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TRADEMARK REGISTRATION TREATY

Implementing Legislation

On September 3, 1975 the Trademark Registration Treaty (TRT), signed at Vienna, Austria, on June 12, 1973, was transmitted by the President to the Senate of the United States with a view to receiving its advice and consent to ratification. Legislation designed to implement the TRT has been prepared by the Patent and Trademark Office in the Department of Commerce.

Following a suggestion by the General Accounting Office, the Patent and Trademark Office is planning a survey of a random sample of United States trademark owners who would have a direct interest in the TRT and in the changes required in United States trademark law. In order to provide the interested public with the information on which the sampled companies will base their responses, the complete draft legislation, including Summary, Statement of Purpose and Need and Sectional Analysis is reproduced below. A copy of the survey questionnaire will be published in a future issue of the OFFICIAL GAZETTE.

The text of the TRT was reproduced in the OFFICIAL GAZETTE *of July 24, 1973. Some post conference documents, including a history of the Treaty, were reproduced in the* OFFICIAL GAZETTE *of February 11, 1974. The report of the United States delegation to the Vienna Conference was reproduced in the* OFFICIAL GAZETTE *of February 11, 1975. Additional copies of the material reproduced below as well as the previous* OFFICIAL GAZETTE *publications are available upon request to the Commissioner of Patents and Trademarks.*

DONALD W. BANNER,
Commissioner of Patents and Trademarks

Date July 11, 1978.

SUMMARY

In 1973, the United States and thirteen other countries signed the Trademark Registration Treaty. This Treaty was transmitted to the Senate on September 3, 1975, with a view to advice and consent to receiving its ratification.

The Trademark Registration Treaty will establish an international trademark filing arrangement, through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Since the Treaty is not self-executing, the instrument of United States ratification will not be deposited until the necessary implementing legislation is enacted.

The proposed implementing legislation effects the necessary changes in the trademark statutes and provides to persons filing domestic applications the same benefits in the United States as those accorded under the Treaty. The implementing legislation would not come into force until the Treaty enters into force. Entry into force requires the deposit of instruments of ratification or accession by five States.

STATEMENT OF PURPOSE AND NEED

The enclosed bill would amend the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) to implement the Trademark Registration Treaty and make certain of its benefits available to persons filing national applications for United States trademark registration.

First, the bill would implement the Trademark Registration Treaty (TRT), an agreement adopted on June 12, 1973, by the Vienna Diplomatic Conference on Industrial Property to facilitate the protection of trademarks used or intended to be used in international commerce. This Treaty was signed by the United States and was transmitted by the President to the Senate of the United States on September 3, 1975, with a view to receiving its advice and consent to ratification.

Ratification of the Treaty and its implementation by this bill would enable United States nationals and residents to avail themselves of the advantages offered by the Treaty when it has entered into force with respect to the United States. In addition to the procedural implementing provisions, the bill would effect certain changes in the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) that are required to be made in order to comply with certain conditions and requirements of the Trademark Registration Treaty. These changes would not come into effect until the entry into force of the Treaty.

Second, the bill also makes modifications in the present law to provide to United States nationals and residents the same benefits when filing national applications for trademark registration in the United States Patent and Trademark Office as would be available to such applicants in the United States if filing under the Treaty.

Purpose of Trademark Registration Treaty

The Trademark Registration Treaty has as its primary purpose the establishment of a trademark filing arrangement through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Separate actions in approximately 150 jurisdictions (i.e. States, possessions, territories, etc.) are now required by United States companies in order to extend the protection of a trademark throughout the world. The complexity and high cost of establishing and protecting trademarks in international markets through the diverse national laws and procedures is a serious problem for businessmen seeking to further their commercial objectives by the sale of trademarked products across national boundaries. However, if trademark protection in potential foreign markets is not secured promptly, the unprotected mark is frequently appropriated by a "pirate" or may even be coincidentally adopted by another.

The entry into force of the Trademark Registration Treaty would help alleviate these problems by establishing an alternative international registration procedure through which the effects of national trademark registration in member countries could be secured, maintained and renewed on a central international register of marks. With a few exceptions, the effects of international registration in each participating State would remain subject to the substantive requirements of the national laws of such State.

History of Treaty Development

The Trademark Registration Treaty is the culmination of continuous efforts, since 1965, by the United States, to participate in an acceptable international arrangement to facilitate the protection of trademarks in international commerce. Consideration was first given to the possibility of United States adherence to the Madrid Agreement for the International Registration of Marks, a special arrangement under the Paris Convention for the Protection of Industrial Property. The Madrid Agreement, in force since 1891, has long operated successfully among twenty-three countries, principally European.

By 1968, it became apparent that there was substantial U.S. private sector opposition to adherence to the Madrid Agreement in its present form, largely because of certain of its features which, it was argued, would be contrary to the interests of United States firms.

From 1968 to 1970, there were efforts to revise the Madrid Agreement to correct these alleged deficiencies, but these efforts were not successful. However, whereas there was opposition to our adherence to the Madrid Agreement, interested private groups continued to urge United States participation in an acceptable trademark registration treaty.

In September, 1970, a United States sponsored resolution to develop a new trademark registration treaty was adopted unanimously by the competent administrative organs of the Paris Convention. After several drafts and examination by three Committees of Experts and several Consultants' groups, a final draft was considered at a diplomatic conference held in Vienna, Austria, from May 17 to June 12, 1973. Fifty States and thirty-one international organizations (governmental and non-governmental) were represented at the conference. On June 12, 1973, the Trademark Registration Treaty was signed by eight countries, including the United States, and remained open for signature until December 31, 1973, by which date a total of fourteen countries had become signatories. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession. To date, none of the signatory States has ratified the Treaty. Four States (Congo, Gabon, Togo, and Upper Volta) have deposited instruments of accession.

Main Features of Treaty

The Trademark Registration Treaty will establish a multilateral trademark filing arrangement for residents or nationals of its member countries, which provides easier procedures for securing, administering and maintaining national trademark registration effects in other countries by filing a single international application, securing a single international registration and maintaining a record of such rights on a central international register. International registration amounts to central recording of a "bundle of national rights" rather than a separate property right.

With some exceptions (as noted below), the substantive aspects of rights are regulated by each member State according to its national law. The main features of the Treaty are as follows:

1. A national or resident of a member State may file directly with the International Bureau of the World Intellectual Property Organization an international application designating the States in which protection of the trademark is desired. Any number of States, including the applicant's home State, may be designated.

2. The international application may claim the priority (Paris Convention "right of priority") of an earlier first application to register the same trademark.

3. The application is subject to an international fee plus a fee for each designated State (not higher than 100% of the total fees for national registration).

4. After a brief examination as to formal requirements, the trademark is registered by the International Bureau. The details of the international registration are promptly published in English and French in an international gazette and communicated to each of the designated States.

5. Unless refused by a designated State, the international registration is accorded the same legal effect as if the same trademark were registered nationally in that State. The time limit for the initial notice of refusal, including all reasons or possible reasons for refusal, is fifteen months from the date of the international publication. The reasons for refusal cannot be different from those applicable to national applications.

6. If initially refused by any designated State, the owner is notified of the refusal and is guaranteed the same procedural rights of re-examination and/or remedies available in the case of refusals of national trademark applications. Further proceedings are not subject to any Treaty time limits, and are carried out directly between the owner and the concerned national office.

7. The effects of an international registration may be cancelled in any designated State according to the national law of that State. The effect of cancellation is limited to the State in which the legal action for cancellation was brought.

8. An international registration may be renewed at ten year intervals by a single renewal application filed with the International Bureau.

9. States not originally designated may be added later by requesting the recording of later designations of the new States.

10. Assignments, changes of name, limitations of the goods and/or services, etc. may be recorded by filing a single international request, with the same legal effect as if recorded in the national registers.

11. Non-use of the trademark during an initial period of three years counted from the filing date cannot result in refusal or cancellation by any State. However, any State may require that the owner declare his intention to use the trademark in that State and may further provide in its law that no action for infringement may be commenced until the continuing use of the trademark in that State has started and that any remedy (e.g. damages or profits) may relate only to the period after use has commenced.

The benefits of the Treaty will be available only to nationals or residents of member countries. As to such persons, the Treaty may be used to secure protection in a few countries, or in many, depending upon the extent of the commercial interests.

The Treaty provides that the contracting States shall constitute a Union for the international registration of marks. The provisions for administration of the Union are similar to those established for the Patent Cooperation Treaty, which was transmitted to the Senate on September 12, 1972, and was favorably acted on by that body on October 30, 1973.

The Regulations annexed to the Treaty provide rules concerning administrative requirements and procedures and details useful in implementation of the Articles.

Interest of Other Countries

In addition to the United States, the signatories of the TRT include a number of major trading countries (e.g. Federal Republic of Germany, United Kingdom, Italy, Sweden, Austria). Others are awaiting developments in the United States, which furnished primary impetus to the negotiations. In particular, the interest of most Western European countries is contingent upon United States ratification, primarily because of the existence of the Madrid Agreement. The Trademark Registration Treaty is more modern than the Madrid Agreement, has more advantages for trademark owners and eliminates features which have long inhibited the territorial growth of the Madrid system. However, the position of the Madrid Agreement members is dependent upon the interest of major countries outside that Union in the new arrangement. Of these, the United States is clearly the most important. However, Japan, United Kingdom, Canada, and the Scandinavian group are among other countries outside the Madrid Union which are known to be seriously considering participating in the TRT arrangement, or, failing that, in some other multilateral agreement, such as Madrid.

Main Advantages

The main advantages of the Treaty are the simplified procedures provided in order to secure national registration effects, to maintain the rights thereby acquired, and to continue these rights by renewal. Other benefits are the time limits for national refusal notifications and the limitations on national use requirements.

The Treaty will not be a panacea for all trademark problems. It will establish what is essentially a multilateral trademark filing arrangement, reserving (except for a few points) the substantive aspects of rights to regulation on a country-by-country basis under the national law of each country. However, by limiting participation to States having previously adhered to the Paris Convention for the Protection of Industrial Property, it assimilates or applies the norms and standards of trademark protection law which have been agreed to by the eighty-seven member countries of that Union over the almost 100 years of its existence. The fact that its filing, maintenance and administrative procedures are independent of national procedures means that a framework for future development of international substantive standards and further rationalization of procedures is provided. Also, since trademark piracy is best dealt with preemptively by prompt filing and diligent maintenance practices, the Treaty attacks this problem directly by facilitating the filing and maintenance procedures.

Even the short range objectives and benefits will not be immediately realized upon United States ratification. Five States must ratify before the Treaty enters into force. To date, only eighteen out of the eighty-seven potential member States have taken positive steps (i.e. fourteen signatories and four adherents). The benefits of simplified filing and maintenance will accrue in proportion to the number of member States.

Effect on U.S. System—Cost

As the Treaty matures in terms of the number of participating States, one of its effects will probably be an increase of foreign origin filings in this country (present foreign origin filings are less than 10% of total filings). It is fundamental that the benefits of simplification accrue in both directions. To the extent that any increased filings reflect existing commercial rights, this result would be consistent with a fundamental purpose of the federal trademark registration system, i.e. the central recording of marks in which rights may exist. Because registration is not mandatory in order to secure rights in a trademark in the United States (and this would not change under the Treaty), the U.S. system is designed to encourage federal registration, in order to provide centralized information to those searching for and selecting new marks for new products or services to be sold in commerce. Part of the increase, as explained later, may result from permitting the filing and registration of marks based on an intent to use as an alternative to actual use.

Since the intent to use amendments to be effected by the bill will not come into force until the date of entry into force of the Treaty, none of the financial consequences will accrue until after that date. It is assumed that entry into force will occur promptly after United States ratification, if not before that date. Assuming action by the 95th Congress, increased incremental costs and manpower requirements of the Patent and Trademark Office have been estimated as shown in the following chart.

ESTIMATED COSTS INCURRED BY RATIFICATION OF TRT AND ENACTMENT OF RELATED LEGISLATION[1]

[Dollar Amounts in Thousands]

	FY 1979		Adjustment for FY 1980		Total FY 1980		Adjustment for FY 1981		Total FY 1981	
	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar
Operational printing [2]		584.9		+65.7		650.6		+54.8		705.4
Operational, other [3]	21.7	420.3	+11.8	+252.6	33.5	672.9	+7.2	+176.1	40.7	849.0
Start-up [4]	3.0	106.8	−2.0	−70.7	1.0	36.1	−1.0	−31.2		4.9
	24.7	1,112.0			34.5	1,359.6			40.7	1,559.3

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[1] These estimated costs will be partially offset by fees to the same extent as under our national system.

[2] Assumes additional publication of all applications will be required; see discussion of Sections 9 and 10 of bill in the Sectional Analysis.

[3] Includes supervisory, professional and clerical personnel, and mail.

[4] Includes Legislation and International staff, Organization and Systems, and all travel.

[5] Only travel remains.

An important caveat is that many of the assumptions on which the above estimates are based are, at this point, very speculative. Also, since the Treaty provides for the assessment of country designation fees (paid centrally) at a level equal to the fees for national registration, any increased operational costs of the Patent and Trademark Office due to increased filings will be offset to the same extent as under the national system. The above cost estimate does not reflect these partially offsetting fees.

Additional cost factors, too remote for attempting to estimate at this time, involve contributions to the World Intellectual Property Organization (WIPO) which will serve as the International Bureau under the Treaty. Article 34(5) of the Treaty establishes a working capital fund, constituted by a single payment made by each contracting State. Based on the experience in the case of other treaties administered by WIPO, it is believed that consideration of any working capital fund would be deferred, at least, until several years after the Treaty enters into force. The amount of the initial payment of each contracting State to this fund is computed with due regard to the number of international applications which are filed by residents of that State. Thus, a direct relationship exists between the amount of the payment by the United States and the use of the TRT by U.S. companies.

In starting up for operations under the TRT, the International Bureau will have to establish a budget financed from fees and charges for services rendered by the International Bureau, from sales of publications and other miscellaneous income. While the Madrid Agreement, also administered by WIPO, has operated at a profit for many years, and the TRT is designed to be self-supporting under normal circumstances (Article 34(4)), the possibility of deficits cannot be ruled out altogether. Deficits would be covered out of the working capital fund, which fund would then be reimbursed by the States. Deficits are not expected to be of any significant magnitude. Contributions to the working capital fund would be the responsibility of the Department of State.

Effect on U.S. Trademark Law

Participation in the international system will require that our national trademark law be amended in a number of respects. The most fundamental change is one which would permit the securing of a national registration in the United States based on intention to use the trademark applied for, and provide for an initial period of 3 years during which nonuse of the mark could not be a basis for refusing or cancelling such registration. Consistent with the Treaty, the proposed legislation provides that infringement actions in the courts would continue to be contingent upon the commencement of use, however.

As explained by the President in forwarding the Treaty to the Senate for its advice and consent, there is a sharp difference of opinion among interested persons, firms and associations in the United States as to the desirability of making this change, and, to a lesser extent, other less significant changes, required by the Treaty, in our national law.

The essence of the change in United States law is that it would move us from the strict use approach (today held to only by the United States, and a few other countries, e.g. Republic of Philippines, Panama) to the middle position, i.e. a use or intention to use system similar in principle to that of the British. The change is believed to be more consistent with the legitimate needs of businessmen, especially where international trade is contemplated.

Intention To Use Legislation

In fact, legislation permitting the filing of a trademark application based on an intent to use was widely supported in the private sector and, in the 91st Congress, identical House and Senate bills, substantially the same as the earlier Senate bills, were introduced at the request of the Administration (S. 3110, McClellan; H.R. 14050 Kastenmeier). This legislation was not reintroduced in the 93rd and 94th Congresses, however, since it was known at an early stage in the Treaty negotiations that the use requirements of the United States would be affected.

The support of intention to use legislation in the United States had its foundation in domestic concerns. Under present law actual use of a mark is a prerequisite to the filing of an application for registration. Thus, every applicant for federal registration, in addition to other requirements, must specify in his application the date of first use of the mark and the date of first use in commerce over which Congress has control (usually interstate commerce).

As applied to the adoption of new trademarks, the requirement of establishing use of a mark prior to applying for its registration is unrealistic since the time interval between clearance and adoption of a trademark and use of commercial quantities varies from several months to several years depending upon the products involved. Typically, before a consumer product is marketed commercially, there is considerable time and effort expended in the developmental effects. After having undertaken the effort and expense of creating and planning the promotion of a new mark, however, the businessman may find that the mark is not registrable because of conflict with another mark or some other reason. These problems led to the drafting and introduction of intent to use legislation.

Canada, in 1954, after careful study, adopted a system permitting applications for registration on the basis of an owner's proposed use. The Canadian system is favorably regarded by businessmen, as are the intention to use systems of many other nations. Approximately one-half of the trademark applications filed today in Canada are based on proposed use, rather than actual use, evidencing the usefulness and acceptability of the system.

Differences Between Previous Intention To Use Legislation and the Treaty

Although similar in terms of their substantive effect, the "intent to use" amendments previously proposed in this country do not satisfy the requirements of the Treaty. There are two basic differences:

> (1) The time period under the Treaty during which use may not be required cannot be less than 3 years, counted from the filing date.
>
> Under the "intent to use" bills, the time period was flexible, depending upon the length of time consumed by the examination, i.e. 90 days, counted from the date of allowance of the application by the examiner (a shorter period if the application were opposed). Although entirely dependent upon pendency experience of the Patent and Trademark Office, the period of permitted non-use of most of the applied for marks under those bills would have been in the approximate range of one to two years, counted from the filing date.

Whereas the Treaty permits the "reserving" of a mark for an initial 3 years, more extended "reserving" may be precluded under Article 19(3) and this is done in the proposed implementing legislation. Thus, the 3 year period cannot be extended except for extraordinary reasons. The fact that an application is still pending at the date of expiration of the 3 years may *not* be accepted as a reason for extension. The use requirements after 3 years are the same as under present law.

> (2) Under the Treaty, the national *registration* effect of an international registration may not, for the initial three year period, be refused or cancelled on the ground of non-use. However, any country may provide that the right to sue for infringement of the registered mark (even during the three years) is subject to the condition of use, i.e. no right to sue until after continuous use has commenced; and that any remedy may relate only to the period after use has commenced.
>
> Under the "intent to use" bills, an application could be filed, and priority secured, based on intent to use, without actual use, but the *registration* would not issue until a declaration demonstrating actual use had been filed and accepted.

The implementing legislation takes into account the above differences, as the Treaty requires. Also, in all respects, the benefits to applicants from the 3 year use moratorium are accorded to United States residents filing regular national applications in the United States as well as to those applicants filing under the Treaty.

A BILL

To amend the Act entitled "An Act to provide for the registration and protection of trademarks used in commerce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946, as amended.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, that, in order to carry out the provisions of the Trademark Registration Treaty and extend its benefits to citizens and residents of the United States pursuant to the authority of Congress to regulate commerce within its control, section 1 of the Act entitled "An Act to provide for the registration and protection of trademarks used in commerce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946 (60 Stat. 427), as amended, is amended to read as follows:

"(a) Any person who is the owner of a trademark which is used or intended to be used in commerce may register that trademark on the principal register hereby established, subject to the conditions and requirements of this Act.

"(b) Application by a person described in section 1(a) to register a trademark on the principal register may be made:

(1) By paying in the Patent and Trademark Office the filing fee and filing in such Office—

(A) A written application, in such form as may be prescribed by the Commissioner, signed by the applicant or by a duly appointed representative of the applicant, specifying the applicant's domicile and citizenship and the particular goods in connection with which the trademark is used or intended to be used in commerce;

(B) A drawing of the trademark;

(C) Except where the declaration under section 1(c) is filed together with the application, a declaration of the applicant's intention to use the trademark in commerce in connection with the goods specified in the application;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By designating the United States in an international registration, or in the recording of any later designation in an international registration, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty: *Provided*, That—

(A) the person applying was entitled to file international applications, is entitled to own international registrations, and is the Owner of the international registration of the trademark sought to be registered under this Act; and

(B) a declaration of such person's intention to use the trademark in commerce in connection with the goods specified in the international registration is notified to the Patent and Trademark Office in conformity with the said Treaty.

"A person whose international application, or request for the recording of later designation, designating the United States, has been declined by the International Bureau may apply to register the same trademark under paragraph (1) of this subsection. If the application under paragraph (1) is filed in the Patent and Trademark Office prior to the expiration of two months, counted from the date of the notification by the International Bureau of its declining of the corresponding international application or request, and if the Commissioner determines that such declining was not justified, the application shall be treated as if it had been filed on the date which would have been the international registration date or the recording date of the later designation had the declining not taken place.

"(c)(1) The applicant of an application for registration under this Act, or the registrant of a registration issued on the basis of such application, shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the trademark is in use in commerce and that such use commenced on or prior to the date of expiration of three years counted from the filing date of the application, and specifying the date of his first use of the trademark, the date of his first use of the trademark in commerce, those of the particular goods identified in the registration, or, if the registration has not been issued, in the application for registration, in connection with which the trademark is used, and the mode or manner in which the trademark is used in connection with such goods. The declaration shall be signed by the registrant or his duly appointed representative, or, if the registration has not been issued, by the applicant or his duly appointed representative, and it shall be accompanied by such number of specimens or facsimiles of the trademark as actually used as may be prescribed by the Commissioner. Where the declaration concerns an application filed under, or registration issued pursuant to, section 1(b)(2), it may, in such form as may be prescribed by the Commissioner or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application to which it pertains, or later: *Provided*, That unless such declaration has been filed prior to the expiration of four years, counted from the filing date, the Commissioner shall cancel the registration, if issued, or refuse the application for registration, if pending. If the declaration is accepted in respect of fewer than all of the goods stated in the registration or identified in the application, the application or registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is in use in commerce.

(3) If an application for registration is pending after the expiration of the three-year period referred to in paragraph (1) of this subsection, or if a registration is relied upon in an opposition or cancellation proceeding under this Act which was filed, or which is pending, after the expiration of such period, the Commissioner may require that the declaration under this subsection in respect of such application or registration be filed within such earlier period as he may prescribe: *Provided*, That such earlier period shall not expire earlier than 2 months, counted from the date of a notice mailed to the applicant or registrant.

(4) If a person who applied for registration of a trademark under this Act, or any successor, assignee or related company of such applicant, shall subsequently apply for registration under this Act of the same or a substantially equivalent trademark on or prior to the date of expiration of five years from the filing date of the said earlier application in respect of all or fewer than all of the goods recited in the said earlier application, the three-year period referred to in paragraph (1) of this subsection shall, in respect of those of the goods which are the same, be counted from the filing date of the said earlier application, or if there were more than one such earlier application, from the filing date of the earliest of them: *Provided*, That this paragraph shall not be applicable if a declaration of use

conforming to the requirements of this subsection is filed together with the said subsequently filed application.

(5) Upon a satisfactory showing by the applicant or registrant that his failure to commence use of the mark in commerce on or prior to the date of expiration of the three-year period referred to in paragraph (1) of this subsection was due to extraordinary circumstances which excuse such failure and was not due to any intention to abandon the mark, the Commissioner may extend the date of expiration of the said period and of the time limit for filing the declaration under this subsection: *Provided*, That the said expiration dates may not be extended for the reason that the application for registration was pending after the date of expiration of the said three-year period.

(6) The Commissioner shall notify the applicant or registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor.

"(d) In any application in respect of which the declaration under section 1(c) has been filed, the applicant may claim concurrent use. If concurrent use is claimed, the applicant shall state exceptions to his claim of exclusive use, in which he shall specify, to the extent of his knowledge, any concurrent use by others, the goods in connection with which and the areas in which each concurrent use exists, the periods of each use, and the goods and area for which the applicant desires registration.

"(e) If the applicant is not domiciled in the United States he shall designate by a written document filed in the Patent and Trademark Office the name and address of some person resident in the United States on whom may be served notices or process in proceedings affecting the trademark. Such notices or process may be served upon the person so designated by leaving with him or mailing to him a copy thereof at the address specified in the last designation so filed. Unless filed with the application, the document designating such person shall be filed on or prior to the date on which the applicant, or the registrant of any registration issued on the basis of such application, replies to any communication by the examiner, or otherwise institutes or defends any proceeding under this Act, relating to such application or registration. Until such person has been designated, or if the person so designated cannot be found at the address given in the last designation, such notices or process may be served upon the Commissioner."

Sec. 2 The first sentence of section 3 of such Act is amended by striking out "used in commerce".

Sec. 3 The first sentence of section 4 of such Act is amended by striking out "used in commerce" and by inserting, following "exercising", the words "or intending to exercise".

Sec. 4 Section 5 of such Act is amended by inserting, following "used" (first occurrence), the words ", or is intended to be used,"; and by inserting, following "use" (both occurrences), the words "or intention to use".

Sec. 5(a) The second sentence of section 7(a) of such Act is amended by inserting, following "date" (third occurrence), the words "of issue"; by striking out "date on which the application for registration was received in the Patent and Trademark Office" and inserting in lieu thereof the words "filing date"; and by changing the period at the end of the sentence to a colon and adding the following proviso:

"*Provided*, That if the declaration under section 1(c) has not been filed, this fact shall be indicated in lieu of the dates of first use of the mark."

(b) A new sentence is added to section 7(a) of such Act reading as follows:

"The Commissioner shall cause a notice concerning the issuance of the registration to be published in the Official Gazette of the Patent and Trademark Office."

(c) Section 7(b) of such Act is amended to read as follows:

"Subject to any conditions and limitations stated therein, a certificate of registration of a mark upon the principal register provided by this Act shall be prima facie evidence of the validity of the registration, of the registrant's ownership of the mark, and of the right of the registrant to prevent registration under this Act by any other person, except a lawful concurrent user, of the mark either in the identical form as reproduced in the registration, or in such near resemblance thereto as to be likely, when applied to the goods or services of such other person, to cause confusion or to cause mistake, or to deceive."

(d) Section 7(d) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The registrant of any registration under this Act may limit the goods and/or services specified in his registration by filing an application, in such form as may be prescribed by the Commissioner, for the recording of such limitation or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), by filing at the International Bureau a request for the recording of a limitation, in respect of the United States, of the goods and/or services of the international registration on the basis of which such registration was issued. The Commissioner shall refuse to record any limitation requested by the registrant if its effect would be to enlarge the scope of the goods and/or services beyond that of the goods and/or services specified in the registration. The recording by the International Bureau of a limitation of the goods and/or services, in respect of the United States, of an international registration shall, unless refused by the Commissioner, have the same effect as if such limitation had been entered in the records of the Patent and Trademark Office on the same date of such recording."

"(3) Where the Commissioner has limited the goods and/or services of any registration pursuant to the provisions of paragraph (2) of this subsection, or sections 1(c)(2), 8(a)(2), or 9(c)(2) of this Act, appropriate entry of such limitation shall be made in the records of the Patent and Trademark Office and, if requested by the registrant, upon the certificate of registration or, if such copy is lost or destroyed, upon a certified copy thereof."

(e) Section 7 of such Act is amended by adding, after subsection 7(g), the following new subsection:

"(h)(1) Appropriate entry shall be made in the records of the Patent and Trademark Office of any recording notified to it by the International Bureau in respect of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), unless the effect of such recording has been refused in conformity with the provisions of this Act or of the Trademark Registration Treaty.

(2) The Commissioner shall notify the International Bureau as provided in the Trademark Registration Treaty before making any entry, other than as specified in paragraph (1) of this subsection, in the records of the Patent and Trademark Office in respect of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), and the entry in such records shall not be made until the corresponding entry has been annotated and published by the International Bureau as provided in the said Treaty."

Sec. 6 Section 8(a) of such Act is amended to read as follows:

"(1) The initial term of a registration under this Act shall be 10 years counted from the filing date:

Provided, That the registration of any mark under the provisions of this Act shall be cancelled by the Commissioner at the end of 6 years counted from its date of issue, unless, within 1 year next preceding the expiration of such 6 year period, the registrant shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, an affidavit or declaration showing that the mark is still in use in commerce. Special notice of the requirement for such affidavit or declaration shall be attached to each certificate of registration. Where the affidavit or declaration concerns a registration issued pursuant to section 1(b)(2), it may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the same date as the date on which it was received by the International Bureau.

(2) If the affidavit or declaration of use under paragraph (1) of this subsection is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods and/or services specified in the affidavit or declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the affidavit or declaration under this section."

Sec. 7 Section 9 of such Act is amended to read as follows:

"(a) The owner of a mark which is still in use in commerce may renew his registration of that mark for periods of ten years from the end of each expiring period of the registration, subject to the conditions and requirements of this Act.

"(b) Renewal of a registration by a person described in section 9(a) may be effected:

(1) By paying in the Patent and Trademark Office the prescribed fee and filing in such Office—

(A) within the six months next preceding the date of expiration of the period for which the registration was issued or renewed, an application for renewal; or

(B) prior to the expiration of six months counted from the date of expiration of the period for which the registration was issued or renewed, an application for late renewal, on payment of the additional fee herein prescribed;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By the renewal of an international registration in respect of which the United States is a designated State, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, *Provided:* That the person applying is entitled to own international registrations and is the Owner of the international registration of the mark sought to be renewed under this Act.

If the Commissioner refuses an application for renewal of a registration filed under paragraph (1), he shall notify the registrant of his refusal and the reasons therefor. The provisions of section 1(e) shall be applicable to any person not domiciled in the United States who applies for or effects the renewal of a registration under this Act.

"(c)(1) The registrant of a registration renewed under this Act shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the mark is still in use in commerce, and specifying those of the particular goods and/or services identified in the registration on or in connection with which the mark is so used. The declaration shall be signed by the registrant or by his duly appointed representative, and shall be accompanied by a specimen or facsimile showing current use of the mark. Where the renewal is effected pursuant to section 9(b)(2), tbe declaration may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application for renewal under section 9(b)(1), or, in the case of a renewal effected pursuant to section 9(b)(2), with the demand for renewal of the corresponding international registration filed with the International Bureau, or later: *Provided*, That unless such declaration has been filed prior to the expiration of six months, counted from the starting date of the term of renewal, the Commissioner shall cancel the registration. If the declaration is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the declaration under this section.

(4) The Commissioner shall notify the registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor."

Sec. 8(a) Section 10 of such Act is amended by inserting, preceding the first sentence of such section, "(a)(1)", by striking out "(d)" in the last sentence and inserting in lieu thereof "(e)", and by adding at the end of such section the following new paragraphs:

"(2) A change in the ownership of a registration or application for registration under this Act may be recorded in the Patent and Trademark Office in such form as may be prescribed by the Commissioner, or, in the case of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in Ownership, in respect of the United States, of the international registration on the basis of which such application was filed or such registration was issued. The recording by the International Bureau of a change in the Ownership, in respect of the United States, of an international registration shall, if valid, have the same effect as if such change had been entered in the records of the Patent and Trademark Office on the same date as the date of such international recording.

"(3) The recording of a change in ownership pursuant to paragraph (2) which is the result of an assignment of the registered or applied for mark shall, as of the date of such recording, be accorded the same effects as those which are accorded to the recording of such assignment: *Provided*, That within three months from the date of notice of such recording, mailed to the person who applied therefor, or, where the recording is effected by the International Bureau, from the date of publication of such international recording, instruments of assignment conforming to the requirements of paragraph (1) have been recorded in the Patent and Trademark Office.

"(4) Any person, not entitled to file international applications, who has, nevertheless, become the owner of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), other than as a result of a contract between him and the previous applicant or registrant, may file an application for registration of the same mark under section 1(b)(1). If the application under section 1(b)(1) is filed by such person in the Patent and Trademark Office within two years from the said change in ownership and prior to six months after the expiration of the initial term, or of the then running term of renewal, of the international registration on which such application or registration is based, it shall, in respect of those of the goods and/or services which are the same, be treated as if it had been filed on the same date as the date on which the designation of the United States in such corresponding international registration took effect: *Provided*, That such application under section 1(b)(1) conforms to all of the requirements of this Act."

(b) Section 10 of such Act is amended by adding the following subsections:

"(b) Instruments evidencing changes in the name of the applicant or registrant may be recorded in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, or, in the case of a registration issued on the basis of an application filed under section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in the name of the Owner of the international registration on the basis of which such registration was issued. The recording by the International Bureau of a change in the name of the Owner of an international registration, in which the United States is a designated State, shall, if valid, have the same effect as if it had been entered in the records of the Patent and Trademark Office on the same date as the date of such recording.

"(c) Where at any time, as a result of a final decision in any proceeding under this Act, it is determined that a recording made under this section is void or that such recording was made contrary to the requirements of the Act, the Commissioner shall, upon request of any interested party, cause an appropriate correction to be entered in the records of the Patent and Trademark Office. If such recording was effected on the basis of a recording in respect of an international registration, the Commissioner shall, if appropriate, deny the effect of such international recording and notify the International Bureau accordingly, as prescribed in the Trademark Registration Treaty."

Sec. 9 Section 12(a) of such Act is amended to read as follows:

"Upon the filing of an application for registration, the Commissioner shall refer the application to the examiner in charge of the registration of marks, who shall cause an examination to be made. Unless the application has been previously withdrawn or abandoned, the mark shall be published in the Official Gazette of the Patent and Trademark Office at such time as the Commissioner shall prescribe, not later than 12 months, counted from the filing date of the application. In the case of an applicant claiming concurrent use, or in the case of an application to be placed in an interference as provided for in section 16 of this Act, the mark may be published subject to the determination of the rights of the parties to such proceedings."

Sec. 10 Section 12(b) of such Act is amended by striking out "6" in two places and inserting, in lieu thereof "3" and by adding at the end thereof:

"Except for the failure of an applicant to comply with the requirements of section 1(c), no mark shall be refused registration for a reason which has not been indicated in a communication given or mailed to the applicant on or prior to 12 months, counted from the filing date: *Provided*, That this limitation shall not apply to any refusal determined by the Trademark Trial and Appeal Board or by a court."

Sec. 11 The second sentence of section 13 of such Act is amended by changing the period at the end of this sentence fo a colon and adding a proviso and a new third sentence reading as follows:

"*Provided*, That such time shall in no event be extended to a date which is later than 14 months, counted from the filing date of the application for registration in respect of which the extension of time for filing opposition is requested. An opposition may be filed by a duly authorized attorney of the opposer."

Sec. 12 Section 14 of such Act is amended by inserting, following "person" the words, "or by a duly authorized attorney of any person"; by inserting, following "date" in clause (a), the words "of issue", and by inserting, following "thereunder", in clause (c), the following words:

"or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), on the ground that the registrant was not entitled to own international registrations,".

Sec. 13 The first sentence of section 15 of such Act is amended by inserting, following the third occurrence of "date", the words "of issue".

Sec. 14 The first sentence of section 16 of such Act is amended by inserting, following "may" the words ", prior to the publication under section 12(a) of such mark,".

Sec. 15 Section 17 of such Act is amended by inserting, between the first and second sentences thereof:

"Where an interference, opposition to registration or concurrent user proceeding concerns an application for registration under this Act of a mark, the entitlement to registration of which has not been finally determined by the examiner in charge of the registration of marks or, as a result of an appeal from a final refusal of the examiner, by the Trademark Trial and Appeal Board or a court, the Commissioner may, with notice to all parties, defer the commencement of such proceeding until such final determination has been made."

Sec. 16 The first sentence of paragraph (1) of section 21(a) of such Act is amended by inserting, following "affidavit", the words "or declaration"; and by striking out "section 8" and inserting in lieu thereof "section 8, 1(c), or 9(c)".

Sec. 17 Section 22 of such Act is amended by inserting, at the beginning of the sentence, "Issuance of a" and by changing the "R" in "Registration" to "r".

Sec. 18 Section 23 of such Act is amended by inserting, following "commerce" in the second sentence of such section, ", or are intended to be used in commerce,"; by striking out in the second sentence of such section "for the year preceding the filing of the application"; by inserting between the second and third sentences of such section: "An application for the registration of a mark shall be treated as an application under this section only if the application or, in the case of an application pursuant to section 1(b)(2), if the international registration or recording of later designation which is the basis for such application, contains an indication to this effect."; and by striking out in its entirety the last sentence of such section.

Sec. 19(a) The second sentence of section 24 of such Act is amended by inserting, preceding "may," the words ", or his duly authorized attorney," and by striking out the word "verified".

(b) The fourth sentence of section 24 of such Act is amended by inserting, following "used", the words ", following the date of expiration of the period referred to in section 1(c)(1),".

Sec. 20 The second sentence of section 30 of such Act is amended to read as follows:

"When the goods and/or services specified in an application fall within a plurality of classes, a fee equalling the sum of the fees for filing an application in each class shall be paid, and the Commissioner may issue a single certificate of registration for such mark."

Sec. 21(a) Subsection (a) of section 31 of such Act is amended by striking out paragraph (3) of such subsection, by appropriately renumbering the remaining paragraphs; and by inserting, following "mark" in newly renumbered clause (6) (old paragraph (7)), ", change in the name of the registrant,".

(b) Section 31 of such Act is amended by adding, after subsection 31(c), the following new subsection:

"(d) The fees specified in paragraphs (1) and (2) of subsection (a) shall, in the case of applications pursuant to section 1(b)(2) and renewals pursuant to section 9(b)(2), be deemed to be substituted for, respectively, by the individual State fees and the individual State renewal fees applicable to designations of and renewals concerning the United States pursuant to the Trademark Registration Treaty. The Commissioner shall communicate to the International Bureau the amounts of such individual State fee and individual State renewal fee and such amounts shall be the same, respectively, as the amounts of the fees specified in paragraphs (1) and (2) of subsection (a)."

Sec. 22 Section 32(1) of such Act is amended by adding at the end of such section the following sentence:

"No action under this section may be started by the registrant of a registration issued under this Act until the declaration under section 1(c) in respect of the mark which is the subject of such registration has been filed in the Patent and Trademark Office and accepted by the Commissioner."

Sec. 23(a) Section 33(a) of such Act is amended by inserting following "registration" (second occurrence), the words ", and in respect of which the mark is stated to be in use in commerce in the registration, or in the declaration under section 1(c) which has been filed in the Patent and Trademark Office and accepted by the Commissioner,"

(b) Paragraph (5) of section 33(b) of such Act is amended by inserting, preceding "registration" the words "the date of issue of the".

(c) Section 33 of such Act is amended by adding, after subsection 33(b), a new subsection reading as follows:

"(c) For the purpose of determining priority of rights in any proceeding under this Act, an application for registration of a mark which has not been withdrawn or abandoned or a registration issued on the basis of such application, shall, from and after its filing date, be accorded the same effect as if the applicant, or the registrant, had commenced use of the mark in commerce on the said filing date, without derogation, however, of any earlier priority based on use of the mark commenced earlier than the said filing date or of any right of priority to which the applicant or registrant may be entitled pursuant to section 44(d) of this Act."

Sec. 24 Section 35 of such Act is amended by adding at the end of such section the following sentence:

"Any remedy under this section shall relate only to the period after the registrant commenced the continuing use of the mark in commerce."

Sec. 25 Section 44(a) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The Commissioner shall keep a register of international registrations designating the United States which have been published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, including renewals thereof and recordings related thereto, and shall be authorized to accord and refuse effects, communicate notifications, make attestations, decide petitions, determine the amounts of and receive payments of fees, and perform all other acts prescribed by the said Treaty, subject to the requirements thereof.

"(3) Where the time limit for a notification to the International Bureau prescribed by the Trademark Registration Treaty is stated in terms of the date of receipt of such notification by the International Bureau, such notification shall be transmitted by Registered Mail no later than 14 days prior to the expiration of the time limit and, except where an agency of the said Bureau, established pursuant to the said Treaty, is operating within the United States, shall be transmitted to that bureau via Air Mail.

"(4) A mark subject of an application under section 1(b)(2) in respect of which no notification of refusal or possible refusal was received by the International Bureau within the time limit fixed in Article 12(2)(a)(i) of the Trademark Registration Treaty shall be automatically entitled to registration under this Act on the same register as the one for which such application was made. Upon request by the applicant of such an application and unless the registration has been previously issued, the Commissioner shall issue the registration to which such applicant is entitled under this paragraph and the date of issue of such registration shall be the date of the Official Gazette next preceding the date of expiration of the said time limit. Registration of a mark under the provisions of this paragraph shall be without prejudice to the right of any person to petition to cancel such registration under section 14 of this Act for any reason, including one which was referred to in a refusal made pursuant to section 12(b) or in an opposition filed pursuant to section 13, the notification of which was not received by the International Bureau or which was not received by such Bureau within the said time limit. If a registration is issued pursuant to this paragraph in respect of a mark, the registration of which had been opposed in a timely filed opposition, the Commissioner shall notify the opposer in such opposition and shall, upon request of such opposer received within 30 days from the date of such notice, direct the Trademark Trial and Appeal Board to determine and decide the rights of registration as if the opposition to registration had been filed as an application to cancel the said registration on the date of issue of such registration.

"(5) Failure by the applicant of an international application or by the Owner of an international registration to act within prescribed time limits in connection with requirements pertaining to an international application, international registration or later designation designating the United States, or to any recording related thereto, may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the Trademark Registration Treaty or by this Act."

SEC. 26 Section 44(c) of such Act is amended by striking out the first sentence of such section; and by striking out the heading, preceding the second sentence, "Country of origin defined."

SEC. 27 Section 44(d) of such Act is amended to read as follows:

"An application for registration of a mark under sections 1, 2, 3, 4 or 23 of this Act filed by a person described in paragraph (b) of this section who has previously duly filed an application for registration of the same mark in one of the countries described in paragraph (b), or a regular international application in respect of the same mark designating at least one country other than the United States, shall be accorded the same force and effect as would be accorded to the same application if filed under this Act on the same date on which such application was first filed in such foreign country, or on which such international application was first filed with the International Bureau: *Provided*, That—

(1) The application under this Act is filed within 6 months from the date on which the application was first filed in the foreign country or on which the international application was first filed with the International Bureau;

(2) The rights acquired by third parties before the date of the filing of the first application in the foreign country or of the first international application shall in no way be affected by a registration obtained on an application filed under this subsection (d):

(3) Nothing in this subsection (d) shall entitle the owner of a registration granted under this section to sue for acts committed prior to the date on which such registrant has commenced the continuing use of the mark in commerce.

In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed foreign application or subsequent regular international application, instead of the first filed foreign application or international application: *Provided*, That any foreign application or international application filed prior to such subsequent application or international application has been withdrawn, abandoned, or otherwise disposed of, without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority."

SEC. 28(a) The paragraphs headed "Trademark," "Service Mark," "Certification Mark," "Collective Mark" and "Intent of Act" in section 45 of such Act are amended by inserting, following each occurrence of "used", the words "or intended to be used".

(b) Clause (a) of the paragraph in section 45 of such Act headed "Abandonment of Mark" is amended to read as follows:

"(a) when its use has not commenced and there is no intent to commence use or when its use has been discontinued with intent not to resume. Lack of intent to commence or intent not to resume may be inferred from the circumstances. If use of a mark has been discontinued, its nonuse for two consecutive years shall be prima facie abandonment."

(c) Section 45 of such Act is amended by adding the following paragraphs:

"*Filing date*. The filing date of an application for registration under section 1(b)(1) shall be the date on which all of the elements prescribed by the Commissioner as minimum elements for according a filing date have been received in the Patent and Trademark Office. The filing date of an application for registration under section 1(b)(2) shall be the same date as the international registration date of the international registration or, if applicable, the recording date of the later designation, on the basis of which such application is filed."

"*Date of issue*. The date of issue of a registration under this Act is the date of the issue of the OFFICIAL GAZETTE of the Patent and Trademark Office in which the notice concerning the issuance of the registration appears."

"*Trademark Registration Treaty*. The term "Trademark Registration Treaty" means the Treaty so entitled, done at Vienna, Austria, on June 12, 1973, including the Regulations under the said Treaty."

"*International application, international registration, request for the recording of later designation, recording of later designation, International Bureau, regular international application, individual State fee, individual State renewal fee*. The terms "international application", "international registration", "request for the recording of later designation", "recording of later designation", "International Bureau", "regular international application", "individual State fee" and "individual State renewal fee" are to be taken in the sense indicated by the Trademark Registration Treaty."

"*Owner, Ownership*. The terms "Owner" and "Ownership" are to be taken in the sense indicated by the Trademark Registration Treaty where they appear in this Act in capitalized form."

"*Owner of a trademark*. The term "owner of a trademark" means a person who is using, or who has an intention to use, a trademark in commerce: *Provided*, That no other person, except a lawful concurrent user, has the right to use, and is using or has previously declared, in an application filed under this Act which has not been withdrawn or abandoned, his intention to use, such mark in commerce either in the identical form thereof or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive."

SEC. 29(a) This Act shall come into force on the same date as the entry into force of the Trademark Registration Treaty with respect to the United States. It shall apply to applications for registration of marks filed in the Patent and Trademark Office on or after such date, even though entitled to an earlier effective filing date, and to registrations issued on the basis of such applications; to international applications and later designations designating the United States filed with the International Bureau on or after such date, even though entitled to an earlier effective filing date, and to international registrations accorded effects in the United States on the basis of such international applications and later designations; and to proceedings under the Trademark Act of 1946, as amended, commenced on or after such date.

(b) Except as otherwise hereafter provided, applications for registration of marks on file in the Patent and Trademark Office on the date this Act comes into force, registrations issued on the basis of such applications, and proceedings under the Trademark Act of 1946, as amended, which are pending on such date, shall be governed by the provisions of the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(c) Except as otherwise provided hereafter in this section, all registrations under the Trademark Act of 1946, as amended, or under the previous Acts specified in section 46(b) of such Act, existing on the date this Act comes into force shall be governed by the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(d) The provisions of section 9 of the Trademark Act of 1946, as amended, as amended by this Act, shall apply to all registrations under such Act and under the previous Acts specified in section 46(b), whether issued or applied for before, on, or after the date this Act comes into force: *Provided*, that the amendments to such section by this Act shall not apply to the renewal of any registration for any period which started on a date which is earlier than six months after such date.

(e) The amendment by this Act, of the Trademark Act of 1946, as amended, shall not affect any rights or liabilities existing under such Act in effect immediately prior to the date this Act comes into force.

SECTIONAL ANALYSIS

SECTION 1 of the bill amends section 1 of the Trademark Act of 1946, as amended (hereinafter referred to as Trademark Act)[1] in a number of respects. The preamble makes it clear that the commerce clause as well as the treaty power is invoked to support the amendments. Section 1 of the amended Trademark Act is divided into five subsections, each of which is separately discussed below:

Section 1(a) *Entitlement to registration of a trademark*. Entitlement to registration is changed from present law in one fundamental respect. This is that intention to use, as well as actual use of, a trademark is a valid basis for ownership and registration. The other conditions are essentially the same as under present law.

The applicant must be a "person", as defined in section 45. The definition of "person" has not been changed.

As under the present statute, the applicant must be the "owner" of the trademark sought to be registered. The concept of ownership is modified as necessary to be consistent with the new alternative basis of rights. Also, rather than being part of the verified statement, the definition of "owner of a trademark" is in section 45.

The term "owner" is defined, as under present law, in respect of the absence of a superior right in any other person. What is new is that a claim of ownership is defeated not only by the superior right of a prior *user* of the same or a similar mark but also by the superior right of one who has a prior *intention to use* such a mark. However, the latter right can defeat the claim of ownership *only* if the intention to use has been previously declared in an application filed under the Act which has not been withdrawn or abandoned. Accordingly, while a person acquires (absent a superior right) an ownership right by reason of his intention to use a trademark, the right in that case is inchoate and is accorded no protection under the statute and no priority until it has been fixed in an application filed under the Act in which the intention to use is declared. Thus, filing the application is critical to a claim of ownership by intention to use and except, of course, where the Paris Convention "right of priority" (i.e. section 44(d)) is invoked, the filing date is the earliest date on which such a person can rely in a priority contest. (See SECTION 23(c))

Finally, the use or intended use must be in commerce. The definition of "commerce" is not changed. The outside parameters of "intended use in commerce" are left to interpretation just as has been the case with "use in commerce" under the present statute, and the principles that would be applied in such interpretation are essentially the same.

Section 1(b) *Procedure for applying to register a trademark*. Under the amended Act, there are two basic procedures for securing the registration of a trademark, i.e. by filing an application in the Patent and Trademark Office (section 1(b)(1)) and by designating the United States in an international registration pursuant to the Trademark Registration Treaty[2] (section 1(b)(2)). Except for the place where the application is filed and the fee is paid, the substantive requirements applicable to the alternative procedures are essentially the same.

Section 1(b)(1) *Domestic procedure*. In order to achieve harmonization of domestic and international procedures, the following changes are made in the national application procedures.

1. The application may be signed by a representative, duly appointed by the applicant, as an alternative to signing by the applicant himself. The same benefit is provided to applicants filing under the Trademark Registration Treaty (Article 26).

2. Consistent with the requirements of the Trademark Registration Treaty and modern practice in regard to the filing of statements with federal agencies the verification of ownership requirement has been eliminated.

Of course, the criminal provisions of 18 U.S.C. 1001 would remain applicable to a statement made in a trademark application irrespective of whether such statement is verified.

3. The applicant need not allege use of the mark in his application. The Trademark Registration Treaty prohibits such a requirement (Article 19(3)(a)) for the owners of international registrations; consequently, the same benefit is accorded to persons filing regular national applications. Substituted for this requirement is the declaration of intention to use the mark in commerce, which *is* permitted by the Treaty (Article 19(4)). Consistent with this change, specimens or facsimiles of the mark as actually used need not be submitted with the application.

It should be noted that required allegations and exhibits relating to actual use according to the present statute are retained in section 1(c). It should also be noted here that the applicant *may* file the section 1(c) declaration together with his application (section 1(c)(2)), if the mark is already in use in commerce. In such case, the declaration of intention to use is obviously superfluous and need not be made.

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[1] Public Law 489, 79th Congress, approved July 5, 1946; 60 Stat. 427. Amendments have been effected by the following public laws.
P.L. 710, 81st Cong., 64 Stat. 459, 8-17-50.
P.L. 593, 82nd Cong., 66 Stat. 792, 7-19-52.
P.L. 609, 85th Cong., 72 Stat. 540, 8-8-58.
P.L. 333, 87th Cong., 75 Stat. 748, 10-3-61.
P.L. 772, 87th Cong., 76 Stat. 769, 10-9-62.
P.L. 89-83, 89th Cong., 79 Stat. 260, 7-24-65.
P.L. 93-596, 93rd Cong., 88 Stat. 1949, 1-2-75.
P.L. 93-600, 93rd Cong., 88 Stat. 1955, 1-2-75.

[2] Done at Vienna, Austria, June 12, 1973. This is the Treaty which was transmitted by the President to the Senate for advice and consent to ratification on September 3, 1975. *Congressional Record* 9/3/75, S. 15139.

Section 1(b)(2) *International procedure.*

This paragraph states the requirements which must be satisfied in order to secure the effect of a United States application, i.e. the effect required by the Trademark Registration Treaty (Article 11(1)).

The provisions of Article 19(4) of the Treaty, requiring a declaration of intention to use, are also implemented, corresponding to the same requirement in section 1(b)(1)(C) for domestic applicants.

Finally, a special requirement as to entitlement of a foreign applicant to use the Trademark Registration Treaty (Article 4) has been added since the International Bureau will only examine this question formally, leaving it to the designated States to examine it as to substance. Thus, non-entitlement of a foreign applicant to use the Treaty procedure is a ground for refusal (Article 12(1)(ii)) or cancellation (Article 13(1)(ii)) in addititon to the grounds applicable under the national law.

The final two sections of section 1(b) implement part of Article 9 of the Treaty whereunder the improper declining of an international application or later designation request by the International Bureau can be rectified by filing a regular domestic application within 2 months from the notice of the declining.

Section 1(c) *Declaration of use.*

Section 1(c) calls for a declaration of use showing that use of the mark commenced on or prior to the date of expiration of three years, counted from the filing date. Paragraph (1) requires the declaration to contain essentially the same information as that required by present section 1.

Paragraph (2) prescribes a time limit of four years, counted from the filing date, within which the declaration may be filed, and indicates the consequences of failure to file an acceptable declaration.

Paragraph (3) authorizes the Commissioner to require the earlier filing of a declaration when important relative to an issue in any Office proceeding, provided that the three-year period has expired.

Paragraph (4) prevents abuse of the intention to use provisions by a person filing successive applications for the same, or a substantially equivalent, mark by providing that, unless there is a gap of at least two years between the expiration of the nonuse moratorium of the earlier case and the date of filing of the later case, the three-year period in the later case is measured from the filing date of the earlier case. Any subsequent application which is accompanied by a declaration of use is excluded from the special provisions.

Paragraph (5) provides for an extension of the time limits when due to extraordinary circumstances nonuse is excusable. The proviso expressly states, however, that the mere pendency of the application for registration as of the expiration of the three-year period shall not justify an extension, making it clear that Article 19(3)(b) of the Trademark Registration Treaty does not apply in the United States.

Paragraph (6) requires the Commissioner to give notice regarding acceptance or refusal of a declaration.

Section 1(d) *Special requirement for concurrent use applications.*

This provision, unchanged from present law, is placed in a separate subsection because its applicability is limited to applications wherein the section 1(c) declaration of use has been filed.

Section 1(e) *Special requirement for applicants not domiciled in United States.*

This subsection requires all applicants not domiciled in the United States to designate an agent for service on or prior to the institution or defense of a proceeding under this Act. Before a local agent for service has been designated, service may be made upon the Commissioner.

SECTIONS 2 and 3 of the bill amend sections 3 and 4 of the Trademark Act so that service marks and collective and certification marks may be registered based on either use or intention to use.

SECTION 4 of the bill amends section 5 of the Trademark Act to provide that the intended use by a related company inures to the benefit of the registrant or applicant.

SECTION 5(a) of the bill amends section 7(a) of the Trademark Act to take into account the fact that registrations issued on the basis of intent applications would not, if the declaration of use has not been filed, contain any data concerning use of the mark. In such cases, the fact that the declaration has not been filed would he indicated in the registration in lieu of the indications as to use. Also, the term "date of the registration" has been deleted, the significant dates under the amended statute being the "filing date" and the "date of issue."

SECTION 5(b) amends section 7(a) by requiring a notice of registration to be published in the OFFICIAL GAZETTE in support of the definition of "date of issue" in section 45.

SECTION 5(c) amends section 7(b) of the Trademark Act by deleting the presumption of the registrant's exclusive right to use the registered mark in commerce on the goods specified in the registration. One reason is that this presumption in the present statute is repeated in section 33(a).

The other reason is that this presumption, as it pertains to infringement actions, must be limited to be consistent with the limitation on the right even to file an infringement action prior to the commencement of use (see SECTION 23(a)).

Deletion of the "exclusive right to use" presumption from section 7(b) leaves a gap in the statute, however, the bringing of Patent and Trademark Office proceedings, i.e. oppositions and cancellations is not subject to the above mentioned limitation. The exclusive right to use presumption has served in such proceedings as the basis of the ruling that a registrant is entitled to rely solely upon his registration on the principal register as prima facie evidence of his right to exclude any other person from securing a registration under the Act of a confusing mark. Therefore, a presumption as to this right has been added.

SECTION 5(d) of the bill amends section 7(d) by adding two new paragraphs which provided domestic and international procedures, consistent with present law and with the Treaty, for amending a registration in respect of the specification of goods and/or services.

SECTION 5(e) of the bill amends section 7 by adding a new subsection, section 7(h), providing for appropriate notification, consistent with Article 20 of the Treaty, with respect to entries concerning registration based on international registrations.

SECTION 6 of the bill amends section 8(a) of the Trademark Act by changing the term of a registration from 20 to 10 years and the date from which the terms is measured from the registration date to the filing date. These changes correspond the term of domestic registrations to that of registrations secured under the Trademark Registration Treaty. The shorter term also facilitates the clearing from the register of unused marks.

The section is also amended to require that the use declared in the affidavit or declaration set forth in the proviso, i.e. the present section 8 affidavit, be use "in commerce".

Finally, the section is amended to permit, consistent with the requirement in the Treaty (Article 19(3)(d)), that such affidavit or declaration requirements be capable of being fulfilled in the case of an international registration by filing with the International Bureau.

SECTION 7 of the bill amends section 9 of the Trademark Act to set forth domestic and international procedures for renewal and to provide equivalent treatment, as to substantive requirements, of international and domestic registrants. Thus, as in the case of an application for registration, the renewal application may be signed by a representative, duly appointed by the registrant.

Two changes are made in the statute which conform to the Treaty, as follows:

1. The term of renewal is 10 years rather than 20, consistent with the Treaty (Article 17).
2. The time period, counted from the expiration date of the expiring term, in which a late renewal application can be filed is increased from three months to six months, corresponding to Article 17(3)(a).

Section 9(c) requires a declaration of use which requirement is applicable to all renewed registrations. Other than the three additional months in which to declare use of the mark, the only difference from present law is that the consequence of failure to satisfy the requirement is cancellation of the registration rather than refusal to renew.

SECTION 8(a) of the bill amends section 10 of the Trademark Act in several minor respects. Except for a technical change, the present provision for recording of assignments (section 10) is not changed.

Three new paragraphs have been added to the assignment section. The first two of these (i.e. 10(a)(2) and 10(a)(3)) implement Article 14 of the Treaty, under which a change in the ownership of an international registration may be recorded, by adding equivalent procedures to the national law. Thus, any applicant or registrant may record the fact that a new person has become the owner of an application filed or registration issued under the Act by complying with certain basic formalities. Paragraph (3) provides that if this step is taken within the period specified in paragraph (1) and it is followed up by the recording of instruments of assignment conforming to the requirements of paragraph (1), the constructive notice effect of recording an assignment in the Office will accrue.

The third additional paragraph (i.e. 10(a)(4)) is a special provision, implementing Article 14(5), for the benefit of one who, although not entitled to file under the Treaty, becomes the owner of an international registration by operation of law (e.g. by inheritance). Such a person may, subject to special requirements, rectify this defect by filing a regular national application.

SECTION 8(b) of the bill amends section 10 of the Trademark Act by adding two new provisions. The first of these (Section 10(b)) adds a new procedure, consistent with Article 15 of the Treaty, for recording a change in the name of the registrant.

Subsection (c) is added to clarify the procedure where a recording is void. Recordings under subsections (a) and (b) may later be determined to be void or contrary to law in another proceeding (cancellation, infringement action, etc.) under the Act. A specific provision has been added to clarify the fact that the Commissioner has the authority to correct the records and to provide a basis for denial of any international recording which formed the basis of the national entry.

SECTION 9 of the bill amends section 12(a) of the Trademark Act to provide for a "cut off" in the length of the ex parte examination of twelve months counted from the filing date of the application. Under amended section 12(a) all applications, the examination of which has not been completed, would have to be published for opposition purposes no later than 12 months from the filing date.

The reason for 12 months as the "cut off" is that the time required to effect publication, to receive oppositions (including delays in processing oppositions received on the last day), and to communicate, in the case of international registrations, all grounds of refusal or possible refusal to the International Bureau, must be taken into account in order to meet the deadlines prescribed by the Treaty (see Article 12).

It should he noted that the exact schedule for publication is left to determination by the Commissioner. There are, at least, two possibilities: (1) publication, promptly after filing, of all applications: and (2) publication (of allowed cases) after completion of the ex parte examination (as at present), or (of all still pending cases) at the expiration of 12 months, whichever event is the earlier to occur.

SECTION 10 of the bill amends section 12(b) of the Trademark Act by reducing the period of time in which to reply to an Office communication concerning the application from six to three months and by providing a time limitation applicable to notifying the applicant of grounds raised during the ex parte examination. The reduction of response time should make it possible for the Office to complete the ex parte examination of most applications within the 12 months period of amended section 12(a).

The cut off is the same as the one in amended section 12(a), i.e. 12 months, counted from the filing date. The examination need not he completed within the 12 months as the Treaty requirement is only that all grounds be communicated within that period. Also, the limitation would not apply to a new ground of refusal based on a decision of the Trademark Trial and Appeal Board or of a court.

SECTION 11 of the bill amends section 13 of the Trademark Act by providing for a time limit of 14 months for receiving oppositions. The 14 month time limitation ties in with the amendment to section 12(a) of the Act, providing equivalence of treatment of domestic and Treaty applicants. Section 13 is also amended to provide that an attorney may file an opposition on behalf of the opposer.

SECTION 12 of the bill amends section 14 of the Trademark Act in two respects, conforming this section to amended section 13, and a minor change in terminology ("date of issue").

SECTION 13 of the bill amends section 15 of the Trademark Act by a minor change in terminology ("date of issue").

SECTION 14 of the bill amends section 16 of the Trademark Act by providing specifically that an interference may be declared as to any particular application for registration of a mark only prior to the publication for opposition of that mark. While this is no different than current practice, the change in the statute seemed desirable, Since the declaration of an interference would constitute a ground of possible refusal under the Trademark Registration Treaty, such ground would have to be notified to the International Bureau within the prescribed time limit.

By requiring the declaration of the interferences prior to the date of publication, the section is subject to the same time limitation as in amended section 12(a), i.e. 12 months from the filing date.

Section 15 of the bill amends section 17 of the Trademark Act by providing discretionary authority to the Commissioner to defer the commencement of certain inter partes proceedings where the ex parte examination of a concerned application is not complete.

Section 16 of the bill amends section 21 of the Trademark Act by providing for an appeal from a refusal to accept a declaration pursuant to sections 1(c) and 9(c), as is now provided in the case of refusal of a section 8 affidavit.

Section 17 of the bill makes a language change in section 22 of the Trademark Act, consistent with the change from "date of registration" to "date of issue". Thus, constructive notice begins with publications of issuance of the registration (date of issue), no different in substance than under present law.

Section 18 of the bill amends section 23 of the Trademark Act by eliminating the requirements and provisions relating to use in the first and fourth paragraphs. Also, provision is made for treatment of applications as being under this section only where the application or the international registration (or recording of later designation) so indicates. The specific reference implements Article 11(3) which requires this treatment in the case of international registrations.

Section 19(a) of the bill amends section 24 of the Trademark Act by deleting the requirement that a petition to cancel a registration on the Supplemental Register be verified (consistent with amended section 14).

Section 19(b) of the bill amends section 24 of the Trademark Act by limiting the authority to cancel a registration on the Supplemental Register for nonuse, consistent with the use moratorium of the Treaty.

Section 20 of the bill amends section 30 of the Trademark Act in minor respects to remove an incidental reference to use of a mark that is inconsistent with amended section 1.

Section 21(a) of the bill amends section 31 of the Trademark Act by deleting the requirement of a fee for the filing of a section 8 affidavit. Since a section 8 fee cannot be assessed against a registration issued on the basis of an international registration (Article 19(1)), it is deleted in order to provide equivalence between domestic and Treaty applicants as to fees payable to the United States.

Section 21(b) of the bill amends section 31 of the Trademark Act by adding new subsection (d) whereby the filing and renewal fees are deemed to be substituted for by the corresponding fees set forth in the Treaty, where the international procedure is followed. This provision also obligates the Commissioner to fix the Treaty fees at the same amounts as the national fees.

Section 22 of the bill amends section 32(1) of the Trademark Act by providing that no infringement action may be started under the Act until the declaration of use of the mark in commerce has been filed in the Patent and Trademark Office and accepted by the Commissioner. This change implements the last sentence of Article 19(3)(a). Examination of the declaration could be accelerated if the registrant faced an impending infringement situation.

Section 23(a) of the bill amends section 33(a) of the Trademark Act so that the presumption of exclusive right to use the mark would apply as a rule of evidence only as to those goods and/or services in respect of which the mark is stated to be in use in commerce either in the registration itself or in the declaration under section 1(c).

Section 23(b) makes some minor changes in the language of section 33(b).

Section 23(c) amends section 33 of the Trademark Act by adding a new subsection (c) to define priority of rights accorded to applications or registrations based on an intention to use the mark. Under new subsection (c), the priority of an intent applicant or registrant would be *the same as if* he had commenced use of the mark in commerce on the filing date, unless, of course, he had an earlier priority based on use or based on the Paris Convention priority provisions of section 44(d) of the Act.

Section 24 of the bill amends section 35 of the Trademark Act in order to implement the last sentence of Article 19(3)(a) so that the remedies of profits and damages cannot date back prior to the date of commencement of use.

Section 25 of the bill renumbers present section 44(a) of the Trademark Act as section 44(a)(1) and adds to it some special provisions relating to the Trademark Registration Treaty.

Paragraph (2) authorizes the Commissioner to keep a register of international registrations designating the United States.

Paragraph (2) also contains a broad implementing provision, authorizing the Commissioner to take various actions prescribed by the Treaty. While all of the essential Treaty provisions parallel to provisions concerning domestic applications and registrations have been specifically implemented, a large number of Treaty provisions remain which solely concern the international procedures.

Paragraph (3) prescribes a procedure for communicating notifications where the deadline is stated in terms of the date of receipt by the International Bureau, most importantly the notification of refusal or possible refusal under Article 12(2)(a)(i).

Paragraph (4) implements Article 11(2)(i) of the Treaty providing for automatic registration as of the date of expiration of the time limit fixed in Article 12(2)(a)(i) where no notification of refusal or possible refusal has been received by the International Bureau.

Paragraph (5) implements Article 29 of the Treaty whereby certain delays in meeting the time limits fixed in the Treaty must be waived and others may be waived. There are some specific exceptions in the Treaty which is the reason for the last clause in this paragraph.

Section 26 of the bill amends section 44(c) of the Trademark Act by deleting the first sentence of this subsection. Since a person can secure a registration based on an intention to use the mark in commerce, the sentence is inconsistent with the amended Act. However, the sentence is no longer necessary. Under the amended Act all applicants would be required to declare use or an intention to use in commerce, whether or not the mark is also registered in the country of origin.

Section 27 of the bill deletes present subsection 44(d) of the Trademark Act and substitutes therefor a subsection providing that a right of priority may be based on a first international application as well as a first national application. Paragraph (2) of present subsection (d) is not continued. Waiver of use in commerce is no longer necessary since an application need not allege use under the amended Act. Old paragraph (4) (new paragraph (3)) of the subsection is amended to be consistent with the first sentence of section 44(c).

Section 28(a) of the bill amends the definitions, in section 45 of the Trademark Act, of the terms "trademark,"

"service mark," "certification mark," "collective mark" and "Intent of Act" by adding the phrase, "or intended to be used" in appropriate places consistent with the new basis for securing registrations.

Section 28(b) of the bill amends the definition, in section 45 of the Trademark Act, of "abandonment" to provide for abandonment of a mark applied for based on an intention to use where no use is commenced and there was never any intention to commence use. The two year prima facie abandonment provision is amended to make it clear that it applies only where use of a mark is discontinued.

Section 28(c) of the bill amends section 45 of the Trademark Act by adding the following new definitions:

(1) "Filing date" is defined because of its significance in respect of priority of rights in the case of an application or registration based on the intention to use;

(2) "Date of issue" is defined;

(3) "Trademark Registration Treaty" is defined;

(4) Various terms used in respect of the Trademark Registration Treaty are referenced to the Trademark Registration Treaty definitions;

(5) The terms "Owner" and "Ownership," used in capitalized form are referenced to the Trademark Registration Treaty.

This was done in order to distinguish these references from other references in the statute to "owner" or "ownership" which refer to the owner, or ownership, of a mark.

Finally, the term "owner of a trademark" is defined. The reason for this definition is discussed under Section 1, infra.

Section 29 of the bill prescribes the implementation of the various changes effected by the bill. The effective date of the Act coincides with the entry into force of the Treaty with respect to the United States. Appropriate provisions specify the controlling law which is applicable before, or on or after, the effective date.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Trademark Applications Under Section 44 of the Trademark Act of 1946

[37 CFR Parts 2 and 4]

Withdrawal of Proposed Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Withdrawal of proposed rules.

SUMMARY: The Patent and Trademark Office hereby withdraws its rule proposals (FR Doc. 77–23095 published in the Federal Register on August 10, 1977, 42 FR 40450; 962 TMOG 2–4, September 6, 1977) regarding applications filed under section 44 of the Trademark Act of 1946.

Under the proposed rules, foreign applicants filing under section 44 (d) or (e) of the Trademark Act of 1946, as amended, 15 U.S.C. 1126, would no longer have been required to allege use of the mark somewhere or to submit specimens or facsimiles demonstrating such use.

The primary consideration for the withdrawal of this rules proposal was the strong objection voiced by several commenters that the proposed rule changes would have placed some United States nationals in a less favorable position than foreign nationals than is the case under the present rules.

EFFECTIVE DATE: June 30, 1978.

FOR FURTHER INFORMATION CONTACT: J. Paul Williamson, Patent and Trademark Office, 703–557–2521.

SUPPLEMENTARY INFORMATION: A notice was published in the OFFICIAL GAZETTE of the United States Patent and Trademark Office on April 30, 1974 (921 OG TM 250) detailing the procedure being followed by this Office in connection with applications filed under section 44 of the Trademark Act of 1946 without specimens and without a statement of use of the mark. That notice is hereby withdrawn and the procedure thereunder terminated. Henceforth, in order to receive a formal filing date, an application under section 44 must include in the application at least one specimen and a statement that the mark has been used.

Those applicants having cases now under suspension in this Office in accordance with the April 1974 OFFICIAL GAZETTE notice will be notified individually of the Office policy regarding specimens and use as set out above.

Finally, the withdrawal of this rules proposal should in no way be interpreted as a diminution of the continuing support of the Department of Commerce and this Office for the Trademark Registration Treaty. Under that Treaty it will be possible to treat all applicants, foreign and domestic, equally in regard to initial use requirements for filing an application for trademark registration in the United States Patent and Trademark Office.

Dated: June 16, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:
JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 78–18301; Filed 6–29–78; 8:45 am]

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 5—SECRECY OF INVENTIONS

Revised Patent Interference Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: These regulations prescribe certain requirements for patent interference proceedings which have not been specifically or clearly covered by existing provisions of the rules. The existing provision on public availability of interference files is clarified. A proposal made earlier to eliminate atachments to preliminary statements in interferences is not adopted.

EFFECTIVE DATE: August 1, 1978.

ADDRESS: Comments on the proposal are available for public inspection in Room 11E10, Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Ian A. Calvert, Chairman, Board of Patent Interferences, Patent and Trademark Office by telephone at (703) 557–3625, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: INTERFERENCE PRACTICE. On November 30, 1976, notice of proposed rulemaking regarding the revision of sections 1.205, 1.207, 1.215, 1.216, 1.217, 1.222, 1.223, 1.225, 1.245, 1.247, 3.44, 3.45, and 5.3 of, and the addition of new section 1.246 to, Title 37 of the Code of Federal Regulations was published in the Federal Register (41 F.R. 52486). Interested persons were asked to comment and a period extending from the date of publication of the proposed rule changes to March 4, 1977 was allocated for such purpose. Eighteen comments were received. The comments are available for public inspection at the address given above.

In view of strong objection to the removal of requirements in sections 1.215, 1.216, 1.217, 1.222, 1.223, 3.44 and 3.45 for documents to be attached to preliminary statements, the proposed amendments to these rules are not being adapted. The consensus of the comments submitted was that the documents required by the present rules can be most useful in promoting an early settlement of interferences. A sentence is added to § 1.223(c) to incorporate into the rules the existing policy that the content of attachments to preliminary statements normally is not considered by the Office. *Reddy* v. *Davis*, 187 USPQ 386 (Commr. Pat. & Tm. 1975). The sentence that was proposed for § 1.217 relative to the signing of statements is adopted as a new last sentence in paragraph 1.217(1).

New paragraph 1.205(c) is being adopted with a change from the proposal. The paragraph as proposed provided for a notice to be placed in the file of a patent and sent to the patentee when claims are copied by an applicant from the patent. Three commenters suggested that a second notice should be placed in the patent file and sent to the patentee if a decision is made not to declare an interference. A sentence is being added to paragraph (c) to adopt this suggestion.

One of the commenters opposed paragraph 1.205(c) on the ground that the market value of a patent will be reduced if a notice is placed in the file that claims have been copied. It is believed that the provision for a second notice when an interference is not declared responds to this objection. One commenter suggested that the notice to the patentee under paragraph 1.205(c) should identify the party copying the patent claims or the attorney representing that party. This suggestion is outside the scope of the proposal and is not adopted. The amendment that was proposed to section 5.3 is adopted in order to provide a cross-reference to new paragraph 1.205(c).

No adverse comments were received relative to the proposed revisions of sections 1.207, 1.225, 1.245, and 1.247, and the addition of new section 1.246. These proposals are being adopted. Section 1.225 is divided into paragraphs and the order of the sentences is changed from the proposal for clarity. Section 1.287(c) is amended to refer to new section 1.246 instead of section 1.245. With regard to the revision of section 1.247(b), the word "expected" is corrected to read "excepted."

Files Open to Public

The second sentence of paragraph 1.11(a) is being amended to make clear that the file of an interference involving an issued patent is open to the public if the interference is terminated without an award of priority by the Board of Patent Interferences, as well as being open when there is an award of priority. The amendment adds the phrase "or after termination if no such award is made" in the second sentence. The language that was used in paragraph 1.11(a) prior to March 1, 1977 was clear on this point. The second sentence of paragraph 1.11(a) was broadened effective March 1, 1977 (42 F.R. 5593, 955 O.G. 1054), however, to make interference files available to the public at an earlier date. In making this change the rule inadvertently was worded so that it is susceptible to the interpretation that the file of an interference is not open to the public if the interference is terminated without an award of priority. The published record shows that the Patent and Trademark Office did not intend this meaning. The Office has continued to grant public access to such files since the March 1977 amendment.

Since the change in paragraph 1.11(a) merely clarifies the rule and is consistent with existing policy, notice and public procedure prior to adoption of the change are deemed unnecessary.

Text of Rules Adopted

As announced in the notice published in the Federal Register of November 30, 1976 (41 F.R. 52486) the Patent and Trademark Office determined that these rules do not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Orders 11821 and 11949 which were in effect at that time.

In consideration of the comments received and pursuant to the authority contained in § 6 of Title 35 of the United States Code, Parts 1 and 5 of Title 37 of the Code of Federal Regulations are hereby amended as set forth below. * * *

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[In the text set forth below, changes from the existing rules are shown by arrows and brackets, additions being indicated by arrows and deletions by brackets.]

LUTRELLE F. PARKER,
Date: 6–5–78. *Acting Commissioner of Patents.*

Approved: June 20, 1978.
Jordan J. Baruch,
Assistant Secretary for Science and Technology.

1. In § 1.11 paragraph (a) is revised to read:

§ 1.11 *Files open to the public.*

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After an award of priority by the Board of Patent Interferences as to all parties, ►or after termination if no such award is made,◄ the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

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2. In § 1.205 a new paragraph (c) is added to read:

§ 1.205 *Interference with a patent; copying claims from patent.*

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►(c) A notice that one or more claims of a patent have been copied or substantially copied by an applicant will be placed in the file of the patent, and a copy of said notice will be sent to the patentee. However, the identify of the applicant will not be disclosed to the patentee unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will also be placed in the file of the patent and sent to the patentee.◄

3. In § 1.207 paragraph (h) is revised to read:

§ 1.207 *Preparation of interference papers and declaration of interference.*

• • • • •

(h) A patent interference examiner will institute and declare the interference by forwarding notices to the several parties to the proceeding. Each notice shall include the name and residence of each of the other parties and those of his attorney or agent, and of any assignee, and will identify the application of each opposing party by serial number and filing date, or in the case of a patentee by the number and date of the patent. The notices shall also specify the issue of the interference, which shall be clearly and concisely defined in only as many counts as may be necessary to define the interfering subject matter (but in the case of an interference with a patent all the claims of the patent which can be made by the applicant should constitute the counts), and shall indicate the claim or claims of the respective cases corresponding to the count or counts. [If the application or patent of a party included in the interference is a division, continuation or continuation-in-part of a prior application and the examiner has determined that it is entitled to the filing date of such prior application, the notices shall so state.] ►If the primary examiner has indicated that the patent or application of any party included in the interference is entitled to the benefit of the filing date of any prior applications as to the subject matter in issue, the notices shall so state and shall specify such prior applications.◄ Except as noted in paragraph (e) of this section, the notices shall also set a schedule of times for taking various actions as follows:

(1) For filing the preliminary statements required by § 1.215 and serving notice of such filing, not less than 2 months from the date of declaration.
(2) For each party who files a preliminary statement to serve a copy thereof on each opposing party who also files a preliminary statement as required by § 1.215(b), not less than 15 days after the expiration of the time for filing preliminary statements.
(3) For filing motions under § 1.231, not less than 4 months from declaration.

4. Section 1.217 is revised to read:

§ 1.217 *Contents of the preliminary statement; invention made abroad.*

[(a)] When the invention was made abroad the facts specified by § 1.216(a) (1) to (6) are not required, and in lieu thereof there shall be stated:

(1) When the invention was introduced into this country by or on behalf of the party, giving the circumstances with the dates connected therewith which are relied upon to establish the fact and, when appropriate, including allegations of activity in this country of the nature of that represented by § 1.216(a) (1) to (6) and documentary attachments if the allegations relate to a drawing or written description. ►Such statement may be signed or sworn to, or made in the form of a declaration, either by the inventor or by one authorized to make the statement and having knowledge of the facts alleged therein.◄
(2) If a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, he must so state and his preliminary statement must include allegations of activity abroad corresponding to those required by § 1.216(a) (1) to (6).

5. In § 1.223 paragraph (c) is revised to read:

§ 1.223 *Effect of Statement.*

• • • • •

(c) If a party to an interference fails to file a statement, testimony will not be received subsequently from him to prove that he made the invention at a date prior to his effective filing date. If a party alleges in his statement a date of first drawing or first written description but does not atach a copy of such drawing or written description as required by § 1.216(b), he will be restricted to his effective filing date as to that allegation unless such copy is admitted by motion under § 1.222. ►The content of a drawing or written description atached to the statement normally will not be considered by the Office.◄

• • • • •

6. Section 1.225 is revised to read:

§ 1.225 *Failure of junior party to file statements or to overcome filing date of senior party.*

►(a)◄ If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a proper motion under § 1.231, within the time set for such motions, seeking some action in the interference. If such motion has been timely filed but does not result in action in the interference which removes the basis for a judgment on the record, such judgment will be entered unless the motion related to a matter which may be reviewed at final hearing under § 1.258, and within 30 days of the decision denying his motion, or a later time set by the patent interference examiner, the junior party concerned requests that final hearing be set to review such matter. Also, such a junior party may within such 30 day period, or time set, request a final hearing to review such a matter raised by his opposition to a motion under § 1.231(a) (2), (3), (4), or (5) which was granted over his opposition.

►(b)◄ Such a junior party will not be permitted to take testimony except on granting of a motion accompanied by a showing of good cause, which should normally include names of proposed witnesses and affidavits or declarations by them giving their expected testimony.

►(c) If, as a result of a decision on motion, the original senior party is deprived of the benefit of an earlier filed application and is thereby made a junior party and if in addition he relies solely on said earlier filed application in his preliminary statement, he stands in the same position as a junior party whose statement fails to overcome the effective filing date of the senior party as in the first sentence of § 1.225(a).◄

7. Section 1.245 is revised to read:

§ 1.245 *Extension of time.*

Extensions of time in any case not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extension. [A motion not timely made may be considered upon a showing of sufficient cause as to why such motion was not timely presented.]

8. A new § 1.246 is added to read:

►§ 1.246 *Late papers.*

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§ 1.68), of sufficient cause as to why such motion or paper was not timely presented.◄

9. Section 1.247 is revied to read.

§ 1.247 *Service of papers.*

►(a)◄ Every paper filed in the Patent and Trademark Office in interference proceeding must be served upon the other parties in the manner provided in § 1.248, except the following:

[(a)] ►(1)◄ Preliminary statements at the time of filing but see § 1.215(b) and (c) [.] ►.◄
[(b)] ►(2)◄ Documentary exhibits introduced at the taking of a deposition.
[(c)] ►(3)◄ Certified transcripts of testimony under § 1.276 (but copies of the record must be served [(§ 1.253a)).] ►(§ 1.253(a)).◄
[(d)] ◄(4)◄ Statutory [declaimers] ►disclaimers◄ under 35 U.S.C. 253.

►(b)◄ The specification in certain sections that a designated paper must be served does not imply that other papers, not [expected] ►excepted◄ above need not be served. However, the requirement for service of designated papers may be waived under particular circumstances and service may be required of other designated papers which need not ordinarily be served. Proof of [such] service must be made before the paper will be considered in the interference by the Office. A statement of the attorney, attached to or appearing in the original paper when filed, clearly stating the time and manner in which service was made will be accepted as [prima facie] ►*prima facie*◄ proof of service.

10. In § 1.287, paragraph (c), first sentence, "§ 1.245" is changed to "§ 1.246."

11. In § 5.3, paragraph (b), at the end of the paragraph, "See § 1.205(c)." is added.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,544,399, Re. S.N. 911,653, Filed Jun. 1, 1978, Cl. 148/184, INSULATED GATE FIELD-EFFECT TRANSISTOR (IGFET) WITH SEMICONDUCTOR GATE ELECTRODE, Hans G. Dill, Owner of Record: *Hughes Aircraft Company, Culver City, Calif.*, Attorney or Agent: William H. MacAllister, Ex. Gp.: 111

3,955,953, Re. S.N. 911,567, Filed Jun. 1, 1978, Cl. 65/18, METHODS OF MAKING SELF FILTERING NOZZLES, Anthony J. Hauser, Owner of Record: *Teletype Corporation, Skokie, Ill.*, Attorney or Agent: J. B. Hoofnagle, Jr., Ex. Gp.: 173

3,959,678, Re. S.N. 906,438, Filed May 17, 1978, Cl. 310/172, CONCENTRATED WINDING SALIENT-POLE SHADED POLE MOTORS HAVING MULTIPLE SHORT CIRCUITED SHADING COILS FOR EACH POLE, Joe T. Donahoo, Owner of Record: *General Electric Company, Fort Wayne, Ind.*, Attorney or Agent: John M. Stoudt, et al., Ex. Gp.: 212

3,961,092, Re. S.N. 904,970, Filed May 11, 1978, Cl. 426/331, METHOD FOR PRESERVING HIGH MOISTURE CONTENT AGRICULTURAL GRAINS, Joseph G. Forest et al., Owner of Record: *Inventor*, Attorney or Agent: Mark P. Levy, Ex. Gp.: 172

3,962,833, Re. S.N. 906,745, Filed May 17, 1978, Cl. 51/284, METHOD FOR THE ALTERATION OF A LENS AND AN ADHESIVE BLOCKING PAD USED THEREIN, Dee Lynn Johnson, Owner of Record: *Inventor*, Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 323

3,979,884, Re. S.N. 875,602, Filed Feb. 6, 1978, Cl. 53/381 R, MAIL EXTRACTING AND SORTING DESK, Robert J. Russell, Owner of Record: *Opex Corporation, Cherry Hill, N.J.*, Attorney or Agent: Alfred Stapler, et al., Ex. Gp.: 324

3,983,309, Re. S.N. 911,738, Filed Jun. 2, 1978, Cl. 13/6, PRIMARY ELECTRODE ARRANGEMENT FOR HIGH TEMPERATURE MELTING FURNACE, Duane Harold Faulkner, et al., Owner of Record: *Johns-Manville Corporation, Greenwood Village, Colo.*, Attorney or Agent: Charles C. Corbin, Ex. Gp.: 212

3,989,851, Re. S.N. 909,598, Filed May 25, 1978, Cl. 426/266, METHOD FOR PROTEIN FORTIFICATION OF EXTRA PUMPED MEATS, Robert Lyle Hawley, et al., Owner of Record: *Ralston Purina Company, St. Louis, Mo.*, Attorney or Agent: R. W. Brukardt, et al., Ex. Gp.: 172

3,992,064, Re. S.N. 903,886, Filed May 8, 1978, Cl. 303/7, VEHICLE BRAKE SYSTEM, Michael L. Carton, et al., Owner of Record: *Wagner Electric Corporation, Parsippany, N.J.*, Attorney or Agent: William D. Lucas, et al., Ex. Gp.: 315

4,008,172, Re. S.N. 894,262, Filed Apr. 7, 1978, Cl. 252/301.21, AGENT FOR BRIGHTENING AND REMOVING GREYNESS FROM TEXTILES, Richard von Rutte, et al., Owner of Record: *Inventor*, Attorney or Agent: Karl F. Jorda, et al., Ex. Gp.: 114

4,018,656, Re. S.N. 912,139, Filed Jun. 2, 1978, Cl. 203/11, THERMAL SOFTENING AND DISTILLATION BY REGENERATIVE METHOD, Alfred N. Rogers, et al., Owner of Record: *Bechtel International Corporation, San Francisco, Calif.,* Attorney or Agent: Stephen S. Townsend, Ex. Gp.: 171

4,023,433, Re. S.N. 907,808, Filed May 19, 1978, Cl. 74/425, POWER TRANSFER, Ewald Schutz, Owner of Record: *Power Transfer Corporation, Lancaster, Pa.,* Attorney or Agent: Karl L. Spivak, et al., Ex. Gp.: 345

4,048,355, Re. S.N. 909,720, Filed May 25, 1978, Cl. 427/375, PROCESS FOR THE FORMATION OF A POLYOLEFIN COATING LAYER ONTO A METAL SURFACE, Seigo Sakayori, et al., Owner of Record: *Mitsui Petrochemical Ind., Ltd.; Toa Paint Co., Ltd., Tokyo, Japan,* Attorney or Agent: Leonard W. Sherman, Ex. Gp.: 162

4,066,403, Re. S.N. 907,362, Filed May 18, 1978, Cl. 23/230 B, MULTILAYER ANALYTICAL ELEMENT, Barbara J. Bruschi, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Dana M. Schmidt, et al., Ex. Gp.: 171

4,073,282, Re. S.N. 909,719, Filed May 25, 1978, Cl. 126/270, SOLAR PANEL, Arno H. Schriefer, Jr., Owner of Record: *Inventor,* Attorney or Agent: Jack E. Dominik, Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for the Week of Aug. 1, 1978

Re. 29,239
3,784,599
3,818,258
3,889,535
3,939,208
3,965,172
3,997,272
4,023,440
4,031,395
4,034,136
4,034,772
4,041,084
4,042,488
4,044,337
4,050,296
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4,065,506
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4,070,970
4,071,374
4,072,027
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4,075,052
4,076,229
4,076,534
4,076,611
4,076,777
4,076,830
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4,077,212
4,077,521
4,077,891
4,077,965
4,078,498
4,078,888
4,079,449
4,079,566
4,079,660
4,079,909
4,080,097
4,080,114
4,080,120
4,080,158

Disclaimers

3,037,057.—*Samuel W. Tinsley,* South Charleston, and *John T. Fitzpatrick,* Charleston, W. Va. PRODUCTION OF AROMATIC AMINOALCOHOLS. Patent dated May 29, 1962. Disclaimer filed May 30, 1978, by the assignee, *Union Carbide Corporation.*

Hereby enters this disclaimer to claims 7, 8 and 9 of said patent.

3,929,049.—*Curtis L. Graversen,* Milwaukie, Oreg. EXTENDED PITCH SAW CHAIN. Patent dated Dec. 30, 1975. Disclaimer filed June 14, 1978, by the assignee, *Omark Industries, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

4,070,450.—*Richard Barner,* Witterswil, and *Walter Boguth,* Riehen, Switzerland. SUNSCREENING COMPOUND AND METHOD. Patent dated Jan. 24, 1978. Disclaimer filed June 8, 1978, by the assignee, *Hoffmann-La Roche Inc.*

Hereby enters this disclaimer to claim 16 of said patent.

Dedication

3,991,279.—*Dennis James Morgan,* Howell, and *Douglas Charles Smith,* Locust, N.J. MONOBUS INTERFACE CIRCUIT. Patent dated Nov. 9, 1976. Dedication filed June 2, 1978, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire term of said patent.

Patents Available for Licensing or Sale

3,770,297. TRAVEL HOME WITH CAR TOP HITCH. Robert G. Quick, Hy-Rider Associates, 7419 Allstate Drive, Petersburg, Va. 23803.

4,034,611. PARTICULATE SAMPLING PROBE. James E. Harling. Correspondence to: M. F. Laughton, APCO-ERS Environment Canada, Ottawa, K1a 1C8, Canada.

4,074,538. WALL STRUCTURES. Jurgen. Peter Janus, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Potent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW.
Washington, D.C. 20324

Patent 4,070,661. Photo Electronic Direction of Motion Indicator. Filed Feb. 10, 1976. Patented Jan. 24, 1978. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 745,942. Magnetohydrodynamic Electrode. Filed Nov. 29, 1976.

Patent 4,057,678. Molten Salt Battery Having Inorganic Paper Separator. Filed Mar. 16, 1977. Patented Nov. 8, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent application 850,810. Duel Circuit, Woven Artificial Capillary Bundle for Cell Culture. Filed Nov. 11, 1977.

Patent 4,006,413. Field Instrument for Measurement of AC Voltage Fluctuations. Filed Dec. 19, 1974. Patented Feb. 1, 1977. Not available NTIS.

Patent 4,050,533. Powered Wheel Chair. Filed June 22, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,053,952. Magnetic Fluid Actuated Control Valve, Relief Valve and Pump. Filed Apr. 8, 1977. Patented Oct. 18, 1977. Not available NTIS.

Patent 4,073,194. Noise Chrono-Dosimeter System. Filed Oct. 8, 1976. Patented Feb. 14, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts, NW.
Washington, D.C. 20240

Patent application 870,162. Ventilation System for Continuous Mining Machines. Filed Jan. 17, 1978.

Patent 4,053,575. Sulfur Recovery From H_2S and SO_2-Containing Gases. Filed Mar. 15, 1976. Patented Oct. 11, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 846,091. Method and Means for Defocusing Engine Cavity Reflected Energy. Filed Oct. 27, 1977.

Patent application 851,243. Hydrogen-Oxygen Mixer. Filed Nov. 14, 1977.

Patent application 853,656. Single-Fiber Duplex Coupler. Filed Nov. 21, 1977.

Patent application 855,035. Supercorroding Alloys for Generation of Heat and Gas. Filed Nov. 25, 1977.

Patent application 855,633. Expanding Stabilizing Fin Cup. Filed Nov. 28, 1977.

Patent application 867,631. High Lateral Load Capacity, Free-Fall Deadweight Anchor. Filed Jan. 9, 1978.

Patent application 870,048. Constant Illumination Control System. Filed Jan. 16, 1978.

Patent application 870,387. Grinding and Polishing Tool. Filed Jan. 18, 1978.

Patent application 871,265. Laser Marksmanship Target. Filed Jan. 23, 1978.

Patent application 871,313. Image Stabilizing System for Stop-Action Playback. Filed Jan. 23, 1978.

Patent application 874,093. Passive High-Speed Automatic Shutter for Imaging Devices. Filed Jan. 31, 1978.

Patent application 876,297. Photochemical Separation of Metals in Solution by Precipitation Following Reduction or Oxidation. Filed Feb. 9, 1978.

Patent application 876,373. Laser Safety Goggles. Filed Feb. 9, 1978.

Patent application 876,447. Spiral-Passage-Honeycomb Chemical Converter-Heat Exchanger. Filed Feb. 9, 1978.

Patent 3,934,259. All-Sky Camera Apparatus for Time-Resolved Lightning Photography. Filed Dec. 9, 1974. Patented Jan. 20, 1976. Not available NTIS.

Patent 4,011,418. Vibration Responsive Switch. Filed Oct. 18, 1963. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,012321. Oxidation of Refractory Organics in Aqueous Waste Streams by Hydrogen Peroxide and Ultraviolet Light. Filed Mar. 25, 1975. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,012,613. Inertial Switch. Filed Oct. 18, 1963. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,025,848. Waveform Comparing Phasemeter. Filed Sept. 11, 1975. Patented May 24, 1977. Not available NTIS.

Patent 4,029,529. Crosslinked Carboxyl Containing Polymer and Nitrocellulose as Solid Propellant Binder. Filed July 12, 1967. Patented June 14, 1977. Not available NTIS.

Patent 4,037,517. Fuze Activation Device. Filed Sept. 24, 1976. Patented July 26, 1977. Not available NTIS.

Patent 4,051,390. Parallel/Time-Shared Variable Time Delay Generator With Common Timing Control and Fast Recovery. Filed June 18, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,437. Method and Apparatus for Semiconductor Profiling Using an Optical Probe. Filed Apr. 2, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,062,605. Portable Seating Apparatus. Filed Oct. 4, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,186. Broadband Millimeter Wave Amplifier. Filed Oct. 10, 1975. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,291. Apparatus and Method for Encoding and Decoding Digital Information. Filed Oct. 15, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,064,360. High Speed Digital Switch. Filed July 6, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,066,234. Universal Shock and Vibration Mounts. Filed Jan. 23, 1974. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,066,878. Time-Domain Filter for Recursive Type Signals. Filed Mar. 29, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,067,392. Toxic Gas Control for BF Absorber Fires. Filed May 24, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,067,860. N,N'-bis(3,4-dicyanophenyl) alkanediamide, Polyphthalocyanines, and Preparation Thereof. Filed July 23, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,069,059. Silicon Nitride-Zirconium Silicate Ceramics. Filed June 11, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,070,092. Active Waveguide Branch With Variable Synchronism. Filed Sept. 22, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,211. Technique for Threshold Control Over Edges of Devices on Silicon-on-Sapphire. Filed Apr. 4, 1977. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,412. Method for Production of Acetylene by Laser Irradiation. Filed Sept. 8, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,463. Antimotion Sickness Remedy. Filed Mar. 3, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,071,194. Means for Cooling Exhaust Nozzle Sidewalls. Filed Oct. 28, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,071,907. Radar Signal Processor Utilizing a Multi-Channel Optical Correlator. Filed Oct. 12, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,072,949. Range Gate Walk-Off of Compressive Radar. Filed Mar. 17, 1970. Patented Feb. 7, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—R. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents	Numbers 2,067 to 2,075, inclusive

Oxidation. Filed Feb. 9, 1978.

Patent application 876,373. Laser Safety Goggles. Filed Feb. 9, 1978.

Patent application 876,447. Spiral-Passage-Honeycomb Chemical Converter-Heat Exchanger. Filed Feb. 9, 1978.

Patent 3,934,259. All-Sky Camera Apparatus for Time-Resolved Lightning Photography. Filed Dec. 9, 1974. Patented Jan. 20, 1976. Not available NTIS.

Patent 4,011,418. Vibration Responsive Switch. Filed Oct. 18, 1963. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,012321. Oxidation of Refractory Organics in Aqueous Waste Streams by Hydrogen Peroxide and Ultraviolet Light. Filed Mar. 25, 1975. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,012,613. Inertial Switch. Filed Oct. 18, 1963. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,025,848. Waveform Comparing Phasemeter. Filed Sept. 11, 1975. Patented May 24, 1977. Not available NTIS.

Patent 4,029,529. Crosslinked Carboxyl Containing Polymer and Nitrocellulose as Solid Propellant Binder. Filed July 12, 1967. Patented June 14, 1977. Not available NTIS.

Patent 4,037,517. Fuze Activation Device. Filed Sept. 24, 1976. Patented July 26, 1977. Not available NTIS.

Patent 4,051,390. Parallel/Time-Shared Variable Time Delay Generator With Common Timing Control and Fast Recovery. Filed June 18, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,437. Method and Apparatus for Semiconductor Profiling Using an Optical Probe. Filed Apr. 2, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,062,605. Portable Seating Apparatus. Filed Oct. 4, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,186. Broadband Millimeter Wave Amplifier. Filed Oct. 10, 1975. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,066,234. Universal Shock and Vibration Mounts. Filed Jan. 23, 1974. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,066,878. Time-Domain Filter for Recursive Type Signals. Filed Mar. 29, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,067,392. Toxic Gas Control for BF Absorber Fires. Filed May 24, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,067,860. N,N'-bis(3,4-dicyanophenyl) alkanediamide, Polyphthalocyanines, and Preparation Thereof. Filed July 23, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,069,059. Silicon Nitride-Zirconium Silicate Ceramics. Filed June 11, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,070,092. Active Waveguide Branch With Variable Synchronism. Filed Sept. 22, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,211. Technique for Threshold Control Over Edges of Devices on Silicon-on-Sapphire. Filed Apr. 4, 1977. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,412. Method for Production of Acetylene by Laser Irradiation. Filed Sept. 8, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,463. Antimotion Sickness Remedy. Filed Mar. 3, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,071,194. Means for Cooling Exhaust Nozzle Sidewalls. Filed Oct. 28, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,071,907. Radar Signal Processor Utilizing a Multi-Channel Optical Correlator. Filed Oct. 12, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,072,949. Range Gate Walk-Off of Compressive Radar. Filed Mar. 17, 1970. Patented Feb. 7, 1978. Not available NTIS.

PATENT EXAMINING *CORPS*

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
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GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

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Patents ---------- Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents ---------- Numbers 2,067 to 2,075, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 1, 1978

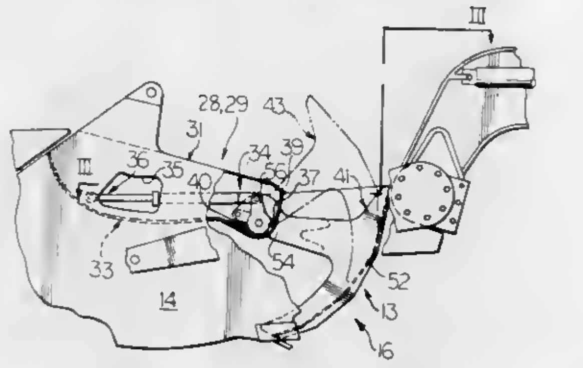
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T973,001

SCRAPER APRON ASSEMBLY

Carroll R. Cole, Decatur, and Edward J. Ohms, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Continuation of Ser. No. 788,858, Apr. 19, 1977, abandoned. This application Nov. 10, 1977, Ser. No. 850,432
Int. Cl.^{2} E02F *5/00*
U.S. Cl. 37—126 AD
2 Sheets Drawing. 8 Pages Specification



A scraper apron assembly has a bowl member which has a front opening and first and second sides. Each of the sides has an upper portion and extends rearwardly from the front opening. Each of the upper portions has first and second end portions with a slot in the second end portion.

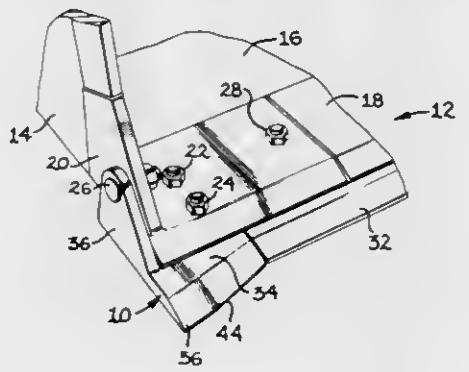
An apron is of a size sufficient for closing the front opening, and is pivotally connected and movable through the bowl.

Each of the first and second actuating motors have first and second ends and are positioned between the first and second walls of the bowl. The motors are pivotally connected at their first ends to the apron through respective flanges and at their second ends to first and second walls of the bowl.

T973,002

REPLACEABLE CORNER CUTTING EDGE

Gene R. Klett, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 22, 1977, Ser. No. 863,485
Int. Cl.^{2} E02F *9/28*
U.S. Cl. 37—142 R
2 Sheets Drawing. 7 Pages Specification

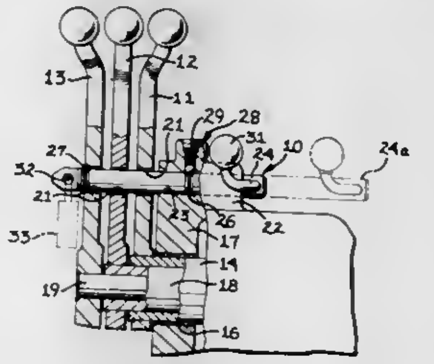


A replaceable cutting edge includes a substantially horizontal bottom plate having an upright opening therethrough, a side wall and a tapered front edge, and a substantially vertical side plate integrally secured to the bottom plate adjacent the side wall. The side plate has upwardly converging front and rear surfaces forming an apex and a substantially horizontal opening through the apex. The cutting edge is positioned protectively over the corner of an implement such as a loader bucket, and is positively secured thereat through bolts through the openings.

T973,003

LEVER LOCKING ASSEMBLY

Orson K. Kelly, and Henry J. Perez, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 8, 1978, Ser. No. 884,676
Int. Cl.^{2} G05G *5/08*
U.S. Cl. 70—200
1 Sheets Drawing. 6 Pages Specification



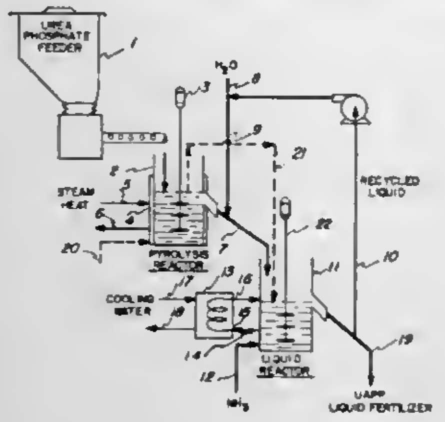
Each of a plurality of levers has a hole extending therethrough with the holes being in axial alignment at a nonoperational position of the levers. A lock bolt is slidably positioned within a bore of a bracket mounted adjacent one of the levers and is movable therethrough to a first position at which the bolt extends through the holes in the levers for maintaining the levers in the nonoperational position and a second position at which the bolt is retracted from the holes and the levers are free to move to their operational positions.

T973,004

PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA PHOSPHATE

John M. Stinson, 1525 Ridge Dr., Sheffield, Ala. 35660; Horace C. Mann, Jr., 1942 Holiday Dr., and John F. McCullough, 2909 Alexander, both of Florence, Ala. 35630, assignors to Tennessee Valley Authority
Filed Oct. 3, 1977, Ser. No. 838,503
Int. Cl.^{2} C05C *9/00*
U.S. Cl. 71—29
5 Sheets Drawing. 32 Pages Specification

A process for the production of high-purity urea-ammonium polyphosphate fertilizers from crystalline urea orthophosphate derived from the reaction of wet-process acid and urea. Initially, urea phosphate was pyrolyzed in one stage to give molten urea-ammonium polyphosphates that contained up to 95 percent of the phosphate as polyphosphate, dependent upon the reaction conditions used. Heat to effect condensation of orthophosphate with urea to form polyphosphate was provided by steam. Reaction conditions ranging from a retention time of 1 minute at 350° F to 30 minutes at 260° F were satisfactory. The pyrolyzate contained mixtures of urea, ammonium orthophosphate, and ammonium polyphosphates and was dissolved in aqua ammonia to yield clear liquid fertilizers containing 12 to 15 percent nitrogen and 18 to 29 percent P_2O_5. Addition of either urea to the process to maintain a urea:biuret ratio of at least 16, or about 2 pounds NH_3 per unit P_2O_5 to the pyrolysis reactor prevented biuret precipitation in the liquid



fertilizers. Granulation of urea-ammonium polyphosphate melt by conventional means gave solids containing 19 to 21 percent N and 45 to 47 percent P_2O_5. Supplementary, secondary, or micronutrient-containing materials may be incorporated in the liquid or solid products.

T973,005
TUNED VISCOUS DAMPER

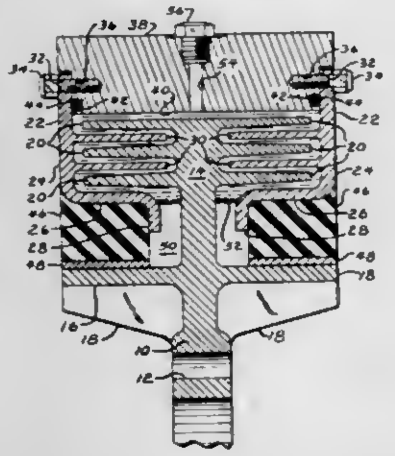
Tsu Pin Shyu, Peoria, and Byron H. Lofquist, Creve Coeur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 733,485, Oct. 18, 1976. This application Nov. 9, 1977, Ser. No. 850,893

Int. Cl.^{2} F16F *15/00*

U.S. Cl. 74—574

2 Sheets Drawing. 17 Pages Specification



A tuned viscous damper including a hub adapted to receive a rotational input force, a first element carried by the hub having a plurality of spaced, annular fins directed generally axially of the hub and concentrically therewith, a second element having a plurality of spaced, annular fins directed generally axially of the hub and concentric therewith, the fins on the first element projecting into the spaces between the fins on the second element in noncontacting relation, an annular inertia weight, an annular spring secured to the second means and to one of the inertia weight and the hub, a housing including at least one of the first and second elements, the inertia weight and the annular spring defining a closed chamber encompassing the fins, and a body of viscous liquid at least partially filling the chamber. The first element is a web and carries its fins on both sides thereof. The second element is a housing and comprises two identical parts each having fins thereon with the identical parts being disposed on opposite sides of the web such that the fins thereon are directed toward the web. All of the fins are generally axially extending. The housing and/or the web can be formed of metals having low densities or of metals which are principally ferrous in composition, as desired, to adjust the mass ratio of the damper without changing the geometry of the parts.

T973,006
REPLACEABLE TIRE TREAD BELT AND TIRE CARCASS WITH A BUTTRESSED SIDEWALL

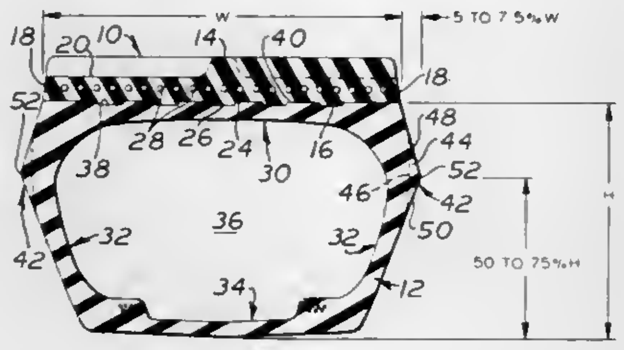
Marvin E. Beyers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1978, Ser. No. 880,821

Int. Cl.^{2} B60C *11/00*

U.S. Cl. 152—176

1 Sheets Drawing. 7 Pages Specification



A replaceable tire tread belt has radially outer and inner peripheral surfaces and a pair of opposite side surfaces defining a preselected axial width. The tread belt is mounted on a tire carcass having a radially outer peripheral portion, a facing pair of sidewalls, and a radially inner base portion. A buttressed deflector of preselected cross sectional configuration extends axially outwardly from at least one sidewall of the tire carcass a distance axially beyond the tread belt of from 5 to 7½% of the preselected axial width for deflecting external objects away from the sidewall.

T973,007
REPLACEABLE TIRE TREAD BELT

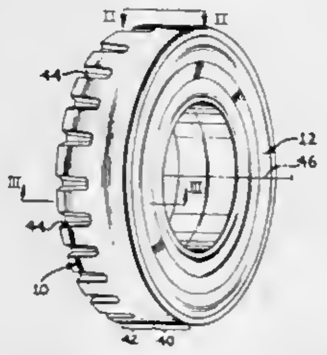
Marvin E. Beyers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1978, Ser. No. 880,668

Int. Cl.^{2} B60C *11/00*

U.S. Cl. 152—176

1 Sheets Drawing. 7 Pages Specification



A replaceable tire tread belt has outer and inner peripheral surfaces and a pair of opposite side surfaces. The inner peripheral surface has a plurality of projections for interlocking engagement with a tire carcass, and the outer peripheral surface is axially divided into a smooth portion extending about the circumference and providing an extended service life, and a grooved portion extending about the circumference and defining the remaining portion of the outer peripheral surface and providing traction.

T973,008
METHOD FOR REMOVING LAYERS OF ORGANIC MATERIAL

Leon H. Kaplan, Yorktown Heights, N.Y.; Nungavaram S. Viswanathan, Lancaster, Calif., and Steven M. Zimmerman, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 743,190, Nov. 19, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 858,985

Int. Cl.^{2} B08B *3/08*

U.S. Cl. 134—3

No Drawing. 14 Pages Specification

Organic materials, such as organic polymer resist layers, are removed from substrates by contacting the materials with a mixture consisting essentially of an alkali metal persulfate and concentrated (96%) sulfuric acid wherein the mixture contains from above about 13 to about 50 grams of alkali metal persulfate per 100 milliliters of sulfuric acid.

T973,009
APPARATUS AND METHOD FOR HEATING A CONTROLLED, MOVING WIRE CONTAINING TREATING AGENTS

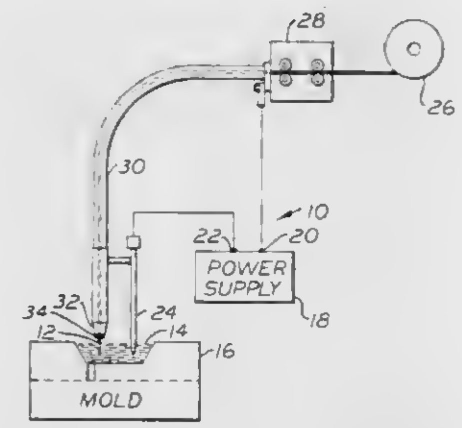
John G. Frantzreb, Sr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 9, 1977, Ser. No. 849,730

Int. Cl.^{2} B22D *27/20*

U.S. Cl. 164—50

1 Sheets Drawing. 7 Pages Specification



An electric circuit controllably heats a controlled, moving wire containing treating agents during entry of the wire into molten metal of a mold. The electric circuit includes an electrode and a power supply which has first and second terminals. The first terminal is connected to the wire at a location spaced from the mold and the second terminal is connected to the electrode. The electrode extends into the mold and forms a current path through the molten metal to the wire. The wire is controllably heated to a preselected temperature in response to current flow therethrough.

A method of heating the controlled, moving wire during entry of the wire into a mold is provided by connecting the power supply to the wire at a location outside the mold to the electrode which extends into the mold; submerging selected portions of the wire and electrode into the molten metal and forming the electric circuit; and delivering current to the wire of a magnitude sufficient for increasing the temperature of the wire to a preselected temperature.

T973,010
ELECTRICAL CONDUCTOR SYSTEMS

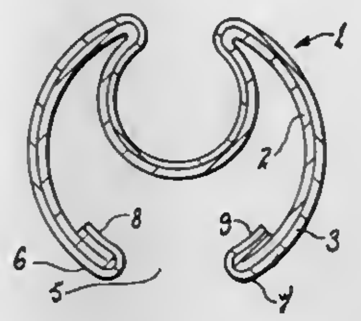
Kenneth Herbert McDonald, 6 Wallabah St., Mount Waverley 3149 Victoria, Australia

Filed Sep. 9, 1975, Ser. No. 613,881

Int. Cl.^{2} B60M *1/12*

U.S. Cl. 191—23 A

1 Sheets Drawing. 10 Pages Specification



An electrical conductor system to supply power to a travelling collector comprises an elongated hollow conduit formed with a continuous longitudinally extending slot. An insulating layer is bonded to the outer surface of the conduit and the conduit may be used as the sole current carrier. A continuous elongated conductor may be held in electrical contact with the inner surface and supported by discrete lengths of conduit in a position where the conductor is adapted to be contacted by a brush extending through the slot.

T973,011
CALENDERABLE PROPYLENE POLYMER COMPOSITIONS

Peter Ernest Waghorn, 29 Brockswood La., Welwyn Garden City, Hertfordshire, England

Filed Jul. 1, 1977, Ser. No. 812,439

Claims priority, application United Kingdom, Jul. 13, 1976, 29059/76; Mar. 29, 1977, 13126/77

Int. Cl.^{2} C08L *91/00*

U.S. Cl. 260—23 H

1 Sheets Drawing. 20 Pages Specification

Crystalline polypropylene compositions of low melt flow index which can be calendered into foils having a melt flow index of below 5 are obtained by using a soap and a particulate inorganic material together with highly effective stabilizer systems. Low melt flow index polypropylene polymers and copolymers arc rendered adequately resistant to degradation while in the molten state associated with a calendering process.

A composition calenderable into foils and which comprises:

a. a crystalline homopolymer of propylene and/or a crystalline copolymer of propylene with up to **25**%, preferably from over **5** up to **17**%, by weight of ethylene,
b. from **0.1** to **1.5**%, preferably **0.15** to **0.3**%, by weight of a "highly effective stabilizer system" as defined below,
c. from **0.1** to **2.0**%, preferably **0.15** to **0.8**%, by weight of a soap as described, and
d. **10** to **60**%, preferably **15** to **45**% by weight of a solid particulate inorganic material is described.

The percentages quoted are based on the weight of the polymer and/or copolymer present in the composition.

Preferred highly efficient stabilizers are pentaerythritol tetra-β-3,5-ditertiary butyl-4-hydroxyphenyl propionate and tris(3,5-ditertiary butyl-4-hydroxybenzyl) isocyanurate but stabilizers such as 2,6-ditertiary butyl-4-methyl phenol or 1,1,3-tris(2′-methyl-5′-tertiary butyl-4-hydroxy phenyl) butane are also effective.

T973,012

COMPOSITIONS SUITABLE FOR MAKING FLOOR TILE

Kenneth W. Hyche, Rte. 3, Cooks Valley Rd., and Martin F. Schick, 1360 Holyoke St., Apt. 28, both of Kingsport, Tenn. 37664

Continuation of Ser. No. 657,348, Feb. 11, 1976. This application Dec. 14, 1977, Ser. No. 860,499

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 H

No Drawing. 13 Pages Specification

A molding composition capable of forming floor tile comprising (1) about 100 parts of an ethylene containing thermoplastic rubber, (2) about 50 to 200 parts of polyolefin and (3) about 100 to 700 parts filler.

T973,013

COMBINED MICROWAVE OVEN AND REFRIGERATOR

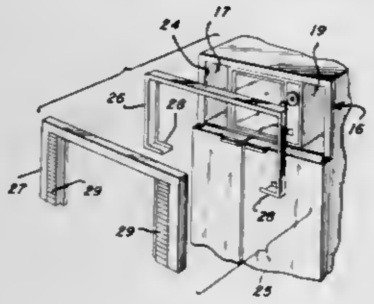
Frank I. Ferrara, Newburgh, Ind., and Samuel J. Pearson, St. Joseph, Mich., assignors to Whirlpool Corporation

Filed Sep. 19, 1977, Ser. No. 834,761

Int. Cl.² A47B *83/00*

U.S. Cl. 312—237

1 Sheets Drawing. 12 Pages Specification



A refrigerated appliance having a cabinet defining a pair of cavities and an apparatus for refrigerating one of the cavities. The refrigerated cavity is provided with doors for selectively closing the refrigerated cavity. The other of the cavities defines an opening and is adapted to receive a freestanding microwave oven having an integral door. The open cavity may be provided with a trim for adapting the cavity to any one of a plurality of different microwave ovens electrically disposed therein. The trim may define a vent for providing the microwave oven with cooling air flow circulation. The refrigeration apparatus may define a freestanding cabinet with the microwave oven defining a freestanding oven carried on a horizontal support wall at the top of the refrigeration space.

T973,014

IMMERSIBLE BAG FOR EXHAUSTABLE SUBSTANCES

Adolf Rambold, Bachstrasse 8, D-4005 Meerbusch 1, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,727

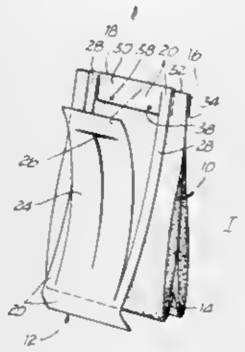
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755203

Int. Cl.² A47G *19/16;* **B65B** *29/04*

U.S. Cl. 426—83

1 Sheets Drawing. 14 Pages Specification

An immersible bag (**10**) for exhaustable substances, with a bag containing the substance, which bag has a closed bag opening on the bag head (**16**), and with a bendable strip (**12**) folded along a transversely extending fold line, the strip having two legs continuously connected at the fold line, which legs are fastened on the bag and which legs receive therebetween the bag head adjacent the fold line, whereby the inner surface of the strip (which inner surface faces the bag) is formed at least at the fastening places by a thermoplastic synthetic material which is welded at the fastening places on the bag. The strip and the bag are spot welded at least at a spot or point-shaped fastening spot (**38**) on both outer sides of the bag, in the manner that the synthetic material is fused at the fastening spots with the porous material of the bag.



T973,015

CATHODICALLY PROTECTED POLYOLEFIN COATED PIPELINES

Julian Burrell Chadwick, 23 Linwood Rd., Ware, Hertfordshire, and Victor George Kendall, 9 Ducketts Wood, Thundrige, Ware, Hertfordshire, both of England

Filed Sep. 26, 1977, Ser. No. 836,570

Claims priority, application United Kingdom, Jun. 29, 1977, 27190/77

Int. Cl.² F16L *58/02*

U.S. Cl. 428—36

No Drawing. 18 Pages Specification

The resistance to stress cracking or cathodic disbonding of an external polyolefin coating on a cathodically protected pipeline, especially a steel pipe for conveying fuel gas at high pressure, is improved by including 1–18%, preferably 4–8%, by weight, based on the polyolefin, of cured epoxy resin in at least the region of the polyolefin coating adjacent the pipe. The concentration of cured epoxy resin may be uniform throughout, or the coating may comprise a primer layer of polyolefin containing the epoxy resin adjacent the pipe and an outer layer of polyolefin containing no epoxy resin.

Suitably cured epoxy resins are described in Kirk-Othmer Encyclopedia of Chemical Technology 2nd Ed. Vol. 8, pp. 294–312. The polyolefin is preferably low-density polyethylene but may also be an ethylene copolymer, high-density polyethylene, polypropylene or a propylene copolymer with up to 20% by weight of ethylene. Its melt flow index is preferably 0.1–200 when used as primer and 0.1–2 otherwise (units g/10 min. measured according to British Standard 2782:Part 1/105C/1976 using 2–16 kg load and for propylene polymers performed at 230° C. instead of 190° C.). Stabilizers, especially antioxidants, pigments such as carbon black, e.g. 1–5% by weight and peroxy cross-linking agents may also be included in the polyolefin compositions.

The powdered composition may be coated by electrostatic spraying onto the heated pipe, e.g. at 190° C. for low-density polyethylene, with possible subsequent application by extrusion or otherwise of polyolefin containing no epoxy resin. It may alternatively be strew-coated onto the pipe heated to a higher temperature, e.g. 320° C.

T973,016

CYANOETHYLATION OF HYDANTOINS

Samuel Ellsworth Shull, Cogan Station, Pa., and John Douglas Freilich, Grand Island, N.Y., assignors to Glyco Chemicals, Inc., Greenwich, Conn.

Continuation of Ser. No. 747,987, Dec. 6, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 846,019

Int. Cl.² C07D *233/72*

U.S. Cl. 548—312

No Drawing. 18 Pages Specification

An improved process for the manufacture of a 3-β-cyanoethyl- or a 1,3-di(β-cyanoethyl)-5,5-disubstituted hydantoin, by reacting acrylonitrile and a 5,5-disubstituted hydantoin in the presence of a base catalyst in a solvent media composed of a secondary and/or tertiary alcohol having up to 5 carbon atoms and a boiling point from between about 80°–135° C as a reaction solvent. The alcohol reaction solvent may be used for crystallization of the cyanoethylated product.

The solvent media can for example be selected from the group of isopropanol, 2-methyl-2-butanol, 3-methyl-2-butanol, 2-pentanol, 3-pentanol, tertiary butanol, 1,1-dimethylpropanol and mixtures thereof. The process provides for obtaining high yields of pure product with the formation of a minimum of side reactions and by-products.

REISSUES

AUGUST 1, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

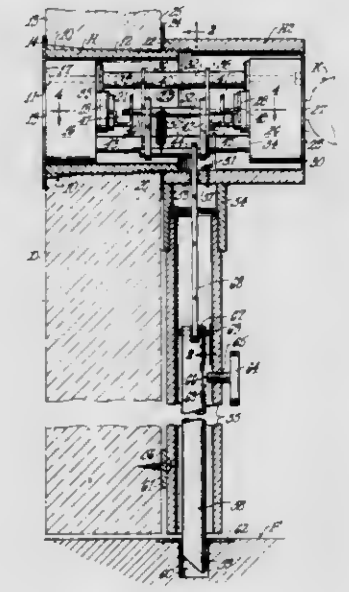
Re. 29,712

DOUBLE CYLINDER LOCK BOLT ASSEMBLY

Paul Shipman, 3835 Ridgeley Dr., Los Angeles, Calif. 90008
Original No. 3,964,281, dated Jun. 22, 1976, Ser. No. 562,631, Mar. 27, 1975. Application for reissue Mar. 28, 1977, Ser. No. 781,930

Int. Cl.² E05B *63/14*

U.S. Cl. 70—120 **14 Claims**



1. A lock assembly comprising in combination:

a pair of axially aligned, individually rotatable operating cylinders having means for selective anchorage spaced-apart opposite ends of a transverse bore of a closure, which closure carries a projectable lock bolt, [the adjacent inner ends of each cylinder carrying a generally diametricaly disposed contact surface projecting toward the adjacent spaced-apart cylinder and extending laterally to both sides of the common axis of said cylinders,]

arcuately reciprocable shift means for moving the lock bolt between alternate locked and unlocked positions, said means being located between the spaced-apart cylinders and having a coupling portion [arcuately] swingable [from a pivot point along] *in a direction transverse to* said common axis with the arcuate portion thereof disposed in operative connection with the lock bolt,

intermediate activating means connecting the inner end of each operating cylinder to the adjacent shift means therebetween, said activating means comprising a pair of [crank members each secured to a respective end of said shift means at points coaxial with and adjacent to a respective cylinder, each crank member having an arm laterally extending to one side of the common axis and disposed to contactingly overlie the adjacent contact-surface and thus to be turned by rotation of said surface, thereby] *lost-motion coupling elements each connected at one of its ends, for rotary movement by the inner end of a respective operating cylinder, and at its other end to said shift means thus enabling* arcuately moving the shift means plus its connected lock bolt between locked and unlocked positions in response to rotation of either operating cylinder.

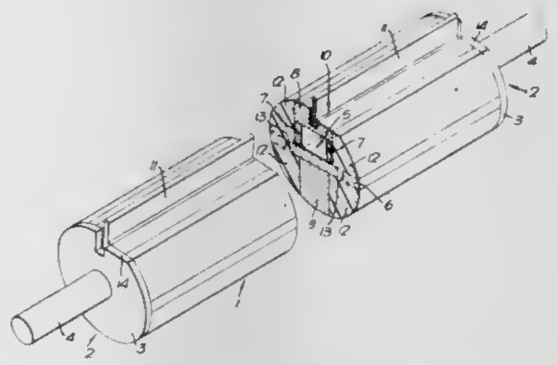
Re. 29,713

ROTARY CUTTER DRUMS

Richard Adrian Craddy, Alveston, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, Great Britain
Original No. 4,005,627, dated Feb. 1, 1977, Ser. No. 643,269, Dec. 22, 1975. Application for reissue May 27, 1977, Ser. No. 801,193
Claims priority, application United Kingdom, Jan. 17, 1975, 2077/75

Int. Cl.² B26D *1/36*

U.S. Cl. 83—674 **6 Claims**



1. A rotary cutter drum for use in apparatus for cutting continuous web material into discrete lengths including a load carrying member, means for attachment of a cutter blade thereto, and non-load carrying light-weight material secured to said load carrying member and so arranged that the whole forms a body whose outer surface is rotationally symmetrical, interrupted as necessary to allow for the presence of such cutter blade, in which means is provided on said load carrying member to balance said cutter blade and said attachment means.

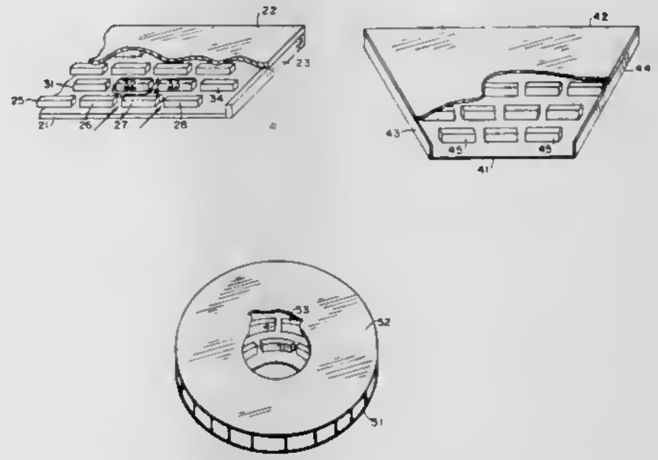
Re. 29,714

FLUID FLOW RESTRICTOR

Paul F. Hayner, Gilford, and Richard J. Brockway, Amherst, both of N.H., assignors to Sanders Associates, Inc., South Nashua, N.H.
Original No. 3,688,800, dated Sep. 5, 1972, Ser. No. 93,192, Nov. 27, 1970. Application for reissue Mar. 11, 1976, Ser. No. 665,989

Int. Cl.² F15D *1/02*

U.S. Cl. 138—42 **12 Claims**



1. A *low noise level* restrictor *having an inlet* for insertion in a fluid path for controlling the flow of fluid therethrough, comprising,

a plurality of spaced apart parallel impervious plates,

means for constraining fluid to flow between adjacent plates, *and*

a plurality of unconnected baffles between said plates, *each* in engagement with *both* facing surfaces of adjacent plates and arranged in rows transverse to the general direction of fluid flow, undeviating spaces between adjacent rows and spaces between adjacent baffles in each row as to define transverse passageways between rows and substantially straight longitudinal passageways between adjacent baffles in each row interconnecting adjacent transverse passageways,

the baffles in succeeding rows being positioned so as to divide the flow arriving from the spaces between adjacent baffles of the preceding row[.].

said restrictor having a first row of baffles at said inlet defining a first longitudinal set of passageways having a first total cross-sectional flow area and each succeeding row of longitudinal passageways having a total cross-sectional flow area greater than the cross-sectional flow area of the preceding row, such that the total cross-sectional flow area of said longitudinal passageways between said baffles at any given distance from said inlet increases with the distance from the inlet as measured along the direction of flow of fluid so as to reduce the noise level caused by the insertion of said restrictor into said fluid path.

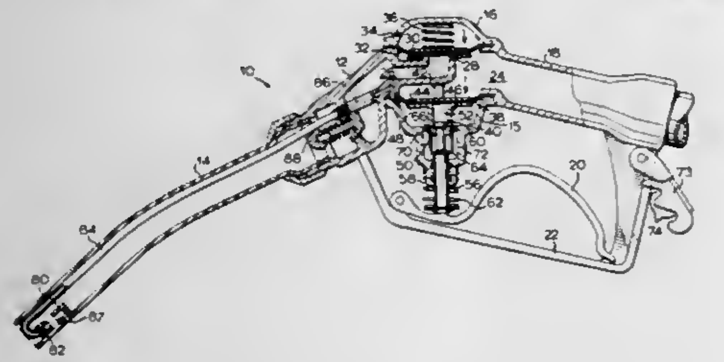
Re. 29,715
FLUIDIC AUTOMATIC NOZZLE

George B. Richards, 1212 Ranch Rd., Lake Forest, Ill. 60045; Leonard W. Swain, and Edward W. Hunter, both of London, Canada, assignors to George B. Richards, Lake Forest, Ill.

Original No. 3,866,637, dated Feb. 18, 1975, Ser. No. 329,226, Feb. 2, 1973. Application for reissue Feb. 16, 1977, Ser. No. 769,101

Int. Cl.^{2} B65B *3/26*

U.S. Cl. 141—226 **17 Claims**



1. In an automatic nozzle for use in controlling the flow of fluids having a housing having a fluid passage opening therethrough, valve means in said passage including a valve member for opening and closing said fluid passage, and means for generating a positive fluid pressure in response to the flow of liquid through said fluid passage, diaphragm means mounted in said housing forming a diaphragm chamber communicating with said means for generating a positive pressure, said means for generating a positive pressure including means for disrupting its pressure generating ability in response to the level of liquid in the tank being filled rising above a predetermined height with respect to said nozzle, manually operable valve opening means movable between a first position in which said valve member is closed and a second position in which said valve is open, the improvement of

means connecting said diaphragm means and said valve means whereby said valve means moves with said diaphragm, and wherein said manually operable actuator means includes collapsible stem means extending into said housing and engaging said diaphragm means, locking means for releasably locking said stem means in an extended position in which said stem is operable to move said diaphragm to move said valve member to an open position,

and means urging said stem means to said first position to close said valve,

said releasable locking means being released when said stem means is moved to a predetermined position at least partially opening said valve and when said diaphragm chamber is positively pressurized at a pressure sufficient to move said valve closure member independently of said stem, thereafter said valve closure means being closable in response to a predetermined decrease in pressure by collapsing of said stem.

Re. 29,716
METHOD OF DRILLING A BOREHOLE USING GELLED POLYMERS

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 3,921,733, dated Nov. 25, 1975, Ser. No. 372,825, Jun. 22, 1973. Continuation-in-part of Ser. No. 224,914, Feb. 9, 1972, abandoned. Application for reissue May 23, 1977, Ser. No. 799,611

The portion of the term of this patent subsequent to Sep. 30, 1992, has been disclaimed.

Int. Cl.^{2} C09K *7/00;* **E21B** *21/00, 43/22*

U.S. Cl. 175—65 **14 Claims**

1. In a method for drilling a borehole into the earth wherein a drill bit is actuated in said borehole and penetrates a subterranean formation in the presence of a drilling fluid, and said drilling fluid, together with formation solids entrained therein, is removed from said borehole, the improvement wherein said drilling fluid comprises an aqueous gel, and wherein said gel comprises water *having an initial total dissolved solids of not greater than about 40,000 ppm by weight* to which there has been added:

a water thickening amount of a water-dispersible polymer selected from the group consisting of: polyacrylamides and polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; polyacrylic acid and polymethacrylic acid; polyacrylates, polymers of N-substituted acrylamides wherein the nitrogen atoms in the carboxamide groups can have from 1 to 2 alkyl substituents which contain from 1 to 4 carbon atoms; copolymers of acrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; and mixtures of said polymers;

a sensible amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

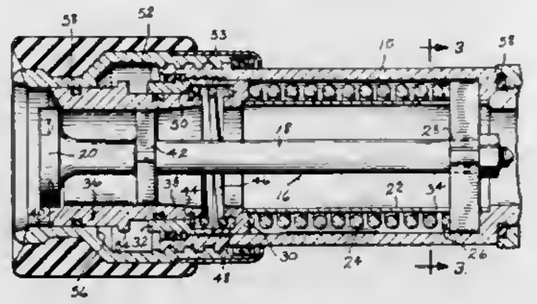
Re. 29,717
AUTOMATIC VOLUME ADJUSTING FIRE HOSE NOZZLE WITH FLUSHING MECHANISM

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Original No. 3,893,624, dated Jul. 8, 1975, Ser. No. 508,064, Sep. 23, 1974. Application for reissue Mar. 25, 1976, Ser. No. 670,263

Int. Cl.^{2} B05B *1/32, 15/02*

U.S. Cl. 239—107 **9 Claims**



1. In a fire hose nozzle including a tubular body part having an inlet end and an outlet end, a pressure responsive valve assembly shiftable in said body part and including a valve head and a valve stem, said valve head being shiftable toward and away from said body part outlet in response to variations in pressure of liquid supplied to said nozzle, the improvement comprising a barrel member having fore and aft ends surrounding said valve stem, the aft end of the said barrel member fitting slidably within the outlet end of said body part, said barrel member being shiftable longitudinally relative to said body part between a forward position in which the barrel member fore end spacedly encircles said valve head to define a liquid flow path from the nozzle and a rearward position in which the barrel member fore end is shifted rearwardly of the valve head to increase the spacing between the barrel member and valve head, a sleeve member encircling the fore end of said body part and surrounding said barrel member, means rotatably connecting said sleeve member to said body part wherein rotation of the sleeve member upon the body part causes the sleeve member to shift longitudinally of the body part between extended and retracted positions, said sleeve member including abutment part means for contacting said barrel member to shift the barrel member from its forward position into its rearward position as said sleeve member is shifted from its extended position into its retracted position.

Re. 29,718
RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK

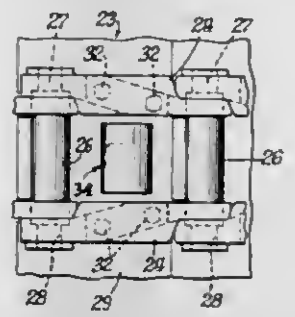
Harold L. Reinsma, Dunlap, and Frederick D. Proksch, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,887,244, dated Jun. 3, 1975, Ser. No. 420,720, Nov. 30, 1973. Application for reissue May 31, 1977, Ser. No. 801,716

Int. Cl.^{2} B62D *55/08*

U.S. Cl. 305—57 **3 Claims**

9. In an endless track assembly of the type used on a vehicle provided with a drive sprocket having teeth and notches alternately disposed about the circumference of the sprocket, said track assembly comprising a pair of laterally upstanding link elements; [parralel] *parallel* pin and bushing elements secured to and interconnecting respectively opposite ends of the links; a track shoe secured to the bottoms of said links; the improvement comprising a resilient impact lug in the form of a hollow, generally tubular body of synthetic plastic material substantially harder than natural rubber releasably secured to the shoe midway between the bushing elements, said tubular body being provided with capping means at the contact end thereof and contains therewithin spring means biased between a pair of pressure plates secured within the body at opposite ends thereof, said impact lug having a topmost portion *of greater height from the track shoe than the topmost portion* of the adjacent bushings whereby initial contact is made by said lugs so that impact energy is absorbed by the lug prior to engagement of an adjacent bushing.



Re. 29,719
THERMOPLASTIC MOULDING COMPOSITIONS REINFORCED WITH A MIXTURE OF GLASS AND ASBESTOS FIBERS

George Leonard Wicker, Milnrow, England, assignor to T.B.A. Industrial Products Limited, England

Original No. 3,773,705, dated Nov. 20, 1973, Ser. No. 198,410, Nov. 12, 1971. Application for reissue Apr. 14, 1976, Ser. No. 677,031

Claims priority, application United Kingdom, Nov. 18, 1970, 54899/70; Dec. 10, 1970, 58746/70

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—37 N **5 Claims**

1. A *granular* thermoplastic *molding* composition, comprising (i) from 60 to 90 percent by weight of a thermoplastic polymeric material selected from the group consisting of polyolefins, polystyrene, polyamides, copolymers of butadiene, copolymers of acrylonitrile and copolymers of styrene; (ii) at least 10 percent by weight, based on the total weight of the composition, of a mixture of glass fibres and asbestos fibres in a weight ratio of from 1:0 11 to 1:9; and (iii) from zero to 20 percent by weight based on the polymeric material of a component selected from the group consisting of fillers and additives other than glass fibres and asbestos fibres; said ratio of glass and asbestos fibres [lending] *being selected to impart* synergistic properties to *an article injection molded from* the *granular* thermoplastic molding composition in at least one of the properties of tensile strength, flexural strength, tensile modulus and flexural modulus *of the article.*

PLANT PATENTS

GRANTED AUGUST 1, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,286

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 5, 1976, Ser. No. 739,127

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium* plant known by the cultivar name Camino Pink and particularly characterized as to uniqueness by the combined characteristics of flat inflorescence form, daisy inflorescence type, lavender pink ray floret color with minimal color oxidation, uniform nine week flowering response, medium plant height, diameter across face of inflorescence up to 80 mm. at maturity, semi-upright branching pattern, and high percentage grade-out in top SAF grades.

4,287

CHRYSANTHEMUM

Nicolaas Middelburg, 's Gravenzande, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Willemstad, Netherlands Antilles

Filed Aug. 26, 1977, Ser. No. 828,259

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its satiny golden blooms, vigorous growth, three month response and permanence.

4,288

CHRYSANTHEMUM

Nicolaas Middelburg, 's Gravenzande, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Willemstad, Netherlands Antilles

Filed Aug. 29, 1977, Ser. No. 828,501

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its satiny pink blooms, vigorous growth, three month response and permanence.

PATENTS

GRANTED AUG. 1, 1978

ERRATA

For CLASS	See PATENT NO.
028-173	4,103,390
066-192	4,103,485
042-001 D	4,103,639
134-073	4,103,698
214-086 A	4,103,799
138-145	4,103,800
214-001 HA	4,103,831
366-178	4,103,876
272-077	4,103,889
299-004	4,103,963
071-107	4,104,043
062-324	4,104,044
204-181 R	4,104,100
209-074 R	4,104,156
521-032	4,104,204
521-084	4,104,207
521-053	4,104,208
521-062	4,104,209
528-102	4,104,257
528-334	4,104,258
528-169	4,104,259
528-323	4,104,260
528-295	4,104,262
528-279	4,104,263
528-370	4,104,264
528-046	4,104,265
528-289	4,104,297
264-089	4,104,394
264-060	4,104,395
428-035	4,104,404
235-064.7	4,104,510
235-132 R	4,104,511
364-439	4,104,512
235-450	4,104,513
235-466	4,104,514
235-488	4,104,515

PATENTS

GRANTED AUGUST 1, 1978

GENERAL AND MECHANICAL

4,103,359

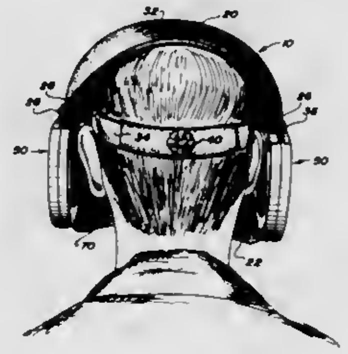
NOISE SUPPRESSING WELDING HELMET

Perry J. Rieppel, Worthington, and Harold Richard Heoderson, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Feb. 28, 1977, Ser. No. 773,633

Int. Cl.^{2} A61F *9/06*

U.S. Cl. 2—8 **11 Claims**



1. In a welder's helmet of the type having a front section containing a light filtering glass window and oppositely disposed rearwardly extending sides supported by a head harness for positioning the helmet to protect the face and sides of a welder's head when the helmet is worn during a welding operation, the improvement comprising:

a forward extending recess in each of said sides, said recess sized to be larger than the area covering a welder's ears;

ear protection means including an acoustical absorbing medium covering said recesses and extending rearwardly therefrom, said means and acoustical medium being disposed in said recesses so that when said helmet is being worn, neither said means nor said acoustical absorbing medium touches the ears of the user/welder.

4,103,360

WOMAN'S GARMENT WHICH MOLDS THE UPPER BODY

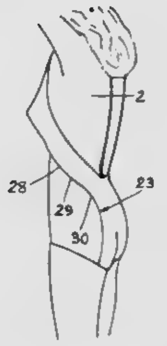
Charles Belpaume, Bouc Bel Air, France, assignor to Baron Chalmalla SA, Fribourg, Switzerland

Filed Jun. 27, 1977, Ser. No. 810,275

Claims priority, application France, Jun. 25, 1976, 76 19315

Int. Cl.^{2} A41D *5/00*

U.S. Cl. 2—67 **5 Claims**



1. Woman's garment, and more particularly a garment which moulds the upper body such as a one-piece bathing costume, an all-body-tight garment, a leotard, a blouse of the type closing between the legs, the said garment having seams which extend continuously from its upper edge to its lower edge characterised in that it has two lateral seams symmetrical in relation to the vertical plane of symmetry of the body, and each seam following, downwardly, a path such that it crosses the breast while passing substantially over the nipple region and while forming by a first contour a housing for the breast, and such that it crosses the side in order to be directed downwards and outwards towards the iliac crest then downwards and backwards to the level of the sacral promontory, and finally such that it crosses the gluteal muscles to extend at least as far as the gluteal fold while forming by a second contour, a housing for the buttock.

4,103,361

OUTERWEAR

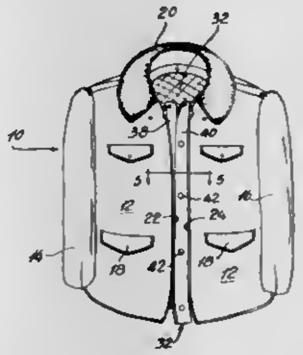
Hyman Carmen, St. Laurent, Canada, assignor to Evin Industries Ltd., Montreal, Canada

Filed Jun. 27, 1977, Ser. No. 810,395

Claims priority, application Canada, Jun. 7, 1977, 280067

Int. Cl.^{2} A41D *1/00*

U.S. Cl. 2—97 **6 Claims**



1. Outerwear including an outer shell and an inner shell, the outer shell and inner shell each having front edges, the inner shell having fastening means spaced from its front edges adapted to engage with similar fastening means on the front edges of the outer shell so as to provide a panel extending beyond the front edges of the outer shell, closure means provided on the panel for effectively closing the assembled outerwear jacket, whereby the inner girth of the outer shell when worn independently of the inner shell is equal to the inner girth of the composite outerwear when the inner shell is provided in the outer shell such that the overall girth of the composite outerwear has been expanded.

4,103,362

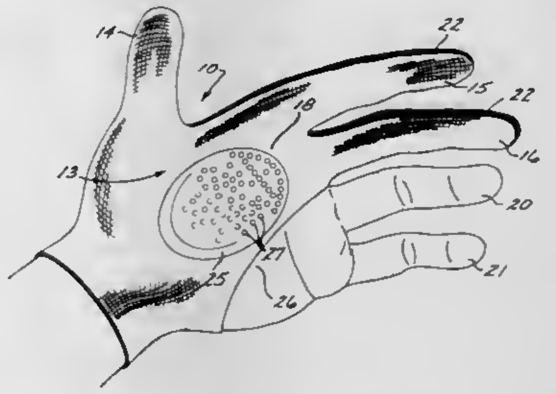
BILLIARD GLOVE

Carl E. Blakeman, 6001 Downey Ave., Long Beach, Calif. 90805

Filed Oct. 7, 1976, Ser. No. 730,445

Int. Cl.^{2} A41D *19/00*

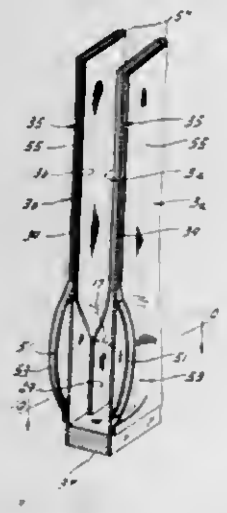
U.S. Cl. 2—161 A **7 Claims**



1. An apparatus for facilitating the sliding movement of a billiard cue relative to the guide hand of a billiard player comprising a covering formed to encompass the knuckles of the

thumb, index finger and middle finger of said guide hand and to encircle said guide hand and having expansive surfaces constructed to soft, porous fabric to reduce friction with respect to a billiard cue sliding thereover and including a releasable fastening strap and wherein the ring finger and little finger of said guide hand protrude freely from said covering.

4,103,363
METHODS OF MANUFACTURING PANTS
William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.
Filed Aug. 9, 1976, Ser. No. 712,711
Int. Cl.^{2} A41D *1/07, 27/00*
U.S. Cl. 2—227 **13 Claims**



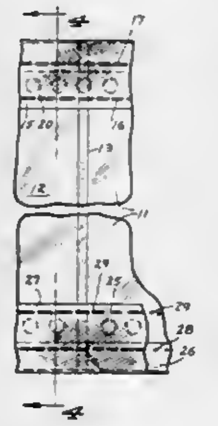
1. The method of making a pair of pants comprising assembling component parts to form the legs and the upper part of the pants, one end of the resultant assembly constituting its waist end, each component part being of heat-settable textile material;

applying the assembly to a molding form having a hip section for molding the outer side portions of the assembly adjacent its waist end to conform to the shape of the torso at the hips and leg portions extending from said hip section, said hip section being shaped to conform to the hip portion of the human figure and the leg portions comprising flat members extending from the hip section generally in front-to-rear vertical central leg planes on opposite sides of the front-to-rear vertical central plane of the hip section, said flat members extending for a distance corresponding to the length of the legs of said assembly and having a width greater than the width of the legs of said assembly generally at all points along the length of said flat members for stretching each leg girthwise generally throughout the length, said applying of the assembly to said molding form being carried out by drawing the waist end portion of the assembly over said leg portions and then over said hip section to apply said waist end portion of the assembly to said hip section and the legs of said assembly to said flat members, the outer side portions of the assembly adjacent its waist end being bulged out by said hip section and the legs of the assembly extending generally for their full length on said flat members and being stretched flat on said flat members;

applying heat to the assembly while on said molding form with said outer side portions of the assembly so bulged out and with the legs of the assembly stretched flat generally throughout their length on said flat members to set the assembly with said outer said portions of the assembly so bulged out and with said legs of the assembly having pants leg creases; and

removing the assembly from the molding form.

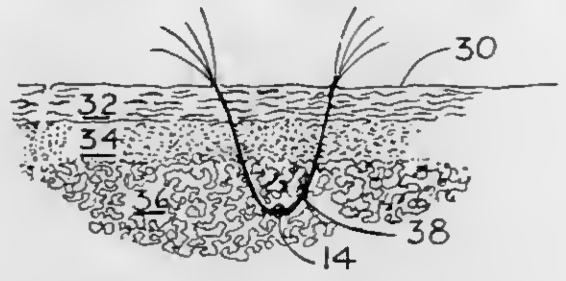
4,103,364
VENTED WATERPROOF PANTS
Burch O. Gustafson, 2677 S. Shore Blvd., White Bear Lake, Minn. 55110
Filed Nov. 1, 1976, Ser. No. 737,383
Int. Cl.^{2} A41B *9/04*
U.S. Cl. 2—406 **7 Claims**



1. Baby pants having a main body section of waterproof material that has front and rear panels, said panels each having an interior surface, an exterior surface, a top waist opening terminal edge, a first leg opening edge, a second leg opening edge, a first side edge extending longitudinally between the top edge and the first leg edge, a second side edge transversely opposite the first side edge extending between the top edge and the second leg edge, and a crotch area between the leg opening edges, the first and second panels being joined together along the lengths thereof adjacent their first side edges and also joined together along the length thereof adjacent their second side edges, at least one of said panels having a first row of vent apertures adjacent to and extending along one of the opening edges from adjacent one of the first and second side edges toward the other of the first and second side edges, and terminating remote from the said other of the first and second side edges, the vent apertures being in direct air flow communication with the interior of the pants and remote from the crotch area when the pants are in a normal condition of use, an open mesh band extending over the apertures, an elastic waistband adjacent the top edges, an elastic first leg opening band adjacent the first leg opening edge, an elastic second leg opening band adjacent the second leg opening edge, first means for securing the open mesh band and the elastic band that is adjacent to the same opening edge that the apertures are adjacent to the main body section with the apertures more remote from the last mentioned opening edge than the last mentioned elastic band, and second and third means for respectively securing the two elastic bands other than said last mentioned elastic band to the main body adjacent the respective one of the two opening edges other than the one the apertures are adjacent to.

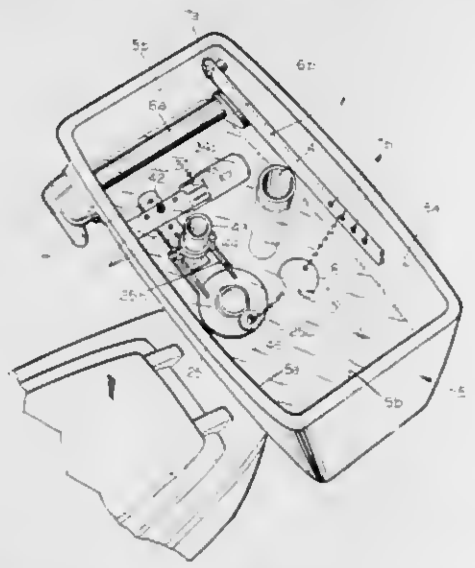
4,103,365
METHOD OF IMPLANTING SYNTHETIC HAIR
George D. J. Applegate, 9526 E. Harrison Cir., Tucson, Ariz. 85710
Filed Jul. 6, 1976, Ser. No. 702,415
Int. Cl.^{2} A61F *1/00*
U.S. Cl. 3—1 **12 Claims**

1. A method for implanting synthetic hair fiber into living skin tissue comprising the steps of attaching synthetic hair fiber to a needle; tying at least one knot in the synthetic hair fiber; passing the needle under the skin tissue into the subcutaneous tissue layer such that separate entrance and exit points are made; drawing the synthetic fiber through the skin tissue; leaving the portion of the synthetic fiber having the knot under the skin; and separating the needle from the synthetic fiber



whereby the synthetic fiber emerging from the skin tissue creates the appearance of living hair.

4,103,366
REPLACEMENT VALVE ASSEMBLY FOR FLUSH TANK TOILETS
John La Tour, Jr., 124 Emmett St., Daytona Beach, Fla. 32014
Filed Sep. 8, 1976, Ser. No. 721,246
Int. Cl.^{2} E03D *1/34;* **F16B** *7/10*
U.S. Cl. 4—393 **1 Claim**

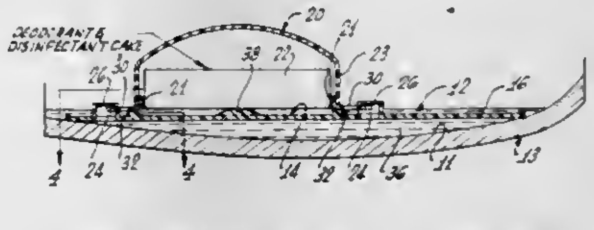


1. A replacement flush valve assembly for a toilet having a flush tank which has generally parallel, spaced vertical side walls, vertical end walls and a bottom and a discharge pipe protruding upwardly through the bottom with an annular, planar seat on its upper end, said assembly comprising:
- (a) a flapper valve adapted to sealingly fit over said seat, said valve having
  - (1) a disc-like body and
  - (2) spaced apart pivot arms extending outwardly from said body,
- (b) and means for mounting said valve member for angular movement between a raised position spaced above said seat and a closed position sealingly overlying said seat, said mounting means comprising
  - (1) an axially extendible support adapted to be positioned horizontally in said tank with its ends tightly engaging said side walls, said support having a plurality of axially spaced apertures extending therethrough
  - (2) means for locking said support in its extended position with the apertures extending generally vertically,
  - (3) an elongated support bar having a plurality of longitudinally spaced apertures,
  - (4) a post extending upwardly of said bar,
  - (5) a resilient ring adapted to embrace said post frictionally for slidable movement therealong, said ring having radially protruding pivots adapted for pivotal engagement with the free ends of said valve pivot arms, and
  - (6) a fastener adapted to extend through a selected pair of the apertures in said support and in said bar for fastening said bar to said support at a position in which said bar extends laterally from said support toward said discharge pipe seat with said post extending vertically relative to said support bar to place said flapper valve in a position overlying said seat,

said extendible support comprising first and second telescoping tubular elements having mutually engageable threaded portions, a rod adapted to be inserted into the open end of the second of said tubular elements, and compressable friction pads at the outer ends of the first of said tubular elements and said rod,

said support locking means comprising a pin having a radially extending projection on its medial portion and adapted to extend through diametrically aligned apertures in the wall of the second of said tubular elements adjacent the inner end of said rod for rotation between a locked position with said projecting medial portion in engagement with the inner end of said rod thrusting said rod axially to tightly lock said support in position and an unlocked position with the pin rotated out of disengagement with said rod.

4,103,367
CHEMICAL DISPENSER FOR URINALS
Leo Kaufer, 14144 Dickens St., Sherman Oaks, Calif. 91423
Filed Mar. 30, 1977, Ser. No. 782,948
Int. Cl.^{2} E03D *9/02*
U.S. Cl. 4—222 **5 Claims**



1. A dispensing container for solid deodorant and/or disinfectant media, for use in urinals, which comprises:

a generally flat plate having a perforate central portion and a perforate peripheral portion;

an imperforate cover adapted to contain therewithin said solid media and being provided with a peripheral flange thereanround;

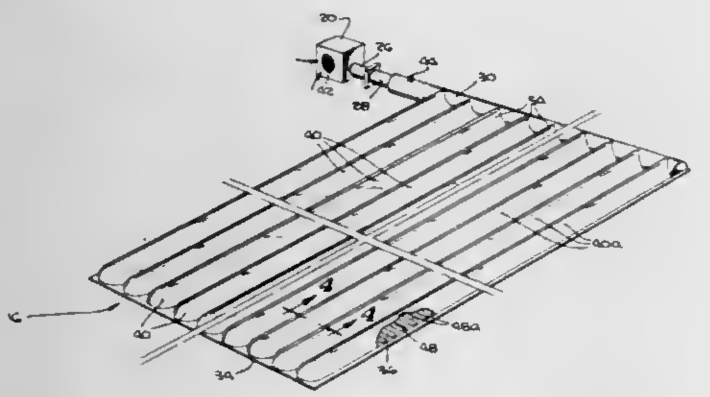
cooperating fastening means on said imperforate cover and said plate for releasably engaging said imperforate cover with said plate in overlying relationship with said perforate central portion of said plate; and

lug means affixed to said plate and lying in abutment with said peripheral flange of said cover thereby prevening abutment of said cover to said plate and forming a substantially continuous peripheral channel immediately adjacent and below said cover whereby the flush water path includes passage of flush water from the underside of the plate upwardly through the central porforate portion thereof, into the interior of the imperforate cover, and outwardly through the peripheral channel formed immediately below said cover.

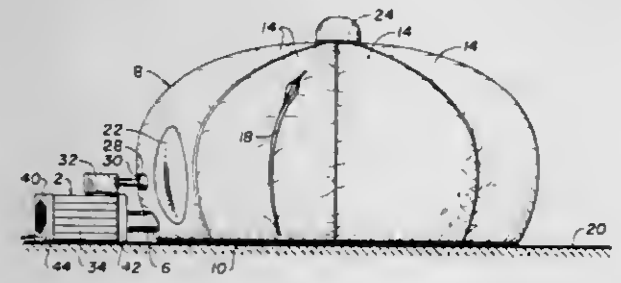
4,103,368
POOL COVER HAVING SOLAR ENERGY HEATING FEATURE
James J. Lockshaw, Huntington Beach, Calif., assignor to Tolo, Incorporated, Santa Ana, Calif.
Filed Jul. 12, 1976, Ser. No. 704,301
Int. Cl.^{2} E04H *3/19;* **F24J** *3/02*
U.S. Cl. 4—172.12 **19 Claims**

1. In a cover for a swimming pool adapted to furling about a storage locus and alternatively to planar deployment for use, said cover comprising flexible, water resistant sheet material, biasing means comprising a plurality of spaced parallel spring fingers carried by the cover and normally coiled to resiliently exert a furling bias continuously against said cover into furled position about said locus, and inflatable structure responsive to

inflation to overbalance said bias and deploy said cover into use position thereby, said inflatable structure comprising a series of hollow, solar radiation transparent ribs extending parallel to each other and to said spring fingers and normal to said storage locus, said cover including a wall portion underlying said inflatable structure in solar radiation receiving relation partially defining water conduit means and responsive to solar radiation reception to heat water in contact therewith.



4,103,369
INFLATABLE STRUCTURE
David B. Riordan, 3115 Eton Ave., Berkeley, Calif. 94705
Filed Feb. 28, 1977, Ser. No. 772,452
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172.12 **12 Claims**



1. A portable, self-ventilating inflatable enclosure assembly for providing a separate, completely enclosed space, defined by the interior of the enclosure, within a room, comprising

an enclosure floor portion of flexible sheet material for contacting the surface supporting the structure, the periphery of said floor portion defining the base of said enclosure,

an enclosure upper portion of flexible sheet material attached to said floor portion adjacent said floor portion periphery, the space between said floor portion and said upper portion defining the interior space of the enclosure,

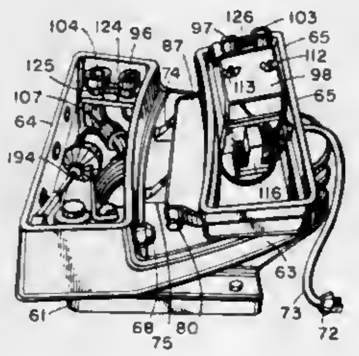
blower means for supplying air at a predetermined rate at greater than ambient pressure to fill said enclosure interior space therewith, whereby the enclosure may be inflated,

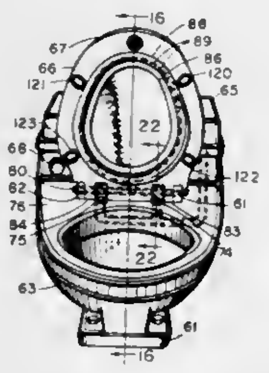
conduit means joining said blower means to said enclosure interior for introduction of said supplied air into said interior,

vent means positioned adjacent the attachment of said upper portion to said floor portion providing for automatic venting of said supplied air from said enclosure interior space at a predetermined rate after said enclosure is fully inflated, and

a carrying case containing said blower means and into which said floor portion, upper portion, conduit means and vent means are insertable for carrying when the enclosure is deflated.

4,103,370
ODORLESS WATER CLOSET
Douglas L. Arnold, 111 Sorento Dr., Holland, Mich. 49423
Filed Sep. 13, 1976, Ser. No. 722,696
Int. Cl.² E03D *9/04;* **A47K** *13/00, 3/22*
U.S. Cl. 4—213 **4 Claims**





1. An odorless water closet including a bowl, a tank having a cover, flushing conduit means communicating between said bowl and said tank, discharge conduit means including a trap, and communicating with said bowl and adapted for connection to a sewage pipe, water-control means adapted to control the supply of water to said tank, flush valve means adapted to discharge the contents of said tank to said bowl, and seat means pivotally mounted on said bowl for movement between a horizontal position over said bowl and an elevated substantially vertical position normally at the rear of said bowl and adjacent said tank, and also including ventilating means adapted to exhaust gases from within said bowl, wherein the improvement comprises:

an intake manifold disposed and mounted on the underside of said seat and adjacent the periphery of said bowl, and an intake conduit extending from said intake manifold; and

an exhaust conduit communicating between said intake conduit and said discharge conduit within said tank on the opposite side of said trap from said bowl, said exhaust conduit including blower means adapted to induce flow in said exhaust conduit toward said discharge conduit, and also including one-way valve means, said exhaust conduit also including a tubular member forming a pivotal mounting for said seat, and further including hollow bracket means mounted on said bowl and supporting said tubular member, said bracket means having a tubular vertical portion traversing a portion of said bowl.

4,103,371
TOILET SEAT LIFT
Lester J. Wilson, R.D. 3, Cambridge Springs, Pa. 16403
Filed Dec. 14, 1976, Ser. No. 750,424
Int. Cl.² A47K *13/10;* **E05F** *13/00;* **F16J** *3/06*
U.S. Cl. 4—251 **1 Claim**

1. In combination, a toilet having a seat **11** and a cover **12**,

hinge means **41** connecting said seat **11** to said toilet **1**,

bulb means **17** to be engaged by a person's foot for operating said toilet seat **11**,

a rod **15** pivotally connected to said seat in a position spaced from said hinge means,

a hollow cylinder supported relative to said toilet at one end,

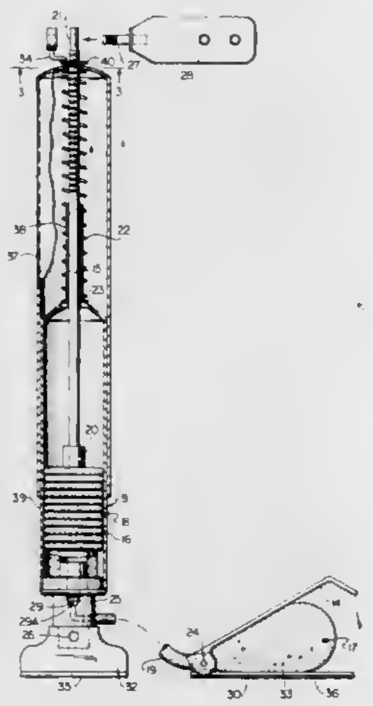
a bellows-like member **18** in said hollow cylinder **9** having said rod **15** connected to the upper end thereof **20** and adapted to be expanded by fluid from said bulb means **17**,

said bulb means **17** comprising a hollow expandable bulb connected to said bellows-like member for forcing air into said bellows-like member whereby said rod swings said seat to lifted position,

a C-shaped washer on an end of said rod,

spaced grooves in said rod receiving said washer,

a cylindrical dust cover telescopically received on said cylinder,



a helical spring supported on said rod,

one end of said helical spring resting on said cylinder and the other end of said spring supported on said dust cover urging said rod and said seat upward to counterbalance said seat,

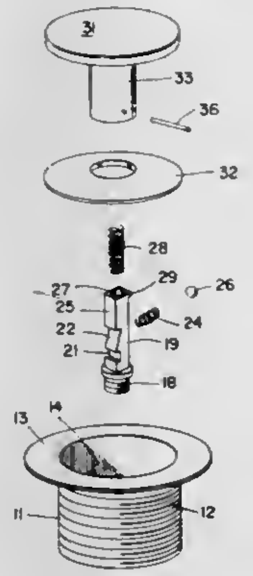
said rod having longitudinally-spaced grooves,

said C-shaped washer being selectively received in said longitudinally-spaced grooves in said rod whereby said seat is counter-balanced to swing upwardly,

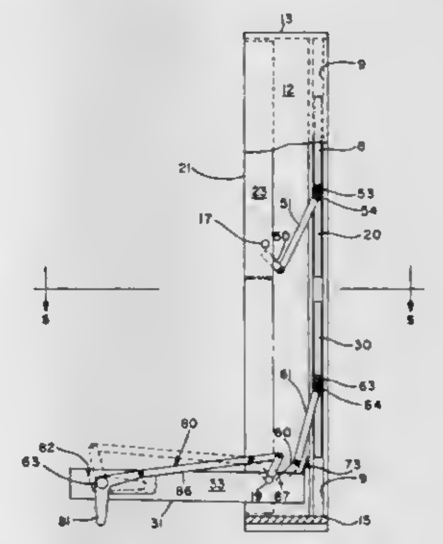
and said spring extending through the inside of said dust cover and engaging the top of said dust cover for urging said rod upwardly.

4,103,372
POP UP DRAIN FITTING
Casper Cuschera, 800 Durham Rd., Fremont, Calif. 94538
Filed Feb. 28, 1977, Ser. No. 773,138
Int. Cl.² A47K *1/14;* **E03C** *1/26*
U.S. Cl. 4—286 **1 Claim**

1. In a drain valve including a drain body having a flow channel therethrough and a post extending azially through said flow channel, and a drain sealing cover provided with a tubular portion having a central passage receiving said post for slidable translation thereabout and radial clearance therefrom, detent means in one axially extending surface of said post for selectively securing said post and said tubular portion with said drain sealing cover sealing said flow channel, said detent means being disengageable by rocking said tubular portion about the upper end of said post, the improvement comprising first compression spring means for biasing said drain sealing cover upwardly to clear said flow channel; and resilient means for biasing said tubular portion radially to oppose said rocking disengagement of said detent means, said resilient means including a hole extending radially into said post, the opening of said hole being in opposed relationship to said one axially extending surface, a detent member disposed in said hole, and second compression spring means for biasing said detent member into impingement with said central passage of said tubular member.



4,103,373
PORTABLE FOLDING BED CABINET
Oscar F. Luedtke, and Sarah Luedtke, both of 1636 Jasper Ave., Chula Vista, Calif. 92011
Filed May 5, 1977, Ser. No. 793,916
Int. Cl.² A47C *17/40*
U.S. Cl. 5—166 R **7 Claims**



1. A portable folding bed cabinet comprising:

a vertically elongated frame;

at least one mattress frame;

means pivotally attaching said mattress frame to said vertically elongated frame;

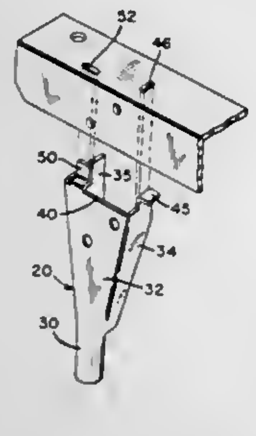
counterweight means connected to said mattress frame;

said vertically elongated frame comprising a pair of vertical side frame members connected together by a top frame member, said vertical side frame members having track means along their innersurfaces for guiding said counterweight means as they are raised and lowered when said mattress frame is pivoted from a vertical position to a horizontal position; and

said counterweight means being elongated panels that extend across the back of said vertically elongated frame with their ends inserted into said track means.

4,103,374
BED FRAME LEG CONSTRUCTION

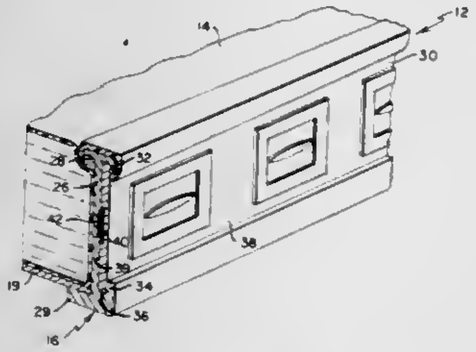
Silas J. Knoke, Seymour, Ind., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Apr. 7, 1977, Ser. No. 785,583
Int. Cl.^{2} A47B *19/02, 19/04*
U.S. Cl. 5—176 R **3 Claims**



1. In a folding bed frame having an angle iron end rail pivotally attached in underlying relation to a side rail for movement between a folded position in which the end rail is adjacent to the side rail and an erected position in which the end rail is normal to the side rail, and in which said end rail has a horizontal flange and a vertically depending flange, the improvement in frame supporting structure comprising, a sheet metal support leg having a castor-receiving socket portion at the bottom flaring into a generally flat tapered back wall and a pair of laterally-extending side walls, said back wall being received against an inside surface of the depending flange of said end rail, said side walls tapering from said socket portion upwardly to the top of said leg, rivet means extending through said back wall and said depending side rail flange fixing said back wall in abutment with the inside surface of said depending flange, said back wall being provided with an inwardly and upwardly extending stop member, and slot means in said horizontal flange receiving said stop member therethrough, said stop member being positioned to engage said side rail when the associated end rail is positioned in right angled relation thereto.

4,103,375
DECORATIVE WATERBED FRAME

Philip J. Santo, 130 Larkspur La., Rochester, N.Y. 14622
Filed Jun. 10, 1977, Ser. No. 805,583
Int. Cl.^{2} F16B *12/00;* **A47C** *27/08*
U.S. Cl. 5—282 R **8 Claims**



1. A decorative frame of modular construction for supporting the perimeter of a mattress such as a flexible bladder for a waterbed, said decorative frame comprising:

a plurality of upstanding elongated wall members of uniform cross-sectional configuration, said wall members having channel means formed along the longitudinal marginal edges thereof;

a plurality of decorative panels supported in said channel means of said plurality of wall members respectively;

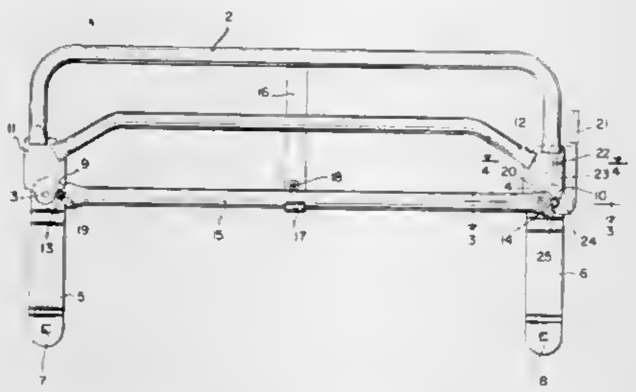
means for releasably fastening a decorative panel to a respective wall member within the channel means thereof;

a plurality of corner members of uniform configuration, said corner members interconnecting adjacent wall members at right angles, whereby a support frame for the perimeter of the waterbed mattress is formed; and

a plurality of decorative panels releasably fastened to said plurality of corner members respectively.

4,103,376
SAFETY SIDE FOR HOSPITAL BED

Roland A. Benoit, and Edmund P. Guillot, both of Danielson, Conn., assignors to InterRoyal Corporation, New York, N.Y.
Continuation of Ser. No. 626,798, Oct. 29, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,485
Int. Cl.^{2} A47C *21/00*
U.S. Cl. 5—331 **9 Claims**



1. Safety side apparatus for a hospital bed comprising:

a longitudinally extending rigid side frame having a pair of longitudinally spaced apart fixed distance pivot locations thereon,

a pair of longitudinally spaced apart crank levers, each adapted to be mounted operatively at one portion thereof on the bed and each having a floating frame pivot point and a biasing crank pivot point radially spaced from the frame pivot point at another portion thereof spaced from the first portion thereof,

the frame being pivotally connected at the fixed pivot locations thereon to the levers at the corresponding frame pivot points of the levers to move the frame from a lower position to an upper position with respect to the bed,

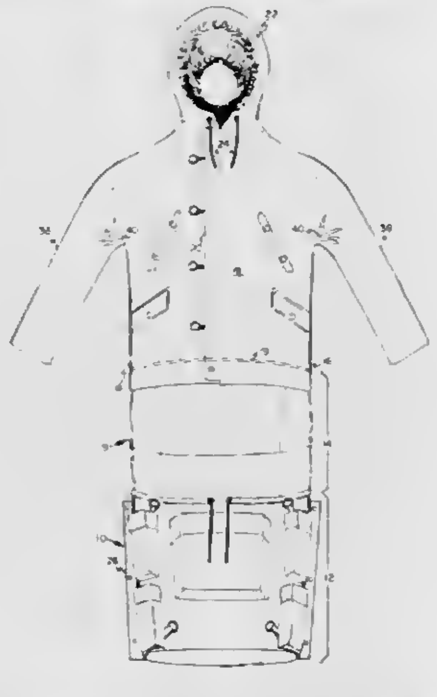
intermediately disposed retaining means on the frame, and

a bilateral longitudinal resilient biasing member operatively mounted intermediate its ends on the frame by the retaining means and operatively connected at its ends to the levers at the corresponding biasing crank pivot points and arranged with respect to the levers for bending the bilateral member out of its normal longitudinal disposition as the levers rotate about the floating frame pivot points with respect to the frame at the fixed distance pivot locations thereon to move the frame from the upper position to the lower position against the resilient force of the bilateral member exerted on the levers operatively connected to the ends of the bilateral member at the biasing crank pivot points and which force normally urges the frame pivot points of the levers and in turn the frame at the fixed distance pivot locations thereon to the upper position.

4,103,377
KNAPSACK-PARKA SLEEPING BAG

James W. Mayer, and Albert G. Smart, both of Santa Fe, N. Mex., assignors to Mel A. Pfreizer, Santa Fe, N. Mex.
Filed Jan. 27, 1977, Ser. No. 763,035
Int. Cl.^{2} A47G *9/08*
U.S. Cl. 5—343 **3 Claims**

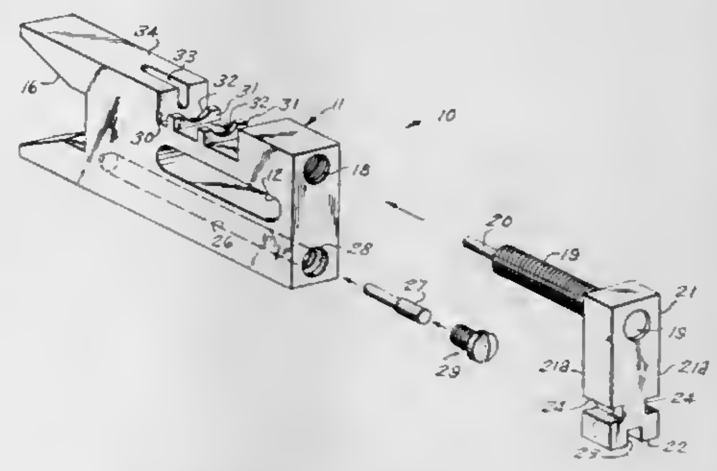
1. A sleeping bag comprising in combination, a parka and a knapsack, said knapsack having a substantially rectangular hollow bag-shape lower closed end portion formed by shape defining insulating lateral walls and an insulating bottom wall, a pair of flanges attached to and extending colinearly outwardly from and in the plane of one of the lateral walls whereby the knapsack lower end portion is adapted to be secured to and carried on a backpack frame; a substantially limp elongated insulating tube portion connected at one end to the open end of the knapsack closed end portion whereby it forms when in extended condition, a tubular insulating extension thereof, the combined length of the knapsack closed end portion and the tubular extension, (when extended,) being adequate to house the body of the user from feet to (hips) — a lower portion of said parka — substantially, and the combined lengths of the knapsack closed end portion and the tubular extension when compacted being that of the knapsack closed end portion substantially; (a parka,) said parka comprising inner and outer walls and an insulating layer therebetween, detachable fastening means comprising two elongated coextensive cooperative elements, means affixing one of said cooperative elements to the inner wall of the parka parallel to the bottom edge thereof and spaced from said bottom edge by the width of a depending parka flap portion, and the other cooperative element of the detachable fastening means being attached to the free end of the knapsack limp tube portion around all the peripheral extent thereof, the inside transverse peripheral extent of the parka when closed at the location of the detachable fastening means being equal to the peripheral extent of the free end of the knapsack limp tube portion, whereby said fastening means is adapted to detachably fasten the open end of the knapsack insulating tube portion throughout its peripheral extent to the inside wall of said parka to form a draft proof junction, the flap portion of said parka covering the fastening means to thermally insulate the fastening means, and the junction between parka and knapsack elongated insulating tube portion.



4,103,378
PORTABLE-THREE-IN-ONE BICYCLE TOOL

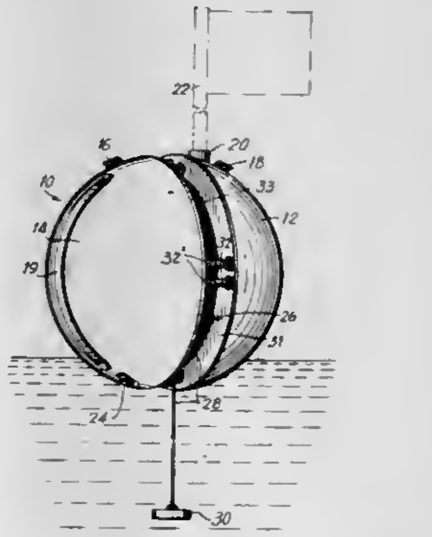
Javier F. Granados, 204 E. 1st Pl., Kennewick, Wash. 99336
Filed Aug. 8, 1977, Ser. No. 822,930
Int. Cl.^{2} B25F *1/00*
U.S. Cl. 7—138 **5 Claims**

1. A portable three-in-one bicycle tool, comprising an elongated main body of rectangular cross-sectional configuration, a cut-out portion in one end of said main body providing a means of trueing a wheel of a bicycle, a threaded bolt and wing nut fastener removably securing said main body to a bicycle, a handle with spoke adjustment means and a shaft means for adjusting and fixing a bicycle chain, received removably in said main body, and a chamber within said main body for storing rivet extractor tips.



4,103,379
MARKER BUOY

Henry S. Wolfe, Clearwater, Fla., assignor to American Clearwater Corp., Clearwater, Fla.
Filed Sep. 9, 1977, Ser. No. 831,941
Int. Cl.^{2} B63B *21/52*
U.S. Cl. 9—8 R **8 Claims**



1. A marker buoy for marking a selected location on the surface of a body of water having a particular depth at said location, said marker buoy comprising:

a body portion of buoyant material operative to float said buoy on said water surface, said body portion being free to rotate on said water's surface about an axis substantially parallel to said surface;

a core portion centrally disposed in said body portion, said core portion having a central hub and opposed sidewalls overextending said hub to define an annular recess about the periphery of said marker buoy, the axis of said hub being substantially coincident with the rotational axis of said body portion;

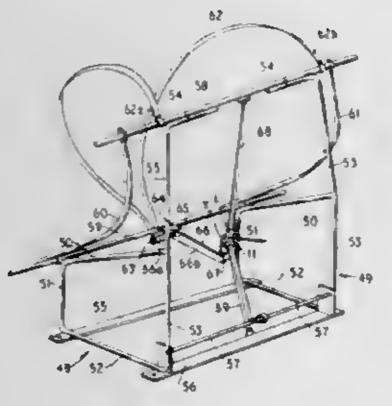
an anchor line for winding and unwinding movement within said recess about said hub when one end of said line is fixedly secured to said marker buoy, the other end of said line being free to engage an anchor weight operative to sink in said body of water and ~~to~~ unwind said line until a length of said line corresponding to said particular depth is unwound to anchor said marker buoy; and

a plurality of resilient finger elements each being fixedly mounted at one end to one of said core portion sidewalls and extending across said recess towards the opposite sidewall;

whereby when said anchor weight is secured to said free end of said line and descends in said water and unwinds said line to anchor said buoy, said line is pulled against said successive finger elements, and after said buoy is anchored, said finger elements prevent said line from further unwinding from said buoy.

4,103,380
CLAMPING DEVICES

Raymond Richmond, c/o Thornton, Baker & Co., Eldon Lodge, Eldon Place, Bradford, England
Filed Oct. 27, 1976, Ser. No. 735,915
Claims priority, application United Kingdom, Oct. 29, 1975, 44521/75
Int. Cl.^{2} B63B *23/00;* **A44B** *11/10*
U.S. Cl. 9—30 **9 Claims**

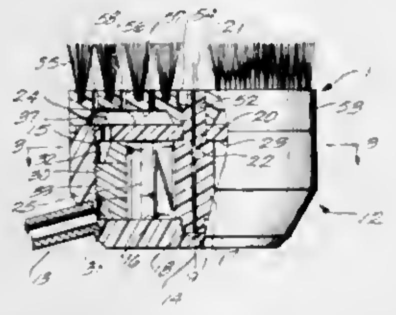


1. In combination, a support arrangement for a floatation device and a clamping device, said support device comprising a frame for supporting the floatation device, a restraining sling for restraining the floatation device on the frame and a lever pivotally attached to said frame and having one free end detachably engageable with said restraining sling and its other end supportable by the clamping device, said clamping device comprising a co-operating element, attached to that end of said lever remote from said end detachably engageable with said restraining sling, having an aperture therethrough, a U-shaped clamping member, defined by a base with two spaced apart limbs integral with said base, mounted on said co-operating member with the said base located in said aperture and said limbs passing one on each side of the said co-operating member, first apertures in the free ends of said limbs, second apertures in said limbs between said first apertures and said base, a flexible adjustable length member having one end passing through said first apertures in both said limbs and secured to retain said end with said limbs, said flexible adjustable length member extending from said end around a fixed part of said frame and then back to the clamping device to pass through said second apertures in said limbs whereby a section of said flexible adjustable length member lies between said co-operating element and said base, and a quick release element associated with the said clamping member and actuable to displace the said clamping member relative to the co-operating element in the direction to increase the distance between the said base and said co-operating member.

4,103,381
HYDRAULIC MOTOR

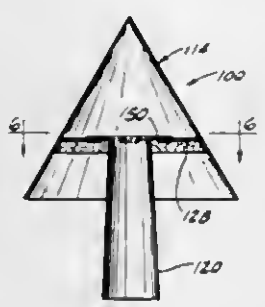
Otto W. Schulz, San Diego, Calif., and Tor Jan Pedersen, Hellandsbygd, Norway, assignors to Randolph C. H Michaelson, Malibu, Calif.
Filed Aug. 12, 1977, Ser. No. 824,057
Int. Cl.^{2} A46B *13/06*
U.S. Cl. 15—29 **7 Claims**

1. A hydraulic motor in which a circular sliding-vane rotor is centrally disposed in a substantially elliptically cylindrical rotor chamber formed in a body to which the rotor is rotatably mounted to define a pair of diametrically opposed arcuate work cavities to each of which a working liquid is introduced under pressure via an inlet port and from which spent liquid is withdrawn via an exit port displaced angularly from the inlet port in the direction of rotation of the rotor, the rotor carrying a sufficient number of radially movable spring-biased vanes slidably engaging the walls of the chamber that at least one vane is always disposed in cavity-dividing position in each cavity for application thereto of pressure of liquid in the cavity between the vane and the inlet port, thereby to urge the vane toward the outlet port and to turn the rotor about an axis of rotation thereof, and characterized in that the body defines a pair of annular spaces concentrically of the rotor chamber at axially displaced locations in the body adjacent the corresponding opposite axially spaced ends of the rotor chamber, and comprising means for supplying working liquid to one of the spaces, the inlet ports communicating from the one space to the respective cavities, the outlet ports communicating from the respective cavities to the other of the spaces, and means for discharging liquid from the outer space substantially parallel to the axis of the rotor.



4,103,382
ADHESIVE DEVICE FOR CLEANING HARD TO REACH AREAS

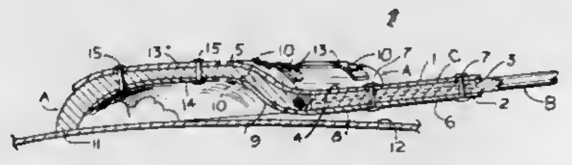
Jeffrey J. Gitt, 13368 LaBarge Dr., St. Louis County, Mo. 63141
Filed Nov. 8, 1976, Ser. No. 740,178
Int. Cl.^{2} A47L *13/00*
U.S. Cl. 15—104 R **2 Claims**



1. A disposable cleaning device for connection to a conventional broom handle comprising:
a hollow conical member having a solid exterior surface contiguous with the apex thereof and formed from a single paper blank;
said conical member including a tacky substance means on the exterior surface thereof for holding debris thereon;
a paper, circular disk having a peripheral, crimped, depending skirt adhesively connected to the interior surface of said conical member and positioned coaxially therewith;
said disk having a central passageway therethrough;
a paper tubular stem member passing through said passageway;
said stem member including a plurality of integral tab members at the inner end thereof, said tab members being bent radially outwardly with respect to said stem member and being secured to said disk;
said conical member having an apex angle of less than 90°;
said tubular stem member being tapered toward said conical member and having decreasing inside diameters from the outer end to said inner end thereof, and the range of said inside diameters being such that conventional broom handles will frictionally engage the interior of said stem member at some degree of axial insertion of such broom handle within said stem member.

4,103,383
SNOW DRAG AND SCOOP

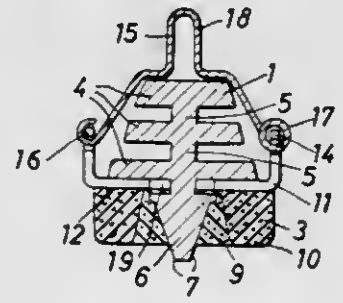
Alice I. Martin, 1001 E. 5th, Long Beach, Calif. 90802
Filed Apr. 29, 1977, Ser. No. 792,266
Int. Cl.^{2} A47L *1/06;* **A01B** *1/22*
U.S. Cl. 15—245 **2 Claims**



1. A device of the type described comprising:
(a) a pneumatic tire carcass sector of about one-half the width of a cross section through the carcass and having a length extending substantially through a one hundred and twenty degree arc;
(b) a handle;
(c) a holder interconnecting the handle to the inner arcuate edge of the tire carcass and at the midpoint of this edge, said holder consisting of two complemental parts forming a ferrule secured to said handle and having two arcuate-shaped portions engaging with the adjacent outer and inner surfaces of said carcass and being secured to said carcass;
(d) radially extending and arcuate-shaped reinforcing pairs of strips, the outer strips contacting and conforming to the outer surface of said carcass, and the inner strips underlying the outer strips and conforming to the inner surface of said carcass; and
(e) means for securing the pairs of strips to the carcass.

4,103,384
WINDSHIELD WIPER

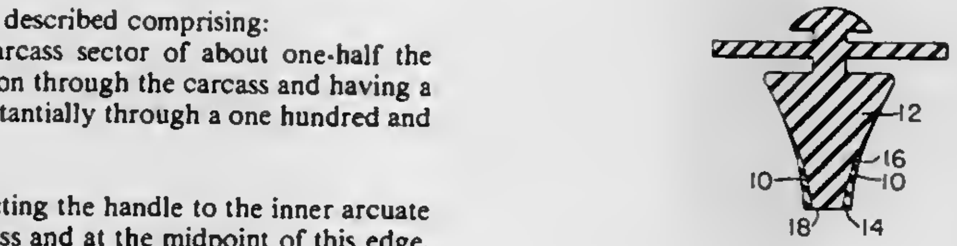
Wolfgang Priesemuth, Postkamp 13, 221 Itzehoe-Nordoe, Fed. Rep. of Germany
Division of Ser. No. 456,976, Apr. 1, 1974, Pat. No. 4,019,216. This application Oct. 8, 1976, Ser. No. 730,750
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1973, 2315891
Int. Cl.^{2} B60S *1/46*
U.S. Cl. 15—250.03 **11 Claims**



1. A windshield wiper which includes: spring bow means, a wiper blade in the form of a roll having wiping edge means and being connected to said spring bow means, a pad fastened to said roll and extending substantially along the length of said roll on at least that one side of said wiping edge means which faces the windshield to be contacted thereby, said pad being adapted to receive and store a cleaning fluid and substantially evenly to release the same onto the windshield to be wiped, rotary support means between the ends of said roll and the free ends of said spring bow means for holding said roll rotatable about its longitudinal axis in said spring bow means, and a wiper blade lip on said wiping edge means projecting from said roll towards the windshield to be wiped, the surface of said pad adjacent at least one side of said lip bearing on the windshield surface to be wiped during the wiping operation of said windshield wiper.

4,103,385
METHOD OF FORMING IMPROVED WINDSHIELD WIPER BLADES

Raymond P. Porter, North Dartmouth, Mass., assignor to Acushnet Company, New Bedford, Mass.
Continuation-in-part of Ser. No. 667,163, Mar. 15, 1976, Pat. No. 4,045,838. This application Nov. 15, 1976, Ser. No. 741,570
The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.
Int. Cl.^{2} B60S *1/38*
U.S. Cl. 15—250.36 **14 Claims**



1. A process of forming an improved flexible windshield wiper blade predominantly composed of polyisoprene, zinc oxide, carbon black and sulfur comprising the consecutive steps of:
(a) melt extruding at least one blade member;
(b) curing the blade member in a heated salt bath;
(c) rinsing the blade member;
(d) treating the blade member to harden its surface at least on the sides of the lip of the blade to a coefficient of friction no greater than about 2.1 according to Friction Test CFRP 113;
(e) drying the blade member;
(f) applying at least one coating to at least the sides of the lip of said blade member, said coating having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm^2 and said coating extending all the way to the lip edge and said coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade;
(g) drying the coated blade member;
(h) curing the coated blade member.

8. A process of forming an improved flexible windshield wiper blade comprising:
(a) melt extruding at least one blade member;
(b) setting the extrudate;
(c) treating the blade member to harden its surface at least on the sides of the lip of the blade to reduce its coefficient of friction to no greater than about 2.1 according to Friction Test CFRP 113;
(d) applying at least one coating to at least the sides of the lip of said blade member, said coating having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm^2 and said coating extending all the way to the lip edge and said coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade;
(e) curing the coated blade member.

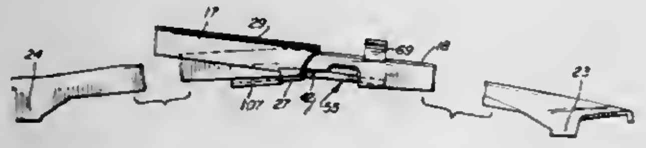
13. A flexible windshield wiper blade comprising a basic blade portion which is formed by extrusion and which has a coefficient of friction on at least the sides of the lip of the blade of no greater than about 2.1 according to Friction Test CFRP 113, said basic blade being selected from the group consisting of those blades which inherently have a coefficient of friction of no greater than about 2.1 those blades which have a coefficient of friction above 2.1 and which have been treated to reduce their coefficient of friction so that it is no greater than 2.1, and those blades which have a coefficient of friction above 2.1 which have been coated to reduce their coefficient of friction

so that it is no greater than 2.1, at least on coating on said sides of the lip extending all the way to the lip edge, said at least one coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade and said coating being selected from the group consisting of those elastomeric and plastic materials having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm^2, said coating being of a thickness effective to reduce the number of streaks the coated blade will give in Wipe Test WT-1 as compared to the number of streaks given by said basic blade.

4,103,386
LOCKING CLIP

John J. Arndt, Chestertoo, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Mar. 14, 1977, Ser. No. 776,997
Int. Cl.² B60S *1/04*
U.S. Cl. 15—250.42 11 Claims



9. In a pressure-distributing superstructure for a wiper blade having at least two generally elongate parts connected together, a pair of aligned claws formed on at least one end portion of one of said parts, said claws passing through a reduced sized portion of said other part, a locking clip carried by said other part for maintaining said parts in assembled relationship comprising:

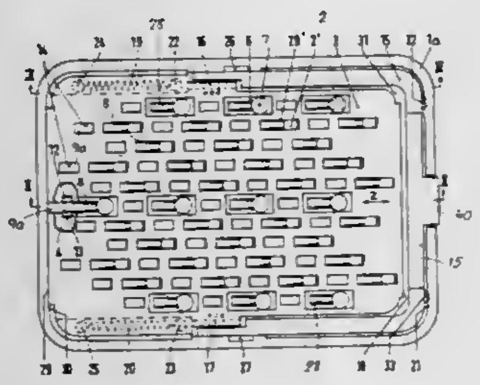
said clip having a mounting portion with a pair of laterally spaced legs extending from a crosspiece and interlocking with said other part to prevent relative movement between said clip and said other part; and

said clip having a latching portion with a pair of laterally spaced legs extending longitudinally from said mounting portion, means formed in each latching portion leg for receiving a respective claw therein, whereby said parts may be assembled or disassembled by closing said latching portion legs together and moving said claws into or out of said means.

4,103,387
BRUSH WITH RETRACTABLE BRISTLES

Leopold Anetseder, Jr., and Leopold Anetseder, Sr., both of Munich, Germany, assignors to Leopold Anetseder, Jr., Munich, Germany

Filed Aug. 10, 1976, Ser. No. 713,214
Claims priorlty, application Fed. Rep. of Germany, Aug. 11, 1975, 2535773
Int. Cl.² A46B *9/10*
U.S. Cl. 15—203 20 Claims



1. A collapsible brush comprising:

a generally flat body with a first member defining a first major surface or said body and a second member defining a second major surface of said body, said second member being superposed on said first member with limited relative slidability in a predetermined direction along a parting plane generally parallel to said major surfaces between a first and a second stop position;

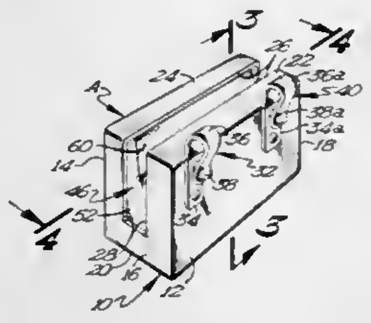
a set of bristle carriers journaled in one of said members and provided with coupling formations extending across said parting plane into engagement with coacting camming formations within the other of said members for swinging said carriers and their bristles about pivotal axes transverse to said predetermined direction upon a relative shift of said members between said stop positions, said bristles being retracted into said first member in said first stop position and projecting perpendicularly from said first major surface in said second stop position; and

connecting elements on one of said members passing through slits on the other of said members and terminating in heads holding said members together.

4,103,388
OIL DIP STICK WIPER

James L. DeVitis, 5 E. Lyons St., Duluth, Minn. 55811

Filed Mar. 4, 1977, Ser. No. 774,327
Int. Cl.² F01M *11/12;* G01F *15/12*
U.S. Cl. 15—210 B 1 Claim



1. An oil dip stick wiper compromising:

(a) a housing having spaced flat sidewalls,
(b) flat end walls of a length less than said sidewalls
(c) a flat bottom and
(d) a top,
(e) each of said end walls having a slot extending from the upper end and terminating short of the lower end of the wall,
(f) said top having a slot extending throughout the length thereof and coterminous with said slots in said end walls,
(g) an oil absorbent pad of a length less than the internal length of the housing,
(h) each of said end walls having an L-shaped projection with one leg thereof carried by the inner surface of the end wall for positioning the pad spaced from the end wall and with the other leg carried by the bottom for positioning the pad spaced from the bottom,
(i) said pad having a slot formed in the upper edge thereof coterminous with said slot in said top,
(j) hook-like clip means mounted on the flat outer surface of a sidewall of said housing for attaching the wiper to a portion of an internal combustion engine.

4,103,389
CLEANING UNIT

Marvin Resnick, and Stanley Homer Mounts, both of Washington, Pa., assignors to Textile Associates, Inc., Washington, Pa.

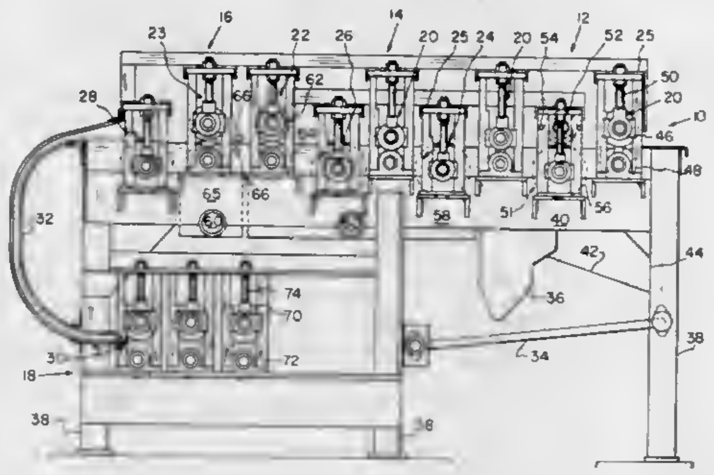
Filed Mar. 25, 1976, Ser. No. 670,115
Int. Cl.² A47L *5/38*
U.S. Cl. 15—302 19 Claims

8. A cleaning machine for mats having a stiff backing and a fibrous nap comprising:

A. an entry station for receiving the mats stiff backing side up, said entry station including at least one feed roll assembly and a beater roll positioned above a pass line of the mat for beating the stiff back;

B. a washing station adjacent the entry station for receiving the mats, said washing station including a soap tank having mounted therein at least one wet wash brush roll for engaging the nap,

C. a rinse station adjacent the wash station for receiving the washed mats, said rinse station including a rinse tank and a wringer roll assembly for passing the mats therethrough;



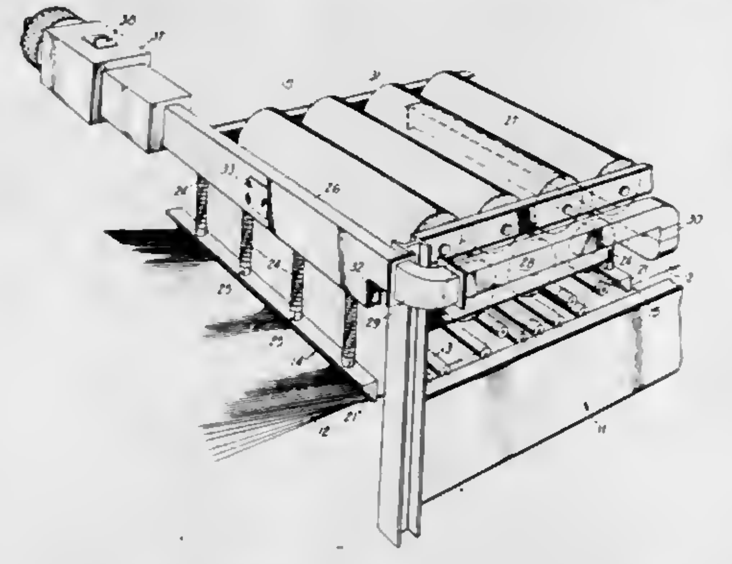
D. a drying station positioned below the rinse stations, said drying station including at least one roll assembly, said roll assembly comprising a floating upper heated roll for engaging the nap and a lower nonheated roll for engaging the backing; and

E. a duct means communicating between the rinse station and the drying station for inverting the mats so as to feed the mats nap side up into the drying station.

4,103,390
SLASHER VACUUM CLEANING SYSTEM

Samuel M. Tucker, Rome, Ga., assignor to John C. Robinson; Wade H. Youngblood and Harry H. Briscoe, all of Rome, Ga., part interest to each

Filed Dec. 20, 1976, Ser. No. 752,450
Int. Cl.² A47L *5/38*
U.S. Cl. 28—173 10 Claims

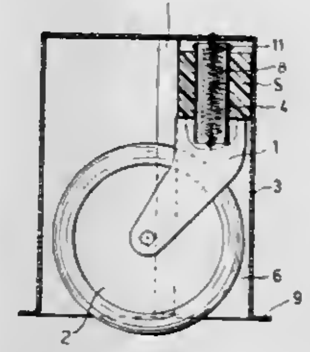


7. A vacuum cleaning system for the creel portion of a slasher comprising a suction source, suction manifolds mounted near opposite ends of the creel above a sheet of warps passing into the slasher, a pair of suction cleaning heads, each suction head being suspended by a plurality of tubes from its associated manifold and extending transversely across the sheet of warps in close proximity to the top of the sheet, said suction source being in fluid communication with said manifolds and through said pluralities of tubes, with said suction heads.

4,103,391
WHEEL UNIT FOR MOUNTING IN A SUITCASE

Hans Thomas Thomsen, Friisvej 10, DK-2635, Ishoj, Denmark

Filed Jun. 27, 1977, Ser. No. 810,594
Claims priority, application Denmark, Aug. 19, 1976, 3743/76
Int. Cl.² B60B *33/06*
U.S. Cl. 16—33 10 Claims



1. A wheel unit for use in a suitcase, comprising:

(a) a housing adapted to be secured to the suitcase, and having an outwardly directed opening,
said housing having a guide channel at one end, and there being locking recesses within said housing adjacent to one end of said channel at said opening;
(b) a bearing block movably supported on said housing, and slidable linearly in said guide channel, said bearing block having a cross-section corresponding to that of said guide channel;
(c) a wheel bracket having a connection with said bearing block for movement therewith, and said connection also enabling said bracket to be turned with respect to said housing, a portion of said bracket in response to 90° of such turning being receivable in said locking recesses in said housing;
(d) a wheel rotatably carried on said wheel bracket and being movable between a retracted position substantially inside said housing and an extended position outside said housing; and
(e) a spring reacting against said housing and biasing said bearing block, said wheel bracket and said wheel to urge said wheel toward said retracted position.

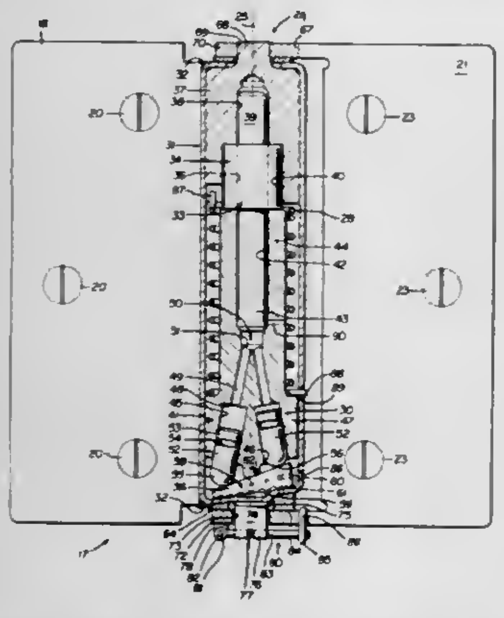
4,103,392
DOOR CLOSING APPARATUS

Robert D. MacDonald, Phoenix, Ariz., assignor to Masco Corporation, Taylor, Mich.

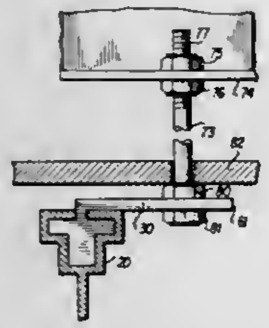
Filed Oct. 26, 1976, Ser. No. 735,305
Int. Cl.² E05F *3/20*
U.S. Cl. 16—54 23 Claims

1. A door closing apparatus comprising a swash plate hydraulic damping apparatus for controlling the rate at which a door closes with respect to a fixed support to provide a relatively constant closing force, said damping apparatus having a swash plate with at least one sloping surface, piston means for engaging said swash plate, second rotatable means for effecting relative motion between said piston means and said swash plate such that the rotational resistance encountered as said piston means operatively engages said swash plate is proportional to the rate of rotation of said second rotatable means, spring means having a first portion anchored to one of said door and said fixed support and said spring means also having a second portion, and a first rotatable means operatively coupled between said second portion and the other of said door and said fixed support for rotating in a first direction when said door is opened to wind-up said spring means, said first rotatable means being responsive to the unwinding of said spring means when said door is released for rotating in a direction opposite to said first direction, and a one-way clutch means having an input element operatively coupled to said first rotatable means for

rotation therewith and an output means responsive to the rotation of said first rotatable means in said opposite direction for controllably rotating said second rotatable means to close said door with a relatively constant closing force.



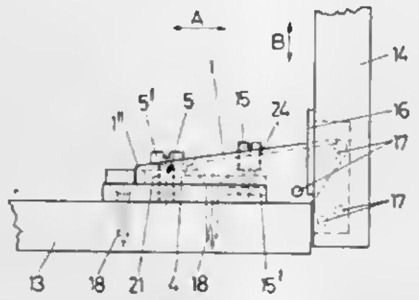
4,103,393
CURTAIN SUSPENSION ASSEMBLY
Richard W. Janson, Box 8110, Canton, Ohio 44711
Division of Ser. No. 617,508, Sep. 29, 1975, Pat. No. 4,014,071. This application Oct. 22, 1976, Ser. No. 734,984
Int. Cl.² H47H *1/104*
U.S. Cl. 16—94 R **5 Claims**



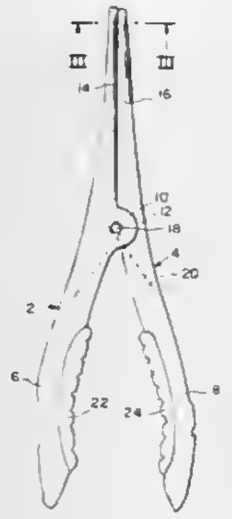
1. A traverse rod for supporting curtains and the like in combination with a supporting structure, said rod comprising an upper support portion which defines a cruciform-shaped groove and a lower portion which defines a flange, said rod being symmetrically disposed on either side of a vertically disposed plane parallel to its length and having a substantially uniform cross-section within a further vertical plane perpendicular to the first-mentioned plane, said supporting structure comprising a cruciform-shaped part adapted to mate with and be slideably received in said groove and a connection part integral with and extending from said cruciform-shaped part, a suspended roof immediately above said rod, said supporting structure providing support for said suspended roof as well as for said rod.

4,103,394
DOOR HINGE
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst
Filed Mar. 18, 1977, Ser. No. 779,230
Claims priority, application Austria, Apr. 8, 1976, 2569/76
Int. Cl.² E05D *7/04*
U.S. Cl. 16—129 **12 Claims**

1. A hinge arrangement particularly for pieces of furniture comprising a mounting plate which can be positioned on a piece of furniture, a hinge arm carrying link means anchorable on said mounting plate, at least one stop placed in the path of motion of said hinge arm, a counter-stop, said first mentioned resting against said counter-stop when said hinge arm is positioned on said mounting plate, said hinge arm having a U-shaped profile and a cross-member, said counter-stop being formed by said cross-member of said hinge arm, said stop and said counter-stop being on different parts of furniture, said stop being displaceable and forcing said hinge arm in a position on said mounting plate corresponding to a predetermined position of the hinge arm, said stop being displaceable for adjusting said position.

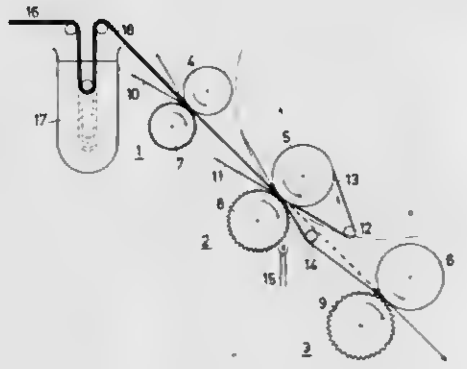


4,103,395
SHELL FISH TOOL
William Latorella, 61 Gourley Rd., Medford, Mass. 02155
Filed Aug. 4, 1977, Ser. No. 821,691
Int. Cl.² A22C *29/00*
U.S. Cl. 17—71 **6 Claims**



1. A shell fish tool comprising first and second lever units pivotally connected to each other, each lever unit comprising an elongated handle portion, a shoulder portion, and an elongated jaw portion, said jaw portions comprising a first jaw portion of said first lever unit and a second jaw portion of said second lever unit, said first jaw portion having a sectional configuration including a first circular convex outside wall, a first rounded convex inside wall and a second rounded convex inside wall, said first and second inside walls each extending at one end thereof from said first outside wall and each joining the other at the other end thereof to form a sharp angle depression in said first jaw, said first and second inside walls forming a first jaw face, said second jaw portion having a sectional configuration including a second circular convex outside wall, a third rounded concave inside wall and a fourth rounded concave inside wall, said third and fourth inside walls each extending at one end thereof from said second outside wall and each joining the other at the other end thereof to form a sharp angle protrusion in said second jaw, said third and fourth inside walls forming a second jaw face, said first and second jaw faces being complementarily shaped and engageable with each other, said first and second outside walls defining in section a complete circle when said first and second faces are engaged.

4,103,396
DUAL ZONE WET DRAFTING DEVICE FOR TWISTLESS YARNS
Jan Nijbuis, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands
Filed Mar. 14, 1975, Ser. No. 558,316
Claims priority, application Netherlands, Apr. 5, 1974, 7404653
Int. Cl.² D01H *5/22, 5/72*
U.S. Cl. 19—66 R **1 Claim**



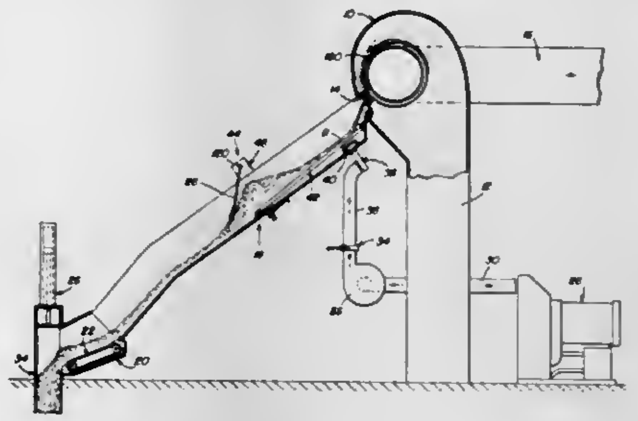
1. A drafting device for wet drafting an assembly of staple fibres, comprising:

a. three cylinder pairs arranged one behind the other, so as to form first and second drafting zones;
b. first condenser means arranged at the feed-in side of the first cylinder pair, for removing most of the excess of liquid between staple fibres being drafted, and for bundling the staple fibres more compactly;
c. second condenser means arranged at the feed-in side of the second cylinder pair for bundling the staple fibres still more compactly at the end of the first drafting zone;
d. a belt passed around a first roller of the second cylinder pair and a wheel downstream of said second cylinder pair, said belt running at a given angle to a feed-through direction of the assembly of staple fibres being drafted so as to reduce fibre sticking, any fibres tending to stick being pulled along by accelerating fibres;
e. a guide positioned between the second and third cylinder pairs to one side of a direct path between lines of contact of the second and third cylinder pairs, so arranged that an assembly of fibres being drafted passes over a side of said guide remote from said path; and
f. means for blowing air along a surface of a second roller of the second cylinder pair at the feed-out side of the pair in a direction opposite to the surface velocity of the second roller.

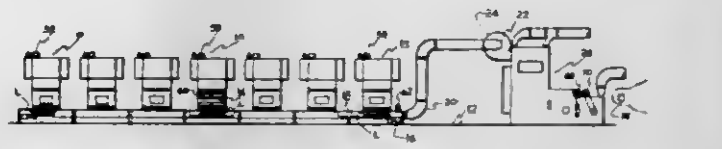
4,103,397
LINT SLIDE GRID HUMIDIFIER
Samuel G. Jackson, P.O. Box 16587, Lubbock, Tex. 79490
Filed Jan. 3, 1977, Ser. No. 758,698
Int. Cl.² D01B *1/04*
U.S. Cl. 19—66 CC **6 Claims**

1. A Apparatus for humidifying lint cotton in a cotton gin, comprising, in combination:

(a) conveyor means for receiving material and controlling the movement of the material along a path of travel;
(b) exchanger means disposed on the conveyor means in the path of travel of the material for subjecting the material to a treating fluid; and
(c) the conveyor means including retarder means for holding the material on the exchanger means for a predetermined period of exposure to the treating fluid, the exchanger means including, in combination:
  (1) grid means arranged on the conveyor means for forming a part of the path of travel of the material; and
  (2) diffuser means arranged on the conveyor means beneath the grid means for passing the fluid through the grid means.



4,103,398
METHOD AND APPARATUS FOR BLENDING TEXTILE FIBERS
Ralph H. Rhyne, and Dan S. Wise, both of Bessemer City, N.C., assignors to Wise Industries, Inc., Bessemer City, N.C.
Filed Jul. 5, 1977, Ser. No. 812,514
Int. Cl.² D01G *13/00*
U.S. Cl. 19—145.5 **4 Claims**



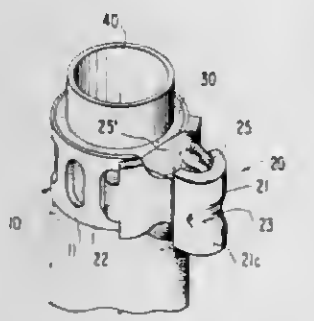
1. Apparatus for blending textile fibers, comprising:

(a) a continuously moving and horizontally extending conveyor;
(b) a plurality of fiber depositing means positioned at spaced locations along the extend of said first conveyor surface, said plurality of fiber depositing means being selectively operable to deposit simultaneously a plurality of predetermined fiber loads on said continuously moving conveyor at spaced locations therealong;
(c) a receiver unit having a selectively movable and horizontally extending conveyor therein, and vertical side walls extending upwardly from a portion of said selectively movable conveyor to form a chute for guiding and stacking fiber on said selectively movable conveyor, said receiver unit including a compressing conveyor located in spaced angular relationship above said selectively movable conveyor for compressing and holding said stacked fibers therebetween;
(d) suction means located adjacent the delivery end of said continuously moving conveyor for accepting said plurality of fiber loads and for serially and separately delivering said fiber loads to the upper portion of said chute;
(e) a rotating beater roll associated with said receiver unit and located adjacent the delivery ends of said selectively movable conveyor and said compressing conveyor for engaging the edges of said fiber stacks delivered to said beater roll when said selectively movable conveyor and said compressing conveyor are operated; and
(f) control means selectively operable to start movement of said selectively movable conveyor and said compressing conveyor after a pre-set time period following said simultaneous dumping of said plurality of fiber loads, and to stop movement of said selectively movable conveyor and said compressing conveyor after said fiber loads stacked on said selectively movable conveyor by said chute have moved a predetermined distance.

4,103,399

HOSE CLAMP

Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland
Filed Mar. 2, 1977, Ser. No. 773,653
Int. Cl.² B65D *63/06*
U.S. Cl. 24—22 **24 Claims**

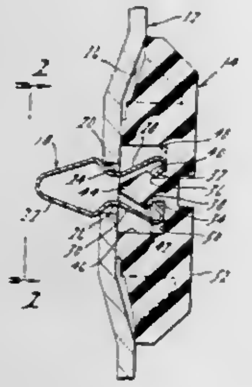


1. A hose clamp for tightening a hose onto a fixed member disposed within said hose, comprising clamping band means provided with a gap in at least one place thereof and means including approximately U-shaped deformable ear means interconnecting said clamping band means, said ear means having leg portions extending generally away from said clamping band means and being operable upon deformation of said ear means by contraction of said leg portions within the area of their connection with the band means to also draw together the clamping band means at said gap and to thereby tighten the hose onto the fixed member, characterized by elastic insert means in said ear means, said elastic insert means being displaceable into the gap of said band means underneath the ear means during deformation of the ear means to effectively counteract outward displacement of the hose into the gap during tightening thereof onto the fixed member and therewith prevent non-tightness within the gap area.

4,103,400

DART CLIP

Robert A. Munse, Troy, Mich., assignor to Microdot Inc., Greenwich, Conn.
Filed Jul. 25, 1977, Ser. No. 818,510
Int. Cl.² A44B *21/00;* B60R *13/02*
U.S. Cl. 24—73 MF **4 Claims**

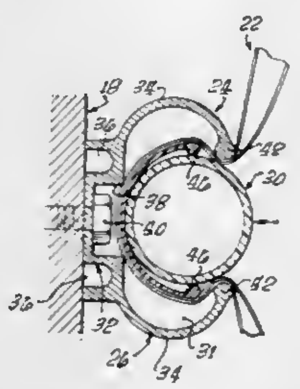


1. A dart clip for the retention of a first member having an arrow-shaped projection thereon to a second member having an aperture therein, said clip comprising a spring metal strip folded to a generally V-shaped configuration, the leg portions of said clip having end portions re-entrantly folded toward each other for gripping engagement with said first member, said end portions having end faces which bear in flat juxtaposed relation against complementary surfaces on said arrow-shaped projection.

4,103,401

SHEET GRIPPING ASSEMBLY

John L. Cooley, 3870 Chino Ave., Chino, Calif. 91710
Filed Feb. 3, 1977, Ser. No. 765,098
Int. Cl.² A44B *21/00*
U.S. Cl. 24—243 K **8 Claims**



1. A sheet gripping assembly for thin pliable sheet material such as plastic film, comprising:

an elongate channel-like base member containing a longitudinal, laterally opening channel bounded along its sides by side walls on the member having sheet gripping edges bounding the side opening of the channel,

an elongate sheet gripping channel member having an open longitudinal side bounded by longitudinal sheet gripping edges on the channel member and a major lateral dimension greater than the width of said base member side opening,

an elongate gripping bar member having a major lateral dimension greater than the width of said base member side opening and shaped to fit closely within said gripping channel member with the bar member protruding through the open side of said channel member to resist lateral deflection of said channel member edges toward one another, and

certain of said members being laterally resilient whereby said gripping members may be inserted channel member first into said base member channel through said base member side opening with sheet material extending through the channel between said channel walls and said gripping members and to sheet gripping positions behind said base member gripping edges wherein said gripping bar member fits within said gripping channel member, said sheet material is gripped between said base member gripping edges and said gripping bar member, and tension force in said sheet material tending to dislodge said gripping members from said base member channel through said base member side opening urges said gripping channel member outwardly to engage said gripping channel edges with said base member gripping edges, thereby further gripping the sheet material and preventing dislodging of said gripping members from said base member channel.

4,103,402

EDGE DRIVE STOP MECHANISM FOR FABRIC SPREADERS

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.
Filed May 4, 1977, Ser. No. 793,610
Int. Cl.² D06C *5/00*
U.S. Cl. 26—74 **9 Claims**

1. In an apparatus for processing tubular knitted fabric and including a spreader frame and opposed edge drive rolls engaging and supporting said spreader frame, an improved system for detecting displacement of said spreader frame with respect to said edge drive rolls, which comprises

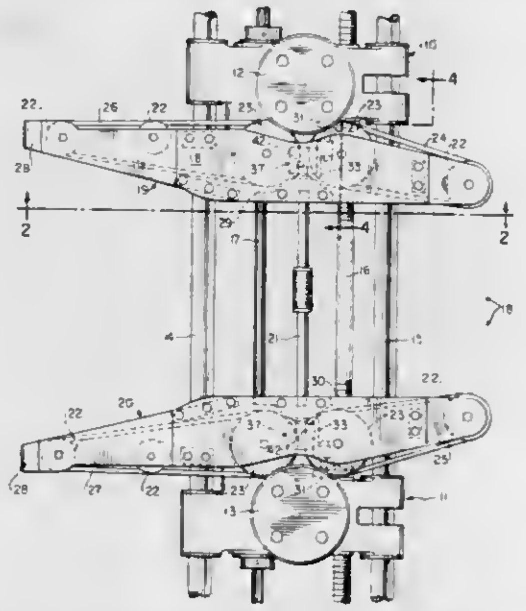
(a) magnetic sensing switches mounted closely adjacent to and in predetermined relation to said edge drive rolls,

(b) said sensing switches being mounted below the plane of said spreader frame,

(c) magnetic elements mounted in fixed relation to said spreader frame at each side thereof and normally positioned in close proximity to said magnetic sensing switches,

(d) said magnetic sensing switches being operative to stop said processing apparatus upon displacement of a magnetic element in relation to its associated sensing switch.

7. In an apparatus for processing tubular knitted fabric and including a spreader frame and opposed edge drive rolls engaging and supporting said spreader frame, and where the spreader frame includes spaced, longitudinally extending belt frames each mounting a pair of belt drive rolls engaging an edge drive roll in straddling relation, an improved system for detecting displacement of said spreader frame with respect to said edge drive rolls, which comprises



(a) a permanent magnet member mounted on each of said belt frames generally between the belt drive rolls thereof,

(b) a sealed, magnetic sensing switch associated with each of said edge drive rolls and positioned for cooperation with said magnetic elements when said belt drive rolls are properly positioned with respect to said edge drive rolls, and

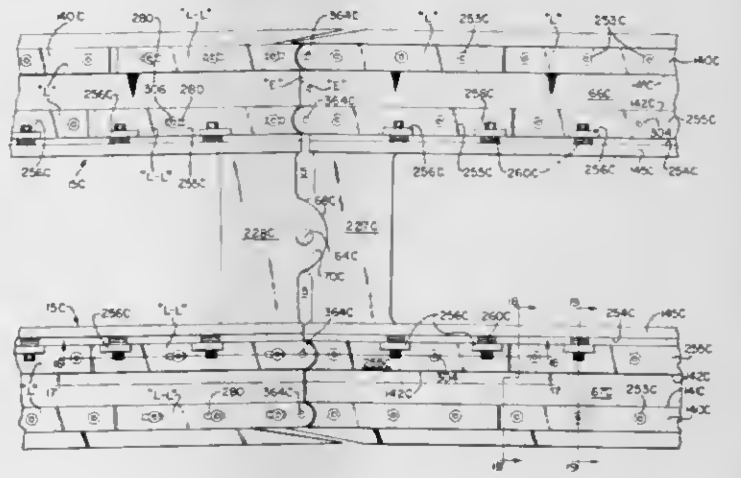
(c) means for adjustably positioning said switches in relation to said edge drive rolls immediately below a plane defined by said spreader frame.

4,103,403

TENTER GUIDE RAIL GAP CROSSING MECHANISM

Henry Parrillo, Johnston; John Sherman Harrington, Warwick, and Glenn Howard Curtis, North Kingstown, all of R.I., assignors to Marshall and Williams Company, Providence, R.I.
Filed Nov. 18, 1974, Ser. No. 524,550
Int. Cl.² D06C *3/04*
U.S. Cl. 26—91 **1 Claim**

1. Apparatus for stretching web material by use of tentering clips and providing a uniform distribution of transverse stretching forces comprising a frame, a plurality of cross members secured to said frame, a plurality of bearings fastened to each cross member, a plurality of shafts, one for each cross member, each shaft having a right hand thread and a left hand thread, means rotatably mounting said shafts in said plurality of bearings, a plurality of saddles, two for each cross member, means slidably mounting said saddles to said cross members, a plurality of nuts, one secured in each saddle, one nut of one saddle of an associated shaft connected to a right hand thread, alternately, another nut of the other saddle of the shaft connected to a left hand thread, whereby rotation of the shaft in one direction draws the saddles toward each other and rotation of the shaft in an opposite direction separates said saddles, a plurality of blocks, one for each saddle, means slidably mounting a block in each saddle, a plurality of pivot pins, one fastened in each block, a plurality of grooved guide straight rail sections having straight tenter clip engaging faces pivotally mounted to said saddles, with the end of one rail being pivotally mounted to the end of an adjacent rail through said pivot pins, thereby to provide two pivotally connected adjacent grooved guide straight rail sections with a gap therebetween, said plurality of grooved guide straight rail sections forming two closed loop paths to accommodate, respectively, two closed loop tentering chains, said shafts providing incremental adjustment between pairs of rails controlled by the same shaft and incremental adjustment between adjacent rails, that improvement in which means between the ends of adjacent grooved guide straight rail sections provide a gap crossing mechanism, said means yielding on an arc upon relative pivotal movement between adjacent grooved guide straight rail sections, said means providing a smooth arcuate connection between the straight tenter clip engaging faces having various degrees of diverging and converging relationship with respect to one another, said plurality of pivotally connected adjacent grooved guide straight rail sections each having a body provided with a front projection, and a rear flange, a plurality of front projection wear strips having a tenter clip engaging face,



screw means fastening said wear strips to said front projection, the wear strips on opposite ends of each front projection having a lower shelf and an upper shelf, respectively, and each shelf having a rounded end, the lower shelf of one front projection wear strip slidingly engaging the upper shelf of an adjacent front projection wear strip, pivot pin means pivotally connecting an upper shelf to a lower shelf to provide an arcuate tenter clip engaging face across the gap between adjacent pivotally connected straight rail sections, said rear flange having a cut-back to provide a seat, and a longitudinal surface, a plurality of rear wear strips, each wear strip comprising a body having an upstanding arm and a lower tenter clip engaging face, means slidably mounting said plurality of rear wear strips to said rear flange for sliding movement, longitudinally and laterally, to said seat, said rear wear strips on opposite ends of said rear flange having a lower shelf and an upper shelf, respectively, and each shelf having a rounded end, the lower shelf of one rear strip slidingly engaging the upper shelf of an adjacent rear wear strip, pivot pin means pivotally connecting an upper shelf to a lower shelf to provide an arcuate tenter clip engaging face between adjacent pivotally connected grooved guide straight rail sections.

4,103,404

NOZZLE DEVICE FOR THE PRODUCTION OF TEXTURIZED FILAMENT YARNS

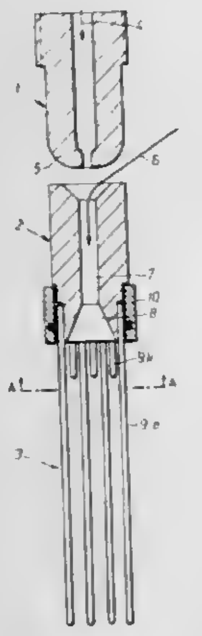
Wolfgang Bäcker, Dormagen; Heinzbert Wojahn, Monheim; Hans-Theo Esser, Cologne; Karlheinz Feltgen, Dormagen, and Roland Weisbeck, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,651

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631393

Int. Cl.^{2} D02G *1/12, 1/16*

U.S. Cl. 28—255 **11 Claims**



1. Nozzle device for the production of texturised filament yarns from synthetic, high molecular weight substances by means of heated gases or vapours, comprising three chambers arranged one behind the other, the hot medium in the form of gas or vapour flowing into one section in its first chamber and the thread being sucked at an angle to the direction of flow in the second section, the thread being heated by the hot medium in the second chamber and the thread being compressed with the formation of plugs in the third chamber, wherein the compression chamber is formed from elastically soft flexible rods which are arranged on the surface of a right circular cylinder or a right circular truncated cone and fixed at one end on the end of the second chamber, said compression chamber being formed from rods of two different lengths *l* and *k*.

4,103,405

TOOL CHANGING ARRANGEMENT

Günther Blum, Gullen, Rauensburg, and Gerhard Stark, Notzingen, both of Fed. Rep. of Germany, assignors to Stama Stark Maschinenfabrik Gotthilf Stark, Schlierbach, Fed. Rep. of Germany

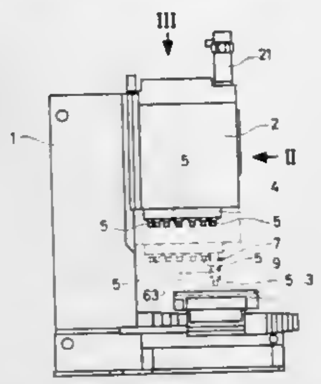
Filed Jun. 14, 1976, Ser. No. 695,654

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1975, 2526902

Int. Cl.^{2} B23Q *3/155*

U.S. Cl. 29—26 A **21 Claims**

1. A tool changing arrangement for a machine tool, comprising a rotary drive spindle movable in axial direction between two end positions; a tool holding member coaxially carried by said spindle for rotation therewith and axially movable with respect thereto, said tool holding member having a tool carrier receiving part projecting beyond one end of said spindle, said tool carrier receiving part comprising a cross bar extending transversely to the axis of said tool holding member; a tool carrier movable transversely to said holding member and having at one end facing said one end of said spindle a slot in which said cross bar is inserted for transmitting a turning movement from said spindle to said tool carrier; and centralizing portions at facing ends of said spindle and said tool carrier interengaging with each other during axial movement of said holding member relative to said spindle to axially align said tool carrier and said spindle.



4,103,406

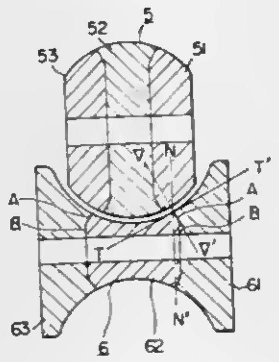
SPLIT TYPE SECTIONAL FORMING ROLL

Tsuneo Ito; Tatuya Hashiba; Takesi Inoue, and Kunihiro Nagata, all of Yasugi, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,099

Int. Cl.^{2} B21B *31/08*

U.S. Cl. 29—125 **16 Claims**



1. A split type sectional forming roller comprising a plurality of roll segments assembled together on a roll shaft to constitute a desired roll caliber profile, including at least one curved section, at least two adjacent segments of said plurality of roll segments mating along surfaces which are convex-concave frusto-conical and intersect at said curved section, wherein inner planar portions of said mating convex-concave frusto-conical surfaces extend perpendicularly with respect to the longitudinal axis of said roller shaft and wherein outer slanting portions of said convex-concave frusto-conical mating surfaces extend obliquely with respect to both the longitudinal axis of said roller shaft and a line which is both oblique with respect to said longitudinal axis and tangential with respect to the roll caliber profile at the peripheral point of said profile at which said frusto-conical surfaces mate, said slanting portions extending at an angle θ_A included in an angle θ_V formed between lines passing through said peripheral point which are normal to said tangential line and to said longitudinal axis, respectively.

4,103,407

MANUFACTURING METHOD FOR A HIGH PRESSURE DISTRIBUTOR ROTOR

Manuel Coll Elizalde, and Juan Simon Bacardit, both of Barcelona, Spain, assignors to The Bendix Corporation, Southfield, Mich.

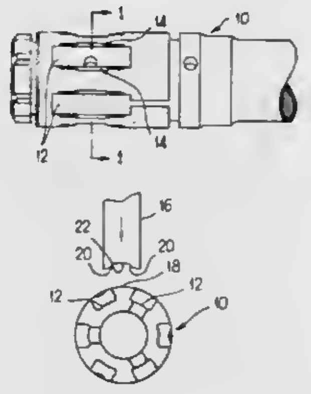
Filed Jan. 7, 1977, Ser. No. 757,524

Int. Cl.^{2} B21D *53/00, 53/10;* **B23P** *17/02*

U.S. Cl. 29—157.1 R **4 Claims**

1. A method for manufacturing a rotor for a high pressure distributor comprising the steps of:

providing a rotor having a plurality of axial grooves; and applying a plurality of tools radially against the peripheral surface of said rotor to form chamfers on adjacent edges of consecutive grooves, one of said tools including protruding portions defining punches of predetermined length and depth and said punches on the one of said tools contacting adjacent edges of consecutive axial grooves to form the chamfers when the one of said tools is applied radially against the peripheral surface of said rotor between the consecutive axial grooves.



4,103,408

METHOD FOR THE COLD WORKING OF HEAT EXCHANGER TUBING FOR THE ATTACHMENT OF SPIRAL FINS

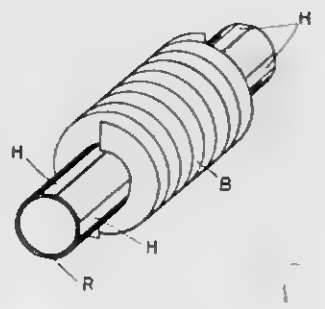
Alfred Joekel, Essen-Werden, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Jul. 27, 1976, Ser. No. 709,130

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534217

Int. Cl.^{2} B23P *15/26*

U.S. Cl. 29—157.3 AH **6 Claims**



1. In a method involving the production of finned heat transfer tubing, where one or more continuous metal strips are wound onto a length of smooth round tubing, as the latter is rotated, so as to create one or more helical fins on the tubing, the improvement comprising the step of:

shaping the cylindrical outer surface of the tubing prior to said winding operation, so as to form thereon at least one circumferentially narrow land which, in the subsequent winding operation, produces a corresponding very small inward deviation from the true circular inner curvature of the wound fins, thereby causing the non-circular portions of the wound fins to engage a longitudinal edge of the land, so as to prevent rotation of the fins relative to the tubing surface, independently of frictional engagement.

4,103,409

ANGULARLY ADJUSTABLE FORCE IMPARTING TOOL

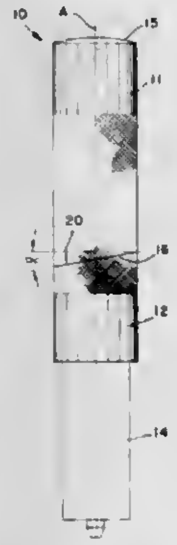
David W. Young, 421 Larkin, Akron, Ohio 44305

Filed Dec. 13, 1976, Ser. No. 749,750

Int. Cl.^{2} B23P *19/04*

U.S. Cl. 29—249 **10 Claims**

1. A tool for imparting force to a mechanical element located in a confined area comprising, an impact member for receiving and transferring force applied thereto, an end member having a tapered recess in an outer end thereof engageable with the mechanical element, said end member and said impact member having mating faces at least one of which lies in a plane oblique to the force transmitting axis thereof for applying a force to the mechanical element from an angular position of said impact member relative to said end member by selective relative rotation of said impact member and said end member, and a coil spring connector engaging and rotatably joining said end member and said impact member and maintaining said mating faces of said end member and said impact member in force transmitting engagement.



4,103,410

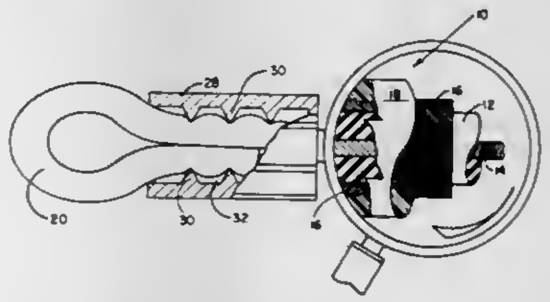
METHOD OF USING A FLEXIBLE MANDREL FOR MAKING A LOCKING CABLE

Phillip E. Pennell, Lakewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 598,959, Jul. 24, 1975, which is a division of Ser. No. 371,313, Jun. 18, 1973, Pat. No. 3,991,445. This application Jul. 18, 1977, Ser. No. 816,407

Int. Cl.^{2} B23Q *17/00*

U.S. Cl. 29—403 **2 Claims**



1. A new use for a flexible mandrel used conventionally in the manufacture of tubular articles, the mandrel comprising an elongated heat setting polymeric rod in which is embedded a longitudinally disposed element of high modulus, the new use comprising reclaiming the mandrel for use in the production of a flexible locking cable by the sequential steps of:

cutting the mandrel to a desired length;

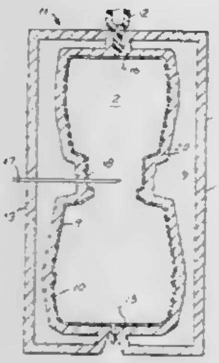
applying a metal reinforcement intimately onto the surface of the flexible mandrel thereby forming a metal reinforced flexible mandrel;

extruding a heat setting polymeric cover onto the reinforced mandrel forming a bond between the cover and reinforcement and sandwiching the reinforcement between layers of polymeric material, thus defining a length of cable;

attaching coupling means to each end of the cable so as to produce an end configuration engagable with locking means for coupling the ends of the cable together.

4,103,411
BLOW MOLDING METHOD

Marten Gottsegen, 1212 Lake Shore Dr., Chicago, Ill. 60610
Continuation of Ser. No. 537,288, Dec. 30, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,927
Int. Cl.^{2} B23P *17/00;* **B29H** *7/04*
U.S. Cl. 29—416 **13 Claims**

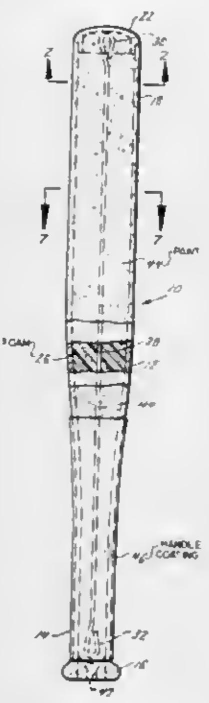


1. In a method of blow molding thermoplastic articles having interrelated sized parts comprising the steps of melting a plastic, extruding a tube of the plastic melt into a mold, closing the mold on the extrudate, expanding the plastic extrudate in the mold by applying fluid pressure internally thereof to form an object, cooling the mold, and removing the blown object, the improvement which includes the steps of:
- (a) providing a tandem mold having a plurality of interconnected cavities;
- (b) said interconnected cavities being interrelated and of different sizes or/and shapes;
- (c) said interconnected cavities including:
  - (i) a first cavity adapted to form a first part of an object which is adapted to fit inside a second part of said object, and
  - (ii) a second cavity adapted to form said second object part;
  - (iii) said first cavity being adapted to provide an annular space between said first and said second parts;
- (d) simultaneously expanding said plastic in both of said cavities to form interrelated parts of said object which form at least a part of a multi-part object;
- (e) separating said parts; and
- (f) interfitting said parts to form said object.

4,103,412
METHOD OF MAKING A FOAM FILLED DIE CAST BAT

George H. Krieger, St. Louis, Mo., assignor to St. Louis Diecasting Corporation, Bredgeton, Mo.
Division of Ser. No. 685,168, May 11, 1976, Pat. No. 4,056,267, which is a continuation-in-part of Ser. No. 468,815, May 10, 1974, abandoned, and a continuation-in-part of Ser. No. 549,701, Feb. 13, 1975, abandoned. This application May 25, 1977, Ser. No. 800,556
Int. Cl.^{2} B23P *3/00, 19/04*
U.S. Cl. 29—460 **11 Claims**

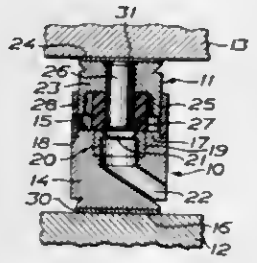
2. A method for making a foam filled metal bat comprising the steps of:
- (a) die casting a generally elongated porous metal tube element,
- (b) die casting a second porous metal cap element having a portion adapted to fit within the metal tube element to form a closed end portion,



- (c) welding the cap to the metal tube element to form a substantially non-porous weld seam, and
- (d) filling the capped bat structure with a foam material.

4,103,413
METHOD AND ARRANGEMENT FOR FASTENING AND CENTERING PUNCHING TOOLS

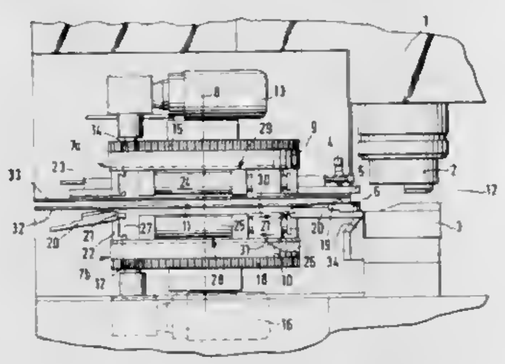
Sven Kurt Bernhard Malmberg, Bokvagen 3, S-265 00 Åstorp, Sweden
Filed May 11, 1977, Ser. No. 795,913
Claims priority, application Sweden, May 11, 1976, 7605336
Int. Cl.^{2} B26F *1/02*
U.S. Cl. 29—465 **7 Claims**



6. A punching tool setup method for fastening and centering a tool in presses having press members movable in relation to each other, said tool including die and punch elements, said punch element having a punch and a stripper, comprising the steps of positioning one tool element on one press member in a predetermined place, placing a setup socket on either tool element, centering said tool elements in relation to each other by means of said setup socket, fastening said tool elements in said centered position in relation to each other, mounting said setup socket for axial movement on said tool elements and to surround said punch and said stripper, said setup socket remaining in position on said tool elements during operation of said punch element.

4,103,414
MACHINE TOOL WITH AT LEAST ONE TOOL MAGAZINE

Eugen Herb, Ditzingen, and Erich Brekle, Benningen, both of Germany, assignors to Trumpf Maschinen AG, Switzerland Switzerland
Filed Jun. 10, 1976, Ser. No. 694,604
Claims priority, application Germany, Jun. 14, 1975, 2526764
Int. Cl.^{2} B23D *27/00;* **B23Q** *3/155*
U.S. Cl. 29—568 **7 Claims**

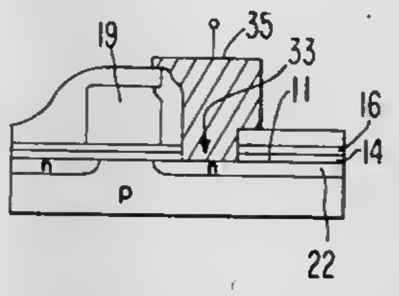


1. In a machine tool, particularly a stamping or nibbling machine, having work support means defining a displacement plane in which a workpiece is movable, at least one tool carrier an axially movable male die located in said tool carrier, at least one tool magazine lying in a plane which is spaced from the displacement plane of the workpiece and which is rotatable about an axis substantially parallel to the longitudinal axis of movement of said male die in said tool carrier, tool holders in each magazine and a tool exchanger operable to move a tool from each magazine into said tool carrier and vice versa, the improvement comprising, in combination, means, mounting all tool holders in each magazine, except the tool holder carrying the tool to be exchanged, in a mounting plane spaced sufficiently from the displacement plane of the workpiece to provide clearance for displacement of the workpiece in its displacement plane, during working thereof by a tool then in a working position in a tool carrier, without interference with tools in a non-working position in a magazine; a lifting device operable, responsive to rotation of each magazine into a position to engage and align a tool holder with a tool to be exchanged, to move the thus aligned tool holder, relative to its magazine, out of the mounting plane, with the workpiece remaining in its displacement plane, and into a working plane which includes the working position of a tool in a tool carrier; said tool changing device having means engageable with each lifted tool holder responsive to such rotation of the associated magazine, and said tool changing device further including means operable to shift the thus lifted tool holder linearly relative to the associated tool carrier; each lifted tool holder, responsive to further rotation of a magazine, being disengaged from said tool changing device, and said lifting device lowering the tool holder, with a tool extracted from a tool carrier and from the working position, relative to its associated magazine into the mounting plane of the other tools in its associated magazine.

4,103,415
INSULATED-GATE FIELD-EFFECT TRANSISTOR WITH SELF-ALIGNED CONTACT HOLE TO SOURCE OR DRAIN

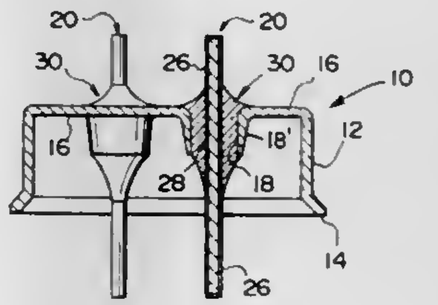
James A. Hayes, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Dec. 9, 1976, Ser. No. 748,977
Int. Cl.^{2} B01J *17/00*
U.S. Cl. 29—571 **6 Claims**

1. Method comprising:
- forming a substrate of semiconductor material of one conductivity type, the substrate having a principal surface;
- growing a first layer comprising oxide passivation material over a portion of the principal surface;
- depositing a second layer comprising nitride dielectric material over a portion of the first layer;
- forming a third layer comprising polysilicon material in a desired pattern over a portion of the second layer;
- forming a plurality of spaced regions of opposite conductivity type, each region forming a PN junction with the substrate, with an edge of each junction extending to the principal surface under the first layer of oxide;
- forming a fourth layer comprising phosphorous vapox over the third layer and exposed portions of the second layer;
- removing a selected portion of the fourth layer to create a hole therethrough that extends to the second layer and abuts said third layer;
- growing a fifth layer comprising oxide passivation material over exposed portion of the third layer;
- removing selected portions of the first and second layers to extend the hole therethrough to the principal surface overlying a region of opposite conductivity type, and
- depositing conductive metal into the hole and onto the principal surface to provide electrical contact to the underlying region of opposite conductivity whereby said fifth layer provides electrical insulation between said conductive metal and said third layer.



4,103,416
METHOD OF MANUFACTURING AN HERMATICALLY SEALED ELECTRICAL TERMINAL

Yoshimasa Sakamoto, Otsu, Japan, assignor to New Nippon Electric Co., Ltd., Osaka, Japan
Filed Oct. 15, 1976, Ser. No. 733,013
Claims priority, application Japan, Oct. 21, 1975, 50/127247
Int. Cl.^{2} H01B *17/26*
U.S. Cl. 29—630 D **5 Claims**



1. A method of making an electrical terminal device, comprising covering the free ends of an iron-chromium alloy lead wire with a layer of oxidation resistant metal, coating an intermediate length of said lead wire between said free ends with a resist material to prevent the covering of said length by said oxidation resistant metal, when the latter is applied to cover said free ends, removing said resist material, then oxidizing said intermediate length of said lead wire between said free ends to provide a chromium oxide layer intermediate said free ends, thereafter securing, in an insulated and sealed manner, said lead wire to a support cup means at said intermediate length having said chromium oxide layer thereon, said oxidizing taking place in a selective oxidation process to produce said chromium oxide layer.

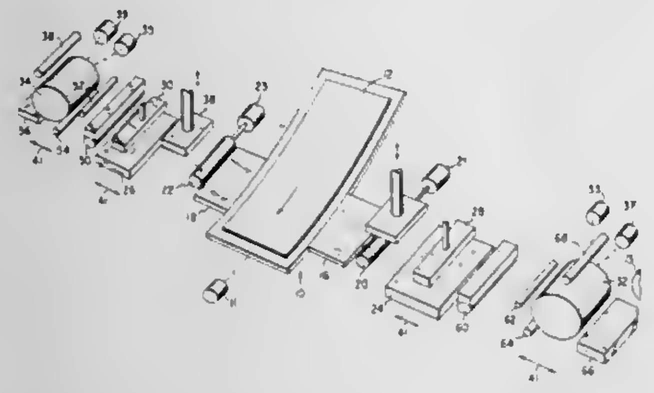
4,103,417
WIRE STRINGING DEVICE

Richard Ernest Hoffman, and Maximilliaan Bruckner, both of San Jose, Calif., assignors to Dataproducts (Santa Clara), Inc., Santa Clara, Calif.

Filed Aug. 25, 1977, Ser. No. 827,466

Int. Cl.^{2} H01F *41/08*

U.S. Cl. 29—737 **10 Claims**



1. A device for stringing a multiplicity of wires through an array in a plurality of directions comprising:
- means for holding said wires in a preselected configuration;
- means for driving said wires through said array in a first direction;
- means for capturing said wires leaving said array in said first direction;
- means for providing tension on said wires leaving said array in said first direction and for redirecting said wires to pass through said array in a second direction;
- means for driving said wires in said second direction;
- means for capturing said wires leaving said array in said second direction; and
- means for providing tension on said wires leaving said array in said second direction and redirecting said wires to pass through said array in said first direction.

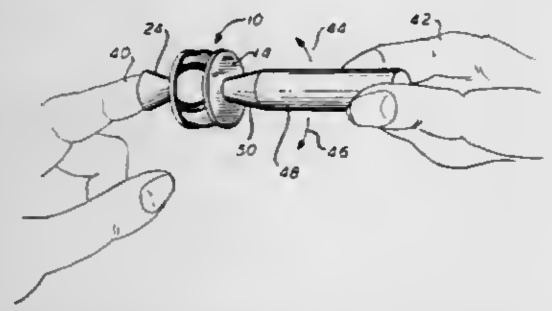
4,103,418
MANUALLY-OPERATED REVOLVABLE SHAVING DEVICE

Marcial Alvarez, 225 E. Jersey St., Elizabeth, N.J. 07206

Continuation-in-part of Ser. No. 732,744, Nov. 9, 1976, abandoned. This application Jul. 26, 1977, Ser. No. 819,108

Int. Cl.^{2} B26B *21/00*

U.S. Cl. 30—50 **13 Claims**



1. A manually-operated device for shaving areas of the skin in the course of surgical or cosmetic treatment or the like, said device comprising:
- a wheel-shaped shaving head, the rim of said wheel carrying a plurality of at least partially protruding shaving blades;
- generally cylindrical handle means rigidly secured to said wheel, and extending outwardly therefrom in alignment with the wheel axis, said means being of reduced diameter with respect to the diameter of said shaving head and being adapted for grasping by an operator to enable manual rotation of said wheel about said axis by rotation of said handle means; and
- a support member secured to said wheel and extending in alignment with the wheel axis from the side of said wheel opposite said handle means, said member being foreshortened in comparison to said handle means and adapted to be pivotably and rotatably supported by the hand of said operator opposed to that manipulating said handle means, thereby enabling rotation and orientation of said shaving body with respect to the skin area being shaved.

4,103,419
PIPE CUTTER

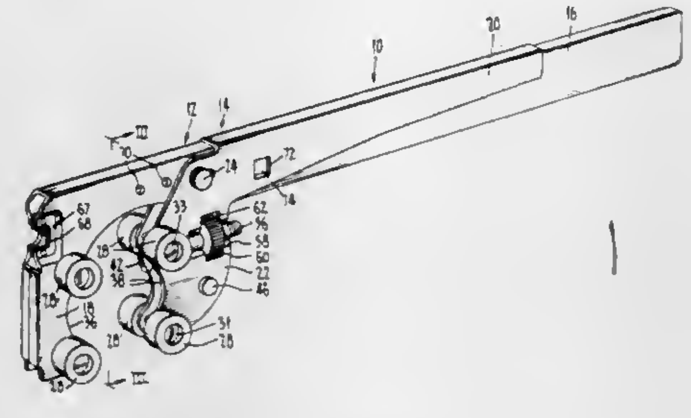
Bruce Ernest Matthews, Warrandyte, and Ronald Day, Mt. Evelyn, both of Australia, assignors to The Stanley Works Pty. Ltd., Nunawading, Australia

Filed Apr. 4, 1977, Ser. No. 784,337

Claims priority, application Australia, Aug. 19, 1976, PC7070

Int. Cl.^{2} B23D *21/06*

U.S. Cl. 30—95 **9 Claims**



1. A pipe cutting device comprising:
- A. a first operating member having an elongated handle portion and a jaw portion at one end thereof having its longitudinal axis extending transversely of the longitudinal axis of said handle portion;
- B. a second operating member having an elongated handle portion and a jaw portion at one end thereof having its longitudinal axis extending transversely of the longitudinal axis of said handle portion, the longitudinal axes of the handle portions of said first and second operating members being closely spaced and substantially parallel, the jaw portion of said second operating member being disposed in spaced relationship to said first operating member to provide a spacing between said jaw portions for receiving a pipe therebetween;
- C. pivot means pivotably mounting said operating members adjacent the jaw portion of said first operating member for movement of the jaw portions about a pivot point defined thereby in response to movement of said handle portions, said handle portions extending in close parallel relationship in the closed position thereof and the jaw portions also extending in generally parallel relationship in the closed position thereof, movement of said first operating member handle portion away from said second operating member handle portion causing pivoting of said jaw portions to increase the spacing therebetween at the outer ends thereof to permit insertion of a pipe therebetween;
- D. a pair of guide roller means rotatably mounted on each of said jaw portions and spaced along the length thereof with the periphery of said guide roller means extending beyond the opposed edges of said jaw portions and defining an imaginary circle therebetween for gripping and rotatably supporting a pipe therebetween;
- E. a cutting blade mounted on the jaw portion of said one operating member for movement beyond the opposed edges of the jaw portion and into the imaginary circle defined by said guide roller means; and
- F. adjustment means for said cutting blade mounted on said jaw portion of said first operating member and operable to move said cutting blade relative to the opposed edge of the jaw portion, whereby the pipe may be gripped between said jaw portions and supported upon said roller means by one-handed gripping of said handle portions and the cutting blade may be advanced by manipulation of the adjustment means into progressively deeper engagement with the associated pipe to sever the pipe upon rotation of the cutting device about the pipe.

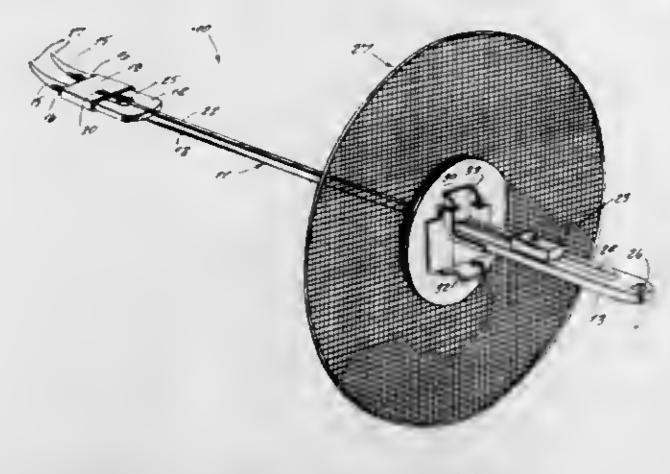
4,103,420
UTENSIL WITH GREASE SHIELD

Albert F. Davis, 2148 W. Washburne, Chicago, Ill. 60608

Continuation-in-part of Ser. No. 627,235, Oct. 30, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,253

Int. Cl.^{2} A47J *43/28*

U.S. Cl. 30—129 **15 Claims**



1. A protective hot item utensil comprising:
- (a) elongated manipulating means including, at a first end, handle means for permitting the manual holding of said manipulating means, and, at a second end, retaining means for making contact with a hot item;
- (b) shield means for preventing heated particles, traveling in a substantially straight line from the region in proximity to said retaining means, from reaching the region in proximity to said handle means; and
- (c) coupling means including two parts, the first of said parts being coupled to said manipulating means and the second of said two parts being coupled to said shield means, said first and second parts being engageable with and disengageable from each other, for, when said first and second parts are engaged with each other, retaining said shield means at a predetermined location on and with a fixed orientation relative to said manipulating means.

4,103,421
BLADE-HOLDING CUTTING DEVICE

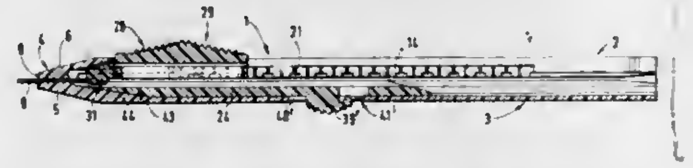
Michel Quenot, Besancon, France, assignor to Stanley-Mabo S.A., Besancon, France

Filed Apr. 29, 1977, Ser. No. 792,194

Claims priority, application France, Apr. 30, 1976, 76 13654

Int. Cl.^{2} B26B *3/06*

U.S. Cl. 30—162 **5 Claims**



1. In a cutting blade holding handle having a segmented removable blade comprising a unitary generally rectangular hollow body formed of a molded plastics material and having a longitudinal slot extending through one side wall from one end thereof, a pair of facing longitudinal grooves within said hollow body terminating in an end slot through the other end of said body to slidably mount the blade to advance and retract the blade through said end slot, a series of notches formed along one edge of said longitudinal slot, and a unitary slider adapted to control the longitudinal movement of the blade, the improvement comprising a wedging member engageable with one side of the blade, said hollow body having an inclined interior wall adjacent said end slot, and said wedging member having a bevelled end engageable therewith to frictionally engage and apply a lateral pressure against the blade and means to slide said wedging member from an inactive position in which the wedging member does not apply lateral pressure to the blade to an active position wherein the wedging member is slid up the inclined interior wall adjacent said end slot and the bevelled end of said wedging member frictionally engages and applies a lateral pressure against the blade to lock the blade in position.

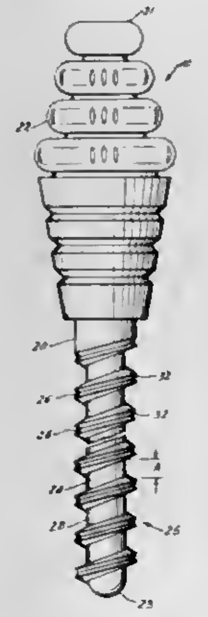
4,103,422
THREADED SELF-TAPPING ENDODONTIC STABILIZER

Charles M. Weiss, and Kenneth W. M. Judy, both of New York, N.Y., assignors to Oratronics, Inc., New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,456

Int. Cl.^{2} A61C *13/00*

U.S. Cl. 32—10 A **6 Claims**



1. In a threaded, self-tapping endodontic stabilizer for insertion into the jawbone of a patient's mouth through an aperture in a loose tooth to stabilize the tooth comprising an elongated penetrating member having adjacent its coronal end a head adapted for manual rotation and adjacent its apical end a threaded shaft defining a plurality of lands and grooves, the improvement wherein a plurality of said grooves have a longitudinal height of at least 0.20 mm. and a plurality of said lands have a shallow recess extending along the peripheral edge thereof.

4,103,423
ORTHODONTIC BRACKET

Stanley P. Kessel, Suite 411, 3325 Hollywood Blvd., Hollywood, Fla. 33021

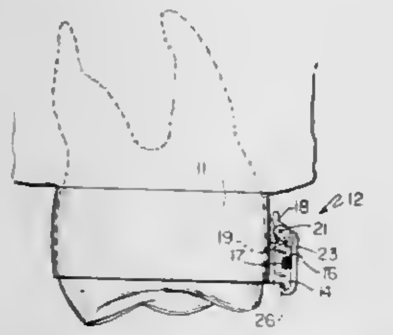
Filed Mar. 4, 1977, Ser. No. 774,447

Int. Cl.^{2} A61C *7/00*

U.S. Cl. 32—14 A **11 Claims**

1. An orthodontic appliance comprising:
- a bracket projecting from a tooth band and including two spaced ends;
- a handle privotally attached to one of said spaced ends of said bracket;

a locking hook pivotally attached to said handle in an over-center relationship;

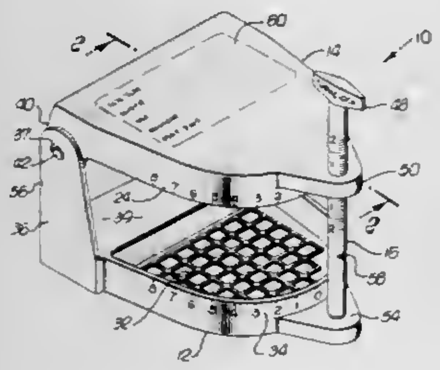


whereby as the handle is rotated to a locking position, the locking hook engages the other spaced end of the bracket and is locked thereto.

4,103,424
DENTAL ARTICULATION APPARATUS AND METHOD

Adrian Benjamin; Walter G. Churgin, both of Millburn; Frederick Biermann, Maplewood; David W. Benjamin, Millington, all of N.J.; Finton P. Cordell, Lutherville, Md.; Robert M. Tempkin, Rochester; Carl A. Zambrano, New York, both of N.Y., and Peter Halasz, West Los Angeles, Calif., assignors to Bergen Brunswig Corporation, Los Angeles, Calif.

Filed Jul. 12, 1976, Ser. No. 704,124
Int. Cl.^{2} A61C *13/22*
U.S. Cl. 32—32 **3 Claims**



1. A device for dental articulation comprising in combination:

an upper cup member having first peripheral wall means for receiving a plaster mounted cast therebetween;

a lower cup member having second peripheral wall means for receiving another plaster mounted cast therebetween;

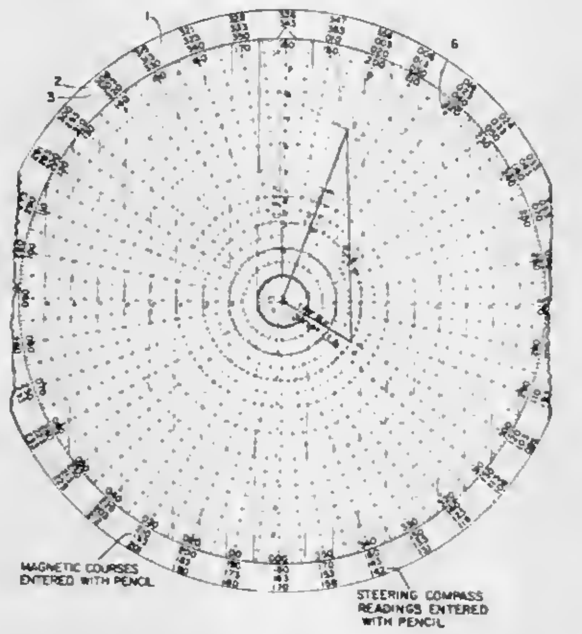
pivotal means connected to each of said cup members for allowing manually induced relative movement between said cup members, said pivotal means comprising a pair of horizontal dowels on one of said cup members respectively engagable with and rotatable in a pair of bearings on the outer of said cup members and wherein said bearings are slotted to enable relative lateral movement between said cup members.

4,103,425
MARINE NAVIGATIONAL PROTRACTOR

B. Wayne Harter, 823 Canyon Rd., Redwood City, Calif. 94062

Continuation-in-part of Ser. No. 501,821, Aug. 28, 1974. This application Dec. 8, 1975, Ser. No. 638,825
Int. Cl.^{2} G01C *21/00*
U.S. Cl. 33—1 SD **1 Claim**

1. A 360° marine navigational protractor comprised of a transparent plastic disc, or chart overlay; with sufficient diameter to cover a geographic area on a conventional coastwise or harbor chart which includes most landmarks and navigational aids from which useful bearings can be taken; with graduations marked by means of short lines on the periphery at one degree intervals, the numerical values of said graduations being permanently printed thereon at ten degree intervals, along with reciprocals (values of graduations 180° away, or on the opposite side) permanently printed in smaller figures, and with slightly longer and more vivid graduations identifying each intervening five-degree mark; with equally-spaced circles printed from the center to the periphery, separated by a distance equal to one-half nautical mile on a chart with a scale of 1:80,000, and comprised of small but highly-visible dots rather than solid lines, said dots printed at one degree intervals, with still more visible dots or other appropriate marks being used at each five degree interval, said circles to be numbered consecutively in four places 90° apart, with number "1" being nearest the center; with straight lines radiating from the center and printed on the face of the instrument, starting at the inner most circle and extending to the periphery, at ten degree intervals, said lines consisting of highly-visible dots rather than solid lines, each such dot representing one-tenth of the distance between circles, and with each fifth dot being more visible than the others; with a red-colored triangular pointer, or arrowhead, identifying the zero degree ("north" designation) printed on the periphery; with solid lines printed parallel to the 0° – 180° axis and tangent to the circles; with a border approximately ⅜ inch wide outside the periphery heretofore described, with the surface thereof treated so as to be translucent and permit the entry of erasable data with a common graphite pencil; with a small hole (no more than ⅛ inch diameter) in the exact center of the instrument; and with an accompanying but separate cylindrical straight-edge of the approximate dimensions of a common "lead" pencil, carrying graduations permanently marked thereon equal to the spacing of the circles heretofore described, having ends which have been dipped in liquid latex or otherwise equipped with non-skid rubber tires.


1
2
3
6
MAGNETIC COURSES ENTERED WITH PENCIL
STEERING COMPASS READINGS ENTERED WITH PENCIL

4,103,426
APPARATUS FOR CONVERTING A MEASURING TAPE TO A COMPASS

Rollin Robin, 17815 Valley Vista Blvd., Encino, Calif. 91316

Filed Aug. 19, 1977, Ser. No. 825,930
Int. Cl.^{2} B43L *9/04*
U.S. Cl. 33—27 C **8 Claims**

1. A compass comprising

a measuring tape including

a housing,

an elongated tape extensible from said housing, and

a holding means on the end of said tape extending out of said housing;

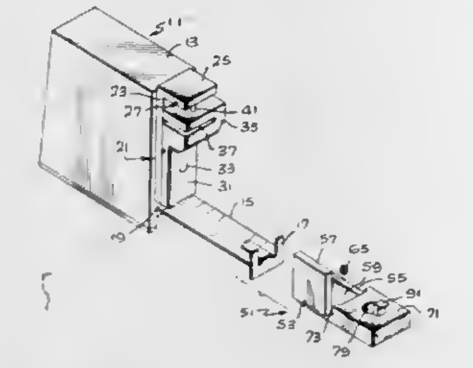
means for pivotally supporting said housing in a fixed position including

base means mounted on said housing,

pivot means pivotally mounted on said base means and having

means for selectively receiving and holding said elongated tape within said pivot means; and

center point means fixedly mounted on said pivot means and extensible beyond one edge of said housing when said pivot means is moved to a fixed position relative to said base means; and



means for mounting a marking device adjacent said holding means comprising

carriage means including

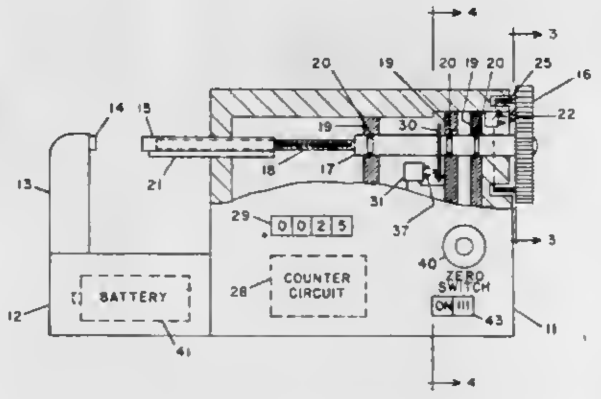
means for mounting said carriage means on said tape near said holding means and

means for releasably holding a marking device at a predetermined distance from said holding means.

4,103,427
ELECTRONIC DIGITAL MICROMETER

Robert E. Ledley, III, Wilmington, Del., assignor to Suntech, Inc., St. Davids, Pa.

Filed Aug. 30, 1976, Ser. No. 718,749
Int. Cl.^{2} G01C *03/18, 07/02*
U.S. Cl. 33—166 **5 Claims**



1. A micrometer having electronic means for determining the measurement of an object taken by the micrometer, said micrometer comprising:

(a) a micrometer housing, said housing having a side extension with an upward extending arm, forming a "U" shaped enclosure between the side of said housing and the upward extending arm;

(b) an anvil mounted on the inside edge of the upright extending arm;

(c) a spindle, slidably mounted by means to prevent its rotation through the micrometer housing so that it may be moved into contact with and away from said anvil, with the object to be measured being placed between the anvil and the spindle;

(d) a thimble, rotatably mounted on said housing;

(e) means for connecting the thimble to the spindle so that rotation of the thimble causes the spindle to move toward or away from the anvil;

(f) means for producing a first signal related to the amount of movement of the spindle toward or away from the anvil, wherein said first signal producing means includes,

(i) a light source,

(ii) light sensitive means for producing the first signal when light is sensed, and

(iii) means for reflecting pulses of light from the light source to the light sensitive means, the number of reflected pulses being related to the distance the spindle is moved;

(g) means for producing a second signal indicating the direction the spindle is moving, said second signal having a first value for movement of the spindle away from the anvil and a second value for movement of the spindle toward the anvil;

(h) a counter means, responsive to the second signal producing means for adding the first signals when the second signal has its first value, and for subtracting the first signals when the second signals has its second valve;

(i) means for displaying the number of signals counted by said counting means wherein the second signal producing means (g) comprises:

(i) means, responsive to the rotation of the thimble for producing a light absorbing surface at a predetermined point when the thimble is rotated in one direction, and for providing a light reflective surface at said predetermined point when the thimble is rotated in the opposite direction;

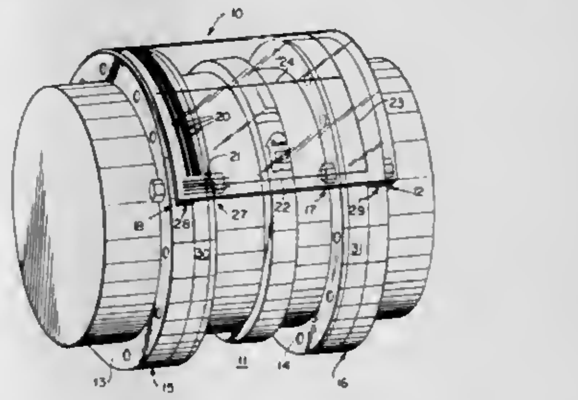
(ii) light source means for supplying light at this predetermined point; and,

(iii) means for sensing a presence of light at the predetermined point and for producing a signal related to the amount of light at the predetermined point, for receipt by the counter means.

4,103,428
PIPE JOINT ALIGNMENT MEASURING TOOL

Lawrence L. Guzick, 10322 Royal Rd., Silver Spring, Md. 20903

Filed Nov. 1, 1977, Ser. No. 847,649
Int. Cl.^{2} G01B *5/24*
U.S. Cl. 33—180 R **5 Claims**



1. A measuring instrument for determining the alignment between two pipes, said pipes coupled to each other through a joint and split flange arrangement, comprising:

an arcuate member having a radius of curvature approximately equal to the radius of curvature of the outer surface of said flanges;

said member having a shoulder at one longitudinal end extending below the interior surface of said member and having lines marked on its surface;

whereby when said arcuate member is placed across said joint flush with against said flange surfaces with its shoulder abutting the side of one of said flanges, lateral displacement, twist, parallelism, and face to face dimensions of said joint may be compared to reference distances represented by said lines.

4,103,429

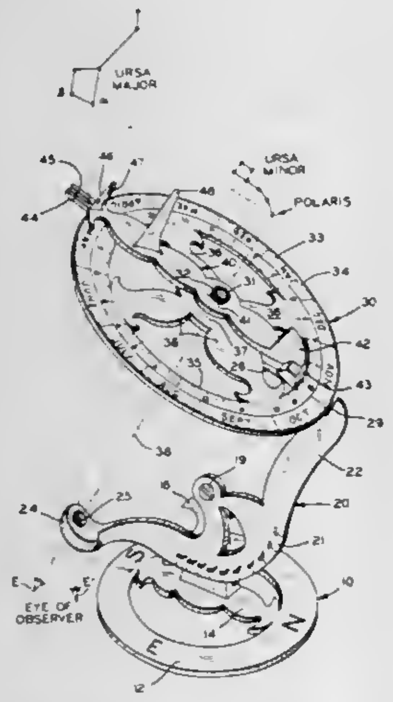
SUN AND STAR TIME DIAL

James E. Wagoner, Swanton, Ohio, assignor to Toledo Astronomical Association, Toledo, Ohio

Continuation-in-part of Ser. No. 770,521, Feb. 22, 1977. This application Aug. 22, 1977, Ser. No. 826,729

Int. Cl.² G01C *17/34. 21/02:* **G04B** *49/00*

U.S. Cl. 33—270 **12 Claims**



1. A sun and star time dial comprising:

A) a base supporting an east-west clampable pivot,

B) a first means angularly adjustable in a vertical plane and having aligned apertures at its ends, the axis of which first means is clampable at said pivot so that said apertures align with Polaris,

C) a freely rotatable date and hour disc radially mounted on and around said axis at one of said apertures, said disc having an outer peripheral date scale settable to an indicator on said first means and an inner peripheral time scale, and

D) a rotatable gnomon pointer means pivotly mounted on and around said one aperture and diametrically of said disc, said pointer means having:

1. a time indicating end cooperating with said inner time scale,
2. a sight at its other end projecting radially outwardly beyond the periphery of said disc for alignment with the other aperture of said first means for sighting a pointer star of the Big Dipper,
3. a gnomon orthogonal of and adjacent to said other end having an aperture whose axis is parallel to the longitudinal axis of said pointer means, and
4. a post intermediate the ends of said pointer means and parallel to said gnomon for alignment with the sun's rays through said aperture in said gnomon in the same plane as the longitudinal axis of said pointer means.

4,103,430

VIEWING DEVICE FOR A BUBBLE LEVEL

Joseph F. Schrader, 22 Pearl St., New Hartford, N.Y. 13413

Filed Aug. 31, 1977, Ser. No. 829,443

Int. Cl.² G01C *9/32*

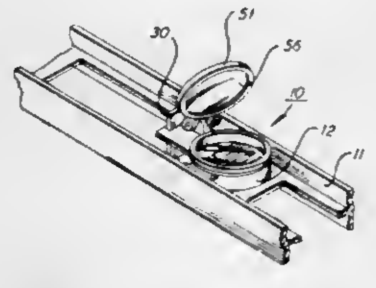
U.S. Cl. 33—348 **8 Claims**

1. Apparatus for use in conjunction with a bubble level of the type having at least one bubble indicator mounted between two opposed windows of a bubble housing, the apparatus including

a base member, containing a luminescent panel therein, being arranged to seat in contact against one of the windows of the bubble housing whereby the panel illuminates the bubble region,

a post affixed normal to the base and extending upwardly beyond the opposite window of the bubble housing,

a light shield having a central aperture therein slidably mounted upon the post and being arranged to be moved into seating contact against the opposite window of the bubble window whereby the bubble indicator is readable through said aperture, and



a viewing mirror adjustably pivotally mounted upon said light shield so that the illuminated bubble region within said aperture is viewable through said mirror.

4,103,431

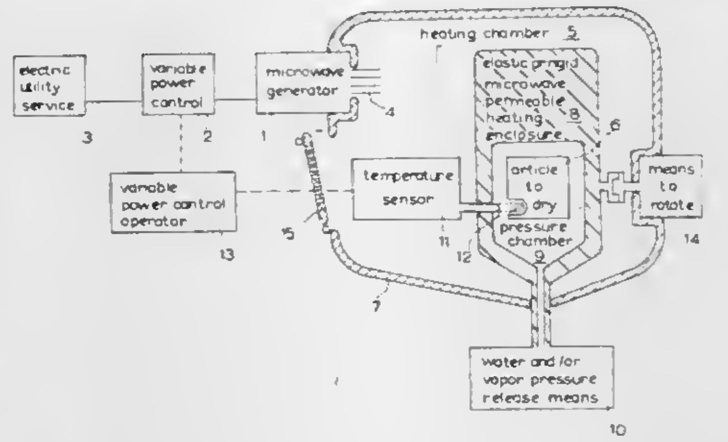
MICROWAVE DRYING

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. No. 572,385, Apr. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 325,330, Jan. 22, 1973, Pat. No. 3,881,027, Ser. No. 400,416, Sep. 24, 1973, Pat. No. 3,985,991, and Ser. No. 529,052, Dec. 3, 1974, Pat. No. 3,985,990. This application Aug. 10, 1976, Ser. No. 713,235

Int. Cl.² F26B *3/28*

U.S. Cl. 34—4 **23 Claims**



21. A process for drying a wet article which comprises: stressing apart an elastic, liquid absortive material by inserting said wet article in an opening within said material, and exposing said article, confined by said elastic material, to microwave energy until said article is dried.

4,103,432

VEGETABLE DRYING APPARATUS

Frank L. Dieterich, 3727 S. Robertson Blvd., Culver City, Calif. 90230, and Stanton Abrams, 3040 Greenfield Ave., Los Angeles, Calif. 90034

Filed May 6, 1977, Ser. No. 794,556

Int. Cl.² F26B *17/24*

U.S. Cl. 34—58 **14 Claims**

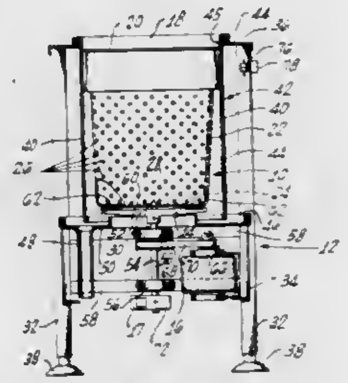
1. An apparatus for drying vegetables comprising;

a basket having water permeable sidewalls for holding the vegetables to be dried;

holding means for rotatably supporting said basket;

means for magnetically attaching said basket to said holding means for rotation therewith;

electric motor means for rotating said basket, whereby water is driven from said vegetables and through said sidewalls by centrifugal force as said basket is rotated; and



brake means for arresting rotation of said basket including a spring biasing said brake means toward a basket-arresting position and electro-magnetic means for moving said brake means against the bias of said spring when energized.

4,103,433

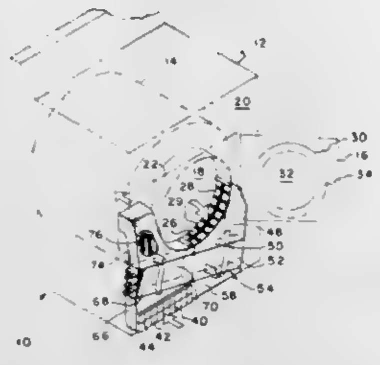
HOME LAUNDRY DRYER

James R. Taylor, Dallas, Tex., assignor to Q-dot Corporation, Dallas, Tex.

Filed Nov. 8, 1976, Ser. No. 739,815

Int. Cl.² F26B *19/00*

U.S. Cl. 34—86 **20 Claims**



1. A home laundry dryer comprising a housing of substantially standard size and, in said housing:

a drum to contain the laundery;

blower means for generating a flow of air entering the drum and a flow of air exhausted therefrom;

a thermal recovery unit, including

a low temperature passage and a high temperature passage, a thermally conductive partition disposed intermediate the low temperature passage and high temperature passage providing fluid isolation of the low temperature passage relative to the high temperature passage while permitting heat transfer from heated air in the high temperature passage to relatively cooler air in the low temperature passage by conduction and radiation through the thermally conductive partition;

a plurality of heat pipes in said passages, each heat pipe extending through said thermally conductive partition and substantially across each of the passages, each pipe having a plurality of fins in contact therewith;

an intake duct connected to direct said entering air to the drum from the outlet of the low temperature duct, whereby the entering air is drawn through the low temperature passage from the inlet thereof;

heater means in the intake duct for heating said entering air; and

an exhaust duct connected to direct said exhausted air to the inlet of the high temperature passage to flow therethrough in a direction opposite to the flow of the entering air in the low temperature passage,

whereby heat can be transferred to the entering air in the low temperature passage from exhausted air in the high temperature passage.

4,103,434

DRYING APPARATUS

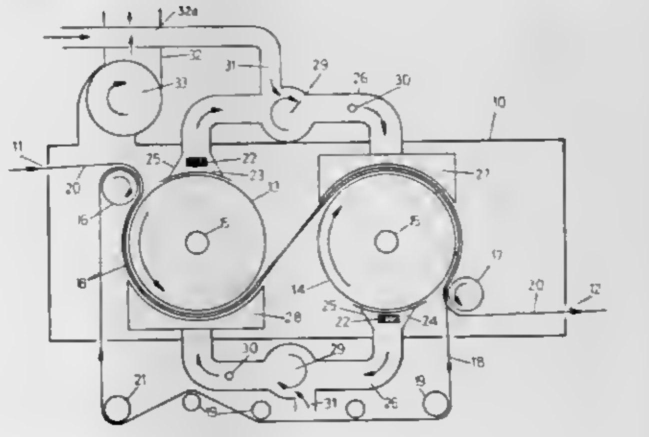
Richard Turner Walker, 175 S. Creek Rd., Dee Why 2099 Sydney, Australia

Continuation of Ser. No. 362,490, May 21, 1973, abandoned. This application Jun. 28, 1976, Ser. No. 700,568

Claims priority, application Australia, May 30, 1972, PA9144

Int. Cl.² F26B *13/08*

U.S. Cl. 34—114 **11 Claims**



1. A drying apparatus comprising:

a housing;

a plurality of spaced-apart, imperforate roller means located within the housing with spaced-apart circumferences for supporting a fibrous web of material transported through the housing;

means to introduce fibrous web material to be dried into said housing located adjacent to, but spaced apart from, the first of said roller means;

guide means to direct said fibrous web material to overlie at least a portion of each of said roller means;

means to drive each of said roller means;

heating means to heat the roller means sufficient to expand by vaporization, moisture contained within the fibrous material to be dried; and

web material tensioning means located adjacent to and spaced-apart from the last of said roller means to apply sufficient tension to said web material to permit said web material to be transported through said housing about said roller means and spaced-apart from the periphery thereof by a layer of vapor from said vaporized moisture which discharges from the side of the web adjacent the portion of the roller periphery which would otherwise be contacted at any given time by the material but for the presence of said vapor layer.

4,103,435

HEAD TRACKABLE WIDE ANGLE VISUAL SYSTEM

John W. Herndon, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 8, 1976, Ser. No. 730,892

Int. Cl.² G09B *9/08*

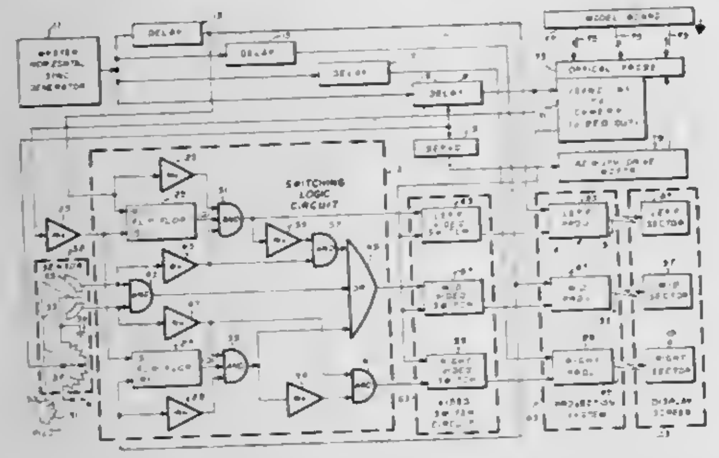
U.S. Cl. 35—12 N **25 Claims**

9. A head trackable visual system, comprising in combination:

a plurality of means for projecting a like plurality of optical images toward a like plurality of visible sectors of a display screen, respectively, in response to a video signal and a plurality of synchronization signals;

means for generating the aforesaid video signal;

- a plurality of switch means respectively connected to the output of said video signal generating means and the video inputs of said plurality of projecting means for timely supplying said video signal thereto, respectively, in response to a plurality of timing signals;
- means connected to said plurality of switch means for respectively and selectively supplying said plurality of timing signals thereto in response to said plurality of synchronization signals and in correspondence with predetermined dispositions of the aforesaid head; and
- means connected to said plurality of projecting means and said plurality of timing signals supplying means for timely supplying the aforesaid plurality of synchronization signals thereto, respectively.



4,103,436

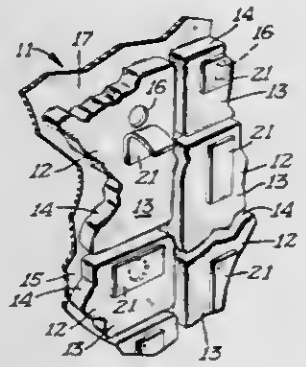
MAP DISPLAY DEVICE

Thomas Strussion, 4999 Jefferson St., Belaire, Ohio 43906, and Harry D. Moore, Rte. 1, Clarington, Ohio 43915

Filed Jul. 5, 1977, Ser. No. 812,857

Int. Cl.^{2} G09B *29/00*

U.S. Cl. 35—40 **5 Claims**



1. A map display device comprising a substantially rigid boundary defining structure formed from a single piece of rigid, moldable material,

- said boundary defining structure having a plurality of recessed portions each being shaped to define a geographical area, each recessed portion including a lower wall and a continuous peripheral wall integral with said lower wall and projecting therefrom,
- said boundary defining structure including a plurality of boundary defining surfaces integral with and interconnecting peripheral wall portions of adjacent recessed portions,
- the lower wall of each recessed portion having an opening therein,
- means for closing each of said openings,
- a flowable material filling each recessed portion,
- and a transparent, flat recessed cover corresponding in size and shape to said boundary defining structure engaging in sealing relation the boundary defining portions of the boundary defining structure and retaining the flowable material therein.

4,103,437

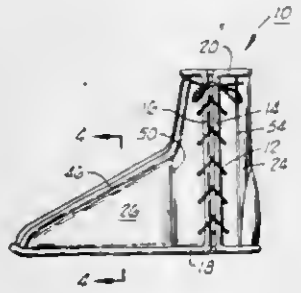
KARATE COMBAT SHOE

Lawrence Michael Dillard, 2624 SW. 69th St., Oklahoma City, Okla. 73159

Filed Feb. 24, 1977, Ser. No. 771,819

Int. Cl.^{2} A41D *17/00*

U.S. Cl. 36—2 R **5 Claims**



1. A protective foot covering for use in Karate combat, comprising:

- resilient panel means having a bottom edge and being disposed to provide ankle top covering around the inside, instep, outside and heel of the foot;
- resilient securing means maintaining said panel means around said foot;
- resilient strap means affixed to the bottom edge of said panel means to extend across the sole of the foot;
- a plurality of additional resilient padding means retained within said panel means at each of the inside sector, the outside sector and the heel sector thereof; and
- a tongue flap of padded consistency which is secured to said panel means bottom edge and foldable beneath said instep sector for positioning adjacent the foot instep to provide additional padding.

4,103,438

PLASTIC FOOT PROTECTOR

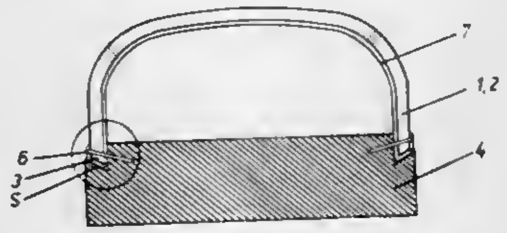
Frode Fron, Damvegen 24 A, Krakeroy, 1600 Fredrikstad, Norway

Filed Jun. 16, 1976, Ser. No. 696,819

Claims priority, application Norway, Jun. 20, 1975, 752194; Feb. 4, 1976, 760364; Feb. 4, 1976, 760365

Int. Cl.^{2} A43B *13/22*

U.S. Cl. 36—72 R **5 Claims**



1. A foot protector in combination with footwear comprising a plastic material conforming to the shape of the toe and to the instep part of a foot and including a toe cap portion and an instep cap portion covering the entire instep of the foot, said toe cap portion and instep cap portion including lower parts extending to the sole of the footwear, said toe cap and instep cap portions being shaped to be secured to said footwear sole to prevent the foot protector from pressing against the foot or penetrating into the sole by application of high loads, said lower parts being shaped at an angle of 30° to 75° corresponding to a groove provided in said sole, the lower parts being attached to the sole by rivets or nails, the sole being of wood.

4,103,439

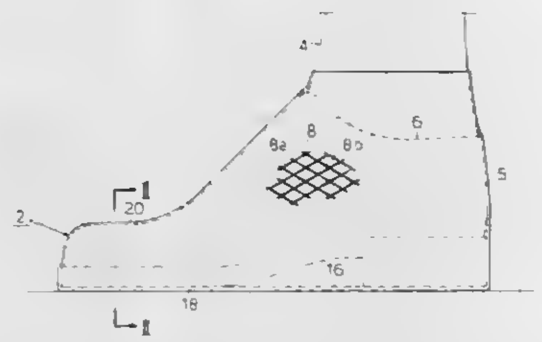
SHOE COVER AND METHOD OF MAKING SAME

Harvey J. Abramson, Tel Aviv, Israel, assignor to Metatech Corporation, Northbrook, Ill.

Filed Sep. 16, 1976, Ser. No. 724,008

Int. Cl.^{2} A43B *1/10*

U.S. Cl. 36—7.3 **4 Claims**



1. A shoe cover for use in dust-free and decontamination rooms, as protective rainwear, or the like, characterized in that the shoe cover is a one-piece unit of thin, pliable, elastic material including a sole portion and a top portion formed in the shape of a foot to tightly enclose the complete wearer's shoe and to extend slightly above and to grip its upper edge, the outer face of the shoe cover being formed with a network of ribs which increase its tensile and shear strength, isolate tears, and reduce slip, said network of ribs including a first plurality of parallel ribs extending in one direction, and a second plurality of parallel ribs intercepting the first plurality of ribs at oblique angles to form diamond-shaped sections having their long dimensions in the longitudinal direction of the shoe cover.

4,103,440

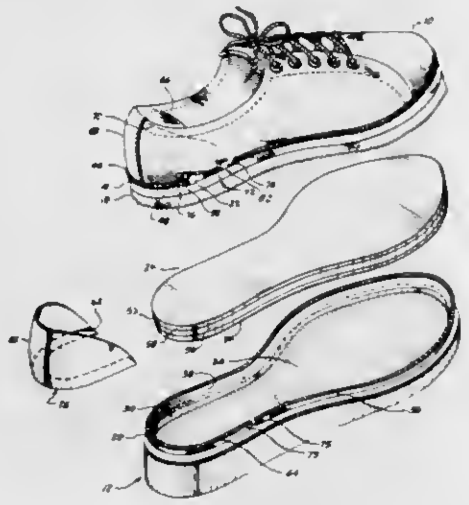
SHOE WITH DETACHABLE UPPER

Peter A. Lawrence, 27215 SE. Duthie Hill Rd., Issaquah, Wash. 98027

Filed Aug. 15, 1977, Ser. No. 824,424

Int. Cl.^{2} A43B *3/24*

U.S. Cl. 36—101 **7 Claims**



1. A shoe comprising:

- (a) a sole having a tread portion and an upstanding side wall extending around the perimeter of said tread portion;
- (b) an upper having a lower edge portion extending around the perimeter of said upper; and,
- (c) slide fastener means for detachably connecting said upper to said sole, said slide fastener means including,
  - (1) a lower stringer comprising a lower stringer mounting tape and first coupler means extending along an edge thereof, said lower stringer mounting tape being attached to the inside surface of said sole side wall and supporting said first coupler means along the perimeter of said sole at an elevation above the top of said sole side wall,
  - (2) an upper stringer comprising an upper stringer mounting tape and second coupler means extending along an edge thereof, said upper stringer mounting tape being attached to said upper along the outside surface of said lower edge portion of said upper with said second coupler means directed upwardly, said upper stringer tape being folded outwardly and downwardly over on itself both to form an upwardly directed bight and to locate the second coupler means in a depending position laterally outwardly of said upper and above the top of said sole side wall, and
  - (3) slider means for coupling and uncoupling the first and second coupler means on said lower and said upper stringers.

4,103,441

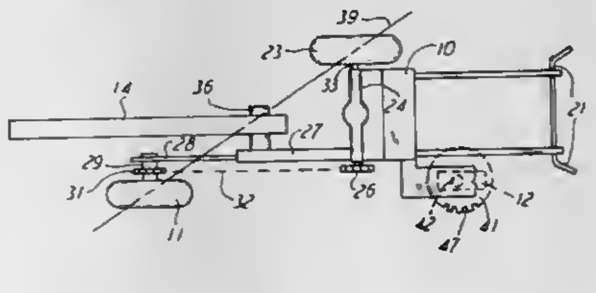
TRENCHER WITH OFFSET DRIVE WHEELS

James Samuel Flippin, Clearwater, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed May 9, 1977, Ser. No. 794,953

Int. Cl.^{2} E02F *5/06*

U.S. Cl. 37—86 **10 Claims**



1. In a trencher for digging a trench in the ground, a mobile trencher including three ground wheels and a powered drive unit and a trencher boom with a digging chain thereon and driven by said drive unit, said trencher boom being pivotally supported about an axis and as an element of said mobile trencher and extending to a free end for penetrating the ground and forming the trench in the ground and with said chain being driven along the length of said boom for digging into the ground, two of said ground wheels being drivingly associated with said drive unit to be traction wheels and to drivingly support said mobile trencher in a fore-and-aft direction of movement, the improvement comprising all of said wheels being located on separate and respective axes offset from each other in the fore-and-aft direction of said mobile trencher and with said two traction wheels being disposed on opposite sides of said trencher and with said three wheels being located at the respective corners of an imaginary triangle in plan view of said trencher, said trencher boom being pivotally supported on a pivot axis located to intersect a vertical plane extending between the said two traction wheels and said trencher boom being pivotally supported at a location within the geometric limits of said imaginary triangle, whereby the forces of said trencher boom on said mobile trencher are neutralized through the location of said two traction wheels.

4,103,442

ADJUSTABLE SHOVEL TOOTH CAP HOLDER

Hans-Rudolf Zepf, Hirsackerstrasse 30, Horgen, Switzerland

Filed Apr. 1, 1977, Ser. No. 783,567

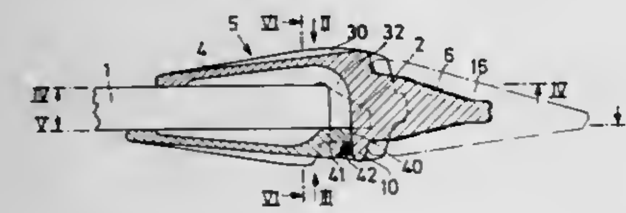
Claims priority, application Switzerland, Apr. 12, 1976, 4616/76

Int. Cl.^{2} E02F *9/28*

U.S. Cl. 37—142 R **7 Claims**

1. A shovel tooth cap holder attachable to a shovel blade for supporting a tooth cap replaceably attachable to the tooth holder, the tooth holder comprising

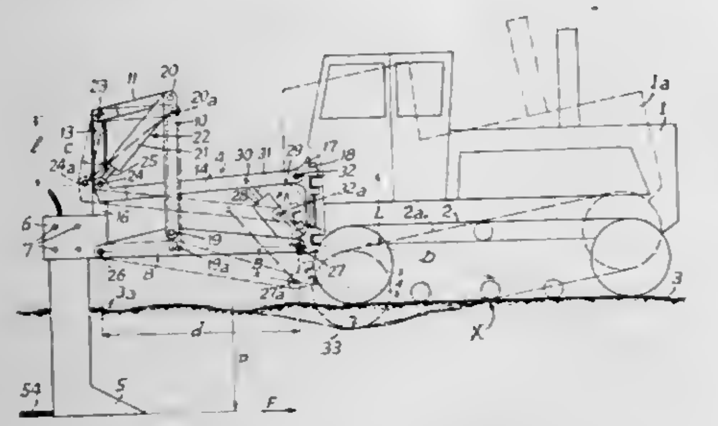
- a front portion adapted to receive a tooth cap;
- a first rear portion shaped to lie against one surface of the shovel blade;
- a transverse web between said front and rear portions, said web having front and rear surfaces and upper and lower ends, said front portion coupled to and extending forwardly from said web front surface, said first rear portion coupled to and extending rearwardly from said web upper end; and
- a separately formed second rear portion comprising a hollow shell having parallel legs adapted to lie against the opposite surface of said shovel blade and a front surface shaped to abut only a portion of said web rear surface to permit said front surface of said second rear portion to be located adjacent any portion of said web rear surface to enable the spacing between said first and second rear portions to be varied, said first and second rear portions being fixedly connectable to the respective surfaces of said blade and said second rear portion being fixedly connectable to any portion of said rear surface of said web whereby said holder is attachable to blades of different thicknesses.



4,103,443
LINKAGE FOR AN EXCAVATING TOOTH

Gilles Pelsy, Domaine de l'Epina, Maucourt-sur-Orne, France (55400)

Filed Mar. 31, 1977, Ser. No. 783,465
Claims priority, application France, Apr. 6, 1976, 76 09979
Int. Cl.^{2} A01B *13/08;* **E02F** *5/18*
U.S. Cl. 37—193 **5 Claims**

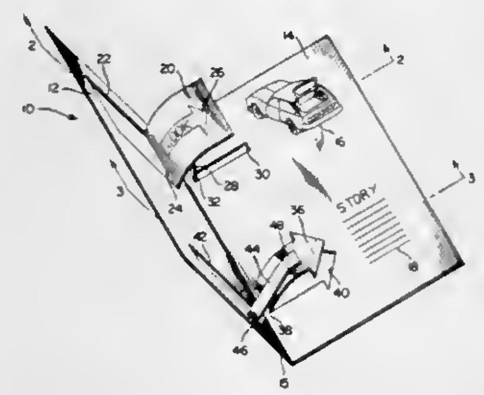


1. Drainage machine apparatus constituted by a structure and by working equipment, said apparatus comprising a tooth mounted on a support and a system of arms articulated about horizontal shafts connecting the support to the structure, wherein the system of arms is formed by first, second and third arms which, in cooperation with the tooth support form an articulated quadrilateral, the first arm being articulated to the support and to the third arm and the third arm also being articulated to the support, wherein the second arm is spaced from the structure, while the first arm is articulated to the structure by a different shaft from that which articulates it to the second arm and the system of arms also comprises fourth and fifth arms articulated to each other wherein additionally the fourth arm is articulated to the third arm and the fifth arm to the structure, and a locking member coupled to the third and fourth arms in such a way as to selectively maintain at a given value the angle formed by the third and fourth arms.

4,103,444
FLAP POP-UP FOR ADVERTISING LEAFLETS

John H. Jones, Westfield; Donald W. Schoenleber, Princeton, and Frederick Grainger, Green Brook, all of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,363
Int, Cl.^{2} G09F *1/00*
U.S. Cl. 40—124.1 **6 Claims**

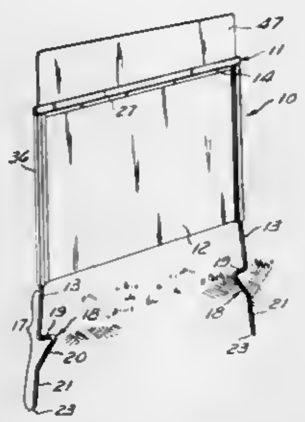


1. An advertising pop-up assembly, comprising:
(a) two rectangular paper sheets joined along a fold line
(b) at least one of the sheets having advertising material on its inside face
(c) a direction indicating element partially cut from and integral with and projecting from one of the sheets and extending outwardly from the fold line with its free end disposed immediately adjacent the advertising material and movable from the plane of the sheet
(d) a partially cut out elongated relatively thin articulating element extending substantially in the same direction as and integrally connected at one end to the central section of the direction indicating element, and
(e) the articulating element having its other end connected to the other sheet at a point spaced from the fold line such that when the two sheets are parted the articulating elements pulls on the direction indicating element and brings it to a position above and adjacent the advertising material to direct the reader's attention thereto.

4,103,445
ROLL-UP SIGN

David A. Smith, 200 Columbus St., and Thomas P. Hertrick, 859 Sherwood Dr., both of Elyria, Ohio 44035

Filed Sep. 2, 1976, Ser. No. 719,687
Int. Cl.^{2} G09F *7/00*
U.S. Cl. 40—125 G **11 Claims**

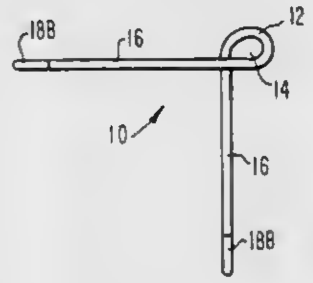


3. A sign for outdoor display comprising a rigid frame and a flexible web for carrying an image, the frame members including an elongated crosspiece and a pair of elongated legs for supporting the crosspiece, said web being constructed of thermoplastic rubber whereby the web is sufficiently flexible to be rolled on itself, means for securing the web to the frame, the upper end portion of each leg being adapted to interengage opposite end portions of the crosspiece, means on the end portion of one of said frame members at both ends of said crosspiece for releasably interlocking the respective leg and crosspiece end portions together, said releasable interlocking means being constructed and arranged to permit both locking interengagement and release of said crosspiece and leg end portions while said web is secured to said frame by said securing means, said interlocking means preventing separation of each of said upper leg end portions from its associated crosspiece end portion under tensile forces between such leg end portions and respective crosspiece end portions when the lower end portions of said legs are embedded in the ground, each of said legs including lower end means extending laterally at a slight angle in a direction away from the opposite leg whereby said legs are caused to be separated by ground reaction forces as said lower end means are driven into the ground, said web being secured to said legs whereby said web is stretched and thereby tensioned throughout substantially its full area by said legs as said lower end means are driven into the ground.

4,103,446
FRAMING SYSTEM

Larry Franklin Maglott, 361b Commercial St., Provincetown, Mass. 02657

Filed Jun. 23, 1976, Ser. No. 699,190
Int. Cl.^{2} G09F *1/12*
U.S. Cl. 40—155 **9 Claims**

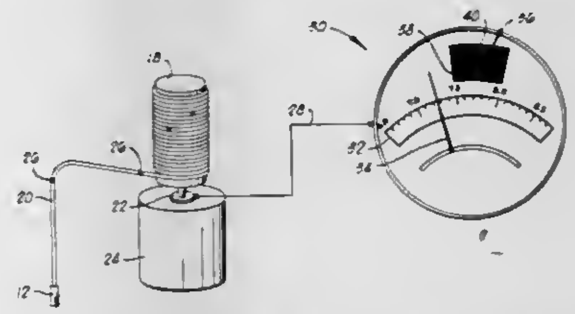


1. A framing system for a rigid assembly including a picture or like item to be exhibited, front and rear major faces and a plurality of corners, said system comprising:
- A. bracket means for each corner of the assembly, each of said bracket means including:
  - i. means disposed adjacent the rear face of the assembly and defining an opening,
  - ii. first and second arms extending away from said opening defining means toward adjacent edges of the assembly at the corner, and
  - iii. hook means at the end of each of said first and second arms for engaging the adjacent edges of the assembly; and
- B. a one-piece, flexible binder cord for interconnecting said bracket means at the rear face of the assembly, for providing a point for hanging the assembly and for holding said bracket means on the assembly whether or not the assembly is hung by said cord, said cord including:
  - i. a first end which is secured to said opening defining means in one of said bracket means,
  - ii. a first intermediate section adjacent said first end which is passed successively through said opening defining means in at least the remaining of said bracket means,
  - iii. a second intermediate section adjacent said first intermediate section which is looped around a portion of said first intermediate section extending between two of said remaining bracket means to form an inverted "V" shape, and
  - iv. a second end adjacent said second intermediate section which is secured so as to maintain said cord under tension thereby to hold each of said bracket means on the assembly, the apex of the inverted "V" of said second intermediate section providing a rigid, stable, laterally centered point for hanging the assembly.

4,103,447
APPARATUS AND METHODS FOR LOCATING, CATCHING AND RAISING FISH

Loren G. Hill, 1125 Westbrooke Ter., Norman, Okla. 73069

Filed Dec. 29, 1976, Ser. No. 755,249
Int. Cl.^{2} A01K *79/00*
U.S. Cl. 43—4.5 **11 Claims**

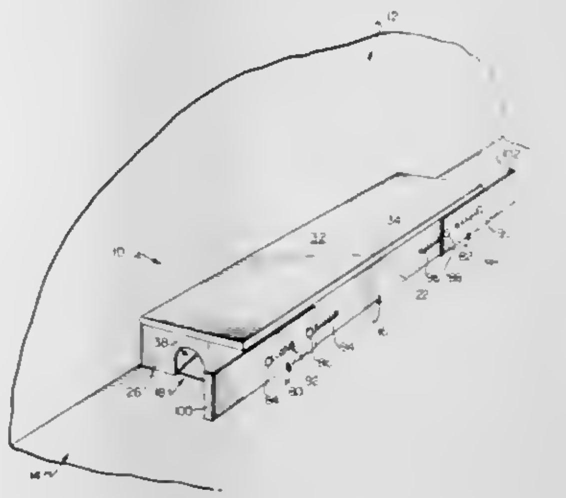


9. The method of locating and catching a species of fish which prefers a fresh water environment with a pH within a given range, by determining those locations, within a body of fresh water known to be inhabited by the species, which have a pH within the preferred pH range of the species, comprising:
- measuring the pH of the water at a plurality of locations within the body of water;
- determining which of those locations has a pH closest to the preferred pH range of the species; and placing fish catching means in contact with the water at those locations indicated by the step of determining to have a pH closest to the preferred pH range of the species.

4,103,448
REPEATING ANIMAL TRAP WITH SIDE EXTENSION

Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

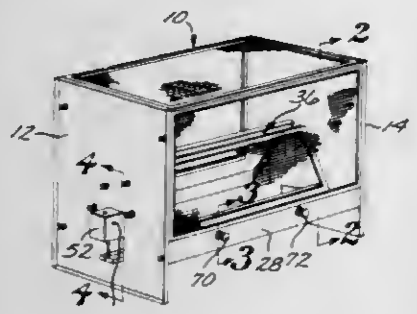
Filed May 20, 1976, Ser. No. 688,463
Int. Cl.^{2} A01M *23/08*
U.S. Cl. 43—67 **3 Claims**



1. In an animal trap including a collection means having parallel side walls, end walls, a top and a bottom and trap means defined in at least one of the end walls, one of the side walls being adapted to be juxtaposed to a wall in a room in which the trap is to be used, the improvement which comprises confining means carried by the other of the side walls of the collection means, said confining means including portions parallel to said other side wall and extendable beyond the point at which said other side wall meets an end wall containing a trap means to direct an animal passing the trap means back toward the trap means.

4,103,449
FLY TRAP

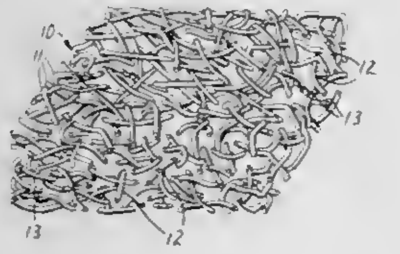
Joe M. Z. Vasquez, 122 N. Orange St., Azuza, Calif. 91702
Filed Jul. 26, 1976, Ser. No. 708,585
Int. Cl.^{2} A01M *1/10*
U.S. Cl. 43—111 4 Claims



1. A trap particularly suitable for capturing flying insects including: a container formed on the outside by closed walls which are structured internally to define an insect entry; a movable food tray positioned beneath said container close enough to said insect entry thereof to cause an insect jumping from said tray to alight near said entry and pass through it into said container; agitating means operatively associated with said food tray; said container having screened top and side walls secured by end walls and upwardly angled, inwardly converging, screened botton walls which extend from the lower inner edges of said side walls to define said insect entry by a predetermined space between their upper edges; said end walls being provided with vertical slots positioned below the entry space defined by said bottom walls; said food tray mounted in said slots in said walls in position for vertical movement therein; and said agitating means connected to said food tray so as to be able to move it at predetermined intervals.

4,103,450
INSECTICIDAL DEVICE

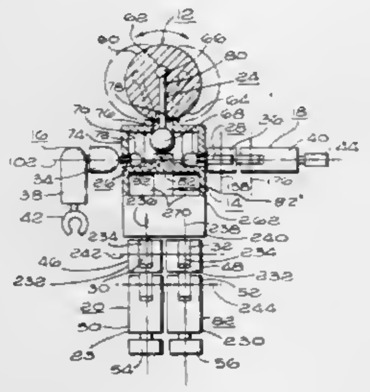
John F. Whitcomb, Mendota, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 645,259, Dec. 29, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,631
Int. Cl.^{2} A01M *1/20*
U.S. Cl. 43—131 5 Claims



1. An insecticidal device which can be deposited in areas infested with undesirable insects and after use easily removed, comprising an insecticidal substance impregnating and coating the fiber surfaces of a lofty, low-density, open non-woven web which will permit the passage therethrough of smaller-size insects such as ants, mites and lice, and has a thickness of at least 0.5 cm thick and a void volume within the range of about 85 to 97 percent, said web being formed of randomly disposed crimped or looped synthetic fibers having a fiber size on the order of 6 to 200 denier and being bonded together at points where they touch and cross, said insecticidal substance being selected from the group consisting of pyrethrum, endrin, aldrin and its epoxide, dieldrin, heptachlor, DDT, BHC, lindane, chlordane, methoxychlor, DDD, TDE, toxaphene, malathion, parathion, TEPP, schradan, demeton, dimethoate, carbaryl and methyl carbamate, organic thiocyanates, haphthalene, paradichlorobenzene, pentachlorophenol, and tetrachlorophenol.

4,103,451
DOLL WITH NECK DETACHABLY SECURED BETWEEN OPPOSED BABY MEANS PORTIONS

Chikao Kawada, Tokyo, and Toshio Tsuchikura, Koshigaya, both of Japan, assignors to Chikao Kawada, Japan
Filed Apr. 9, 1976, Ser. No. 675,640
Claims priority, application Japan, Apr. 18, 1975, 50-51994; Apr. 18, 1975, 50-51995; Apr. 9, 1975, 50-138003; Apr. 9, 1975, 50-138004; Apr. 9, 1975, 50-138005; Apr. 9, 1975, 50-138006
Int. Cl.^{2} A63H *3/00*
U.S. Cl. 46—22 28 Claims



1. In an articulated doll arrangement of the type having a head means, a body means and a neck means interconnecting said head means to said body means, the improvement comprising, in combination:

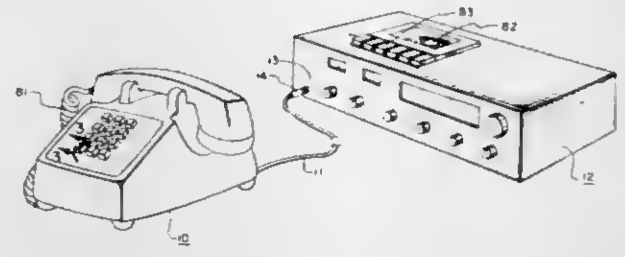
said neck means comprising:

an upper knob portion, a lower knob portion, and an intermediate portion extending between said upper knob portion and said lower knob portions; and

said body means including means for detachably connecting said lower knob portion of said neck means to said body means comprising: a planar surface in a portion of said body means bearing against said lower knob portion of said neck means, neck walls in another portion of said body means defining a neck aperture, and said neck walls engaging said lower knob portion of said neck means in opposed spaced relationship to said planar surface, and said intermediate portion of said neck means extending with clearance through said neck aperture to provide nutational movement of said neck means with respect to said body means.

4,103,452
CHILD'S TELEPHONE APPARATUS

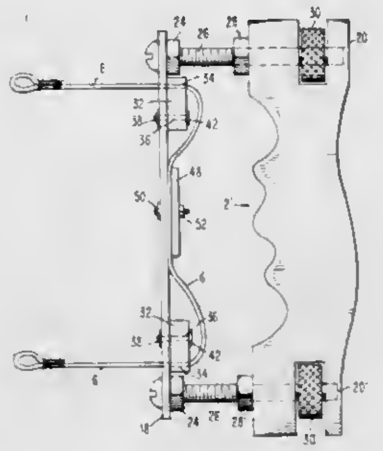
Richard G. Wood, 857 E. 3rd South, Salt Lake City, Utah 84102
Filed Dec. 13, 1976, Ser. No. 750,006
Int. Cl.^{2} A63H *33/30*
U.S. Cl. 46—33 5 Claims



1. A toy telephone having a handset and a base coupled to and selectively supporting said handset, said handset being provided with a first speaker, said base being provided with a second speaker, and first means for coupling separate channels from an external, audio-signal stereo playback unit to respective ones of said speakers.

4,103,453
ADJUSTABLE U-CONTROL HANDLE

Robert Michael Baron, 834-4th St., Santa Monica, Calif. 90403
Filed Feb. 1, 1977, Ser. No. 764,584
Int. Cl.^{2} A63H *27/04*
U.S. Cl. 46—77 5 Claims



1. A U-control handle for controlling the flight of a powered airplane by a cable secured to said handle and said airplane comprising:

a member adapted to be gripped by a hand of the person controlling said flight;

two parallel channels in said member, each located respectively at opposite ends of said member;

a movable bolt in each channel having nuts thereon so that each bolt can be individually set in a chosen position and locked in that position by the free hand of the person holding said handle;

a cross-bar secured to an end of each bolt so that said bar is substantially parallel to said member being gripped;

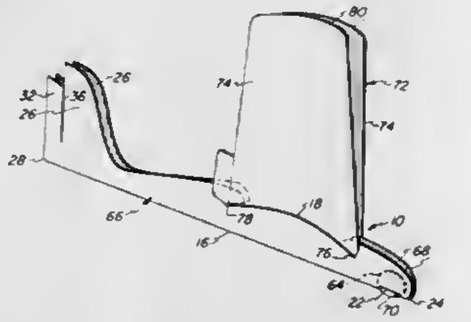
multiple openings in said cross-bar;

two nylon blocks adjustably lockable along the length of said cross-bar through said openings, and

passageways in said blocks for allowing the passage of said cable therethrough.

4,103,454
FOLDING ASSEMBLED ARTICLE SUCH AS A TOY AIRPLANE

Myron Stone, 188 Polifly Rd., Hackensack, N.J. 07601
Filed May 19, 1977, Ser. No. 798,472
Int. Cl.^{2} A63H *27/00*
U.S. Cl. 46—79 11 Claims



11. In a toy paper airplane having a fuselage extending between a nose portion and a tail portion and including juxtaposed parts folded side-by-side about a longitudinal fold line, an empennage comprising:

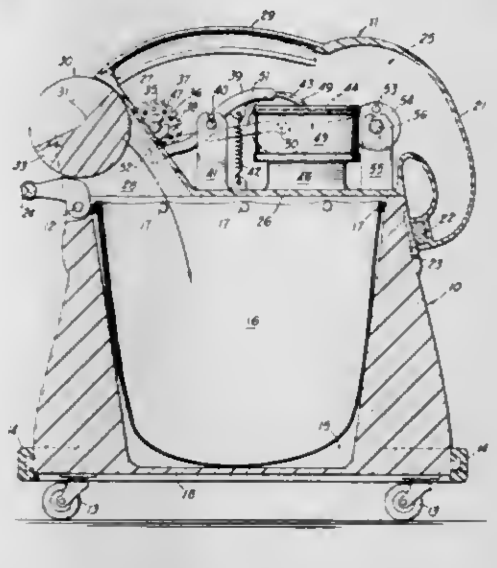
a pair of lateral extensions adjacent the tail portion of the fuselage, the lateral extensions being located one on each of the side-by-side parts of the fuselage and being movable into laterally opposite positions, corresponding to the second position of the wing halves, to establish horizontal stabilizers;

a rearmost laterally extending portion at the tail portion of the fuselage; and

a lateral fold line between the rearmost portion and the lateral extensions, the rearmost portion being foldable about the lateral fold line between a first position rearward of the lateral fold line and a second position forward of the lateral fold line to establish a vertical stabilizer at a selected one of the first and second positions.

4,103,455
TOY CHEST

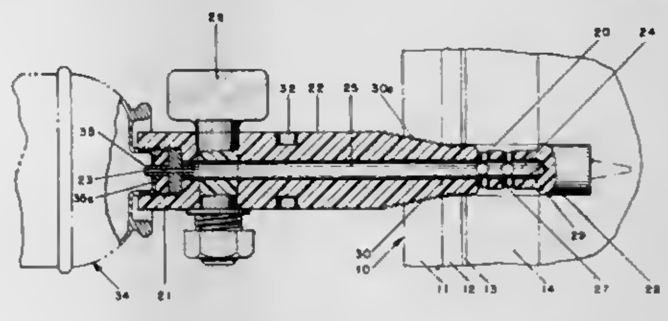
Robert L. Silvey, 589 Woodland Hills Dr., Athens, Ga. 30601
Filed Mar. 17, 1977, Ser. No. 778,482
Int. Cl.^{2} A63H *5/00*
U.S. Cl. 46—99 12 Claims



1. A toy chest comprising a base section having an open top storage compartment and a hinged lid section, said lid section having a passage leading into said storage compartment when the lid section is in a closed position, a manually movable toy delivery member on the lid section operable to deliver toys through said passage to said storage compartment, and audio-visual means on said lid section operated by movement of said toy delivery member to reward a child for placing a toy in the toy chest by use of the toy delivery member.

4,103,456
DEVICE AND METHOD FOR TREATING TREES

Dale Z. Hendrixson, 340 Summit Rd., and John C. Macbeth, 224 Summit Rd., both of Springfield, Pa. 19064
Filed Aug. 5, 1976, Ser. No. 711,983
Int. Cl.^{2} A01G *29/00*
U.S. Cl. 47—57.5 7 Claims



1. Apparatus for use in injecting a fluid into a boring made in a tree for the purpose of treating said tree with said fluid which is fed into said apparatus from a vessel and through said apparatus into said boring, which apparatus comprises a unitary device comprising:

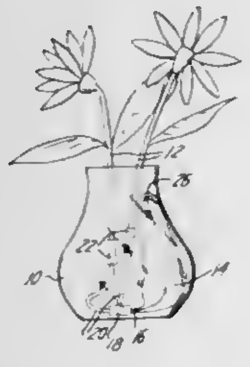
an injector element containing therein a tube affording a

passageway for said fluid through said element, said tube having an inlet and an outlet for said fluid;
said inlet being adapted to being attached directly to said vessel;
said outlet comprising a plurality of apertures in conduit relationship with said tube;
contiguous with said plurality of apertures and positioned on said unitary device between said apertures and said inlet of said tube a tapered, threaded element affording a sealing means with the bark of said tree, thereby to avoid leakage of said fluid out of said boring;
contiguous with said plurality of apertures and at the furthermost position from the inlet a solid element positionable in the innermost end of said boring, thereby affording stability to the mounting of said apparatus in said boring; the apertured outlet portion of said element being of a reduced width with respect to the threaded and solid elements on either end thereof, and
positioned on said apparatus between said tapered, threaded element and said inlet, a valve in closing and opening relationship with said tube.

4,103,457

HORTICULTURAL METHOD AND APPARATUS

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580
Filed Aug. 16, 1976, Ser. No. 714,818
Int. Cl.² A01G *1/00*
U.S. Cl. 47—58 **19 Claims**



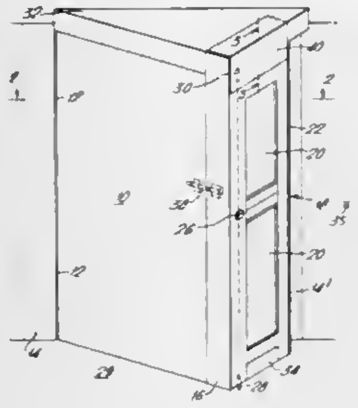
1. A method of sustaining life processes of a cutting such as a living branch or flower, including the steps of providing in a collapsible reservoir a wholly enclosed supply of liquid suitable for maintaining viability of said cutting and conducting the liquid through an unobstructed liquid delivery and coupling means to essentially all of the cut end of the cutting, the liquid delivery and coupling means including an elastic sleeve of water-impermeable material at the delivery end thereof remote from the collapsible reservoir, and applying said resilient sleeve in tension about all of that portion of the lateral surface of the cutting which is at and adjacent to the cut end of the cutting for forming a leak-preventing cover thereon and the resilient sleeve having a portion extending beyond said cut end, such that only the cut end of the cutting is in contact with the liquid in the extending portion of the elastic sleeve, said reservoir collapsing as the cutting absorbs liquid.

4,103,458

SECURING OF DOORWAYS

Ernest R. Booker, Teddington, England, assignor to Plan Partitions Limited, Loodon, England
Filed Dec. 14, 1976, Ser. No. 750,389
Claims priority, application United Kingdom, Jun. 21, 1976, 25678/76; Sep. 17, 1976, 38525/76
Int. Cl.² E06B *7/08*
U.S. Cl. 49—56 **10 Claims**

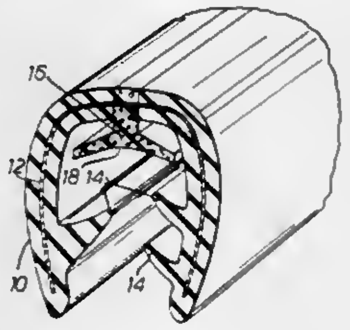
1. A doorway comprising a generally rectangular door which is pivotally carried by a door frame in a manner allowing movement of the door over an adjacent floor in one direction only out of the plane of the door frame, the door and the floor and the door frame thus constituting respective elements of a conventional doorway, and the present improvement residing in adapting such a conventional doorway to resist forceful entry by a caller, even after initial opening of the door by an occupant, by providing a non-collapsible canopy extending outwardly from the door frame above the door in combination with a generally rectangular closure member formed as a non-collapsible imperforate bullet-resistant member which extends from the floor to the canopy and which includes at least one translucent portion of a bullet-resistant material, the entire length of one vertical edge of the closure member being pivotally hinged to the door frame with the entire length of the other vertical edge of the closure member including a flange extending perpendicular to the main portion of the closure member to form therewith an L-section, both upper and lower portions of the closure member carrying respective bolts which are movable into and out of respective sockets set in said canopy and said floor to secure and release the closure member from an operative stationary position, in which the closure member lies at a predetermined position with the flange lying in the path of movement of the door to prevent subsequent opening of the door through more than a predetermined angle, the closure member and the canopy then bridging the gaps which would otherwise have appeared between the door and the door frame so that entry through the doorway by the caller is denied until said bolts have been released by the occupant.



4,103,459

CHANNEL-SHAPED SEALING STRIPS

Jean Barnerias, Chartres, France; Anthony E. Johnson, Coventry, England, and Erich Weimar, Viesen, Fed. Rep. of Germany, assignors to Draftex Development AG, Switzerland
Filed Dec. 17, 1976, Ser. No. 751,593
Claims priority, application United Kingdom, Dec. 19, 1975, 52005/75
Int. Cl.² E06B *7/16*
U.S. Cl. 49—491 **9 Claims**

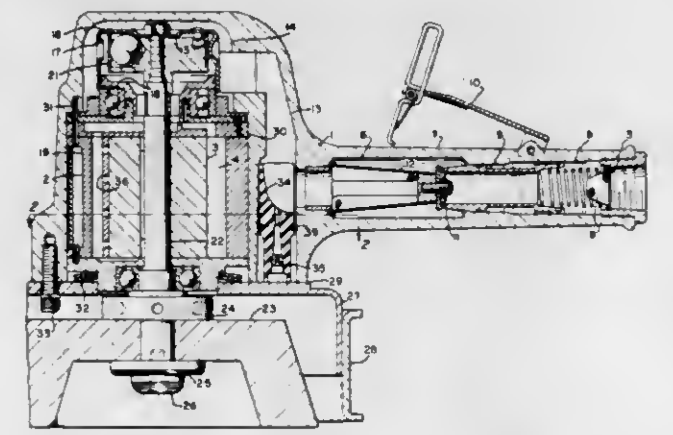


1. A channel-shaped sealing strip, comprising
U-shaped metal carrier means,
channel-shaped elastomeric material enclosing the carrier means,
a linear insert of softer elastomeric material in and extending through the thickness of the channel-shaped elastomeric material and running along the base of the channel and being proud of the inside surface of the base, the said insert being of cellular elastomeric material and being formed integrally with the remainder of the elastomeric material, and
a sealing part attached to and running along the outside of the channel, the sealing part being made of cellular elastomeric material formed integrally with and being an extension of the cellular elastomeric material of the linear insert.

4,103,460

GRINDER SAFETY DEVICE

John P. Law, Athens, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Feb. 2, 1977, Ser. No. 764,724
Int. Cl.² B24B *23/00*
U.S. Cl. 51—170 R **7 Claims**



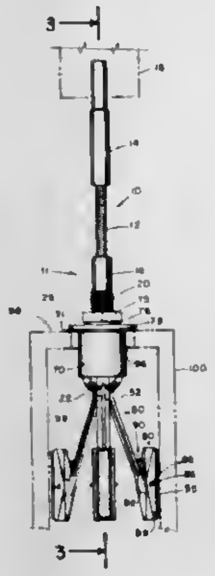
1. A tool guard in combination with a pressure-fluid driven tool comprising:
a tool housing;
a pressure fluid supply connected to said housing;
a pressure-fluid driven motor in said housing communicating with said pressure fluid supply and having its work output on a spindle;
a work engaging means mounted on said spindle;
a guard attached to said housing for at least partially surrounding said work means;
a pressure fluid passage means in said housing communicating with said motor and sealed by said guard; and
removal of said guard permits said passage means to communicate with the atmosphere and thereby vent said pressure fluid to atmosphere.

4,103,461

GRINDING TOOLS FOR CYLINDERS

Alex Besenbruch, Isabela, P.R., assignor to Besenbruch-Hofmann, Inc., Lindenburst, N.Y.
Filed Aug. 1, 1977, Ser. No. 820,549
Int. Cl.² B24B *33/08*
U.S. Cl. 51—352 **9 Claims**

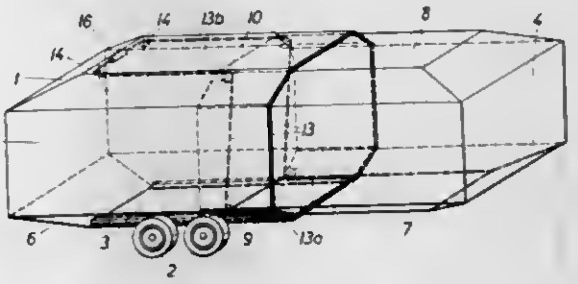
1. A grinding tool for a hollow cylinder having an end wall formed with a central hole, and a cylindrical inner wall to be ground, comprising:
a stem assembly including a cylindrical hub at one end;
a hub member surrounding said hub;
a plurality of flexible legs each having one end engaged on said hub member and having blade portions extending radially outward of said hub member;
a sleeve surrounding said hub member to hold said legs clamped on said hub member; and
flange means loosely fitting around said hub to be manually gripped and held stationary when said stem assembly, said legs, and said sleeve rotate.



4,103,462

MOBILE HOME

Walter Freller, Sierning, Austria, assignor to "Wohn-Art" - Freizeltartikel Gesellschaft m.b.H., Windischgarsten, Austria
Filed May 4, 1977, Ser. No. 793,748
Claims priority, application Austria, May 5, 1976, 3301/76; Nov. 8, 1976, 8279/76
Int. Cl.² E04B *1/346, 7/16*
U.S. Cl. 52—67 **12 Claims**



1. A mobile home comprising
(a) a box-like main part having two side walls, a floor and an end wall interconnecting the side walls, an end of the main part opposite to the end wall being open,
(b) a box-like extension part having two side walls, a rigid floor and an end wall interconnecting the side walls, an end of the extension part opposite to the end wall thereof being received in the open end of the main part,
(c) a guide means in the main part for glidably guiding the extension part in the main part whereby the extension part may be telescopingly moved in the main part between a transport position and an extended position,
(d) wheels supporting the main part for mobility of the home,
(e) a pair of superposed pulleys mounted in the vicinity of each of the side walls of the extension part at the end thereof,
  (1) a lower one of the pulleys of each pair cooperating with the guide means and being constituted by rollers capable of running along the guide means for glidably moving the extension part with respect to the main part,
(f) a flexible tensile element trained over each pair of pulleys in zigzag arrangement,
(g) means for anchoring respective end portions of each of the tensile elements respectively in the region of vertical planes extending through the respective ends of the guide

means, the tensile elements being tensioned between the anchoring means in the zigzag arrangement, and

(h) a force-transmitting connection between the end portions of the tensile elements anchored near the end wall of the main part and forming the tensile elements into an endless element, each end portion being immovably connected to the force-transmitting connection.

4,103,463

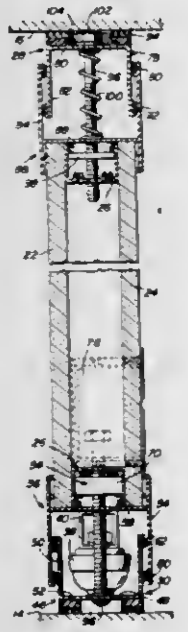
PORTABLE WALL SYSTEM

Guy E. Dixon, Maimi, Fla., assignor to Panelfold Doors, Inc., Mlami, Fla.

Filed Sep. 28, 1976, Ser. No. 727,605

Int. Cl.² E04B *2/74;* **E04H** *3/02*

U.S. Cl. 52—122 **10 Claims**



1. In a portable wall system extending generally vertically between a floor and ceiling and including at least one wall panel, that improvement in which the wall panel includes a fixed dimension panel assembly having a vertical heighth only slightly less than the distance between the floor to the ceiling, a floor engaging supporting assembly on the lower edge of said panel assembly for movably supporting the lower end of the panel assembly for moving the wall panel along the surface of the floor, and a manually operated, vertically extendible and retractable lifting assembly continuously along the bottom edge of said panel assembly for selective vertical orientation above the point of contact between the supporting assembly and the floor surface and below the bottom edge of the supporting assembly, the vertical extension of the assembly serving to lift the panel assembly to bring it into engagement with the ceiling and secure the wall panel between the floor and ceiling, and a spring biased assembly at the upper edge of the panel assembly for engagement with the ceiling, said spring biased assembly including spring means exerting a small upward force to compensate for irregularities in building surfaces and to engage the ceiling with a "light touch".

4,103,464

TOOL FOR BLOWING INSULATION INTO AN EXISTING WALL STRUCTURE

Dale L. Clifft, Tarzana, and Melvin G. Green, San Diego, both of Calif., assignors to Melvin G. Green, Inc., San Diego, Calif., a part interest

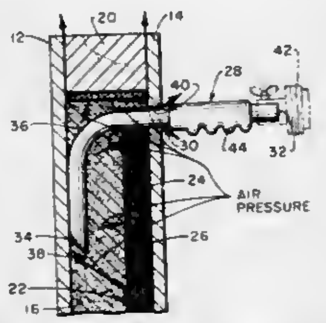
Filed Feb. 18, 1977, Ser. No. 770,006

Int. Cl.² E04G *21/00*

U.S. Cl. 52—127 **4 Claims**

1. In combination with an existing wall structure being formed of an inner wall surface, an outer wall surface, with there being an enlarged opening therebetween, a layer of insulation located within said opening, said layer insulation being composed of a pad of insulative material which is secured to a backing layer of material, said backing layer of material located adjacent said inner wall surface, a tool to facilitate the blowing of additional insulation within said opening, said tool comprising:

an elongated tubular member having an internal chamber to facilitate the passage of blown insulation therethrough, said tubular member having an inner end and an outer end, said inner end adapted to be connected to an insulation blowing machine, said outer end terminating in a cutting edge, said outer end being angularly located with respect to said inner end, an access opening being provided through said outer wall connecting with said internal enlarged opening, the outer end of said tool to be inserted through said access opening and to be moved cutting through said pad of insulation into contact with said backing layer of material, upon pivoting of said tool said cutting edge cuts through said backing layer of material until further pivoting motion of said tool results in said outer end to be located between said backing layer of material and said inner wall surface, whereupon conducting of insulation through said tubular member such is deposited between said backing layer of material and said inner wall thereby compressing said pad of insulation thereby permitting a substantial higher quality and greater amount of insulation to be supplied within said opening.



4,103,465

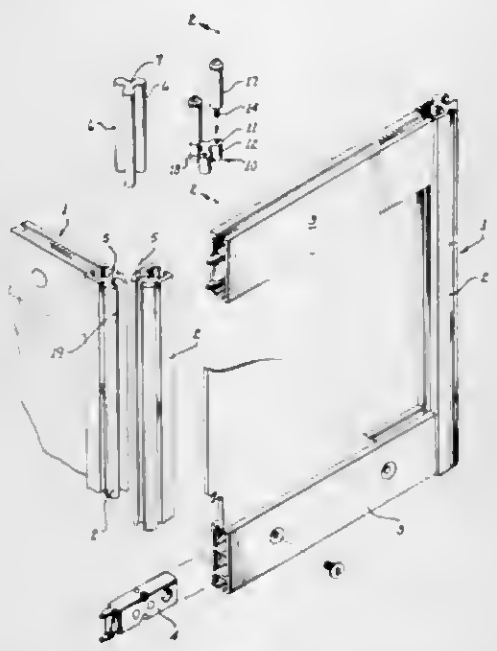
MODULAR PANEL DISPLAY SYSTEM

Leo S. McDonald, Jr., Glenview, Ill., assignor to Greyhound Exhibitgroup, Inc., Elk Grove, Ill.

Filed Aug. 25, 1977, Ser. No. 827,483

Int. Cl.² E04C *2/42;* **A47G** *5/00;* **E04B** *2/74*

U.S. Cl. 52—127 **6 Claims**



1. A modular display panel system comprising a plurality of panels, each of said panels having a vertical frame on at least one side; at least one vertical post; means defining closely fitting longitudinal mating splines and keyways carried by said post and vertical frames; and means for temporarily and releasably preventing longitudinal movement of said frames relative one another comprising an insert adapted to fit said keyways, an elastomeric material carried by said insert and means for expanding and contracting said elastomer to frictionally engage the walls of said keyways.

4,103,466

BAY WINDOW UNIT

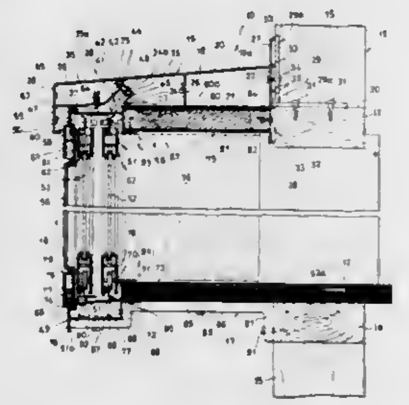
Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jan. 14, 1977, Ser. No. 759,485

Claims priority, application Japan, Jan. 17, 1976, 51/4129[U]

Int. Cl.² E06B *1/38*

U.S. Cl. 52—201 **11 Claims**



1. A bay window unit for covering an opening in a building, said opening having a first header and a first sill, the bay window unit comprising:

(a) a mounting member of L-shaped cross section, one leg of said mounting member being adapted to be fixedly secured to a top surface of the first header;

(b) an overhanging roof decking structure for extending along the length of the first header, said structure being adapted to project outwardly from the first header, said structure including a hollow body of generally rectangular cross section having a pair of generally horizontal upper and lower plates and a pair of vertical inner and outer end plates interconnecting said upper and lower plates at their inner and outer ends, respectively, said structure having a vertical first mounting portion at its inner end adapted to be fixedly secured to the first header, said vertical first mounting portion including said inner end plate fixedly secured to the other leg of said mounting member, and a first vertical flange extending from said inner end plate at its lower edge and adapted to be held against the exterior vertical surface of said first header, said roof decking structure including a second mounting portion at its outer end, and a downwardly facing third mounting portion disposed intermediate said first and second mounting portions; .

(c) a generally horizontally extending bracket member for extending along the length of the first sill, said bracket member being adapted to have its inner end secured to an exterior vertical surface of the first sill, said bracket member extending outwardly generally the same distance as said roof decking structure;

(d) an exterior window assembly comprising a frame including a second header and a second sill, and a pair of sashes mounted within said frame in parallel closely spaced planes, said frame being disposed at the outer ends of said roof decking structure and said bracket member, said second header being fixedly secured to said second mounting portion, and said second sill resting on and being fixedly secured to the outer end of said bracket member;

(e) a pair of side board structures extending between said roof decking structure and said bracket member at their opposite sides; and

(f) a head board assembly attached to said third mounting portion, the inner end of said head board assembly being held against and secured to the exterior surface of said first vertical flange.

4,103,467

COMPRESSABLE PREFABRICATED PANEL SECTIONS FOR WOOD FRAME BUILDINGS

Sir Walter Lindal, 1120 Eighth Ave., #1201, Seattle, Wash. 98101

Filed Sep. 16, 1976, Ser. No. 723,753

Int. Cl.² E04B *1/74*

U.S. Cl. 52—404 **4 Claims**

1. A prefabricated wood frame wall section for a building wall containing outside siding, inside panelling, insulation and stud and plate framing; the height of the section being the desired building wall height; the thickness of the section being the thickness of the panelling, plus the larger dimension of the framing, plus the thickness of the outside siding, said stud and plate frame consisting of a split vertical stud and split horizontal bottom plate, split lengthwise in the same plane as the section surfaces so that the section is effectively divided in half, with the division of said framing members varying with the relative comparative thickness of the inside panelling and outside siding that is used; said insulation being left uncut and affixed to the internal surface of the inside panelling, the split stud and plate framing parts being fixed to the inside panelling and outside siding section halfs so as to form an "L" with the stud part on the inside panelling half section edge opposing the stud part on the outside siding half section edge and the opposing plate parts being on the bottom of the section, the said split stud parts being attached to their respective half sections so that a small fraction of their edge is exposed malelike to receive the opposite section edge of a similar connecting section and the split bottom plate having the "toe" of the "L" the same fraction short of extending to its section edge to allow the insertion of the male part of another similar section's stud; wherein one half of the divided section has been rotated 180° in its plane causing the "L" framing to form a rectangle and with the framing members of each half overlapping the edges of the opposing panel forming a compressible box in which the insulation has been crushed; said half panels being compressed together and fixed together by packaging and banding into a package approximately half the thickness of the section.

4,103,468

DRAINABLE BLADE LOUVER

Robert W. Olsen, New Providence, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.

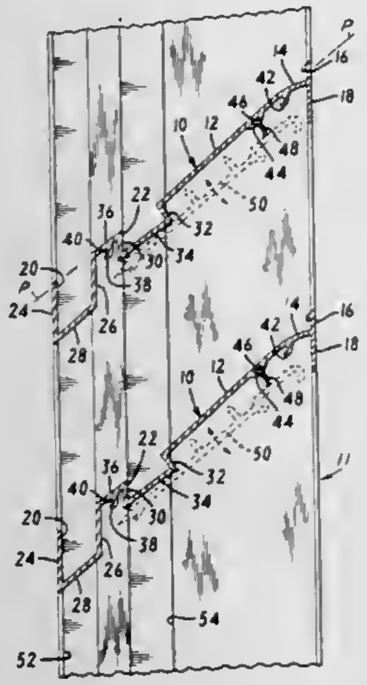
Filed Apr. 22, 1977, Ser. No. 790,025

Int. Cl.² F24F *13/08*

U.S. Cl. 52—473 **5 Claims**

1. In a louver having a pair of spaced-apart vertical members supporting a multiplicity of elongated horizontally extending inclined blades, each of which is of uniform cross section along its length and has a front edge that is located substantially

below its back edge, and an upwardly open front drainage trough located adjacent the front edge of the blade, the improvement wherein each blade has at least one second upwardly open drainage trough located in at least about the front one-third of the blade closely adjacent the front trough, each such trough being defined by spaced-apart front and back walls, the upper edges of which are located substantially above a bottom wall of the trough such that the splash from water drops impinging on the bottom walls of the troughs is largely confined to the zones bounded by the walls of the troughs, thereby minimizing entrainment of water in an airflow through the spaces between the blades from front to back, and wherein each vertical member has a vertical drainage channel in register with the corresponding troughs of all blades and receiving water therefrom.



4,103,469

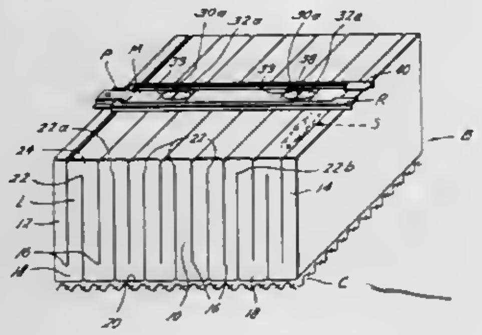
REFRACTORY FIBER BLANKET MODULE FOR FURNACE AREAS WITH HIGH GAS VELOCITIES

Carlisle O. Byrd, Jr., Houston, Tex., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 603,391, Aug. 11, 1975, Pat. No. 4,001,996, which is a continuation-in-part of Ser. No. 475,439, Jun. 3, 1974, Pat. No. 3,952,470. This application Jan. 7, 1977, Ser. No. 757,749

Int. Cl.^{2} E04B *1/80;* C04B *43/02*

U.S. Cl. 52—509 12 Claims



1. A modular refractory fiber insulating block comprising:

(a) an insulating refractory fiber blanket folded into a plurality of adjacent layers of refractory fiber insulating material and having folds formed between said adjacent layers alternately at outer and inner ends thereof, respectively;

(b) means for attaching said insulating blanket to the wall of the furnace, said means for attaching including a support member mounted in at least one of said outer folds;

(c) said insulating blanket further including inner end portions connecting adjacent layers of said blanket at inner ends thereof to form said inner folds, said inner end portions having fibers transversely disposed to the direction of the heat flow towards the furnace wall to increase the insulating capacity of said insulating block; and

(d) said insulating block having attached to the hot face surface thereof a layer of cloth formed from fibers of metal oxides to prevent erosion of the refractory fibers in said insulating blanket.

4,103,470

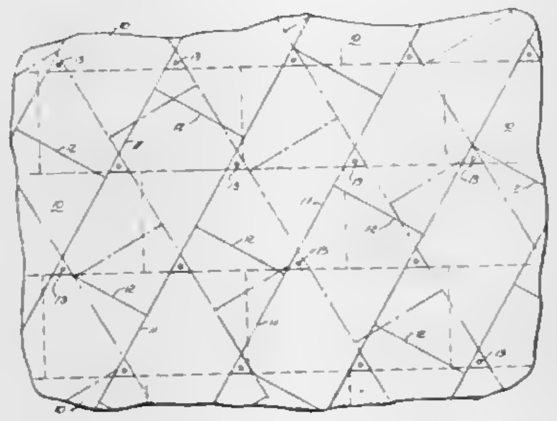
STRESSED SKIN STRUCTURAL DIAPHRAGM

Charles E. Cook, 1515 Lilac La., Liberty Lake, Wash. 99019

Filed Oct. 14, 1976, Ser. No. 732,192

Int. Cl.^{2} E04C *2/00*

U.S. Cl. 52—794 9 Claims



1. A structural diaphragm, comprising:

a plurality of layers of structural sheet material overlaid on one another across the length and width of an area to be spanned;

each layer comprising a plurality of longitudinal rows of sheet material having parallel side edges extending longitudinally along that area; each of said rows of sheet material being arranged in a co-planar, side-by-side abutting position with respect to the rows of sheet material adjacent to it;

each row of sheet material having a plurality of equally-spaced apertures formed through them along the full length of the row, the apertures being located along at least one line on each row of sheet material, each line being parallel to the side edges of the row containing it, the apertures along each line being offset longitudinally midway between the apertures along each line adjacent to it and the spacing between the lines and apertures being such that any three adjacent apertures form an equilateral triangle;

each layer being superimposed on an adjacent layer with the apertures located thereon coincident with one another and the respective side edges of the rows of sheet material being angularly offset 120° from one another about said apertues.

4,103,471

ATMOSPHERE EXCHANGING AND BAG SEALING MACHINE AND METHOD

Loren L. Lowdermilk, Middletown, N.J., assignor to International Paper Company, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 823,333

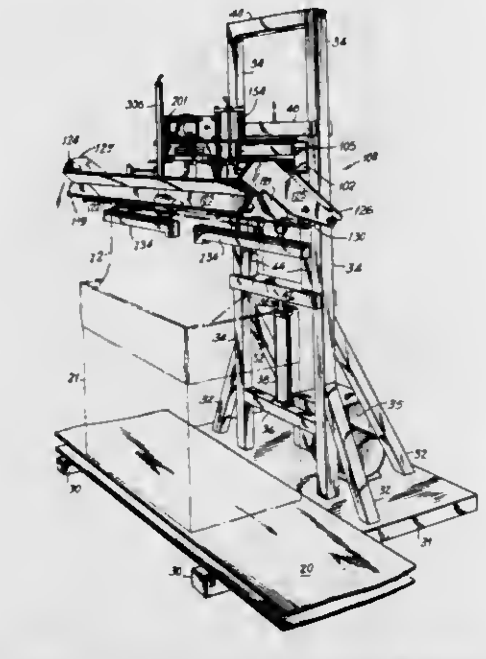
Int. Cl.^{2} B65B *31/06*

U.S. Cl. 53—22 B 41 Claims

30. A method of heat sealing a bag which is mounted on a machine and wherein a manifold on said machine extends into said bag, said method comprising the steps of:

(a) partially heat sealing bag while said manifold extends into said bag;

(b) temporarily sealing the unsealed portion of said bag around said manifold;



(c) operating on said bag through said manifold; and then

(d) heat sealing the remaining unsealed portion of said bag, while said manifold is still disposed within said bag and thereby forming a complete heat seal of said bag.

4,103,472

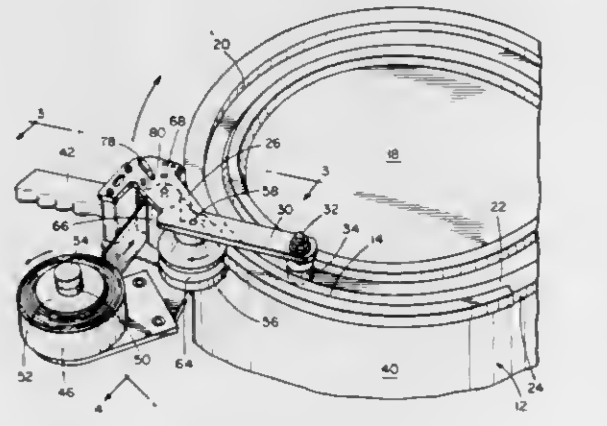
MANUAL TAPING DEVICE

Ronald Heringer, Pennsauken, N.J., assignor to Natico, Inc., Chicago, Ill.

Filed Nov. 14, 1977, Ser. No. 851,209

Int. Cl.^{2} B65B *61/00;* B32B *31/00;* B44C *7/00*

U.S. Cl. 53—139.3 14 Claims



1. A device for taping a cover onto a drum in which the cover has a peripheral rim and the drum has a peripheral lap adapted to be received in fitting relation within the rim when the cover is mounted onto the drum, said taping device comprising a rigid support plate, a first roller mounted for free rotational movement on a rearward portion of the support plate in position to engage the inner surface of the rim when the device is mounted in position of use, a second roller mounted for free rotational movement on a forward portion of the support plate at a level below the first roller and outwardly thereof to engage the outer surface of the drum below the lip when the device is in position of use, a pressure roller mounted for free rotational movement on the support plate between the first roller and the second roller at a level aligned with the rim for engaging the outer walls thereof when the device is in position of use, a tape supply roll mounted for free rotational movement on the support plate outwardly of the pressure roller, and a tension post fixed to the support plate forwardly of a line between the pressure roller and the tape supply roll for engagement by the tape during passage from the supply roll to the pressure roller, and a handle on the support plate.

4,103,473

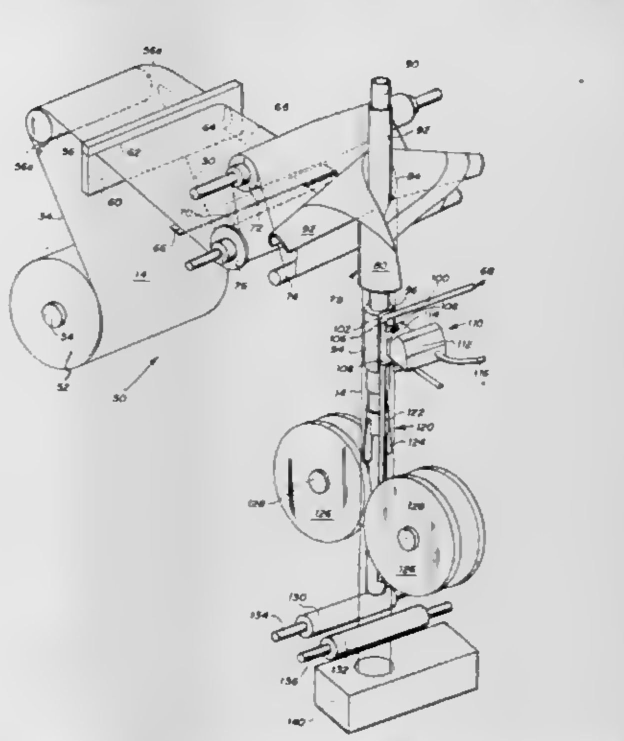
APPARATUS FOR MAKING A COMPARTMENTED CONTAINER

Bernard John Bast, Bethlehem, and Howard Elias Schaffer, Allentown, both of Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Aug. 24, 1977, Ser. No. 827,156

Int. Cl.^{2} B65B *9/12*

U.S. Cl. 53—180 M 14 Claims



1. An apparatus for making a dual compartmented container, comprising:

a forming anvil including a material supply tube therethrough,

a mandrel supported adjacent to said anvil including a material supply tube and a trailing fin attached thereto, said mandrel and anvil forming a cylinder with a passageway therebetween,

means for feeding a continuous film of material having first and second longitudinal edges toward said anvil and mandrel combination,

means for folding the first edge of the film onto the film to form a two-ply margin on one side of the film about a folded seam,

means for guiding the film around said anvil and mandrel with said mandrel positioned between the layers of the two-ply margin such that the two-ply margin completely encircles said mandrel and with the second edge of the film encircling said anvil and overlapping the outer layer of the two-ply margin,

means for attaching the first edge of the film to the film adjacent therebelow along a continuous first seam to form a first compartment and for attaching the second edge of the film to the outer layer of the two-ply margin intermediate of the fold seam and the first edge of the film along a continuous second seam adjacent the first seam to form a second compartment,

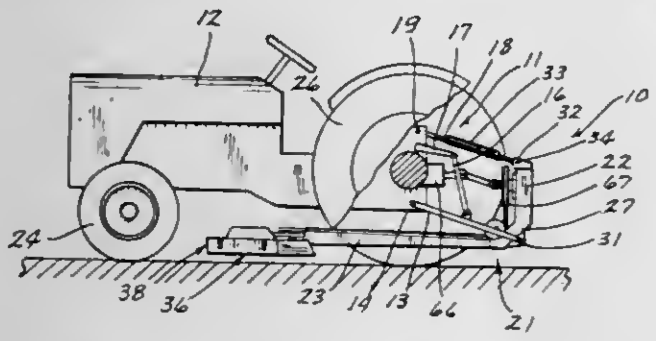
means for filling the compartments with different substances, and

means for gathering and sealing the compartments at spaced lengths along the longitudinal length thereof.

4,103,474
THREE POINT HITCH APPARATUS FOR SUPPORTING AN IMPLEMENT UNDERNEATH A TRACTOR

Simon Bylsma, Temple, Tex., assignor to Continental Belton Co., Belton, Tex.

Filed Apr. 21, 1977, Ser. No. 789,659
Int. Cl.² A01B *63/104;* A01D *35/262*
U.S. Cl. 56—15.9 **9 Claims**



7. Hitch apparatus for supporting an implement on and beneath a tractor having a three-point hitch which includes a pair of elongated transversely spaced lift arms pivotally supported on the tractor and extended rearwardly therefrom and an elongated center link pivotally connected to the tractor above and between the lift arms, said hitch apparatus comprising:

(a) an integral main frame of a generally right angle shape having an upright leg with upper and lower portions and a generally horizontal implement supporting leg extended forwardly from said upright leg,

(b) means for pivotally connecting the center link to said upper portion of the upright leg,

(c) means for pivotally connecting the lift arms to the main frame at transversely spaced positions adjacent the juncture of the upright and horizontal legs, and

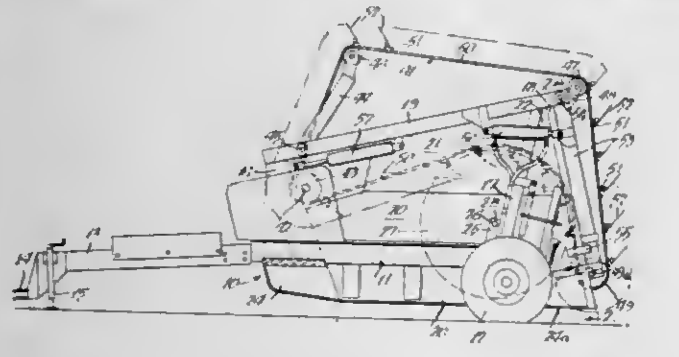
(d) means for supporting an implement on the horizontal leg forwardly of the upright leg,

(e) said upright leg, center link and lift arms forming a parallel link system for vertical movement of the implement supporting leg in a horizontally extended position in direct response to up and down movement of the lift arms.

4,103,475
APPARATUS FOR FORMING A BALE OF HAY

Lester R. Kampman; James K. Ulrich, and James H. Hodgson, all of Vinton, Iowa, assignors to Chromalloy American Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 719,064
Int. Cl.² A01D *75/00*
U.S. Cl. 56—16.4 **10 Claims**



1. Rotary baling apparatus comprising, in combination:

a wheeled frame which is adapted to span a windrow of hay and be moved forwardly therealong;

means defining a baling chamber on said frame which receives the windrow as the apparatus is moved therealong;

a pair of rotatable disks at the sides of the baling chamber which confine the sides of a forming bale, the diameter of said disks being a major fraction of the diameter of a finished bale;

means in said chamber for forming the windrow into a spiral bale as the apparatus is moved forwardly, said means including

endless means which has a lower bale rolling run that may contact hay in the chamber and roll it forwardly, said endless means in said lower run having its sides supported on said disks, and

means which permits at least a part of said lower run to move upwardly as a bale enlarges;

means for driving said endless means so the lower run moves forwardly;

and means for elevating the rearward portion of the chamber defining means to release a finished bale from the chamber,

whereby a bale formed in said apparatus has a relatively loose core and a firmly packed exterior, and the sides of the bale are relatively smooth and even.

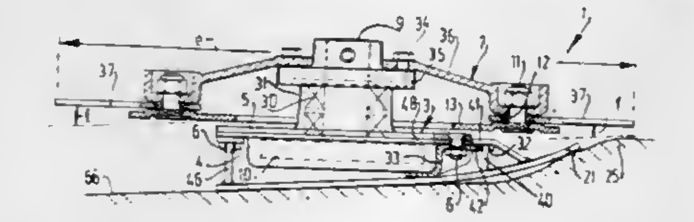
4,103,476
MOWING DEVICE

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed Nov. 2, 1976, Ser. No. 737,899

Claims priority, application Netherlands, Nov. 28, 1975, 7513925

Int. Cl.² A01D *75/30*
U.S. Cl. 56—13.6 **5 Claims**



1. A mowing device comprising in combination:

an elongate housing extending transversely of the direction of travel of the device, said housing presenting a hollow interior of generally rectangular cross section and having a straight forward edge and a top surface;

a plurality of generally vertical shafts journalled in said housing and disposed in spaced relation along the length thereof and in alignment with each other along a line which is rearwardly offset and parallel to said straight forward edge of said housing, each shaft having an upper end projecting through said top surface;

drive means within said interior of the housing for simultaneously rotating all of said shafts and comprising a straight train of generally horizontal gears spaced ones of which are connected to said shafts;

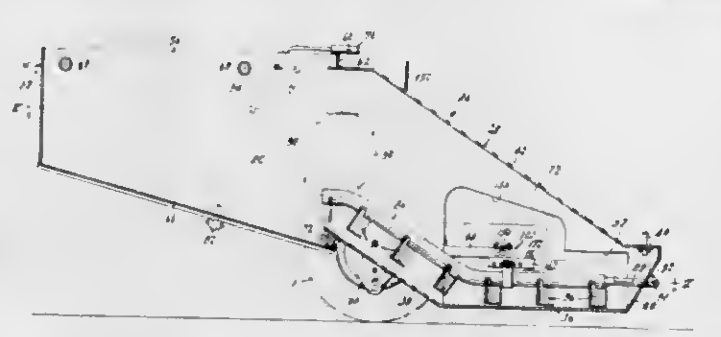
a plurality of cutting assemblies, one mounted on each of said shafts, each cutting assembly comprising a disc secured to the upper end of an associated shaft, a ring carried by said disc and disposed therebelow, and at least one cutter disposed between said disc and ring, said disc being of inverted dish-like configuration with its central region secured to said shaft and having a peripheral edge which projects forwardly beyond said forward edge of the housing and is located above said top surface, said ring being of annular form and being secured peripherally to the peripheral edge of said disc at a level which is spaced slightly above the level of said forward edge of the housing and having a radial thickness such that the ring overlaps and closely overlies said forward edge of the housing to prevent stones or the like from lodging between the cutting assembly and said top surface of the housing, said cutter extending from between the peripheries of said disc and ring radially outwardly therefrom and substantially perpendicular to the axis of its associated shaft to sweep an annular cutting path which projects well forwardly of said forward edge of the housing; and

a plurality of ground scanner means each secured to the exterior of said housing for lifting said housing vertically to ride over undulations in ground surface thereby to prevent the rings of the cutting assemblies from penetrating such ground surface, each ground scanner means comprising an elongate shoe underlying said housing substantially directly below the shaft of an associated cutting assembly and having a forwardly projecting portion which extends forwardly and upwardly from beneath the housing to terminate well forwardly of said front edge of the housing and below the periphery of an associated ring of the cutting assembly.

4,103,477
GRASS AND LEAF COLLECTOR AND COMPACTOR ATTACHMENT FOR MOWERS

David Mullet, Hesston; Raymond J. Rilling, Moundridge, and Elmer D. Voth, Newton, all of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Mar. 25, 1977, Ser. No. 781,336
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 **10 Claims**



1. In combination with a power propelled mower having cutting blades disposed beneath a hood and operable to eject cuttings through a side opening of said hood, and having groundengaging drive wheels at the sides thereof, said drive wheels being disposed rearwardly of said hood, an attachment for collecting said cuttings comprising:

a. a hollow chute attached to said mower at a side thereof, having a side opening generally registering with the side opening of said hood to receive cuttings therein, and being elongated rearwardly from said side opening,

b. a receptacle supported by said mower rearwardly of said chute, and into which the open rearward end of said chute projects,

c. a cuttings impelling device constituting a paddle bar extending generally longitudinally through said chute, and a series of paddles affixed to said paddle bar generally transversely thereof and in spaced relation along the length thereof,

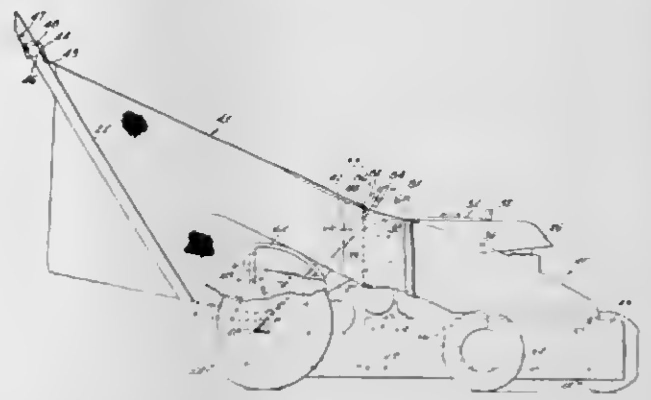
d. mounting means for said paddle bar whereby it may be pivoted vertically about a horizontal transverse axis at the forward end of said chute, and moved longitudinally of itself within said chute, and

e. a pitman arm connected at its forward end to said paddle bar at a point thereof spaced rearwardly from the pivotal axis thereof, said connection being normally rigid, and rotatably connected at its rearward end to the mower drive wheel at that side of the mower, on an axis parallel with but eccentric to the axis of rotation of said wheel, whereby rotation of said wheel imparts a vertical orbital movement to said paddle bar, said paddles sweeping rearwardly in close proximity to the floor of said chute in the lower portions of their orbits, and moving forwardly in spaced relation above said chute floor in the upper portions of their orbits.

4,103,478
MOWER SUPPORT FOR REAR MOUNTED GRASS CATCHER

Daniel W. Schaefer, Port Washington, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 3, 1977, Ser. No. 774,515
Int. Cl.² A01D *53/06*
U.S. Cl. 56—205 **4 Claims**



1. In a rear support for a rear mounted grass catching bag of a rotary lawn mower, the lawn mower including

a housing which mounts an engine for driving a rotary blade located within the housing and provided with an engine shroud which substantially encloses the engine and which is movably secured to the housing for movement to a retracted rearward position, the housing having a rearwardly facing grass discharge chute, the lawn mower also having a handle for guiding the mower;

a rear support pivotally connected to the housing rearwardly of the engine and movably between a forward operating position and a rearward retracted position;

a flexible grass catching bag having a grass entrance sleeve releaseably connectible to the mower grass discharge chute;

first means detachably secured to the forward end of said bag and releaseably connectible with said rear support;

second means detachably secured to the rear end of said bag and releasably connectible with the mower handle;

whereby said rear support maintains said grass catching bag in position to receive grass clippings from the mower chute and upon pivotal movement of said rear support to a retracted rearward position, said bag moves with said support collapsing upon itself thereby eliminating the need to dismantle the bag from the support.

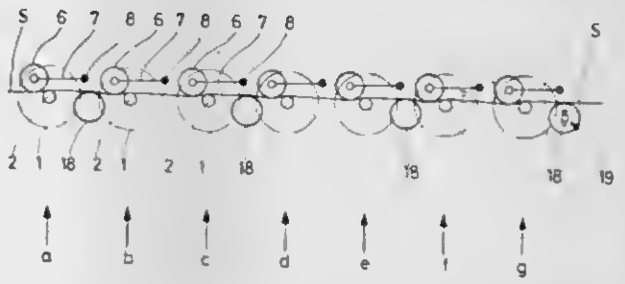
4,103,479
TANGENTIAL BELT DRIVE MECHANISM FOR SPINNING ROTORS

Fritz Stahlecker, Josef-Neidhart-Str.18, 7341 Bad Uberkwgen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Jan. 12, 1977, Ser. No. 758,791

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602392

Int. Cl.² D01H *1/241*
U.S. Cl. 57—105 **19 Claims**



1. Apparatus for driving spinning rotors at a plurality of

spinning units of an open-end spinning machine; said apparatus including:

- a tangential belt extending adjacent spinning rotor shafts of a plurality of said spinning units,
- pressure means for each of said rotor shafts, said pressure means being arranged at a first side of said tangential belt and being movable between a driving position forcing said tangential belt and associated rotor shaft into driving engagement with one another and a non-driving position with said tangential belt and associated rotor shaft out of driving engagement with one another,
- and guide members disposed on a second side of said tangential belt opposite said first side, said guide members including belt guide surfaces which are offset with respect to outer belt driven surfaces of said rotor shafts such that a line between guide surfaces of adjacent guide members extends past intervening rotor shafts, said guide members being disposed so that at most two rotor shafts are positioned between respective adjacent guide members,
- whereby when the pressure means is in a non-driving position, said tangential belt is maintained out of driving contact with said respective rotor shaft by said guide members,
- wherein said rotor shafts includes a plurality of at least three of said rotor shafts disposed side by side with their rotational axes parallel to one another and in a common plane,
- and wherein said tangential belt extends parallel to said common plane when in a non-driving position with respect to said rotor shaft.

4,103,480

METHOD FOR PRODUCING TEXTURED FILAMENT YARNS WITH IMPROVED YARN QUALITIES FROM PREORIENTATED POLYAMIDE 6

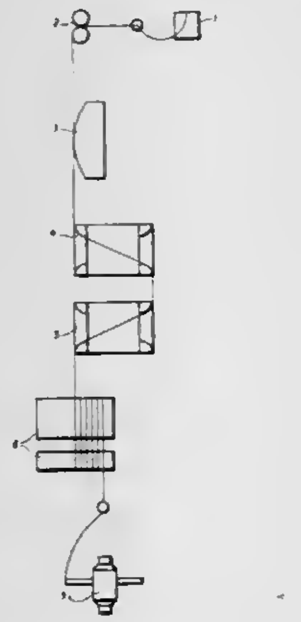
Wolfgang Rellensmann, Dormagen; Michael Bueb, Leverkusen; Lothar Rupprecht, Dormagen; Herbert Schmidt, Dormagen, and Wolfram Wagner, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 10, 1977, Ser. No. 776,412

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610325

Int. Cl.^{2} D02G *1/02, 3/04*

U.S. Cl. 57—140 R **4 Claims**



4. A false twist, texturised polyamide 6 yarn, of which the intensity of the standardized meridian reflex (002), determined by measuring the CuK$_\alpha$-X-ray diagram has a value of H_{002} of from 0.2 to 0.9 [1/degree], wherein H_{002} is defined as the intensity of the (002)-reflex in relation to the total surface under the equatorial deviation ($H_{002} = I(002)/_F$).

4,103,481

VARIABLE DIAMETER YARN

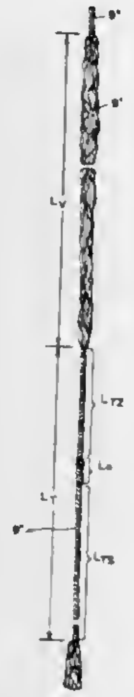
Tatjana Vukoje, Dusseldorf, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 555,900, Mar. 6, 1975, Pat. No. 4,033,103. This application Mar. 31, 1977, Ser. No. 783,279

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1974, 2411074

Int. Cl.^{2} D02G *3/26, 3/34*

U.S. Cl. 57—140 J **10 Claims**



1. A variable diameter "thick-thin" effect yarn having a substantially non-twisted, voluminous, false twist texturized segment as the "thick" portion of the yarn alternating with a less voluminous twisted segment as the "thin" portion of the yarn in which the twist alternates to first run in one S- or Z-direction and then reverses over a zero twist point to run in the opposite direction.

4,103,482

WRISTWATCH HAVING A LIQUID CRYSTAL DISPLAY

Mitsuaki Maruyama, 3-5, 3-chome, Owa Suwa-shi, Nagano-ken, Japan

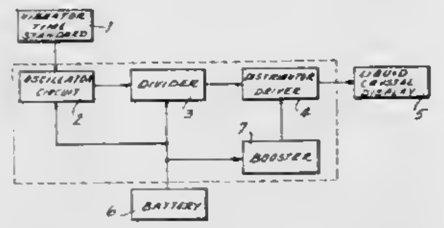
Filed Mar. 8, 1976, Ser. No. 664,463

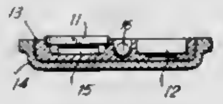
Claims priority, application Japan, Mar. 7, 1975, 50-28460

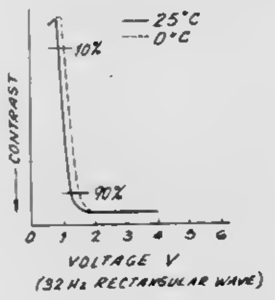
Int. Cl.^{2} C09K *3/34;* **G02F** *1/13;* **G04C** *3/00*

U.S. Cl. 58—23 R **8 Claims**

1. A wristwatch, comprising opposed electrode plates for forming a cell for holding a liquid crystal composition therebetween, said electrode plates having transparent electrodes at the inner surfaces thereof for forming a liquid crystal display, the inner surfaces of said electrode plates being oriented at right angles to each other with respect to the property of aligning adjacent molecules of nematic liquid crystals of high positive dielectric anisotropy, polarizer and analyzer plates sandwiching said electrode plates, a small piezoelectric vibrator to serve as time standard for said wristwatch, electronic circuitry including a complementary type field effect transistor for converting the time standard supplied by said vibrator into indicia in said liquid crystal display, said circuitry being free of a voltage booster, a liquid crystal composition of high positive dielectric anisotropy between said plates, and a single electrochemical cell, said composition having a wide mesomorphic phase including room temperature and being activatable to 90% of saturation at a temperature at least as low as about 9° C by the voltage supplied by said single electrochemical cell, the voltage of said single electrochemical cell being approximately 1.5 V or less, said composition consisting essentially of a majority of at least two p-cyanophenyl-p'-n-alkylbenzoates wherein said alkyl group is from 3 to 8 carbon atoms in length and enough of a compound of low dielectric anisotropy to lower the crystalline-to-nematic phase temperature at least to as low as about 9° C, said compound being selected from the group consisting of p-n-alkoxyphenyl-p'-n-alkyl benzoates where said alkoxy group is from 5 to 7 carbon atoms in length and said alkyl group is from 4 to 7 carbon atoms in length.







4,103,483

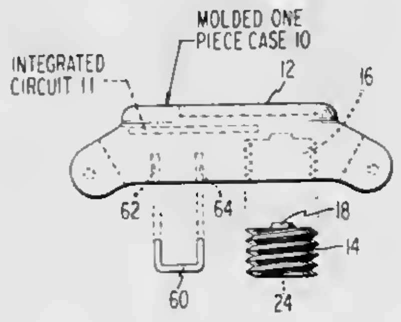
ELECTRONIC WRISTWATCH

George Andrew Riley, Rocky Hill, N.J., assignor to RCA Corp., New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,367

Int. Cl.^{2} G04B *37/0;8;* **G04C** *3/00;* **G04B** *19/30*

U.S. Cl. 58—90 R **8 Claims**



1. A wristwatch comprising, in combination:

- a first element comprising an electrical circuit;
- a second element comprising an electrooptical display of time, having a surface at which the time may be observed, said electrical circuit connected to said electrooptical display; and
- a one piece plastic case and support in intimate contact with the first element over at least a substantial portion of the peripheral surface of said first element and embedding said first element and in intimate contact with a substantial portion of said second element for holding said second element so that its said surface is visible, said case serving as the sole outer case of said wristwatch and serving also as the means for holding the first and second elements immobile with respect to each other without the need for other clamping or holding means, and as the means maintaining them in a desired positional relationship to one another.

4,103,484

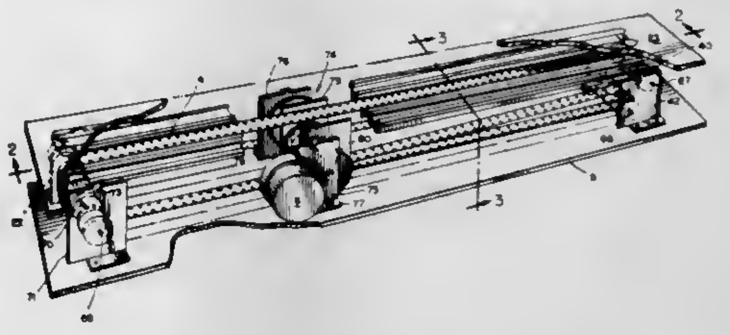
TIME INDICATING DEVICE

James R. Bailey, 4020 N. Pioneer Ave., Chicago, Ill. 60634

Filed Jul. 22, 1976, Ser. No. 707,516

Int. Cl.^{2} G04B *45/00, 19/02*

U.S. Cl. 58—125 C **2 Claims**



1. A time indicating device comprising one or more endless belts divided into segments of contrasting appearance which meet one another successively end to end, motive means for moving said belts, a face member containing one or more viewing areas through which said segments of said belts are visible, and a rigid elongated guide member for each of said belts adjacent said face member, said guide members having a base to receive the lower sides of said belts, a pair of opposing undercut sides to receive the opposing sides of each of said belts in the undercut portion of said sides with the tops of said sides projecting inwardly and providing an opening above said belts through which said segments are visible, the base of said guide members over which said belts pass being colored and said belts being divided into equal segments which are alternately transparent and opaque, each segment having a length corresponding to the length of the viewing areas in the face member so that the color of said guide members is transmitted through said transparent segments and is visible in its respective viewing area.

4,103,485

ELASTIC WARP-KNIT FABRIC

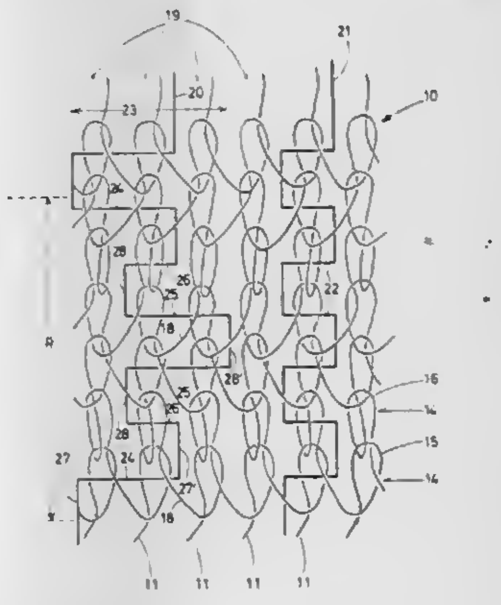
Friedrich E. Brües, Hilden, Fed. Rep. of Germany, assignor to Gold-Zack Werke AG, Mettmann, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,618

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538776; Jul. 21, 1976, 2632793

Int. Cl.^{2} D04B *23/08*

U.S. Cl. 66—192 **10 Claims**



1. A warp-knit fabric comprising:

a multiplicity of longitudinally extending and relatively inelastic warp yarns forming a multiplicity of respective longitudinally extending chains of loops in turn forming longitudinally extending wales and transversely extending courses;
a multiplicity of mainly transversely extending and relatively elastic first yarns each laid into said loops of said warp yarns over only a predetermined first number of said wales; and
a multiplicity of mainly transversely extending and relatively elastic second weft yarns each laid into said loops of said warp yarns over a predetermined second number of said wales equal to at least twice said first number, each of said second weft yarns having a predetermined weft reach equal to at least three of said wales and extending over said weft reach in at least three of said courses in the first and third of which each second weft yarn extends in one weft direction over a third number equal to at least two of said wales and in the second of which each second weft yarn extends in the opposite weft direction over a fourth number smaller than said third number of said wales, said first and second weft yarns all extending in the same direction between adjacent courses.

4,103,486

METHOD OF CONTROLLING TEMPERATURE IN THERMAL REACTOR FOR ENGINE EXHAUST GAS AND IGNITION SYSTEM FOR PERFORMING SAME

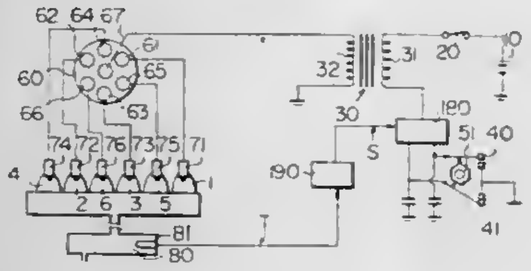
Yoshitaka Hata, Fujisawa; Kenji Masaki, and Kenji Ikeura, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Division of Ser. No. 554,494, Mar. 3, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,536

Claims priority, application Japan, Apr. 15, 1974, 49/41911

Int. Cl.² F02B *75/10*

U.S. Cl. 60—274 3 Claims



1. A method of raising a temperature in a thermal reactor, which reactor communicates with a spark-ignited internal combustion engine having a plurality of combustion chambers for oxidizing carbon monoxide and hydrocarbons in the engine exhaust gas, when the temperature falls below a predetermined temperature, the method comprising the step of retarding the ignition timing of the engine from a normal ignition timing thereof for a portion of total firings in all the combustion chambers during a period of time by connecting a primary winding of an ignition coil in an ignition circuit for the engine alternately and repeatedly to a set of breaker points adjusted to break at a normal timing and a set of auxiliary breaker points adjusted to break with a predetermined time delay from each break of said breaker points at a variable frequency such that a relative amount of time during which the primary winding is connected to the auxiliary breaker points increases as said temperature lowers and when the temperature in the thermal reactor is below the predetermined temperature thereby to raise the temperature of the exhaust gas.

4,103,487

ENGINE EXHAUST PORT LINER SYSTEM

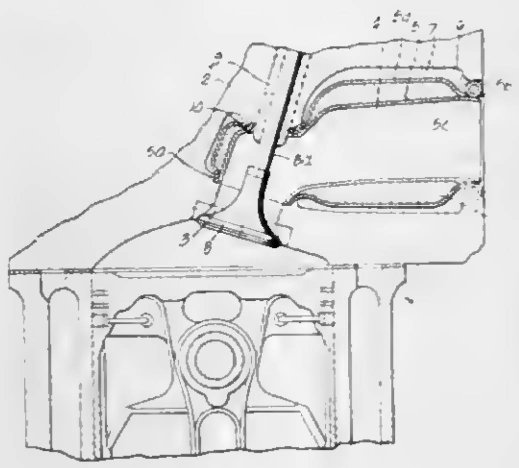
Sbuichi Yamazaki; Shinichi Shimada; Yasubito Sato, and Hiroshi Shirakura, all of Kamifukuoka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,525

Claims priority, application Japan, Nov. 7, 1975, 50-132992

Int. Cl.² F01N *3/00;* F02B *23/00*

U.S. Cl. 60—282 5 Claims



1. An engine exhaust port liner system comprising a liner rigidly affixed at one end thereof to the exhaust port and being spaced therefrom to define an insulating space between said liner and said exhaust port and a sealing ring disposed about the other end of said liner between said liner and said exhaust port for slidably mounting said other end of said liner on said exhaust port while continually maintaining said insulating space in a substantially airtight disposition during sliding movement of said other end on said exhaust port, wherein said sealing ring is hollow, has a circular cross-section, and is constructed of an elastic, metallic material.

4,103,488

INTERNAL COMBUSTION ENGINE WITH CONTROL SYSTEM FOR SECONDARY AIR SUPPLY

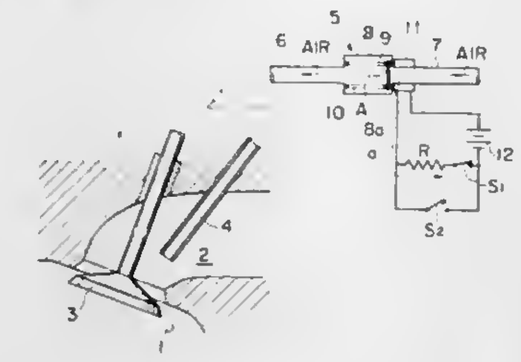
Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 22, 1977, Ser. No. 770,764

Claims priority, application Japan, Feb. 23, 1976, 51-17885

Int. Cl.² F01N *3/10;* F02B *75/10*

U.S. Cl. 60—289 9 Claims



1. An internal combustion engine comprising:
an exhaust system;
a passageway having at one end thereof a nozzle opening to said exhaust system, said passageway having an opposite end thereof communicating with the atmosphere;
a valve means responsive to exhaust pressure in said exhaust system for opening said passageway when said exhaust pressure is relatively low, but closing said passgeway when said exhaust pressure is relatively high, said valve means having a valve member of a material which is movable by influence of magnetic fields and an electromagnet means for attracting said valve member towards a valve seat upon passing of electric current therethrough;
first circuit means for permitting a predetermined relatively large electric current to pass through said electromagnet at a first predetermined operating condition of the engine, causing said electromagnet to urge said valve member towards said valve seat to close said passageway; and
second circuit means for permitting a predetermined relatively small electric current to pass through said electromagnet at a second predetermined operating condition of the engine, causing said electromagnet to urge said valve member towards said valve seat to restrict said passageway, but preventing electric current from passing through said electromagnet at a third predetermined operating condition of the engine.

4,103,489

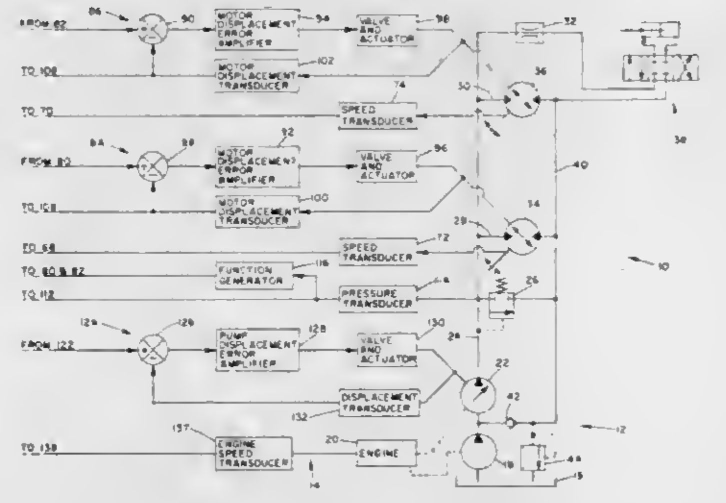
TOTAL POWER FLUID SYSTEM

Edward Horton Fletcher, Waterloo, and Gordon K. Wiegardt, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 15, 1977, Ser. No. 787,789

Int. Cl.² F16H *39/46*

U.S. Cl. 60—395 34 Claims



1. A total fluid power system comprising: a variable displacement fluid pump means having an outlet providing a flow of pressurized fluid proportional to pump means displacement; a variable displacement, variable speed fluid motor means having an inlet connected to the pump means outlet and providing a torque output proportional to motor means inlet fluid pressure and motor means displacement; pump control means connected to between the pump means outlet and the motor means inlet and operatively associated with the pump means for changing the displacement thereof in response to changes in the pressure of the pressurized fluid between the pump means outlet and the motor means inlet; and motor control means operatively associated with the motor means for changing the displacement thereof in response to changes in the speed of the motor means due to motor means loading whereby the pump means output flow is changed by changing the pump means displacement so as to maintain the motor means speed and the motor means torque output is changed by changing the motor means displacement so as to match the motor means loading.

4,103,490

APPARATUS FOR HARNESSING TIDAL POWER

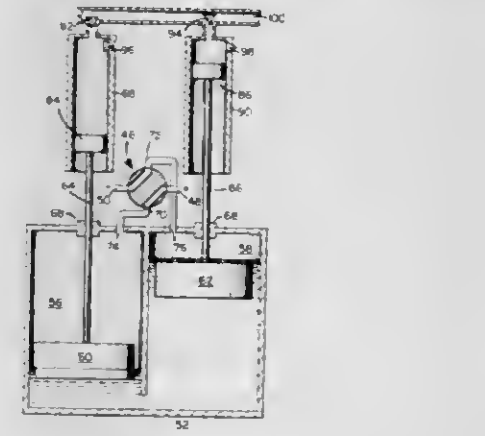
Alexander Moiseevich Gorlov, 234 Main St., Brighton, Mass. 02155

Filed Mar. 28, 1977, Ser. No. 781,949

Int. Cl.² F03B *13/12*

U.S. Cl. 60—398 6 Claims

1. An apparatus for extracting usable power from a tidal water flow, comprising:
means for creating a low, positive pressure air flow in response to a rising tide and a partial vacuum in response to a falling tide;
first and second chambers, the lower portions of which are in fluid combination with each other;
in said chambers, a liquid having a volume approximately equal to half the sum of the volumes of said first and second chambers;
each of said chambers having an inlet/outlet port located near the top thereof;
a multi-state valve for connecting, in a first state, a first input port thereof to a first output port thereof and a second input port thereof to a second output port thereof and, in the second state, connecting the first input port to the second output port and the second input port to the first output port;
the first output port of the valve being connected to the inlet/outlet port of the first chamber and the second output port of the valve being connected to the inlet/outlet port of the second chamber;
each chamber having a float therein, said float being disposed to ride upon the surface of the liquid in the chamber;
the means for creating positive pressure air flow and partial vacuum being connected to the multi-state valve to supply the positive pressure air flow to a first input port thereof and to supply the partial vacuum to the second input port thereof, whereby the liquid level in each chamber is responsive to the difference in the pressures in the chambers, above the surface of the liquid;
each of said floats being attached to a rod which extends generally vertically through the housing in a fluid-sealed aperture;
the valve being in the first state while the liquid level and float in the first chamber are descending;
means for switching the valve to a second state when the float in the first chamber nears the lower end of its range of travel and, equivalently, when the float in the second chamber nears the upper end of its range of travel;
the valve being in the second state while the liquid level and float in the second chamber are descending;
means for switching the valve to the first state when the liquid in the second chamber nears the lower end of its range of travel and, equivalently, when the float in the first chamber nears the upper end of its range of travel; and
means operable by the reciprocating motion of at least one of said rods to provide output power.



4,103,491

STIRLING CYCLE MACHINE

Yosbibiro Ishizaki, 702 Yamanouchi, Kamakura, Japan

Filed Apr. 26, 1977, Ser. No. 790,904

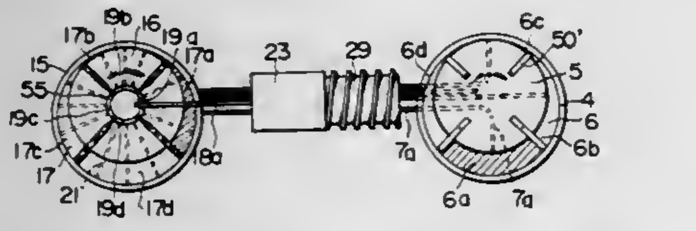
Claims priority, application Japan, Apr. 28, 1976, 51-48802

Int. Cl.² F02G *1/04*

U.S. Cl. 60—519 11 Claims

1. A Stirling cycle machine comprising first housing means having first cavity means formed therein, first rotor means

disposed in said first cavity means in the first housing means for defining first chamber means together with the first housing means, said first chamber means having a volume variable in response to rotation of said first rotor means, second housing means having second cavity means formed therein, second rotor means disposed in said second cavity means in the second housing means for defining second chamber means together with the second housing means, said second chamber means having a volume variable in response to rotation of said second rotor means, means for connecting said first and second rotor means so that they are simultaneously rotated, passage means for connecting the first chamber means with the second chamber means with a predetermined phase difference, regenerator means provided in said passage means, means provided adjacent to the first chamber means for maintaining the first chamber means at a substantially constant temperature, said passage means including a plurality of passages between the regenerator means and the second chamber means.



4,103,492

RESERVOIR IN MASTER CYLINDER OF VEHICLE BRAKING SYSTEM

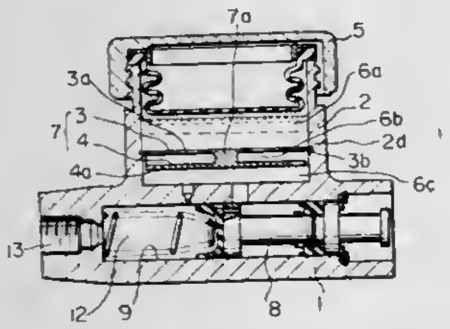
Takeshi Sakazume, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Jul. 27, 1976, Ser. No. 709,104

Claims priority, application Japan, Aug. 7, 1975, 50-96138

Int. Cl.² B60T *11/26;* **F15B** *7/08*

U.S. Cl. 60—588 **5 Claims**



2. A reservoir for a master cylinder of a hydraulic brake system for holding hydraulic brake fluid therein, said reservoir having at least two barrier plates stationarily disposed therein for partitioning the interior thereof into at least three vertically spaced fluid chambers, each of said chambers containing therein fluid, each of said barrier plates extending in a generally horizontal direction across substantially the entire reservoir, each of said barrier plates having extending therethrough a plurality of hole means for allowing restricted fluid flow between adjacent said fluid chambers, said hole means formed in adjacent barrier plates being out of alignment in the vertical direction, and means for rigidly connecting together at least two adjacent barrier plates to thereby form a barrier plate assembly, said connecting means comprising a solid plug connecting said adjacent barrier plates substantially centrally thereof.

4,103,493

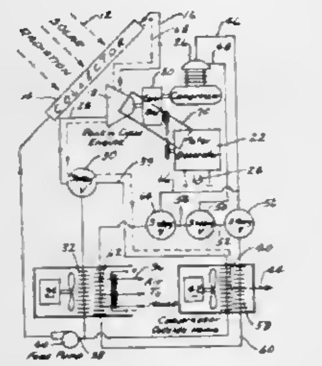
SOLAR POWER SYSTEM

James L. Schoenfelder, Coralville, Iowa, assignor to Hansen, Lind, Meyer, Iowa City, Iowa

Filed Mar. 6, 1975, Ser. No. 556,008

Int. Cl.² F03G *7/02;* **F24J** *3/02*

U.S. Cl. 60—641 **6 Claims**



1. A solar system comprising,

a direct boil solar collector for gathering solar energy, converting said solar energy to heat energy, and transfer of said heat energy to a refrigerant within said collector, and vaporizing said refrigerant;

a Rankine cycle engine for converting heat energy transferred to said refrigerant to kinetic energy, said Rankine cycle engine being fluidly and sealingly in communication with said refrigerant and said direct boil solar collector via a Rankine cycle entrance line and a Rankine cycle exit line,

a first three-way diverting valve positioned on said Rankine cycle exit line being in fluid and sealing communication with a first heat exchange means, for heat exchange with an air space,

said first heat exchange means having an exit line in fluid and sealing communication with said direct boil solar collector,

said first three-way diverting value also being in communication with a second heat exchange means, for heat exchange with a second air space,

said second heat exchange means having an exit line in fluid and sealing communication with said direct boil solar collector, a generator;

a heat pump system; and

means connected to said Rankine cycle engine to selectively transfer said kinetic energy from said Rankine cycle engine to said generator or said heat pump system, whereby in times of solar energy generation said solar energy may be used for heating or cooling said first air space via said heat pumps system and the heated refrigerant passing through said Rankine cycle exit line or alternatively for generating electrical current.

4,103,494

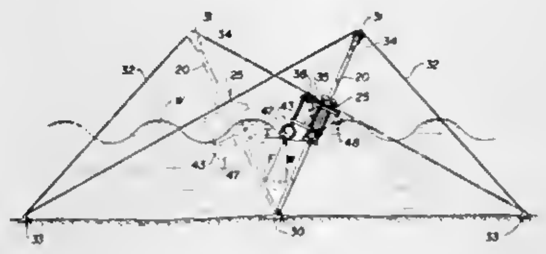
WAVE AND TIDE MOTOR

Hubert Tidwell, Box 57, Wellington, Utah 84542

Filed Apr. 25, 1977, Ser. No. 790,557

Int. Cl.² F03G *7/00*

U.S. Cl. 60—648 **8 Claims**



1. A wave and tide motor comprising a support boom, means to pivotally anchor one end of said boom to the ocean bottom, whereby the boom can be adjusted angularly on its pivot axis in relation to incoming or outgoing tidal flow, a main frame on said boom, a sub-frame movably mounted on the main frame, a float carried by the sub-frame and adapted to respond to impingement forces on the float due to tidal flow and wave action whereby a resultant impingement force on the float will move the sub-frame in one direction along the main frame, the sub-frame moving in the opposite direction along the main frame under the influence of gravity, and coating means on the main frame and sub-frame for converting linear reciprocation of the sub-frame into rotational movement of a shafl.

4,103,495

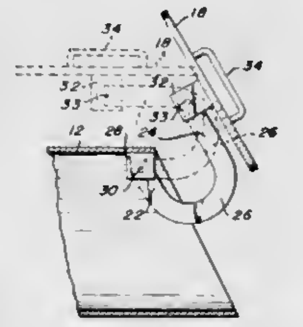
FLOW CONTROL DEVICE FOR AN IRRIGATION DITCH

Gordon L. Graham, Glasgow, Mont., assignnr to Richard Rhode, Glasgow, Mont., a part interest

Filed Sep. 9, 1976, Ser. No. 721,731

Int. Cl.² E02B *7/40;* **F16K** *51/00*

U.S. Cl. 61—12 **5 Claims**



1. A device for controlling water flow from an irrigation ditch to an adjacent field comprising, a conduit having an inlet end opening into said field, a cover for said inlet end moveable between a closed position and an open position, hinge means connecting said cover to said conduit for movement between said open and closed positions, said cover when in said open position being disposed above the inlet end of said conduit, said hinge means comprising a "J"-shaped bar which is pivotably attached at one end to the inner top portion of said inlet end of said conduit and attached at the other end to said cover.

4,103,496

COLLAPSIBLE AND EXPANSIBLE BARRAGE

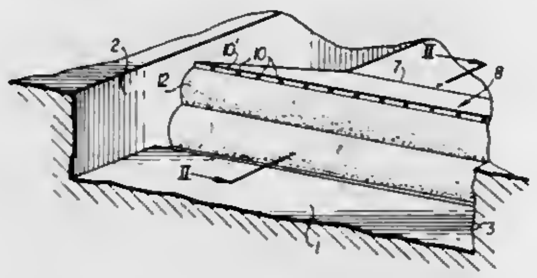
Arturo Colamussi, and Vittorio Merli, both of Ferrara, Italy, assignors to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A., Milan, Italy

Filed Apr. 11, 1977, Ser. No. 786,558

Claims priority, application Italy, Apr. 15, 1976, 9004 A/76; Dec. 30, 1976, 30986 A/76

Int. Cl.² E02B *7/40*

U.S. Cl. 61—27 **10 Claims**



1. A collapsible and expansible barrage, comprising:

a threshold structure on the bottom of a waterway to be dammed-up, provided with a hollow recess for housing the barrage itself in its collapsible state

a metallic flap provided with an air-tank, open along its side that is turned towards the threshold structure, when the barrage is in its expanded state, said metallic flap being hinged along one of its own edges to the threshold structure

a flexible sheet fixed by one of its borders to the metallic flap, and with its other border fixed down to the threshold structure

means being housed in the threshold structure, for extracting and admitting water under pressure in the enclosed space defined by the threshold structure, the metallic flap, and the flexible sheet

means being housed in the threshold structure for admitting air into the air-tank by means of the air-tank opening that is turned towards the threshold structure

at least one flexible member provided with at least one damping element, connecting the threshold structure with the metallic flap whereby the configuration of the barrage in its expanded state is non-modifiable by strain and fatigue stresses in the flexible sheet.

4,103,497

MANOEUVRABLE WEIR

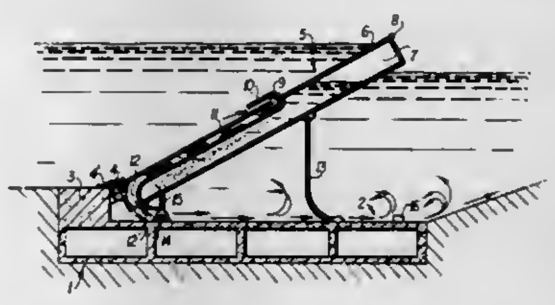
Arturo Colamussi, and Vittorio Merli, both of Ferrara, Italy, assignors to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A., Milan, Italy

Filed Apr. 11, 1977, Ser. No. 786,552

Claims priority, application Italy, Apr. 28, 1976, 9005 A/76; May 14, 1976, 9008 A/76

Int. Cl.² E02B *7/40*

U.S. Cl. 61—27 **5 Claims**



1. A weir for damming water in a waterway comprising a base member disposed on the bottom of the waterway and a pivotable flap member having a wall enclosing an elongated space adapted to contain air under pressure, said flap member having one end wall hinged to the base member and an opposite end wall disposed above the base member and having one sidewall which faces the base member and an opposite sidewall, said flap member being inclined upwardly from its hinged end above the base member, means in said wall adjacent to said opposite end for relieving pressure in said elongated space, a plurality of spaced first openings in said opposite side of the said wall member, conduit means disposed in said elongated space adjacent said opposite sidewall and connected to each of said first openings, means external of the said opposite wall protecting each of said first openings, an elbow curved portion in the wall of each conduit adjacent said hinged end of the flap member and having a second open end to permit water flowing through the said first openings and conduit to flow out into the waterway below the flap member, means for checking flow of water into the conduit through said second opening, and means for admitting air under pressure into the said elongated space.

4,103,498

PLUGS FOR BORES IN ROCKS OR THE LIKE

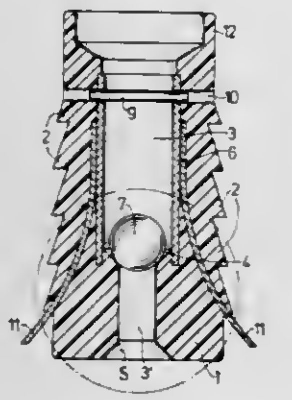
Wilhelm Steinborn, Remscheid, and Alois Mechenbier, Illingen, both of Germany, assignors to Diehl, Nuremberg and Tip-Top-Saar Gesellschaft fur industrielle Vulkanisierung m/b/H., Sulzbach-Altenwald d, both of Germany

Filed Jul. 18, 1977, Ser. No. 816,861

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633434

Int. Cl.² E21D *21/00*

U.S. Cl. 61—45 B **20 Claims**



1. A plug adapted to be introduced into a bore in rock or the like, which comprises:

a section of elastically deformable material, said section having a front end, a back end, and a lateral surface area, said front end being adapted to enter the rock bore to be plugged prior to any other portion of said plug, the outer diameter of said section roughly corresponding to the diameter of said rock bore to be plugged, the outer peripheral surface area of said plug tapering slightly mainly toward said front end;

grabbing elements provided on at least a portion of said peripheral surface area, said grabbing elements being adapted to frictionally engage the inner surface of the rock bore to be plugged for securely holding said plug therein, the inside of said plug being provided with an axial bore which narrows toward said back end, said axial bore being adapted to receive a self-hardening material; and

a closure member displaceably arranged in said axial bore for sealing off same at its narrower end when pressure is directed against said closure member from the said front end in the direction toward said rear end.

4,103,499

METHOD OF FORMING A WATER BARRIER AROUND FOUNDATIONS

Arthur G. Clem, Des Plaines, Ill., assignor to American Colloid Company, Skokie, Ill.

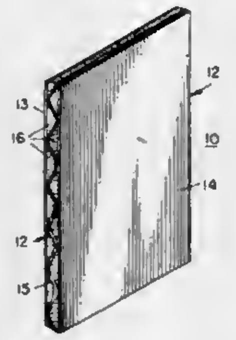
Divisioo of Ser. No. 626,572, Oct. 28, 1975, Pat. No. 4,048,373, Continuation-in-part of Ser. No. 472,668, May 23, 1974, Pat. No. 3,949,560. This application May 25, 1977, Ser. No. 800,475

Int. Cl.² E02D *3/14;* B23B *19/00*

U.S. Cl. 61—50 **2 Claims**

1. A method of forming a water barrier around an inground foundation comprising,

removing soil from the location where the inground foundation is to be formed, constructing a foundation in the location from which the soil was removed, locating a panel against the foundation and backfilling on the other side of the panel, said panel containing a soil sealant composition comprising bentonite; a water-soluble dispersing agent selected from the group consisting of a water-soluble salt of acetic acid, a water-soluble salt of phosphoric acid, and a water-soluble salt of boric acid; and a water-soluble polymer selected from the group consisting of polyacrylic acid, water-soluble salts of polyacrylic acid, hydrolyzed polyacrylonitrile, polyvinyl acetate, polyvinyl alcohol, copolymers of the foregoing, and a copolymer of acrylic acid and maleic anhydride, the amount of water-soluble polymer in said soil sealant composition being from 0.1% to 3.0%, by weight, and the amount of water-soluble dispersing agent in said soil sealant composition being from 0.1% to 3.0%, by weight, and filling said void space.



4,103,500

APPARATUS FOR CONNECTING THE ENDS OF SUBMERGED PIPES

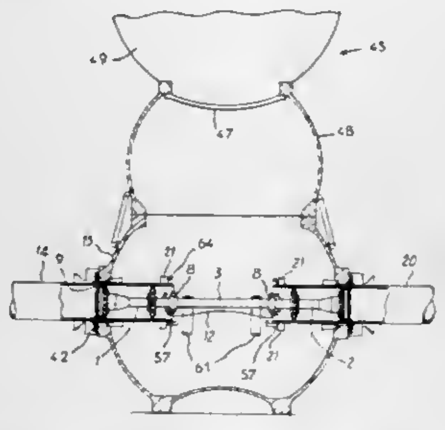
Philippe C. Nobileau, Neuilly sur Seine; Rene M. Dermy, Courcouronnes, and Guy J. Fleury, Paris, all of France, assignors to Compagnie Francaise des Petroles, Societe Anonyme; Etudes Petrolieres Marines, Societe a Responsabilite Limitee, both of Paris; Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme, Nantes; Compagnie Maritime d'Expertises, Societe Anonyme, Marseilles; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS) Societe Anonyme, Paris and Societe Nationale Elf Aquitaine (Production), Courbevoie, all of, France

Division of Ser. No. 750,315, Dec. 14, 1976, Pat. No. 4,068,491. This application Aug. 9, 1977, Ser. No. 823,076

Claims priority, applicatioo France, Dec. 19, 1975, 75 38988

Int. Cl.² F16L *1/04*

U.S. Cl. 61—69 R **8 Claims**



1. Apparatus for connecting two ends of submerged pipes comprising a receiver having two aligned apertures through which the pipe ends extend, jack means for moving the receiver relative to one pipe end to assist in the introduction of the other pipe into said receiver, an undersea intervention unit detactably secured onto said receiver to define a watertight enclosure for an intervention crew for connecting the two ends of the pipes by means of a sleeve, first seal means between the outer surfaces of the pipes and the apertures in the receiver, a stopper having second seal means disposed within the end of each pipe, a first boom detactably connected to said stoppers for holding said stoppers apart, a sleeve having a length equal to the gap between the ends of the pipes, a replacement boom disposed inside said sleeve, and movable sleeve support means for placing the sleeve in position between the pipe ends under remote control for simultaneous replacement of the first boom by the replacement boom while the receiver is under hydrostatic pressure to balance the pressures being exerted upon the faces of the stoppers.

4,103,501

DEVICE FOR EMBEDDING FLEXIBLE ELEMENTS OF GREAT LENGTH IN THE GROUND

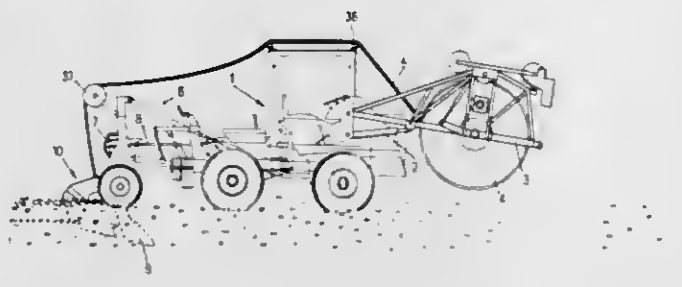
Jean Laurent, Morainvilliers, France, assignor to Institut Francais du Petrole, France

Filed Jun. 8, 1976, Ser. No. 693,957

Claims priority, application France, Jun. 11, 1975, 75 18478

Int. Cl.² A01B *3/64;* E02F *3/62;* F16L *1/00*

U.S. Cl. 61—72.6 **10 Claims**



1. A device for embedding flexible elements of great length in the ground, comprising means for handling said flexible elements; means for digging a trench into the ground, said digging means including a vibrating tool; guiding means including at least one guide member for guiding the flexible elements to the bottom of the trench, wherein at least a portion of said guide member includes a guiding path, said portion of said guide member having a wall portion which is linearly displaceable in translation with respect to said guiding path as a result of variations of cross-section of said flexible elements; and means for suspending said guide member from said vibrating tool, wherein suspending means includes constituted by elastic material for dampening vibrations imparted from said vibrating tool to said guide member.

4,103,502

PRODUCTION OF ARTIFICIAL ISLANDS

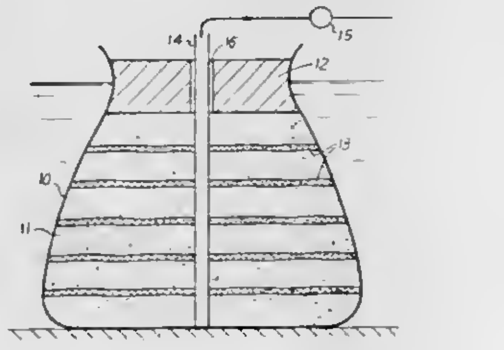
Patrick Michael Cashman, London, England, assignor to Sykes Construction Services Limited, London, England

Filed Jun. 3, 1977, Ser. No. 803,252

Claims priority, application United Kingdom, Jun. 9, 1976, 23930/76

Int. Cl.² E02D *21/00;* E02B *1/00*

U.S. Cl. 61—86 **10 Claims**



1. In a method of constructing an artificial island in which sand or other permeable material is placed in a flexible envelope and suction is applied to the interior of the envelope to extract water and reduce pressure whereby the hydrostatic pressure of the surrounding water acts to rigidify the material in the envelope, the improvement wherein relatively coarse material is introduced initially to form a drainage layer at the bottom of the envelope, at least one extraction and suction pipe is introduced to extend downwardly to the bottom drainage layer, and at least one drainage tube is introduced to extend downwardly towards the bottom drainage layer, the drainage tube has perforations along its length, and closure means are moved upwardly along said tube during material filling to connect said perforations in succession with said bottom drainage layer from which water is extracted.

4,103,503

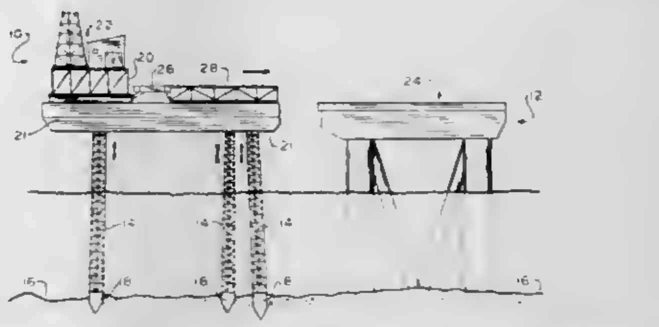
DRILLING SUBSTRUCTURE TRANSFER SYSTEM

Marvin L. Smith, Houston, Tex., assignor to Dixilyn International, Inc., Houston, Tex.

Filed Dec. 21, 1976, Ser. No. 753,092

Int. Cl.² E02D *25/00*

U.S. Cl. 61—97 **12 Claims**



1. An apparatus for transferring an oil or gas drilling apparatus from a jack-up rig to a fixed platform which apparatus comprises:

a substructure capable of supporting a drilling apparatus;

b. a structural bridge connectable to said substructure;

c. a structural skid mat connectable to the opposite end portion of said structural bridge from the portion of said bridge connectable to said substructure, said substructure, said bridge, and said skid mat connectable in a manner which allows said substructure, said bridge and said skid mat to be skidded on the surface of the jack-up rig to a position placing said skid mat on the fixed platform, said substructure remaining on said jack-up rig; and;

d. connection means on said bridge for connecting said bridge to a side deck portion of the jack-up rig, the top portion of said bridge being substantially level with the top portions of said skid mat and said jack-up rig, said bridge and said skid mat when so connected being capable of supporting said substructure with a contained drilling apparatus thereon.

4,103,504

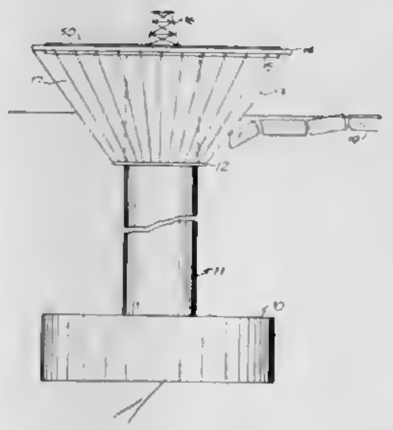
OFFSHORE PLATFORM FOR ICE-COVERED WATERS

Norman A. Ehrlich, 138 A Eureka St., San Francisco, Calif. 94114

Filed Oct. 7, 1977, Ser. No. 840,275

Iot. Cl.² E02D *31/00;* E02B *15/02*

U.S. Cl. 61—102 **4 Claims**



1. An offshore platform for resisting external ice forces and for supporting a deck and equipment comprising:

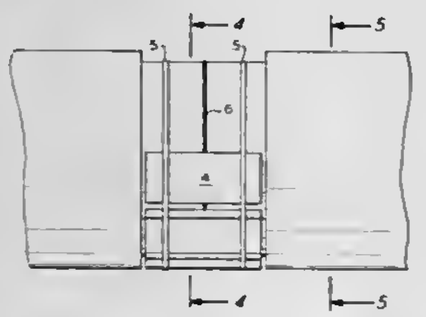
(a) a base,

(b) a support extending vertically from the base,

(c) a deck mounted on top of the support,
(d) means attached to the deck for securing cables,
(e) means attached to the support for securing cables,
(f) a plurality of cables attached to the deck securing means at one end and the support securing means at the other end,
(g) means for vibrating the securing means at either ends of the cable whereby the cables are caused to vibrate,
(h) means for adjusting the tension in the cables.

4,103,505
TEMPORARY PROTECTION OR BLOCKING FOR FIELD JOINT IN WEIGHT COATING ON SEA FLOOR PIPELINE

John M. Howerton, Newberry, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 22, 1976, Ser. No. 744,055
Int. Cl.² F16L *1/04*
U.S. Cl. 61—108 **2 Claims**

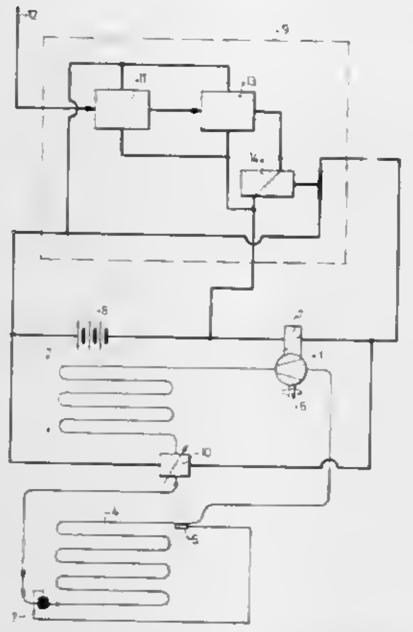


1. A method of at least temporarily releasing the end of a coated pipeline from a pipelaying means on to the bottom of the sea bed, as when pipelaying must be temporarily discontinued, and when there are in the coating of the pipeline, as at welded ends of sections of pipe constituting said pipeline, gaps or a discontinuum in the coating thereon which have not yet been filled with a permanent coating, while protecting against damage to the coating as the gap or discontinuum presenting portion passes over rollers or a stinger which comprises temporarily filling the discontinuum with a temporary filler of the same approximate thickness as the coating in a manner to provide a continuum or even surface to prevent damage of the coated end as it passes over the rollers or stinger, said temporary filler being composed of pieces of wood banded together by at least one steel band.

4,103,506
METHOD AND ARRANGEMENT FOR CONTROLLING THE OPERATION OF A COOLING SYSTEM IN AN AUTOMOTIVE VEHICLE

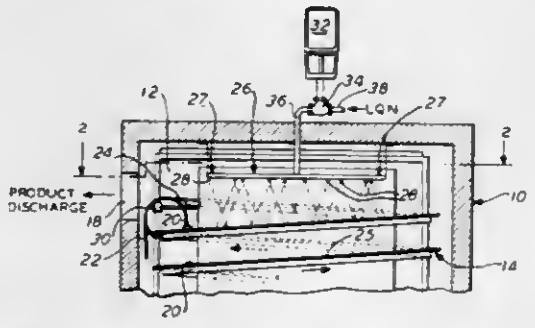
Gerhard Adalbert, Campinas, Brazil; Jürgen Hess, Baden-Baden, and Ulrich Hecht, Bühlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 20, 1976, Ser. No. 650,762
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1975, 2502184
Int. Cl.² B60H *3/04;* F25B *1/00;* F01C *11/00;* F03C *3/00*
U.S. Cl. 62—61 **4 Claims**

1. A method of controlling the cooling power of the cooling system of the interior of the passenger compartment of an automotive vehicle, the cooling system being of the type including a cyclically operating cooling-medium compressor producing at low to medium engine speeds a cooling power sufficient to satisfactorily cool the interior of the passenger compartment, the method comprising the steps of using speed-measuring means to generate an engine-speed-dependent signal whose value is dependent upon engine speed; and, by applying the engine-speed-dependent signal to a volumetric-throughput adjusting means for the compressor, decreasing the cooling power of the cooling system at higher engine speeds by decreasing the per-cycle volumetric throughput of the compressor.



4,103,507
HIGH SPEED FREEZING SYSTEM

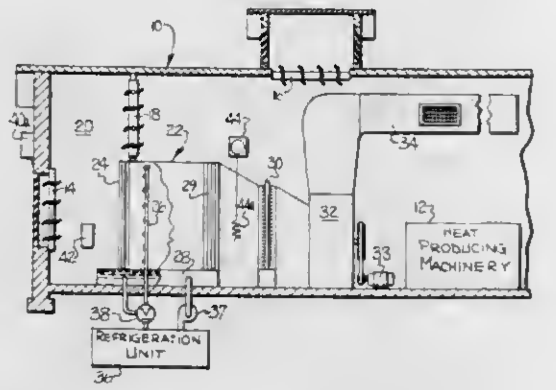
Hugues G. Benois, Reinach, Switzerland, assignor to Airco, Inc., Montvale, N.J.
Continuation of Ser. No. 594,928, Jul. 10, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,621
Int. Cl.² F25D *13/02*
U.S. Cl. 62—63 **6 Claims**



1. A high-rate freezing system of the kind having an insulating housing forming a freezing compartment with an entrance port and a discharge port for the product to be frozen, and a product conveyor of the porous belt vertical helix type within the compartment with the lower and upper terminal tiers thereof located opposite the entrance and discharge ports respectively, the freezing system comprising:
(a) a header having a multiplicity of spray nozzles grouped in compact array and disposed in an arc along and above the upper tier leading to the discharge port, the arcuate array spanning a partial circumferential section of the upper tier and the nozzle spray patterns of the array merging throughout the length of the spanned section, thereby covering the tier area spanned,
(b) a source of liquid nitrogen connected through a control valve to the header and spray nozzles,
(c) flow control means for adjusting the control valve according to a pre-set compartment freezing temperature to cause the liquid nitrogen spray to be concentrated on and to flood the spanned section area, thereby establishing on the upper tier a single high-rate heat transfer zone in advance of the discharge port, and
(d) guiding means at the lower tier for causing used nitrogen vapor drawn by induction through the entrance port to flow over and pre-cool the entering product.

4,103,508
METHOD AND APPARATUS FOR CONDITIONING AIR

Hugh C. Apple, 2023 Lynwood Dr., Greensboro, N.C. 27406
Filed Feb. 4, 1977, Ser. No. 765,746
Int. Cl.² F25D *17/06, 23/00;* F24F *3/14;* B01F *3/02*
U.S. Cl. 62—92 **12 Claims**

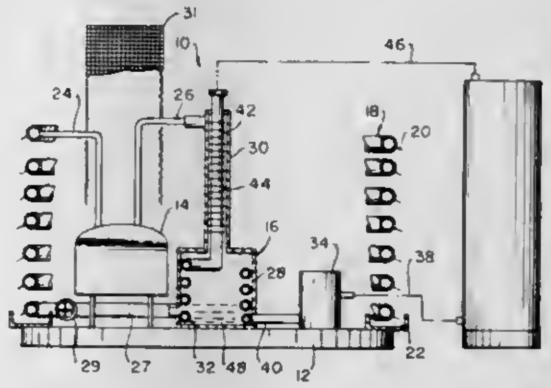


1. A method for providing temperature and humidity controlled air to an enclosed space to achieve desired conditions of temperature and humidity therein, and which is characterized by the maximum use of the outside air for cooling purposes to thereby minimize the load on the refrigeration unit and while insuring a predetermined minimum load on the refrigeration unit during periods of its operation to thereby avoid undesirable cycling of the unit, and comprising
(a) during conditions wherein the outside air has a wet bulb temperature in a predetermined range immediately above the dew point temperature of air at the desired conditions of temperature and humidity, the steps of:
(1) introducing outside air and return air from the enclosed space into a mixing chamber,
(2) conveying the air from the mixing chamber through an air washer while cooling the same with a refrigeration unit to an extent such that the wet bulb temperature of the mixed air approximately equals the dew point temperature of air at the desired conditions of temperature and humidity,
(3) controlling the proportions of the outside air and return air being introduced into the mixing chamber such that the total heat of the mixed air is only sufficient to permit the continuous operation of the refrigeration unit in cooling the mixed air as recited in step 2, and
(4) conveying the mixed and saturated air resulting from steps 1-3 into the enclosed space, and
(b) during conditions wherein the outside air has a wet bulb temperature between the highest temperature in said predetermined range and the wet bulb temperature of air at the desired conditions of temperature and humidity, the steps of:
(5) introducing substantially only outside air into the mixing chamber,
(6) conveying the air from the mixing chamber through the air washer while saturating the mixed air and cooling the same with the refrigeration unit to an extent such that the wet bulb temperature thereof approximately equals the dew point temperature of air at the desired conditions of temperature and humidity, and
(7) conveying the mixed and saturated air resulting from steps 5-6 into the enclosed space.

4,103,509
WATER HEATER-DEHUMIDIFIER COMBINATION HEAT PUMP

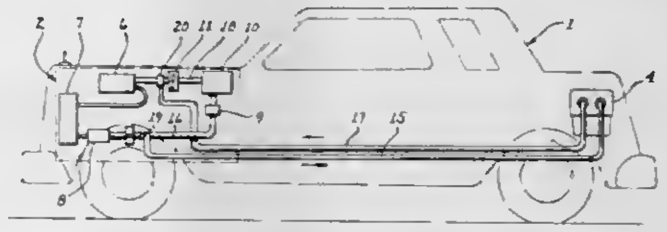
Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116
Filed Feb. 28, 1977, Ser. No. 772,538
Int. Cl.² F25B *27/02, 39/02*
U.S. Cl. 62—238 **6 Claims**

1. A water heater-dehumidifier heat pump system including a compressor, condenser and evaporator operatively connected together, said evaporator including means for the circulation of air thereover in heat exchange relationship therewith for the purpose of dehumidifying the air, said evaporator being a vertically oriented helical tubular coil with the turns thereof spaced apart to permit flow of air by convection therearound, said coil being of relatively large diameter, said condenser and compressor being physically located within the evaporator coil, a drain structure provided beneath the evaporator to collect water condensate falling by gravity from the evaporator, a hot water tank including a water inlet and a water outlet, a heat exchange structure placed in heat exchange relationship with the condenser, said heat exchange structure including a water inlet, a water outlet and means for the flow of water therethrough, the water inlet of the heat exchange structure being connected to the water outlet of the hot water tank and the water outlet of the heat exchange structure being connected to the water inlet of the hot water tank for flow of water from the hot water tank through the heat exchange structure and thence back to the hot water tank for the purpose of heating the water.



4,103,510
PORTABLE COOLING CHEST OPERATIVELY ATTACHABLE TO AN AUTOMOBILE AIR CONDITIONING SYSTEM

Roger W. Hall, 27706 N. Pales, Mission Viejo, Calif. 92675
Filed Dec. 13, 1976, Ser. No. 749,839
Int. Cl.² F25D *19/00;* B60H *3/04;* F25D *23/12, 11/04*
U.S. Cl. 62—299 **10 Claims**



1. A portable cooling chest detachably attachable to an external source of refrigerant under pressure for chilling the contents disposed within said cooling chest, said cooling chest comprising in combination:
a. an outer shell;
b. a middle liner having side walls and a bottom and nested within said shell, said middle liner defining a compartment intermediate said shell and said middle liner;
c. insulation means disposed within the compartment for reducing the rate of heat transfer between said shell and said middle liner;
d. an inner liner having side walls and a bottom and nested within said middle liner for defining the storage capacity of said cooling chest, said inner liner developing a cavity intermediate said inner liner and said middle liner;
e. spacing and retaining means disposed within the cavity for restraining bulging and deformation of the side walls of said inner liner;
f. eutectic fluid disposed within the cavity;

- g. a cooling coil disposed within the cavity for chilling said eutectic fluid; and
- h. coupling means for coupling said cooling coil in fluid communication with the source of refrigerant;

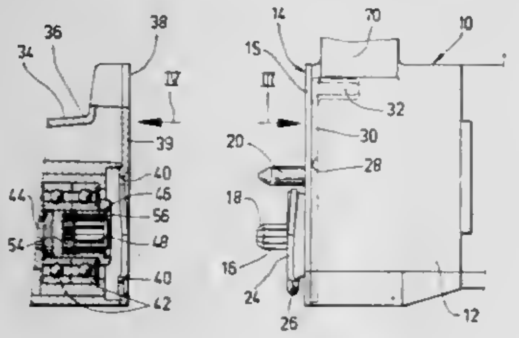
whereby, said chilled eutectic fluid absorbs heat from the contents of said cooling chest through the side walls of said inner liner and said insulation means reduces the transfer of heat from said shell to said eutectic fluid to maintain the contents chilled after detachment of said cooling coils from the source of refrigerant.

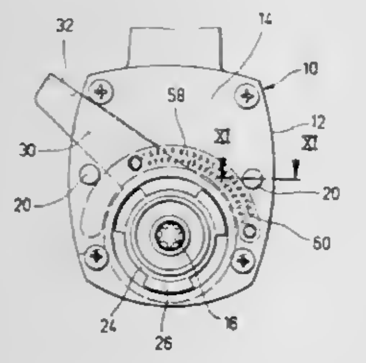
4,103,511

CONNECTING ARRANGEMENT FOR A MACHINE TOOL

Willy Kress, Bisingen, and Josef Seifert, Grosselfingen, both of Germany, assignors to Firma Kress elektrik GmbH & Co., Bisingen, Germany

Filed Oct. 4, 1976, Ser. No. 729,006
Int. Cl.^{2} F16C *1/06, 1/12*
U.S. Cl. 64—4 6 Claims





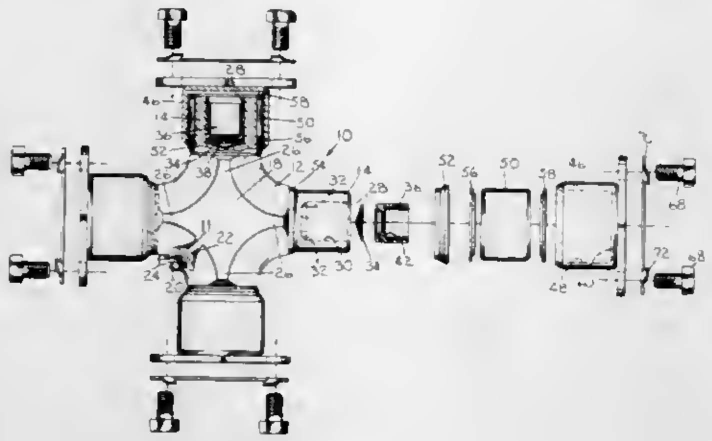
1. Connecting arrangement for a machine tool having an electromotor driving device in a housing and an exchangeable operating device comprising a driving shaft projecting from the housing of the driving device and a receiving coupling part in a housing of the operating device receiving the driving shaft, so that the housings of the driving device and operating device may be fixed together in a centered manner, wherein the housings of the driving device and operating device have flat, perfectly equal contact surfaces disposed perpendicularly in relation to the driving shaft, and wherein the housings are fixed mutually untwistably on their contact surface by means of axially outward protruding centering pins on one contact surface and centering openings on the other contact surface receiving the centering pins, further comprising coupling means operated from the outside of said contact surfaces when said contact surfaces are fitted against each other in a twist-secure manner.

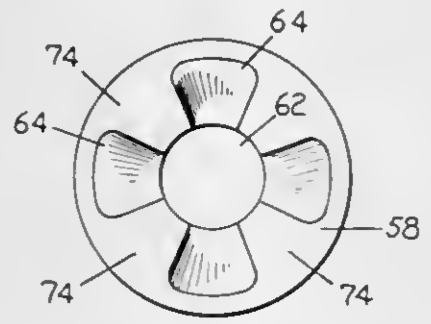
4,103,512

UNIVERSAL JOINT AND CROSS THEREFOR

John Christee McElwain, Rochester, and Lawrence Howard Hogan, Bloomfield Hills, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 686,038, May 13, 1976, Pat. No. 4,047,396. This application Nov. 15, 1976, Ser. No. 741,600
Int. Cl.^{2} F16D *3/30, 3/41*
U.S. Cl. 64—17 A 2 Claims





1. A universal joint including a cross operably connected therein, said cross comprising a body having four trunnions extending therefrom along two mutually perpendicular lines, each of said trunnions having a cylindrical outer bearing surface thereon, needle bearings interposed between said outer cylindrical bearing surface on said trunnions and an inner cylindrical bearing surface within a bearing cup which covers and surrounds each of said outer bearing surfaces of said trunnions, a resilient thrust washer operably disposed between said bearing cup and said trunnions, said thrust washer having a series of channels defined by alternating offset portions formed thereon, said alternating offset portions extending radially from a central bore provided in said thrust washer and terminating at a point distant from the outer periphery of said washer to provide and define a continuous smooth annular bearing surface which transmits bearing loads between said bearing cup and said trunnions, said thrust washer in bearing engagement with a radially extending circumferential surface at the end of each of said trunnions and a radially extending inner surface at the end of said bearing cup, said thrust washer being a compliant member whereby it absorbs thrust transmitted through and between it from said cross to said bearing cup, said thrust washer additionally serving to maintain said needle bearings in alignment.

4,103,513

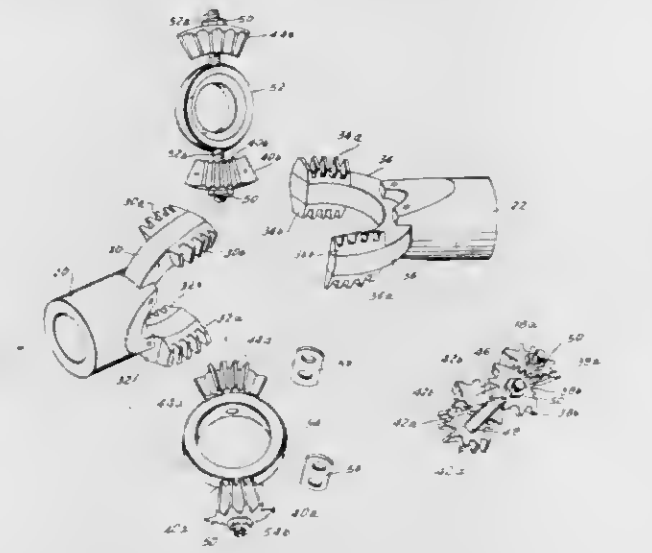
CONSTANT VELOCITY UNIVERSAL JOINT

Christian E. Grosser, 214 Sleepy Hollow Rd., Richmond, Va. 23229

Filed Apr. 6, 1977, Ser. No. 785,315
Int. Cl.^{2} F16D *3/30*
U.S. Cl. 64—21 29 Claims

1. A constant velocity universal joint for rotatably transmitting power from one shaft to another without substantial variations in velocity at relatively large angles of deflection between shafts without substantial backlash comprising:

- drive shaft coupling means for coupling the joint with a drive shaft;
- driven shaft coupling means for coupling the joint with a driven shaft;
- a first pair of bifurcated forks extending from the drive shaft coupling means and including a first fork and a second fork each having spaced-free ends;
- a second pair of bifurcated forks extending from the driven shaft coupling means and being interposed between and in space relationship with the first fork pair, the second fork pair including a third fork and a fourth fork each having spaced-free ends;
- each fork having opposed side faces;
- gear segment torque transmitting means interposed between and coupling the opposed side faces of the adjacent forks while filling the space therebetween when the shafts are disposed at an angle relative to one another and the drive shaft is rotated and the driven shaft is rotated by the universal joint, the gear segment means including a gear segment on each side face at the fork-free end, the gear segment means including a pinion segment meshed with each gear segment; and
- split interengagement means being provided for interengaging each pair of pinion segments between the first and fourth fork, fourth and second fork, second and third fork, and third and first fork whereby the pinion segments will rock back and forth relative to the associated meshed gear segment through the associated interengagement means when the shafts are disposed at an angle relative to one another and the drive shaft is rotated and the driven shaft is rotated by the universal joint.



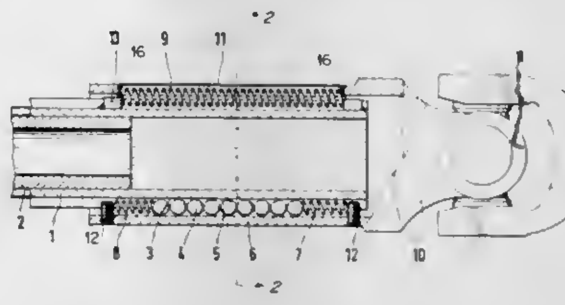
4,103,514

TELESCOPING TORQUE TRANSMITTING SHAFT

Hubert Grosse-Entrup, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

Filed Jul. 20, 1976, Ser. No. 707,106
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1975, 2532661
Int. Cl.^{2} F16D *3/06*
U.S. Cl. 64—23.7 6 Claims

1. A telescoping torque transmitting shaft comprising a first shaft having an inner element and an outer element non-rotatably and slidably mounted thereon, said outer element having a plurality of axially extending circumferentially spaced grooves therein and on, a tubular second shaft co-axially positioned on said outer element and having a plurality of axially extending circumferentially spaced grooves corresponding in plurality to said outer element grooves to define pairs of opposed grooves, a plurality of roller elements linearly disposed in each said pair of opposed grooves, first spring means on said second shaft for limiting the axial movement of the roller elements in each pair of opposed grooves, and second spring means acting between both said second shaft and said outer element of the first shaft for biasing said second shaft and said outer element to a predetermined axial position with respect to each other said second shaft is attached to a yoke member of a universal joint.

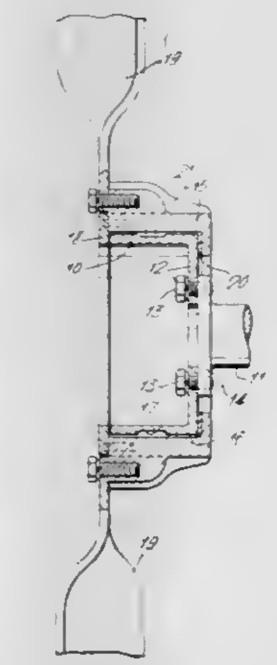


4,103,515

DRIVING MECHANISMS

Edward George Barrett, Witney, England, assignor to Smiths Industries Limited, London, England

Filed Aug. 6, 1975, Ser. No. 602,502
Int. Cl.^{2} F16D *31/06, 31/08*
U.S. Cl. 64—26 12 Claims



1. A driving mechanism comprising,
- a drive part,
- a driven part rotatable about a common axis with said drive part with a shear-type fluid coupling therebetween,
- said drive part and said driven part having respective opposing cylindrical surfaces which are spaced apart from, and substantially coaxial with, one another to define therebetween an annular space centered on said rotational axis of the parts,
- said drive part and said driven part together with the fluid therebetween constituting the sole bearing for the driven part,
- said cylindrical surfaces being formed at least in part by a member which is porous to the fluid comprising said shear-type fluid coupling, said member defining one of said opposing cylindrical surfaces, and means comprising only said porous member for storing said fluid.

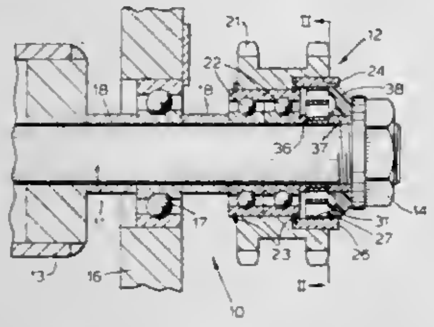
4,103,516
LIMITED TORQUE DRIVE ROLLER

Richard Marcin, New Baltimore, Mich., assignor to Newcor, Inc., Bay City,, Mich.

Filed Apr. 8, 1977, Ser. No. 785,927

Int. Cl.² F16D *7/02*

U.S. Cl. 64—30 E **6 Claims**



1. In a torque-limiting drive mechanism, the combination comprising:

a first member supported for rotation about an axis, and a second member supported for rotation about said axis, said first and second members being supported for rotation relative to one another, and one of said members being adapted for driving connection with a power source;

said first and second members defining a pair of concentric opposed surfaces which are radially spaced apart and define a substantially annular recess therebetween, one of said surfaces being rotatable with one of the members, and the other of said surfaces being rotatable with the other of said members;

a non-circular resilient device interposed between said pair of surfaces for creating a torque-limiting driving path between said first and second members to cause the latter to synchronously rotate as a unit, said non-circular resilient device comprising a multiple coil spring member which is radially spirally wound and is solely in frictional engagement with one of said surfaces, the frictional engagement between said spring member and said one surface occurring solely through one or more small points of frictional contact;

the spring member including an inner annular hub portion which is fixedly anchored with respect to the inner one of said surfaces, said spring member also including an outer curved portion which is spaced radially outwardly from the hub portion and is frictionally engaged with said other surface at a plurality of angularly spaced points; and

said spring member further including an elongated resilient ramp portion which extends spirally outwardly from the hub portion and is joined to the outer curved portion, said ramp portion extending through at least one-half of a revolution.

4,103,517
STRAIGHT KNITTING MACHINE

Manfred Schmid, Morikestr. 8, 7445 Bempflingen; Werner Sommer, Kolpingstr. 51, 7300 Esslingen, and Antonius Vinnemann, Am Bopserweg 11, 7000 Stuttgart 1, all of Fed. Rep. of Germany

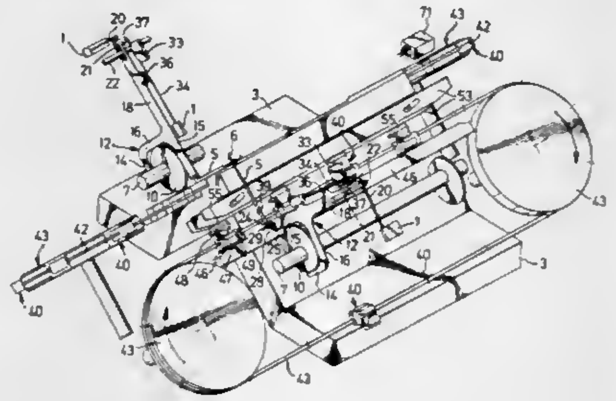
Continuation of Ser. No. 705,286, Jul. 14, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,909

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531705

Int. Cl.² D04B *7/00, 15/66*

U.S. Cl. 66—75.1 **25 Claims**

1. A knitting machine comprising: at least one needle bed; at least one knitting tool which is movably mounted in said needle bed; at least one eccentric cam disc rotatably mounted in said needle bed, driving means for coupling said knitting tool with said cam disc for reciprocating said knitting tool in at least two opposite directions during knitting operations, said driving means permitting some play such that said knitting tool may be reciprocated in at least one of said directions by an additional distance; and adjustable means cooperating with said knitting tool for superimposing an additional movement on the movements thereof caused by said cam disc in said at least one of said directions by a preselectable part of said additional distance.



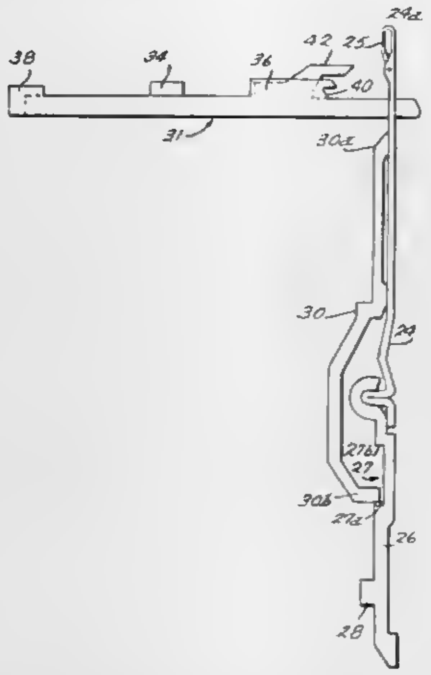
4,103,518
KNITTING MACHINE FOR KNITTING FABRICS HAVING TERRY LOOPS AT LEAST ON THE TECHNICAL FRONT FACE THEREOF

Victor J. Lombardi, Burlington, N.C., and José Ma Dalmau, Barcelona, Spain, assignors to Jumberca S.A., Spain, by José Ma Dalmau, a part interest

Division of Ser. No. 698,213, Jun. 21, 1976, Pat. No. 4,038,838, and Ser. No. 569,742, Apr. 21, 1975, Pat. No. 3,977,216. This application May 13, 1977, Ser. No. 796,822

Int. Cl.² D04B *15/06*

U.S. Cl. 66—107 **6 Claims**



1. Improved knitting apparatus for knitting terry loop fabric having terry loops knitted in on at least the technical front face of a base fabric, said apparatus comprising:

needle means for forming a knitted base fabric;

means for feeding ground and front loop yarns;

a plurality of sinker elements cooperating with said needle means for supporting the fabric at a level sufficiently high so that loops can be formed in the front face of said fabric, each of said sinker elements comprising an upper portion and a lower portion, said upper and lower portions being spaced apart thereby defining a sinker throat therebetween, said lower portion having top and leading edges said leading edge having a throat provided therein for receiving a yarn, said upper edge of said lower portion having a recessed portion therein defining the bottom of said sinker throat;

the upper portion of each of said sinker elements having top, front and bottom edges, said front edge being sloped downwardly toward said throat, so that as the fabric web is contacted by said downwardly sloped leading edge, the fabric is forced down into the sinker throat; and

means for operating said needle means, and said plurality of sinker elements.

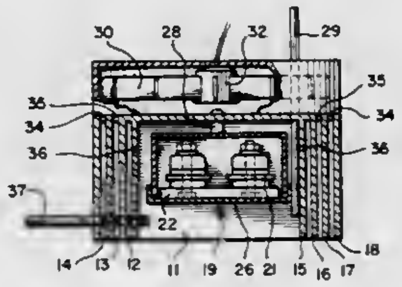
4,103,519
APPARATUS FOR ULTRASONIC CLEANING OF CARPET, UPHOLSTERY, AND SIMILAR MATERIALS

Amber Charles Davidson, Salt Lake City, Utah, assignor to Byron W. Boyd, Orem, Utah

Filed Mar. 18, 1977, Ser. No. 779,189

Int. Cl.² D06F *19/00;* B08B *3/12*

U.S. Cl. 68—3 SS **13 Claims**



1. Apparatus for cleaning carpet, upholstery, and similar materials, comprising a cleaning head adapted to rest on and be moved over material to be cleaned and having a central chamber, open at its bottom, and at least one relatively narrow chamber, open at its bottom, peripherally surrounding the central chamber; transducer means mounted in the central chamber for vibrating cleaning solution at an ultrasonic frequency; means for supplying a cleaning solution to the central chamber in quantity sufficient to maintain a cleaning solution level in the chamber, when the cleaning head rests on the material to be cleaned, such that at least a portion of the transducer means is immersed in the cleaning solution, whereby vibration of the transducer means causes vibration of the solution; and means for controlling pressure in the central chamber above the cleaning solution thereby controlling pressure of the cleaning solution in the central chamber and for controlling pressure in the at least one relatively narrow peripheral chamber surrounding the central chamber, to substantially eliminate any flow of air into the solution in the central chamber and to prevent escape of substantial amounts of solution from the cleaning head.

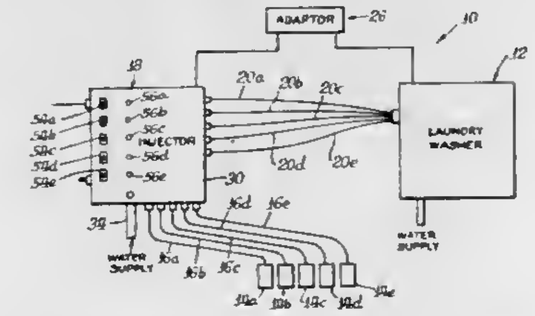
4,103,520
ADAPTOR FOR AUTOMATED LAUNDRY SYSTEM

John R. Jarvis, Dallas, and Eldon W. Brown, Garland, both of Tex., assignors to Ald, Inc., Dallas, Tex.

Filed Mar. 11, 1977, Ser. No. 776,645

Int. Cl.² D06F *39/02*

U.S. Cl. 68—12 R **23 Claims**



1. In a laundry system which includes a washer having means operative to effect a cycle of operation during which the washer undergoes a plurality of operating stages, said washer further having means for establishing a recurring impulse signal at predetermined time periods during said cycle of operation, said system including injector means adapted to inject a quantity of at least one laundry additive into said washer in response to a command signal, said injector means including timer means operative to receive said command signal and establish the time duration of each additive injection, the combination therewith comprising adaptor means separate from but operatively associated with said washer and said injector means for controlling the injection of said laundry additives into said washer in direct relation to establishment of said recurring impulse signals, said adaptor means including primary electrical power supply means separate from said washer, first means connected in circuit to said primary supply means and operable to establish a plurality of command signals in selected sequence, each of said command signals having operative association with said timer means in a manner to control injection of a selected laundry additive into said washer, said adaptor means including second means adapted to receive each impulse signal from said washer and being operative in response to receipt of each impulse signal to actuate said first means to establish a command signal so as to effect injection of a selected laundry additive into said washer.

4,103,521
APPARATUS FOR SUCCESSIVELY PROCESSING CONTINUOUS TEXTILE FABRIC

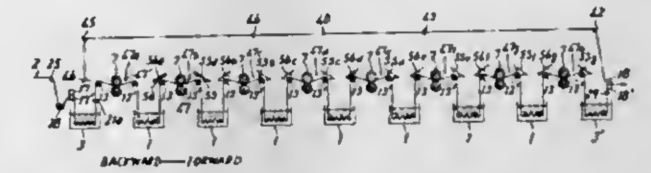
Yoshishige Tachibana, Akashi, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Japan

Filed Apr. 6, 1976, Ser. No. 674,070

Claims priority, application Japan, Dec. 15, 1975, 50-149868

Int. Cl.² D06B *3/10*

U.S. Cl. 68—22 R **48 Claims**



1. An apparatus for successively processing a continuous textile fabric traveling along a predetermined feed path, said apparatus comprising:

means for feeding said continuous textile fabric along said path,

squeeze roll means having one end and another end defining an axial direction thereof, said squeeze roll means being disposed in said path for squeezing and nipping said continuous textile fabric at a plurality of nip points when said textile fabric is passed therethrough,

first and second guide roll means provided at respective sides of said squeeze roll means in parallel with and equally spaced apart from said squeeze roll means and having one end and another end defining an axial direction parallel to said axial direction of said squeeze roll means for guiding said continous textile fabric fed to and from said squeeze roll means,

said continuous textile fabric being successively and spirally set around said squeeze roll and said guide roll means from said one end to said other end thereof, respectively, said plurality of nip points of said continuous textile fabric as nipped by said squeeze roll means being grouped into pairs of adjacent nip points, each pair of said adjacent nip points defining a corresponding loop-like portion of said continuous textile fabric,

means provided along said feed path for processing said loop like portions of said continuous textile fabric,

first feed control means connected to said feeding means for enabling said feeding means to feed said continuous textile fabric in a first direction, and

second feed control means connected to said feeding means for enabling said feeding means to feed said continuous textile fabric in a second direction, wherein said first and said second feed control means include respective means for setting said amount of travel in said first and second directions, respectively, and wherein the amount of travel of said continuous textile fabric along said feed path in said first direction of the feeding operation is set to be larger than that in said second direction of the feedingoperation, so that said continuous textile fabric is advanced in said first direction by a predetermined amount as a result of a predetermined number of said first and second directions of reciprocating feeding operations, said apparatus further comprising means operatively associated with said first and second feed control means for alternately enabling said first and said second feed control means, respectively, wherein said guide roll means is provided above the nip points of said continuous textile fabric nipped by said squeeze roll means, said squeeze roll means having a withdrawing side from which said textile fabric is withdrawn, and

the circumferential speed of said guide roll means at the withdrawing side of said squeeze roll means is adapted to be larger than the circumferential speed of said squeeze roll means.

4,103,522

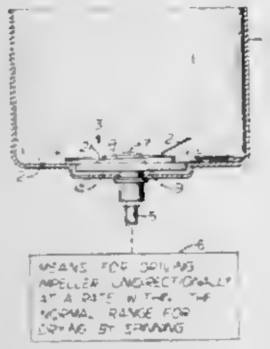
SPIRAL DASHER FOR WASHING MACHINES

George M. Gibson, 640 W. 249th St., Riverdale, N.Y. 10471

Filed Mar. 25, 1977, Ser. No. 781,501

Int. Cl.² D06F *17/10*

U.S. Cl. 68—133 **2 Claims**



3
2
5
6
MEANS FOR DRIVING IMPELLER UNIDIRECTIONALLY AT A RATE WITHIN THE NORMAL RANGE FOR DRYING BY SPINNING

1. A washing machine comprising:

a tub having a bottom and a substantially vertical wall for enclosing a space to contain wash,

a dasher within said space, said dasher having a generally circular base and a hub about the axis of said base, unidirectional driving means connected to said hub to rotate said dasher about said axis thereof,

a volute portion disposed on one side of said base, said volute portion being positioned within said space to permit freedom of movement of wash therein in any radial direction about said hub and in any direction incident to said one side of said base, said volute portion having a gradually curving smooth driving surface facing outwardly with respect to said hub, said driving surface having an inner end connected to said hub and extending spirally outwardly from said hub with gradually decreasing rate of curvature to an outer end of the driving surface terminating near the periphery of said base, and said ends of said driving surface having smooth and gradual contours.

4,103,523

APPARATUS FOR DYEING FLOCKED TEXTILE FIBERS

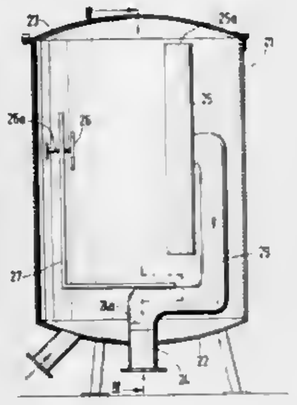
Ludwig Plack, Biedenkopf, Germany, assignor to Obermaier & Cie., Neustadt an der Weinstrasse, Germany

Filed Oct. 12, 1976, Ser. No. 731,784

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546878

Int. Cl.² D06B *5/14*

U.S. Cl. 68—187 **2 Claims**



1. In an apparatus for dyeing pressed balls of flocked textile fibers of the type comprising a water-tight container having a liquid inlet opening, a liquid outlet opening and pump means connected to the inlet and outlet openings for circulating dye liquor through the container, and one wall of the container being hinged to provide a watertight door, the improved structure for the dyeing of the pressed balls of flocked textile fibers wherein said container has a cross-section of larger size than the size of the pressed balls to be dyed and comprises pressed ball positioning means consisting essentially of a collar-like spacing ring surrounding the outlet opening, a series of radial spacing ribs extending from the outlet opening towards said spacing ring whereby a pressed ball to-be-dyed can be placed over said outlet opening without blocking the latter, and means opposite said outlet opening for holding a pressed ball to-be-dyed on the spacing ring and radiating ribs, said inlet opening being positioned to supply dye liquor to the space surrounding the pressed ball, said outlet opening for the dye liquor being contained in a plate device containing the collar-like spacing ring which also comprises internal pipe means extending inside the container from the outlet opening towards one wall of the container, connecting pipe means for the internal pipe means extending through one wall of the container, said means opposite the outlet opening for holding a pressed ball on the spacing ring being connected to said plate device.

4,103,524

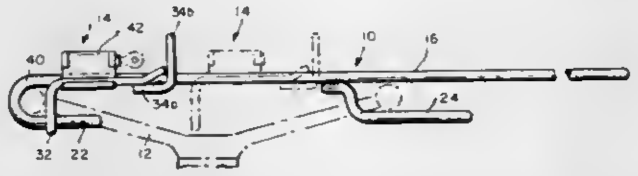
THEFTPROOF STEERING WHEEL LOCK

Ronald A. Mitchell, 87 Wesson Ave., Quincy, Mass. 02169, and William Augustus Bedford, Jr., Brockton, Mass., assignors to Ronald A. Mitchell, Quincy, Mass.

Filed Mar. 10, 1977, Ser. No. 775,950

Int. Cl.² B60R *25/02*

U.S. Cl. 70—209 **10 Claims**



1. An antitheft device for attachment to a steering wheel in an automobile comprising a rigid elongated bar of greater length than the diameter of the steering wheel, longitudinally spaced hooks on the bar for engagement with diametrically opposed segments of the steering wheel, one of said hooks being disposed to engage the rim from the outside and the other from the inside, means mounted on the bar for movement thereon to a position to confine the rim within the one of said hooks and means for releasably locking said last-named means in confining position.

4,103,525

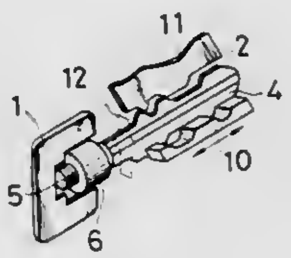
LEVER TUMBLER LOCK DEVICE HAVING VARIABLE WARD PATTERNS

Minoru Kamiya, 2-46-3, Minami-Otsuka, Toshima-ku, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,532

Int. Cl.² E05B *19/18*

U.S. Cl. 70—347 **10 Claims**



1. A lock device comprising:

a key having a stationary bit member integral with the body of said key, a movable bit member slidably engageable with said stationary bit member for lengthwise displacement of said movable bit member relative to said stationary bit member and key fixing means for rigidly maintaining said movable bit member in selected position in respect to said stationary bit member;

a lock having a stationary ward member corresponding to said stationary bit member, a movable ward member corresponding to said movable bit member, and lengthwise displaceable in respect to said stationary ward member, said movable ward member being lengthwise displaceable by and simultaneously with said movable bit member to form various ward patterns, and lock fixing means for rigidly fixing said movable ward member in respect to said stationary ward member; and

whereby after said key is inserted in a keyhole in said lock and turned to the lock-open position, then said movable bit member is lengthwise displaceable to a desired position relative to said fixed bit member, thereby resulting in said movable ward member being cooperatively displaced in response to the movement of said movable bit member.

4,103,526

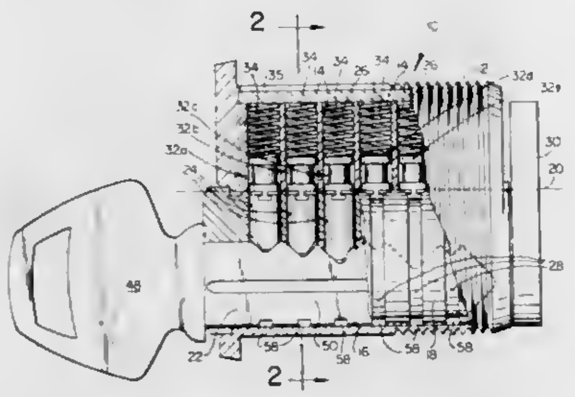
PIN TUMBLER LOCK

Walter E. Surko, Jr., Southiogton, Conn., assignor to Embart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 555,404, Mar. 5, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,199

Int. Cl.² E05B *15/14, 27/04*

U.S. Cl. 70—364 A **35 Claims**



1. In a pin tumbler lock having a shell, a plug rotatable relative to said shell along a shear line between locked and unlocked positions, said shell and said plug having holes therein coaxially aligned in said locked position to define a plurality of bores, a plurality of axially elongated tumbler assemblies respectively received in said bores, each of said tumbler assemblies having at least one split line, means normally biasing each of said tumbler assemblies in an axial direction to a position relative to said shell and said plug wherein a split line thereof is out of alignment with said shear line to prevent rotation of said plug from its locked position, and means defining a keyway in said lock for receiving a proper key to move each of said tumbler assemblies axially in opposition to its biasing means and to a position wherein a split line thereof is generally aligned with said shear line to permit said plug to be rotated from its locked position to an unlocked position, the improvement comprising at least one of said tumbler assemblies supported in an associated one of said bores for angular movement about its axis within said one bore, said one tumbler assembly including a pin tumbler, a driver, and means releasably coupling said driver to said pin tumbler for angular movement of said driver about its axis in response to angular movement of said pin tumbler about its axis within said one bore, said coupling means at least partially defining an associated split line along which said pin tumbler and said driver may separate when said one tumbler assembly is axially and angularly positioned relative to said plug and said shell in a predetermined releasing position wherein said associated split line is aligned with said shear line, means on said pin tumbler for positioning said one pin tumbler assembly in said predetermined releasing position in response to insertion of a proper key into said keyway, and a groove in said plug receiving an associated portion of said coupling means therein for preventing angular movement of said driver about its axis when said driver and said pin tumbler are separated by rotation of said plug from its locked position to an unlocked position.

4,103,527

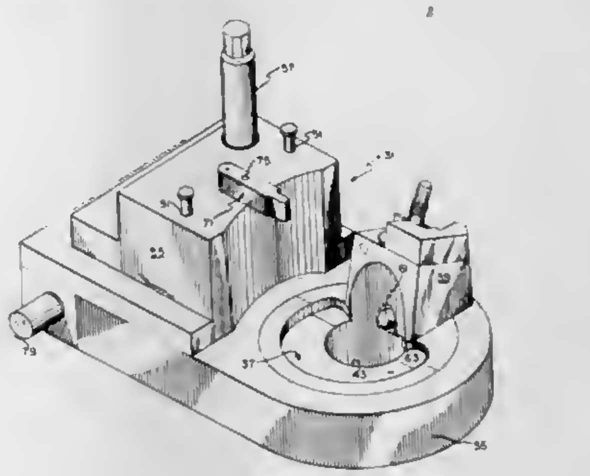
ROLL CRIMP MACHINE

John S. Eldridge, Sr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 20, 1977, Ser. No. 798,850

Int. Cl.² B21D *39/04, 17/04*

U.S. Cl. 72—75 **5 Claims**



1. An apparatus for joining two or more round members in an overlapping relation comprising:

a main body part;

an annular platform rotatably supported within said main body part, said platform being rotatable about a centerline axis and having a co-axial bore formed therethrough;

a ball bearing disposed within said annular platform and rotatable therewith about the centerline axis;

a window formed in the inner circumference of said annular platform; and,

means for automatically advancing said ball bearing through said window and into said bore as the annular platform is rotated relative to the main body part whereby as the annular platform is rotated a circumferential groove is formed about said round members insertable in said bore to form a roll joint between the members.

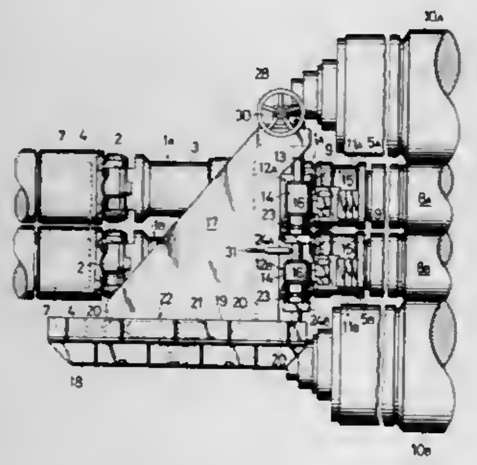
4,103,528
APPARATUS FOR RELEASING DRIVE ASSEMBLY FROM DRIVEN SHAFT AND CONNECTING SAME THERETO

Hiroji Okuda, Kitakatsuragigun; Masaaki Washida, Muroran, and Hisashi Ide, Ikomagun, all of Japan, assignors to Koyo Selko Company, Limited and Nippon Steel Corporation, both of Tokyo, Japan

Filed Jul. 28, 1977, Ser. No. 820,124

Int. Cl.^{2} B21B *35/14*

U.S. Cl. 72—238 **16 Claims**



1. An apparatus for releasing a drive assembly from a driven shaft and connecting the same thereto, the drive assembly including a telescopic spindle and a sleeve-shaped coupling member connected to the spindle by a universal joint and releasable from and connectible to the driven shaft by the apparatus, comprising:

- a frame supported on a base and slidable toward or away from the driven shaft in parallel to an extension of the axis of the driven shaft,
- means for slidingly driving the frame,
- a pair of holding means vertically slidably supported by the frame and arranged on the opposite sides of the coupling member of the drive assembly respectively, the holding means having holders respectively for holding the opposite sides of the coupling member to support the coupling member in its horizontal position in alignment with the driven shaft, each of the holding means including drive means for moving the holder toward or away from the coupling means in a horizontal direction, and
- control assemblies mounted on the frame for vertically slidingly moving the holding means.

4,103,529
EXTRUSION PRESS FOR DIRECT AND INDIRECT EXTRUDING WITH DIE SHIFTER

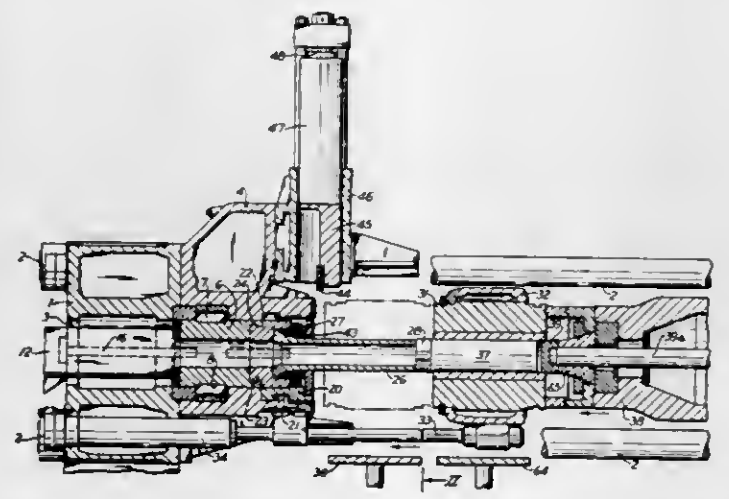
Helmut B. Huertgen, Pittsburgh; Walter F. Larson, McKeesport, and Guenter W. Sibler, Pittsburgh, all of Pa., assignors to Sutton Engineering Company, Pittsburgh, Pa.

Filed Feb. 9, 1976, Ser. No. 656,518

Int. Cl.^{2} B21C 23/08, 35/06

U.S. Cl. 72—253 A **2 Claims**

1. In an extrusion press for both direct and indirect extrusion, a platen having a rear face and an extrusion-receiving horizontal passage extending through it from front to back, a gate lock housing mounted against said rear face and provided with a passage aligned with said platen passage, a billet container behind said housing passage and movable toward and away from it, ram means behind the container, means for moving the ram means and container toward and away from said housing, a tubular block member normally disposed in said housing passage, releasable gate lock means in said housing normally holding said block member in place, an indirect-extrusion bolster located behind said block member and having a passage therethrough aligned with the passage through the block member, an indirect-extrusion stem secured to the bolster and extending rearwardly from said housing toward said container, an extrusion die carried by the rear end of said stem, means secured to said block member for pulling it forward in said platen passage after release of said gate lock means, means connecting said bolster to said block member for forward movement therewith to draw said stem into an extrusion shearing position, said connecting means being formed to permit lateral movement of the bolster away from the block member when in their rear position, a direct-extrusion bolster, a direct-extrusion die mounted behind said direct-extrusion bolster and movable therewith, carrier means supporting said bolsters and slidable horizontally, the carrier means being provided with an open end recess containing said indirect-extrusion bolster to permit said forward movement of that bolster out of said carrier means, and means for sliding the carrier means transversely of said aligned passages for moving said indirect-extrusion bolster and stem laterally away from said block member and out beyond the side of said housing when said container is in its rear position and for moving said direct-extrusion bolster laterally into the space behind said block member vacated by the indirect-extrusion bolster to locate the direct-extrusion die in operative position for direct extrusion, and said ram means including means for engaging the rear end of a billet in the container in the container's forward position to push the billet forward out of it and through said direct-extrusion die in said operative position.



4,103,530
SELF-CENTERING PUNCH FOR BILLET CENTERING MACHINE OR THE LIKE

James W. Schuetz, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

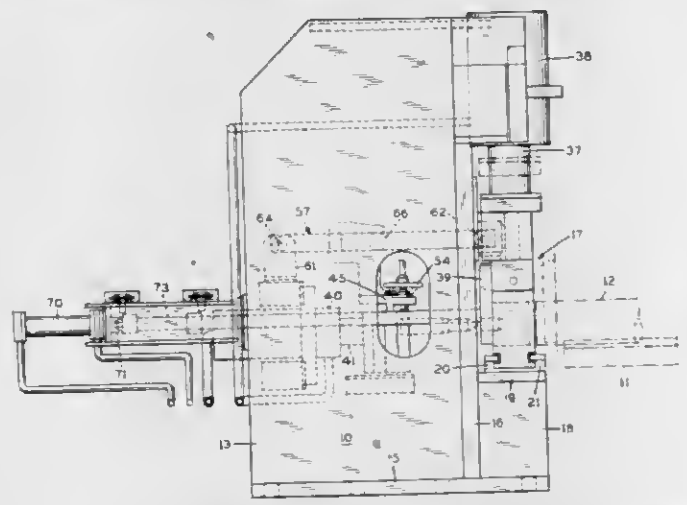
Filed Apr. 18, 1977, Ser. No. 788,253

Int. Cl.^{2} B21D *28/04*

U.S. Cl. 72—312 **11 Claims**

1. In an apparatus for center punching billets, as for the production of seamless tubing, wherein the apparatus includes

- (a) means for clamping a billet in position for punching,
- (b) a center punching tool,
- (c) actuator means for advancing said center punching tool into an end face of a clamped billet,
- (d) mounting means for securing said tool for advancing movement by said actuator means, and
- (e) primary adjusting means for adjustably positioning said tool in alignment with the nominal axis of a billet of predetermined nominal diameter, the improvement characterized by
- (f) compensating means mechanically coupled with said clamping means for adjustably positioning said tool independently of said primary adjusting means, to compensate for variation of the billet from nominal diameter.



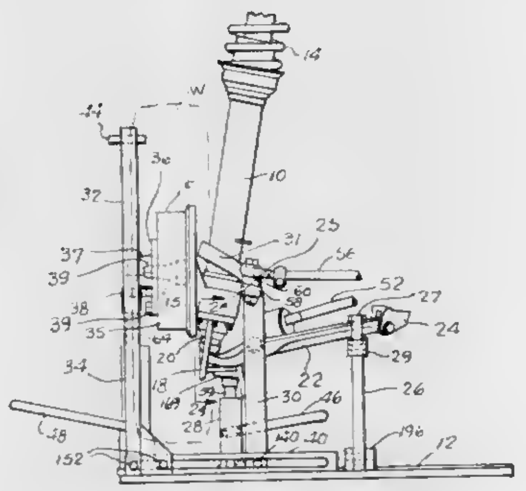
4,103,531
METHOD AND APPARATUS FOR CORRECTING BENT STRUT MISALIGNMENT

Danny O. Daniel, 230 N. 2nd, Pocatello, Id. 83201

Filed Aug. 18, 1976, Ser. No. 715,375

Int. Cl.^{2} B21D *1/12*

U.S. Cl. 72—380 **42 Claims**



1. Apparatus, which comprises:

- means for holding a strut of a vehicle having a wheel drum, a hub projecting through said drum, and a strut connected to said hub; and
- bending means operatively connected to said wheel drum but not contacting said strut for bending said strut while installed in said vehicle.

4,103,532
DEVICE FOR MEASURING THE DAMPING EFFECT OF MOTOR VEHICLE SUSPENSIONS

Carlo Buzzi, Via Risorgimento 60, Mandello Del Lario (Como), Italy

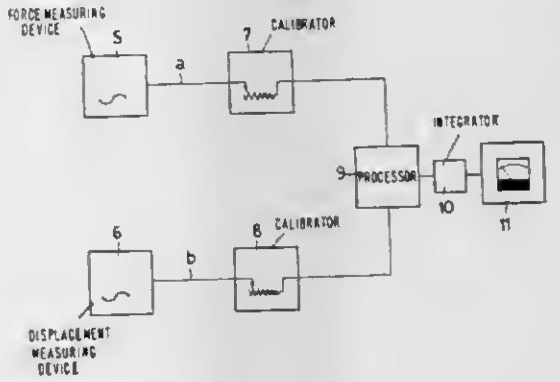
Filed May 11, 1977, Ser. No. 795,831

Claims priority, application Italy, Jun. 10, 1976, 7213 A/76

Int. Cl.^{2} G01M *17/04*

U.S. Cl. 73—11 **11 Claims**

1. A device for measuring the damping effect of motor vehicle suspensions, comprising operating means for imparting a periodic vertical oscillating movement to a motor vehicle suspension, first sensor means for transducing the instantaneous force transmitted to the suspension into an electrical signal, second sensor means for transducing the instantaneous displacements of the point of application of said oscillating movement to the suspension into an electrical signal, first processing means for integrating over one cycle the scalar product of the signals emitted by the first and second sensor means to produce a first signal which is indicative of the amount of energy dissipated in one cycle, and second processing means for dividing said first signal by a quantity proportional to the product of the oscillation frequency and the square of the oscillation amplitude to produce a second signal indicative of the value of the equivalent viscous damping coefficient of the suspension.



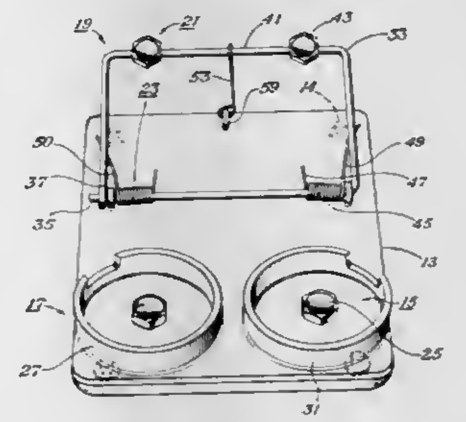
4,103,533
IMPACT GREASE TESTER

Curt Dinwiddie, Burbank, Calif., assignor to Lubrication Engineers, Inc., Fort Worth, Tex.

Filed Nov. 17, 1977, Ser. No. 852,197

Int. Cl.^{2} G01N *3/34*

U.S. Cl. 73—12 **6 Claims**



1. Apparatus for testing grease comprising:

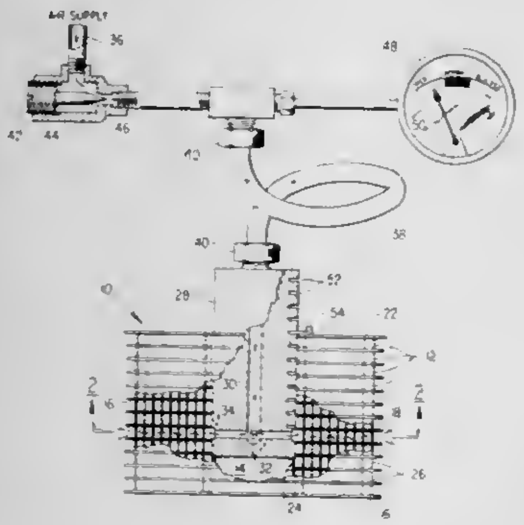
- a. a base;
- b. at least two anvil means carried by said base; each anvil means being adapted for receiving a grease sample thereon;
- c. display means disposed adjacent the respective said anvil means and adapted to display for visual observation any grease that is splattered from said anvil means under a predetermined impact load;
- d. bracket means carried by said base and adapted to deliver respective hammer means onto the respective anvil means and any grease thereon with equal impact forces;
- e. at least two hammer means carried by said bracket means such that said hammer means are disposed one each to strike respective said anvil means and deliver an impact thereto and to any grease thereon; and
- f. biasing means biasing said hammer means toward said anvil means with equal forces on each of said hammer means;

such that two greases can be emplaced on respective said anvil means and to be tested for tackiness and resistance to being displaced under shock loading by equal predetermined impact forces delivered by said hammer means and the results graphically displayed on said display means.

4,103,534
HIGH ENERGY LOSS DISK STACK TESTING APPARATUS

Robert Grant Hoof, Irvine, Calif., assignor to Control Components, Inc., Irvine, Calif.

Filed Jun. 3, 1977, Ser. No. 803,171
Int. Cl.^{2} G01M *3/02*
U.S. Cl. 73—37 **10 Claims**



1. A testing apparatus for

testing a disk stack having a central inlet and a peripheral outlet with labyrinth passageways formed in the stack between the inlet and the outlet at different heights of the disk stack to provide a predetermined resistance to fluid flow therethrough comprising:

a plug member sealably movable in the central inlet of said disk stack, said plug member having a passageway formed therein to supply fluid only to the labyrinth passageways aligned with the passageway of said plug member;

supply means connected to the passageway of said plug member to provide a supply of pressurized fluid thereto; and

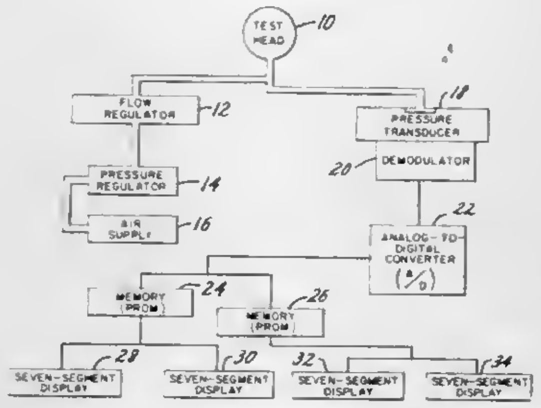
indicating means connected to said supply means to indicate the pressure of the fluid flowing from said supply means to the passageway of said plug member.

4,103,535
METHOD AND APPARATUS FOR EXAMINING ROD-SHAPED ARTICLES

Walter F. Mutter, and Francis M. Watson, III, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,756
Int. Cl.^{2} G01B *13/02*
U.S. Cl. 73—37.5 **10 Claims**

1. A method for measuring and displaying characteristics of rod-shaped articles, comprising the steps of:
(a) providing signal-addressable storage locations in preselected number;
(b) storing separately in said storage locations information signals indicative of diverse values of article characteristics in number equal to said preselected number;
(c) disposing a rod-shaped article to be examined in a fluid-pressurized conduit;
(d) generating an output signal indicative of back pressure from said conduit during disposition of said article therein;
(e) converting said output signal into a further signal having address indication in predetermined relation to such back pressure indication in said output signal whereby such further signal identifies that storage location containing an information signal indicative of the article characteristic value of such examined article; and

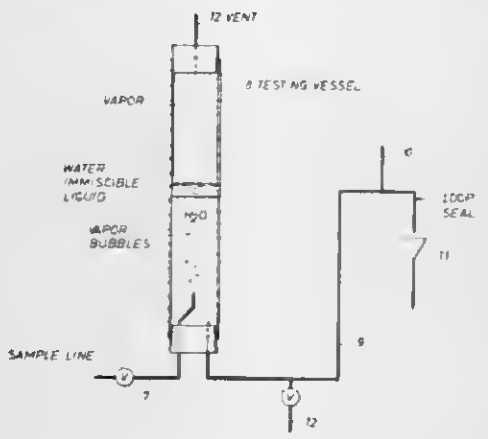


(f) displaying the value indication in said information signal stored in such storage location identified by said further signal.

4,103,536
METHOD FOR DETECTING LEAKS IN HEAT EXCHANGERS

Arthur H. Tigner Chipman, Long Beach, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 16, 1977, Ser. No. 768,934
Int. Cl.^{2} G01M *3/04*
U.S. Cl. 73—40 **2 Claims**



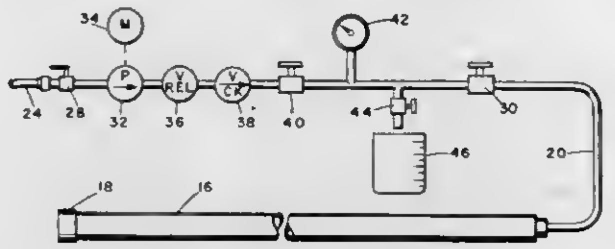
1. The method of detecting leakage into cooling water of water-immiscible, liquid or gaseous process fluids which comprise at least one member of the group consisting of hydrocarbon liquids having a lower density than water and hydrocarbon vapors, from at least one piece of indirect heat exchange equipment wherein the process fluid is at a higher pressure than the cooling water, which comprises continuously withdrawing a sample stream of cooling water downstream from said heat exchange equipment from the upper portion of the conduit in which the cooling water is returned to the cooling means and passing the sample stream through a vertical transparent testing vessel which permits visual observation of its contents, wherein the liquid flow is slowed sufficiently to permit entrained process fluids to separate while a constant water level is maintained, and determining the presence and, if desired, the identity of said process fluids separated in said testing vessel.

4,103,537
MEANS AND METHOD OF HYDROSTATIC TESTING

Floyd Ray Victor, San Diego, Calif., assignor to Rice Hydro Equipment Manufacturing, San Diego, Calif.

Filed Sep. 7, 1976, Ser. No. 720,902
Int. Cl.^{2} G01M *3/28*
U.S. Cl. 73—40.5 R **9 Claims**

1. A method of quantitatively determining leakage in hydrostatic testing of pipe lines, comprising the following steps in the order named:
(a) first measuring the leakage in terms of pressure drop, during a test period, in a test section of the pipe lines; and

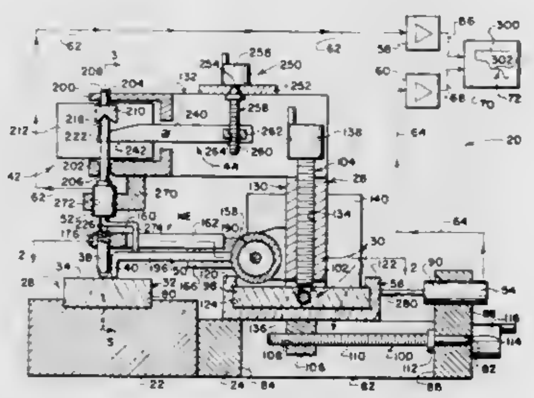


(b) converting the first measurement into terms of quantity of fluid loss by repressurizing the test section and then achieving an identical pressure drop by a reasonably quick, controlled bleeding of the test section collected into a measuring means to duplicate the leakage, and measuring the amount of bled-off fluid.

4,103,538
SURFACE HARDNESS TESTING APPARATUS

Theodor Stöferle, Weinbergstr. 29, D-6101 Seeheim and Paul Heinz Theimert, Gerhart-Hauptmann 10, D-6101 Weiterstadt, both of Germany

Filed Apr. 18, 1977, Ser. No. 788,661
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1976, 2617256
Int. Cl.^{2} G01N *3/46*
U.S. Cl. 73—81 **15 Claims**

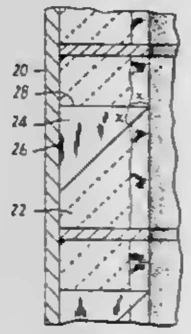


1. A surface hardness testing apparatus, comprising:
a. structure defining a test station adapted to receive and support a test member having a surface which is to be tested for hardness;
b. penetration member means for contacting and penetrating selected portions of the test surface;
c. sensor member means for gently engaging certain portions of the test surface at a location close beside the penetration member means;
d. penetration member support means for movably mounting the penetration member means for movement toward and away from the plane of the test surface;
e. sensor member support means for movably mounting the sensor member means for movement toward and away from the plane of the test surface;
f. force transmission means for applying a controlled loading to the penetration member means to effect its penetration of the test surface;
g. the penetration member support means and the sensor member support means being operable to permit concurrent lateral movement of the penetration member means and the support member means relative to the test member in directions paralleling the plane of the test surface while maintaining the penetration member means and the sensor member means in closely spaced relationship and without permitting the position and operation of the sensor member means to be influenced by the operation of the force transmission means; and,
h. transducer means for sensing relative positioning of the penetration member means and the sensor member means and for providing a corresponding representative output signal.

4,103,539
NON-DESTRUCTIVE REFRACTORY EROSION INDICATOR

Arthur C. Worley, Morristown, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 7, 1977, Ser. No. 766,129
Int. Cl.^{2} G01N *3/56*
U.S. Cl. 73—86 **7 Claims**

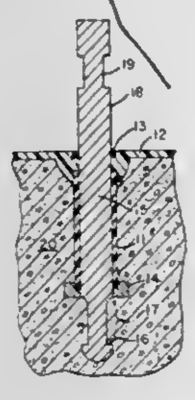


1. A gage for monitoring erosion and/or wear in combination with equipment having an erodable refractory lining, comprising: an indicator plate member disposed within the lining of said equipment having a triangular configuration including at least one dimension which corresponds to the original thickness of said lining of said equipment, said dimension being in the direction of the thickness of said lining, said indicator member comprising a material different from that of said refractory lining such that it is non-destructive during operation of said equipment, such that as said lining is eroded and/or worn from its original thickness said indicator member is exposed relative to the remaining thickness at said lining, whereby said indicator member provides monitoring means for determination of the erosion and/or wear of said lining.

4,103,540
TESTING DEVICE FOR IN-SITE CEMENTITIOUS MATERIAL

Robert R. McLaughlin, Jl. Baranangsiang, Bogor, Indonesia

Filed Sep. 23, 1977, Ser. No. 835,997
Int. Cl.^{2} G01N *3/00*
U.S. Cl. 73—88 C **7 Claims**



1. A device for testing the strength of cementitious material at some depth below the surface comprising in combination:
(a) a test rod of generally cylindrical shape,
(b) a reaction piece of generally cylindrical shape and having a hollow bore,
(c) said test rod having a central portion adapted for sliding engagement within said bore,
(d) said hollow bore having a length less than said test rod whereby each end of said rod protrudes from said bore,

(e) said test rod having a first end comprising a head portion with means to which an external axial force may be applied,

(f) said test rod having a second end comprising a foot portion,

(g) said test rod having a generally cylindrical portion extending from the central portion to the foot portion and occupying a region of cementitious material comprising the test grip,

(h) said test grip portion of said test rod having an inner diameter less than the diameter of said foot,

(i) said foot having a generally flat surface in a plane normal to the axis of the test rod adjoining the test grip portion,

(j) said reaction piece having a section with an outer diameter greater than said foot and a generally flat surface facing said foot, and terminating at an inner diameter adjoining said test rod

whereby said device may be cast into the cementitious material at some depth with said foot and said reaction piece spaced apart the distance comprising said test grip and an axial force may be applied to determine the strength of said cementitious material as a function of the force required to rupture the cementitious material in the test grip between said foot and said reaction piece.

4,103,541

METHOD OF AND A DEVICE FOR MEASURING A RELAXATION PHENOMENON

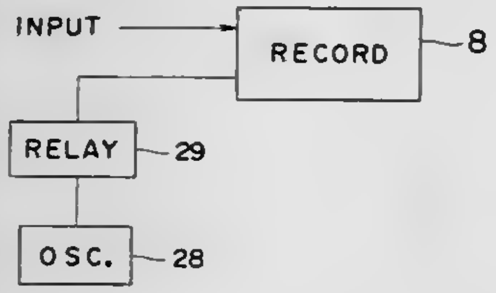
Kozo Arai; Teizo Kotani, both of Yokohama, and Toshio Mizushima, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

Filed Nov. 3, 1977, Ser. No. 848,160

Claims priority, application Japan, Jan. 12, 1977, 52-1431

Int. Cl.^{2} G01D *9/16;* G01N *3/06*

U.S. Cl. 73—88 R **3 Claims**



1. A method of measurement of relaxation phenomena, whereby pulse signals are generated at equal intervals for logarithmic values of time by means of a logarithmic time pulse oscillator, and input signals representing a relaxation phenomenon are recorded every time said pulse signal is delivered.

4,103,542

METROLOGY INSTRUMENT FOR MEASURING VERTICAL PROFILES OF INTEGRATED CIRCUITS

William R. Wheeler, Saratoga; George J. Kren, Los Altos, and Karel Urbanek, Atherton, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed Sep. 9, 1977, Ser. No. 831,870

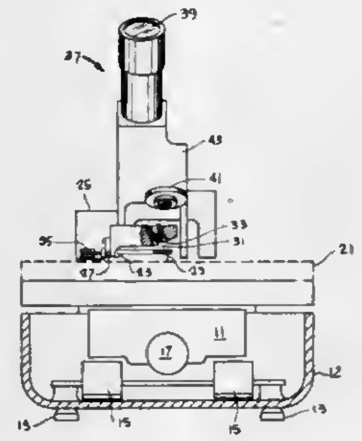
Int. Cl.^{2} G01B *5/28*

U.S. Cl. 73—105 **24 Claims**

1. A tilt compensated stylus scanner assembly comprising,

a balanced scanner arm mounted for rotation about a vertical axis, said scanner arm having a stylus mounted proximate to a first end of said scanner arm for contact with a flat article to be scanned, said scanner arm having scanning motion means connected to said scanner arm for providing motion to said scanner arm,

gimbal mount means having aligned pivots defining a horizontal axis and aligned pivots defining said vertical axis perpendicularly intersecting said horizontal axis for mounting said balanced scanner arm, said gimbal mount means itself mounted for rotation relation to a fixed base about said horizontal axis, and



force means connected to said base and communicating force to said gimbal mount means for compensating undesired tilt of said vertical axis with respect to said horizontal axis.

4,103,543

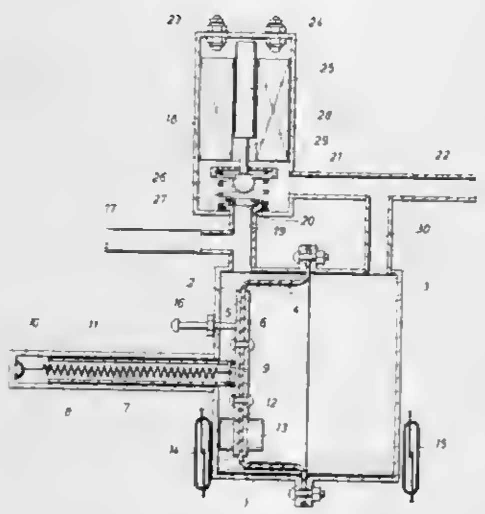
METHOD AND APPARATUS FOR DETERMINING VEHICLE FUEL CONSUMPTION

John W. Bertetti, 2215 San Jacinto, Pasadena, Tex. 77502

Filed Sep. 29, 1976, Ser. No. 727,417

Int. Cl.^{2} G01L *3/26*

U.S. Cl. 73—114 **5 Claims**



1. Apparatus for indicating the ratio of fuel consumption to distance travelled in a vehicle having a motor, a fuel supply and a fuel line extending between said motor and said supply, comprising

container means having an internal fuel-filled chamber and first and second ports interconnecting said chamber with said fuel line,

a movable wall member disposed in said container means for dividing said chamber into a first compartment interconnected with said first port for receiving fuel from said fuel line and a second separate compartment interconnected with said second port for supporting and discharging a preselected quantity of fuel into said fuel line,

valve means interconnected with said fuel line and normally positioned to permit fuel flow to by-pass said container means and alternatively positionable to divert fuel flow from said supply to said first port and into said first compartment in said container means to displace said preselected quantity of fuel from said second compartment therein through said second port and said fuel line to said motor,

metering means for generating discrete impulses functionally related to predetermined increments of distance travelled by said vehicle during said displacement of said preselected quantity of fuel,

counting means responsive to said metering means for counting the number of said discrete impulses generated by said metering means during said displacement of said preselected quantity of fuel to said motor and for providing a visible representation of said number of discrete impulses counted thereby indicating the ratio of fuel consumed to distance traveled,

first actuating means interconnected to said valve means and to said metering means and energizable for positioning said valve means to said alternative position to divert said fuel flow from said supply to said first port and instituting generation of said discrete impulses simultaneously therewith,

second actuating means interconnected to said first actuating means and responsive to manual initiation for energizing said first actuating means, and

means interconnected with said movable wall and responsive to said displacement of said preselected quantity of fuel for deactuating said first actuating means for interrupting generation of said discrete impulses and for repositioning said valve means to said position for allowing said fuel flow to normally by-pass said chamber means simultaneously therewith.

4,103,544

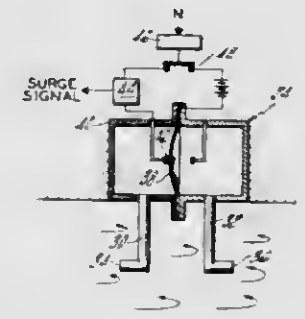
TURBINE ENGINE SURGE DETECTOR

Peter V. Beckmann, Lake Park, and James B. Kelly, Lake Worth, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 18, 1977, Ser. No. 825,871

Int. Cl.^{2} G01M *15/00*

U.S. Cl. 73—115 **7 Claims**



1. Apparatus for detecting incipient surge in a gas turbine type power plant having an axial flow compressor comprising a pair of back-to-back disposed pitot tubes extending in the working medium of the gas turbine power plant, each of said pitot tubes oriented so that each of its openings is disposed substantially parallel to the flow of the working medium, means for sensing the pressure differential created by said pair of pitot tubes and means responsive to a predetermined threshold value of said pressure differential below which a signal is produced indicative of an incipient surge in said compressor.

4,103,545

LOAD CELL

Stanley J. Rykwalder, Farmington, and Frederick J. Zink, Redford, both of Mich., assignors to Lebow Associates, Inc., Troy, Mich.

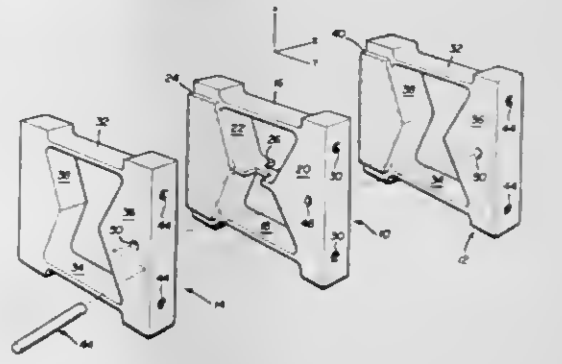
Filed Sep. 9, 1977, Ser. No. 832,044

Int. Cl.^{2} G01L *1/26*

U.S. Cl. 73—141 A **3 Claims**

1. A device for measuring forces along and parallel to a first axis comprising:

a sensing structure comprising a first pair of spaced parallel beams oriented with their longitudinal axes perpendicular to the first axis and coplanar therewith; a first pair of end structures extending parallel to the first axis and interconnecting the ends of said first pair of beams; said first pair of beams and their connections with said end structures being configured to be resiliently yieldable to a relatively large degree to forces applied parallel to the first axis but substantially unyieldable to forces applied along a third axis mutually perpendicular to the first axis and to said longitudinal axes, said first pair of beams and said end structures forming a generally rectangular substantially open-centered structure which yields as a parallelogram in response to applied forces to be measured, said first pair of beams preventing relative rotation between said end structures, said pair of end structures being essentially rigid and unyieldable within the range of forces to be measured; and a sensing member located parallel to and midway between said first pair of beams and rigidly connected at its ends to the mid-points of said end structures, said sensing member being constructed and proportioned to be resiliently yieldable to forces to be measured, but less yieldable thereto than are said first pair of beams, and substantially unyieldable to forces applied along said third axis, one of said end structures adapted to have the force to be measured applied thereto as the force input element and the other of said end structures adapted to be the force output element of said sensing structure;



a pair of outer structures located on opposite sides of said sensing structure and spaced therefrom in a direction parallel to said third axis, each of said outer structures comprising a pair of spaced parallel flexural beams parallel to said first pair of beams, and a pair of end structures parallel to said first pair of end structures and interconnecting the ends of said flexural beams of said outer structures so that each of said outer structures is in the form of a generally rectangular open-centered structure which yields as a parallelogram in response to applied forces to be measured, said flexural beams preventing relative rotation between the end structures which they interconnect;

said force output element of said sensing structure being rigidly joined to the corresponding end structure of each of said outer structures, but said sensing and outer structures being otherwise normally unconnected to each other, the other end structure of each of said outer structures being rigidly connected to a fixed reaction structure;

whereby the bending of said sensing member in response to a force to be measured applied parallel to the first axis is proportional to such force.

4,103,546

TENNIS RACQUET STRING TENSION GAUGE

Robert Hickey, 1725 N. 16th Ave., Hollywood, Fla. 33020, and Erik Fahnoe, 655 Jeffrey St. #103, Boca Raton, Fla. 33432

Filed Sep. 22, 1976, Ser. No. 725,666

Int. Cl.^{2} G01L *5/06*

U.S. Cl. 73—145 **5 Claims**

1. A guage for measuring the tension in the strings of a tennis racquet head comprising:

a rigid frame including

an upper arm having opposite end portions and an intermediate portion;

end portions lying in the same plane surface and said intermediate portion being spaced from a planar surface parallel to the planar surface of said end portions

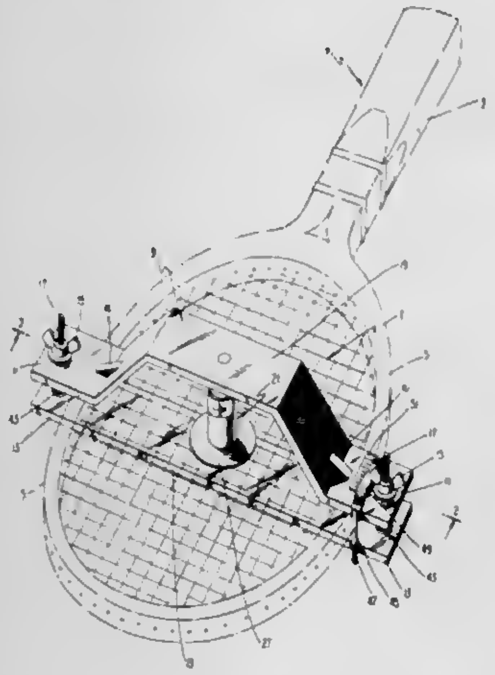
a lower arm;

attachment means including means disposed on the opposite ends of the frame for clamping said upper and lower arms about the head of a tennis racquet for releasably securing said frame across said head;

a first spring housing on said frame projecting toward a racquet face;

a second housing telescopically received in said first housing and including a pressure plate in position for engaging a plurality of strings of the racquet face;

a spring disposed inside said first and second housings for biasing said housings axially apart from each other;



means on said housing for indicating the force exerted by said tennis racquet strings on said spring by means of said pressure plate and thereby providing an indication of the tension in the strings of the racquet; and,

means for correcting the calibration of the gauge to account for head frames of different thicknesses comprising:

- a thickness guide supported from one end of said upper arm projecting toward said lower arm and including a scale on the end thereof aligned with an edge of said lower arm; and,
- said lower arm edge being cooperative with said scale to provide a correction factor whereby the string tension may be accurately measured for tennis racquets having head frames of different thicknesses.

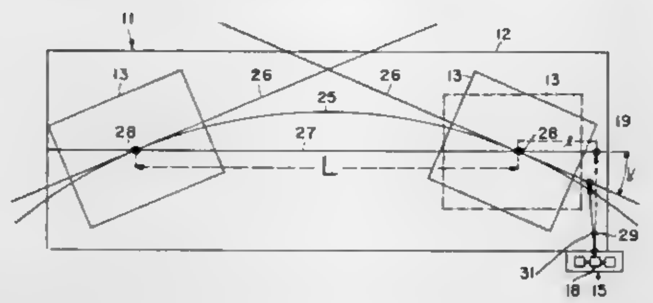
4,103,547
LOCOMOTIVE TRACK CURVATURE INDICATOR
Joseph D. Vrabel, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.
Filed Feb. 7, 1977, Ser. No. 765,876
Int. Cl.² G01M *17/02*
U.S. Cl. 73—146 **8 Claims**

1. Apparatus for dynamically determining track curvature and comprising:

a railroad car comprising a car frame pivotally supported on track means;

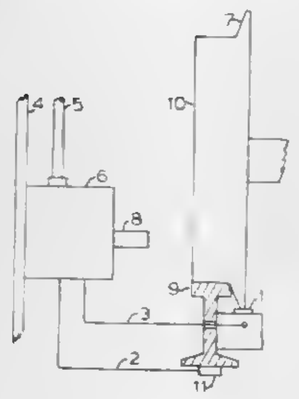
a sensor means for mounting on said railroad car frame, said sensor means producing a variable output responsive to rotational movement in the horizontal plane between said railroad car frame and said track means;

control circuit means for converting said output into an electrical signal representative of the track curvature causing said rotational movement; and



indicator means receiving said signal and providing dynamic and static indications of track curvature in response thereto.

4,103,548
WHEEL-WEAR MONITOR
Frank W. McDonald, 4420 Choctaw Circle, SE., Huntsville, Ala. 35801
Filed Mar. 7, 1977, Ser. No. 774,918
Int. Cl.² G01M *17/00*
U.S. Cl. 73—146 **2 Claims**



1. Apparatus mounted at track side which detects overlength flanges of freight car wheels, predicts wheel position for the purpose of marking, marks the wheel with a pneumatically driven paint pellet, and is comprised of:

a. Multiple rail-mounted contacts, one set for each direction of train travel, so positioned with respect to the rail surface that flanges of worn wheels momentarily actuate the switches, sending pulses to pulse detectors;

b. pulse detectors which receive the input pulses from the rail-mounted contacts and generate a timing marker which passes through the logic unit and actuates counters;

c. a logic unit which is selective between two sets of rail-mounted contacts, as required for direction of travel of the train and which utilize the output of counters in conjunction with constants derived from the installation configuration to compute and transmit to the comparator, timing values required to produce timed signals that discharge an air pellet gun, operate the shuttle in the air pellet gun for the purpose of reloading the gun, operate the reload accessories which reload the gun, cut off counter (**14C**), and reset all counters to zero in readiness for detection of the next overlength flange;

d. a comparator which (1) compares the outputs of counters (**14A** and **14B**) for equality and monitors the output of an underrail load cell to prevent tampering and (2) compares the output of a free-running counter, (**14C**) with timing values from the logic unit and on coincidence (3) generates signals which operate pneumatic valves and apply and remove compressed air to and from the air gun discharge chamber, drive the shuttle in the air pellet gun to reload the gun, drive reload rams to reload the shuttle,

stop counter (**14C**), and resets the counters to zero in preparation for the next overlength flange;

e. counters which are activated and deactivated by signals from pulse detectors (**14C** deactivated by comparator generated signal) and which count cycles of a time base oscillator that are transmitted to the comparator and, in the case of counters **14A** and **14B**, to the logic unit;

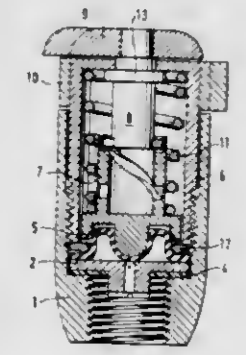
f. reload accessories consisting of refillable springloaded clips with paint pellets and electrically controlled pneumatic pistons which punch paint pellets from the clips into bores in the shuttle in the air pellet gun;

g. an oscillator which provides the signal to the counters and provides the time base for predicting an intercept of a paint pellet and a wheel in motion and a means for synchronizing the apparatus operations;

h. a load cell which the comparator monitors to assure the presence of a train on the track, and

i. an air-pellet gun which is discharged by an electrically controlled pneumatic valve, on signal from the comparator, and which drives a marking paint pellet into the face of a wheel.

4,103,549
TIRE VALVE CAP WITH PRESSURE INDICATOR
Helmut Schmidt, Keplerstrasse 51, 7530 Pforzheim, Fed. Rep. of Germany
Filed Jun. 20, 1977, Ser. No. 808,180
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627529
Int. Cl.² B60C *23/04*
U.S. Cl. 73—146.8 **10 Claims**



1. A pressure indicating valve cap assembly which is adapted for attachment to a conventional automotive tire valve, the assembly comprising in combination:

an elongated closed housing structure with a female connecting thread in one end portion by which it can be threaded onto the end of a tire valve stem in the manner of a conventional tire valve cap, the housing structure having an axial bore and including means for opening the tire valve so as to connect an axial end portion of said bore with the tire pressure;

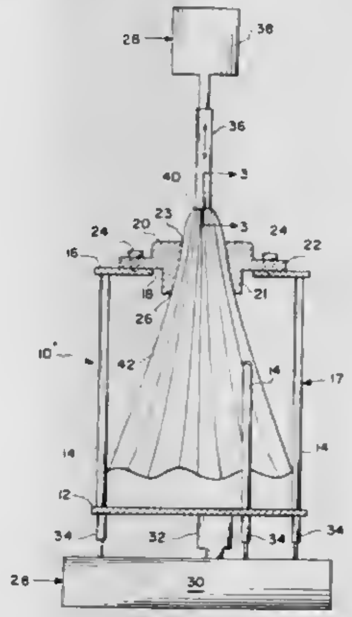
piston means arranged inside the housing structure and guided for movement along its axial bore, the piston means being exposed to the tire pressure and biased against said pressure by a spring, so that a change in tire pressure reflects itself in a corresponding axial displacement of the piston means;

rotary pointer means journalled inside the housing structure, in a generally coaxial relationship with its axial bore, the pointer means including a pointer member with a pointer protrusion which is located on the outside of the housing structure;

a stationary pointer protrusion arranged on the housing structure, in the vicinity of the path of said pointer member protrusion, so that the relative angular positions of the two pointer protrusions are ascertainable visually and by finger touch; and

means for converting the axial displacements of the piston means into rotary displacements of the pointer means.

4,103,550
NOZZLE EXTRACTION PROCESS AND HANDLEMETER FOR MEASURING HANDLE
Vernon L. Alley, Jr., Newport News, and Austin D. McHatton, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 19, 1976, Ser. No. 733,825
Int. Cl.² G01L *5/04*
U.S. Cl. 73—159 **30 Claims**



1. A system for quantitatively measuring the handle of flexible materials comprising:

a nozzle composed of a truncated cone section and an annulus section;

a sample of flexible material to be measured;

means for holding said nozzle;

means for drawing said flexible material sample through the truncated cone and annulus sections of said nozzle;

means for determining a force necessary to draw said flexible material sample through said nozzle; and

means for determining a displacement of said flexible material sample with respect to said nozzle in order to determine a compaction ratio of said flexible material sample in said nozzle.

4,103,551
ULTRASONIC MEASURING SYSTEM FOR DIFFERING FLOW CONDITIONS
Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.
Filed Jan. 31, 1977, Ser. No. 763,939
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A **23 Claims**

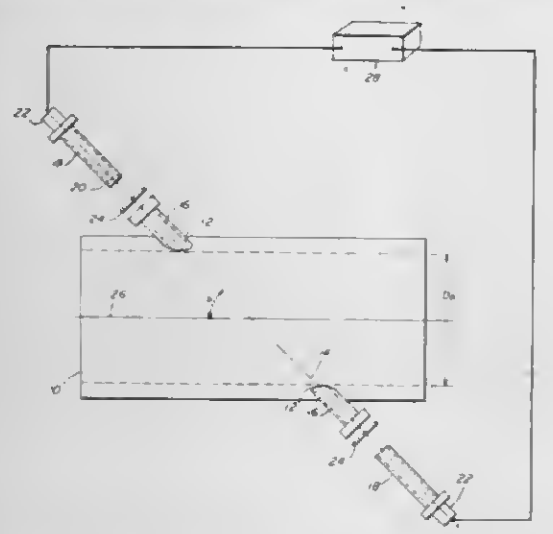
22. The method of measuring ultrasonic response characteristics of a fluid medium flowing within a duct having a circular internal cross section comprising the steps of

transmitting a beam of ultrasonic energy into said flowing material from a first position on the duct wall located on a midradius chord of said circular cross section,

directing said beam along the entire length of said midradius chord,

measuring at a second position ultrasonic energy transmitted through said fluid medium;

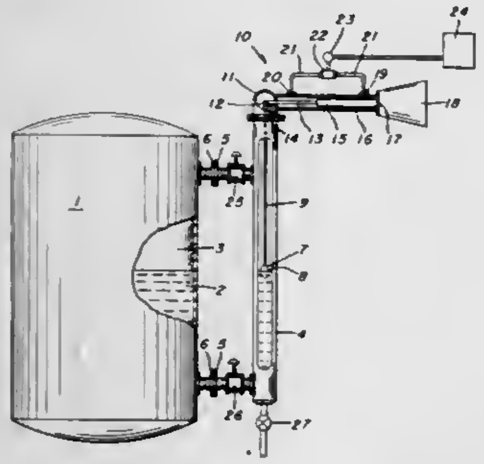
said beam following a path from said first position to said second position that includes said midradius chord; and



directing said beam along at least one other midradius chord prior to said measuring step.

4,103,552
IN-SERVICE CLEANING OF A LIQUID LEVEL SENSOR

Bernard A. Bucchianeri, Carrol Township, Washington County, and Robert A. Senchur, Plum Boro, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed May 24, 1976, Ser. No. 689,609
Int. Cl.² B08B ***3/02;*** **G01F** ***23/10***
U.S. Cl. 73—309 **1 Claim**



1. In a combination which includes a vessel for containing liquid and a liquid level sensor connected to said vessel, said sensor comprising:

means forming a chamber communicating with said vessel to receive liquid therefrom;

a displacer within said chamber movable up and down with changes in the level of liquid in said vessel;

a tubular housing located at the top of said chamber and communicating therewith;

rotary means within said housing and connected with said displacer; and

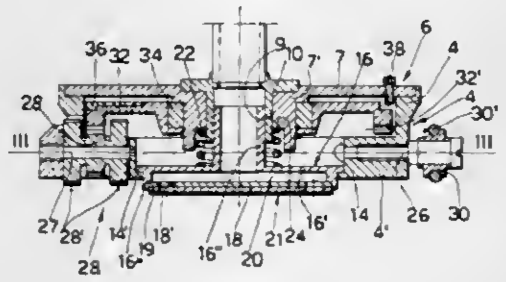
a controller carried by said housing and operatively connected with said rotary means;

the improvement comprising:

two tubular fittings connected to said housing adjacent opposite ends thereof; and a source of cleaning liquid externally located with respect to said housing, said source serving to provide liquid under sufficient pressure for introduction into said housing; said tubular fittings each serving to increase the flow of cleaning liquid so as to inject a stream of cleaning liquid into the housing for flushing solid particles from said housing and from the rotary means within said housing; and means for selectively conducting cleaning liquid out of the housing.

4,103,553
APPARATUS FOR THE INDIRECT MONITORING OF THE RADIOACTIVE CONTAMINATION OF SURFACES

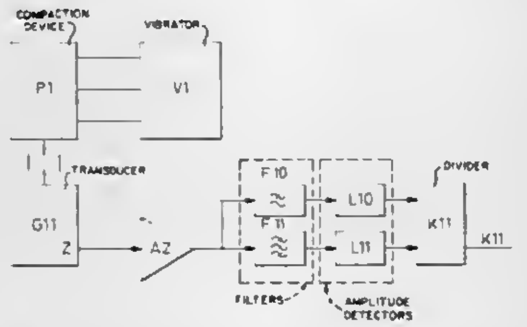
Mario De Blasis; Antonio Moccaldi; Attilio Rori, and Silvano Tagliati, all of Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare-CNEN, Rome, Italy
Filed Jul. 27, 1976, Ser. No. 709,185
Claims priority, application Italy, Sep. 4, 1975, 51197 A/75
Int. Cl.² G01N ***1/04***
U.S. Cl. 73—425 **9 Claims**



1. An apparatus for the indirect monitoring of the radioactive comtamination of surfaces by smearing a predetermined area thereof by means of a thin disk of filter paper or similar material which apparatus comprises a hollow cylindrical member with parallel end walls and a peripheral wall which walls define a space within said member, one of said parallel walls being provided with an array of through bores; a pierced layer of elastic material over said pierced wall which layer is provided with a similar array of through holes as said pierced wall the holes of the latter and of the elastic layer being made to coincide, said thin disk of filter paper being applied over the exposed face of said elastic layer; a cylindrical guide attached to a wheeled frame in which guide said cylindrical member is slidably fitted, a helical spring being provided for biasing said member towards said surface, the space within said cylindrical member being connected to an exhausting means.

4,103,554
METHOD AND A DEVICE FOR ASCERTAINING THE DEGREE OF COMPACTION OF A BED OF MATERIAL WITH A VIBRATORY COMPACTING DEVICE

Heinz Friedrich Thurner, Bunsövägen 29, Slatsjö-Boo, Sweden (13200)
Filed Mar. 2, 1977, Ser. No. 773,783
Claims priority, application Sweden, Mar. 12, 1976, 7603249; Aug. 3, 1976, 7608709
Int. Cl.² G01M ***7/00;*** **E02D** ***3/06***
U.S. Cl. 73—573 **9 Claims**



1. A method for measuring the degree of compaction achieved in a bed of material by a vibratory compaction device comprising the steps of:

vibrating the compaction device against the bed of material to be compacted to generate a characteristic signal of the vibratory motion of the compacting device against said material, said characteristic vibratory motion signal having a fundamental frequency and a plurality of harmonic frequencies;

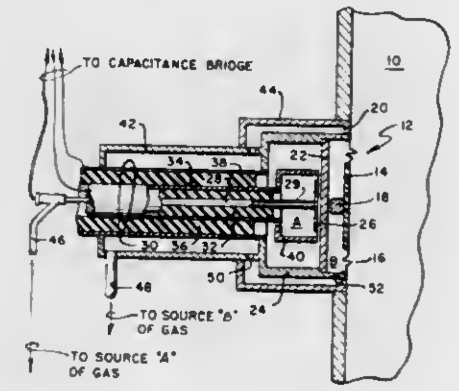
measuring the amplitude of said characteristic vibratory motion signal at said fundamental frequency;

measuring the amplitude of said characteristic vibratory motion signal for at least the second harmonic of said fundamental frequency; and

comparing the measured amplitudes of said fundamental frequency and said at least second harmonic frequency to ascertain the degree of compaction of said bed of material.

4,103,555
PRESSURE SENSOR FOR HIGH-TEMPERATURE LIQUIDS

George A. Forster, Westmont, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jun. 6, 1977, Ser. No. 804,123
Int. Cl.² G01L ***7/08, 9/12***
U.S. Cl. 73—706 **4 Claims**



1. A sensor of pressure in a fluid comprising:

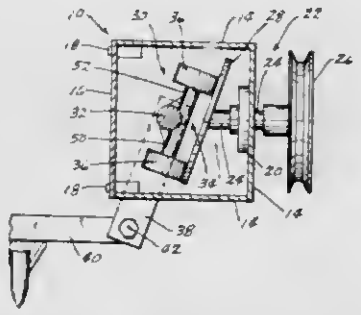
a soft diaphragm exposed on a first side to the fluid and on a second side to a first source of gas at a first gas pressure;

a stiff diaphragm exposed on a first side to the first source of gas and on a second side to a second source of gas at a second gas pressure, the stiff diaphragm disposed in pushing engagement with the soft diaphragm such that motion of the soft diaphragm is transmitted to the stiff diaphragm when and only when the pressure in the fluid exceeds the first and second gas pressures; and

means for measuring displacement of the stiff diaphragm, which displacement is a function of the pressure in the fluid.

4,103,556
MECHANICAL MOVEMENT MECHANISM

Louis L. Niday, 2816-42nd, Des Moines, Iowa 50310, assignor to Louis L. Niday, Des Moines, Iowa
Filed May 12, 1976, Ser. No. 685,656
Int. Cl.² F16H ***21/16***
U.S. Cl. 74—25 **12 Claims**



1. A mechanical movement assembly comprising:

a frame means;

rotatable means rotatably attached to said frame means and having a contact face disposed at an oblique angle to the axis of rotation of said rotatable means;

an oscillatory shaft rotatably attached to said frame means;

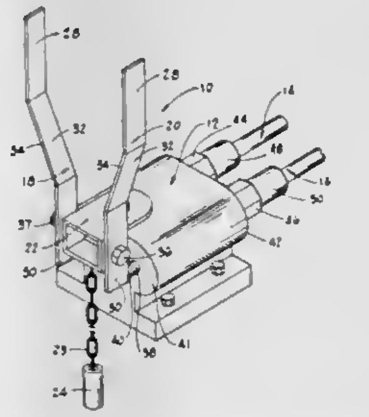
bearing means attached to said oscillatory shaft and oscillated thereby and in contact with said contact face;

said bearing means including a first bearing arm attached to said oscillatory shaft and spaced in one direction from the longitudinal axis of the oscillatory shaft and a second bearing arm attached to said oscillatory shaft and spaced in an opposite direction from said first bearing arm; and

said first bearing arm being offset parallel with respect to said second bearing arm and disposed such that the midpoint between the axes of the first and second bearing arms is intersected by the axis of rotation of said rotatable means.

4,103,557
TOOL APPARATUS FOR MOUNTING ON A HOUSING

Richard E. Guthrie, 524 S. 7th St., and Ronald L. Allenbach, 516 S. 8th St., both of Kiowa, Kans. 67070
Continuation of Ser. No. 628,583, Nov. 4, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,360
Int. Cl.² F16H ***21/44***
U.S. Cl. 74—102 **4 Claims**



1. A tool apparatus for urging a pair of slidably mounted plungers inwardly into a housing, the apparatus comprising:

a hollow angular shaped lever mount having a top portion, a bottom portion, side portions, and a hollow center portion, said lever mount having an outwardly extending flange portion integrally formed in the top portion of said lever mount, the flange portion having an aperture therein for receiving a bolt therethrough and securing the lever mount to the housing; and

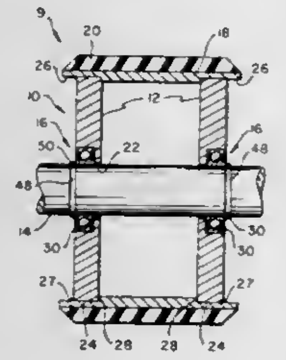
a pair of levers having a first end, a second end, sides, and an edge therearound, a portion of the sides of said levers disposed against the side portions of said lever mount, the sides of said levers and the side portions of said lever mounts having apertures in said levers indexed with the apertures in the side portions of said lever mount for receiving a bolt therethrough and rotatably mounting said levers to said lever mount.

4,103,558
BOGIE WHEEL

Edwin A. Peabody, deceased, late of Grosse Pointe Woods, Mich., and by Gertrude A. Peabody, administratrix, 1010 Rowlyn Rd., Grosse Pointe Woods, Mich. 48236
Filed Sep. 13, 1976, Ser. No. 722,484
Int. Cl.² F16H ***55/48;*** **B62D** ***55/14***
U.S. Cl. 74—230.7 **2 Claims**

1. A bogie wheel comprising a shaft, a wheel body composed of a pair of laterally spaced radially extending annular flanges, a rim extending about the radially outer peripheries of said flanges, sealed bearings mounting said flanges on said shaft, the axially outer surfaces of said flanges at the radially

inner edges thereof having recesses in which said bearings are disposed, and removable retainers on said shaft on opposite sides of said wheel body and engageable with said bearings to retain said wheel body on said shaft.



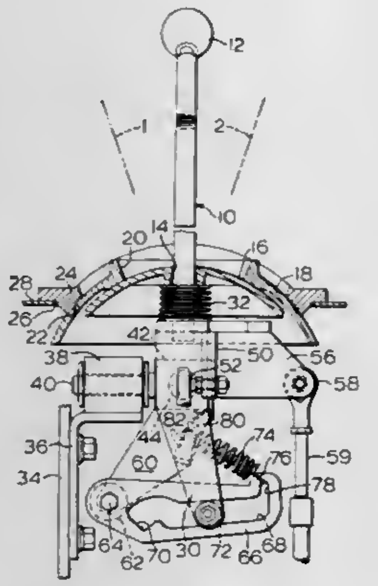
4,103,559
DETENTED MANUAL ACTUATOR FOR A MULTIFUNCTION SYSTEM

Ramon C. Kuhler, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 9, 1977, Ser. No. 776,075

Int. Cl.² G05G *9/00*

U.S. Cl. 74—471 XY **8 Claims**



4. A manual actuator for a multifunction system, comprising:
- a lever including a manually grippable handle and a projection on said lever;
- a first mounting element mounting said lever for movement along a first axis between first and second positions;
- a second mounting element mounting said first mounting element, and thus said lever, for movement along a second axis intersecting said first axis so that said lever is movable between third and fourth positions; and
- a detent mechanism carried by said first mounting element, and movable therewith along said second axis for holding said lever in at least one of said first and second positions, said detent mechanism including a detent element having a recess opening towards said projection movably mounted on said first mounting element, and means urging said detent element toward said projection.

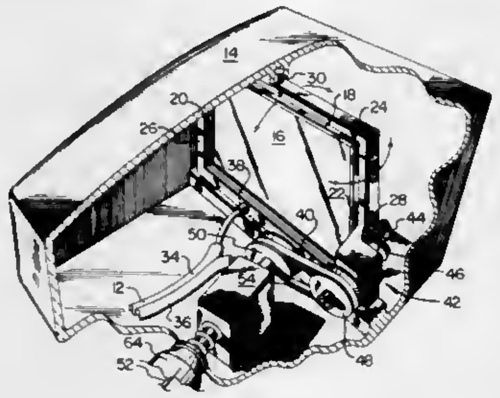
4,103,560
DAY-NIGHT MIRROR CONTROL APPARATUS

Robert W. Stoffel, 1890 Le Tarte, and Robert A. Berntsen, 4295 Armstrong Rd., both of Muskegon, Mich. 49441

Filed Mar. 17, 1977, Ser. No. 778,701

Int. Cl.² F16C *1/14*

U.S. Cl. 74—501 M **31 Claims**



16. An improved control apparatus for an outside, day-night, rearview mirror of the type having reflective surfaces on relative opposite sides thereof and supported within gimbal mounted mirror frame means connected to a control bat through a series of control cables adapted for sychronous pivotal control of said mirror in adjusting the bi-axial field of view and day-night flip configuration thereof, said improvement comprising a mechanical servo adapted for flipping said mirror to respectively identical field of view positions and being interposed between and interconnected with said mirror and control bat and including a housing having a movable transducer assembly mounted therein and coupled thereto in selectable interengagement, which interengagement is responsive to actuation of said control bat for controllably segregating an imparted transducer movement for purposes of flipping said mirror from an imparted transudcer movement for purposes of adjusting the field of view of said mirror.

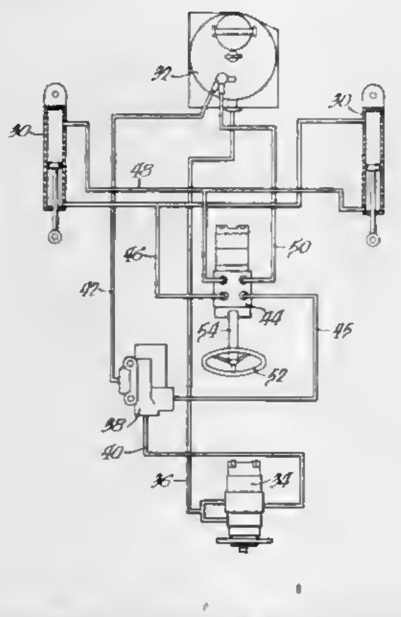
4,103,561
VEHICLE WITH IMPROVED STEERING SYSTEM

Donald C. Baker, Rosedale, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 31, 1977, Ser. No. 783,164

Int. Cl.² B62D *1/04;* F16D *31/02*

U.S. Cl. 74—552 **14 Claims**



8. In an articulated vehicle having a forward section and a rear section pivotally interconnected for relative movement about a vertical pivot, hydraulic motor means connected to the respective sections for pivoting said sections about said vertical pivot, a pressurized fluid source, a control member actuatable to supply pressurized fluid from said source to said hydraulic motor means and an actuator movable about a fixed rotational axis and connected to said control member for actuating said control member, the improvement comprising means within said actuator providing increased mass spaced from said rotational axis for producing increased moment of inertia for said actuator so that a normal input force normally applied to said actuator by an operator will gradually accelerate said pivotal movement of said sections relative to each other and thereby reduce the lateral jerky motion to the operator that is spaced from a reference pivot point for a section having an operator's seat thereon.

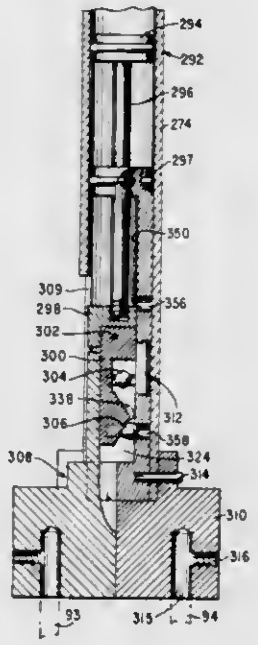
4,103,562
SEWING APPARATUS

Ronald J. Boser, Huntington Station, N.Y., assignor to B & W Manufacturing Co., Inc., New York, N.Y.

Division of Ser. No. 591,948, Jun. 30, 1975, Pat. No. 3,994,246, which is a division of Ser. No. 402,876, Oct. 2, 1973, Pat. No. 3,893,402. This application Aug. 30, 1976, Ser. No. 718,482

Int. Cl.² F16H *53/00;* G05G *5/06;* F16H *25/08, 25/16*

U.S. Cl. 74—567 **7 Claims**



1. A linear motion apparatus with locking comprising
- a support having a locking recess formed in a surface thereof;
- a member to be moved and locked, said member slidably mounted for movement in a first direction along the support, said member having a bore extending in a second direction transverse to the first direction, said member having a locking element slidably mounted in the member bore for movement in the second direction;
- a cam slidably mounted for movement in the first direction relative to both the support and the member, said cam engaging the locking element as so to urge the locking element in the first and second directions when the cam is moved in the first direction;
- said locking element when engaged by the cam being slidable along the surface of the support to the locking recess; and
- a single linear motor connected to the cam for moving the cam in the first direction whereby the cam applies force in both the first and second directions to the locking element to move the member in the first direction to a first position were the cam urges the locking element into the locking recess to lock the member in the first position.

4,103,563
METHOD AND STRUCTURE FOR ORIENTING A BICYCLE PEDAL

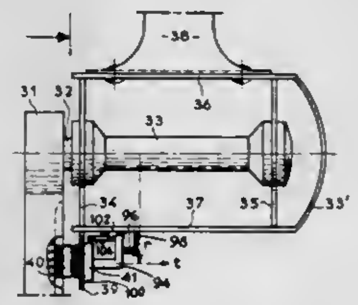
Claude Genzling, 15 Avenue des Cedres, 92410 Ville D'Avray, France

Filed Feb. 17, 1977, Ser. No. 769,694

Claims priority, application France, Dec. 10, 1976, 76 37271

Int. Cl.² G05G *1/14;* B60B *37/00*

U.S. Cl. 74—594.5 **14 Claims**



2. In a bicycle, rotary crank means having a turning axis about which said crank means rotates during operation of a bicycle, said rotary crank means having a free end region distant from said axis and carrying at said free end region a shaft extending from said crank means in a direction parallel to said axis, pedal means supported by said shaft for free rotation at all times with respect thereto and having an upper surface adapted to be engaged by a sole of a shoe of a cyclist during operating of the bicycle, said pedal means carrying a toe-clip means which extends around the toe region of a shoe which engages the upper surface of said pedal means during operation of the bicycle, and magnetic orienting means operatively connected with said pedal means for automatically orienting the latter magnetically when it is not engaged by a shoe of a cyclist in an attitude where the upper surface of the pedal means is directed upwardly and substantially horizontal at least when said rotary crank means has turned through an angle of approximately 90° beyond a top dead center position of said rotary crank means, and said orienting means acting on said pedal means without inhibiting the freedom of said pedal means to turn with respect to said shaft.

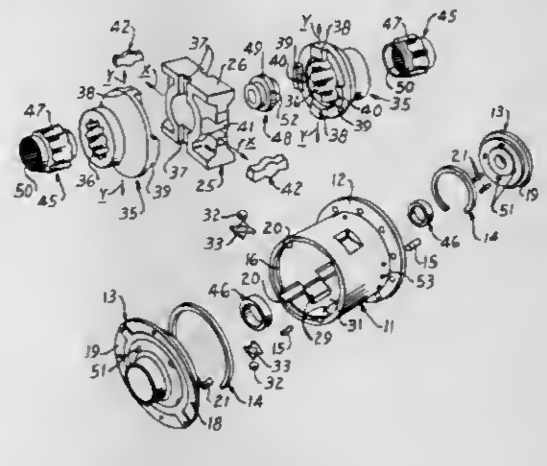
4,103,564
LIMITED SLIP DIFFERENTIAL

Samuel I. Caldwell, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1976, Ser. No. 751,565

Int. Cl.² F16H *35/04*

U.S. Cl. 74—650 **60 Claims**



1. A differential disposed for rotation on a longitudinal axis thereof comprising
- a housing,
- a slide block,
- means mounting said slide block in said housing for rotation

therewith and for permitting said slide block to reciprocate in a first direction perpendicular relative to said axis,

a pair of intermediate members disposed on either side of said slide block and each having first driving means thereon,

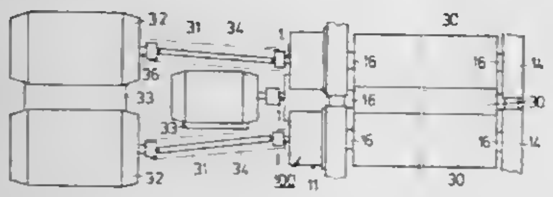
interengaging guide means formed on said slide block and on each of said intermediate members for permitting each intermediate member to reciprocate on said slide block in a second direction perpendicular relative to said first direction and relative to said axis,

a pair of driven members each mounted for rotation about said axis on said housing and having second driving means thereon which engage with said first driving means of a respective one of said intermediate members whereby each intermediate member is adapted to orbit in a circular path about said axis, and

means operatively interconnected between said slide block and each of said intermediate members for forcing said driven members to rotate in opposite directions during all phases of differentiation of said differential comprising a pair of cross-over control pivot members disposed on opposite sides of said slide block and pivotally mounted thereon.

4,103,565
ROLL DRIVE FOR PAPER MACHINES AND THE LIKE

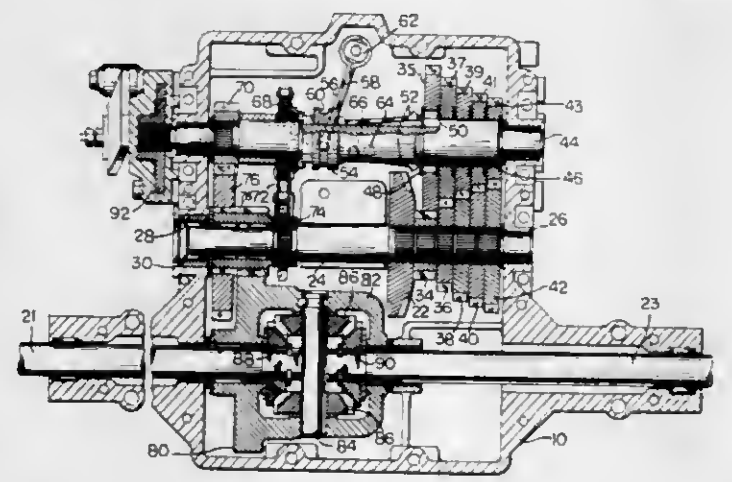
Martti Matikainen, and Juhani Ovaska, both of Jyväskylä, Finland, assignors to Valmet Oy, Helsinki, Finland
Filed Apr. 22, 1976, Ser. No. 679,234
Claims priority, application Finland, Apr. 25, 1975, 751262
Int. Cl.^{2} F16H *37/06, 57/02, 1/28;* **B21B** *35/00*
U.S. Cl. 74—665 L **9 Claims**



1. In a machine which has a roll which is to be rotated about its axis, such as a machine of the type used in connection with the manufacture of paper, said roll having an end situated at a plane which is normal to said roll axis, and support means situated at said plane for supporting said roll at said end thereof for rotation about said axis, planetary gear transmission means situated adjacent to said plane and having an output and an input, connecting means connecting said output of said planetary gear transmission means to said end of said roll for transmitting a drive from said planetary gear transmission means to said roll, and rotary drive means operatively connected with said input of said planetary gear transmission means for driving said roll through said planetary gear transmission means and said connecting means, said planetary gear transmission means including an outer ring gear having inner and outer teeth, an inner sun gear, and a rotary spider means carrying a plurality of planetary gears which extend between and mesh with said inner sun gear and said inner teeth of said outer ring gear, said rotary spider means forming said output of planetary gear transmission mean while said sun gear forms said input thereof, and said support means including an outer stationary ring surrounding said outer ring gear and having inner teeth with which said outer teeth of said outer ring gear mesh, thus providing between said outer stationary ring and said outer ring gear and geared connection supporting said outer ring gear for substantially free movement in a plane containing said outer ring gear, planetary gears, and sun gear, said free movement of said outer ring gear being a non-rotary movement for the purpose of compensating for any inaccuracies which otherwise might be present in the mounting of said planetary gear transmission on said support means, said spider means having a pair of walls between which said planetary gears are located and including bodies extending between and fixed to said walls and situated circumferentially between said planetary gears.

4,103,566
TRANSAXLE

Roland L. von Kaler, Tecumseh, and Norman E. Jolliff, Tipton, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.
Filed Dec. 6, 1976, Ser. No. 747,916
Int. Cl.^{2} F16H *37/08*
U.S. Cl. 74—701 **6 Claims**



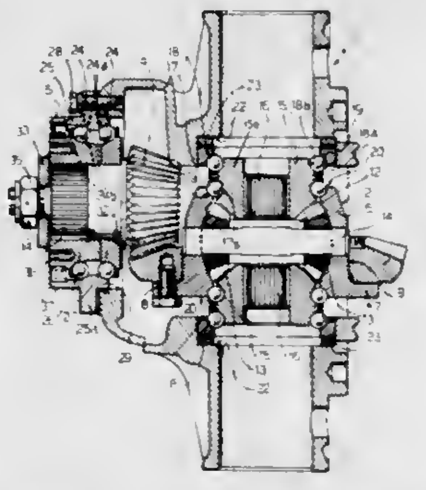
1. In a transaxle; a housing, a first shaft and an intermediate shaft parallel thereto journalled in said housing, a plurality of sets of meshing gears on said shafts for establishing a plurality of reversing drives at respective ratios between said shafts, a nonreversing drive connecting said shafts, clutch means shiftable to make any one only of said drives effective, and a differential in said housing having an input member, means drivingly connecting said input member to said intermediate shaft, said differential comprising a pair of coaxial output members rotatable on an axis parallel to said shafts, the sets of machine gears on the shafts including first gears nonrotatable on said first shaft and second gears rotatable on said intermediate shaft, said clutch means being slidably supported on said intermediate shaft, said nonreversing drive comprising a first sprocket nonrotatable on the first shaft, a second sprocket rotatable on said intermediate shaft, and a chain entrained about the sprockets, said second sprocket being on the opposite axial side of said clutch means from said second gears, and being engageable by the clutch means only when the clutch means is fully disengaged from said second gears.

4,103,567
DIFFERENTIAL PINION ASSEMBLY, ESPECIALLY FOR MOTOR VEHICLES

Colanzi Franco, and Sapello Guido, both of Turin, Italy, assignors to SKF Industrial Trading and Development Company N.V., Jutphaas, Netherlands
Filed Jun. 14, 1976, Ser. No. 695,857
Claims priority, application Italy, Jun. 20, 1975, 68591 A/75
Int. Cl.^{2} F16H *1/38*
U.S. Cl. 74—710 **1 Claim**

1. A differential pinion assembly adapted to transmit rotation from a source of mechanical power to two aligned axle-shafts, comprising a box inside which a differential carrier rotates on the shaft axes and actuated by a driving toothed pinion engaging with a crown gear affixed to and concentric of the differential carrier, such differential carrier carrying satellite gears rotatable with respect to the carrier and meshing with a pair of planetary gears on the shaft axes, each of said planetary gears being adapted to be affixed to a respective one of said axle shafts, said differential carrier having an inside recess accommodating such planetary and satellite gears, and the differential carrier having a pair of aligned axial openings concentric of the shaft axes, each of said planetary gears having a hub projecting

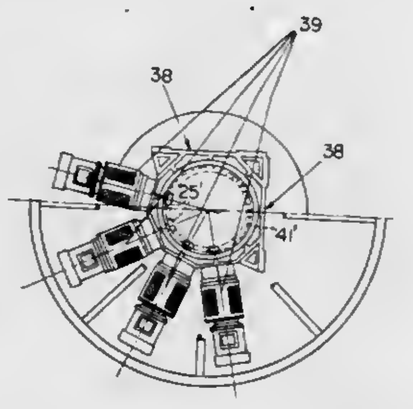
through a respective one of said openings and outwardly of the differential carrier, said planetary gears having external peripheral surfaces defining two adjacent raceways spaced axially from each other, one of said raceways guiding a first row of rolling bearing elements and the other of said raceways guiding a second row of rolling bearing elements, said first rows of rolling bearing elements on the respective planetary gear hubs also being guided in first raceways on the differential carrier and respectively located on opposite sides of the carrier at the peripheries of the axial openings to mount and carry the differential carrier on such planetary gears, and said second rows of rolling bearing elements on the respective planetary gear hubs also being guided in second raceways concentric of



the planetary gear axis and formed in annular elements adjacent respective planetary gear hubs and affixed to the box and carrying the planetary gears on the box, said driving toothed pinion being solid with a driving shaft supported during rotation with respect to the box by means of a pair of rows of rolling bearing elements rolling on raceways provided in an annular element affixed to said box, the shaft having two concentric rings affixed thereto, each of said rings having a raceway for such rolling elements, said rings engaging each other and axially against a shoulder of the shaft, and one of the rings having axial grooves on its inner periphery receiving axial projections on the periphery of said shaft and also having axial holes for connection of the rings with such a source of mechanical power by which the assembly is driven.

4,103,568
MODULAR KINEMATIC CHAIN FOR TRANSMITTING A TORQUE WITH SLIP

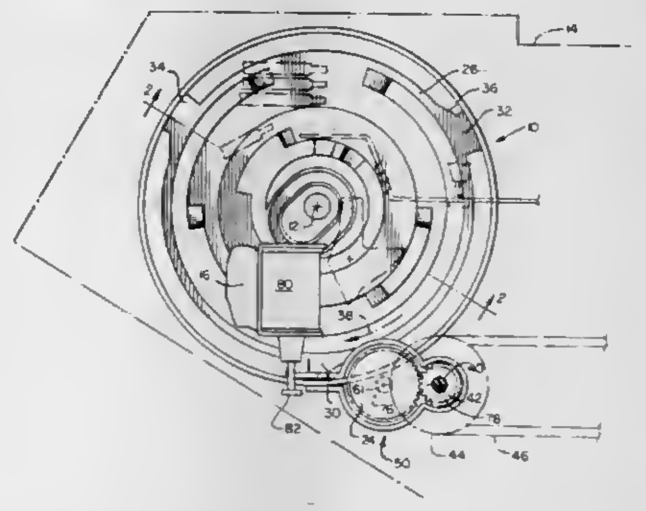
Michel Bérard, and André Lecoustey, both of Belley, France, assignors to Cefilac, Paris, France
Filed Dec. 2, 1976, Ser. No. 746,949
Claims priority, application France, Dec. 18, 1975, 75 39640
Int. Cl.^{2} F16H *1/28*
U.S. Cl. 74—801 **10 Claims**



1. A modular kinematic chain for transmitting a torque, with slip and speed reduction, to a member which is rotated, characterized in that it comprises; at least one motor-coupling group consisting of a standard motor, a hysteresis coupling means with permanent magnets, and an output shaft, at least one complementary reducing cell coaxial with the output shaft of a motor-coupling group and having an output shaft drivingly engaged with the motor-coupling group output shaft, and a basic convertible reducing mechanism including a casing containing an aperture, an output shaft for passage through said aperture, and at least two holes for selectively receiving a motor-coupling group, and associated complementary reducing cell, the output shaft of the reducing mechanism being driven by the output shaft of the reducing cell by means of a mechanical reducing arrangement.

4,103,569
PROGRAMMING CAM INDEXING MECHANISM

Paul W. Thomas, Duxbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jan. 3, 1977, Ser. No. 756,381
Int. Cl.^{2} B23B *29/24;* **B23Q** *17/00*
U.S. Cl. 74—816 **13 Claims**



1. An indexing mechanism comprising:

a programming member having means for defining an outer traction surface and an inner track surface spaced from said outer traction surface, said inner track surface having notches formed therein and spaced to establish successive indexed positions;

a rotatable drive shaft supported on a first axis parallel to and spaced from said outer traction surface;

a latch member pivoted on said first axis;

a capstan supported from said latch member for swinging movement therewith about said first axis and for rotation on a second axis parallel to and spaced from said first axis and said outer traction surface;

bracket means movable with said latch member and capstan and defining a latch tab engageable with said inner track, said latch tab being positioned with respect to said inner track, said first axis and said capstan to maintain a pivotal position of said latch member on said first axis to hold said capstan in frictional engagement with said outer traction surface when said latch tab is engaged with said inner track and to space said capstan from said outer traction surface when said latch tab is engaged in one of said notches;

means to move said latch tab out of said notches by pivoting said latch member on said first axis to move said capstan into engagement with said outer traction surface; and

means driveably coupling said capstan with said drive shaft.

4,103,570

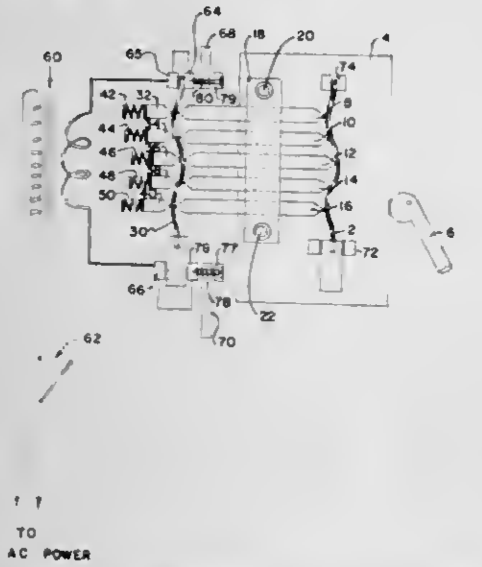
METHOD OF AND APPARATUS FOR MAKING A SHEET METAL ZIG-ZAG KEY

Jacob Rabinow, Bethesda, Md., assignor to Hall & Myers, Potomac, Md., a part interest

Filed Feb. 22, 1977, Ser. No. 770,485

Int. Cl.² B21D *53/42*

U.S. Cl. 76—110 **9 Claims**



1. The method of making a key of the type that is used to open a lock, from a blank, that comprises a strip of metal, comprising:

heating said blank, to a plastic state, and

converting said blank into a key of the type used to open a lock comprising deforming said blank from a flat plane to give the blank curvature and provide displaced areas at given locations along its length, to give desired displacement to tumblers by said areas.

4,103,571

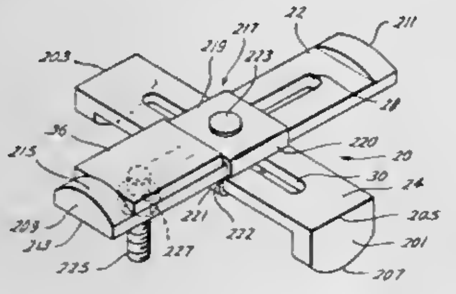
HUB NUT WRENCH

Robert L. Matthews, Baton Rouge, La., assignor to M & M Tools, Inc., Baton Rouge, La.

Continuation of Ser. No. 664,948, Mar. 8, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 807,814

Int. Cl.² B25B *13/48*

U.S. Cl. 81—74 **12 Claims**



1. A wrench for removing a polygonal sided nut from a threaded axle located within a wheel hub comprising:

a connector having a central pivot pin;

at least a pair of elongated members each having an axial slot, said members being mounted in said connector such that said elongate members are in intimate contact with one another and such that said elongate members are slidable and rotatable with respect to one another and are slidable with respect to said connector, said pivot pin passing through the slot of each said elongated member; and

at least one nut engaging portion at the end of at least one of said slotted elongated members, said nut engaging portion having a flat lateral face parallel to the longitudinal axis of said elongated member, and an outwardly curved surface opposite said lateral face, said curved surface having for its axis of curvature a line substantially parallel to the longitudinal axis of said longitudinal member; whereby said nut engaging portion may be inserted within a wheel hub such that such curved surface contacts the inner surface of the hub and the flat surface is proximate one facet of said axle nut.

4,103,572

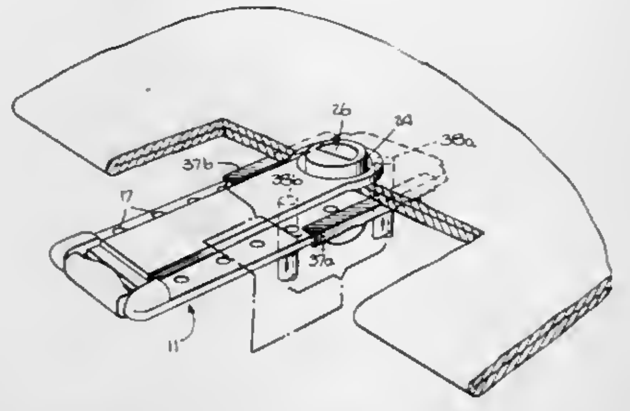
UNLATCHING TOOL FOR REUSABLE SECURITY TAG

David Raymond Humble, Plantation, Fla., and Harry Godfrey Walters, III, Lancaster, Pa., assignors to Sensormatic Electronics Corporation, Hollywood, Fla.

Division of Ser. No. 428,827, Dec. 27, 1973, Pat. No. 3,942,829. This application Jul. 25, 1975, Ser. No. 599,081

Int. Cl.² B23P *19/04;* B25B *7/02*

U.S. Cl. 81—418 **1 Claim**



1. An unlatching tool for a reusable security tag of generally flat rectangular configuration with opposite broad surfaces extending between substantially parallel side edges, comprising in operationally interconnected relationship a pair of confronting jaws spaced apart and arranged to straddle said tag with a close fit alongside said side edges, each jaw having a portion for disposition alongside a corresponding side edge and an inwardly directed lip projecting toward the other jaw but not connected thereto for overlying and engaging a given one of the broad surfaces of said tag to prevent movement of said tag from between said jaws in a direction past said lips, and a pair of spaced apart fingers mounted for oppositional movement relative to the lips of said jaws for engaging the other broad surface of said tag to apply pressure to said tag against the restraint of said jaw lips, said fingers being located in a plane passing between said jaws so as to engage said tag to points on a line which is spaced from and substantially parallel to said portions of said jaws.

4,103,573

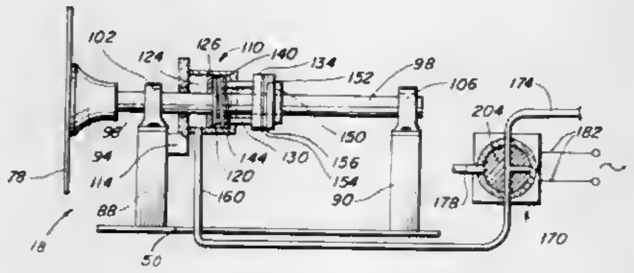
BRAKING SYSTEM FOR ROLL-CUTTING KNIFE

Richard L. Witcraft, Park Ridge, Ill., assignor to Unipat Corporation of America II, Harwood Heights, Ill.

Filed Sep. 15, 1977, Ser. No. 833,551

Int. Cl.² B23B *3/04, 7/00*

U.S. Cl. 82—93 **5 Claims**



1. In a tape slitting machine including mandrel means and means rotatably supporting said mandrel means to turn a core wound roll of tape to be cut, blade means including a circular blade for slitting the roll of tape to provide a plurality of narrower roll strips, carriage means and drive means for moving said blade toward and from said roll of tape to cut therethrough a transform the roll of tape into a series of incremental roll strips, and

means supporting said blade for rotation about a center thereof:

the improvement comprising clutch means for locking said blade against rotation upon entry of said blade edgewise radially into cuttingly to engage an annular peripheral margin of a roll of tape to be cut into incremental roll strips, and

means to release said clutch means to allow free rotation of said blade upon engagement of said blade with and positive entry of a leading edge thereof into said roll of tape,

to promote sustained, uninterrupted positive contact of said blade with said roll of tape and to minimize disruptive, detrimental, sporadic multiple engagement therebetween, thereby to obviate nicking and double cutting of the roll of tape.

4,103,574

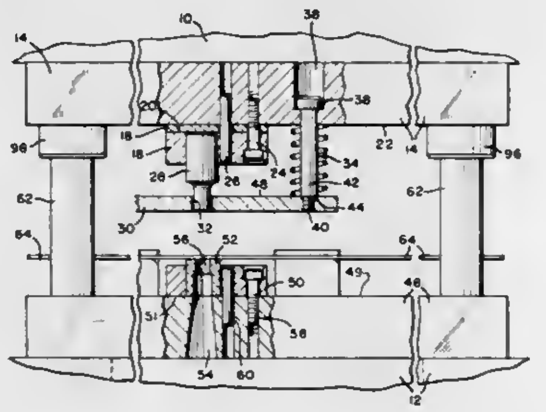
TOOL ASSEMBLY, METHOD OF MANUFACTURE AND COMPONENTS THEREOF

H. William Greer, 18 Patti Ct., Franklin, Ohio 45005

Filed Aug. 1, 1974, Ser. No. 493,757

Int. Cl.² B26F *1/14*

U.S. Cl. 83—140 **19 Claims**



14. An improved tool assembly comprising:

(a) a tool retainer having inner and outer faces,

(b) a tool receiving socket in said retainer,

(c) means for fixing a tool in said socket,

(d) a plurality of bolt holes in said retainer,

(e) a backing shoe having inner and outer faces,

(f) a plurality of bolt holes in said shoe in alignment with said bolt holes in said retainer,

(g) a plurality of bolts each having a head and a leading end received in said bolt holes in said retainer and said shoe and securing said retainer to said shoe with said inner face of said shoe adjacent said inner face of said retainer,

(h) means defining tool engageable sockets in the heads of said bolts, and

(i) means defining tool engageable sockets in the leading ends of said bolts,

(j) whereby said bolts can be manipulated from said outer face of said shoe during initial assembly of said shoe and retainer and said bolts can be manipulated from said outer face of said retainer after said assembly thereof to facilitate retainer removal and replacement.

4,103,575

SYNCHRONOUS WEB CUTTING APPARATUS

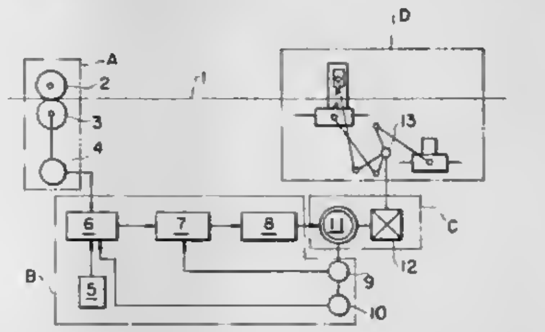
Masaaki Utsui; Hikaru Tsuruta; Shigemitsu Mizutani, and Shigehisa Shimizu, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 28, 1977, Ser. No. 819,918

Claims priority, application Japan, Jul. 29, 1976, 51-90494

Int. Cl.² B23D *25/04*

U.S. Cl. 83—298 **3 Claims**



1. An apparatus for cutting a web travelling at a constant speed into desired lengths, comprising:

a. a first slider movable in a direction parallel to the web,

b. a first cutting member mounted on the first slider on one side of the web,

c. a second slider mounted on the first slider and movable in a direction perpendicular to the web,

d. a second cutting member mounted on the second slider on the other side of the web for reciprocating engagement with the first cutting member to cut the web,

e. a rotary drive shaft,

f. a drive mechanism connected between the shaft and the first slider for reciprocatingly driving the latter in response to the rotation of the shaft,

g. a second drive mechanism connected between the shaft and the second slider for reciprocatingly driving the latter in response to the rotation of the shaft,

h. a movable torque balancer for offsetting shaft torque variations in a cutting region whereat the first slider is being driven at substantially the same speed as the web and in the same direction, and

i. a third drive mechanism connected between the shaft and the torque balancer, whereby the shaft torque and first slider speed remain substantially constant throughout the cutting region.

4,103,576

FLYING CROSS CUTTING SHEAR FOR PLATE

Willi Benz, Neuss, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,683

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611988

Int. Cl.² B26D *1/56*

U.S. Cl. 83—320 **6 Claims**

1. Flying cross-cutting shear for cutting a moving strip, comprising

a stationary frame,

guides on the frame,

a blade carriage guided on the guides,

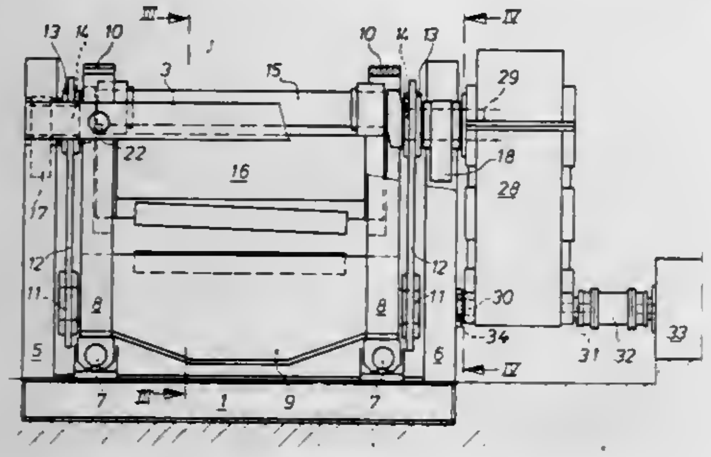
a pair of opposite blade carriers mounted in the blade carriage and movable therewith in the direction of movement of the strip,

blades mounted in each of the carriers,

a crankshaft for moving one of the blade carriers towards and away from the plane of the strip to carry out cutting actions,

bearing means in the stationary frame,

cam discs mounted at ends of the crankshaft and contacting the bearing means so as to guide the blade carriage, when the crankshaft turns, in the direction of movement of the strip at the same time as the crankshaft is moving said one of the blade carriers to cut the strip, and guide links, supported on the blade carriage, in which the crankshaft is journalled.



4,103,577
SHEARS

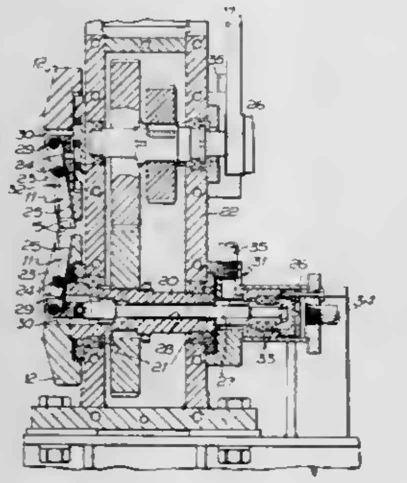
John Charles Jackson, and Percy Bruce Gordon Selous, both of Sheffield, England, assignors to Ashlow Steel & Engineering Company Limited, Sheffield, England

Filed Feb. 3, 1977, Ser. No. 765,388

Claims priority, application United Kingdom, Feb. 17, 1976, 6107/76

Int. Cl.^{2} B26D *3/22;* B23D *25/12*

U.S. Cl. 83—337 4 Claims



1. A shearing device for cutting rod comprising a pair of blades projecting one from each of a pair of coplanar discs between which the rod is adapted to pass, means for rotating the discs continuously such that at the positions of closest approach of the blades to the path of the rod the tips of the blades move in the direction of motion of the rod and with exactly the same linear speed as the rod, each blade being pivotally mounted in a groove in its disc to move to either side of a plane perpendicular to the axis of rotation of its disc between an operative position on one side of said plane in which the path of the tip of the blade will intersect with the path of the rod and an inoperative position on the opposite side of said plane in which the path of the tip of the blade will pass clear of the path of the rod, and a pair of double-acting air cylinders for moving the blades between the aforesaid positions.

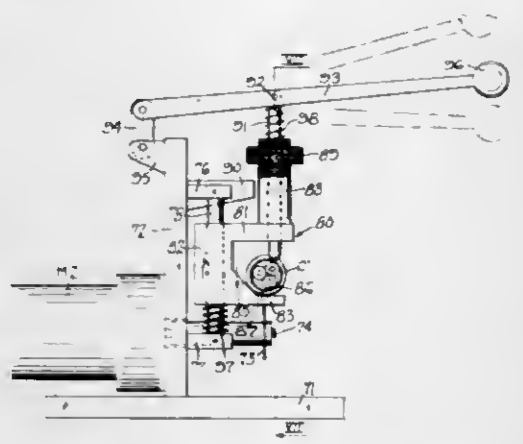
4,103,578
CABLE ARMOR CUTTING MACHINE

Lucien C. Ducret, 8 Apache Pl., Riverside, Conn. 06878

Filed Jul. 8, 1976, Ser. No. 703,669

Int. Cl.^{2} B26D *7/02*

U.S. Cl. 83—409 2 Claims



1. A cable armor cutting machine comprising, a fixed support, a motor mounted on said support, a saw operatively connected to said motor, at least one vertical shaft mounted on the support, a cable guide slidable on said shaft toward and away from said saw, a cable clamping means movable into and out of engagement with the cable, and operating means adapted to move the clamping means into engagement with the cable and to move the cable into cutting engagement with the saw, the cable guide being a laterally open-faced block provided with a vertically disposed bushing, the clamping means being a plunger slidable in said bushing, and the operating means being a lever pivotally connected at one end to the fixed support.

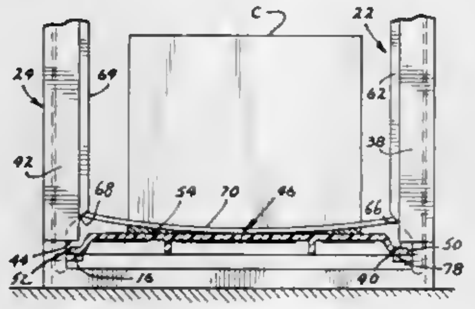
4,103,579
DEVICE FOR SLICING A BLOCK OF CHEESE AND THE LIKE

Blaine F. Rowe, Edina, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Jun. 16, 1977, Ser. No. 807,246

Int. Cl.^{2} B26D *7/06, 4/12*

U.S. Cl. 83—435.1 5 Claims



1. A device for slicing a block of cheese and the like comprising:

(a) a base having

(b) spaced flanges carried thereby,

(c) a pallet for mounting a block of cheese or the like thereon,

(d) means slideably mounting said pallet on said flanges,

(e) a cutter,

(f) means slideably mounting said cutter on said base normal thereto,

(g) said cutter having a frame including first and second spaced legs,

(h) a wire member secured at one end to said first leg and at the other end to said second leg under compression so as to be positioned convexly toward said pallet and contactable with said pallet with the pallet tangentially thereof so that the entire length of the wire member is pressed through a block of cheese to a position upon and extending completely across the pallet.

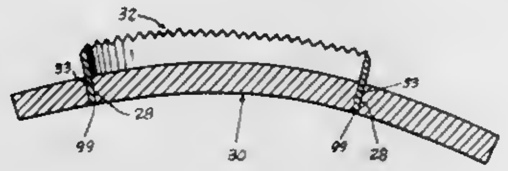
4,103,580
DIE BOARDS AND METHOD OF PRODUCING CUTTING RULE FOR SAME

Louis E. Sauer, and Orville C. Miller, both of St. Louis, Mo., assignors to L.E. Sauer Machine Co., St. Louis, Mo.

Continuation of Ser. No. 318,220, Dec. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,248, Sep. 27, 1971, abandoned, which is a division of Ser. No. 840,384, Jul. 9, 1969, Pat. No. 3,696,480. This application Jun. 27, 1974, Ser. No. 483,530

Int. Cl.^{2} B26F *1/44*

U.S. Cl. 83—663 2 Claims



1. A die assembly comprising a die board having round holes therein, the spacing and pattern of which define a preselected design, routing between said holes, and die rule having dependent tangs spaced along its length at locations to match at least some of the holes, said tangs being received in said holes and having portions with corners which engage the walls of said holes, said routing snugly receiving said die rule and accurately positioning the same.

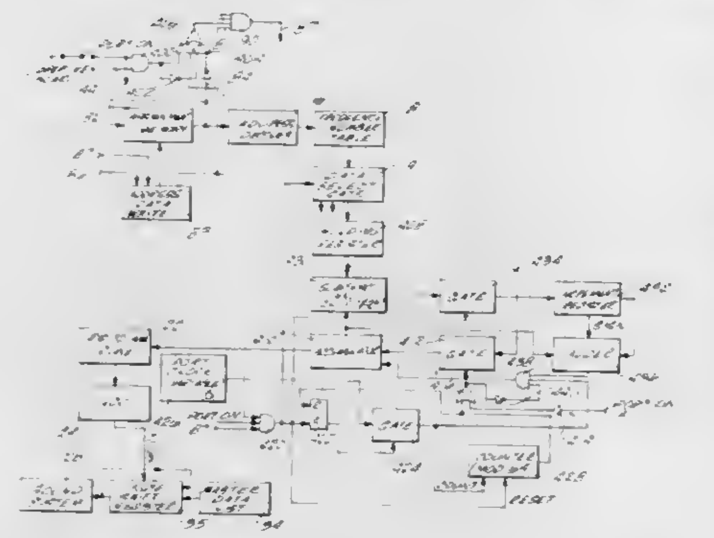
4,103,581
CONSTANT SPEED PORTAMENTO

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawaii Musical Instrument Mfg. Co., Hamamatsu, Japan

Filed Aug. 30, 1976, Ser. No. 718,791

Int. Cl.^{2} G10H *1/02*

U.S. Cl. 84—1.24 12 Claims



1. In a keyboard operated tone synthesizer in which the pitch of each note generated by the synthesizer is determined by a frequency control number stored in a table, the number being selected by operation of the associated key and used to set the frequency of an oscillator which fixes the fundamental frequency of the generated tone, a portamento control comprising:

accumulator means for storing a frequency control number,

means responsive to operation of any selected key on the keyboard for selecting a corresponding frequency control number from said table,

means subtracting the selected number from said table from the number in said accumulator means,

means responsive to the operation of the selected key and to the subtracting means for periodically changing the number in the accumulator means in increments corresponding to a predetermined fraction of the output of the subtracting means,

means interrupting the means periodically changing the number in the accumulator when the number in the accumulator is incremented a predetermined number of times, and

means responsive to the contents of the accumulator means for generating a musical tone having a fundamental frequency fixed by the value of the number stored in the accumulator means.

4,103,582
ELECTRONIC MUSICAL INSTRUMENT

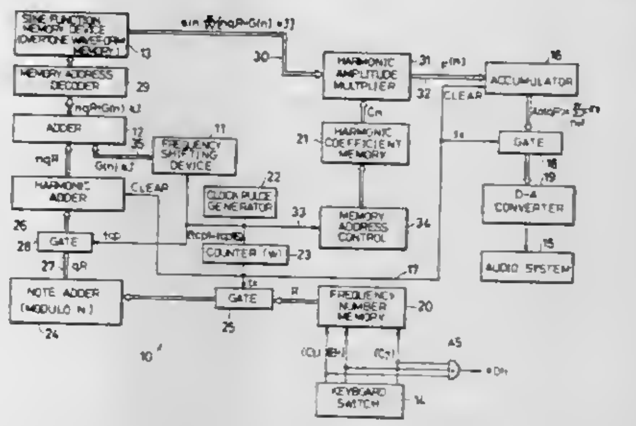
Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 24, 1977, Ser. No. 780,752

Claims priority, application Japan, Apr. 2, 1976, 51/36756

Int. Cl.^{2} G10H *1/02*

U.S. Cl. 84—1.24 2 Claims



1. In an electronic musical instrument of the class wherein amplitude sample values of a tone at successive sampling points of a musical tone waveform are calculated by independently calculating sample values of respective partials that constitute said musical tone waveform and then adding the calculated partial values, the improvement which comprises:

a variable generating circuit which generates a variable which varies with time, and

a variable-modifying circuit which modifies said variable with a coefficient corresponding to each partial thereby independently modifying the normal frequency of each one of the corresponding partials in accordance with the output from said variable modifying circuit, and wherein

said variable-generating circuit comprises a circuit for generating a value *kJ* which varies with time, and a circuit for changing the period of said value *kJ* with time, and

said variable modifying circuit comprises a circuit for generating frequency deviation coefficients $G(n)$ respectively corresponding to the order n of said partials, and a multiplier that multiplies said variable kJ with said coefficients $G(n)$ thereby modifying said period for respective partials such that the normal frequencies of respective partials are modified independently by amounts corresponding to the varied period of respective partial outputs $G(n)kJ$ from said multiplier.

4,103,583
ELECTRIC GUITAR

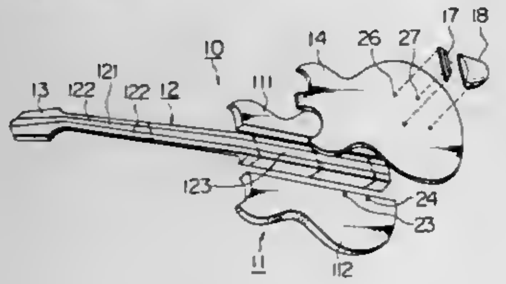
Yojiro Takabayashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 19, 1976, Ser. No. 706,153

Claims priority, application Japan, Jul. 18, 1975, 50/99072[U]; Jan. 10, 1976, 51/1703[U]

Int. Cl.^{2} G10D *1/08*

U.S. Cl. 84—291 **15 Claims**



1. An electric guitar comprising:
an elongated neck formed of a plurality of elongated pieces, one of said elongated pieces being formed of a harder material than the remaining of said elongated pieces, said one of said elongated pieces extending throughout substantially the entire longitudinal length of said neck;
a body coupled to said neck, said neck extended a substantial distance into said body;
a top board covering at least a part of the surface of said body, said top board being made of a harder material than said body and contacting said one of said elongated pieces;
a bridge element attached to said top board in a portion of the area where said top board contacts said one of said elongated pieces.

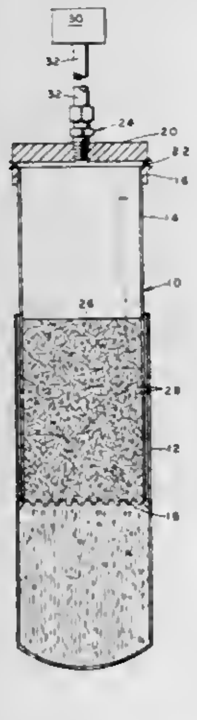
4,103,584
STAPLE ORIENTING METHOD AND APPARATUS

Edwin L. Lista, Roseville, and Kenneth S. Williams, Sacramento, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Jan. 18, 1966, Ser. No. 521,757

Int. Cl.^{2} F42B *33/10;* C06B *21/00*

U.S. Cl. 86—1 R **2 Claims**



1. A method of orienting metal staples dispersed in a solid propellant which comprises the steps of:
(a) filling a bayonet having a screen at the bottom thereof with uncured solid propellant having metal staples randomly dispersed therein;
(b) forcing the uncured propellant through the bayonet screen to orient the metal staples within the solid propellant; and
(c) vibrating the screen as the propellant is forced therethrough to impart a radial moment to the propellant leaving said screen.

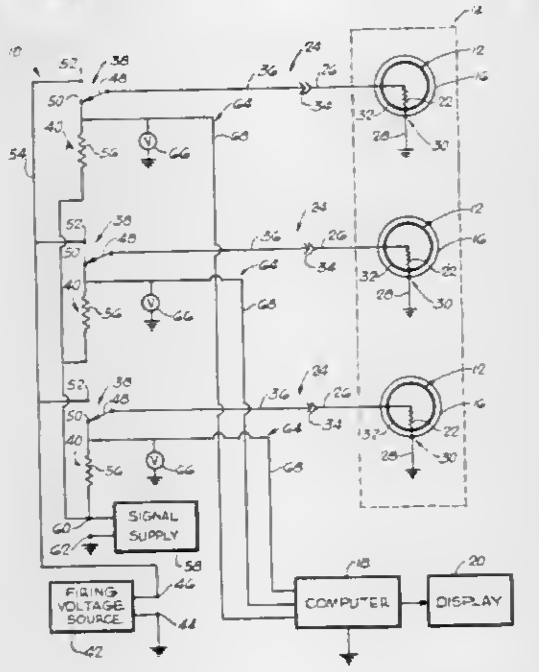
4,103,585
AMMUNITION FIRING SYSTEM HAVING MEANS FOR ELECTRICALLY SIGNALING PRESENCE OR ABSENCE OF AMMUNITION

Nelson D. Foley, Little Rock, Ark., assignor to Bei Electronics, Inc., Little Rock, Ark.

Filed Jan. 18, 1977, Ser. No. 760,377

Int. Cl.^{2} F41F *3/04*

U.S. Cl. 89—1.814 **8 Claims**



1. An ammunition firing system,
comprising a plurality of rounds of ammunition,
each of said rounds having an electrically operable igniter with a predetermined electrical resistance,
a plurality of igniter circuits connected to the respective igniters,
a firing voltage source,
a signal source,
a plurality of switching devices connected to the respective igniter circuits,
each of said switching devices being independently operable between a signal condition and a firing condition,
and a plurality of signal circuits connected between said signal source and the respective switching devices,
each switching device including means operative in said signal condition for connecting the corresponding igniter circuit to the corresponding signal circuit,
each signal circuit including a current limiting impedance for limiting the signal current supplied by said signal source to the corresponding igniter to a low value which is insufficient to fire the round of ammunition,
each signal circuit including indicating means for indicating the presence or absence of the signal current between said signal source and the corresponding igniter,
each switching device including means operative in said firing condition for connecting the corresponding igniter circuit to said firing voltage source for firing the round of ammunition.

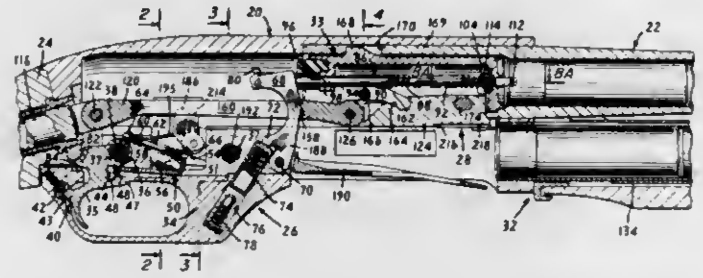
4,103,586
FIREARM TRIGGER MECHANISM

James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company, Inc., Ithaca, N.Y.

Division of Ser. No. 525,072, Nov. 19, 1974, Pat. No. 4,014,247. This application Dec. 22, 1976, Ser. No. 753,190

Int. Cl.^{2} F41C *19/00*

U.S. Cl. 89—144 **1 Claim**



1. A trigger disconnect for a firearm, comprising:
a trigger housing,
a member slidably and rotatably mounted in the trigger housing and including a hammer sear for engaging a hammer and a trigger sear for engaging a trigger;
a hammer having a catch engageable with said hammer sear, and a hammer biasing spring operating to urge said member for rotation in one direction when said hammer sear on said member is engaged with said hammer;
a biasing spring acting on said member to bias said member for rotation in the other direction; and
a trigger catch on said trigger engageable with said member trigger sear when said member is rotated to the full extent possible in the said one direction but disengaged therefrom when said member is rotated to the full extent in the said other direction;
said trigger housing further comprising an abutment member on said member and a pin mounted above said member against which said member abuts in the extreme forward sliding position under the influence of said member spring and about which said member rotates.

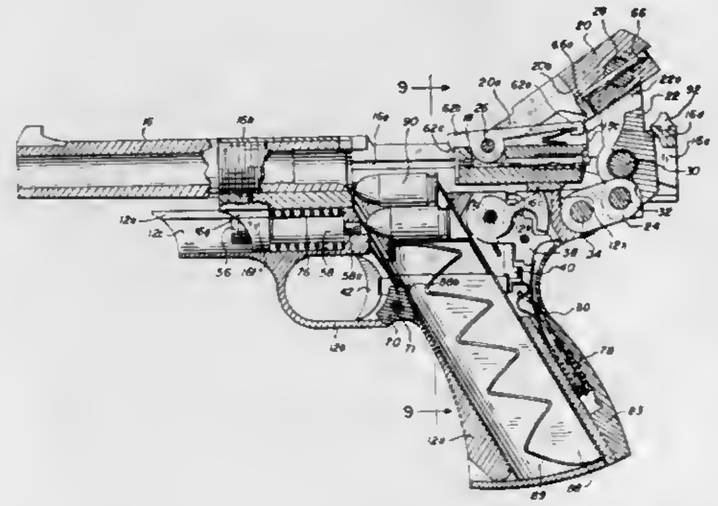
4,103,587
AUTOLOADING PISTOL

Chester F. Vanek, 5154 N. Lotus Ave., Chicago, Ill. 60630

Filed Oct. 6, 1976, Ser. No. 729,894

Int. Cl.^{2} F41D *3/02*

U.S. Cl. 89—175 **13 Claims**



1. A pistol having a frame with longitudinally directed guides in its sides, a barrel assembly and including a barrel extension mounted on said frame, said which extension is slidable in said guides and having a rear portion of said extension also formed with longitudinally directed guides, a bolt behind the barrel and slidable along the guides of the extension, front and rear toggle links pivotally joined together behind the bolt, the front link pivotally attached to the bolt, the rear link pivotally attached to the rear of said frame, a passive firing pin slidable in bolt and a firing impulse transmittance pin in the front toggle link and aligned with the firing pin when the toggle is open, the transmittance pin having a depending leg which is contacted by the rear of the bolt to hold the pin in the link when the toggle is closed and to project the pin from the rear of the link into the striking path of a hammer when the toggle is open.

4,103,588
CRANKSHAFT MILLING MACHINE AND MILLING TOOL FOR SUCH MACHINE

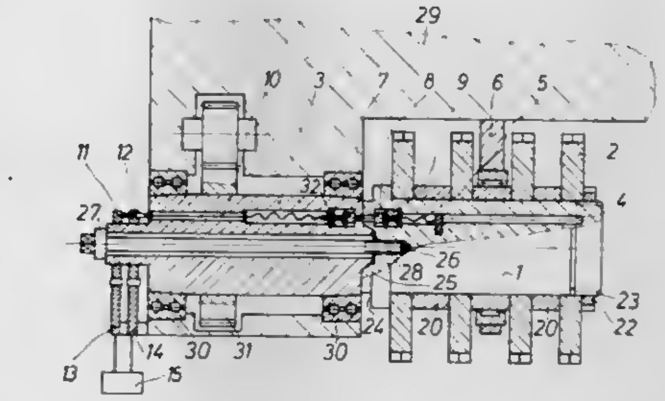
Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gebrueder Heller, Maschinenfabrik Gesellschaft mit beschraenkter Haftung, Nuertingen, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,430

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2630047

Int. Cl.^{2} B23C *5/08*

U.S. Cl. 90—11 A **7 Claims**



1. A milling tool comprising arbor means, milling discs, means securing said milling discs in spaced relationship on said arbor means, electric heating means operatively disposed inside said arbor means, and electric conductor means operatively disposed to contact said electric heating means and to be accessible from the outside of said arbor means.

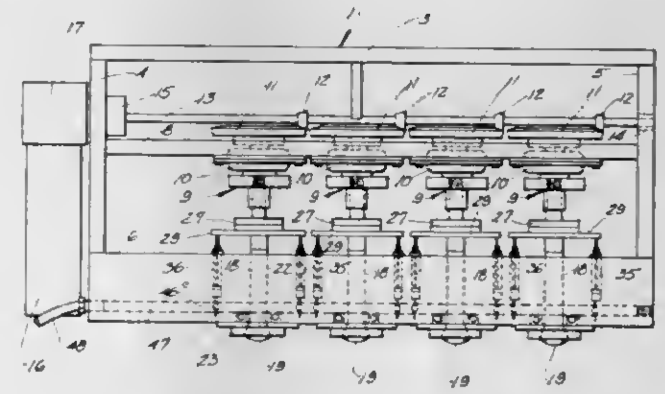
4,103,589
MULTIPLE SPINDLE DIVIDING HEAD

Walter C. Francis, Newport News, Va., assignor to Trans-ACC, Inc., Cincinnati, Ohio

Filed Sep. 15, 1976, Ser. No. 723,242

Int. Cl.^{2} B23B *31/30;* B23Q *17/04*

U.S. Cl. 90—56 R **6 Claims**

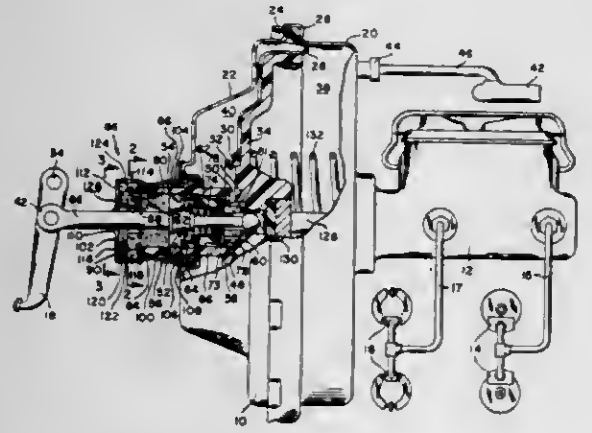


1. A multiple spindle dividing head comprising a housing, a plurality of spindles rotatably mounted in said housing, a common drive shaft in said housing, gear means operatively connecting said spindles to said drive shaft, actuator means operatively connected to said drive shaft for rotating said spindles, split ring collets having work-piece receiving openings therein

operatively connected to said spindles for rotation therewith, means mounting said collets for axial movement relative to said spindles, said collets having tapered heads at their forward ends projecting through openings in said housing, bearing collars mounted on said housing and surrounding the heads of said collets, said bearing collars having tapered surfaces engaging the tapered heads of said collets, face plates surrounding said collets, said face plates being operatively connected to said collets to displace them axially rearwardly, pairs of fluid cylinders on opposite sides of each of said collets extending in parallel relation thereto, said cylinders containing rearwardly projecting piston rods positioned to contact said face plates upon movement from a retracted to an extended position, and means for supplying fluid under pressure to said cylinders to displace said piston rods rearwardly, whereby the tapered heads of the collets are radially contracted by the tapered surfaces of said bearing collars as said collets are displaced from a forward work-piece receiving position to a rearward work-piece clamping position by the piston rods as they bear against said face places, said face plates permitting said collets to rotate while maintained in their work-piece engaging position.

4,103,590
FILTER FOR A SERVOMOTOR

James Basil Putt, Granger, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Mar. 10, 1977, Ser. No. 776,393
Int. Cl.² F15B *9/10, 25/02, 21/04*
U.S. Cl. 91—376 R **7 Claims**



1. In a servomotor having a housing with a wall means movable therein moved by a pressure differential created between a first fluid and a second fluid to produce an output force, said first fluid being communicated into said housing by flowing through a passageway in a hub upon movement of a control valve by an input push rod responding to an operator input, flow means for assuring communication of said first fluid from a source to said passageway comprising:

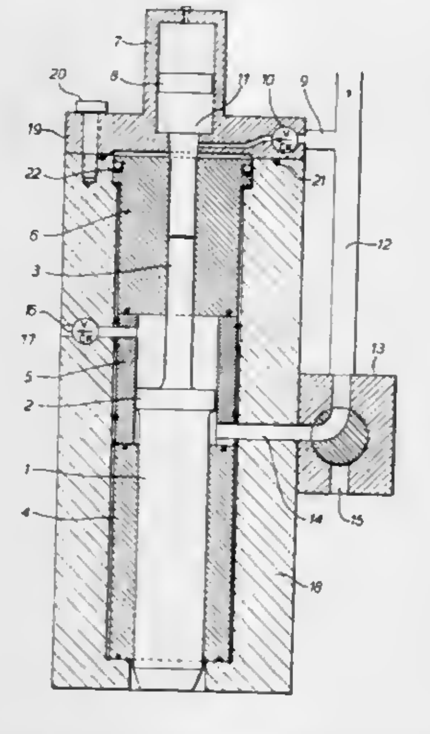
a boot having an end closure section and a body section, said body section being fixed to said housing and said closure section surrounding said push rod, said closure section having a first series of openings substantially parallel to said passageway, said body section having a second series of openings substantially perpendicular to said passageway;

first filter means adjacent said first series of openings for providing a first flow path for said first fluid in said passageway; and

second filter means adjacent said second series of openings for providing a second flow path for said first fluid in said passageway, said first and second flow paths merging into a single flow path adjacent said passageway in order that the flow of the first fluid into said passageway is substantially the same irrespective of the selected flow path traversed in reaching the passageway.

4,103,591
DEVICE FOR A HYDRAULICALLY DRIVEN PERCUSSION HAMMER

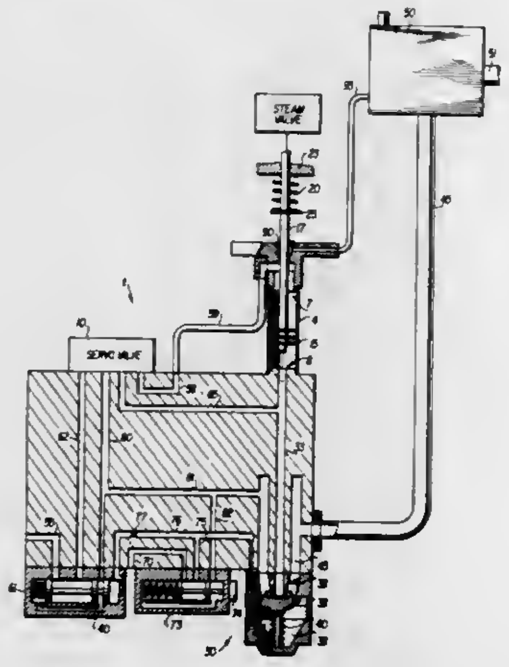
Olav L. Reiersdal, Sandvatn st., 4480 Kvinesdal, Norway
Filed Aug. 30, 1976, Ser. No. 719,011
Int. Cl.² F15B *15/17, 21/02*
U.S. Cl. 91—417 R **4 Claims**



1. An hydraulically driven percussion device for actuating a tool, comprising means defining a cavity having first, second and third coaxial cylindrical regions of which the first and second regions are of smaller diameter than the third region, a differential piston having first and second end portions and an intermediate portion fitted slidingly in the first, second and third regions respectively of the cavity, the first end portion having two ends, one of which is further from the second end portion than is the other, and the intermediate portion having two end surfaces, one of which is further from the first end portion and gains the intermediate portion to the second end portion and the other of which is further from the second end portion and gains the intermediate portion to the first end portion, the piston having two working surfaces of which a first is constituted by said one end of the first end portion and of which the second is constituted by said one end surface of the intermediate portion, the area of the second working surface being greater than the area of the first working surface, means defining a cylinder which is coaxial with the three coaxial cylindrical regions of said cavity and has one end in direct communication with said first region of the cavity, a second piston fitted slidingly in said cylinder, resiliently compressible means effective on said second piston to urge said second piston toward said one end of said cylinder source means for supplying hydraulic fluid under pressure, first duct means for placing said source means in communication with said first region of the cavity whereby the resiliently compressible means are placed in hydraulic pressure-transmitting relationship with said first working surface, a check valve for preventing flow of hydraulic fluid from said first region towards said source means, second duct means for placing said source means in communication with the second working surface, and a multiple way valve defining a discharge outlet and having a first position in which the source means communicate with the second working surface via said second duct means and both the source means and the second duct means are shut off from the discharge outlet and a second position in which the source means are shut off from the second working surface and the second duct means communicate with said discharge outlet.

4,103,592
VALVE OPERATOR

Donald H. Davis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 642,396, Dec. 19, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,055
Int. Cl.² F15B *11/08, 13/04*
U.S. Cl. 91—448 **3 Claims**



1. A valve operator for providing remote control of a controlled valve which is both fast closing and slowly positionable; said valve operator comprising:

a double-acting hydraulic cylinder having first and second opposite, open ends with a valve actuating piston slidable therebetween, said valve actuating piston biased by a spring in the valve close direction and including a rod connectable to a controlled valve;

a hydraulic manifold including a servo valve in fluid communication with each opposite end of said hydraulic cylinder whereby an input of hydraulic fluid to the first end of said hydraulic cylinder moves the controlled valve toward a closed position and the input of hydraulic fluid to the second end of said hydraulic cylinder moves the controlled valve toward a valve open position;

a disk-dump valve in fluid communication with the second end of said hydraulic cylinder;

a drain tank in fluid communication with the second end of said hydraulic cylinder through said disk-dump valve;

sealing means in fluid communication with the first end of said hydraulic cylinder, said sealing means circumferentially positioned about the valve actuating piston rod; and,

a fluid supply conduit interconnecting the drain tank and sealing means, the fluid level in said drain tank being maintained at a level sufficient to apply fluid pressure to said seal means, whereby fluid from the second end of said hydraulic cylinder may be dumped to said drain tank through said disk-dump valve whereupon it pressurizes said sealing means through said fluid supply conduit.

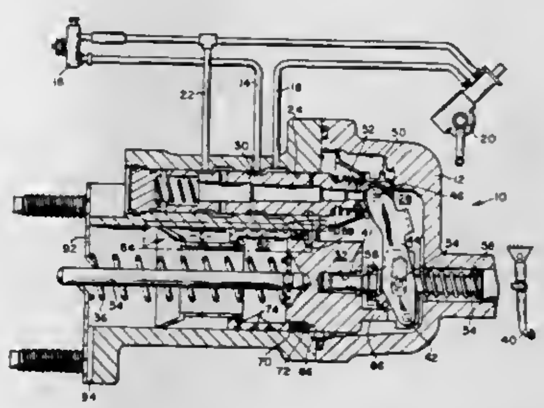
4,103,593
HYDRAULIC BRAKE BOOSTER AND SHIELD THEREFOR

Arthur K. Brown, Jr., South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Oct. 15, 1976, Ser. No. 732,573
Int. Cl.² F15B *21/04;* **F16J** *15/18*
U.S. Cl. 92—78 **7 Claims**

1. A hydraulic brake booster comprising:

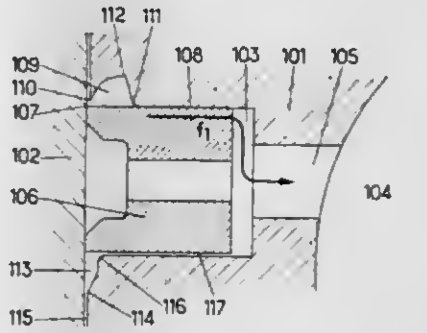
a housing defining a pressure chamber;

a piston slidably mounted in a bore in said housing, said piston being responsive to increasing pressure in the pressure chamber to move a shield connecting the piston with a wall of the housing bore in a non-braking position, which said piston moves during braking to isolate that portion from atmosphere, said shield also sealingly and slidingly engaging the wall of the housing bore, said shield being engageable with said piston when the latter is in the non-braking position and being spaced from said piston when said piston moves to a braking position.



4,103,594
PISTON AND SCRAPER RING ASSEMBLY

Robert Geffroy, 1, Boulevard Richard Wallace, 92200 Neuilly-sur-Seine, France
Filed Jun. 17, 1974, Ser. No. 480,191
Claims priority, application France, Jun. 26, 1973, 73 23318
Int. Cl.² F01M *11/02;* **F16J** *1/08*
U.S. Cl. 92—159 **13 Claims**

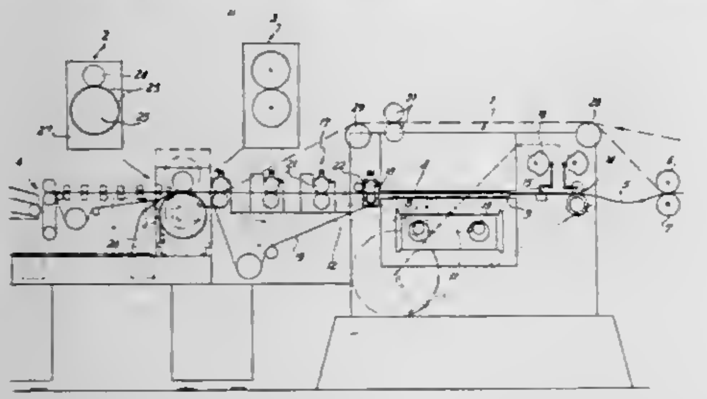


1. A crowned reciprocating engine piston having at least one peripheral groove containing a scraper ring dimensioned with relative clearance permitting axial shifting of said ring within said groove and said ring having peripheral scraping lips thereon, one of which is relatively nearer the piston crown, a recess in said piston in a position adjoining said one scraper lip, said recess defining a reservoir extending closer to said piston crown than any outlet for oil collected therein, an oil recovery lip formed at the circumferential face of the piston and bounding one side of the recess and disposed in closely spaced relation to said one scraper lip, said reservoir being adapted to cooperate with said one scraper lip and said oil recovery lip to collect oil from a cylinder wall during a limited portion of said piston's reciprocating cycle, and with a clearance open during a different limited portion of said cycle between those adjacent sides of said ring and said groove which are closer to the crown of the piston providing communication for the collected oil from said recess to said groove, and an outlet from the groove.

4,103,595

CUTTING MACHINES FOR CUTTING UP A WEB OF MATERIAL SUCH AS PAPER OR CARDBOARD

Louis Gaston Corse, Chaumont sur Tharonne, France, assignor to Machines Chambon, Chaumont sur Tharonne, France
Filed Jul. 26, 1977, Ser. No. 819,000
Claims priority, application France, Aug. 5, 1976, 76 23914
Int. Cl.² B31B *1/14*
U.S. Cl. 93—58.3 **9 Claims**

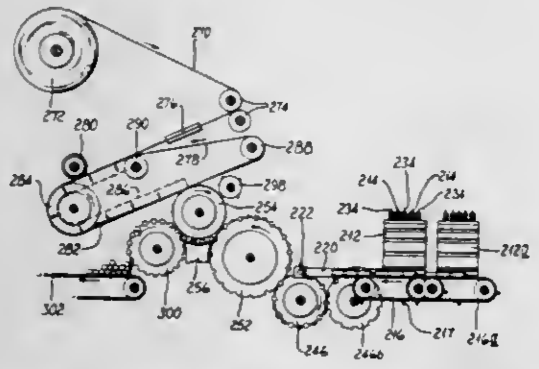


1. A machine for cutting up a web of material, the machine comprising three units arranged along the path of movement of the web through the machine, the first unit being a flat cutting press, the second unit being a rotary peeling apparatus, and the third unit being a reception unit for cut sheets of web material, a fourth unit being provided as a replacement for the second unit, the fourth unit being a rotary cutting apparatus, wherein means are provided for by-passing the first unit when the fourth unit replaces the second unit.

4,103,596

APPARATUS FOR FEEDING AND CUTTING CIGARETTE FILTER WRAPPER MATERIAL

Desmond Walter Molins, London, England, assignor to Molins Limited, England
Filed Jun. 20, 1977, Ser. No. 808,366
Claims priority, application United Kingdom, Jun. 19, 1976, 25561/76
Int. Cl.² A24C *5/50*
U.S. Cl. 93—77 FT **14 Claims**

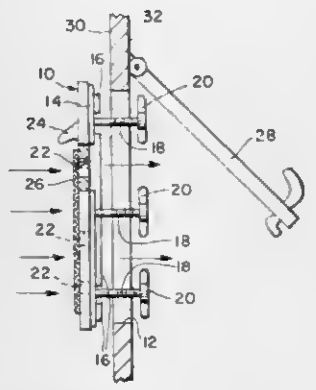


1. Apparatus for feeding wrapper material, comprising means for feeding a web of wrapper material, means for continuously longitudinally slitting the web into a number of strips, at least two endless bands, guide means defining paths for said bands and arranged so that the paths are adjacent in a first region and laterally spaced apart in a second region, said bands being arranged so that each strip is supported by a band between said first and second regions, and means for receiving laterally spaced strips from the bands in said second region.

4,103,597

COOLING VENT ATTACHMENT FOR SIDE WINDOW OF AIRCRAFT

Rudolph Williams, 26 South Rd., Parkway Gardens Greenburgh, White Plains, N.Y. 10600
Continuation of Ser. No. 650,299, Jan. 19, 1976, abandoned. This application Feb. 22, 1977, Ser. No. 770,996
Int. Cl.² B60H *1/24*
U.S. Cl. 98—2.12 **1 Claim**



1. A removeable vent for aircraft having at least one hinged window in a window opening between the outer skin and the interior wall of the aircraft comprising:

(a) a panel substantially similar in shape to said window opening;
(b) said panel being substantially larger than said window opening;
(c) the entire perimeter of said panel overlapping the outer skin of the aircraft outside said window opening;
(d) a resilient gasket on the overlap area of said entire perimeter whereby a waterproof seal between said panel and the outer skin of the aircraft is achieved;
(e) a plurality of rigid frame blocks on the inside of said panel, said frame blocks being positioned to partially enter said window opening and laterally position said panel centered on said window opening;
(f) ventilating holes in said panel;
(g) insect screening on said panel at least over said ventilating holes;
(h) at least two spaced-apart threaded posts extending inward normal to said panel;
(i) said at least two spaced-apart threaded posts passing grazingly through said window opening into the interior of the aircraft;
(j) wing nuts threaded onto each of said at least two threaded posts;
(k) the wings of said wing nuts engaging the interior wall adjacent to said window opening and applying inward force on said at least two threaded posts whereby said resilient gasket is compressed between said panel and said outer skin; and
(l) a rain gutter across the top of said panel at least over the area of said panel containing said ventilating holes, said rain gutter directing rainwater downward and away from said ventilating holes.

4,103,598

WALL STRUCTURE

Kenneth R. Cooper, Don Mills, Canada, assignor to Canada Square Management Ltd., Toronto, Canada
Filed Jan. 24, 1977, Ser. No. 762,075
Claims priority, application Canada, Jan. 30, 1976, 244844
Int. Cl.² F24F *7/00;* F24D *5/10*
U.S. Cl. 98—31 **3 Claims**

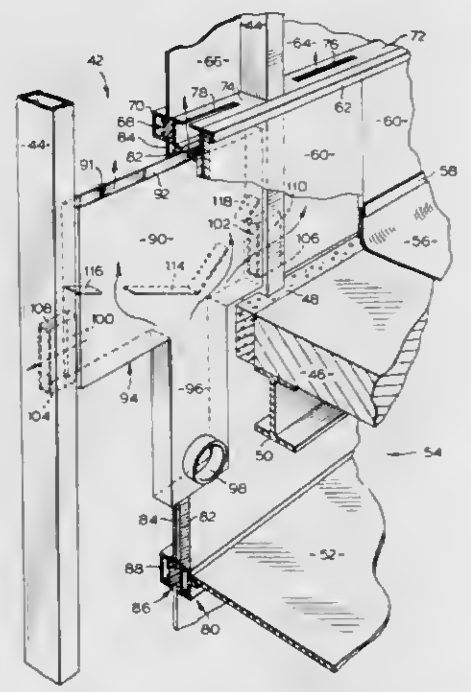
1. A wall structure incorporating at least one air outlet unit for a forced air circulation system;

wherein the structure includes: a plurality of spaced vertical posts defining at least two adjacent wall sections, each including: a transverse member extending between the posts defining said section; and inner and outer wall panels co-operating with said member to define an air space between the posts; said transverse member being formed with at least one opening through which air can flow from said air space;

and wherein the air outlet unit is disposed in the said air space of one of said at least two adjacent sections and defines a chamber having: an air inlet adapted to be coupled to an air supply duct of said air circulation system; a first air outlet communicating with said opening of the transverse member defining the air space; and at least one additional air outlet for delivering air to the air space of said adjacent wall section, the intervening wall post being formed with an opening permitting communication between the last-mentioned air space and said additional air outlet, so that air delivered to the outlet unit in use issues through the outlet openings in the transverse members of both of said adjacent wall sections;

and wherein the transverse member of at least one of said wall sections defines a window sill, the inner and outer wall panels of that section being disposed below the sill member;

and wherein the structure further includes a window panel above said sill member, said opening in the sill member being disposed at the inner side of the window panel, whereby air issuing through said opening in the sill member passes upwardly at the inner side of the window panel.

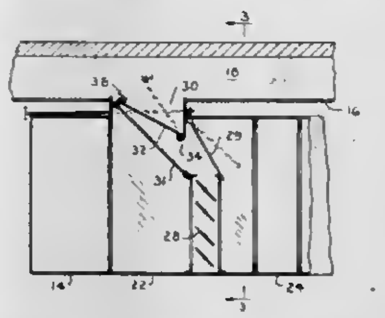


4,103,599

METHOD AND MEANS FOR IMPROVED AIR DISTRIBUTION

Louis Walker, Griffith, Ind., assignor to Armand Ascani, Park Forest and Louis J. Piattoni, Chicago Heights, both of, Ill., part interest to each
Continuation of Ser. No. 607,119, Aug. 25, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 757,831
Int. Cl.² F24F *13/08*
U.S. Cl. 98—33 A **7 Claims**

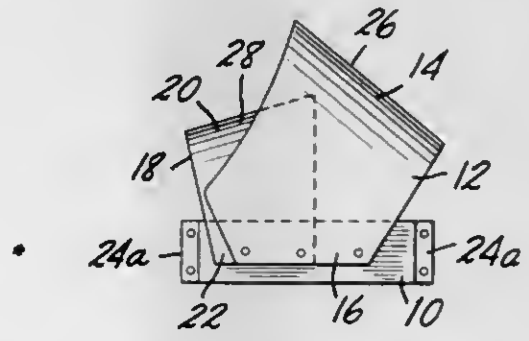
4. In an air distribution system for a plurality of rooms wherein a duct line channels air from a blower source to said rooms and wherein a plurality of air control boxes are interposed between said duct line and said rooms, and wherein each of said air control boxes having an opening to communicate said duct line and at least one of said plurality of rooms, wherein means operate a damper in said opening of said control box to control air flow through said air control box from said duct line to said rooms, and further wherein a return plenum opening is provided for each of said air control boxes communicating said air control boxes and said blower source for recirculating the air when said damper in said opening of said control box is closed, the improvement therewith comprising: a pivoted closure means in each of said return plenum openings having counterweight means and weighted to progressively close each of said return plenum openings as said damper in said opening of said control box progressively opens, and to progressively open said return plenum opening as said damper progressively closes said opening in said control box.



4,103,600

CHIMNEY CAP

John Gardiner Bridge, R.D. 1, Chestnut Ridge, Glens Falls, N.Y. 12801
Filed May 18, 1977, Ser. No. 798,249
Int. Cl.² F23L *17/02*
U.S. Cl. 98—66 R **3 Claims**



1. A chimney cap for diverting rain and downdrafts with minimal restriction to the escape of gases from the chimney, comprising:

a generally horizontally disposed open base for attachment to a chimney; and
two arch-like members of sheet material, each having a central portion and two opposite leg portions, one arch-like member being larger than the other, the opposite leg portions of both arch-like members being attached in overlapping relation to the same opposite sides of the base such that the crowns of said central portions are inclined to the horizontal in opposite directions so as to slant downward from the center of the cap towards opposite ones of the two remaining sides of the base, the larger arch-like member overlapping the smaller arch-like member near the center of the cap and defining a clearance therebetween for escape of chimney gases, the arch-like members also overlapping and defining clearances with said opposite ones of the remaining sides of the base.

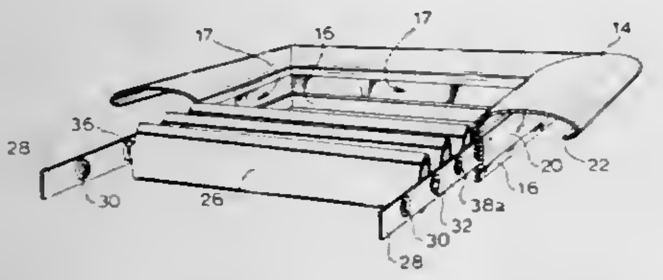
4,103,601

AIR GRILLE COMPONENTS AND AIR GRILLE THEREFROM

Lloyd Giddis Dayus, 3400 Riverspray Dr., Mississauga, Canada
Filed Oct. 22, 1976, Ser. No. 734,956
Int. Cl.² F24F *13/00*
U.S. Cl. 98—110 **20 Claims**

1. A frame member for use in the construction of a frame for an air grille, said frame member comprising;

a facing flange adapted to provide a border for said air grille, and having inner and outer edges;
a frame wall extending along said inner edge at an angle relative to said flange for supporting said air grille;
recessed channel means formed along said frame wall;
an inturned portion on said outer edge of said facing flange and defining a groove therebetween;

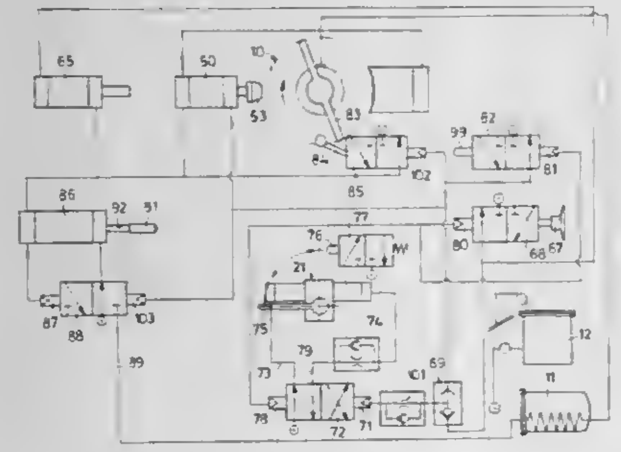


four rectangular L-shaped joining members, at the four corners of said frame, said joining members fitting in said groove, and,
tooth means on said joining members engaging at least one of said flange and inturned portion.

4,103,602

AUTOMATIC HYDRAULIC MACHINE FOR PREPARING INFUSIONS, IN PARTICULAR OF COFFEE

Marco Oggioni, Via Tritone 12, and Vinicio Rastrelli, Via A. Volta 27/22, both of Genova, Italy
Filed May 10, 1977, Ser. No. 795,548
Claims priority, application Italy, May 28, 1976, 23778 A/76
Int. Cl.² A47J *31/34*
U.S. Cl. 99—289 D **6 Claims**

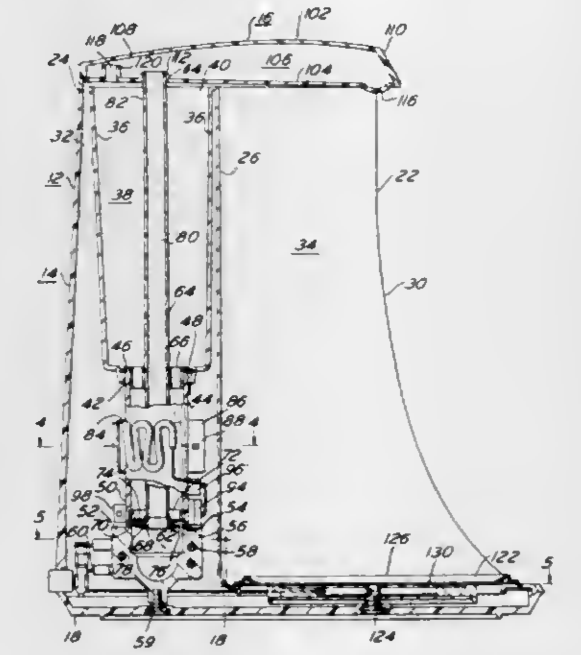


1. An automatic machine for preparing infusions, in particular of coffee, comprising in combination an infusion unit including a casing (13) with four apertures (45, 46, 47, 48) disposed at 90° one to another, a heat insulatable infusion cylinder (14) with two opposing chambers (28, 29) means for feeding said opposing chambers alternately with a predetermined measure of hot water under pressure from a boiler (11) fed by a hydraulic dispensing cylinder (86);
two hydraulic pistons (30, 31) carrying a filter (42), mobile respectively in said chambers (28, 29) and interconnected by a central rod (32) slidable in an intermediate chamber (33) to which the hot infusion water is fed, and is then fed through passages (37, 38) alternately into the chambers (28, 29) respectively, and then through the filter (42) via bores (44);
a hydraulic motor (21) rotating said infusion cylinder (14) stepwise so that its two chambers (28, 29) become successively aligned with the four apertures (45, 46, 47, 48);
at the apertures (45, 46) there are located two respective opposing hydraulic pistons (51, 56) for pressing one of the two filter-carrying pistons (30, 31) against a counterfilter (57) there is clamped a predetermined does of coffee powder previously fed through the aperture (47), said dose being traversed by the hot water required for preparing the infusion which is delivered through a duct (58) partly provided in the piston (56), the used coffee cake being discharged downstream through the aperture (48) by a nozzle also fed with high pressure water; and
an assembly of suitably interconnected hydraulic components arranged to control and program all the various stages of the cycle.

4,103,603

AUTOMATIC COFFEE BREWING DEVICE

Karl H. Bergmann, Cherry Hill, N.J., and Harvey Levine, Fairfield, Conn., assignors to Melitta, Inc., Cherry Hill, N.J.
Continuation-in-part of Ser. No. 490,063, Jul. 19, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,476
Int. Cl.² A47J *31/00*
U.S. Cl. 99—294 **7 Claims**

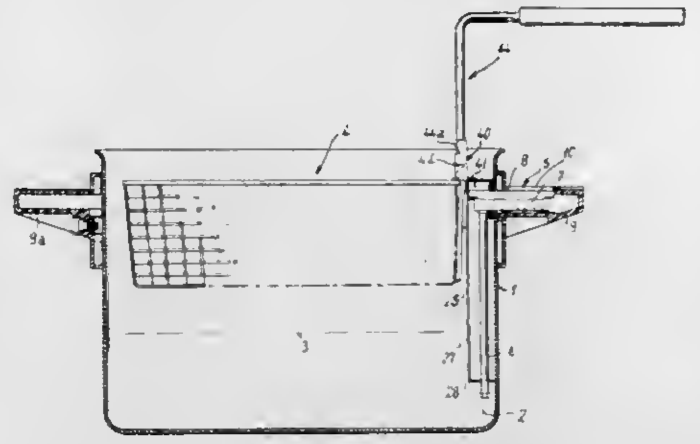


1. An automatic coffee brewing device comprising a structure having a cavity therein providing a reservoir for receiving water, a water heating and pumping means positioned under the reservoir, an elongated tubular connecting means extending vertically between said reservoir and said heating and pumping means having a top end secured with the bottom of the reservoir and a bottom end secured to the top of said heating and pumping means for delivering water from the reservoir to the heating and pumping means, said pumping means including a valve for receiving water from said connecting means and a riser tube for receiving heated water from said heating and pumping means having a bottom end secured with said valve and extending upwardly and centrally through said connecting means and vertically through said reservoir, said tube being heat conductive for transferring heat from the fluids pumped therethrough to the water in said connecting means and reservoir, and water dispensing means receiving and dispensing externally the fluids being pumped through the riser tube, the connecting means having a water containing capacity greater than that of the heating and pumping means and a reduced water containing capacity with respect to that of the reservoir for causing a higher temperature rise for water contained therein with respect to the water contained in the reservoir, said structure having an opening at its top communicating with its reservoir for receiving water therethrough to fill said reservoir, and including a cover member received over and enclosing the top opening of said structure, said cover member including said dispensing means and having bottom and top walls enclosing a chamber therein, said cover member having a first opening over the reservoir of said structure for removably receiving therethrough the top end of the riser tube of said pump, the bottom wall of said cover member having a second opening for providing a water dispensing spout, and a third opening over the reservoir of said structure for venting and returning heated fluid to said reservoir.

4,103,604

COOKING CONTAINER, ESPECIALLY FOR FRYING FOOD PRODUCTS

Jean Claude Berard, Saint Chamond, France, assignor to SEB S.A., Selongey, France
Filed Jun. 22, 1976, Ser. No. 698,717
Claims priority, application France, Feb. 24, 1976, 76 05068
Int. Cl.² A47J *37/12*
U.S. Cl. 99—342 **6 Claims**

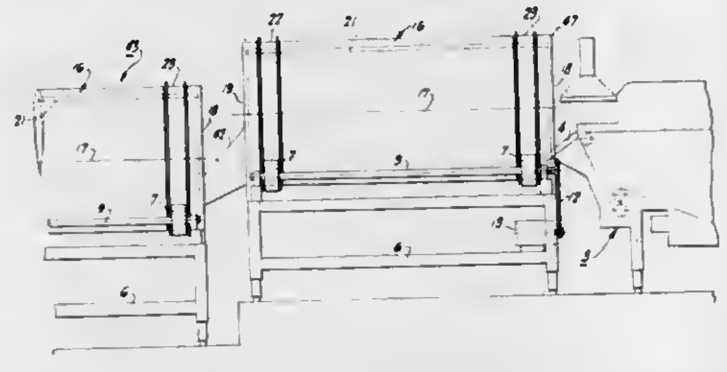


1. A cooking container especially for frying food comprising a vessel which is intended to contain a cooking bath and to be placed on a heat source, said vessel has a handle and comprises a thermometer probe extending within said vessel and fitted with a reading dial which is inserted in a visible manner in said handle for holding said vessel, said probe comprising a casing which is flush-mounted in a removable manner within a recess of the handle, a temperature-sensitive stem extending from said casing and located inside the vessel along a lateral wall of said vessel, said casing passing through a passage formed in the vessel wall, sealing means sealing said casing in a leak-tight manner in said passage, a seal within the interior of the vessel surrounding said passage, a cover plate covering said seal within the interior of the vessel, the seal having a flexible lip which is adapted to the contours of the casing, and at least one fixing screw by which the cover plate is attached to the handle.

4,103,605

MEATBALL COOKER

Göeran Hemborg, Aengelholm; Winje Green, Helsingborg, both of Sweden; Nils Lang-ree, Los Altos, and Edward D. Baker, San Francisco, both of Calif., assignors to N.P.1. Corporation, Burlingame, Calif.
Filed Jan. 17, 1977, Ser. No. 760,162
Int. Cl.² A47J *37/00*
U.S. Cl. 99—345 **4 Claims**

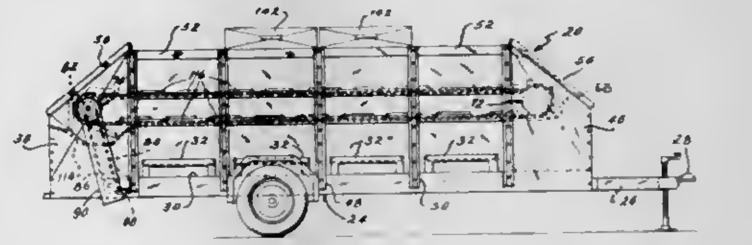


1. A meatball cooker comprising a frame, an open-ended drum having a solid inner wall concentric with an axis and having an axial inlet opening to the atmosphere at one end and an axial outlet opening to the atmosphere at the other end, means for mounting said drum on said frame for rotation about said axis in substantially a horizontal position, an outer wall on said drum and with said inner wall defining a jacket, means for supplying said jacket with heating fluid, means for releasing heating fluid from said jacket, means for supplying meatballs through said inlet opening to said drum, means for supplying cooking oil through said inlet opening to said drum, helical fins on said inner wall adapted to propel said meatballs and said cooking oil together along the bottom of said inner wall and through said drum from said inlet opening to and through said outlet opening.

4,103,606

COOKING DEVICE

Theodore N. Gitcho, Pana, Ill., assignor to Mr. Drumstick, Inc., Pana, Ill.
Filed Apr. 22, 1977, Ser. No. 789,858
Int. Cl.² A23L *3/00;* A47J *31/04, 37/10*
U.S. Cl. 99—443 C **19 Claims**



1. A cooking device comprising an elongated housing having spaced opposite side and end walls and a closure wall extending therebetween, means for supporting fuel located in the housing near the bottom thereof, sprocket means mounted for rotation in the housing at spaced locations between the opposite ends thereof, a pair of continuous flexible drive members mounted in opposed relationship to each other in the housing, each of said drive members being engageable with the spaced sprocket means located in said housing and having reaches which extend therebetween, means for connecting the drive members at spaced corresponding locations therealong including a plurality of rod members attached therebetween, spaced and opposed means pivotally supported on selected ones of said rod members, a plurality of rack members for holding food products to be cooked, each of said rack members having spaced end walls with aligned means for engaging the spaced and opposed means on a selected one of the selected rod members, means for supporting the rack members in a first position during movement in one direction in the housing between the spaced sprocket means, means for supporting the rack members in a different position during movement in the opposite direction in the housing, means operatively engageable with the sprocket means for rotation thereof, and means providing access into the housing for enabling attaching the rack members to and detaching the rack members from the means on the rod members, the spaced and opposed means pivotally supported on selected ones of said rod members including a pair of hook-like members mounted thereon, said hook-like members of each pair having portions that extend toward each other, and means biasing at least one of the hook-like members on each of the selected rod members toward the opposed hook-like member thereon.

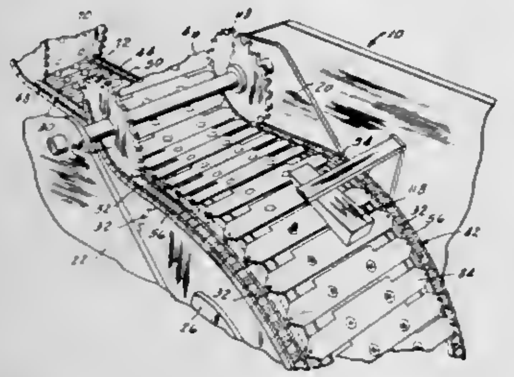
4,103,607
PITTING DEVICE FOR DRUPACEOUS FRUIT

Clarence M. Hansen, East Lansing; John P. Harvey, Grand Haven, and Richard L. Ledebuhr, Haslett, all of Mich., assignors to Dura Corporation, Southfield, Mich.

Filed Aug. 30, 1976, Ser. No. 718,467

Int. Cl.² A23N *4/06, 3/04;* **A47J** *23/00*

U.S. Cl. 99—548 **2 Claims**



2. Conveying and pitting apparatus for continuous, high volume processing of pieces of drupaceous fruit comprising,

apparatus body having two spaced uprights and an L-shaped outer support portion rotatively carried by said uprights to allow said outer portion to be swung upward and away from said uprights and provide separation therebetween,

a drive wheel rotatively carried between said uprights and having a pair of spaced inner conveyor portion drive sprockets and a pair of spaced outer conveyor portion drive sprockets, said pairs having a proximately equal diameter,

a continuous, triangular-shaped inner conveyor portion having one substantially vertical leg and one substantially horizontal leg and further comprising,

a pair of spaced chains positioned to engage said inner conveyor portion drive sprockets at a junction of said horizontal and said vertical legs, a first pair of idle sprockets positioned at an outer end of said horizontal leg, and second pair of idle sprockets positioned at a bottom of said vertical leg,

a plurality of crossbars carried between alternate links of said spaced chains, said crossbar having legs carried one each at ends of said crossbars and pivotably joined to said links to form an inner offset, and

a plurality of fruit receiving cups carried on an outer surface of said crossbar, said cups having a semi-spherical inner surface and an aperture through said cup,

a continuous L-shaped outer conveyor portion having a first pair of substantially horizontal legs and second pair of substantially vertical legs and further comprising,

a pair of spaced chains positioned to engage said outer conveyor portion drive sprockets at a junction of said vertical and horizontal legs, a first pair of idle sprockets positioned at an outer end of said pairs of horizontal legs and above said horizontal leg of said inner conveyor portion of a proximate midpoint thereof, and a second pair of idle sprockets positioned at a bottom of said pairs of said vertical legs and aligning with said second pair of idle sprockets of said inner conveyor portion,

a plurality of crossbars carried between alternate links of said spaced chains, said crossbar having legs carried one each at ends of said crossbars and pivotably joined to said links to form an outer offset, and

a plurality of fruit covering cups carried on an inner surface of said crossbar having a semi-spherical-shaped inner surface and a flat resilient perforated diaphragm in part covering an aperture through said cup, said cups positioned to align and mate with said cups of said inner conveyor portion to form a fruit closure,

fruit depositing means to feed articles of fruit into said fruit receiving cups of said inner conveyor portion, said means positioned between said ends of said horizontal legs of said inner and outer conveyor portions, said pair of spaced chains of said inner conveyor portion engaging said depositing means and driving such at a synchronized speed,

cam means carried on said apparatus body

pitting means carried by said drive wheel between said pairs of sprockets and actuable by said cam means to selectively reciprocate into said aperture in said cups of said inner and outer conveyor portions as said spaced chains of said inner and outer conveyor portions engage with said pairs of drive sprockets respectively,

wherein pitting can be accomplished continuously in that there is no relative longitudinal motion between said pitting means and said fruit closure.

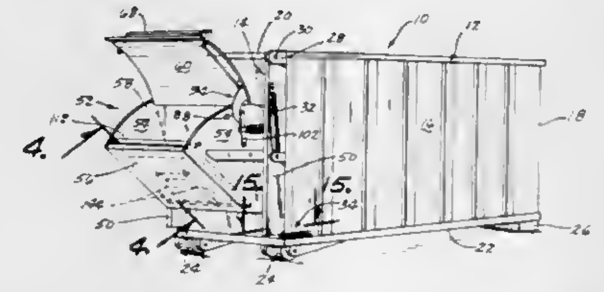
4,103,608
TRASH COMPACTOR

Louis A. Chenot, Grundy Center, Iowa, assignor to Mid-Equipment, Inc., Grundy Center, Iowa

Filed Apr. 21, 1977, Ser. No. 789,348

Int. Cl.² B30B *1/08*

U.S. Cl. 100—53 **19 Claims**



1. A compactor comprising:

a container having side walls, top and bottom walls and an end wall;

a compactor blade pivotally mounted adjacent one end of said container for pivotal movement about a horizontal axis from an initial position to a compacting position;

a stationary frame mounted in fixed relation to said container;

a linkage mechanism interconnecting said stationary frame and said compactor blade;

said linkage mechanism comprising a frame link hinged to said stationary frame, a primary link hinged to said frame link, and a blade link pivotally connected to said primary link and also pivotally connected to said blade at a point spaced from said horizontal pivotal axis of said blade;

longitudinally extensible power means;

means connecting said power means to said linkage mechanism whereby said power means upon actuation causes movement of said compactor blade from said initial position to said compacting position; and

coacting stop means on said frame link, primary link and blade link, said stop means on said primary link engageable with said stop means on said frame link and blade link for pivotal movement of the engaged links in unison in response to actuation of said power means.

4,103,609
METAL CAN PELLETIZER

Martin H. Hiatt, 993 Vernon Ave., Venice, Calif. 90291

Filed Dec. 13, 1976, Ser. No. 749,887

Int. Cl.² B30B *1/18, 15/32*

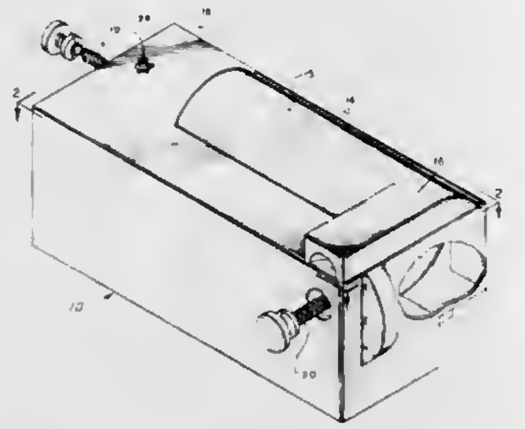
U.S. Cl. 100—218 **3 Claims**

1. A compactor for metal cans comprising

(a) a housing containing therein a closeable longitudinal cavity with a lid and having a forward endwall, said cavity opening at the opposite end into a cavity extension, said longitudinal cavity and cavity extension being adapted to receive a metal can,

(b) a power driven primary ram in the longituindal cavity, a primary driving rod and primary power means wherein the primary driving rod interconnects the primary ram with the primary power means, said driving rod passing through the forward endwall of the housing portion of said longitudinal cavity, said ram having the diameter the same as the diameter of the longitudinal cavity and wherein said power means is adapted to drive the primary ram a predetermined distance to the opposite end of the longitudinal cavity,

(c) said transverse extension forming an extension of the longitudinal cavity being substantially rectangular in shape having an endwall, a rectangular sidewall, and opposing endwall, and floor which is partially open,



(d) a power driven transverse ram in the cavity extension at right angles to the primary ram, a transverse driving rod and transverse power means wherein the transverse driving rod interconnects the transverse ram with the transverse power means said driving rod passing through the endwall of said cavity extension and wherein said transverse power means is adapted to drive the transverse ram a predetermined distance across the cavity extension and means to reverse the direction of the primary ram and transverse ram.

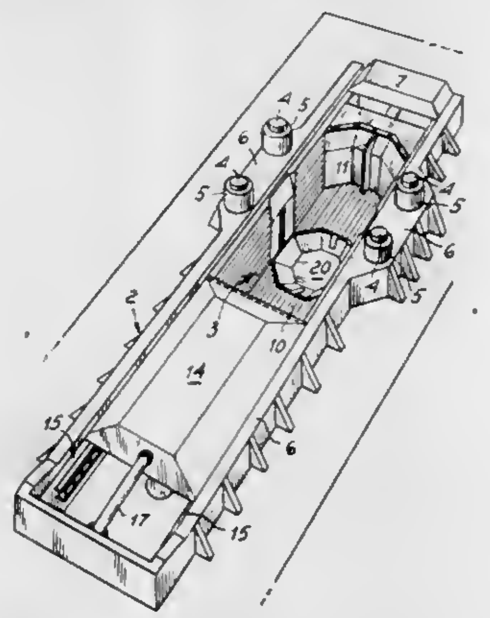
4,103,610
METAL SCRAP COMPACTING PRESS

Luciano Vezzani, Corso Italia, 43, Ovada, Alessandria, Italy

Filed Nov. 22, 1976, Ser. No. 744,213

Int. Cl.² B30B *7/04*

U.S. Cl. 100—232 **3 Claims**



1. A scrap metal compacting press, comprising a supporting bed, a chamber formed in said bed, said chamber having a bottom surface and being open at the top for the introduction of scraps thereinto, a closing cover for said chamber, means for locking said cover in its closed position, movable walls and stationary walls defining the sides of said chamber and associated with said bed, control and guide means for the shifting movement of said movable walls operative to bring the movable walls closer to each other until there is defined therebetween a cavity wherein the distances between said walls are smaller and proximate the distances between the inner walls of a furnace whereinto the compacted scraps are to be molten, a ram having an active face defining the base of said cavity, and means for moving said ram in said bed to and away from said cover in order to press, against said cover, the scraps already compacted in said cavity, wherein said active face of said ram has a cup-like configuration including a bottom and lateral walls surrounding said bottom and projecting towards said cavity, said ram being movable between a rest position in which said bottom lies at a level below said bottom surface of said chamber and a number of operative positions in which said bottom lies above said bottom surface of said chamber.

4,103,611
STROKE-LIMITING ARRANGEMENT IN A MULTI-CYLINDER HYDRAULIC PRESS

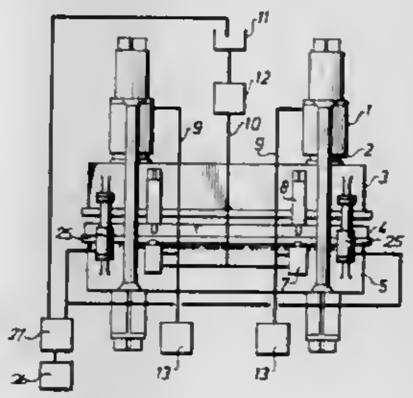
Bengt-Johan Carlsson, Motala, Sweden, assignor to A B Motala Verkstad, Motala, Sweden

Continuation-in-part of Ser. No. 659,788, Feb. 20, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,035

Claims priority, application Sweden, Feb. 28, 1975, 7502302

Int. Cl.² B30B *15/16*

U.S. Cl. 100—257 **6 Claims**



1. In a single or multi-opening, multi-cylinder hydraulic press for pressing of resilient material between two operating press surfaces, an arrangement for maintaining the relative spacing of the press surfaces at a predetermined value greater than the minimum value of said spacing during the pressing operation, and characterized by further comprising for each press cylinder (1) or each group of press cylinders, liquid supplying means (13) and, a liquid discharge valve (7) and actuating means (8) operably positioned in association with the press surfaces for mechanically opening the valve as, within the operating range of the cylinder, the relative spacing of said operating press surfaces decreases below a predetermined value, and, for each press cylinder (1) or for a plurality of cylinders in common, a valve (12) adapted to prevent or allow liquid to be discharged from the cylinder or cylinders (1).

4,103,612
INK MIST TYPE HIGH SPEED PRINTER

Akinori Watanabe; Matsusaburo Noguchi, and Toshimichi Ota, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,477

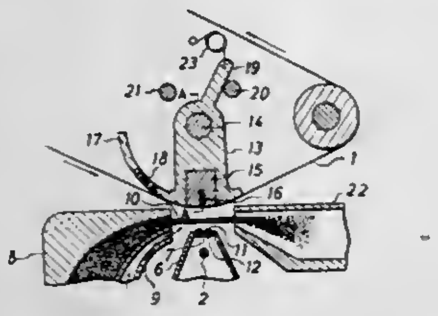
Claims priority, application Japan, Mar. 25, 1976, 51-31948

Int. Cl.² B41J *3/12, 3/18*

U.S. Cl. 101—1 **6 Claims**

1. An ink mist type high speed printer comprising a first electrode and a second electrode between which a high voltage is applied, an aperture board disposed between said first and second electrodes and adapted to selectively control passage of ions generated from the second electrode, a back bar

containing said first electrode, said back bar being in opposed relation to said aperture board, and means for generating a stream of ink mist between said aperture board and said first electrode, wherein the ink mist particles are selectively charged by the ions which have passed said aperture board and the electrically charged ink mist particles are attracted by the first electrode to print desired characters on a recording paper placed on said first electrode, and further characterized in that said back bar and said contained first electrode are divided along their lengths into plural segments so that the respective back bar segments and their respective contained first electrode segments may be separated and moved individually away from the aperture board, and a shaft extending across said printer upon which are rotatably mounted said back bar segments, each of said back bar segments comprising an insulator spaced apart from said contained first electrode segment, each of said back bar segments being rotatable on said shaft, said back bar segments being rotated to present said first electrode having a length corresponding to a desired printing width, said next adjoining back bar segments on both sides of the outer ones of said rotated back bar segments presenting said insulator, such that an insulator is located on both sides of said rotated back bar segments adjoining said first electrode.



4,103,613
SCREEN PRINTING MACHINE WITH INK SUPPLY RECIPROCATION

Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Fed. Rep. of Germany

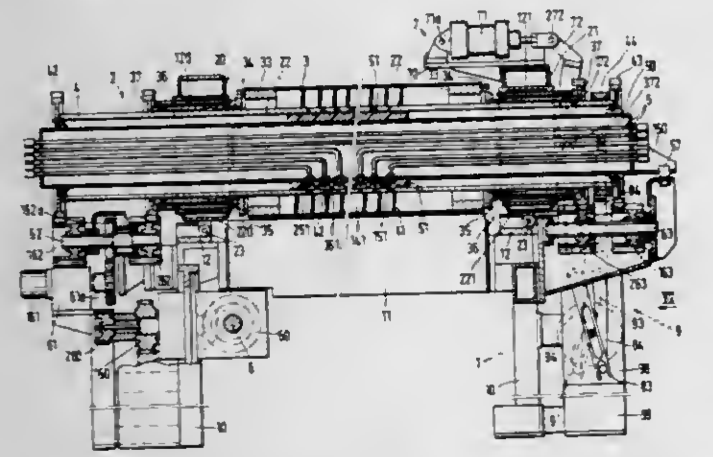
Filed Sep. 27, 1976, Ser. No. 726,876

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543394

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.² B41F *15/40*

U.S. Cl. 101—115 **27 Claims**



1. In a screen printing machine, a combination comprising workpiece supporting means having a surface; an endless printing screen of substantially annular configuration, said screen having an inner screen surface a portion of which is juxtaposed with said surface of said workpiece supporting means; drive means for advancing said screen in an endless path; an elongated carrier extending axially through said substantially annular printing screen and defining an annular clearance with said inner screen surface thereof; partition means provided on and extending from said carrier across said clearance to at least said portion of said screen surface and partitioning said annular clearance into at least two axial chambers; means for admitting printing medium into each of said chambers; and means for displacing said carrier and partition means in said annular clearance relative to said screen in at least one of the axial and circumferential directions of said annular clearance.

4,103,614
SCREEN PRINTING MACHINE WITH RECIPROCATING ENDLESS PRINTING SCREEN

Mathias Mitter, Gescbaftsfuhrer Falkenstrasse 57, 4815 Schloss Holte, Germany

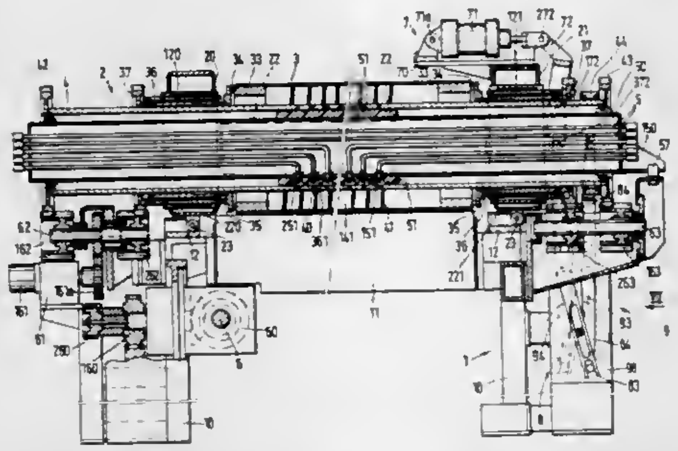
Filed Sep. 27, 1976, Ser. No. 726,877

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543419

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.² B41F *15/10, 15/38, 15/40*

U.S. Cl. 101—115 **33 Claims**



1. In a screen printing machine, a combination comprising an endless printing screen having an outer surface and a corresponding inner surface; means mounting said printing screen for advancement in a printing path in which successive portions of said outer surface become juxtaposed with a web travelling past said outer surface so as to print patterns onto said web; an elongated carrier extending through the space surrounded by said screen transversely of the path of travel of said web and defining with said inner surface an annular clearance; at least one partition on said carrier, extending across said clearance at least opposite said web and subdividing said clearance into two successive axial chambers; means for admitting flowable printing medium via said carrier into said chambers from where the printing medium passes through the screen so as to print on said web; and means for continuously reciprocating said screen in direction transversely of said printing path while said screen is advancing in said path, so that the location of successive patterns printed onto said web varies transversely of the web as a function of the reciprocation of said screen.

4,103,615
VERTICAL ROTARY SCREEN PRINTING MACHINE AND INK SUPPLY THEREFORE

Edmundo Novas Cruz, and Alvaro Neff Valadares, both of Lisbon, Portugal, assignors to Sir James Farmer Norton & Co., Limited, Salford, England

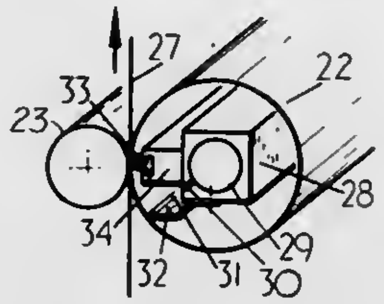
Filed Jul. 29, 1976, Ser. No. 709,736

Claims priority, application Portugal, Jan. 14, 1976, 64693; United Kingdom, May 25, 1976, 21574/76

Int. Cl.² B41F *15/44*

U.S. Cl. 101—120 **12 Claims**

1. A rotary screen printing machine comprising; a frame including a plurality of screen printing cylinders, means for superimposing said printing cylinders in a vertical arrangement one above another on said frame; a dye dispensing bar and squeegee arrangement extending through each said printing cylinder and including a hollow bar extending therethrough and projecting beyond the ends thereof; spaced platforms for said each cylinder; a first bearing slidably mounted on one said platform and rotatably mounting one end of said hollow bar; a second bearing slidably mounted on the other said platform and mounting the other end of the hollow bar; a squeegee blade mounted along the hollow bar for contact with the internal surface of the corresponding printing cylinder; a plate supported along the hollow bar to define with the squeegee blade a dye liquor weir in communication with the hollow bar interior via metering passage means; means connected to one of said ends of the hollow bar for controllably feeding dye liquor into the hollow bar interior and from thence via said metering passage means and weir to the printing cylinder internal surface; means on each said platform and connected to each bearing for sliding the latter along the platforms radially towards or away from the internal surface of its corresponding printing cylinder to vary the contact pressure between the squeegee blade and each said printing cylinder and adjustment means interconnecting the second bearing and the hollow bar for pivoting the hollow bar about its own axis and locking the same in adjusted angular position to thereby control the amount of dye liquor egressing from the weir radially towards the corresponding printing cylinder internal surface.



4,103,616
ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS

Joseph Y. Chu, Fairport, and Richard L. Schank, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1977, Ser. No. 791,354

Int. Cl.² B05D *3/06*

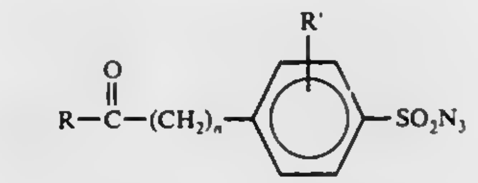
U.S. Cl. 101—467 **8 Claims**

1. A process for preparing an imaged waterless lithographic printing master comprising

(a) providing a suitable master substrate,

(b) providing a silicone elastomer gum having pendant reactive hydroxyl or primary or secondary amino groups,

(c) providing an azide which is thermally stable at ambient temperature in an amount sufficient to react with said pendant groups wherein said azide is of the formula



$$\mathrm{R-C(=O)-(CH_2)_n-C_6H_3(R')-SO_2N_3}$$

wherein R is chloro or hydroxyl, R' is chloro, cyano, hydrogen or nitro or an alkyl of from 1–8 carbon atoms and *n* is an integer of from 0–20,

(d) reacting said azide with said pendant groups and coating said substrate with the reaction product,

(e) depositing a particulate image pattern comprising a thermoplastic hydrocarbon polymer on said coating in image configuration, and

(f) crosslinking said silicone to chemically bond said hydrocarbon polymer thereto and the silicone to the substrate.

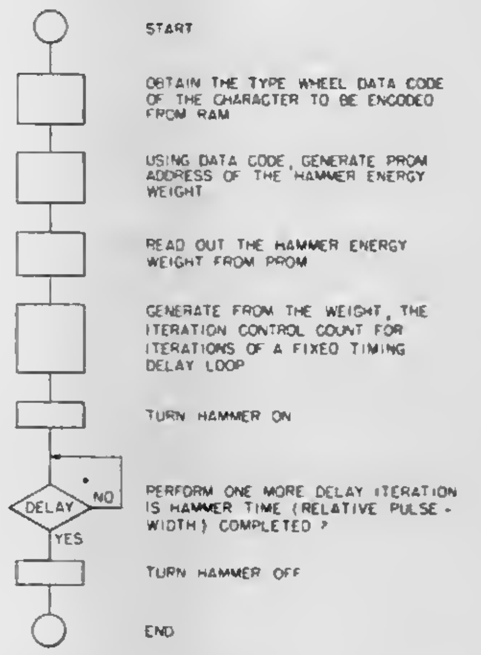
4,103,617
HAMMER ENERGY IMPACT CONTROL USING READ ONLY MEMORY

William L. O'Brien, Waterloo, and Wayne M. Doran, Kitchener, both of Canada, assignors to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Jan. 10, 1977, Ser. No. 758,220

Int. Cl.² B41J *7/92*

U.S. Cl. 101—93.03 **9 Claims**


START
OBTAIN THE TYPE WHEEL DATA CODE OF THE CHARACTER TO BE ENCODED FROM RAM
USING DATA CODE, GENERATE PROM ADDRESS OF THE HAMMER ENERGY WEIGHT
READ OUT THE HAMMER ENERGY WEIGHT FROM PROM
GENERATE FROM THE WEIGHT, THE ITERATION CONTROL COUNT FOR ITERATIONS OF A FIXED TIMING DELAY LOOP
TURN HAMMER ON
DELAY
NO
YES
PERFORM ONE MORE DELAY ITERATION IS HAMMER TIME (RELATIVE PULSE-WIDTH) COMPLETED ?
TURN HAMMER OFF
END

1. In a printer having movable means for carrying type characters, hammer means for impacting against the type characters, and means for controlling the impact energy of said hammer means, said impact energy controlling means including first memory means containing coded data of the position of said type characters on said movable means,

second memory means containing coded data representative of the surface areas of the respective type characters;

computer means for selecting coded data from said second memory means as defined by the type character being printed, and

means for energizing said hammer means for a duration comprising the sum of a fixed period of time and of an additional period of time representative of the coded data selected by said computer means.

4,103,618
MEANS FOR EXTRACTING A SOIL ANCHOR CONSISTING OF A PRESTRESSED STEEL TENDON

Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG, Bern, Switzerland

Division of Ser. No. 586,801, Jun. 13, 1975, Pat. No. 4,036,137. This application Jan. 19, 1977, Ser. No. 760,583

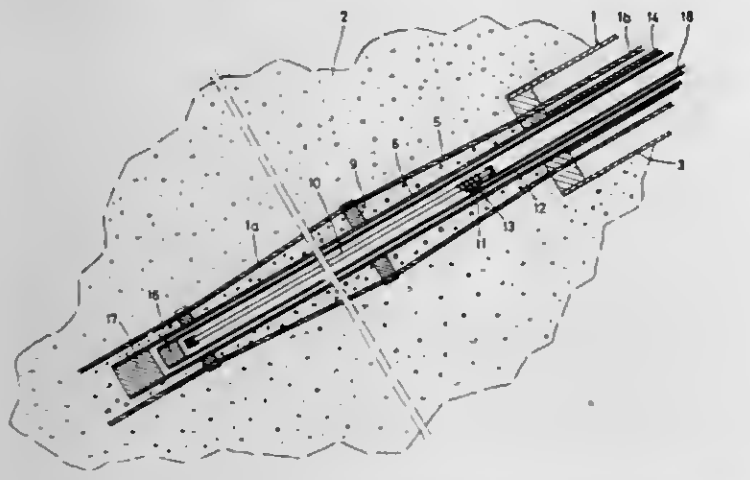
Claims priority, application Switzerland, Jun. 19, 1974, 8424/74

Int. Cl.² F42D *1/00*

U.S. Cl. 102—22 R **2 Claims**

1. Means for extracting a ground anchor embedded in the ground including a tendon embedded in concrete in a borehole in the ground, comprising a hollow loading tube placed longitudinally of the entire length of the tendon and an explosive means for subjecting the ground anchor to a rupturing force in the borehole so that after detonating the explosive means the ground anchor can be withdrawn from the borehole, said

explosive means comprising a charge tube having a fuse cord and an electric detonator attached to said cord; said charge tube with said fuse cord and said electric detonator being introduceable in said loading tube.



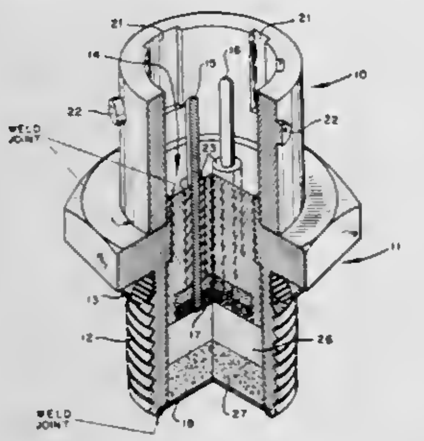
4,103,619
ELECTROEXPLOSIVE DEVICE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Vincent J. Menicbelli, Glendale, Calif.

Filed Nov. 8, 1976, Ser. No. 740,153

Int. Cl.² F42C *19/12*

U.S. Cl. 102—28 R **9 Claims**



1. In an electroexplosive device, a body having a passage and a header comprised of an insert having an external configuration matching said passage through said body such that said header will lodge in said passage at said one end leaving a space in said body for explosive materials to be loaded into said body behind said header, said insert having a cavity in the end thereof over which said explosive material is loaded, said header further comprising at least two electrical contact pins passing through said insert with ends of said pins protruding from said insert at said one end of said body passage, and with the other ends of said pins in said cavity of said insert flush with the cavity-end of said insert, a first layer of nonlinear resistive composition formed in said cavity of said insert in electrical contact with both pins, a second layer of thermal conductive dielectric composition over said layer of nonlinear resistive composition, and a bridgewire connected across the ends of said pins in thermal contact with said second layer over its full length between said contact pins.

4,103,620
PROJECTILE EXPLOSIVE

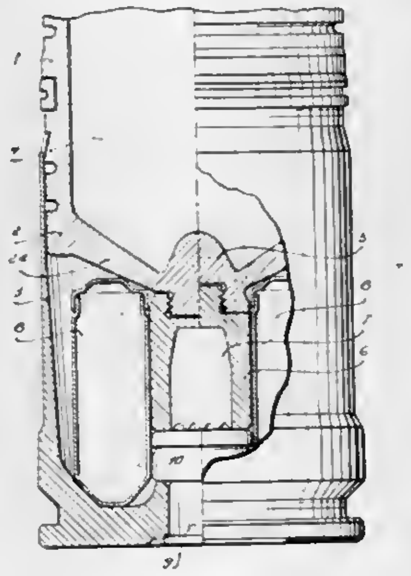
Maurice Rusbach, Vernier, Geneva, Switzerland, assignor to Sarmac S.A., Carouge, Geneva, Switzerland

Filed Oct. 28, 1976, Ser. No. 736,305

Claims priority, application Switzerland, Nov. 12, 1975, 14699/75

Int. Cl.² F42B *13/34*

U.S. Cl. 102—38 **16 Claims**



1. An explosive fragmentation type projectile stabilised by gyration, carrying a tubular case and provided with an instantaneous percussion head fuse and a tracer, in which the base of the projectile comprises a thick heavy and projecting central part, having at its rear end means of attaching a tracer and in which an annular part of the base connecting the central part to a cylindrical wall of the projectile is of a thickness which diminishes in the direction of the central part, and which extends towards the rear of the projectile, and in which this annular part of the base comprises at least one zone of diminished strength.

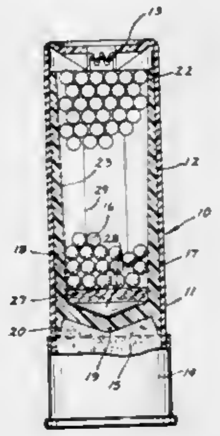
4,103,621
WAD COLUMN FOR SHOTSHELLS

David G. Fackler, 16230 Fifth Ave., North, Wayzata, Minn. 55391

Filed Jul. 19, 1976, Ser. No. 706,219

Int. Cl.² F42B *7/08*

U.S. Cl. 102—95 **2 Claims**



1. A wad column for a shotshell and a shotgun with a full choke barrel incorporating a tapered choke restriction, the wad column comprising:

a resiliently flexible molded plastic shot cup having a peripheral cup wall and a transverse bottom wall formed integrally and in one piece with the peripheral wall and extending entirely across the peripheral wall,

the peripheral wall having an outer open mouth end and an inner sealing skirt end adjacent the bottom wall, the bottom wall being dome-shaped with a concave side facing the open mouth end of the peripheral wall, the bottom wall having an obliquely angular relation to the adjacent peripheral cup wall, the peripheral wall progressively increasing in thickness from the open mouth end to the bottom wall to the extent that the inner peripheral surface of the cup wall tapers conically and divergently toward the open mouth end, the peripheral cup wall having slits extending from the open mouth end substantially to the bottom wall; and

a hard cardboard wad in the cup and bearing against the entire periphery of the dome-shaped bottom wall and cooperating therewith to define an air chamber, and the bottom wall supporting the periphery of the wad and facilitates efficient sealing between the wad and bottom wall, and

the cardboard wad deforming under pressure of rapid acceleration in the shotgun barrel to at least partially collapse the air chamber and reduce pressures upon the shot in the cup.

4,103,622
BALLAST TAMPING MACHINE

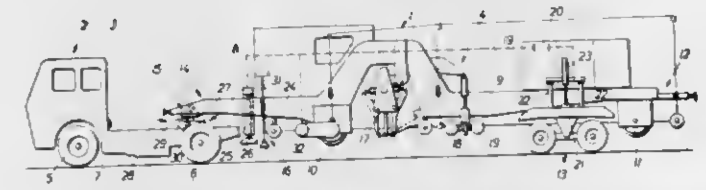
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen m.b.H., Vienna, Austria

Filed May 12, 1977, Ser. No. 796,373

Claims priority, application Austria, Sep. 10, 1976, 6746/76

Int. Cl.² E01B *27/17;* **B61F** *13/00*

U.S. Cl. 104—7 R **8 Claims**



1. A machine for tamping ballast under the ties of a track and adapted for selective movement on a road or on the track, comprising

(a) a machine frame having two ends,

(b) an undercarriage at each of the machine frame ends, whereon the machine frame is mounted, the undercarriages having wheels adapted for engagement with, and mobility on, the track,

(c) a truck tractor and undercarriages supporting the truck tractor, the undercarriages of the truck tractor having wheels adapted for engagement with, and mobility on, the road,

(d) coupling means for coupling one of the machine frame ends to the truck tractor,

(e) a vertically adjustable lifting and support means for the machine frame,

(f) a ballast tamping unit mounted on the machine frame between the coupling means and the undercarriage at the other machine frame end,

(g) a vertically adjustable undercarriage having wheels adapted for engagement with, and mobility on, the road mounted at the other end of the machine frame,

(h) a drive for vertically adjusting the vertically adjustable undercarriage, and

(i) a drive for moving the machine.

4,103,623
SQUARING FRICTIONALLY SNUBBED RAILWAY CAR TRUCK

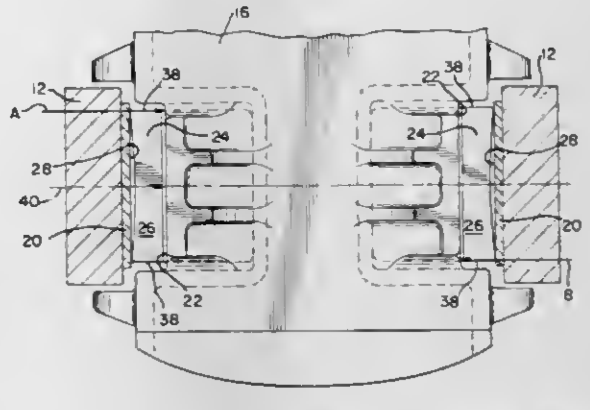
Robert P. Radwill, Oak Lawn, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 23, 1976, Ser. No. 753,790

Int. Cl.² B61F *5/06, 5/12, 5/24, 5/50*

U.S. Cl. 105—197 DB **9 Claims**

1. A truck squaring apparatus for a railway car truck comprising: a side frame having a column a relatively vertically movable bolster supported adjacent thereto; a friction surface on said column; a friction shoe pocket having a guiding surface on said bolster a friction shoe disposed in said pocket and having a first wall engageable with said friction surface on said column and a second wall engageable with said guiding surface; said respective engaging surfaces and walls having a transversely disposed recess intermediate spaced ends thereof and extending in the direction of relative movement so that initial contact between said engaging surfaces and walls is made adjacent said spaced ends of said walls.

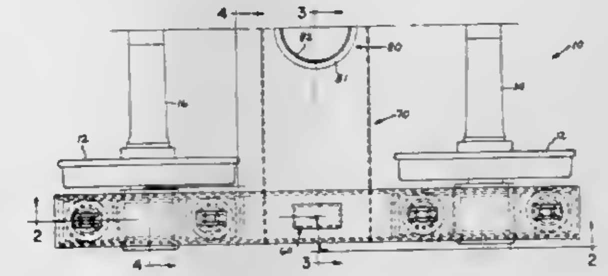


4,103,624
RAILWAY CAR TRUCK SIDE BEARINGS

James C. Hammonds, and Jan D. Holt, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y. Division of Ser. No. 519,976, Nov. 1, 1974, Pat. No. 4,082,043, which is a continuation-in-part of Ser. No. 447,823, Mar. 4, 1974, abandoned. This application Nov. 26, 1976, Ser. No. 745,315

Int. Cl.² B61F *5/14;* **C10M** *5/00, 7/00;* **F16C** *33/24*

U.S. Cl. 105—199 CB **2 Claims**



1. A railway car truck assembly comprising: an integral H frame including spaced apart, longitudinally extending side frames integrally joined by means of a transversely extending transverse member having a center fearing;

a pair of transversely extending axles journalled in journal boxes respectively on opposite sides of the truck; said axles having four wheels integral therewith for movement along a railway car track;

said side frames being resiliently mounted for rocking movement on said journal boxes;

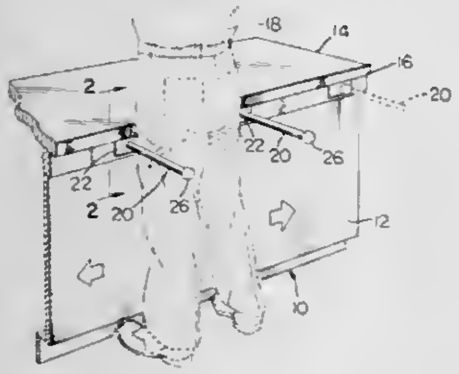
said side frames each having mounted thereon at about the midpoint thereof at least one constant contact side bearing adapted to take the weight of said car body; said side bearing having an upper surface made of a first low friction material;

a car body above said truck to pivot about said center bearing including a depending portion having a lower surface made of a second low friction material supported on said side bearings;

one of said first and second low friction material comprising filled nylon and the other of said first and second low friction materials comprising filled polytetrafluoroethylene; said first and second low friction materials having a coefficient of friction sufficiently low to allow relative rotation between the truck and the car body.

4,103,625
SUPPORTING OR STABILIZING DEVICE

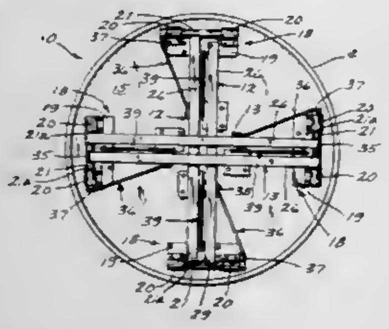
Robert B. Black, 5110 Berkley Ct., Fort Wayne, Ind. 46815
Continuation of Ser. No. 606,535, Aug. 21, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,682
Int. Cl.^{2} A61G *13/00;* A47B *37/00*
U.S. Cl. 108—44 **8 Claims**



1. In combination with a work table having a planar surface and a front edge and mounted within a vehicle, said vehicle having a floor located in front of said table, a support and stabilizing apparatus comprising: a horizontal elongate support element telescopically received in said table and extensible out of said table beyond said front edge in a direction generally parallel to said planar surface, said support element being spaced above the vehicle floor at a level which would be above the knees of a person standing in front of said table whereby the person can brace his body against said element, means for preventing movement of said element in a lateral direction with respect to the longitudinal axis thereof, and retaining means engaging said element for releasably retaining said element in its extended body bracing position.

4,103,626
TABLE WITH FOLDABLE LEGS

Arthur G. Barricks, 7605 Vincennes Ave., Chicago, Ill. 60620
Filed Nov. 7, 1977, Ser. No. 848,879
Int. Cl.^{2} A47B *3/00*
U.S. Cl. 108—127 **5 Claims**



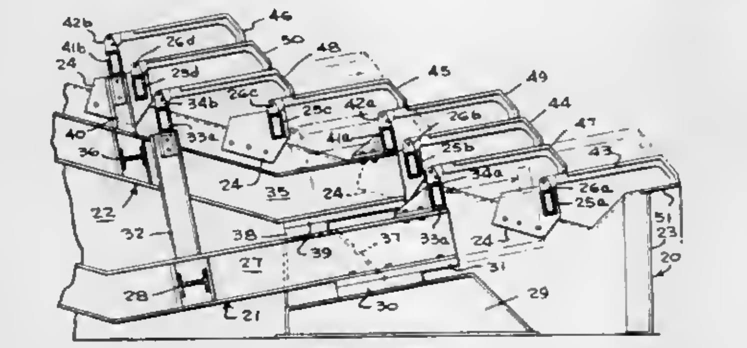
1. A table naving a table top and two pairs of legs foldable into planes parallel with the table top whereby one leg of each pair is parallel to the other leg of such pair, said table comprising:

(a) means having pivot shaft portions for mounting each of said legs to the underside of said table top near the periphery thereof, with opposite end portions of each pair of associated legs fixed to an associated pivot shaft portion for independent movement of the legs to folded and unfolded positions therefor, and

(b) the legs of one of said pairs of legs having the longitudinal axes thereof in a plane common to the longitudinal axes of said associated pivot shaft portions when in the folded positions therefor, and the legs of the other of said pairs of the legs having the longitudinal axes thereof in a plane laterally offset from the plane of the longitudinal axes of the associated shaft portions therefor when in folded positions so as to be beneath and abut against the legs of said one pair when both pairs of legs are in the folded positions therefor.

4,103,627
STOKER AND GRATE THEREFORE

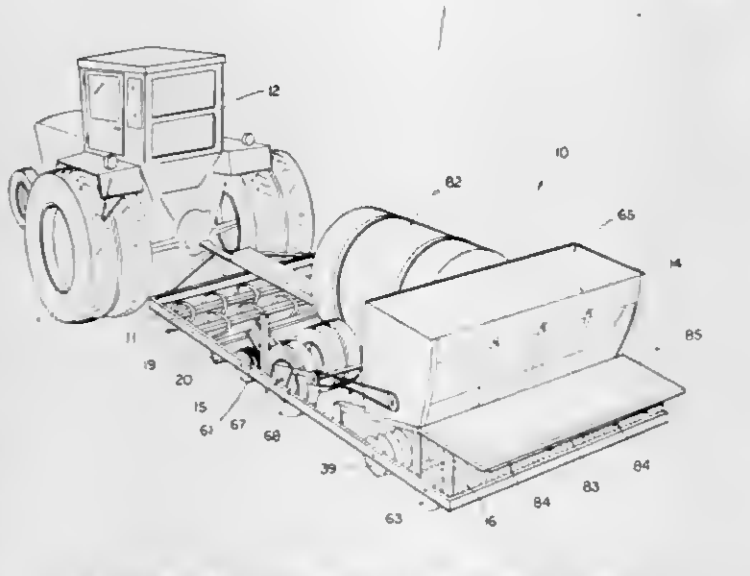
Christian M. Mainka, Bayside, N.Y., assignor to Morse Boulger, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 610,439, Sep. 4, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 779,988
Int. Cl.^{2} F23B *1/22;* F23C *7/00*
U.S. Cl. 110—281 **30 Claims**



1. A stoker comprising a support frame, a first plurality of longitudinally spaced sets of grates mounted on said support frame, a second plurality of longitudinally spaced sets of grates mounted on said support frame, each set of said second plurality of sets of grates being interposed between a set of said first plurality of sets of grates and another of said sets of grates, each of said sets of grates comprising a plurality of transversely spaced grates, each of said grates having an underside surface and an upper surface for supporting a grate of a longitudinally successive set of grates, each transversely successive pair of grates having laterally projecting, overlapping flanges providing a tortuous air passage between said successive pair of grates, at least one of said flanges terminating at a point disposed in spaced relation to said underside surface of said grate to provide a substantially longitudinal air passageway between transversely successive grates, and means for reciprocating said second plurality of sets of grates relative to said first plurality of sets of grates.

4,103,628
CONDITIONER DRILL

Charles O. Gaston, R.R. 2, Box 18, Cloverdale, Ind. 46120
Filed Sep. 7, 1976, Ser. No. 721,165
Int. Cl.^{2} A01C *5/00*
U.S. Cl. 111—52 **2 Claims**



1. In a conditioner drill having a frame and means for moving the frame relative the ground, and including first and second compressor roll devices and a planter mounted upon the frame, the frame having a front half portion and a back half portion, the first compressor roll device being mounted upon the frame in front of the planter, the improvement comprising:

a first plurality of plow teeth mounted upon the frame in front of the first compressor roll device; and

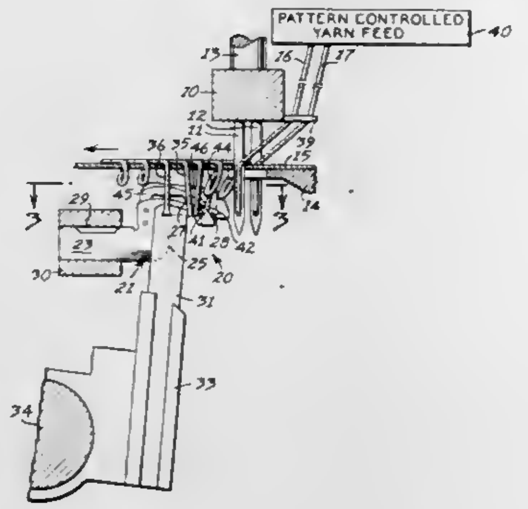
the planter being located on the frame between the first and second compressor roll devices, and having means whereby seed deposited by the planter as the frame is moved relative the ground is located at a uniform depth in the ground, said means including said first compressor roll device located in said front half portion whereas said second compressor roll device and said seed drill are located in the back end of said back half portion, said first and second compressor roll devices cooperatively supporting said frame above ground;

said planter located on said frame having a plurality of ground engaging extensions to form furrows into which seed is planted;

drive means mounted on said frame between said first compressor roll device and said planter and including a drive wheel pivotally mounted upon said frame and positioned to engage ground over which the frame is moved and being connected to said planter to cause the planter to deposit seed into the ground at an even rate per unit area regardless of the speed of said frame over the ground, said drive means including means connected to said drive wheel operable to force said drive wheel to extend at an elevation different than said compressor roll devices to continuously contact ground in the event a ground ridge is present between the compressor roll devices and beneath said drive wheel.

4,103,629
LOOPER APPARATUS FOR FORMING CUT PILE AND LOOP PILE IN THE SAME ROW OF STITCHING IN A NARROW GAUGE TUFTING MACHINE

Roy T. Card, Chattanooga, Tenn., assignor to Card & Co., Inc., Chattanooga, Tenn.
Filed Jun. 21, 1977, Ser. No. 808,646
Int. Cl.^{2} D05C *15/24*
U.S. Cl. 112—79 R **7 Claims**



6. A looper apparatus for a tufting machine comprising:

(a) a hook comprising a shank having a mounting portion adapted to be mounted on the hook bar of a tufting machine, and a bill projecting from said shank and terminating in a free end portion,

(b) said bill having a top edge and a bottom edge converging into said free end portion,

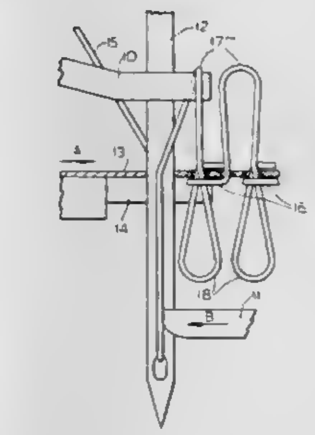
(c) said bill comprising a cutting zone adapted to cooperate with a knife in said tufting machine to cut tufted loops on said bill,

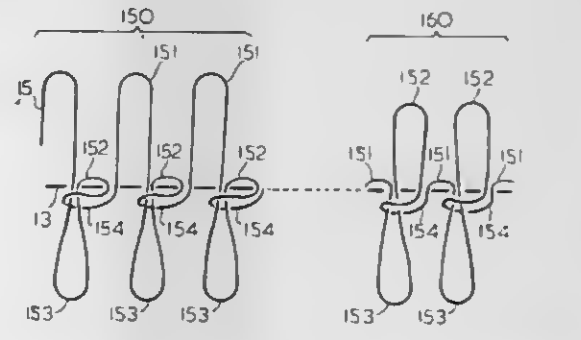
(d) a spring clip having a body portion and a clamp portion,

(e) means mounting said body portion upon said hook to normally bias said clamp portion against the free end portion of said bill, said body portion extending above said cutting zone, and all portions of said spring clip being transversely disaligned with said cutting zone.

4,103,630
TUFTING MACHINES AND METHOD

Norman Wignall, Blackburn, England, assignor to Cupa Engineering Co. Ltd., England
Filed May 17, 1976, Ser. No. 687,426
Int. Cl.^{2} D05C *15/16*
U.S. Cl. 112—79 R **14 Claims**





1. A method of forming a double-sided pile fabric including repeatedly effecting the cycle comprising:

a. projecting a reciprocating eyed needle carrying yarn through said base fabric from one side thereof to form a non-pile loop of yarn on the other side of said base fabric;
b. advancing a first latchless looper through said non-pile loop;
c. retracting said needle to a position spaced from said one side of said base fabric while said non-pile loop is retained on said first looper;
d. advancing said base fabric along a path;
e. projecting said needle carrying said yarn through said base fabric to a dwell position wherein the point of said needle is adjacent said first looper to form a pile loop of yarn on said other side of said base fabric;
f. tensioning said yarn to cause said non-pile loop to slide off said first looper and about the end of said needle and to tighten around said needle and pile loop and against said other side of said base fabric;
g. withdrawing said first looper;
h. further advancing said needle with said pile loop;
i. advancing said first looper through said pile loop;
j. retracting said needle to a position spaced from said one side of said base fabric while said pile loop is retained on said first looper;
k. advancing said base fabric along said path and withdrawing said pile loop from said first looper; and
l. retaining said yarn with a reciprocating second latchless looper spaced from said one side of said base fabric while said needle is moved towards said base fabric following one of said steps (d) and (k) to form a pile loop on said one side of said base fabric;
m. whereby a succession of contiguous loops are formed on

said one side of said base fabric and a succession of spaced-apart loops are formed on the other side of said base fabric.

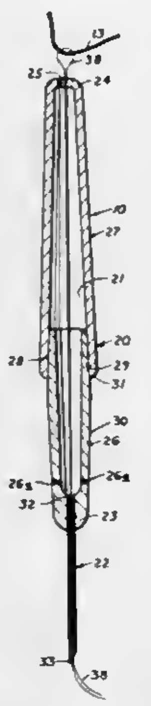
7. A machine for manufacturing a double sided pile fabric comprising:

a. at least one eyed needle;
b. drive means to reciprocate the needle through a base fabric;
c. means to feed the base fabric along a path past the needle so that, as the needle reciprocates, a yarn passing through the eye of the needle is passed from one side through to the other side the base fabric at a succession of spaced-apart points to form a succession of spaced-apart loops on one side of the base fabric and a succession of alternate non-pile loops and adjacent pile loops on the other side of the base fabric;
d. a first latchless looper spaced from the other side of said path of the base fabric;
e. means to provide relative displacement between said first looper and said needle so that said first looper alternately retains each alternate non-pile loop and each adjacent pile loop away from the other side of said base fabric and positions said first looper, while said looper is retaining each alternate non-pile loop, in advance of the point of said needle forming each adjacent pile loop;
f. means to pull the yarn forming said alternate non-pile loop while said first looper is positioned adjacent the point of said needle such that said alternate non-pile loop is slid off said first looper and about the point of said needle and tightened around said needle and adjacent pile loop and against the other side of said base fabric whereby a first set of pile loops is formed on the other side of said base fabric;
g. a second latchless looper spaced from said one side of said path of said base fabric; and
h. means to provide relative displacement between said second looper and said needle so that on alternate strokes of said needle the needle travels along one side of said second looper and then back along the other side of said second looper, carrying the yarn with it whereby alternate loops of the yarn are held away from the base fabric by said second looper to form a set of spaced-apart pile loops on the one side of said base fabric.

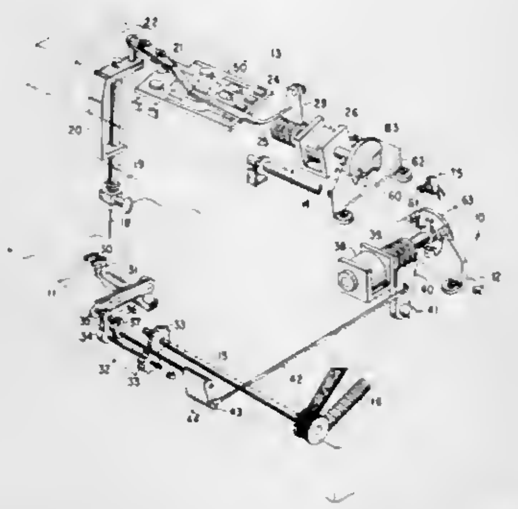
4,103,631
EMBROIDERY PUNCH
Sharon Mae Gray, Rte. 3, Box 166, Cheney, Wash. 99004
Filed May 20, 1977, Ser. No. 798,792
Int. Cl.^{2} D05B *15/06*
U.S. Cl. 112—80 **3 Claims**

1. An embroidery tool, comprising:

a hollow elongated body having a female member and a male member that are reversibly frictionally interconnectible;
said male member having a hollow interior extending between a needle receiving end and an open opposite end;
said male member having two exterior surfaces that are oppositely tapered inward toward respective ends of the male member;
an elongated hollow needle mounted to the needle receiving end of the male member in open communication with the hollow interior and projecting longitudinally from the male member a prescribed distance and terminating in a pointed tip;
said needle having a transverse eye formed adjacent the tip communicating with the hollow interior of the needle; and
said female member having a thread receiving opening formed in one end thereof communicating with a hollow interior that extends to an opposite end having a tapered female opening formed therein complementary to the tapered exterior surfaces of the male member for frictionally receiving either of the ends of the male member; and
said hollow interior of the female member having a length greater than the prescribed distance of the needle to encase the needle in the hollow interior of the female member when the needle receiving end of the male member is received in the tapered female opening of the female member.

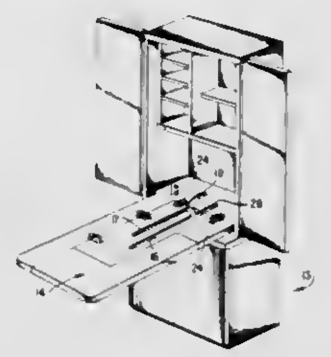


4,103,632
STEPPING MOTOR SHAFT POSITION DETERMINING ARRANGEMENT
Theodore L. Bowles, South Orange, N.J., assignor to The Singer Company, New York, N.Y.
Filed Oct. 20, 1977, Ser. No. 843,763
Int. Cl.^{2} D05B *3/02*
U.S. Cl. 112—158 E **5 Claims**



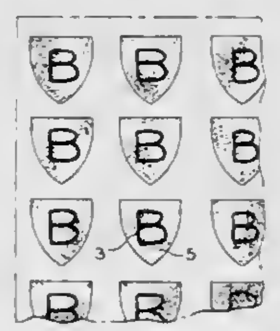
1. In a sewing machine having at least one stitch forming instrumentality variable in position over a predetermined range of possible positions between successive stitches to produce a predetermined pattern of stitches, a stepping motor including a shaft operatively connected to impart movement to said stitch forming instrumentality over said predetermined range of positions, said stepping motor including a rotor member fixedly connected to said shaft and a plurality of diametrically opposed coil pairs circumferentially disposed about said shaft, and control means responsive to stitch pattern signals applied thereto for selectively and sequentially energizing said stepping motor coil pairs so as to move said rotor in discrete angular increments, the improvement comprising means for sensing which one of a plurality of defined angular sectors said shaft is in, said plurality of defined angular sectors being less than the number of discrete angular orientations which said shaft can assume, and means responsive to said sensing means and to a signal from said control means representative of which of said plurality of coil pairs is energized for determining the angular orientation of said shaft.

4,103,633
SEWING MACHINE TRACK STORAGE SYSTEM
Carl S. Frank, Clark; John J. Grzybowski, Rahway, and Robert S. Peets, Watchung, all of N.J., assignors to The Singer Company, New York, N.Y.
Filed Nov. 21, 1977, Ser. No. 853,688
Int. Cl.^{2} A47B *29/00*
U.S. Cl. 112—217.1 **4 Claims**



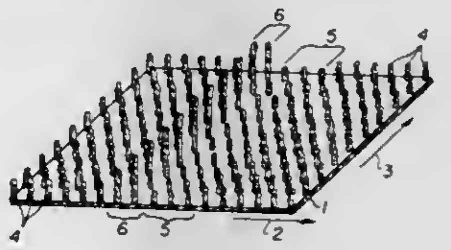
1. A track storage system for a sewing machine comprising an enclosure having an inside base; a work leaf attached to said enclosure and rotatable to form a horizontal extension of said inside base; guide means disposed on said work leaf and said inside base, said guide means on said inside base and on said work leaf providing an uninterrupted guide track system when said work leaf is rotated to form a horizontal extension of said inside base; means on said sewing machine for operatively engaging said guide means; said guide means including first portions disposed at the inside surface extremity thereof whereby a sewing machine can be horizontally turned to a position normal to its stored position within said enclosure, and said guide means including second portions disposed at the work leaf extremity thereof, accommodating translational movement of said sewing machine along said guide means to a work position on said work leaf.

4,103,634
CREST AND METHOD OF MANUFACTURE
Joseph D. Schachter, 866 Elm St., Winnipeg, Manitoba, Canada
Filed Jan. 7, 1977, Ser. No. 757,664
Claims priority, application Canada, Oct. 7, 1976, 262935
Int. Cl.^{2} D05C *17/00*
U.S. Cl. 112—439 **11 Claims**



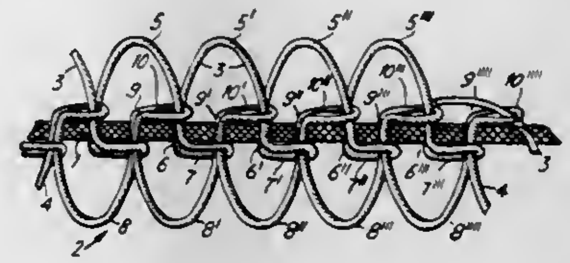
7. A crest comprising a chenille body having a surface containing a coloured design imprint of sublistatic ink, and stitched bound edges.

4,103,635
METHOD FOR MAKING TUFTED GOODS
Richard Sedlaczek, Wels, Austria, assignor to Edgar Pickering (Blackburn) Limited, Blackburn, England
Filed May 25, 1976, Ser. No. 690,030
Claims priority, application Austria, May 26, 1975, 3967/75
Int. Cl.^{2} D05C *3/00, 15/00*
U.S. Cl. 112—266 **4 Claims**



1. In a method for the manufacture of a pile fabric, wherein a rotary drive shaft is driven at a normal operating speed to operate needles punching yarns through a foundation for forming yarn loops thereon, and the rotation of the shaft is stopped in case of yarn breakage, the steps of continuously reducing the rotary speed of the shaft from the normal operating speed to a low speed before it is stopped from the low speed and then, after repair of the yarn breakage, restarting the shaft rotation at the low speed and thereafter continuously increasing the rotary speed of the shaft to the normal operating speed.

4,103,636
METHOD FOR INSERTING SEAMS IN BASE FABRIC
Gerald Frank Ward, and Gordon Richard Wray, both of Loughborough, England, assignors to National Research Development Corporation, London, England
Division of Ser. No. 509,021, Sep. 24, 1974, Pat. No. 4,041,884, which is a continuation of Ser. No. 883,876, Dec. 10, 1969, abandoned. This application Mar. 18, 1977, Ser. No. 778,923
Claims priority, application United Kingdom, Dec. 10, 1969, 1623/69
Int. Cl.^{2} D05C *15/04*
U.S. Cl. 112—266 **3 Claims**



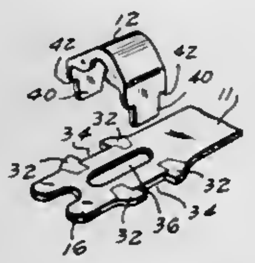
1. A method of forming a line of stitching of tufted fabric which includes continuously passing a base fabric through a tuft insertion zone, providing two needles, each with means to move the needle in turn through the base fabric so that they penetrate the fabric from opposite sides in the tuft zone, actuating the needles to move them with the base fabric when penetrating the fabric, each needle being threaded with a thread from an individual supply, causing one needle to pass a first doubled portion of its thread through the fabric at a first point of insertion, forming a portion of thread between the said point of insertion and the immediately previous point of insertion of the said one needle into a first tufting loop bridging the two said points of insertion, preventing part of the said first doubled portion from being pulled back through the fabric when said one needle is retracted so as to form a first 'double' loop on the opposite side of the fabric from said first tufting loop, causing said other needle to pass a doubled portion of the second thread through the fabric at a point less than a said first tufting

loop stitch length from the insertion point of said one needle, forming a portion of thread between the latter insertion point and the immediately previous point of insertion of the said other needle into a second tufting loop portion bridging the two latter points of insertion, preventing part of said doubled portion of the second thread from being pulled back through the fabric when said other needle is retracted so as to form a second 'double' loop on the opposite side of the fabric from said second tufting loop, causing the said first 'double' loop of the first thread to embrace the adjacent parts of two adjacent tufting loops on said second thread, causing the said first 'double' loop to lie prone on the fabric so as to lie around said two adjacent parts of tufting loops substantially at the point of penetration of said fabric by said adjacent parts, causing the said second 'double' loop of the second thread to embrace the adjacent parts of two adjacent tufting loops on said first thread and causing the said second 'double' loop to lie prone on the fabric so as to lie around said other two adjacent parts of tufting loops substantially at the point of penetration of said fabric by said adjacent parts, whereby the said prone loops are anchored at the bases of adjacent tufting loops, and repeating the passing of the threads alternately through the fabric to form a line of stitching in which tufting loops appear on both sides of the base fabric.

4,103,637

METHOD OF SHAPING A SCREW TYPE CLAMPING COLLAR

Andre R. Luc, Ozoir-la-Ferriere, France, assignor to Tridon-Serflex S. A., Bry-sur-Marne, France
Continuation of Ser. No. 692,335, Jun. 4, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,358
Claims priority, application France, Jun. 4, 1975, 75 18313
Int. Cl.² B21O *45/00*
U.S. Cl. 113—116 M 8 Claims

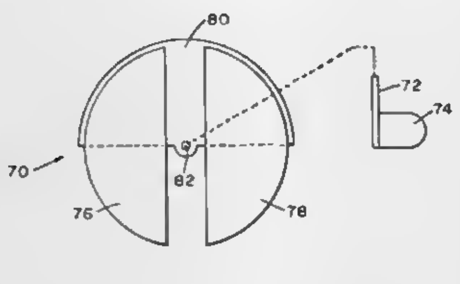


1. The method of treating a flexible band for use in a screw-type clamping collar having a saddle housing including a pair of spaced legs thereon comprising the steps of forming the flexible band of malleable material in a predetermined width, stamping one end of said band along its edges to extend the material of a predetermined portion of the band beyond the edges thereof and form transverse shoulders on said band edges in spaced relation to each other, whereby the legs of said housing may be placed between the shoulders and bent under the band with said shoulders, integral with the band, resisting longitudinal movement of the housing along the band and the forces applied thereto when the clamp is used; said stamping step comprising the steps of cutting an elongated slot in said one end of said band along its median axis in a length substantially equal to the desired spacing between shoulders on opposite sides of the band; enlarging said slot laterally by pushing the side edges of the slot, between an anvil and pressure plate, laterally outwardly towards adjacent edges of the band without changing the direction of said band; and punching the pushed out edges of the band to form recesses therein which define spaced transverse shoulders on the edges of the band.

4,103,638

AUTOMATIC PILOTING SYSTEM

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, Harahan, La.
Division of Ser. No. 630,539, Nov. 10, 1975, Pat. No. 4,038,528. This application Apr. 13, 1977, Ser. No. 787,271
Int. Cl.² B63H *25/36*
U.S. Cl. 114—144 E 6 Claims



1. For use in an automatic piloting system in which rudder control signals are provided to control rudder position, a rudder angle indicator comprising:

a differential capacitor coupled to said rudder and including a first and a second capacitor respectively providing a first capacitance and a second capacitance;

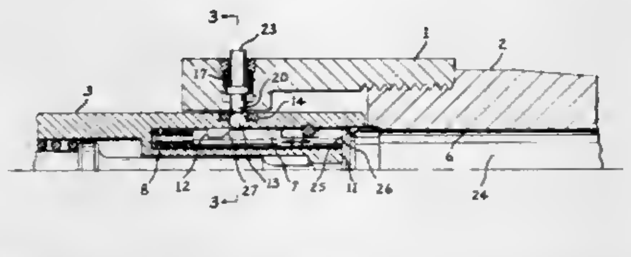
said first capacitance increasing and said second capacitance correspondingly decreasing for rudder positions of one sense, said first capacitance decreasing and said second capacitance correspondingly increasing for rudder positions of opposite sense; and

means operative in response to said first and second capacitances for providing a pulse width modulated signal, the pulse width of which is representative of rudder position.

4,103,639

GUN CHAMBER INDICATOR

Nelson Stuart Otteson, 6724 Caneel Ct., Springfield, Va. 22152
Filed Mar. 24, 1977, Ser. No. 780,990
Int. Cl.² F41C *27/12;* G08B *5/02*
U.S. Cl. 42—1 D 10 Claims

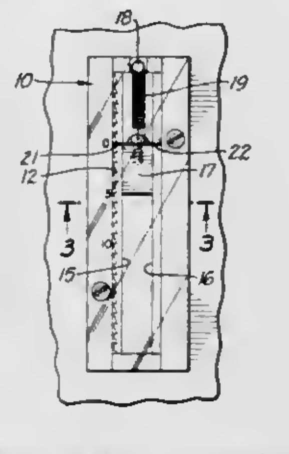


1. In a firearm, a breech bolt and a receiver, said breech bolt moving within said receiver from an unlocked and open position to a closed and locked position, and vice-versa, a barrel secured to a front portion of said receiver, a rear portion of said barrel containing a chamber, a head portion, said head portion being at the front part of said breech bolt and cooperating with said chamber when said breech bolt is in the closed and locked position to contain and support a cartridge when the cartridge is inserted into said chamber of said barrel, a spring-powered ejector means fitted into said head of said breech bolt to eject the cartridge from said firearm by spring power if the bolt is moved from the closed and locked position to the unlocked and open position, the improvement comprising a mechanical indicator means for determining the presence or the absence of a cartridge in said chamber of said firearm when said breech bolt is in said closed and locked position, said indicator means operationally coacting with said ejector means, said ejector means functioning as the probe for said indicating means for determining the presence or absence of a cartridge in said chamber, said indicator means being moveable to an indicating position by said ejector means in response to the presence of a cartridge in said chamber.

4,103,640

GRAVITY IMPACT INDICATOR FOR SHIPPING CONTAINERS

Leo Feder, 1734 Ellincourt Dr., South Pasadena, Calif. 91030
Filed May 19, 1977, Ser. No. 798,373
Int. Cl.² G01P *15/04*
U.S. Cl. 116—114 AH 10 Claims

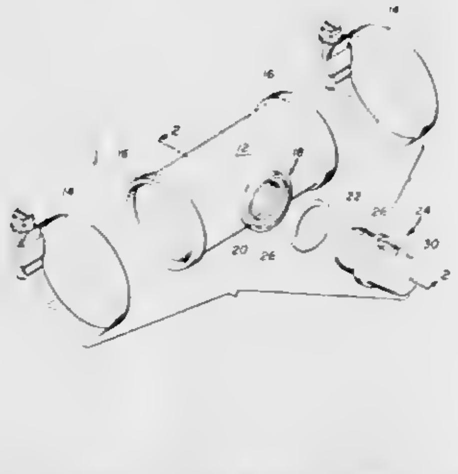


1. A gravity impact indicator for shipping containers carrying valuable delicate cargo, said indicator comprising a case, means for attaching said case to a shipping container, a weight mounted for vertical movement within the hollow interior of said case, resilient means normally restraining said weight against downward movement under normal gravity force, said resilient means comprising an elongated coil spring connected at its upper end to said case and at its lower end to said weight, said weight being adapted to move downwardly within said case upon said container being subjected to gravity impact greater than normal, means to restrain said weight against return upward movement, said means to restrain said weight comprising ratchet means engageable between said weight and said case, said ratchet means comprising a plurality of vertically spaced teeth carried by said case and means carried by said weight for engaging said teeth, means sealing said weight and weight restraining means against access from the exterior of said case to prevent changing the vertical position of said weight, and track means within said case for guiding downward movement of said weight.

4,103,641

SIGHT GAUGE DEVICE FOR FLEXIBLE LIQUID CARRIERS

Thomas R. Demyon, 6201 Loch Raven Blvd., Baltimore, Md. 21212
Filed Oct. 6, 1976, Ser. No. 729,924
Int. Cl.² G01F *23/02*
U.S. Cl. 116—117 C 1 Claim

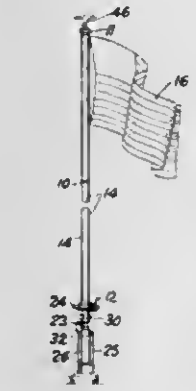


1. A sight gauge device for flexible liquid carriers comprising a cylindrical body means, a cylindrical port means in the side of said cylindrical body means, a bulb-like observation means assembled to said cylindrical port means, said bulb-like observation means having at least one protrusion on the outside thereof to facilitate the assembly of said bulb-like observation means to said cylindrical port means, base clamp means, said cylindrical body means having flanged ends for insertion into and then for coupling to a flexible liquid carrier and secured thereto by said base clamp means around said flexible liquid carrier on the inboard side of each of said flanged ends of said cylindrical body means, the interior of said cylindrical body means communicates with the interior of said flexible liquid carrier into which each end of said cylindrical body means has been inserted with the interior of said cylindrical port means communicating with the interior of said cylindrical body means and also communicating with interior of said observation means assembled to said cylindrical port means, said observation means being hollow and formed of a transparently clear material wherein liquid level can be visually observed as the liquid flows by communication of and from said flexible liquid carrier into said cylindrical body means and then into said cylindrical port means and thence into said observation means, seal means, and said observation means being sealed by said seal means at the interface with said port means.

4,103,642

REMOTE THREADING FLAGPOLE

Gordon Swenson, 310 Arbuckle Rd., Erie, Pa. 16509
Filed Mar. 21, 1977, Ser. No. 781,770
Int. Cl.² E21C *29/18;* G09F *17/00*
U.S. Cl. 116—174 10 Claims



1. A remote threading flagpole comprising,
a pole,
a cap on the upper end of said pole,
a laterally extending slot in the top of said cap,
two horizontally spaced pulleys on said cap,
said slot being open at its top and disposed in said cap top tangentially to the top of said pulleys,
a rope having an intermediate part between its ends disposed in said slot passing around said pulleys and having its ends adapted to be attached to a flag,
a sleeve means slidably supported on the lower end of said flagpole,
at least one pulley on said sleeve means,
said rope passing around said pulley whereby the weight of said sleeve means exerts a downward force on said pulley holding said flag to said pole.

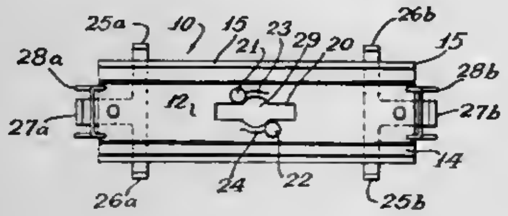
4,103,643

AEROSOL-REDUCING SLIDE HOLDER SYSTEM

John J. J. Staunton, Oak Park, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Continuation of Ser. No. 428,295, Dec. 26, 1973, abandoned, which is a continuation of Ser. No. 341,347, Mar. 15, 1973, abandoned. This application Jun. 23, 1977, Ser. No. 809,504
Int. Cl.² B05C *11/08*
U.S. Cl. 118—50 22 Claims

1. Apparatus for holding a planar specimen slide during rotation by drive means comprising, in combination:

support means for said slide; and means for attaching said support means to the drive means so that said support means may be rotated about a substantially vertical axis by said drive means, said support means including a cavity with at least one passage transverse to the vertical axis, mechanical means for at least lightly retaining said slide to said support means, said support means also including U-shaped ascending walls defining said cavity, said walls

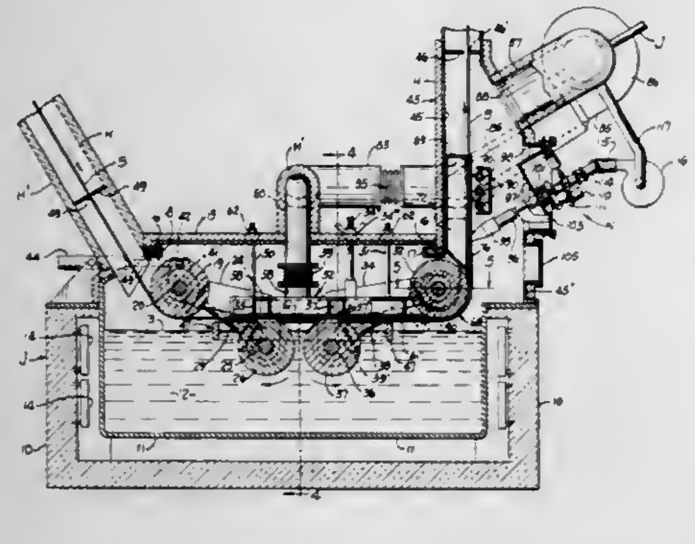


terminating in a substantially planar surface transverse to said axis for abutment with said planer slide so that positioning of said slide on said support means forms a tubular configuration having the ends thereof open to the atmosphere and rotation thereof by said drive means causes air within said configuration to be discharged via said open ends thereby creating a partial vacuum that tends to adhere said slide to said support means.

4,103,644

APPARATUS FOR COATING ONE SIDE ONLY OF STRIP MATERIAL

Norman C. Michels, 30500 Salem Dr., Bay Village, Ohio 44140
Filed Sep. 16, 1976, Ser. No. 724,079
Int. Cl.² B05C *1/08, 11/06*
U.S. Cl. 118—62 **24 Claims**

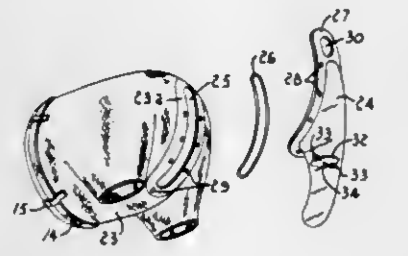


1. Apparatus for coating one side only of a strip material including a vessel having a bath of coating material in fluid condition therein, said coating material being adapted to change to substantially non-fluid condition after leaving said bath, a coating roll supported for rotation in said vessel partially submerged in said bath whereby said fluid coating material is picked up on the surface of said roll while rotating, means for moving said strip longitudinally in a path over said roll whereby one side only of said strip engages the fluid coating material on said roll and said coating material is transferred to said one side of said strip, gas manifold means extending in the direction of strip movement above said coating roll and said path of said strip thereover for a distance greater than the diameter of said coating roll, said manifold means having gas outlet means adapted to direct gas from said manifold means outwardly over both edges of the opposite uncoated side of said strip in unbroken flow from the area of first engagement of said strip and said coating material for a distance in the direction of strip movement greater than the diameter of said coating roll whereby contact of said coating material in fluid condition with said opposite side of said strip is prevented, and means for maintaining a flow of gas through said outlet means in said manifold.

4,103,645

WASTE BAG FOR ANIMALS

Harold E. Tyler, 3129 Flora St., Kansas City, Mo. 64109
Filed Jan. 7, 1977, Ser. No. 757,657
Int. Cl.² A01K *23/00*
U.S. Cl. 119—95 **3 Claims**



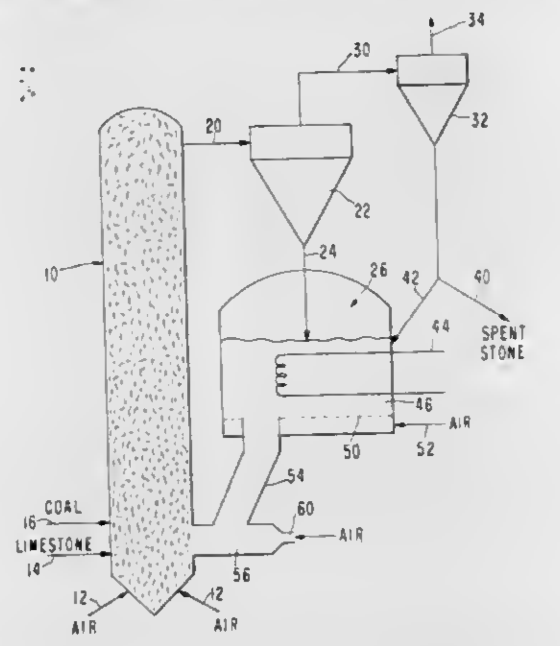
1. In a waste bag arrangement for animals such as dogs, the combination of:
trousers adapted to fit on the rear legs and rear body portion of the animal, said trousers presenting at least one opening therethrough;
means providing a relatively hard mounting surface on said trousers at a location substantially surrounding said opening;
a bag for containing the waste material of the animal, said bag having an open end for receiving the waste material;
a mounting pad secured to said bag at a location to substantially surround the open end thereof;
mating fasteners on said mounting surface and pad adapted to releasably secure said pad against said surface, thereby positioning the bag to receive the waste material discharged by the animal;
a disc member secured within said bag; and
means presenting a slit through said disc member for passage of the waste material therethrough.

4,103,646

APPARATUS AND METHOD FOR COMBUSTING CARBONACEOUS FUELS EMPLOYING IN TANDEM A FAST BED BOILER AND A SLOW BOILER

Joseph Yerushalmi, New York, N.Y.; Shelton Ehrlich, Palo Alto, Calif.; Mohammad Maaghoul, deceased, late of Sunnyvale, Calif. (by Nassrine S. Maaghoul, administratrix), and Terry E. Lund, Foster City, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Mar. 7, 1977, Ser. No. 775,656
Int. Cl.² F22B *1/02;* **F23D** *19/00*
U.S. Cl. 122—4 D **9 Claims**

1. A method for operating a fluid bed boiler which comprises:
in a first combustion zone, fluidizing with air under fast bed conditions limestone and carbonaceous fuel, whereby a portion of said limestone and fuel are spent to provide a solid-gas mixture effluent;
transferring said solid-gas mixture effluent to a separation zone and separating solids from gases;
transferring said solids from separation zone to a second combustion zone, and fluidizing in said second combustion zone said solids with air under slow bed conditions, wherein unspent fuel from said first combustion zone is consumed; said second zone having heat exchange tubes in heat exchanging relationship with said slow bed; and

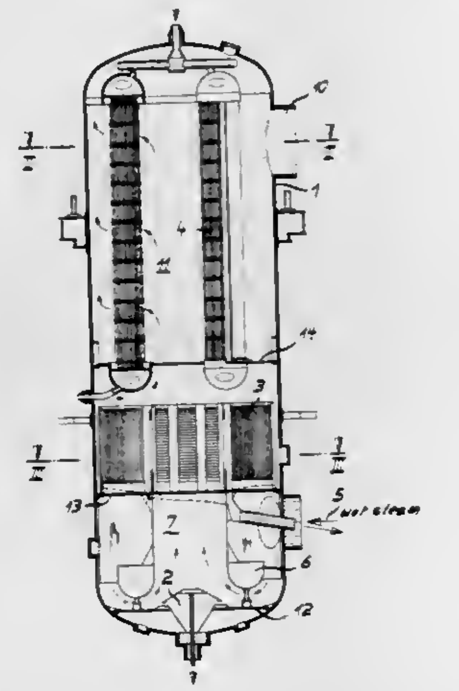


circulating a major portion of solids exiting from said second combustion zone to said first combustion zone.

4,103,647

APPARATUS FOR DRYING WET STEAM AND SUBSEQUENTLY SUPERHEATING THE DRIED STEAM

Rolf Dörling, and Klaus Westebbe, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany
Filed Dec. 9, 1976, Ser. No. 748,962
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555539
Int. Cl.² F22G *1/00;* **F22B** *1/16, 37/26*
U.S. Cl. 122—483 **7 Claims**

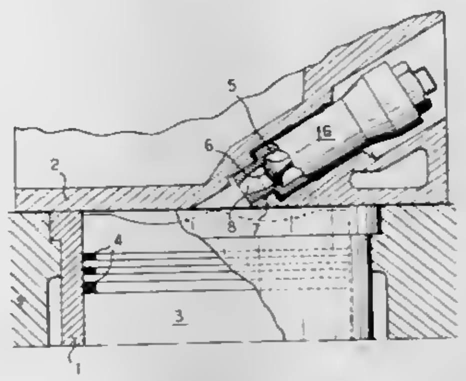


1. An apparatus for drying wet steam and subsequently superheating the dried steam, which includes in combination: an upright cylindrical container having an axis as well as a lower bottom and an upper bottom, a coarse separator arranged inside said container and within the region of said lower bottom, a fine separator arranged within said container and following said coarse separator in axially upward direction of said coarse separator, said container being provided with upwardly directed coaxial passage means, and superheating elements arranged around said coaxial passage means and extending parallel to the container axis nearly up to said upper bottom.

4,103,648

INTERNAL COMBUSTION ENGINE WITH AIR RESERVOIR

Philippe Jarry, Sevres, France, assignor to Le Moteur Moderne, Boulogne-Billancourt, France
Filed Oct. 7, 1976, Ser. No. 730,321
Claims priority, application France, Oct. 17, 1975, 75 31775
Int. Cl.² F02B *41/00*
U.S. Cl. 123—30 R **9 Claims**

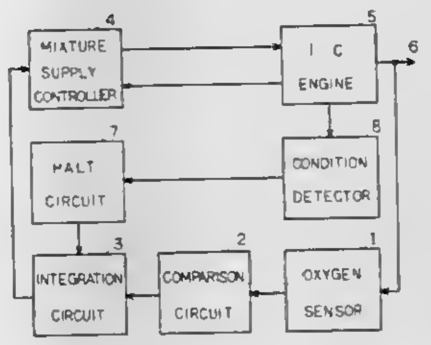


1. An internal combustion engine comprising at least one cylinder, a piston within said cylinder and defining a chamber therewith, said piston being movable alternately between top dead center and bottom dead center positions within said cylinder, means carried by said engine providing for a continuous operating cycle including, in sequence, intake, compression, power and exhaust stages, said operating cycle means including in said compression stage means for introducing into said chamber a charge of air for compression therein during movement of said piston toward top dead center, means defining a reservoir in communication with said chamber, means for charging said reservoir with a fraction of the air introduced into said chamber during said compression stage, means operable during said power stage for temporarily capturing within said reservoir the fraction of air charged therein and preventing communication between said reservoir and said cylinder, and means operable at the beginning of the next compression stage for restituting to said chamber the fraction of air previously charged into said reservoir.

4,103,649

METHOD AND SYSTEM FOR CONTROLLING THE MIXTURE AIR-TO-FUEL RATIO

Eizi Matumoto, and Hideaki Norimatsu, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jun. 2, 1976, Ser. No. 692,049
Claims priority, application Japan, Jun. 17, 1975, 50-73970
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EE **9 Claims**



1. An air-fuel mixture ratio control system for internal combustion engines comprising:
an oxygen responsive sensor, positioned in an exhaust pas-

sage of an engine, for producing a sensor signal indicative of the oxygen concentration therein;

a comparison circuit, connected to said sensor, for producing a comparison signal in response to said sensor signal, said comparison signal having two constant signal levels indicative of the oxygen presence and the oxygen absence, respectively;

an integration circuit, connected to said comparison circuit and including an operational amplifier and a capacitor adapted to be charged and discharged in response to said comparison circuit, for producing an integration signal changing in the increasing and decreasing directions in response to said signal levels of said comparison signal;

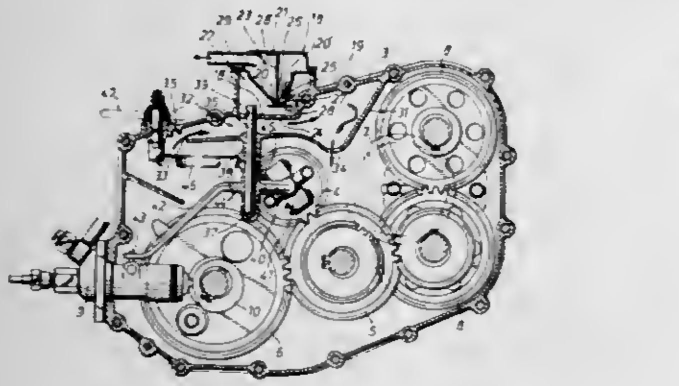
a mixture supply controller, positioned in an intake passage and connected to said integration circuit, for supplying said engine with air-fuel mixture, the air-to-fuel ratio thereof being responsive to engine operating conditions and said integration signal;

a condition detector, coupled to said engine, for producing a detection signal indicative of at least one of full-opening and full-closing of a throttle valve and inoperativeness of said sensor; and

an integration half circuit, connected between said condition detector and said integration circuit and including switching means connected across said capacitor, for short-circuiting said capacitor by said switching means in response to said detection signal to thereby halt the integration operation and cause said mixture air-to-fuel ratio to be irresponsive to said integration signal.

4,103,650
HORIZONTAL TYPE DIESEL ENGINE

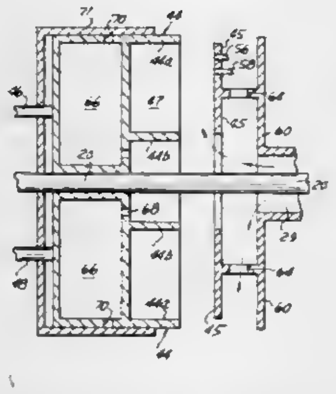
Tsuyoshi Nishida; Satoshi Tabusbe, and Kouichi Akeda, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Sep. 20, 1976, Ser. No. 724,864
Int. Cl.^{2} F01M ***13/00***
U.S. Cl. 123—41.86 **10 Claims**



1. A horizontal type Diesel engine wherein a gear case is juxtaposed to a crankcase axially of a crank shaft, said crankcase horizontally receiving a cylinder therein, and a radiator and a fuel tank are juxtaposed on top of said crankcase, said engine being characterized by comprising a breather which establishes communication between the interior of said gear case and the atmosphere and which is disposed on the upper wall of said gear case substantially at the middle between the front and rear ends of said upper wall, an oil partition wall opposed to said breather and disposed in said gear case, a pre-breather chamber defined between said oil partition wall and said upper wall mounting said breather thereon, and a governor shaft pivotally vertically supported by said gear case and having one end thereof projecting into said breather.

4,103,651
INTERNAL COMBUSTION-GAS TURBINE ENGINE

John S. Larkins, Mouo't Valley Farm, #5, Box 60, New Castle, Va. 24127
Filed Aug. 9, 1976, Ser. No. 712,658
Int. Cl.^{2} F02B ***59/00***
U.S. Cl. 123—50 B **23 Claims**



1. An air-cooled, super charged internal combustion engine comprising:

a stationary piston having an end face portion;

a cylinder movable longitudinally relative to said piston face portion from a first abutting position to a second spaced position; a compression chamber formed therebetween in said first position;

means for providing a pressurized air flow stream;

a plurality of ports in said cylinder for passing said stream therethrough;

a further port associated with said piston for passing said stream in cooling proximity to the back surface of said piston face portion;

means for admitting a fuel to said chamber;

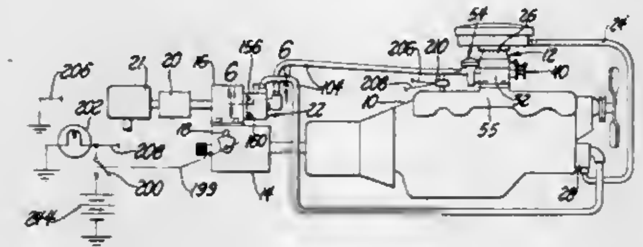
means for igniting said fuel and providing such longitudinal movement of said cylinder from said first to said second position;

means enabling the cylinder to disengage contact with the piston in the second position;

means for passing said stream through said cylinder responsive to its movement to said second position; and means for returning said cylinder to said first position.

4,103,652
AUXILIARY ENGINE GOVERNING SYSTEM

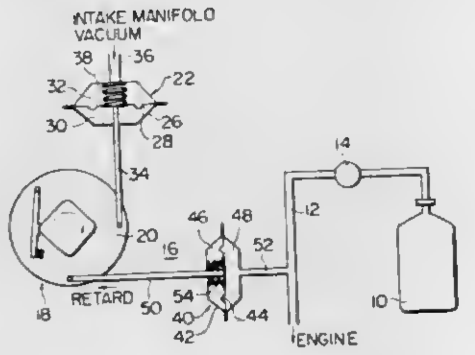
Arthur F. Garside, Grabil, and Dudley D. Avery, New Haven, both of Ind., assignors to Colt Industries Operating Corp., New York, N.Y.
Filed Feb. 23, 1977, Ser. No. 771,155
Int. Cl.^{2} F02D ***11/08***
U.S. Cl. 123—103 R **8 Claims**



1. A governor system for a vehicle driven by an internal combustion engine having a throttle valve for controlling the flow of combustible mixture to said engine, comprising a vacuum motor operatively connected to said throttle valve, means communicating said vacuum motor to a source of vacuum, air bleed means for rendering said vacuum motor inoperative, means responsive to the speed of said engine for at selected engine speeds restricting said air bleed means and causing actuation of said vacuum motor, and additional valving means constructed and arranged to be effective at selected conditions of engine operation for providing an auxiliary passage for communication between said vacuum motor and a source of vacuum for actuation of vacuum motor.

4,103,653
METHOD OF AND APPARATUS FOR CONTROLLING IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

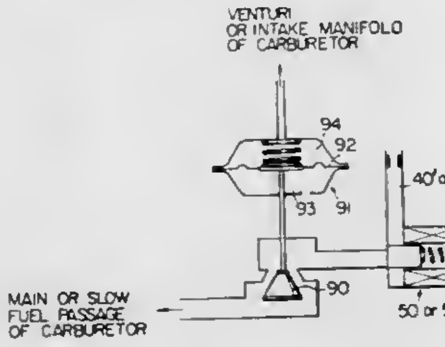
Zene Ueno, Fucbu; Akira Morita, Tokyo, and Atusbi Chida, Sayama, all of Japan, assignors to Nissan Motor Company, Limited, Japan
Filed Nov. 28, 1975, Ser. No. 635,867
Int. Cl.^{2} F02P ***5/04***
U.S. Cl. 123—117 R **7 Claims**



1. An ignition timing control apparatus in combination with an internal combustion engine including an ignition distributor, a source of auxiliary fuel, and conduit means for providing communication between said source of auxiliary fuel and said engine for feeding auxiliary fuel thereinto in addition to a main fuel, said apparatus comprising variable control means for communicating with said conduit means and the position of which is varied in accordance with the amount of said auxiliary fuel fed to said engine, and connecting means for operatively connecting said variable control means to said ignition distributor for variably controlling the ignition timing of said engine in accordance with the position of said variable control means.

4,103,654
METHOD AND APPARATUS TO CONTROL AIR/FUEL RATIO OF THE MIXTURE APPLIED TO AN INTERNAL COMBUSTION ENGINE

Koyo Nakamura, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan
Filed Oct. 31, 1975, Ser. No. 627,860
Claims priority, application Japan, Nov. 1, 1974, 49-126241
Iot. Cl.^{2} F02B ***73/10:*** **F02H** ***3/00:*** **F02M** ***37/00***
U.S. Cl. 123—119 EC **6 Claims**


VENTURI OR INTAKE MANIFOLO OF CARBURETOR
94
92
40' or 41'
93
91
60
90
MAIN OR SLOW FUEL PASSAGE OF CARBURETOR
50 or 51

1. In an internal combustion engine including an intake passage, an exhaust passage and a carburetor forming part of the engine intake passage and having a fuel delivery passage fluidly connected between the engine intake passage and a source of fuel supply and a calibrated fuel jet located in said fuel delivery passage,

an apparatus to control the ratio of air to fuel of the air/fuel mixture being delivered to the engine, comprising

means sensing the concentration of a gas component of the exhaust gases through the exhaust passage which is related to the ratio of air to fuel of the air/fuel mixture and generating an electric output signal indicative of the sensed concentration of the gas component,

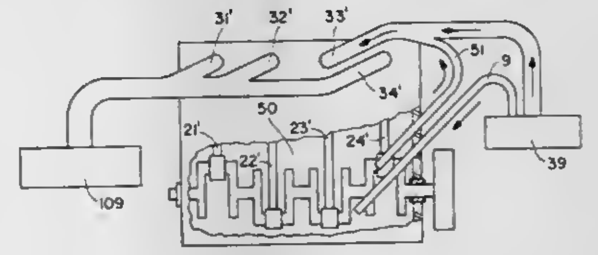
additional air passage means fluidly connected between the atmosphere and said fuel delivery passage at a portion downstream of said fuel jet,

electromagnetic means actuable in accordance with said output signal for controlling the rate of air passing through said additional air passage means, and

means for limiting the flow rate of the additional air through said additional air passage means in accordance with the vacuum being created by operation of the engine in a portion of the engine intake passage.

4,103,655
INTERNAL COMBUSTION ENGINE

Donald Kennedy Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806
Filed Mar. 22, 1977, Ser. No. 780,172
Int. Cl.^{2} F02B ***3/00***
U.S. Cl. 123—119 B **2 Claims**



1. An internal combustion engine having a special combustion chamber and a plurality of M ordinary combustion chambers, each combustion chamber being partly bounded by its movable piston, all the pistons being mechanically coupled to a common power output shaft, each combustion chamber having an air inlet port, exhaust port, and associated means for executing a series of combustion chamber cycles, each cycle including air intake, compression, expansion and exhaust, the engine having means for taking a ration of fuel in each of its combustion chamber cycles,

a single enclosure receiving air and fuel leaking past the pistons from all of the combustion chambers,

a duct connecting the enclosure to the air inlet port of the special combustion chamber and not to the ordinary combustion chambers, the duct conveying the air and fuel leaking from all of the combustion chambers to be reburned in the special combustion chamber only,

torque control means, overriding the fuel taking means, for enabling the fuel ration in every cycle of the special combustion chamber and for partially inhibiting the fuel rations for the ordinary combustion chambers in a repetitive pattern of successive enabled and inhibited combustion chamber cycles, the period of repetition containing N cycles of each of the combustion chambers, of which P cycles of each ordinary combustion chamber have their fuel ration inhibited, where N is a plural integer, P is an integer greater than zero and smaller than N,

the total number of inhibited cycles of all of the combustion chambers within the period of repetition being MP, the product of M and P.

2. An improved internal combustion engine having at least first and second combustion chambers, each combustion chamber being partially bounded by its movable piston, the two pistons coupled to a common power output shaft, each combustion chamber having an air inlet port, exhaust port, and associated means for executing a series of combustion chamber

cycles, each chamber cycle including air intake, compression, expansion and exhaust,

a primary fuel supply to the first combustion chamber,

a primary fuel supply to the second combustion chamber,

a single enclosure receiving air and fuel leaking past the pistons from both the first and second combustion chambers,

a duct connecting the enclosure to the air inlet port of the second combustion chamber only and not to the first combustion chamber, the duct conveying the air and fuel leaking from the first and second combustion chambers to be reburned in the second combustion chamber only,

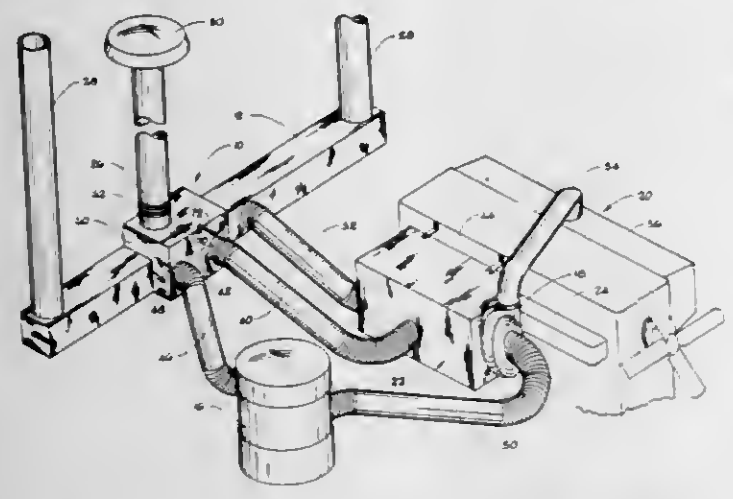
the improvement comprising:

first means for enabling and inhibiting the primary fuel supply to the first combustion chamber separately from the second combustion chamber,

second means for enabling and inhibiting the primary fuel supply to the second combustion chamber separately from the first combustion chamber,

an interlock, coupled to the first and second enabling means for ensuring that the primary fuel supply to the second combustion chamber is completely enabled whenever the primary fuel supply to the first combustion chamber has been enabled during the current cycle or the immediately preceding cycle of the second combustion chamber.

4,103,656
TRUCK ENGINE AIR PREHEATING SYSTEM
Aaron Reddekopp, 12056 N. Jantzen Beach Ave, Portland, Oreg. 97217
Filed Feb. 28, 1977, Ser. No. 773,010
Int. Cl.^{2} F02M *31/00*
U.S. Cl. 123—122 D **8 Claims**



1. In combination with a truck tractor including an engine having a hot exhaust manifold and a turbocharger,

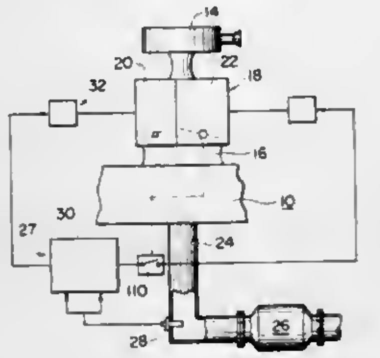
a muffler extending crosswise of the tractor and connected to the exhaust manifold,

a valve mounted on the muffler having a preheated air inlet, a cold air inlet, an outlet and closure means selectively movable between a normal condition wherein the cold air inlet is connected to the outlet and the preheated air inlet is closed and a preheating condition in which the preheated air inlet is connected to the outlet and the cold air inlet is closed,

a manifold chamber in a heat exchange relationship with the hot exhaust manifold and connected to the preheated air inlet,

and means connecting the outlet of the valve to the turbocharger.

4,103,657
TWIN-BARREL CARBURETOR WITH AN AIR-FUEL RATIO CONTROL DEVICE
Hidebiro Minami, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Jun. 11, 1976, Ser. No. 695,185
Claims priority, application Japan, Jun. 13, 1975, 50-81031
Int. Cl.^{2} F02M *7/24*
U.S. Cl. 123—127 **4 Claims**



1. In combination with an internal combustion engine,

a carburetor, and

an exhaust gas passageway,

the carburetor including:

a primary intake passageway having:

a primary throttle valve rotatably mounted therein,

a primary main fuel passage communicating with the primary intake passageway and from which fuel is drawn into the primary intake passageway,

a primary low speed running fuel passage communicating with the primary intake passageway and from which fuel is drawn into the primary intake passageway;

a secondary intake passageway having:

a secondary throttle valve rotatably mounted therein,

a secondary main fuel passage communicating with the secondary intake passageway and from which fuel is drawn into the secondary intake passageway,

a secondary low speed running fuel passage communicating with the secondary intake passageway and from which fuel is drawn into the secondary intake passageway;

an improved air-fuel ratio control system comprising:

a sensor located in the exhaust gas passageway for sensing the concentration of a component contained in exhaust gases of the engine and for generating an electric signal representative of the sensed concentration of the component, said concentration being a function of the air-fuel ratio of an air-fuel mixture formed by the carburetor,

a control circuit electrically connected to said sensor to be responsive to said signal for comparing the value of said signal with a reference value representative of a desired air-fuel ratio and for generating a command signal representative of an error between said signal value and said reference value,

a first air bleed passage communicating with the atmosphere and with the primary main and low speed running fuel passage,

first control valve means located relative to said first air bleed passage for controlling the flow of air drawn into the primary main and low speed running fuel passages through said first air bleed passage, said first control valve means being electrically connected to said control circuit and being operable, in response to said command signal, for reducing and increasing the flow of said air, thereby respectively to increase and reduce the flow of fuel drawn from the primary main and low speed running fuel passages into the primary intake passageway and to control the air-fuel ratio of an air-fuel mixture formed by the carburetor to said desired air-fuel ratio,

a second air bleed passage communicating with the atmosphere and with the secondary main and low speed running fuel passages,

second control valve means located relative to said second air bleed passage for controlling the flow of air drawn into the secondary main and low speed running fuel passages through said second air bleed passage, said second control valve means being electrically connected to said control circuit and being operable, in response to said command signal, for reducing and increasing the flow of said air, thereby respectively to increase and reduce the flow of fuel drawn from the secondary main and low speed running fuel passages into the secondary intake passageway and to control the air-fuel ratio of an air-fuel mixture formed by the carburetor to said desired air-fuel ratio, and

a switch means interposed between said control circuit and said second control valve means for connecting and disconnecting said second control valve means to and from said control circuit in response to said secondary throttle valve being opened and closed, respectively.

2. In combination with an internal combustion engine,

a carburetor, and

an exhaust gas passageway;

the carburetor including:

a primary intake passageway having a primary throttle valve rotatably mounted therein,

primary fuel supply passage means communicating with the primary intake passageway and from which fuel is drawn into the primary intake passageway to form a primary air-fuel mixture,

a secondary intake passageway having a secondary throttle valve rotatably mounted therein,

secondary fuel supply passage means communicating with the secondary intake passageway and from which fuel is drawn into the secondary intake passageway to form a secondary air-fuel mixture;

an improved air-fuel ratio control system comprising:

sensing means located in the exhaust gas passageway for sensing the concentration of a component contained in exhaust gases of the engine for generating an electric signal representative of the sensed concentration of the component, said concentration being a function of the air-fuel ratio of an air-fuel mixture formed by the carburetor,

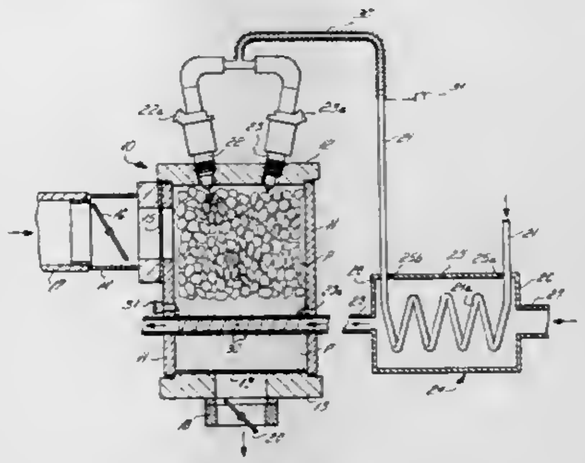
a control circuit electrically connected to said sensing means to be responsive to said signal for comparing the value of said signal with a reference value representative of a desired air-fuel ratio and for generating a command signal representative of an error between said signal value and said reference value,

first fuel flow control means electrically connected to said control circuit to be responsive to said command signal and associated with said primary fuel supply passage means for adjusting, in accordance with said command signal, the flow of fuel drawn from the primary fuel supply passage means into the primary intake passageway, whereby the air-fuel ratio of the primary air-fuel mixture is controlled to said desired air-fuel ratio,

second fuel flow control means electrically connected to said control circuit to be responsive to said command signal and associated with said secondary fuel supply passage means for adjusting, in accordance with said command signal, the flow of fuel drawn from the secondary fuel supply passage means into the secondary intake passageway, whereby the air-fuel ratio of the secondary air-fuel mixture is controlled to said desired air-fuel ratio, and

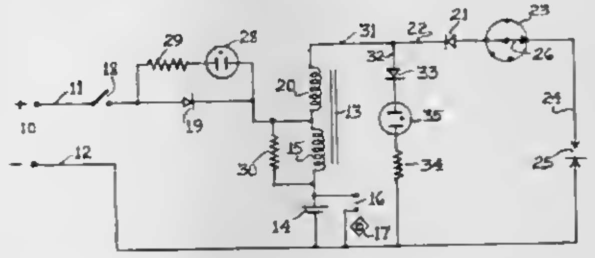
switch means interposed between said control circuit and said second control valve means for connecting and disconnecting said second control valve means to and from said control circuit in response to said secondary throttle valve being opened and closed, respectively.

4,103,658
CARBURETOR
Gunther Bernecker, Montvale, N.J., assignor to Donald B. Conlin, Mabwah, N.J., a part interest
Continuation-in-part of Ser. No. 806,798, Jun. 15, 1977, which is a continuation-in-part of Ser. No. 770,964, Feb. 22, 1977, Pat. No. 4,086,893. This application Jan. 26, 1978, Ser. No. 872,707
Int. Cl.^{2} F02M *33/00*
U.S. Cl. 123—133 **4 Claims**



1. A carburetor for supplying a fuel/air mixture to an internal combustion engine having an intake manifold comprising a housing, contained in the housing only matter which is inert relative to the fuel, said matter being porous, means for injecting fuel into the housing and onto said porous matter, means for transferring sufficient heat from the exhaust gases of the engine to the fuel before the fuel is injected into the housing and means for transferring sufficient heat to the housing and the porous matter so that all the fuel is completely vaporized when it leaves the housing, means for admitting air into the housing simultaneously with the injection of the fuel to form a mixture with all the vaporized fuel and means for conducting the entire mixture out of the housing directly to the intake manifold during all phases of operation of the engine, for combustion in the engine.

4,103,659
IGNITION SYSTEM
Donald S. Donigian, 6016 West Fullerton, Chicago, Ill. 60639
Continuation-in-part of Ser. No. 494,453, Aug. 5, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,185
Int. Cl.^{2} F02P *1/00*
U.S. Cl. 123—148 DC **4 Claims**



1. In an ignition system as used with a gas internal combustion engine comprising

(a) an ignition circuit including a power source and an on-off switch,

(b) an ignition coil having a primary and secondary winding,

(c) switch means adapted to close and open between said power source and said primary winding of said ignition coil and adapted when open and closed to develop surge and oscillatory voltages therein,

(d) a capacitor connected in series with said primary winding of said coil and adapted to be shunted by said switch means so as to be responsive to said switch means' open condition to prevent electrical current flow in said primary winding of said ignition coil from said power source and to permit electrical current flow when said switch is in its closed condition,

(e) means in the circuit between said power source and said ignition coil cooperating with said capacitor for preventing dissipation of the surge and oscillatory voltages in said circuit during the open condition of said switch means through said ignition circuit and said power source,

(f) a gaseous lamp and series-protective resistance in the circuit between said power source and said ignition coil for regulating and stabilizing the voltage developed therein,

(g) distributing means in the output of said secondary winding of said coil, and

(h) means in the output of said secondary winding between said coil and said distributing means converting the voltage of the output of said secondary winding to a single unidirectional high voltage impulse to said distributing means immediately followed by a quiescent interval for each ignition period.

4,103,660

PULL-ROPE RECOIL STARTER

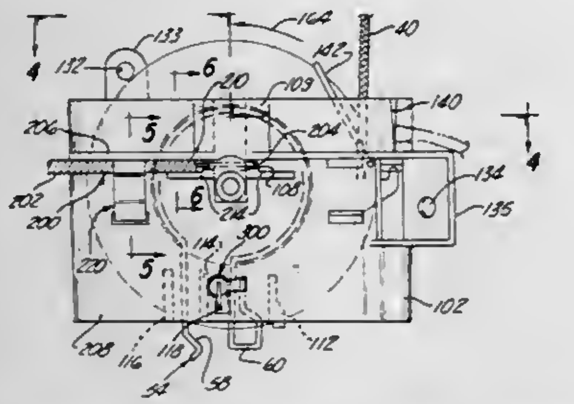
Paul T. Reese, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 576,199, May 9, 1975, Pat. No. 4,019,490.

This application Jan. 5, 1977, Ser. No. 757,032

Int. Cl.^{2} B60K *41/04*

U.S. Cl. 123—179 K **5 Claims**



1. The combination comprising an internal combustion engine, a propulsion system coupled to said engine including a transmission having at least neutral and drive positions, and a pull-rope recoil starter for starting said engine including a pull-rope and support means fixedly attached to said engine having slot means extending generally in the direction of normal pulling force exerted by an operator on said pull-rope, engine cranking means operatively coupled to said pull-rope and responsive to pulling of said rope to translate in said slot means into starting engagement with said engine, and means operatively coupled to said transmission to block translation in said slot means of said cranking means into starting engagement with said engine when said transmission is in other than said neutral position.

4,103,661

DIESEL ENGINE STARTING SYSTEMS

William David Holt, Cologne, England, assignor to Lucas Industries Limited, Birmingham, England

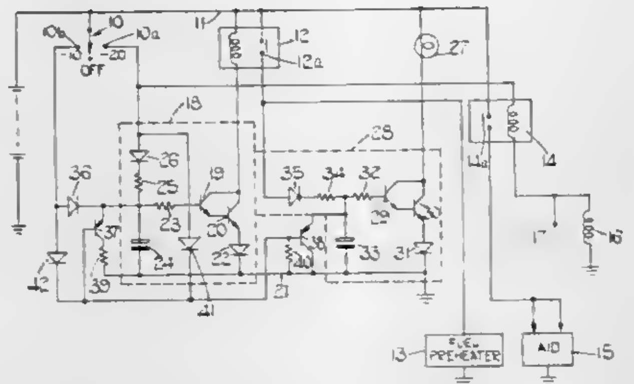
Filed Jan. 26, 1977, Ser. No. 762,643

Claims priority, application United Kingdom, Jan. 30, 1976, 3678/76

Int. Cl.^{2} F02N *17/00*

U.S. Cl. 123—179 H **5 Claims**

1. A control circuit for a diesel engine starting system including a starting aid device and a fuel preheater device, said circuit comprising a selector switch having an off position and first and second on positions, a first delay circuit for operating the fuel preheater device, a second delay circuit for operating for an indicator to indicate when cranking of the engine can be commenced, and means for operating the starting aid device when the selector switch is moved to its first on position, the devices being so connected to the delay circuits that when the switch is moved to its first on position there is a first delay before the fuel preheater device is operated and a second delay before the indicator is operated, but when the switch is moved to its second on position, there is no delay before the fuel preheater device is operated and only said second delay elapses before the indicator is operated, wherein said delay circuits comprise a resistor-capacitor delay network and a transistor controlled by the voltage on the capacitor, and a reset circuit for causing discharge of both capacitors when the switch is in its off position.



4,103,662

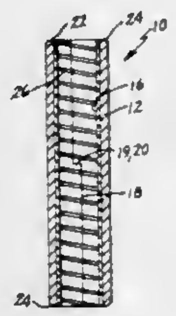
INSERT FOR REBUILDING VALVE GUIDES

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

Filed Sep. 2, 1976, Ser. No. 719,958

Int. Cl.^{2} F01L *3/08*

U.S. Cl. 123—188 GC **15 Claims**



1. A valve guide insert for lining and relining the entire length of a valve guide of an internal combustion engine comprising an outer, metallic, cylindrical sleeve having an outside diameter adapted to be press-fitted within a valve guide and an inside diameter adapted to receive an inner sleeve; and a separate, wear-resistant, metallic, inner cylindrical sleeve located concentrically within, being substantially coterminous with, and extending the entire length of said outer sleeve, the metal of said inner sleeve being dissimilar to that of said outer sleeve, said inner sleeve having an outside diameter slightly larger than said inside diameter of said outer sleeve before insertion in the outer sleeve such that the outside wall surface of said inner sleeve tightly, frictionally engages the slightly smaller, inside wall surface of said outer sleeve after insertion to positively retain said sleeves together, said inner sleeve having an inside diameter adapted to receive a valve stem therethrough whereby the separate formation and subsequent assembly of said inner and outer sleeves allows precise control of tolerances, wall thicknesses and concentricities of said insert and provides strength, wear-resistance, and an outer diameter adapted for installation with standard size, commonly available installation tools.

4,103,663

CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY DIESEL ENGINES

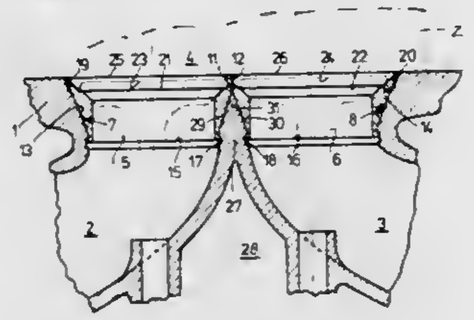
Ludwig Elsbett and Günter Elsbett, both of Industriestr. 14, D8543 Hilpoltstein, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,351

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550781

Int. Cl.^{2} F01L *3/00*

U.S. Cl. 123—188 S **14 Claims**



1. A cylinder head for internal combustion engines, especially Diesel engines, which includes wall means defining passage means and a mouth section therefor for communication with a combustion chamber, said mouth section comprising an inner portion and an outer portion and a conical surface flaring outwardly from said inner portion to said outer portion, and valve seating ring means having an outer peripheral surface substantially parallel to and adjacent said conical surface, while projecting over the latter, said valve seating ring means being connected to said inner portion only of said mouth section and having its inner peripheral surface provided with a valve seating area, thermal insulation means between the outer peripheral surface of said valve seating ring means and the adjacent surface of said mouth section, said thermal insulation means between said valve seating ring means and the wall means of said mouth section being provided only within the region of said valve seating area and that rim portion of the respective valve seating ring means which is remote from said inner mouth portion.

4,103,664

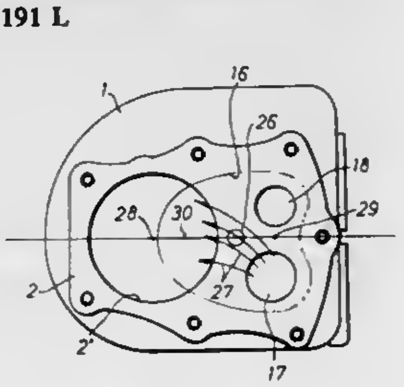
COMBUSTION CHAMBER FOR COMPACT ENGINE OF THE SIDE VALVE TYPE FOR UNIVERSAL USE HAVING CONTACTLESS IGNITION SYSTEM

Kiyonobu Iida; Yoshio Tani, and Kouichi Sugahara, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Sep. 21, 1976, Ser. No. 725,187

Int. Cl.^{2} F02B *23/00*

U.S. Cl. 123—191 L **6 Claims**



1. In a combustion chamber for a compact engine of a side valve type having a contactless ignition system said engine comprising a cylinder, an intake valve, an exhaust valve and an ignition plug, the improvement wherein the spark gap portion of the ignition plug is positioned in said combustion chamber on a line extending from the center of the cylinder to the midpoint between the edges of said intake valve and said exhaust valve and midway between the center of said cylinder and said midpoint, and wherein said spark gap is opposed to a bundle of streams of an air fuel mixture drawn into said combustion chamber through said intake valve.

4,103,665

LUBRICATING DEVICE FOR INTERNAL COMBUSTION ENGINES

Johann Prasch, Sindorf, Fed. Rep. of Germany, assignor to Klöckner-humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

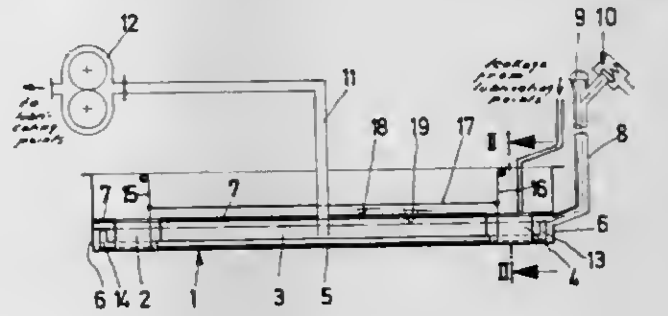
Division of Ser. No. 503,491, Sep. 5, 1974, Pat. No. 4,023,548.

This application Feb. 14, 1977, Ser. No. 768,336

Claims priority, application Fed. Rep. of Germany 2344949

Int. Cl.^{2} F02M *1/00*

U.S. Cl. 123—196 R **2 Claims**



1. A lubricating device for an internal combustion engine for securing the oil supply to the points to be lubricated, also in greatly inclined positions of said device, which includes: a longitudinal oil pan comprising a closed main chamber, a first open auxiliary chamber arranged near one end of said oil pan, and a second open auxiliary chamber arranged near the other end of said oil pan, the major portion of said main chamber being located between said first and second auxiliary chambers, said main chamber also including a space between each of said auxiliary chambers and the respective adjacent end wall of said oil pan; pressure pump means having a pressure side for connection with an oil conveying line leading to points to be lubricated, said pressure pump also having a suction side, first conduit means establishing communication between said suction side and the interior of said closed main chamber; second conduit means leading from the space between one of said open auxiliary chambers and the adjacent end wall of said oil pan to the outer one of said open auxiliary chambers, and third conduit means leading from said one auxiliary chamber to said other auxiliary chamber, and a delivery pump interposed in said third conduit means.

4,103,666

FUEL SUPPLY MEANS FOR ROTARY PISTON ENGINES

Masaharu Shimoji; Yasuo Tatsutomi, both of Hiroshima; Yutaka Hirose, Aki; Atsumichi Yamasaki, and Katsuaki Kikura, both of Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed May 26, 1976, Ser. No. 690,319

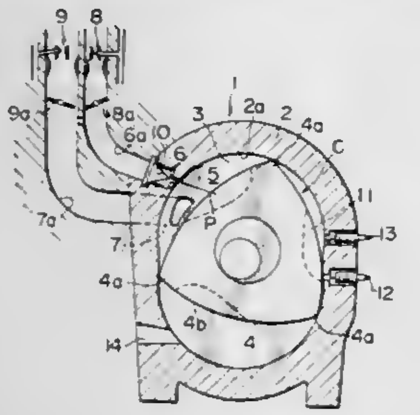
Claims priority, application Japan, May 26, 1975, 50-63178

Int. Cl.^{2} F02B *53/04*

U.S. Cl. 123—219 **9 Claims**

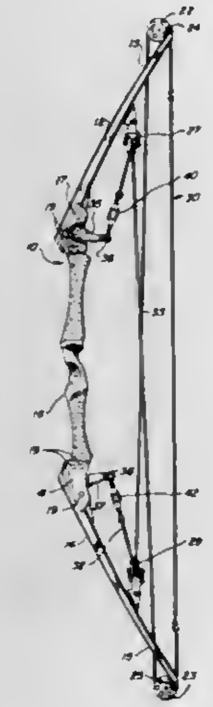
1. Rotary piston engine comprising a casing which includes a rotor housing having an inner wall of trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define therein a rotor cavity of trochoidal configuration, and a rotor of substantially polygonal configuration disposed in said rotor cavity of the casing for revolution and rotation with apex portions in sliding contact with the inner wall of the rotor housing so as to define working chambers of variable volume between flank portions thereof and the trochoidal inner wall of the rotor housing, each of the flank portions of the rotor being formed with a recess at a leading part thereof, first intake port means formed in said rotor housing and located at such a position that it is closer to the preceding rotor apex portion than to any of the other rotor apex

portions when the rotor is in the intake top dead center, means for supplying rich air-fuel mixture having an air-fuel ratio of 2 to 6 through the first intake port means into the intake working chamber, second intake port means formed in at least one of the side housings, said first intake port means having an effective area which is less than one-third that of the said second intake port means, means for supplying combustion sustaining fluid through the second intake port means into the intake working chamber in such a manner that the total air-fuel ratio of the mixture supplied to the intake working chamber becomes 15 to 20.



4,103,667
BOW STRING MOUNTING AND TENSIONING BRACKETS

Paul E. Shepley, Jr., Rte. 1, Mahomet, Ill. 61853
Continuation of Ser. No. 541,718, Jan. 17, 1975, abandoned. This application May 2, 1977, Ser. No. 792,880
Int. Cl.^{2} F41B *5/00*
U.S. Cl. 124—24 R **5 Claims**



1. In an archery bow of the type having a pair of resilient bow limbs joined to a handle section, each of the bow limbs provided with a bifurcated outer end and having an eccentric pulley mounted within the bifurcated end, each of the bow limbs further provided with an idler wheel mounted interiorly thereof and spaced inwardly from the corresponding eccentric pulley, a bow string having opposed ends and having a central stretch portion carried between the ends of the pair of bow limbs and circumscribing the essentric pulleys, and the opposed ends having a portion of one of the opposed ends of the bow string circumscribed thereabout and terminating at an inner end adapted for mounting to the archery bow, the improvement comprising in combination,

mount means provided on said archery bow, to provide a mount for the inner ends of the bow string,

said mount means comprising a pair of bracket arms, one of each of said bracket arms mounted on the opposed end of said handle section and positioned intermediate the corresponding idler wheel and handle section and extending laterally inwardly for a distance to an inward end,

the inward end of each of said bracket arms forming the sole and only point of attachment and anchoring of a corresponding inner end of the bow string such that the bow string end emmanating from the idler wheel is anchored to the said corresponding bracket arm thereby to insure that the inner end of the bow string avoids contact with the bow limbs and all other portions of said archery bow at all points excepting said bracket arm,

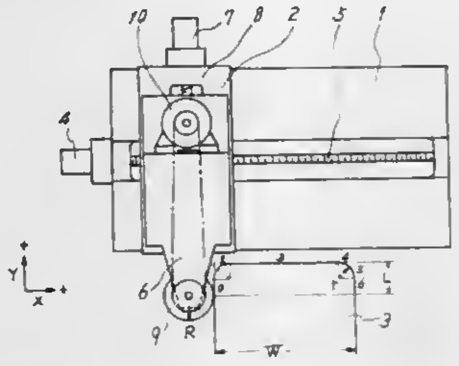
each of said bracket arms further positioned and arranged to form a tensioning point for the bow string at a point spaced between each of the bow limbs and the intermediate stretch of the bow string,

said bracket inner end being secured to anchor the bow string at a point spaced from the handle end, said bracket inner end being spaced from said handle a sufficient distance to define a vectoral force component perpendicular to the limb greater than that when the bowstring is attached at the bracket attachment to the handle while simultaneously reducing the corresponding parallel force component along the limb,

whereby a larger portion of the potential energy prior to release is directed perpendicularly to the flexed limb and the parallel component is reduced.

4,103,668
DRESSING APPARATUS FOR GRINDING WHEEL

Hideo Nishimura, Nagoya, and Kunihiko Etoh, Toyota, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan
Filed Jul. 25, 1977, Ser. No. 818,837
Claims priority, application Japan, Jul. 30, 1976, 51-191481; Dec. 24, 1976, 51-157077
Int. Cl.^{2} B24B *53/06*
U.S. Cl. 125—11 CD **7 Claims**



1. A dressing apparatus for dressing a grinding wheel having a straight portion and a circular portion continuous to the straight portion comprising:

a dressing tool for dressing the grinding wheel;

a first servomotor operably connected to said dressing tool for moving the same in a direction parallel with the axis of the grinding wheel;

a second servomotor operably connected to said dressing tool for moving the same in a direction perpendicular to the axis of the grinding wheel;

a mode counter for designating a mode of a dressing operation on the straight and circular portions of the grinding wheel, depending upon the content thereof;

a memory device for storing numerical information to move said dressing tool along the circular portion of the grinding wheel;

a pulse generator for generating a train of clock pulses;

a first gate circuit operably connected to said mode counter, said memory device and said pulse generator for distributing clock pulses from said pulse generator to said first and second servomotors in accordance with the content of said mode counter and said memory device, when said mode counter designates a dressing operation on the circular portion;

means for generating a signal to be applied to said mode counter to change a mode of a dressing operation, when the pulse distribution is completed by said first gate circuit;

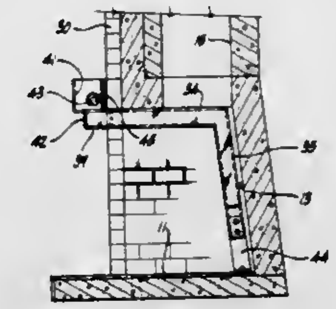
setting means for setting a moving amount of said dressing tool to dress the straight portion of the grinding wheel;

a second gate circuit operably connected to said mode counter and said pulse generator for distributing clock pulses from said pulse generator to one of said first and second servomotors in accordance with the content of said mode counter, when said mode counter designates a dressing operation on the straight portion; and

means for generating a signal to be applied to said mode counter to change a mode of a dressing operation, when said dressing tool is moved by one of said first and second servomotors along the straight portion of the grinding wheel by the moving amount set in said setting means.

4,103,669
FIREPLACE HEAT EXCHANGER ASSEMBLY

Eugene E. Pauley, 45 Coral Dr., Belleville, Ill. 62221
Filed Jun. 3, 1976, Ser. No. 692,570
Int. Cl.^{2} F24B *7/00*
U.S. Cl. 126—121 **4 Claims**



1. In a fireplace heat exchanger assembly:

(a) a conduit having an air inlet and an air outlet located outwardly of the fireplace, the conduit including:

(1) a first passage communicating with the air inlet and extending rearwardly across the top of the fireplace, and

(2) a second passage communicating with the first passage at the rear of the fireplace and extending forwardly across the top of the fireplace for communication with the air outlet,

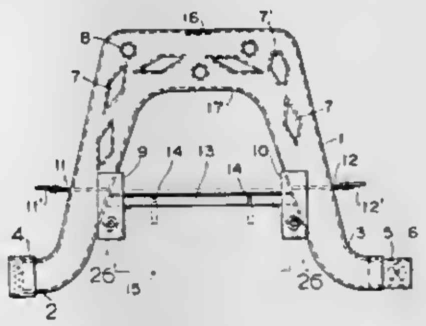
(b) support means for holding the conduit at the top of the fireplace,

(c) blower means introducing air into the air inlet, passing the air through the first and second passages, and discharging the air through the air outlet,

(d) the conduit including a heat exchanger box of relatively smaller height than width and depth, the box being provided with laterally spaced and enclosed slots extending therethrough and extending rearwardly to provide the first passage between the slots communicating with the air inlet, and to provide a pair of second passages laterally outward of the slots communicating with the air outlet, the slots terminating in spaced relation to the rear of the box to provide a transverse passage placing the first and second passages in communication.

4,103,670
FIREPLACE HEAT INTENSIFIER

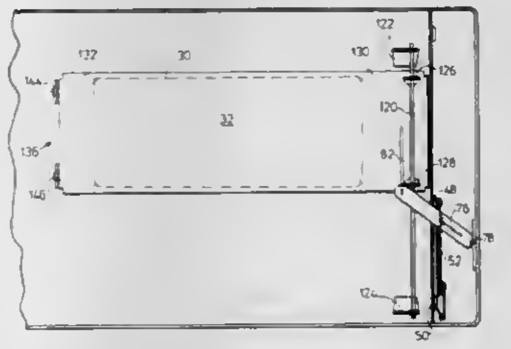
Andrew Bergs, 3214 Clemenceau Blvd., Windsor, Ontario, Canada
Filed Apr. 18, 1977, Ser. No. 788,533
Int. Cl.^{2} F24B *7/00*
U.S. Cl. 126—121 **3 Claims**



1. A heat intensifier insert into a fireplace comprising a U-shaped tube of rectangular cross-section having a somewhat straight rear section with a diverging arm extending from each end thereof, said arms terminating in short outwardly curved ends; a plurality of open end ducts located inside and in the rear and part way up the arms of said tube, said open duct ends terminating at the top and bottom of said tube; a casing containing a fan or blower therein for attaching to the end of one of said arms by tightly sliding part way into said arm; a louver attached to the end of the other arm of said tube by tightly sliding over said arm; said blower contained casing and said louver being interchangeable with respect to the arms to which they are attached; an extendable baffle located at each side of said tube for the purpose of enclosing any space between the tube and the opening of the fireplace into which it is inserted; a plate bent into an angle attached to each of said arms, the horizontal leg of which is flush with the top of said arm and extending outwardly to the inside of the "U," by means of which the said tube can be attached to said fireplace; a narrow baffle attached to the rear inside bottom edge of the tube and running part way along each arm to make contact with each of said extendable side baffles; and a narrow plate joining the insides of the two arms, for attaching thereto a comparatively wide baffle for preventing the escape of smoke from the fireplace into the room, when required.

4,103,671
WINDOW OVEN DOOR FOR SELF-CLEANING OVEN

David G. Smith, Weston, Canada, assignor to GSW Limited - GSW Limitee, Toronto, Canada
Filed Jan. 3, 1977, Ser. No. 756,119
Int. Cl.^{2} F23M *7/00*
U.S. Cl. 126—200 **20 Claims**



1. In an oven door having spaced apart outer and inner panels with aligned window openings and one or more transparent window panes, an apparatus for raising and lowering a shield to and from a position which covers and shields such transparent window pane in said outer panel from thermal radiation generated by an oven operating at high temperatures, said oven door being mounted on an oven by a hinge assembly

at each side of said door which enables said oven door to be raised from and lowered to an oven door open position, locking means for locking said oven door shut on an oven when said shield is raised to a window covering position, a drive means adapted for movement in said door relative to and along the door's height, the movement of said drive means being associated with the hinged movement of said door, a track system to which said shield is connected for movement to and from a window covering position, said apparatus comprising an actuator arm pivotally mounted within said door and connected to said shield, a fastener means for connecting said actuator arm with said drive means to transfer the movement of said drive means to said actuator arm, said actuator arm being in a position which places said shield in a window uncovered position with said fastener means connected and with said door in its open position, said shield remaining in a window uncovered position when said fastener means is unconnected as said oven door is raised and lowered, the arrangement being such that as said door is raised from its open position, with said fastener means connected, said actuator arm is swung upwardly relative to said door's height to raise said shield to its window covering position.

4,103,672

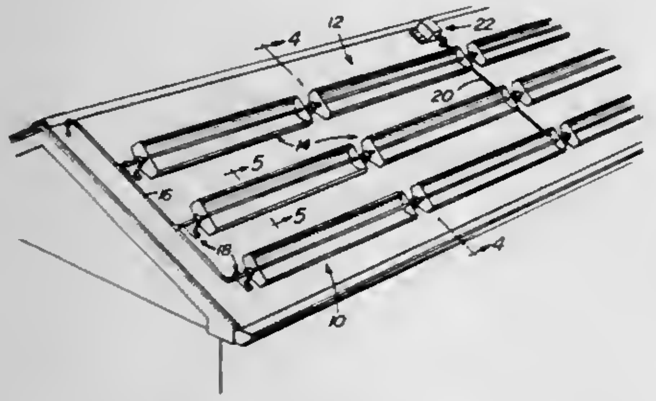
SOLAR COLLECTOR

Warren A. Meyer, 8612 Bellehaven Pl., N.E., Albuquerque, N. Mex. 87112

Filed May 21, 1976, Ser. No. 688,830

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—270 **11 Claims**



1. A solar collector, comprising, in combination:
(a) a heat collector;
(b) reflector means for directing radiation from the sun onto the heat collector;
(c) support means for mounting the heat collector and reflector means in cooperating relationship and for exerting opposed forces at spaced points on the reflector means and biasing the reflector means toward a parabolic contour focusing rays toward the head collector; and
(d) the reflector means including a substantially rectangular, normally substantially planar reflector element including a pair of spaced, substantially parallel, peripheral edges, with the support means including a pair of spaced, opposed attachment points engaging the peripheral edges of the reflector element, the attachment points being spaced from one another a distance less than a distance between the peripheral edges of the reflector element for biasing the reflector element toward the desired parabolic contour, the reflector means further including a resilient strip engaging the attachment points and partially overlying and abutting the reflector element for biasing the reflector element toward a parabolic contour.

4,103,673

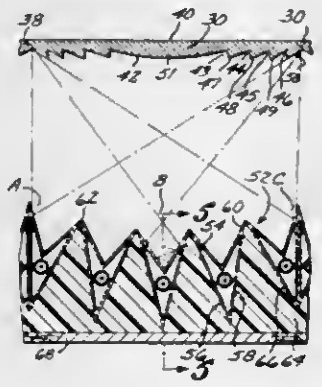
NON-TRACKING SOLAR ENERGY CONCENTRATOR

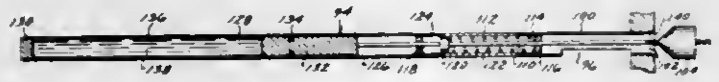
Robert N. Woodworth, 2838 Graysby St., San Pedro, Calif. 90732, and Ulf Brynjestad, 1047 W. Ashbridge La., Harbor City, Calif. 90710

Filed Dec. 6, 1976, Ser. No. 748,140

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **6 Claims**





1. A solar energy concentrator comprising:
a lens element to receive incident solar energy and focus the received solar energy into a narrow, concentrated beam;
a plurality of parallel flow channels having inlet and outlet ends and in side-by-side relationhsip beneath said lens element and oriented with respect thereto for reception of said concentrated beam of solar energy on respective ones of said flow channels;
inlet cross header means in open communication to each of said flow channels to supply a heat exchange fluid to the inlet of said flow channels;
outlet cross header means in communciation through outlet valve port means with each of said flow channels to remove heated heat exchange fluid from the other said flow channels;
valve means in each of said flow channels including a tubular valve body having an open end received in said outlet cross header and positioned within its respective flow channel with inlet port means in the wall of said tubular member and valve seat means extending about the open end of each of said outlet port means, a valve closure member carried on a valve stem for movement between closed and open registration with said valve seat means;
a coaxial tubular spring housing received on the inboard end of said valve body and bearing an end plate and receiving said valve stem with the latter fixedly carrying a piston;
a helical coil spring received between said end plate and piston;
thermostatic actuator means supported within its respective flow channel and including a displaceable member moveably responsive to temperature changes experienced by said thermostatic actuator and moveable into an abutment position with the received end of said valve stem to effect relative movement of said closure member; and
adjustment means whereby the spacing between said displaceable member and the received end of said valve stem is adjustably variable to provide a controllable deadband in response of said valve closure member to temperature changes of said thermostatic actuator.

4,103,674

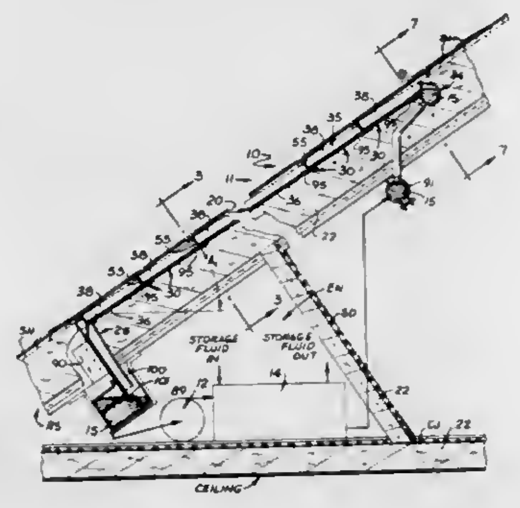
MODULAR SOLAR COLLECTOR SYSTEM

Glen P. Robinson, Jr., Atlanta; Samuel V. Shelton, Stone Mountain, and Samuel F. Hutchins, Lilburn, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 660,249, Feb. 23, 1976, Pat. No. 4,074,705. This application Dec. 2, 1976, Ser. No. 746,850

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **44 Claims**



1. A modular solar collector system for installation on the spaced apart, generally parallel refters in a building to expose heat transfer fluid to solar radiation including a collector pan assembly adapted to fit in the opening between and be attached to the opposed inside edges of the adjacent building rafters said collector pan assembly defining a common fluid flow channel therein inclined with respect to the horizontal at a prescribed inclination angle so that the heat transfer fluid can flow down the fluid flow channel under the force of gravity, said collector pan assembly comprising a plurality of collector pans; each of said collector pans having an upstream end and a downstream end, and comprising a generally flat bottom wall over which the heat transfer fluid can flow in a thin fluid film and a pair of side walls along opposite sides of said bottom wall so that said side walls and said bottom wall define a pan fluid flow channel along the length of said collector pan; each of said side walls including a mounting leg flexibly movable with respect to said bottom wall; each of said collector pans having a transverse width such that said collector pan can be positioned in the opening between the building rafters and at least a portion of said mounting leg of each of said side walls can be forced into juxtaposition with one of the opposed inside edges of the adjacent building rafters and attached thereto to mount said collector pan within the opening between the building rafters, the upstream end of said collector pan having a prescribed exterior size and shape and the downstream end of said collection pan having a prescribed interior size and shape complimentary to said upstream exterior shape, said plurality of collector pans serially connected together with the downstream end of each of said collector pans overlapping the upstream end of another of said collector pans immediately downstream thereof with the downstream interior shape of each said collector pan complimentarily fitting over the upstream exterior shape of the next downstream said collector pan so that the pan fluid flow channels are serially connected to form said common fluid flow channel and to prevent leakage of said heat transfer fluid as said heat transfer fluid flows from the downstream end of each said collector pan onto the upstream end of the next downstream said collector pan.

4,103,675

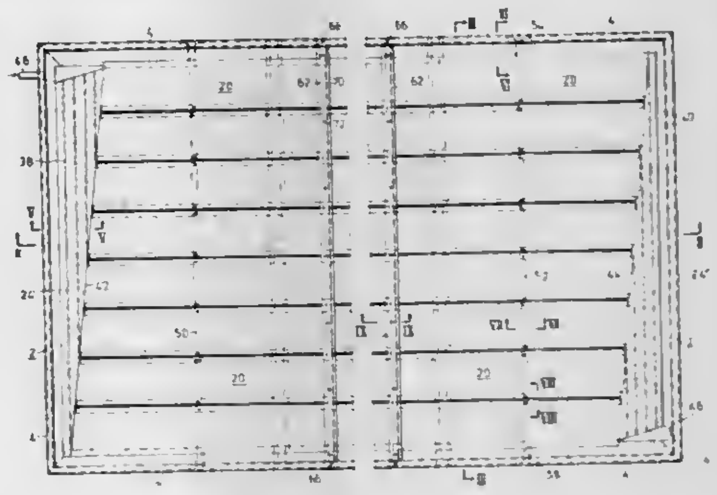
SOLAR COLLECTORS

Benjamin Bar-On, 15 Hacarmel St., Rishon Lezion, and Eldad Paz, 9 Haysur St., Ramat Hasharon, both of Israel

Filed Jan. 31, 1977, Ser. No. 763,990

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **9 Claims**



1. A solar collector comprising a housing having a window transparent to solar radiations, and an absorber panel disposed within the housing and having a solar-radiation-absorbing surface facing said window; said absorber panel including a main extrusion section integrally formed with a plurality of fluid-conducting channels extending in one direction through the panel for conducting a fluid to be heated by the solar radiations intercepted by the absober panel, and two end extrusions each integrally formed with a plurality of fluid-conducting channels extending at right angles to those of the main extrusion section, and each cut along a diagonal line through its respective plurality of channels, one end extrusion being joined along its diagonal cut line to one end of said main extrusion section and constituting the inlet manifold of the absorber panel, the other end extrusion being joined along its diagonal cut line to the opposite end of said main extrusion section and constituting the outlet manifold of the absorber panel.

4,103,676

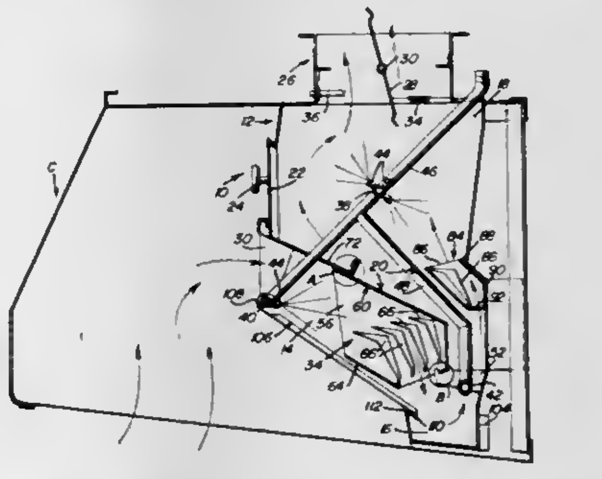
GREASE EXTRACTION CARTRIDGE FOR KITCHEN EXHAUST VENTILATOR

Karl F. Kastner, 6025 Smokey Canyon Dr., Sun Valley, Nev. 89431

Filed Nov. 3, 1976, Ser. No. 738,359

Int. Cl.^{2} F24C *15/20*

U.S. Cl. 126—299 E **4 Claims**



1. In a kitchen exhaust ventilator including a housing divided into a first chamber, a second chamber, and a third chamber, with the three chambers being in serial communication with one another and defining a flow path through the housing passing from the first chamber through the second chamber

and into the third chamber, and a grease extraction system disposed for partially forming the flow path, the grease extraction system including a grease extraction cartridge removably mounted on the housing, the improvement wherein the grease extraction cartridge forms the flow path entirely through the first chamber of the housing, the cartridge comprising a common fire wall separating the first chamber and third chamber, and the cartridge including a support, an airfoil mounted on the support and arranged for changing the direction of a flow of fluid passing over the airfoil and causing foreign matter to be separated from the fluid and deposited on the airfoil, and connector means provided on the housing for removably mounting the fire wall thereto in the housing of the ventilator so that the cartridge may be removed thereby placing the third chamber in direct communication with the first chamber for purposes of cleaning and maintaining the housing.

4,103,677
ULTRASONIC CAMERA

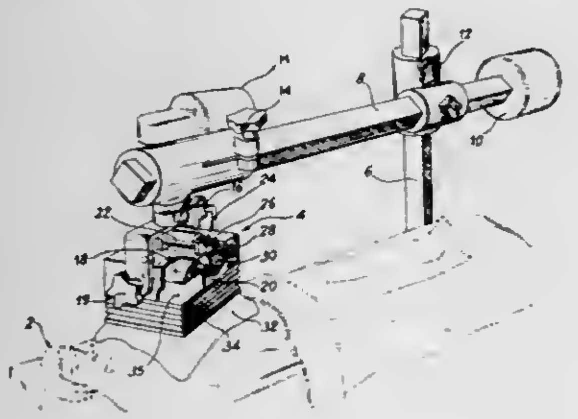
Alain Lansiart, Gif; Jean-Claude Gaucber, Versailles; Jean Lequais, St. Remy les Chevreuse; Jean-Luc Moretti, St-Maur, and Annick Quettier, Cretell, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 16, 1976, Ser. No. 742,234

Claims priority, application France, Nov. 24, 1975, 75 35817

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 V **9 Claims**



1. An ultrasonic camera comprising an emitting section and a receiving section which are both located on the inner surface of a portion of a cyliner, the receiving section being constituted by a plurality of n receiving elements in the form of strips disposed in parallel relation and the emitting section being constituted by a plurality of m emitters which are also in the form of parallel strips, the strips of the emitter are disposed in two groups, each group being constituted by a band of parallel strips and the two bands being located on each side of the receiving section, each emitter being constituted by a pair of strips, the parallel side of each of the two emitting strips being such as to form part of a directrix of said cylinder, the ultrasonic camera being further provided with electronic means for exciting the different emitting strips with the same phase and electronic means for collecting the signals received by the different receiving strips.

4,103,678
NOCTURNAL PENILE TUMESCENSE MONITOR

Ismet Karacan, Houston, Tex.; Larry G. Paulsoo, and Gerald W. Timm, both of Minneapolis, Minn., assignors to American Medical Systems, Inc., Minneapolis, Minn.

Filed Apr. 21, 1977, Ser. No. 789,713

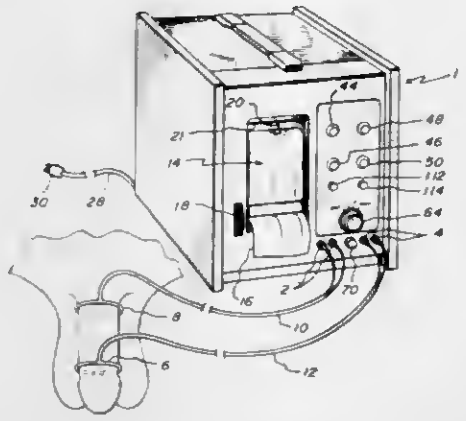
Int. Cl.² A61B *5/00;* **G01D** *15/10*

U.S. Cl. 128—2.05 V **19 Claims**

1. Apparatus for simultaneously monitoring electrical signals from two, separate sensing devices and recording same on a single, multiplexing strip chart recorder, comprising:

a strip chart recorder comprising:
- a movable pen disposed in trace producing relation to heat sensitive recording paper;
- a motor drivingly connected to said pen;
- a heater on said pen;
- drive means for advancing said recording paper past said pen at a predetermined speed;

electrical circuit means connecting said pen motor and said pen heater to a power source and comprising:
- switch means interconnected to said pen motor for transmitting drive signals thereto;
- two separate sensing devices connected to said switch means, said sensing devices being selectively positionable at different monitoring locations to detect changes in a condition to be monitored and trigger the generation of signals in response to same;
- control means connected to said switch means and operative to emit control signals at predetermined time intervals to condition said switch means to receive input signals alternately from said two sensing devices at predetermined time intervals, and said switch means transmitting said input signals alternately from said two sensing devices to said pen motor, whereby said motor actuates said pen so as to record two separate traces on said recording paper corresponding to respective ones of said input signals from said two sensing devices; and



signal relaying means connected between said control means and said pen heater and operative to selectively transmit an energizing signal to said pen heater in response to control signals from said control means in synchronization with the alternate conditioning of said switch means, at such frequency that said pen heater is de-energized during switching excursions of said pen between said two traces.

4,103,679
METHOD AND APPARATUS FOR MEASURING BLOOD FLOW NONINVASIVELY

Harmoo J. Aronson, Wayne, N.J., assignor to Biosonics, Inc., Wayne, N.J.

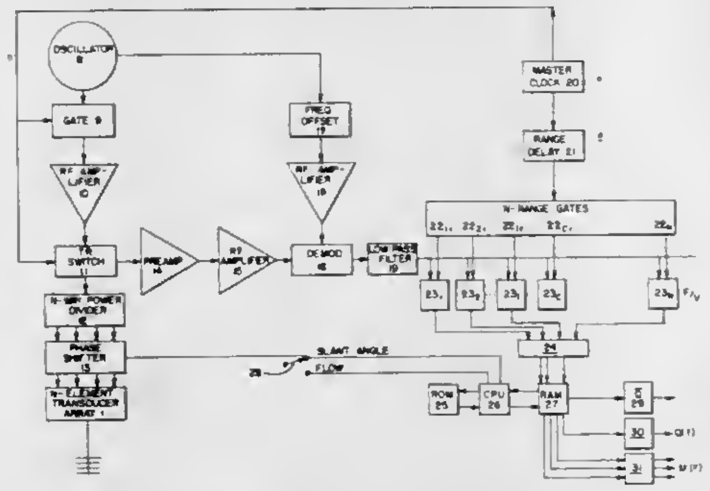
Filed Mar. 22, 1977, Ser. No. 780,078

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 F **26 Claims**

18. An apparatus for noninvasively measuring rate of volumetric blood flow and velocity profile in a vessel in a section of a living body comprising;

- (a) electronic means including transmitting means located outside of the body for noninvasively transmitting beams of pulsed ultrasonic energy in the direction of the vessel at different angles relative to the direction of fluid flow;
- (b) said electronic means including receiving means for receiving the ultrasonic energy backscattered by the flowing blood at the different angular orientations of said beams;
- (c) said electronic means including means for measuring the different frequency shifts of the received ultrasonic energy corresponding to said beams of pulsed ultrasonic energy transmitted at said different angular orientations;
- (d) said electronic means including stored program and computing means for calculating one of the angles at which the ultrasonic beam intercepts the blood flow;
- (e) said electronic means including means for measuring the frequency shifts between the transmitted and received ultrasonic wave energy backscattered at said one of the angles at incremental radial positions along the cross-section of the vessel; and



- (f) said electronic means including stored program and computing means for calculating the blood flow rate and velocity profile from said measured frequency shifts at said radial positions along the cross-section of the vessel and from the previously calculated said one of the angles

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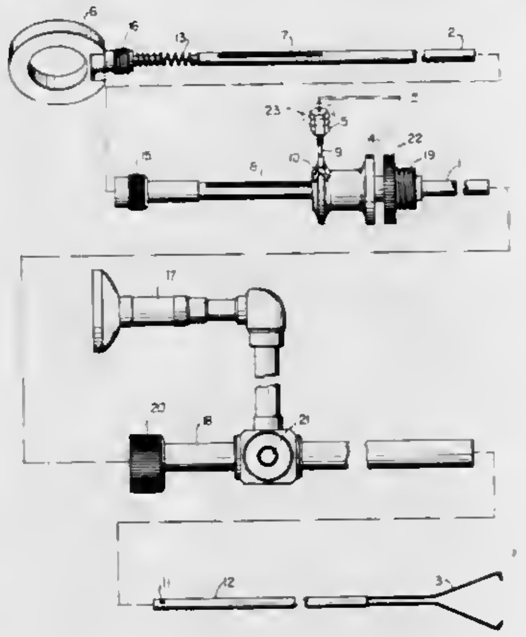
4,103,680
MULTIPLE OCCLUSION RING APPLICATOR AND METHOD

In Bae Yoon, 2213 Forest Ridge Rd., Timonium, Md. 21093

Continuation-in-part of Ser. No. 605,217, Aug. 15, 1975, which is a continuation-in-part of Ser. No. 518,617, Oct. 29, 1974, Pat. No. 3,989,049, which is a division of Ser. No. 383,475, Jul. 30, 1973, Pat. No. 3,870,048. This application Aug. 15, 1975, Ser. No. 605,197

Int. Cl.² A61B *17/12, 17/22*

U.S. Cl. 128—6 **25 Claims**



1. An instrument for applying multiple elastic occluding rings to anatomical tubular structures without the necessity of reloading the instrument which comprises a ring applicator device combined with an endoscope, said ring applicator device comprising an inner cylinder and an outer cylinder, said inner cylinder being slidably disposed within said outer cylinder, forceps means slidably disposed within said inner cylinder and operating slide means operatively associated with the forceps means and the inner and outer cylinders for sequentially displacing the forceps means in the proximal direction relative to the inner and outer cylinders and for displacing the forceps means and inner cylinder in the proximal direction relative to the outer cylinder as the result of a single movement of said operating slide means toward the proximal end of the instrument, said ring applicator device being combined with said endoscope so that the distal end portion of the ring applicator device extends beyond the distal end portion of the endoscope, and engaging means provided with the ring applicator device and the endoscope, said engaging means cooperating to produce relative movement between the ring applicator device and the endoscope in the axial direction of the instrument for displacing an elastic occluding ring from the outer cylinder to the inner cylinder at the distal end of the ring applicator device.

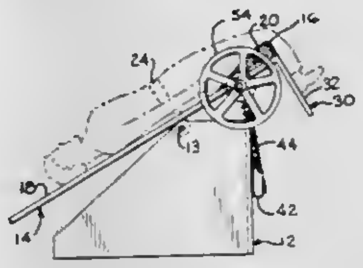
4,103,681
TILTING TRACTION APPARATUS

Bernard J. Sbanley, 1241 Gardeo Ave., Roseville, Minn. 55113

Filed Sep. 10, 1976, Ser. No. 721,977

Int. Cl.² A61F *5/00*

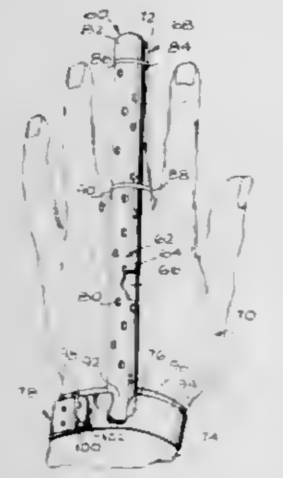
U.S. Cl. 128—71 **9 Claims**



1. A tilting therapeutic traction table comprising:
- (a) a base;
- (b) a body support platform having first and second ends and a broad upper surface extending continuously between said first and said second ends and of a width sufficiently large to fully support the upper leg and torso portion of a human body, said platform being adapted for supporting a patient such that the head of a patient is disposed adjacent said first end and the legs of the patient from his knees downward hang freely over said second end of said platform, said platform being configured to further define a ramp-like surface disposed adjacent said second end of said platform, said surface being inclined upwardly in the direction from said first to said second ends and adapted to elevate the knees of a patient supported thereby above the general plane of said platform while fully supporting the thigh portion of the patient's legs, in a manner which contains the buttocks of the patient in engagement with said platform;
- (c) hinge means for pivotally connecting said platform to said base, said hinge means being mounted intermediate said first end and said second ends of said platform;
- (d) power transmission means suitable for direct operation by a patient lying on said platform, for tilting said platform about said hinge means to a degree proportional to the actuation input stimulus provided by the patient to the transmission means, said transmission means being operable to cause said first end of said platform to move downward while said second end of said platform moves upward and in a manner such that said first end of said platform is disposed increasingly relatively lower than said second end of said platform; and
- (e) restraining means adapted for engaging the hip portion of a patient lying on said platform for preventing movement of the patient against longitudinal translation of the patient along said platform in the direction from said second to said first end thereof when said platform is tilted.

4,103,682
ANATOMICAL DIGIT AND APPENDAGE-IMMOBILIZING DEVICE

Gertrude K. Franzl, 105-25 65th Ave., Forest Hills, New York, N.Y. 11375
Filed Sep. 20, 1976, Ser. No. 724,713
Int. Cl.^{2} A61F *5/04*
U.S. Cl. 128—87 A **2 Claims**

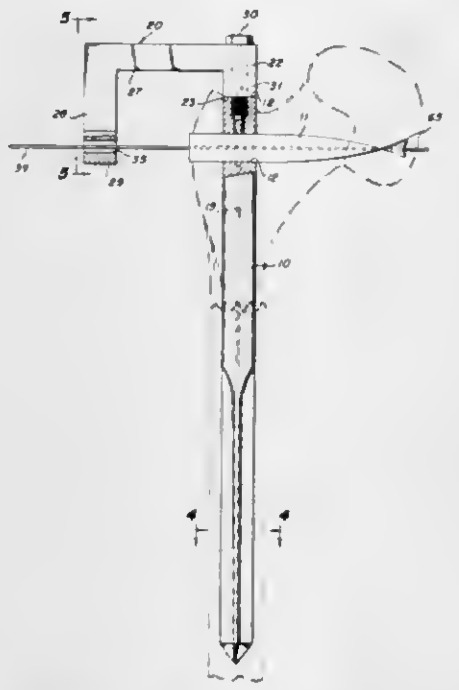


1. An improved device for supporting one or more fingers, said device comprising, in combination:

a. at least one generally rigid elongated mold adapted to generally conform to a major surface of at least one digit and extending along the length of said digit over both finger joints and terminating at and overlying the wrist;
b. a wrist securing means including a composite band adapted to encircle the wrist;
c. a non-allergenic layer of material secured to the underside of said mold;
d. said mold and said layer having a plurality of aligned openings therein;
e. a non-allergenic layer secured to the underside of said composite band;
f. said composite band having an inner band portion and an outer band portion constructed so as to form a pocket therein;
g. adjustable fastening means secured to both ends of said composite band;
h. said composite band being adapted to selectively receive and frictionally, releasably retain one end of one or more of said molds therein;
i. said adjustable fastening means adapted to be adjusted to accommodate within said pocket the ends of varying numbers of molds and further adapted to be tightened to frictionally and releasably retain said ends within the pocket of the composite band;
j. said mold having a first groove disposed in the upper end thereof extending in a transverse direction to the length of the mold and at a location overlying the portion of a finger extending past the outermost finger joint;
k. a first elastic band member;
l. said first elastic band member adapted to be disposed within said first groove and encircle both said mold and the portion of a finger lying thereunder;
m. said first groove adapted to maintain said first elastic band member in a firxed position with respect to said finger; and,
n. whereby said molds can readily be removed from said pocket by selectively sliding them out of said pocket.

4,103,683
SUB-TROCHANTERIC NAIL

John A. Neufeld, 10,000 SE. Main, Suite 402, Portland, Oreg. 97216
Filed Jun. 3, 1977, Ser. No. 803,347
Int. Cl.^{2} A61F *5/04;* **A61B** *17/18*
U.S. Cl. 128—92 BA **10 Claims**



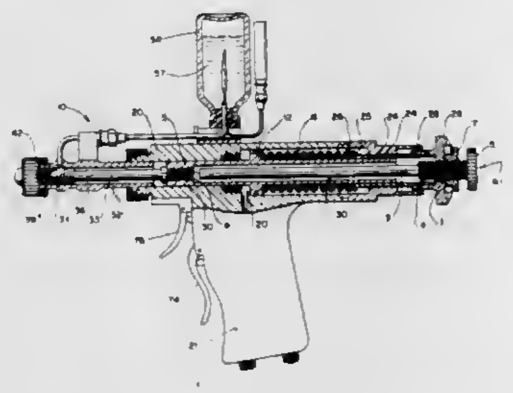
1. A sub-trochanteric fracture appliance for use in a surgical procedure for stabilizing the trochanter and distal portions of a fractured upper thighbone, the appliance including a crosspiece that may be assembled in combination with a universal right and left handed femoral nail, the nail being adapted for insertion in the medullary canal of the thighbone to extend from the trochanter into the distal portion of the bone and the crosspiece extending across the trochanter and into the neck and femoral head thereof, comprising a cylindrical femoral nail adapted to be inserted to extend for a substantial distance from the greater trochanter through the medullary canal into a distal portion of a fractured thighbone, said femoral nail having a narrow longitudinally extending slot near one end thereof defined by top and bottom walls and longitudinally aligned arcuate side walls, said slot being positioned lengthwise of said femoral nail to be situated opposite the femoral head of the thighbone when said nail is positioned in said trochanter and medullary canal with said slot traversing a portion of said trochanter, an elongated flat spirally designed crosspiece having a cross sectional shape that has an area of a size to just neatly fill the open area constituting said slot, said spiral of said crosspiece having a pitch in the order of one revolution in an 8-inch length, said crosspiece having a length equal to about ½ a full twist of the spiral and being adapted to be inserted in said slot to be driven therethrough to extend through the neck of the femur and have one end firmly seated in said slot and its other end positioned generally horizontally and lodged in the femoral head of the thighbone.

4,103,684
HYDRAULICALLY POWERED HYPODERMIC INJECTOR WITH ADAPTERS FOR REDUCING AND INCREASING FLUID INJECTION FORCE

Aaron Ismach, 200 Upper College Ter., Frederick, Md. 21701
Filed Dec. 30, 1976, Ser. No. 755,475
Int. Cl.^{2} A61M *5/30*
U.S. Cl. 128—173 H **4 Claims**

1. A hypodermic jet injection device comprising:
a barrel having a chamber adjacent one end thereof for containing a quantity of fluid to be discharged;
a reciprocatable piston in said chamber for discharging said fluid under pressure;

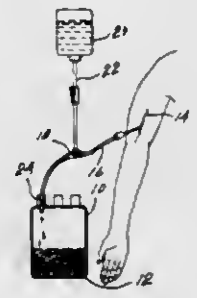
a reciprocatable hollow plunger in said barrel secured to said piston;
first trigger means arranged to initiate hydraulic retraction and retention of said plunger;
second trigger means arranged to release hydraulic retention of said plunger;
a coil spring in said barrel biasing said plunger toward said chamber and compressible by said plunger and operable when said plunger is released to drive said plunger and said piston forwardly toward said chamber a predetermined distance with a maximum initial driving force and a minimum final driving force to eject said fluid from said chamber;
an adjustment knob means mounted on the other end of said barrel and abutting said coil spring for adjusting said minimum driving force at the forward end of travel of said piston;



an adapter assembly means removably mountable on said adjustment knob and comprising means for varying said maximum initial driving force,
said assembly comprising;
a housing detachably mounted to said adjustment knob means;
a shaft slidably mounted in said housing and extending from said housing coaxially said spring and said hollow plunger; said shaft terminating within said hollow plunger adjacent the point where said piston is secured to said plunger;
another spring in said housing axially aligned with said first named spring and operatively biasing said shaft towards said hollow plunger so that retraction of said shaft by said plunger, with respect to said adjustment knob means, simultaneously compresses both the first named spring and said other spring.

4,103,685
METHOD AND APPARATUS FOR EXTRAVASCULAR TREATMENT OF BLOOD

Paul J. Lupien, 686 Le Cavalier; John A. Awad, 632 Ave. Charron, and Sital Moorjani, 2905 De la Providence, all of Ste-Foy, Quebec, Canada
Filed Jan. 5, 1976, Ser. No. 646,567
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—214 R **14 Claims**



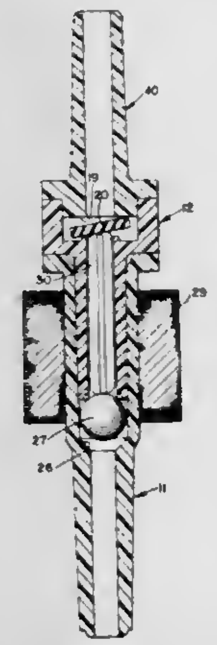
1. A method for the extracorporeal treatment of the blood of a patient afflicted with hyperlipemia and/or hypercholesteremia to effect a reduction of the β and pre-β lipoproteins in said blood without substantially affecting the remaining constituents of the blood, which comprises:

(a) withdrawing a portion of blood from said patient,
(b) contacting said blood portion with a water-insoluble gel of a sulfated polysaccharide coupled to an activated non-sulfated polysaccharide having its remaining sites blocked, in the presence of calcium cation in a concentration of 0.02 to 0.04M, thereby selectively binding a substantial portion of the beta and pre-beta lipoproteins with the calcium complex gel,
(c) causing the thus treated blood portion to be filtered, thereby to separate the treated blood portion from the complex gel, whereby there is obtained the same blood portion wherein the initial amount of beta and pre-beta lipoproteins has been substantially reduced without affecting the remaining constituents of the blood, and
(d) returning the thus filtered blood portion to the patient.

5. In an apparatus for removing a substantial amount of β0 and pre-β lipoproteins from blood comprising recipient means for receiving therein blood to be treated; means allowing the removal of treated blood from said recipient means; and filter means disposed between said gel support and said means allowing treated blood removal, the improvement comprising a calcium metallic complex of sulfated polysaccharide coupled to an activated non-sulfated polysaccharide gel support wherein the remaining sites are blocked being contained in said recipient means whereby, when in the presence of said gel support, said blood is treated by the fixing of a substantial amount of β and pre-β lipoproteins to said support and said filter means having a porosity such as to prevent passage of said gel support therethrough as said treated blood is withdrawn from said recipient means.

4,103,686
DUAL VALVE ASSEMBLY

Robert J. LeFevre, Bethlehem, Pa., assignor to Burron Medical Products, Inc., Bethlehem, Pa.
Filed Mar. 29, 1977, Ser. No. 782,411
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—214 R **10 Claims**



1. A dual valve assembly for use in intravenous administration from multiple parenteral fluid sources, said valve assembly controlling flow of fluid in forward and reverse directions therethrough, comprises a valve body having an inlet and an outlet and defining first and second spaced apart valve chambers therein, a first valve member is movable in the first valve chamber between a valve seat and a valve stop, a second valve member is movable in the second valve chamber between spaced opposed valve seats, and means extends between the first valve member and the second valve member to engage the second valve member and move it from one of its seats in

response to movement of the first valve member from its seat, whereby flow is enabled from the inlet to the outlet, said second valve member being movable by fluid pressure into closing engagement with the other of its seats in response to flow from the outlet toward the inlet to preclude reverse flow through the assembly.

4,103,687
USE OF HAPTOGLOBIN FOR THERAPY OF CEREBRAL VASOSPASM

Sbozo Ishii, Tokyo, Japan, assignor to The Green Cross Corporation, Osaka, Japan

Filed Jul. 20, 1976, Ser. No. 707,069

Claims priority, application Japan, Apr. 16, 1976, 51-43100

Int. Cl.^{2} A61M *5/00;* A61K *29/00*

U.S. Cl. 128—214 R **12 Claims**

1. A method of releasing and remedying human cerebral vasospasm comprising administering to a spastic cerebral artery haptoglobin or haptoglobin-hemoglobin complex in an amount sufficient for such purpose.

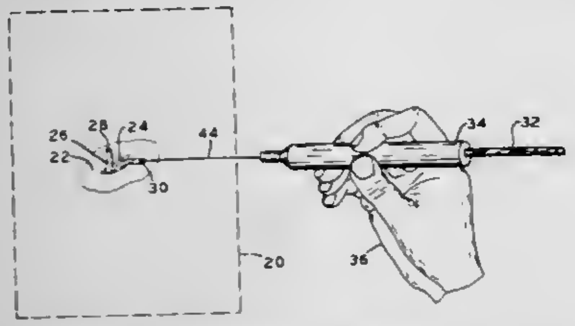
4,103,688
METHOD AND APPARATUS FOR STERILIZATION

John Edwards, Rte. 1, County Rd. 550 S., Churubusco, Ind. 46723

Filed Apr. 29, 1976, Ser. No. 681,401

Int. Cl.^{2} A61B *17/36*

U.S. Cl. 128—303.17 **8 Claims**



1. A vas deferens cauterizing instrument for use with an energy source comprising:
  a flexible, non-resilient, pliable, filamentar elongate electrode of a size to be slidably inserted within a vas deferens and capable of being retentively configured to conform to the shape of the vas deferens having an exposed cauterizing tip of predetermined length at one end;
  a conductive connecting member secured to the other end of said electrode and in electrical contact therewith, and adapted to be removably received in electrical engagement with the energy source;
  a thin, flexible, lubricous, dielectric covering on said electrode along its length from said member to said exposed cauterizing tip for low friction sliding engagement with the inner walls of the vas deferens; and
  said cauterizing tip being electrically exposed to transmit energy directly to the inner walls of said vas deferens to cause cauterization and resultant sealing thereof on withdrawal of the tip from the vas deferens.

4,103,689
TISSUE PRESSURE REFERENCE FOR CEREBROSPINAL FLUID SHUNTING DEVICE

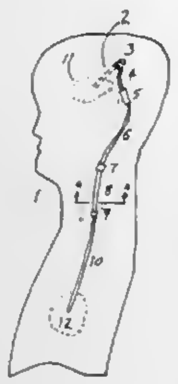
Stephen Beecber Leighton, 93 Jefferson Ave., Maplewood, N.J. 07040

Filed Dec. 13, 1976, Ser. No. 750,154

Int. Cl.^{2} A61M *27/00*

U.S. Cl. 128—350 V **5 Claims**

1. A hydrocephalus shunt system comprising an inlet tube for connection to the ventricles of the brain, and an outlet tube for connection to a body cavity downstream, and interposed there between a pressure regulating collapsible tube, the improvement wherein said collapsible tube consists of an annular walled structure of compliant material having closely juxtaposed sides such that in the relaxed position of zero transmural pressure, the lumen of the tube has a substantially closed cross-section and wherein the collapsible section is substantially free of a case or compartment or enclosure or inner wall spacing means of any kind and wherein intimate contact of the collapsible section with body tissue is maintained said collapsible tube being connected to and supported at its ends by said inlet and outlet tubes.



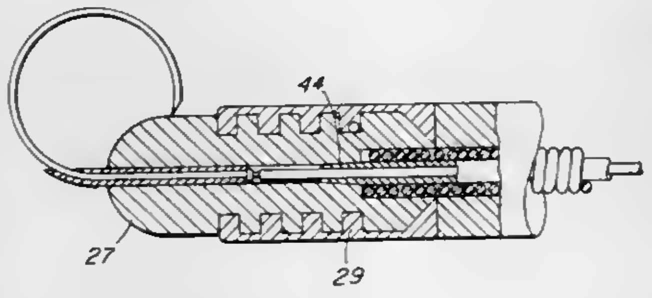
4,103,690
SELF-SUTURING CARDIAC PACER LEAD

Donald Leal Harris, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 21, 1977, Ser. No. 779,686

Int. Cl.^{2} A61N *1/04*

U.S. Cl. 128—418 **6 Claims**



1. A cardiac pacer lead comprising:
an electrical terminal;
a tip for contacting cardiac tissue;
flexible conductor means extending between said terminal and said tip;
a length of formable wire;
a tubular die mounted at the tip end of said lead, said die having a central bore which receives said formable wire, said die having, at the distal end thereof, means for deflecting said wire out of alignment with said bore to impart a curvature of predetermined radius to said wire as it is driven through the die, said length of wire being provided with means for limiting the passage of said wire through the die,
said terminal, said tip and said flexible conductor means being hollow to permit the passage therethrough of elongate means for driving said wire through the die, said elongate means being operable from the terminal end of said lead, whereby said tip may be secured to cardiac tissue ejecting said length of wire through said die while said tip contacts cardiac tissue, the wire passing through the tissue in a curved path which arches back toward the tip effectively forming a suture holding the tip in place.

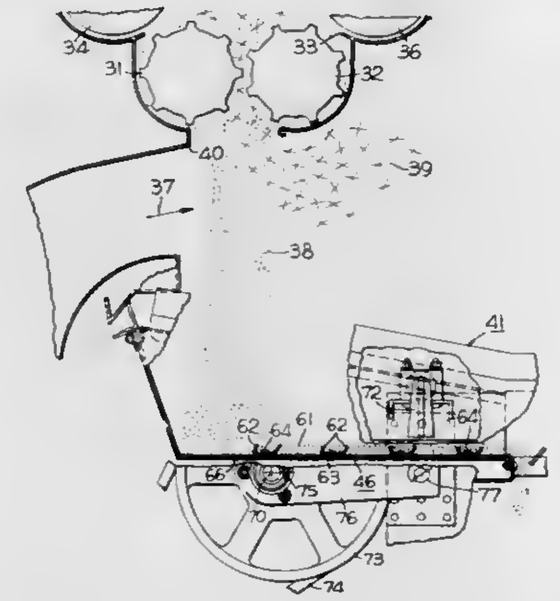
4,103,691
COMBINE WITH MEANS FOR REDUCING THE BOUNCE OF ACCELERATED GRAIN

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuatinn-in-part of Ser. No. 592,713, Jul. 2, 1975, Pat. No. 4,007,744. This application Aug. 11, 1976, Ser. No. 713,536

Int. Cl.^{2} A01F *12/00*

U.S. Cl. 130—24 **3 Claims**



1. In a combine including a threshing cylinder, the combination comprising:
  accelerator means receiving a mixture of threshed grain and chaff from said threshing cylinder and accelerating said grain and chaff downwardly;
  means supplying a horizontal stream of air intersecting said grain and chaff accelerated downwardly by said accelerator means, said air stream carrying the chaff horizontally out of said downwardly accelerated grain; and
  a horizontally disposed grain pan supported on said combine for horizontal oscillation, said grain pan being disposed beneath said accelerator means at a level below said air stream and in receiving relation to said grain accelerated downwardly by said accelerator means through said air stream, said grain pan including a substantially flat bottom and a plurality of horizontally spaced baffles extending upwardly and horizontally, in the direction of said air movement, from said bottom of said grain pan to a height sufficient to retain a layer of grain on the bottom of said grain pan during oscillation thereof, said layer of grain serving to absorb the impact of the grain accelerated downwardly by said accelerator means.

4,103,692
CIGAR WRAPPING MACHINE AND METHOD

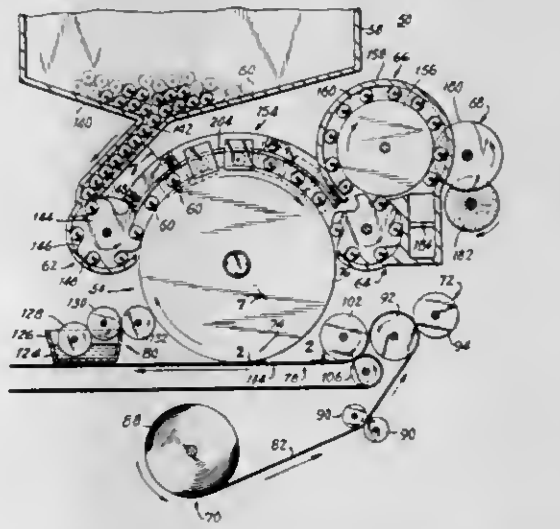
Robert J. Baier, West Chester; Vern Anderson, Berwick, and William S. Aseltine, Devon, all of Pa., assignors to Gulf & Western Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 808,919

Int. Cl.^{2} A24C *1/30*

U.S. Cl. 131—32 **37 Claims**

1. A machine for spirally applying wrappers to cigar bunches said machine including means for supplying bunches having fire ends and tapered mouth ends; means for supplying elongated wrappers having flag ends; a continuously moving bunch carrier; a continuously moving wrapper carrier; means for applying bunches to the bunch carrier spaced apart in the direction of movement of the bunch carrier and with their longitudinal axes perpendicular to said direction of movement; means for applying wrappers to the wrapper carrier spaced apart in the direction of movement of the wrapper carrier, with their longitudinal axes at the same acute angle to the direction of travel of the wrapper carrier and with the tip of each wrapper foremost; each of said carriers having a different predetermined path of travel; the paths of travel of said bunch carrier and of said wrapper carrier having common portions that are coextensive; the paths of travel of said bunch carrier and of said wrapper carrier approaching each other as they approach the coextensive common portions and the tip of each wrapper reaching the common portion before the balance of such wrapper; the tip of each wrapper being brought into contact with the fire end of an associated bunch as the bunch and wrapper reach the common portions; means to apply paste to the tip of each wrapper before the wrapper reaches the common portions so that said tip will adhere to the bunch when the tip is applied to the bunch; means to spin the bunches as they traverse the common portions while the bunches are bodily moving through the common portions in a direction perpendicular to their lengths; means to move each wrapper relative to its associated bunch at such a speed that the wrapper is spirally applied to the spinning bunch; suction means to hold the wrapper to the wrapper carrier as it is being applied; flag carriers on the wrapper carrier, each flag carrier being disposed to receive the flag end of a different wrapper supported on the wrapper carrier; and means to move the flag carrier relative to the wrapper carrier in a fore and aft direction and in an inboard/-outboard direction, and to angularly rotate the flag carrier to apply the flag to the tapered mouth end of the associated bunch being wrapped in such a manner as nicely to apply the flag to the mouth end of the bunch in conformance with the configuration of said end, whereby the flag-ended wrappers are spirally wrapped about the bunches while moving the bunches and wrappers continuously from a point of application of the bunches and wrappers to their respective carriers to a point of delivery spaced from the point of application.



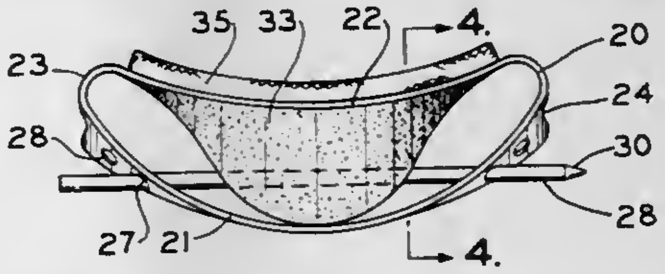
4,103,693
HAIR ARRANGING ACCESSORY

Rose M. Reagan, 1550 E. 221st St., Euclid, Ohio 44117

Filed Mar. 3, 1977, Ser. No. 774,150

Int. Cl.^{2} A45D *8/00*

U.S. Cl. 132—46 R **10 Claims**



1. A hair arranging accessory for securing a strand of hair gathered together at a predetermined location on the head and providing a base for a hairpiece, said accessory comprising:
  a substantially flattened annulus, said annulus having substantially flattened front and rear semirigid wall portions

at least partly overlapping each other and of similar slight initial predetermined concavity;

said wall portions being connected to each other at laterally disposed rounded ends;

said accessory adapted to be disposed against the head with said rear wall portion positioned adjacent to the head and an intermediate portion of said front wall portion positioned outwardly and generally downwardly offset with respect to said rear wall portion;

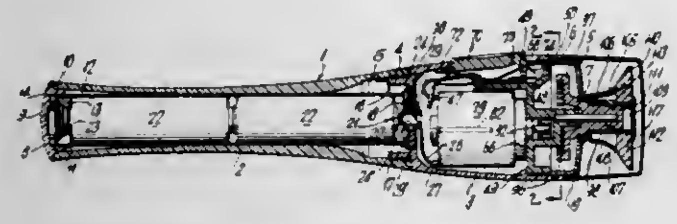
said front and rear wall portions being sufficiently flexible whereby they can be flexed apart to define an opening for projecting the strand therethrough prior to disposing the rear wall portion against the head;

said front wall portion having a pair of apertures spaced inwardly of the ends thereof; and

an elongated pin projectable through said apertures, said strand, and the hair of the head to securely fasten the hair.

4,103,694
MANICURING UNIT

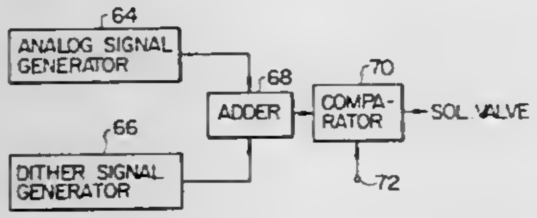
Paul D. Burian, Elmsford, and Arthur T. Sempliner, New York, both of N.Y., assignors to Clairol, Inc., New York, N.Y.
Filed May 6, 1976, Ser. No. 683,854
Int. Cl.² A45D ***29/05***
U.S. Cl. 132—73.6 **14 Claims**



1. A portable manicure unit comprising
(a) a battery source,
(b) a battery-driven motor,
(c) a gear-reduction train and
(d) a manicuring tool rotatably driven by said motor via said gear-reduction train,
(e) said manicuring tool having an abrading working surface having a diameter of at least 0.75 inches and not substantially exceeding 1.5 inches, and
(f) said motor and said gear reduction train being correlated with the diameter of said manicuring tool to provide said working surface speed not substantially exceeding 30 inches per second, whereby said manicuring unit with said large-diameter, low-speed working surface is easily controlled and capable of use in self-manicuring while avoiding undesirable consequences, such as scalloping.

4,103,695
METHOD OF AND DEVICE FOR CONTROLLING SOLENOID OPERATED FLOW CONTROL MEANS

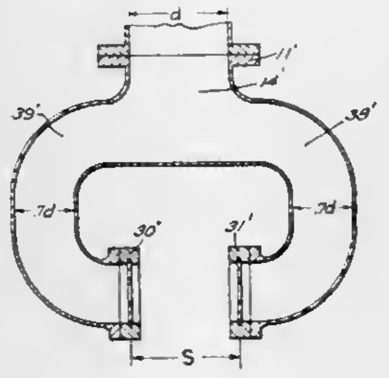
Shigeo Aono, Seki, Japan, assignor to Nissan Motor Company, Limited, Japan
Filed Nov. 5, 1975, Ser. No. 629,094
Claims priority, application Japan, Nov. 6, 1974, 49/127654; Mar. 7, 1975, 50/26962
Int. Cl.² F16K ***31/06;*** **F02M** ***7/12***
U.S. Cl. 137—1 **8 Claims**



1. A method of controlling a solenoid-operated fluid flow control valve having a non-linear intrinsic signal-to-output characteristic, comprising (1) producing an analog basic signal representative of a desired flow rate of fluid through said control valve, (2) producing a steady-state dither signal having a predetermined oscillation frequency, (3) modifying said basic signal with said dither signal for producing a binary control signal digitally representative of a modified version of said basic signal, said dither signal having a waveform which is selected so that said control signal provides a non-linear compensating signal-to-output characteristic which is substantially complementary to said intrinsic signal-to-output characteristic with respect to a linear desired signal-to-output characteristic, and (4) controlling said valve with said binary signal to compensate for said intrinsic signal-to-output characteristic into a substantially linear effective signal-to-output characteristic substantially identical with said desired signal-to-output characteristic of said control valve and thereby enabling the control valve to provide therethrough an effective fluid flow rate which is substantially equal to said desired flow rate.

4,103,696
CONTROL VALVE

Francis H. Cary, Apple Hill Dr., North Scituate, R.I. 02857
Continuation-in-part of Ser. No. 408,096, Oct. 19, 1973, abandoned. This application May 19, 1976, Ser. No. 687,924
Int. Cl.² F16K ***47/00***
U.S. Cl. 137—14 **4 Claims**



1. The method of controlling dissipation of liquid pressure energy in liquid flowing as a stream comprising the steps of separating the stream into only two symmetrical flow paths, placing at the end of each flow path a single variable orifice which form at the end of each path matched jets having equal cross-sectional area, spacing the orifices apart a distance whereby the vena contracta of each is spaced apart, directing each jet toward the other into an unobstructed liquid filled space between the two orifices and effecting a stable dissipation zone between the two vena contractas and discharging the flow of the said unobstructed space with substantially spherical expansion.

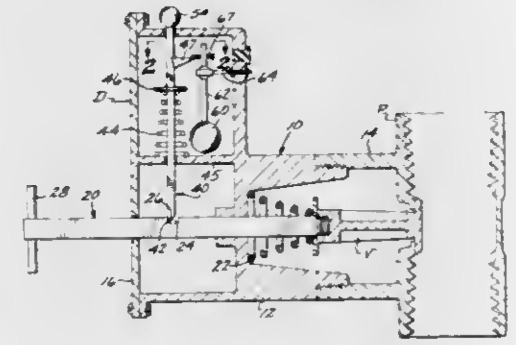
3. A valve assembly for dissipating pressure in a liquid comprising two variable orifices, an orifice actuating means mounted at the ends of symmetrical flow paths, said orifices axially facing one another in a liquid filled space, having equal cross-sectional area and spaced apart substantially within the range of −5% to +30% of a distance S defined by the expression

$$[1.3 + 0.1\sqrt[3]{\Delta P}]d$$

where ΔP equals the maximum design dissipation pressure and d is the flow path diameter, said orifices directing jets at each other in an unobstructed liquid filled space and being spaced apart a distance to create a stable dissipation zone therebetween, the flow discharging from the said zone with substantially spherical expansion.

4,103,697
SAFETY SENSOR DEVICE

Herbert L. Kiesow, 3251 E. Artesia, Long Beach, Calif. 90805
Filed Apr. 22, 1977, Ser. No. 789,783
Int. Cl.² F16K ***17/36;*** **H01H** ***35/02***
U.S. Cl. 137—45 **7 Claims**



1. A safety sensor device, comprising:

a body;

a shut off arm supported on said body for linear movement relative thereto between a normal retracted position and an extended operative position;

spring means biasing said arm towards its operative position;

a stop formed on said arm;

a latch finger supported on said body for linear movement relative thereto towards and away from said arm, said latch finger having a latch surface engageable with said stop to normally retain said arm in its retracted position;

second spring means biasing said latch finger away from said arm;

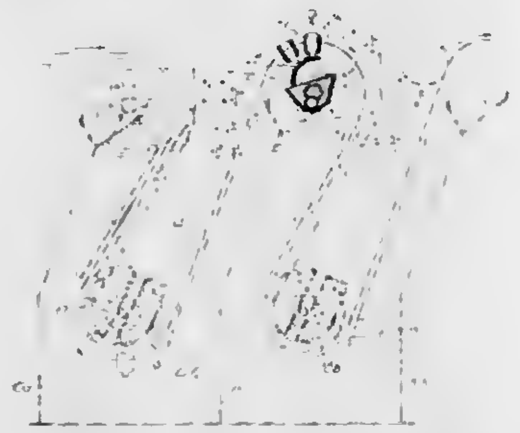
a pendulum secured to one end of a rod that is secured to said body;

a post supported by said rod; and

a pad carried by said latch, said pad including a triangular surface that tapers towards said post with said post normally overlapping said triangular surface to prevent movement of said latch finger away from said arm, and with movement of said pendulum relative to said body causing said post to be moved out of the path of said pad whereby said latch finger will move away from said arm and the latter will be urged to its operative position.

4,103,698
BOTTLE LABEL REMOVING DEVICE

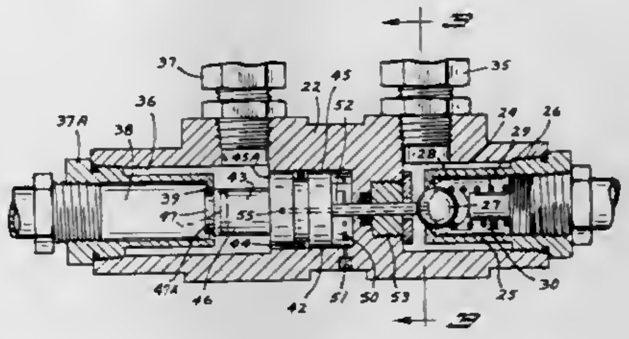
Bruce E. Richardson, and Rudy Oetliker, both of London, Canada, assignors to Labatt Breweries of Canada Limited, London, Canada
Filed Jun. 29, 1977, Ser. No. 828,282
Int. Cl.² B08B ***3/02***
U.S. Cl. 134—73 **7 Claims**



1. In a bottle soaking apparatus comprising a pocket conveyor having an endless chain of spaced bottle receiving pocket members moveable along an endless patch, each of said pocket members including an open-ended tubular element adpated to support a bottle in inverted position by engagement with the bottle shoulder, wheel means defining a portion of said endless path wherein said pocket members pass successively along a downwardly inclined run and thence upwardly about a lower direction changing wheel in a soaking compartment and thence downwardly about an upper direction changing wheel into a subsequent soaking compartment, said pocket members being in a generally inverted position as they travel over said upper direction changing wheel, the improvement comprising rinsing means for discharging downwardly directed sprays of a rinsing solution onto said bottles to flush off labels as they travel over said upper direction changing wheel, fluid collecting and discharging means positioned below said pocket members and sprays to collect rinsing solution and labels and cam means for engaging the mouths of the inverted bottles and lifting the bottle shoulders out of engagement with the pocket members while beneath said sprays to permit passage of the freed labels through the open pocket member lower ends and into the collecting means.

4,103,699
FLUID CYLINDER MOUNTED LOCK OUT VALVE DEVICE

Albam M. Vik, New Brighton, Minn., assignor to Avon Enterprises, Inc., Melrose, Minn.
Filed Jul. 16, 1976, Ser. No. 705,949
Int. Cl.² F15B ***13/042;*** **G05D** ***7/00***
U.S. Cl. 137—106 **2 Claims**

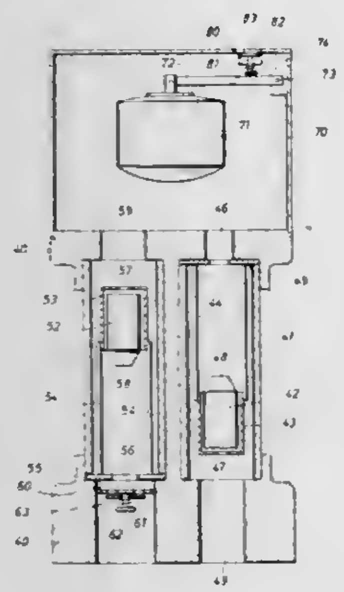


1. A lock out valve assembly for controlling fluid flow to and from a hydraulic jack cylinder which comprises
(a) an elongated valve body having a passageway extending longitudinally therethrough,
(b) rigid conduit means for connecting the ends of the said passageway to opposite ends of a jack cylinder,
(c) the passageway including first and second chambers opening one to each of said conduit means and being separated by a spool chamber,
(d) first and second port means for connecting fluid lines respectively to said first and second chambers,
(e) a cylindrical valve spool slidably disposed in the spool chamber with its end faces open one to each of said first and second chambers,
(f) a ball check valve in the first chamber between the conduit means and first port means to check the flow from the end of a cylinder to which it is connected,
(g) a valve in the second chamber between the conduit means and second port means permitting open flow of fluid under pressure from the conduit means into the chamber but substantially blocking flow of fluid from the chamber to the conduit means,
(h) said valve spool having a stem extending axially therefrom into the first chamber and adapted to engage and unseat the ball check valve when fluid pressure is applied to the end face of the spool open to the second chamber,
(i) said spool and stem having a small orifice extending axially therethrough to provide limited open communication between the first and second chambers, and
(j) the ball check valve closing the end of the orifice in the

stem when the stem is in unseating engagement with the check valve.

4,103,700
AVIATION FUEL GRADE MONITOR

Leonard Orrell, Warrington, and John Whittle, Upton, both of England, assignors to Shell Oil Company, Houston, Tex.
Filed Mar. 3, 1977, Ser. No. 773,997
Claims priority, application United Kingdom, Mar. 16, 1976, 10504/76
Int. Cl.² F16K *31/28*
U.S. Cl. 137—172 **6 Claims**



1. A system for monitoring the density and preventing the passage of a liquid with a density outside a predetermined range having at least two parts arranged in a substantially vertical manner where each part comprises:

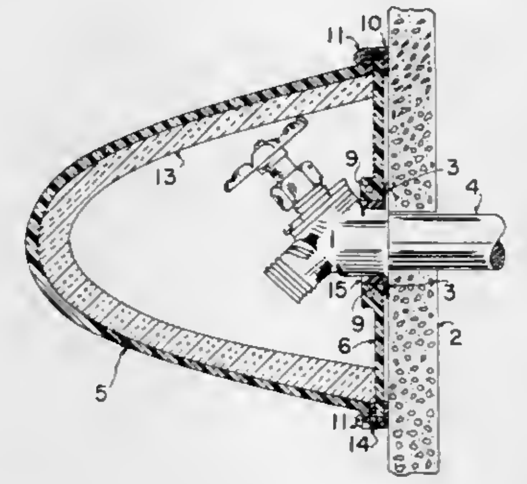
- a body having an inlet and an outlet, and adapted for the passage of said liquid therethrough; and
- a movable member having a weight/volume ratio substantially equal to said density, which member is adapted to move freely within said body between its outlet and its inlet, and is also adapted sealingly to engage with said outlet;

where the outlet of the first part communicates with the inlet of the second part, whereby a flow of liquid is made to pass through the substantially vertically placed parts in such a manner that the flowing liquid passes upwardly through one and downwardly through the other part, while the movable member in the one part will close off its outlet when the density of the flowing liquid increases beyond the predetermined range and the movable member in the other part will close off its outlet when the density of the flowing liquid decreases beyond the predetermined range.

4,103,701
FREEZE-PROOF CAP FOR OUTDOOR FAUCET

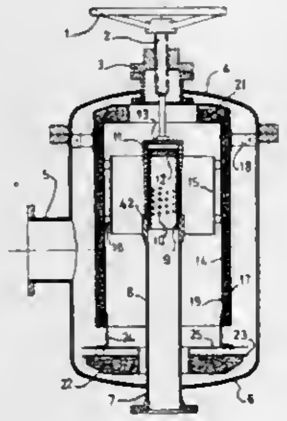
Duen-Ren Jeng, 5334 Fredelia Dr., Toledo, Ohio 43623
Filed Jul. 29, 1977, Ser. No. 820,346
Int. Cl.² F16K *51/00*
U.S. Cl. 137—375 **2 Claims**

1. A thermally insulated cap for protecting the outdoor faucets and the like from freezing and to reduce the heat leakage from a building through the space between a wall and a pipe line, comprising a thermally insulated cap section and a face plate providing means for rigidly mounting the said cap to an existing outdoor faucet adjacent to a wall, the cap integral formed with a rigid shell, preferably of hemi-spherical in shape, being made of PVC or plastic type of material with its inner surface thermally insulated using a layer of fiberglass or styrofoam, at the opening end of the said cap, a ring shape flange on which a layer of sponge rubber glued along the edge facing the face plate providing a means for perfectly shielding the faucet when the said cap being mounted on the face plate by two adapting screws provided on the flange, the mounting face plate having a cylindrical shape and being divided into half cylindrical plates with its center having a concentric cylindrical recess with a layer of sponge rubber glued around, with two screws passing thru two apertured lugs adapted to draw said plates together yielding means for fastening the said plates to the neck of faucet without dismantling any part of existing faucet, a ring type of rubber sponge glued around the edge of plates on the side facing to a wall to minimizing the heat loss thru the space between the plate and the wall.



4,103,702
SOUND PROOFED VALVE FOR FLUID UNDER PRESSURE

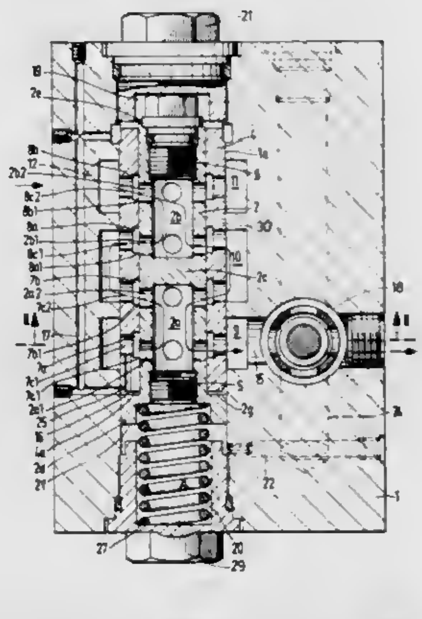
Louis Duthion; Pierre Bonnet, both of Paris, and Paul Amand Louis Coudray, Les Clayes-sous-Bois, all of France, assignors to Bertin & Cie, Plaisir, France
Filed Jun. 17, 1976, Ser. No. 697,216
Claims priority, application France, Jun. 20, 1975, 75 19305
Int. Cl.² F16K *47/02*
U.S. Cl. 137—375 **5 Claims**



1. A sound proofed valve for fluid under pressure, comprising a movable obturator for progressively uncovering a series of fluid expansion orifices positioned inside an expansion area, a primary sound proofing means also positioned inside said expansion area and located opposite fluid jets issuing, in operation of said valve, from said orifices, said sound proofing means forming a baffle masking an outlet for an expanded fluid, supplementary sound proofing means being spaced from said primary sound proofing means to form the base of said baffle; a primary permeable splash guard obstacle placed between said orifices and said primary sound proofing means and spaced from said primary sound proofing means; and a supplementary permeable splash guard obstacle positioned between said primary sound proofing means and said supplementary sound proofing means.

4,103,703
MULTISTAGE PILOT-CONTROLLED PRESSURE-REDUCING VALVE

Johannes Fooke, Lohr, Main, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr, Main, Fed. Rep. of Germany
Filed Dec. 6, 1976, Ser. No. 747,546
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554670
Int. Cl.² G05D *7/01*
U.S. Cl. 137—501 **7 Claims**



1. A flow-control valve assembly for connection between a source of fluid under pressure and a fluid-operated load, said assembly comprising: a main valve defining a continuous flow path having an input end connectable to said source and an output end, said valve further having a valve member defining a plurality of variable flow restrictions along said path, said valve member being longitudinally displaceable in said main valve between an open position wherein said restrictions are all of maximum flow cross section and a closed position wherein said restrictions are all of minimum flow cross section, said valve member being formed with pairs of radially spaced and of longitudinally spaced compartments and two pairs of longitudinally spaced valve-member ports opening laterally from said chamber, said main valve including a housing slidably receiving said valve member and formed with two pairs of longitudinally spaced housing ports alignable and forming four restrictions with said ports of said member, said compartment forming part of said path; a pilot valve having an input side connected to said output end and an output side connectable to said load, whereby a pressure differential is created by said pilot valve between its said sides; and means connected between said sides and said valve member for displacing said member toward said open position when said pressure differential decreases below a predetermined level and for displacing said member toward said closed position when said pressure differential increases above a predetermined level.

4,103,704
SAFETY RELIEF VALVE

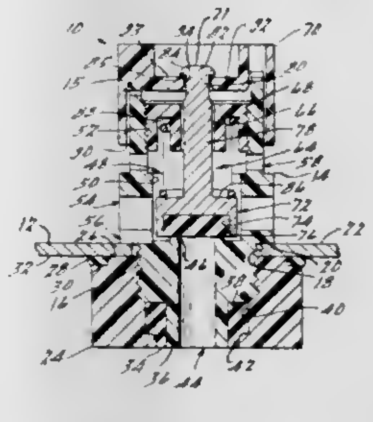
Donald L. Richards, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio
Filed Feb. 16, 1977, Ser. No. 769,144
Int. Cl.² F16K *15/06, 17/08*
U.S. Cl. 137—522 **9 Claims**

1. A relief valve comprising:

A. housing means including:
   1. means defining a valve passage therein;
   2. means defining a fluid inlet port communicating with said passage and adapted for connection to a source of pressurized fluid;
   3. means defining a fluid outlet port communicating with said valve bore;
   4. means defining a cam surface remote from said inlet port and including detent means provided on said cam surface;

B. a poppet member disposed within said valve passage and movable therein between a sealing position wherein one portion of said poppet member blocks communication between said inlet and outlet port means and an open position permitting fluid communication between said inlet and outlet ports; and

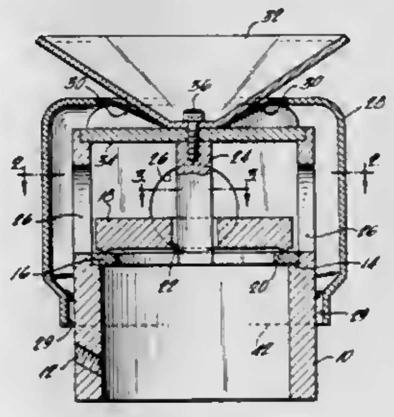
C. a generally cup-shaped acutator knob having:



   1. an open end with the portion of said housing means having said cam surface received therein;
   2. means defining a projection within said open end for selective engagement with said detent means;
   3. means for effecting driving engagement of said knob with second portions of said poppet member remote from said fluid blocking portion upon axial movement of said knob from a first position and rotation of said knob to a second position, thereby effecting movement of said poppet member from said sealing position to said open position and
   4. means formed in said knob defining a fluid outlet port communicating with said valve bore.

4,103,705
PRESSURE STABILIZER DEVICE

Walter D. Wagner, Chadds Ford, Pa., and Harold R. Gayle, Wilmington, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Continuation-in-part of Ser. No. 690,701, May 27, 1976, abandoned. This application May 26, 1977, Ser. No. 800,669
Int. Cl.² B65D *51/16;* F16K *15/08*
U.S. Cl. 137—544 **9 Claims**



1. A pressure stabilizer device designed to have a given open effective aperture to allow inbreathing and outbreathing of gases through it during normal operation without movement of internal parts and comprising:

(a) a housing having a valve seat;

(b) a plate-like valve element resting on said valve seat and being spaced apart therefrom by a plurality of spacer elements, whereby the spacer elements provide a first, open aperture area through the device between the valve seat and the plate-like valve element;

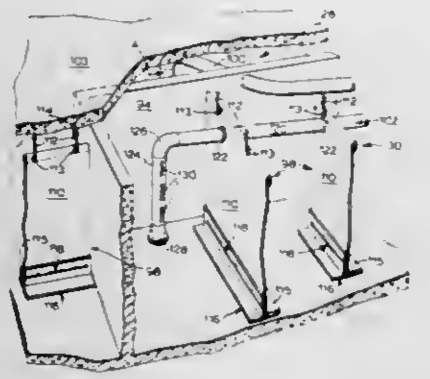
(c) said plate-like valve element having a guide aperture centrally located therein;

(d) a guide element affixed to the valve housing and extending through said aperture in said plate-like element to guide any movement of the plate-like element within the housing and to prevent it from being cocked therein, with the area between the guide aperture and the guide element providing a second open aperture through the device, and whereby said plate-like valve element will lift off the valve seat and be displaced up along said guide element to provide a larger first, open aperture area in the event the pressure across the valve becomes too great.

4,103,706
RESERVOIR

Gerhard W. Moog, Toronto, and Kenneth R. Cooper, Don Mills, both of Canada, assignors to Canada Square Management Ltd., Toronto, Canada

Division of Ser. No. 579,341, May 21, 1975, Pat. No. 4,049,045.
This application Aug. 30, 1976, Ser. No. 718,713
Int. Cl.² F24D *11/00*
U.S. Cl. 137—574 **2 Claims**



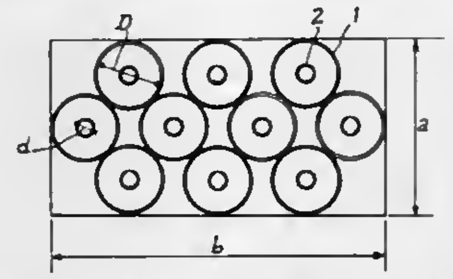
1. A heat energy storage reservoir for use in a temperature control system for a building, the reservoir comprising: a tank intended to contain a fluid and including a cover; a plurality of upright baffles disposed in spaced, generally parallel positions and formed by a plurality of sheets suspended in upright positions in the reservoir, each baffle extending from the bottom of the tank to a position above the intended level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can flow generally horizontally in the form of a column, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path; a plurality of suspension elements extending between each said sheet and said cover; and means securing a lower marginal portion of each sheet to a bottom surface of the reservoir.

4,103,707
DEVICE FOR DISPERSING EXHAUST GASES

Gilbert Blu, Paris, and Flavien Lazarre, Pau, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jul. 27, 1976, Ser. No. 709,227
Claims priority, application France, Jul. 31, 1975, 75 23892
Int. Cl.² F16K *19/00*
U.S. Cl. 137—604 **2 Claims**

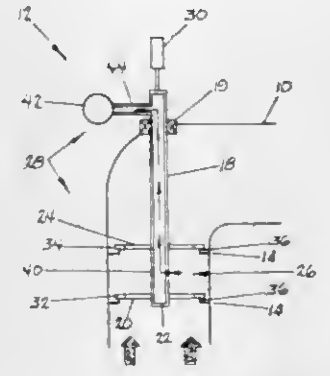
1. A device for dispersing a gas into the atmosphere at an optimum rate from a chamber of finite volume to be evacuated and not supplied with gas during evacuation but without exceeding a predetermined gas to air ratio, said device comprising at least one mixing duct open at its two ends and a gas injector coaxial with the mixing duct and extending into said mixing duct from a tube for supplying gas at high pressure, said supply tube leading to said chamber containing the gas to be evacuated at an initial high pressure, the ratio between the square roots of the smallest sections of the duct and the injector lying between 30 and 300, and pressure regulating means for delivering said gas to the injector at a maximum delivery pressure of between 4 and 10 bars, said delivery pressure being between said initial high pressure in the chamber and the pressure in the mixing duct.



4,103,708
VENTILATED POPPET DAMPER

Robert G. Huntington, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 22, 1976, Ser. No. 744,195
Int. Cl.² F16K *1/00*
U.S. Cl. 137—614.11 **18 Claims**



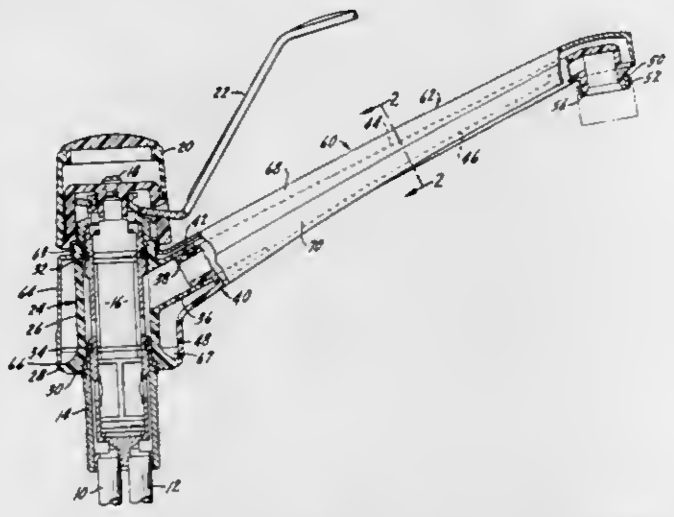
1. A ventilated poppet damper assembly for selectively opening and closing the gas stream passageway through a gas conveying conduit, the ventilated damper assembly comprising:

- a first peripheral sealing seat disposed within the conduit;
- a second peripheral sealing seat disposed within the conduit and spaced from the first peripheral sealing seat;
- a hollow close-ended activating rod coaxially disposed within the conduit and mounted for axial movement therein;
- a first damper plate coaxially disposed with the hollow rod and attached thereto proximate one of the rod ends for movement with the rod between an open position spaced from the first peripheral sealing seat and a closed position engaging the first peripheral sealing seat;
- a second damper plate coaxially disposed with the hollow rod, spaced from the first damper plate, and attached to the hollow rod for movement therewith between an open position spaced from the second peripheral sealing seat and a closed position engaging the second peripheral sealing seat;
- the first and second damper plates cooperating, in the closed position, to define a transverse chamber;
- means for axially moving the rod and, therefore, the first and second damper plates as a unit with the rod between the open and closed positions; and,
- means for ventilating the transverse chamber through the hollow rod.

4,103,709
SPOUT TUBE ASSEMBLY

Frank S. Fischer, Lorain, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Sep. 13, 1976, Ser. No. 722,661
Int. Cl.² E03C *1/04*
U.S. Cl. 137—615 **8 Claims**



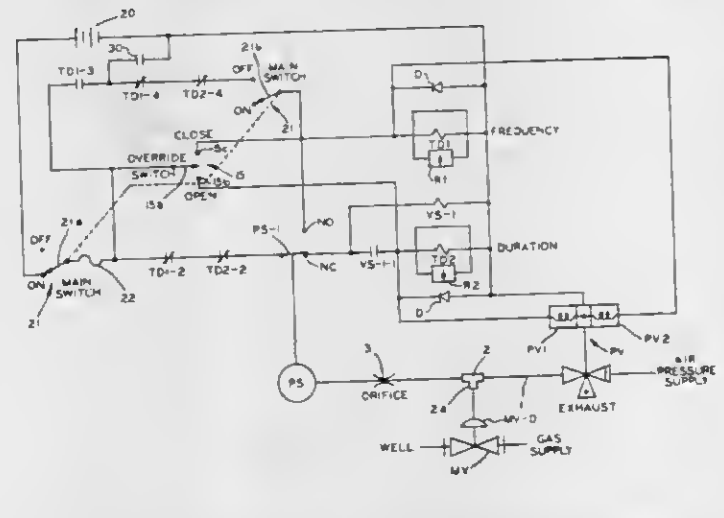
1. A faucet spout including a non-metallic hub having a lower outwardly extending integral flange and an integral tubular spout projection in communication with the interior of said hub, valve means positioned within said hub, a spout cover having a metallic outer surface, said spout cover having a body portion surrounding said hub and extending adjacent but slightly spaced from said hub flange, a spout portion integral with said spout cover and extending outwardly therefrom, a spout tube positioned within said spout portion and terminating in a discharge opening adjacent one end thereof, said spout tube being telescopically engaged with said spout projection,

- said spout cover portion being in the form of a shell, having sides, a top and an open bottom, said spout tube having a tubular section integral with a wall portion, which wall portion forms a bottom closure for said shell,
- spaced support members integral with and extending outwardly from said flange for support at one end of said cover body portion, and a ring attached to said hub and bearing against the opposite end of said cover body portion, said hub and spout covers being pivotally movable, as a unit, about said valve means.

4,103,710
TIME CYCLE CONTROLLER FOR PNEUMATIC VALVE

Sidney James Labit, Kenner, and Robert Edwin Furmaga, New Orleans, both of La., assignors to Baker International Corporation, Orange, Calif.

Filed Sep. 12, 1977, Ser. No. 832,720
Int. Cl.² F16K *31/42*
U.S. Cl. 137—624.13 **10 Claims**

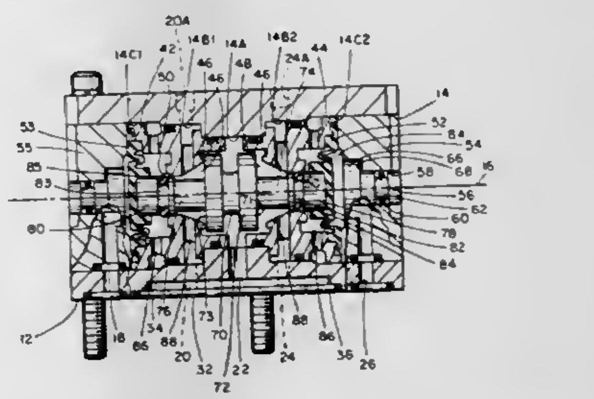


1. A controller for providing timed cycles of operation of a main valve actuated from a source of fluid pressure, comprising: a source of electric power; an electrically actuated pilot valve connected between the fluid pressure source and the main valve, said pilot valve being responsive to first and second electric pulses respectively for moving said pilot valve to its open and closed positions; relay means responsive to said first and second electrical pulses respectively for maintaining a first plurality of relay contacts in their energized positions for a first predetermined time period and a second plurality of relay contacts in their energized positions for a second predetermined time period; a single pole pressure switch movable between two contacts in response to the application of the fluid pressure to the main valve; and means connecting a pair of normally closed contacts of each of said first and second pluralities of relay contacts in series between said power source and the single pole of said pressure switch and connecting said two pressure switch contacts to said relay means and said pilot valve whereby said first electrical pulses are generated when said normally closed contacts are closed and said pressure switch is moved to one of said two contacts and said second electrical pulses are generated when said normally closed contacts are closed and said pressure switch is moved to the other one of said two contacts, said first predetermined time period determining the duration of the opening of said pilot valve and said second pre-determined time period determining the frequency of generation of said first and second electrical pulses and the opening of said pilot valve.

4,103,711
FLUID LOGIC FLIP-FLOP

Paul Arvio, Bryan, Ohio, assignor to The Aro Corporation, Bryan, Ohio

Filed Feb. 3, 1977, Ser. No. 765,372
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.66 **9 Claims**



1. An improved flip-flop fluid logic device comprising, in combination:

- a body having a through bore with a centerline axis, a plurality of passages through the body and connected to the bore, said passages including at least the following in serial order along the axis: first inlet passage, first exhaust passage, first outlet passage, supply inlet passage, second outlet passage, second exhaust passage, and second inlet passage;
- first and second identical inserts positioned in fixed opposed relation in said bore, said first insert defining an internal fluid passage along the axis between the first exhaust passage, the first outlet passage, and the supply inlet passage and including an exhaust valve seat intermediate the first exhaust passage and first outlet passage and also including a supply valve seat intermediate the first outlet and the supply inlet passage, said second insert similarly positioned with respect to said second exhaust passage, second outlet passage and supply inlet passage;
- a composite valve positioned intermediate the inserts, said valve comprising four valve members, one for cooperation with each seat of the two inserts, said valve members being rigidly connected and spaced from one another to

seat one pair of said valve members against the supply valve seat of the first insert and the exhaust valve seat of the second insert or to seat the remaining pair of said valve seat members against the supply valve seat of the second insert and the exhaust valve seat of the first inserts, said valve members for engaging the exhaust valve seat including ring seal means for engaging the respective exhaust valve seats, said valve members for engaging the supply valve seats being substantially a planar surface;

first fluid pressure responsive means intermediate the first inlet passage and first exhaust passage, said first fluid pressure responsive means being mechanically connected with the composite valve to displace said valve along the axis in response to fluid pressure through the first inlet passage, said first fluid pressure means having an effective surface area greater than the effective surface area of the valve member associated with the supply valve seat of the second insert;

second fluid pressure responsive means intermediate the second inlet passage and the second exhaust passage, said second fluid pressure responsive means being mechanically connected with the composite valve to displace said valve along the axis in response to fluid pressure through said second supply inlet, said second fluid pressure means having an effective surface area greater than the effective surface area of the valve member associated with the supply valve seat of the first insert; and

means for sealing the opposite ends of the bore and providing a chamber for fluid pressure to effect operation of the fluid pressure responsive means in response to fluid pressure through the first or second supply inlet.

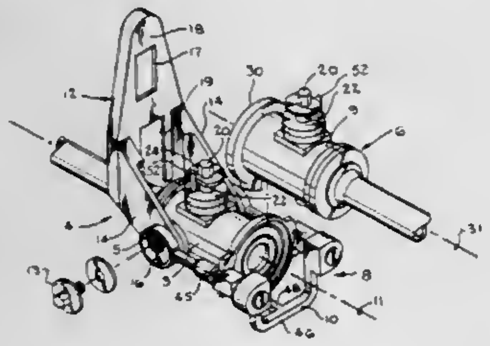
4,103,712
POSITIVE ISOLATION DISCONNECT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Morley V. Friedell, Stevensville, Mont.

Filed Dec. 15, 1976, Ser. No. 750,792

Int. Cl.² F16L *29/00*

U.S. Cl. 137—637.05 **3 Claims**



1. A positive isolation quick-disconnect comprising:

(a) A pair of axially separable valve housing members having through-bores communicating when said housings are coupled at an interface to form a passage therethrough, wherein the coupled ends of said housings are radially outwardly flanged and spaced away from said interface, and wherein one of said housings is provided with a pair of radially outwardly extending coaxial, fixed stub shafts;

(b) a poppet valve axially slidable within each of said housings and disposed in coaxial, end-to-end relationship with their abuting ends capable of forming a fluid-tight interface;

(c) a valve seat in each of said housings for sealingly engaging said valves at said interface;

(d) an operating stem engaging each of said valves for controlling the positions of said valves, said stems extending through said housings for external manipulation of said valves through their open and closed positions;

(e) clamping means for selectively connecting and disconnecting said housings, said clamping means comprising (1) a pair of cross-linked pivot legs disposed on opposite sides of said one housing, each said pivot leg having a cylindrical boss with an eccentric opening therethrough for receiving one of said housing stub shafts extending radially therethrough, said eccentric openings being coaxial with one another and said pivot legs being cross linked for common rotation, and (2) a generally U-shaped clamping yoke having a pair of generally parallel arms each with one free end and a crossarm joining the other ends of said parallel arms, said free ends being provided with a pair of opposed, transverse coaxial cylindrical openings for receiving said cylindrical bosses of said pivot legs in rotatable relationship, said parallel arms being generally disposed to straddle said one housing and parallel to the axis thereof, and said crossarm of said yoke being disposed to matingly engage said end flanges of said other housing, said clamping means having a relaxed position in one rotary position of said pivot legs in which no pulling force is exerted through said yoke and said flanges are separated by a gap, and an engaged position in a second rotary position of said pivot legs in which a pulling force is exerted through said clamping yoke to eliminate said gap and thereby clamp said flanges together in sealing, fluid-flow relationship; and

(f) interlock means between said valve operating stems and said clamping means to permit release of the clamping means only when both of said valves are in the closed position.

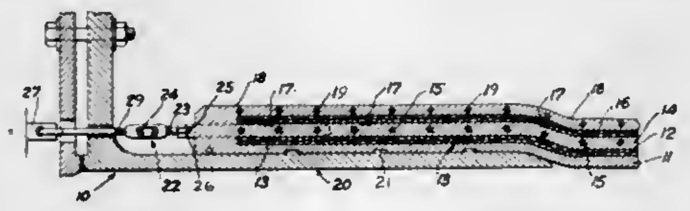
4,103,713
REINFORCED OIL HOSE

Benjamin Haytock, III, Erie, Pa., assignor to Continental Rubber Works, Erie, Pa.

Filed Mar. 24, 1977, Ser. No. 780,711

Int. Cl.² F16L *11/08. 11/12*

U.S. Cl. 138—133 **4 Claims**



1. A reinforced oil hose assembly comprising,

a tubular inner liner of oil-resistant material,

a tubular first ply of reinforcing material made of fabric overlying said inner lining and resting thereon,

a plurality of first metal rings overlying said first ply of reinforcing material,

said first metal rings being spaced along the length of said first ply of reinforcing material and engaging the outside periphery thereof,

a first layer of resilient tubular material overlying said first ply of reinforcing material and said first metal rings,

a first spiral wire embedded in the layer of resilient material and disposed concentric to said inner liner and embedded in said first ply of resilient material,

a second layer of tubular reinforcing material overlying said first ply of resilient material and resting thereon,

a plurality of second metal retaining bands spaced along the length of the said reinforced oil hose and concentric to said second ply of reinforcing material and disposed between said second ply of reinforcing material,

a layer of abrasive resistant material overlying said second ply of reinforcing material and said second retaining bands and a spiral material wound around said tubular member embedded in said abrasive material.

4,103,714
APPARATUS FOR REMOVING FLUES FROM SELVAGE YARN FEEDING DEVICE OF WEAVING LOOM

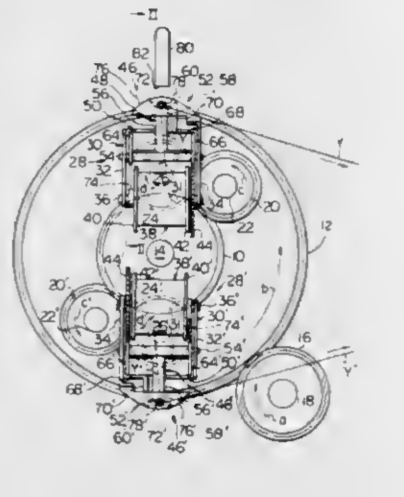
Tetsuzi Hasebe, Koganei, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 30, 1976, Ser. No. 746,111

Claims priority, application Japan, Mar. 29, 1976, 51-36292[U]

Int. Cl.² D03I *1/00*

U.S. Cl. 139—1 C **22 Claims**



1. In a weaving loom having a selvage yarn feeding device including a pair of selvage yarn feeding units rotatable about respective axes concurrently revolvable about a common axis substantially parallel with the respective axes of rotation of said units and each of which has a yarn guide area movable describing a closed-loop composite curve substantially symmetric with respect to said common axis and which has two predetermined angular positions substantially symmetric to each other with respect to said common axis, the selvage yarn feeding units being alternately movable in cycles into a predetermined transitional position in which the yarn guide area of each of the yarn feeding units is at least partially in one of said angular positions, a method of removing fibrous flues from the respective yarn guide areas of said selvage yarn feeding units during operation of the weaving loom, comprising producing signals respectively representative of the cycles in which said selvage yarn feeding units are to be alternately moved into said transitional position, and periodically inducing streams of air through the yarn guide area of each of said yarn feeding units being moved through said transitional position in response to said signals, and each of said streams of air being of a limited duration and having substantially fixed directional relationship to said angular position.

4,103,715
VERSATILE HAND LOOM

Ramsay L. Harris, 1175 W. Baseline Rd., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 661,692, Feb. 26, 1976. This application Nov. 21, 1977, Ser. No. 853,396

Int. Cl.² D03D *29/00*

U.S. Cl. 139—33 **7 Claims**

1. In a hand loom, the combination comprising:

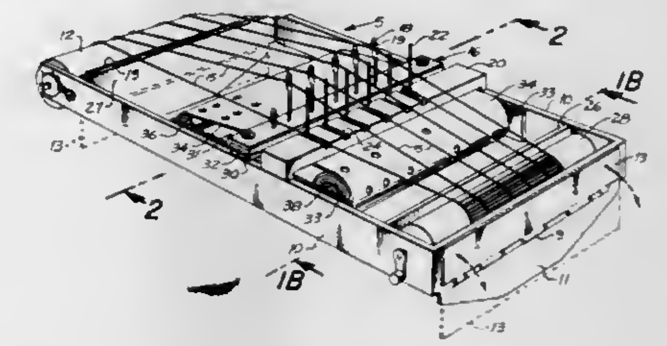
means for uniformly advancing a plurality of warp threads in a first direction;

shuttle means including a shuttle board for free movement of at least one weft thread in reciprocal motion solely by gravitational forces across the path of said warp threads in a transverse direction to the direction of said warp threads advance; and

means for selectively arranging each of said warp threads in an upper or lower position to form a shed through which said shuttle means passes,

said means for selectively arranging each of said warp threads comprising movable warp thread holding means cooperating with means for transporting a pattern member adapted to determine the upper or lower position of each warp thread in conformance with preselected instructions contained upon said pattern member;

said pattern member transport means being adapted to selectively advance in synchronism with said warp threads, move in a direction opposite to the direction of the warp thread advancement, or remain static as said warp threads advance;



said warp thread advancement means and said shuttle means being movable in a vertical plane in a direction away from said pattern transport means to permit ready access thereto.

4,103,716
LENO MOTION DEVICE

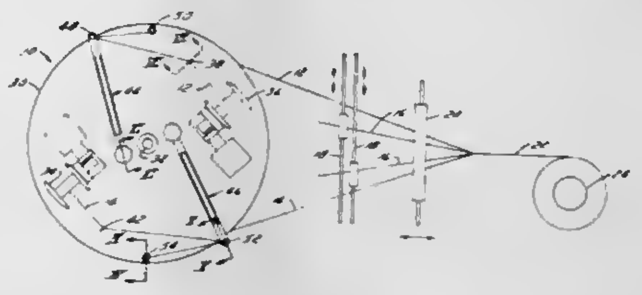
Joseph Rene Cornellier, Knowlton, Canada, assignor to Neretex Corp., Chicago, Ill.

Filed Apr. 11, 1977, Ser. No. 786,596

Claims priority, application Canada, Mar. 15, 1977, 273993

Int. Cl.² D03D *7/00*

U.S. Cl. 139—54 **9 Claims**



1. A device for forming selvage in a weaving apparatus, said device comprising a rotatable plate member, first and second plate guide means associated with said plate member, first and second thread supply means mounted on one side of said plate member, and first and second tensioning members pivotably mounted on said one side of said plate member, each of said first and second tensioning members comprising an elongated arm having at one end thereof guide means through which thread passes from said supply means to an associated plate guide member, the other end of said arm being pivoted on said one side of said plate member such that said thread guide means and said plate guide means are aligned with each other under tensionless conditions, and means for biasing said arm so as to maintain tension on a thread passing from said supply means through said guide means to said plate guide means.

4,103,717
SEAM WEBBING

Gilbert A. Clark, Perth Amboy, N.J., assignor to William Kenyon & Sons, Inc., Perth Amboy, N.J.

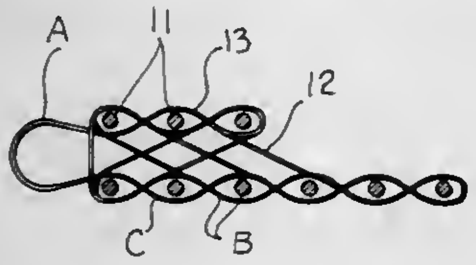
Filed Jun. 18, 1976, Ser. No. 697,338

Int. Cl.² D03D *25/00;* **D21F** *1/12. 7/10*

U.S. Cl. 139—383 A **5 Claims**

1. A woven seam webbing formed from interwoven warp and filling yarns for use in receiving pintle means for joining dryer felts and the like comprising:

- a series of spaced monofilament upright pintle receiving loops carried adjacent an edge of said webbing;
- said monofilament loops being formed in spaced filling yarns; and



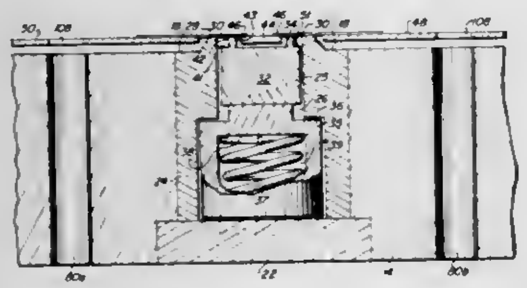
- said webbing adjacent said loops including an upper woven portion extending over only a partial portion of said webbing.

4,103,718
APPARATUS FOR CUTTING AND FORMING FLEXIBLE BEAM LEADS OF AN INTEGRATED CIRCUIT CHIP

Conrad John Steigerwald, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 6, 1977, Ser. No. 839,965
Int. Cl.^{2} B21F *1/00*

U.S. Cl. 140—105 **10 Claims**



1. In combination: die wall means, said die wall means having a planar upper surface and contiguous inner surfaces substantially perpendicular to the upper surface, the inner surfaces of the die wall means forming a die recess, a stop formed in the die wall means, the intersections of the upper surface and the inner surfaces defining continuous die cutting edges lying in a die cutting plane, said die wall means adapted to be mounted on the base plate of a punch press;

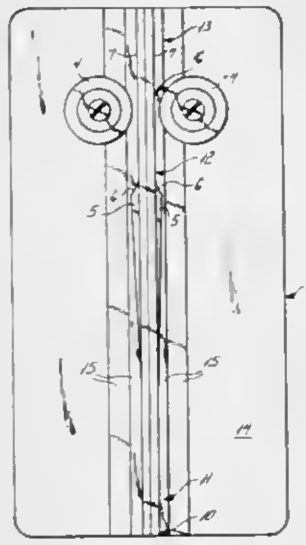
- a forming block reciprocally mounted in the die recess for reciprocal movement therein; said forming block having an upper surface, contiguous outer surfaces, and a forming shoulder; continuous forming edges positioned substantially at the intersections of said outer surfaces and the upper surface, the outer surfaces of the forming block being spaced a predetermined distance from the inner surfaces of the die; said contiguous outer surfaces and the forming shoulder defining a punch receiving space; the upper surface of the forming block lying slightly below the die cutting plane; a recess formed in the upper surface of the forming block adapted to receive a work piece; and a stop shoulder formed on said block;
- means for exerting force on the forming block to force the stop shoulder of the block against the stop formed in the die recess of the die,
- punch wall means, said punch wall means having a planar forming surface, contiguous outer surfaces, and contiguous inner surfaces; the inner and outer surfaces of the punch wall means being substantially perpendicular to the planar forming surface; the inner surfaces forming a punch recess; the intersections of the forming surface and the outer surfaces of the punch wall means forming continuous punch cutting edges; and continuous punch forming edges positioned substantially at the intersections of the bottom surface and the inner surfaces; said punch cutting edges lying in a punch cutting plane; a portion of the punch wall means adapted to fit within the punch receiving space of the die; said punch wall means adapted to be mounted on the top plate of a punch press;
- a pressure pad reciprocally mounted in the punch recess for reciprocal movement therein; and
- means for exerting pressure on the pressure pad to force the pad toward the forming block, said pressure pad normally projecting below the punch cutting plane.

4,103,719
UNIVERSAL LEAD FORMING TOOL FOR DUAL-IN-LINE INTEGRATED CIRCUIT PACKAGES

Wilbur W. Witt, 2517-A Suffolk Ave., High Point, N.C. 27260

Filed Aug. 11, 1977, Ser. No. 823,585
Int. Cl.^{2} B21F *1/02*

U.S. Cl. 140—147 **11 Claims**



1. A hand operated tool for automatically straightening leads on an IC chip prior to insertion in an IC socket, said tool comprising

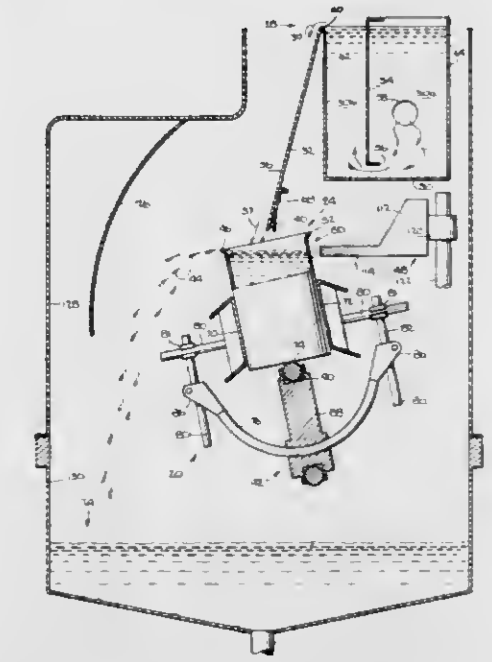
- a forming rail being generally of a rectangular shape having a flat top surface to accomodate the flat bottom surface of the IC chip to facilitate sliding said IC chip along said top surface,
- said forming rail having opposite side surfaces flared outwardly to force the leads on the IC chip outwardly as said chip is slid along said guide rail,
- and roller means located away from opposite sides of said forming rail at distances slightly less than the thickness of said leads to force said leads downwardly against said opposite sides after said leads have been forced outwardly,
- said IC chip being slid off one end of said forming rail with said leads at substantially 90° angles with respect to the plane of said chip and parallel to each other.

4,103,720
METHOD AND APPARATUS FOR FILLING CONTAINERS WITH LIQUID

Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Filed Oct. 21, 1976, Ser. No. 734,667
Int. Cl.^{2} B65B *3/26*

U.S. Cl. 141—1 **46 Claims**



1. A method for filling a container with a material capable of flowing while maintaining the exterior of the container free of the material, the container having an open top portion and a side portion at the exterior thereof adjacent the open top portion, comprising:

- (a) forming a flow of material descending toward a predetermined location, the extent of the descending flow adjacent the predetermined location being exposed;
- (b) placing the container adjacent the predetermined location with the open top portion thereof facing upwardly toward the exposed extent of the descending flow of material and being in the path of flow thereof, the side portion of the container being exposed when the container is placed adjacent the predetermined location; and
- (c) directing at least one stream of fluid toward the exposed side portion of the container adjacent the open top portion thereof as at least a portion of the exposed extent of the descending flow of material flows into the open top portion of the container, the stream of fluid directed toward the exposed side portion of the container being diverted by the exposed side portion to flow about the container and away thereform, the stream of fluid being operative to deflect the exposed extent of the descending flow of material not entering the open top portion of the container away from the side portion at the exterior of the container adjacent the top portion thereof and to urge any material overflowing the container to move laterally away from the open top portion of the container without contacting the exterior of the container.

4,103,721
METHOD AND APPARATUS FOR BOTTLING BEER

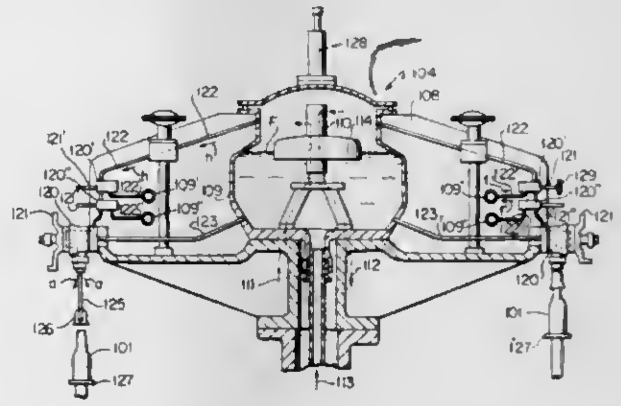
Sadao Noguchi, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,842
Int. Cl.^{2} B65B *31/00;* B67C *3/06*

U.S. Cl. 141—6 **7 Claims**

1. In a method of bottling beer wherein beer is supplied to an empty bottle from a bottling tank containing beer and air under pressure, the improvement comprising:

- leading an empty bottle to a first counter-pressurizing section and thereat pressurizing the interior of said bottle by means of pressurized air fed from a pressurized air source separate from said bottling tank and at a pressure less than the pressure of said air in said bottling tank;
- then leading said bottle to a second counter-pressurizing section and thereat pressurizing said interior of said bottle by means of pressurized air fed from said bottling tank until said interior of said bottle is at the same pressure as said air within said bottling tank; and
- thereafter leading said bottle to a bottling section and thereat supplying beer into said bottle.

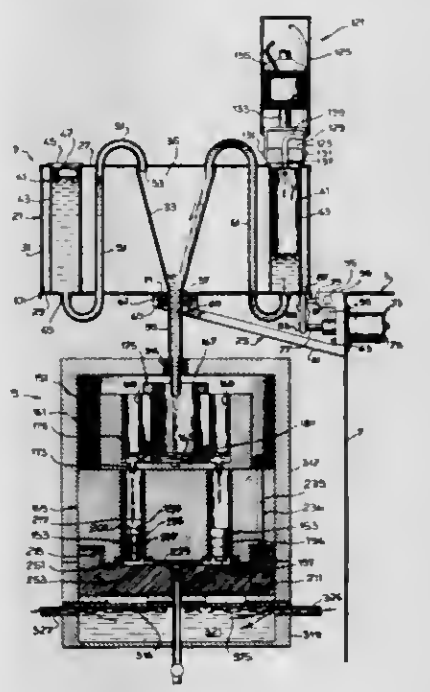


4,103,722
APPARATUS FOR SEQUENTIALLY TREATING ONE OR MORE SPECIMENS OF CELLULAR MATERIAL WITH A PLURALITY OF TREATING LIQUIDS

Max Zollinger, 7589 de Normanville, Montreal, Quebec, Canada

Filed Aug. 23, 1976, Ser. No. 716,780
Int. Cl.^{2} B65B *3/14*

U.S. Cl. 141—70 **7 Claims**



1. Apparatus for use in treating cellular material with a plurality of liquids, comprising:

- (A) a tissue treatment component, comprising:
  - (a) a treating element having a plurality of treating chambers arranged in a circle about a vertical axis, each treating chamber having a liquid inlet at its top and a liquid outlet at its bottom;
  - (b) a mounting base for receiving and supporting said treating element, and having a liquid outlet to which are connected said liquid outlets of all the treating chambers of said treating element;
  - (c) tissue mounting means receivable within said treating chambers, for supporting cellular material to be treated; and

(d) liquid distributing means arranged to distribute liquid to said liquid inlets of said treating chambers, including a distributor element having a main central liquid distributing well and a plurality of secondary liquid distributing wells arranged in a circle about said main well, each of said secondary wells being connected with said main well to receive liquid therefrom, and with a corresponding one of said treating chambers to discharge liquid thereto; and

(B) a liquid supply component arranged to supply liquid to said main well of said distributor element, comprising:

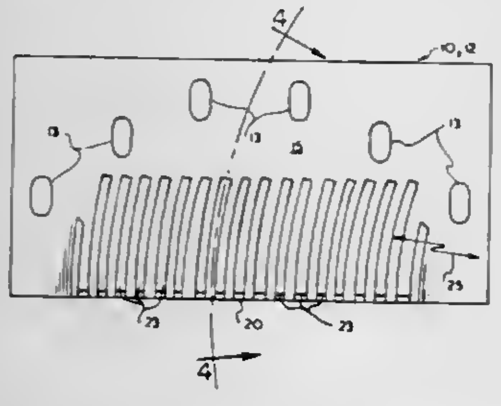
(a) a rotatably mounted liquid holder having a main liquid outlet and a plurality of separate liquid storage chambers arranged in a circle about a vertical axis for carrying a plurality of treating liquids, each of said storage chambers having an inlet in its top and a liquid outlet, and said main liquid outlet being arranged to discharge into said main well of said distributor element; and conduit means connecting said liquid outlets of all of said storage chambers with said main liquid outlet;

(b) storage chamber emptying means operatively associated with said liquid holder, including: a vertically movable head mounted above said circle of liquid storage chambers, said storage chambers being alignable with said head as said liquid holder is rotated; means arranged and operable to move said head downwardly onto the top of a selected one of said storage chambers to tightly close the same and to return said head to an elevated position when desired, said movable head carrying conduit means that is connected with said inlet of the associated storage chamber when said head is moved downwardly to close the top of the chamber; and means operable for introducing compressed air through said conduit means of said vertically movable head into said selected storage chamber while said head is pressed against the top of said chamber, for causing the liquid carried within the selected storage chamber to move into said treating chambers via said main liquid outlet and said liquid distributing means; and

(c) drive means for rotating said liquid holder for selectively positioning said storage chambers under said vertically movable head.

4,103,723
TREE HARVESTING BLADE

William Earl Carmichael, 2592 McBride Crescent, Prince George, British Columbia, Canada (V2M 2A1)
Filed Jul. 5, 1977, Ser. No. 812,606
Int. Cl.^{2} A01G *23/08;* A47J *49/02*
U.S. Cl. 144—34 E **10 Claims**



1. A tree shear blade characterized by:

(a) a web portion having; upper and lower web faces, a datum plane, a lower bevelled face and a cutting edge, the cutting edge being defined by intersection of the lower bevelled face with the upper web face at the datum plane of the web portion,

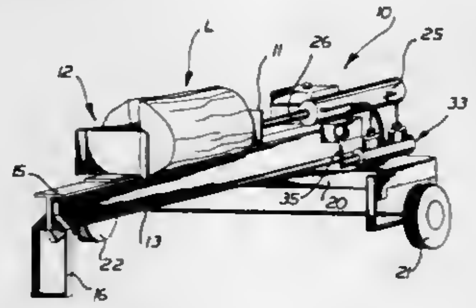
(b) a plurality of similar upper rib portions spaced along the blade and extending upwardly from the upper web face and rearwardly from the cutting edge, each rib portion being generally rectangular in cross-section and having a leading end having an inclined rib leading face extending rearwardly from the cutting edge,

(c) a plurality of similar lower rib portions spaced along the blade and extending downwardly from the lower web face and rearwardly from the lower bevelled face, each lower rib portion being generally rectangular in cross-section and having a leading end having an inclined rib leading face extending rearwardly from and being coplanar with the lower bevelled face, the lower rib portions being generally staggered relative to the upper rib portions along the blade,

each rib portion being adapted to follow sweep of the blade.

4,103,724
LOG SPLITTING MACHINE

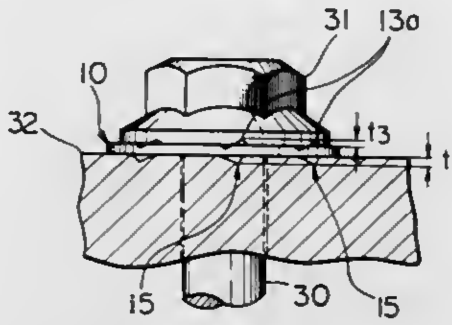
Murray D. Braid, 8126 Middlesex Rd., Mentor, Ohio 44060
Filed Dec. 29, 1976, Ser. No. 755,251
Int. Cl.^{2} B27L *7/00*
U.S. Cl. 144—193 A **4 Claims**



1. A manually movable log splitter for longitudinally splitting a log comprising a support having a horizontally extending surface for supporting the log to be split, a base plate having first and second major surfaces which extend generally parallel, said first major surface being in contact with said horizontally extending surface of said support, a double-angled wedge structure secured to said second major surface and located at one end of said support to engage one end of a log, a ram for engaging the other end of the log, means for adjustably securing said plate to said horizontally extending surface of said support to adjustably position the double-angled wedge structure along said horizontally extending surface of said support, hydraulic means for moving the ram to force the one end of the log against the double-angled wedge structure and cause movement of the log relative thereto, said double-angled wedge structure comprising a pair of plates extending transverse to the direction of movement of the ram, each of said pair of plates having first portions which converge at one angle as they extend toward the one end of the log and second portions which converge at another lesser angle as they extend toward the one end of the log from said first portions, said double-angled wedge structure having a splitting edge which extends transverse to the direction of log movement and which engages the one end of the log to initiate splitting thereof, said second portions having outer surfaces which engage the splitting log to force portions of the log apart, said first portions having outer surfaces which engage the splitting log and increase the splitting action per increment of movement of the ram as compared to the splitting action of said second portions, ground-engaging wheels supporting said support, and means on said support which may be manually gripped for moving said log splitter along the ground, said base plate having a first leading side surface extending generally transversely between said first and second major surfaces, said first leading side surface protruding beyond said double-angled wedge structure and having an angled surface to upwardly cam the log toward the splitting edge of said double-angled wedge structure.

4,103,725
CONICAL SPRING WASHER

Michio Abe, Kasugai, Japan, assignor to Kinoshita Seiki Kabushiki Kaisha, Kyoto, Japan
Filed Oct. 27, 1976, Ser. No. 736,187
Claims priority, application Japan, Oct. 28, 1975, 50-129706
Int. Cl.^{2} F16B *39/24*
U.S. Cl. 151—35 **4 Claims**



1. A truncated conical spring lock-washer for fitting between a fastening device and a material through which said fastening device is fastened, said washer comprising:

a conical spring lock-washer body having upper and lower contacting surfaces, said upper surface being substantially the same size as the underside of said fastening device and contactable thereby and said lower surface contacting said material; and

a plurality of deformable lock pawl means extending downward from said lower contacting surface of said washer toward said material for engaging said material when said fastening device is tightened and for deforming and pushing areas of said pawl means upward to engage against said underside of said fastening device when said device is tightened, whereby said fastening device is engaged and prevented from loosening, each lock pawl means comprised of:

a substantially triangular, inclined V-shaped depression in and extending beneath said lock-washer body having one gradually sloped face in the tightening direction of said fastening device, and a sharply sloped face in the loosening direction of said fastening device.

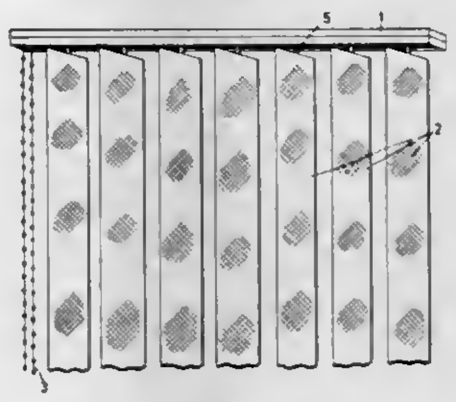
4,103,726
METHOD OF MAKING A TIRE AND SAID TIRE

James D. Wolfe, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 7, 1973, Ser. No. 422,640
Int. Cl.^{2} B60C *1/00*
U.S. Cl. 152—330 R **3 Claims**

1. A tire, including a unitary reinforcing network filled with an elastomer, said network being a reticulated foam plastic.

4,103,727
SLATTED BLINDS

Horst Spohr, Cuxhaven, Fed. Rep. of Germany, assignor to Bautex Adolf Stöver KG., Langen-Sievern, Fed. Rep. of Germany
Filed Nov. 9, 1976, Ser. No. 740,181
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554351; Jun. 23, 1976, 2628162
Int. Cl.^{2} E06B *9/30*
U.S. Cl. 160—168 R **17 Claims**



1. A slatted blind consisting of a support rail, vertically disposed slats which are all rotateable to a limited extent around their longitudinal axes and which are shiftable laterally on said support rail, a guide carriage for each slat, pivot means positioned in said guide carriage, a screw threaded shaft extending through said guide carriages, threaded nuts mounted in said guide carriages and fitted on said shaft, said nuts having inner threads matching the screw threads on the shaft, a bush arranged on the pivot means of each slat, a gear ring formed on the outside of said bush, said nuts also having outer threads for driving said gear rings, said pivot means having friction surfaces and said bush having pressure surfaces resiliently acting on said friction surfaces to form a slip clutch, said bush being provided with a plurality of integral resilient fingers spacedly mounted from the body of said bush so that when said pivot means are inserted to be in operative position the fingers flex inwardly and when operative frictional mating occurs the fingers are released from said inward deflection and operatively bear upon said friction surfaces with said friction surfaces and said resilient fingers being in mating and locked relationship with respect to each other, said fingers having said pressure surfaces which are knurled and said friction surfaces on said pivot means also being knurled with said slip clutch components being operatively engaged only by exertion of frictional forces.

4,103,728
MEMBRANE MOUNTING SYSTEM FOR WINDOWS

Robert E. Burdette, 2032 Verde Ave., Akron, Ohio 44314, and Aubrey M. Fuller, 5832 Spikerman Dr., Clinton, Ohio 44216
Filed May 6, 1977, Ser. No. 794,470
Int. Cl.^{2} E06B *3/00*
U.S. Cl. 160—368 R **7 Claims**

1. A system for mounting a thin, flexible membrane over the interior of a window having a peripherally disposed angular frame mounted in a plane comprising:

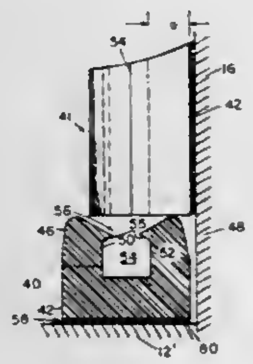
an elongate, narrow retainer molding extensible along a substantial portion of said frame for defining an angular geometric shape generally corresponding to the window frame, said retainer molding including a narrow base portion having a flat, outwardly disposed connecting surface for positioning adjacent said frame;

first and second elongate side components formed integrally with and extending from said base portion and having mutually inwardly disposed opposed side surfaces spaced to define an elongate central groove having a width *b*, the top surface of each said first and second side component being configured to slope toward said groove at an acute angle with respect to said connecting surface to define a concave self-aligning receiving region;

said first and second side component top surfaces further being configured to extend a given distance over each said side surface to define detent means;

means for connecting said retainer molding to said frame such that said flat base portion connecting surface abuts against the surface of said frame;

resilient beading means having a circular cross-section of diameter corresponding to the width *b* of said groove for positioning over a peripheral portion of said membrane and subsequent insertion thereof into said groove and whereby extraction from said groove is arrested by said detent means; and



said first and second side components are configured having substantially equivalent thicknesses with each other and with said flat base, the angular geometric shape defined by the frame and the molding including at least three angles and the molding defining the geometric shape being formed by at least three separate pieces, the receiving region of one of said pieces having a first orientation with respect to the plane of said frame and the receiving region of both the other pieces being oriented orthogonal to the first named piece;

the pieces being in abutting relationship at the angles and the resilient beading at a constant elevation with respect to the plane of the frame completely around the frame.

4,103,729

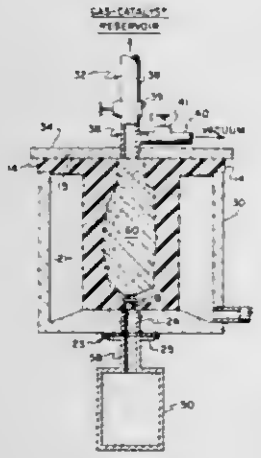
APPARATUS AND PROCESS FOR CATALYTIC GASSING IN THE MANUFACTURE OF FOUNDRY CORES AND MOLDS, AND THE LIKE

Andrew P. Dunlop, Riverside, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 611,913, Sep. 10, 1975, Pat. No. 4,068,703. This application Mar. 7, 1977, Ser. No. 775,157

Int. Cl.² B22C ***1/20***

U.S. Cl. 164—12 **2 Claims**



1. The method of shaping and hardening masses of catalyst-hardenable binder-coated porous particulate material with a gas catalyst in an apparatus comprising shaping means including a shaping cavity, gassing means for introducing a gas catalyst into interstitial void space in the particulate mass residing within such shaping cavity, whereby said gas catalyst is introduced into said shaping cavity at a first portion thereof, and aftervoid chamber means connected directly to said shaping cavity at a second portion thereof which is opposite said first portion of said shaping cavity, said aftervoid chamber means including a dead-end chamber of sufficient volume for gas catalyst which is introduced at said first portion to pass at least through the entirety of the interstitial voids within said shaping cavity, and means for disconnecting and connecting said shaping means to said gassing means and said aftervoid chamber means, the method comprising:

1. reducing the gas pressure in the apparatus which includes a first of said shaping means having a first mass of said catalyst-hardenable binder-coated particulate material packed therein;
2. introducing a gas catalyst into the apparatus sufficiently for at least a portion of said gas catalyst to pass through the shaping cavity and into the aftervoid chamber means;
3. disconnecting and removing the first shaping means from the apparatus, and replacing it with a second shaping means having a second mass of catalyst-hardenable binder-coated particulate material packed therein, wherein a respective first portion thereof is hermetically joined to said gassing means, and a respective second portion thereof is hermetically joined to said aftervoid chamber means;
4. reducing the gas pressure within said apparatus by withdrawing at least the interstitial gas in the shaping means outwardly through said respective first portion, whereby catalyst gas which was in excess and had entered the aftervoid chamber means during the preceding gassing step is drawn into the shaping cavity and catalyst gas is drawn into intimate contact with at least a portion of said second mass of catalyst-hardenable binder-coated porous particulate material residing in said second shaping chamber means, and
5. introducing fresh gas catalyst into the shaping cavity through said first portion thereof sufficiently for at least some of the newly introduced catalyst gas to pass through the shaping cavity and into said aftervoid chamber means.

4,103,730

PROCESS FOR ELECTROMAGNETIC STIRRING

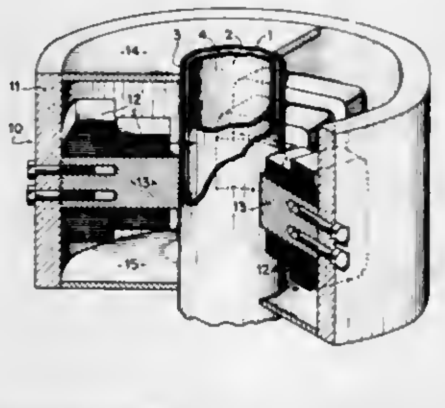
Bernard Emile André Dussart, Denain, France, assignor to Union Siderurgique du Nord et de l'Est de la France, Paris, France

Continuation of Ser. No. 593,959, Jul. 8, 1975, abandoned. This application Dec. 7, 1976, Ser. No. 748,301

Claims priority, application France, Jul. 22, 1974, 74 25315

Int. Cl.² B22D ***27/02***

U.S. Cl. 164—49 **4 Claims**



1. A continuous-casting process for liquid metal comprising the steps of:

pouring liquid metal into a stationary continuous-casting mold having a copper wall of about 10 to 20mm thickness;

producing a rotating electromagnetic induction field in the mold and in the metal having an intensity between 500 and 2000 Gauss and exciting the electromagnetic induction field with an alternating current having a frequency less than 10 Hz thereby minimizing eddy currents in the mold and attenuating field damping;

rotating the electromagnetic induction field about an axis substantially parallel to a longitudinal axis of the mold to rotate liquid metal relative to the solidified peripheral portion at a frequency between a synchronism frequency, defined as the frequency at which the induction field and the liquid metal have the same rotational speed, and twice the synchronism frequency;

thereby scraping inclusions and porosities from the solidified peripheral portion by relative movement between the liquid metal and the solidified peripheral portion and moving the inclusions and porosities toward the center of the liquid metal by the effect of the centrifugal force exerted on the metal which is much more dense than the inclusion and porosities so that an improved surface structure results.

4,103,731

SHAKE-OUT MACHINE FOR USE WITH SELF-CURING MOLD

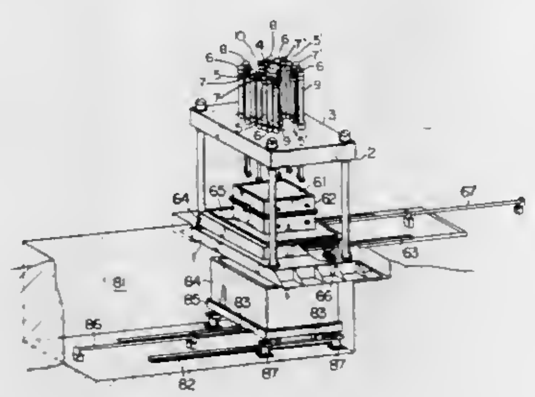
Shunichi Aoki, and Eiji Maeda, both of Shimizu, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1977, Ser. No. 767,889

Claims priority, application Japan, Feb. 18, 1976, 51-57812; Feb. 18, 1976, 51-17203[U]; Feb. 27, 1976, 51-21611[U]; Apr. 23, 1976, 51-50061[U]

Int. Cl.² B22D ***29/00***

U.S. Cl. 164—147 **11 Claims**



1. A shake-out machine for use with a self-curing mold, the shake-out machine comprising:

a body member provided with a bridge-shaped frame, a plurality of hydraulic cylinder means disposed on the top of a ceiling portion of said frame;

a downwardly directed plunger provided at each hydraulic cylinder means;

mold feeding means operatively associated with the body member and including a wheeled panel having an opening, said wheeled panel being movably mounted on rails laid on a floor so as to transport a mold under said plungers, said wheeled panel acting as a supporting mount for a molding flask during a shake-out operation;

a dropped material delivery means operatively associated with the body member and including a wheeled panel, said last-mentioned wheeled panel being movably mounted on rails laid on a bottom portion of a pit provided in the floor, and a delivery box mounted on said last-mentioned wheeled panel; and

means operatively connected with said hydraulic cylinder means for operating said hydraulic cylinder means independently of each other such that desired plungers in said hydraulic cylinder means may be lowered in dependence upon a size of a molding flask.

4,103,732

DEVICE FOR THE DELIVERY AND UNIFORM DISTRIBUTION OF LUBRICANTS

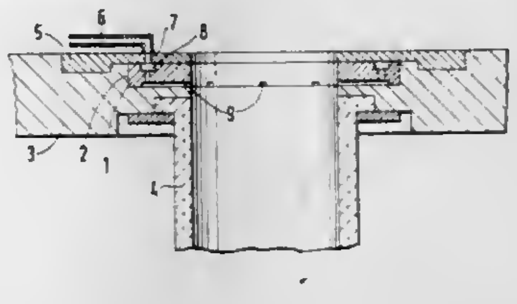
Dietrich Habert, Eschweiler, Fed. Rep. of Germany, assignor to ARBED, Aciéries Réunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg and Eschweiler Bergwerks-Verein AG, Herzogenrath-Kohlscheid, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,387

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609075

Int. Cl.² B22D ***11/00***

U.S. Cl. 164—147 **4 Claims**



1. A continuous casting apparatus comprising mold means defining a substantially cylindrical mold cavity, a device for the delivery and uniform distribution of lubricants to the inside wall of said mold cavity, said mold means comprising an upper portion, annular chamber means in said upper mold portion, lubricant distributor ring means rotatably located in said chamber means, circular groove means in said distributor ring means, holding means rotatably holding said distributor ring means in said annular chamber means, lubricant supply means operatively connected to said holding means for supplying lubricant into said circular groove means, and lubricant conduit means operatively located for feeding lubricant into said mold cavity from said circular groove means.

4,103,733

MANUFACTURE OF FOUNDRY CORES AND MOULDS

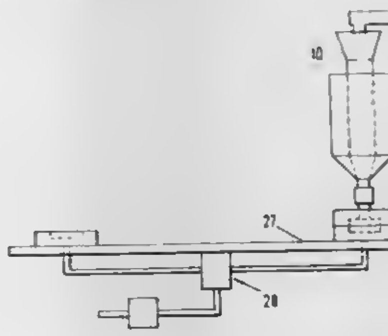
Albert Edwards, Ailsworth, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed May 3, 1976, Ser. No. 682,469

Claims priority, application United Kingdom, May 1, 1975, 18257/75

Int. Cl.² B22C ***9/12, 15/22, 15/28***

U.S. Cl. 164—160 **7 Claims**

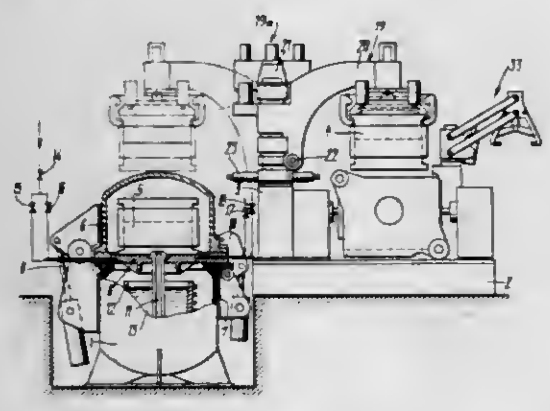


1. Apparatus for preparing foundry molds or cores from a cold setting sand based molding mixture comprising an indexing table having a plurality of locations thereon for mold or core boxes, a suction system positioned beneath said table and having a plurality of branches movable with said table upon indexing movement thereof and operatively connected to the respective ones of said plurality of locations, and suction valve means in said suction system for conditioning said suction system to constantly apply suction to boxes positioned at said locations on said table as said table is indexed through a plurality of work stations.

4,103,734
COUNTERPRESSURE CASTING ARRANGEMENT

Evgeny Emelyanovich Mikotin, ulitsa Tereshkovoi, 8a, kv. 61, Odessa; Mikhail Konstantinovich Trifsik, ulitsa Nikolaeva, 21a, kv. 8, Smolensk; Igor Stepanovich Vavilov, ulitsa Chkalova, 119, kv. 11, Odessa; Jury Danilovich Mangubi, ulitsa Krasnogvardeiskaya, 13, kv. 47, Smnlensk; Boris Andreevich Timofeev, ulitsa B. Khmelnitskogo, 36, kv. 44, Odessa; Anatoly Filippovich Timofeev, ulitsa Tvardovskogo, 8, kv. 9, Smolensk; Yakov Mikhailovich Ryvkis, ulitsa Garibaldi, 14, kv. 26, Odessa; Mark Moiseevich Aizenkaid, ulitsa Lomonosova, 1/74, kv. 39, Smolensk; Nikolai Vasilievich Samusenkov, ulitsa Leningradskaya, 1, kv. 3, Odessa; Alexandr Ivanovich Ermolaev, ulitsa Lenina, 75b, kv. 38, Chernigov; Anatoly Andreevich Zuev, Tiraspolskoe shosse, 21, kv. 121, Odessa; Vladimir Alexandrovich Antonov, ulitsa Karla Libknekhta, 142, kv. 11, Tiraspol; Evgeny Efremovich Kosogov, ulitsa Dyatkovskaya, 32, Bryansk; Stanislav Andreevich Aldakushin, ulitsa Dekhoti, 23/17, kv. 76, Dushanbe; Viktor Gavrilovich Yanin, ulitsa Perekopskoi divizii, 12/7, kv. 10, Odessa; Vitaly Ivanovich Mazurik, prospekt Shevchenko, 6, korpus 1, kv. 6, Odessa; Ivan Nikiforovich Teslya, ulitsa Chkalova, 40, kv. 16, Odessa; Savely Leonidovich Burakov, Treugolny pereulok, 13, kv. 23, Odessa; Petr Petrovich Soloviev, ulitsa Nikolaeva, 42, kv. 59, Smolensk, and Rostislav Lukyanovich Soezhnoi, ulitsa Bogdana Khmelnitskogo, 34/36, kv. 42, Odessa, all of U.S.S.R.

Filed May 12, 1977, Ser. No. 796,079
Int. Cl.^{2} B22D *27/10*
U.S. Cl. 164—309 11 Claims



1. A counterpressure casting arrangement, comprising: a pouring device; a partition plate dividing said pouring device into a top chamber and a bottom chamber, a body of said top chamber and said partition plate being turnably mounted with respect to a body of said bottom chamber; a vessel for melt accommodated in said bottom chamber; a split casting die accommodated in said top chamber; a pipe interconnecting said vessel and said split casting die; a die-casting machine disposed outside the body of said top chamber and acting as a device for assembly and disassembly of the die and for removing castings from said die; a device for reiterated introduction and withdrawal of the dies arranged in said die-casting machine; a transporting device, on which said device for reiterated introudction and withdrawal of the die is mounted, to carry the dies from said die-casting machine to said partition plate and back to the machine; a stationary spindle about which the body of said top chamber turns to permit movement of said transporting device.

4,103,735
HEAT EXCHANGER

Albert Woodrow Warner, Rte. 100, Lowell, Vt. 05847
Filed Sep. 7, 1976, Ser. No. 720,684
Int. Cl.^{2} B60H *1/18*; F24H *3/02*
U.S. Cl. 165—39 7 Claims

1. A heat exchanger, for use with a heating plant or like device having a hot-combustion-products or exhaust-products duct, comprising:

an elongate housing;

said housing having an exhaust-products inlet means and an exhaust-products outlet means at one end thereof, for coupling of said means, interpositionally, intermediate the length of an exhaust-products duct of such a heating plant or device, to cause said housing to be supported, in cantilevered fashion, only at said one end by said exhaust-products duct;

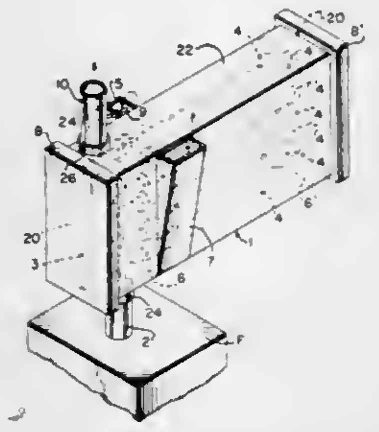
first conduit means, within said housing, opening onto said inlet means for directing exhaust-products from said one end of said housing to the end opposite;

second conduit means, within said housing, opening onto said outlet means for directing exhaust-products from said opposite end to said one end;

means disposed at said opposite end of said housing communicating said first and second conduit means for transferring exhaust-products therebetween;

means for forcing air into heat-exchanging contact with said conduit means to cause such air to be warmed; wherein,

said air-forcing means comprises an air inlet means and an air outlet means formed in said housing at said one end, and passageways formed in said housing for moving air through said housing from said air inlet means and to said air outlet means in flow directions which are counter-current to exhaust-products flow directions therethrough;



said first and second conduit means are vertically stacked to provide maximum contact between said conduit means and the air;

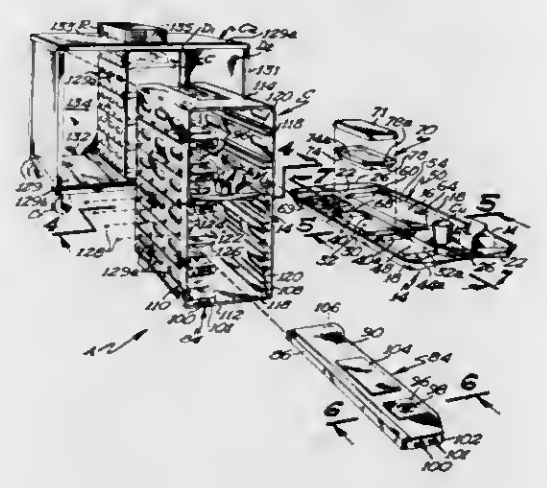
said air inlet means has a triangular cross-section with a maximum cross-sectional area thereof being fixed adjacent to the uppermost portion of said vertically stacked second conduit means, and a minimum cross-sectional area thereof being fixed adjacent to the lowermost portion of said vertically stacked second conduit means, to cause said air inlet means to proportion air intake equally across said second conduit means; and

said air outlet has a triangular cross-section with a maximum cross-sectional area thereof being fixed adjacent to the uppermost portion of said vertically stacked first conduit means, and a minimum cross-sectional area thereof being fixed adjacent to the lowermost portion of said vertically stacked first conduit means, to cause said air outlet means to proportion air discharge equally across said first conduit means.

4,103,736
APPARATUS FOR HEATING A FOOD ITEM WHILE RETAINING ITS MOISTURE AND NUTRITIONAL COMPONENTS

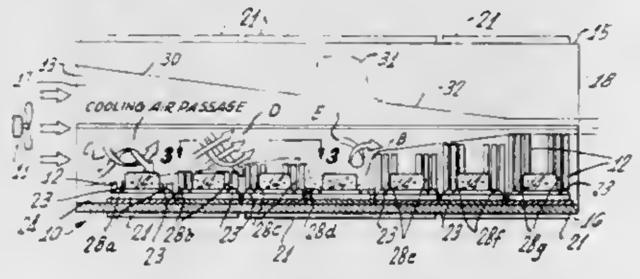
Albert E. Colato, St. Paul, and Jerome L. Formo, Roseville, both of Minn., assignors to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 510,746, Sep. 30, 1974, Pat. No. 4,005,745. This application Aug. 2, 1976, Ser. No. 710,697
Int. Cl.^{2} F25B *13/00*
U.S. Cl. 165—48 R 5 Claims

1. Apparatus for heating a food item while retaining in said food item its moisture and nutritional components comprising a food item container having a bottom and side walls and being open at the top, a removable top cover on the container, an enclosure for the container, heat energizing means within the enclosure which contacts the container bottom to heat said food item in said container, and container side wall and cover cooling means connected with the enclosure for cooling the container side walls and container cover when the food item in the container is being heated.



4,103,737
HEAT EXCHANGER STRUCTURE FOR ELECTRONIC APPARATUS

Calvin C. Perkins, Simi Valley, Calif., assignor to Marantz Company, Inc., Chatsworth, Calif.
Filed Dec. 16, 1976, Ser. No. 751,156
Int. Cl.^{2} F28F *13/08*
U.S. Cl. 165—80 12 Claims



1. An electronic apparatus comprising:

a chassis having two parallel walls with opposing internal surfaces and two open ends forming an entrance and exit;

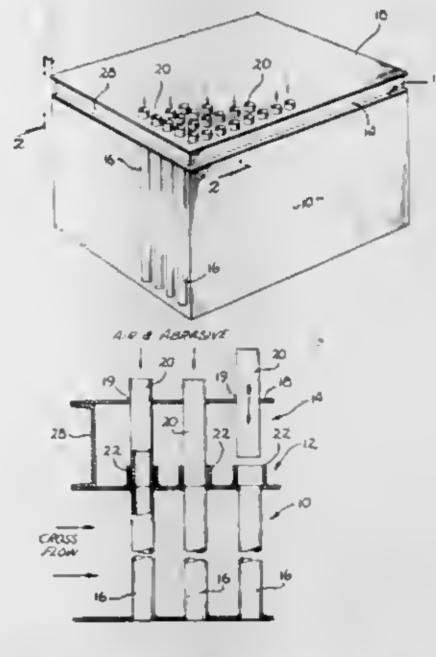
a plurality of heat exchangers each formed of a single metal sheet of uniform thickness, having a base overlying one of said walls and a plurality of parallel, elongated fingers of uniform length extending away from said one wall and normal to said base; and

a plurality of electrically interconnected circuit elements, including at least one power transistor, each said element being mounted on said base of one of said heat exchangers and surrounded by said fingers of said heat exchanger;

said fingers of different heat exchangers being of different lengths and being arranged according to a predetermined pattern to define between them a passage for cooling air extending from said entrance to said exit, said passage comprising a first vortical portion adjacent said entrance having an effective cross-sectional area that decreases with increasing distance from said entrance, a diffuser portion in which said passage is of maximum effective cross-sectional area centered between said entrance and said exit, and a second vortical portion adjacent said exit in which said passage is of minimum effective cross-sectional area, the effective cross-sectional area of said second vortical portion decreasing with decreasing distance from said exit.

4,103,738
REPLACEABLE INLET MEANS FOR HEAT EXCHANGER

Max M. Aydelott, West Covina; Richard L. Hartman, Hacienda Heights, and James A. York, Glendale, all of Calif., assignors to Smith Engineering Company, South El Monte, Calif.
Filed Aug. 16, 1976, Ser. No. 714,377
Int. Cl.^{2} F28F *19/06, 9/02*
U.S. Cl. 165—178 4 Claims



1. In a heat exchanger having inlet means for accepting hot inlet fluids containing an abrasive, said heat exchanger including a plurality of elongated tubes of predetermined diameter and having its open ends disposed at a tube plate, the improvement comprising:

a bulkhead secured to said tube plate including a perforated upper plate;

a plurality of replaceable tubes, corresponding in number to the heat exchanger tubes, slidably positioned in said bulkhead upper plate and extending therethrough, each of said replaceable tubes having a length at least five times its diameter, the diameter of said replaceable tubes being substantially equal to the diameter of said heat exchanger tubes;

means cooperating with said replaceable tubes for positioning said replaceable tubes in said bulkhead for axial alignment with said heat exchanger tubes;

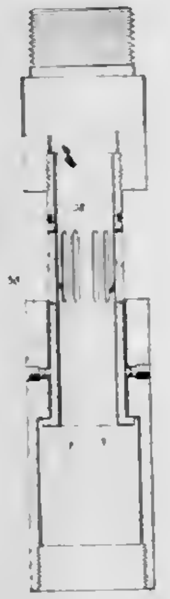
whereby said replaceable tubes are in substantially abutting relationship with said heat exchanger tubes.

4,103,739
SAND RELEASE APPARATUS FOR A PUMP

L. D. Hall, P.O. Box 264, Hull, Tex. 77564
Filed Sep. 3, 1976, Ser. No. 720,246
Int. Cl.^{2} E21B *43/00*
U.S. Cl. 166—105 8 Claims

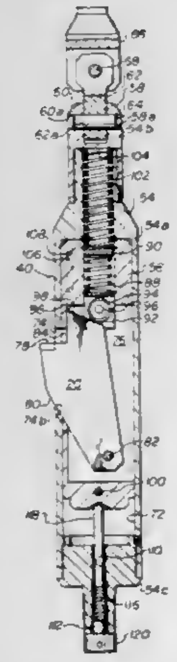
1. An improvement in an oil well pump which pump is typically installed in a well for lifting liquid to the surface which liquid carries with it sand and which pump is exposed to sand locking between the pump and the tubing string in which it is installed, the improvement comprising first and second tubular sleeves which are telescoped together to be incorporated in the body of the pump and forming an elongate tubular extension thereof, said tubular sleeves being joined by a means which is operable only on exceeding an axial pull beyond a specified level which relatively axially separates the sleeves, one of the sleeves being affixed to the upper portions of the pump and the other of the sleeves being affixed to the lower portions of the pump and which sleeves are in a closed telescoping arrangement prior to pulling and which pull apart to an extended telescoping arangement, and a set of drain opening

means on the inner sleeve which opening means are exposed upon extending telescoping movement to thereby drain sand around the exterior of the pump through the opening means to the interior of the pump and downwardly through the lower portions thereof and wherein said lower sleeve closes said drain opening means by encircling said upper sleeve and including a seal means above said drain opening means for sealing against flow through said drain opening means prior to extension by telescoping movement.



4,103,740
WELL TOOL WITH A PAWL

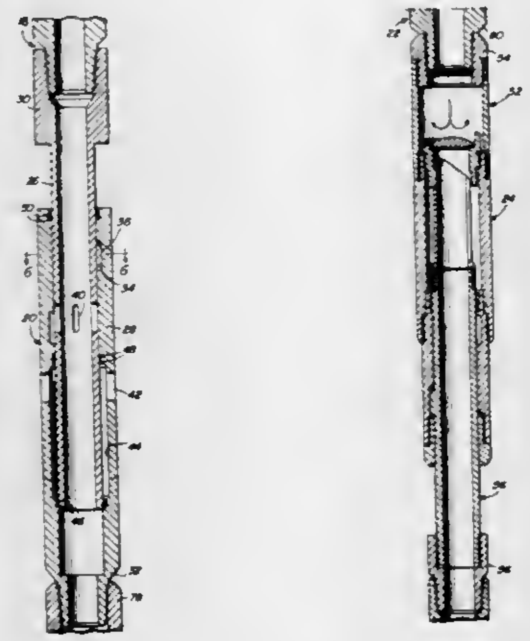
John H. Yonker, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Filed Jun. 2, 1977, Ser. No. 802,732
Int. Cl.² E21B ***7/06***
U.S. Cl. 166—117.5 **12 Claims**



1. In combination:
a well tool comprising:
  body means,
  carrier means carried by said body means and movable with respect to said body means between a first position and a second position,
  pawl means carried by said carrier means and when said carrier means is in its first position being movable between a position projecting laterally beyond said body means and a retracted position with respect to said body means and when said carrier means is in its second position being maintained in a retracted position with respect to said body means,
  means for resiliently urging said carrier means towards its second position,
  means for releasably holding said carrier means in its first position,
  means for resiliently biasing said pawl means towards its position projecting laterally beyond said body means, and
  said body means including aperture means for providing access to said carrier means; and
redressing tool means cooperable with said body means and adapted for extending through said aperture means for engaging said carrier means and for moving said carrier means to its first position;
one of said redressing tool means and said body means including mechanical advantage means for overcoming the force of said resiliently urging means.

4,103,741
OIL WELL PERFORATION TESTING DEVICE

Milton L. Daigle, Houma, La., assignor to Tool Masters, Inc., Houma, La., a part interest
Filed Jun. 1, 1977, Ser. No. 802,481
Int. Cl.² E21B ***33/124***
U.S. Cl. 166—147 **11 Claims**



1. A perforation wash tool including an elongated tubular assembly defining a longitudinal main passage therethrough, longitudinally spaced opposing packer means carried by and extending about the exterior of said tubular assembly intermediate the opposite ends thereof, said tubular assembly including a continuously open bypass passage extending therealong independent of said main passage and opening, at its opposite ends, to the exterior of said assembly on the remote sides of said packer means, said assembly further including continuously open perforation wash fluid passage means communicating the interior of said central passage with the exterior of said assembly intermediate said packer means, said main passage extending the full length of said wash tool, being longitudinally straight and unobstructed and opening centrally outwardly of the opposite ends of said tubular assembly, said bypass being defined by a generally annular passage extending longitudinally of said tubular assembly disposed about said main passage inwardly of the exterior of said tubular assembly, said wash tool including a central tubular body having a threaded bore formed therethrough including opposite end threaded counterbores, loosely telescopingly engaged inner and outer tubular mandrils threaded into said bores and counterbores, respectively, at each end of said body, tubular end subs threaded onto

the remote ends of said outer mandrils and into which the remote ends of said inner mandrils are rotatably and telescopingly sealingly received, said packer means being carried by said outer mandrils, said central body including a flow passage therethrough, outwardly of said threaded bore, communicating the annular areas defined between said inner and outer mandrils, said subs including lateral openings therein opening into said annular areas, said flow passage, annular areas and lateral openings defining said bypass passage, and said wash fluid passage means including lateral ports in said central body opening into said threaded bore and outwardly of the exterior of said central body independent of said flow passage.

4,103,742
METHOD FOR ACIDIZING SUBTERRANEAN FORMATIONS

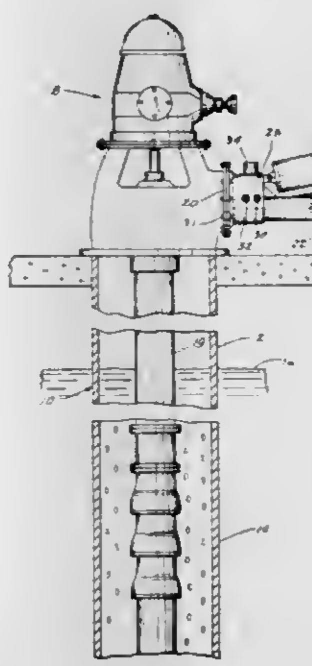
Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 24, 1975, Ser. No. 643,983
Int. Cl.² E21B ***43/27***
U.S. Cl. 166—282 **31 Claims**

9. A method for acid treating a porous subterranean formation susceptible of attack by an acid and penetrated by a well bore, which method comprises:
injecting into said formation via said well bore a gelled acidic composition comprising
water;
a water-thickening amount of a water-dispersible copolymer of acrylamide or methacrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide or methacrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water;
an amount of an acid which is capable of, and sufficient for, reacting with a significant amount of the acid-soluble components of said formation;
a small but effective amount of a mixture of at least two water-dispersible aldehydes which is sufficient to cause gelation of an aqueous dispersion of said polymer, said acid, and said aldehydes;
said polymer, said acid, and said aldehydes, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation; and
maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to react significantly with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,103,743
METHOD AND MEANS OF TREATING WATER WELLS

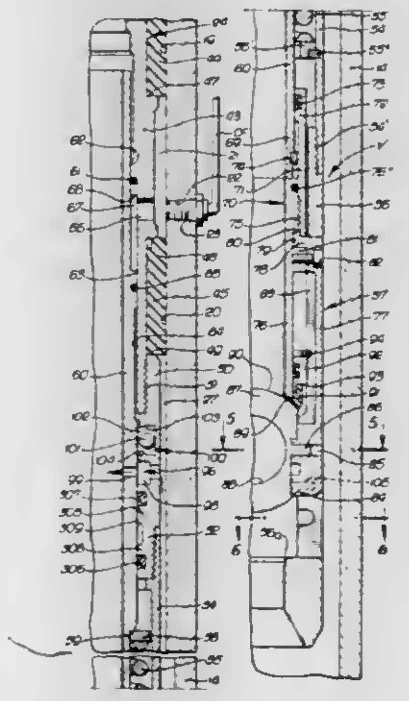
Dwaine M. Paul, Amarillo, Tex., assignor to Thomas L. Moran, Amarillo, Tex., a part interest
Filed Oct. 29, 1976, Ser. No. 736,693
Int. Cl.² E21B ***37/00, 43/24, 43/27***
U.S. Cl. 166—299 **6 Claims**

1. The method of treating water wells having a column pipe positioned within a perforated casing and a pump apparatus at the upper end thereof, comprising the steps of:
placing a liquid chemical in the column pipe,
sealing the upper end of the column pipe,
injecting compressed air into the upper end of the column pipe,
injecting a combustible mixture of gas and air into the upper end of the column pipe,
and igniting the gas-air mixture whereby the pressure combustion will force a portion of the water and liquid chemical in the column pipe and casing outwardly through the perforations in the casing into the water bearing formation around said casing.



4,103,744
SAFETY VALVE AND BALL TYPE EQUALIZING VALVE

Neil H. Akkerman, New Orleans, La., assignor to Baker International Corporation, Orange, Calif.
Filed Aug. 4, 1977, Ser. No. 821,656
Int. Cl.² E21B ***43/12***
U.S. Cl. 166—324 **35 Claims**



1. In a subsurface shutoff valve for wells adapted to be supported in a well fluid production pipe: a tubular body having a flow passage therethrough; shutoff valve means including a valve member shiftable between a first position closing said passage and a second position at which said passage is open; actuator means for shifting said valve member between said positions, including a piston sleeve in said body; said piston sleeve and said body defining a control fluid pressure chamber therebetween for moving said piston sleeve longitudinally in said body in one direction in response to the pressure of control fluid in said chamber; equalizing valve means for equalizing well fluid across said valve member upon control fluid responsive movement of said piston sleeve; said equalizing valve

means including by-pass port means in said piston sleeve and by-pass port means in said body, axially spaced shoulders on one of said piston sleeve and said body defining a circumferentially extended groove communicating with one of said port means, and ball means loosely disposed in said groove to seat in the other of said port means responsive to well fluid pressure; one of said shoulders wiping said ball means from said other of said port means upon control fluid responsive movement of said piston sleeve to allow communication between said port means; means for moving said valve member to said second position from said first position upon further control fluid responsive movement, of said piston sleeve following equalization of well fluid across said valve member; means for effecting return movement of said piston sleeve upon reduction of said control fluid pressure; and means for moving said valve member to said first position from said second position upon return movement of said piston sleeve.

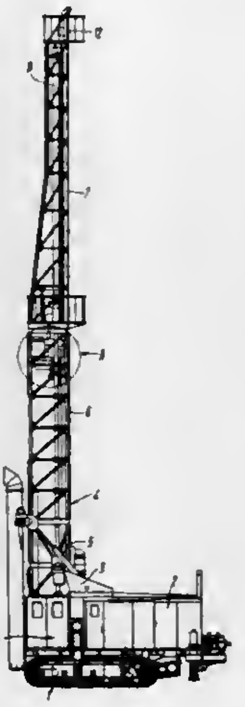
28. In a valve assembly: a pair of relatively longitudinally shiftable cylindrical members; radial port means in each of said members, one of said members having an annular groove defined between axially spaced opposed shoulders and communicating with the port means thereof; a plurality of balls loosely disposed in said groove; and means for relatively shifting said members longitudinally from a first position at which said balls close said port means of the other of said cylindrical members to a second position at which one of said shoulders pushes said balls from the last mentioned port means and fluid can flow through said port means and said groove.

4,103,745
PORTABLE DRILLING MACHINE

Mikhail Sidorovich Varich, ulitsa Mosfilmovskaya, 25, kv. 58; Vladimir Konstantinovich Grigoriev, 1 Streletsky pereulok, 3, kv. 24, both of Moscow; Viktor Dmitrievich Chugunov, Solnechnogorsky raion, Povarovo, poselok 2, 4, kv. 13, Moskovskaya oblast; Alexei Pavlovich Dmitriev, ulitsa Udaltsova, 16, kv. 63, Moscow; Boris Nikolaevich Kutuzov, Sirenevy bulvar, 43, kv. 42, Moscow; Rudolf Genrikhovich Shmidt, 2 Spasonalivkovsky pereulok, 16, kv. 91, Moscow; Isaak Emmanuilovich Narinsky, Khimki, ulitsa Leningradskaya, 16, kv. 40; Alexandr Adolfovich Vukkert, Solnechnogorsky raion, Povarovo, poselok 2, 12, kv. 51, both of Moskovskaya oblast; Yakov Isaakovich Shnapir, 3 Pryadilnaya ulitsa, 7, kv. 111, Moscow; Viktor Alexeevich Soldatov, Solnechnogorsky raion, Povarovo, poselok 2, 7, kv. 7; Vladimir Ilich Antoshenkov, Solnechnogorsky raion, poselok Krjukovo, ulitsa Lenina, 29, kv. 59, both of Moskovskaya oblast, all of U.S.S.R.; Pavel Ivanovich Deev, deceased, late of Moskovskaya oblast, U.S.S.R., and by Alexandra Ivanovna Deeva, administratrix, Mytischi, 2 Parkovaya ulitsa, 5, Moskovskaya oblast, U.S.S.R.

Filed Sep. 13, 1976, Ser. No. 722,677
Int. Cl.^{2} B25D *17/14*
U.S. Cl. 173—57 **2 Claims**

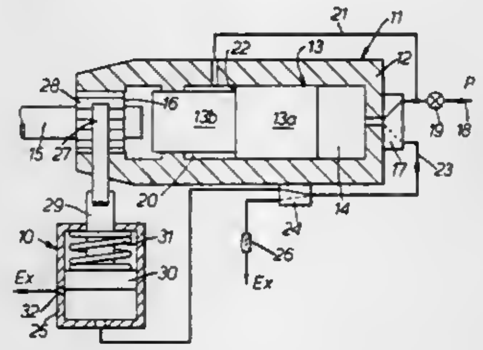
1. A portable drilling machine comprising: a crawler vehicle; a derrick installed on said vehicle and having longitudinal racks; a vertical traverse mechanism mounted on said longitudinal racks; a power-driven rotating jaw chuck for rotating a drill pipe positioned longitudinally in said derrick in alignment with a drilling axis and mounted in said vertical traverse mechanism, said jaw chuck serving as a traverse mounted in said vertical traverse mechanism, during a drilling operation said chuck grips said drill pipe and during an idle run, when said chuck is unclenched, said chuck and said verticle traverse mechanism regrip said drill pipe, which is now being held by a clamp located in a bottom portion of the derrick, said jaw chuck having a body, a hollow spindle on bearings mounted in said body, said drill pipe passing through said spindle, and jaws installed in radial ports of said spindle, said jaws being mounted on a faceplate surrounding said spindle, said chuck being rotated by means of a flexible coupling having an elastic shell connected to a flange rigidly attached to an outlet shaft of a reducing gear of a drive of a means for rotation of said chuck and to a bush connected through a spline to said spindle; a pulldown unit connected by a flexible transmission with said vertical traverse mechanism and said chuck to feed said drill pipe to the bottom of a hole during a working run of said vertical traverse mechanism and said chuck along said longitudinal racks, and to raise said drill pipe during an idle run; additional racks mounted on said derrick; and a swivel moving along said additional racks, being attached to the top of said drill pipe and connecting said hollow drill pipe with means for feeding a scavenging agent for cleaning cuttings from said hole.



4,103,746
ROTARY AND PERCUSSIVE DEVICES

Lionel Arthur Reynolds, Painswick, England, assignor to A. F. Hydraulics Limited, Chequers Bridge, England

Filed Dec. 13, 1976, Ser. No. 750,161
Claims priority, application United Kingdom, Dec. 23, 1975, 52761/75
Int. Cl.^{2} B25D *9/00*
U.S. Cl. 173—107 **9 Claims**

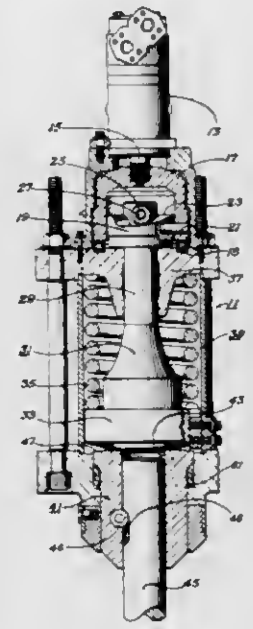


1. A rotary and percussive device comprising means for holding a tool, hydraulic reciprocatory percussive means adapted to impact the tool and having an inlet and an exhaust outlet, said inlet being adapted for connection to a hydraulic pressure supply and the percussive means exhausing through the exhaust outlet at a lower pressure than the supply pressure, and hydraulic rotary drive means adapted to rotate the tool and connected in series hydraulically with said reciprocatory percussive means, said rotary drive means being operated by hydraulic fluid supplied from said exhaust outlet.

4,103,747
BUFFER SPRING FOR AN IMPACT TOOL

James L. Finney, 53 Princeton Arms South, Cranbury, N.J. 08512

Filed Jan. 14, 1977, Ser. No. 759,600
Int. Cl.^{2} B25D *9/00*
U.S. Cl. 173—119 **6 Claims**



1. In an impact tool having a housing, a hammer positioned in the housing for axial movement with respect to the housing, a working tool carried in an axial alignment with the hammer for transmitting energy received from the hammer to a workpiece, and means for reciprocating the hammer, the improvement comprising:

a tool guide carried in the housing, having an axial passage for slidingly receiving the working tool, an anvil for receiving blows from the hammer should the working tool be extended so that its end that contacts the hammer is within the axial passage of the anvil, and reduced and expanded cylindrical wall portions separated by a shoulder that faces away from the hammer; and

an annular metal buffer ring encircling the reduced wall portion between the shoulder and an annular internal ledge in the housing; the buffer ring having an inner convex wall portion and an outer concave wall portion, with a selected clearance being provided between the reduced wall portion and the inner wall portion, for allowing the buffer ring to buckle a selected amount, corresponding to an axial movement of the tool guide caused by the blow, thereby absorbing a portion of the energy;

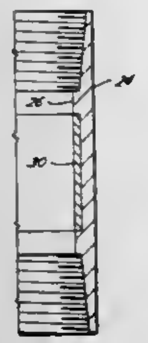
the shoulder being inclined with respect to the axis of the tool, and the buffer ring having a mating inclined surface; the shoulder facing generally the outer concave wall portion to urge the outer edges of the buffer ring against the inner wall of the housing.

4,103,748
METHOD FOR INHIBITING THE WEAR IN A WELL CASING

James F. Arnold, 6440 Hillcroft, Houston, Tex. 77081

Filed Dec. 10, 1976, Ser. No. 748,889
Int. Cl.^{2} E21B *7/04*
U.S. Cl. 175—61 **10 Claims**

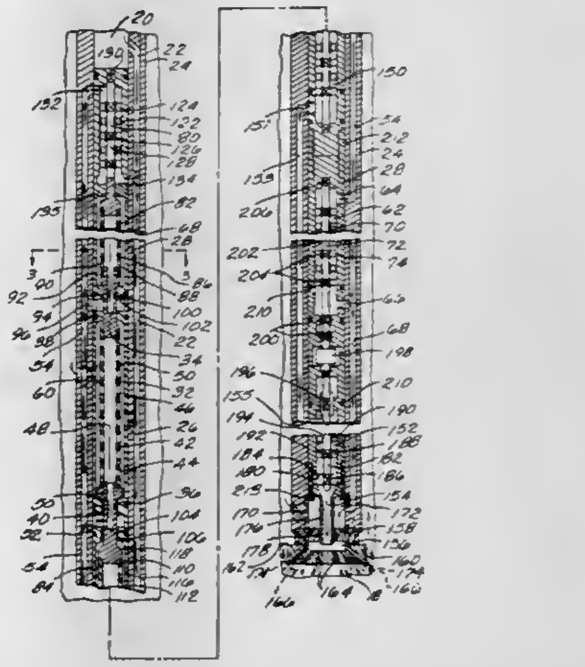
3. A method for inhibiting the wear in a well casing, comprising determining the depths within a bore hole of a well where a drill string may contact the well casing, running the casing into the bore hole with one or more hardened wear sections positioned within the casing for ultimate landing at the depths where the drill string may contact the casing and selecting the wear sections for installation in the well casing to have substantially the same internal diameter as the remainder of the well casing.



4,103,749
DOWNHOLE CLEANER ASSEMBLY FOR PETROLEUM WELLS

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Huntington Park, Calif.

Continuation-in-part of Ser. No. 746,408, Dec. 1, 1976. This application Feb. 2, 1977, Ser. No. 764,824
Int. Cl.^{2} E21B *3/12*
U.S. Cl. 175—70 **22 Claims**



1. A downhole cleaner assembly for a petroleum well comprising:

(a) an elongated housing adapted for receipt in a bore hole of the petroleum well at the base of a drill string;
(b) means for delivering drilling mud to the interior of the housing;
(c) passage means in the housing dividing the drilling mud into a first fluid stream and a second fluid stream, the second stream being delivered to a drilling zone at the base of the bore hole;
(d) cleaner means in the housing for at least partly removing solids from the first stream of the drilling mud and forming a cleansed liquid stream and an exhaust liquid stream containing solids from the drilling mud;
(e) drive means in the housing to drive the cleaner means;
(f) passage means to discharge the exhaust liquid stream containing solids from the drilling mud into an annulus between the housing and the wall of the bore hole to combine with drilling mud there that passed from the drilling zone; and

(g) means for doing useful work with the stream of cleansed liquid in the bore hole.

18. A method for cleaning drilling mud downhole in a petroleum well and doing useful work with a cleansed stream generated by the cleaning comprising the steps of:
- delivering drilling mud containing liquid and solid materials down a conduit in a well bore
- separating at least a portion of the liquid and solid materials in the well bore into a first cleansed liquid stream having relatively low concentration of solid materials and a second liquid stream having a relatively high concentration of solid materials;
- working with at least a portion of the first liquid; and
- combining the first and second liquid streams in the bore hole annulus surrounding the conduit.

4,103,750

METHOD OF AND CIRCUIT FOR FORMING SIGNALS FOR DAMPING CONTROL OF AN ELECTRICAL MEASURED-VALUE INDICATOR

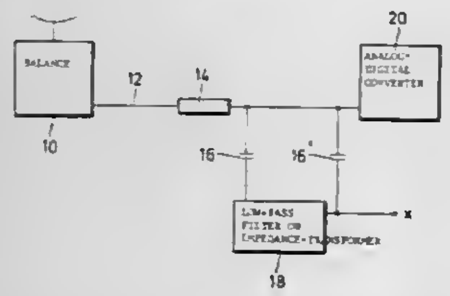
Franz Josef Melcher, Ellierode, and Christian Oldendorf, Gottingen, both of Fed. Rep. of Germany, assignors to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH), Gottingen, Fed. Rep. of Germany

Filed Jan. 12, 1977, Ser. No. 758,852

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601150

Int. Cl.² G01G *23/10*

U.S. Cl. 177—1 **15 Claims**



1. In a method for producing signals for monitoring the resting or equilibrium position of an electromagnetic precision balance which includes a branch for coupling out a.c. voltages and an active filter or impedance transformer, at the output of which a.c. voltages in a noise range having different frequencies appear, the improvement comprising integrating the a.c. voltages coupled out in respectively equal time intervals to provide at least two integrals, and determining the difference between two of said integrals following one another as a measurement for monitoring the rest or equilibrium position of the balance.

4,103,751

CHECK WEIGHING APPARATUS FOR ARTICLES

Alan Moss, Penketh, Nr. Warrington, England, assignor to Golden Wonder Limited, England

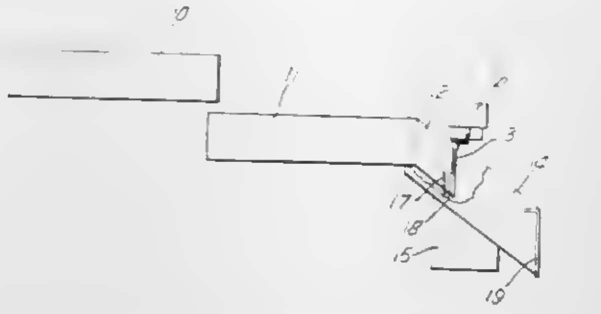
Filed Feb. 17, 1977, Ser. No. 769,383

Claims priority, application United Kingdom, Feb. 19, 1976, 6518/76

Int. Cl.² G01G *13/02, 13/24*

U.S. Cl. 177—122 **13 Claims**

1. Check-weighing apparatus comprising,
- (a) a conveyor,
- (b) receptacle means for receiving articles from said conveyor,
- (c) a first gate in the receptacle means for providing an exit for articles from said receptacle means,
- (d) a weighing device comprising a weighing pan and means responsive to the weight in said weighing pan, the weighing pan being located beneath the exit from the receptacle means to receive articles therefrom,
- (e) means for releasing articles from the weighing pan,
- (f) first control means, responsive to the attainment of a predetermined weight of articles on the weighing pan, for releasing the predetermined weight of articles from the weighing pan and for halting the feed of articles to the receptacle means from the conveyor,
- (g) second control means for controlling the feed of articles from the conveyor into the receptacle means until a required quantity of articles is attained which is less than the predetermined weight of articles to be weighed by the weighing device, for, responsive to said required quantity being attained, opening the first gate and releasing the required quantity of articles into the weighing pan and for thereafter permitting the conveyor to feed through the receptacle means to top up the articles on the weighing pan to the predetermined weight.



4,103,752

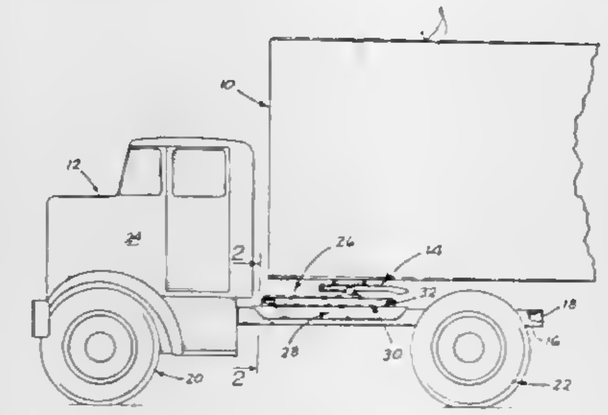
FIFTH WHEEL SCALE APPARATUS

Kenneth J. Schmidt, Thurston, Oreg., assignor to General Trailer Company, Inc., Springfield, Oreg.

Filed Jan. 10, 1977, Ser. No. 758,008

Int. Cl.² G01G *19/10*

U.S. Cl. 177—141 **9 Claims**



1. Weighing apparatus adapted for operative interposition between a fifth wheel assembly and a vehicle frame, said apparatus comprising
- a mounting subframe adapted for attachment to a vehicle frame,
- a rockable subframe pivoted on said mounting subframe and adapted for carrying a fifth wheel assembly,
- an expandible-contractible device mounted on said mounting subframe for engagement and disengagement with said rockable subframe, said device, when disengaged from said rockable subframe, being inflatable to engage the same, thereby to cause rocking of said rockable subframe to a condition wherein at least a portion of any load borne by such a subframe is transmitted through said device, and
- means operatively connected to said device for producing an indication of the magnitude of any such transmitted load portion.

4,103,753

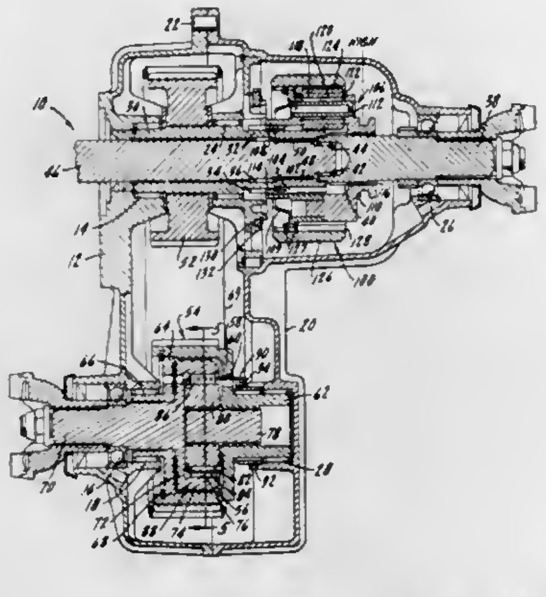
MANUALLY SHIFTABLE PLANETARY GEARSET

John William Holdeman, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 621,194, Oct. 9, 1975, abandoned. This application Jan. 25, 1977, Ser. No. 762,371

Int. Cl.² F16H *3/44;* B60K *17/34*

U.S. Cl. 180—49 **17 Claims**



1. In power transmission apparatus especially adapted for driving a motor vehicle having front and rear ground engaging wheels, said apparatus including a rotary input member adapted for connection to a source of power and rotary output means adapted for connection to said ground engaging wheels, said rotary output means including a pair of spaced primary rotary members coupled to each other for synchronous rotation and providing a driving connection for one of said wheels, and an auxiliary rotary member providing a driving connection for the other of said wheels, said auxiliary member being coupled to one of said primary members by a clutch arranged to permit overrunning of said auxiliary member with respect to said one primary member and to prevent overrunning of said one primary member with respect to said auxiliary member, and means arranged for transmission of power between said rotary input member and said rotary output means selectively in a plurality of drive conditions; the improvement wherein said power transmission means comprises a planetary gear assembly including an input sun gear in engagement with said rotary input member, and a sub-assembly including an output carrier, a ring gear, and a plurality of planet gears in meshing relationship with said sun and ring gears, said sub-assembly being slidable relative to said sun gear to a first position wherein said carrier is in engagement with said sun gear and said rotary output means and wherein said ring gear is not grounded, and to a second position wherein said carrier is not in engagement with said sun gear and is in engagement with said rotary output means and wherein said ring gear is grounded.

4,103,754

PROTECTION OF OCCUPANTS OF A VEHICLE

Roger Anderton Ashworth, Carlisle; John Michael Pollitt, Gretna, and Graham Colin White, Bellinge, all of England, assignors to Kangol Magnet Limited, London, England

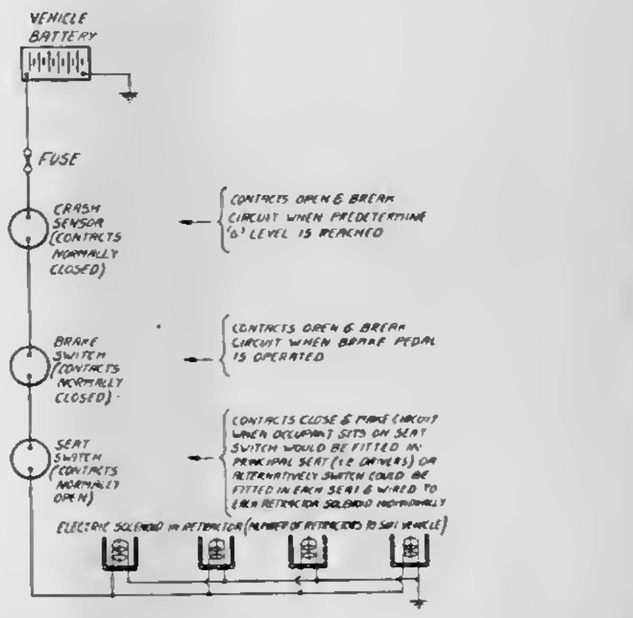
Filed Sep. 10, 1976, Ser. No. 722,263

Claims priority, application United Kingdom, Sep. 10, 1975, 37268/75

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **2 Claims**

1. A system for protection of occupants of a vehicle having braking means, a driver's seat, and at least one passenger seat, said system comprising:
- a plurality of seat belt means each associated with a respective seat and each comprising a seat belt, a seat belt retractor from which the seat belt can be withdrawn for use by the occupant of the seat, lock means operable to prevent withdrawal of the belt from the retractor, biasing means urging said lock means to the operative condition, and solenoid means responsive to the supply thereto of an electric power supply to hold said lock means inoperable against said biasing means,
- means connecting said plurality of solenoid means in parallel,
- first switch means having switch contacts, means responsive to vehicle deceleration to cause circuit breaking opening of said contacts, and means holding said contacts closed in the absence of said deceleration,
- second switch means having switch contacts, means responsive to operation of said vehicle braking means to cause circuit breaking opening of the last-named contacts, and means holding the last-named contacts closed in the absence of said braking means operation,
- third switch means having switch contacts, means responsive to occupation of said driver's seat to close the last-named contacts, and means holding the last-named contacts open when said driver's seat is unoccupied,
- electrical power supply means,
- and means connecting said first, second and third switch means in series with said parallel-connected solenoid means.


VEHICLE BATTERY
FUSE
CRASH SENSOR (CONTACTS NORMALLY CLOSED)
CONTACTS OPEN & BREAK CIRCUIT WHEN PREDETERMINED 'G' LEVEL IS REACHED
BRAKE SWITCH (CONTACTS NORMALLY CLOSED)
CONTACTS OPEN & BREAK CIRCUIT WHEN BRAKE PEDAL IS OPERATED
SEAT SWITCH (CONTACTS NORMALLY OPEN)
CONTACTS CLOSE & MAKE CIRCUIT WHEN OCCUPANT SITS ON SEAT SWITCH WOULD BE FITTED IN PRINCIPAL SEAT (I.E DRIVERS) OR ALTERNATIVELY SWITCH COULD BE FITTED IN EACH SEAT & WIRED TO EACH RETRACTOR SOLENOID INDIVIDUALLY
ELECTRIC SOLENOID IN RETRACTOR (NUMBER OF RETRACTORS TO SUIT VEHICLE)

4,103,755

GAS-CUSHION VEHICLES

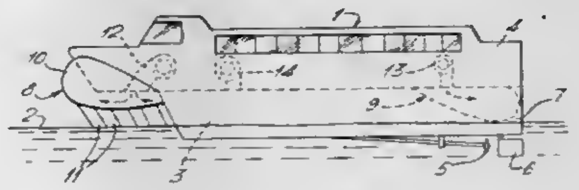
Edward Gunston Tattersall, Southhampton, England, assignor to Hovermarine Transport Limited, Southampton, England

Filed Mar. 28, 1977, Ser. No. 781,815

Claims priority, application United Kingdom, Mar. 29, 1976, 12489/76

Int. Cl.² B60V *1/11*

U.S. Cl. 180—117 **6 Claims**



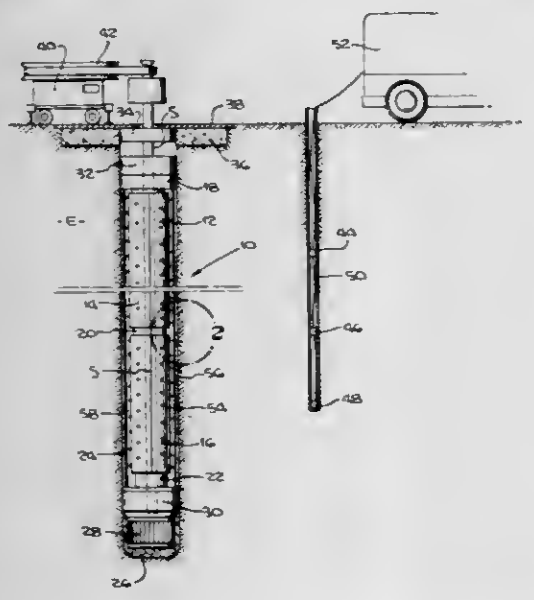
1. A gas-cushion vehicle provided with first and second fan means operable independently of each other, said first fan means being operable so as to supply vehicle support gas to the cushion, and said second fan means being operable so as to be responsive to changes in cushion pressure, whereby said second fan means acts to supply gas to the cushion as cushion

pressure tends to decrease, and to allow excess gas to be released by backflow as cushion pressure tends to increase.

4,103,756
STRESS WAVE GENERATOR

John G. Trulio, Los Angeles, Calif., and Stephan J. Bless, Dayton, Ohio, assignors to Applied Theory, Inc., Los Angeles, Calif.

Filed Dec. 21, 1976, Ser. No. 745,081
Int. Cl.² G01V *1/14*
U.S. Cl. 181—121 **34 Claims**



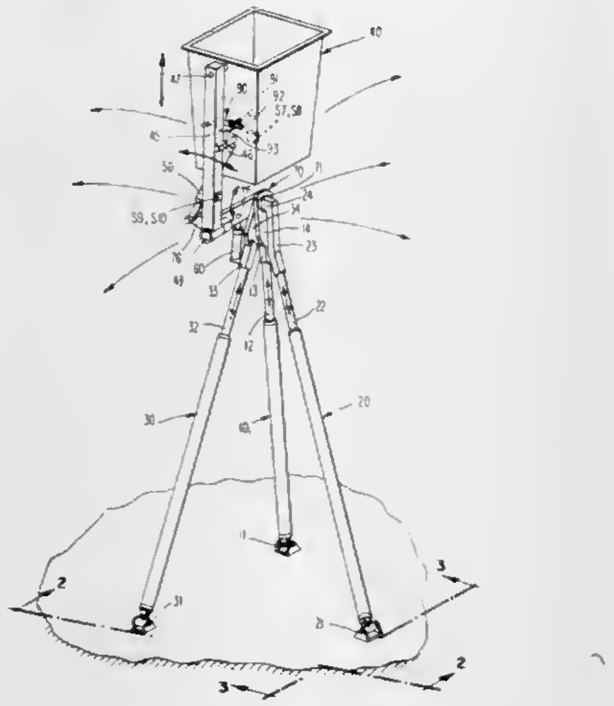
1. Apparatus for generating in situ in a zone of earth surrounding a bore hole longitudinal and shear waves of predetermined relative amplitude, said apparatus comprising a striker having plural individually separable mass elements collectively rotatable at a selected speed within a locus of rotation coaxial with the bore and inward from the bore inner periphery to define a mass element travel space predetermined in relation to said selected rotational speed; means to separate said mass elements from said locus at said selected speed to travel centrifugally outward through said space in timed response to striker rotation and angularly impact said periphery in circularly distributed dragging relation generating longitudinal and shear waves having predetermined relative amplitudes responsive to said relation of travel space, rotational speed, and element areal mass.

4,103,757
TRIPOD AERIAL LIFT

Arthur K. McVaugh, 2009 Old Sumneytown Pike, Harleysville, Pa. 19438

Filed Jun. 30, 1977, Ser. No. 811,730
Int. Cl.² B66F *11/04*
U.S. Cl. 182—2 **16 Claims**

1. An aerial lift apparatus comprising:
a. a man-carrying aerial bucket;
b. a tripod comprising three hydraulic cylinders each having a barrel and an extendable-retractable piston rod;
c. means for mounting the lower ends of the three cylinders for pivotal movement in two planes;
d. a universal vertex connector pin assembly;
e. means at the upper ends of said piston rods for connecting said piston rods to said vertex connector pin assembly;
f. a lateral arm;
g. means for pivotally connecting one end of said lateral arm to said vertex connector pin assembly;
h. a jib boom;
i. means for pivotally connecting the other end of said lateral arm to the lower end of said jib boom;
j. means for pivotally supporting said bucket to the upper end of said jib boom;
k. means for latching said jib boom to said bucket in the vertical plane of said bucket;
l. a hydraulic system including solenoid control valves for each cylinder;

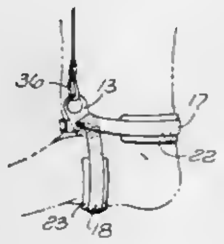


m. an electrical system including manually operable switches for controlling the solenoid valves for selectively and individually controlling the extension and retraction of the piston rods in said three hydraulic cylinders, thereby to control the movement and positioning of the bucket.

4,103,758
SAFETY/TOOL BELT COMBINATION

Lew Himmelrich, P.O. Box 777, San Juan Capistrano, Calif. 92675

Filed Mar. 3, 1977, Ser. No. 773,956
Int. Cl.² A62B *35/00*
U.S. Cl. 182—3 **11 Claims**

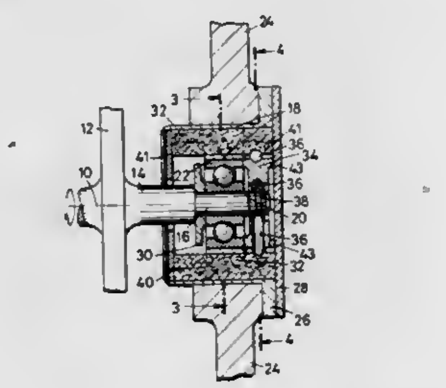


1. A safety belt assembly comprising:
two connecting rings to be received near opposite sides respectively of a user's body;
a first belt connected at spaced locations to said two rings respectively in a relation forming a rear portion of the first belt adapted to extend across the back of a user's waist between said rings, and forming a seat portion of the first belt which can extend downwardly between the two rings to support the user in essentially a sitting position;
a second belt to extend about the back of the user's waist adjacent said first belt and between said rings; and
buckle means for releasably securing opposite ends of said second belt together to retain said assembly about a user's waist;
said second belt having a portion which is received essentially adjacent said first belt between said rings and toward the back of the user's waist when the assembly is in use, but which is free of direct attachment to the adjacent portion of said first belt in a relation enabling a tool carrier to be slipped onto and be carried by said portion of the second belt between said rings; and
said rings containing slits slidably receiving said first belt to enable adjustment of the rings along said first belt and consequent adjustment of the relative lengths of said rear portion and seat portion thereof.

4,103,759
LUBRICATING SYSTEM FOR AN ANTIFRICTION BEARING

Hans Erich, Kiel-Schulensee; Alfred Jordt, Neumühlen-Dietrichsdorf, and Klaus König, Kiel, all of Germany, assignors to Anschutz & Co. G.m.b.H., Germany

Filed Mar. 4, 1977, Ser. No. 774,313
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609736
Int. Cl.² F16N *7/12*
U.S. Cl. 184—64 **7 Claims**

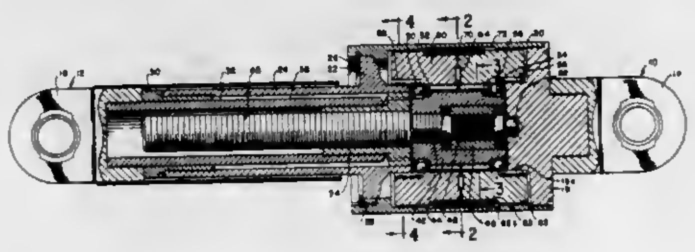


4. The combination comprising a rotary shaft, an inner race ring thereon, an outer race ring surrounding said inner race ring, a set of antifriction elements mounted between said race rings for rolling motion thereon, a supporting member fixed to said outer race ring and provided with at least one cavity, a filling of porous material soaked with a liquid lubricant mounted in said cavity, a wick, means for mounting said wick on said supporting member in contact with said filling and in frictional contact with a cylindrical surface of said shaft located close to one end of said inner race ring, said surface being provided with helical grooves for feeding lubricant from said wick to said inner race ring during relative rotation of said shaft and said supporting member.

4,103,760
MECHANICAL SHOCK ARRESTOR

Elmer Chensheng Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Continuation-in-part of Ser. No. 776,397, Mar. 10, 1977, abandoned. This application Dec. 30, 1977, Ser. No. 866,097
Int. Cl.² F16F *7/10*
U.S. Cl. 188—1 B **12 Claims**

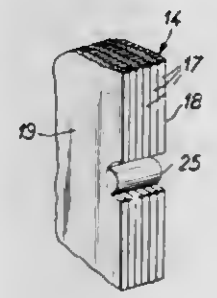


1. A motion snubbing device comprising:
first and second strut members mounted for relative movement;
a pair of inertia elements rotatably mounted on said first strut member;
a threaded shaft fixed to said second strut member;
a nut mounted on said shaft to be rotated by the shaft when the shaft is moved axially relative to said nut;
means connecting said nut to said elements so that relative movement of said members in one direction will drive one of said inertia elements, and relative movement of said members in an opposite direction will drive the other inertia element; and
means connecting said inertia elements in a manner such that rotating either of the elements below a predetermined motion threshold causes such element to rotate the other inertia element, and attempting to rotate said other inertia element above said threshold initiates braking action on said elements and said members which limits motion to said threshold.

4,103,761
BRAKE FRICTION-LINING SUPPORT

René Gabriel Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Apr. 7, 1977, Ser. No. 785,752
Claims priority, application France, Apr. 8, 1976, 76 10219
Int. Cl.² F16D *65/02*
U.S. Cl. 188—73.5 **16 Claims**

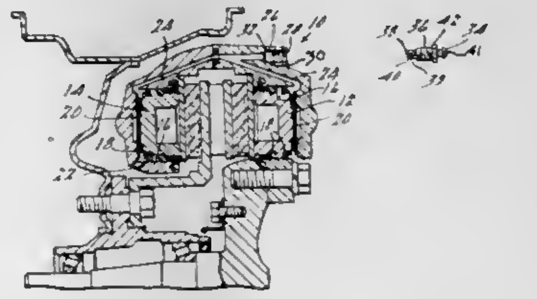


8. An anti-noise support for a friction-lining of a braking member, in which the lining is fixed to the support and is intended to be applied against a braking surface by operating means acting or reacting on the support over contact area thereof, said support comprising a stack of wholly metallic sheets which are contiguous to each other over their entire facing surfaces and are assembled together by localised assembly means, characterised in that at least some of the said localised assembly means are bonding means provided on peripheral edges of the support.

4,103,762
METHOD AND DEVICE FOR REPAIRING DAMAGED BLEEDER VALVE APERTURES

Thomas C. Sawyer, 19435 Lancashire Rd., Detroit, Mich. 48223

Filed Feb. 20, 1976, Ser. No. 659,653
Int. Cl.² B22D *19/10;* **B23D** *7/00*
U.S. Cl. 188—352 **4 Claims**



1. A repaired disc brake caliper comprising:
a housing having at least one cylinder therein;
a piston movably disposed within said housing;
said housing having a first fluid passage and means for connecting a fluid supply line thereto, said fluid passage conducting a fluid from said supply line connecting means to

said piston so as to cause said piston to move outwardly with respect to said cylinder in response to a flow of fluid thereto;

a second fluid passage in said housing extending from said first fluid passage to the exterior of said housing;

the outer end of said second fluid passage being drilled out so as to form an enlarged diameter portion;

a cylindrical repair sleeve member of substantially constant diameter fixedly disposed within said enlarged diameter portion of said second fluid passage and having a first aperture of a predetermined diameter extending axially inwardly through a portion of said cylindrical member from one end thereof, a second aperture extending axially inward from another end of said cylindrical member, of a diameter smaller than said predetermined diameter and communicating with said first aperture and a valve seat portion disposed between said first and second apertures;

a bleeder valve disposed within said first aperture and adapted to cooperate with said valve seat portion to seal said second passage when in a first position and to allow fluid and entrained air to be expelled from said caliper when in a second position, and

sealing means disposed between the longitudinal surfaces of said cylindrical member and said second fluid passage.

4,103,763
BRAKING DEVICE FOR DRIVE MOTORS

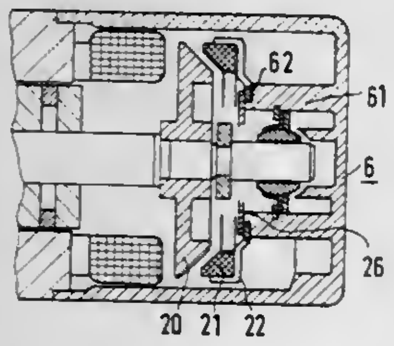
Erhard Glöckner, Eibelstadt, and Anton Wittstadt, Sommerach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 669,103

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1975, 2513219

Int. Cl.² F16D *3/14*

U.S. Cl. 192—2 **3 Claims**



1. A braking device for use with a drive motor, said motor being of a type comprising a rotor which is axially displaced by a spring force when the motor winding is de-energized, said braking device comprising:

a brake lining having a contact surface;

a brake disk having a contact surface for movement into engagement with said contact surface of said brake lining, said brake disk being adapted to be connected to said rotor for movement therewith when said rotor is axially displaced;

said contact surfaces being formed at an angle relative to the direction of said movement in the manner of a cone brake;

a stationary part;

an elastic intermediary member for resiliently connecting, at least in a radial direction, said stationary part to said brake lining;

a brake lining ring for supporting said brake lining, said brake lining ring being connected to said intermediary member and including prong-like radial projections distributed over its circumference;

and said stationary part having recesses for receiving said prong-like projections.

4,103,764
CONTROL SYSTEM FOR AN AUTOMATIC POWER TRANSMISSION

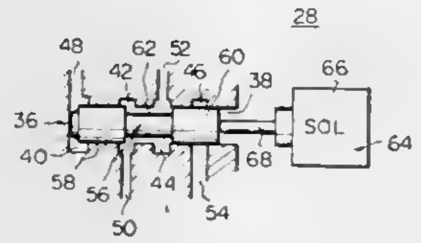
Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Japan

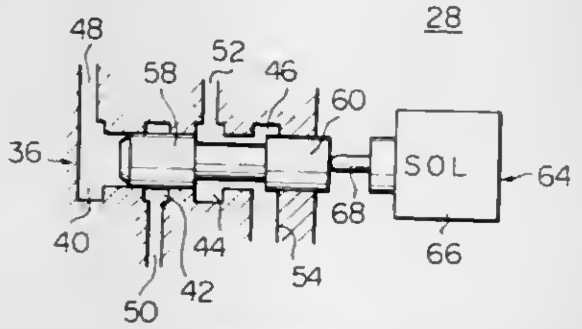
Filed Nov. 10, 1976, Ser. No. 740,712

Claims priority, application Japan, Nov. 12, 1975, 50-135024

Int. Cl.² B60K *21/00*

U.S. Cl. 192—4 A **8 Claims**





1. A control system for an automatic power transmission of a motor vehicle having an engine and means producing a throttle pressure the magnitude of which is substantially proportional to the output of said engine, said transmission including a downshift circuit into which hydraulic fluid from a fluid supply under pressure is introducible for achieving downshift to the next lower vehicle speed gear ratio at relatively high vehicle speed, said control system comprising:

switch means;

a valve member including a valve body and a valve spool slidably held in said body, said valve spool taking first and second positions in said valve body, said first position being one in which said downshift circuit fluidly communicates with said fluid supply to be fed with said hydraulic fluid, said second position being a position in which said downshift circuit fluidly communicates with a drain passage for draining said hydraulic fluid therefrom;

means for maintaining said valve spool of said valve means at said second position when the magnitude of said throttle pressure is higher than a predetermined level;

a solenoid coil electrically connected to said switch means to be energized when said switch means closes; and

a plunger cooperating with said solenoid coil so as to move said valve spool of said valve member into said first position even when the magnitude of said throttle pressure is higher than said predetermined level so long as said solenoid coil is energized in response to close condition of said switch means.

4,103,765
RESILIENT SUPPORT FOR COIL OF VISCOUS FLUID DRIVE

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 5, 1977, Ser. No. 784,897

Int. Cl.² F16D *43/25*; C09J *5/00*

U.S. Cl. 192—58 B **14 Claims**

1. A temperature responsive viscous fluid drive comprising:

a housing member rotatable about an axis and defining a cavity;

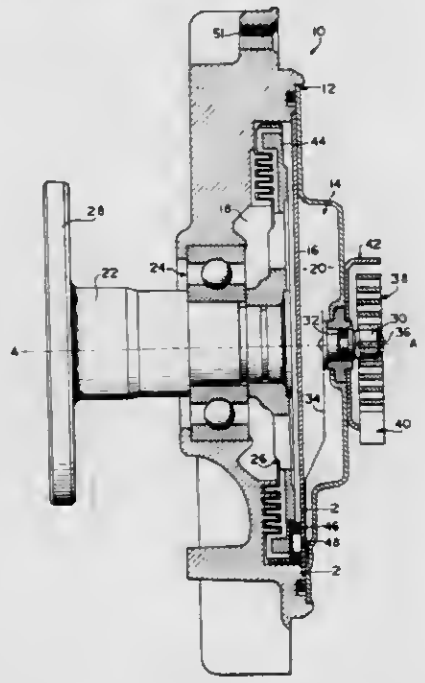
a valve plate dividing said cavity into a working chamber and a reservoir;

a clutch member located within said working chamber and rotatable about said axis;

an input shaft secured to one of said members to rotate said one member about said axis and being supported on the other member for relative rotation;

viscous shear fluid in said cavity;

valve means to control fluid communication between said reservoir and said working chamber;



means defining an opening on one of said members;

temperature responsive means controlling said valve means and including a bimetallic member having one end secured to said valve means and another end located in said opening;

retention means located on the other end of said bimetallic member; and

resilient means associated with said retention means to retain said other end in a given position relative to said opening and resiliently restrict radial movement of said other end from said given position.

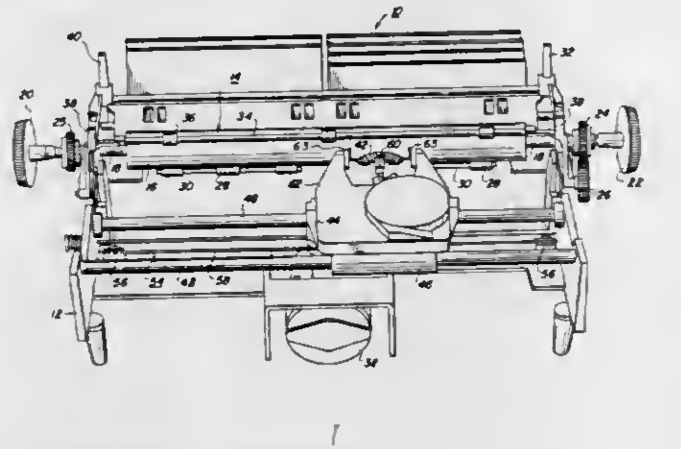
4,103,766
CONTROL APPARATUS FOR SERIAL PRINTER

Frank D. Ruble, Fremont; Louis H. Chang, and John C. Fravel, both of San Jose, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 682,877, May 3, 1976. This application Jan. 13, 1977, Ser. No. 759,224

Int. Cl.² B41J *1/30*

U.S. Cl. 197—62 **2 Claims**



1. A serial printer comprising:

a carriage;

a print member rotatably mounted to said carriage and including a plurality of character elements;

drive means coupled to said print member for rotating said print member to a desired rotational position in order to place a selected character element at a printing position adjacent a record medium to be printed upon;

servo control means coupled to said drive means and responsive to a set of input data and instructions for generating a control signal to control the direction and to regulate the speed of rotation of said print member in order to bring said selected character element to a stop at said printing position; and

programmed data processing means coupled to said servo control means for supplying at least some of said set of input data and instructions under program control to said servo control means, said data processing means comprising a random-access-memory having a first addressable storage location for storing a first position signal indicative of the actual rotational position of said print member relative to a reference location and a second addressable storage location for storing a second position signal indicative of said desired rotational position of said print member, said first and second storage locations capable of being addressed under program control to provide said first and second position signals at the output of said random-access-memory, said data processing means further comprising an arithmetic logic unit responsive to said first and second position signals for calculating the clockwise rotational difference between said first and second position signals under program control, and means responsive to said calculated difference being zero for supplying a disable command signal under program control to said servo control means for disabling same.

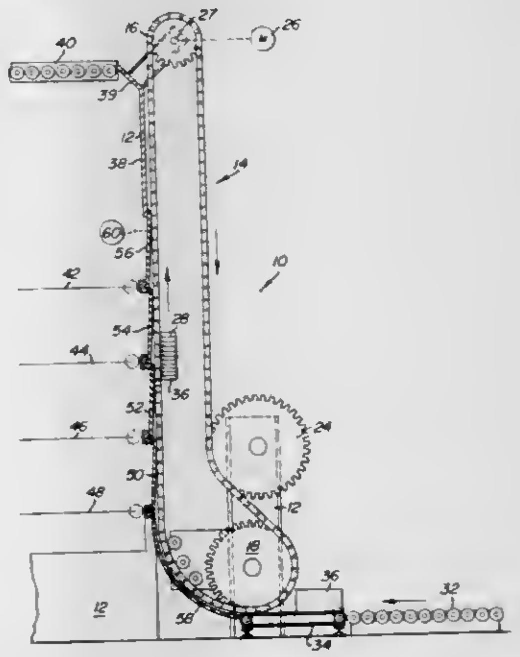
4,103,767
ELEVATING APPARATUS

Kent F. Warner, White Plains, N.Y., assignor to W & H Conveyor Systems, Inc., Carlstadt, N.J.

Filed Jan. 25, 1977, Ser. No. 762,366

Int. Cl.² B65G *37/00*

U.S. Cl. 198—366 **7 Claims**



1. Apparatus comprising:

(a) an endless conveyor having generally vertically runs, said conveyor having stretchable means for contacting and pushing a package along one of said runs,

(b) an input conveyor means and a discharge conveyor means at different elevations adjacent said one run of said endless conveyor,

(c) a generally vertical, slippery reaction surface along said one run and stationary with respect to said endless conveyor for cooperation with said stretchable means to confine a container as it is moved generally vertically along said one run, said reaction surface being defined by a plurality of panels at least one of which is movable to a position to provide an opening adjacent one of said conveyor means and through which a container can be moved.

4,103,768

CONVEYOR FOR CONVEYING ARTICLES IN A HELICALLY CURVED PATH

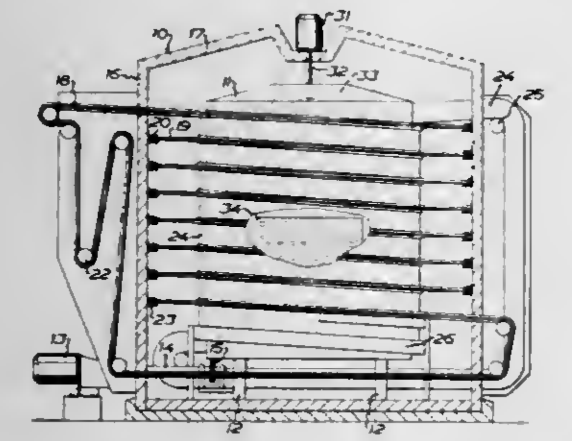
Sven Erik Persson, Landsurona, Sweden, assignor to Teknisk Konsult Sven Persson AB, Sweden

Filed Dec. 7, 1976, Ser. No. 748,173

Claims priority, application Sweden, Dec. 17, 1975, 7514249

Int. Cl.² B65G *15/62*

U.S. Cl. 198—778 **4 Claims**



1. A conveyor for conveying materials in a helical curved path through a treating zone, comprising at least one conveyor belt, a cylindrical envelope fixedly mounted with its axis in a vertical position and defining the treating zone, a drum mounted coaxially within and spaced from said envelope, means for rotating said drum about its axis, a plurality of spaced supporting means fixed to the longitudinal edges of said conveyor belt, a plurality of projections mounted on the inner face of said envelope and arranged in a helical path thereabout having spaced convolutions to receive the spaced supporting means along that edge of said conveyor which constitutes the outer edge thereof for sliding engagement therewith when said belt is arranged in a helically curved path within the space between said envelope and said rotatable drum, a spacing belt arranged helically around the outer wall of said drum and in a plane parallel therewith, the convolutions of said spacing belt being spaced apart from each other, said spacing belt being frictionally engaged with said drum to rotate therewith, said spaced supporting means along that edge of said conveyor belt which constitutes the inner edge thereof being disposed between the convolutions of said spacing belt and frictionally engaged therewith to be driven thereby when said drum is rotated, said spacing belt having a width which separates adjacent convolutions of said conveyor belt a distance corresponding to the helical spacing of said plurality of projections on the inner face of said envelope whereby the conveyor belt is driven in a helical path by rotation of said drum and is disposed substantially horizontally while being moved helically within the space between said envelope and said drum.

4,103,769

LIVE ROLLER CONVEYOR

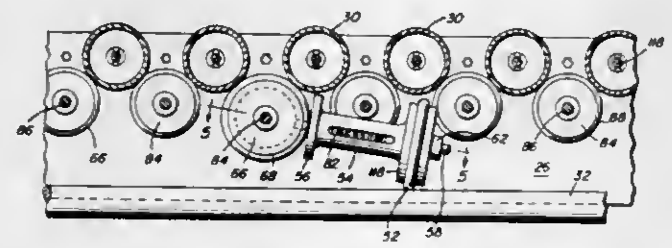
Morell L. Jorgensen, Honeoye Falls, N.Y., assignor to Stone Conveyor, Inc. (Entire), Honeoye, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,077

Int. Cl.² B65G *13/06*

U.S. Cl. 198—781 **10 Claims**

1. In an accumulating conveyor including a frame and a plurality of transport rollers disposed in adjacent spaced relation and rotatably supported by the frame, the improvement comprising friction drive wheels rotatably supported by the frame in peripheral contact with the rollers for drivingly interconnecting all of the rollers, with each drive wheel being in contact with two adjacent rollers, means driving at least one of said drive wheels for imparting drive torque to the rollers and the other drive wheels, and means supporting said drive wheels from the frame for biasing the drive wheels into driving engagement with the rollers, said means biasing the drive wheels toward the rollers including supporting shaft means for each of said drive wheels with the shaft means being supported from said frame, means engaged with each end of the drive wheel shaft means and connected with the frame for biasing the shaft means and drive wheels toward the rollers, said means at one end of each of said shaft means including a multiple convolution spring having a diameter greater than the shaft means to floatingly and resiliently support one end of the shaft means, the means at the other end of the shaft means including a single convolution spring having a diameter smaller than the shaft means for expansion of the convolution when assembling the spring on the shaft means for gripping the shaft means to prevent rotation thereof and resiliently supporting the shaft means for translatory movement in relation to the frame.



4,103,770

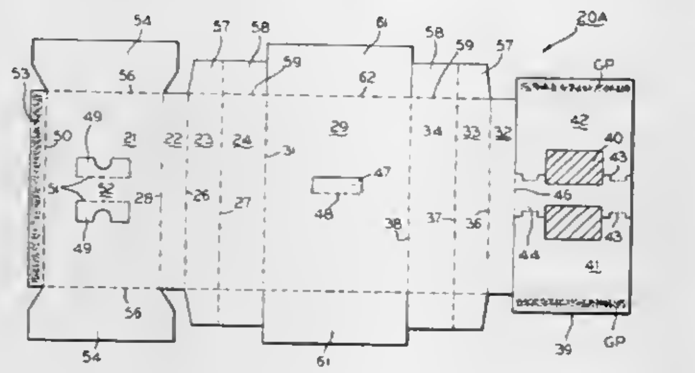
CARTON WITH TRANSVERSE PARTITION AND METHOD OF ASSEMBLING SAME

A. M. Brandenburger, Forest Park, Ill.; C. R. Helms, Collegeville, Pa., and D. F. Barker, Barrington, Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 749,749

Int. Cl.² B05D *75/06*

U.S. Cl. 206—193 **2 Claims**



1. A paperboard blank cut and scored to form a carton for enclosing a pair of article groups, each blank comprising:
- (a) a top forming panel and a bottom forming panel;
- (b) a pair of side forming panels foldably connected to opposite side edges of said bottom forming panel;
- (c) one of said side forming panels being foldably connected to an edge of said top forming panel;
- (d) said side forming panels being formed from a plurality of hingedly interconnected panel elements to give truncated appearance to the carton when erected;
- (e) a web element hinged to the other of said side forming panels along a fold line;
- (f) a pair of partition forming elements foldably secured to opposite edges of said web element along hinge lines disposed in normal relationship to said fold line.

4,103,771

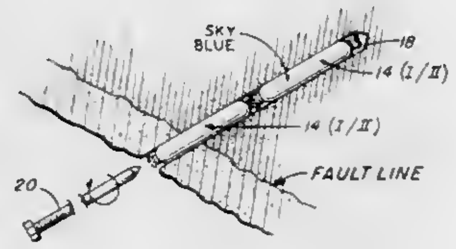
DETECTING RESIN CURE

Kenneth G. Klatt, Brown Deer, and Leon D. Robnolt, Jr., New Berlin, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jun. 11, 1976, Ser. No. 695,099

Int. Cl.² B65D *77/08, 31/12*

U.S. Cl. 206—219 **3 Claims**



1. In a method of anchoring in a hole a rock bolt by means of rotating the bolt in a resin reaction mixture in the hole including a cross linkable polyester prepolymer reaction constituent which undergoes cross linking by a curing agent through the prepolymer chains and is thereby cured to a hard, infusible thermoset resin, and wherein gelation characterizes the onset of resin cure, the step of inserting and then rotating a rock bolt in the opening in which the reaction mixture has been implanted together with an Oil Blue dye which is distributed throughout the resin but separated from the curing agent in a plastic package ruptured when the bolt is rotated to release the dye which undergoes a color change characterizing the onset of resin cure if resin cure indeed occurs.

4,103,772

SEALED CONTAINER WITH FRANGIBLE PARTITION

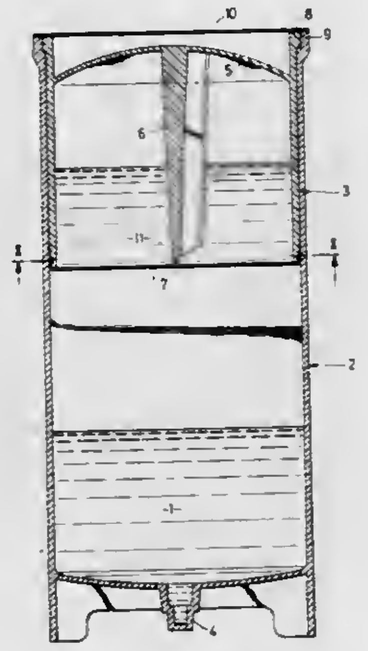
Georg Wiegner, Breslauer Str. 35, Viersen 11, Fed. Rep. of Germany (4060)

Filed Sep. 3, 1976, Ser. No. 720,154

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539291

Int. Cl.² B65D *25/08*

U.S. Cl. 206—222 **8 Claims**



1. A container comprising:
- (a) an elongated shell defining a cavity therein,
  - (1) said shell including two substantially cup-shaped parts defining therein respective, corresponding compartments of said cavity,
  - (2) each part including two longitudinally terminal, annular portions and a bottom wall adjacent one of said annular portions and remote from the other annular portion,
  - (3) the bottom wall of each part bounding a corresponding compartment in one longitudinal direction, and
  - (4) the annular portion remote from said bottom wall bounding a side of the corresponding compartment open in the other longitudinal direction;
- (b) first and second, substantially planar, frangible membrane members transverse to said longitudinal directions,
  - (1) the first membrane member being fixedly sealed to the remote annular portion of one of said parts and closing the open side of the corresponding compartment, whereby said compartments are separated from each other,
  - (2) the second membrane member being fixedly sealed to the adjacent annular portion of said one part outside said cavity,
  - (3) one of said membrane members being sealed to the remote annular portion of the other part and constituting fastening means fastening said parts to each other;
- (c) a piercing member secured to the bottom wall of said one part in said cavity for joint movement,
  - (1) said piercing member having a free end portion directed toward said first membrane member,
  - (2) said bottom wall of said one part being resiliently movable inward of said cavity a distance sufficient to cause piercing of said first membrane member when said bottom wall of said one part is moved; and
- (d) releasing means on said shell for directly connecting the compartment defined by the other part to the surrounding atmosphere.

4,103,773

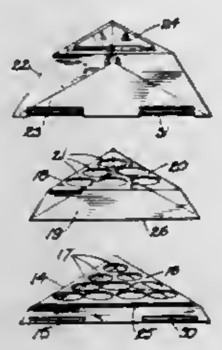
COMBINATION PACKAGE AND RACK FOR POOL BALLS

Terry M. Haber, 3197 B Airport Loop Dr., Costa Mesa, Calif. 92626

Filed Dec. 5, 1977, Ser. No. 857,461

Int. Cl.² B65D *85/58*

U.S. Cl. 206—315 B **5 Claims**



1. A combination package and rack for pool balls comprising, in combination:
- (a) a bottom tray having downwardly depending side walls and an upper surface including a first plurality of openings of smaller diameters than the diameters of said pool balls for supporting a majority of said pool balls respectively;
- (b) an intermediate tray having downwardly depending side walls positionable on and supported by the marginal edge of said upper surface of said bottom tray, said intermediate tray having an upper surface including a second plurality of openings of smaller diameters than the diameters of said pool balls for supporting the remainder of said pool balls; and
- (c) a top tray having downwardly depending side walls positionable over both said bottom tray and intermediate tray to cover the same and having an imperforate upper surface, adjacent marginal wall portions of said top tray and bottom tray including cooperating fastening means for holding said top tray onto said bottom tray, said down-

wardly depending side walls of said intermediate tray functioning as a pool ball rack when separated from said top and bottom trays for properly positioning all of said pool balls in a triangular array preparatory to play.

4,103,774

CAPSULE

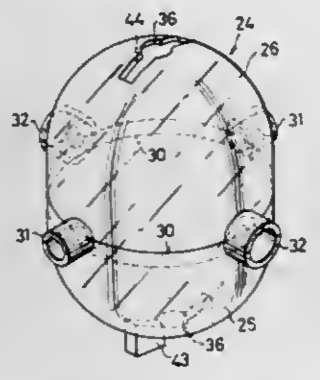
Fusao Shingyouchi, 39-9, Moto-yoyogi, Shibuya-ku, Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,123

Claims priority, application Japan, Jan. 14, 1976, 51-3150[U]; Mar. 15, 1976, 51-30765[U]

Int. Cl.^{2} B65D *5/52, 25/24*

U.S. Cl. 206—45.2 **4 Claims**



1. A capsule for containing a commodity, sold by a slot machine, comprising:

(A) a main body defining a holding portion for holding a commodity;

(B) a cover member for covering an opening of said holding portion, said cover member being removable from said main body;

(C) cooperating closure means formed integrally at respective edges of said main body and said cover member for enclosing said holding portion of said main body by said cover member to prevent said commodity from dropping out of said holding portion through said openings; and

(D) independent combining means for connecting said main body with said cover member in such a condition that the opening of said holding portion is exposed and not covered with said cover member, said combining means also being adapted to connect a plurality of said capsules with each other in such a condition that the opening of said holding portion is covered with said cover member by means of said closure means,

said combining means comprising an oblong opening and a ridge dimensioned to be received by said opening, said capsule being usable as a container for coins when said opening of said holding portion is enclosed with said cover member by said closure means, said oblong opening permitting the insertion of coins into said holding portion, said ridge being formed on the bottom of said main body, and said oblong opening is defined by said cover member, said capsule being usable as an egg stand when said ridge is received in said oblong opening, said holding portion of said main body serving to hold an egg and said cover member comprising a base for said main body.

4,103,775

FOUR-CORNERED FLAT WRAPPING

Albert Emiel Smolderen, Aartselaar, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

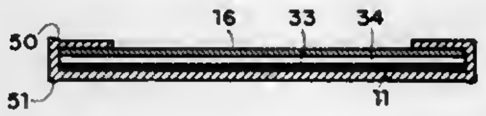
Division of Ser. No. 174,807, Aug. 25, 1971, Pat. No. 3,782,067. This application Oct. 1, 1973, Ser. No. 402,164

Claims priority, application United Kingdom, Aug. 26, 1970, 41126/70

Int. Cl.^{2} B65B *9/02*

U.S. Cl. 206—455 **2 Claims**

1. A film sheet wrapping for flat contents which includes at least one radiographic film sheet, said wrapping comprising a first sheet of wrapping material at one side of said contents, and a second sheet of wrapping material at the other side of said contents, one of said wrapping sheets being larger than the other along two opposite sides and having the margins on such sides folded inwardly over the contents into parallel contacting relation to the contiguous margins of the other wrapping sheet and adhered thereto, said larger sheet being creased along each of the two opposite exterior folded edges thereof to impart to such edge an inwardly curved concave configuration between an upper and a lower corner.



4,103,776

INSPECTION MACHINE FOR FUEL PELLETS

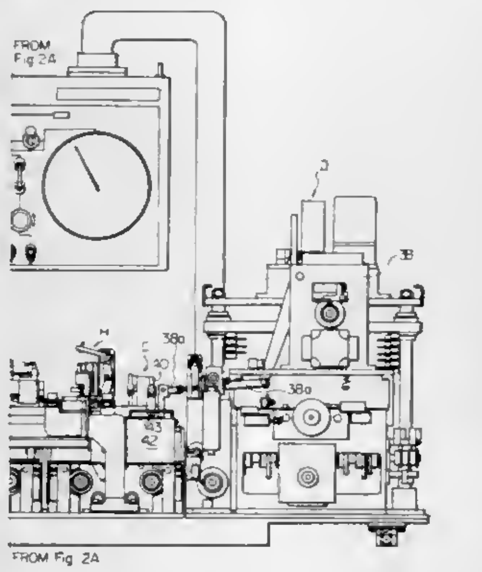
Tadashi Taniguchi, Kawagoe; Takeshi Miyaoka, Sayama; Daiji Hagino, Tokorozawa; Ken-Ichi Matsumoto, Naka; Kazuo Sakamoto, Higashi-Ibaragi; Akira Matsuda, Nakaminato, and Toshio Shishido, Naka, all of Japan, assignors to Citizen Watch Company Limited and Doryokuro Kakunenryo Kaihatsu Jigyodan, both of Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,241

Claims priority, application Japan, Sep. 16, 1975, 50-111870

Int. Cl.^{2} B07C *1/10*

U.S. Cl. 209—73 8 Claims



1. A cylindrical inspection station for an inspection machine adapted to detect the surface of cylindrical pellets, which inspection machine has a supporting block comprising:

a pair of rollers rotatably supported on shafts mounted in parallel to said supporting block;

a lifting mechanism including an arm formed with a groove to support each of said pellets;

an additional roller rotatably supported by said arm for rotatably supporting said each of the pellets in said groove;

said arm being movable to a position to cause an outer surface of said each of the pellets to come into contact with each of said rollers of said pair of rollers such that said each of the pellets is held at a predetermined position; and

means for detecting flaws in an outer periphery of said each of the pellets by utilizing changes in pressure caused by the contact of an air stream with said flaws.

4,103,777

VIBRATING DISC SEPARATOR

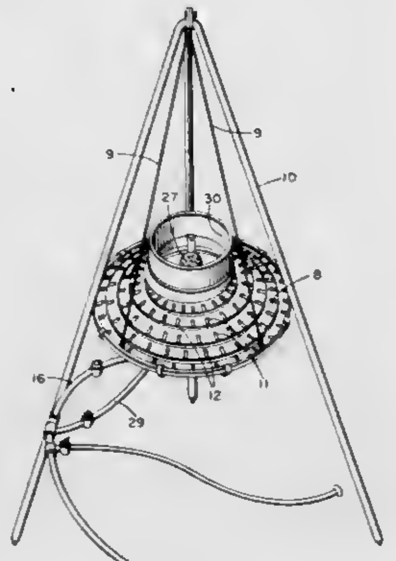
Victor Harold Goulter, via Tabulam, Jackson's Flat, N.S.W., 2470, Australia

Filed Aug. 25, 1975, Ser. No. 607,704

Claims priority, application Australia, Oct. 15, 1974, 367/74

Int. Cl.^{2} B03B *5/04, 7/00*

U.S. Cl. 209—43 **9 Claims**



1. A separator for mixed solid particulate materials comprising, in combination, a generally circular member having a raised central input region for said materials and a lower output region along the outer edge, said member having a plurality of riffles disposed upon the upper surface thereof and defined by a plurality of annular baffles, each having a plurality of short radially extending walls with the length of the riffles being greater near the edge than near the center, means for vibrating said member, means for admitting irrigating liquid near said input region, the arrangement being such that said riffles progressively capture and retain a substantial proportion of the heavier components of said materials, while a substantial proportion of the lighter components of said materials is progressively washed clear of said member at said output region.

4,103,778

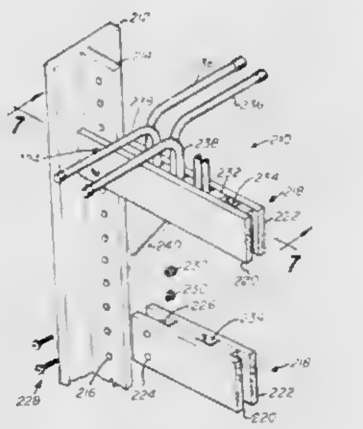
DISPLAY RACK

Gary W. Bradshaw, 1313 Rae St., Mt. Morris, Mich. 48451

Continuation-in-part of Ser. No. 506,219, Sep. 16, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,445

Int. Cl.^{2} A47F *7/16, 7/19*

U.S. Cl. 211—47 **4 Claims**



1. a free standing display device, comprising:

(a) a pair of spaced apart upstanding support posts,

(b) an inwardly directed support brace connected to each support post, each brace extending along the length of the associated post, each brace having a plurality of throughbores along the extent thereof,

(c) at least one support member extending between the support posts, the support member being vertically positionally adjustable between the support posts, the support member comprising:

  (1) a pair of spaced apart bodies, the inner surfaces of the ends thereof abutting against the opposed lateral sides of the braces,

  (2) a plurality of spacers equidistantly spaced apart and disposed between the spaced apart bodies, the spacers defining a plurality of adjacent gaps along the extent of the support means,

  (3) the ends of each body having at least one aperture, the apertures of one end being in registry and alignable with any one of the throughbores of the brace associated therewith,

(d) a plurality of display rods frictionally retained by the support member in the gaps, and

(e) means for connecting the ends of the support member to the support braces, the connecting means comprising fastening means, the fastening means being insertable through the registering apertures and associated throughbores, and wherein the fastening means, registering apertures and throughbores cooperate to render the support means vertically positionally adjustable.

4,103,779

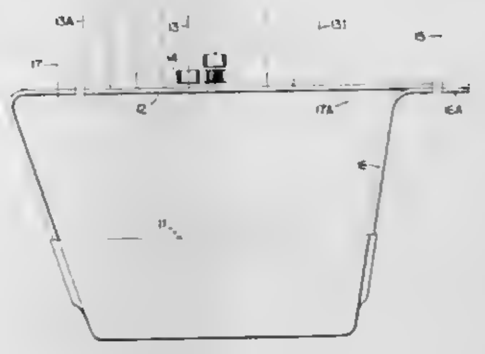
BRUSH TENDER

Jerome Wagner, New York, N.Y., assignor to Harry Fraider, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,378

Int. Cl.^{2} A47B *81/02*

U.S. Cl. 211—65 **2 Claims**



1. A brush tender including a receptacle, a stem holder, a plurality of stems, and a plurality of spring-type clamping devices, wherein the improvement comprises the stem holder disposed horizontally above, and functionally connected to, the receptacle, the stems disposed in spaced relation along the upper surface of, and functionally connected perpendicular to, the stem holder, at least one clamping device removably mounted on at least one stem, whereby, at least one brush may be releasably held above the receptacle by the at least one clamping device.

4,103,780

BILLIARDS CUE HOLDER

John W. Winfree, Jr., 1502 S. Virginia St., Hopkinsville, Ky. 42240

Division of Ser. No. 639,895, May 19, 1976, Pat. No. 4,079,839. This application Jul. 18, 1977, Ser. No. 816,544

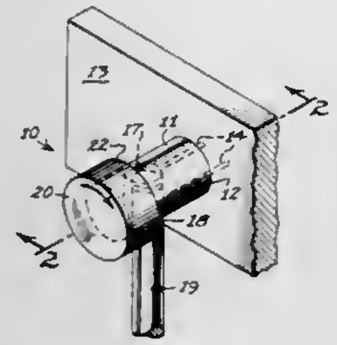
Int. Cl.^{2} A47F *5/00*

U.S. Cl. 211—68 **2 Claims**

1. A holder for a billiards cue having a tip portion, comprising:

(a) a body member comprising a bottom portion and a vertical hole in said bottom portion having a diameter slightly larger than a cue tip portion, one side of said hole defining

a fixed jaw element adapted to engage one side of the tip portion of said cue in a position suspended from said body member,
(b) said body member further comprising an externally threaded, cylindrical end portion, including the opposite side of said hole,
(c) a movable jaw element having an internally threaded portion receiving and threadedly engaging said cylindrical end portion for threaded movement toward and away from said fixed jaw element,



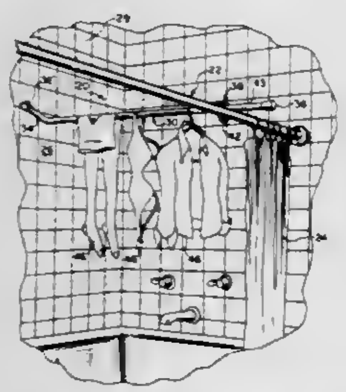
(d) said movable jaw element having an annular jaw face in a plane substantially normal to the rotary threaded axis of said movable jaw element, said jaw face being movable across said hole to squeeze the cue tip portion against said fixed jaw element in a suspended position,
(e) support means adapted to mount said body member at a predetermined elevation to provide the sole means of support of the cue in said suspended position.

4,103,781

PORTABLE ADJUSTABLE CLOTHES DRYING DEVICE

John R. Sterling, Crystal Lake, Ill., assignor to John Sterling Corporation, Richmond, Ill.

Filed Aug. 25, 1977, Ser. No. 827,554
Int. Cl.² A47F *5/00*
U.S. Cl. 211—86 **1 Claim**



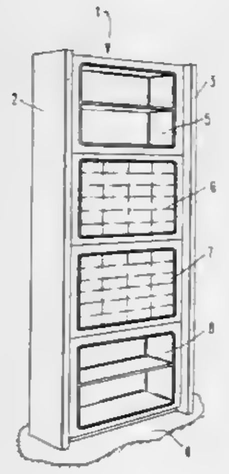
1. A lightweight, portable clothes drying rack adapted to be removably erected over a shower or bath tub enclosure to extend between a horizontal shower curtain rod and an opposing wall of the enclosure, comprising: a unitary elongated tubular member formed with a linear body portion having one end thereof bent angularly outward to provide an upturned end portion extending at substantially 45 degrees relative to said body portion, said upturned end portion being operationally engagable with said opposing wall at an elevation above said body portion and the latter overlying said curtain rod and extending horizontally toward said wall in operation; a protective cap member mounted over the open end of said upturned end portion for frictionally engaging said wall, and a unitary resiliently flexible stop member mounted on said body portion; said stop member being substantially triangular in shape with a central opening for the passage of said body portion therethrough and of a size to produce relatively tight frictional engagement therewith while affording selective positioning of said stop member along said body portion whereby to accommodate variations in the shower curtain rod to opposing wall distance; and a depending lobe portion on said stop member for abuttingly engaging said curtain rod, the abutting engagement of said lobe portion serving to flex the stop member and resiliently deform said opening therein whereby to frictionally lock said stop member to said body portion and frictionally couple the latter to said curtain rod.

4,103,782

DISPLAY UNITS

Raymond E. Mayer, 88 Salem Rd., Schwenksville, Pa. 19473

Filed Jun. 7, 1976, Ser. No. 693,309
Int. Cl.² A47F *3/14*
U.S. Cl. 211—126 **5 Claims**



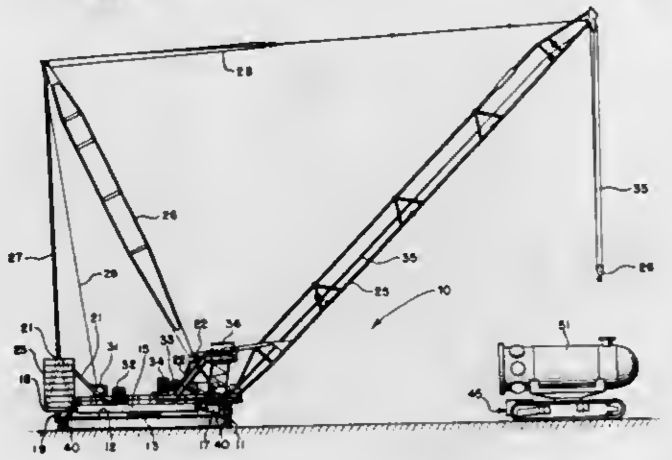
1. A composite merchandise display and simulated building unit comprising:
a pair of side supports comprising elongated panels standing upright on a floor and the panels extending generally parallel one another;
on each panel, a retaining groove co-extensive with the panel and the grooves being formed on the sides of the panels which face one another;
a plurality of display trays extending between said panels, the trays being stacked one on top of the other;
means on each tray for supporting an article to be displayed and/or stored;
in each tray, a pair of tongues respectively formed on opposite sides of the tray and being respectively disposed in said retaining grooves;
said tongues and grooves being configured and dimensioned whereby each groove permits its tongue to slide axially along the groove and retains its tongue against motion transverse the axis of the groove whereby to hold the panels and trays together as a unit;
for each tray, a skirt means on the bottom of the tray below the front wall, the skirt means extending downwardly from the front wall and being offset to the rear;
for each tray, means on the top of the tray for use in being engaged by the skirt on the adjacent upper tray; and
as between adjacent trays, the skirt on the upper tray engaging said means on the lower tray, said means providing vertical support for the upper tray.

4,103,783

PLATFORM CRANE WITH COUNTERWEIGHT AND BOOM CARRIER SUPPORT LINKAGES

Daniel E. Beduhn; James G. Morrow, Sr., and David J. Pech, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 801,597, May 31, 1977, abandoned, which is a division of Ser. No. 709,451, Jul. 28, 1976, Pat. No. 4,042,115. This applicatinn Nov. 25, 1977, Ser. No. 854,479
Int. Cl.² B66C *23/72*
U.S. Cl. 212—48 **2 Claims**



1. In a crane assembly, the combination comprising, a ring defining an annular track, an elongated platform mounted for rotation on said ring, said platform having a boom carrier extending at one end therefrom and having roller means in riding contact with said track and a counterweight support means for supporting a counterweight at the other end also having roller means in riding contact with said track, a first set of links defining a triangular frame substantially rigidly interconnecting said counterweight support means and said platform, a second set of links defining a triangular frame substantially rigidly interconnecting said boom carrier and said platform, whereby said platform, counterweight support means and boom carrier are supported as a unit for rotation on said ring said second set of links defining an open, uncluttered region between said platform and said carrier for passage and guidance of rigging, a boom pivoted on said carrier over said track, a cushioned boom stop secured at an upper portion of said second set of links for arresting rearward tilting of said boom beyond a predetermined angle, a mast pivoted on said carrier over said track, a mast strut supported by said first set of triangular links for arresting rearward tilting of said mast beyond a predetermined angle, and a stay interconnecting a central portion of said mast strut and said mast.

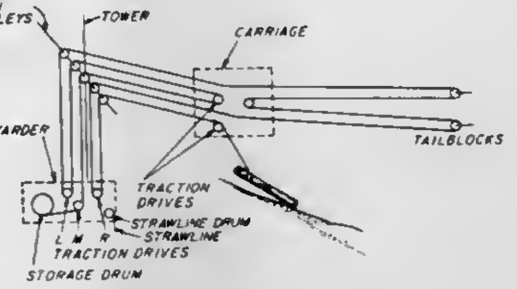
4,103,784

SINGLE LINE, TRACTION DRIVEN RUNNING SKYLINE SYSTEM

Michael J. Gonsior, Missoula, Mont., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 29, 1977, Ser. No. 792,366
Int. Cl.² B66C *21/00*
U.S. Cl. 212—94 **11 Claims**

1. A traction driven cable transportation system comprising:
(a) a yarder containing:
  (1) Three traction drives (a left, a middle, and a right traction drive) each of which may be driven, without regard to the manner in which the others are being driven, either clockwise or counterclockwise, or may be prevented from rotating by brakes; and
  (2) a storage drum, upon which a slight clockwise rotational force is maintained such that when the system calls for cable this force can be readily overcome enabling line to be withdrawn from the drum, but when cable is being released from the system the storage drum readily accepts it; which is distinct from any power drives enabling great variation in the dimensions of said drum and thus great variation in the amount of line which can be stored on said drum;
(b) a yarder tower;
(c) a carriage which contains an upper traction drive and which is designed to pass an intermediate support;



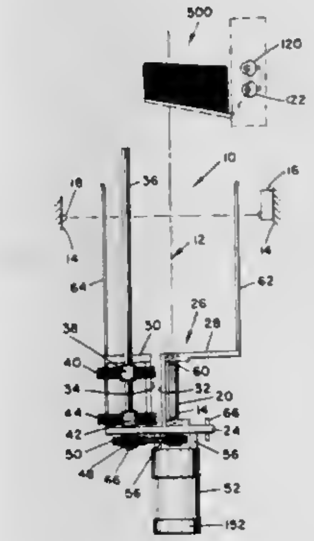
(d) a source of power;
(e) tailblocks;
(f) a single line which constitutes a support member for said carriage, a hauling cable for said carriage and a haulback line for said carriage; and
(g) anchorages for said yarder and said tailblocks; and
(h) a strawline, drum, and tower for rigging purposes.

4,103,785

APPARATUS FOR ROTATING AND DISCHARGING ARTICLES

Raymond L. Wiseman, 1550 S. Macon St., Aurora, Colo. 80012

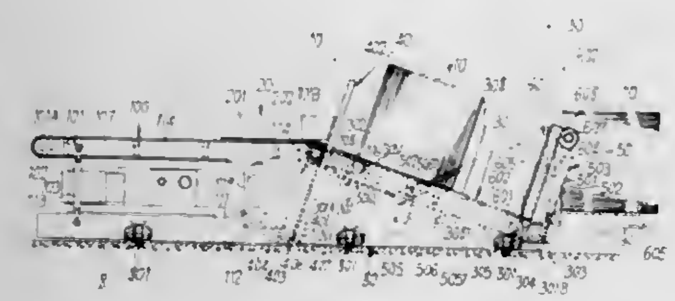
Filed Aug. 18, 1976, Ser. No. 715,430
Int. Cl.² B65G *57/16*
U.S. Cl. 214—6.5 **26 Claims**



1. In an article stacker, in combination:
a turntable;
means for depositing articles on said turntable such that they form an initial stack of articles;
means for rotating said turntable through a half circle;
means for depositing a further quantity of articles such that they form an extension of said initial stack; and cooperate therewith to define an extended stack;
pushing means extending the full height of the extended stack of articles for pushing same from said turntable; and
said pushing means being carried by said turntable and being rotatable therewith during formation of the extended stack and being movable relative thereto for pushing the extended stack therefrom.

4,103,786
BOARD PILING-UP APPARATUS

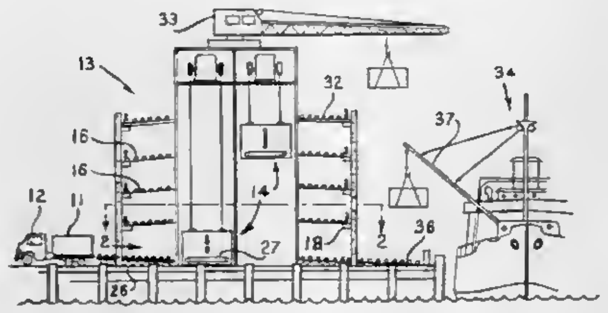
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan
Filed Aug. 6, 1976, Ser. No. 712,046
Claims priority, application Japan, Oct. 11, 1975, 50-136109
Int. Cl.² B65G *57/28*
U.S. Cl. 214—7 15 Claims



15. Board piling-up apparatus wherein boards, such as corrugated boards, which are individually fed lying flat or in the form of small bundles and which are collected in an erected posture, the collected boards being subsequently turned to be piled up, and thereafter the piled up boards are discharged, said board piling-up apparatus comprising:
- a first conveyor which receives said boards fed lying in a flat posture and on which said boards are erected;
- an arranging device which is disposed on one side of said first conveyor in order to push against the side ends of said boards erected on said first conveyor and to thus position said side ends uniformly;
- a second conveyor which has a board support capable of reciprocating on the transferring side of the conveyor between a feed end and a delivery end in combination with a transporting member;
- said second conveyor is inclined downwardly from the feed end thereof to the delivery end: and
- said transporting member and said support intermittently receive said boards erected on said first conveyor until a predetermined number is reached, and thereafter continuously feeds said boards while supporting them by said board support;
- a stopper device which can protrude straightforward from a position below said first conveyor to above said delivery end of said first conveyor at substantially the same time as the start of said continuous feeding operation of the second conveyor and then continues to protrude until said board support returns to the position for starting the next board receiving operation in order to support said boards erected on said first conveyor;
- a piling-up device which has a scooping bed and a piling-up bed extending from said scooping bed substantially perpendicularly thereto;
- said scooping bed lifts and turns boards which are fed to a predetermined position by said second conveyor and piles them up on said piling-up bed; and
- a device which discharges said boards from said piling-up bed.

4,103,787
CONTAINER HANDLING STRUCTURE

Charles R. Salloum, 120 Ellis St., Apt. 307, San Francisco, Calif. 94102
Division of Ser. No. 553,600, Feb. 27, 1975, Pat. No. 4,023,687, which is a continuation-in-part of Ser. No. 287,750, Sep. 11, 1972, abandoned, which is a continuation of Ser. No. 52,381, Jul. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 720,952, Apr. 12, 1968, Pat. No. 3,613,909, which is a continuation-in-part of Ser. No. 404,622, Oct. 19, 1964, Pat. No. 3,378,151, and a continuation-in-part of Ser. No. 646,671, Jun. 16, 1967, Pat. No. 3,382,990. This application May 16, 1977, Ser. No. 797,422
Int. Cl.² E04H *6/06*
U.S. Cl. 214—16.1 A 4 Claims



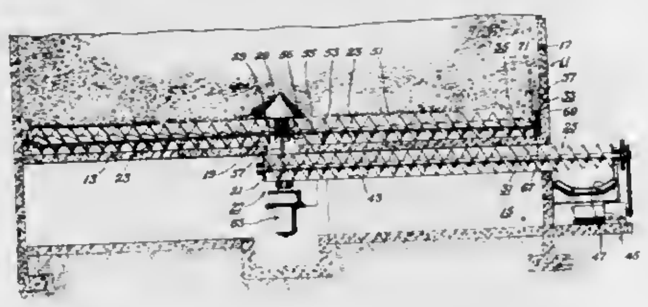
1. A container storage system comprising
- a building structure defining a plurality of vertically spaced storage levels
- at least one annular rotary-mounted storage platform at each level with each platform having a plurality of circumferentially spaced storage spaces extending radially across the platform and each space having rollers rotatably mounted laterally thereacross for facilitating the movement of a container into and out of the space, said storage spaces each having a radially inclined floor,
- a plurality of elevators extending vertically through said structure in a central core within the annular platforms and said elevators opening outwardly directly onto a storage platform at each of said storage levels at the upper end of the storage spaces of the platform adjacent said central core, each of said elevators having controllably operable conveyor means on the floor thereof for horizontal movement of a container into and out of an elevator,
- controllably operable unloading means at each of said levels having controllable drive means mounted on said structure in alignment with at least one elevator at each storage level and an element movable thereby for engaging a container disposed in a storage space aligned with an elevator and urging the container toward and at least partially into the elevator onto the conveyor thereof whereby the container may be drawn into said elevator, and
- controllable drive means for rotatably indexing said storage platforms to align any desired storage space with a selected elevator whereby all storage spaces may be loaded and unloaded in any desired order.

4,103,788
APPARATUS FOR DISCHARGING FROM A SILO

William H. Sutton, P.O. Box 18793, Fort Worth, Tex. 76118
Filed Jun. 23, 1977, Ser. No. 809,293
Int. Cl.² B65G *65/46*
U.S. Cl. 214—17 DA 1 Claim

1. A silo and unloader combination comprising:
- a. a silo having a substantially horizontal floor with a central opening therewithin and having a cylindrical wall extending above said floor and connected therewith;
- b. a pit at said central opening for receiving silage and the like from within said silo responsive to a radial sweep auger moving said silage toward said central opening;

- c. removal means extending from said pit radially outwardly exteriorly of the cylindrical wall of said silo;
- d. at least one radial sweep auger having its interior end adjacent said pit and having its interior end adapted for connection with a rotation means for effecting rotation about the longitudinal axis of said auger; said auger having its exterior end near said cylindrical wall of said silo; said radial auger having a tapered central shaft that is larger adjacent its exterior end than adjacent its interior end and having substantially uniformly spaced flights of auger blades extending rotationally and peripherally exteriorly of said shaft for drawing in respectively increasing amounts of silage and the like along the interiorly spaced flights as compared with the exteriorly spaced flights for preventing bridging of the silage and keeping it flowing into the front of said auger for being moved toward the central opening;
- e. rotation means disposed in said pit and connected with said at least one auger and operationally effecting rotation thereof;
- f. housing means disposed over said rotation means for protecting said rotation means;
- g. track means disposed peripherally about the floor of said silo and adjacent said cylindrical wall;

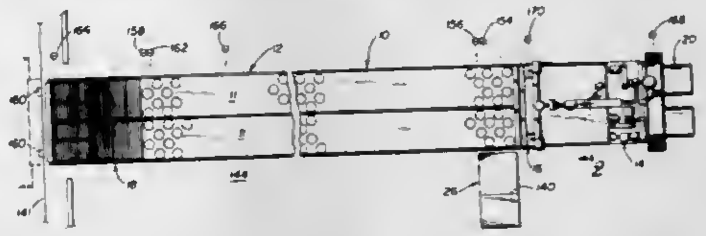


- h. advancing means connected with the exterior end of said at least one auger and engaging said track means; said advancing means including support means supporting a free end of said auger and including a toothed drive means for engaging said track means;
- i. torque inducing means for utilizing differential rotational speed between the toothed drive means of said advancing means and the shaft of the auger to generate a torque to cause the auger to move into the silage; said torque inducing means for utilizing differential rotational speed between said toothed drive means of said advancing means and said shaft of said auger comprising a hydraulic reservoir and hydraulic motor means with an output shaft and with its casing connected with said shaft of said auger so as to spin at the same speed as said shaft; said toothed drive means for engaging said track means comprising a sprocket gear that is connected via gear reducer with the output shaft of said hydraulic motor means such that substantially constant torque is developed to force said auger to advance into said silage and the like; and
- j. a track clearing means on the exterior end of said auger for displacing material from said track means into the path of said radial auger and off said track means.

4,103,789
UNITIZED LOADING SYSTEM

Richard E. Andrews; Ira D. Hooker, both of Arvada, and Daniel R. Simons, Evergreen, all of Colo., assignors to Adolph Coors Company, Golden, Colo.
Filed Mar. 28, 1977, Ser. No. 781,539
Int. Cl.² B65G *67/04*
U.S. Cl. 214—41 R 15 Claims

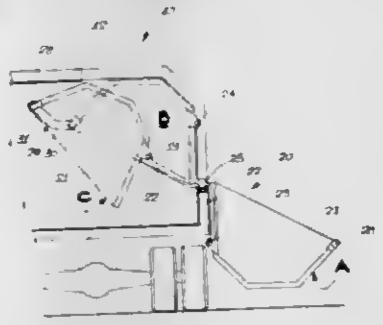
1. A unitized loader for receiving cargo in relatively small unit loads, indexing the unit loads into a compact total load, moving to extend its front at least partially into a hauling vehicle, delivering the total cargo load into the vehicle, and retracting from the vehicle into a position to receive additional unit loads of cargo, comprising:
- (a) a structural framework having fluid bearings supported on its top surface for floating said cargo units and having fluid bearings supported on its bottom surface for supporting the framework for motion on a fluid cushion during extension and retraction of the loader;
- (b) pusher means movable between the rear and front of the loader for a first distance for indexing said units of cargo toward the front of the loader into a compact load and for



a second distance for pushing the entire load forward for delivering the cargo into the hauling vehicle;
- (c) extension and retraction means for moving the loader forward to deliver cargo into a vehicle and for moving the loader rearward in conjunction with the forward motion of said pusher for removing the loader from under the cargo and depositing the cargo in a compact load in the hauling vehicle; and
- (d) fluid bearing inflating means for selectively providing fluid to the top side and bottom side fluid bearings.

4,103,790
BUCKET ACTUATING LINKAGE

Jacob J. Neufeldt, Box 597, Lethbridge, Alberta, Canada (T1J 3Z4)
Filed Sep. 16, 1976, Ser. No. 723,909
Int. Cl.² B60P *1/04*
U.S. Cl. 214—80 16 Claims



1. In combination, a bucket for a self-loading refuse vehicle, said bucket operatively connected to a shaft for rotation therewith about an axis, and a linkage means for applying torque to said shaft,
- such shaft and bucket being movable through a lifting stroke between a lower position for loading, a raised position for unloading and through a compacting stroke to a further position for compacting wherein the shaft is turned beyond the raised position, and through a return stroke back to said lower position,
- said drive linkage means including a plurality of interconnected links, said linkage means connected to the vehicle and to the said shaft and operable, upon powered actuation thereof, to transmit the force of the power actuation to exert a torque on the said shaft to move the bucket through said lift stroke from said lower position to said raised position and then through the compacting stroke to said further position,
- said drive linkage means including means for exerting on the shaft, during said lifting stroke, the greatest torque at about halfway between the lower and raised positions, and including means for exerting on the shaft during the

compacting stroke a further torque which is greater than the said torque about halfway through the lifting stroke.

4,103,791

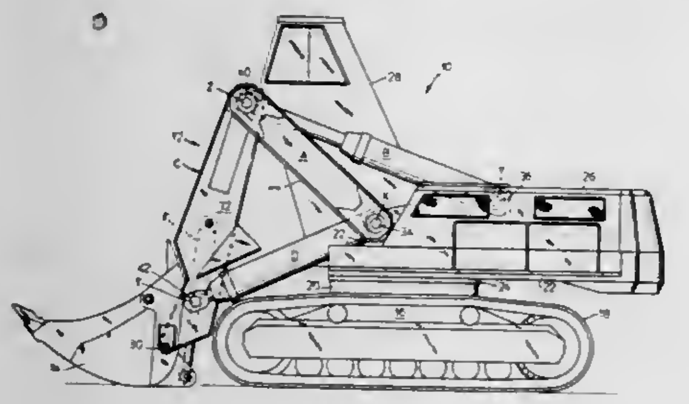
SHOVEL ATTACHMENT MEANS FOR HYDRAULIC EXCAVATOR

Karl Hans Ullmann, Dortmund, Fed. Rep. of Germany, assignor to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Jun. 3, 1977, Ser. No. 803,356

Int. Cl.² E02F *3/30*

U.S. Cl. 214—138 R **8 Claims**



5. In an excavating machine:

a mobile lower section;

a rotatable upper section mounted on said mobile lower section and comprising an upper frame having a working end;

shovel attachment means mounted on said upper frame and comprising:

a stroke arm having its lower end pivotally connected to a first point on said upper frame;

an extendable and retractable stroke arm cylinder for pivotally moving said stroke arm about said first point and having its lower end pivotally connected to a second point on said upper frame, said stroke arm and said stroke arm cylinder having their upper ends pivotally connected to each other at a common point;

a shovel arm assembly having its upper end pivotally connected to said stroke arm and said stroke arm cylinder at said common point;

an extendable and retractable shovel arm cylinder for pivotally moving said shovel arm assembly about said common point and having one end pivotally connected to said shovel arm assembly at a point near an end of said shovel arm assembly and having its other end pivotally connected to a fixed point relative to said upper frame;

and a shovel mounted on said shovel arm assembly near the lower end thereof.

4,103,792

FISH UNLOADING SYSTEM

Mario J. Puretic, 259 6th Ave. North, Tierra Verde, Fla. 33715

Filed Jan. 27, 1977, Ser. No. 762,854

Int. Cl.² B63B *35/14*

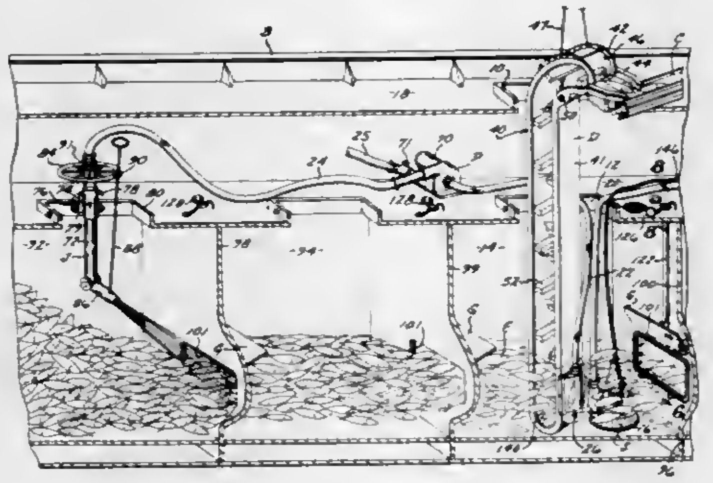
U.S. Cl. 214—152 **14 Claims**

1. A system of unloading fish from the main fish hold and auxiliary fish holds of a fishing boat through an upwardly opening main fish hold hatch, said auxiliary fish holds being connected to said main fish hold by vertically extending access hatches, said system comprising:

maintaining water in said holds at a level intermediate the elevation of said access hatches;

positioning a generally vertically extending power-driven fish-impelling device within said main fish hold with its lower portion submerged in said water, said fish-impelling device receiving fish at its lower submerged portion and discharging said fish without water upwardly through said main fish hold hatch; and

continually recirculating said water from said main fish hold through said auxiliary fish holds towards said main fish hold and back into said auxiliary fish holds so as to progressively float fish from said auxiliary fish holds through said access hatches into said main fish hold for removal by said fish-impelling device.



4,103,793

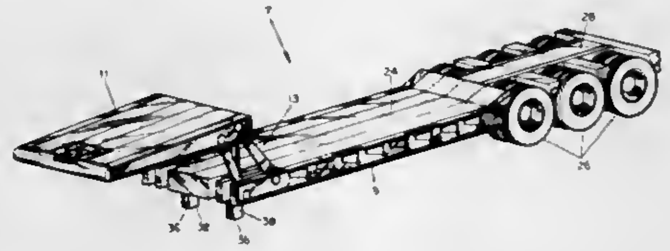
FOLDING GOOSENECK TRAILER WITH POSITIONING SYSTEM

Leslie A. Weaver, Monon, Ind., assignor to Talbert Manufacturing, Inc., Rensselaer, Ind.

Filed May 6, 1977, Ser. No. 794,537

Int. Cl.² B60P *1/20*

U.S. Cl. 214—506 **17 Claims**



9. A folding gooseneck trailer, comprising:

a main bed having ground engaging wheels at one end portion and frame means defining at least a partial substantially vertical rectangular passage in said main bed at the other end portion;

a loading bed having a king pin mounted on one end portion for adapting said loading bed to be connected with the fifth wheel of a tractor, the other end portion of said loading bed being adjacent to said main bed;

a pair of parallel links each of which is pivotally connected at opposite ends to the other end portions of said main and loading beds so that said loading bed can be raised and lowered with respect to said main bed;

an elongated element having a cross-section smaller than that of said rectangular passage in said main bed so that said element is movable in and constrained to movement in opposite longitudinal directions with respect to said element, said elongated element terminating at the bottom portion in a ground engageable foot;

a clevis plate connected to the bottom portion of said elongated element; and

a power actuated cylinder and piston assembly connected between said loading bed and clevis whereby when said piston is extended said elongated element is extended from said passage in said main bed so that said foot is in ground engagement with said other end portion of said main bed being then held in a raised position with respect to said ground by said cylinder and piston assembly and said parallel links, and whereby said piston is retracted said elongated element is withdrawn into said passage in said main bed and said loading bed is pivoted with respect to said main bed at said pair of parallel links so that said loading bed can assume a lowered position to act as a ramp for loading and unloading from said main bed.

4,103,794

BALE MOVER

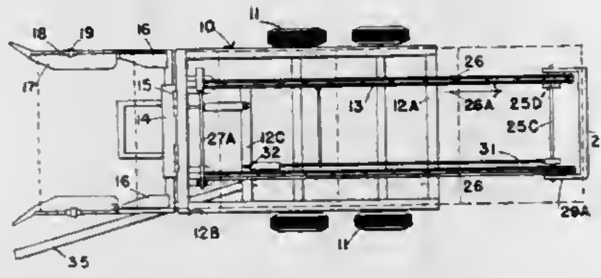
Robert Shaw, Killarney, Canada, assignor to B & K Industries Ltd., Killarney, Canada

Filed Jun. 29, 1976, Ser. No. 700,748

Claims priority, application United Kingdom, Feb. 20, 1976, 06801/76

Int. Cl.² B60P *1/38*

U.S. Cl. 214—518 **25 Claims**



1. A bale-mover adapted to load, transport and unload large cylindrical bales of hay, straw and the like and adapted to be towed and operated by a source of power including a source of hydraulic fluid under pressure; said bale mover comprising in combination a substantially rectangular chassis, means mounting said chassis for movement across the ground, hitch means for connecting the associated source of power to the chassis, conveyor means operatively mounted upon said chassis, said conveyor means including an endless conveyor for moving the associated bales from the front of the chassis towards the rear thereof and a pair of arm components pivoted by one end thereof to the front end of the chassis, means on said arm components to detachably engage said components one into each end of an associated bale whereby said bale is clamped between said arms, means to raise said arm components through an arc thereby lifting the associated bale engaged by said arm components, through an arc and depositing said bale transversely upon said conveyor means adjacent the front end thereof, means operatively connected between said arm components and said conveyor means to move said conveyor means incrementally, together with any bales thereon, towards the rear of said chassis each time said arm components are actuated and stop means intermediate the ends of said conveyor means to initially retain the associated bale on the front end of said conveyor means until said conveyor means move rearwardly upon actuation of said arm components.

4,103,795

LIFTING AND LOADING DEVICE

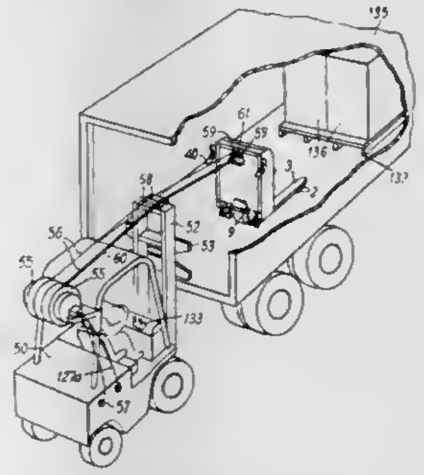
Dennis M. Miller, Andover, England, assignor to Automatic Container Loading Limited, England

Continuation-in-part of Ser. No. 534,446, Dec. 19, 1974, abandoned. This application Jun. 18, 1976, Ser. No. 697,448

Int. Cl.² B66F *9/14*

U.S. Cl. 214—621 **30 Claims**

1. The combination of a power deriven lift truck and an auxiliary lifting and loading device wherein said auxiliary lifting and loading device is detachable from said lift truck and is individually operable from said lift truck; the improvement wherein said lift truck is provided with a vertically movable lifting assembly of the type including a lifting member having an upper horizontally extending edge; and said auxiliary lifting and loading device including a horizontally extending lower part having support wheel means and support elements and height adjustment means for raising and lowering said lower part in relation to said support wheel means and said support elements, and a vertically extending upper part connected to said lower part, said upper part having transversely spaced hook elements for vertical movement therewith, said hook elements being configurated for interlocking engagement over said lifting member upper horizontally extending edge for releasably suspending said auxiliary lifting and loading device therefrom, said lifting member upper horizontally extending edge having a rearwardly facing portion which is oblique to a vertical plane and each of said hook elements having a horizontally extending portion and a downwardly extending portion, part of said horizontally extending portion having a downwardly facing surface which is oblique to a vertical plane for engagement over said oblique rearwardly facing portion on said lifting member when in interlocking engagement therewith to urge said upper part against said lifting member, rollable support means carried by said support elements for cooperation with said support wheel means for supporting said auxiliary lifting and loading device independently of said lift truck, means for extending and retracting said rollable support means in response to operation of said height adjustment means for raising and lowering said lower part, a support frame carrying said support wheel means, a lifting frame guidably carried by said support frame, and lift means extending between said support frame and said lifting frame for vertically moving and positioning said lifting frame relative to said support frame, a lower portion of said lifting frame providing said horizontally extending lower part of said auxiliary lifting and loading device and carrying said rollable support means and also having an upper portion which provides said vertically extending upper part of said auxiliary lifting and loading device and carrying said hook elements.



4,103,796

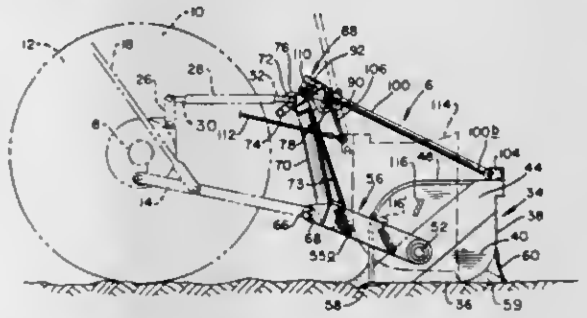
BUCKET ATTACHMENT FOR TRACTORS

Kenneth H. Hare, Rte. 5, Box 334-A, Greenville, Tex. 75401

Filed Jan. 3, 1977, Ser. No. 756,113

Int. Cl.² E02F *3/00*

U.S. Cl. 214—766 **11 Claims**



1. Apparatus to attach a bucket to a hitch on a tractor comprising: a bucket having a rear wall and a bottom spaced between two sidewalls; a frame; means securing the frame to the hitch on the tractor; means pivotally securing the bucket to the frame; a sleeve; means pivotally securing the sleeve to the frame; a rod slideably disposed through the sleeve; means pivotally securing a first end of the rod to the upper rear wall

of the bucket such that as the bucket pivots on the frame the rod slides within the sleeve; a stop member pivotally secured over the upper end of the sleeve arranged to limit the upward movement of the rod in the sleeve; means to move the stop member from a position over the upper end of the sleeve and rod to a position away from the upper end of the rod allowing passage of the rod upwardly through the sleeve as the bucket pivots in the frame to dump the contents of the bucket.

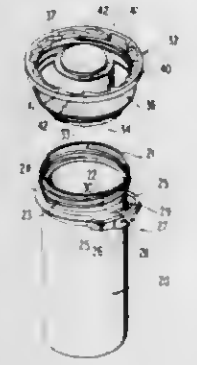
4,103,797
TIGHTLY CLOSED SAFETY CAP AND VIAL

Glenn H. Morris, 4203 Highwood Dr., Chattanooga, Tenn. 37415

Continuation-in-part of Ser. No. 690,962, May 28, 1976, Pat. No. 4,036,385. This application Feb. 10, 1977, Ser. No. 767,288

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—209 **9 Claims**



1. In a container, a container body having a mouth provided with internal and external screw-threads, a reversible closure for the container having an externally threaded plug body and an opposite end internally threaded skirt, the threads of the plug body being engageable with the internal screw-threads of the container mouth in one position of use of the closure and the threads of the skirt being engageable with the external screw-threads of the container mouth in a second position of use of the closure, and first and second oppositely facing wedge sealing rings on the closure, one wedge sealing ring engaging the exterior of the mouth of the container in said one position of use of the closure and forcing the internal screw-threads of said mouth into tight compressive engagement with the external threads of said plug body, and the other wedge sealing ring engaging within the container mouth in the second position of use of the closure and forcing the external screw-threads of said mouth into tight compressive engagement with the internal threads of said skirt.

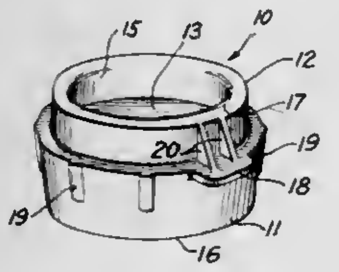
4,103,798
COMBINATION CAP

Richard H. Moeller, Arlington Heights, Ill., assignor to G. M. Tool Corporation, Elk Grove Village, Ill.

Filed Jun. 20, 1977, Ser. No. 808,109

Int. Cl.² B65D *51/00*

U.S. Cl. 215—305 **1 Claim**



1. A combination cap to recap a container from which a non-reusable cap has been removed comprising,

a generally cylindrical hollow body having,

a first end having a generally cylindrical inner surface defining a first cup-shaped space and a second end having a general frusto-conical inner surface tapering inwardly toward its open end and defining a second cup-shaped space therein,

said first end and said second end adjacent said first end having substantially the same diameter,

an intermediate web in the form of a relatively thin, circular disk integrally attached at its outer periphery to the inner periphery of said inner surfaces and disposed between said first end and said second end forming a partition between said cup-shaped spaces,

said first end having internal threads thereon for engaging the threaded top of a threaded container,

said second end being adapted to receive an end of a snap-on type container,

the inner surface of said second end tapering inwardly from said intermediate web toward an outer edge of said second end in the shape of the frustum of a cone to a position adjacent said outer edge then curving outwardly toward said outer edge,

an annular radially-extending shoulder on said cap,

said shoulder being disposed in a plane substantially coextensive with the side of said web adjacent said second end,

the outer surface of said cap tapering inwardly from said shoulder toward an outer edge of said first end and terminating at said outer edge and having a first outside surface formed generally in the shape of a frustum of a cone,

the outer surface of said cap between said shoulder and said outer edge of said second end being in the shape of a cylinder,

a tab integrally attached to said cap and extending radially outwardly therefrom,

said tab having a flat surface forming a continuation of said shoulder and two spaced gussets attached to said outer surface adjacent said second end and attached to the surface of said shoulder and said surface of said tab forming a continuation of said shoulder to a position spaced inwardly from the outside edge of said tab, and circumferentially-spaced, axially-extending ribs on said first outer surface.

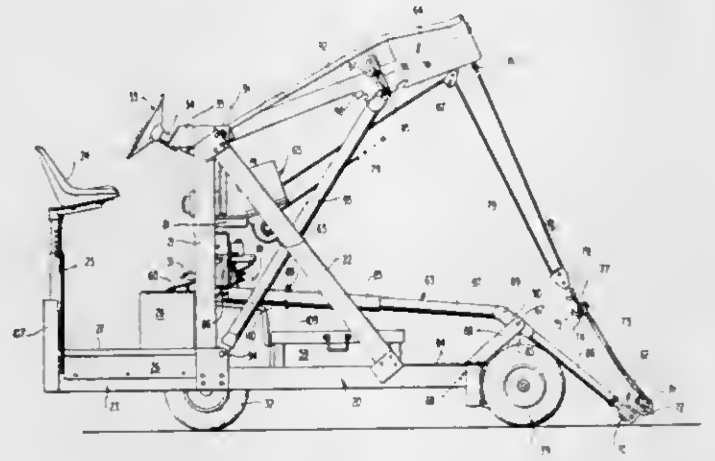
4,103,799
MULTI-PURPOSE WORKING VEHICLE

Hector R. Perez, HN-22 El Comandante Ave., Country Club, Rio Piedras

Filed Jul. 20, 1977, Ser. No. 817,261

Int. Cl.² B60P *3/12*

U.S. Cl. 214—86 A **18 Claims**



1. A working machine comprising a wheeled frame including steering and power driving means, a main elevated lifting boom on said frame, winch and cable lifting means associated with the boom, a hitch means and an associated load and hitch positioning means on the wheeled frame substantially below said boom, fore and aft vertically swingable links pivoted to the wheeled frame near its front and sides, common pivot

means connecting the tops of said links with said hitch and positioning means, means on the hitch means forwardly of said common pivot means for lifting the hitch means and adapted for connection with the winch and cable lifting means, said positioning means having a rear end pivoted to said wheeled frame substantially rearwardly of said links and said positioning means including forwardly extensible and rearwardly retractable interfitting parts, and a multi-position abutment element placeable at selected positions on said positioning means and adapted to positively limit retraction of the positioning means while allowing free forward extension of such means.

4,103,800
BACKING MATERIAL

Donald P. Lomax, 706 S. Waterville Lake Rd., Oconomowoc, Wis. 53066, and Ronald M. Boggs, Rte. 1, Box 56F, Mukwonago, Wis. 53149

Filed Apr. 28, 1977, Ser. No. 792,007

Int. Cl.² B32B *15/18;* **B65D** *25/14*

U.S. Cl. 138—145 **2 Claims**

1. In combination, a low alloy nickel-manganese steel cylinder and a lining centrifugally cast onto the inner surface of said cylinder consisting of a wear and corrosion resistant alloy, said steel cylinder being composed essentially of the following elements in the weight percentage composition stated below:

Ingredient	Weight Percent
Carbon	0.18–0.23
Manganese	0.70–0.90
Silicon	0.20–0.35
Chromium	0.40–0.60
Nickel	0.40–0.70
Molybdenum	0.15–0.25
Iron	Balance.

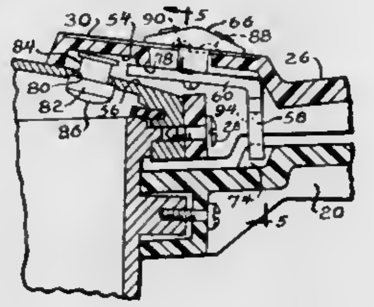
4,103,801
PRESSURE COOKER WITH MANUALLY-OPERATED COVER INTERLOCK

Duane Hubert Walker, Fall Creek, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.

Filed Aug. 15, 1977, Ser. No. 824,421

Int. Cl.² B65D *51/16, 45/00*

U.S. Cl. 220—203 **12 Claims**



1. A pressure cooker comprising a body having an open top and a cover which removably seals over said open top, said body and cover each having a handle and means which are brought into engagement with rotation of the cover to a position where the cover and cooker body handles align one over the other to secure the cover to the cooker body in a sealed relation, the cover being rotatable out of said position to a further position where said means disengage to permit assembly and removal of the cover; the cover having a vent opening and a sealing plug loosely supported therein which rises through this vent opening to seal the vent opening with pressure buildup in the cooker, and the cover handle having a movable lock which catches with the cooker body handle in one position when the handles are aligned to inhibit rotation of the cover, the lock being movable to a second position where it is free of the cooker body handle to permit cover rotation, the sealing plug when raised through the vent opening being positioned to bar movement of the lock out of its position where it catches with the cooker body handle.

4,103,802
CLOSURE FOR A CONTAINER

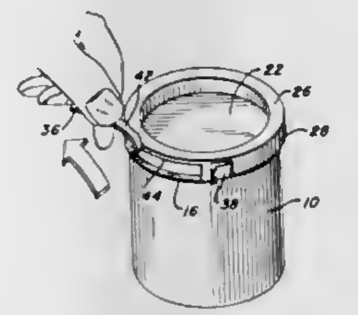
Lars-Eric Piltz, Dalby, and Jan-Bertil Jeppsson, Lomma, both of Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

Filed Nov. 29, 1977, Ser. No. 855,558

Claims priority, application Sweden, Dec. 6, 1976, 7613640

Int. Cl.² B65D *51/22*

U.S. Cl. 220—258 **19 Claims**



1. A closure for sealing an opening of a container, comprising:

a sealing member for sealing the opening of said container,

a cover to be attached to said container for closing said opening,

means for attaching said sealing member to said container and for supporting said sealing member on the inside surface of said cover,

said cover including a flange attached to the external wall of said container, and

said flange including a weakened area forming a tear strip for removing said cover from said container.

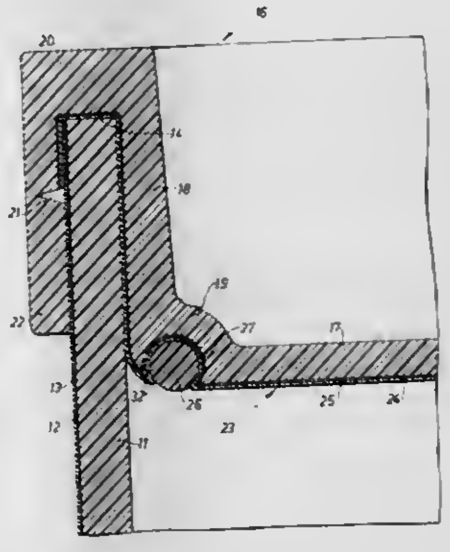
4,103,803
TAMPERPROOF CONTAINER AND CAP ASSEMBLY

Ronald T. Irvine, Leominster, Mass., assignor to Modern Tool & Die Co., Inc., Leominster, Mass.

Filed Apr. 18, 1977, Ser. No. 788,301

Int. Cl.² B65D *41/32*

U.S. Cl. 220—270 **4 Claims**



1. A tamperproof container and cap assembly including a container having a sidewall with a top rim defining an opening,

the improvement comprising: a peripheral flange extending radially from the sidewall; a cap comprising a top closure surface, an inner wall, a top wall and an outer wall, said inner wall, top wall and outer wall having an inverted U-shape and being located for engagement with said rim; said outer wall having a distal end which vertically overlies and is located adjacent said container flange when the cap is in its closed position on the container, with the cap and distal end being positioned to prevent access to the cap for removal; said outer wall defining a frangible section having a cross-sectional dimension that is smaller than the cross-sectional dimension of the major portion of said outer wall, a peripheral cap-engaging bead extending radially from said container rim above said peripheral flange; said outer wall defining an internal shoulder for cooperation with said cap-engaging bead and being located intermediate said frangible section and said distal end; said frangible section being located for positioning adjacent said cap-engaging bead when the cap is in its closed position on the container; a pair of spaced lugs carried by said outer wall, a frangible membrane coupling said spaced lugs to said outer wall frangible section, said lugs being spaced a sufficient distance to permit the insertion of a tool which may be operated to force said lugs apart thereby breaking said frangible membrane, with one of said lugs forming a pull tab, said pull tab being operative when pulled to cause removal of the portion of the outer wall between the frangible section and the distal end, thereby allowing access to the cap for removal.

4,103,804

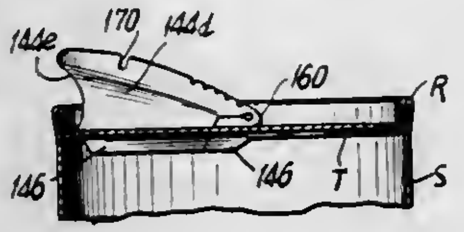
CLAMP ACTION SEALING DEVICE FOR TAB OPENING CANS

Erick-Pierre Fournier, and Ethel V. Hill, both of 30 Park Ave., New York, N.Y. 10016

Filed Oct. 6, 1975, Ser. No. 620,180

Int. Cl.^{2} B65D *39/16*

U.S. Cl. 220—281 **7 Claims**



1. A reusable, flexible resilient closure for sealing a can top aperture having a generally triangular shape which comprises: a manually grippable handle portion having a flange at its lower portion, said flange having a shape generally corresponding to but larger in dimension than said can aperture, sealing means depending from said flange and arranged to cooperate with said flange to form a seal with part of said can top aperture; and the handle defining a deep internal cavity open to the bottom of the closure such that said closure may be flexed laterally when manual pressure is applied thereto to facilitate insertion and removal of the closure and to apply lateral sealing force when the closure is inserted in the aperture; an anchor portion hinged to one end of said handle and nestable therebeneath and having a depending sealing lip, which defines a groove with the anchor portion, said sealing lip and groove being arranged to cooperate with said sealing means to complete the seal between said closure and said aperture, said groove being tapered from the free end of the anchor portion to provide a can top entrance, whereby the anchor portion may be slid into and engage the edges of said can aperture and retaining said closure on the can top during use.

4,103,805

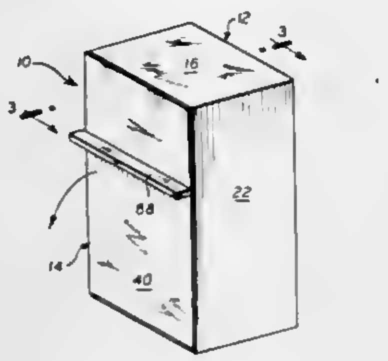
CONTAINER

Sidney Silverstein, Flushing, N.Y., assignor to Pearl-Wick Corporation, Long Island City, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,139

Int. Cl.^{2} B65D *43/20, 85/56*

U.S. Cl. 220—331 **7 Claims**



1. A container comprising,

(a) a housing having a top wall, a bottom wall, a rear wall, a pair of side walls and a front opening,

(b) a closure comprising a panel having compartment defining means secured thereto, at the inner side thereof,

(c) cooperating means on said housing and closure for releasably securing said closure to said housing and for permitting said closure to pivotally move with respect to said housing from an opening position thereof in which there is access to said compartment defining means to a closing position thereof in which said panel covers said housing front opening and said compartment defining means is disposed inwardly of said housing,

(d) said compartment defining means comprising a pair of side walls extending from opposite sides of said panel, a top wall and an end wall extending between said side walls, and a front opening opposite said end wall, the bottom edge of said end wall being spaced from the bottom edge of the panel to define a slot therebetween, and

(e) said cooperating means comprising a lip extending upwardly of the front edge of said housing and adapted to be inserted in said slot so as to seat the bottom edge of the end wall within the juncture of the lip and housing whereby said closure is pivotally movable with respect to the housing.

4,103,806

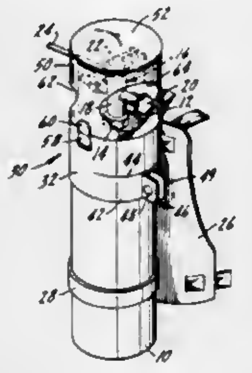
VALVE GUARD FOR PROTECTING THE REGULATOR VALVE ON A SCUBA TANK

E. Vernon White, 2 Circle Dr., Apt. 6, Florence, Ky. 41042

Filed Jan. 3, 1977, Ser. No. 756,324

Int. Cl.^{2} B67B *7/24*

U.S. Cl. 222—3 **6 Claims**



1. A valve guard for protecting a regulator valve assembly of an air tank for a self-contained underwater breathing apparatus from damage and abuse during both storage and use, the air tank being of substantially cylindrical configuration and including a semispherical end having a boss located centrally thereof with the valve assembly received therein and projecting axially therefrom, the valve guard being releasably secured to and supported solely by the air tank and comprising:

a. an elongate, hollow, cylindrical base portion for receiving the semispherical end of the tank and for engaging the cylindrical portion of the tank adjacent to said semispherical end, said base portion including an upper end terminating in a bearing surface which projects radially of the cylindrical base portion;

b. tightening means carried by the base portion for selectively securing the base portion to the cylindrical portion of the tank by increasing the friction-gripping force therebetween; and

c. a protective cap releasably secured to the base portion and projecting axially outward from the semispherical end of the tank, said cap of hollow, substantially cylindrical configuration conforming to and disposed in alignment with the cylindrical base portion and having a closed outer end for enveloping and shielding the regulator valve assembly, the cap including through apertures in the cylindrical portion thereof for permitting ready access to the regulator valve assembly, said cap being movable between an open, valve-assembly-exposing position and a closed bearing-surface-engaging position, wherein said cap is in abutting engagement with said bearing surface when in the closed position; and

a locking device mounted on said cap for selectively locking the cap in the closed position relative to the base portion.

4,103,807

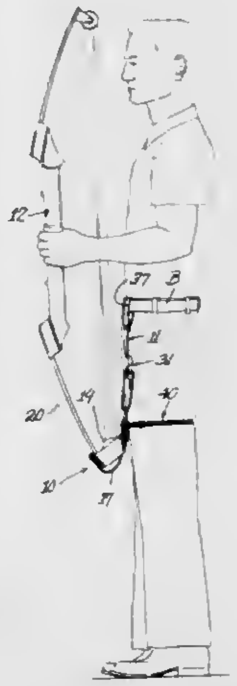
COMPOUND BOW HOLSTERS

John A. Lyon, 4745 Damon Ave., and Robert E. Whyel, Jr., 819 Rex Blvd. NW, both of Warren, Ohio 44485

Filed Mar. 7, 1977, Ser. No. 774,930

Int. Cl.^{2} F41B *5/00*

U.S. Cl. 224—1 R **7 Claims**



1. An accessory to be worn by an archer for supporting a compound bow which includes a handle, limbs extending from opposite ends of the handle, and a wheel at the end of each limb over which the draw string is trained, the accessory comprising:

a holster of a size and shape to receive one said wheel and the adjoining portion of a limb at one end of the bow, said holster including a pair of flexible straps;

one said strap extending generally vertically and defining a U-shaped curved configuration having upstanding portions and having width sufficient to define a cradle to engage and support said bow wheel and limb, said one strap terminating at one upper end in a connecting portion;

the other said strap disposed generally in a plane transverse to said one strap and inclined from the vertical when said holster is in normal use, said other strap defining a loop respectively connected at generally opposed portions thereof to said upstanding portions of said one strap, one said upstanding portion being disposed adjacent an end of said one strap and the other upstanding portion being disposed adjacent said upper end and between said connecting portion and said cradle;

said other strap thereby defining side guards for the cradle to prevent lateral dislodgement of said bow therefrom, and, supporting means extending from and secured to said one strap connecting portion and including:

(1) adjustable belt strap means for securement to the waist of the archer thereby to support pendently substantially the entire weight of the bow when holstered, and,

(2) detachable leg strap means for securement to the leg of the archer adjacent said holster thereby to maintain said holster substantially laterally stable when so secured,

whereby holstering said bow with both said belt strap means and said leg strap means secured provides a substantially rigid bow support for target and like standing position purposes of the archer, while holstering said bow with said belt strap means secured and with said leg strap means detached permits weight support of said bow with lateral flexibility of said holster for transport, crouching, setting and like activities of the archer.

4,103,808

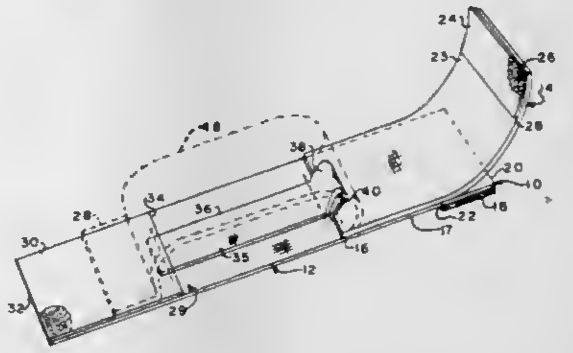
WATCHBAND

Edward L. Hallman, 707 Ridge St., Copperas Cove, Tex. 76522, and Arthur E. Hallman, Jr., 6207 Cricket La., Columbus, Ga. 31904

Filed Aug. 12, 1977, Ser. No. 823,984

Int. Cl.^{2} A45C *11/10*

U.S. Cl. 224—4 D **1 Claim**



1. A watchband comprising:

first, second, and third flaps of relatively flat flexible material meeting along and attached together at a common junction, said second flap being shorter than said third flap;

attachment means extending for a selected distance from adjacent said common junction and positioned on a first side of said first flap for attaching a watch to said first flap;

a first Velcro surface of a first character on said first side of said first flap and extending substantially between an end of said first flap and said attachment means;

a second Velcro surface of a second character extending from the end of said second flap along said second flap, and said second surface of Velcro being on a side of said second flap adapted to mate with said first flap without folding when the first and second flaps together encircle a wrist of a wearer with said first side of said first flap facing outward and said second Velcro surface facing inward;

a third Velcro surface of a second character affixed to an end region of said third flap and being on a side of said third flap,

- wherein when said third flap is extended in a first direction over said attachment means, said first and third Velcro surfaces may be engaged and attached without folding;
- whereby when said first and second flaps are in an encircling configuration around the wrist, a watch held by said attachment means may be securely covered by said third flap; and
- whereby when said third flap is extended in an opposite direction over said second flap, and the end region of the third flap having the third surface thereon is folded back, said third surface and said first surface may be engaged and attached enabling the watch to be viewed without interference from the third flap.

4,103,809
PILOT'S KNEEPAD

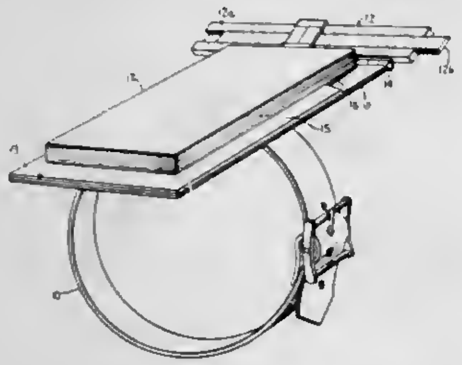
Richard Butler Frost; Joseph Laszlo Jubasz, and Barry Walter Wing, all of Sydney, Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Jun. 7, 1977, Ser. No. 804,433

Claims priority, application Australia, Jun. 15, 1976, PC6275/76

Int. Cl.^{2} A45C ***11/00***

U.S. Cl. 224—5 R **4 Claims**



1. A pilot's kneepad comprising, first plate means carrying permanent indicia on an upper surface thereof for use in navigational calculations, means connected with said first plate means for attachment of the kneepad to the upper surface of a seated pilot's thigh to lie flat thereon, a second plate means overlying said first plate means, said second plate means being hingedly connected to said first plate means along one edge thereof for movement of said second plate between a closed position in which said upper surface of said first plate means and a lower surface of said second plate means are in face-to-face relation and an open position, means carried on an upper surface of said second plate means for attachment of a writing pad thereto, and permanent indicia carried on the lower surface of said second plate means for use in navigational calculations whereby said permanent indicia on said upper surface of said first plate means and on said lower surface of said second plate means are readily available for view and use by the pilot when said second plate means is in the open position, and whereby a writing pad attached to said upper surface of said second plate means is in position for use by the pilot when said second plate means is in the closed position.

4,103,810
PACKAGING OF GOODS ON A VEHICLE

Christopher Daniel Dowling Hickey, 5, Heathside, Hinchley Wood, Esher, Surrey, England

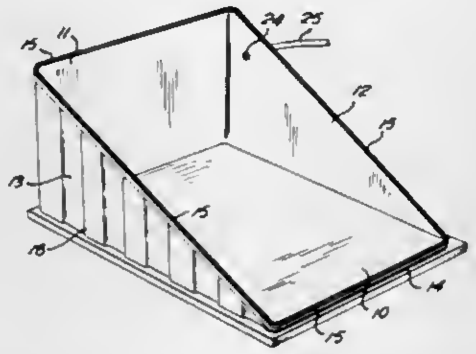
Filed Aug. 13, 1976, Ser. No. 714,285

Claims priority, application United Kingdom, Sep. 18, 1975, 34286/75

Int. Cl.^{2} B60R ***9/00***

U.S. Cl. 224—29 R **2 Claims**

1. A vehicle having a container mounted thereon, which container comprises a lower portion having a substantially rectangular base of rigid impermeable material secured to the vehicle, upright front, rear and side walls of rigid impermeable material extending upwardly from the periphery of the base to form a continuous enclosure, the front wall having a uniform height which is greater than the uniform height of the rear wall and the side walls each having a height at the front end equal to that of the front wall and, at the rear end equal to that of the rear wall, the side walls sloping uniformly downwardly along a flat plane from front to rear, said walls having a groove in their top edges forming a continuous channel around the upper edge of said lower portion, said container further comprising an impermeable flexible envelope having an opening with a periphery of length equal to the length of said channel and adapted to fit in said channel, an inflatable tubular seal on the periphery of the opening in said envelope and extending along the length of the periphery of said opening for effecting an airtight seal between the envelope and said lower portion, and one-way valve means in an air extraction duct through said lower portion to permit of extraction of air from within said container.



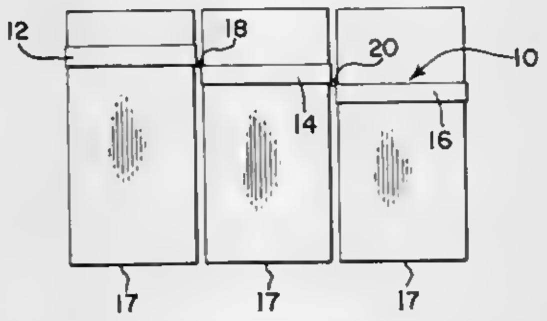
4,103,811
ARTICLE CARRIER AND METHOD OF MAKING SAME

Ronald C. Owen, Harwood Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 360,081, May 14, 1973. This application Oct. 14, 1975, Ser. No. 622,049

Int. Cl.^{2} B65D ***71/00***

U.S. Cl. 224—45 AA **3 Claims**



1. A carrier for a plurality of articles such as containers comprising a plurality of adjacently disposed annular sections of flexible expansible material for carrying articles each section having an upstanding wall having a height greater than its thickness but substantially less than its diameter and having upper and lower margins, and junction elements joining adjacent sections to each other along segments of their adjacent margins when said sections are unfolded in side-to-side relationship for carrying said articles, said sections including at least an intermediate section and additional sections adjacent thereto, said junction elements including a first junction element joining the upper margin of said intermediate section with a lower margin of one adjacent section and a second junction element joining a lower margin of the intermediate section with an upper margin of another of said adjacent sections whereby said junction elements provide for axial offset configuration of said sections.

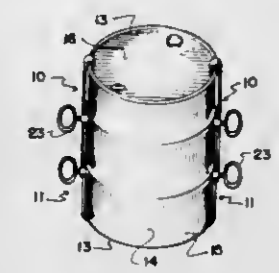
4,103,812
BARREL CARRIER

Henry William Steiner, Box 18, Site 19, R.R. #1, Dryden, Canada

Filed Jun. 17, 1977, Ser. No. 807,543

Int. Cl.^{2} B65D ***71/00***

U.S. Cl. 224—45 P **1 Claim**



1. A barrel carrier for use with barrels having a cylindrical wall with upper and lower rims joining the upper and lower ends of the barrel and the upper and lower ends of the cylindrical wall respectively; comprising in combination a pair of flat, strap type bars, retainer bracket means rigidly attached on each of said bars adjacent one end thereof, each of said bars being slidably engageable within the retainer bracket means of the other of said bars whereby said bars may be adjusted lengthwise one relative to the other, a barrel rim engaging jaw formed intergrally upon the other end of each of said bars, a clamping bolt on each retainer bracket means, operatively engaging between said retainer bracket means and the strap bar slidably passing therethrough, to clamp the bars in the desired relationship, and a hand engaging handle on each of said clamp bolts rigidly secured thereto, to actuate said clamp bolts and to assist in the grasping of said carrier to lift the barrel to which said carrier is attached.

4,103,813
SEALING OF CONTROLLED-ATMOSPHERE CONTAINERS BY MAGNEWELDING

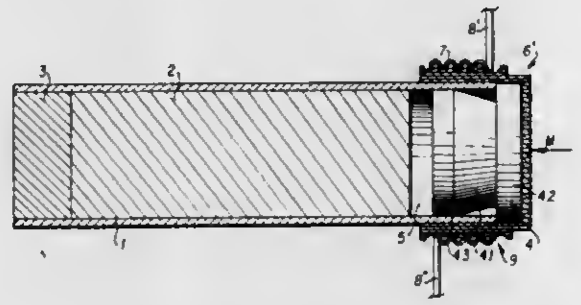
René Pierre Debeir, Osmate (Varese), Italy, assignor to European Atomic Energy Community (Euratom), Luxembourg

Filed Aug. 20, 1976, Ser. No. 716,351

Claims priority, application Luxembourg, Aug. 21, 1975, 73231

Int. Cl.^{2} B23K ***21/00***

U.S. Cl. 228—2.5 **5 Claims**



1. A sealing cap for facilitating the magnewelding of the end of a tubular container by means of an exploding coil, said cap comprising:

- a tubular wall structure and an end surface, said tubular wall structure and said end surface being made of elastic material and defining said cap and being adapted to be force-fitted over said end of said tubular container in a tight-sealing relationship therewith;
- said tubular wall structure including a plurality of circumferential grooves containing therein windings of said exploding coil, said grooves serving to fix the number of windings surrounding said tubular wall structure, the relative spacing of the windings and the pitch of said windings, said grooves further serving when said cap is force-fitted over said end of said tubular container to fix the location of said windings with respect to said tubular container.

4,103,814
CHIP BONDING UNIT

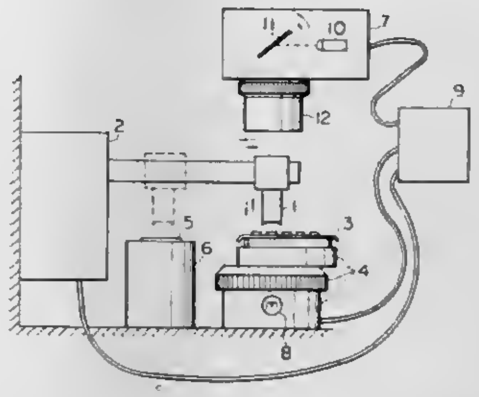
Hideya Nishioka, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed May 6, 1976, Ser. No. 683,730

Claims priority, application Japan, Oct. 5, 1975, 50-56621

Int. Cl.^{2} H01L ***21/60***

U.S. Cl. 228—6 A **10 Claims**



1. A chip bonding unit including a collet for holding a semiconductor chip having a silhouette, a mounting bed for mounting semiconductor chips, and a working table for holding a base plate to which the chip is to be attached, said collet having variable relative positions with respect to said mounting bed and said working table, respectively; said unit further comprising:

- a light source for generating a light beam and for scanning the surface of said chip therewith so as to define a scanning line, and a light receiving element on a side of said chip remote from said light source for receiving said light beam so as to detect, by non-reception of light, the silhouette of said chip;
- means for controlling the relative position of said collet and chip in accordance with said detection of said silhouette so that said chip comes to a normal position relative to said collet;
- means responsive to said chip being at said normal position for actuating said collet to pick up said chip; and
- means for controlling the relative position of said collet and said working table so as to place said chip in a predetermined position relative to said working table, and including means for attaching said chip to said base plate;
- said means for controlling the relative position of said collet and said chip including means for rotationally reorienting said chip relative to said collet so that one of the diagonals extending from one corner to the opposite corner of said chip coincides with said scanning line defined by said surface scanning of said light source.

8. In a chip bonding unit for bonding semiconductor chips having a predetermined silhouette, wherein each successive chip to be bonded is opaque to light and is disposed in a pickup area prior to pickup for bonding by a collet also having said predetermined silhouette, each successive chip being further disposed in said pickup area so that the center of each successive chip coincides with the center of said pickup area; an apparatus for rotatably adjusting the orientation of each successive chip in said pickup area, comprising in combination:

- a mounting bed rotatable about a fixed vertical axis and having an overlying adjustable sheet for holding said chips to be bonded, said vertical axis defining the center of said pickup area on said sheet;
- means for laterally scanning said pickup area with a light beam along at least one predetermined axis thereof;
- means for receiving said light beam and responsive thereto for producing an output signal waveform indicating the

positioning of said chip in the light beam path in said pickup area;

control circuit means responsive to said output signal waveform for correlating the orientation of said chip in said pickup area with the orientation of said collet to issue a control signal indicating a rotational difference between the orientation of said chip and the orientation of said collet; and

motor means coupled to said control circuit means and operatively associated with said mounting bed for rotating said mounting bed about said fixed axis to adjust the orientation of said sheet in accordance with said control signal from said control circuit means, whereby to adjustably reduce the rotational difference between the orientation of said chip and the orientation of said pickup area.

4,103,815

GAS PRESSURE WELDING SYSTEM

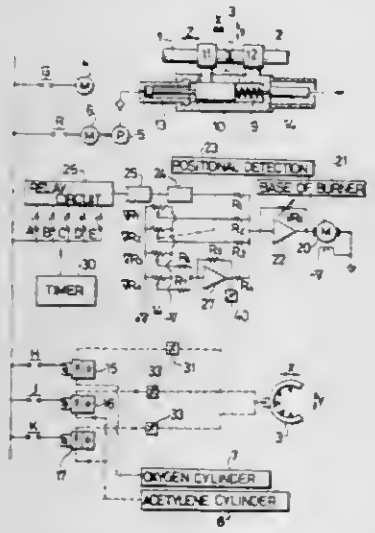
Takao Yokokawa, Tokyo; Shigeo Takano, Machida; Yasuaki Ichinose, Sayama; Toshiyuki Kasahara, Hino, and Fumiaki Ikeda, Nishinomiya, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 674,558, Apr. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,748

Claims priority, application Japan, May 26, 1975, 50-62615; Apr. 7, 1975, 50-42074

Int. Cl.^{2} B23K *19/00*

U.S. Cl. 228—9 **9 Claims**



1. An automatic gas pressure welding system comprising:

means for causing the ends of a couple of steel bars to be butted to each other by pressing of said steel bars;

means for heating the vicinity of the butted portion of said steel bars;

means for controlling the action of said pressing means and that of said heating means; said control means comprises the following items:

means for detecting that the amount of contraction of said bars has reached a preset value of δ_2 and thereafter stopping a primary pressing action of said pressing means, provided that a designated time has elasped.

means for starting a secondary pressing stage in the wake of the stop of the pressing by said pressing means;

means for stopping heating by said heating means, when the amount of contraction of said steel bars reaches the preset value of δ_3 while the pressure continues to provide a tertiary pressing action; and

means for stopping the tertiary pressing action of said pressing means, when the amount of contraction of said steel bars reaches the preset value of δ_4.

4,103,816

METHOD AND DEVICE FOR WELDING CYLINDRICAL ELEMENTS TO ONE ANOTHER

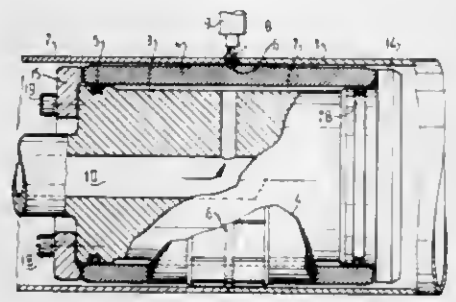
Christiaan Gustaaf Adolf Scholtus, Oudorp; Eduard Lijbrink, Bergen; Franciscus Alexander Theodorus Meijer, Egmond a d Hoef, and Antonius Ruiter, Schagen, all of Netherlands, assignors to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed Oct. 24, 1975, Ser. No. 625,474

Claims priority, application Netherlands, Oct. 25, 1974, 7414020

Int. Cl.^{2} B23K *37/04*

U.S. Cl. 228—49 **7 Claims**



1. A device for welding cylindrical elements which comprises:

an elastic ring being accommodated in a sleeve such that a space exists laterally between said ring and said sleeve;

means for introducing a pressurized medium into said space;

said ring, sleeve and space between said ring and sleeve being specially arranged such that when the pressurized medium is introduced into said space, said ring is displaced laterally so as to engage and align both of the cylindrical elements to be welded by placing radial pressure to said elements near the site of welding; and

said sleeve being thicker adjacent the center of the sleeve than at its ends, the open surface of the sleeve extending from the ends of the sleeve to the thicker section being recessed, said extended recessed sections comprising at least 50 percent of the sleeve length.

4,103,817

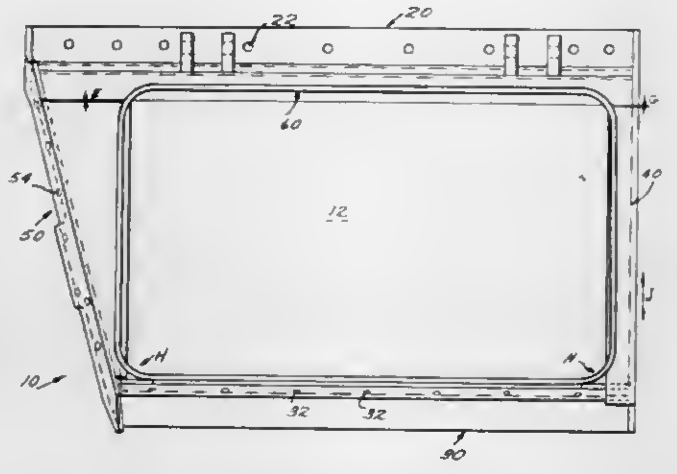
RAILWAY HOPPER CAR DOOR FRAME ASSEMBLY

Thomas G. Spatig, Huntington, W. Va., assignor to The Chesapeake and Ohio Railway Company, Cleveland, Ohio and The Baltimore and Ohio Railroad Company, Baltimore, Md.

Filed Jul. 3, 1975, Ser. No. 592,862

Int. Cl.^{2} B23K *31/02, 37/04;* **B61D** *7/18, 7/72*

U.S. Cl. 228—173 C **4 Claims**



1. A method of constructng a railway hopper car door frame assembly having a vertical and a horizontal dimension comprising the steps of

(a) forming opposed top and bottom components, two opposed side components and a door closure surface forming member, of plate steel, individual components of one pair of opposed components each being of a predetermined length,

(b) placing said top, bottom, and side components in position to be assembled, one of said dimensions of said assembly to be formed being defined by said predetermined lengths of said one pair of opposed components,

(c) adjusting said other dimension of said assembly to be formed by moving adjoining components relative to each other in said other dimension,

(d) welding said components together along two surfaces of engagement therebetween each,

(e) bringing said door closure surface forming member into engagement with receiving surfaces on said top, bottom, and side components,

(f) adjusting said door closure surface forming member with respect to said top, bottom, and side components, and

(g) welding said door closure surface forming member to the respective receiving surfaces of said top, bottom and side components.

4,103,818

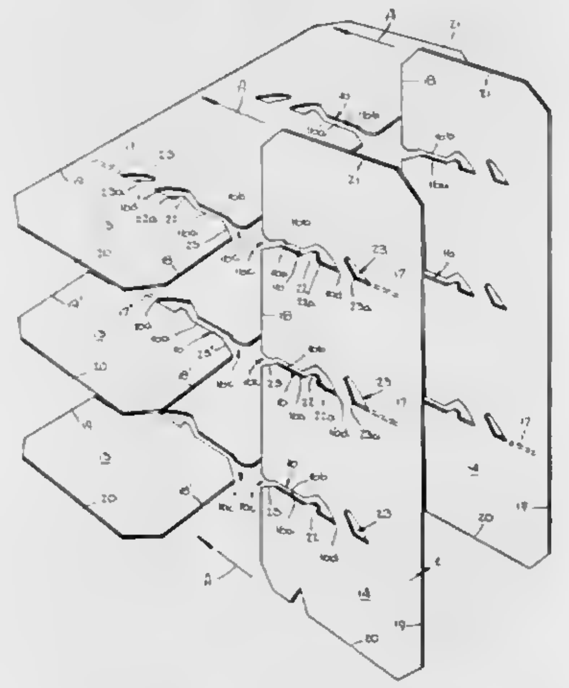
CARTON DIVIDER

Wallace O. Raubenheimer, R.D. #2, Guinea Hollow Rd., Lebanon, N.J. 08833

Filed Mar. 23, 1977, Ser. No. 780,517

Int. Cl.^{2} B65D *5/48*

U.S. Cl. 229—15 **15 Claims**



1. A collapsible carton divider having at least one substantially planar partition and one substantially planar cross-partition interlocked therewith along an imaginary line of intersection between their respective planes, each said partition and cross-partition having parallel and opposite first and second edges and partition interlock means for interlocking with each partition which interlocks therewith, each said partition interlock means comprising means defining an open-ended slot having opposite side edges extending inwardly from said first edge thereof and being spaced apart a distance which is substantially greater than the thickness of the partition and a closed-end thereof located intermediate said first and second edges of the partition, a surface portion aligned with said slot and which determines, and extends beyond, said closed end of the latter towards said second edge of the partition, means defining a locking tab projecting from one of said side edges of said slot and providing a first abutment edge facing away from the open end of said slot, and means defining a tab-receiving opening within said surface portion and providing a second abutment edge aligned with said first abutment edge and also facing away from the open end of said slot, said surface portion on each of said interlocked partitions being received in said slot of its interlocked partition and said locking tab on each of said interlocked partitions being received in said tab-receiving opening of its interlocked partition, said interlocked partitions being pivotable in either direction along all of said lines of intersection whereby said divider may be pivoted from an open condition thereof defined by a substantially angular disposition of each said partition with resepct to each said interlocked cross-partition to either of two collapsed conditions thereof depending upon the direction of said pivoting from said open condition, either of said collapsed conditions being defined by a substantially adjacent and parallel disposition of each said partition with respect to each said interlocked cross-partition, said first abutment edges on the respective of said partitions respectively abutting said second abutment edges on the respective of said interlocked partitions when said divider is in either of its said collapsed conditions and in its said open condition, said tab-receiving opening of each said partition further providing a tab-retainer edge aligned with said one side edge of said slot from which said locking tab projects, the distance of projection of said locking tab on each of said partitions being substantially greater than the thickness of the partition whereby said locking tabs overlap the respective of said tab-retainer edges of said tab-receiving openings with which said locking tabs are respectively associated when said divider is collapsed in one direction to a first of said two collapsed conditions thereof, all of said locking tabs in their said overlapping positions then being on the same side of said divider, and whereby disengagement of said interlocked partitions by movement of one with respect to another in either direction along any of said lines of intersection is substantially prevented when said divider is in both its said first collapsed condition and its said open condition.

4,103,819

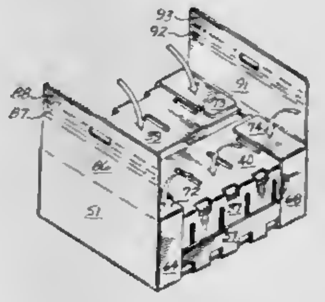
TWO-PIECE CONTAINER

Herbert D. Muise, Garden Grove, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 667,047, Mar. 15, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 749,850

Int. Cl.^{2} B65D *5/28, 5/18*

U.S. Cl. 229—33 **16 Claims**



1. A container comprising:

an inner tray comprising bottom, side and end walls;

an outer tray comprising bottom and end walls contiguous with the bottom and end walls of said inner tray, and side flaps attached to said inner tray side walls;

a cover panel attached to one of said trays; and

cover panel locking means attached to one of said trays.

4,103,820

CARTON WITH INSERT

Frederic N. Mathison, and Roger E. Straub, both of Camden, Del., assignors to General Foods Corporation, White Plains, N.Y.

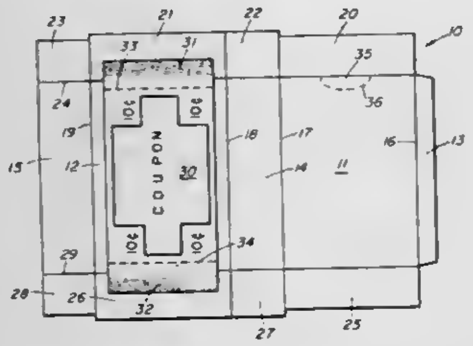
Filed Jan. 9, 1973, Ser. No. 322,235

Int. Cl.^{2} B65D *5/10*

U.S. Cl. 229—37 R **16 Claims**

1. In a carton formed of semi-rigid packaging material which carton includes a pair of opposed face panels joined along fold lines to a pair of opposed side panels:

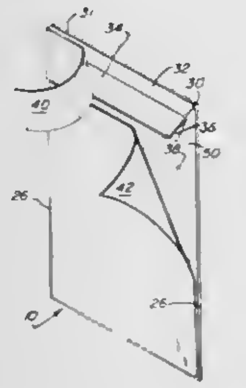
(a) a flap joined along a fold line to one of said panels;
(b) an insert adhered to the interior surface of said flap and having a line of perforations perpendicular to the length of said insert and extending along said fold line joining said flap and adjacent panel;



(c) said insert further adhered to the interior surface of said adjacent panel and having a second line of perforations perpendicular to the length of said insert.

4,103,821
SHIPPING ENVELOPE

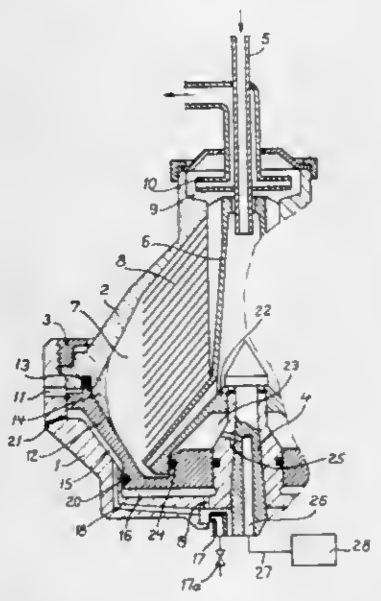
Peter A. Gartshore, and James O. Ward, both of Portland, Oreg., assignors to Pak-Well Corporation, Denver, Colo.
Filed Jul. 22, 1977, Ser. No. 818,119
Int. Cl.² B65D *27/00*
U.S. Cl. 229—74 **5 Claims**



1. A shipping envelope for containing packing sheets and the like, comprising:
a forward panel and a rear panel closed along their side edges and along a first bottom end edge, with their second ends free of each other to provide access to the interior;
each panel having an interior face and an exterior face;
the forward panel being substantially longer than the rear panel;
the excess length of the forward panel constituting a flap foldable over the rear panel and the mouth of the envelope to serve as a closure, a fold line being formed between the flap and the forward panel;
a first area of adhesive on a major part of the exterior face of the rear panel;
a second area of adhesive on at least a portion of the exterior face of the flap;
and release sheets overlying the adhesive areas of the flap and the rear panel;
the release sheet on the rear panel being removable to facilitate attachment of the envelope to a package with the mouth of the envelope open to receive shipping documents;
and the release sheet on the flap being removable to facilitate folding the flap over and under the mouth of the envelope and attachment of the exterior face of the flap to the package.

4,103,822
CENTRIFUGAL SEPARATOR

Klaus H. D. Stroucken, Rooninge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden
Filed Jun. 6, 1977, Ser. No. 804,074
Claims priority, application Sweden, Jun. 11, 1976, 7606638
Int. Cl.² B04B *11/00*
U.S. Cl. 233—20 A **9 Claims**



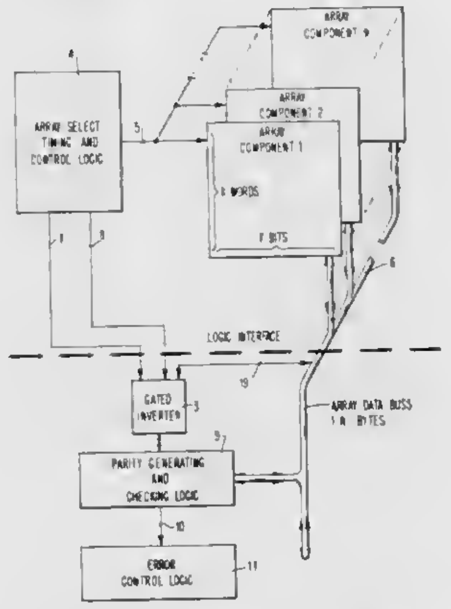
1. A centrifugal separator comprising a rotor mounted for rotation about an axis and having a separating chamber with an inlet for material to be centrifuged, the rotor also having a central outlet for a light component of the material separated in said chamber and having peripheral outlets for a heavy component of the material separated in said chamber, a member slidable axially in the rotor body to open and close said peripheral outlets and forming a substantial part of one end wall of the separating chamber, the side of said member turned away from the separating chamber coacting with the rotor to form an operating chamber for receiving operating liquid which, by its pressure during operation of the separator, keeps the slidable member in position to close said peripheral outlets, means for supplying liquid to the operating chamber, means for draining off operating liquid from said operating chamber during operation of the separator, whereby the slidable member is actuated to open the peripheral outlets and thereby discharge material from the separating chamber, means for retaining a predetermined amount of liquid in the operating chamber upon draining thereof, whereby the slidable member is actuated to close the peripheral outlets when only part of the material in the separating chamber has been discharged through said outlets, and means independent of said liquid supplying means and said liquid draining means for adjusting the magnitude of the force by which the sliding member is kept in its position for closing the peripheral outlets, so that upon draining of operating liquid by actuation of said draining means, an accurately predetermined force is maintained acting on the sliding member in the direction toward its position for closing the peripheral outlets.

4,103,823
PARITY CHECKING SCHEME FOR DETECTING WORD LINE FAILURE IN MULTIPLE BYTE ARRAYS

Frederick John Aicbelmann, Jr., Hopewell Junction; Nino Mario Di Pilato, Unionvale; Thomas Peter Fehn, Mahopac, and George John Rudy, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 20, 1976, Ser. No. 752,336
Int. Cl.² G06F *11/00;* G11C *29/00*
U.S. Cl. 235—312 **6 Claims**

1. Word line failure detecting apparatus comprising:

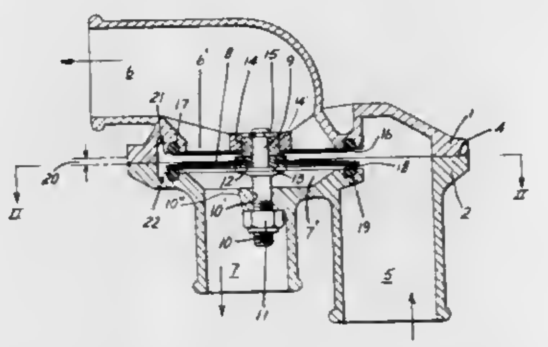
word line means for storing a plurality of bytes of data bit signals and respective parity bit signals,
an equal plurality of parity generating and checking means,
means for directly applying the data bit signals of each stored byte to a respective one of said parity generating and checking means,



means for directly intercoupling the parity bit signals associated with all but one of said stored bytes with respective parity generating and checking means, and
means for inversely intercoupling the parity bit signal associated with said one of said stored bytes with its respective parity generating and checking means.

4,103,824
THERMOSTAT FOR COOLANT PRESENTED AS SWITCH SPECIFICALLY FOR COMBUSTION ENGINES

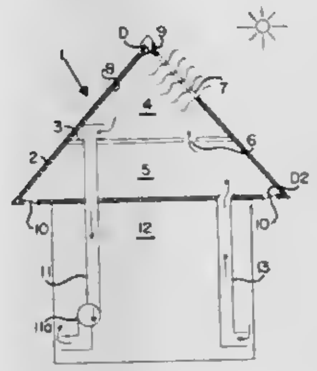
Gerd W. Seifert, P.O. Box Seeberg 29, D-8919 Schondorf, Fed. Rep. of Germany
Filed Jul. 25, 1974, Ser. No. 491,818
Int. Cl.² F01P *7/02*
U.S. Cl. 236—34.5 **17 Claims**



1. Thermostat for engine liquid coolant for changing coolant passage from an input chamber to one of a radiator passage and a bypass passage comprising:
a temperature sensitive elastic spring valve member;
a thermal insulating layer on one surface of said valve member;
said valve member being mounted to spring in one direction at a first predetermined coolant temperature to effect a first open passage between said input chamber and said radiator passage; and
said valve member being mounted to spring in a second direction below a second predetermined coolant temperature which is less than said first predetermined coolant temperature to effect a second open passage between said input chamber and said bypass passage to thereby bypass said radiator passage.

4,103,825
SOLAR HEATED AND COOLED DWELLING

Harold F. Zornig, Pendleton, S.C., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed May 19, 1977, Ser. No. 798,723
Int. Cl.² F27J *3/02*
U.S. Cl. 237—1 A **4 Clalms**



1. A solar heated and cooled dwelling comprising:
(a) a ceiling;
(b) one or more rooms below said ceiling;
(c) an attic roof above said ceiling defining an attic enclosed by said roof and ceiling;
(d) a partition in said attic dividing the attic into first and second attic plenums; wherein said first plenum is enclosed by said partition and by part of said attic roof; wherein said second plenum is enclosed by said ceiling, said partition, and by that part of said attic roof not enclosing said first plenum; wherein said partition has an aperture therein to permit air to flow between said first and second plenums, said aperture being disposed in the lower part of said first plenum; wherein a part of said attic roof which partially encloses said first plenum is composed of material that readily transmits solar energy into said first plenum;
(e) solar energy-absorption means disposed within said first plenum to generate hot air therein;
(f) first attic vent means in the upper part of said first plenum;
(g) second attic vent means in said second plenum;
(h) means to close said first vent means;
(i) means to close said second vent means;
(j) first conduit means between said first plenum and said rooms to convey heated air from said first plenum to said rooms;
(k) second conduit means between said rooms and said second plenum to convey air from said rooms to said second plenum;
(l) means to close said first conduit means; and
(m) means to close said second conduit means.

4,103,826
HEAT EXCHANGER FOR A FREESTANDING HEATING UNIT

Richard J. Wass, 376 Gorden Petty Ct., Brentwood, Tenn. 37027
Filed Apr. 4, 1977, Ser. No. 784,582
Int. Cl.² F24B *7/04*
U.S. Cl. 237—55 **5 Claims**

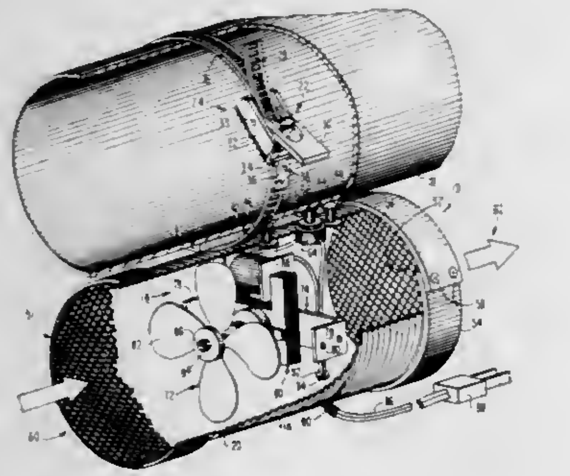
1. A heat exchanger for a freestanding heating unit having an exhaust duct, said heat exchanger comprising:
(a) a tubular body having inlet and outlet ports at opposite ends;
(b) a bracket mounted to the outer surface of said tubular body;
(c) a clamp constrained by said bracket, said clamp configured to captively hold said tubular body to said exhaust duct of said freestanding heating unit, said clamp disposed about an axis that is parallel to a longitudinal axis of said tubular body, a longitudinal axis of said tubular body in

spaced parallel relationship to a longitudinal axis of said exhaust duct when said heat exchanger is mounted to said exhaust duct;

(d) a temperature sensor mounted to said bracket, said temperature sensor having opened and closed states; and

(e) a blower including a motor and a blade assembly, said motor mounted within said tubular body and electrically connected to said temperature sensor, said motor having energized and deenergized states, said blade assembly is connected to said motor and is operative to create an air flow inwardly through said inlet port, about said motor and outwardly through said outlet port;

(f) a power line connected to said temperature sensor and said blower,



(g) said motor in its energized state when said temperature sensor is in its closed state, said motor in its deenergized state when said temperature sensor is in its opened state,

(h) said tubular body includes a plurality of ribs about its periphery, said ribs forming expanded interior and exterior conductive heating surfaces;

(i) a cap mounted to each end of said tubular body, each said cap having a face plate with a plurality of interwoven strips defining an air deflector and a band, the margins of each said face plate wrapped about the margin of said tubular body, said band superposed on the wrapped margins of said face plate, said band mounted to said tubular body and captively holding said face plate to said tubular body.

4,103,827

METHOD OF AND APPARATUS FOR GENERATING MIXED AND ATOMIZED FLUIDS

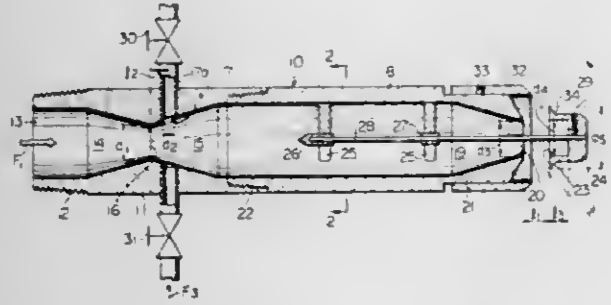
Toshiharu Kumazawa, Fujisawa, Japan, assignor to Mitsubishi Precision Co., Ltd., Kamakura, Japan

Filed Sep. 22, 1976, Ser. No. 725,567

Claims priority, application Japan, May 27, 1976, 51-060558; Jul. 8, 1976, 51-089803[U]

Int. Cl.^{2} B05B *7/00*

U.S. Cl. 239—8 **10 Claims**



1. A method of generating a flow of mixed and atomized fluids from at least two fluids selected from gases, liquids and powders, said method comprising the steps of:

directing a flow of a first fluid along a conduit means into a flow passageway having a first convergent flowing zone and a divergent flowing zone fluidly connected to an end of said first convergent flowing zone, thereby generating a low pressure flow of the first fluid in said flow passageway;

separately and concurrently introducing at least two separate flows of a second fluid into the low pressure flow of the first fluid thereby causing a first stage mixing of the first and second fluids and also a first stage atomizing of the resulting mixed fluids in said flow passageway;

guiding a flow of the mixed fluids from said flow passageway into a subsequent flow passageway having a second convergent flowing zone, thereby accelerating said flow of the mixed fluids;

spouting said flow of the mixed fluids from said second convergent flowing zone of the subsequent flow passageway at a side of said second convergent flowing zone, thereby colliding said high speed flow of the mixed fluids with said reflecting means and generating a reflected flow of the mixed fluids reflected from said reflecting means, and;

colliding said reflected flow of the mixed fluids with a subsequent high speed flow of the mixed fluid subsequently spouted from said second convergent flowing zone, to cause a second stage mixing and atomizing of said mixed fluids while said mixed fluids are dispersed toward a space surrounding said reflecting means.

3. A fluid spouting composite nozzle unit, for generating mixed and atomized fluids from at least two fluids selected from gases, liquid and powders, comprising in combination:

first nozzle means for effecting a first stage mixing and atomizing of the fluids;

second nozzle means for spouting the fluids mixed and atomized by said first nozzle means toward a downstream side thereof;

guide conduit means for guiding the fluids mixed and atomized said first nozzle means to said second nozzle means;

fluid reflecting means positioned on the downstream side of said second nozzle means for cooperation therewith to define an outlet space in which fluid from said second nozzle means collides with fluid reflected from said reflecting means, the shape and size of said space being determined by the configurations, dimensions, and spacing of said reflecting means and said second nozzle; and

means for interconnecting said first and second nozzle means, said conduit means, and said fluid reflecting means,

wherein said first nozzle means has a conical convergent passageway, a conical divergent passageway concentrically connected to said conical convergent passageway and at least two fluid supply openings into said conical divergent passageway, and wherein said second nozzle means has a conical convergent passageway.

4,103,828

ROTARY SPRINKLER IMPACT ARM SPRING ADJUSTMENT

H. Curtis Ridgway, Dallas, Tex., assignor to Telsco Industries, Inc., Dallas, Tex.

Filed Jan. 17, 1977, Ser. No. 759,727

Int. Cl.^{2} B05B *3/14*

U.S. Cl. 239—206 **17 Claims**

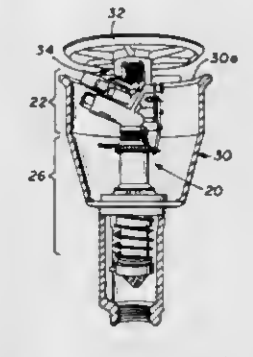
1. Adjustment means for the bias spring on an impact arm of an impact sprinkler having a laterally directed nozzle cooperating with the impact arm which comprises:

a shaft extending above the nozzle on which the impact arm is journaled;

a cage extending above the nozzle within which the arm is mounted and having a top plate;

a helical bias spring surrounding said shaft secured at the lower end to the impact arm;

a bushing secured to the upper end of said spring and engaging the plate of said cage said bushing being manually adjustable relative to the top plate from above the top plate for varying the force supplied by said spring to the impact arm; and



a top cover supported by said cage and having an aperature therethrough to permit adjustment of said bushing from above said top cover.

4,103,829

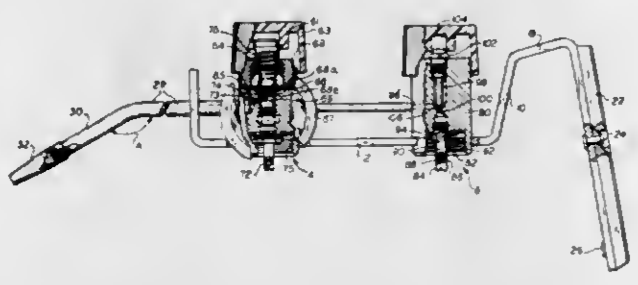
PORTABLE OXYPROPANE TORCH

Frank A. Zagara, Pittsford, and John M. Nelson, Rochester, both of N.Y., assignors to Bernzomatic Corporation, Rochester, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,470

Int. Cl.^{2} F23D *13/04*

U.S. Cl. 239—304 **11 Claims**



1. Portable hand-held oxypropane torch comprising a generally rectangular planar sheet of material forming a carrier member having openings adjacent opposite ends, oxygen valve means and propane valve means supported on the carrier member each in one of said openings each of said valve means including means for attaching a tank of fuel or oxygen, said sheet of material including a bent end portion forming an integral handle connected to the carrier member, a nozzle conduit, means connecting said oxygen valve means for gaseous fluid communication to the nozzle conduit, a propane conduit connected at one end to said propane valve means and connected at the other end thereof in gaseous fluid communication with said nozzle conduit downstream from the point where the oxygen valve means is connected to the nozzle conduit and a nozzle terminating said nozzle conduit.

4,103,830

FLAT SPRAY NOZZLE HEAD FOR A MANUALLY-OPERATED SPRAY GUN

Heinrich Roth, Kreuzlingen, Switzerland, assignor to Theo Krebs AG, Kreuzlingen, Switzerland

Filed Dec. 22, 1976, Ser. No. 753,489

Claims priority, application Switzerland, Jan. 28, 1976, 1029/76

Int. Cl.^{2} B05B *1/04*

U.S. Cl. 239—587 **7 Claims**

1. A flat jet spray head for a manually-operated spray gun operating without compressed air for spraying a material, comprising:

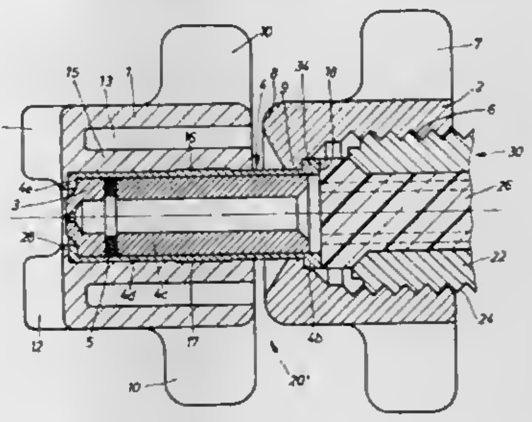
a connection portion adapted to be connected to a spray gun;

a nozzle portion;

a nozzle body arranged in said nozzle portion;

an infeed element arranged in the nozzle portion for the infeed of material to be sprayed to said nozzle body;

said infeed element being of bipartite construction composed of an inner portion and an outer casing portion surrounding said inner portion; said outer casing portion connecting the nozzle portion to the connection portion and having a front end wall engaging with said nozzle body



and a rear end wall rotatably mounted in said connection portion, whereby any forces exerted on the nozzle body are transmitted to and taken up by said connection portion.

4,103,831

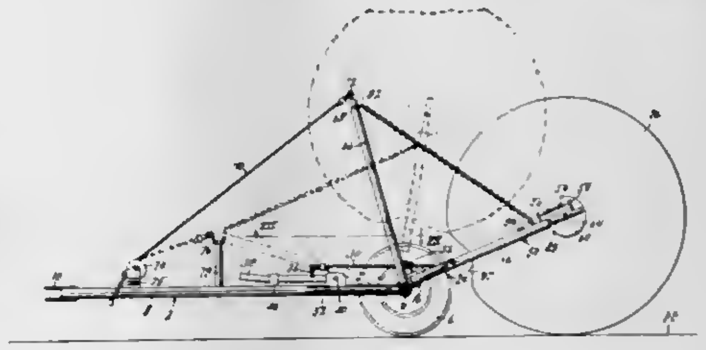
BALE HANDLING DEVICE

Ronald L. Laudemann, Rte. 1 - Box 39, and Gary L. Kasten, Rte. 1 - Box 98, both of White City, Kans. 66872

Filed May 2, 1977, Ser. No. 792,650

Int. Cl.^{2} B60P *1/04*

U.S. Cl. 214—1 HA **4 Claims**



1. A bale handling device comprising:

a. a wheeled vehicle adapted to be moved over the ground,

b. a pair of laterally spaced apart arms carried by said vehicle and extending rearwardly therefrom to bridge the ends of a cylindrical bale resting on the ground, said arms being disposed in a laterally horizontal plane, each of said arms being pivotally connected at its forward end to said vehicle on a transverse axis lying in a vertical plane, whereby to be horizontally pivotable, and for vertical movement about a transverse horizontal axis,

c. a spindle carried by each of said arms at its rearward end, said spindle being generally horizontal and extending transversely of said arm toward the other of said arms, whereby when said arms are pivoted horizontally to a rearwardly divergent relation, said spindles may also bridge the ends of said bale,

d. means operable to pivot said arms horizontally inwardly to a parallel position, whereby said spindles enter said bale axially thereof,

e. means operable to pivot said arms simultaneously upwardly and forwardly toward a vertical position, whereby said spindles elevate said bale above the ground, and

f. a bale support member affixed to each of said arms intermediate its pivotal axis and the spindle carried thereby, the support member of each arm extending toward the other of said arms, and being generally parallel with and laterally spaced apart from the associated spindle by a distance no greater than the radius of said cylindrical bale, whereby to be engaged by, and to assist said spindle in supporting the weight of, said bale as said arms are pivoted upwardly toward a vertical position, and whereby, as said vehicle is positioned to bridge said arms, while in their rearwardly divergent positions, across the ends of said bale, said support members engage a side of said bale and are deflected thereby to assist in pivoting said arms toward each other.

4,103,832
CRUSHER HAVING ROTATABLE ARMS WITH STRIKER TOOLS AND LIQUID SPRAY MEANS

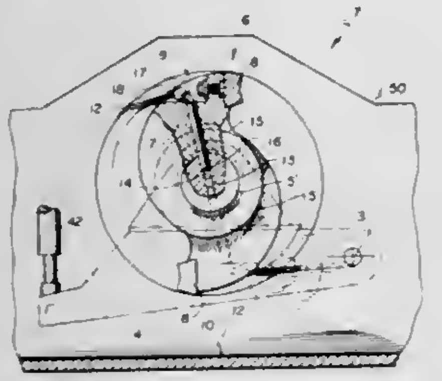
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach and Braun, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,648

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623304

Int. Cl.² B02C *23/18*

U.S. Cl. 241—38 **7 Claims**



1. A crusher for breaking up large size pieces of material, and particularly for breaking up coal, comprising a housing, a crank, pivotal support means pivotally supporting said crank adjacent one end of said crank on said housing, oscillation means connected to said crank to oscillate it about said pivotal support means, a crushing roller rotatably mounted on said crank having a shaft portion, a plurality of striking arms secured to said shaft portion for rotation therewith and extending radially outwardly from said shaft portion, a striking tool on each of said arms oriented forwardly in a direction of rotation of said arms, a crusher plate in said housing cooperable with said striking tools and spaced from said crushing roller by a distance defining a vertical passage clearance for material to be crushed therebetween, a liquid supply means including a conduit extending through at least one of said striking arms and having a discharge end, a spray nozzle on said discharge end directed in a direction opposite to the rotational direction of said arms so that the liquid is discharged in the shadow area of said striking tools.

4,103,833
YARN WINDING APPARATUS

Katsumi Hasegawa, Kusatsu; Akio Ando, Otsu; Chikayasu Yamazaki, Kyoto; Morio Okada, Nishinomiya; Norihiro Aoi, Okazaki, and Nobuhiko Tanbara, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,921

Claims priority, application Japan, May 29, 1975, 50-64763; May 29, 1975, 50-64766; May 29, 1975, 50-64768

Int. Cl.² B65H *54/02, 67/04*

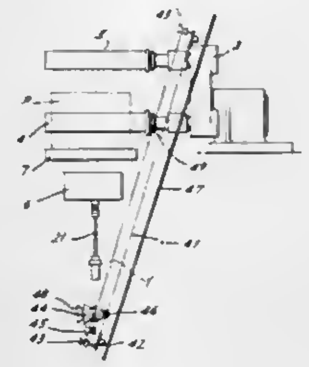
U.S. Cl. 242—18 A **7 Claims**

1. In a yarn winding apparatus for the continuous winding of a single end of yarn including a revolving mechanism carrying a plurality of spindles wherein each spindle is adapted to carry a bobbin, yarn catching means associated with said bobbin for catching yarn for winding thereon, and wherein means are provided for rotating said revolving mechanism so that an end can be shifted from a full bobbin to an empty bobbin, the combination which comprises:

(a) a plurality of intermediate shafts, each shaft installed concentrically with the axis of rotation of fais revolving mechanism, each shaft connected to one of said spindles;

(b) drive means including independent sources of power, each source connected to one of said shafts so that said spindles are individually driven, each of said power sources being positioned at the back of said revolving mechanism, and each of said spindles being positioned at the front of said revolving mechanism, said intermediate shafts extending from said front to said back;

(c) a plurality of dead axles, each of said dead axles attached to the front of said revolving mechanism and supporting one of said spindles; and



(d) shifting means comprising support means, a traverse fulcrum guide means and a travelling yarn guide means positioned on said support for automatically guiding the yarn from a full bobbin to an empty bobbin, means for moving said travelling yarn guide along a predetermined path surrounding said fulcrum guide and said spindles along the exterior of said winder so as to cross the path of yarn extending to the full bobbin, said traverse fulcrum guide consisting of a fixed conical member and a rotating member only so positioned relative to the travelling guide so as to catch at a predetermined point, only the yarn extending from the travelling guide to the full bobbin, whereby when the travelling guide reaches a predetermined position above said revolving mechanism, said mechanism is actuated and rotated to shift from a full to an empty bobbin so that the yarn is picked up by the yarn catching means for winding on the empty bobbin.

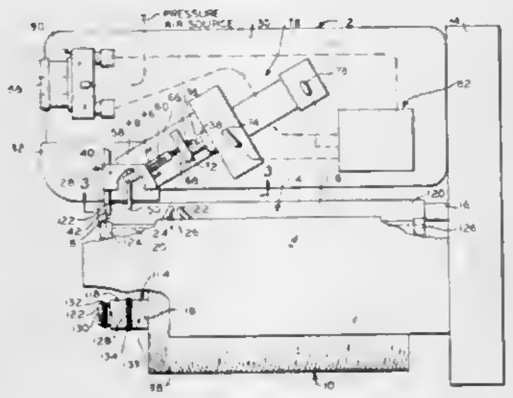
4,103,834
APPARATUS FOR WINDING AN IMPROVED YARN SUPPLY PACKAGE

Jack A. Banning, Rocky Mount, N.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Jul. 13, 1977, Ser. No. 815,399

Int. Cl.² B65H *54/02, 65/00*

U.S. Cl. 242—18 PW **10 Claims**



1. In a continuous delivery yarn winding device of the type which includes chuck means for rotatably supporting at least one yarn package holder, drive means for rotating a yarn package holder supported by said chuck means, and yarn traversing means for traversing a running yarn during the winding thereof upon a yarn package holder to from a main yarn package, the improvement comprising:

yarn engaging means on a first end portion of a yarn package holder for engaging a running yarn whereby said yarn is wound about said yarn engaging means adjacent the first end portion of said rotating yarn package holder;

yarn tailing means for positioning said running yarn relative to said rotating yarn package holder, said yarn tailing means including:

first tailing pin means for contacting said running yarn and positioning said yarn along said rotating yarn package holder in a first position corresponding to a first position of said first tailing pin means and thereafter guiding said running yarn along said rotating yarn package holder from the first position of said yarn on said yarn package holder; and

second tailing pin means for contacting said running yarn and positioning said yarn along said rotating yarn package holder in a second position corresponding to a first position of said second tailing pin means and thereafter guiding said running yarn along said rotating yarn package holder from the second position on said yarn package holder; and

control means operatively connected to said yarn tailing means for positioning said first tailing pin means in the first position thereof and for positioning said second tailing pin means in the first position thereof in response to a first signal applied to said control means whereby said running yarn is aligned with the first position on said yarn package holder to form a first waste bunch of yarn thereon, for automatically moving said first tailing pin means out of contact with said running yarn in response to a second signal applied to said yarn tailing means whereby said running yarn is positioned in contact with said second tailing pin means and is aligned with the second position on said yarn package holder for a predetermined time period whereby said running yarn is positioned to form a second waste bunch of yarn on said rotating yarn package holder a distance from said first waste bunch of yarn, and for automatically moving said second tailing pin means from the first position thereof to a second position thereof after said predetermined time period whereby said running yarn forms a transfer tail on said rotating yarn package holder during said movement of said second tailing pin means to the second position thereof, whereby the running yarn is so positioned as to be engaged by said traversing means for traversing the running yarn along said yarn package holder to form main yarn package and said second tailing pin means is disengaged from said running yarn.

4,103,835
STRAND WINDING APPARATUS

Ralph W. List, East Lansdowne, Pa., assignor to Techniservice Division, Textured Yarn Co., Inc., Kennett Square, Pa.

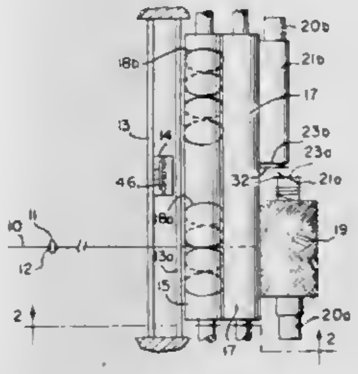
Filed Aug. 31, 1976, Ser. No. 719,277

Int. Cl.² B65H *54/02, 67/04*

U.S. Cl. 242—18 A **5 Claims**

1. In an apparatus for delaying the transfer of a textile strand from a first package for winding said strand onto a second package spaced endwise therefrom, said apparatus including a delay means having passive and active delay positions and comprising a generally T-shaped device having a base leg and an upper cross bar, said base leg being for limited tilting movement from side to side, said active position tilted to engage said strand from said first package and allowing movement along said upper cross bar causing tilting by said strand thereof to a delay position and allowing strand to transfer onto second package, and said passive position not engaging said strand and comprising means including a recocking surface arranged at an angle to contact said strand and to recock said delay device from said passive to said active delay position under the influence of said strand, said tilting to said delay position causing delay of said strand during the strand transfer operation.

5. An apparatus for winding a textile strand, comprising a first circular spindle for formation of a first package thereon, a second circular spindle spaced endwise from said first spindle for formation of a second package therein, means for transferring said strand from a package on said first spindle to said second spindle, strand transfer delay means positioned to be contacted by the transferring strand to delay the transfer of the strand, a first and second circular brush coaxially disposed to said first and second spindles respectively, said circular brushes each capable of catching the strand at a point along the length of the strand whereby said strand is formed into a transfer tail on the respective spindle and is subsequently formed into said respective package, and first and second circular strand cutting means coaxially disposed with respect to said first and second circular brushes for cutting the strand extending between said spindles.



4,103,836
UNDOING OR REMOVING THE THREAD ENDS OF TEXTILE BOBBINS

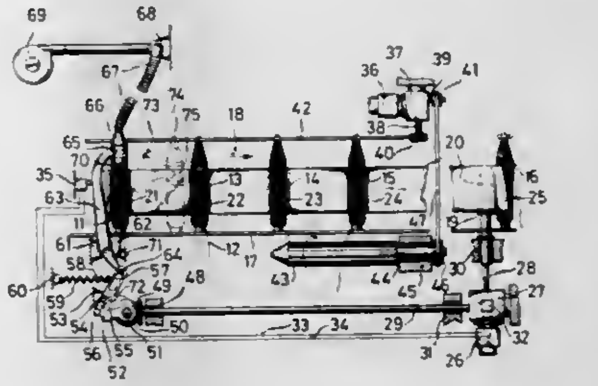
Willi Küpper, Rickelrath, Germany, assignor to W. Schlafhorst & Co., MönchenGladbach, Germany

Filed Jun. 25, 1976, Ser. No. 699,843

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528281

Int. Cl.² B65H *54/22, 67/08*

U.S. Cl. 242—35.6 E **8 Claims**

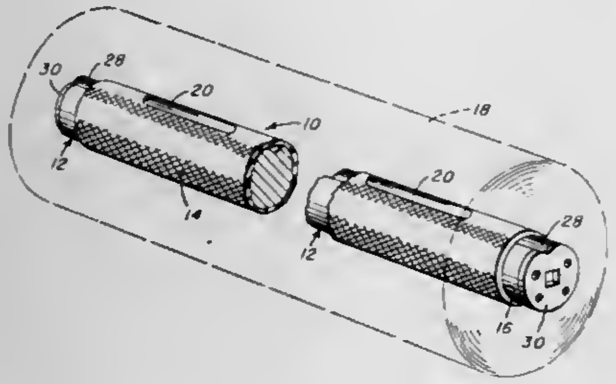


1. In apparatus for undoing or removing thread ends of individually transported textile bobbins which are rotated about their longitudinal axis during transport thereof in a given direction generally transverse to the longitudinal axis of the bobbins and which are blasted with compressed air during the transport from at least one blasting nozzle, the improvement comprising nozzle control means for moving the blasting nozzle axially of the textile bobbins to obtain controlled intensity of the air blast on the surface of the textile bobbin for a controlled period of time.

4,103,837
LOOM CORE

Anthony J. Peters, Columbia, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jul. 11, 1977, Ser. No. 814,687
Int. Cl.^{2} B65H *75/30, 75/10*
U.S. Cl. 242—46.21 **8 Claims**

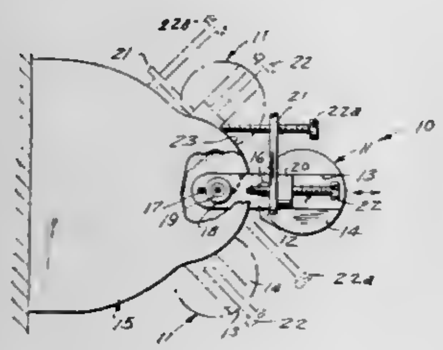


1. A textile fabric take-up spindle for a weaving machine and an associated core, said spindle having a cylindrical exterior with a single full length longitudinal groove formed therein, said core being of an elongated hollow configuration defined by a cylindrical wall with opposed open ends, said core being slidably receivable on said spindle, said cylindrical wall being interrupted solely by a plurality of longitudinally elongated and aligned depressions formed in the exterior thereof, said depressions defining a plurality of internal protrusions closely conforming to and receivable within the single spindle groove for a keying of the core to the spindle to preclude relative rotational movement therebetween.

4,103,838
ADJUSTABLE TOILET PAPER HOLDER

Ernest V. Young, 3 Park View La., Bradford, Mass. 01830

Filed Feb. 7, 1977, Ser. No. 766,086
Int. Cl.^{2} A47K *10/24*
U.S. Cl. 242—55.2 **4 Claims**

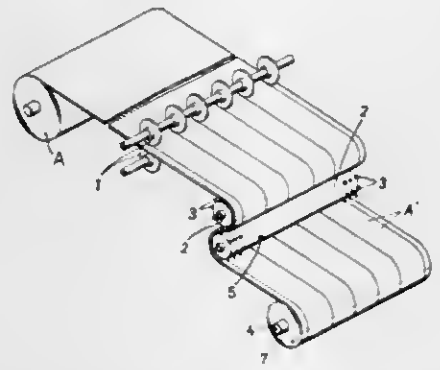


1. An adjustable toilet paper holder comprising an elongated cylinder for removably receiving a roll of paper thereon, a transverse slot on one end of said elongated cylinder, an opening within said transverse slot, a rigid arm slidably received within said transverse slot and having a plurality of openings therein, a first screw fastener received in one of said plurality of openings in said rigid arm and said opening within said transverse slot to secure said rigid arm to said elongated cylinder, a first cylindrical projection, a second screw fastener received in a second of said plurality of openings in said rigid arm to secure said first cylindrical projection to said rigid arm, a hinged arm on the other end of said elongated cylinder, a second cylindrical projection, and means attaching said second cylindrical projection to said hinged arm whereby the holder can be supported by said projections within opposed openings of a mounting bracket.

4,103,839
APPARATUS FOR WINDING CUT BELT-LIKE MATERIAL

Tadayoshi Arimatsu, No. 470, Ibatabama-cho, Turumi-ku, Osaka-shi, Osaka-fu, Japan

Filed Apr. 12, 1977, Ser. No. 786,861
Int. Cl.^{2} B65H *35/02*
U.S. Cl. 242—56.2 **2 Claims**

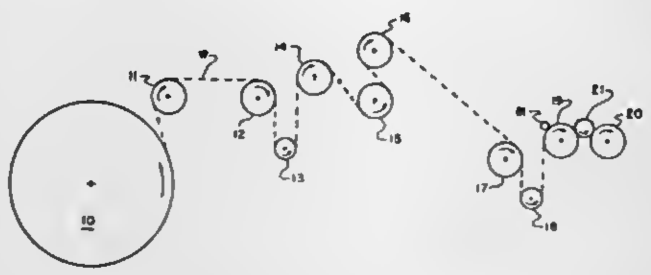


1. In a cut beltlike material winding apparatus having a take-up winding spindle, a multiplicity of parallel cutters for cutting beltlike material with a longitudinal travel zone therebetween, and, a beltlike material travel adjusting mechanism provided in said travel zone intermediate to said cutters and take-up winding spindle, the improvement therein comprising of said travel adjusting mechanism including rolling conveyor means with projections so disposed thereon as to be brought into contact with the cut beltlike material at right angles to the longitudinal travel zone.

4,103,840
STRETCHABLE MATERIAL REWINDING MACHINE

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 14, 1976, Ser. No. 750,469
Int. Cl.^{2} B65H *25/22*
U.S. Cl. 242—67.3 R **4 Claims**

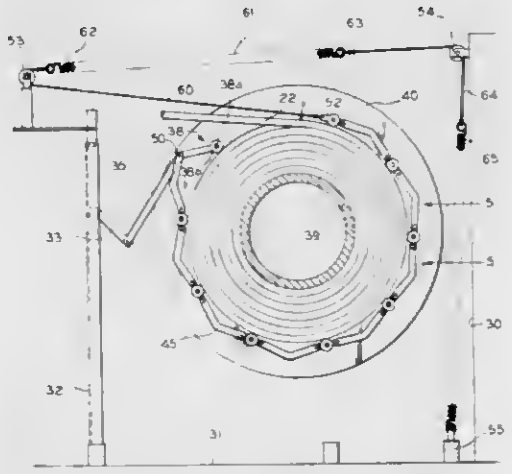


1. A stretchable web material rewind machine comprising a plurality of web guide rolls along a web route between a material supply reel and a rewind reel, said plurality of guide rolls including a pair of S-wrap rolls, said supply reel being driven with an independent drive roll by means of a surface drive belt coursed about said drive roll and bearing against said web material on said supply reel, said independent drive roll and said S-wrap rolls being sheave belt driven, a rotational power source, first and second variable pitch diameter sheave belt drives connecting said power source with said independent drive roll and said S-wrap rolls, respectively, first dancer roll means predominantly supported by said web at a first set position in said web route between said supply reel and said S-wrap rolls and second dancer roll means predominantly supported by said web at a second set position in said web route between said S-wrap rolls and said rewind reel, first dancer roll position sensing means for increasing the variable pitch diameter of said first variable pitch sheave in proportional response to displacements of said first dancer roll in one direction from said first set position and decreasing said first sheave pitch diameter in proportional response to displacements of said first dancer roll in the other direction from said first set position; and, second dancer roll position sensing means for increasing the variable pitch diameter of said second variable pitch sheave in proportional response to displacements of said second dancer roll in one direction from said second set position and decreasing said second sheave pitch diameter in proportional response to displacements of said second dancer roll in the other direction from said second set position.

4,103,841
HOSE REEL APPARATUS

Thomas P. Flynn, and James C. Wurster, both of Milwaukee, Wis., assignors to Super Products Corporation, Milwaukee, Wis.

Filed Aug. 26, 1977, Ser. No. 827,877
Int. Cl.^{2} B65H *75/42*
U.S. Cl. 242—86.2 **9 Claims**



1. A reel system for storing, supplying and winding elongate materials comprising:

a reel mounted upon a support for being rotated for winding or unwinding said elongate material, said reel including parallel side walls and a cylindrical core extending perpendicularly therebetween;

supports means adjacent said reel;

an elongate link assembly, a first end of said link assembly being pivotally mounted to said support means, said link assembly including rollers each having an axis parallel to the axis of said reel and said assembly encircling at least a substantial amount of the circumference of the windings of elongate material provided on said reel; and

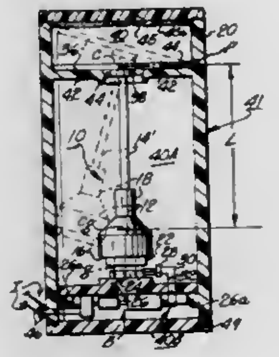
means for maintaining tension on said link assembly whereby contact is maintained by said rollers on said windings regardless of the circumference of windings upon said reel.

4,103,842
LOCKING SENSOR FOR BELT RETRACTOR

Thomas F. Martin, Euclid; James A. Nagy, and Harold R. Scibbe, both of Chardon, all of Ohio, assignors to Repa Feinstanzwerk GmbH, Industriegebiet, Germany

Filed Jul. 7, 1975, Ser. No. 593,276
Int. Cl.^{2} A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **24 Claims**

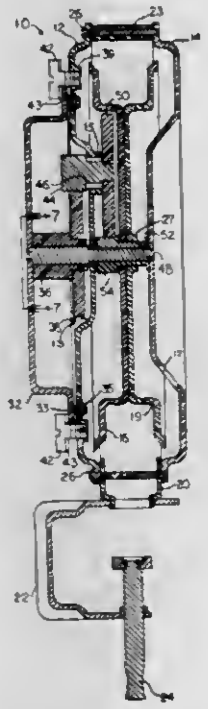
10. In a vehicle having an occupant restraint system having means for restraining forward movement of an occupant in response to an emergency condition including a retractor connected with the restraint system, an emergency locking system including means for actuating the retractor to place the restraint system in a condition in which it restrains forward movement of the occupant, lock control means actuable to lock the retractor, an electrical circuit including mechanically static signal means including means for generating an electric output signal which changes in magnitude in response to changes in the magnitude of an energy field imposed on said mechanically static signal means, an energy field source for imposing an energy field on said mechanically static signal means, circuit means for causing said output signal of said signal means to actuate said lock control means to actuate said retractor at a predetermined magnitude of said output signal, and means for changing the magnitude of the energy field on said mechanically static signal means comprising a pendulum having a pendulum weight mounted for multidirectional displacement from a rest position in response to gravitational-inertial forces due to predetermined modes of the vehicle during an emergency condition, said energy field source being fixedly connected with said pendulum weight and being movable therewith in response to gravitational-inertial forces to change the strength of the energy field on said mechanically static signal means.



4,103,843
FISHING REEL

Carl Nothdurft, 22,412 LaVon, St Clair Shores, Mich. 48081

Filed Mar. 29, 1976, Ser. No. 671,570
Int. Cl.^{2} B65H *75/48;* **A01K** *89/017*
U.S. Cl. 242—107 **1 Claim**



1. Improvement in a fishing reel having a spool upon which a fishing line is wound, cover means for said spool, a coil spring for automatically winding up the fishing line upon release thereof, a spring cover for winding up the spring, a gear train for rotating the spool upon unwinding of the spring, said improvement comprising said cover means including two spool covers held together with a first set of fasteners disposed radially outwardly of said spool, said spring cover carried on one of said spool covers, an axle extending between said spring cover and the other of said spool covers, said gear train including a compound gear and a driver gear and a pinion gear, said driver gear and said pinion gear rotatably supported on said axle, said driver gear including a hub made fast therewith, a

second set of fasteners carried on said one spool cover for fastening the spring cover thereon, bosses formed in said one spool cover for threadably carrying said second set of fasteners, tongue and groove means between the spring cover and said one spool cover disposed inwardly of said second set of fasteners, said spring cover, when loosened during winding of the spring, being held in place and located by the second set of fasteners, by said tongue and groove means, and by said axle, the axle having an end disposed in said spring cover serving as a rotation axis for the latter during winding up of said spring, the inner end of said spring held in a slot in said driver gear hub, means for fastening the fishing line to said spool consisting of an aperture in said spool, a larger aperture in said other spool cover so that the inner end of said fishing line can be threaded through said reel and knotted to hold it against the outside of said spool, and a line guide means for guiding the movement of the fishing line, said line guide means comprising a line guide member and a tubular spacer carried on one of the fasteners of said first set of fasteners, said line guide means serving as a closed loop line guide opening for said fishing line immediately adjacent the spool.

4,103,844

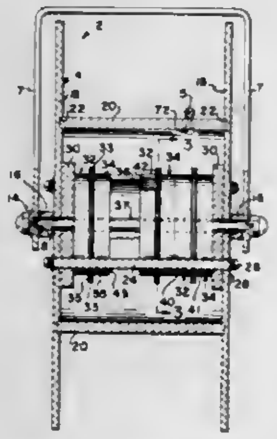
REEL

J. Clifford Deinert, Waverly; Charles E. Taylor, Summit, and Harry W. Mumford, Waverly, all of Pa., assignors to Sandvik, Inc., Scranton, Pa.

Filed Apr. 14, 1977, Ser. No. 787,371

Int. Cl.² B65H *75/48*

U.S. Cl. 242—107 **9 Claims**



1. A reel construction comprising, the combination of, mounting means comprising a pair of fixed side members which are spaced from each other, fixed axis means mounted respectively in said side members, a reel spool rotatably mounted on said axis means and having side discs adjacent said side members and a cylinder positioned between said side discs and presenting a surface having the same axis as said axis means and forming with said discs a space within which a rope or the like can be wound, a pair of bearing plates positioned respectively adjacent said discs within said cylinder, a plurality of bolts extending through said reel parallel to said axis and positioned less than the radius of said cylinder therefrom, whereby said discs are clamped against said cylinder by said bolts, and a plurality of coil spring assemblies having axes concentric with said axis, each of said spring assemblies comprising a coil spring and a cylindrical casing surrounding the spring, each of said springs having an inner anchor adjacent said axis means and forming a releasable operating connection therewith and having its outer end fixed to its casing, said operating relationship being formed by a notch in said axis means providing a surface which extends radially from said axis and said inner anchor of said surface having an end anchor portion engaging said surface.

4,103,845

TAKE-UP FORCE ELIMINATOR FOR SAFETY BELT RETRACTOR

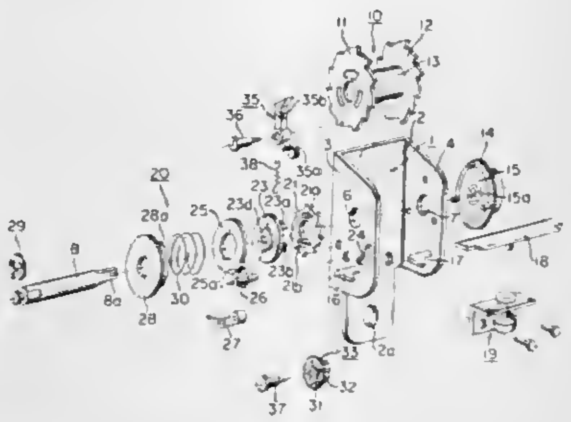
Takeo Ueda, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Jul. 18, 1977, Ser. No. 816,492

Claims priority, application Japan, Aug. 18, 1976, 51-109649[U]

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.7 **7 Claims**



1. A take-up force eliminator for a safety belt retractor using a spring force to take up webbing, comprising:

a ratchet wheel rotatable with a webbing take-up spindle after a delay corresponding to a predetermined angle;

rotating means adapted to follow the rotation of said take-up spindle to assume a first and a second position;

cam means adapted to stepwisely advance with the displacement of said rotating means from said first position to said second position and to assume a first and a second operative position in accordance with the stepwisely advanced positions; and

locking means adapted to follow said cam means to engage said ratchet wheel when said cam means is in said first operative position, thereby locking said take-up spindle against rotation in the take-up direction, and to be disengaged from said ratchet wheel when said cam means is in said second operative position.

4,103,846

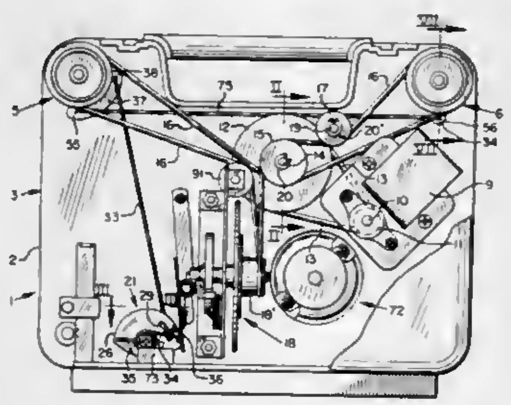
FILM WEB HANDLING MECHANISM

Donald I. Loofbourow, Canby, and Robert E. Lach, Beavertown, both of Oreg., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,647

Int. Cl.² G03B *1/04;* G11B *15/32*

U.S. Cl. 242—205 **5 Claims**



1. An improved film web handling mechanism having a housing, a supply spindle and a take-up spindle rotatably mounted on said housing for transporting a film web therebetween, means for rotatably driving said spindles comprising a motor carried on said housing, an endless belt driven by said motor for movement in one direction only not withstanding

the direction of movement of the supply second takeup spindles for imparting a rotational and directional drive force to said spindles, a rotatably mounted supply drive assembly and a rotatably mounted take-up drive assembly, each comprised of a pulley, a clutch means and a rotational drive control means, connected with said spindles for transmitting drive force from the endless belt to the spindles respectively, each of said supply and take-up drive assemblies being rotatably movable between at least a first operating position and a second operating position, each of said supply and take-up drive assemblies being operatively connected by said endless belt to a film web advancing mechanism for advancing said film web, a mode selector assembly mounted for rotation between at least a first and a second operating position connected with said supply drive assembly and said take-up drive assembly for selecting a mode of operating position on the respective supply drive and take-up drive assemblies so that the film web is driven in one mode of operation when said mode selector assembly, said supply drive assembly and said take-up drive assembly are in said first position and in a different mode of operation when said mode selector assembly, said supply drive assembly and said take-up drive assembly are in said second position.

4,103,847

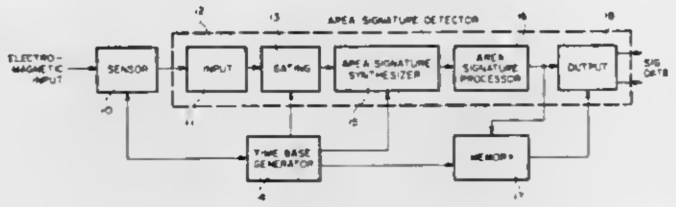
LINE SCAN AREA SIGNATURE DETECTION METHOD

Frank J. Thomas, and Max W. Farrow, both of Orlando, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Division of Ser. No. 437,406, Jan. 28, 1974, Pat. No. 3,974,328, which is a continuation-in-part of Ser. No. 165,597, Jul. 23, 1971, abandoned. This application Feb. 9, 1976, Ser. No. 656,683

Int. Cl.² F42B *15/02;* F41G *9/00, 7/00;* F42B *15/10*

U.S. Cl. 244—3.18 **14 Claims**



1. A method of modifying the flight path of a missile comprising the steps of:

(a) scanning a field of view from the missile with a line scan sensor to produce a line scan signal representing sensed variations in scene content along each scan line of the field of view;

(b) generating, in response to the line scan signal, a first electronic signature characterizing area variations within selected segments of a field of view from the missile;

(c) generating, in response to the line scan signal, a second electronic signature characterizing area variations within corresponding selected segments of the field of view from the missile, the second electronic signature characterizing area variations in the field of view at a time subsequent to the variations characterizing by the first electronic signature;

(d) correlating the first electronic signature with the second electronic signature to generate a control signal related to the degree of correlation between the area variations within the selected segments of the first electronic signature and the area variations with the corresponding segments of the second electronic signature; and

(e) controlling the flight path of the missile in response to the control signal.

4,103,848

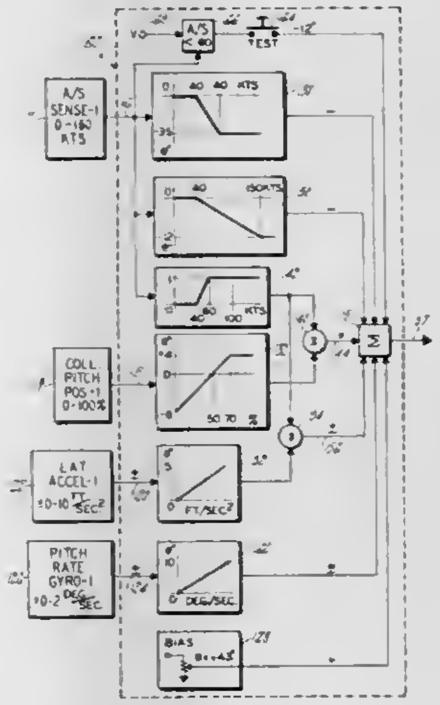
VARIABLE INCIDENCE HELICOPTER STABILATOR AND FAIL SAFE ACTUATOR

Raymood G. Johnson, Jr., Milford; Lou S. Cotton, Monroe, both of Conn., and David J. Verzella, North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 8, 1977, Ser. No. 775,670

Int. Cl.² B64C *11/44*

U.S. Cl. 244—17.13 **15 Claims**



1. A helicopter, comprising:

a fuselage;

a main rotor disposed for rotation with respect to said fuselage in a first plane oriented to provide vertical lift to said fuselage;

airspeed sensing means for providing a signal indicative of the airspeed of said fuselage;

lateral accelerometer means for providing a signal indicative of lateral accelerations of said fuselage;

a stabilator pivotably disposed about a transverse axis substantially parallel to said first plane at the tail of said fuselage;

positioning means disposed between said stabilator and said fuselage and adapted to rotate said stabilator about its axis for various angles of incidence with respect to said fuselage, said positioning means including an electromechanical actuator and an electrical servo loop for driving said actuator to a desired position in response to a position command signal applied thereto;

a tail rotor adapted to rotate in a second plane, substantially parallel to the longitudinal axis of said fuselage and at a small angle with respect to the vertical axis of said fuselage, oriented to provide a thrust component, parallel to said first plane, to the tail of said fuselage in a direction to stabilize said fuselage against the counter-rotative forces resulting from the rotation of said main rotor, and oriented to provide a vertical lift thrust component to the tail of said fuselage;

and position command signal generating means, connected for response to said airspeed sensing means and to said lateral accelerometer means, for generating a combined command signal, including signal components for causing said positioning means to position said stabilator at substantially zero average angle of incidence at high speeds and at a maximum angle of incidence at low speeds and to position said stabilator to increased or decreased angles of incidence as a result of lateral accelerations of said fuselage in a direction the same as or opposite to, respectively, the direction of thrust component parallel to said first plane provided to the tail of said fuselage by said tail rotor.

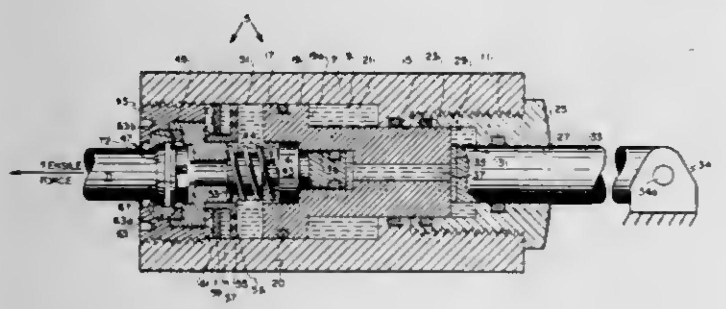
4,103,849
CATAPULT RESTRAINT/RELEASE SYSTEM

Lloyd J. Holt, and Clayton E. Panlaqui, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,415

Int. Cl.² B64F *1/04, 1/16*

U.S. Cl. 244—63 **6 Claims**



1. Apparatus for releasably restraining an aircraft prior to launch comprising:

- a housing having a concentrically stepped central bore defined by a large diameter bore at a first end joined to a small diameter bore at a second end by an intermediate diameter bore;
- a concentrically stepped plunger having first and second ends, and defined by a large diameter section at said first end joined to an elongated small diameter section at said second end by an intermediate diameter section;
- said plunger occupying said stepped central bore in sealing relationship with said housing and said elongated small diameter section extending from said housing through said small diameter bore;
- said second end of said plunger having means for attachment to a stationary object;
- said housing and plunger defining an annular compression chamber and an annular displacement chamber;
- said plunger defining a bore communicating with said annular displacement chamber and extending to said plunger first end;
- a compressible liquid filling said annular compression and displacement chambers and partially filling said plunger bore;
- a piston sealingly engaging said plunger bore and being motion responsive to displacement of liquid from said annular displacement chamber;
- a mechanism operative to releasably grip structure attached to an aircraft, said mechanism being attached to said first end of said housing, and said mechanism being operative to release said grip in response to movement of said piston; and
- means for dissipating energy from fluid in said compression chamber in response to said mechanism releasing said grip.

4,103,850
MANEUVERABLE GLIDER KITE

Helen Bushell, 10 Elm Grove, North Kew, Victoria 3102, Australia

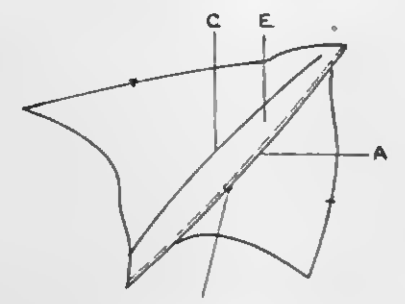
Filed Apr. 1, 1976, Ser. No. 664,455

Claims priority, application Australia, Apr. 9, 1975, 83667/75

Int. Cl.² B64C *31/06*

U.S. Cl. 244—153 R **1 Claim**

1. A kite, comprising a pair of substantially triangular panels made of pliable material joined along the base edges to form two sails, and joined again along a central joining line spaced from and curved with respect to said base line, and enclosing a portion of the sail area to form a keel, the longitudinal upper edge of the keel formed by said central joining line and the wings thereat having a smooth aerodynamic curve in the longitudinal vertical plane, the bottom edge of the keel and the leading edges of the wings being stiffened by a mast and two spars respectively, the wings being held in a spread position by a cross-stay non-rigidly connected to each spar member.



4,103,851
CONTINUOUS SPEED CHECKING PROCESS FOR A POWERED VEHICLE AND APPARATUS FOR CARRYING THE PROCESS INTO EFFECT

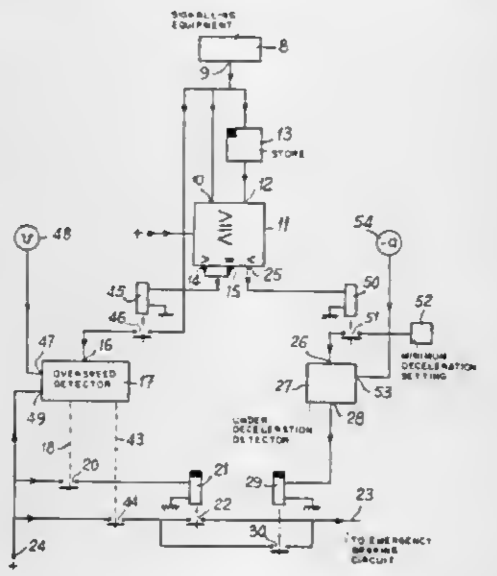
Jean P. Salmon, Sevran, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Dec. 22, 1976, Ser. No. 753,616

Claims priority, application France, Dec. 24, 1975, 75 39693

Int. Cl.² B61L *3/16*

U.S. Cl. 246—63 C **5 Claims**


SIGNALLING EQUIPMENT
OVERSPEED DETECTOR
UNDER DECELERATION DETECTOR
MINIMUM DECELERATION SETTING
STORE
TO EMERGENCY BRAKING CIRCUIT

1. A continuous speed checking process for a powered vehicle under automatic or manual supervision, traveling along a track divided into consecutive block sections, comprising the steps of:

- (a) transmitting to the vehicle, immediately upon entering any block section, an exit speed, defined as a speed limit with which the vehicle must comply upon exiting from such section;
- (b) storing said exit speed in the vehicle's driving cab;
- (c) comparing said exit speed with a stored exit speed for the previous block section;
- (d) continuously measuring the vehicle's actual speed and actual deceleration; and
- (e) initiating emergency braking under two conditions:
  - (i) when said exit speed of the block section upon which said vehicle travels equals or exceeds the stored exit speed for the previous block section, and when the vehicle's actual speed exceeds an exit speed of the block section upon which the vehicle travels, said emergency braking is initiated after a predetermined delay;
  - (ii) when said exit speed is less than an exit speed of the previous block section, and the vehicle's actual deceleration is less than a predetermined acceleration, emergency braking is initiated after a predetermined delay.

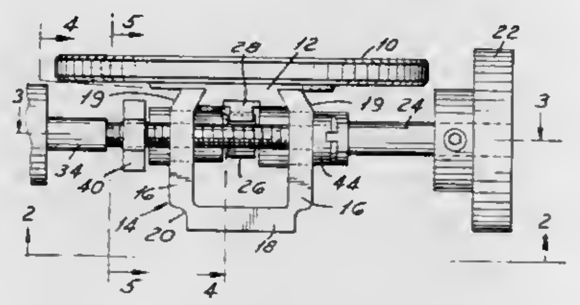
4,103,852
ADJUSTABLE INSTRUMENT MOUNTING BRACKET

James C. Fisk, G-3219 E. Bristol, Burton, Mich. 48529

Filed Jul. 12, 1976, Ser. No. 704,231

Int. Cl.² F16M *11/04*

U.S. Cl. 248—178 **2 Claims**



1. An adjustable instrument mounting bracket comprising, in combination:

- a relatively rigid one-piece frame member of general channel-shaped formation formed from a flat strip metal stock cold worked into the channel-shaped formation, said frame member having a common edge of each of its opposing side wall sections integrally joined to the opposite side margins of its bottom section, said opposing side walls having their respective free ends similarly slanting inwardly toward one another and V-shaped to form parallel tracks of a dovetailed guideway in the space between the free ends of the opposing side walls of the frame member;
- an instrument mounting part having the underside thereof shaped with V-shaped recesses the walls of which complementarily slidably receive and engage the V-shaped tracks of the dovetailed guideway formed by the channel-shaped frame member;
- at least one of said two opposing sidewall sections of the channel-shaped frame member being elastically distortable out of its normal plane and toward the other side wall to decrease the width of the dovetailed guideway with the result that when the width of the dovetailed guideway is decreased in this manner it imposes sufficient clamping pressures on the dovetailed-shaped underside of the instrument mounting part to hold the instrument mounting part from movement along the dovetailed guideway;
- means extending across the space between the opposing side wall sections of the channel-shaped frame member and operatively coupled thereto for elastically distorting at least one of said side wall sections out of its normal plane and toward the other side wall to vary the clamping pressure exerted by the side wall sections upon the dovetailed underside of the instrument mounting part; and
- the resistance of either one or both of the elastically distortable side wall sections toward the opposing side wall section being lessened by reducing the thickness of the corner formed between the bottom section and at least one of said side wall sections of the channel-shaped frame member thereby to provide a hinge axis along each such corner about which each such side wall section is elastically deflectable toward the other.

4,103,853
ALUMINUM CLUSTER MOUNT

Edward C. Bannan, Vicksburg, Miss., assignor to McGraw-Edison Company, Elgin, Ill.

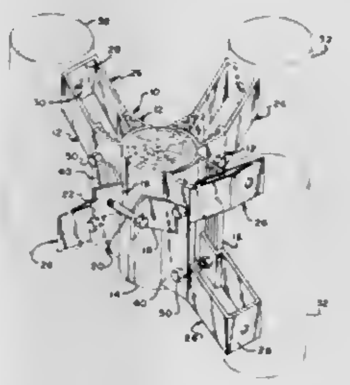
Filed Dec. 22, 1976, Ser. No. 753,605

Int. Cl.² E04G *3/00*

U.S. Cl. 248—219.1 **11 Claims**

1. A mount for supporting electrical apparatus on an associated pole comprising:

- bearing plate means of generally U-shape with a transverse wall adapted to bear against said pole and having outwardly extending substantially parallel wall portions; slot means in said wall portions of said bearing plate means;
- connecting link means having a hook member on the end thereof for engagement into said slot means and attaching said bearing plate means around said pole; and
- bracket means fastenable to said bearing plate means and having mounting means for fastening said electrical apparatus thereto;
- said bracket means having a portion overlapping said slot means to lock said hook member therein upon being fastened to said bearing plate means.



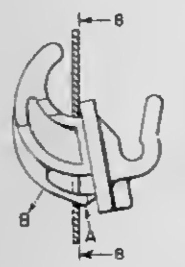
4,103,854
SUPPORT FASTENER

Frank V. Pliml, Arlington Heights, and Lloyd A. Erickson, Park Ridge, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 19, 1977, Ser. No. 788,727

Int. Cl.² F16M *13/00*

U.S. Cl. 248—235 **2 Claims**

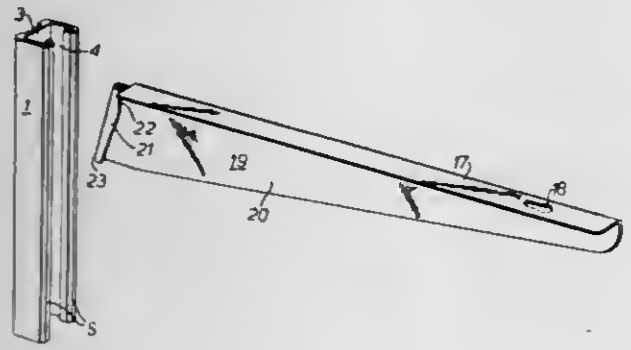


1. A one-piece plastic fastener in combination with a non-circular aperture in a panel, said fastener including a base adapted to cover said aperture and having rear surface means defining a reference for engaging the panel and support means on the opposite surface of said base adapted to engage secondary means, an integral substantially rigid curved hook-like stud which extends outwardly from a root portion adjacent the rear surface of said base and thence reversely bends toward said reference with the free end of said hook-like stud extending beyond an edge margin of said base and terminating in spaced relation to said reference a predetermined distance so that said base rear surface means contacts one surface of said panel while said free end will contact the opposite surface of said panel, said root of said stud having a cross-sectional configuration which at least at a plurality of points is complementary to said aperture and provides shoulder means adjacent to said base which in installed position engages in loadbearing relationship walls of the panel forming said aperture so as to substantially prevent any motion of said fastener in the plane of said panel, and resilient nonload-bearing retaining means carried by said stud and cooperating with said aperture to lock said fastener in non-removeable installed relation with said panel, the aperture in said panel including an enlarged upper portion for accepting said rigid shoulder means of said hook-like stud in complementary loadbearing relation and a communicating slot of smaller size having side and bottom end edges

for accepting said retaining means in overlying relation to two adjacent edges thereof, said hook-like stud including a convex exterior surface facing away from said base and a concave recess facing said reference, said retaining means being a resilient arm connected at one end to said convex surface intermediate its length and extending initially generally parallel to said hook-like stud and thence being canted laterally to its free end from said initial position and extending toward said base, the canted free end portion of said retaining arm including a recess along one edge of said arm facing said reference which accepts and overlies a side edge of said slot means and with the free end of said arm overlying said bottom end edge to thereby make said retaining arm nonremoveable.

4,103,855
SUPPORT SYSTEMS FOR ARTICLES OF FURNITURE

Maurice Grosse, 25 Woodberry Crescent, London N10., England
Filed Jul. 1, 1976, Ser. No. 701,529
Int. Cl.² A47G *29/02*
U.S. Cl. 248—246 **6 Claims**

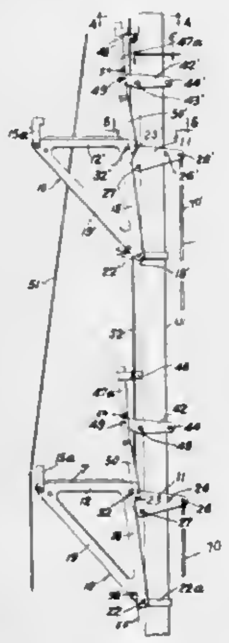


1. A support system for articles of furniture which system comprises at least one upright shaped to define along substantially the whole of its length a recess which includes a rear wall having a forwardly facing substantially planar and rigid surface throughout substantially the whole of its width and side walls which open onto the front of the upright, the opening of the recess being flanked at at least one edge by a re-entrant lip turned by substantially 180°, and which system also comprises at least one bracket comprising a single limb constructed and arranged for entry in said recess, the bracket limb comprising a turned back upright engaging portion which is turned back by substantially 180° and which includes an upper rim that hooks behind said re-entrant lip and has a free edge which, in use, extends substantially vertically and engages the concave surface of the lip, and a flat formed on a lower region of said turned back upright engaging portion that abuts against the said forwardly facing substantially planar and rigid surface of the rear wall of the recess at points defining a finite transversely and vertically extending area, said bracket also comprising a support portion which projects forwardly from the upright when the bracket is operatively connected to the upright.

4,103,856
ADJUSTABLE SCAFFOLD BRACKET

Henry Riblet, 87 Crescent Rd., Needham, Mass. 02194
Continuation-in-part of Ser. No. 514,583, Oct. 15, 1974, Pat. No. 3,970,277. This application Jul. 19, 1976, Ser. No. 706,376
Int. Cl.² A47B *47/00*
U.S. Cl. 248—246 **28 Claims**

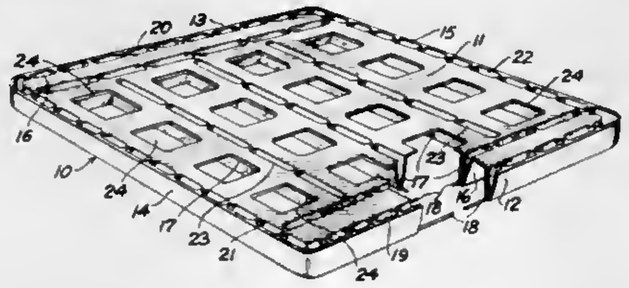
1. In combination,
a scaffold bracket,
an upright member,
said scaffold bracket comprising,
a platform support,
a lock means,
said platform support being attached to said lock means,
said lock means supporting said platform support on said upright,
mechanical jack means, including a jack lock, connected to said scaffold bracket for raising said bracket,
flexible hoist means connected to said scaffold bracket for raising said scaffold bracket and elongated lock disabling means attached to said lock means,



said elongated actuating member being accessible to a person below said scaffold bracket whereby a tensile force on said elongated actuating member will release said lock means from said upright member allowing said scaffold bracket to be lowered by said flexible hoist means.

4,103,857
REINFORCED FIBERGLASS PALLET

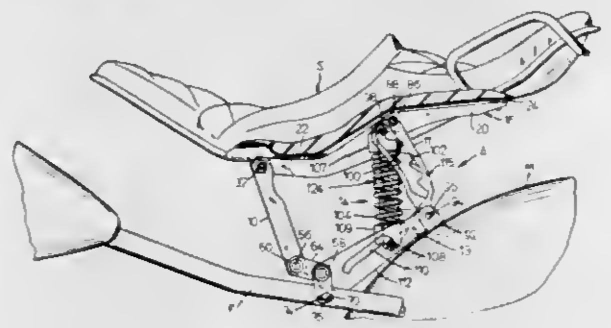
Alvin W. Levenhagen, Linesville, Pa., assignor to Molded Fiber Glass Tray Company, Linesville, Pa.
Continuation of Ser. No. 659,467, Feb. 19, 1976, abandoned. This application May 6, 1977, Ser. No. 794,665
Int. Cl.² B65D *19/24*
U.S. Cl. 248—346 **2 Claims**



1. A rectangular pallet made of a composite thermo-setting resin reinforced with glass fiber and steel bars comprising,
a rectangular platform having sides and ends made generally of a flat, plate-like member having a generally flat top surface made of thermo-setting resin reinforced with glass fiber,
two downwardly extending, spaced marginal first ribs integrally attached to said platform adjacent its sides and two spaced downwardly extending marginal second ribs integrally attached to said platform adjacent its said ends,
spaced third ribs extending parallel to said second ribs and attached to said first ribs,
each said first rib being integrally attached to a said second rib at a corner of said platform,
a grid made of steel rods providing tensile members comprising longitudinally extending first rods and laterally extending second rods and laterally extending third rods,
and said ribs being V-shaped in cross-section having plate-like sides integrally attached to said platform at their upper ends and converging downwardly and toward each other and being integrally connected together at their lower end at an externally rounded apex portion substantially thicker than said plate-like side,
each of said thickened lower ends providing a matrix receiving one of said rods in the said thickened end portion of each said rib,
and spaced webs integrally attached to the sides of said ribs acting as stiffeners for said ribs.

4,103,858
SEAT SUPPORT ASSEMBLY FOR A RECREATIONAL VEHICLE

Richard F. Swenson, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Brown Deer, Wis.
Filed Jul. 21, 1977, Ser. No. 817,574
Int. Cl.² A45D *19/04*
U.S. Cl. 248—399 **5 Claims**

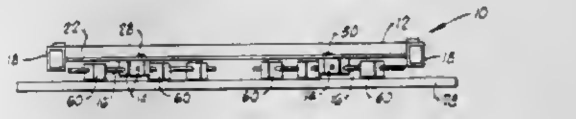


1. A seat supporting assembly for use in a vehicle to resiliently support a seat, said seat supporting assembly comprising: at least a pair of spaced apart pivotable arms, including a forward arm and a rearward arm, each of said arms including an upper end pivotably connected to said seat and a lower end pivotably connectable to said vehicle for supporting said seat for generally vertical movement, and said rearward arm including a longitudinally extending slot therein; and a spring assembly for resiliently supporting said seat and including a lower end pivotably supportable by said vehicle intermediate said lower ends of said forward arm and said rearward arm, said assembly including an upper end shiftably supported by said longitudinal slot wherein said spring assembly is moveable between a substantially vertical position where said seat is resiliently supported by said spring assembly to a position wherein said spring assembly extends rearwardly and wherein said upper end of said spring assembly is received adjacent to said lower end of said rearward arm wherein the amount of resilient support of said seat by said spring assembly is reduced, said spring assembly including a pair of spaced apart parallel shafts, and a telescoping strut having a connection at each of its ends with said shafts, said connections between said strut and shaft shafts, and including a non-circular opening in said strut means and said shafts have a correspondingly shaped end portion inserted in said opening for preventing relative rotation between said shafts, and spring means mounted between said shafts for resiliently supporting said vehicle seat.

4,103,859
LINEAR SUPPORT APPARATUS

Jerald L. Brown, Oklahoma City, and John J. Shelton, Tuttle, both of Okla., assignors to Fife Corporation, Oklahoma City, Okla.
Continuation of Ser. No. 606,127, Aug. 20, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,743
Int. Cl.² F16M *13/00*
U.S. Cl. 248—425 **11 Claims**

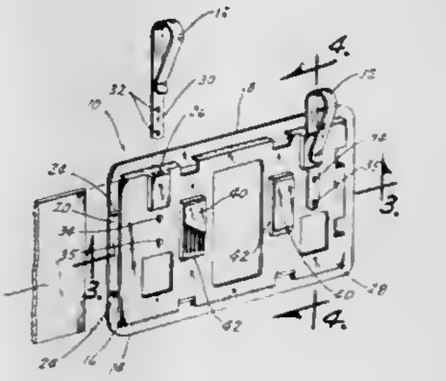
1. An apparatus for pivotally supporting a frame for rotation of the frame relative to a selected axis of pivotation, comprising:
a plurality of connectors connected to the frame at pivot support points; and
linear means for supporting the connectors, each connector movable along a respective axis of travel defined as passing through its respective pivot support point and through a travel axis convergence point, the axis of travel for each connector passing through the travel axis convergence



point, all of the pivot support points and the travel axis convergence point characterized as being on the circumference of a reference circle when the frame is positioned in a reference mode, the reference circle intersecting the axis of pivotation at an initial pivotation center which is located at one end of a reference diameter of the reference circle, the travel axis convergence point being located at the other end of the reference diameter.

4,103,860
MIRROR HOLDER

Charles A. Haas, and John E. Schenken, both of 420 E. Grand Ave., Des Moines, Iowa 50309
Filed Feb. 14, 1977, Ser. No. 768,285
Int. Cl.² A47G *1/17*
U.S. Cl. 248—467 **8 Claims**



1. A mirror holder comprising,
a molded support structure having a front and back wall with a slot therebetween having one open end for slidably removably receiving a mirror therethrough for securement between said front and back walls, said slot having lateral edges,
one of said front and back walls having at least one node at said open end of said slot for blocking said open end and holding said mirror in place;
said node being spaced inwardly from said lateral edges and having an angularly disposed camming surface positioned to engage said mirror and cam said mirror outwardly away from said one wall during insertion,
the other of said front and back walls having sufficient flexibility to be flexed outwardly away from said one wall in response to said camming action of said mirror against said camming surface of said node during insertion;
said front wall having an opening therein exposing said mirror; and
means associated with said support structure for attaching said support structure to another supporting surface.

4,103,861
ARRANGEMENT FOR THE SECTIONAL CANTILEVER PROJECTION OF MULTI-PANEL BRIDGE SUPPORTING STRUCTURES OF STEEL OR PRESTRESSED CONCRETE

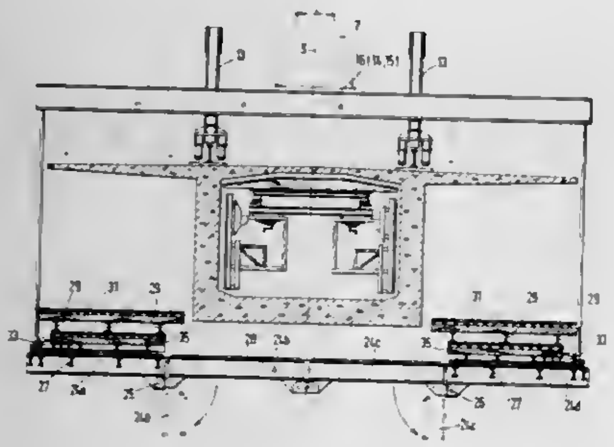
Wilhelm Büchler, Munich; Gotthard Müller, Aschheim, and Hans-Joachim Mende, Munich, all of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Feb. 17, 1977, Ser. No. 769,729

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607805

Int. Cl.² E01D *1/00*

U.S. Cl. 249—20 **11 Claims**



10. An arrangement for projecting cantilever sections of multi-sectional bridge supporting structures of steel and concrete and/or prestressed concrete forming a superstructure which is supported on bridge piles, comprising at least one traveling auxiliary beam movably carried on and arranged above said superstructure for spanning between superstructure sections, two concreting scaffolds each comprising a supporting part having crossbeams and rollers arranged above said superstructure, said rollers riding on rails positioned above said superstructure, a platform suspended from said supporting part of said scaffolds and arranged below said superstructure for carrying casings for extending said projecting superstructure sections, a transport device movably carried on said auxiliary beam so as to support therefrom said concreting scaffolds for transporting said scaffolds between superstructure sections and from completed sections to a bridge pile for beginning construction of the next section, said supporting part of each concreting scaffold having longitudinal girders arranged adjacent said auxiliary beam, said crossbeams of said supporting part being connected to said longitudinal girders and arranged below said auxiliary beam, a pair of retractable supporting blocks supporting said auxiliary beam on a pile next succeeding a completed superstructure section, said supporting blocks being alternately retractable to allow passage of said crossbeams of said supporting part when said scaffold is transported to said next succeeding bridge pile, said platform of said scaffolds comprising a bending resistant lattice formed by a plurality of longitudinally extending platform girders and a plurality of platform crossbeams extending transverse to said platform girders, each of said platform crossbeams having inner and outer parts, said innr parts being movable with respect to said outer parts to permit the formation of openings in said platform corresponding to the width of a bridge pile to allow said platform to pass said pile as it is transported to the next section, and one of said concreting scaffolds having a forked rear portion, wherein the other of said concreting scaffolds has a rear portion arranged to be complementarily fit within said forked rear portion of the other of said concreting scaffolds.

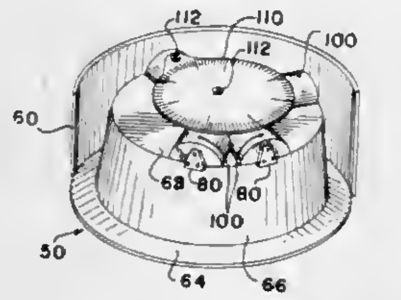
4,103,862
APPARATUS FOR PRODUCTION OF PRECAST MANHOLE BASES

Wayne O. Moore, P.O. Box 961, Mt. Vernon, Ill. 62864

Filed Apr. 25, 1977, Ser. No. 790,547

Int. Cl.² B28B *7/02*

U.S. Cl. 249—53 R **7 Claims**



1. In a precast concrete manhole base molding apparatus including a mold jacket having vertical walls defining a top edge and having interior dimensions corresponding to the dimensions of the exterior walls of said base, a mold form disposed within said jacket, said form comprising a base portion extending to the interior face of said jacket, a central portion extending upwardly from said base portion in spaced apart relationship with respect to said interior face of said jacket, and a top surface defined by said central portion, and including channel forming members extending upwardly from said top surface short of the extent of said top edge, and insert members extending outwardly from the central portion into abutting relationship with said jacket and positioned in line with said channel forming members, the improvement wherein said channel forming members comprise a first effluent channel forming member, means associated with said first member and said top surface attaching said first member in a fixed location on said top surface, said first member having one end positioned on the outer periphery of said top surface, and said first member extending inwardly from said one end to an opposite end at the center of said top surface, and including at least one additional channel forming member extending radially outwardly from said opposite end of said first member to the periphery of said top surface, said first member comprising a channel section extending inwardly from said one end and an enlarged basin section positioned at the center of said top surface, said additional channel forming member being positioned in engagement with said basin section, said additional member being movable over said top surface to thereby vary the angular relationship between said first member and said additional member, and including means associated with said additional member and said top surface locking said additional member in position on said top surface after a desired angular relationship is achieved.

4,103,863
ACTUATOR FOR EXPANDING GATE VALVES

Robert C. Houlgrave, and Larry J. Talafuse, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 567,573, Apr. 14, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,324

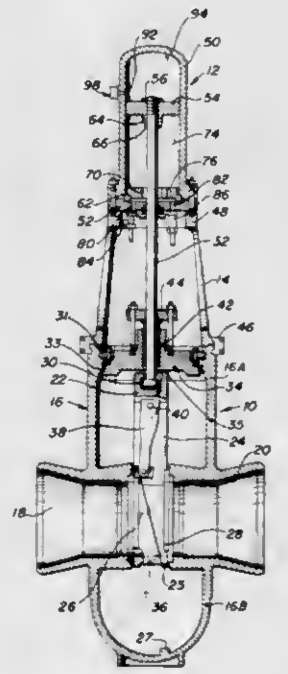
Int. Cl.² F16K *31/122*

U.S. Cl. 251—48 **10 Claims**

1. A gate valve and actuator assembly therefor, particularly adapted for high temperature service over around 450° F. comprising:

a gate valve body having a main flow passage therethrough and spaced seats therein about the flow passage, an expanding gate assembly within said body between the seats including a gate valve member having a notch on one face thereof and a segment movably mounted in said notch and carried on said gate valve member, said gate valve member and segment having an opening in a lower portion thereof alignable with said flow passage in a retracted position, an operating stem secured to the gate valve member for movement therewith, said gate valve body including a stop therein for limiting movement of said segment when moved to an extended closed position of said gate valve member;

a gas-hydraulic valve actuator mounted on the gate valve adjacent an upper end of said valve stem, said valve actuator including a cylinder with a piston therein secured to the upper end of said stem forming a hydraulic fluid chamber with hydraulic fluid on the lower side of said piston and a closed gas chamber with pressurized gas on the upper side of said piston to urge said piston and said stem continuously to the extended closed position of the gate valve; and



said actuator including means to meter hydraulic fluid flowing from the cylinder to slow the rate of travel of said stem adjacent the end of travel of the gate member to extended position, said means to meter permitting a fast rate of travel of said gate valve member and decelerating the movement of said gate valve member and segment between around ¾ inch and three inches from said stop, the metering of fluid by said means to meter providing a relatively slow rate of travel when the segment engages the stop to minimize the slamming action of the segment against the stop, said gate valve member moving downwardly after said segment has been stopped to provide lateral expansion between the gate valve member and segment for fluid-tight metal-to-metal sealing engagement with the seats, said means to meter thereby permitting a relatively slow expansion of the gate assembly to fully seated position while permitting the gate assembly to move to an extended position in a minimum of time.

4,103,864
HYDRAULIC POSITIONER FOR VALVES

Heinrich Hagendorn, Wesel, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

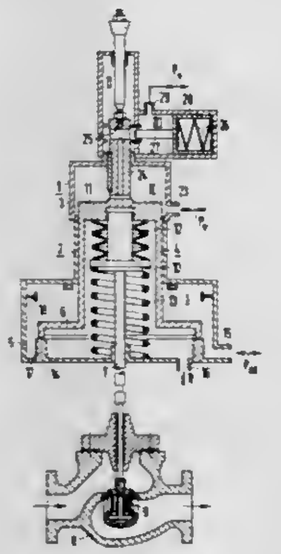
Filed Dec. 27, 1976, Ser. No. 754,358

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558959

Int. Cl.² F16K *31/122*

U.S. Cl. 251—63.6 **10 Claims**

1. A hydraulic positioner for a valve or the like comprising:
(a) a housing;
(b) a stepped differential piston disposed within said housing for motion therein;
(c) a coupling member coupled to act on the valve;
(d) a closing spring disposed inside said piston and acting between said piston and said coupling member in a first direction;
(e) an opening spring disposed within said housing between the bottom of said housing and said coupling member acting in a second direction opposite said first direction;
(f) a hydraulic latching system supplied with an oil pressure coupled to act on said differential piston so as to hold said



opening and closing springs cocked against each other when said oil pressure is present, at the same time holding said coupling member, in a first, normal position, whereby, if said oil pressure drops, said closing spring is first released causing said differential piston to move upward whereafter said opening spring is free to move said coupling member from said first position to a second position suddenly.

4,103,865
BALL VALVE

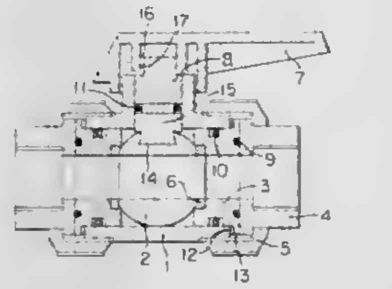
Kamori Nanba; Tomoyuki Ueda, and Tetsunori Matsuda, all of Nobeoka, Japan, assignors to Asahi Yukizai Kogyo Kabushiki Kaisha, Nobeoka, Japan

Continuation of Ser. No. 605,838, Aug. 19, 1975, abandoned. This application Jun. 18, 1976, Ser. No. 697,529

Claims priority, application Japan, Aug. 24, 1974, 49-100790

Int. Cl.² F16K *5/06*

U.S. Cl. 251—148 **1 Claim**



1. A ball valve comprising:

a valve body having a substantially cylindrical internal wall, a substantially cylindrical external wall, and substantially flat radially extending end faces;

a valve ball within said valve body, said ball being rotatable for controlling fluid flow therethrough and having a trapezoidal groove defined therein;

a carrier on each side of said ball, each of said carriers comprising:

- a substantially cylindrical section having a diameter substantially equal to that of the internal wall of the valve body and extending into said valve body, said section having a first substantially circular recess defined in the outer periphery thereof;

a substantially straight radially outwardly extending flange of an outer diameter greater than that of the internal wall of the valve body but less than that of the external wall of the valve body; and

a substantially flat radially extending end face defined in part by said flange, said end face having a second substantially circular recess defined therein;

a seat packing in direct contact with and positioned between the ball and each of said carriers;

two body caps, each of said caps comprising:

a substantially cylindrical section;

a substantially radially outwardly extending flange of an outer diameter substantially equal to that of the flanges of the carriers; and

a substantially flat radially extending end face, defined in part by the flange of the body cap, which abuts flush with a respective one of the flat end faces of the carriers;

a first O-ring in each of said first recesses for sealing any space between said carriers and the internal wall of said valve body;

a second O-ring in each of said second recesses for sealing any space between the end faces of said carriers and the corresponding end faces of said body caps;

an annular elastic seat gasket, sandwiched between the flange of each of said carriers and a respective one of the end faces of the valve body, for absorbing stress caused by thermal expansion which would otherwise be transmitted from the carriers to the ball;

two cap nuts, each of said nuts having a substantially cylindrical section threadingly engagable with a respective end of the valve body and a radially inwardly extending flange which abuts a respective one of the flanges of the carriers;

a stem having a trapezoidal protuberance positioned in said trapezoidal groove; and

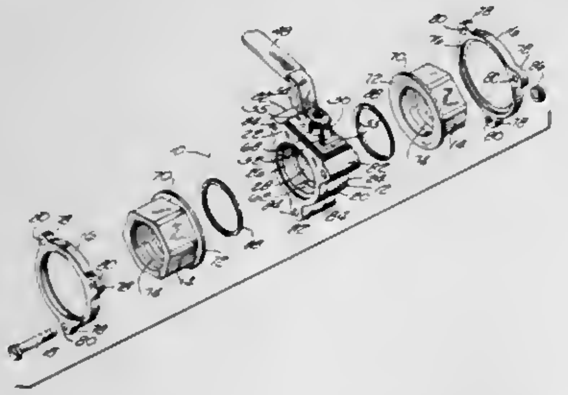
a handle engaged with said stem for rotating the ball via said stem whereby the valve ball can be easily changed by removing the cap nuts from the valve body, withdrawing the carriers from the valve body, disengaging the valve ball from the trapezoidal protuberance on the stem and removing the ball from the valve body.

4,103,866
BUTTERFLY VALVE

Bernie E. Robinson, Milwaukee, Wis., assignor to Milwaukee Valve Cnmpany, Inc., Milwaukee, Wis.

Filed Jan. 10, 1977, Ser. No. 758,066
Int. Cl.^{2} F16K *1/22*

U.S. Cl. 251—151 **12 Claims**



1. A butterfly valve adapted to be mounted between axially spaced tubular sections of a fluid system comprising

a pair of tailpieces, each adapted to be mounted on the end of one of the tubular sections and having a radially extending flange including an inner face;

a pair of annular clamping members, each adapted to fit over and slidably encircle one of said tailpieces and including a plurality of circumferentially spaced apertures, said apertures of one clamping member being axially alignable with the apertures of the other clamping member;

a valve unit including

a valve body having opposed end faces fitting between said tailpiece inner faces in face-to-face relationship, a bore defining a flow passage extending between said end faces, and a plurality of circumferentially spaced apertures located on the outer periphery thereof and axially alignable with said clamping member apertures, and

a valve member mounted in said valve body bore for rotation about an axis extending transversely of said flow passage between an open position and a closed position to shut off flow through said flow passage; and

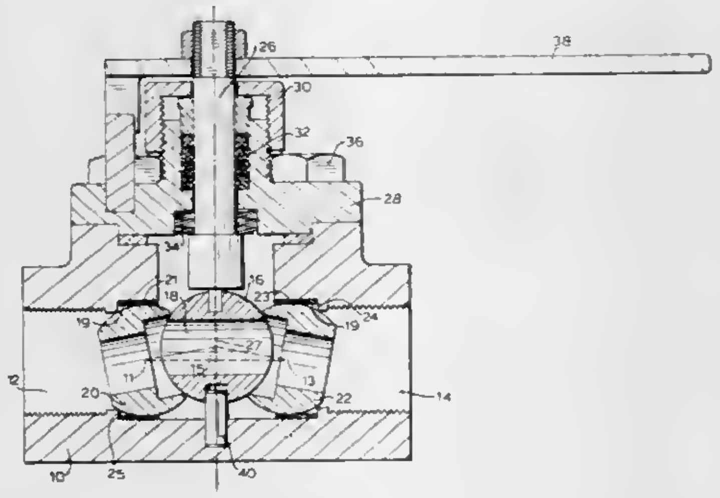
mounting means extending through said clamping member apertures and said valve body apertures for supporting said valve unit between said tailpieces and for moving the inner faces of said tailpieces into clamping engagement with the end faces of said valve body when said mounting means is moved to a clamping position, whereby said valve unit and said clamping members can be rotated as a subassembly relative to said tailpieces when said mounting means is in an unclamping position.

4,103,867
BALL VALVE

James Douglas Orr, 355 Rayette Rd., Coocord, Ontario, Canada (L4K IBI)

Filed Feb. 4, 1977, Ser. No. 765,874
Int. Cl.^{2} F16K *25/04*

U.S. Cl. 251—180 **4 Claims**



1. A valve comprising:

a housing having a flow passage;

a spherical flow control ball having a flow passage;

a pair of tubular sealing members each having a flow passage and a spherical outer wall;

the spherical outer wall of said tubular sealing members being seated in said flow passage of said housing for rotational movement about the centres of their respective spherical surfaces and with their flow passages generally aligned with the flow passage of the housing;

said control ball being between said tubular sealing members and having its surface in sealing engagement with an end of the passage of each sealing member;

means for maintaining said control ball and sealing members in spaced relation longitudinally of the flow passage of the housing with the centers of the control ball and centers of the sealing members in triangular relation, the centers of said spherical surfaces of said sealing members being below the center of said control ball whereby a downward force on said control ball and through its center causes a rotational force on said sealing members and tightens the engagement of the ends of the passages of the sealing members with the spherical surface of said ball;

a stem keyed to said control ball and extending exteriorly of said housing that is rotatable to align or disalign the flow passage of the control ball with the flow passage of the housing and sealing members to control flow; and

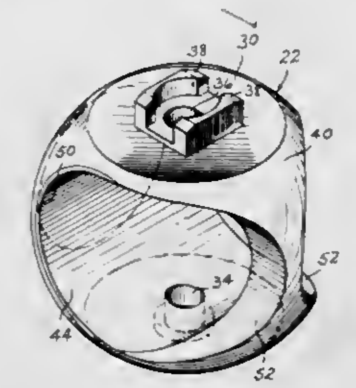
means for maintaining a downward force on said control ball through its center to maintain a rotational force on said sealing members and maintain them in sealing contact with said control ball.

4,103,868
BALL VALVE HAVING AN IMPROVED BALL ELEMENT DESIGN

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Filed Dec. 29, 1976, Ser. No. 755,269
Int. Cl.^{2} F16K *5/06*

U.S. Cl. 251—283 **3 Claims**



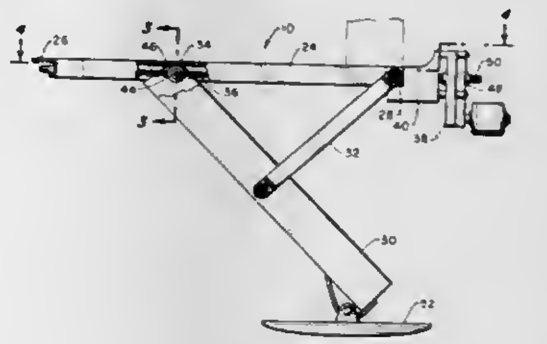
1. A ball valve to accommodate liquid flow comprising a housing having a chamber therein, said housing including an inlet into said chamber and an outlet from said chamber, a ball element in said chamber positioned between said inlet and outlet, handle means located exteriorly of said housing and contacting said ball element for rotating the ball element upon an axis between closed and full open positions, one of said inlet and outlet defining a valve seat, said ball element having a circumferentially located generally spherical outer surface extending radially about said axis of rotation, said ball element having a liquid flow passage therethrough formed by a continuous side wall, said ball element flow passage intersecting said axis of rotation and interrupting said outer surface of the ball element at spaced locations to define first and second opening edge portions into the ball element, said ball element flow passage being aligned with said inlet and outlet when said ball element is in its full open position to permit liquid flow from said inlet and through said outlet, each of said opening edge portions having a beveled reaction face means constituting an arcuate surface located laterally of said axis of rotation for making contact with liquid flow when said ball element is rotated between its closed and full open positions, said reaction face means of both opening edge portions converging toward each other from said opening edge portions and terminating at said ball element outer surface, said reaction face means of both opening edge portions interrupting said flow passage side wall at spaced locations, said ball element including spaced ends intersecting said axis of rotation, said ball element outer surface located between said ends, each reaction face means extending from adjacent one end to the other end of said ball element with the spacing between the reaction face means of both opening edge portions and said ball outer surface varying from a maximum adjacent each ball element end to a minimum at a location between said ball element ends.

4,103,869
VEHICLE LEVELLING AND STABILIZING SYSTEM

Philip R. Mesny, 20233 Parthenia, Canoga Park, Calif. 91306, and Jake E. Peoples, 5034 Cahuenga Blvd., North Hollywood, Calif. 91601

Continuation of Ser. No. 759,319, Jan. 13, 1977, abandoned. This application Nov. 25, 1977, Ser. No. 854,934
Int. Cl.^{2} B66F *7/24*

U.S. Cl. 254—86 R **4 Claims**



1. A levelling and stabilizing jack system for retrofitting to vehicles such as campers, trailers and the like comprising:

a plurality of separately mounted, reversible, horizontal folding jacks with extendable and retractable jack legs mounted at strategic locations on said vehicle,

said jacks comprising:

an elongate channel,

a worm gear traversing the length of said channel,

an elongate jack leg swingable from a position parallel with said channel to a substantially vertical position,

a trunnion connecting said leg to said worm gear having bushings between the trunnion and said leg for preventing said trunnion from binding on said worm gear,

a hexagonal shaft attached to said worm gear and extending beyond one end of said channel means,

a gear box engaging the end of said hexagonal shaft,

an electric motor for connecting to a vehicle battery for driving said worm gear,

a symmetrical reversible gear box motor mount attached to said channel means for adapting said motor and gear box arrangement so that said jack system may be adapted to mount at a variety of locations on said vehicle,

selective means for selectively operating said jacks individually or in predetermined groups or pairs,

means for securing said plurality of jack systems at convenient locations on said vehicle.

4,103,870
INSTRUMENT FOR SETTING A NON-SKID CHAIN ON A CAR TIRE

Keisuke Murakami, 2-22-3 Megurohon-cho, Meguro-ku, Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 825,164
Int. Cl.^{2} E02C *3/00;* B60C *27/00*

U.S. Cl. 254—88 **7 Claims**

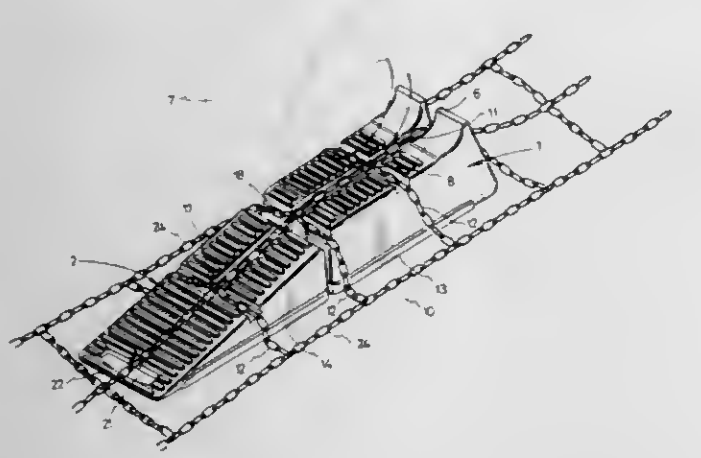
1. Apparatus for mounting a chain on a tire comprising:

(a) a bed adapted to be placed on the ground and having a mounting surface for placing the tire thereon, said mounting surface having a longitudinal groove and a plurality of transverse grooves therein for placing a chain therein,

(b) said bed consisting of first and second bed sections respectively having flat and inclined surfaces cooperating to form said mounting surface of said bed, said grooves in said mounting surface of the bed defining perpendicularly intersecting grooves in both the flat and inclined surfaces of said bed sections,

(c) said grooves being of sufficient size to allow said chain to be accommodated therein for longitudinal and transverse movement with the tire on the mounting surface,

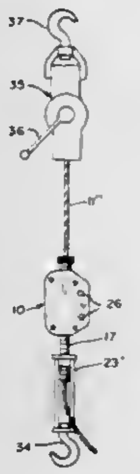
(d) said first and second bed sections having adjacent lower surfaces, said apparatus further including hinge means disposed between said adjacent lower surfaces of said two



bed sections and hingedly connecting said two bed sections for allowing said bed to be folded.

4,103,871
WIRE ROPE BINDER

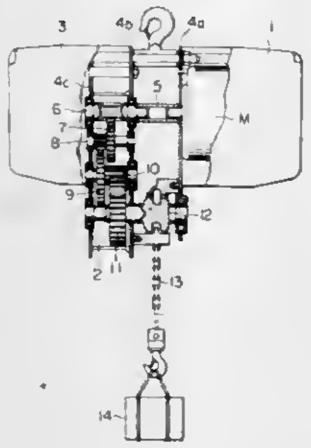
W. W. Patterson, III, and Eugene F. Grapes, both c/o W. W. Patterson & Company, 830 Brocket St., Pittsburgh, Pa. 15233
Division of Ser. No. 618,807, Oct. 2, 1975, Pat. No. 4,062,520, which is a division of Ser. No. 399,826, Sep. 24, 1973, Pat. No. 3,934,855. This application Nov. 1, 1976, Ser. No. 737,171
The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.² A63B *61/04*
U.S. Cl. 254—164 **2 Claims**



1. A wire rope binder apparatus comprising a wire rope of given length, a clamp having a body through which the wire rope extends adjustable on said wire rope to any position on its length with respect to one end thereof and having a threaded tubular extension thereon, threaded substantially over its length, through which the other end of said wire rope coaxially projects, a frame means having an opening through which the tubular extension on the clamp extends, and nut means screwed on said threaded tubular extension adjustably bearing against said frame means for pulling said clamp relative to said frame means to apply a tensioning force to said other end of said wire rope and means on said frame for attachment to a second object spaced from said first object and means in said body adapted to grip the wire rope on tensioning the wire rope, a winch having means for supporting it in a fixed position on a first object, and to which said one end of the wire rope connects for applying a tension force to said wire rope.

4,103,872
OVERLOAD PROTECTION APPARATUS FOR HOISTING MACHINE

Koki Hirasuka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 2, 1977, Ser. No. 764,892
Claims priority, application Japan, Feb. 2, 1976, 51-9325
Int. Cl.² B66D *1/00*
U.S. Cl. 254—168 **5 Claims**

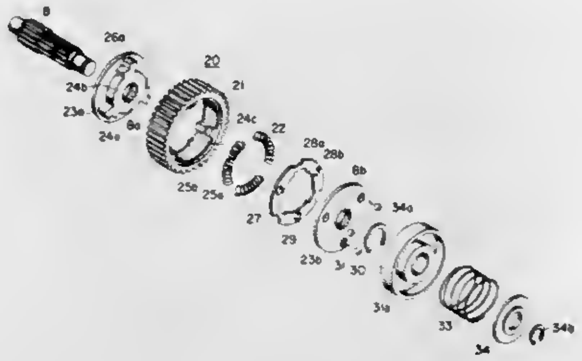


1. In an overload protection apparatus for hoisting machines having a driving part including an electric motor, an output, and a reduction part interconnecting said driving part and said output, with said reduction part having parallelly disposed input and output shafts, the improvement comprising: a slipping gear unit and a ratchet gear unit which are mounted drivingly connected between said input and said output shafts, said slipping gear unit and said ratchet gear unit respectively having outer ring gears engaging with said input shaft, said slipping gear unit having means to slip for torques exceeding a predetermined torque, said ratchet gear unit having ratchet means to engage its ring gear when said output shaft is rotated in a direction for lowering the load carried by said hoisting machine at a speed exceeding a predetermined speed, said slipping gear unit ring gear having inwardly extending protrusions, gear retaining plates for clamping said ring gear at its opposite sides and a spring acting between said protrusions and said plates for biasing said protrusions and said plates to one extreme position of limited relative lost motion and being compressed as said protrusions and said plates move to the opposite extreme position of the limited relative lost motion when transmitting torque between said input shaft and said output shaft.

4,103,873
OVERLOAD PROTECTION APPARATUS FOR HOISTING MACHINE

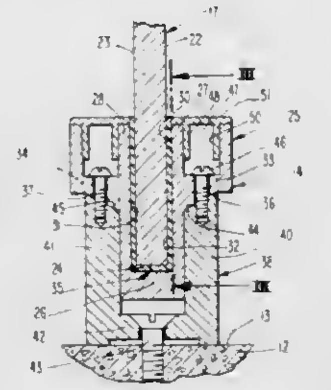
Isao Sato; Shigenori Gomi, and Mitsuyuki Furuichi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Mar. 18, 1977, Ser. No. 778,934
Claims priority, application Japan, Apr. 2, 1976, 51-36955
Int. Cl.² B66D *1/00*
U.S. Cl. 254—168 **6 Claims**

1. In an overload protection apparatus for hoisting machines having a driving section including an electric motor, an output, and a reduction section interconnecting said driving section and said output, with said reduction section having parallelly disposed input and output shafts, the improvement comprising:
  a gear drivingly mounted and connected between said input and output shafts, said gear including an outer gear unit having peripheral gear for engagement with a pinion and an inner gear unit constituted by first and second gear support means facing to each other and housed by said outer gear unit, said first and second gear supporting means have respective projecting members, said first and second gear supporting means abutting each other at their projecting members to provide a power transmission path to raise the load, spring means disposed between said first and second gear support means and in contact with said outer gear unit, said spring means being adapted to allow a relative movement of said inner and outer gear units when the load torque actually applied exceeds a predetermined torque in the direction of rotation applied to raise the load, means for converting the relative movement in the direction of rotation into a movement in the direction of thrust, and means for detecting the movement caused by said converting means and wherein said means for detecting the movement of said converting means effects a stopping of the lifting operation upon the movement of said converting means in the direction of thrust.



4,103,874
RAILING ASSEMBLY

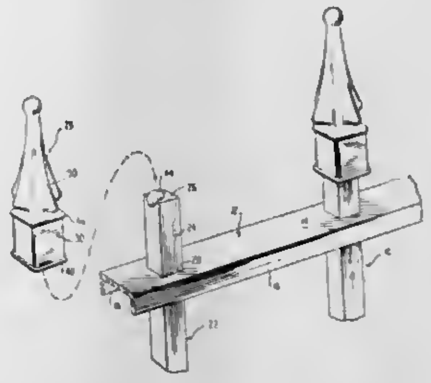
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Sep. 26, 1977, Ser. No. 836,408
Int. Cl.² E04H *17/16*
U.S. Cl. 256—24 **7 Claims**



1. A railing assembly comprising a handrail, railing mounting means for connecting the handrail to a building structure, and handrail supporting means connecting said mounting means and said handrail; said handrail supporting means comprising at least one panel, said railing mounting means comprising bracket means in the form of a channel member having an upwardly opening channel therein, the lower edge portions of said panel being disposed within said channel, with the channel member having portions that extend up along lower opposite sides of the panel in bracketing relation therewith, and tape means disposed in said channel between said upwardly extending portions of said channel and said lower opposite sides of said panel, said tape means including a plurality of upwardly extending spaced apart strip portions defining therebetween upwardly opening adhesive-receiving voids, for receiving a liquified adhesive therein, and with a panel-securing adhesive disposed in said voids.

4,103,875
SPEAR POINTS FOR FENCE STRUCTURE AND METHOD

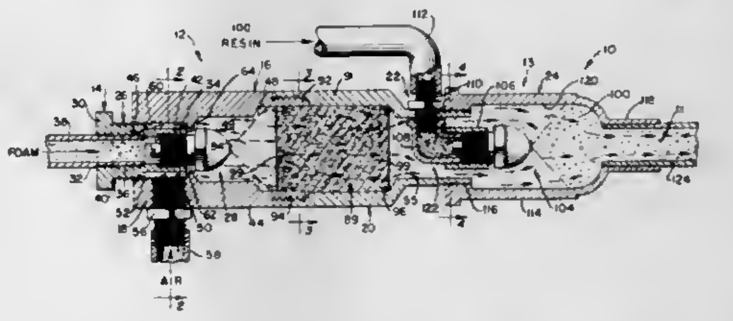
Carl R. Glass, 2749 N. Orange Blossom Trail, Kissimmee, Fla. 32741
Continuation of Ser. No. 612,521, Sep. 11, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,708
Int. Cl.² E04H *17/14*
U.S. Cl. 256—59 **1 Claim**



1. In a fence construction which includes a longitudinal stringer, and a plurality of substantially vertical metallic posts, said posts being substantially rectangular in cross section, and having upper side portions and top walls, protective and decorative spear points for said posts, and wherein each point comprises:
  a spear point body section having upper and lower portions;
  the lower body section having top and bottom flanges;
  the lower body section having a substantially rectangular chamber, said chamber being defined by inner walls which are inclined from the vertical so that the chamber is of increased dimension at its entry portion;
  the chamber having flat top walls;
  a spear point section projecting integrally, vertically from the upper portion of each body section;
  the body section and spear point section being formed of resilient plastic material; and wherein for each post the lower body section being expandably engaged on the respective upper side portions of a corresponding post with the chamber expanded throughout its depth to frictionally engage the side portions along the complete axial length thereof, with the top wall of the post abutted against the flat top wall of the chamber and an epoxy mastic bonding substance on the end of the post receiving the spear point to permanently adhere the spear point thereon.

4,103,876
METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING AND APPLYING FOAM

Walter J. Hasselman, Jr., and Walter J. Hasselman, Sr., both of 1084 Post Rd., Scarsdale, N.Y. 10583
Filed Apr. 30, 1975, Ser. No. 573,120
Int. Cl.² B01F *5/04*
U.S. Cl. 366—178 **23 Claims**



1. An apparatus for homogeneously mixing materials comprising a first material delivery and mixing means having a feed opening, a first mixing chamber having a generally central axis,

first outlet means, and first nozzle means, said first nozzle means for delivering a stream of finely atomized spray of a first material in said feed opening in directions generally parallel and transverse to the central axis of said chamber, and said first delivery and mixing means for delivering into said feed opening a generally annular stream of a second material about the spray of the first material such that both the first and second materials flow in substantially the same general direction, wherein the first stream mixes in the core of the layer of the second material to enable intimate and homogeneous mixing of the first and second materials, said first chamber being dimensioned larger than said feed opening to reduce the flow rate of the first and second materials passing therethrough, and said outlet means positioned downstream of said first chamber and being dimensioned smaller than said first chamber to increase the flow rate of the admixed material exiting said first chamber; and second material delivery and mixing means including third assembly means having a second mixing chamber and third material delivery means with a second nozzle means being operatively connected downstream to said first chamber, said third assembly and delivery means forming the homogeneous admixture of the first and second materials into a generally annular stream which flows in substantially the same general direction with respect to the mixing chamber as the first and second materials, said second nozzle means for introducing a finely atomized spray of a third material into the approximate center of the annular layered admixed stream such that the third material also flows in directions generally parallel and transverse to the annular stream of admixed first and second materials, thereby enabling the homogeneous admixture of the first, second and third materials in said second chamber, said second chamber being dimensioned larger than said outlet means to reduce the flow rates of the admixed stream and third material passing therethrough, means associated with said third assembly means to discharge the resultant admixture in substantially the same general direction as the first, second and third materials.

12. A process for manufacturing a foam material or the like comprising the steps of

(a) introducing into a first mixing zone a generally annular stream of a first gaseous material;

(b) introducing into the central portion of said first annular stream an atomized stream of a foam-forming material such that the foam-forming material flows in directions generally parallel and transverse to said first annular stream thereby causing substantially uniform and homogeneous intermixing of said materials;

(c) forming said admixed stream of first and second materials into a second generally annular stream;

(d) directing said generally annular stream into a second mixing zone while simultaneously reducing the speed of said first and second materials;

(e) introducing into the central portion of said annular admixed stream an atomized stream of a curable synthetic resinous material in directions generally parallel and transverse to said second annular admixed stream thereby causing said curable synthetic resinous material to become intermixed substantially uniformly with said annular admixed stream to form a substantially homogeneous synthetic resinous foam material; and

(f) directing said synthetic resinous foam material away from said second mixing zone.

4,103,877

DEVICE FOR THE FLAME TREATMENT OF A WORK-PIECE

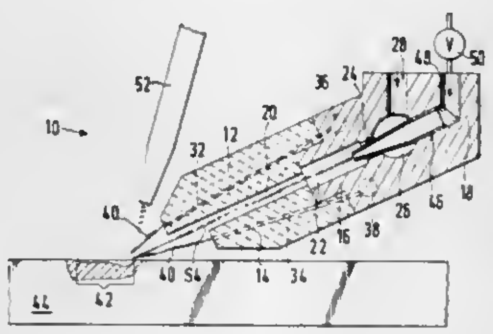
Alfred Pfeuffer, Neu-Isenburg, Germany, assignor to Messer Griesheim GmbH., Frankfurt am Main, Germany

Filed Nov. 22, 1976, Ser. No. 743,793

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2553553

Int. Cl.^{2} B23K *7/06*

U.S. Cl. 266—51 **5 Claims**



1. Device for scarfing of a metal work-piece, the combination with upper and lower preheating blocks disposed to define a scarfing-oxygen duct, holding means operable for holding said blocks, and including an oxygen distribution system in communication with said duct, and a separate nozzle communicating with said duct and operable for supplying an additional oxygen stream through said duct to the work-piece zone for ignition of said metal heating zone, said separate nozzle being arranged in an expansion chamber in the interior of said holding means and being connected to a separate supply line.

4,103,878

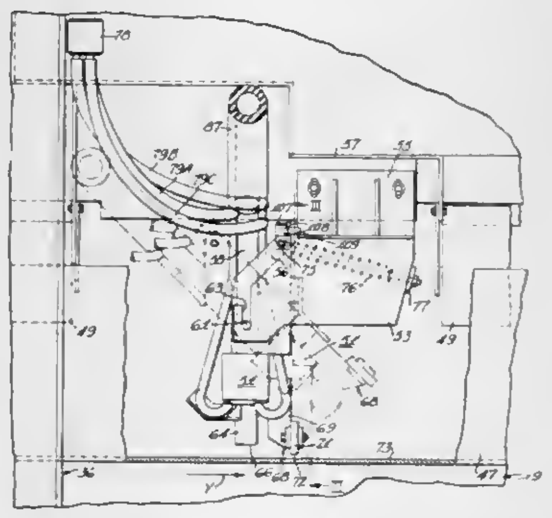
APPARATUS FOR REMOVING SOLIDS FROM THE WATER SEAL TROUGH OF AN ANNULAR MATERIAL COOLER

Richard W. Graef, Franksville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 8, 1977, Ser. No. 822,699

Int. Cl.^{2} C21D *11/00*

U.S. Cl. 266—78 **11 Claims**



1. In an annular material cooler device having at least one gas seal water trough, an apparatus for removing solids from said water trough comprising;

an ejector pump mounted in said water trough having a body portion provided with a main bore having an inlet and an outlet, said inlet being immersed in the water of the water trough;

a source of air under pressure;

conduit means connecting said source of air under pressure to said ejector pump; and

control means operable when actuated to direct the air under pressure to said ejector pump to create a vacuum at the inlet thereof to draw solids from the water trough into said ejector pump and into the stream of air under pressure passing through said ejector pump to be expelled therefrom through said outlet.

4,103,879

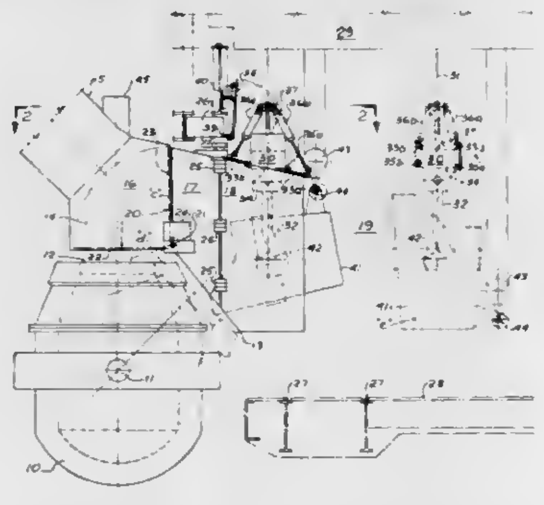
APPARATUS FOR CONTROLLING EMISSIONS FROM OXYGEN STEELMAKING FURNACES

Albert Calderon, 1065 Melrose Dr., Bowling Green, Ohio 43402

Continuation-in-part of Ser. No. 758,599, Jan. 12, 1977. This application Feb. 3, 1977, Ser. No. 765,208

Int. Cl.^{2} C21C *5/40*

U.S. Cl. 266—158 **7 Claims**



1. In the controlling of emissions from a basic oxygen steelmaking furnace an improved apparatus comprising in combination the following:

(a) an overhead hood having an entry point located over the mouth of said furnace when said furnace is in its upright position,

(b) suction means to create a negative pressure within said hood,

(c) an extension means to said hood to protrude away from the axis of rotation of said furnace in such a way as to communicate with said hood by means of an aperture, said extension being positioned over the mouth of said furnace when said furnace is in the reclined position towards the charging aisle, and said extension having the top thereof removeable for access purposes, and

(d) gate means to selectively control the emission of gases from either said entry point of said hood or said aperture of said extension.

4,103,880

APPARATUS FOR HEAT TREATING DRILL BLANKS

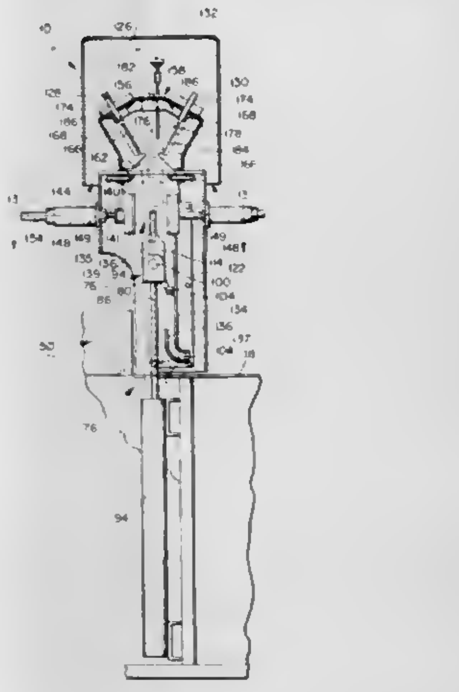
Herbert W. Westeren, Barrington, R.I., and Richard P. McCally, N. Attleboro, Mass., assignors to C. I. Hayes Inc., Cranston, R.I.

Filed Sep. 16, 1976, Ser. No. 723,704

Int. Cl.^{2} C21D *1/12*

U.S. Cl. 266—253 **21 Claims**

1. Apparatus for automatically heat treating a plurality of elongated articles, wherein each of said articles includes a first portion and a second portion, comprising a base, a feeding assembly mounted on said base and including means for feeding a predetermined number of said articles to a pick-up station located on said base, a furnace housing mounted on said base in spaced relation with respect to said pick-up station and having a heating chamber and a cooling station located in spaced vertical relation therein, said cooling station being spaced above said pick-up station in vertical alignment therewith, and said heating chamber being spaced above said cooling station in vertical alignment therewith and said pick-up station, and a transfer mechanism mounted on said base and including a jaw assembly for receiving the first portion of a plurality of said articles therein at said pick-up station and a lift device for moving said jaw assembly and the articles retained therebetween from said pick-up station through said cooling station and to said heating chamber, wherein only the second portion of said articles are exposed for the heat treatment thereof, said lift device thereafter moving said articles to said cooling station for a preselected interval for the cooling thereof, whereafter the treated articles are returned to the pick-up station for removal therefrom to a collection station.



4,103,881

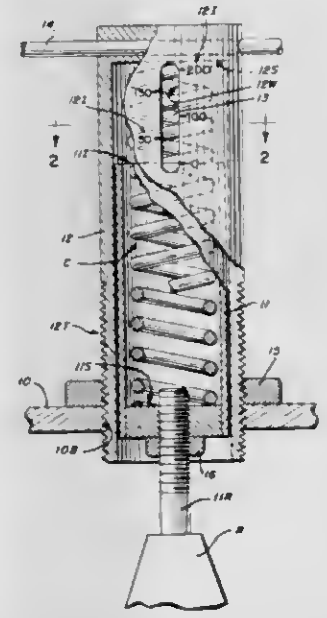
LOAD REGULATOR

Irene C. Simich, 5555 N. Sheridan Rd., Chicago, Ill. 60640

Filed Sep. 13, 1976, Ser. No. 722,658

Int. Cl.^{2} F16F *1/12*

U.S. Cl. 267—177 **7 Claims**

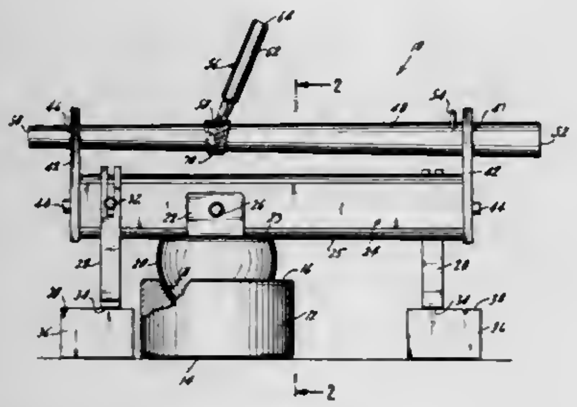


1. In a machine arrangement for accurately setting the load applied to a workpiece, an improved load regulator mounted to act between the machine and the workpiece for applying a load to the workpiece and comprising cooperating piston and cylinder means defining a variable length chamber, a coil spring disposed in the chamber to react between the piston and cylinder means and change in length in unison therewith for applying a load from the piston means to the workpiece, said piston and cylinder means having cooperating cylinder indicia and piston indicia arranged to indicate the value of the load in proportion to the length of the coil spring, and means to axially adjust the position of the cylinder means relative to the machine in accordance with the value registered by the indicia to set the load applied to the workpiece by the piston means, said cylinder means having external threads engageable with a threaded machine mounting bore to enable axial adjustment of the position of the cylinder means for setting the load to be applied to the workpiece.

4,103,882

APPARATUS FOR USE IN FORMING A FINISH ON A JEWELRY BAND

Abraham Winzelberg, 3620 Bowne St., Flushing, N.Y. 11354
Filed Sep. 29, 1977, Ser. No. 837,852
Int. Cl.^{2} B25B *5/14*
U.S. Cl. 269—51 **2 Claims**



1. Apparatus for use in forming a finish on a jewelry band comprising: a base; a chassis rotatably mounted to said base; first locking means for securing said chassis in position relative to said base; a mandrel, said mandrel being shaped in the form of a frustum of continuously increasing cross-sectional area, said mandrel further having a substantially circular cross section; and positioning means operable selectively to move said mandrel from a first position in disengageable relation to said jewelry band to a second position in rotatable relation to said chassis to a third position secured to said chassis, said positioning means including two arms extending from said chassis, each of said arms including an aperture, said mandrel being suspended within said apertures, said apertures being dimensioned in accordance with said mandrel so that when said mandrel is in said first and second positions, said mandrel is freely rotatable with respect to said arms, and when said mandrel is in said third position, said mandrel is secured in position with respect to said arms.

4,103,883

ADJUSTABLE SUPPORTING STRUCTURE

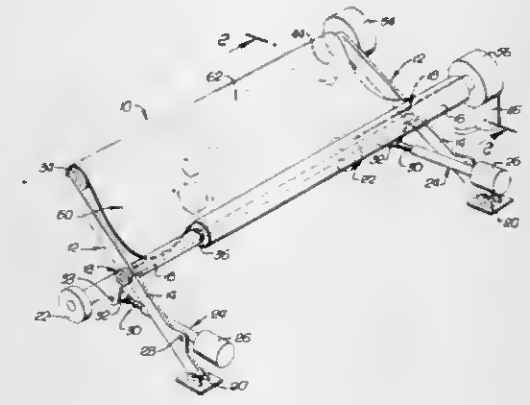
Willard W. Shepherd, Whittier, Calif., assignor to Shepherd Machinery Company, Los Angeles, Calif.
Filed Sep. 14, 1977, Ser. No. 833,155
Int. Cl.^{2} B23Q *3/00*
U.S. Cl. 269—71 **4 Claims**

1. In an adjustable supporting structure, the combination of:

(a) two end frames each comprising frame members having upper ends and each having means pivotally mounting said frame members thereof below their upper ends;

(b) two adjustable-length spacing means respectively having ends connected to said frame members of said end frames, respectively, for varying the spacings of said upper ends of said frame members;

(c) laterally spaced rolls extending longitudinally between said end frames and rotatably mounted on said upper ends of said frame members;



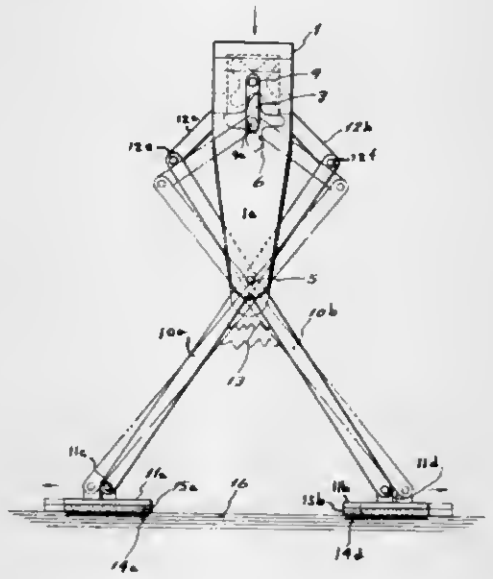
(d) a flexible sheet extending between and having portions carried by said rolls, respectively; and

(e) means for rotating said rolls.

4,103,884

CLOTH ARTICLE TRANSPORTERS

Yoshiro Kawashima, 18 Higashikomazume-cho, Gifu City, Japan
Filed Jan. 10, 1977, Ser. No. 758,189
Int. Cl.^{2} B65H *3/22*
U.S. Cl. 271—18.3 **5 Claims**

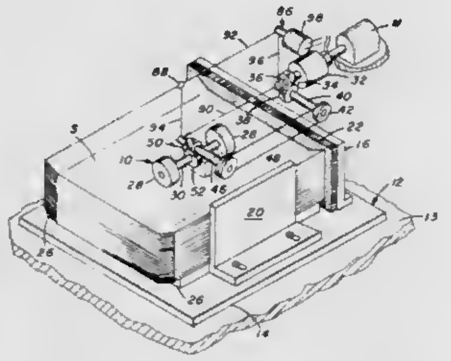


1. A transporter for a cloth article which comprises a body member adapted to be moved up and down, a pair of spaced plates carried by said body member, a bias means to urge said pair of spaced plates towards each other, needle members extending downwardly from each of said plates, a first means for moving said body member downwardly so that the needles in the plates can pierce a cloth article placed thereunder, a second means for moving said plates away from each other, a locking means coupled to and actuated by said first means to arrest the inwardly displacement of said spaced plates upon a downward movement of said body member and upon the next downward movement of said body member to automatically release said spaced plates and allow said bias means to move said spaced plates together, and a third means for moving said body member for selected vertical and horizontal distances, respectively.

4,103,885

TIMING MECHANISM FOR SHEET FEED APPARATUS

Richard Samuel Fox, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 2, 1977, Ser. No. 830,255
Int. Cl.^{2} B65H *3/06*
U.S. Cl. 271—117 **9 Claims**



1. Apparatus for feeding sheets seriatim from the variable top level of a stack of sheets to arrive at a sheet utilization device during a predetermined portion of the time cycle of the utilization device, said apparatus comprising:

means engageable with the top sheet of the stack for feeding such top sheet from the stack;

control means operatively connected to said feeding means for initiating feeding of the top sheet by said feeding means in response to a feed signal;

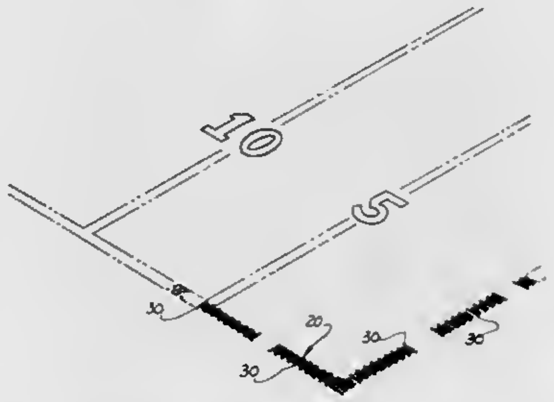
means for sensing the level of the top sheet in the stack prior to feeding such top sheet from the stack, and for producing a position signal corresponding to such level; and

means responsive to said position signal for producing a feed signal, the timing of which varies in accordance with said position signal, and for applying such feed signal to said control means so that the top sheet arrives at the sheet utilization device during said predetermined portion of said time cycle regardless of the level of the stack from which the sheet is fed.

4,103,886

PERMANENT ATHLETIC FIELD MARKER

Carl W. Eley, Rte. 1, Zanesfield, Ohio 43360
Filed Mar. 14, 1977, Ser. No. 777,399
Int. Cl.^{2} A63C *19/06*
U.S. Cl. 272—3 **2 Claims**

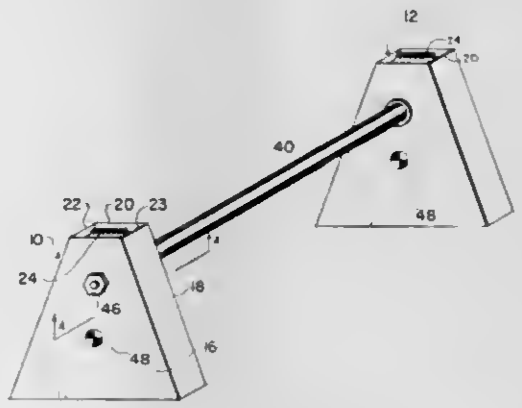


1. In combination, an athletic field and a permanent type of athletic field boundary marker comprising an elongated relatively narrow strip comprised of a flexible elongated base portion including a plurality of integrally formed and closely spaced upstanding projections, said projections having a height significantly greater than the depth of said base portion and having rounded tip portions, said base portion and projections being buried underground in said athletic field with only the tip portions of said projections being visible to clearly define a boundary marker when viewed from above ground.

4,103,887

BARBELL WITH COLLAPSIBLE LOAD CARRYING CHAMBERS

Renald Shoofler, 777 Greene Ave., Montreal, Quebec, Canada (H4C 2J8)
Filed Feb. 28, 1977, Ser. No. 772,350
Int. Cl.^{2} A63B *13/00*
U.S. Cl. 272—123 **7 Claims**

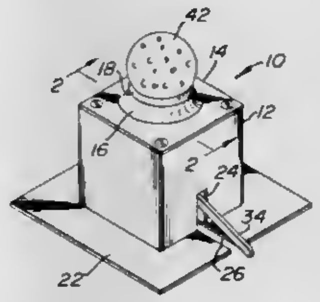


1. Exercising apparatus comprising two collapsible enclosures, each said enclosure having side walls and an end wall base, a walled opening in each of said enclosure side walls for receiving the end of a weight supporting bar, a support bar connecting said enclosures, the center of gravity of each of said enclosure being positioned between each said base and each said walled opening, an openable and closable aperture in each of said enclosures opposite the end wall base, each said wall opening and the center of gravity of each said enclosure being positioned in between each said aperture and each said base, each said side wall being flexible and composed of flexible polymeric material, each said side wall extending from the base to said aperture, each said openable and closable aperture comprising a slit in a wall of said enclosure, resilient means extending around the periphery of each of said apertures to resiliently bias said slit to a closed position to retain a weighted substance in each said enclosure.

4,103,888

GOLF TEE

Joseph H. Ricketts, 1 Lindenwood Ter., Ambler, Pa. 19002
Filed Dec. 28, 1976, Ser. No. 754,967
Int. Cl.^{2} A63B *57/00*
U.S. Cl. 273—33 **1 Claim**

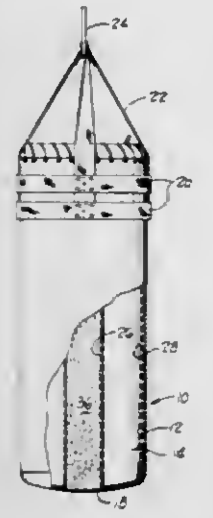


1. A golf tee assembly comprising a hollow housing, a support for said housing, an aperture in said housing, a sleeve extending from said aperture, said sleeve having a passage therethrough in communication with said aperture, a lip surrounding said passage at that end of said sleeve which is remote from said aperture, said lip being constructed and arranged to support a golf ball upon said sleeve above said passage, a piston in said housing movable toward and away from said aperture, said piston being in sealingly slidable contact with the inner surfaces of said housing to form at least a partial vacuum in said housing behind said aperture, and a pivoted lever arm pivotally connected to said piston and said housing, said lever arm when

pivoted will cause said piston to move in said housing to form said vacuum therein.

4,103,889
COLLAPSIBLE BAG FOR IMPACT ABSORBING ACTIVITIES AND METHOD OF MAKING

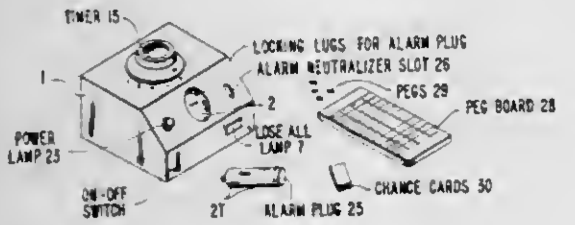
Terry J. Lobur, 1914 Walbrook Ave., Cleveland, Ohio 44109
Filed Apr. 5, 1976, Ser. No. 673,430
Int. Cl.² A63B *67/00, 69/00*
U.S. Cl. 272—77 **8 Claims**



3. A collapsible bag for use in athletic impact absorbing activities, comprising:
(a) a flexible casing,
(b) a collapsible and inflatable envelope disposed within said casing, the envelope being adapted to be inflated to expand said envelope within said casing,
(c) a recess defined by said envelope;
(d) a quantity of generally granular weighting material removably contained within the recess;
(e) access means for providing access through said casing to said recess to enable selective addition or removal of weighting material to or from said recess to thereby impart a selected weight to said bag; and,
(f) said envelope being inflated when in use to envelope and retain the weighting material in place.

4,103,890
GAME

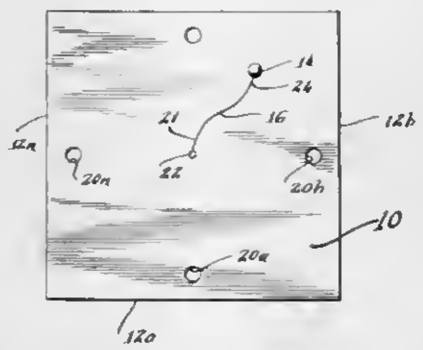
Robert J. Treasarden, Lake Errock, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Dec. 8, 1977, Ser. No. 858,692
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 E **2 Claims**



1. A game, comprising
a box having an alarm plug tube of electrically insulative material has electrical contacts in spaced relation;
an alarm circuit in the box electrically connected to the electrical contacts for indicating when the electrical contacts in the alarm plug tube are in electrical connection, said alarm circuit having a battery, lamps and an audible alarm connected to the electrical contacts;
an alarm plug of electrically insulative material having raised electrically conductive contact projections extending from the surface thereof in spaced random relation whereby a player attempts to withdraw the alarm plug from the alarm plug tube without electrically connecting the electrical contacts of said alarm plug tube via the contact projections of said alarm plug;
a switch in the box; and
a timer in the box electrically connected in circuit with the switch, the audible alarm and the battery for determining a period of time during which a player attempts to remove the alarm plug from the alarm plug tube, said switch neutralizing the timer and the audible alarm when opened.

4,103,891
GAME DEVICES

Patrick L. Stefano, Cleveland, Ohio, assignor to Stanley M. Miska, Sr., Weston, Conn.
Filed Feb. 4, 1977, Ser. No. 765,598
Int. Cl.² A63B *67/10*
U.S. Cl. 273—97 R **14 Claims**

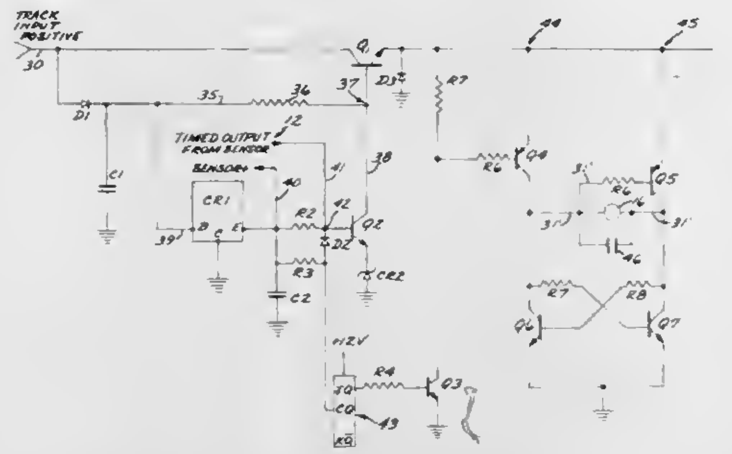


1. A game device comprising
a sheet-like playing surface made from supple, wrinklable, snappable, flexible material, for being grasped for manipulation by at least two players,
and a tether, one end of which is affixed to the mid-region of said surface, and to the other end of which is affixed a playing object,
said surface having at least two object receiver areas positioned in the edge region of said surface with their respective mid-points substantially equidistant from the point of affixation of said tether to said surface, each of which areas comprises one or more holes in said surface into which said object will fit, the outermost of which holes have their centers at a distance from said point not greater than the length of said tether plus the distance from the center of said object to its point of affixation to said tether, the angular displacement of the mid-points of said areas with respect to each other being substantially 360°/*n* where "*n*" is the number of said areas,
whereby players grasping edges of said surface may manipulate said surface to cause relative motion between said playing object and one or more of said holes.

4,103,892
LIGHT ACTUATED TARGET CONTROL FOR AN AMUSEMENT DEVICE

George B. Hinze, Westminster, Calif., assignor to Walt Disney Productions, Burbank, Calif.
Filed May 19, 1977, Ser. No. 798,606
Int. Cl.² F41J *5/02, 9/00*
U.S. Cl. 273—101.1 **10 Claims**

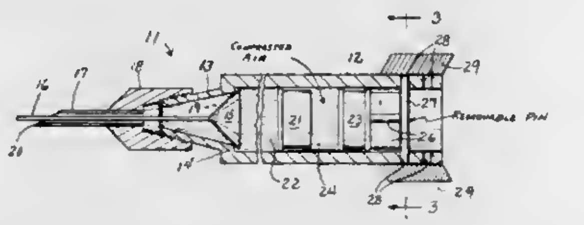
1. A reaction circuit for an amusement device in which means for providing a beam of energy is directed at a target constrained to move along a predetermined path comprising:
(a) a direct current electrical motor driving said target in a first direction along said path;
(b) an electrical power supply connected to said motor for supplying direct electrical current thereto through driving transistor means when said driving transistor means is biased to a conducting state below saturation;
(c) a bias connection from an electrical voltage supply to bias said driving transistor means into a conducting state;
(d) voltage clamping circuitry connected to said bias connection and including a normally conductive semiconductor element through which current is drained when voltage in said bias connection exceeds a preselected steady state bias level to thereby maintain a bias voltage;
(e) a shunt circuit connected to a direct current supply to normally bias said semiconductor element into a conducting state;



(f) a ground connection from said shunt circuit including a normally non-conductive circuit element actuable to a conductive state by a beam of energy directed thereat;
whereby actuation of said normally non-conductive circuit element by a beam of energy completes said ground connection to drop the bias from said semiconductor element in said shunt circuit to temporarily disable said bias voltage and increase the bias on said driving transistor means, thereby increasing power to said motor to accelerate said target along said path.

4,103,893
TRANQUILIZER DART

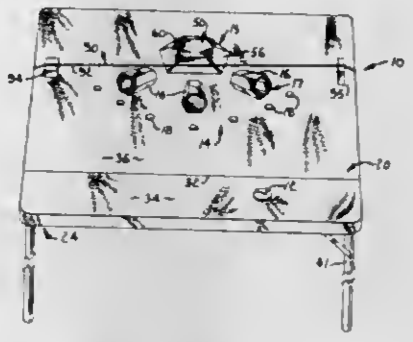
Elijah C. Walker, Takoma Park, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.
Filed Jun. 10, 1977, Ser. No. 805,567
Int. Cl.² A61D *7/00*
U.S. Cl. 273—106.5 D **10 Claims**



1. A lightweight projectile dart for injecting liquid into an animal upon impact, comprising:
a barrel having a forward end and a rearward end and being provided at said forward end with a hollow needle,
means defining a valve seat in the barrel near said forward end,
a valve element sealingly engageable with said seat and movable toward said rearward end to unseat
a triggering pin connected to said valve element and extending through said needle and projecting forwardly therefrom when the valve element engages the seat,
first movable plunger means in the barrel spaced rearwardly from said valve element and defining a liquid reservoir relative to said valve element,
second movable plunger means in the barrel spaced rearwardly from said first movable plunger means defining an air space relative to said first plunger means, and
stop means in the barrel located rearwardly of said second movable plunger means and holding the second movable plunger means in a pressurizing position for compressing the air in said air space,
whereby the compressed air acts on the first plunger means to force liquid in said reservoir past the valve element when the valve element is unseated by impact of the triggering pin with an animal, said valve seat being communicatively connected with said hollow needle.

4,103,894
DISK ROLLING GAME OF VARIABLE DIFFICULTY

Dan McCraw, Hot Springs, Ark., assignor to Domination Incorporated, Hot Springs, Ark.
Filed May 26, 1977, Ser. No. 800,806
Int. Cl.² A63F *3/00*
U.S. Cl. 273—126 A **18 Claims**



1. An amusement game adapted to be played by one or more players, said game comprising:
a plurality of disk-like magnetically attachable game pieces:
a fortress adapted to be disposed upon a supporting surface, said fortress comprising:
a base portion;
a substantially planar safe area in which pieces may be received;
a wall extending around said safe area and above said base; and
a plurality of nubs disposed at radially spaced apart locations on at least a portion of said wall and the edge of said safe area for impeding passage of pieces between said wall and into said safe area;
a plurality of cup-like traps for impeding passage of said game pieces which contact same, said traps comprising a mouth portion substantially larger than said game pieces whereby said game pieces may be admitted into said traps; and
a plurality of magnetic parasites for altering the course of said game pieces travelling in close proximity thereto.

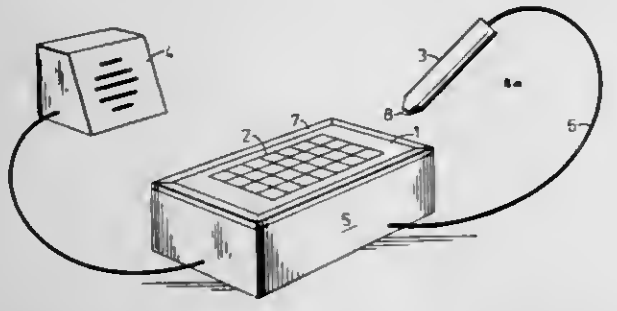
4,103,895
CONCEALED PATTERN DETECTION GAME

Gerald L. Pressman, 7925 Rainbow Dr., Cupertino, Calif. 95014, and Louis Wilk, 12440 Hilltop Dr., Los Altos Hills, Calif. 94022
Filed Mar. 19, 1976, Ser. No. 668,376
Int. Cl.² A63F *9/06*
U.S. Cl. 273—153 R **13 Claims**

1. A game or test of skill comprising:
a playing surface concealing a pattern of paths;
a means for selecting areas or points on said playing surface;
electronic circuit means connected to said selecting means and said pattern of paths, wherein said selecting means and said pattern of paths, during said selection of areas or points, comprise electronic circuit coupling for said electronic circuit means, and said circuit coupling is effected

by electromagnetic fields between said selecting means and said pattern of paths; and

an indicator means, activated by said electronic circuit means in response to said electronic circuit coupling, for revealing whether the selected point on said surface corresponds to a point on said pattern of paths; in which the object of the game is to discover properties of the concealed pattern.



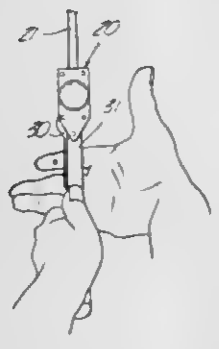
4,103,896
GOLF GRIP TRAINING APPARATUS

Walter R. Lorang, 2239 W. Maple Rd., Walled Lake, Mich. 48088

Filed Apr. 25, 1977, Ser. No. 790,258

Int. Cl.^{2} A63B *69/36*

U.S. Cl. 273—183 D **8 Claims**



1. Golf-grip training apparatus in combination with a golf club having a shaft, a hand-grip portion on said shaft, a head on said shaft, and a striking face on said head;

said striking face defining the target side of said shaft, said head, said hand-grip portion, and said striking face;

said apparatus comprising

signal means, and

force sensitive means connected to said signal means to cause said signal means to emit a signal upon more than minimal force being imposed on said force sensitive means;

said signal means being mounted on said shaft of said golf club and said force sensitive means being mounted on said target side of said hand grip portion of said golf club;

said force sensitive means being positioned on the target side of said hand-grip portion of said golf club when held in the address position so as to be in alignment with said striking face relative to the target;

said force sensitive means overlying said hand-grip portion of said golf club in the location of at least the tip joints of at least the middle two fingers of the golfer's off-target hand;

force in excess of minimal exerted by the fingers of the off-target hand on said force sensitive means in the golfer's grip on and in his swing of a golf club causing said force sensitive means to activate said signal means to emit a signal advising the golfer that his off-target hand has interfered with his swing;

minimal force exerted by the fingers of the off-target hand on said force sensitive means in the grip and in the swing of a golf club not causing said force sensitive means to activate said signal means and the absence of a signal advising the golfer that his off-target hand has not interfered with his swing.

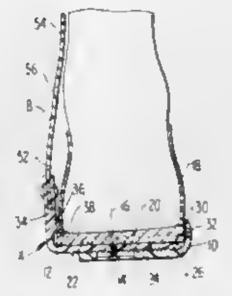
4,103,897
GOLFER'S STANCE CORRECTING DEVICE

Rene Ostyn, 810 S. 11th St., Fort Pierce, Fla. 33450

Filed Jun. 27, 1977, Ser. No. 810,320

Int. Cl.^{2} A63B *69/36;* A61F *3/00*

U.S. Cl. 273—188 A **5 Claims**



1. A golfer's stance correcting device comprising:

clamp means comprising a J-shaped rigid member, an L-shaped rigid member and a fastener element to fix said members together in a U-shaped configuration of adjustable width for clamping across the shank of a golfer's shoe,

a flexible band for strapping about the lower leg of the golfer above the shoe carrying said clamp means,

a rigid strip member having upper and lower ends pivoted at its lower end to the free end a said L-shaped member for rocking movement substantially parallel to the longitudinal axis as said golfer's shoe, and

a pocket in said flexible band in which said upper end of said strip member is held.

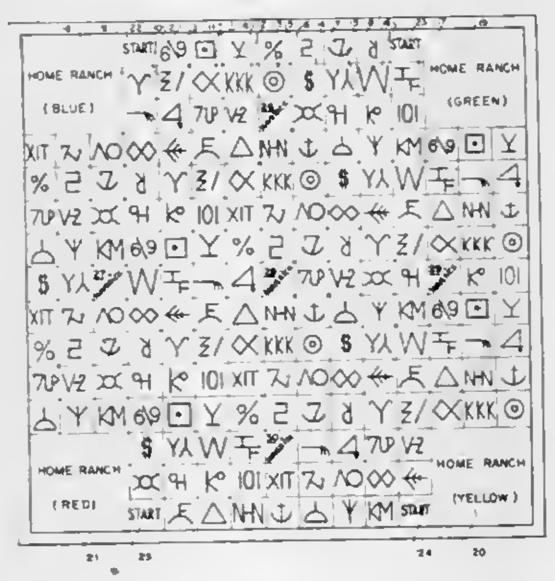
4,103,898
BOARD GAME

Frank F. Fulton, Las Vegas, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 5, 1977, Ser. No. 794,109

Int. Cl.^{2} A63F *3/00*

U.S. Cl. 273—248 **1 Claim**



1. A board game, comprising

a game board of square shape having a plurality of equally dimensioned squares thereon in rows and columns, said squares constituting five sets of 36 squares each, each set having the same indications as the others, but in different locations on the board, each set having 36 different cattle brands each in a corresponding one of its squares, four corner squares larger than each of the plurality of squares, each of the corner squares being identified as the home ranch of a specific color different from the colors of the other home ranches, four START squares of the same dimensions as the plurality of squares, each of said START squares being next adjacent a corresponding one of the corner squares, five MAVERICK squares of the same dimensions as the plurality of squares in different locations on the board;

four groups of miniature plastic calves, each group having a plurality of calves of the same color different from the colors of other groups; and

four pairs of dice, each die having six surfaces, two blank and the remaining four having 1, 2, 3 and 4 dots thereon, respectively, each pair of dice having the same color different from the colors of the other pairs, the colors of the home ranches, the calves and the dice corresponding so that each of the four players has a home ranch, a group of calves and a pair of dice of the same color.

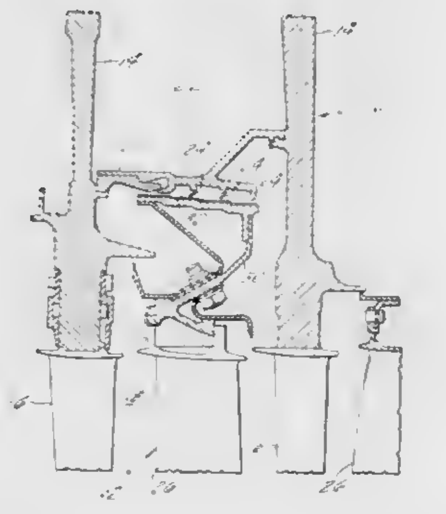
4,103,899
ROTARY SEAL WITH PRESSURIZED AIR DIRECTED AT FLUID APPROACHING THE SEAL

Albert Harold Turner, East Hampton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 618,541, Oct. 1, 1975, abandoned. This application Jul. 28, 1976, Ser. No. 709,463

Int. Cl.^{2} F16J *15/40, 15/44*

U.S. Cl. 277—1 **12 Claims**



7. A method for reducing the leakage of a fluid medium across a rotary seal between two relatively rotating components of a machine, comprising the steps of:

flowing air which is at a pressure greater than the pressure of the fluid medium at the upstream end of the rotary seal to the seal region; and

discharging the air across the upstream end of the rotary seal in opposition to the flow of the fluid medium approaching the seal to form an aerodynamic barrier impeding the flow of the fluid medium.

4,103,900
ORIGINALITY SEAL FOR DISPOSABLE RECEPTACLES

Adam Wittersheim, Nieder-Ramstadt-Trautheim, Fed. Rep. of Germany, assignor to Goldwell GmbH Chemische Fabrik H.E. Dotter, Darmstadt-Eberstadt, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,698

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1975, 2539838

Int. Cl.^{2} B65B *7/28;* B65D *41/32*

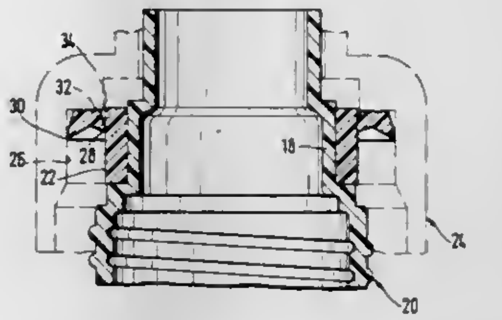
U.S. Cl. 277—2 **8 Claims**

1. An originality seal for a disposable, non-reusable receptacle having a spout receivable within an opening of an applicator, which applicator has a wall extending peripherally about, and outwardly from the opening therein, comprising:

sealing means associated with said spout of said receptacle, said sealing means including a peripheral wall sealing surface disposable about said spout which opposes and is spaced from the interior peripheral surface of said applicator wall when said spout is received in said opening of said applicator;

a resilient sealing ring receivable on said spout adjacent to said peripheral sealing surface associated therewith, said ring having at least two sealing lips, one of which is disposed for cooperative sealing engagement with the interior peripheral surface of the wall of the applicator and the other of which is disposed for cooperative sealing engagement with said sealing surface associated with said spout of said receptacle when said spout is received within said opening; and

frangible web means coupling said resilient sealing ring to said sealing surface associated with said receptacle spout which ruptures upon receipt of said spout within the opening of said applicator to prevent reuse of said sealing ring and, in turn, said originality seal.



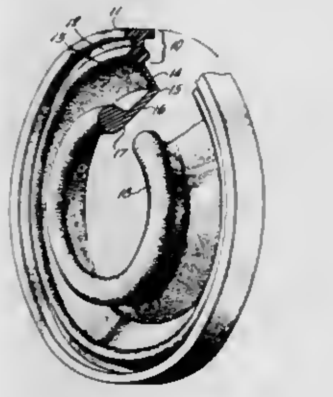
4,103,901
MOLDED PLEATED GASKET AND DEVICE FOR INSTALLING SAME ON PIPE

John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.

Filed Dec. 27, 1976, Ser. No. 754,109

Int. Cl.^{2} F16J *15/10;* B23P *19/00*

U.S. Cl. 277—9.5 **9 Claims**



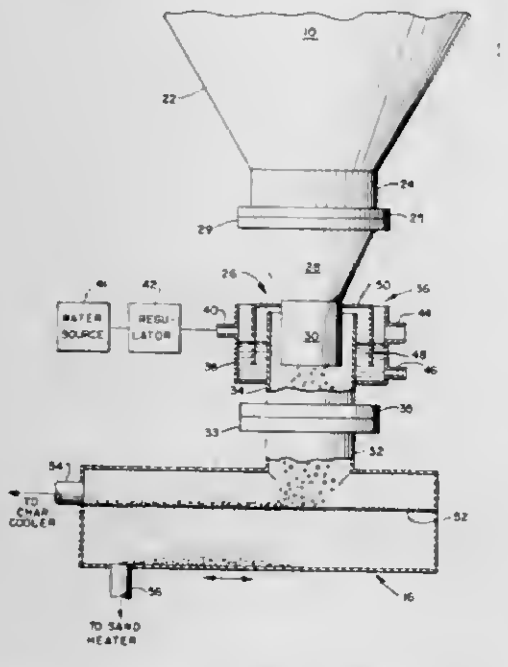
1. A molded elastomeric gasket for resiliently supporting a sewer pipe in a manhole opening and sealing the space between the wall of the opening and the surface of the pipe, said gasket having an outer cylindrical flange member extending axially on both sides of a mid-plane which is normal to the axis of the pipe; a first web of substantial thickness extending radially inwardly from a mid-region of the inner surface of said cylindrical flange member and integral therewith, said web and said flange being adapted for embedment in settable material lining the manhole opening; an intermediate web, integral with said first web and extending at an obtuse angle radially inwardly from the mid-plane and at its inner edge being united with a third web, which extends from the juncture line at a reverse angle towards the pipe, said third web terminating in a rim portion of toroidal form, integral with said web and having an

inner diameter substantially less than the outer diameter of said pipe.

4,103,902
WATER SEAL FOR REGENERATOR

Peter Steiner, Edison, and William Frederick Bischoff, Califon, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 16, 1977, Ser. No. 825,122
Int. Cl.² B01J *8/08;* **F16J** *15/40*
U.S. Cl. 277—12 **4 Claims**



1. In combination with a regeneration vessel for the thermal regeneration of an adsorbent material, means for introducing the saturated adsorbent material from an adsorption source into the vessel, means for introducing into the vessel a heated, inert material from a second source, a discharge means disposed adjacent to the exit portion of said vessel, and a vibratory separator means disposed adjacent to said discharge means for receiving the mixture of adsorbent and inert materials passing from said discharge means and for separating said materials, a device for establishing a fluid seal between said discharge means and said vibratory separator means which comprises:

a fluid container having a fluid therein and attached to and movable with said vibratory separator means;

sealing means having an open end portion and a closed end portion and supported upon said discharge means with said open end portion extending below the level of the fluid in said container, such that a hydrostatic seal is established within the enclosed volume defined by the internal volume of said sealing means and the surface of the fluid; and

conduit means interconnecting said discharge means and said separator means to provide an unobstructed flow path for said materials.

4,103,903
FLUID ACTUATED SEALING ARRANGEMENT

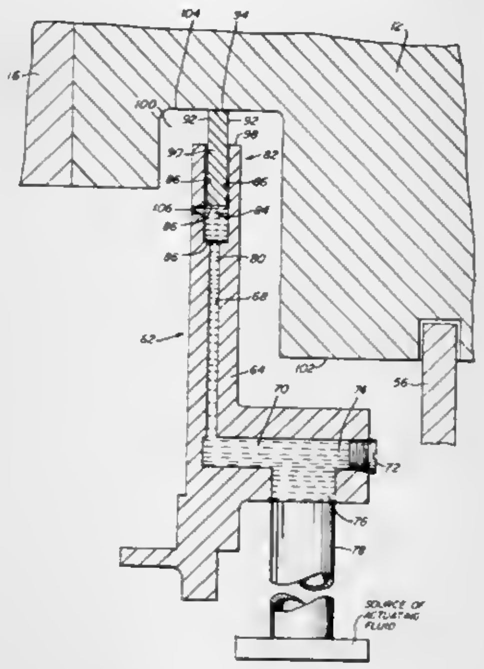
Alfred J. Capriotti, Falls Township, Bucks County; John Gana, Buckingham Borough, and Thomas J. Korpela, Upper Merion Township, Montgomery County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 29, 1976, Ser. No. 709,732
Int. Cl.² F16J *15/16;* **F16L** *17/00*
U.S. Cl. 277—27 **24 Claims**

1. A fluid actuated sealing arrangement adapted to provide a seal for an element to be sealed, said fluid actuated sealing arrangement comprising:

a housing, said housing having a means defining a bore extending therethrough through which an actuating fluid, from a source, may be passed from an entrance end of said housing to a sealing end of said housing and means defining a slot at said sealing end of said housing connected to said bore and being configured having a sealing seat therein; and

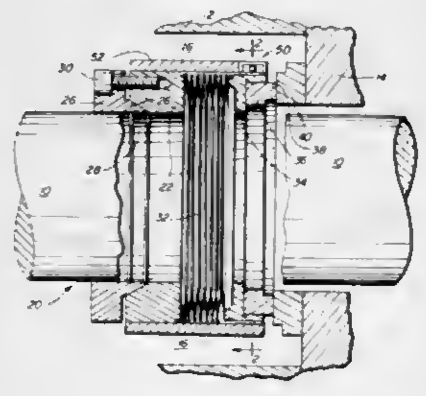
a seal element, adapted to fit within said slot, said seal element being movable by such actuating fluid away from said sealing seat into sealing association with such element to be sealed, a portion of said seal element being extendable from without the confines of said slot thereby leaving a fluid fillable volume between the bottom of said seal element and said sealing seat for accommodating movement of said element to be sealed toward and away from said sealing seat, such fluid being operative to both actuate said seal element and lubricate said seal element within said slot of said housing.



4,103,904
ELASTIC POSITIVE DRIVE BELLOWS SEAL

Harry Tankus, Wilmette, Ill., assignor to Crane Packing Co., Morton Grove, Ill.

Filed Sep. 7, 1977, Ser. No. 831,331
Int. Cl.² F16J *15/36*
U.S. Cl. 277—42 **7 Claims**



1. An elastic positive drive mechanical bellows seal for sealing a space between a housing and a rotating shaft extending therethrough, said seal comprising:

(a) an annular collar support means mounted coaxially upon said shaft and in sealing engagement with said shaft;

(b) an annular bellows section carried by said support means extending coaxial of said shaft and having a first sealing element mounted on an end opposite said support means, said sealing element having a first radially extending sealing face;

(c) a sealing element carried by said housing coaxial of said shaft, and having a second radially extending sealing face positioned in mating relating to said first face;

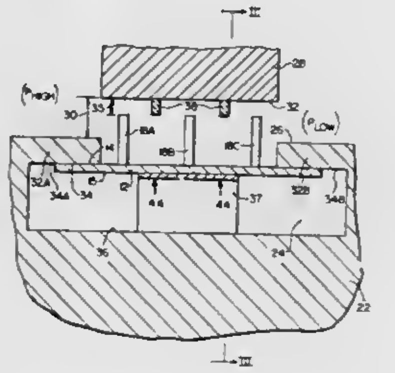
(d) resilient means for interconnecting said support means and said first sealing element to minimize torsional forces imposed on said bellows, said means including a biasing means whose force is directed circumferentially of said bellows;

(e) said resilient means including a tubular member constrained for rotation with said collar means and extending coaxial of said shaft towards said washer; a detent means affixed to said washer; and compression springs interposed between said tubular member and said detent means.

4,103,905
VARIABLE RADIUS SPRINGBACK WAVY SEAL

John W. Desmond, Media; Joseph F. Kmec, Aston, and Charles A. Meyer, Media, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 665,346, Mar. 9, 1976, abandoned. This application Feb. 7, 1977, Ser. No. 766,475
Int. Cl.² F16J *15/48;* **F01D** *5/20*
U.S. Cl. 277—56 **11 Claims**



1. In combination a seal arrangement, a rotatable member, and a stationary member spacially separated from and disposed about said rotatable member, one of said members having a circumferential groove therein, said seal arrangement comprising:

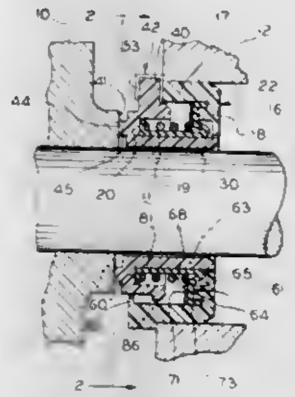
a thin strip having generally parallel major surfaces an at least one undulating ribbon mounted in an edgewise manner along its length on one of said major surfaces so that the undulating ribbon and its undulations are generally perpendicular to the attached major surface, said strip being conformable to and receivable in said groove, the ends of said strip and attached ribbon being disposed in closely spaced, circumferentially adjacent relationship.

4,103,906
ROTARY SEAL WITH RESILIENT DIAPHRAGM

Norbert W. Gits, 6417 Blackhawk Trail, Indian Head Park, Ill. 60525

Filed Nov. 11, 1977, Ser. No. 850,542
Int. Cl.² F16J *15/34*
U.S. Cl. 277—88 **11 Claims**

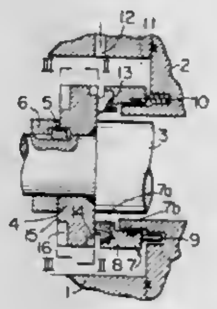
1. In a rotary seal for use between a fixed part (10) and a shaft (11) rotating relative to the fixed part (12), the fixed part (10) and shaft (11) each having a pad(41, 44) in face-to-face rubbing contact, an annular member (16) surrounding the shaft (11) and means to prevent rotation of the member (16) relative to the fixed part (10), the improvement which comprises means constituting a liquidtight seal between the fixed and rotatable parts (10, 11), said member (16) and annular member (20) having respective male and female loosely-interengaged elements (16, 14) for joint coupling thereof, the annular member (20) and the member (16) having interior cavities together defining a chamber to house a diaphragm (61) sealing the chamber against leakage of the medium being sealed, and a compression spring (81) biasing the rotatable seal pad (41) into rubbing contact with the fixed part (12), the part (10) having an annular hub (19) extending along substantially the whole axial length of the seal assembly, the diaphragm (61) being of sleeve-like form terminating at one end in an integral bead (65) of substantially U-shaped transverse cross section deformable both axially and radially in response to forces applied radially and axially to the diaphragm, the compression spring (81) being inerposed between respective shoulders at respective ends of the diaphragm to bias the pads (41, 44) together in rubbing abutment.



4,103,907
MECHANICAL SEAL

Hiroshi Inouye, Ibaraki, and Sadao Kobayashi, Takarazuka, both of Japan, assignors to Hitachi, Ltd. and Nippon Pillar Packing Co., Ltd., both of, Japan

Filed Jun. 7, 1976, Ser. No. 693,314
Claims priority, application Japan, Jun. 9, 1975, 50-68605
Int. Cl.² F16J *15/34*
U.S. Cl. 277—96.1 **23 Claims**



1. A mechanical seal suitable for shaft sealing under the conditions of high pressure, high temperature and high speed, comprising:

a shaft;

a rotatable sealing element mounted on a shaft and rotated along with said shaft;

a stationary sealing element forming a sliding seal surface where sealing action is performed in cooperation with said rotatable sealing element;

spring means provided in the axial direction to increase the surface pressure of said sliding seal surface;

a plurality of surface deformation generating groove means for generating surface deformations at the sliding seal surface with thermal expansion to thereby create a film of cooling fluid therein, said surface deformation generating groove means extending radially and being spaced apart in the circumferential direction thereof in portions close to but not in contact with the sliding seal surface on the side of the sliding seal surface of at least one of the sealing elements.

4,103,908
SEAL STRUCTURES FOR ROTARY REGENERATIVE HEAT EXCHANGERS OF GAS TURBINE ENGINES

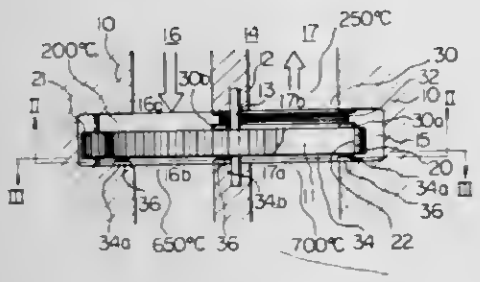
Osamu Kobayashi, Yokohama; Ikuo Nakamura, and Akira Shimozono, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 12, 1976, Ser. No. 713,963

Claims priority, application Japan, Aug. 26, 1975, 50-103281

Int. Cl.² F16J *15/34*

U.S. Cl. 277—96.2 **2 Claims**



1. In a gas turbine engine, a rubbing seal for engagement with a hot face of a matrix of a rotary regenerative heat exchanger, comprising an annular portion made from carbon block, a diametrical portion having a rubbing contact surface made of a compound of nickel and calcium fluoride, and a layer of a compound of nickel oxide and calcium fluoride formed on an inner circumferential wall of the annular portion.

4,103,909
SEAL FOR A DRIVE JOURNAL OF A BALL VALVE

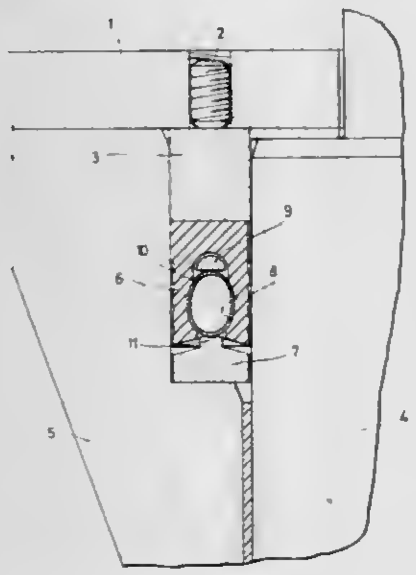
Michael Hoffman, and Rolf Pape, botb of Berlin, Fed. Rep. of Germany, assignors to Borsig Gesellschaft mit beschrankter Haftung, Berlin, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,523

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644419

Int. Cl.² F16J *15/24;* **F16K** *31/44*

U.S. Cl. 277—101 **3 Claims**



1. A seal for a drive journal of a ball valve, which comprises:

a housing which accommodates said drive journal;

a cover, located on said housing, through which a portion of said drive journal juts;

an annular thrust collar located in said housing adjacent said drive journal and directed against said cover;

a plurality of set screws located in said cover and adapted to displace said thrust collar in the axial direction of said drive journal;

a U-ring which acts as a sealing ring and which abuts the thrust collar and is located between said drive journal and said housing, said U-ring being provided with an annular slot which is open toward that end of said U-ring which is remote from said thrust collar;

a thrust ring located in said housing at the open end of said slot;

a metallic compensating ring located in the deepest portion of said slot; and

an annular spiral spring located in said slot between said compensating ring and said thrust ring.

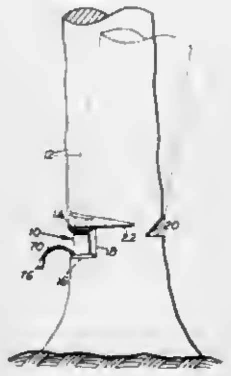
4,103,910
PISTON-CYLINDER SEAL ASSEMBLY

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Division of Ser. No. 621,757, Oct. 14, 1975, Pat. No. 4,026,524. This application May 5, 1977, Ser. No. 793,839

Int. Cl.² F16J *15/18;* **A01G** *23/08*

U.S. Cl. 277—165 **3 Claims**



1. A piston-cylinder seal assembly comprising

(a) a cylinder housing having an inner surface,

(b) a piston in said cylinder having an outer surface,

(c) a groove in one of said inner surface of the cylinder housing and the outer surface of the piston,

(d) said groove having an inner wall surface and opposed end wall surfaces,

(e) a resilient pressure sealing ring in said groove,

(f) said sealing ring having opposite surface portions one of which has engagement with one of said end wall surfaces of said groove,

(g) a resilient ring in said groove having inner and outer edges and having surface engagement between the other surface of said sealing ring and the other of said end wall surfaces of the groove,

(h) and a semi-resilient ring in said groove having inner and outer edges and also being in surface engagement between the said other surface of said sealing ring and the other of said end wall surfaces,

(i) the inner edge of said semi-resilient ring having edge engagement with the outer edge of said resilient ring and the outer edge of said semi-resilient ring having edge engagement with one of said housing and piston, whereby upon the application of surface pressure by the sealing ring against said resilient ring as a result of fluid pressure in the cylinder, said resilient ring is compressed and expands to a larger diameter which in turn expands said semi-resilient ring to a larger diameter as pressure expands said cylinder, thus preventing failure of said pressure seal.

4,103,911
SEALING MEMBER FOR CABLE INLETS

Wolfgang Giebel, and Herbert Krause, Both of Municb, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Contiouation-in-part of Ser. No. 584,522, Jun. 6, 1975, abandoned. This application Apr. 1, 1977, Ser. No. 783,752

Int. Cl.² H02G *15/24. 15/18*

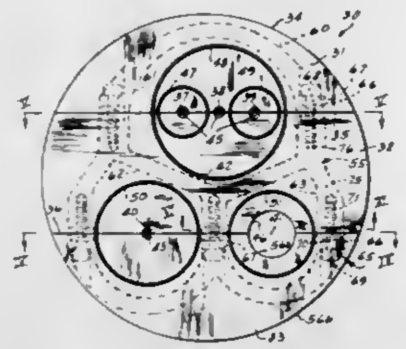
U.S. Cl. 277—210 **11 Claims**

1. An annular sealing member having an axis and comprising:

at least two rigid, spaced-apart disk portions each coaxial with and extending transversely of said axis of the sealing member;

a rigid reinforcing portion extending between said disk members, having a continuous annular periphery about said axis, and being apertured through at least one central portion;

the disk portions and reinforcing portion together being divided into at least two separate sealing member portions on a plane extending substantially parallel to said axis of the sealing member and through the central portion of the reinforcing portion; and



bolt means for selectively connecting the portions of the sealing member together across said plane and about said central portion of said reinforcing portion,

whereby the sealing member may be bored through at said plane to form a desired semi-circular, ribbed recess in each of said sealing member portions, the sealing member portions being clampable about a cable to form a gas-tight seal along said cable at a cable inlet fitting into which the seal member and cable are inserted.

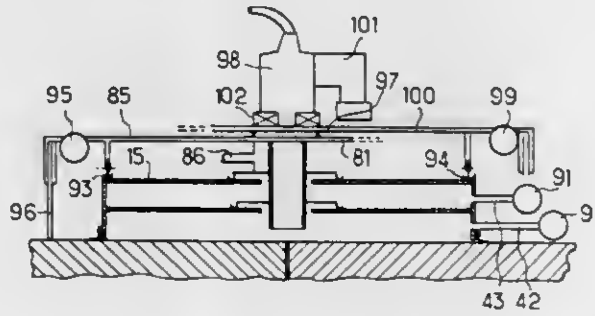
4,103,912
MOVING SEALING JUNCTION WITH SEALING STRIPS CONTROLLED BY MECHANICAL OPERATORS

Paul Thomé, 8 rue Coutureau, 92210 Saint-Cloud, France

Filed Aug. 30, 1976, Ser. No. 718,822

Int. Cl.² B23K *15/00;* **F16J** *15/32*

U.S. Cl. 277—226 **10 Claims**



1. A movable sealing device of the type comprising a chamber movable along a pre-determined path along a wall with which it is tightly connected on a closed contour, and means for providing an opening through the wall within said contour and for causing said opening to progress along the pre-determined path of the chamber simultaneously with the latter, wherein said device comprises, along the mobile chamber path, at least one row of mechanically resistant members removable from a supporting position to a non-supporting position while the chamber is passing, and at least one uninterrupted sealing strip, at least partly supported by said members when they are in the supporting position, and resiliently deformable for forming said opening at those places where said members are removed.

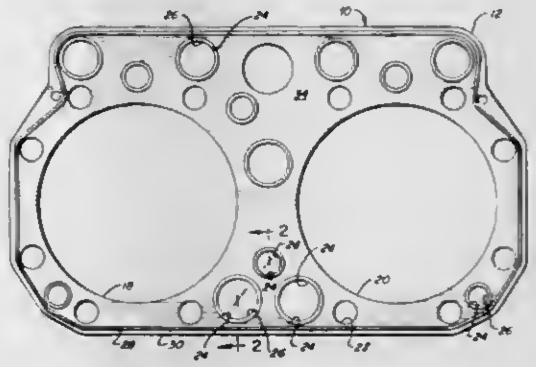
4,103,913
FRETTING CORROSION RESISTANT GASKET AND METHOD OF MAKING SAME

Donald J. McDowell, Riverside, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Apr. 19, 1976, Ser. No. 678,043

Int. Cl.² F16J *15/10*

U.S. Cl. 277—235 B **3 Claims**



1. A fretting corrosion resistant gasket assembly adapted to be positioned between an engine block and head, comprising:

a steel gasket body having first and second generally planar surfaces defining a plurality of piston-size apertures and a plurality of fluid flow passageways, and at least one of said surfaces having a roughened surface and being coated with a substantial uniform layer of a mixture of molybdenum disulfide and polytetrafluoroethylene in a ratio of from about 35 percent to about 65 percent molybdenum disulfide and from about 65 percent to about 35 percent polytetrafluoroethylene by weight, and wherein said layer is from about 0.0005 to about 0.001 inch thick, and wherein said layer serves to enhance resistance to fretting corrosion.

4,103,914
DRILL CHUCK

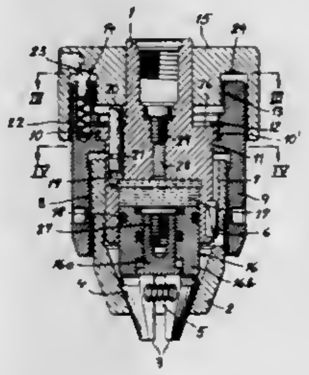
Günter Horst Röhm, Heinrich-Rohm-Str. 50, Sontheim, Fed. Rep. of Germany (7927)

Filed Aug. 11, 1977, Ser. No. 823,868

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639214

Int. Cl.² B23B *31/12*

U.S. Cl. 279—4 **10 Claims**



1. A drill chuck comprising:

a chuck body having an axis and adapted to be fixed to a drilling machine spindle;

a tightening cone mounted on said body for displacement axially relative thereto but angularly fixed on said body;

a plurality of chuck jaws radially displaceable by said cone and axially aligned with said body;

a tightening sleeve rotatable on said body but axially fixed relatively thereto and threadedly engaging said cone for axially displacing same upon angular displacement of said sleeve;

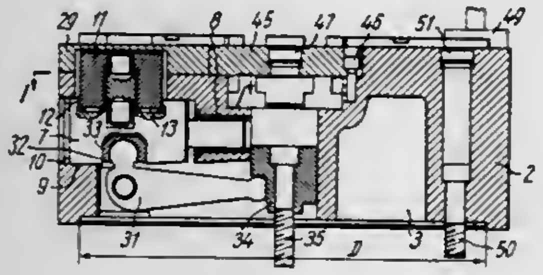
a tightening ring rotatable and axially shiftable on said body;

- a torque-responsive clutch between said sleeve and said ring effective to couple said sleeve to said ring for joint angular displacement below a predetermined torque and to allow rotation of said ring relative to said sleeve upon the application of a torque above said predetermined torque to said ring;
- a power piston axially displaceable in said body, said body forming a power cylinder receiving said power piston, said ring being threaded onto said sleeve and said power piston bearing upon jaws for applying axial force thereto upon pressurization of said cylinder; and
- pressurizing means operated by relative axial displacement of said ring and said body for pressurizing said cylinder, said pressurizing means having a smaller cross section than that of said power piston.

4,103,915
CENTERING CLAMPING DEVICE

Mikhail Romanovich Zdanovsky, ulitsa Chernyakhovskogo, 4a, kv. 50; Viktor Vasilievich Minashin, ulitsa Shukhova, 5/7, kv. 58; Vladimir Yakovlevich Nikolaev, Yaltinskaya ulitsa, 12, kv. 17; Viktor Alexandrovich Razuvaev, Varshavskoe shosse, 3, linia, 12, kv. 13; Ivan Petrovich Perelygin, Avtozavodskaya ulitsa, 17, korpus 1, kv. 15; Stanislav Leonidovich Mikhaevich, ulitsa Chernyakhovskogo, 9, korpus 3, kv. 286, and Lev Samuilovich Dridze, ulitsa Guryanova, 3, kv. 41, all of, Moscow, U.S.S.R.

Filed Dec. 7, 1976, Ser. No. 748,365
Int. Cl.² B23B *31/16*
U.S. Cl. 279—119 9 Claims

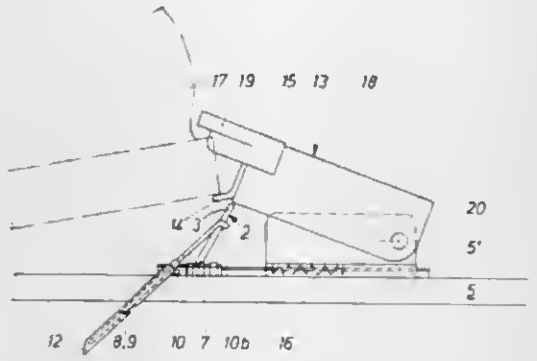


1. A centering clamping device comprising: a housing; means defining guideways radially arranged in said housing from the periphery toward the center thereof; paired clamping jaws accommodated in said guideways for reciprocation therealong toward and away from the center of said housing to position a workpiece at the center of said housing of the clamping device and to retain said workpiece in a centered position; driving trains in a number corresponding to the number of pairs of said clamping jaws, each said driving train operatively interconnecting two adjacent ones of said clamping jaws, in at least three groups of symmetrically arranged pairs of said clamping jaws; a drive common to all said pairs of the jaws for displacement thereof toward and away from the center of said housing; each said driving train including a member operatively connected to said drive and mounted for reciprocation along a bisector of an angle defined by the guideways of each respective pair of said clamping jaws, each said member carrying thereon a freely rotatable element having an axis of rotation situated on said bisector of the angle between the respective clamping jaws of a pair, means connecting each said element with each one of said clamping jaws of the respective one of said pairs so that when one of said clamping jaws of said pair contacts the workpiece, the other said clamping jaw of said pair is moved into engagement with the workpiece, whereby all said pairs of said clamping jaws simultaneously displace the workpiece with efforts directed substantially toward the center of said housing.

4,103,916
BRAKE DEVICE FOR SKIS

Erwin Krob, Vienna; Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwachat, all of Austria, assignors to TMC Corporation, Baar, Zug, Switzerland

Filed Nov. 24, 1976, Ser. No. 744,940
Claims priority, application Austria, Nov. 25, 1975, 8939/75
Int. Cl.² A63C *7/10*
U.S. Cl. 280—605 7 Claims

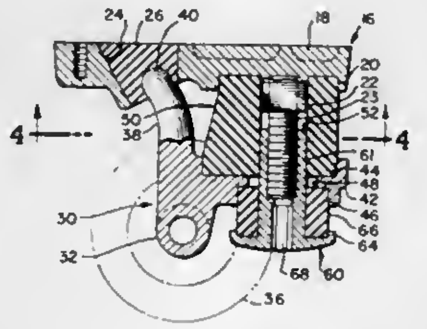


1. In a ski brake for a ski including a brake member having a pair of brake legs, said brake member being pivotally supported on said ski for movement between a ready position and a braking position and which can be moved under spring action automatically into said braking position and in this position said brake legs project downwardly over said ski, each brake leg being constructed with two extensions wherein a first extension includes a part projecting under a holding plate secured to said ski and thereafter is attached to a step-on member and wherein a second extension is directly engaged with said step-on member, wherein at least said first extension consists of spring steel wire and said part which projects under said holding plate serves as a bearing, the improvement comprising a heel holder and support means for supporting said heel holder for movement on said ski in a direction parallel to the longitudinal axis of said ski, wherein said spring steel wire is approximately U-shaped having a pair of legs and a cross-part interconnecting said legs, wherein said U-shaped spring steel wire forms said step-on member, wherein said second extension extends beneath the associated one of said two legs of said U-shaped spring steel wire, and wherein a projection is provided on said heel holder, said projection engaging said step-on member to effect a lifting of said brake legs into said ready position above the ski surface by closing said heel holder and to further effect simultaneous with the closing a pulling in of the brake legs over the upper surface of the ski.

4,103,917
SKATEBOARD TRUCK

Philip R. Widolf, Santa Ana, Calif., assignor to Woody-Widolf, Inc., Newport Beach, Calif.

Filed Oct. 26, 1976, Ser. No. 735,651
Int. Cl.² A63C *17/02*
U.S. Cl. 280—11.28 15 Claims



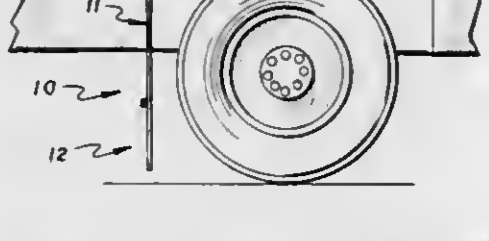
1. A truck for a skateboard or the like having a platform comprising:

- a support base adapted to be mounted to the under side of the platform;
- threaded means on said base;
- a wheel support housing;
- a resilient cushion having walls defining a bore therethrough extending between the housing and said base; and
- an elongated threaded retainer having a shank extending through a hole in said housing and into said cushion bore, said retainer shank having a threaded portion threaded to said base threaded means to compress said cushion and thereby resiliently mount the housing on the base, said retainer shank having an exterior portion with means thereon which mate with means on the walls of said cushion bore to prevent rotation of said retainer relative to said cushion during use of said truck, although the resiliency of said cushion permits manual forceable rotation of the retainer relative to the cushion for adjusting compression on the cushion.

4,103,918
FENDER FLAP

Leroy Salden, St. Peter, Minn., assignor to Winden Tool & Stamping, Inc., St. Peter, Minn.

Filed May 19, 1977, Ser. No. 798,657
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 R 3 Claims



1. A fender flap for the deflection of road materials consisting of:

- a. a first, generally rectangular plate member arranged for attachment to a vehicle;
- b. a second, generally rectangular plate member arranged for attachment to said first plate member to be in depending relation thereto;
- c. means for hingedly connecting said first plate member to said second plate member; and,
- d. said means for hingedly connecting said first plate member to said second plate member including a plurality of spaced, aligneable, pivot receiving members arranged along respective edges thereof, said pivot receiving members defining a generally rectangular interior configuration and said means including a connecting member of a generally circular configuration.

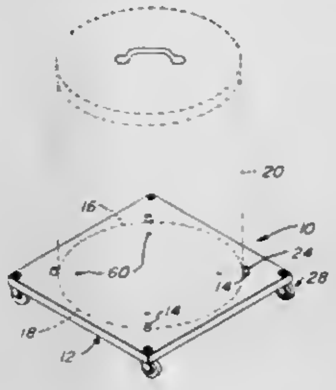
4,103,919
LOAD CARRYING DOLLY WITH SECURED POST CASTERS

Robert R. Greenheck, 3053 S. Ivory Ct., Aurora, Colo. 80013

Filed Jun. 6, 1977, Ser. No. 803,475
Int. Cl. B62D *53/06*
U.S. Cl. 280—79.1 A 9 Claims

1. A load carrying dolly comprising:

- a thin generally planar base provided with a first series of apertures passing therethrough and arranged in spaced relation around and slightly outward of a peripheral path corresponding to the planform of the base of a receptacle to be carried by the dolly;
- a guiding post passing through each aperture and extending above the surface of the base to guide a selected receptacle into a predetermined position on the base;
- a second series of apertures passing through the base and spaced outwardly of the first series;
- a tubular caster socket extending upward through each aperture of the second series to a level substantially above the upper surface of the base;

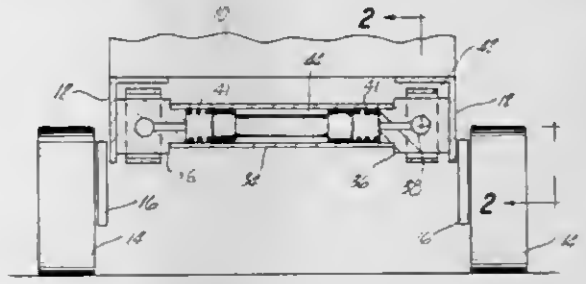


- a caster post provided with a caster at its lower end and extending upward through each socket;
- and securing means connected to the upper end of each caster post to retain the post in the socket without restricting rotation of the caster post and prevent inadvertent disengagement therefrom.

4,103,920
VEHICLE ANTI-ROLL MECHANISM

Roger R. Smith, 7261 Lyons Rd., Imlay City, Mich. 48444

Filed Mar. 21, 1977, Ser. No. 779,857
Int. Cl. B60G *21/06*
U.S. Cl. 280—112 A 2 Claims

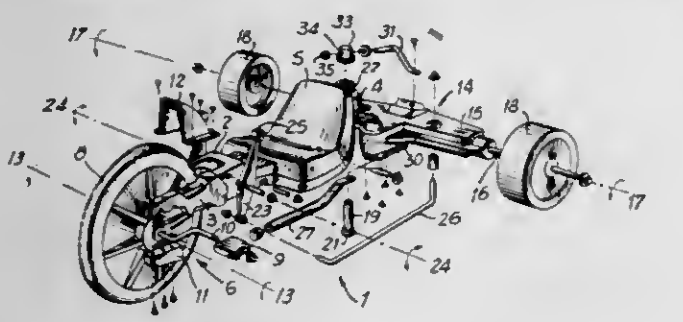


1. In a cargo-carrying road vehicle comprising a cargo body, roadwheels for the cargo body, and resilient suspension means operably connecting the cargo body to the roadwheels: the improvement comprising anti-roll means interposed between the cargo body and each resilient suspension means; said anti-roll means comprising a main hydraulic cylinder extending transversely across the undersurface of the cargo body, a main piston of appreciable mass slidably positioned within the cylinder for inertial movement in either direction from a normal position substantially equidistant from the cargo body sides, second and third auxiliary cylinders extending right angularly from the main cylinder at its opposite ends, second and third auxiliary pistons slidably disposed in respective ones of the auxiliary cylinders, force-transmitting hydraulic liquids filling the cylinders whereby movement of the main piston from its normal position in a given direction extends one auxiliary piston relative to its cylinder and retracts the other auxiliary piston relative to its cylinder; the main piston having sufficient mass so that when the vehicle is steered through a turn the resultant centrifugal force will move the main piston radially away from the turn axis, said main piston thereby causing the associated liquids to pressurize the auxiliary piston at the outer turn circumference and de-pressurize the auxiliary piston at the inner turn circumference; each resilient suspension comprising a first anchorage (26) operatively connected to a roadwheel, a second anchorage (24) operatively connected to an auxiliary piston, and a spring (22) trained between said anchorages, whereby extension or retraction of the auxiliary piston reposi-

tions the associated anchorage (**24**) for thereby raising or lowering the adjacent portion of the cargo body.

4,103,921
REAR STEERING TOY WHEELED VEHICLE

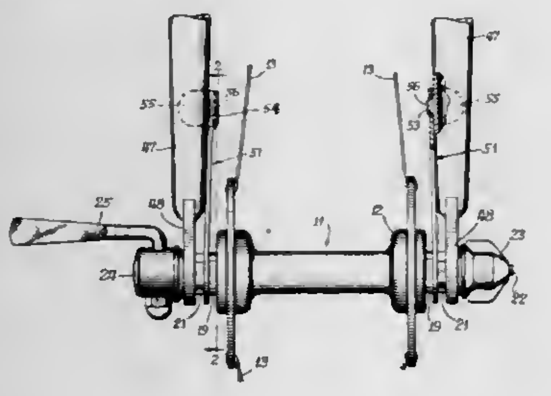
Bertram Brooks, New York, N.Y., and Eugene Speed, Tarboro, N.C., assignors to Carolina Enterprises, Inc., New York, N.Y.
Filed Jun. 29, 1977, Ser. No. 811,245
Int. Cl.^{2} B62K *9/00*
U.S. Cl. 280—267 **17 Claims**



1. A vehicle, particularly a toy vehicle, comprising:
(a) an elongated body unit having opposite end regions;
(b) means at one of said end regions for propelling said body unit over a surface;
(c) means for steering said body unit over the surface during such propulsion, including
  a steering unit located at the other of said end regions of said body unit;
(d) means for pivotally connecting said steering unit to said body unit for turning movement about an axis which extends transversely of the elongation of said body unit, including
  a pivot element extending generally along said axis intermediate said units and forming a pivot connection therewith; and
(e) stabilizing means for reinforcing said pivot connection during turning movement of said steering unit about said pivot axis, said stabilizing means including a support member detachably connected to said body unit and to one end portion of said pivot element, and a support rod detachably connected to said steering unit and to another opposite end portion of said pivot element.

4,103,922
QUICK-RELEASE HUB RETENTION DEVICE

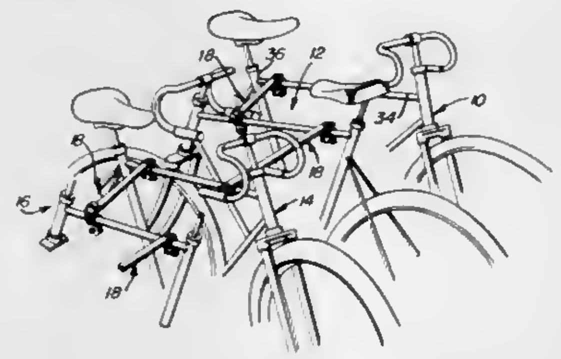
Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.
Filed Oct. 28, 1976, Ser. No. 736,328
Int. Cl.^{2} B62K *25/02*
U.S. Cl. 280—279 **6 Claims**



1. A safety mounting for a bicycle quick-release hub having an axle engageable in open-ended slots in the lower ends of the legs of the front fork of the bicycle for receiving said axle, and a quick-release unit including adjustable retainer members movable relative to said axle longitudinally thereof for clampingly retaining said axle in said slots; comprising a pair of flexible retainer clips, each having a lower end mounted on said axle and an upper end with retainer means formed integrally therewith, and receiving means for cooperatively receiving a said retainer means and disposed on the laterally inner portion, and adjacent said lower end, of each of said front fork legs to prevent accidental separation of said hub from said fork despite release of said adjustable retainer members.

4,103,923
BICYCLE HOLDER

Marion V. Thomas, 545 Thornwood Dr., Baton Rouge, La. 70806
Filed Jan. 26, 1977, Ser. No. 765,760
Int. Cl.^{2} B62H *5/00*
U.S. Cl. 280—289 L **6 Claims**

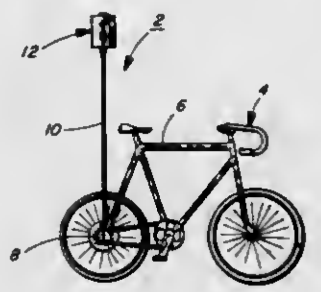


1. A bicycle holder for support from a bicycle frame and locking and supporting the frame relative to a frame bar of a second bicycle frame or other similar object, said holder including an elongated brace, a mount pivotally supported from one end of said brace for relative angular displacement about a first axis extending transversely relative to said brace, said mount including structure for at least semi-permanent attachment to a frame bar of a first bicycle, an anchor, means pivotally supporting said anchor from the second end of said brace for relative angular displacement about a second axis extending transversely of said brace, said anchor including engaging means adapted to engage and to be locked against displacement away from an elongated member such as a frame bar of a second bicycle and to also releasably engage and be releasably supported from said frame bar of said first bicycle, said anchor including a split, generally cylindrical clamp having opposing generally semi-cylindrical spring jaws for releasable clamped engagement with a cylindrical member, said anchor including an integral finger-engageable eye member to facilitate manual withdrawal of said anchor from clamped engagement with a frame bar engaged thereby.

4,103,924
VEHICLE SAFETY DEVICE

Richard R. Suhm, 21380 Lorain Ave., Fairview Park, Ohio 44126
Filed Dec. 6, 1976, Ser. No. 747,715
Int. Cl.^{2} B62J *5/00*
U.S. Cl. 280—289 R **4 Claims**

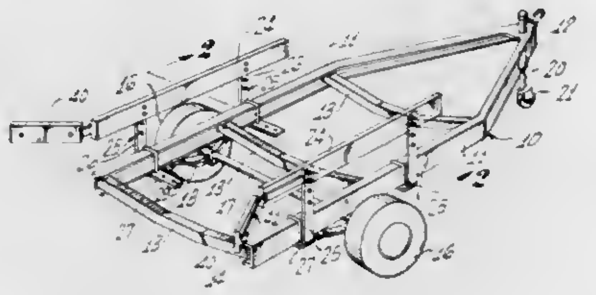
1. A vehicle safety device adapted for detachable connection on a vehicle, such as a bicycle or the like, comprising
  an elongated shaft member adapted to be detachably connected to said vehicle,
  an elongated body member detachably mounted adjacent the opposite end of said shaft member,
  the elongated portion of the body defining alternating convex and concave surfaces wherein a plurality of the convex surfaces blend at one end into an adjacent concave surface and at the other end combine with a non-parallel concave surface to form blade-like terminal end edges,



  support means for rotatably mounting said body on said shaft member for rotational movement about the vertical axis of said shaft member.

4,103,925
GUIDE MEANS FOR BOAT TRAILER

Anthony P. Palamara, 7559 Calle Granada, Anaheim, Calif. 92807
Filed Jul. 30, 1976, Ser. No. 709,965
Int. Cl.^{2} B60P *3/10*
U.S. Cl. 280—414 A **6 Claims**

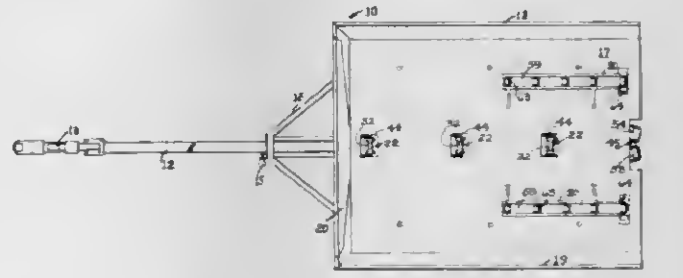


1. In a guide means for guiding a boat onto a wheeled trailer that has a boat carrying chassis including means adapted to support the hull of a boat in a longitudinally centered position thereon:
  substantially parallel, horizontal side rails, one extending a substantial distance along each side of said chassis, adapted for sliding engagement by opposite sides of the hull of a boat entered longitudinally onto said chassis;
  a pair of upright spring arms rigidly mounted at their lower ends on said chassis on each side thereof and being spaced a substantial distance along said side rails, the upper ends of said upright spring arms being supportingly fixed to said side rails, said upright spring arms being relatively stiff but resiliently deflectable outwardly of the chassis owing to impact by the side of a boat hull with a side rail supported thereby;
  convergent auxiliary guide wings supported from said spring arms at the level of said rails and located as rearward extensions of said rails to guide a misaligned boat toward a centralized position relative to said chassis; and
  means for yieldably mounting said wings on the rearward portions of said rails.

4,103,926
CONVERTIBLE BOAT-UTILITY TRAILER

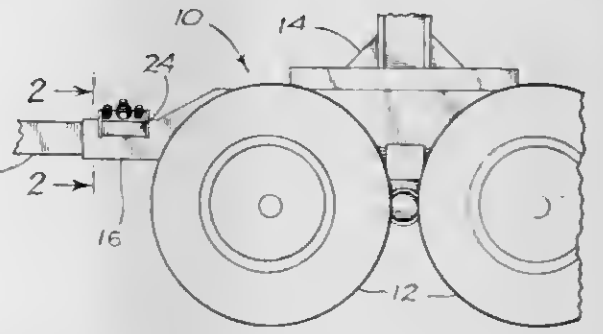
Charles Richard Johnston, and James G. MacGregor, both of Wilmington, N.C., assignors to Consolidated Energy Products Co., Wilmington, N.C.
Filed May 9, 1977, Ser. No. 794,961
Int. Cl.^{2} B60P *3/10*
U.S. Cl. 280—414 R **9 Claims**

6. A convertible utility-boat trailer having a wheeled undercarriage and a telescoping tow bar including
(a) a utility carryall flat bed supported on said undercarriage,
(b) a series of keel rollers spaced along the centerline of said flat bed for supporting the hull of a boat thereon,
(c) mounting brackets for said keel rollers,
(d) openings formed along the centerline of said flat bed through which said keel roller brackets are adapted to be moved into and out of an elevated position with respect to the normal plane of said flat bed,
(e) fixed U-shaped mounting plates positioned in said openings beneath said flat bed with the side walls thereof providing toothed indexing quadrants,
(f) means for pivotally connecting said keel roller mounting brackets to said U-shaped mounting plates,
(g) indexing keys mounted on said keel roller mounting brackets and adapted to have releasable contact with said toothed indexing quadrants so as to releasably latch said keel roller mounting brackets and said keel rollers in a predetermined position relative to the normal plane of said flat bed,
(h) a pair of chine roller supporting means to either side of the centerline of said flat bed,
(i) a series of chine rollers mounted on each of said chine roller supporting means for contacting and centering the hull of a boat on said flat bed,
(j) means movably supporting each of said chine roller supporting means,
(k) a pair of openings formed in said flat bed to either side of said openings formed along the centerline of said flat bed through which said chine roller supporting means are adapted to be moved into an elevated position with respect to the normal plane of said flat bed, and
(l) means for releasably latching said chine roller supporting means in a predetermined position with respect to the normal plane of said flat bed of said trailer.



4,103,927
CORNER MOUNT REACH CLAMP WITH HINGED CLAMP PADS

Kenneth J. Schmidt, Thurston, Oreg., assignor to General Trailer Company, Inc., Springfield, Oreg.
Filed Mar. 17, 1977, Ser. No. 778,661
Int. Cl.^{2} B60D *1/14*
U.S. Cl. 280—482 **9 Claims**



1. In a trailer,
an elongate trailer member having a substantially rectangular opening therein,
an elongate reach member having a cross section substantially complementary to said opening in said trailer member, said reach member extending telescopically into said

opening in the trailer member permitting adjustment therebetween, and

clamping means for securing said reach member in a selected adjusted position relative to said trailer member comprising a pair of clamping members hingedly interconnected for swinging relative to one another, said clamping members being mounted on said trailer member and positioned to engage angularly disposed side portions of said reach member adjacent a corner thereof and operating means engaging said clamping members operable to urge said clamping members to swing toward each other to conform to the angle between such side portions and to force said clamping members against said side portions of said reach member to frictionally secure the same within said trailer member.

4,103,928

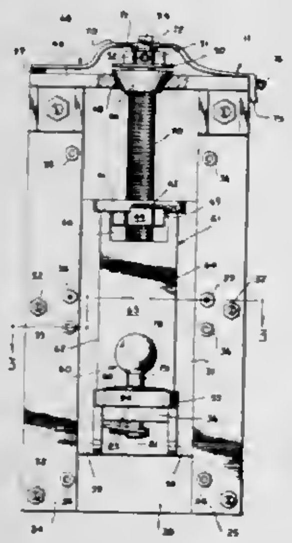
ADJUSTABLE TRAILER HITCH WITH INTERCHANGEABLE CONNECTING MEANS

Walter R. Sheppard, Jr., P.O. Box 797, Fletcher, N.C. 28732

Filed Feb. 18, 1977, Ser. No. 769,922

Int. Cl.^{2} B60D ***1/16***

U.S. Cl. 280—490 R **3 Claims**



1. An adjustable trailer hitch for attaching a trailer to a traction vehicle, said trailer hitch being carried by said traction vehicle and comprising a mounting plate fixed to said traction vehicle, a pair of spacer plates fixed to said mounting plate and parallel to each other, a pair of face plates juxtaposed on said spacer plates and extending beyond said spacer plates for forming a pair of vertically disposed parallel grooves between said face plates and said mounting plate, a slide plate being received within said grooves and movable therein, a top plate at the upper end of said face plates and extending across said mounting plate, a traveller plate fixed to said slide plate, a jackscrew mounted generally parallel to said slide plate, said jackscrew being journaled in said top plate and depending therefrom, a traveller nut engaged with said traveller plate and threadedly engaged with said jackscrew for causing motion of said traveller plate along said jackscrew on rotation of said jackscrew, a tongue carried by said slide plate and extending outwardly therefrom, a socket in said tongue, said hitch member including a shank receivable in said socket, said traveller plate being located generally at the top of said slide plate, said tongue being located generally towards the bottom of said slide plate, and a box extending between said tongue and said traveller plate, said box being fixed to both said tongue and said traveller plate and at least partially enclosing said jackscrew.

4,103,929

SKI BINDING

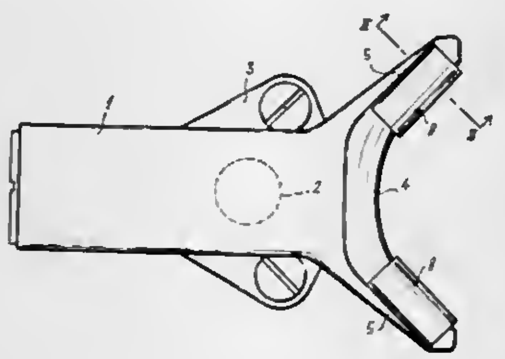
Jean Joseph Alfred Beyl, 10 Boulevard Victor-Hugo, Nevers, Nievrè, France

Filed Aug. 2, 1976, Ser. No. 710,897

Claims priority, application France, Aug. 5, 1975, 75 24342

Int. Cl.^{2} A63C ***11/00***

U.S. Cl. 280—611 **5 Claims**



1. In a ski binding for engagement with a ski boot of the kind including structure for mounting on a ski, said structure including a generally arcuate cheek for engagement selectively with the opposite sides of the sole and upper of the ski boot, the improvement which comprises:

(i) a pair of horizontally spaced, transverse ribs each extending across respective outer portions of said cheek, projecting in a direction to overlie at least partially the sole of the ski boot, bridging sections of less thickness than said ribs connecting each of said ribs to said cheek, and

(ii) a pair of resiliently deformable slip lining means shaped to respectively fit about each rib and engaging the same by resilient deformation, each of said slip lining means having opposed internal transverse edges grasping opposite sides of the respective bridging sections and at least externally being formed of material selected to have a low coefficient of friction.

4,103,930

HEEL HOLDER FOR SKI BINDINGS

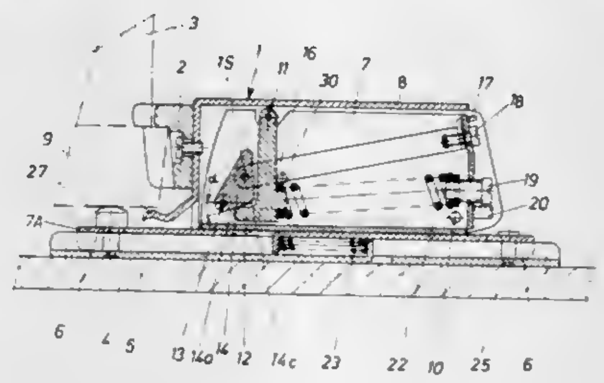
Alfons Valob, Vienna, Austria, assignor to TMC Corporation, Baar, Zug, Switzerland

Filed Feb. 16, 1977, Ser. No. 769,269

Claims priority, application Austria, Feb. 18, 1976, 1142/76

Int. Cl.^{2} A63C ***9/08***

U.S. Cl. 280—614 **11 Claims**



1. A heel holder for a safety ski binding for use on the upper surface of a ski, comprising:

a base member having means defining a locking projection thereon, said locking projection having an inclined slideway surface thereon, the inclination of which is variable relative to said upper surface of said ski;

sole holder means pivotally supported to said base member for movement about a pivot axis;

a locking member pivotally supported on said sole holder means, said locking member having lip means thereon extending beneath said locking projection when said sole holder means is in a position of use;

resilient means extending between said base member and said locking member to resiliently urge said locking member into engagement with and beneath said slideway surface, said locking projection being maintained beneath said locking projection and in engagement with said locking surface by the force of said resilient means; and

adjustment means for adjusting and fixably locating the inclination of said slideway surface in selected positions relative to said upper surface of said ski.

4,103,931

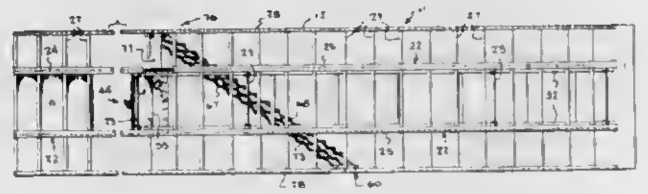
EXTENSIBLE VEHICLE TRAILER WITH SAFETY LOCKING BAR AND CABLE AND HOSE SUPPORTING OUTRIGGERS

Frederick A. Weiss, 1148 Gypsy La., Towson, Md. 21204

Filed Aug. 10, 1977, Ser. No. 823,519

Int. Cl. B62d ***53/06***

U.S. Cl. 280—656 **20 Claims**



1. A longitudinally adjustable extensible trailer to be drawn by a truck tractor, comprising a main front frame section and a rear frame section telescopically interfitted with the front frame section, the front frame section adapted to have its front end supported by a truck tractor and the rear frame section having a wheel assembly carried thereby providing rear support for the trailer, the front frame section including a pair of longitudinal I-beams forming the main supporting beams therefor held in laterally spaced parallel relation, the rear frame section having a pair of longitudinal I-beams forming the main supporting beams therefor held in laterally spaced parallel relation located immediately inwardly of the pair of parallel I-beams of the front frame section forming companion pairs of relatively longitudinally movable I-beams, roller means carried on said I-beams of the front frame section and on said I-beams of the rear frame section disposed in rolling contact with the I-beams of the other frame section to allow relative longitudinal movement between the front and rear sections to permit lengthening and shortening of the trailer, manually operable locking means for locking the rear frame section against relative lonitudinal movement with respect to the front frame section at different length adjustment positions over a predetermined range of lengths between maximum and minimum length limit positions, an elongated floating safety locking bar extending through said longitudinal I-beams of said rear frame section supported thereby for axial sliding movement in a horizontal transverse position, said safety locking bar having a length corresponding closely to the spacing between the confronting vertical surface portions of the longitudinal I-beams of said front frame section and being captured in the longitudinal I-beams of the rear frame section by said surface portions of the I-beams of the front frame section, and front and rear stop members on the longitudinal I-beams of said front frame section extending toward the adjacent companion I-beams of the rear frame section and into the path of movement of the end portions of said floating safety locking bar when the front and rear frame sections are being lengthened or shortened to engage the end portions of the safety locking bar at said limit positions and prevent complete disengagement of the rear frame section from the front frame section.

4,103,932

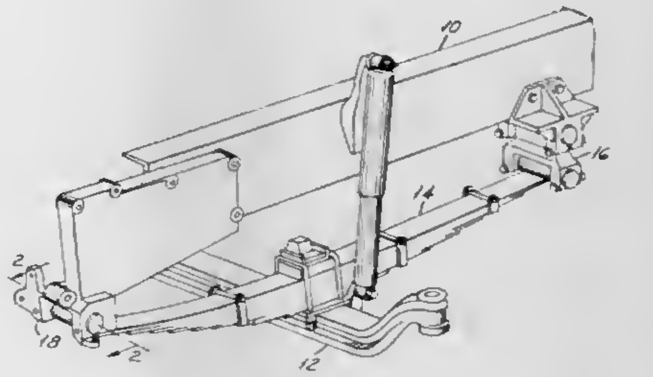
PIVOT CONSTRUCTION FOR A MOTOR VEHICLE SUSPENSION SYSTEM

Robert J. Parker, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 26, 1976, Ser. No. 735,464

Int. Cl.^{2} B60G ***11/12***

U.S. Cl. 280—718 **7 Claims**



1. A pivot means constructed to interconnect first and second members for angular displacement of one of said members relative to the other of said members about a fixed pivot axis;

said pivot means comprising a pair of ball studs;

each of said ball studs having a shank portion and a head portion;

said shank portions being in axial alignment with the ends of said shank portions being in juxtaposed relationship;

a sleeve surrounding said shank portions supported by one of said members;

a pair of socket means enclosing said head portions of said pair of ball studs;

each of said socket means being secured to the other of said members.

4,103,933

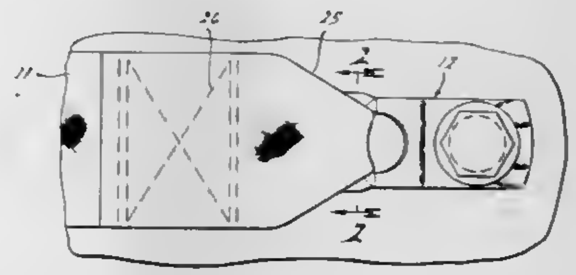
FLOOR ANCHOR FOR SEAT BELT

Robert C. Fisher, 4210 N. Dixie, West Palm Beach, Fla. 33407, and Cecil A. Collins, Pontiac, Mich., assignors to Robert C. Fisher, West Palm Beach, Fla.

Continuation of Ser. No. 648,399, Jan. 12, 1976, abandoned. This application May 31, 1977, Ser. No. 802,025

Int. Cl.^{2} B60R ***21/10***

U.S. Cl. 280—744 **1 Claim**



1. An anchor plate for a belt having a pair of apertures located adjacent to the opposite ends of the plate, and a belt having a folded end portion which extends through one of said apertures, securing means extending through said other aperture of the plate, the portion of the plate between said other aperture and the adjacent end being of sinuous form to limit the angular movement of the plate when engaging an element which extends within said sinuous form.

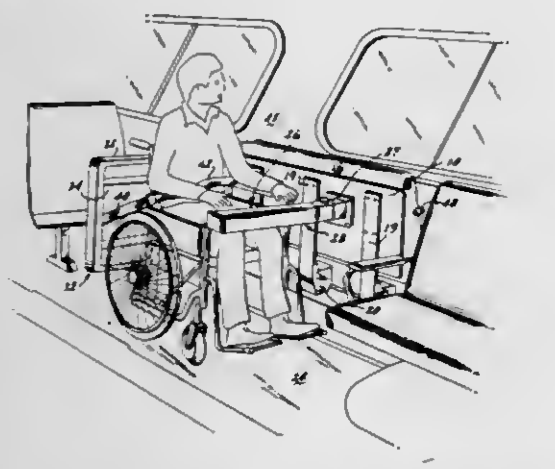
4,103,934
FOLDING SEAT AND WHEELCHAIR RESTRAINT

Jack C. Arnholt, Loudonville, and Ronald J. Main, Wooster, both of Ohlo, assignors to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Aug. 10, 1977, Ser. No. 823,211

Int. Cl. B60r *21/10*

U.S. Cl. 280—744 **6 Claims**



1. A wheelchair restraint assembly for a vehicle comprising:

a barrier fixedly attached to said vehicle and positioned substantially transverse to the longitudinal axis of said vehicle;

a vehicle passenger seat having a seat back portion fixedly secured to said vehicle and a seat bottom portion pivotally attached to said seat back portion, said seat bottom portion pivotable between a normal horizontally oriented passenger seating position and a vertical oriented passenger non-seating position; and

a restraint arm pivotally attached to the under surface of said seat bottom portion, said restraint arm being pivotable between a stored position adjacent said seat bottom portion oriented substantially parallel to said longitudinal axis of said vehicle to a wheel chair restraint position substantially parallel to said barrier whereby a wheelchair positioned between said barrier and said restraint arm is restrained thereby.

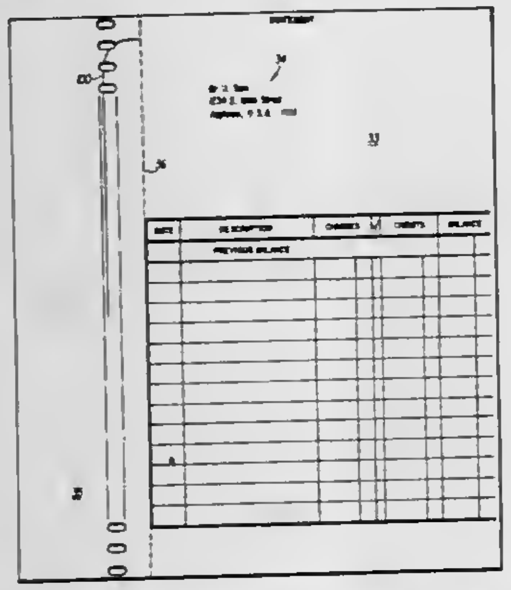
4,103,935
ACCOUNTS RECEIVABLE SYSTEM

Arnold Henry Adler, Penfield, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 803,482

Iot. Cl.^{2} B42D *12/02*

U.S. Cl. 283—66 R **4 Claims**



1. An accounts receivable system having a ledger card and a statement for use with a pegboard,

said ledger having alignment perforations for mounting the ledger on the pegboard, and

said statement also having alignment perforations for mounting the statement on the pegboard over the ledger,

both the ledger and the statement being printed with entry points for various entries to be made representing a transaction, such transactions to be posted to the ledger concurrently with the posting on the statement,

the said ledger also bearing a stencil at the top thereof positioned so that an address entered thereon may conform to the position of an address used in a standard window envelope, and

the statement bearing a marginal guideline corresponding to the upper left-hand corner of the ledger so that the ledger can be fitted into the marginal guideline to transfer an address entered on the stencil of the mating ledger to the statement by stencil transfer.

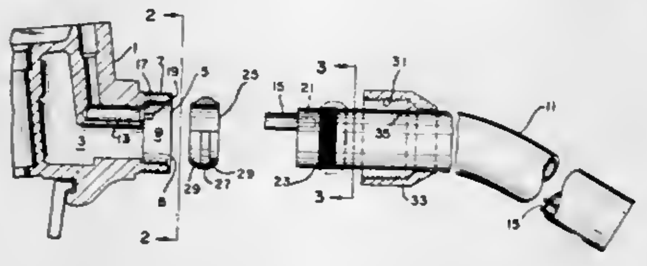
4,103,936
NOZZLE SPOUT COUPLING

Grenville G. Sutcliffe, Villa Ridge; Roy F. Washausen, St. Louis; William L. Tomes, St. Clair, and Herman Ray Gould, Sullivan, all of Mo., assignors to Husky Corporation, Pacific, Mo.

Filed Feb. 14, 1977, Ser. No. 768,204

Iot. Cl.^{2} F16L *35/00*

U.S. Cl. 285—26 **8 Claims**



1. In a dispensing nozzle, a nozzle body having an outlet nipple with external threads, a main fuel passage communicating with said nipple, a replaceable spout assembly comprising a cylindrical spout having its inlet end matingly received in said nipple and an annular gland mounted on the inlet end of said spout with its upstream end engaged by the rim of said nipple, said spout being formed with a knurled band and a smooth surface adjacent thereto, said knurled band underlying only the upstream end of said gland and radially expanded into locking engagement with said gland, and a clamp nut on said spout having internal threads engaged with said nipple external threads and having an internal taper at its downstream end in compressive engagement with the downstream end of said gland for compressing the latter radially into sealing engagement with said smooth surface of said spout downstream from said knurled band and for compressing said gland axially and sealingly against the rim of said nipple and thereby coupling said spout securely to said nozzle body.

4,103,937
SELF-ALIGNING PERMANENT FITTING

Fancber B. Wakefield, Holbrook, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,386

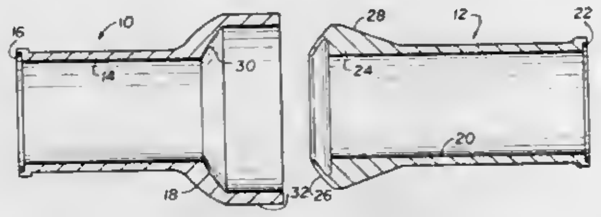
Int. Cl.^{2} F16L *17/00*

U.S. Cl. 285—110 **5 Claims**

1. Coupling means capable of connecting two sections of high pressure fluid carrying conduit, said coupling comprising:

a socket element having one end adapted to receive and thereby be a continuation of a first conduit to be coupled, said socket element having a bell mouth including an integral cylindrical projection extending about and from a concave interior spherical sealing surface having a predetermined radius and located a predetermined distance inwardly of the end of the cylindrical projection;

a bulbous seat element having one end adapted to receive and thereby be a continuation of a second conduit, said bulbous seat element having a body, a flexible lip on the other end having a convex exterior spherical sealing surface of another predetermined radius, said flexible lip being on an integral raised portion of said body to snuggly fit within the cylindrical projection of the socket element, and a cam surface fairing the raised portion to the body behind the flexible lip of the second seat element, said cam surface being on an incline that will allow said cylindrical projection of said socket element in contact with said cam surface of said bulbous seat element to draw said socket element and said bulbous seat element together regardless of angular misalignment such that said concave interior spherical surface and said convex exterior spherical surface have an uninterrupted abutting contact one with the other over a wide expanse determined by the contact force of the cylindrical projection on the cam surface to solely maintain the sealed integrity of the coupling means at the contact of the flexible lip and concave sealing surface.



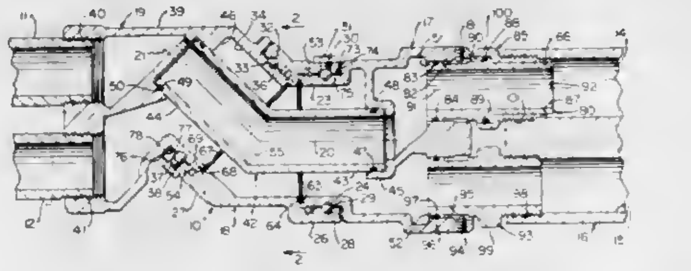
4,103,938
SWIVEL CONNECTOR

Donald A. Lasater, Fairfield, and Steven R. Ebbesmeyer, Middletown, both of Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Aug. 10, 1976, Ser. No. 713,257

Int. Cl.^{2} F16L *39/00*

U.S. Cl. 285—136 **28 Claims**



1. A swivel connector adapted to connect a pair of flexible hoses or the like to a pair of passages or the like in a member to allow fluid flow between one of the hoses and one of the passages and fluid flow between the other of the hoses and the other of the passages including a first member having first means connected to one of the passages and second means connected to the other of the passages, a second member, means rotatably connecting said first and second members for relative rotation therebetween about a first axis so that either of said first and second members can rotate through 360° relative to the other of said first and second members about the first axis, a third member, means rotatably connecting said second and third members for relative rotation therebetween about a second axis at an angle to the first axis so that either of said second and third members can rotate through 360° relative to the other of said second and third members about the second axis, said third member having first means for connection to one of the hoses and second means for connection to the other of the hoses, said first member, said second member, and said third member having first passage means connecting said first means of said first member and said first means of said third member to allow fluid flow therebetween and second passage means connecting said second means of said first member and said second means of said third member to allow fluid flow therebetween.

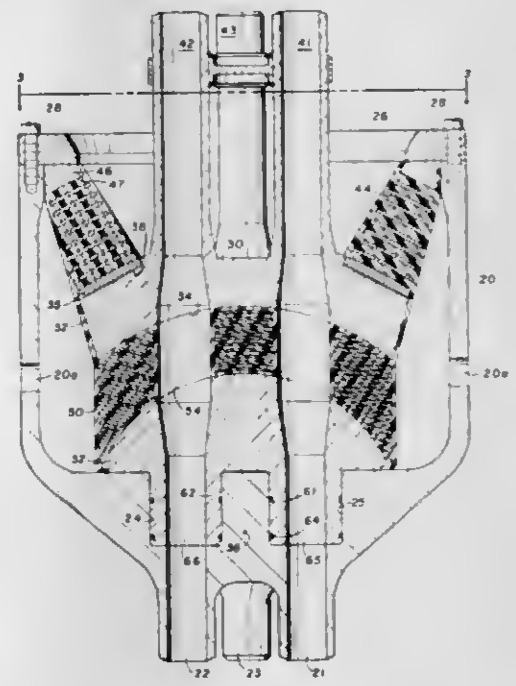
4,103,939
MULTI PASSAGE FLEXIBLE CONNECTOR

John T. Herbert; Frank J. Kovitch, both of Arlington, and Paul E. Sullivan, Euless, all of Tex., assignors to Murdock Machine & Engineering Company, Irving, Tex.

Filed Jun. 15, 1976, Ser. No. 696,396

Int. Cl.^{2} F16L *39/04*

U.S. Cl. 285—137 A **11 Claims**



1. In a flexible connector for interconnecting a plurality of input and output conduit pairs for relative angular deflection between mating input and output conduits wherein a ported cup receives a nipple having an outwardly flared wall structure, the combination comprising:

(a) an outer reinforced elastomeric annular support between and in contact with the outer surface of said wall structure and the wall of said cup,

(b) an inner reinforced elastomeric seal between and in contact with the inner surface of said wall structure and structure within said cup, and

(c) structure forming a plurality of laterally offset and spaced apart flow channels individually interconnecting said input and output conduits and extending through said nipple including flow ports through said wall structure and through the body of said inner elastomeric seal with the axis of each being laterally offset from the axis of said cup.

(d) and means for retaining said combination is assembled relationship.

4,103,940
BRANCH FITTING FOR A PIPE

Franklin Deloy Bills, Elkbart, Ind., assignor to Elkhart Products Corporation, Elkhart, Ind.

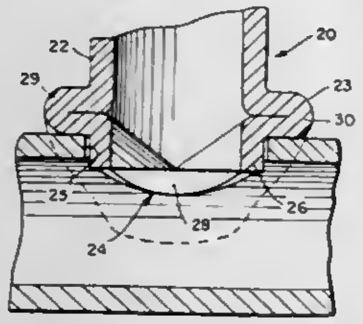
Filed Dec. 30, 1976, Ser. No. 755,816

Int. Cl.^{2} F16L *41/00*

U.S. Cl. 285—189 **2 Claims**

1. A branch fitting for permanent attachment to the periphery of a pipe comprising a single tubular portion having an inner diameter the same as the inner diameter of said pipe, saddle portion means having its undersurface generally conforming to the outer surface of said pipe, said saddle portion means having opposing ends extending outwardly and opposing sides extending outwardly and downwardly from the base of said tubular portion, extended pilot means circumferentially interrupted at two diametrically opposed positions aligned

with said sides, the edges of said pilot means defining the interrupted portions terminating flush with the outer surface of said pipe, said extended pilot means projecting downwardly from the junction of said saddle portion and said tubular portion for insertion into an opening in said pipe, and means for permanently attaching said branch fitting to the periphery of said pipe, said saddle portion means and said extending pilot means cooperating to prevent relative lateral, longitudinal and rotational movement of said fitting relative to said opening in said pipe prior to introduction of said permanent attachment means to assure a size-for-size joint having a strength at least as great as the strength of said branch fitting and said pipe, said opposing ends of said saddle portion means are formed with a thickness double the thickness of said opposing sides thereof.



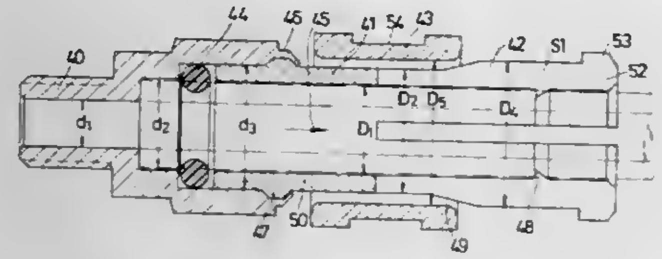
4,103,941
DISCONNECTABLE COUPLING FOR CONDUITS OF DEFORMABLE MATERIAL

Kurt Stoll, Lenzhalde 72, Esslingen, Germany

Continuation of Ser. No. 595,619, Jul. 14, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,002

Int. Cl.^{2} F16L *33/18*

U.S. Cl. 285—238 **1 Claim**



1. A disconnectable coupling device in the form of a plug-in-socket-connection for conduits of deformable material, which comprises, at one end, a socket having a bore adapted to receive the end of a conduit, at the other end, a threaded connecting member having three coaxial bores of different diameters, the first bore of the three being nearest the socket and having a diameter approximately equal to the outside diameter of the socket, the second bore of the three being adjacent to the first bore and having a diameter approximately equal to the inside diameter of the socket, and the third bore of the three being adjacent to the second bore and nearest the free end of the connecting member and having a diameter smaller than that of the second bore and corresponding to the inner diameter of the conduit to be connected to the device, an end of said socket being partially inserted into the first bore of the said threaded connecting member, said inserted end of the socket including an annular projection on the outside surface thereof and the threaded connecting member including an annular recess on the inner surface thereof adapted to receive the annular projection, the device further including a sealing ring located between the inserted end of the socket and the intersection of the first and second bores of the threaded connecting member, and a securing device to fix the inserted conduit in position, said socket being subdivided by longitudinally extending slots into a plurality of resilient collet chuck elements uniformly distributed around the periphery and having a generally smooth bore surface including one projecting annular tooth element spaced a distance from the free end of the socket, which collet chuck elements upon insertion of the end of the conduit into the bore of the socket surround from the outside the inserted end of the conduit which is without support at its inner side, the socket having at least one outer conical portion with the outer diameter increasing in the axial direction towards a securing section at the free end thereof, said securing section having an inclination which is less than that of the conical portion, said conical portion and said securing section including at least partially the outer surfaces of said collet chuck elements, said securing device comprising a securing ring axially slidable along the outer surfaces of said collet chuck element of the socket, said securing ring having a cylindrical inner surface of a diameter which is slightly less than the outer diameter of the securing section and being movable by hand between an inactive position on the side of the socket facing the threaded connecting member and an active position in which it surrounds the securing section of the socket, in which active position the securing ring forces the collet chuck elements into their locking position in which they clamp the end of the conduit in the manner of a collet chuck and in which active position the securing ring is retained by self-locking.

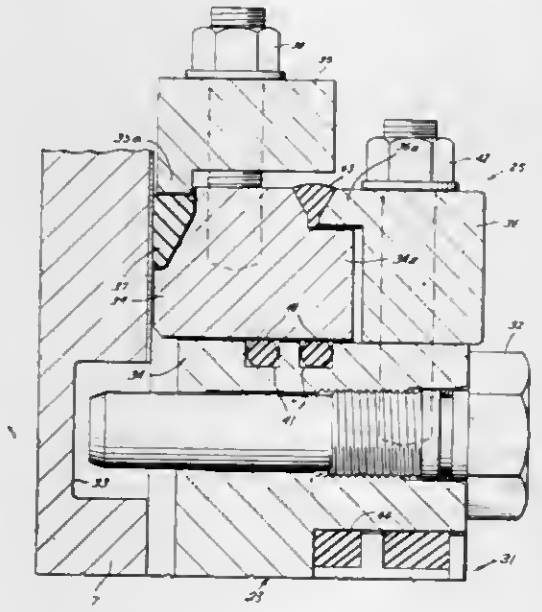
4,103,942
SEAL FOR SUBMERSIBLE PIPE SWIVEL

William L. Kiely, Houston, Tex., and Kristen I. Pedersen, Armonk, N.Y., assignors to Sotec, Inc., Tex.

Filed Aug. 30, 1976, Ser. No. 718,564

Int. Cl.^{2} F16L *27/00*

U.S. Cl. 285—276 **4 Claims**



1. The combination with first and second conduits of swivel bearing means sealingly interconnecting the same, said bearing means having inner and outer swivelling members, respectively sealingly secured to said conduits, means loosely securing said inner swivelling member to said first conduit, a seal-carrying ring encompassing and slightly spaced from said first conduit adjacent to said inner swivelling member, means sealing securing said seal-carrying ring to said inner swivelling member, a yieldable sealing gasket interposed between said seal-carrying ring and said first conduit, and means to adjust the tightness of said gasket to avoid leakage between said first conduit and said inner swivelling member without affecting the ease of movement of said outer swivelling member and said second conduit.

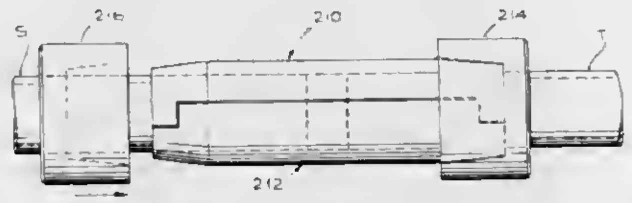
4,103,943
PIPE COUPLING

Hoyt S. Curtin, 3706 Capstan Cir., Westlake, Calif. 91361

Continuation-in-part of Ser. No. 695,462, Jun. 14, 1976, which is a continuation-in-part of Ser. No. 537,093, Dec. 30, 1974, Pat. No. 3,971,574, which is a continuation-in-part of Ser. No. 329,727, Feb. 5, 1973, Pat. No. 3,857,588. This application Nov. 4, 1976, Ser. No. 738,753

Int. Cl.^{2} F16L *13/10, 47/00*

U.S. Cl. 285—419 **5 Claims**



1. A device for coupling first and second pipes having open ends spaced by less than a predetermined distance to form a water-tight seal therebetween, said device comprising:

- first and second pipe sections each comprised of a substantially semi-cylindrically shaped wall having first and second longitudinal edges and an outer circumferential surface extending from said first edge to a first shoulder extending parallel to and spaced from said second edge, and an inner circumferential surface extending from said second edge to a second shoulder extending parallel to and spaced from said first edge, said wall being of substantially uniform thickness between said first and second shoulders and of reduced thickness between said first shoulder and said second edge and between said second shoulder and said first edge;
- first and second end collars each comprised of a tubular wall having inner and outer surfaces, said collar inner surface including a first portion shaped to conform to, but dimensioned slightly greater than, the outer circumferential surface of one of said pipes so as to be adapted to slide along and be adhesively adhered thereto, and a second portion shaped to conform to and dimensioned slightly greater than the outer circumferential surface of said first and second pipe sections so as to be adapted to slide along and be adhesively adhered thereto to mate said first and second pipe sections to one another with the reduced thickness wall portions of each section overlapping the reduced thickness wall portions of the other section.

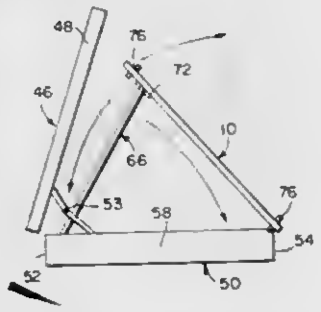
4,103,944
MACRAME BOARD AND KIT

Jim Alvarado, and Richard G. Righter, both of 9000 Foothill Blvd., Sunland, Calif. 91040

Filed May 20, 1976, Ser. No. 688,379

Int. Cl.^{2} D03J *3/00;* **D04G** *3/02, 5/00*

U.S. Cl. 289—18 **11 Claims**



1. A macrame board for fabricating items by the knotting of cords, comprising:

- a board having top, bottom and side peripheral edges, a central area provided with an array of apertures, the bottom peripheral edge of the board having a laterally extending scalloped section substantially coextensive with said apertured area, the top peripheral edge of the board being formed with a single cutout section substantially coextensive laterally with said apertured area, and each of the opposed side peripheral edges having a plurality of peripherally spaced inwardly directed slots, at least one of said slots being in the configuration of an inwardly pointing arrow; and
- starter means removably attached to said board adjacent said top peripheral edge for holding the finished portion of said item during the course of fabrication.

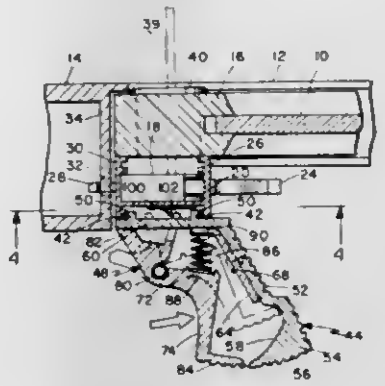
4,103,945
EMERGENCY OPENING LATCH ACTUATOR FOR SLIDING DOOR

Thomas Bray Turman, 1280 Clarendon St., El Cajon, Calif. 92021

Filed Nov. 3, 1977, Ser. No. 848,268

Int. Cl.^{2} E05C *19/10;* **E05B** *3/00, 65/10*

U.S. Cl. 292—100 **9 Claims**



1. In combination with a sliding door structure including a fixed jamb, a sliding door having a frame member to seat against the jamb, a latch unit mounted on the frame member and having a latch element selectively engageable with the jamb to lock the door, an actuator coupled to said latch element and having an extended operating lever for moving the latch element between locked and unlocked positions, and a housing enclosing said latch unit, the improvement comprising:

- a handle mounted on said housing;
- said handle having a grip portion for gripping by a hand to open the door, the grip portion being pivotally mounted to move between a rest position and an open position;
- and an adapter coupled between said actuator and said grip portion to unlock the latch element when the grip portion moves to the open position.

4,103,946
FLUSH SET LOCK FOR SLIDING DOORS

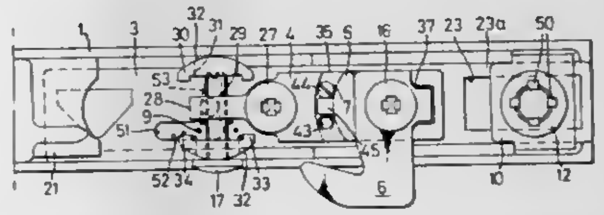
Donald Henry Tipler, Hunts, England, assignor to Schlegel (UK) Limited, Leeds, England

Filed Jan. 26, 1977, Ser. No. 762,583

Claims priority, application United Kingdom, Jan. 29, 1976, 3518/76

Int. Cl.^{2} E05C *5/00, 19/12*

U.S. Cl. 292—114 **12 Claims**



1. A bolt mechanism for use in a sliding door or the like for interengagement with a keeper, comprising:

a body having a rectilinear slideway with a closing position and an open position;

a first member located in said rectilinear slideway, said first member having manually operable means for sliding said first member between said closing and open positions and having second member pivotal mounting means;

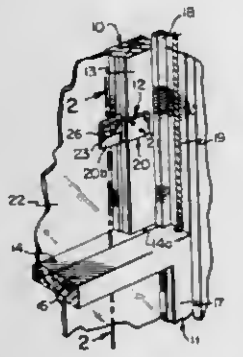
a second member pivotally mounted on said first member by said second member pivotal mounting means, having engagement means and having a hook-shaped bolt means with a free end portion, said bolt means extending laterally from said second member with the free end portion projecting generally parallel to said rectilinear slideway;

second member holding means for holding the second member with its bolt means in a predetermined closing attitude, said second member holding means comprising resilient biasing means and second member stop means engageable by said second member engagement means, said resilient biasing means being arranged to urge said second member rotationally into said predetermined closing attitude defined by said second member stop means, at least one of said second member engagement means and said second member stop means having adjustment means for, respectively, adjusting the position of said second member engagement means on said second member and the position of said second member stop means, whereby said predetermined closing attitude of said second member with its bolt means is adjustable; and

locking means mounted on said body and manually moveable when said first member is in said closing position, into and out of a locking position, said locking means when in said locking position preventing return movement of said first member to said open position, whereby said first member may be locked in said closed position.

4,103,947
VENTILATION STOP FOR WINDOWS

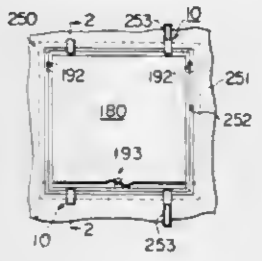
John H. Delaney, 146-25 20th Rd., Whitestone, N.Y. 11357
Filed Feb. 4, 1977, Ser. No. 765,632
Int. Cl.² E05C *3/02*
U.S. Cl. 292—194 3 Claims



1. A ventilation stop adapted to be mounted to the side rail of the upper window sash of a double-hung window a predetermined distance above the upper horizontal rail of the lower sash, comprising a generally rectangular mounting plate, means for securing said mounting plate in a normally installed position to said side rail such that a section of said mounting plate extends from said side rail generally parallel to and above said upper horizontal rail, said section having an upper horizontal edge in said normally installed position, a wedge support plate hinged along one edge to the upper horizontal edge of said section about a horizontal axis to alternately depend therefrom inwardly and toward said lower sash in its operative position and alternately to be swung over said section in its operative position, a generally rigid wedge-shaped member attached to said wedge support plate, said wedge-shaped member defining a planar surface connected to said wedge support plate and projecting inwardly therefrom such that a part of said planar surface lies toward and into the path of the upper horizontal rail of the lower sash during relative movement between the upper sash and the lower sash thereby effecting a stopping and jamming action of said horizontal rail against said planar surface, said wedge-shaped member further including an upper surface interconnecting said support plate and said planar surface and being horizontal in the operative position, said surface being vertical and acting as a stop and abutting said section to limit swinging movement of said wedge support plate in the inoperative position when the latter is swung about said horizontal axis up and over the section of said mounting plate to which said support plate is hinged.

4,103,948
ANCHORING DEVICE

Hiromitsu Naka, No. 39, Oaza Shiomachi, Yashio-shi, Saitama-ken, Japan
Filed Jul. 12, 1976, Ser. No. 704,616
Claims priority, application Japan, Jul. 18, 1975, 50-87216
Int. Cl.² E05C *19/18*
U.S. Cl. 292—256 9 Claims



1. In combination;

an access door for a rough opening in a panel such as a ceiling or wall panel and having an outer frame adapted to be fitted into the rough opening, an outwardly extending flange integral with the outer end edge of said outer frame extending laterally outwardly of the frame for engaging the outer face of the panel around said rough opening, and an inwardly extending flange integral with the inner edge of the frame on the opposite side of the panel from the outwardly extending flange; and

an anchoring device comprising a hanger member having a support arm portion with a threaded hole at one end thereof, and a hook portion integral with the other end of said support arm portion and depending therefrom and engaging with the inwardly extending flange, and a screw-threaded clamping member screw-threadedly engaged in said threaded hole and having the free end extending from the support arm portion in the same direction as said hook portion depends for engagement with the rear face of said panel.

4,103,949
SAFETY DOOR LATCH

Jose B. Bouloy, P.O. Box F2666, Freeport G.B.I., The Bahamas
Filed May 7, 1976, Ser. No. 684,117
Int. Cl.² E05C *19/18*
U.S. Cl. 292—342 6 Claims

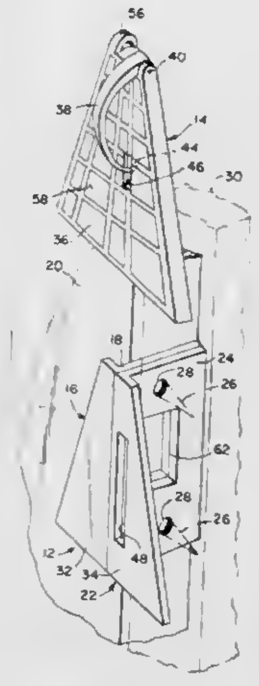
1. A safety latch for a door or the like comprising:

a keeper element including a first and second L-shaped part, each part being adapted to have one of its legs attached to the edge of a door and a door frame or the like, respectively, in back to back relation so that when the door is closed the other legs of each part will be in abutment in the same vertical plane parallel to but spaced apart from the door and door frame;

a latch element adapted to be slid and positioned over the other legs of said keeper element to retain the first and second parts of said keeper element in abutment so they cannot be separated to prevent opening of a door, said latch element including,

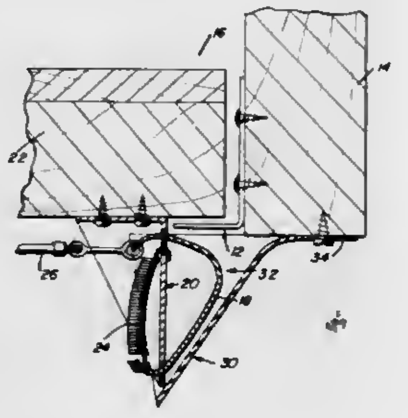
a hollow sleeve having a complemental shape to said other legs of each keeper part when they are positioned in back to back relation; and

handle means for raising and lowering said sleeve relative to said keeper element parts, said handle means being pivotally connected to said sleeve and including a hook at the end thereof remote from said pivotal connection, a slot in said sleeve, and a complemental slot in said other leg of one of said keeper parts, the hook on said end of said handle means being received within said complemental slots to preclude removal of said sleeve from said keeper parts.



4,103,950
LATCH SHIELD

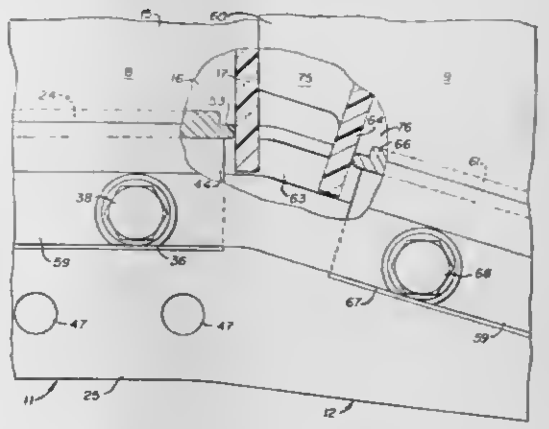
Daniel C. Yuot, 928 Susan Lee La., Modesto, Calif. 95350
Filed Oct. 28, 1976, Ser. No. 736,719
Int. Cl.² E05C *3/06*
U.S. Cl. 292—346 4 Claims



1. In combination with a latch assembly including a door stop, a tongue, a spring biasing the tongue toward engagement with the door stop, and a manipulating means for pulling the tongue away from engagement with the door stop against the bias of the spring, a latch shield for covering the latch assembly and preventing opening of the latch assembly from outside of a closure associated with the latch assembly, the latch shield comprising a cover member separate from the latch assembly and having a hollow interior arranged for protectively receiving the latch assembly with engaging the latch assembly, and provided with a mounting means for permitting attachment of the member to a stationary frame part associated with the closure.

4,103,951
SEMI-PNEUMATIC ENERGY ABSORBING BUMPER SYSTEM FOR MOTOR VEHICLES

Thomas A. Bank, Carmel, Ind.; Jack E. Gieck, and David A. Weitzenhof, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 638,388, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,932, Feb. 25, 1975, Pat. No. 3,989,292, which is a continuation-in-part of Ser. No. 426,615, Dec. 12, 1973, Pat. No. 3,902,748. This application Jun. 6, 1977, Ser. No. 803,826
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.² B60R *19/00*
U.S. Cl. 293—71 P 7 Claims



1. A non-pressurized bumper comprising

an elastomeric member having an impact face and rearwardly extending walls terminating in a partially continuous bead;

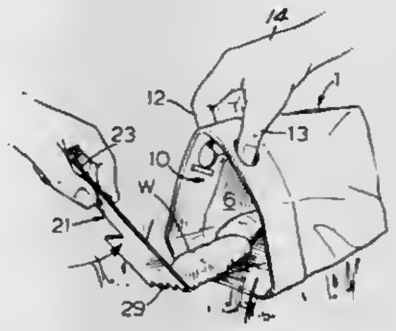
a closure plate received within said member and abutting the inner surfaces of said walls;

a clamp mounting said bead on said closure plate; and

means venting directly to the atmosphere through, and at an edge of, said closure plate.

4,103,952
COMBINATION BAG AND SCOOP

John Douglas Thompson, 2660 Midland Ave., Agincourt, Ontario, Canada
Filed May 9, 1977, Ser. No. 794,834
Int. Cl.² A01K *29/00;* A47L *13/52*
U.S. Cl. 294—1 R 7 Claims



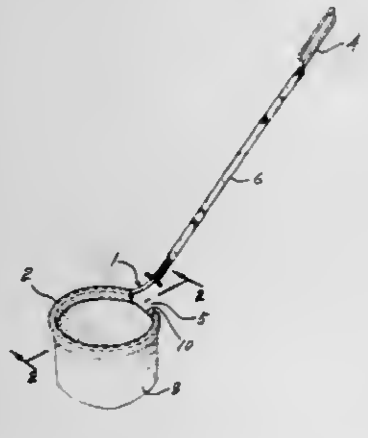
1. A bag used for cleaning waste material, said bag including a closed bottom portion for holding waste material, an upper portion having an open mouth for insertion of waste material into said bag, and closing means for closing said bag after inserting waste material therein, said bottom portion being constructed of a flexible impermeable material, said upper portion including two relatively flat parallel sidewalls adjacent one another, each of said sidewalls being provided with a finger insert at one end thereof such that both of the inserts are located at the same end of the upper portion, said upper portion being rigid to the extent that upon insertion of a finger and

a thumb or a pair of fingers in said inserts said mouth is spread open by spreading a finger and a thumb and bowing said sidewalls, said upper portion also being resilient to the extent that upon withdrawal of a finger and a thumb from said inserts said sidewalls tend to resume their flat parallel relationship, the size of the bag being such that it is easily opened by one hand with the thumb and finger firmly engaged in said finger inserts, said closing means being located on said bag such that said bottom portion is closed after use by the closing means for closing said bag and its contents.

4,103,953

PORTABLE ANIMAL SANITARY DEVICE

Gilles Raoul Lachance, 56 Place Montmoreacy, Laval, Canada (H7N 1T6)
Filed Aug. 30, 1977, Ser. No. 829,584
Int. Cl.^{2} A01K *29/00*
U.S. Cl. 294—19 R **2 Claims**



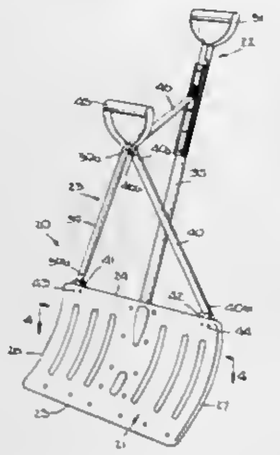
1. A portable animal sanitation device comprising a rigid, one-piece, rod-like frame including a straight handle section integrally joined at one end to one end of an annular section having a free end terminating short of and adjacent the junction of said straight and annular sections, said annular section lying in a plane making an obtuse angle with said handle section, a spirally wound spring wire surrounding said frame and slidable along the same between an inoperative position in which said spring wire is substantially co-extensive with said handle section and terminates at said junction, and an operative position in which the spring wire extends along both said handle section and said annular section and terminates close to said free end of said annular section, and a disposable bag having a hem at its top edge extending along the greater part of the length of said top edge and opened at both its ends and removably receiving said annular section, whereby said frame carries said bag, movement of said spring wire along said frame from said inoperative position to said operative position causing said wire to push against said hem and to cause said bag to come off said annular section.

4,103,954

SNOW SHOVEL

John W. Vaslas, 282 Park St., Staten Island, N.Y. 10306
Filed Apr. 14, 1977, Ser. No. 787,360
Int. Cl.^{2} A01B *1/22;* E01H *5/02*
U.S. Cl. 294—54 **14 Claims**

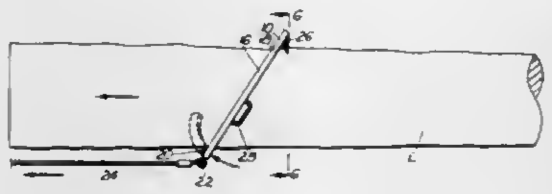
1. A snow shovel, comprising a plate-shaped scoop having a top edge, a bottom ground-engaging edge, and opposite side edges, a main handle rod rigidly affixed at one of its ends to the medial region of said scoop, a first hand grip secured to said main handle rod at the other end thereof, a pair of coplanar auxiliary handle rods located frontwardly of said main handle rod and having respective first and second ends, said auxiliary handle rods being closely juxtaposed to one another at said first ends and diverging from one another in the direction of said second ends, the lengths of said auxiliary handle rods and the angle of divergence thereof disposing said second ends of said auxiliary handle rods at a spacing from each other approximating the distance between said side edges of said scoop, a second hand grip secured to said auxiliary handle rods at said first ends thereof and projecting therefrom in a direction generally away from said second ends of said auxiliary handle rods, respective hinge means interconnected between said second ends of said auxiliary handle rods and said scoop adjacent said top edge thereof, a rigid cross-brace bar, means pivotally connecting said cross-brace bar at one of its ends to said auxiliary handle rods adjacent the juncture thereof with said second hand grip, coupling means hingedly connected with said cross-brace bar at the other of its ends and engaging said main handle rod, and means for releasably locking said coupling means to said main handle rod, whereby said coupling means can be adjusted to a plurality of positions along said main handle rod for adjusting the angular orientation of said cross-brace bar between said main handle rod and said auxiliary handle rods and thereby the disposition of said auxiliary handle rods and said second hand grip relative to said main handle rod and said first hand grip.



4,103,955

LOG CINCH

Louis F. Hill, 555 Walnut St., Lebanon, Oreg. 97355
Filed Dec. 6, 1976, Ser. No. 747,692
Int. Cl.^{2} B25B *11/00*
U.S. Cl. 294—92 **3 Claims**

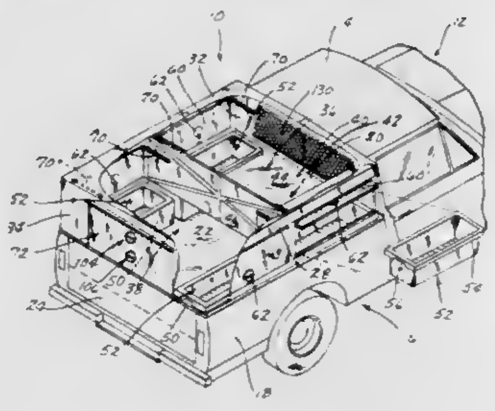


1. A log cinch comprising
(a) a body member,
(b) said body member consisting of a bar curved to define a central area,
(c) said body member having an intermediate portion and having opposite end portions terminating in end edges spaced from each other in a cut-out portion forming a transverse opening,
(d) said end portions being spaced from each other an amount sufficient to form an opening large enough to receive a log such that the body member when positioned crosswise over a log can be moved down to receive the log through said opening,
(e) said intermediate portion and one of said end portions of said body member being substantially straight and in straight line alignment with each other and the other end portion of said body member being curved in oblique relation in a forward direction,
(f) line connecting means on said body member adjacent said other end portion to which a pulling line is arranged to be secured whereby upon a forward pull being applied to said body member at said line connecting means, said body member is moved obliquely of the log to have a binding connection thereto,
and a rearwardly extending barb on said other end portion of said body member arranged to penetrate into a log for gripping engagement with the log when the body member extends obliquely relative to the log.

4,103,956

PICKUP TRUCK BOX ENCLOSURE

Eugene W. Faulstich, 1415 18th Ave. West, Spencer, Iowa 51301
Filed Nov. 19, 1976, Ser. No. 743,229
Int. Cl.^{2} B60D *15/50*
U.S. Cl. 296—10 **12 Claims**

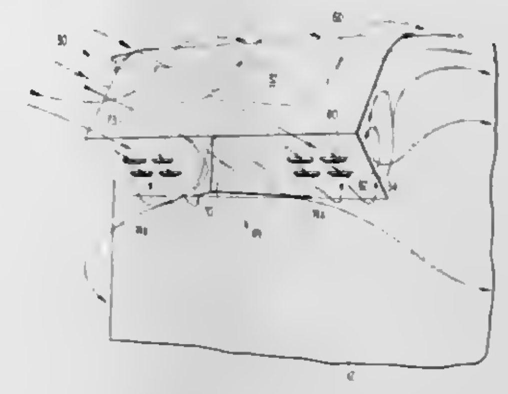


12. In a pickup truck having a cab, and a box including opposite sidewalls, front wall, and rear tailgate, the improvement comprising,
a box enclosure on said box including a top wall, and front and rear end walls and opposite sidewalls operatively associated with the front wall, rear tailgate and opposite sidewalls, respectively of the box so as to form an upper vertical extension thereof,
a support wall situated along one sidewall of said box in a horizontal plane extending substantially through the intersection of said box enclosure and box and said support wall having an opening,
a storage tray, coacting means on said storage tray and support wall for positioning the storage tray in nesting relation in said opening substantially below said support wall, said support tray having handle means above said support wall for handling said tray,
the enclosure sidewall above said one sidewall of said box having an access opening for access to said storage tray and large enough to allow removal of said tray through said access opening,
a door positioned in said enclosure sidewall access opening, said rear wall of said enclosure having an opening defined by top and bottom, and opposite sidewall portions,
a door adapted to be positioned in said opening and having top and bottom and opposite side edges,
oppositely disposed horizontally outwardly extending retractable actuating pins on said door adjacent its top edge,
the opposite side wall portions operatively including horizontally extending slots having inner and outer ends, and stop elements are positioned on said sidewall portions adjacent the inner ends of said slots,
said oppositely disposed pins insertable into the slots in said opposite sidewall portions to support said door,
said door being pivotable about the longitudinal axis of said pins when said pins are positioned in the outer ends of said slots between a vertically closed position and a horizontally raised position and said upper end of said door being adapted to engage said stops when said pins are in the inner ends of said slots to limit downward pivoting of said door to a closed position, and
control means on said door connected to said actuation pins for retracting said pins from said slots to allow said door to be removed from said opening.

4,103,957

TRUCK AIR FOILS

Robert G. Landry, 45 Rachel Blvd.,, Lewiston, Me. 04240, and Sherman R. Jenney, 27 Rochelle St., Auburn, Me. 04210
Filed Sep. 21, 1976, Ser. No. 725,258
Int. Cl.^{2} B62D *35/00*
U.S. Cl. 296—1 S **14 Claims**

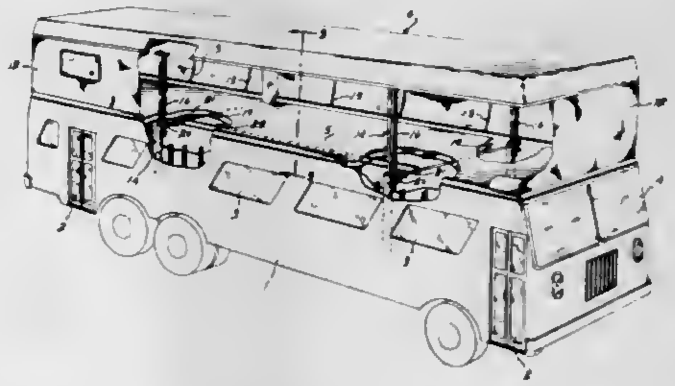


9. A truck air foil for mounting on the front face of a truck cargo box and directing the impinging air stream comprising:
elongated upper and lower generally rectangular panels,
means for hingedly coupling the long lower and upper edge portions of the respective upper and lower panels one to the other,
means for securing said upper panel to the truck cargo box such that said upper panel inclines forwardly and downwardly from the forward face of the cargo box,
means carried by said lower panel for securing the lower panel to the cargo box with the lower panel inclined forwardly and upwardly away from the front face of the cargo box, and
means providing for passage of air between the lower edge portion of said lower panel and the front face of the cargo box into the space behind said upper and lower panels and forwardly of the front face of the cargo box for pressurizing this space, the opposite ends of said air foil behind said panels being open to transmit air from said space outwardly through said opposite open ends.

4,103,958

CAMPING VEHICLE BODY

Jean-Marc Parent, 9e rang, Wickham, Canada
Filed Mar. 30, 1977, Ser. No. 783,009
Claims priority, application Canada, Dec. 30, 1976, 268956
Int. Cl.^{2} B62P *3/32*
U.S. Cl. 296—23 C **4 Claims**



1. A camping vehicle body comprising a first floor, a peripheral side wall fixed around said first floor and laterally confining a passenger compartment over said first floor, a roof covering said peripheral side wall and selectively liftable to a desired elevation above said peripheral side wall, a second floor fixedly secured to said peripheral side wall at a fixed height over said passenger compartment and below said roof, collaps-

ible side walls positioned at the periphery of said second floor and of said roof and laterally confining a livable compartment between said second floor and said roof, said roof being liftable by means including hydraulic cylinders fixedly connected at the opposite ends to said roof and relative to said peripheral side wall respectively and selectively elevating and lowering said roof upon actuation, and an intercoupling system connected to said hydraulic cylinders and controlling concurrent operation thereof, said intercoupling system including a rack adjacent each of said hydraulic cylinders, fixedly secured relative to said roof and displaceable endwise bodily therewith, a gear meshing with each of said racks, shafts carrying said gears and bodily rotatable therewith, and a rotation transmitting assembly interconnecting said shafts and producing concerted rotation of the latter and of said gears and a resulting concerted endwise displacement of said racks.

4,103,959

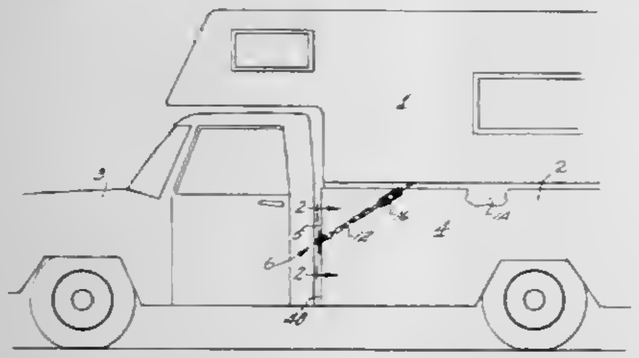
HOLD DOWN PLATE FOR CAMPER UNITS

Wesley W. Whiting, 83 Kingsbury Ave., and John A. Anderson, 4422 Ryan St., both of Eugene, Oreg. 97404

Filed Mar. 11, 1977, Ser. No. 776,500

Int. Cl.^{2} B60P *3/32*

U.S. Cl. 296—23 MC **6 Claims**



1. In combination with the front wall structure a pick up truck box within which a camper unit is supported for transport, the improvement comprising a hold down plate adapted for securement to the forward side of the front wall of said box structure, said plate including a major portion in abutment with the forward side of said wall, a secondary portion offset forwardly from said front wall and projecting laterally beyond the forward edge of the truck box sidewall and thereat defining an aperture for receiving camper tie down means, an intermediate portion between said major and secondary portions and extending forwardly from said major portion away from the box front wall.

4,103,960

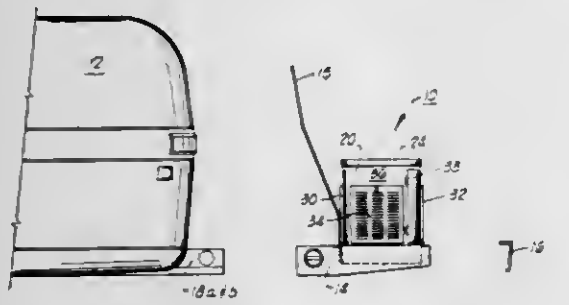
UTILITY COMPARTMENT FOR A TRAVEL TRAILER

Joe W. Ziese, P.O. Box 14209, Oklahoma City, Okla. 73114

Filed Jun. 24, 1977, Ser. No. 809,538

Int. Cl.^{2} B60R *9/06*

U.S. Cl. 296—37.1 **5 Claims**



1. Utility compartment apparatus for installation and use on a vehicle of the type having on-board living accommodations and which has at least two spaced, longitudinal frame members extending rearward from the vehicle to support the rear bumper assembly, the apparatus comprising:

carrier support frame means having first and second side members each adapted for rigid affixure to said longitudinal frame members, and having a transverse panel with forward and rearward parallel sides bend-formed to extend at 90° upward from said transverse panel, said transverse panel being rigidly secured between said first and second side panels;

side panel means formed as a rectangular enclosure and inserted downward within said first and second side members and said transverse panel parallel bend portions for secure affixure therein;

top lid means hingedly secured over the top of said side panel means rectangular enclosure;

divider panel means secured generally centrally to said transverse panel and said side panel means rectangular enclosure;

electrical power generation means resiliently secured to said transverse panel on a selected side of said divider panel means; and

a muffler and muffler extension means maintaining said electrical power generation means exhaust outlet external to said utility compartment.

4,103,961

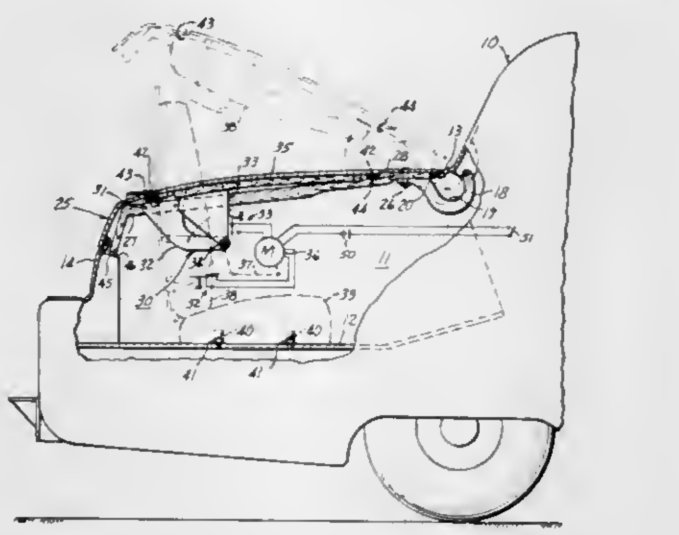
RUMBLE SEAT

Donald B. Cerf, and Perry J. Dreibus, 5435 Corning Ave., Los Angeles, Calif. 90056

Filed Nov. 8, 1976, Ser. No. 739,544

Int. Cl.^{2} B60N *1/06*

U.S. Cl. 296—63 **15 Claims**



1. A rumble seat for use in the trunk cavity of an automobile body, said cavity having a floor, and an opening bounded by a forward edge, a rear bulkhead and a pair of spaced apart side ledges, and hinge means mounted to the body for pivotally mounting a trunk lid for upward and downward movement to open and to close the said opening, the improvement comprising: a support lid having structure attachable to said hinge means to replace said trunk lid; a fairing attached to the structure and so proportioned and arranged as to close on the periphery of said opening in the same manner as the replaced trunk lid, there being an aperture in said fairing; a back support; pivot means mounted to said structure and said back support, said back support being so proportioned and arranged as to close said aperture in one position and to be pivoted by the pivot means to open and form a back restraint in another position; motor means for moving said back support between said positions; a seat cushion to rest on the floor of the trunk without upward support by the support lid or by the back support; and restraint means restraining the seat cushion from forward and backward movement.

4,103,962

SLIDING ROOF FOR AUTOMOBILES

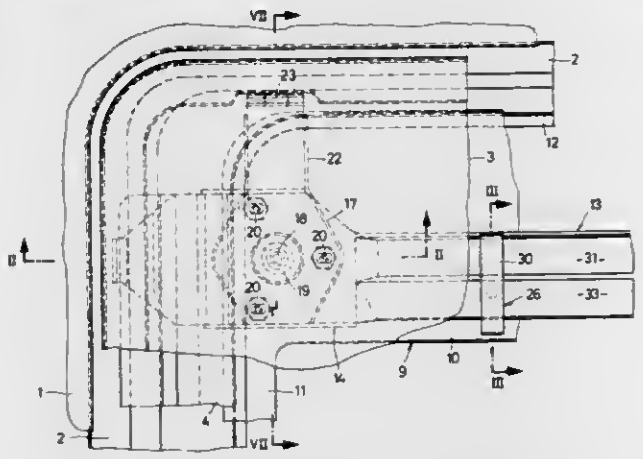
Albert Schlapp, Sprendlingen, Fed. Rep. of Germany, assignor to Rockwell-Golde G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1976, Ser. No. 740,342

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551335

Int. Cl. B60j *7/10*

U.S. Cl. 296—137 E **5 Claims**



1. A sliding roof for automobiles, comprising a rigid sliding panel, slidably guided in a roof opening on lateral guide rails by means of forward and rear sliding shoes, said guide rails supported by the housing attached to the roof of said automobile, which panel is connected in a pivotally movable and height adjustable manner generally toward the forward edge of said panel with the forward sliding shoes, and the lower face of which is covered with a panel lining secured to a lining frame, said lining frame being attached at the front to a cross-beam which rigidly connects together the forward sliding shoes, at least two spaced apart, stirrup-shaped, forwardly open stop springs are attached to the forward transverse portion of the lining frame on its surface remote from the panel lining, which stop springs can be engaged onto the cross-beam when the lining frame is pushed in from the rear edge of the sliding panel.

4,103,963

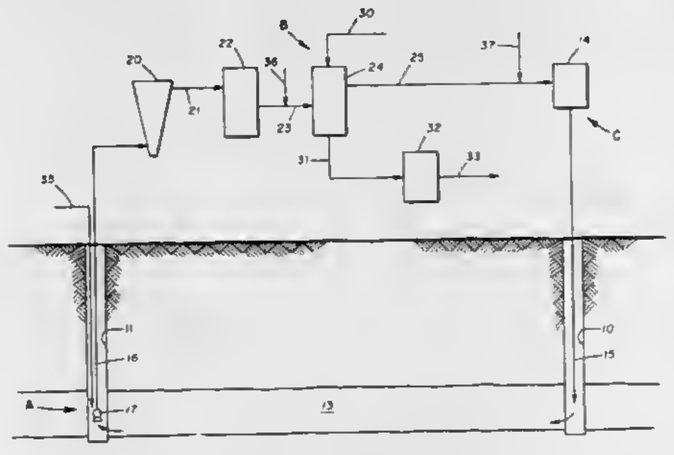
CALCITE CONTROL IN AN IN SITU LEACH OPERATION

Wilton F. Espenscheid; Israel J. Heilweil, both of Princeton, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,238

Int. Cl.^{2} E21B *43/28*

U.S. Cl. 299—4 **12 Claims**



1. In an in situ leaching circuit wherein a lixiviant is flowed through a calcium-based, uranium and/or other metal values bearing formation from an injection well to a production well to dissolve the uranium and/or metal values and to carry said values to processing equipment on the surface, the method of controlling calcite precipitation in said circuit comprising:

determining the resident time that said lixiviant remains in a critical area of said circuit; and

adding a chemical inhibitor to said lixiviant as said lixiviant enters said critical area to retard the growth of calcite crystals, said chemical inhibitor being added in an amount that will prevent substantial calcite precipitation during said resident time but will not substantially interfere with calcite precipitation after said resident time has expired.

4,103,964

ADJUSTABLE HINGE ASSEMBLY FOR SEAT OF TWO-DOOR MOTOR VEHICLE

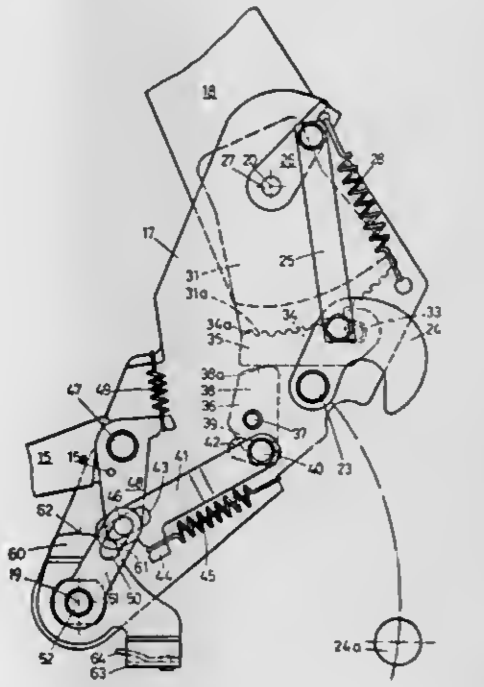
Friedrich Klingelhöfer, and Heinz-Jürgen Wagener, both of Remscheid, Germany, assignors to Keiper K.G., Remscheid-Hasten, Germany

Filed Nov. 22, 1976, Ser. No. 744,176

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1975, 2552787

Int. Cl.^{2} A47C *1/026;* B60N *1/06*

U.S. Cl. 297—367 **12 Claims**



1. A hinge assembly comprising:

a support;

a first hinge element pivotal on said support about a tipping axis between a rest position and a pivoted position angularly offset therefrom;

a second hinge element pivotal on said first hinge element about an adjustment axis through a plurality of angularly offset adjustment positions;

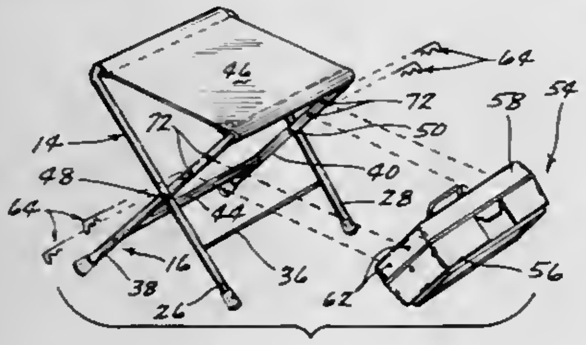
respective first and second interengageable formations on said first and second elements relatively displaceable between an engaged position wherein said second element is fixed relative to said first element in any of said adjustment positions and a disengaged position wherein said second element is freely pivotal relative to said first element about said adjustment axis;

adjustment means including an adjustment member connected to one of said formations and displaceable between a normal position and an actuated position for displacing said one formation and thereby relatively displacing said formations between said engaged and disengaged positions, respectively; and

lockout means including an abutment mounted on one of said elements and operatively engageable with said adjustment member for preventing displacement of said adjustment member into said actuated position except when said first element is in said rest position.

4,103,965
FISHING CHAIR

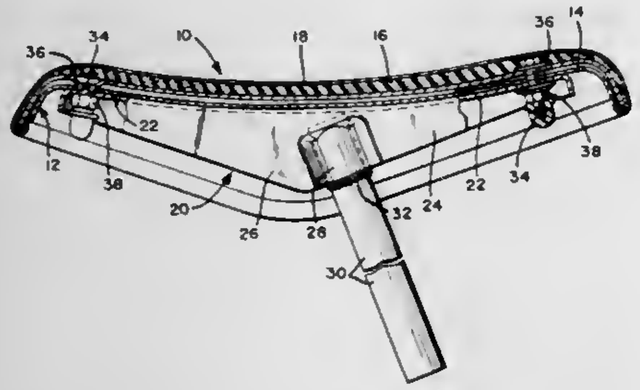
Norman R. Engman, Des Moines, Iowa, assignor to Emco Industries, Inc., Des Moines, Iowa
Filed Nov. 8, 1976, Ser. No. 739,573
Int. Cl.^{2} A47C *9/10*
U.S. Cl. 297—192 **1 Claim**



1. A fishing chair comprising:
- a pair of inverted U-shaped, two legged folding tubular leg sections wherein one leg of each section is pivotally secured to one leg of the other section,
- a support brace securely mounted between each of said U-shaped leg sections,
- a collapsible seat member carried by said leg sections,
- a plurality of pins having an elongated shank portion and a V-shaped spring clip portion for yieldably embracing a portion of said tubular leg to yieldably maintain said pin on said leg, and
- a tackle box including a lid having a plurality of pin receiving apertures and a bottom section hingedly secured thereto and positioned between one of said leg sections such that said bottom section opens forwardly and downwardly relative to an occupant's position on said seat member with said leg section having a plurality of pin receiving apertures therethrough with said shank portion being of such greater length than said V-shaped clip portion so as to extend through said leg apertures into said lid apertures to support said tackle box and said V-shaped clip portion embraces said leg thereby detachably securing said tackle box to said leg section.

4,103,966
SADDLE CONSTRUCTION

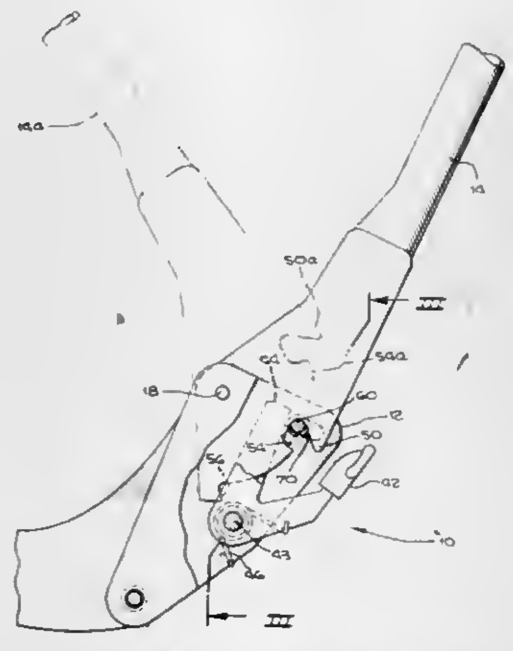
David A. Allen, Glendora, Calif., assignor to Huffy Corporation, Miamisburg, Ohio
Filed Sep. 19, 1977, Ser. No. 834,275
Int. Cl.^{2} B62J *1/00*
U.S. Cl. 297—195 **7 Claims**



1. A saddle construction comprising:
- a saddle pan including a lower plate,
- a one-piece saddle support including an upper plate complementary to said lower plate of said saddle pan throughout substantially the length of said saddle pan,
- means securing said saddle support to said saddle pan with said upper plate of said support in supporting relationship to said lower plate of said pan,
- said saddle support further including a dependent skirt portion extending downwardly from said upper plate along opposite sides thereof throughout substantially the length thereof,
- an intermediate section of said depending skirt portion defining a downwardly opening socket,
- an elongated seat post,
- an upper end of said seat post being received in said socket, and
- means permanently and immovably fixing said upper end of said seat post in said socket with said seat post upper end permanently attached to inner surfaces of said depending skirt portion.

4,103,967
ROLLER SEAT BACK LATCH MECHANISM

Akira Tanaka, Northridge, and William M. Hollowell, Pacific Palisades, both of Calif., assignors to American Safety Equipment Corporation, Los Angeles, Calif.
Filed Dec. 13, 1976, Ser. No. 750,178
Int. Cl.^{2} B60M *1/02*
U.S. Cl. 297—216 **18 Claims**

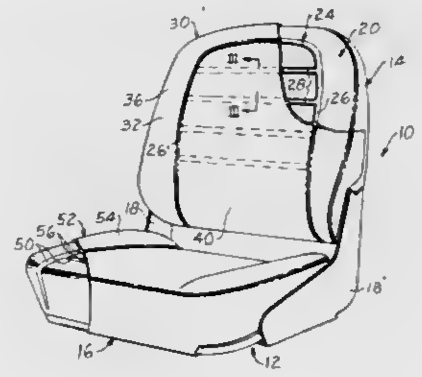


1. An inertia-responsive vehicle seat back latch mechanism for a vehicle seat assembly having a seat cushion support, and a seat back pivotally supported for forwardly tilting movement, said latch mechanism comprising:
- forwardly-inclined roller guide means adapted for attachment to the vehicle seat assembly for guiding a roller means;
- roller means contained within said guide means for moving between a seat back locking position and a seat back tilting position, said roller guide means being adapted so that during a vehicle deceleration greater than a first predetermined value, the roller means is positioned in the seat back locking position; and
- latching means adapted to be attached to the seat back assembly for direct engagement with said roller means when said roller means is in its seat back locking position to prevent said seat back from tilting forward.

4,103,968
SEAT COVER

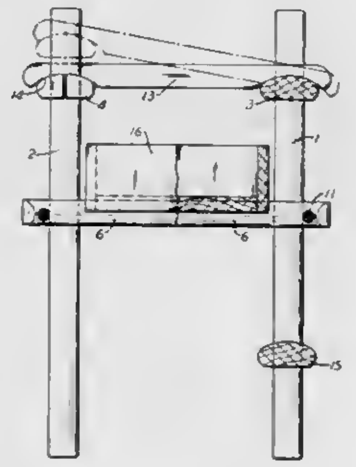
Max E. Butterfield, Peoria, and John Molnar, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jun. 9, 1977, Ser. No. 804,976
Int. Cl.^{2} A47C *31/10*
U.S. Cl. 297—219 **2 Claims**

1. A seat cover for a seat portion having in free form a plurality of elongated depressions therein, comprising a seat cover body having in free form a plurality of of elongated ribs thereon, positioned to seat generally within respective depressions of the seat portion with the seat cover body fitted to the seat portion, said seat cover including means for removably securing said seat cover body to the seat portion, wherein said seat cover is readily removable from and readily positionable on the seat portion, said seat cover body having a generally smooth outer surface, and wherein the seat cover body includes a forward edge portion and a rearward edge portion, and further wherein said securing means comprises snap means mounted to the seat cover body adjacent the forward edge portion for securing the forward edge portion of the seat cover body to the seat portion, and said securing means also comprises generally hook-shaped means mounted to the seat cover body adjacent the rearward edge portion for securing the rearward edge portion of the seat cover body to the seat portion, wherein said hook-shaped means includes a continuous U-shaped channel substantially co-existent with the rearward edge portion of said seat cover body.



4,103,969
ADJUSTABLE WOODEN STUDIO BENCH

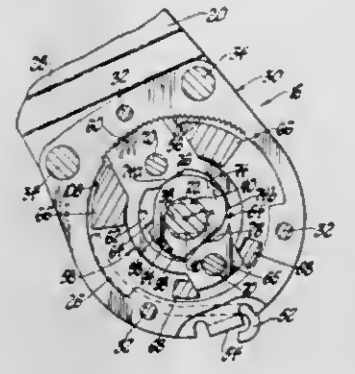
James Stoy Glessner, R.D. #2, Somerset, Pa. 15501
Filed Jun. 17, 1977, Ser. No. 807,353
Int. Cl.^{2} A47C *3/28*
U.S. Cl. 297—311 **2 Claims**



1. An adjustable wooden studio bench comprising a pair of front legs spaced lengthwise of the bench, a horizontal top rail provided at its ends with vertical openings receiving the upper portions of said legs, a horizontal footrest rail provided at its ends with vertical openings receiving the lower portions of said legs, a back leg behind each front leg, a second horizontal top rail provided at its ends with vertical openings receiving the upper portions of said back legs, a cross bar at each end of the bench provided at its ends with vertical openings receiving the central portions of the adjoining front and back legs, each rail and bar having a vertical slot through each end extending from the opening therethrough out through the adjacent end to form a pair of horizontally spaced jaws, fastening means extending through each pair of jaws and drawing them toward each other to clamp the rails and bars at any desired height on the legs extending therethrough, and a seat resting on said top rails and slidable only lengthwise thereof the upper surfaces of said top rails being convex transversely of the rails, each of said surfaces forming a segment of a cylinder, and the bottom of said seat being provided with concave grooves receiving said convex surfaces, the wall surface of each groove forming a segment of a cylinder, all of said surfaces having substantially the same radius so that said wall surfaces fit said upper surfaces of the top rails when those rails are at the same level and also when one of them is lower than the other one to slant the seat whereby line contact between the seat and the top rails is avoided.

4,103,970
SEAT RECLINER

Robert I. Homier, Shelby, Ohio, assignor to Lear Siegler, Inc., Morristown, Tenn.
Filed Jan. 13, 1977, Ser. No. 758,898
Int. Cl.^{2} B60N *1/02*
U.S. Cl. 297—363 **10 Claims**



1. A seat recliner comprising: seat back and cushion arms having plate-like ends connected to each other for relative movement about a pivotal axis; a locking ring positioned between the ends of the arms encircling the pivotal axis and fixed to one of the arms; the locking ring having an opening therethrough and including inwardly extending locking teeth located within the opening in an arcuate shape about the pivotal axis; the other arm having spaced guides located within the opening of the locking ring; a locking dog received within the opening of the locking ring between the ends of the arms and having a plate-like construction that is slidably supported between the arm ends; the dog having a toothed end slidably supported between the spaced guides on the other arm for movement relative thereto toward and away from the ring teeth and also having an opening through which the pivotal axis extends; a cam received within the opening of the dog and movable about the pivotal axis to slidably move the dog; the cam being pivotal in one direction to slidably move the dog to a locking position where the toothed end thereof engages the ring teeth to prevent relative pivoting between the arms; the cam being pivotal in the opposite direction to slidably move the dog to a nonlocking position where the toothed end thereof is disengaged from the ring teeth and thereby allows pivotal adjusting movement between the arms; the opening of the dog including a locking surface located toward the toothed dog end from the pivotal axis and an unlocking surface located on the opposite side of the pivotal axis from the locking surface; the cam including a surface having a lobe that slidably engages the dog locking surface during the pivotal cam movement in the one direction to move the cam lobe into an overcenter relationship with the dog locking surface and the pivotal axis so as to maintain the dog in the locking position; the cam surface slidably engaging the unlocking surface during pivotal cam movement in the opposite direction to move the dog to the nonlocking position; and actuator means for pivoting the cam in opposite directions to move the dog between the locking and nonlocking positions.

4,103,971
METHOD FOR BREAKING ROCK BY DIRECTING HIGH VELOCITY JET INTO PRE-DRILLED BORE

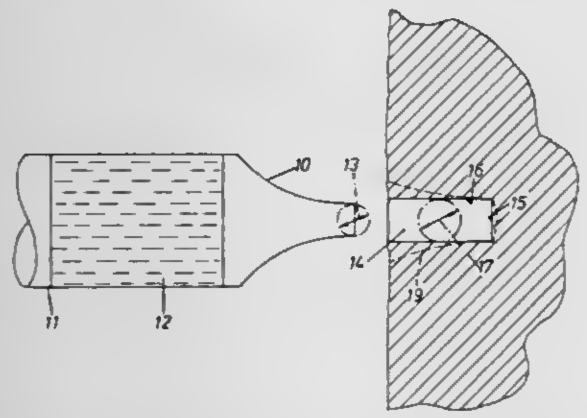
Jean-Paul Denisart, Lutry; Barry E. Edney, and Chapman Young, both of Lausanne, all of Switzerland, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 31, 1976, Ser. No. 719,246

Claims priority, application Sweden, Sep. 19, 1975, 7510556

Int. Cl.² E21C *37/12*

U.S. Cl. 299—17 **13 Claims**



1. A method of breaking a hard compact material, such as rock, comprising:
  - mechanically drilling a substantially cylindrical blind hole in the material to be broken, said material having free surfaces adjacent said hole;
  - locating a nozzle outside of said hole and in alignment therewith, said nozzle having an internal cavity which has a converging contour leading to a nozzle exit area;
  - supplying a substantially incompressible fluid to said nozzle to generate a high velocity jet of said substantially incompressible fluid at said nozzle exit area, the smallest cross sectional dimension of said jet being between 30-100% of the free cross sectional diameter of said hole; and
  - directing said jet from said nozzle exit area in the axial direction of said hole toward the bottom of said hole so as to be suddenly arrested upon impact with said hole bottom to create a jet stagnation pressure in said hole to break said material toward adjacent free surfaces of said material.

4,103,972
OPEN PIT MINE

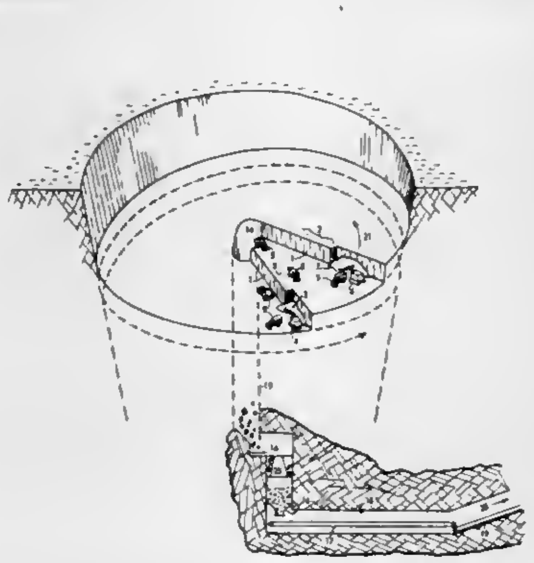
Boris J. Kochanowsky, c/o Synnestvedt & Lechner, 12 S. 12th St., Philadelphia, Pa. 19107

Continuation-in-part of Ser. No. 420,886, Dec. 3, 1973, Pat. No. 3,975,053. This application Jul. 15, 1976, Ser. No. 705,508

Int. Cl.² E21D *1/03;* E21F *13/00;* E21C *41/06*

U.S. Cl. 299—18 **10 Claims**

1. An open pit mine for the extraction of mineral materials from the earth's crust comprising:
  - a turning point area having a substantially horizontally level floor adapted to facilitate the operation of material-handling equipment and to receive crushed mined mineral material;
  - at least one bench moving on a downwardly sloping screw-shaped path extending radially outward from the turning point area;
  - a mobile crusher for crushing mined mineral materials located adjacent the bench;
  - a belt conveyor system for conveying crushed mined mineral materials from the crusher to the turning point area; and
  - means for discharging the crushed mined mineral materials downwardly from the turning point area.



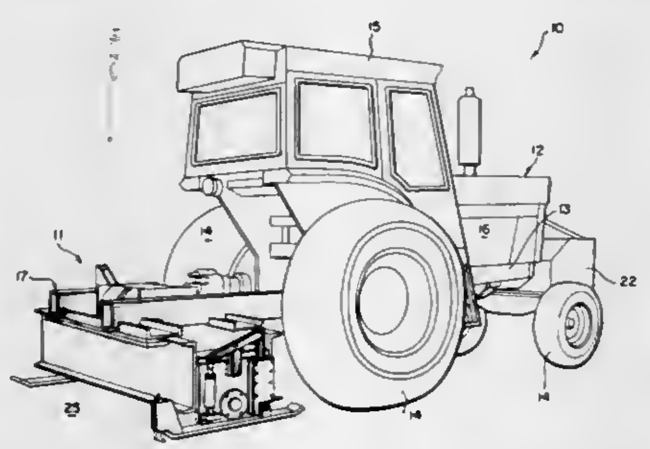
4,103,973
DEPTH CONTROL FOR ASPHALT PAVEMENT MILLING MACHINE

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving, Inc., Lawrence, Kans.

Filed Apr. 6, 1977, Ser. No. 785,308

Int. Cl.² E01C *23/12*

U.S. Cl. 299—39 **20 Claims**



1. An asphalt pavement milling machine having a frame adapted for movement along a line of machine travel, rotary milling means rotatably carried on the frame for milling engagement with the pavement, and depth-of-cut control means for locating the frame at a precise distance above the pavement to be milled so as to locate the rotary milling means relative to the pavement to provide a precise depth of cut, the depth-of-cut control means including depth control shoe means adapted to slide over the pavement, slide means connected to the shoe and carried for vertical sliding motion on the frame, rocker arms means pivotally connected to the slide means and to the main frame, and fluid power cylinder means having a cylinder body and a rod partially extensible from and retractable into the cylinder body, the cylinder means being pivoted to the main frame and to the rocker arm, cylinder rod movement relative to the cylinder body thus operating to rock the rocker arm means, slide the slide means, and raise and lower the shoe means relative to the frame.

4,103,974
CABLE CARRIAGE AND SPILL-PLATE HOUSING ASSEMBLY FOR A MINING MACHINE

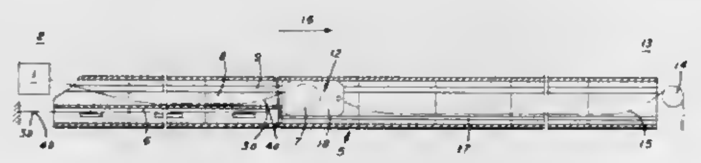
Georg Nowacki, Datteln, and Karl-Heinz Weber, Witten-Heven, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Nov. 12, 1976, Ser. No. 741,338

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550729

Int. Cl.² E21C *27/34*

U.S. Cl. 299—43 **10 Claims**



1. In a spill-plate apparatus adapted to extend along at one side of the course of travel by a mining machine having cutter means for releasing material from the mine face, the combination including:
  - a cable having an end connected to said mining machine while the cable extends along at one side of the course of travel by the mining machine,
  - a spill-plate housing defining an internal cable duct adapted to protectively enclose at least a portion of the extended length of said cable, said spill-plate housing having a slot along the length thereof to pass said cable for connection to said mining machine,
  - cover means normally closing that slot in said spill-plate housing while permitting the end of the cable to pass to the mining machine while moving along the course of travel,
  - a cable carriage protectively enclosed within said spill-plate housing for guided movement along said one side of the course of travel by the mining machine,
  - a pulley supported by said cable carriage for rotating about a horizontal axis, said cable being trained about said pulley to form a return cable loop which is guided and tensioned by said cable carriage, and
  - a tension reel means including a rope coupled to said cable carriage while extending within said spill-plate housing from one end thereof.

4,103,975
MINING MACHINE PARTICULARLY A DRUM-CUTTER MINING MACHINE

Wilhelm Funke; Heinrich Honke, both of Bochum, Fed. Rep. of Germany, and Heinz Simonides, deceased, late of Bochum, Fed. Rep. of Germany (by Charlotte Simonides, executrix), assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

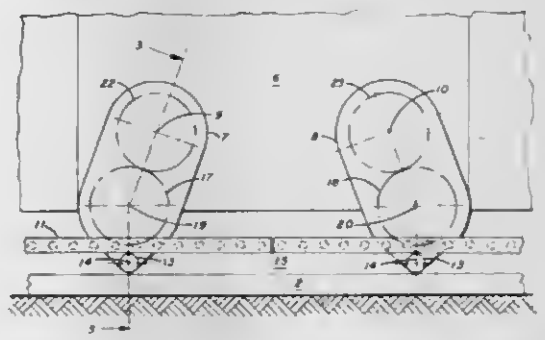
Filed Jul. 22, 1976, Ser. No. 707,534

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532893

Int. Cl.² E21C *29/22*

U.S. Cl. 299—43 **10 Claims**

1. In combination with a mining machine having a winch for propelling the mining machine along a course of travel at the working face of the mine upon a face conveyor, each end of the mining machine including a pivotal support arm that carries a drum cutter to release coal from said working face for transportation by said face conveyor, an apparatus including the combination of:
  - wheel means coupled for rotation by said winch,
  - a sprocket wheel driven by said wheel means,
  - an elongated rack extending along said course of travel by the mining machine, said rack having teeth at spaced-apart locations at the top along the length thereof,
  - at least one support arm carried by said mining machine to pivot about a horizontal axis that extends at right angles to the course of travel by the mining machine, said support arm pivoting at one end thereof about said horizontal axis and said support arm positioning said sprocket wheel at the other end thereof to mesh with the teeth at the top of said rack by pivotal movement of the support arm about said horizontal axis, and
  - support means extending from said support arm beneath the teeth of said rack to position and maintain a meshed relation between said sprocket wheel and the teeth of said rack during the transmission of forces to the rack to propel the mining machine therealong.



4,103,976
TWO-PRESSURE BRAKE CONTROL VALVE FOR SINGLE STAGE RELEASING INDIRECTLY ACTING AIRBRAKES

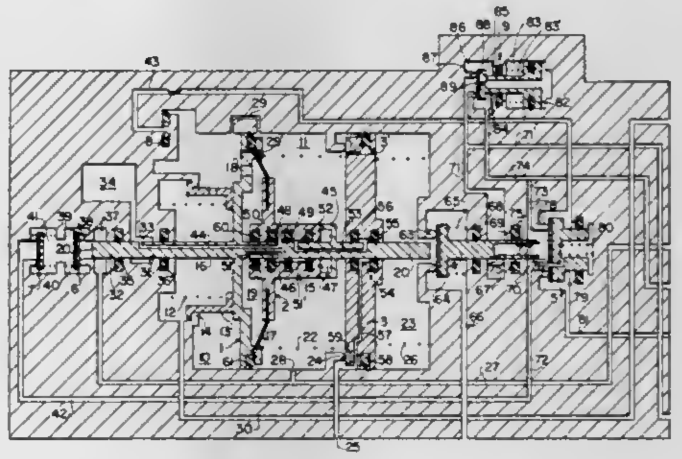
Peter Pick, Munich, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,705

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634320

Int. Cl.² B60T *15/44*

U.S. Cl. 303—38 **12 Claims**



1. In a two-pressure brake control valve for a single stage releasing indirectly acting air brake for railway vehicles having a valve controlled by a main control element of a service brake portion in response to a decrease in pressure in the brake line per unit time below a predetermined value to subject a brake cylinder to the action of air from an auxiliary air reservoir, an emergency brake portion having a second main control element having an inactive position, means responsive to a decrease in pressure in the brake line per unit time exceeding the predetermined value for controlling a second valve by said second main control element to further subject the brake cylinder to the action of air from an emergency brake reservoir, an auxiliary control element on said second main control element, and a service brake acceleration valve in said emergency brake portion actuated by said auxiliary control element in response to variation of pressure in the brake line during a service braking operation when said second main control element is in an inactive position.

4,103,977

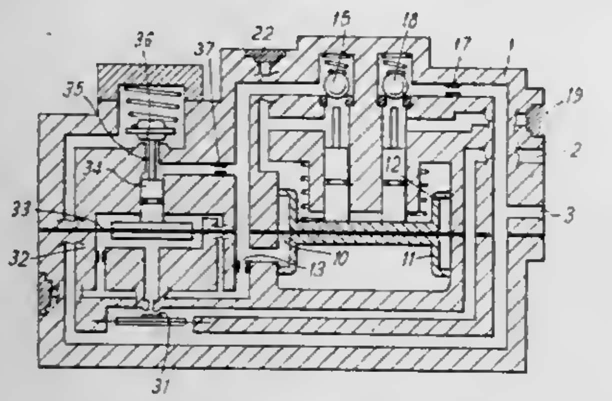
VEHICLE BRAKING CONTROL VALVE APPARATUS FOR QUICK SERVICE OPERATION

David John Wickham, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Continuation-in-part of Ser. No. 708,317, Jul. 26, 1976. This application Sep. 21, 1977, Ser. No. 835,191

Int. Cl.² B60T *15/42*

U.S. Cl. 303—38 **8 Claims**



1. A valve apparatus for improved quick service operation in a vehicle braking system, including a reference pressure signal input port and a brake pipe pressure signal input port, a pressure responsive member responsive to a pressure difference at said ports for permitting a fluid flow tending to equalize said pressure signals and means responsive to said fluid flow to produce a control pressure on a further pressure responsive member which controls one valve to assist a changing brake pipe pressure and another valve for modifying said control pressure to thereby reciprocate the said further pressure responsive member, said apparatus further comprising a relay valve operable in response to pressure built up due to said fluid flow to produce said control pressure.

4,103,978

LIQUID PASSAGE THROUGH A MACHINE-PART

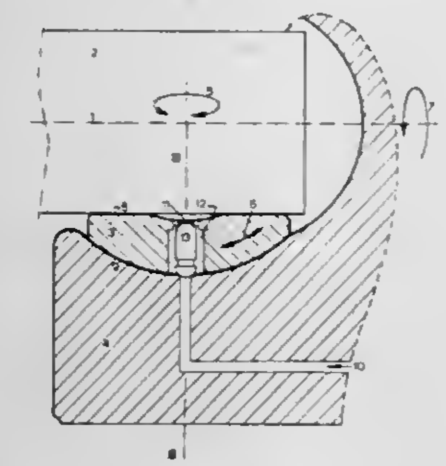
Simon Hoornstra, Sautpoort, Netherlands, assignor to Hoogovens Ijmuideo, B.V., IJmuideo, Netherlands

Filed Mar. 18, 1976, Ser. No. 668,264

Claims priority, application Netherlands, Mar. 13, 1975, 7503175

Int. Cl.² F16C *17/00*

U.S. Cl. 308—9 **9 Claims**



1. A machine part, in which a limited swingable motion can be carried out along a slide surface between a first element and a second element, means being provided for conducting a liquid from a point of the first element which is distant from the slide surface to a side of the second element which faces away from the slide surface, said means having channels or bore holes through both elements with a connecting passage on the slide surface between them, the bore hole in at least one of the two elements being widened at the connecting passage to form an elongated chamber in which there is arranged a body through which fluid flows and provided in the axial direction with bore holes, and axially under pressure semi-spherical head ends on said body resting in sealing manner against two ends of the chamber.

4,103,979

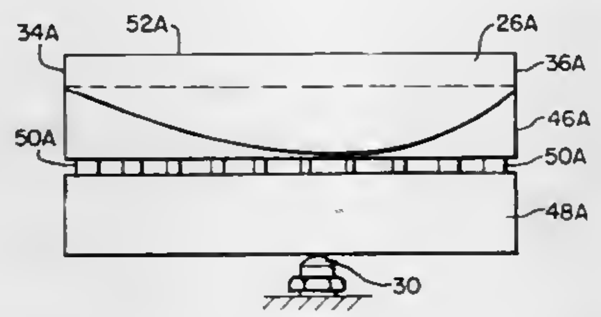
THRUST BEARING ASSEMBLY

Earl C. Kuhn, Penn Hills Townsbip, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 720,333, Sep. 3, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,441

Int. Cl.² F16C *17/03*

U.S. Cl. 308—160 **18 Claims**



1. An apparatus having a rotatable shaft with a thrust member affixed thereto, said shaft's axial displacement being restrained by a thrust bearing assembly, said thrust bearing assembly comprising:

- a plurality of bearing pads disposed about said shaft with each pad having a first surface for engaging said thrust member, said first surfaces, when loaded, being deformable into substantially cylindrically crowned surfaces each with their axis extending in the radial direction;
- means for providing an elastic foundation for each bearing pad's radial centerline, said elastic foundation being narrow in said circumferential direction and having variable elasticity in said radial direction such that said foundation deflects uniformly along said radial centerline when said bearing pads are subjected to operating loads; and
- a plurality of stationary pivot members each of which is fixed in position and provides support for said elastic foundation means.

4,103,980

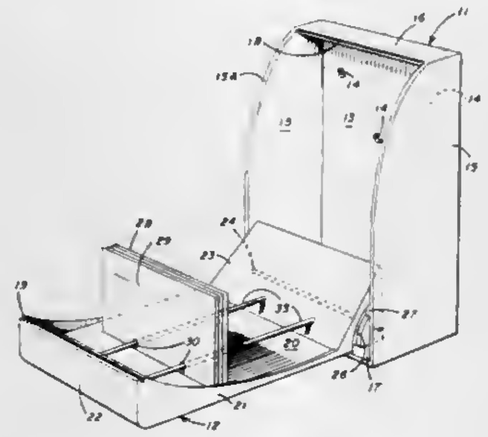
WALL-MOUNTED DIRECTORY

Patricia A. Silva, 2215 Aurora Dr., Pittsburgh, Pa. 15237

Filed Feb. 15, 1977, Ser. No. 768,766

Int. Cl.² A47B *63/00;* B42F *17/00*

U.S. Cl. 312—185 **3 Claims**



1. An enclosure which is adapted for mounting on a wall and suitable for use as a card directory, said enclosure comprising:

A. a wall-mounted portion and a desk portion,

- (a) said wall-mounted portion having a back wall, two side walls and two end walls,
- (b) said desk portion being pivotally mounted on the side walls of said wall-mounted portion at an end thereof and adapted to move from a closed position against the wall-mounted portion to an open position whereby the desk portion extends perpendicularly to the wall-mounted portion,
- (c) the wall-mounted portion including a laterally extending and forwardly facing rib on an edge of the end wall opposite the end of the side wall to which the desk portion is pivotally mounted,
- (d) the desk portion including along an edge thereof opposite the end at which the desk portion is pivotally mounted to the side walls of the wall-mounted portion a laterally extending notch for engagement with said rib whereby, when the desk portion is closed against the wall-mounted portion, the rib engages the notch to secure the enclosure,
- (e) the desk portion also including a member having a triangular cross section forming a card rest and being pivotally mounted on a rod which extends from one side wall to the other of the wall-mounted portion through the card rest,
- (f) each side wall of the wall-mounted portion having a flange on the opposed inside surfaces adjacent a front edge of the sidewall,
- (g) said desk portion including a curved groove on each side of the member forming the card rest, each of said grooves having an open end and a closed end forming a stop, the flanges being adapted to fit within said grooves, the extent of travel of the desk portion in an arc toward and away from the wall-mounted portion being limited by the length of the grooves, the flanges engaging the stops formed by the ends of the grooves when the desk portion is in a position substantially perpendicular to the backwall of the wall-mounted portion and closing the open ends of the grooves when the desk portion is in its closed position against the wall-mounted portion, and

B. means on the desk portion for removably mounting a plurality of cards bearing indicia providing a directory or the like, said card mounting means comprising at least one rod extending from the front edge of the desk portion on which the notch is located to the other end of the desk portion where at the rod extends into the card rest for holding cards containing an opening through which the rod can extend for supporting the cards so that they are visible when the desk portion is in an open position and so that they are held during and upon closure of the desk portion against the wall-mounted portion.

4,103,981

REMOVABLE FURNITURE PANEL

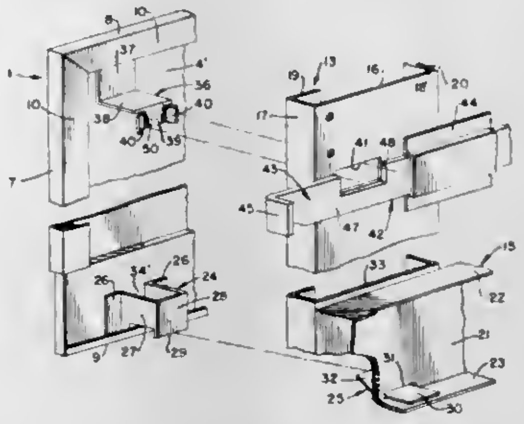
Charles R. Donahue, and Leo Terlecki, both of Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Oct. 6, 1976, Ser. No. 730,278

Int. Cl.² A47B *43/00*

U.S. Cl. 312—257 A **6 Claims**

1. A furniture article including, a top, a frame assembly including a plurality of laterally spaced uprights engageable by said top and defining a drawer opening on the interior thereof, a vertical panel removably attached to the exterior of said frame assembly, said panel including a plurality of hanger members projecting inwardly from the lower portion of said panel, a plurality of retainer brackets extending outwardly from the lower portion of said frame assembly adapted to be engaged by said panel hanger members, a plurality of fixed clips projecting inwardly from the upper portion of said panel each including integral lock means having a rear surface spaced from said panel and disposed within the interior of said frame assembly when said panel hanger members engage said frame assembly retainer brackets and said panel is pivoted to juxtaposition said panel against the exterior of said frame assembly, at least a pair of said uprights each provided with a clip opening permitting passage of a pair of said panel clip lock means therethrough, a reciprocating latch member including a slide bar carried by at least a pair of said uprights and on the interior of said frame assembly and displaceable from an unlocked position allowing passage of said panel clip lock means into and out of the interior of said frame assembly through said upright clip openings, to a locked position whereby said slide bar engages behind said clip lock means to tightly retain said panel against the exterior of said frame assembly uprights, said slide bar having a notch therein alignable with one said clip opening when said slide bar is displaced to said unlocked position, a slidable drawer having a drawer front disposed within said drawer opening adjacent said latch member slide bar, and a handle on the forward end of said slide bar engageable by said drawer front when said slide bar is displaced to said unlocked position whereby, closing of said drawer produces engagement between said drawer front and handle and concurrent displacement of said slide bar to said locked position.



4,103,982

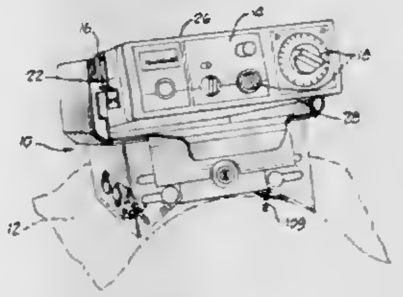
ACCESSORY LOCKING MOUNT

Edward H. Rudd, Wooster, Ohio, assignor to Magni-Power Company, Wooster, Ohio

Filed Nov. 16, 1976, Ser. No. 742,252

Int. Cl.² H01R *13/54*

U.S. Cl. 339—91 R **13 Claims**



1. A locking mount for attaching an accessory to a support member, comprising:

- (a) a first bracket having sidewalls and a central, planar portion movable with respect to the sidewalls, the first bracket being rigidly affixed to the accessory at the sides of the accessory to embrace the accessory along three sides, the first bracket and the accessory being transportable as a unit;
- (b) a second, box-like bracket rigidly affixed to the support member, the second bracket having sidewalls, the sidewalls adapted to be adjustable relative to each other and engage and slidably receive the sidewalls of the first bracket;
- (c) adjustable mounting means for attaching the second bracket to the support member, the mounting means being disposed within the confines of the second bracket;

(d) a tab extending outwardly of the first bracket to serve as a finger grip;

(e) a plurality of stops affixed to the first bracket and adapted to engage the second bracket to limit relative movement of the first and second brackets;

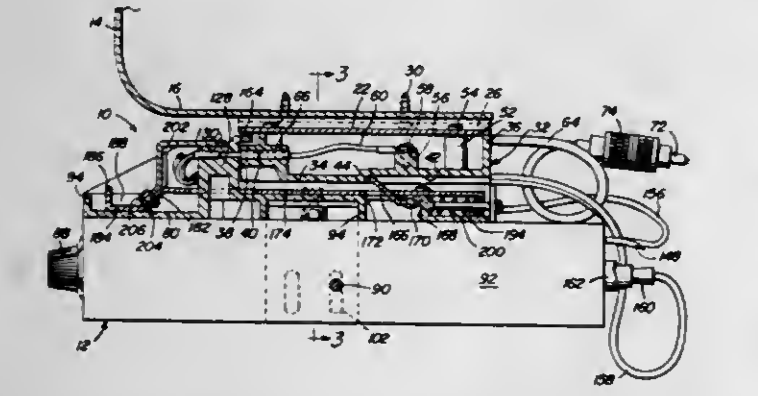
(f) a locking device carried by one of the brackets and disposed substantially within the confines of the second bracket when the first and second brackets are engaged; and

(g) a plug-in electrical connector interconnecting the accessory and the vehicle and disposed substantially within the confines of the second bracket when the first and second brackets are engaged.

4,103,983
QUICK DISCONNECT SLIDE MOUNT

Lowell D. Morrison, and Howard R. Moon, both of Fort Atkinson, Wis., assignors to Gamber-Johnson, Inc., Stevens Point, Wis.

Filed Mar. 30, 1977, Ser. No. 783,082
Int. Cl.^{2} H01R *13/54*
U.S. Cl. 339—91 R 12 Claims



1. A slide mount for CB radios or other electrical or electronic equipment comprising: a base and a slide, one of which is adapted to be connected to a supporting structure and the other adapted to be connected with a CB radio, or the like, means releasably interconnecting said slide and base with said means being rendered effective and ineffective in response to relative sliding movement between the base and slide, latch means releasably locking the base and slide in interconnected relation by positively precluding relative sliding movement, and release means for said latch means to enable separation of the base and slide by permitting relative sliding movement, said release means including handle means manually actuated by exerting force in the direction of longitudinal relative movement between the base and slide whereby the same longitudinal force exerted to actuate the release means will move the base and slide in relation to each other for separating the base and slide.

4,103,984
INSULATION DISPLACING PIN CONNECTOR

James Lenhart Mixon, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 763,277, Jan. 27, 1977, abandoned. This application Feb. 6, 1978, Ser. No. 875,269
Int. Cl.^{2} H01R *11/20*
U.S. Cl. 339—98 1 Claim

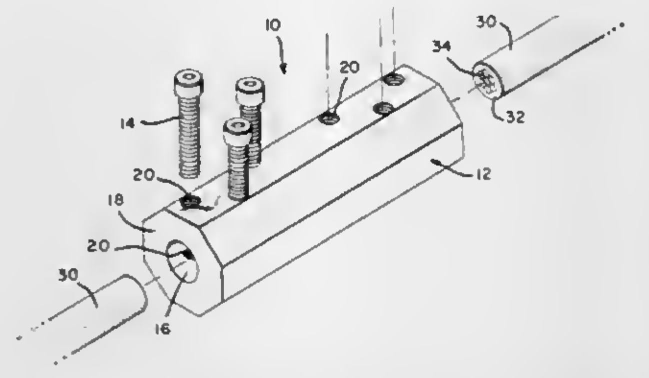
1. An insulation displacing pin connector for interconnecting two electrical cables, comprising:

a. a body member of conductive material having cable-receiving apertures at either end thereof;

b. a plurality of threaded bores positioned in the body member with three bores intersecting each aperture with two of the three being on one side of the aperture and the third being on the opposite side and longitudinally between the first two;

c. a plurality of conductive pins having a threaded shank with the free end of the shank being hollowed out to define a frontal cutting edge.

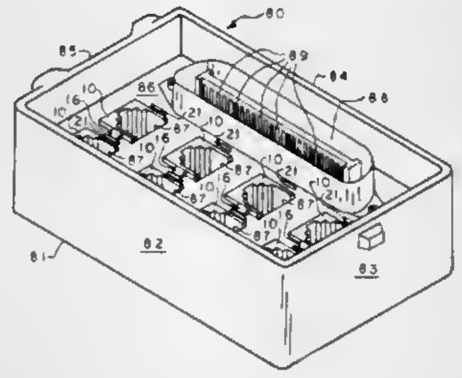
so that as the pins are threadedly advanced into a bore, the frontal cutting edge cuts through the insulation on a cable which may be positioned in the aperture and scrapes the edge of the underlying conductor and as the pins are further advanced, the threaded shanks electrically and mechanically engage peripherally the conductor on both sides thereof.



4,103,985
CONNECTOR ADAPTER CONSTRUCTIONS WITH IMPROVED CONNECTION AND CONNECTOR MOUNTING ARRANGEMENT

Ronald F. Krolak, North Riverside, and Frederick J. Radloff, Northlake, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 22, 1977, Ser. No. 770,805
Int. Cl.^{2} H01R *11/08;* H02B *1/02*
U.S. Cl. 339—126 R 18 Claims



1. A bridge adapter assembly for connecting selected conductors of a first multi-conductor cable to selected conductors of one or more second multi-conductor modular cables, each said second modular cable having at its end a first modular connector component, comprising:

an enclosure including a plurality of walls;

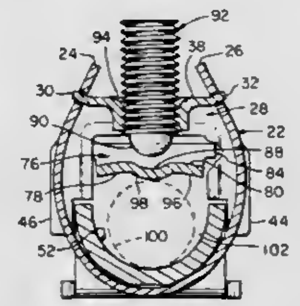
multiple contact connector means within said enclosure having a first predetermined plurality of contacts adapted to be coupled to the conductors of the first multi-conductor cable; and

at least one modular connector member disposed within said enclosure and arranged in a predetermined pattern relative to said multiple contact connector means, each of said connector members including means for releasably engaging one said first modular connector components and a second predetermined plurality of contacts less in number than said first predetermined plurality of contacts, and said contacts of each said modular connector member being electrically coupled to selected ones of said multiple contact connector means and adapted to be electrically coupled to the conductors of one of said second multi-conductor modular cables upon engagement of one said first modular connector component with said modular connector member.

4,103,986
ELECTRICAL TERMINAL

Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sep. 12, 1977, Ser. No. 832,679
Int. Cl.^{2} H01R *11/10*
U.S. Cl. 339—272 UC 17 Claims



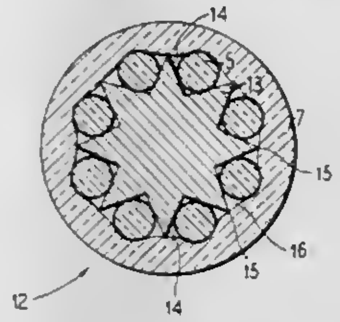
1. A terminating device comprising: a resilient generally annular prestressed split collar member having free ends each of which has an elongate transverse slot therethrough; a generally U-shaped bridge member seated tightly between said free ends to maintain said free ends in spaced apart relationship and to preload said collar member, said bridge member having a top portion and opposing leg portions, said leg portions extending from lateral edges of said top portion and straddling the sides of said collar member, said top portion having a generally centrally located threaded opening therethrough; a pressure screw threaded within said threaded opening in said bridge member and extending within the interior of said collar member; an arcuate saddle member seated against an inner surface of said collar member opposite said bridge member and having an outer surface having a radius of curvature generally equal to the radius of curvature of the adjacent portion of said inner surface of said collar member and seated intimately thereagainst, said saddle member having free ends each of which abuts a respective pair of free ends of said leg portions of said bridge member, said bridge member and said saddle member being held in abutting relationship by the stored energy in said preloaded collar member; and a pressure plate slidably disposed between said bridge member and said saddle member, said pressure plate being engageable by said pressure screw for movement towards said saddle member to provide a variable conductor receiving opening therebetween, the bowed sides of said collar member providing a reacting force against pressure exerted on said saddle member as said pressure plate is brought to bear against the portion of a conductor placed within said conductor receiving opening to compensate for the expansion and contraction of such portion by providing a relatively constant pressure thereagainst.

4,103,987
DEVICE FOR CONNECTING TWO GROUPS OF GLASS FIBERS

Ralf Kersten, Rottach-Egern, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 26, 1975, Ser. No. 635,276
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456552
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.21 11 Claims

1. A connection between a first and second group of fibers with each group having the same number of fibers, each fiber in the first group being aligned with a given fiber in the second group, said connection comprising a single elongated carrier member having a plurality of longitudinally extending grooves with at least one groove for each fiber of the first group, each groove having a dimension and shape to receive a portion of a fiber disposed therein, said fibers of the first group being arranged with an end portion of each fiber extending into its respective groove from one end, the fibers of the second group being arranged with the end portion of each fiber extending into its respective groove from an opposite end of the groove

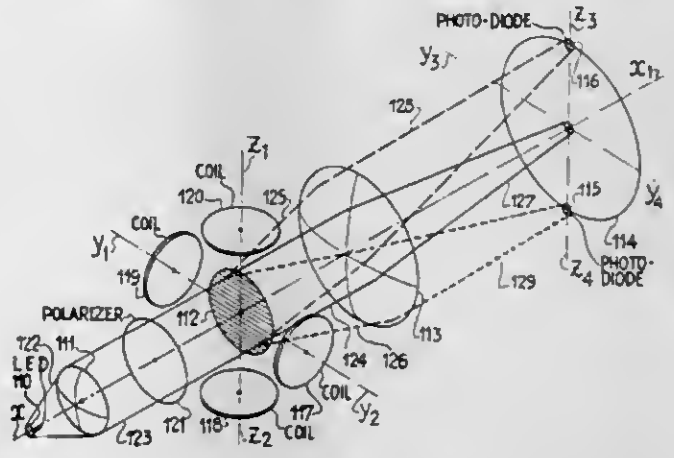


and with the end surface of the fiber engaging an end surface of the fiber of the first group, and a shrinking tube surrounding the carrier member and fibers disposed in the grooves and tightly engaging both the carrier member and fibers to hold the fibers in a stable and aligned position within their respective grooves.

4,103,988
ELECTRICALLY CONTROLLED OPTICAL SWITCH

Bernard Désormière, and Erich Spitz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 7, 1976, Ser. No. 684,383
Claims priority, application France, May 13, 1975, 75 14873
Int. Cl.^{2} G02B *5/18*
U.S. Cl. 350—162 R 5 Claims



1. An electrically controlled optical switch for optically connecting at least one electrical incoming circuit to at least one electrical output circuit, which comprises:

at least one emitting means for generating under the control of said electrical incoming circuit a parallel polarized light beam;

a thin layer of transparent magnetic material exhibiting a magnetic remanence effect for diffracting by transmission said light beam into at least two diffracted beams;

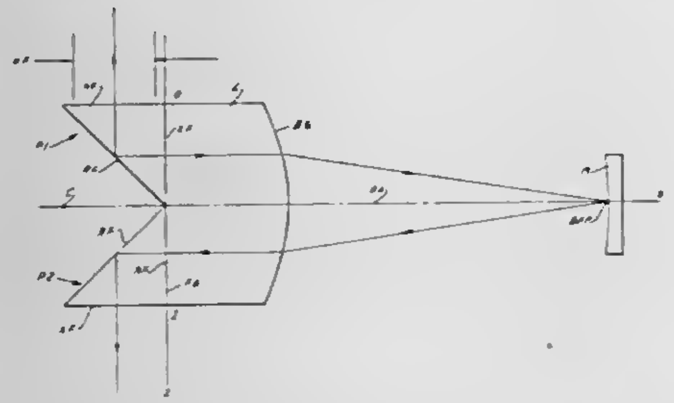
means for magnetizing said thin layer in accordance with a grating of thin parallel bands oriented along a controllable direction; said magnetizing means being designed for acting under the control of short strong electrical current pulses, and said controllable direction being constant between two of said pulses without an applied bias magnetic field because of said remanence effect;

means for focusing said two diffracted beams on two spots situated onto a reference surface; and

at least one group of photo-electric means disposed onto said reference surface and connected to said electrical output circuit; said photo-electric means being excited by at least one of said spots for a given value of said controllable direction.

4,103,989
UNIT-POWER CONCENTRIC OPTICAL SYSTEMS

Seymour Rosin, 94 Laurel Dr., Massapequa, N.Y. 11762
Filed Feb. 7, 1977, Ser. No. 765,894
Int. Cl.² G02B *17/08*
U.S. Cl. 350—199 **27 Claims**



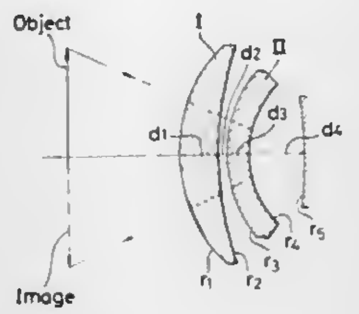
1. A self-conjugate optical system of substantially unit power, comprising, in combination, a concave spherical mirror having a center of curvature; and a lens having a planar front surface coincident with said center of curvature and coincident with the image and object planes of the self-conjugate optical system and a spherical back surface intermediate said spherical mirror and said center of curvature and concentric with said spherical mirror, said spherical back surface and said spherical mirror being spaced apart a distance producing at said planar front face at a predetermined distance from said center of curvature a locus of points of zero tangential aberration.

10. An optical system of substantially unit power comprising, in combination, a concave spherical mirror having a center of curvature; a lens having a spherical back surface concentric with said spherical mirror and a planar front surface located intermediate said spherical back surface and said center of curvature; and a prism having planar entrance and exit faces one of which adjoins said planar front surface of said lens, said prism having an inclined reflecting face inclined relative to the optical axis of said lens and relative to said planar front surface of said lens, the direction of inclination of said inclined reflecting face being such that points thereon of increasing distance from the optical axis of said lens are of increasing distance from said planar front surface of said lens, said inclined reflecting face having an inner edge located at most slightly spaced from said planar front surface of said lens and at most slightly spaced from the optical axis of said lens, the dimensions of and the angles included by said faces of said prism being such that the travel distance through said prism from the entrance to the exit face thereof for rays passing through said planar front surface of said lens parallel to the optical axis is equal to the distance along the optical axis from said center of curvature to said planar front surface of said lens.

26. A self-conjugate optical system of substantially unit power comprising, in combination, a concave spherical mirror having a center of curvature; and a lens having a planar front surface coincident with said center of curvature and coincident with the image and object planes of the self-conjugate optical system and a spherical back surface intermediate said spherical mirror and said center of curvature and concentric with said spherical mirror, said spherical back surface and said spherical mirror being spaced apart a distance producing at said planar front face a tangential aberration which is zero at the optical axis of said lens, increases with increasing distance from the optical axis but then decreases with further increasing distance from the optical axis.

4,103,990
CATADIOPTRIC WIDE-ANGLE LENS SYSTEM FOR REPRODUCTION

Yu Yamada, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 5, 1976, Ser. No. 739,041
Claims priority, application Japan, Nov. 7, 1975, 50-133676
Int. Cl.² G02B *17/08*
U.S. Cl. 350—199 **7 Claims**



1. A catadioptric wide-angle lens system for reproduction comprising:

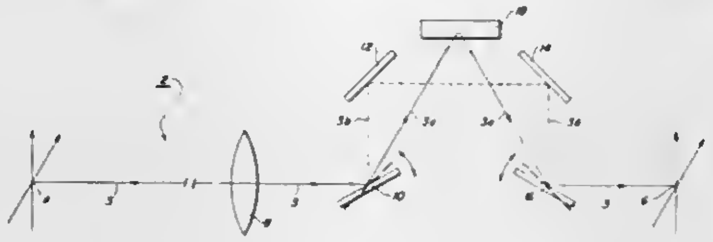
a positive meniscus lens with its convex surface directed toward an object and an image;

a negative meniscus lens being arranged axially behind said positive meniscus lens, with its convex surface directed to the object and the image, said negative meniscus lens made of dense flint glass, and satisfying the condition of $0.206F < r_3 < 0.239F$ in which r_3 is a radius of curvature of the front lens surface of said negative meniscus lens, wherein F is a focal length of said lens system; and

a concave mirror arranged axially behind said negative meniscus lens with its concave surface directed to the object and the image; the radius of a curvature of the front surface of said positive meniscus lens being larger than the radius of curvature of the front surface of said negative meniscus lens.

4,103,991
OPTICAL SYSTEM FOR SCANNING DURING RECIPROCAL MOTION PROVIDING 180° ROTATION OF IMAGE

Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 3, 1976, Ser. No. 747,467
Int. Cl.² G03B *27/48;* G02B *17/06*
U.S. Cl. 350—297 **3 Claims**



1. An optical system for projecting an image of an object along an optical axis from an object plane to an image plane alternatively along a first alternate optical path and a second shunt optical path, said image being in a first orientation when projected along said first alternate optical path and in a second orientation, rotated 180° about the axis of propagation from said first orientation, when projected along said second shunt optical path, said system including:

a first reflector disposed on said optical axis and arcuately rotatable between a first position to deflect said optical axis along said first alternate optical path and a second position to deflect said optical axis along said second shunt optical path,

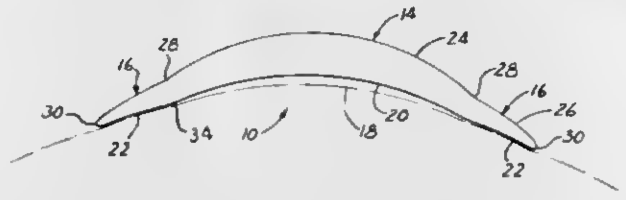
a second reflector disposed on said optical axis and arcuately rotatable between a first position to deflect said first alternate optical path along said optical axis and a second position to deflect said second shunt optical path along said optical axis,

a roof reflector disposed in said first alternate optical path to receive light from said first reflector and deflect the same to said second reflector, said roof reflector having an apex extending in a first direction,

first and second fixed reflectors disposed on said second shunt optical path, said first fixed reflector disposed to receive light from said first rotatable reflector when the same is disposed in its second position, said second fixed reflector disposed to receive light from said first fixed reflector and to deflect the same to said second rotatable reflector when said second rotatable reflector is in its second position, said first and second fixed reflectors together forming the equivalent of a roof reflector with an apex extending in a direction perpendicular to said first direction of the apex of said roof reflector in said first alternate optical path.

4,103,992
CORNEAL CONTACT LENS AND METHOD OF MAKING THE SAME

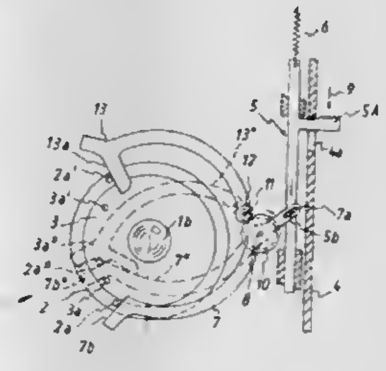
Joseph L. Breger, Highland Park, Ill., and Joseph A. Stemmle, Thousand Oaks, Calif., assignors to Breger-Mueller Welt Corp., Chicago, Ill.
Filed Jan. 20, 1975, Ser. No. 542,576
Int. Cl.² G02C *7/04*
U.S. Cl. 351—160 **4 Claims**



1. A structurally stable transparent corneal contact lens of generally concavo-convex form in cross section and having an outer diameter of about 7.0 to about 8.2 millimeters and sized to be fitted substantially within the limbus of the eye, the posterior side of the central portion of the lens having a curvature at least about one-half to six diopters steeper than the curvature of the cornea and the posterior side of the outer edge portion of the lens having a curvature such that it is substantially parallel to the curvature of the cornea, the outer edge portion of the lens being defined by the portion extending from the apex of the edge to a position located radially inwardly a distance of about 0.5 to about 0.7 millimeter, the thickness of the outer edge at said inward position being within the range of about 0.003 and 0.004 inch, the apex of said outer edge portion being between the center line of the outer edge portion and the posterior surface of the outer edge portion to enable flow of lacrimal fluid therebetween and to substantially reduce collision of the upper eyelid with the apex during closing of the eyelid, the center line of the outer edge portion being defined by a line running midway between the posterior and anterior surfaces thereof, the anterior surface of the outer edge portion having a gradual bevel extending to a point immediately adjacent the apex beyond which the anterior and posterior surfaces become increasingly curved toward one another to define the apex, the thickness of the outer edge portion at the point where the anterior and posterior surfaces begin to form the apex being within the range of about 0.0015 and 0.0025 inch and the surface area of the outer edge portion being at least about 30% of the combined surface areas of said central portion and said outer edge portion.

4,103,993
MOTION PICTURE CAMERA WITH VARIABLE FOCAL LENGTH LENS

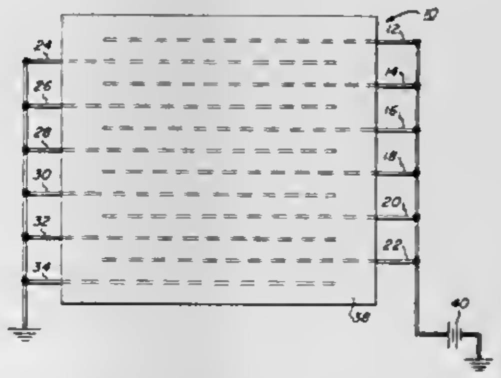
Friedrich Winkler, Unterhaching; Anton Theer, Munich; Peter Lermann, Narring; Volkmar Stenzenberger, Unterhaching; Peter Griessner, Munich; Dieter Sandl, Ottobrunn; Hermann Müller, Munich, and Herbert Wilsch, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany
Filed Sep. 2, 1976, Ser. No. 719,956
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540460; Mar. 17, 1976, 2611230; Mar. 17, 1976, 2611229; May 14, 1976, 2621626
Int. Cl.² G03B *3/00*
U.S. Cl. 352—140 **56 Claims**



1. In a photographic apparatus, particularly in a motion picture camera, a combination comprising a variable focal length lens; means for adjusting the focal length of said lens, said adjusting means being movable between a plurality of positions including at least one neutral position corresponding to a predetermined focal length; at least one additional adjusting means movable between a plurality of positions including at least one neutral position, said additional adjusting means including focusing means for said lens; actuating means movable between operative and inoperative positions; and motion transmitting means for simultaneously moving both said adjusting means to the respective neutral positions in response to movement of said actuating means between said operative and inoperative positions, irrespective of the position of either of said adjusting means prior to such movement of said actuating means.

4,103,994
RECORDING PLATE

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 11, 1977, Ser. No. 767,706
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **12 Claims**



1. An image recording member, including:

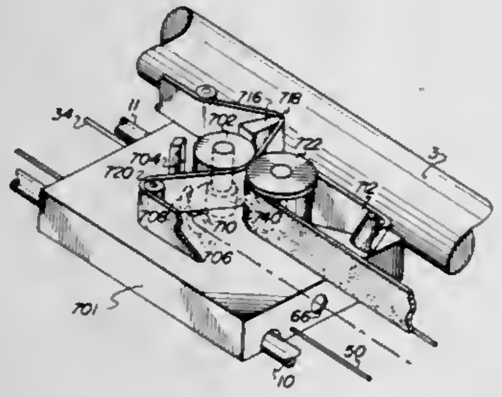
a support member;

a photoconductive layer contiguous with said support member;

at least a pair of conductive members embedded in said photoconductive layer with each of said conductive members being spaced from one another and having an insulating coating thereon for electrical isolation thereof; and
means for generating an electrical potential difference between said pair of conductive members so as to form an electrical field in said photoconductive layer.

4,103,995
IMAGING APPARATUS

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 18, 1975, Ser. No. 569,339
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **48 Claims**

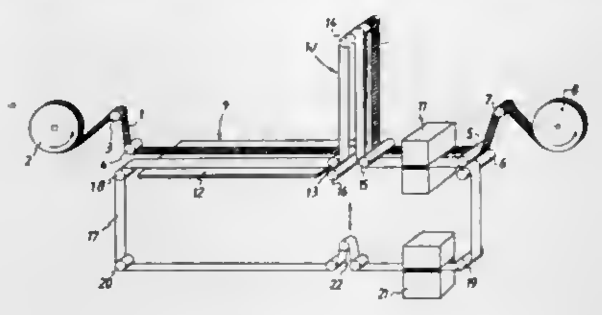


1. Imaging apparatus comprising:
(a) an elongate platen for supporting a receiving medium;
(b) a print head mounted for advancement along the length of said platen and adjacent the surface thereof; said print head including means for handling an intermediate surface and means for handling marking material for forming an image of marking material on the intermediate surface, and means to transfer the marking material image formed on the intermediate surface to the receiving medium supported by said platen;
(c) additional imaging means cooperating with said print head to produce a marking material image at said print head;
(d) means to advance said print head along the length of said platen; and
(e) control logic circuitry to control said means to advance said print head and said means to transfer the marking material image to the receiving medium and coordinate the operation of said means to advance and said means to transfer, whereby marking material images may be transferred to a pre-determined position on the receiving medium.

4,103,996
METHOD AND APPARATUS FOR EVALUATING AND PROCESSING A STRIP OF ORIGINALS TO BE COPIED

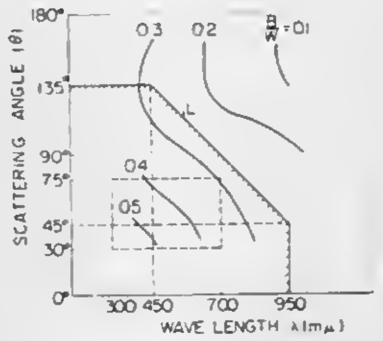
Berthold Fergg; Walter Knapp, both of Taufkirchen, and Wolfgang Zahn, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 17, 1976, Ser. No. 751,603
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557756
Int. Cl.² G03B *27/32, 27/52*
U.S. Cl. 355—32 **12 Claims**

1. In an apparatus for processing a strip of originals to be copied, in combination, an evaluating station at which the strip of originals can be displayed and evaluated, a strip-shaped first information carrier upon which information indicative of the evaluations can be entered, means for transporting the strip of originals and the first information carrier parallel to and in step with each other away from the evaluating station along a predetermined path, and a reading and encoding station located downstream of the evaluating station operative for reading the information on the first carrier and transferring that information in encoded form onto a second information carrier in an arrangement coordinated with the corresponding ones of the originals of the strip of originals.



4,103,997
LIGHT SCATTERING TYPE SMOKE DETECTOR

Tsunehiko Araki, Takarazuka, and Yoshihiko Okuda, Izumi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jul. 7, 1976, Ser. No. 703,201
Claims priority, application Japan, Jul. 15, 1975, 50-86793
Int. Cl.² G01N *21/00, 21/26*
U.S. Cl. 356—104 **5 Claims**



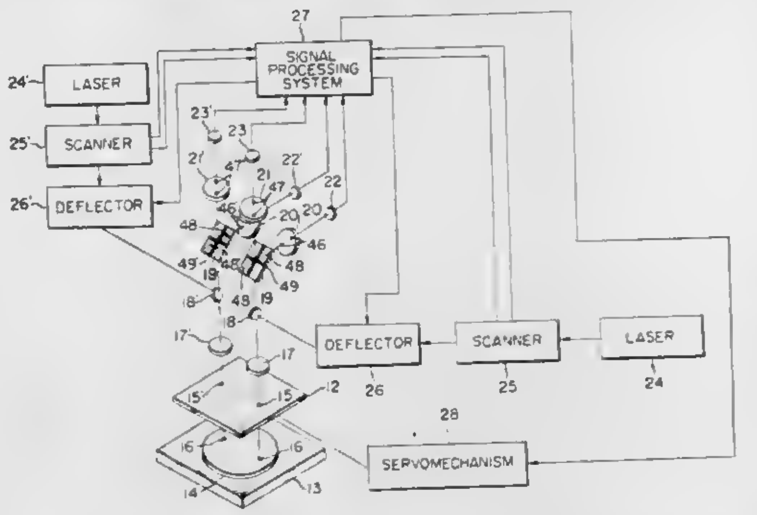
1. In a smoke detector of the light scattering type for actuating a warning device and comprising a housing containing a light source for emitting incident light having a wave length λ, a light receiving element, and a smoke collecting region so arranged that incident light from said source which contacts a smoke particle in said region is scattered such that the scattered light directed toward said receiving element forms an angle θ with the direction of the incident light, the ratio of the intensity I_s of the scattered light to the intensity I_o of the incident light defining an intensity ratio I_s/I_o for the smoke; the ratio of the intensity ratio for a black smoke to the intensity ratio for a white smoke defining the sensitivity ratio of the detector; the improvement wherein said wave length λ and said angle θ each bear a relationship to the intensity ratio and are determined as a function of one another within the limits $\lambda \leqq 950$ mμ when $\theta \leqq 45°$, $\theta \leqq -0.18\lambda + 216$ when $45° \leqq \theta \leqq 135°$, and $\theta \leqq 135°$ when $\lambda = 450$ mμ, to define a preselected range of sensitivity ratios for the detector.

4,103,998
AUTOMATIC ALIGNMENT APPARATUS

Kiwao Nakazawa, Tokyo, and Akikazu Tanimoto, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Jul. 19, 1976, Ser. No. 706,292
Claims priority, application Japan, Jul. 21, 1975, 50-88398
Int. Cl.² G01B *11/26*
U.S. Cl. 356—152 **11 Claims**

1. An alignment apparatus for photoelectrically detecting X- and Y-direction position signals of a wafer and a mask each having thereon right-hand and left-hand reference marks and

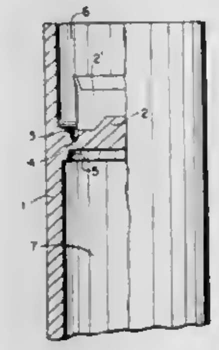
for aligning the wafer and the mask in a predetermined positional relationship by the use of said signals, comprising:
reference marks formed at the right-hand and left-hand sides of each of said wafer and said mask, each of said reference marks comprising two mark elements extending in two different directions, said reference marks being formed such that when said mask and wafer are overlapped with each other, diffracted lights in different directions are produced from adjacent ones of said mark elements on said mask and wafer;
a first source of coherent light for illuminating the right-hand marks on said mask and wafer with a coherent spot light;
a second source of coherent light for illuminating the left-hand marks on said mask and wafer with a coherent spot light;
first scanning means for scanning the right-hand marks on said mask and wafer by said spot light so that diffracted lights are produced from said mark elements of said wafer and mask in one stroke of scanning; and
second scanning means for scanning the left-hand marks on said mask and wafer by said spot light so that diffracted lights are produced from said mark elements of said wafer and mask in one stroke of scanning;
first, second, third and fourth detector means for respectively detecting the diffracted lights in one direction and the diffracted lights in the other direction produced from the right-hand marks on said wafer and mask and the diffracted lights in one direction and the diffracted lights in the other direction produced from the left-hand marks on said wafer and mask, and for photoelectrically converting said diffracted lights respectively;
whereby wafer position signals and mask position signals for the alignment of said wafer and mask may be separately produced by said first, second, thrid and fourth detector means.



4,103,999
RUPTURABLE SEALING ELEMENT WITHIN AN INK RESERVOIR CARTRIDGE

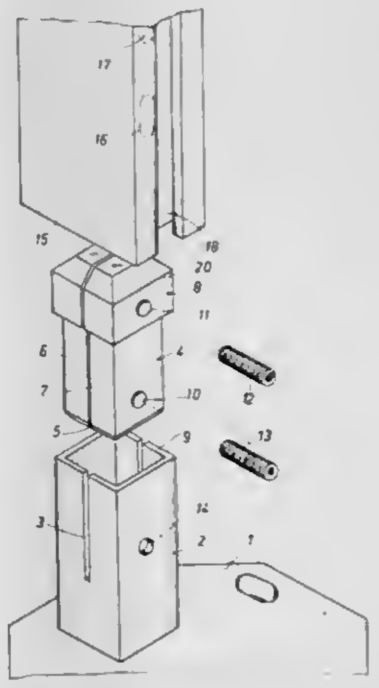
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Dec. 14, 1976, Ser. No. 750,497
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559294
Int. Cl.² B43K *23/02*
U.S. Cl. 401—134 **1 Claim**

1. In a capillary writing pen of the type having a scribing point, a tubular shaped ink reservoir cartridge, further including:
A. An open ended elongated chamber having a filling end and an ink flowing end;
B. A reservoir defined in said filling end and including an inwardly turned circular rib;
C. A rupturable reduced thickness sealing element for said ink flowing end, said sealing element being further defined by;
i. a transverse petition within said elongated chamber and adjacent said inwardly turned circuit rib and,
ii. a circular exterior notch defining a preset rupturing point as said sealing element engages an inner end of the scribing point;
iii. an enlarged upper end axially offset with respect to said circular rib and engagable with said inwardly turned circular rib, as said sealing element is ruptured and so as to permit ink flow.



4,104,000
ARRANGEMENT FOR SUPPORTING A RAILING AND THE LIKE

Horst Fleischmann, Munich, Fed. Rep. of Germany, assignor to Gebrüder Kömmerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany
Filed Apr. 22, 1977, Ser. No. 790,138
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618442
Int. Cl.² F16B *7/00*
U.S. Cl. 403—7 **14 Claims**



1. A supporting arrangement for a railing and the like, comprising a hollow base member; a hollow bar-shaped member telescopable over said base member; an elongated clamping element including at least two clamping portions which are at least partially separated from each other over a plane extending in a direction of elongation of said clamping element and movable relative to each other in a direction substantially transverse to said direction of elongation of said clamping element, said clamping portions having first sections insertable in and engageable with said base member, and second sections projecting outwardly beyond said base member as well as

insertable in and engageable with said bar-shaped member; and means for spreading apart said clamping portions of said clamping element in said transverse direction so that said first sections of said clamping portions are spread apart and thereby spread said base member into clamping engagement with said bar-shaped member, whereas said second sections of said clamping portions are spread into clamping engagement with said bar-shaped member.

4,104,001

RECIPROCATING TAMPING TOOL

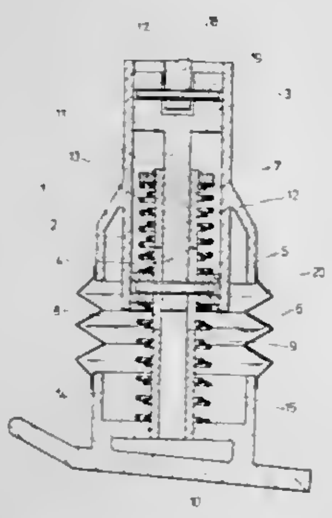
Philip Uebel, Unterschleissheim, Lohhof, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,767

Claims priority, applicatinn Fed. Rep. of Germany, Jan. 22, 1977, 2702577

Int. Cl.² E01C *19/30*

U.S. Cl. 404—133 **9 Claims**



1. A manually guided implement with a tool performing a reciprocating up-and-down motion, comprising a cylinder; a first piston axially movably guided in said cylinder; a second piston axially spaced from said first piston and also axially movably guided in said cylinder; a piston rod rigidly connecting said first and said second piston with each other; a guide sleeve axially movable on said piston rod, projecting through said second piston beyond said cylinder and carrying on the free end thereof outside said cylinder the tool; an abutment on the other end of said guide sleeve; first spring means abutting with opposite ends against said abutment and said second piston; second spring means abutting with opposite ends against said second piston and said tool, said spring means forming with said guide sleeve, said first and said second piston and said piston rod a swing system; and drive means connected to said swing system for reciprocating the same in said cylinder.

4,104,002

SPIRAL STRIP ACOUSTIC TREATMENT

Frederic Franklin Ehrich, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

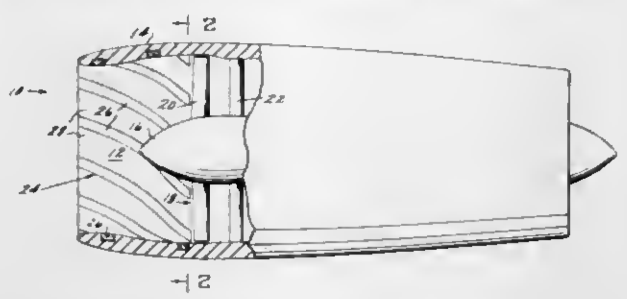
Filed Dec. 2, 1976, Ser. No. 746,975

Int. Cl.² F04D *29/66*

U.S. Cl. 415—119 **7 Claims**

1. An acoustic duct for transmitting and absorbing acoustic pressure fields characterized by spinning modes comprising

a longitudinally extending rigid duct having attached to the inner surface thereof a set of at least several circumferentially spaced, strips of sound-absorbing material which extend helically about the longitudinal axis of the duct,



said set of peripherally spaced strips being effective to achieve scattering of the spinning mode acoustic pressure fields for improved sound suppression.

4,104,003

ROTOR ARRANGEMENT FOR ROTARY WING AIRCRAFT

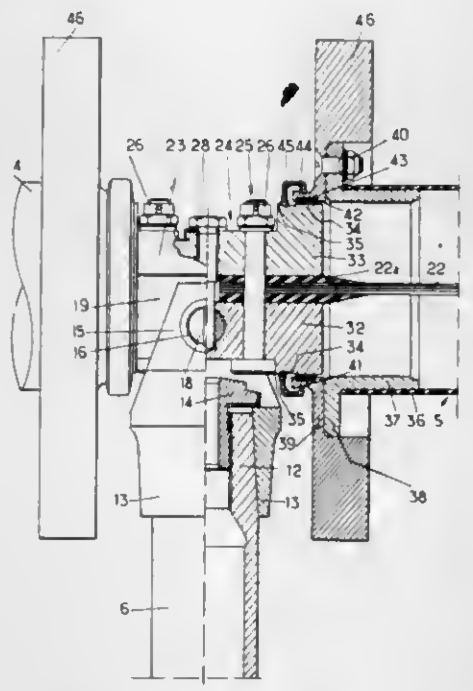
René Louis Mouille, Aix en Provence, France, assignor to Societe Anonyme dite Societe Nationale Industrielle Aerospatiale, Paris, France

Filed May 14, 1976, Ser. No. 686,638

Claims priority, application France, May 14, 1975, 75 14987

Int. Cl.² B64C *27/38*

U.S. Cl. 416—141 **6 Claims**



1. A rotor head assembly for rotary wing aircraft, comprising: a rotor hub having a two pronged fork; a pair of blades disposed on opposite sides of said hub; a one-piece, flexible, twistable beam connecting said blades; a shaft means rotatably mounted between the prongs of said fork and extending transversely to the longitudinal axis of said blades and intersecting the axis of rotation of said rotor hub, said shaft means having a mounting plate disposed between said prongs and arranged to receive the median part of said beam, said mounting plate having a recess disposed transversely to said shaft means, said recess housing said median part of said beam; cap means enclosing said median part within said recess; said beam being pivotably mounted for pivoting about the axis of rotation of said shaft means.

4,104,004

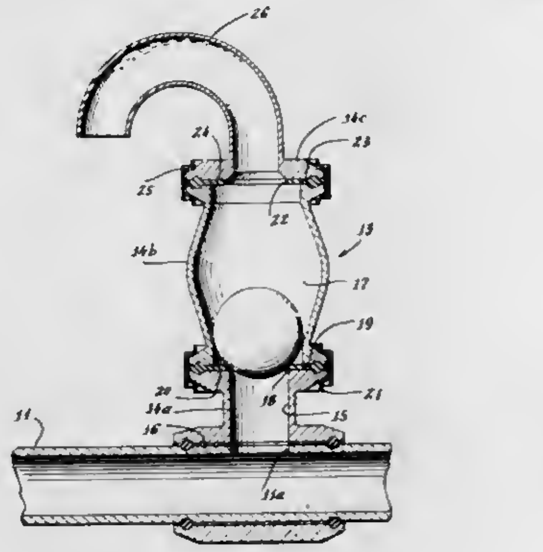
AIR ELIMINATOR FOR PUMPS

Myron Lee Graef, Hebron, Ill., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,300

Int. Cl.² F04B *21/00*

U.S. Cl. 417—313 **4 Claims**



1. In combination with a pump having an inlet and an outlet, and a suction pipe leading to said inlet for conducting a liquid to be pumped, an air eliminator comprising a valve housing having an inlet passage at one end thereof in sealed communication with said suction pipe, the housing defining a chamber and having a first valve seat through which said inlet passage communicates with the chamber, the housing having at the opposite end thereof a second valve seat forming a discharge opening leading to atmosphere, said chamber forming a main passage which increases and then decreases in cross-sectional area from said first valve seat toward said second valve seat, a ball valve in said chamber adapted to seat alternately on the valve seats, the ball valve being normally seated only on said first valve seat to prevent entrance of air into the suction pipe but being displaceable from the first seat to allow discharge of air under pressure from the suction pipe through said second valve seat while suspended by the force of the discharging air, the ball valve having a specific gravity less than that of said liquid, whereby liquid entering the chamber from the suction pipe floats the ball valve against said second seat to prevent discharge of liquid from the chamber, the housing including a first section forming said inlet passage and a second section separable from the first section and forming said chamber, a compressible gasket inserted between said first and second sections and forming said first valve seat, and releasable means located outside the housing for clamping said sections together to compress said gasket.

4,104,005

PNEUMATIC BLADDER PUMP HAVING STIFFNESS SYMMETRY

Victor L. Poirier, Chelmsford, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 9, 1976, Ser. No. 647,842

Int. Cl.² F04B *43/08, 43/10, 45/06*

U.S. Cl. 417—394 **8 Claims**

7. A blood pump comprising:

a flexible axis-symmetrical bladder having a midsection, a first end section defining a first port and a second end section defining a second port smaller in diameter than said first port;

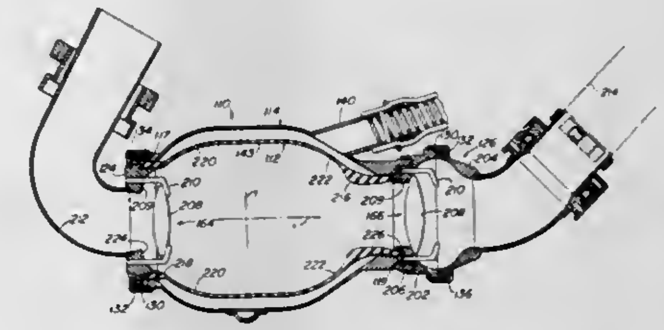
means associated with said bladder for producing substantially equal stiffness at all points on said bladder equidistant from a plane perpendicular to its axis of symmetry and located substantially at the center of said midsection, for maximizing collapse during external pressurization, said means for producing having at least an annular stiffening means associated with the wall of said second end section;

peripheral means around each of said first and second ports;

a rigid housing enclosing said bladder;

means in said housing forming an opening coinciding with each of said first and second ports for sealing engagement with each said peripheral means;

means forming a third opening in said housing for introducing compressed gas between said bladder and said housing;



a pair of end adaptor means having passageways for conducting blood to and from said bladder, one adaptor means being located at each of said first and second ports for sealing engagement with the associated peripheral means; and

means for holding each said adaptor means in sealing engagement with the corresponding said peripheral means and each said peripheral means in sealing engagement with said housing.

4,104,006

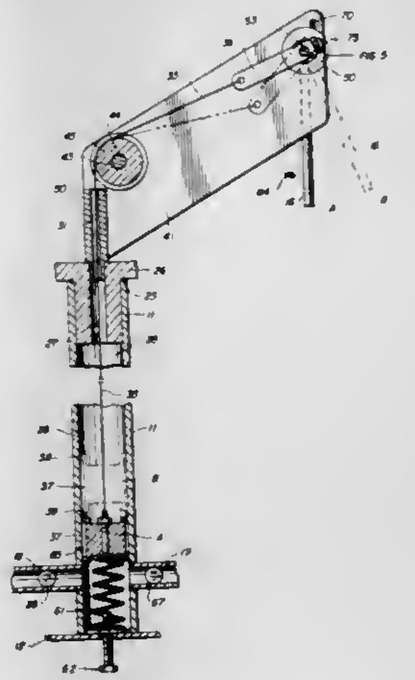
WIND-ENERGY CONVERSION DEVICE

Shmuel Meiri, Skokie, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Jan. 10, 1977, Ser. No. 758,086

Int. Cl.² F04B *17/02*

U.S. Cl. 417—334 **7 Claims**



1. Apparatus for transducing gusts of wind into reciprocal motion, said apparatus comprising

support means comprising a vertically extending mast,

a rotatable axle supported by said mast,

flap means affixed to said axle and including a principal surface extending radially outwardly thereof in a single direction, said flap means being pivotable leewardly with said axle in response to gusts of wind striking said principal surface, shaft means having a proximal end coupled to said axle and a distal end connected to tension-producing spring means, and

coupling means intercoupling the proximal end of said shaft means to said axle and comprising an inflexible torque arm attached to said axle and extending radially outwardly thereof,

whereby said shaft means is pulled proximally in response to gusts of wind displacing the principal surface of said flap means from a first, rest position to a second, displaced position; and said spring means pivots said flap means windwardly from a second, displaced position to a first, rest position in response to relaxation of wind gusts against said principal surface of the flap means;

and wherein said apparatus further comprises

vane means for maintaining the principal surface of said flap means generally normal to prevailing winds in a first rest position of said flap means, said vane means comprising a pair of parallel plates pivotally supported by said mast and extending radially outwardly thereof, and

a cross-bolt extending horizontally between and adjoining said parallel plates radially outwardly of the mast, wherein said torque arm is adapted to abut against said cross-bolt in response to extremely strong gusts of wind directed against the principal surface of said flap means, whereby said cross-bolt limits pivotal rotation of said axle to preclude coiling of said flexible cable around said axle in extremely gusty winds.

4,104,007
ELASTIC SUPPORT FOR HYDRAULIC PUMP OF INJECTION MOLDING

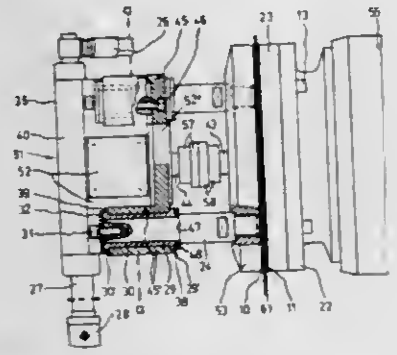
Karl Hehl, Artbur-Hebl-Strasse 32, 7298 Lossburg, Fed. Rep. of Germany

Filed Jan. 4, 1976, Ser. No. 729,035

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544536

Int. Cl.² F16F *15/20*

U.S. Cl. 417—360 **8 Claims**



1. A device for elastically supporting a hydraulic pump as part of an electro-hydraulic pump unit of a production machine, such as a hydraulic drive unit of an injection molding machine, where the power unit includes a hydraulic pump with a central drive shaft which is coaxially coupled with the drive shaft of an electric motor, and the power unit is mounted on a stationary base of the machine in the manner of a self-contained assembly by means of supporting members which carry the weight of the assembly; the elastic pump supporting device comprising in combination:

a pump supporting structure extending axially forwardly from the electric motor to the pump, on opposite sides of the unit center axis defined by said coupled drive shafts, the pump supporting structure being rigid and solidary with the electric motor and including a plurality of strut rods reaching forwardly at least far enough to intersect a radial plane through the centroid of the hydraulic pump;

a plurality of pump support points defined by the pump supporting structure in the vicinity of said radial centroid plane, said support points being spaced around the pump centroid;

the pump includes a pump body portion having axial supporting bores in alignment with said pump support points;

each strut rod is aligned with a pump support point, extending forwardly through the associated supporting bore of the pump body, but with a smaller diameter than said bore, so as to define an annular gap therewith; and

a plurality of elastomeric sleeve elements arranged at the pump support points, in said annular gaps, each sleeve element engaging a supporting bore of the pump body and a strut rod of said supporting structure on opposite sides of an elastomeric material thickness in such a configuration that direct metallic contact between the two structures is precluded.

4,104,008
PUMP HAVING FLUID-ACTUATED MOTOR CONTROLLED BY FLUID-ACTUATED DISTRIBUTOR

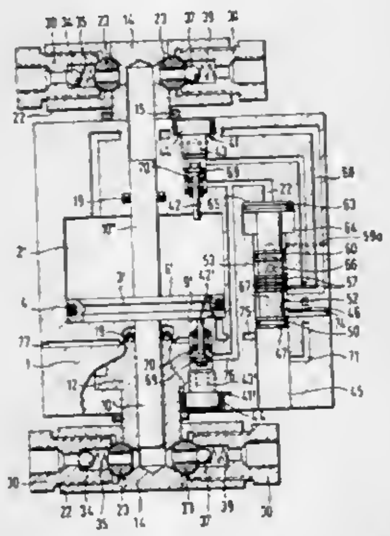
Ernst Hoffmann, Braunlage; Siegfried Reimann, and Heinz Aschermann, both of Walkenried, all of Germany, assignors to Schmidt Kranz & Co., Zorge, Sudharz, Germany

Filed Jun. 9, 1977, Ser. No. 805,077

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626954

Int. Cl.² F04B *17/00, 35/00;* F01L *25/06*

U.S. Cl. 417—397 **18 Claims**



1. In a fluid-actuated pump, a combination comprising at least one pumping unit including a pump chamber, a pumping piston received in said pumping chamber for reciprocation to one end position in a suction stroke and to another end position in a pumping stroke, and means for admitting a medium to be pumped into said pumping chamber during said suction stroke and for discharging the medium being pumped from said pumping chamber during said pumping stroke; an actuating unit including an actuating chamber and an actuating piston subdividing said actuating chamber into two actuating compartments and connected to said pumping piston for joint reciprocation; a source of pressurized actuating fluid; a sink for the actuating fluid; and means for alternately communicating at least one of said actuating compartments with said source and said sink, including a main valve having a control chamber and an elongated main valve member mounted in said control chamber for movement between an extended and a retracted position and having a larger first end face facing a first, and a smaller second face facing a second, control compartment into which said main valve member subdivides said control chamber, and a first and second connecting compartment at the circumference of said main valve member intermediate said end faces and separate from each other and from said control compartments, said communicating means further including first duct means permanently communicating said second connecting and control compartments with said source for the pressurized actuating fluid to urge said main valve member toward said extended position thereof, second duct means communicating said first connecting compartment with said sink, third duct means communicating said source with said first control compartment, an auxiliary valve member interposed in said third duct means for displacement from a closed toward an open position, means for displacing said auxiliary valve member toward said open position thereof when said pumping piston is at said one end position thereof, fourth duct means communicating said first control compartment with said sink when said pumping piston is at said other position thereof, and fifth duct means communicating said one actuating compartment with said second connecting compartment in said retracted, and with said first connecting compartment in said extended, position of said main valve member.

4,104,009
SCREW PUMP STATORS

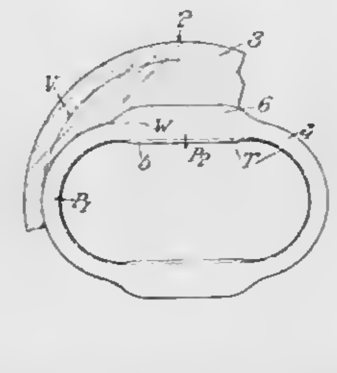
Edmond Chanton, Clamart, France, assignor to Societe Generale de Mecanique et de Metallurgie, Vanves, France

Filed Mar. 4, 1977, Ser. No. 774,650

Claims priority, application France, Mar. 9, 1976, 76 06736

Int. Cl.² F04C *1/02*

U.S. Cl. 418—48 **5 Claims**



1. A screw pump stator comprising a rigid tubular body lined on the inside with a resilient sleeve, characterised in that its resilient sleeve(4) is formed by a twisted liner whose thickness varies along the periphery of each transverse section, this thickness being the highest in the zones corresponding to the highest sliding speeds of the rotor, these thickened zones forming bosses (5,6) both on the outside surface and on the inside surface of this liner, and in that its rigid body (3) has an inside surface of generally the same form as that of the inside surface of the twisted liner, but hollowed out at the level of the bosses of this liner so as to receive sealingly the outside bosses of this latter.

4,104,010
ROTARY COMPRESSOR COMPRISING IMPROVED ROTOR LUBRICATION SYSTEM

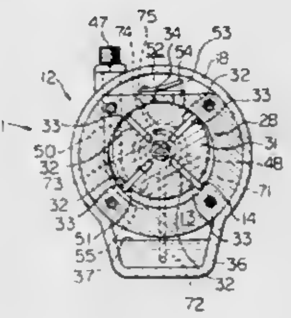
Tsunenori Sbibuya, Konan, Japan, assignor to Diesel Kiki Co. Ltd., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,025

Claims priority, application Japan, Aug. 18, 1975, 50-113520[U]

Int. Cl.² F04C *29/02*

U.S. Cl. 418—76 **2 Claims**



1. A rotary compressor comprising:

a housing formed with a bore and having end plates and an end cover;

a rotor comprising a rotor body and a shaft fixed to the rotor body, the rotor body being operatively disposed in the bore and being formed with a plurality of substantially radial slots, the shaft extending through the end cover;

a bearing mounted in an opening through one of the end plates and rotatably supporting the shaft;

a plurality of vanes slidably retained in the slots respectively for sealing engagement with an inner wall of the housing defining the bore thereby partitioning the bore into a plurality of fluid chambers, the rotor being disposed in the bore in such a manner that upon rotation thereof the fluid chambers increase in volume in an inlet portion of the bore and decrease in volume in an outlet portion of the bore;

a fluid inlet passageway opening into the inlet portion of the bore;

a fluid outlet passageway opening from the outlet portion of the bore;

an oil reservoir in said housing;

a communicating passageway between the oil reservoir and the fluid outlet passageway such that the fluid in the fluid outlet passageway pressurizes the oil reservoir;

a substantially semi-annular high pressure oil chamber formed in the housing and communicating with the slots of the rotor radially inwardly of the vanes in the outlet portion of the bore;

an interconnecting passageway between the high pressure oil chamber and the oil reservoir;

a substantially semi-annular low pressure oil chamber formed in the housing and communicating with the slots of the rotor radially inwardly of the vanes in the inlet portion of the bore;

a conducting passageway between the low pressure oil chamber and the fluid inlet passageway providing for flow of oil through the conducting passageway to the inlet portion of the bore, the bearing being located in the conducting passageway such that oil passing from the low pressure oil chamber to the fluid inlet passageway passes through the bearing to lubricate the latter, the conducting passageway being further formed by an oil chamber in the end cover disposed about the shaft; and

a flow restriction passageway connecting the high pressure oil chamber with the low pressure oil chamber in such a manner that the vanes are pressed by oil in the slots of the rotor into sealing engagement with the wall of the bore with a high pressure in the outlet portion of the bore and with a low pressure in the inlet portion of the bore, the high and low pressure oil chambers and the flow restriction passageway being formed as grooves in the end plate which mounts the bearing.

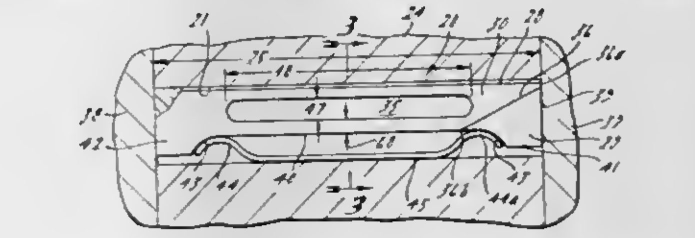
4,104,011
I-BEAM APEX SEAL

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 458,378, Apr. 5, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 754,662

Int. Cl.² F01C *19/04, 21/08*

U.S. Cl. 418—121 **5 Claims**



1. In a rotary internal combustion engine having a rotor with slots and gas communicating channels, said slots having flat leading and trailing side walls arranged in a generally radial

direction with respect to the rotor center of rotation, and having a predetermined width, length and depth, each communicating channel extending between the rotor outer surface and an interior location of one of said slots, an apex seal comprising:

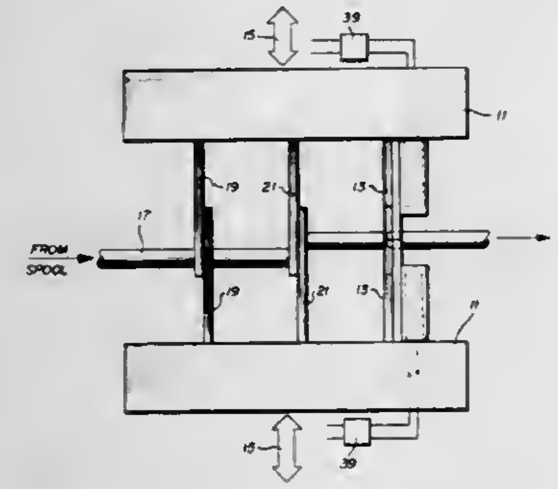
(a) a crown portion extending out of said slot,

(b) a unitary impervious body portion residing within said slot having leading and trailing side walls carrying grooves extending at least 80% the length of said body portion and extending into the body portion a depth at least 33% of the width of said body portion, and extending a height sufficient to leave an uninterrupted residual side wall surface below said groove which is substantially about 0.04 inch, and

(c) means providing length adjustment of said seal in conformity with any variance of the spacing between ends of said rotor slots.

4,104,012
IMPROVED WIRE STRIPPING APPARATUS

Michael R. Ferrante, 9820 S. 50th Ct., Oak Lawn, Ill. 60453
Filed Oct. 12, 1976, Ser. No. 731,138
Int. Cl.² M02G *1/12;* B29C *17/08*
U.S. Cl. 425—299 **8 Claims**



1. In a wire stripping apparatus having means for removing the insulation from the end of the electrical conductor of an insulated wire to expose a predetermined length of said electrical conductor, the improvement comprising:

means for compressing a predetermined length of said insulation remaining on said electrical conductor immediately adjacent said exposed electrical conductor to secure the predetermined length of said remaining insulation in position on said electrical conductor; and

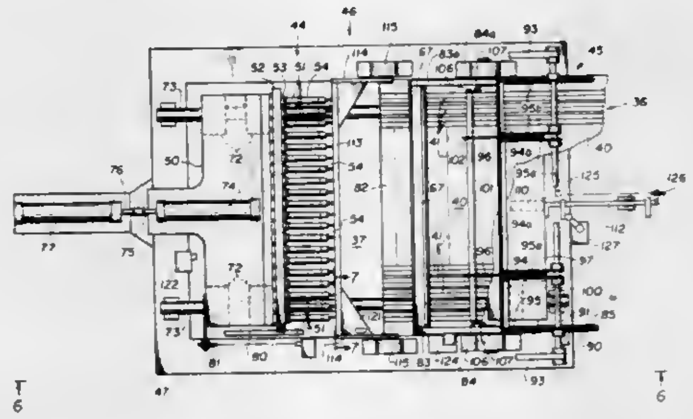
means for simultaneously heating said compressed remaining insulation immediately adjacent said exposed electrical conductor,

said compressing means and said heating means cooperating to cause said adjacent remaining insulation to adhere to said electrical conductor along said predetermined length of remaining insulation.

4,104,013
TAMPON EJECTOR TUBE AND APPARATUS

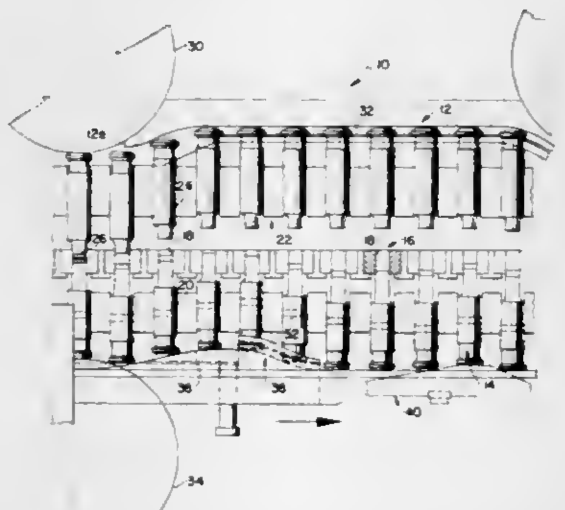
Eugene R. Kelly, Hauppauge, and Donald M. Gould, Glen Cove, both of N.Y., assignors to Product Design & Engineering Corp., Minneapolis, Minn.
Filed Feb. 2, 1976, Ser. No. 654,378
Claims priority, application United Kingdom, Aug. 7, 1975, 28706/75
Int. Cl.² B29C *17/00*
U.S. Cl. 425—324.1 **11 Claims**

1. Apparatus for forming the inner ejector tube of a telescoping tampon applicator comprising, a first die means for shaping one end of a tubular cylinder to form an inwardly turned end wall having a central aperture therein, a second die means for shaping the other end of a tubular cylinder to form an outwardly turned bead-like rim, means for supporting a tubular cylinder with its ends in alignment with said first and said second die means, longitudinal tube feeding means for feeding tubular cylinders one at a time in a longitudinal direction to said supporting means, means for moving at least one of said die means towards the other until the distance separating said die means is less than the length of a tubular cylinder supported therebetween whereby the ends of a tubular cylinder are shaped by said die means to form a tampon applicator tube, means for internally supporting said tubular cylinder when its ends are being shaped by the converging die means, and means for removing a formed ejector tube from said internal supporting means, said die means being heated to soften the tube ends for shaping.



4,104,014
PUNCH FOR COMPRESSING MACHINE

Arthur R. Pearce, Point Pleasant Beach, N.J., assignor to Key Industries, Englishtown, N.J.
Filed Jul. 13, 1977, Ser. No. 815,192
Int. Cl.² B30B *11/08*
U.S. Cl. 425—345 **8 Claims**



1. A compressing machine, comprising:

relatively movable punches for compressing a charge of material,

a die head having a plurality of die cavities and axially-extending passageways in which said punches are mounted for reciprocation,

means for controlling the reciprocation of said punches within said passageways relative to said die head,

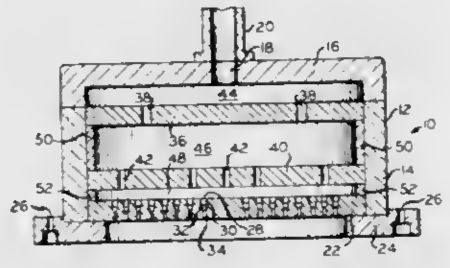
each of said punches having an opening extending completely therethrough, said opening extending in a direction transverse to the longitudinal axis of said punch,

a resiliently-biased plunger positioned within each of said transverse openings for adjustment relative thereto, and

means for adjusting each of said plungers to engage the walls of their respective axial passageways whereby the amount of pressure applied by said plungers to the walls of said passageways may be fixed at a predetermined pressure to prevent undesired movements of said punches.

4,104,015
SPINNERET ASSEMBLY

Richard D. Meyer, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 11, 1977, Ser. No. 758,601
Int. Cl.² B29F *3/04;* D01D *3/00*
U.S. Cl. 425—382.2 **7 Claims**



1. A spinneret assembly comprising:

annular inlet means,

distributor means,

a spinneret, and

means for positioning said annular inlet means, distributor means and spinneret in that order in spaced relationship wherein said annular inlet means is circular and has a plurality of equally spaced orifices positioned therein to generally define in circle having a center concentric with said annular inlet means and a radius ranging from about 25 to about 80 percent of the radius of said distributor means, and

wherein said distributor means is circular and has a plurality of orifices positioned therein to generally define three concentric circles, each circle having a center concentric with said distributor means and the circumference of each circle intersecting the radius of said distributor means at points approximately equally spaced along the radius and between the center and the circumference of said distributor means, and

the orifices defining each circle of said distributor means being equally spaced from each other.

4,104,016
CYCLING PILOT BURNER CONTROL SYSTEM WITH SAFETY TIMING

Robert L. Baysinger, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jun. 3, 1977, Ser. No. 803,072
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—54 **5 Claims**

1. In a fuel burner control system,

control means including an electrical winding for controlling the flow of fuel to a burner;

means for igniting said burner;

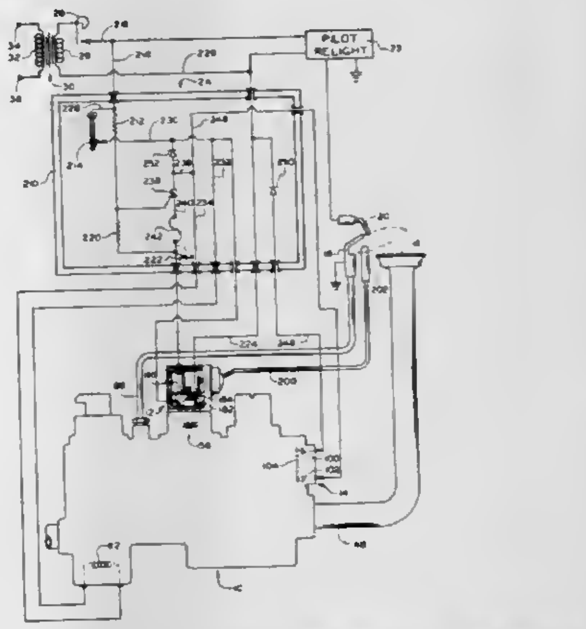
a normally closed bimetal operated safety switch having an electrical resistance heater which, when energized for a predetermined time period, effects opening of said safety switch:

a solid-state switch having a control electrode;

gating circuit means including said resistance heater connected to said control electrode of said solid-state switch for controlling the conduction thereof;

control circuit means including said safety switch, said winding, and said solid-state switch connected in series for controlling initial flow of fuel to said burner;

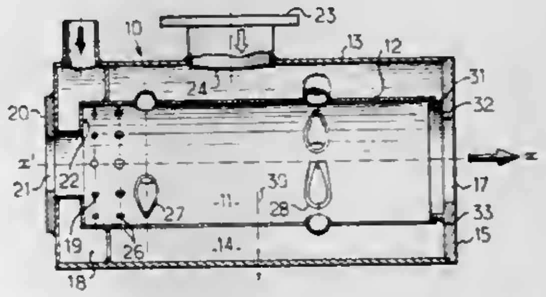
flame responsive means for effecting energizing of both said circuit means in the absence of a burner flame whereby said resistance heater is energized and said electrical winding is energized to initiate the flow of fuel to said burner, and for effecting de-energizing of both said circuit means when said burner flame exists whereby said resistance heater is de-energized; and



means connected to said electrical winding for maintaining energizing thereof when said flame responsive means effects de-energizing of both said circuit means.

4,104,017
METALLIC NON-PREMIXED GAS-BURNER WITH COUNTER-ROTATION OF GASES

Jean-Marie Georges Fernand Alin, Le Plessis Belleville, France, assignor to Gaz de France, Paris, France
Filed Mar. 30, 1977, Ser. No. 782,629
Claims priority, application France, Feb. 1, 1977, 77 02749
Int. Cl.² F23D *15/02*
U.S. Cl. 431—352 **12 Claims**



1. A metallic gas-burner with high-velocity gas outflow allowing a high temperature of the burnt gases to be obtained, of the type comprising a central fire-tube comprising a rear portion closed by a rear wall, and a front portion on both sides of a medial transverse plane, said fire-tube constituting a mixing and combustion chamber into which is admitted, on the one hand, a fuel-gas and, on the other hand a gaseous combustion agent usually air, from an annular space constituting an air box provided between the outer wall of the said fire-tube and an external tube surrounding it, the said burner being provided at its front end portion with a front plate closing the said air-box, wherein the fuel gas is supplied at a low pressure, e.g. on the order of a few tens of millibars, into the rear of the fire-tube by a fuel-gas intake and the gaseous combustion agent is distributed at a low pressure into the said fire-tube in the form of at least essentially three main flows from the rear to the front of the said tube, the intake of the first flow being provided in a transverse plane close to the rear wall of the said fire-tube, the intakes of the second and third flows being provided in counter-rotation relationship with respect to one another, the second flow being fed into the rear portion of the

fire-tube and the said third flow being fed into its front portion beyond the said medial transverse plane respectively.

4,104,018
COMBUSTER

Richard A. McKay, Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 26, 1976, Ser. No. 745,384

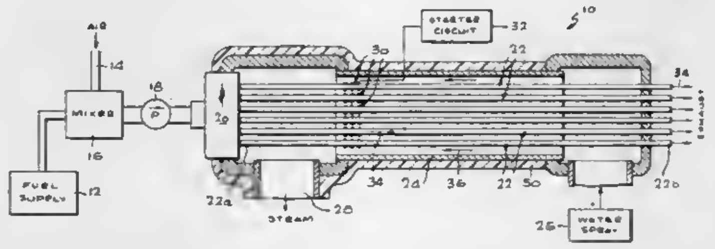
Int. Cl.^{2} F24H *1/36, 1/00*

U.S. Cl. 432—29 **10 Claims**

7. A method for heating a load fluid comprising:

passing a combustible medium which includes air, through a conduit that has highly thermally conductive walls, while heating said medium sufficiently to cause combustion of said medium along a predetermined combustion zone portion of said conduit, and flowing the products of said combustion along a transfer conduit portion extending downpath from said combustion zone portion; of and

flowing a load fluid past the outer surface of said conductive walls at said transfer portion and said combustion zone portion of said conduit;



said combustion being maintained at a temperature below that of free flame, along said combustion zone, whereby to minimize the generation of nitrogen oxide.

CHEMICAL

4,104,019
FIXATION OF DYES AND OTHER CHEMICALS IN TEXTILE FIBRES

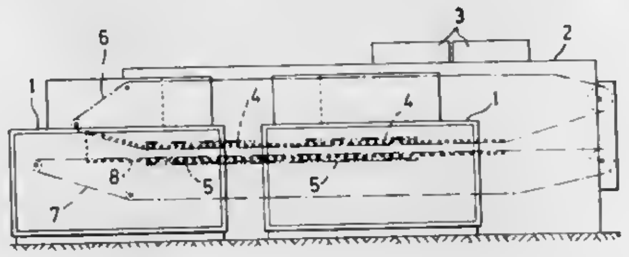
Geoffrey Allan Smith, Melrose, Scotland, assignor to Dawson International Limited, Edinburgh, Scotland

Filed May 18, 1976, Ser. No. 687,602

Claims priority, application United Kingdom, May 21, 1975, 21924/75

Int. Cl.^{2} D06P *5/20*

U.S. Cl. 8—2 **1 Claim**



1. A process for the fixation of dyes and other chemicals in textile fibres, however formed or combined, which comprises continuously mechanically conveying fibres which have been wetted with dye or other chemical substance through a closely confining tube located between electrodes by which a radio frequency energy field is created in the tube, the packing of the tube being sufficiently dense as to ensure that when heated by the energy field the tube and its contents form a partially self sealing pressure chamber due to generation of steam from the wetted fibres whereby the rate of reaction of the dye or chemical on the fibres is accelerated.

4,104,020
HAIR DYE COMPOSITIONS CONTAINING 4,7-DIAMINOINDAZOLES

David Rose, Hilden, Germany, assignor to Henkel Kommanditgesellschaft Auf Aktien, Düsseldorf-Holthausen, Germany

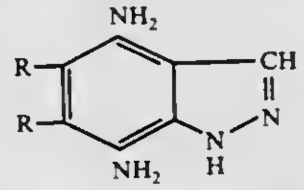
Filed Jun. 14, 1976, Ser. No. 695,454

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1975, 2527791

Int. Cl.^{2} A61K *7/13*

U.S. Cl. 8—10.2 **21 Claims**

1. A hair dyestuff of the developer-coupler type, wherein the developer is selected from the group consisting of (I) a substituted 4,7-diaminoindazole of the formula:



wherein one of said R's represents C_1-C_4alkyl and the other R represents a substituent selected from the group consisting of C_1-C_4alkyl and H, and (II) the water-soluble salts thereof, and a coupler therefor, said developer and said coupler being present in the molar range of 2:1 to 1:2.

4,104,021
PROCESS FOR DYEING HAIR IN WHICH THE DEPTH OF SHADE IS GRADUALLY INCREASED IN SUCCESSIVE TREATMENTS

Herbert Lapidus, Ridgefield, and Albert Shansky, Norwalk, both of Conn., assignors to Combe Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 690,885, May 28, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,076

Int. Cl.^{2} A61K *7/12, 7/13*

U.S. Cl. 8—10.2 **16 Claims**

1. A process for dyeing hair by application of a mixture of colorant solution of primary aromatic amines and aminophenols and an oxidant containing H_2O_2 or a peroxy derivative for a time period yielding color development, followed by a rinse removal of the residual mixture;

the improvement to the aforesaid process comprising:

(a) applying said colorant-oxidant mixture in successive applications to gradually get rid of the undesirable hair color, wherein

(i) the time period of application of the mixture being short, on the order of five (5) to fifteen (15) minutes and of substantially the same length for each subsequent application,

(ii) the quantity of colorant solution is suitable for moistening a head of hair uniformly, and substantially constant through all applications,

(iii) the quantity of oxidant in the mixture in the first application is 0.5 to 2 times the amount required to oxidize the primary aromatic amines and aminophenols contained in the colorant solution, and successive applications having increased quantities of oxidant above said initial quantity, ranging up to 10 times the amount required for the aforesaid oxidation;

(b) each mixture having the ability to produce an oxidation color on ordinary human hair; and

(c) each such color being a deeper shade than the preceding application, whereby the user can stop the coloration process at any desirable color attainment and thereafter maintain such color level by repeating the application with the mixture of colorant and oxidant last used.

4,104,022
DURABLE PRESS PROCESS FOR CELLULOSIC FIBER-CONTAINING FABRICS UTILIZING FORMALDEHYDE AND A WATER SOLUBLE LIQUID OR GASEOUS ACID CATALYST

George Louis Payet, Cincinnati, Ohio, assignor to The Strike Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 524,770, Nov. 18, 1974, Pat. No. 3,960,483, and a continuation-in-part of Ser. No. 486,168, Jul. 5, 1974, Pat. No. 3,960,482. This application Apr. 14, 1976, Ser. No. 676,793

The portion of the term of this patent subsequent to Jun. 1, 1993, has been disclaimed.

Int. Cl.^{2} D06M *1/14, 1/16, 9/06, 13/14*

U.S. Cl. 8—115.6 **16 Claims**

1. A durable press process for cellulosic fiber-containing fabrics, comprising: impregnating a cellulosic fiber-containing fabric with an aqueous solution containing a water soluble liquid or gaseous acid which is capable of catalyzing the crosslinking reaction betweeen formaldehyde and cellulose; to provide from 0.1% to about 3.5% of said catalyst in said fabric on a dry weight basis, then exposing said impregnated fabric, while said fabric has a moisture content of above 20% by weight where the cellulose fibers are substantially completely swollen, to formaldehyde vapors and curing under conditions at which formaldehyde reacts with cellulose in the presence of the catalyst to improve the wrinkle resistance of the fabric.

4,104,023
RING POLYSULFONATED ALKYLPHENOXY ALKYLOLS AS DETERGENTS

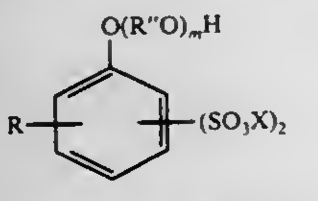
Gar Lok Woo, Tiburon, and Ralph House, El Sobrante, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 97,302, Dec. 11, 1970, abandoned. This application Jun. 24, 1976, Ser. No. 699,402

Int. Cl.² D06M *13/26*

U.S. Cl. 8—137 **4 Claims**

1. In a method of washing fabric by contacting said fabric with an aqueous solution containing a detergent amount of detergent active material under conditions of time and temperature to effect substantial soil removal from the fabric, the improvement which comprises carrying out the washing at substantially neutral pH and in the absence of phosphate builders and employing as detergent active material ring polysulfonated alkylphenoxy alkylols of the formula



in which R is linear alkyl of 16 to 22 carbon atoms, X is H or a water-soluble salt-forming cation, *m* is 1 to 10, and R'' is alkylene of 1 to 5 carbon atoms, the attachment of said linear alkyl R being greater than 90% ortho.

4,104,024
PROCESS FOR STERILIZATION, MORE PARTICULARLY FOR STERILIZATION OF PACKAGING MATERIALS

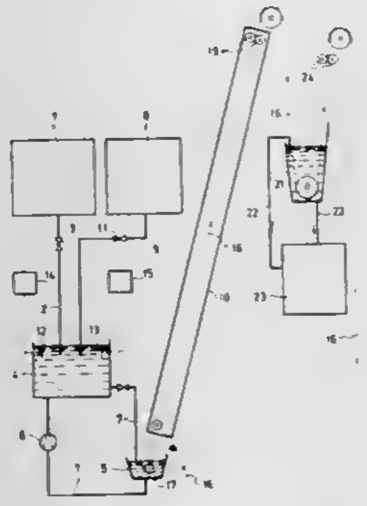
Peter Vogele, Sindelfingen, and Diethard Schulte, Hochheim, both of Fed. Rep. of Germany, assignors to Tetra Pak Developpement, S.A., Lausanne, Switzerland

Filed May 20, 1977, Ser. No. 798,822

Claims priority, application Fed. Rep. of Germany, May 29, 1976, 2624264

Int. Cl.² A61L *13/00;* **B65B** *55/10;* **B08B** *3/08*

U.S. Cl. 21—58 **16 Claims**



1. A process for sterilizing an article by wetting said article at a temperature below 70° C with a sterilizing solution of a compound having an active-chlorine concentration of from 500 to 20,000 mg/l and being selected from the group consisting of sodium hypochlorite, calcium hypochlorite, chlorinated trisodium phosphate, chlorine dioxide, sodium p-toluenesulfochloroamide, p-toluene-sulfonsulfochloroamide, N-chlorosuccinimide, 1, 3-dichloro-5, 5-dimethylhydantoin, trichlororoisocyanuric acid, salts of trichloroisocyanuric acid, trichloromelamine and dichloroglycoluril, the pH of said sterilizing solution being from 8 to 10, and treating the thus sterilized article with an aqueous solution of hydrogen peroxide at a temperature below 90° C to deactivate any remaining active chlorine, said solution of hydrogen peroxide having a concentration of lower than 30%.

4,104,025
METHOD OF PREPARING LIQUID SAMPLES FOR TESTING

Erich Retzer, Miasach, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

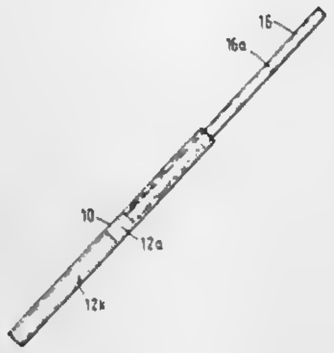
Filed Oct. 14, 1976, Ser. No. 732,217

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553613

The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.² A61B *10/00;* **B01L** *3/02;* **G01N** *1/10, 33/16*

U.S. Cl. 23—230 R **7 Claims**



1. The method of preparing a liquid sample for testing which comprises the steps of

(a) introducing a quantity of a liquid substance to be tested into a first capillary tube by capillary action,
(b) subjecting the liquid contents of said first tube to centrifugal force exerted in a direction longitudinally of said first tube for a sufficient time to separate said contents into a plurality of components,
(c) thereafter introducing into said first tube a second capillary tube whose external diameter is smaller than the internal diameter of said first tube and allowing capillary action to draw into said second tube a predetermined measured quantity of one of said components in the first tube,
(d) providing a cuvet with a predetermined measured quantity of a reagent liquid,
(e) placing said second tube with said one of said components therein into said cuvet with said reagent liquid therein, and
(f) mixing the component from said second tube with the reagent liquid in said cuvet,

thereby to form in said cuvet a mixture of reagent liquid and selected component from the original substance, ready for testing.

4,104,026
IMMUNOASSAY SEPARATION TECHNIQUE

Gary Brooker; Wesley L. Terasaki, and Michael G. Price, all of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Continuation-in-part of Ser. No. 666,302, Mar. 12, 1976, Pat. No. 4,022,577. This application Oct. 7, 1976, Ser. No. 730,630

Int. Cl.² G01N *33/16, 23/12*

U.S. Cl. 23—230 B **14 Claims**

1. In a method for effecting immunoassay of a multiplicity of samples, each possibly containing an antigen or an antibody to be assayed, wherein each sample is incubated with a solution containing a detectable antigen or antibody to form a multiplicity of mixtures, each mixture containing as components:complexed antigen-antibody, non-complexed antigen and noncomplexed antibody, separating at least one of the components

of said mixture by adsorption and thereafter detecting the quantity of detectable antigen or antibody, in the non-adsorbed portions of the mixture,

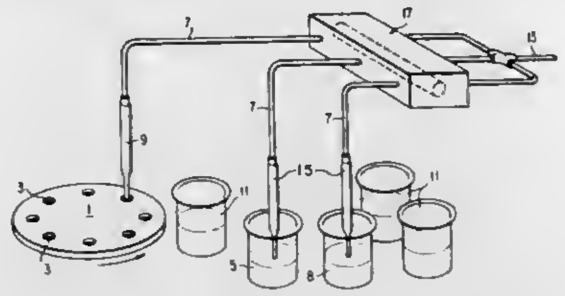
the improvement which comprises continuously and sequentially separating at least one component intended to be separated from each of said multiplicity of mixtures by

passing a first mixture from said multiplicity of mixtures over an adsorbent which adsorbs the components intended to be separated from said mixture,

removing from said adsorbent the non-adsorbed portion of said mixture, and

repetitively passing each next succeeding mixture from said multiplicity of mixtures over the same adsorbent without intermittent removal of the components of the mixture which had been adsorbed onto said adsorbent from the preceding mixtures, and removing from said adsorbent the non-adsorbed portion following each pass,

wherein each sequential mixture is in contact with said adsorbent for a residence time which is sufficient to permit adsorption of the said component, but which is insufficient to effect significant disassociation of the prior adsorbed component, and which is insufficient to effect adsorption of additional components of said mixture onto the additional adsorption sites created on said adsorbent by the prior adsorption of the components from the preceding mixture.



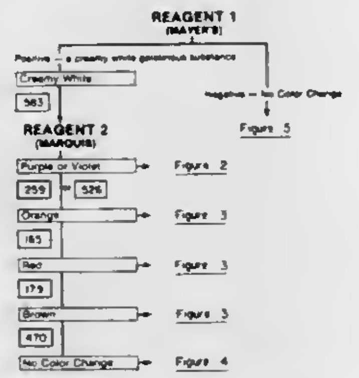
4,104,027
PROCESS FOR THE PRESUMPTIVE IDENTIFICATION OF NARCOTICS AND DRUGS OF ABUSE

Robert B. Carroll, P.O. Box 305, S. Paris, Me. 04281

Filed Nov. 21, 1977, Ser. No. 853,682

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **6 Claims**



1. A process for the presumptive identification of narcotics and drugs of abuse which comprises applying to a sample of the drug in an amount within the range from about 2 to about 3 mg in the sequence stated:

(1) from about 0.5 to about 0.55 ml Mayer's reagent and then
(2) in the event a creamy white precipitate forms, applying Marquis reagent; and then
  (a) in the event a purple color No. **259** (PC) or violet color No. **526** (PCS) forms, applying the test sequence of FIG. 2;
  (b) in the event an orange color No. **165** (PCS) forms, a red color No. **179** (PCS) forms, or a brown color No. **470** (PCS) forms, applying the sequence of FIG. 3; and
  (c) in the event there is no color change, applying the sequence of FIG. 4; and
(3) in the event there is no precipitate with Mayer's reagent, applying the sequence of FIG. 5; and thereby identifying the drug according to the color changes produced in the test sequences applied.

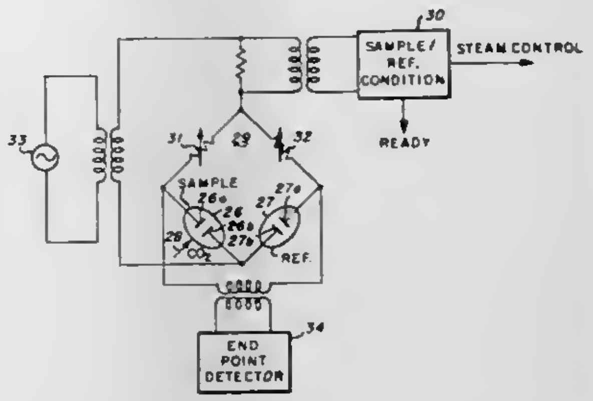
4,104,028
METHOD OF TITRATING LIQUOR

John Joseph Howarth, Monte Sereno, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 629,859, Nov. 7, 1975, Pat. No. 4,012,197. This application Mar. 3, 1977, Ser. No. 774,157

Int. Cl.² G01N *27/10*

U.S. Cl. 23—230 R **6 Claims**



1. A method of titrating alkali paper pulp solution comprising the steps of:

removing a portion of said solution into a sample vessel, said portion having a known volume;

selecting a physical characteristic of said solution; introducing carbon dioxide into the sample vessel; monitoring the amount of carbon dioxide introduced; detecting an abrupt change in said physical characteristic of said solution;

measuring the total amount of carbon dioxide introduced into said sample vessel immediately upon the detection of said abrupt change; and

calculating the alkalinity of said solution based upon said amount of carbon dioxide measured and said known volume of said portion.

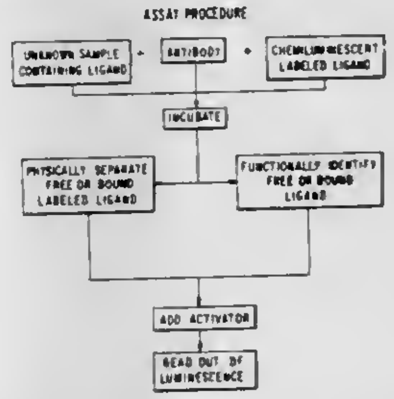
4,104,029
PROCEDURE FOR THE ASSAY OF PHARMACOLOGICALLY IMMUNOLOGICALLY AND BIOCHEMICALLY ACTIVE COMPOUNDS IN BIOLOGICAL FLUIDS

Charles L. Maier, Jr., P.O. Box 232, Yardley, Pa. 19067

Division of Ser. No. 607,151, Aug. 25, 1975. This application Mar. 22, 1977, Ser. No. 780,204

Int. Cl.² G01N *33/16, 21/22;* **C09K** *11/00*

U.S. Cl. 23—230 B **14 Claims**


ASSAY PROCEDURE
UNKNOWN SAMPLE CONTAINING LIGAND
+
ANTIBODY
+
CHEMILUMINESCENT LABELED LIGAND
INCUBATE
PHYSICALLY SEPARATE FREE OR BOUND LABELED LIGAND
FUNCTIONALLY IDENTIFY FREE OR BOUND LIGAND
ADD ACTIVATOR
READ OUT OF LUMINESCENCE

1. A method of determining the presence of a ligand in a medium suspected of containing said ligand which comprises;

bringing together in an aqueous liquid zone; (1) said medium; (2) a chemiluminescent labeled ligand; and (3) a soluble receptor having sites capable of bonding to said ligand and said chemiluminescent labeled ligand; the concentration of said receptor being such that there are insufficient receptor sites to combine with all of said labeled ligand present in the three component mixture; and analysing in said zone for the effect of said medium on the amount of chemiluminescent labeled ligand bound to said receptor.

4,104,030

PHOTOMETRIC DETERMINATION OF PROTEIN, AND OF ENDOTOXIN WITH LIMULUS PROTEIN

Robert E. Hopkins, II, Morton Grove, and Kathleen Hughes, Des Plaines, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 4, 1977, Ser. No. 848,628
Int. Cl.^{2} G01N *33/16, 21/06*

U.S. Cl. 23—230 B **6 Claims**

1. The method of photometrically determining the presence of protein in an unknown which comprises digesting said protein in an alkali solution equivalent to 0.1 to 0.4N sodium hydroxide, forming a Lowry-type protein-indicating complex with said protein, and photometrically analyzing for the presence of said protein-indicating complex, whereby said protein-indicating complex exhibits an improved stability.

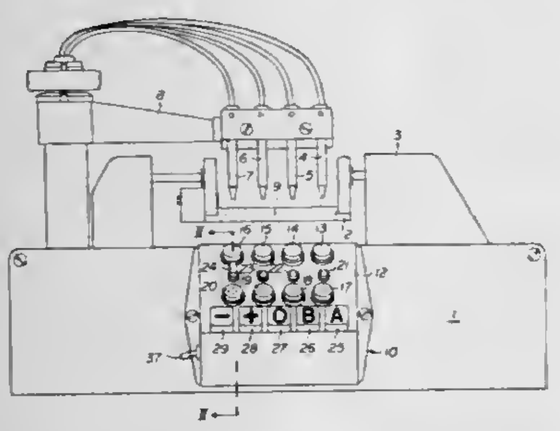
4,104,031

APPARATUS FOR DISPLAYING THE RESULTS OBTAINED ON AN AGGLUTINATION SUPPORT

Romain Gabriel Robuchon-Merovak, Levallois-Perret, and Christian Romain Robuchoo-Merovak, Paris, both of France, assignors to Readymatie S.A., Lausanne, Switzerland

Filed Dec. 8, 1975, Ser. No. 638,462
Int. Cl.^{2} G01N *33/16*

U.S. Cl. 23—253 R **9 Claims**



7. In a blood-typing installation comprising means for supporting at a position where it can be visually examined an agglutination support carrying, at given discrete locations, a series of blood tests each with a mixture of blood taken from an individual and an appropriate test serum, said blood tests having visually perceptible results depending on a state of agglutination and a state of non-agglutination of said mixtures, a display apparatus for providing indications, A, B, AB or O followed by + or −, of the results of said tests, said apparatus comprising
   a control panel located adjacent said supporting means;
   a plurality of manually-actuatable switch members disposed on the control panel at locations corresponding to respective ones of said given locations on an agglutination support carried by the supporting means;
   positive and negative indication means associated with the switch members for providing, when the switch members are actuated according to the results of the tests after visual examination of an agglutination support carried by the supporting means, positive and negative indications representing respectively said state of agglutination and said state of non-agglutination of said mixtures corresponding to the results of the tests, said positive and negative indications being disposed spaced apart from one another on the control panel and in correlation with the locations of the switch members; and
   display means for selectively displaying the letters A, B, O and the signs + and − in response to actuation of said switch members and in correspondence with said positive and negative indications corresponding to the results of the tests.

4,104,032

DUAL TEMPERATURE EXCHANGE SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 492,186, Jul. 26, 1974, which is a division of Ser. No. 126,692, Mar. 22, 1971, Pat. No. 3,860,698. This application Oct. 3, 1975, Ser. No. 619,462
Int. Cl.^{2} B01D *59/24, 59/33*

U.S. Cl. 23—270.5 W **20 Claims**

1. In an integrated system for concentrating a desired material exchangeable between two separate fluid substances containing said material and another material exchangeable therewith, at least one of said fluid substances being in liquid phase, said system including
   (a) a first enrichment section comprising a first stage operating system having at least one pair of dual temperature exchange hot and cold towers and a prescribed feed supply of one of said fluid substances, and connected thereto
   (b) an intermediate enrichment section comprising an operating system of at least a second stage of dual temperature exchange hot and cold towers, and connected thereto
   (c) a final enrichment section comprising a system for further enriching at least one of the enriched fluids from said intermediate enrichment section to a prescribed final product concentration,

the improvement which provides for modification to increase the quantity of final product output without physical alteration of the intermediate and final enrichment sections wherein:
   (1) the hot and cold towers of said first enrichment section comprise enrichment means which include therein countercurrent contact exchange elements sufficient in number to provide that when the volume of enriched fluids withdrawn from said first enrichment section and delivered to said second enrichment section is fractionally reduced such reduced volume will transport to the intermediate enrichment section substantially the same amount of the desired material at an increased concentration, and
   (2) said final enrichment section comprises enrichment means of sufficient capacity to produce a final product of the prescribed concentration when said volume of enriched fluids delivered to said second enrichment section is not so fractionally reduced.

4,104,033

FOAM PREVENTION IN SODIUM CARBONATE CRYSTALLIZATION

Frederick Maho, Verona; Kenneth Breindel, Landing; Clyde Scanley, Morristown, and David Sexsmith, Kinnelon, all of N.J., assignors to Drew Chemical Corporation, Boonton, N.J.

Continuation-in-part of Ser. No. 612,641, Sep. 12, 1975, abandoned. This application May 20, 1976, Ser. No. 688,271
Int. Cl. B01d *9/02;* **C01d** *7/24*

U.S. Cl. 23—300 **16 Claims**

1. In a process for crystallizing a carbonate of sodium from an aqueous solution containing a carbonate of sodium, the improvement comprising:
   effecting said crystallization in the presence of a foam preventing amount of a defoamer consisting essentially of at least one water soluble oxyalkylene polymer, said oxyalkylene polymer being selected from the group consisting of oxyethylene homopolymers have a molecular weight of at least 200 and no greater than about 1,000,000; regular block copolymers of oxyethylene and oxypropylene wherein the molecular weight is at least 200 and no greater than from about 1,000 to about 4,500 when the oxyethylene content is from about 10 to about 50%, by weight, the molecular weight being at least 200 and no greater than about 4,500 to about 13,000 when the oxyethylene content is from about 50% to about 75%, and the molecular weight being at least 200 and no greater than from about 13,000 to about 1,000,000 when the oxyethylene content is at least 75%, by weight; and reverse oxyethylene-oxypropylene block copolymers wherein the molecular weight is at least 200 and no greater than about 2,400 to about 4,000 when the oxyethylene content is from about 10% to about 40%, by weight, with the molecular weight being at least about 200 and no greater than about 4,000 to about 1,000,000 when the oxyethylene content is above about 40%, by weight, said oxyalkylene polymer being in a form selected from the group consisting of glycols and glycols in which at least one of the terminal hydrogen atoms is substituted with a residue selected from the group consisting of a hydrocarbon alcohol having 1–5 carbon atoms, a hydrocarbon carboxylic acid having 1–5 carbon atoms, and a hydrocarbon amide having 1–5 carbon atoms.

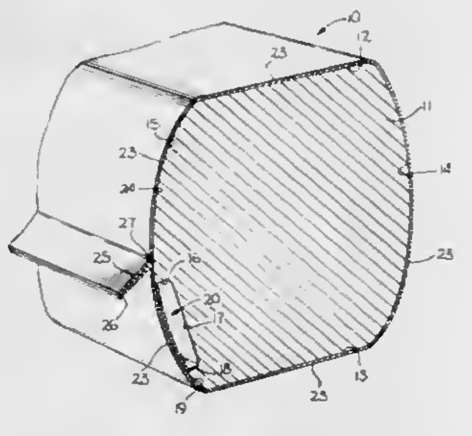
4,104,034

EASY LIGHTING FIREPLACE LOG

Kent Yengtsu Wu, and Roger S. Barron, both of Stockton, Calif., assignors to Duraflame, Inc., Stockton, Calif.

Continuation-in-part of Ser. No. 705,687, Jul. 15, 1976, abandoned. This application May 5, 1977, Ser. No. 793,947
Int. Cl.^{2} C10L *5/00, 11/00, 5/14*

U.S. Cl. 44—10 R **13 Claims**



12. An artificial fireplace log assembly comprising:
   an artificial fireplace log consisting substantially of comminuted cellulosic material and a wax bonding agent,
   an elongated groove in said log,
   a wrapper covering said log,
   a layer of combustible material disposed on said wrapper facing said groove and substantially out of contact with said log, said material comprising a high flash point resin, a gelling agent for inhibiting the combustible material from dripping off the wrapper when ignited and a wax binder, said wrapper functioning as a wick for said combustible material, and
   an elongated flap on the outside of said wrapper, said flap terminating adjacent an edge of said groove,
   whereby when said flap is ignited, the flame will burn through said wrapper to admit air into said groove, thereby providing sufficient oxygen to support ignition of said combustible material, the separation of said combustible material from said log preventing heat transfer away from said combustible material into said log so that said high flash point resin will be ignited by the burning flap and wicking action of said wrapper.

4,104,035

PREPARATION OF SOLID FUEL-WATER SLURRIES

Edward L. Cole, Fishkill; Howard V. Hess, Glenham, and Frank E. Guptill, Jr., Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,730
Int. Cl.^{2} C10L *1/32*

U.S. Cl. 44—51 **16 Claims**

1. A process for the preparation of a pumpable solid fuel-water slurry having a solids content measured on a dry basis of between about 50 and 60% by weight said solid fuel having a particle size such that at least 70% passes through a 200 mesh sieve which comprises subjecting finely-divided solid fuel selected from the group consisting of sub-bituminous coal and lignite to a hydrothermal treatment by forming a mixture of finely-divided solid fuel and water, heating the mixture to a temperature between about 300 and 700° F. under a pressure sufficient to maintain water in the liquid phase for a period of time between 1 minute and 2 hours under non-oxidizing conditions, separating the solid fuel from the water used to form said mixture and adding to said hydrothermally treated fuel having a particle size such that at least 70% passes through a 200 mesh sieve water in an amount to form a slurry containing about 50 to 60 wt. % solid fuel and also adding as a surface active agent a salt of an organic sulfonic acid in an amount to confer pumpability to said slurry.

4,104,036

IRON-CONTAINING MOTOR FUEL COMPOSITIONS AND METHOD FOR USING SAME

Tai S. Chao, Homewood, and Ernest H. Owston, Jr., Park Forest, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 8, 1976, Ser. No. 664,731
Int. Cl.^{2} C10L *1/18*

U.S. Cl. 44—56 **14 Claims**

1. A fuel composition comprising a major amount of hydrocarbons boiling in the gasoline boiling range; a minor amount capable of improving the octane rating of said composition of at least one hydrocarbon-soluble compound of iron; a minor amount of at least one aliphatic alcohol containing from 1 to about 8 carbon atoms and a minor amount of at least one organic peroxy component containing from 1 to about 20 carbon atoms, wherein said iron compound and the combination of said alcohol and said component are present in mutually activating amounts to improve the octane number rating of said fuel composition.

4,104,037

GASEOUS DIFFUSION SYSTEM

George A. Garrett, Oak Ridge, Tenn., and John Shacter, Stamford, Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 23, 1957, Ser. No. 685,762
Int. Cl.^{2} B01D *59/10*

U.S. Cl. 55—16 **9 Claims**

1. A gaseous diffusion system comprising a plurality of diffusers connected in cascade to form a series of stages, each of said diffusers having a porous partition dividing it into a high pressure chamber and a low pressure chamber, and means for combining a portion of the enriched gas from a succeeding stage with a portion of the enriched gas from the low pressure chamber of each stage and feeding it into one extremity of the high pressure chamber thereof.

4,104,038

DESORPTION OF VOLATILE COMPOUNDS DISSOLVED IN A LIQUID PHASE

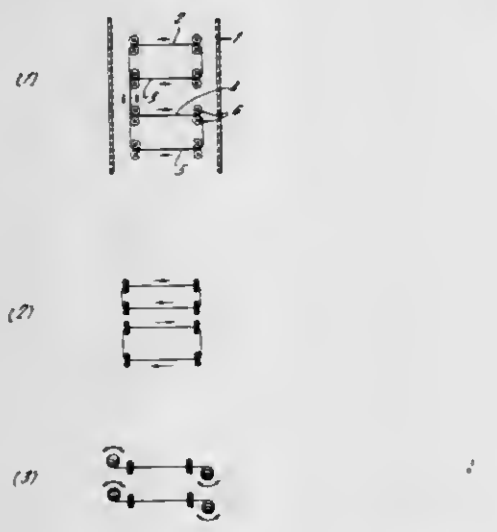
Christian Rubens Josis, Gembloux, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Jun. 15, 1976, Ser. No. 696,175

Claims priority, application Belgium, Jun. 24, 1975, 830595

Int. Cl.^{2} B01D *19/00*

U.S. Cl. 55—19 **6 Claims**



1. A method of desorption of volatile compounds from an aqueous liquid containing ammonia, by means of a stripping column, comprising the steps of supplying the aqueous liquid to the upper part of the column, blowing a gaseous mixture including free oxygen into the lower part of the column, supplying at least one of sodium hydroxide and calcium hydroxide to an intermediate part of the column at a plurality of levels, withdrawing a gaseous mixture including ammonia from the top of the column, measuring the pH and the temperature of the aqueous liquid at a plurality of levels in the column, controlling the flow rate of the aqueous liquid and the flow rate and temperature of the gaseous mixture blown in and of the hydroxide so that the pH of the aqueous liquid, at least in a predetermined zone in the column, is at least 11 and, subsequently reacting the ammonia content and oxygen content of the withdrawn gaseous mixture, the amount of oxygen in the gaseous mixture blown in being controlled so that substantially only water and nitrogen are produced.

4,104,039

PROCESS FOR CONCENTRATING OR LIQUEFYING A SPECIFIED COMPONENT OF A GASEOUS MIXTURE

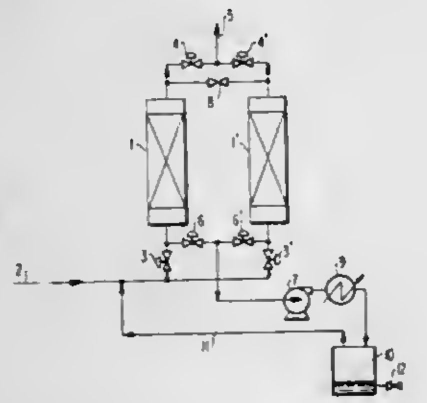
Setuya Kuri, Kamakura, and Sinji Fuwa, Yokohama, both of Japan, assignors to Kuri Chemical Engineers, Incorporated and Chlorine Engineers Corp., both of Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,566

Claims priority, application Japan, Oct. 22, 1975, 50-126337

Int. Cl.^{2} B01D *53/04*

U.S. Cl. 55—23 **9 Claims**



1. A process for concentrating or liquefying a specified component of a gaseous mixture as a product, characterized by a combination of a step comprising passing a starting gaseous mixture containing a dilute gaseous substance to be selectively separated as said specified component into one adsorbing layer of an adsorbing device consisting of a pair of adsorbing layers to allow it to adsorb the gaseous substance to be selectively separated, releasing the remainder of the gaseous mixture, and before the amount of the adsorbed gas in the said one adsorbing layer reaches saturation, switching the passing of the starting gaseous mixture over to the other of said adsorbing layers; a step comprising maintaining the pressure of the inside of the adsorbing layer which has adsorbed the gaseous substance to be selectively separated lower than the pressure of the starting gaseous mixture fed, feeding a part of the gas released from the other adsorbing layer which now has a low concentration of the gaseous substance to be selectively separated or an inert gas from outside the system to desorb the adsorbed gas and to obtain a gas rich in said gaseous substance to be selectively separated, again passing the starting gaseous mixture after the end of desorption into said one adsorbing layer, and switching the desorption of the adsorbed gaseous mixture over to the said other adsorbing layer; and a step comprising mixing the desorbed gas which is rich in said gaseous substance to be selectively separated with the starting gaseous mixture either directly or after separation of the resulting liquefied gas to thereby increase the concentration of said gaseous substance to be selectively separated in said starting gaseous mixture, and recycling and passing the resulting gaseous mixture having the increased concentration of said gaseous substance to be selectively separated through the adsorbing layer; wherein the recycling is repeated until the concentration of the specified component in the recycle gas to be passed into the adsorbing layer increases to the desired concentration or said component is liquefied, and the specified component having attained the desired concentration or the liquefied specified component is thereafter continuously recovered to maintain the gas recycling system always in balance and steady state while continuing the recycling, further, wherein the recycle gas concentration Cn (% by volume) is represented by the following general formula:

$$Cn(\%) = \frac{nCo}{nCo + \frac{P_0D}{P_1 - P_2} \times N} \times 100$$

wherein Co is the volume of adsorbate gas in the feed, D is the volume of primary-off gas, P_1 is the pressure of the feed starting gaseous mixture, P_0 is the reduced pressure, *n* is the recycling number until the concentration of the specified component in the recycle gas to be passed into the adsorbing layer reaches the desired concentration or said component is liquefied, Cn is the recycled gas concentration, wherein the concentration of Co is from 0.01 to 10% (by volume), the recycling number *n* is at least 5, $P_0/P_1 - P_0$ is a value not larger than about 0.3, and N is a value of from about 1.2 to about 10.

4,104,040

USE OF S-TRIAZINE DERIVATIVES IN A GAS CHROMATOGRAPHIC METHOD

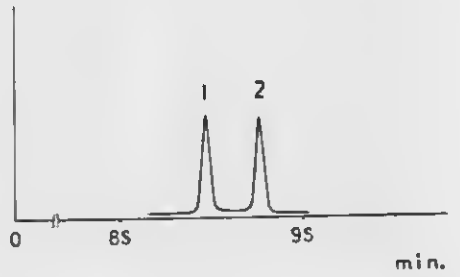
Naobumi Oi; Koichi Moriguchi, both of Kyoto, and Mari Matsuda, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

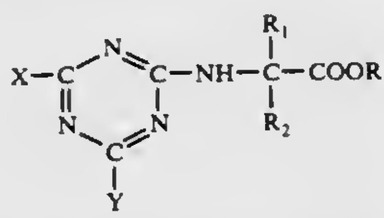
Division of Ser. No. 660,680, Feb. 23, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 760,849

Int. Cl.^{2} B01D *15/08*

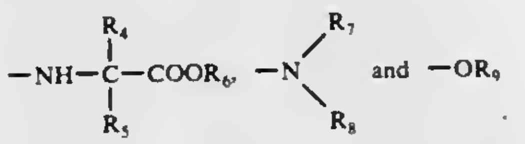
U.S. Cl. 55—67 **11 Claims**

1. In a gas chromatographic method for the resolution and analysis of a mixture of enantiomers having an —NH— group linked to an asymmetric carbon atom or to an atom in the α-position with respect to an asymmetric carbon atom comprising reacting said mixture with an optically active reagent to form the diastereomers and resolving and analyzing the diastereomers on an optically inactive stationary phase, the improvement which comprises using as the stationary phase an s-triazine derivative with at least one asymmetric carbon atom of the following general formula:





wherein R_1 and R_2 are different and are each hydrogen, an alkyl having 1 to 8 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl; R_3 is an alkyl having 1 to 12 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl; and X and Y are the same or different and are each a member selected from the group consisting of the moieties:



$$-NH-\overset{R_4}{\underset{R_5}{C}}-COOR_6,\quad -N\begin{matrix}R_7\\R_8\end{matrix}\quad \text{and}\quad -OR_9$$

wherein R_4, R_5, R_7, R_8 and R_9 are the same or different and are each hydrogen, an alkyl having 1 to 8 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl; and R_6 is an alkyl having 1 to 12 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl.

4,104,041

APPARATUS AND METHOD FOR TREATING WASTE GAS FROM UREA PRILLING TOWER

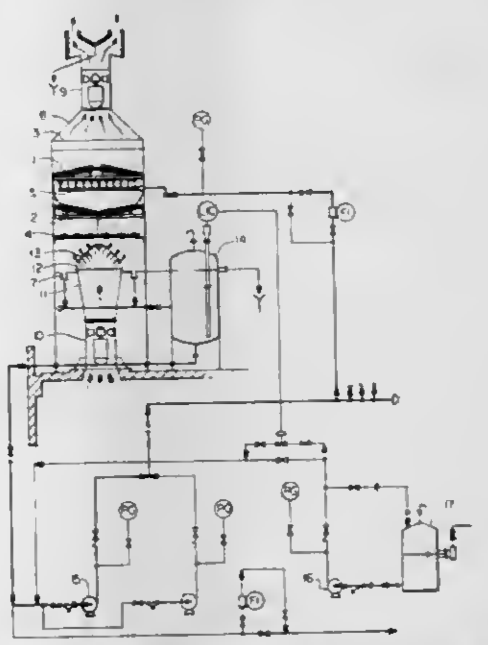
Hidemasa Arita, Hunabashi; Hitoshi Tomiyama, Tokyo, and Shigeyasu Mori, Tama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Japan

Filed Dec. 8, 1976, Ser. No. 748,541

Int. Cl.^{2} B01D *47/00*

U.S. Cl. 55—90 **10 Claims**

1. A process for treating waste gas from a urea prilling tower employing a scrubbing solution, said waste gas containing hydrophilic and water-soluble fumes, which process is characterized by that in a scrubbing tower, which is provided with a perforated tray, a slightly inclined lower mesh tray, a spraying device of scrubbing solution, a slightly inclined upper mesh tray, and a demister, the waste gas is caused to flow successively through the perforated tray, the lower mesh tray, the upper mesh tray and the demister; scrubbing solution is sprayed co-currently with the flow of said waste gas from a position between the upper mesh tray and lower mesh tray onto the underside of said upper mesh tray from a plurality of nozzles uniformly distributed throughout the cross-sectional area of the scrubber to cause the scrubbing solution to fully wet the entire surface of said upper mesh tray and to form a continuous liquid film on said upper mesh tray; and causing said liquid film to flow from said upper mesh tray to said lower mesh tray and thereby form a coninuous film on said lower mesh tray and to thereafter flow to the perforated tray, and thus, the waste gas, which is introduced into said scrubbing tower from the bottom while said scrubbing solution is discharged from said tower wetting said perforated tray, is contacted with said scrubbing solution on each of the above described trays so as to remove the fumes in said waste gas, and further mist, which is the liquid entrainment with said waste gas when it passes through the upper mesh tray, is recovered by means of said demister.



4,104,042

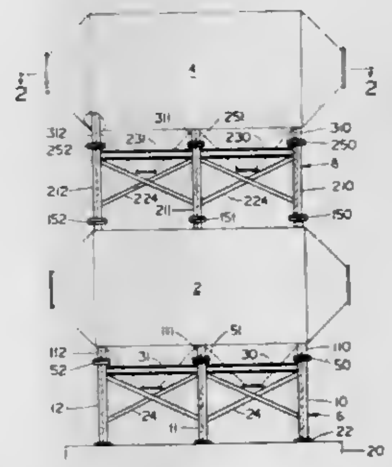
MULTI-STORIED ELECTROSTATIC PRECIPITATOR

Nicholas J. Brozenick, Clarksville, Ind., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 29, 1977, Ser. No. 792,240

Int. Cl.^{2} B03C *3/82*

U.S. Cl. 55—101 **2 Claims**



1. A multi-storied electrostatic precipitator comprising:

a base support including a vertically extending member at each corner;

a first electrostatic precipitator including a vertically extending member at each corner in alignment with and movably fastened to a respective one of said vertically extending members of said base support to provide pairs of vertically extending members with first horizontal sliding means disposed therebetween, said first horizontal sliding means including a connection assembly connecting each pair of aligned vertically extending members, said connection assembly including a pair of plate members, one plate member being attached on one face to said vertically extending member of said first electrostatic precipitator, the other plate member being attached on one face to said vertically extending member of said base support with a sliding connection assembly disposed therebetween, said sliding connection assembly including a first slide pad attached to an opposed face of said one plate member and a second slide pad attached to an opposed face of said other plate member, said first slide pad and said one plate member having aligned elongated slots therein in parallel alignment with a plane passing through the center of said multi-storied electrostatic precipitator and the corner of said first electrostatic precipitator to which said connection assembly is disposed, said second slide pad and said other plate member having aligned openings therein in vertical alignment with said elongated slots, and bolt means passing through said aligned slots and openings whereby said first electrostatic precipitator is freely movable for a distance defined by the length of said elongated slots;

an intermediate support mounted onto said first electrostatic precipitator with second horizontal sliding means disposed therebetween; and,

a second electrostatic precipitator mounted onto said intermediate support with third horizontal sliding means disposed therebetween whereby said first and second electrostatic precipitators are movable in a horizontal direction independent of each other.

4,104,043

ESTERS OF 3-HYDROXYINDONE COMPOUNDS AS HERBICIDES AND MITICIDES

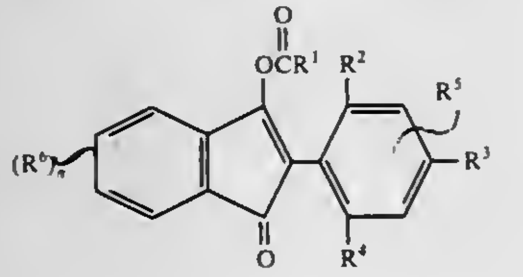
John A. Durden, Jr., South Charleston; Anthony A. Sousa, St. Albans, both of W. Va., and John F. Stephen, New City, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 12, 1972, Ser. No. 314,370

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—107 **34 Claims**

1. A pre-emergent herbicide comprising an extender and as an active toxicant a herbicidally effective amount of a compound having the structural formula:



wherein:

R^1 is hydrogen, halogen or an organic radical;

R^2 is hydrogen, methyl, ethyl, methoxy, ethoxy, fluorine, chlorine, bromine, trichloromethyl, trifluoromethyl or mixed chlorofluoromethyl;

R^3 is hydrogen, lower alkyl, lower alkoxy, fluorine, chlorine, bromine, nitro, acylamido, trichloromethyl, trifluoromethyl or mixed chlorofluoromethyl;

R^4 is methyl, ethyl, methoxy, ethoxy, fluorine, chlorine or bromine;

R^5 is hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, acylamido, fluorine, chlorine or bromine;

R^6 is hydrogen, lower alkyl, lower alkoxy, fluorine, chlorine, bromine, trifluoromethyl, trichloromethyl or acylamido;

n is a small whole number from 1 to 4; and

R^2 and R^5 or R^4 and R^5 taken together, may be —CH=CH—CH=CH— with the proviso that when R^4 is ethyl, methoxy or ethoxy R^2, R^3 and R^5 may not all be hydrogen.

4,104,044

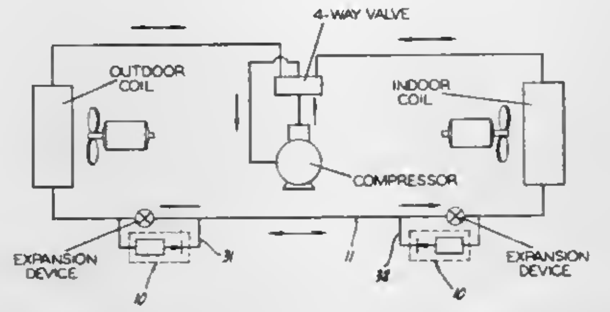
BIDIRECTIONAL FLOW FILTER-DRIER ASSEMBLY

Harold T. Lange, St. Louis, Mo., assignor to Sporlan Valve Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 729,670, Oct. 5, 1976, Pat. No. 4,029,580. This application Apr. 21, 1977, Ser. No. 789,360

Int. Cl.^{2} B01D *39/02;* **F25B** *13/00*

U.S. Cl. 62—324 **4 Claims**



1. A filter-drier assembly for heat pump systems in which a compressor is connected by mode-switching valve means to an outdoor coil and an indoor coil, a liquid line interconnects the coils, and first and second expansion devices are located in the liquid line, the first expansion device being located ahead of the outdoor coil for use in one mode of operation, and the second expansion device being located ahead of the indoor coil for use in the other mode of operation, comprising:

(a) a pair of bypass lines in the liquid line, each bypass line circumventing one of the expansion devices, and

(b) a filter-drier unit in each bypass line, each filter-drier unit including a check valve means enabling flow through the associated bypass line and filter-drier unit in one direction and precluding flow in the opposite direction.

4,104,045

THERMALLY STABLE QUARTZ GLASS

Manfred Mansmann, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 6, 1976, Ser. No. 702,835

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530808

Int. Cl.^{2} C03B *37/00, 32/00;* **C04B** *35/64*

U.S. Cl. 65—2 **6 Claims**

1. The process for the production of SiO_2 fibers consisting essentially of hydrolyzing a silicate ester to form an alkali metal and alkaline earth metal-free SiO_2-containing solution or sol, adding a high molecular weight filament-forming material selected from the group consisting of a polymeric C_1 to C_4 alkylene oxide, polyvinyl alcohol, polyvinyl acetate, polyvinyl pyrrolidone, polyvinyl butyral, polymethacrylate, cellulose derivative and polyacrylamide, incorporating into said solution or sol at least one alkali metal and alkaline earth metal-free compound of chromium or manganese in about 0.05 to 20% by weight expressed as Cr_2O_3 and Mn_2O_3 based on SiO_2, spinning said solution or sol to form filaments, and subjecting said filaments to a thermal treatment to effect crystallization, whereby the resulting filaments are of improved thermal stability.

4,104,046

TEMPERATURE CONTROL FOR THE FORMING UNITS OF A MACHINE OF THE PRESS AND BLOW TYPE

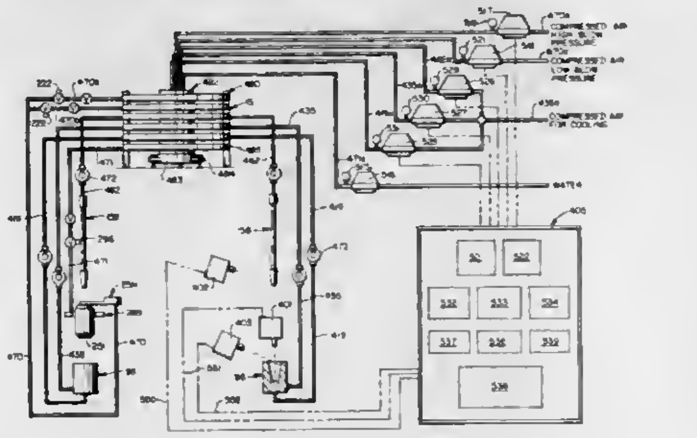
Cecil Wayne McCreery, Columbus, Ohio, assignor to Glass Industry Consultants, Inc., Columbus, Ohio

Filed Jun. 16, 1977, Ser. No. 807,169

Int. Cl.^{2} C03B *9/40, 11/12*

U.S. Cl. 65—161 **28 Claims**

1. Apparatus for forming articles from charges of deformable hot material which includes an implement for forming successive charges of the hot material into shaped articles and thereby absorbing some of the heat from the charges, means for subjecting the implement to temperature-controlling fluid, and means for automatically controlling the supply of that fluid by temperature-sensing means directed at said implement subsequent to each forming operation so that it will be at the proper controlled temperature for forming the successive charges; said means for subjecting the implement to temperature-controlling fluid supplying it continuously, and said means for automatically controlling the supply of that fluid varying it in accordance with the temperature of the implement sensed by said temperature-sensing means; said means for subjecting the implement to temperature-controlling fluid including fluid passages in said implement; said forming implement including a mold for receiving the charge and a plunger for pressing the charge in the mold, said passages being formed in said mold and in said plunger; said means for automatically controlling the supply of temperature-controlling fluid comprising independent means for controlling the supply to the passages of the mold and the plunger including independent temperature-sensing means directed at the mold and the plunger; said mold and cooperating plunger producing a pressed blank; said apparatus including blow molds for receiving the successive blanks, said temperature-controlling means causing the successively formed blanks to be at a proper controlled temperature for blowing; a rotatable turret which carries a plurality of forming units each of which includes one of said blank molds and a cooperating plunger for pressing a blank and a blow mold for subsequently blowing the blank into final shape, said temperature-sensing means being located around the turret to sense the blank mold after the article is formed therein and the plunger after it has been withdrawn from the blank mold in which it pressed the blank; a fluid supply unit mounted in cooperative relationship with said turret, said independent means for controlling the supply of fluid to the passages of the mold and plunger including a separate supply line connected to each, said fluid supply unit comprising manifolds which rotate with said turret and are connected to each of said supply lines, and a source of supply connected to said manifolds to permit relative rotation thereof.



4,104,047

SUPPORTING GLASS GRIPPING TONGS DURING GLASS SHEET PROCESSING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 23, 1977, Ser. No. 799,411

Int. Cl.^{2} C03A *23/02*

U.S. Cl. 65—273 **5 Claims**

1. Apparatus for press bending glass sheets, comprising:

a furnace for heating glass sheets to a softened condition;

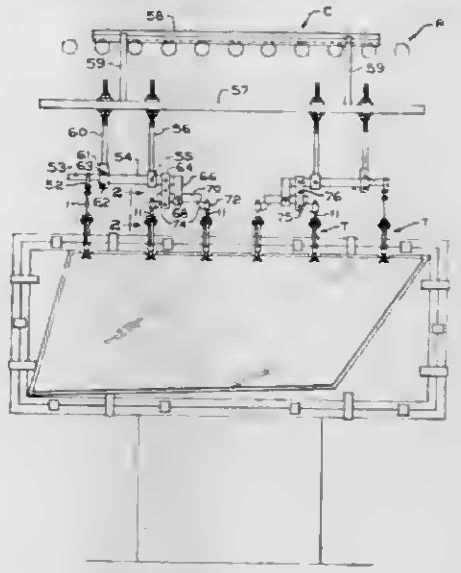
conveyor means extending horizontally from the furnace over a bending position in a longitudinal direction defining a direction of glass travel;

a pair of opposed complementary bending molds mounted for reciprocation in a direction transverse to the direction of glass travel toward opposite sides of said bending position so as to bend a vertically suspended glass sheet therebetween;

a carriage adapted for movement by the conveyor means in the direction of glass travel;

first pivot means supported by the carriage with essentially no freedom of motion in the direction of glass travel relative to the carriage;

a first pivot bar rotatably affixed to the carriage by way of said pivot means so as to permit rotation of the bar in a vertical plane parallel to the direction of glass travel;



stop means carried by the carriage for limiting the rotation of the pivot bar to a small angle from horizontal; and

a set of glass-gripping tongs affixed to each end of the pivot bar so as to swing freely in transverse planes with essentially no freedom to oscillate in the longitudinal direction of glass travel.

4,104,048

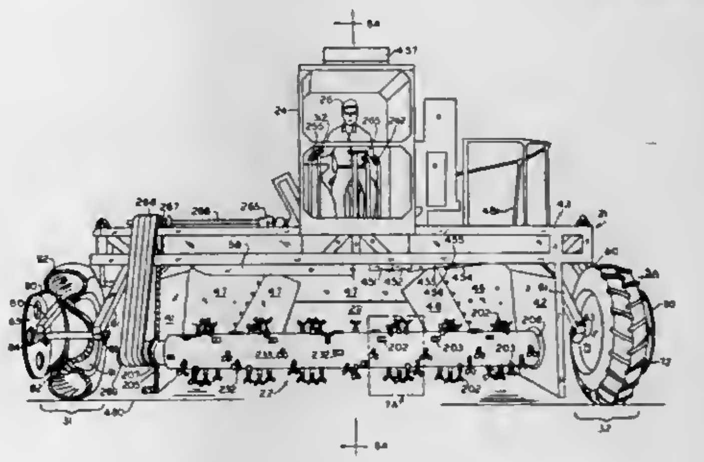
MANURE TREATING PROCESS

Marvin L. Urbanczyk, Rte. 2, White Deer, Tex. 79097

Continuation-in-part of Ser. No. 550,272, Oct. 18, 1975, Pat. No. 4,019,723. This application Dec. 16, 1976, Ser. No. 751,153

Int. Cl.^{2} C05F *11/08*

U.S. Cl. 71—9 **8 Claims**



1. A process of treating masses of manure from cattle feedlots, said masses comprising dimensionally stable lumps of size in excess of ½ inch diameter and containing portions from ½ inch diameter to —40 mesh size, which process comprises the sequence of steps of

(1) arraying said masses of manure in horizontally elongated dimensionally stable ground supported piles of substantially uniform transverse cross section and exposed to the atmosphere;

(2) adding water to each of said piles to bring the percentage moisture thereof to the mass of said pile within the range of 25% to 35% water by weight;

(3) flailing portions of the resultant stationary dimensionally stable masses by passing a series of flails in one horizontal direction through an agitating zone in said stationary resultant dimensionally stable mass, said series of flails

extending horizontally and transversely to said one horizontal direction, each of said series of flails moving in an upward direction while said flail moves in said one direction to selectively reduce the amount of material in said resultant mass which material is in form of lumps in excess of ½ inch in diameter, while not substantially affecting the −40 mesh particles; said flailing occurring in such agitating zone;

(4) and raising a portion of said resultant mass and creating confined zone of temporarily raised and dispersed particles above and in back of said agitating zone and adding moisture to said confined zone of temporarily raised and dispersed particles and wherein the finer particles of said resultant mass are moved to the top and center of said confined zone of temporarily raised and dispersed particles and moisture is applied to said finer particles in said confined zone concomitant in time and place with said flailing of said mass in said agitating zone, and forming from said dispersed particles an elongated treated ground supported dimensionally stable pile of granular particulate mass containing 25% to 30% by weight of water wherein said moistened finer particles selectively applied to the outside of the treated pile; and

(5) after each of a plurality of periods of time during which the thus treated pile mass is subjected to bacterial action and air to form a resultant dimensionally stable treated pile, and

(6) sequentially flailing successive portions of said dimensionally stable treated pile by passing a series of flails in a horizontal direction through a second agitating zone in said dimensionally stable treated pile, said series of flails extending horizontally and transversely to said last horizontal direction, each of said series of flails moving in an upward direction while said flails move in said last horizontal direction to selectively reduce the amount of material in said resulting treated pile which is in form of lumps in excess of ½ inch in diameter, while not substantially affecting the −40 mesh particles; and then raising a portion of said pile and creating a second confined zone of temporarily raised and dispersed particles above and in back of said second agitating zone and adding moisture to said raised confined second zone of temporarily raised and dispersed particles;

(7) and wherein the finer particles of said treated pile are moved to the top and center of said second confined zone of temporarily raised and dispersed particles and wherein moisture is selectively applied to the finer particles in said second confined zone concomitant in time and place with said flailing of said mass in said second agitating zone;

(8) and forming from said dispersed particles a second elongated treated ground supported heterogeneous pile of granular particulate mass containing 25% to 30% by weight of water and substantially free of odor and wherein said moistened finer particles are selectively applied to the outside of said second pile.

4,104,049

CHLORINE-SUBSTITUTED VINYLAMINOBENZOIC ACID COMPOUNDS AND PLANT GROWTH REGULANT COMPOSITIONS

Fritz Maurer; Hans-Jochem Riebel; Rolf Schroder, all of Wuppertal, and Klaus Lürssen, Berg.Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

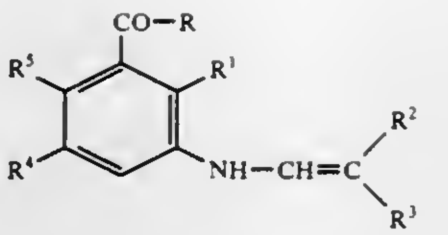
Filed Oct. 20, 1976, Ser. No. 734,478

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550519

Int. Cl.^{2} A01N *5/00, 9/20;* C07C *101/54, 121/78*

U.S. Cl. 71—76 **22 Claims**

1. Chlorine-substituted vinylaminobenzoic acid compound of the formula



(I)

in which

R is hydroxyl, alkoxy of from 1 to 4 carbon atoms or monoalkylamino of from 1 to 3 carbon atoms,

R^1, R^4 and R^5 are individually selected from hydrogen and chlorine, provided that at least one of R^1, R^4 and R^5 is chlorine,

R^2 is alkylcarbonyl of from 1 to 4 carbon atoms in the alkyl moiety or carbalkoxy of from 1 to 4 carbon atoms in the alkoxy moiety; and

R^3 is cyano, alkylcarbonyl of from 1 to 4 carbon atoms in the alkyl moiety or carbalkoxy of from 1 to 4 carbon atoms in the alkoxy moiety.

19. Method of influencing plant growth which method comprises applying to plants or their habitat an effective amount of a chlorine-substituted vinylaminobenzoic compound as claimed in claim 1.

4,104,050

ACETIMIDIC (α-DIARYLOXYPHOSPHINYLMETHYLAMINO) ACID ESTER HYDROCHLORIDES, HERBICIDAL COMPOSITION AND HERBICIDAL USE THEREOF

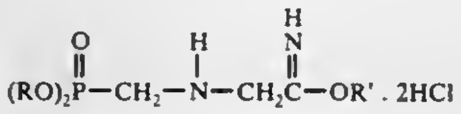
Gerard A. Dutra, Ladue, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 20, 1977, Ser. No. 807,953

Int. Cl.^{2} A01N *9/36;* C07F *9/40*

U.S. Cl. 71—86 **30 Claims**

1. A compound of the formula



$$(RO)_2\overset{\overset{O}{\|}}{P}-CH_2-\overset{\overset{H}{|}}{N}-CH_2\overset{\overset{\overset{H}{N}}{\|}}{C}-OR' \,.\, 2HCl$$

wherein R is phenyl or a lower alkyl substituted phenyl group said lower alkyl containing 1 to 4 carbon atoms and R′ is a primary or secondary alkyl group containing 2 to 10 carbon atoms, cyclohexyl, phenyl or a lower alkyl, lower alkoxy or chlorosubstituted phenyl group said lower alkyl and lower alkoxy containing 1 to 4 carbon atoms.

11. A herbicidal method which comprises applying to plants a herbicidally effective amount of a compound of claim **1**.

4,104,051

SUBSTITUTED BROMO- OR CHLORO-ACETAMIDE HERBICIDES

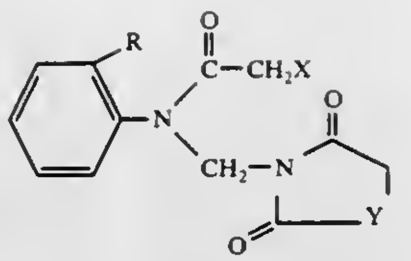
Jün Duey Cheog, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 667,279, Mar. 15, 1976, Pat. No. 4,055,410. This application Aug. 1, 1977, Ser. No. 820,883

Int. Cl.^{2} A01N *9/22;* C07D *233/72*

U.S. Cl. 71—92 **12 Claims**

1. A compound of the formula:



where

R is alkyl or alkoxy of 1 to 4 carbon atoms;

X is chlorine or bromine; and

Y is N—CH_3.

5. A composition for the control of undesirable vegetation consisting essentially of a herbicidally effective amount of a compound of claim **1** and at least one of (a) a surface-active agent or (b) a solid or liquid diluent.

4,104,052

PLANT GROWTH REGULANTS

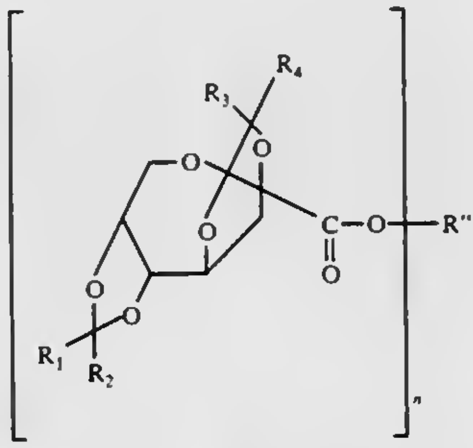
William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 481,265, Jun. 20, 1974, Pat. No. 3,981,860, which is a continuation-in-part of Ser. No. 344,657, Mar. 26, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,916

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 71—88 **56 Claims**

1. A plant growth regulating composition comprising inert growth regulating adjuvant and, as the active ingredient, an amount effective in regulating plant growth of a compound of the formula:



wherein, when *n* is 1, R″ is hydrogen, sodium, potassium, ammonium, substituted ammonium, straight or branched chain alkyl of from 1 to 12 carbon atoms, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, or halo-lower alkyl and, when *n* is 2, R″ is calcium or lower alkylene; R_1, R_2, R_3 and R_4 are hydrogen, straight or branched chain, lower alkyl, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, halo-lower alkyl, phenyl, (lower alkoxy) phenyl or R_1 and R_2 together and R_3 and R_4 together are each a saturated ring containing from 3 to 8 carbon atoms and wherein the combination of the substituents of R_1 and R_2 is the same as the combination of the substituents of R_3 and R_4; *n* is an integer from 1 to 2 and X is a number from 0 to 1.

4,104,053

3-BENZYL-2-METHYLIMINO-5-PHENYL-Δ^4-1,3,4-THIADIAZOLINES AND METHOD OF COMBATING UNDESIRED PLANT GROWTH

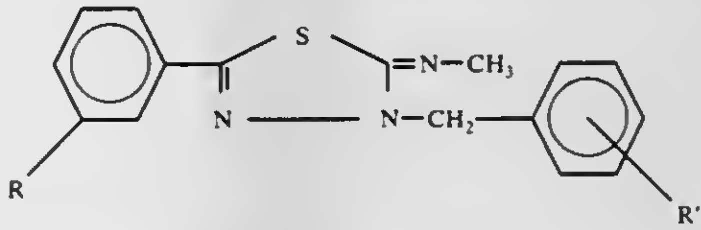
Norman A. Dahle, deceased, late of Lenexa, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sep. 4, 1974, Ser. No. 503,211

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—90 **11 Claims**

1. The method of combating weeds in grain fields which comprises applying to the area where the combating effect is desired a herbicidally effective amount of a compound of the formula



in which R is methyl or chloro and R′ is hydrogen, methyl, trifluoromethyl, chloro or fluoro, said compound being applied either in unmodified form or in the form of a salt with an acid in combination with an inert carrier.

4,104,054

N^1-CHLORO-3,5-DINITROSULFANILAMIDES

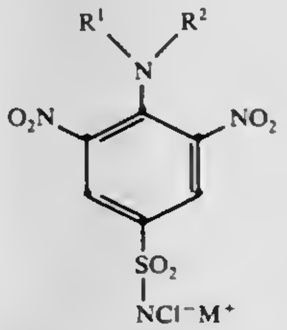
James Richard Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 9, 1976, Ser. No. 748,856

Int. Cl.^{2} A01N *9/14*

U.S. Cl. 71—103 **21 Claims**

1. A compound having the formula



wherein each of R^1 and R^2 is independently C_1–C_6 alkyl, C_2–C_4 alkenyl, halo C_1–C_6 alkyl or cyclopropylmethyl; and M is sodium or potassium.

9. A pesticidal composition comprising a compound of claim **1** and a carrier.

16. A method for the control of undesired vegetation in an area which comprises applying to said area a herbicidally effective amount of a compound of claim **1**.

19. A method for reducing the incidence and severity of grape downy mildew which comprises applying to the foliage of the host plant a fungicidally effective amount of a compound of claim **1**.

4,104,055
PROCESS FOR WORKING UP COPPER CEMENTATE SLUDGES

Karl Lippert, and Heinz Planken, both of Duisburg, Germany, assignors to Duisburger Kupferhutte, Duisburg, Germany

Filed Mar. 18, 1974, Ser. No. 452,484

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1973, 2315614

Int. Cl.^{2} C22B *1/00, 1/11*

U.S. Cl. 75—1 R **9 Claims**

1. A process for recovering metallic values from arsenic-containing copper cementate sludges, which comprises:

a. admixing the cementate with lime in an amount sufficient to form calcium sulfate by reaction with any water-soluble sulfates present in the cementate, and calcium arsenate from the arsenic present in the cementate,

b. roasting the admixture produced in step (a) in an oxygen-containing atmosphere at a temperature above about 300° C, to oxidize the metallic values to a state in which said values are soluble in aqueous acid,

c. leaching the roasted material produced in step (b) with aqueous acid to dissolve said values.

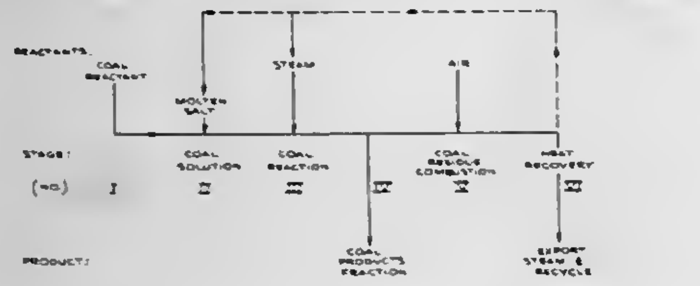
4,104,056
ORE REDUCTION USING MOLTEN SALTS

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Division of Ser. No. 512,539, Oct. 7, 1974, Pat. No. 3,966,583. This application Dec. 29, 1975, Ser. No. 644,712

Int. Cl.^{2} C21B *13/00*

U.S. Cl. 75—33 **3 Claims**



1. In the process of sequentially hydrogenating carbonaceous solid fuel reactant with in situ steam derived hydrogen to produce hydrocarbons and a fuel reactant residuum, comprising recovering produced hydrocarbons, and oxidizing the fuel reactant residuum to produce heat energy by mixing said fuel reactant in a molten inorganic halide salt to form a solution of the fuel reactant in said salt in advance of and for the hydrogenation reaction and maintaining the fuel reactant residuum from the hydrogenation so dissolved for the oxidation thereof; the improvement effecting said oxidation by ore reduction which comprises adding a group VIII metal ore to said fuel reactant residuum-salt solution and reducing said ore to metal by reaction with said residuum while simultaneously oxidizing said ore to produce heat energy.

4,104,057
METHOD FOR MAKING LOW CARBON HIGH CHROMIUM ALLOYED STEELS

Hermann Maas, Niermannsweg 11, Gelsenkirchen, and Franz-Josef Habn, Gabelsberger Str. 9, Dortmund, both of Germany

Division of Ser. No. 685,771, May 12, 1976, abandoned, and a continuation of Ser. No. 366,491, Jun. 4, 1973, abandoned. This application Jun. 4, 1976, Ser. No. 692,758

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1972, 2228462

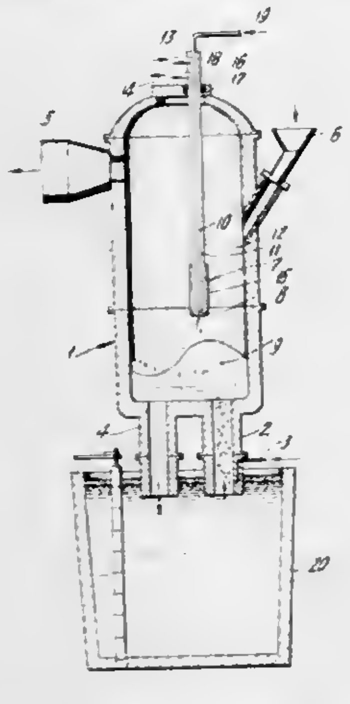
Int. Cl.^{2} C21C *7/10;* C22C *33/00*

U.S. Cl. 75—49 **5 Claims**

1. In the process of producing a high chromium, low carbon alloy steel from a melt of high chromium, high carbon steel through the oxidation of carbon with oxygen and the removal of CO and CO_2 gas while minimizing the oxidation of chromium and the resulting formation of chromium slag, by positioning a recycle vacuum degassing unit in which there is a vacuum chamber with two depending open-ended legs, one of which is a riser leg and the other of which is a down leg with the chamber at an elevation where the said legs project through said slag layer into the molted metal in the ladle beneath said slag layer, the vacuum degassing unit having means maintaining upward flow of molten metal in the riser leg and sufficient vacuum in the degassing chamber that there is an area of turbulence at the surface of the molten metal in the degassing chamber where the metal from the riser enters said chamber and having a lance in the top thereof and adjustable vertically above said area of turbulence, the steps comprising:

(a) charging a melt of high chromium, high carbon steel with its attendant slag into an open top ladle exposed to the ambient air where the slag forms a protective covering over the molten metal against exposure of the molten metal to the ambient air;

(b) then continuously circulating molten steel substantially free of slag from a level below the slag in the ladle upwardly through the riser leg of the recycle vacuum degassing chamber which is maintained throughout the operation under a partial vacuum and from the degassing chamber returning the molten metal through the down leg of the degassing chamber to the metal in the ladle below the covering slag through a first time period of operation;



(c) in the first time period of such circulation of the metal through the vacuum degassing chamber oxidizing carbon in the molten steel with oxygen gas inherently present and contained in the steel and withdrawing gases generated by such oxidation along with other gases emitted from the steel until degassing of the steel is substantially completed and while elevating the lance above the area of turbulence to a level where it is substantially free of being splashed by the metal;

(d) immediately following the first time period of degassing, continuing the circulation of the molten metal through the degassing chamber, as previously recited, through a second time period while projecting oxygen gas against the turbulent surface of the upflowing molten metal where it enters the degassing chamber through the riser leg and with the lance moved lower to said area of turbulence to thereby then rapidly oxidize the carbon at said surface while oxidation of the chromium in the molten steel is substantially prevented by the rapid displacement of the decarbonized surface metal by reason of the surface turbulence of the incoming metal followed by the quick discharge of the moltem metal after such local exposure to the oxygen back into the ladle, a partial vacuum being maintained in the degassing chamber during this second time period with the withdrawal of reaction and other gases as produced;

(e) immediately following said second time period of oxidation of the metal with oxygen gas and when the carbon content of the metal has been reduced to a predetermined level, continuing the circulation of the molten metal from the ladle through the vacuum degassing chamber for a third time period but with the oxygen gas discharged from the lance now reduced and diluted with an inert gas while maintaining the volume of the mixture of oxygen and inert gas substantially the same as the volume of oxygen alone in said second time period until a final level of minimum carbon content in the molten metal is reached with the lance again raised to a higher level above said area of turbulence to increase its area of contact with the incoming metal, and while continuing to maintain a partial vacuum in the degassing chamber for this third period of time; and

(f) thereafter terminating the operation of the degassing unit, deoxidizing the molten metal and effecting the required correction of alloying ingredients made and the molten metal then discharged from the ladle.

4,104,058
STEELMAKING

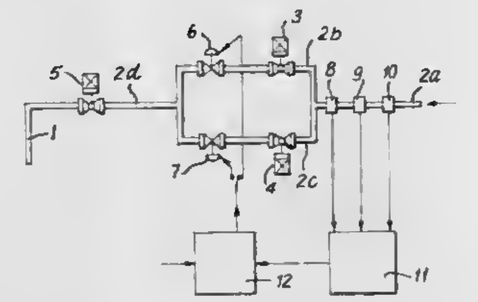
Hugh Willmott Grenfell, and David James Bowen, both of Swansea, Wales, assignors to British Steel Corporation, London, England

Continuation-in-part of Ser. No. 675,795, Apr. 12, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,793

Claims priority, application United Kingdom, Apr. 11, 1975, 15039/75

Int. Cl.^{2} C21C *5/30*

U.S. Cl. 75—60 **12 Claims**



1. A method for enabling the refining of a molten steelmaking charge to be ceased when the temperature of the steel is at a desired value, the method comprising the steps of:

(a) injecting oxygen into the molten steelmaking charge,

(b) measuring the weight of the vessel at time t,

(c) measuring the weight of the vessel at time $t + dt$,

(d) measuring dw/dt where dw/dt is the weight change of the charge in time increment dt,

(e) determining dc/dt from the equation $dc/dt = [(dOt/dt) - (dw/dt)]/2.33$ where dc/dt is the rate of decarburisation, dOt/dt is the rate at which oxygen is being supplied to the charge and 2.33 is the ratio molecular weight CO: molecular weight C,

(f) determining dOs/dt from the equation $dOs/dt = dw/dt + dc/dt$ where dOs/dt is the rate at which oxygen enters the steelmaking slag,

(g) inserting the values of dc/dt and dOs/dt in the equation: charge weight × [(heat content of the charge at time $t + dt$) − (heat content of the charge at time t)] = dc/dt × heat of combustion of C + dOs/dt × molecular weight factor to convert O content to Fe content used in combustion × heat of combustion of Fe − $d(W.G.)/dt$ × waste gas heat content − $d(H.L.)/dt$ where $d(W.G.)/dt$ is the rate at which waste gas is produced and $d(H.L.)/dt$ is the rate at which unaccountable heat losses occur,

(h) determining from the equation the temperature of the charge at time $t + dt$,

(i) repeating steps (a) to (h) above for further time increments dt until the desired value of the molten steel temperature has been determined, and

(j) ceasing oxygen injection at the time corresponding to the time at which the molten steel reaches the desired temperature.

4,104,059
MOLYBDENUM-TITANIUM-ZIRCONIUM-ALUMINUM MASTER ALLOYS

Frederick H. Perfect, Wyomissing, Pa., assignor to Reading Alloys, Inc., Robesonia, Pa.

Filed May 27, 1977, Ser. No. 801,086

Int. Cl.^{2} C22C *21/00*

U.S. Cl. 75—134 F **3 Claims**

1. A molybdenum-titanium-zirconium-aluminum master alloy comprising from about 35 to about 40% molybdenum, from about 1 to about 5% titanium, from about 15 to about 25% zirconium, balance aluminum, said alloy containing not more than about 0.004%, by weight, nitrogen.

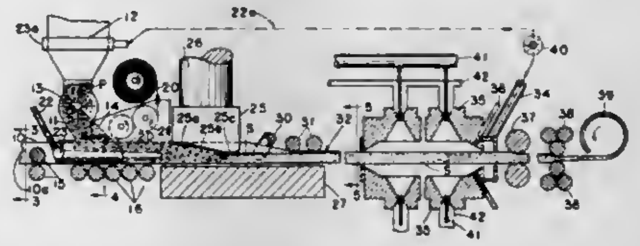
4,104,060
SOLID-PHASE CONVERSION OF PARTICULATE METAL INTO CONTINUOUS STRIP

Herbert G. Johnson, 17 N. Drexel Ave., Havertown, Pa. 19083

Continuation-in-part of Ser. No. 557,394, Mar. 11, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,435

Int. Cl.^{2} B22F *3/12, 9/00*

U.S. Cl. 75—208 CS **18 Claims**

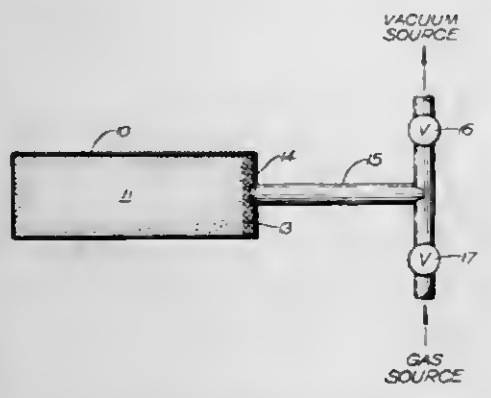


1. The method of converting particulate metal into continuous strip without melting, which comprises, feeding into a feeding enclosure a plurality of sheet metal jacket components which together will form a complete jacket around a core of metal particles, feeding particulate metal to form a core between the advancing jacket components, feeding a protective gas under pressure between the jacket components and into the particulate metal to purge the air from said particulate metal and from said feeding enclosure, bringing the jacket components together to form a complete gas-retaining jacket over the core of particulate material, and compacting the composite strip of core and jacket while still filled with protective gas under pressure, with some of the gas in the composite strip being forced back by the compacting action toward the feeding enclosure.

12. Apparatus for continuously converting particulate metal material into strip of indefinite length without melting, comprising in combination, means for sealingly feeding to a feeding enclosure filled with protective gas under pressure a plurality of metal jacket sheet components which together form a longitudinally and circumferentially complete jacket around the metal core of the strip, means for sealingly feeding particulate metal material between the jacket components in the feeding enclosure, the jacket sheet components as fed in forming a complete enclosure over a core of material, means for injecting air-purging protective gas into the particulate metal, and means for compacting the jacketed strip as it moves along after the jacket components have been closed over the core material and while the interior of the jacketed strip is still in communication with the protective gas within the feeding enclosure.

4,104,061
POWDER METALLURGY

Sidney G. Roberts, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Oct. 21, 1976, Ser. No. 734,575
Int. Cl.^{2} B22F *3/00*
U.S. Cl. 75—211 **36 Claims**



1. A method of preparing essentially porosity free powder metallurgical products comprising:

(a) subjecting powdered metal or a porous compact thereof to a plurality of treatment cycles to remove volatile and gaseous contaminants, each of said cycles comprising a vacuum treatment of the powder or compact followed by infusion thereof with a depurative gas;

(b) controlling the temperature of the environment surrounding the powder or compact during said treatment cycles to above 400° F and increasing said temperature during said cycles so that upon completion of the treatment cycles the temperature of the powder or compact is essentially at the desired level for compacting;

(c) developing a pressure of less than 5 torr during each vacuum treatment and maintaining the pressure during at least one of the vacuum treatments following the initial treatment cycle at a level sufficiently below 5 torr to remove essentially all volatile and gaseous contaminants from the powder or compact; and

(d) compacting the powder or compact to essentially full density.

4,104,062
PROCESS FOR MAKING ALUMINUM MODIFIED BORON CARBIDE AND PRODUCTS RESULTING THEREFROM

Gerald Q. Weaver, Princeton, Mass., assignor to Norton Company, Worcester, Mass.
Filed Aug. 13, 1969, Ser. No. 849,927
Int. Cl.^{2} B22F *3/00*
U.S. Cl. 75—238 **8 Claims**

1. A process of forming boron carbide-aluminum reaction products comprising:

uniformly blending 70–97% by weight of powdered boron carbide with 3–30% by weight of powdered metallic aluminum;

wetting the blended boron carbide-aluminum mixture with temporary organic binder contained in a vehicle;

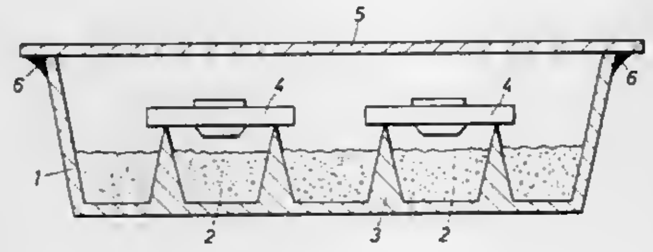
volatilizing the vehicle for said temporary organic binder;

preforming and densifying said boron carbide-aluminum-organic binder mixture with pressure at a temperature below 200° C;

hot-pressing said preform at a pressure of at least 500 psi at a temperature of from 1800° to 2300° C in an atmosphere substantially free of oxygen.

4,104,063
FORMED PART OF SINTERED IRON AND METHOD AND SINTERING TILE FOR MAKING SAME

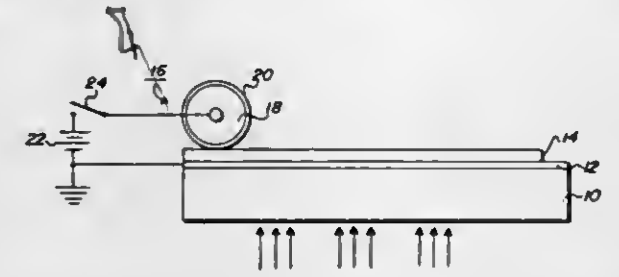
Dieter Pohl, Aalen, and Franz Redlinger, Kuchen, both of Fed. Rep. of Germany, assignors to Schwäbische Hüttenwerke Gesellschaft mit beschränkter Haftung, Wasseralfingen, Fed. Rep. of Germany
Continuation of Ser. No. 419,346, Nov. 27, 1973, abandoned. This application Oct. 18, 1976, Ser. No. 733,268
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1972, 2258310
Int. Cl.^{2} B22F *3/00*
U.S. Cl. 75—243 **3 Claims**



1. A part formed of sintered iron body having a wear-resistant surface layer of an austenitic steel which has manganese added to the material of said layer, so that said surface layer has a greater proportion of manganese than remainder of the body of said part, said surface layer constituting exclusively a manganese diffusion alloy purely of austenitic steel and also being cold deformed for greater hardness than said body.

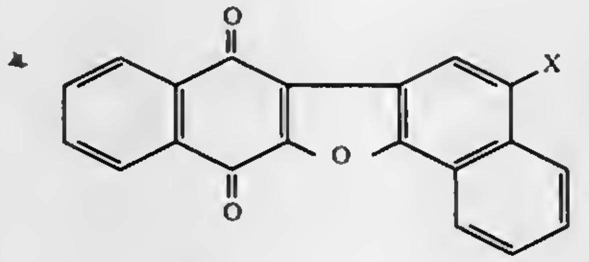
4,104,064
PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING DINAPHTHO-FURAN-DIONE PIGMENTS

Robert J. Gruber, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 630,479, Nov. 5, 1975, Pat. No. 4,017,311, which is a division of Ser. No. 492,555, Jul. 29, 1974, Pat. No. 3,957,829. This application Oct. 15, 1976, Ser. No. 732,580
Int. Cl.^{2} G03G *17/04*
U.S. Cl. 96—1 PE **6 Claims**

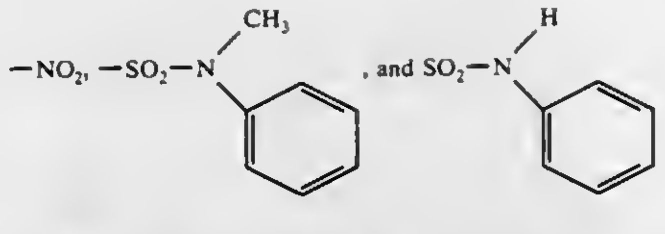


1. A photoelectrophoretic imaging method comprising the steps of

(a) applying a layer of an imaging suspension comprising an electrically photosensitive pigment particle represented by the general formula



wherein X is defined as a member selected from the group consisting of



in an electrically insulating carrier liquid, between a pair of electrodes, at least one of which is transparent;

(b) subjecting said suspension layer to an electrical field; and substantially simultaneously therewith

(c) exposing said suspension layer to an imagewise pattern of activating electromagnetic radiation to which at least a portion of said pigment particles are sensitive, through said transparent electrode;

whereby an image is formed on at least one of the said electrodes.

4,104,065
PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE POWDERS OF CADMIUM SULFIDE TYPE MATERIALS

Noriyoshi Tarumi, Tama; Akihiko Tamura, and Masakazu Kokiso, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Mar. 14, 1977, Ser. No. 777,124
Claims priority, application Japan, Mar. 16, 1976, 51-27686
Int. Cl.^{2} G03G *5/04*
U.S. Cl. 96—1.5 R **2 Claims**

1. A process for preparing photoconductive powders having improved photosensitive properties which consists of forming a mixture of a powdered photoconductive material selected from the group consisting of cadmium sulfide, cadmium selenide, cadmium sulfide selenide, and zinc oxide with an effective amount of a donor material and an activator, adding to the resulting mixture at least about 20% by weight of the photoconductive material of a water soluble dispersant selected from the group consisting of sodium chloride, sodium sulfate, cadmium sulfate, potassium chloride, anhydride of magnesium chloride, anhydride of cadmium chloride, anhydride of cobalt chloride, barium chloride, sodium bromide, potassium bromide, anhydride of cadmium bromide, anhydride of cobalt bromide, sodium iodide, potassium iodide, barium iodide and potassium carbonate, then firing the mixture in the presence of oxygen at a temperature selected from about 400° to about 800° C. at which temperature the dispersant does not melt and finally removing the dispersant to obtain a finely divided photoconductive powder.

4,104,066
COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE

Meurig W. Williams, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,629
Int. Cl.^{2} G03G *9/10, 13/08, 9/08*
U.S. Cl. 96—1 SD **21 Claims**

1. A pressure-fixable toner capable of being fixed to a support medium in image configuration by the application of pressure comprising a colorant and a material selected from the group consisting essentially of polycaprolactone polymer, polycaprolactone polymer blends and polycaprolactone copolymers, wherein said polycaprolactone polymer has a number average molecular weight of between about 2,000 and about 15,000, said polycaprolactone blends comprise greater than about 50 percent by weight of polycaprolactone and said polycaprolactone copolymers comprise block copolymers having a number average molecular weight of between about 2,000 and about 15,000.

4,104,067
POLYMER BINDER

Werner Krafft, Leverkusen; Günther Arnold, Ulm; Gabor Paal, Stuttgart, and Hans-Peter Vollmer, Ulm, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany
Filed Jan. 23, 1975, Ser. No. 543,273
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1974, 2404042
Int. Cl.^{2} G03G *5/04;* B32B *27/36*
U.S. Cl. 96—1.5 R **5 Claims**

1. An improved recording material sensitive to UV-radiation comprising a film substrate and a binder layer adhered to a surface of said substrate containing at least one substance which is capable of discoloration on response to UV-radiation.

wherein the improvement comprises a binder layer transparent to UV-radiation consisting essentially of a copolymer of 33%–91% by weight of methyl methacrylate and 67%–9% by weight of alkyl acrylate or alkyl methacrylate, the alkyl group of the alkyl acrylate or alkyl methacrylate containing from 2 to 6 carbon atoms,

said binder layer on said substrate being flexible as a recording material and free from hair cracks after over 1000 flexures over curved surfaces of radii ranging from 15–24 mm.

4,104,068
SILVER HALIDE EMULSIONS CONTAINING MICROVOIDS

Karl J. Schreiber, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Feb. 16, 1977, Ser. No. 769,171
Int. Cl.^{2} G03C *7/00, 1/48, 1/02, 1/84*
U.S. Cl. 96—3 **14 Claims**

14. A photographic process which comprises the steps of:

(a) Exposing a film unit which comprises, in order, a support carrying an additive multi-color screen, a silver precipitating layer, a layer comprising photosensitive silver halide crystals and microvoids less than one micron average diameter and adapted to scatter light incident on said layer comprising silver halide crystals, said microvoids comprising at least about 25% by volume of said layer comprising silver halide crystals; and

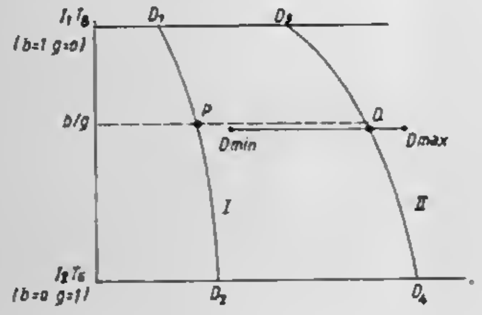
(b) contacting exposed film unit with an aqueous alkaline photographic processing composition to develop said exposed silver halide emulsion and to form a silver transfer image in said silver precipitating layer and to collapse said microvoids.

4,104,069
METHOD OF DETERMINING EXPOSURE TIMES FOR PHOTOGRAPHIC COPYING MATERIAL

Jacques Leon Vanheerentals, Schoten, Belgium; Josef Pfeifer, Unterhaching, Fed. Rep. of Germany; Helmut Klocke, Pocking, Fed. Rep. of Germany, and Rudolf Paulus, Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 522,945, Nov. 11, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 699,862
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1973, 2356277
Int. Cl.^{2} G03C *7/16, 7/00;* G03B *27/74*
U.S. Cl. 96—23 **1 Claim**

1. A process of forming from an original having respective minimum and maximum density values D_{min} and D_{max} on a copying material an image of the original having respective minimum and maximum density values P and Q, different from D_{min} and D_{max}, comprising the steps of forming a first test wedge image by exposing a first specimen of said copying material to light of a respective first color, the exposure of said first specimen being such that the average exposure time is T_B, with the exposure to light increasing across said first specimen;

forming a second test wedge image by exposing a second specimen of said copying material to light of a respective second color, the exposure of said second specimen being such that the average exposure time is T_G, with the exposure to light increasing across said second specimen; determining from said first test wedge image the density values D_1 and D_3 which an original must have to produce upon said copying material the respective density values P and Q if the copying of such original onto said copying material were performed with said light of said first color for an exposure time T_B; determining from said second test wedge image the density values D_2 and D_4



which an original must have to produce upon said copying material the respective density values P and Q if the copying of such original onto said copying material were performed with said light of said second color for an exposure time T_G; determining from the values enumerated above the values b, g, t_b and t_g, t_b and t_g being the respective exposure time intervals which must be employed for said light of said first and second colors to form from an original having said respective minimum and maximum density values D_{min} and D_{max} on said copying material an image of the original having said respective minimum and maximum density values P and Q and where $b = t_b/(t_b + t_g)$ and where $g = t_g/(t_b + t_g)$, by solving the equation

$$10^{(D_{max} - D_{min})} = \frac{b^{p_1} \cdot 10^{D_3} + g^{p_2} \cdot 10^{D_4}}{b^{p_1} \cdot 10^{D_1} + g^{p_2} \cdot 10^{D_2}}$$

for the unknowns b and g using a reiterative numerical method, where p_1 and p_2 are the Schwarzschild exponents for said copying material for the two color exposures employed, by solving for t_b using the equation

$$t_b = T_B \cdot b \cdot \text{antilog}(D_{min} - P),$$

and by solving for t_g using the equation

$$t_g = T_G \cdot g \cdot \text{antilog}(D_{min} - P),$$

forming from said original said image of said original by illuminating said original with said light of said first color and exposing said copying material to such light for a time interval t_b and by illuminating said original with said light of said second color and exposing said copying material to such light for a time interval t_g.

4,104,070

METHOD OF MAKING A NEGATIVE PHOTORESIST IMAGE

Holger Moritz, Holzgerlingen, Fed. Rep. of Germany, and Gabor Paal, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1976, Ser. No. 682,804

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529054

Int. Cl.^{2} G03C *5/00*

U.S. Cl. 96—36 **5 Claims**

1. A method of making a negative photoresist image on a substrate consisting essentially of the steps of:

Applying to a substrate a layer of a positive working photoresist material consisting essentially of a phenolformaldehyde resin, a naphthoquinone (1,2) diazide sulfonic acid ester sensitizer, and a 1-hydroxyethyl-2-alkylimidazoline,

imagewise exposing the layer with actinic radiation;

heating the imagewise exposed layer for a sufficient period of time to a sufficient temperature to render the exposed areas insoluble in alkaline developer,

subsequently blanket exposing the layer with actinic radiation and, removing the portions of the layer which were not exposed during the imagewise exposure with an alkaline developer.

4,104,071

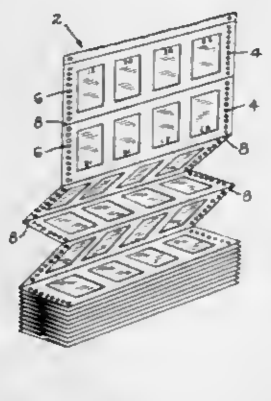
METHOD FOR ORGANIZING AND PREPARING PHOTOGENERATED PRINTING MEDIA

Robert J. Crissy, West Caldwell, N.J., assignor to Powers Chemco, Inc., Glen Cove, N.Y.

Filed Oct. 13, 1972, Ser. No. 297,367

Int. Cl.^{2} G03C *5/04;* **G03B** *27/44*

U.S. Cl. 96—41 **1 Claim**



1. A method for preparing proof copy page lay-outs for multi-page printing comprising the steps of recording at predetermined spaced intervals on a film the page sequence in which such pages are to be printed, advancing a conveyer sheet through a first conveyer sheet holder and stopping said sheet in said first holder after a predetermined length of said conveyer sheet has been advanced, advancing said recorded film a predetermined length to expose said film for viewing of the intervals of said page printing sequence and stopping said film, after stopping the advance of said conveyer sheet and said film affixing to said conveyer sheet at pre-determined intervals across said conveyer sheet and in the sequence exposed for viewing on said film the proof copy pages of the pages to be printed, after said proof copy pages have been affixed to said conveyer sheet, advancing said conveyer sheet with said proof copy pages affixing thereto through a second conveyer sheet holder and stopping said conveyer sheet in said second conveyer sheet holder after a pre-set segment length of said conveyer sheet has been advanced through said second sheet holder, advancing a pre-set length of photosensitive film and stopping said photosensitive film and, after each pre-set segment of said conveyer sheet and said pre-set length of said pre-set length of said photosensitive film have been advanced and while said conveyer sheet is stopped in said second sheet holder and said photosensitive film is stopped, reproducing the images of said proof copy pages affixed to said conveyer sheet onto said photosensitive film and, thereafter, reproducing the images of said proof page copy on said photosensitive film onto a printing plate for use in said multi-page printing.

4,104,072

WATER DEVELOPABLE LITHOGRAPHIC PRINTING PLATE HAVING DUAL PHOTOSENSITIVE LAYERING

Eugene Golda, Monsey; Alan Leonard Wilkes, Brewster, and Simon Long Chu, Dobbs Ferry, all of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed May 19, 1977, Ser. No. 798,531

Int. Cl.^{2} G03C *1/76, 1/52*

U.S. Cl. 96—68 **20 Claims**

13. A method of producing a lithographic printing plate which comprises first applying a water soluble, lithographically suitable, light sensitive aromatic diazo substance as a first layer to at least one surface of a metal sheet substrate and secondly applying to said layer, a second layer of a water insoluble, ink receptive photosensitive composition which comprises a water permeable, water insoluble, oleophilic resin and a lithographically suitable photosensitizer selected from the group consisting of the reaction product of the paradizo diphenylamineparaformaldehyde condensate with 2-hydroxy-4-methoxy benzophenone sulfonic acid, the azido pyrenes, aromatic diazo oxides, polyacetals which depolymerize under ultraviolet radiation, polymonochloroacetaldehyde, polypropionaldehyde, poly-n-butyraldehyde, poly-cyanopentaldehyde, polycyanovaleraldehyde, poly-n-butyraldehyde, polyisobutyraldehyde, polyvaleraldehyde and polyheltaldehyde, said water soluble, lithographically suitable, light sensitive substance and said water insoluble, ink receptive photosensitive composition are characterized as being either both positive working or both negative working.

4,104,073

FIRE RETARDANT INTUMESCENT PUTTY

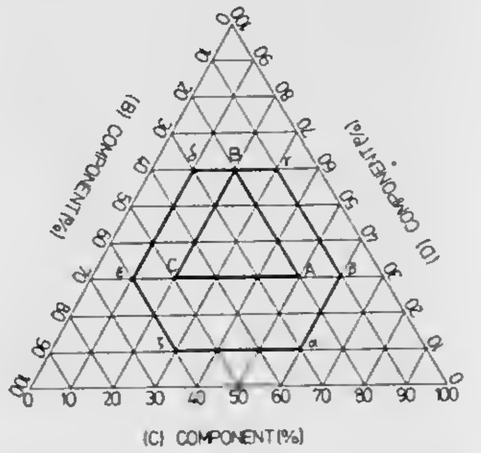
Yooichi Koide; Tamotsu Kaide; Michio Takada, and Keiji Ichikawa, all of Amagasaki, Japan, assignors to Dainichi-Nippon Cables, Ltd., Japan

Filed May 14, 1976, Ser. No. 686,964

Claims priority, application Japan, May 16, 1975, 50-58936; May 16, 1975, 50-58937; Sep. 22, 1975, 50-115002; Sep. 22, 1975, 50-115003

Int. Cl.^{2} C09D *5/18*

U.S. Cl. 106—15 FP **22 Claims**



1. A fire retardant intumescent putty having a cone penetration value of 2-40 (mm/150 g, 5 sec., at 20° C) determined in accordance with JIS A 5752-1966, which comprises (a) at least 4% by weight of an organic material which is a semi-solid or liquid at room temperature and has a viscosity of 50-100,000 c.st. at 210° F, (b) at least 13% by weight of a nitrogen-containing phosphate which contains at least 7% by weight of phosphorus and corresponds in structure to a phosphoric acid represented by the general formula, $(xH_2O \cdot yP_2O_5)n$, wherein $0 < (x/y) \leqq 3$ and n is 1–14, one or all of the hydrogen atoms of which are substituted with at least one mono-, di-, or trivalent nitrogen-containing group consisting essentially of nitrogen and either or both of hydrogen and carbon, and (c) lubricating grease wherein said grease is in the form of a viscous paste or semi-solid at room temperature, has a cone penetration value of about 40–500 determined in accordance with JIS K 2560-1969, and comprises a thickener and a natural or synthetic oil which is nonvolatile at room temperature.

4,104,074

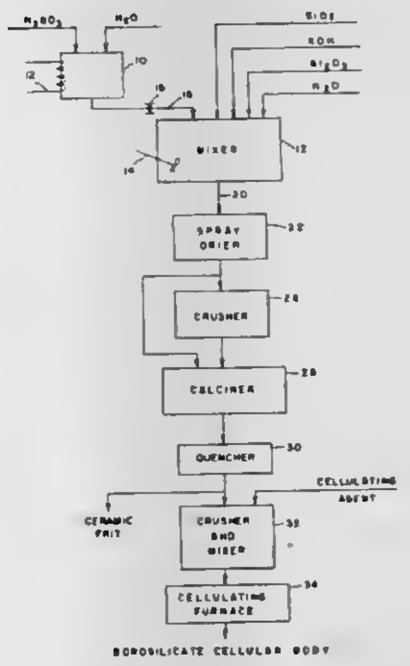
PULVERULENT BOROSILICATE COMPOSITION AND A METHOD OF MAKING A CELLULAR BOROSILICATE BODY THEREFROM

David Rostoker, Monroeville, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Division of Ser. No. 685,054, May 10, 1976. This application Aug. 18, 1977, Ser. No. 825,840

Int. Cl.^{2} C03B *1/00*

U.S. Cl. 106—40 V **4 Claims**



1. A pulverulent borosilicate composition consisting essentially of an admixture of silica, alumina, boric acid and an alkali metal hydroxide in which,

said boric acid is in the form of B_2O_3 and said alkali metal hydroxide is in the form of K_2O, and

said composition contains between about 80 and 88 percent by weight SiO_2, between about 7 and 13 percent B_2O_3, between about 1 and 3 percent by weight K_2O and about 4 percent Al_2O_3.

4,104,075

REFRACTORIES, BATCH FOR MAKING THE SAME AND METHOD FOR MAKING THE SAME

Takeshi Hayashi, Bizen; Masao Shibuno, Okayama; Chokei Sawaki, Bizen, and Susumu Okazaki, Okucbo, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1977, Ser. No. 759,242

Claims priority, application Japan, Jan. 26, 1976, 51-6702

Int. Cl.^{2} C04B *35/52, 35/56*

U.S. Cl. 106—44 **28 Claims**

1. A refractory comprising about 30 to 70% by weight of a coarse refractory grain and, as an indispensable ingredient for the coarse refractory grain, a bonded structure comprising about 0.1 to 8.0% by weight titanium nitride, about 0.5 to 30% by weight silicon carbide, and about 1.5 to 55% by weight of alumina, said bonded structure being formed in the refractory.

4,104,076
MANUFACTURE OF NOVEL GREY AND BRONZE GLASSES

André Pons, Villejuif, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 495,218, Aug. 6, 1974, abandoned, and a continuation of Ser. No. 124,240, Mar. 15, 1971, abandoned.
This application Sep. 8, 1976, Ser. No. 721,509
Claims priority, application France, Mar. 17, 1970, 70.09441
Int. Cl.² C03C *3/08, 3/04*

U.S. Cl. 106—52 **4 Claims**

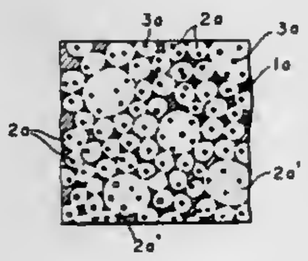
1. A tinted silica-soda-lime glass consisting in its essential elements, by weight percent, of: SiO_2 60–75%, B_2O_3 0–7%, Al_2O_3 0–5%, $K_2O + Na_2O$ 10–20% of which K_2O is 0–10%, CaO + MgO 6–18% of which CaO is 0–16% and MgO is 0–10%, and containing by weight percent of tinting agents: Fe_2O_3 0.2–1.5%, CoO 0.0010–0.0300%, Se 0–0.0200%, and Cr_2O_3 0.0010–0.0200%.

4,104,077
POROUS INORGANIC PRODUCT

Kazuaki Kobayashi, Fujisawa; Noboru Takaha, Tokyo, and Masao Katsuragi, Hamura, all of Japan, assignors to The Yokohama Rubber Co., Ltd.; Nihon Cement Co., Ltd. and Asano Pole Co., Ltd., all of Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 740,793
Int. Cl.² C04B *7/32*

U.S. Cl. 106—88 **13 Claims**



1. A porous, inorganic, molded product, comprising a matrix of molded, shape-retaining, inorganic binder, said binder having substantially uniformly distributed therein a multiplicity of open interconnecting cells wherein each of said cells has a volume of from 0.52 mm^3 to 4200 mm^3, said open cells being interconnected by holes so that the interconnection coefficient of said product is from 0.5 to 15%, wherein the interconnection coefficient is defined as the sum of the areas of the holes that communicate with the cells that are directly intersected by an imaginary cross-sectional plane through said product divided by the area of that plane, the ratio of

$$\frac{\text{apparent density of said product}}{\text{true density of said binder}}$$

being in the range of 0.15 to 0.5.

4,104,078
METHOD FOR SEPARATION OF DEXTRANS

Philip Edwin Barker, Birmingham; Brian William Hatt, Bromsgrove, and Frederick John Ellison, Liverpool, all of England, assignors to Fisons Limited, London, England

Filed Jun. 2, 1977, Ser. No. 802,783
Claims priority, application United Kingdom, Jun. 16, 1976, 24908/76
Int. Cl.² C08B *37/02;* **C13L** *3/00*

U.S. Cl. 127—46 R **11 Claims**

1. A method for separation of a fluid mixture of dextrans of differing molecular weights into two fractions, which comprises

(a) passing said mixture into chromatographic apparatus which comprises a plurality of compartments which contain a chromatographic packing material, valve-containing conduits interconnecting the compartments to provide a closed loop column, at least one additional valve controlled fluid inlet and at least one additional valve controlled fluid outlet for each compartment, and means for sequential operation of the valves, and

(b) operating the valves sequentially such that each compartment undergoes, and at any one time there is at least one compartment undergoing, the following operations:
   (i) being fed with the fluid mixture to be separated,
   (ii) being fed with a carrier fluid,
   (iii) having carrier fluid and any entrained faster moving components of the fluid mixture removed therefrom, and
   (iv) being isolated and treated to remove any slower moving components of the fluid mixture; the compartment being fed with fluid mixture to be separated being a compartment through which the carrier fluid passes.

4,104,079
METHOD OF REMOVING SCALE CAUSED BY RAFFINATE IN A PHOSPHORIC ACID PURIFICATION PROCESS

Sakumi Fujii; Masao Uchida, and Osamu Watanabe, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Apr. 11, 1977, Ser. No. 786,191
Claims priority, application Japan, Apr. 16, 1976, 51-42413
Int. Cl.² B08B *3/08*

U.S. Cl. 134—2 **3 Claims**

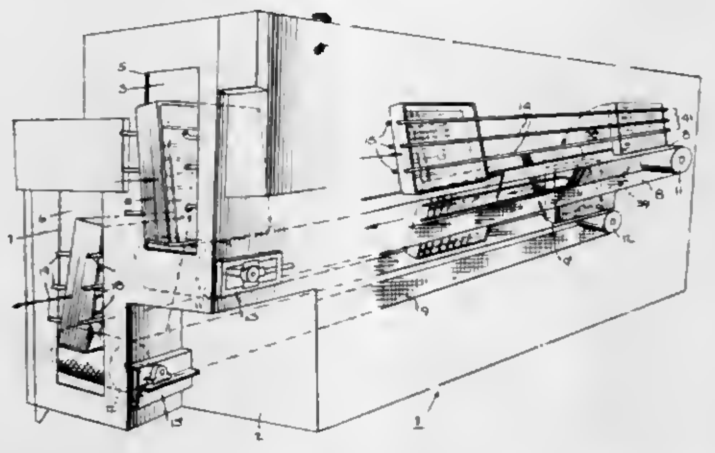
1. In a method of removing adhered scale which deposits on surfaces of process apparatus when said surfaces are in contact with a raffinate obtained by extracting wet process phosphoric acid with an organic solvent or a mixture of an organic solvent and a strong acid, the improvement which comprises contacting said scale with an aqueous solution having a concentration of greater than 5 wt. % of at least one strong base selected from the group consisting of sodium hydroxide, potassium hydroxide, calcium hydroxide and barium hydroxide for a time sufficient to remove said scale from said surfaces.

4,104,080
APPARATUS AND METHOD FOR WASHING AND DRYING REUSABLE CONTAINERS

Howard M. Sadwith, 16 Fairway E., Colts Neck, N.J. 07722

Continuation-in-part of Ser. No. 665,819, Mar. 11, 1976, abandoned. This application Apr. 22, 1976, Ser. No. 679,317
Int. Cl.² B08B *9/00*

U.S. Cl. 134—23 **26 Claims**



18. A method for washing and drying reusable container-like articles comprising the steps of:

transporting said articles through a washing station for applying washing fluid thereto;

transporting said articles through a rinsing station for applying rinsing fluid thereto;

flipping said rinsed articles so as to abruptly rotate said articles end over end to shake a portion of the excess rinsing fluid on said articles therefrom, the flipping of said articles comprising:

pushing said articles onto an inclined chute;

and righting said articles when they reach the end of said chute;

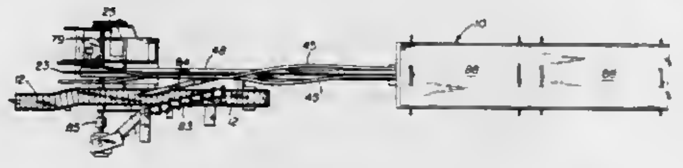
and transporting said flipped articles through a drying station for drying said articles.

4,104,081
IN-LINE BOTTLE RINSER

Roger W. Totten, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Aug. 9, 1976, Ser. No. 712,676
Int. Cl.² B08B *3/02, 13/00*

U.S. Cl. 134—23 **16 Claims**



1. The method of rinsing bottles, comprising in the order stated:

(a) loading upright bottles into carriers on a conveyor chain traveling in a substantially straight path,

(b) inverting the bottles by pivoting their carriers in a plane perpendicular to the path of the conveyor chain, the carriers retaining the bottles in defined position with respect to the carriers,

(c) spraying rinse liquid into the moving bottles through a varying angle as the inverted bottles approach, pass over, and travel beyond spray means along said straight path,

(d) returning the bottles to upright position by pivoting their carriers in a plane perpendicular to the path of the conveyor, and

(e) unloading upright bottles from the carriers, the loading, inverting, spraying, uprighting, and unloading taking place along said straight path.

9. An in-line rinser for bottles and the like comprising:

(a) a conveyor carrying a succession of bottles in predetermined locations with respect to the length of the conveyor;

(b) spray means for spraying rinse liquid into passing bottles on the conveyor through an angle that varies with respect to each bottle;

(c) said spray means comprising a circular rotatable nozzle manifold with a plurality of spray nozzles mounted in its circumferential edge, synchronizing means connected to the conveyor for rotating the manifold through a spray arc in response to the passage of said predetermined bottle locations of the conveyor; and means delivering a supply of rinse liquid to the manifold;

(d) sealing means covering a portion of the circumferential edge of said circular nozzle manifold; and

(e) means for limiting radially outward movement of the nozzles with respect to said circular nozzle manifold but permitting the nozzles to be pushed radially inwardly by said sealing means.

13. In combination with a conveyor for bottles for use with bottle rinsing means, an improved bottle carrier characterized by the absence of springs and rollers, for use with a necked bottle of predetermined axial height and shape, comprising:

(a) a lengthwise member approximately parallel to and spaced from the vertical axis of a carried bottle and spaced from the side wall of the bottle;

(b) a bottom member substantially perpendicular to the lengthwise member and contacting at least a portion of the bottom of a carried bottle;

(c) a pair of side arms angling obliquely from said lengthwise member toward the carried bottle and contacting the side of the bottle; and

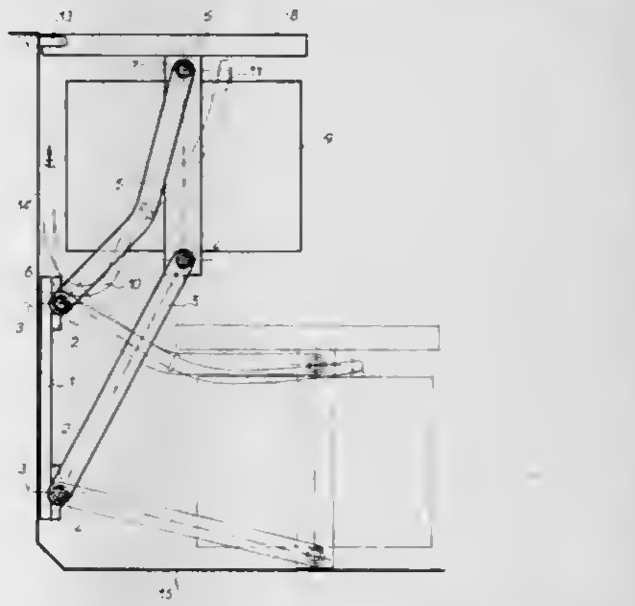
(d) a flexible bottle neck retaining member connected to said lengthwise member and angling acutely toward said bottom member for urging a bottle into the carrier and assisting in retaining the bottle against said bottom and side members, said neck retaining member contacting the bottle between the finish and the bottom of the bottle for improved exposure of the finish to rinse liquid.

4,104,082
LIFTING DEVICE FOR USE IN A LIQUID MEDIUM

Claude Boujard, 138 Rue Davis Johnston, 33000 Bordeaux, France, and Joseph Vilaldach, 74 Avenue de Verdun, 33200 Bordeaux, France

Filed Feb. 25, 1977, Ser. No. 772,024
Claims priority, application France, Feb. 27, 1976, 7606058
Int. Cl.² B08B *13/00;* **B63B** *21/00*

U.S. Cl. 134—141 **15 Claims**



1. A lifting device for use in a liquid medium, comprising:

a substantially parallelepipedical bottomless tank having an upper wall and submergible in the liquid medium

means for introducing air into said tank for driving the liquid out of the tank to raise the tank from the liquid medium and for discharging air from the tank to fill the tank with liquid to lower the tank into the liquid medium; and

guide means for guiding the tank with respect to a side wall of a space containing the liquid medium, during the lowering and the raising of the tank, so that the longitudinal axis of said tank remains parallel to the side wall, said guide means comprising a first pair of parallel arms and a second pair of parallel arms, first corresponding ends of the two arms of the first pair of arms being pivotally mounted with respect to said side wall for pivotal movement about a common first horizontal axis, second corresponding ends of said first pair of arms and being pivotally mounted with respect to the tank for pivotal movement about a second common horizontal axis, first corresponding ends of the two arms of the second pair of arms being pivotally mounted with respect to the said side wall for pivotal movement about a common third horizontal common axis, and second corresponding ends of said second pair of arms being pivotally mounted with respect to the tank for pivotal movement about a common fourth horizontal axis, said tank having its length parallel to said axis and the two arms of each pair of arms being spaced apart horizontally at a distance greater than the length of the tank, said fourth axes being parallel, said first and third axes being spaced apart in the plane of said side wall, and said second and fourth axes being spaced the same distance as said first and third axes in a plane containing the longitudinal axis of the tank and perpendicular to the upper wall of the tank.

4,104,083

SOLAR BATTERY PACKAGE

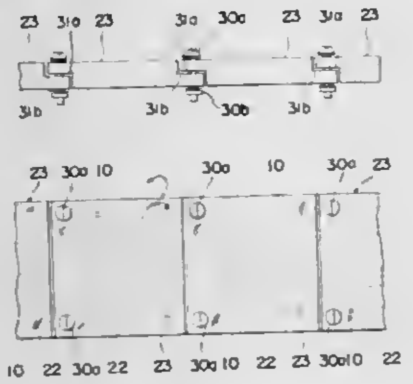
Taizö Hirano, Tenri, Japan, assignor to Japanese Government, Japan

Filed Apr. 5, 1977, Ser. No. 784,775

Claims priority, application Japan, Apr. 23, 1976, 51-45353

Iot. Cl.² H01L *31/04*

U.S. Cl. 136—89 H **8 Claims**



1. A solar battery package which comprises:

a solar cell having a pair of lead wires extending therefrom and a light receiving area defined on one surface thereof; and

a block of fiber-reinforced thermosetting synthetic resin, said solar cell being embedded in said block with the free ends of said lead wires extending outwardly of said block, at least the portion of said block which overlays the light receiving area of the solar cell being transparent, said block having four right-angled corners, at least two opposite sides of said block having respective cutout portions therein in asymmetrical relation to each other for connection of said solar battery package with another similarly shaped solar battery package.

2. A solar battery package as claimed in claim 1 wherein said cutout portions extend the full length of the respective opposite sides of said block, one being on one face of the block and the other being on the other face of the block.

4,104,084

SOLAR CELLS HAVING INTEGRAL COLLECTOR GRIDS

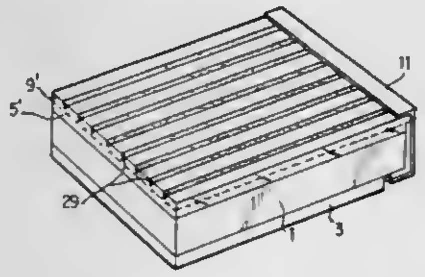
John C. Evans, Jr., N. Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 803,823

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 CC **19 Claims**



1. A heterojunction or Schottky barrier solar cell which comprises;

a heterojunction or Schottky barrier device, each having opposed upper and lower surfaces;

a conductive base metal layer compatible with and coating predominantly the lower surface of the substrate of each said device such that a back surface field region is formed at the interface between each said device and said base metal layer;

a transparent, conductive mixed metal oxide layer in integral contact with the upper surface of said heterojunction device or said Schottky barrier device and having a metal alloy grid network composed of the same metal elements as the oxide constituents of said mixed metal oxide layer, said network being embedded in said mixed metal oxide layer;

an insulating layer which prevents electrical contact between said conductive metal base layer and said transparent conductive metal oxide layer; and

a metal contact means covering said insulating layer and in intimate contact with said metal grid network embedded in said transparent oxide layer for conducting electrons generated by the photovoltaic process from said device.

4,104,085

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY IMPLANTING IONS THROUGH BEVELLED OXIDE LAYER IN SINGLE MASKING STEP

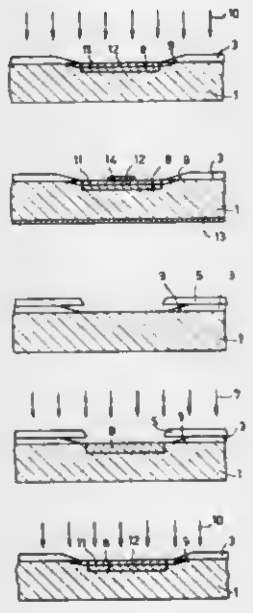
Paul Zandveld, Amsterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,530

Claims priority, application Netherlands, Nov. 11, 1975, 7513161

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **15 Claims**



1. A method of manufacturing a semiconductor device in a semiconductor body having a surface at a semiconductor region thereof, comprising the steps of:

(a) providing a first masking layer on said surface of said semiconductor region,

(b) providing a second masking layer on said first masking layer,

(c) providing a window in said second masking layer,

(d) directing toward said layers at a first part of said surface, ions of a dopant material having an energy level such that, outside said window, said first dopant ions being retained entirely by the combined said first and second masking layers and, inside said window, they are retained at most only partly, said ions thus being implanted selectively into said semiconductor region at said first surface part so as to form a first doped semiconductor zone,

(e) subjecting said first masking layer to an etching treatment while using said second masking layer as an etching mask, so that the exposed part of said first masking layer is etched away and form at the edge of the etched-away part thereof a transition region having a thickness increasing towards the exterior of the window,

(f) then directing toward said surface of said semiconductor body ions of a second dopant material, said second dopant ions having such energy that said second dopant ions are retained entirely by said first masking layer outside said transition region and are retained only partly by at least a part of the transition region, said second dopant ions thus being selectively implanted into said semiconductor region to form a second doped semiconductor zone that adjoins a second part of said surface, said second surface part comprising and entirely surrounding said first surface part.

4,104,086

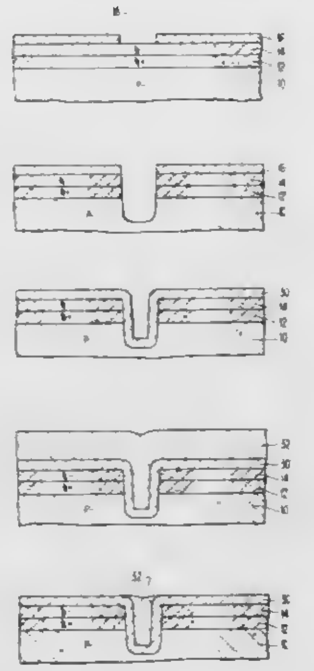
METHOD FOR FORMING ISOLATED REGIONS OF SILICON UTILIZING REACTIVE ION ETCHING

James Allan Bondur, Walden, and Hans Bernhard Pogge, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,361

Int. Cl.² H01L *21/76, 27/00*

U.S. Cl. 148—1.5 **21 Claims**



1. A method for isolating regions of silicon comprising:

providing a silicon body composed principally of one conductivity;

forming tapered sided openings of less than about 4 micrometers in width at the surface in said body by reactive ion etching;

the taper of said tapered sided openings being greater than about 2° from the vertical and terminating into the substantially flat bottom of said openings;

thermally oxidizing the surfaces of said openings;

filling said thermally oxidized openings with a dielectric material wherein the said regions of silicon are isolated; and

removing said dielectric material from above the surface of said body wherein the said openings are uniformly filled at the said surface.

4,104,087

METHOD FOR FABRICATING MNOS MEMORY CIRCUITS

Alfred C. Ipri, Princeton, and Doris W. Flatley, Belle Meade, both of N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 7, 1977, Ser. No. 785,481

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **1 Claim**

1. The method of fabricating an MNOS memory circuit comprising the steps of

fabricating semiconductor islands on a substrate member of non-conducting material to provide stable, memory and tunnel device islands,

depositing a layer of silicon dioxide on said islands and substrate member,

defining a MNOS silicon nitride channel region on said memory device island and removing the silicon dioxide therefrom,

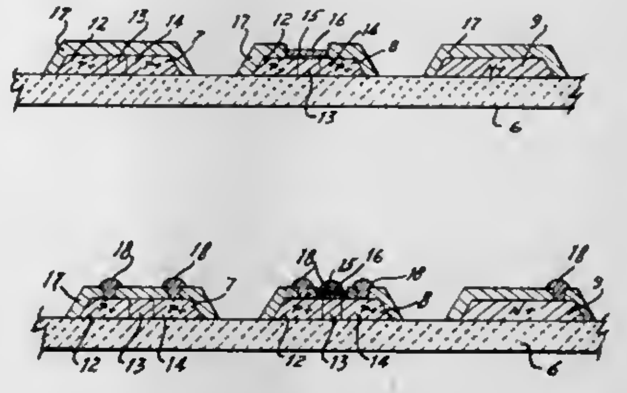
implanting ions into said silicon nitride channel region to a selected memory device thereshold level,

stripping the silicon dioxide layers from the top surfaces of said stable and memory device islands,

growing a thermal oxide layer over the stripped island surfaces,

defining channels on the top surfaces of said stable and memory device islands,

stripping the thermal oxide from stable and memory device island top surface areas other than areas defining said channels,



effecting P+ diffusion to said stable and memory device islands and N+ diffusion to said tunnel device island,

stripping said deposited silicon dioxide and said thermal oxide layers,

growing a thin oxide layer on the top surface of said memory device island,

depositing a layer of nitride on said layer of oxide,

defining a nitride-thin oxide region on the top surface of said memory device island and removing nitride-thin oxide from non-defined regions thereof,

growing a thick layer of thermal oxide over the surfaces and edges of said stable, memory and tunnel device islands, and

providing said stable, memory and tunnel devices with contact electrodes.

4,104,088

METHOD OF MAKING DIFFERENTIALLY COATED ONE SIDE ALLOYED GALVANIZED STEEL STRIP

Walter Batz, Hopewell Township, Beaver County, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

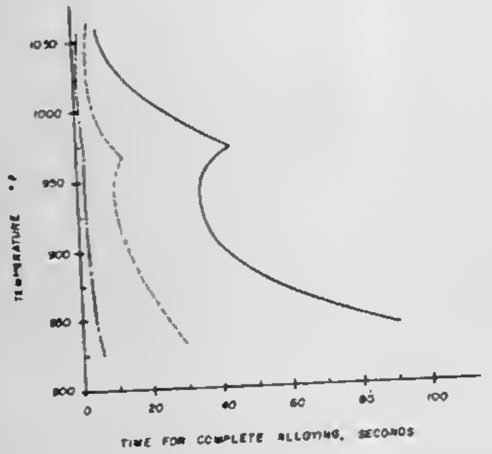
Filed May 23, 1977, Ser. No. 799,876

Int. Cl.² C23C *1/02*

U.S. Cl. 148—12 R **5 Claims**

1. A method for producing a zinc coated and heat-treated sttel substrate, comprising:

passing a low carbon steel substrate through a molten zinc bath containing from 0.15% to 0.18% aluminum so as to form an essentially unalloyed zinc coating on both sides of said substrate; controlling the zinc coating so as to obtain a coating weight of about 0.20 oz./sq.ft. maximum on a first side of said substrate and about 0.30 oz./sq.ft. minimum on a second side; and uniformly heating both sides of said zinc coated substrate for a time and to a temperature sufficient to form a fully alloyed iron-zinc coating on said



first side and to retain the essentially unalloyed zinc coating on said second side.

4,104,089

DIE-CAST ALUMINUM ALLOY PRODUCTS

Isao Miki, Shimizu, Japan, assignor to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Jul. 8, 1976, Ser. No. 703,654

Int. Cl.^{2} C22C *21/02*

U.S. Cl. 148—32.5 **3 Claims**

1. Die-cast aluminum alloy products of high strength, toughness and impact strength and consisting essentially be weight of 7 to 12% of Si, 0.2 to 0.5% of Mg, 0.65 to 1.2% of Fe, 0.55 to 1.0% of Mn and the balance being Al and impurities, said products obtained by die-casting said aluminum alloy while molten into any desired shape by means of a pore-free die-casting process in which oxygen gas is the active gas, cooling the resultant die-castings at a cooling velocity of at least 20° C/sec and subjecting the resultant cooled die-castings to solution heat treatment at a temperature ranging from 450° to 530° C, followed by aging at a temperature ranging from 150 to 230° C.

4,104,090

TOTAL DIELECTRIC ISOLATION UTILIZING A COMBINATION OF REACTIVE ION ETCHING, ANODIC ETCHING, AND THERMAL OXIDATION

Hans Bernhard Pogge, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,593

Int. Cl.^{2} H01L *21/76, 27/04*

U.S. Cl. 148—175 **12 Claims**

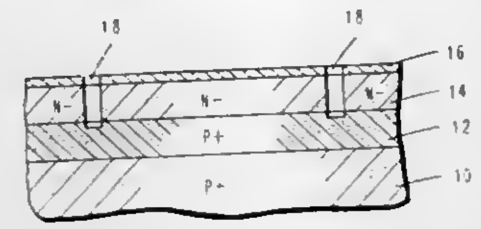
1. A method for forming total dielectric isolation in a silicon structure comprising:

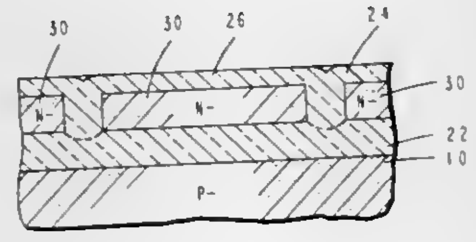
providing a silicon body composed principally of one conductivity, a layer of P+ conductivity thereover and a surface layer of a conductivity other than that of said layer; said body and said surface layer being less highly doped than said P+ layer;

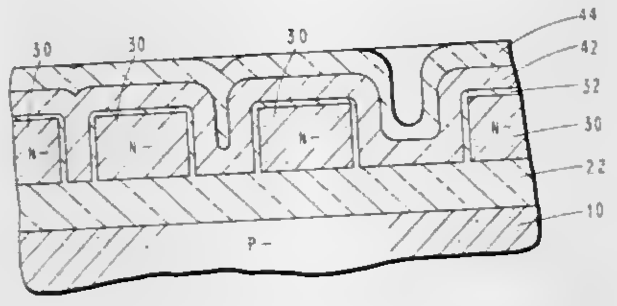
forming openings in said surface layer by reactive ion etching down to the said P+ layer;

anodically etching the body in a hydrofluoric acid solution to selectively convert the said P+ conductivity silicon layer to a layer of porous silicon; and

oxidizing the resultant porous silicon layer to form a silicon oxide layer and oxidizing the silicon in the said surface







layer within the said openings and on its surface to form fully isolated regions of said surface layer.

4,104,091

APPLICATION OF SEMICONDUCTOR DIFFUSANTS TO SOLAR CELLS BY SCREEN PRINTING

John C. Evans, Jr., North Olmsted; Henry W. Brandhorst, Jr., Berea; George A. Mazaris, Brookpark, and Larry R. Scudder, Berea, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 20, 1977, Ser. No. 799,026

Int. Cl.^{2} H01L *21/225*

U.S. Cl. 148—188 **6 Claims**

1. An automatable method for doping a solar cell substrate of the flat wafer type having opposed surfaces which comprises

screen printing onto each of said opposed surfaces a layer of a glass-forming chemical containing an electrical-type dopant which molecularly bonds to a resulting glass coating, the dopant in said chemical on one of said surfaces being of a first electrical type and the dopant in said chemical on the opposed surface being of a second electrical type,

heating said printed substrate at a first elevated temperature to remove volatiles from said layer and to dry the same, and

thereafter heating said printed substrate at a second elevated temperature greater than said first elevated temperature to form said glass coating of said opposed surfaces of said substrate, said second elevated temperature being effective to simultaneously diffuse both of the dopants into said substrate.

4,104,092

EMULSION SENSITIZED GELLED EXPLOSIVE COMPOSITION

John J. Mullay, Hazelton, Pa., assignor to Atlas Powder Company, Tamaqua, Pa.

Filed Jul. 18, 1977, Ser. No. 816,858

Int. Cl.^{2} C06B *45/00*

U.S. Cl. 149—2 **25 Claims**

1. An aqueous gel explosive composition comprising up to about 90 percent by weight inorganic oxidizing agents, from about 5 to about 25 percent by weight water, from about 0.2 to about 2.0 percent by weight aqueous gelling agents, from 0.2 to about 10% by weight bulking agents, in the gel portion, and from about 1 to about 80 percent by weight of an explosive emulsion comprising a continuous carbonaceous fuel phase and a discontinuous aqueous phase, said emulsion uniformly distributed in said gel portion.

4,104,093

THERMIT COMPOSITION

Nobuyoshi Yamaji, Akashi, Japan, assignor to Foseco Trading A.G., Switzerland

Filed Mar. 4, 1977, Ser. No. 774,368

Claims priority, application Japan, Jun. 23, 1976, 51-74929

Int. Cl.^{2} C06B *33/12*

U.S. Cl. 149—40 **4 Claims**

1. In a thermit composition comprising a particulate oxidizable metal, particulate iron oxide and particulate refractory filler, the improvement that the particulate refractory filler comprises zircon and is present in an amount of greater than 35 and up to 50 parts by weight per 100 parts by weight of the easily oxidizable metal and iron oxide.

4,104,094

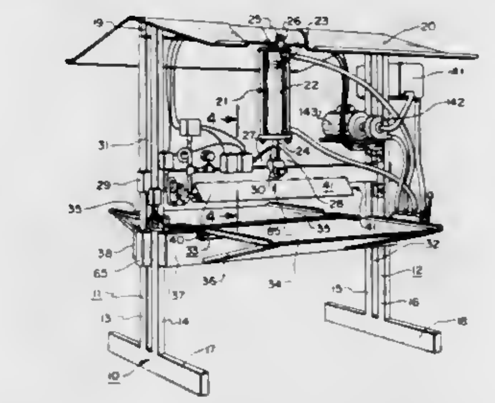
APPARATUS FOR FORMING CLEATS ON BELTING

Soren E. Peterson, 1649 W. 3300 South, Salt Lake City, Utah 84119

Filed Dec. 17, 1976, Ser. No. 751,262

Int. Cl.^{2} B32B *31/14*

U.S. Cl. 156—500 **4 Claims**



1. Apparatus for affixing cleats to belting including, in combination: a bed; a press disposed over said bed and having a cleat-forming die; first and second, mutually spaced means for heating said die coupled thereto, said bed including a support disposed underneath said die; third means for heating said support, said first, second, and third means each including interior, fluid-containing cavities and electrical heating elements disposed within said cavities; and means for supplying electrical power to said electrical heating elements.

4,104,095

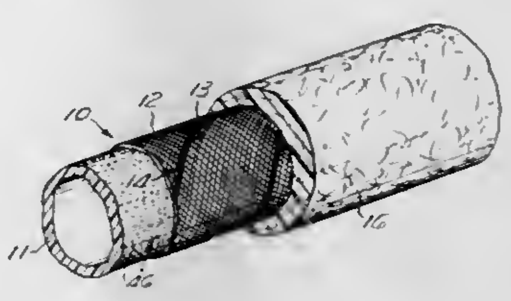
METHOD FOR PRODUCING TUBULAR ARTICLE

William D. Shaw, 4494 Orchard St., Mantua, Ohio 44255

Filed Nov. 17, 1976, Ser. No. 742,694

Int. Cl.^{2} B32B *31/26*

U.S. Cl. 156—83 **11 Claims**



1. A method of forming composite hollow articles with non-collapsible liners for containing destructive materials and an outer sleeve of substantially rigid high strength material in which material forming the liner cannot be directly bonded to the material forming said sleeve, comprising the steps of selecting a preformed seamless extruded liner of thermoplastic material with an inner wall shaped to contain said destructive materials and an outer surface, applying a fabric to said outer surface of said liner material, externally applying heat to said outer surface through said fabric at a sufficiently high rate and a period of time required to melt said outer surface of said thermoplastic material without melting the portions of said thermoplastic material spaced from said surface, said application of heat causing heating without melting of said portions of said thermoplastic material spaced from said surface and causing radial expansion thereof a greater amount than said fabric thereby causing nodules of said melted outer surface to flow radially outward into openings in said fabric to partially enclose said fabric in said melted outer surface while leaving substantial portions of said fabric exposed, cooling said liner to solidify said outer surface and produce a permanent mechanical bond between said fabric and said outer surface of said liner without separate bonding agents, and thereafter enclosing said liner and fabric with said sleeve material causing it to bond to said exposed fabric without bonding to said liner material, said fabric providing substantially the entire interconnection between said liner and said sleeve and providing a sufficient connection to prevent collapse of said liner.

4,104,096

DIFFUSION BARRIER AND SEPARATION SUBSTANCE FOR METAL PARTS ADJOINING EACH OTHER IN AN OXYGEN FREE ATMOSPHERE

Hans Gass, Neuchatel; Hans Erich Hintermann, Ins, and Hartmut Griepentrog, Oberhausen, all of Fed. Rep. of Germany, assignors to Laboratoire Suisse de Recherches Horlogeries, Switzerland and Gutehoffnungshutte Sterkrade Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 601,538, Aug. 4, 1975, Pat. No. 4,072,797. This application Feb. 18, 1977, Ser. No. 769,881

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1974, 2441260

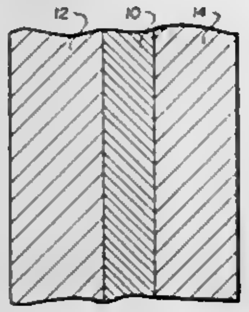
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.^{2} C01B *21/06, 35/08;* B32B *15/04*

U.S. Cl. 156—89 **5 Claims**

1. A method of forming a diffusion barrier between first and second metal parts with diffusion barriers therebetween in face to face direct contact with the metal parts comprising forming a protective film from an aqueous suspension of a substance comprising from 5 to 50% of hexagonal boron nitride, from 0.5 to 30% binder, from 2 to 6% of swelling agents and the balance a liquid suspension medium, subjecting the suspension to a burning for from 0.35 to 2 hours at a temperature of from 100° to 500° C.

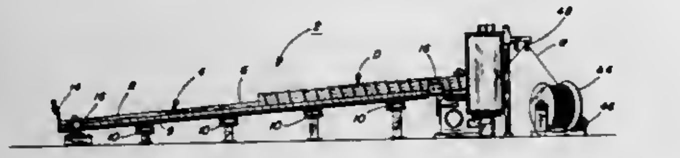
4. A method of producing a layer which is effective as a separation and diffusion barrier in an oxygen-free inert preferably helium-containing atmosphere between contiguous metal parts and high temperature reactors or gas turbines having a closed circuit, comprising positioning a layer consisting substantially of hexagonal boron nitride between the metal parts in face to face contact with said metal parts.



4,104,097
METHOD FOR MAKING FLEXIBLE DUCT

Raymond A. Gregory, Garfield Heights, and DeWitt Gifford Wilcox, Tallmadge, both of Ohio, assignors to Clecon Incorporated, Cleveland, Ohio

Filed Aug. 5, 1976, Ser. No. 711,797
Int. Cl.^{2} B31C *1/00, 5/00*
U.S. Cl. 156—143 **10 Claims**



1. Method for making a flexible, wire-reinforced duct comprising:

providing a stationary mandrel having an endless helical groove corresponding in shape to the cross-sectional shape of a reinforcement wire,

providing a drive belt positioned opposite said groove,

feeding at least one flexible strip wider than and conformable to said groove in helical relation onto said mandrel,

feeding at least one reinforcement wire substantially simultaneously in helical relation over said strip by causing said belt to press said strip into the groove in said mandrel, and overlapping said strip and wire by a covering,

applying adhesive at some time to at least one of said strips and wire to provide a composite unitary structure,

said drive belt has an endless longitudinally spaced groove dimensioned so as to receive the cross-sectional dimension of said reinforcement wire, and wherein the groove in said belt is disposed opposite the groove in said mandrel, and said wire is fed from the groove in said belt whereby a portion of the wire is disposed within the confines of the mandrel groove.

4,104,098
METHOD AND APPARATUS FOR CURING AND REINFORCING HOSE

James M. Hush, Evergreen, and Donald J. McPhee, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 18, 1977, Ser. No. 779,213
Int. Cl.^{2} B65H *81/00*
U.S. Cl. 156—149 **17 Claims**

1. A method of making flexible reinforced tubular articles such as hose having a core formed of curable elastomeric material, comprising:

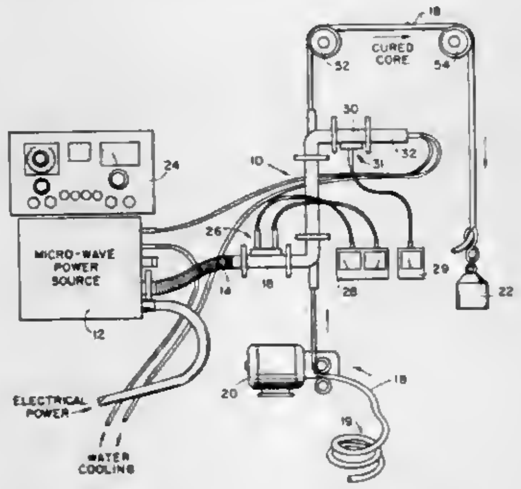
establishing at least one microwave applicator confined zone having an inlet and outlet for passage of an at least partially uncured core;

passing the curable core through the confined zone while substantially simultaneously (a) exposing the core to an applied microwave field, and (b) contacting substantially only the outer surface of the core with a cool stream of fluid within the confined zone, whereby the core becomes substantially cured with the exception of a layer at the outer surface of the core which remains substantially uncured;

twining reinforcement on said uncured outer surface of the core; and

adhering the reinforcement to the core.

13. Apparatus for partially curing flexible curable elastomeric cores useful in the manufacture of reinforced tubular articles such as hose, comprising:



at least one microwave applicator confined zone of generally elongated cylindrical shape and of greater internal cross dimension than the core to be cured, thereby defining an annular zone therebetween, and the confined zone having an inlet and outlet for through passage of an uncured core;

means coupled to the confined zone for supplying a microwave field to the confined zone; and

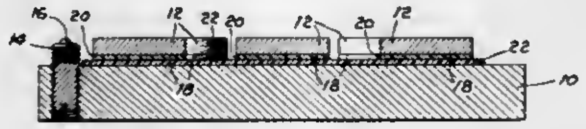
means for contacting the surface of the uncured core with a cooling fluid in the annular zone simultaneously as the core is passed through the confined zone and exposed to the microwave field without using a mandrel as an internal support for the core;

means for twining reinforcement on said core downstream of said confined zone.

4,104,099
METHOD AND APPARATUS FOR LAPPING OR POLISHING MATERIALS

Raymond E. Scherrer, West Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 27, 1977, Ser. No. 763,451
Int. Cl.^{2} B32B *31/00*
U.S. Cl. 156—155 **15 Claims**



1. A method for mounting material to be processed to a supporting surface of a processing apparatus wherein a selected surface of the material is to be protected, comprising the steps of:

applying a protective coating to the selected surface of the material; and

disposing a temperature-sensitive material between the protective coating and the supporting surface for securing the coating to said surface, whereby the protective coating protects the selected surface of the material during the processing and from solvents used to remove the temperature-sensitive material.

3. A method for mounting a semiconductor wafer to the surface of a lapping plate in such a manner as to protect the front face of the wafer during the lapping operation, comprising the steps of:

laminating the front face of said semiconductor wafer to a dry film photopolymer disposed on a carrier sheet; and

securing said carrier sheet over the surface of said lapping plate.

4,104,100
PROCESS FOR ANODIC ELECTRODEPOSITION OF AQUEOUS EMULSIONS

Dale F. Anders, Fox River Grove; Peter V. Brizgys, Chicago; Ronald Mattiuz, Downers Grove, all of Ill., and Edward J. Murphy, Williamsport, Pa., assignors to DeSoto, Inc., Des Plaines, Ill.

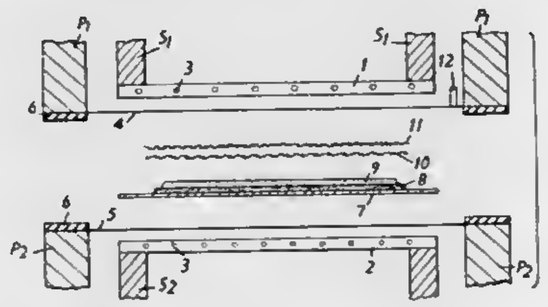
Filed Nov. 12, 1976, Ser. No. 741,386
Int. Cl.^{2} C25D *13/08*
U.S. Cl. 204—181 R **14 Claims**

1. A method for electrodepositing a continuous polymer film on a conductive substrate comprising, passing a unidirectional electrical current through an aqueous bath of emulsion copolymer particles and then through said conductive substrate as anode, said emulsion copolymer particles being provided by aqueous emulsion copolymerization of monoethylenically unsaturated monomers in the presence of about 0.5–5% of the weight of materials subjected to copolymerization, of a polyanionic phosphate-based emulsifying agent, and then withdrawing the coated anode from said bath.

4,104,101
PROCESS FOR MAKING A PLASTIC SHEET

Armen Garabedian, 8-22 Astoria Blvd., Long Island City, N.Y. 11102

Continuation of Ser. No. 279,964, Aug. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 141,495, May 10, 1971, abandoned, which is a division of Ser. No. 805,093, Feb. 14, 1969, abandoned, which is a continuation of Ser. No. 536,140, Mar. 21, 1966, abandoned, which is a continuation-in-part of Ser. No. 473,342, Jul. 20, 1965, Pat. No. 3,383,265. This application Jul. 19, 1977, Ser. No. 817,048
Int. Cl.^{2} B29C *17/06*
U.S. Cl. 156—285 **34 Claims**

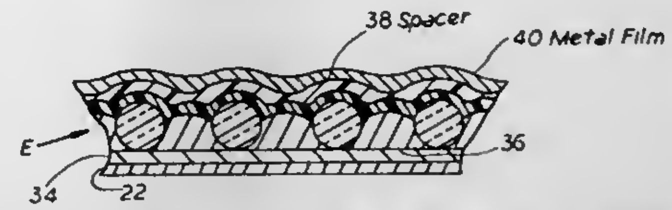


1. The process for producing a plastic sheet having on a major face thereof the characteristics of one surface of a master layer, comprising the steps of disposing on said surface of said master layer a plastic material in comminuted form, disposing over said plastic material a microporous parting element and an air-releasing wire screen means to form a multiple layer sandwich which includes said wire screen means, said parting element, said plastic material, and said master layer, positioning said multiple layer sandwich between two spaced flexible diaphragms, heating said plastic material to at least its fusion temperature, applying a fluid pressure to said diaphragms to evenly impress a fluid-like pressure to said multiple layer sandwich with a force sufficient to cause the plastic material to fuse to a coherent mass defining a plastic sheet as said major face takes on the characteristics of said one surface of the juxtaposed master layer.

4,104,102
METHOD OF MAKING A RETROREFLECTIVE LAMINATE

Beverly M. Eagon, Hudson; Russell L. Carlson, Tallmadge, and Raymond C. Fry, Stow, all of Ohio, assignors to Morgan Adhesives Company, Stow, Ohio

Division of Ser. No. 552,325, Feb. 24, 1975, Pat. No. 4,023,889. This application Aug. 12, 1976, Ser. No. 713,790
Int. Cl.^{2} B05D *5/06;* **B32B** *31/00*
U.S. Cl. 156—298 **3 Claims**

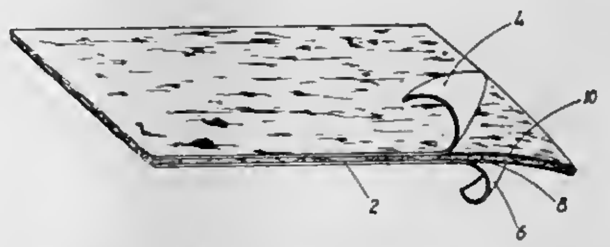


1. In a method of making a retroreflective laminate, the steps of applying a binder layer to a face layer, applying glass beads to the surface of said binder layer and embedding them in such layer but having said glass beads protruding from said binder layer, applying a liquid sealer layer to the surface of the binder layer and the protruding glass beads, drying to obtain a sealer layer that follows the contour of the protruding glass beads and the binder layer surface on both the inner and outer surfaces of such sealing layer, heating the resultant laminate, and laminating a preformed uniform thickness spacer film to the sealer, glass bead and binder layer under controlled heat conditions to bond the spacer film thereto, the spacer film substantially maintaining its uniform thickness as it is heated and laminated to the sealer-glass bead binder layer, the sealer layer aiding the bonding of the spacer film to the bead-binder surfaces, the spacer film having a metal reflective layer on its outer surface in the completed retroreflective laminate.

4,104,103
METHOD FOR MAKING CORK WALL COVERING

John A. Tarullo, Box 32159, Louisville, Ky. 40232

Continuation-in-part of Ser. No. 507,725, Sep. 30, 1974. This application Mar. 4, 1977, Ser. No. 774,259
Int. Cl.^{2} C09J *5/00*
U.S. Cl. 156—309 **14 Claims**



1. A process of making a cork wall covering comprising the steps of:

(a) placing a sheet of backing material onto one side of a sheet of cork with a thermoplastic adhesive being disposed therebetween;

(b) adhering said backing material to said sheet of cork to form a two-ply sheet by subjecting said material to preselected temperature and pressure for a preselected period of time;

(c) flexing said sheet of cork and backing material by stress relieving sequentially each side of said two-ply sheet;

(d) coating the opposite side of said cork sheet with a mixture of a polyester resin adhesive and a curing agent for said polyester resin;

(e) placing a sheet of facing material onto said side of cork sheet including said polyester resin adhesive;
(f) adhering said facing material to said cork to form a three-ply sheet by subjecting said material to preselected temperature and pressure for a preselected period of time; and,
(g) cooling said three-ply sheet to a preselected temperature.

4,104,104

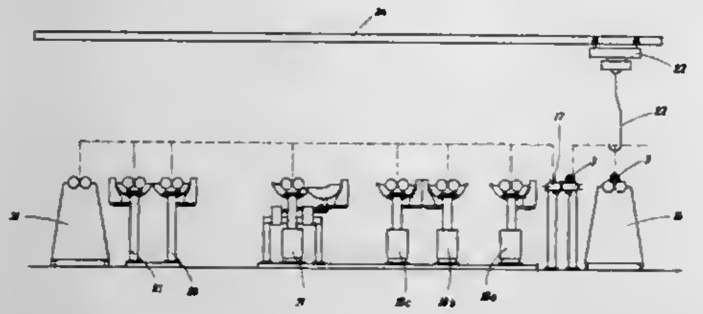
APPARATUS FOR AUTOMATICALLY PROCESSING PHOTOGRAVURE CURVILINEAR SURFACES

James Kagey Anderson, 1110 Rostrevor Cir., Louisville, Ky. 40205

Division of Ser. No. 392,475, Aug. 29, 1973, abandoned. This application May 15, 1975, Ser. No. 577,898

Int. Cl.² C23F *1/02*

U.S. Cl. 156—345 **3 Claims**



1. An apparatus for processing of photogravure curvilinear surfaces comprising: (a) at least three etching stations located in side by side sequential relationship to each other in a co-extensive series, each including opposed vertically extending support members and an etching tray positioned therebetween, said support members terminating in gravure cylinder receiving means for supporting said curvilinear surfaces in a preselected relationship with said tray and rotating said surfaces at a preselected speed, and, an etching system including for each station, an etching solution, an etching solution transfer means and an etching solution storage means in communication therewith, said transfer means functioning to transfer etching solution from said storage means to said etching tray and back for reuse, the concentration of the etching solution of each station being more dilute than in the preceding of each of said sequential stations in said series; (b) at least one cleaning station located in sequential, co-extensive relationship to the last of the etching stations in said series, and including opposed vertically extending support members and cleaning solution receiving means supported therebetween, said support members terminating in gravure cylinder receiving means for supporting and rotating said curvilinear surfaces at a preselected speed, said cleaning station further including a cleaning system having a cleaning solution, cleaning solution transfer means, a cleaning solution storage means in communication therewith, and delivery means for applying said cleaning solution to said cylinder; (c) conveying means supported in juxtaposition above said etching and cleaning stations for sequentially conveying said curvilinear surfaces to and from said etching stations in said series and said cleaning station; and (d) control circuit means for controlling said conveying means and rotating means of said stations so that all of said cylinder receiving means at said stations function collectively, in combination with said conveying means and said dilute etching solutions to provide that said curvilinear surfaces are treated at each of said stations for a preselected time, which time of treatment is generally the same thereby providing that movement of said curvilinear surfaces from one station to the next will be accomplished at a uniform rate.

4,104,105

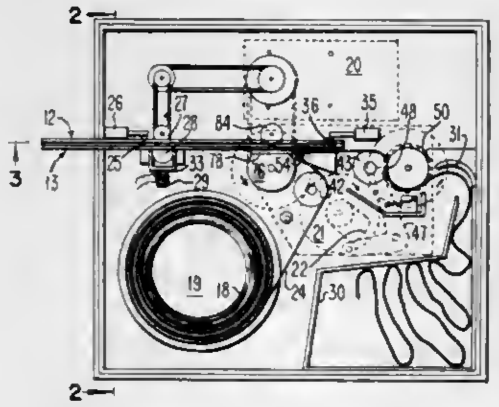
AUTOMATIC OVERLAY ATTACHING APPARATUS

Wilson Parker Rayfield, Pittsford, and Robert H. Jurgensen, Rochester, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 28, 1976, Ser. No. 736,674

Int. Cl.² B44C *3/00;* **B32B** *35/00*

U.S. Cl. 156—364 **7 Claims**



1. An apparatus for applying an overlay patch to a flexible item or document such as a check or deposit slip to enable correction of an encoded number and suitable for use with items of various sizes and thicknesses, comprising:
a housing,
a document receiving and entry throat mounted on said housing the said throat having parallel channel guide members oriented vertically relative to a horizontal advancing path of movement of the document and for holding the document vertical during the overlay attaching and ejecting operation and having detection means for sensing the entry and presence of a document at an overlay application position in said throat, said throat further having a ball and skewed roller advancing means providing point contact with the document for driving the document into said advancing means, and
having means for releasing the point contact to permit the document to be ejected from the throat, and
means responsive to said detection means to cause a tape bearing an overlay patch which is to be applied to said document to advance within said housing and in said throat, and
means within said housing for attaching said overlay to said document after it has been received in said throat and while simultaneously ejecting said document from said throat, and
said ball and skewed roller advancing means comprises a roller skewed at an angle to the vertical so as to drive the document downwardly and horizontally along the horizontal path of movement of the document and located on one side of the document path, and a ball located on the opposite side of the document path and normally biased by gravity to roll toward and against said skewed roller or document positioned between said skewed roller and ball,
said ball being metallic and housed in a nonmetallic casing having a floor sloping toward the throat such that
said ball is responsive to energization of an electromagnet provided adjacent said casing for attracting the ball away from the roller or document while said document is being ejected from said throat.

4,104,106

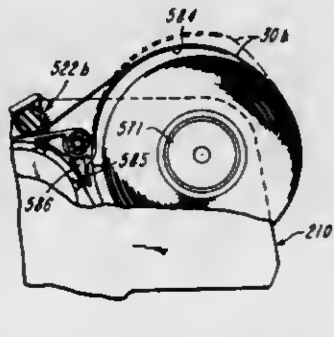
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 449,111, Mar. 7, 1974, abandoned, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 15, 1976, Ser. No. 649,603

Int. Cl.² B32B *35/00;* **B41K** *1/00*

U.S. Cl. 156—384 **32 Claims**



1. Apparatus for printing and applying pressure sensitive labels utilizing a supply roll comprising a composite web having pressure sensitive labels releasably secured to a web of supporting material, the apparatus comprising: printing means for printing on successive labels, a delaminator for delaminating successive printed labels from the supporting material web, an applicator for applying successive printed labels, means engageable with the supporting material web downstream of the delaminator for feeding the composite web to present partially delaminated labels to the applicator, means for operating the printing means and the feeding means in sequence, and means effective upon completion of the sequence for applying braking force to the composite web upstream of the delaminator to prevent the web from advancing toward the delaminator during application of a printed label by the applicator, wherein the means for applying braking force includes a rotatably mounted brake roll and means providing a back-up surface between which the composite web is disposed, the printing means comprising a print head for moving the brake roll into braking coaction with the composite web.

4,104,107

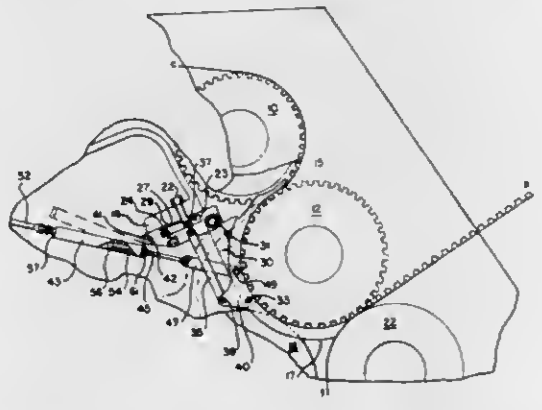
APPARATUS FOR URGING WEB GUIDES TOWARD THE CORRUGATING ROLL OF A SINGLE FACER

Kenneth Kaae Christensen, Winfield, Ill., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 18, 1977, Ser. No. 778,881

Int. Cl.² B31F *1/00*

U.S. Cl. 156—473 **3 Claims**



1. Apparatus for resiliently urging the web guide means of a single facer station of a machine for making corrugated board toward the corrugating rolls so as to maintain the contact of the web of corrugated medium with the corrugating rolls, comprising:
(a) plate means;
(b) means for fixably supporting said plates on said machine;
(c) a planar linkage connecting said guide means and said plates comprising
  (i) a pair of spaced bars,
  (ii) first pivot means connecting said bars and said plates, and
  (iii) second pivot means connecting said web guide and said bars whereby oscillation of said guide means is constrained within a predetermined plane,
(d) pneumatic ram means;
(e) a hanger connecting said ram and said plate; and
(f) a pivot connecting said ram and one of said bars whereby said ram resiliently urges said guide means toward said roll to maintain the contact of said web with said corrugated roll.

4,104,108

PLASTIC BAG FORMING AND SEALING APPARATUS

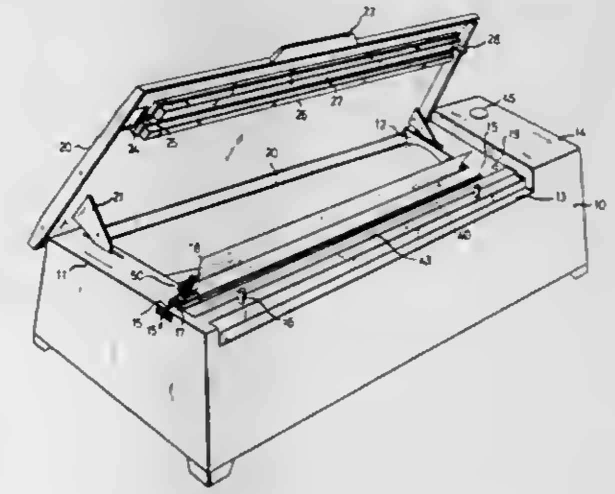
Shizuaki Kishida, and Misao Takahashi, both of Atsugi, Japan, assignors to Sanyei Corporation, Tokyo, Japan

Filed Nov. 8, 1976, Ser. No. 739,987

Claims priority, application Japan, Dec. 6, 1975, 50-145226

Int. Cl.² B32B *31/00;* **B30B** *15/34*

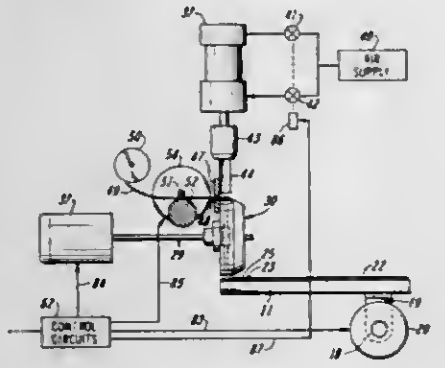
U.S. Cl. 156—510 **16 Claims**



1. Apparatus for forming and sealing plastic bags or the like, comprising:
a casing having a surface;
heating means at said surface and extending across said casing for heating a bag to seal it, when the bag is at said casing surface and said heating means is activated to heat;
means for activating said heating means;
a bag material cutter spaced away from said heating means and operable to cut a bag from a length of plastic held in the cutting pathway of said cutter;
a cover over said casing surface and connected with said casing; bag material support means being disposed to be beneath and supported on said cover and engageable with bag material to hold same against said casing surface as said heating means is activated and to hold same in the cutting pathway of said cutter; said cover being raisable off and to raise said support means off said casing surface;
said cutter being movable across said casing; said cutter including a blade to cut the bag material as said cutter is moved;
cutter guide and support means in said cover and shaped and positioned to be engaged by and to guide said cutter in motion thereof across said casing.

4,104,109
APPARATUS FOR BONDING ELECTRICAL CONTACTS TO PRINTED WIRING CIRCUIT BOARDS

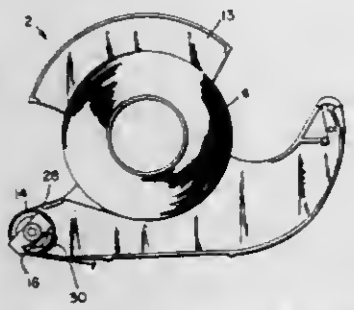
Thomas George Grau, Westerville, and David Elliott Tompsett, Lancaster, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 29, 1977, Ser. No. 828,513
Int. Cl.² B32B *31/00;* **B65C** *11/04*
U.S. Cl. 156—521 **17 Claims**



1. Apparatus for applying electrical contact segments to conductor terminations of a printed wiring circuit board comprising a table for supporting said circuit board, centrally pivotable and radially moveable plunger means arranged at right angles to the plane of said wiring board, contact segment retaining means mounted at opposite ends of said plunger means, one of said retaining means presenting a first contact segment opposite a first of said conductor terminations of said wiring board, loading means for feeding a second contact segment opposite the other of said retaining means, blade means suspended along the longitudinal axis of said plunger means and opposite said second contact segment, and means for driving said blade means along said axis for depositing said second contact segment on said other of said retaining means and for further driving said plunger means along said axis for applying said first contact segment on said wiring board at said first conductor termination.

4,104,110
HAND HELD APPLICATOR

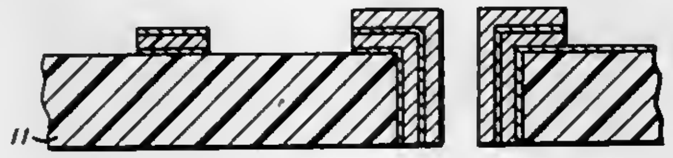
Robert Lee Macosko, 9701 Nita Ave., Chatsworth, Calif. 91311
Filed Jun. 6, 1977, Ser. No. 804,063
Int. Cl.² B32B *31/00;* **B44C** *7/06*
U.S. Cl. 156—523 **2 Claims**



1. A tape applicator for directly dispensing pressure sensitive adhesive tape from a roll onto a surface to receive the tape comprising:
a housing;
tape roll support means on said housing for supporting a roll of tape in a tape storage compartment;
tape roller means for pressing tape to be dispensed against a surface to receive the tape;
means for maintaining tape to be dispensed in contact with said tape roller means, said means comprising;
a tape clamp operated by means of a slide button against the forces of a tape clamp return spring and a slide arm return spring;
a tooth on said tape clamp to engage a star gear mounted to the roller;
a cam for forcing said tooth to engage said star gear;
a rocker snap spring to maintain the engagement of said tooth with said star gear until after the start of dispensing said pressure sensitive adhesive tape;
tape guide means for positioning tape to be applied;
tape cut-off means operable to cut the tape when a desired length of tape has been dispensed.

4,104,111
PROCESS FOR MANUFACTURING PRINTED CIRCUIT BOARDS

Robert L. Mack, 1881 Martin Ave., Santa Clara, Calif. 95050
Filed Aug. 3, 1977, Ser. No. 821,604
Int. Cl.² C23F *1/02*
U.S. Cl. 156—656 **10 Claims**

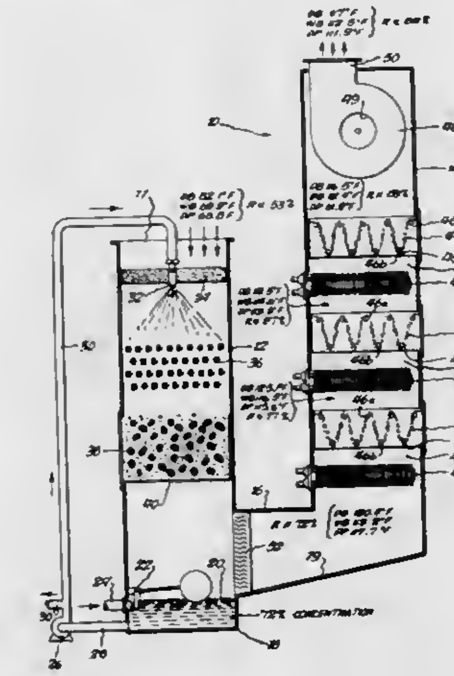


1. A process for the manufacturing of printed circuit boards, comprising:
a. pre-drilling a dielectric substrate to the desired hole pattern;
b. chemically depositing a first conductive material in a layer onto the surface of the substrate including the walls of the holes;
c. coating the substrate with a first layer of plating resist in a negative image of the desired circuit pattern;
d. plating a second conductive material onto said first conductive material, in those areas not covered by said first layer of plating resist, in the desired thickness;
e. plating a durable, chemically passive third conductive material over said second conductive material;
f. coating said first layer of plating resist and conductive material with a second layer of plating resist registered with the desired circuitry and in a negative pattern of the desired terminal pad and connector areas whereby said areas are left uncoated;
g. cleaning and reactivating the uncoated areas of conductive material left uncoated following application of the second layer of plating resist coating;
h. plating a eutectic alloy in the desired thickness to said uncoated areas of the conductive material;
i. chemically stripping the first and second layers of plating resist from the substrate;
j. immersing the substrate into a chemical etching bath, said bath being adapted to chemically etch away said first conductive material but to leave said third conductive material intact.

4,104,112
METHOD AND APPARATUS FOR CONCENTRATING AQUEOUS SOLUTIONS

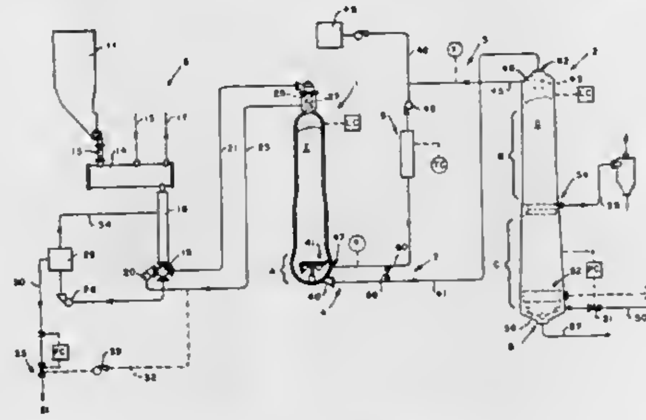
Robert C. Stutz, Kenmore, N.Y., assignor to Niagara Blower Company, Buffalo, N.Y.
Filed Oct. 17, 1973, Ser. No. 407,231
Int. Cl.² B01D *1/16*
U.S. Cl. 159—4 R **7 Claims**

1. Apparatus for concentrating an aqueous solution of an organic antifreeze medium comprising a casing including a first upright leg open at its upper end to provide an air inlet, a second upright leg and a connecting leg connecting said first and second upright legs at their lower ends, said first upright leg containing means for evaporating said aqueous solution into a stream of ambient air, a sump positioned at the lower end of said casing for said aqueous solution and spray means positioned at said air inlet for discharging the aqueous solution against said evaporating means, pump means and conduit for drawing said aqueous solution from said sump and directing it to said spray means; said second leg containing a plurality of alternately-disposed cooling coils and reclaiming filters forming a multistage reflux chamber, the stages of said multistage chamber being disposed one below the other and interdependent, each stage being in direct counterflow communication with an adjacent stage with respect to condensed liquid, each reclaiming filter except the uppermost being positioned to receive gravitating droplets directly from a subsequent superjacent reclaiming filter whereby condensed droplets of said antifreeze medium gravitate from one stage to the preceding stage relative to the direction of air flow to thereby clean the reclaiming filter of said preceding stage and to dilute the solution condensed thereon and thence gravitate to the sump, and fan means for drawing the ambient air through said air inlet, said evaporating means thence through the connecting leg and multistage reflux chamber.



4,104,113
TWO-STAGE DIGESTION WITH BETWEEN VESSEL HEATING

Michael I. Sherman, and James R. Prough, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.
Filed Jun. 21, 1976, Ser. No. 698,125
Int. Cl.² D21C *7/10*
U.S. Cl. 162—19 **18 Claims**

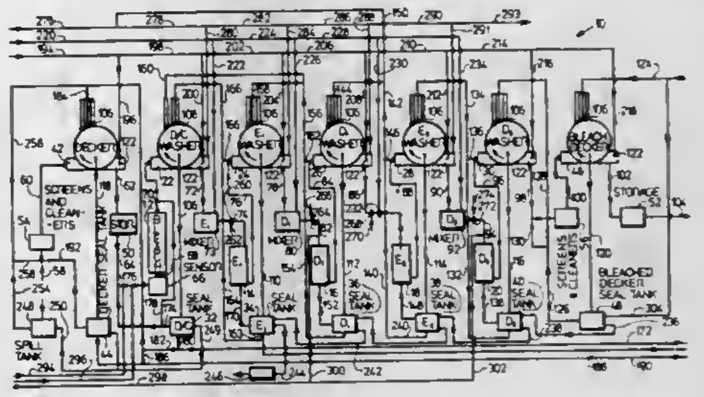


1. A method of digesting cellulosic fiber material utilizing a first vessel and a separate second vessel, said method comprising the steps of continuously
(a) feeding cellulosic fiber material entrained in treatment liquid into a top portion of the first vessel,
(b) establishing a first flow path of cellulosic fiber material entrained in and impregnated with treatment liquid from a bottom portion of the first vessel to a top portion of the second vessel, liquid substantially filling the second vessel,
(c) establishing a column of fiber material in the second vessel below the level of liquid in the second vessel,
(d) withdrawing liquid from a top portion of the second vessel,
(e) establishing a second flow path of the liquid withdrawn from the second vessel back toward a bottom portion of the first vessel,
(f) heating the liquid during transport in said second flow path,
(g) feeding a portion of the heated liquid flowing in said second flow path into said first flow path, while feeding the rest of the heated liquid to a bottom portion of the first vessel, and
(h) withdrawing digested fiber material from the bottom of the second vessel.

8. Apparatus for the digestion of cellulosic fiber material comprising
(a) a first vertical treatment vessel having top and bottom portions,
(b) a second vertical treatment vessel separate from said first vessel and having top and bottom portions, and being substantially liquid filled,
(c) means for feeding cellulosic fiber material entrained in treatment liquid to the top portion of said first vessel,
(d) means for establishing a first flow path of cellulosic fiber material entrained in and impregnated with treatment liquid from the bottom portion of said first vessel to the top portion of said second vessel, a column of fiber material being established in said second vessel below the level of liquid in said second vessel,
(e) means for establishing a second flow path of liquid withdrawn from the top portion of said second vessel back toward the bottom portion of the first vessel,
(f) means for heating the liquid in the second flow path,
(g) means for feeding a portion of the heated liquid flowing from the heating means in the second flow path into the first flow path while feeding the rest of the heated liquid to the bottom portion of said first vessel, and
(h) means for withdrawing digested fiber material from the bottom of said second vessel.

4,104,114
BLEACH PLANT OPERATION

Gordon Rowlandson, Birmingham, Ala.; Douglas W. Reeve, Orton, and W. Howard Rapson, Scarborough, both of Canada, assignors to Erco Envirotech Ltd., Islington, Canada
Filed May 5, 1977, Ser. No. 794,240
Int. Cl.² D21C *3/18*
U.S. Cl. 162—29 **16 Claims**



1. A bleach plant process including a combination of steps to achieve a low volume of effluent, a low consumption of water, energy and chemicals and efficient bleaching, caustic extraction and washing of cellulosic fibrous material pulp in a D/CEDED sequence, the steps comprising:
(a) passing unbleached pulp sequentially to a D/C bleaching

tower for initial bleaching with an aqueous solution of chlorine dioxide and chlorine mixed therewith, to a D/C washer for washing the initially-bleached pulp, to an E_1 caustic extraction tower for initial extraction with an aqueous sodium hydroxide solution mixed therewith, to an E_1 washer for washing the initially-extracted pulp, to a D_1 bleaching tower for further bleaching with an aqueous chlorine dioxide solution mixed therewith, to a D_1 washer for washing the further-bleached pulp, to an E_2 extraction tower for further extraction with aqueous sodium hydroxide solution mixed therewith, to an E_2 washer for washing the further-extracted pulp, to a D_2 bleaching tower for final bleaching with an aqueous chlorine dioxide solution mixed therewith, to a D_2 washer for washing the finally-bleached pulp, to a bleached pulp decer for final washing of the bleached pulp and to bleached pulp storage;

(b) controlling the quantity of chlorine fed to the initial bleaching operation to minimize overchlorination and strength losses and to result in a substantial absence of residual chlorine in the initially-bleached pulp;

(c) passing filtrate from each of said washers and said bleached decker to a seal tank associated with the respective washer or decker;

(d) removing two effluents from the process consisting of an acid effluent from the D/C seal tank and an alkaline effluent from the E_1 seal tank;

(e) providing a countercurrent flow of wash water with respect to the flow of pulp through the bleach plant consisting of passing respectively fresh water to the bleached pulp decker, passing filtrate from the bleached decer seal tank to the D_2 washer, passing filtrate from the D_2 seal tank to the E_2 washer, passing filtrate from the E_2 seal tank to the D_1 wahser, passing filtrate from the D_1 seal tank to the E_1 washer and to an initial portion of the washing on the D/C washer, and passing liquor from the E_1 seal tank to a latter portion of the washing on the D/C washer while avoiding the presence of E_1 seal tank filtrate in the D/C filtrate;

(f) conducting said washing on said E_1 washer at a dilution factor of a least about 3 while conducting said washing on said D/C washer, D_1 washer, E_2 washer, D_2 washer and bleached decker washer at a dilution factor of at least about 2;

(g) individually controlling the liquid level in each of said seal tanks below a minimum level except under emergecy conditions by cycling filtrate at a controlled rate from the respective seal tank to the appropriate washer; and

(h) connecting the seal tanks in countercurrent overflow arrangement for the accommodation of emergency conditions in which overflow from the bleached decker seal tank passes to the D_2 seal tank, overflow from the D_2 seal tank passes to the E_2 seal tank, overflow from the E_2 seal tank passes to the D_1 seal tank, overflow from the D_1 seal tank passes to the E_1 seal tank, overflow from the E_1 seal tank passes to a first spill storage tank and overflow from the D/C seal tank passes to a second spill storage tank.

4,104,115

METHOD OF MAKING PAPER FROM WATER INSOLUBLE ALGINATE FIBERS AND THE PAPER PRODUCED

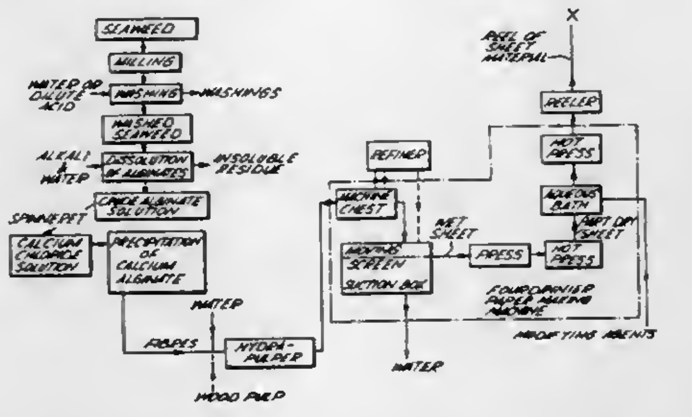
Ronald Ernest Prouse, Upminster; Anthony Alfred West, Basildon; Derek Anthony King, South Woodham Ferrers, and Roger Poulson, Billericay, all of England, assignors to Carreras Rothmans, Limited, England

Continuation of Ser. No. 420,052, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 231,837, Mar. 2, 1972, abandoned. This application Mar. 8, 1977, Ser. No. 775,621

Int. Cl.² D21H *5/12*

U.S. Cl. 162—100 **18 Claims**

1. A method of manufacturing alginate paper without the use or formation of an additional adhesive binder comprising the steps of forming a papermaking stock of raw fibrous water insoluble alginate material, said fibrous water insoluble alginate material being free of surface sodium alginate and being the only fibrous material used in said method, presenting said stock to the screen of the web-forming unit of a paper making machine arranged to form said paper and forming said paper on said machine, the pH value of said stock presented to said screen being at or below pH 7.0.



16. An alginate paper consisting essentially of raw water insoluble alginate fibres which are held together to form the sheet material without the use or formation of an additional adhesive binder.

4,104,116

HEADBOX FLOW CONTROLS

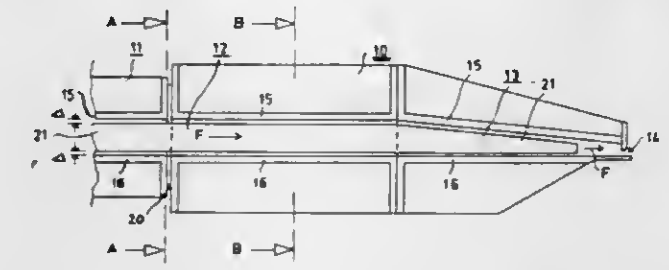
Jouni Koskimies, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Aug. 19, 1977, Ser. No. 826,271

Claims priority, application Finland, Aug. 20, 1976, 762393

Int. Cl.² D21E *1/02*

U.S. Cl. 162—343 **16 Claims**



1. In a headbox system of a paper-manufacturing machine, equalizing chamber means having an outlet end and an interior for receiving pulp stock, from a source such as one or more distribution pipes, and delivering the pulp stock to said outlet end, a slice distant from said equalizing chamber means, a plurality of elongated passage-forming means situated beside each other in a substantially horizontal plane and respectively having inlet ends communicating with said outlet end of said equalizing chamber means for receiving therefrom pulp stock to be directed by said plurality of passage-forming means toward said slice, throttling means situated between said outlet end of said chamber means and said inlet ends of said passage-forming means for throttling the flow of pulp stock from said equalizing chamber means into said plurality of passage-forming means, and flow-guide means extending along the interior of said equalizing chamber means, through said throttling means, and along at least some of said passage-forming means for guiding the pulp stock flowing from said equalizing chamber means into and along said plurality of passage-forming means and for preventing creation of flow-rate variations from changes in the direction of flow of pulp stock from said equalizing chamber means into said plurality of passage-forming means.

4,104,117

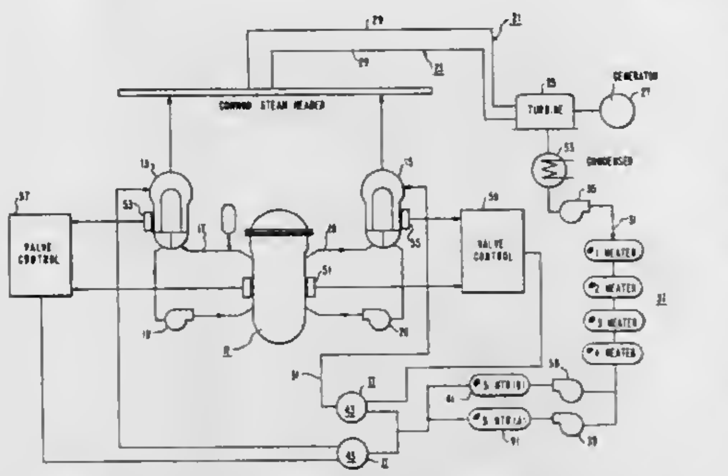
NUCLEAR REACTOR POWER GENERATION

Ernest A. Parziale, Richland, Wash., and Dennis C. Richardson, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,477

Int. Cl.² G21C *7/00*

U.S. Cl. 176—20 R **9 Claims**



1. Apparatus for generating power including a nuclear reactor, a turbine to be energized from said reactor, a steam generator, connected to said reactor, for deriving energy therefrom, fluid-circulating means connected to said turbine and generator, said fluid-circulating means including a first branch for circulating steam from said generator to said turbine to energize said turbine and a second branch for circulating feedwater from said turbine to said generator, said feedwater to be converted into steam by said generator by the energy supplied by said reactor to said generator, valve means in said second branch for controlling the flow of said feedwater to said generator particularly at low load levels and means responsive to the magnitude of the power supplied by said reactor and the level of the water in said generator at low loads for controlling said valve means.

4,104,118

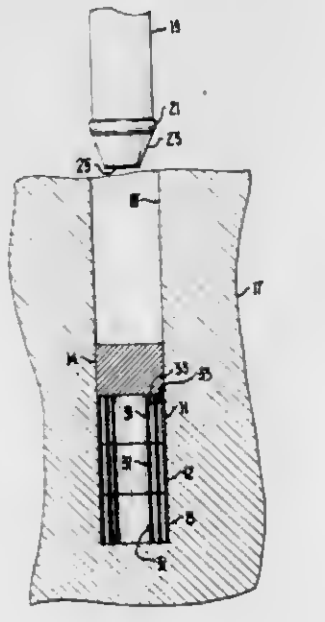
SHOCK ABSORBER

Joseph J. Housman, Del Mar, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Nov. 26, 1975, Ser. No. 635,749

Int. Cl.² G21C *9/00*

U.S. Cl. 176—38 **6 Claims**



1. In combination with a nuclear reactor core structure having a blind control rod passage, a shock absorber comprising a plurality of rigid fracturable elements having a lateral size sufficient to occupy a substantial portion of the cross-sectional area of said control rod passage and having a longitudinal size sufficient to extend axially in said passage, said element being positioned in said passage adjacent the blind end thereof, said element being composed solely of a porous brittle carbonaceous material, a porous brittle ceramic material, or a porous brittle refractory oxide, said elements having a plurality of parallel holes extending longitudinally therethrough and parallel with the longitudinal axis of the passage, said holes providing a void volume of between 30% and 70% of the total volume of the elements corresponding to a predetermined level of energy absorption by said elements upon being fractured due to impact loading by a control rod.

4,104,119

EMERGENCY FEED SYSTEM FOR COOLING NUCLEAR REACTOR INSTALLATIONS

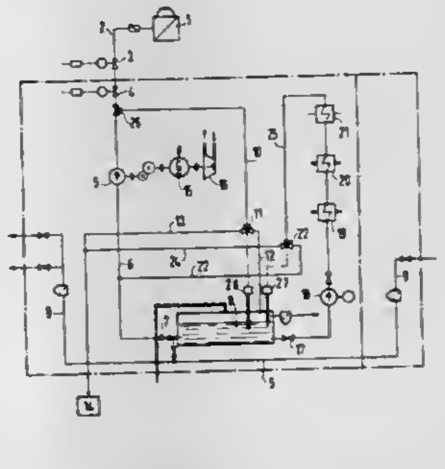
Rainer Schilling, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Feb. 14, 1977, Ser. No. 768,500

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606469

Int. Cl.² G21C *9/00*

U.S. Cl. 176—38 **4 Claims**



1. Emergency feed system for cooling nuclear reactor installations having a vessel for containing deionate which is fed to a steam generator through an emergency feed pump having a suction line connected to the vessel comprising a circulating line extending at one end thereof from the vessel and having connected therein a circulating pump and heat exchanger means for cooling components of the emergency feed system, valve means connected to the other end of said circulating line, and a pair of lines both extending from said valve means and connected, respectively, to the suction line of the emergency feed pump and to a drainage system.

4,104,120

STATIC FUEL HOLDDOWN SYSTEM

Francis Thomas Grubelich, Wethersfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 21, 1977, Ser. No. 760,881

Int. Cl.² G21C *3/30*

U.S. Cl. 176—50 **6 Claims**

1. In a nuclear reactor comprising at least one fuel assembly having fuel members and structural members for spacing and support of the fuel members, the fuel assembly being disposed longitudinally in a path of intended coolant flow, the intended coolant flow defining upstream and downstream directions, a means for preventing downstream motion of the fuel assembly, comprising:

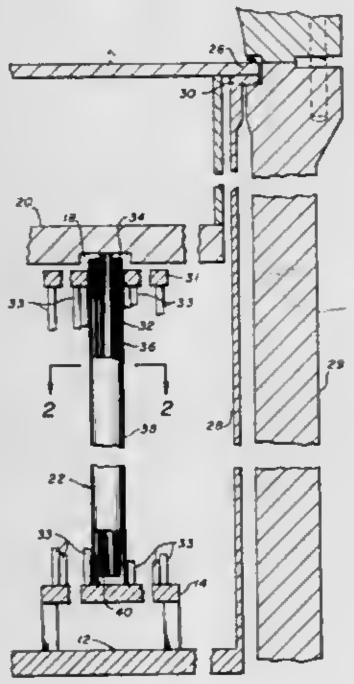
- a. a lower end fitting constituting the upstream end of the fuel assembly and connected to the rest of the fuel assembly so as to prevent relative downstream motion of the fuel assembly with respect to the lower end fitting;
- b. a force-transmitting member, comprising:
  - (i) an inner column having an engagement end, the inner

column extending longitudinally in one of the upstream and downstream directions from the engagement end of the inner column;

(ii) an intermediate column concentric with the inner column and hollow along at least a part of its length, which part encloses at least part of the inner column;

(iii) means for preventing movement of a point on the inner column with respect to a first point on the intermediate column when a compressive force is applied to the force-transmitting member, the remainder of the inner column being free to move with respect to the remainder of the intermediate column, simultaneous expansion of the intermediate column and compression of the inner column thereby being permitted;

(iv) an outer column concentric with the intermediate column and hollow along at least a part of its length, which part encloses at least part of the intermediate column, the outer column having an engagement end from which the outer column extends in a direction opposite to that in which the inner column extends; and



(v) means for preventing movement of a point on the outer column with respect to a second point on the intermediate column, which second point is located on the intermediate column further in the direction in which the outer column extends than is the first point, when a compressive force is applied to the force-transmitting member, the remainder of the outer column being free to move with respect to the remainder of the intermediate column, simultaneous expansion of the intermediate column and compression of the outer column thereby being permitted; for transmitting to the lower end fitting a force applied to one of the engagement ends; and

c. means for applying sufficient upstream force to the other engagement end to hold the fuel assembly in place against downstream force from the coolant, the upstream force thereby being applied through the outer, intermediate, and inner columns to the lower end fitting;

wherein the upstream and downstream movement of the force-transmitting member is restricted only by the lower end fitting and the upstream-force means.

4,104,121

SOLID ABSORBENT SAFETY DEVICE FOR A NUCLEAR REACTOR

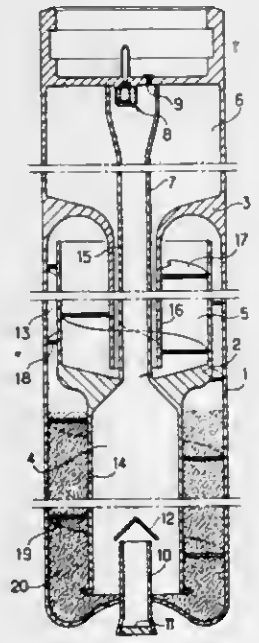
Claude Malaval, Antony, France, assignor to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France

Continuation-in-part of Ser. No. 365,946, Jun. 1, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,194

Claims priority, application France, Jun. 2, 1972, 72.19990

Int. Cl.^{2} G21C *7/22*

U.S. Cl. 176—86 R **3 Claims**



1. In combination, a nuclear reactor and a safety device, said nuclear reactor including:
  a reactor core having vertical cylindrical openings therein for receiving cylindrical fuel assemblies,
said safety device comprising:
  a closed cylindrical elongated container having its lower end mounted within one of said core openings,
  said container comprising upper and lower, vertically spaced transverse partition means defining an upper compartment, an intermediate compartment and a lower compartment, with said lower compartment positioned within said core,
  pulverulent solid absorbent within said container,
  means for applying fluid under pressure to said lower compartment and to effect by pressurized fluid passage from said lower compartment through said intermediate compartment to said upper compartment passage fluidized transport of said absorbent into said intermediate compartment for storage therein, and
  an axial tube extending through the bottom of the container and having the inner end disposed within said lower comparment, and
  a closing member comprising a destructible seal whose physical destruction is responsive to neutronic flux increase under reactor malfunction sealably closing the end of said tube external of said cylindrical elongated container;
  whereby, the discharge of said fluid under pressure through said tube causes fluidized transport of said pulverulent absorbent from said intermediate compartment into said lower compartment to shut down said reactor.

4,104,122

LIQUID ABSORBENT SAFETY DEVICE FOR A NUCLEAR REACTOR

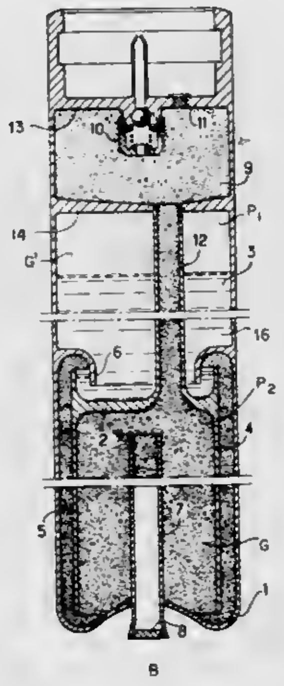
Claude Malaval, Antony, and Jean-Loup Picou, L'Hay Les Roses, both of France, assignors to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France

Continuation of Ser. No. 366,921, Jun. 3, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,463

Claims priority, application France, Jun. 2, 1972, 72.19989

Int. Cl.^{2} G21C *7/22*

U.S. Cl. 176—86 L **6 Claims**



1. A safety shut down assembly for a nuclear reactor including a reactor core, said safety shut down assembly comprising:
  a vertical, closed, cylindrical casing for partial vertical placement within the reactor core,
  a first horizontal, transverse partition dividing said casing into vertically upper and lower compartments,
  means communicating said compartments,
  said upper compartment being located in said reactor above the core,
  a liquid absorbent within said casing in an amount initially nearly filling said lower compartment,
  said lower compartment being situated in the core of said reactor,
  means for gas pressurization of the lower compartment for forcing liquid absorbent through said communicating means and into said upper compartment,
  an axial vertical pipe extending through said cylindrical casing within said lower compartment and having an end external of said cylindrical casing closed off by a closing member defining a physically destructible seal whose destruction is directly responsive to a predetermined neutronic flow corresponding to a reactor malfunction;
  whereby, destruction of said closure seal opens said lower compartment directly to the reactor core to cause liquid absorbent stored within the upper compartment to move into the lower compartment for shut down of said reactor.

4,104,123

PROCESS OF PRODUCING A "XANTHEMONAS-TYPE" POLYSACCHARIDE

Nguyên-Công Duc, Oulcby-le-Chateau; Jean-Louis Marie Brehant, Amiens; Benoît-Joseph Pons, Languevoisin Nesle, and Maurice Henri Séchet, Nesle, all of France, assignors to Les Produits Organiques du Santerre Orsan, Paris, France

Filed Oct. 13, 1976, Ser. No. 732,139

Claims priority, application France, Oct. 23, 1975, 75 32498

Int. Cl.^{2} C12D *13/04;* C12K *1/00*

U.S. Cl. 195—31 P **20 Claims**

1. A method of producing a Xanthane type of polysaccharide through fermentation under aerobiosis and under stirred conditions with a pH value ranging from about 5.5 to 9 and at a temperature of 25° to 35° C of an aqueous fermentation medium containing sources of carbon and of nitrogen by inoculating said aqueous fermentation medium with a strain of Xanthomonas having an increased polysaccharide production output of at least 20 percent in terms of viscosity when compared to that achieved by *Xanthomonas compestris* NRRL-B-1459 grown under the same conditions on a growth medium containing as nitrogen source any one of the amino-acids selected from the group consisting of glutamic acid, glutamine, arginine, tyrosine, threonine, aspartic acid, asparagine, proline, leucine and tryptophane, by using as said aqueous fermentation medium an aqueous medium with a content of at least 5 g/l to 55 g/l of carbohydrates and containing at least one amino-acid selected from said group as well as any other amino-acids yielding a polysaccharide producing capacity at least equal under the same conditions and with the same total nitrogen content to 50% of that yielded by corn steep liquor, the source of nitrogen of said fermentation medium corresponding to a nitrogen value ranging from 0.1 g/l to 5 g/l, and by recovering said polysaccharide from the fermented aqueous medium.

17. A method of isolating a novel strain of microorganism belonging to the Xanthomonas kind having an increased polysaccharide production output of at least 20 percent in terms of viscosity when compared to that achieved by *Xanthomonas campestris* NRRL-B-1459 when grown under the same conditions, consisting in effecting a selection of said strain from a swab taken from a sick plant through successive cultures in successive fractions of an isolating aqueous medium containing trace elements, a source of carbon, and a source of nitrogen with successive periods of incubation in each fraction of said medium, said source of nitrogen comprising a substantial amount of at least one amino-acid selected from the group consisting of glutamic acid, glutamine, arginine, tyrosine, threonine, aspartic acid, asparagine, proline, leucine and tryptophane.

4,104,124

PROCESS FOR THE PRODUCTION OF SINGLE CELL PROTEIN AND AMINO ACIDS

Vadake R. Srinivasan, Baton Rouge, La., and Ye-Chin Chol, Atbens, Ga., assignors to Louisiana State University Foundation, Batnn Rouge, La.

Filed Aug. 30, 1976, Ser. No. 718,974

Int. Cl.^{2} C12B *1/00;* C12D *13/06*

U.S. Cl. 195—33 **14 Claims**

1. A process for the production of comestible, digestible protein which comprises cultivating a cellulase-elaborating bacterium of a mutant of Cellulomonas (ATCC-21399) which has the ability to excrete L-glutamic acid or L-lysine, or both, when the mutant microorganism is grown in a fermentation medium in the substantial absence of yeast extract on an assimilable source of carbon, and supplied with nitrogen and mineral nutrients, in the presence of oxygen at temperatures ranging from about 20° to about 40° C.

4,104,125

PROCESS FOR PRODUCING HUMAN LYSOZYME

Kazuo Takechi, Sakai; Tsuyoshi Takahashi, Osaka; Toyoaki Inaba, Nagaokakyo, and Ellchl Hasegawa, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jul. 13, 1977, Ser. No. 815,359

Claims priority, application Japan, Feb. 28, 1977, 52/20984

Int. Cl.^{2} C07G *7/026*

U.S. Cl. 195—66 R **16 Claims**

1. A process for producing a human lysozyme preparation which comprises fractionating a human blood by solubility difference to isolate an albumin fraction, contacting said albumin fraction with a weakly acidic cation-exchanger to adsorb the lysozyme contained in said albumin fraction and desorbing the adsorbed lysozyme.

4,104,126
NON-ISOTOPIC SUBSTRATE ASSAY EMPLOYING BACTERIOLYSIS PRODUCTS

David M. Young, Sherborn, Mass., assignor to Nichols Institute of Endocrinology, Inc., San Pedro, Calif.

Continuation of Ser. No. 653,455, Jan. 29, 1976, abandoned. This application Nov. 19, 1976, Ser. No. 743,413

Int. Cl.² G01N ***31/14***

U.S. Cl. 195—103.5 A **16 Claims**

1. In a non-isotopic assay for a substrate for specific binding protein involving:
(a) bacteriophage-substrate conjugate, which substrate is specifically bound by said protein; and
(b) said protein in an amount insufficient to bind all of said conjugate;
wherein free substrate and said conjugate compete for binding sites on the protein, protein-bound conjugate is inactivated, bacteriophage remaining viable are incubated with their host bacteria to occasion lysis and the level of said substrate in the specimen under assay is determined as an inverse function of a value corresponding to the extent of cell lysis, the improvement wherein an intracellular constituent freed by lysis is assayed, yielding a value proportional to the amount of said constituent, and the latter value is compared to one or more like values similarly obtained upon bacteriophage assay of standards containing known quantities of said substrate.

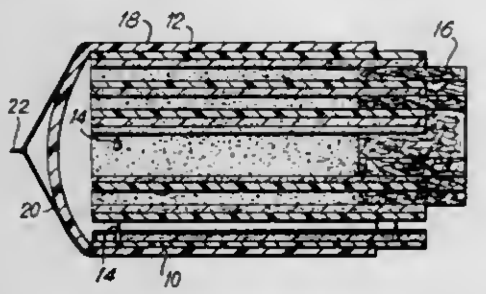
4,104,127
ARTICLE FOR GROWING CULTURES IN A BODY CAVITY IN THE PRESENCE OF GAS, AND PACKAGE FOR THE ARTICLE

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Division of Ser. No. 478,706, Jun. 12, 1974, Pat. No. 3,979,263. This application Jun. 18, 1976, Ser. No. 698,470

Int. Cl.² C12K ***1/04. 1/10***

U.S. Cl. 195—127 **38 Claims**



1. An article for growing a culture in a body cavity, comprising enclosure means, a nutrient for growing a microorganism in a given gaseous atmosphere in said enclosure means, support means for supporting said nutrient in said atmosphere and gaseous atmosphere generating means cooperating with the support means for providing a gaseous atmosphere to which the nutrient and microorganism will be exposed when the article is in said body cavity.

4,104,128
APPARATUS AND METHOD FOR RECOVERY OF COAL FINES

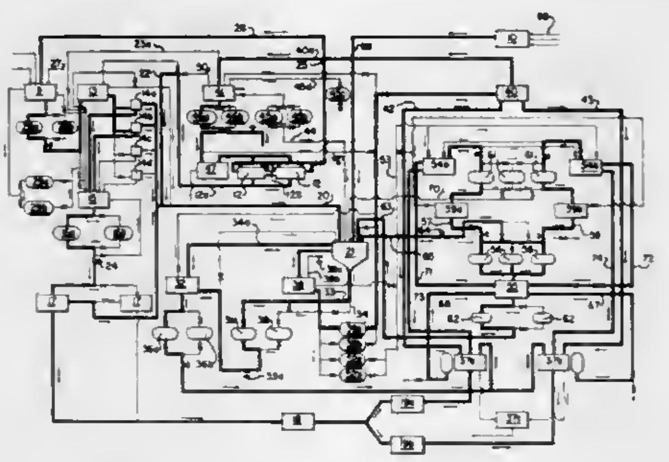
Paul V. Faber, Morristown; Edwin R. Daly, Morris Plains, and Prithvi Jain, Parsippany, all of N.J., assignors to Wilputte Corporation, New Providence, N.J.

Filed Jul. 21, 1976, Ser. No. 707,699

Int. Cl.² B03B ***9/00;*** **C10B** ***53/04***

U.S. Cl. 201—4 **32 Claims**

27. A method for recovering coal particles and fines collected in a charge bin vent condenser of a coke oven charging system having a coal preheating stage, which method comprises the steps of:
(a) passing a liquid through the charge bin vent condenser to discharge the coal particles and fines therewith,
(b) clarifying the liquor discharged from the charge bin vent condenser in step (a) to separate liquid from solids, and



(c) returning solids obtained in step (b) to the coal preheating stage of the coke oven charging system.

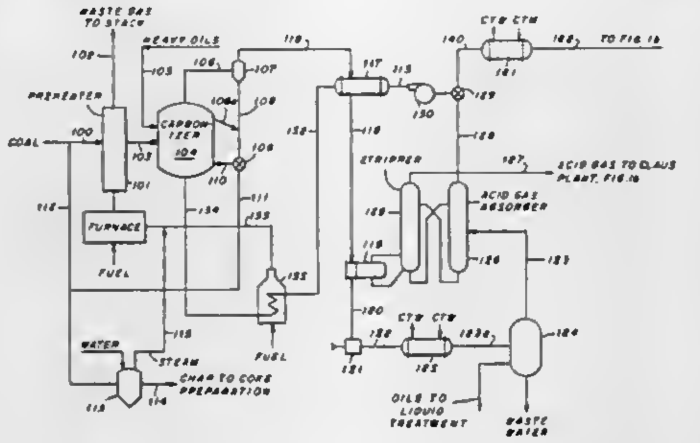
4,104,129
LOW TEMPERATURE CARBONIZATION AND DESULFURIZATION OF COAL UNDER ELEVATED PRESSURES

Marvin C. Fields, Wilkins Township, Allegheny County, and Richard F. Wyse, Plum Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 410,072, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 195,075, Nov. 2, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 501,898

Int. Cl.² C10B ***55/10. 57/00***

U.S. Cl. 201—17 **6 Claims**



1. A method of coal conversion and subsequent product recovery comprising:
(i) a first step of conducting a coal carbonization and desulphurization by contacting a mixture of finely divided particles of char and coal with a gas having at least about 20 mol percent hydrogen and at a temperature of between about 950° to about 1500° F and a pressure of 30-300 psi, said gas containing no more than about 2% by volume of hydrogen sulphide and being substantially free of oxygen, said process yielding a char containing no more than about 1% by weight of sulphur, said char being suitable for the production of a metallurgical grade coking material, and
(ii) a second step of recovering individual components including a pure carbon dioxide from the gaseous products of said carbonization and desulphurization step by the use of the gas pressures from said carbonization and desulphurization step which carbon dioxide is recovered by reacting a gas stream containing hydrogen, methane and carbon monoxide with steam and removing carbon dioxide from the reaction products, and wherein this second step includes low temperature condensation of individual components from said gaseous products.

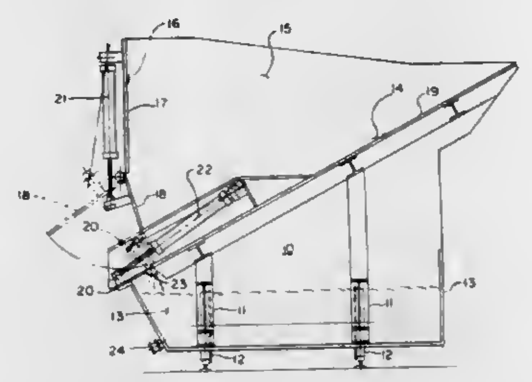
4,104,130
COKE QUENCHING CAR

Albert Calderon, 1065 Melrose Dr., Bowling Green, Ohio 43402

Filed Jul. 9, 1976, Ser. No. 703,857

Int. Cl.² C10B ***39/14***

U.S. Cl. 202—230 **6 Claims**



1. Apparatus comprising a movable carriage for supporting a body of coke as the body of coke is quenched with liquid to reduce the temperature of the body of coke, said carriage comprising a substantially unbroken surface portion which is inclined with respect to a horizontal plane so that liquid disposed thereon may advance toward the bottom thereof under the influence of gravity, gate means associated with said substantially unbroken surface portion, said gate means including at least one gate member which is selectively movable to a first position to limit the range of movement of a body of coke disposed on said substantially unbroken surface portion under the influence of gravity and which is selectively movable to a second position to permit discharge of the body of coke from said substantially unbroken surface portion, means defining a liquid reservoir supported by said carriage and disposed below said substantially unbroken surface portion, said reservoir including an upwardly extending wall portion having an upper end spaced from the lower end of said substantially unbroken surface portion, a bottom wall means disposed in the space between the upper end of said upwardly extending wall portion and the lower end of said substantially unbroken surface portion for guiding coke under the influence of gravity across said space when said gate member is in said second position, said bottom wall means including a fluid passage between the bottom of said substantially unbroken surface portion and said reservoir when said gate member is in said first position, said gate member being positioned relative to said substantially unbroken surface when said gate member is in said first position so as to allow liquid to flow therebetween, thus establishing and maintaining fluid communication between said substantially unbroken surface portion, said fluid passage, and said reservoir to allow quenching liquid to drain from the body of coke into said reservoir.

4,104,131
PROCESS FOR SEPARATING AMMONIA AND ACID GASES FROM WASTE WATERS CONTAINING FIXED AMMONIA SALTS

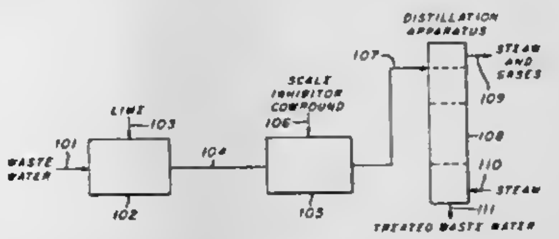
William J. Didycz, Whiteball Borough; Donald Glassman, Mount Lebanon Borough; Edward E. Maier, Plum Borough, and George T. Saniga, Penn Hills Township, Alleghany County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 8, 1976, Ser. No. 703,407

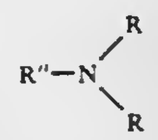
Int. Cl.² B01D ***3/38***

U.S. Cl. 203—7 **38 Claims**

1. A process for separating acid gases and ammonia from a dilute aqueous solution thereof, said solution being derived from a coal conversion process and also containing free and fixed ammonia salts and sulfate ion in a concentration of less than about 1500 ppm, said process comprising:
(a) subjecting said solution to a first countercurrent multi-stage continuous distillation, said distillation being conducted by having a gradient of ammonia concentration decreasing towards the region of bottom liquid withdrawal which results in said bottom liquid having a pH of more than 9,
(i) withdrawing an overhead vapor stream containing a major proportion of stripping vapor, some of said acid gases from said solution, and some of the ammonia from said free ammonia salts,

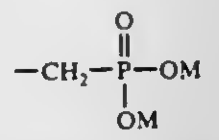


(ii) withdrawing an aqueous bottom stream which contains a major proportion of water, acid gases, free ammonia salts and substantially all of said fixed ammonia salts;
(b) adding lime to said withdrawn bottom stream, said lime being added in an amount sufficient to form an insoluble precipitate and evolve ammonia contained in the fixed ammonia salts during a second distillation of said mixture;
(c) adding a threshold amount of at least one scale inhibitor compound of the general formula



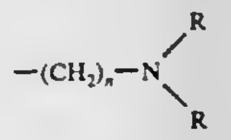
$$R''-N(R)_2$$

where R is



$$-CH_2-P(=O)(OM)-OM$$

R′ is selected from the group consisting of R and $-CH_2CH_2OH$, and
R″ is selected from the group consisting of R, $-CH_2CH_2OH$, and



$$-(CH_2)_n-N(R)_2$$

where each M is independently selected from the group consisting of H, NH_4, and alkali metal, "n" is a whole number from 1 to 3, to said dilute aqueous solutions to thereby inhibit the deposition of scale on the trays of the distillation towers; and
(d) subjecting said withdrawn bottom stream to a second countercurrent multi-stage continuous distillation,
(i) withdrawing an overhead vapor stream, said vapor stream containing a major proportion of stripping vapor and a portion of the ammonia from the fixed ammonia salts and reusing this overhead vapor stream as a stripping vapor in the first distillation, and
(ii) withdrawing an aqueous bottom stream, said stream having a substantially reduced concentration of acid gases and ammonia as compared to said aqueous solution.

4,104,132

METHOD FOR ELIMINATING SOLUTION-LEVEL ATTACK ON CATHODES DURING ELECTROLYSIS

Ernest R. Cole, Jr., Newburg, Mo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 818,183
Int. Cl.^{2} C25C *1/16, 7/00*

U.S. Cl. 204—12 **6 Claims**

1. In a process for electrolytically depositing zinc from a solution of an electrolyte in a cell by passing a current from the anode to the cathode and depositing the zinc on the cathode, the improvement consisting of positioning a barrier structure between, but not in contact with, said anode and said cathode and extending above and below the solution level to eliminate oxygen attack on said cathode at solution level during operation of said cell.

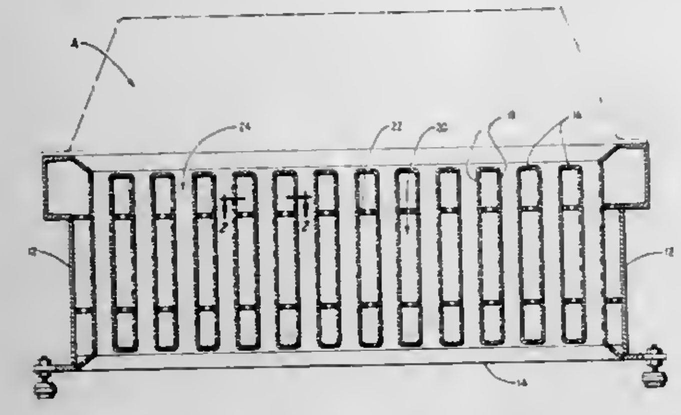
4,104,133

METHOD OF IN SITU PLATING OF AN ACTIVE COATING ON CATHODES OF ALKALI HALIDE ELECTROLYSIS CELLS

James R. Brannan, Painesville; Irving Malkin, University Heights, and Claude M. Brown, Perry, all of Ohio, assignors to Diamood Shamrock Corporation, Cleveland, Ohio

Filed Jul. 27, 1977, Ser. No. 819,458
Int. Cl.^{2} C25D *5/02, 5/48, 7/04*

U.S. Cl. 204—25 **6 Claims**



1. A method of in situ electrodeposition of a nickel-zinc alloy coating onto surfaces of cathode tubes disposed within a cathode can of an electrolysis cell for the production of ahlogens and alkali metal hydroxides, said cathode tubes each having a pair of vertically oriented parallel foraminous planar side walls each having outside surfaces and facing inside surfaces and a catholyte space intermediate said inside surfaces and a plurality of horizontally disposed spacer members connecting said inside surfaces of each of said pair of foraminous side walls and having vertically aligned openings therethrough, the method which comprises:

cleaning and rinsing said cathode can;
immersing said cathode can in a plating solution containing nickel ions and zinc ions;
immersing plating anodes within said cathode can and parallel to said cathode tubes;
electrically connecting said plating anodes and said cathode tubes to a source of direct current so that said plating anodes are anodic and said cathode tubes are cathodic;
electrodepositing a nickel-zinc alloy coating on said inside and outside surfaces of said cathode tubes;
removing said anodes and said plating solution from said electrolysis cell, and
leaching said coating to remove at least some zinc therefrom whereby said cell may be placed in use for the production of halogens and alkali metal hydroxides.

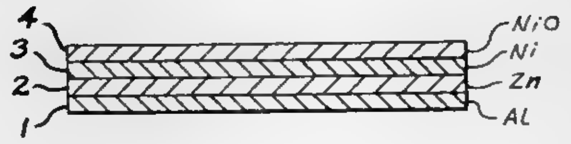
4,104,134

METHOD FOR MAKING AN ALUMINUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY

Marion L. Roberts; Max H. Sharpe, and Albert C. Krupnick, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1977, Ser. No. 829,390
Int. Cl.^{2} C25D *5/50, 5/34, 5/44*

U.S. Cl. 204—37 R **10 Claims**



1. A method for making a panel for selectively absorbing solar thermal radiation, comprising the steps of:

(a) cleaning the aluminum substrate;
(b) zincating the substrate by immersion in an alkaline solution of zinc ions;
(c) electroplating on the thus-zincated substrate a layer of nickel from a basic nickel sulfamate bath;
(d) oxidizing the thus-produced nickel layer in an oxygen-containing gas at 800°–1050° F. for 2–7 minutes.

7. A method for making a panel for selectively absorbing solar thermal radiation, comprising the steps of:

(a) cleaning the copper substrate,
(b) electroplating on the copper substrate a layer of nickel from a basic nickel sulfamate bath;
(c) oxidizing the thus-produced nickel layer in an oxygen-containing gas at 800°–1050° F. for 2–7 minutes.

4,104,135

METHOD OF PRODUCING HIGHLY CORROSION RESISTANT TIN-PLATED STEEL SHEET

Taketoshi Fujimaki; Shoji Shijima, and Shunichi Harada, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 454,150, Mar. 25, 1974, abandoned. This applicatioo Aug. 4, 1975, Ser. No. 601,516
Claims priority, application Japan, Apr. 3, 1973, 48-37395
Int. Cl.^{2} C25D *5/10, 5/50*

U.S. Cl. 204—37 T **5 Claims**

1. A method for producing a highly acid corrosion resistant tin-plated steel sheet having a reduced ATC value when compared to conventional tin-plate comprising:

electroplating a coating selected from the group consisting of nickel, copper and nickel-tin alloy upon a steel sheet said coating having a thickness immediately after coating of between 0.005μ and 0.5μ;
heating the plated steel sheet in a non-oxidizing atmosphere to completely diffuse the coating, enable the coating to penetrate the surface and to allow for reformation of the steel sheet surface so that the plating metal layer has substantially disappeared from said surface; and
electroplating a tin coating on the reformed steel sheet surface to produce a tin-plated steel sheet.

4,104,136

PROCESS FOR APPLYING THIN MOLYBDENUM CONTAINING COATINGS ON ALUMINUM FOR SOLAR ENERGY ABSORPTION

Daniel Joseph Schardein, and Ruth Diane Lloyd, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 615,245, Sep. 22, 1974, abandoned. This application Jun. 3, 1977, Ser. No. 803,320
Int. Cl.^{2} C25D *5/44, 9/12*

U.S. Cl. 204—38 B **7 Claims**

1. The process of producing a thin, adherent coating on an article of aluminum and alloys thereof that is highly absorptive to solar energy and has a low emissivity for thermal energy, said process comprising:

A. providing a clean surface on said article;
B. immersing said surface in a solution containing ammonium molybdate;
C. connecting said article as the cathode in a direct-current circuit; and
D. electrochemically plating said clean surface to form a coating which is a nearmonatomic layer of molybdenum and oxides thereof.

4,104,137

ALLOY PLATING

Ronald J. Lash, Warren, and Otto Kardos, Ferndale, both of Mich., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jun. 10, 1977, Ser. No. 805,410
Int. Cl.^{2} C25D *3/56*

U.S. Cl. 204—43 T **18 Claims**

1. A process for the preparation of an electrodeposit which contains iron and at least one metal selected from the group consisting of nickel and cobalt which comprises passing current from an anode to a cathode through an aqueous acidic plating solution containing an iron compound and at least one member selected from the group consisting of cobalt compounds and nickel compounds providing cobalt or nickel ions for electrodepositing alloys of iron with cobalt and/or nickel and containing 1 to 50 g/l of at least one substituted or unsubstituted dihydroxybenzene complexing agent.

4,104,138

BRASS PLATING

Frank Passal, Royal Oak; Ronald J. Lash, Warren, and Otto Kardos, Ferndale, all of Mich., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jun. 7, 1977, Ser. No. 804,468
Int. Cl.^{2} C25D *3/58*

U.S. Cl. 204—44 **11 Claims**

11. A composition for electroplating bright brass having an alloy composition of from 45% to 65% copper comprising an aqueous alkaline cyanide electroplating solution containing:

at least one copper compound providing 11 to 26 g/l of copper ions,
at least one zinc compound providing 11 to 26 g/l of zinc ions,
0.1 to 10 g/l of a salt of at least one condensed arylsulfonic acid, and
0.1 to 2 g/l of at least one aldehyde or the bisulfite adduct of at least one aldehyde.

4,104,139

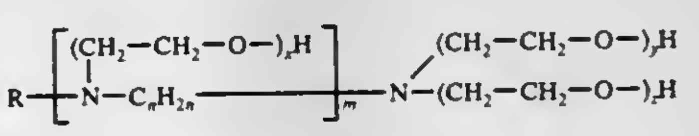
ELECTROPLATING ZINC

Francesco Cargnino, Venaria (Turin), and Giorgio Audisio, Turin, Italy, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 810,732
Int. Cl.^{2} C25D *3/22*

U.S. Cl. 204—55 R **5 Claims**

1. Zinc-containing aqueous electroplating bath containing alkali metal hydroxide and, as complexing agent, a reaction product of phosphoric acid or polyphosphoric acid with a compound of the formula



$$R-\left[\begin{array}{l}(CH_2-CH_2-O-)_xH\\ \quad|\\ N-C_nH_{2n}-\end{array}\right]_m-N\begin{array}{l}(CH_2-CH_2-O-)_yH\\ (CH_2-CH_2-O-)_zH\end{array} \quad (I),$$

in which

R represents methyl, ethyl, hydroxyethyl or hydrogen,
n is 2, 3 or 4,
m is in the range of from 1 to 5,
x and *y* are 1 or 2, and
z is 0 or 1.

4,104,140

PROCESS FOR THE ELECTROCHEMICAL SYNTHESIS OF ORGANIC METAL COMPOUNDS

Wilhelm Eisenbach; Herbert Lehmkuhl, and Günther Wilke, all of Mulheim, Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim, Ruhr, Fed. Rep. of Germany

Division of Ser. No. 403,239, Oct. 3, 1973, Pat. No. 3,964,983. This applicatinn May 26, 1976, Ser. No. 690,339
Claims prinrity, application Austria, Oct. 5, 1972, 8547/72
The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.
Int. Cl.^{2} C25B *3/02*

U.S. Cl. 204—78 **15 Claims**

10. Process for the reaction of an H-acidic organic compound in which the acidic H-atom is bonded by oxygen or sulphur to the organic radical and which has a pK value of up to about 20, with a metal having a standard potential which is more positive than −1.66 volts and which does not or only incompletely reacts with the H-acidic compound under current-free conditions, wherein the H-acidic compound or its solution in polar solvent is made conducting by addition of a soluble salt containing ions of at least one of chloride, bromide and iodide and is electrolysed at temperatures up to 150° C, using said metal as the anode, wherein the H-acidic compound is ethylacetoacetate.

4,104,141

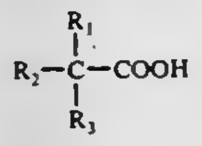
ELECTROCHEMICAL OXIDATION OF ALKOXY-SUBSTITUTED AROMATIC COMPOUNDS

Michael Martan, Rehovot, Israel, and Mark A. Halter, Arlington Heights, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 752,653, Dec. 20, 1976, abandoned. This applicatioa Aug. 3, 1977, Ser. No. 821,454
Int. Cl.^{2} C25B *3/02*

U.S. Cl. 204—78 **10 Claims**

1. A process for the electrochemical oxidation of an alkoxy-substituted aromatic compound which comprises treating said compound a temperature in the range of from about 0° to about 100° C. and a pressure in the range of from about atmospheric to about 100 atmospheres with an acid having the formula:



$$R_2-\overset{\displaystyle R_1}{\underset{\displaystyle R_3}{\overset{|}{\underset{|}{C}}}}-COOH$$

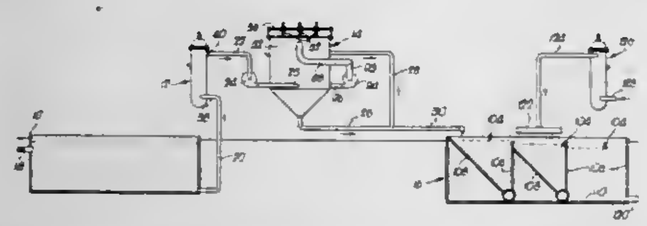
in which at least 2 R's are alkyl groups containing from 1 to about 10 carbon atoms and the remaining R is hydrogen or an alkyl group containing from 1 to about 10 carbon atoms and an alkali or alkaline earth metal salt of such an acid and a phase transfer agent comprising a symmetrical or asymmetrical tetraalkylnitrogen or phosphorus-based salt containing from 1 to about 20 carbon atoms in the alkyl chain, in an electrochemical cell maintained at a voltage in the range of from about 2 to about 20 volts and a current density in the range of from about

20 to about 200 milliamperes/cm^2, and recovering the resultant acetoxylated alkoxy-substituted aromatic compound.

4,104,142

SUSPENDED SOLIDS EXTRACTION SYSTEM AND METHOD

Arthur Shelley King, 8021 Cherokee La., Leawood, Kans. 66206
Division of Ser. No. 713,251, Aug. 10, 1976. This application Apr. 27, 1977, Ser. No. 791,337
Int. Cl.^{2} C02B *1/82;* C02C *5/12;* B03C *5/00*
U.S. Cl. 204—152 5 Claims



1. In a method of treating a liquid suspension to remove suspended solids, the steps of:

subjecting the suspension to an electrostatic field to initiate coagulation and flocculation;

allowing the suspension to thereafter rest to settle out the flocculated solids; and

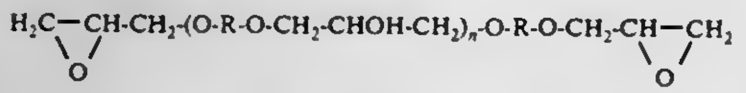
between said subjecting and settling steps, exposing the suspension sequentially to groups of concentrated lines of force in an electrolytic treater whereby to intensify the coagulation and flocculation initiated by said electrostatic field.

4,104,143

INKS AND COATING COMPOSITIONS CONTAINING ROSIN-MODIFIED EPOXY RESINS

Olgierd Wasilewski, Edison; Ronald Saltzman, Morris Plains, and William J. Ferrara, Hackensack, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 628,835, Nov. 14, 1975. This application Mar. 30, 1977, Ser. No. 782,928
Int. Cl.^{2} C08L *93/04;* C08F *2/46*
U.S. Cl. 204—159.15 7 Claims

1. A solvent-free photopolymerizable printing ink comprising an ethylenically unsaturated monomeric ester; a photoinitiator; a colorant; and about 5 to 25 percent, based on the weight of the total composition, of a hydrogenated wood rosin-modified epoxy resin, said epoxy resin having the formula



$$\underset{\diagdown O \diagup}{H_2C-CH}\text{-}CH_2\text{-}(O\text{-}R\text{-}O\text{-}CH_2\text{-}CHOH\text{-}CH_2)_n\text{-}O\text{-}R\text{-}O\text{-}CH_2\text{-}\underset{\diagdown O \diagup}{CH-CH_2}$$

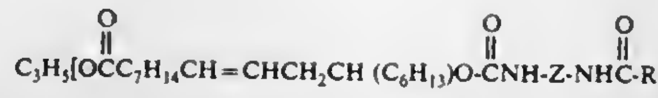
wherein R is the divalent hydrocarbon radical of a dihydric phenol and *n* is an integer of 1 to about 10, and the equivalent ratio of rosin acid to epoxy resin being about 0.85-1:1.

4,104,144

RADIATION-CURABLE COATING COMPOSITIONS AND INKS

Marvin Weiss, New Providence; Phillip Adams, Murray Hill; Gerald I. Nass, Secaucus, and Roland L. Leitner, Somerset, all of N.J., assignors to Kewanee Industries, Bryn Mawr, Pa.
Division of Ser. No. 585,615, Jun. 10, 1975, Pat. No. 4,026,939. This application Dec. 9, 1976, Ser. No. 749,168
Int. Cl.^{2} C08F *2/46, 4/00*
U.S. Cl. 204—159.23 5 Claims

1. A radiation curable composition containing, as a vehicle, a polymerizable agent selected from the group consisting of a monomer, and mixtures of such monomers, wherein said monomer has the formula:



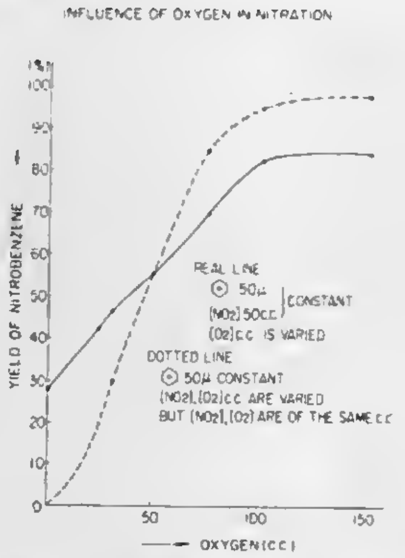
$$C_3H_5[O\overset{O}{\overset{\|}{C}}C_7H_{14}CH{=}CHCH_2CH\,(C_6H_{13})O\text{-}\overset{O}{\overset{\|}{C}}NH\text{-}Z\text{-}NH\overset{O}{\overset{\|}{C}}\text{-}R]_3$$

wherein Z is a divalent aromatic, aliphatic or cycloaliphatic radical and R is an alkoxy group substituted by a plurality of α,β -unsaturated low molecular weight acylate groups.

4,104,145

METHOD FOR PRODUCING NITROBENZENE

Wataru Ando, Sakura, and Ichiro Nakaoka, Machida, both of Japan, assignors to Kabushiki Kaisha Pollution Preventing Research Laboratory, Tokyo, Japan
Filed Mar. 28, 1977, Ser. No. 782,165
Claims priority, application Japan, Mar. 27, 1976, 51-33082
Int. Cl.^{2} B01J *1/10*
U.S. Cl. 204—162 R 6 Claims



1. In the method for reacting benzene with nitrogendioxide to produce nitrobenzene under irradiation of visible ray or ultraviolet ray in the presence of oxygen characterized in that excess nitrogendioxide and excess oxygen are added to benzene, respectively.

4,104,146

PROCESS FOR THE PURIFICATION OF GAS STREAMS

Jerome R. Sudduth, Pasadena, and Donald A. Keyworth, Houston, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.
Filed Jul. 2, 1975, Ser. No. 592,563
Int. Cl.^{2} B01K *1/00;* B01D *53/34*
U.S. Cl. 204—165 4 Claims

1. The process for the removal of vinyl chloride from a gas stream that contains from about 10 ppm to 1000 ppm of vinyl chloride and substantially no oxygen that comprises passing said gas stream through a silent electric discharge zone at such a rate that at least 80% of the vinyl chloride in the gas stream is destroyed.

4,104,147

PROCESS FOR CATIONIC ELECTRODEPOSITION OF AMINE ACID SALT-CONTAINING POLYMERS

Joseph R. Marchetti, Greensburg; Robert R. Zwack, New Kensington, and Robert D. Jerabek, Glenshaw, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 648,982, Jan. 14, 1976, which is a continuation-in-part of Ser. No. 547,323, Feb. 5, 1975, Pat. No. 3,947,339, which is a continuation-in-part of Ser. No. 203,875, Dec. 1, 1971, abandoned. This application Apr. 19, 1977, Ser. No. 788,706
Int. Cl.^{2} C25D *13/06*
U.S. Cl. 204—181 C 15 Claims

1. An improved method for coating a conductive substrate

serving as a cathode, which method comprises passing electric current between an anode and said cathode in electrical contact with the water dispersion of a resinous composition, the improvement wherein the resinous composition comprises the reaction product of:

(A) a polyepoxide having a molecular weight of at least 350,

(B) a secondary amine,

(C) a polyester polyol containing at least two alcoholic, primary hydroxyl groups, said polyester polyol being selected from the class consisting of polylactones and polyesters prepared by polyesterification of organic polycarboxylic acids or anhydrides thereof with organic polyols; said reaction product being dispersible in water with the aid of an acid to provide cationic groups in the resin.

4,104,148

ELECTROPLATING TANK HAVING ELECTRIC RINSE WATER HEATING SYSTEM

Don W. Stech, Broadview Hts., Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed May 21, 1976, Ser. No. 688,710
Int. Cl.^{2} C25B *9/00;* H05B *3/00;* F24H *1/16*
U.S. Cl. 204—242 2 Claims

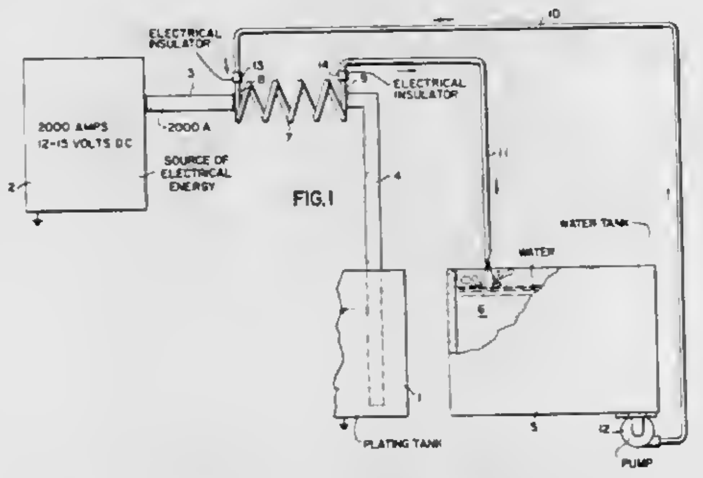


FIG.1

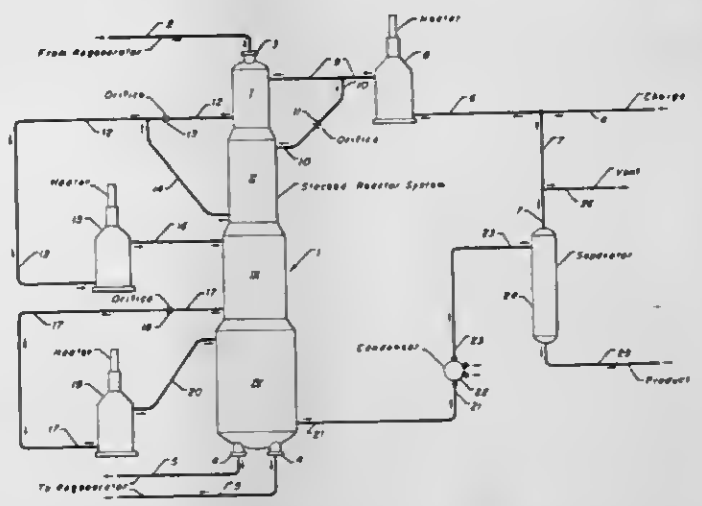
1. The combination of a plating tank system for plating items, said plating tank system having a plating tank, a 12–15 volt, 2000 amp. DC source of electrical energy and an electrical bus bar having two spaced apart segments conducting electrical energy from the source of electrical energy to the plating tank; and

a water tank system comprising a water tank having water therein to be heated for washing items plated in the plating tank system, a water coil of electrically conductive material electrically bridging the gap between the segments of the electrical bus bar of the plating tank system and electrically connecting said bus bar segments in series current flow relationship in a manner whereby current can flow from the source of electrical energy, through one bus bar segment, the water coil and the other bus bar segment to the plating tank to heat the coil, said water coil being capable of carrying a current of 2000 amps at 12–15 volts DC and having spaced opposite ends, duct means connecting one end of the water coil to the water tank, additional duct means connecting the other end of the water coil to the water tank, pump means in the duct means for circulating water from the water tank through the duct means, water coil and additional duct means whereby said water is heated by electrical energy from the source of electrical energy, and a current return path from the plating tank back to said source of electrical energy.

4,104,149

MULTIPLE-STAGE HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Elliot Veinerman, Des Plaines; Donald E. Felch, Arlington Hts., and Kenneth D. Peters, Elmhurst, all of Ill., assignors to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 795,250, May 9, 1977. This application Aug. 29, 1977, Ser. No. 828,803
Int. Cl.^{2} C10G *35/12*
U.S. Cl. 208—64 13 Claims



1. In a multiple-stage catalytic conversion system wherein, (1) heated hydrocarbonaceous charge stock and hydrogen flow serially through a plurality of catalytic reaction zones; (2) reaction product effluent is subjected to inter-stage heating between successive reaction zones; and, (3) catalyst particles are movable through each reaction zone via gravity-flow, the method of effecting the conversion of said charge stock which comprises the sequential steps of:

(a) heating said charge stock and hydrogen, and introducing a first portion thereof into a first reaction zone maintained at hydrocarbon conversion conditions;

(b) restricting the flow of a second portion of the heated charge stock and hydrogen, and introducing said second portion into a second reaction zone maintained at hydrocarbon conversion conditions;

(c) restricting the flow of the effluent from said first reaction zone and combining therewith the effluent from said second reaction zone;

(d) heating the resulting mixture and introducing the same into a third reaction zone maintained at hydrocarbon conversion conditions;

(e) separting the effluent from the last reaction zone in said system to provide (i) a normally liquid product stream and, (ii) a hydrogen-rich vaporous phase, and recycling at least a portion of said vaporous phase to said first reaction zone;

(f) at least periodically withdrawing catalyst particles from the last reaction zone in said system; and,

(g) at least periodically introducing fresh, or regenerated catalyst particles into the first reaction zone in said system.

4,104,150

PROCESS FOR THE PRODUCTION OF COKE FROM PITCH

Ingo Romey, Drevenack; Georg Kölling, and Hellmut Kokot, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 596,055, Jul. 7, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 765,892
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1974, 2434295
Int. Cl.^{2} C10G *9/14*
U.S. Cl. 208—91 10 Claims

1. The improvement in preparing pitch for a coking procedure to obtain acicular coke of premium quality wherein the

pitch is subjected to a preliminary filtration to remove undesirable elements, including ashes, soot and heavy metals therefrom,

the said improvement comprising

preheating crude coal tar pitch to at least 100° C above its softening point and a point below its decomposition temperature, mixing the pitch with at least 5 g of a particulate solid adsorbent filtering aid per kg of crude pitch prior to filtration and then filtering the coke at at least the said preheat temperature in the absence of a solvent or diluent through a pressure filter having a mesh size of about 3–200 μ at a pressure of about 2 to 10 bars, followed by subjecting the pitch to said coking procedure.

4,104,151

ORGANIC COMPOUND CONVERSION OVER ZSM-23

Mae K. Rubin, Bala Cynwyd, Pa.; Charles J. Plank, Woodhury, and Edward J. Rosinski, Pedricktown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 739,414, Nov. 8, 1976, Pat. No. 4,076,842, which is a continuation-in-part of Ser. No. 585,632, Jun. 10, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,919

Int. Cl.^{2} B01J *8/24;* **C07C** *15/02;* **C01B** *29/28*

U.S. Cl. 208—111 **32 Claims**

1. A process for effecting catalytic conversion of an organic compound charge which comprises contacting said charge under catalytic conversion conditions with a catalyst comprising a synthetic crystalline aluminosilicate zeolite having a composition expressed in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.58 \text{ to } 3.4)M_{2/n}O : Al_2O_3 : (40 \text{ to } 250)SiO_2$$

wherein M is at least one cation having a valence *n* and having an X-ray powder diffraction pattern substantially as shown in Table I of the specification, or a thermal decomposition product thereof.

4,104,152

HYDROGENATION PROCESS WITH SULFIDED CATALYST

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 716,904, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,627, Jul. 21, 1975, Pat. No. 3,981,796, which is a continuation-in-part of Ser. No. 418,700, Nov. 23, 1973, Pat. No. 3,933,683. This application Sep. 19, 1977, Ser. No. 834,621

Int. Cl.^{2} C10G *13/06;* **B01J** *23/16, 27/04*

U.S. Cl. 208—112 **6 Claims**

1. A hydrogenation process utilizing a catalyst containing a Group VIB metallic component and a Group VIII metallic component present in an oxidized form which catalyst is activated according to a method which comprises the steps of:
   (a) intimately contacting said mass of catalyst with gaseous hydrogen, containing a sulfur compound, at a temperature within the range of from about 550° F. to about 800° F. for a sufficient time to effect the reduction and sulfiding of a major proportion of said metallic components; and
   (b) stripping the resulting reduced and sulfided catalyst with substantially pure hydrogen at a temperature within the range of from about 750° F. to about 900° F.

4,104,153

METHOD FOR REFORMING HYDROCARBONS

Henry Erickson, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 205,355, Dec. 6, 1971, Pat. No. 4,066,740. This application Aug. 3, 1977, Ser. No. 821,382

Int. Cl.^{2} C10G *35/08*

U.S. Cl. 208—138 **6 Claims**

1. In a method for reforming a hydrocarbon feedstock comprising paraffins and naphthenes in at least one reaction zone with a catalyst comprising platinum group metal and alumina in the presence of free molecular hydrogen at hydrocarbon conversion conditions, the improvement which comprises using alumina prepared by a method which comprises:
   (1) forming a mixture of an aqueous slurry of hydrous alumina and at least one surface active agent, said hydrous alumina predominating in α-alumina monohydrate having a crystallite size of less than 100A, said surface active agent being present in the mixture in an amount sufficient to increase the porosity of the calcined alumina hereinafter described;
   (2) drying said mixture to obtain a solid product which can be formed into macrosized particles;
   (3) forming said solid product into macrosized particles; and
   (4) calcining said macrosized particles to form calcined alumina having increased porosity.

4,104,154

REFORMING OF A NAPHTHA FRACTION IN CONTACT WITH AN ALUMINA-SUPPORTED CATALYST

Roy T. Mitsche, Wauconda, and George N. Pope, McHenry, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 18, 1977, Ser. No. 788,375

Int. Cl.^{2} C10G *35/04*

U.S. Cl. 208—138 **12 Claims**

1. A process for the catalytic reforming of a naphtha fraction which comprises passing said naphtha fraction and hydrogen in contact with an alumina-supported platinum group metal catalyst at reforming conditions, said alumina support having been prepared by (a) admixing a finely divided alpha-alumina monohydrate with an aqueous alkaline solution having a pH of at least about 7.5 to form a stable suspension; (b) commingling a metal salt of a strong acid with said suspension to convert said suspension to a paste or dough; (c) extruding said paste or dough; and (d) drying and calcining the extrudate to form said alumina support.

4,104,155

MERCAPTAN EXTRACTION PROCESS UTILIZING A STRIPPED ALKALINE SOLUTION

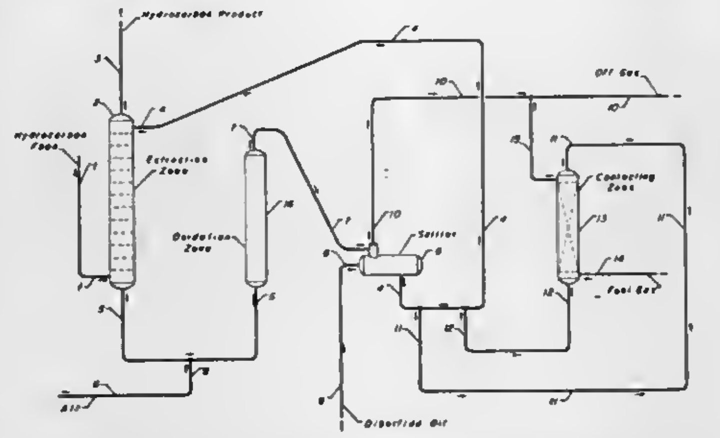
William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 675,081, Apr. 8, 1976, Pat. No. 4,040,947. This application Apr. 14, 1977, Ser. No. 787,690

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.^{2} C10G *19/08*

U.S. Cl. 208—235 **5 Claims**



1. A continuous process for the removal of mercaptans from a feed stream comprising at least 1000 wt. ppm. mercaptans and a mixture of hydrocarbons having boiling points below about 650° F., which comprises the steps of:
   (a) contacting the feed stream with an alkaline solution comprising water and an alkaline reagent in an extraction zone maintained at extraction conditions effective to promote the transfer of essentially all of the mercaptans from the feed stream to the alkaline solution and the formation of a treated product stream, which is removed from the extraction zone, and a mercaptan-containing alkaline solution;

   (b) contacting said mercaptan-containing alkaline solution with oxygen and with an oxidation catalyst in an oxidation zone at conditions effective to form an oxidation zone effluent stream comprising disulfide compounds in said alkaline solution;
   (c) passing said oxidation zone effluent stream into a phase separation zone operated at conditions selected to produce a first liquid phase comprising said alkaline solution, a second liquid phase comprising said disulfide compounds and an off-gas stream comprising oxygen;
   (d) withdrawing the second liquid phase from the phase separation zone of step (c);
   (e) recycling a first portion of said first liquid phase from step (c) to the extraction zone of step (a);
   (f) removing said off-gas stream from said process in admixture with a first vapor stream as hereinafter delineated;
   (g) countercurrently stripping a second portion of said first liquid phase with a second vapor stream comprising hydrocarbons having less than 5 carbon atoms at conditions effective to strip water from the second portion of said first liquid phase and to form said first vapor stream; and,
   (h) admixing the stripped second portion of said first liquid phase from step (g) with said first portion of the liquid phase of step (e) being recycled to the extraction zone to form said alkaline solution of step (a), whereby water formed in the oxidation zone is removed from the process and the concentration of alkaline reagent in the alkaline solution is controlled.

4,104,156

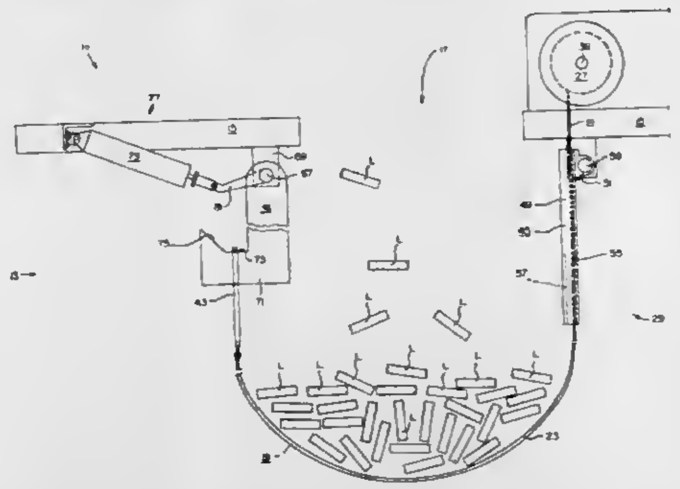
DETACHABLE SLING LETDOWN APPARATUS FOR LUMBER SORTER

John K. Fletcher, Rte. 8, Box 320, Hot Springs, Ark. 71901

Filed Jun. 13, 1977, Ser. No. 805,901

Int. Cl.^{2} B65G *47/34*

U.S. Cl. 209—74 R **9 Claims**



1. In a lumber sorter of the type having frame means defining a plurality of bays for receiving pieces of lumber, each of said bays being provided with at least a pair of elongated flexible members establishing cooperative forward and rearward sling-like cradles which support the lumber pieces as they are systematically dropped therein, and means for selectively controlling the height of said forward and rearward cradles, the improvement which comprises at least a pair of automatically operable coupler means for selectively coupling and uncoupling one of the respective ends of said pair of elongated flexible members with said frame means for enabling dangling ends thereof to readily be established thus facilitating disengagement from the lumber pieces.

4,104,157

FLOTATION OF SULFIDE MINERALS

Gerald F. Fountain; Jaime Veloz; Edward A. Bilson, and John A. Cronin, all of Inspiration, Ariz., assignors to Inspiration Consolidated Copper Company, Morristown, N.J.

Filed May 12, 1976, Ser. No. 685,544

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.^{2} B03D *1/02*

U.S. Cl. 209—166 **10 Claims**

1. In the process of froth flotation concentration of a sulfide mineral which minimizes the collection of slimes and in which an aqueous pulp of an ore containing such mineral is subjected to a flotation operation to produce a final high recovery of such mineral in a flotation concentrate, the improvement comprising carrying out said flotation with a polyglycerol added prior to flotation to deactivate said slimes and present in the aqueous pulp in an amount sufficient to increase recovery of such mineral in the final concentrate over that obtainable without the presence of said polyglycerol.

4,104,158

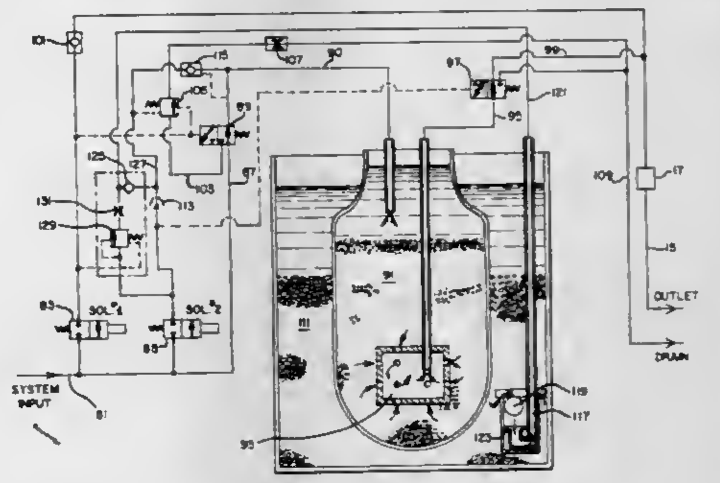
VOLUME AND TIME OF DAY CONTROL FOR WATER SOFTENER REGENERATION

Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed Mar. 18, 1977, Ser. No. 779,097

Int. Cl.^{2} B01D *15/04*

U.S. Cl. 210—25 **7 Claims**



1. A control circuit for controlling initiation of the regeneration cycle of a water softener, which softener is capable of softening a predetermined quantity of water before requiring regeneration, comprising:
   flow meter means for sensing the rate of water flow through said softener and providing a pulse output, the frequency of which is proportional to the flow rate,
   predetermined counter means, responsive to said flow meter pulse output for providing a first enabling output when a first count is reached indicating that the capacity for treating a normal 24 hour supply of water remains, and for providing a second enabling output when a second count is reached indicating that the capacity for treating has been depleted,
   timer means, having an input responsive to the first enabling output of said counter means, for connecting its input to an output once each timer cycle at a predetermined time, and
   regeneration timer means, responsive to the output from said timer means and to said second enabling output from said counter means for initiating and timing softener regeneration whereby regeneration will be initiated at a predetermined time of day after the capacity of the softener is reduced to a 24 hour supply of water or when the capacity for treating water has been depleted, if such depletion of

the water should occur prior to said predetermined time of day.

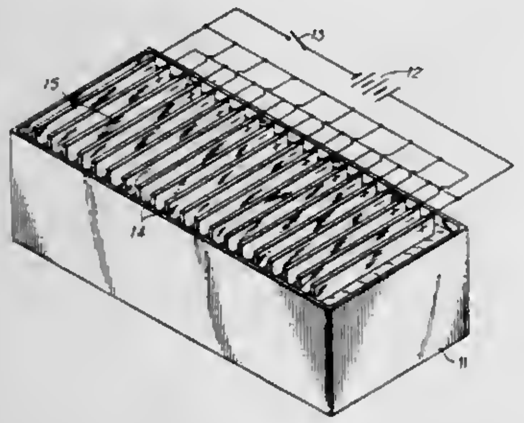
4,104,159
METHOD OF SEPARATION OF FLUORIDE ION FROM WATER

Masakuni Kanai, No. 1-5-601, Arai 1-chome, Nakano-ku, Tokyo-to, Japan

Continuation-in-part of Ser. No. 544,544, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 305,758, Nov. 13, 1972, abandoned. This application Jan. 24, 1977, Ser. No. 761,557

Int. Cl.^{2} C02B *1/14*

U.S. Cl. 210—28 **22 Claims**



1. A method of removing fluoride from raw water where said fluoride is present in solution or as a colloidally-dispersed salt, comprising the steps of preparing electrolyzed diatomaceous earth by the substeps of dissolving in water an activating electrolyte taken from the group consisting of $MgCl_2$, $Fe_2(SO_4)_3$, $AlCl_3$ and alum, adding diatomaceous earth to the resultant solution in an amount from 0.5 to 50 g/l, and electrolyzing said solution by passing current through said solution at a volume current density of 7 to 50 A/m^3 to convert said diatomaceous earth to a floc, adding at least a stoichiometric quantity of calcium ion to said raw water as based on fluoride uncombined with calcium, said calcium ion being added as the oxide or hydroxide in quantity sufficient to bring the pH of said raw water to about 7 when the pH is less than 7 and otherwise as a member of the group consisting of $CaCO_3$, $CaCl_2$ and $CaSO_4$; adding said diatomaceous earth floc in said electrolyzed solution to said raw water in an amount from 5 to 100 liters of electrolyzed solution per 1000 liters of raw water subsequent to said addition of calcium ion and passing electric current through said raw water at a volume current density of 5 to 20 A/m^3 until virtually all of said fluoride is converted to CaF_2 and adsorbed on said floc.

4,104,160
PROCESS FOR THE PURIFICATION OF INDUSTRIAL EFFLUENTS

Hans Wegmüller, Riehen, and Jaroslav Haase, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 690,804, May 27, 1976, Pat. No. 4,026,796, which is a division of Ser. No. 582,021, May 29, 1975, Pat. No. 3,979,285, which is a continuation of Ser. No. 356,853, May 3, 1973, abandoned. This application Feb. 25, 1977, Ser. No. 772,169

Claims priority, application Switzerland, May 10, 1972, 7012/72

Int. Cl.^{2} C02B *1/60;* **C02C** *5/08*

U.S. Cl. 210—36 **4 Claims**

1. A process for purifying industrial effluents containing residual dyestuffs, optical brighteners, dyeing auxiliaries, detergents, tanning agents or mixtures thereof, which comprises bringing said effluents into contact with a cellulosic absorbent pretreated with a mixture of polyalkyleneimine which has a molecular weight of 20,000 to 80,000 and a salt of a polyvalent metal.

4,104,161
METHOD FOR TREATING AQUEOUS WASTES CONTAINING AT LEAST 1% PROTEINACEOUS MATTER

Gary M. Welo, Hanover Park, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 18, 1978, Ser. No. 788,200

Int. Cl.^{2} C02B *1/20*

U.S. Cl. 210—54 **3 Claims**

1. A method for treating rendering plant aqueous wastes containing at least 1% by weight of proteinaceous matter which comprises:

A) adding at least 0.48% by weight based on dry proteinaceous matter of a water-soluble polyamine polymer to the aqueous wastes, said polymer being chosen from the group consisting of ethylene dichloride-ammonia, ethylene dichloride-ammonia-methyl chloride, and dimethylamine-epichlorohydrin-ammonia;

B) dispersing said polyamine within the aqueous wastes;

C) allowing the aqueous wastes to stand for a sufficient period of time to allow the flocs of proteinaceous matter to coagulate and settle thereby producing a precipitate of proteinaceous matter; and,

D) recovering the precipitate of proteinaceous matter.

4,104,162
PROCESS FOR DETOXIFICATION OF FORMALDEHYDE CONTAINING WASTE WATERS

Helmut Junkermann, and Heinrich Schwab, both of Frankfurt, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Koessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 569,747, Apr. 21, 1975, abandoned. This application Aug. 4, 1975, Ser. No. 601,957

Claims priority, application France, Apr. 22, 1974, 74 13931; Sep. 26, 1974, 74 32527

Int. Cl.^{2} C02B *1/34;* **C02C** *5/04*

U.S. Cl. 210—63 R **10 Claims**

1. A process for detoxifying formaldehyde containing waste water comprising treating the waste water with an alkaline material at a temperature of at least 50° C. and then adding hydrogen peroxide in an amount equivalent to 10–35% of the formaldehyde in the waste water.

4,104,163
REGENERATION OF FIXED BED FILTERS

James F. Grutsch, Hammond, Ind., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 699,696, Jun. 25, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,432

Int. Cl.^{2} B01D *23/24*

U.S. Cl. 210—80 **5 Claims**

1. A method for the regeneration of a fixed bed granular media filter used for the clarification of liquids, after said filter has become unsuitable or inefficient due to the occlusion of oily substances, said regeneration comprising:

first, backwashing the filter;

second, draining the filter;

third, contacting the filter with an aqueous alkali solution comprised of sodium hydroxide dissolved in demineralized water, said solution having a pH value of about 10.5 or greater, at a temperature ranging from about ambient to about 200° F, for a time sufficient to regenerate the filter;

fourth, backwashing the filter.

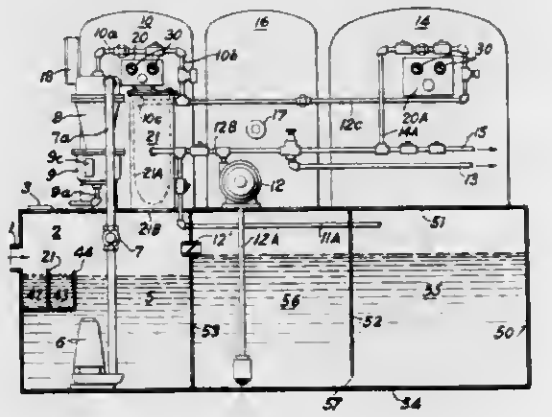
4,104,164
DEVICE FOR TREATING WASTE WATER

Robert G. Chelton, 1337 SW. 21 Ter., Ft. Lauderdale, Fla. 33312

Filed Mar. 2, 1977, Ser. No. 773,703

Int. Cl.^{2} C02B *5/00;* **B08B** *3/10;* **B60S** *3/04*

U.S. Cl. 210—136 **7 Claims**



1. A recirculating filter system for treating wash water containing contaminated components made up of cleaning components and sediment components comprising,

a generally rectangular tank having a top,

a centrifugal filter,

a wash water filter containing gravel, sand and anthrafil,

a pressure tank,

a rinse water filter containing activated charcoal,

and a backwash reclaim unit supported on said tank top, and connected to said rinse water filter and said tank,

said tank having a partition therein dividing said tank into an unfiltered storage well and a filtered storage well,

an inlet to said unfiltered storage well adapted to be connected to a source of unfiltered water,

a sand trap in said unfiltered well disposed to receive water from said inlet,

wier means from said sand trap through which water may flow to said unfiltered well,

a submersible pump disposed in said unfiltered well,

check valve means connecting said submersible pump to said centrifugal filter,

means connecting said centrifugal filter to said wash water filter,

and means connecting said rinse water filter to said filtered water well,

a pressure pump having an inlet in said filtered water well and selective valve means for connecting the output of said pressure pump to a wash water supply, and to said pressure tank,

and means selectively connecting the output of said pressure pump to said rinse water filter whereby a part of said water can be used with dissolved cleaning components therein and the other part of said water having said cleaning components removed therefrom can be used as rinse water.

4,104,165
WATER SOFTENING SYSTEM

John W. Braswell, 712 S. West End Blvd., Cape Girardeau, Mo. 63701

Filed Jun. 24, 1976, Ser. No. 699,215

Int. Cl.^{2} B01D *23/24*

U.S. Cl. 210—191 **7 Claims**

1. In a water treatment system having a treatment tank and an ion-exchange mineral bed therein, and a brine tank, regeneration control apparatus comprising:

(a) a plunger valve means including an aspirator for producing a flow of fluid,

(b) a raw liquid inlet port, and a treated liquid outlet port,

(c) a first conduit means connecting the raw liquid inlet port to the top of the treatment tank in a first position of the plunger valve means,

(d) a second conduit means connecting the treated liquid outlet port to the lower interior of the treatment tank,

(e) a drain port and a drain valve means for opening or closing the drain port, the drain port being connected to the first conduit and the raw liquid inlet port through the aspirator in the plunger valve means in a second position of the plunger valve means when the drain valve means is open,

(f) a third conduit means connecting the raw liquid inlet port to the second conduit means,

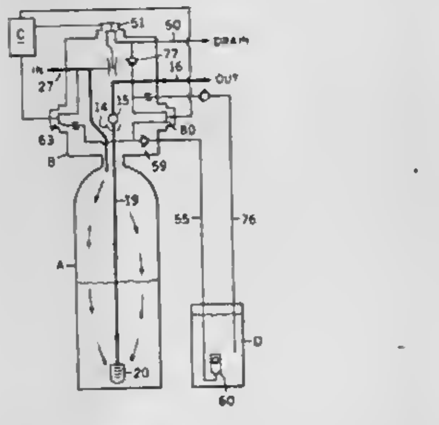
(g) a wash valve means for opening or closing the third conduit means,

(h) a brine tank inlet port and a brine tank outlet port, and separate conduit means connecting each of the last said ports separately to the brine tank to provide one conduit means for delivering brine from the brine tank and another separate conduit means for delivering treated liquid to the brine tank,

(i) a fourth conduit means connecting the brine tank inlet and outlet ports to the second conduit means,

(j) a brine valve means in the fourth conduit between the brine tank inlet and outlet ports for controlling flow therethrough,

(k) means maintaining the drain valve means, wash valve means and brine valve means closed in the service cycle for water flow from the raw liquid inlet port, through the first and second conduit means and in one direction through the mineral bed, and through the treated liquid outlet port,



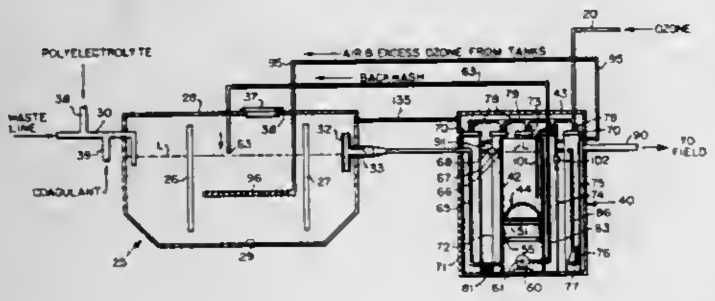
SERVICE CYCLE

(l) the last said means maintaining the drain valve means open, and the wash valve means and brine valve means closed in the brining cycle for water flow from the raw liquid inlet port and through the aspirator in the plunger valve means to the drain port, and for concurrent brine flow from the brine tank inlet port, through the fourth, second and first conduit means and in the opposite direction through the mineral bed, and to the drain port through the aspirator in the plunger valve means,

(m) the last said means maintaining the drain valve means and the wash valve means open, and the brine valve means closed in the wash cycle for water flow from the raw liquid inlet port through the aspirator in the plunger valve means to the drain port, and for concurrent water flow from the raw liquid inlet port, through the second and first conduit means and through the mineral bed in the same direction as the brine flow through the mineral bed in the brining cycle, and through the aspirator in the plunger valve means to the drain port whereby to remove the brine, and

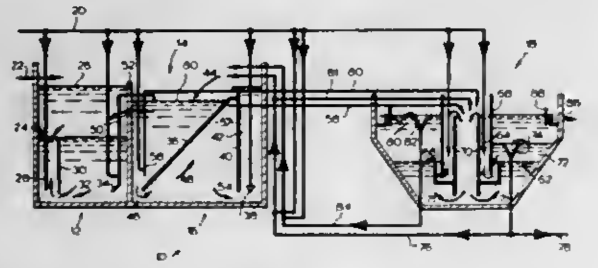
(n) the last said means maintaining the drain valve means and the wash valve means closed, and the brine valve means open in the rinse and brine tank refill cycle for liquid flow from the raw liquid inlet port, through the first, second and fourth conduits, and to the brine tank outlet port.

4,104,166
APPARATUS FOR PURIFYING SEPTIC TANK EFFLUENT
Julius LaRaus, 150 Crandon Way, Rochester, N.Y. 14618
Filed May 17, 1976, Ser. No. 687,041
Int. Cl.² C02B *1/38;* B01D *21/02*
U.S. Cl. 210—195 R 7 Claims



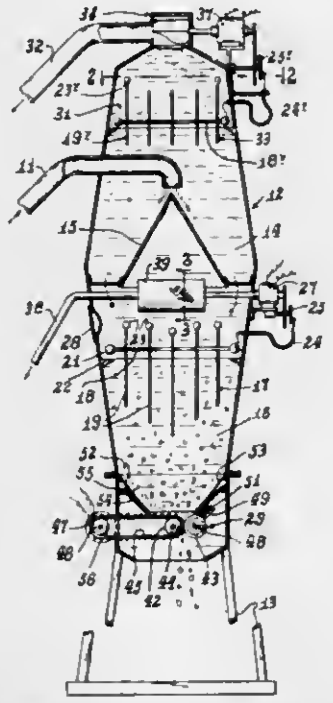
1. Apparatus for purifying septic tank effluent, comprising
a first tank adapted to be placed in the ground adjacent a septic tank,
a plurality of ozonating tanks smaller than said first tank and mounted in said first tank in spaced relation,
a filter tank also smaller than said first tank and mounted therein in spaced relation to said ozonating tanks,
a first pipe for connecting said filter tank to an adjacent septic tank to have the liquid effluent from the septic tank pass substantially at atmospheric pressure through said filter tank from an inlet adjacent one end of said filter tank to an outlet adjacent its opposite end,
a filter mounted in said filter tank between said inlet and said outlet to filter solids from the liquid passing through said filter tank,
means connecting said ozonating tanks in series with one another and to the outlet of said filter tank to cause filtered liquid from said filter tank to pass longitudinally and successively through the ozonating tanks in said series thereof, and for a cumulative distance greater than sixteen feet, and
means for supplying ozone gas to each of said ozonating tanks for contact with the fluid passing therethrough,
the last ozonating tank in said series thereof having an outlet adjacent its upper end thereof for discharging ozonated effluent from said last tank into a storage space formed in said first tank around the outsides of said ozonating tanks and said filter tank, and
said first tank having an outlet disposed at approximately the same level as the outlet in said last ozonating tank to allow discharge of excess effluent from said storage space.

4,104,167
APPARATUS FOR PURIFYING WASTE WATERS
Ferdinand Besik, 3243 Chokecberry Cres., Mississauga, Ontario, Canada (L5L 1B1)
Division of Ser. No. 730,815, Oct. 8, 1976. This application Feb. 7, 1977, Ser. No. 765,886
Int. Cl.² C02C *1/08*
U.S. Cl. 210—195 S 7 Claims



1. An apparatus for treatment of contaminated waters comprising a first tank in which an equalization zone is defined, a second tank in which aeration and sludge separation zones are defined and a third tank in which a clarifying zone is defined, means for transferring such waters from the equalization zone to the upper region of said aeration zone, a slanted plate located in said second tank with its lower end being spaced from tank bottom and side walls to define said aeration zone which overlies said sludge separation zone; the slanted plate extending across said second tank thereby separating the aeration zone from the sludge separation zone, an aeration upflow channel means being provided in said second tank with its intake across the lower region of said tank and with its outlet across the upper region of said tank, means for circulating such waters and active media up said aeration channel means, out the outlet of said upflow channel means and downwardly through said aeration zone, under the lower end of said slanted plate, along the second tank bottom and through the inlet of said upflow channel means, means for dispensing oxygen into such active media which flows up said aeration channel means, said slanted plate sloping upwardly towards said aeration channel, the lower end of said slanted plate forming a constriction to the circulation of such waters so that the velocity of such waters is increased along the bottom of said second tank below the sludge separation zone, a portion of such waters entering the sludge separation zone and flowing upwardly to develop a fluidized bed of active media, the height of said sludge separation zone being sufficient to effectively separate a major portion of active media from the processed contaminated waters in the fluidized bed, and means for transferring the processed waters from the upper region of said sludge separation zone to said clarifying zone of the third tank.

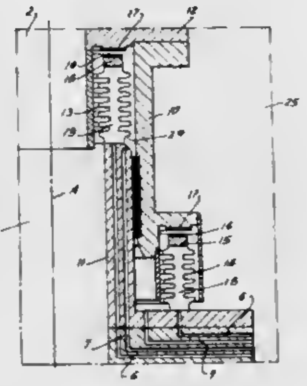
4,104,168
SLUDGE SETTLING AND DE-WATERING APPARATUS
Sandor G. Kiss, 236 E. Sunset Ave., Lombard, Ill. 60148
Filed Aug. 8, 1975, Ser. No. 603,004
Int. Cl.² B01D *21/24*
U.S. Cl. 210—297 8 Claims



4. A sludge consolidator comprising a vertically elongated tank, a sludge inlet located substantially midway between its ends, a disbursing element below said inlet, a water discharge line located beneath said disbursing element, a filter in the water discharge line, said filter comprising a revolvable screen and means associated with the screen to remove solid particles therefrom and discharge them outside the tank, a collection chamber for heavy solids below said filter, a vibratory means in said chamber, a valved outlet in the bottom of said chamber, said valved outlet including a pair of rollers arranged parallel one to the other, a belt trained over one roller, means to rotatably drive said rollers, means mounting one roller for movement toward and away from the other roller, spring means

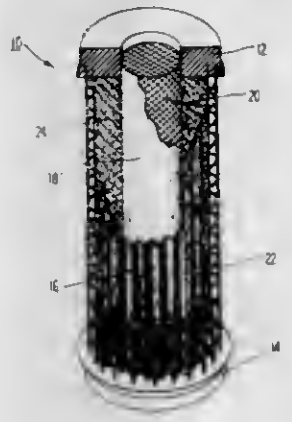
normally urging said movable roller in surface to surface contact with the belt, said belt and movable roller being resilient to yield under pressure of solids passing between them, and a trapezium-shaped hopper arranged above the nip of said rollers, said tank including a compartment above the sludge inlet in which particles of less weight than the water accumulate, and discharge means in said compartment to carry the said particles away from said compartment.

4,104,169
FILTERING APPARATUS WITH ROTATABLE FILTER ELEMENTS AND SEAL
Hans Müller, Im Allmendli, 8703 Erlenbach, Switzerland, and Bruno Guazzone, Rapperswil, Switzerland, assignors to Hans Muller, Erlenbach, Zurich, Switzerland
Filed Jun. 21, 1976, Ser. No. 697,762
Claims priority, applicatioo Switzerland, Jun. 20, 1975, 8107/75
Int. Cl.² B01D *33/28*
U.S. Cl. 210—331 6 Claims



1. A filter comprising:
a housing defining a closed chamber;
a hollow shaft rotatable in said chamber about an axis;
a sleeve connected to said housing and centered on said axis;
a plurality of filter elements connected to and rotatable with said shaft;
means including a filtrant inlet opening into said chamber and a filtrate outlet opening into said shaft for passage of a suspension to be filtered from said inlet to said outlet through said filter elements;
a pair of axially connected sealing surfaces connected to and rotatable with said shaft and annularly surrounding said axis;
a pair of annular bellows-type seals each having a hollow interior and concentrically surrounding said shaft, said seals each having one axial end secured nonrotatably to said sleeve and an opposite axial end axially engageable with a respective one of said surfaces, and said seals each being axially extensible between a normal relaxed position with said opposite end spaced from the respective surface and an extending position with said opposite end bearing axially on the respective surface, said seals forming with said shaft and sleeve in the respective extended positions an annular compartment isolated from the interior of said shaft and from said chamber and annularly surrounding said shaft;
means for introducing a clean liquid under pressure into said annular compartment between said seals and thereby flushing particles between said opposite ends and the respective surfaces; and
means including a fluid passage opening into said hollow interior of said seals for pressurizing said interiors and thereby extending said seals into said extended positions.

4,104,170
LIQUID FILTER HAVING IMPROVED EXTENDED POLYPROPYLENE ELEMENT
Donald A. Nedza, Furlong, Pa., assignor to Met-Pro Corporation, Hatfield, Pa.
Continuation-in-part of Ser. No. 608,501, Aug. 28, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,599
Int. Cl.² B01D *39/16*
U.S. Cl. 210—487 7 Claims



1. A filter comprising at least one folded pleat for removing contaminants from a fluid stream comprising:
a laminated filter element including a single supporting underlayer formed of a highly dispersed continuous polypropylene filament oriented in a random pattern and repeatedly crossing itself, said filament being partially fused and thereby bonded to itself at substantially all of those points at which it crosses itself, and a filtering overlayer comprising a plurality of individual polypropylene fibers randomly arranged upon said supporting underlayer and bonded both to said underlayer and to one another, said folded pleat being substantially resistant to breakage at its fold.
5. A filter of the cylindrical cartridge type, comprising:
a pleated outer element having a plurality of folds;
an unpleated inner element disposed concentrically within said outer element;
a pair of elastomeric end caps enveloping the axial ends of said first and second element;
said outer filament comprising a laminate including a first, supporting underlayer formed of a highly dispersed continuous polypropylene filament oriented in a random pattern, and a filtering overlayer comprising a plurality of individual polypropylene fibers randomly arranged upon said underlayer and being partially fused and thereby bonded to both said underlayer and to one another, said folds being substantially resistant to breakage.
7. A filter of the cylindrical cartridge type, comprising:
a pleated outer filter element having a plurality of folds;
a pair of elastomeric end caps disposed at either end of said filter element and enveloping the ends thereof;
said filter element comprising:
  a supporting underlayer of a highly dispersed continuous polypropylene filament oriented in a random pattern, said continuous filament being partially fused and thereby bonded to itself at points of intersection; and
  a plurality of individual polypropylene fibers disposed upon said underlayer, said polypropylene fibers and filament material being at least partially heat-fused, whereby the polypropylene fibers are bonded to both said continuous filament and to one another, said folds being substantially resistant to breakage.

4,104,171

METHOD FOR TRANSPORTING WAXY OILS BY PIPELINE

Frank W. Stechmeyer, Newport Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Dec. 30, 1976, Ser. No. 755,840

Int. Cl.² C09K *3/00*

U.S. Cl. 252—8.3 **11 Claims**

1. In the transportation of a wax-containing oil by pipeline, a method for reducing the force required to initiate the flow of a gelled static column of the oil in the pipeline, the method comprising:

forming a plurality of segments in the column of oil, the number and length of said segments being selected so that the pressure required to initiate flow of the oil at any point in the pipeline is less than the maximum operating pressure allowable at that point; and

separating each segment from adjacent segments by a fluid spacer comprising a material which is fluid at the temperature of the static column of oil and which has a low yield strength relative to said oil at that temperature.

4,104,172

DURABLE FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

Ray E. Smith, and James A. Albright, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

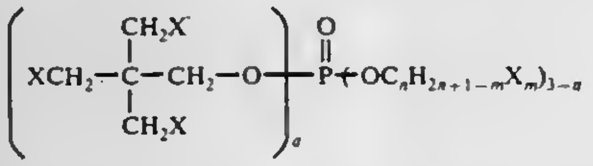
Filed Feb. 23, 1976, Ser. No. 660,500

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **50 Claims**

1. A flame retardant textile finish, said textile being cotton or a blend of cotton and polyester fibers, consisting essentially of:

(a) from about 15 to about 35 percent of a flame retardant compound of the formula



$$\left(XCH_2-\underset{CH_2X}{\overset{CH_2X}{\underset{|}{\overset{|}{C}}}}-CH_2-O \right)_a \overset{O}{\overset{\|}{P}}(OC_nH_{2n+1-m}X_m)_{3-a}$$

wherein each X is independently selected from chlorine, bromine, and hydrogen, wherein a is an integer from 1 to 2, wherein n an integer from 1 to 8, and wherein m is an integer from 0 to n, provided that when n is 1, m is 0, and mixtures thereof;

(b) from about 0.5 to about 10 percent of an emulsifying agent which is capable of passing the following three tests: (1) Solubility (Compatability) Test: said emulsifying agent (20 parts by weight) must be soluble in 80 parts by weight of said flame retardant compound at no more than 80° C.; (2) Shelf Life Test: a blend of said emulsifying agent and said flame retardant compound prepared as in the Solubility Test must remain in one clear homogeneous phase at 22° C. for at least 1 hour; (3) Finish Formulation Test: a flame retardant finish within the scope of this invention is prepared and must remain in one homogeneous phase for a minimum of 1 hour at 20° C.;

(c) from about 25 to about 45 percent of a water soluble quaternary phosphonium salt selected from the group consisting of tetrakis (hydroxymethyl) phosphonium and tetrakis(methylhydroxymethyl)phosphonium salt;

(d) from about 9 to about 16 percent of a water soluble organic nitrogen containing compound selected from the group consisting of urea, thiourea, guanidine, and dicyandiamide; and

(e) from about 20 to about 32 percent of water.

4,104,173

GELLING AGENTS FOR HYDROCARBON COMPOUNDS

Robert L. Gay, Portland, Oreg.; Richard J. Schlott, Arlington Heights, and James E. Burroughs, Mt. Prospect, both of, IL, assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 306,773, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 209,401, Dec. 17, 1971, abandoned. This application Aug. 20, 1975, Ser. No. 606,264

Int. Cl.² C09K *3/00*

U.S. Cl. 252—8.55 R **5 Claims**

1. A method of making a gelled hydrocarbon composition comprising the steps of

(a) preparing a mixture of alkyl acid orthophosphates by reacting phosphorus pentoxide with a mixture of at least two alcohols wherein at least one alcohol is selected from the group consisting of C_1 to C_5 n-alkanols and at least one alcohol is selected from the group consisting of C_6 to C_{18} alkanols and C_6 to C_{18} alkenols,

(b) reacting said mixture of alkyl acid orthophosphates with a basic aluminum compound selected from the group consisting of hydrated alumina and aluminum alkoxides in a ratio of from 2.67 to 8 gram atoms of phosphorus per gram atom of aluminum to produce a partial aluminum salt of the alkyl acid orthophosphates,

(c) adding from 0.1 to about 10 parts by weight of said partial aluminum salt to 100 parts by weight of a liquid hydrocarbon, and

(d) adding thereto sufficient amount of a second base selected from the group consisting of alkali metal hydroxides, alkali metal oxides, ammonium hydroxide, alkaline earth metal hydroxides, alkaline earth metal oxides, and alkali metal salts of weak acids to neutralize the remaining acidity.

4,104,174

WATER SOLUBLE WATERFLOOD CORROSION INHIBITOR

Philip Merchant, Jr., Houston; F. Luther Powell, Willis, and Cosmas O. Ohaji, Houston, all of Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 611,993, Sep. 10, 1975, Pat. No. 3,989,460. This application Jun. 30, 1976, Ser. No. 701,282

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.² C23F *11/10*

U.S. Cl. 252—8.55 D **5 Claims**

1. A water-soluble corrosion inhibiting composition, particularly useful in waterflooding environments in which the water is a brine, which comprises from 45 to 90 wt. % of a heterocyclic nitrogen hydrochloride selected from the group consisting of alkyl piperazine hydrochloride and alkyl pyridine hydrochloride, and from 2 to 40 wt. % of an ethoxylated tridecyl alcohol containing about 10 units of ethylene oxide.

4,104,175

AQUEOUS SOLUTIONS OF QUATERNARY AMMONIUM COMPOUNDS

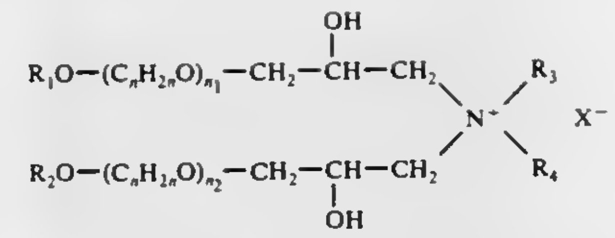
Eva Margareta Martinsson, Stenungsund, and Karl Martin Edvin Hellsten, Odsmal, both of Sweden, assignors to Modokemi Aktiebolag, Stenungsund, Sweden

Division of Ser. No. 423,592, Dec. 10, 1973, Pat. No. 3,972,855, which is a continuation-in-part of Ser. No. 306,251, Nov. 10, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,317

Int. Cl.² C14C *9/00;* **D06M** *13/18;* **D06M** *13/46*

U.S. Cl. 252—8.57 **6 Claims**

1. A freeze-thaw stable aqueous solution comprising a quaternary ammonium compound having the general formula:



OH
$R_1O-(C_nH_{2n}O)_{n_1}-CH_2-CH-CH_2$
R_3
N^+
X^-
$R_2O-(C_nH_{2n}O)_{n_2}-CH_2-CH-CH_2$
R_4
OH

wherein:

R_1 and R_2 are aliphatic hydrocarbon groups having from about eight to about fourteen carbon atoms;

R_3 and R_4 are methyl, ethyl or hydroxyethyl;

n is a number from 2 to 4, representing the number of carbon atoms in the oxyalkylene substituent;

n_1 and n_2 are numbers within the range from 0.5 to about 10; and

X is an anion selected from the group consisting of chloride, bromide, iodide, nitrate, hydroxyl, phosphate, methyl sulfate, formate, acetate, citrate, propionate, tartrate and carbonate in a concentration from about 5 to about 10% by weight, having no or only a slight tendency to gel and freeze-separate when subjected to repeated freezing and thawing.

4,104,176

POROUS LUBRICANT-IMPREGNATED BEARING

James L. Bidler, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 615,993, Sep. 23, 1975, abandoned. This application May 13, 1977, Ser. No. 796,789

Int. Cl.² C10M *5/00, 7/00;* **F16D** *69/00;* **F16C** *0/00*

U.S. Cl. 252—12.2 **19 Claims**

1. A porous lubricant-impregnated bearing comprising a body shaped to support a rotating shaft and containing an interconnected pore structure filled with migratable lubricant that is drawn from the pore structure to lubricate rotation of the shaft; characterized in that said body comprises a matrix of solid discrete particles closely packed so as to define a network of interconnected interstices and bonded together with a bonding material that is different from the particles, is disposed within and chemically reacted in situ in the interstices so as to be dimensionally stable at PV's of 100,000, and only partially fills the interstices so as to leave spaces between substantially all adjacent matrix particles, whereby a uniform fine pore structure is formed from which lubricant will be uniformly drawn and maintained during rotation of said shaft.

4,104,177

GREASE COMPOSITIONS

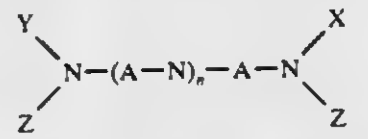
Gerard P. Caruso, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 751,413, Dec. 16, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 839,071

Int. Cl.² C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 A **6 Claims**

1. A grease composition comprising of a major amount of a lubricating oil base vehicle, a polyurea gellant in an amount sufficient to thicken the base vehicle to a grease consistency and a minor amount of an acylated alkylene polyamine or mixture of acylated alkylene polyamines, the acylated alkylene polyamine or acylated alkylene polyamines having the formula



wherein A is alkylene of 2 to 4 carbon atoms and n is an integer of from 0 to 3, X is H or Z, Y is selected from H, alkyl containing 12 through 22 carbon atoms, and Z, and Z is an acyl group selected from alkanoyl containing 2 to 22 carbon atoms, hydroxy alkanoyl containing 2 to 22 carbon atoms, alkenoyl containing 2 to 22 carbon atoms, hydroxyalkenoyl containing 2 to 22 carbon atoms, hexahydrobenzoyl, and cycloalkylalkanoyl containing 5 through 28 carbon atoms.

4,104,178

WATER-BASED FORGING LUBRICANT

Sulekh C. Jain, Shrewsbury, and Charles A. Morris, Grafton, both of Mass., assignors to Wyman-Gordon Company, Worcester, Mass.

Continuation of Ser. No. 625,592, Nov. 24, 1975, Pat. No. 3,983,042. This application Aug. 9, 1976, Ser. No. 712,702

Int. Cl.² C10M *3/04*

U.S. Cl. 252—30 **4 Claims**

1. A forging lubricant comprising:

(a) from about 0.5% to 1.5% by weight of an organic thickener selected from the group consisting of sodium carboxymethylcellulose and hydroxypropylcellulose,

(b) from about 8% to 16% by weight of graphite,

(c) from about 2% to 5% by weight of sodium pentaborate,

(d) from about 4% to 8% by weight of sodium molybdate, and

(e) water base of sufficient percentage by weight to complete a 100% by weight mixture.

4,104,179

LUBRICATING AND PETROLEUM FUEL OIL COMPOSITIONS CONTAINING AZOLE POLYSULFIDE WEAR INHIBITORS

Terence Colclough, Oxford, Great Britain, assignor to Exxon Research & Engineering Co., Linden, N.J.

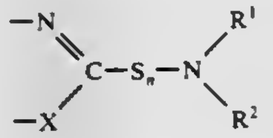
Filed Jan. 30, 1976, Ser. No. 653,935

Claims priority, application United Kingdom, Feb. 14, 1975, 6354/75

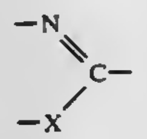
Int. Cl.² C10M *1/48*

U.S. Cl. 252—32.7 E **8 Claims**

1. An oil composition comprising a major amount of lubricating oil, a minor but at least a metal wear inhibiting amount of an azoleamino polysulfide or an azine aminopolysulfide of the structure:



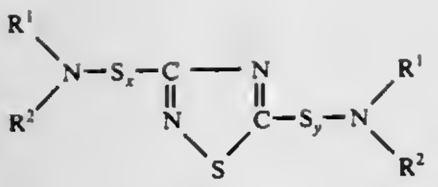
where the group



forms part of a 5-membered azole heterocyclic ring or a 6-membered azine heterocyclic ring, n is at least 2, X is O, S, or NR^3 where R^3 is H or a lower alkyl group and R^1 and R^2 which are the same or different are hydrogen, a hydrocarbyl group containing from 1 to 25 carbons or one part of a ring of the class consisting of morpholino, piperidino and piperazino and a minor but at least dispersing amount of a lubricating oil ashless dispersant.

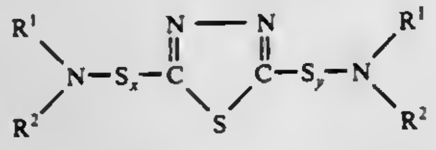
2. An oil composition according to claim 1 containing in addition a minor but at least oxidation-inhibiting amount of a zinc dialkyldithiophosphate and said polysulfide is morpholino benzothiazole disulfide.

7. An oil composition comprising a major amount of a lubricating oil and a minor but at least metal wear inhibiting amount of an azole polysulfide of the general formula:



wherein at least one of X and Y is at least 2, and R^1 and R^2 which are the same or different are hydrogen, a hydrocarbyl group containing from 1 to 25 carbons or one part of a ring of the class consisting of morpholino, piperidino and piperazino.

8. An oil composition comprising a major amount of a lubricating oil and a minor but at least metal wear inhibiting amount of an azole polysulfide of the general formula:



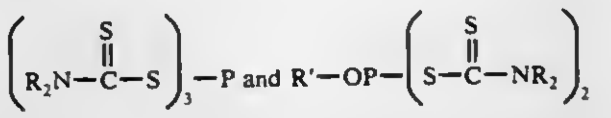
where at least one of *x* and *y* is at least 2 and R^1 and R^2 which are the same or different are hydrogen, a hydrocarbyl group containing from 1 to 25 carbons or one part of a ring of the class consisting of morpholino, piperidino and piperazino.

4,104,180
PRODUCTION OF OVERBASED METAL PHENATES
Victor Charles Ernest Burnop, Wantage, England, assignor to Exxon Research & Engineering Co., Linden, N.J.
Continuation-in-part of Ser. No. 687,557, May 18, 1976, abandoned. This application Apr. 28, 1977, Ser. No. 791,714
Claims priority, application United Kingdom, May 23, 1975, 22510/75
Int. Cl.^{2} C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **26 Claims**

1. A process for preparing an oil soluble overbased metal additive, useful as a lubricating oil detergent and having a total base number of about 150 to 400, comprising the following steps:
- (i) forming a reaction mixture comprising:
  - (a) an alkaline earth metal alkoxyalkoxide together with alkoxyalcohol to serve as solvent,
  - (b) a surfactant selected from the group consisting of C_{18} to C_{30} sulphonic acid, metal sulphonate of said sulphonic acid, hydrocarbyl substituted phenols, metal phenates and sulphurised phenols, having one or more hydrocarbyl group substituents each substituent containing at least 9 and up to 60 carbon atoms, or mixtures of said surfactants with each other,
  - (c) a non-volatile diluent oil, and
  - (d) at least one mole of water for every gram atom of the alkaline earth metal present in excess of the amount of the metal required to neutralise the surfactant,
- (ii) hydrolysing the alkaline earth metal alkoxyalkoxide by heating the mixture to a temperature from 50° to 100° C.,
- (iii) introducing carbon dioxide into the reaction mixture at a temperature below about 100° C. to thereby form said overbased metal phenates, and
- (iv) removing volatiles from the reaction mixture, and wherein there are about 2 to 5 equivalents of metal alcoholate per equivalent of surfactant.

4,104,181
ADDITIVES COMPRISING (N, N-DIORGANOTHIOCARBAMYL) PHOSPHOROTHIOITES AND LUBRICANT COMPOSITIONS CONTAINING THE SAME
Phillip S. Landis, Woodbury, and Abraham O. M. Okorodudu, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 19, 1977, Ser. No. 834,368
Int. Cl.^{2} C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—46.7 **26 Claims**

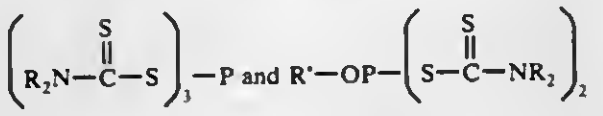
1. A lubrication composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom and a minor load-carrying amount of a compound selected from the group consisting of compounds of the following general formulae:



$$\left(R_2N-\overset{\overset{S}{\|}}{C}-S\right)_3-P \text{ and } R'-OP-\left(S-\overset{\overset{S}{\|}}{C}-NR_2\right)_2$$

or mixtures thereof where R and R' are alkyl of 1 to 32 carbon atoms, aryl of 6 to 32 carbon atoms or alkaryl of 7 to 32 carbon atoms, and where R and R' are also selected from (C_nH_{2n-1}) where *n* is from 3 to about 20 and R is also selected from $(CH_2)_n$ in heterocyclic systems with *n* being from 2 to about 10.

16. A compound selected from the groups consisting of compounds of the following general structure:

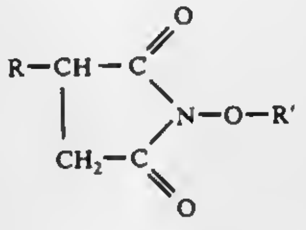


$$\left(R_2N-\overset{\overset{S}{\|}}{C}-S\right)_3-P \text{ and } R'-OP-\left(S-\overset{\overset{S}{\|}}{C}-NR_2\right)_2$$

where R and R' are alkyl of 1 to about 32 carbon atoms, aryl of 6 to 32 carbon atoms or alkaryl of 7 to 32 carbon atoms and where R and R' are also selected from (C_nH_{2n-1}) where *n* is from 3 to 20 and R may be selected from $(CH_2)_n$ in heterocyclic systems where *n* is from 2 to 10.

4,104,182
LUBRICATING OIL COMPOSITION
Kechia J. Chou, Fishkill, and Walter W. Hellmuth, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed May 16, 1977, Ser. No. 796,915
Int. Cl.^{2} C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A **16 Claims**

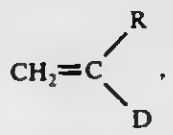
1. A lubricating oil composition comprising a major portion of a hydrocarbon oil of lubricating viscosity, a minor amount of a metal-containing additive characterized by promoting the formation of hard deposits in an internal combustion engine and an effective deposit softening amount of a hydrocarbon-substituted N-hydrocarbyloxy succinimide represented by the formula:



in which R is a hydrocarbon radical having from 1 to 50 carbon atoms and R' is a hydrocarbon radical having from 3 to 20 carbon atoms.

4,104,183
LIQUID DEVELOPER FOR USE IN ELECTROSTATIC PHOTOGRAPHY COMPRISING NATURAL RESINS AND NATURAL RESIN-MODIFIED THERMOSETTING RESINS COMBINED WITH POLYMERS
Kazuo Tsubuko, and Yasuo Kizu, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed Dec. 16, 1976, Ser. No. 751,097
Claims priority, application Japan, Dec. 24, 1975, 50-154429
Int. Cl.^{2} G03G *9/12*
U.S. Cl. 252—62.1 L **11 Claims**

1. A liquid developer for use in electrostatic photography consisting essentially of a toner dispersed in a carrier liquid having a high resistivity and a low dielectric constant, said toner consisting essentially of pigment or dye particles and a non-aqueous resin dispersion, said non-aqueous resin dispersion consisting essentially of a non-aqueous solvent having a high insulating property and a low dielectric constant selected from the group consisting of aliphatic hydrocarbons and halogen derivatives thereof, said solvent having dispersed therein at least one resin which is substantially insoluble in said solvent, said resin being selected from the group consisting of natural resins and natural resin-modified thermosetting resins, said solvent also having dispersed therein a polymer of at least one monomer A which has the formula



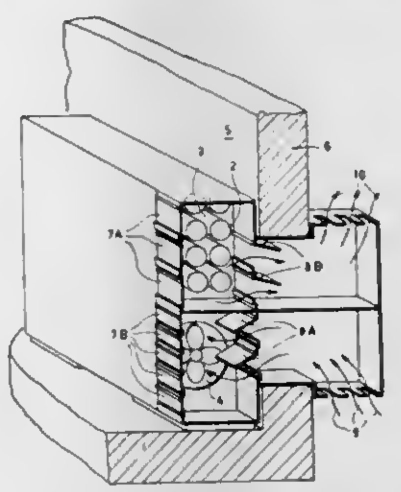
wherein R is hydrogen or CH_3, D is $-COOC_nH_{2n+1}$ or $-OC_nH_{2n+1}$, and *n* is an integer ranging from 6 to 20, said monomer A being capable of dissolving said resin, the weight ratio of said resin:said polymer being in the range of from about 5-50:50-95, said polymer being solvated by said solvent.

4,104,184
ELECTRICAL DEVICES CONTAINING SELECT VINYLSILOXANE DIELECTRIC FLUIDS
William T. Brooks, and Gary A. Vincent, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed May 9, 1977, Ser. No. 794,878
Int. Cl.^{2} H01B *3/46, 3/24, 3/20*
U.S. Cl. 252—63.7 **3 Claims**

1. In an electrical device containing a dielectric fluid, the improvement comprising employing as the dielectric fluid $CH_2{=}CH(CH_3)_2SiOSi(CH_3)_2CH{=}CH_2$.

4,104,185
LATENT HEAT ACCUMULATOR
Johann Schröder, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 14, 1976, Ser. No. 676,649
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1975, 2517920
Int. Cl.^{2} C09K *5/06*
U.S. Cl. 252—70 **4 Claims**

1. A method of operating a latent heat accumulator including a heat-energy storage medium, which comprises utilizing a heat-energy storage medium consisting essentially of a potassium fluoride-water system having a potassium fluoride content between 44 and 48% by weight.



4,104,186
ORGANOSILICON ANTI-FOAMING COMPOSITIONS
Jean-Claude Caffarel, Decines, and Bernard Papillon, La Mulatiere, both of France, assignors to Rhone-Poulenc Industries, Paris, France
Filed May 6, 1977, Ser. No. 794,522
Claims priority, application France, May 11, 1976, 76 14094
Int. Cl.^{2} C11D *3/065*
U.S. Cl. 252—89 R **12 Claims**

11. A composition which comprises a powdered detergent in admixture with a composition comprising:
- A. from about 2% to about 50% by weight of organosilicon anti-foaming agents, and
- B. from about 98% to sbout 50% of particulate solid carriers of the general formula $(CH_3)_a(HO)_b(RO)_c SiO(4-a-b-c)/2$, in which the symbol "*R*" represents a methyl, ethyl, n-propyl, isopropyl, or n-butyl radical, the symbol "*a*" represents any number ranging from about 0.8 to about 1.1, the symbol "*b*" represents any number ranging from about 0.002 to about 0.2, and the symbol "*c*" represents any number ranging from about 0 to about 0.2.

4,104,187
COMPOSITION AND METHOD TREATING SOFT CONTACT LENSES AT ELEVATED TEMPERATURES
Murray J. Sibley, Berkeley; Gordon H. K. Yung, Sunnyvale, and Petronio D. Urrea, Sunol, all of Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.
Filed Apr. 12, 1976, Ser. No. 676,280
Int. Cl.^{2} C11D *1/84, 1/48*
U.S. Cl. 252—106 **5 Claims**

1. A soft lens thermal disinfecting and cleaning solution consisting essentially of:
- an aqueous isotonic saline solution buffered with a physiologically acceptable buffer at a pH in the range of about 6.5-7.6, having a physiologically acceptable preservative system comprising at least one member of the group consisting of ethyl(2-mercaptobenzato-S) mercury sodium salt, ethylene diamine tetraacetic acid and sorbic acid, and from 0.001-0.1w/v of a fatty acid amide of 10 to 18 carbon atoms of diethanolamine.

3. A method for disinfecting and cleaning soft contact lenses which comprises heating said lenses in a solution at a temperature of at least 60° C for a time sufficient to disinfect and clean such soft contact lens, said solution consisting essentially of:
- an aqueous saline solution buffered with a physiologically acceptable buffer to a pH in the range of 6.5-7.6 having a physiologically acceptable perservative system comprising at least one member of the group consisting of ehtyl(2-

mercaptobenzato-S)mercury sodium salt, ethylene diamine tetraacetic acid and sorbic acid in a total amount of from about 0.001 to 0.1 weight percent and from about 0.001–0.1w/v of a non-eye irritating neutral surfactant selected from the group consisting of fatty acid amides of from 10 to 18 carbon atoms of diethanolamine and 2-undecyl-3-(2'-carboxymethoxyethyl)-3-carboxymethyl-1-imidazoline disodio salt hydroxide.

4,104,188
PRODUCTION OF ZINC POWDER FOR ELECTROCHEMICAL BATTERIES

Robert Nicaise, Neerpelt, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 499,346, Aug. 21, 1974, abandoned. This application Jul. 27, 1976, Ser. No. 709,070

Int. Cl.^{2} H01M *4/42, 4/26*

U.S. Cl. 252—182.1 **2 Claims**

1. A process for production of powdered electrode material for use in electrochemical batteries which use zinc powder and mercury as the electrode material, which process comprises

(a) mixing molten zinc with an amount of mercury effective to inhibit gassing,

(b) subjecting the molten mixture resulting from step (a) to a homogenizing treatment to obtain a homogenized molten alloy of zinc and mercury,

(c) subjecting the homogenized molten alloy from step (b) to atomization to obtain a zinc-mercury alloy in powder form, each grain of said powder consisting of the same homogeneous zinc-mercury alloy.

4,104,189
CURING AGENT FOR POLYSULFIDE-POLYMER COMPOSITIONS

Askan Hertwig, Seelze, and Horst Krampitz, Lohnde, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Hannover, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,071

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557012

Int. Cl.^{2} C08F *28/00;* **C08G** *75/14*

U.S. Cl. 252—186 **8 Claims**

1. A curing agent for polysulfide polymer compositions based on manganese(IV) oxide containing from 1 to 15% by weight, based on the weight of manganese(IV) oxide, of metal other than manganese selected from alkali metals, foreign metals and mixtures thereof, and from 0.1 to 8% by weight of water, said manganese(IV) oxide having a specific surface of 5 to 20 m^2/g.

2. A process for the manufacture of a curing agent for polysulfide polymers which comprises treating an oxidic manganese compound having an oxidation number of 2 to 4 with an alkali lye at a temperature of 120° to 400° C. under a pressure of 1 to 15 bars, washing the resulting material with water which may contain up to 10% of acid to produce a lattice containing from 0.1 to 15% by weight of alkali metal, grinding the washed material to a specific surface of 5 to 20 m^2/g and drying it to a water content of 0.1 to 8% by weight.

4,104,190
GENERATION OF CHLORINE DIOXIDE FOR DISINFECTION AND STERILIZATION

Stephen R. Hartshorn, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 21, 1977, Ser. No. 779,696

Claims priority, application United Kingdom, Mar. 23, 1976, 11676/76

Int. Cl.^{2} D06L *3/08;* **C01B** *11/02*

U.S. Cl. 252—187 R **25 Claims**

1. A method of generating chlorine dioxide in an aqueous liquid containing an alkali metal or alkaline earth metal chlorite by adding to the aqueous liquid a water-soluble solid composition containing a chlorine-releasing component consisting of a compound or mixture of compounds which is stable when dry but releases chlorine when dissolved in water, the chlorine released generating chlorine dioxide by reaction with the alkali metal or alkaline earth metal chlorite.

4,104,191
HYDROGEN GENERATION FROM FLUE GASES

Jack Brocoff, Fullerton, Calif., assignor to Ralph M. Parsons Co., Pasadena, Calif.

Continuation-in-part of Ser. No. 450,550, Mar. 13, 1974, Pat. No. 4,012,488. This application Mar. 10, 1977, Ser. No. 776,353

Int. Cl.^{2} C09K *3/00*

U.S. Cl. 252—188 **8 Claims**

1. A process for the production of a reducing gas which comprises:

(a) extracting a high temperature gas from a reaction zone at a temperature sufficiently high to promote thermal reactions between an oxidant and an added hydrocarbon;

(b) adding to the extracted high temperature gas a carbon containing fuel in an amount to provide the sum of from about 5 to about 100 mols of carbon and H_2 per 100 mols of extracted gas; and

(c) thermally converting the carbon containing fuel in the presence of a gaseous oxidant provided in a quantity sufficient to convert the carbon present in the fuel to carbon monoxide, but insufficient to convert all of the carbon in the fuel to carbon dioxide to form a resultant high temperature reducing gas containing a reductant selected from the group consisting of hydrogen, carbon monoxide and mixtures thereof.

4,104,192
OXYGEN ABSORBENT

Yoshio Yoshikawa, Ushiku; Akira Amemiya, Kana; Sigeru Kimoto, and Hidenori Kimpara, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company Inc., Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,817

Claims priority, application Japan, Jan. 26, 1976, 51-7300

Int. Cl.^{2} C09K *15/00;* **C01B** *17/64*

U.S. Cl. 252—188 **12 Claims**

1. An oxygen absorbent comprising a dithionite and at least one compound having water of hydration.

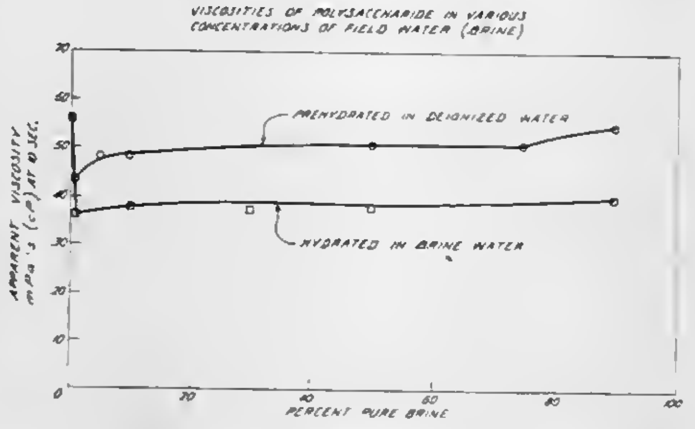
4,104,193
IMPARTING SUPERIOR VISCOSITY TO AQUEOUS POLYSACCHARIDE SOLUTIONS

Walter H. Carter, Houston; Charles A. Christopher, Stafford, and Thomas Jefferson, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,976

Int. Cl.^{2} E21B *33/138, 43/22*

U.S. Cl. 252—316 **8 Claims**



1. A method for imparting superior viscosity to an aqueous polysaccharide B-1459 solution wherein the aqueous component is hard water consisting of prehydrating the polysaccharide in fresh water before mixing with hard water.

4,104,194
METHOD FOR PROTECTING METAL FROM EROSION

Arthur Botta, Krefeld, and Christian Rasp, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

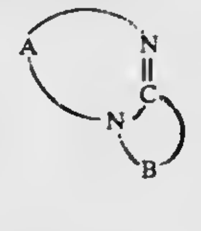
Division of Ser. No. 591,789, Jun. 30, 1975, Pat. No. 4,048,174. This application May 16, 1977, Ser. No. 797,651

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1974, 2435406

Int. Cl.^{2} C09K *3/00*

U.S. Cl. 252—390 **8 Claims**

1. Method for protecting metal from erosion comprising treating the metal with a compound having the formula

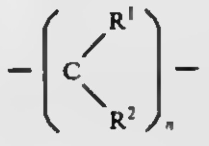


(I)

wherein

A is an arylene radical and

B is unsubstituted or halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted alkylene chain



$$-\left(\overset{R^1}{\underset{R^2}{C}}\right)_n-$$

wherein

R^1 and R^2 individually represent hydrogen and/or unsubstituted or halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted aliphatic, cycloaliphatic, araliphatic or aromatic radicals and

n represents a number from 3 to 6,

or

B is unsubstituted or a halogen, lower alkyl, CF_3, alkoxy. aryloxy or dialkylamino substituted 1,8-naphthylene, 2,2'-diohenylene or 4,5-phenanthrylene radical.

4,104,195
BLOWING AGENTS BASED ON UREA DICARBOXYLIC ACID ANHYDRIDE

Kurt Ley, Odenthal-Gloebusch; Hermann Hagemann, Cologne, and Helmut Hurnik, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 25, 1975, Ser. No. 616,523

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1974, 2452740

Int. Cl.^{2} C09K *3/00;* **C08J** *9/08*

U.S. Cl. 252—350 **2 Claims**

1. A blowing agent composition comprising 10 to 80% by weight of urea dicarboxylic acid anhydride, 0–90% by weight of at least one water-eliminating compound and the balance, if any, being at least one known blowing agent, said blowing agent composition decomposing without giving off any corrosive, discoloring, unpleasant smelling or toxic decomposition products.

4,104,196
NONABSORBABLE ANTIOXIDANT METHOD

Alejandro Zaffaroni, Atherton, Calif., assignor to Dynapol, Palo Alto, Calif.

Division of Ser. No. 367,971, Jun. 7, 1973, Pat. No. 3,994,828. This application Mar. 15, 1976, Ser. No. 666,845

Int. Cl.^{2} C09K *15/08*

U.S. Cl. 252—404 **2 Claims**

1. A method of restricting the rate of oxidation of an edible material selected from among foods, beverages and pharmaceuticals which comprises adding to said edible material in an amount sufficient to restrict the rate of oxidation thereof a nonabsorbable nonnutritive antioxidant consisting essentially of a compound having a molecular weight in excess of 1000 and having the formula $(AN\rightarrow)_nR$ wherein An is an antioxidant capable of substantially retarding the rate of oxidation of an oxidizable material, n is a number having a value of at least 1, R is a polymeric restricting means which is essentially nonmetabolizable and nonbiodegradable under the conditions of passage through the gastrointestinal tract, and ~ is a covalent bond that substantially maintains its physical and chemical integrity under the conditions of passage through the gastrointestinal tract and wherein during passage of $(AN\rightarrow)_nR$ through the gastrointestinal tract, the restricting means, R, substantially prevents passage of $(AN\rightarrow)_nR$ from the gastrointestinal lumen through the gastrointestinal mucosa into the systemic circulation.

4,104,197
METHOD OF MAKING GAS DIFFUSION ELECTRODES FOR ELECTROCHEMICAL CELLS WITH ACID ELECTROLYTES

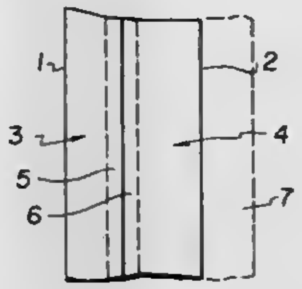
Jochen Heffler, Grossauheim, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Germany

Division of Ser. No. 749,663, Dec. 13, 1976. This application May 23, 1977, Ser. No. 799,601

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556731

Int. Cl.^{2} H01M *4/88*

U.S. Cl. 252—425.3 **1 Claim**



1. A method of forming a gas diffusion electrode for electrochemical cells with acid electrolytes comprising, mixing hard coal powder with a most common particle size of about 10 to 25 microns with polytetrafluorethylene or the like in a suspension medium to form a first pulp, pressing the first pulp into a first body, cutting a skin from the first body, rolling the skin to a thickness of about up to 0.4 mm to form a prerolled hydrophobic layer, mixing catalyst containing activated carbon powder with a most common particle size of about 0.5 microns with polytetrafluorethylene or the like in a suspension medium to form a second pulp, pressing the second pulp into a second body, cutting skins from the second body, rolling the skins to a thickness of about 0.6 mm to form a prerolled hydrophilic layer, superposing the prerolled hydrophilic and hydrophobic layers, and sintering the layers together with heat and under pressure and in an inert atmosphere to form the electrode with final thicknesses, of up to 0.2 mm for the hydrophobic layer and of about 0.3 mm for the hydrophilic layer, wherein the most frequent pore diameter of the hydrophobic and hydrophilic layers is 1.8 microns and 0.08 microns respectively.

4,104,198
HIGH YIELD COMPLEX CATALYST FOR POLYMERIZING OLEFINS

James A. May, Jr., and Wilbur L. Bressler, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1976, Ser. No. 705,311
Int. Cl.^{2} B01J *31/02*
U.S. Cl. 252—429 B **10 Claims**

1. A catalytic reaction product of (A) a hydrocarbonsoluble complex of a halide of a transition metal selected from Groups 4*b*, 6*b*, 7*b* and 8 of the Periodic Table wherein the complex contains at least one coordinate covalent bond to molecular nitrogen or hydrogen, (B) an organometallic compound wherein the metal thereof is a divalent non-transition metal selected from Groups 2*a* and 2*b* of the Periodic Table and the organo portion of said organometallic compound is selected from alkyl, aryl, dialkyl, diaryl, aryl hydride, alkyl hydride, alkyl halide and aryl halide, and (C) a halide source selected from the group consisting of (1) hydrogen halides, (2) active organic hydrocarbyl halides and (3) metallic halides represented by the formula $MR_{y-a}X_a$ wherein M is a metal of Group 3*a* or 4*a*, R is a monovalent organic hydrocarbyl radical, X is a halogen, Y corresponds to the valence of M and *a* is a number from 1 to *y*, the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of the divalent nontransition metal to the transition metal is within the range from about 10:1 to about 2000:1, and the atomic ratio of the divalent metal to X is within the range from about 0.1:1 to about 2.5:1.

4,104,199
CATALYST FOR THE POLYMERIZATION OF ETHYLENE OR MIXTURES OF ETHYLENE WITH TERMINAL OLEFINS

Glen R. Hnff, Naperville, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 645,708, Dec. 31, 1975, abandoned. This applicatioo Apr. 25, 1977, Ser. No. 790,194
Int. Cl.^{2} C08F *4/64, 4/16*
U.S. Cl. 252—430 **7 Claims**

1. A catalyst for polymerizing ethylene or ethylene containing up to about twenty mol percent of another polymerizable terminal olefin comprising:

(a) a solid catalyst component which is the reaction product of (1) hydrated magnesium stannate, (2) a lower alkyl titanium (IV) or vanadium (V) alkoxide, and (3) a lower alkyl alkylaluminum dichloride, wherein the weight ratio of (2) to (1) ranges from about 0.1 to about 5 and the weight ratio of (3) to (2) ranges from about 2 to about 30, said reaction comprising a step wherein at least (1) and (2) are reacted at a temperature ranging from about 25° to about 150° C; and

(b) a lower alkyl organoaluminum compound selected from the group consisting of trialkylaluminum, dialkylaluminum hydrides, dialkylaluminum halides and mixtures thereof in an amount, exceeding about 2 millimols per gram of solid catalyst component, said amount being effective to promote the activity of the solid catalyst component.

4,104,200
HYDROGENATING CATALYST

Donald C. Cronauer, Gibsonia, and William L. Kehl, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 6, 1976, Ser. No. 707,521
Int. Cl.^{2} B01J *21/04, 23/78, 23/88*
U.S. Cl. 252—465 **4 Claims**

1. A hydrogenation catalyst comprising a magnesium-deficient magnesium aluminate spinel of the following formula:

$$Mg_xAl_2O_{3+x},$$

wherein *x* is a number ranging from about 0.10 to about 0.40, carrying nickel, titanium and molybdenum.

4,104,201
CATALYTIC STEAM REFORMING AND CATALYSTS THEREFOR

Reginald George Sinclair Banks; David James Paterson, and Alan Williams, all of Solihull, England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 609,486, Sep. 2, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,513
Claims priority, application United Kingdom, Sep. 6, 1974, 39048/74
Int. Cl.^{2} B01J *21/04, 23/46, 23/74*
U.S. Cl. 252—466 B **7 Claims**

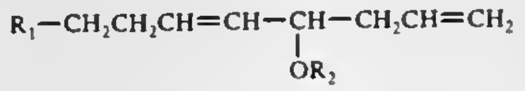
1. A process for the preparation of a low temperature steam reforming catalyst, said catalyst comprising nickel in an amount of from 25 to 75% nickel, ruthenium in an amount less than 0.8% and alumina, said percentages being calculated as weight percentages of the total calcined but unreduced catalsyt, wherein said process comprises coprecipitation of the nickel and aluminum components from aqueous solutions of nickel and aluminum salts followed by washing, drying, calcination and reduction of the precipitate to reduce the nickel component to metallic nickel, and wherein said ruthenium component is incorporated into the catalyst prior to the reduction step by a step selected from the group consisting of (a) impregnation of the washed, dried and calcined nickel-aluminum containing precipitate, from an aqueous solution of a ruthenium containing salt, or (b) physical blending of a solid ruthenium compound with the washed, dried and calcined nickel-aluminum containing precipitate.

4,104,202
PERFUME COMPOSITIONS AND PROCESS FOR PREPARING SAME

Hans J. Wille, Naarden, Netherlands, assignor to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Mar. 11, 1977, Ser. No. 776,764
Claims priority, application Netherlands, Mar. 15, 1976, 7602686
Int. Cl.^{2} C11B *9/00*
U.S. Cl. 252—522 **15 Claims**

1. A compound for use in a perfume composition having the structural formula



$$R_1-CH_2CH_2CH{=}CH-\underset{\displaystyle OR_2}{\underset{|}{CH}}-CH_2CH{=}CH_2$$

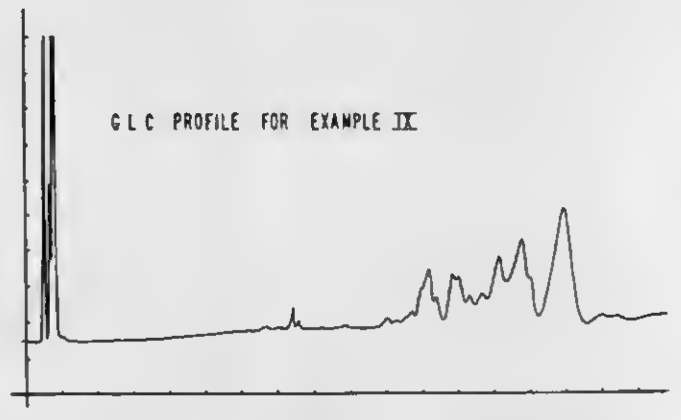
wherein R_1 is an alkyl radical having from 1 to 4 carbon atoms and R_2 is selected from the group consisting of hydrogen and formyl radicals and alkyl carbonyl radicals, the alkyl portion of which has 1 or 2 carbon atoms.

8. A composition according to claim 7, wherein R_2 of said alkadiene compound is a CH_3CO radical.

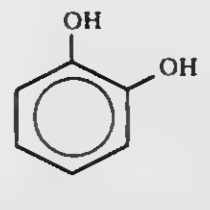
4,104,203
PERFUME COMPOSITIONS CONTAINING CATECHOL-CAMPHENE REACTION PRODUCTS

John B. Hall, Rumson, and Wilhelmus Johannen Wiegers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

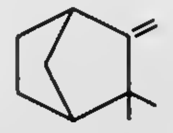
Continuation-in-part of Ser. No. 753,618, Dec. 22, 1976, Pat. No. 4,061,686, which is a continuation-in-part of Ser. No. 662,818, Mar. 1, 1976, Pat. No. 4,014,944. This application Oct. 31, 1977, Ser. No. 846,960
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.^{2} C11B *9/00*
U.S. Cl. 252—522 **4 Claims**



1. A perfume composition comprising a product produced according to a process which comprises reacting catechol having the structure:



with camphene having the structure:



in the presence of a Friedel Crafts Catalyst to form a catechol-camphene alkylation product, recovering said alkylation product at a temperature in the range of from 186° up to 236° C and at a pressure of from 2.3 up to 3.8 mm Hg, hydrogenating the said catechol-camphene alkylation product in the presence of a hydrogenation catalyst to form a hydrogenated catechol-camphene addition product and recovering the said hydrogenated catechol-camphene addition product at a temperature in the range of from 150° C up to 172° C and a pressure of about 2.5 mm Hg, the Friedel Crafts Catalyst being selected from the group consisting of boron trifluoride etherate, sulfuric acid, acid clay, aluminum trichloride, boron trifluoride, boron trifluoride-acetic acid, boron trifluoride-phosphoric acid, zinc chloride, aluminosilicate molecular sieve, and ferric chloride, the reaction between catechol and camphene being carried out at a temperature in the range of from about 120° C up to 175° C and the mole ratio of catechol to camphene being in the range of from about 0.5:1 up to about 4:1, the hydrogenation reaction being carried out within a temperature range of 100° C up to 300° C, the latter portion of the reaction time being at from 200° up to 300° C in a perfuming amount, and at least one perfume adjuvant selected from the group consisting of an alcohol, an aldehyde, a hydrocarbon, a nitrile, an ester, a lactone, a natural essential oil, and a mixture of two or more alcohols, aldehydes, nitriles, esters, hydrocarbons, lactones and natural essential oils.

4,104,204
PHOTOSENSITIZATION OF OXYGEN TO THE SINGLET EXCITED STATE USING ION EXCHANGE RESIN TO WHICH IS ATTACHED A DYE AND PHOTOOXIDATIVE WASTE WATER TREATMENT

John R. Williams, St. Davids, Pa., assignor to Temple University, Philadelphia, Pa.

Division of Ser. No. 496,069, Aug. 9, 1974, Pat. No. 4,008,136. This application Jun. 25, 1976, Ser. No. 699,706
Int. Cl.^{2} B01J *1/10, 31/08;* **C02C** *5/04*
U.S. Cl. 521—32 **4 Claims**

1. A composition comprising an ion exchange resin to which is attached a photosensitizing dye capable of exciting ground state oxygen to the singlet excited state.

4. A composition, as recited in claim 1 wherein said photosensitizing dye, capable of exciting ground state oxygen to the singlet excited state, is rose bengal, eosin Y, alizarin red S, congo red, orange G, methylene blue, crystal violet, proflavine sulfate, neutral red, or pyronin B.

4,104,205
MICROWAVE DEVULCANIZATION OF RUBBER

Donald S. Novotny, Windsor, Vt.; Richard L. Marsh, Springfield, Mo.; Frank C. Masters, Palmyra, Nebr., and David N. Tally, Arvada, Colo., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

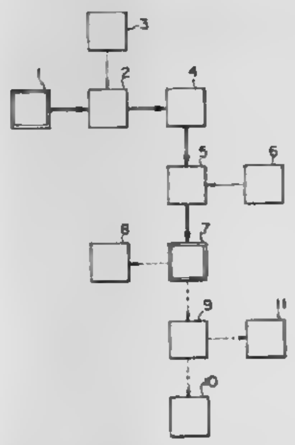
Filed Jan. 6, 1976, Ser. No. 646,821
Int. Cl.^{2} C08F *2/46*
U.S. Cl. 260—2.3 **10 Claims**

1. The method of devulcanizing sulfur-vulcanized elastomer containing polar groups which comprises applying a controlled dose of microwave energy of between 915 and 2450 MHz and between 41 and 177 watt-hours per pound in an amount sufficient to sever substantially all carbon-sulfur and sulfur-sulfur bonds and insufficient to sever significant amount of carbon-carbon bonds.

4,104,206
PROCESS FOR REPROCESSING ATACTIC POLYPROPYLENE

Takeshi Hachisu, and Akinari Uchida, both of Niihari, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 17, 1976, Ser. No. 667,470
Claims priority, application Japan, Mar. 19, 1975, 50-32220
Int. Cl.^{2} C08F *6/00*
U.S. Cl. 260—2.3 **4 Claims**



1. A process for reprocessing normally tacky atactic polypropylene, produced in the preparation of a particulate polypropylene, to a freeflowing particulate form comprising

(a) cooling the tacky atactic polypropylene at a low temperature sufficient to cause embrittlement of said atactic polypropylene;

(b) crushing the embrittled atactic polypropylene to about the same particle size as that of said polypropylene;

(c) depositing a non-tacky fine powder on the surface of said particulate atactic polypropylene; and

(d) raising the temperature of said particulate atactic polypropylene having a surface deposit of said fine powder to room temperature where said particular atactic polypropylene is free-flowing.

4,104,207

PROCESS FOR PRODUCTION OF CELLULAR CAVITIES IN THERMOPLASTIC MATERIAL IN WHICH THE MEDIUM WHICH FORMS THE GAS BUBBLES IS BOUND TO A CARRIER

Hans Dieter Pelikan, Am Prinzenwaldchen 13, and Siegfried Titz, Im Laar 25, both of 521 Troisdorf, Germany, assignors to Hans Dieter Pelikan and Siegfried Titz, both of Germany

Filed Apr. 5, 1976, Ser. No. 673,528

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514691

Int. Cl.^{2} C08J *9/12*

U.S. Cl. 521—84 **35 Claims**

1. A process for the production of cellular cavities in thermoplastic plastic material, said material being suitable for use as molding compositions or for extrusion, comprising addding to the material a carrier having bound thereto, by at least one of molecular bonding or capillary bonding, a medium which forms gas bubbles, the bond being such that there is direct communication between the medium and the material, whereby, when the temperature of the thermoplastic plastic material is above the minimum temperature at which the medium forms the gas bubbles, the bubbles are formed and act to produce cellular cavities in the thermoplastic plastic material.

4,104,208

PROCESS FOR PREPARATION OF HARD AND POROUS POLYVINYLALCOHOL GELS

Shiro Kido, Hoya; Yuji Saito, Yokohama, and Toshinao Iwaeda, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Dec. 1, 1976, Ser. No. 746,532

Claims priority, application Japan, Mar. 9, 1976, 51-24693

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 521—53 **4 Claims**

1. A process for the preparation of hard and porous polyvinyl alcohol gels for aqueous gel permeation chromatography, which comprises:

suspension-polymerizing a mixture of vinyl acetate and at least one crosslinking agent selected from the group consisting of diethylene glycol dimethacrylate and glycidyl methacrylate, in the presence of a diluent, wherein the weight ratio of the amount of said diluent to the amount of said mixture of vinyl acetate and crosslinking agent is in the range of from 50 : 100 to 250 : 100, and the weight ratio of the amount of said vinyl acetate to the amount of said crosslinking agent is in the range of from 90 : 10 to 30 : 70.

saponifying the resulting porous polyvinyl acetate gel with an alkali; and

subjecting the resulting porous polyvinyl alcohol gel to postcrosslinking with epichlorohydrin.

4,104,209

HIGHLY POROUS ION EXCHANGE RESINS PREPARED BY SUSPENSION POLYMERIZATION IN THE PRESENCE OF LINEAR POLYMER

John A. Mikes, Cherry Hill; Albert H. Greer, Haddonfield, both of N.J., and Amos Norwood, Philadelphia, Pa., assignors to Sybron Corporation, Rochester, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,067

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 521—62 **6 Claims**

1. A process for the preparation of crosslinked copolymer beads suitable for conversion to ion exchange resins having improved mechanical properties, improved chemical properties and porosity of 0.14 to 0.85 ml/g by octane absorption which comprises the steps of

(a) forming a liquid monomer phase comprising:
  i. a mixture of mono-olefinic monomer(s) and at least one poly-olefinic monomer which are miscible and copolymerizable, said mono-olefinic monomer selected from a group consisting of mono-vinyl aromatic hydrocarbons, mono-vinyl heterocylic compounds, and (meth)acrylic esters, and said polyolefinic monomers selected from the group consisting of polyvinyl aromatic hydrocarbons, poly(meth)acrylates and polyvinyl heterocylic compounds,
  ii. from 5–20 parts by weight of total monomers of a linear polymer component selected from a group consisting of cellulose acetate butyrate, cellulose acetate, cellulose nitrate, polycaprolactam, polyvinyl pyridine and aliphatic polyesters, dispersed and preferably dissolved in the monomer phase,
  iii. optionally an inert solvent selected from either C_6–C_{10} hydrocarbons or C_3–C_6 monohydric alcohols, such solvent being included in amounts of 0–50 percent by weight based on the total monomer weight,
  iv. an initiator component providing free radical selected from a group consisting of peroxides, hydroperoxides, azo/nitrile compounds, and
(b) forming a aqueous phase comprising:
  i. a major portion of water
  ii. salts of alkali and/or alkali earth metals
  iii. hydrophilic polymer(s) selected from a group consisting of gelatin, casein, starch, polyvinyl alcohol, maleic acid copolymer(s), poly(meth)acrylic acid derivatives; and
(c) combining said monomer phase (a) and said aqueous phase (b) to form a suspension of said monomer phase in said aqueous phase and
(d) heating said suspension to polymerization temperature of between 50° C and 90° C while stirring said dispersion to form a multiplicity of macroporous polymer beads, and
(e) separating said macroporous beads from the aqueous phase.

4,104,210

THERMOPLASTIC COMPOSITIONS OF HIGH UNSATURATION DIENE RUBBER AND POLYOLEFIN RESIN

Aubert Y. Coran, and Raman P. Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 17, 1975, Ser. No. 641,547

Int. Cl.^{2} C08L *7/00, 23/00*

U.S. Cl. 260—4 R **20 Claims**

1. An elastomeric thermoplastic composition comprising a blend of about 25–45 parts by weight of crystalline thermoplastic polyolefin resin and about 75–55 parts by weight of vulcanized high unsaturation diene rubber particles of a size below about 50 microns dispersed throughout said resin per 100 total parts by weight of resin and rubber, which rubber is a homopolymer of a diolefin or copolymer in which the major component of the polymer chain is derived from a diolefin.

4,104,211

SEALANTS

David Edward Keene, and Anthony Frederick Douglas, both of London, England, assignors to British Gas Corporation, London, England

Continuation-in-part of Ser. No. 507,620, Sep. 19, 1974, abandoned. This application Jun. 18, 1976, Ser. No. 697,362

Claims priority, application United Kingdom, Sep. 25, 1973, 44845/73

Int. Cl.^{2} C08L *89/00*

U.S. Cl. 260—8 **12 Claims**

1. A sealant composition for sealing leaks in gas transmission or distribution pipes comprising an aqueous anionic or non-ionic emulsion of bitumen and rubber containing an anionic or non-ionic emulsifier in which emulsion is incorporated a flow modifier comprising a colloidal stabilizer selected from the group consisting of casein, methyl cellulose, hydroxyethyl cellulose and polymers and copolymers of acrylic acid and salts or esters of polyacrylic acid alone or in conjunction with bentonite clay or china clay and a modifier selected from the group consisting of fillers and soluble alkali wherein the rubber and bitumen content of the emulsion is at least 50% by weight of the total solids content of the sealant, the total solids content of the sealant is from 30 – 72% by weight, the apparent viscosity of the emulsion is not greater than 500 poise at a shear rate of one reciprocal second and the concentration of flow modifier is such that the yield stress of the sealant ranges from 100 to 500 dynes/cm^2.

4,104,212

NON-BIREFRINGENT GRANULAR STARCH LATEX THICKENER

Robert L. Bruner, Hinsdale, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 26, 1976, Ser. No. 745,147

Int. Cl.^{2} C08L *3/02*

U.S. Cl. 260—17.3 **16 Claims**

10. A product useful as a thickening agent for latex comprising:

(a) a substantially non-birefringent, cold water swelling, granular starch product characterized as having a viscosity from about 150 to about 650 centipoise at 10 percent solids after being dispersed in water at 1500 rpm for 2 minutes;
(b) tricalcium monophosphate from about 2% to about 10% by weight; and
(c) a hydrophobic agent.

4,104,213

STARCH REPLACEMENT FOR LATEX POLYMER

Mutong T. Chiang, Palos Heights, and John P. Gibbons, Western Springs, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 26, 1976, Ser. No. 745,145

Int. Cl.^{2} C08L *3/02*

U.S. Cl. 260—17.3 **25 Claims**

1. In a latex composition comprising water, polymer solids and thickener, the improvement wherein said thickener comprises a substantially non-birefringent, cold water swelling, granular starch product having an "A" pattern X-ray diffraction and characterized as having less than 10% solubles and a swelling power such that 5 g. thereof dispersed in water for 16 hours at 25° C. swells from about 20 ml. to about 35 ml.

4,104,214

FLUID ABSORBENT CELLULOSE FIBERS CONTAINING ALKALINE SALTS OF POLYMERS OF ACRYLIC ACID, METHACRYLIC ACID OR AN ACRYLOAMIDOALKANE SULFONIC ACID WITH ALIPHATIC ESTERS OF ACRYLIC ACID OR METHACRYLIC ACID

Alan W. Meierhoefer, Gaithersburg, Md., assignor to Akzona Incorporated, Asheville, N.C.

Filed Dec. 1, 1976, Ser. No. 746,539

Int. Cl.^{2} C08L *1/02*

U.S. Cl. 260—17.4 CL **15 Claims**

1. A fluid absorbent cellulose fiber containing in an admixture with cellulose an alkali metal salt or ammonium salt of a polymer having repeating units derived from an aliphatic ester of acrylic acid or methacrylic acid and having repeating units derived from at least one member from the group consisting essentially of acrylic acid, methacrylic acid or an anhydride thereof and acrylamidoalkyl sulfonic acid.

4,104,215

ODORLESS OR LOW-ODOR RESINOUS COMPOSITION

Yuji Aimono; Eiji Omori, and Mineo Nakano, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Jun. 4, 1976, Ser. No. 692,953

Claims priority, application Japan, May 12, 1975, 50-56852

Int. Cl.^{2} C09D *3/58, 3/66, 5/25*

U.S. Cl. 260—22 CB **20 Claims**

1. A resinous composition comprising (a) a low-odor crosslinkable monomer obtained by reacting a glycidyl ester of synthetic or vegetable oil fatty acid with acrylic acid or methacrylic acid with heating, and (b) a polybutadiene modified by acrylic acid or methacrylic acid or an unsaturated polyester resin.

4,104,216

COPOLYMERS CONTAINING AN ALPHA-OLEFIN AND AN ALPHA, BETA-ETHYLENICALLY UNSATURATED CARBOXYLIC ACID PLASTICIZED WITH LONG-CHAIN FATTY ACID

Bert H. Clampitt, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1977, Ser. No. 774,983

Int. Cl.^{2} C08F *10/00, 210/00*

U.S. Cl. 260—23 AR **22 Claims**

1. A plasticized copolymer consisting essentially of at least about 50 mol percent of an alpha-olefin of the formula:

$$RCH = CH_2$$

wherein R is a radical selected from the group of hydrogen and alkyl radicals having from 1 to about 8 carbon atoms; and an alpha, beta-ethylenically unsaturated carboxylic acid having from about 3 to about 8 carbon atoms or the respective salts thereof; said copolymer having a molecular weight of from about 20,000 to about 200,000; and as a plasticizing agent from about 5 weight percent to about 50 weight percent, based on the weight of the copolymer of a long-chain fatty acid selected from saturated and unsaturated fatty acids containing 9 to 11 carbon atoms; said plasticized copolymer having a glass transition temperature below about 0° C.

4,104,217

CARBONATE ESTER STABILIZERS FOR POLYMERS

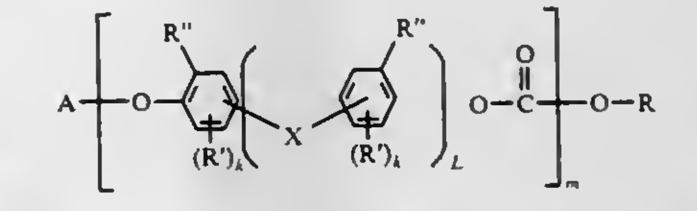
William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,886

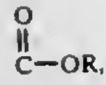
Int. Cl.^{2} C07C *69/00;* **C08K** *5/10*

U.S. Cl. 260—23 XA **17 Claims**

1. As a new composition of matter, a carbonate ester having a molecular weight between 700 and about 7000, of at least one hydrocarbon-substituted phenol, each hydrocarbon-substituted phenol having 2 to 3 phenolic hydroxyl groups disposed on an odd number of benzenoid rings, and having a formula

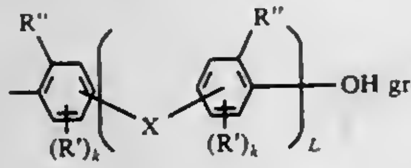


in which independently at each occurrence R′ and R″ are selected from the group consisting of alkyl having one to 10 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, and alkylcycloalkyl having 6 to 10 carbon atoms, A is selected from the group consisting of hydrogen and



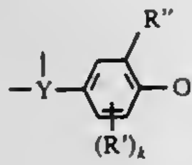
$\overset{O}{\overset{\|}{C}}-OR$, R is

selected from the group consisting of alkyl, aryl, and



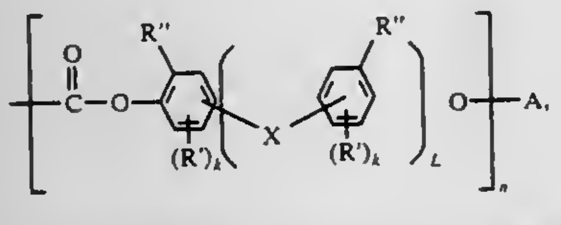
groups,

X has the structure



where

Y is a hydrocarbon radical, B is selected from the group consisting of hydrogen and



L is 0 or 1, K is an integer from 0 to 3, *m* is 1 to about 20, and *n* is an average of 0.1 to about 20.

12. A stabilized synthetic resin composition comprising a synthetic resin and a carbonate ester according to claim 1.

14. A stabilized synthetic resin composition according to claim 12 comprising polyvinyl chloride, epoxidized soybean oil, and zinc stearate.

4,104,218
STABILIZED HALOBUTYL RUBBER

Pierre Hous, Steenokkerzeel, Belgium, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 21, 1976, Ser. No. 752,866

Claims priority, application United Kingdom, Dec. 30, 1975, 53133/75

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23.7 H **12 Claims**

1. A stabilized halobutyl rubber composition comprising a halobutyl rubber, and a stabilizer, the stabilizer consisting essentially of an alkali metal carboxylate or an alkaline earth metal carboxylate at a level of about 0.01 to about 3.0 equivalents of metal in the metal carboxylate per gm atom of halogen in the halobutyl rubber and an ether at a level of about 0.01 to about 3.0 equivalents of ether oxygen per gm atom of halogen in the halobutyl rubber.

4,104,219
PRINTING INK

Victor Peters, Windach-Schöffelding, and Franz Krammer, Friedberg, both of Fed. Rep. of Germany, assignors to ALKOR Gesellschaft mit beschränkter Haftung Kunststoffverkauf, Munich-Solln, Fed. Rep. of Germany

Filed Dec. 29, 1975, Ser. No. 644,527

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1975, 2500500

Int. Cl.² C09D *11/10*

U.S. Cl. 260—29.6 RB **6 Claims**

1. A printing ink consisting essentially of 70% to 95% by weight of a varnish and 30% to 5% by weight of a pigment stock; said varnish consisting essentially of 10% to 30% by weight of an aqueous dispersion of a polyacrylic acid ester, 1.5% to 4.5% of an aqueous dispersion of a polymethacrylic acid ester, and the remainder of a liquid medium consisting of a homogeneous, neutral to slightly alkaline mixture of a minor amount of water and a major amount of an alkanol having 1 to 3 carbon atoms; said pigment stock consisting essentially of 30% to 55% by weight of an aqueous dispersion of said polyacrylic acid ester, 5% to 20% by weight of a pigment and the remainder of said liquid medium; wherein the amount of said polymethacrylic acid ester in said printing ink is between 3% and 25% of the weight of said polyacrylic acid ester in said printing ink, and wherein the alcohol moieties of said esters are alkyl or cycloalkyl having 1 to 8 carbon atoms.

4,104,220
ALKENYL 1-(2-AMINOETHYL) ALKYLENEUREIDO SUCCINAMATES, THEIR SYNTHESIS, AND USE IN AQUEOUS EMULSION POLYMER SYSTEMS

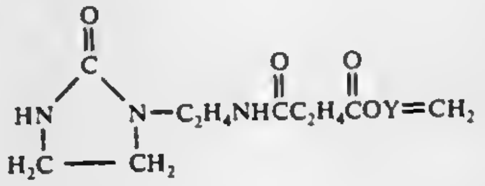
Victor A. Sims, Bayonne, N.J., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jul. 29, 1976, Ser. No. 709,916

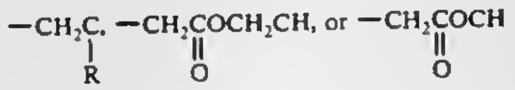
Int. Cl.² C08L *39/04*

U.S. Cl. 260—29.6 R **12 Claims**

1. Compounds of the structural formula:



wherein Y is



$-CH_2\underset{R}{\underset{|}{C}}.$ $-CH_2\underset{O}{\underset{\|}{C}}OCH_2CH,$ or $-CH_2\underset{O}{\underset{\|}{C}}OCH$

and R is H or CH_3.

4,104,221
PROCESS FOR MAKING WATER DILUTED ELECTROINSULATION ENAMELS

Harald Janssen, Reinbek, and Ferdinand Hansch, Wedel, both of Fed. Rep. of Germany, assignors to Dr. Beck & Co., AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,204

Int. Cl.² C08L *77/12*

U.S. Cl. 260—29.2 N **16 Claims**

1. A process of making electro-insulation enamels which are adapted for water dilution,

the said process comprising reacting an aromatic tricarboxylic acid monoanhydride with about equivalent amounts of a diamine, a difunctional alcohol and a trifunctional alcohol which latter in its structure includes an isocyanurate ring so as to obtain a hydroxyl groups containing polyesterimide of an acid number of at most 10,

and then reacting the said polyesterimide with at least one amine and/or aminoalcohol in an amount of 5 to 30% by weight relative to the weight of the esterimide to effect an aminolysis,

whereupon the reaction product is diluted with water until it has the desired viscosity for enameling purposes.

4,104,222
DISPERSION OF LINEAR POLYESTER RESIN

Masakazu Date, Takatsuki, and Masahiro Wada, Moriguchi, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Feb. 13, 1974, Ser. No. 441,990

Int. Cl.² C08J *3/06;* **C08G** *63/50;* **D06M** *15/10, 15/68*

U.S. Cl. 260—29.2 E **4 Claims**

1. A dispersion of a linear polyester resin for use in improving the properties of shaped high polymer articles, said dispersion being obtained by mixing a linear polyester resin with a surface-active agent of the higher alcohol/ethylene oxide addition type, melting the mixture, and dispersing the resulting melt by pouring it into an aqueous solution of an alkanolamine under stirring at a temperature of 70°–95° C, said alkanolamine being selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, monomethylethanolamine, monoethylethanolamine, diethylethanolamine, propanolamine, butanolamine, pentanolamine, N-phenylethanolamine, and an alkylolamine of glycerine, said alkanolamine being present in the aqueous solution in an amount of 0.2 to 5 weight percent, said surface-active agent of the higher alcohol/ethylene oxide addition type being an ethylene oxide addition product of a higher alcohol having an alkyl group of at least 8 carbon atoms, an alkyl-substituted phenol or a sorbitan monoacylate and wherein said surface-active agent has an HLB value of at least 12.

4,104,223
AQUEOUS EPOXY RESIN PAINT COMPOSITION

Minoru Hosoda, Yokohama; Eiichi Kasiwagi, Fujisawa; Fumio Murayama, Yokohama, and Kohei Isayama, Kamakura, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Division o. Ser. No. 509,315, Sep. 25, 1974, Pat. No. 3,903,056.

This application Mar. 12, 1976, Ser. No. 666,452

Claims priority, application Japan, Sep. 27, 1973, 48-108808; Sep. 27, 1973, 48-108809; Oct. 1, 1973, 48-110393; Dec. 24, 1973, 48-3633

The portinn of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.

Int. Cl.² C08L *3/00, 63/00*

U.S. Cl. 260—29.2 EP **8 Claims**

1. An aqueous epoxy resin paint composition which comprises an epoxy resin emulsion formed by emulsifying a bisphenol type epoxy resin in water with a polyoxyethylene benzylated phenyl ether having an HLB value of at least 15, and a polyamide resin curing agent is derived from a dimer acid and a polyether diamine incorporated in said epoxy resin emulsion.

4,104,224
PROCESS FOR PREPARING WATER-DILUTABLE, HEAT-CURING EPOXY RESIN COATING COMPOSITIONS USING ORGANIC COSOLVENTS

Robert C. Nelson, Central Valley, N.Y.; John Allister Gannon, Danbury, Conn., and Kwan Ting Shen, Lakewood, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,871

Int. Cl.² C08L *61/24, 61/28*

U.S. Cl. 260—29.4 R **44 Claims**

1. An improved process for preparing a water-dilutable, heat-curable coating composition which comprises

(a) a hydroxy-containing adduct formed by reacting an aromatic polyglycidyl ether having a molecular weight in the range of 360 to 500 with a polyethylene glycol having an average molecular weight in the range of 400 to 800 in the presence of 10 to 30% by weight of a polyhydric phenol, wherein the moles of aromatic polyglycidyl ether to combined moles of polyethylene glycol plus polyhydric phenol are in the ratio of 1.0/1.0 to 2.0/1.0, and wherein the moles of polyethylene glycol to moles of polyhydric phenol are in the ratio of 1.0/1.5 to 1.0/9.0,

(b) 5 to 50% by weight of solids of an aminoplast or phenoplast curing agent, and

(c) sufficient water to bring the total percent solids in the range of 10 to 65% by weight,

wherein the improvement comprises

adding to the hydroxy-containing adduct (a) either before or after addition of the curing agent (b) from 5 to 50% by weight based on the adduct (a) of an organic solvent selected from the group consisting of tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, an alkanol of 1 to 4 carbon atoms, ethylene glycol, propylene glycol, tetrahydrofurfuryl alcohol, a dialkyl ketone of 3 to 7 carbon atoms, a 2-alkoxyethanol of 1 to 4 carbon atoms in the alkoxy group, an alkoxydiethylene glycol of 1 to 4 carbon atoms in the alkoxy group, diethylene glycol, triethylene glycol, and a lower alkyl acetate, or a mixture thereof before dilution with water (c) to give a stable, aqueous organic composition which contains no particles larger in size than 0.1 micron or which is a fine particle emulsion with particles up to 5 microns in size, and

with the proviso that the weight ratio of organic solvent to water cannot exceed 1 to 3.

4,104,225
METHOD OF MAKING A COATING COMPOSITION CONTAINING A FLUOROCARBON POLYMER RESIN AND AN ALUMINUM CONTAINING BINDER

John P. Conbere, Holmdel, N.J., assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 459,700, Apr. 10, 1974, abandoned, which is a continuation of Ser. No. 207,644, Dec. 13, 1971, abandoned. This application Dec. 23, 1975, Ser. No. 643,868

Claims priority, application United Kingdom, Nov. 26, 1971, 54948/71

Int. Cl.² C08L *27/18*

U.S. Cl. 260—29.6 F **16 Claims**

1. A method of making a coating composition which consists essentially of an aqueous dispersion containing a fluorocarbon polymer resin and, as binder, an aqueous solution identifiable as equivalent to a solution of an aluminum phosphate in a mineral acid, wherein the binder is prepared by mixing an aluminum hydroxychloride with an acid selected from the group consisting of phosphoric acids and mixtures of at least one phosphoric acid with at least one mineral acid selected from the group consisting of hydrochloric acid, sulphuric acid and nitric acid, and dispersing the fluorocarbon polymer resin in the aqueous binder solution, the weight of fluorocarbon polymer resin in the coating composition being from 1% to 60% by weight based on the weight of the composition, the amount of the binder in the composition being such that the weight of aluminum divided by the weight of the fluorocarbon polymer resin is from 0.02 to 0.25, the ratio of the number of aluminum atoms to the number of mineral acid molecules, whether added as mineral acid or derived from the aluminum hydroxychloride by reaction with the phosphoric acid or both, being from 1:0.1 to 1:5 and the ratio of the number of aluminum atoms to the number of atoms of phosphorus being 1:*x* where *x* is up to 2.

4,104,226
RETENTION AIDS AND FLOCCULANTS BASED ON POLYACRYLAMIDES

Jaroslav Melzer, Ludwigshafen, and Hans-Uwe Schenck, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 21, 1976, Ser. No. 707,432

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538281

Int. Cl.² C08L *39/04*

U.S. Cl. 260—29.6 WB **6 Claims**

1. A mixed polyacrylamide composition with improved retention aid and flocculant properties, said composition consisting essentially of a mixture of cationic and anionic polyacrylamides in the form of a water-in-oil polymer dispersion containing, in the inner phase, 99.99 to 95% by weight of one of said polyacrylamides and from 0.01 to 5% by weight of the other of said polyacrylamides, said percentages of cationic and anionic polyacrylamides adding up to 100, the cationic polyacrylamide being a copolymer of acrylamide containing from 10 to 90% by weight of a comonomer selected from the group consisting of esters of amino alcohols and C_{3-5} ethylenically unsaturated carboxylic acids, amides of said carboxylic acids derived from diamines, N-vinylimidazoles and vinylpyridine,

said comonomers being in neutralized or quaternized form, and the anionic polyacrylamide being a copolymer of acrylamide with from 10 to 90% by weight of at least one C_{3-5} ethylenically unsaturated carboxylic acid.

4,104,227

FILM FORMING AQUEOUS SYNTHETIC RESIN DISPERSIONS AND PAINTS PREPARED THEREFROM

Hanns Boessler, Darmstadt; Wilhelm Elser, Graefenhausen; Klaus Huebner, Ober Ramstadt-Eiche, and Hans Ottofrickenstein, Darmstadt-Eberstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

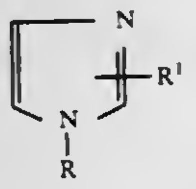
Filed Oct. 18, 1976, Ser. No. 733,325

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547970

Int. Cl.^{2} C08F *26/06*

U.S. Cl. 260—29.6 HN **4 Claims**

1. An aqueous film-forming dispersion of a synthetic resin, said dispersion being capable of forming a film having a dynamic freezing temperature between 0°, and 90° C. and comprising a continuous aqueous phase; at least 0.1 percent, by weight of the dispersion, of an emulsifier; and a polymer phase, dispersed in said aqueous phase, said polymer phase comprising particles of an average particle size between 0.05 and 2 microns of a copolymer comprising from 0.5 to 5 percent by weight of units of an imidazole comonomer of the formula



wherein R' is hydrogen or alkyl having 1 to 4 carbon atoms and R is an aliphatic group having a polymerizable carbon-carbon double bond therein, and more than 80 percent by weight of an alkyl ester of acrylic acid or methacrylic acid having 1 to 8 carbon atoms in the alkyl group thereof or of styrene or a vinyl ester of an saturated carboxylic acid having 2 to 4 carbon atoms.

4,104,228

LINEAR, PARTIALLY DEACYLATED POLY(N-ACYL)ALKYLENIMINES AS TANNIN MIGRATION INHIBITORS

Victor E. Meyer, and Kenneth M. Kem, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1976, Ser. No. 754,398

Int. Cl.^{2} C08L *79/00*

U.S. Cl. 260—29.6 NR **12 Claims**

1. A method of inhibiting tannin migration through a latex paint applied to a tannin-containing wood surface, the method comprising applying to the wood surface a latex paint blended with an inhibiting amount of a linear, water-soluble, partially deacylated poly(N-acyl)alkylenimine having a weight average molecular weight of at least about 10,000.

4,104,229

PIGMENTED LATEX PAINTS HAVING SUPERIOR GLOSS PREPARED BY GRINDING A PIGMENT INTO A SOLUTION OF A COPOLYMER OF AN UNSATURATED CARBOXYLIC ACID

Kazys Sekmakas, Chicago, and Kenneth K. Hesler, West Chicago, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

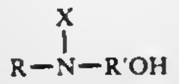
Continuation of Ser. No. 589,876, Jun. 24, 1975, Pat. No. 4,058,499. This application Feb. 10, 1977, Ser. No. 767,327

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.^{2} C08L *33/02*

U.S. Cl. 260—29.6 RW **9 Claims**

1. A method of producing a high gloss finish employing a water base, pigmented, latex paint which is air dried comprising, grinding a pigment into a water-free solution of an at least partially neutralized carboxyl-functional addition copolymer of monoethylenically unsaturated monomers including at least about 3% by weight of monoethylenically unsaturated carboxylic acid in water miscible organic solvent, the major proportion of said pigment being titanium dioxide, and the pigment volume concentration being at least 10%, said copolymer being at least partially neutralized with an hydroxy amine having the formula:



$$R-\overset{X}{\overset{|}{N}}-R'OH$$

in which R is hydrogen or an alkyl group, R' is an alkylene group, and X is either R or R'OH, to render the said copolymer dispersible in water, and thereby form a nonaqueous pigment paste, mixing the nonaqueous pigment paste with an air drying aqueous latex consisting essentially of emulsified aqueous emulsion copolymer particles having a T_g below 20° C., applying the resulting latex paint to a substrate and air drying the paint.

4,104,230

TWO-PACKAGE POLYMERIC COMPOSITIONS

Wen-Hsuan Chang, Gibsonia; Karl F. Schimmel, Verona, and James A. Claar, Export, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,135

Int. Cl.^{2} C08L *33/02, 63/10*

U.S. Cl. 260—29.6 NR **13 Claims**

1. A two-package polymeric composition, the film-forming vehicle components of which consists essentially of:

(a) a polyepoxide having a 1,2-epoxy equivalent of greater than 1.0 and a molecular weight below about 4,000; and

(b) an addition interpolymer formed from at least one polymerizable ethylenically unsaturated carboxylic acid monomer with one or more other polymerizable ethylenically unsaturated monomers wherein the unsaturated carboxylic acid monomer comprises about 5 percent to about 60 percent of the addition interpolymer, and pendent thereto:

  (1) anionic salt groups formed by reacting said carboxyl groups with a sufficient amount of a base to give the interpolymer a pH of greater than about 6 in an aqueous medium; and

  (2) amine groups formed by reacting from about 5 mole percent to about 95 mole percent of said carboxyl groups with an alkylenimine;

said components (a) and (b) being interractive to form a crosslinked, hard and solvent- and stain-resistant material.

4,104,231

POLYCARBONATE COMPOSITIONS CONTAINING IMINATED AND THIONATED CARBONATE PLASTICIZERS

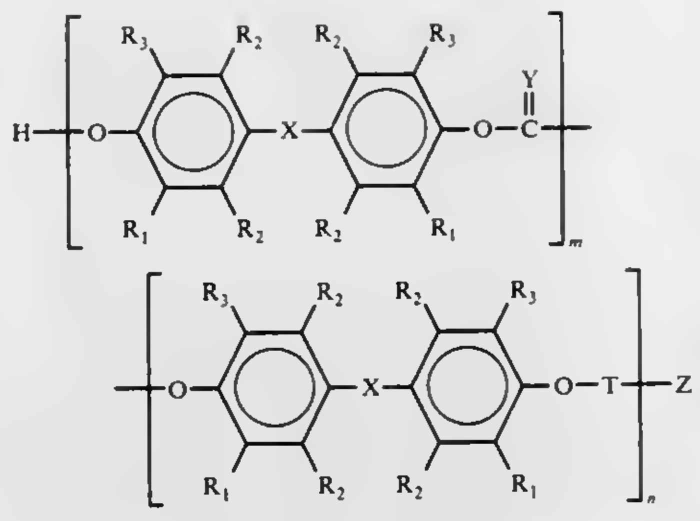
Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1976, Ser. No. 748,468

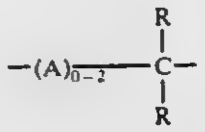
Int. Cl.^{2} C08K *5/36, 5/29*

U.S. Cl. 260—30.8 R **7 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an oligomeric-polymeric plasticizer of the following formula:

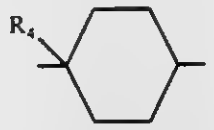


wherein R_1 is independently selected from the group consisting of hydrogen, halogen or C_1 to C_{12} alkyl; R_2 is independently selected from the group consisting of hydrogen of C_1 to C_5 alkyl; R_3 is independently selected from the group consisting of hydrogen, halogen or C_1–C_2 alkyl; X is selected from the group consisting of:

(a)


$$-(A)_{\overline{0-2}}-\overset{R}{\overset{|}{\underset{\underset{R}{|}}{C}}}-$$

wherein A is

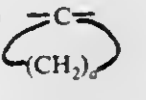


and R_4 is hydrogen of C_1–C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl; aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_5 alkyl;

(b) $—CH_2CH_2—$

(c) $—CH_2B\text{-}CH_2—$

wherein B is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

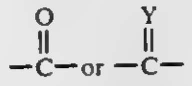
(d)


wherein *a* is an integer of 3 to 15;

(e) —O—

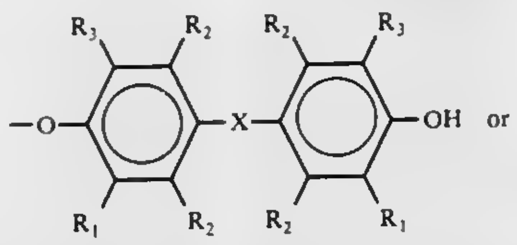
(f) —S—

Y is =S or =N—R_5, wherein R_5 is C_1–C_{30} alkyl; aryl of 6 to 12 carbon atoms or substituted aryl wherein the substituents C_1–C_{15} alkyl or halogen; T is



$$-\overset{O}{\overset{\|}{C}}-\text{or}-\overset{Y}{\overset{\|}{C}}-$$

wherein Y is as previously defined; *m* and *n* are integers from 0 to 80 provided the sum of *m* and *n* is at least 2; and Z is



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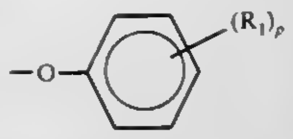


wherein R_1, R_2, R_3 and X are as previously defined and *p* is an integer of 0–5.

4,104,232

HALOGEN-CONTAINING RESIN COMPOSITION

Takeo Inagaki, Yachiyo; Hideki Nakagawa, Tokyo, and Hiroshi Isa, Yachiyo, all of Japan, assignors to Lion, Fat & Oil Company, Ltd., Tokyo, Japan

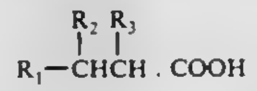
Filed Jul. 12, 1976, Ser. No. 704,657

Claims priority, application Japan, Jul. 18, 1975, 50-87954

Int. Cl.^{2} C08K *5/10*

U.S. Cl. 260—31.6 **6 Claims**

1. A halogen-containing resin composition comprising a halogen-containing resin having incorporated therein one or more esters which lubricate and heat stablize said resin, said esters being derived from one or more fatty acids and one or more polyhydric alcohols selected from the group consisting of ethylene glycol, propylene glycol, 1,3-butanediol, 1,4-butanediol, glycerol, trimethylolethane, and pentaerythritol, said fatty acids being expressed by the general formula



$$R_1-\overset{R_2}{\overset{|}{C}}H\overset{R_3}{\overset{|}{C}}H\ .\ COOH$$

where at least two of the R_1, R_2 and R_3 radicals are alkyl radicals and, when two of them are alkyl radicals, the remaining one is hydrogen; and the total number of carbon atoms contained in the R_1, R_2 and R_3 radicals is in the range of from 18 to 38.

4,104,233

ω-BROMOALKYL PLASTICIZER COMPOSITIONS

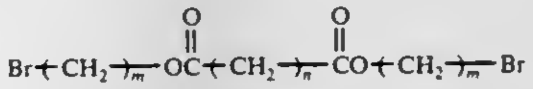
Thomas C. Mathis, St. Louis, Mo.; Albert W. Morgan, Collinsville, Ill., and William Vanderlinde, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 642,965, Dec. 22, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,976

Int. Cl.^{2} C08K *5/11*

U.S. Cl. 260—31.8 HA **11 Claims**

1. A composition comprising a vinyl halide polymer and an ω-bromoalkyl ester of an aliphatic dicarboxylic acid of the formula



$$Br\!\left(CH_2\right)_m O\overset{O}{\overset{\|}{C}}\left(CH_2\right)_n \overset{O}{\overset{\|}{C}}O\left(CH_2\right)_m Br$$

wherein *m* represents an integer from 1 to 8 and *n* represents an integer from 4 to 6.

4,104,234

NOVEL BIOLOGICALLY ACTIVE COPOLYMERS

John R. Bednarski, Jackson Heights, N.Y., and David B. Russell, Westfield, N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

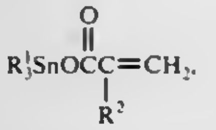
Division of Ser. No. 738,001, Nov. 2, 1976. This application Jun. 13, 1977, Ser. No. 805,837

Int. Cl.^{2} C08K *5/01*

U.S. Cl. 260—33.6 UA **7 Claims**

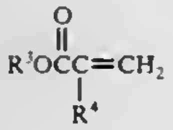
1. In an improved coating composition for controlling the attachment and growth of fouling organisms, said composition comprising a liquid diluent and, as a film-forming component of said coating composition, from 1 to 50%, based on the weight of said composition, of a biologically active copolymer

obtained by reacting in the presence of a polymerization initiator and a solvent at least one solubilized triorganotin compound of the general formula



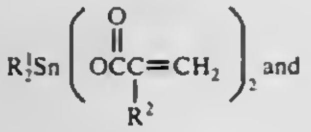
$$R^{1}_{3}SnO\overset{O}{\overset{\|}{C}}\underset{R^{2}}{\underset{|}{C}}{=}CH_{2},$$

wherein said organotin compound constitutes from 10 to 90 mole % of the total monomers, with at least one solubilized copolymerizable monomer of the general formula

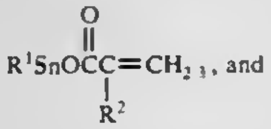


$$R^{3}O\overset{O}{\overset{\|}{C}}\underset{R^{4}}{\underset{|}{C}}{=}CH_{2}$$

and from 0.01 to 10%, based on the total monomer weight, of a crosslinking agent selected from the group consisting of divinyl benzene, compounds of the formulae



$$R^{1}_{2}Sn\left(O\overset{O}{\overset{\|}{C}}\underset{R^{2}}{\underset{|}{C}}{=}CH_{2}\right)_{2}\text{ and}$$



$$R^{1}SnO\overset{O}{\overset{\|}{C}}\underset{R^{2}}{\underset{|}{C}}{=}CH_{2\,3},\text{ and}$$

esters of acrylic or methacrylic acid with polyfunctional alcohols and phenols, wherein said esters contain from 2 to 4 residues of said acid, each R^1 is individually selected from the group consisting of alkyl radicals containing from 1 to 8 carbon atoms, cycloalkyl and aryl radicals, R^2 and R^4 are individually selected from hydrogen and methyl radicals and R^3 represents an alkyl radical containing from 1 to 18 carbon atoms, a cyclohexyl or a phenyl radical, the improvement which resides in reacting said triorganotin compound, copolymerizable monomer and crosslinking agent in the presence of at least one liquid aliphatic or cycloaliphatic hydrocarbon containing from 7 to 14 carbon atoms as the solvent for the reactants.

4,104,235
SOLDERABLE WIRE LACQUERS

Klaus Ohm, Nettetal-Lobberich, Fed. Rep. of Germany, assignor to Chemische Fabrik Dr. Wiedeking, Kempen, Fed. Rep. of Germany

Filed Oct. 13, 1976, Ser. No. 731,925

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545912

Int. Cl.² C08K *5/06*

U.S. Cl. 260—33.2 R **1 Claim**

1. In a wire lacquer permitting tinning and soldering of a wire coated therewith, the lacquer consisting essentially of a polyester of isophthalic or terephthalic acid having a hydroxyl number of 150 to 450, an isocyanate having masked isocyanato groups, and a solvent dissolving said polyester and said isocyanate, the improvement which includes:
(a) said isocyanate being masked by ϵ-caprolactam; and
(b) said solvent consisting essentially of at least one member of the group consisting of diglycol monomethyl ether or diglycol monoethyl ether.

4,104,236
LIQUID POLYMER/POLYOLS AND POLYURETHANE ELASTOMERS BASED THEREON

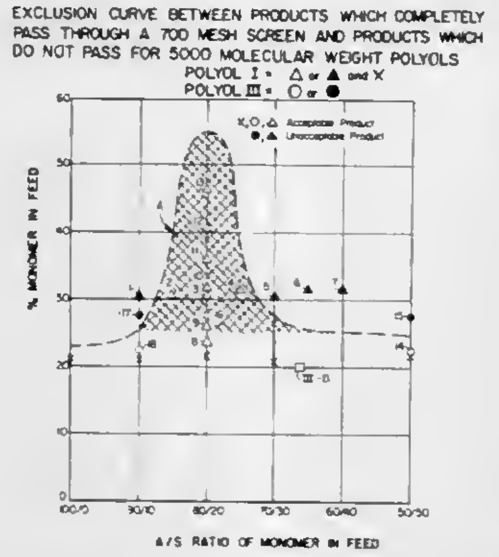
Donald W. Simroth, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 501,362, filed Aug. 28, 1974, abandoned

Filed Jul. 3, 1975, Ser. No. 593,164

Int. Cl.² C08K *5/06;* **C09K** *3/00;* **C08G** *18/14, 18/62*

U.S. Cl. 260—33.2 R **10 Claims**



1. A liquid polymer/polyol composition consisting essentially of: (1) from 45 to less than 80 wt.% of a polyoxypropylene polyol having a molecular weight of at least 2000 and (2) from 55 to over 20 wt.% of an acrylonitrile-styrene polymer consisting essentially of: (a) from 60 to 90 wt.% polymerized acrylonitrile and (b) from 40 to 10 wt.% polymerized styrene, said polymer being in the form of particles that are stably dispersed in the polyol, said composition being essentially free of polymer particles having diameters over 30 microns, said composition having been produced by polymerizing a monomer mixture of acrylonitrile and styrene in the polyol, said composition having (i) a wt.% of the monomer mixture, based on the sum of the weights of the monomer mixture and the polyol used to produce the composition, and (ii) a weight ratio of acrylonitrile to styrene in the monomer mixture such that a plot of (i) versus (ii) falls in area A of FIG. 4 when the polyol has a molecular weight of about 5,000, in area B of FIG. 8 when the polyol has a molecular weight of about 3,000 or in area C of FIG. 9 when the polyol has a molecular weight of about 2,000 and said composition being a composition other than: (A) a composition produced from 60 wt.% of a polyol having a molecular weight of about 4000 produced by the addition of 87 parts by weight of propylene oxide and 13 parts by weight of ethylene oxide to propylene glycol and 40 wt.% of a mixture of 80 wt.% acrylonitrile and 20 wt.% styrene; and (B) a composition produced from 70 wt.% of a polyol having a molecular weight of about 4,000 produced by the addition of 87 parts by weight of a propylene oxide and 13 parts by weight of ethylene oxide to propylene glycol and 30 wt.% of a mixture of 80 wt.% of acrylonitrile and 20 wt.% styrene.

4,104,237
ORGANOSILICON SUNLIGHT-RESISTANT PASTES

Louis Linguenheld, Saint Genis-Laval, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Oct. 18, 1976, Ser. No. 733,173

Claims priority, application France, Oct. 21, 1975, 75 32123

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **12 Claims**

1. An organosilicon paste comprising:
(a) an oily diorganopolysiloxane polymer;
(b) an inorganic filler; and,
(c) an ultraviolet radiation absorbing effective organic compound, wherein said inorganic filler is present in the range of from about 5 to about 30 parts per 100 parts of said polymer.

4,104,238
SILICA-ALUMINA TRIHYDRATE FILLED EPOXY CASTINGS RESISTANT TO ARCED SF_6

Terrence E. Chenoweth, Monroeville, and Frederick A. Yeoman, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1976, Ser. No. 744,379

Int. Cl.² C08L *63/00*

U.S. Cl. 260—37 EP **10 Claims**

1. An electrical article comprising a metal conductor and a container, cured, insulating body produced by curing the admixture consisting essentially of:
(A) 100 parts of hydantoin epoxy resin;
(B) about 75 parts to about 110 parts of anhydride curing agent;
(C) about 0.04 part to about 1.5 parts of a cure promoter;
(D) about 100 parts to about 450 parts of fused silica; and
(E) about 75 parts to about 275 parts of alumina trihydrate; wherein the weight ratio of fused silica:alumina trihydrate is between about 0.75:1 to about 3.5:1; said cured insulating body characterized by being resistant to arced SF_6 gas and having a coefficient of linear thermal expansion of up to about 38×10^{-6} in./in./° C.

4,104,239
ORGANOPOLYSILOXANE COMPOSITIONS TRANSFORMABLE INTO ELASTOMERS WITHOUT USE OF VULCANIZING AGENTS

Michel Bargain, Lyon, and Robert Lagarde, Feyzin, both of France, assignors to Rhone-Poulenc Industries, Paris, France

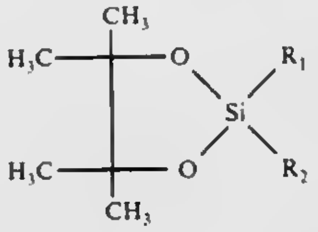
Filed Mar. 4, 1977, Ser. No. 774,485

Claims priority, application France, Mar. 5, 1976, 76 07043

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **14 Claims**

1. A storage stable organopolysiloxane composition devoid of a curing agent which is heat curable into elastomers comprising:
[1] 100 parts by weight of at least one hydroxylated polydiorganosiloxane having a viscosity of between about $2 \cdot 10^5$ and about $80 \cdot 10^6$ cps at 25° C. and containing about 0.001 to about 0.1% by weight of terminal hydroxy groups per weight of the polysiloxane;
[2] at least 10 parts by weight of a silica having a specific surface of between about 100 and about 400 m^2/g; and,
[3] 0.5 to 15 parts by weight of at least one silane of the formula (1)


(1)

wherein R_1 and R_2 are the same or different and represent methyl or ethyl.

4,104,240
HIGH SOLIDS PIGMENT COATING COMPOSITION

Roelof Buter, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

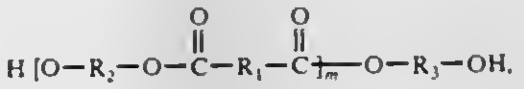
Filed Dec. 10, 1976, Ser. No. 749,698

Claims priority, application Netherlands, Dec. 15, 1975, 7514566

Int. Cl.² C08G *37/30*

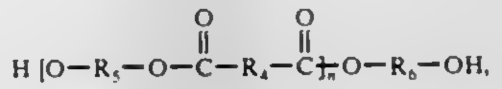
U.S. Cl. 260—39 P **9 Claims**

1. A high solids pigmented coating composition prepared from a blend of an ester diol as binder and a curing agent for the binder, characterized in that (1) the ester diol is a mixture of
(a) 20-80 mole % of an ester diol having the general formula:



$$H[O-R_2-O-\overset{O}{\overset{\|}{C}}-R_1-\overset{O}{\overset{\|}{C}}]_m-O-R_3-OH,$$

where R_1 represents the group formed by abstraction of the carboxyl groups from a cycloaliphatic and/or aromatic dicarboxylic acid having 8 to 20 carbon atoms and R_2 and R_3 may be the same or different and represent groups formed by abstraction of the two hydroxyl groups from a divalent alcohol having 2 to 12 carbon atoms, and *m* is a number of 1-3, and
(b) 80-20 mole % of an ester diol having the general formula:



$$H[O-R_5-O-\overset{O}{\overset{\|}{C}}-R_4-\overset{O}{\overset{\|}{C}}]_n-O-R_6-OH,$$

where R_4 represents the group formed by abstraction of the two carboxyl groups from an aliphatic dicarboxylic acid having 2 to 12 carbon atoms, and R_5 and R_6 may be the same or different and represent groups formed by abstraction of the two hydroxyl groups from a divalent alcohol having 2 to 12 carbon atoms, and *n* is a number of 1-3,
(2) the curing agent for the binder is an aminoplast, and
(3) the amount of pigment in said coating composition is at least 30% by weight, based on the total solids content.

4,104,241
THERMOSETTING ADDITIVES FOR POLYESTER-BASED MOLDING COMPOUNDS

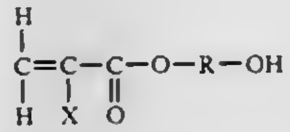
Michael G. Roberts, Heath; Carl R. Strauss, and Charles E. Bolen, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 517,695, Oct. 24, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,285

Int. Cl.² C08K *7/14;* **C08L** *67/06*

U.S. Cl. 260—40 R **18 Claims**

1. A method of improving the surface characteristics of a molded composition produced from a molding composition comprising a thermosetting unsaturated polyester resin, said method comprising incorporating into said polyester resin a resin comprising the adduct of:
1. a polymer formed from a liquid monomer selected from the group consisting of styrene, substituted styrenes, lower alkyl esters of acrylic anc methacrylic acids, cyclic acrylates and diallyl phthalate and an unsaturated dicarboxylic acid selected from the group consisting of maleic anhydride, fumaric acid, citraconic acid, chloromaleic acid and itaconic acid; and,
2. a hydroxy-alkyl unsaturated monomer having the formula

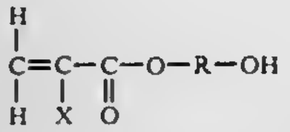


$$\overset{H}{\overset{|}{\underset{H}{\underset{|}{C}}}}=\underset{X}{\underset{|}{C}}-\underset{O}{\underset{\|}{C}}-O-R-OH$$

wherein X is hydrogen or methyl and R is an alkyl group containing from 1 to 10 carbon atoms, said adduct containing functional carboxylic acid groups, being capable of polymerizing with the thermosetting unsaturated polyester resin and being incorporated in said polyester in an amount sufficient to improve at least one surface characteristic of said molded composition.

10. A composition of matter comprising:
a. a thermosetting unsaturated polyester resin; and,

b. an adduct of:
  1. a polymer formed from a liquid monomer selected from the group consisting of styrene, substituted styrenes, lower alkyl esters of acrylic and methacrylic acids, cyclic acrylates and diallyl phthalate and an unsaturated dicarboxylic acid selected from the group consisting of maleic anhydride, fumaric acid, citraconic acid, itaconic acid and chloromaleic acid; and,
  2. a hydroxy-alkyl unsaturated monomer having the formula



$$\overset{\displaystyle H}{\underset{\displaystyle H}{C}}=\underset{\displaystyle X}{C}-\underset{\displaystyle \| \atop O}{C}-O-R-OH$$

wherein X is hydrogen or methyl and R is an alkyl group containing from 1 to 10 carbon atoms and wherein said adduct is capable of polymerizing with the thermosetting unsaturated polyester.

18. A composition comprising glass fibers and the composition of claim **10**.

4,104,242
REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED HIGH VOLTAGE BREAKDOWN RESISTANCE

John Edward Kochanowski, Stockbridge, Mass., and Allen Dale Wambacb, Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1976, Ser. No. 751,186

Int. Cl.² C08K *5/25*

U.S. Cl. 260—40 R **17 Claims**

1. A reinforced thermoplastic composition having improved dielectric resistance comprising:
  (a) a high molecular weight linear polyester resin;
  (b) a reinforcing amount of a reinforcing agent; and
  (c) a minor amount of an alkylhydroxyphenylalkanoylhydrazine.

4,104,243
METHOD OF PREPARING LOW VISCOSITY/INORGANIC FILLER

Edward G. Howard, Jr., Hockessin, Del., assignor to E. 1. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-In-part of Ser. No. 424,819, Dec. 14, 1973, abandoned. This application Jun. 2, 1975, Ser. No. 582,816

Int. Cl.² B01J *31/02;* **C08K** *9/10*

U.S. Cl. 260—42.14 **19 Claims**

13. A method of preparing a polyolefin in the presence of a high solids dispersion of finely divided inorganic filler compound in a liquid hydrocarbon diluent under los viscosity conditions which comprises
  (a) mixing the hydrocarbon diluent with 0.01-2% by weight, based on the inorganic filler compound, of an organoaluminum compound selected from the group consisting of trialkylaluminums, dialkylalkylaluminum hydrides, dialkylaluminum alkoxides, alkylaluminum halides and polymeric hydrocarbylaluminums in which the alkyl groups, alike or different, contain 1-10 carbon atoms,
  (b) dispersing at least 9 weight/volume percent of the inorganic filler compound as a slurry in the mixture of hydrocarbon diluent and organoaluminum compound, said dispersion containing a transition metal compound component of a coordination polymerization catalyst system,
  (c) adding to the dispersion an olefin selected from the group consisting of 1-alkenes of 2-10 carbon atoms and mixtures thereof with agitation at a temperature from 0° to 250° C and a pressure from atmospheric to 500 atmospheres, and
  (d) isolating the product.

4,104,244
METHOD FOR PROTECTION VINYL POLYMERS FROM THERMO-OXIDATIVE DESTRUCTION

Alexandr Evgenievich Chuchin, Petrovsko-Razumovsky proezd, 20, kv. 52, and Leonid Leonidovich Proskurin, 2 Sinichkina ulitsa, 26, kv. 76, both of Moscow, U.S.S.R.

Filed Jan. 22, 1975, Ser. No. 543,048

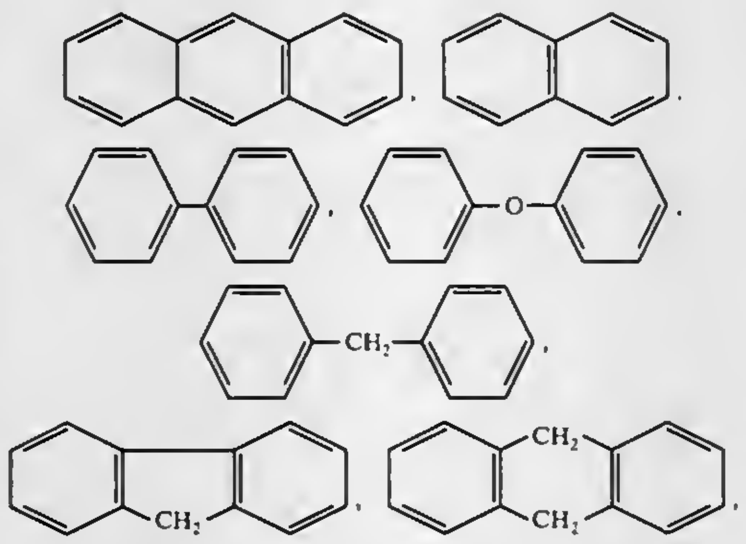
Int. Cl.² C08K *5/01*

U.S. Cl. 260—45.7 R **10 Claims**

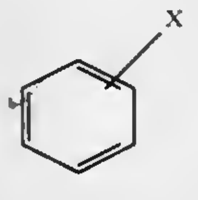
1. A method for stabilizing a vinyl polymer against thermo-oxidative degradation which comprises incorporating into a previously prepared unstabilized vinyl polymer an inhibitor selected from the group consisting of (1) poly(arylene alkylenes) of the formula:

$$\left[Ar_1 \left(CH_2 \right)_k \right]_m Ar_2 \left[\left(CH_2 \right)_k Ar_1 \right]_n$$

wherein Ar_1 and Ar_2 are



$m + n = 2$ to 30; k is an integer of 1 and 2; and when $k = 1$, Ar_1 and Ar_2 are also



where X is H or a C_1-C_4 alkyl; and (2) hydroperoxides of said poly(arylene alkylenes); said inhibitor being used in an amount within the range of from 0.01 to 10% by weight of the vinyl polymer.

4,104,245
NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,120, Dec. 28, 1973, Pat. No. 3,940,366. This application Oct. 29, 1975, Ser. No. 626,936

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.² C08K *5/42*

U.S. Cl. 260—45.7 S **20 Claims**

1. a non-opaque flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and from 0.001 to about 2.0 parts per hundred part of the aromatic carbonate polymer of an additive selected from the group consisting of a metal salt of a monomeric substitued aromatic sulfonic acid and a polymeric substituted aromatic sulfonic acid and/ or mixtures thereof, and wherein said metal salts thereof are selected from the group consisting of the alkali metal salts and the alkali earth metal salts, and mixtures thereof, and said substituent on the metal salts of the substituted aromatic sulfonic acid is selected from the group consisting of an electron withdrawing radical and mixtures thereof; said aromatic carbonate polymer and additive having a refractive index in the range of 1.54 to 1.65.

4,104,246
NON-OPAQUE FLAME-RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Compaoy, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,002

Int. Cl.² C08K *5/42*

U.S. Cl. 260—45.7 S **14 Claims**

1. In a flame-retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of aromatic ketones and mixtures thereof, wherein said metal salts are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic ketones is selected from the group consisting of electron withdrawing radicals and mixtures of electron withdrawing radicals; the improvement comprising including said additive in said admixture in an amount of from 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer, said aromatic carbonate polymer and said additive each having a refractive index in the range of 1.54 to 1.65 such that said composition is non-opaque.

4,104,247
METHOD FOR STABILIZING AN OLEFIN POLYMER

Koicb Kato, and Saburo Murata, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,152

Claims priority, application Japan, Apr. 6, 1976, 51-38464; Jun. 10, 1976, 51-68123; Jun. 10, 1976, 51-68124

Int. Cl.² C08F *6/00;* **C08J** *3/20;* **C08K** *5/56*

U.S. Cl. 260—45.7 R **15 Claims**

1. A method for stabilizing a polymer selected from the group consisting of a homopolymer or a copolymer of propylene produced by olefin polymerization using a Ziegler type catalyst which comprises treating a polymer selected from the group consisting of a homopolymer or a copolymer of propylene, containing residual catalyst therein, with an aluminic ester as a treating agent.

4,104,248
POLYOLEFINE-BASED POLYMERIC COMPOSITIONS STABILIZED BY ORGANIC POLYAMINES, TEXTILE FIBERS OBTAINED THEREFROM, AND NOVEL ORGANIC POLYAMINES

Giuseppe Cantatore, Collescipoli (Terni), Italy, assignor to Montefibre S.p.A., Milan, Italy

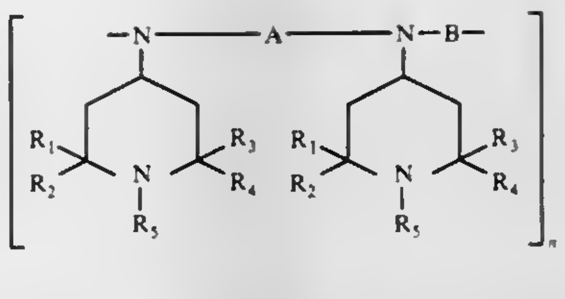
Filed Mar. 17, 1976, Ser. No. 667,657

Claims priority, application Italy, Mar. 21, 1975, 21490 A/75; Mar. 21, 1975, 21491 A/75

Int. Cl.² C08K *5/34*

U.S. Cl. 260—45.8 N **12 Claims**

1. A stabilized polyolefine-based polymeric composition characterized in that it contains as stabilizer and a stabilizing amount of an organic polyamine having the following general formula:



(I)

wherein
  R_1, R_2, R_3 and R_4 are equal to or different from each other and are an alkyl group having from 1 to 4 carbon atoms;
  R_5 is hydrogen or an alkyl group having from 1 to 4 carbon atoms;
  A is an alkylene group having from 2 to 10 carbon atoms;
  B is a divalent aliphatic cycloaliphatic, aromatic or alkylaromatic radical, which can contain hetero atoms such as O, S, N and P either in the chain or as side substituents; and
  n is a whole number between 2 and 1000.

4,104,249
HEXAHYDROPYRIMIDINES AS ANTI-OXIDANTS IN NATURAL AND SYNTHETIC RUBBERS

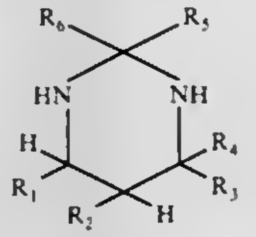
Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 1, 1976, Ser. No. 691,530

Int. Cl.² C08K *5/34;* **C07D** *239/02, 239/06, 239/70*

U.S. Cl. 260—45.8 N **14 Claims**

1. A rubber composition containing an antioxidant amount of a hexahydropyrimidine of the formula



where the R's are hydrogen, alkyl, aryl, cycloalkyl, aralkyl, alkaryl or heterocyclic, and where R_1 and R_2 may be joined to form a cycloalkyl group, R_3 and R_4 may be joined to form a cycloalkyl group and R_5 and R_6 may be joined to form a cycloalkyl group.

4,104,250
FLAME-RETARDANT POLYMERS WITH 1,3,5-TRIAZINES HAVING HALO- AND HALO-ARYL SUBSTITUTENTS

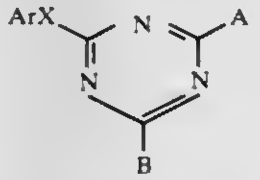
Nicodemus E. Boyer, Redwood City, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 11, 1976, Ser. No. 713,466

Int. Cl.² C08K *5/34, 5/36;* **C07D** *251/52*

U.S. Cl. 260—45.8 NT **8 Claims**

1. A flame-retardant polymeric composition comprising in combination a normally flammable polymer and a substituted triazine having the structural formula



where Ar is haloaryl, X is sulfur or imino, A is halogen, and B is ArX or halogen.

4,104,251

SUBSTITUTED TETRAALKYLPIPERIDONE-4-OXIMES

Hartmut Wiezer, Gersthofen; Gerhard Pfahler, Augsburg, and Norbert Mayer, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

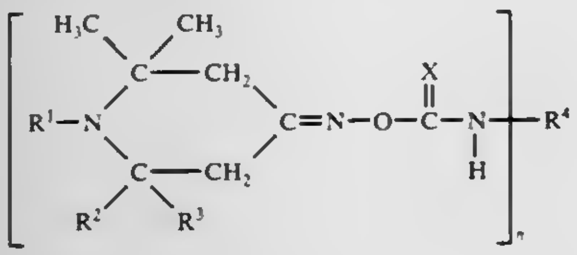
Filed Nov. 16, 1976, Ser. No. 742,233

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552176

Int. Cl.^{2} C08K *5/34;* C07D *211/72*

U.S. Cl. 260—45.8 N **6 Claims**

1. A compound of the formula



in which

n is 1 or 2,

R^1 represents hydrogen or oxygen or a hydroxyl group,

R^2 and R^3 represent identical or different linear or branched, but not in alpha-position, alkyl radicals having from 1 to 9 carbon atoms or R^2 and R^3 form a cycloalkyl ring having 5 to 7 carbon atoms inclusive of the carbon atom of the hetero ring,

R^4 represents, when n is equal to 1, a linear, cyclic or branched alkyl radical having from 1 to 18 carbon atoms or a phenyl- or naphthyl radical unsubstituted or substituted by a halogen atom or an alkyl or alkoxy radical each having from 1 to 4 carbon atoms, or, when n is equal to 2, an alkylene radical having from 1 to 6 carbon atoms or a phenylene or naphthalene radical unsubstituted or substituted by an alkyl radical having from 1 to 4 carbon atoms, and

X stands for oxygen or sulfur.

6. Stabilized synthetic polymer compositions containing as stabilizer a compound as claimed in claim 1 in an amount of from 0.01 to 5% by weight calculated on the polymer.

4,104,252

OLEFIN POLYMER STABILIZER

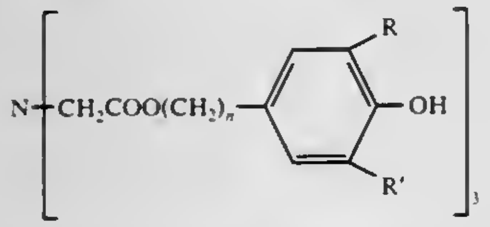
Ingenuin Hechenbleikner, West Cornwall, and William Palmer Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 26, 1977, Ser. No. 836,282

Int. Cl.^{2} C08K *5/17;* C07C *101/20*

U.S. Cl. 260—45.8 R **9 Claims**

1. A substituted nitriloacetate having the structure



wherein R and R′ are lower alkyl radicals and n is 1–4.

3. A polymer composition containing a major proportion of an olefin polymer and a minor proportion, sufficient to provide heat and light stability, of the substituted nitriloacetate of claim 1.

4,104,253

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,017

Int. Cl.^{2} C08K *5/42*

U.S. Cl. 260—45.8 RW **10 Claims**

1. An improved flame retardant polycarbonate composition of a aromatic carbonate polymer in admixture with 0.01 to about 5.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of organic alkali metal salts, organic alkaline earth metal salts, and mixtures thereof, the improvement which comprises having, in admixture with the flame retardant aromatic carbonate polymer, 0.01 to about 5.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of halogenated organic alkali metal salts, halogenated organic alkaline earth metal salts of aromatic sulfonic acids, or mixtures thereof.

4,104,254

METHOD FOR STABILIZATION OF UV SENSITIVE PLASTICS WITH SUBSTITUTED 1,3-OXAZOLIDINE

John Ta-Yuan Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

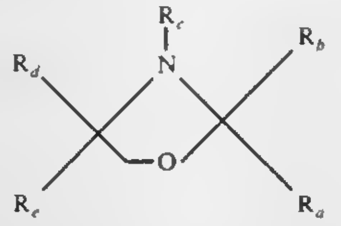
Filed Dec. 2, 1977, Ser. No. 856,876

Int. Cl.^{2} C08K *5/35*

U.S. Cl. 260—45.8 NZ **3 Claims**

1. A method for extending the useful life of polymers which are sensitive to photodegradation by ultraviolet light, said method comprising:

incorporating within said ultraviolet light sensitive polymer a UV stabilizer effective amount of at least one compound of the formula



wherein R_a, R_b, R_d and R_e are independently selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl, and aryl; and R_c is hydrogen or hydroxyalkyl.

4,104,255

THIOETHER BIS PHENOLIC ANTIOXIDANTS

John C. Wollensak; Kju Hi Shin, both of Bloomfield Hills; Kryn G. Ihrman, Farmington, all of Mich., and Paul G. Elsey, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 2, 1977, Ser. No. 792,645

Int. Cl.^{2} C08K *5/36;* C07C *149/00*

U.S. Cl. 260—45.95 C **3 Claims**

1. An antioxidant compound namely di-(3,5-dicyclopentyl-4-hydroxybenzyl)sulfide.

2. A polyolefin normally subject to gradual degradation due to oxidation containing an antioxidant amount of the antioxidant compound of claim 1.

4,104,256

LOW PRESSURE ETHYLENE POLYMER BASED COMPOSITIONS

Mats-Olov Hedblom, Stenungsund, and Sven Gilbert Sultan, Billingsfors, both of Sweden, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,666

Claims priority, application Sweden, Apr. 19, 1974, 7405343

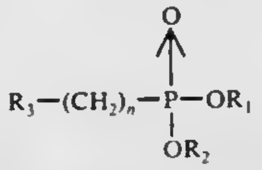
Int. Cl.^{2} C08K *5/53*

U.S. Cl. 260—45.95 D **17 Claims**

1. An ethylene polymer based composition comprising

ehtylene polymer prepared by chromium containing catalyst having a melt index of less than 1.0 gram per 10 minutes, and a terminal vinyl group content of approximately one vinyl group per polymer molecule, and

melt viscosity stabilizing amounts of at least one phosphonic acid compound which is an alkyl phosphonic acid or a monoalkyester thereof and having the structure



$$R_3-(CH_2)_n-\overset{O}{\overset{\uparrow}{\underset{OR_2}{\underset{|}{P}}}}-OR_1$$

wherein n is a whole number of 1 to 10, and each of R_1, R_2 and R_3 is selected from the group consisting of H, C_1 to C_{30} alkyl groups and an aryl or benzyl group substituted with one OH group and one or two C_1 to C_6 alkyl groups, with the proviso that at least one of R_1 and R_2 is H.

4,104,257

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT POLYETHER RESINS FROM BISPHENOLS AND EPOXY RESINS

James Albert Clarke, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 27, 1977, Ser. No. 819,321

Int. Cl.^{2} C08G *59/62, 59/00*

U.S. Cl. 528—102 **6 Claims**

1. In a process for preparing high molecular weight polyhydroxyether resins by reacting in the presence of a suitable quantity of a suitable solvent or reaction medium, (A) an epoxy resin which is a glycidyl ether of a bisphenol with (B) a bisphenol in the presence of (C) a catalytic quantity of a suitable catalyst; the improvement which comprises adding, after the reaction between Components (A) and (B) is at least about 97% complete based upon the phenolic hydroxyl content, (D) from about 0.005 to about 0.12 phenolic hydroxyl equivalents per total phenolic hydroxyl equivalent contained in Components (B) and (D) of a halogenated bisphenol.

4,104,258

METAL COMPLEX COMPOUNDS OF POLYACYL-2,4-DIHYDRAZINO-5-TRIAZINES

Marija del Rio, Obernburg am Main; Joachim Behnke, Miltenberg; Michael Wallrabenstein, Worth am Main, and Dieter Frank, Elsenfeld, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

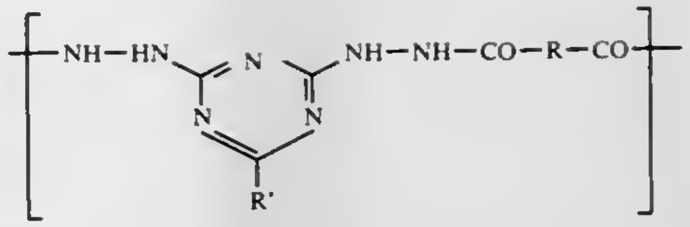
Filed May 20, 1974, Ser. No. 471,505

Claims priority, application Fed. Rep. of Germany, May 24, 1973, 2326472

Int. Cl.^{2} C08G *73/08*

U.S. Cl. 528—334 **10 Claims**

1. A metal compound of a fiber-forming polyacyl-2,4-dihydrazino-s-triazine polymer consisting essentially of recurring structural units of the formula



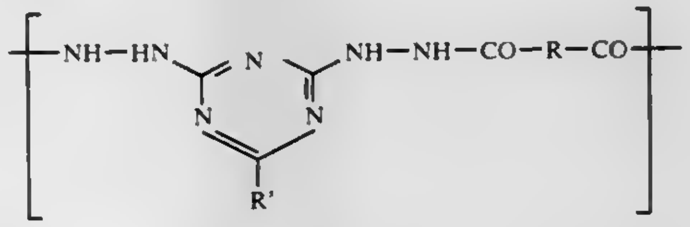
in which:

R is a divalent aromatic radical of 6 to 15 carbon atoms; and

R′ is alkyl of 1 to 4 carbon atoms, phenyl, alkoxy of 1 to 4 carbon atoms, phenoxy, dialkylamino of 2 to 8 carbon atoms, piperidyl, morpholyl or phosphonic acid dialkyl ester of 2 to 8 carbon atoms,

said metal being chemically bound in complex form to at least one of the polymer units in an amount of at least 0.1% by weight with reference to said polymer and said metal being at least one member selected from the class consisting of the metals of Groups IIa, IIIa, IVa, Va, VIa, VIIa, VIII, Ib, IIb, IIIb, IVb and Vb of the long periodic system of elements.

5. A process for the production of a metal-containing and fiber-forming polyacyl-dihydrazino-s-triazine which comprises contacting a polyacyl-dihydrazino-s-triazine polymer consisting essentially of recurring structural units of the formula



in which:

R is a divalent aromatic radical of 6 to 15 carbon atoms; and

R′ is alkyl of 1 to 4 carbon atoms, phenyl, alkoxy of 1 to 4 carbon atoms, phenoxy, dialkylamino of 2 to 8 carbon atoms, piperidyl, morpholyl or phosphonic acid dialkyl ester of 2 to 8 carbon atoms,

said metal being chemically bound in complex form to at least one of the polymer units in an amount of at least 0.1% by weight with reference to said polymer and said metal being at least one member selected from the class consisting of the metals of Groups IIa, IIIa, IVa, Va, VIa, VIIa, VIII, Ib, IIb, IIIb, IVb and Vb of the long periodic system of elements.

4,104,259

FIREPROOF POLYESTERS FROM BROMINATED DIHYDROXY ALKOXY-DIPHENYL SULFONES

Yasuo Kato, Shiga; Tadashi Ikegami; Junichi Harukawa, both of Otsu, and Katsuhiko Kato, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

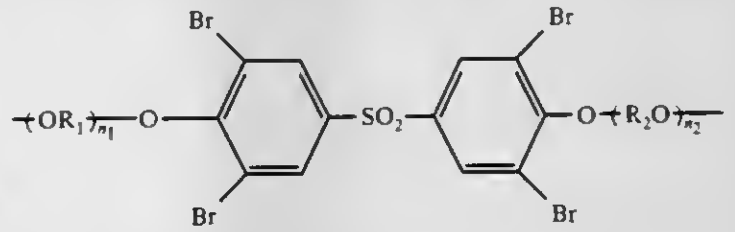
Continuation-in-part of Ser. No. 503,692, Sep. 6, 1974, abandoned. This application Nov. 18, 1975, Ser. No. 633,091

Claims priority, application Japan, Sep. 7, 1973, 48-101423; Nov. 21, 1973, 48-131427

Int. Cl.^{2} C08G *63/68*

U.S. Cl. 528—169 **11 Claims**

1. A fireproof composition comprising a linear aromatic polyester having in its molecular chain a unit of the formula:



wherein R_1 and R_2 are each a straight or branched alkylene group having 1 to 5 carbom atoms and n_1 and n_2 are each of an integer of 1 to 4, said unit being contained in an amount of from about 3 to 30 percent by weight in terms of bromine based on the weight of said polyester, said polyester being prepared by a process comprising polycondensing at least one diol component with at least one dicarboxylic acid component, the diol component containing a brominated compound containing said unit, further including an organic compound of pentavalent phosphorous selected from at least one member of the group consisting of a phosphoric ester, a phosphonic ester, a phosphinic ester and a high molecular weight phosphorus compound having a degree of polymerization of 5 to 100 and wherein said organic phosphorus compound is incorporated into the polyester in an amount of not more than about 1.0 percent by weight based on the weight of the polyester.

4,104,260
POLY-2-PYRROLIDONE PREPARED WITH INERT DRYING AGENT

Stephen F. Pusztaszeri, P.O. Box 1181, Port Chester, N.Y. 10573

Continuation of Ser. No. 488,298, Jul. 12, 1974, abandoned, which is a continuation of Ser. No. 344,036, Mar. 22, 1973, Pat. No. 3,842,047, which is a continuation-in-part of Ser. No. 237,173, Mar. 22, 1972, abandoned. This application Jan. 14, 1976, Ser. No. 649,159

The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.² C08G *69/24*

U.S. Cl. 528—323 **1 Claim**

1. A filament-forming open chain poly (2-pyrrolidone) homopolymer prepared by the process which comprises the steps of:

(a) mixing substantially pure, substantially anhydrous 2-pyrrolidone with a substantially anhydrous alkaline reactant selected from the group consisting of alkali metals and alkali metal hydroxides in a mole ratio of from about 10:1 to 27:1;

(b) heating said mixture under vacuum to a temperature of from 100° to 120° C. to react the alkaline reactant with the 2-pyrrolidone and form a mixture comprising 2-pyrrolidone and the alkali metal salt of 2-pyrrolidone and to distill off the water formed in the reaction mixture;

(c) cooling the reaction mixture to room temperature;

(d) bubbling a dry gas selected from the group consisting of carbon dioxide, nitrogen dioxide and sulfur dioxide through the previously cooled reaction mixture in an amount sufficient to react with substantially all of the metal in the 2-pyrrolidone salt;

(e) mixing the mixture of step (d) with between about 1–5% by weight, based upon the weight of the reaction mixture, of an inert drying agent selected from the group consisting of alkali metal sulfates, bicarbonates and carbonates;

(f) heating to a temperature of about 48° to 52° C. for at least about 40 hours to cause polymerization;

(g) grinding the polymer;

(h) washing the ground polymer with water to neutral pH; and

(i) drying the washed polymer said homopolymer having the structure

$$H_2NCO(CH_2)_3[NHCO(CH_2)_3]_xNHCOCH_2CH_2CH_3$$

where *x* has a value such that viscosity of the polymer is about 12 to 14 stokes, determined at about 25° C. on a 0.5% solution of the polymer in formic acid.

4,104,261
LOW PILLING POLYESTER FIBERS AND PROCESS FOR THEIR MANUFACTURE

Karl-Heinz Magosch; Roland Feinauer, and Jörn Rüter, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls, AG, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 536,988, Dec. 27, 1974, abandoned. This application Jan. 21, 1977, Ser. No. 760,924

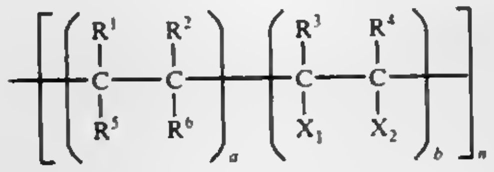
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402035

Int. Cl.² C08G *63/22*

U.S. Cl. 260—873 **3 Claims**

1. An improvement in the process of melt spinning ethylene terephthalate polyester to produce textile fibers having substantially decreased pilling in fabrics containing the fibers comprising melt polymerizing ethylene terephthalate in the presence of a condensation catalyst to a final temperature of about 250° to 300° C and a final pressure of less than 10 mm of mercury to form an anhydrous melt, the improvement comprising:

conducting said melt polymerizing in the presence of about 0.005 to 2.0 percent by weight, with respect to the dicarboxylic acid component of a substance having the general formula:



$$-\left[\left(\overset{R^1}{\underset{R^5}{C}}-\overset{R^2}{\underset{R^6}{C}}\right)_a\left(\overset{R^3}{\underset{X_1}{C}}-\overset{R^4}{\underset{X_2}{C}}\right)_b\right]_n-$$

where:

n is an integer from 10 to 10,000;

a is zero or an integer from 1 to 100;

b is an integer from 1 to 100;

R^1 through R^6 are hydrogen, an alkyl group with 1 to 3 carbon atoms or an oxalykyl group $—OR^7$;

R_7 is an alkyl group with 1 to 6 carbon atoms or an aryl group with 6 to 10 carbon atoms;

X_1 is hydrogen, an alkyl group with 1 to 3 carbon atoms, a carboxyl group, or an esterified carboxyl group; and

X_2 is a carboxyl group, a hydroxyl group, an esterified carboxyl group or an esterified hydroxyl group;

building polymerous compounds selected from the group consisting of at least ten carboxyl and hydroxyl groups or at least ten hydroxyl groups as branching components in said polyester; and melt spinning said anhydrous melt.

4,104,262
WATER-DISPERSIBLE ESTER RESIN CONTAINING A MOIETY OF POLYACID OR BIVALENT ALCOHOL CONTAINING A SULFO GROUP

Gerhard Schade, Witten-Bommern, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 8, 1976, Ser. No. 675,083

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1975, 2516305

Int. Cl.² C08G *63/12*

U.S. Cl. 528—295 **24 Claims**

1. A water-dispersible polycondensation polyester resin having moieties of at least one dicarboxylic acid and at least one bivalent alcohol having terminal hydroxyl groups, said polyester having a molecular weight between 300 and 3,000, a softening point between 30° and 60° C, a hydroxyl number of at least 35 mg KOH/g, an acid number of less than 5 wherein said polyester additionally contains an amount of 1 to 5 mole percent, based upon the moieties of polycarboxylic acid or bivalent alcohol, moieties of an alkali metal - sulfo group containing polycarboxylic acid or bivalent alcohol.

4,104,263
PROCESS FOR PRODUCING FILM AND FIBER-FORMING POLYALKYLENE TEREPHTHALATE

James F. Kenney, Mendbam, N.J., assignor to M&T Chemicals Inc., Stamford, Conn.

Division of Ser. No. 670,654, Mar. 26, 1976. Filed Jan. 21, 1977, Ser. No. 761,338

Int. Cl.² C08G *63/14*

U.S. Cl. 528—279 **22 Claims**

1. A method for producing high molecular weight, substantially colorless film and fiber-forming polyalkylene terephthalate whereby an alkylene glycol containing from 2 to 10 carbon atoms is reacted under ester interchange conditions with a lower dialkyl terephthalate wherein the alkyl portions of the dialkyl terephthalate each contain from 1 to 4 carbon atoms, and the resultant bis-hydroxyalkyl terephthalate is polycondensed at a temperature from 200 to 300° C. under reduced pressure and with the evolution of free glycol, said method being characterized in that the only catalyst present during the transesterification and polycondensation is from about 0.01 to about 0.3%, based on the weight of the lower dialkyl terephthalate, of a bimetallic compound obtained by reacting 1) a first compound selected from the group consisting of antimony (III) salts of monocarboxylic and dicarboxylic acids, zirconium (IV) salts of monocarboxylic and dicarboxylic acids, antimony (III) and zirconium (IV) alkoxides wherein each alkyl residue of said glycoxides contains from 1 to 12 carbon atoms, and antimony trioxide, 2) a second compound selected from the group consisting of zinc, calcium and manganese salts of monocarboxylic acids and zinc, calcium and manganese salts of dicarboxylic acids, the molar ratio of said first to said second compound being from 1:1 to 1:6, respectively, and 3) at least a stoichiometric amount of a third compound selected from the group consisting of anhydrides of monocarboxylic and dicarboxylic acids, alcohols containing from 1 to 20 carbon atoms and glycols containing from 2 to 20 carbon atoms, wherein the hydrocarbon residue of each of said monocarboxylic acids and dicarboxylic acids contains from 1 to 20 carbon atoms and is present as an aliphatic or aromatic group.

4,104,264
END CAPPED POLYALKYLENE CARBONATES HAVING IMPROVED THERMAL STABLITY

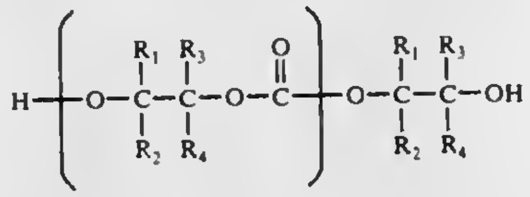
Dale D. Dixon, Kutztown; Michael E. Ford, Trexlertown, and Gerald J. Mantell, Allentown, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed May 5, 1977, Ser. No. 794,263

Int. Cl.² C08G *63/62*

U.S. Cl. 528—370 **15 Claims**

1. A process for improving the thermal stability of a normally solid polyalkylene carbonate having substantially alternating epoxide and carbon dioxide units and having a plurality of free hydroxyl groups represented by the formula:



$$H-\left(O-\overset{R_1}{\underset{R_2}{C}}-\overset{R_3}{\underset{R_4}{C}}-O-\overset{O}{\overset{\|}{C}}\right)-O-\overset{R_1}{\underset{R_2}{C}}-\overset{R_3}{\underset{R_4}{C}}-OH$$

wherein:

R_1 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_3 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_2 and R_4 are hydrogen or a hydrocarbyl group having from 1 to 6 carbon atoms; or

R_1, R_2, R_3 and R_4 are combined together constituting a carbocyclic ring of from 4 to 7 carbon atoms;

which comprises end-capping at least a portion of the free hydroxyl groups of said polyalkylene carbonate by reacting said hydroxyl groups with a hydroxyl reactive sulfur compound having the ability to replace the active hydrogen atom on said hydroxyl group for forming an oxygen-sulfur bond.

4,104,265
VULCANIZATION PROCESS FOR PREPARATION OF POLYURETHANE TIRES

Yves deZarauz, Le Cendre, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 652,122, Jan. 26, 1976, abandoned. This application Feb. 10, 1977, Ser. No. 767,371

Claims priority, application France, Jan. 30, 1975, 75 03001

Int. Cl.² C08G *18/62, 18/82*

U.S. Cl. 528—46 **11 Claims**

1. A process for the manufacture of a vulcanized elastomer which comprises

(1) forming a mix comprising

- (a) at least one functional liquid diene prepolymer having reactive mobile hydrogen functions and a degree of functionality of between 1.8 and 2.0;
- (b) a reinforcing filler; and
- (c) a vulcanizing system comprising sulfur, zinc oxide, and an accelerator having no mobile hydrogen; and adding to the mix
- (d) a hydrocarbon chain lengthening bifunctional compound having reactive isocyanate groups and in such amount that the ratio of the number of reactive isocyanate groups of the hydrocarbon chain lengthening bifunctional compound to the number of reactive mobile hydrogen functions of the functional liquid diene prepolymer in the resultant mix is equal to one;

(2) in a first stage, heating the resultant mix to a temperature of from 20° C. to about 140° C. to obtain exclusively a chain lengthening reaction between the functional liquid diene prepolymer and the hydrocarbon chain lengthening bifunctional compound; and

(3) in a second stage, further heating the resultant mix to a higher temperature of from about 145° C. to about 200° C. to effectuate the vulcanization of the chain lengthened reaction product formed at the end of the first stage.

4,104,266
METHOD FOR PREPARATION OF ANTIHEMOPHILIC FACTOR

Milan Wickerhauser, Bethesda, Md., assignor to American National Red Cross, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,425

Int. Cl.² A23J *1/06;* **A61K** *35/14*

U.S. Cl. 260—112 B **4 Claims**

1. In a method for the preparation of purified AHF which includes the thawing of frozen plasma at a temperature of between about 0° and about 1° C to obtain a cryoprecipitate containing AHF, the improvement which comprises:

(a) extracting said cryoprecipitate with a low ionic strength buffer solution comprising tris (hydroxymethyl) aminomethane at a temperature of about 0° C to obtain a cold insoluble fraction having cold soluble impurities removed therefrom;

(b) extracting said cold insoluble fraction with a low ionic strength buffer solution comprising tris (hydroxymethyl) aminomethane at a temperature of about 21° C to obtain a solution comprising AHF and said buffer solution;

(c) deprothrombinizing said solution with aluminum hydroxide gel; and

(d) recovering an AHF-rich solution.

4,104,267

SOMATOSTATIN ANALOGS

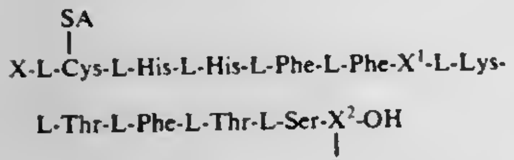
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 770,953, Feb. 22, 1977, abandoned. This application Sep. 6, 1977, Ser. No. 830,930

Int. Cl.^{2} C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 S **10 Claims**

1. A chemical compound of the structure:



$$\text{X-L-}\overset{\overset{\text{SA}}{|}}{\text{Cys}}\text{-L-His-L-His-L-Phe-L-Phe-X}^1\text{-L-Lys-}$$

$$\text{L-Thr-L-Phe-L-Thr-L-Ser-}\underset{\underset{\text{SA}}{|}}{\text{X}^2}\text{-OH}$$

wherein A is hydrogen or the two A groups form a direct bond between the sulfur atoms; X is H, L-Ala-Gly, L-Ala-D-Ala, Gly-Gly-Gly, or Gly-Gly; X^1 is L-Trp, or D-Trp; X^2 is L-Cys, or D-Cys; and the pharmacologically acceptable acid addition salts thereof.

4,104,268

CATIONIC DIAZACYANINE DYESTUFFS

Hans-Lothar Dorsch, Koeln-Stammheim, and Roderich Raue, Leverkusen-Wiesdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

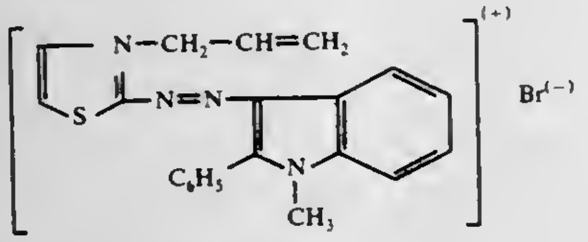
Filed Jun. 8, 1973, Ser. No. 368,304

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1972, 2228147

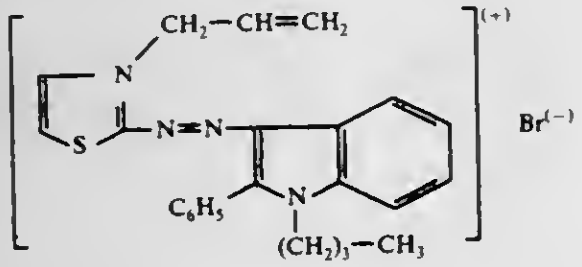
Int. Cl.^{2} C09B *43/00*

U.S. Cl. 260—158 **2 Claims**

1. A dyestuff of the formula



2. A dyestuff of the formula



4,104,269

METHOXYMETHOXY PROTECTED INTERMEDIATES FOR PHOTOGRAPHIC DYES

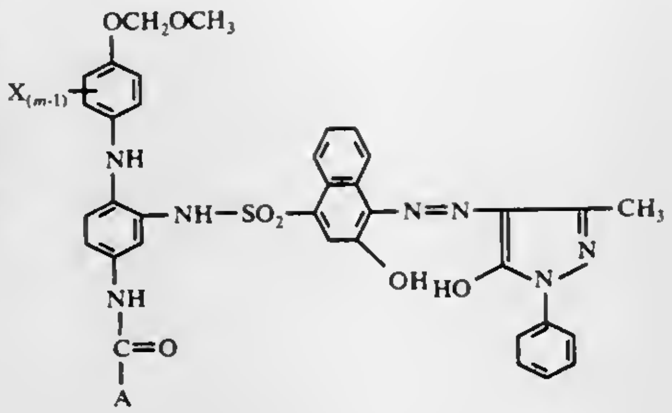
Paul S. Huyffer, West Boxford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 282,872, Aug. 22, 1976, Pat. No. 4,035,401, which is a division of Ser. No. 22,114, Mar. 30, 1970, Pat. No. 3,925,347, which is a continuation of Ser. No. 655,306, Jul. 24, 1967, abandoned. This application Feb. 28, 1977, Ser. No. 773,004

Int. Cl.^{2} C09B *29/38;* G03C *5/54. 7/00*

U.S. Cl. 260—162 **2 Claims**

1. A compound of the formula:



wherein:

X is methyl, methoxy, hydroxy, amino, chloro or carboxy;

m is a positive integer from 1 to 2; and

A is alkyl having from 9–17 carbon atoms.

4,104,270

PROCESS FOR THE MANUFACTURE OF AROMATIC PHOSPHONATES

Nigel Hall; Raymond Price, and Philip Martin Rowbotham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1977, Ser. No. 777,648

Claims priority, application United Kingdom, Apr. 26, 1976, 16778/76; May 27, 1976, 22053/76

Int. Cl.^{2} C07C *107/06;* C07F *9/40*

U.S. Cl. 260—205 **11 Claims**

1. A process for the manufacture of aromatic phosphorus derivatives of the formula:

$$\text{Ar.PO(OR)}_2 \tag{1}$$

where R is an optionally substituted alkyl, alkenyl, aralkyl, cycloalkyl or aryl radical, and Ar is an aromatic radical linked to the phosphorus atom through a carbon atom of the aromatic radical which comprises contacting a phosphorous acid diester of the formula:

$$\text{HO.P(OR)}_2 \tag{2}$$

with an aromatic halide of the formula Ar—X in the presence of copper or a copper compound, an acid-binding agent and a solvent, the symbols R and Ar having the meanings stated above and X representing a halogen atom.

4,104,271

11β,18-EPOXY-9α-HALO-17,18-DIHYDROXY-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONES AND CONGENERS

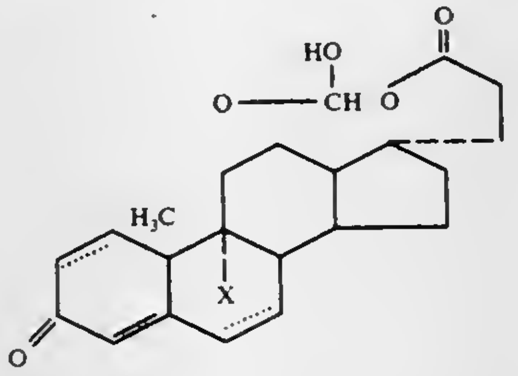
John S. Baran, Winnetka, and Ivar Laos, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jun. 13, 1977, Ser. No. 806,024

Int. Cl.^{2} C07J *17/00*

U.S. Cl. 260—239.57 **4 Claims**

1. A compound of the formula



wherein X represents fluorine, chlorine, or bromine and the dotted lines signify optional Δ^1 and/or Δ^6 unsaturation.

4,104,272

PROCESS FOR THE PRODUCTION OF CONCENTRATED POLYCHLOROPRENE LATICES

Hans-Jürgen Pettelkau, Burscheid, Germany, assignor to Bayer Aktienfesellschaft, Germany

Filed May 3, 1976, Ser. No. 682,359

Claims priority, application Fed. Rep. of Germany, May 7, 1975, 2520339

Int. Cl.^{2} C08L *93/00*

U.S. Cl. 260—27 BB **5 Claims**

1. A process for polymerizing chloroprene together with up to 50% by weight of a comonomer to form a concentrated polymer latex in aqueous alkaline emulsion containing from 55 to 95 parts of water per 100 parts of monomer, said process comprising carrying out said polymerization in the presence of an emulsifier having a pH greater than 10 and comprising

(a) a non-ionic emulsifier in an amount of from 0.01 to 1.0 parts by weight per 100 parts by weight of monomer and either

(b) an alkali metal salt of disproportionated abietic acid in an amount of from 2.0 to 6.0 parts by weight per 100 parts by weight of monomer or

(c) a mixture of an alkali metal salt of disproportionated abietic acid in an amount of from 1.5 to 4.0 parts by weight per 100 parts by weight of monomer and an alkali metal salt of a fatty acid having a chain length of 6 to 25 carbon atoms in an amount of from 0.05 to 3.0 parts by weight per 100 parts by weight of monomer.

4,104,273

DERIVATIVES OF 3-CYANO-PYRID-2-ONES

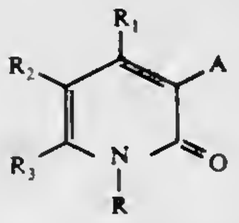
Patrick J. McNalty, Wyndmoor, and Harlow L. Warner, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 513,988, Oct. 11, 1974, Pat. No. 4,028,084. This application Mar. 16, 1977, Ser. No. 777,989

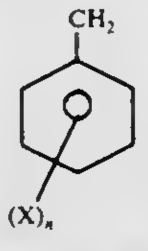
Int. Cl.^{2} C07D *213/57;* A01N *9/22*

U.S. Cl. 260—294.9 **1 Claim**

1. A compound of the formula:



wherein A is cyano; R_1, R_2, R_3 are hydrogen, methyl or ethyl; R is a group of the formula:



wherein X is hydrogen, NH_2, halogen, trifluoromethyl, nitro, or $(C_1–C_4)$ alkyl; n is 0–2.

4,104,274

1-SUBSTITUTED-2-(2-PYRIDINYL)ETHANONE N-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, Morris County, all of N.J., assignors to Warner-Lambert Company, MorrisPlains, N.J.

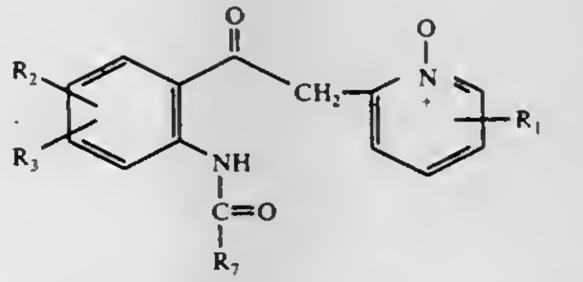
Division of Ser. No. 611,282, Sep. 8, 1975, Pat. No. 4,056,619. This application Aug. 16, 1977, Ser. No. 825,011

Int. Cl.^{2} C07D *213/89*

U.S. Cl. 260—295 AM **1 Claim**

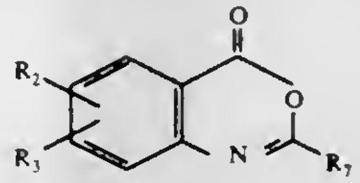
1. A process for preparing a compound of the formula IX:

IX



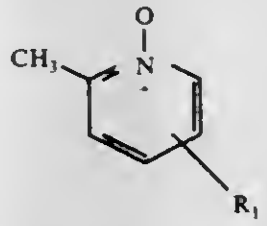
wherein R_1 is hydrogen or lower alkyl; R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or benzyloxy; and R_7 is lower alkyl or phenyl; which comprises reacting a compound of the formula X:

X



wherein R_2, R_3 and R_7 are as defined above in IX, with a substituted 2-picoline N-oxide of the formula V:

V



wherein R_1 is as defined above in IX in liquid ammonia in the presence of an alkali metal amide, to obtain a compound having the formula IX above.

4,104,275

HETEROARYL CROWN ETHERS

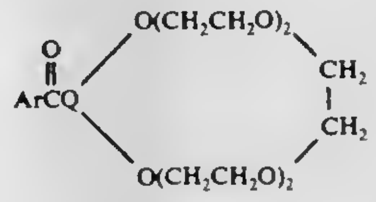
James Charles Kauer, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 615,184, Sep. 19, 1975, Pat. No. 4,024,158. This application Feb. 1, 1977, Ser. No. 764,580

Int. Cl.^{2} C07D *323/00*

U.S. Cl. 260—297 B **14 Claims**

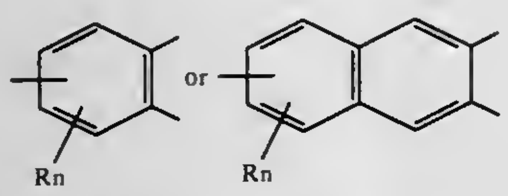
1. A compound of the formula



wherein

Ar is thienyl, pyridyl or furyl, each with up to two substituents of alkyl of 1-10 carbons, alkoxy of 1-10 carbons, halogen, carboxy or cyano groups;

Q is



in which R is fluorine, chlorine, bromine, nitro, amino, or alkyl of 1-10 carbons; and *n* is 0 to 2.

4,104,276

CONVERSION OF CRUDE COPPER PHTHALOCYANINES TO A PIGMENTARY FORM

Joachim Kranz, Ludwigshafen; Werner Jettmar, Mannheim, and Rudolf Polster, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

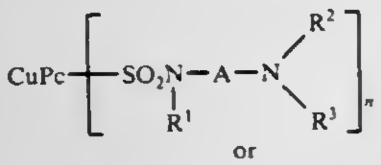
Filed Nov. 8, 1976, Ser. No. 740,009

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554252

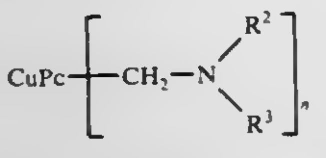
Iot. Cl.^{2} C09B *47/04*

U.S. Cl. 260—314.5 **10 Claims**

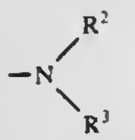
1. In a process for converting crude copper phthalocyanines to a pigmentary form by treating finely divided and heavily agglomerated copper phthalocyanines which exhibit disturbed crystallization and have a primary particle size of less than 0.1 μm, and which are obtained by ball-milling crude copper phthalocyanines while suspending the milled material in an organic or aqueous organic phase, the improvement wherein the finely divided milled material is introduced into the organic or aqueous organic medium together with from 0.5 to 7 percent by weight, based on the crude copper phthalocyanine, of one or more basic copper phthalocyanines of the formula


(I)

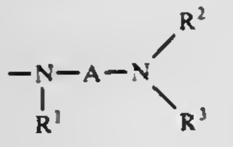
or


(II)

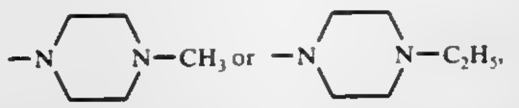
where CuPc is an n-valent copper phthalocyanine radical, R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, A is saturated, linear or branched alkylene of 2 to 6 carbon atoms, the N atoms being on different carbon atoms, R^2 is alkyl of 1 to 20 carbon atoms or alkoxyalkyl of 3 to 12 carbon atoms or cycloalkyl of 6 to 8 carbon atoms, R^3 is hydrogen, alkyl of 1 to 4 carbon atoms or cycloalkyl of 6 to 8 carbon atoms, or the group



is a saturated heterocyclic 5-membered, 6-membered or 7-membered ring which may in addition contain an oxygen atom, sulfur atom or a further nitrogen atom as a ring member, or



denotes



and *n* is a number from 1 to 6, and the mixture is kept at from room temperature to 180° C for recrystallization, after which the pigment is isolated.

4,104,277

PROCESS FOR PREPARING AN ALPHA OR BETA FORM COPPER PHTHALOCYANINE PIGMENT

Robert Langley, Glasgow, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 15, 1977, Ser. No. 768,811

Claims priority, application United Kingdom, Feb. 19, 1976, 6571/76

Int. Cl.^{2} C09D *47/04*

U.S. Cl. 260—314.5 **13 Claims**

1. A process for preparing an alpha or beta form copper phthalocyanine pigment which comprises dry milling a crude copper phthalocyanine followed by mixing with an aqueous emulsion comprising a liquid amine having from 3 to 20 carbon atoms which is insoluble in water or alkali and soluble in acid and a surfactant which is capable of emulsifying the liquid amine and subsequently acidifying the mixture to dissolve the amine.

4,104,278

PROCESS FOR THE PRODUCTION OF COMPOUNDS WITH ANTIPHLOGISTIC ACTIVITY

Karl-Heinz Boltze, Bensberg-Kippekausen; Otfried Brendler, Cologne (Mülheim), and Peter-Rudolf Seidel, Porz-Wahnheide, all of Germany, assignors to Troponwerke Dinklage & Co., Cologne (Mülheim), Germany

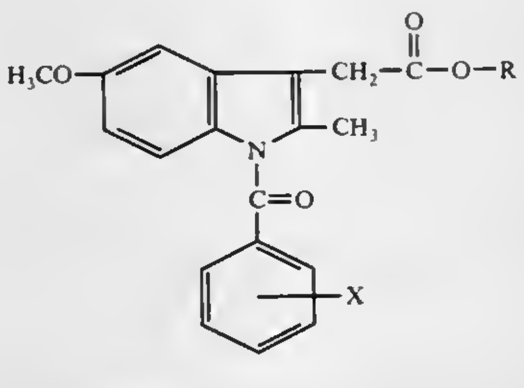
Cootinuation of Ser. No. 413,135, Nov. 5, 1973, abandoned. This application Dec. 11, 1975, Ser. No. 639,674

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1972, 2257867

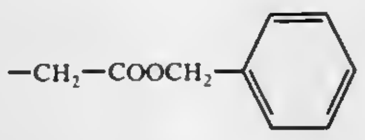
Int. Cl.^{2} C07D *209/18*

U.S. Cl. 260—326.13 A **13 Claims**

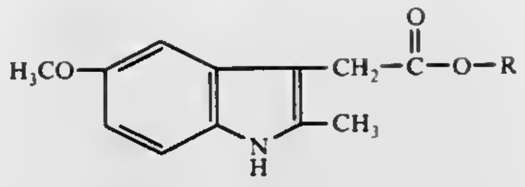
1. Process for the production of a compound of the formula


IV

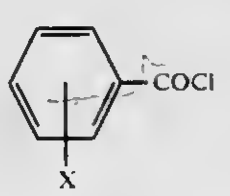
in which R stands for a benzyl radical or the radical



and X is hydrogen or represents one or more of halogen, methoxy, nitro, and trifluormethyl, wherein a compound of the formula


VII

is condensed with a compound of the formula


VIII

in which R and X have the meaning indicated, at temperatures of at least 100° C in an inert solvent as reaction medium, with formation of free HCl.

4,104,279

PROCESS FOR N-AROYLIMIDES

Richard S. Norton, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Oct. 12, 1976, Ser. No. 731,273

Int. Cl.^{2} C07D *209/34*

U.S. Cl. 260—326 N **13 Claims**

1. A process for making an N-aroyl derivative of an aromatic imide which comprises reacting an aromatic o-dicarboxylic acid anhydride with a nitrile selected from the group of aliphatic and aromatic mono and polynitriles of structure R—$(CN)_n$ where R is the aliphatic or aromatic group containing from one to thirty carbon atoms having no α-hydrogen atom, said aromatic group being of the benzene or naphthalene series and *n* is an integer of from one to two at a temperature of at least about 250° C and in the presence of an acid as a labile proton source.

4,104,280

DIBENZO [b.f]THIEPIN AND DIBENZO[b.f]OXEPIN DERIVATIVES

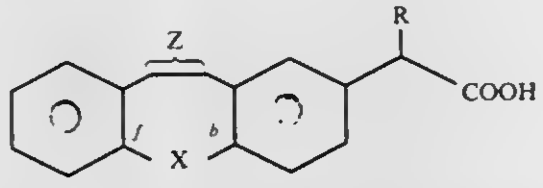
Jack Ackrell, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 4, 1977, Ser. No. 765,493

Int. Cl.^{2} C07D *337/14, 313/14*

U.S. Cl. 260—327 B **23 Claims**

1. A compound selected from the group of those represented by the formula:



and the pharmaceutically acceptable esters and salts thereof, wherein R is hydrogen or methyl, X is oxygen or $S(O)_n$, in which *n* is the integer of 0, 1 or 2, and Z is a single or double bond, provided that when Z is a double bond X is not SO, and when R is methyl the compounds are (dl) mixtures.

4,104,281

PROCESS FOR PREPARING NOVEL ISOMERIC DICARBOXY, DI (HYDROXYMETHYL) DIPHENYLMETHANE DILACTONES

Anatoli Onopchenko, Monroeville; Johann G. Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 8, 1976, Ser. No. 748,686

Int. Cl.^{2} C07D *307/88, 407/10*

U.S. Cl. 260—343.3 R **11 Claims**

1. A process for converting benzophenone-3,4,3′,4′-tetracarboxylic dianhydride to dicarboxy, di(hydroxymethyl), diphenylmethane dilactones which comprises subjecting said benzophenone-3,4,3′,4′-tetracarboxylic dianhydride to hydrogenation in a hydrogen atmosphere using an ether or ester carrier in the presence of nickel pretreated in a hydrogen atmosphere using an ether solvent.

4,104,282

NOVEL 3-(OXYGENATED ALKYL)-1,9-DIHYDROXY AND 1-HYDROXY-9-KETO DIBENZO[b,d]PYRANS

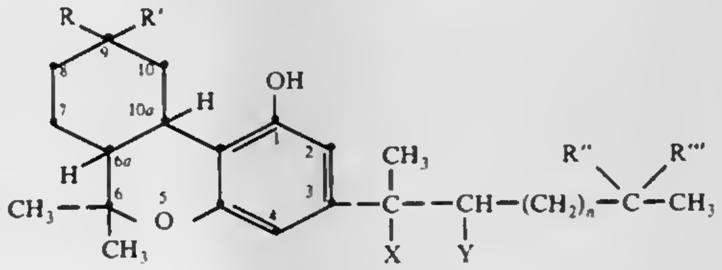
David S. Fukuda, Brownsburg; Bernard J. Abbott, Greenwood, and Robert A. Archer, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 694,512, Jun. 9, 1976, Pat. No. 4,064,009. This application Aug. 8, 1977, Ser. No. 822,467

Int. Cl.^{2} C07D *311/78*

U.S. Cl. 260—345.3 **5 Claims**

1. A compound of the formula


I

wherein X and Y are either both hydrogen or one is hydrogen and the other methyl;

wherein, when taken singly, one of the pair R and R′ and one of the pair R″ and R‴ is H and the other is OH and, when taken together, the pair R and R′ and the pair R″ and R‴ form the oxygen of a ketone group; and

wherein *n* is 1, 2, 3 or 4.

4,104,283

POLYTHIOETHERALKYLENEOXIDE EPOXIDES

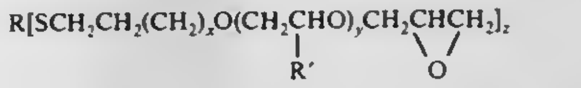
Richard A. Hickner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 789,954, Jan. 8, 1969, abandoned. This application Nov. 26, 1971, Ser. No. 202,546

Int. Cl.^{2} C07D *303/34*

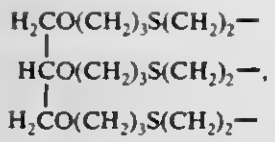
U.S. Cl. 260—348.43 **12 Claims**

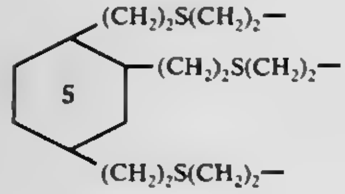
1. Compounds of the structure

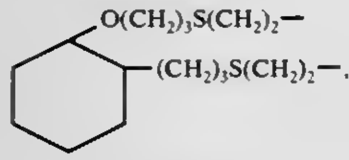


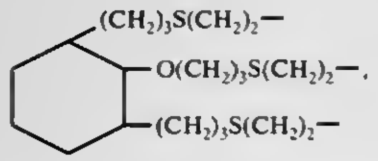
$$R[SCH_2CH_2(CH_2)_xO(CH_2\underset{\displaystyle R'}{\underset{|}{C}}HO)_yCH_2\underset{\displaystyle O}{CHCH_2}]_z$$

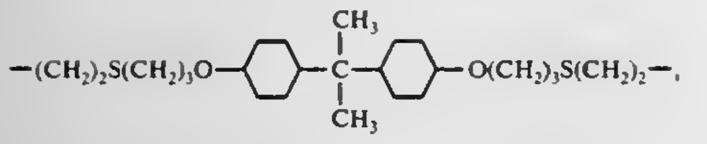
wherein *x* is an integer from 1 to 9, R′ is H, an alkyl group of from 1 to 4 C atoms or CH_2Cl, *y* is an integer from 0 to 10, *z* is an integer from 2 to 3 and R is - -$(CH_2)_2O(CH_2)_2$, —$(CH_2)_3O(CH_2)_3$—, —$(CH_2)_2S(CH_2)_2$—, —$(CH_2)_2S(CH_2)_2S(CH_2)_2$—, —$(CH_2)_2S(CH_2)_2O(CH_2)_2S(CH_2)_2$—,











or

the reaction product of a polyallyl ether of penterythritol having an average of about 3.5 allyl groups and 1,2-ethanedithiol.

4,104,284
NITROANTHRAQUINONES

Walter Hohmann, Leverkusen; Helmut Herzog, Bergisch-Neukirchen, and Hans-Samuel Bien, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

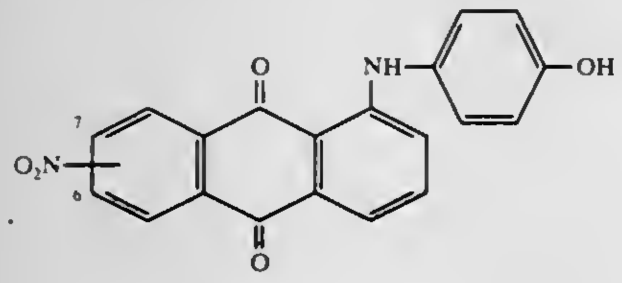
Division of Ser. No. 431,710, Jan. 8, 1974, Pat. No. 3,989,450. This application Jun. 11, 1976, Ser. No. 695,184

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1973, 2305916; Jan. 30, 1973, 2304320

Int. Cl.² C07C *97/12*

U.S. Cl. 260—378 **3 Claims**

1. Anthraquinone compound of the formula



4,104,285
TAURINE AND GLYCINE DERIVATIVES

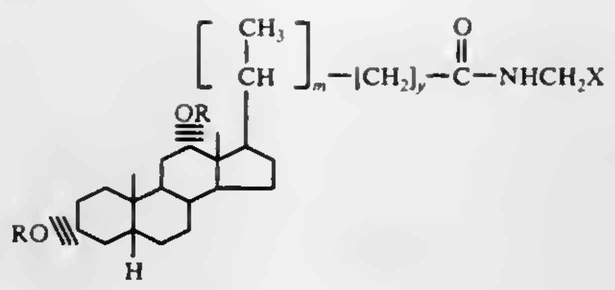
Hugo Gallo-Torres, Livingston; Robert William Guthrie, Fairfield; James Guthrie Hamilton, Nutley; Richard Wightman Kierstead, North Caldwell, and Ann Clare Sullivan, Cedar Grove, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 22, 1977, Ser. No. 790,164

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.1 **17 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkanoyloxy or benzoyloxy, X is —COOR₁ or CH₂SO₃H; R₁ is hydrogen or lower alkyl; *m* and *y* are 0 or 1 with the proviso that when *m* is 0, *y* is 0;

or pharmaceutically acceptable salts thereof.

4,104,286
CHOLESTEROL SEPARATION PROCESS

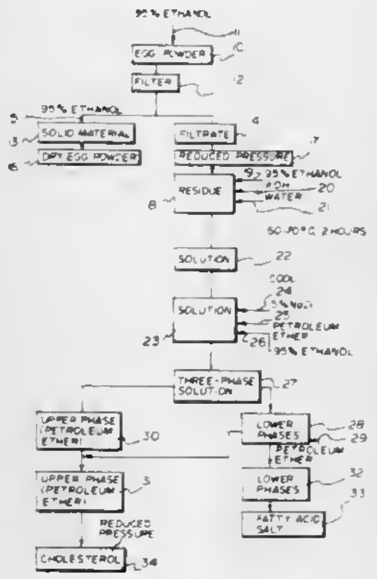
Alexander Graham Fallis, 22 Laurier St., St. John's, Newfoundland, Canada (A1A 2W3); John Marshall William Scott, 34 Poplar Ave., St. John's, Newfoundland, Canada, and June Gertrude Winter, 4 Yellowknife St., St. John's, Newfoundland, Canada (A1A 2Z8)

Filed Jan. 14, 1977, Ser. No. 759,443

Claims priority, application Canada, Nov. 19, 1976, 266152

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.25 **11 Claims**



1. A process for separating and recovering discrete portions from egg which comprises the steps of:
- (A) extracting a dried egg powder with an aqueous ethanol solution under mild extraction conditions at a temperature of about 25°-30° C. for a time of from 2-4 hours, thereby providing:
  - (i) an edible egg solid material from which at least about 70% by weight of cholesterol contained in the egg has been removed, and
  - (ii) an aqueous ethanolic solution containing egg fats and free cholesterol;
- (B) recovering said edible egg solid (A) (i);
- (C) subjecting the egg fats and the cholesterol contained in said aqueous ethanolic solution (A) (i) to a saponification reaction, thereby to provide
  - (iii) a free cholesterol-containing solution, and
  - (iv) a saponified fatty acid;
- (D) extracting said saponified solution with an extractant including an organic non-polar solvent to form at least a two-phase solution;
- (E) recovering saponified fatty acid (D) (iv) from an upper phase of said solution;
- (F) concentrating said free cholesterol-containing solution in a lower phase of said solution; and

- (G) recovering free crystallized cholesterol from said solution in said organic non-polar solvent.

4,104,287
4-m,m'-DI-t-BUTYL-p-HYDROXYPHENYL) BUTYL-2 COMPOUNDS

Roman Fischer, Matterstadt; Werner Fliege, Oterstadt; Wolfgang Koernig, Mannheim, and Peter Horn, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

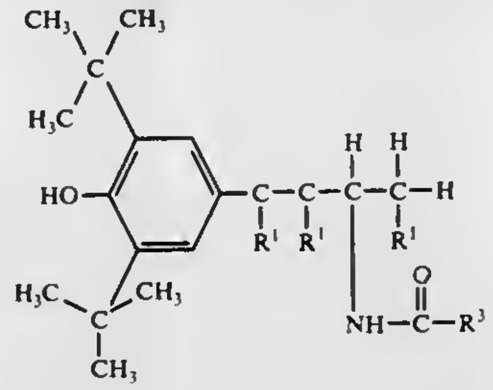
Division of Ser. No. 443,822, Feb. 19, 1974, Pat. No. 4,026,952. This application Nov. 18, 1976, Ser. No. 743,086

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1973, 2309375; Feb. 24, 1973, 2309376; Feb. 24, 1973, 2309377

Int. Cl.² C11C *3/02*

U.S. Cl. 260—404 **7 Claims**

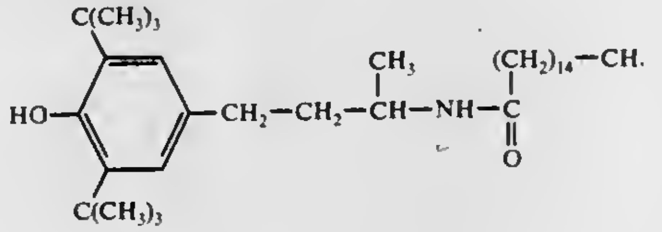
1. 4-(m,m'-di-t-butyl-p-hydroxyphenyl)-butyl-2-amides of the formula:



VI

in which the radicals R¹ are the same or different and each individually is hydrogen or an aliphatic radical, and R³ denotes an aliphatic, cycloaliphatic, araliphatic or aromatic radical.

7. A compound as claimed in claim 1, said compound having the formula



4,104,288
METHOD FOR PRODUCING HARD BUTTER FRACTION FROM SHEA FAT

Yukiya Iwanaga, Sennan, and Hayato Kubota, Izumi, both of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Nov. 16, 1976, Ser. No. 742,353

Claims priority, application Japan, Nov. 19, 1975, 50-139539

Int. Cl.² C11B *1/10*

U.S. Cl. 260—412.8 **5 Claims**

1. A method for producing a hard butter fraction from a shea fat by fractionation thereof, which comprises dissolving the shea fat in n-hexane, maintaining the resulting solution at a temperature of 5° to 10° C to precipitate the gummy unsaponifiable substances in the shea fat, separating the precipitated gummy unsaponifiable substances, cooling the solution obtained after the separation of the gummy substances at a temperature of 25° to 10° C, and collecting the precipitated hard butter fraction.

4,104,289
FILLED THERMOPLASTIC RESIN COMPOSITIONS

Giffin D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 20, 1976, Ser. No. 724,888

Int. Cl.² C08K *5/34*

U.S. Cl. 260—42.41 **10 Claims**

1. In a curable composition consisting essentially of a normally solid thermoplastic olefinic polymer resin, a normally non-reinforcing finely divided inorganic filler in proportion by weight from 1:4 to 4:1 to the polymer resin, and an ethylenically unsaturated material polymerizable under free-radical initiation to effect curing of the composition, the improvement wherein the ethylenically unsaturated material is trivinylisocyanurate and wherein the trivinylisocyanurate is imbibed on particles of solid thermoplastic polymer of styrene.

4,104,290
PROCESS FOR SEPARATING OILS AND FATS INTO LIQUID AND SOLID FRACTIONS

Ladislav Koslowsky, Ramat-Gan, Israel, assignor to H.L.S. Ltd., Industrial Engineering Company, Petah-Tikva, Israel

Continuation of Ser. No. 612,978, Sep. 12, 1975, abandoned. This application Nov. 4, 1976, Ser. No. 738,914

Claims priority, application Israel, Feb. 7, 1975, 46595

Int. Cl.² C11B *7/00, 11/00*

U.S. Cl. 260—428.5 **19 Claims**

1. A process for separating an edible oil selected from the group consisting of natural and semi-processed animal and vegetable oils and fats and mixtures thereof into a less saturated fraction (liquid fraction) and a more saturated fraction (solid fraction) comprising the steps of:
- dissolving one part by weight of the oil in about 0.5 to about 4 parts by weight of a solvent consisting of a C_2–C_3 alkanol containing about 2 to about 10% by weight of water at a dissolution temperature of above about 40° C,
- rapidly cooling the resulting solution to a crystallization temperature lower than the dissolution temperature, thereby to cause formation of substantially spherical shaped alpha-form crystals of said more saturated fraction of the oil capable of floating in said solvent,
- allowing said mixture to separate into three phases consisting of a lower liquid layer comprising said less saturated fraction of the oil and a part of said solvent, an upper liquid layer comprising another part of said solvent, and a solid phase consisting of said crystals of said more saturated fraction of the oil, said solid phase floating in said upper liquid layer to form a suspension therein, and
- separating said lower liquid layer from said suspension by decantation.

4,104,291
METAL DITHIOPHOSPHATES AND THEIR MANUFACTURE

Albert R. Sabol, Munster, Ind., and Nicholas C. Petrellis, Lisle, Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 781,626

Int. Cl.² C07F *3/06*

U.S. Cl. 260—429.9 **13 Claims**

1. A process for the continuous neutralization of dithiophosphoric acid with metal base comprising:
- contacting dialkyl or diaryl dithiophosphoric acid with zinc, barium, cadmium, magnesium or nickel metal base to form a neutralization mixture;
- passing said neutralization mixture through a static mixer in order to achieve mixing of the neutralization mixture and substantial neutralization of said dithiophosphoric acid;
- cooling the substantially neutralized dithiophosphoric acid; and
- recovering metal dithiophosphate.

4,104,292

METHOD FOR PREPARING ORGANOTIN COMPOUNDS

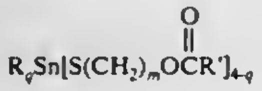
Robert D. Dworkin, Old Bridge, and Adam J. Ejk, Piscataway, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Nov. 2, 1976, Ser. No. 738,183

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 17 Claims

1. A method for preparing an organotin compound of the general formula



$$R_qSn[S(CH_2)_mO\overset{\overset{O}{\|}}{C}R']_{4-q}$$

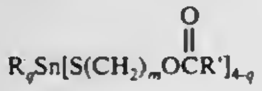
wherein R and R′ are individually selected from the group consisting of alkyl containing from 1 to 20 atoms, cycloalkyl, aryl, alkaryl and aralkyl, *m* represents the integer 2 or 3 and *q* represents the integer 1 or 2, said method consisting essentially of the following sequence of steps:

(1) combining 4-q moles of 2-mercaptoethanol or 3-mercaptopropanol for every one mole of an organostannoic acid, RSnOOH, when *q* is 1 or a diorganotin oxide, R_2SnO, when *q* is 2, and heating the resultant mixture at a temperature of from 40° to 100° C and for a period of time sufficient to substantially complete the reaction;

(2) combining the resultant product with a stoichiometric quantity of a carboxylic acid R′COOH, or an ester thereof, R′COOR″, wherein R″ is alkyl and contains from 1 to 20 carbon atoms, and subsequently removing the aqueous phase of the reaction mixture;

(3) heating the organic phase of said reaction mixture to a temperature of from 100° to about 180° C and simultaneously removing any by-product water or any alcohol boiling at or below the temperature of the reaction mixture;

(4) removing the resultant organotin compound,



$$R_qSn[S(CH_2)_mO\overset{\overset{O}{\|}}{C}R']_{4-q}$$

from the reaction vessel.

4,104,293

OIL-SOLUBLE CHROMIUM COMPOSITIONS

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 5, 1976, Ser. No. 683,407

Int. Cl.² C07F *11/00*

U.S. Cl. 260—438.5 R 15 Claims

1. A process of preparing oil-soluble chromium compositions having from about 15% to about 30% chromium which comprises reacting hydrated chromium oxide obtained by the reduction of dichromates with an oil-soluble sulfonic acid having about 10 to 60 carbon atoms in a volatile solvent by stirring for a period of about 1 to about 1.5 hours at room temperature and then heating to reflux, removing water and solvent and finally centrifuging to remove insolubles.

5. The process of claim 1 where a carboxylic acid is also employed in the reaction in a molar ratio of sulfonic acid to carboxylic acid of about 10:1 to 1:10.

4,104,294

CRYSTALLINE SILICATES AND METHOD FOR PREPARING SAME

Robert William Grose, Mobile, Ala., and Edith Marie Flanigen, White Plains, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,363

Int. Cl.² C07F *7/10, 5/06*

U.S. Cl. 260—448 C 2 Claims

1. A crystalline microporous organosilicate having a composition in terms of moles of oxides of:

$$R_2O{:}\ 0\text{–}1.5\ M_2O{:} < 0.05\ Al_2O_3{:}\ 40\text{–}70\ SiO_2{:}\ x\ H_2O.$$

wherein R represents tetraethylammonium cation, M represents an alkali metal cation and *x* has a value of from 0 to 15, the X-ray powder diffraction pattern of said organosilicate having at least the lines set forth in Table I.

4,104,295

METHYLSILACYCLOPENTENYL-CONTAINING SILYLATING AGENTS AND METHOD THEREFOR

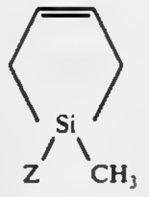
Jerome M. Klosowski, Monitor Township, Bay County, and Charles A. Romig, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 1, 1976, Ser. No. 737,744

Int. Cl.² C07F *7/10*

U.S. Cl. 260—448.2 N 6 Claims

1. A composition having the formula



wherein Z is a monovalent amido radical.

4,104,296

ORGANOFUNCTIONAL SILICON COMPOUNDS

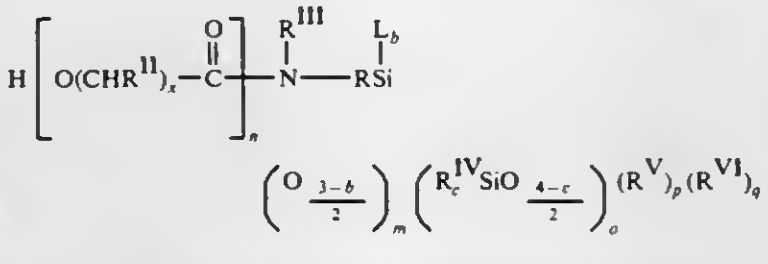
Roscoe A. Pike, Simsbury, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 76,321, Sep. 28, 1970, abandoned. This application Apr. 6, 1977, Ser. No. 785,110

Int. Cl.² C07F *7/10, 7/18*

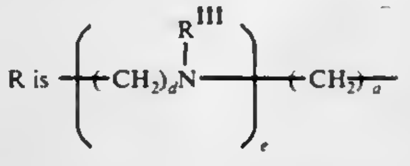
U.S. Cl. 260—448.8 R 7 Claims

1. The silicon compounds having the average formula:



$$H\left[O(CHR^{II})_x-\overset{\overset{O}{\|}}{C}\right]_n\overset{\overset{R^{III}}{|}}{N}-R\overset{\overset{L_b}{|}}{Si}\left(O_{\frac{3-b}{2}}\right)_m\left(R_c^{IV}SiO_{\frac{4-c}{2}}\right)_o(R^V)_p(R^{VI})_q$$

wherein *x* is about 2 to 8; *n* is at least 1; *b* is 0, 1 or 2; *c* is 0, 1, 2 or 3; *m* is 0 or 1; *o* is 0 or a positive number and when *o* is a positive number, *m* is 1; *p* is equal to 3-*b* when *m* is 0 and *o* is 0, and when *m* is 1, *p* is 0; *q* is 0 when *p* is equal to 3-*b* and *q* is 0 or a positive number when *m* is 1;



$$R \text{ is } \left((CH_2)_d\overset{\overset{R^{III}}{|}}{N}\right)_e(CH_2)_o$$

wherein $(CH_2)_d$ is bonded to Si; *o* is at least 3; *d* is at least 2; and *e* is 0 or a positive number; each R^{II} is hydrogen or alkyl of 1

to about 4 carbon atoms; R^{III} is hydrogen, alkyl, cycloalkyl, aryl, aminoalkyl, or hydroxyalkyl, which alkyls contain 1 to about 8 carbon atoms; L is a monovalent organic radical bonded to silicon by a carbon to silicon bond; R^{IV} is silicon bonded and is hydrogen or an organic radical bonded to silicon by a carbon to silicon bond; R^V is silicon bonded and is one of a hydrolyzable or condensable group selected from the group consisting of hydroxyl, halide, alkali metaloxy, alkoxy, aroxy, and acyloxy; and R^{VI} is bonded to oxygen and is hydrogen, alkyl, alkali metal, aryl, or acyl; provided that L and R^{IV} are organic radicals which do not interfere with the reaction of the lactone and the amino substituent of the silicon compound as recited in claim 2.

4,104,297

THERMOPLASTIC POLYESTERS PREPARED FROM DICARBOXYLIC ACIDS CONTAINING N-HETEROCYCLIC RINGS

Lothar Buxbaum; Thomas Kainmüller, both of Lindenfels, Odenwald, Fed. Rep. of Germany, and Jürgen Habermeier, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1977, Ser. No. 794,692

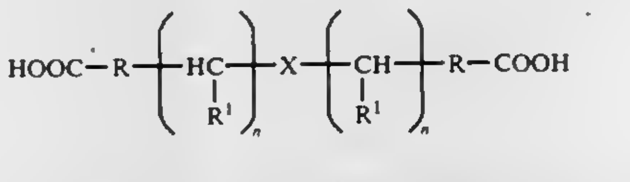
Claims priority, application Switzerland, May 12, 1976, 5935/76

Int. Cl.² C08G *63/68*

U.S. Cl. 528—289 15 Claims

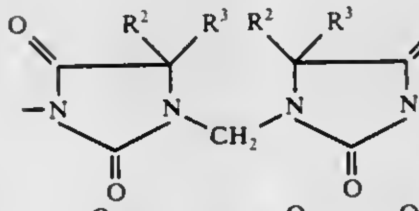
1. A linear thermoplastic polyester, having a relative viscosity of 1.1 to 3.5, measured on a solution of 1 gram of polyester in 100 ml of a solvent consisting of equal parts of phenol and symmetrical tetrachloroethane at 30° C., which comprises the condensation product in about a 1:1 molar ratio of diacids (a) and (b) with diols (c) and (d) so that the composition of the polyester comprises

in the diacid component of the polyester (a) from 1 to 50 mol %, based on the total polyester, of radicals of at least one dicarboxylic acid of the general formula I

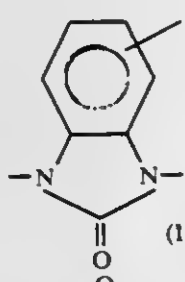


$$HOOC-R-\left(\underset{R^1}{\underset{|}{HC}}\right)_n-X-\left(\underset{R^1}{\underset{|}{CH}}\right)_n-R-COOH \qquad (I)$$

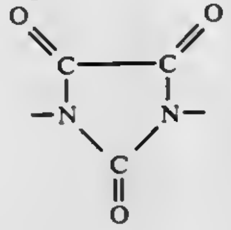
wherein R^1s each represent a hydrogen atom or alkyl having 1 to 10 C atoms, R represents phenylene or alkylene having 1 to 17 C atoms, and X represents a heterocyclic radical selected from the group consisting of the following formulae IIa to IIg



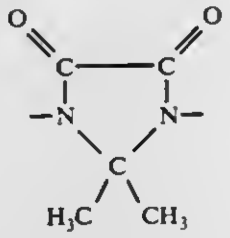
(IIa),



(IIb),



(IIc),



(IId),

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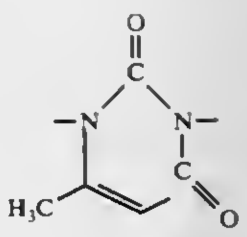
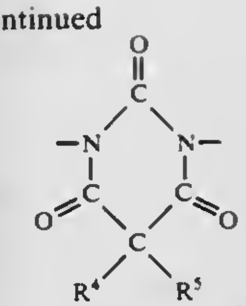
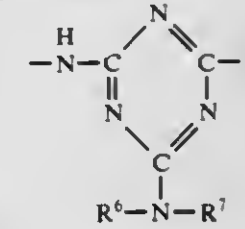


(IIe)



(IIf), and



(IIg)

wherein R^2 represents a hydrogen atom, methyl or ethyl, R^3 represents methyl, ethyl, propyl or isopropyl, R^4 and R^5 each represent methyl, ethyl or phenyl, R^6 and R^7 each represent alkyl having 1 to 6 C atoms, cyclohexyl or phenyl, Y represents a bromine or chlorine atom, and *m* is naught or represents a number from 1 to 4, and *n* represents 1 when X is formula IIa to IIf, and *n* represents 0 or 1 when X is formula IIg; and

(b) from 49 to 0 mol %, based on the total polyester, of radicals of at least one aromatic, cycloaliphatic or aliphatic dicarboxylic acid; and in the diol component of the polyester

(c) from 20 to 50 mol %, based on the total polyester, of radicals of an aromatic diol; and

(d) from 30 to 0 mol %, based on the total polyester, of radicals of an aliphatic or cycloaliphatic diol;

wherein the radicals (a) and (b) are attached to the radicals (c) and (d) through ester linkages and in a random distribution when any (b) or (d) radicals are present.

4,104,298

MANUFACTURE OF SULFAMIC ACID HALIDES

Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

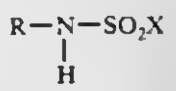
Filed Mar. 23, 1976, Ser. No. 669,467

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1975, 2514937

Int. Cl.² C07C *139/00*

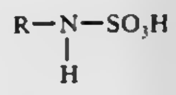
U.S. Cl. 260—543 R 10 Claims

1. A process for the manufacture of sulfamic acid halides of the formula



$$R-\underset{\underset{H}{|}}{N}-SO_2X \qquad I$$

where R is an aliphatic or cycloaliphatic radical and X is halogen, which comprises: reacting sulfamic acids of the formula



$$R-\underset{\underset{H}{|}}{N}-SO_3H \qquad II$$

where R has the above meanings, or their metal salts, with an acid halide in the presence of a solvent, wherein the reaction is carried out with a phosphorus pentahalide as the acid halide in an amount of from 0.35 to 0.6 mole, per mole of starting material II, in the presence of from 1 to 5 moles of phosphorus oxyhalide per mole of phosphorus pentahalide, and in the presence of from 50 to 300% by weight — based on starting material II — of a halohydrocarbon as the solvent.

4,104,299

PRODUCTION OF PURE METHYLDICHLOROPHOSPHANE

Alexander Ohorodnik; Klaus Gehrmann, both of Erftstadt; Stefan Schäfer, Brühl, and Albert Mainski, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1977, Ser. No. 818,124

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633661; May 28, 1977, 2724407

Int. Cl.² C07F *9/52, 9/02*

U.S. Cl. 260—543 P **7 Claims**

1. A process for recovering methyldichlorophosphane from a mixture containing phosphorus trichloride and methyldichlorophosphane as its principal constituents by distillation in two stages, phosphorus trichloride and other low-boiling material being distilled off overhead in the first stage, methyldichlorophosphane being distilled off from high-boiling material in the second stage, and the latter being fed with base product coming from the first stage, which comprises: dissolving in the said mixture, prior to admitting it to the first distillation stage, 0.01 to 1 weight % of a soluble barium phenate-sulfonate mixture or 0.1 to 10 weight % of a non-ionic surfactant wherein a non-ionic polymer derived from ethylene oxide or from ethylene oxide and propylene oxide or wherein an ethoxylated unbranched fatty alcohol having from 6 to 30 carbon atoms is used as the non-ionic surfactant, and admixing the base product coming from the first distillation stage, prior to admitting it to the second distillation stage, with 1 to 10 weight % of phosphorus oxychloride.

4,104,300

METHOD OF PREPARING CARBOXYLIC ACID CHLORIDES OF THE BENZENE SERIES

Günter Zoche, Bonn-Beuel; Hermann Richtzenhain, Much-Schwellenbach, and Wilhelm Vogt, Cologne, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation-in-part of Ser. No. 737,368, Nov. 1, 1976. This application Jul. 7, 1977, Ser. No. 813,595

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630429

Int. Cl.² C07C *51/58*

U.S. Cl. 260—544 D **11 Claims**

1. In a process for preparing a substituted or unsubstituted carboxylic acid chloride of the benzene series by reaction of the corresponding carboxylic acid ester with an aromatic compound containing at least one nuclearly bound trichlormethyl group in the presence molybdenum or a molybdenum compound as catalyst wherein the corresponding carboxylic acid chloride is recovered by distillation, the improvement which comprises introducing into the reaction product prior to distillation of the carboxylic acid chloride a complexing agent which complexes with the molybdenum or molybdenum containing catalyst.

4,104,301

SYNTHESIS OF SULFONYL SEMICARBAZIDES

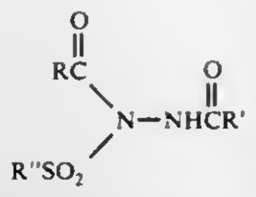
John E. Herweh, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 675,452, Apr. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 490,040, Jul. 19, 1974. This application Feb. 18, 1977, Ser. No. 770,016

Int. Cl.² C07C *133/02*

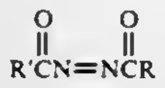
U.S. Cl. 260—554 **8 Claims**

1. A process for the manufacture of sulfonyl dicarboxamides of the formula



$$R\overset{\overset{O}{\|}}{C}\diagdown N{-}NH\overset{\overset{O}{\|}}{C}R' \quad (R''SO_2\diagup N)$$

wherein R and R' may be the same or different and are C_1 to C_8 alkylamino, di C_1 to C_8 alkylamino, phenylamino, diphenylamino, C_1 to C_8 alkyl substituted phenylamino, di C_1 to C_8 alkyl substituted phenylamino, naphthylamino or dinaphthylamino; R'' is selected from the group consisting of C_1 to C_8 alkyl, phenyl, C_1 to C_8 alkyl substituted phenyl and naphthyl, which comprises reaction in an inert aprotic dipolar solvent a diazenedicarboxamide of the formula



$$R'\overset{\overset{O}{\|}}{C}N{=}N\overset{\overset{O}{\|}}{C}R$$

with an organosulfinic acid salt of the formula $R''SO_2M$ wherein R, R' and R'' is defined above and M is potassium, sodium, zinc or ammonium and recovering the sulfonyl dicarboxamide.

4,104,302

VINYLSULPHONE HARDENERS

Norman Alfred Smith, Hornchurch, and Rainer Kitzing, Ingatestone, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 22, 1976, Ser. No. 734,781

Claims priority, application United Kingdom, Oct. 31, 1975, 45280/75

Int. Cl.² C07C *103/60;* **G03C** *1/30*

U.S. Cl. 260—561 S **4 Claims**

1. A vinylsulphone compound of the general formula

$$[CH_2{=}CHSO_2CH_2CH_2(CONH)_x(CH_2)_3]_2{-}O(CH_2CH_2O)_y{-}.$$

wherein x is 1 or 2, and y is 0 or an integer of 1 to 100.

4,104,303

ACID INHIBITOR COMPOSITION AND PROCESS IN HYDROFLUORIC ACID CHEMICAL CLEANING

James Douglas Anderson, Ambler; Edgar S. Hayman, Jr., Doylestown, and Edward A. Rodzewich, Flourtown, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 595,974, Jul. 14, 1975, Pat. No. 3,992,313. This application Aug. 26, 1976, Ser. No. 717,971

Int. Cl.² C23G *1/06;* **C07C** *85/18*

U.S. Cl. 260—570.9 **4 Claims**

1. A product prepared by reacting an amine having at least one active hydrogen attached to the nitrogen; an alpha ketone selected from the group consisting of acetophenone and acetone; and formaldehyde, in the presence of hydroxyacetic acid.

4,104,304

PRODUCTION OF METHYLDICHLOROPHOSPHANE

Stefan Schäfer, Brühl; Klaus Gehrmann; Alexander Ohorodnik both of Erfstadt; Karl-Heinz Steil, Hürth; Wernfried Riechmann, Brühl, and Friedhelm Bylsma, Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,465

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631608; Apr. 26, 1977, 2718391

Int. Cl.² C07F *9/52, 9/02*

U.S. Cl. 260—543 P **6 Claims**

1. A process for making methyldichlorophosphane by reacting methane and phosphorus trichloride in a reaction zone in which a temperature higher than 500° C is maintained, which comprises mechanically freeing hot reaction gas coming from the reaction zone from solid matter, and passing the reaction gas freed from solid matter to a quenching zone in which it is quenched with liquefied reaction mixture having 0.3 to 5 weight % of a soluble barium phenate-sulfonate mixture or a non-ionic surfactant dissolved therein wherein an ethoxylated unbranched fatty alcohol having 6 to 30 carbon atoms or wherein a polymeric surfactant derived from ethylene oxide or from ethylene oxide and propylene oxide is used as the non-ionic surfactant.

4,104,305

1-AMINOTRICYCLO (4.3.1.1^{2,5}) UNDECANE AND SALTS THEREOF

Yoshiaki Inamoto; Koji Aigami; Motoyoshi Ohsugi; Yoshiaki Fujikura, and Hiroshi Ikeda, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

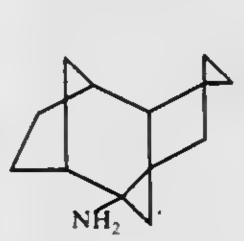
Filed Oct. 6, 1977, Ser. No. 839,977

Claims priority, application Japan, Oct. 13, 1976, 51-123360

Int. Cl.² C07C *87/40*

U.S. Cl. 260—563 P **2 Claims**

1. 1-Aminotricyclo [4.3.1.1^{2,5}] undecane having the formula (I):



and acid addition salts thereof.

4,104,306

12A-DEOXY CHELOCARDIN

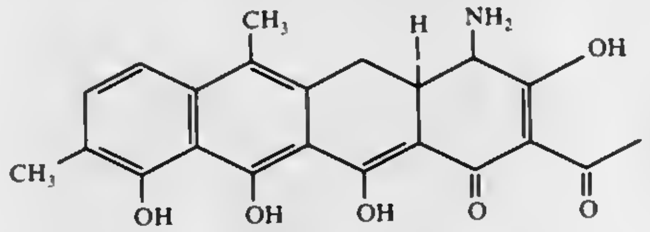
Edith Bernstein, Montreal; Daniel Tim-Wo Chu, Dollard des Ormeaux, and Stuart Nicholas Huckin, Dorion, all of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 5, 1976, Ser. No. 683,570

Int. Cl.² C07C *91/16*

U.S. Cl. 260—571 **3 Claims**

1. The compound of the formula



and an acid addition salt thereof.

4,104,307

PROCESS FOR PREPARING 2-AMINOALKYL HALIDE BISULFATE SALTS

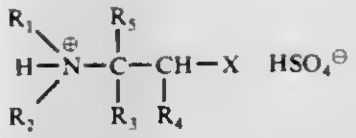
Carmine P. Iovine, Somerset, and Dilip K. Ray-Chaudhuri, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jan. 7, 1977, Ser. No. 757,633

Int. Cl.² C07C *85/24*

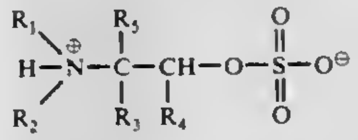
U.S. Cl. 260—583 G **14 Claims**

1. A process for preparing 2-aminoalkyl halide bisulfate salts of the general formula:



$$H{-}\underset{R_2}{\overset{R_1}{\overset{\oplus}{N}}}{-}\underset{R_3}{\overset{R_5}{C}}{-}\underset{R_4}{CH}{-}X \quad HSO_4^{\ominus}$$

wherein R_1 is selected from the group consisting of alkyl (C_1 to C_{18}), cycloalkyl and hydrogen; R_2 is selected from the group consisting of alkyl (C_1 to C_{18}) and cycloalkyl; R_3, R_4 and R_5 are selected independently from the group consisting of alkyl (C_1 to C_3) and hydrogen; and X is selected from the group consisting of Cl and Br, said process comprising reacting dry hydrogen halide, selected from the group consisting of hydrogen chloride and hydrogen bromide, in an amount ranging from about stoichiometric to 15 mole percent excess, under essentially anhydrous conditions, with the corresponding 2-aminoalkyl monosulfate ester of the general formula:



$$H{-}\underset{R_2}{\overset{R_1}{\overset{\oplus}{N}}}{-}\underset{R_3}{\overset{R_5}{C}}{-}\underset{R_4}{CH}{-}O{-}\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}{-}O^{\ominus}$$

wherein R_1, R_2, R_3, R_4 and R_5 are all as defined above, the reaction being maintained at about 100° – 200° C.

4,104,308

SYNTHESIS OF SQUARIC ACID

Thomas Richard Gadek; David Berhard Sclove, and Robert Lee Vollmer, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,614

Int. Cl.² C07C *45/00;* **C07D** *295/06*

U.S. Cl. 260—586 R **5 Claims**

1. In a process for the preparation of 3,4-dihidroxy-3-cyclobutene-1,2-dione by the steps of (a) reacting hexachlorobutadiene with an excess of morpholine, the morpholine being present at the start of the reaction in a molar ratio of about 6 to 1 with respect to the hexachlorobutadiene, (b) converting the thus formed 1,1,3-trichloro-2,4,4-trimorpholinobutadiene to 3-morpholinotrichloro-2-cyclobuten-1-one by heating, and (c) hydrolyzing the 3-morpholinotrichloro-2-cyclobuten-1-one to 3,4-dihydroxy-3-cyclobuten-1,2-dione, the improvement according to which the reaction between the hexachlorobutadiene and the morpholine is carried out in the presence of an aromatic hydrocarbon solvent, and at a temperature maintained between 110° C and 120° C, and the conversion of the 1,1,3-trichloro-2,4,-trimorpholinobutadiene to 3,morpholinotrichloro-2-cyclobutene-1-one is carried out in the presence of a buffer at a pH between 4.0 and 7.0.

4,104,309

PHOSPHINE OXIDES HAVING POLYFLUORINATED-CHAIN AND THEIR PREPARATION

Joseph Sleziona, and Michel Demarcq, both of Lyons, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

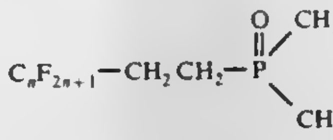
Filed Jan. 3, 1975, Ser. No. 537,446

Claims priority, application France, Jan. 3, 1974, 74.00108

Int. Cl.² C07F *9/53*

U.S. Cl. 260—606.5 P **1 Claim**

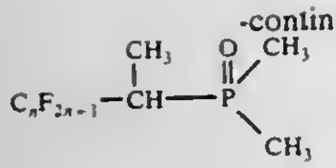
1. New products comprising at least one isomer of polyfluorinated-chain phosphine oxides with the general formulae II or III:



(II)

$$C_nF_{2n+1}{-}CH_2CH_2{-}\overset{\overset{O}{\|}}{P}(CH_3)_2$$

-continued



(III)

in which C_nF_{2n+1} represents a perfluorinated aliphatic chain, n lying between 2 and 18.

4,104,310

ORGANOMETALLIC COMPLEXES AS ALKYLAROMATIC OXIDATION CATALYSTS

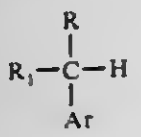
Howard P. Angstadt, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 773,633, Nov. 5, 1968, abandoned. This application Nov. 18, 1974, Ser. No. 524,910

Int. Cl.^{2} C07C *179/04*

U.S. Cl. 260—610 B **13 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having from 3 to 19 carbon atoms, or secondary or tertiary alkylaromatic hydrocarbons of the formula



$$R_1-\overset{\overset{R}{|}}{\underset{\underset{Ar}{|}}{C}}-H$$

wherein R is lower alkyl; R_1 is lower alkyl or hydrogen; and Ar is an aromatic nucleus selected from the group consisting of phenyl and naphthyl, in the presence of air or oxygen at a temperature of from about 80° to 150° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is of the formula

$$MX_n(DASO)_m$$

wherein DASO is a dialkylsulfoxide, the alkyl moiety of which has from one to four carbon atoms; MX is a metal salt wherein M is a transition metal cation of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB or IIa of the Periodic Table and X is the anion of said metal salt; m is an integer of from 1 to 8; and n is an integer of from 1 to 4, wherein the ratio of said catalyst to said olefin or alkylaromatic hydrocarbon is from about 0.01 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin or alkylaromatic hydrocarbon.

4,104,311

ORGANOMETALLIC COMPLEXES AS OXIDATION CATALYSTS

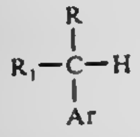
Howard P. Angstadt, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 801,187, Feb. 20, 1969, abandoned. This application Nov. 20, 1974, Ser. No. 525,548

Int. Cl.^{2} C07C *179/04*

U.S. Cl. 260—610 B **13 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having from 3 to 19 carbon atoms, or secondary or tertiary alkylaromatic hydrocarbons of the formula



$$R_1-\overset{\overset{R}{|}}{\underset{\underset{Ar}{|}}{C}}-H$$

wherein R is lower alkyl; R_1 is lower alkyl or hydrogen; and Ar is an aromatic nucleus selected from the group consisting of phenyl and naphthyl, in the presence of air or oxygen at a temperature of from about 80° to 150° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is of the formula

$$MX_n(TAP)_m$$

wherein TAP is a trialkylphosphate, the alkyl moiety of which has from one to four carbon atoms; MX is a metal salt wherein M is a transition metal cation of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB or IIA of the Periodic Table and X is the anion of said metal salt; m is an integer of from 1 to 8; and n is an integer of from 1 to 4, wherein the ratio of said catalyst to said olefin or alkylaromatic hydrocarbon is from about 0.01 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin or alkylaromatic hydrocarbon.

4,104,312

OXIDATION OF OLEFINS WITH ORGANOMETALLIC COMPLEX CATALYSTS

Howard P. Angstadt, Media, and William P. Griffin, Jr., Pittsburgh, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 777,493, Nov. 20, 1968. This application Nov. 21, 1974, Ser. No. 526,036

Int. Cl.^{2} C07C *179/04*

U.S. Cl. 260—610 B **11 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having from 3 to 19 carbon atoms, in the presence of air or oxygen at a temperature of from about 50° to 150° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is of the formula

$$MX_n(HAPA)_m$$

wherein HAPA is a hexaalkylphosphoramide, the alkyl moiety of which has from one to four carbon atoms; MX is a metal salt wherein M is a transition metal cation of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB or IIA of the Periodic Table and X is the anion of said metal salt; m is an integer of from 1 to 8; and n is an integer of from 1 to 4, wherein the ratio of said catalyst to said olefin is from about 0.1 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin.

4,104,313

HALOGENATED 4-TRIFLUOROMETHYL-4'-NITRO-DIPHENYL-ETHER

Lothar Rohe, Wuppertal; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal-Hahnenberg; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 483,332, Jun. 26, 1974, abandoned. This application May 14, 1976, Ser. No. 686,349

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1973, 2333848

Int. Cl.^{2} C07C *43/20, 43/28*

U.S. Cl. 260—612 R **1 Claim**

1. Halogenated 2,6-dichloro-3'-fluoro-4-trifluoromethyl-4'-nitrodiphenyl-ether.

4,104,314

ETHER COMPOUNDS

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 705,369, Jul. 14, 1976, Pat. No. 4,059,639, which is a division of Ser. No. 633,763, Nov. 20, 1975, Pat. No. 3,987,111, which is a division of Ser. No. 367,596, Jun. 6, 1973, Pat. No. 3,947,595, which is a division of Ser. No. 170,954, Aug. 11, 1971, Pat. No. 3,764,706. This application Sep. 6, 1977, Ser. No. 830,735

Int. Cl.^{2} C07C *43/12;* A61K *31/08*

U.S. Cl. 260—614 F **1 Claim**

1. The compound having the formula $CF_3CHClOCF_2CF_2H$.

4,104,315

PROCESS FOR SEPARATING AN AR, AR-DIHALO-AR-ALKYLBENZENE FROM AN ISOMERIC MIXTURE OF AR, AR-DIHALO-AR-ALKYLBENZENES

James R. Dewald, Bay City, Mich., and Lowell D. Markley, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 707,924, Jul. 22, 1976, Pat. No. 4,059,642. This application Mar. 10, 1977, Ser. No. 776,168

Int. Cl.^{2} C07C *25/04*

U.S. Cl. 260—650 R **7 Claims**

1. A process for separating ar,ar-dihalo-ar-alkylbenzenes wherein two of the ring substituents are meta oriented with respect to each other and wherein alkyl includes substituted alkyl, said process comprising (1) contacting an isomeric mixture containing an ar,ar-dihalo-ar-alkylbenzene having the substituents in the 1,2,4- ring positions (1,2,4- isomer) and an isomer thereof having the substituents in the 1,3,5-ring positions (1,3,5- isomer) with an alkylating agent in the presence of a catalytic amount of a Friedel-Crafts catalyst at a reaction temperature less than about 90° C such that the 1,2,4- isomer is preferentially alkylated and (2) separating the alkylated 1,2,4- isomer from the unreacted 1,3,5- isomer.

4,104,316

PROCESS FOR THE PREPARATION OF 2-CHLOROBUTA-1,3-DIENE

Gerhard Scharfe, and Rupert Wenzel, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 6, 1976, Ser. No. 702,834

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1975, 2533429

Int. Cl.^{2} C07C *17/34, 21/20*

U.S. Cl. 260—655 **11 Claims**

1. Process for the production of 2-chlorobuta-1,3-diene which comprises contacting 3,4-dichlorobut-1-ene and sodium butylate in n-butanol for formation of a reaction mixture containing said 2-chlorobuta-1,3-diene and sodium chloride in the n-butanol with the sodium chloride being a suspended solid, passing said reaction mixture without having separated off the sodium chloride into a distillation column and therein distilling said reaction mixture to separate the 2-chlorobuta-1,3-diene as top product and n-butanol having the sodium chloride suspended therein as sump product.

4,104,317

DEHYDROGENATION METHOD

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 684,811, May 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 555,648, Mar. 5, 1975, Pat. No. 3,956,103. This application Mar. 7, 1977, Ser. No. 775,079

Int. Cl.^{2} C07C *15/00;* C07B *3/00*

U.S. Cl. 260—666 A **28 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, and about 0.01 to about 2 wt. % rhenium; wherein the platinum or palladium, rhodium and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium is present in the elemental metallic state; and wherein substantially all of the rhenium and rhodium are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,104,318

PROCESS FOR REMOVING ORGANIC OXYGEN-CONTAINING IMPURITIES FROM AN ORGANIC COMPOSITION IN THE PRESENCE OF STEAM

Stephen S. Hupp, Reserve Township, Allegheny County; Edward T. Sabourin, Allison Park; Harold E. Swift, Gibsonia, and Roger F. Vogel, Butler, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 27, 1977, Ser. No. 801,038

Int. Cl.^{2} C07C *15/00*

U.S. Cl. 260—669 A **23 Claims**

1. The process for substantially increasing the amount of stilbene and substantially reducing the aromatic carbonyl and aromatic hydroxyl impurities in an organic composition comprising toluene, stilbene, benzene and bibenzyl and containing aromatic carbonyl and aromatic hydroxyl impurities which comprises contacting said organic composition with a catalyst comprising a Group VIb or Group VIII metal oxide, metal phosphate or a mixture thereof and a promoter amount of an alkali metal or an alkaline earth metal compound at a temperature between about 400° C. to about 700° C. in the presence of about two to about 90 weight percent steam, whereby the amount of stilbene is substantially increased and the amount of said aromatic carbonyl and aromatic hydroxyl impurities is substantially decreased.

4,104,319

ETHYLATION OF MONO ALKYL BENZENE

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,510

Int. Cl.^{2} C07C *3/52*

U.S. Cl. 260—671 C **12 Claims**

1. Process for effecting ethylation of a mono alkyl benzene wherein the alkyl substituent contains 1 to 2 carbon atoms to yield a mixture of ethyl toluene or diethylbenzene isomers with minimal undesired by-product formation which comprises contacting said mono alkyl benzene with an ethylating agent, under conversion conditions, including a temperature between about 250° C. and about 600° C., a pressure between about 0.1 and about 100 atmospheres, utilizing a feed weight hourly space velocity between about 0.1 and about 1000 and a molar feed ratio of toluene/ethylating agent between about 1 and about 10, in the presence of a catalyst comprising a crystalline aluminosilicate zeolite characterized by a constraint index within the approximate range of 1 to 12 and a silica to alumina ratio greater than about 500.

4,104,320

METHOD OF DEHYDROCYCLIZING ALIPHATIC HYDROCARBONS

Jean René Bernard, St-Symphorien sur Ozon, and Jean Nury, Caluire, both of France, assignors to Elf-Union, Paris, France

Filed Aug. 30, 1976, Ser. No. 718,584

Claims priority, application France, Sep. 10, 1975, 75 27781

Int. Cl.^{2} C07C *15/02;* B01J *29/28*

U.S. Cl. 260—673.5 **25 Claims**

1. A method of dehydrocyclising non-cyclic aliphatic hy-

drocarbons, characterised in that in the presence of hydrogen a batch of the hydrocarbons is contacted at a temperature of 430° - 550° C with a catalyst consisting essentially of a type L zeolite having exchangeable cations of which at least 90% are alkali metal ions selected from the group consisting of ions of sodium, lithium, potassium, rubidium and caesium and containing at least one metal selected from the group which consists of metals of group VIII of the periodic table of elements, tin and germanium, said metal or metals including at least one metal from group VIII of said periodic table having a dehydrogenating effect, so as to convert at least part of the batch into aromatic hydrocarbons.

4,104,321

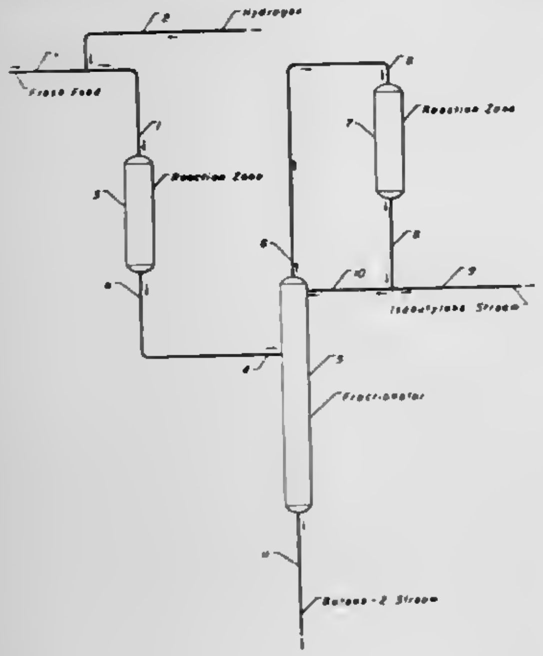
PROCESS FOR THE SEPARATION OF OLEFINS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 18, 1977, Ser. No. 779,414

Int. Cl.^{2} C07C *11/02, 5/24*

U.S. Cl. 260—677 A **9 Claims**



1. A process for the separation of isoolefin and normal olefin hydrocarbons from a mixture containing the same, which comprises the steps of:
   (a) subjecting said mixture to isomerization in a first isomerization zone to convert a portion of the normal olefin hydrocarbons to isoolefin;
   (b) fractionating the resultant isomerization zone effluent to separate the same into an isoolefin-rich stream containing normal olefin and a normal olefin-rich stream of reduced isoolefin content;
   (c) subjecting said isoolefin-rich stream to isomerization in a second isomerization zone to isomerize normal olefin hydrocarbons contained therein;
   (d) recovering an isoolefin product stream from the effluent of said second zone; and
   (e) separately recovering said normal olefin-rich stream from the aforesaid fractionating step (b).

4,104,322

RUBBER COMPOSITIONS CONTAINING POLYSILOXANE ELASTOMERS AND BUTADIENE-STYRENE COPOLYMERS

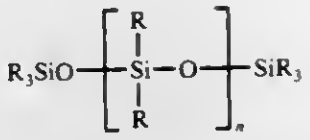
Kenneth E. Snavely, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 24, 1975, Ser. No. 598,898

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—827 **14 Claims**

1. A rubber blend comprising:
a. a silicone rubber having a formula



$$R_3SiO\left[\begin{matrix} R \\ | \\ -Si-O- \\ | \\ R \end{matrix}\right]_n SiR_3$$

wherein the radicals R, which can be the same or different, can be alkyl, cycloalkyl, aryl radicals which can be unsubstituted or substituted by alkyl, cycloalkyl and aryl radicals, said radicals R containing 1 to about 12 carbon atoms and wherein 0 to about 5 percent of the radicals R are olefinically unsaturated radicals having from 2 to about 12 carbon atoms,

b. Z weight percent or less of the total blend of a hydrocarbon rubber selected from the group consisting of solution polymerized hydrocarbon rubbers, emulsion polymerized hydrocarbon rubbers, and mixtures thereof, Z being defined by the formula

$$Z = 15 + 25 \cdot (P/100)$$

wherein P which can be any value between 0 and 100 is the weight percentage of solution polymerized hydrocarbon rubber in the total hydrocarbon rubber of the blend, said hydrocarbon rubber being a copolymer of a conjugated alkadiene having 4–12 carbon atoms per molecule and a vinyl-substituted aromatic monomer of 8 to about 18 carbon atoms, and

c. up to 0.003 weight % (calculated as sulfur) of sulfur or a sulfur-containing compound,
up to 0.07 weight % ionic surfactants,
up to 0.03 weight % water,
up to 0.1 weight % antioxidants.

4,104,323

ADHESIVE COMPOSITION CONTAINING A PRE-BLENDED POLYPHENYLENE ETHER RESIN

David R. Hansen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1977, Ser. No. 788,186

Int. Cl.^{2} C08L *45/00, 53/00*

U.S. Cl. 260—829 **9 Claims**

1. A hot melt adhesive composition comprising:
(a) 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated-diene mid-block B, said blocks A comprising 8 - 55% by weight of the block copolymer;
(b) about 50 to about 200 parts by weight of a tackifying resin compatible with block B;
(c) about 0 to about 200 parts by weight of a hydrocarbon extending oil; and
(d) about 5 to about 50 parts by weight of a melt blend of
   (i) a low molecular weight polyphenylene ether resin, and
   (ii) a block A compatible resin selected from the group consisting of coumarone-indene resins, vinyltoluene-alphamethyl-styrene copolymers and mixtures thereof, wherein the weight ratio of the polyphenylene ether resin to the block A compatible resin is between about 1:1 and about 1:6, the molecular weight (M_{vis}) of the polyphenylene ether resin is between about 6,000 and about 25,000, the glass transition temperature of the polyphenylene ether resin is between 170° C and 205° C; and the glass transition temperature of the block A compatible resin is between about 40° C and about 100° C.

4,104,324

DEEP-DYEING POLYCAPROLACTAM FIBRES AND FILAMENTS

Eduard Radlmann; Hans-Georg Gelbaar, and Günther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

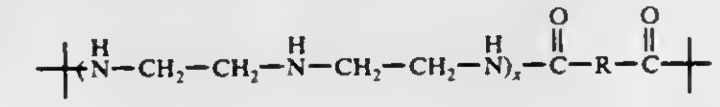
Filed Sep. 21, 1977, Ser. No. 835,310

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642980

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—857 TW **5 Claims**

1. Basically modified polycaprolactam filaments or fibres comprising a physical mixture of an unmodified polycaprolactam and a basic polycaprolactam containing structural units corresponding to the formula:



$$-\!\!\left[\!\!\left(\overset{H}{N}-CH_2-CH_2-\overset{H}{N}-CH_2-CH_2-\overset{H}{N}\right)_x-\overset{O}{\overset{\|}{C}}-R-\overset{O}{\overset{\|}{C}}\right]\!\!-$$

in which
R represents an alkylene radical with 4 to 12 carbon atoms, and
x is an integer from 1 to 5, having a solution viscosity of from 2.9 to 3.5 (as measured on a solution of 1 g of non-extracted polyamide in 100 ml of m-cresol at 25° C) and containing free amino groups in a concentration range from 60 to 180 millivals per kg of fibre.

4,104,325

RESIN COMPOSITION COMPRISING CYANO-SUBSTITUTED NORBORENE POLYMERS BLENDED WITH GRAFT COPOLYMERS

Takashi Ueshima, Yokohama; Yasuzi Tanaka; Toshiro Yokoyama, both of Kawasaki, and Shoichi Kobayashi, Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

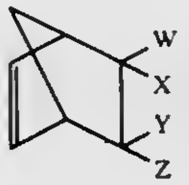
Division of Ser. No. 452,623, Mar. 19, 1974, Pat. No. 4,021,510. This application Jan. 10, 1977, Ser. No. 758,314

Claims priority, application Japan, Sep. 19, 1972, 47-93273; Oct. 4, 1973, 48-110957; Oct. 5, 1973, 48-111526

Int. Cl.^{2} C08L *51/04, 51/06, 55/02*

U.S. Cl. 260—876 R **4 Claims**

1. Rosin compositions comprising 5 to 95 parts by weight of polymers prepared by ring-opening polymerization of cyano-substituted norbornene derivatives and 95 to 5 parts by weight of graft copolymers prepared by grafting at least one vinyl compound selected from the group consisting of styrene, acrylonitrile and methyl methacrylate to at least one elastomer selected from the group consisting of butadien rubbers, acrylic esters rubbers, chlorinated polyethylene and ethylene-propylene rubbers, said cyano-substituted norbornene derivatives being expressed by the general formula



where:
W, X, Y and Z = radicals selected from the group consisting of hydrogen, nitrile group, substituents containing nitrile group, alkyl radical having 1 to 20 carbon atoms, alkenyl radical having 1 to 20 carbon atoms, aryl radical having 1 to 20 carbon atoms and aralkyl radical having 1 to 20 carbon atoms; and at least one of said W, X, Y and Z is the radical being selected from the group consisting of nitrile group and substituents containing nitrile group.

4,104,326

RESINOUS RADIAL-LINEAR COPOLYMER BLEND HAVING BLOCKS WITH A HETEROGENEITY INDEX RANGING FROM 2.5 TO 4

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1977, Ser. No. 813,582

Int. Cl.^{2} C08L *51/00, 53/00*

U.S. Cl. 260—876 B **10 Claims**

1. A composition comprising a blend of:
(1) at least one resinous radial block copolymer of at least one monovinyl-substituted aromatic compound and at least one conjugated diene, said radial block copolymer having a configuration $(A—B)_nY$, wherein A represents a block of polymerized monovinyl-substituted aromatic compound, B represents a block of polymerized conjugated diene, Y represents a residue of a polyfunctional coupling agent, and n represents the number of functional groups of the coupling agent which have entered into the coupling reaction and is an integer of at least 3, said monovinyl-substituted aromatic compound blocks having a heterogeneity index outside the range of 2.5 to 4; and
(2) at least one resinous linear block copolymer of at least one monovinyl-substituted aromatic compound and at least one conjugated diene, said resinous linear block copolymer having a configuration selected from A—B—A and $(A—B)_2X$, wherein A and B are as defined above and X is a residue of a difunctional coupling agent, said monovinyl-substituted aromatic compound blocks having a heterogeneity index outside the range of 2.5 to 4;
said blend having a heterogeneity index of said monovinyl-substituted aromatic compound blocks within the range of 2.5 to 4.

4,104,327

ADHESIVE COMPOSITIONS

Hisaaki Inoue, Fujisawa; Hisataka Komai, Kamakura, and Seiichi Okada, Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,325

Claims priority, application Japan, Jan. 16, 1975, 50/7211; Jan. 22, 1975, 50/9578

Int. Cl.^{2} C08L *7/00, 9/00, 9/06*

U.S. Cl. 260—876 B **20 Claims**

1. An adhesive composition consisting essentially of
(A) 100 parts by weight of an elastomer consisting of (I) 30 to 100% by weight of a thermoplastic elastomer expressed by the general formula $(S\text{-}B)_{n\ or\ (S\text{-}B)n\text{-}1}—S$ in which S is substantially a polystyrene block, B is substantially a polybutadiene block, and n is an integer of from 2 to 10, and (II) 70 to 0% by weight of a thermoplastic elastomer expressed by the general formula $(S—I)_n$ or $(S\text{-}I)_{n\text{-}1}—S$ in which S is substantially a polystyrene block, I is substantially a polyisoprene block, and n is an integer of from 2 to 10, and
(B) 50 to 250 parts by weight of a hydrocarbon tackifier resin containing 40 to 95% by weight of a 1,3-pentadiene unit and 60 to 5% by weight of an α-methylstyrene unit in the polymer chain and having a softening point of 60° to 140° C.

4,104,328

IMPACT RESISTANT THERMOPLASTIC MOLDING COMPOSITIONS

Johann Swoboda; Rudolf Stephan, both of Ludwigshafen, and Gerhard Heinz, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 5, 1976, Ser. No. 646,602

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2503966

Int. Cl.² C08L *51/04*

U.S. Cl. 260—876 R **6 Claims**

1. A thermoplastic molding composition consisting essentially of:

- (A) from 80 to 50% w/w, based on (A+B), of an 80:20 to 60:40 w/w copolymer of styrene and acrylonitrile; and
- (B) from 20 to 50% w/w, based on (A+B), of a graft copolymer of
  - (1) from 20 to 50% w/w, based on (B), of an 80:20 to 60:40 w/w mixture of styrene and acrylonitrile grafted on
  - (2) from 80 to 50% w/w, based on (B), of a rubbery polymer containing polymerized units of
    - (α) from 10 to 100% w/w, based on the rubbery polymer (B2), of butadiene,
    - (β) from 0 to 90% w/w, based on the rubbery polymer (B2), of an alkyl acrylate having from 1 to 8 carbon atoms in the alkyl, and
    - (γ) from 0 to 30% w/w, based on the rubbery polymer (B2), of another monomer selected from the group consisting of isoprene, styrene, acrylonitrile and their alkyl derivatives, the percentages given under (α), (β) and (γ) totaling 100% w/w,

with the proviso that the rubbery polymer (B2) serving as base for the graft copolymer has been prepared in a primary stage by polymerization of the monomers (α), (β) and (γ) in the proportions recited under (B2), said polymerization being carried out in an aqueous emulsion and in the presence of from 0.2 to 5% w/w, based on said monomers used in the primary stage, of an alkanol of from 1 to 4 carbon atoms.

4,104,329

ACRYLATE-MODIFIED ETHYLENE-VINYL ACETATE POLYMER

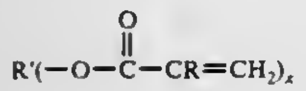
Sabet Abdou-Sabet, and J. Paul Ferrin, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 10, 1977, Ser. No. 805,535

Int. Cl.² C08F *263/04*

U.S. Cl. 260—878 R **20 Claims**

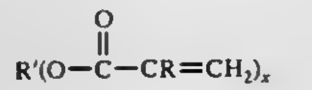
1. An acrylate-modified EVA polymer which comprises the product of EVA polymer and polyfunctional acrylate of the formula



$$R'(-O-\overset{O}{\overset{\|}{C}}-CR=CH_2)_x$$

wherein x is 2 to 5, R is hydrogen or methyl, and R' is C_1–C_{10} alkane radical, hydroxyalkane radical or said alkane radicals interrupted by —O—, phenylene, phenyleneoxy, or isocyanurate radical in which the product is substantially free of crosslinks.

11. A process for the preparation of acrylate-modified EVA polymer which comprises masticating massed EVA polymer and, in an amount effective to modify but without substantially cross-linking the polymer, polyfunctional acrylate of the formula



$$R'(O-\overset{O}{\overset{\|}{C}}-CR=CH_2)_x$$

wherein x is 2 to 5, R is hydrogen or methyl, and R' is C_1–C_{10} alkane radical, hydroxyalkane radical or said alkane radicals interrupted by —O— phenylene, phenyleneoxy, or isocyanurate radical, at a temperature and for a time sufficient to effect modification of the polymer.

4,104,330

SYNTHESIS AND COPOLYMERIZATION OF TAPERED BLOCK MACROMER MONOMERS

Morris J. Danzig, Skokie, Ill., and Ralph Milkovich, Murrysville, Pa., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 27, 1976, Ser. No. 690,757

Int. Cl.² C08F *297/04*

U.S. Cl. 260—880 B **61 Claims**

1. A copolymerizable tapered block macromolecular monomer of the formula:

I — A — B — C — A' — X

wherein I is the residue of a monofunctional anionic initiator "A" and "A'" are each a polymerized mono-alkenyl-substituted aromatic hydrocarbon, "B" is a polymer of a conjugated diene, "C" is a tapered copolymer of a mono-alkenyl-substituted aromatic hydrocarbon and a conjugated diene, "X" is a copolymerizable end group containing either a vinyl moiety, a vinylene moiety, an epoxy moiety, or a thioepoxy moiety, said tapered block macromolecular monomer having a molecular weight in the range of from about 5,000 to about 50,000 and being further characterized as having no more than one vinyl moiety, vinylene moiety, epoxy, or thioepoxy moiety on the terminal portion per linear copolymer chain.

4,104,331

PROCESS FOR THE PREPARATION OF NOVEL BLOCK POLYMERS

Robert E. Cunningham, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 536,540, Dec. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 385,916, Aug. 6, 1973, abandoned. This application Sep. 24, 1975, Ser. No. 616,354

Int. Cl.² C08F *297/04*

U.S. Cl. 260—880 B **8 Claims**

7. A block polymer composition according to claim 5 wherein the alkyl substituted styrene is selected from the group consisting of vinyl toluene, p(t-butyl) styrene, vinyl xylene and p(ethyl) styrene.

4,104,332

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

Robert P. Zelinski, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 678,097, Apr. 19, 1976, Pat. No. 4,039,633. This application Mar. 14, 1977, Ser. No. 777,218

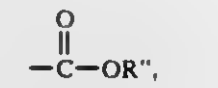
Int. Cl.² C08F *8/04, 8/18, 8/00*

U.S. Cl. 260—880 B **9 Claims**

1. A polymer having the structure

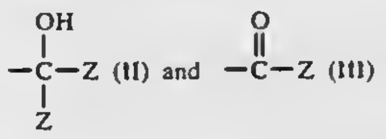
$$A(Y')_{n-1}YR_{6-n} \qquad (I)$$

wherein A represents a benzene ring, wherein the radicals R which can be the same or different, are selected from the group consisting of hydrogen and hydrocarbyl radicals with 1–6 carbon atoms per radical, the total number of carbon atoms in all R radicals being between 0 and about 10, wherein n is 2, 3 or 4, wherein the radicals Y' which can be the same or different, are selected from the group of radicals consisting of —Y and



$$-\overset{O}{\overset{\|}{C}}-OR'',$$

wherein —Y is a radical selected from the group of radicals represented by the formulae



$$-\underset{Z}{\underset{|}{\overset{OH}{\overset{|}{C}}}}-Z \text{ (II) and } -\overset{O}{\overset{\|}{C}}-Z \text{ (III)}$$

wherein R'' is hydrogen or a hydrocarbyl radical having 1–10 carbon atoms and the radicals Z, which can be the same or different, are selected from the group consisting of polymer chains of one or more alkadienes having 4–12 carbon atoms and copolymer chains of one or more alkadienes having 4–12 carbon atoms and one or more monovinylarenes of 8–18 carbon atoms, having the vinyl radical attached to an arene ring carbon atom, said polymer chains being unhydrogenated or having at least a portion of the olefinic unsaturation thereof removed by hydrogenation,

with the further provision that at least 160 polymer chains Z are present in 100 molecules of the formula (I).

4,104,333

SELF-CURING ARTIFICIAL FINGERNAILS

Henry L. Lee, Jr., Pasadena, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 665,214, Mar. 9, 1976, abandoned, which is a continuation of Ser. No. 527,221, Nov. 26, 1974, abandoned. This application Nov. 29, 1977, Ser. No. 855,629

Int. Cl.² C08F *265/06*

U.S. Cl. 260—885 **13 Claims**

1. A self-curing, dermatologically acceptable composition to be applied to a natural nail as a hardenable coating or to form an artificial nail, which composition consists essentially of a mixture of the following ingredients, by weight based on the total weight of the composition:

- (a) from about 5% to about 80% of a first addition polymerizable, ethylenically unsaturated monomer that can form a cross-linked polymer upon polymerization during self-curing of the composition, which monomer contains in its molecule at least two groups that are capable of being addition polymerized upon contact with a peroxide-type free radical initiator and a tertiary amine-type accelerator, the polymerizable groups being members of the group consisting of allyl, acryloyl, methacryloyl, or combinations thereof;
- (b) a second monomer that is monoethylenically unsaturated, in an amount up to about 60%, that copolymerizes with the first monomer upon self-curing of the composition to form a copolymeric structure that is cross-linked, the second monomer being either tetrahydrofurfuryl acrylate or tetrahydrofurfuryl methacrylate;
- (c) a peroxide-type free radical initiator;
- (d) a tertiary amine-type accelerator; and
- (e) from about 5% to about 60% of a polymeric filler that is at least partially soluble in the composition;

the composition being formulated and the initiator and the accelerator being present in a quantity to cause self-curing to occur in situ within about 120 to about 400 seconds after mixture of the ingredients and application to a nail, under ambient conditions to which the nail is normally exposed including ambient temperature and the presence of atmospheric oxygen.

4,104,334

RUBBER COMPOSITION

Kenneth E. Snavely, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1975, Ser. No. 621,099

Int. Cl.² C08L *9/06, 23/22*

U.S. Cl. 260—888 **6 Claims**

1. A halogen-free vulcanizable rubber composition consisting essentially of

- from 70 to 90 parts per hundred parts rubber of at least one butyl rubber, and
- from 30 to 10 parts per hundred parts rubber of at least one solution formed random copolymer of at least one vinylaromatic monomer of 8 to 12 carbon atoms and a conjugated acyclic diene monomer of 4 to 8 carbon atoms, said random copolymer having been produced by polymerizing said vinylaromatic monomer and said acyclic diene monomer in solution in the presence of a randomizing agent, wherein the total quantity of the butyl rubber and the solution formed random copolymer is 100 parts per hundred parts rubber, and
- from 0.1 to 8 parts per hundred parts rubber of a vulcanizing agent selected from the group consisting of sulfur, tetramethylthiuram disulfide, dimorpholinyl disulfide, and dibutylxanthogen disulfide, and mixtures thereof.

4,104,335

DUSTLESS, FREE-FLOWING ULTRAVIOLET ABSORBING COMPOSITIONS FOR POLYOLEFINS

Leigh Cameron Allen, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 2, 1976, Ser. No. 719,796

Int. Cl.² C08K *5/36*

U.S. Cl. 260—897 A **7 Claims**

1. An essentially dustless, free-flowing light stabilizer composition for polyolefins comprising an intimate mixture of a nickel amine complex of a 2,2'thiobis(4-alkylphenol) and from about 1 to 10 percent by weight thereof of a low molecular weight polyethylene.

4. A composition stabilized against the deteriorative effects of ultraviolet radiation comprising a polymer of a mono-olefin and an effective stabilizing amount of the dustless light stabilizer composition of claim 1.

4,104,336

POLYETHYLENE MODIFIERS FOR HIGH NITRILE POLYMERS

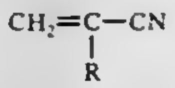
I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 7, 1977, Ser. No. 774,885

Int. Cl.² C08L *23/06, 25/12, 33/18, 33/20*

U.S. Cl. 260—897 A **10 Claims**

1. A nitrile polymer composition comprising (a) from about 50 to about 90% by weight, based on total polymer weight calculated as acrylonitrile, of a polymerized nitrile monomer having the formula:



$$CH_2=\underset{R}{\underset{|}{C}}-CN$$

wherein R is hydrogen, an alkyl group of 1 to 4 carbon atoms or halogen, (b) one or more ethylenically unsaturated polymerized comonomer materials, and (c) from about 0.005 to about 2% by weight based on total polymer weight, of a low molecular weight polyethylene modifier.

4,104,337

MIXTURE FEED REGULATION DEVICE FOR AN INTERNAL-COMBUSTION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Jul. 27, 1977, Ser. No. 819,565

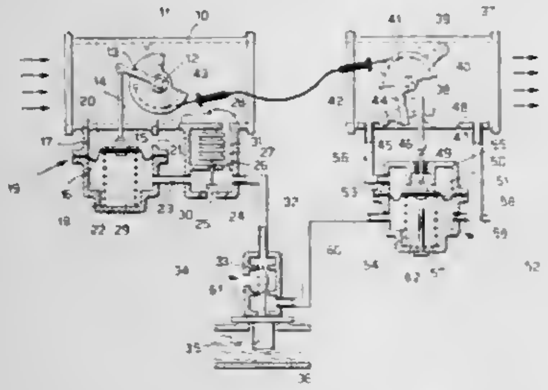
Claims priority, application Italy, Aug. 4, 1976, 26015 A/76

Int. Cl.² F02M *1/10*

U.S. Cl. 261—39 A **3 Claims**

1. A device for the regulation of the feed of mixture in an internal combustion engine when operating at high altitudes during the engine warm-up stage and the accelerator pedal release stage, characterized in that it comprises first valve

means arranged in the duct through which the air drawn by the engine flows upstream of the usual valve throttling means actuated by the driver through the accelerator pedal and arranged at the inlet of the feeding ducts of the engine, a first diaphragm capsule in which the diaphragm is mechanically linked to the first valve means aforesaid, a chamber in the capsule being in communication with the outside atmosphere, the other chamber of the capsule being in communication, through a calibrated port, with the duct through which air flows downstream of same first valve means and being also in communication with the outside atmosphere through a first variable-cross-section port as defined by valve means operatively connected to a member responsive to a pressure which is a function of the ambient pressure and through a second variable-cross-section port defined by valve means operatively connected to a member sensitive to the engine working temperature, resilient means in engagement with said diaphragm balancing the force due to the pressure differential on the diaphragm faces, the device further comprising stop means in engagement with said throttling value means, said stop means being capable of varying the end-of-stroke position of said usual throttling valve means, said stop means being mechanically linked to the diaphragm of a second diaphragm capsule, a chamber of the capsule being in communication with the duct through which air flows downstream of said first valve means, the other chamber of the capsule being in communication with at least an engine-feeding duct downstream of the usual feed-throttling means through a second calibrated port and being also in communication with the outside atmosphere through a third variable-cross-section port as defined by valve means operatively connected with a member responsive to the engine working temperature, resilient means in engagement with said diaphragm balancing the force originated by the pressure differential on the diaphragm faces.



4,104,338

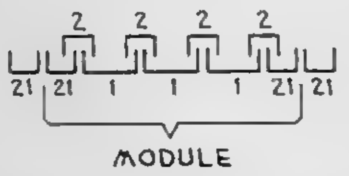
BUBBLE CAP TRAY

Salvatore A. Guerrieri, 503 Beverly Rd., Newark, Del. 19711

Filed Apr. 30, 1976, Ser. No. 682,088

Int. Cl.^{2} B01D *3/20*

U.S. Cl. 261—114 TC 4 Claims



1. An improved liquid-vapor contacting bubble cap tray constructed of channels of two different widths and thicknesses, each channel having a cross section shaped approximately like a block U, the wider channels forming the tray floor and chimneys, being spaced from each other with the sides of channels pointing upward and the space between two adjacent troughs being closed at each end by an end closure whereby the combination of the sides of two adjacent channels and the two end closures form a long, low, narrow chimney; the narrower channels, with sides pointing downward, and with each end closed by said end closures, to form caps which are positioned over the chimneys, thereby providing a continuous vapor passage connecting the space below said channels with the space above them, said vapor passages being uniformly spaced across the diameter of the tower with their long axes parallel to each other, the improvement wherein said tray channels are thinner than said cap channels and said end closures have a modified U-shaped cross section, the outer extension of the sides of said U being at a greater distance from each other than inner extensions, said sides being formed by turning said inner extension first outwardly 90° and extending said sides outwardly for a distance and then turning said outward extension back 90° to form sides extending in the same direction as the inner extension of said sides but spaced at a greater distance from each other, the distance between the outside faces of the narrower portion of said closure being equal to the distance between adjacent tray channels, the distance between the outside faces of the wider portion of said closure being equal to the inside width of the cap channel, the height of said closure being equal to the distance between the bottom face of said tray channels and the inside top face of the cap channel, the ends of the tray channels, the cap channel and said closures being firmly attached to each other.

4,104,339

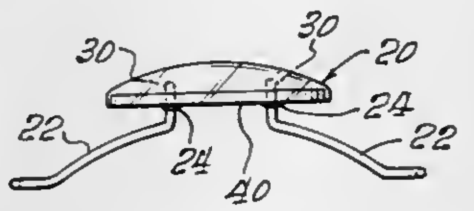
METHOD FOR THE MANUFACTURE OF INTRAOCULAR LENSES

James G. Fetz, 14930 E. Ramona Blvd., Baldwin Park, Calif. 91706, and Ronald P. Jensen, 540 N. Central Ave., Glendale, Calif. 91203

Filed Dec. 3, 1975, Ser. No. 637,321

Int. Cl.^{2} B29D *11/00;* A61F *1/16, 1/24*

U.S. Cl. 264—1 13 Claims



1. A method for connecting an attachment to the material of a thermoplastic intraocular lens body, said attachment being comprised of a length of thin metal line or wire, the method comprising the steps of providing a thermoplastic intraocular lens body having a central area constituting an area of vision and a surrounding area outside said area of vision; providing an attachment in the form of a length of thin metal line or wire adapted to be attached to said lens body; positioning at least one end of the attachment internally of said lens remote from the outer periphery of said lens body and outside said area of vision, heating said material to its melting point only in the vicinity of said at least one end; said steps of positioning at least one end of the attachment internally of the lens body and of heating said material to its melting point being performed simultaneously, by applying heat to said metal attachment to raise its temperature and pushing said at least one end into the material of the lens body, whereby the material of the lens body in the vicinity only of the said at least one end is melted to permit positioning of said at least one end in said lens body and whereby upon cooling, said material forms a fused connection with said attachment.

10. A method for connecting an attachment to the material of a thermoplastic intraocular lens body, said attachment being comprised of a length of thin line or wire, the method comprising the steps of providing a thermoplastic intraocular lens body having a central area constituting an area of vision and a peripheral area outside said area of vision; providing an attachment in the form of a length of thin line or wire adapted to be attached to said lens body; positioning at least one end of the attachment internally of said lens body outside said area of vision, heating said material to its melting point only in the vicinity of said at least one end; and allowing the melted material to cool, whereby to form a fused connection between said material and said attachment, the steps of positioning at least one end of the attachment internally of said lens body comprising drilling a pair of spaced holes into the anterior surface of said lens body along parallel paths spaced on opposite sides of and exterior to said area of vision and less than half way through said lens body and placing the two ends of the attachment into said holes; the heating of said material comprising the positioning of a heatable probe outside the base of said lens body in alignment with one of said ends positioned in one of said holes; heating said probe and moving it into and through the base of said lens body into contact with one of said two ends by melting the lens body material from the base through to said end and melting the material adjacent said end; removing said probe; repositioning said probe in alignment with the second of said ends positioned in the other of said holes; heating said probe and moving it into and through the base of said lens body into contact with said second end; and removing the probe and allowing the attachment and lens body to cool whereby to form a loop attachment having two ends fused to the material of the lens body.

4,104,340

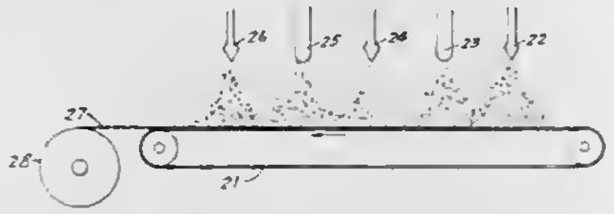
METHOD OF MAKING STRUCTURAL MEMBER FROM PREPREG SHEET OF FUSIBLE RESIN MICROFIBERS AND HEAT-RESISTANT REINFORCING FIBERS

Gene R. Ward, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 544,192, Jan. 27, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 712,834

Int. Cl.^{2} B01J *2/04*

U.S. Cl. 264—6 15 Claims



1. Method of making a fiber-reinforced structural member comprising the steps of

(a) extruding at least one jet of liquefied resin, which fuses within the range of 50°–300° C, through a fine orifice into a high-velocity stream of gas where the extruded jet is attenuated, subdivided, and cooled to form a stream of randomly intermingled solid fusible microfibers having an average diameter of 0.1–25 micrometers;

(b) directing said stream of microfibers and at least one stream of reinforcing fibers which have an average length of at least 1 cm and do not fuse or degrade at or below the fusing temperature of the microfibers at a longitudinally moving porous screen so as to intermingle 12–98 volume-parts of said fusible microfibers and 2–80 volume-parts of said reinforcing fibers and form a composite open pliant prepreg sheet having a lofty surface quality enabling said sheet to conform to and cling to mold surfaces; said fusible microfibers extending to both surfaces of said formed sheet;

(c) removing said prepreg sheet from the porous screen;

(d) placing at least one layer of said prepreg sheet in a mold, to the surfaces of which said sheet clings;

(e) heating and pressing said prepreg sheet in said mold to fuse the microfibers to provide an essentially void-free matrix for the reinforcing fibers; and

(f) cooling said sheet and releasing the pressure to provide an essentially void-free structural member comprising reinforcing fibers in a matrix of the resin of the microfibers.

4,104,341

UTILIZATION OF CONSTITUENTS OF EFFLUENT FROM THE MANUFACTURE OF STYRENE BEAD POLYMERS IN THE MANUFACTURE OF FIBRIDS

Hans Georg Keppler, Weinheim; Bruno Sander; Rolf Moeller, both of Ludwigshafen; Eckhard Bonitz, Frankenthal, and Werner Simmler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Apr. 6, 1976, Ser. No. 674,148

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516562

Int. Cl.^{2} B22D *23/08*

U.S. Cl. 264—9 1 Claim

1. A process for the manufacture of discrete fibrids from a macromolecular waste material contained in the aqueous phase effluent obtained form the bead polymerization of a styrene monomeric reactant after removal of the bead polymer, said polymerization having been carried out in the presence of a vinylpyrrolidone polymer or a vinyl alcohol polymer as a protective colloid also present in said effluent, which process comprises:

flocculating said macromolecular waste material in said aqueous phase effluent by carrying out one of the following steps,

(a) when said effluent contains said vinylpyrrolidone polymer, by adding per 100 parts of effluent about 0.05 to 5.0 parts of a water-soluble or water-dispersible high molecular weight compound containing at least 10 percent by weight of polymerized acrylic acid units, or the alkali metal or ammonium salts thereof, and reducing the pH below 3 by adding an inorganic acid, or

(b) when said effluent contains said vinylpyrrolidone polymer or said vinyl alcohol polymer, by heating the effluent in the presence of from about 0.02 to 5 percent by weight of sodium persulfate, potassium persulfate or ammonium persulfate;

separating the resulting flocculated macromolecular waste material from the effluent as a solid product;

dissolving or finely dispersing the waste material obtained as the solid product in an organic solvent selected from the group consisting of tetrahydrofuran and 1,4-dioxane; and

introducing the resulting solution or dispersion into water as a fluid precipitation medium to precipitate the waste material under shearing forces applied thereto sufficiently to produce fibrids having a specific surface area of from 10 to 30 m^2/g, a freeness of from 15 to 30° SR, a length of from 0.5 to 20 mm and a thickness of from 1 to 10 μ.

4,104,342

METHOD FOR MAKING METAL POWDER OF LOW OXYGEN CONTENT

Otto Wessel, Duisburg; Georg Hofmann, Krefeld; Hartmut Gesell, and Werner Scholz, both of Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 29, 1972, Ser. No. 284,504

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1971, 2144220

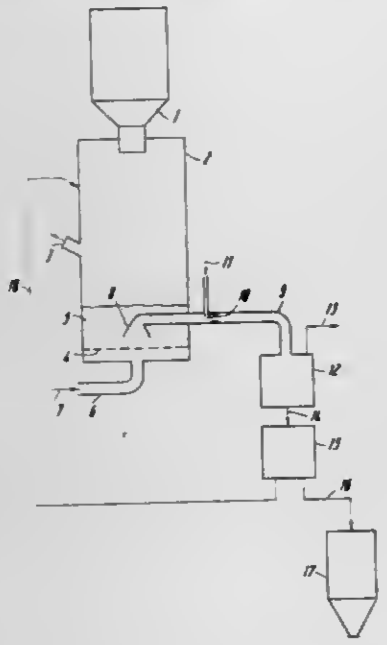
Int. Cl.^{2} B01J *2/16*

U.S. Cl. 264—12 13 Claims

1. In a method of producing metal powder by means of atomizing a stream of molten metal through a pressurized gas, wherein the resulting metal droplets upon solidifying fall as particles in a vessel towards the bottom of the vessel, in which the atomization takes place, the improvement comprising the steps of:

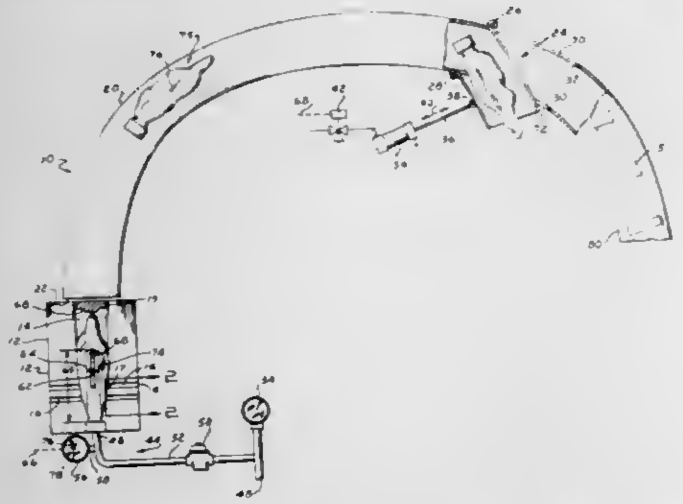
(a) providing a cooling powder to the vessel, the powder having temperature below the melting point of the metal;

(b) feeding a gas into the vessel near the bottom thereof and including blowing the gas in an upward direction for blowing the cooling powder also in an upward direction to form a fluidized bed, the falling metal particles as intercepting the upwardly blown cooling powder is intimately mixed with said cooling powder for obtaining a mixture of metal particles and cooling powder whirling together in the fluidized bed, wherein said metal particles are cooled and solidified by the cooling powder;



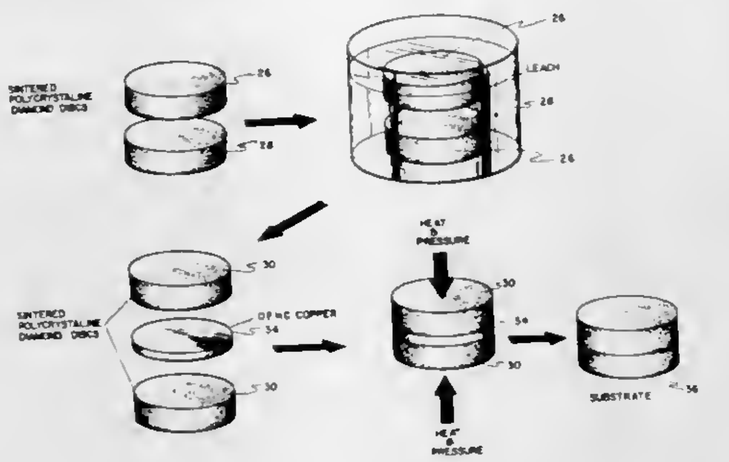
(c) extracting a portion of the mixture of solidified metal particles and cooling powder from the fluidized bed in the vessel by maintaining an extracting gas flow from the vessel carrying along metal particles and cooling powder as mixed together and out of the vessel.

4,104,343
DETECTING AND SORTING ABNORMAL ARTICLES DURING BLOW MOLDING
Harry C. Cornelius, East Granby, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Mar. 4, 1977, Ser. No. 774,618
Int. Cl.^{2} B29C *17/07*
U.S. Cl. 264—40.1 **8 Claims**



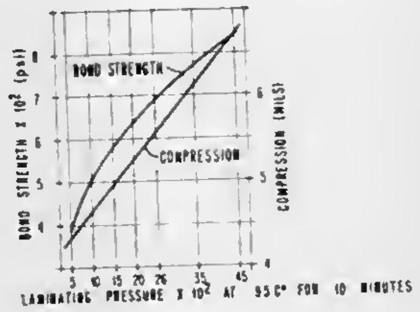
1. In the process of blow molding hollow articles which includes the step of:
distending precursors of thermoplastic material at molding temperature within the cavity of a blow mold with fluid under pressure while venting residual air within said cavity to the exterior of said mold;
the improvement which comprises, in combination:
sensing a variation in pressure of said fluid outside a predetermined limit upstream of the mold during said distending when an abnormal article of unacceptable quality is formed in said cavity from one of such precursors; and
creating a signal in response to said variation to isolate said abnormal article from those of acceptable quality.

4,104,344
HIGH THERMAL CONDUCTIVITY SUBSTRATE
Bill J. Pope; M. Duane Horton, and H. Tracy Hall, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah
Filed Sep. 12, 1975, Ser. No. 612,603
Int. Cl.^{2} C04B *35/52*
U.S. Cl. 264—42 **3 Claims**



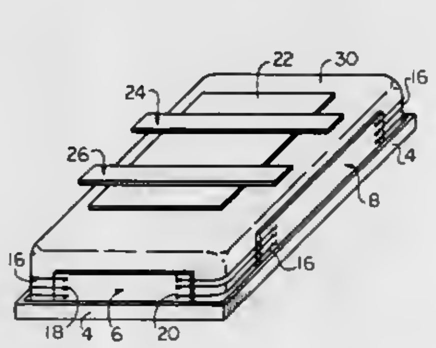
1. A method of treating a polycrystalline diamond composite so as to make a high thermal conductivity substrate usable as a heat sink, the method comprising the steps of:
preparing at least one sintered polycrystalline diamond composite;
leaching the composite to remove non-diamond carbon;
placing a selected quantity of material having known electrical conductivity characteristics in contact with the leached composite; and
infusing the selected quantity of material of known electrical conductivity characteristics such that the material is infiltrated into the leached composite by subjecting both the leached composite and the material to pressure and temperature conditions under which conversion of diamond to graphite will be minimized while at the same time maintaining the material in a molten state until it is perfused sufficiently into the leached composite, thereby forming a unitary substrate having both (1) high thermal conductivity properties and (2) selected electrical conductivity properties which enable use of the substrate as a heat sink.

4,104,345
CERAMIC DIELECTRICS
Leslie C. Anderson, Poughkeepsie; Robert W. Nufer, Hopewell Junction, and Frank G. Pugliese, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 589,305, Jun. 23, 1975, which is a continuation-in-part of Ser. No. 158,387, Jun. 30, 1971, abandoned. This application Mar. 11, 1977, Ser. No. 776,815
Int. Cl.^{2} C08J *9/28*
U.S. Cl. 264—43 **26 Claims**



1. A thermoplastic resin composition adapted for forming ceramic slips comprising:
(A) a solvent soluble thermoplastic organic resin dissolved in a
(B) volatile organic solvent mixture completely miscible with said resin and comprising a first solvent fraction and a asolvent fraction, with
- (a) said first solvent fraction constituting a complete solvent for said resin,
- (b) said asolvent fraction providing a maximum solubility of 5% for said resin therein,
- (c) the ratio of the evaporation rates of said first solvent fraction to said asolvent fraction being at least two, and
- (d) the ratio, in parts by weight in said mixture, of said first solvent fraction to said asolvent fraction being less than said evaporation rate ratio.

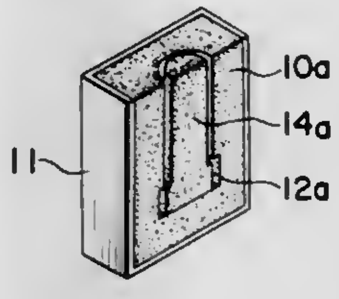
4,104,346
PROCESS FOR MOLDING A SUBSTANTIALLY ISOTROPIC ISOCYANATE-BASED POLYMER FOAM BUN
John N. Curtiss, Seabrook; Charles E. Koehler, Baytown, and Pat L. Murray, Dayton, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Jul. 29, 1976, Ser. No. 709,777
Int. Cl.^{2} B29D *27/04*
U.S. Cl. 264—51 **10 Claims**



1. In a process for molding a substantially isotropic isocyanate-based polymer foam bun by charging an isocyanate-based polymer foam forming mixture to a box mold, the improvement which comprises charging said foam forming mixture to a mold having
- (i) a floor,
- (ii) sidewalls of which at least one oppositely disposed pair is adapted to slide laterally outwards on said floor, said sidewalls being held in initially abutting relationship by extensible coupling means, and
- (iii) stop means provided on said floor of said mold to limit the outward movement of such of said sidewalls as are adapted to slide laterally;

the amount of foam forming mixture so charged being in excess of the amount which, after expansion under free rise conditions, is necessary to fill said mold cavity in unexpanded condition of the latter;
closing said mold by means of a cover slidably mounted on, but not attached to, the upper edges of said sidewalls;
permitting said laterally slidable sidewalls to be pushed outwardly towards said stop means when the lateral pressure exerted by the rising foam exceeds the restraining pressure exerted by said extensible coupling means; and
permitting said mold cover to float freely on the upper surface of said rising foam after the latter contacts the underside of said cover.

4,104,347
METHOD OF MAKING A SAND MOLD
Yoshinobu Ohashi, Nishinomiya, and Shizuo Inoue, Amagasaki, both of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Nov. 17, 1975, Ser. No. 632,720
Claims priority, application Japan, Nov. 19, 1974, 49-134772; Nov. 19, 1974, 49-142294[U]; Feb. 18, 1975, 50-20596
Int. Cl.^{2} C04B *35/14*
U.S. Cl. 264—113 **1 Claim**



1. A method of making a sand mold having a part molding cavity and a core for casting an annular part between the portion defining said part molding cavity and said core, comprising:
- (a) forming a mixture of sand having a particle size of 200–400 microns and a self-hardening binder therefor;
- (b) placing a sufficient amount of said mixture in a mold jacket to fill said mold jacket;
- (c) pressing and forming said mixture in said mold jacket into a block having at least one surface a portion of which is a substantially planar;
- (d) relieving said block of said pressure;
- (e) allowing said block to stand to permit said binder to partially cure to give said block a predetermined compressive strength of from 2–10 kg/cm^2 which is less than the ultimate compressive strength when said binder is fully cured;
- (f) bringing into contact with said portion of said surface the cutter element of a rotating blade assembly to cut said block and moving the peripheral surface of said cutter element which trails, relative to the direction of movement of said blade assembly, the portion of the cutter element which carries out the cutting action along the surface exposed by the cutting for exerting a compressive force on the exposed surface;
- (g) moving said blade assembly in a plane transverse to said block planar surface while said blade assembly continues cutting in said block a core molding cavity corresponding to the shape of a core for at least part of the part to be cast;
- (h) applying a coating of a parting agent to the exposed surface of said core molding cavity;
- (i) placing an additional amount of said mixture in said core molding cavity to fill said core molding cavity;
- (j) pressing and forming said mixture in said core molding cavity into a core member corresponding to the shape of the core molding cavity;
- (k) relieving said core member of said pressure;
- (l) removing said core member from said core molding cavity;
- (m) again carrying out the steps (f) and (g) for further cutting the exposed surface of said block in said core forming cavity to form in said block the part molding cavity; and
- (n) placing said core member in said part molding cavity as at least part of the core for the annular part prior to casting the annular part.

4,104,348

METHOD AND APPARATUS FOR FILLING MOLDS

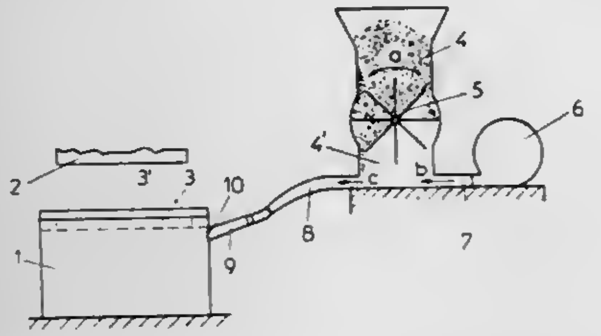
Edmund Munk; Herbert Haas, and Gerd Weinberg, all of Oberstenfeld, Fed. Rep. of Germany, assignors to Werzalit-Pressholzwerk J.F. Werz Jr. KG, Oberstenfeld, Fed. Rep. of Germany

Continuation of Ser. No. 337,217, Mar. 1, 1973, which is a division of Ser. No. 78,959, Oct. 7, 1970, which is a continuation of Ser. No. 655,024, Jul. 21, 1967. This applicatioo May 21, 1976, Ser. No. 688,919

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1966, 49820

Int. Cl.^{2} B29C *5/06*

U.S. Cl. 264—121 **5 Claims**



1. A method of filling a mold with fibrous material and pressure molding the material in the mold, said method comprising the steps of providing a female mold having a cavity having an open end and an inlet port extending transverse to said open end and communicating with the cavity adjacent said open end; placing across said open end a screening device having an inner surface facing the interior of said cavity and having a predetermined configuration; feeding into a stationary chamber spaced from said mold a stream of the fibrous material in a first direction while passing a stream of gas in a second direction transverse to said first direction through the stream of fibrous material so that the fibrous material is entrained by said gas stream; blowing said stream of gas with said fibrous material entrained therein through said inlet port into the cavity of said mold substantially parallel to and adjacent the screening device while venting the gas through said screening device thus retaining the fibrous material in said cavity for uniformly charging the same; terminating admission of the stream of gas with the fibrous material entrained therein when the cavity is fully charged; closing said port; removing said screening device; and applying a male plunger of a configuration corresponding to said predetermined configuration through said open end of said cavity to thereby pressure mold the fibrous material in said mold.

4,104,349

METHOD OF MAKING A PERFORATED, MOLDED CONTAINER

David E. Hillgenberg, 551 W. Parkwood Ave., La Habra, Calif. 90631

Filed Feb. 4, 1976, Ser. No. 655,667

Int. Cl.^{2} B29C *17/03, 17/10*

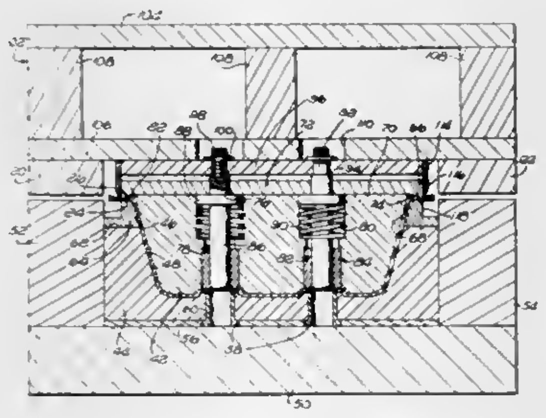
U.S. Cl. 264—153 **9 Claims**

1. In the molding of a container by forming a softened sheet of organic polymer material between male and female mold parts in which said sheet is disposed over a female die surface arranged on said female mold part to define the side and bottom walls of said container and said male mold part includes a male die surface arranged to close with said female mold part, the improvement for forming a peripheral lip entirely around the top edge of said container, sand improvement comprising:

providing an annular region on said female die surface for defining a peripheral lip of said container;

slidably disposing a blade of steel entirely around said male mold part said blade being formed with serrates pointing downwardly and closely adjacent the outer edge of said male mold parts;

moving said mold parts together to form said container; and thereafter sliding said blade downwardly so that said serrates tear through said sheet of organic material to define the outer edge of said lip,



molding said container bottom so as to form at least one platform region displaced inwardly from surrounding portions of the container bottom and perforating said at least one platform region while said material is between said male and female mold parts by moving a punch member relative said mold parts and through said platform regions.

4,104,350

PROCESS FOR ENCAPSULATING OBJECTS AND FOR FORMING FLEXIBLE MOLDS

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 23, 1975, Ser. No. 616,092

Int. Cl.^{2} B29C *1/02, 6/02*

U.S. Cl. 264—225 **7 Claims**

1. A method of encapsulating regular or irregular shaped objects which comprises:

forming a mixture comprising (1) an uncured or partially cured poly(oxyalkylene)-polyester-poly(monosulfide)-polythiol having an average of more than two pendent thiol groups per molecule formed by reacting (a) at least one mercaptoalkanoic acid, (b) at least one thiodialkanoic acid, and (c) at least one poly(oxyalkylene)-polyol containing an average of more than two pendent hydroxyl groups per molecule and a molecular weight in the range 200–20,000; and (2) a curing agent selected from metallic oxides, organic peroxides, organic hydroperoxides, metallic salts of carboxylic acid, ammonium persulfate, sulfur, metal chromates, and dichromates which is present in an amount sufficient to convert at least about 70 percent of the pendent thiol groups to polysulfide groups;

immersing the desired object in said uncured or partially cured mixture; and

allowing said mixture containing said object immersed therein to cure and form a solid mass encapsulating said object.

4. A method of producing molds and molding regular or irregular shaped objects which comprises:

forming a mixture comprising (1) an uncured or partially cured poly(oxyalkylene)-polyester-poly(monosulfide)-polythiol having an average of more than two pendent thiol groups per molecule formed by reacting (a) at least one mercaptoalkanoic acid, (b) at least one thiodialkanoic acid, and (c) at least on poly(oxyalkylene)-polythiol containing an average of more than two pendent hydroxyl groups per molecule and a molecular weight in the range 200–20,000; and (2) a curing agent selected from metallic oxides, organic peroxides, organic hydroperoxides, metallic salts of carboxylic acid, ammonium persulfate, sulfur, metal chromates, and dichromates which is present in an amount sufficient to convert at least about 70 percent of the pendent thiol groups to polysulfide groups;

immersing a replica of the desired object in said uncured or partially cured mixture;

allowing said mixture containing said object immersed therein to cure by heating at a temperature in the range of about −20° C to about 100° C for a time ranging from about one minute to about 24 hours to form a solid mass encapsulating said object;

removing the object from the solid mass of cured formulation, leaving a mold having a cavity of desired size, shape, and proportion in which a regular or irregular shaped object can be molded;

filling the cavity with a moldable material and allowing same to form the desired object within said cavity conforming to the shape of said cavity; and

removing said desired object from said cavity.

4,104,351

PROCESS FOR SHAPING LOW DUROMETER SILOXANE ELASTOMERS CONTAINING POLYTETRAFLUOROETHYLENE POWDER

John D. Blizzard, and Carl M. Monroe, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 591,906, Jun. 30, 1975, abandoned. This application Jun. 3, 1976, Ser. No. 692,614

Int. Cl.^{2} B29C *25/00*

U.S. Cl. 264—236 **4 Claims**

1. A method of preparing a low durometer elastomeric article comprising:

(i) preparing a composition by mixing components consisting essentially of
  (a) 100 parts by weight of a polydiorganosiloxane gum having a Williams plasticity of from 0.040 to 0.100 inches and having an average of from 1.999 to 2.001 organic radicals per silicon atom, at least 95 percent of the organic radical being methyl, any remaining organic radical being selected from the groups consisting of 3,3,3-trifluoropropyl and monovalent hydrocarbon radicals having from 1 to 6 carbon atoms, no more than 0.1 percent of all organic radicals in (a) having aliphatic unsaturation, said gum being endblocked with radicals selected from the group consisting of silicon-bonded hydroxyl radicals and silicon-bonded vinyl radicals,
  (b) from 15 to 25 parts by weight of a reinforcing silica filler having a surface area of at least 50 square meters per gram,
  (c) from 0.3 to 1.0 parts by weight, for every 100 parts by weight of the total of (a) and (b) of a polytetrafluoroethylene powder having an average particle diameter of less than 1,000 microns and,
  (d) from 0.3 to 2.0 percent by weight, based on the total weight of said composition of an organic peroxide curing agent,
(ii) extruding said composition to form a desired article,
(iii) heating said article at an elevated temperature to cure said composition and,
(iv) recovering the cured article of (iii) as an elastomeric article characterized by a durometer of less than 30 and reduced porosity.

4,104,352

METHOD OF MAKING A BOWLING PIN

Wesley W. Morgan, San Antonio, and Frank E. Davis, Arlington, both of Tex., assignors to Columbia Industries, Inc., San Antonio, Tex.

Division of Ser. No. 425,327, Dec. 17, 1973, abandoned. This application Mar. 30, 1977, Ser. No. 782,901

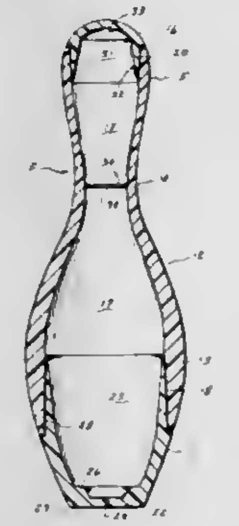
Int. Cl.^{2} B29C *5/00;* **B29D** *9/00;* **B29G** *1/00*

U.S. Cl. 264—250 **8 Claims**

1. The method for forming a plastics body having a cavity therein comprising:

predetermined quantities of at least first and second thermosetting molding materials are preliminary shaped in at least one mold to form at least one rough molding, said materials being adapted to form portions of the final product having different hardness characteristics.

placing said at least one rough molding in a mold cavity of a finishing mold having a desired shape,



thereafter inserting at least one mandrel into said mold cavity and into said at least first and second materials so as to at least partially mix adjacent portions of said materials, and

curing said materials with heat thereby forming said body, and removing said at least one mandrel from said body and said body from said finishing mold.

4,104,353

METHOD OF INJECTION MOULDING OF ARTICLES OF SEVERAL MATERIALS

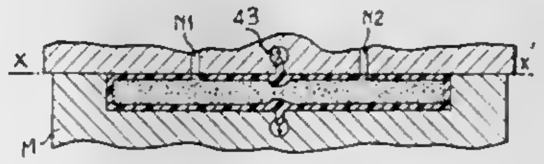
Bernard Leon Monnet, Bellignat, France, assignor to Billion S.A., Oyonnax, France

Division of Ser. No. 508,568, Sep. 23, 1974, Pat. No. 4,029,454. This application Apr. 5, 1976, Ser. No. 673,940

Claims priority, application France, Sep. 25, 1973, 73 34327

Int. Cl.^{2} B29D *27/00*

U.S. Cl. 264—255 **12 Claims**



1. A method of injection molding of complex articles of large size, having at least locally, composite portions comprised of at least two materials of different compositions, one of which is coated by the other, the injection of the materials forming said composite portions being effected in at least two different zones of the mold cavity, said method comprising the steps of:

injecting into each said zone of the mold cavity a mass of a moldable first material,

injecting into each mass of first material a mass of a moldable second material which pushes said first material against the walls of said mold cavity and toward the first material in the other zone of the mold cavity whereby the masses of the first material form a junction, and

evacuating adjacent the junction of the masses of said first material a quantity of the first material situated between said masses of said second material to enable the two masses of said second material to join and mix together to form a homogeneous core of second material in said composite portion.

4,104,354
METHOD FOR ASSEMBLING BY ADHESION WITH SYNTHETIC RESINS

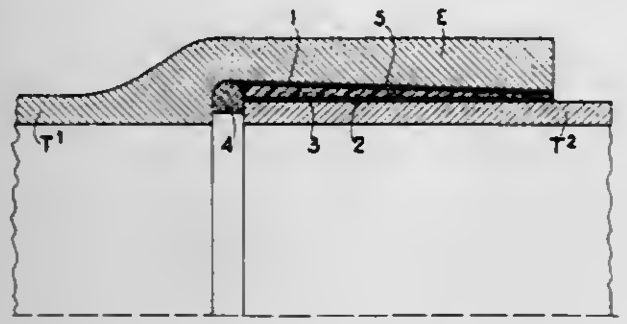
Donald Arthur Hubbard, Cambridge, England, assignor to Pont-A-Mousson S.A., Pont-A-Mousson, France

Continuation of Ser. No. 426,733, Dec. 20, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,943

Claims priority, application France, Dec. 29, 1972, 7246885; Oct. 26, 1973, 73 38341

Int. Cl.² B29C *27/00;* **B29G** *7/00*

U.S. Cl. 264—262 23 Claims



1. A method for assembling two planar parts at surrounding temperature with no necessity to apply heat comprising applying on a surface of each the parts to be assembled a thin layer of a polymerizable first mixture at surrounding temperature and containing a first resin which polymerizes slowly at surrounding temperature and is slightly exothermic as it polymerizes and has a good adherence to said surfaces while allowing a space between said thin layers in the desired and final position of said parts, and thereafter introducing in said space between the layers, before the first resin has substantially polymerized, a polymerizable second mixture at surrounding temperature and containing a second resin which polymerizes more rapidly at surrounding temperature than said first resin and has a good adherence to the first resin and is sufficiently exothermic as it polymerizes to accelerate the polymerization of the first resin, said method including a step of adding a filler between the layers of said first mixture before said second mixture is introduced by injecting the second mixture in said filler and in said space.

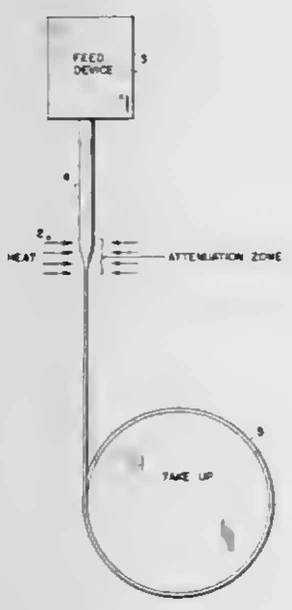
4,104,355
VITREOUS FIBER DRAWING PROCESS

Stanley A. Dunn, and Elmer G. Paquette, both of Madison, Wis., assignors to Bjorksteo Research Laboratories, Inc., Madison, Wis.

Filed May 3, 1976, Ser. No. 682,444

Int. Cl.² B29C *17/02*

U.S. Cl. 264—290 R 6 Claims



1. The process of drawing an inviscid melt spun fiber having a composition consisting essentially of at least one nonnetwork forming refractory metal oxide, said composition characterized by melting at a relatively high temperature so that it has a solidus point or melting point in excess of 1300° C., said process characterized by drawing at a temperature significantly below said temperature at which said composition melts so that all temperatures in the heated zone within which the fiber undergoes attenuation are substantially below the said solidus point or melting point of said composition, so as to produce controlled devitrification.

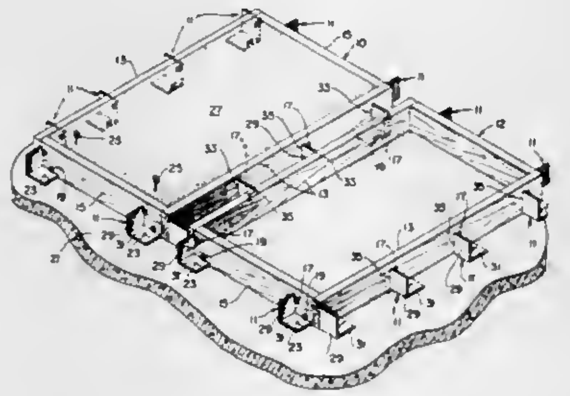
4,104,356
TILT-UP PANEL BRACKET

Joseph Paul Deutsch, 21 Almond Tree La., Irvine, Calif. 92664, and Ray A. Jones, 9760 Lemon Ave., Alta Loma, Calif. 91701

Filed Jan. 26, 1977, Ser. No. 762,602

Int. Cl.² E04B *1/40*

U.S. Cl. 264—297 5 Claims



1. A method of forming a tilt-up, concrete wall panel, comprising:

aligning wood form members on a horizontal slab of set concrete to define the length and width of a tilt-up concrete wall panel, said panel being shorter and narrower than said slab;

placing a plurality of angle iron members in abutment with the exterior surfaces of said wood form members, each of said angle iron members having a horizontal and vertical leg each of which abuts said wood form members, said angle iron members oriented so that said vertical leg extends outwardly from the adjacent wood form member in a plane perpendicular thereto;

driving a nail through a pilot hole in a tab provided on one of said vertical and horizontal legs of each of said angle iron members into said wood form members;

attaching said horizontal leg of each of said angle iron members to said horizontal slab using easily removable attachment means;

pouring concrete into the form provided by said wood form members to form a tilt-up wall section; and

after said tilt-up wall section has cured, removing said wood form members by removing said angle iron members, said nails, and the means attaching said horizontal leg of said angle iron members in one operation by jarring said angle iron members away from said horizontal slab of concrete.

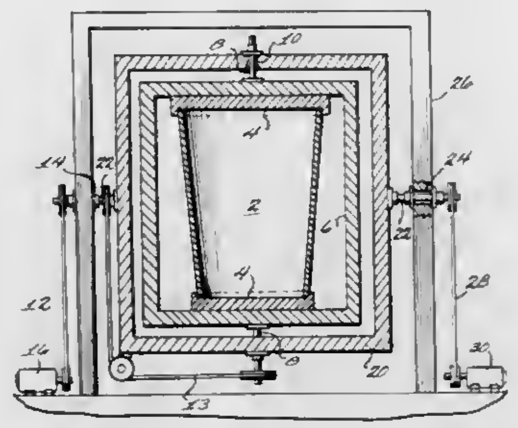
4,104,357
METHOD OF ROTATIONAL MOLDING ABOUT PLURAL AXES AT LOW ROTATIONAL SPEEDS

Edgar Allan Blair, Princeton, N.J., assignor to Monster Molding, Inc., Hingham, Mass.

Continuation-in-part of Ser. No. 322,457, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 105,099, Jan. 8, 1971, abandoned. This application May 17, 1974, Ser. No. 471,124

Int. Cl.² B29C *5/04;* **B29D** *3/02*

U.S. Cl. 264—255 32 Claims



1. A process for low rotational velocity molding at a temperature of less than 100° C of a shape comprising the successive steps of:

(a) mixing a liquid thermosetting polymer or a liquid polymer with a curing agent capable of hardening said thermosetting polymer or pre-polymer at ambient temperatures, and placing the resulting liquid mixture into a mold;

(b) moving said mold, said moving consisting of rotating said mold about two axes at such low rotational velocity, at ambient temperatures such that the centrifugal force on said mixture is negligible and adjusting the rotational velocity about each axis such that, upon observation, a uniform distribution of said polymer is obtained;

(c) maintaining the polymer while thus rotating said mold substantially under gravitational force influence with respect to said axes causing said mixture to distribute uniformly over and to coat the walls of said mold taking the form thereof without accumulation of said polymer due to centrifugal force;

(d) continuing said rotation until said liquid mixture hardens to a solid shape; and

(e) removing the solid shape thus produced from said mold.

4,104,358
SELECTIVE EXTRACTION OF YTTRIUM IONS

Yukinori Minagawa, Yokohama; Tsugio Kaneko; Fumikazu Yajima, both of Tokyo; Kunihiko Yamaguchi, Yokohama, and Tosbihiko Yosbitomi, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

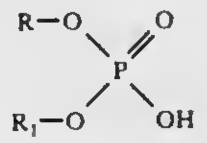
Filed Jun. 7, 1977, Ser. No. 804,465

Claims priority, application Japan, Jun. 11, 1976, 51-68332

Int. Cl.² C01F *17/00*

U.S. Cl. 423—21 7 Claims

1. A method for selectively extracting yttrium ions which comprises contacting an aqueous solution containing diethylenetriaminepentaacetic acid, yttrium ions, and one or more heavy rare earth (atomic number 64 to 71) ions, and having an initial pH of from 6 to 9, with a phosphoric acid ester having the formula



$$(\mathrm{R{-}O})(\mathrm{R_1{-}O})\mathrm{P({=}O)OH}$$

wherein R is a C_4-C_{18} aliphatic hydrocarbon group or aryl group, and R_1 is a C_4–C_{18} aliphatic hydrocarbon group, aryl group, or hydrogen atom.

4,104,359
REGENERATION OF ORGANIC EXTRACTANTS CONTAINING α-HYDROXYOXIMES

Phillip K. Davis, Boise, Id.; Helen S. Leaver, Denver, Colo., and Henry Freiser, Tucson, Ariz., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 28, 1977, Ser. No. 772,559

Int. Cl.² C01G *51/00, 53/00;* **C07C** *131/14*

U.S. Cl. 423—139 1 Claim

1. A process for extracting at least one metal selected from the group consisting of cobalt and nickel from an acidic aqueous process solution which comprises maintaining the process solution at a temperature between about 10° C and about 40° C; contacting the process solution with a liquid extractant of at least one oxime selected from the group consisting of α-hydroxyoximes or a ketoxime which ketoxime has its oxime in the anticonfiguration with respect to the hydroxyl group and at least one sulfonic acid dissolved in a water immiscible organic solvent to load the organic extractant with the metal value; stripping the metal value from the loaded extractant with a concentrated aqueous solution of an inorganic acid to regenerate the organic extractant, recycling the regenerated extractant to the metal loading step and regenerating the organic extractant when its capacity falls below about 90% of its original capacity by reacting the organic extractant with a salt of a hydroxylamine.

4,104,360
PROCESS FOR REDUCING OXIDES NITROGEN IN THE EXHAUST GAS FROM INTERNAL COMBUSTION ENGINES

Garbis H. Meguerian, Olympia Fields, and Frederick W. Rakowsky, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 329,898, Feb. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 104,214, Jan. 6, 1971, abandoned. This application Apr. 16, 1975, Ser. No. 568,469

Int. Cl.² B01D *53/34*

U.S. Cl. 423—213.2 35 Claims

1. A process for reducing nitrogen oxides in an exhaust gas obtained from the combustion of hydrocarbon materials, which process comprises the step of passing said nitrogen oxides through a zone maintained at conditions at which said nitrogen oxides will be reduced, said zone including a substantially rigid catalytic member of a metal support or substrate plated with one or more members selected from the group consisting of copper, nickel, iron, and chromium and having, at least in part, an oxidized surface that catalytically promotes the reduction of said nitrogen oxides as they pass through said zone, said catalytic member having a reticulated structure and said metal support or substrate being a tough, strong metal or metal alloy having a melting point in excess of about 2,000° F., and said catalyst being prepared by the method comprising the steps of: (a) plating the surface of said support or substrate with one or more layers of one or more of said members to form a plated support or substrate, (b) heating in an inert atmosphere said plated support or substrate so that the atoms on the surfaces of said members interdiffuse with themselves and with surface atoms of said support or substrate, and (c) exposing said plated support or substrate to an oxygen-containing atmosphere in the presence or absence of moisture and at a temperature of about 1,200° F. to about 1,600° F. to oxidize, at least in part, the atoms at or near the surface of said plated support or substrate to form thereat oxides of said members.

4,104,361

CATALYST FOR REDUCTION OF NITROGEN OXIDES AND PROCESS FOR PREPARING THE SAME

Elichirob Nishikawa; Takuji Itob; Tsugio Maeshima, and Setsuo Kamiyama, all of Ohi, Japan, assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 668,608, Mar. 19, 1976, Pat. No. 4,052,337. This application Apr. 6, 1977, Ser. No. 784,959

Claims priority, application Japan, Mar. 28, 1975, 50-37676

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—239 **12 Claims**

1. A process for treating a gaseous mixture comprising nitrogen oxides and oxygen in order to reduce the nitrogen oxides content thereof which comprises contacting said gaseous mixture and ammonia with a catalyst comprising at least one base metal component impregnated on a synthetic zeolite which has been ion exchanged with at least one alkaline earth metal ion to ion exchange the alkali metal in the zeolite so that the alkali metal content remaining is within the range from 0.2 to 0.6 equivalents per gram atom of aluminum, said contacting conducted at a temperature of from about 200° to 500° C.

4,104,362

PROCESS FOR THE MANUFACTURE OF AMMONIUM POLYPHOSPHATE

Heinrich Hahn, Gladbeck; Hans Heumann, Herne; Heioz Liebing, Wanoe-Eickel; Manfred Schweppe, and Walter Hilt, both of Herne, all of Fed. Rep. of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkircben-Buer, Fed. Rep. of Germany

Continuation of Ser. No. 429,311, Dec. 28, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,416

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1972, 2264306

Int. Cl.^{2} C01B *15/16, 25/26*

U.S. Cl. 423—315 **10 Claims**

1. A process for the continuous preparation of ammonium polyphosphate which comprises:

A. Continuously passing crude or pure wet process phosphoric acid containing solids having a phosphoric acid concentration, calculated as P_2O_5, of 28 to 32 weight percent, in the form of a falling film downwardly within at least one fall tube of a falling film reactor;

B. Continuously evaporating water from said wet process phosphoric acid or the resultant polyphosphate solution and continuously condensing phosphate therein to form polyphosphate while;

C. Continuously introducing gaseous ammonia upwardly through said fall tube in counter-current flow to the downwardly falling film of crude wet process phosphoric acid, the ammonia being present in a molar excess such as to form a product whose $NH_3:P_2O_5$ is between 0.5 and 4.5:1;

D. Continuously maintaining the temperature in the fall tube reaction zone in the range of 120° to 260° C such that the temperature is higher at the lower region of the fall tube than it is thereabove; and

E. Continuously adjusting the pH of the resultant ammonium phosphate solution by evaporation of water therefrom so that an aqueous solution containing 10% by weight sample has a pH between 2.5 and 6.0, said evaporation being affected employing the heat of neutralization generated by the reaction of the crude wet process phosphoric acid with the gaseous ammonia.

4,104,363

METHOD FOR PREPARATION OF PERFECTLY SPHERICAL PARTICLES OF SILICAGEL WITH CONTROLLED SIZE AND CONTROLLED PORE DIMENSIONS

Stanislav Vozka; Pavel Špaček, and Miroslav Kubín, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jul. 23, 1976, Ser. No. 708,044

Claims priority, application Czechoslovakia, Jul. 25, 1975, 5256-75

Int. Cl.^{2} C01B *33/16*

U.S. Cl. 423—338 **2 Claims**

1. A method of preparing perfectly spherical particles of silicagel with controlled particle size and with controlled pore dimensions comprising the following steps:

A. preparation of a hydrogel by:
  (1) acidifying a solution of an alkali metal silicate by an organic acid miscible with water;
  (2) emulsifying said solution in a combination of organic liquids which is selected from the group consisting of chloroform-hexane, tetrachloromethane-hexane, tetrachloromethane-cyclohexane, and tetrachloromethane-petroleum fraction; said fraction having a distillation range of 60° - 80° C. in the presence of octadecylamine;
  (3) agitating the emulsion until a silica hydrogel is formed;

B. preliminary hardening of said hydrogel by heating above 100° C. a suspension of the hydrogel in a liquid boiling above 100° C., said liquid being selected from the group consisting of amyl acetate, dibutyl sebacate, glycol, glycerol, and phosphoric acid;

C. hydrothermal processing of the hardened hydrogel by heating same with water in an autoclave at 150° C. to 300° C. at a pressure corresponding to the vapor pressure of water at the temperature used; and

D. final hardening of the gel by:
  (1) heating of the gel at 300° - 900° C.;
  (2) boiling the gel in water; and
  (3) repeating steps D(1) and (2) three times.

4,104,364

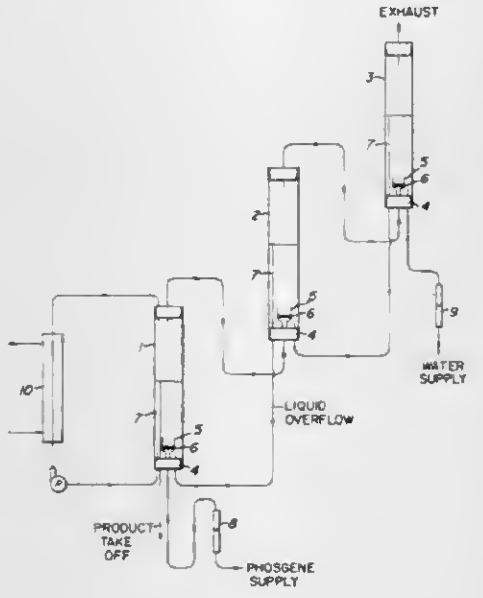
METHOD FOR HYDROLYZING PHOSGENE

Herman F. Hildebrandt, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1977, Ser. No. 812,546

Int. Cl.^{2} C01B *7/08*

U.S. Cl. 423—481 **5 Claims**



1. A process for directly hydrolyzing phosgene with water as the sole reactant to produce a commercially useful hydrochloric acid product by insuring intimate contact between the phosgene and water through use of a porous material as a

reactant surface consisting essentially of the steps of providing contacting means containing a porous material submerged in an aqueous medium within each of three reactor means connected in series at staggered column heights and subsequently passing the phosgene through the porous material submerged in an aqueous medium within the lowermost first reactor means to effect intimate contact between phosgene and the aqueous medium at the porous material interface to thereby achieve the solution and subsequent hydrolysis of phosgene to commercially useful hydrochloric acid and carbon dioxide gas, subsequently passing unhydrolyzed phosgene and carbon dioxide in the exhaust from said first reactor means in turn through the porous material in next higher second and third reactor means in series to effect intimate contact between phosgene and the aqueous medium which flows in a countercurrent downward cascade to the first reactor means, removing the aqueous medium from the first reactor means as a hydrochloric acid product of approximately 33% by weight, and exhausting the carbon dioxide gas, which flows upward from said lowermost first reactor means to the third reactor means, to the atmosphere.

4,104,365

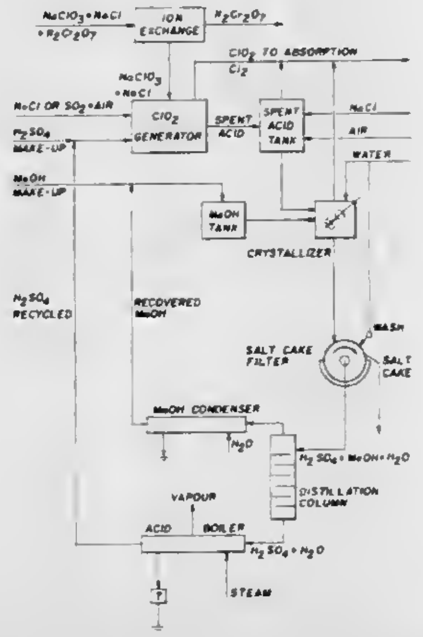
METHOD OF SEPARATING SULFURIC ACID FROM NEUTRAL SODIUM SULFATE IN SPENT CHLORINE DIOXIDE GENERATOR LIQUOR

John Howard, 5788 Olympic St., Vancouver, British Columbia, and Derek Gordon Lobley, 18775-54th Ave., R.R. 3, Surrey, British Columbia, both of Canada

Continuation-in-part of Ser. No. 690,373, May 27, 1976, abandoned. This application May 9, 1977, Ser. No. 794,740

Int. Cl.^{2} C01B *17/90;* **C01D** *15/06*

U.S. Cl. 423—531 **5 Claims**



1. A method of separating sulfuric acid and anhydrous sodium sulfate from the effluent of a chlorine dioxide generator said effluent containing sulfuric acid, sodium sulfate, water, dissolved gases and multivalent cations, the method comprising:
  removing the multivalent cations from the effluent;
  oxidizing the residual chlorate in the effluent to chlorine dioxide and venting the chlorine dioxide;
  purging dissolved gases from the effluent;
  subjecting the purged effluent to high shear agitation while continually adding a mixture of an organic compound selected from alcohols and ketones with 5% to 50% water by volume, based on the volume of the organic compound, to adjust the normality of the effluent with respect to sulfuric acid to at most 4 and to precipitate anhydrous sodium sulfate from the effluent;
  passing the mother liquor from the sulfate separation to a distillation column;
  separating the organic compound from the distillate; and recovering sulfuric acid from the still bottoms.

4,104,366

COMPOSITIONS FOR PREPARATION OF AQUEOUS SOLUTIONS OF LOW VALENCE ^{99}TECHNITIUM SALTS

Manfred Schmidt-Dunker, and Wolfgang Greb, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

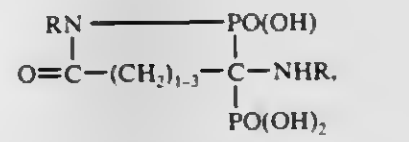
Filed Sep. 23, 1976, Ser. No. 725,883

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543349

Int. Cl.^{2} A61K *29/00, 43/00*

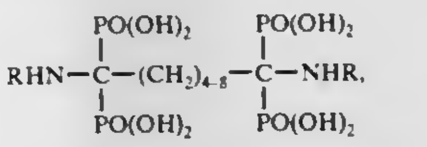
U.S. Cl. 424—1 **12 Claims**

1. A composition for use in the preparation of aqueous solution containing ^{99m}technetium for use in the detection by scintography of bones and calcareous tumors, comprising:
  (A) one or more water-soluble phosphonic compounds of the formulae:



I

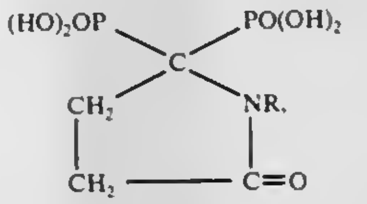
wherein R represents a substituent from the group consisting of H and C_{1-6} alkyl;



$$RHN-\underset{PO(OH)_2}{\overset{PO(OH)_2}{C}}-(CH_2)_{4-8}-\underset{PO(OH)_2}{\overset{PO(OH)_2}{C}}-NHR,$$

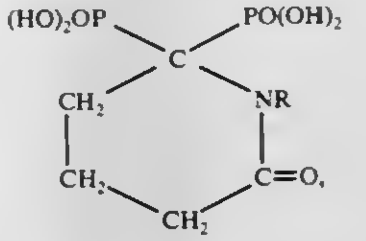
II

wherein R represents a substituent from the group consisting of H and C_{1-4} alkyl;



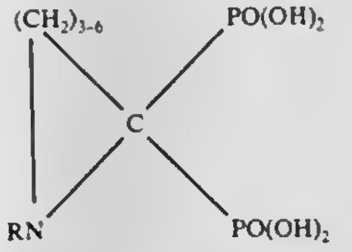
III

wherein R represents a substituent from the group consisting of H and C_{1-6} alkyl;



IV

wherein R represents a substituent from the group consisting of H and C_{1-6};



V

wherein R represents a substituent from the group consisting of H and C_{1-4} alkyl;

VI the pharmaceutically-acceptable water-soluble salts of the above acids (I)—(V); and

(B) a pharmaceutically acceptable water-soluble salt selected from the group consisting of tin (II), iron (II) and chromium (II) salts and mixtures thereof in less than stoichiometric quantity relative to component (A).

4,104,367

RADIOIMMUNOASSAY FOR METHADONE

Magdalena Usategui Gomez, Wayne; Harvey Gurien, Irvington; John Edward Heveran, Fairfield, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 13, 1976, Ser. No. 731,620

Int. Cl.^{2} G01N *33/16;* A61K *43/00*

U.S. Cl. 424—1 **15 Claims**

4. A method for the radioimmunoassay of methadone in a sample which method comprises mixing said sample with a known amount of I^{125} radiolabelled methadone derivative selected from the group consisting of I^{125} -N-2-(4-hydroxyphenyl)-ethylsuccinamic acid N-methyl-N- [1-methyl-3,3-diphenyl-4-oxohexyl] aminoethanol ester and I^{125}-6-dimethylamino-4-phenyl-4-(4-hydroxyphenyl)-hepten-3-one and an antibody which will selectively complex with methadone and said radiolabeled methadone derivative, measuring the degree of binding of the said labeled methadone derivative and determining the amount of methadone present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of methadone with fixed amounts of said labeled methadone derivative and said antibody and determining the degree of binding for each known amount of methadone.

4,104,368

COMPOSITION AND METHOD FOR PROTECTING SKIN AND HAIR

Arnold Lada, Montclair, and James J. Middleton, Orange, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 36,490, May 11, 1970, abandoned, which is a division of Ser. No. 747,500, Jul. 25, 1968. This application Jul. 12, 1972, Ser. No. 271,206

Int. Cl.^{2} A61K *7/44*

U.S. Cl. 424—60 **2 Claims**

1. A method of protecting human skin or hair from the effects of erythematous light rays in the range of wave length of between about 2200A and 3120A which comprises applying to said skin or hair an effective amount sufficient to obtain effective radiation absorption within such range of stearyl dimethyl benzyl ammonium p-aminobenzoate.

4,104,369

LYMPHOSARCIN AND METHOD OF PRODUCING LYMPHOSARCIN

Birger H. Olson; David M. Schuurmans; Theodore R. Watson, all of Lansing; Chun-nan Shih, and Burton D. Cardwell, both of East Lansing, all of Mich., assignors to State of Michigan, Lansing, Mich.

Filed Aug. 31, 1976, Ser. No. 719,132

Int. Cl.^{2} A61K *35/74*

U.S. Cl. 424—115 **25 Claims**

1. Lymphosarcin, a methyl pentaene which in methanol has absorption maxima at approximately 322, 338, and 357 nanometers in the ultraviolet spectrum; which in a potassium bromide pellet has major absorption maxima at approximately 3450, 3050, 1460, 1145, and 1005 reciprocal centimeters in the infrared spectrum; and which is soluble in methanol, ethanol, butanol, phenol, formamide, dimethyl formamide, and proprionic acid; has limited solubility in isopropyl alcohol and tetrahydrofuran; and is insoluble in water, diethyl ether, petroleum ether, benzene, acetone, ethyl acetate, and acetonitrile.

2. A process for the preparation of lymphosarcin comprising cultivating *Streptomyces murinus* NRRL 8171 under aerobic conditions in an aqueous nutrient medium containing available sources of carbon, nitrogen and minerals to produce lymphosarcin in the medium, and recovering lymphosarcin therefrom.

22. A process for treating cancer in animals which comprises administering a therapeutically effective amount of lymphosarcin to an affected animal.

4,104,370

METHOD OF TREATING MAGNESIUM/POTASSIUM DEPLETION

Maurice Bloch, London, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation-in-part of Ser. No. 487,117, Jul. 10, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,210

Int. Cl.^{2} A61K *33/14, 33/06, 9/22, 9/24*

U.S. Cl. 424—153 **8 Claims**

1. A method of treating magnesium/potassium depletion without the unwanted purgative action of magnesium in a human requiring such treatment which comprises administering orally to said human a pharmaceutical composition, in an effective amount of the composition to produce said activity, in solid form for oral administration in a sustained release capsule or layered tablet, comprising magnesium oxide, magnesium hydroxide or a non-toxic pharmaceutically acceptable salt of magnesium in combination with potassium chloride, the equivalent weight of the magnesium being between 1 and 3 times the equivalent weight of the potassium, together with a pharmaceutical carrier such that the rate of release of the magnesium and potassium into the digestive system is controlled so that the length of time of action of said composition is from 2 to 8 hours.

4,104,371

PSYCHOPHARMACOLOGICALLY ACTIVE PEPTIDES AND PEPTIDE-DERIVATIVES, AND THE USE THEREOF

Hendrik Marie Greven, Heesch, and David de Wied, Bilthoven, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 30, 1977, Ser. No. 811,859

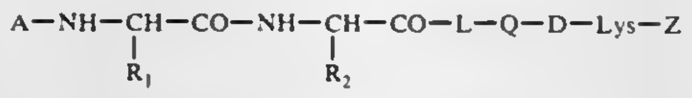
Claims priority, application Netherlands, Jul. 12, 1976, 7607684

Int. Cl.^{2} A61K *37/100;* C07C *103/52*

U.S. Cl. 424—177 **23 Claims**

8. A pharmaceutical composition having conditioned flight inhibiting psychopharmacological properties, comprising:

(A) a pharmaceutically effective amount of a compound of the formula:



$$A-NH-\underset{R_1}{\underset{|}{CH}}-CO-NH-\underset{R_2}{\underset{|}{CH}}-CO-L-Q-D-Lys-Z$$

or a functional derivative thereof, wherein:

A is an N-terminal chain prolongation selected from the group consisting of H—(L or D)Met, H—(L or D) Met(→O), H—(L or D)Met(→O_2), desamino-Met, desamino-Met(→O), desamino-Met(→0_2), and H_2N—B—CO—, wherein B represents a branched or straight-chain alkylene (C_1-C_6) or alkylidene (C_1-C_6) group;

Q is an amino-acid residue —NH—CHR—CO—, wherein R is selected from the group consisting of alkyl (C_1–C_6), p-hydroxyphenylmethyl, 3-idolylmethyl, and phenylmethyl radials;

R_1 and R_2 each selected from hydrogen and alkyl (1–6C) groups; and

Z is seleted from the group consisting of N-(phenylalkyl-)amino, N-(β-indolylalkyl)amino, L-Trp, L-Phe-OH, L-Trp-Gly-OH, and L-Phe-Gly-OH; and

(B) a pharmaceutically acceptable carrier therefor.

4,104,372

1-N-(α-HYDROXY-ω-AMINOALKANOYL) DERIVATIVES OF 3'-DEOXYKANAMYCIN A AND THE PRODUCTION THEREOF

Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Tsutomu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 20, 1976, Ser. No. 678,560

Claims priority, application Japan, Apr. 24, 1975, 50-49105

Int. Cl.^{2} A61K *31/71;* C07H *15/22*

U.S. Cl. 424—180 **7 Claims**

7. A pharmaceutical composition for treating infections in living animals, including man, caused by gram-negative and gram-positive bacteria, which comprises an anti-bacterially effective dosage of 1-N-((S)-γ-amino-α-hydroxybutyryl)-3'-deoxykanamycin A or a pharmaceutically acceptable acid-addition salt thereof as the active ingredient, in combination with a pharmaceutically acceptable carrier for the active ingredient.

4,104,373

THERAPEUTICAL COMPOSITION

Richard Sichert, Schneckenburger Strasse 42 8 Munich 80, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 43,947, Jun. 5, 1970, abandoned. This application May 16, 1973, Ser. No. 360,935

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1969, 1931467; Dec. 19, 1969, 1963706

Int. Cl.^{2} A61K *35/78, 31/22, 47/00*

U.S. Cl. 424—195 **11 Claims**

1. A composition of matter for treating lymphatic congestions comprising a mixture of:

(a) an extract of an Umbelliferae selected from the group consisting of *Conium maculatum, Cicuta virosa, Aethusa cynapium* and *Oenanthe crocata,*

(b) an extract of a Liliaceae selected from the group consisting of *Colchicm autumnale, Veratrum album.* Aloe and Asparagi,

(c) an extract of a plant selected from the group consisting of Digitalis, Strophanthus, Convallaria and Crataegus,

(d) an extract of a Berberidaceae selected from the group consisting of Podophylli and *Berberis vulgaris,* and

(e) an extract of a Solanaceae selected from the group consisting of Hyoscyami, *Atropa bellodonna,* Mandragorae and *Datura stramonium,*

the ratios of extracts (a), (b), (c), (d) and (e) present being, respectively, about 4 to 12 : about 2.8 to 9 : about 2 to 6.5 : about 2 to 6 : about 2 to 7.5.

4,104,374

WOOD PRESERVATIVE

Wolfgang Reuther, Ziegelhausen; Knut Oppenlaender; Paul Raff, both of Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Manfred Siegler, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,769

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622028

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 424—185 **5 Claims**

1. A process for protecting wood against ligniperdous insects, termites, ligniperdous fungi, soft rot and mold fungi, which comprises bringing into contact with the wood an effective amount of wood preservative compounds effective against ligniperdous insects, termites, ligniperdous fungi, soft rot and mold fungi, said compounds being o-boric acid/propylene oxide adducts having a molar ratio of said acid to said propylene oxide in the range of 1:1 to 1:5, respectively, said adducts being formed by reacting said o-boric acid and propylene oxide either in an aprotic solvent at 100° to 160° C. in the absence of a catalyst or at 70° to 120° C. in a closed vessel in an aprotic solvent and in the presence of a catalytic amount of a base or a Lewis acid at a pressure of said propylene oxide of 4 to 9 bars, and thereafter distilling off said solvent.

4,104,375

ISOXAZOLE PHOSPHATES AND PHOSPHONATES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Weatport, Conn.

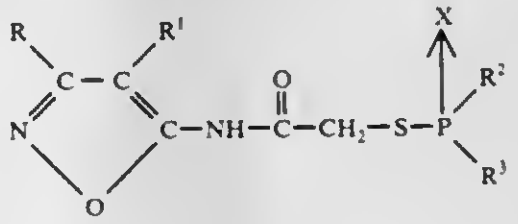
Filed Feb. 24, 1977, Ser. No. 771,503

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.^{2} C07D *261/14;* A01N *9/36*

U.S. Cl. 424—200 **48 Claims**

1. A compound having the formula



in which

R is hydrogen or methyl,

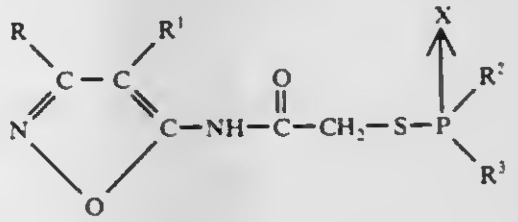
R^1 is hydrogen or methyl,

R^2 is a member selected from the group consisting of methyl, methoxy, ethyl, and ethoxy,

R^3 is alkoxy having 1 to 6 carbon atoms, and

X is oxygen or sulfur.

17. A method of controlling insects comprising applying to said insects or the habitat or feedstuffs of said insects an insecticidally effective amount of a compound having the formula



in which

R is hydrogen or methyl,

R^1 is hydrogen or methyl,

R^2 is a member selected from the group consisting of methyl, methoxy, ethyl, and ethoxy,

R^3 is alkoxy having 1 to 6 carbon atoms, and

X is oxygen or sulfur.

4,104,376

SYNERGISTIC COMPOSITION FOR THE CONTROL OF INSECTS

Walter Maria Zeck, Vero Beach, Fla., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1977, Ser. No. 813,722

Int. Cl.^{2} A01N *9/02, 9/20, 9/36*

U.S. Cl. 424—216 **9 Claims**

1. A synergistic insecticidal composition comprising an insecticidally effective amount of O-ethyl-O-[4-(methylthio)-phenyl]-S-propyl phosphorodithioate and N-methyl-N'-2,4-xylyl-N-(N-2,4-xylyl-formimidoyl) formamidine in a weight ratio of about 1:0.03–10.

4,104,377
DISUBSTITUTED-O-(1-FLUORO-2-HALOGENOETHYL)-PHOSPHORIC(PHOSPHONIC) ACID ESTERS, AND METHOD OF COMBATING INSECTS

Dieter Arlt, Cologne; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

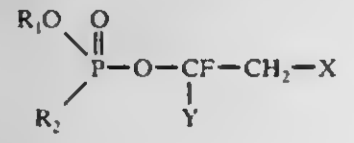
Filed Jun. 14, 1976, Ser. No. 696,147

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528996

Int. Cl.² A01N *9/36;* **C07F** *9/09, 9/40*

U.S. Cl. 424—222 **12 Claims**

1. A 1-fluoro-2-halogeno-ethyl-phosphoric(phosphonic) acid ester of the formula



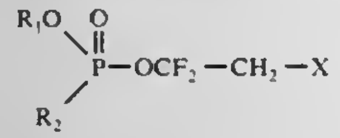
(I)

in which

- R_1 is alkyl with 1 to 4 carbon atoms optionally substituted by fluorine, chlorine or bromine,
- R_2 is alkyl with 1 to 4 carbon atoms and optionally substituted by fluorine, chlorine or bromine,
- X is chlorine or bromine, and
- Y is hydrogen or fluorine.

2. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes or to a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim 1.

9. A 1-fluoro-2-halogeno-ethyl-phosphoric(phosphonic) acid ester of the formula



in which

- R_1 is alkyl with 1 to 4 carbon atoms optionally substituted by fluorine, chlorine or bromine,
- R_2 is alkoxy with 1 to 4 carbon atoms and substituted by fluorine, chlorine or bromine, and
- X is chlorine or bromine.

10. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes or to a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim 9.

4,104,378
COMBATTING PESTS WITH O,S-DIALKYL-O-(4-PHENYLAZOPHENYL)-THIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

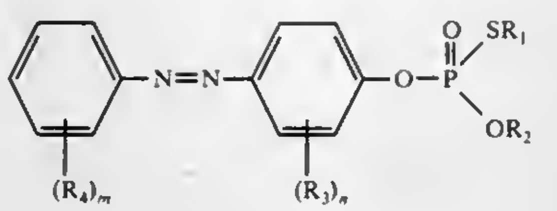
Division of Ser. No. 666,120, Mar. 11, 1976, Pat. No. 4,051,240, which is a continuation-in-part of Ser. No. 377,855, Jul. 9, 1973, abandoned. This application Jul. 18, 1977, Ser. No. 816,559

Claims priority, application Switzerland, Jul. 7, 1972, 10210/72; May 11, 1973, 6720/73

Int. Cl.² A01N *9/00, 9/36*

U.S. Cl. 424—225 **9 Claims**

1. A method for combatting insects, acarids and nematodes which comprises applying thereto an insecticidally, acaricidally or nematicidally effective amount of a compound of the formula



wherein R_1 represents propyl or butyl; R_2 represents methyl or ethyl; each of R_3 and R_4 represents hydrogen, halogen or alkyl having from 1 to 5 carbon atoms; *n* is a number from 1 to 4; and *m* is a number from 1 to 5.

4,104,379
SUBSTITUTED 1-ALKYLTHIOPHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS

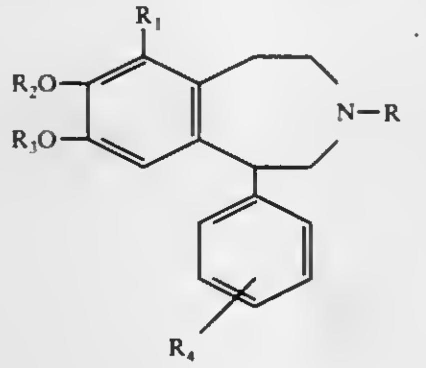
Gregory Gallagher, Jr., Collegeville, Pa.; Francis R. Pfeiffer, Cinnaminson, N.J., and Joseph Weinstock, Phoenixville, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 19, 1977, Ser. No. 760,480

Int. Cl.² A61K *31/55;* **C07D** *223/16*

U.S. Cl. 424—244 **16 Claims**

1. A chemical compound of the structural formula:



in which:

- R is hydrogen, benzyl, phenethyl, carbobenzoxy, hydroxyethyl, lower alkyl of 1–5 carbons, lower alkenyl of 3–5 carbons or lower alkanoyl of 1–5 carbons;
- R_1 is hydrogen, halo or trifluoromethyl;
- R_2 and R_3 are each hydrogen, lower alkyl of 1–5 carbons, lower alkanoyl of 2–5 carbons or, when taken together, methylene and ethylene; and
- R_4 is lower alkylthio of 1–5 carbons, lower alkylsulfinyl of 1–5 carbons, lower alkylsulfonyl of 1–5 carbons, trifluoromethylthio, trifluoromethylsulfonyl, trifluoromethylsulfinyl, or dimethylsulfonium halide; or a nontoxic, pharmaceutically acceptable salt thereof.

15. The method of inducing dopaminergic activity in a subject in need thereof comprising administering orally or by injection a nontoxic dopaminergic quantity of a compound of claim 1.

4,104,380
DIBENZYL GLYCOLIC ACID DERIVATIVES

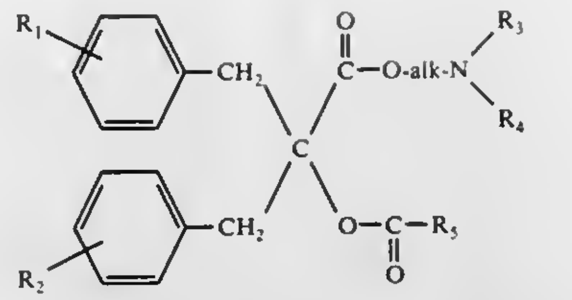
Wolf-Dieter Vigelius; Gerhard Satzinger, both of Denzlingen, and Manfred Herrmann, St. Peter, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 696,665, Jun. 16, 1976. This application Mar. 15, 1977, Ser. No. 777,731

Int. Cl.² A61K *31/55*

U.S. Cl. 424—244 **43 Claims**

1. A method of treating hypertonia and hyperacidity in a mammal by the administration to said animal of an effective amount of a compound having the formula:



wherein R_1 and R_2, which may be the same or different, are hydrogen, halogen, or lower alkyl or lower alkoxy of 1 to 3 carbon atoms; R_3 and R_4, which may be the same or different, are lower alkyl of 1 to 3 carbon atoms or R_3 and R_4, together with the nitrogen atom to which they are attached, is a saturated or unsaturated ring structure of 3 to 5 carbon atoms which, in the ring system, can contain an oxygen or imino group and can be substituted by a phenyl or benzyl radical or by lower alkyls of 1 to 4 carbon atoms; R_5 is hydrogen, lower alkyl or alkoxyalkyl of 1 to 5 carbon atoms or benzyl; alk is a branched or unbranched alkylidene of 2 to 4 carbon atoms; and the quaternary lower alkyl ammonium halides thereof and the pharmaclogically compatible salts thereof.

4,104,381
PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

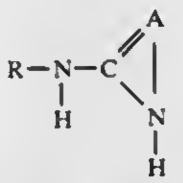
Division of Ser. No. 619,985, Oct. 6, 1975, Pat. No. 4,005,205, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Oct. 29, 1976, Ser. No. 736,662

Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 35551/73

Int. Cl.² A61K *31/54, 31/415;* **C07D** *285/16;* **C07B** *285/22*

U.S. Cl. 424—246 **5 Claims**

3. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a benzothiadiazine or 1,2,4-thiadiazine ring, said rings having a sulfone group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$\text{Het}\cdot CH_2Z(CH_2)_n$-

where Het is an imidazole ring, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,104,382
PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING H-1 AND H-2 HISTAMINE RECEPTORS

James Whyte Black, Hemel Hempstead, and Michael Edward Parsons, St. Albans, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

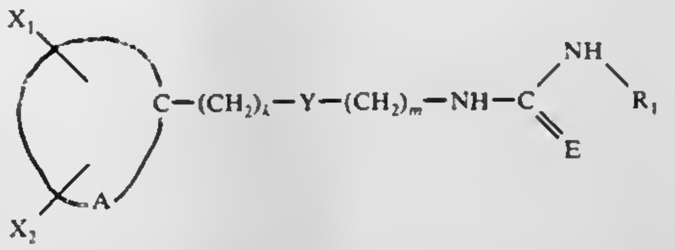
Division of Ser. No. 568,481, Apr. 16, 1975, Pat. No. 4,000,302, which is a continuation-in-part of Ser. No. 349,151, Apr. 9, 1973, Pat. No. 3,894,151. This application Sep. 27, 1976, Ser. No. 726,886

Claims priority, application United Kingdom, Apr. 20, 1972, 18301/72

Int. Cl.² A61K *31/40, 31/44, 31/135, 31/415*

U.S. Cl. 424—247 **6 Claims**

1. A pharmaceutical composition having H-1 and H-2 histamine receptor inhibiting activity which comprises about 30 mg. to about 250 mg. of an antihistamine, said antihistamine being a compound which inhibits those histamine receptors inhibited by mepyramine, about 50 mg. to about 500 mg. of an H-2 histamine receptor inhibitor, H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, and a pharmaceutically acceptable diluent or carrier, wherein said H-2 histamine receptor inhibitor is a compound of the formula:



wherein A is such that there is formed together with the carbon atom shown a thiazole, isothiazole or pyridine ring; X_1 is hydrogen, lower alkyl, halogen, amino or hydroxyl; X_2 is hydrogen; k is 1; *m* is 2; Y is sulphur; E is NR_2; R_1 is hydrogen or lower alkyl; and R_2 is hydrogen, nitro or cyano, or a pharmaceutically acceptable acid addition salt thereof.

4,104,383
DERIVATIVES OF PHENYLPROPENYLAMINE

François Krausz, Montpellier, France, assignor to C M Industries, Paris Cedex, France

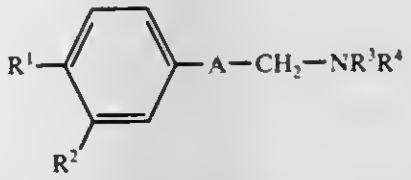
Continuation of Ser. No. 519,752, Oct. 31, 1974, abandoned. This application Jun. 4, 1976, Ser. No. 692,787

Claims priority, application United Kingdom, Nov. 2, 1973, 51123/73

Int. Cl.² A61K *31/395, 31/135*

U.S. Cl. 424—248.4 **12 Claims**

1. A method of treating adynamic and depressive states in a patient suffering from said states which comprises administering an anti-depressive amount of a compound of the formula:



(I)

R^1–(ring)–$A-CH_2-NR^3R^4$

in which R^2 is selected from the group consisting of a hydrogen atom and a halogen atom; R^1 is selected form the group consisting of a cyclohexyl group and phenyl group; and is a cyclohexyl group when R^2 is a halogen atom; A is selected from the group consisting of CH_2CH_2 and $CH{=}CH$ groups; and NR^3R^4 is selected from the group consisting of an alkylamino group, a dialkylamino group and a heterocyclic group selected from the group consisting of pyrrolidino, morpholino, thiomorpholino, 2,6-dimethylmorpholino, piperidino, 4-methylpiperidino, piperazino, 4-(β-hydroxyethyl)-piperazino, 4-

methylpiperazino and azepino groups; and acid addition salts of said compounds.

4,104,384
1-(2′-AROYL ETH-1′YL) 2-(4″-ACETAMIDO PIPERAZINE-1″YL METHYL) BENZIMIDAZOLES AND THEIR THERAPEUTICAL APPLICATIONS

Claude P. Fauran; Michel J. Turin, both of Paris; Thierry F. Imbert, La Celle Saint-Cloud; Guy M. Raynaud, and Nicole A. M. Dorme, both of Paris, all of France, assignors to Delalande S.A., Courbevoie, France

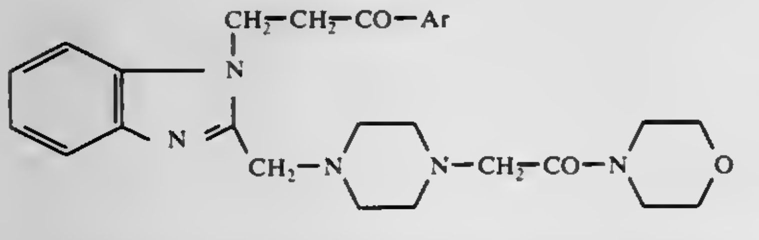
Division of Ser. No. 643,490, Dec. 22, 1975, Pat. No. 4,072,682. This application Nov. 28, 1977, Ser. No. 855,419

Claims priority, application France, Jan. 10, 1975, 75 00724; Dec. 5, 1975, 7537297

Int. Cl.^{2} C07D *413/14;* A61K *31/535*

U.S. Cl. 424—248.51 **5 Claims**

1. A compound having the formula



wherein Ar is α-furyl, α-thienyl, phenyl or phenyl substituted by one substituent selected from the group consisting of methoxy, alkyl having one to 4 carbon atoms, nitro and chloro, and the pharmacologically acceptable acid addition salts thereof.

3. A pharmaceutical composition for use in the treatment of gastroduodenal ulcers, hypochlorohydrias, visceral spasms, asthma, hypertension, oedemas, and pains, comprising an effective amount of a compound as claimed in claim 1, in combination with a pharmaceutically acceptable carrier.

4,104,385
CYCLIC ALKYLIDENYL N-[6-(AMINO)-3-PYRIDAZINYL]AMINOMETHYLENEMALONATES

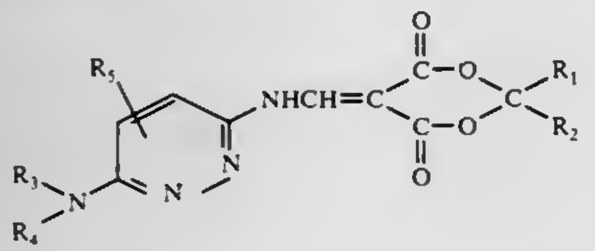
George Y. Lesher, and Chester J. Opalka, Jr., both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,699, Aug. 19, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,419

Int. Cl.^{2} C07D *405/12*

U.S. Cl. 424—250 **18 Claims**

1. Cyclic alkylidenyl N-[6-(R_3R_4N)-4(or 5)-R_5-3-pyridazinyl]aminomethylenemalonate having the formula



wherein

R_1 and R_2 are each lower-alkyl having from one to three carbon atoms;

R_3 and R_4 are each lower-alkyl having from one to three carbon atoms or R_3R_4N is 1-piperidinyl, 1-pyrrolidinyl, 4-methyl-1-piperazinyl, 4-morpholinyl or 4-morpholinyl having from one to four ring-carbon alkyl substituents selected from methyl, ethyl, n-propyl and isopropyl with the total number of carbon atoms of the alkyl substituent or substituents being from one to four;

R_5 is hydrogen or lower-alkyl having from one to three carbon atoms; or

pharmaceutically acceptable salt thereof.

4,104,386
DERIVATIVES OF 1,2-DITHIOLE AND ANTI-BILHARZIA COMPOSITIONS THEREOF

Michel Barreau; Claude Cotrel, both of Paris, and Claude Jeanmart, Brunoy, all of France, assignors to Rhone-Poulenc Industries, Paris, France

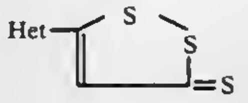
Filed Feb. 9, 1977, Ser. No. 766,967

Claims priority, application France, Feb. 10, 1976, 76 03603; Nov. 30, 1976, 76 36038

Int. Cl.^{2} A61K *31/50, 31/505;* C07D *409/04*

U.S. Cl. 424—250 **8 Claims**

1. A 1,2-dithiole compound of the formula:



wherein Het represents a pyridazin-3-yl radical, or a pyridazin-3-yl radical substituted by a halogenatom or by an alkyl radical of 1 through 4 carbon atoms, on alkoxy radical of 1 through 4 carbon atoms, the mercapto radical, an alkylthio radical of 1 through 4 carbon atoms or a dialkylamino group having 1 through 4 carbon atoms in each alkyl radical.

8. A pharmaceutical composition with anti-bilharzia activity which comprises an effective amount of a 1,2-dithiole compound as claimed in claim 1 in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,104,387
3-(ARYLCYCLOIMINOALKYL)BENZISOTHIAZOLE 1,1-DIOXIDES

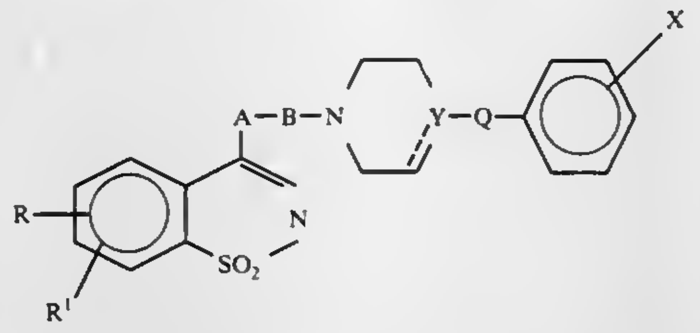
Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 23, 1977, Ser. No. 799,865

Int. Cl.^{2} A61K *31/495;* C07D *417/12*

U.S. Cl. 424—250 **12 Claims**

1. A compound of the structure



wherein R is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; R^1 is hydrogen, lower alkoxy or halogen with the proviso that R^1 can be lower alkoxy or halogen only when R is lower alkoxy or halogen, respectively; A is O or NH; X is hydrogen, halogen, lower alkyl, lower alkoxy, or trifluoromethyl; Y is C or N, where Y is C,==== represents a double bond, and when Y is N,==== represents a single bond, B is an alkylene group containing 2 to 5 carbons in the normal chain; Q is a single bond or an alkylene group containing 1 to 3 carbons in the normal chain; and physiologically acceptable acid-addition salts thereof.

11. A composition which comprises a compound of claim 1 in a physiologically acceptable vehicle, said compound being present in an effective amount for treating an inflammatory condition.

4,104,388
3-SUBSTITUTED BENZISOTHIAZOLE, 1,1-DIOXIDES

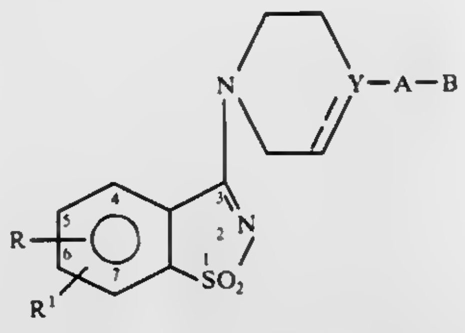
Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 23, 1977, Ser. No. 799,879

Int. Cl.^{2} A61K *31/495;* C07D *417/04*

U.S. Cl. 424—250 **20 Claims**

1. A compound of the structure



wherein R is hydrogen, halogen, lower alkyl, lower alkoxy, or nitro, R^1 is hydrogen, lower alkoxy or halogen with the proviso that R^1 can be lower alkoxy or halogen only when R is lower alkoxy or halogen, respectively; Y is C or N, where Y is C, ==== represents a single bond or a double bond, and when Y is N, ==== represents a single bond, A is a single bond or an alkylene group containing from 1 to 4 carbons, and B is hydrogen, hydroxyl, phenyl or phenyl substituted with halogen, lower alkyl, lower alkoxy, or trifluoromethyl, with the proviso that when Y is C, B is phenyl or substituted phenyl, and when Y is N and B is hydrogen, A has at least 1 carbon and when B is hydroxyl, A has at least 2 carbons; and physiologically acceptable acid-addition salts thereof where Y is N.

19. A composition for treating an inflammatory condition which comprises an effective amount of a compound of claim 1 in a physiologically acceptable vehicle.

4,104,389
ANTIALLERGIC PYRIDO[2,1-b]QUINAZOLIN-ONES

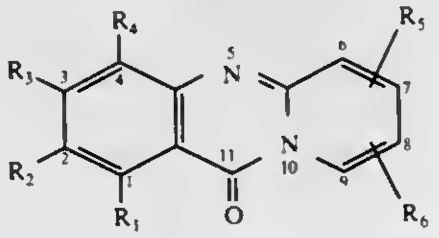
Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 620,471, Oct. 7, 1975, Pat. No. 4,033,961. This application Mar. 7, 1977, Ser. No. 775,015

Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 **7 Claims**

1. A method of inhibiting the symptoms of an allergic reaction resulting from a antigen-antibody reaction in a sensitized mammal which comprises the administration to said mammal of an effective amount of compound or its pharmaceutically acceptable salt having the formula:



wherein R_1 and R_4 are hydrogen; R_2 is hydrogen, methyl, chlorine, hydroxy, or methoxy, or together with R_3 is dioxolo; R_3 is hydrogen, carboethyoxy, carboxyl, methyl, or chlorine or together with R_2 is dioxolo; R_5 is carboxyl, cyano, methyl or carbamoyl, with the proviso that R_5 is not 6-carboxyl when $R_{1\text{-}4}$ are hydrogen; and R_6 is hydrogen.

4,104,390
THIENO [2,3-c] AND [3,2-c] PYRIDINES

Gerard Ferrand, Lyon; Daniel Frehel, and Jean-Pierre Maffrand, both of Toulouse, all of France, assignors to Parcor, Paris, France

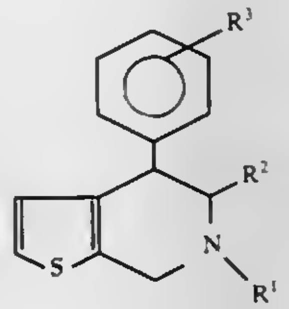
Filed Jun. 21, 1977, Ser. No. 808,694

Claims priority, application France, Jul. 13, 1976, 76 21440

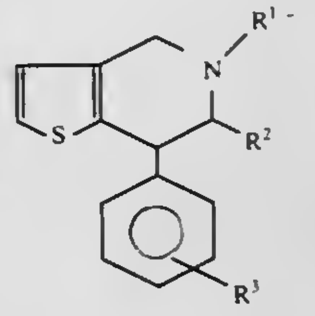
Int. Cl.^{2} C07D *513/04;* A61K *31/38*

U.S. Cl. 424—256 **5 Claims**

1. Pyridine derivatives having the following formulae (I) and (II):



and



(I) (II)

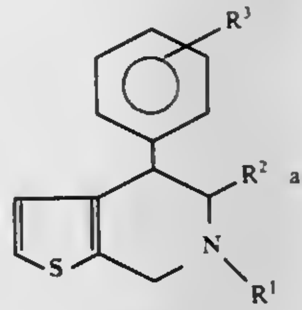
in which R^1 represents a radical selected from hydrogen, lower alkyl and aralkyl optionally substituted in the aromatic nucleus with at least a group selected from halogen, hydroxy, nitro, amino, cyano, carboxy, alkoxycarbonyl, lower alkyl, lower alkoxy and trifluoromethyl;

R^2 represents a group selected from hydrogen and lower alkyl; and

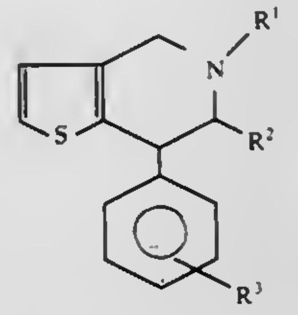
R^3 represents a group selected from hydrogen and at least a substituent selected from halogen, hydroxy, lower alkyl and lower alkoxy,

and their pharmaceutically acceptable inorganic and organic acid addition salts.

4. Therapeutic composition having an anti-inflammatory and blood-platelet aggregation inhibiting activity, comprising, as active ingredient, an efficient amount of a pyridine derivative selected from the compounds having the following formulae (I) and (II):



and



(I) (II)

in which R^1 represents a radical selected from hydrogen, lower alkyl and aralkyl optionally substituted in the aromatic nucleus with at least a group selected from halogen, hydroxy, nitro, amino, cyano, carboxy, alkoxycarbonyl, lower alkyl, lower alkoxy and trifluoromethyl;

R^2 represents a group selected from hydrogen and lower alkyl; and

R^3 represents a group selected from hydrogen and at least a substituent selected from halogen, hydroxy, lower alkyl and lower alkoxy,

and their pharmaceutically acceptable inorganic and organic acid addition salts, together with pharmaceutically acceptable excipients.

4,104,391
METHOD OF PREPARING STABLE STERILE AMPOULES OF CRYSTALLINE CEPHALOSPORINS FOR PARENTERAL ADMINISTRATION

Michael D. Cise, Iodianapolis, Ind., assignor to Eli Lilly and Company, Iodianapolis, Ind.

Division of Ser. No. 567,224, Apr. 11, 1975, Pat. No. 4,029,655. This application Feb. 9, 1977, Ser. No. 767,234

Int. Cl.^{2} A61K *31/38;* C07D *501/12*

U.S. Cl. 424—246 11 Claims

1. A method of preparing an ampoule of a sterile, essentially crystalline cephalosporin for reconstitution for parenteral administration, said cephalosporin being selected from the group consisting of cephalothin sodium, cephaloridine betaine and cefazolin sodium, comprising the steps of:

(a) dissolving said cephalosporin in water;
(b) filtering the solution from (a) through a sterilizing filter into a previously sterilized container;
(c) filling a volume of the sterile solution from (b) into a previously sterilized ampoule such that the quantity of solute therein is the amount of said cephalosporin desired in said ampoule;
(d) cooling the filled ampoule from (c) rapidly to a temperature below at least $-15°$ C. within an interval of not longer than 3 hours;
(e) warming the ampoule from (d) to between $<0°$ C. and about $-10°$ C.;
(f) maintaining the temperature of the ampoule from (e) between $<0°$ C. and about $-10°$ C. until the nucleation of the crystals of said cephalosporin is substantially complete;
(g) reducing the pressure of the environment in which the ampoule from (f) is maintained to a maximum of 1mm of mercury absolute.
(h) raising the temperature of the environment in which the ampoule from (g) is maintained to a maximum of about 50° C., avoiding the melting of the contents of such ampoule; and
(i) subliming the water from the preparation from (h) until the resulting crystals of said cephalosporin have a moisture content of no more than 6.0 percent.

4,104,392
N^2-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF, AND ANTITHROMBOTIC COMPOSITIONS AND METHODS EMPLOYING THEM

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tooomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, both of, Japan

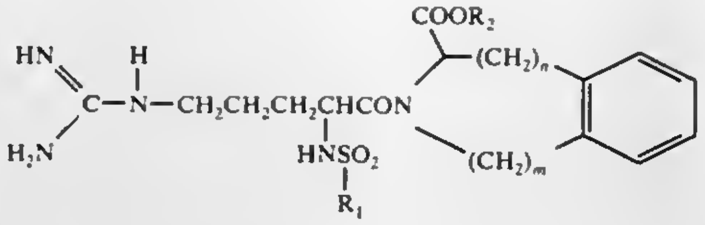
Continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, aod Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, each is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,051

Claims priority, application Japan, Nov. 8, 1974, 49/128774; Nov. 8, 1974, 49/128775; Nov. 29, 1974, 49/136695; Nov. 29, 1974, 49/136697; Feb. 25, 1975, 50/023268; Feb. 26, 1975, 50/023635; Mar. 5, 1975, 50/026768; Mar. 11, 1975, 50/029357; Mar. 11, 1975, 50/029358

Int. Cl.^{2} A61K *31/47, 31/40;* C07D *217/26, 209/44*

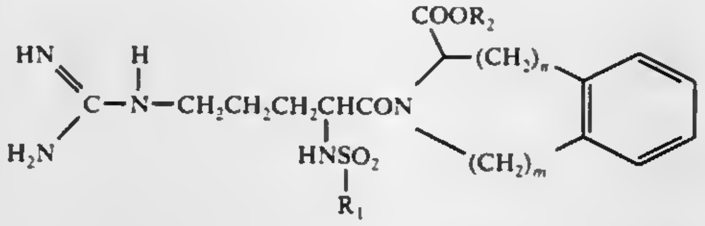
U.S. Cl. 424—258 12 Claims

1. N^2-naphthalenesulfonyl-L-argininamides having the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl; m is an integer of 0, 1 or 2; n is an integer of 0, 1 or 2; and $m + n$ is an integer of 1 or 2.

11. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-argininamide having the formula



or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10}alkyl, C_1–C_{10}alkoxy and C_2–C_{20}dialkylamino; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl, m is an integer of 0, 1 or 2; n is an integer of 0, 1 or 2; and $m + n$ is an integer of 1 or 2.

12. A pharmaceutical composition which comprises an antithrombotically effective amount of a compound of claim 1 and a pharmaceutically acceptable adjuvant.

4,104,393
1,3,5-TRISUBSTITUTED-1,2,4-TRIAZOLE COMPOUNDS

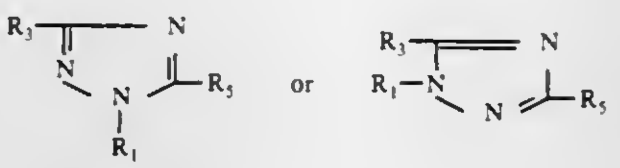
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 672,899, Apr. 2, 1976, Pat. No. 4,048,183, which is a division of Ser. No. 599,504, Jul. 28, 1975, Pat. No. 3,978,054, which is a division of Ser. No. 527,992, Nov. 29, 1974, Pat. No. 3,928,361, which is a division of Ser. No. 361,914, May 21, 1973, Pat. No. 3,882,134. This application Sep. 2, 1977, Ser. No. 830,245

Int. Cl.^{2} A61K *31/44;* C07D *249/08*

U.S. Cl. 424—263 8 Claims

1. A compound of the formula



wherein

R_1 is a substituted loweralkyl having one of the substituents carboxy or cyano;
R_3 is pyridyl; and
R_5 is pyridyl.

4,104,394
METHOD FOR DIAMETRICALLY EXPANDING THERMALLY CONTRACTIVE PTFE RESIN TUBE

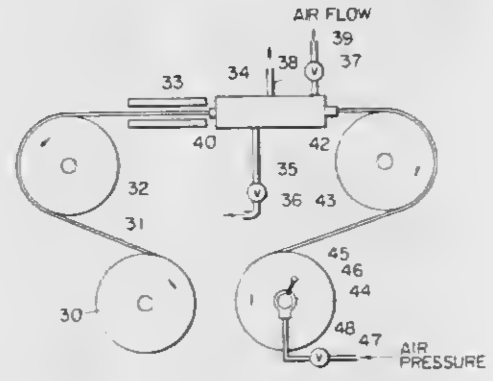
Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 14, 1976, Ser. No. 750,319

Claims priority, application Japan, Dec. 15, 1975, 50-149718; Dec. 24, 1975, 50-155226; Sep. 22, 1976, 51-114006; Sep. 11, 1976, 51-134853

Int. Cl.^{2} B29C *17/07*

U.S. Cl. 264—89 20 Claims



1. A method of manufacturing a thermall contractive tube of a desired diameter from a polytetrafluoroethylene resin, comprising the ordered steps of:

a. extruding a mixture of liquid lubricant and tetrafluoroethylene resin to form an unsintered tube;
b. removing said lubricant;
c. heating said unsintered tube to a temperature higher than 327° C under atmospheric pressure;
d. immediately after the heating step, and while the tube temperature is still above 327° C, reducing the pressure applied to the outer surface of the tube to provide a pressure differential between the inner and outer surfaces of the tube sufficient to thereby radially expand the tube to said desired diameter: and
e. cooling the tube to a temperature below 327° C while maintaining the pressure differential.

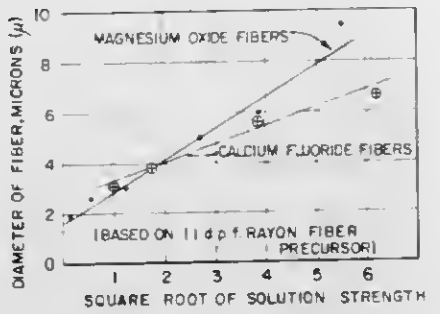
4,104,395
METHOD FOR CONTROLLING DIAMETERS OF MICROCRYSTALLINE MINERAL FIBERS

Irwin Frankel, Springfield, Va., assignor to Versar, Inc., Springfield, Va.

Filed Jun. 23, 1977, Ser. No. 809,255

Int. Cl.^{2} D02G *3/00*

U.S. Cl. 264—60 3 Claims



1. The method of making high tensile strength microcrystalline mineral fibers, by impregnating organic rayon precursor fibers with a desired mineral compound selected from the group magnesium oxide and calcium fluoride which is deposited in the fibers in solution form, and then calcining the impregnated precursor, where the diameters of the resulting mineral fibers for a particular diameter of precursor fiber are controlled and varied linearly as the square root of the strength of the impregnating mineral compound solution, the process including the steps of:

(a) washing and drying rayon precursor fibers to drive moisture therefrom until their weight becomes substantially constant;
(b) immersing the dried fibers in an impregnating solution and depositing the desired mineral compound in the precursor fibers with such concentration that the mole ratio of mineral compound deposited to rayon precursor lies in the range from 0.0015 to just below 0.25;
(c) drying the fibers to drive the moisture therefrom;
(d) heating the fibers in a furnace gradually to a temperature of about 400° C and maintaining that temperature for about 4 hours to drive off the organic precursor fibers and leave mineral fibers, and
(e) further heating the mineral fibers to a higher temperature approaching but below their melting temperature to calcine and sinter the mineral fibers.

4,104,396
2-PIPERIDINOALKYL-1,4-BENZODIOXANS

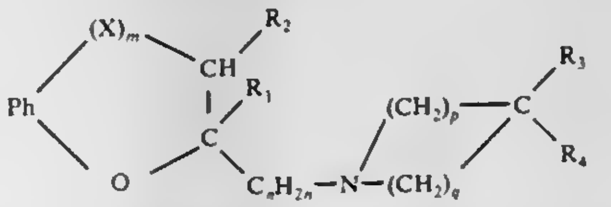
Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 589,118, Jun. 23, 1975. This application Apr. 26, 1976, Ser. No. 680,318

Int. Cl.^{2} C07D *405/06;* A61K *31/445*

U.S. Cl. 424—267 8 Claims

1. A compound corresponding to the formula



wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one or two identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylthio, halogeno, trifluoromethyl, nitro, or amino; X is oxygen; m is the integer 1; n is an integer from 1 to 4; each of p and q is an integer from 1 to 3, but $(p + q) = 4$; each of R_1 and R_2 is hydrogen or lower alkyl; R_3 is hydrogen, hydroxy, lower alkoxy, alkanoyloxy of up to 18 carbon atoms and R_4 is lower alkyl or HPh-C_nH_{2n} or a therapeutically acceptable acid addition salt thereof.

7. A neuroleptic or analgetic pharmaceutical composition comprising a neuroleptically or analgetically effective amount of a compound claimed in claim 1, together with a pharmaceutical excipient.

8. A method of treating aggression, agitation, anxiety or pain in mammals, which consists in administering to said mammal enterally or parenterally a composition claimed in claim 7.

4,104,397
SPIRO (1,3-DIOXOLANE-4,3') QUINUCLIDINE COMPOUNDS

Sasson Cohen, Tel-Aviv, and Abraham Fisher, Holon, both of Israel, assignors to The Purdue Frederick Company, Norwalk, Conn.

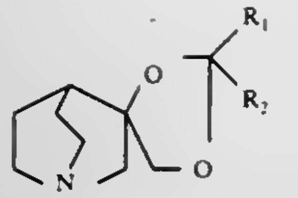
Filed Feb. 6, 1976, Ser. No. 656,056

Claims priority, application Israel, Nov. 11, 1975, 48452

Int. Cl.^{2} A61K *31/445;* C07D *455/02*

U.S. Cl. 424—267 8 Claims

1. A compound selected from the group consisting of spiro (1,3-dioxolane-4,3') quinuclidines of the formula



(1)

wherein R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl, and phenyl, and physiologically compatible salts thereof.

4,104,398

3-LOWER ALKOXYCYPROHEPTADINES AS SEROTONIN INHIBITORS

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 12, 1976, Ser. No. 713,773

Int. Cl.² C07D *211/70;* A61K *31/445*

U.S. Cl. 424—267 **6 Claims**

1. A compound, (−)-1-methyl-4-(3-lower alkoxy-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine, or pharmaceutically acceptable salt thereof.

3. A pharmaceutical antiserotonin composition in unit dosage form comprising a pharmaceutical carrier and an effective amount of (−)-1-methyl-4-(3-lower alkoxy-5H-dibenzo[a,d]-cyclohepten-5-ylidene)piperidine.

5. A method of inhibiting serotonin which comprises the administration to a patient in need of such treatment of an effective amount of (−)-1-methyl-4-(3-lower alkoxy-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine.

4,104,399

TRIAZOLE DERIVATIVES

Ernst-Heinrich Pommer, Limburgerhof; Klaus Gutsche, Rellingen, and York Hartleben, Heist, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

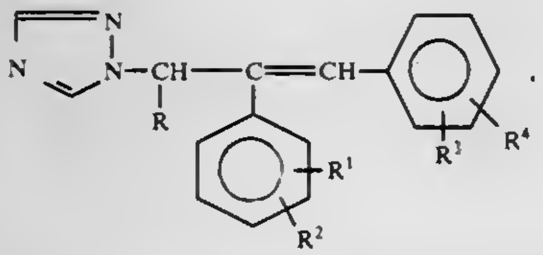
Filed Oct. 6, 1977, Ser. No. 839,761

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652313

Int. Cl.² C07D *249/08*

U.S. Cl. 424—269 **5 Claims**

1. Triazole derivatives of the formula



where R denotes hydrogen, lower alkyl or phenyl, R^1 denotes hydrogen or halogen, R^2 denotes hydrogen or halogen, R^3 denotes hydrogen, halogen or methoxy, and R^4 denotes hydrogen, halogen, methoxy or methyl, and salts thereof.

4,104,400

IMIDAZO(2,1-b)THIAZOLE DERIVATIVES, COMPOSITIONS CONTAINING SAME, AND METHOD OF TREATING HELMINTHIASIS

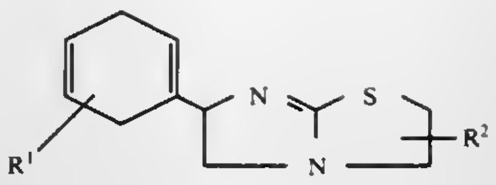
Frank Lee Weisenborn; Rudiger D. Haugwitz, both of Titusville, and Frederic Peter Hauck, Somerville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 8, 1977, Ser. No. 813,910

Int. Cl.² C07D *513/04;* A61K *31/425*

U.S. Cl. 424—270 **12 Claims**

1. A compound of the structure



wherein R^1 is hydrogen, lower alkyl, or carboxy, and R^2 is hydrogen, lower alkyl or phenyl, and physiologically acceptable acid-addition salts thereof.

7. A pharmaceutical composition for use in treating or preventing helminthiasis in mammalian species comprising an anthelmintically effective amount of a compound as defined in claim 1 and a non-toxic physiologically acceptable carrier therefor.

9. A method of treating or preventing helminthiasis, which comprises administering to a mammalian host a therapeutically effective amount of a composition as defined in claim 7.

4,104,401

CONTROL OF INSECTS AND ACARIDS WITH ALKYNYL PHENYLPHENOL DIVALENT ALIPHATIC SULFITES

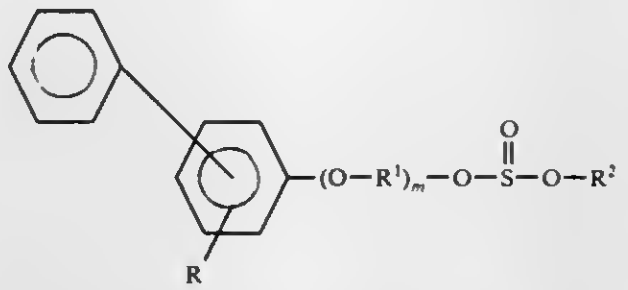
Rupert A. Covey, Bethany, and Robert E. Grahame, Jr., Cheshire, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 598,463, Jul. 23, 1975, Pat. No. 4,003,940, which is a division of Ser. No. 414,047, Nov. 8, 1973, Pat. No. 3,916,005. This application Oct. 29, 1976, Ser. No. 737,121

Int. Cl.² A01N *9/14*

U.S. Cl. 424—303 **11 Claims**

1. A method for killing insects and acarids, including mites and ticks, comprising applying to said insects or acarids or a locus subject to attack by said pests a pesticidally effective amount of a sulfite having the formula:



wherein R is hydrogen, bromine, chlorine, iodine or an alkyl radical having not more than 6 carbon atoms;

R^1 is an ethylene, 1,2-propylene, 1,2-butylene or 2,3-butylene radical or a cycloalkylene radical containing 5 or 6 carbon atoms;

R^2 is an alkynyl group containing from 3-6 carbon atoms; and, *m* is an integer from 1 to 3.

4,104,402

5,6-DIHYDROXY AMINOTETRALOL COMPOUNDS

Hirosada Sugihara, Osaka; Masazumi Watanabe, Kawanishi; Michio Motohashi, Kobe; Masao Nishikawa, Kyoto, and Yasushi Sanno, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

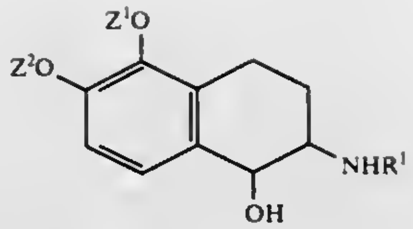
Division of Ser. No. 555,128, Mar. 4, 1975, Pat. No. 4,010,202. This application Nov. 11, 1976, Ser. No. 741,020

Claims priority, application Japan, Apr. 25, 1974, 49-47211

Int. Cl.² C07C *87/28;* A01N *9/20*

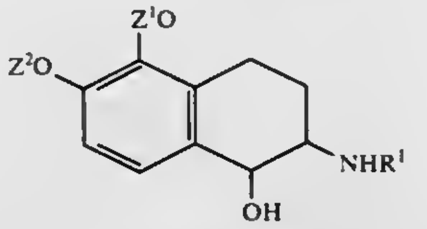
U.S. Cl. 424—330 **15 Claims**

1. A compound of the formula



wherein each of Z^1 and Z^2 is hydrogen and R^1 is alkyl of 1-6 carbon atoms substituted by phenyl, said phenyl being unsubstituted or substituted by hydroxyl or alkoxy of 1-4 carbon atoms, or a pharmaceutically acceptable salt thereof.

14. A pharmaceutical composition capable of use as a bronchodialator which comprises, as active ingredient, a pharmaceutically effective amount of a compound of the formula



(1)

wherein each of Z^1 and Z^2 is hydrogen and R^1 is alkyl of 1-6 carbon atoms, substituted by phenyl, said phenyl being unsubstituted or substituted by hydroxyl or alkoxy of 1-4 carbon atoms, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier therefor.

4,104,403

WATER-OIL EMULSIONS AND METHOD OF PREPARING SAME

Graham Barker, Fair Lawn, and Martin J. Barabash, Montvale, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Dec. 21, 1976, Ser. No. 753,147

Int. Cl.² A61K *47/00, 31/00*

U.S. Cl. 424—365 **12 Claims**

1. A high internal phase ratio cosmetic emulsion having a water disperse phase and an oil continuous phase which comprises (a) a cosmetic emulsion oil, (b) an emulsifier combination comprising aluminum and/or calcium stearate and an alkali metal phosphoric acid ester of a mono- and/or diglyceride, and (c) water, said components (a) (b) and (c) being present in the following concentration ranges expressed in percent by weight based upon the total weight of the resulting emulsion:

Component	Concentration Range
(a) Cosmetic emulsion oil	balance
(b) Al/Ca stearate	0.5 - 3.0
Phosphated glyceride	0.5 - 5.0
(c) H_2O	40.0 - 85.0

7. A method of preparing a high internal phase ratio cosmetic emulsion having a water disperse phase and an oil continuous phase which comprises (i) admixing (a) a cosmetic emulsion oil and (b) an emulsifier combination comprising aluminum and/or calcium stearate and an alkali metal phosphoric acid ester of a mono- and/or di-glyceride and (ii), while agitating, blending therewith (c) water which has been heated to a temperature in the range of about 90° to about 95° C, said components (a) (b) and (c) being present in the following concentration ranges expressed in percent by weight based upon the total weight of the resulting emulsion:

Component	Concentration Range
(a) Cosmetic emulsion oil	balance
(b) Al/Ca stearate	0.5 - 3.0
Phosphated glyceride	0.5 - 5.0
(c) H_2O	40.0 - 85.0

4,104,404

CROSS-LINKED AMIDE/OLEFIN POLYMERIC TUBULAR FILM COEXTRUDED LAMINATES

Anne C. Bieler, Greenville, and Henry G. Schirmer, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 556,755, Mar. 10, 1975, Pat. No. 3,997,383. This application May 24, 1976, Ser. No. 689,440

Int. Cl.² B65D *85/30*

U.S. Cl. 428—35 **5 Claims**

1. A coextruded, tubular, laminated polymeric film for use in elevated temperature media comprising:

(a) a layer comprising a film-forming amide polymer;

(b) a layer comprising a mono-alpha olefin polymer;

(c) an adhesive disposed between said amide and olefin layers, said adhesive having mono-olefin units as the major component thereof;

(d) said adhesive and said olefin polymer each being cross-linked by radiation to a dosage level of at least 6 MR.

4,104,405

FOOD PRODUCT HAVING EXPANDED CONFECTION AND METHOD OF MANUFACTURE

John H. Forkner, 2116 Mayfair Dr., West, Fresno, Calif. 93703

Continuation-in-part of Ser. No. 798,255, May 8, 1977, abandoned, which is a continuation of Ser. No. 550,549, Feb. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 517,078, Oct. 23, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,091

Int. Cl.² A23G *3/00;* A21D *13/00*

U.S. Cl. 426—94 **21 Claims**

1. A food product comprising a shell of cooked dough having an upper annular head portion adapted to receive a mass of frozen dessert and a lower hand hold portion, and an annular cellular mass of solid friable expanded confection carried by and surrounding only the head portion and bonded to the outer peripheral surface of the same, said expanded mass surrounding the region that is adapted to receive a mass of frozen dessert.

4,104,406

COATED EXPANDED ANIMAL FOOD

William G. Stringer; Robert E. Schara, both of Battle Creek, and Charles T. Stocker, Augusta, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 337,338, Mar. 2, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,341

Int. Cl.² A23J *3/00*

U.S. Cl. 426—99 **2 Claims**

1. A dry, porous particulate nutritionally balanced animal food product comprised of an expanded mixture of between 35 to 70% by weight farinaceous and from about 20 to about 50% by weight proteinaceous ingredients, said animal food product having coated on the exterior thereof an emulsified mixture comprised of an emulsifier, fat and a dextrin material selected from the group consisting of corn syrup, corn syrup solids, dextrins and mixtures thereof, said product containing on the exterior thereof from about 1 to 8% by weight fat and 1 to 8% by weight dextrin material, said animal food product characterized by its improved resistance to rapid extensive hydration when mixed with liquid and improved palatability.

4,104,407

EXPANDED ANIMAL FOOD COATED WITH DEXTRIN AND FAT

William G. Stringer; Robert E. Schara, both of Battle Creek, and Charles T. Stocker, Augusta, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 337,337, Mar. 2, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,731

Int. Cl.^{2} A23J *3/00*

U.S. Cl. 426—99 2 Claims

1. A dry, particulate, porous, nutritionally balanced animal food product comprising an expanded mixture of between 35 to 70% by weight farinaceous and from about 20 to 50% by weight proteinaceous ingredients, said animal food product having thereon a first coating of from about 1 to 8% by weight of a dextrin material selected from the group consisting of corn syrup, corn syrup solids, dextrins, and mixtures thereof and a second exterior coating of from 1 to 8% by weight of fat, said animal food product characterized by its improved resistance to rapid extensive hydration when mixed with liquid and improved palatability.

4,104,408

SUBSTANTIALLY NEUTRALIZED AQUEOUS LIQUID SMOKE COMPOSITIONS

Herman Shin-Gee Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,425

Int. Cl.^{2} A22C *13/00;* A23L *1/22*

U.S. Cl. 426—135 30 Claims

1. An aqueous liquid smoke composition having a pH greater than 5, comprising a uniform mixture of smoke coloring and flavoring constituents, an alkaline neutralizing agent in an amount sufficient to maintain said composition at a pH greater than 5, and an amount of a water soluble alcohol solubilizing agent sufficient to prevent said smoke constituents from separating out.

4,104,409

PRODUCTION OF HOP EXTRACTS

Otto Vitzthum, Bremen; Peter Hubert, Bremen-Lesum, and Wolfgang Sirtl, Bremen, all of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim (Ruhr), Germany

Continuation of Ser. No. 498,159, Aug. 16, 1974, abandoned, which is a continuation of Ser. No. 258,587, Jun. 1, 1972, abandoned. This application Jan. 6, 1976, Ser. No. 646,780

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1971, 2127618

Int. Cl.^{2} A23L *1/00*

U.S. Cl. 426—386 40 Claims

1. A process for the production of hop extract which comprises extracting air dried hops with an extraction solvent gas while maintaining the gas in the supercritical state with respect to temperature and pressure, and separating the hop extract from the solvent gas laden therewith.

4,104,410

PROCESSING OF GREEN VEGETABLES FOR COLOR RETENTION IN CANNING

George J. Malecki, 157 Weston Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 427,242, Dec. 21, 1973, abandoned. This application Sep. 9, 1976, Ser. No. 721,878

Int. Cl.^{2} A23B *7/00*

U.S. Cl. 426—399 7 Claims

1. A process for canning green vegetables to produce a canned product substantially having the green color characteristic of the fresh green vegetable, said process being characterized by the absence of a blanching step and the absence of an addition of color retention additives, said process consisting of the steps of:

maintaining the vegetable from the time of harvest at a temperature below its thermal injury temperature and in a storage condition which allows air to flow about said vegetable to inhibit anaerobic respiration whereby the vegetable enters a subsequent sterilization step in a fresh, respiring state, substantially the same as when harvested;

sterilizing the vegetable at a temperature from about 250° F up the scorching temperature of the vegetable for a time sufficient to produce a commercially sterile vegetable; and

sealing said vegetable in a container.

4,104,411

FORMING OF ICE LOLLIES AND OTHER CONFECTIONS

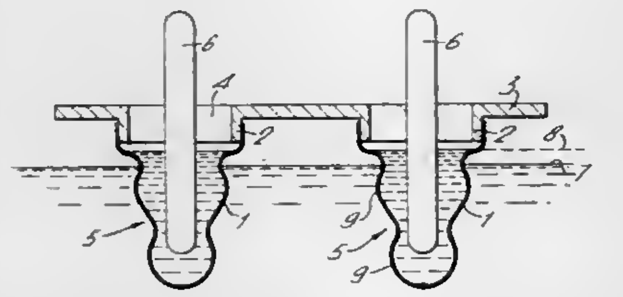
John Dennis Pooler, Stroud, England, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 560,933, Mar. 21, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,818

Claims priority, application United Kingdom, Mar. 28, 1974, 13801/74

Int. Cl.^{2} A23P *1/00*

U.S. Cl. 426—421 5 Claims



1. A method of forming moulded ice confections of re-entrant shape comprising filling ice confection mix into a plurality of thin-wall flexible elastic moulds of cavity shape which is re-entrant along at least one wall surface from the deepest part of the mould to the mouth of the mould, inserting a handle into the ice confection mix in each mould, applying a liquid freezant to the outer surface of each mould so as to freeze the ice confection mix and anchor the handle whjle said thin-wall moulds are supported by said freezant, and withdrawing the handle so as to cause the moulds to distort and release an ice confection of re-entrant shape on the handle.

4,104,412

METHODS AND SYSTEMS FOR MAKING AERATED CANDY

Harry A. Fischer, Frankenmuth, and Richard R. Wrubel, Ann Arbor, both of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Aug. 22, 1977, Ser. No. 826,400

Int. Cl.^{2} A23G *3/00, 3/02*

U.S. Cl. 426—572 8 Claims

1. In a candy making process including the steps of:

(a) heating a candy mass to prepare a viscous melt product and discharging the heated mass in a stream;

(b) introducing the mass to a closed chamber and homogeneously intermixing a gas such as air with said melt product stream to form gas bubbles therein while moving the mass through said chamber under pressure, the improvements wherein:

(c) sequentially, as the product moves through the chamber, and in a repeated series of steps as the viscosity is maintained at a high level, the bubbles are repeatedly elongated and then sliced when the product is forced through reduced size openings and a low velocity knife moves through the product thereafter at a speed such as to slice the elongated bubbles, as distinguished from smashing them;

(d) cooling the product to remove "work energy" heat therefrom during said slicing steps as the mass moves through the chamber and maintain the viscosity of the mass at a relatively high viscosity suited to slicing which prevents migration and coalescence of the bubbles; and

(e) discharging the bubble incorporating mass from the chamber to atmosphere at substantially the relatively high bubble slicing viscosity.

4,104,413

PREPARATION OF IMITATION CHEESE

John Dee Wynn; George Terrance Denton, both of Plano; Richard Judd Bell, Sherman; Harry Rowe Vernon, Dallas, all of Tex., and Lloyd Roy Custer, Columbus, Ohio, assignors to Anderson, Clayton & Co., Houston, Tex.

Continuation-in-part of Ser. No. 217,997, Jan. 14, 1972, abandoned. This application Jun. 10, 1974, Ser. No. 478,032

Claims priority, application Ireland, Feb. 17, 1971, 190/71; United Kingdom, Sep. 16, 1971, 43145/71

Int. Cl.^{2} A23C *19/02, 19/12*

U.S. Cl. 426—582 13 Claims

1. A food resembling mozzarella cheese, said food comprising a substantially gas-free homogeneous blend of:

(a) an emulsion of water with hydrogenated soybean oil having a Wiley melting point of about 95° F., the water being about 47% and the fat being about 22% of the food,

(b) about 25% calcium caseinate, and

(c) about 1.3% adipic acid, said food having a pH of about 5.1.

6. A process for making a food having a moisture content between about 46 and 52% and resembling cheddar cheese, said food including about 12 to 35% fat having a Wiley melting point of between about 90° and 110° F. and dry ingredients including calcium caseinate in an amount equal to about 15 to 33% of the food, about 1 to 5% ungelatinized flour, up to about 2% of emulsifying salts in an amount effective to give desired characteristics of melting, shredding and matting, and about 0.5 to 1.8% of an acid selected from the class consisting of adipic, lactic, citric, malic, and combinations thereof, the food having a pH of about 4.8 and 5.7, said process comprising,

(a) melting the fat and then forming an emulsion of it with water under subatmospheric pressure, and

(b) blending the dry ingredients with the emulsion under high shear mixing, a subatmospheric pressure, and at a temperature above the melting point of the fat to form a substantially gas-free homogeneous blend of the dry ingredients and the emulsion.

4,104,414

PROCESS OF MAKING DEHYDRATED FRUIT JUICE

Abdul R. Rahman, and Wayne A. Deneke, both of Natick, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 269,630, Jul. 7, 1972. This application Jun. 21, 1974, Ser. No. 481,926

Int. Cl.^{2} A23L *2/06*

U.S. Cl. 426—599 2 Claims

1. A process for producing a dehydrated orange juice powder which is storage-stable, non-caking when packaged under vacuum in flexible packages and stored at temperatures of 100° F. or higher, and instantly rehydratable after storage at said temperatures, which comprises the steps of extracting orange juice from oranges, said orange juice comprising liquid and pulp components, centrifuging said orange juice at about 2000 r.p.m. for a time sufficient for separation of said orange juice into a sediment portion and a supernatant liquid portion to occur, said sediment portion containing substantially all of said pulp components, removing a first fraction of said supernatant liquid portion while leaving the remaining fraction of said supernatant liquid portion with said sediment portion, remixing said sediment portion with said remaining fraction of said supernatant liquid portion, freeze-vacuum-dehydrating the resulting mixture of said sediment portion with said remaining fraction of said supernatant liquid portion to produce dehydrated orange juice solids having a moisture content of not more than about 2.0 percent by weight, and comminuting said dehydrated orange juice solids to form a dehydrated orange juice powder of particle size capable of passing through a sieve having about 0.0335 inch openings, said first fraction being not less than about eighty percent by weight of said supernatant liquid portion and said remaining fraction being up to twenty percent by weight of said supernatant liquid portion.

4,104,415

PROCESS FOR PREPARING BACON ANALOG

Sudhakar P. Shanbhag, Yorktown Heights; Louis G. Liggett, Brooklyn, and Adrienne C. Mlkovits, Suffern, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 10, 1975, Ser. No. 622,272

Int. Cl.^{2} A23J *3/00*

U.S. Cl. 426—656 5 Claims

1. A process for preparing a bacon analog comprising: preparing a first slurry comprising from about 35 to about 55% water, from about 10 to about 20% fat, and from about 10 to about 50% of heat coagulable protein; preparing a second slurry comprising from about 20 to about 45% water, from about 25 to about 45% fat, and from about 15 to about 30% of heat coagulable protein; deaerating said first slurry sufficiently to raise the density thereof to about 1.08 g/cc; preparing a layered mass containing at least one layer of said first slurry and at least one layer of said second slurry, said first slurry amounting to at least 50% of the weight of the layered mass and said second slurry amounting to no more than 30% of the layered mass; heating said layered mass sufficiently to heat set the coagulable protein; slicing the resulting heat set layered mass; and immersing the slices into a bath of heated cooking oil at a temperature and for a time sufficient to reduce the moisture content of the slices to less than 10%.

4,104,416

THIN WALLED PROTECTIVE COATINGS BY ELECTROSTATIC POWDER DEPOSITION

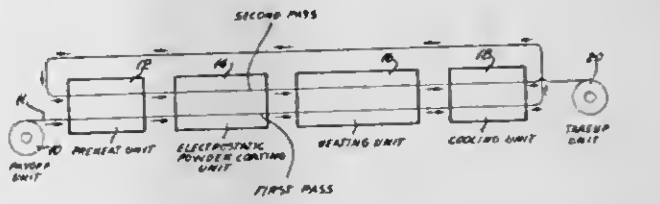
Mellapalayam R. Parthasarathy, Verdun; Douglas C. Nethersole, Laval, and Michael A. Dudley, Toronto, all of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed May 6, 1976, Ser. No. 683,749

Claims priority, application Canada, Feb. 5, 1976, 245068

Int. Cl.^{2} B05D *1/06*

U.S. Cl. 427—29 20 Claims



1. A process for production of thin walled coatings on continuous elongated substrates through an electrostatic cloud application of two superimposed layers of powder material comprising the steps of:

(a) applying electrostatically a first layer of fusible powder material to a continuous elongated substrate by passing said substrate through an electrostatic cloud coater;

(b) at least partially fusing said first layer of powder material to provide a uniform coating on the elongated substrate;

(c) holding the at least partially fused coating at an elevated temperature below the full fusion temperature of the powder material to be applied as the second layer immediately prior to the application of said second layer, said elevated temperature being sufficient to reduce the surface resistivity of the first deposited layer, thereby resulting in a uniform second layer deposition;

(d) applying electrostatically a second layer of fusible powder material to the at least partially fused first layer by passing the coated substrate through an electrostatic cloud coater; and

(e) fusing the total applied coating to achieve the desired coating thickness.

4,104,417

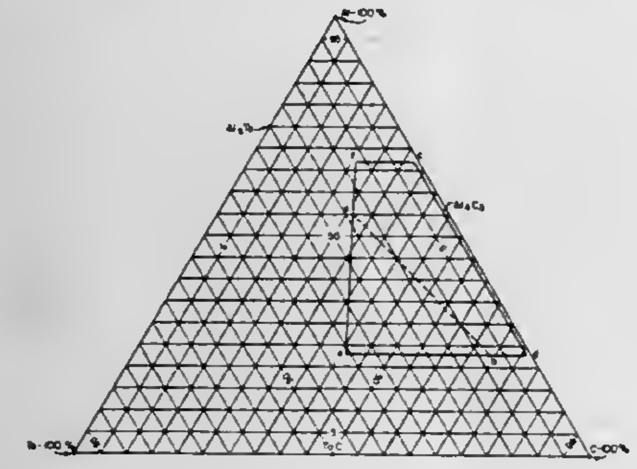
METHOD OF CHEMICALLY BONDING ALUMINUM TO CARBON SUBSTRATES VIA MONOCARBIDES

Raymood Vincent Sara, North Olmstead, Obio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 444,556, Feb. 21, 1974, abandoned, which is a continuatioo-in-part of Ser. No. 340,287, Mar. 12, 1973, abandoned. This application Jun. 18, 1976, Ser. No. 697,611

Int. Cl.² B05D *3/06*

U.S. Cl. 427—37 **29 Claims**



1. A process for chemically bonding aluminum to a carbon substrate comprising:

(a) depositing aluminum and a metal selected from the group consisting of tantalum, titanium and hafnium onto a carbon substrate, wherein said metal is present in an amount greater than its solubility limit in said aluminum at the reaction temperature of the subsequent heating step (b), the insoluble amount of said metal being present at the carbon substrate as an insoluble intermetallic phase of said aluminum and said metal at the temperature of the subsequent heating step (b); and

(b) heating the aluminum, metal and carbon substrate in an inert atmosphere at a temperature at which said metal is soluble in said aluminum, for a time period sufficient to form an interface of metal carbide on the substrate which serves to chemically bond the aluminum to the carbon substrate.

20. A process for chemically bonding aluminum to a carbon substrate comprising:

(a) depositing a mixture comprising aluminum and a metal selected from the group consisting of tantalum, titanium and hafnium onto a carbon substrate, wherein said metal is present in said mixture in an amount greater than its solubility limit in said aluminum at the reaction temperature of the subsequent heating step (b), the insoluble amount of said metal being present at the carbon substrate as an insoluble intermetallic phase of said aluminum and said metal at the temperature of the subsequent heating step (b); and

(b) electric arc heating the deposited mixture to a temperature at which the metal is soluble in the aluminum for a time period sufficient to form an interface of metal carbide on the substrate which serves to chemically bond the aluminum to the carbon substrate.

4,104,418

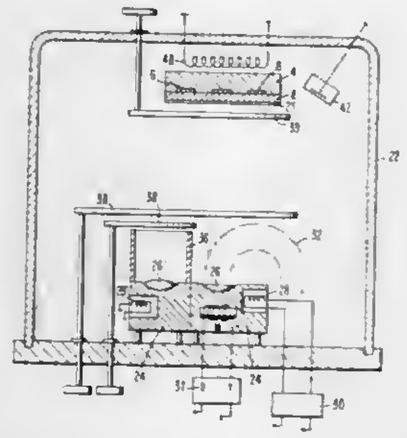
GLASS LAYER FABRICATION

Kyu C. Park, Yorktown Heights, N.Y., and Elizabeth J. Weltzman, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 615,967, Sep. 23, 1975, abandoned, which is a continuation of Ser. No. 462,289, Apr. 19, 1974, abandoned. This application Jul. 7, 1976, Ser. No. 703,382

Int. Cl.² B05D *3/06*

U.S. Cl. 427—42 **9 Claims**



1. Method of fabricating a dielectric glass layer on a substrate comprising the steps of:

heating a source of borosilicate glass in an evacuated chamber by a scanning electron beam to a uniformly heated molten pool whose surface area is in the range from at least 2cm² to approximately 10cm² to provide a stream of evaporated source material at a rate equivalent to 40–80 A/sec. as measured at approximately 10 inches away from said source,

shielding said substrate from said stream until the latter has attained a uniform evaporation rate,

maintaining said substrate at a temperature of 200° C to 300° C during such deposition,

depositing a layer of borosilicate glass of thickness less than approximately 50 microns on said substrate; and

annealing said deposited layer at temperature substantially higher than said substrate temperature during said depositing of said borosilicate glass.

4,104,419

SURFACE TREATMENT OF A TIN-PLATE

Keiichi Tanikawa, Yokohama; Tatsuro Obi, Tokyo; Tadashi Tanaka; Susumu Otsuka, both of Yokohama, and Takao Saito, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 27, 1976, Ser. No. 718,318

Claims priority, application Japan, Aug. 27, 1975, 50-103677

Int. Cl.² B05D *3/02, 3/14*

U.S. Cl. 427—46 **8 Claims**

1. A method for surface treating an electrolytic tin plate, comprising coating an electrolytically tin-plated steel sheet with an aqueous solution consisting essentially of 0.1 to 10% of a pyrazole derivative after the step of electrolytically tin-plating the steel sheet prior to the step of reflowing the plated tin layer on the steel sheet, and then subjecting the thus-treated tin plate to drying and reflowing.

4,104,420

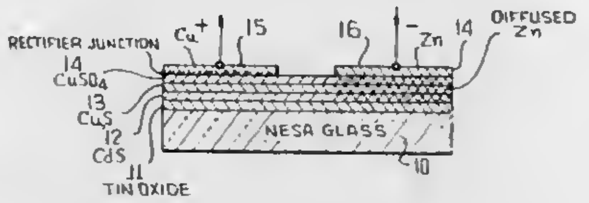
PHOTOVOLTAIC CELL

John F. Jordan, El Paso, Tex., and Curtis Lampkin, Cincinnati, Ohio, assignors to Photon Power, Inc., El Paso, Tex.

Continuation of Ser. No. 607,233, Aug. 25, 1975, abandoned, which is a division of Ser. No. 476,062, Jun. 3, 1974, abandoned, which is a division of Ser. No. 303,365, Nov. 3, 1972, Pat. No. 3,902,920. This application Feb. 11, 1977, Ser. No. 767,684

Int. Cl.² B05D *5/12;* **H01M** *2/00*

U.S. Cl. 427—74 **14 Claims**



1. The method of fabricating a photovoltaic cell of the type having a layer comprised of CdS microcrystals on an electrically conductive surface of a substrate, wherein the improvement comprises the step of forming said layer by a spray process conducted while said electrically conductive surface is maintained at a constant temperature by heating said substrate while spraying said substrate through an oscillating nozzle which repeatedly re-traces a planar path designed to cover said substrate with spray, and at a sufficiently small rate of spray to enable said heating to supply heat to said substrate at a rate sufficient to maintain the temperature of said surface adjacent said planar path essentially constant during the spray process.

12. The method of fabricating a photovoltaic cell, comprising the steps of

forming a layer of CdS microcrystals over an electrically conductive layer on a substrate by a spray process;

forming a layer of Cu_2S over said layer of CdS to form a photovoltaic heterojunction with said CdS;

applying Zn over a portion of said layer of Cu_2S;

heating said Zn to about 500° F for a time sufficient to diffuse a portion of said Zn through said layer of Cu_2S and form a low resistance path between said electrically conductive layer and said Zn remaining above said Cu_2S.

4,104,421

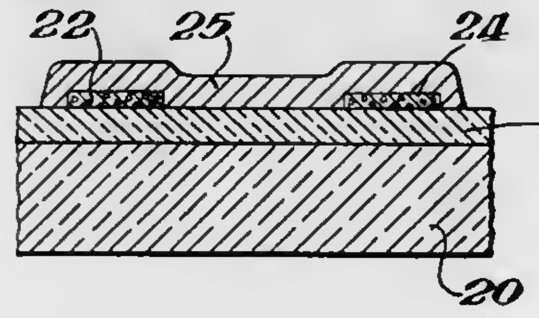
METHOD OF MAKING A GLASS CONTAINING RESISTOR HAVING A SUB-MICRON METAL FILM TERMINATION

John P. Maher, Adams, and Theodore W. Johnsoo, Williamstown, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Division of Ser. No. 528,052, Nov. 29, 1974, Pat. No. 4,016,525. This application Aug. 3, 1976, Ser. No. 711,174

Int. Cl.² H01C *1/012*

U.S. Cl. 427—96 **6 Claims**



1. A method for making a resistor comprising preparing a termination paste consisting essentially of a metallo-organic compound , glass, and a quantity of particles determined from the total weight of said particles plus the metal of said compound, which quantity is selected from at least 20% silica, at least 17% manganese dioxide, and at least 17% of a mixture of silica and manganese dioxide, said glass amounting to as much as 22% by weight relative to the total weight of said glass plus said particles plus the metal of said compound, said silica particles having an average diameter no less than 0.2 micron; applying a coating of said paste to a substrate in selected areas thereof; firing said coated substrate; depositing a glass containing resistor ink on said substrate in overlapping relationship with said fired terminations; and firing said resistor ink, for the purpose of forming a cermet type resistor having sub-micron thick terminations.

4,104,422

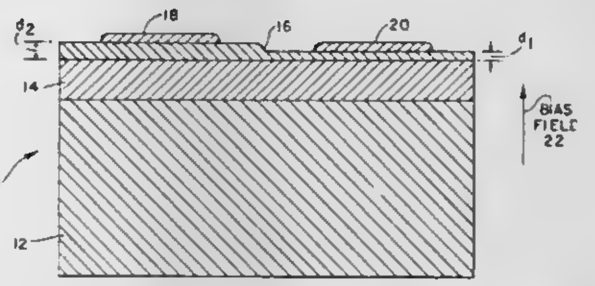
METHOD OF FABRICATING MAGNETIC BUBBLE CIRCUITS

Robert Melvio Sandfort, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 455,219, Mar. 27, 1974, Pat. No. 3,921,157. This application Juo. 2, 1975, Ser. No. 582,787

Int. Cl.² B05D *5/12*

U.S. Cl. 427—123 **3 Claims**



1. A method of fabricating a bubble chip, comprising the steps of depositing a first spacing layer of nonferromagnetic material on top of a sheet of magnetic bubble material, then depositing a second spacing layer of a different nonferromagnetic material on top of said first spacing layer, then selectively removing portions of said second spacing layer to leave a mesa topography in which the locations of raised plateaus correspond to the locations of subsequently applied ferromagnetic overlay circuit elements from which bubbles are to be deflectible, then depositing a layer of ferromagnetic material on top of the partially removed second spacing layer, and then selectively removing portions of said layer of ferrogmagnetic material to leave a pattern of ferromagnetic overlay circuit elements, selected ones of the circuit elements of said pattern being left at least partially on the raised plateaus of said second layer, whereby two different degrees of magnetic coupling are achieved for ferromagnetic overlay circuit elements with different functions on the same bubble chip.

4,104,423

CORROSION INHIBITORS

Peter Miles, Stockport; James Roger Hargreaves, Sale, and John Burrows, Congleton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

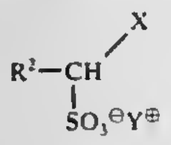
Filed Feb. 14, 1977, Ser. No. 768,244

Claims priority, application United Kingdom, Feb. 21, 1976, 6935/76

Int. Cl.² C07C *143/14, 143/10;* **B32B** *15/18;* **B05D** *1/18*

U.S. Cl. 427—402 **10 Claims**

1. A compound having the general formula



$$R^2-\underset{\displaystyle SO_3^{\ominus}Y^{\oplus}}{\underset{|}{CH}}-X$$

wherein X is OH or NHR^1, Y is hydrogen or NH_3R^1, with the proviso that when X is OH Y cannot be hydrogen, R^1 is a saturated or unsaturated aliphatic or cycloaliphatic hydrocarbon radical containing from 1 to 20 carbon atoms optionally substituted by one or more halogen, cyano, nitro, hydroxyl, carboxyalkyl or sulphoxyalkyl radicals in which the alkyl group contains from 1 to 4 carbon atoms, and R^2 is an aryl, alkaryl or aralkyl radical containing from 6 to 20 carbon atoms which may be optionally substituted by one or more cyano, nitro, halogen, hydroxyl, carboxyl, carboxymethyl, carboxyethyl, hydroxymethyl or methoxymethyl radicals or mixtures thereof.

4,104,424
PROCESS FOR COATING METALS

Lester Steinbrecher, Southampton, and Wilbur S. Hall, Plymouth Meeting, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 113,685, Feb. 8, 1971, abandoned, which is a division of Ser. No. 791,801, Jan. 16, 1969, Pat. No. 3,585,084, which is a continuation-in-part of Ser. No. 554,336, Jun. 1, 1966, abandoned. This application Aug. 20, 1974, Ser. No. 499,039

The portion of the term of this patent subsequent to Jun. 15, 1988, has been disclaimed.

Int. Cl.^{2} B05D *1/18*

U.S. Cl. 427—435 22 Claims

1. A process for applying a coating to a metallic surface comprising:

(a) immersing a metallic surface in an aqueous acidic organic coating composition comprising, in coating-forming proportions, water, hydrogen ion, an oxidizing agent which contains oxygen, and an organic, water-dispersible, film-forming polymeric resinous material dispersed in the coating composition;

(b) depositing said resinous material on said surface to form thereon a resinous coating while said surface is immersed in said composition; and

(c) maintaining said surface in said composition and depositing thereon additional resinous material to thereby produce a resinous coating, the thickness of which increases during the time said surface is immersed in said composition; and

(d) withdrawing the resinous-coated surface from said composition after the desired amount of resinous coating has been deposited on said surface; wherein said composition will produce said coating on said metallic surface in the absence of any electrical charge on said metallic surface other than that imparted thereto by said composition, and

wherein said composition is sufficiently acidic to effect an increase in the amount of resinous coating deposited for a period of at least about 10 minutes from the time said metallic surface is immersed in said composition; and wherein said resinous coating is adherent from the time it deposits on the surface and is resistant to removal by rinsing with water after it is withdrawn from said composition.

4,104,425
POWER CELL DRIVEN BY A GASEOUS OR LIQUID PRESSURE MEDIUM

Georg Hirmann, Zürich, Switzerland, assignor to Rudolf Felix Homberger, Schaffhausen, Switzerland

Filed Mar. 16, 1977, Ser. No. 778,253

Int. Cl.^{2} A47C *27/08;* **B63C** *7/10*

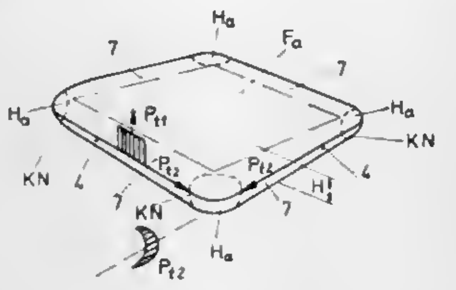
U.S. Cl. 428—12 12 Claims

1. A hollow body device for displacing masses by filling the device with pressurized fluid comprising:

a pair of like upper and lower planar segments, the periphery of said segments including rectilinear side portions, the like side portions being aligned and the shape of the segments being substantially unvarying as the device is pressurized;

a plurality of wall segments, each of said wall segments interconnecting respective ones of said aligned side portions of the planar segments, said wall segments varying in shape as the device is pressurized for providing a lift between the upper and lower segments and the wall segments developing part of a curved wall surface of a circular cylinder when the device is pressurized, the axis of the cylinder being orthogonal to the operational direction of the lift; and

corner segments interconnecting adjoining ones of said wall segments, said corner segments varying in shape without substantial kinking as the device is pressurized.



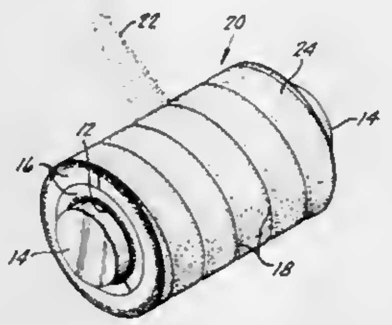
4,104,426
PRODUCTION OF MUFFLER MATERIAL

Rodolfo Gonzalez, Palos Verdes Estates, and Allen P. Penton, III, Costa Mesa, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 28, 1975, Ser. No. 636,291

Int. Cl.^{2} E04B *1/99;* **G10K** *11/04*

U.S. Cl. 428—36 9 Claims



1. A muffler material having good sound absorption characteristics, high temperature and chemical resistance, and having structural rigidity when exposed to engine heat, vibration and exhaust gas pressures, consisting essentially of a ring shaped blanket of alumina-silica fibers impregnated along the inside and outside surfaces thereof, and on opposite ends thereof with a silica binder.

2. A muffler material as defined in claim 1, said alumina-silica fibrous blanket containing about 40 to about 50% alumina and about 50 to about 60% silica, by weight, the silica binder content of the coated or impregnated fibrous blanket ranging from about 5 to about 50% by weight.

3. A muffler material as defined in claim 2, said ring shaped blanket of alumina-silica fibers being cylindrical in shape, the silica binder content of the cylindrical fibrous blanket along the length thereof ranging from about 10 to about 20%, and at the ends thereof ranging from about 30 to about 40% silica binder by weight.

4,104,427
LAMINATED LIGHT-TRANSMITTING FIRE-SCREENING PANEL

Hans-Henning Nolte, Gelsenkirchen, Fed. Rep. of Germany; Marcel De Boel, Chatelineau, and Pol Baudin, Fontaine-l'Eveque, both of Belgium, assignors to BFG Glassgroup, Paris, France

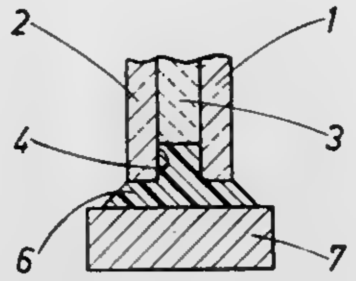
Filed Aug. 10, 1976, Ser. No. 713,181

Claims priority, application United Kingdom, Aug. 22, 1975, 34950/75

Int. Cl.^{2} B32B *1/04, 17/00*

U.S. Cl. 428—68 9 Claims

1. A laminated light-transmitting fire-screening panel comprising two outer nitreous plies, each having an inner face and at least one layer of intumescent material bonded to each said inner face over an area which is less than the total surface area of at least one of said inner faces of one of said outer plies to define therewith at least one recess leading along at least a portion of the edge of said panel, frame means having a portion inserted in said recess for holding said panel so that upon swelling of said layer, at least one of said plies is free to move away from the other ply, said frame means also including sealing means in said recess for protecting the intumescent material against contact with the atmosphere.



4,104,428
CROSSLINKED MOLDED PILE PRODUCT

William Chang Liu, Northbrook, Ill., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 9, 1974, Ser. No. 531,183

Int. Cl.^{2} B29D *7/20;* **D06N** *7/04*

U.S. Cl. 428—85 23 Claims

1. A molded pile product comprising a base and a plurality of fibers extending from the base, said fibers:

(a) having an aspect ratio greater than 10,

(b) having been shaped in a mold,

(c) being formed from a molding composition including a crosslinkable polymeric material which is crosslinked during formation of said fibers, and

(d) exhibiting no material deformation or elongation due to their removal from the mold.

18. A molded pile product comprising a base and a plurality of fibers extending from the base, said fibers having:

(a) an average diameter measured at the base ranging between 0.01 and 0.05 centimeters,

(b) an average length ranging between 0.01 and 5 centimeters,

(c) a density of from 0.10 to 0.50, and

(d) an aspect ratio greater than 10, said fibers having been:

(e) shaped in a mold

(f) formed from a molding composition including a crosslinkable polymeric material which is crosslinked during formation of said fibers and, after being crosslinked, has an elastic modulus ranging between 50 and 14,000 kilograms per square centimeter, and

(g) given no material permanent deformation or elongation due to their removal from the mold.

4,104,429
BRANDED WOOD BASED COMPOSITION BOARD PRODUCT

Gary C. Colledge, P. O. Box 2178, Newport Beach, Calif. 92663

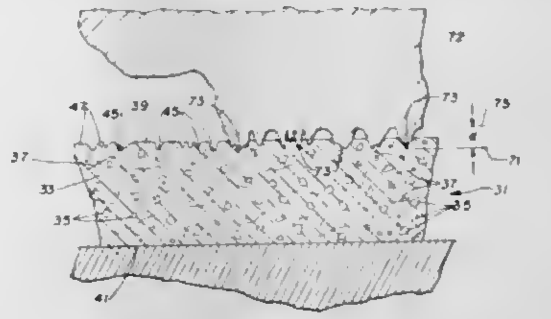
Continuation-in-part of Ser. No. 598,772, Jul. 29, 1975, Pat. No. 4,007,767. This application Feb. 9, 1977, Ser. No. 767,055

Int. Cl.^{2} B32B *21/06*

U.S. Cl. 428—151 4 Claims

1. A wood based composition board product for use in the fabrication of articles such as furniture, doors, panels and the like including a solid body formed from wood based components held together by binder means and having a relatively hard outer surface, wherein the improvement in said composition board product is comprised of:

said outer surface being permanently compressed in selected areas to form an intricate pattern of recesses therein, said pattern of recesses being formed as a wood grain simulating pattern extending over substantially the entire area of said outer surface, and substantially all of said recesses being charred to produce a discolored appearance as compared to the color of said outer surface intermediate said recesses.



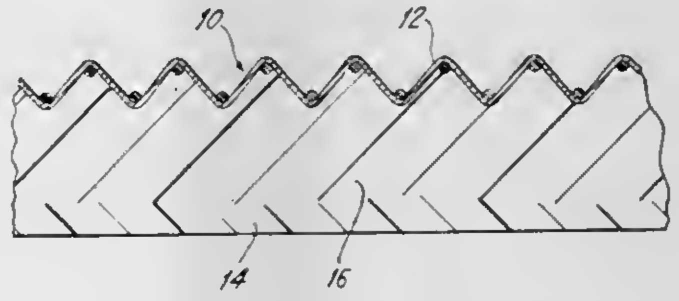
4,104,430
VACUUM FORMABLE MATERIALS

Sidney Desmond Fenton, Lancashire, England, assignor to Storey Brothers and Company Limited, Lancaster, England

Filed Jun. 2, 1975, Ser. No. 583,126

Int. Cl.^{2} B32B *5/02, 5/18*

U.S. Cl. 428—175 9 Claims



1. A vacuum formed laminate from a material comprising:

a. a stretchable fabric having a ready stretchability of at least 20% in at least about one direction under a 5 lb load for a 2 inch wide strip,

b. a cast plasticized vinyl chloride polymer layer which is 0.1 to 2 mm thick, and

c. sandwiched between said fabric and said layer, a plastic foam layer which is from 1 to 20 mm thick.

4,104,431
POROUS WRAPS FOR SMOKING ARTICLES

John Anthony Luke, Romsey, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

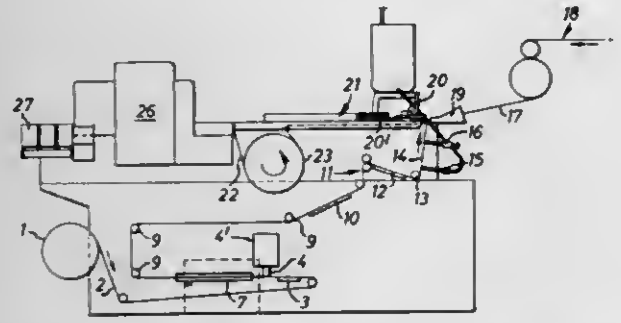
Division of Ser. No. 709,346, Jul. 28, 1976, Pat. No. 4,036,114. This application May 12, 1977, Ser. No. 796,252

Int. Cl.^{2} B05D *1/38, 5/10*

U.S. Cl. 428—211 5 Claims

1. A method of treating porous wrapping material to be incorporated in the filter structure of a smoking article, wherein the porous material is provided with at least one impervious region by applying a coating of a film-forming substance at a region positioned to coincide with a region at which adhesive is to be applied, which substance is dried before such adhesive is applied, said film-forming substance

being at least the same width as said adhesive, said film-forming substance being applied to the same face of the wrapping



material as said adhesive is added, said face being on the inside of the wrap formed from the said material.

4,104,432
PLASTIC ARTICLES HAVING ON THE SURFACE THEREOF A PROTECTED METAL FILM

Katsuhide Manabe, Ichinomiya; Jiro Masumi, Aichi; Tomotada Tocbitani, Ichinomiya, and Kenzo Shinoda, Gifu, all of Japan, assignors to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.), Japan

Filed Jun. 28, 1976, Ser. No. 700,117

Claims priority, application Japan, Jun. 30, 1975, 50-80074

Int. Cl.² B32B *15/08*

U.S. Cl. 428—216 **8 Claims**

1. A molded plastic article having on the surface thereof a metal film coated with the following protective layers in any order of (a) a layer applied from a mixture consisting essentially per 100 parts by weight of an acrylic copolymer of a lower alkyl ester of acrylic or methacrylic acid and a lower hydroxyalkyl ester of acrylic or methacrylic acid and having a hydroxyl number of 10–150, 10–150 parts by weight of an anti-yellowing polyisocyanate and 2–10 parts by weight of an ultraviolet ray-absorbing agent and cured by heating and (b) a layer consisting essentially of an unsaturated polyester and about 10–80 parts by weight of an anti-yellowing polyisocyanate per 100 parts of said unsaturated polyester, which layer is curable by the action of ultraviolet rays and then cured by exposure to such rays.

4,104,433
FLAME RETARDANT, NON-DRIPPING COATING COMPOSITION COMPRISING CROSSLINKABLE COPOLYMERS OF DIHYDRIC PHENOLS WITH BIS CHLOROALKYL OXETANES

James P. Kirk, Seeley Lake, Mont., and Robert L. Wear, West St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

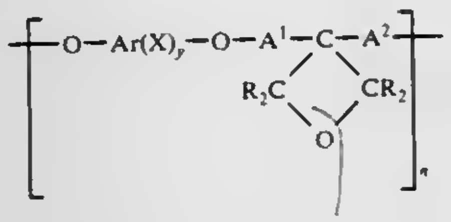
Filed Jan. 2, 1976, Ser. No. 645,956

Int. Cl.² C08G *65/00;* **B32B** *25/08, 25/10, 27/12;* **C08G** *65/00;* **B32B** *25/08, 25/10, 27/12*

U.S. Cl. 428—245 **9 Claims**

1. A char-forming, flame-retardant polymeric composite sheet comprising a flexible polymeric substrate having adhered thereto and substantially coextensive with at least one major surface thereof the char-forming, flame retardant coating of a composition comprising

(a) a condensation polymer consisting essentially of repeating units having the formula



$$\left[-O-Ar(X)_y-O-A^1-\underset{\substack{R_2C\quad CR_2\\ \diagdown\ O\ \diagup}}{C}-A^2-\right]_n$$

wherein

Ar is a monocyclic or bicyclic aromatic nucleus,
X is halogen,
y is an integer from 1 to 8,
A^1 and A^2 are lower aliphatic radicals containing 1 to 6 carbon atoms,
R is independently hydrogen or lower alkyl of 1 to 6 carbon atoms, and
n is an integer representing the degree of polymerization and is selected to provide said polymer with an inherent viscosity, determined with a 0.5 weight % solution in 1,1,2,2-tetrachloroethane of at least 0.1,

(b) a crosslinking agent for said polymer comprising stannic chloride-acetonitrile complex, and

(c) solvent for said polymer.

4,104,434
SIZING COMPOSITION AND GLASS FIBERS SIZED THEREWITH

Carl A. Johnson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 438,041, Jan. 30, 1974, abandoned, which is a continuation of Ser. No. 203,012, Nov. 29, 1971, abandoned. This application Jan. 23, 1976, Ser. No. 651,754

Int. Cl.² B32B *17/02, 17/06*

U.S. Cl. 428—273 **11 Claims**

1. At least one glass fiber coated with a composition comprising a water emulsifiable resin system and an emulsifiable lubricant in a ratio by weight of about 1:2 to about 2:1 respectively, a water-soluble, volatile aliphatic monocarboxylic acid containing from 1 to 8 carbon atoms and an aliphatic polycarboxylic acid containing from 2 to 9 carbon atoms.

4,104,435
SPONGE

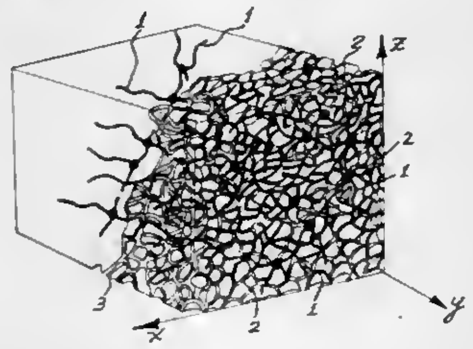
Juan Carlos Corral Ballesteros, Buenos Aires, Argentina, assignor to Suilene Argentina S.A., Buenos Aires, Argentina

Filed May 11, 1977, Ser. No. 795,753

Claims priority, application Argentina, May 28, 1976, 263437

Int. Cl.² D04H *1/68;* **B32B** *3/26, 5/20*

U.S. Cl. 428—288 **5 Claims**



1. A sponge comprising:
a. a three-dimensional fibrous reticular structure formed of a plurality of fibers randomly arranged in a three-dimensional relationship to provide a predetermined fiber density, at least some of said fibers being connected to each other at points where said fibers intersect;
b. a body of compressibly resilient foamed material formed around said fibrous reticular structure to fill spaces in said structure and engulf said structure, said foamed material being intimately bonded to said fibers to form an integral and resilient sponge combining said fibrous structure with said foamed material so that said fibrous structure moves resiliently with said foamed material;
c. portions of said fibers extending outward from at least one surface of said sponge;
d. said fibrous structure being stronger and more abrasive than said foamed material; and
e. the ratio by weight of said foamed material relative to total weight of said sponge including said fibrous structure ranging from 20 to 80%.

4,104,436
MAGNETIC HEAD CLEANING ARTICLE

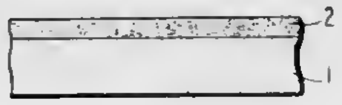
Osamu Suzuki; Masaki Ueda, and Akira Ishii, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 30, 1974, Ser. No. 501,957

Claims priority, application Japan, Aug. 31, 1973, 48-102259[U]

Int. Cl.² B32B *21/06*

U.S. Cl. 428—297 **19 Claims**



1. An article for cleaning a magnetic head comprising a support having a Japanese paper laminated thereon, the Japanese paper consisting of the bast fibers of natural vegetable fibers having a fiber length of about 5 mm or longer and an average fiber diameter of about 10 μ to 40 μ.

4,104,437
PRESSURE-SENSITIVE COPY SYSTEM INCLUDING UREIDO FLUORAN CHROMOGENIC COMPOUNDS

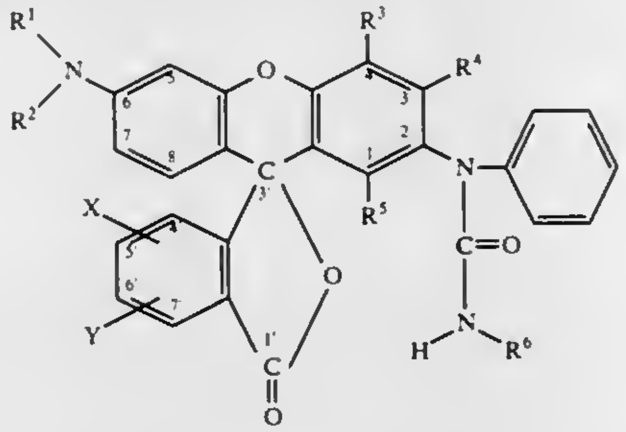
David N. Vincent, San Diego, Calif., and Cheng-Hsiung Chang, Naperville, Ill., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 508,834, Sep. 24, 1974, abandoned. This application Sep. 8, 1975, Ser. No. 611,205

Int. Cl.² B32B *3/26*

U.S. Cl. 428—307 **10 Claims**

1. A pressure-sensitive copy system comprising a substrate bearing pressure-rupturable microcapsules containing a chromogenic compound having the formula



wherein

R^1 and R^2 each represent an alkyl group;
R^3 and R^4 each represent a hydrogen atom; a halogen atom, an alkyl group, a nitro group, an amino group, an acyl group, or a carboalkoxy group;
R^5 represents a hydrogen atom or an alkyl group, with the proviso that R^5 represents an alkyl group only when R^4 represents a hydrogen atom;
R^6 represents an alkyl group, an aryl group or an aralkyl group; and
X and Y each represent a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, an aryl group, an alkoxy group, or a carboalkoxy group.

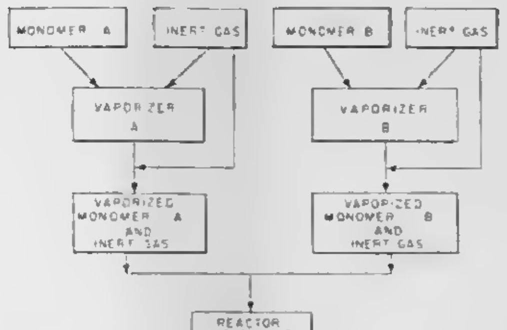
4,104,438
GAS-BARRIER COATED FILMS, SHEETS OR FOILS AND METHOD OF PREPARATION

Rudolph John Angelo; Richard Nelson Blomberg, both of Wilmington; Fritz Peter Boettcher, Newark, all of Del.; Richard Masayoshi Ikeda, Chadds Ford, Pa., and Michael Robert Samuels, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 542,237, Jan. 20, 1975, abandoned. This application Nov. 12, 1975, Ser. No. 630,996

Int. Cl.² B32B *27/34*

U.S. Cl. 428—332 **3 Claims**


MONOMER A
INERT GAS
MONOMER B
INERT GAS
VAPORIZER A
VAPORIZER B
VAPORIZED MONOMER A AND INERT GAS
VAPORIZED MONOMER B AND INERT GAS
REACTOR CONTAINING SUBSTRATE

1. An organic polymeric film having a gas-barrier coating thereon of an aromatic polyamide consisting essentially of units p-phenylene diamine and terephthalic acid having a density greater than about 1.42, a planar X-ray orientation and an electron microscope morphology of a coalesced particulate texture.

4,104,439
TEXTILE FIBER

John Frank Fuzek, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1977, Ser. No. 802,089

Int. Cl.² D02G *3/00*

U.S. Cl. 428—397 **4 Claims**

1. Textile fiber comprising poly(1,4-cyclohexylenedimethylene terephthalate) containing about 2 to 15 percent by weight of a second fiber forming polyester selected from poly(ethylene terephthalate), poly(tetramethylene terephthalate) or copolyester thereof, present as microfibrils, the microfibrils having diameters of 50-150A in cross section and 500-1000A in length, in the poly(1,4-cyclohexylenedimethylene terephthalate), said fiber having a luster similar to degummed and bleached silk fibers as determined by Goniophotometric luster curves, and said fiber has a non-round cross section.

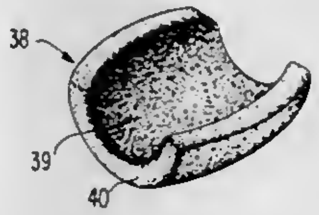
4,104,440
METHOD FOR MAKING PACKAGING PARTICLES AND RESULTING PRODUCT

Frederick H. Collins, Thousand Oaks, Calif., assignor to Valcour Imprinted Papers, Inc., Glens Falls, N.Y.

Division of Ser. No. 632,073, Nov. 14, 1975, Pat. No. 4,042,658. This application Mar. 2, 1977, Ser. No. 773,672

Int. Cl.² B32B *27/00*

U.S. Cl. 428—402 **5 Claims**



1. A sheet-like packaging particle comprised of a polymer-

ized vinyl aromatic monomer formed with a normally curved configuration having two spaced apart, curved, substantially coextensive surfaces, one of said surfaces being concave and comprising a substantially unfoamed skin and the remainder of said particle including the other said surface being foamed.

4,104,441

POLYCRYSTALLINE DIAMOND MEMBER AND METHOD OF PREPARING SAME

Dmitry Valerianovich Fedoseev; Boris Vladimirovich Deryagin, both of Moscow; Valentin Nikolaevich Bakul; Alexei Iosifovich Prikhna, both of Kiev; Valentin Pavlovich Varnin; Stanislav Pavlovich Vnukov, both of Moscow; Valentin Korneevich Gerasimenko, Kiev; Jury Ivanovich Nikitin, Kiev; Nekhemyan Veniaminovich Tsypio, Kiev, and Anatoly Vasilievich Hochko, Kiev, all of U.S.S.R., assignors to Institut Sverkhtverdykh Materialov SSR, Kiev and Institut Fizicheskoi Khimii Akademii Nauk, Moscow, both of, U.S.S.R.

Continuation of Ser. No. 600,080, Jul. 29, 1975, abandoned. This application May 19, 1976, Ser. No. 688,003

Int. Cl.² B29F *5/00;* **C04B** *31/16*

U.S. Cl. 428—408 **2 Claims**

1. A method of preparing a polycrystalline diamond member comprising:
  using diamond particles of any size including those smaller than one micron, said particles having substantially identical size;
  epitaxially coating said particles in a flow of a carbonaceous medium to deposit both diamond and diamond-graphite coating on said particles;
  interrupting said coating at a predetermined moment prior to the formation of a pure graphite layer on the particles;
  bringing said particles into mechanical contact with one another and sintering them under a pressure of at least 40 kbar and at a temperature of at least 1000° C for a time sufficient for effecting phase conversions of the diamond-graphite material in the zones of contact of the diamond-graphite coatings of neighboring particles into diamond so as to strongly bind all particles into a single compact body.

2. The polycrystalline diamond member prepared as claimed in claim 1, containing a plurality of diamond particles bound into a single compact body, wherein the binder consists of diamond zones substantially free from graphite which are formed as a result of phase conversion in the zones of contact of diamond-graphite coatings of various neighbouring particles.

4,104,442

SILICON NITRIDE-CONTAINING MATERIAL WITH SELF-GLAZING SURFACE AND PROCESS FOR ITS PRODUCTION

Godehard Sussmuth, Selb, Bazen, Fed. Rep. of Germany, assignor to Rosenthal AG, Fed. Rep. of Germany

Filed Mar. 23, 1976, Ser. No. 669,654

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544437

Int. Cl.² B32B *13/04*

U.S. Cl. 428—428 **5 Claims**

1. A process for the production of a silicon nitride-containing material with a gas-tight surface and improved oxidation resistance which comprises admixing 3–25 percent by weight based on the weight of the resulting admixture of at least one powdered ceramic, silicate-containing additive having a particle size of less than 20 mμ and the silicon raw material, subjecting the admixture to standard nitriding condition and subjecting the nitrided admixture to a heat treatment between 1,000° C and 1,500° C in an oxygen-containing atmosphere, wherein said admixture is heated to said temperature at a rate exceeding 100° C per minute, nitride-containing material.

5. A silicon nitride-containing body having a gas tight surface and improved resistance to oxidation produced by the process of claim 1.

4,104,443

ANTISTATIC FINISH FOR TEXTILES MATERIAL

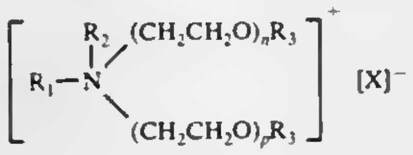
Bruce M. Latta, Wayne; Catherine V. Stevens, Closter, and Bruce E. Dennis, Clifton, all of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed May 6, 1977, Ser. No. 794,575

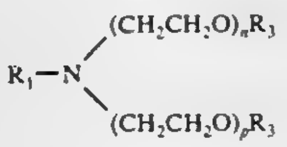
Int. Cl.² B44D *1/22*

U.S. Cl. 428—474 **10 Claims**

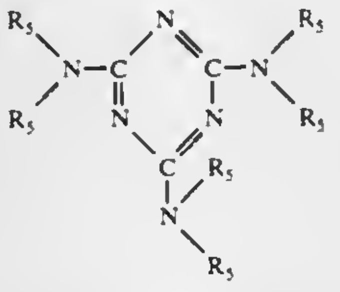
1. A process of imparting durable antistatic properties to synthetic polymer fabric which comprises applying to said fabric an aqueous composition containing
  (A) an ethoxylated compound selected from the group consisting of compounds having the formula



and



wherein
  R_1 is an alkyl group of 8 to 22 carbon atoms;
  R_2 is an alkyl group of 1 to 22 carbon atoms or $—(CH_2CH_2O)_rR_4$;
  R_3 is hydrogen, $—CH_2CH_2NH_2$ or $—CH_2CH_2SH$;
  R_4 is hydrogen, $—CH_2CH_2NH_2$, $—CH_2CH_2SH$ or an alkyl group of 1 to 4 carbon atoms; .
  n, p and r are integers of from 5 to 60, and
  X^- is an anion and
  (B) A melamine derivative of the formula



where
  R_5 at each occurrence is independently selected from the group consisting of hydrogen and $—CH_2OZ$ with Z being hydrogen or alkyl of 1 to 4 carbon atoms, provided that at least two of said R_5 groups are $—CH_2OZ$,
and heating said fabric to coreact said ethoxylated compound and said melamine derivative.

10. A synthetic polymer fabric having deposited thereon a water insoluble antistatic composition comprising the reaction product of the melamine derivative and the ethoxylated compound of claim 1.

4,104,444

FIBER REINFORCED CHEMICALLY MODIFIED PROTEIN ARTICLES

Klaus-Dieter Hammer, Mainz; Günter Gerigk, Oberursel, and Max Bytzek, Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 31, 1976, Ser. No. 719,257

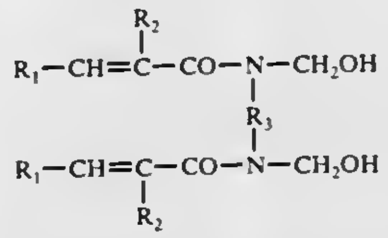
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539302

Int. Cl.² A22C *13/00;* **B29D** *23/01;* **C07G** *7/00*

U.S. Cl. 428—474 **29 Claims**

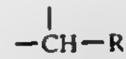
1. A process for the manufacture of a fiber-reinforced article

which comprises the steps of (a) applying to a fibrous material a reaction liquid comprising a modified protein which has been modified by reaction with at least one compound of the formula III



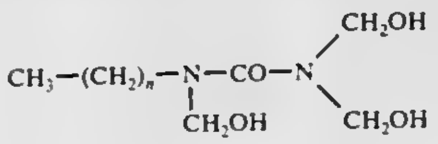
$$\begin{array}{l} R_1-CH=\overset{\displaystyle R_2}{\overset{|}{C}}-CO-N-CH_2OH \\ \qquad\qquad\qquad\qquad\qquad\;\; | \\ \qquad\qquad\qquad\qquad\qquad\; R_3 \\ \qquad\qquad\qquad\qquad\qquad\;\; | \\ R_1-CH=\underset{\displaystyle R_2}{\underset{|}{C}}-CO-N-CH_2OH \end{array} \qquad \text{III}$$

in which R_1 and R_2, which may be the same or different, represent hydrogen or an alkyl group having 1 to 6 carbon atoms, and R_3 represents a $(CH_2)_p$ group, in which *p* represents an integer from 1 to 8 inclusive, or a

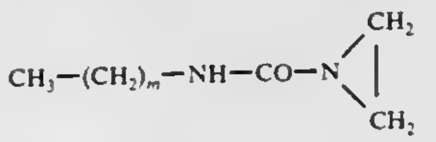


$$-\overset{|}{C}H-R_4$$

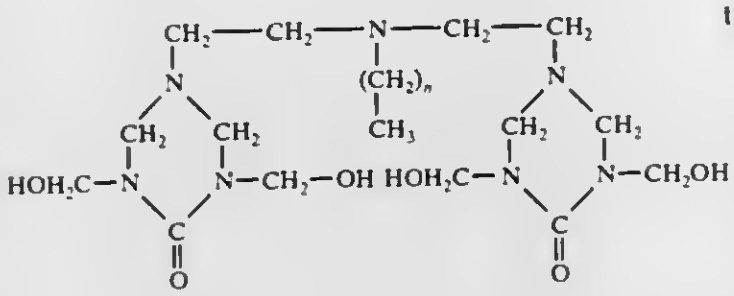
group
in which R_4 represents an alkyl group containing from 1 to 18 carbon atoms, and at least one compound of the formulae IIa, IIb, IIc or IId



IIa

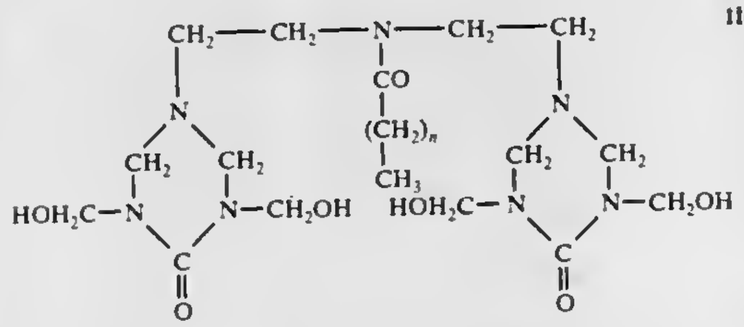


IIb



IIc

or



IId

in which formulae *n* represents an integer between 9 and 24, inclusive, and *m* represents an integer between 11 and 19, inclusive, and which is a reaction product obtainable by reacting a protein solution containing about 3 to 16% by weight of a protein the pH value of which is sufficiently high to insure the dissolution of the protein with a liquid formulation containing about 5 to 30% by weight of at least one compound of the formulae IIa, IIb, IIc or IId, and a solution containing about 1 to 30% by weight of at least one compound of the formula III at a temperature and for a period of time sufficient to form the modified protein, to produce a coated and/or impregnated product, (b) passing said product into a liquid precipitating agent for the modified protein and (c) treating the product of step (b) with a cross-linking agent comprising at least one saturated organic compound containing at least two reactive OH groups, at least two reactive NH_2 groups or at least one reactive NH_2 and at least one reactive OH group.

4,104,445

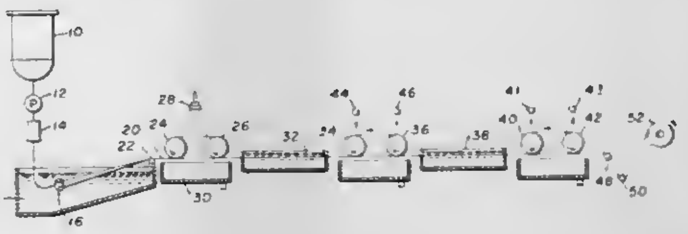
METHOD FOR MAKING STEEL WIRE

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 20, 1975, Ser. No. 624,076

Int. Cl.² B22F *3/00. 1/00*

U.S. Cl. 428—567 **12 Claims**



1. A method for producing filamentary steel wire wherein particles of iron oxide are combined with a fiber-forming acrylic polymer to first form a precursor filament which is then converted to steel wire, said method comprising the following steps in sequence:
  (A) providing a spinning dope wherein particles of iron oxide having an average diameter of about 5 microns or less are uniformly dispersed within a solution of acrylic polymer with the weight ratio of iron oxide to acrylic polymer being within the range of from about 3:1 to 7:1 respectively;
  (B) forming a precursor filament by extruding said dope through a spinnerette and into a coagulation bath; and
  (C) converting said precursor filament to filamentary steel wire by subjecting the filament to a temperature in the range of from 900° C. to 1150° C. for a period of from about 3 to 8 minutes while being exposed to a gaseous atmosphere consisting of from about 80 to 94 percent by volume of hydrogen, from about 2 to 15 percent by volume of carbon monoxide and from 0 to 10 percent by volume of a gaseous hydrocarbon.

9. A synthetic filament which is convertible to filamentary steel wire when exposed to a reducing environment at temperatures in the range of from about 900° C. to 1150° C. for a period of from 3 to 8 minutes, said synthetic filament comprising a mixture of iron oxide particles and an acrylic polymer in a weight ratio of from about 3:1 to 7:1, respectively.

10. A filamentary steel wire product obtained from the reduction, carbonization and sintering of iron oxide particles which has a tensile strength of at least 140,000 psi, said steel wire product being further characterized by an essentially ferritic-pearlitic structure and a carbon content of from about 0.6 to 0.8 percent by weight.

4,104,446

SELF-TAPPING OR THREAD-FORMING SCREW

Lawrence D. Johnson, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

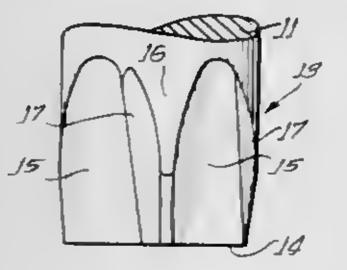
Continuation of Ser. No. 588,292, Jun. 19, 1975, abandoned, which is a continuation of Ser. No. 489,413, Jun. 17, 1974, abandoned, which is a continuation of Ser. No. 196,431, Nov. 8, 1971, abandoned. This application Sep. 14, 1976, Ser. No. 723,329

Int. Cl.² B21H *3/02. 3/10*

U.S. Cl. 428—585 **1 Claim**

1. A blank for use in the manufacture of a thread-forming screw product by the process of rolling a constant root diameter thread on said blank, said blank comprising, in combination:
  an enlarged head, a cylindrical body with a longitudinal axis, and a tapered, generally conical point merging into the body at an upper edge, said conical tapered point being formed with a taper of approximately 4° from the longitu-

dinal axis and with four equi-spaced, flat surfaces, each of said flat surfaces formed at an angle of 8°–10° from the longitudinal axis, said point further being formed with four equi-spaced additional flat surfaces, each one of said flat surfaces being in a counterclockwise direction from an associated one of said additional flat surfaces when said blank is viewed as an end elevation of the tapered point,



the intersection of each flat surface and each associated additional flat surface defining a leading edge, each additional flat surface forming an angle of approximately 33° relative to the associated flat surface, said flat surfaces and said additional flat surfaces extending upward along the point and merging into the shank at approximately the upper edge of the point.

4,104,447

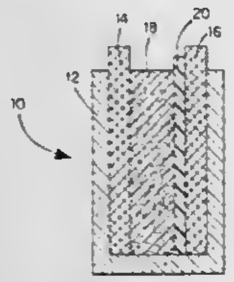
HALOGEN COMPLEXING ALKYL SALTS FOR USE IN HALOGEN CELLS

Fraser M. Walsh, Arlington; Dennis N. Crouse, Melrose, and Alfred M. Ajami, Boston, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Sep. 26, 1977, Ser. No. 836,553

Int. Cl.^{2} H01M *8/22*

U.S. Cl. 429—15 **26 Claims**



1. A process for improving the performance of current delivering electrochemical systems of the type which utilize a substance selected from the group consisting of bromine, chlorine, iodine, and mixtures thereof as their electrochemically active agent, said process comprising adding to the electrolyte of said system, at least one halogen complexing compound which exists as a substantially water insoluble liquid at the operating temperature of the system in the presence of one or more equivalents of halogen, said compound being selected from the group consisting of alkyl (C_1-C_7) and haloalkyl (C_1-C_7) substituted quaternary ammonium salts having a cationic nitrogen symmetry number no greater than three and a halide counterion.

4,104,448

ALKALI METAL-SULPHUR CELLS

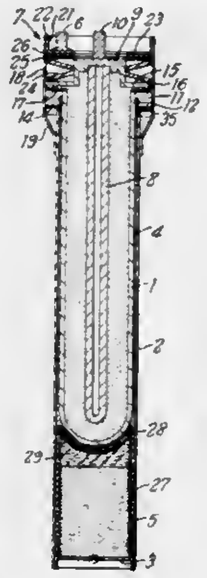
John George Gibson, Whatstandwell, and Alec Roger Tilley, Blackbrook, nr. Belper, both of England, assignors to British Railways Board, London, England

Filed Oct. 8, 1976, Ser. No. 730,771

Int. Cl.^{2} H01M *10/38*

U.S. Cl. 429—72 **10 Claims**

1. An alkali metal sulphur cell comprising:
an outer tube;
an inner tube forming the solid electrolyte of the cell and dividing the interior of the outer tube into anode compartment and cathode compartment adjacent respective sides of the inner tube; said anode containing alkali metal; said cathode containing sulphur material;
the annular space between the outer tubes constituting the anode compartment of the cell;
an alkali metal reservoir in communication with said anode compartment;
means located at the lower end of said anode compartment for defining an inlet and communicating passage to said anode compartment from said alkali metal reservoir;



the outer tube extending at one end beyond the inner tube to provide a housing for said alkali metal reservoir which is spaced from the inner surface of the outer tube to define a communicating passage for alkali metal from said reservoir to said anode compartment;
gas space closed to the atmosphere above the alkali metal in said reservoir for forcing alkali metal at the operating temperature of the cell to flow upwards into said anode compartment via said inlet for maintaining the operative surface area of said inner tube covered with liquid alkali metal during discharge of the cell.

4,104,449

PRIMARY BATTERY OF THE REMOTELY ACTIVATED TYPE

Werner Böhnstedt, Rheinberg, and Manfred Stommel, Duisburg, both of Fed. Rep. of Germany, assignors to Electrochem, Inc., New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,367

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2550304

Int. Cl.^{2} H01M *6/30*

U.S. Cl. 429—110 **9 Claims**

1. An improved primary battery comprising at least one zinc electrode and a silver oxide counter-electrode, said battery including acid in aqueous solution as a battery-activating electrolyte.

4,104,450

ALKALI METAL BATTERIES HAVING ELECTROLYTES INCLUDING ALKALI METAL SALTS OF COMPLEX ANIONS CONTAINING HETEROATOM SUBSTITUENTS IN ORGANIC SOLVENT

Thomas A. Whitney, Roselle, and Lawrence P. Klemann, Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 24, 1977, Ser. No. 827,133

Int. Cl.^{2} H01M *6/14*

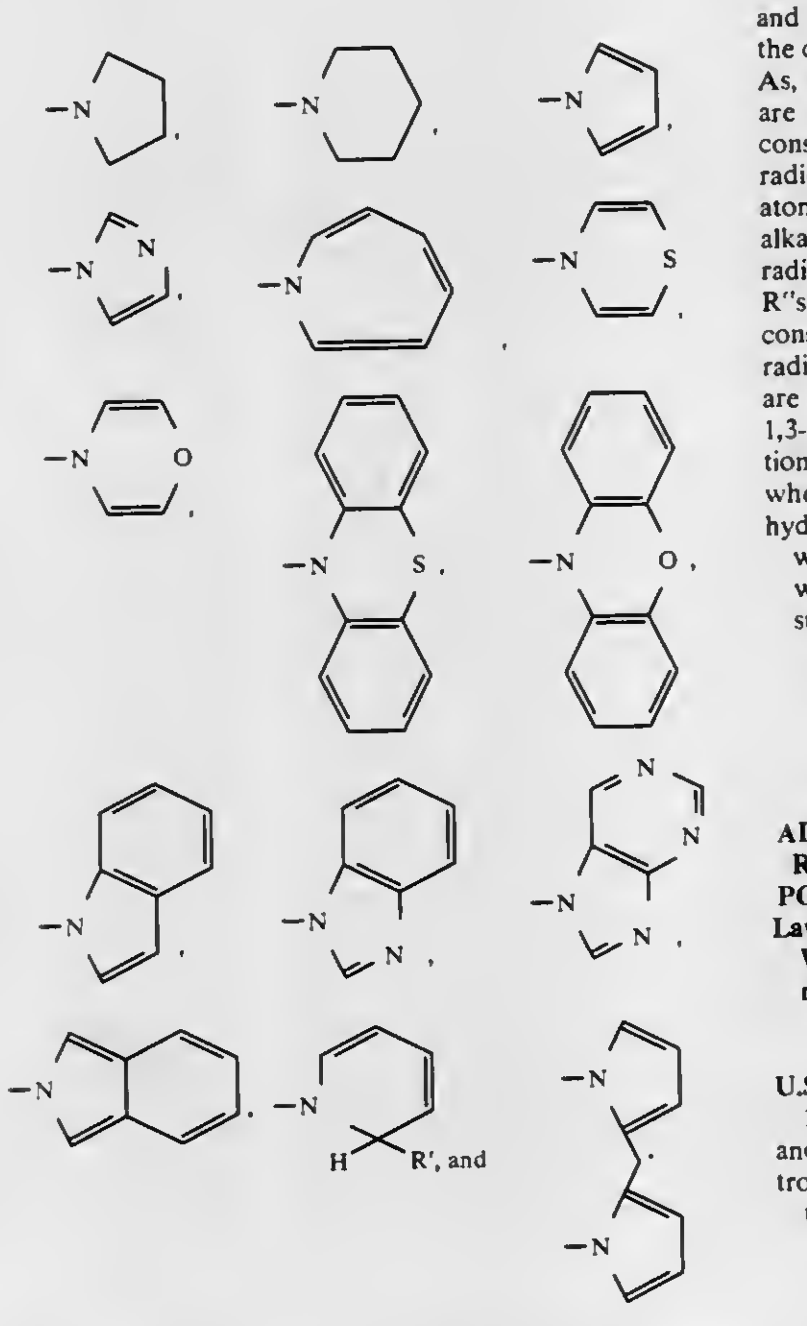
U.S. Cl. 429—194 **64 Claims**

1. In an electrochemical cell which contains an alkali metal

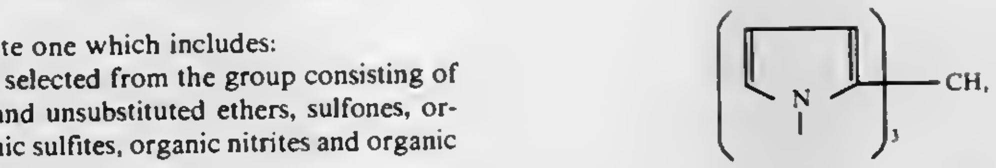
anode, a cathode and a non-aqueous electrolyte, the improvement comprising:
using as said electrolyte one which includes:
(a) an organic solvent selected from the group consisting of inertly substituted and unsubstituted ethers, sulfones, organic sulfates, organic sulfites, organic nitrites and organic nitro compounds; and,
(b) electrolytically active alkali metal salts including alkali metal complex anion salts having the formula:

ZMR_xQ_y

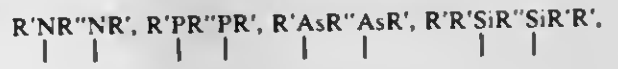
wherein Z is an alkali metal;
wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, Sn (stannous), In, Tl, P, and As;
wherein R represents x number of radicals which may be the same or different and are inertly substituted or unsubstituted organic radicals selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, aryl radicals having 6 to 18 carbon atoms, alkaryl and aralkyl radicals having 7 to 25 carbon atoms and naphthenic radicals having 3 to 10 carbon atoms,
wherein Q represents heteroatom substituents selected from the group consisting of:

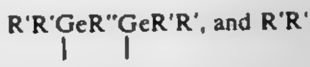


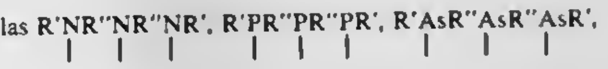
and any dimeric or trimeric composite of the foregoing radicals, and any group composed of two or three of the above structural units linked directly or through additional carbon (methylene);

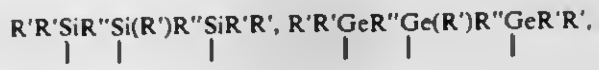


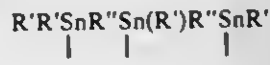
—NR'R', —PR'R', —AsR'R', —SiR'R'R', —GeR'R'R', —SnR'R'R', chelating dianions of the formulas


$R'NR''NR'$, $R'PR''PR'$, $R'AsR''AsR'$, $R'R'SiR''SiR'R'$,


$R'R'GeR''GeR'R'$, and $R'R'SnR''SnR'R'$, chelating trianions of


the formulas $R'NR''NR''NR'$, $R'PR''PR''PR'$, $R'AsR''AsR''AsR'$,


$R'R'SiR''Si(R')R''SiR'R'$, $R'R'GeR''Ge(R')R''GeR'R'$, and


$R'R'SnR''Sn(R')R''SnR'R'$,

and the chelating tetraanions, the chelating pentaanions and the chelating hexaanions corresponding to the foregoing N, P, As, Si, Ge and Sn trianion formulas, wherein each of the R's are the same or different and are selected from the group consisting of unsubstituted and inertly substituted organic radicals consisting of alkyl radicals having 1 to 20 carbon atoms, aryl radicals having 6 to 18 carbon atoms, aralkyl and alkaryl radicals having 7 to 25 carbon atoms and naphthenic radicals having 3 to 10 carbon atoms, and wherein each of the R''s are the same or different and are selected from the group consisting of (1) hexa- and penta-cycloaliphatic and aromatic radicals and their lower alkyl derivatives wherein said radicals are attached in the above Q heteroatom substituents at 1,2- or 1,3- positions on the cycloaliphatic rings and at the 1,2-positions on the aromatic rings, and (2) 2 and 3 methylenic radicals, wherein each methylenic radical contains 0 to 2, monovalent hydrocarbon radicals of 1 to 6 carbon atoms;
wherein *x* is zero or a positive integer; and
wherein *y* is a positive integer;
subject to the proviso that the sum of *x* plus *y* is equal to one plus the valence of the metal M, that *x* is equal to the number of R radicals present and that *y* equals the total valence of all Q radicals present.

4,104,451

ALKALI METAL ANODE/CHALCOGENIDE CATHODE REVERSIBLE BATTERIES HAVING ALKALI METAL POLYARYL METALLIC COMPOUND ELECTROLYTES

Lawrence P. Klemann, Somerville, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Sep. 26, 1977, Ser. No. 836,314

Int. Cl.^{2} H01M *6/14*

U.S. Cl. 429—194 **19 Claims**

1. In an electrochemical cell which contains an alkali metal anode, a metal chalcogenide cathode and a non-aqueous electrolyte, the improvement comprising:
using as said electrolyte one which consists essentially of:
(a) an organic solvent selected from the group consisting of inertly substituted and unsubstituted ethers, sulfones, organic sulfates, organic sulfites, organic nitro compounds and organic nitrites; and,
(b) electrolytically active alkali metal salts including an electrolytically active amount of a polyaryl metallic alkali metal salt having the formula:

ZMR_n

wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, Sn (stannous), In, Tl, P and As, wherein R represents *n* number of radicals which may be the same or different and are inertly substituted or unsubstituted aryl radicals selected from the group consisting of aryl radicals having 6 to 50 carbon atoms, and wherein *n* is a numerical value equal to one plus the valence of the metal M.

4,104,452

VINYL POLYMER-FLUOROALKYLETHER OLIGOMER COMPOSITION

Marianne K. Bernett, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1977, Ser. No. 839,946
Int. Cl.^{2} C08K *5/06, 5/20, 5/42*

U.S. Cl. 526—3 **8 Claims**

1. A vinyl polymer-fluorolkylether oligomer composition which comprises:

a vinyl polymer selected from the class consisting of polyvinylchloride, polyvinylidene chloride, copolymers of vinylidine chloride and vinyl chloride, copolymers of vinylidene chloride and acrylonitrile in proportions in which vinylidene chloride is at least 70 percent by weight, polymethylmethylmethacrylate, and polystyrene; and from 0.05 weight percent based on total composition weight to the dispersibility limit of a fluoroalkylether oligomer of the general formula:

$$F[C(CF_3)F\text{—}CF_2\text{—}O]_m\text{-}\ C(CF_3)F\text{—}CO\text{—}R$$

wherein *m* is an integer from 4 to 10 and R is further defined by the formulas:

$$OR^1(OR^2)_nOR^2 \tag{1}$$

wherein R^1 is an alkyl radical having from 1 to 3 carbon atoms, R^2 is an alkyl radical having from 1 to 3 carbon atoms, and *n* is an integer from 3 to 10;

$$OR^3 \tag{2}$$

wherein R^3 is an alkyl having from 1 to 10 carbon atoms;

$$N\text{—}(C_pH_{2p}OH)_2 \tag{3}$$

wherein *p* is an integer from 2 to 4;

$$N\ (CH_2)_qCH_3 \tag{4}$$

wherein *q* is an integer from 2 to 8; and

$$N(R^4)C_sH_{2s}N^+(R^5)(R^6)(R^7)A^- \tag{5}$$

wherein R^4 is hydrogen or an alkyl having 1 to 3 carbon atoms, R^5 and R^6 and R^7 are alkyl groups having 1 to 3 carbonatoms, *s* is an integer from 1 to 3, andA is a sulfonate or halide, said fluoroalkylether oligomer being incorporated therein in an amount sufficient to provide a surface of lower energy thereon.

4,104,453

MELT DISPERSION SAPONIFICATION OF ETHYLENE-VINYL ACETATE POLYMER

Leo H. Broering, Fort Wright, Ky., and Gary W. Duncan, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,134
Int. Cl.^{2} C08F *8/12*

U.S. Cl. 526—10 **12 Claims**

1. A process for preparing in finely divided form saponified ethylene-vinyl acetate polymer comprising the steps of heating with agitation an aqueous mixture comprised of molten ethylene-vinyl acetate polymer, a strong inorganic base, a block copolymer of ethylene oxide and propylene oxide containing at least about 50% by weight ethylene oxide and at least one other anionic dispersant selected from the group consisting of a salt of a polycarboxylic acid and a condensed arylsulfonate salt at a temperature below the decomposition temperature of the polymer and cooling the resulting dispersion to obtain the saponified product in finely divided state with the majority by weight of the particles being less than 50 microns in diameter.

4,104,454

METHOD FOR REDUCING PVC POLYMER BUILDUP IN POLYMERIZATION REACTORS

Dean R. Weimer, and Albert M. Durr, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 699,100, Jun. 23, 1976, Pat. No. 4,068,052.
This application Jun. 20, 1977, Ser. No. 807,853
Int. Cl.^{2} C08F *10/60*

U.S. Cl. 526—62 **7 Claims**

1. In a suspension polymerization an improved method for preventing polymer buildup in the polymerization reactor during the polymerization of vinyl chloride monomer to form polyvinyl chloride polymer and copolymers, the improved method comprising coating reactor surfaces in contact with the reaction medium with dithiooxamide prior to carrying out the polymerization.

4,104,455

POLYMERIZATION OF MONOMER

Mitsuru Nagasawa, Nagoya; Teruo Fujimoto, Chiryu, and Kazuo Tago, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 614,777, Sep. 19, 1975, abandoned. This application Mar. 30, 1977, Ser. No. 783,003
Claims priority, application Japan, Mar. 25, 1975, 50-34950
Int. Cl.^{2} C08F *4/46, 4/48, 4/50*

U.S. Cl. 526—173 **6 Claims**

1. In the polymerization of an anionically polymerizable monomer using a polymerization system comprising a monomer and a polymerization solvent wherein an organometallic compound polymerization initiator, soluble in said polymerization system having the formula:

$$MeR_x$$

wherein Me is a metal selected from the group consisting of Groups I and II of the Periodic Test; R represents an alkyl or aryl group, or an aliphatic or aromatic hydrocarbon residue; and the integer *x* is 1 or 2; is added to said system, the improvement which comprises adding said polymerization initiator to said polymerization system as a solution comprising said polymerization initiator dissolved in a high viscosity solvent having a viscosity

greater than 1 cp at room temperature and which is at least one member selected from the group consisting of n-hexylbenzene, n-butylbenzene, decalin, 1,2,3,4-tetrahydronaphthalene, liquid paraffin, and a mixture of liquid paraffin and benzene, wherein polymerization is subsequently initiated as the initiator dissolves in said polymerization system.

4,104,456

PROCESS FOR THE PRODUCTION OF POLY(ALLYLHALIDE-ALLYL ALCOHOL)

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 757,239, Jan. 6, 1977, which is a division of Ser. No. 622,525, Oct. 15, 1975, which is a continuation-in-part of Ser. No. 551,534, Feb. 21, 1975, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Nov. 9, 1977, Ser. No. 849,856
Int. Cl.^{2} C08F *4/16, 30/08, 230/08*

U.S. Cl. 526—194 **5 Claims**

1. The process for the production of poly (allyl halide allyl alcohol) copolymer by the following steps:

(a) providing a quantity of silicon acid;

(b) admixing 1 part by weight of an alkali metal carbonate, selected from the group consisting of sodium carbonate and potassium carbonate;

(c) mixing therewith 2 parts by weight of an allyl halide compound with 1 part by weight of the silicon acid;

(d) agitating said mixture in a closed system and keeping the temperature between 0 degree and 100 degree C for about 20 to 40 minutes at ambient pressure, thereby

(e) producing poly (allyl halide allyl alcohol) copolymer.

4,104,457

BULK POLYMERIZATION OF VINYL CHLORIDE TO CONTROL GRAIN SIZE

Daniel Debord, St-Auban, and Salomon Soussan, St-Fons, both of France, assignors to Rhone-Progil, Paris, France

Continuation of Ser. No. 522,571, Nov. 11, 1974, abandoned, which is a continuation of Ser. No. 322,501, Jan. 10, 1973, abandoned. This application Feb. 3, 1977, Ser. No. 765,414
Claims priority, application France, Jan. 11, 1972, 72.00766
Int. Cl.^{2} C08F *2/02*

U.S. Cl. 526—203 **7 Claims**

1. In a process for the preparation of polymers and copolymers of vinyl chloride by bulk polymerization, the improvement in producing polymers and copolymers having a relatively narrow grain size distribution and a relatively large average grain diameter comprising carrying out the polymerization under low agitation of a reaction medium consisting essentially of vinyl chloride and a prepolymeric composition (A), said prepolymeric composition being obtained by polymerization under high turbulence, to a conversion of about 5 to 15%, of a monomeric composition based on vinyl chloride in the presence of 0.05 to 2% by weight of an auxiliary compound selected from (a) acrylic acid or methacrylic acid, (b) a substituted or unsubstituted aliphatic ester of acrylic or methacrylic acids, (c) ethylene glycol dimethacrylate or polyethylene glycol dimethacrylate, or (d) propylene glycol dimethacrylate or polypropylene glycol dimethacrylate with the prepolymeric composition (A) being present in the reaction medium in an amount sufficient to provide a population of polymers and copolymers having a grain size distribution in which the mean diameter is at least equal to about 150 microns.

7. In a process for the preparation of polymers and copolymers of vinyl chloride by bulk polymerization, the improvement in producing polymers and copolymers having a relatively narrow grain size distribution and a relatively large average grain diameter comprising carrying out the polymerization under low agitation of a reaction medium consisting essentially of vinyl chloride, a prepolymeric compostion (A), said prepolymeric composition being obtained by polymerization under high turbulence, to a conversion of about 5 to 15%, of a monomeric composition based on vinyl chloride in the presence of 0.05 to 2% by weight of an auxiliary compound selected from (a) acrylic acid or methacrylic acid, (b) a substituted or unsubstituted aliphatic ester of acrylic or methacrylic acids, (c) ethylene glycol dimethacrylate or polyethylene glycol dimethacrylate, or (d) propylene glycol dimethacrylate or polypropylene glycol dimethacrylate, and a prepolymeric composition (B) obtained by polymerization under high turbulence, to a conversion of about 5 to 15%, of a monomeric composition based on vinyl chloride not containing said auxiliary compound, with the contents by weight of the particles of prepolymer composition (A) in relation to the total weight of prepolymer particles in the reaction medium varying from 50 to 100% and with the prepolymeric composition (A) being present in the reaction medium in an amount sufficient to provide a population of polymers and copolymers having a grain size distribution in which the mean diameter is at least equal to about 150 microns.

4,104,458

MULTIFUNCTIONAL ACRYLATE N-VINYLAMIDE ANAEROBIC ADHESIVE COMPOSITION

Julian L. Azorlosa, Kinnelon, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,473
Int. Cl.^{2} C08F *124/00*

U.S. Cl. 526—264 **15 Claims**

1. A solventless, fast-setting adhesive composition consisting essentially of two monomer parts which are adapted to be copolymerized anaerobically at ambient temperature between opposing surfaces to form a high-strength bond thereto, one of said parts being an ethylenically unsaturated polymerizable multifunctional acrylate monomer and the other part an N-vinylamide monomer, one of said parts having an oxidizing agent present therein and the other part a reducing agent, said agents being capable of reacting when brought together to initiate copolymerization of said monomers to form said desired bond.

4,104,459

TREATING POLYVINYL CHLORIDE RESINS

Edwin D. Hornbaker, and Adam Nugent, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 498,547, Aug. 19, 1974, abandoned.
This application Mar. 25, 1976, Ser. No. 670,239
Int. Cl.^{2} C08F *6/24, 6/00*

U.S. Cl. 528—499 **9 Claims**

1. In the method of treating particles of a polyvinyl chloride resin which have a susceptibility to degradation in dynamic thermal stability and an increase in bulk density upon prolonged heating, which have previously been subjected to a flashing step to remove a major portion of the unreacted vinyl chloride monomer therefrom, the improvement for further reducing the vinyl chloride monomer content of the resin particles comprising:

a. suspending the resin particles in an aqueous medium in a closed vessel to form a resin-water slurry;

b. indirectly applying heat to the slurry to maintain the temperature thereof in a range between about 50° C to about 95° C for a time period of from about one minute to about 120 minutes;

c. applying a continuous vacuum in the range of from about 5 in. Hg to about 26 in. Hg to produce boiling of the slurry from the heat applied to the vessel while simultaneously removing from the vessel a vapor phase containing vinyl chloride monomer and the aqueous medium; and

d. cooling the slurry to produce resin particles having a vinyl chloride monomer content of less than about 420 ppm (dry resin basis), a dynamic thermal stability of at least 7 minutes and a bulk density of at least 0.5 g/cc.

4,104,460

METHOD FOR TREATING SEAWEED WITH HYDROGEN PEROXIDE OR HYDROGEN PEROXIDE COMPOUND

Nobuyasu Hasebe, No. 24-8, 2-chome, Nishiogikita, Suginami-ku, Tokyo, Japan

Filed Sep. 14, 1976, Ser. No. 723,172
Int. Cl.^{2} C08B *37/04*

U.S. Cl. 536—3 **12 Claims**

1. A method for preparing seaweed powder from seaweed which comprises treating the seaweed with hydrogen peroxide in aqueous solution in an amount sufficient to strip off the outer skin of the seaweed and then drying the seaweed which has been stripped of its outer skin.

4,104,461

2,2'-ANHYDRO-β-D-ARABINOFURANOSYL-5-FLUOROCYTOSINE

Jack J. Fox, White Plains, N.Y., and Joseph H. Burchenal, Noroton, Conn., assignors to Research Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,704

Int. Cl.^{2} C07H *19/06*

U.S. Cl. 536—23 **8 Claims**

8. 2,2'-anhydro-1-(β-D-arabinofuranosyl)-5-fluorocytosine hydrochloride.

4,104,462

CARDIOACTIVE ADENOSINE NITRATES

Ulf Fischer, Frankendorf, and Günther Haüsler, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

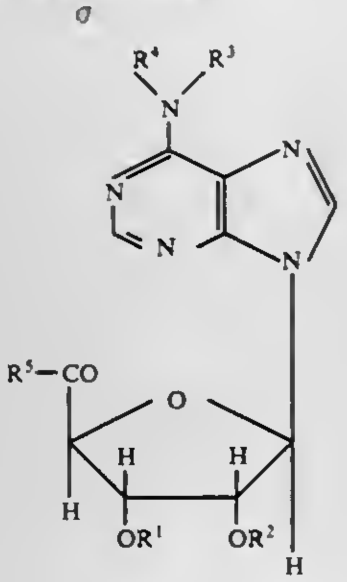
Continuation of Ser. No. 654,510, Feb. 2, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,200

Claims priority, application Switzerland, Feb. 18, 1975, 2032/75; Jul. 4, 1975, 8748/75; Dec. 11, 1975, 16094/75

Int. Cl.^{2} C07H *19/16, 19/18*

U.S. Cl. 536—26 **23 Claims**

1. A compound of the formula



wherein R^1 and R^2 each independently is hydrogen, or nitro with at least one of R^1 and R^2 being nitro; R^3 and R^4 each independently is hydrogen and R^5 is hydroxy, lower alkoxy, amino, (lower alkyl)-amino, di(lower alkyl)amino, phenyl-(lower alkyl)-amino, a cycloalkylamino group selected from cyclopentylamino and cyclohexylamino, 2-(dimethylamino)-ethylamino, 2(2,4-dinitrophenyl)-ethylamino, 2-(nitro-oxy)-ethylamino or a nitrogen-containing 5 or 6 membered heterocyclic ring which can contain another hetero atom selected from oxygen or sulphur which ring is bonded via a nitrogen atom and pharmaceutically acceptable acid addition salts thereof.

4,104,463

METHOD FOR TREATMENT OF CORN HULLS

Richard Lee Antrim, Clinton, and Donald Wayne Harris, Camanche, both of Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 689,232, May 24, 1976, Pat. No. 4,038,481. This application Jul. 5, 1977, Ser. No. 812,939

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

Int. Cl.^{2} C08B *1/00, 37/14*

U.S. Cl. 536—56 **3 Claims**

1. A method for treating corn hulls wherein said materials are subjected to an alkaline hydrolysis treatment under conditions whereby a non-carbohydrate fraction is solubilized and the resulting residue comprises a holocellulose fraction.

4,104,464

PURIFICATION OF SUCROSE ESTERS

Kenneth James, Reading, England, assignor to Tate & Lyle Limited, London, England

Filed Apr. 16, 1976, Ser. No. 677,702

Claims priority, application United Kingdom, Apr. 18, 1975, 16216/75; Feb. 13, 1976, 5795/76

Int. Cl.^{2} C07H *13/06;* C07G *3/00;* C11C *3/10*

U.S. Cl. 536—115 **16 Claims**

1. A process for the preparation of a soap-free, sucrose ester-containing surfactant, which comprises transesterifying sucrose with at least one fatty acid triglyceride to form a first solid material containing:

(i) fatty acid mono- and di-esters of sucrose;

(ii) fatty acid mono-, di- and tri-glycerides; and

(iii) fatty acid soaps, and without an intervening distillation treatment, treating said first solid material with a solution of . metal salt in water or in an alkanol containing 1 to 4 carbon atoms, the salt being a salt of a metal selected from those which form fatty acid salts which are insoluble in said solvent to produce a second solid material containing said insoluble fatty acid metal salts, and separating a product containing sucrose esters by dissolving the esters present in an alkanol with 1 to 4 carbon atoms and evaporating the alkanolic solution to dryness to give a third solid material.

4,104,465

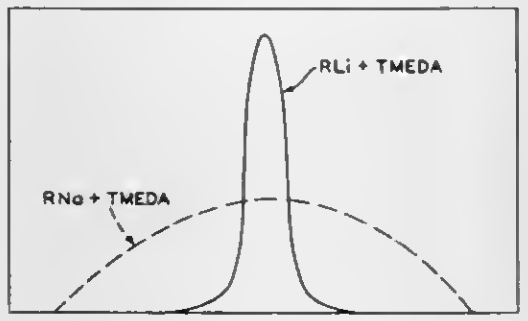
HIGH-VINYL HOMOPOLYMERS AND COPOLYMERS OF BUTADIENE

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 657,001, Feb. 11, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 764,502

Int. Cl.^{2} C08F *4/46*

U.S. Cl. 526—174 **6 Claims**



1. The process of polymerizing monomer selected from the group consisting of (a) conjugated diene containing 4 to 8 carbon atoms, (b) a mixture of such conjugated dienes, and (c) a mixture of such conjugated diene and a vinyl aromatic compound, to produce a polymer having a molecular weight of 100,000 to 5,000,000, a dilute solution viscosity of 1 to 10, and a 1,2-vinyl group content of at least 80 percent, which process comprises polymerizing such conjugated diene with or without vinyl monomer by reacting 1 to 2 parts of sodium as hydrocarbon sodium with the monomer in the presence of 0.1 to 10 parts by weight of chelating diamine and 0.1 to 2.0 parts of lithium or potassium t-alkoxide per 100 parts of monomer, in which alkoxide the alkane group contains 3 to 20 carbon atoms.

4,104,466

POLYMERIC METAL COMPLEX AND METHOD OF MANUFACTURING THE SAME

Eishun Tsuchida, 1-141, Seki-machi, Nerima-ku, Tokyo, Japan, and Kenji Honda, Tokyo, Japan, assignors to Eishun Tsuchida, Seki, Japan

Filed Mar. 4, 1975, Ser. No. 555,134

Claims priority, application Japan, Mar. 13, 1974, 49-28858; Jun. 14, 1974, 49-67806

Int. Cl.^{2} C07D *207/20*

U.S. Cl. 542—433 **9 Claims**

1. A polymeric composite metal complex which comprises a polymeric metal complex whose central metal is a low valency transition metal selected from the group consisting of metals belonging to Groups VIA, VIIA, VIII, IB and IIB of the fourth to the sixth periods of the periodic table, whose planar ligand is a quadri-dentate monomeric ligand chelate, and whose axial ligand is a polymeric ligand containing a functional group having a coordinating capacity; and one or more addition compounds capable of interaction with said polymeric metal complex, wherein the addition compound is a polyanion which is an acid selected from the group consisting of polycrylic acid, polymethacrylic acid, polyitaconic acid, polyglutamic acid, pectic acid and alginic acid.

4. A method of preparing a polymeric metal complex which comprises (A) reacting a monomeric metal complex whose central metal is a low or high valency transition metal selected from the group consisting of metals belonging to Groups VIA, VIIA, VIII, IB and IIB of the fourth to the sixth periods of the periodic table and whose ligand consists of a quadri-dentate chelate ligand with a polymeric ligand to replace the axial ligand of said monomeric metal complex by said polymeric ligand; or (B) bonding the residual group of a polymeric compound with the central metal of the monomeric metal complex to provide a σ bond between carbon mdetal, and, where the central metal of the monomeric metal complex is a high valency transition metal, reducing said central metal back to a low valency state by carrying out a chemical reaction using a reducing agent or an electrode reaction before, after or simultaneously with the reaction (A) or (B), wherein the residual group of the polymeric compound contains a group selected from the group consisting of a halogenated alkyl group, a hydroxyl group and a carbonyl group.

5. A method according to claim 4, wherein the residual group of the polymeric compound is a copolymer of p-(chloromethyl)styrene or chloroethyl vinyl ether with N-vinylpyrrolidone, acrylamide or acrylic acid.

4,104,467

1,3-BENZODITHIOLANES

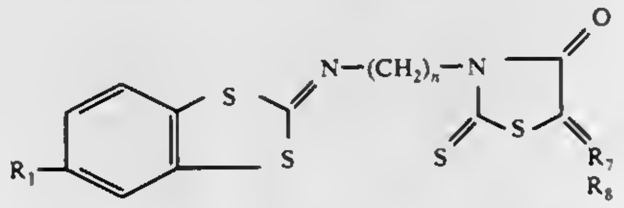
Peter W. Sprague, Titusville, and James E. Heikes, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 16, 1976, Ser. No. 705,849

Int. Cl.^{2} C07D *277/36*

U.S. Cl. 542—442 **23 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, trifluoromethyl, alkyl, alkoxy, nitro, amino or hydroxy; R_7 and R_8 are hydrogen, or together R_7 and R_8 are $=CH-(CH_2)_p-R_9$ wherein p is 0 or an integer of from 1 to 9, and R_9 is hydrogen, carboxy, alkoxycarbonyl, alkyl, phenyl or phenyl mono- or disubstituted with trifluoromethyl, halogen or alkoxy; and n is 0, 1, 2, 3, 4 or 5; wherein the terms "alkyl" and "alkoxy," by themselves or as part of a larger group, refer to groups having 1 to 4 carbon atoms.

4,104,468

1,3,4-OXADIAZOLYL-(2)-VINYL STILBENE OPTICAL BRIGHTENERS

Salvatore Valenti, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

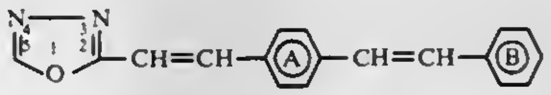
Filed Oct. 26, 1976, Ser. No. 735,797

Claims priority, application Switzerland, Oct. 28, 1975, 13938/75

Int. Cl.^{2} C07D *271/10*

U.S. Cl. 542—447 **21 Claims**

1. A compound useful as an optical brightener and having the formula



wherein the oxadiazole group is unsubstituted or substituted in the 5-position and the rings A and B are unsubstituted or substituted by non-chromophoric substituents.

4,104,469

7-(SYN-α-ALKOXY-IMINOFURYL)ACETAMIDO-3-(2-METHYL-2,3-DIHYDRO-S-TRIAZOLO[4,3-b]PYRIDAZIN-3-ON-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

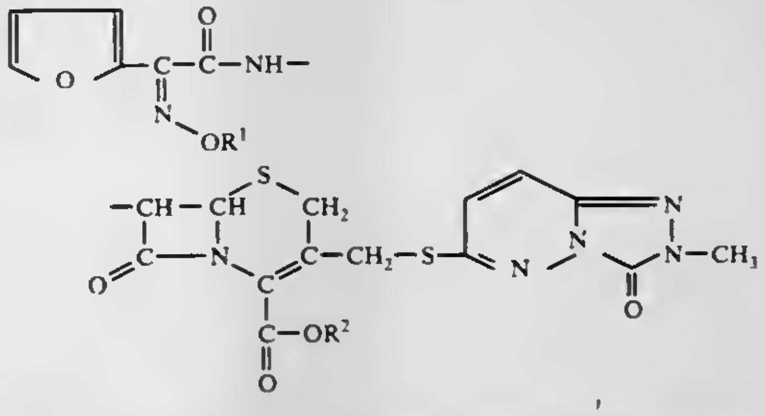
Takayuki Naito, Kawasaki; Jun Okumura, Yokohama, and Seiji Iimura, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,056

Int. Cl.^{2} C07D *501/36*

U.S. Cl. 544—27 **5 Claims**

1. A compound having the formula



wherein R^1 is alkyl of 1–4 carbon atoms and R^2 is hydrogen or pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl or a nontoxic, pharmaceutically acceptable salt thereof, said compound being at least 75% by weight in the form of its syn isomer.

4,104,470

CRYSTALLIZATION PROCESS FOR CEFAZOLIN SODIUM

Michael D. Cise, Indianapolis, and Harold E. Osborne, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 3, 1977, Ser. No. 803,018

Int. Cl.^{2} C07D *501/36*

U.S. Cl. 544—27 **7 Claims**

1. A process for preparing cefazolin sodium in the monohydrate crystalline form substantially free of other crystalline forms which comprises adding at a temperature between about 10° C. and about 35° C. a solution of substantially pure cefazo-

lin acid in a water-miscible organic solvent selected from the group consisting of dimethylacetamide, dimethylformamide, dimethylsulfoxide, acetonitrile, and isopropanol, said solution having a concentration of cefazolin acid of between about 250 mg./ml. and about 500 mg./ml.; to a solution of a sodium ion donor substance in a water-miscible organic solvent selected from the group consisting of methanol, ethanol, isopropanol, acetone, and methylethyl ketone, wherein said sodium ion donor substance is selected from the group consisting of sodium acetate, sodium propionate, sodium citrate, sodium lactate, sodium 2-ethylhexanoate, sodium hydroxide and sodium carbonate; said sodium ion donor solution containing water in an amount sufficient to constitute between about 3 and about 7 percent by volume of the mixed solutions following addition, and wherein said addition is carried out for between about 2.0 hours and about 2.5 hours.

4,104,471
METHOD OF ADDING AMINES TO 1,3 DIENES
Francis Gordon Albert Stone, Bristol; Michael Green, Chew Stoke; Gary Scholes, and John Liooel Spencer, both of Bristol, all of England, assignors to Air Products & Chemicals, Ioc., Allentown, Pa.

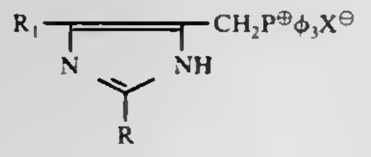
Filed Mar. 9, 1977, Ser. No. 775,822
Int. Cl.² C07D *295/02, 211/14;* **C07C** *87/24*
U.S. Cl. 544—178 **1 Claim**

1. In a process for dimerizing a conjugated olefin in the presence of a secondary amine by contacting the conjugated olefin and amine with a palladium catalyst, the improvement for obtaining enhanced yields of dimers while minimizing the formation of trimers and producing 1:2 amine-diene adducts with little to no 1:1 amine diene adducts which comprises: reacting a conjugated olefin selected from the group consisting of butadiene and isoprene with a secondary amine selected from the group consisting of morpholine, piperidine, dimethylamine, and diethylamine in the presence of a complex of bis(cyclo-octa-1,5-diene)palladium and a tertiary phosphine ligand in a 1:1 mole ratio as the palladium catalyst at a temperature of from 50°–60° C and a pressure of from 6–7 atmospheres.

4,104,472
IMIDAZOLEMETHYLPHOSPHONIUM SALTS
Clifford Steven Labaw, Philadelphia; Robert Lee Webb, West Chester, and George Robert Wellman, Warminster, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 767,083, Feb. 9, 1977. This application May 24, 1977, Ser. No. 800,150
Int. Cl.² C07F *9/65*
U.S. Cl. 548—337 **7 Claims**

1. A compound of the formula:



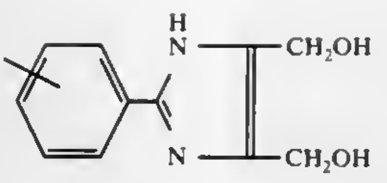
in which:

R is sulfinic acid, carbolower-alkoxy or carboxy;
R_1 is hydrogen, lower alkyl of 1–6 carbons or phenyl; and
$X^{\ominus}$ is chloride or bromide; or its acid addition salts.

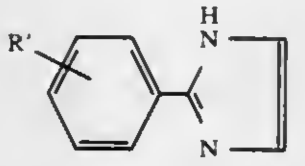
4,104,473
NOVEL IMIDAZOLE COMPOUNDS AND PROCESS FOR PREPARATIONS THEREOF
Natsuo Sawa, Nakatado, and Kyoko Gohda, Kanonji, botb of Japan, assignors to Shikoku Chemicals Corporation, Japan

Filed Apr. 23, 1976, Ser. No. 679,663
Int. Cl.² C07D *233/64*
U.S. Cl. 548—342 **12 Claims**

1. A process for preparing a compound of the formula



wherein R' represents hydrogen or alkyl of 1 to 4 carbon atoms, which comprises reacting a 2-arylimidazole of the formula

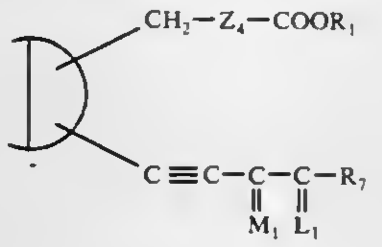


wherein R' is as defined above, with at least 2 moles, per mole of the 2-arylimidazole, of formaldehyde in a reaction medium having a pH of at least 7.

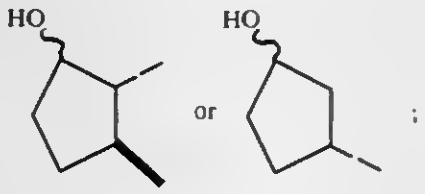
4,104,474
5-OXA-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINOR-PGF$_{1\alpha}$ COMPOUNDS
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 821,008
Int. Cl.² C07C *177/00*
U.S. Cl. 560—53 **73 Claims**

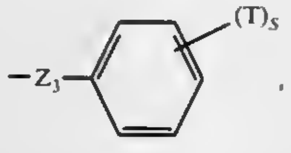
1. A prostaglandin analog of the formula



wherein D is

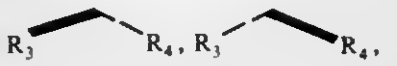


wherein Z_4 is
$—CH_2—O—CH_2—(CH_2)_g—CH_2—$,
$—(CH_2)_2—O—(CH_2)_g—CH_2—$, or
$—(CH_2)_3—O—(CH_2)_g—$; wherein *g* is one, 2, or 3;
wherein R_7 is



wherein Z_3 is oxa or methylene, *s* is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein L_1 is



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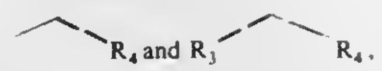
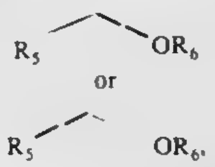
or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene; wherein M_1 is



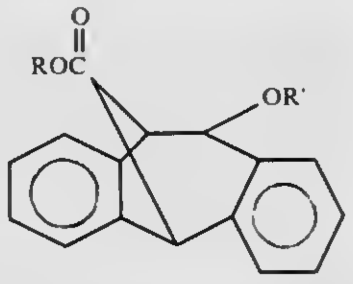
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,104,475
DIBENZO[a,d]CYCLOHEPTENES
Walton J. Hammar, Saint Paul, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 371,118, Jun. 18, 1973, Pat. No. 3,950,407. This application May 19, 1975, Ser. No. 578,725
Int. Cl.² C07C *69/76*
U.S. Cl. 560—56 **2 Claims**

1. A syn or anti compound of the formula

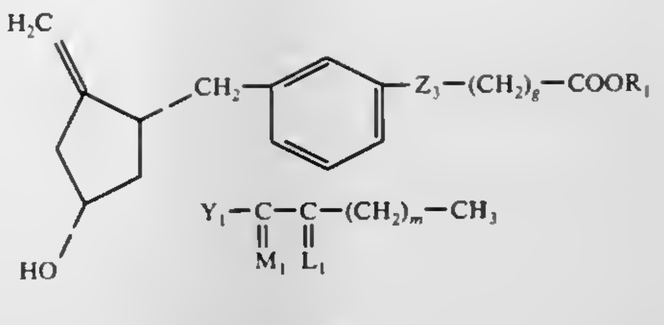


wherein R is lower alkyl and R' is hydrogen, lower alkyl or lower alkyl acyl.

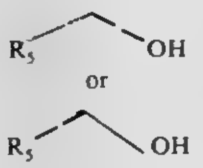
4,104,476
3,7-INTER-m-PHENYLENE-4,5,6-TRINOR-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,330
Int. Cl.² C07C *177/00*
U.S. Cl. 560—61 **61 Claims**

1. A prostaglandin analog of the formula



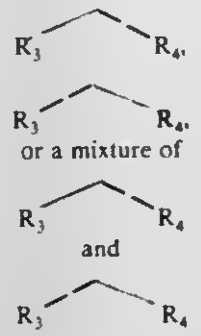
wherein Z_3 is oxa or methylene;
wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2C-H_2—; wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

wherein L_1 is



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

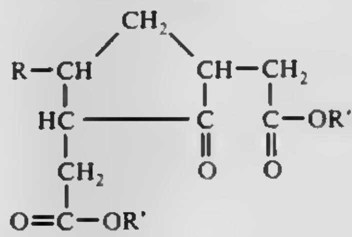
wherein *g* is one, 2, or 3; and

wherein *m* is one to 5, inclusive.

4,104,477
ESTER DERIVATIVES
Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 549,612, Feb. 13, 1975. This application Jan. 11, 1977, Ser. No. 758,388
Int. Cl.² C07C *61/38, 69/74*
U.S. Cl. 560—122 **1 Claim**

1. Cyclic keto esters or acids of spirodilactones from alkenyl bis(succinic anhydride) having the formula



in which R is alkenyl of 2 to 28 carbon atoms and R' groups, which may be the same or different, are hydrogen or alkyl groups of 1 to 8 carbon atoms each.

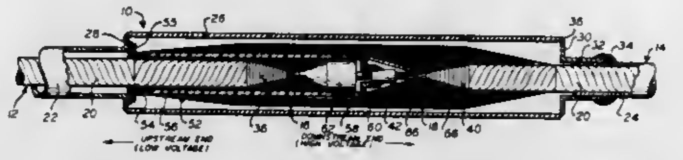
4,104,478
CATALYTIC HYDROGENATION OF FATTY ACIDS

Bhupendra C. Trivedi, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.
Filed Nov. 23, 1977, Ser. No. 854,441
Int. Cl.² C07C *29/00*
U.S. Cl. 568—885 **10 Claims**

1. A process for the catalytic reduction of a C_4–C_{24} fatty acid to the corresponding carbon length alcohol which comprises hydrogenating the fatty acid at a temperature of from about 170°–250° C. and at a pressure of from about 20–140 atmospheres in the presence of a catalytically effective amount of a co-catalyst system consisting essentially of 1 part by weight of activated rhenium and from 0.25–1.5 parts of an extrinsic metal catalyst selected from the group consisting of ruthenium, rhodium, platinum and palladium.

4,104,479
STOP JOINT FOR LAMINAR DIELECTRIC CABLE

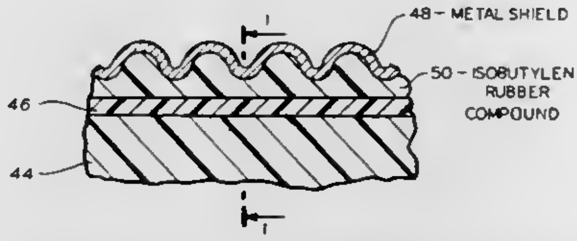
George Bahder, Edison; George S. Eager, Jr., Upper Montclair; Attila F. Dima, Piscataway, and James J. Walker, Berkeley Heights, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.
Filed Dec. 28, 1976, Ser. No. 755,029
Int. Cl.² H02G *15/24*
U.S. Cl. 174—22 R **12 Claims**



11. A stop joint located between ends of different lengths of cable that are connected together including in combination a stop tube connected fluid-tight at its upstream end with a shield that surrounds a cable for confining a fluid around the cable core, an inner electrode surrounding a bare end of a conductor of the cable that passes through the stop tube, the electrode being adjacent to the downstream end of the stop tube, and a connector at the downstream end of the stop tube and into which the conductor of the cable is secured, the connector sealing the downstream end of the stop tube to prevent escape of fluid therefrom, and an inner barrier in the connector to stop fluid flow through the connector.

4,104,480
SEMICONDUCTIVE FILLING COMPOUND FOR POWER CABLE WITH IMPROVED PROPERTIES

Paul F. Thompson, Millington, N.J., assignor to General Cable Corporation, Greenwich, Conn.
Filed Nov. 5, 1976, Ser. No. 739,315
Int. Cl.² H01B *7/28*
U.S. Cl. 174—23 C **13 Claims**

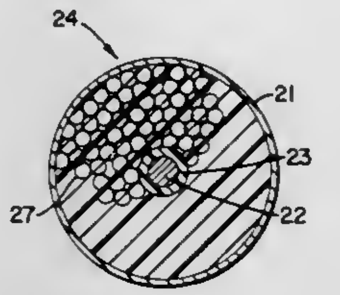


1. A high-voltage, power transmission cable including a conductor, conductor shield, insulation, insulation shield and outer shield, that are subject to a wide range of temperature variations during the service conditions under which the cable is intended to be used, and a filler compound between one of the shields and a confronting face of another part of the cable to prevent migration of water longitudinally along the interface of said shield and said other part, the filler material being amorphous polypropylene adhered to both the shield and said other part at all temperatures within said range.

4,104,481
COAXIAL CABLE WITH IMPROVED PROPERTIES AND PROCESS OF MAKING SAME

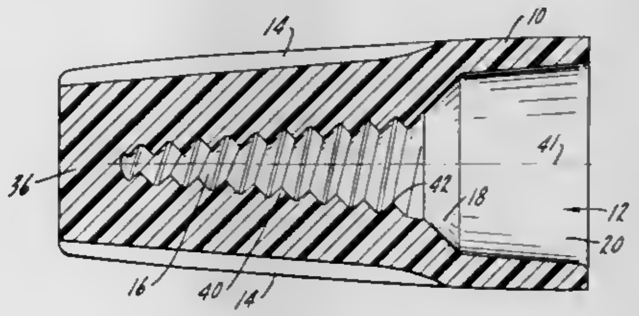
Frederic Nash Wilkenloh, Conover; Paul Alan Wilson, Hickory, and Steve Allen Fox, Taylorsville, all of N.C., assignors to Comm/Scope Company
Continuation of Ser. No. 584,164, Jun. 5, 1977, abandoned. This application Jun. 8, 1977, Ser. No. 804,520
Int. Cl.² H01B *3/30;* **H01P** *3/06;* **H01B** *11/18*
U.S. Cl. 174—28 **25 Claims**

1. An electrical cable having at least one inner conductor, an outer tubular conductor circumferentially surrounding the inner conductor and a gas expanded polyolefin dielectric formed by a composite of polyolefin, entrapped gas, and particles of a nucleating agent disposed between the inner and outer conductors to electrically insulate the inner and outer conductors from each other, the improvement comprising said composite of polyolefin, and entrapped gas and nucleating agent having a density between 0.20 and 0.10 grams per cubic centimeter and said nucleating agent being composed of undecomposed particles selected from the group consisting essentially of azobisformanies, calcium carbonate, silica, and silicates.



4,104,482
SCREW-ON CONNECTOR

William J. Scott, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.
Continuation of Ser. No. 617,820, Sep. 29, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,180
Int. Cl.² H01R *5/12*
U.S. Cl. 174—87 **26 Claims**



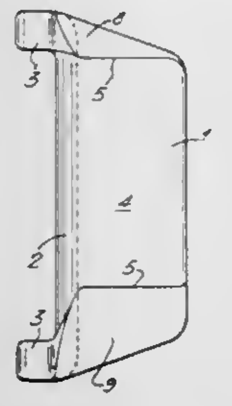
14. An insulated cap for covering and connecting by compression the stripped ends of a plurality of insulated electrical conductor wires or the like, including a shell of insulating material with an interior open at one end to receive the stripped ends of the wires and closed at the other end by an end wall, and a wire-engaging, nonexpanding thread formation in the interior for engaging the stripped ends of the wires, the thread formation being larger at the open end of the shell and smaller toward the end wall, the small end of the thread formation being at a lesser included angle than the included angle at the large end while presenting an intermediate included angle different from the other two included angles.

26. A method of joining the stripped ends of a plurality of insulated electric wires, including the steps of providing an insulating cap having a generally open threaded central bore in the general shape of a concave frustum of a cone with at least two threaded thread-forming portions therein that have different included angles, grouping together the stripped ends of a plurality of insulated electric wires, inserting the thus grouped stripped ends into the threaded bore of the cap, initially engaging the stripped ends of the wires with threaded thread-forming portion having a greater included angle while turning the cap down progressively on the striped ends of the wires, and thereafter engaging the stripped ends of the wires with a threaded thread-forming portion having a lesser included angle than the initially engaged portion while continuing to turn the cap down progressively on the stripped ends of the wires so the stripped ends of the wires are captured in both included angles.

4,104,483

DEVICE SUITABLE FOR USE IN A RAILWAY RAIL-AND-FASTENING ASSEMBLY TO INSULATE A RAIL FROM A RAIL CLIP AND FROM AN ANCHORAGE FOR THE CLIP

David Ronald Seeley, Hertford, England, assignor to Pandrol Limited, London, England
Filed Nov. 26, 1976, Ser. No. 745,424
Int. Cl.² E01B *26/00, 9/44;* **H01B** *17/00*
U.S. Cl. 174—138 R **9 Claims**

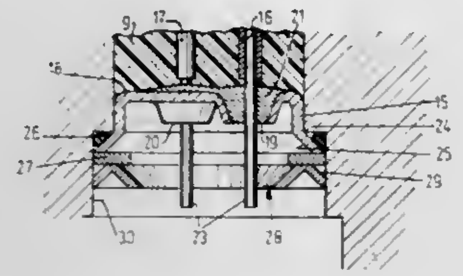


2. A device suitable for use in a railway rail-and-fastening assembly to insulate a rail from a rail clip and from an anchorage for the clip, comprising a first portion which is elongate and plate-like, said first portion having first and second ends, a second portion depending from one side of the first portion, and two lugs projecting from the second portion in the same direction as one another away from the first portion and near opposite ends thereof, said first portion comprising on its upper face a flat surface, the center of which is substantially nearer to said first end of said first portion than to said second end of said first portion, a first ramp surface leading up to said flat surface from said first end of said first portion, a second ramp surface leading up to said flat surface from said second end of said first portion, said first ramp surface having an angle from the horizontal substantially greater than the angle of said second ramp surface from the horizontal with said second ramp surface angle being small enough to permit the driving of the clip onto said flat surface without shearing off the second lug.

4,104,484

CONDUCTOR LEAD-THROUGH

Hendrik Jan Ijlstra, Egmond a/d Hoef, and Gerardus Joachim Maria van den Boogaard, Utrecht, both of Netherlands, assignors to Ultra Centrifuge Nederland N.V., The Hague, Netherlands
Filed May 13, 1976, Ser. No. 687,299
Claims priority, application Netherlands, Jun. 23, 1975, 7507440
Int. Cl.² H01B *17/30;* **H02K** *5/22*
U.S. Cl. 174—151 **2 Claims**

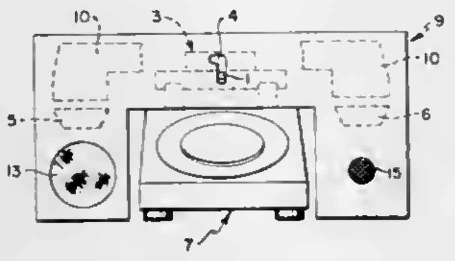


1. A conductor lead-through for elongated bodies, comprising at least one electric current conductor, which conductor lead-through contains no welded joints and is particularly suitable for use with difficultly weldable or non-weldable combinations of materials, said conductor lead-through comprising an assembly of parts including a cover through which said current conductor passes in insulating relationship with respect thereto, said cover having an outwardly sloping flanged edge, an intermediate ring engaging the flanged edge of the cover, and an O-ring seal fitted about said cover and engaging the outer surface of the flanged edge of the cover and being held in compression between said outer surface and a shoulder on the wall of an opening into which said assembly is fitted, said parts of said assembly being retained together and secured in the opening by means of a clamp ring, said clamp ring having a flexible part which extends around its periphery and which engages the wall of the opening, the outer diameters of said clamp ring and said intermediate ring being the same.

4,104,485

TELEPHONE LOUD-SPEAKER SYSTEM

David Pessel, 14 Courtenay Cir., Pittsford, N.Y. 14534, and Neil C. Wilhelm, 3631 Gleason Ave., San Jose, Calif. 95130
Filed Mar. 15, 1976, Ser. No. 667,129
Int. Cl.² H04M *1/00*
U.S. Cl. 179—1 HF **4 Claims**



1. Apparatus for use with a telephone of the type having a handset receivable on at least one spring-raised switch button when not in use to depress the switch button for controlling electrical operation of the telephone, said apparatus comprising:

a chassis;

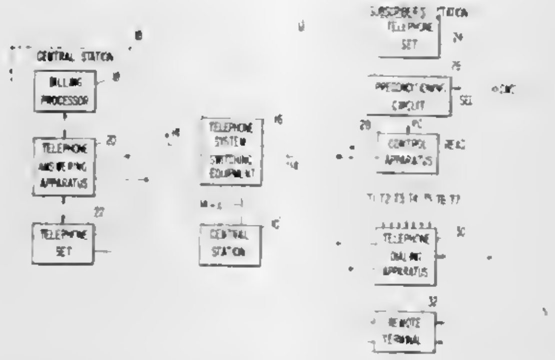
a cradle, adapted to receive a telephone handset, mounted in said chassis for movement between a first position causing said switch button to assume its depressed position when a handset is received thereon, and a second position raising a received handset and causing said switch button to assume its raised position; and

means for selectively moving said cradle from its first position to its second position when a handset is received thereon.

4,104,486

SYSTEM FOR ACCUMULATING DATA OVER NONDEDICATED TELEPHONE LINES

John R. Martin, 3129 W. Mill Rd., Milwaukee, Wis. 53209, and Robert S. Block, 777 W. Glencoe Pl., Milwaukee, Wis. 53217
Filed Jun. 29, 1976, Ser. No. 701,033
Int. Cl.² H04Q *9/00;* **H04M** *11/00*
U.S. Cl. 179—2 AM **6 Claims**



1. A telephone data accumulator system comprising:

at least one selectively operable telephone data transmitting device at a remote location, said device including a data accumulator that accumulates data pertaining to services used at the remote location and means for generating a predetermined telephone dialing signal, both connected across non-dedicated telephone lines in parallel therewith so as not to interfere with normal service to a telephone connected across said lines;

line capture means connected across the telephone lines in parallel therewith at the remote location for seizing the telephone lines in preparation for placing a call;

means at the remote location for selectively conditioning said line capture means and generating means respectively on a time-selected basis to seize the telephone lines and to generate said dialing signals and apply said dialing signals to the telephone lines to thereby initiate a call from the remote location to a central location over the non-dedicated telephone lines;

a data utilization device at the central location;

means at the central location for automatically answering the call initiated from the remote location and producing a connection between the remote location and the central location over the telephone lines;

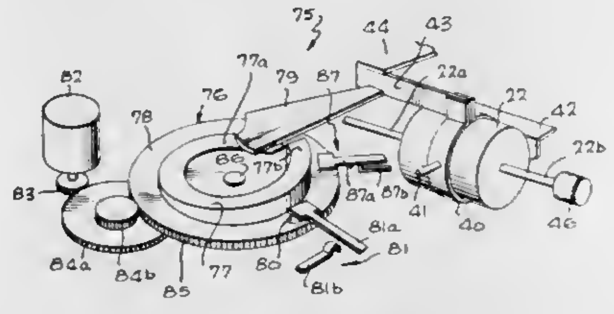
means at the remote location connected to the telephone lines for detecting a go-ahead signal on the telephone lines; and,

means responsive to said detected go-ahead signal for transferring data from the data accumulator at the remote location to the utilization device at the central location over the telephone lines connecting said remote location and said central location.

4,104,487

TELEPHONE ANSWERING DEVICE WITH REMOTE CONTROLLED PLAYBACK

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406
Filed Dec. 13, 1976, Ser. No. 749,676
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 E **7 Claims**



7. A telephone answering device of the type including means for automatically playing back incoming messages that have been previously recorded on tape, and having a reel drive motor that is mechanically positionable alternately to forward and reverse tape drive positions by an assembly comprising:

a motor positioning cam,

a cam follower cooperating with said cam and connected to position said drive motor in accordance with the orientation of said cam,

a cam drive motor for driving said cam between first and second orientations in which the cam follower positions said reel drive motor respectively in said forward and reverse positions,

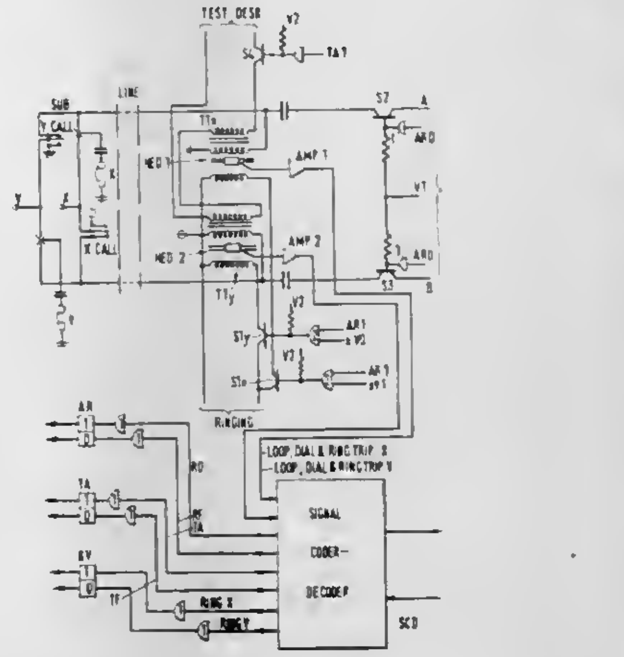
first circuit means for energizing said cam drive motor in response to occurrence of an automatic playback control signal and for maintaining said cam drive motor energized only long enough to rotate said cam from said first orientation to said second orientation so as to position said reel drive motor in said reverse position, and

second circuit means, including an end of rewind switch actuated when all of said tape has been rewound, for energizing said cam drive motor upon actuation of said end of rewind switch and for maintaining said cam drive motor energized only long enough to rotate said cam from said second orientation back to said first orientation so as to position said reel drive motor in said forward position.

4,104,488

SUBSCRIBER LINE CIRCUIT

Donald A. Weir, Goff's Oak, Nr. Cheshunt, and Anthony W. Sweet, Saffron Walden, both of England, assignors to International Standard Electric Corporation, New York, N.Y.
Filed May 19, 1977, Ser. No. 798,415
Int. Cl.² H04B *3/46;* **H04M** *3/02*
U.S. Cl. 179—18 FA **9 Claims**



7. In an automatic telephone exchange serving two subscribers connected in a party line manner a line circuit comprising:

direct current supply means having one terminal thereof connected to one wire of the line via a winding on a first transformer and the other terminal of the direct current supply connected to the other wire of the line via a winding on a second transformer;

an additional winding on each of said transformers via which an alternating current may be coupled when required to its one of the line wires;

two Hall effect devices each of which being associated with one only of the line wires for detecting when direct current flows in its one of the line wires with which it is associated; and

magnetic circuit means for each Hall effect device of each of said line wires coupled to said transformer windings and including said transformer windings for each of said line wires.

4,104,489

HOLOGRAPHIC MEMORY WITH FRINGE STABILIZING COMPENSATION FOR RECORDING MEDIUM MOTION

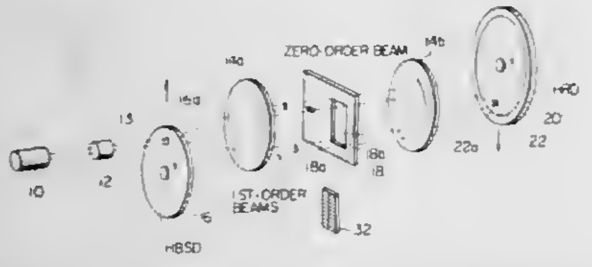
Isao Satoh, and Makoto Kato, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Feb. 15, 1977, Ser. No. 768,744
Claims priority, application Japan, Feb. 18, 1976, 51-17294
Int. Cl.² G03H *1/30;* **G11B** *7/00*
U.S. Cl. 179—100.3 G **18 Claims**

1. A holographic recording system for recording the hologram of an electrical signal, comprising:

an array of identical random phase illumination holograms arranged in sequence to successively receive substantially monochromatic light for diffracting the light incident thereon into a zero-order diffracted beam of light and into a first-order diffracted array of sampled, phase-shifted beams of light;

a double diffraction lens system comprising a first Fourier transforming lens receptive of the zero-order beam and the first order diffracted array of light beams for focusing the light beams in the focal plane and a second Fourier transforming lens aligned to receive the light beams focussed by said first Fourier transforming lens;

a mask having a first and a second aperture and disposed in the focal plane of said first and second Fourier transforming lenses for allowing the transmittance of only the zero-order diffracted beam and the first-order diffracted array of light beams through the first and second apertures, respectively, and beyond the focal plane;



means disposed in said second aperture of said mask for spatially modulating the first-order diffracted array of light beams in accordance with said electrical signal to form a holographic interference pattern between the zero-order diffracted beam and the spatially modulated first-order diffracted array of light beams in a plane conjugate to said array of random phase illumination holograms; and

means for moving said array of random phase illumination holograms in a given direction so that said holograms are successively receptive of said substantially monochromatic light and moving said hologram forming plane in a direction opposite to said given direction at equal speed to the speed of movement of said random phase illumination holograms so that a series of holographic interference patterns is formed on said hologram forming plane.

4,104,490

CODING LOCK

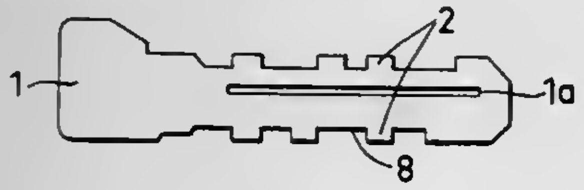
Göran Lundström, Enskede, and Karl Nolte, Huddinge, both of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

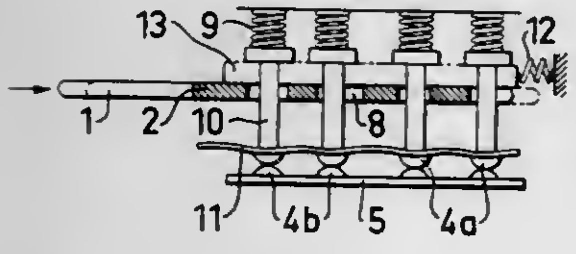
Filed Jun. 21, 1976, Ser. No. 697,990

Claims priority, application Sweden, Jun. 19, 1975, 7507082

Int. Cl.^{2} H01H *3/16*

U.S. Cl. 200—44 **9 Claims**





1. A lock system comprising:

a key having an edge portion along which there are formed a plurality of lugs and gaps in a predetermined pattern;

a key receiving means having an elongated passage for insertion of the key and longitudinal movement of the key along the passage;

a plurality of electrical contact members arrayed in first and second rows longitudinally along said passage, with the respective contact members of said first and second rows being opposite each other, and said contact members of said first row being fixedly mounted and said contact members of said second row being selectively movable toward and away from the contact members of said first row under control of the key;

a resilient return means adjacent said key passage for engagement by said key as it is moved longitudinally through said key passage, said key being movable to a rest position in said key passage where it is unbiased by said resilient means and said contact members of said second row are not moved, said key, when moved to a second position in said key passage engaging said return means and controlling corresponding contact members of said second row in accordance with the pattern of lugs and gaps on said key, to move said corresponding second row contact members toward and into electrical contact with said contact members of the first row.

4,104,491

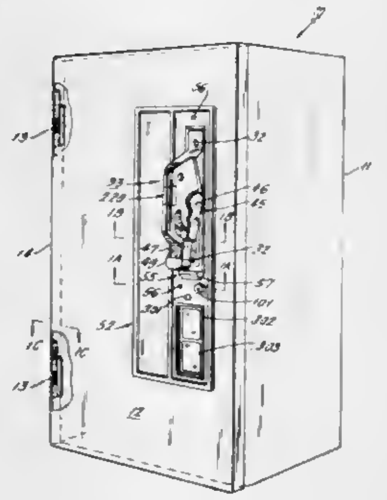
LATCH MEANS FOR SWITCH ENCLOSURE

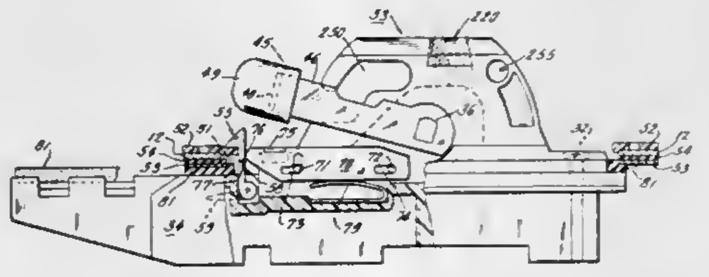
Gerald R. Duble, New Windsor, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 9, 1976, Ser. No. 748,731

Int. Cl.^{2} H01H *9/20*

U.S. Cl. 200—50 A 5 Claims





1. Enclosed electric switch apparatus including an enclosure having a front opening, a cover hingedly connected along one of its edges to said enclosure for closing said opening, switch means inside said enclosure including a contact operating mechanism, switch operating means mounted to said enclosure forward of said contact operating mechanism, said operating means including platform means comprising a housing, manual operating handle keyed to pivot means mounted to said housing, linkage means keyed to said pivot means and connected to said operating mechanism for operation of the latter by operation of said handle, said cover including aperture means through which said housing extends when said cover is closed, said aperture means disposed adjacent an edge of said cover opposite said one edge thereof, cover catch means on said platform means biased toward a holding position for maintaining the cover closed, defeatable cover interlock means on said platform means to normally prevent operation of said catch means to release said cover when said handle is in switch closed position, and defeatable switch interlock means on said platform means to normally prevent operation of said handle to switch closed position when said cover is open, holding means biased toward an active position and operated to an inactive position by said cover upon closing thereof, said holding means when in said active position maintaining said catch means in cover releasing position.

4,104,492

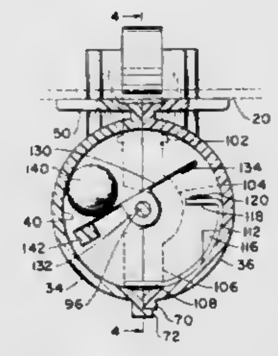
GRAVITY ACTUATED LIGHT SOCKET AND SWITCH MEANS

Frank V. Pliml, Jr., Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 23, 1977, Ser. No. 836,182

Int. Cl.^{2} H01R *33/28*

U.S. Cl. 200—51.14 **11 Claims**



1. A gravity actuated light socket and switch means including a dielectric light socket having a horizontal axis, means adapted for retaining said socket in mounted relation to an apertured panel fixed on a support member angularly moveable about a horizontal axis, multiple socket contact means for connection to and conveying a source of power to and from said socket, moveable switch contact means teeter-totter fashion intermediate its extremities on a horizontal shaft connected to one of said socket contact means, moveable weight means shiftable along said contact means in response to angular movement of said support member, stop means for controlling the angular shifting of said moveable switch contact means between a first angular disposition of said light socket and a second angular disposition, the second one of said stop means being a fixed contact connected to a power source and adapted to be touched by said moveable switch contact means when said light socket is placed in said second disposition by shifting of said moveable weight means, whereby power is supplied to said socket contacts.

4,104,493

SWITCH FOR DETECTING COLLISION OF VEHICLE

Yoshihiro Hibino; Hideaki Sasaya, both of Okazaki, and Akihiro Kobayashi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 4, 1976, Ser. No. 738,756

Claims priority, application Japan, Dec. 15, 1975, 50-169631[U]

Int. Cl.^{2} H01H *35/14*

U.S. Cl. 200—61.45 R **4 Claims**

1. A collision detecting apparatus for motor vehicle comprising:

a casing made of non-conductive material;

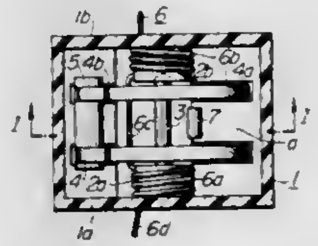
a shaft disposed in said casing:

supporting means, fixed to said casing, for rotatably supporting said shaft;

a pair of plate members, each being fixed to said shaft and spaced at a predetermined distance from each other;

massive weight means fixed to said pair of plate members at a position apart from said shaft for rotating said pair of plate members;

a conductive stationary contact fixed to said casing and extending through the space defined between said pair of plate members;



conductive movable contact means coupled to said pair of plate members for making contact with said stationary contact upon sufficient rotation of of said pair of plate members; and

biasing means secured to said housing and to said pair of plate members, for biasing said movable contact means to a position apart from said stationary contact.

4,104,494

ELECTRIC SWITCHES

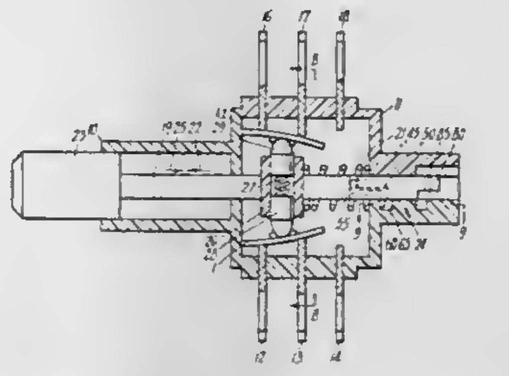
David Allen Swann, 17-21 Carinish Rd., Clayton, Victoria, 3168, Australia

Continuation of Ser. No. 634,176, Nov. 21, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,283

Claims priority, application Australia, Nov. 25, 1974, 9740/74; Dec. 3, 1974, 9857/74

Int. Cl.^{2} H01H *9/00*

U.S. Cl. 200—67 G **10 Claims**



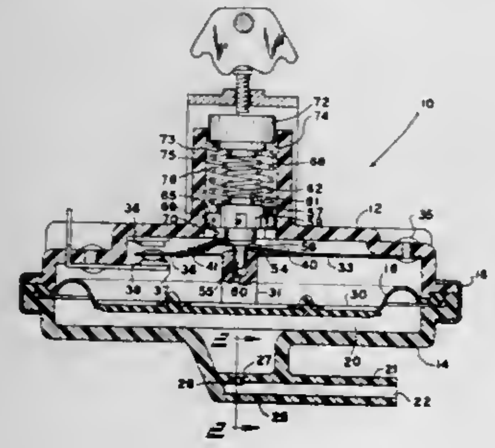
1. An electric switch having a linearly reciprocably moveable actuator; a first electric contact which acts, in use, as a fulcrum, a second electric contact and a first contact bridging member on one side of the path traversed by the actuator in linearly reciprocably moving; a third electric contact which acts, in use, as a fulcrum, a fourth electric contact and a second contact bridging member on an opposite side of said path; an aperture extending through the actuator transverse to said path, the actuator including biasing means extending through the aperture, urging the first and second contact bridging members outwardly of said path into engagement with the respective fulcrum and operative in use to transmit linear reciprocating movement of the actuator into sliding movement of the contact bridging members over the respective fulcrum and to bias the contact bridging members to pivot about the respective fulcrum to bring the leading or trailing end of the contact bridging members into or out of contact with the respective one of the second and fourth contacts;

the biasing means including a coil spring extending in said aperture and having each of its ends received within a respective one of two blind sleeves which are in part received in and guided by the aperture and which transmit the bias of the spring to the contact bridging members;

each contact bridging member having means defining a pair of longitudinally spaced, opposed abutments thereon which are effective on that side of the respective contact members which is remote from the respective contacts for engagement by the respective blind sleeves externally of said blind sleeves for translating reciprocating movement of said actuator into rocking, sliding movement of said contact bridging members in the absence of mechanical pinning of the contact bridging members to the blind sleeves.

4,104,495
PRESSURE SWITCH AND ACTUATING MEANS RESPONSIVE TO LOW PRESSURE

William H. Jones, Villa Park, and Gordon L. Astrom, Byron, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 405,225, Oct. 10, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,948
Int. Cl.² H01H *35/34*
U.S. Cl. 200—83 P **4 Claims**



1. A pressure switch comprising:

first and second housing portions;

diaphragm means between said housing portions defining an expansible pressure chamber on one side of said diaphragm means at least partially within said second housing portion;

switch means on the opposite side of said diaphragm movable from a normal to an actuated position by said diaphragm means, said switch means including a snap blade having a guide tongue element operatively associated with said diaphragm means and an actuating tongue element carrying a contact movable between said positions;

said first housing portion having a bore aligned with said guide tongue and an annular base within said bore adjacent said guide tongue, said annular base defining a central opening extending therethrough and at least two configured slots extending outwardly from said opening and extending through said bore;

adjustable spring means within said bore for biasing said guide tongue and said blade to said normal position, said spring means including an actuator having a body portion disposed within said opening in said base and at least two ears extending from said body generally conforming to the shape of said slots and received therein, said actuator at least partially disposed within said base and contacting said guide tongue element;

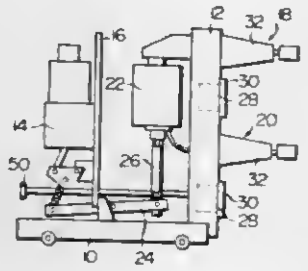
said guide tongue has an elongated slot therethrough;

said diaphragm means includes a resilient diaphragm, a relatively rigid plate secured to said diaphragm and an actuating post extending from said diaphragm plate, said actuating post having a generally spherical end abutting said guide tongue element and an opening extending within said actuating post from said spherical end, said opening generally aligned with said slot in said guide tongue; and

said actuator has a spherical portion depending from the body thereof and contacting said guide tongue and a guide stem portion depending from said spherical portion and received within said opening in said actuating post.

4,104,496
VACUUM INTERRUPTER DEVICE

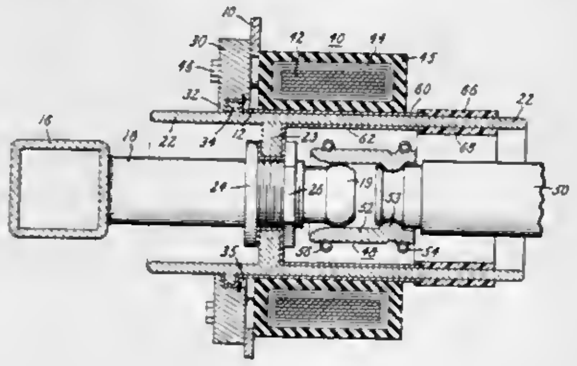
Hiroshi Koike, Tama; Hideaki Wakayama, Fuchu; Hiroshi Ohashi, Tokyo, and Kunio Yokokura, Fuchu, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Jan. 18, 1977, Ser. No. 760,424
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**



1. A vacuum interrupter device comprising a frame; an insulating barrier erected on said frame; a pair of terminals attached to said barrier which are to be connected to a main electric circuit; a chamber provided at the vicinity of said pair of terminals; a vacuum interrupter connected between said pair of terminals; an operating means to operate the vacuum interrupter; a non-linear resistor placed in said chamber connected between either one of the pair of terminals and the ground to lead make-and-break surges caused by said vacuum interrupter to the ground.

4,104,497
DISCONNECT CONTACT ASSEMBLY FOR METAL-CLAD SWITCHGEAR AND THE LIKE

Robert Harwood Brealey, Exton, Pa., assignor to General Electric Company, Philadelphia, Pa.
Filed Aug. 30, 1976, Ser. No. 719,044
Int. Cl.² H01H *9/02*
U.S. Cl. 200—305 **4 Claims**



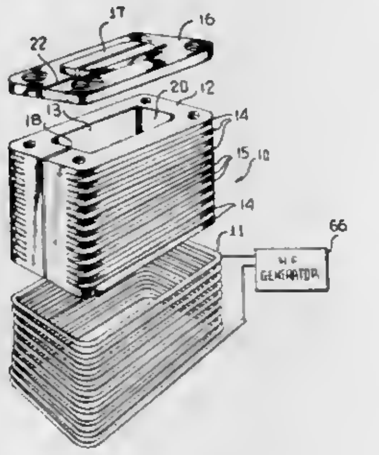
1. A disconnect contact assembly for metal clad switchgear and the like, comprising:

- a. a metal plate at ground potential having an opening therein,
- b. a first conductive stud extending forwardly through said opening in radially-spaced relationship to the periphery of said opening and terminating in a free end,
- c. a tubular insulator surrounding and fixed to said first stud and also extending through said opening, said tubular insulator having a forward tubular portion that surrounds and is radially spaced from said free end of said first stud,

- d. a second conductive stud generally aligned with said first stud and having an end portion surrounded in radially-spaced relationship by said forward portion of said tubular insulator,
- e. a bridging contact subassembly bridging the ends of said studs and conductively interconnecting said ends, said bridging contact subassembly being located in a position surrounded by said forward portion of said tubular insulator and radially spaced from said forward portion of said tubular insulator,
- f. an annular current transformer secondary assembly surrounding said portion of said tubular insulator,
- g. a first metallic coating normally at ground potential surrounding said portion of said tubular insulator and said secondary assembly, and coating the outer periphery of said portion of said tubular insulator,
- h. a second metallic coating normally at the potential of said first stud coating the inner periphery of said forward portion of said tubular insulator and surrounding said bridging contact subassembly in radially-spaced relationship thereto,
- i. a first semiconductor coating having non-linear resistivity properties on the external surface of said tubular insulator at the forward end of said first metallic coating, and
- j. a second semiconductor coating having non-linear resistivity properties on the internal surface of said tubular insulator at the forward end of said second metallic coating.

4,104,498
APPARATUS FOR AND METHOD OF INDUCTION HEATING OF METAL PLATES WITH HOLES

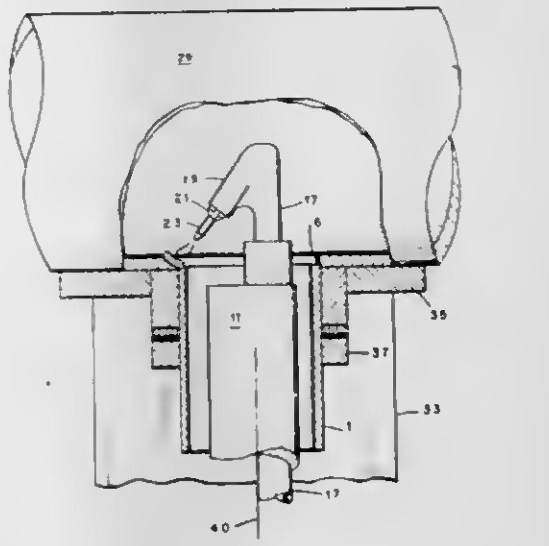
Howard L. Gerber, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Jun. 28, 1976, Ser. No. 700,494
Int. Cl.² H05B *5/18*
U.S. Cl. 219—10.43 **16 Claims**



1. A flux concentrator for induction heating of preselected areas of metal plates, said flux concentrator comprising a transformer; said transformer comprising a single winding secondary coil form in the form of a thick wall tubular body of a selected height, said body having remote end faces, said body being interrupted by an axial slot extending from the exterior of said body to the interior thereof for the full height of said body, and a multiple winding primary coil wrapped around the exterior of said secondary coil form with the windings of said primary coil bridging said slot; and a nosepiece overlying one of said coil form end faces in electrical conducting relation, said nosepiece being in the form of a generally axially coextensive cover plate for said coil form and having a longitudinal slot therein for the full height thereof, said nosepiece slot being in alignment with said coil form slot with a portion of said nosepiece slot forming an axial extension of said coil form slot.

4,104,499
ELECTRIC ARC WELDING GUN

Edward Luttrell, Clinton, Tenn., and Paul W. Turner, Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Nov. 2, 1976, Ser. No. 737,757
Int. Cl.² B23K *9/02*
U.S. Cl. 219—60 A **5 Claims**



1. Apparatus for interiorly welding the joint formed by a first tubular member teed into a second tubular member comprising:

an arc welding gun including an elongated and electrically conductive barrel positioned to extend longitudinally through the first member, in laterally offset relation to the axis thereof, and into the interior of the second member, the portion of said barrel extending into the second member being provided with an electrically conductive and reversely extending tubular tip which extends adjacent to said portion, said gun also including a welding electrode which is supported by and extends from said tip, the axes of said tip and electrode defining an acute angle with the axis of said portion of said barrel;

electrically non-conductive gun-support means extending coaxially within said first member and rotatable about the axis of the first member, said means being clamped to a section of said barrel;

drive means coupled to said support means for rotating the same; and

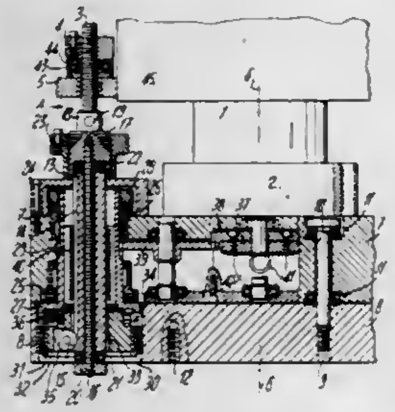
an electrical power supply connected between said barrel and said joint.

4,104,500
DEVICE FOR ELECTRICAL DISCHARGE MACHINING WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLE TRANSLATIONAL MOVEMENT OF THE ELECTRODES

Georges Wyss, Niederrohrdorf, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland
Filed Jun. 16, 1976, Ser. No. 696,712
Claims priority, application Switzerland, Jun. 18, 1975, 7932/75; Sep. 8, 1975, 11598/75
Int. Cl.² B23P *1/08*
U.S. Cl. 219—69 V **10 Claims**

1. In an electrical discharge machining arrangement for machining the surface of a recess in a workpiece electrode, in which relative movements of the electrodes are controlled to maintain given sparking conditions in a machining zone comprised between the electrodes, and comprising a device for controlling a translational displacement of one electrode relative to the other both in the direction of an axis of penetration of one of said electrodes into the other electrode and in a plane perpendicular to said axis, said device comprising a support for

said one electrode, first means for moving the support in translation along said axis, and second means for moving the support in translation according to a predetermined amplitude in a plane perpendicular to said axis to provide a combined translational movement of the support along said axis and in said perpendicular plane, said second means comprising an eccentric member having, parallel to said axis of penetration, an axis in relation to which said support is fixed, the improvement comprising a rotatable shaft having an axis parallel to said axis of penetration, said eccentric member cooperating with said shaft for sliding in relation to said shaft in a direction forming a 45° angle with said axis of penetration and for rotating with said shaft about the axis of said shaft, and means for sliding said eccentric member relative to said shaft in response to movement of the support along said axis by said first means such that the amplitude of said translation of said support in said plane progressively increases as a function of the translational movement along said axis when advancing said support beyond a predetermined distance and decreases as a function of the translational movement along said axis when withdrawing said support to said predetermined distance.



4,104,501

METHOD OF ELECTRICAL DISCHARGE MACHINE WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLIC TRANSLATIONAL MOVEMENT OF THE ELECTRODES

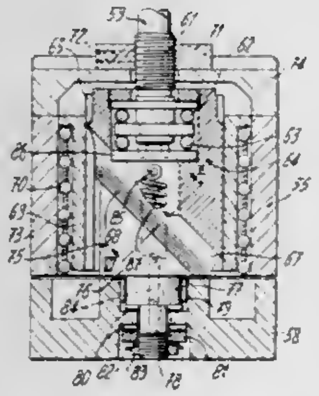
Georges Wyss, Niederrohrdorf, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Jun. 16, 1976, Ser. No. 696,713

Claims priority, application Switzerland, Jun. 18, 1975, 7932/75

Int. Cl.^{2} B23K *9/16*

U.S. Cl. 219—69 M **5 Claims**



1. In a method of machining by electrical discharges the surfaces of a recess in a workpiece electrode to substantially the same shape as a tool electrode, said method comprising controlling the relative displacements of the electrodes which are translationally movable relative to one another both in the direction of an axis of penetration of one electrode into the other and in a plane perpendicular to said axis and displacing one of the electrodes along said axis of penetration to produce sparking in a machining zone comprised between corresponding surfaces of said electrodes, said machining zone extending on frontal and lateral portions of said surfaces, the improvement comprising simultaneously relatively moving the electrodes in translation in said perpendicular plane with a predetermined amplitude, and progressively increasing said amplitude as a function of the penetration along said axis to provide a combined oblique relative translational movement along at least one generatrix of a surface of revolution of increasing section in said direction of penetration, while controlling said oblique relative translational movement to maintain given sparking conditions in the machining zone comprised between said electrodes at said frontal and lateral portions of said surfaces, wherein the amplitude of said relative translational movement in said plane increases linearly with the penetration along said axis whereby said oblique relative translational movement is along a generatrix of a cone coaxial to said axis of penetration and said generatrix is substantially at 45° to said axis of penetration.

4,104,502

ELECTRO-EROSION MACHINE TOOL WITH COMPENSATION FOR OPERATING FORCES, AND METHOD OF OPERATION

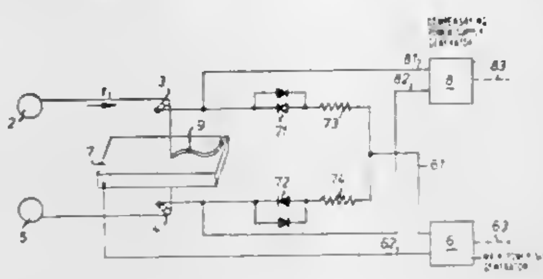
Werner Ullmann, Locarno, Switzerland, and Rudolf Panschow, Hanover, Germany, assignors to A.G. für industrielle Elektronik AGIE, Locarno, Switzerland

Continuation-in-part of Ser. No. 588,620, Jun. 19, 1975, abandoned. This application Jul. 26, 1976, Ser. No. 708,299

Claims priority, application Switzerland, Nov. 25, 1974, 15639/74

Int. Cl.^{2} B23K *9/16*

U.S. Cl. 219—69 W **14 Claims**



1. In an electro-erosion machining method, which includes the steps of controlling movement of a wire, ribbon or strip-like tool electrode (1) with respect to a workpiece (7) while leaving a spark gap (9) between the electrode and the workpiece, and while supplying electrical power to the spark gap, the step of

supplying a compensating electrical current to the tool electrode (1) to generate an electromagnetic compensating field which generates forces acting on the electrode of a magnitude and direction which compensate uncontrolled disturbance and distortion forces acting on the tool electrode during operation.

4,104,503

METHOD OF ELECTROEROSION AND AN APPARATUS FOR PRODUCING CAVITIES INSIDE A SOLID METAL COMPONENT

Learco Di Piazza, Ispra (Varese), and Angelo Migoni, Castelletto Ticino, both of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed Sep. 29, 1976, Ser. No. 727,631

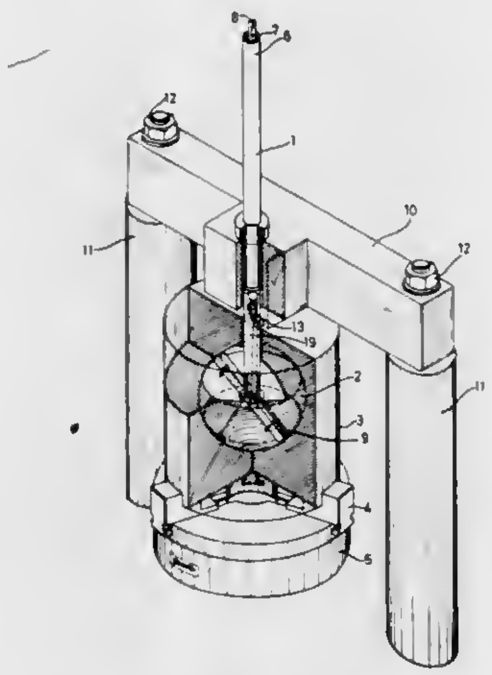
Claims priority, application Luxembourg, Oct. 2, 1975, 73498

Int. Cl.^{2} B23P *1/04, 1/16;* **B23K** *9/16*

U.S. Cl. 219—69 E **7 Claims**

1. An apparatus for creating cavities by electroerosion within a solid component, comprising a hollow stationary cylinder; a single electrically conductive driving control rod surrounded by and coaxial with said cylinder; a driving square terminating one end of said rod; and an electrode connected to

said driving square, said electrode by the driving control rod being pivotable around an axis perpendicular to the axis of the cylinder, movable together with the rod along the axis of the cylinder, positionable perpendicular to the axis of said cylinder and rotatable around said axis of said cylinder.



4,104,504

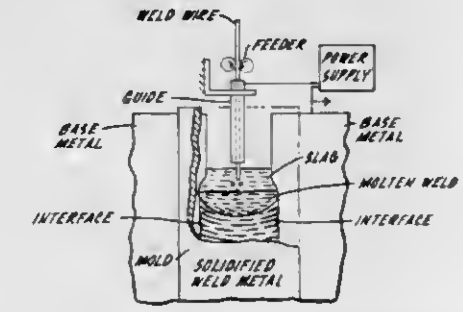
WELDING MANGANESE STEEL

Charles E. Ridenour, Chicago Heights; Herman A. Fabert, Jr., Homewood, both of Ill.; John Tasker, West Milford, and Hugo R. Larson, Ridgewood, both of N.J., assignors to Abex Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 613,040, Sep. 12, 1975, abandoned. This application May 23, 1977, Ser. No. 799,567

Int. Cl.^{2} B23K *9/18*

U.S. Cl. 219—73.1 **42 Claims**



1. A method for joining sections of austenitic manganese steel by welding comprising:

A. separating the sections to afford a gap therebetween;
B. disposing in the gap a coaxially related weld wire and guide for the weld wire;
C. consumming the weld wire and guide by the electroslag process progressively to deposit weld metal to join the sections, the sides of the base metal facing the gap melting to contribute manganese steel to the weld;
D. the guide and weld wire being constituted to contribute austenite stabilizers selected from the group consisting of manganese, nickel and copper, together with at least about 0.55% carbon in the weld wire, in amounts adequate to maintain substantially the austenitic integrity of the weld metal; and
E. maintaining a gap width and weld wire feed rate such that the weld metal deposits at a rate sufficiently rapid to avoid embrittlement in the heat affected zone.

4,104,505

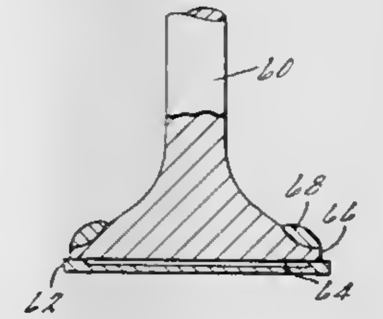
METHOD OF HARD SURFACING BY PLASMA TORCH

Larry W. Rayment, Battle Creek, and Thomas S. Kilbourn, Richland, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 28, 1976, Ser. No. 736,296

Int. Cl.^{2} B23K *9/04*

U.S. Cl. 219—76.16 **8 Claims**



1. A method of hard surfacing a workpiece using a plasma arc torch, comprising the steps of:

(a) traversing said torch with respect to said workpiece to be surfaced at a first speed;
(b) initiating and increasing a weld current and plasma arc to a predetermined level over a predetermined period of time;
(c) initiating feeding into the torch a surfacing material and increasing the feed rate of said surfacing material into said plasma arc during the period of time said weld current is increasing to provide a smooth lead-in on said surfacing;
(d) establishing a substantially constant welding traversing speed at the same time that said surfacing material feeding begins, said welding speed being substantially less than said first speed;
(e) establishing a steady state weld current and surfacing material feed rate and continuing to feed said material to said plasma arc and maintaining said material feed substantially constant at said steady state weld current, and traversing at said constant welding speed for a predetermined period of time required to surface the desired area of said article;
(g) decreasing said welding current at a predetermined rate upon completion of the surfacing of the desired area of said article;
(g) decreasing the feed rate of said surfacing material while said weld current is decreasing to provide a smooth run-out on said surfacing;
(h) operating said weld current at a decreased rate after the feed of said surfacing material has stopped and simultaneously increasing the traversing speed to said first speed; and
(i) extinguishing said weld current.

4,104,506

PROCESS FOR SOLDERING TO LAMINATIONS OF AN ARCING CONTACT FOR A HIGH CURRENT SWITCH

Bernard L. Phillips, Norwood, Mass., assignor to Arrow Hart Inc., Hartford, Conn.

Division of Ser. No. 489,753, Jul. 18, 1974, Pat. No. 4,002,870. This application Sep. 13, 1976, Ser. No. 722,639

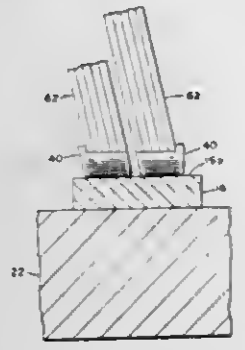
Int. Cl.^{2} B23K *1/12*

U.S. Cl. 219—85 CM **2 Claims**

1. A process for attaching a metallic element onto an edge of a set of resilient, metallic laminations without distempering the laminations, comprising the steps of

clamping the laminations together at the region of attachment to prevent a liquid flow therebetween,
,applying flux and solder between the element and the edges of the lamination,

urging the element against the laminations and the interposed flux and solder, and



rapidly heating the element to fuse the solder and firmly attach the element to the laminations.

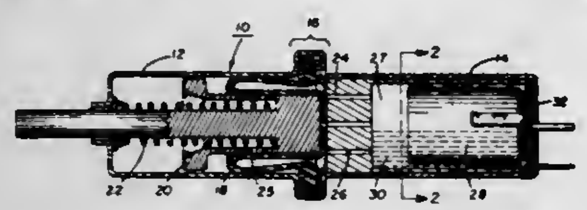
4,104,507
PTC HEATER FOR ENHANCING THERMAL ACTUATOR RESPONSE

Thomas C. Tisone, Thousand Oaks, Calif.; Helmut H. A. Krueger, Elgin, Ill.; Ronald S. Sobecks, Seven Hills, Ohio, and Richard N. Tauber, Rancho Palos Verdes, Calif., assignors to Design & Manufacturing Corporation, Willoughby, Ohio

Filed Jan. 14, 1977, Ser. No. 759,280

Int. Cl.² H05B *1/02*

U.S. Cl. 219—513 **11 Claims**



1. A self-regulating heater for an electrothermal actuator or the like including a working medium expandible upon heating to effect a mechanical output from the actuator, comprising: an integral elongated annulus of a positive temperature coefficient material having a low resistance to electrical current at ambient temperatures and an anomaly temperature above which the resistance of the material rises dramatically; said annulus including thin wall means for providing a relatively high resistance to thermal shock and a fast temperature rise in response to electrical energization; said annulus including inner and outer faces electrically connectible in an electric circuit to produce a heating current across the thin wall thereof; said annulus having a diameter and length for generally maximizing the heating surface area of said inner and outer faces to produce a rapid actuation of said actuator by expanding such a working medium and a relatively small thermal storage capacity, whereby upon termination of such electrical energization said annulus is capable of relatively prompt cooling.

4,104,508
SUPPORT FOR DEFORMABLE ARTICLES AND METHOD OF MAKING THE SAME

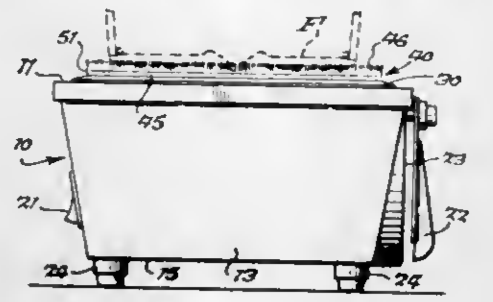
Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Filed Dec. 20, 1976, Ser. No. 752,609

Int. Cl.² H05B *3/06*

U.S. Cl. 219—521 **25 Claims**

1. A support carpet comprised of multitudinous vertically disposed fibers having upper and lower ends, means supporting said lower ends to form a rigid support structure at said lower ends, said support structure comprising a resin, relatively transparent to infrared radiation, said upper ends being positioned for supporting the bottom surface of a heat softened article, each of said fibers being at said upper ends more resilient than said surface so that deformation of said surface cannot occur while said upper ends of said fibers support said heat softened article.



4,104,509
SELF-REGULATING HEATING ELEMENT

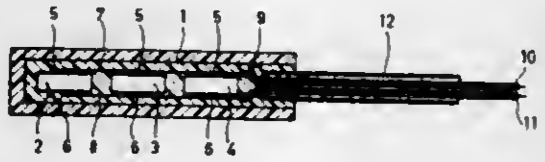
André Marcel Alfred Van Bokestal, and Charles Joseph Ghislain Belhomme, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1976, Ser. No. 725,170

Claims priority, application Netherlands, Sep. 23, 1975, 7511173

Int. Cl.² H05K *5/06*

U.S. Cl. 219—544 **8 Claims**



1. In a self-regulating heating device containing at least one resistor body provided with current conductors and consisting of a ceramic body having a positive temperature coefficient electrical resistance, a casing enclosing said resistor body and spaced from said resistor body by heat conducting electrically insulating material surrounding said resistor body and located between said resistor body and said casing, the improvement wherein both the casing and the material located between the casing and the resistor body consist essentially of a vulcanized synthetic resin material capable of resisting the highest operating temperature of said device, an electrically insulating, heat conducting metal compound and a finely divided reinforcing filler material.

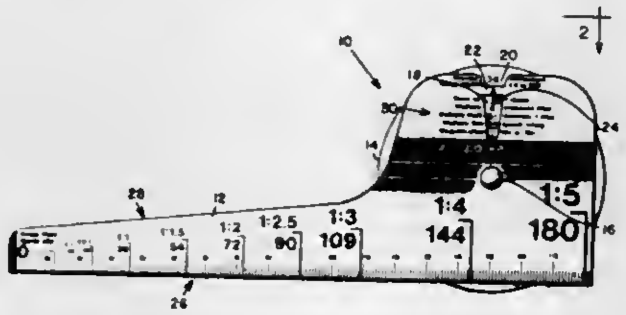
4,104,510
EXPOSURE CORRECTION CALCULATOR FOR TAKING CLOSE-UP PICTURES

Clifford M. Miyashiro, 5267 Tendella Ave., Woodland Hills, Calif. 91364

Filed Oct. 18, 1976, Ser. No. 733,265

Int. Cl.² G06C *3/00*

U.S. Cl. 235—64.7 **1 Claim**



1. A calculator useful in making camera adjustments when taking close-up exposures including:

an elongated member having a first scale, said first scale including indicias imprinted thereon which includes a plurality of spaced numbers disposed along the elongated line of said member and being a measurement indicative of the length of a desired field of view, said scale includes a second row of numbers placed therealong which is indicative of a magnification ratio of the field of view of the exposed closeup exposures;

an extended area on said elongated member being substantially wider than said elongated member and including a window opening therein and a pivot opening spaced substantially below said window opening on alignment therewith; and,

a circular member being pivotally mounted to said pivot opening in said elongated area whereby portions of said circular member being exposed in said window opening of said extended area on said elongated member, said circular member having a plurality of rows of indicia arranged in a circular pattern thereon and each indicia in said row being in a columnar arrangement extending along the radii thereof, each row in said columnar arrangement being indicative of a significant exposure factor for exposure settings on a camera when taking close-up pictures, the outside row of indicia on said circular member being a member corresponding to said numbers indicative of the length of said elongated member scale which is further indicative of the length of desired field of view measured by the scale on said elongated member, each row in its ordinal significance beginning with the outside of said circular member being a calculated figure for the opening of the *f.* stops on said camera, the multiple flash distance *f.* stops on said camera, the multiple film speed rating and the magnification ratio thereof.

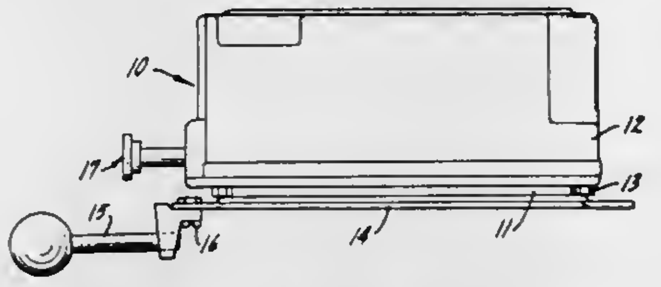
4,104,511
SAFETY INTERLOCK SYSTEM FOR PRESET COUNTERS

Howard E. Rittenhouse, Lindenhurst, Ill., assignor to Liquid Controls Corporation, North Chicago, Ill.

Filed Mar. 15, 1976, Ser. No. 666,600

Int. Cl.² G06F *15/18;* **B67D** *5/22*

U.S. Cl. 235—132 R **7 Claims**



1. In combination in an actuating counter of the type in which a predetermined quantity of product to be counted out can be preset thereon, and which operates to terminate product flow through a fluid meter by actuation of off-on flow control valve means in a fluid flow conduit upon count-out of the predetermined quantity,

frame means carried by the fluid meter,

flow control actuating means carried by the frame means and adapted for connection to on-off flow control mechanism,

said flow control actuating means including

firstly, an actuating member which is moveable from a first, flow closed position to a second, flow open position, and returnable to a flow closed position.

secondly, pre-set means operable at any time said actuating member is in a flow closed position for establishing a predetermined quantity of product units to be counted out whereby a desired quantity of product units can be preset on the actuating counter,

thirdly, structural means for moving the actuating member from the second, flow open position, to flow closed position upon count-out of the desired quantity of units established by the preset means, and

fourthly, interlock means disposed in a blocking and unblocking relationship to the preset means,

said interlock means being actuateable simultaneously with movement of said off-on flow control actuating means into a flow on condition,

said interlock means including a blocking member,

said blocking member consisting of an abutment member which is pivoted about an axis which is fixed with respect to the frame means,

said abutment member having a first portion which moves between a blocking position in which it provides an obstruction to the operation of the preset means, and a clearance position in which it provides no obstruction to the operation of the preset means, and

a second portion which is in operative engagement with the actuating member,

said second portion being arranged to be cammed by movement of the actuating member, and thereby interaction between the actuating member and said second portion, from a first position which causes the first portion to be disposed in a locking position, to a second position in which the aforesaid first portion is in a clearance position, and

means for resiliently urging the abutment member into a position in which the first portion obstructs the operation of the preset means,

said interlock means further being operable to preclude interference, except in an emergency, with the pre-set means until the quantity of product units established by the pre-set means have been counted out.

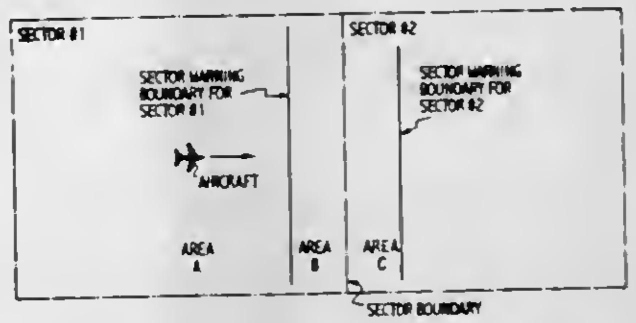
4,104,512
COMPUTER CONTROL OF MOVING OBJECTS SUCH AS AIRCRAFT MOVING FROM ONE SECTOR TO ANOTHER

Larry G. Strayer, Chatsworth, Calif., assignor to Hawaiian Trust Company Ltd., Honolulu, Hi.

Filed Nov. 29, 1974, Ser. No. 528,434

Int. Cl.² G06F *15/16, 15/48*

U.S. Cl. 364—439 **2 Claims**


SECTOR #1
SECTOR #2
SECTOR WARNING BOUNDARY FOR SECTOR #1
SECTOR WARNING BOUNDARY FOR SECTOR #2
AIRCRAFT
AREA A
AREA B
AREA C
SECTOR BOUNDARY

1. A method of maintaining continuity of computer control and information exchange between moving vehicles and a computer, with a different computer being operative as a given moving vehicle moves from a first defined sector to a second defined sector, the data link between each computer and the moving vehicles located in its sector being provided by radio transmission, each sector having a different given transmission frequency comprising:

defining a transition area at the interface between the first and second defined sectors wherein the moving vehicle is under joint control of the computers of the successive sectors,

automatically switching control of the moving vehicle from the computer of the first defined sector to the computer of the second defined sector when the moving vehicle leaves the transition area,

transmitting a message from the computer of the first defined sector to the moving vehicle after completing the switching step informing the latter that control has been switched to the computer of the second defined sector.

polling the moving objects located in each defined sector for information exchange by the computer associated with each defined sector, and

removing a given moving object from the polling list of the first defined sector when the computer of the second defined sector successfully polls the given moving object entering therein.

4,104,513
MAGNETIC RECORDING

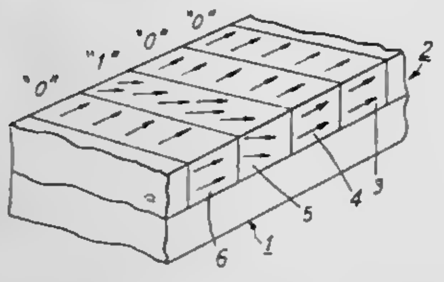
Ralph Reginald Pearce, West Drayton, England, assignor to E M I Limited, Hayes, England

Filed Oct. 14, 1975, Ser. No. 621,862

Claims priority, application United Kingdom, Oct. 16, 1974, 44748/74; Jan. 29, 1975, 3989/75

Int. Cl.^{2} G06K *7/08, 19/06;* G11B *25/04*

U.S. Cl. 235—450 2 Claims



1. A method of examining a magnetic recording medium comprising a permanently structured magnetic material of particles whose preferred axis of magnetisation has been aligned to respective first and second substantially non-orthogonal directions in different regions of the material as a pattern of a distinct magnetic property including:

applying a magnetic field substantially perpendicularly to said second direction to magnetise said particles,

relatively moving the material and a reading head with a gap aligned to the second direction in said second direction to read any variation of remanence in the medium.

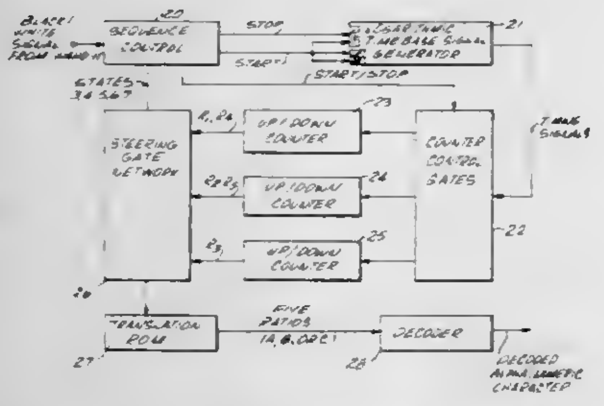
4,104,514
BAR CODE READER AND DECODER

Paul Sherer, Costa Mesa, and Gerald Paul Hester, Santa Ana, both of Calif., assignors to MSI Data Corporation, Costa Mesa, Calif.

Division of Ser. No. 638,056, Dec. 5, 1975, Pat. No. 4,058,708. This application Dec. 13, 1976, Ser. No. 749,879

Int. Cl.^{2} G06K *7/10;* G06F *11/00;* G06G *7/00;* G06K *7/016*

U.S. Cl. 235—466 26 Claims



1. Apparatus for reading recorded patterns of bar coded data on a record member comprising:

means for scanning a pattern of bar coded data and producing electrical signals representative thereof,

means for producing control signals corresponding to the scanned transitions between segments of the bar coded data,

means for producing logarithmically related timing signals having a preselected logarithmic base other than the base two, coupled to be responsive to a control signal corresponding to a sensed transition to provide timing signals until the next successive transition is scanned and in response to the corresponding control signal,

means for accumulating the timing signals provided during the time interval between scanned transitions, the accumulating means being controlled for accumulating the timing signals for two preselected segments of the bar coded data whereby the result is representative of the ratio of their widths, and

means for assigning a ratio significance to the accumulated result.

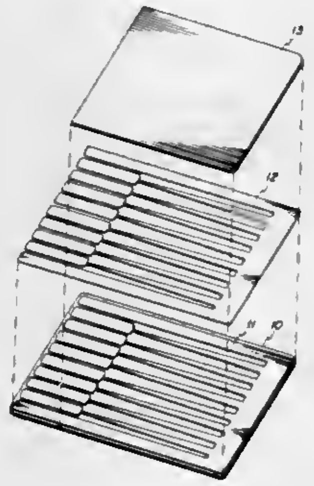
4,104,515
CONSUMABLE CREDIT CARD

David D. Thornburg, Los Altos, Calif., and Roy J. Lahr, Fairfield, Conn., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,150

Int. Cl.^{2} G06K *19/02, 19/06*

U.S. Cl. 235—488 8 Claims



1. A consumable credit card comprising an electrically insulating substrate, at least one tapered resistance element comprising a resistive film having contacts at either end placed on said substrate said film being heated from an electrical source impressed through said contacts, each element being in thermal contact with said substrate, a thermographic substance coated over said resistance element which at a certain temperature undergoes a rapid and abrupt irreversible color change.

4,104,516
DIRECT VIEW, PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE

Shih-Ping Wang, Los Altos; Charles D. Robbins, Los Altos Hills, and Elisha Merritt, Sunnyvale, all of Calif., assignors to Diagnostic Information Inc., Sunnyvale, Calif.

Filed Jan. 28, 1977, Ser. No. 763,638

Int. Cl.^{2} H01J *31/50*

U.S. Cl. 250—213 VT 11 Claims

1. A directly viewable, x-ray sensitive image intensifier tube comprising:

a metallic tube envelope open at both ends,

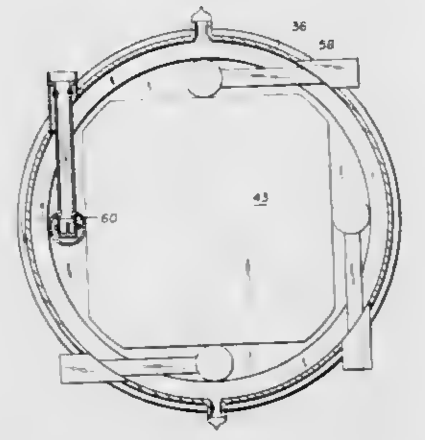
an inwardly concave metallic input window at one end of the envelope,

a flat, directly viewable, output phosphor display screen mounted at the other end of the envelope,

a flat, scintillator-photocathode screen,

electrically insulating means for suspending the scintillator-photocathode screen within the envelope and in a plane parallel to, but spaced apart from, the output display screen, and

means for applying a high, negatively charged, electrostatic potential to the scintillator-photocathode screen, the potential being taken with respect to the output display screen and all of the other tube elements, including the envelope which are at a neutral potential with respect to each other.



4,104,517
METHOD AND OPTICAL SYSTEM FOR AUTOMATIC PARALLAX DETERMINATION

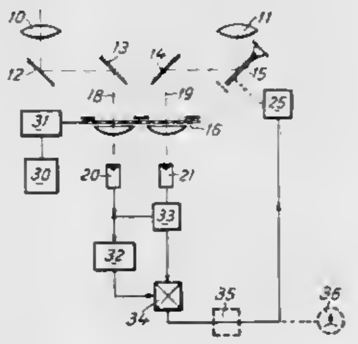
Franz Mesch, Karlsruhe, and Horst Moll, Blankenloch, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH., Wetzlar, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,604

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619795

Int. Cl.^{2} G01J *1/36*

U.S. Cl. 250—204 21 Claims



1. A method for automatically generating an electrical signal corresponding to parallax in a steroscopic system, comprising the steps of:

passing at least two imaging light channels through a moving grating structure;

converting said light channels into separate electrical signals after passage through the grating structure;

subtracting one of the electrical signals from the other to produce a signal difference;

differentiating one of the electrical signals to produce a differentiated signal; and

multiplying the signal difference by the differentiated signal to produce a first multiplied signal corresponding to the parallax.

4,104,518
SHUT-DOWN APPARATUS FOR CONVEYOR BELTS IN UNDERGROUND MINES

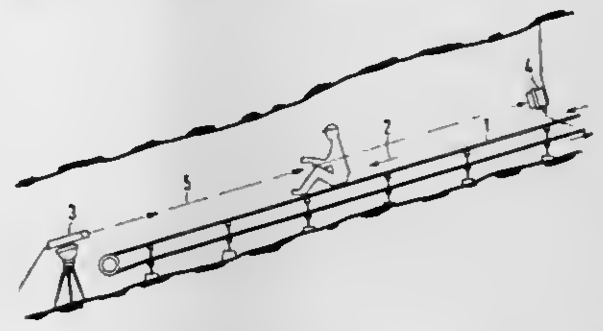
Martin Schachinger, and Heiko Krüger, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,864

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558323

Int. Cl.^{2} G01D *21/04*

U.S. Cl. 250—221 4 Claims



1. In a manually-operated, emergency shutdown apparatus for a conveyor belt driven by drive means in an underground mine, the improvement comprising,

laser light beam transmission means, disposed at one of the ends of said conveyor belt and laterally spaced from one of the sides of said conveyor belt, for generating a laser beam in a direction parallel to the longitudinal axis of said conveyor within reaching distance of a person riding on said belt and

laser light beam receiving means, disposed at the other end of said conveyor belt and coupled to said drive means, for receiving said laser beam generated by said transmission means and controlling movement of said conveyor belt in response to manual interruption of said laser beam by a person riding on said belt,

said laser light beam transmission means and receiving means being arranged so that the direction of transmission of said laser beam from said transmission means to said receiving means is opposite the direction of movement of said conveyor belt and said laser light beam receiving means including circuit means for counting the number of interruptions of said laser beam.

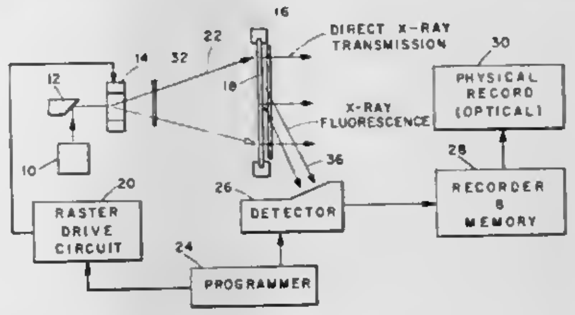
4,104,519
METHOD AND APPARATUS FOR RETRIEVAL OF EXPOSURE INFORMATION FROM FILM IMAGES

William Henry Oldendorf, 2805 Angelo Dr., Los Angeles, Calif. 90024

Filed Oct. 20, 1976, Ser. No. 734,300

Int. Cl.^{2} G01N *23/20*

U.S. Cl. 250—274 26 Claims



1. A method of retrieving image information from a photosensitive emulsion comprising the steps of:

selecting a region of an exposed and developed photographic emulsion;

systematically raster scanning the entire selected region of said emulsion with X-rays on a high density point by point basis;

measuring regionally the resultant fluorescence; and

recording the resultant fluorescence intensity and location.

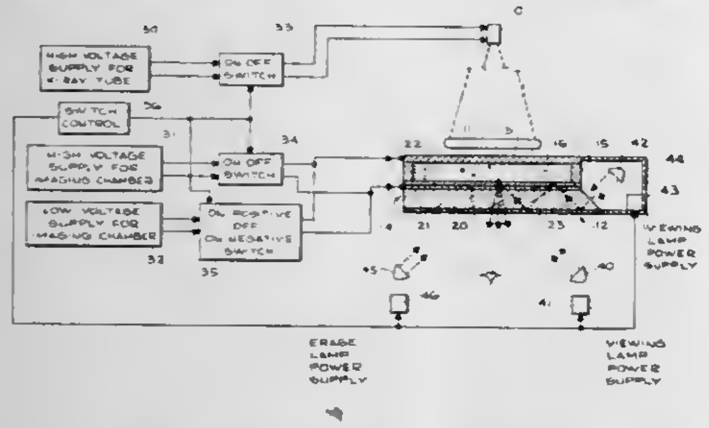
4,104,520
IMAGE CHARGE RELAXATION IN ELECTROPHORETIC DISPLAYS

John H. Lewis; Kathrine J. Lewis, both of Los Angeles; Fremont Reizman, Northridge, and Murray S. Welkowsky, Chatsworth, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed May 24, 1977, Ser. No. 800,025

Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—315 R **15 Claims**


50
33
HIGH VOLTAGE SUPPLY FOR X-RAY TUBE
ON OFF SWITCH
SWITCH CONTROL
36
31
34
HIGH VOLTAGE SUPPLY FOR IMAGING CHAMBER
ON OFF SWITCH
LOW VOLTAGE SUPPLY FOR IMAGING CHAMBER
ON POSITIVE OFF ON NEGATIVE SWITCH
32
35
22
16
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42
44
43
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23
12
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41
40
VIEWING LAMP POWER SUPPLY
ERASE LAMP POWER SUPPLY
VIEWING LAMP POWER SUPPLY

1. In an electrostatic imaging chamber for providing a visual image and having

first and second electrodes;

means for supporting said electrodes in spaced relation with a gap therebetween, with said first electrode being relatively transparent optically,

a plurality of electrophoretic particles in said gap, and

means for connecting an electric power source across said electrodes for attracting electrons and negative ions toward one electrode and positive ions toward the other depending upon the polarity of the power source and forming an electrostatic charge image,

the improvement comprising a conductivity control layer at one surface of said gap, with said electrostatic charge image formed at said layer,

with said particles being selectively moved toward said first electrode as a function of said electrostatic charge image forming a visual image viewable through said first electrode, and with said electrostatic charge image being discharged through said layer.

4,104,521
COROTRON CONNECTOR

Henry Otto Herrmann, Jr., Mt. Joy, and Douglas Wade Glover, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 675,412, Apr. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 673,037, Apr. 2, 1976, abandoned. This application May 9, 1977, Ser. No. 795,050

Int. Cl.^{2} H01T *19/04*

U.S. Cl. 250—324 **13 Claims**

1. In a corotron having plate conductors mounted on a bottom wall of an elongate dielectric tray and elongate conductors supported along said tray in vertical spaced relationship from said plate conductors, the improvement comprising:

a dielectric end block at a first end of said tray confined between vertically projecting sidewalls of said tray, said end block having integral projecting rigid dielectric bushings encircling conductor means exposed from said bushings for connection to corresponding sources of voltage;

said conductor means projecting into said end block with selected ones electrically inserted in corresponding plate conductors and with selected ones being electrically connected to electrical contacts within top accessible contact receiving recesses provided in said end block;

said elongate conductors having portions thereof received and supported in said top accessible recesses of said end block with further portions of said elongate conductors received in said contact receiving recesses and electrically connected to said electrical contacts;

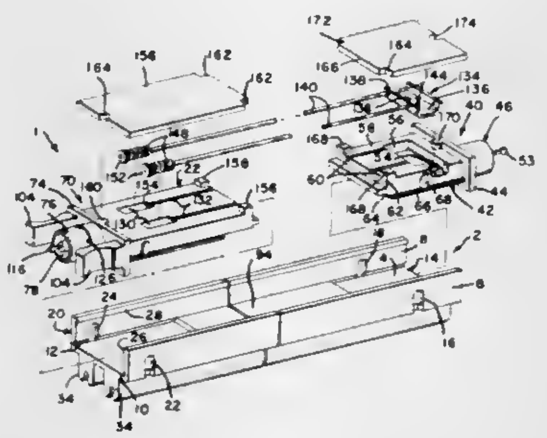
said end block further being provided with integral vertically projecting wall means extending continuously along both sides of a corresponding groove and the perimeter of a corresponding contact receiving recess;

a dielectric cover vertically assembled over said end block and covering said elongate conductor portions received in said end block grooves;

said cover including integral depending flange means surrounding said wall means on said end block;

said wall means cooperating with said cover and with said flange means to define an interface which provides lengthy voltage tracking paths from said recesses to the nearest external surfaces of said cover and the nearest external surfaces of said end block and between internal conductive parts;

said tray bottom wall having a surface portion between one said plate conductors and said one end of said tray;



said end block having a stepped configuration complementary to said stepped surface portion and vertically overlying said stepped surface portion to provide at the interface there between a relatively lengthy voltage tracking path from said plate conductor to the nearest exposed surface of said tray;

another end of said tray including vertically projecting pillars integral with said bottom wall and provided with vertically recessed top accessible cavities containing tensioning recesses for said elongate conductors;

said pillars further including vertically recessed top accessible grooves communicating with an end wall of said pillars and said cavities;

said elongate conductors having portions received and supported in said grooves of said pillars and portions connected to said terminating means;

said elongate conductors extending along said tray in free space between said end block and said pillars;

a dielectric cover overlying said pillars and having depending flanges means surrounding said pillar and defining there between relatively lengthy voltage tracking paths from said cavities to the corresponding nearest exposed external surfaces of said tray and of said pillars and between internal conductive parts; and

dielectric partitions integral with said bottom wall of said tray and separating said plate conductors.

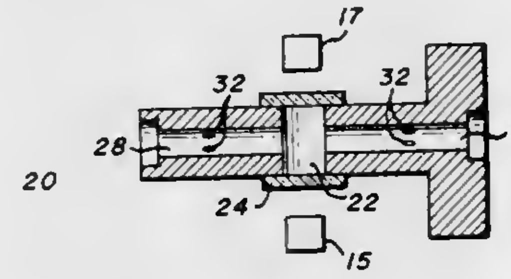
4,104,522
APPARATUS FOR MEASURING THE WEIGHT PER UNIT LENGTH OF A CIGARETTE ROD

Peter William Rees, Bexley Heath, England, assignor to Measurex Corporation, Cupertino, Calif.

Filed Mar. 14, 1977, Ser. No. 776,826

Int. Cl.^{2} G01N *23/02*

U.S. Cl. 250—359 **5 Claims**



1. An apparatus for measuring the weight per unit length of a cigarette rod in a cigarette making machine, said apparatus comprises:

a radio-active source to one side of said rod, said source capable of emitting a radiation beam substantially in a radial direction through the rod;

a detector to other side of said rod, said detector capable of receiving said radiation;

first means for guiding said rod located to one side of said beam, said means having a plurality of ducts for introducing air under pressure to form an air bearing between said means and said rod; and

second means for guiding said rod located to other side of said beam, said means having a plurality of ducts for introducing air under pressure to form an air bearing between said means and said rod.

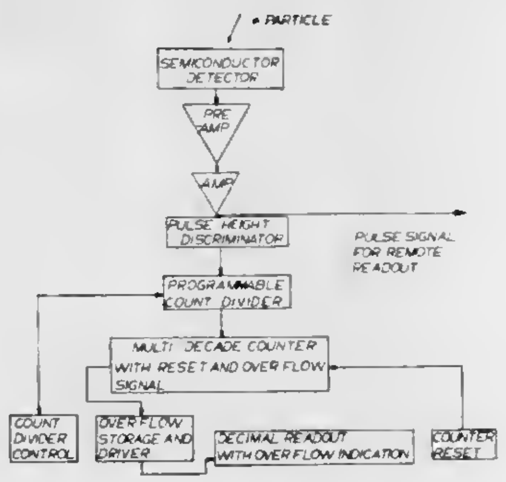
4,104,523
ELECTRONIC ALPHA PARTICLE COUNTER

Ludwig G. Wolfert, Littleton, Colo., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Oct. 6, 1976, Ser. No. 730,077

Int. Cl.^{2} G01T *1/22*

U.S. Cl. 250—370 **21 Claims**


α PARTICLE
SEMICONDUCTOR DETECTOR
PRE AMP
AMP
PULSE HEIGHT DISCRIMINATOR
PULSE SIGNAL FOR REMOTE READOUT
PROGRAMMABLE COUNT DIVIDER
MULTI DECADE COUNTER WITH RESET AND OVER FLOW SIGNAL
COUNT DIVIDER CONTROL
OVER FLOW STORAGE AND DRIVER
DECIMAL READOUT WITH OVER FLOW INDICATION
COUNTER RESET

1. In a radon-222 alpha particle counter for detection of radon gas concentrations near the ground surface, including an elongated tubular housing, a semiconductor detector, and circuitry for counting alpha particle impulses, said detector being exposed to a gaseous medium permeable to alpha particles, the improvement which comprises means for attenuating moisture from said gaseous medium.

4,104,524
CIRCUIT ARRANGEMENT FOR A DETECTOR FOR IONIZING RADIATION

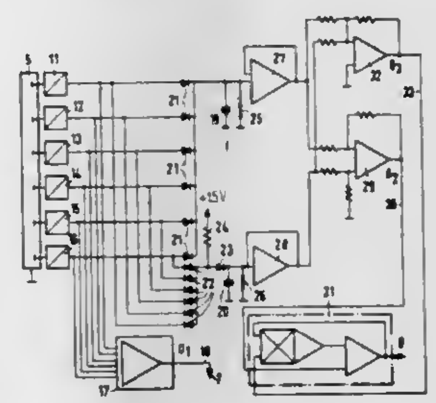
Horst Aichinger, Fuerth; Heinz-Erik Kranberg, and Karlheinz Koehler, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 25, 1977, Ser. No. 771,847

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610845

Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—402 **4 Claims**



1. An apparatus for producing an ionizing radiation image, having a detector for ionizing radiation with at least three measurement fields and operable for supplying respective output signals as a function of the radiation impinging on the respective fields thereof, a computer circuit for forming a difference signal which corresponds to the difference between the greatest and the smallest output signals of the measuring fields, a computer circuit for forming a sum signal which corresponds to the sum of the greatest and the smallest output signals of the measuring fields, and a division circuit for supplying a quotient signal corresponding to the difference signal divided by the sum signal, as a measure of dosage contrast over the region of the measurement fields of the image, and means for adjusting said contrast.

4,104,525
X-RAY DIAGNOSTICS INSTALLATION COMPRISING A SHORT-TERM SWITCHING MECHANISM

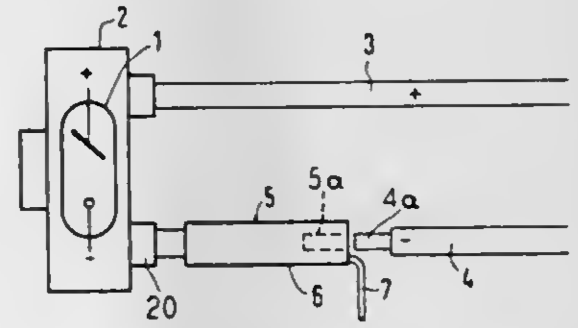
Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 8, 1977, Ser. No. 785,748

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637161

Int. Cl.^{2} H05G *1/56*

U.S. Cl. 250—402 **2 Claims**



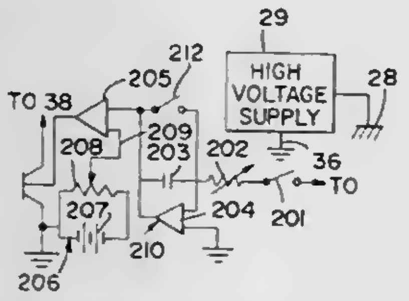
1. An x-ray diagnostics installation comprising an x-ray tube having a housing and terminal means connected to one of the electrodes of the x-ray tube, a high voltage cable for connection with the one electrode, and a switching mechanism for a short-term switching on of the x-ray tube, characterized in that the switching mechanism is mounted directly at the x-ray tube

housing between said terminal means of the x-ray tube and an end of said high voltage cable.

4,104,526

GRID-CATHODE CONTROLLED X-RAY TUBE

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526
Continuation-in-part of Ser. No. 353,451, Apr. 24, 1973, Pat. No. 3,925,660, which is a continuation-in-part of Ser. No. 251,378, May 8, 1972, abandoned. This application Dec. 8, 1975, Ser. No. 638,434
Int. Cl.² G03B *41/10*
U.S. Cl. 250—403 **15 Claims**



1. Apparatus for pulsing the current output of an X-ray tube over a given time interval to produce a measurable value of anode current that is indicative of actual X-ray production by said tube, said tube having a single anode including at least one target adapted to generate X-rays upon bombardment by an electron beam, and electron gun means including a cathode for generating said electron beam and a control grid for modulating or suppressing substantially the entire electron flow from said cathode to said single anode, said electron gun means being positioned at the opposite end of an evacuated tube containing said anode, comprising

a high potential source,

means for applying relatively high negative potentials to said cathode and said control grid from said source,

means for connecting said single anode to the ground side of said high potential source,

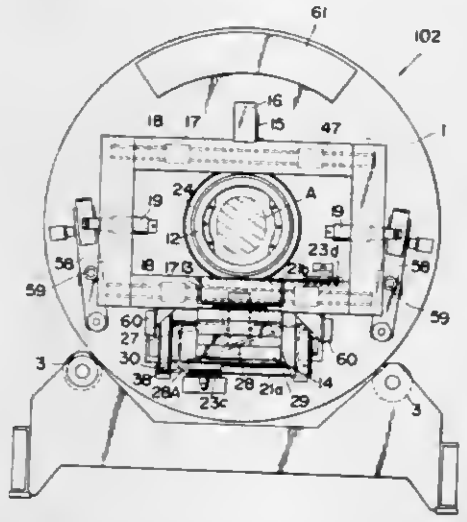
means for detecting return current flow from said anode through said connecting means to said ground side of said high potential source as a measure of actual X-ray production during said given time interval, and means for controlling the potential difference between said cathode and control grid in accordance with said return current flow from said anode as a measure of actual X-ray production during said given time interval.

4,104,527

SCANNING APPARATUS FOR CROSS-SECTIONAL INSPECTION EQUIPMENT

Chuji Tomita, Tokyo, and Hiroshi Abe, Kashiwa, both of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan
Filed Sep. 29, 1976, Ser. No. 727,866
Claims priority, application Japan, Sep. 30, 1975, 50/117122
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **8 Claims**

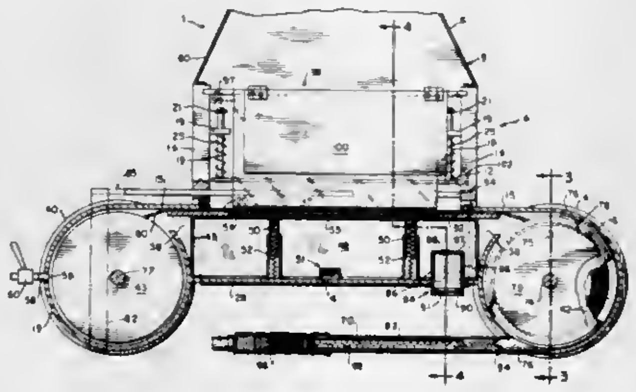
1. A scanning apparatus for cross-sectional inspection equipment, comprising a bed, rollers on said bed, a circular rotating disc having the periphery thereof rotatably supported on said rollers, a shaft rotatably mounted on said bed and on which said disc is mounted for rotation therewith, a housing positioned on the axis of rotation at the center of said rotating disc for accommodating therein an object to be inspected, a movable frame surrounding said housing, guide rails on said rotating disc on which said movable frame is mounted for travel along a required cross-sectional inspection plane of the object, an X-ray source and a detector mounted on said movable frame in positions opposed to each other with said housing therebetween, and drive means for driving said movable frame reciprocally along said rails and rotating said rotating disc in accordance with the travel of said movable frame, said drive means having a single driving source, an intermittent transmission gear on said disc and driven by said driving source, a barrel cam rotatably mounted on said rotating disc and driven for constant rotation from said drive source and having a cam groove with which said movable frame is engaged for driving said movable frame reciprocally along said guide rails, a worm rotatable around its own axis and fixed to said shaft for rotation around said shaft with the axis of rotation of the worm transverse to the axis of the shaft, said worm being rotated by the intermittent transmission gear, a worm gear loosely mounted on said shaft and meshing with said worm, and means engaged with said worm gear for blocking rotation of said worm gear relative to said shaft, said intermittent transmission gear driving said worm for rotating said disc a small amount when the direction of travel of said movable frame is reversed by said barrel cam.



4,104,528

AUTOMATED MAMMOGRAPHY APPARATUS FOR MASS SCREENING

Norman Strax, Fredericton, Canada, assignor to Charles & Stella Guttman Breast Diagnostic Institute, New York, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,478
Int. Cl.² G21K *5/08;* G11B *1/00*
U.S. Cl. 250—451 **21 Claims**



1. Apparatus for recording an image of the breast of a woman on a film comprising:

a surface member having a surface adapted to support the breast while exposed to energy for irradiating the breast to form an image of the breast in a plane spaced from said supporting surface;

means for urging said film into the plane of said image for recording said image on said film;

means for supplying a continuous roll of said film for recording images therealong;

take-up means for sequentially storing sections of said film after each section has an image recorded thereon;

movable transport means for advancing said film from said supply means to said take-up means; and

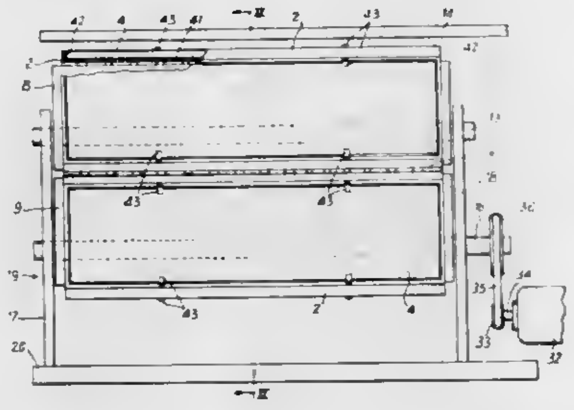
means for selectively evacuating the space between said film and said film urging means for moving said film urging means into a first position in contact with said film and for repressurizing said space to move said film urging means to a second position displaced from said film;

said transport means being responsive to the pressure between said film and said urging means so that said film is advanced only when said urging means is in a position other than said first position.

4,104,529

APPARATUS FOR SUCCESSIVELY POSITIONING A SERIES OF RADIOGRAPHIC FILM CASSETTES AT A FILM-EXPOSING STATION

Jacques Gaudel, 5 du Tertre St., Remiremont, France (88200)
Filed Dec. 14, 1976, Ser. No. 750,532
Int. Cl.² G11B *1/00*
U.S. Cl. 250—470 **9 Claims**

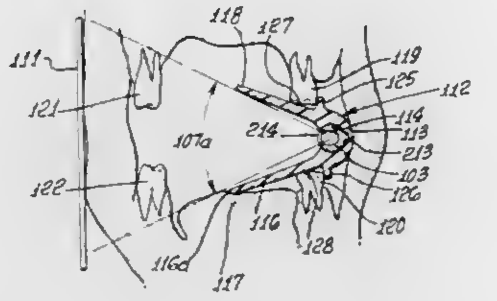


1. An apparatus for successively positioning a series of radiographic film cassettes at a film-exposing station, comprising a chain, the links of which consist of boxes hinged one to the other and each carrying a radiographic film cassette, said chain being trained on two polygonal drums having flat faces, the width of each face equal to the length of a chain link, mounted for rotation on two parallel shafts, the distance between the rotation axes of said drums being equal to the length of a chain link multiplied by a whole number, said shafts being mounted parallel to a patient-examining plane and at a distance from this plane as small as possible without preventing rotation of the drums.

4,104,530

DENTAL AND MEDICAL X-RAY APPARATUS

Mortimer E. Weiss, Laguna Beach, Calif., assignor to Thoro-Ray Inc., Santa Ana, Calif.
Continuation-in-part of Ser. No. 672,608, Apr. 1, 1976, abandoned. This application Oct. 4, 1976, Ser. No. 728,959
Int. Cl.² H01J *35/00;* H05G *1/00*
U.S. Cl. 250—490 **21 Claims**



1. In dental X-ray apparatus,

(a) X-ray tube means for providing an electron beam,

(b) a target for said beam carried by said means and spaced therefrom to be received rearwardly into a patient's mouth,

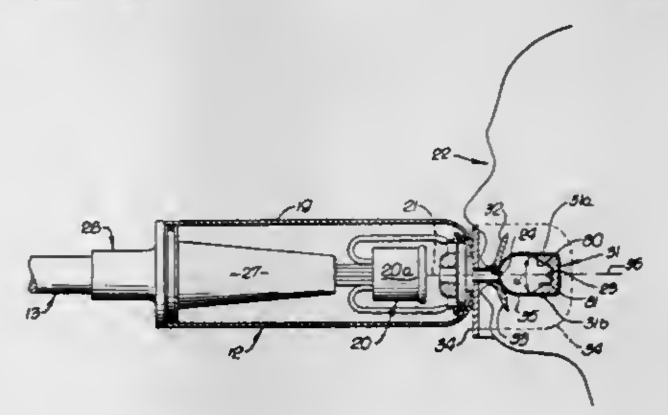
(c) a carrier element projecting rearwardly of the tube means and carrying said target, said carrier element and target being interconnected,

(d) and X-ray shielding and tongue suppressing means carried by said carrier element to be received into the patient's mouth, and characterized in that when the target is located at one side of the mouth to direct an X-ray beam toward teeth at the opposite side of the mouth the shield will protect portions of the head from the X-ray beam and the patient's tongue will be suppressed relative to the X-ray beam, said means projecting sidewardly of and relatively away from the carrier element.

4,104,531

ELECTRON BEAM TARGET CARRIER WITH CERAMIC WINDOW FOR DENTAL OR MEDICAL X-RAY USE

Mortimer E. Weiss, Laguna Beach, Calif., assignor to Thoro-Ray Inc., Fort Worth, Tex.
Continuation-in-part of Ser. No. 728,959, Oct. 4, 1976, which is a continuation-in-part of Ser. No. 672,608, Apr. 1, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,133
The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.
Int. Cl.² H01J *35/00;* H05G *1/00*
U.S. Cl. 250—490 **17 Claims**



1. In dental X-ray apparatus, the combination comprising

a. X-ray tube means for providing an electron beam,

b. a target for said beam, and

c. a carrier for said target and locating the target in longitudinally spaced relation from said means to be received rearwardly into a patient's mouth,

d. said carrier defining a tubular X-ray absorbing shield, and there being a ceramic element defining an X-ray window carried by the carrier and positioned to sidewardly laterally pass X-rays emanating from the target, said shield extending at the side of the target spaced from the window, the shield and target being integrally connected.

4,104,532

DENTAL AND MEDICAL X-RAY APPARATUS

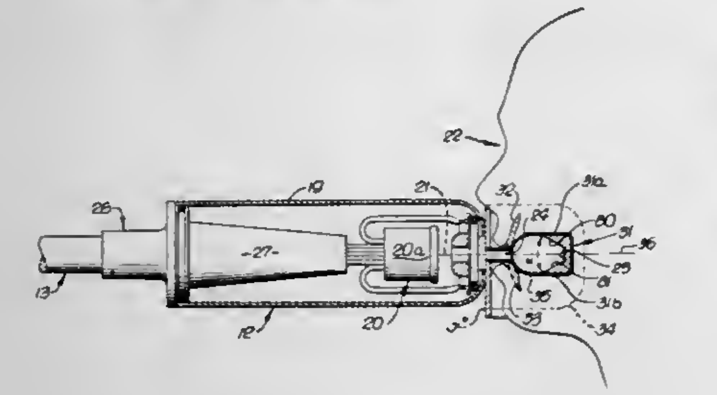
Mortimer E. Weiss, Laguna Beach, Calif., assignor to Thoro-Ray Inc., Fort Worth, Tex.
Continuation-in-part of Ser. No. 672,608, Apr. 1, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,160
Int. Cl.² H01J *35/00*
U.S. Cl. 250—490 **19 Claims**

1. In dental X-ray apparatus

(a) X-ray tube means providing an electron beam,

(b) a beam target carried by said means and located axially rearwardly thereof to be received rearwardly into a patient's mouth,

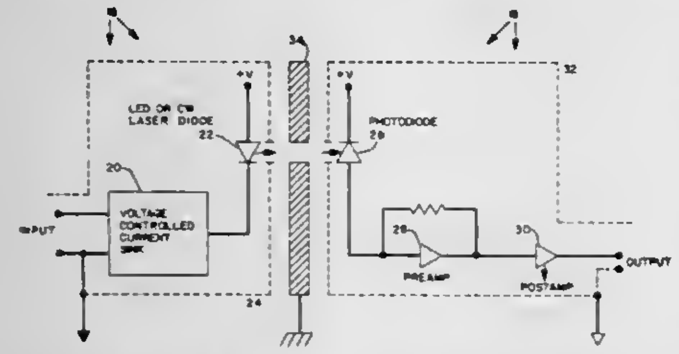
(c) the target angled relative to said axis to produce a radiation pattern that extends forwardly of the target and also rearwardly and sidewardly of the target, said X-ray tube means including structure to cause the electron beam to form a beam impingement spot on the target of sufficiently small size that radiation emanating from said spot and directed toward a tooth and film produce a sharp boundary tooth image on the film, and



(d) an X-ray absorbing shield adjacent the target rearwardly thereof and extending forwardly at the side of the target, the shield and target being integrally connected, the shield defining a probe that projects rearwardly for reception into the patient's mouth.

4,104,533
WIDEBAND OPTICAL ISOLATOR
Myren L. Iverson, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

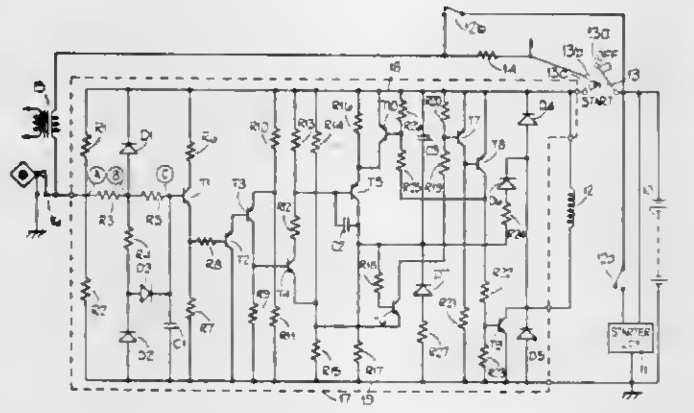
Filed Feb. 28, 1977, Ser. No. 772,615
Int. Cl.² G02B *5/00*
U.S. Cl. 250—551 **2 Claims**



1. A large bandwidth analog optical isolator comprising:
- a linear voltage controlled current sink capable of being modulated for a large bandwidth signal;
- a linear fast optical rise time light emitting diode, LED, operatively attached to the current sink for transmitting an optical signal;
- a first shield around the current sink and LED tied to the sink input ground for protecting the sink and LED from stray charge;
- a hole in said first shield appropriately placed for permitting the optical signals from the LED to pass through;
- a PIN photodiode with a linear fast rise time for receiving the optical signal placed in the path of said optical signals;
- a linear transimpedance preamplifier operatively connected to the photodiode for amplifying the signal;
- a postamplifier operatively attached to the preamplifier for increasing the signal to the predetermined level needed for desired output;
- a second shield around the photodiode and amplifiers tied to the sink output of the postamplifier for protecting the photodiode and amplifiers from stray charge and with a hole for permitting access of the optical signal; and
- a chassis grounded metal plate placed between said shields and separated therefrom by an air gap on both sides for preventing capacitive coupling between the first and second shield with a hole in said metal plate properly placed and sized for transmitting the optical signal through it from the LED to the photodiode.

4,104,534
STARTER MOTOR CONTROL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE
William Frank Hill, Stafford, and John Peter Southgate, Sutton Coldfield, both of England, assignors to Lucas Electrical Limited, Birmingham, England

Filed Apr. 9, 1976, Ser. No. 675,357
Claims priority, application United Kingdom, Apr. 15, 1975, 15360/75
Int. Cl.² F02N *11/06;* H02P *9/04*
U.S. Cl. 290—37 A **12 Claims**



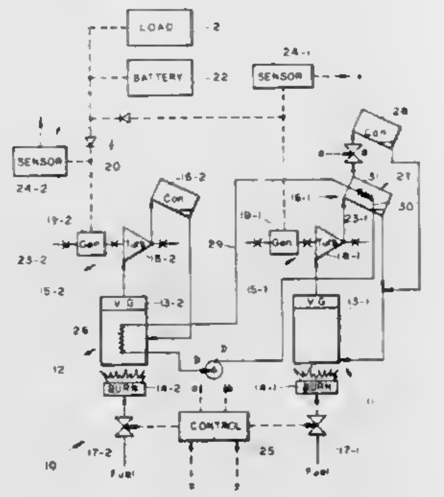
1. A starter motor control circuit for an internal combustion engine comprising pulse generating means driven by the engine for producing a pulse train at a frequency related to the engine speed, a starter motor switching circuit switchable between a first state in which starter motor operation is permitted and a second state in which such operation is inhibited, frequency sensitive means connecting the pulse generating means to the starter motor switching circuit and operating to switch said circuit to its first or second state according to the frequency of the pulse train, means responsive to the state of the starter motor switching circuit for changing the mode of operation of the frequency sensitive means, the frequency sensitive means acting as a frequency voltage converter when the starter motor switching circuit is in its first state and operating to switch the starter motor switching circuit to its second state when the frequency of the pulse train exceeds its predetermined value, and operating as a pulse resettable timer circuit which is reset by each pulse of said pulse train when the starter motor switching circuit is in its second state and acts until the expiry of the timer circuit output duration, i.e. until no pulses of said pulse train have occurred during the period exceeding the timer circuit output duration, to prevent the starter motor switching circuit from reverting to its first state.

4,104,535
HYBRID ELECTRIC POWER GENERATING SYSTEM
Yehuda L. Bronicki, Rehovoth, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Apr. 23, 1976, Ser. No. 679,757
Int. Cl.² F01K *23/04;* H02P *9/04*
U.S. Cl. 290—52 **14 Claims**

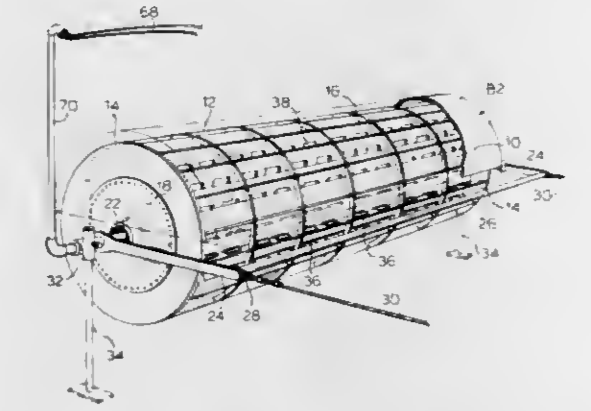
1. A hybrid power system comprising a pair of energy converters operating on a closed Rankine cycle, each energy converter having a vapor generator for vaporizing a high molecular weight working fluid in response to heat furnished from a burner associated with the generator, a turbo-generator responsive to vaporized working fluid for generating electrical power, a condenser responsive to the the exhaust vapors from the turbo-generator for converting such vapors into a condensed liquid, and means for returning the condensed liquid to the vapor generator; a sensor associated with each converter

and responsive to the output of its turbo-generator for producing a control signal when the output drops below a threshold; and a control system responsive to the sensors for controlling the burners in the converters, the system being responsive to the absence of a control signal for causing the burners to be adjusted such that each converter furnishes about half the electrical load on the system, and being responsive to a control signal from a sensor for causing the burner of the converter with which the sensor is associated to shut down and the other burner to be adjusted such that the other converter furnishes the entire load; one of the converters, termed the primary converter, operating with a working fluid having a higher boiling point than the working fluid in the other converter which is termed the secondary converter, and means for causing the condenser of the primary converter to reject heat into the vapor generator of the secondary converter when both turbo-generators are operating normally.



4,104,536
STREAM -OR RIVER-POWERED TURBINE
Anton Franz Gutsfeld, 13 London St. N., Hamilton, Ontario, Canada (L8H 4B2)

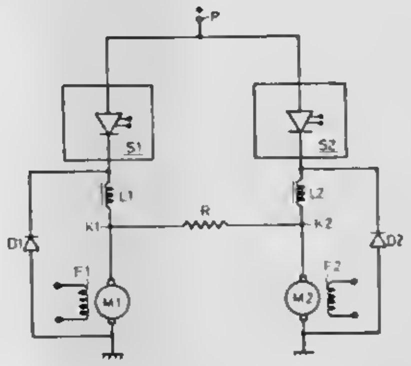
Filed Apr. 27, 1976, Ser. No. 680,684
Int. Cl.² F03B *13/00*
U.S. Cl. 290—54 **4 Claims**



1. A stream powered turbine, comprising
- restraining means for holding said turbine in the stream against a flow of water therein, said restraining means including a torque member;
- an elongated body rotatably mounted on said torque member and having inner and outer cylindrical surfaces;
- a plurality of vanes spaced circumferentially about said body outer surface and extending radially outwardly therefrom, each of said vanes having at least one opening therethrough;
- a valve member mounted on each vane adjacent each opening and severally adapted to uncover the associated opening upon encountering a tail wave, to close such opening while such vane is in the stream, and to uncover such opening as such vane exits the stream;
- a generator mounted on said torque member within said body;
- drive means arranged within said body and operative to transmit rotational movement of said body to said generator, said drive means including an endless chain fastened to said body inner surface and a sprocket engaging said chain and arranged to drive said generator; and
- a casing mounted on said body inner surface and enclosing said chain except proximate said sprocket.

4,104,537
STATIC CONVERTER EQUIPMENT
Sten Elvin, Vesteras, Sweden, assignor to ASEA AB, Vesteras, Sweden

Filed Dec. 17, 1976, Ser. No. 751,563
Claims priority, application Sweden, Dec. 29, 1975, 7514669
Int. Cl.² H02J *1/10*
U.S. Cl. 307—58 **9 Claims**



1. Converter apparatus for supplying at least two loads with direct current without requiring large smoothing inductors or special regulating systems for load current distribution comprising:
- at least two converters each having a DC output terminal, each converter operating in phase shifted relation to other converters,
- a load for each converter, each load having an input terminal connected to an output terminal of the corresponding converter, each load having a resistance R and impedance Z,
- the improvement comprising impedance means galvanically interconnecting the input terminals of said loads, said impedance means having a resistance RZ of at least the same order of magnitude as the resistance of said loads, the impedance ZZ of said impedance means having a value at the most the same order of magnitude as the load impedance.

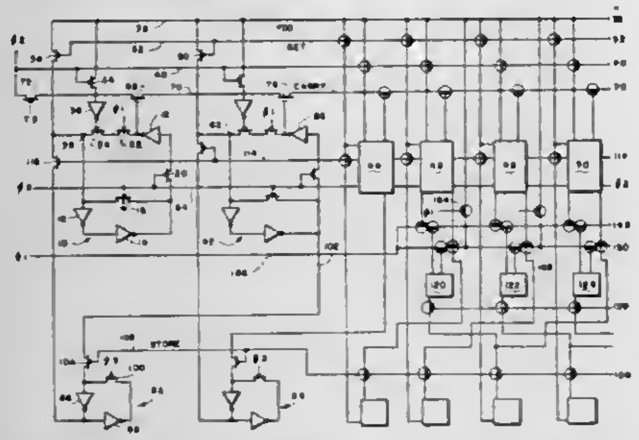
4,104,538
DIGITALLY SYNTHESIZED BACK-UP FREQUENCY
Thomas J. Davies, Jr., San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 29, 1977, Ser. No. 792,155
Int. Cl.² H02J *9/00*
U.S. Cl. 307—64 **11 Claims**

1. A.C. back-up frequency synthesizer circuitry for generating signals precisely indicative of the half-period of an applied A.C. frequency after removal of said frequency, said synthesizer circuitry comprising:
- high frequency generating means for producing a continuous train of pulses at a substantially constant frequency several orders of magnitude greater than the frequency of the applied A.C.;
- counting means coupled to said high frequency generating means and reset by the occurrence of a positive line transition denoting the beginning of a cycle of said applied A.C.

for counting the number of pulses between said occurrences;

count storage means coupled to said counting means for storing the count, excluding the lease significant digit thereof, reached by said counting means between said occurrences of positive line transitions; and



loading means responsive to the absence of said positive line transition and the subsequent count overflow of said counting means for loading the inverted value in said count storage means into said counter including the least significant digit portion thereof, whereby said counter will produce overflow signals upon counting a number of pulses representing each half-period of the frequency of the previously applied A.C.

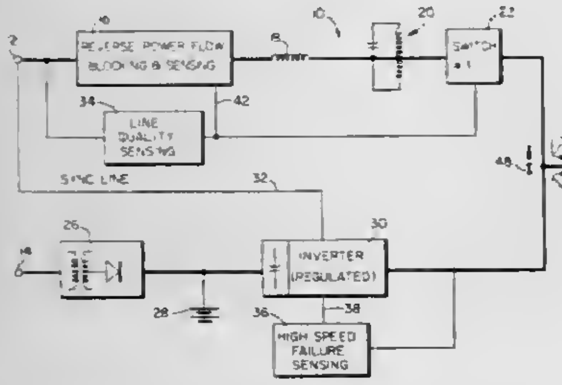
4,104,539
PARALLEL REDUNDANT AND LOAD SHARING REGULATED AC SYSTEM

Alfred Max Hase, 6 Manorwood Rd., Scarborough, Ontario, Canada

Filed Apr. 5, 1976, Ser. No. 673,820

Int. Cl.^{2} H02J *7/00*

U.S. Cl. 307—64 **11 Claims**



1. In an electrical power system having two power sources, where at least the first power source is an ordinarily available alternating current having a voltage regulator in series therewith, and the second power source is synchronized to said first power source; and where the load is an alternating current load which is connected to both power sources so that during normal operation the load demand is shared by said power sources, the improvement comprising:

failure sensing and voltage and power isolation control means associated with said second power source, and adapted to sense failure of said second power source and to isolate it, voltage and power-wise, from said load in the event of failure thereof;

reverse power flow sensing means associated with said voltage regulator and said first power source for sensing reverse power flow towards said first power source; and

reverse power flow blocking means actuable by said reverse power flow sensing means for blocking reverse power flow in a direction from said load towards said first power source upon sensing reverse power flow by said reverse power flow sensing means so as to isolate said first power source, voltage and power-wise, from said load when said reverse power flow is sensed.

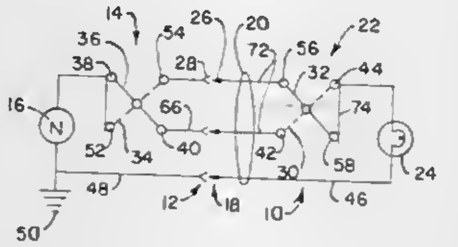
4,104,540
LAMP SWITCH CIRCUIT

Del R. Lien, 143 Eastview Dr. NW., Cedar Rapids, Iowa 52405

Filed Aug. 23, 1977, Ser. No. 826,994

Int. Cl.^{2} H01R *13/70*

U.S. Cl. 307—114 **4 Claims**



1. A lamp switch circuit comprising:

a lamp having a three-way switch provided with two operative positions, adapted to receive a lamp bulb, said lamp switch including three contact elements, two of which are connected in series in the operative position of said switch, and a reciprocating switch element, and means on said switch element for alternately connecting two of said three contact elements, said alternate connecting means including
  a coil spring connected to one end of said switch element adapted to be snapped over a center pedestal in response to reciprocable movement of said switch element, and
  a contact bar for alternately bridging two of said three contact elements in response to reciprocable movement of said switch element.
  a three-way wall-mounted switch provided with two operative positions remotely located from said lamp adapted to be connected to a source of electrical power, and

means for directly connecting said lamp switch and wall-mounted switch in series to operate said lamp from either one of said switches.

4,104,541
AUTOMATIC ELECTRIC POWER SWITCH

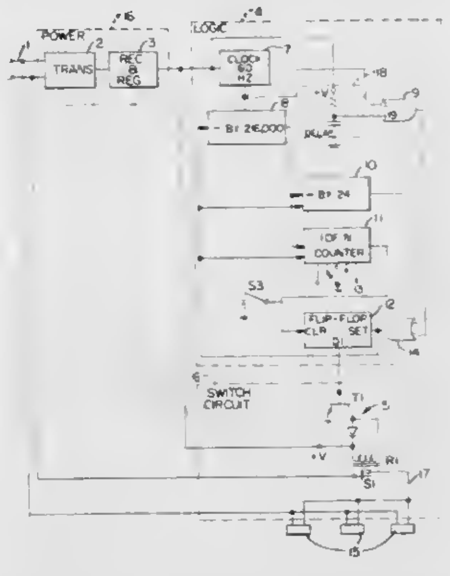
William R. Jewell, 8600 Nan Lee Dr., Springfield, Va. 22152

Filed Mar. 18, 1977, Ser. No. 779,010

Int. Cl.^{2} H01H *7/00*

U.S. Cl. 307—141 **12 Claims**

1. An automatic programmed time delay switching device for use as a time delayed switch in circuit with at least one external electrical device and an external electrical source, wherein the power to the external electrical device is switched in a specified time cycle, said cycle including a first automatic switch setting when power is initially applied to the switching device and when said cycle is completed and a second automatic switch setting at a specified time delay after said first switch setting, said switching device comprising a power input means structurally adapted to receive power from said external electrical source and to conduct the power to the electrical circuitry of the switching device, switch timing means in circuit with said source and said power input means for measuring said specified time delay after power is applied to the switching device and generating a switch control signal, timing circuit initialization means in circuit with said switch timing means for initializing said timing means when power is first applied to said switching device, switching means in circuit with said external source and said timing means for switching on or off the power to said external electrical device in response to said switch control signal, and power output means in circuit with said switching means structurally adapted to distribute power to said external electrical device.



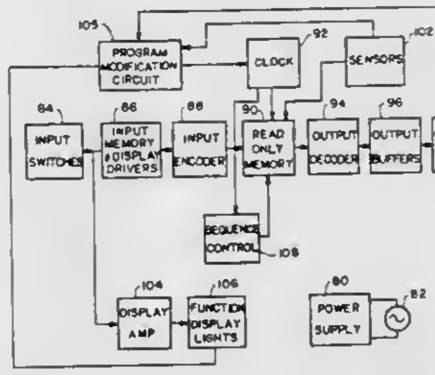
4,104,542
PROGRAM MODIFICATION CIRCUIT FOR ELECTRONIC APPLIANCE PROGRAMMER

Joseph Karklys, and Junji Cary Yamanaka, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 688,092, May 19, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 748,778

Int. Cl.^{2} H01H *7/00, 43/00*

U.S. Cl. 307—141 **7 Claims**



1. An automatic washing appliance including an electronic control for stepping the appliance through an operating program comprising a sequence of operations,

a clock for supplying electrical pulses at discrete timer intervals,

a sequence control for establishing said sequence of operations,

a memory circuit connected to said clock and said sequence control for generating a sequence of output signals,

a plurality of output circuits connected to said memory circuit for performing said operations in response to said output signals, and

sensing means connected to said memory circuit for generating a sensing signal indicating a condition of the appliance,

an improved program modification means connected to said output circuits, said sensing means and said clock for modifying the length of at least one of said discrete time intervals, comprising:

switching means and a gate and responsive to said sensing signal for modifying said operating program, said sensing means comprising a water level sensing switch for generating a signal indicative of the water level in said washing appliance.

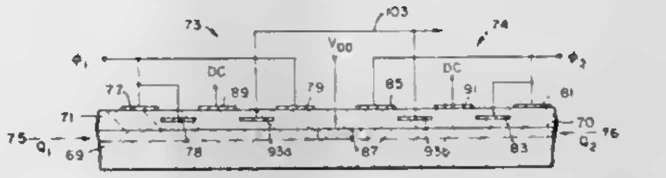
4,104,543
MULTICHANNEL CCD SIGNAL SUBTRACTION SYSTEM

Dale G. Maeding, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 22, 1977, Ser. No. 770,556

Int. Cl.^{2} G11C *19/28;* **H01L** *29/78*

U.S. Cl. 307—221 D **6 Claims**



1. A method of subtracting a first signal from a second signal comprising the steps of:

(a) providing, in a semiconducting substrate first and second individual charge flow channels, extending first and second sets of charge transfer electrodes over respective ones of said channels, and extending an equipotential electrode structure over both of said channels;

(b) generating first and second pulse trains corresponding to the amplitudes of said first and second signals and applying said first and second pulse trains respectively to said first and second charge transfer electrodes;

(c) alternately clamping said electrode structure by connecting said structure to a source of clamping potential and floating said electrode structure by disconnecting said structure from said source of clamping potential;

(d) alternately stepping first and second trains of charge packets corresponding to said first and second pulse trains along said first and second charge flow channels respectively, into and out of the substrate region under said equipotential electrode structure so that each time said electrode structure is clamped, charge is shifted under it from one of said channels and each time it floats, charge is shifted under it from the other of said channels; and

(e) detecting the potential of said electrode structure when it floats.

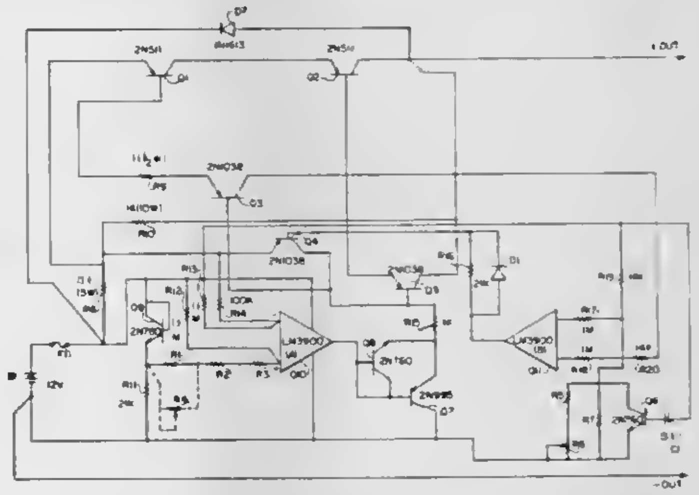
4,104,544
CURRENT LIMITING CIRCUIT FOR DIRECT CURRENT POWER SUPPLIES

Robert A. Bradburn, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,271

Int. Cl.^{2} H03K *1/02*

U.S. Cl. 307—297 **4 Claims**



1. A circuit for limiting the output from a constant voltage, single direct current power supply to a load, said circuit comprising:

first and second transistor switches connected in series between the power supply and load for controlling the passage of current from the power supply to the load;

third and fourth transistor switches for controlling said first and second switches, respectively; and

first and second control means for controlling said third and fourth switches, said first control means including a first comparator means responsive to the current being drawn by the load and sensing the differential between the load current and the current limit reference from the power supply such that both said first and second switches are closed unless the current being drawn by the load exceeds a predetermined value therefor, and said second control means including a second comparator means responsive to the voltage across the load and sensing the differential between the load voltage and the reference voltage from the power supply such that both said first and second switches are open when the voltage across the load is below a predetermined value therefor, at least one of said control switches being in a nonconductive state when an output switch is in a nonconductive state to eliminate stand-by drain from the single power source.

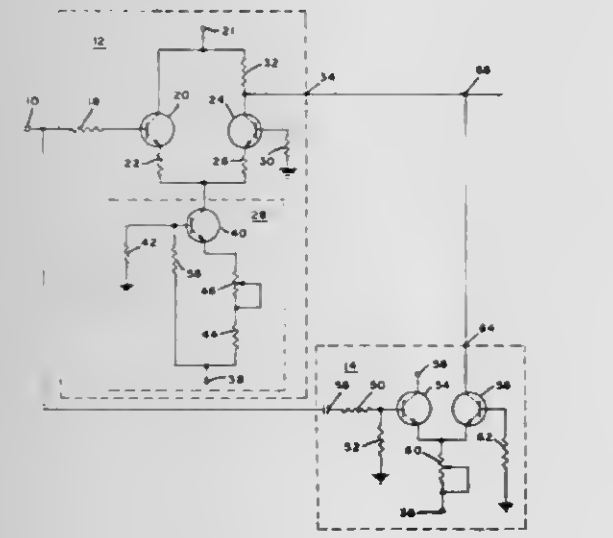
4,104,545
PULSE PEAK DETECTOR CIRCUIT

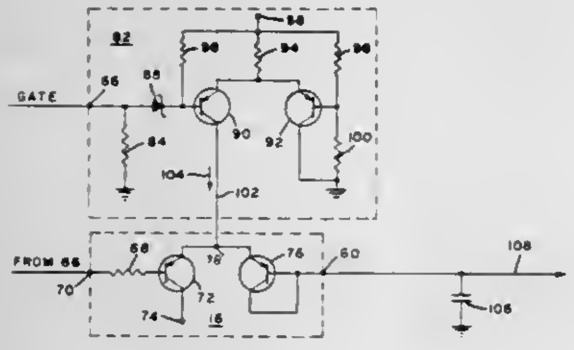
Gary S. Dallas, Monroe, and Richard J. Pittaro, Stamford, both of Conn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Aug. 4, 1977, Ser. No. 821,821

Int. Cl.² H03K *5/18, 5/20*

U.S. Cl. 307—351 **10 Claims**





1. A pulse peak detector circuit for generating a direct current voltage proportional to the peak amplitude of an applied input signal having a short duration and fast rise time comprising:

input terminal means for receiving the applied pulse signal;

first amplifying means coupled to said input terminal means for receiving said applied pulse signal and providing at its output terminal a signal for compensating for a small amplitude pulse signal;

second amplifying means coupled to said input terminal means for receiving said applied pulse signal for providing at its output terminal a signal commensurate with said applied input pulse signal;

unidirectional current conducting means coupled to said output terminals of said first amplifying means and said second amplifying means for receiving said respective signals and passing the sum of said signals therethrough;

current means coupled to said unidirectional current conducting means for causing said unidirectional current conducting means to be rendered conducting when said signals are received, and

charge storage means coupled to said unidirectional current conducting means for providing a direct current voltage proportional to the peak amplitude of said applied pulse signal.

4,104,546
INTEGRATED CIRCUIT FOR USE WITH VARIABLE VOLTAGES

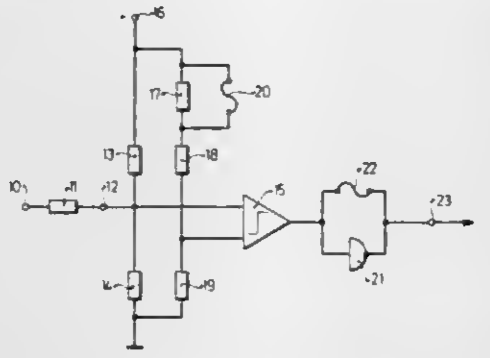
Hartmut Seiler, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 17, 1977, Ser. No. 769,431

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614781

Int. Cl.² H03K *5/20, 19/40*

U.S. Cl. 307—362 **9 Claims**



1. Integrated circuit for use with variable voltage inputs comprising

a signal processing stage;

an input stage having its output connected to the signal processing stage and its input connected to a signal source (10),

said input stage including

a threshold circuit (15) connected to the signal source;

a voltage divider (13, 14; 17, 18, 19) having a plurality of circuit components connected to the threshold circuit (15) and determining its threshold response level, and

at least one burn-off shunt path (20) connected in parallel with at least one circuit component (17) of the voltage divider to permit modification of the response level of the threshold circuit (15) with respect to a predetermined signal level of the input signal source.

4,104,547
EXTENDED RANGE CURRENT-TO-TIME CONVERTER

Thomas M. Frederiksen; Robert S. Sleeth, both of San Jose, and William M. Howard, Campbell, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 21, 1977, Ser. No. 779,393

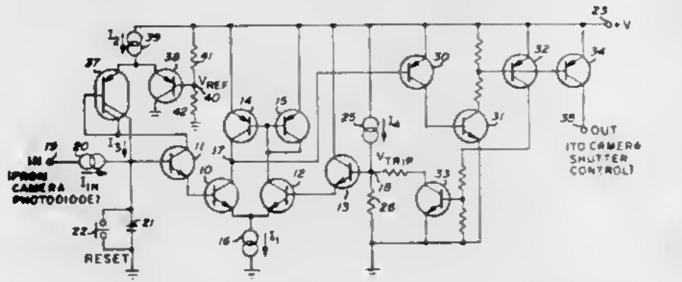
Int. Cl.² H03K *5/153, 5/20*

U.S. Cl. 307—362 **8 Claims**

1. A comparator circuit for sensing the difference between an input potential applied to one side thereof and a reference potential applied to the other side and providing an output when said input potential exceeds said reference potential by a predetermined amount, said comparator circuit comprising:

a bipolar transistor connected into said one side of said comparator circuit to provide an input for receiving said input potential on the base thereof;

means for sensing the flow of collector current in said bipolar transistor; and



means responsive to said collector current for supplying base current to said bipolar transistor, whereby said comparator circuit can be operated from an input source supplying a current that is smaller than the current required by the comparator input bipolar transistor.

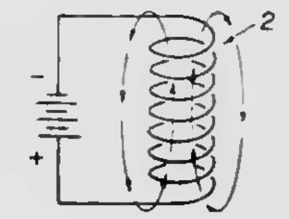
4,104,548
ELECTRIC MOTOR FOR GENERAL PURPOSES (II)

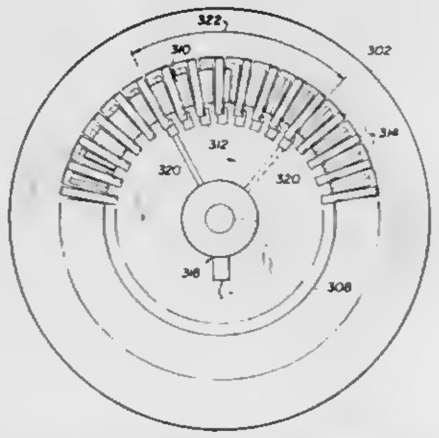
Domenic Borello, 142 Nyack Ave., Pelham, N.Y. 10803

Division of Ser. No. 640,974, Dec. 15, 1975, Pat. No. 4,020,370. This application Nov. 17, 1976, Ser. No. 742,421

Int. Cl.² H02K *41/00*

U.S. Cl. 310—14 **1 Claim**





1. In an electric motor of the type including at least one coil having a central opening and electrically connected to generate a magnetic field, and a magnetizable body carried at the periphery of a rotor adapted to be powered in rotation by said field, the improvements comprising said coil of said magnetic field being in the specific form of individual helical turns disposed in a circumferential arrangement with said central opening in each said helical turn located along the contemplated rotary path of said rotor magnetizable body, each said helical turn having a segment missing therefrom in an area thereof coincident with said rotary path of said rotor magnetizable body, means supporting said rotor in an operative relation to said magnetic field coil such that said central openings of said helical turns occupy a position in surrounding relation to said contemplated rotary path of said magnetizable body of said rotor, and a select number of electrically conductive segments disposed in circumferential relation to each other in said rotor in advanced relation to said magnetizable body thereof, said conductive segments being disposed in locations effective to electrically complete corresponding helical turns with which said conductive segments establish contact, whereby said helical turns in said completed condition are effective when energized to generate a magnetic field powering said rotor in rotation.

4,104,549
MAGNETITE FERRITE FOR MAGNETOSTRICTIVE VIBRATORS

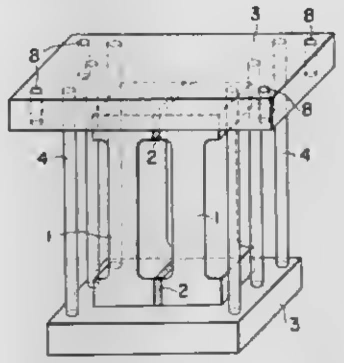
Yumi Akimoto; Tamotsu Ishii, both of Omiya; Motohiko Yoshizumi, Urawa, and Sadaaki Haghino, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 484,883, Jul. 1, 1974, abandoned. This application Apr. 27, 1976, Ser. No. 680,669

Claims priority, application Japan, Jul. 3, 1973, 48-74415; Jul. 7, 1973, 48-76131; Jul. 7, 1973, 48-76133; Jul. 7, 1973, 48-76134; Jan. 28, 1974, 49-10982; Feb. 4, 1974, 49-13760; Apr. 10, 1974, 49-39820; Apr. 15, 1974, 49-41875; United Kingdom, Jul. 3, 1974, 29453/74; Fed. Rep. of Germany, Jul. 2, 1974, 2431698; Netherlands, Jul. 2, 1974, 7408914; France, Jul. 3, 1974, 74 23131

Int. Cl.² H01L *41/06*

U.S. Cl. 310—26 **8 Claims**



1. A method for generating magnetostrictive vibration which comprises:

providing a vibrator element comprising a sintered structure of magnetite having an oxygen/iron (O/Fe) atomic ratio within the range of 4.0/3 to 4.1/3, a specific resistance of not less than 0.1 ohm.cm, and a positive static magnetostriction and containing cobalt in a quantity of 0.01 to 1.0% by weight of the sintered structure; and applying an alternating magnetic field to the vibrator element.

4,104,550
MOTOR SEALS

Herbert F. Penhorwood, Owosso, Mich., assignor to Universal Electric Company, Owosso, Mich.

Filed Dec. 3, 1976, Ser. No. 747,064

Int. Cl.² H02K *11/00*

U.S. Cl. 310—71 **2 Claims**

1. In a submersible motor or the like, the combination comprising

a first housing containing a motor field stator having a field winding,

a second plastic housing mounted on said first housing,

said field having unencased field winding wires,

said first housing having an open ended cylindrical cavity therein in the periphery thereof with the open end of said cavity extending outwardly of said housing,

said first housing having an opening in the base of said cavity of lesser diameter than said cavity,

a cylindrical body of compressible elastomeric material positioned in said cavity,

said body being shaped such that it has a lower cylindrical portion and an upper frusto-conical portion which has a maximum diameter at the juncture with the cylindrical portion which is less than the diameter of the cylindrical portion,

said cylindrical portion of said body having a diameter which conforms with the diameter of the cavity so that said body can be readily inserted in said cavity without substantial compression and which is greater than the diameter of said opening in the base of said cavity,

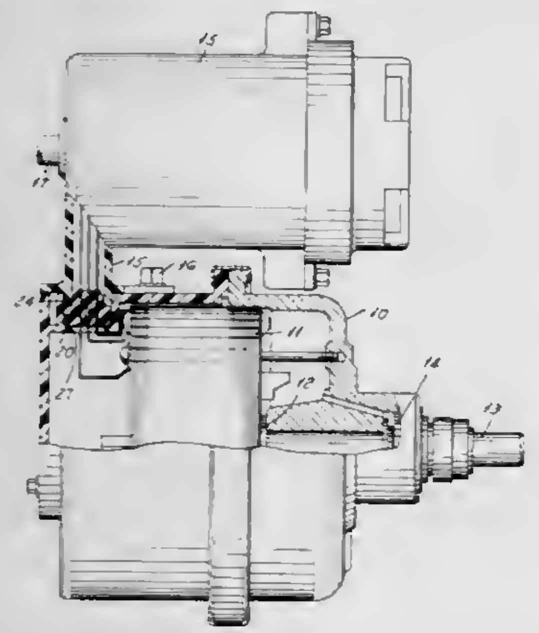
said body having a plurality of generally axial passages therein,

said unencased wires from said field winding having a diameter such that they can be readily inserted through said passages when said body is radially uncompressed,

said second housing having a cylindrical tubular wall having a uniform thickness and an internal diameter less than the maximum diameter of said frusto-conical portion of said body,

said tubular wall extending axially into the open end of said cavity and has a radial end surface,

said frusto-conical portion having a greater diameter at its base than the internal diameter of said tubular wall,



and mounting means for mounting said second housing on said first housing and drawing said housing toward one another to force said tubular wall axially into said cavity and against said body to compress said body when said second housing is in mounted position on said first housing thereby compressing the cylindrical portion of said body radially outwardly into tight conformity with the periphery of the cavity and radially inwardly into tight conformity with the unencased wires from the motor and thereby also compressing the frusto-conical portion radially outwardly against the interior said said tubular wall into tight conformity therewith and radially inwardly into tight conformity with said unencase wires,

the part of said frusto-conical portion of said body radially inwardly of said tubular wall being unrestrained axially at one end of said body,

the part of said cylindrical body radially inwardly of said opening in said cavity being unrestrained axially.

4,104,551
MEANS FOR COLLECTING MOISTURE IN CANNED ELECTRIC MOTORS

Wilhelm Blank, Speichersdorf, and Ernst Roth, Pegnitz, both of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker AG, Frankenthal, Pfalz, Fed. Rep. of Germany

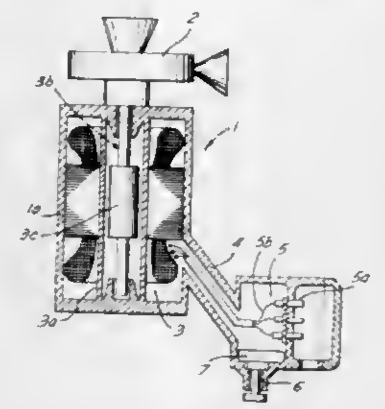
Filed Apr. 14, 1976, Ser. No. 676,701

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516783

Int. Cl.² H02K *5/10, 5/22;* **B01D** *53/04*

U.S. Cl. 310—88 **8 Claims**

1. An explosion-proof canned electric motor for use at elevated temperatures, comprising a housing having a hollow upper portion and a hollow lower portion, said lower portion having a venting opening at the lowermost point thereof and said opening containing a porous hygroscopic desiccant body, said desiccant body absorbing moisture which is in the air flowing from the atmosphere into said housing via said opening when the temperature in said housing decreases and from said housing into the atmosphere when the temperature in said housing increases, as well as any condensate which accumulates in said housing during operation of the motor and flows toward said opening.



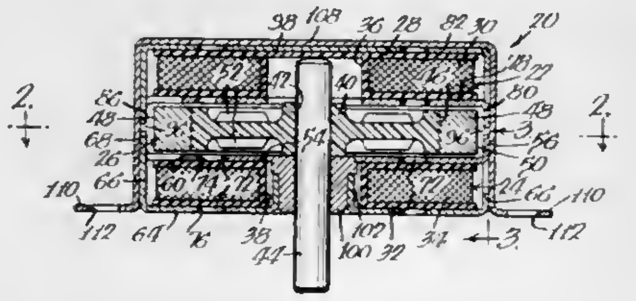
4,104,552
SYNCHRONOUS MOTOR STRUCTURE

Athanase N. Tsergas, Medinah, Ill., assignor to Merkle-Korff Gear Co., Des Plaines, Ill.

Filed Mar. 4, 1976, Ser. No. 664,034

Int. Cl.² H02K *21/14*

U.S. Cl. 310—156 **9 Claims**



1. In a synchronous motor structure, a circular rotor having an outer peripheral surface of a magnetic material with permanent magnet north and south poles alternately formed therein circumferentially therearound; first and second annularly shaped electrical coils, having approximately the same diameter as said rotor, positioned on opposite sides of the rotor and coaxial therewith, each coil having a pair of inputs thereto for receiving an a.c. voltage for generating a field of magnetic flux; a first plurality of poles of a magnetic material in proximity with and extending circumferentially around the outer periphery of said rotor, with alternate ones of said poles magnetically coupled with a field of magnetic flux generated by said first coil on the side thereof toward said rotor, and with the remaining poles of said first plurality magnetically coupled with a field of magnetic flux generated by said coil on the opposite side thereof; and a second plurality of poles of a magnetic material in proximity with and extending circumferentially around the outer periphery of said rotor spaced from and aligned with said poles of said first polarity, with alternate ones of said poles of said second plurality magnetically coupled with a field of magnetic flux generated by said second coil on the side thereof toward said rotor, and with the remaining poles of said second plurality magnetically coupled with a field of magnetic flux generated by said coil on the opposite side thereof, said first and second plurality of poles extending across opposite peripheral halves of said rotor toward, but not across, the center of said periphery thereof.

4,104,553
FASTENING AND SUSPENSION ELEMENT FOR A PIEZOELECTRIC RESONATOR

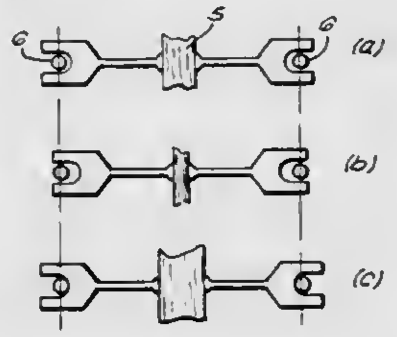
Jean Engdahl, Bienne, and Huber Matthey, Brugg, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A., Bienne, Switzerland

Filed Mar. 24, 1975, Ser. No. 561,309

Claims priority, application Switzerland, Mar. 29, 1974, 4401/74

Int. Cl.² H01L *41/10*

U.S. Cl. 310—352 **5 Claims**



1. A suspension element for fastening a piezoelectric resonator to a support while isolating mechanical vibrations tending to be transmitted between the support and the resonator, said suspension element comprising a body having an active zone portion bounded on the ends thereof by two zone portions said two zone portions having cross sections substantially greater than that of said active zone portion, said active zone portion and said two end zone portions being formed from a single planar piece of material the cross sectional changes of which result entirely from changes of width, the distance separating said zone portions of greater cross section defining the free length of the element, said zone portions of greater cross section comprising two expansions for dampening said vibrations and for fastening the element to the resonator and to the support, respectively.

4,104,554
ELECTRON BEAM PRODUCING ARRANGEMENT FOR A CATHODE RAY TUBE

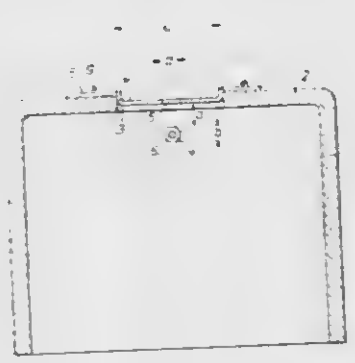
Rainer Kolbeck; Heinz Kuckenburg, both of Ulm, Donau, and Klaus Schaffernicht, Herrlingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 15, 1977, Ser. No. 768,707

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606896; Feb. 20, 1976, 7605093[U]

Int. Cl.² H01J *29/02, 29/46*

U.S. Cl. 313—447 **11 Claims**



1. An electron beam producing arrangement for a cathode ray tube comprising a target electrode constructed like a fluorescent screen, said target electrode consisting of a vessel-shaped metallic control electrode having a wall thickness which is reduced in the region of the opening for passage of the beam and comprising a cathode arranged inside the control electrode and in front of the opening for passage of the beam, characterized in that said opening for passage of the beam is arranged in a hat-shaped drawn dish made of metal foil; that said dish is placed in a bore in the end wall of said control electrode with its substantially cylindrical part; that said dish is fixed at its edge to the outer surface of said end wall of said control electrode; and that said cathode has an electrically heatable cathode wire tensioned by at least one spring, with said wire being arranged at a spacing of 0.15 to 0.4 mm from the upper surface of said dish, below said opening for the passage of the beam and running substantially parallel to said end wall of said control electrode.

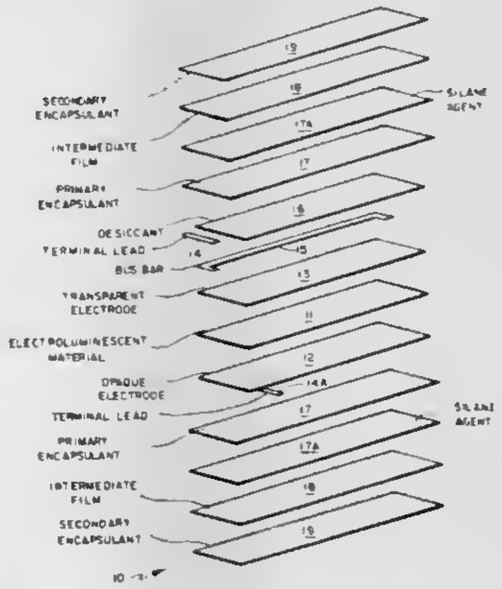
4,104,555
HIGH TEMPERATURE ENCAPSULATED ELECTROLUMINESCENT LAMP

Gordon R. Fleming, Hanover, N.H., assignor to Atkins & Merrill, Inc., Lebanon, N.H.

Filed Jan. 27, 1977, Ser. No. 762,853

Int. Cl.² H05B *33/04*

U.S. Cl. 313—512 **19 Claims**



1. An electroluminescent lamp comprising

a layer of electroluminescent material disposed between a pair of electrodes, at least one of said electrodes being capable of transmitting light emitted by the electroluminescent material therethrough;

at least one layer of a primary encapsulant material encasing at least one of said pair of electrodes;

at least one layer of substantially transparent polymeric film material encasing said at least one layer of primary encapsulant material; and

at least one layer of a secondary encapsulant material encasing said at least one layer of polymeric film material.

4,104,556
HIGH ENERGY RADIO FREQUENCY PULSE GENERATORS

Joseph M. Proud, Jr., Wellesley Hills, and Charles N. Fallier, Jr., Westford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,926

Int. Cl.² H01J *7/46, 19/80*

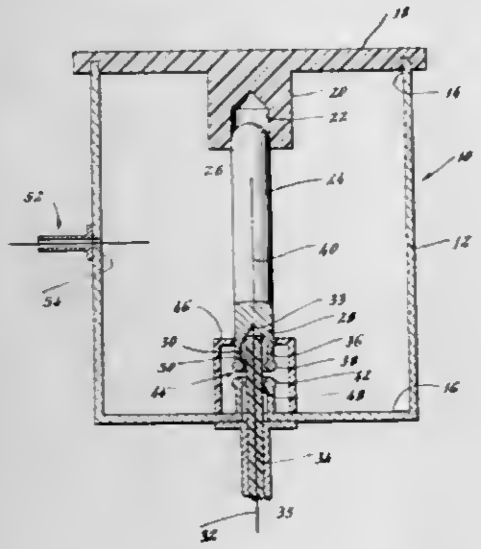
U.S. Cl. 315—39 **8 Claims**

1. A radio frequency generator for providing high energy pulses comprising in combination:

a. an elongated resonant cavity having an open end and an essentially closed end;

b. insulator means adapted to cooperate with said cavity open end and having an inwardly extending portion, said inwardly extending portion being provided with support means;

c. an elongated resonant element centrally disposed within said resonant cavity, one end thereof being disposed within said insulator support means, said resonant element being provided with input receiving means at its other end proximate the longitudinal axis thereof;



d. switching means disposed on said other end of said resonant element and connected to said closed end of said resonant cavity; and

e. input terminal means adapted to be coupled to a source of pulsed DC voltage and including an electrically conductive means for providing a conductive path to said resonant element input receiving means.

4,104,557

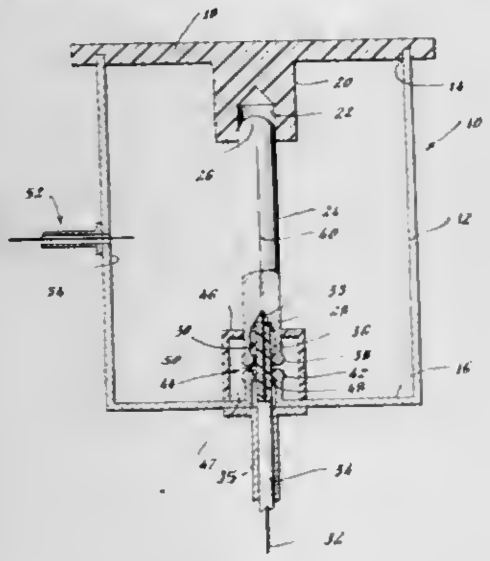
LIQUID DIELECTRIC RADIO FREQUENCY PULSE GENERATORS

Joseph M. Proud, Jr., Wellesley Hills, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,927

Int. Cl.² H01J *7/46, 19/80*

U.S. Cl. 315—39 **12 Claims**



1. A liquid dielectric radio frequency generator for providing high energy pulses comprising in combination:

a. an elongated resonant cavity having an open end and an essentially closed end;

b. insulator means adapted to cooperate with said cavity open end and having an inwardly extending portion, said inwardly extending portion being provided with support means;

c. an elongated resonant element centrally disposed within said resonant cavity, one end thereof being disposed within said insulator support means, said resonant element being provided with input receiving means at its other end proximate the longitudinal axis thereof;

d. switching means disposed on said other end of said resonant element and connected to said closed end of said resonant cavity;

e. housing means for enclosing said switching means;

f. a liquid disposed within said housing means; and

g. input terminal means adapted to be coupled to a source of pulsed voltage and including an electrically conductive means for providing a conductive path to said resonant element input receiving means.

4,104,558

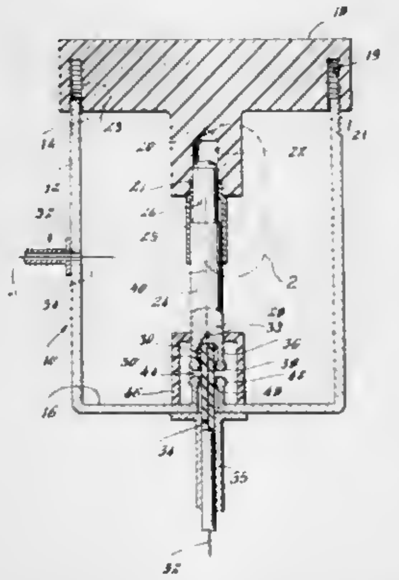
TUNABLE RADIO FREQUENCY PULSE GENERATORS

Joseph M. Proud, Jr., Wellesley Hills, and William H. McNeill, Carlisle, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,928

Int. Cl.² H01J *7/46, 19/80*

U.S. Cl. 315—39 **5 Claims**



1. A tunable radio frequency generator for providing high energy pulses comprising in combination:

a. an elongated resonant cavity having an open end and an essentially closed end;

b. insulator means for varying the resonant frequency of said generator, said means adapted to movably cooperate with said cavity open end to vary the distance between said open end and said closed end and having an inwardly extending portion, said inwardly extending portion being movable along the longitudinal axis of said cavity and including support means;

c. an elongated resonant element centrally disposed within said resonant cavity, one end thereof being slidably received by the support means of said insulator means for changing its effective length, said resonant element being provided with input receiving means at its other end proximate the longitudinal axis thereof;

d. switching means disposed on said other end of said resonant element and connected to said closed end of said resonant cavity; and

e. input terminal means adapted to be coupled to a source of pulsed DC voltage and including an electrically conductive means for providing a conductive path to said resonant element input receiving means.

4,104,559

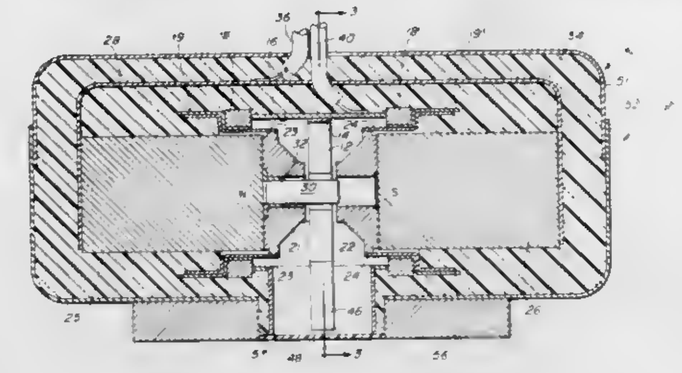
ISOPOLAR MAGNETRON SUPPORTED WITH RIGID INSULATION IN A REMOTE HOUSING

David Hobbs, Belmont, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed Nov. 1, 1976, Ser. No. 737,076

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.51 **11 Claims**



1. In a microwave magnetron of the type having a cavity-resonator anode, a cathode space, a cathode in the cathode space, and means to furnish magnetic flux in the cathode space for magnetron operation, an assembly of an anode structure comprising a generally tubular anode support having first and second ends and said cavity-resonator anode supported from said tubular anode support between said ends, output means for said magnetron coupled to said anode, a magnetic flux providing structure comprising magnetic pole pieces insulated from said anode structure for providing said magnetic flux, said cathode means extending between said pole pieces in said cathode space, a housing surrounding and spaced from said anode structure, said flux producing structure and said cathode means, and solid insulator material filling the space between said housing and said structures for rigidly supporting the same within said housing, said housing having an access passage for coupling to said output means, a first electrical connector passing through said housing and said filling material to said anode structure, and a second electrical connector passing through said housing and said filling material for connection to said cathode means.

4,104,560

LIGHTING SYSTEM FOR A MOTOR VEHICLE

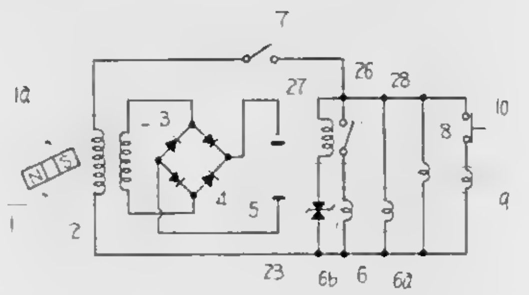
Tetsuo Kato, Anjo, and Kazumasa Mori, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 603,502, Aug. 11, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,471

Claims priority, application Japan, Aug. 21, 1974, 49/96312

Int. Cl.² B60Q *1/02*

U.S. Cl. 315—83 **3 Claims**



1. A lighting system for a motor vehicle of the type having a magneto-generator rotated by an engine of said vehicle to develop alternating voltages from separate first and second windings, said first winding being associated with circuit means for charging a battery,

the system comprising:

lighting means including a main lamp and an auxiliary lamp;

a first switching means for connecting the lighting means across the second winding whereby the main lamp is normally conducting;

a second switching means including: (1) a contact switch which is arranged in series with the auxiliary lamp, the series arrangement being connected across the main lamp; and (2) a bidirectional voltage sensing means connected across said main lamp, said sensing means being responsive to a rise in alternating voltage above a predetermined value, in both positive and negative directions, resulting from interruption of the conduction of said main lamp, thereby actuate said contact switch and energize the auxiliary lamp.

4,104,561

MAGNETRON OPERATING CIRCUIT

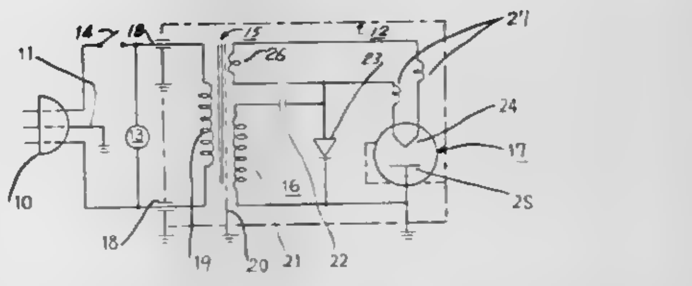
Kozo Iwata, Kyoto, Japan, assignor to New Nippon Electric Co., Ltd., Osaka, Japan

Filed Nov. 22, 1976, Ser. No. 743,649

Claims priority, application Japan, Nov. 28, 1975, 50/162523[U]

Int. Cl.² H05B *39/00, 41/14*

U.S. Cl. 315—101 **5 Claims**



1. An operating circuit for energizing a magnetron tube from an a.c. low voltage power source comprising a microwave generator including a magnetron tube having an anode and a cathode, a high voltage transformer having a primary winding and conductor wires connecting said primary winding to said a.c. power source and a secondary winding connected to said magnetron, a rectifier coupled to said magnetron tube and poled oppositely to said magnetron so as to allow the flow of current through the magnetron tube for alternate half-cycles of said a.c. power source, a filter including a pair of feed-through capacitors and a choke coil, and means for shielding said high voltage transformer, said rectifier and said filter by a metal shield housing to suppress undesired radiation, one of said feed-through capacitors of said filter being operatively connected to each of said conductor wires which connect said primary transformer winding to said low voltage power source, each of said feed-through capacitors having a relatively large capacitance, for example, at least about 1000pF.

4,104,562

TRAFFIC LIGHT DIMMER SYSTEM

Joseph A. DiCola, Willingboro, N.J., assignor to Traffic Systems, Inc., Brentwood, N.Y.

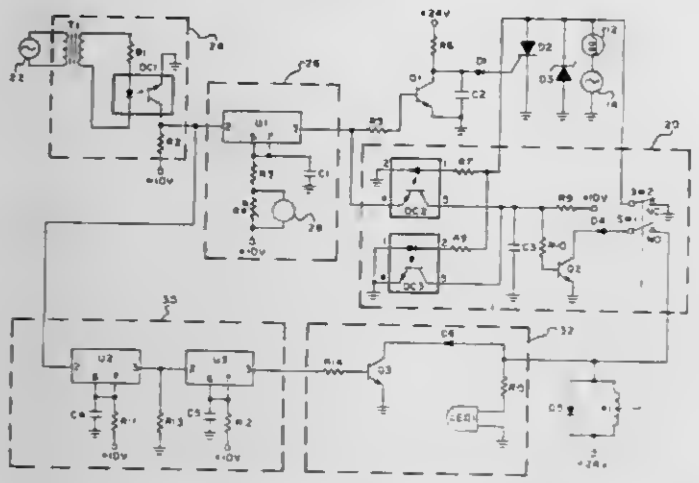
Filed Nov. 17, 1976, Ser. No. 742,582

Int. Cl.² H05B *41/392, 39/04*

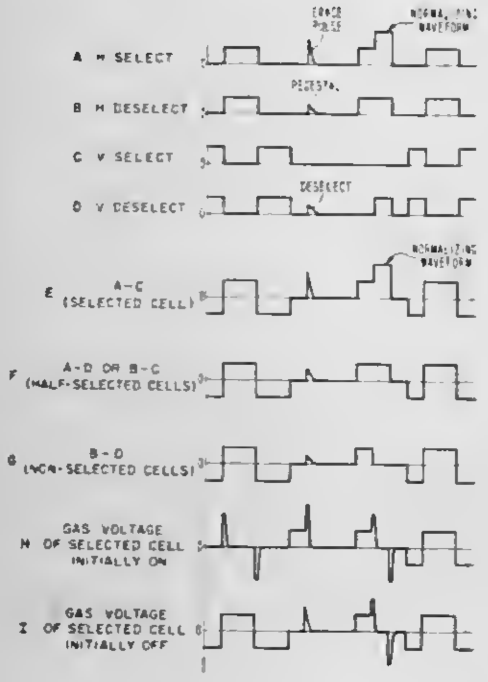
U.S. Cl. 315—158 **10 Claims**

1. In a dimmer circuit including a unilateral conducting means adapted to be placed in series with a light means for decreasing the power provided by an A.C. source of voltage to said light means, the improvement comprising:

means for sensing the forward voltage across said unilateral conducting means, and means responsive to said sensing means for overriding said unilateral conducting means for providing full power to said light means upon failure of said unilateral conducting means.

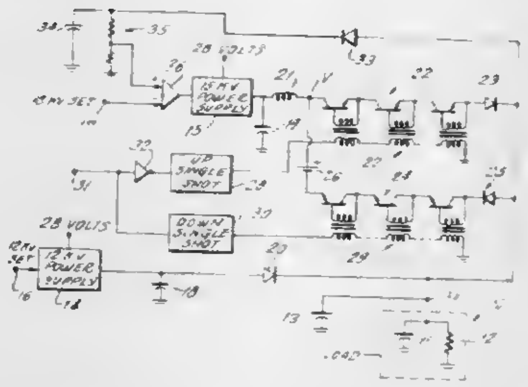


4,104,563
WRITING AND ERASING IN AC PLASMA DISPLAYS
Eugene Stewart Schlig, Somers, and George Raymond Stilwell, Jr., West Nyack, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 755,894, Dec. 30, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,100
Int. Cl.² H05B *41/14*
U.S. Cl. 315—169 TV **15 Claims**



I. A method of reducing error in the addressing operations of an AC gas discharge display panel via normalizing the state of addressed cells by applying a voltage complex to addressed cells during the erase and/or write cycle therefor, said voltage complex including at least a first component of at least one voltage level having a magnitude approximately equal to that of the magnitude of the sustain voltage level V_s for said display panel, at least a second component of at least one voltage level having a polarity the same as the polarity of said at least one voltage level of said first component and a magnitude approximately equal to twice that of the sustain voltage level V_s, and at least a third component of at least one voltage level approximately equal to zero volts.

4,104,564
HIGH SWITCHING SPEED HIGH VOLTAGE POWER SUPPLY
David A. Cohen, Hauppauge, and Charles Lien, Huntington, both of N.Y., assignors to Venus Scientific Inc., Farmingdale, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,402
Int. Cl.² H01J *29/80*
U.S. Cl. 315—171 **16 Claims**

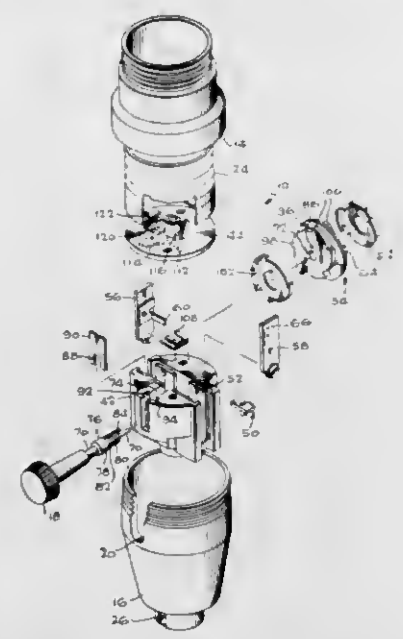


1. A high voltage power supply for supplying at least first and second high voltage outputs to a capacitive load; said power supply comprising first and second voltage sources having different high voltage outputs, an inductive means, first and second high speed switching means and first and second diodes connected in series with said first and second high speed switching means; said series-connected first switching means and first diode being connected in parallel with said series-connected second switching means and second diode; said first and second diodes being poled in opposite directions; and first and second high speed switch operating means operable for closing said first and second switching means respectively in order to switch said power supply output between said first and second voltage outputs; said first voltage source being connected directly to said capacitive load; said second voltage source being connected in series with said inductive means and said capacitive load, and in series with said parallel connection of said first and second high speed switching means and said respective first and second diodes respectively; said inductive means being resonant which said capacitive load at a given frequency, whereby the switching speed of said supply is about one-half the period of said given frequency.

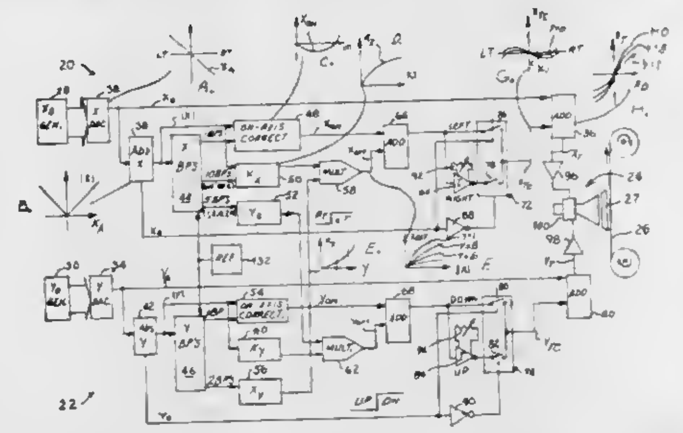
4,104,565
LAMP SOCKET FOR USE WITH MULTI-LEVEL BULB AND NIGHTLIGHT
Fritz E. Klassen, 4860 McKinnon Dr., Anaheim, Calif. 92807
Filed May 20, 1977, Ser. No. 798,756
Int. Cl.² H05B *35/00;* H01R *19/54*
U.S. Cl. 315—178 **10 Claims**

I. A socket for use with a main bulb having at least two different levels of illumination and an auxiliary bulb, the socket comprising a housing, a plurality of power terminals within the housing adapted to be coupled to a source of power, a plurality of main terminals within the housing adapted to be coupled to a main bulb having at least two different levels of illumination, at least one auxiliary terminal within the housing adapted to be coupled to an auxiliary bulb, and manually actuable means coupled to the power terminals, the main terminals and the at least one auxiliary terminal and operative to couple the power terminals to different combinations of the main terminals, the

at least one auxiliary terminal, and both the main terminals and the at least one auxiliary terminal as the manually actuable means is manually advanced through a plurality of different positions.



4,104,566
ANALOG CORRECTION SYSTEM
Naren Chimanlal Shah, Indian Harbor Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio
Filed Apr. 29, 1976, Ser. No. 681,588
Int. Cl.² H01J *29/56*
U.S. Cl. 315—371 **10 Claims**



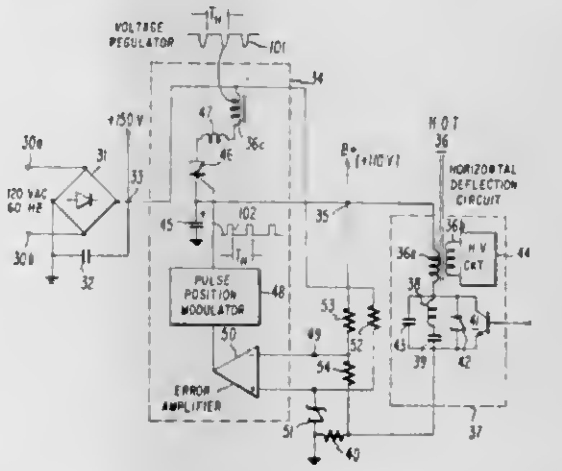
1. Apparatus for compensating for nonlinear deflection characteristics of a display system for displaying graphical images on an energy responsive surface with a radiant energy beam and having deflection means responsive to at least one deflection signal for controlling deflection of said beam, said nonlinear deflection characteristic being such that the amount of deflection error due to said nonlinearity is a function of the amount of deflection of said beam on said energy responsive surface and is greatest at the extremes of said deflection, said apparatus comprising:

means for providing a deflection signal linearly responsive to an input signal, and for scaling said deflection signal such that a deflection signal corresponding to an input signal indicative of maximum deflection will cause said deflection means to produce said maximum deflection substantially without compensation;

compensation means for generating a compensation signal having a non-monotonic functional relationship to said deflection signal, said functional relationship being selected so that said compensation signal, when additively combined with said deflection signal, will compensate said deflection signal for said nonlinear deflection characteristic of said display system; and

means for additively combining said compensation signal and said deflection signal so as to provide a compensated said deflection signal for application to said deflection means.

4,104,567
TELEVISION RASTER WIDTH REGULATION CIRCUIT
John Charles Peer, and David Warren Luz, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.
Filed Jan. 24, 1977, Ser. No. 762,097
Int. Cl.² H01J *29/70, 29/72*
U.S. Cl. 315—387 **19 Claims**



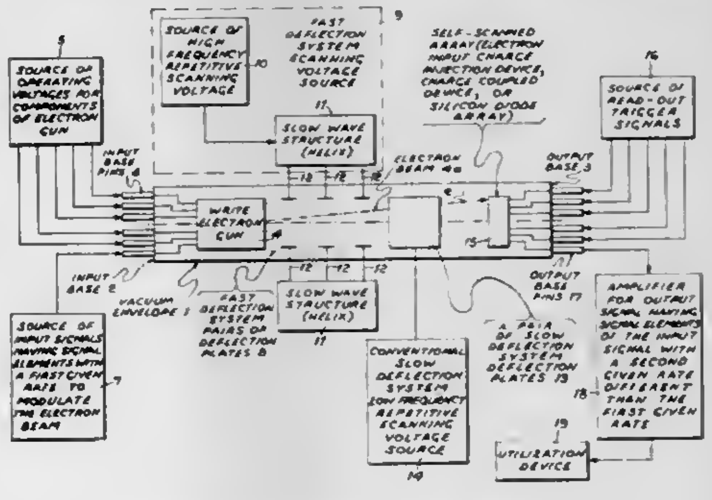
1. A raster width regulation circuit, comprising:

a deflection circuit;

a variable impedance means responsive to a source of unregulated voltage for providing a first direct current voltage to said deflection circuit, said variable impedance means including a variable reactive impedance means coupled to said deflection circuit, said deflection circuit drawing a load current from said variable impedance means which tends to decrease the magnitude of said first direct current voltage; and

first feedback means coupled to said variable impedance means and responsive to said load current for providing a first feedback voltage for increasing the magnitude of said reactive impedance means as said load current increases for further decreasing the magnitude of said first direct current voltage for maintaining a substantially constant raster width.

4,104,568
SCAN-CONVERTER TUBE SYSTEM
Charles Bruce Johnson, Fort Wayne, Ind., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.
Filed Sep. 27, 1976, Ser. No. 726,894
Int. Cl.² H01J *29/70, 29/72*
U.S. Cl. 315—394 **15 Claims**


SOURCE OF OPERATING VOLTAGES FOR COMPONENTS OF ELECTRON GUN
SOURCE OF HIGH FREQUENCY REPETITIVE SCANNING VOLTAGE
FAST DEFLECTION SYSTEM SCANNING VOLTAGE SOURCE
SLOW WAVE STRUCTURE (HELIX)
SELF-SCANNED ARRAY (ELECTRON INPUT CHARGE INJECTION DEVICE, CHARGE COUPLED DEVICE, OR SILICON DIODE ARRAY)
SOURCE OF READ-OUT TRIGGER SIGNALS
INPUT BASE PINS 6
ELECTRON BEAM 4a
OUTPUT BASE 3
WRITE ELECTRON GUN
INPUT BASE 2
VACUUM ENVELOPE 1
FAST DEFLECTION SYSTEM PAIRS OF DEFLECTION PLATES 8
SLOW WAVE STRUCTURE (HELIX)
OUTPUT BASE PINS 17
A PAIR OF SLOW DEFLECTION SYSTEM DEFLECTION PLATES 13
SOURCE OF INPUT SIGNALS HAVING SIGNAL ELEMENTS WITH A FIRST GIVEN RATE TO MODULATE THE ELECTRON BEAM
CONVENTIONAL SLOW DEFLECTION SYSTEM LOW FREQUENCY REPETITIVE SCANNING VOLTAGE SOURCE
AMPLIFIER FOR OUTPUT SIGNAL HAVING SIGNAL ELEMENTS OF THE INPUT SIGNAL WITH A SECOND GIVEN RATE DIFFERENT THAN THE FIRST GIVEN RATE
UTILIZATION DEVICE

1. A scan-converter tube system comprising:

a write electron gun disposed at one end of a vacuum envelope to produce an electron beam modulated by an external input signal having signal elements occurring at a first given rate;
a self-scanned matrix array disposed at the other end of said envelope;
an electron beam deflection system disposed in said envelope between said electron gun and said array to scan said electron beam over said array to store said signal elements in said array, said array providing amplification of said stored signal elements;
said deflection system including
  a fast deflection system disposed along said electron beam to scan said electron beam along lines of said array, and
  a slow deflection system disposed along said electron beam spaced from said fast deflection system to move said electron beam sequentially to successive lines of said array, and
a source of read out signals disposed externally of said envelope, said read out signals being coupled as inputs to said array to read out said signal elements at a second given rate different than said first given rate.

4,104,569
HORIZONTAL DEFLECTION CIRCUIT WITH AUXILIARY POWER SUPPLY

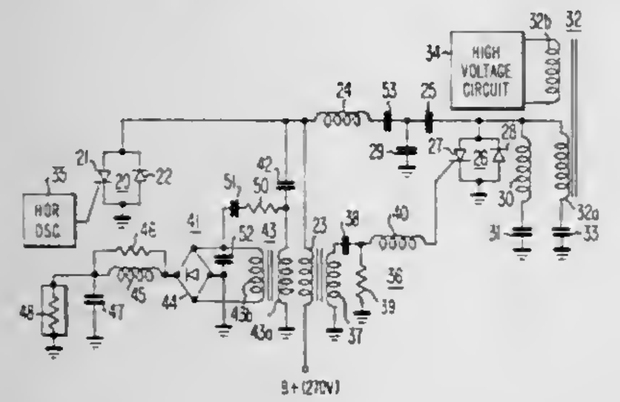
Gerhard Förster, Würenlos, and Walter Bohringer, Schlieren, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,216

Claims priority, application United Kingdom, Apr. 26, 1976, 16868/76

Int. Cl.² H01J *29/70, 29/76*

U.S. Cl. 315—408 **7 Claims**



1. A deflection circuit for a television receiver comprising:
a deflection winding;
first and second controllable switching means coupled to said deflection winding and arranged for conducting during respective first and second portions of each deflection cycle;
reactive circuit means coupled between said first and second switching means, said reactive circuit means comprising an energy storage capacitance coupled to a commutating inductance; and
first damping means coupled to said first switching means for damping transient voltages across said first switching means, said damping means including a first inductance to which said transient voltages are coupled; and a load circuit coupled to said first inductance, the reflected impedance of said load circuit as developed by said first inductance selected to provide substantially all of the transient voltage damping across said first switching means.

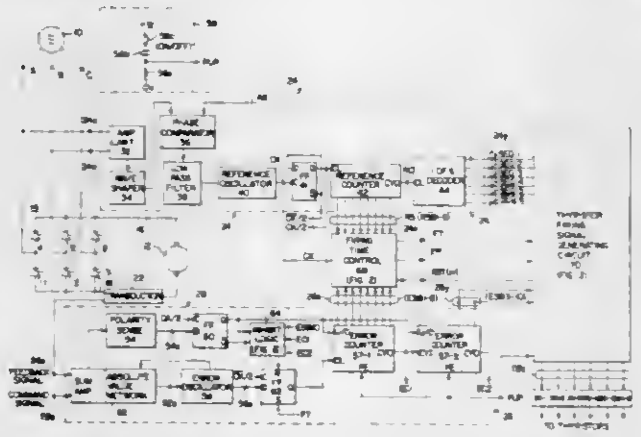
4,104,570
DIGITAL CONTROL SYSTEM FOR MOTORS

Russell Hamby, Euclid, and Kenneth A. Ostrander, Columbus, both of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 12, 1976, Ser. No. 731,642

Int. Cl.² A02P *5/06*

U.S. Cl. 318—318 **36 Claims**



1. A digital d-c motor control circuit comprising:
an a-c input for connection to an a-c source,
a d-c output for connection to a motor,
a controlled rectifier circuit for controlling the flow of power between the a-c input and the d-c output,
a firing control circuit for applying firing signals to the controlled rectifier circuit to control the magnitude and direction of power flow therethrough, said firing control circuit including:
  (a) reference signal generating means for generating a periodic digital reference signal having at least eight bits, the reference signal being maintained in a predetermined phase and frequency relationship to the voltage at the a-c input,
  (b) error signal generating means for generating a digital error signal having a digital value which varies in accordance with the difference between a command signal indicative of the desired value of a motor variable and a feedback signal indicative of the actual value of that motor variable, the error signal having at least two more higher order bits than the reference signal,
  (c) means for applying firing signals to the controlled rectifier circuit within angular ranges determined by said at least two more higher order bits and substantially at times determined by the remaining bits of the error signal and the digital reference signal,
whereby the digital control circuit may control the operation of a motor over both the monitoring and inverting ranges thereof.

4,104,571
PULSE CONTROLLERS

David Gurwicz, and Albert Everett Sloan, both of Gateshead, England, assignors to Sevcon Limited, Gateshead, England

Filed Nov. 16, 1976, Ser. No. 742,227

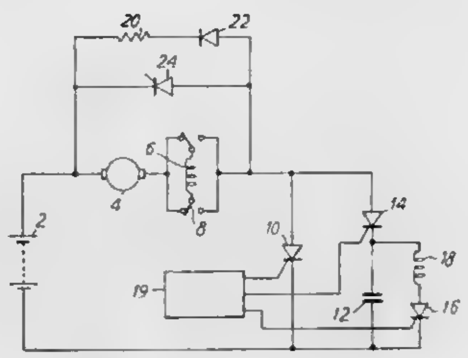
Claims priority, application United Kingdom, Nov. 18, 1975, 47483/75

Int. Cl.² H02P *3/12*

U.S. Cl. 318—380 **16 Claims**

1. A pulse controller for controlling the current supply to a reversible d.c. series motor, comprising semiconductor switching means for connection in series with the d.c. motor and a d.c. supply and adapted repetitively to connect the motor to and disconnect the motor from the d.c. supply, a unidirectional current path connected in use across the motor armature and field windings so that motor current can circulate in the loop including the armature, field windings and current path during interpulse periods when the motor is disconnected from the d.c. supply by the semiconductor switching means, the unidirectional current path containing impedance such that when

the motor is in the plugging mode the current circulating through the said loop decays during the said interpulse periods, a switch means arranged on actuation thereof to short out the impedance in the unidirectional current path, actuating means for actuating the switch means to short out the impedance during interpulse periods at least when the motor is not in the plugging mode, and means for controlling the mark-space ratio of the semiconductor switching means during plugging.



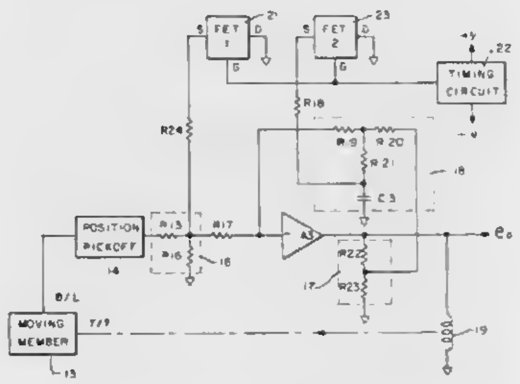
4,104,572
SERVO SYSTEM TEMPORARY DESTABILIZATION CIRCUIT AND METHOD

Richard A. Hanson, Concord, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Apr. 25, 1977, Ser. No. 790,475

Int. Cl.² G05B *11/01*

U.S. Cl. 318—631 **11 Claims**



1. An electrical apparatus for reducing static friction in a mechanical bearing assembly disposed in a housing, which supports a moving member for rotational movement about a pivot axis extending through the mechanical bearing assembly, comprising
  means for urging said moving member toward a reference position about the pivot axis,
  a position pickoff for providing a position signal indicative of the rotational position of the moving member relative to said reference position,
  an amplifier coupled between said position pickoff and said means for urging and having an output and an input, said means for urging, position pickoff, and amplifier thereby forming a servo loop,
  a feedback circuit coupled between said amplifier output and input,
  means for damping said servo loop disposed in said feedback circuit,
  an input divider coupled between said position pickoff and said amplifier input operating to attenuate the input to said amplifier when one leg of said divider is shunted,
  a first field effect transistor connected to shunt said means for damping when conducting,
  a second field effect transistor connected to shunt said one leg of said input divider so that the gain of said loop is attenuated,
  and a timing circuit for enabling said first and second field effect transistors to conduct for a predetermined period of time,
so that when said first and second field effect transistors are enabled by said timing circuit phase lag through said servo loop is increased to more than 180°, thereby producing instability in said servo loop and a substantially symmetrical oscillatory motion of the moving member about said reference position.

4,104,573
SPEED CONTROL DEVICE FOR A MOVING MEMBER

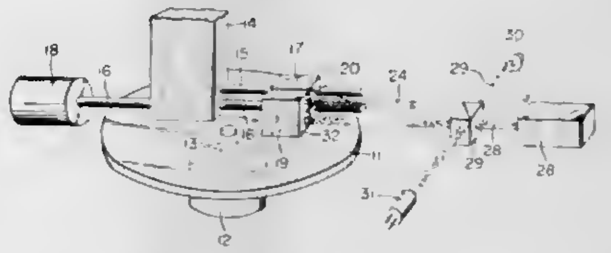
Takeshi Goshima, Tokyo; Yoshinori Sugiura, Kawasaki; Kiyonobu Endo; Hideaki Sato, both of Yokohama, and Kimio Kono, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1975, Ser. No. 612,478

Claims priority, application Japan, Sep. 14, 1974, 49-106343

Int. Cl.² G05B *1/06*

U.S. Cl. 318—640 **6 Claims**



1. An optical head moving apparatus comprising:
a movable base stand (17);
first driving means (18) for moving said movable base stand in predetermined direction at a constant speed;
an optical head (19) to be moved at a constant speed, said optical head having an optical system for projecting a light beam, and light reflecting means;
coupling means (20) coupling said optical head with said movable base stand such that said optical head is movable with respect to said movable base stand while said first driving means is operative to move said movable base stand;
a first position coherent light obtained by irradiation onto said reflection means of a laser beam from a laser beam generator fixedly disposed at a predetermined position;
a second position coherent light obtained by irradiation onto said reflecting of a laser beam from said laser beam generator, said second position coherent light being different in phase from said first position coherent light;
a reference coherent light;
means for forming first and second interference lights by combination of said first and second coherent lights, and said reference coherent light;
first detecting means for detecting said first interference light;
second detecting means for detecting said second interference light;
means for producing sinusoidal waveform of first and second reference signals having a predetermined frequency, resspectively, but different in phase from each other;
first comparison means for comparing the output from said first detecting means with said first reference signal;
second comparison means for comparing the output from said second detecting means with said second reference signal;
means for alternately selecting the output from said first comparison means and the output from said second comparison means in accordance with their amplitude; and
means for applying an output from said selecting means to said second driving means to control same such that the outputs from said first and second detecting means coincide with said first and second reference signals, respectively.

4,104,574

STEPPING MOTOR CONTROL ARRANGEMENT

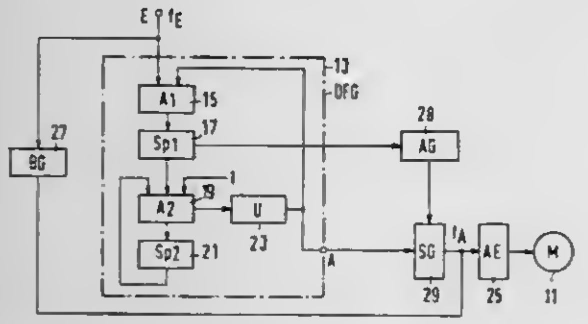
Ulrich Schäff, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 560,403, Mar. 20, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,432

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1974, 2414627

Int. Cl.² H02K ***37/00***

U.S. Cl. 318—696 2 Claims



1. In a control arrangement for driving a stepping motor through a control unit including digital frequency smoothing means, an improved arrangement which permits using such digital frequency smoothing means for a typing head or carriage control of a motor driven typewriter or the like comprising means associated with the digital frequency smoother to cause the first input pulse of an input pulse series supplied thereto to also be supplied directly to the output of the digital frequency smoother and means to suppress the last output pulse from the digital frequency smoother.

4,104,575

CONSTANT CURRENT SEMICONDUCTOR CIRCUIT ARRANGEMENT

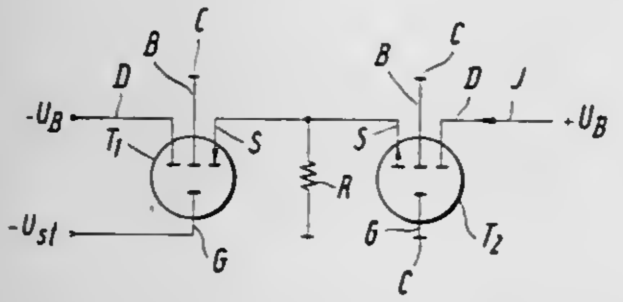
Hubert Bauer, Holzkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,231

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615848

Int. Cl.² G05F ***3/08;*** **H02J** ***1/04***

U.S. Cl. 323—4 7 Claims



1. A constant current circuit arrangement comprising a pair of enhancement type MOSFETs having opposite conductivities relative to each other and including a first input transistor and a second output transistor, each transistor having a source terminal, a gate terminal, a substrate terminal, and a drain terminal, said gate terminal of said first input transistor providing a control input, a control voltage source having a polarity corresponding to the conductivity type of said first input transistor and being connected to said gate terminal of said first input transistor, said drain terminal of said second transistor providing a constant current output, first means interconnecting said source terminals to each other, resistor means connecting said interconnected source terminals to ground, second means connecting said substrate terminals of both transistors and the gate terminal of the second output transistor to ground, an operating voltage source connected to the drain terminals of both transistors in such a manner that the polarities of the operating voltage source correspond to the respective conductivity type of said first and second transistors, whereby said drain current of said second transistor constitutes a constant current proportional to the control voltage of said control voltage source even if the control voltage has a high switching speed.

4,104,576

EQUIPMENT WITH CONTROLLED REACTANCE

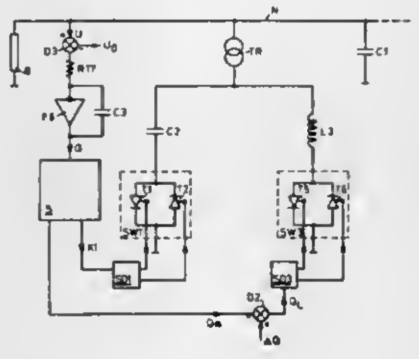
Harry Frank, Västerås, Sweden, assignor to ASEA AB, Västerås, Sweden

Filed Nov. 29, 1976, Ser. No. 745,906

Claims priority, application Sweden, Dec. 1, 1975, 7513475

Int. Cl.² H02J ***3/18***

U.S. Cl. 323—102 7 Claims



1. Power factor correcting equipment for connection to an alternating current network including:
- a transformer with two windings, one winding connected to said network,
- switching means,
- first reactance means rated at reactive power *q* and connected to said other winding including at least one reactance device serially connected to said switching means for rapid connection to and disconnection from said network,
- second reactance means rated substantially at said reactive power *q* and also connected to said other winding including at least one inductor and a control means for continuous control of the reactance of said at least one inductor, and
- second control means responsive to a signal determinative of necessary reactive power for controlling said switching means, for step-wise varying the reactance provided by said first reactance means, and for controlling said control means for continuous control of the reactance contributed by said second reactance means, to provide for overall continuous control of reactance as a function of said signal.

4,104,577

MAGNETIC RESONANCE APPARATUS

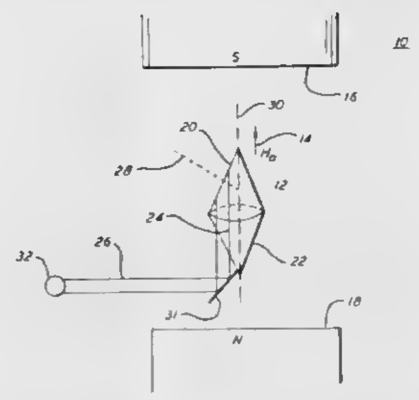
Ivan Anderson Greenwood, Stamford, Conn., assignor to The Singer Company, Little Falls, N.J.

Filed Feb. 2, 1977, Ser. No. 765,135

Int. Cl.² G01R ***33/08***

U.S. Cl. 324—0.5 F 18 Claims

1. In a magnetic resonance apparatus having an alignment axis which is located in and oriented parallel to a unidirectional magnetic field when the apparatus is in operation and an absorption cell intersected by the alignment axis having a plurality of surface elements, each of said plurality of surface elements having a normal, surrounding a hollow cell interior in which a magnetic resonance medium is located, the improvement comprising: the absorption cell having surface elements the normals of which simultaneously form angles of around 55° with lines parallel to the alignment axis.



4,104,578

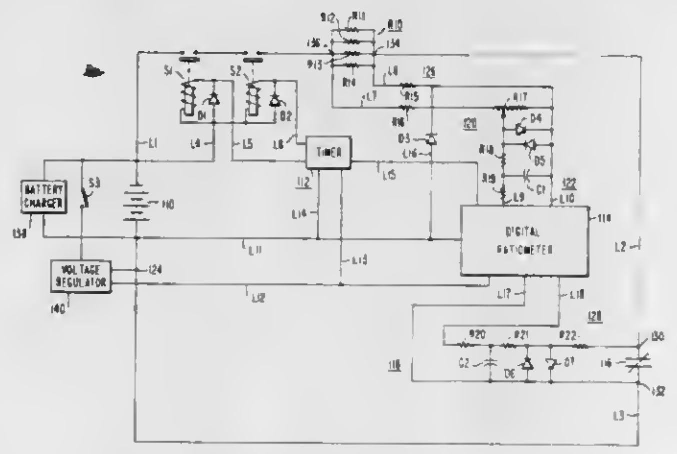
PORTABLE DIGITAL OHMMETER

Michael E. Thuot, Espanola, N. Mex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,686

Int. Cl.² G01R ***31/02***

U.S. Cl. 324—28 CR 10 Claims



1. A portable ohmmeter useful in measuring the resistance of an electrically conducting member comprising:
- a direct current power source;
- a resistive element serially connected to said power source, said resistive element having a resistance greater than the resistance of said conducting member to be measured;
- means for connecting said conducting member in series with said power source and said resistive element to thereby complete a circuit;
- means for sensing the voltage drop across said resistive element;
- means for sensing the voltage drop across said conducting member;
- a digital ratiometer having inputs connected to said conducting member sensing means and said resistive element sensing means, said ratiometer comparing said conductive member voltage drop to said resistive element voltage drop, said ratiometer digitally displaying the ratio of said conducting member voltage drop to said resistive element voltage drop; and
- calibration means for calibrating said ratiometer as a function of the resistance of said resistive element.

4,104,579

METHOD OF EXAMINATION OF PROTECTIVE COATINGS

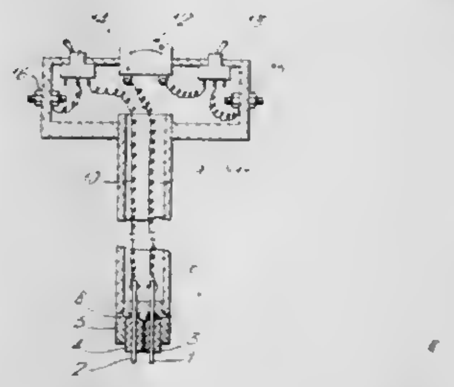
Malcolm Charles McIvor, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1976, Ser. No. 666,933

Claims priority, application United Kingdom, Mar. 27, 1975, 12872/75

Int. Cl.² G01N ***27/42***

U.S. Cl. 324—29 13 Claims



1. A method for detecting the presence of a failure in a protective coating on the interior surface of a metal vessel which comprises causing an electrolyte to make contact with the protective coating, and making comparison of the electric current generated through the electrolyte
- (a) between the metal vessel and a reference-electrode immersed in the electrolyte, and
- (b) between the same reference electrode and a simulation-electrode immersed in the electrolyte and having a working surface of the same metal as that of the metal vessel said reference electrode and simulation-electrode simultaneously contacting said electrolyte.

4,104,580

STORAGE BATTERY TEST APPARATUS TO DETERMINE REMAINING STORED CHARGE THEREIN

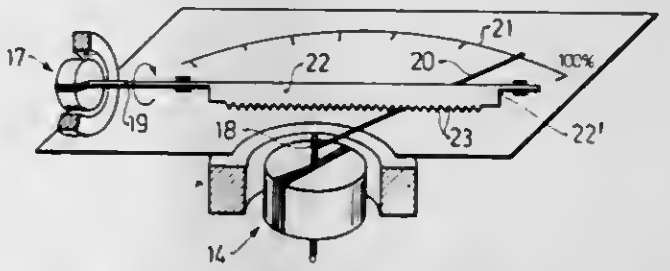
Josef Juhasz, Möglinegen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 28, 1976, Ser. No. 727,951

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545086

Int. Cl.² G01N ***27/42***

U.S. Cl. 324—29.5 7 Claims



1. Storage battery test apparatus to determine the remaining storage capacity of the battery (10) comprising
- a volt meter (14) having a needle (20) and voltage connection means to connect said volt meter across the battery terminals (12, 13);
- a standard load (11) and power connection means (15) to connect the standard load across the battery terminals (12, 13);
- a current sensing means (16, 17) including an ammeter (17) and current connection means to connect the current sensing means into the power connection means and hence into the battery — standard load circuit,
- and a meter arresting device (22, 22', 23) mechanically coupled to the volt meter (14) and controlled by the ammeter

to arrest movement of the volt meter needle (20) under current sensing conditions of current flow other than current flow at a predetermined test current range, the ammeter sensing when a predetermined current flows from the battery (10) to the standard load, and controlling the volt meter to then provide an output indication which will be representative of the remaining charge stored in the battery.

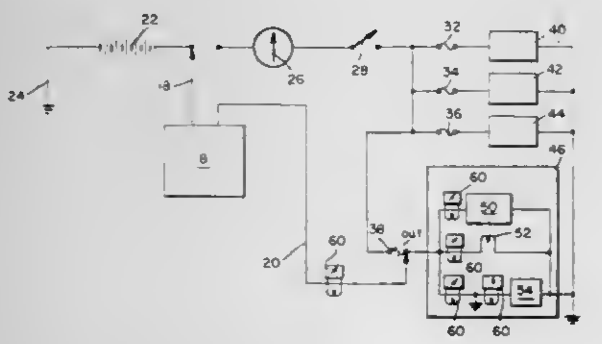
4,104,581
METHOD UTILIZING AN AUTOMATIC RESETTABLE CIRCUIT BREAKER FOR LOCATING GROUND FAULTS IN A VEHICLE

Steven Arkosy, 463 Elevado Terrace, Monterey Park, Calif. 91754

Filed Nov. 1, 1976, Ser. No. 737,603

Int. Cl.² G01R *31/08*

U.S. Cl. 324—52 1 Claim



1. A method for locating a grounded fault in a vehicle having a plurality of protected electrical circuits energized by a battery comprising the steps of,

first disconnecting the battery hot terminal leaving only the grounded terminal of the battery connected,

connecting an automatic resettable circuit breaker across the free hot terminal of the battery and the load side of each of the pluarlity of protected circuits under test individually one by one,

selecting a protected circuit under test showing evidence of sparking when connecting the circuit breaker while maintaining the connection of the circuit breaker across the hot terminal and the load side of the protected circuit under test showing evidence of sparking,

then moving an induction current measuring ammeter over the selected protected circuit under test showing evidence of sparking without disturbing said circuit and detecting a varying current, and

then locating the grounded fault by noting the immediate absence of detected varying current.

4,104,582
SYSTEM FOR LOCALIZING A SPOT ALONG A CONDUCTOR IN WHICH AN IMPEDANCE CHANGE SUCH AS A BREAK OR SHORT CIRCUIT OCCURS

Ejvind Lambertsen, Fredericia, Denmark, assignor to i. c. møller a/s, Denmark

Filed Dec. 20, 1976, Ser. No. 752,192

Claims priority, application United Kingdom, Dec. 24, 1975, 52789/75

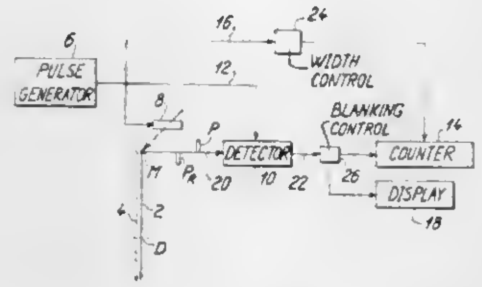
Int. Cl.² G01R *31/11*

U.S. Cl. 324—52 12 Claims

6. A system for localizing a spot along an electric conductor in which an impedance change such as a break or a short circuit has taken place, comprising:

pulse generator means for transmitting a series of electric pulse trains to the conductor from one end thereof, each of said pulse trains comprising a series of pulses of individual widths ranging between a minimum width corresponding to the pulse running to and back again from a conductor point relatively close to said conductor end and a maximum width corresponding to the pulse running to and back again from at least a point near the opposite end of the conductor length to be supervised;

detector means for detecting the return of a pulse front reflected from said spot when this pulse front reception coincides substantially with the termination of the individual pulse from said pulse train giving rise to the reflection of said pulse front and generating an output response; and



pulse identification means connected to said pulse generator means and said detector means for producing information selectively indicative of the single individual pulses of each of said pulse trains, said pulse identification means producing information identifying the pulse giving rise to said detector response in accordance with a signal from said detector means so that the time interval between the transmission and the reception of the reflected pulse may be determined and the position of said spot from which said pulse was reflected may be located.

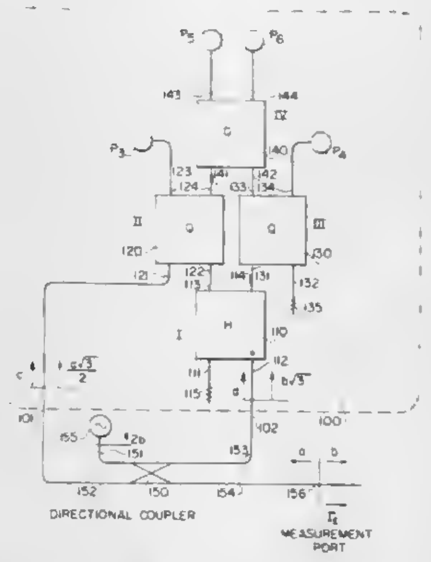
4,104,583
SIX-PORT MEASURING CIRCUIT

Glenn F. Eogen, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 31, 1977, Ser. No. 829,381

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58 A 21 Claims



17. A six-port measuring network comprising:

first, second, third, and fourth hybrid means;

an input port connected to said first hybrid means;

a second input port connected to said second hybrid means;

a first measuring port connected to said second hybrid means;

a second measuring port connected to said third hybrid means; and

third and fourth measuring ports connected to separate terminals of said fourth hybrid means.

4,104,584
MOISTURE CONTENT METER

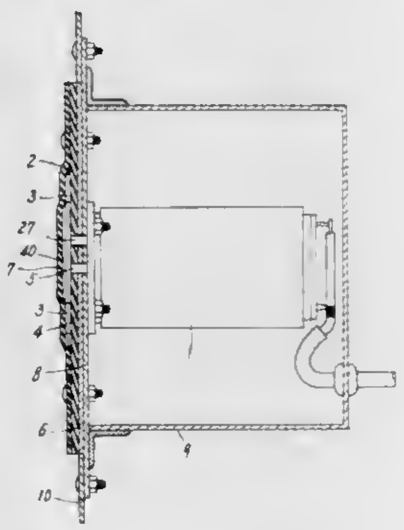
Yukio Miyai, Osaka; Takeshi Kojo; Junichi Takahashi, both of Kyoto; Satoshi Yoshioka, Nagaokakyo; Kensuke Nakamichi, Ibaraki; Kozo Okada, Osaka, and Setsuko Takeda, Muko, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 2, 1977, Ser. No. 764,864

Claims priority, application Japan, Feb. 6, 1976, 51-12530

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 R 4 Claims



1. A moisture content meter comprising

a microwave generator for generating a microwave signal of a constant power level,

a microstrip transmission line connected in a manner to receive at one end thereof the microwave signal from said microwave generator and disposed on one side of a sample body to be measured so as to substantially contact the surface thereof and

a microwave detector connected in a manner to detect the power level of the microwave signal taken out from the other end of said microstrip transmission line, the difference in power lines at the opposite ends of the microstrip reflecting the moisture content of the body.

4,104,585
MEASUREMENT OF IMPURITY CONCENTRATION IN LIQUIDS

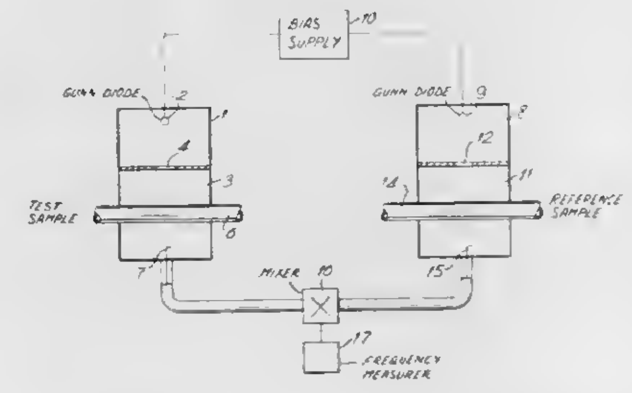
John Wardman Schofield, Hitchin, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 590,822, Jun. 26, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,923

Claims priority, application United Kingdom, Dec. 23, 1974, 55455/74

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 C 5 Claims



1. Apparatus for the measurement of the concentration of impurities in liquids comprising two microwave cavity resonators, two microwave generators each coupled to a respective cavity resonator, means for enabling a standard sample of liquid to be coupled to one of the resonators to affect the resonant frequency thereof, means for enabling a sample of liquid under test to be coupled to the other resonator to affect the resonant frequency thereof, and means for mixing the outputs from the resonators to derive a difference frequency dependent on the difference in concentration of impurities in the two samples.

4,104,586
APPARATUS FOR INDICATING THE SEQUENCE OF ALTERNATING CURRENT SIGNALS

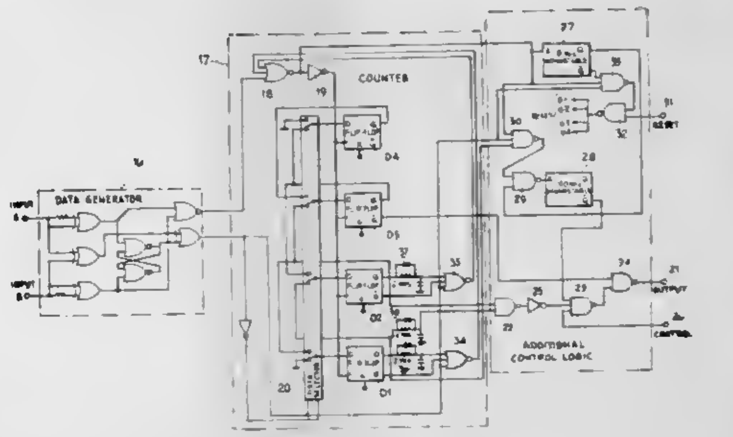
Adrian Orton Newbould; Edward Piper Walker, both of Stafford, and Anthony Williams, Newport, all of England, assignors to The General Electric Company Limited, London, England

Filed Nov. 22, 1976, Ser. No. 744,087

Claims priority, application United Kingdom, Dec. 1, 1975, 49229/75

Int. Cl.² G01R *25/00*

U.S. Cl. 324—83 D 14 Claims



1. An apparatus for indicating the sequence of a pair of alternating current input signals comprising:

first means which produces an output having a first value when the two input signals are of the same polarity and a second value when the two input signals are of opposite polarity, to thereby indicate in respect of each datum crossing in both input signals the sense of that datum crossing with respect to the polarity of the other input signal at the time of that datum crossing;

second means which produces an output which assumes or remains at a first value in response to each datum crossing in one input signal and assumes or remains at a second value in response to each datum crossing in the other input signal; and

third means responsive to the output of said second and first menas which produces an output having a first value when the outputs of the first and second means both have their first values or both have their second values, and having a second value when the output of one of said first and second means has its first value and the other its second value, the output of the third means thereby having one value when one input signal lags the other, and its other value when that one input signal leads the other.

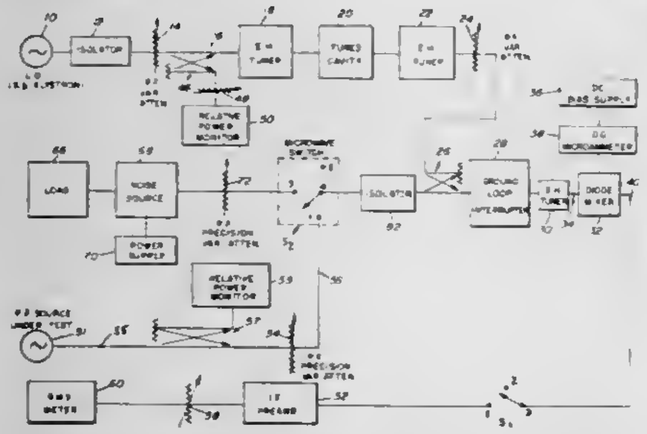
4,104,587
BANDWIDTH SUBSTITUTION METHOD AND SYSTEM FOR ABSOLUTE MEASUREMENT OF POWER AT ALL RADIO FREQUENCIES

Abraham Singer, Silver Spring, and Jan M. Minkowski, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 3, 1976, Ser. No. 692,270

Int. Cl.² G01R *21/00*

U.S. Cl. 324—95 **10 Claims**



1. A method for measuring coherent as well as incoherent (or noise) rf power from an rf source connected to a measuring system, the steps comprising:
- measuring the i.f. noise bandwidth (B) of the system;
- determining the temperature (T_o) of the system;
- measuring the system noise factor by using a noise source;
- measuring the system noise factor by using the rf source under test; and
- calculating the rf power from a source under test according to the formula

$$P = \frac{kT_o b}{AI}\,\frac{2N-I}{Y-I} + 1$$

wherein:
- Y is the Y-factor determined in the system noise factor measurement by use of the noise source;
- N is the available excess noise power;
- k is Boltzmann's constant;
- I is the insertion loss; and
- A is the numerical value of an attenuator setting in measuring the system noise factor in terms of the unknown available power from the rf source under test, taking into account losses and attenuation.

4,104,588
TAMPER PREVENTION APPARATUS FOR WATT-HOUR METER

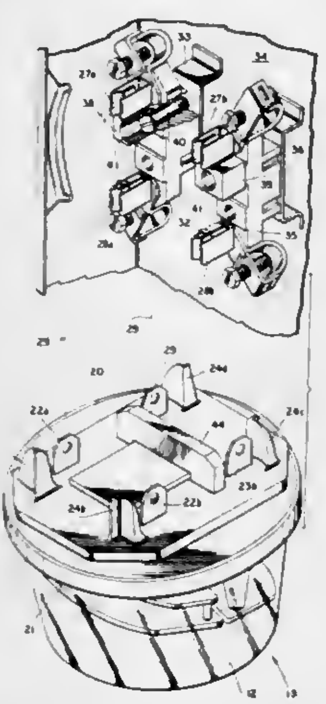
Wyman Westberry, St. Mary's, Ga. 31558

Filed Jan. 28, 1977, Ser. No. 763,360

Int. Cl.² G01R *11/24, 1/04;* H01R *13/20*

U.S. Cl. 324—110 **6 Claims**

4. Apparatus for tamperproofing a conventional electrical watt-hour meter of the type which has symmetrically disposed line contacts and load contacts, and which can conventionally be engaged in either of two operative modes with a converted meter box having symmetrically disposed line contacts and load contacts, said apparatus comprising:
- at least one meter box obstruction member separate from and securable within said meter box in predetermined asymmetrical relation to said contacts within the meter box; and
- a meter obstruction member separate from and securable to said meter in predetermined complementary asymmetrical relation to said meter contacts and in predetermined position to engage said meter box obstruction member, so as to prevent engagement of said contact means in only one of said operative modes.



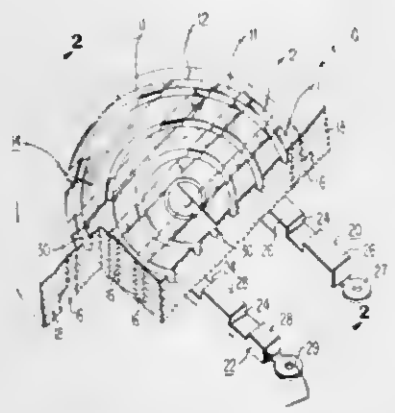
4,104,589
CHUCK FOR USE IN THE TESTING OF SEMICONDUCTOR WAFERS

Robert Lee Baker, Conyngham; Calvin Michael Mahoski, Hazleton; John David Partilla, Wilkes-Barre, and Harold Robert Ronan, Jr., Mountaintop, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,332

Int. Cl.² G01R *31/02, 31/22;* H01B *13/00*

U.S. Cl. 324—158 F **13 Claims**



1. A chuck having a wafer receiving surface for testing semiconductor wafers comprising:
- a first and a second plurality of electrically conductive members, said members being alternately arranged and substantially electrically isolated from each other;
- means for retaining said members together such that said wafer receiving surface is provided;
- means electrically connecting said first plurality of members together;
- means electrically connecting said second plurality of members together;
- means for attaching power and sensing means to said first and second members connecting means, respectively; and
- means, integral with said chuck for holding a semiconductor wafer to said wafer receiving surface.

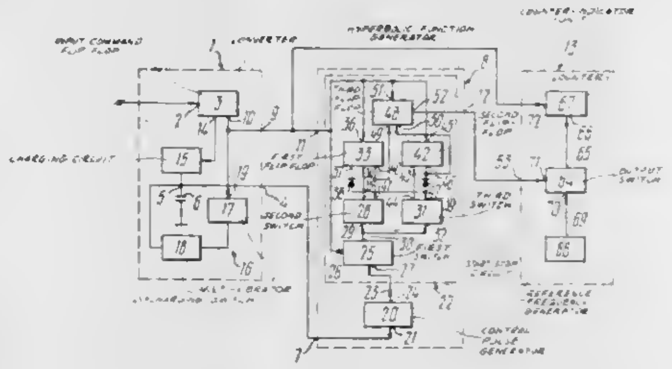
4,104,590
DIGITAL DEVICE FOR MEASURING INSTANTANEOUS PARAMETER VALUES OF SLOWLY VARYING PROCESSES

Sergel Vasilievich Zhevnerov, ulitsa Geroev Sibiryakov, 30, kv. 103, Voronezh, U.S.S.R.

Filed Nov. 30, 1976, Ser. No. 746,005

Int. Cl.² G01P *3/48*

U.S. Cl. 324—166 **12 Claims**



1. A digital device for measuring instantaneous parameter values of slowly varying processes, comprising:
- a time-to-voltage converter having an input, a first output and a second output;
- an input command flip-flop of said converter having two outputs and
- a counting input which is connected to the input of the converter and to an input of the device, a first of said outputs being connected to said second output of said converter;
- a capacitor of said converter having
- a leadout connected to said first output of said converter;
- a charging circuit having an input connected to said second output of said input command flip-flop and an output connected to said leadout of said capacitor;
- a discharging circuit having an input connected to a first output of said input command flip-flop and
- an output connected to said leadout of said capacitor;
- a hyperbolic function generator having
- a control input connected to said leadout of said capacitor and
- a command input connected to said second output of said converter;
- a controlled pulse generator, with a linear modulation characteristic of said hyperbolic function generator, having
- an input connected to the control input of said hyperbolic function generator;
- a start-stop circuit of said hyperbolic function generator having
- a first input connected to an output of said pulse generator,
- a second input connected to the command input of said hyperbolic function generator, and
- an output connected to the output of said hyperbolic function generator; and
- a counter-indicator unit having an input connected to said output of said hyperbolic function generator.

4,104,591
METHOD OF ADJUSTING A PERMANENT MAGNET BY USING A HYPOTHETICAL DEMAGNETIZATION CURVE LOWER THAN THE ACTUAL VALUE

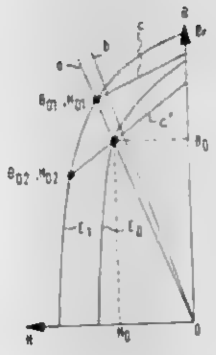
Hans-Werner Reüting, Peine, Fed. Rep. of Germany, assignor to Elmeg Elektro-Mechanik GmbH, Peine, Fed. Rep. of Germany

Filed Aug. 2, 1976, Ser. No. 710,455

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 2534419

Int. Cl.² G01R *33/12*

U.S. Cl. 324—205 **23 Claims**



1. Method of providing a permanent magnet with a particular magnetization, comprising the steps of:
- providing a particular load condition for the magnet, which includes a parallel shunt for the magnet, the magnetic permeance of the magnet and of the shunt together exceeding the sum of a magnetic permeance of any additional load or load relief on the manget during subsequent use;
- selecting a particular operation point in a hypothetical magnetic flux/field diagram which is inside of all actual demagnetization curves for magnetizable material from which the magnet is made, said operating point being determined based upon said particular load condilion of the magnet, and providing a signal representation thereof;
- magnetizing the magnet to establish a permanent magnetic state, the magnet obtaining therewith a particular demagnetization curve which does not include said point;
- stepwise reducing the resulting permanent magnetization by particular demagnetization steps;
- measuring a parameter indicative of the permanent magnetization in between the steps of the stepwise reducing "and comparing this parameter with the signal representation to determine" whether the particular operating point is approached said measuring being along a load characteristics for the magnet corresponding to magnetic flux extraction not larger than during normal load conditions during subsequent use of the magnet; and
- terminating the stepwise reducing when the said point has been reached at least approximately.

4,104,592
REMOTE CONTROL OF A MOBILE UNDERGROUND MACHINE, PARTICULARLY IN A MINE

Walter Rätz, Gelsenkirchen, and Werner Lindemann, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,528

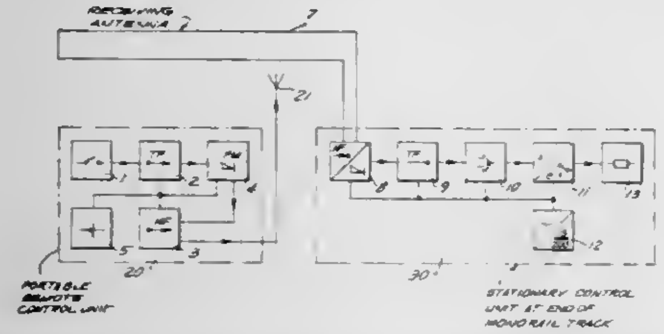
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612368

Int. Cl.² H04B *1/00, 7/26*

U.S. Cl. 325—37 **4 Claims**

1. In combination with a mobile underground machine driven by an external stationary prime mover, the travelling underground machine having a substantially closed passenger compartment, a control arrangement therefor, the control arrangement comprising, in combination, a portable remote

control unit including a multi-step self-locking master switch having a plurality of settings corresponding to different control signals for the control of the prime mover and provided with a dead man's button for preventing unintentional generation of control signals, and an emergency stop switch for generating a stop signal for the prime mover, means for generating audio-frequency control signals corresponding to the settings of the master switch, means for frequency-modulating the control signals onto a high-frequency carrier, and a U-shaped ferrite transmitting antenna for transmitting the thusly modulated carrier out into space, an insulated conductor loop antenna extending along the path of travel of the mobile underground machine for receiving the thusly modulated carrier from the transmitting antenna of the portable remote control unit when the latter is being used from outside the passenger compartment of the machine; a stationary control unit electrically connected to the conductor loop antenna and including means for receiving the thusly modulated carrier signal, demodulating the latter so as to recover the control signals, decode the control signals and in dependence upon the decoded control signals correspondingly control the operation of the prime mover of the mobile underground machine; an exterior ferrite rod transmitting antenna mounted on the mobile underground machine exteriorly of the passenger compartment; a holder inside the passenger compartment for holding the portable remote control unit when the human operator of the portable remote control unit is riding in the passenger compartment of the machine; and coupling means for coupling the transmitting antenna of the portable remote control unit when the latter is inside the passenger compartment to the exterior transmitting antenna, the coupling means comprising a high-frequency coupling circuit consisting of passive circuit components not requiring a separate electrical energy supply.


RECEIVING ANTENNA
7
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11
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12
30
PORTABLE REMOTE CONTROL UNIT
STATIONARY CONTROL UNIT AT END OF MONORAIL TRACK

4,104,593
RECEIVER CIRCUIT INCLUDING AN HYSTERESIS CIRCUIT FOR USE WITH A REMOTE CONTROLLER

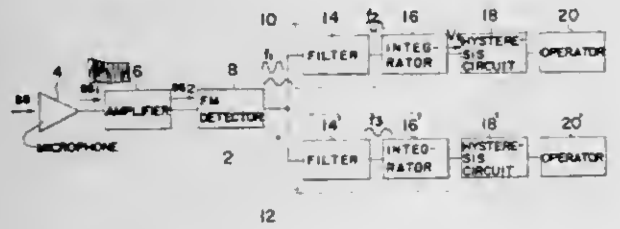
Toshio Orii, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,369

Claims priority, application Japan, Oct. 28, 1975, 50-147539[U]

Int. Cl.² H04B *1/16*

U.S. Cl. 325—392 **14 Claims**



1. A remote controller for controlling telecommunication devices having a transmitter unit separately provided for said telecommunication device for producing a carrier sound signal of high frequency carrying a remote control signal and a receiver unit incorporated in said telecommunication device for operating various tuning devices in said telecommunication device upon receipt of said carrier signal from said transmitter, said receiver unit comprising;

(a) a converter means for converting a received carrier sound signal into an electrical signal;

(b) a hysteresis circuit connected to said converter means for receiving said electrical signal, said hysteresis circuit comprising means for producing one of a first or second output level signals wherein the first output level signal when the level of the input signal applied to said hysteresis circuit is higher than a second predetermined level which is higher than a first predetermined level and the second output level signal when the level of the input signal applied to the hysteresis circuit is less than the first predetermined level; whereby during an increase of the input signal level to said hysteresis circuit, the output therefrom is maintained at the second output level until the input signal thereto increases above said second predetermined level, and during a decrease of the input signal level to said hysteresis circuit, the output is maintained at the first output level until the input signal thereto decreases below said first predetermined level and

(c) an operating circuit for operating said tuning device upon receipt of the output signal of said hysteresis circuit.

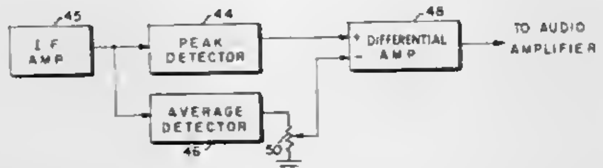
4,104,594
MODIFIED A. M. DETECTOR

Alfred J. Cann, Wilton, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 1, 1976, Ser. No. 719,560

Int. Cl.² H04B *1/12;* **H03D** *1/04*

U.S. Cl. 325—475 **13 Claims**



1. An a.m. receiver, comprising:

an input for receiving amplitude modulated desired and interfering signals;

an average detector coupled to said input, said average detector being used for detecting amplitude modulation on the desired signals while ignoring amplitude modulation on the interfering signals, and having a time constant short compared to the periods of the frequencies of the amplitude modulation; and

means for utilizing the amplitude modulation of the desired signals, said utilization means being coupled to said average detector.

4,104,595
SIGNAL TRANSLATING CIRCUIT FOR VARIABLE AREA CAPACITIVE PRESSURE TRANSDUCER

John Kenneth Overzet, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,381

Int. Cl.² G01M *27/00;* **H03F** *1/00*

U.S. Cl. 328—1 **2 Claims**

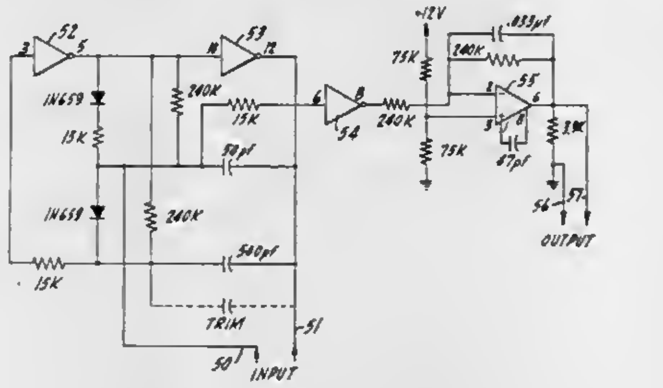
1. The combination of a variable area capacitive transducer of the type having two electrodes abutting each other, with a thin-film layer applied to one of the electrodes as a dielectric layer, and a signal translating circuit comprising:

an astable multivibrator circuit for providing a square-wave output signal;

a capacitor, connected in the multivibrator circuit to determine the duty cycle of the square-wave signal;

a first conductor coupled between one of the transducer electrodes and one plate of said capacitor, and a second conductor coupled between the other transducer electrode and the other plate of said capacitor, to modify the duty cycle of the output signal as a function of a change in the effective capacity of the transducer;

an integrating circuit connected to receive the square-wave signal and to provide a d-c signal which varies with the variations in the duty cycle of the received square-wave signal; and



a pair of output conductors connected to pass the d-c signal from the integrating circuit to associated equipment.

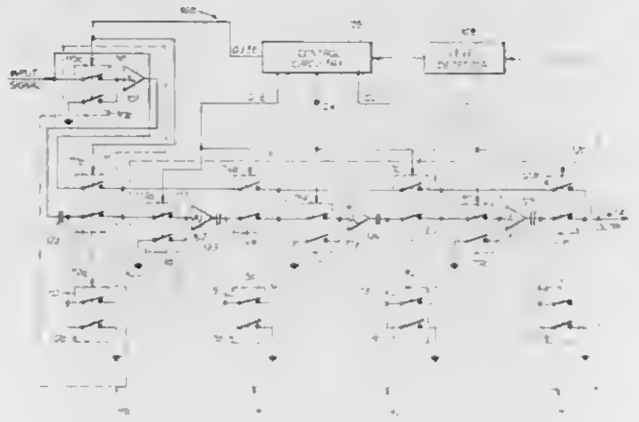
4,104,596
INSTANTANEOUS FLOATING POINT AMPLIFIER

Miles A. Smither, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Dec. 10, 1976, Ser. No. 749,218

Int. Cl.² H03F *1/00*

U.S. Cl. 330—9 **5 Claims**



1. An instantaneous floating point amplifier for ammplifying an input signal to a level within preselected limits, which comprises:

a plurality of n cascaded amplifier stages, wherein each amplifier stage includes an operational amplifier and wherein the gain, A_i, of the ith stage is given by the expression $A_i = (A_{i-1})^2$, for $i=2, 3, \ldots, n$, and where A_1 is the gain of the amplifier stage have the least gain of the n stages;

a level detector coupled to the output of the cascaded amplifiers for producing an output signal indicative of the voltage level of the signal at the output of the cascaded stages; and

control circuitry for generating signals to sequentially enable each stage of amplification, said control circuitry responsive to the output signal produced by the level detector following enablement of each stage to retain that stage if it is required to amplify the input signal to a level within predetermined limits and to bypass that stage, if it is not required to amplify the input signal to a level within predetermined limits.

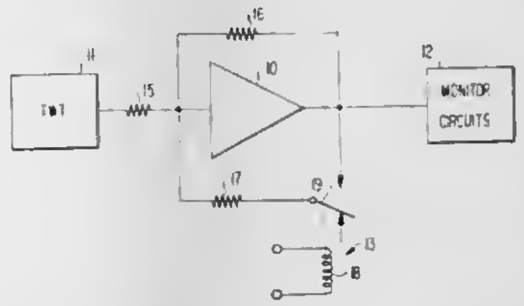
4,104,597
VARIABLE SENSITIVITY MONITOR CIRCUIT

Nelson Mortimer Jacobus, Jr., Kensington, Md., assignor to Communications Satellite Corp., Washington, D.C.

Filed Feb. 1, 1977, Ser. No. 764,608

Int. Cl.² H03F *3/58*

U.S. Cl. 330—43 **5 Claims**



1. In a process or equipment of the type wherein process or equipment conditions are monitored to detect an abnormal condition and wherein when said process or equipment is first started up or turned on, a transient having a magnitude substantially larger than the steady-state monitored condition limits is normally produced, the improvement comprising:

a gain switched device adapted to be connected between a monitored device a monitor circuit for detecting said abnormal condition of the monitored device, and

means actuated at start-up or turn-on of the monitored device for controlling said gain switched device to decrease the gain thereof during said transient and thereafter increase the gain of said gain switched device to a normal steady-state level thereby changing the sensitivity of the monitor circuit during the transient period from that during normal steady-state operation, said gain being decreased at start-up or turn-on by an amount sufficient to prevent expected transients normally encountered at start-up or turn-on from falsely indicating an abnormal condition, while allowing abnormal transients to be recognized during turn-on or start-up.

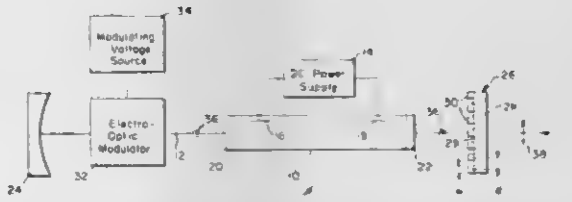
4,104,598
LASER INTERNAL COUPLING MODULATION ARRANGEMENT WITH WIRE GRID POLARIZER SERVING AS A REFLECTOR AND COUPLER

Richard L. Abrams, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 9, 1975, Ser. No. 584,788

Int. Cl.² H01S *3/10*

U.S. Cl. 331—94.5 M **4 Claims**



1. A laser modulation arrangement comprising:

a laser medium disposed along a predetermined axis;

means for exciting said laser medium to a condition of population inversion;

a reflective element spaced from one end of said laser medium along said axis and a wire grid polarizer spaced from the other end of said laser medium along said axis in such manner as to constitute a laser optical cavity for stimulating the emission of laser radiation from said medium along said axis;

an electrooptic modulator disposed along said axis within said laser optical cavity and responsive to an applied voltage to change the plane of polarization of said laser radiation traversing said modulator by an angle dependent upon the magnitude of said applied voltage; and

means for applying a modulating voltage to said modulator.

4,104,599
CRYSTAL OSCILLATING CIRCUIT

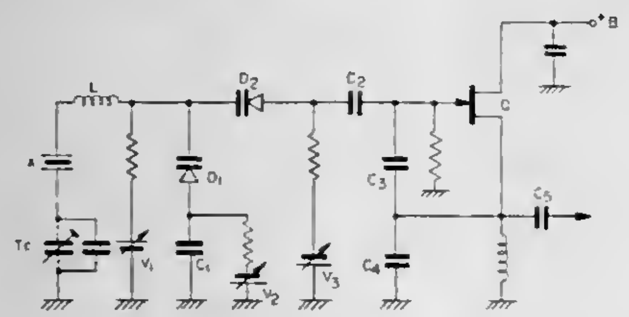
Masatoshi Tagawa, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,897

Claims priority, application Japan, Apr. 20, 1976, 51-49516[U]

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 R **5 Claims**



1. A quartz crystal variable frequency oscillation circuit comprising

an active oscillation element;

a quartz crystal resonant element connected to said active oscillation element;

first and second variable capacity diodes respectively connected in series and in parallel with said quartz crystal resonant element; and

variable control voltage means connected to said first and second variable capacity diodes for applying variable control voltages to said variable capacity diodes and thereby varying the frequency of said oscillation circuit so that the amplitude of the output from said oscillation circuit remains substantially constant over a broad frequency range.

4,104,600
INTEGRATED ABSORPTIVE POWER LINE FILTERS

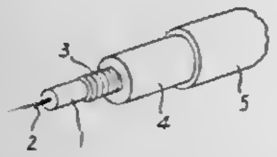
Ferdy P. Mayer, 18 rue Thiers, 38000 Grenoble, France

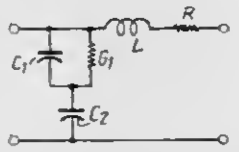
Filed Oct. 5, 1976, Ser. No. 729,628

Claims priority, application France, Oct. 6, 1975, 75 30476

Int. Cl.² H04B *3/28;* H01H *7/14;* H01P *1/00*

U.S. Cl. 333—79 **4 Claims**





1. A low-pass filter having a coaxial cable structure and including at least four layers, comprising:

(a) a lossy magnetic core,

(b) a single layer winding of closely spaced conductive wire surrounding said core,

(c) a special magnetic layer surrounding said winding, and

(d) a conductive outer sheath surrounding said magnetic layer and adapted to be connected to a ground terminal,

wherein the magnetic effects of the core and of the special magnetic layer are of the high frequency absorptive type through magnetic and dielectric losses, and the outer layer is so formed as to comprise a conductive path to ground great enough to introduce an important ground conductance with a resistivity sufficient to admit the penetration of currents and fields at frequencies equal to or higher than the maximum utilization frequency.

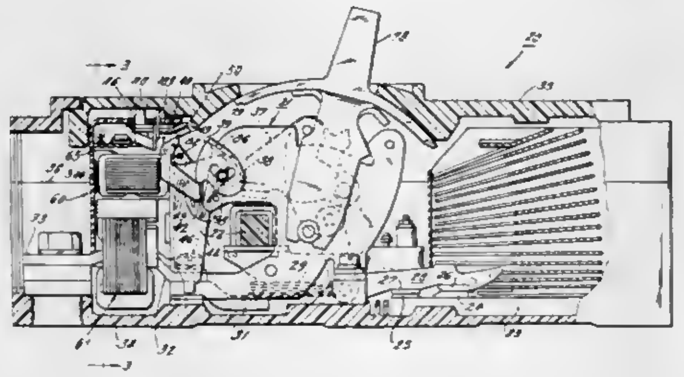
4,104,601
DIRECT FAULT TRIPPING OF CIRCUIT BREAKER HAVING SOLID STATE TRIP MEANS

Carl E. Gryctko, Bellefontaine, Ohio, assignor to I-T-E Imperial Corp., Spring House, Pa.

Filed Apr. 12, 1976, Ser. No. 675,970

Int. Cl.² H01H *71/24, 73/00*

U.S. Cl. 335—6 **4 Claims**



1. A circuit breaker including cooperating contact means; main conductor means in series with said contact means; an operating mechanism operatively connected to said contact means; a latch means normally maintaining said mechanism latched in position for opening and closing said contact means; first means for monitoring currents flowing in said main conductors means; second means including solid state circuitry for processing signals generated by said first means; third means for releasing said latch means to automatically trip said mechanism thereby opening said contact means responsive to a trip signal generated by said second means when fault currents of predetermined magnitude and character flow in said main conductor means; said third means being operatively constructed and positioned relative to said main conductor means so that as a result of magnetic coupling, magnetic flux generated by severe fault currents flowing in said main conductor means acts directly on said third means for actuating the latter to release said latch means prior to receipt of said trip signal by said latch means; said third means including an operating means, spring means urging said operating means to a trip position for releasing said latch means, permanent magnet means for holding said operating means in a latched position against force exerted by said spring means, and an actuating coil operatively positioned whereby current flowing therein generates a flux which bucks flux of said permanent magnet whereby said permanent magnet releases said operating means when said trip signal is applied to said third means; and magnetic director means operatively positioned to control direct magnetic coupling between said main conductor means and said permanent magnet.

4,104,602
PNEUMATIC TIMER

Teizo Fujita, Ibaraki; Shunzo Yoshida, Takatsuki, and Toshio Koizumi, Kashihara, all of Japan, assignors to Izumi Denki Corporation, Osaka, Japan

Filed Dec. 7, 1976, Ser. No. 748,368

Claims priority, application Japan, Apr. 5, 1976, 51-38411

Int. Cl.² H01H *7/03*

U.S. Cl. 335—61 **29 Claims**

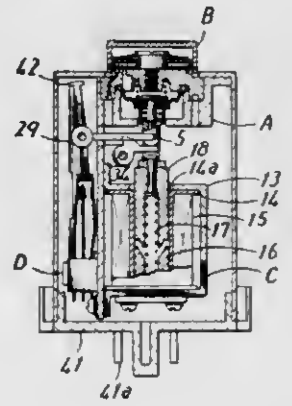
1. A pneumatic timer, comprising:

a pneumatic timing mechanism including displacement means adapted to be displaced in a predetermined direction from an initial position to a displaced position with a time characteristic determined as a function of a pneumatic resistance;

means for providing an input signal;

means operatively coupled to said displacement means for normally urging said displacement means toward said initial position and for allowing displacement of said displacement means in said predetermined displacement direction in response to said input signal;

contact means provided laterally of at least one of said timing mechanism and said displacement allowing means and operatively coupled to said displacement means and responsive to displacement of said displacement means for effecting a switching operation for generating an output signal;



said contact means including a first cam rotatably provided in association with the displacement of said displacement means, said first cam comprising one arm operatively coupled to said displacement means and the other arm extending in the direction perpendicular to said one arm; and

a first leaf contact member extending in the same direction as said predetermined displacement direction and operatively coupled to the other arm of said first cam, whereby said leaf contact member is switch operated in association with rotation of said first cam.

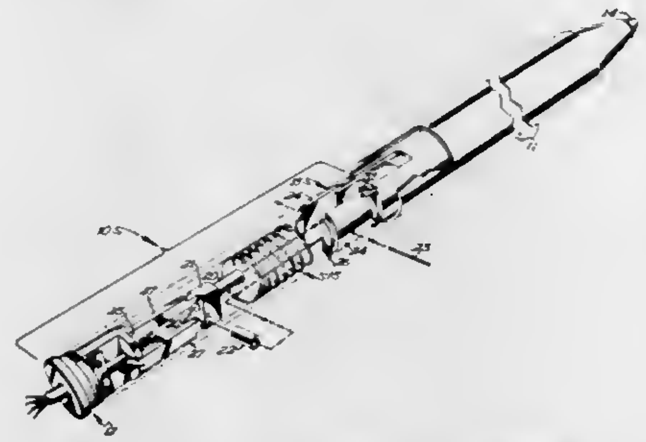
4,104,603
TACTILE FEEL DEVICE

Jay A. Wheeler, Minneapolis; Henry L. Miszkiewicz, Minnetonka; Ronald O. J. Lindberg, Hopkins, and James A. Willmore, Eden Prairie, all of Minn., assignors to HEI, Inc., Chaska, Minn.

Filed Feb. 16, 1977, Ser. No. 769,051

Int. Cl.² H01F *7/04;* H01H *5/02*

U.S. Cl. 335—306 **8 Claims**



1. In a tactile feel device utilizing axial compressive movement resisted by biasing means and magnetic force to achieve suitable resistance to movement and breakaway feel, and having an actuator member coaxially and reciprocally disposed with respect to a fixed member, thereby defining an overall stroke for said device, a magnet mounted to one of said members, a magnetically attractable element mounted to the other of said members, and means biasing said members coaxially apart causing said magnet to engage said magnetically attractable element, the improvement comprising:

a. means mounting said magnet to said one member and mounting said magnetically attractable element to said other member, to permit limited axial sliding movement of said magnet with said magnetically attractable element engaged therewith, relative to one of said members, thereby defining initial stroke; and

b. means for limiting the length of said initial stroke to less than the length of said overall stroke, whereby axial compressive actuator movement is resisted only by said biasing means the distance of said initial stroke, whereby said movement is resisted by said biasing means plus said magnetic force at the end of said initial stroke, and whereby the magnetically attractable element and magnet are disengaged for the balance of the distance of said overall stroke.

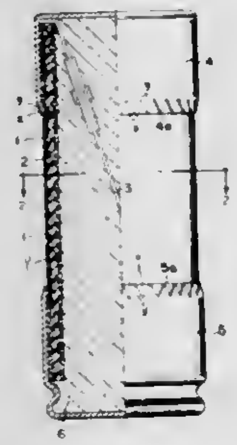
4,104,604
NARROWLY KNAULED END CAP FOR AN ELECTRIC FUSE

Delbert L. George, Salem, N.H., assignor to Gould Inc., Newburyport, Mass.

Filed Jul. 26, 1977, Ser. No. 819,061

Int. Cl.² H01H *85/02*

U.S. Cl. 337—248 **4 Claims**



1. An electric fuse comprising

(a) a tubular casing of electric insulation;

(b) a fusible element inside said casing;

(c) a granular arc-quenching filler embedding said fusible element;

(d) said casing comprising an outermost and an innermost ply of woven glass cloth and at least one intermediate ply of nonwoven glass fiber mat, each of said plies overlapping in a direction longitudinally of said casing, and said casing further comprising a polyester resin integrating said plies into a laminate; and

(e) a pair of ferrules press-fitted on the ends of said casing and conductively interconnected by said fusible element, said pair of ferrules being shaped at the axially inner ends thereof to form narrowly knurled frustums of cones, the knurled area encompassing the entire periphery of said axially inner ends of said pair of ferrules rather than spaced points thereof.

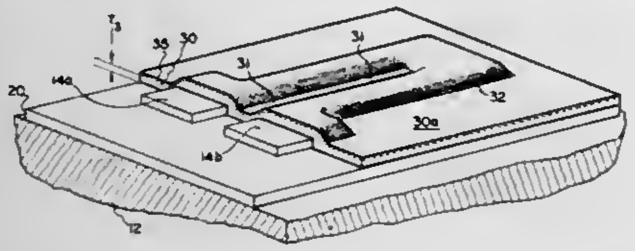
4,104,605
THIN FILM STRAIN GAUGE AND METHOD OF FABRICATION

Lee J. Boudreaux, Schenectady, N.Y., and James H. Foster, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1976, Ser. No. 723,566

Int. Cl.^{2} G01L *1/22*

U.S. Cl. 338—2 **17 Claims**



1. A method for fabricating a thin film resistive strain gauge upon a surface of an article, comprising the steps of:
  R.F. sputtering a first film of an insulating material, selected from the group consisting of Alumina and Forsterite, to a first thickness upon said article surface;
  selecting a strain-sensing resistive material from the group of materials consisting of Nichrome, platinum, molybdenum silicide and chromium silicide;
  fabricating a pattern of the strain-sensing resistive material upon a surface of said first insulating film furthest from said article; fabricating, upon said surface of said first insulating film and substantially co-planar with said pattern, conduction means for electrically coupling directly to said pattern to ascertain the value of the resistance thereof; and
  R.F. sputtering a second film of the selected insulating material directly in contact with and covering all of said pattern and at least a portion of said conduction means and adjacent regions of said first insulating film.

8. A thin film strain gauge for use upon a surface of an article, comprising:
  a first film of an insulating material fabricated directly upon said article surface, said insulating material being one of Alumina (Al_2O_3) and Forsterite ($2MgO$-SiO_2);
  at least one member of a resistive strain-sensing material fabricated directly upon a surface of said first insulating film furthest from said article surface;
  said strain-sensing material selected from a group consisting of Nichrome, platinum, molybdenum silicide and chromium silicide;
  first means fabricated upon said surface of said first insulating film and substantially co-planar with said at least one member for electrically coupling to said at least one member to ascertain the value of the resistance thereof; and
  a second film of the selected insulating material fabricated directly over said at least one member, a portion of said first means and adjacent regions of said first insulating film surface to encapsulate said at least one element and said portion of said first means in cooperation with said first insulating film.

4,104,606
DIMMER SWITCH WITH INSULATION HOUSING

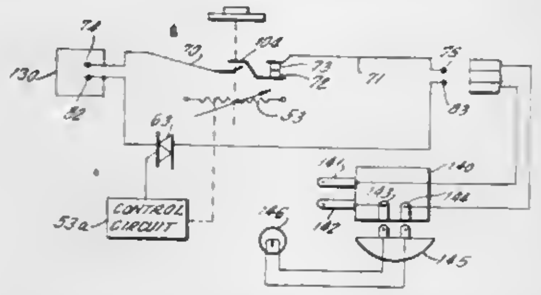
Robert R. DeWitt, Slatington, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Dec. 23, 1976, Ser. No. 754,101

Int. Cl.^{2} H01C *10/50*

U.S. Cl. 338—198 **27 Claims**

1. An in-line switch for an electrical circuit comprising, in combination:
  a housing for enclosing said in-line switch;
  an externally operable operating member extending through said housing;
  a pair of cooperating contacts operable by said operating member and operated thereby between engaged and disengaged positions;
  first and second pairs of terminals positioned at opposite sides of said housing,
  said first and second pairs of terminals each comprising first and second spaced conductive stabs disposed in respective first and second elongated channels;



and first and second plunger means being movable in said first and second channels and being adapted to force parallel-disposed insulated wires into engagement with said first and second stabs respectively of said first and second pairs of terminals respectively;
  said first stabs of said first and second pairs of stabs being connected to one another;
  said second stabs of said first and second pairs of stabs being connected to respective ones of said pairs of contacts.

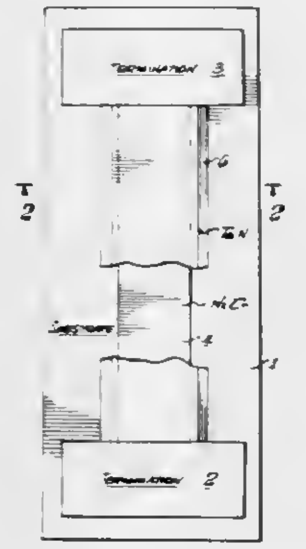
4,104,607
ZERO TEMPERATURE COEFFICIENT OF RESISTANCE BI-FILM RESISTOR

William Kinzy Jones, Cambridge, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 14, 1977, Ser. No. 777,225

Int. Cl.^{2} H01C *1/012*

U.S. Cl. 338—309 **9 Claims**



1. A bi-film resistor system having a parallel temperature coefficient of resistance (TCR) less than ±50 ppm/° C comprising:
  a substrate, and
  a parallel resistor circuit mounted on said substrate,
  said circuit including:
    elongate coaxially-disposed first and second thin-film resistor members formed of selected materials having substantially equal resistance values per square (Ω/□) with said first member overlying said second and being formed of a material that is anodically non-reactive and has a negative TCR, said second being anodically reactive and having a positive TCR, and
    conductive terminal members coupled to each end of each member,
    said thin film members being of substantially equal electrical length with first member being of sufficient width for blanketing said second and providing anodic passivation protection for it; said materials having positive and negative TCRs of such values that, when included in said parallel circuit algebraically, add to provide said parallel TCR of less than ±50 ppm/C°.

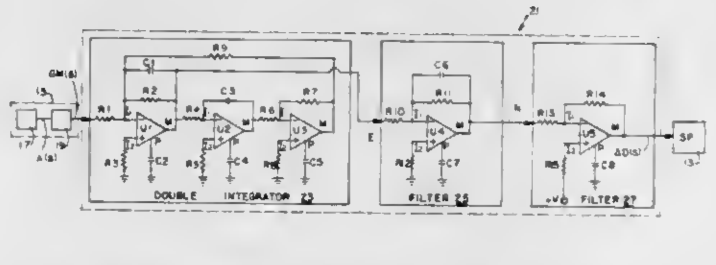
4,104,608
HEAVE METER

Norman D. Melling; John J. De Matteo, both of Doylestown; Melvyn A. Levrant, Holland, all of Pa., and Ronald J. Juels, Freeport, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1977, Ser. No. 782,661

Int. Cl.^{2} G01S *9/66*

U.S. Cl. 340—3 PS **8 Claims**



1. A contour mapping system for measuring bottom elevation from a ship, with heave compensation, comprising:
  gravity metering means for producing a signal GM(s) indicative of gravity at the ship, including accelerometer means for measuring the vertical acceleration, and frequency compensating means for attenuating non-gravimetric frequencies;
  heave metering means connected to receive said signal GM(s) for producing a signal ΔD(s) indicative of the heave displacement including integrator means adapted to receive a gravity meter output signal GM(s) for producing an output signal E indicative of the relationship

$$[G]\ GM(s)\left[\frac{\frac{S}{\omega_f^2}}{\frac{S^2}{\omega_f^2}+\frac{2\zeta S}{\omega_f}+1}\right]$$

where:
  s = complex Laplace transform operator,
  ω_f = filter transfer function breakpoint frequency, and
  ζ = filter transfer function damping constant;
  first filter means connected to receive said integrator means output signal E for producing an output signal N indicative of the relationship

$$[M]\ E\left[\frac{1}{S+\frac{1}{\tau_f}}\right]$$

where
  τ_f = filter transfer function cutoff breakpoint; and
  second filter means connected to receive said first filter means output signal for producing an output signal ΔD(s) indicative of heave displacement according to the relationship

$$N\left[\frac{\tau_g}{\tau_f}\right]$$

where
  τ_g = gravity meter breakpoint; and
  depth measuring means connected to receive said signal ΔD(s) for producing a signal indicative of the heave compensated vertical distance from the ship to the bottom.

4,104,609
FISH-FINDER

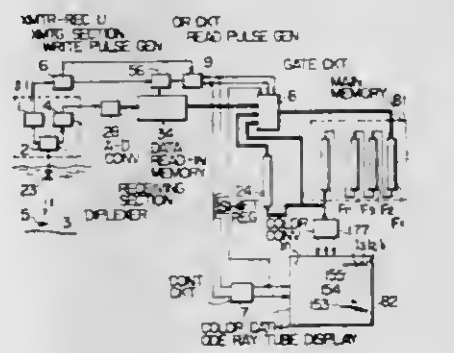
Yukihiko Minegishi, 451-54, Noba-cho, Konan-ku, Yokohama-shi, Kanagawa-ken; Shokichi Sato, 105, 6-2, 2-chome, Fuchinobe, Sagamihara-shi, Kanagawa-ken, and Toshikazu Yamada, Sakaeso, 7-20, 3-chome, Ichikawa, Ichikawa-shi Chiba-ken, all of Japan

Filed May 16, 1977, Ser. No. 797,145

Claims priority, application Japan, May 19, 1976, 51-57676; May 19, 1976, 51-57677; Nov. 17, 1976, 51-138029

Int. Cl.^{2} G01S *9/70, 7/62*

U.S. Cl. 340—3 C **21 Claims**



1. A fish-finder comprising:
  a transmitter-receiver unit for periodically emitting an ultrasonic pulse into the water and receiving its reflected wave, the transmitter-receiver unit including a reference oscillator, a frequency divider for frequency dividing the oscillation output from the reference oscillator, a range switch for selectively changing the frequency dividing ratio of the frequency divider in accordance with the detection range adopted and means for deriving a transmission pulse from the output from the frequency divider;
  an A-D converter connected to the transmitter-receiver unit for converting the received reflected wave into a digital signal;
  a main memory supplied with the digital signal, having a storage capacity of one picture frame and repeatedly read out;
  a color converter supplied with the output from the main memory to convert it into a color signal corresponding to the value of the output digital signal;
  a color cathode ray tube display supplied with the color signal;
  a normal display data read-in memory supplied with the output from the A-D converter before it is supplied to the main memory and having a capacity corresponding to the number of picture elements of one display line of the color cathode ray tube display;
  a data write pulse generator supplied with the output from the frequency divider to change the output frequency in accordance with the setting of the range switch and generate write pulses of the same number as the picture elements of one display line, thereby controlling data writing in the data read-in memory; and
  control means for transferring the digital signal from the read-in memory to the main memory so that the digital signal is displayed in the form of one display line at a predetermined position of the screen of the color cathode ray tube display and display lines provided until they are each shifted to the older display line to remove the oldest display line.

4,104,610
ULTRASONIC WAVE HORN

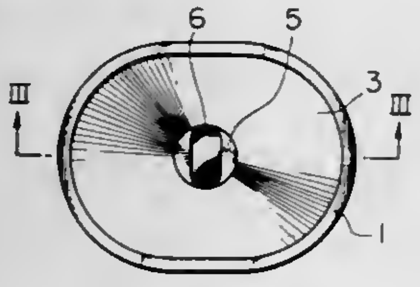
Hiromitsu Inoue, Kyoto; Susumu Katayama, and Hirosbi Ohasbl, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 10, 1976, Ser. No. 749,287

Claims priority, application Japan, Dec. 15, 1975, 50-149809; Jun. 30, 1976, 51-78069; Jun. 30, 1976, 51-78075

Int. Cl.^{2} H04B ***11/00***

U.S. Cl. 340—15 **10 Claims**



1. An ultrasonic wave horn including an outwardly and uniformly flaring horn body having a constricted throat at one end and an expanded mouth at the other, means defining a transducer cavity adjacent the throat and having a front wall and a back wall, the throat being entirely contained in the front wall, the horn body being unobstructed between the throat and the mouth, an ultrasonic transducer adjacent the back wall of the transducer cavity having electric terminals and for converting between an electrical wave and ultrasonic vibrations, the horn body being oblong in transverse cross section and symmetrical in shape to define major and minor axes, the throat being also oblong in transverse cross section and symmetrical in shape to define major and minor axes, the major axes being arranged at right angles to one another.

4,104,611
SUPPRESSING CONSTANT FREQUENCY NOISE IN SEISMIC RECORDS

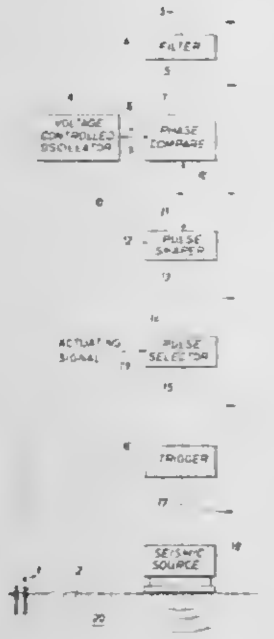
Adrianus B. Kalden, Rijswijk, Netherlands, assignor to Sbell Oil Company, Houston, Tex.

Filed Apr. 21, 1977, Ser. No. 789,461

Claims priority, application United Kingdom, Apr. 4, 1976, 18185/76

Int. Cl.^{2} G01V ***1/36***

U.S. Cl. 340—15.5 F **12 Claims**



1. An apparatus for removing an unwanted sinusoidal noise signal having constant frequency and amplitude from a seismic signal, said apparatus comprising:
- monitoring means for monitoring the noise signal and detecting the phase pattern thereof;
- a pulse selector circuit, said pulse selector circuit being coupled to said monitoring means to produce first and second trigger signals in response to first and second zero crossings of said noise signal and an actuating signal; said trigger pulses being separated by at least a plurality of periods of the noise signal;
- a trigger circuit, said trigger circuit being coupled to said pulse selector circuit; and
- a seismic source, said trigger circuit being coupled to said seismic source to fire said source in response to said first and second trigger pulses.

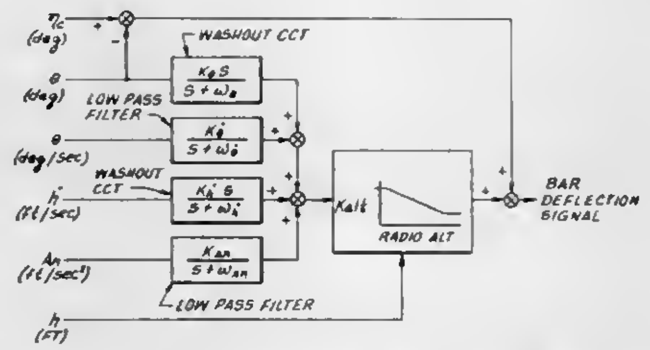
4,104,612
HEAD-UP DISPLAY COMMAND BAR GENERATOR

James R. Lowe, Palos Verdes, Calif., assignor to McDonoell Douglas Corporation, Long Beacb, Calif.

Filed Feb. 3, 1977, Ser. No. 765,254

Int. Cl.^{2} G08G ***5/00***

U.S. Cl. 340—27 AT **13 Claims**



1. Apparatus for providing to the pilot of an aircraft during visual landing approaches the image of a horizontal bar projected onto the lens of a head-up display, said bar indicating to the pilot the point at which the aircraft will touch down on the runway, said apparatus comprising;
- means for generating a fixed angle signal proportional to the desired approach angle of descent,
- means for generating a lead compensation signal,
- means for generating a gain factor signal that varies as a function of aircraft altitude,
- a multiplier circuit for generating the product of said lead compensation signal and said gain factor signal, and
- a summing amplifier for adding said fixed angle signal and the product generated by said multiplier circuit to control the vertical deflection of said horizontal bar.

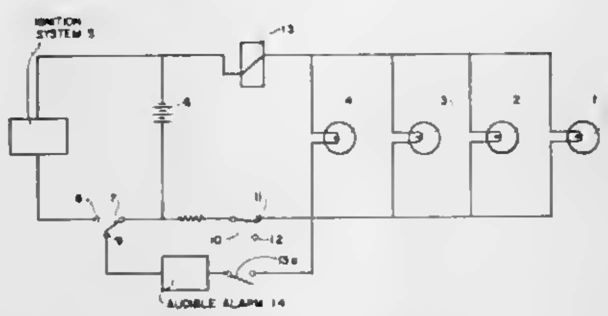
4,104,613
VEHICLE HEADLIGHT ALARM

Stanley H. Chaput, Sarnia, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 28, 1977, Ser. No. 763,642

Int. Cl.^{2} G08B ***21/00***

U.S. Cl. 340—52 D **1 Claim**



1. A vehicle headlight alarm for an automotive vehicle having headlights, tail lights, an ignition system, a battery, an ignition switch electrically connected between the battery and the ignition system for selectively controlling the ignition of the vehicle, said ignition switch having an ON position in which it conducts electrical energy from the battery to the ignition system and an OFF position in which it prevents electrical energy from the battery from reaching the ignition system and a headlight switch electrically connected between the battery and the headlights and tail lights for selectively controlling the energization of said lights, said headlight switch having an ON position in which it conducts electrical energy from the battery to the lights and an OFF position in which it prevents electrical energy from the battery from reaching the lights, said vehicle headlight alarm comprising
- a relay having an energizing winding electrically connected between the battery and the lights in a manner whereby when the headlight switch is ON the relay winding is energized and when the headlight switch is OFF the relay winding is deenergized and a relay armature switch controlled in position by said relay winding;
- an electrical contact positioned at the OFF position of the ignition switch; and
- an audible alarm connected in series with the relay armature switch between the electrical contact and a point electrically connected to the headlight switch in its ON position whereby when the headlight switch is in its ON position and the ignition switch is in its OFF position, the relay energizing winding is energized by the battery via the headlight switch and closes its relay armature switch to actuate the alarm.

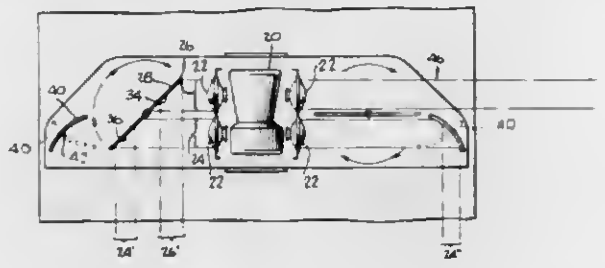
4,104,614
WARNING LIGHT FOR EMERGENCY VEHICLES

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Pittsburgh, Pa.

Filed Mar. 10, 1976, Ser. No. 665,357

Int. Cl.^{2} B60Q ***1/46***

U.S. Cl. 340—81 R **22 Claims**



1. Warning light apparatus for emergency vehicles comprising a light source carried by said apparatus for projecting a light beam along a predetermined path, a first reflector carried by said apparatus for rotation about a generally vertical axis and having a reflective surface, said reflective surface being disposed in the path of said light beam when said reflector lies in a first rotary position to reflect the light beam in a first direction, said reflector being movable to a second rotary position to position the reflective surface out of the path of said light beam, a second reflector carried by said apparatus and having a reflective surface, said second reflector being located in the path of said light beam a greater distance from said light source than said first reflector so that when said first reflector lies in said second rotary position the second reflector reflects said light beam in substantially a like direction as said first direction.

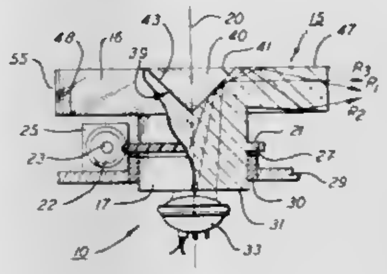
4,104,615
FLASHING SIGNAL LIGHT

Everest C. Hunter, Syracuse, N.Y., assignor to R. E. Dietz Company, Syracuse, N.Y.

Filed Dec. 16, 1976, Ser. No. 750,951

Int. Cl.^{2} B60Q ***1/52***

U.S. Cl. 340—84 **6 Claims**



1. A warning device for creating a moving visual signal including
- a rotatably mounted signal generator constructed of a light transmitting material capable of conducting light internally, said generator being formed of two cylindrical sections coaxially aligned along the central axis of the generator with a first section being of greater diameter than a second section,
- a stationary source of illumination positioned adjacent to and in close proximity with the end face of the second cylindrical section whereby light from said source is directed into the generator through said end face along the central axis of said generator,
- a plurality of reflecting surfaces formed in the first cylindrical section being arranged to intercept the light directed into said generator and redirect the light internally within a plane substantially normal to the axis of said generator whereby a plurality of light beams, equal in number to the number of reflecting surfaces, exit said generator through the cylindrical outer periphery of the first cylindrical section, and
- drive means operatively associated with the generator for rotating the generator about its axis whereby the beams of light exiting the generator are swept through a circular path of travel normal to the axis of rotation.

4,104,616
HAND OPERATED OPTICAL CHARACTER RECOGNITION SYSTEM

Isao Issbiki, and Koji Sato, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 28, 1977, Ser. No. 763,759

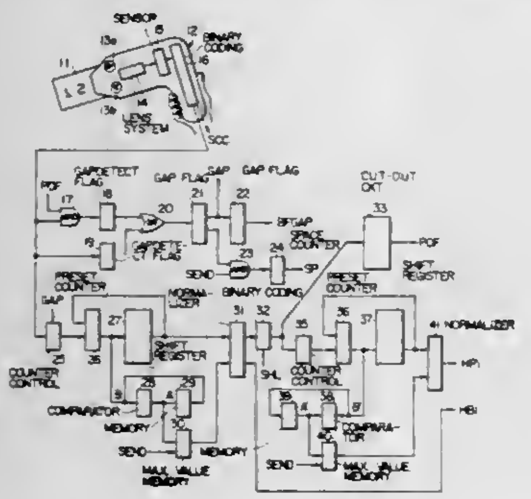
Claims priority, application Japan, Jan. 28, 1976, 51-8703; Feb. 17, 1976, 51-16823; Mar. 20, 1976, 51-30568; Mar. 20, 1976, 51-30569; Jun. 30, 1976, 51-78196

Int. Cl.^{2} G06K ***9/12***

U.S. Cl. 340—146.3 Y **35 Claims**

1. A character recognition system, comprising: a scanner having an aligned, one dimensional array of photosensitive elements mounted thereon and grouped into a plurality of sections, each section including at least one of said photosensitive elements and forming a unit region, said scanner being adapted to be moved in a direction substantially normal to the direction of alignment of said array to thereby scan characters and/or symbols arranged in parallel with the scanning direction, first means responsive to an output of said scanner for counting the number of occurrences of character segments for each of said unit regions to obtain a segment occurrence frequency distribution in the direction of alignment of said array, second means responsive to an output of said scanner for counting the number of scans in the direction of alignment of said array for each of said unit regions, starting when the first and/or last character segment is detected and ending when one character scan is completed, to thereby obtain the front side

and/or rear side shape of the character, and third means for recognizing the character according to the character segment occurrence frequency distribution and the front and/or rear shape of the character.



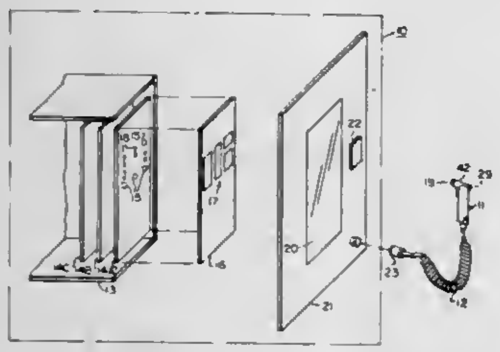
4,104,617
CONTROL PANEL SYSTEM

Lawrence M. Bean, Ellicott City; Robert W. Edwards, Glen Burnie, and Theodore Wright, Crownsville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1977, Ser. No. 761,165

Int. Cl.² G06F *3/02*

U.S. Cl. 340—147 R **13 Claims**



1. A control panel system, comprising

a panel having a plurality of spaced locations, each location being designated for the switching of respective apparatus to a selected state;

a light-emitting means for each of the switching locations of the panel;

switching means operable from one predetermined state to another predetermined state associated with each of the light-emitting means;

a manually manipulable probe having a light-sensitive means attached thereto for placing the light-sensitive means in optical relationship with a selected one of the light-emitting means;

a trigger means operable manually to a first and second condition;

first circuit means coupled to each light-emitting means operative to cause each light-emitting means to emit repetitively a first distinct code, the emission of each first distinct code for each location being different than the emitted first code for another location;

second circuit means responsive to the optical relationship of the light-sensitive means and any one of the light-emitting means to detect the reception of a respective first code at times when the trigger means is in its first condition;

third circuit means responsive to the reception of each first distinct code by the light-sensitive means and the operation of the trigger means to its second condition to convert a respective first code to a distinct second code representative of the respective received first code; and

control circuit means responsive to the detection of the reception of the first distinct code by the second circuit means followed by the reception of its representative second distinct code generated by the third circuit means to operate the switching means associated with the light-emitting means that is emitting said first distinct code.

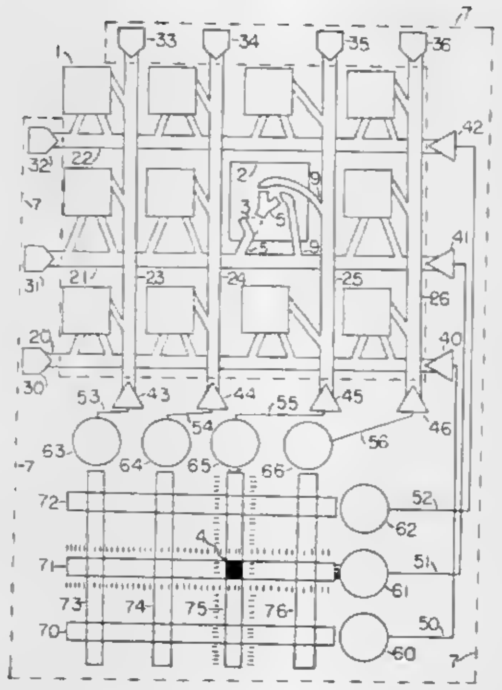
4,104,618
REMOTE SIGNALING SYSTEM

Marvin Stanley Towsend, 1365 Potomac Hts. Dr., Oxon Hill, Md. 20022

Continuation-in-part of Ser. No. 732,784, Oct. 15, 1976, which is a continuation of Ser. No. 586,512, Jun. 12, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,558

Int. Cl.² G08B *25/00*

U.S. Cl. 340—524 **9 Claims**



1. A remote signaling system for simultaneously monitoring signals, at a central console display, which are generated from a plurality of remote stations distributed in a matrix array, comprising:

a. a plurality of remote stations distributed in a matrix array whereby said plurality of remote stations are distributed in a series of horizontally oriented row zones, and in a series of vertically oriented column zones;

b. two families of energy waveguides, a first family having row energy waveguides equal in number to the number of said row zones of remote stations and a second family having column energy waveguides equal in number to the number of said column zones of remote stations;

c. sources of wave energy for coupling to said row and column energy waveguides and a detector of wave energy coupled to each of said row and column energy waveguides at the detector end of each waveguide;

d. at each remote station, energy beam combiners connected with said row and column energy waveguides and a sensor-controlled wave energy source coupled to said energy beam combiners for signaling the central console by decreasing or increasing the wave energy which normally passes through the remote station along its associated row and column energy waveguides; and

e. at the central console, a display of zonal indicators associated with said row and column wave energy detectors for displaying the location of the remote station in which sensor-controlled wave energy signals are generated.

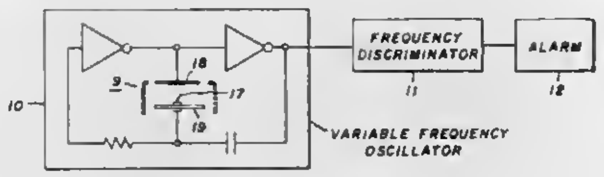
4,104,619
SMOKE DETECTOR

Joseph P. Hesler, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 1, 1976, Ser. No. 728,524

Int. Cl.² G08B *17/10*

U.S. Cl. 340—629 **11 Claims**



1. A smoke detector comprising:

A. a smoke detection cell including:

  (1) a measuring chamber open to the ambient air and any airborne products of combustion,

  (2) a source of radiation disposed within said chamber for ionizing the contained air and airborne matter,

  (3) a pair of spaced conductive electrodes disposed within said chamber for establishing an electric field which attracts positively ionized particles to one electrode and negatively ionized particles to the other electrode, ionic impingement on said electrodes producing a small current whose direction depends on field polarity, the detection cell current decreasing and its resistance increasing when airborne combustion products are present in the air, and

B. an electrical network into which said detection cell is connected, comprising:

  (1) an alternating voltage source,

  (2) means for applying said alternating voltage to said detection cell to provide a bidirectional current flow therein, and

  (3) sensing means responsive to a network parameter dependent on the resistance of said detection cell for actuating an alarm when a predetermined increase in resistance of said detection cell has taken place indicating the presence of airborne combustion products.

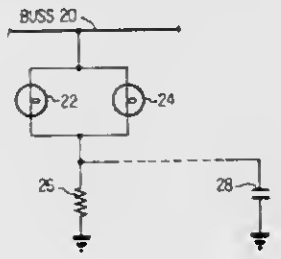
4,104,620
DUAL FILAMENT CURRENT LIMITING AND STATUS INDICATING CIRCUIT

Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 30, 1976, Ser. No. 755,558

Int. Cl.² G08B *21/00;* H01J *7/42*

U.S. Cl. 340—642 **21 Claims**



1. An electrical circuit comprising:

first and second terminals;

lamp means connected to said first terminal, said lamp means including a plurality of filaments connected in parallel;

switch means connected between said lamp means and said second terminal; and,

impedance means connected in parallel with said switch means between said lamp means and said second terminal, said impedance means having a value such that the current through the filaments of said lamp means when said switch means is open is insufficient to illuminate said lamp means, said value also being such that the same total current through less than all of the filaments of said lamp means due to the failure of one of said filaments is sufficient to illuminate said lamp means to a first illumination level with said switch means open whereby the status of said lamp means is indicated.

4,104,621
STEERING-WHEEL REVERSAL DRIVER ALERTNESS MONITOR

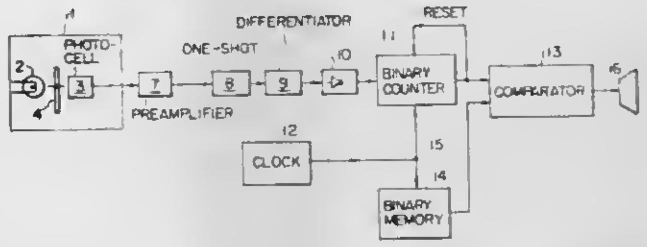
Takayuki Yanagishima, and Akira Matsumura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 19, 1976, Ser. No. 715,827

Claims priority, application Japan, Aug. 20, 1975, 50-101610; Sep. 3, 1975, 50-107453

Int. Cl.² G08B *21/00;* B60R *27/00*

U.S. Cl. 340—576 **4 Claims**



1. A driving assurance system for a wheeled vehicle having a steering wheel, comprising: first means for detecting in use the oscillatory angular movement of a steering wheel of a wheeled vehicle to generate an electrical pulse for every angular movement exceeding a predetermined arcuate extent smaller than 10° so that a series of pulses are generated when the angular movement exceeds an integral multiple of said arcuate extent, a monostable multivibrator connected to said detecting means to generate an output pulse in response to the first one of a series of said electrical pulses, said output pulse having a predetermined duration greater than the greatest possible interval between successive ones of said electrical pulses generated when the driver is normally operating the steering wheel, second means for generating a signal of which the magnitude increases in the presence of said output pulses, and third means for comparing at predetermined intervals the magnitude of said signal with a reference value to generate a warning signal if said signal is less than said reference value.

4,104,622
MONITOR ACTUATING DEVICE AND REUSABLE FASTENER THEREFOR

Clarence R. Van Niel, North Olmsted, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 2, 1975, Ser. No. 636,901

Int. Cl.² G08B *21/00;* A44B *9/00*

U.S. Cl. 340—572 **18 Claims**

1. A reusable, releasable, tamper resistant fastener for attachment to the end of a shaft, said fastener comprising:

a generally hollow body having an upper portion and a lower portion, said lower portion defining a bore opening to the bottom surface of said lower portion for receipt of the shaft, said lower portion including a generally tubular member at least partially defining the bore adjacent the opening thereto, said tubular member axially movable relative to the upper portion, said tubular member having an outer cam surface tapered radially inwardly and towards the opening to the bore, radially inwardly directed force on said cam surface being effective to resiliently deform said lower portion to resiliently move said tubular member towards said upper portion; and

a resilient one-piece spring steel clip mounted within said body, said clip having a base axially fixed and freely rotatable relative to said upper portion and a generally dome shaped portion having a generally concave inner surface and a generally convex outer surface arranged concave surface towards the opening to the bore, said dome shaped portion having an aperture therein generally coaxial with said bore and having a cross section having at least one dimension smaller than the cross section of the shaft, a plurality of generally radially extending slits in said dome shaped portion intersecting said aperture and dividing said dome shaped portion into a plurality of spring fingers adjacent said aperture, said fingers being resiliently radially outwardly deformable upon the application of an axial force to said concave surface to enlarge said aperture,

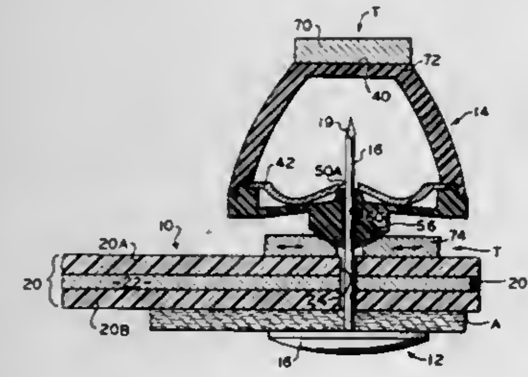
said axially movable tubular member being engageable with said concave surface to resiliently radially outwardly deform said spring fingers upon resilient movement of said tubular member towards said upper portion.

8. A monitor actuating device attachment assembly comprising:

a monitor actuating device,

a pin member attachable to the monitor actuating device having a shaft for piercing a monitored article; and

a reusable, releasable, tamper-resistant fastener for selective attachment to the free end of the shaft of the pin member to capture the monitored article on the pin member shaft, said fastener comprising:



a body having an upper portion and a lower portion, said lower portion defining a bore opening to the exterior surface of the lower portion for receipt of the shaft, said lower portion including a member being axially movable relative to the upper portion and having an outer cam surface tapered radially inwardly and away from the upper portion, radially inwardly directed force on said cam surface being effective to resiliently move said axially movable member towards said upper portion; and

a resilient spring steel clip mounted within said body, said clip having a base axially fixed and freely rotatable relative to the upper portion and a generally dome shaped portion defining a generally concave inner surface and a generally convex outer surface arranged concave surface towards the opening to the bore, said dome shaped portion having an aperture therein generally coaxial with said bore and having a cross section having a least one dimension smaller than the cross section of the shaft, a plurality of generally radially extending slits in said dome shaped portion intersecting said aperture and dividing said dome shaped portion into a plurality of spring fingers adjacent said aperture, said fingers being resiliently radially outwardly deformable upon the application of an axial force to said concave surface to enlarge said aperture, said axially movable member being engageable with said concave surface to resiliently radially outwardly deform said spring fingers when said member is resiliently moved towards said upper portion.

4,104,623

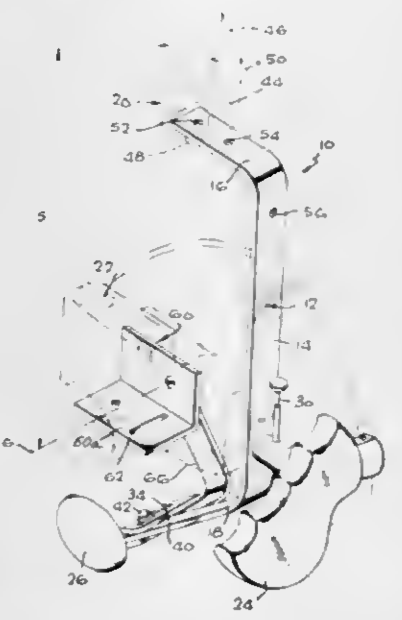
FRAME FOR HOLDING A CAMERA

Conrad Beebe Sloop, 9092 Bermuda Dr., Huntington Beach, Calif. 92646

Filed Nov. 6, 1975, Ser. No. 629,531

Int. Cl.^{2} G03B *17/56*

U.S. Cl. 354—293 **1 Claim**



1. Camera holding apparatus designed to be held by a photographer and to hold the tripod socket of a camera with a rotatable lens barrel, comprising:

a frame;

a camera support having a tripod-engaging portion for engaging the tripod socket of a camera;

said support being pivotally mounted on said frame about a predetermined axis of rotation, to permit a camera on said support to be turned 90° from the horizontal to the vertical;

a palm pad mounted on said frame so it lies under the lens barrel of a camera which is mounted on said camera support, said palm pad positioned so that a hand which receives the palm pad in its palm, can also reach up with fingers of that hand to turn the lens barrel of a camera on said support to focus the lens;

said camera support being pivotally mounted on said frame to turn 90° about a predetermined axis located about 1½ inches above said tripod engaging portion, so that after turning 90° from the horizontal to the vertical, the lens barrel does not substantially shift position.

4,104,624

MICROPROCESSOR CONTROLLED CRT DISPLAY SYSTEM

Nagaharu Hamada, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 28, 1976, Ser. No. 754,997

Claims priority, application Japan, Dec. 29, 1975, 50-158480

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—324 AD **4 Claims**

1. A display system comprising:

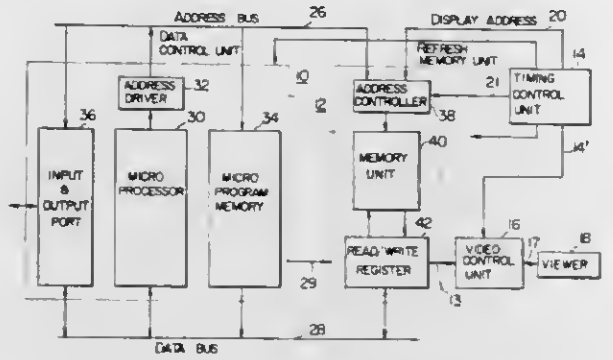
a refresh memory unit having a memory unit in which at least a screen of display data is divided into a plurality of memory blocks each consisting of a byte;

a data control unit for microprogram-controlling byte-by-byte exchange of the data between said memory unit and an external data source;

a timing control unit for controlling the timing of the data exhange and display;

an address controller provided in said refresh memory unit for selectively controlling the access to said memory unit by said data control unit to access a memory block and the access to said memory unit by said timing control unit to simultaneously access a plurality of memory blocks;

a video control unit for generating a video signal for display based on the display data in which one character is represented by a plurality of bytes and the display timing signal; and



a viewer for displaying the video signal on a CRT screen as a visible image.

4,104,625

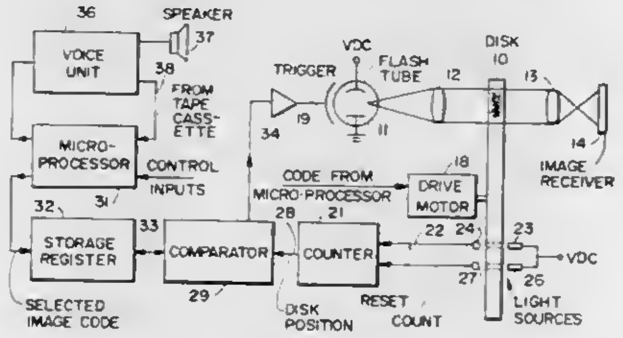
APPARATUS FOR PROVIDING FACIAL IMAGE ANIMATION

Stephen D. Bristow, Los Altos Hills, and Nolan K. Bushnell, Woodside, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 12, 1977, Ser. No. 758,714

Int. Cl.^{2} G06K *15/18*

U.S. Cl. 340—324 R **7 Claims**



1. Apparatus for providing facial image animation comprising: a plurality of image forming units each with at least a portion of a facial expression corresponding to a spoken phoneme; means for visually displaying images received from said forming units; and means for selectively activating different pluralities of said image forming units in any of a plurality of different orders to provide correspondingly different facial expression sequences.

4,104,626

ARRANGEMENT UTILIZING THE MECHANISM OF CHARGE SPREADING TO PROVIDE AN AC PLASMA PANEL WITH SHIFTING CAPABILITY

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1977, Ser. No. 767,143

Int. Cl.^{2} G06F *3/14*

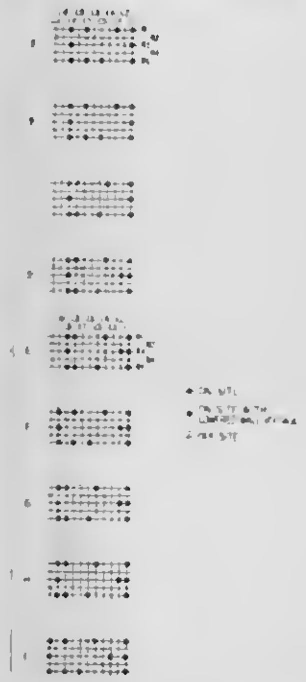
U.S. Cl. 340—324 M **15 Claims**

1. A gas discharge display system comprising

at least a first row of at least first through fourth adjacent gas discharge display sites having ON and OFF states, each site comprising a volume of gas having an associated breakdown voltage V_b and each adapted to store voltages across said volume of gas,

sustain means for repetitively applying first- and second-polarity sustain signals of predetermined duration and magnitude $V_s < V_b$ alternately across each of said sites, said sustain signals causing a characteristic voltage of magnitude $V_m > (V_b - V_s)$ to be stored across a site which is in said ON state, a spread voltage $V_{ms} < (V_b - V_s)$ being stored across a site which is in said OFF state if it is immediately adjacent in said row to a site which is in said ON state,

erase means for applying an erase signal across said first and



third sites during first and second time intervals, respectively, each of said intervals being intermediate a respective one of said second-polarity sustain signals and the immediately succeeding, first-polarity sustain signal, and

shifting write means for applying a shifting write signal across said second and fourth sites during said first and second intervals, respectively, said shifting write signal being of said first polarity and having a magnitude V_{sw}, $(V_b - V_{ms}) < V_{sw} < V_b$.

4,104,627

DIGITALE, AN INDICATING DEVICE CONTAINING LIQUID CRYSTALS

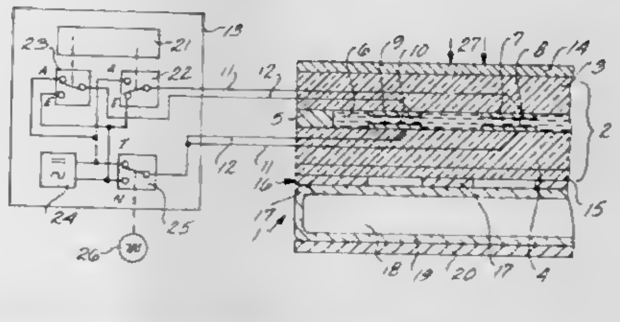
Oscar W. Thuler, Bern, Switzerland, assignor to Merz & Benteli Nuklear AG, Bern, Switzerland

Filed May 2, 1975, Ser. No. 573,930

Claims priority, application Switzerland, May 3, 1974, 6082/74

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 340—336 **15 Claims**



1. A digital indicating device comprising:

a liquid crystal cell having first and second planar, approximately parallel, spaced-apart faces between which a liquid crystal showing optical rotary power is disposed, and a plurality of light transmissive, electrically conductive electrode pairs on opposite sides of the liquid crystal corresponding to character regions to be displayed, the first face of the cell being exposed to ambient light;

first and second light polarizing means having directions of polarization at right angles to each other, the first and second light polarizing means being disposed adjacent to opposite sides of the liquid crystal cell parallel to the first and second planar faces thereof, respectively;

light emitting means disposed adjacent to the second polarizing means on the side thereof opposite the second face of the cell to direct light through the cell toward the first face;

a reflector disposed between the light emitting means and the second polarizing means, the reflector being light transmissive on the areas corresponding to the character regions;

means for generating electrical control signals corresponding to the different characters to be displayed to impress an electrical potential difference across certain combinations of the electrode pairs to deactivate the liquid crystal between such electrode pairs;

first means responsive to the control signals for displaying the corresponding characters as dark characters on a light background at the first face of the cell in the presence of ambient light incident upon the first face of the cell; and

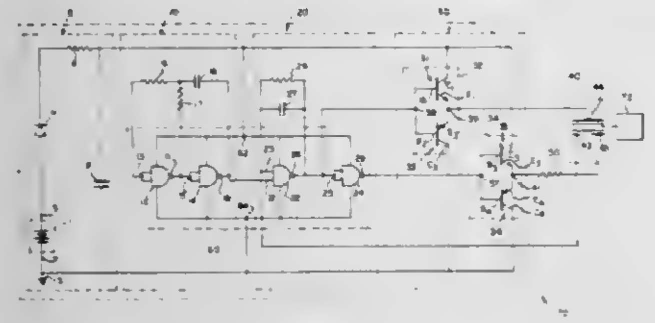
second means responsive to the control signals for displaying the same corresponding characters as light characters on a dark background at the first face of the cell in the absence of ambient light incident upon the first face of the cell.

4,104,628

HIGH OUTPUT AUDIBLE ALARM DEVICE UTILIZING A PIEZOELECTRIC TRANSDUCER AND VOLTAGE DOUBLING MEANS

Louis P. Sweany, Carmel, and Michael T. Burk, Indianapolis, both of Ind., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 15, 1976, Ser. No. 732,884
Int. Cl.^{2} G08B *3/00*
U.S. Cl. 340—384 E 6 Claims



1. In a high output audible alarm device comprising a power supply means, a pulsator means responsive to said power supply means for producing pulsations in said audible alarm device, an amplifier means electrically coupled to said pulsator means for oscillating said power supply input voltage, and a piezoelectric transducer responsive to said amplifier means, the improvement comprising a means simultaneously responsive to a plurality of electrical pulses of opposite polarities for doubling the voltage of said power supply means whereby a drive voltage is supplied to said piezoelectric transducer which is double said power supply means input voltage.

4,104,629

MARINE RADAR INTERROGATOR-TRANSPONDER TARGET DETECTION, IDENTIFICATION, AND RANGE MEASUREMENT SYSTEM

Eric J. Isbister, Greenlawn, N.Y., and Horace E. Fidler, Charlottesville, Va., assignors to Sperry Rand Corporation, New York, N.Y.

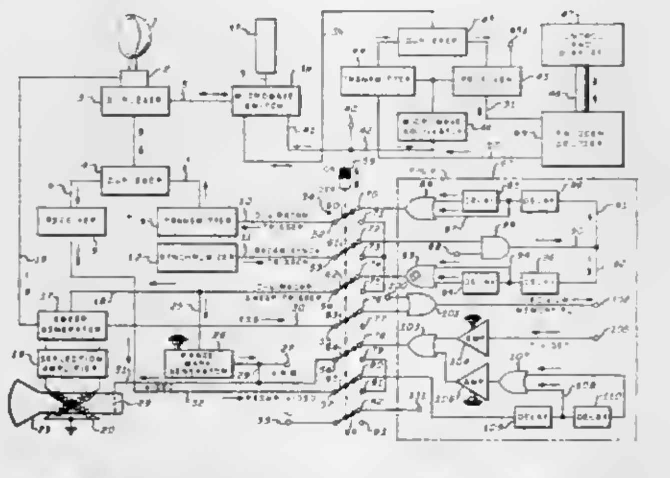
Filed Aug. 13, 1976, Ser. No. 714,211
Int. Cl.^{2} G01S *9/56*
U.S. Cl. 343—6 R 85 Claims

1. In a radio aid to navigation adapted for cooperative use with an azimuth scanning radar transmitter-receiver system wherein a radar echo signal is represented by intensification of a cathode ray beam of radar indicator means, said radio system including synchronizer means for generating at least one synchronizer pulse for initiating a radial sweep of said cathode ray beam and for initiating operation of said radar transmitter-receiver system:

first clock pulse generator means for generating a train of first clock pulses of a predetermined phase and frequency,

selector means responsive to said one radar synchronizer pulse for selecting a first clock pulse immediately following said one radar synchronizer pulse for forming a selected pulse,

first pulse train frequency divider means cleared by said selected pulse and responsive to said first clock pulses for initiating trains of second clock pulses of first and second phase and of a second predetermined pulse frequency,



first counter-decoder means cleared by said selected pulse and responsive to said first phase second clock pulses for producing a delayed radar synchronizer pulse for delayed operation of said radar transmitter-receiver system and a delayed radar sweep trigger pulse for delayed initiation of said radial sweep,

adjustable video delay means responsive to radar video signals output from said radar transmitter-receiver system and to said first phase second clock pulses for producing delayed radar video signals for intensifying said cathode ray beam, and

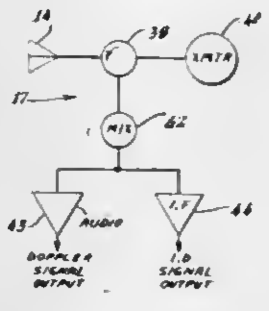
transceiver means responsive to said first clock pulse generator means.

4,104,630

VEHICLE IDENTIFICATION SYSTEM, USING MICROWAVES

Norman E. Chasek, 24 Briar Brae Rd., Stamford, Conn. 06903

Filed Jun. 21, 1976, Ser. No. 698,468
Int. Cl.^{2} G01S *9/56*
U.S. Cl. 343—6.5 R 12 Claims



11. A vehicle identification system comprising:

tuned reflective means adapted to be mounted on a vehicle for directionally reflecting microwave energy in a predetermined frequency range,

transponder means adapted to be mounted on the vehicle comprising an antenna tuned to said predetermined frequency range, a digital coder, and a transponder circuit interconnecting said antenna and said coder for transmitting a coded signal upon reception by said antenna of microwave energy in said predetermined frequency range,

an interrogating station including directional antenna means adapted to be aimed at a passing vehicle,

transmitter means for transmitting microwave energy in said frequency range from said directional antenna means,

a mixer,

a circulator interconnecting said directional antenna means and said transmitter and said mixer for producing a doppler beat frequency signal resulting from such transmitted microwave energy having been reflected by the tuned reflective means on a passing vehicle,

audio amplifier means connected to said mixer for amplifying said doppler beat frequency signal for verifying that a vehicle is passing, irrespective of the operation of said transponder means, and

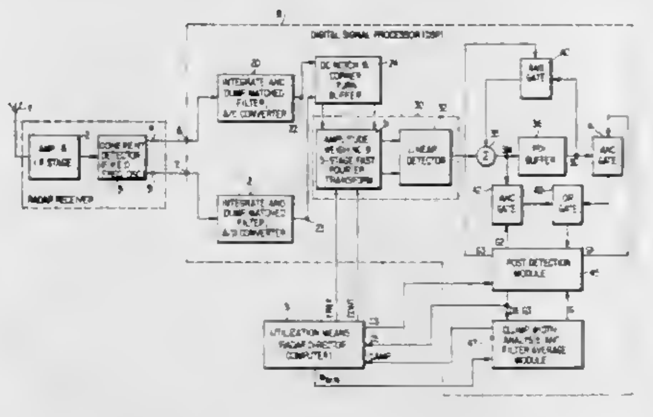
said interrogating station also including intermediate frequency amplifier means for amplifying a coded intermediate frequency signal resulting from transmission of a coded signal by said transponder means for vehicle identification.

4,104,631

METHOD AND SYSTEM FOR CLUTTER BLANKING IN A RADAR TARGET PROCESSOR

Wayne L. Weigle, Ellicott City; Edgar L. Fogle, Severna Park; Oscar M. Cromer, Baltimore, and Larry C. Schafer, Glen Burnie, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1976, Ser. No. 672,823
Int. Cl.^{2} G01S *7/44*
U.S. Cl. 343—7 A 7 Claims



DIGITAL SIGNAL PROCESSOR (DSP)
INTEGRATE AND DUMP MATCHED FILTER, A/C CONVERTER
DC NOTCH & CORNER TURN BUFFER
POST DETECTION MODULE
UTILIZATION MEANS RADAR DIRECTOR COMPUTER
CLUMP WIDTH ANALYSIS FILTER AVERAGE MODULE

1. In a doppler radar receiver including a processor for producing in-phase and quadrature components of returned signals, a system for removing main beam clutter from radar returns comprising:

a buffer memory for storing signals received from range gate filters during first and second portions of a look period and for providing a first and a second digital data signal representative of the signals stored during the respective first and second portions of the look period;

processing means operatively connected to said buffer memory for successively processing the first and second data signals from said buffer memory in accordance with a radar processing algorithm to provide respective first and second data matrices representing return signal amplitude as a function of range for a plurality of doppler frequencies;

means for summing the data matrices from said processing means for two different halflook periods;

a post detection module;

gating and synchronizing means coupled to said summing means for establishing a clutter processing period corresponding to the first portion of the next look period, and a target processing period corresponding to a second portion of a next look period, said gating and synchronizing means supplying to said post detection module during said clutter processing period an output indicative of the first data signal, and said gating and synchronizing means supplying to said post detection module during said target processing period an output indicative of the sum of the first and second data signals;

said post detection module including an amplitude channel for selecting the largest amplitude from range gate filters and a threshold channel for summing values of a data signal and said post detection module further including means for comparing the outputs of said amplitude channel and said threshold channel,

whereby said post detection module provides outputs indicative of the location of main beam clutter in the doppler frequency domain,

means for storing the outputs of said post detection module, and

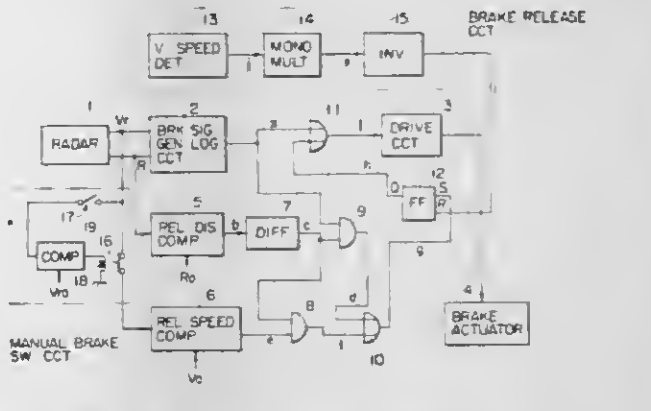
means coupling the stored outputs of said post detection module to said gating and synchronizing means for inhibiting inputs, to said post detection module during said target processing period, whereby main beam clutter is blanked from radar returns.

4,104,632

SYSTEM FOR PREVENTING COLLISION OF VEHICLES

Norio Fujiki, Yokohama, and Hiroshi Endo, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 9, 1976, Ser. No. 740,215
Claims priority, application Japan, Nov. 10, 1975, 50/134116
Int. Cl.^{2} G01S *9/02*
U.S. Cl. 343—7 VM 7 Claims



1. An anti-crash system for a vehicle comprising:

a brake actuator of said vehicle;

a radar system mounted on said vehicle for generating a relative speed signal representative of a relative speed between said vehicle and an obstacle in front of said vehicle and a relative distance signal representative of a relative distance between said vehicle and said obstacle;

a brake signal-generating logic circuit connected to said radar system for producing a brake signal in response to said relative speed and relative distance signals;

means for comparing said relative speed signal with a first predetermined reference value and for producing a higher speed signal when said relative speed signal exceeds said first reference value;

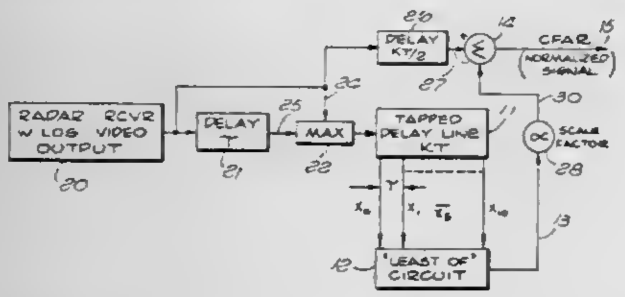
means for comparing said relative distance signal with a second predetermined reference value and for producing a blind zone signal when said relative distance signal is lower than said second reference value;

means connected for receiving said blind zone signal and said higher speed signal and for generating a first holding signal when receiving both said blind zone signal and said higher speed signal;

means connected for receiving said braking signal and said blind zone signal and for generating a second holding signal when receiving both said braking signal and said blind zone signal;

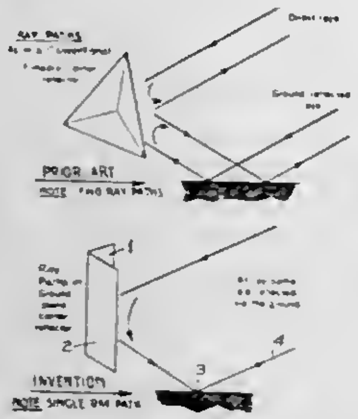
means for generating a brake holding signal in response to either one of said first and second holding signals; and
means for driving said brake actuator in response to either one of said braking signal or said brake holding signal.

4,104,633
EXTENDED TARGET-LOG CFAR PROCESSOR
Thomas H. Donahue, Glendale, and John F. Chaney, West Covina, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Apr. 18, 1977, Ser. No. 788,134
Int. Cl.² G01S *7/02*
U.S. Cl. 343—7 A **12 Claims**



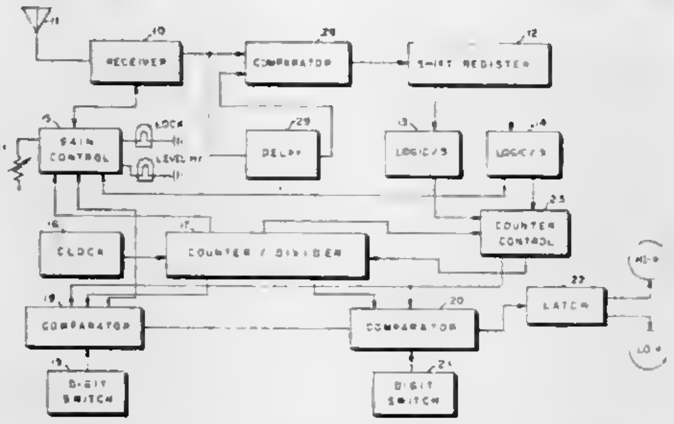
1. A CFAR radar video signal processor comprising:
first means including at least one delay line responsive to said radar video signal and having a predetermined plurality of outputs spaced in time by one range cell of the radar system in which said CFAR processor is being used;
second means including a least of circuit connected to provide an output corresponding to the least of the signals extant on any of said first means outputs except a predetermined centrally located output, in time;
and a differencing circuit responsive to said least of circuit output and to the signal provided by said first means corresponding to a centrally located signal to subtract said least of circuit output from said signal on said centrally located tap to produce a CFAR video output signal.

4,104,634
GROUND PLANE CORNER REFLECTORS FOR NAVIGATION AND REMOTE INDICATION
Paul O. Gillard, Salisbury, and Kenneth B. Whiting, Tea Tree Gully, both of Australia, assignors to The Commonwealth of Australia, Parkes, Australia
Continuation of Ser. No. 536,617, Dec. 26, 1974, abandoned. This application Nov. 30, 1976, Ser. No. 746,152
Claims priority, application Australia, Jan. 3, 1974, PB6147
Int. Cl.² H01Q *15/00, 15/14*
U.S. Cl. 343—18 C **16 Claims**



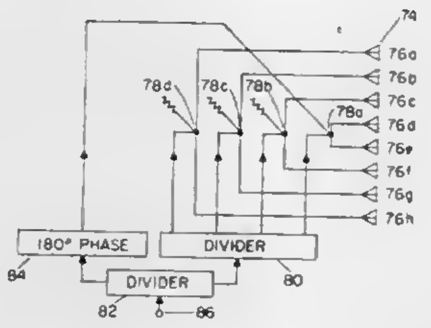
1. In a system including a trihedral reflector for reflecting a sonar or radar signal, an arrangement comprising dihedral plates normal to each other and to the earth's reflecting surface to form with the earth's natural reflecting surface a trihedral reflector, the earth's natural surface extending ahead of and beyond the confines of the dihedral plates at elevation angles including angles below the Brewster angle, the signal being reflected once each by the two reflecting surfaces of said dihedral plate and the earth's surface in any order whereby normal and circularly polarized radar transmission is achieved.

4,104,635
LORAN-C NAVIGATION APPARATUS
Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Nov. 12, 1976, Ser. No. 741,268
Int. Cl.² G01S *1/24, 1/30*
U.S. Cl. 343—103 **26 Claims**



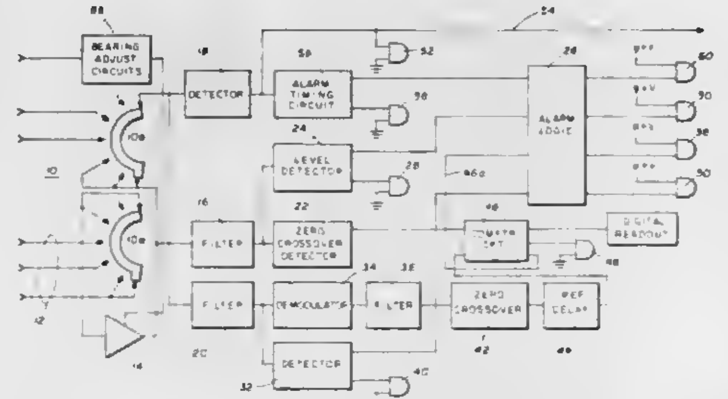
22. A method of deriving position information for navigation purposes by making measurements of the time period between receipt of signals from a first or master transmitting station and selected ones of a plurality of secondary transmitting stations in a navigation system comprising steps of,
checking signals received from said master and said secondary stations to determine which of the received signals is from said master station and which of the received signals is from one of said secondary stations,
manually selecting a first time period only in which the received signals from a selected one of said plurality of secondary stations will be recognized after consulting a navigation chart having time period information thereon for the approximate geographical location of equipment performing this method, and
measuring the time period between receipt of the signals from said master station and the signals from said selected one of said secondary stations received in said manually selected first time period to derive said navigation position information.

4,104,636
DOPPLER REFERENCE ANTENNA WITH PHASED CENTERLINE EMPHASIS
Richard F. Frazita, Deer Park, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.
Filed Oct. 4, 1976, Ser. No. 729,064
Int. Cl.² G01S *1/40*
U.S. Cl. 343—106 D **14 Claims**



10. In a Doppler navigation system wherein a ground station uses a reference antenna to radiate a reference frequency signal into an angular region of space and a coding antenna to radiate a frequency coded signal into said region during first and second time intervals, said coded signal having a first frequency offset from said reference signal and a first angular frequency variation during said first time interval and an opposite frequency offset and an opposite angular frequency variation during said second time interval, and wherein a mobile receiver determines its angular location by comparison of the frequency of said reference and coded signals during said first and second time intervals, the improvement wherein said reference antenna has a first radiation mode during said first time interval and a second radiation mode during said second time interval, said second mode having a phase between the radiation in a selected angular direction in said region and the radiation in the remainder of said region which is different than said phase for said first mode.

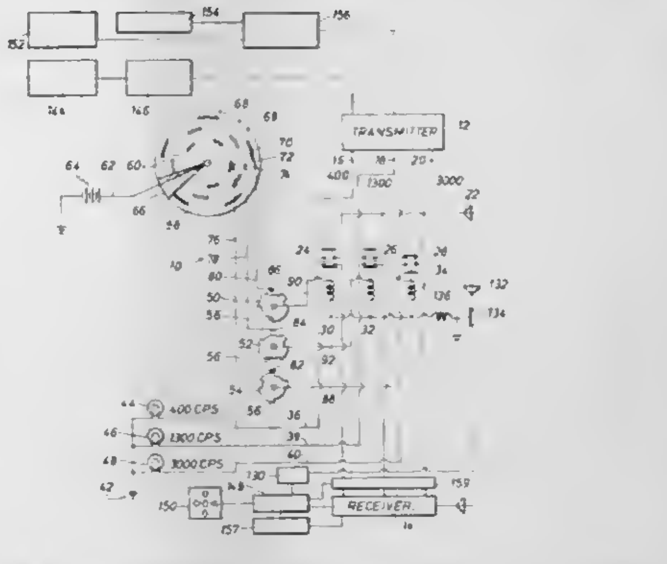
4,104,637
VOR PHASE MONITORING SYSTEM
David R. Nielson, Sandy, Utah, assignor to E-Systems, Inc., Dallas, Tex.
Filed Oct. 27, 1976, Ser. No. 735,947
Int. Cl.² G01S *1/44;* H04B *1/06*
U.S. Cl. 343—106 R **13 Claims**



9. An aircraft navigation receiver monitor where first and second signals of given frequency are received from a field station, comprising:
means responsive to the first and second signals to change the frequency thereof and generate first and second signals at the changed frequency, said means including a programmable delay to introduce a phase delay to the second signal, and
means for comparing the phase of the first signal with the phase of the second signal and generating an alarm when the phase difference exceeds a preset limit.

4,104,638
COOPERATIVE TYPE ANTI-COLLISION RADIO SYSTEM
Raymond R. Middleton, 1203 W. 16th St., Topeka, Kans. 66604
Filed Jun. 23, 1976, Ser. No. 699,019
Int. Cl.² G08G *5/04*
U.S. Cl. 343—112 CA **13 Claims**

1. An aircraft anti-collision radio system for sending and receiving radio transmissions on the same radio frequency, said system comprising radio transmitter circuitry continuously transmitting radio signals of at least one designated tone, radio receiver circuitry continuously receiving said radio signals of said designated tone, transmitting and receiving antenna circuitry means for said system, indicator circuitry means capable of being energized upon receiving radio signals of said designated tone through said receiver circuitry, switching circuitry means for selectively completing the circuitry between said transmitter circuitry and said antenna circuitry means in a first operative condition thereof whereby radio signals of said designated tone are transmitted from said antenna circuitry means and completing the circuitry between said receiver circuitry and said indicator circuitry means in a second operative condition thereof for receiving radio signals transmitted from other aircraft, means for sequentially actuating said switching circuitry means to said first and second positions thereof in response to a coded sequence that is different in said radio system from the coded sequence of all other aircraft having a similar anti-collision radio system, whereby said radio system is capable of intermittently transmitting and receiving radio signals of said designated tone through said transmitting and receiving antenna circuitry means.



4,104,639
ANTENNA FORMED OF TWO CLOSELY COUPLED LINEAR CONDUCTORS WITH HELICAL TOP LOADING
Jerome J. Muchiarone, Anderson, S.C., assignor to True Temper Corporation, Cleveland, Ohio
Filed Oct. 4, 1976, Ser. No. 727,861
Int. Cl.² H01Q *1/32, 9/36*
U.S. Cl. 343—723 **9 Claims**

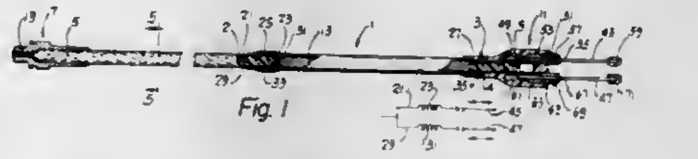
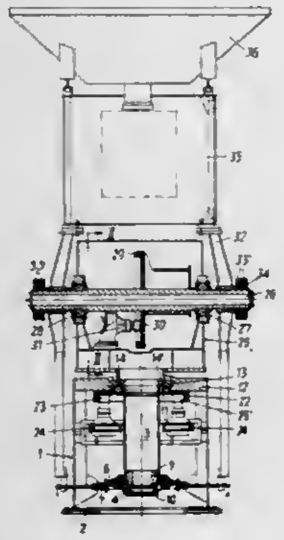


Fig. 1

1. A radio frequency antenna comprising:
an elongated shaft of dielectric material, said shaft having a base end, a tip end, and an exterior surface between the base and tip ends; and
first and second electrical conducting means electrically connected to each other at the base end of the antenna and electrically insulated from each other at the tip end of the antenna, said conducting means comprising:
- first and second generally linear conductors electrically insulated from each other and extending along opposite sides of the exterior surface of a first portion of the shaft; and
- first and second conducting coils electrically insulated from each other and extending around the exterior surface of a second portion of the shaft, said first and second coils being electrically connected to said first and second linear conductors, respectively, to form said first and second conducting means; and
- first tuning means electrically connected to one of said first and second conducting means, said first tuning means being selectively movable relative to said one conducting means for changing the resonant frequency of the antenna.

4,104,640
STEERABLE ANTENNA ARRANGEMENT

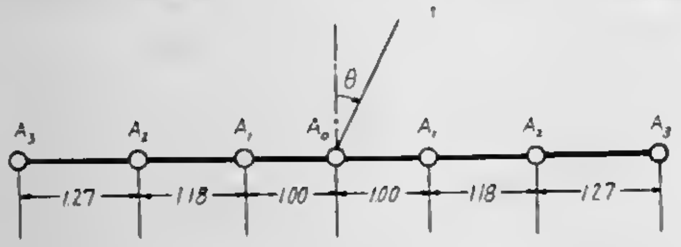
Gerhard Trauner, and Michael Kiripolszki, both of Vienna, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria
Filed May 31, 1977, Ser. No. 801,600
Claims priority, application Austria, Jun. 11, 1976, 4253/76
Int. Cl.² H01Q *3/08*
U.S. Cl. 343—765 **10 Claims**



1. In a steerable antenna arrangement of the type including a stator, a king post with an upper end, a lower end, rotatable around an azimuth axis and arranged in the stator, a rotating mechanism mounted on the king post, a four-point bearing accommodating the upper end of the king post, a tilting mechanism mounted on a horizontal elevation axis in the rotating mechanism, and an antenna carried by said tilting mechanism, the improvement comprising in combination:
- a. a cylindrical roller bearing with a conical inner race arranged in the stator and accommodating the lower end of the king post without play,
- b. a running plane of the four-point bearing which is adjustable to the azimuth axis of the king post and fixable,
- c. adjustment means provided between the king post and the rotating mechanism for adjusting and fixing the elevation axis of the tilting mechanism relative to the azimuth axis of the king post, and
- d. anti-friction bearings with equal play, equal running out of true and equal installation position provided in the rotating mechanism and accommodating the elevation axis.

4,104,641
NONUNIFORMLY OPTIMALLY SPACED ARRAY WITH SPECIFIED SIDELOBE POSITIONS IN THE RADIATION PATTERN

Hillel Unz, c/o EE Dept. Kansas Univ., Lawrence, Kans. 66045
Filed Jan. 31, 1977, Ser. No. 764,410
Int. Cl.² H01Q *21/08*
U.S. Cl. 343—844 **10 Claims**

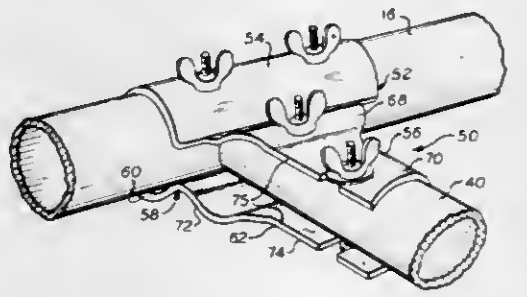


1. A method of synthesis for controlling the radiation pattern of a linear symmetric nonuniformly spaced array with nonuniform amplitudes by specifying explicitly the sidelobe positions (directions) in the array radiation pattern, said method based on the following rigorous relationship which expresses the array radiation pattern $F(u)$ of a symmetric nonuniformly spaced array of (2N) or (2N+1) elements by a constant plus a determinant of N rows and N columns, with the first row of the determinant consisting of N terms $(1/x_p)\cos(x_p u)$, and each subsequent row consisting of N terms $\sin(x_p v_s)$, with v_s being identical in all the terms of each row and represents explicitly the position (direction) of the corresponding sidelobe so specified in the array radiation pattern $F(u)$, the total number of sidelobe positions (directions) so explicitly specified is equal to $(N-1)$, where one has a total of $2(N-1)$ sidelobe positions (directions) explicitly specified in the symmetric radiation pattern $F(u)$ of the symmetric nonuniformly spaced array of (2N) or (2N+1) elements, where $u = \pi \sin \theta$, with θ being the angle with the normal to the array axis, x_p is the distance of the p-th array element in terms of half wavelength ($\lambda/2$) from the center of the symmetric array, with only the elements of one side of the symmetric array to be used as terms in the above mentioned determinant,

A_p is the amplitude of each element of the symmetric array to be found by developing the above mentioned determinant along its first row and identifying the amplitude of each element at position x_p as the factor multiplying the corresponding term $\cos(x_p u)$.

4,104,642
T-SHAPED SWIVEL JOINT FOR AN ANTENNA MOUNTING STRUCTURE

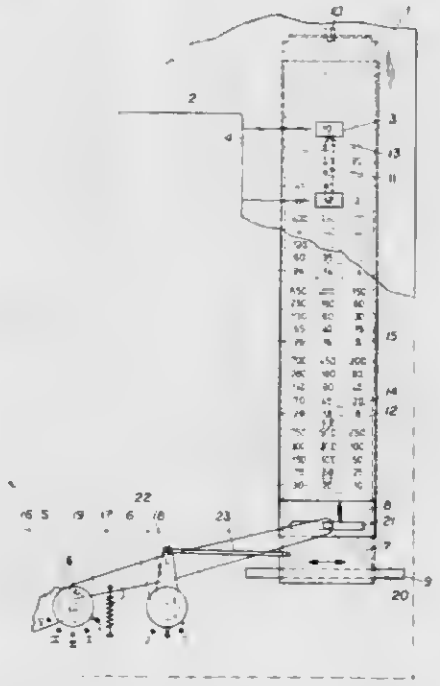
Gilbert Padilla, and Dominick Padilla, both of Bronx, N.Y., assignors to RMS Electronics, Inc., Bronx, N.Y.
Filed Feb. 25, 1977, Ser. No. 772,285
Int. Cl.² H01Q *1/12*
U.S. Cl. 343—882 **9 Claims**



1. In an antenna window mount assembly of the type including a bracing member adapted to be secured within the frame of a window; a supporting member; and means for securing one end of the supporting member to the bracing member to secure said supporting member in outwardly extending relation from the window, the free end of said supporting member being adapted to be connected to an antenna; the improvement comprising a swivel joint for releasably securing the supporting member to the bracing member to permit said supporting member to be moved between said outwardly extending position and a swivel position in which the free end of said supporting member is in relatively close spaced relation with the window, said swivel joint comprising:
- a pair of T-shaped clamps each including a base portion and a protruding portion, said clamps being disposed in spaced confronting relation to define a first sleeve between said base portions in which said bracing member is disposed, and a second sleeve between said protruding portions in which said one end of said supporting member is disposed;
- means for removably securing said base portions to said bracing member;
- each of said protruding portions having a hole therein, said one end of said supporting member having a thru-hole therein, said protruding portion holes being in register with said thru-hole; first bolt means extending through said registered holes for pivotally mounting said supporting member on said bracing member for movement between said outwardly extending position in which said supporting member is coaxial with said second sleeve and said swivel position in which said supporting member is non-coaxial with said second sleeve; first nut means for engaging said first bolt means and securing said supporting member in said second sleeve;
- at least one of said protruding portions having a first slot extending inwardly from an axially extending edge thereof, said one end of said supporting member having an additional hole therein, said first slot being registerable with said additional hole when said supporting member is coaxial with said second sleeve; second bolt means extendable through said first slot and said additional hole when said first slot and said additional hole are registered; second nut means for engaging said second bolt means for releasably securing said supporting member in said coaxial position, the loosening of said first and second nut and bolt means permitting said second bolt means to be disengaged from said first slot, and allowing said protruding portions to be sufficiently separated to accommodate movement of said supporting member between said protruding portions toward said non-coaxial position.

4,104,643
ECHO-SOUNDING RECORDER WITH DIFFERENT DEPTH-MEASURING RANGES

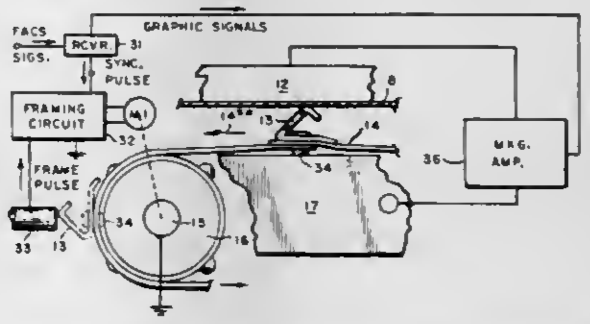
Dieter Block, Kiel, Germany, assignor to Electroacustic GmbH, Germany
Filed Jul. 20, 1977, Ser. No. 817,489
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632799
Int. Cl.² G01D *9/00*
U.S. Cl. 346—17 **4 Claims**



1. In an echo-sounding recorder wherein received echoes are recorded on a common recording surface, starting from a common zero mark, by means of a recording member moving with uniform velocity, the echo-sounding recorder being switchable to different depth-measuring ranges, respective switching members operable independently of one another for setting the recorder to different main measuring ranges and to different offset measuring ranges, and a scale associated with each of the measuring ranges, the improvement therein comprising a scale carrier carrying all of the scales in a common plane, said scale carrier being formed of at least two parts respectively displaceable vertically and horizontally relative to one another, a cover plate disposed in front of said scale carrier parallel to the recorder and formed with a row of windows spaced from one another a distance corresponding to the distance between divisions of the respective scales, said scale carrier being mounted for movement relative to said cover plate in two mutually perpendicular directions disposed in the common plane of the scales over a distance corresponding to the scale offset, and kinematic transmission means for coupling said scale carrier to the switching members so that actuation of one of the switching members moves the scale carrier in one of said mutually perpendicular directions, and actuation of the other of the switching members moves the scale carrier in the other of said mutually perpendicular directions, each of the movements of the scale carrier being equal to the respective horizontal and vertical offset of the scales or a multiple thereof.

4,104,644
FRAMING PULSE GENERATOR FOR FACSIMILE RECORDER

George C. Williams, South Easton, Mass., assignor to Alden Research Foundation, Westboro, Mass.
Filed Dec. 29, 1976, Ser. No. 755,342
Int. Cl.² G01D *15/06*
U.S. Cl. 346—139 A **4 Claims**



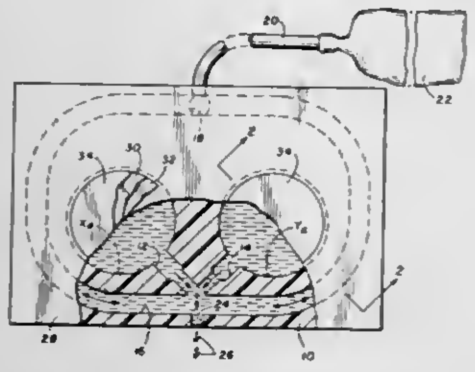
1. Facsimile recording apparatus for electrically marking graphic signals line by line on a recording web, each line of graphic signals being preceded by a syncronization pulse, said apparatus comprising:
- an assembly defining an elongate scanning zone through which the web is fed;
- a belt carrying at least one conductive stylus and conveying the stylus along the zone across the web to mark signals on the web;
- a conductive pulley at one end of the scanning zone interengaging with the belt, the belt including conductive means electrically connected to the stylus and making electrical contact with the pulley;
- means for driving the belt;
- contact means adjacent the pulley beyond the scanning zone in the path of the stylus so that the stylus completes a pulse generating circuit through the pulley and contact means for each scan of the zone before the stylus is conveyed into the recording zone; and
- a framing circuit connected to the contact means for receiving the generated pulse and controlling the belt driving means thereby to frame the graphic signals on the recording web.

4,104,645
COINCIDENCE INK JET

Kenneth H. Fischbeck, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 625,988, Oct. 28, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,407
Int. Cl.² G01D *15/18*
U.S. Cl. 346—140 R **47 Claims**

1. In a multiple ink jet assembly comprising: at least two ink jets each having an outlet orifice, a first fluid chamber, first passage means communicating said first fluid chamber with the orifice of one of said jets, a second fluid chamber, second passage means communicating said second fluid chamber with each of the orifices of said jets, liquid in said first and second fluid chambers and each of said passage means, means for independently decreasing the volume of each of said first and second fluid chambers to generate pressure pulses therefrom,

and means for effecting coincidently only at the orifice of said one jet the pressure pulse generated by said first chamber and the pressure pulse generated by said second chamber to express a liquid droplet therefrom.



4,104,646
INK EJECTION

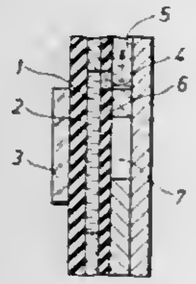
Karl-Heinz Fischbeck, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Dec. 10, 1976, Ser. No. 749,518

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555749

Int. Cl.^{2} G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—140 R **4 Claims**



1. An arrangement comprising, in combination:

(a) an ink ejector head having an ink flow system incorporating

(1) means forming a chamber capable of being supplied with ink from an ink reservoir and having a nozzle through which ink is ejected, and

(2) a pressure producer capable of being subjected to pulses for applying pressure to the ink in said chamber so as to cause the ink to be ejected through said nozzle, said pressure producer being a ceramic oscillator comprising a ceramic oscillator element and first and second membranes, said second membrane being arranged in said ejector head and being spaced from said first membrane so as to divide the interior of said ejector head into an air chamber and an ink chamber; and

(b) means for applying to said pressure producer a series of pulses consisting of alternating primary and secondary pulses of which only said primary pulses are pulses which cause the ink to be ejected through said nozzle, said secondary pulses occurring a predetermined time interval after the cessation of the application of the immediately preceding primary pulse and being pulses for counteracting the outside air pressure and preventing the entry of a column of air into said nozzle above the returning stream of ink when there is a pressure reduction in the ejection system, said secondary pulses being applied while said oscillator is at rest.

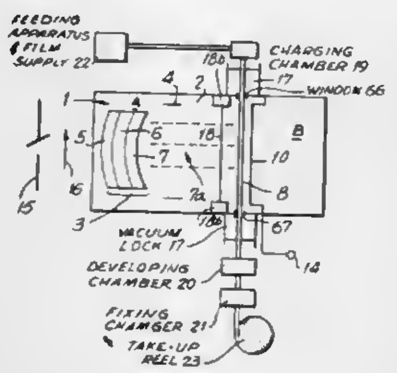
4,104,647
APPARATUS WITH TWO VACUUM CHAMBERS FOR ELECTROPHOTOGRAPHY PRODUCING IMAGE BY ELECTRICAL CHARGES

Edward Emanuel Sheldon, 30 E. 40 St., New York, N.Y. 10016

Filed Dec. 27, 1976, Ser. No. 754,405

Int. Cl.^{2} G03G *15/044*

U.S. Cl. 346—158 **20 Claims**



1. A vacuum tube containing a first vacuum compartment and a second vacuum compartment, said first vacuum compartment comprising means for producing a beam of electrons, accelerating electrodes means for said electron beam, and an imperforate membrane mounted in the path of said electron beam, said membrane transmitting said accelerated beam of electrons and impervious to ions of energy below 25 KV, said membrane separating said first vacuum compartment from said second vacuum compartment, said second vacuum compartment comprising means for receiving said transmitted beam of electrons, producing electrical conductivity changes in response to said electron beam and producing an image corresponding to said electron beam, and window means for the passage of said image producing means into said second compartment and to the outside of said second compartment.

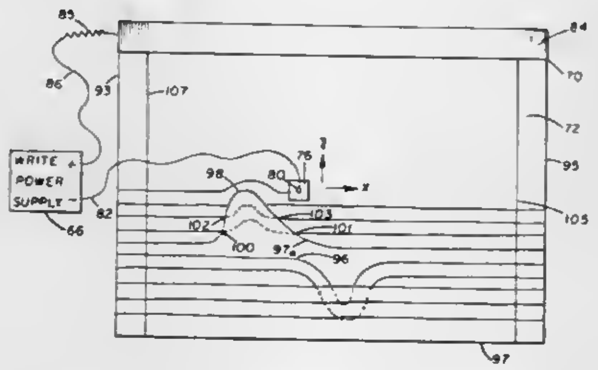
4,104,648
ELECTRIC SPARK RECORDING

John Blumenthal, Wickliffe, and Arling Dix Brown, Jr., Cleveland Heights, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 12, 1976, Ser. No. 704,373

Int. Cl.^{2} G01D *15/08, 9/32*

U.S. Cl. 346—163 **2 Claims**



1. In a method for providing a two-dimensional graphic display of a three-dimensional surface of an object, the method having the steps of drawing a micro-stylus transducer sequentially over the surface along a first plurality of spaced, horizontal scan lines while simultaneously measuring movement of the micro-stylus in the vertical direction orthogonal to the direction of the scan lines, the improvement comprising:

providing an arc erodable, electrically conductive recording medium having a recording surface;

applying an electrical potential to said medium along a first boundary thereof;

providing an electrically conductive writing stylus;

applying a different electrical potential to said writing stylus so that a writing potential is developed between said writing stylus and said medium;

scanning said writing stylus sequentially across said medium along a further plurality of horizontal scan lines corresponding to said first plurality of horizontal scan lines, said scanning beginning from a second boundary of said medium spaced from said first boundary, so that each one of said further plurality of scan lines is spaced from said first boundary and is closer to said first boundary than the previous scan line; and

during each sequential scan of said writing stylus across said medium, displacing said writing stylus in the horizontal direction orthogonal to the direction of said scan line by an amount proportional to movement measured by the micro stylus in the vertical direction on the surface of the object,

whereby each scan of said writing stylus arc erodes said recording medium to produce a record trace, thereby providing an open circuit between said first boundary and the portion of said medium opposite said record trace from said first boundary; and thereby further preventing the record trace produced during one scan of said writing stylus from overwriting the record trace produced by the previous scan.

4,104,649
ADAPTOR FOR PROVIDING A DIGITAL SIGNAL INDICATING THE FULL OPEN F NUMBER OF AN INTERCHANGEABLE PHOTO-TAKING LENS IN A SINGLE LENS REFLEX CAMERA SYSTEM

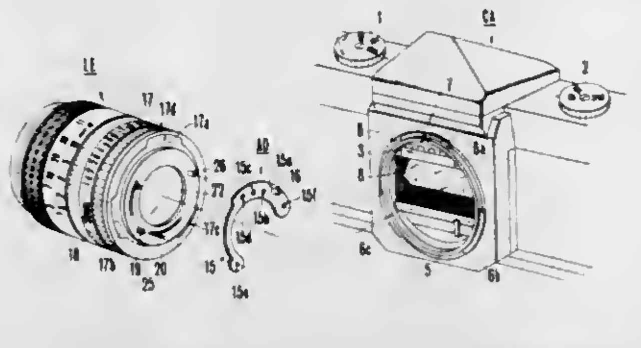
Katsumi Tanaka, Kawasaki; Shigeru Hashimoto, Yokohama; Shohei Ohtaki, Yokohama; Tadashi Ito, Yokohama; Tomonori Iwashita, Fuchu, and Susumu Kozuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,119

Claims priority, application Japan, Nov. 6, 1975, 50-133306

Int. Cl.^{2} G03B *17/00*

U.S. Cl. 354—289 **17 Claims**



1. An adaptor for extablising the use of a conventional interchangeable photographic lens in combination with a digitalized camera body which is provided with an inputting device for inputting the full open F number information of said photographic lens as a coded digital signal of n-bits, said adaptor comprising:

supporting means attachable to said photographic lens in rigidly secured relation at a predetermined position; and

k-signal members, wherein k represents an integer from 0 to n inclusive, for providing said full open F number information of the photographic lens as the coded digital signal of said *n*-bits, said signal members being disposed on said supporting means and having n setting positions on the supporting means and being able to provide 2^n different digital signals corresponding to 2^n different combinations of positions of said signal members, and being adapted to actuate said inputting device of the camera body for inputting the full open F number information of the photographic lens as the coded digital signal of said n-bits when the photographic lens is mounted on the camera body, whereby it is made possible to use a conventional interchangeable photographic lens in combination with a digitalized camera body.

4,104,650
SHARP FOCUS DETECTING SYSTEM

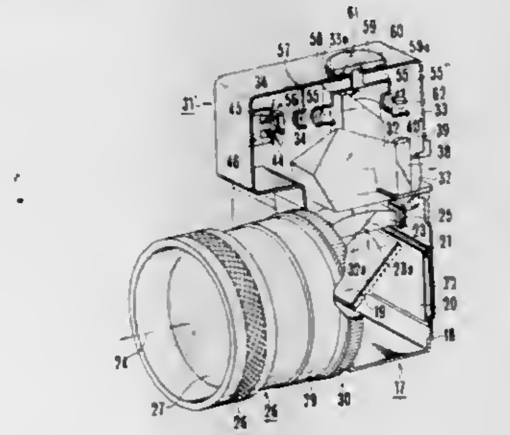
Kazuya Hosoe, Machida; Seiichi Matsumoto; Shigeru Hashimoto, both of Yokohama; Tomonori Iwashita, Chofu; Tadahide Fukushima, and Hideo Yokota, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,535

Claims priority, application Japan, Aug. 16, 1974, 49-94369; Aug. 20, 1974, 49-95167; Aug. 20, 1974, 49-95168; Aug. 30, 1974, 49-100154

Int. Cl.^{2} G03B *7/08*

U.S. Cl. 354—25 **26 Claims**



1. A focus detecting system for use with an optical instrument, comprising:

(a) an image-forming lens system mounted on said optical instrument and arranged to be adjustable so that an image of an object is formed on a focal plane of said optical instrument, said lens system being interchangeable with another image-forming lens system having different imaging performance;

(b) a housing adapted to be attachable to and detachable from said optical instrument;

(c) sensing means mounted in said housing and having a light sensitive image-receiving surface transversely positioned in the path of a light projected through said optical lens system, said sensing means producing an electrical output which changes in correspondence with the change in the sharpness of the object image formed on the image-receiving surface;

(d) means for periodically varying the substantial length of the light beam path between said lens system and said sensing means;

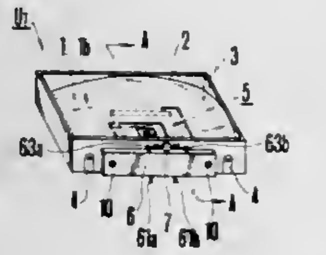
(e) circuit means mounted in said housing and electrically connected to said sensing means for processing said electrical output produced therefrom to produce an electrical signal commensurate with the focusing condition of said lens system, and

(f) compensating means mounted in said housing and arranged upon interchanging said image-forming lens system for compensating a deviation of the electrical output of the sensing means caused by the difference in the imaging performance of said image-forming lens system,

said compensation means including a plurality of lenses having different refractive powers from one another and selecting means being mounted in said housing and arranged to be operable from the outside of said housing for selecting one of said lenses in correspondence with the imaging performance of said optical lens system for cooperation with said sensing means.

4,104,651
FOCUSING SCREEN UNIT FOR SINGLE LENS REFLEX CAMERA

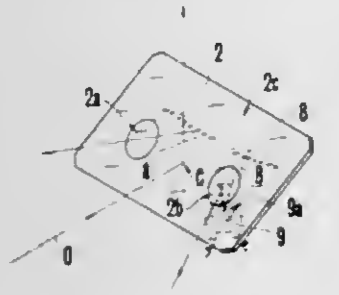
Seiichi Matsumoto; Mutsuhide Matsuda, both of Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 14, 1977, Ser. No. 768,417
Claims priority, application Japan, Feb. 17, 1976, 51-16297
Int. Cl.² G03B *7/08, 17/20*
U.S. Cl. 354—25 **32 Claims**



1. A focusing screen assembly for a single lens reflex camera which is equipped with a photo-taking lens means, said lens means being adjustable along an optical axis for focusing an image of an object on a predetermined film plane of the camera, said assembly comprising;
(a) a focusing screen means having an image receiving surface adapted to receive the object image formed by said photo-taking lens means at a position conjugate to that of said predetermined film plane; and
(b) light transmissive photoelectric transducing means arranged substantially on said image receiving surface of the screen means and capable of producing an electrical output substantially corresponding to the sharpness of the image on said image receiving surface as the image sharpness is varied by the axial adjustment of the lens means,
whereby it is made possible to detect the focusing condition of the lens means to the object by the electrical output of the transducing means.

4,104,652
SINGLE LENS REFLEX CAMERA

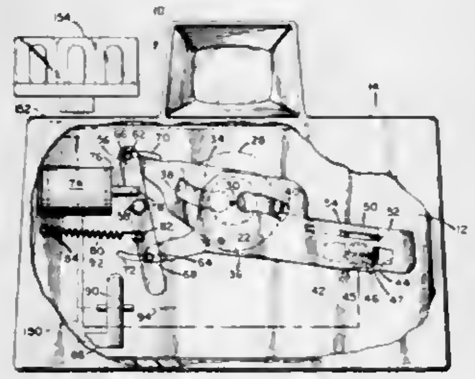
Kazuya Hosoe, and Hideo Yokota, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1977, Ser. No. 776,246
Claims priority, application Japan, Mar. 12, 1976, 51-27580
Int. Cl.² G03B *3/00*
U.S. Cl. 354—25 **13 Claims**



1. A single lens reflex camera comprising:
(A) a photo-taking lens system having an optical axis and adjustable along the axis so as to form an object image on a predetermined film plane;
(B) a view finder optical system adapted for viewing the object image to be formed on the film plane by the lens system from outside the camera;
(C) a viewing mirror for deflecting an image light coming from said lens system to said view finder optical system;
(D) an auxiliary mirror arranged behind said viewing mirror, at least one of said viewing mirror and said auxiliary mirror having a function of causing only at least one part of the image light coming through said taking lens system in an outer zone comparatively distant from a center thereof to go out from the path of the light going to the film plane; and
(E) photo-electric detecting means for detecting the focusing condition of the lens system to the object, said detecting means being arranged to receive only said image light of the outer zone through said auxiliary mirror and being responsive to said image light of the outer zone to produce a signal corresponding to the focusing condition of the lens system to the object.

4,104,653
SCANNING SHUTTER BLADE ARRANGEMENT WITH AMBIENT AND FLASH RANGES

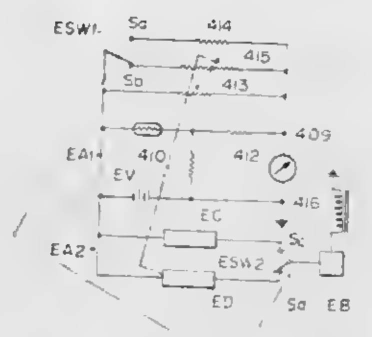
Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed May 31, 1977, Ser. No. 801,477
Int. Cl.² G03B *7/14*
U.S. Cl. 354—27 **17 Claims**



1. A photographic camera apparatus for use in either an ambient scene lighted mode or an artificially scene lighted mode wherein the camera includes means for mounting photographic film material at a given focal plane, said camera comprising:
a blade mechanism;
means for mounting said blade mechanism for displacement along a predetermined path between a first arrangement wherein it precludes scene light from reaching the film plane and a second arrangement wherein it defines a maximum size aperture, said blade mechanism serving to define a range of progressively increasing sized apertures as it moves from its said first arrangement to its said second arrangement;
means for detecting scene light in correspondence to the scene light admitted to the focal plane by said blade mechanism as it moves through said range of apertures between said first and second arrangements and for integrating said detected scene light to provide an output signal corresponding to a select exposure value;
selectively actuable drive means for initially displacing said blade mechanism from its said first arrangement toward its said second arrangement, and in at least one of said modes of operation for thereafter displacing said blade mechanism back toward its said first arrangement in response to said output signal from said scene light detecting and integrating means to define an exposure cycle;
and means responsive to camera operation in the ambient scene lighted mode for limiting displacement of said blade mechanism along said predetermined path to an intermediate arrangement wherein it defines an aperture size less than said maximum aperture size and responsive to camera operation in the artificially scene lighted mode for not limiting displacement of said blade mechanism along said predetermined path intermediate its said first and second arrangements thereby providing for varying depths of field in at least said one mode of operation.

4,104,654
PHOTOMETRIC APPARATUS FOR SINGLE LENS REFLEX CAMERA

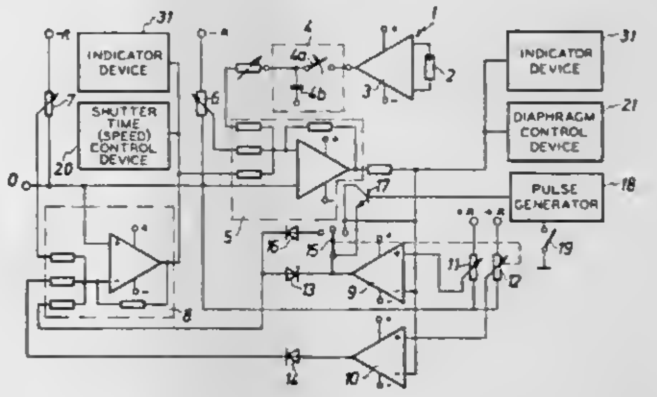
Yoshihisa Maitani; Kunio Shimoyama; Muneaki Yoshida; Akihiko Hashimoto, and Masahiro Kitagawa, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Division of Ser. No. 505,956, Sep. 13, 1974, Pat. No. 3,994,001. This application Aug. 24, 1976, Ser. No. 717,087
Claims priority, application Japan, Jul. 2, 1974, 49-75694
Int. Cl.² G03B *7/08*
U.S. Cl. 354—31 **2 Claims**



1. A photographic camera operable in an automatic and manual mode, comprising:
means for positioning a light sensitive film along a focal plane of said camera;
first and second shutter blinds;
means for drawing said first shutter blind across said focal plane for initiating exposure of said film;
means for drawing said second shutter blind across said focal plane at the end of an exposure period for terminating exposure of said film;
a light reflecting mirror movable between a first position wherein said mirror directs light entering said camera to a view finder system and a second position wherein said mirror permits said light to reach said focal plane;
means for moving said mirror from said first to said second position upon the iniation of a shutter release operation;
a first photoelectric transducer element mounted in said camera at a location which permits said first transducer element to receive light reflected from said first shutter blind and/or said film;
a second photoelectric transducer element mounted in said camera at a location which permits said second transducer element to receive light directed by said mirror to said view finder system;
automatic exposure circuit means cooperating with said first transducer element and independent of said second transducer element for controlling the exposure time of said film as a function of the amount of light reflected from said first shutter blind and/or said film, when said camera is in an automatic mode;
meter means cooperating with said second transducer element for providing photometric information regarding the amount of light entering said camera prior to a shutter release operation, said meter means including a meter pointer and a scale, the position of said pointer relative to said scale providing said photometric information;
manual exposure circuit means cooperating with said meter pointer and said second transducer element for permitting manual adjustment of the exposure period of said film according to the information supplied by said meter means when said camera is in said manual mode.

4,104,655
CAMERA WITH AUTOMATIC EXPOSURE CONTROL SYSTEM

Karl-Peter Strauss, Volkmarode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Dec. 20, 1976, Ser. No. 752,053
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558254
Int. Cl.² G03B *7/08*
U.S. Cl. 354—38 **15 Claims**



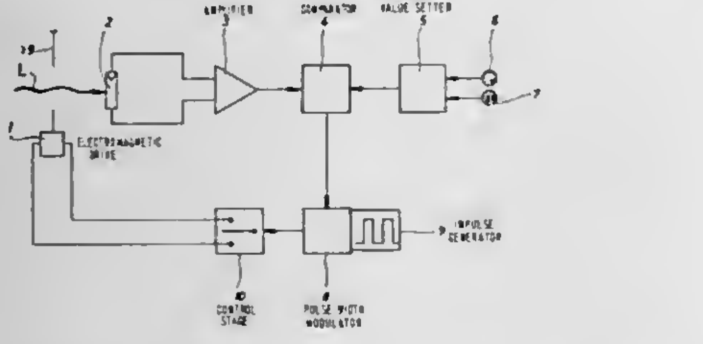
1. A camera comprising
(a) first factor means for preselecting a value for one of the two exposure value factors of shutter speed and diaphragm aperture and for producing a first output signal in accordance with such preselected value,
(b) light measuring circuit means for measuring brightness of a subject to be photographed and producing a second output signal in accordance with such brightness,
(c) means for setting a film sensitivity value and producing a third output signal in accordance therewith,
(d) means responsive to said first, second, and third output signals for determining an optimum value for the other of said two exposure value factors and for producing an optimum value signal in accordance therewith,
(e) means for producing range limit signals indicating an available range of values for said other of said two factors,
(f) comparator circuit means for comparing said optimum value signal with said range limit signals and producing a comparator output signal,
(g) circuit means for conveying said comparator output signal to said first output signal to influence said first output signal produced by said first factor means,
(h) gate means preventing transmission of said comparator output signal to said first output signal when said optimum value signal is within the range of said range limit signals and allowing such transmission when it is outside said range, thereby to modify said first output signal, and
(i) means responsive to said first output signal produced by said first factor means as and when modified by said comparator output signal for controlling an operating value of said first factor.

4,104,656
CONTROL MEANS FOR A DIAPHRAGM OF A SINGLE LENS REFLEX CAMERA

Karl-Peter Strauss, Volkmarode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Continuation-in-part of Ser. No. 594,466, Jul. 9, 1975, abandoned, which is a continuation of Ser. No. 467,754, May 7, 1974, abandoned. This application Oct. 19, 1976, Ser. No. 733,770
Claims priority, application Fed. Rep. of Germany, May 5, 1973, 2322747; Feb. 16, 1974, 2407600
Int. Cl.² G03B *7/08*
U.S. Cl. 354—43 **24 Claims**

1. Control means for controlling an adjustable aperture of a

diaphragm of a photographic camers, said control means comprising electromagnetic diaphragm drive means, a photoelectric converter situated behind said diaphragm in position to receive light through the aperture of said diaphragm, exciter current supply means responsive in part to current from said photoelectric converter for supplying a succession of exciter pulses to said electromagnetic drive means to cause movement of said drive means to adjust said diaphragm to a different aperture, said exciter current supply means including an operation amplifier having two inputs and an output, a control stage, means for supplying an output from said photoelectric converter to an input of said amplifier, nominal value setting means operatively connected to influence voltage supplied to one input of said amplifier, a feedback circuit from the output of said amplifier to one input thereof, an operative connection from the output of said amplifier to an input of said control stage, and an operative connection from an output of said control stage to said electromagnetic drive means.



4,104,657

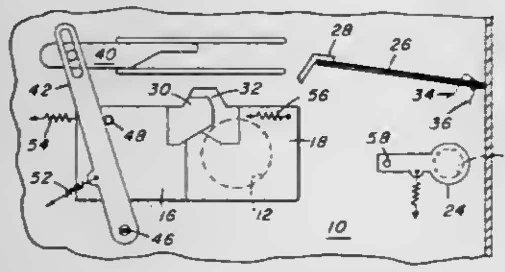
PIEZOELECTRIC ELECTRONIC SHUTTER CONTROL FOR CAMERAS

Lee Fitzpatrick Frank, and James Kelly Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,834

Int. Cl.² G03B *7/08, 9/62*

U.S. Cl. 354—50 **13 Claims**



1. A camera of the type having (1) an exposure aperture and (2) a shutter movable to open and close the aperture; said camera comprising:

a piezoelectric energy conversion device having an original shape;

releasable means for deforming said piezoelectric device from its original shape in a first direction to create a first electric charge tending to return said device to its original shape;

means for dissipating said first electric charge from said piezoelectric device, whereby a second electric charge tending to resist the return of said device to its original shape is created when said deforming means is released;

means for dissipating said second electric charge at a rate which is a function of the level of scene illumination; and

means, responsive to said second charge having dissipated to a predetermined level, for controlling movement of the shutter from its open to its closed position.

4,104,658

DATA PRINTING DEVICE FOR CAMERA

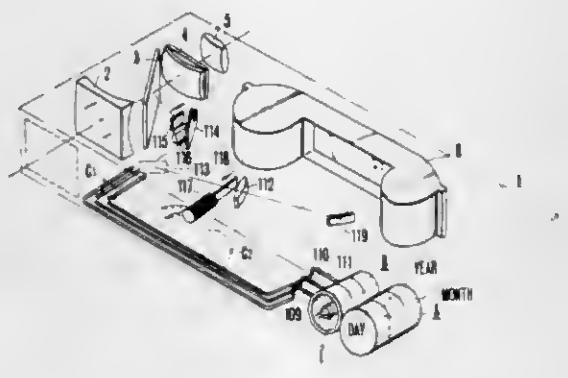
Takashi Uchiyama; Noriaki Sanada, both of Yokohama; Teruo Otaka, Kawasaki; Yoshio Komiya, Tokyo; Youichi Okuoo, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,462

Claims priority, application Japan, Nov. 25, 1975, 50-140880; Dec. 8, 1975, 50-146155; Dec. 17, 1975, 50-151143; Jan. 14, 1976, 51-3591

Int. Cl.² G03B *17/24*

U.S. Cl. 354—106 **4 Claims**



1. A data printing device for a camera comprising:

a data figure carrier for carrying figures representing photographing data to be inserted on a portion of photosensitive film simultaneously with a picture image being photographed;

data setting means interengaged with said data figure carrier for setting the data to be inserted on a photograph;

a light source for illuminating the data figures set by the data setting means;

optical means for guiding light flux passing through the set data figures to a film surface; and

bundles of optical fibers being provided as optical means for guiding light flux supplied by said light source passing through the set data figures to an optical path of a view finder, one end of each of the optical fiber bundles facing said data figure carrier.

4,104,659

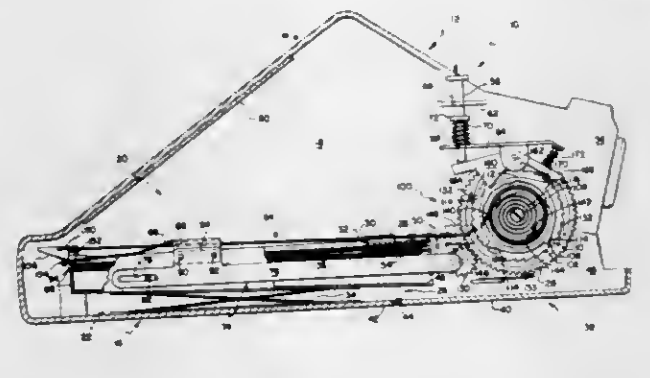
PHOTOGRAPHIC APPARATUS HAVING A SPRING DRIVEN MOTOR

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 28, 1977, Ser. No. 781,724

Int. Cl.² G03B *1/18*

U.S. Cl. 354—170 **8 Claims**



1. Photographic apparatus comprising:

means for locating a film cassette in position for exposure of a film unit contained therein;

means, extending between the exterior of said apparatus and said locating means, for defining a path along which the film cassette travels as it is manually moved toward said locating means;

means for exposing the film unit;

means for performing a post exposure function associated with the advancement of the exposed film unit from said exposure position;

a spring motor;

means for coupling said spring motor to said performing means;

means coupled to said spring motor for winding said spring motor to increase the energy thereof, said winding means including a member located at a first position within said means for defining a path so as to be engaged and moved by the film cassette toward a second position during movement of the cassette toward said locating means, such movement of said member between said first and second positions being transmitted to said spring motor to wind the latter; and

means responsive to the actuation of said exposing means for enabling said spring motor to drive said performing means via said coupling means to move the exposed film unit away from said exposure position.

4,104,660

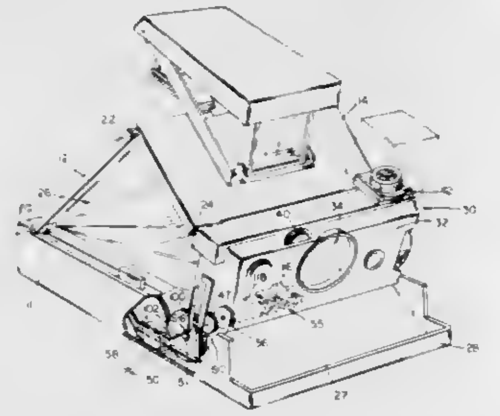
CAMERA HAVING AUTOMATIC SHUTTER RECOCK BY FILM PROCESSING MECHANISM

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporatioo, Cambridge, Mass.

Filed Dec. 10, 1976, Ser. No. 749,309

Int. Cl.² G03B *17/52, 1/18, 19/10, 17/04*

U.S. Cl. 354—171 **27 Claims**



12. A camera of the type employing a removable film cartridge including a plurality of individual film units, said camera having:

a base including forward and rear portions;

a motor carried on said base;

an output gear mechanism mounted on said base in driving connection to said motor;

an access door coupled to said base forward portion for pivotal movement between an open position permitting insertion or removal of a said film cartridge and a closed position for camera operation;

a shutter mechanism housing pivotably connected to said base forward portion at a housing pivot axis for pivotal movement of said housing between an erect position for camera operation and a collapsed position for storage;

said access door closed position and said shutter mechanism housing erect position together defining a camera operating condition;

a film advance gear arrangement including a processing roll gear mounted on said access door and drivably connected with said output gear when said access door is in its said closed position, said processing roll gear having its axis forward of said door pivot axis;

shutter mechanism recock means carried in said housing and including a recock gear having its axis forward of said housing pivot axis and of said processing roll gear axis, said recock gear being drivably engaged with said processing roll gear when said camera is in its operating condition with said housing erect and said door closed, and disengaged therefrom when said housing is in its said collapsed position or said door is in its said open position;

said door pivot axis, said housing pivot axis, said processing roll gear axis, and said recock gear axis all lying in a common plane in said camera operating condition;

said recock gear being thereby smoothly pivotable into and out of engagement with said processing roll gear during said pivotal motion of said housing when said access door is in its said closed position; and

said processing roll gear being thereby smoothly pivotable into and out of engagement with said recock gear and during said pivotal motion of said access door when said housing is in its said erect position.

4,104,661

SAFETY DEVICE FOR AUTOMATIC EXPOSURE CONTROL CAMERA HAVING MOTOR DRIVE EQUIPMENT

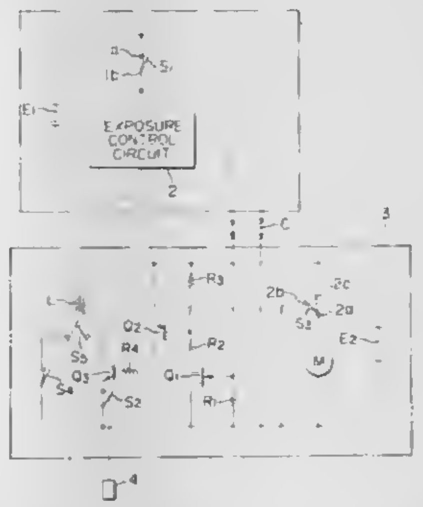
Shiro Sugimori, and Kenji Toyoda, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 7, 1975, Ser. No. 620,423

Claims priority, application Japan, Oct. 14, 1974, 49-122776[U]

Int. Cl.² G03B *1/18*

U.S. Cl. 354—173 **8 Claims**



1. In a camera having an exposure control circuit determining shutter speed or stop value for obtaining a proper exposure, an electric motor effecting shutter release, shutter charge and film winding operations when the motor is energized, and a phototaking switching means manually operable from outside the camera for energizing the motor when the phototaking switching means is closed, the improvement comprising, in combination, a main switching means making the exposure control circuit operable when the main switching means becomes conductive, an auxiliary switching means connected in series with the phototaking switching means and interlocking means which interlocks the main and auxiliary switching means to prevent the phototaking switching means from energizing the motor until the main and auxiliary switching means are both conductive.

4,104,662

FOLDING TYPE PHOTOGRAPHIC CAMERA

Susumu Fukuda, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 16, 1976, Ser. No. 723,859

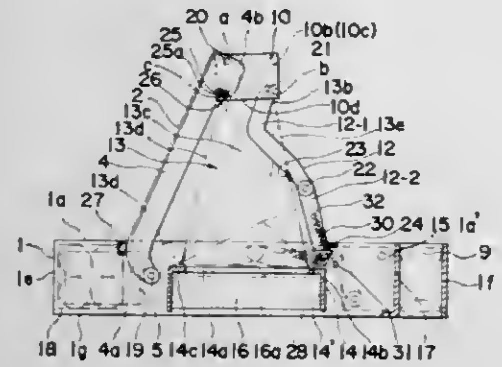
Claims priority, application Japan, Sep. 23, 1975, 50-115251

Int. Cl.² G03B *17/04*

U.S. Cl. 354—187 **9 Claims**

1. A photographic camera of folding type which comprises a main body of rectangular box-like configuration having a first housing section which is formed with an exposure aperture in a forward wall thereof facing a forward side of said

main body in terms of the object being photographed so as to accommodate therein a film container in such a manner that an exposure opening of the film container coincides with said exposure aperture of said first housing section and a second housing section being formed in a position adjacent to said first housing section and between said forward side and a rear side of said main body, lens supporting means having exposure means incorporated therein, a cover plate member pivotally connected, at one end thereof, to said main body in a position corresponding to said second housing section, with said exposure opening of said first housing section being located therebetween, for rotation between a first position to cover said forward side of said main body and a second position whereat said lens supporting means is held in photographing position, with the other end of said cover plate member pivotally connected to an adjacent corner portion of the side wall of said lens supporting means for covering, at said first position, said forward side of said main body into which said lens supporting means is housed, a pair of folding link levers, each pair having first and second lever members pivotally connected at their ends to each other for being folded in one direction, with one end of the first lever member of each of said pairs being pivotally connected to said main body and one end of the second lever member of each of said pairs being pivotally connected to the corner portion diametrically opposite to said adjacent corner portion of the side wall of said lens supporting means, for pivotally supporting said lens supporting means together with said cover plate member, during rotation thereof, between said first and second positions, and a tension spring for said first lever member, said tension spring being connected at one end to said main body and at the other end to said first lever member intermediate of its ends so as to bias said first lever member into its two extreme positions and to resist movement between those positions such that said lens supporting means automatically moves during rotation of said cover plate member towards a first position from said second position and vice versa after being partially rotated out of one position and towards another, and a collapsible light-shielding bellows having one peripheral edge secured around said exposure aperture of said first housing section, and the other peripheral edge thereof around the rear face of said lens supporting means with said bellows being expanded at said second position and folded into a flat state at said first position.



4,104,663

MULTIPLE OBJECTIVE LENS CAMERA

Yasuo Yamazaki, Kawachinagano; Taizo Kawaguchi, Amagasaki, and Kazuo Kimura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1977, Ser. No. 790,220

Claims priority, application Japan, May 12, 1976, 51-53251

Int. Cl.^{2} G03B *3/00, 13/02*

U.S. Cl. 354—197 **12 Claims**

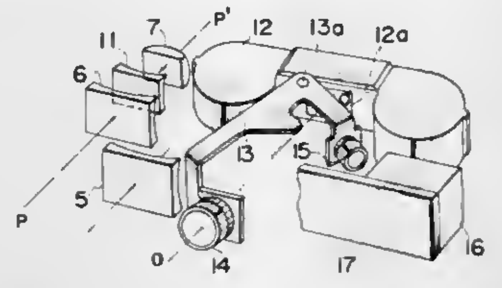
1. A camera comprising:

a body having a lens storage space and a photographic optical axis perpendicularly incident on a focal plane in said body;

a plurality of objective lenses located in said body and selectively transferrable between advanced and retracted positions respectively in and out of registry with said optical axis for varying the camera image magnification;

a finder optical system proximate said storage space and including a field varying lens member transferrable between advanced and retracted positions respectively in and out of registry with said finder optical system, said lens member in its retracted position occupying said lens storage space; and

operating means for selectively advancing and retracting a first of said objective lenses, said first objective lens in its retracted position occupying said storage space and in its advanced position being out of said storage space and permitting the occupation thereof by said lens member.



4,104,664

FILM ADVANCE MECHANISM FOR STILL CAMERAS

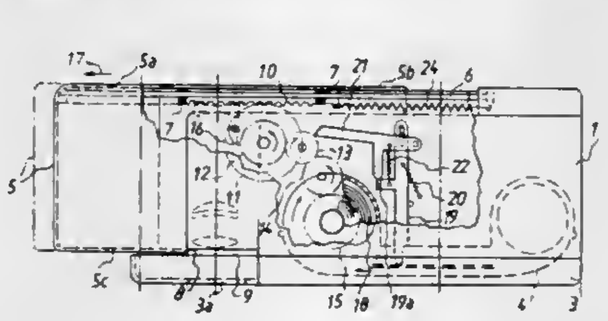
Alfred Winkler, Munich; Peter Lermann, Narring; Dieter Engelsmann, and Günter Fauth, both of Unterbaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,683

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603661; May 14, 1976, 2621614

Int. Cl.^{2} G03B *1/00, 17/04, 17/26*

U.S. Cl. 354—213 **15 Claims**



9. In a still camera having a housing a shutter and means for receiving a roll of film in said housing, a film advance device comprising, in combination, a hand operated film advance slide movable in two opposite positions, film takeup means coupled to said slide and to said film for advancing said film in one direction and for blocking the same in opposite direction; film advance control means coupled to said takeup means and to said shutter for blocking the advance of said film after a predetermined frame distance aod for unblocking the film in response to the shutter actuation; and first spring means for returning and releasably arresting independently from said film advance control means said slide in a predetermined pulled-out position thereof corresponding to said frame distance.

4,104,665

CONTACT MECHANISM OF SHUTTER FOR CAMERA

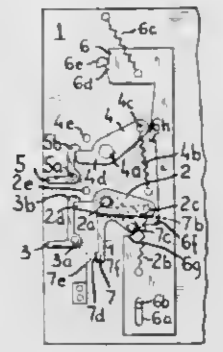
Nakagawa Tadashi; Masanori Watanabe; Eiichi Onda; Mitsuo Koyama, and Ichiro Nemoto, all of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Nov. 24, 1976, Ser. No. 744,924

Claims priority, application Japan, Nov. 25, 1975, 50-159497[U]

Int. Cl.^{2} G03B *9/08*

U.S. Cl. 354—226 **6 Claims**



1. In a camera shutter mechanism having a shutter aperture, an opening member mounted to undergo movement from an initial position to an open position in which said shutter aperture is open and back to its initial position and being normally biased for movement to said open position, and a closing member mounted to undergo movement from an initial position to a closed position in which said shutter aperture is closed and back to its initial position and being normally biased for movement to said closed position: two contact members normally biased into an initial state; means for moving one of said contact members from its initial state into or out of electrical contact with the other of said contact members only when said opening member is moved into its open position and for returning said one contact member to its initial state in response to movement of said opening member back to its initial position; and means for effecting movement of said opening member from its open position back to its initial position during the course of movement of said closing member into its closed position.

4,104,666

EXPOSURE CONTROL CIRCUIT FOR CAMERA

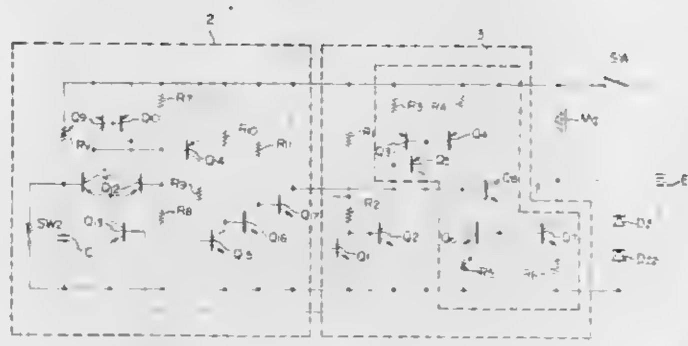
Kenji Toyoda, Kawasaki, and Sakuji Watanabe, Yono, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 739,850

Claims priority, application Japan, Nov. 14, 1975, 50-136311

Int. Cl.^{2} G03B *9/02, 9/08*

U.S. Cl. 354—234 **2 Claims**



1. An exposure control circuit for electrically controlling a camera shutter or diaphragm, comprising:

(a) an electromagnet for actuating the shutter or diaphragm when its electromotive force has reached a predetermined value;

(b) a battery the output voltage of which varies depending on variations in its condition of use;

(c) constant current means which has for its source an output voltage of said battery, the constant current means exciting the electromagnet with constant current independently of the output voltage of said battery, as long as said last mentioned output voltage varies within a range in which the constant current means is actuated normally; and

(d) a setting circuit for determining whether or not the constant current means is in condition to excite said electromagnet so that the shutter or diaphragm may be controlled.

4,104,667

MOUNTING MEANS FOR BLADES OF PHOTOGRAPHIC SHUTTERS

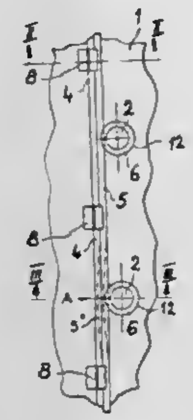
Erwin Scholz, and Albert Ehlers, both of Brunswick, Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,685

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610350

Int. Cl.^{2} G03B *9/10*

U.S. Cl. 354—250 **9 Claims**



1. Mounting means for mounting photographic shutter blades swingably on a mounting member, said mounting means comprising means forming a plurality of bearing holes in said member, a trunnion secured to a shutter blade and rotatably received in each of said holes, each of said trunnions having a circumferential groove intermediate its length, a wire retaining groove in said mounting member, said wire retaining groove extending approximately tangentially with respect to all of said holes, and a single retaining wire extending along said wire retaining groove and engaged in the respective circumferential grooves of all of said trunnions to retain said trunnions against withdrawal from their respective holes.

4,104,668

CONTINUOUS PROCESSOR FOR PHOTOGRAPHIC FILMS OR THE LIKE

Erwin Laar, Taufkirchen, Fed. Rep. of Germany, assignor to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,800

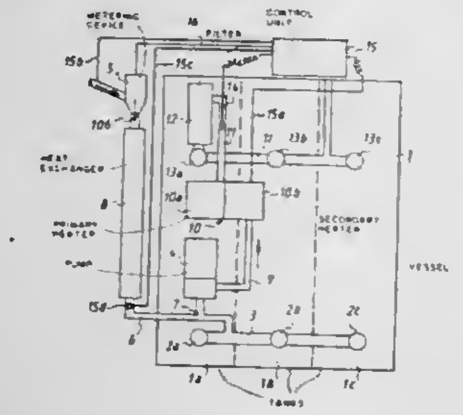
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616869

Int. Cl.^{2} G03D *13/00*

U.S. Cl. 354—299 **10 Claims**

1. In a developing machine for exposed photosensitive material, the combination of a vessel containing a supply of a first liquid and having at least one inlet and at least one outlet; first conduit means connecting said inlet with said outlet; pump means installed in said conduit means to circulate the first liquid through said conduit means from said outlet to said inlet; a heating device installed in said conduit means intermediate said pump means and said inlet, said device including a primary heater and an auxiliary heater; second conduit means communicating with said first conduit means upstream of said heating

device; means for admitting to said second conduit means a second liquid at certain intervals so that said second liquid is admixed to said first liquid; and control means including means for actuating said auxiliary heater during said intervals.



4,104,669

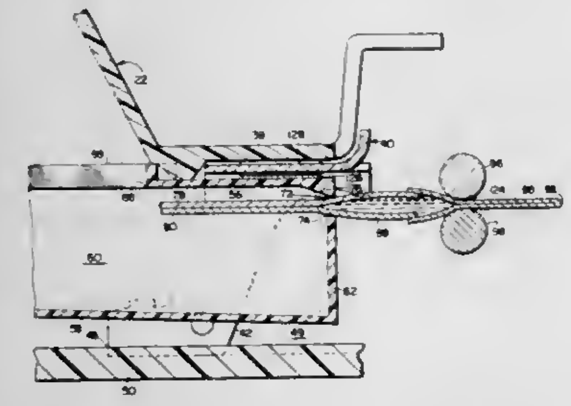
THERMALLY RESPONSIVE PHOTOGRAPHIC PROCESSING APPARATUS FOR USE WITH SELF-PROCESSABLE FILM UNITS

Harvey S. Friedman, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 15, 1977, Ser. No. 787,748

Int. Cl.^{2} G03D *9/02*

U.S. Cl. 354—304 12 Claims



1. Photographic processing apparatus for use with a self-processable film unit of the type including a pair of sheet elements and a rupturable container of processing fluid positioned adjacent a leading edge of the film unit, the processing fluid having a viscosity which varies with temperature, said apparatus comprising:

means for spreading the processing fluid in a thin layer between the sheet elements, said fluid spreading means including a pair of elongated juxtaposed pressure applying members which define an elongated gap through which the film unit is advanced with the sheet elements in superposed relationship to apply a first pressure to the film unit to first rupture the container to release the processing fluid and then to cause the released mass of processing fluid to flow between the sheet elements opposite to the direction of advancement of the film unit through said gap such that the processing fluid is progressively deposited between the sheet elements as a thin layer extending over a preselected area of the sheet elements;

means for advancing the film unit through said gap; and

means for applying a second pressure to the film unit to oppose the flow of the processing fluid relative to the sheet elements as the film unit is advanced through said gap, said means for applying a second pressure being responsive to ambient temperature to adjust the magnitude of the flow opposition pressure applied so that the thickness of the processing fluid layer is maintained substantially constant over a predetermined temperature operating range of said apparatus.

4,104,670

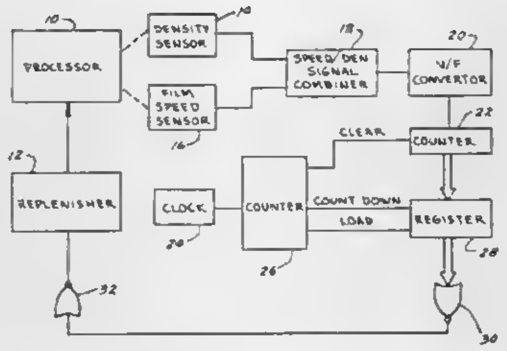
AUTOMATIC REPLENISHER CONTROL

Ralph L. Charnley, Minneapolis, and Clyde A. Kumpula, Little Canada, both of, assignors to Pako Corporation, Minneapolis, Minn.

Filed Apr. 8, 1977, Ser. No. 785,840

Int. Cl.^{2} G03D *13/00*

U.S. Cl. 354—324 16 Claims



1. A control system for controlling replenisher means to provide replenisher fluid to a processor of photosensitive material, the control system comprising:

variable frequency signal providing means for providing a variable frequency signal having a frequency indicative of a measured parameter associated with operation of the processor;

counter means for counting in response to the variable frequency signal;

interrogate means for interrogating the counter means at predetermined intervals; and

energizing signal providing means for providing an energizing signal to the replenisher means, the energizing signal having a time duration determined by the count in the counter when the counter means is interrogated.

4,104,671

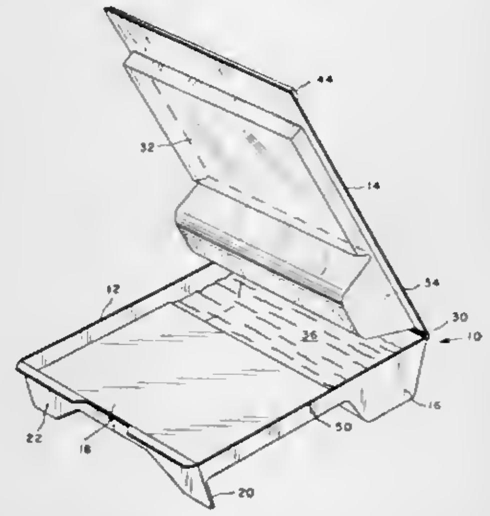
PHOTOGRAPHIC PRINTING AND DEVELOPING TRAY

Roy M. Harrigan, Bromley Mountain Rd., Manchester, Vt. 05254

Filed Jan. 15, 1976, Ser. No. 649,454

Int. Cl.^{2} G03D *13/02;* **G03B** *27/32*

U.S. Cl. 354—337 5 Claims



1. A tray for photographic printing and developing which comprises:

a lower member having a generally planar horizontal first surface and a reservoir section disposed with the bottom thereof at a lower elevation than said planar horizontal first surface; and

a cover cooperating with said lower member and having a transparent generally planar second surface disposed in generally parallel, spaced, overlapping relationship to said first generally planar surface when said cover is positioned on said lower member, said cover further including a depending displacement member extending into said reservoir section when said cover is positioned on said lower section to displace liquid located therein to a position intermediate said first and second generally planar surfaces, said displacement member being withdrawn from said reservoir section when said cover is moved away from said lower member to allow liquid intermediate said first and second surfaces to flow into said reservoir section.

4,104,672

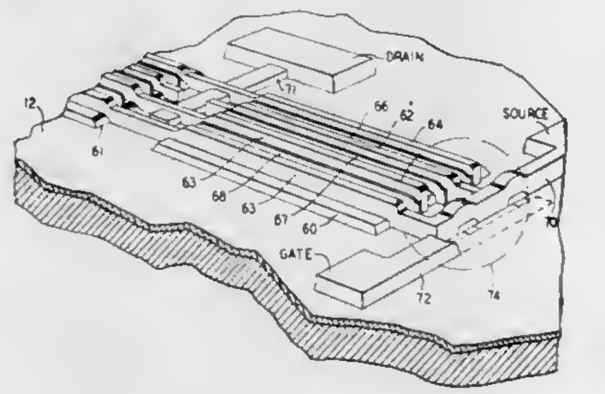
HIGH POWER GALLIUM ARSENIDE SCHOTTKY BARRIER FIELD EFFECT TRANSISTOR

James Vincent DiLorenzo, Piscataway; Gerard Edward Mahoney, Branchburg, and Joseph Michael Moran, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1976, Ser. No. 736,731

Int. Cl.^{2} H01L *29/80, 29/48, 29/56*

U.S. Cl. 357—22 4 Claims



1. In combination in a high-power microminiature gallium arsenide field-effect-transistor device,

a gallium arsenide substrate having an epitaxial mesa formed thereon,

multiple interleaved source, gate and drain electrodes formed on said mesa, each of said electrodes including a portion that extends beyond one edge or the opposite edge of the mesa and onto said substrate,

a drain bus bar on said substrate adjacent said one edge of said mesa connecting together said drain electrodes,

a gate bus bar, including cross-under fingers, on said substrate adjacent the opposite edge of said mesa connecting together said gate electrodes,

insulating portions disposed on selected regions of said cross-under fingers,

and a source bus bar on said substrate adjacent said opposite edge of said mesa extending over the insulating portions on said cross-under fingers to connect together said source electrodes,

wherein said cross-under fingers are respectively deposited in convex-bottom channels formed in said substrate, each of said fingers comprising, in order of deposition, layers of germanium/gold, silver, gold and tungsten.

4,104,673

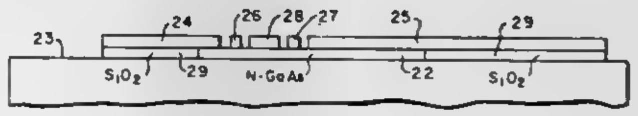
FIELD EFFECT PENTODE TRANSISTOR

Lawrence E. Dickens, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,401

Int. Cl.^{2} H01L *29/80*

U.S. Cl. 357—22 7 Claims



1. A field effect pentode transistor, comprising a first supporting layer of semi-conductive material, a second active semi-conductor layer formed on one face of the first layer,

a source electrode and a drain electrode spaced from each other one portion of each said electrode being formed on the first layer and a second portion of each said electrode overlying and being in ohmic contact with the second layer, a screen electrodes spaced from and positioned between the source and drain electrodes, overlying and in ohmic contact with said second layer, a first control gate electrode formed on the second layer spaced from and positioned between the source and screen electrodes, and a second control gate formed on the second layer spaced from and positioned between the drain and screen electrodes.

4,104,674

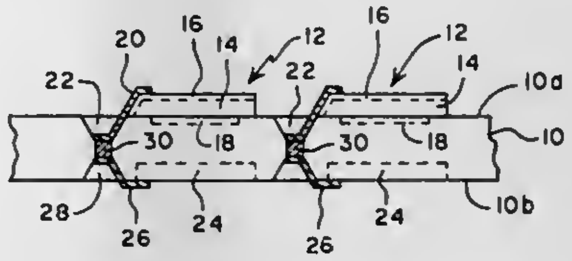
DOUBLE SIDED HYBRID MOSAIC FOCAL PLANE

Robert V. Lorenze, Jr., Westford, and William Joseph White, Chelmsford, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 7, 1977, Ser. No. 766,327

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 1 Claim



1. An infrared detector system comprising:

a silicon semiconductor substrate having first and second surfaces;

a plurality of epitaxial (Hg,Cd)Te detectors on the first surface, each detector having p-type and n-type regions, the p-type regions being in an electrically conductive relationship with conductive areas on said substrate;

solid state signal processing circuitry formed in said semiconductor substrate proximate the second surface;

a plurality of first valleys in the first surface, a first valley being associated with each said detector;

a plurality of second valleys in the second surface positioned so that individual second valleys are opposite individual first valleys to form pairs of first and second valleys;

regions of ion implantation in said substrate respectively connecting the first and second valleys in each pair of valleys so as to provide high conductivity between the pairs of valleys in the first and second surfaces;

first electrode means individually connecting said detectors to said first valleys; and

second electrode means individually connecting said second valleys to said solid-state signal processing circuitry.

4,104,675

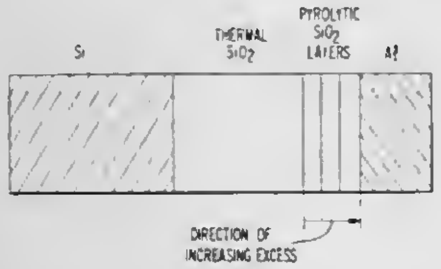
MODERATE FIELD HOLE AND ELECTRON INJECTION FROM ONE INTERFACE OF MIM OR MIS STRUCTURES

Donelll J. DiMaria, Mt. Kisco, and Donald R. Young, Ossining, both of N.Y., assignors to International Business Machioes Corporation, Armonk, N.Y.

Filed Jun. 21, 1977, Ser. No. 808,501

Int. Cl.² H01L *29/34*

U.S. Cl. 357—54 **8 Claims**



1. A metal-insulator-metal or metal-insulator-semiconductor structure wherein the band gap of the insulator layer near one interface only is reduced to provide an injection region where holes or electrons, depending on voltage bias, can be injected into the insulator under moderate electric field conditions from the contact at this interface while, simultaneously, electron or hole injection from the opposite interface is blocked due to the large insulator band gap near this interface.

4,104,676

SEMICONDUCTOR DEVICE WITH PRESSURE ELECTRICAL CONTACTS HAVING IRREGULAR SURFACES

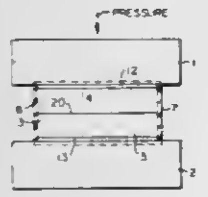
Klaus Bednorz; Jon W. Johansen, and Fritz Scheidel, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

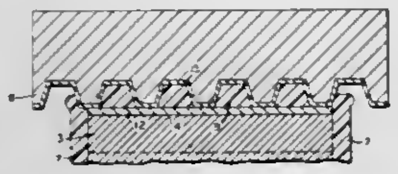
Filed Dec. 13, 1976, Ser. No. 750,074

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1975, 2556469

Int. Cl.² H01L *23/42, 23/44, 23/46*

U.S. Cl. 357—79 **7 Claims**





1. A semiconductor device comprising, a body of semiconductor material, said body having opposed, flat, substantially parallel main faces and an edge portion extending between said main faces, said body containing at least one pn junction, said pn junction being exposed at said edge portion of said body, a metal electrode affixed to and in electrical contact with a least a portion of each of said main faces, at least one lead electrode having at least a portion of a surface in physical and electrical contact with at least a portion of at least one of said metal electrodes, at least a portion of said surface of said lead electrode being held in said physical and electrical contact with said metal electrode by a compressive force, said surface of said lead electrode being comprised of lands and grooves with said lands being the portion of the surface of said lead electrode in physical and electrical contact with said metal electrode, a layer of a protective coating disposed on said edge portion of said body of semiconductor material and on at least a portion of said main faces, said layer of protective coating extending over at least a portion of said metal electrode and into the grooves in the surface of said lead electrode, the grooves in the surface of said lead electrode having a depth greater than the thickness of the protective layer and at least the land portions of the surface of the lead electrode having a Brinell hardness greater than the hardness of the protective layer.

4,104,677

ARRANGEMENT FOR ADJUSTABLY URGING A SEMI-CONDUCTIVE ELEMENT AGAINST A HEAT SINK

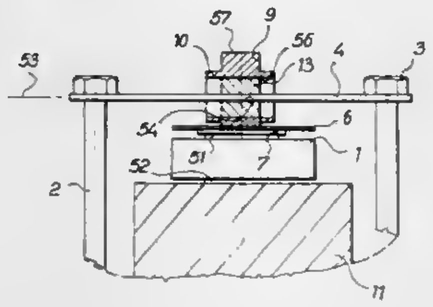
Jiři Kovář; Pavel Kafuněk; Pavel Reichel; Oldřich Pokorný; Michal Pellant; Jindřich Kratina, and Jaroslav Zůna, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Nov. 26, 1976, Ser. No. 745,201

Claims priority, application Czechoslovakia, Nov. 28, 1975, 8082-75

Int. Cl.² H01L *23/02, 23/48, 29/44*

U.S. Cl. 357—81 **7 Claims**



1. In an arrangement for adjustably urging a first surface of a planar semiconductive element disposed above a heat sink downwardly against the underlying heat sink, a pair of spaced anchor elements associated with the heat sink and projecting above a second opposite surface of the semiconductive element, an elongated resilient member extending transversely between and secured on opposite ends to the respective anchor elements above the second surface of the semiconductive element, eccentric means carried on the resilient member intermediate its ends above the second surface of the semiconductive element for rotation in a vertical plane against the biasing force of the resilient member, and means associated with the eccentric means for contacting the underlying second surface of the semiconductive element with a variable downward pressure corresponding to the rotation of the eccentric to correspondingly urge the first surface of the semiconductive element against the heat sink.

4,104,678

VIDEO SWITCHING CIRCUIT

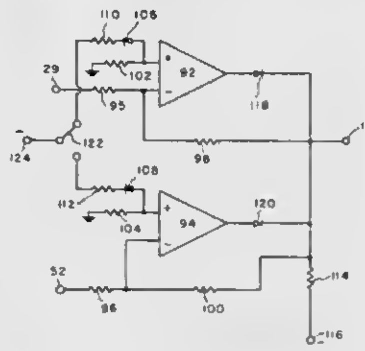
Frederik Johannes Van Roessel, Upper Saddle River, N.J., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 624,727, Oct. 22, 1975, abandoned. This application May 19, 1977, Ser. No. 798,320

Int. Cl.² H04N *9/52*

U.S. Cl. 358—30 **7 Claims**

1. A circuit comprising two differential amplifiers, each of said amplifiers having inverting input means for receiving respective input signals, a common emitter lead pair, and a common low impedance output, each pair of said emitter leads including a diode, each amplifier further comprising a feedback network coupled to said common output and to said respective input means, and means coupled to said amplifiers for selecting which of said input signals is amplified and applied to said common output including switchable means for biasing one of said diodes on and the other diode off.



4,104,679

COLOR ERROR SUPPRESSION APPARATUS AND METHOD

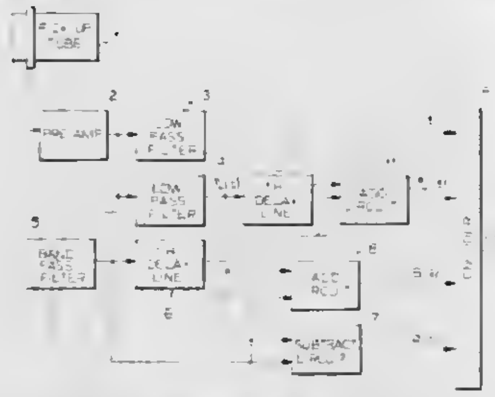
Yoshinori Kitamura, Katano, and Ryuhel Nakabe, Hirakata, both of Japan, assignors to Matsushlta Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 599,651, Mar. 18, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,884

Claims priority, application, Japan, Mar. 18, 1974, 49-31204; Mar. 19, 1974, 49-32121; Mar. 19, 1974, 49-32122; Sep. 26, 1974, 49-11036

Int. Cl.² H04N *9/07*

U.S. Cl. 358—44 **23 Claims**



1. A color error suppression apparatus for a color television camera in which at least a first and second color are spatially modulated in a pick-up tube by color filter means, so that at least one of the modulated signals representing the first and second colors has a phase which is different from the phase of the same color in adjacent scan lines and color signals are produced by utilizing the difference in phases in successive scan lins, said apparatus comprising:

color correction signal generating means including a filter circuit means responsive to an output from said pickup tube for generating a luminance signal representing the luminance of the color signal, a delay circuit means coupled to said filter circuit means for delaying said luminance signal and a correction circuit means coupled to said filter circuit means and said delay circuit means for operatively combining said luminance signal and the output of said delay circuit means for generating a color correction signal;

color component recovery circuit means responsive to the modulated component of the output from said pick-up tube for operating upon such component to recover color component signals which represent at least the first and second colors of the color image and include color error components generated in this circuit means; and

signal combining circuit means coupled to said color correction signal generating means, and said color component recovering circuit means and responsive at least to said color correction signal and color component signals for combining said signals to generate color signals representing colors of the color image, such that the color error components included in the color signals are suppressed.

4,104,680

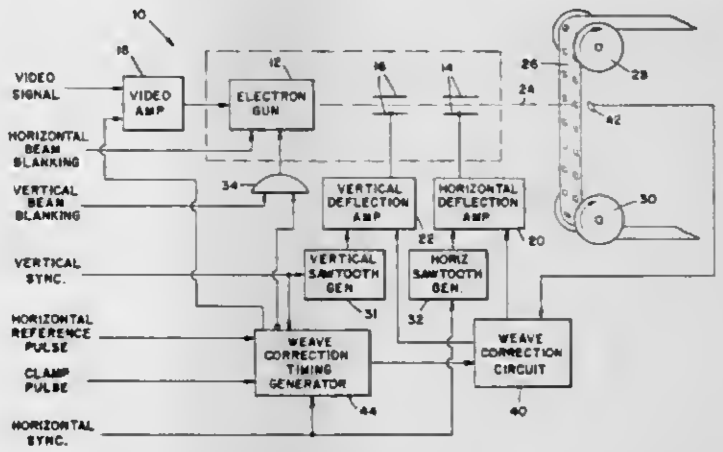
METHOD AND APPARATUS FOR FILM WEAVE CORRECTION

David E. Holland, Sepulveda, Calif., assignor to Ellanin Investments, Ltd., Canada

Filed Jan. 24, 1977, Ser. No. 761,710

Int. Cl.² H04N *3/36, 5/86*

U.S. Cl. 358—132 **14 Claims**



1. The method of correcting film weave in a motion picture film recording or reproducing apparatus using a scanning device which employs a continuous motion film drive during scanning of the film over a plurality of frames of data comprising the steps of:

(a) causing the scanning beam to horizontally cross the edge of a sprocket hole on said film;

(b) detecting said beam as it crosses said sprocket hole edge and generating an edge crossing occurrence signal representative thereof;

(c) comparing this edge crossing occurrence signal with a reference time;

(d) generating a correction signal in response to the difference in time found in step (*c*) between said edge crossing time and said reference time;

(e) coupling said correction signal to a horizontal sweep circuit such that all beam sweeps in a given frame are shifted in horizontal position as a function thereof; and

(f) repeating of steps (*a*)-(*e*) for each frame scanned by said scanning device.

4,104,681

INTERLEAVED PROCESSOR AND CABLE HEAD

Richard Saylor, Monsey; Alfred A. Dalimonte, Westbury, and Robert H. Nagel, New York, all of N.Y., assignors to IDR, Inc., Farmingdale, N.Y.

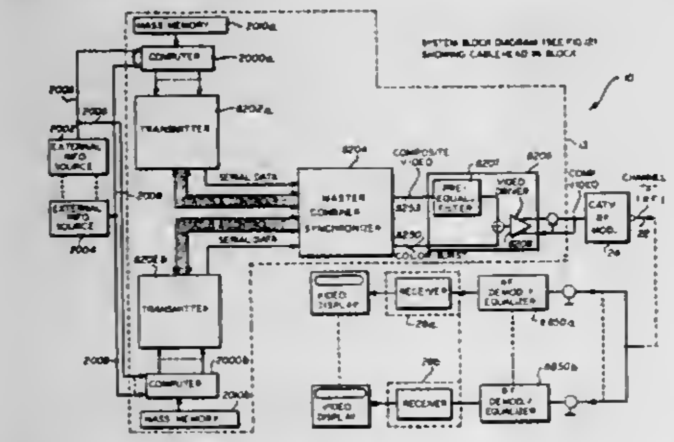
Filed Oct. 27, 1976, Ser. No. 736,217

Int. Cl.² H04N *1/02*

U.S. Cl. 358—141 **28 Claims**

1. A real time frame grabbing system for substantially instantaneously providing a continuous video display of a selectable predetermined video frame of information on a video display means from continuously transmittable video information comprising first means for transmitting said video information as a first plurality of pseudo video scan lines, second means for transmitting said video information as a second plurality of pseudo video scan lines, each of said pseudo video scan lines from said first and second transmitting means having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide an entire displayable row of video data characters, said displayable row comprising a plurality of television video scan lines, said pseudo video scan line having an associated transmission time equivalent to said television video scan line, said

packet of digital information comprising at least address information for said displayable row and data information for said displayable characters in said displayable row, said first transmitting means transmitting said first plurality of pseudo video scan lines out of phase in time in a predetermined phase relationship with the transmission of said second plurality of pseudo video scan lines by said second transmitting means with said digital information content of said first and second plurality of pseudo video scan lines being substantially identical, and means for selectively combining and interleaving corresponding identical out of phase digital information content containing pseudo video scan line portions of said first and second plurality of pseudo video scan lines to provide an in phase composite combined interleaved pseudo video scan line to said video display means, said composite combined interleaved pseudo video scan line having said television video scan line format and capable of comprising a complete self-contained composite packet of digital information equivalent in content to said content of either of said interleaved pseudo video scan lines and sufficient to provide said entire displayable row of video data characters to said video display means, said combined interleaved composite pseudo video scan line having said associated transmission time, the interleaved information containing portions of said corresponding pseudo video scan line of said first plurality of pseudo video scan lines comprising different television video scan lines of said plurality of television video scan lines which comprise said composite pseudo video scan line displayable row than the interleaved portions of said corresponding pseudo video scan line of said second plurality of pseudo video scan lines.



4,104,682

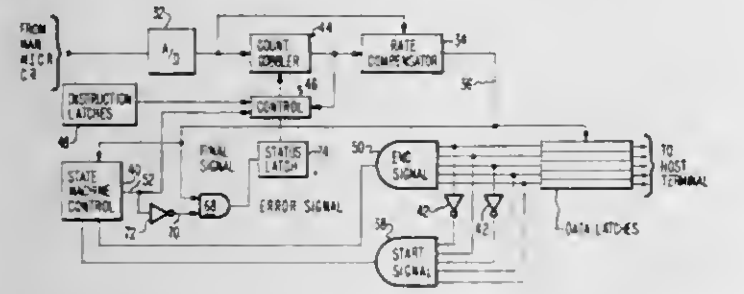
APPARATUS FOR REDUCING THE NUMBER OF UNDETECTED ERRORS READ ALONG THE LENGTH OF A BINARY INFORMATION BEARING MEDIUM

Gerald J. Lehner, and Eugene F. Banka, both of Livonia, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 7, 1977, Ser. No. 774,740

Int. Cl.^{2} G06K *7/08, 7/10;* **G11B** *25/04*

U.S. Cl. 360—2 **11 Claims**



1. An apparatus for reducing the number of undetected errors serially read along the length of a binary information bearing medium, the read information comprising a serial self-clocking data stream having clock and data signals including a start signal, an end signal, and a summation signal following the end signal to indicate the number of data signals in the data stream, said apparatus comprising:

first detecting means for detecting the end signal; and

second detecting means responsive to said first detecting means for detecting a data signal read from a predetermined portion of the medium read after the summation signal.

4,104,683

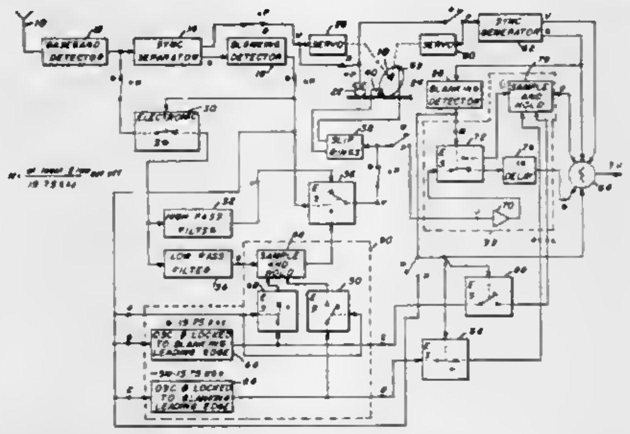
VIDEO RECORDING APPARATUS

Edward Maurice Granger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1976, Ser. No. 669,925

Int. Cl.^{2} H04N *5/79, 5/795*

U.S. Cl. 360—9 **3 Claims**



1. Signal processing apparatus comprising:

a. means for producing NTSC-type television signals;

b. means for stripping sync and blanking information from said NTSC-type television signals, thereby to produce a series of video signals separated in time from each other;

c. means for splitting the video signals into respective high and low frequency component bands;

d. means for time compressing the signals which comprise the low frequency component band of the video signals so that such signals respectively occur during periods corresponding to the duration of sync and blanking;

e. means for delaying the signals which comprise the time compressed low frequency band to occur respectively during the time separation between successive video signals; and

f. means for combining the signals which comprise the delayed time compressed low frequency band with the signals which comprise the high frequency band, thereby to produce a train of signals having high frequency components periodically interspersed with low frequency components, and

a. said means for time compressing the signals which comprise the low frequency component band being adapted to time compress such signals to occur during a period less than the duration of sync and blanking; and

b. wherein said apparatus includes means for adding reference signal information to occur during that part of the time separation between successive video signals which is unoccupied by time compressed signals.

4,104,684

ROTARY HEAD TYPE MAGNETIC VIDEO RECORDING AND REPRODUCING SYSTEM

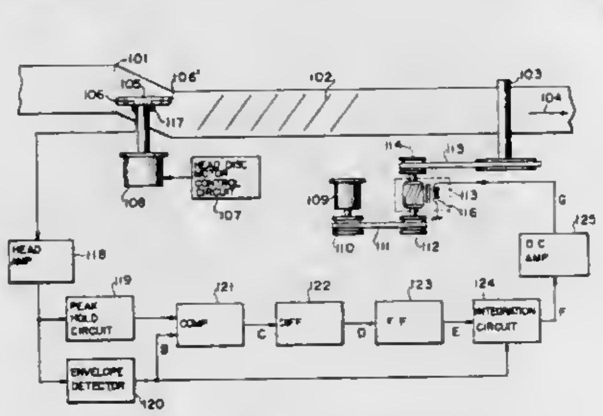
Noboru Wakami, Hirakata, and Masahiro Deguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1976, Ser. No. 686,396

Claims priority, application Japan, May 19, 1975, 50/60386; May 19, 1975, 50/60387; May 19, 1975, 50/60388; Jul. 14, 1975, 50/86505; Aug. 27, 1975, 50/104380; Nov. 12, 1975, 50/136502; Nov. 12, 1975, 50/136503

Int. Cl.^{2} G11B *15/46, 15/26*

U.S. Cl. 360—70 **17 Claims**



1. A rotary head type magnetic recording and reproducing system comprising:

means for transporting a magnetic tape having an information signal thereon in record tracks which are oblique to the longitudinal length of the tape,

means for rotating a rotary head for scanning said record tracks on said magnetic tape,

means connected to said rotary head for providing a read-out envelope signal representing said information signal recorded on said tape,

a peak hold circuit for holding a signal representing the maximum amplitude of said read-out envelope signal,

an envelope detection circuit for detecting the envelope of said read-out envelope signal,

detection means coupled to said peak hold circuit and said envelope detection circuit for producing a first level output voltage signal when the difference between the output voltage of said peak hold circuit and the output voltage of said envelope detection circuit is less than a predermined threshold and producing a second level output voltage signal when the difference between the output voltage of said peak hold circuit and the output voltage of said envelope detection circuit is greater than or equal to said threshold voltage,

control signal producing means responsive to the output of said detection means for producing a first control signal, and

control means responsive to said first control signal for controlling the movement of either said tape transport means or said rotary head rotating means to control the relative positional relationship between a trace of rotation of said rotary head and said record tracks on said magnetic tape.

4,104,685

VIDEO RECORDER/REPRODUCER TRANSPORT HAVING TWO MOVABLE TENSION GUIDES FOR CONTROLLING TAPE TENSION

David T. L. Chang, Palo Alto, Calif., assignor to Recortec, Inc., Sunnyvale, Calif.

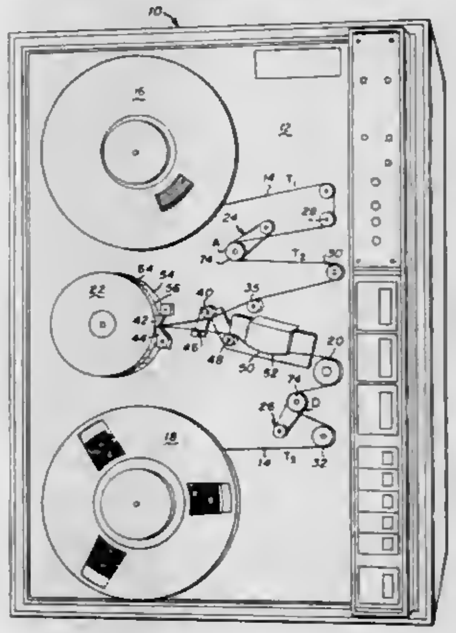
Filed Jan. 13, 1977, Ser. No. 759,238

Int. Cl.^{2} G11B *15/43;* **G03B** *1/04;* **B65H** *59/38, 63/02*

U.S. Cl. 360—84 **5 Claims**

1. In an improved video magnetic tape recording/playback transport apparatus including a supply of magnetic recording tape having a first end portion wound around a tape supply means and having a second end portion wound around a tape take-up means, a tape driving capstan intermediate to the tape supply means and the tape take-up means and engaging the tape, a helical head scanner assembly positioned intermediate the capstan and one of the tape means having a midlength portion of the tape helically wrapped thereabout, tape tension sensing means for producing a first and a second signal, servo control means responsive to the first and to the second signal and operative to generate a first and a second servo control signal, first motor means responsive to said first servo signal and operative to drive said tape supply means and second motor means responsive to said second servo signal and operative to drive said tape take-up means, an improved tension sensing means comprising:

- a first tension guide assembly intermediate the helical head scanner and the tape supply means including
  - first tape guide means movable under tension between a first and a second position for engaging with and guiding the tape,
  - a first arm carrying said first tape guide means, said first arm being movable along an arcuate path between said first and said second position,
  - a first light source mounted on said first arm and serving to emit an illuminating beam of light,
  - a first photocell means for sensing the location of said first guide means between said first and second positions, said first photocell means being responsive to the amount of light illuminating it and operative to produce a first signal, said first photocell means being mounted on said first tape guide means,
  - a first fixed plate disposed between said first light source and said first photocell means, said first plate including an arcuately-shaped aperture that may serve to partially block the light emitted by said first light source so that an amount of light corresponding to the location of said first tape guide means illuminates said first photocell means;
- a second tension guide assembly intermediate the helical head scanner and the tape take-up means including
  - second tape guide means movable under tension between a third and fourth position for engaging with and guiding the tape,
  - a second arm carrying said second tape guide means, said second arm being movable along an arcuate path between said third and fourth positions,
  - a second light source mounted on said second arm and serving to emit an illuminating beam of light,
  - a second photocell means for sensing the location of said second guide means between said third and fourth positions, said second photocell means being responsive to the amount of light illuminating it and operative to



produce a second signal, said photocell means being mounted on said second tape guide means;

a second fixed plate disposed between said second light source and said second photocell means, said second plate including an arcuately-shaped aperture that may serve to partially block the light emitted by said second light source so that an amount of light corresponding to the location of said second tape guide means illuminates said second photocell means.

4,104,686
TAPE CASSETTE WITH REEL TO REEL AND ENDLESS TAPES

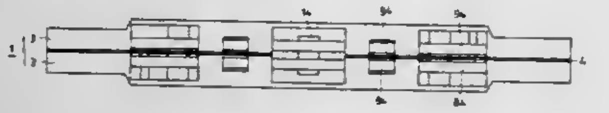
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,512

Claims priority, application Japan, Nov. 22, 1976, 51-140561

Int. Cl.^{2} B65H *17/48;* G11B *23/04;* H04M *1/64*

U.S. Cl. 360—132 **1 Claim**



1. A tape cassette comprising a cassette composed of an upper and a lower cassette half, and a partition plate disposed in the cassette to extend therein in a transverse direction to define an upper and a lower compartment, wherein the partition plate has first and second reel insertion holes, wherein the cassette has disposed therein first and second reels extending into the upper and lower compartments through the first and second reel insertion holes of the partition plates, respectively, wherein the lower compartment has housed therein a first magnetic tape retained at one end to the lower half part of the first reel and at the other end to the lower half part of the second reel and guided to travel between the first and second reels, and wherein the upper compartment has disposed therein a third reel loosely engaged with the upper half part of the first reel and has housed therein a second magnetic tape endlessly wound on the third reel.

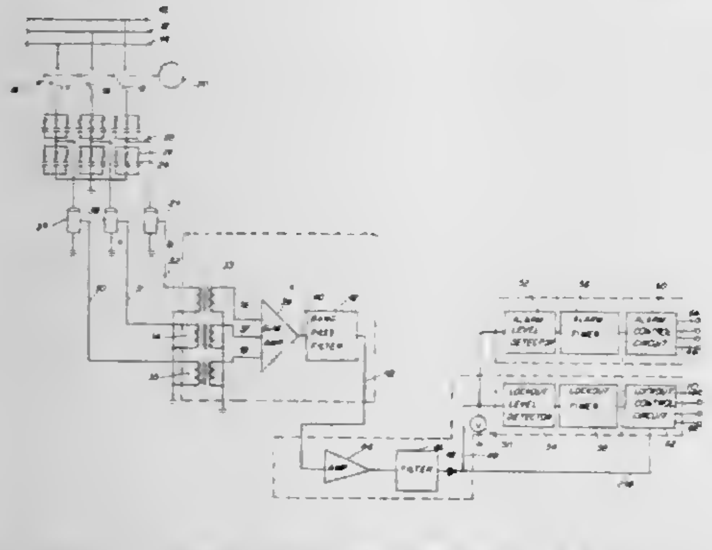
4,104,687
DEVICE FOR DETECTING UNBALANCED CONDITIONS IN A POLYPHASE EQUIPMENT BANK

John A. Zulaski, Mt. Prospect, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Nov. 24, 1976, Ser. No. 744,868

Int. Cl.^{2} H02H *7/16*

U.S. Cl. 361—17 **25 Claims**



25. A device for detecting voltage unbalances in a grounded polyphase equipment bank, each phase leg of the bank being energized by a respective line of an electrical power system, the unbalances resulting from failure or inadvertent change of one or more components of the polyphase equipment bank comprising:

voltage sensing means for providing a voltage signal between an electrically similar point within each phase leg of the equipment bank and ground, the voltage at each such similar point being less than line voltage;

means for summing the voltage signals from each phase leg and creating an artificial neutral voltage as long as there is no failure or change of the components but providing an AC signal when the components fail or change representative of the voltage unbalance caused by the failure or change of components.

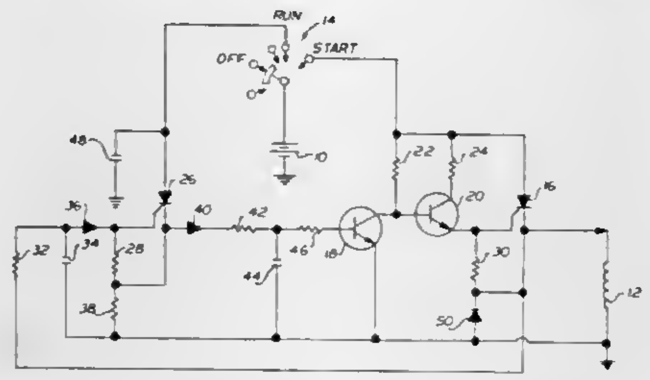
4,104,688
STARTER MOTOR PROTECTOR CIRCUIT

Louis E. Pecsl, Deptford, N.J., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 13, 1976, Ser. No. 750,298

Int. Cl.^{2} H02H *7/00*

U.S. Cl. 361—28 **6 Claims**



4. A circuit for preventing energization of a starter motor for an internal combustion engine when the internal combustion engine is running comprising:

a power supply;

a starter relay for energizing the starter motor;

control means for establishing an engine start signal and an engine run signal, said control means being capable to simultaneously establish said start and run signals and to establish said run signal without the establishment of said start signal;

first switching means actuated by a control signal applied thereto in response to said start signal, said first switching means, when actuated, connecting said power supply to said starter relay to energize said starter relay;

second switching means actuated by a control signal applied thereto in response to said run signal and energization of said starter relay, said second switching means, when actuated, prohibiting said first switching means from being responsive to said start signal as long as said run signal is applied to said second switching means, and circuitry for providing a first time delay preventing the actuation of said second switching means in response to said run signal and energization of said starter relay until said first time delay has expired.

4,104,689
VACUUM CONTACTOR PROTECTOR

Thomas G. Rohner, Minneapolis, Minn., assignor to Electric Machinery Manufacturing Company, Minneapolis, Minn.

Filed Sep. 29, 1976, Ser. No. 727,663

Int. Cl.^{2} H02H *7/22, 3/28*

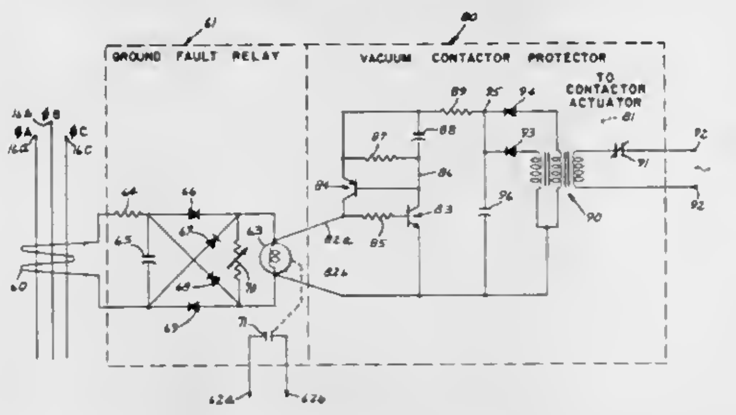
U.S. Cl. 361—44 **9 Claims**

5. Protection apparatus for a power system having a vacuum contactor including actuating means therefor, comprising:

means for sensing current imbalance in said power system; and

means connected to said sensing means and operatively

associated with said vacuum contactor for providing an output signal indicating when said imbalance reaches a first predetermined value when said contactor is open or a second predetermined value larger than said first value, when said contactor is closed.



4,104,690
ARRANGEMENT FOR RECEIVING CONTACT POTENTIAL RESPONSIVE SWITCHING DEVICES

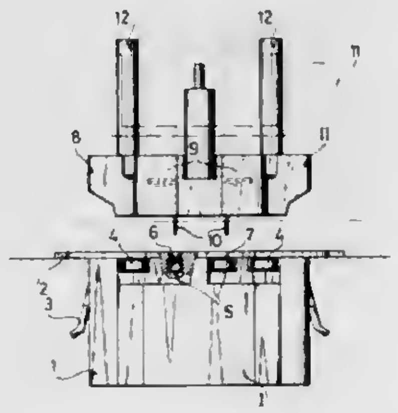
Endre Csutor, Hochstein 5, Ludenscheid, Fed. Rep. of Germany (588); Leo Mittler, Beethovenstr. 9, Meinerzhagen, Fed. Rep. of Germany (5892), and Rudolf Wörtche, Parkstr. 155c, Ludenscheid, Fed. Rep. of Germany (588)

Filed Oct. 12, 1976, Ser. No. 732,401

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546868

Int. Cl.^{2} H02B *3/28*

U.S. Cl. 361—45 **5 Claims**



1. An arrangement of a contact potential responsive switching device including

(a) a switching device socket supporting the constituent parts of a contact potential responsive switching device which are a plurality of relatively movable contacts, a latch mechanism for maintaining said contacts in the closed position thereof, a first operating member for manually operating said latch mechanism, a tripping coil responsive to the contact potential prevailing between ground and a load for automatically tripping said latch mechanism, a change-over switch for selectively connecting a phase-conductor over said tripping coil to ground, a first pair of terminals for connecting a power supply to some of said contacts, a second pair of terminals for connecting others of said contacts to said load;

(b) said second pair of terminals being conductively connected to a first pair of female contacts;

(c) a receptacle body arranged in front of said socket and affixed to said socket, said receptacle body having a second pair of female contacts each conductively connected to a stab contact projecting beyond said receptacle body and cooperating with said first pair of female contacts, and said receptacle body further defining a pair of passageways of which one receives manual operating means for said latch mechanism and the other receives operating means for said change-over switch.

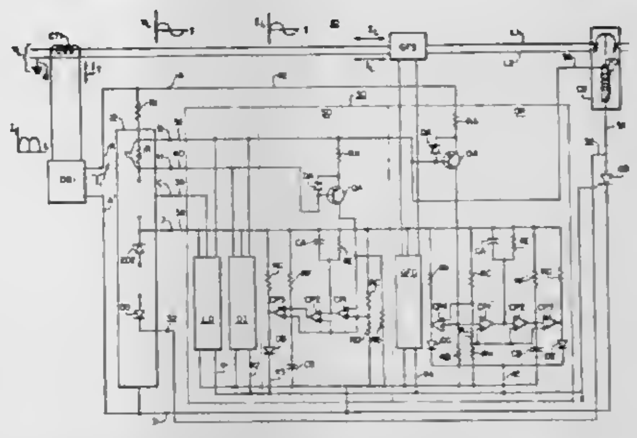
4,104,691
CIRCUIT BREAKER APPARATUS INCLUDING ASYMMETRICAL FAULT DETECTOR

Alan B. Shimp, Monroeville; Thomas N. Meyer, Murrysville, and Robert T. Elms, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1976, Ser. No. 728,088

Int. Cl.^{2} H02H *3/08*

U.S. Cl. 361—96 **12 Claims**



1. Circuit breaker apparatus, comprising:

a. monitoring means interconnected with an electrical conductor in which a decaying asymmetrical fault current is present, said monitoring means providing an ouput voltage signal which is generally proportional to the value of said asymmetrical fault current;

b. peak detector means connected to receive said proportional output voltage signal from said monitoring means and provide a peak detector output voltage at the time said voltage signal from said monitoring means first exceeds a predetermined level;

c. storing means connected to receive said peak detector output voltage at said time and store said voltage as a discrete value within limits;

d. timed output means connected to receive said stored voltage of said storing means at said time and to produce a timed output means output signal at a time thereafter if all successive monitoring means output signal signal peaks do not occur below said predetermined level within a predetermined number of fault current cycles, said timed output means output signal not being produced if any successive signal peak from said monitoring means occurs below said predetermined level before said predetermined number of fault current cycles have expired; and

e. circuit interrupting means having the separable main contacts thereof connected in circuit relationship with said conductor, said circuit interrupting means being interconnected with said timed output means to receive said timed output means output signal, said separable main contacts opening to interrupt said fault current when said output signal is produced.

4,104,692
DEVICE FOR DETECTING ABNORMAL TEMPERATURE IN FIXER

Katsumi Sudo, and Yukio Kanazawa, both of Ebina, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Jan. 3, 1977, Ser. No. 756,522

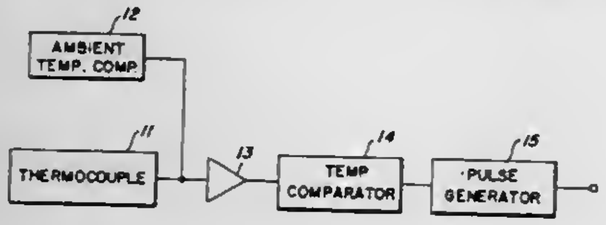
Claims priority, application Japan, Jan. 19, 1976, 51-004717

Int. Cl.^{2} H02H *5/04*

U.S. Cl. 361—106 **2 Claims**

1. A device for detecting an abnormal temperature in a fixer, including a pulse generation controller capable of detecting the temperature in the fixer, comparing it with a predetermined reference temperature, and generating pulses continuously

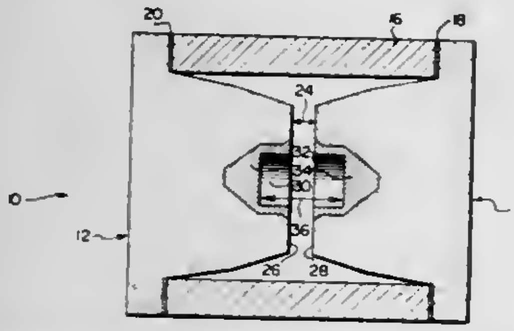
during the time period that the fixer temperature is lower than the reference temperature; a pulse interrupter for interrupting the pulse output from the pulse generation controller until the temperature in the fixer reaches a desired fixing temperature for the first time after the start of power supply to the fixer, and an abnormality detector for detecting an abnormal fixing temperature when the integral of the pulses having passed through the pulse interrupter within a given time has reached a predetermined value.



4,104,693
GAS FILLED SURGE ARRESTER

Toshiharu Toda, Mitaka, and Daizo Shigemori, Sagami-Hara, both of Japan, assignors to Reliable Electric Company, Franklin Park, Ill.

Filed Mar. 18, 1977, Ser. No. 778,992
Claims priority, application Japan, Mar. 23, 1976, 51-034113
Int. Cl.^{2} H02H *9/06*
U.S. Cl. 361—120 7 Claims



1. A gas-filled surge arrester comprising a generally cylindrical tubular insulator member, a pair of electrodes of substantially uniform composition having opposed generally planar end faces, said electrodes being hermetically sealed to opposite ends of said insulator member, said insulator member, serving to isolate electrically said electrodes and to space apart said opposed end faces to define a discharge gap therebetween, said electrodes including at least one pair of opposed cavities formed as recesses in the end faces, the cavity in each face being of a size as to occupy less than the full end face area and the cavities having respective end walls which are spaced apart a distance greater than the width of said gap, said cavities being lined with a substance of high electron emission ability relative to that of the adjacent electrode material at said gap, said substance in each cavity forming a ring substantially coplanar with the associated end face and the depth and width of the cavities being such that the discharge tends to take place between said lined cavities to discourage dispersion of particles from the electrodes during discharge onto the insulator member.

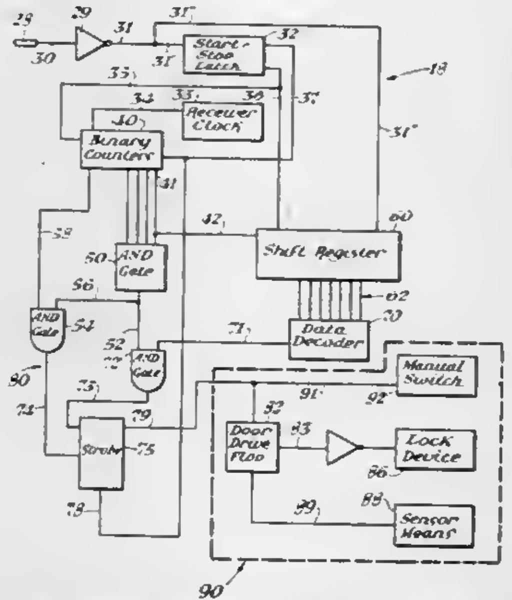
4,104,694
ASYNCHRONOUS DIGITAL LOCKING SYSTEM

Daniel J. Hargrove, 4306 NE. 6th Ave., Ft. Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 520,460, Nov. 4, 1974, abandoned. This application Oct. 28, 1976, Ser. No. 736,715
Int. Cl.^{2} H04Q *9/00*
U.S. Cl. 361—172 12 Claims

1. An electronic combination locking system including a binary electrical transmitter circuit and a binary electrical receiver circuit means in which the transmitter circuit signal to the receiver circuit enables the receiver clock comprising:

said transmitter circuit including,
- a transmitter clock, and
- a transmitter means connected to said transmitter clock for providing an timed and coded signal, and said transmitter means connectable to said receiver circuit means, and said transmitter means includes at least one parallel to serial shift register,



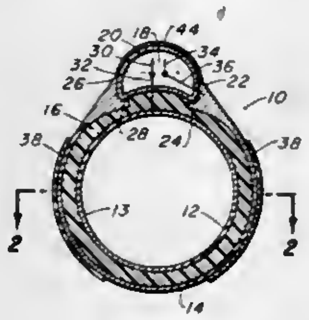
said receiver circuit means including, a receiver clock means, a start-stop means connected to said receiver clock means, said start-stop means connectable to said transmitter means for enabling said receiver clock means by receipt of said timed and coded signal, and

data and time comparator means connected to said receiver clock means for decoding the timed and coded signal and providing a true code at true time output signal for operating locking means when the receiver circuit means is connected to said transmitter means.

4,104,695
STATIC ELECTRICITY DISCHARGE RING

Wanda L. Hollis, and Darrell E. Hollis, both of 637 High Point Dr., Ventura, Calif. 93003

Filed Jan. 27, 1977, Ser. No. 763,034
Int. Cl.^{2} H05F *3/00*
U.S. Cl. 361—220 23 Claims



1. A static electricity discharge ring for discharging static electricity from a human body comprising:

a. a first substantially ring-shaped electrically conductive member having an inside surface adapted to abut the human body, said inside surface providing a reduction in the shock perceptible to a human body during discharge of static electricity accumulated in the human body by reducing the amount of static electricity discharging through a unit area of skin;

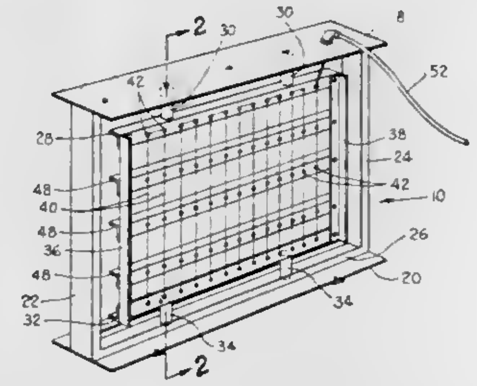
b. a second substantially ring-shaped electrically conductive member spaced from said first member; and

c. discharge indication means electrically interconnected between said first member and said second member for providing an indication of the discharge of static electricity accumulated in the human body when said second member is grounded, said static electricity traversing a path from the human body through said first member, then through said discharge means, then through said second member to ground.

4,104,696
GRID WIRE SUPPORT

John M. Cochran, Jr., Greenville, S.C., assignor to Frontier Electronics, Inc., Greenville, S.C.

Filed May 27, 1977, Ser. No. 801,077
Int. Cl.^{2} F24F *3/12*
U.S. Cl. 361—229 4 Claims



1. A grid for use in a duct for imparting ions in the air flowing through said duct responsive to a voltage being imparted to said grid from a voltage source, said grid comprising:

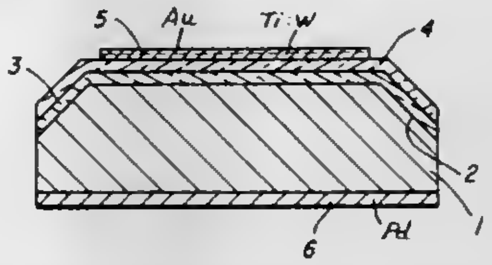
- a housing corresponding in shape to the interior of said duct;
- a horizontally extending upper support member carried adjacent the top of said housing:
- a horizontally extending non-conductive lower support member carried adjacent the bottom of said housing;
- a horizontally extending non-conductive intermediate support member carried in said housing between said upper and lower support members;
- laterally spaced grid wires extending between said upper and lower support members; and
- means for securing said grid wires to said horizontally extending non-conductive intermediate support member so as to minimize the length of free swinging wire in case a grid wire breaks;
- whereby a substantially uniform discharge of ions is produced by said grid wires when a voltage is applied to said grid and grid wires.

4,104,697
DISCRETE, FIXED-VALUE CAPACITOR

Don L. Kendall, La Paz, Mexico; Byron T. Ahlburn, Dallas, and Klaus C. Wiemer, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 582,951, Jun. 2, 1975, Pat. No. 4,015,175. This application Jan. 14, 1977, Ser. No. 759,518
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.^{2} H01G *1/01*
U.S. Cl. 361—305 5 Claims

1. A capacitor device comprising a double-plug, coaxial-lead, glass-sealed package having a semiconductor capacitor chip sealed therein said chip comprising a monocrystalline silicon body doped to a concentration in excess of 10^{19} atoms per cm^3 and having first and second substantially parallel opposite faces, a first dielectric layer of thermally grown silicon oxide on said first face, a second dielectric layer on said oxide comprising silicon nitride, a first metal film comprising Ti:W on said nitride layer, a gold-comprising film on said Ti:W, and a metal contact comprising palladium on said second face.



4,104,698
WAX COMPOSITIONS FOR FLAME RETARDANT ELECTRICAL INSULATION COATINGS

Takao Murata; Nobutaka Nakamura, and Tateo Goto, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

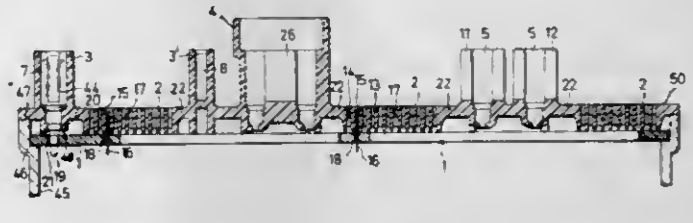
Division of Ser. No. 621,458, Oct. 10, 1975, Pat. No. 4,032,490, which is a continuation-in-part of Ser. No. 524,304, Nov. 15, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,413
Claims priority, application Japan, Nov. 15, 1973, 48-127721
Int. Cl.^{2} H01G *4/12*
U.S. Cl. 361—321 6 Claims

1. A ceramic capacitor containing as a coating an electrical insulating composition comprising a microcrystalline wax, a halogenated organic flame retardant, and a synthetic resin, the improvement wherein the insulating composition contains as a flame retardant tribromophenol alkyl ether which has a decomposition temperature above about 200° C and which has a melting point of about 70° C to about 150° C in a proportion of about 10 to about 200 percent by weight of the wax and as the synthetic resin a thermoplastic resin selected from the group consisting of phenolic resins, alkyl-phenolic resins, alkyl-benzene resins, terpene resins, cumarone resins, quanamine resins, and alicyclic saturated hydrocarbon resins, said thermoplastic resin having a melting point of about 70° C to about 150° C and is present in a proportion of about 10 to about 50 percent by weight of said wax.

4,104,699
ELECTRICAL CURRENT DISTRIBUTING ARRANGEMENT

Alfred Könnemann, Wuppertal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co KG, Wuppertal, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,543
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555708
Int. Cl.^{2} H05K *1/02*
U.S. Cl. 361—349 23 Claims



1. A current-distributing arrangement for electrical components, comprising an electrical circuit board having opposite sides, and conductive paths at one of said sides; an elongated mounting member mounted at the other of said sides, said mounting member having first wall portions which bound a plurality of first sockets, and second wall portions which bound a plurality of second sockets and which are raised relative to said first wall portions in direction away from said one

side of said board said sockets being spaced from one another in and transverse to the direction of elongation of said mounting member; and spring contact members each having resilient contact portions for receiving electrical components so as to make electrical connection therewith and fixedly mounted within said second sockets so as to be protected from mechanical damage, and a solderable portion connected with said contact portions and extending away from the latter in direction from said other side of said board towards and beyond said one side thereof so that solder contact may be made with said conductive paths only at said one side of said board.

4,104,700

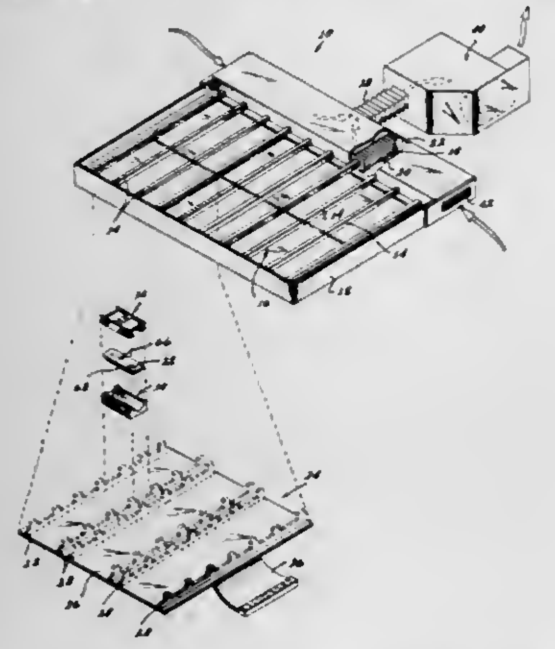
HEAT PIPE COOLING FOR SEMICONDUCTOR DEVICE PACKAGING SYSTEM

Robert V. Hutchison, Oceanside; Peter P. Gregg, Vista, and James J. MacBride, Carlsbad, all of Calif., assignors to Burroughs Corporation, San Diego, Calif.

Filed Jan. 31, 1977, Ser. No. 764,064

Int. Cl.^{2} H02B *1/00*

U.S. Cl. 361—384 **16 Claims**



1. In a system for packaging and cooling electronic equipment, a sub-island comprising,

a plurality of integrated circuit packages, each package having a plurality of electrical conductors and an integral heat sink member thereon,

connector means for mounting said packages,

an interconnection medium having a plurality of conductor leads,

each of said connector means having a plurality of electrical contacts and being operatively connected in a predetermined relationship to said interconnection medium and providing respective electrical paths between said integrated circuit package electrical conductors and said interconnection medium conductor leads,

interconnection medium heat sink means disposed in parallel spaced apart relationship transverse said interconnection medium for connecting said sub-island to a means for conducting heat from said integrated circuit package, and

means for clamping said integrated circuit packages into said connector means and said package heat sink members into engagement with said interconnection medium heat sink means, so that heat generated by said packages is transferred to said interconnection medium heat sink means, said integrated circuit packages, interconnection medium, and clamping means thus forming an integral unit interconnected electrically and thermally.

4,104,701

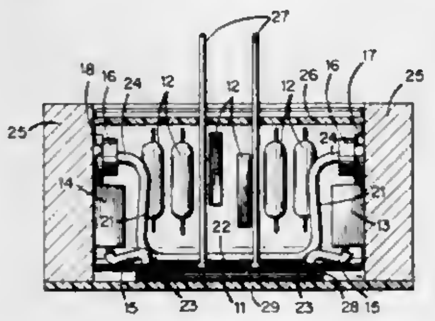
MOUNTING ASSEMBLY FOR ELECTRONIC POWER DEVICES

Conrad J. Baranowski, Arlington Heights, Mass., assignor to Powercube Corporation, Waltham, Mass.

Filed Nov. 22, 1976, Ser. No. 744,137

Int. Cl.^{2} H05K *7/20*

U.S. Cl. 361—386 **17 Claims**



1. A modular electronic assembly comprising:

at least one pair of electronic power devices arranged in spaced confronting relationship;

a deformable electrically insulating button mounted to each said power device, said button having a blind hole extending from one side thereof part way therethrough and a slot through said button, said slot extending radially from the axis of said blind hole; and

a spring member extending into each said blind hole, said spring member being arranged between and urging apart said power devices in each said pair of said power devices.

4,104,702

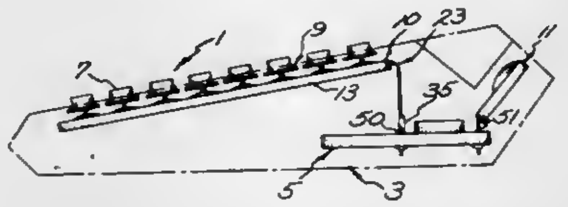
KEYBOARD APPARATUS INCLUDING ELONGATED BAR FOR ALIGNING LEVEL FROM CONNECTORS TO MOTHERBOARD

James J. Armstrong, Seekonk, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 6, 1976, Ser. No. 747,653

Int. Cl.^{2} H05K *1/00;* **H01H** *9/00*

U.S. Cl. 361—421 **10 Claims**



1. A switch assembly comprising a base member, switching stations disposed on the base member, a plurality of electrically conductive wires supported by the base member each having a free end extending beyond the base member in a direction parallel to a given axis, the wires providing means for electrically connecting the switches to a motherboard, a spacer bar having a stop surface extending along its length disposed intermediate the free ends of the wires and the base member, the wires attached to the bar a selected distance from the free ends of the wires so that the stop surface extends in a direction generally perpendicular to the given axis whereby bending of the wires prior to assembly of the switch assembly to the motherboard is minimized as well as providing a stop surface so that a given length of each wire is presented for connection to the motherboard.

4,104,703

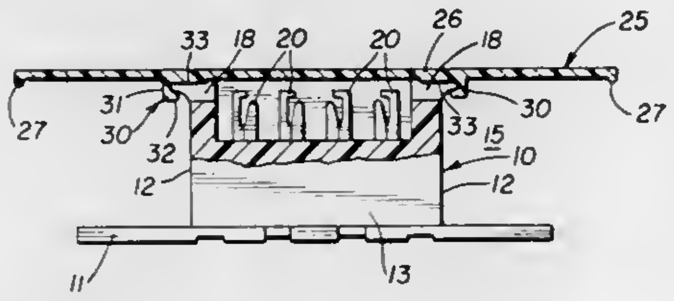
TERMINAL BLOCK COVER FOR COVERING BLOCK AND SPACE BETWEEN ADJACENT BLOCKS

Kenneth W. Hotchkiss, Golden, Colo., assignor to Proto Production Plastics, Inc., Boulder, Colo.

Filed Aug. 30, 1976, Ser. No. 718,886

Int. Cl.^{2} H02B *1/06;* **H01B** *17/00*

U.S. Cl. 361—426 **5 Claims**



2. An improved terminal block and distribution panel cover for use in telephone installation equipment and the like, wherein a base carries a distribution panel with a plurality of mushroom pins thereon and normal thereto at predetermined spacing intervals and also carries a plurality of terminal blocks in parallel rows having fixed, predetermined sidewise spacing between adjacent, independent, parallel terminal blocks, each terminal block having parallel longitudinal side walls, the parallel rows of terminal blocks running normally to the distribution panel and terminating adjacent to the distribution panel at one end of each row, the predetermined spacing of the parallel rows of terminal blocks corresponding to the spacing of the mushroom pins such that a pair of mushroom pins is spaced on the distribution panel with one pin near each of the opposite longitudinal sides of each row of terminal blocks, wherein the improved cover comprises:

(a) a flat top of width greater than the width of one of said terminal blocks and greater than the distance between the opposite edges of said pair of mushroom pins at the end edge of the terminal block, a first portion of the top extending sidewise at a first side of the terminal block for a predetermined first distance, and a second portion extending sidewise at a second and opposite side of the terminal block for a second predetermined distance, said first and second predetermined distances substantially equalling the predetermined distance between said adjacent parallel terminal blocks for cooperative full coverage of the space between adjacent, parallel, independent terminal blocks by a pair of said terminal block covers on adjacent terminal blocks;

(b) a plurality of snap tabs depending from the inner surface of the flat top inwardly of the flat top side edges in positions providing frictional engagement of the snap tabs with the side walls of the terminal block when the cover is pressed against the block; and

(c) mushroom pin engaging means located on the inner surface of the flat top on said first and second portions of the top for frictionally engaging the top to a pair of mushroom pins.

4,104,704

CAPACITOR INCLUDING AN ELECTROPLATED LAYER THEREOVER

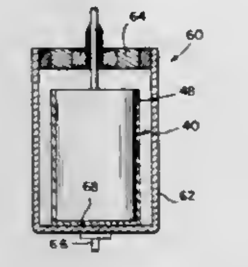
Charles A. Weaver, Indianapolis, Ind., assignor to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 536,013, Dec. 23, 1974, Pat. No. 4,000,046. This application Oct. 13, 1976, Ser. No. 731,876

Int. Cl.^{2} H01G *9/00*

U.S. Cl. 361—433 **10 Claims**

1. A capacitor comprising a film-forming metal anode, a dielectric oxide layer over anode, a semiconductive layer over oxide layer, a conductive layer over semiconductive layer, and an electroplated layer containing a metal and having a thickness of at least about 0.008 inches over conductive layer



whereby the capacitor is resistant to mechanical shock and termination means are welded to electroplated layer.

4,104,705

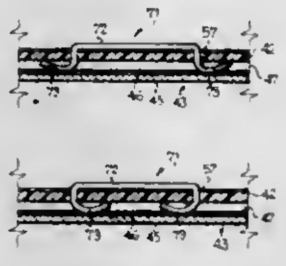
PHOTOFLASH LAMP ARRAY HAVING SHIELDED SWITCHING CIRCUIT

Victor A. Levand, Jr., Lyndhurst, Ohio, and William A. Lenkner, Neoga, Ill., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 13, 1977, Ser. No. 805,770

Int. Cl.^{2} G03B *15/02*

U.S. Cl. 362—5 **7 Claims**



1. A multiple flash lamp array comprising a plurality of flash lamps of the electrically fired type, a circuit board having circuitry on one side thereof for sequentially firing said lamps, means electrically connecting said lamps to said circuitry, and an electrically conductive shield in the form of a conductive sheet member positioned substantially parallel to and spaced from at least a part of the opposite side of said circuit board, said circuitry including at least one electrical ground circuit run on said one side of the board, and means electrically connecting said shield to said circuit run comprising a staple of conductive material having a pair of legs extending through said circuit board and having a center region positioned over and against a portion of said circuit run, said legs being bent at said opposite side of the circuit board so as to hold said center section of the staple against said circuit run, at least one of said legs of the staple being in contact against said shield.

4,104,706

PHOTOFLASH LAMP ARRAY HAVING CONDUCTIVE REFLECTOR

James M. Hanson, Euclid; Stanley S. Palagyi, Conneaut, and Gerald W. Povall, Highland Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 655,005, Feb. 4, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,317

Int. Cl.^{2} G03B *15/02*

U.S. Cl. 362—10 **12 Claims**

1. A multiple flash lamp array comprising a plurality of electrically fired flash lamps each having a pair of lead-in conductors, a circuit board containing thereon circuitry for sequentially firing said flash lamps, means electrically connecting said lead-in conductors of the flash lamps to said circuitry, a reflector unit positioned between said lamps and said circuit board and shaped to define individual concave reflectors fac-

ing the front thereof for reflecting light from said lamps frontwardly of the array when flashed, said reflector unit comprising electrically insulating material having a coating of electrically conductive material on the front surface thereof, an opening through said reflector unit, and an electrical ground conductive area carried on the front of said circuit board behind and substantially in alignment with at least a portion of the edge of said opening, the rear surface of said reflector unit at said edge of the opening being adjacent to or against said electrical ground conductive area, said conductive coating on the front of the reflector being against or adjacent to said electrical ground conductive area to provide an electrical connection for electrostatic charges between said electrical ground conductive area and said conductive coating on the reflector.

4,104,707

ELECTRONIC FLASHLIGHT FOR DIRECT AND INDIRECT FLASHING

Arthur Schneider, Völkenrode, Germany, assignor to Rollei-Werke Franke & Heidecke, Germany

Filed Aug. 8, 1977, Ser. No. 822,561

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 7626537[U]

Int. Cl.^{2} G03B *15/02*

U.S. Cl. 362—17 **7 Claims**

1. In a light-generating electronic flashlight including a housing, a light source and a reflector mounted in said housing, primary disc means connected to said housing and being movable among a plurality of positions including one position in a light path between the reflector and an object to be illuminated from the light source, the light source being disposed between said reflector and said one position, comprising,

secondary disc means movable to and from said one position for unilateral deflection of the light from said light source in at least one of a plurality of selectable directions, and upon the light source pointing in the selected direction.

4,104,708

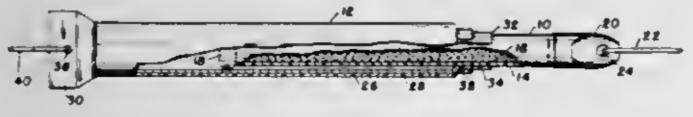
SHROUDED CHEMICAL LIGHT SOURCE

William H. Bohli, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 8, 1974, Ser. No. 486,556

Int. Cl.^{2} F21V *9/16*

U.S. Cl. 362—34 **7 Claims**



1. Self-luminescent article comprising an opaque tubular shroud and a chemiluminescent device which comprises a light transmitting tubular body having closed ends, said tubular body containing a chemiluminescent material;

said chemiluminescent device being in telescopic relationship with said shroud and reciprocally moveable therein, one end of said device being contained within said shroud and the other end being exposed, said end of the device contained within said shroud having a portion of larger cross-sectional area than the remainder of said device contained within said shroud, said shroud being provided with a stop means which cooperates with said enlarged end of the chemiluminescent device to prevent the complete removal of said chemiluminescent device from said shroud.

4,104,709

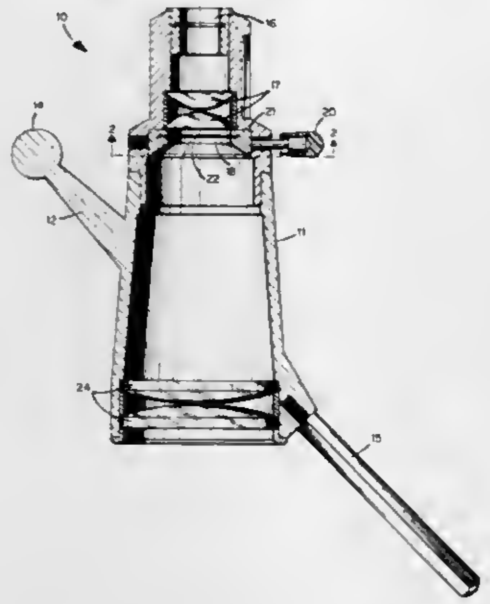
SURGEONS HEADLIGHT WITH CONTINUOUSLY VARIABLE SPOT SIZE

Jacobus Kloots, Sturbridge, Mass., assignor to Applied Fiberoptics, Inc., Southbridge, Mass.

Filed Apr. 11, 1977, Ser. No. 786,283

Int. Cl.^{2} F21C *15/14*

U.S. Cl. 362—105 **8 Claims**



1. A surgeon's headlight for providing a variable diameter illuminating spot comprising:
- (a) a lamp housing;
- (b) means to secure said housing to a headband;
- (c) a fiberoptic cable receptacle in said housing;
- (d) a fixed entrance condenser lens following said receptacle in said housing;
- (e) a variable iris proximate said entrance condenser lens in said housing;
- (f) a fixed exit lens following said iris in said housing arranged to image said iris in a field 25 to 45 cm in front of said housing; and,
- (g) manipulatable means connected to said iris and extending through said housing for varying the aperture of said iris, said condenser lens having a configuration and position to provide magnification of the exit pupil at said receptacle so as to illuminate the entire entrance surface of said exit lens, whereby changing the diameter of said iris will change the diameter of an illuminated spot without changing illuminance.

4,104,710

PATIENT HEADWALL UNIT

Frank M. Damico, Stevens Point, and Patrick John O'Toole, Wisconsin Rapids, both of Wis., assignors to Joerns Furniture Company, Division of American Seating Company, Stevens Point, Wis.

Filed May 31, 1977, Ser. No. 801,735

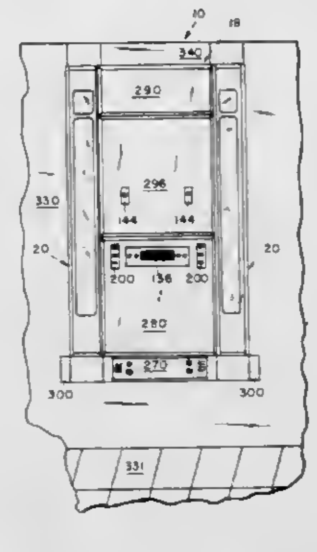
Int. Cl.^{2} A47B *97/00*

U.S. Cl. 362—130 **41 Claims**

1. A patient headwall unit adapted for positioning against the headwall of a patient room in a hospital or like facility between two beds, such unit comprising:

a generally rectangular, vertically elongated central section having means therein for accommodating electrical services and means for making such services available at the exterior of the unit for use at either of said beds;

a vertically elongated lighting section integral with and affixed to either side of said central section, each said lighting section being of heighth generally equal to said central section, each said lighting section including a reading light, a general room illumination light and means for directing the light rays from said reading light downwardly, outwardly and forwardly onto the upper section of the bed positioned adjacent thereto; and



means for switching said reading and general room illumination lights on and off.

4,104,711

AIRPORT LIGHT FIXTURE

Herbert F. Carter, Simsbury, Conn., assignor to Connecticut International Corporation, Windsor Locks, Conn.

Filed May 25, 1977, Ser. No. 800,183

Int. Cl.^{2} F21S *1/02*

U.S. Cl. 362—153 **5 Claims**

1. In an airport light fixture having a support member provided with a spherical support surface, a lamp base provided with a mating spherical support surface engaging the spherical support surface of the support member to form a universal joint therebetween for adjusting the tilt of the lamp base, a lamp mounted on the lamp base and a lens cooperating with said lamp base to cover the lamp and direct the light emanating therefrom, and means for clamping the spherical support surfaces of said lamp base and support member together, the improvement wherein said spherical support surfaces have different curvatures to minimize the area of contact therebetween to concentrate the clamping forces on the contacting areas to prevent the relative movement of the lamp base and the support member under the severe vibrational stress encountered in use.

4,104,712

OUTDOOR LIGHT FIXTURE

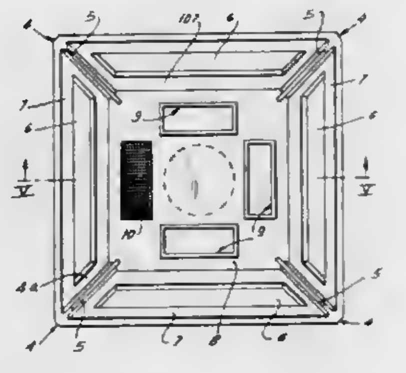
Erich Häfner, Doktorkamp 11, Leopoldshöhe, Fed. Rep. of Germany (D-4811)

Filed Feb. 1, 1977, Ser. No. 764,639

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604840

Int. Cl.^{2} F21S *2/00*

U.S. Cl. 362—218 **10 Claims**



1. A light fixture, comprising a one-piece hollow truncated pyramidal frame with an open base, said frame including an end wall located opposite said base and elongated sloping corner sections extending from said base to said end wall, each of said sections including two legs and a partition extending into the interior of said frame, disposed between and making an acute angle with each of said legs, said frame having a plurality of first ventilating openings in the region of said end wall; a discrete light-transmitting pane for each of said corner sections, said panes being located in the interior of said frame between neighboring corner sections and each having two sloping marginal portions, one of which sealingly engages one leg and abuts against the partition of one of the neighboring sections and the other of which sealingly engages one leg and abuts against the partition of the other neighboring section; and a one-piece cover overlying said base, said fixture having a plurality of second ventilating openings in the region of said cover and each of said first and second openings being sufficiently small to prevent insects, particularly nocturnal insects, from entering the interior of the fixture.

4,104,713

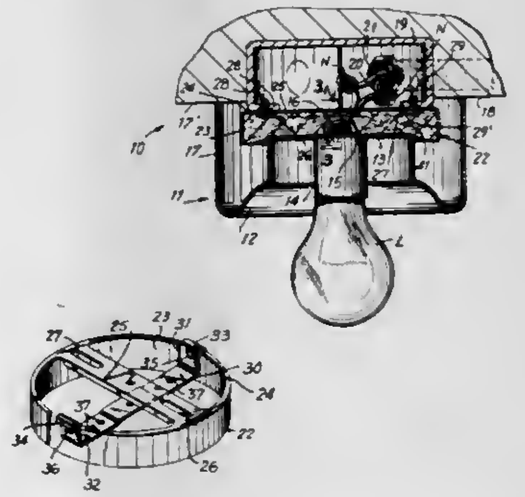
HEAT DISSIPATING LIGHTING FIXTURE MOUNT

Kingsley Chan, Rutherford; Mahendra K. Patel, Carteret, and Sidney Wolkin, Rahway, all of N.J., assignors to Lightoller Incorporated, Jersey City, N.J.

Filed May 2, 1977, Ser. No. 792,722

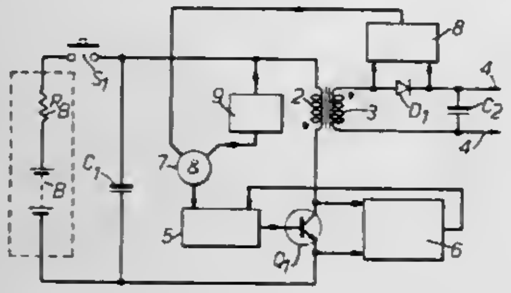
Int. Cl.^{2} F21V *29/00*

U.S. Cl. 362—294 **6 Claims**



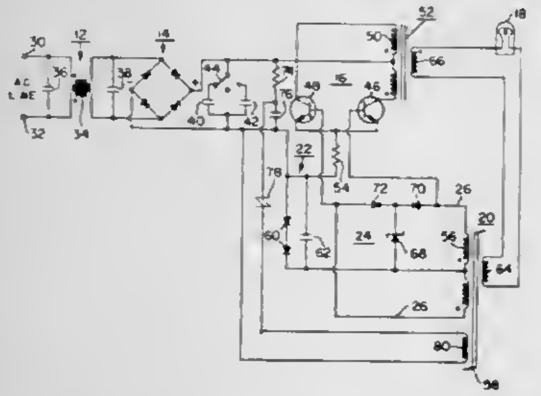
1. A heat dissipating lighting fixture adapted to be mounted to a junction box having spaced mounting screws extending into said box comprising, in combination, a housing including a top plate member, a light socket mounted on said plate member, a mounting ring assembly adapted to connect said housing to said junction box, said ring assembly including a horizontally directed annular rim, a mounting bar at the upper edge of said ring assembly, said bar including spaced elongate aperture means for receiving said mounting screws of said junction box to hold said bar to said box, a housing support bracket movably mounted to said ring assembly, said bracket extending diammetrically of said ring assembly in parallel spaced relation to said bar, said bracket including at each of its longitudinal extremities means releasably and rotatively to support said bracket with respect to said ring assembly, whereby said bracket may be rotated relative to said ring assembly but is locked against substantial movement in directions normal to the plane of said rim, heat insulation means disposed in said ring assembly between said bracket and said bar and fastener means on said bracket adapted to be received in complemental fastener means on said top plate of said housing, whereby said bracket is clampingly engaged against said top plate, said assembly providing an elongate heat conducting path from said housing to said junction box, said path extending through said bracket to said rim and from said rim to said bar.

4,104,714
CONVERTER ARRANGEMENTS
Richard Hanley Smith, Cirencester, and Peter Graham Laws, Wootton Bassett, both of England, assignors to Plessey Handel und Investments AG., Zug, Switzerland
Filed Jan. 14, 1977, Ser. No. 759,477
Claims priority, application United Kingdom, Jan. 14, 1976, 1472/76; Feb. 13, 1976, 5709/76
Int. Cl.^{2} H02M *3/335*
U.S. Cl. 363—21 **18 Claims**



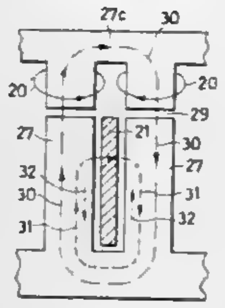
1. A DC/DC converter comprising a transformer means having a primary and a secondary circuit, a chopper transistor means for periodically interrupting current flow in said primary circuit to effect energy transfer into said secondary circuit when the current flow in the primary circuit is interrupted, first and second current flow sensing means in said primary and secondary circuits respectively, and means for interconnecting said first and second current flow sensing means with said chopper transistor means to form a relaxation oscillator wherein current flow through the chopper transistor means remains interrupted at least until the energy transfer into said secondary circuit is substantially complete.

4,104,715
ALTERNATING CURRENT TO ALTERNATING CURRENT CONVERTER APPARATUS
Harry W. Lawson, Jr., Rush, N.Y., assignor to Acme Electric Corp., Cuba, N.Y.
Filed Mar. 10, 1977, Ser. No. 776,403
Int. Cl.^{2} H02M *5/458*
U.S. Cl. 363—37 **19 Claims**



1. Alternating current to alternating current converter apparatus which provides controlled alternating current to a load, said apparatus comprising
- (a) means for converting input alternating current into direct current,
- (b) means for inverting said direct current into alternating current and applying said alternating current therefrom to said load, said inverting means comprising
  - (1) oscillator means connected in current feedback relationship with said load for self excitation thereof by said load current,
  - (2) means for sensing the output current of said oscillator and providing a control voltage, and
  - (3) means responsive to said control voltage for reducing said oscillator output current without cutting off said oscillator output current when said control voltage exceeds a predetermined magnitude.

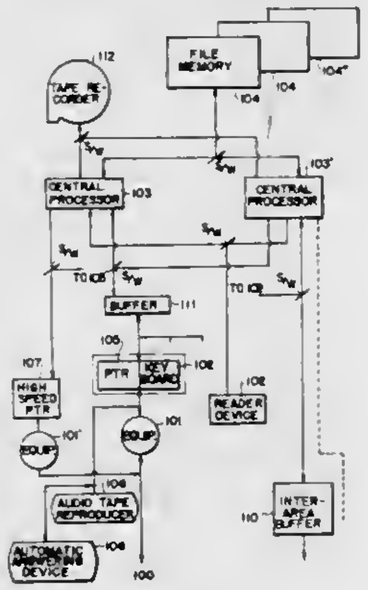
4,104,716
SATURABLE MAGNETIC DEVICE FOR REGULATING COMMUTATING OR CONVERTING AN ELECTRIC CURRENT FROM AC TO DC OR VICE VERSA
Luigi Ruggeri, Via Mosé Bianchi, 40 - Milan, Italy
Filed Aug. 11, 1976, Ser. No. 713,602
Claims priority, application Italy, Aug. 13, 1975, 26329 A/75
Int. Cl.^{2} H02M *5/32*
U.S. Cl. 363—102 **4 Claims**



1. A saturable magnetic device for regulating, commutating or converting an electric current, comprising a magnetic circuit including a ferromagnetic laminated core with at least one slot having saturable slot walls, at least one conductor arranged in said slot, said conductor conducting said electric current and having an elongated cross-sectional shape to minimize the conductor inductance and to enhance the conductor added resistance due to stray flux from a current passing through the conductor when the slot walls are unsaturated, means on said core for applying an external magnetic control field to said magnetic circuit to saturate the slot walls and reduce thereby the stray flux and the conductor added resistance according to a prefixed program.

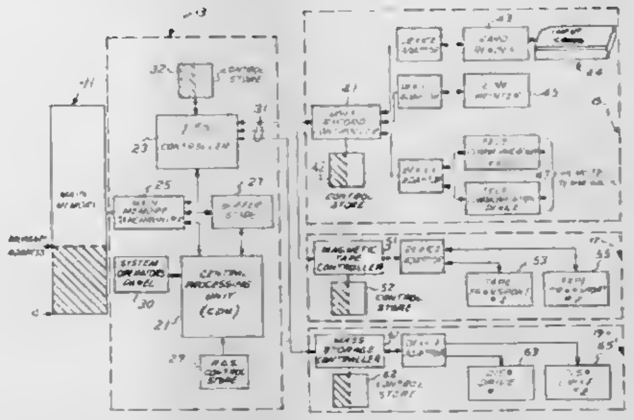
4,104,717
AUTOMATIC SYSTEM FOR PROVIDING TELEPHONE NUMBER INFORMATION SERVICE
Eiji Fujimura, 24-4, Shinohara-dai-machi, Kohuku-ku, Yokohama, Japan
Continuation of Ser. No. 642,760, Dec. 22, 1975, Pat. No. 4,020,473, which is a continuation-in-part of Ser. No. 396,306, Sep. 11, 1973, abandoned, which is a continuation of Ser. No. 162,236, Jul. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 834,226, Jun. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 730,973, Apr. 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 438,325, Mar. 9, 1965, abandoned. This application Aug. 17, 1976, Ser. No. 715,000
Claims priority, application Japan, Mar. 11, 1964, 39-13453
The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.
Int. Cl.^{2} G06F *7/10, 15/02, 15/40*
U.S. Cl. 364—200 **6 Claims**

1. An apparatus for providing telephone numbers in response to inquiries, comprising:
- at least one input device for use by operators to supply inquiry information including a format control symbol for an inquiry index;
- at least one output device for use by operators to receive information in response to inquiries;
- at least one file memory device to which random access can be gained for storing data entries;
- at least one central processor for carrying out mathematical and logical computations including a comparing operation, said central processor having:
- an index shaping device coupled to said input device and comprising:
  - (a) detector switching means for identifying breaks between items in the inquiry information and switching the items to registers for each of said items,
  - (b) register means connected with said detector switching means for storing each of said items, and limiting the number of characters as to any needed one of said items,
  - (c) conversion means connected to said detector switching means for converting each of the needed items into a corresponding generic concept code,
  - (d) a further register means connected to said conversion means for storing each of said generic concept codes,
  - (e) integrating register means connected to said register means and further register means for integrating each item to shape a set of inquiry items comprised of the inquiry index, a desk and question number, and a format control symbol, and,
  - (f) a dividing device coupled to said integrating register means for separating the inquiry index from said set of inquiry items and registering said inquiry index,
- a joining device coupled to the dividing device and the output channel of said file memory device to receive and combine the set of inquiry items with response data from the file memory device, and
- a comparison device, which comprises:
  - (a) a random access storage means having storage cells to store keywords that are prepared in the same format as the inquiry index item, and having a control unit,



  - (b) a further storage means to store area-unit numbers corresponding to said keywords and having storage cells corresponding to the storage cells in said random access storage means on a one to one basis,
  - (c) comparing means coupled to both said storage means to determine the position of an inquiry index among a plurality of keywords stored in the random access storage means which respectively correspond to the storing areas of the file memory device,
  - (d) address calculating means connected to the comparing means and the control unit of the random access storage means for calculating the memory address of a next keyword in accordance with a result of a latest comparison with respect to the inquiry index,
  - (e) keyword registering means coupled between said random access storage means and said comparing means for receiving and storing the keyword for the next comparison step, and
  - (f) area-built number registering means connected to the file memory device for receiving and storing area-unit numbers corresponding to the keywords, and for transmitting the contents thereof to the file memory device at the time of determination of the inquiry index position among the keywords.

4,104,718
SYSTEM FOR PROTECTING SHARED FILES IN A MULTIPROGRAMMED COMPUTER
Alain Poublan, Paris, France; Charles Bachman, Lexington, and Jacques Bouvard, Wellesley, both of Mass., assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France
Filed Dec. 16, 1974, Ser. No. 533,038
Int. Cl.^{2} G06F *9/19, 7/10, 3/00*
U.S. Cl. 364—200 **10 Claims**



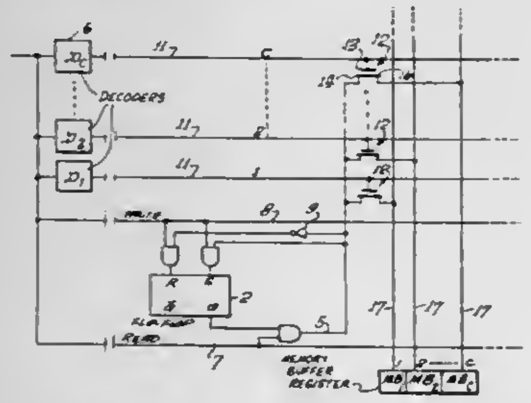
1. Apparatus for selectively permitting access to a related file of information by a candidate job step in a queue of job steps stored in preparation to be processed by a computing system, the related file including information related to the processing of said candidate job step by the computing system and information related also to the processing of an active job step currently being processed by the computing system, said apparatus comprising:
- (a) first means for storing a request file control manifestation associated with said candidate job step, said request manifestation including data identifying said related file of information, data identifying a set of requested rules which are to govern the sharing of said related file of information as said candidate job step is processed by the computing system, and data identifying a requested use to be made of said related file of information by said candidate job step;
- (b) second means for storing a current-status file control manifestation, said current-status manifestation including data identifying said related file, data identifying a set of current rules governing the sharing of said related file of information, and data identifying a current use being made of said related file of information by said active job step currently being processed by the computing system;
- (c) third means coupled to said first and second means for comprising said request control manifestation with said current-status control manifestation;
- (d) fourth select control means coupled to said first and second means, for making a first determination whether the requested use as identified by the data of said request structure manifestation violates one of the current rules as identified by the data of said current-status manifestation, and for selectively permitting access to said related file of information by said candidate job step in accordance with said first determination;
- (e) fifth select control means coupled to said first and second means, for making a second determination whether the current use as identified by the data of said current manifestation violates of the requested rules as identified by the data of said request manifestation, and for selectively permitting access to said related file of information by said candidate job step in accordance with said second determination; and
- (f) sixth means coupled to said first and second means, for entering in said first means, when access to said related file by said candidate job step is granted in accordance with at least one of said first and second determinations of said fourth and fifth means, the requested rules as identified by said request manifestation as said current rules, and for

entering in said second means said requested use as indicated by said request manifestation as said current use as identified by said current-status manifestation, thereby to determine the use by said candidate job step of said related file of information.

4,104,719
MULTI-ACCESS MEMORY MODULE FOR DATA PROCESSING SYSTEMS

Wesley W. Chu, Pacific Palisades, Calif., and Phillip B. Korff, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1976, Ser. No. 687,977
Int. Cl.^{2} G06F *13/00;* G11C *7/00*
U.S. Cl. 364—200 **2 Claims**



1. Multi-access memory apparatus for use with a digital data computer system of a type having a memory formed of a plurality of memory modules each containing data bit storage cells, the computer system further including a digital data processor providing address instructions to address registers, the outputs of which are applied to decoders functioning responsively to said instructions to activate particular storage cells of a particular module and permit the logic state of said particular cells to be supplied for storage to memory buffer registers, the memory apparatus comprising:

a plurality of independent memory access channels for each of said data bit storage cells of each of the modules, each of said channels including:

an address register having an input coupled to said processor for receiving said processor provided address instructions and an output,

an address instruction decoder having an input coupled to said address register output and an output,

an individual electrically-conductive drive line coupled to and electrically activated by said decoder output,

an individual memory buffer register for receiving the logic contents of the storage cell of the channel,

a normally-open data-bit-line circuit coupling said buffer register to said data bit storage cell of the channel,

said data-bit-line circuit including a normally-open switch means, and

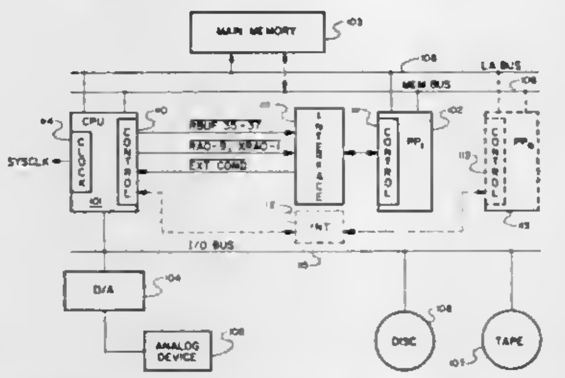
conductive means coupling said drive line to said normally-open switch means when said decoder functions for activating the drive line, said activating closing said switch means and permitting said logic state of said cell to be supplied through said data-bit-line circuit to said buffer register,

said plurality of channels for each cell permitting simultaneous accessing of the logic state of said cell whereby identical address instructions calling for the same storage cell locations can be simultaneously serviced.

4,104,720
CPU/PARALLEL PROCESSOR INTERFACE WITH MICROCODE EXTENSION

Ronald Hans Gruner, Cary, N.C., assignor to Data General Corporation, Westboro, Mass.

Filed Nov. 29, 1976, Ser. No. 745,898
Int. Cl.^{2} G06F *9/16*
U.S. Cl. 364—200 **10 Claims**



1. In an improved data processing system including a main memory for storing at least said data, peripheral device means for providing inputs to and outputs from said system, a CPU connected from said main memory for processing certain of said data, said CPU including clock means for providing timing signals for operation of said system and a system controller for controlling operation of said system, said system controller including a microprogram control store for storing a microprogram and having a plurality of pages of predetermined word length, said system further including I/O bus means connected from said CPU to said peripheral device means for transferring said data therebetween, and at least one parallel processor connected between said CPU and said main memory for parallel processing other certain of said data, the improvement comprising:

said at least one parallel processor having associated therewith a separate CPU/parallel processor interface structure, said structure including extended microprogram control store means consisting of extension of said predetermined word length of at least one of said pages and having stored therein an extension of said microprogram for controlling operation of said at least one parallel processor;

means responsive to the operation of said system controller controlling said system from the portion of said microprogram contained within said predetermined word length of said at least one of said pages and synchronized with said clock means for enabling the operation of said extended microprogram control store means;

whereby the speed of operation of said system is increased since said at least one parallel processor operates upon said other certain of said data under control of said extended microprogram simultaneously and synchronously with operation of said CPU.

4,104,721
HIERARCHICAL SECURITY MECHANISM FOR DYNAMICALLY ASSIGNING SECURITY LEVELS TO OBJECT PROGRAMS

Peter Willy Markstein, and Alan Levi Tritter, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,899
Int. Cl.^{2} G06F *9/18*
U.S. Cl. 364—200 **23 Claims**

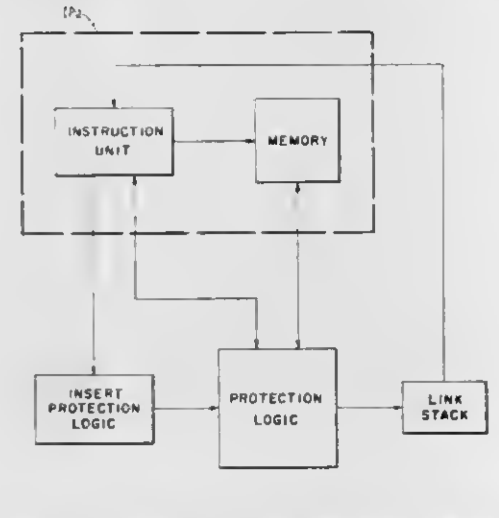
1. An electronic computing system having a hierarchical security mechanism incorporated therein, said system including a memory for storing both instructions and data, an instruction execution unit for extracting series of instructions from the memory and executing same, and a processing unit for performing the data operations required by said instructions, said hierarchical security mechanism being dynamically actuable by application programs and including

means actuable by an application programmer for assigning a hierarchical protection level for each program instruction sequence included in an overall running program, wherein successive hierarchical protection levels have successively reduced privelege to access storage locations in said memory,

means for assigning a unique protection field to each such instruction sequence,

means for storing the particular protection field assigned to each instruction sequence in every storage location in said memory to which it is intended that access by said instruction sequence is to be permitted, and

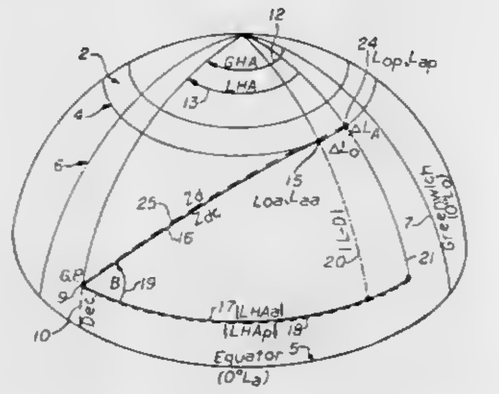
means actuable during the running of a program for ascertaining that the protection field of each memory access matches the protection field of the instruction sequence which initiated said access, which comprises means for comparing the protection field of a requesting instruction with the stored protection field of the accessed location in memory and predicating access on a successful comparison, said comparison being a function of the hierarchical protection level of the requesting instruction.



4,104,722
METHOD AND APPARATUS FOR CELESTIAL NAVIGATION

Dow J. Evans, 6525 Hillcroft, Apt. 503, Houston, Tex. 77036

Filed Sep. 10, 1976, Ser. No. 722,085
Int. Cl.^{2} G06F *15/50*
U.S. Cl. 364—455 **24 Claims**



1. An apparatus for celestial navigation, comprising

means for deriving a first input functionally representative of the observed altitude of a selected celestial body,

means for deriving a second input functionally representative of the geographical coordinates of an assumed position,

means for deriving a third input functionally related to the ground position of said celestial body,

means for deriving from said second and third inputs a fourth input functionally representative of a first right spherical triangle having the apex of one of its acute angles at said ground position of said body and its hypotenuse between said ground position and said assumed position,

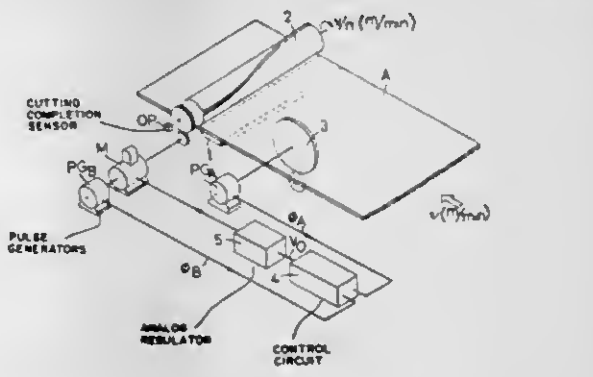
means for deriving from said first and third inputs a fifth input functionally representative of a second right spherical triangle proportional to said first triangle and having the apex of its corresponding angle at said ground position and its hypotenuse extending therefrom along the hypotenuse of said first triangle, and

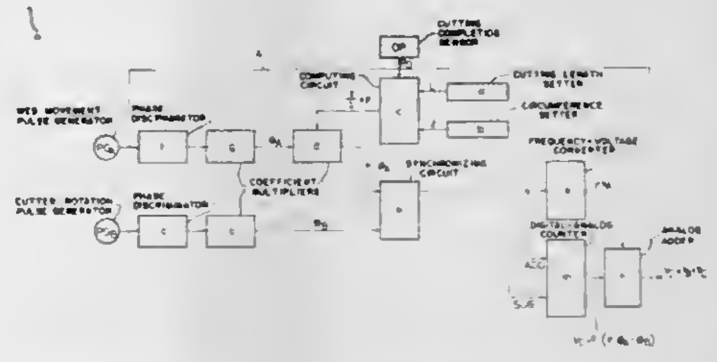
means for deriving from said fourth and fifth inputs an output functionally representative of the coordinates of the point of position of the apex of the other acute angle of said second triangle.

4,104,723
METHOD OF CONTROLLING WEB CUTTING

Masateru Tokuno, Nishinomiya; Hisahiro Tanigawa, Koganei; Masayoshi Kaneko, and Noboru Shinmura, both of Yokohama, all of Japan, assignors to Rengo Kabushiki Kaisha (Rengo Co., Ltd), Osaka and Nippon Riraiansu Kabushiki Kaisha (Japan Reliance Electric Ltd.), Yokohama, both of, Japan

Continuation-in-part of Ser. No. 597,815, Jul. 21, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,846
Int. Cl.^{2} G05B *19/26;* B26D *5/20*
U.S. Cl. 364—475 **2 Claims**





1. A method for controlling the cutting of a continuously fed web by means of a rotary cutter, comprising the steps of:

generating a signal representative of the circumference of said rotary cutter;

generating a signal representative of a predetermined length into which the web is to be cut;

detecting the speed of the web and generating a signal representative thereof;

detecting the speed of the rotary cutter and generating a signal representative thereof;

dividing said signal representative of the circumference of said rotary cutter by said signal representative of the predetermined cutting length to produce a coefficient K;

multiplying said signal representative of the speed of the web by the coefficient K;

comparing said multiplied signal and said signal representative of the speed of said rotary cutter to determine any difference between them;

converting the result of said determination to an analog error voltage;

converting said multiplied signal to a reference voltage proportional thereto;

combining said reference voltage with said error voltage, and

controlling the speed of said rotary cutter by the combined voltage, thereby cutting the web accurately into the predetermined lengths.

4,104,724

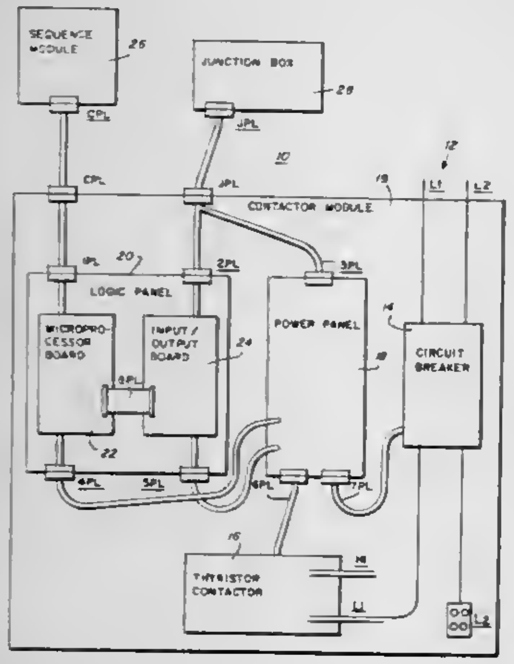
DIGITAL WELDER CONTROL SYSTEM

James Allen Dix, Greenfield; Marvin A. Guettel, Milwaukee, and Michael Aslin, Cedarburg, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Jun. 27, 1977, Ser. No. 809,959

Int. Cl.² G06F *15/46;* B23K *9/12*

U.S. Cl. 364—477 **9 Claims**



1. A digital welder control system for a portable gun welder of the type connecting and disconnecting a welding transformer load from an electrical source to control the timing periods of the welding sequence and the level of heat intensity in the weld, comprising:

a means responsive to manual actuation for producing a plurality of output signals representing timing period and weld heat constants of the welding sequence;

a sensing means responsive to the end of current conduction in each half-cycle of a welding period for generating an automatic power factor signal having a timing point which varies with changes in the power factor of the welding installation; and

a digital control means, responsive to the heat, period, and automatic power factor signals and having a fixed and known cycling time to execute a particular instruction so that by placing the control means in a programmed loop after the automatic power factor signal is sensed, a real time delay is produced, for generating a digital phase shift heat control weld firing signal and for generating each of the timing periods within the weld sequence.

4,104,725

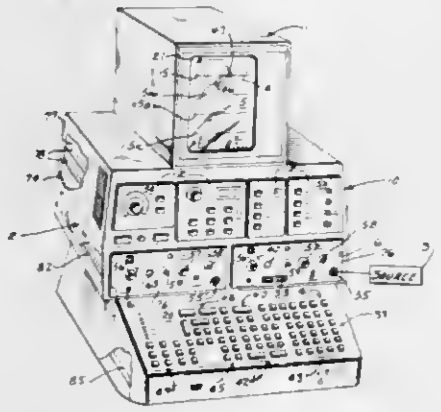
PROGRAMMED CALCULATING INPUT SIGNAL MODULE FOR WAVEFORM MEASURING AND ANALYZING INSTRUMENT

Frederick A. Rose; Russell H. Nord, and Roger E. Lidicker, all of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Mar. 26, 1976, Ser. No. 670,891

Int. Cl.² G01R *13/20*

U.S. Cl. 364—487 **19 Claims**



1. A waveform measuring and analyzing instrument having a visual display output means and a digital memory array means for storage of the coordinates of a digital representation of a waveform, a data acquisition means connected to said memory array means for establishing digitized waveform signals of a waveform, a programmed processor having a program memory and an interactive user operated control means for the processor for programmed data reduction of the data in the memory array means, the improvement in the data acquisition means comprising a releasably connected signal coupling unit in said instrument having a first bus connection means including a hardware bus connector and a software bus connector connected to the processor and to the data acquisition means, plug-in modules having a single integrated support having second connection means including a hardware bus connector and a software bus connector for connection to said first bus connection means, said integrated support being insertable as a unit into said coupling unit and establishing the interconnection of said corresponding connectors, said plug-in unit including a resident software program means connected to the software bus connector of said plug-in module and a hardware signal processing means connected to the hardware bus connector of said plug-in module, said hardware bus connector and said software bus connector of said first connection means establishing transmission of signals between said processor and said module resident software program memory means and said hardware signal processing means for processing of data in said hardware signal processing means and for executing a software program resident in said module.

4,104,726

PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

Bernard C. Fisk, Dallas, Tex., and Gerald C. Verschage, Henrietta, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,663, Aug. 12, 1974. This application Nov. 3, 1975, Ser. No. 628,035

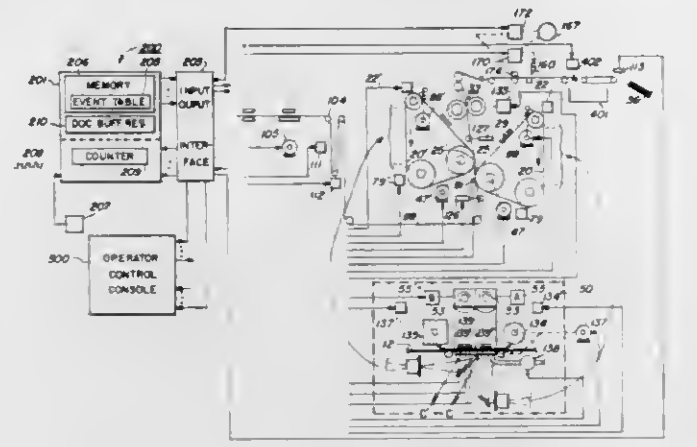
Int. Cl.² G06F *15/20;* G03G *15/00*

U.S. Cl. 364—518 **5 Claims**

1. In a synchronous reproduction machine for producing impressions of variable size and quantity from an original, the reproduction machine having a photosensitive member and a plurality of discrete operating components cooperable with one another and the photosensitive member to electrostatically produce impressions on support material, the improvement comprising:

programming means for programming the machine to produce the impressions desired;

control means for operating said components in timed relationship with one another to produce the desired impressions in accordance with said programing means; and



component monitoring means for periodically checking at least one of said operating components in the intervals between actuation of said operating components to determine if said one component is functioning properly.

4,104,727

LIQUID CRYSTAL DISPLAY CALCULATOR CONSTRUCTION

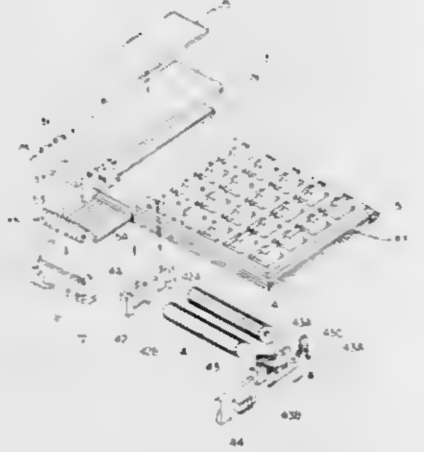
Isamu Washizuka, Kyoto; Shintaro Hashimoto, Nara; Masaru Kakumae, Yamatokoriyama; Yuuichi Sato, Nara; Isao Fujisawa, Yamatokoriyama; Yukihiro Inoue, Kashihara; Sadakatsu Hashimoto, Yamatokoriyama; Yoshio Takeda, Nara; Mitsuo Ishii, Yamatokoriyama, and Yoshitomo Kitanishi, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1976, Ser. No. 725,928

Claims priority, application Japan, Sep. 23, 1975, 50-115190; Sep. 23, 1975, 50-115191; Sep. 23, 1975, 50-115192; Sep. 23, 1975, 50-115193

Int. Cl.² G06F *15/02;* G02F *1/13*

U.S. Cl. 364—710 **22 Claims**



1. An electronic calculator comprising:

keyboard means having a plurality of integral key actuators for introducing data into said calculator on which computations are to be preformed;

a data processor unit implemented with an LSI semiconductor chip for performing computation functions on the data introduced by said keyboard means;

a multi-digit liquid crystal display means for displaying data introduced by said keyboard means and results of the computation functions performed by said data processor unit, said liquid crystal display means having a portion with electrical terminals thereon which extends from one end of said display means and supports said LSI semiconductor chip thereon;

a printed circuit flexible film having electrical leaf conductors formed thereon in a predetermined pattern, said electrical leaf conductors having portions which define electrical key contacts for cooperation with said key actuators and terminals for interconnection with said terminals of said liquid crystal display; and

means for holding said electrical key contacts of said printed circuit flexible film in juxtaposition to said respective key actuators and said terminals of said film into contact with said terminals of said liquid crystal display.

4,104,728

ELECTRONIC APPARATUS EQUIPPED ON A FLEXIBLE SUBSTRATUM

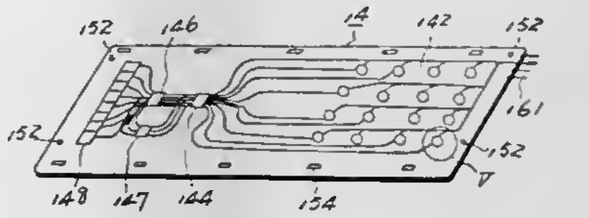
Takeshi Kasubuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 476,864, Jun. 6, 1974, abandoned. This application Nov. 4, 1976, Ser. No. 739,002

Claims priority, application Japan, Jun. 6, 1973, 48-63482

Int. Cl.² G06F *3/00;* H01H *9/00*

U.S. Cl. 364—712 **8 Claims**



1. An electronic apparatus comprising a housing, a flexible substratum carrying a wiring pattern formed thereon, said flexible substratum being disposed in the housing in a serpentine fashion at at least one portion thereof, a display unit formed directly on the flexible substratum, said display unit being adjustable with respect to its angle or its position thereof because of the flexibility of the substratum; a semiconductor circuit unit including at least a computation function circuit formed directly on the flexible substratum and protected from the environment with a resinous material; key contact patterns formed directly on the flexible substrate and a keyboard unit disposed on the flexible substratum, said keyboard unit containing a plurality of key contacts which are adapted to make contact with the key contact patterns.

4,104,729

DIGITAL MULTIPLIER

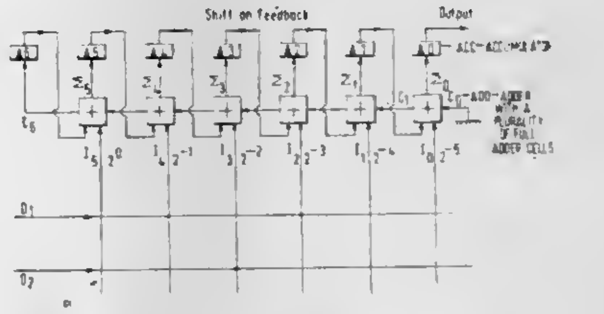
Michael J. Gingell, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 688,520, May 20, 1976, abandoned. This application May 16, 1977, Ser. No. 796,920

Claims priority, application United Kingdom, Aug. 27, 1975, 35345/75

Int. Cl.² G06F *7/52*

U.S. Cl. 364—757 **17 Claims**



1. A digital multiplier providing a calculated output signal comprising:

a first adder having a plurality of first adder cells;
an accumulator coupled to each of said first adder cells to store the output of each of said first adder cells and to shift said stored output one bit for each addition operation said calculated output signal being provided by said accumulator;
input means coupled to said first adder cells for applying simultaneously a plurality of serial data words to said first adder cells, said input means being arranged so that each of said serial words is applied to predetermined ones of said first adder cells but no two serial words are applied to the same one of said first adder cells;
first means coupled to said accumulator for examining a given number of the most significant bits of said calculated output signal to determine if the complete calculated output signal value will exceed a predetermined range of values; and
second means coupled to said accumulator and a given one of said first adder cells for substituting for said calculated output signal a selected one of a maximum positive and negative data signal according to the sign of said calculated output signal when the value of the latter exceeds said predetermined range of values.

4,104,730

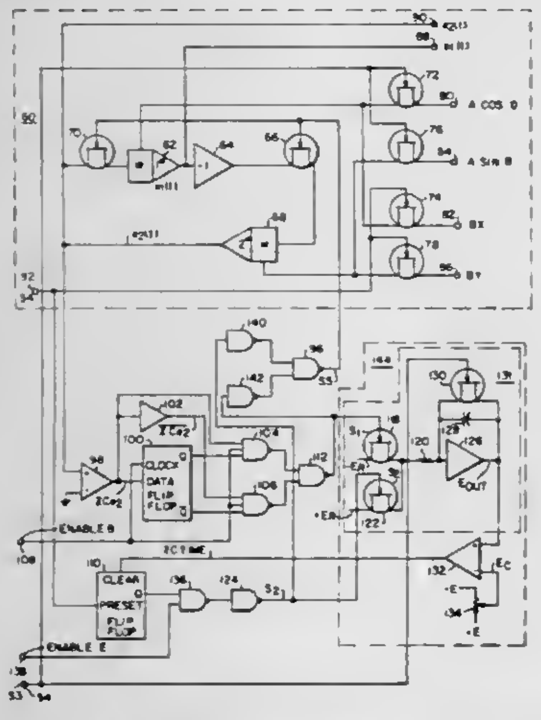
BORESIGHT ADJUSTMENT FOR A HARMONIC OSCILLATOR COORDINATE CONVERTER

Steven Morrison, Baltimore, and William J. Dorman, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 2, 1976, Ser. No. 672,894

Int. Cl.^{2} G06G *7/22, 7/80*

U.S. Cl. 364—815 **11 Claims**



6. Resolver apparatus for transforming vectors comprising:
a harmonic oscillator coordinate converter;
means for varying the time of oscillation of said harmonic oscillator when a vector is rotated to provide a coordinate adjustment angle $\Delta\theta$ to said vector transformation wherein said means for varying the time of oscillation includes a clock and counter for storing the time of oscillation and means for adjusting the value stored in the counter by an amount indicative of the adjustment angle $\Delta\theta$.

4,104,731

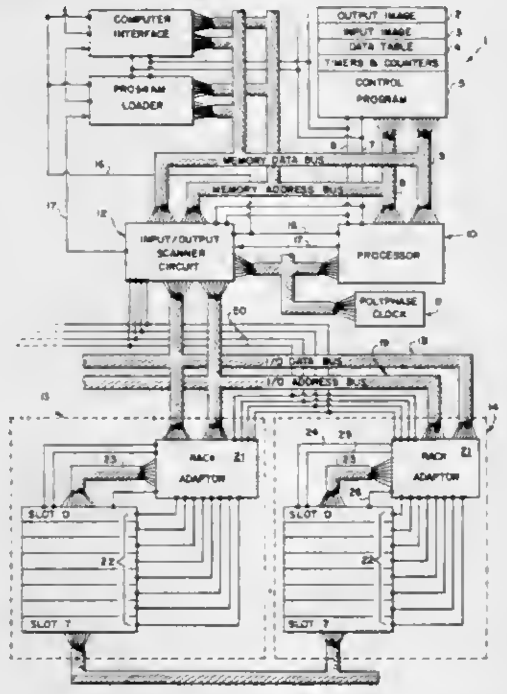
ASYNCHRONOUS COUPLING OF DATA BETWEEN A WORD-ORIENTED I/O MODULE AND THE MEMORY OF A PROGRAMMABLE CONTROLLER

Raymond A. Grudowski, South Euclid, and Odo J. Struger, Chagrin Falls, both of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Jun. 14, 1976, Ser. No. 696,138

Int. Cl.^{2} G06F *9/06, 3/00, 15/46*

U.S. Cl. 364—900 **8 Claims**



1. A programmable controller, the combination comprising:
a memory which includes a set of command words in a data table, which includes an output image table, and which includes a control program;
an input/output scanner circuit coupled to said memory and being operable to periodically read a command word from a selected location in said output image table out of said memory, to couple said command word to a data bus, and to generate a selected address which is associated with the selected location in said output image table and to couple said selected address to an address bus;
an input/output module coupled to said address bus and being enabled by said selected address, the input/output module including:
  (a) a plurality of circuit elements, each coupled to said data bus to receive a multi-digit number contained within each of said command words; and
  (b) circuit means coupled to said data bus to receive an identification code contained within each command word, and in response thereto, to selectively enable one of said circuit elements to operate on the multi-digit number associated with the identification code; and
a processor connected to said memory to execute said control program, said processor being operable in response to control program instructions to sequentially and selectively transfer command words from said data table to said selected location in said output image table.

4,104,732

STATIC RAM CELL

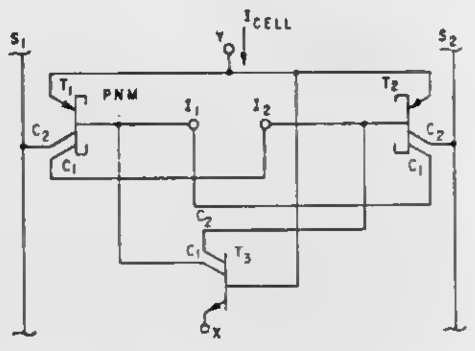
Frank Wilson Hewlett, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1977, Ser. No. 821,068

Int. Cl.^{2} G11C *11/40*

U.S. Cl. 365—179 **4 Claims**

1. A storage cell comprising first and second multiple-Schottky-collector switching transistors wherein a first collector of each is coupled to first and second sources of read/write data, respectively, and wherein a second collector of each transistor is cross-coupled with the base of the other transistor.



4,104,733

ADDRESS SELECTING CIRCUITRY FOR SEMICONDUCTOR MEMORY DEVICE

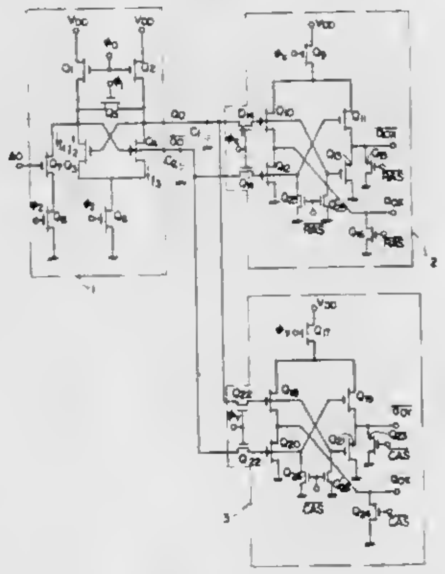
Takashi Satoh, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 15, 1977, Ser. No. 824,740

Claims priority, application Japan, Aug. 23, 1976, 51-99685

Int. Cl.^{2} G11C *11/40*

U.S. Cl. 365—189 **9 Claims**



1. In a semiconductor memory device including a matrix of memory cells arrayed in rows and columns, an address selecting circuitry for driving row and column decoder circuits connected with said rows and columns respectively, comprising:
an address signal setting circuit for receiving an address input signal to produce at their output nodes two selected different address setting signals in accordance with said address input signal;
a row decoder driving circuit having two input nodes thereof coupled with the two output nodes of said address signal setting circuit respectively and two output nodes thereof coupled with said row decoder circuit, said row decoder driving circuit being responsive to a row decoder drive timing signal to produce at the two output nodes thereof two different row decoder driving signals corresponding to said two address setting signals respectively; and
a column decoder driving circuit having two input nodes thereof coupled with the two output nodes of said address signal setting circuit respectively and two output nodes thereof coupled with said column decoder circuit, said column decoder driving circuit being responsive to a column decoder drive timing signal to produce at the two output nodes thereof two different column decoder driving signals corresponding to said two address setting signals respectively.

4,104,734

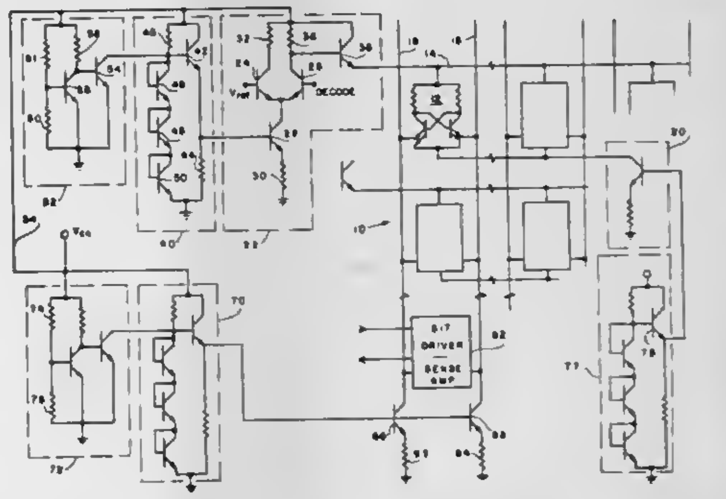
LOW VOLTAGE DATA RETENTION BIAS CIRCUITRY FOR VOLATILE MEMORIES

William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jun. 30, 1977, Ser. No. 811,806

Int. Cl.^{2} G11C *11/40, 13/00*

U.S. Cl. 365—228 **6 Claims**



1. Memory control circuitry for supplying operating bias and for controlling the removal of said bias from a volatile memory without loss of data therefrom, said memory having at least one row and column of binary storage cells respectively coupled to a corresponding number of word lines and bit line pairs, said memory control circuitry including:
word driver circuitry coupled to each of said word lines, said driver circuitry having biasing means for applying a normal standby bias level to said word line and having switching means responsive to a decoder signal for applying an address voltage level to said word line;
word driver bias circuitry coupled to said word driver circuitry, said word driver bias circuitry having bias determining means for establishing a predetermined bias voltage level and for applying said voltage level to said word driver circuitry for the control of said biasing means;
cell current bias circuitry coupled to each cell in a row of cells in said memory, said cell current bias circuitry having means for establishing a predetermined bias level for applying to each of said cells the minimum unaddressed power required to retain the data stored therein; and
first voltage sensing means coupled to said word driver bias circuitry and to the memory power supply voltage source for disabling said bias determining means when said voltage sensing means detects a drop in power supply voltage to a first voltage level.

4,104,735

ARRANGEMENT FOR ADDRESSING A MOS STORE

Rüediger Hofmann, Munich, and Paul-Werner Von Basse, Wolfratshausen-Farchet, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 825,274, Aug. 17, 1977, and Ser. No. 825,225, Aug. 17, 1977. This application Sep. 14, 1977, Ser. No. 833,051

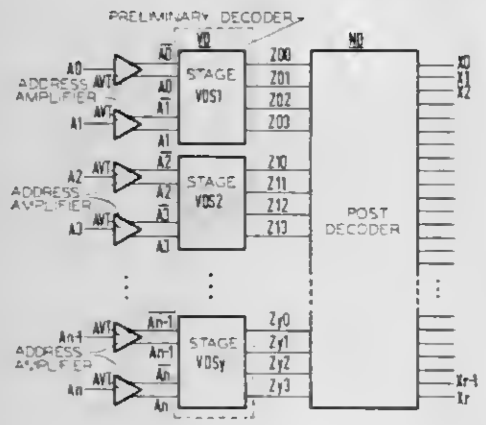
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641524

Int. Cl.^{2} G11C *8/00*

U.S. Cl. 365—230 **4 Claims**

1. An arrangement for addressing by use of address signals a MOS store having MOS transistor storage cells comprising: means for amplifying, inverting, and intermediately storing the address signals, means for feeding negated and non-negated

address signals to a decoder circuit means, drive lines connecting the decoder circuit to the storage cells, said decoder circuit means selecting a drive line in dependence upon prevailing address signals, said decoder circuit means comprising a preliminary decoder circuit and a post decoder circuit, said preliminary decoder circuit including a plurality of stages; for *n* address signals, means for supplying each of said plurality of stages with *m* different address signals in negated and non-negated form such that (n/m) stages are provided; each stage having 2^m output lines; means for marking the output lines of each stage in dependence upon address signal combinations prevailing at the stages; output lines of the stages being connected to the post decoder circuit; the post decoder circuit having 2^n drive lines which connect to the storage cells; said post decoder circuit having logic-linking element means for logic-linking the drive lines to the output lines of the stages in such manner that each drive line can be selected by a different combination of an output line with respect to each stage via a logic-linking element; and means for feeding the remaining address signals to the post decoder circuit in negated and non-negated form in the event that the *n* address signals are divisible by *n* with a remainder, the drive lines being selected by said remaining address signals via logic-linking elements.

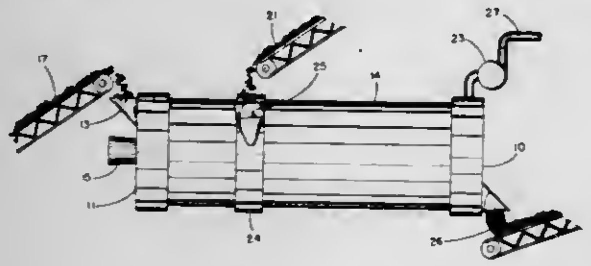


4,104,736
APPARATUS AND METHOD FOR RECYCLING USED ASPHALT-AGGREGATE COMPOSITION

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Filed Dec. 27, 1976, Ser. No. 754,312
Int. Cl.^{2} E01C ***19/10***

U.S. Cl. 366—2 **7 Claims**



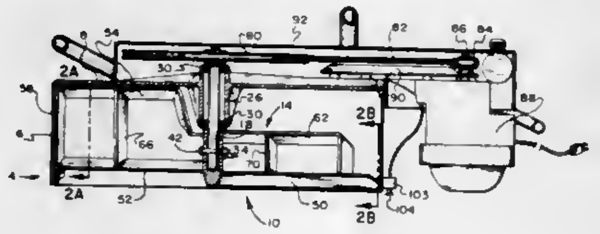
1. A process for heating asphalt-aggregate composition comprising directly exposing the composition to hot gases of hydrocarbon combustion to form a gaseous exhaust mixture comprising carbon dioxide, water vapor and hydrocarbon volatiles form heated asphalt, directing said gaseous mixture through a chamber to create centrifugal force on said gaseous mixture sufficient to separate said mixture into a first layer comprising said hydrocarbon volatiles, and a second layer comprising said carbon dioxide and water vapor, directing said first layer to a combustion chamber in which a flame and oxygen containing gas is introduced, and directing said second layer to atmosphere.

4,104,737
MIXER APPARATUS

Gerold Wayne Brailsford, 490 N. 970 East, Springville, Utah 84663

Filed May 13, 1976, Ser. No. 685,737
Int. Cl.^{2} B28C ***5/00;*** **B01F** ***7/18***

U.S. Cl. 366—65 **18 Claims**



1. A portable mixer for mixing mortar and the like comprising

a housing having side walls and a top wall and open at the bottom thereof, with the margin of the opening substantially defining a plane so that the housing may rest stably on a generally flat surface,

a mixer blade disposed to move within the housing generally in the plane defined by the opening in the housing to thereby mix and agitate material positioned on a support surface on which the housing is placed,

motor or engine means mounted on the housing,

means responsive to the operation of the motor or engine means for driving said mixer blade to move within the housing, and

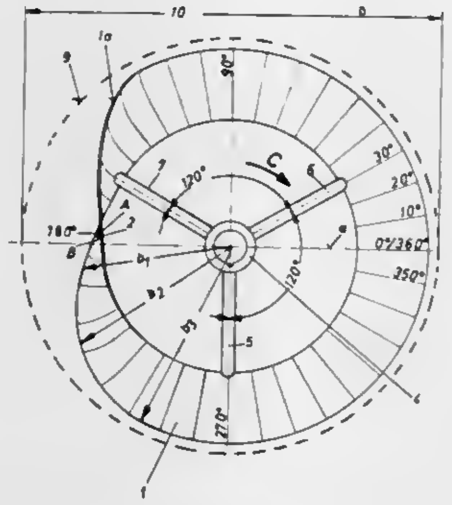
variable speed control means for causing the motor or engine means to operate at variable speeds to thereby cause said driving means to move the blade at variable speeds.

4,104,738
MIXING TOOL

Stefan Schulz, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jul. 28, 1976, Ser. No. 709,305
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 2534418
Int. Cl.^{2} B01F ***7/26, 7/32***

U.S. Cl. 366—343 **1 Claim**



1. A rotatable mixing tool for installation in a mixing container, which includes: a rotatable shaft, having an axis of rotation, a member surrounding said shaft in radially spaced relationship thereto and being connected to said shaft for rotation therewith, said member having a first disc-shaped section coaxial with the axis of rotation of said shaft and having a top and a bottom surface located in planes perpendicular to said axis of rotation of said rotatable shaft, said member also having a second section twisted relative to said first section so as to merge said top surface of said first section with the bottom surface of the latter.

DESIGNS

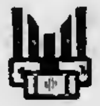
AUGUST 1, 1978

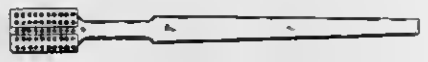
248,696
TOOTH BRUSH

Sylvan Greenberg, 111 E. 85th St., New York, N.Y. 10028

Filed Sep. 2, 1976, Ser. No. 719,725
Term of patent 14 years
Int. Cl. D4—*02*

U.S. Cl. D4—25



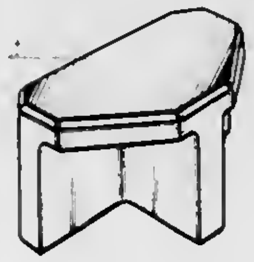


248,697
STOOL OR SIMILAR ARTICLE

James E. Miller, 12900 W. Ten Mile Rd., South Lyon, Mich. 48178

Division of Ser. No. 698,167, Jun. 21, 1976. This application Oct. 17, 1977, Ser. No. 842,496
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—32

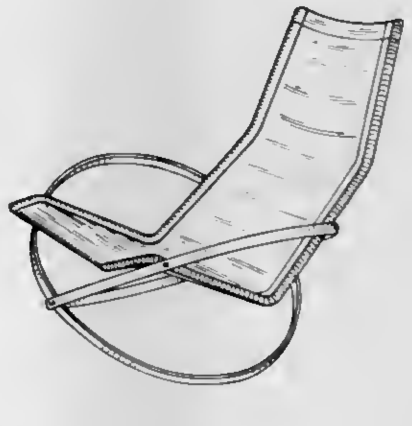


248,698
ROCKING CHAIR

Roger Louis Lecal, 74, rue de Meaux, 75019 Paris, France

Filed Apr. 26, 1976, Ser. No. 680,150
Claims priority, application France, Oct. 24, 1975, 75 28493
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—49

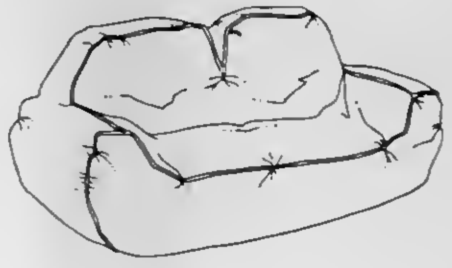


248,699
SOFA

Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.

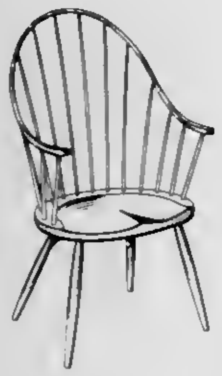
Filed Sep. 7, 1976, Ser. No. 720,544
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—63



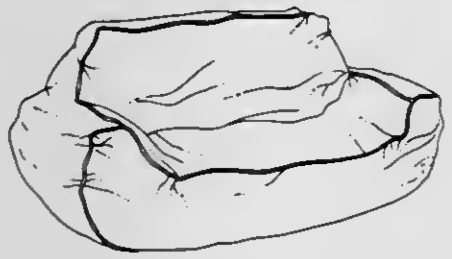
248,700
CHAIR

Thomas F. Moser, Cobb's Bridge Rd., New Gloucester, Me. 04260
Filed Jan. 13, 1977, Ser. No. 759,087
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70



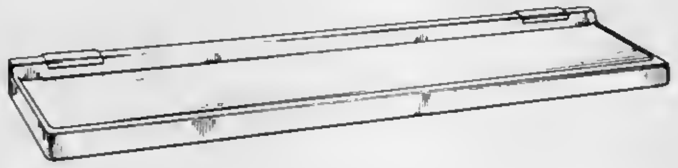
248,701
SOFA

Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 7, 1976, Ser. No. 720,548
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



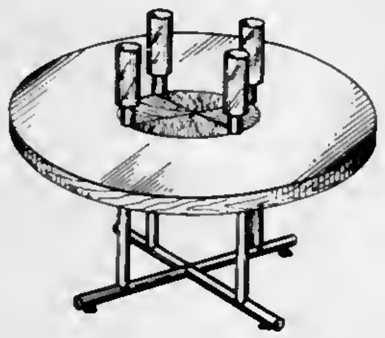
248,702
BATHROOM SHELF

Giovanni Baldini, Turin, Italy, assignor to Carrara & Matta S.p.A., Turin, Italy
Filed Aug. 17, 1976, Ser. No. 715,081
Claims priority, application Italy, Feb. 24, 1976, 52982/76
Term of patent 14 years
Int. Cl. D6—*04*; D23—*02*
U.S. Cl. D6—132



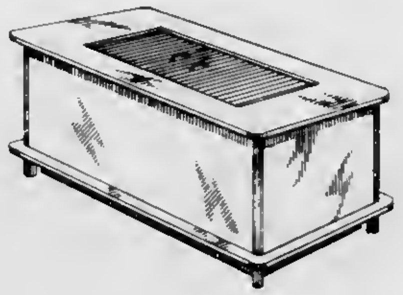
248,703
COMBINED AND MULTIPLE CANDLEHOLDER UNIT

Alexander P. Morgan, Jr., Constitution Hill, Princeton, N.J. 08540
Filed Mar. 29, 1976, Ser. No. 671,208
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146



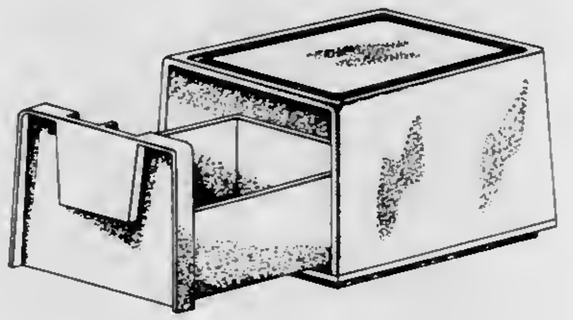
248,704
STORAGE CABINET

Nadine F. Gayda, 1734 Kaiser, Irvine, Calif. 92714
Filed Oct. 7, 1976, Ser. No. 730,451
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—150



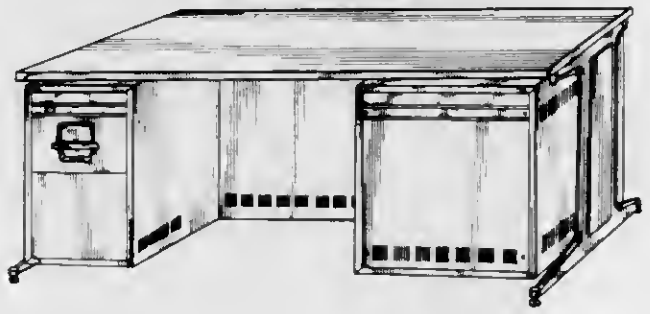
248,705
FILE CABINET

Fred L. Thomas, 1541 Siskiyou Dr., Walnut Creek, Calif. 94598
Filed Sep. 30, 1975, Ser. No. 618,151
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158



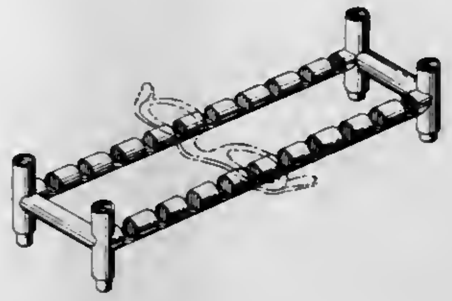
248,706
DESK OR SIMILAR ARTICLE

David Rolfe Smith, Hillsboro, and Richard Ellwood Hansen, Portland, both of Oreg., assignors to Tektronix, Inc.
Filed Apr. 5, 1976, Ser. No. 673,780
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



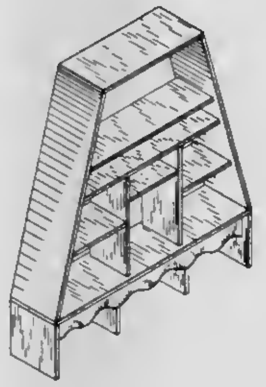
248,707
EYEGLASS HOLDER

Marcia M. Gitlitz, P.O. Box 1084, Fort Lee, N.J. 07204
Filed Jun. 28, 1976, Ser. No. 700,604
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



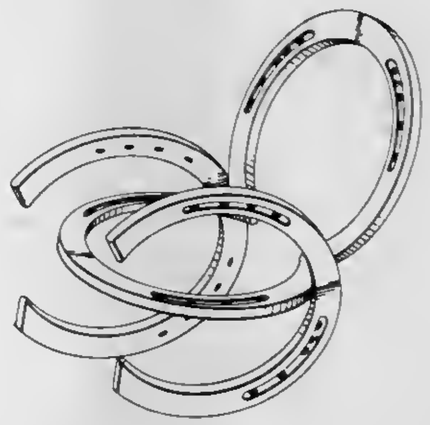
248,708
SHELF UNIT OR SIMILAR ARTICLE

Sheldon Howard Graff, 707 Continental, Mountain View, Calif. 94040
Filed Feb. 25, 1976, Ser. No. 656,312
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—190



248,709
HORSE SHOES SHAPED SUPPORT FRAME FOR ROCKING CHAIR

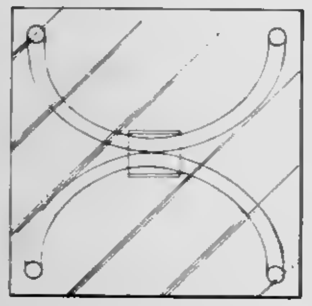
Emil Vee Lundgren, 1715 W. Westward, Banning, Calif. 92220
Filed Aug. 2, 1976, Ser. No. 710,803
Term of patent 3½ years
Int. Cl. D6—*06*
U.S. Cl. D6—191



248,710

PICTURE FRAME

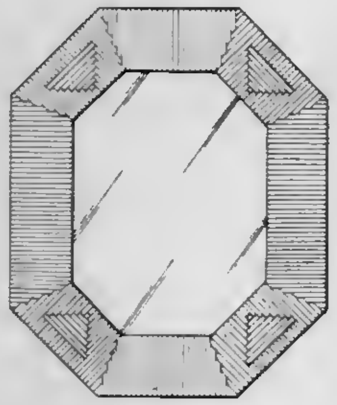
Edward S. Korzon, Beacon Falls, Conn., assignor to Dura Plastics of New York, Inc., Westport, Conn.
Filed Dec. 22, 1976, Ser. No. 753,196
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235



248,711

MIRROR FRAME

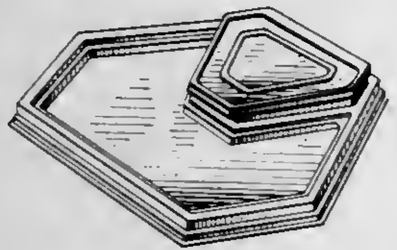
David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc.
Filed Feb. 8, 1977, Ser. No. 766,808
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—241



248,712

COMBINED SERVING TRAY AND COVERED DISH

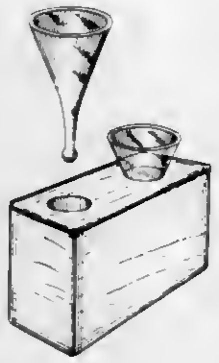
Raul Guibert, 8343 W. 4th St., Los Angeles, Calif. 90048
Filed Oct. 20, 1976, Ser. No. 734,050
Term of patent 14 years
Int. Cl. D7—*01, 99*
U.S. Cl. D7—3



248,713

COMBINED BEVERAGE GLASSES AND HOLDER THEREFOR

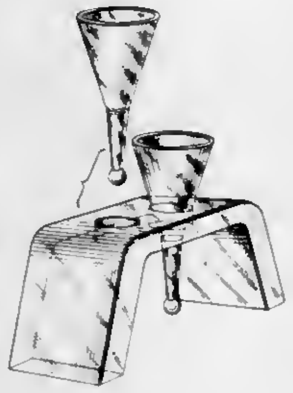
Robert L. Dedrick, 4025 W. Lee St., Skokie, Ill. 60076
Filed Oct. 26, 1976, Ser. No. 735,815
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3



248,714

COMBINED BEVERAGE GLASSES AND HOLDER THEREFOR

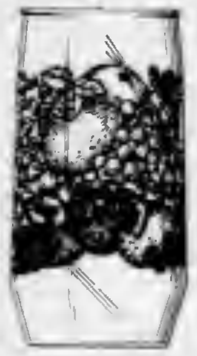
Robert L. Dedrick, 4025 W. Lee St., Skokie, Ill. 60076
Filed Nov. 29, 1976, Ser. No. 745,612
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3



248,715

TUMBLER OR SIMILAR ARTICLE

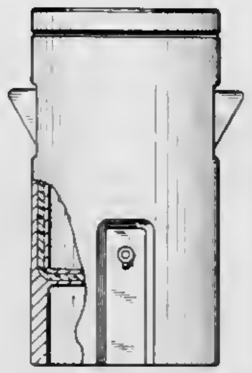
Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Feb. 20, 1976, Ser. No. 659,966
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6



248,716

BEVERAGE CONTAINER

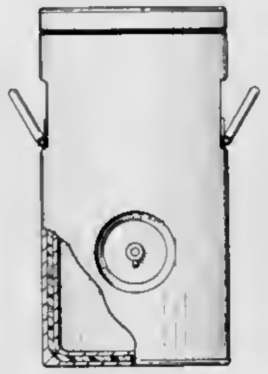
Thomas E. Little, 2610 Nicholson, Houston, Tex. 77008
Continuation-in-part of Ser. No. 567,778, Apr. 14, 1975, Pat. No. Des. 242,834. This application Aug. 6, 1976, Ser. No. 712,406
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—61



248,717

BEVERAGE CONTAINER

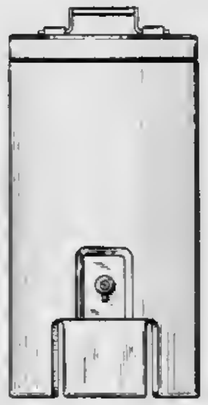
Thomas E. Little, 2610 Nicholson, Houston, Tex. 77008
Continuation-in-part of Ser. No. 567,778, Apr. 14, 1975, Pat. No. Des. 242,834. This application Aug. 6, 1976, Ser. No. 712,407
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—61



248,718

BEVERAGE CONTAINER

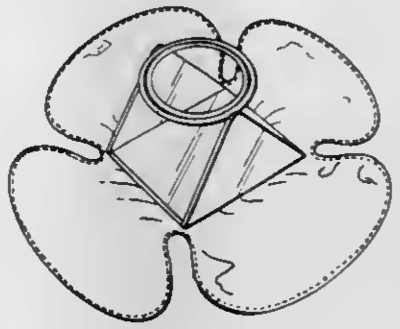
Thomas E. Little, 2610 Nicholson, Houston, Tex. 77008
Continuation-in-part of Ser. No. 567,778, Apr. 14, 1975, Pat. No. Des. 242,834. This application Aug. 6, 1976, Ser. No. 712,408
Term of patent 14 years
Int. Cl. D7—*61, 04*
U.S. Cl. D7—61

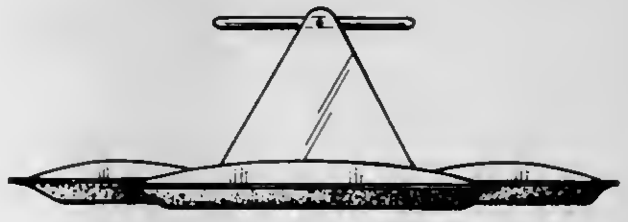


248,719

GIMBALLED BEVERAGE CUP HOLDER

Jerry C. Broyles, 8571 18th St., Alta Loma, Calif. 91701
Filed Apr. 14, 1976, Ser. No. 676,692
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

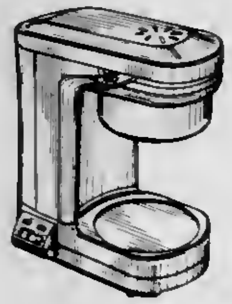




248,720

COFFEE MAKER

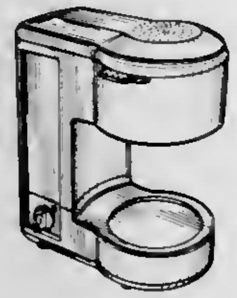
Teizo Sato; Masaru Miyazaki, and Takuji Kaneko, all of Suita, Japan, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,260
Claims priority, application Japan, Oct. 6, 1975, 5040276
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85



248,721
COFFEE MAKER

Teizo Sato; Masaru Miyazaki, and Takuji Kaneko, all of Suita, Japan, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,268
Claims priority, application Japan, Oct. 6, 1975, 50-40277
Term of patent 14 years
Int. Cl. D7—*02*

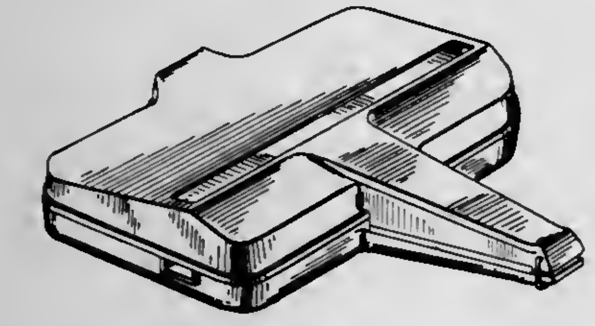
U.S. Cl. D7—85



248,722
HAMBURGER COOKER

Masao Tsuji, North Plainfield, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Apr. 26, 1976, Ser. No. 680,079
Term of patent 14 years
Int. Cl. D7—*02*

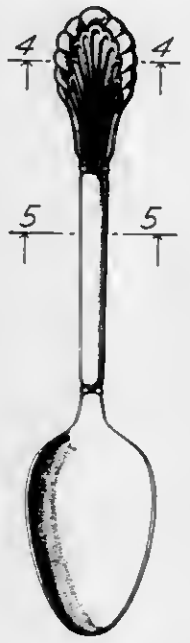
U.S. Cl. D7—88



248,723
SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 10, 1976, Ser. No. 749,706
Term of patent 14 years
Int. Cl. D7—*03*

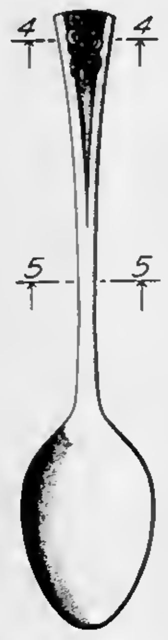
U.S. Cl. D7—137



248,724
SPOON OR SIMILAR ARTICLE

Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 10, 1976, Ser. No. 751,049
Term of patent 14 years
Int. Cl. D7—*03*

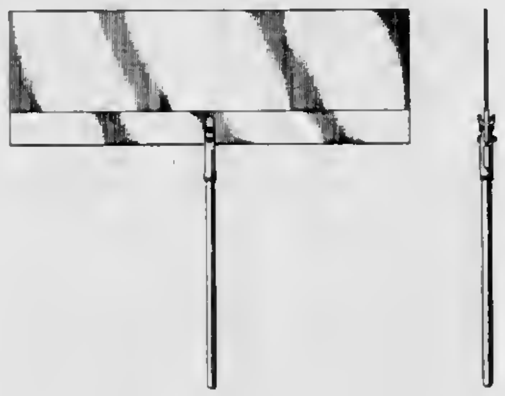
U.S. Cl. D7—137



248,725
PAINT SHIELD

Robert A. McClane, Anaheim, Calif., assignor to Impact Manufacturing Co., Inc., Santa Fe Springs, Calif.
Filed Nov. 22, 1976, Ser. No. 743,728
Term of patent 14 years
Int. Cl. D8—*05*

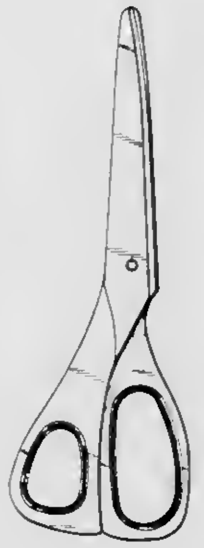
U.S. Cl. D8—14



248,726
SCISSORS

Hidekazu Okada, No. 17-29, Asahigaoka-cho, Ashiya-shi, Japan
Filed Jun. 10, 1976, Ser. No. 694,696
Term of patent 14 years
Int. Cl. D8—*03*

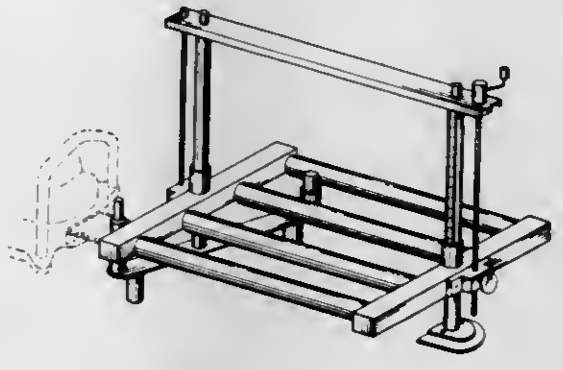
U.S. Cl. D8—57



248,727
SAWMILL ATTACHMENT FOR A CHAIN SAW

Robert Sperber, 217 Smull Ave., North Caldwell, N.J. 07006
Filed Sep. 13, 1976, Ser. No. 722,619
Term of patent 14 years
Int. Cl. D8—*03*

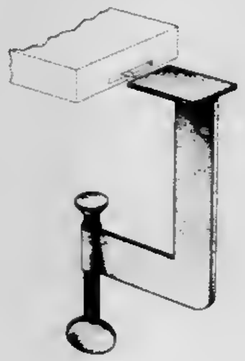
U.S. Cl. D8—71



248,728
FLAT-HEADED CLAMP FOR USE WITH SLOTTED CUTTER GUIDE

Clayton A. Elliott, 1931 Arbor La., Union, N.J. 07083
Filed Mar. 8, 1976, Ser. No. 664,499
Term of patent 14 years
Int. Cl. D8—*05, 08*

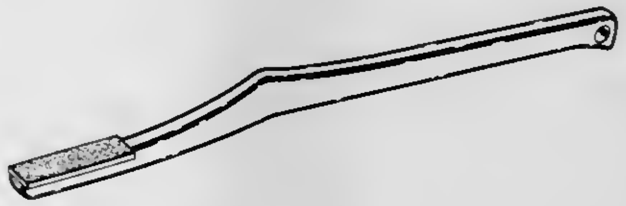
U.S. Cl. D8—72



248,729
DIAMOND SHARPENING HONE

Fred G. Gunzner, P.O. Box 8, Colton, Oreg. 97017
Filed Mar. 7, 1977, Ser. No. 775,251
Term of patent 14 years
Int. Cl. D8—*05*

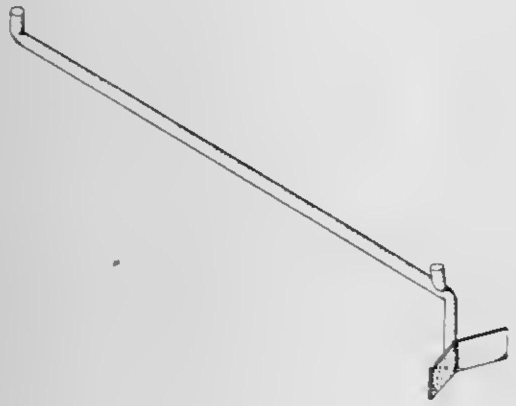
U.S. Cl. D8—91



248,730

CONTAINER BRACKET OR THE LIKE

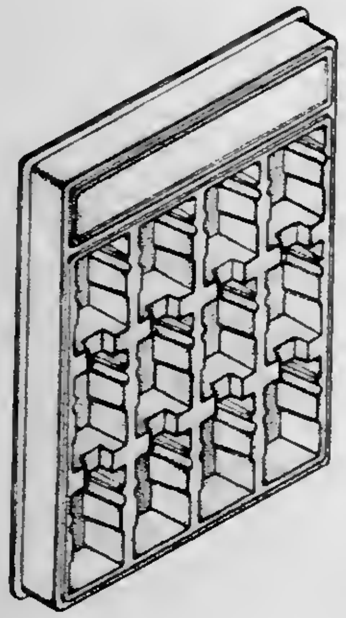
Ellis L. Blann, 213 Oak Leaf Dr., Wilmington, N.C. 28401
Filed Oct. 1, 1976, Ser. No. 728,532
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—363



248,731

DISPLAY CONTAINER

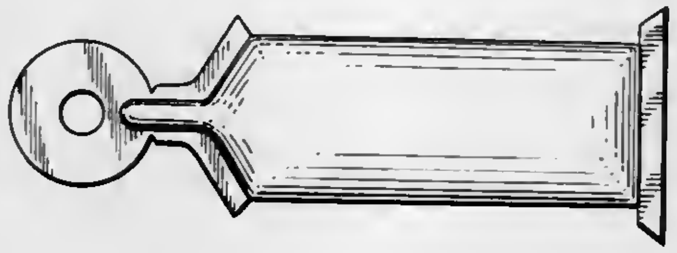
Katsuyoshi Ken Ogawa, 10838 Washington Blvd., Culver City, Calif. 90230
Filed Nov. 26, 1976, Ser. No. 745,310
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187



248,732

COLLAPSIBLE TUBELIKE CONTAINER

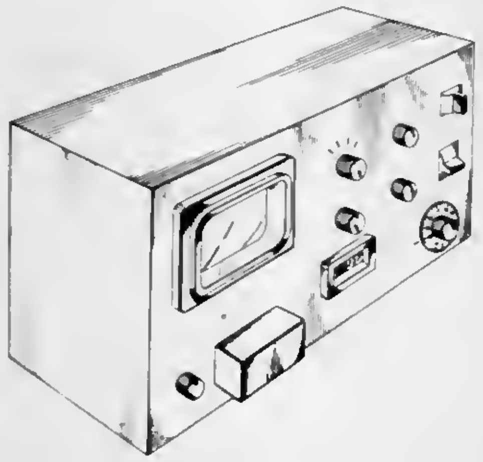
Neithard Vollmar, Schillerstr. 46, 4000 Dusseldorf 1, Germany
Filed Jul. 1, 1976, Ser. No. 701,927
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—194



248,733

LORAN RECEIVER

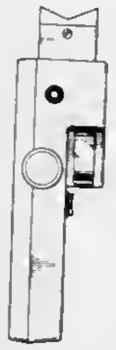
James R. Haynes, Lake City, S.C., assignor to Kayot, Inc., Mankato, Minn.
Filed Feb. 23, 1976, Ser. No. 660,456
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



248,734

CABLE SHEATH CONTINUITY TESTER

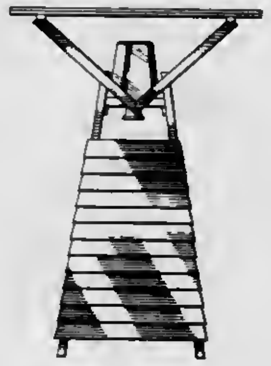
Robert Husserl, Northridge, Calif., assignor to Perkins Research and Manufacturing Co., Canoga Park, Calif.
Filed Sep. 2, 1976, Ser. No. 719,922
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



248,735

COMBINED LIGHTHOUSE AND WIND DIRECTION INDICATOR

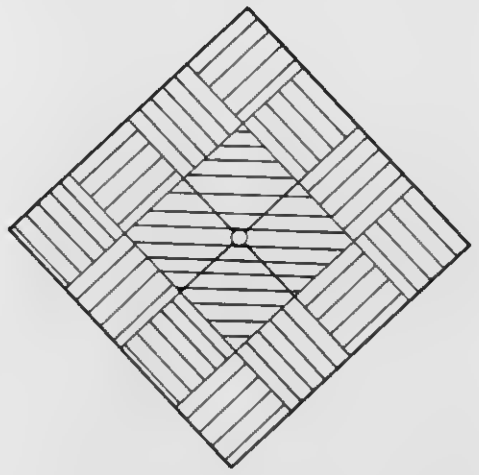
Joseph O. Tally, Jr., 560 N. St., SW., Washington, D.C. 20024
Filed Nov. 17, 1976, Ser. No. 742,445
Term of patent 14 years
Int. Cl. D10—*06, 04*
U.S. Cl. D10—114



248,736

DIAL FOR TIMEPIECES

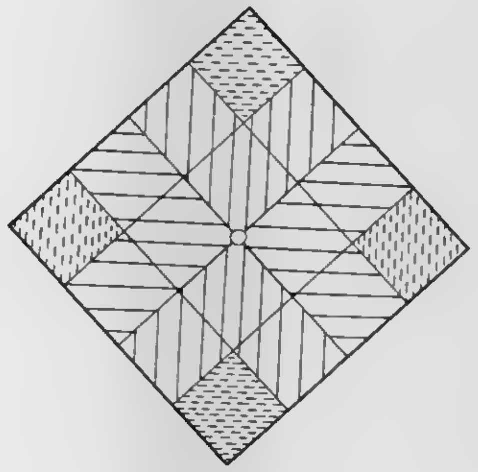
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,873
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



248,737

DIAL FOR TIMEPIECES

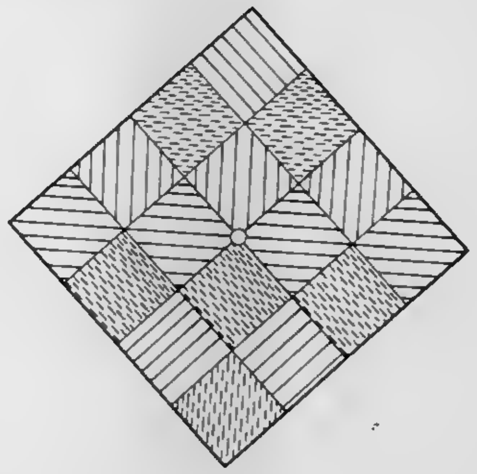
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,858
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



248,738

DIAL FOR TIMEPIECES

Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,856
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

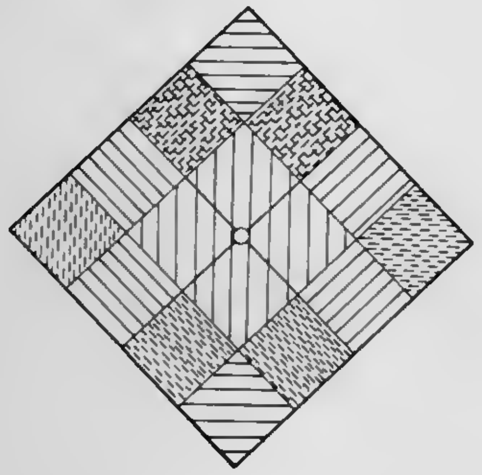


248,739

DIAL FOR TIMEPIECES

Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,857
Term of patent 14 years
Int. Cl. D10—*07*

U.S. Cl. D10—125

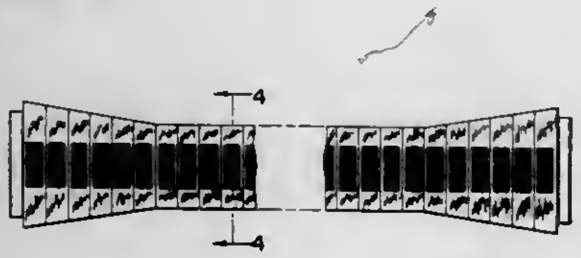


248,740

WATCHBAND

Robert I. Harris, Providence, R.I., assignor to Brite Industries, Inc., Providence, R.I.
Filed Apr. 5, 1976, Ser. No. 673,978
Term of patent 14 years
Int. Cl. D11—*01*

U.S. Cl. D11—25

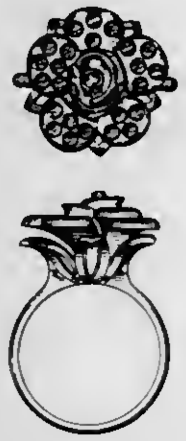


248,741

DIAMOND RING

Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Mar. 30, 1976, Ser. No. 672,485
Term of patent 14 years
Int. Cl. D11—*01*

U.S. Cl. D11—33

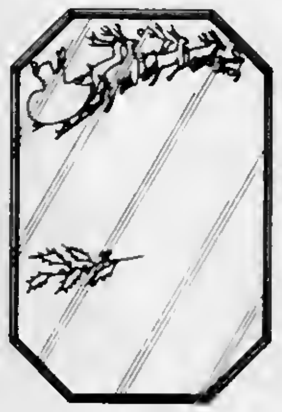


248,742

CHRISTMAS ORNAMENT

William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,531
Term of patent 14 years
Int. Cl. D11—*05*

U.S. Cl. D11—129

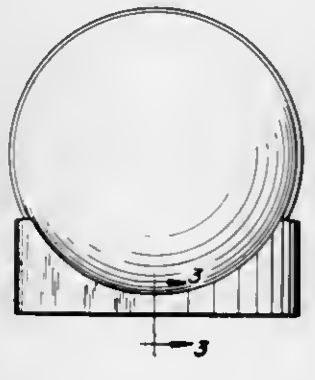


248,743

STANDING PLAQUE

William B. Campbell, Saint Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Division of Ser. No. 788,650, Apr. 18, 1977. This application Oct. 11, 1977, Ser. No. 840,723
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D11—140

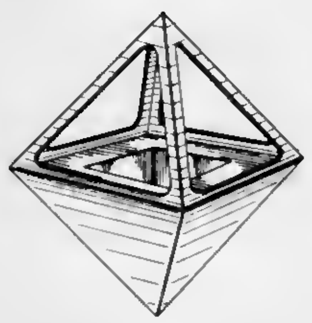


248,744

PLANTER

Dennis A. Murray, Briarcliff Manor, N.Y., assignor to Pyramid Planter, Inc.
Filed Mar. 9, 1977, Ser. No. 776,009
Term of patent 14 years
Int. Cl. D11—*02;* D6—*06*

U.S. Cl. D11—143

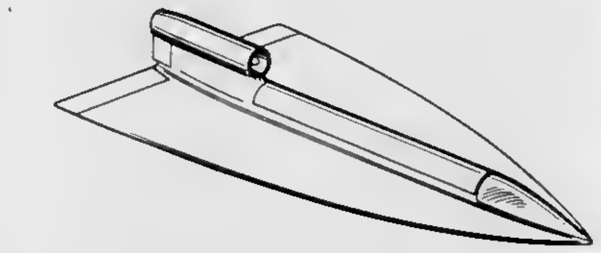


248,745

MODIFIED DELTA WING SUPERSONIC AIRCRAFT

Frank W. Jager, 7050 Tait St., San Diego, Calif. 92111
Filed Jun. 1, 1976, Ser. No. 691,851
Term of patent 14 years
Int. Cl. D12—*07*

U.S. Cl. D12—71

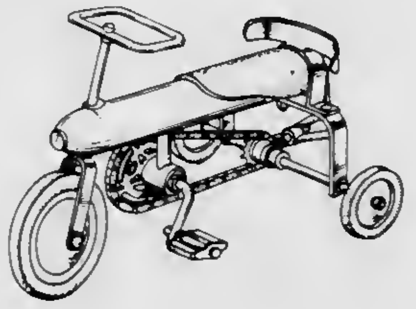


248,746

TRICYCLE

Phillipp Gonzalez, 2730 W. 15th St., Los Angeles, Calif. 90006
Filed Jul. 5, 1977, Ser. No. 812,586
Term of patent 14 years
Int. Cl. D12—*11*

U.S. Cl. D12—112

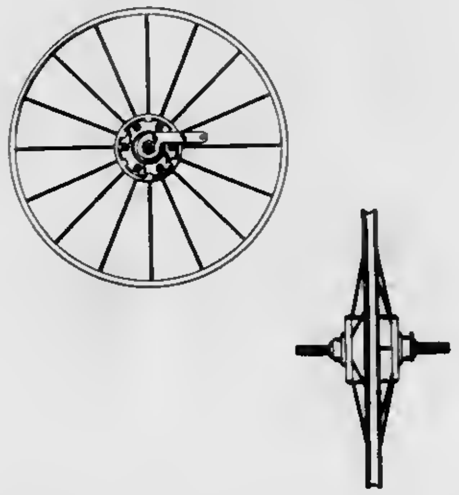


248,747

COMBINED BICYCLE BRAKE AND WHEEL ASSEMBLY

Edwin Elliott Hood, South Bend, Ind., assignor to Bendix Corporation, Southfield, Mich.
Continuation-in-part of Ser. No. 712,997, Aug. 9, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 823,898
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—205

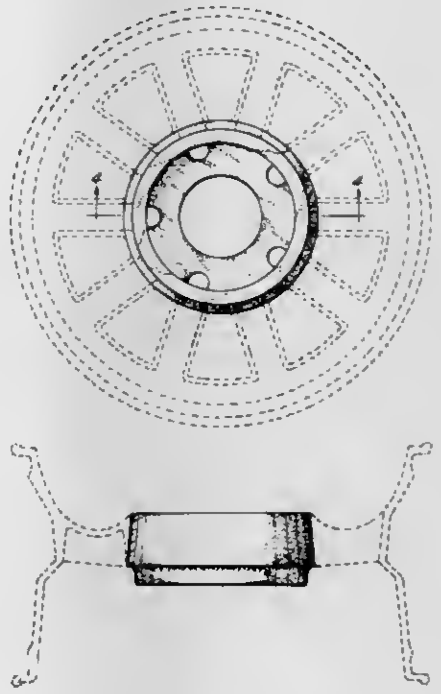


248,748

WHEEL CENTER

John Siroonian, Fresno, Calif., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Apr. 28, 1977, Ser. No. 792,026
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—207

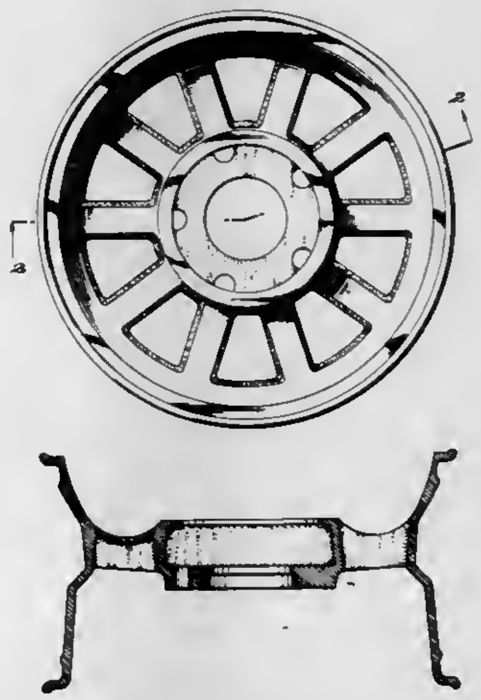


248,749

WHEEL

John Siroonian, Fresno, Calif., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Nov. 26, 1976, Ser. No. 745,439
Term of patent 14 years
Int. Cl. D12—*16*

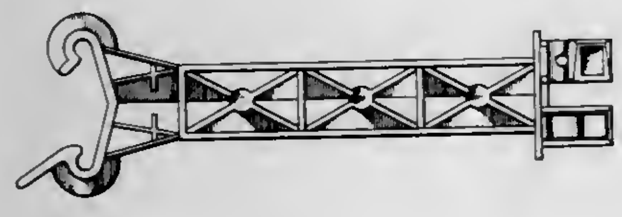
U.S. Cl. D12—211



248,750

ELECTRIC FENCE EXTENDER FOR T-POSTS

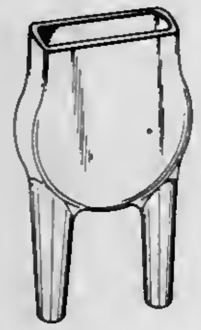
Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed Apr. 25, 1977, Ser. No. 790,748
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17



248,751

CAPACITOR-COVER

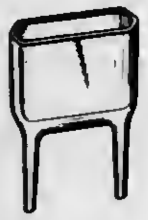
Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd.
Filed Mar. 9, 1977, Ser. No. 776,001
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—21



248,752

CAPACITOR-COVER

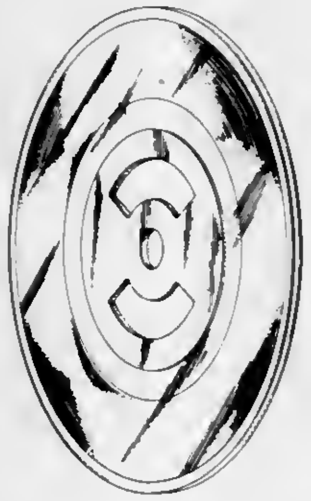
Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd.
Filed Mar. 9, 1977, Ser. No. 776,002
Claims priority, application Japan, Oct. 27, 1976, 51-42465
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—21



248,753

RECORD

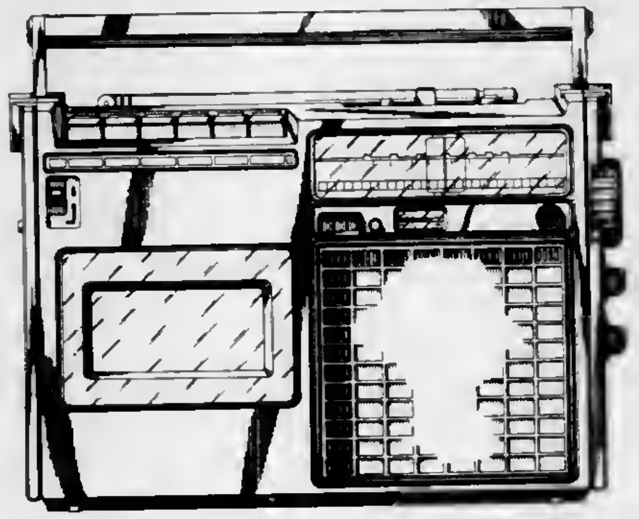
Carl Frederick Pulse, Greenwood, Ind., assignor to RCA Corporation, New York, N.Y.
Filed Jul. 18, 1975, Ser. No. 597,219
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1



248,754

COMBINED CASSETTE TAPE RECORDER AND RADIO

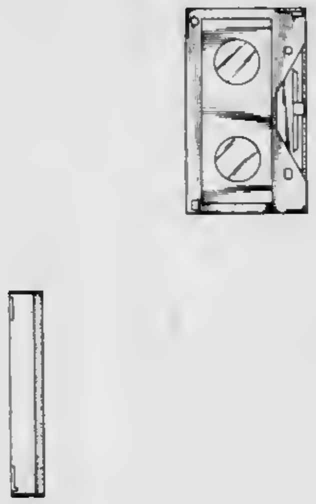
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed Jun. 11, 1976, Ser. No. 695,173
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



248,755

TAPE CASSETTE CASE

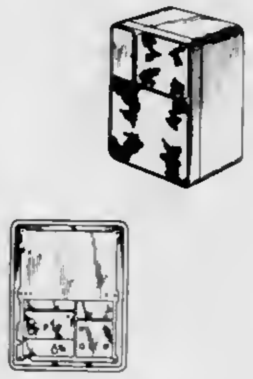
Daizi Nagatomo, Yokohama, Japan, assignor to Sony Corporation
Filed Mar. 8, 1976, Ser. No. 662,950
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11



248,756

LOUDSPEAKER HOUSING

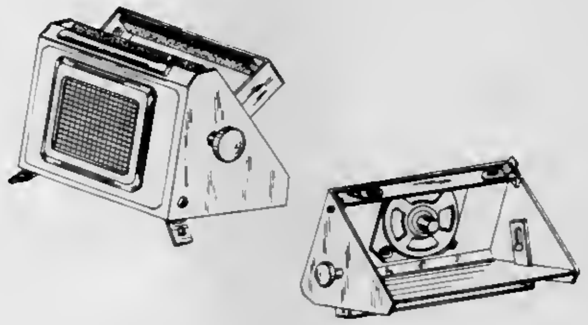
Alfonsus Bernardus Antonius Labohm, Maarheeze, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 24, 1976, Ser. No. 660,999
Claims priority, application Benelux, Aug. 25, 1975, 50511-04
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



248,757

PORTABLE COMBINATION LOUDSPEAKER AND RADIO MOUNT

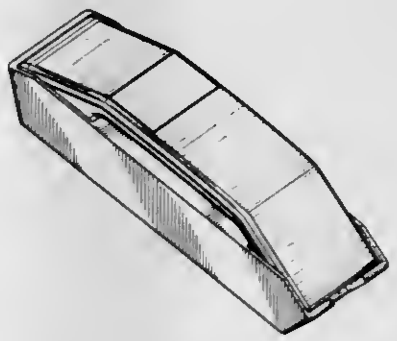
David J. Bokmiller, Lakewood, Ohio, assignor to Falcon Enterprises, Inc.
Filed Jun. 29, 1976, Ser. No. 700,753
Term of patent 14 years
Int. Cl. D14—*99;* D12—*16;* D8—*08*
U.S. Cl. D14—37



248,758

VEHICULAR TELEPHONE APPARATUS OR SIMILAR ARTICLE

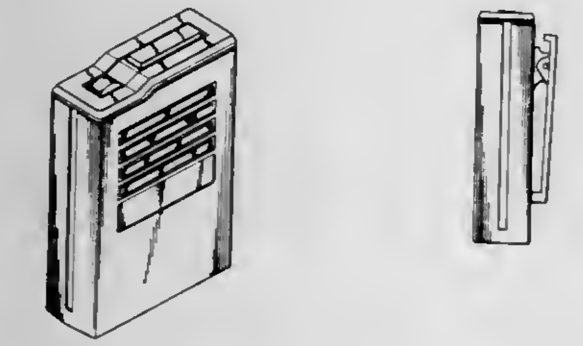
Rudolph William Krolopp, Palatine, and Orville Walter Larson, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 12, 1976, Ser. No. 713,762
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



248,759
RADIO PAGER OR SIMILAR ARTICLE
John Allie Eckmann, Pompano Beach, and Richard John Toth, Oakland Park, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 29, 1977, Ser. No. 811,226
Term of patent 14 years
Int. Cl. D14—*03*

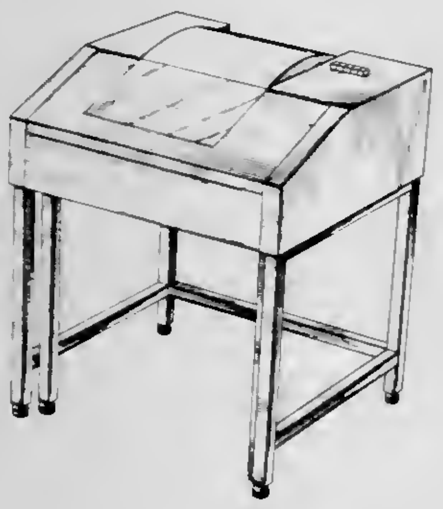
U.S. Cl. D14—68



248,760
COMBINED SOUND REDUCING COVER FOR TELEPRINTER OR THE LIKE AND SUPPORT MEMBER THEREFOR
Berndt Ebbe Frick, Herrgårdsvägen 9, 135 00 Tyresö, Sweden

Division of Ser. No. 544,767, Jan. 28, 1975, Pat. No. Des. 245,628. This application Aug. 2, 1976, Ser. No. 710,469
Claims priority, application Sweden, Aug. 5, 1974, 741241
Term of patent 14 years
Int. Cl. D14—*03*

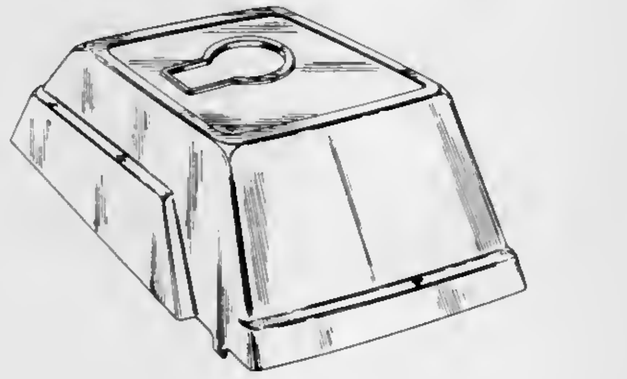
U.S. Cl. D14—93



248,761
ENGINE SHROUD FOR ROTARY LAWN MOWER
Charles E. Uhlinger, Des Moines, and Herbert Owen Dixon, Jr., Altoona, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed May 7, 1976, Ser. No. 684,389
Term of patent 14 years
Int. Cl. D15—*03*

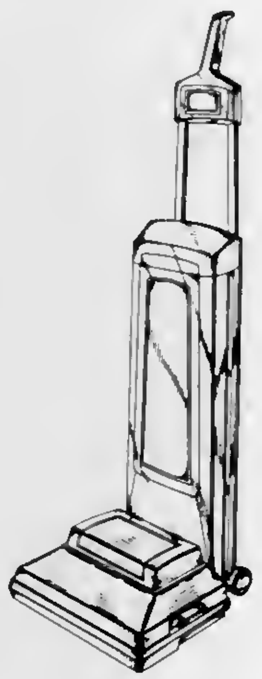
U.S. Cl. D15—17



248,762
UPRIGHT VACUUM CLEANER
Fred R. Burgess, Wallingford, and George Schick, Easton, both of Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.

Filed Oct. 5, 1976, Ser. No. 729,625
Term of patent 14 years
Int. Cl. D15—*05*

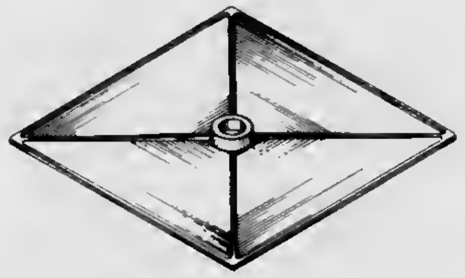
U.S. Cl. D15—53



248,763
FLAT-PLATE NOZZLE FOR A VACUUM CLEANER
Albert F. Muller, 11724 Eton Dr., Colton, Calif. 92324

Filed Jan. 10, 1977, Ser. No. 758,179
Term of patent 14 years
Int. Cl. D15—*05*

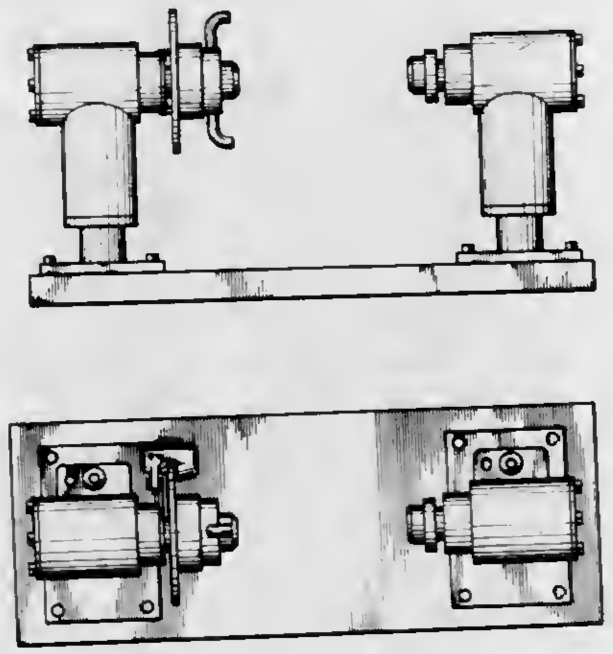
U.S. Cl. D15—63



248,764
UNROLLING DEVICE FOR A CABLE
Per Olof Hedlund, Norsborg; Lars Olov Hertsius, Bromma, and Hans Theo Lessmann, Trangsund, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 25, 1976, Ser. No. 661,409
Claims priority, application Sweden, Sep. 4, 1975, 751708
Term of patent 7 years
Int. Cl. D15—*99*

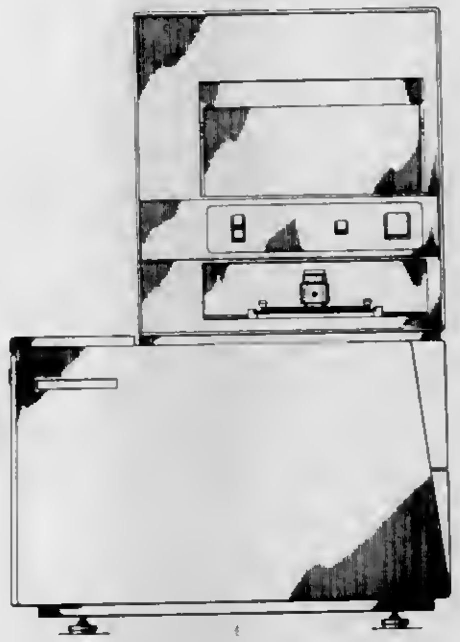
U.S. Cl. D15—122



248,765
MICROFICHE COPIER
Robert A. Clowe, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 16, 1977, Ser. No. 778,306
Term of patent 14 years
Int. Cl. D16—*03*

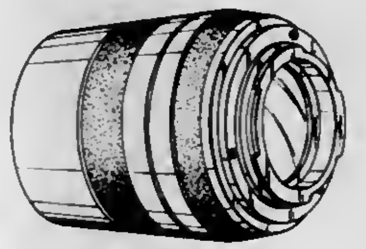
U.S. Cl. D16—29



248,766
BARREL FOR INTERCHANGEABLE LENS
Takeyuki Arai, Omiya, Japan, assignor to Kabushiki Kaisha Tamron, Omiya, Japan

Filed May 20, 1976, Ser. No. 688,339
Term of patent 14 years
Int. Cl. D16—*06*

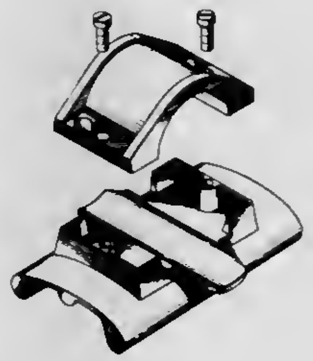
U.S. Cl. D16—50



248,767
FISHING REEL CLAMP
Carl W. Newell, 940 Allen Ave., Glendale, Calif. 91201

Filed Mar. 24, 1976, Ser. No. 670,085
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—23

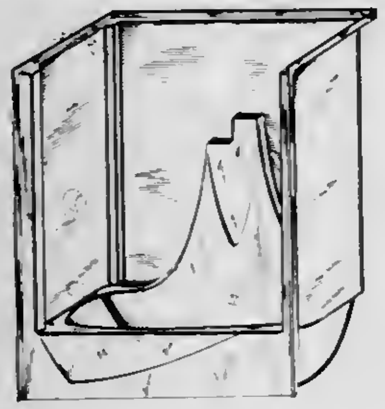


248,768

COMBINED BATHTUB AND SHOWER STALL

Erwin G. Rehbein, P.O. Box 80A, Waupaca, Wis. 54981
Filed Dec. 23, 1976, Ser. No. 753,635
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—49

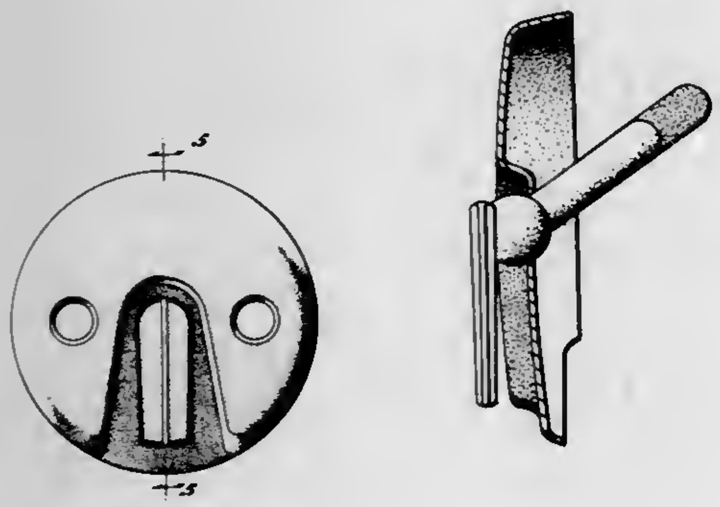


248,769

COMBINED BATHTUB WASTE AND OVERFLOW FACE PLATE

George G. Jetter, Fort Recovery, Ohio, assignor to Fort Recovery Industries, Inc., Fort Recovery, Ohio
Filed Dec. 2, 1976, Ser. No. 746,992
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D23—69

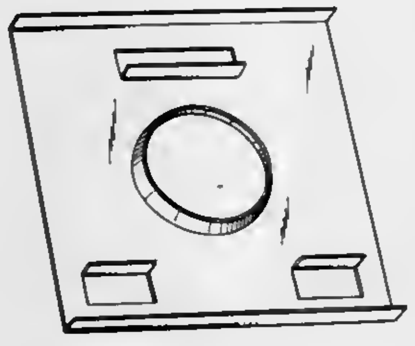


248,770

CONVECTOR PLATE

Niels Runar Hilding Michaelsen, Bot 12031, 63012 Eskilstuna, Sweden
Filed Mar. 25, 1976, Ser. No. 670,390
Claims priority, application Sweden, Sep. 30, 1975, 751945
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—127

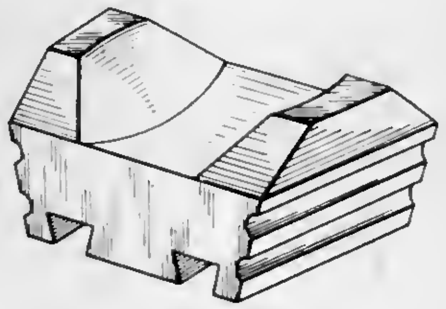


248,771

TIBIAL PROSTHESIS

Harry E. Groth, Jr., 3840 SW. Dosch Rd., Portland, Oreg. 97201, and Philip J. Fagan, 3480 SW. 106th St., Beaverton, Oreg. 97005
Filed Aug. 31, 1976, Ser. No. 719,229
Term of patent 14 years
Int. Cl. D24—*03*

U.S. Cl. D24—33

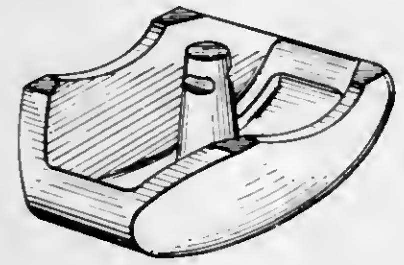


248,772

TALAR PROSTHESIS

Harry E. Groth, Jr., 3840 SW. Dosch Rd., Portland, Oreg. 97201, and Philip J. Fagan, 3480 SW. 106th St., Beaverton, Oreg. 97005
Filed Aug. 31, 1976, Ser. No. 719,230
Term of patent 14 years
Int. Cl. D24—*03*

U.S. Cl. D24—33

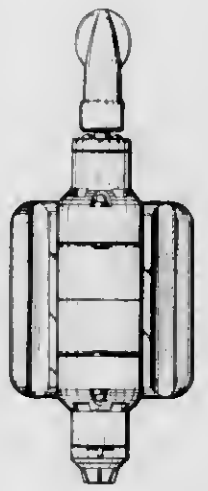


248,773

ORBITAL VIBRATORY MASSAGER

E. Lowell Schaefer, 6347 Deerfield Ave., San Gabriel, Calif. 91775
Filed Jan. 27, 1977, Ser. No. 763,068
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*

U.S. Cl. D24—36

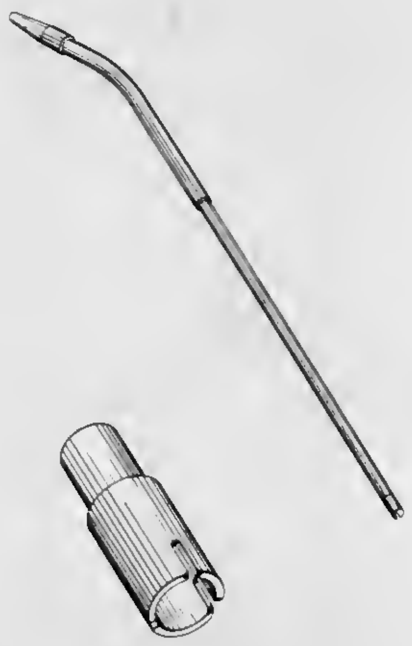


248,774

SURGICAL ASPIRATION CATHETER

Bertil Sven Vällfors, Goteborg, Sweden, assignor to Astra -Sjuco AB
Filed Apr. 28, 1976, Ser. No. 681,242
Claims priority, application Sweden, Oct. 30, 1975, 752144
Term of patent 14 years
Int. Cl. D24—*04*

U.S. Cl. D24—54

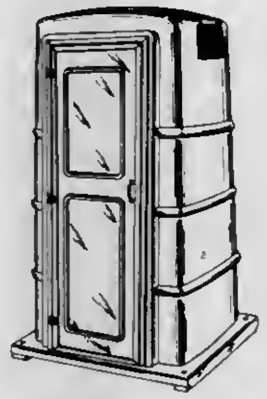


248,775

PORTABLE SANITATION UNIT

Clarence Samuel Brown, Los Angeles County, Calif., assignor to Usanco, Inc., El Monte, Calif.
Filed Dec. 17, 1976, Ser. No. 751,904
Term of patent 14 years
Int. Cl. D25—*99*

U.S. Cl. D25—16

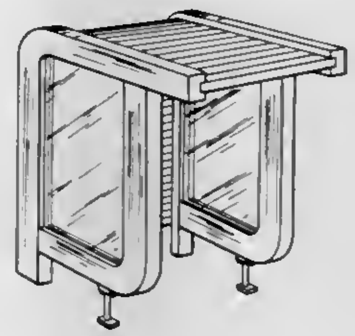


248,776

TRANSIT SHELTER

Joseph E. Kinnebrew, IV, 13300 Beckwith Dr. NE., Lowell, Mich. 49331
Filed Nov. 8, 1976, Ser. No. 739,569
Term of patent 14 years
Int. Cl. D25—*99*

U.S. Cl. D25—18

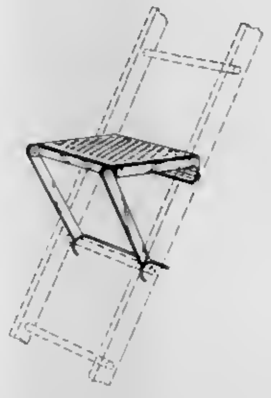


248,777

LADDER PLATFORM

Edward Spencer, La Grange, Ill., and Harold R. Wing, Springville, Utah, assignors to Little Giant Industries, Inc., American Fork, Utah
Filed Jun. 1, 1976, Ser. No. 691,644
Term of patent 14 years
Int. Cl. D6—*99*

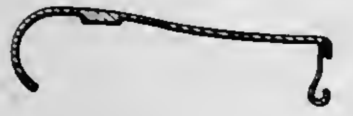
U.S. Cl. D25—68



248,778

SWIMMING POOL COPYING OR THE LIKE

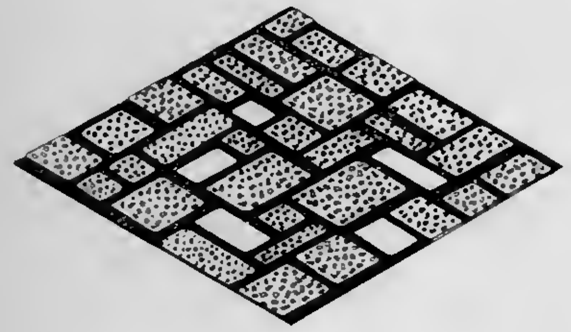
Herbert O. Kaufmann, Kew Gardens, N.Y., assignor to Swim 'N Play, Inc., Newark, N.J.
Filed May 25, 1976, Ser. No. 689,863
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—74



248,779

DECORATIVE TILE

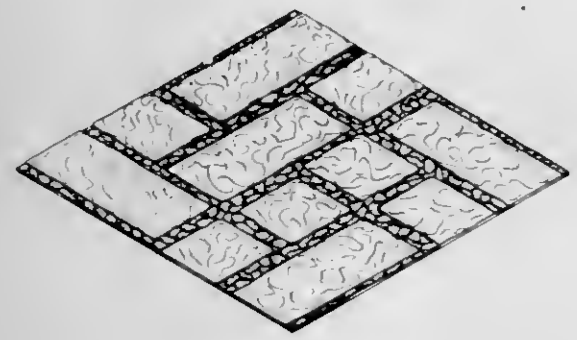
Eugene J. Demetrovics, Whitehall, Pa., assignor to GAF Corporation, New York, N.Y.
Filed Nov. 16, 1976, Ser. No. 742,273
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—86



248,780

DECORATIVE TILE

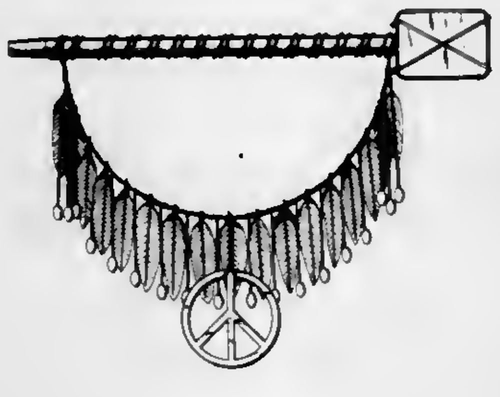
James W. Sears, Jr., Newburgh, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Nov. 16, 1976, Ser. No. 742,274
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—86



248,781

PEACE PIPE

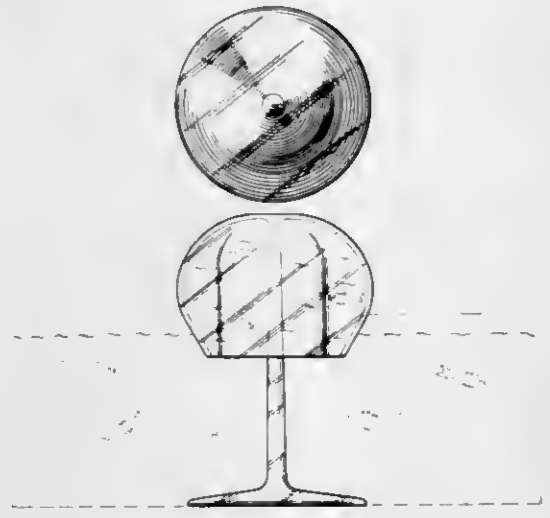
Gary Mead, Blairhill Rd., Fleischmann Village, N.Y. 12430
Filed Jan. 26, 1977, Ser. No. 762,501
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—04



248,782

AQUARIUM ATTACHMENT

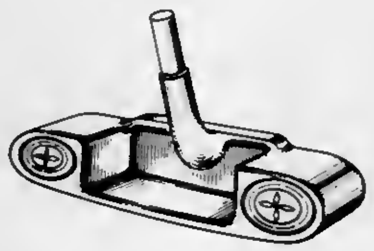
Thomas G. Randall, Jr., Rte. 2, Box 71e, Williston, Vt. 05495
Filed Jul. 20, 1977, Ser. No. 817,193
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—12



248,783

GOLF PUTTERHEAD

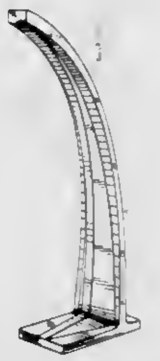
Steven Kenneth Long, 17151 Almaden Rd., San Jose, Calif. 95120
Filed Nov. 28, 1975, Ser. No. 636,115
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



248,784

CONCRETE BASKETBALL STANDARD

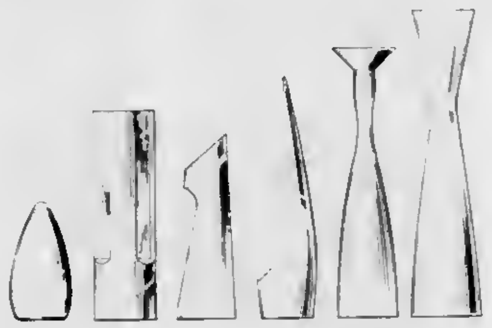
James E. Miller, 12900 W. Ten Miles Rd., South Lyon, Mich. 48178
Filed Jun. 21, 1976, Ser. No. 698,209
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 VV



248,785

SET OF CHESS GAME PIECES

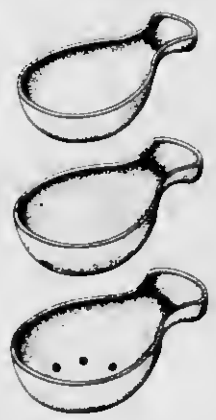
Terry M. Haber, 3050 S. Bristol #8C, Santa Ana, Calif. 92707
Filed Jan. 27, 1977, Ser. No. 763,067
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH



248,786

COMBINED NESTABLE BATH TOY

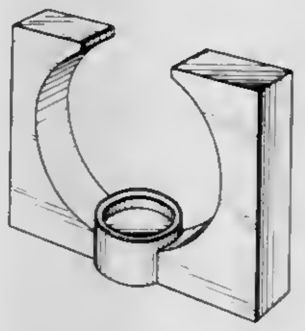
Shinroku Nakao, Yokohama, Japan, assignor to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1976, Ser. No. 659,827
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 V



248,787

BASE FOR CANDLE HOLDER, LAMP OR SIMILAR ARTICLE

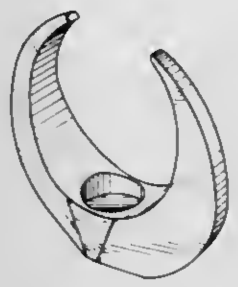
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,697
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2



248,788

BASE FOR CANDLE HOLDER, LAMP OR SIMILAR ARTICLE

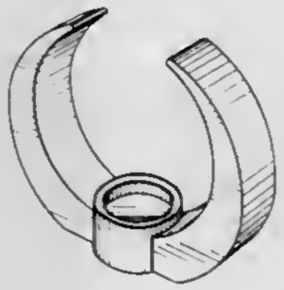
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,700
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2



248,789

BASE FOR CANDLE HOLDER, LAMP OR SIMILAR ARTICLE

Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,702
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2



248,790

LANTERN HOLDER OR SIMILAR ARTICLE

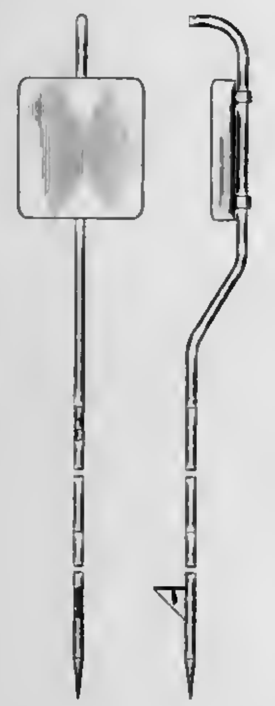
Frank L. Castor, Cheney, Kans. 67025

Filed Jun. 30, 1976, Ser. No. 701,118

Term of patent 7 years

Int. Cl. D26—*05*

U.S. Cl. D48—4 A



248,791

LENS FOR VEHICLE SIGNAL LIGHT

Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

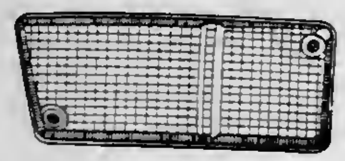
Filed Dec. 23, 1975, Ser. No. 643,673

Claims priority, application France, Jul. 1, 1975, 75 73991

Term of patent 14 years

Int. Cl. D26—*06*

U.S. Cl. D48—32 A



248,792

AUTOMOBILE HEADLIGHT LENS

Pierre Cibie, Paris, France, assignor to Cibie Projecteurs, Paris, France

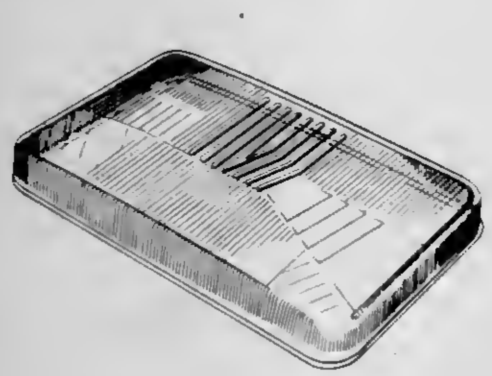
Filed Aug. 18, 1977, Ser. No. 825,809

Claims priority, application France, May 26, 1977, 77 40288

Term of patent 14 years

Int. Cl. D26—*06*

U.S. Cl. D48—32 A



248,793

COIN SECTIONS FOR USE WITH A CASH DRAWER

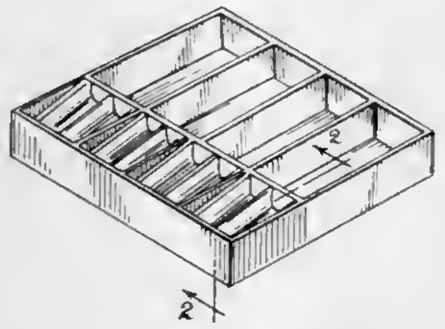
Tom H. Ross, 2761 Georgian Ter., Marietta, Ga. 30062

Filed Jul. 6, 1976, Ser. No. 703,060

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D52—4 R



248,794

TRAVEL BAG

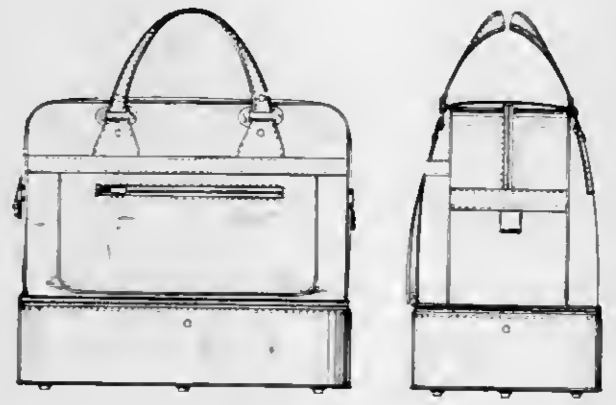
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics, Ltd., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,276

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D87—5 G



248,795

DISPLAY STAND

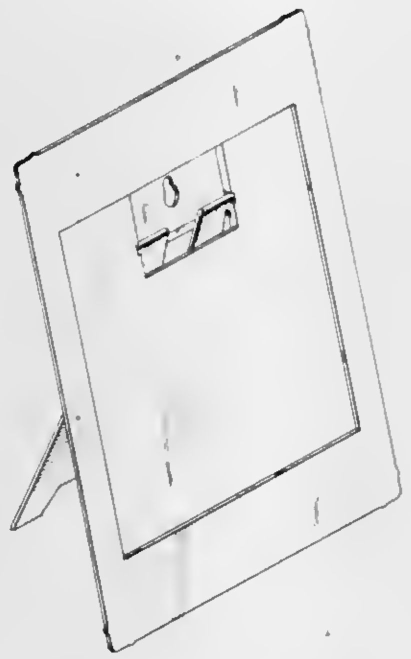
Anthony Restaino, Plainview, N.Y., assignor to Revloo, Inc.

Filed Dec. 17, 1976, Ser. No. 751,380

Term of patent 14 years

Int. Cl. D20—*03;* D6—*07*

U.S. Cl. D96—12 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B Motala Verkstad: *See—*
  Carlsson, Bengt Johan, 4,103,611, Cl. 100-257.000.
A. F. Hydraulics Limited: *See—*
  Reynolds, Lionel Arthur, 4,103,746, Cl. 173-107.000.
A-Lok Corporation: *See—*
  Ditcher, John, 4,103,901, Cl. 277-9.500.
AB Akerlund & Rausing: *See—*
  Piltz, Lars-Eric; and Jeppsson, Jan-Bertil, 4,103,802, Cl. 220-258.000.
Abbott, Bernard J.: *See—*
  Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., 4,104,282, Cl. 260-345.300.
Abbott Laboratories: *See—*
  Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, 4,104,306, Cl. 260-571.000.
Abdou-Sabet, Sabet; and Ferrin, J. Paul, to Monsanto Company. Acrylate-modified ethylene-vinyl acetate polymer. 4,104,329, Cl. 260-878.00R.
Abe, Hiroshi: *See—*
  Tomita, Chuji; and Abe, Hiroshi, 4,104,527, Cl. 250-445.00T.
Abe, Michio, to Kinoshita Seiki Kabushiki Kaisha. Conical spring washer. 4,103,725, Cl. 151-35.000.
Abex Corporation: *See—*
  Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,104,504, Cl. 219-73.100.
Abrams, Richard L., to Hughes Aircraft Company. Laser internal coupling modulation arrangement with wire grid polarizer serving as a reflector and coupler. 4,104,598, Cl. 331-94.50M.
Abrams, Stanton: *See—*
  Dieterich, Frank L.; and Abrams, Stanton, 4,103,432, Cl. 34-58.000.
Abramson, Harvey J., to Metatech Corporation. Shoe cover and method of making same. 4,103,439, Cl. 36-7.300.
ACF Industries, Incorporated: *See—*
  Hammonds, James C.; and Holt, Jan D., 4,103,624, Cl. 105-199.0CB.
  Houlgrave, Robert C.; and Talafuse, Larry J., 4,103,863, Cl. 251-48.000.
Ackrell, Jack, to Syntex (U.S.A.) Inc. Dibenzo [b.f]thiepin and dibenzo[b.f]oxepin derivatives. 4,104,280, Cl. 260-327.00B.
Acme Electric Corp.: *See—*
  Lawson, Harry W., Jr., 4,104,715, Cl. 363-37.000.
Acushnet Company: *See—*
  Porter, Raymond P., 4,103,385, Cl. 15-250.360.
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, to Robert Bosch GmbH. Method and arrangement for controlling the operation of a cooling system in an automotive vehicle. 4,103,506, Cl. 62-61.000.
Adams, Phillip: *See—*
  Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., 4,104,144, Cl. 204-159.230.
Adler, Arnold Henry, to Burroughs Corporation. Accounts receivable system. 4,103,935, Cl. 283-66.00R.
Adolph Coors Company: *See—*
  Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., 4,103,789, Cl. 214-41.00R.
  Totten, Roger W., 4,104,081, Cl. 134-23.000.
Aerojet-General Corporation: *See—*
  Lista, Edwin L.; and Williams, Kenneth S., 4,103,584, Cl. 86-1.00R.
Aetna-Standard Engineering Company: *See—*
  Schuetz, James W., 4,103,530, Cl. 72-312.000.
AGFA-Gevaert, AG: *See—*
  Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, 4,103,996, Cl. 355-32.000.
  Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.
  Laar, Erwin, 4,104,668, Cl. 354-299.000.
  Vanheerentals, Jacques Leon; Pfeifer, Josef; Klocke, Helmut; and Paulus, Rudolf, 4,104,069, Cl. 96-23.000.
  Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.
  Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.
AGFA-GEVAERT N.V.: *See—*
  Smolderen, Albert Emiel, 4,103,775, Cl. 206-455.000.
Ahlburn, Byron T.: *See—*
  Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., 4,104,697, Cl. 361-305.000.
Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, to International Business Machines Corporation. Parity checking scheme for detecting word line failure in multiple byte arrays. 4,103,823, Cl. 235-312.000.
Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, to Siemens Aktiengesellschaft. Circuit arrangement for a detector for ionizing radiation. 4,104,524, Cl. 250-402.000.
Aigami, Koji: *See—*
  Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.
Aimono, Yuji; Omori, Eiji; and Nakano, Mineo, to Hitachi Chemical Company, Ltd. Odorless or low-odor resinous composition. 4,104,215, Cl. 260-22.0CB.
Air Products & Chemicals, Inc.: *See—*
  Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,104,264, Cl. 528-370.000.
  Sims, Victor A., 4,104,220, Cl. 260-29.60R.
  Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.
Airco, Inc.: *See—*
  Benois, Hugues G., 4,103,507, Cl. 62-63.000.
  Terrell, Ross C., 4,104,314, Cl. 260-614.00F.
Aizenkaid, Mark Moiseevich: *See—*
  Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Ajami, Alfred M.: *See—*
  Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,104,447, Cl. 429-15.000.
Akeda, Kouichi: *See—*
  Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, 4,103,650, Cl. 123-41.860.
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, to Mitsubishi Kinzoku Kabushiki Kaisha. Magnetite ferrite for magnetostrictive vibrators. 4,104,549, Cl. 310-26.000.
Akkerman, Neil H., to Baker International Corporation. Safety valve and ball type equalizing valve. 4,103,744, Cl. 166-324.000.
A.G. fur industrielle Elektronik AGIE: *See—*
  Ullmann, Werner; and Panschow, Rudolf, 4,104,502, Cl. 219-69.00W.
Akzo N.V.: *See—*
  Buter, Roelof, 4,104,240, Cl. 260-39.00P.
Akzona Incorporated: *See—*
  del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.
  Greven, Hendrik Marie; and de Wied, David, 4,104,371, Cl. 424-177.000.
  Meierhoefer, Alan W., 4,104,214, Cl. 260-17.4CL.
  Vukoje, Tatjana, 4,103,481, Cl. 57-140.00J.
Albert, Richard D. Grid-cathode controlled X-ray tube. 4,104,526, Cl. 250-403.000.
Albright, James A.: *See—*
  Smith, Ray E.; and Albright, James A., 4,104,172, Cl. 252-8.100.
Ald, Inc.: *See—*
  Jarvis, John R.; and Brown, Eldon W., 4,103,520, Cl. 68-12.00R.
Aldakushin, Stanislav Andreevich: *See—*
  Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis,

Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Alden Research Foundation: *See—*

Williams, George C., 4,104,644, Cl. 346-139.00A.

Alfa-Laval AB: *See—*

Stroucken, Klaus H. D., 4,103,822, Cl. 233-20.00A.

Alfa Romeo S.p.A.: *See—*

Garcea, Giampaolo, 4,104,337, Cl. 261-39.00A.

Alin, Jean-Marie Georges Fernand, to Gaz de France. Metallic nonpremixed gas-burner with counter-rotation of gases. 4,104,017, Cl. 431-352.000.

ALKOR Gesellschaft mit beschrankter Haftung Kunststoffverkauf: *See—*

Peters, Victor; and Krammer, Franz, 4,104,219, Cl. 260-29.6RB.

Allen-Bradley Company: *See—*

Grudowski, Raymond A.; and Struger, Odo J., 4,104,731, Cl. 364-900.000.

Allen, David A., to Huffy Corporation. Saddle construction. 4,103,966, Cl. 297-195.000.

Allen, Leigh Cameron, to American Cyanamid Company. Dustless, free-flowing ultraviolet absorbing compositions for polyolefins. 4,104,335, Cl. 260-897.00A.

Allenbach, Ronald L.: *See—*

Guthrie, Richard E.; and Allenbach, Ronald L., 4,103,557, Cl. 74-102.000.

Alley, Vernon L., Jr.; and McHatton, Austin D., to United States of America, National Aeronautics and Space Administration. Nozzle extraction process and handlemeter for measuring handle. 4,103,550, Cl. 73-159.000.

Allis-Chalmers Corporation: *See—*

Graef, Richard W., 4,103,878, Cl. 266-78.000.

Schaefer, Daniel W., 4,103,478, Cl. 56-205.000.

Shaver, J. Lyle, 4,103,691, Cl. 130-24.000.

Alvarado, Jim; and Righter, Richard G. Macrame board and kit. 4,103,944, Cl. 289-18.000.

Alvarez, Marcial. Manually-operated revolvable shaving device. 4,103,418, Cl. 30-50.000.

Amax Inc.: *See—*

Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, 4,104,359, Cl. 423-139.000.

Amchem Products, Inc.: *See—*

Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., 4,104,303, Cl. 260-570.900.

Steinbrecher, Lester; and Hall, Wilbur S., 4,104,424, Cl. 427-435.000.

Amemiya, Akira: *See—*

Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, 4,104,192, Cl. 252-188.000.

American Air Filter Company, Inc.: *See—*

Brozenick, Nicholas J., 4,104,042, Cl. 55-101.000.

Huntington, Robert G., 4,103,708, Cl. 137-614.110.

American Clearwater Corp.: *See—*

Wolfe, Henry S., 4,103,379, Cl. 9-8.00R.

American Colloid Company: *See—*

Clem, Arthur G., 4,103,499, Cl. 61-50.000.

American Cyanamid Company: *See—*

Allen, Leigh Cameron, 4,104,335, Cl. 260-897.00A.

American Home Products Corporation: *See—*

Sarantakis, Dimitrios, 4,104,267, Cl. 260-112.50S.

American Medical Systems, Inc.: *See—*

Karacan, Ismet; Paulson, Larry G.; and Timm, Gerald W., 4,103,678, Cl. 128-2.05V.

American National Red Cross: *See—*

Wickerhauser, Milan, 4,104,266, Cl. 260-112.00B.

American Safety Equipment Corporation: *See—*

Tanaka, Akira; and Hollowell, William M., 4,103,967, Cl. 297-216.000.

AMP Incorporated: *See—*

Herrmann, Henry Otto, Jr.; and Glover, Douglas Wade, 4,104,521, Cl. 250-324.000.

Mixon, James Lenhart, Jr., 4,103,984, Cl. 339-98.000.

AMSTED Industries Incorporated: *See—*

Radwill, Robert P., 4,103,623, Cl. 105-197.0DB.

Anchor Hocking Corporation: *See—*

Colato, Albert E.; and Formo, Jerome L., 4,103,736, Cl. 165-48.00R.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Rupturable sealing element within an ink reservoir cartridge. 4,103,999, Cl. 401-134.000.

Anders, Dale F.; Brizgys, Peter V.; Mattiuz, Ronald; and Murphy, Edward J., to DeSoto, Inc. Process for anodic electrodeposition of aqueous emulsions. 4,104,100, Cl. 204-181.00R.

Anderson, Clayton & Co.: *See—*

Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.

Anderson Company, The: *See—*

Arndt, John J., 4,103,386, Cl. 15-250.420.

Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., to Amchem Products, Inc. Acid inhibitor composition and process in hydrofluoric acid chemical cleaning. 4,104,303, Cl. 260-570.900.

Anderson, James Kagey. Apparatus for automatically processing photogravure curvilinear surfaces. 4,104,104, Cl. 156-345.000.

Anderson, John A.: *See—*

Whiting, Wesley W.; and Anderson, John A., 4,103,959, Cl. 296-23.0MC.

Anderson, Leslie C.; Nufer, Robert W.; and Pugliese, Frank G., to International Business Machines Corporation. Ceramic dielectrics. 4,104,345, Cl. 264-43.000.

Anderson, Vern: *See—*

Baier, Robert J.; Anderson, Vern; and Aseltine, William S., 4,103,692, Cl. 131-32.000.

Ando, Akio: *See—*

Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.

Ando, Wataru; and Nakaoka, Ichiro, to Kabushiki Kaisha Pollution Preventing Research Laboratory. Method for producing nitrobenzene. 4,104,145, Cl. 204-162.00R.

Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., to Adolph Coors Company. Unitized loading system. 4,103,789, Cl. 214-41.00R.

Anetseder, Leopold, Jr.; and Anetseder, Leopold, Sr., to Anetseder, Leopold, Jr. Brush with retractable bristles. 4,103,387, Cl. 15-203.000.

Anetseder, Leopold, Sr.: *See—*

Anetseder, Leopold, Jr.; and Anetseder, Leopold, Sr., 4,103,387, Cl. 15-203.000.

Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, to Du Pont de Nemours, E. I., and Company. Gas-barrier coated films, sheets or foils and method of preparation. 4,104,438, Cl. 428-332.000.

Angstadt, Howard P., to Sun Ventures, Inc. Organometallic complexes as alkylaromatic oxidation catalysts. 4,104,310, Cl. 260-610.00B.

Angstadt, Howard P., to Sun Ventures, Inc. Organometallic complexes as oxidation catalysts. 4,104,311, Cl. 260-610.00B.

Angstadt, Howard P.; and Griffin, William P., Jr., to Sun Ventures, Inc. Oxidation of olefins with organometallic complex catalysts. 4,104,312, Cl. 260-610.00B.

Anschutz & Co. G.m.b.H.: *See—*

Erich, Hans; Jordt, Alfred; and Konig, Klaus, 4,103,759, Cl. 184-64.000.

Antonov, Vladimir Alexandrovich: *See—*

Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Antos, George J., to UOP Inc. Dehydrogenation method. 4,104,317, Cl. 260-666.00A.

Antoshenkov, Vladimir Ilich: *See—*

Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Antrim, Richard Lee; and Harris, Donald Wayne, to Standard Brands Incorporated. Method for treatment of corn hulls. 4,104,463, Cl. 536-56.000.

Aoi, Norihiro: *See—*

Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.

Aoki, Shunichi; and Maeda, Eiji, to Hitachi, Ltd. Shake-out machine for use with self-curing mold. 4,103,731, Cl. 164-147.000.

Aono, Shigeo, to Nissan Motor Company, Limited. Method of and device for controlling solenoid operated flow control means. 4,103,695, Cl. 137-1.000.

Aoyama, Syunichi, to Nissan Motor Company, Limited. Internal combustion engine with control system for secondary air supply. 4,103,488, Cl. 60-289.000.

Apple, Hugh C. Method and apparatus for conditioning air. 4,103,508, Cl. 62-92.000.

Applegate, George D. J. Method of implanting synthetic hair. 4,103,365, Cl. 3-1.000.

Applied Fiberoptics, Inc.: *See—*

Kloots, Jacobus, 4,104,709, Cl. 362-105.000.

Applied Theory, Inc.: *See—*

Trulio, John G.; and Bless, Stephan J., 4,103,756, Cl. 181-121.000.

Arai, Kozo; Kotani, Teizo; and Mizushima, Toshio, to Japan Synthetic Rubber Company Limited. Method of and a device for measuring a relaxation phenomenon. 4,103,541, Cl. 73-88.00R.

Araki, Tsunehiko; and Okuda, Yoshihiko, to Matsushita Electric Works, Ltd. Light scattering type smoke detector. 4,103,997, Cl. 356-104.000.

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Habert, Dietrich, 4,103,732, Cl. 164-147.000.

Arcair Company: *See—*

Rieppel, Perry J.; and Henderson, Harold Richard, 4,103,359, Cl. 2-8.000.

Archer, Robert A.: *See—*

Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., 4,104,282, Cl. 260-345.300.

Argus Chemical Corporation: *See—*

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,104,217, Cl. 260-23.0XA.

Arimatsu, Tadayoshi. Apparatus for winding cut belt-like material. 4,103,839, Cl. 242-56.200.

Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, to Chiyoda Chemical Engineering & Construction Co., Ltd. Apparatus and method for treating waste gas from urea prilling tower. 4,104,041, Cl. 55-90.000.

Arkosy, Steven. Method utilizing an automatic resettable circuit breaker for locating ground faults in a vehicle. 4,104,581, Cl. 324-52.000.

Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Disubstituted-O-(1-fluoro-2-halogenoethyl)-phosphoric(phosphonic) acid esters, and method of combating insects. 4,104,377, Cl. 424-222.000.

Armstrong Cork Company: *See—*

Herweh, John E., 4,104,301, Cl. 260-554.000.

Armstrong, James J., to Texas Instruments Incorporated. Keyboard apparatus including elongated bar for aligning level from connectors to motherboard. 4,104,702, Cl. 361-421.000.

Arndt, John J., to Anderson Company, The. Locking clip. 4,103,386, Cl. 15-250.420.

Arnholt, Jack C.; and Main, Ronald J., to Rohr Industries, Incorporated. Folding seat and wheelchair restraint. 4,103,934, Cl. 280-744.000.

Arnold, Douglas L. Odorless water closet. 4,103,370, Cl. 4-213.000.

Arnold, Gunther: *See—*

Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.

Arnold, James F. Method for inhibiting the wear in a well casing. 4,103,748, Cl. 175-61.000.

Aro Corporation, The: *See—*

Arvin, Paul, 4,103,711, Cl. 137-625.660.

Aronson, Harmon J., to Biosonics, Inc. Method and apparatus for measuring blood flow noninvasively. 4,103,679, Cl. 128-2.05F.

Arrow Hart Inc.: *See—*

Phillips, Bernard L., 4,104,506, Cl. 219-85.0CM.

Arvin, Paul, to Aro Corporation, The. Fluid logic flip-flop. 4,103,711, Cl. 137-625.660.

Asahi Yukizai Kogyo Kabushiki Kaisha: *See—*

Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, 4,103,865, Cl. 251-148.000.

Asano Pole Co., Ltd.: *See—*

Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.

Ascani, Armand: *See—*

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Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, 4,104,008, Cl. 417-397.000.

ASEA AB: *See—*

Elvin, Sten, 4,104,537, Cl. 307-58.000.

Frank, Harry, 4,104,576, Cl. 323-102.000.

Aseltine, William S.: *See—*

Baier, Robert J.; Anderson, Vern; and Aseltine, William S., 4,103,692, Cl. 131-32.000.

Ashland Oil, Inc.: *See—*

Trivedi, Bhupendra C., 4,104,478, Cl. 568-885.000.

Ashlow Steel & Engineering Company Limited: *See—*

Jackson, John Charles; and Selous, Percy Bruce Gordon, 4,103,577, Cl. 83-337.000.

Ashworth, Roger Anderton; Pollitt, John Michael; and White, Graham Colin, to Kangol Magnet Limited. Protection of occupants of a vehicle. 4,103,754, Cl. 180-82.00C.

Aslin, Michael: *See—*

Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, 4,104,724, Cl. 364-477.000.

Astrom, Gordon L.: *See—*

Jones, William H.; and Astrom, Gordon L., 4,104,495, Cl. 200-83.00P.

Atari, Inc.: *See—*

Bristow, Stephen D.; and Bushnell, Nolan K., 4,104,625, Cl. 340-324.00R.

Ateliers des Charmilles S.A.: *See—*

Wyss, Georges, 4,104,500, Cl. 219-69.00V.

Wyss, Georges, 4,104,501, Cl. 219-69.00M.

Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme: *See—*

Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Atkins & Merrill, Inc.: *See—*

Fleming, Gordon R., 4,104,555, Cl. 313-512.000.

Atlantic Richfield Company: *See—*

Chao, Tai S.; and Owston, Ernest H., Jr., 4,104,036, Cl. 44-56.000.

Erickson, Henry, 4,104,153, Cl. 208-138.000.

Atlas Copco Aktiebolag: *See—*

Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, 4,103,971, Cl. 299-17.000.

Atlas Powder Company: *See—*

Bast, Bernard John; and Schaffer, Howard Elias, 4,103,473, Cl. 53-180.00M.

Mullay, John J., 4,104,092, Cl. 149-2.000.

Audisio, Giorgio: *See—*

Cargnino, Francesco; and Audisio, Giorgio, 4,104,139, Cl. 204-55.00R.

Automatic Container Loading Limited: *See—*

Miller, Dennis M., 4,103,795, Cl. 214-621.000.

Avery, Dudley D.: *See—*

Garside, Arthur F.; and Avery, Dudley D., 4,103,652, Cl. 123-103.00R.

Avon Enterprises, Inc.: *See—*

Vik, Albam M., 4,103,699, Cl. 137-106.000.

Awad, John A.: *See—*

Lupien, Paul J.; Awad, John A.; and Moorjani, Sital, 4,103,685, Cl. 128-214.00R.

Aydelott, Max M.; Hartman, Richard L.; and York, James A., to Smith Engineering Company. Replaceable inlet means for heat exchanger. 4,103,738, Cl. 165-178.000.

Azorlosa, Julian L., to GAF Corporation. Multifunctional acrylate N-vinylamide anaerobic adhesive composition. 4,104,458, Cl. 526-264.000.

B. F. Goodrich Company, The: *See—*

Lai, John Ta-Yuan, 4,104,254, Cl. 260-45.8NZ.

B & K Industries Ltd.: *See—*

Shaw, Robert, 4,103,794, Cl. 214-518.000.

B & W Manufacturing Co., Inc.: *See—*

Boser, Ronald J., 4,103,562, Cl. 74-567.000.

Bacardit, Juan Simon: *See—*

Elizalde, Manuel Coll; and Bacardit, Juan Simon, 4,103,407, Cl. 29-157.10R.

Bachman, Charles: *See—*

Poublan, Alain; Bachman, Charles; and Bouvard, Jacques, 4,104,718, Cl. 364-200.000.

Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, to Bayer Aktiengesellschaft. Nozzle device for the production of texturized filament yarns. 4,103,404, Cl. 28-255.000.

Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., to General Cable Corporation. Stop joint for laminar dielectric cable. 4,104,479, Cl. 174-22.00R.

Baier, Robert J.; Anderson, Vern; and Aseltine, William S., to Gulf & Western Corporation. Cigar wrapping machine and method. 4,103,692, Cl. 131-32.000.

Bailey, James R. Time indicating device. 4,103,484, Cl. 58-125.00C.

Baker, Donald C., to J. I. Case Company. Vehicle with improved steering system. 4,103,561, Cl. 74-552.000.

- Baker, Edward D.: *See—*
  - Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.
- Baker International Corporation: *See—*
  - Akkerman, Neil H., 4,103,744, Cl. 166-324.000.
  - Labit, Sidney James; and Furmaga, Robert Edwin, 4,103,710, Cl. 137-624.130.
- Baker Perkins Holdings Limited: *See—*
  - Edwards, Albert, 4,103,733, Cl. 164-160.000.
- Baker Perkins Inc.: *See—*
  - Fischer, Harry A.; and Wrubel, Richard R., 4,104,412, Cl. 426-572.000.
- Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., to RCA Corporation. Chuck for use in the testing of semiconductor wafers. 4,104,589, Cl. 324-158.00F.
- Bakul, Valentin Nikolaevich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Balcke-Durr Aktiengesellschaft: *See—*
  - Joekel, Alfred, 4,103,408, Cl. 29-157.3AH.
- Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1,3,5-Trisubstituted-1,2,4-triazole compounds. 4,104,393, Cl. 424-263.000.
- Ballesteros, Juan Carlos Corral, to Suilene Argentina S.A. Sponge. 4,104,435, Cl. 428-288.000.
- Baltimore and Ohio Railroad Company, The: *See—*
  - Spatig, Thomas G., 4,103,817, Cl. 228-173.00C.
- Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., to Firestone Tire & Rubber Company, The. Semi-pneumatic energy absorbing bumper system for motor vehicles. 4,103,951, Cl. 293-71.00P.
- Banka, Eugene F.: *See—*
  - Lehner, Gerald J.; and Banka, Eugene F., 4,104,682, Cl. 360-2.000.
- Banks, Reginald George Sinclair; Paterson, David James; and Williams, Alan, to British Gas Corporation. Catalytic steam reforming and catalysts therefor. 4,104,201, Cl. 252-466.00B.
- Bannan, Edward C., to McGraw-Edison Company. Aluminum cluster mount. 4,103,853, Cl. 248-219.100.
- Banning, Jack A., to Phillips Fibers Corporation. Apparatus for winding an improved yarn supply package. 4,103,834, Cl. 242-18.0PW.
- Bar-On, Benjamin; and Paz, Eldad. Solar collectors. 4,103,675, Cl. 126-271.000.
- Barabash, Martin J.: *See—*
  - Barker, Graham; and Barabash, Martin J., 4,104,403, Cl. 424-365.000.
- Baran, John S.; and Laos, Ivar, to G. D. Searle & Co. 11β,18-epoxy-9α-halo-17,18-dihydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactones and congeners. 4,104,271, Cl. 260-239.570.
- Baranowski, Conrad J., to Powercube Corporation. Mounting assembly for electronic power devices. 4,104,701, Cl. 361-386.000.
- Bargain, Michel; and Lagarde, Robert, to Rhone-Poulenc Industries. Organopolysiloxane compositions transformable into elastomers without use of vulcanizing agents. 4,104,239, Cl. 260-37.0SB.
- Barker, D. F.: *See—*
  - Brandenburger, A. M.; Helms, C. R.; and Barker, D. F., 4,103,770, Cl. 206-193.000.
- Barker, Graham; and Barabash, Martin J., to Witco Chemical Corporation. Water-oil emulsions and method of preparing same. 4,104,403, Cl. 424-365.000.
- Barker, Philip Edwin; Hatt, Brian William; and Ellison, Frederick John, to Fisons Limited. Method for separation of dextrans. 4,104,078, Cl. 127-46.00R.
- Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, to Draftex Development AG. Channel-shaped sealing strips. 4,103,459, Cl. 49-491.000.
- Barnes-Hind Pharmaceuticals, Inc.: *See—*
  - Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., 4,104,187, Cl. 252-106.000.
- Baron Chalmalla SA: *See—*
  - Belpaume, Charles, 4,103,360, Cl. 2-67.000.
- Baron, Robert Michael. Adjustable U-control handle. 4,103,453, Cl. 46-77.000.
- Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, to Rhone-Poulenc Industries. Derivatives of 1,2-dithiole and anti-bilharzia compositions thereof. 4,104,386, Cl. 424-250.000.
- Barrett, Edward George, to Smiths Industries Limited. Driving mechanisms. 4,103,515, Cl. 64-26.000.
- Barricks, Arthur G. Table with foldable legs. 4,103,626, Cl. 108-127.000.
- Barron, Roger S.: *See—*
  - Wu, Kent Yengtsu; and Barron, Roger S., 4,104,034, Cl. 44-10.00R.
- BASF Aktiengesellschaft: *See—*
  - Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
  - Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, 4,104,341, Cl. 264-9.000.
  - Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,104,298, Cl. 260-543.00R.
  - Kranz, Joachim; Jettmar, Werner; and Polster, Rudolf, 4,104,276, Cl. 260-314.500.
  - Melzer, Jaroslav; and Schenck, Hans-Uwe, 4,104,226, Cl. 260-29.6WB.
  - Pommer, Ernst-Heinrich; Gutsche, Klaus; and Hartleben, York, 4,104,399, Cl. 424-269.000.
  - Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, 4,104,374, Cl. 424-185.000.
  - Swoboda, Johann; Stephan, Rudolf; and Heinz, Gerhard, 4,104,328, Cl. 260-876.00R.
- Bast, Bernard John; and Schaffer, Howard Elias, to Atlas Powder Company. Apparatus for making a compartmented container. 4,103,473, Cl. 53-180.00M.
- Batz, Walter, to Jones & Laughlin Steel Corporation. Method of making differentially coated one side alloyed galvanized steel strip. 4,104,088, Cl. 148-12.00R.
- Baudin, Pol: *See—*
  - Nolte, Hans-Henning; De Boel, Marcel; and Baudin, Pol, 4,104,427, Cl. 428-68.000.
- Bauer, Hubert, to Messerschmitt-Boelkow-Blohm GmbH. Constant current semiconductor circuit arrangement. 4,104,575, Cl. 323-4.000.
- Bautex Adolf Stover KG.: *See—*
  - Spohr, Horst, 4,103,727, Cl. 160-168.00R.
- Baxter Travenol Laboratories, Inc.: *See—*
  - Hopkins, Robert E., II; and Hughes, Kathleen, 4,104,030, Cl. 23-230.00B.
- Bayer Aktiengesellschaft: *See—*
  - Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,104,377, Cl. 424-222.000.
  - Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.
  - Botta, Artur; and Rasp, Christian, 4,104,194, Cl. 252-390.000.
  - Dorsch, Hans-Lothar; and Raue, Roderich, 4,104,268, Cl. 260-158.000.
  - Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,104,284, Cl. 260-378.000.
  - Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,104,195, Cl. 252-350.000.
  - Mansmann, Manfred, 4,104,045, Cl. 65-2.000.
  - Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.
  - Pettelkau, Hans-Jurgen, 4,104,272, Cl. 260-27.0BB.
  - Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, 4,104,324, Cl. 260-857.0TW.
  - Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.
  - Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.
  - Scharfe, Gerhard; and Wenzel, Rupert, 4,104,316, Cl. 260-655.000.
- Baysinger, Robert L., to Emerson Electric Co. Cycling pilot burner control system with safety timing. 4,104,016, Cl. 431-54.000.
- Bean, Lawrence M.; Edwards, Robert W.; and Wright, Theodore, to Westinghouse Electric Corp. Control panel system. 4,104,617, Cl. 340-147.00R.
- Bean, Lloyd F., to Xerox Corporation. Recording plate. 4,103,994, Cl. 355-3.00R.
- Beatrice Foods Co.: *See—*
  - Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, 4,103,444, Cl. 40-124.100.
- Beck, James Richard, to Eli Lilly and Company. N^1-chloro-3,5-dinitrosulfanilamides. 4,104,054, Cl. 71-103.000.
- Beckmann, Peter V.; and Kelly, James B., to United Technologies Corporation. Turbine engine surge detector. 4,103,544, Cl. 73-115.000.
- Bedford, William Augustus, Jr.: *See—*
  - Mitchell, Ronald A.; and Bedford, William Augustus, Jr., 4,103,524, Cl. 70-209.000.
- Bednarski, John R.; and Russell, David B., to M&T Chemicals Inc. Novel biologically active copolymers. 4,104,234, Cl. 260-33.6UA.
- Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, to Siemens Aktiengesellschaft. Semiconductor device with pressure electrical contacts having irregular surfaces. 4,104,676, Cl. 357-79.000.
- Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., to Manitowoc Company, Inc., The. Platform crane with counterweight and boom carrier support linkages. 4,103,783, Cl. 212-48.000.

- Behnke, Joachim: *See—*
  - del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.
- Behrenz, Wolfgang: *See—*
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- Bei Electronics, Inc.: *See—*
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- Belhomme, Charles Joseph Ghislain: *See—*
  - Van Bokestal, Andre Marcel Alfred; and Belhomme, Charles Joseph Ghislain, 4,104,509, Cl. 219-544.000.
- Bell, Richard Judd: *See—*
  - Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.
- Bell Telephone Laboratories, Incorporated: *See—*
  - DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, 4,104,672, Cl. 357-22.000.
  - Grau, Thomas George; and Tompsett, David Elliott, 4,104,109, Cl. 156-521.000.
  - Ngo, Peter Dinh-Tuan, 4,104,626, Cl. 340-324.00M.
- Belpaume, Charles, to Baron Chalmalla SA. Woman's garment which molds the upper body. 4,103,360, Cl. 2-67.000.
- Bendix Corporation, The: *See—*
  - Brown, Arthur K., Jr., 4,103,593, Cl. 92-78.000.
  - Elizalde, Manuel Coll; and Bacardit, Juan Simon, 4,103,407, Cl. 29-157.10R.
  - Putt, James Basil, 4,103,590, Cl. 91-376.00R.
- Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, to Bergen Brunswig Corporation. Dental articulation apparatus and method. 4,103,424, Cl. 32-32.000.
- Benjamin, David W.: *See—*
  - Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
- Benois, Hugues G., to Airco, Inc. High speed freezing system. 4,103,507, Cl. 62-63.000.
- Benoit, Roland A.; and Guillot, Edmund P., to InterRoyal Corporation. Safety side for hospital bed. 4,103,376, Cl. 5-331.000.
- Benz, Willi, to Schloemann-Siemag Aktiengesellschaft. Flying cross cutting shear for plate. 4,103,576, Cl. 83-320.000.
- Berard, Jean Claude, to SEB S.A. Cooking container, especially for frying food products. 4,103,604, Cl. 99-342.000.
- Berard, Michel; and Lecoustey, Andre, to Cefilac. Modular kinematic chain for transmitting a torque with slip. 4,103,568, Cl. 74-801.000.
- Bergen Brunswig Corporation: *See—*
  - Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
- Bergmann, Karl H.; and Levine, Harvey, to Melitta, Inc. Automatic coffee brewing device. 4,103,603, Cl. 99-294.000.
- Bergs, Andrew. Fireplace heat intensifier. 4,103,670, Cl. 126-121.000.
- Bergwerksverband GmbH: *See—*
  - Ratz, Walter; and Lindemann, Werner, 4,104,592, Cl. 325-37.000.
  - Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, 4,104,150, Cl. 208-91.000.
- Bernard, Jean Rene; and Nury, Jean, to Elf-Union. Method of dehydrocyclizing aliphatic hydrocarbons. 4,104,320, Cl. 260-673.500.
- Bernecker, Gunther, to Conlin, Donald B., a part interest. Carburetor. 4,103,658, Cl. 123-133.000.
- Bernett, Marianne K., to United States of America, Navy. Vinyl polymer-fluoroalkylether oligomer composition. 4,104,452, Cl. 526-3.000.
- Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, to Abbott Laboratories. 12a-Deoxy chelocardin. 4,104,306, Cl. 260-571.000.
- Berntsen, Robert A.: *See—*
  - Stoffel, Robert W.; and Berntsen, Robert A., 4,103,560, Cl. 74-501.00M.
- Bernzomatic Corporation: *See—*
  - Zagara, Frank A.; and Nelson, John M., 4,103,829, Cl. 239-304.000.
- Bertetti, John W. Method and apparatus for determining vehicle fuel consumption. 4,103,543, Cl. 73-114.000.
- Bertin & Cie: *See—*
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- Besenbruch, Alex, to Besenbruch-Hofmann, Inc. Grinding tools for cylinders. 4,103,461, Cl. 51-352.000.
- Besenbruch-Hofmann, Inc.: *See—*
  - Besenbruch, Alex, 4,103,461, Cl. 51-352.000.
- Besik, Ferdinand. Apparatus for purifying waste waters. 4,104,167, Cl. 210-195.00S.
- Beyl, Jean Joseph Alfred. Ski binding. 4,103,929, Cl. 280-611.000.
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- Bidler, James L., to Minnesota Mining and Manufacturing Company. Porous lubricant-impregnated bearing. 4,104,176, Cl. 252-12.200.
- Bieler, Anne C.; and Schirmer, Henry G., to W. R. Grace & Co. Cross-linked amide/olefin polymeric tubular film coextruded laminates. 4,104,404, Cl. 428-35.000.
- Bien, Hans-Samuel: *See—*
  - Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,104,284, Cl. 260-378.000.
- Biermann, Frederick: *See—*
  - Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
- Billion S.A.: *See—*
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- Bills, Franklin Deloy, to Elkhart Products Corporation. Branch fitting for a pipe. 4,103,940, Cl. 285-189.000.
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- Biosonics, Inc.: *See—*
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- Bischoff, William Frederick: *See—*
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- Bjorksten Research Laboratories, Inc.: *See—*
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- Black, James Whyte; and Parsons, Michael Edward, to Smith Kline & French Laboratories Limited. Pharmaceutical compositions and methods of inhibiting H-1 and H-2 histamine receptors. 4,104,382, Cl. 424-247.000.
- Black, Robert B. Supporting or stabilizing device. 4,103,625, Cl. 108-44.000.
- Blair, Edgar Allan, to Monster Molding, Inc. Method of rotational molding about plural axes at low rotational speeds. 4,104,357, Cl. 264-255.000.
- Blakeman, Carl E. Billiard glove. 4,103,362, Cl. 2-161.00A.
- Blank, Wilhelm; and Roth, Ernst, to Klein, Schanzlin & Becker AG. Means for collecting moisture in canned electric motors. 4,104,551, Cl. 310-88.000.
- Bless, Stephan J.: *See—*
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- Blizzard, John D.; and Monroe, Carl M., to Dow Corning Corporation. Process for shaping low durometer siloxane elastomers containing polytetrafluoroethylene powder. 4,104,351, Cl. 264-236.000.
- Bloch, Maurice, to Smith Kline & French Laboratories Limited. Method of treating magnesium/potassium depletion. 4,104,370, Cl. 424-153.000.
- Block, Dieter, to Electroacustic GmbH. Echo-sounding recorder with different depth-measuring ranges. 4,104,643, Cl. 346-17.000.
- Block, Robert S.: *See—*
  - Martin, John R.; and Block, Robert S., 4,104,486, Cl. 179-2.0AM.
- Blomberg, Richard Nelson: *See—*
  - Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
- Blount, David H. Process for the production of poly(allylhalide-allyl alcohol). 4,104,456, Cl. 526-194.000.
- Blu, Gilbert; and Lazarre, Flavien, to Societe Nationale Elf Aquitaine (Production). Device for dispersing exhaust gases. 4,103,707, Cl. 137-604.000.
- Blum, Gunther; and Stark, Gerhard, to Stama Stark Maschinenfabrik Gotthilf Stark. Tool changing arrangement. 4,103,405, Cl. 29-26.00A.
- Blumcraft of Pittsburgh: *See—*
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- Blumenthal, John; and Brown, Arling Dix, Jr., to Gould Inc. Electric spark recording. 4,104,648, Cl. 346-163.000.
- Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, to Rohm GmbH. Film forming aqueous synthetic resin dispersions and paints prepared therefrom. 4,104,227, Cl. 260-29.6HN.
- Boettcher, Fritz Peter: *See—*
  - Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
- Boggs, Ronald M.: *See—*
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- Bohli, William H., to United States of America, Navy. Shrouded chemical light source. 4,104,708, Cl. 362-34.000.
- Bohnstedt, Werner; and Stommel, Manfred, to Electrochem, Inc. Pri-

mary battery of the remotely activated type. 4,104,449, Cl 429-110.000.

- Bohringer, Walter: *See—*
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- Bolen, Charles E.: *See—*
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- Boltze, Karl-Heinz, Brendler, Otfried; and Seidel, Peter-Rudolf, to Troponwerke Dinklage & Co. Process for the production of compounds with antiphlogistic activity. 4,104,278, Cl 260-326.13A.
- Bondur, James Allan, and Pogge, Hans Bernhard, to International Business Machines Corporation. Method for forming isolated regions of silicon utilizing reactive ion etching. 4,104,086, Cl 148-1.500
- Bonitz, Eckhard: *See—*
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- Bonnet, Pierre: *See—*
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- Booker, Ernest R., to Plan Partitions Limited. Securing of doorways 4,103,458, Cl 49-56.000
- Borello, Domenic. Electric motor for general purposes (II). 4,104,548, Cl 310-14.000
- Borg-Warner Corporation: *See—*
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  - Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., 4,104,173, Cl 252-8.55R
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- Borsig Gesellschaft mit beschrankter Haftung: *See—*
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- Boser, Ronald J., to B & W Manufacturing Co., Inc. Sewing apparatus. 4,103,562, Cl 74-567.000.
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- Bottum, Edward W. Water heater-dehumidifier combination heat pump. 4,103,509, Cl 62-238.000
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- Boujard, Claude, and Vilaldach, Joseph. Lifting device for use in a liquid medium. 4,104,082, Cl 134-141.000
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- Bouvard, Jacques: *See—*
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- Bowles, Theodore L., to Singer Company, The. Stepping motor shaft position determining arrangement. 4,103,632, Cl 112-158.00E
- Boyd, Byron W.: *See—*
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- Boyer, Nicodemus E., to Borg-Warner Corporation. Flame-retardant polymers with 1,3,5-triazines having halo- and halo-aryl substituents 4,104,250, Cl 260-45.8NT
- Bradburn, Robert A., to United States of America, Interior. Current limiting circuit for direct current power supplies. 4,104,544, Cl 307-297.000.
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- Braid, Murray D. Log splitting machine. 4,103,724, Cl 144-193.00A.
- Brailsford, Gerold Wayne. Mixer apparatus. 4,104,737, Cl 366-65.000
- Brandenburger, A. M., Helms, C. R., and Barker, D. F., to Container Corporation of America. Carton with transverse partition and method of assembling same. 4,103,770, Cl 206-193.000
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- Brannan, James R., Malkin, Irving, and Brown, Claude M., to Diamond Shamrock Corporation. Method of in situ plating of an active coating on cathodes of alkali halide electrolysis cells. 4,104,133, Cl 204-25.000
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  - Braun, Ernst; and Braun, Gert, 4,103,832, Cl. 241-38.000
- Brealey, Robert Harwood, to General Electric Company. Disconnect contact assembly for metal-clad switchgear and the like. 4,104,497, Cl 200-305.000
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- Breger-Mueller Welt Corp.: *See—*
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- Brocoff, Jack, to Ralph M. Parsons Co. Hydrogen generation from flue gases. 4,104,191, Cl. 252-188.000
- Brodeur, Lester R., to Sanders Associates, Inc. LORAN-C navigation apparatus. 4,104,635, Cl 343-103.000
- Broering, Leo H., and Duncan, Gary W., to National Distillers and Chemical Corporation. Melt dispersion saponification of ethylene vinyl acetate polymer. 4,104,453, Cl 526-10.000
- Bronicki, Yehuda L., to Ormat Turbines (1965) Ltd. Hybrid electric power generating system. 4,104,535, Cl. 290-52.000.
- Brooker, Gary; Terasaki, Wesley L.; and Price, Michael G., to University of Virginia. Immunoassay separation technique. 4,104,026, Cl 23-230.00B
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- Bucchianeri, Bernard A.; and Senchur, Robert A., to United States Steel Corporation. In-service cleaning of a liquid level sensor. 4,103,552, Cl. 73-309.000.
- Buchler, Wilhelm; Muller, Gotthard; and Mende, Hans-Joachim, to Dyckerhoff & Widmann Aktiengesellschaft. Arrangement for the sectional cantilever projection of multi-panel bridge supporting structures of steel or prestressed concrete. 4,103,861, Cl. 249-20.000.
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- Bunker Ramo Corporation: *See—*
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- Burroughs Corporation: *See—*
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  - Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,104,700, Cl. 361-384.000.
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- Buter, Roelof, to Akzo N.V. High solids pigment coating composition. 4,104,240, Cl. 260-39.00P.
- Butterfield, Max E.; and Molnar, John, to Caterpillar Tractor Co. Seat cover. 4,103,968, Cl. 297-219.000.
- Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Thermoplastic polyesters prepared from dicarboxylic acids containing N-heterocyclic rings. 4,104,297, Cl. 528-289.000.
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- Bylsma, Simon, to Continental Belton Co. Three point hitch apparatus for supporting an implement underneath a tractor. 4,103,474, Cl. 56-15.900.
- Byrd, Carlisle O., Jr., to Johns-Manville Corporation. Refractory fiber blanket module for furnace areas with high gas velocities. 4,103,469, Cl. 52-509.000.
- Bytzek, Max: *See—*
  - Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, 4,104,444, Cl. 428-474.000.
- C. I. Hayes Inc.: *See—*
  - Westeren, Herbert W.; and McCally, Richard P., 4,103,880, Cl. 266-253.000.
- C M Industries: *See—*
  - Krausz, Francois, 4,104,383, Cl. 424-248.400.
- Caffarel, Jean-Claude; and Papillon, Bernard, to Rhone-Poulenc Industries. Organosilicon anti-foaming compositions. 4,104,186, Cl. 252-89.00R.
- Calderon, Albert. Apparatus for controlling emissions from oxygen steelmaking furnaces. 4,103,879, Cl. 266-158.000.
- Calderon, Albert. Coke quenching car. 4,104,130, Cl. 202-230.000.
- Caldwell, Samuel I., to Caterpillar Tractor Co. Limited slip differential. 4,103,564, Cl. 74-650.000.
- Canada Square Management Ltd.: *See—*
  - Cooper, Kenneth R., 4,103,598, Cl. 98-31.000.
  - Moog, Gerhard W.; and Cooper, Kenneth R., 4,103,706, Cl. 137-574.000.
- Canada Wire and Cable Limited: *See—*
  - Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., 4,104,416, Cl. 427-29.000.
- Cann, Alfred J., to Sanders Associates, Inc. Modified A. M. detector. 4,104,594, Cl. 325-475.000.
- Canon Kabushiki Kaisha: *See—*
  - Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
  - Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.
  - Hosoe, Kazuya; and Yokota, Hideo, 4,104,652, Cl. 354-25.000.
  - Matsumoto, Seiichi; Matsuda, Mutsuhide; and Yokota, Hideo, 4,104,651, Cl. 354-25.000.
  - Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
  - Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.
  - Yamada, Yu, 4,103,990, Cl. 350-199.000.
- Cantatore, Giuseppe, to Montefibre S.p.A. Polyolefine-based polymeric compositions stabilized by organic polyamines, textile fibers obtained therefrom, and novel organic polyamines. 4,104,248, Cl. 260-45.80N.
- Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., to United States Steel Corporation. Fluid actuated sealing arrangement. 4,103,903, Cl. 277-27.000.
- Card & Co., Inc.: *See—*
  - Card, Roy T., 4,103,629, Cl. 112-79.00R.
- Card, Roy T., to Card & Co., Inc. Looper apparatus for forming cut pile and loop pile in the same row of stitching in a narrow gauge tufting machine. 4,103,629, Cl. 112-79.00R.
- Cardwell, Burton D.: *See—*
  - Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.
- Cargnino, Francesco; and Audisio, Giorgio, to Hoechst Aktiengesellschaft. Electroplating zinc. 4,104,139, Cl. 204-55.00R.
- Carlisle, Richard S. Horticultural method and apparatus. 4,103,457, Cl. 47-58.000.
- Carlson, Russell L.: *See—*
  - Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., 4,104,102, Cl. 156-298.000.
- Carlsson, Bengt Johan, to A B Motala Verkstad. Stroke-limiting arrangement in a multi-cylinder hydraulic press. 4,103,611, Cl. 100-257.000.
- Carmen, Hyman, to Evin Industries Ltd. Outerwear. 4,103,361, Cl. 2-97.000.
- Carmichael, William Earl. Tree harvesting blade. 4,103,723, Cl. 144-34.00E.
- Carolina Enterprises, Inc.: *See—*
  - Brooks, Bertram; and Speed, Eugene, 4,103,921, Cl. 280-267.000.

- Carreras Rothmans, Limited: *See—*
  - Prouse, Ronald Ernest; West, Anthony Alfred; King, Derek Anthony; and Poulson, Roger, 4,104,115, Cl. 162-100.000.
- Carroll, Robert B. Process for the presumptive identification of narcotics and drugs of abuse. 4,104,027, Cl. 23-230.00B.
- Carter, Herbert F., to Connecticut International Corporation. Airport light fixture. 4,104,711, Cl. 362-153.000.
- Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, to Texaco Inc. Imparting superior viscosity to aqueous polysaccharide solutions. 4,104,193, Cl. 252-316.000.
- Caruso, Gerard P., to Shell Oil Company. Grease compositions. 4,104,177, Cl. 252-51.50A.
- Cary, Francis H. Control valve. 4,103,696, Cl. 137-14.000.
- Cashman, Patrick Michael, to Sykes Construction Services Limited. Production of artificial islands. 4,103,502, Cl. 61-86.000.
- Caterpillar Tractor Co.: *See—*
  - Butterfield, Max E.; and Molnar, John, 4,103,968, Cl. 297-219.000.
  - Caldwell, Samuel I., 4,103,564, Cl. 74-650.000.
  - Kohler, Ramon C., 4,103,559, Cl. 74-471.0XY.
- Cefilac: *See—*
  - Berard, Michel; and Lecoustey, Andre, 4,103,568, Cl. 74-801.000.
- Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
  - Josis, Christian Rubens, 4,104,038, Cl. 55-19.000.
- Cerf, Donald B.; and Dreibus, Perry J. Rumble seat. 4,103,961, Cl. 296-63.000.
- Ceskoslovenska akademie ved: *See—*
  - Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, 4,104,363, Cl. 423-338.000.
- Champion International Corporation: *See—*
  - Vincent, David N.; and Chang, Cheng-Hsiung, 4,104,437, Cl. 428-307.000.
- Chan, Kingsley; Patel, Mahendra K.; and Wolkin, Sidney, to Lightolier Incorporated. Heat dissipating lighting fixture mount. 4,104,713, Cl. 362-294.000.
- Chaney, John F.: *See—*
  - Donahue, Thomas H.; and Chaney, John F., 4,104,633, Cl. 343-7.00A.
- Chang, Cheng-Hsiung: *See—*
  - Vincent, David N.; and Chang, Cheng-Hsiung, 4,104.437, Cl. 428-307.000.
- Chang, David T. L., to Recortec, Inc. Video recorder/reproducer transport having two movable tension guides for controlling tape tension. 4,104,685, Cl. 360-84.000.
- Chang, Louis H.: *See—*
  - Ruble, Frank D.; Chang, Louis H.; and Fravel, John C., 4,103,766, Cl. 197-62.000.
- Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., to PPG Industries, Inc. Two-package polymeric compositions. 4,104,230, Cl. 260-29.6NR.
- Chanton, Edmond, to Societe Generale de Mecanique et de Metallurgie. Screw pump stators. 4,104,009, Cl. 418-48.000.
- Chao, Tai S.; and Owston, Ernest H., Jr., to Atlantic Richfield Company. Iron-containing motor fuel compositions and method for using same. 4,104,036, Cl. 44-56.000.
- Chaput, Stanley H., to Raymond Lee Organization, Inc., The, a part interest. Vehicle headlight alarm. 4,104,613, Cl. 340-52.00D.
- Charles & Stella Guttman Breast Diagnostic Institute: *See—*
  - Strax, Norman, 4,104,528, Cl. 250-451.000.
- Charnley, Ralph L.; and Kumpula, Clyde A., to Pako Corporation. Automatic replenisher control. 4,104,670, Cl. 354-324.000.
- Chasek, Norman E. Vehicle identification system, using microwaves. 4,104,630, Cl. 343-6.50R.
- Chelton, Robert G. Device for treating waste water. 4,104,164, Cl. 210-136.000.
- Chemische Fabrik Dr. Wiedeking: *See—*
  - Ohm, Klaus, 4,104,235, Cl. 260-33.20R.
- Chemische Werke Huls, AG: *See—*
  - Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, 4,104,261, Cl. 260-873.000.
- Cheng, Jiin Duey, to Du Pont de Nemours, E. I., and Company. Substituted bromo- or chloro-acetamide herbicides. 4,104,051, Cl. 71-92.000.
- Chenot, Louis A., to Mid-Equipment, Inc. Trash compactor. 4,103,608, Cl. 100-53.000.
- Chenoweth, Terrence E.; and Yeoman, Frederick A., to Westinghouse Electric Corp. Silica-alumina trihydrate filled epoxy castings resistant to arced SF_6 4,104,238, Cl. 260-37.0EP
- Chesapeake and Ohio Railway Company, The: *See—*
  - Spatig, Thomas G., 4,103,817, Cl. 228-173.00C.
- Chevron Research Company: *See—*
  - Lavigne, Joe B., 4,104,477, Cl. 560-122.000.
  - Woo, Gar Lok; and House, Ralph, 4,104,023, Cl. 8-137.000.
- Chiang, Mutong T.; and Gibbons, John P., to CPC International Inc. Starch replacement for latex polymer. 4,104,213, Cl. 260-17.300.
- Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,103,582, Cl. 84-1.240.
- Chida, Atushi: *See—*
  - Ueno, Zene; Morita, Akira; and Chida, Atushi, 4,103,653, Cl. 123-117.00R.
- Chikao Kawada: *See—*
  - Kawada, Chikao; and Tsuchikura, Toshio, 4,103,451, Cl. 46-22.000.
- Chipman, Arthur H. Tigner, to Shell Oil Company. Method for detecting leaks in heat exchangers. 4,103,536, Cl. 73-40.000.
- Chiu, Herman Shin-Gee, to Union Carbide Corporation. Substantially neutralized aqueous liquid smoke compositions. 4,104,408, Cl. 426-135.000.
- Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
  - Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, 4,104,041, Cl. 55-90.000.
- Chlorine Engineers Corp.: *See—*
  - Kuri, Setuya; and Fuwa, Sinji, 4,104,039, Cl. 55-23.000.
- Choi, Ye-Chin: *See—*
  - Srinivasan, Vadake R.; and Choi, Ye-Chin, 4,104,124, Cl. 195-33.000.
- Chou, Kechia J.; and Hellmuth, Walter W., to Texaco Inc. Lubricating oil composition. 4,104,182, Cl. 252-51.50A.
- Christensen, Kenneth Kaae, to Koppers Company, Inc. Apparatus for urging web guides toward the corrugating roll of a single facer. 4,104,107, Cl. 156-473.000.
- Christman, William J., to UOP Inc. Mercaptan extraction process utilizing a stripped alkaline solution. 4,104,155, Cl. 208-235.000.
- Christopher, Charles A.: *See—*
  - Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, 4,104,193, Cl. 252-316.000.
- Chromalloy American Corporation: *See—*
  - Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., 4,103,475, Cl. 56-16.400.
- Chu, Daniel Tim-Wo: *See—*
  - Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, 4,104,306, Cl. 260-571.000.
- Chu, Joseph Y.; and Schank, Richard L., to Xerox Corporation. Elastomers and improved waterless lithographic printing masters. 4,103,616, Cl. 101-467.000.
- Chu, Simon Long: *See—*
  - Golda, Eugene; Wilkes, Alan Leonard; and Chu, Simon Long, 4,104,072, Cl. 96-68.000.
- Chu, Wesley W.; and Korff, Phillip B., to United States of America, Navy. Multi-access memory module for data processing systems. 4,104,719, Cl. 364-200.000.
- Chuchin, Alexandr Evgenievich; and Proskurin, Leonid Leonidovich. Method for protection vinyl polymers from thermo-oxidative destruction. 4,104,244, Cl. 260-45.70R.
- Chugunov, Viktor Dmitrievich: *See—*
  - Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
- Churgin, Walter G.: *See—*
  - Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
- Ciba-Geigy AG: *See—*
  - Smith, Norman Alfred; and Kitzing, Rainer, 4,104,302, Cl. 260-561.00S.
- Ciba-Geigy Corporation: *See—*
  - Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,104,297, Cl. 528-289.000.
  - Huebner, Charles Ferdinand, 4,104,396, Cl. 424-267.000.
  - Langley, Robert, 4,104,277, Cl. 260-314.500.
  - Miles, Peter; Hargreaves, James Roger; and Burrows, John, 4,104,423, Cl. 427-402.000.
  - Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, 4,104,224, Cl. 260-29.40R.
  - Oswald, Alexis A.; and Valint, Paul L., 4,104,378, Cl. 424-225.000.
  - Wegmuller, Hans; and Haase, Jaroslav, 4,104,160, Cl. 210-36.000.
- Cise, Michael D., to Eli Lilly and Company. Method of preparing stable sterile ampoules of crystalline cephalosporins for parenteral administration. 4,104,391, Cl. 424-246.000.
- Cise, Michael D.; and Osborne, Harold E., to Eli Lilly and Company. Crystallization process for cefazolin sodium. 4,104,470, Cl. 544-27.000.

- Citizen Watch Company Limited: *See—*
  - Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.
- CKD Praha, oborovy podnik: *See—*
  - Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.
- Claar, James A.: *See—*
  - Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., 4,104,230, Cl. 260-29.6NR.
- Clairol, Inc.: *See—*
  - Burian, Paul D.; and Sempliner, Arthur T., 4,103,694, Cl. 132-73.600.
- Clampitt, Bert H., to Gulf Oil Corporation. Copolymers containing an alpha-olefin and an alpha, beta-ethylenically unsaturated carboxylic acid plasticized with long-chain fatty acid. 4,104,216, Cl. 260-23.0AR.
- Clark, Gilbert A., to William Kenyon & Sons, Inc. Seam webbing. 4,103,717, Cl. 139-383.00A.
- Clarke, James Albert, to Dow Chemical Company, The. Process for preparing high molecular weight polyether resins from bisphenols and epoxy resins. 4,104,257, Cl. 528-102.000.
- Clean Energy Corporation: *See—*
  - Cramer, Frank B., 4,104,056, Cl. 75-33.000.
- Clecon Incorporated: *See—*
  - Gregory, Raymond A.; and Wilcox, DeWitt Gifford, 4,104,097, Cl. 156-143.000.
- Clem, Arthur G., to American Colloid Company. Method of forming a water barrier around foundations. 4,103,499, Cl. 61-50.000.
- Clifft, Dale L.; and Green, Melvin G., to Melvin G. Green, Inc., a part interest. Tool for blowing insulation into an existing wall structure. 4,103,464, Cl. 52-127.000.
- Cochran, John M., Jr., to Frontier Electronics, Inc. Grid wire support. 4,104,696, Cl. 361-229.000.
- Cohen, David A.; and Lien, Charles, to Venus Scientific Inc. High switching speed high voltage power supply. 4,104,564, Cl. 315-171.000.
- Cohen, Sasson; and Fisher, Abraham, to Purdue Frederick Company, The. Spiro (1,3-dioxolane-4,3') quinuclidine compounds. 4,104,397, Cl. 424-267.000.
- Colamussi, Arturo; and Merli, Vittorio, to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A. Collapsible and expansible barrage. 4,103,496, Cl. 61-27.000.
- Colamussi, Arturo; and Merli, Vittorio, to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A. Manoeuvrable weir. 4,103,497, Cl. 61-27.000.
- Colato, Albert E.; and Formo, Jerome L., to Anchor Hocking Corporation. Apparatus for heating a food item while retaining its moisture and nutritional components. 4,103,736, Cl. 165-48.00R.
- Colclough, Terence, to Exxon Research & Engineering Co. Lubricating and petroleum fuel oil compositions containing azole polysulfide wear inhibitors. 4,104,179, Cl. 252-32.70E.
- Cole, Edward L.; Hess, Howard V.; and Guptill, Frank E., Jr., to Texaco Inc. Preparation of solid fuel-water slurries. 4,104,035, Cl. 44-51.000.
- Cole, Ernest R., Jr., to United States of America, Interior. Method for eliminating solution-level attack on cathodes during electrolysis. 4,104,132, Cl. 204-12.000.
- Coles, Donald Kennedy. Internal combustion engine. 4,103,655, Cl. 123-119.00B.
- Colledge, Gary C. Branded wood based composition board product. 4,104,429, Cl. 428-151.000.
- Collins, Cecil A.: *See—*
  - Fisher, Robert C.; and Collins, Cecil A., 4,103,933, Cl. 280-744.000.
- Collins, Frederick H., to Valcour Imprinted Papers, Inc. Method for making packaging particles and resulting product. 4,104,440, Cl. 428-402.000.
- Colt Industries Operating Corp.: *See—*
  - Garside, Arthur F.; and Avery, Dudley D., 4,103,652, Cl. 123-103.00R.
- Columbia Industries, Inc.: *See—*
  - Morgan, Wesley W.; and Davis, Frank E., 4,104,352, Cl. 264-250.000.
- Combe Incorporated: *See—*
  - Lapidus, Herbert; and Shansky, Albert, 4,104,021, Cl. 8-10.200.
- Combustion Engineering, Inc.: *See—*
  - Grubelich, Francis Thomas, 4,104,120, Cl. 176-50.000.
- Comitato Nazionale per l'Energia Nucleare-CNEN: *See—*
  - De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, 4,103,553, Cl. 73-425.000.
- Comm/Scope Company: *See—*
  - Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,104,481, Cl. 174-28.000.
- Commissariat a l'Energie Atomique: *See—*
  - Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, 4,103,677, Cl. 128-2.00V.
- Commonwealth of Australia, The: *See—*
  - Gillard, Paul O.; and Whiting, Kenneth B., 4,104,634, Cl. 343-18.00C.
- Communications Satellite Corp.: *See—*
  - Jacobus, Nelson Mortimer, Jr., 4,104,597, Cl. 330-43.000.
- Compagnie Francaise des Petroles, Societe Anonyme: *See—*
  - Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
- Compagnie Generale des Etablissements Michelin: *See—*
  - deZarauz, Yves, 4,104,265, Cl. 528-46.000.
- Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS) Societe Anonyme: *See—*
  - Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
- Compagnie Honeywell Bull (Societe Anonyme): *See—*
  - Poublan, Alain; Bachman, Charles; and Bouvard, Jacques, 4,104,718, Cl. 364-200.000.
- Compagnie Maritime d'Expertises, Societe Anonyme: *See—*
  - Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
- Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See—*
  - Retzer, Erich, 4,104,025, Cl. 23-230.00R.
- Conbere, John P., to Imperial Chemical Industries Limited. Method of making a coating composition containing a fluorocarbon polymer resin and an aluminum containing binder. 4,104,225, Cl. 260-29.60F.
- Conley, John L. Sheet gripping assembly. 4,103,401, Cl. 24-243.00K.
- Conlin, Donald B.: *See—*
  - Bernecker, Gunther, 4,103,658, Cl. 123-133.000.
- Connecticut International Corporation: *See—*
  - Carter, Herbert F., 4,104,711, Cl. 362-153.000.
- Conner, William R., Jr., to Stahl-Urban Company. Methods of manufacturing pants. 4,103,363, Cl. 2-227.000.
- Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 1-Substituted-2-(2-pyridinyl)ethanone N-oxides. 4,104,274, Cl. 260-295.0AM.
- Consolidated Energy Products Co.: *See—*
  - Johnston, Charles Richard; and MacGregor, James G., 4,103,926, Cl. 280-414.00R.
- Construction Specialties, Inc.: *See—*
  - Olsen, Robert W., 4,103,468, Cl. 52-473.000.
- Container Corporation of America: *See—*
  - Brandenburger, A. M.; Helms, C. R.; and Barker, D. F., 4,103,770, Cl. 206-193.000.
- Continental Belton Co.: *See—*
  - Bylsma, Simon, 4,103,474, Cl. 56-15.900.
- Continental Group, Inc., The: *See—*
  - Gerber, Howard L., 4,104,498, Cl. 219-10.430.
- Continental Oil Company: *See—*
  - Weimer, Dean R.; and Durr, Albert M., 4,104,454, Cl. 526-62.000.
- Continental Rubber Works: *See—*
  - Haytock, Benjamin, III, 4,103,713, Cl. 138-133.000.
- Control Components, Inc.: *See—*
  - Hoof, Robert Grant, 4,103,534, Cl. 73-37.000.
- Cook, Charles E. Stressed skin structural diaphragm. 4,103,470, Cl. 52-794.000.
- Cooper, Kenneth R., to Canada Square Management Ltd. Wall structure. 4,103,598, Cl. 98-31.000.
- Cooper, Kenneth R.: *See—*
  - Moog, Gerhard W.; and Cooper, Kenneth R., 4,103,706, Cl. 137-574.000.
- Coran, Aubert Y.; and Patel, Raman P., to Monsanto Company. Thermoplastic compositions of high unsaturation diene rubber and polyolefin resin. 4,104,210, Cl. 260-4.00R.
- Cordell, Finton P.: *See—*
  - Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
- Cordis Corporation: *See—*
  - Harris, Donald Leal, 4,103,690, Cl. 128-418.000.
- Cornelius, Harry C., to Monsanto Company. Detecting and sorting abnormal articles during blow molding. 4,104,343, Cl. 264-40.100.
- Cornellier, Joseph Rene, to Neretex Corp. Leno motion device. 4,103,716, Cl. 139-54.000.
- Corse, Louis Gaston, to Machines Chambon. Cutting machines for cutting up a web of material such as paper or cardboard. 4,103,595, Cl. 93-58.300.
- Cotrel, Claude: *See—*
  - Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,104,386, Cl. 424-250.000.

Cotton, Lou S.: *See—*

Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., 4,103,848, Cl. 244-17.130.

Coudray, Paul Amand Louis: *See—*

Duthion, Louis; Bonnet, Pierre; and Coudray, Paul Amand Louis, 4,103,702, Cl. 137-375.000.

Covey, Rupert A.; and Grahame, Robert E., Jr., to Uniroyal, Inc. Control of insects and acarids with alkynyl phenylphenol divalent aliphatic sulfites. 4,104,401, Cl. 424-303.000.

CPC International Inc.: *See—*

Bruner, Robert L., 4,104,212, Cl. 260-17.300.

Chiang, Mutong T.; and Gibbons, John P., 4,104,213, Cl. 260-17.300.

Danzig, Morris J.; and Milkovich, Ralph, 4,104,330, Cl. 260-880.00B.

Cramer, Frank B., to Clean Energy Corporation. Ore reduction using molten salts. 4,104,056, Cl. 75-33.000.

Crane Packing Co.: *See—*

Tankus, Harry, 4,103,904, Cl. 277-42.000.

Crissy, Robert J., to Powers Chemco, Inc. Method for organizing and preparing photogenerated printing media. 4,104,071, Cl. 96-41.000.

Cromer, Oscar M.: *See—*

Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.

Cronauer, Donald C.; and Kehl, William L., to Gulf Research & Development Company. Hydrogenating catalyst. 4,104,200, Cl. 252-465.000.

Cronin, John A.: *See—*

Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.

Cronin, Michael Joseph, to Lockheed Aircraft Corporation. Dual filament current limiting and status indicating circuit. 4,104,620, Cl. 340-642.000.

Crouse, Dennis N.: *See—*

Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,104,447, Cl. 429-15.000.

Cruz, Edmundo Novas; and Valadares, Alvaro Neff, to Sir James Farmer Norton & Co., Limited. Vertical rotary screen printing machine and ink supply therefore. 4,103,615, Cl. 101-120.000.

Csutor, Endre; Mittler, Leo; and Wortche, Rudolf. Arrangement for receiving contact potential responsive switching devices. 4,104,690, Cl. 361-45.000.

Cunningham, Robert E., to Goodyear Tire & Rubber Company, The. Process for the preparation of novel block polymers. 4,104,331, Cl. 260-880.00B.

Cupa Engineering Co. Ltd.: *See—*

Wignall, Norman, 4,103,630, Cl. 112-79.00R.

Curtin, Hoyt S. Pipe coupling. 4,103,943, Cl. 285-419.000.

Curtis, Glenn Howard: *See—*

Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,103,403, Cl. 26-91.000.

Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., to Upjohn Company, The. Process for molding a substantially isotropic isocyanate-based polymer foam bun. 4,104,346, Cl. 264-51.000.

Cuschera, Casper. Pop up drain fitting. 4,103,372, Cl. 4-286.000.

Custer, Lloyd Roy: *See—*

Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.

Cutler, Earl F., to Cutler Repaving, Inc. Depth control for asphalt pavement milling machine. 4,103,973, Cl. 299-39.000.

Cutler Repaving, Inc.: *See—*

Cutler, Earl F., 4,103,973, Cl. 299-39.000.

Dahle, Norman A., deceased, to Gulf Oil Corporation. 3-Benzyl-2-methylimino-5-phenyl-Δ^4-1,3,4-thiadiazolines and method of combating undesired plant growth. 4,104,053, Cl. 71-90.000.

Dai Nippon Toryo Co., Ltd.: *See—*

Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,104,223, Cl. 260-29.2EP.

Daigle, Milton L., to Tool Masters, Inc., a part interest. Oil well perforation testing device. 4,103,741, Cl. 166-147.000.

Dainichi-Nippon Cables, Ltd.: *See—*

Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.

Dalimonte, Alfred A.: *See—*

Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., 4,104,681, Cl. 358-141.000.

Dallas, Gary S.; and Pittaro, Richard J., to Krautkramer-Branson, Incorporated. Pulse peak detector circuit. 4,104,545, Cl. 307-351.000.

Dalmau, José Ma: *See—*

Lombardi, Victor J.; and Dalmau, José Ma, 4,103,518, Cl. 66-107.000.

Daly, Edwin R.: *See—*

Faber, Paul V.; Daly, Edwin R.; and Jain, Prithvi, 4,104,128, Cl. 201-4.000.

Damico, Frank M.; and O'Toole, Patrick John, to Joerns Furniture Company, Division of American Seating Company. Patient headwall unit. 4,104,710, Cl. 362-130.000.

Daniel, Danny O. Method and apparatus for correcting bent strut misalignment. 4,103,531, Cl. 72-380.000.

Danzig, Morris J.; and Milkovich, Ralph, to CPC International Inc. Synthesis and copolymerization of tapered block macromer monomers. 4,104,330, Cl. 260-880.00B.

Data General Corporation: *See—*

Gruner, Ronald Hans, 4,104,720, Cl. 364-200.000.

Dataproducts (Santa Clara), Inc.: *See—*

Hoffman, Richard Ernest; and Bruckner, Maximiliaan, 4,103,417, Cl. 29-737.000.

Date, Masakazu; and Wada, Masahiro, to Toyo Boseki Kabushiki Kaisha. Dispersion of linear polyester resin. 4,104,222, Cl. 260-29.20E.

Davidson, Amber Charles, to Boyd, Byron W. Apparatus for ultrasonic cleaning of carpet, upholstery, and similar materials. 4,103,519, Cl. 68-3.0SS.

Davies, Thomas J., Jr., to Fairchild Camera and Instrument Corporation. Digitally synthesized back-up frequency. 4,104,538, Cl. 307-64.000.

Davis, Albert F. Utensil with grease shield. 4,103,420, Cl. 30-129.000.

Davis, Donald H., to General Electric Company. Valve operator. 4,103,592, Cl. 91-448.000.

Davis, Frank E.: *See—*

Morgan, Wesley W.; and Davis, Frank E., 4,104,352, Cl. 264-250.000.

Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, to Amax Inc. Regeneration of organic extractants containing α-hydroxyoximes. 4,104,359, Cl. 423-139.000.

Davis, Stephen H., to Water Refining Company, Inc. Volume and time of day control for water softener regeneration. 4,104,158, Cl. 210-25.000.

Dawson International Limited: *See—*

Smith, Geoffrey Allan, 4,104,019, Cl. 8-2.000.

Day, Ronald: *See—*

Matthews, Bruce Ernest; and Day, Ronald, 4,103,419, Cl. 30-95.000.

Dayus, Lloyd Giddis. Air grille components and air grille therefrom. 4,103,601, Cl. 98-110.000.

De Laval Separator Company, The: *See—*

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Debeir, Rene Pierre, to European Atomic Energy Community (Euratom). Sealing of controlled-atmosphere containers by magnewelding. 4,103,813, Cl. 228-2.500.

De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, to Comitato Nazionale per l'Energia Nucleare-CNEN. Apparatus for the indirect monitoring of the radioactive contamination of surfaces. 4,103,553, Cl. 73-425.000.

De Boel, Marcel: *See—*

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Fletcher, Edward Horton; and Wiegardt, Gordon K., 4,103,489, Cl. 60-395.000.

Deev, Pavel Ivanovich, deceased: *See—*

Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Deeva, Alexandra Ivanovna, administratrix: *See—*

Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Deguchi, Masahiro: *See—*

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Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., to Sandvik, Inc. Reel. 4,103,844, Cl. 242-107.000.

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Delaney, John H. Ventilation stop for windows. 4,103,947, Cl. 292-194.000.

del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, to Akzona Incorporated. Metal complex compounds of polyacyl-2,4-dihydrazino-5-triazines. 4,104,258, Cl. 528-334.000.

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Sleziona, Joseph; and Demarcq, Michel, 4,104,309, Cl. 260-606.50P.

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Demyon, Thomas R. Sight gauge device for flexible liquid carriers. 4,103,641, Cl. 116-117.00C.

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Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, to Atlas Copco Aktiebolag. Method for breaking rock by directing high velocity jet into pre-drilled bore. 4,103,971, Cl. 299-17.000.

Dennis, Bruce E.: *See—*

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Denton, George Terrance: *See—*

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Design & Manufacturing Corporation: *See—*

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Desmond, John W.; Kmec, Joseph F.; and Meyer, Charles A., to Westinghouse Electric Corp. Variable radius springback wavy seal. 4,103,905, Cl. 277-56.000.

Desormiere, Bernard; and Spitz, Erich, to Thomson-CSF. Electrically controlled optical switch. 4,103,988, Cl. 350-162.00R.

DeSoto, Inc.: *See—*

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Sekmakas, Kazys; and Hesler, Kenneth K., 4,104,229, Cl. 260-29.6RW.

Deuterium Corporation: *See—*

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Deutsch, Joseph Paul; and Jones, Ray A. Tilt-up panel bracket. 4,104,356, Cl. 264-297.000.

Deutsch, Ralph, to Kawaii Musical Instrument Mfg. Co. Constant speed portamento. 4,103,581, Cl. 84-1.240.

Deutsche Gold- und Silber-Scheideanstalt vormals Koessler: *See—*

Junkermann, Helmut; and Schwab, Heinrich, 4,104,162, Cl. 210-63.00R.

DeVitis, James L. Oil dip stick wiper. 4,103,388, Cl. 15-210.00B.

Dewald, James R.; and Markley, Lowell D., to Dow Chemical Company, The. Process for separating an ar, ar-dihalo-ar-alkylbenzene from an isomeric mixture of ar, ar-dihalo-ar-alkylbenzenes. 4,104,315, Cl. 260-650.00R.

de Wied, David: *See—*

Greven, Hendrik Marie; and de Wied, David, 4,104,371, Cl. 424-177.000.

DeWitt, Robert R., to Lutron Electronics Co., Inc. Dimmer switch with insulation housing. 4,104,606, Cl: 338-198.000.

deZarauz, Yves, to Compagnie Generale des Etablissements Michelin. Vulcanization process for preparation of polyurethane tires. 4,104,265, Cl. 528-46.000.

Diagnostic Information Inc.: *See—*

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Diamond Shamrock Corporation: *See—*

Brannan, James R.; Malkin, Irving; and Brown, Claude M., 4,104,133, Cl. 204-25.000.

Dickens, Lawrence E., to Westinghouse Electric Corp. Field effect pentode transistor. 4,104,673, Cl. 357-22.000.

DiCola, Joseph A., to Traffic Systems, Inc. Traffic light dimmer system. 4,104,562, Cl. 315-158.000.

Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., to United States Steel Corporation. Process for separating ammonia and acid gases from waste waters containing fixed ammonia salts. 4,104,131, Cl. 203-7.000.

Diehl: *See—*

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Dieterich, Frank L.; and Abrams, Stanton. Vegetable drying apparatus. 4,103,432, Cl. 34-58.000.

Dietrich, Hans, to Losinger AG. Means for extracting a soil anchor consisting of a prestressed steel tendon. 4,103,618, Cl. 102-22.00R.

Dillard, Lawrence. Karate combat shoe. 4,103,437, Cl. 36-2.00R.

DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, to Bell Telephone Laboratories, Incorporated. High power gallium arsenide schottky barrier field effect transistor. 4,104,672, Cl. 357-22.000.

Dima, Attila F.: *See—*

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DiMaria, Donelli J.; and Young, Donald R., to International Business Machines Corporation. Moderate field hole and electron injection from one interface of MIM or MIS structures. 4,104,675, Cl. 357-54.000.

Dinwiddie, Curt, to Lubrication Engineers, Inc. Impact grease tester. 4,103,533, Cl. 73-12.000.

Di Piazza, Learco; and Migoni, Angelo, to European Atomic Energy Community (Euratom). Method of electroerosion and an apparatus for producing cavities inside a solid metal component. 4,104,503, Cl. 219-69.00E.

Di Pilato, Nino Mario: *See—*

Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.

Ditcher, John, to A-Lok Corporation. Molded pleated gasket and device for installing same on pipe. 4,103,901, Cl. 277-9.500.

Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, to Square D Company. Digital welder control system. 4,104,724, Cl. 364-477.000.

Dixilyn International, Inc.: *See—*

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Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., to Air Products & Chemicals, Inc. End capped polyalkylene carbonates having improved thermal stablity. 4,104,264, Cl. 528-370.000.

Dixon, Guy E., to Panelfold Doors, Inc. Portable wall system. 4,103,463, Cl. 52-122.000.

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Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Dobo, Emerick J., to Monsanto Company. Method for making steel wire. 4,104,445, Cl. 428-567.000.

Dr. Beck & Co., AG: *See—*

Janssen, Harald; and Hansch, Ferdinand, 4,104,221, Cl. 260-29.20N.

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Donahue, Charles R.; and Terlecki, Leo, to GF Business Equipment, Inc. Removable furniture panel. 4,103,981, Cl. 312-257.00A.

Donahue, Thomas H.; and Chaney, John F., to International Telephone and Telegraph Corporation. Extended target-log CFAR processor. 4,104,633, Cl. 343-7.00A.

Donigian, Donald S. Ignition system. 4,103,659, Cl. 123-148.0DC.

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O'Brien, William L.; and Doran, Wayne M., 4,103,617, Cl. 101-93.030.

Dorling, Rolf; and Westebbe, Klaus, to L. & C. Steinmuller GmbH. Apparatus for drying wet steam and subsequently superheating the dried steam. 4,103,647, Cl. 122-483.000.

Dorman, William J.: *See—*

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Dorsch, Hans-Lothar; and Raue, Roderich, to Bayer Aktiengesellschaft. Cationic diazacyanine dyestuffs. 4,104,268, Cl. 260-158.000.

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Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.

Doss, Richard C., to Phillips Petroleum Company. Process for encapsulating objects and for forming flexible molds. 4,104,350, Cl. 264-225.000.

- Douglas, Anthony Frederick: *See—*
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- Douglas, Lawrence M., to Polaroid Corporation. Photographic apparatus having a spring driven motor. 4,104,659, Cl. 354-170.000.
- Dover Corporation: *See—*
  - Lasater, Donald A.; and Ebbesmeyer, Steven R., 4,103,938, Cl. 285-136.000.
- Dow Chemical Company, The: *See—*
  - Clarke, James Albert, 4,104,257, Cl. 528-102.000.
  - Dewald, James R.; and Markley, Lowell D., 4,104,315, Cl. 260-650.00R.
  - Hickner, Richard A., 4,104,283, Cl. 260-348.430.
  - Jones, Giffin D., 4,104,289, Cl. 260-42.410.
  - May, James A., Jr.; and Bressler, Wilbur L., 4,104,198, Cl. 252-429.00B.
  - Meyer, Victor E.; and Kem, Kenneth M., 4,104,228, Cl. 260-29.6NR.
- Dow Corning Corporation: *See—*
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  - Brooks, William T.; and Vincent, Gary A., 4,104,184, Cl. 252-63.700.
  - Klosowski, Jerome M.; and Romig, Charles A., 4,104,295, Cl. 260-448.20N.
- Dowd, Daniel J., to Westvaco Corporation. Stretchable material rewinding machine. 4,103,840, Cl. 242-67.30R.
- Draftex Development AG: *See—*
  - Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, 4,103,459, Cl. 49-491.000.
- Dreibus, Perry J.: *See—*
  - Cerf, Donald B.; and Dreibus, Perry J., 4,103,961, Cl. 296-63.000.
- Drew Chemical Corporation: *See—*
  - Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.
- Dridze, Lev Samuilovich: *See—*
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- Duble, Gerald R., to Gould Inc. Latch means for switch enclosure. 4,104,491, Cl. 200-50.00A.
- Duc, Nguyen-Cong; Brehant, Jean-Louis Marie; Pons, Benoit-Joseph; and Sechet, Maurice Henri, to Les Produits Organiques du Santerre Orsan. Process of producing a "xanthemonas-type" polysaccharide. 4,104,123, Cl. 195-31.00P.
- Ducret, Lucien C. Cable armor cutting machine. 4,103,578, Cl. 83-409.000.
- Dudley, Michael A.: *See—*
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- Duisburger Kupferhutte: *See—*
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- Duncan, Gary W.: *See—*
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- Dunlop, Andrew P., to Quaker Oats Company, The. Apparatus and process for catalytic gassing in the manufacture of foundry cores and molds, and the like. 4,103,729, Cl. 164-12.000.
- Dunn, Stanley A.; and Paquette, Elmer G., to Bjorksten Research Laboratories, Inc. Vitreous fiber drawing process. 4,104,355, Cl. 264-290.00R.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
  - Cheng, Jiin Duey, 4,104,051, Cl. 71-92.000.
  - Howard, Edward G., Jr., 4,104,243, Cl. 260-42.140.
  - Kauer, James Charles, 4,104,275, Cl. 260-297.00B.
- Dura Corporation: *See—*
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- Duraflame, Inc.: *See—*
  - Wu, Kent Yengtsu; and Barron, Roger S., 4,104,034, Cl. 44-10.00R.
- Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,104,381, Cl. 424-246.000.
- Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., to Union Carbide Corporation. Esters of 3-hydroxyindone compounds as herbicides and miticides. 4,104,043, Cl. 71-107.000.
- Durr, Albert M.: *See—*
  - Weimer, Dean R.; and Durr, Albert M., 4,104,454, Cl. 526-62.000.
- Dussart, Bernard Emile Andre, to Union Siderurgique du Nord et de l'Est de la France. Process for electromagnetic stirring. 4,103,730, Cl. 164-49.000.
- Duthion, Louis; Bonnet, Pierre; and Coudray, Paul Amand Louis, to Bertin & Cie. Sound proofed valve for fluid under pressure. 4,103,702, Cl. 137-375.000.
- Dutra, Gerard A., to Monsanto Company. Acetimidic (α-diaryloxyphosphinylmethylamino) acid ester hydrochlorides, herbicidal composition and herbicidal use thereof. 4,104,050, Cl. 71-86.000.
- Dworkin, Robert D.; and Ejk, Adam J., to M&T Chemicals Inc. Method for preparing organotin compounds. 4,104,292, Cl. 260-429.700.
- Dyckerhoff & Widmann Aktiengesellschaft: *See—*
  - Buchler, Wilhelm; Muller, Gotthard; and Mende, Hans-Joachim, 4,103,861, Cl. 249-20.000.
- Dynamit Nobel Aktiengesellschaft: *See—*
  - Schade, Gerhard, 4,104,262, Cl. 528-295.000.
  - Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,104,300, Cl. 260-544.00D.
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  - Zaffaroni, Alejandro, 4,104,196, Cl. 252-404.000.
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- E. R. Squibb & Sons, Inc.: *See—*
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  - Wade, Peter C.; and Kissick, Thomas P., 4,104,387, Cl. 424-250.000.
  - Wade, Peter C.; and Kissick, Thomas P., 4,104,388, Cl. 424-250.000.
  - Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, 4,104,400, Cl. 424-270.000.
- E-Systems, Inc.: *See—*
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- Eager, George S., Jr.: *See—*
  - Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.
- Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., to Morgan Adhesives Company. Method of making a retroreflective laminate. 4,104,102, Cl. 156-298.000.
- Eastman Kodak Company: *See—*
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  - Frank, Lee Fitzpatrick; and Lee, James Kelly, 4,104,657, Cl. 354-50.000.
  - Fuzek, John Frank, 4,104,439, Cl. 428-397.000.
  - Granger, Edward Maurice, 4,104,683, Cl. 360-9.000.
- Eaton Corporation: *See—*
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  - Pecsi, Louis E., 4,104,688, Cl. 361-28.000.
  - Rayment, Larry W.; and Kilbourn, Thomas S., 4,104,505, Cl. 219-76.160.
  - Richards, Donald L., 4,103,704, Cl. 137-522.000.
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  - Van Niel, Clarence R., 4,104,622, Cl. 340-572.000.
- Ebbesmeyer, Steven R.: *See—*
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- Eco-Control, Inc.: *See—*
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- Edgar Pickering (Blackburn) Limited: *See—*
  - Sedlaczek, Richard, 4,103,635, Cl. 112-266.000.
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  - Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, 4,103,971, Cl. 299-17.000.
- Edwards, Albert, to Baker Perkins Holdings Limited. Manufacture of foundry cores and moulds. 4,103,733, Cl. 164-160.000.
- Edwards, John. Method and apparatus for sterilization. 4,103,688, Cl. 128-303.170.
- Edwards, Robert W.: *See—*
  - Bean, Lawrence M.; Edwards, Robert W.; and Wright, Theodore, 4,104,617, Cl. 340-147.00R.
- Ehlers, Albert: *See—*
  - Scholz, Erwin; and Ehlers, Albert, 4,104,667, Cl. 354-250.000.
- Ehrich, Frederic Franklin, to General Electric Company. Spiral strip acoustic treatment. 4,104,002, Cl. 415-119.000.
- Ehrlich, Norman A. Offshore platform for ice-covered waters. 4,103,504, Cl. 61-102.000.
- Ehrlich, Shelton: *See—*
  - Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.
- Eisenbach, Wilhelm; Lehmkuhl, Herbert; and Wilke, Gunther, to Studiengesellschaft Kohle mbH. Process for the electrochemical synthesis of organic metal compounds. 4,104,140, Cl. 204-78.000.
- Eisenberg, Bernard C., to Solbern Corp. Method and apparatus for filling containers with liquid. 4,103,720, Cl. 141-1.000.

- Ejk, Adam J.: *See—*
  - Dworkin, Robert D.; and Ejk, Adam J., 4,104,292, Cl. 260-429.700.
- Eldridge, John S., Sr., to General Electric Company. Roll crimp machine. 4,103,527, Cl. 72-75.000.
- Electric Machinery Manufacturing Company: *See—*
  - Rohner, Thomas G., 4,104,689, Cl. 361-44.000.
- Electric Power Research Institute, Inc.: *See—*
  - Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.
- Electroacustic GmbH: *See—*
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- Electrochem, Inc.: *See—*
  - Bohnstedt, Werner; and Stommel, Manfred, 4,104,449, Cl. 429-110.000.
- Eley, Carl W. Permanent athletic field marker. 4,103,886, Cl. 272-3.000.
- Elf-Union: *See—*
  - Bernard, Jean Rene; and Nury, Jean, 4,104,320, Cl. 260-673.500.
- Eli Lilly and Company: *See—*
  - Beck, James Richard, 4,104,054, Cl. 71-103.000.
  - Cise, Michael D., 4,104,391, Cl. 424-246.000.
  - Cise, Michael D.; and Osborne, Harold E., 4,104,470, Cl. 544-27.000.
  - Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., 4,104,282, Cl. 260-345.300.
- Elizalde, Manuel Coll; and Bacardit, Juan Simon, to Bendix Corporation, The. Manufacturing method for a high pressure distributor rotor. 4,103,407, Cl. 29-157.10R.
- Elkhart Brass Manufacturing Co., Inc.: *See—*
  - Thompson, William S., 4,103,868, Cl. 251-283.000.
- Elkhart Products Corporation: *See—*
  - Bills, Franklin Deloy, 4,103,940, Cl. 285-189.000.
- Ellanin Investments, Ltd.: *See—*
  - Holland, David E., 4,104,680, Cl. 358-132.000.
- Ellison, Frederick John: *See—*
  - Barker, Philip Edwin; Hatt, Brian William; and Ellison, Frederick John, 4,104,078, Cl. 127-46.00R.
- Elmeg Elektro-Mechanik GmbH: *See—*
  - Reuting, Hans-Werner, 4,104,591, Cl. 324-205.000.
- Elms, Robert T.: *See—*
  - Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., 4,104,691, Cl. 361-96.000.
- Elsbett, Gunter: *See—*
  - Elsbett, Ludwig; and Elsbett, Gunter, 4,103,663, Cl. 123-188.00S.
- Elsbett, Ludwig; and Elsbett, Gunter. Cylinder head for internal combustion engines, especially diesel engines. 4,103,663, Cl. 123-188.00S.
- Elser, Wilhelm: *See—*
  - Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.
- Elsey, Paul G.: *See—*
  - Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.
- Elvin, Sten, to ASEA AB. Static converter equipment. 4,104,537, Cl. 307-58.000.
- Emco Industries, Inc.: *See—*
  - Engman, Norman R., 4,103,965, Cl. 297-192.000.
- Emerson Electric Co.: *See—*
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- Emhart Industries, Inc.: *See—*
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- Emmett, John Colin: *See—*
  - Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,104,381, Cl. 424-246.000.
- Endo, Hiroshi: *See—*
  - Fujiki, Norio; and Endo, Hiroshi, 4,104,632, Cl. 343-7.0VM.
- Endo, Kiyonobu: *See—*
  - Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
- Engdahl, Jean; and Matthey, Huber, to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A. Fastening and suspension element for a piezoelectric resonator. 4,104,553, Cl. 310-352.000.
- Engelsmann, Dieter: *See—*
  - Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.
- Engen, Glenn F., to United States of America, Commerce. Six-port measuring circuit. 4,104,583, Cl. 324-58.00A.
- Engman, Norman R., to Emco Industries, Inc. Fishing chair. 4,103,965, Cl. 297-192.000.
- Enlow, William Palmer: *See—*
  - Hechenbleikner, Ingenuin; and Enlow, William Palmer, 4,104,252, Cl. 260-45.80R.
- Erco Envirotech Ltd.: *See—*
  - Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,104,114, Cl. 162-29.000.
- Erich, Hans; Jordt, Alfred; and Konig, Klaus, to Anschutz & Co. G.m.b.H. Lubricating system for an antifriction bearing. 4,103,759, Cl. 184-64.000.
- Erickson, Henry, to Atlantic Richfield Company. Method for reforming hydrocarbons. 4,104,153, Cl. 208-138.000.
- Erickson, John W., to Kobe, Inc. Downhole cleaner assembly for petroleum wells. 4,103,749, Cl. 175-70.000.
- Erickson, Lloyd A.: *See—*
  - Pliml, Frank V.; and Erickson, Lloyd A., 4,103,854, Cl. 248-235.000.
- Ermolaev, Alexandr Ivanovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Ernest, Robert P., to Ford Motor Company. I-Beam apex seal. 4,104,011, Cl. 418-121.000.
- Ernst Leitz Wetzlar GmbH.: *See—*
  - Mesch, Franz; and Moll, Horst, 4,104,517, Cl. 250-204.000.
- Eschweiler Bergwerks-Verein AG: *See—*
  - Habert, Dietrich, 4,103,732, Cl. 164-147.000.
- Espenscheid, Wilton F.; Heilweil, Israel J.; and Yan, Tsoung Y., to Mobil Oil Corporation. Caliche control in an in situ leach operation. 4,103,963, Cl. 299-4.000.
- Esser, Hans-Theo: *See—*
  - Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.
- Ethyl Corporation: *See—*
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  - Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.
- Etoh, Kunihiko: *See—*
  - Nishimura, Hideo; and Etoh, Kunihiko, 4,103,668, Cl. 125-11.0CD.
- Etudes Petrolieres Marines, Societe a Responsabilite Limitee: *See—*
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- Eue, Ludwig: *See—*
  - Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.
- European Atomic Energy Community (Euratom): *See—*
  - Debeir, Rene Pierre, 4,103,813, Cl. 228-2.500.
  - Di Piazza, Learco; and Migoni, Angelo, 4,104,503, Cl. 219-69.00E.
- Evans, Dow J. Method and apparatus for celestial navigation. 4,104,722, Cl. 364-455.000.
- Evans, John C., Jr., to United States of America, National Aeronautics and Space Administration. Solar cells having integral collector grids. 4,104,084, Cl. 136-89.0CC.
- Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., to United States of America, National Aeronautics and Space Administration. Application of semiconductor diffusants to solar cells by screen printing. 4,104,091, Cl. 148-188.000.
- Evin Industries Ltd.: *See—*
  - Carmen, Hyman, 4,103,361, Cl. 2-97.000.
- Excel Industries, Inc.: *See—*
  - Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., 4,103,477, Cl. 56-202.000.
- Exxon Research & Engineering Co.: *See—*
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  - Hous, Pierre, 4,104,218, Cl. 260-23.70H.
  - Klemann, Lawrence P.; and Newman, Gerald H., 4,104,451, Cl. 429-194.000.
  - Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., 4,104,174, Cl. 252-8.55D.
  - Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.
  - Whitney, Thomas A.; and Klemann, Lawrence P., 4,104,450, Cl. 429-194.000.
  - Worley, Arthur C., 4,103,539, Cl. 73-86.000.
- Faber, Paul V.; Daly, Edwin R.; and Jain, Prithvi, to Wilputte Corporation. Apparatus and method for recovery of coal fines. 4,104,128, Cl. 201-4.000.
- Fabert, Herman A., Jr.: *See—*
  - Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,104,504, Cl. 219-73.100.
- Fackler, David G. Wad column for shotshells. 4,103,621, Cl. 102-95.000.

- Fahnoe, Erik: *See—*
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- Fairchild Camera and Instrument Corporation: *See—*
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  - Hayes, James A., 4,103,415, Cl. 29-571.000.
  - Herndon, William H., 4,104,734, Cl. 365-228.000.
- Fallier, Charles N., Jr.: *See—*
  - Proud, Joseph M., Jr.; and Fallier, Charles N., Jr., 4,104,556, Cl. 315-39.000.
- Fallis, Alexander Graham; Scott, John Marshall William; and Winter, June Gertrude. Cholesterol separation process. 4,104,286, Cl. 260-397.250.
- Fancher, Llewellyn W., to Stauffer Chemical Company. Isoxazole phosphates and phosphonates. 4,104,375, Cl. 424-200.000.
- Farrow, Max W.: *See—*
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- Faulstich, Eugene W. Pickup truck box enclosure. 4,103,956, Cl. 296-10.000.
- Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., to Delalande S.A. 1-(2'-Aroyl eth-1'yl) 2-(4"-acetamido piperazine-1"yl methyl) benzimidazoles and their therapeutical applications. 4,104,384, Cl. 424-248.510.
- Fauth, Gunter: *See—*
  - Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.
- Feder, Leo. Gravity impact indicator for shipping containers. 4,103,640, Cl. 116-114.0AH.
- Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, to Institut Sverkhtverdykh Materialov SSR; and Institut Fizicheskoi Khimii Akademii Nauk. Polycrystalline diamond member and method of preparing same. 4,104,441, Cl. 428-408.000.
- Fehn, Thomas Peter: *See—*
  - Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.
- Feinauer, Roland: *See—*
  - Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, 4,104,261, Cl. 260-873.000.
- Felch, Donald E.: *See—*
  - Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., 4,104,149, Cl. 208-64.000.
- Felt Products Mfg. Co.: *See—*
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- Feltgen, Karlheinz: *See—*
  - Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.
- Fenton, Sidney Desmond, to Storey Brothers and Company Limited. Vacuum formable materials. 4,104,430, Cl. 428-175.000.
- Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, to AGFA-Gevaert, AG. Method and apparatus for evaluating and processing a strip of originals to be copied. 4,103,996, Cl. 355-32.000.
- Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, to Parcor. Thieno [2,3-c] and [3,2-c] pyridines. 4,104,390, Cl. 424-256.000.
- Ferrante, Michael R. Improved wire stripping apparatus. 4,104,012, Cl. 425-299.000.
- Ferrara, William J.: *See—*
  - Wasilewski, Olgierd; Saltzman, Ronald; and Ferrara, William J., 4,104,143, Cl. 204-159.150.
- Ferrin, J. Paul: *See—*
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- Fetz, James G.; and Jensen, Ronald P. Method for the manufacture of intraocular lenses. 4,104,339, Cl. 264-1.000.
- Fidler, Horace E.: *See—*
  - Isbister, Eric J.; and Fidler, Horace E., 4,104,629, Cl. 343-6.00R.
- Fields, Marvin C.; and Wyse, Richard F., to United States Steel Corporation. Low temperature carbonization and desulfurization of coal under elevated pressures. 4,104,129, Cl. 201-17.000.
- Fife Corporation: *See—*
  - Brown, Jerald L.; and Shelton, John J., 4,103,859, Cl. 248-425.000.
- Filderman, Rene Gabriel, to Societe Anonyme Francaise du Ferodo. Brake friction-lining support. 4,103,761, Cl. 188-73.500.
- Finney, James L. Buffer spring for an impact tool. 4,103,747, Cl. 173-119.000.
- Firestone Tire & Rubber Company, The: *See—*
  - Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., 4,103,951, Cl. 293-71.00P.
  - Halasa, Adel Farhan, 4,104,465, Cl. 526-174.000.
- Fischbeck, Karl-Heinz, to Olympia Werke AG. Ink ejection. 4,104,646, Cl. 346-140.00R.
- Fischbeck, Kenneth H., to Xerox Corporation. Coincidence ink jet. 4,104,645, Cl. 346-140.00R.
- Fischer, Frank S., to Stanadyne, Inc. Spout tube assembly. 4,103,709, Cl. 137-615.000.
- Fischer, Harry A.; and Wrubel, Richard R., to Baker Perkins Inc. Methods and systems for making aerated candy. 4,104,412, Cl. 426-572.000.
- Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, to BASF Aktiengesellschaft. 4-m,m'-Di-t-butyl-p-hydroxyphenyl) butyl-2 compounds. 4,104,287, Cl. 260-404.000.
- Fischer, Ulf; and Hausler, Gunther, to Hoffmann-La Roche Inc. Cardioactive adenosine nitrates. 4,104,462, Cl. 536-26.000.
- Fisher, Abraham: *See—*
  - Cohen, Sasson; and Fisher, Abraham, 4,104,397, Cl. 424-267.000.
- Fisher, Robert C.; and Collins, Cecil A., to Fisher, Robert C. Floor anchor for seat belt. 4,103,933, Cl. 280-744.000.
- Fisk, Bernard C.; and Verschage, Gerald C., to Xerox Corporation. Programmable controller for controlling reproduction machines. 4,104,726, Cl. 364-518.000.
- Fisk, James C. Adjustable instrument mounting bracket. 4,103,852, Cl. 248-178.000.
- Fisons Limited: *See—*
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- Flanigen, Edith Marie: *See—*
  - Grose, Robert William; and Flanigen, Edith Marie, 4,104,294, Cl. 260-448.00C.
- Flatley, Doris W.: *See—*
  - Ipri, Alfred C.; and Flatley, Doris W., 4,104,087, Cl. 148-1.500.
- Fleischmann, Horst, to Gebruder Kommerling Kunststoffwerke GmbH. Arrangement for supporting a railing and the like. 4,104,000, Cl. 403-7.000.
- Fleming, Gordon R., to Atkins & Merrill, Inc. High temperature encapsulated electroluminescent lamp. 4,104,555, Cl. 313-512.000.
- Fletcher, Edward Horton; and Wiegardt, Gordon K., to Deere & Company. Total power fluid system. 4,103,489, Cl. 60-395.000.
- Fletcher, John K. Detachable sling letdown apparatus for lumber sorter. 4,104,156, Cl. 209-74.00R.
- Fleury, Guy J.: *See—*
  - Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
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  - Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
- Flippin, James Samuel, to J. I. Case Company. Trencher with offset drive wheels. 4,103,441, Cl. 37-86.000.
- Flynn, Thomas P.; and Wurster, James C., to Super Products Corporation. Hose reel apparatus. 4,103,841, Cl. 242-86.200.
- Fodor, Lawrence M., to Phillips Petroleum Company. Resinous radial-linear copolymer blend having blocks with a heterogeneity index ranging from 2.5 to 4. 4,104,326, Cl. 260-876.00B.
- Fogle, Edgar L.: *See—*
  - Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.
- Foley, Nelson D., to Bei Electronics, Inc. Ammunition firing system having means for electrically signaling presence or absence of ammunition. 4,103,585, Cl. 89-1.814.
- Fooke, Johannes, to G. L. Rexroth GmbH. Multistage pilot-controlled pressure-reducing valve. 4,103,703, Cl. 137-501.000.
- Ford, Michael E.: *See—*
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- Ford Motor Company: *See—*
  - Ernest, Robert P., 4,104,011, Cl. 418-121.000.
  - Parker, Robert J., 4,103,932, Cl. 280-718.000.
- Forkner, John H. Food product having expanded confection and method of manufacture. 4,104,405, Cl. 426-94.000.
- Formo, Jerome L.: *See—*
  - Colato, Albert E.; and Formo, Jerome L., 4,103,736, Cl. 165-48.00R.
- Forster, George A., to United States of America, Energy. Pressure sensor for high-temperature liquids. 4,103,555, Cl. 73-706.000.
- Forster, Gerhard; and Bohringer, Walter, to RCA Corporation. Horizontal deflection circuit with auxiliary power supply. 4,104,569, Cl. 315-408.000.
- Foseco Trading A.G.: *See—*
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- Foster, James H.: *See—*
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- Foster Wheeler Energy Corporation: *See—*
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- Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., to Inspiration Consolidated Copper Company. Flotation of sulfide minerals. 4,104,157, Cl. 209-166.000.

- Fournier, Erick-Pierre; and Hill, Ethel V. Clamp action sealing device for tab opening cans. 4,103,804, Cl. 220-281.000.
- Fowler, John T., to Laitram Corporation, The. Automatic piloting system. 4,103,638, Cl. 114-144.00E.
- Fox, Jack J.; and Burchenal, Joseph H., to Research Corporation. 2,2'-Anhydro-beta-D-arabinofuranosyl-5-fluorocytosine. 4,104,461, Cl. 536-23.000.
- Fox, Richard Samuel, to Eastman Kodak Company. Timing mechanism for sheet feed apparatus. 4,103,885, Cl. 271-117.000.
- Fox, Steve Allen: *See—*
  - Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,104,481, Cl. 174-28.000.
- Fraider, Harry: *See—*
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- Francis, Walter C., to Trans-ACC, Inc. Multiple spindle dividing head. 4,103,589, Cl. 90-56.00R.
- Franco, Colanzi; and Guido, Sapello, to SKF Industrial Trading and Development Company N.V. Differential pinion assembly, especially for motor vehicles. 4,103,567, Cl. 74-710.000.
- Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., to Singer Company, The. Sewing machine track storage system. 4,103,633, Cl. 112-217.100.
- Frank, Dieter: *See—*
  - del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.
- Frank, Harry, to ASEA AB. Equipment with controlled reactance. 4,104,576, Cl. 323-102.000.
- Frank, Lee Fitzpatrick; and Lee, James Kelly, to Eastman Kodak Company. Piezoelectric electronic shutter control for cameras. 4,104,657, Cl. 354-50.000.
- Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostics installation comprising a short-term switching mechanism. 4,104,525, Cl. 250-402.000.
- Frankel, Irwin, to Versar, Inc. Method for controlling diameters of microcrystalline mineral fibers. 4,104,395, Cl. 264-60.000.
- Franz Plasser Bahnbaumaschinen m.b.H.: *See—*
  - Theurer, Josef, 4,103,622, Cl. 104-7.00R.
- Franzl, Gertrude K. Anatomical digit and appendage-immobilizing device. 4,103,682, Cl. 128-87.00A.
- Fravel, John C.: *See—*
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- Frazita, Richard F., to Hazeltine Corporation. Doppler reference antenna with phased centerline emphasis. 4,104,636, Cl. 343-106.00D.
- Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., to National Semiconductor Corporation. Extended range current-to-time converter. 4,104,547, Cl. 307-362.000.
- Frehel, Daniel: *See—*
  - Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, 4,104,390, Cl. 424-256.000.
- Freiser, Henry: *See—*
  - Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, 4,104,359, Cl. 423-139.000.
- Freller, Walter, to "Wohn-Art" - Freizeitartikel Gesellschaft m.b.H. Mobile home. 4,103,462, Cl. 52-67.000.
- Frezza, Robert, to Samcoe Holding Corporation. Edge drive stop mechanism for fabric spreaders. 4,103,402, Cl. 26-74.000.
- Friedell, Morley V.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Friedell, Morley V., 4,103,712, Cl. 137-637.050.
- Friedman, Harvey S., to Polaroid Corporation. Thermally responsive photographic processing apparatus for use with self-processable film units. 4,104,669, Cl. 354-304.000.
- Fron, Frode. Plastic foot protector. 4,103,438, Cl. 36-72.00R.
- Frontier Electronics, Inc.: *See—*
  - Cochran, John M., Jr., 4,104,696, Cl. 361-229.000.
- Frost, Richard Butler; Juhasz, Joseph Laszlo; and Wing, Barry Walter, to Unisearch Limited. Pilot's kneepad. 4,103,809, Cl. 224-5.00R.
- Fry, Raymond C.: *See—*
  - Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., 4,104,102, Cl. 156-298.000.
- Fuji Oil Company, Limited: *See—*
  - Iwanaga, Yukiya; and Kubota, Hayato, 4,104,288, Cl. 260-412.800.
- Fuji Photo Film Co., Ltd.: *See—*
  - Fukuda, Susumu, 4,104,662, Cl. 354-187.000.
  - Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, 4,104,436, Cl. 428-297.000.
  - Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu, Shigehisa, 4,103,575, Cl. 83-298.000.
- Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, to Toyo Soda Manufacturing Co., Ltd. Method of removing scale caused by raffinate in a phosphoric acid purification process. 4,104,079, Cl. 134-2.000.
- Fujiki, Norio; and Endo, Hiroshi, to Nissan Motor Company, Limited. System for preventing collision of vehicles. 4,104,632, Cl. 343-7.0VM.
- Fujikura, Yoshiaki: *See—*
  - Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.
- Fujimaki, Taketoshi; Shijima, Shoji; and Harada, Shunichi, to Kawasaki Steel Corporation. Method of producing highly corrosion resistant tin-plated steel sheet. 4,104,135, Cl. 204-37.00T.
- Fujimoto, Teruo: *See—*
  - Nagasawa, Mitsuru; Fujimoto, Teruo; and Tago, Kazuo, 4,104,455, Cl. 526-173.000.
- Fujimura, Eiji. Automatic system for providing telephone number information service. 4,104,717, Cl. 364-200.000.
- Fujisawa, Isao: *See—*
  - Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
- Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, to Izumi Denki Corporation. Pneumatic timer. 4,104,602, Cl. 335-61.000.
- Fujitsu Limited: *See—*
  - Nishioka, Hideya, 4,103,814, Cl. 228-6.00A.
- Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., to Eli Lilly and Company. Novel 3-(oxygenated alkyl)-1,9-dihydroxy and 1-hydroxy-9-keto dibenzo[b,d]pyrans. 4,104,282, Cl. 260-345.300.
- Fukuda, Susumu, to Fuji Photo Film Co., Ltd. Folding type photographic camera. 4,104,662, Cl. 354-187.000.
- Fukushima, Tadahide: *See—*
  - Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.
- Fuller, Aubrey M.: *See—*
  - Burdette, Robert E.; and Fuller, Aubrey M., 4,103,728, Cl. 160-368.00R.
- Fulton, Frank F., to Raymond Lee Organization, Inc., The, a part interest. Board game. 4,103,898, Cl. 273-248.000.
- Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased (by Simonides, Charlotte, executrix), to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Mining machine particularly a drum-cutter mining machine. 4,103,975, Cl. 299-43.000.
- Furmaga, Robert Edwin: *See—*
  - Labit, Sidney James; and Furmaga, Robert Edwin, 4,103,710, Cl. 137-624.130.
- Furuichi, Mitsuyuki: *See—*
  - Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, 4,103,873, Cl. 254-168.000.
- Fuwa, Sinji: *See—*
  - Kuri, Setuya; and Fuwa, Sinji, 4,104,039, Cl. 55-23.000.
- Fuzek, John Frank, to Eastman Kodak Company. Textile fiber. 4,104,439, Cl. 428-397.000.
- G. D. Searle & Co.: *See—*
  - Baran, John S.; and Laos, Ivar, 4,104,271, Cl. 260-239.570.
- G. L. Rexroth GmbH: *See—*
  - Fooke, Johannes, 4,103,703, Cl. 137-501.000.
- G. M. Tool Corporation: *See—*
  - Moeller, Richard H., 4,103,798, Cl. 215-305.000.
- Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, to International Business Machines Corporation. Synthesis of squaric acid. 4,104,308, Cl. 260-586.00R.
- GAF Corporation: *See—*
  - Azorlosa, Julian L., 4,104,458, Cl. 526-264.000.
  - Loofbourow, Donald I.; and Lach, Robert E., 4,103,846, Cl. 242-205.000.
- Gallagher, Gregory, Jr.; Pfeiffer, Francis R.; and Weinstock, Joseph, to SmithKline Corporation. Substituted 1-alkylthiophenyl-2,3,4,5-tetrahydro-1H-3-benzazepine compounds. 4,104,379, Cl. 424-244.000.
- Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, to Hoffmann-La Roche Inc. Taurine and glycine derivatives. 4,104,285, Cl. 260-397.100.
- Gamber-Johnson, Inc.: *See—*
  - Morrison, Lowell D.; and Moon, Howard R., 4,103,983, Cl. 339-91.00R.
- Gana, John: *See—*
  - Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., 4,103,903, Cl. 277-27.000.
- Ganellin, Charon Robin: *See—*
  - Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,104,381, Cl. 424-246.000.
- Gannon, John Allister: *See—*
  - Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, 4,104,224, Cl. 260-29.40R.

- Garabedian, Armen. Process for making a plastic sheet. 4,104,101, Cl. 156-285.000.
- Garcea, Giampaolo, to Alfa Romeo S.p.A. Mixture feed regulation device for an internal-combustion engine. 4,104,337, Cl. 261-39.00A.
- Garrett, George A.; and Shacter, John, to United States of America, Energy. Gaseous diffusion system. 4,104,037, Cl. 55-16.000.
- Garside, Arthur F.; and Avery, Dudley D., to Colt Industries Operating Corp. Auxiliary engine governing system. 4,103,652, Cl. 123-103.00R.
- Gartshore, Peter A.; and Ward, James O., to Pak-Well Corporation. Shipping envelope. 4,103,821, Cl. 229-74.000.
- Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, to Laboratoire Suisse de Recherches Horlogeries; and Gutehoffnungshutte Sterkrade Aktiengesellschaft. Diffusion barrier and separation substance for metal parts adjoining each other in an oxygen free atmosphere. 4,104,096, Cl. 156-89.000.
- Gaston, Charles O. Conditioner drill. 4,103,628, Cl. 111-52.000.
- Gates Rubber Company, The: *See—*
  - Hush, James M.; and McPhee, Donald J., 4,104,098, Cl. 156-149.000.
  - Pennell, Phillip E., 4,103,410, Cl. 29-403.000.
- Gaucher, Jean-Claude: *See—*
  - Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, 4,103,677, Cl. 128-2.00V.
- Gaudel, Jacques. Apparatus for successively positioning a series of radiographic film cassettes at a film-exposing station. 4,104,529, Cl. 250-470.000.
- Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., to Borg-Warner Corporation. Gelling agents for hydrocarbon compounds. 4,104,173, Cl. 252-8.55R.
- Gayle, Harold R.: *See—*
  - Wagner, Walter D.; and Gayle, Harold R., 4,103,705, Cl. 137-544.000.
- Gaz de France: *See—*
  - Alin, Jean-Marie Georges Fernand, 4,104,017, Cl. 431-352.000.
- Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
  - Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased, 4,103,975, Cl. 299-43.000.
  - Nowacki, Georg; and Weber, Karl-Heinz, 4,103,974, Cl. 299-43.000.
- Gebruder Kommerling Kunststoffwerke GmbH: *See—*
  - Fleischmann, Horst, 4,104,000, Cl. 403-7.000.
- Gebrueder Heller, Maschinenfabrik Gesellschaft mit beschraenkter Haftung: *See—*
  - Schmid, Karlheinz, 4,103,588, Cl. 90-11.00A.
- Geffroy, Robert. Piston and scraper ring assembly. 4,103,594, Cl. 92-159.000.
- Gehrmann, Klaus: *See—*
  - Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.
  - Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
- Gelhaar, Hans-Georg: *See—*
  - Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, 4,104,324, Cl. 260-857.0TW.
- General Atomic Company: *See—*
  - Housman, Joseph J., 4,104,118, Cl. 176-38.000.
- General Cable Corporation: *See—*
  - Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.
  - Thompson, Paul F., 4,104,480, Cl. 174-23.00C.
- General Electric Company: *See—*
  - Boudreaux, Lee J.; and Foster, James H., 4,104,605, Cl. 338-2.000.
  - Brealey, Robert Harwood, 4,104,497, Cl. 200-305.000.
  - Davis, Donald H., 4,103,592, Cl. 91-448.000.
  - Ehrich, Frederic Franklin, 4,104,002, Cl. 415-119.000.
  - Eldridge, John S., Sr., 4,103,527, Cl. 72-75.000.
  - Hanson, James M.; Palagyi, Stanley S.; and Povall, Gerald W., 4,104,706, Cl. 362-10.000.
  - Hesler, Joseph P., 4,104,619, Cl. 340-629.000.
  - Kochanowski, John Edward; and Wambach, Allen Dale, 4,104,242, Cl. 260-40.00R.
  - Levand, Victor A., Jr.; and Lenkner, William A., 4,104,705, Cl. 362-5.000.
  - Mark, Victor; and Wilson, Phillip Steven, 4,104,231, Cl. 260-30.80R.
  - Mark, Victor, 4,104,245, Cl. 260-45.70S.
  - Mark, Victor, 4,104,246, Cl. 260-45.70S.
  - Mark, Victor, 4,104,253, Cl. 260-45.8RW.
- General Electric Company Limited, The: *See—*
  - Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, 4,104,586, Cl. 324-83.00D.
- General Foods Corporation: *See—*
  - Mathison, Frederic N.; and Straub, Roger E., 4,103,820, Cl. 229-37.00R.
  - Shanbhag, Sudhakar P.; Liggett, Louis G.; and Mikovits, Adrienne C., 4,104,415, Cl. 426-656.000.
  - Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,406, Cl. 426-99.000.
  - Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,407, Cl. 426-99.000.
- General Trailer Company, Inc.: *See—*
  - Schmidt, Kenneth J., 4,103,752, Cl. 177-141.000.
  - Schmidt, Kenneth J., 4,103,927, Cl. 280-482.000.
- Genzling, Claude. Method and structure for orienting a bicycle pedal. 4,103,563, Cl. 74-594.500.
- George, Delbert L., to Gould Inc. Narrowly knauled end cap for an electric fuse. 4,104,604, Cl. 337-248.000.
- Geosource Inc.: *See—*
  - Smither, Miles A., 4,104,596, Cl. 330-9.000.
- Gerasimenko, Valentin Korneevich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Gerber, Howard L., to Continental Group, Inc., The. Apparatus for and method of induction heating of metal plates with holes. 4,104,498, Cl. 219-10.430.
- Gerigk, Gunter: *See—*
  - Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, 4,104,444, Cl. 428-474.000.
- Gesell, Hartmut: *See—*
  - Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.
- GF Business Equipment, Inc.: *See—*
  - Donahue, Charles R.; and Terlecki, Leo, 4,103,981, Cl. 312-257.00A.
- Gibbons, John P.: *See—*
  - Chiang, Mutong T.; and Gibbons, John P., 4,104,213, Cl. 260-17.300.
- Gibson, George M. Spiral dasher for washing machines. 4,103,522, Cl. 68-133.000.
- Gibson, John George; and Tilley, Alec Roger, to British Railways Board. Alkali metal-sulphur cells. 4,104,448, Cl. 429-72.000.
- Giebel, Wolfgang; and Krause, Herbert, to Siemens Aktiengesellschaft. Sealing member for cable inlets. 4,103,911, Cl. 277-210.000.
- Gieck, Jack E.: *See—*
  - Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., 4,103,951, Cl. 293-71.00P.
- Gillard, Paul O.; and Whiting, Kenneth B., to Commonwealth of Australia, The. Ground plane corner reflectors for navigation and remote indication. 4,104,634, Cl. 343-18.00C.
- Gingell, Michael J., to International Standard Electric Corporation. Digital multiplier. 4,104,729, Cl. 364-757.000.
- Gitcho, Theodore N., to Mr. Drumstick, Inc. Cooking device. 4,103,606, Cl. 99-443.00C.
- Gits, Norbert W. Rotary seal with resilient diaphragm. 4,103,906, Cl. 277-88.000.
- Gilt, Jeffrey J. Adhesive device for cleaning hard to reach areas. 4,103,382, Cl. 15-104.00R.
- Glass, Carl R. Spear points for fence structure and method. 4,103,875, Cl. 256-59.000.
- Glass Industry Consultants, Inc.: *See—*
  - McCreery, Cecil Wayne, 4,104,046, Cl. 65-161.000.
- Glassman, Donald: *See—*
  - Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
- Glessner, James Stoy. Adjustable wooden studio bench. 4,103,969, Cl. 297-311.000.
- Glockner, Erhard; and Wittstadt, Anton, to Siemens Aktiengesellschaft. Braking device for drive motors. 4,103,763, Cl. 192-2.000.
- Glover, Douglas Wade: *See—*
  - Herrmann, Henry Otto, Jr.; and Glover, Douglas Wade, 4,104,521, Cl. 250-324.000.
- Gohda, Kyoko: *See—*
  - Sawa, Natsuo; and Gohda, Kyoko, 4,104,473, Cl. 548-342.000.
- Gold-Zack Werke AG: *See—*
  - Brues, Friedrich E., 4,103,485, Cl. 66-192.000.
- Golda, Eugene; Wilkes, Alan Leonard; and Chu, Simon Long, to Polychrome Corporation. Water developable lithographic printing plate having dual photosensitive layering. 4,104,072, Cl. 96-68.000.
- Golden Wonder Limited: *See—*
  - Moss, Alan, 4,103,751, Cl. 177-122.000.

- Goldwell GmbH Chemische Fabrik H.E. Dotter: *See—*
  - Wittersheim, Adam, 4,103,900, Cl. 277-2.000.
- Gomez, I. Luis, to Monsanto Company. Polyethylene modifiers for high nitrile polymers. 4,104,336, Cl. 260-897.00A.
- Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, to Hoffmann-La Roche Inc. Radioimmunoassay for methadone. 4,104,367, Cl. 424-1.000.
- Gomi, Shigenori: *See—*
  - Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, 4,103,873, Cl. 254-168.000.
- Gonsior, Michael J., to United States of America, Agriculture. Single line, traction driven running skyline system. 4,103,784, Cl. 212-94.000.
- Gonzalez, Rodolfo; and Penton, Allen P., III, to McDonnell Douglas Corporation. Production of muffler material. 4,104,426, Cl. 428-36.000.
- Goodyear Tire & Rubber Company, The: *See—*
  - Cunningham, Robert E., 4,104,331, Cl. 260-880.00B.
  - Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., 4,104,205, Cl. 260-2.300.
  - Wolfe, James D., 4,103,726, Cl. 152-330.00R.
- Gorlov, Alexander Moiseevich. Apparatus for harnessing tidal power. 4,103,490, Cl. 60-398.000.
- Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, to Canon Kabushiki Kaisha. Speed control device for a moving member. 4,104,573, Cl. 318-640.000.
- Goto, Tateo: *See—*
  - Murata, Takao; Nakamura, Nobutaka; and Goto, Tateo, 4,104,698, Cl. 361-321.000.
- Gottsegen, Marten. Blow molding method. 4,103,411, Cl. 29-416.000.
- Gould, Donald M.: *See—*
  - Kelly, Eugene R.; and Gould, Donald M., 4,104,013, Cl. 425-324.100.
- Gould, Herman Ray: *See—*
  - Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.
- Gould Inc.: *See—*
  - Blumenthal, John; and Brown, Arling Dix, Jr., 4,104,648, Cl. 346-163.000.
  - Duble, Gerald R., 4,104,491, Cl. 200-50.00A.
  - George, Delbert L., 4,104,604, Cl. 337-248.000.
- Goulter, Victor Harold. Vibrating disc separator. 4,103,777, Cl. 209-43.000.
- Graef, Myron Lee, to De Laval Separator Company, The. Air eliminator for pumps. 4,104,004, Cl. 417-313.000.
- Graef, Richard W., to Allis-Chalmers Corporation. Apparatus for removing solids from the water seal trough of an annular material cooler. 4,103,878, Cl. 266-78.000.
- Graham, Gordon L., to Rhode, Richard, a part interest. Flow control device for an irrigation ditch. 4,103,495, Cl. 61-12.000.
- Grahame, Robert E., Jr.: *See—*
  - Covey, Rupert A.; and Grahame, Robert E., Jr., 4,104,401, Cl. 424-303.000.
- Grainger, Frederick: *See—*
  - Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, 4,103,444, Cl. 40-124.100.
- Granados, Javier F. Portable-three-in-one bicycle tool. 4,103,378, Cl. 7-138.000.
- Granger, Edward Maurice, to Eastman Kodak Company. Video recording apparatus. 4,104,683, Cl. 360-9.000.
- Grapes, Eugene F.: *See—*
  - Patterson, W. W., III; and Grapes, Eugene F., 4,103,871, Cl. 254-164.000.
- Grau, Thomas George; and Tompsett, David Elliott, to Bell Telephone Laboratories, Incorporated. Apparatus for bonding electrical contacts to printed wiring circuit boards. 4,104,109, Cl. 156-521.000.
- Gray, Sharon Mae. Embroidery punch. 4,103,631, Cl. 112-80.000.
- Greb, Wolfgang: *See—*
  - Schmidt-Dunker, Manfred; and Greb, Wolfgang, 4,104,366, Cl. 424-1.000.
- Green Cross Corporation, The: *See—*
  - Ishii, Shozo, 4,103,687, Cl. 128-214.00R.
  - Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, 4,104,125, Cl. 195-66.00R.
- Green, Melvin G.: *See—*
  - Clifft, Dale L.; and Green, Melvin G., 4,103,464, Cl. 52-127.000.
- Green, Michael: *See—*
  - Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.
- Green, Winje: *See—*
  - Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.
- Greenheck, Robert R. Load carrying dolly with secured post casters. 4,103,919, Cl. 280-79.10A.
- Greenwood, Ivan Anderson, to Singer Company, The. Magnetic resonance apparatus. 4,104,577, Cl. 324-0.50F.
- Greer, Albert H.: *See—*
  - Mikes, John A.; Greer, Albert H.; and Norwood, Amos, 4,104,209, Cl. 521-62.000.
- Greer, H. William. Tool assembly, method of manufacture and components thereof. 4,103,574, Cl. 83-140.000.
- Gregg, Peter P.: *See—*
  - Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,104,700, Cl. 361-384.000.
- Gregory, Raymond A.; and Wilcox, DeWitt Gifford, to Clecon Incorporated. Method for making flexible duct. 4,104,097, Cl. 156-143.000.
- Grenfell, Hugh Willmott; and Bowen, David James, to British Steel Corporation. Steelmaking. 4,104,058, Cl. 75-60.000.
- Greven, Hendrik Marie; and de Wied, David, to Akzona Incorporated. Psychopharmacologically active peptides and peptide-derivatives, and the use thereof. 4,104,371, Cl. 424-177.000.
- Greyhound Exhibitgroup, Inc.: *See—*
  - McDonald, Leo S., Jr., 4,103,465, Cl. 52-127.000.
- Griepentrog, Hartmut: *See—*
  - Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,104,096, Cl. 156-89.000.
- Griessner, Peter: *See—*
  - Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.
- Griffin, William P., Jr.: *See—*
  - Angstadt, Howard P.; and Griffin, William P., Jr., 4,104,312, Cl. 260-610.00B.
- Grigoriev, Vladimir Konstantinovich: *See—*
  - Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
- Grose, Robert William; and Flanigen, Edith Marie, to Union Carbide Corporation. Crystalline silicates and method for preparing same. 4,104,294, Cl. 260-448.00C.
- Grosse-Entrup, Hubert, to Jean Walterscheid GmbH. Telescoping torque transmitting shaft. 4,103,514, Cl. 64-23.700.
- Grosse, Maurice. Support systems for articles of furniture. 4,103,855, Cl. 248-246.000.
- Grosser, Christian E. Constant velocity universal joint. 4,103,513, Cl. 64-21.000.
- Grote & Hartmann GmbH & Co KG: *See—*
  - Konnemann, Alfred, 4,104,699, Cl. 361-349.000.
- Groupement Atomique Alsacienne Atlantique: *See—*
  - Malaval, Claude, 4,104,121, Cl. 176-86.00R.
  - Malaval, Claude; and Picou, Jean-Loup, 4,104,122, Cl. 176-86.00L.
- Grubelich, Francis Thomas, to Combustion Engineering, Inc. Static fuel holddown system. 4,104,120, Cl. 176-50.000.
- Gruber, Robert J., to Xerox Corporation. Photoelectrophoretic imaging method employing dinaphtho-furan-dione pigments. 4,104,064, Cl. 96-1.0PE.
- Grudowski, Raymond A.; and Struger, Odo J., to Allen-Bradley Company. Asynchronous coupling of data between a word-oriented I/O module and the memory of a programmable controller. 4,104,731, Cl. 364-900.000.
- Grumman Aerospace Corporation: *See—*
  - Wakefield, Fancher B., 4,103,937, Cl. 285-110.000.
- Gruner, Ronald Hans, to Data General Corporation. CPU/Parallel processor interface with microcode extension. 4,104,720, Cl. 364-200.000.
- Grutsch, James F., to Standard Oil Company a corporation of Indiana. Regeneration of fixed bed filters. 4,104,163, Cl. 210-80.000.
- Gryctko, Carl E., to I-T-E Imperial Corp. Direct fault tripping of circuit breaker having solid state trip means. 4,104,601, Cl. 335-6.000.
- Grzybowski, John J.: *See—*
  - Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., 4,103,633, Cl. 112-217.100.
- GSW Limited - GSW Limitee: *See—*
  - Smith, David G., 4,103,671, Cl. 126-200.000.
- GTE Laboratories Incorporated: *See—*
  - Proud, Joseph M., Jr.; and Fallier, Charles N., Jr., 4,104,556, Cl. 315-39.000.
  - Proud, Joseph M., Jr., 4,104,557, Cl. 315-39.000.
  - Proud, Joseph M., Jr.; and McNeill, William H., 4,104,558, Cl. 315-39.000.
- Guazzone, Bruno: *See—*
  - Muller, Hans; and Guazzone, Bruno, 4,104,169, Cl. 210-331.000.
- Guerrieri, Salvatore A. Bubble cap tray. 4,104,338, Cl. 261-114.0TC.

- Guettel, Marvin A.: *See—*
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- Guido, Sapello: *See—*
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- Gulf Oil Corporation: *See—*
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  - Dahle, Norman A., deceased, 4,104,053, Cl. 71-90.000.
- Gulf Research & Development Company: *See—*
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  - Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
  - Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,104,281, Cl. 260-343.30R.
- Gulf & Western Corporation: *See—*
  - Baier, Robert J.; Anderson, Vern; and Aseltine, William S., 4,103,692, Cl. 131-32.000.
- Guptill, Frank E., Jr.: *See—*
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- Gurien, Harvey: *See—*
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- Gurwicz, David; and Sloan, Albert Everett, to Sevcon Limited. Pulse controllers. 4,104,571, Cl. 318-380.000.
- Gustafson, Burch O. Vented waterproof pants. 4,103,364, Cl. 2-406.000.
- Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See—*
  - Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,104,096, Cl. 156-89.000.
- Guthrie, Richard E.; and Allenbach, Ronald L. Tool apparatus for mounting on a housing. 4,103,557, Cl. 74-102.000.
- Guthrie, Robert William: *See—*
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- Gutsfeld, Anton Franz. Stream -or river-powered turbine. 4,104,536, Cl. 290-54.000.
- Guzick, Lawrence L. Pipe joint alignment measuring tool. 4,103,428, Cl. 33-180.00R.
- H.L.S. Ltd., Industrial Engineering Company: *See—*
  - Koslowsky, Ladislav, 4,104,290, Cl. 260-428.500.
- Haas, Charles A.; and Schenken, John E. Mirror holder. 4,103,860, Cl. 248-467.000.
- Haas, Herbert: *See—*
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- Haase, Jaroslav: *See—*
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- Haber, Terry M. Combination package and rack for pool balls. 4,103,773, Cl. 206-315.00B.
- Habermeier, Jurgen: *See—*
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- Habert, Dietrich, to ARBED, Acieries Reunies de Burbach-Eich-Dudelange S.A.; and Eschweiler Bergwerks-Verein AG. Device for the delivery and uniform distribution of lubricants. 4,103,732, Cl. 164-147.000.
- Hachisu, Takeshi; and Uchida, Akinari, to Hitachi, Ltd. Process for reprocessing atactic polypropylene. 4,104,206, Cl. 260-2.300.
- Hafner, Erich. Outdoor light fixture. 4,104,712, Cl. 362-218.000.
- Hagemann, Hermann: *See—*
  - Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,104,195, Cl. 252-350.000.
- Hagendorn, Heinrich, to Siemens Aktiengesellschaft. Hydraulic positioner for valves. 4,103,864, Cl. 251-63.600.
- Haghino, Sadaaki: *See—*
  - Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,104,549, Cl. 310-26.000.
- Hagino, Daiji: *See—*
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- Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, to Veba-Chemie Aktiengesellschaft. Process for the manufacture of ammonium polyphosphate. 4,104,362, Cl. 423-315.000.
- Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. High-vinyl homopolymers and copolymers of butadiene. 4,104,465, Cl. 526-174.000.
- Halasz, Peter: *See—*
  - Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
- Halbach and Braun: *See—*
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- Hall, H. Tracy: *See—*
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- Hall, John B.; and Wiegers, Wilhelmus Johannen, to International Flavors & Fragrances Inc. Perfume compositions containing catechol-camphene reaction products. 4,104,203, Cl. 252-522.000.
- Hall, L. D. Sand release apparatus for a pump. 4,103,739, Cl. 166-105.000.
- Hall & Myers: *See—*
  - Rabinow, Jacob, 4,103,570, Cl. 76-110.000.
- Hall, Nigel; Price, Raymond; and Rowbotham, Philip Martin, to Imperial Chemical Industries Limited. Process for the manufacture of aromatic phosphonates. 4,104,270, Cl. 260-205.000.
- Hall, Roger W. Portable cooling chest operatively attachable to an automobile air conditioning system. 4,103,510, Cl. 62-299.000.
- Hall, Wilbur S.: *See—*
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- Hallman, Arthur E., Jr.: *See—*
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- Hallman, Edward L.; and Hallman, Arthur E., Jr. Watchhand. 4,103,808, Cl. 224-4.00D.
- Halter, Mark A.: *See—*
  - Martan, Michael; and Halter, Mark A., 4,104,141, Cl. 204-78.000.
- Hamada, Nagaharu, to Hitachi, Ltd. Microprocessor controlled CRT display system. 4,104,624, Cl. 340-324.0AD.
- Hamby, Russell; and Ostrander, Kenneth A., to Reliance Electric Company. Digital control system for motors. 4,104,570, Cl. 318-318.000.
- Hamilton, James Guthrie: *See—*
  - Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, 4,104,285, Cl. 260-397.100.
- Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,104,106, Cl. 156-384.000.
- Hammann, Ingeborg: *See—*
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- Hammar, Walton J., to Riker Laboratories, Inc. Dibenzo[a,d]cycloheptenes. 4,104,475, Cl. 560-56.000.
- Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, to Hoechst Aktiengesellschaft. Fiber reinforced chemically modified protein articles. 4,104,444, Cl. 428-474.000.
- Hammonds, James C.; and Holt, Jan D., to ACF Industries, Incorporated. Railway car truck side bearings. 4,103,624, Cl. 105-199.0CB.
- Hamprecht, Gerhard: *See—*
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- Hansch, Ferdinand: *See—*
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- Hansen, Clarence M.; Harvey, John P.; and Ledebuhr, Richard L., to Dura Corporation. Pitting device for drupaceous fruit. 4,103,607, Cl. 99-548.000.
- Hansen, David R., to Shell Oil Company. Adhesive composition containing a pre-blended polyphenylene ether resin. 4,104,323, Cl. 260-829.000.
- Hansen, Lind, Meyer: *See—*
  - Schoenfelder, James L., 4,103,493, Cl. 60-641.000.
- Hanson, James M.; Palagyi, Stanley S.; and Povall, Gerald W., to General Electric Company. Photoflash lamp array having conductive reflector. 4,104,706, Cl. 362-10.000.
- Hanson, Richard A., to Systron-Donner Corporation. Servo system temporary destabilization circuit and method. 4,104,572, Cl. 318-631.000.
- Harada, Shunichi: *See—*
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- Hargreaves, James Roger: *See—*
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- Hargrove, Daniel J. Asynchronous digital locking system. 4,104,694, Cl. 361-172.000.
- Harnischfeger Corporation: *See—*
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- Harrigan, Roy M. Photographic printing and developing tray. 4,104,671, Cl. 354-337.000.
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- Harris Corporation: *See—*
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- Harris, Donald Leal, to Cordis Corporation. Self-suturing cardiac pacer lead. 4,103,690, Cl. 128-418.000.
- Harris, Donald Wayne: *See—*
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- Harris, Ramsay L. Versatile hand loom. 4,103,715, Cl. 139-33.000.
- Harter, B. Wayne. Marine navigational protractor. 4,103,425, Cl. 33-1.0SD.
- Hartleben, York: *See—*
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- Hartman, Richard L.: *See—*
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- Hartshorn, Stephen R., to Minnesota Mining and Manufacturing Company. Generation of chlorine dioxide for disinfection and sterilization. 4,104,190, Cl. 252-187.00R.
- Harukawa, Junichi: *See—*
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- Haruna, Tohru: *See—*
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- Hase, Alfred Max. Parallel redundant and load sharing regulated AC system. 4,104,539, Cl. 307-64.000.
- Hasebe, Nobuyasu. Method for treating seaweed with hydrogen peroxide or hydrogen peroxide compound. 4,104,460, Cl. 536-3.000.
- Hasebe, Tetsuzi, to Nissan Motor Company, Limited. Apparatus for removing flues from selvage yarn feeding device of weaving loom. 4,103,714, Cl. 139-1.00C.
- Hasegawa, Eiichi: *See—*
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- Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, to Toray Industries, Inc. Yarn winding apparatus. 4,103,833, Cl. 242-18.00A.
- Hashiba, Tatuya: *See—*
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- Hashimoto, Akihiko: *See—*
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- Hashimoto Corporation: *See—*
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- Hashimoto, Kazuo, to Hashimoto Corporation. Tape cassette with reel to reel and endless tapes. 4,104,686, Cl. 360-132.000.
- Hashimoto, Sadakatsu: *See—*
  - Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
- Hashimoto, Shigeru: *See—*
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  - Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
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  - Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
- Hasselman, Walter J., Jr.; and Hasselman, Walter J., Sr. Method and apparatus for continuously producing and applying foam. 4,103,876, Cl. 366-178.000.
- Hasselman, Walter J., Sr.: *See—*
  - Hasselman, Walter J., Jr.; and Hasselman, Walter J., Sr., 4,103,876, Cl. 366-178.000.
- Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, to Nissan Motor Company, Ltd. Method of controlling temperature in thermal reactor for engine exhaust gas and ignition system for performing same. 4,103,486, Cl. 60-274.000.
- Hatt, Brian William: *See—*
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- Hauck, Frederic Peter: *See—*
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- Haugwitz, Rudiger D.: *See—*
  - Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, 4,104,400, Cl. 424-270.000.
- Hausler, Gunther: *See—*
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- Hawaiian Trust Company Ltd.: *See—*
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- Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, to Shinagawa Refractories Co., Ltd. Refractories, batch for making the same and method for making the same. 4,104,075, Cl. 106-44.000.
- Hayes, James A., to Fairchild Camera and Instrument Corporation. Insulated-gate field-effect transistor with self-aligned contact hole to source or drain. 4,103,415, Cl. 29-571.000.
- Hayman, Edgar S., Jr.: *See—*
  - Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., 4,104,303, Cl. 260-570.900.
- Haytock, Benjamin, III, to Continental Rubber Works. Reinforced oil hose. 4,103,713, Cl. 138-133.000.
- Hazeltine Corporation: *See—*
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- Hedblom, Mats-Olov; and Sultan, Sven Gilbert, to Union Carbide Corporation. Low pressure ethylene polymer based compositions. 4,104,256, Cl. 260-45.95D.
- Heffler, Jochen, to Licentia Patent-Verwaltungs-G.m.b.H. Method of making gas diffusion electrodes for electrochemical cells with acid electrolytes. 4,104,197, Cl. 252-425.300.
- Hehl, Karl. Elastic support for hydraulic pump of injection molding. 4,104,007, Cl. 417-360.000.
- HEI, Inc.: *See—*
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- Heikes, James E.: *See—*
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- Heilweil, Israel J.: *See—*
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- Heinz, Gerhard: *See—*
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- Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., to N.P.I. Corporation. Meatball cooker. 4,103,605, Cl. 99-345.000.
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- Henkel Kommanditgesellschaft Auf Aktien: *See—*
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  - Schmidt-Dunker, Manfred; and Greb, Wolfgang, 4,104,366, Cl. 424-1.000.
- Herb, Eugen; and Brekle, Erich, to Trumpf Maschinen AG. Machine tool with at least one tool magazine. 4,103,414, Cl. 29-568.000.
- Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., to Murdock Machine & Engineering Company. Multi passage flexible connector. 4,103,939, Cl. 285-137.00A.
- Heringer, Ronald, to Natico, Inc. Manual taping device. 4,103,472, Cl. 53-139.300.

- Herndoo, John W., to United States of America, Navy. Head trackable wide angle visual system. 4,103,435, Cl. 35-12.00N.
- Herndon, William H., to Fairchild Camera and Instrument Corporation. Low voltage data retention bias circuitry for volatile memories. 4,104,734, Cl. 365-228.000.
- Herrmann, Henry Otto, Jr.; and Glover, Douglas Wade, to AMP Incorporated. Corotron connector. 4,104,521, Cl. 250-324.000.
- Herrmann, Manfred: *See—*
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- Hertrick, Thomas P.: *See—*
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- Hertwig, Askan; and Krampitz, Horst, to Riedel-de Haen Aktiengesellschaft. Curing agent for polysulfide-polymer compositions. 4,104,189, Cl. 252-186.000.
- Herweh, John E., to Armstrong Cork Company. Synthesis of sulfonyl semicarbazides. 4,104,301, Cl. 260-554.000.
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- Hewlett, Frank Wilson, Jr., to Texas Instruments Incorporated. Static RAM cell. 4,104,732, Cl. 365-179.000.
- Hiatt, Martin H. Metal can pelletizer. 4,103,609, Cl. 100-218.000.
- Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, to Nippon Soken, Inc. Switch for detecting collision of vehicle. 4,104,493, Cl. 200-61.45R.
- Hickey, Christopher Daniel Dowling. Packaging of goods on a vehicle. 4,103,810, Cl. 224-29.00R.
- Hickey, Robert; and Fahnoe, Erik. Tennis racquet string tension gauge. 4,103,546, Cl. 73-145.000.
- Hickner, Richard A., to Dow Chemical Company, The. Polythioetheralkyleneoxide epoxides. 4,104,283, Cl. 260-348.430.
- Hijikata, Akiko: *See—*
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohrū; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
- Hildebrandt, Herman F., to United States of America, Army. Method for hydrolyzing phosgene. 4,104,364, Cl. 423-481.000.
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- Hill, Ethel V.: *See—*
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- Hill, Loren G. Apparatus and methods for locating, catching and raising fish. 4,103,447, Cl. 43-4.500.
- Hill, Louis F. Log cinch. 4,103,955, Cl. 294-92.000.
- Hill, William Frank; and Southgate, John Peter, to Lucas Electrical Limited. Starter motor control circuit for an internal combustion engine. 4,104,534, Cl. 290-37.00A.
- Hillgenberg, David E. Method of making a perforated, molded container. 4,104,349, Cl. 264-153.000.
- Hilt, Walter: *See—*
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- Himmelrich, Lew. Safety/tool belt combination. 4,103,758, Cl. 182-3.000.
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- Hinze, George B., to Walt Disney Productions. Light actuated target control for an amusement device. 4,103,892, Cl. 273-101.100.
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- Hirasuka, Koki, to Hitachi, Ltd. Overload protection apparatus for hoisting machine. 4,103,872, Cl. 254-168.000.
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  - Inouye, Hiroshi; and Kobayashi, Sadao, 4,103,907, Cl. 277-96.100.
  - Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, 4,103,873, Cl. 254-168.000.
  - Satoh, Takashi, 4,104,733, Cl. 365-189.000.
- Hitachi Medical Corporation: *See—*
  - Tomita, Chuji; and Abe, Hiroshi, 4,104,527, Cl. 250-445.00T.
- Hitachi Metals, Ltd.: *See—*
  - Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, 4,103,406, Cl. 29-125.000.
- Hobbs, David, to Microwave Associates, Inc. Isopolar magnetron supported with rigid insulation in a remote housing. 4,104,559, Cl. 315-39.510.
- Hochko, Anatoly Vasilievich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Hodgson, James H.: *See—*
  - Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., 4,103,475, Cl. 56-16.400.
- Hoechst Aktiengesellschaft: *See—*
  - Cargnino, Francesco; and Audisio, Giorgio, 4,104,139, Cl. 204-55.00R.
  - Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, 4,104,444, Cl. 428-474.000.
  - Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.
  - Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
  - Wiezer, Hartmut; Pfahler, Gerhard; and Mayer, Norbert, 4,104,251, Cl. 260-45.80N.
- Hoff, Glen R., to Standard Oil Company a corporation of Indiana. Catalyst for the polymerization of ethylene or mixtures of ethylene with terminal olefins. 4,104,199, Cl. 252-430.000.
- Hoffman, Michael; and Pape, Rolf, to Borsig Gesellschaft mit beschrankter Haftung. Seal for a drive journal of a ball valve. 4,103,909, Cl. 277-101.000.
- Hoffman, Richard Ernest; and Bruckner, Maximiliaan, to Dataproducts (Santa Clara), Inc. Wire stringing device. 4,103,417, Cl. 29-737.000.
- Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, to Schmidt Kranz & Co. Pump having fluid-actuated motor controlled by fluid-actuated distributor. 4,104,008, Cl. 417-397.000.
- Hoffmann-La Roche Inc.: *See—*
  - Fischer, Ulf; and Hausler, Gunther, 4,104,462, Cl. 536-26.000.
  - Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, 4,104,285, Cl. 260-397.100.
  - Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, 4,104,367, Cl. 424-1.000.
  - Szkrybalo, William, 4,104,052, Cl. 71-88.000.
- Hofmann, Georg: *See—*
  - Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.
- Hofmann, Ruediger; and Von Basse, Paul-Werner, to Siemens Aktiengesellschaft. Arrangement for addressing a MOS store. 4,104,735, Cl. 365-230.000.
- Hogan, Lawrence Howard: *See—*
  - McElwain, John Christee; and Hogan, Lawrence Howard, 4,103,512, Cl. 64-17.00A.
- Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Nitroanthraquinones. 4,104,284, Cl. 260-378.000.
- Holdeman, John William, to Borg-Warner Corporation. Manually shiftable planetary gearset. 4,103,753, Cl. 180-49.000.
- Holland, David E., to Ellanin Investments, Ltd. Method and apparatus for film weave correction. 4,104,680, Cl. 358-132.000.

- Hollandse Signaalapparaten B.V.: *See—*
  - Nijhuis, Jan, 4,103,396, Cl. 19-66.00R.
- Hollis, Darrell E.: *See—*
  - Hollis, Wanda L.; and Hollis, Darrell E., 4,104,695, Cl. 361-220.000.
- Hollis, Wanda L.; and Hollis, Darrell E. Static electricity discharge ring. 4,104,695, Cl. 361-220.000.
- Hollowell, William M.: *See—*
  - Tanaka, Akira; and Hollowell, William M., 4,103,967, Cl. 297-216.000.
- Holt, Jan D.: *See—*
  - Hammonds, James C.; and Holt, Jan D., 4,103,624, Cl. 105-199.0CB.
- Holt, Lloyd J.; and Panlaqui, Clayton E., to United States of America, Navy. Catapult restraint/release system. 4,103,849, Cl. 244-63.000.
- Holt, William David, to Lucas Industries Limited. Diesel engine starting systems. 4,103,661, Cl. 123-179.00H.
- Homberger, Rudolf Felix: *See—*
  - Hirmann, Georg, 4,104,425, Cl. 428-12.000.
- Homeyer, Bernhard: *See—*
  - Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,104,377, Cl. 424-222.000.
- Homier, Robert I., to Lear Siegler, Inc. Seat recliner. 4,103,970, Cl. 297-363.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See—*
  - Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, 4,103,487, Cl. 60-282.000.
- Honda, Kenji: *See—*
  - Tsuchida, Eishun; and Honda, Kenji, 4,104,466, Cl. 542-433.000.
- Honeywell Inc.: *See—*
  - Lorenze, Robert V., Jr.; and White, William Joseph, 4,104,674, Cl. 357-30.000.
- Honeywell Information Systems Inc.: *See—*
  - Steigerwald, Conrad John, 4,103,718, Cl. 140-105.000.
- Honke, Heinrich: *See—*
  - Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased, 4,103,975, Cl. 299-43.000.
- Hoof, Robert Grant, to Control Components, Inc. High energy loss disk stack testing apparatus. 4,103,534, Cl. 73-37.000.
- Hoogovens Ijmuiden, B.V.: *See—*
  - Hoornstra, Simon, 4,103,978, Cl. 308-9.000.
- Hooker, Ira D.: *See—*
  - Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., 4,103,789, Cl. 214-41.00R.
- Hoornstra, Simon, to Hoogovens Ijmuiden, B.V. Liquid passage through a machine-part. 4,103,978, Cl. 308-9.000.
- Hopkins, Robert E., II; and Hughes, Kathleen, to Baxter Travenol Laboratories, Inc. Photometric determination of protein, and of endotoxin with Limulus protein. 4,104,030, Cl. 23-230.00B.
- Horgan, William J., Jr., to Blumcraft of Pittsburgh. Railing assembly. 4,103,874, Cl. 256-24.000.
- Horn, Peter: *See—*
  - Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
- Hornbaker, Edwin D.; and Nugent, Adam, Jr., to Ethyl Corporation. Treating polyvinyl chloride resins. 4,104,459, Cl. 528-499.000.
- Horton, M. Duane: *See—*
  - Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,104,344, Cl. 264-42.000.
- Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, to Dai Nippon Toryo Co., Ltd. Aqueous epoxy resin paint composition. 4,104,223, Cl. 260-29.2EP.
- Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, to Canon Kabushiki Kaisha. Sharp focus detecting system. 4,104,650, Cl. 354-25.000.
- Hosoe, Kazuya; and Yokota, Hideo, to Canon Kabushiki Kaisha. Single lens reflex camera. 4,104,652, Cl. 354-25.000.
- Hotchkiss, Kenneth W., to Proto Production Plastics, Inc. Terminal block cover for covering block and space between adjacent blocks. 4,104,703, Cl. 361-426.000.
- Houlgrave, Robert C.; and Talafuse, Larry J., to ACF Industries, Incorporated. Actuator for expanding gate valves. 4,103,863, Cl. 251-48.000.
- Hous, Pierre, to Exxon Research & Engineering Co. Stabilized halobutyl rubber. 4,104,218, Cl. 260-23.70H.
- House, Ralph: *See—*
  - Woo, Gar Lok; and House, Ralph, 4,104,023, Cl. 8-137.000.
- Housman, Joseph J., to General Atomic Company. Shock absorber. 4,104,118, Cl. 176-38.000.
- Hovermarine Transport Limited: *See—*
  - Tattersall, Edward Gunston, 4,103,755, Cl. 180-117.000.
- Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Method of preparing low viscosity/inorganic filler. 4,104,243, Cl. 260-42.140.
- Howard, John; and Lobley, Derek Gordon. Method of separating sulfuric acid from neutral sodium sulfate in spent chlorine dioxide generator liquor. 4,104,365, Cl. 423-531.000.
- Howard, William M.: *See—*
  - Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,104,547, Cl. 307-362.000.
- Howarth, John Joseph, to Measurex Corporation. Method of titrating liquor. 4,104,028, Cl. 23-230.00R.
- Howerton, John M., to Phillips Petroleum Company. Temporary protection or blocking for field joint in weight coating on sea floor pipeline. 4,103,505, Cl. 61-108.000.
- Hubbard, Donald Arthur, to Pont-A-Mousson S.A. Method for assembling by adhesion with synthetic resins. 4,104,354, Cl. 264-262.000.
- Hubert, Peter: *See—*
  - Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, 4,104,409, Cl. 426-386.000.
- Huckin, Stuart Nicholas: *See—*
  - Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, 4,104,306, Cl. 260-571.000.
- Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. 2-Piperidinoalkyl-1,4-benzodioxans. 4,104,396, Cl. 424-267.000.
- Huebner, Klaus: *See—*
  - Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.
- Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., to Sutton Engineering Company. Extrusion press for direct and indirect extruding with die shifter. 4,103,529, Cl. 72-253.00A.
- Huffy Corporation: *See—*
  - Allen, David A., 4,103,966, Cl. 297-195.000.
- Hughes Aircraft Company: *See—*
  - Abrams, Richard L., 4,104,598, Cl. 331-94.50M.
  - Maeding, Dale G., 4,104,543, Cl. 307-221.00D.
- Hughes, Kathleen: *See—*
  - Hopkins, Robert E., II; and Hughes, Kathleen, 4,104,030, Cl. 23-230.00B.
- Hugin Kassaregister AB: *See—*
  - Lundstrom, Goran; and Nolte, Karl, 4,104,490, Cl. 200-44.000.
- Humble, David Raymond; and Walters, Harry Godfrey, III, to Sensormatic Electronics Corporation. Unlatching tool for reusable security tag. 4,103,572, Cl. 81-418.000.
- Hunter, Everest C., to R. E. Dietz Company. Flashing signal light. 4,104,615, Cl. 340-84.000.
- Huntington, Robert G., to American Air Filter Company, Inc. Ventilated poppet damper. 4,103,708, Cl. 137-614.110.
- Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., to Gulf Research & Development Company. Process for removing organic oxygen-containing impurities from an organic composition in the presence of steam. 4,104,318, Cl. 260-669.00A.
- Hurnik, Helmut: *See—*
  - Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,104,195, Cl. 252-350.000.
- Hush, James M.; and McPhee, Donald J., to Gates Rubber Company, The. Method and apparatus for curing and reinforcing hose. 4,104,098, Cl. 156-149.000.
- Husky Corporation: *See—*
  - Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.
- Hutchins, Samuel F.: *See—*
  - Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,103,674, Cl. 126-271.000.
- Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., to Burroughs Corporation. Heat pipe cooling for semiconductor device packaging system. 4,104,700, Cl. 361-384.000.
- Huyffer, Paul S., to Polaroid Corporation. Methoxymethoxy protected intermediates for photographic dyes. 4,104,269, Cl. 260-162.000.
- i. c. moller a/s: *See—*
  - Lambertsen, Ejvind, 4,104,582, Cl. 324-52.000.
- I-T-E Imperial Corp.: *See—*
  - Gryctko, Carl E., 4,104,601, Cl. 335-6.000.
- Ichikawa, Keiji: *See—*
  - Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.
- Ichinose, Yasuaki: *See—*
  - Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.
- Ide, Hisashi: *See—*
  - Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, 4,103,528, Cl. 72-238.000.
- Ideal Industries, Inc.: *See—*
  - Scott, William J., 4,104,482, Cl. 174-87.000.
- IDR, Inc.: *See—*
  - Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., 4,104,681, Cl. 358-141.000.

- Ihrman, Kryn G.: *See—*
  - Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.
- Iida, Kiyonobu; Tani, Yoshio; and Sugahara, Kouichi, to Kubota, Ltd. Combustion chamber for compact engine of the side valve type for universal use having contactless ignition system. 4,103,664, Cl. 123-191.00L.
- Iijima, Tetsuya, to Nissan Motor Company, Ltd. Control system for an automatic power transmission. 4,103,764, Cl. 192-4.00A.
- Iimura, Seiji: *See—*
  - Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,104,469, Cl. 544-27.000.
- Ijlstra, Hendrik Jan; and van den Boogaard, Gerardus Joachim Maria, to Ultra Centrifuge Nederland N.V. Conductor lead-through. 4,104,484, Cl. 174-151.000.
- Ikeda, Fumiaki: *See—*
  - Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.
- Ikeda, Hiroshi: *See—*
  - Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.
- Ikeda, Richard Masayoshi: *See—*
  - Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
- Ikegami, Tadashi: *See—*
  - Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.
- Ikeura, Kenji: *See—*
  - Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, 4,103,486, Cl. 60-274.000.
- Illinois Tool Works Inc.: *See—*
  - Owen, Ronald C., 4,103,811, Cl. 224-45.0AA.
  - Pliml, Frank V.; and Erickson, Lloyd A., 4,103,854, Cl. 248-235.000.
  - Pliml, Frank V., Jr., 4,104,492, Cl. 200-51.140.
- Imbert, Thierry F.: *See—*
  - Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.
- Imperial Chemical Industries Limited: *See—*
  - Conbere, John P., 4,104,225, Cl. 260-29.60F.
  - Hall, Nigel; Price, Raymond; and Rowbotham, Philip Martin, 4,104,270, Cl. 260-205.000.
  - McIvor, Malcolm Charles, 4,104,579, Cl. 324-29.000.
- Inaba, Toyoaki: *See—*
  - Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, 4,104,125, Cl. 195-66.00R.
- Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, to Lion, Fat & Oil Company, Ltd. Halogen-containing resin composition. 4,104,232, Cl. 260-31.600.
- Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, to Kao Soap Co., Ltd. 1-Aminotricyclo (4.3.1.1 2, 5) undecane and salts thereof. 4,104,305, Cl. 260-563.00P.
- Ingersoll-Rand Company: *See—*
  - Law, John P., 4,103,460, Cl. 51-170.00R.
- Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, to Matsushita Electric Works, Ltd. Ultrasonic wave horn. 4,104,610, Cl. 340-15.000.
- Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, to Nippon Zeon Co. Ltd. Adhesive compositions. 4,104,327, Cl. 260-876.00B.
- Inoue, Shizuo: *See—*
  - Ohashi, Yoshinobu; and Inoue, Shizuo, 4,104,347, Cl. 264-113.000.
- Inoue, Takesi: *See—*
  - Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, 4,103,406, Cl. 29-125.000.
- Inoue, Yukihiro: *See—*
  - Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
- Inouye, Hiroshi; and Kobayashi, Sadao, to Hitachi, Ltd.; and Nippon Pillar Packing Co., Ltd. Mechanical seal. 4,103,907, Cl. 277-96.100.
- Inspiration Consolidated Copper Company: *See—*
  - Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.
- Institut Fizicheskoi Khimii Akademii Nauk: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Institut Francais du Petrole: *See—*
  - Laurent, Jean, 4,103,501, Cl. 61-72.600.
- Institut Sverkhtverdykh Materialov SSR: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- International Business Machines Corporation: *See—*
  - Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.
  - Anderson, Leslie C.; Nufer, Robert W.; and Pugliese, Frank G., 4,104,345, Cl. 264-43.000.
  - Bondur, James Allan; and Pogge, Hans Bernhard, 4,104,086, Cl. 148-1.500.
  - DiMaria, Donelli J.; and Young, Donald R., 4,104,675, Cl. 357-54.000.
  - Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, 4,104,308, Cl. 260-586.00R.
  - Markstein, Peter Willy; and Tritter, Alan Levi, 4,104,721, Cl. 364-200.000.
  - Moritz, Holger; and Paal, Gabor, 4,104,070, Cl. 96-36.000.
  - Park, Kyu C.; and Weitzman, Elizabeth J., 4,104,418, Cl. 427-42.000.
  - Pogge, Hans Bernhard, 4,104,090, Cl. 148-175.000.
  - Schlig, Eugene Stewart; and Stilwell, George Raymond, Jr., 4,104,563, Cl. 315-169.0TV.
- International Flavors & Fragrances Inc.: *See—*
  - Hall, John B.; and Wiegers, Wilhelmus Johannen, 4,104,203, Cl. 252-522.000.
- International Paper Company: *See—*
  - Lowdermilk, Loren L., 4,103,471, Cl. 53-22.00B.
- International Standard Electric Corporation: *See—*
  - Gingell, Michael J., 4,104,729, Cl. 364-757.000.
  - Weir, Donald A.; and Sweet, Anthony W., 4,104,488, Cl. 179-18.0FA.
- International Telephone and Telegraph Corporation: *See—*
  - Donahue, Thomas H.; and Chaney, John F., 4,104,633, Cl. 343-7.00A.
  - Johnson, Charles Bruce, 4,104,568, Cl. 315-394.000.
  - Scherrer, Raymond E., 4,104,099, Cl. 156-155.000.
- InterRoyal Corporation: *See—*
  - Benoit, Roland A.; and Guillot, Edmund P., 4,103,376, Cl. 5-331.000.
- Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for preparing 2-aminoalkyl halide bisulfate salts. 4,104,307, Cl. 260-583.00G.
- Ipri, Alfred C.; and Flatley, Doris W., to United States of America, Air Force. Method for fabricating MNOS memory circuits. 4,104,087, Cl. 148-1.500.
- Irvine, Ronald T., to Modern Tool & Die Co., Inc. Tamperproof container and cap assembly. 4,103,803, Cl. 220-270.000.
- Isa, Hiroshi: *See—*
  - Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, 4,104,232, Cl. 260-31.600.
- Isayama, Kohei: *See—*
  - Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,104,223, Cl. 260-29.2EP.
- Isbister, Eric J.; and Fidler, Horace E., to Sperry Rand Corporation. Marine radar interrogator-transponder target detection, identification, and range measurement system. 4,104,629, Cl. 343-6.00R.
- Ishii, Akira: *See—*
  - Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, 4,104,436, Cl. 428-297.000.
- Ishii, Mitsuo: *See—*
  - Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
- Ishii, Shozo, to Green Cross Corporation, The. Use of haptoglobin for therapy of cerebral vasospasm. 4,103,687, Cl. 128-214.00R.
- Ishii, Tamotsu: *See—*
  - Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,104,549, Cl. 310-26.000.
- Ishizaki, Yoshihiro. Stirling cycle machine. 4,103,491, Cl. 60-519.000.
- Ismach, Aaron. Hydraulically powered hypodermic injector with adapters for reducing and increasing fluid injection force. 4,103,684, Cl. 128-173.00H.
- Isshiki, Isao; and Sato, Koji, to Sumitomo Electric Industries, Ltd. Hand operated optical character recognition system. 4,104,616, Cl. 340-146.30Y.
- Ithaca Gun Company, Inc.: *See—*
  - Tollinger, James, 4,103,586, Cl. 89-144.000.

- Ito, Tadashi: *See—*
  - Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
- Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, to Hitachi Metals, Ltd. Split type sectional forming roll. 4,103,406, Cl. 29-125.000.
- Itoh, Takuji: *See—*
  - Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.
- Iverson, Myren L., to United States of America, Navy. Wideband optical isolator. 4,104,533, Cl. 250-551.000.
- Iwaeda, Toshinao: *See—*
  - Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, 4,104,208, Cl. 521-53.000.
- Iwanaga, Yukiya; and Kubota, Hayato, to Fuji Oil Company, Limited. Method for producing hard butter fraction from shea fat. 4,104,288, Cl. 260-412.800.
- Iwashita, Tomonori: *See—*
  - Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.
  - Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
- Iwata, Kozo, to New Nippon Electric Co., Ltd. Magnetron operating circuit. 4,104,561, Cl. 315-101.000.
- Izraeli, Hyman, to Thomas & Betts Corporation. Electrical terminal. 4,103,986, Cl. 339-272.0UC.
- Izumi Denki Corporation: *See—*
  - Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, 4,104,602, Cl. 335-61.000.
- J. I. Case Company: *See—*
  - Baker, Donald C., 4,103,561, Cl. 74-552.000.
  - Flippin, James Samuel, 4,103,441, Cl. 37-86.000.
- J. P. Stevens & Co., Inc.: *See—*
  - Latta, Bruce M.; Stevens, Catherine V.; and Dennis, Bruce E., 4,104,443, Cl. 428-474.000.
- Jackson, John Charles; and Selnus, Percy Bruce Gordon, to Ashlow Steel & Engineering Company Limited. Shears. 4,103,577, Cl. 83-337.000.
- Jackson, Samuel G. Lint slide grid humidifier. 4,103,397, Cl. 19-66.0CC.
- Jacobson, Sava. Telephone answering device with remote controlled playback. 4,104,487, Cl. 179-6.00E.
- Jacobus, Nelson Mortimer, Jr., to Communications Satellite Corp. Variable sensitivity monitor circuit. 4,104,597, Cl. 330-43.000.
- Jain, Prithvi: *See—*
  - Faber, Paul V.; Daly, Edwin R.; and Jain, Prithvi, 4,104,128, Cl. 201-4.000.
- Jain, Sulekh C.; and Morris, Charles A., to Wyman-Gordon Company. Water-based forging lubricant. 4,104,178, Cl. 252-30.000.
- James, Kenneth, to Tate & Lyle Limited. Purification of sucrose esters. 4,104,464, Cl. 536-115.000.
- Janson, Richard W. Curtain suspension assembly. 4,103,393, Cl. 16-94.00R.
- Janssen, Harald; and Hansch, Ferdinand, to Dr. Beck & Co., AG. Process for making water diluted electroinsulation enamels. 4,104,221, Cl. 260-29.20N.
- Japan Synthetic Rubber Company Limited: *See—*
  - Arai, Kozo; Kotani, Teizo; and Mizushima, Toshio, 4,103,541, Cl. 73-88.00R.
- Japanese Government: *See—*
  - Hirano, Taizo, 4,104,083, Cl. 136-89.00H.
- Jarry, Philippe, to Le Moteur Moderne. Internal combustion engine with air reservoir. 4,103,648, Cl. 123-30.00R.
- Jarvis, John R.; and Brown, Eldon W., to Ald, Inc. Adaptor for automated laundry system. 4,103,520, Cl. 68-12.00R.
- Jean Walterscheid GmbH: *See—*
  - Grosse-Entrup, Hubert, 4,103,514, Cl. 64-23.700.
- Jeanmart, Claude: *See—*
  - Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,104,386, Cl. 424-250.000.
- Jefferson, Thomas: *See—*
  - Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, 4,104,193, Cl. 252-316.000.
- Jeng, Duen-Ren. Freeze-proof cap for outdoor faucet. 4,103,701, Cl. 137-375.000.
- Jenney, Sherman R.: *See—*
  - Landry, Robert G.; and Jenney, Sherman R., 4,103,957, Cl. 296-1.00S.
- Jensen, Ronald P.: *See—*
  - Fetz, James G.; and Jensen, Ronald P., 4,104,339, Cl. 264-1.000.
- Jeppsson, Jan-Bertil: *See—*
  - Piltz, Lars-Eric; and Jeppsson, Jan-Bertil, 4,103,802, Cl. 220-258.000.
- Jerabek, Robert D.: *See—*
  - Marchetti, Joseph R.; Zwack, Robert R.; and Jerabek, Robert D., 4,104,147, Cl. 204-181.00C.
- Jettmar, Werner: *See—*
  - Kranz, Joachim; Jettmar, Werner; and Polster, Rudolf, 4,104,276, Cl. 260-314.500.
- Jeumont-Schneider: *See—*
  - Salmon, Jean P., 4,103,851, Cl. 246-63.00C.
- Jewell, William R. Automatic electric power switch. 4,104,541, Cl. 307-141.000.
- Joekel, Alfred, to Balcke-Durr Aktiengesellschaft. Method for the cold working of heat exchanger tubing for the attachment of spiral fins. 4,103,408, Cl. 29-157.3AH.
- Joerns Furniture Company, Division of American Seating Company: *See—*
  - Damico, Frank M.; and O'Toole, Patrick John, 4,104,710, Cl. 362-130.000.
- Johansen, Jon W.: *See—*
  - Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, 4,104,676, Cl. 357-79.000.
- John Sterling Corporation: *See—*
  - Sterling, John R., 4,103,781, Cl. 211-86.000.
- Johns-Manville Corporation: *See—*
  - Byrd, Carlisle O., Jr., 4,103,469, Cl. 52-509.000.
- Johnson, Anthony E.: *See—*
  - Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, 4,103,459, Cl. 49-491.000.
- Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Scanning shutter blade arrangement with ambient and flash ranges. 4,104,653, Cl. 354-27.000.
- Johnson, Carl A., to Owens-Corning Fiberglas Corporation. Sizing composition and glass fibers sized therewith. 4,104,434, Cl. 428-273.000.
- Johnson, Charles Bruce, to International Telephone & Telegraph Corporation. Scan-converter tube system. 4,104,568, Cl. 315-394.000.
- Johnson, Herbert G. Solid-phase conversion of particulate metal into continuous strip. 4,104,060, Cl. 75-208.0CS.
- Johnson, Lawrence D., to Keystone Consolidated Industries, Inc. Self-tapping or thread-forming screw. 4,104,446, Cl. 428-585.000
- Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., to United Technologies Corporation. Variable incidence helicopter stabilator and fail safe actuator. 4,103,848, Cl. 244-17.130.
- Johnson, Theodore W.: *See—*
  - Maher, John P.; and Johnson, Theodore W., 4,104,421, Cl. 427-96.000.
- Johnston, Charles Richard; and MacGregor, James G., to Consolidated Energy Products Co. Convertible boat-utility trailer. 4,103,926, Cl. 280-414.00R.
- Jolliff, Norman E.: *See—*
  - von Kaler, Roland L.; and Jolliff, Norman E., 4,103,566, Cl. 74-701.000.
- Jones, Giffin D., to Dow Chemical Company, The. Filled thermoplastic resin compositions. 4,104,289, Cl. 260-42.410.
- Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, to Beatrice Foods Co. Flap pop-up for advertising leaflets. 4,103,444, Cl. 40-124.100.
- Jones & Laughlin Steel Corporation: *See—*
  - Batz, Walter, 4,104,088, Cl. 148-12.00R.
- Jones, Ray A.: *See—*
  - Deutsch, Joseph Paul; and Jones, Ray A., 4,104,356, Cl. 264-297.000.
- Jones, William H.; and Astrom, Gordon L., to Eaton Corporation. Pressure switch and actuating means responsive to low pressure. 4,104,495, Cl. 200-83.00P.
- Jones, William Kinzy, to United States of America, Navy. Zero temperature coefficient of resistance bi-film resistor. 4,104,607, Cl. 338-309.000.
- Jordan, John F.; and Lampkin, Curtis, to Photon Power, Inc. Photovoltaic cell. 4,104,420, Cl. 427-74.000.
- Jordt, Alfred: *See—*
  - Erich, Hans; Jordt, Alfred; and Konig, Klaus, 4,103,759, Cl. 184-64.000.
- Jorgensen, Morell L., to Stone Conveyor, Inc. (Entire). Live roller conveyor. 4,103,769, Cl. 198-781.000.
- Josis, Christian Rubens, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Desorption of volatile compounds dissolved in a liquid phase. 4,104,038, Cl. 55-19.000.
- Judy, Kenneth W. M.: *See—*
  - Weiss, Charles M.; and Judy, Kenneth W. M., 4,103,422, Cl. 32-10.00A.

- Juels, Ronald J.: *See—*
  - Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., 4,104,608, Cl. 340-3.0PS.
- Juhasz, Josef, to Robert Bosch GmbH. Storage battery test apparatus to determine remaining stored charge therein. 4,104,580, Cl. 324-29.500.
- Juhasz, Joseph Laszlo: *See—*
  - Frost, Richard Butler; Juhasz, Joseph Laszlo; and Wing, Barry Walter, 4,103,809, Cl. 224-5.00R.
- Julius Blum Gesellschaft m.b.H.: *See—*
  - Rock, Erich; and Mages, Bernhard, 4,103,394, Cl. 16-129.000.
- Jumberca S.A.: *See—*
  - Lombardi, Victor J.; and Dalmau, José Ma (José Ma Dalmau, a part interest assors. to), 4,103,518, Cl 66-107.000.
- Junkermann, Helmut; and Schwab, Heinrich, to Deutsche Gold- und Silber-Scheideanstalt vormals Koessler. Process for detoxification of formaldehyde containing waste waters. 4,104,162, Cl. 210-63.00R.
- Jurgensen, Robert H.: *See—*
  - Rayfield, Wilson Parker; and Jurgensen, Robert H., 4,104,105, Cl. 156-364.000.
- K-Line Industries, Inc.: *See—*
  - Kammeraad, James A., 4,103,662, Cl. 123-188.0GC.
- Kabushiki Kaisha Pollution Preventing Research Laboratory: *See—*
  - Ando, Wataru; and Nakaoka, Ichiro, 4,104,145, Cl. 204-162.00R.
- Kaeding, Warren W., to Mobil Oil Corporation. Ethylation of mono alkyl benzene. 4,104,319, Cl. 260-671.00C.
- Kafunek, Pavel: *See—*
  - Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.
- Kaide, Tamotsu: *See—*
  - Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.
- Kainmuller, Thomas: *See—*
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- Kaiser Aluminum & Chemical Corporation: *See—*
  - Roberts, Sidney G., 4,104,061, Cl. 75-211.000.
- Kakumae, Masaru: *See—*
  - Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
- Kalden, Adrianus B., to Shell Oil Company. Suppressing constant frequency noise in seismic records. 4,104,611, Cl. 340-15.50F.
- Kamiya, Minoru. Lever tumbler lock device having variable ward patterns. 4,103,525, Cl. 70-347.000.
- Kamiyama, Setsuo: *See—*
  - Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.
- Kammeraad, James A., to K-Line Industries, Inc. Insert for rebuilding valve guides. 4,103,662, Cl. 123-188.0GC.
- Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., to Chromalloy American Corporation. Apparatus for forming a bale of hay. 4,103,475, Cl. 56-16.400.
- Kamyr, Inc.: *See—*
  - Sherman, Michael I.; and Prough, James R., 4,104,113, Cl. 162-19.000.
- Kanai, Masakuni. Method of separation of fluoride ion from water. 4,104,159, CL 210-28.000.
- Kanazawa, Yukio: *See—*
  - Sudo, Katsumi; and Kanazawa, Yukio, 4,104,692, Cl. 361-106.000.
- Kaneko, Masayoshi: *See—*
  - Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.
- Kaneko, Tsugio: *See—*
  - Minagawa, Yukinori; Kaneko, Tsugio; Yajima, Fumikazu; Yamaguchi, Kunihiko; and Yoshitomi, Toshihiko, 4,104,358, Cl. 423-21.000.
- Kangol Magnet Limited: *See—*
  - Ashworth, Roger Anderton; Pollitt, John Michael; and White, Graham Colin, 4,103,754, Cl. 180-82.00C.
- Kao Soap Co., Ltd.: *See—*
  - Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.
- Karacan, Ismet; Paulson, Larry G.; and Timm, Gerald W., to American Medical Systems, Inc. Nocturnal penile tumescense monitor. 4,103,678, Cl. 128-2.05V.
- Kardos, Otto: *See—*
  - Lash, Ronald J.; and Kardos, Otto, 4,104,137, Cl. 204-43.00T.
  - Passal, Frank; Lash, Ronald J.; and Kardos, Otto, 4,104,138, Cl. 204-44.000.
- Karklys, Joseph; and Yamanaka, Junji Cary, to Whirlpool Corporation. Program modification circuit for electronic appliance programmer. 4,104,542, Cl. 307-141.000.
- Kasahara, Toshiyuki: *See—*
  - Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.
- Kasiwagi, Eiichi: *See—*
  - Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kobei, 4,104,223, Cl. 260-29.2EP.
- Kasten, Gary L.: *See—*
  - Laudemann, Ronald L.; and Kasten, Gary L., 4,103,831, Cl. 214-1.0HA.
- Kastner, Karl F. Grease extraction cartridge for kitchen exhaust ventilator. 4,103,676, Cl. 126-299.00E.
- Kasubuchi, Takeshi, to Sharp Kabushiki Kaisha. Electronic apparatus equipped on a flexible substratum. 4,104,728, Cl. 364-712.000.
- Katayama, Susumu: *See—*
  - Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,104,610, Cl. 340-15.000.
- Kato, Katsuhiko: *See—*
  - Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.
- Kato, Koich; and Murata, Saburo, to Mitsubishi Petrochemical Co., Ltd. Method for stabilizing an olefin polymer. 4,104,247, Cl. 260-45.70R.
- Kato, Makoto: *See—*
  - Satoh, Isao; and Kato, Makoto, 4,104,489, Cl. 179-100.30G.
- Kato, Tetsuo; and Mori, Kazumasa, to Nippondenso Co., Ltd. Lighting system for a motor vehicle. 4,104,560, Cl. 315-83.000.
- Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, to Toyo Boseki Kabushiki Kaisha. Fireproof polyesters from brominated dihydroxy alkoxy-diphenyl sulfones. 4,104,259; Cl. 528-169.000.
- Katsuragi, Masao: *See—*
  - Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.
- Kauer, James Charles, to Du Pont de Nemours, E. I., and Company. Heteroaryl crown ethers. 4,104,275, Cl. 260-297.00B.
- Kaufer, Leo. Chemical dispenser for urinals. 4,103,367, Cl. 4-222.000.
- Kawada, Chikao; and Tsuchikura, Toshio, to Chikao Kawada. Doll with neck detachably secured between opposed baby means portions. 4,103,451, Cl. 46-22.000.
- Kawaguchi, Taizo: *See—*
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- Kawaii Musical Instrument Mfg. Co.: *See—*
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- Kawasaki Steel Corporation: *See—*
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- Kawashima, Yoshiro. Cloth article transporters. 4,103,884, Cl. 271-18.300.
- Keene, David Edward; and Douglas, Anthony Frederick, to British Gas Corporation. Sealants. 4,104,211, Cl. 260-8.000.
- Kehl, William L.: *See—*
  - Cronauer, Donald C.; and Kehl, William L., 4,104,200, Cl. 252-465.000.
- Keiper K.G.: *See—*
  - Klingelhofer, Friedrich; and Wagener, Heinz-Jurgen, 4,103,964, Cl. 297-367.000.
- Kelly, Eugene R.; and Gould, Donald M., to Product Design & Engineering Corp. Tampon ejector tube and apparatus. 4,104,013, Cl. 425-324.100.
- Kelly, James B.: *See—*
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- Kem, Kenneth M.: *See—*
  - Meyer, Victor E.; and Kem, Kenneth M., 4,104,228, Cl. 260-29.6NR.
- Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., to Texas Instruments Incorporated. Discrete, fixed-value capacitor. 4,104,697, Cl. 361-305.000.
- Kenney, James F., to M&T Chemicals Inc. Process for producing film and fiber-forming polyalkylene terephthalate. 4,104,263, Cl. 528-279.000.
- Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, to BASF Aktiengesellschaft. Utilization of constituents of effluent from the manufacture of styrene bead polymers in the manufacture of fibrids. 4,104,341, Cl. 264-9.000.
- Kersten, Ralf, to Siemens Aktiengesellschaft. Device for connecting two groups of glass fibers. 4,103,987, Cl. 350-96.210.
- Kessel, Stanley P. Orthodontic bracket. 4,103,423, Cl. 32-14.00A.
- Kewanee Industries: *See—*
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- Key Industries: *See—*
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- Keystone Consolidated Industries, Inc.: *See—*
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- Keyworth, Donald A.: *See—*
  - Sudduth, Jerome R.; and Keyworth, Donald A., 4,104,146, Cl. 204-165.000.
- Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of hard and porous polyvinylalcohol gels. 4,104,208, Cl. 521-53.000.
- Kiely, William L.; and Pedersen, Kristen I., to Sotec, Inc. Seal for submersible pipe swivel. 4,103,942, Cl. 285-276.000.
- Kierstead, Richard Wightman: *See—*
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- Kiesow, Herbert L. Safety sensor device. 4,103,697, Cl. 137-45.000.
- Kikumoto, Ryoji: *See—*
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- Kikura, Katsuaki: *See—*
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- Kimoto, Sigeru: *See—*
  - Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, 4,104,192, Cl. 252-188.000.
- Kimpara, Hidenori: *See—*
  - Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, 4,104,192, Cl. 252-188.000.
- Kimura, Kazuo: *See—*
  - Yamazaki, Yasuo; Kawaguchi, Taizo; and Kimura, Kazuo, 4,104,663, Cl. 354-197.000.
- King, Arthur Shelley. Suspended solids extraction system and method. 4,104,142, Cl. 204-152.000.
- King, Derek Anthony: *See—*
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- Kinoshita Seiki Kabushiki Kaisha: *See—*
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- Kiripolszki, Michael: *See—*
  - Trauner, Gerhard; and Kiripolszki, Michael, 4,104,640, Cl. 343-765.000.
- Kirk, James P.; and Wear, Robert L., to Minnesota Mining and Manufacturing Company. Flame retardant, non-dripping coating composition comprising crosslinkable copolymers of dihydric phenols with bis chloroalkyl oxetanes. 4,104,433, Cl. 428-245.000.
- Kishida, Shizuaki; and Takahashi, Misao, to Sanyei Corporation. Plastic bag forming and sealing apparatus. 4,104,108, Cl. 156-510.000.
- Kiss, Sandor G. Sludge settling and de-watering apparatus. 4,104,168, Cl. 210-297.000.
- Kissick, Thomas P.: *See—*
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  - Wade, Peter C.; and Kissick, Thomas P., 4,104,388, Cl. 424-250.000.
- Kitagawa, Masahiro: *See—*
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- Kitamura, Yoshinori; and Nakabe, Ryuhei, to Matsushita Electric Industrial Co., Ltd. Color error suppression apparatus and method. 4,104,679, Cl. 358-44.000.
- Kitanishi, Yoshitomo: *See—*
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- Kitzing, Rainer: *See—*
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- Kizu, Yasuo: *See—*
  - Tsubuko, Kazuo; and Kizu, Yasuo, 4,104,183, Cl. 252-62.10L.
- Klassen, Fritz E. Lamp socket for use with multi-level bulb and nightlight. 4,104,565, Cl. 315-178.000.
- Klatt, Kenneth G.; and Robnolt, Leon D., Jr., to Rexnord Inc. Detecting resin cure. 4,103,771, Cl. 206-219.000.
- Klauke, Erich: *See—*
  - Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.
- Klein, Schanzlin & Becker AG: *See—*
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- Klemann, Lawrence P.; and Newman, Gerald H., to Exxon Research & Engineering Co. Alkali metal anode/chalcogenide cathode reversible batteries having alkali metal polyaryl metallic compound electrolytes. 4,104,451, Cl. 429-194.000.
- Klemann, Lawrence P.: *See—*
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- Klingelhofer, Friedrich; and Wagener, Heinz-Jurgen, to Keiper K.G Adjustable hinge assembly for seat of two-door motor vehicle. 4,103,964, Cl. 297-367.000.
- Klocke, Helmut: *See—*
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- Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
  - Prasch, Johann, 4,103,665, Cl. 123-196.00R.
- Kloots, Jacobus, to Applied Fiberoptics, Inc. Surgeons headlight with continuously variable spot size. 4,104,709, Cl. 362-105.000.
- Klosowski, Jerome M.; and Romig, Charles A., to Dow Corning Corporation. Methylsilacyclopentenyl-containing silylating agents and method therefor. 4,104,295, Cl. 260-448.20N.
- Kmec, Joseph F.: *See—*
  - Desmond, John W.; Kmec, Joseph F.; and Meyer, Charles A., 4,103,905, Cl. 277-56.000.
- Knapp, Walter: *See—*
  - Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, 4,103,996, Cl. 355-32.000.
- Knoke, Silas J., to Lear Siegler, Inc. Bed frame leg construction. 4,103,374, Cl. 5-176.00R.
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- Kobayashi, Akihiro: *See—*
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- Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, to Yokohama Rubber Co., Ltd., The; Nihon Cement Co., Ltd.; and Asano Pole Co., Ltd. Porous inorganic product. 4,104,077, Cl. 106-88.000.
- Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, to Nissan Motor Company, Limited. Seal structures for rotary regenerative heat exchangers of gas turbine engines. 4,103,908, Cl. 277-96.200.
- Kobayashi, Sadao: *See—*
  - Inouye, Hiroshi; and Kobayashi, Sadao, 4,103,907, Cl. 277-96.100.
- Kobayashi, Shoichi: *See—*
  - Ueshima, Takashi; Tanaka, Yasuzi, Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,104,325, Cl. 260-876.00R.
- Kobe, Inc.: *See—*
  - Erickson, John W., 4,103,749, Cl. 175-70.000.
- Kochanowski, John Edward; and Wambach, Allen Dale, to General Electric Company. Reinforced thermoplastic polyester compositions having improved high voltage breakdown resistance. 4,104,242, Cl. 260-40.00R.
- Kochanowsky, Boris J. Open pit mine. 4,103,972, Cl. 299-18.000.
- Koehler, Charles E.: *See—*
  - Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,104,346, Cl. 264-51.000.
- Koehler, Karlheinz: *See—*
  - Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, 4,104,524, Cl. 250-402.000.
- Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Manufacture of sulfamic acid halides. 4,104,298, Cl. 260-543.00R.
- Koernig, Wolfgang: *See—*
  - Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
- Koh-I-Noor Rapidograph, Inc.: *See—*
  - Anderka, Gerold, 4,103,999, Cl. 401-134.000.
- Kohler, Ramon C., to Caterpillar Tractor Co. Detented manual actuator for a multifunction system. 4,103,559, Cl. 74-471.0XY.
- Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, to Dainichi-Nippon Cables, Ltd. Fire retardant intumescent putty. 4,104,073, Cl. 106-15.0FP.
- Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, to Tokyo Shibaura Electric Co., Ltd. Vacuum interrupter device. 4,104,496, Cl. 200-144.00B.
- Koizumi, Toshio: *See—*
  - Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, 4,104,602, Cl. 335-61.000.
- Kojo, Takeshi: *See—*
  - Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
- Kokiso, Masakazu: *See—*
  - Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,104,065, Cl. 96-1.50R.
- Kokot, Hellmut: *See—*
  - Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, 4,104,150, Cl. 208-91.000.

- Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, to Licentia Patent-Verwaltungs-G.m.b.H. Electron beam producing arrangement for a cathode ray tube. 4,104,554, Cl. 313-447.000.
- Kolling, Georg: *See—*
  - Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, 4,104,150, Cl. 208-91.000.
- Komai, Hisataka: *See—*
  - Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, 4,104,327, Cl. 260-876.00B.
- Komiya, Yoshio: *See—*
  - Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.
- Konig, Klaus: *See—*
  - Erich, Hans; Jordt, Alfred; and Konig, Klaus, 4,103,759, Cl. 184-64.000.
- Konishiroku Photo Industry Co., Ltd.: *See—*
  - Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,104,065, Cl. 96-1.50R.
- Konnemann, Alfred, to Grote & Hartmann GmbH & Co KG. Electrical current distributing arrangement. 4,104,699, Cl. 361-349.000.
- Kono, Kimio: *See—*
  - Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
- Koppers Company, Inc.: *See—*
  - Christensen, Kenneth Kaae, 4,104,107, Cl. 156-473.000.
- Korff, Phillip B.: *See—*
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- Korpela, Thomas J.: *See—*
  - Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., 4,103,903, Cl. 277-27.000.
- Koskimies, Ouni, to Valmet Oy. Headbox flow controls. 4,104,116, Cl. 162-343.000.
- Koslowsky, Ladislav, to H.L.S. Ltd., Industrial Engineering Company. Process for separating oils and fats into liquid and solid fractions. 4,104,290, Cl. 260-428.500.
- Kosogov, Evgeny Efremovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Kotani, Teizo: *See—*
  - Arai, Kozo; Kotani, Teizo; and Mizushima, Toshio, 4,103,541, Cl. 73-88.00R.
- Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, to CKD Praha, oborovy podnik. Arrangement for adjustably urging a semi-conductive element against a heat sink. 4,104,677, Cl. 357-81.000.
- Kovitch, Frank J.: *See—*
  - Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,103,939, Cl. 285-137.00A.
- Koyama, Mitsuo: *See—*
  - Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.
- Koyo Seiko Company, Limited: *See—*
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- Kozuki, Susumu: *See—*
  - Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
- Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, to AGFA-Gevaert, AG. Polymer binder. 4,104,067, Cl. 96-1.50R.
- Kraftwerk Union Aktiengesellschaft: *See—*
  - Schilling, Rainer, 4,104,119, Cl. 176-38.000.
- Kramer, Charles J., to Xerox Corporation. Optical system for scanning during reciprocal motion providing 180° rotation of image. 4,103,991, Cl. 350-297.000.
- Krammer, Franz: *See—*
  - Peters, Victor; and Krammer, Franz, 4,104,219, Cl. 260-29.6RB.
- Krampitz, Horst: *See—*
  - Hertwig, Askan; and Krampitz, Horst, 4,104,189, Cl. 252-186.000.
- Kranberg, Heinz-Erik: *See—*
  - Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, 4,104,524, Cl. 250-402.000.
- Kranz, Joachim; Jettmar, Werner; and Polster, Rudolf, to BASF Aktiengesellschaft. Conversion of crude copper phthalocyanines to a pigmentary form. 4,104,276, Cl. 260-314.500.
- Kratina, Jindrich: *See—*
  - Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.
- Krause, Herbert: *See—*
  - Giebel, Wolfgang; and Krause, Herbert, 4,103,911, Cl. 277-210.000.
- Krausz, Francois, to C M Industries. Derivatives of phenylpropenylamine. 4,104,383, Cl. 424-248.400.
- Krautkramer-Branson, Incorporated: *See—*
  - Dallas, Gary S.; and Pittaro, Richard J., 4,104,545, Cl. 307-351.000.
- Kren, George J.: *See—*
  - Wheeler, William R.; Kren, George J.; and Urbanek, Karel, 4,103,542, Cl. 73-105.000.
- Kress elektrik GmbH & Co., Firma: *See—*
  - Kress, Willy; and Seifert, Josef, 4,103,511, Cl. 64-4.000.
- Kress, Willy; and Seifert, Josef, to Kress elektrik GmbH & Co., Firma. Connecting arrangement for a machine tool. 4,103,511, Cl. 64-4.000.
- Krieger, George H., to St. Louis Diecasting Corporation. Method of making a foam filled die cast bat. 4,103,412, Cl. 29-460.000.
- Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, to TMC Corporation. Brake device for skis. 4,103,916, Cl. 280-605.000.
- Krolak, Ronald F.; and Radloff, Frederick J., to Bunker Ramo Corporation. Connector adapter constructions with improved connection and connector mounting arrangement. 4,103,985, Cl. 339-126.00R.
- Krueger, Helmut H. A.: *See—*
  - Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., 4,104,507, Cl. 219-513.000.
- Kruger, Heiko: *See—*
  - Schachinger, Martin; and Kruger, Heiko, 4,104,518, Cl. 250-221.000.
- Krupnick, Albert C.: *See—*
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- Kubin, Miroslav: *See—*
  - Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, 4,104,363, Cl. 423-338.000.
- Kubota, Hayato: *See—*
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- Kubota, Ltd.: *See—*
  - Iida, Kiyonobu; Tani, Yoshio; and Sugahara, Kouichi, 4,103,664, Cl. 123-191.00L.
  - Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, 4,103,650, Cl. 123-41.860.
  - Ohashi, Yoshinobu; and Inoue, Shizuo, 4,104,347, Cl. 264-113.000.
- Kuckenburg, Heinz: *See—*
  - Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,104,554, Cl. 313-447.000.
- Kuhn, Earl C., to Westinghouse Electric Corp. Thrust bearing assembly. 4,103,979, Cl. 308-160.000.
- Kumazawa, Toshiharu, to Mitsubishi Precision Co., Ltd. Method of and apparatus for generating mixed and atomized fluids. 4,103,827, Cl. 239-8.000.
- Kumpula, Clyde A.: *See—*
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- Kupper, Willi, to W. Schlafhorst & Co. Undoing or removing the thread ends of textile bobbins. 4,103,836, Cl. 242-35.60E.
- Kuri Chemical Engineers, Incorporated: *See—*
  - Kuri, Setuya; and Fuwa, Sinji, 4,104,039, Cl. 55-23.000.
- Kuri, Setuya; and Fuwa, Sinji, to Kuri Chemical Engineers, Incorporated; and Chlorine Engineers Corp. Process for concentrating or liquefying a specified component of a gaseous mixture. 4,104,039, Cl. 55-23.000.
- Kutuzov, Boris Nikolaevich: *See—*
  - Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
- L. & C. Steinmuller GmbH: *See—*
  - Dorling, Rolf; and Westebbe, Klaus, 4,103,647, Cl. 122-483.000
- L.E. Sauer Machine Co.: *See—*
  - Sauer, Louis E.; and Miller, Orville C., 4,103,580, Cl. 83-663.000.
- Laar, Erwin, to AGFA-Gevaert, AG. Continuous processor for photographic films or the like. 4,104,668, Cl. 354-299.000.
- Labatt Breweries of Canada Limited: *See—*
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- Labaw, Clifford Steven; Webb, Robert Lee; and Wellman, George Robert, to SmithKline Corporation. Imidazolemethylphosphonium salts. 4,104,472, Cl. 548-337.000.

- Labit, Sidney James; and Furmaga, Robert Edwin, to Baker International Corporation. Time cycle controller for pneumatic valve. 4,103,710, Cl. 137-624.130.
- Laboratoire Suisse de Recherches Horlogeries: *See—*
  - Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,104,096, Cl. 156-89.000.
- Lach, Robert E.: *See—*
  - Loofbourow, Donald I.; and Lach, Robert E., 4,103,846, Cl. 242-205.000.
- Lachance, Gilles Raoul. Portable animal sanitary device. 4,103,953, Cl. 294-19.00R.
- Lada, Arnold; and Middleton, James J., to Millmaster Onyx Corporation. Composition and method for protecting skin and hair. 4,104,368, Cl. 424-60.000.
- Lagarde, Robert: *See—*
  - Bargain, Michel; and Lagarde, Robert, 4,104,239, Cl. 260-37.0SB.
- Lahr, Roy J.: *See—*
  - Thornburg, David D.; and Lahr, Roy J., 4,104,515, Cl. 235-488.000.
- Lai, John Ta-Yuan, to B. F. Goodrich Company, The. Method for stabilization of UV sensitive plastics with substituted 1,3-oxazolidine. 4,104,254, Cl. 260-45.8NZ.
- Laitram Corporation, The: *See—*
  - Fowler, John T., 4,103,638, Cl. 114-144.00E.
- Lambertsen, Ejvind, to i. c. moller a/s. System for localizing a spot along a conductor in which an impedance change such as a break or short circuit occurs. 4,104,582, Cl. 324-52.000.
- Lampkin, Curtis: *See—*
  - Jordan, John F.; and Lampkin, Curtis, 4,104,420, Cl. 427-74.000.
- Landis, Phillip S.; and Okorodudu, Abraham O. M., to Mobil Oil Corporation. Additives comprising (N, N-diorganothiocarbamyl) phosphorothioites and lubricant compositions containing the same. 4,104,181, Cl. 252-46.700.
- Landry, Robert G.; and Jenney, Sherman R. Truck air foils. 4,103,957, Cl. 296-1.00S.
- Lang-ree, Nils: *See—*
  - Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.
- Lange, Harold T., to Sporlan Valve Company. Bidirectional flow filter-drier assembly. 4,104,044, Cl. 62-324.000.
- Langley, Robert, to Ciba-Geigy Corporation. Process for preparing an alpha or beta form copper phthalocyanine pigment. 4,104,277, Cl. 260-314.500.
- Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, to Commissariat a l'Energie Atomique. Ultrasonic camera. 4,103,677, Cl. 128-2.00V.
- Laos, Ivar: *See—*
  - Baran, John S.; and Laos, Ivar, 4,104,271, Cl. 260-239.570.
- Lapidus, Herbert; and Shansky, Albert, to Combe Incorporated. Process for dyeing hair in which the depth of shade is gradually increased in successive treatments. 4,104,021, Cl. 8-10.200.
- LaRaus, Julius. Apparatus for purifying septic tank effluent. 4,104,166, Cl. 210-195.00R.
- Larkins, John S. Internal combustion-gas turbine engine. 4,103,651, Cl. 123-50.00B.
- Larson, Hugo R.: *See—*
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  - Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., 4,103,529, Cl. 72-253.00A.
- Lasater, Donald A.; and Ebbesmeyer, Steven R., to Dover Corporation. Swivel connector. 4,103,938, Cl. 285-136.000.
- Lash, Ronald J.; and Kardos, Otto, to M&T Chemicals Inc. Alloy plating. 4,104,137, Cl. 204-43.00T.
- Lash, Ronald J.: *See—*
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- Latorella, William. Shell fish tool. 4,103,395, Cl. 17-71.000.
- La Tour, John, Jr. Replacement valve assembly for flush tank toilets. 4,103,366, Cl. 4-393.000.
- Latta, Bruce M.; Stevens, Catherine V.; and Dennis, Bruce E., to J. P. Stevens & Co., Inc. Antistatic finish for textiles material. 4,104,443, Cl. 428-474.000.
- Laudemann, Ronald L.; and Kasten, Gary L. Bale handling device. 4,103,831, Cl. 214-1.0HA.
- Laurent, Jean, to Institut Francais du Petrole. Device for embedding flexible elements of great length in the ground. 4,103,501, Cl. 61-72.600.
- Lavigne, Joe B., to Chevron Research Company. Ester derivatives. 4,104,477, Cl. 560-122.000.
- Law, John P., to Ingersoll-Rand Company. Grinder safety device. 4,103,460, Cl. 51-170.00R.
- Lawrence, Peter A. Shoe with detachable upper. 4,103,440, Cl. 36-101.000.
- Laws, Peter Graham: *See—*
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- Le Moteur Moderne: *See—*
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- Lebow Associates, Inc.: *See—*
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- Ledebuhr, Richard L.: *See—*
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- Ledley, Robert E., III, to Suntech, Inc. Electronic digital micrometer. 4,103,427, Cl. 33-166.000.
- Lee, Henry L., Jr.; and Orlowski, Jan A., to Lee Pharmaceuticals. Self-curing artificial fingernails. 4,104,333, Cl. 260-885.000.
- Lee, James Kelly: *See—*
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  - Lee, Henry L., Jr.; and Orlowski, Jan A., 4,104,333, Cl. 260-885.000.
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- Lehner, Gerald J.; and Banka, Eugene F., to Burroughs Corporation. Apparatus for reducing the number of undetected errors read along the length of a binary information bearing medium. 4,104,682, Cl. 360-2.000.
- Leighton, Stephen Beecher. Tissue pressure reference for cerebrospinal fluid shunting device. 4,103,689, Cl. 128-350.00V.
- Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Carbonate ester stabilizers for polymers. 4,104,217, Cl. 260-23.0XA.
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  - Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.
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- Levand, Victor A., Jr.; and Lenkner, William A., to General Electric Company. Photoflash lamp array having shielded switching circuit. 4,104,705, Cl. 362-5.000.
- Levenhagen, Alvin W., to Molded Fiber Glass Tray Company. Reinforced fiberglass pallet. 4,103,857, Cl. 248-346.000.
- Levine, Harvey: *See—*
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- Levinson, Melvin L. Microwave drying. 4,103,431, Cl. 34-4.000.
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- Lewis, John H.; Lewis, Kathrine J.; Reizman, Fremont; and Welkowsky, Murray S., to Xonics, Inc. Image charge relaxation in electrophoretic displays. 4,104,520, Cl. 250-315.00R.

- Lewis, Kathrine J.: *See—*
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- Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, to Bayer Aktiengesellschaft. Blowing agents based on urea dicarboxylic acid anhydride. 4,104,195, Cl. 252-350.000.
- Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
  - Heffler, Jochen, 4,104,197, Cl. 252-425.300.
  - Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,104,554, Cl. 313-447.000.
- Lidicker, Roger E.: *See—*
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- Lien, Charles: *See—*
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- Lien, Del R. Lamp switch circuit. 4,104,540, Cl. 307-114.000.
- Liggett, Louis G.: *See—*
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- Lightolier Incorporated: *See—*
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- Lijbrink, Eduard: *See—*
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- Lindal, Sir Walter. Compressable prefabricated panel sections for wood frame buildings. 4,103,467, Cl. 52-404.000.
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  - Ratz, Walter; and Lindemann, Werner, 4,104,592, Cl. 325-37.000.
- Linguenheld, Louis, to Rhone-Poulenc Industries. Organosilicon sunlight-resistant pastes. 4,104,237, Cl. 260-37.0SB.
- Lion, Fat & Oil Company, Ltd.: *See—*
  - Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, 4,104,232, Cl. 260-31.600.
- Lippert, Karl; and Planken, Heinz, to Duisburger Kupferhutte. Process for working up copper cementate sludges. 4,104,055, Cl. 75-1.00R.
- Liquid Controls Corporation: *See—*
  - Rittenhouse, Howard E., 4,104,511, Cl. 235-132.00R.
- List, Ralph W., to Techniservice Division, Textured Yarn Co., Inc. Strand winding apparatus. 4,103,835, Cl. 242-18.00A.
- Lista, Edwin L.; and Williams, Kenneth S., to Aerojet-General Corporation. Staple orienting method and apparatus. 4,103,584, Cl. 86-1.00R.
- Litman, Alan, to Smith & Wesson Chemical Company, Inc. Warning light for emergency vehicles. 4,104,614, Cl. 340-81.00R.
- Liu, William Chang; Bratton, Francis H.; and Nali, Robert Ronald, to Brunswick Corporation. Crosslinked molded pile product. 4,104,428, Cl. 428-85.000.
- Lloyd, Ruth Diane: *See—*
  - Schardein, Daniel Joseph; and Lloyd, Ruth Diane, 4,104,136, Cl. 204-38.00B.
- Lobley, Derek Gordon: *See—*
  - Howard, John; and Lobley, Derek Gordon, 4,104,365, Cl. 423-531.000.
- Lobur, Terry J. Collapsible bag for impact absorbing activities and method of making. 4,103,889, Cl. 272-77.000.
- Lockheed Aircraft Corporation: *See—*
  - Cronin, Michael Joseph, 4,104,620, Cl. 340-642.000.
- Lockshaw, James J., to Tolo, Incorporated. Pool cover having solar energy heating feature. 4,103,368, Cl. 4-172.120.
- Lomax, Donald P.; and Boggs, Ronald M. Backing material. 4,103,800, Cl. 138-145.000.
- Lombardi, Victor J.; and Dalmau, José Ma, to Jumberca S.A., by José Ma Dalmau, a part interest. Knitting machine for knitting fabrics having terry loops at least on the technical front face thereof. 4,103,518, Cl. 66-107.000.
- Loofbourow, Donald I.; and Lach, Robert E., to GAF Corporation. Film web handling mechanism. 4,103,846, Cl. 242-205.000.
- Lorang, Walter R. Golf grip training apparatus. 4,103,896, Cl. 273-183.00D.
- Lorenze, Robert V., Jr.; and White, William Joseph, to Honeywell Inc. Double sided hybrid mosaic focal plane. 4,104,674, Cl. 357-30.000.
- Losinger AG: *See—*
  - Dietrich, Hans, 4,103,618, Cl. 102-22.00R.
- Louisiana State University Foundation: *See—*
  - Srinivasan, Vadake R.; and Choi, Ye-Chin, 4,104,124, Cl. 195-33.000.
- Lowdermilk, Loren L., to International Paper Company. Atmosphere exchanging and bag sealing machine and method. 4,103,471, Cl. 53-22.00B.
- Lowe, James R., to McDonnell Douglas Corporation. Head-up display command bar generator. 4,104,612, Cl. 340-27.0AT.
- Lubrication Engineers, Inc.: *See—*
  - Dinwiddie, Curt, 4,103,533, Cl. 73-12.000.
- Luc, Andre R., to Tridon-Serflex S. A. Method of shaping a screw type clamping collar. 4,103,637, Cl. 113-116.00M.
- Lucas Electrical Limited: *See—*
  - Hill, William Frank; and Southgate, John Peter, 4,104,534, Cl. 290-37.00A.
- Lucas Industries Limited: *See—*
  - Holt, William David, 4,103,661, Cl. 123-179.00H.
- Luedtke, Oscar F.; and Luedtke, Sarah. Portable folding bed cabinet. 4,103,373, Cl. 5-166.00R.
- Luedtke, Sarah: *See—*
  - Luedtke, Oscar F.; and Luedtke, Sarah, 4,103,373, Cl. 5-166.00R.
- Luke, John Anthony, to Brown & Williamson Tobacco Corporation. Porous wraps for smoking articles. 4,104,431, Cl. 428-211.000.
- Lund, Terry E.: *See—*
  - Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.
- Lundstrom, Goran; and Nolte, Karl, to Hugin Kassaregister AB. Coding lock. 4,104,490, Cl. 200-44.000.
- Lupien, Paul J.; Awad, John A.; and Moorjani, Sital. Method and apparatus for extravascular treatment of blood. 4,103,685, Cl. 128-214.00R.
- Lurssen, Klaus: *See—*
  - Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.
- Lutron Electronics Co., Inc.: *See—*
  - DeWitt, Robert R., 4,104,606, Cl. 338-198.000.
- Luttrell, Edward; and Turner, Paul W., to United States of America, Energy. Electric arc welding gun. 4,104,499, Cl. 219-60.00A.
- Luz, David Warren: *See—*
  - Peer, John Charles; and Luz, David Warren, 4,104,567, Cl. 315-387.000.
- Lynnworth, Lawrence C., to Panametrics, Inc. Ultrasonic measuring system for differing flow conditions. 4,103,551, Cl. 73-194.00A.
- Lyon, John A.; and Whyel, Robert E., Jr. Compound bow holsters, 4,103,807, Cl. 224-1.00R.
- M & M Tools, Inc.: *See—*
  - Matthews, Robert L., 4,103,571, Cl. 81-74.000.
- M&T Chemicals Inc.: *See—*
  - Bednarski, John R.; and Russell, David B., 4,104,234, Cl. 260-33.6UA.
  - Dworkin, Robert D.; and Ejk, Adam J., 4,104,292, Cl. 260-429.700.
  - Kenney, James F., 4,104,263, Cl. 528-279.000.
  - Lash, Ronald J.; and Kardos, Otto, 4,104,137, Cl. 204-43.00T.
  - Passal, Frank; Lash, Ronald J.; and Kardos, Otto, 4,104,138, Cl. 204-44.000.
- Maaghoul, Mohammad, deceased: *See—*
  - Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.
- Maaghoul, Nassrine S., administratrix: *See—*
  - Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.
- Maas, Hermann; and Hahn, Franz-Josef. Method for making low carbon high chromium alloyed steels. 4,104,057, Cl. 75-49.000.
- Macbeth, John C.: *See—*
  - Hendrixson, Dale Z.; and Macbeth, John C., 4,103,456, Cl. 47-57.500.
- MacBride, James J.: *See—*
  - Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,104,700, Cl. 361-384.000.
- MacDonald, Robert D., to Masco Corporation. Door closing apparatus. 4,103,392, Cl. 16-54.000.
- MacGregor, James G.: *See—*
  - Johnston, Charles Richard; and MacGregor, James G., 4,103,926, Cl. 280-414.00R.
- Machines Chambon: *See—*
  - Corse, Louis Gaston, 4,103,595, Cl. 93-58.300.
- Mack, Robert L. Process for manufacturing printed circuit boards. 4,104,111, Cl. 156-656.000.
- Macosko, Robert Lee. Hand held applicator. 4,104,110, Cl. 156-523.000.
- Maeda, Eiji: *See—*
  - Aoki, Shunichi; and Maeda, Eiji, 4,103,731, Cl. 164-147.000.
- Maeding, Dale G., to Hughes Aircraft Company. Multichannel CCD signal subtraction system. 4,104,543, Cl. 307-221.00D.
- Maeshima, Tsugio: *See—*
  - Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.

- Maffrand, Jean-Pierre: *See—*
  - Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, 4,104,390, Cl. 424-256.000.
- Mages, Bernhard: *See—*
  - Rock, Erich; and Mages, Bernhard, 4,103,394, Cl. 16-129.000.
- Maglott, Larry Franklin. Framing system. 4,103,446, Cl. 40-155.000.
- Magni-Power Company: *See—*
  - Rudd, Edward H., 4,103,982, Cl. 339-91.00R.
- Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, to Chemische Werke Huls, AG. Low pilling polyester fibers and process for their manufacture. 4,104,261, Cl. 260-873.000.
- Maher, John P.; and Johnson, Theodore W., to Sprague Electric Company. Method of making a glass containing resistor having a submicron metal film termination. 4,104,421, Cl. 427-96.000.
- Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, to Drew Chemical Corporation. Foam prevention in sodium carbonate crystallization. 4,104,033, Cl. 23-300.000.
- Mahoney, Gerard Edward: *See—*
  - DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, 4,104,672, Cl. 357-22.000.
- Mahoski, Calvin Michael: *See—*
  - Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., 4,104,589, Cl. 324-158.00F.
- Maier, Charles L., Jr. Procedure for the assay of pharmacologically immunologically and biochemically active compounds in biological fluids. 4,104,029, Cl. 23-230.00B.
- Maier, Edward E.: *See—*
  - Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
- Main, Ronald J.: *See—*
  - Arnholt, Jack C.; and Main, Ronald J., 4,103,934, Cl. 280-744.000.
- Mainka, Christian M., to Morse Boulger, Inc. Stoker and grate therefore. 4,103,627, Cl. 110-281.000.
- Mainski, Albert: *See—*
  - Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.
- Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, to Olympus Optical Co., Ltd. Photometric apparatus for single lens reflex camera. 4,104,654, Cl. 354-31.000.
- Malaval, Claude, to Groupement Atomique Alsacienne Atlantique. Solid absorbent safety device for a nuclear reactor. 4,104,121, Cl. 176-86.00R.
- Malaval, Claude; and Picou, Jean-Loup, to Groupement Atomique Alsacienne Atlantique. Liquid absorbent safety device for a nuclear reactor. 4,104,122, Cl. 176-86.00L.
- Malecki, George J. Processing of green vegetables for color retention in canning. 4,104,410, Cl. 426-399.000.
- Malkin, Irving: *See—*
  - Brannan, James R.; Malkin, Irving; and Brown, Claude M., 4,104,133, Cl. 204-25.000.
- Malmberg, Sven Kurt Bernhard. Method and arrangement for fastening and centering punching tools. 4,103,413, Cl. 29-465.000.
- Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.). Plastic articles having on the surface thereof a protected metal film. 4,104,432, Cl. 428-216.000.
- Mangubi, Jury Danilovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Manitowoc Company, Inc., The: *See—*
  - Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., 4,103,783, Cl. 212-48.000.
- Mannesmann Aktiengesellschaft: *See—*
  - Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.
- Mansmann, Manfred, to Bayer Aktiengesellschaft. Thermally stable quartz glass. 4,104,045, Cl. 65-2.000.
- Mantell, Gerald J.: *See—*
  - Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,104,264, Cl. 528-370.000.
- Marantz Company, Inc.: *See—*
  - Perkins, Calvin C., 4,103,737, Cl. 165-80.000.
- Marchetti, Joseph R.; Zwack, Robert R.; and Jerabek, Robert D., to PPG Industries, Inc. Process for cationic electrodeposition of amine acid salt-containing polymers. 4,104,147, Cl. 204-181.00C.
- Marcin, Richard, to Newcor, Inc. Limited torque drive roller. 4,103,516, Cl. 64-30.00E.
- Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Polycarbonate compositions containing iminated and thionated carbonate plasticizers. 4,104,231, Cl. 260-30.80R.
- Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,104,245, Cl. 260-45.70S.
- Mark, Victor, to General Electric Company. Non-opaque flame-retardant polycarbonate composition. 4,104,246, Cl. 260-45.70S.
- Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,104,253, Cl. 260-45.8RW.
- Markley, Lowell D.: *See—*
  - Dewald, James R.; and Markley, Lowell D., 4,104,315, Cl. 260-650.00R.
- Markstein, Peter Willy; and Tritter, Alan Levi, to International Business Machines Corporation. Hierarchical security mechanism for dynamically assigning security levels to object programs. 4,104,721, Cl. 364-200.000.
- Marsh, Richard L.: *See—*
  - Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., 4,104,205, Cl. 260-2.300.
- Marshall and Williams Company: *See—*
  - Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,103,403, Cl. 26-91.000.
- Martan, Michael; and Halter, Mark A., to UOP Inc. Electrochemical oxidation of alkoxy-substituted aromatic compounds. 4,104,141, Cl. 204-78.000.
- Martin, Alice I. Snow drag and scoop. 4,103,383, Cl. 15-245.000.
- Martin, John R.; and Block, Robert S. System for accumulating data over nondedicated telephone lines. 4,104,486, Cl. 179-2.0AM.
- Martin Marietta Corporation: *See—*
  - Thomas, Frank J.; and Farrow, Max W., 4,103,847, Cl. 244-3.180.
  - Wolfert, Ludwig G., 4,104,523, Cl. 250-370.000.
- Martin, Thomas F.; Nagy, James A.; and Scibbe, Harold R., to Repa Feinstanzwerk GmbH. Locking sensor for belt retractor. 4,103,842, Cl. 242-107.40A.
- Martinsson, Eva Margareta; and Hellsten, Karl Martin Edvin, to Modokemi Aktiebolag. Aqueous solutions of quaternary ammonium compounds. 4,104,175, Cl. 252-8.570.
- Maruyama, Mitsuaki. Wristwatch having a liquid crystal display. 4,103,482, Cl. 58-23.00R.
- Masaki, Kenji: *See—*
  - Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, 4,103,486, Cl. 60-274.000.
- Masco Corporation: *See—*
  - MacDonald, Robert D., 4,103,392, Cl. 16-54.000.
- Masters, Frank C.: *See—*
  - Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., 4,104,205, Cl. 260-2.300.
- Masumi, Jiro: *See—*
  - Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,104,432, Cl. 428-216.000.
- Mathis, Thomas C.; Morgan, Albert W.; and Vanderlinde, William, to Monsanto Company. ω-Bromoalkyl plasticizer compositions. 4,104,233, Cl. 260-31.8HA.
- Mathison, Frederic N.; and Straub, Roger E., to General Foods Corporation. Carton with insert. 4,103,820, Cl. 229-37.00R.
- Matikainen, Martti; and Ovaska, Juhani, to Valmet Oy. Roll drive for paper machines and the like. 4,103,565, Cl. 74-665.00L.
- Matsuda, Akira: *See—*
  - Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.
- Matsuda, Mari: *See—*
  - Oi, Naobumi; Moriguchi, Koichi; and Matsuda, Mari, 4,104,040, Cl. 55-67.000.
- Matsuda, Mutsuhide: *See—*
  - Matsumoto, Seiichi; Matsuda, Mutsuhide; and Yokota, Hideo, 4,104,651, Cl. 354-25.000.
- Matsuda, Tetsunori: *See—*
  - Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, 4,103,865, Cl. 251-148.000.
- Matsumoto, Ken-ichi: *See—*
  - Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.
- Matsumoto, Seiichi; Matsuda, Mutsuhide; and Yokota, Hideo, to Canon Kabushiki Kaisha. Focusing screen unit for single lens reflex camera. 4,104,651, Cl. 354-25.000.

Matsumoto, Seiichi: *See—*

    Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo. 4,104,650, Cl. 354-25.000.

Matsumura, Akira: *See—*

    Yanagishima, Takayuki; and Matsumura, Akira. 4,104,621, Cl 340-576.000.

Matsushita Electric Industrial Co., Ltd.: *See—*

    Kitamura, Yoshinori; and Nakabe, Ryuhei. 4,104,679, Cl. 358-44.000.

    Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.

    Satoh, Isao; and Kato, Makoto. 4,104,489, Cl. 179-100.30G.

    Wakami, Noboru; and Deguchi, Masahiro. 4,104,684, Cl. 360-70.000.

Matsushita Electric Works, Ltd.: *See—*

    Araki, Tsunehiko; and Okuda, Yoshihiko, 4,103,997, Cl. 356-104.000.

    Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,104,610, Cl. 340-15.000.

Matthews, Bruce Ernest; and Day, Ronald, to Stanley Works Pty. Ltd., The. Pipe cutter. 4,103,419, Cl. 30-95.000.

Matthews, Robert L., to M & M Tools, Inc. Hub nut wrench. 4,103,571, Cl. 81-74.000.

Matthey, Huber: *See—*

    Engdahl, Jean; and Matthey, Huber, 4,104,553, Cl. 310-352.000.

Mattiuz, Ronald: *See—*

    Anders, Dale F.; Brizgys, Peter V.; Mattiuz, Ronald; and Murphy, Edward J., 4,104,100, Cl. 204-181.00R.

Matumoto, Eizi; and Norimatsu, Hideaki, to Nippondenso Co., Ltd. Method and system for controlling the mixture air-to-fuel ratio. 4,103,649, Cl. 123-32.0EE.

Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Chlorine-substituted vinylaminobenzoic acid compounds and plant growth regulant compositions. 4,104,049, Cl. 71-76.000.

May, James A., Jr.; and Bressler, Wilbur L., to Dow Chemical Company, The. High yield complex catalyst for polymerizing olefins. 4,104,198, Cl. 252-429.00B.

Mayer, Ferdy P. Integrated absorptive power line filters. 4,104,600, Cl. 333-79.000.

Mayer, James W.; and Smart, Albert G., to Pfreizer, Mel A. Knapsack-parka sleeping bag. 4,103,377, Cl. 5-343.000.

Mayer, Norbert: *See—*

    Wiezer, Hartmut; Pfahler, Gerhard; and Mayer, Norbert, 4,104,251, Cl. 260-45.80N.

Mayer, Raymond E. Display units. 4,103,782, Cl. 211-126.000.

Mazaris, George A.: *See—*

    Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., 4,104,091, Cl. 148-188.000.

Mazurik, Vitaly Ivanovich: *See—*

    Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

McCally, Richard P.: *See—*

    Westeren, Herbert W.; and McCally, Richard P., 4,103,880, Cl. 266-253.000.

McCraw, Dan, to Domination Incorporated. Disk rolling game of variable difficulty. 4,103,894, Cl. 273-126.00A.

McCreery, Cecil Wayne, to Glass Industry Consultants, Inc. Temperature control for the forming units of a machine of the press and blow type. 4,104,046, Cl. 65-161.000.

McDonald, Frank W. Wheel-wear monitor. 4,103,548, Cl. 73-146.000.

McDonald, Leo S., Jr., to Greyhound Exhibitgroup, Inc. Modular panel display system. 4,103,465, Cl. 52-127.000.

McDonnell Douglas Corporation: *See—*

    Gonzalez, Rodolfo; and Penton, Allen P., III, 4,104,426, Cl. 428-36.000.

    Lowe, James R., 4,104,612, Cl. 340-27.0AT.

McDowell, Donald J., to Felt Products Mfg. Co. Fretting corrosion resistant gasket and method of making same. 4,103,913, Cl. 277-235.00B.

McElwain, John Christee; and Hogan, Lawrence Howard, to Rockwell International Corporation. Universal joint and cross therefor. 4,103,512, Cl. 64-17.00A.

McGraw-Edison Company: *See—*

    Bannan, Edward C., 4,103,853, Cl. 248-219.100.

McHatton, Austin D.: *See—*

    Alley, Vernon L., Jr.; and McHatton, Austin D., 4,103,550, Cl. 73-159.000.

McIvor, Malcolm Charles, to Imperial Chemical Industries Limited. Method of examination of protective coatings. 4,104,579, Cl. 324-29.000.

McKay, Richard A., to United States of America, National Aeronautics and Space Administration. Combuster. 4,104,018, Cl. 432-29.000.

McLaughlin, Robert R. Testing device for in-site cementitious material. 4,103,540, Cl. 73-88.00C.

McNeill, William H.: *See—*

    Proud, Joseph M., Jr.; and McNeill, William H., 4,104,558, Cl. 315-39.000.

McNulty, Patrick J.; and Warner, Harlow L., to Rohm and Haas Company. Derivatives of 3-cyano-pyrid-2-ones. 4,104,273, Cl. 260-294.900.

McPhee, Donald J.: *See—*

    Hush, James M.; and McPhee, Donald J., 4,104,098, Cl. 156-149.000.

McVaugh, Arthur K. Tripod aerial lift. 4,103,757, Cl. 182-2.000.

Measurex Corporation: *See—*

    Howarth, John Joseph, 4,104,028, Cl. 23-230.00R.

    Rees, Peter William, 4,104,522, Cl. 250-359.000.

Mechenbier, Alois: *See—*

    Steinborn, Wilhelm; and Mechenbier, Alois, 4,103,498, Cl. 61-45.00B.

Meguerian, Garbis H.; and Rakowsky, Frederick W., to Standard Oil Company. Process for reducing oxides nitrogen in the exhaust gas from internal combustion engines. 4,104,360, Cl. 423-213.200.

Meierhoefer, Alan W., to Akzona Incorporated. Fluid absorbent cellulose fibers containing alkaline salts of polymers of acrylic acid, methacrylic acid or an acryloamidoalkane sulfonic acid with aliphatic esters of acrylic acid or methacrylic acid. 4,104,214, Cl. 260-17.4CL.

Meijer, Franciscus Alexander Theodorus: *See—*

    Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, 4,103,816, Cl. 228-49.000.

Meiri, Shmuel, to Northwestern University. Wind-energy conversion device. 4,104,006, Cl. 417-334.000.

Melcher, Franz Josef; and Oldendorf, Christian, to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfahrik GmbH). Method of and circuit for forming signals for damping control of an electrical measured-value indicator. 4,103,750, Cl. 177-1.000.

Melitta, Inc.: *See—*

    Bergmann, Karl H.; and Levine, Harvey, 4,103,603, Cl. 99-294.000.

Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., to United States of America, Navy. Heave meter. 4,104,608, Cl. 340-3.0PS.

Melvin G. Green, Inc.: *See—*

    Clifft, Dale L.; and Green, Melvin G., 4,103,464, Cl. 52-127.000.

Melzer, Jaroslav; and Schenck, Hans-Uwe, to BASF Aktiengesellschaft. Retention aids and flocculants based on polyacrylamides. 4,104,226, Cl. 260-29.6WB.

Mende, Hans-Joachim: *See—*

    Buchler, Wilhelm; Muller, Gotthard; and Mende, Hans-Joachim, 4,103,861, Cl. 249-20.000.

Mendenhall, Robert L. Apparatus and method for recycling used asphalt-aggregate composition. 4,104,736, Cl. 366-2.000.

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    United States of America, National Aeronautics and Space Administration; and Menichelli, Vincent J., 4,103,619, Cl. 102-28.00R.

Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., to Exxon Research & Engineering Co. Water soluble waterflood corrosion inhibitor. 4,104,174, Cl. 252-8.55D.

Merck & Co., Inc.: *See—*

    Baldwin, John J.; and Novello, Frederick C., 4,104,393, Cl. 424-263.000.

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    Colamussi, Arturo; and Merli, Vittorio, 4,103,497, Cl. 61-27.000.

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    Thuler, Oscar W., 4,104,627, Cl. 340-336.000.

Mesch, Franz; and Moll, Horst, to Ernst Leitz Wetzlar GmbH. Method and optical system for automatic parallax determination. 4,104,517, Cl. 250-204.000.

Mesny, Philip R.; and Peoples, Jake E. Vehicle levelling and stabilizing system. 4,103,869, Cl. 254-86.00R.

Messer Griesheim GmbH.: *See—*

    Pfeuffer, Alfred, 4,103,877, Cl. 266-51.000.

Messerschmitt-Boelkow-Blohm GmbH: *See—*

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Met-Pro Corporation: *See—*

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Meyer, Charles A.: *See—*

    Desmond, John W.; Kmec, Joseph F.; and Meyer, Charles A., 4,103,905, Cl. 277-56.000.

Meyer, Richard D., to Phillips Petroleum Company. Spinneret assembly. 4,104,015, Cl. 425-382.200.

Meyer, Thomas N.: *See—*

    Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., 4,104,691, Cl. 361-96.000.

Meyer, Victor E.; and Kem, Kenneth M., to Dow Chemical Company, The. Linear, partially deacylated poly(N-acyl)alkylenimines as tannin migration inhibitors. 4,104,228, Cl. 260-29.6NR.

Meyer, Warren A. Solar collector. 4,103,672, Cl. 126-270.000.

Michaelson, Randolph C. H: *See—*

    Schulz, Otto W.; and Pedersen, Tor Jan, 4,103,381, Cl. 15-29.000.

Michels, Norman C. Apparatus for coating one side only of strip material. 4,103,644, Cl. 118-62.000.

Microdot Inc.: *See—*

    Munse, Robert A., 4,103,400, Cl. 24-73.0MF.

Microwave Associates, Inc.: *See—*

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Middleton, James J.: *See—*

    Lada, Arnold; and Middleton, James J., 4,104,368, Cl. 424-60.000.

Middleton, Raymond R. Cooperative type anti-collision radio system. 4,104,638, Cl. 343-112.0CA.

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Mikes, John A.; Greer, Albert H.; and Norwood, Amos, to Sybron Corporation. Highly porous ion exchange resins prepared by suspension polymerization in the presence of linear polymer. 4,104,209, Cl. 521-62.000.

Mikhaevich, Stanislav Leonidovich: *See—*

    Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.

Miki, Isao, to Nippon Light Metal Company Limited. Die-cast aluminum alloy products. 4,104,089, Cl. 148-32.500.

Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich. Counterpressure casting arrangement. 4,103,734, Cl. 164-309.000.

Mikovits, Adrienne C.: *See—*

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Milkovich, Ralph: *See—*

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Minagawa, Motonobu: *See—*

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Minagawa, Yukinori; Kaneko, Tsugio; Yajima, Fumikazu; Yamaguchi, Kunihiko; and Yoshitomi, Toshihiko, to Mitsubishi Chemical Industries Ltd. Selective extraction of yttrium ions. 4,104,358, Cl. 423-21.000.

Minami, Hidehiro, to Nissan Motor Company, Limited. Twin-barrel carburetor with an air-fuel ratio control device. 4,103,657, Cl. 123-127.000.

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    Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.

Minegishi, Yukihiko; Sato, Shokichi; and Yamada, Toshikazu. Fish-finder. 4,104,609, Cl. 340-3.00C.

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Minnesota Mining and Manufacturing Company: *See—*

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    Hartshorn, Stephen R., 4,104,190, Cl. 252-187.00R.

    Kirk, James P.; and Wear, Robert L., 4,104,433, Cl. 428-245.000.

    Ward, Gene R., 4,104,340, Cl. 264-6.000.

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Miska, Stanley M., Sr.: *See—*

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Mitchell, Ronald A.; and Bedford, William Augustus, Jr., to Mitchell, Ronald A. Theftproof steering wheel lock. 4,103,524, Cl. 70-209.000.

Mitsche, Roy T.; and Pope, George N., to UOP Inc. Reforming of a naphtha fraction in contact with an alumina-supported catalyst. 4,104,154, Cl. 208-138.000.

Mitsubishi Chemical Industries Ltd.: *See—*

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    Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.

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Mitter, Mathias. Screen printing machine with ink supply reciprocation. 4,103,613, Cl. 101-115.000.

Mitter, Mathias. Screen printing machine with reciprocating endless printing screen. 4,103,614, Cl. 101-115.000.

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Mixon, James Lenhart, Jr., to AMP Incorporated. Insulation displacing pin connector. 4,103,984, Cl. 339-98.000.

Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, to Matsushita Electric Industrial Co., Ltd. Moisture content meter. 4,104,584, Cl. 324-58.50R.

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- Mobil Oil Corporation: *See—*
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  - Landis, Phillip S.; and Okorodudu, Abraham O. M., 4,104,181, Cl. 252-46.700.
  - Rubin, Mae K.; Plank, Charles J.; and Rosinski, Edward J., 4,104,151, Cl. 208-111.000.
- Moccaldi, Antonio: *See—*
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- Modern Tool & Die Co., Inc.: *See—*
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- Moeller, Richard H., to G. M. Tool Corporation. Combination cap. 4,103,798, Cl. 215-305.000.
- Moeller, Rolf: *See—*
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- Molins, Desmond Walter, to Molins Limited. Apparatus for feeding and cutting cigarette filter wrapper material. 4,103,596, Cl. 93-77.0FT.
- Molins Limited: *See—*
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- Moll, Horst: *See—*
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  - Hamisch, Paul H., Jr., 4,104,106, Cl. 156-384.000.
- Monnet, Bernard Leon, to Billion S.A. Method of injection moulding of articles of several materials. 4,104,353, Cl. 264-255.000.
- Monroe, Carl M.: *See—*
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- Monsanto Company: *See—*
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  - Coran, Aubert Y.; and Patel, Raman P., 4,104,210, Cl. 260-4.00R.
  - Cornelius, Harry C., 4,104,343, Cl. 264-40.100.
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  - Dutra, Gerard A., 4,104,050, Cl. 71-86.000.
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  - Mathis, Thomas C.; Morgan, Albert W.; and Vanderlinde, William, 4,104,233, Cl. 260-31.8HA.
  - Sandfort, Robert Melvin, 4,104,422, Cl. 427-123.000.
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- Moog, Gerhard W.; and Cooper, Kenneth R., to Canada Square Management Ltd. Reservoir. 4,103,706, Cl. 137-574.000.
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- Moore, Harry D.: *See—*
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- Moore, Wayne O. Apparatus for production of precast manhole bases. 4,103,862, Cl. 249-53.00R.
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- Morgan, Albert W.: *See—*
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- Morgan, Wesley W.; and Davis, Frank E., to Columbia Industries, Inc. Method of making a bowling pin. 4,104,352, Cl. 264-250.000.
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- Mori, Shigeyasu: *See—*
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- Moriguchi, Koichi: *See—*
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- Morris, Charles A.: *See—*
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- Morris, Glenn H. Tightly closed safety cap and vial. 4,103,797, Cl. 215-209.000.
- Morrison, Lowell D.; and Moon, Howard R., to Gamber-Johnson, Inc. Quick disconnect slide mount. 4,103,983, Cl. 339-91.00R.
- Morrison, Steven; and Dorman, William J., to Westinghouse Electric Corp. Boresight adjustment for a harmonic oscillator coordinate converter. 4,104,730, Cl. 364-815.000.
- Morrow, James G., Sr.: *See—*
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- Morse Boulger, Inc.: *See—*
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- Moss, Alan, to Golden Wonder Limited. Check weighing apparatus for articles. 4,103,751, Cl. 177-122.000.
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- Mouille, Rene Louis, to Societe Anonyme dite Societe Nationale Industrielle Aerospatiale. Rotor arrangement for rotary wing aircraft. 4,104,003, Cl. 416-141.000.
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- Muchiarone, Jerome J., to True Temper Corporation. Antenna formed of two closely coupled linear conductors with helical top loading. 4,104,639, Cl. 343-723.000.
- Muise, Herbert D., to Weyerhaeuser Company. Two-piece container. 4,103,819, Cl. 229-33.000.
- Mullay, John J., to Atlas Powder Company. Emulsion sensitized gelled explosive composition. 4,104,092, Cl. 149-2.000.
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- Muller, Hans; and Guazzone, Bruno, to Muller, Hans. Filtering apparatus with rotatable filter elements and seal. 4,104,169, Cl. 210-331.000.
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- Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., to Excel Industries, Inc. Grass and leaf collector and compactor attachment for mowers. 4,103,477, Cl. 56-202.000.
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- Mumford, Harry W.: *See—*
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- Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, to Werzalit-Pressholzwerk J.F. Werz Jr. KG. Method and apparatus for filling molds. 4,104,348, Cl. 264-121.000.
- Munse, Robert A., to Microdot Inc. Dart clip. 4,103,400, Cl. 24-73.0MF.
- Murakami, Keisuke. Instrument for setting a non-skid chain on a car tire. 4,103,870, Cl. 254-88.000.
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- Murata, Takao; Nakamura, Nobutaka; and Goto, Tateo, to Sumitomo Durez Company, Ltd. Wax compositions for flame retardant electrical insulation coatings. 4,104,698, Cl. 361-321.000.
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- Murphy, Edward J.: *See—*
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- Mutter, Walter F.; and Watson, Francis M., III, to Philip Morris Incorporated. Method and apparatus for examining rod-shaped articles. 4,103,535, Cl. 73-37.500.
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- Nagy, James A.: *See—*
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- Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, to Bristol-Myers Company. 7-(Syn-α-alkoxy-iminofuryl)acetamido-3-(2-methyl-2,3-dihydro-s-triazolo[4,3-b]pyridazin-3-on-6-ylthiomethyl)-3-cephem-4-carboxylic acids. 4,104,469, Cl. 544-27.000.
- Naka, Hiromitsu. Anchoring device. 4,103,948, Cl. 292-256.000.
- Nakabe, Ryuhei: *See—*
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- Nakamura, Ikuo: *See—*
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- Nakamura, Koyo, to Nissan Motor Company, Ltd. Method and apparatus to control air/fuel ratio of the mixture applied to an internal combustion engine. 4,103,654, Cl. 123-119.0EC.
- Nakamura, Nobutaka: *See—*
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- Nakazawa, Kiwao; and Tanimoto, Akikazu, to Nippon Kogaku K.K. Automatic alignment apparatus. 4,103,998, Cl. 356-152.000.
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  - Wein, Gary M., 4,104,161, Cl. 210-54.000.
- Nali, Robert Ronald: *See—*
  - Liu, William Chang; Bratton, Francis H.; and Nali, Robert Ronald, 4,104,428, Cl. 428-85.000.
- Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, to Asahi Yukizai Kogyo Kabushiki Kaisha. Ball valve. 4,103,865, Cl. 251-148.000.
- Narinsky, Isaak Emmanuilovich: *See—*
  - Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
- Nass, Gerald I.: *See—*
  - Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., 4,104,144, Cl. 204-159.230.
- Natico, Inc.: *See—*
  - Heringer, Ronald, 4,103,472, Cl. 53-139.300.
- National Distillers and Chemical Corporation: *See—*
  - Broering, Leo H.; and Duncan, Gary W., 4,104,453, Cl. 526-10.000.
- National Presto Industries, Inc.: *See—*
  - Walker, Duane Hubert, 4,103,801, Cl. 220-203.000.
- National Research Development Corporation: *See—*
  - Schofield, John Wardman, 4,104,585, Cl. 324-58.50C.
  - Ward, Gerald Frank; and Wray, Gordon Richard, 4,103,636, Cl. 112-266.000.
- National Semiconductor Corporation: *See—*
  - Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,104,547, Cl. 307-362.000.
- National Starch and Chemical Corporation: *See—*
  - Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., 4,104,307, Cl. 260-583.00G.
- NCR Canada Ltd. - NCR Canada Ltee: *See—*
  - O'Brien, William L.; and Doran, Wayne M., 4,103,617, Cl. 101-93.030.
- Nedza, Donald A., to Met-Pro Corporation. Liquid filter having improved extended polypropylene element. 4,104,170, Cl. 210-487.000.
- Nelson, John M.: *See—*
  - Zagara, Frank A.; and Nelson, John M., 4,103,829, Cl. 239-304.000.
- Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, to Ciba-Geigy Corporation. Process for preparing water-dilutable, heat-curing epoxy resin coating compositions using organic cosolvents. 4,104,224, Cl. 260-29.40R.
- Nemoto, Ichiro: *See—*
  - Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.
- Neretex Corp.: *See—*
  - Cornellier, Joseph Rene, 4,103,716, Cl. 139-54.000.
- Nethersole, Douglas C.: *See—*
  - Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., 4,104,416, Cl. 427-29.000.
- Neufeld, John A. Sub-trochanteric nail. 4,103,683, Cl. 128-92.0BA.
- Neufeldt, Jacob J. Bucket actuating linkage. 4,103,790, Cl. 214-80.000.
- New Nippon Electric Co., Ltd.: *See—*
  - Iwata, Kozo, 4,104,561, Cl. 315-101.000.
  - Sakamoto, Yoshimasa, 4,103,416, Cl. 29-630.00D.
- Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, to General Electric Company Limited, The. Apparatus for indicating the sequence of alternating current signals. 4,104,586, Cl. 324-83.00D.
- Newcor, Inc.: *See—*
  - Marcin, Richard, 4,103,516, Cl. 64-30.00E.
- Newman, Gerald H.: *See—*
  - Klemann, Lawrence P.; and Newman, Gerald H., 4,104,451, Cl. 429-194.000.
- Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Arrangement utilizing the mechanism of charge spreading to provide an ac plasma panel with shifting capability. 4,104,626, Cl. 340-324.00M.
- Niagara Blower Company: *See—*
  - Stutz, Robert C., 4,104,112, Cl. 159-4.00R.
- Nicaise, Robert, to Metallurgie Hoboken-Overpelt. Production of zinc powder for electrochemical batteries. 4,104,188, Cl. 252-182.100.
- Nichols Institute of Endocrinology, Inc.: *See—*
  - Young, David M., 4,104,126, Cl. 195-103.50A.
- Niday, Louis L., to Niday, Louis L. Mechanical movement mechanism. 4,103,556, Cl. 74-25.000.
- Nielson, David R., to E-Systems, Inc. VOR phase monitoring system. 4,104,637, Cl. 343-106.00R.
- Nihon Cement Co., Ltd.: *See—*
  - Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.
- Nijhuis, Jan, to Hollandse Signaalapparaten B.V. Dual zone wet drafting device for twistless yarns. 4,103,396, Cl. 19-66.00R.
- Nikitin, Jury Ivanovich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Nikolaev Vladimir Yakovlevich: *See—*
  - Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.
- Nippon Gakki Seizo Kabushiki Kaisha: *See—*
  - Chibana, Masanobu, 4,103,582, Cl. 84-1.240.
  - Takabayashi, Yojiro, 4,103,583, Cl. 84-291.000.

- Nippon Kogaku K.K.: *See—*
  - Nakazawa, Kiwao; and Tanimoto, Akikazu, 4,103,998, Cl. 356-152.000.
  - Sugimori, Shiro; and Toyoda, Kenji, 4,104,661, Cl. 354-173.000.
  - Toyoda, Kenji; and Watanabe, Sakuji, 4,104,666, Cl. 354-234.000.
- Nippon Light Metal Company Limited: *See—*
  - Miki, Isao, 4,104,089, Cl. 148-32.500.
- Nippon Pillar Packing Co., Ltd.: *See—*
  - Inouye, Hiroshi; and Kobayashi, Sadao, 4,103,907, Cl. 277-96.100.
- Nippon Riraiansu Kabushiki Kaisha (Japan Reliance Electric Ltd.): *See—*
  - Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.
- Nippon Soken, Inc.: *See—*
  - Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, 4,104,493, Cl. 200-61.45R.
- Nippon Steel Corporation: *See—*
  - Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, 4,103,528, Cl. 72-238.000.
  - Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
  - Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.
- Nippon Zeon Co. Ltd.: *See—*
  - Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, 4,104,327, Cl. 260-876.00B.
- Nippondenso Co., Ltd.: *See—*
  - Kato, Tetsuo; and Mori, Kazumasa, 4,104,560, Cl. 315-83.000.
  - Matumoto, Eizi; and Norimatsu, Hideaki, 4,103,649, Cl. 123-32.0EE.
- Nischk, Gunther: *See—*
  - Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, 4,104,324, Cl. 260-857.0TW.
- Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, to Kubota, Ltd. Horizontal type diesel engine. 4,103,650, Cl. 123-41.860.
- Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, to Exxon Research & Engineering Co. Catalyst for reduction of nitrogen oxides and process for preparing the same. 4,104,361, Cl. 423-239.000.
- Nishikawa, Masao: *See—*
  - Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
- Nishimura, Hideo; and Etoh, Kunihiko, to Toyoda-Koki Kabushiki-Kaisha. Dressing apparatus for grinding wheel. 4,103,668, Cl. 125-11.0CD.
- Nishioka, Hideya, to Fujitsu Limited. Chip bonding unit. 4,103,814, Cl. 228-6.00A.
- Nissan Motor Company, Limited: *See—*
  - Aono, Shigeo, 4,103,695, Cl. 137-1.000.
  - Aoyama, Syunichi, 4,103,488, Cl. 60-289.000.
  - Fujiki, Norio; and Endo, Hiroshi, 4,104,632, Cl. 343-7.0VM.
  - Hasebe, Tetsuzi, 4,103,714, Cl. 139-1.00C.
  - Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, 4,103,486, Cl. 60-274.000.
  - Iijima, Tetsuya, 4,103,764, Cl. 192-4.00A.
  - Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, 4,103,908, Cl. 277-96.200.
  - Minami, Hidehiro, 4,103,657, Cl. 123-127.000.
  - Nakamura, Koyo, 4,103,654, Cl. 123-119.0EC.
  - Uenn, Zene; Morita, Akira; and Chida, Atushi, 4,103,653, Cl. 123-117.00R.
  - Yanagishima, Takayuki; and Matsumura, Akira, 4,104,621, Cl. 340-576.000.
- Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., to Compagnie Francaise des Petroles, Societe Anonyme; Etudes Petrolieres Marines, Societe a Responsabilite Limitee; Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme; Compagnie Maritime d'Expertises, Societe Anonyme; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS) Societe Anonyme; and Societe Nationale Elf Aquitaine (Production). Apparatus for connecting the ends of submerged pipes. 4,103,500, Cl. 61-69.00R.
- Noguchi, Matsusaburo: *See—*
  - Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, 4,103,612, Cl. 101-1.000.
- Noguchi, Sadao, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for bottling beer. 4,103,721, Cl. 141-6.000.
- Nolte, Hans-Henning; De Boel, Marcel; and Baudin, Pol, to BFG Glassgroup. Laminated light-transmitting fire-screening panel. 4,104,427, Cl. 428-68.000.
- Nolte, Karl: *See—*
  - Lundstrom, Goran; and Nolte, Karl, 4,104,490, Cl. 200-44.000.
- Nord, Russell H.: *See—*
  - Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., 4,104,725, Cl. 364-487.000.
- Norimatsu, Hideaki: *See—*
  - Matumoto, Eizi; and Norimatsu, Hideaki, 4,103,649, Cl. 123-32.0EE.
- Norland Corporation: *See—*
  - Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., 4,104,725, Cl. 364-487.000.
- Norris, Philip R., to Polaroid Corporation. Camera having automatic shutter recock by film processing mechanism. 4,104,660, Cl. 354-171.000.
- North American Philips Corporation: *See—*
  - Van Roessel, Frederik Johannes, 4,104,678, Cl. 358-30.000.
- Northwestern University: *See—*
  - Meiri, Shmuel, 4,104,006, Cl. 417-334.000.
- Norton Company: *See—*
  - Weaver, Gerald Q., 4,104,062, Cl. 75-238.000.
- Norton, Richard S., to Suntech, Inc. Process for N-aroylimides. 4,104,279, Cl. 260-326.00N.
- Norwood, Amos: *See—*
  - Mikes, John A.; Greer, Albert H.; and Norwood, Amos, 4,104,209, Cl. 521-62.000.
- Nothdurft, Carl. Fishing reel. 4,103,843, Cl. 242-107.000.
- Novello, Frederick C.: *See—*
  - Baldwin, John J.; and Novello, Frederick C., 4,104,393, Cl. 424-263.000.
- Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., to Goodyear Tire & Rubber Company, The. Microwave devulcanization of rubber. 4,104,205, Cl. 260-2.300.
- Nowacki, Georg; and Weber, Karl-Heinz, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Cable carriage and spill-plate housing assembly for a mining machine. 4,103,974, Cl. 299-43.000.
- NSK-Warner K.K.: *See—*
  - Ueda, Takeo, 4,103,845, Cl. 242-107.700.
- Nufer, Robert W.: *See—*
  - Anderson, Leslie C.; Nufer, Robert W.; and Pugliese, Frank G., 4,104,345, Cl. 264-43.000.
- Nugent, Adam, Jr.: *See—*
  - Hornbaker, Edwin D.; and Nugent, Adam, Jr., 4,104,459, Cl. 528-499.000.
- Nury, Jean: *See—*
  - Bernard, Jean Rene; and Nury, Jean, 4,104,320, Cl. 260-673.500.
- Obermaier & Cie.: *See—*
  - Plack, Ludwig, 4,103,523, Cl. 68-187.000.
- Obi, Tatsuro: *See—*
  - Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
- O'Brien, William L.; and Doran, Wayne M., to NCR Canada Ltd. - NCR Canada Ltee. Hammer energy impact control using read only memory. 4,103,617, Cl. 101-93.030.
- Oetiker, Hans. Hose clamp. 4,103,399, Cl. 24-22.000.
- Oetliker, Rudy: *See—*
  - Richardson, Bruce E.; and Oetliker, Rudy, 4,103,698, Cl. 134-73.000.
- Oggioni, Marco; and Rastrelli, Vinicio. Automatic hydraulic machine for preparing infusions, in particular of coffee. 4,103,602, Cl. 99-289.00D.
- Ohaji, Cosmas O.: *See—*
  - Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., 4,104,174, Cl. 252-8.55D.
- Ohashi, Hiroshi: *See—*
  - Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,104,610, Cl. 340-15.000.
  - Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.
- Ohashi, Yoshinobu; and Inoue, Shizuo, to Kubota, Ltd. Method of making a sand mold. 4,104,347, Cl. 264-113.000.
- Ohkubo, Kazuo: *See—*
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
- Ohm, Klaus, to Chemische Fabrik Dr. Wiedeking. Solderable wire lacquers. 4,104,235, Cl. 260-33.20R.
- Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, to Hoechst Aktiengesellschaft. Production of pure methyldichlorophosphane. 4,104,299, Cl. 260-543.00P.
- Ohorodnik, Alexander: *See—*
  - Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
- Ohsugi, Motoyoshi: *See—*
  - Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.

- Ohtaki, Shohei: *See—*
  - Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
- Oi, Naobumi; Moriguchi, Koichi; and Matsuda, Mari, to Sumitomo Chemical Company, Limited. Use of s-triazine derivatives in a gas chromatographic method. 4,104,040, Cl. 55-67.000.
- Okada, Kozo: *See—*
  - Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
- Okada, Morio: *See—*
  - Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.
- Okada, Seiichi: *See—*
  - Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, 4,104,327, Cl. 260-876.00B.
- Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof, and antithrombotic compositions and methods employing them. 4,104,392, Cl. 424-258.000.
- Okazaki, Susumu: *See—*
  - Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.
- Oki Electric Industry Co., Ltd.: *See—*
  - Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, 4,103,612, Cl. 101-1.000.
- Okita, Koichi, to Sumitomo Electric Industries, Ltd. Method for diametrically expanding thermally contractive ptfe resin tube. 4,104,394, Cl. 264-89.000.
- Okorodudu, Abraham O. M.: *See—*
  - Landis, Phillip S.; and Okorodudu, Abraham O. M., 4,104,181, Cl. 252-46.700.
- Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, to Koyo Seiko Company, Limited; and Nippon Steel Corporation. Apparatus for releasing drive assembly from driven shaft and connecting same thereto. 4,103,528, Cl. 72-238.000.
- Okuda, Yoshihiko: *See—*
  - Araki, Tsunehiko; and Okuda, Yoshihiko, 4,103,997, Cl. 356-104.000.
- Okumura, Jun: *See—*
  - Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,104,469, Cl. 544-27.000.
- Okuno, Youichi: *See—*
  - Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.
- Oldendorf, Christian: *See—*
  - Melcher, Franz Josef; and Oldendorf, Christian, 4,103,750, Cl. 177-1.000.
- Oldendorf, William Henry. Method and apparatus for retrieval of exposure information from film images. 4,104,519, Cl. 250-274.000.
- Olsen, Robert W., to Construction Specialties, Inc. Drainable blade louver. 4,103,468, Cl. 52-473.000.
- Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., to State of Michigan. Lymphosarcin and method of producing lymphosarcin. 4,104,369, Cl. 424-115.000.
- Olympia Werke AG: *See—*
  - Fischbeck, Karl-Heinz, 4,104,646, Cl. 346-140.00R.
- Olympus Optical Co., Ltd.: *See—*
  - Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,104,654, Cl. 354-31.000.
- Omori, Eiji: *See—*
  - Aimono, Yuji; Omori, Eiji; and Nakano, Mineo, 4,104,215, Cl. 260-22.0CB.
- Onda, Eiichi: *See—*
  - Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.
- Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., to Gulf Research & Development Company. Process for preparing novel isomeric dicarboxy, di (hydroxymethyl) diphenylmethane dilactones. 4,104,281, Cl. 260-343.30R.
- Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm B.V. Mowing device. 4,103,476, Cl. 56-13.600.
- Opalka, Chester J., Jr.: *See—*
  - Lesher, George Y.; and Opalka, Chester J., Jr., 4,104,385, Cl. 424-250.000.
- Oppenlaender, Knut: *See—*
  - Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, 4,104,374, Cl. 424-185.000.
- Oratronics, Inc.: *See—*
  - Weiss, Charles M.; and Judy, Kenneth W. M., 4,103,422, Cl. 32-10.00A.
- Orii, Toshio, to Sanyo Electric Co., Ltd. Receiver circuit including an hysteresis circuit for use with a remote controller. 4,104,593, Cl 325-392.000.
- Orlowski, Jan A.: *See—*
  - Lee, Henry L., Jr.; and Orlowski, Jan A., 4,104,333, Cl. 260-885.000.
- Ormat Turbines (1965) Ltd.: *See—*
  - Bronicki, Yehuda L., 4,104,535, Cl. 290-52.000.
- Orr, James Douglas. Ball valve. 4,103,867, Cl. 251-180.000.
- Orrell, Leonard; and Whittle, John, to Shell Oil Company. Aviation fuel grade monitor. 4,103,700, Cl. 137-172.000.
- Osborne, Harold E.: *See—*
  - Cise, Michael D.; and Osborne, Harold E., 4,104,470, Cl. 544-27.000.
- Ostrander, Kenneth A.: *See—*
  - Hamby, Russell; and Ostrander, Kenneth A., 4,104,570, Cl. 318-318.000.
- Ostyn, Rene. Golfer's stance correcting device. 4,103,897, Cl 273-188.00A.
- Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy Corporation. Combatting pests with O,S-dialkyl-O-(4-phenylazophenyl)-thiophosphates. 4,104,378, Cl. 424-225.000.
- Ota, Toshimichi: *See—*
  - Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, 4,103,612, Cl. 101-1.000.
- Otaka, Teruo: *See—*
  - Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo, Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl 354-106.000.
- Otis Engineering Corporation: *See—*
  - Yonker, John H., 4,103,740, Cl. 166-117.500.
- O'Toole, Patrick John: *See—*
  - Damico, Frank M.; and O'Toole, Patrick John, 4,104,710, Cl. 362-130.000.
- Otsuka, Susumu: *See—*
  - Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
- Otteson, Nelson Stuart. Gun chamber indicator. 4,103,639, Cl. 42-1.00D.
- Ottofrickenstein, Hans: *See—*
  - Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.
- Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Hexahydropyrimidines as anti-oxidants in natural and synthetic rubbers. 4,104,249, Cl. 260-45.80N.
- Ovaska, Juhani: *See—*
  - Matikainen, Martti; and Ovaska, Juhani, 4,103,565, Cl. 74-665.00L.
- Overzet, John Kenneth, to Borg-Warner Corporation. Signal translating circuit for variable area capacitive pressure transducer. 4,104,595, Cl. 328-1.000.
- Owen, Ronald C., to Illinois Tool Works Inc. Article carrier and method of making same. 4,103,811, Cl. 224-45.0AA.
- Owens-Corning Fiberglas Corporation: *See—*
  - Johnson, Carl A., 4,104,434, Cl. 428-273.000.
  - Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., 4,104,241, Cl. 260-40.00R.
- Owston, Ernest H., Jr.: *See—*
  - Chao, Tai S.; and Owston, Ernest H., Jr., 4,104,036, Cl. 44-56.000.
- P.R. Mallory & Co. Inc.: *See—*
  - Sweany, Louis P.; and Burk, Michael T., 4,104,628, Cl. 340-384.00E.
  - Weaver, Charles A., 4,104,704, Cl. 361-433.000.
- Paal, Gabor: *See—*
  - Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.
  - Moritz, Holger; and Paal, Gabor, 4,104,070, Cl. 96-36.000.
- Pacific Scientific Company: *See—*
  - Yang, Elmer Chensheng, 4,103,760, Cl. 188-1.00B.
- Padilla, Dominick: *See—*
  - Padilla, Gilbert; and Padilla, Dominick, 4,104,642, Cl. 343-882.000.
- Padilla, Gilbert; and Padilla, Dominick, to RMS Electronics, Inc. T-shaped swivel joint for an antenna mounting structure. 4,104,642, Cl. 343-882.000.
- Pak-Well Corporation: *See—*
  - Gartshore, Peter A.; and Ward, James O., 4,103,821, Cl. 229-74.000.
- Pako Corporation: *See—*
  - Charnley, Ralph L.; and Kumpula, Clyde A., 4,104,670, Cl. 354-324.000.

- Palagyi, Stanley S.: *See—*
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- Palamara, Anthony P. Guide means for boat trailer. 4,103,925, Cl. 280-414.00A.
- Panametrics, Inc.: *See—*
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- Pandrol Limited: *See—*
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- Panelfold Doors, Inc.: *See—*
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- Panlaqui, Clayton E.: *See—*
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- Panschow, Rudolf: *See—*
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- Pape, Rolf: *See—*
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- Papillon, Bernard: *See—*
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- Paquette, Elmer G.: *See—*
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- Parcor: *See—*
  - Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, 4,104,390, Cl. 424-256.000.
- Parent, Jean-Marc. Camping vehicle body. 4,103,958, Cl. 296-23.00C.
- Park, Kyu C.; and Weitzman, Elizabeth J., to International Business Machines Corporation. Glass layer fabrication. 4,104,418, Cl. 427-42.000.
- Parker, Robert J., to Ford Motor Company. Pivot construction for a motor vehicle suspension system. 4,103,932, Cl. 280-718.000.
- Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, to Marshall and Williams Company. Tenter guide rail gap crossing mechanism. 4,103,403, Cl. 26-91.000.
- Parsons, Michael Edward: *See—*
  - Black, James Whyte; and Parsons, Michael Edward, 4,104,382, Cl. 424-247.000.
- Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., to Canada Wire and Cable Limited. Thin walled protective coatings by electrostatic powder deposition. 4,104,416, Cl. 427-29.000.
- Partilla, John David: *See—*
  - Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., 4,104,589, Cl. 324-158.00F.
- Parziale, Ernest A.; and Richardson, Dennis C., to Westinghouse Electric Corp. Nuclear reactor power generation. 4,104,117, Cl. 176-20.00R.
- Passal, Frank; Lash, Ronald J.; and Kardos, Otto, to M&T Chemicals Inc. Brass plating. 4,104,138, Cl. 204-44.000.
- Patel, Mahendra K.: *See—*
  - Chan, Kingsley; Patel, Mahendra K.; and Wolkin, Sidney, 4,104,713, Cl. 362-294.000.
- Patel, Raman P.: *See—*
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- Paterson, David James: *See—*
  - Banks, Reginald George Sinclair; Paterson, David James; and Williams, Alan, 4,104,201, Cl. 252-466.00B.
- Patterson, W. W., III; and Grapes, Eugene F. Wire rope binder. 4,103,871, Cl. 254-164.000.
- Paul, Dwaine M., to Moran, Thomas L., a part interest. Method and means of treating water wells. 4,103,743, Cl. 166-299.000.
- Pauley, Eugene E. Fireplace heat exchanger assembly. 4,103,669, Cl. 126-121.000.
- Paulson, Larry G.: *See—*
  - Karacan, Ismet; Paulson, Larry G.; and Timm, Gerald W., 4,103,678, Cl. 128-2.05V.
- Paulus, Rudolf: *See—*
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- Payet, George Louis, to Strike Corporation, The. Durable press process for cellulosic fiber-containing fabrics utilizing formaldehyde and a water soluble liquid or gaseous acid catalyst. 4,104,022, Cl. 8-115.600.
- Paz, Eldad: *See—*
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- Peabody, Edwin A., deceased; and by Peabody, Gertrude A., administratrix. Bogie wheel. 4,103,558, Cl. 74-230.700.
- Peabody, Gertrude A., administratrix: *See—*
  - Peabody, Edwin A., deceased; and Peabody, Gertrude A., administratrix, 4,103,558, Cl. 74-230.700.
- Pearce, Arthur R., to Key Industries. Punch for compressing machine. 4,104,014, Cl. 425-345.000.
- Pearce, Ralph Reginald, to E M I Limited. Magnetic recording. 4,104,513, Cl. 235-450.000.
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- Pecsi, Louis E., to Eaton Corporation. Starter motor protector circuit. 4,104,688, Cl. 361-28.000.
- Pedersen, Kristen I.: *See—*
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- Pedersen, Tor Jan: *See—*
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- Peer, John Charles; and Luz, David Warren, to RCA Corporation. Television raster width regulation circuit. 4,104,567, Cl. 315-387.000.
- Peets, Robert S.: *See—*
  - Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., 4,103,633, Cl. 112-217.100.
- Pelikan, Hans Dieter; and Titz, Siegfried, to Pelikan, Hans Dieter; and Titz, Siegfried. Process for production of cellular cavities in thermoplastic material in which the medium which forms the gas bubbles is bound to a carrier. 4,104,207, Cl. 521-84.000.
- Pellant, Michal: *See—*
  - Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.
- Pelsy, Gilles. Linkage for an excavating tooth. 4,103,443, Cl. 37-193.000.
- Penhorwood, Herbert F., to Universal Electric Company. Motor seals. 4,104,550, Cl. 310-71.000.
- Pennell, Phillip E., to Gates Rubber Company, The. Method of using a flexible mandrel for making a locking cable. 4,103,410, Cl. 29-403.000.
- Penton, Allen P., III: *See—*
  - Gonzalez, Rodolfo; and Penton, Allen P., III, 4,104,426, Cl. 428-36.000.
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- Perez, Hector R. Multi-purpose working vehicle. 4,103,799, Cl. 214-86.00A.
- Perfect, Frederick H., to Reading Alloys, Inc. Molybdenum-titanium-zirconium-aluminum master alloys. 4,104,059, Cl. 75-134.00F.
- Perkin-Elmer Corporation, The: *See—*
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- Perkins, Calvin C., to Marantz Company, Inc. Heat exchanger structure for electronic apparatus. 4,103,737, Cl. 165-80.000.
- Persson, Sven Erik, to Teknisk Konsult Sven Persson AB. Conveyor for conveying articles in a helically curved path. 4,103,768, Cl. 198-778.000.
- Pessel, David; and Wilhelm, Neil C. Telephone loud-speaker system. 4,104,485, Cl. 179-1.0HF.
- Peters, Anthony J., to Sonoco Products Company. Loom core. 4,103,837, Cl. 242-46.210.
- Peters, Kenneth D.: *See—*
  - Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., 4,104,149, Cl. 208-64.000.
- Peters, Victor; and Krammer, Franz, to ALKOR Gesellschaft mit beschrankter Haftung Kunststoffverkauf. Printing ink. 4,104,219, Cl. 260-29.6RB.
- Peterson, Soren E. Apparatus for forming cleats on belting. 4,104,094, Cl. 156-500.000.
- Petrellis, Nicholas C.: *See—*
  - Sabol, Albert R.; and Petrellis, Nicholas C., 4,104,291, Cl. 260-429.900.
- Petrolite Corporation: *See—*
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  - Redmore, Derek; and Welge, Frederick T., 4,104,293, Cl. 260-438.50R.
- Pettelkau, Hans-Jurgen, to Bayer Aktiengesellschaft. Process for the production of concentrated polychloroprene latices. 4,104,272, Cl. 260-27.0BB.
- Pfahler, Gerhard: *See—*
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- Pfeiffer, Francis R.: *See—*
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- Philip Morris Incorporated: *See—*
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- Phillips, Bernard L., to Arrow Hart Inc. Process for soldering to laminations of an arcing contact for a high current switch. 4,104,506, Cl. 219-85.0CM.
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  - Fodor, Lawrence M., 4,104,326, Cl. 260-876.00B.
  - Howerton, John M., 4,103,505, Cl. 61-108.000.
  - Meyer, Richard D., 4,104,015, Cl. 425-382.200.
  - Snavely, Kenneth E., 4,104,322, Cl. 260-827.000.
  - Snavely, Kenneth E., 4,104,334, Cl. 260-888.000.
  - Swanson, Billy L., 4,103,742, Cl. 166-282.000.
  - Zelinski, Robert P., 4,104,332, Cl. 260-880.00B.
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- Piattoni, Louis J.: *See—*
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  - Colamussi, Arturo; and Merli, Vittorio, 4,103,497, Cl. 61-27.000.
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- Plank, Charles J.: *See—*
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- Pliml, Frank V.; and Erickson, Lloyd A., to Illinois Tool Works Inc. Support fastener. 4,103,854, Cl. 248-235.000.
- Pliml, Frank V., Jr., to Illinois Tool Works Inc. Gravity actuated light socket and switch means. 4,104,492, Cl. 200-51.140.
- Pogge, Hans Bernhard, to International Business Machines Corporation. Total dielectric isolation utilizing a combination of reactive ion etching, anodic etching, and thermal oxidation. 4,104,090, Cl. 148-175.000.
- Pogge, Hans Bernhard: *See—*
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- Pohl, Dieter; and Redlinger, Franz, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Formed part of sintered iron and method and sintering tile for making same. 4,104,063, Cl. 75-243.000.
- Poirier, Victor L., to Thermo Electron Corporation. Pneumatic bladder pump having stiffness symmetry. 4,104,005, Cl. 417-394.000.
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  - Johnson, Bruce K.; and Whiteside, George D., 4,104,653, Cl 354-27.000.
  - Norris, Philip R., 4,104,660, Cl. 354-171.000.
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- Pommer, Ernst-Heinrich: *See—*
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  - Seymour, Samuel L., 4,104,047, Cl. 65-273.000.
- Prasch, Johann, to Klockner-Humboldt-Deutz Aktiengesellschaft. Lubricating device for internal combustion engines. 4,103,665, Cl. 123-196.00R.
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Proud, Joseph M., Jr., to GTE Laboratories Incorporated. Liquid dielectric radio frequency pulse generators. 4,104,557, Cl. 315-39.000.
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Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.
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Forster, Gerhard; and Bohringer, Walter, 4,104,569, Cl. 315-408.000.
Peer, John Charles; and Luz, David Warren, 4,104,567, Cl. 315-387.000.
Riley, George Andrew, 4,103,483, Cl. 58-90.00R.
Reading Alloys, Inc.: *See—*
Perfect, Frederick H., 4,104,059, Cl. 75-134.00F.
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Robuchon-Merovak, Romain Gabriel; and Robuchon-Merovak, Christian Romain, 4,104,031, Cl. 23-253.00R.
Reagan, Rose M. Hair arranging accessory. 4,103,693, Cl. 132-46.00R.
Recortec, Inc.: *See—*
Chang, David T. L., 4,104,685, Cl. 360-84.000.
Reddekopp, Aaron. Truck engine air preheating system. 4,103,656, Cl. 123-122.00D.
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Pohl, Dieter; and Redlinger, Franz, 4,104,063, Cl. 75-243.000.
Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Oil-soluble chromium compositions. 4,104,293, Cl. 260-438.50R.
Rees, Peter William, to Measurex Corporation. Apparatus for measuring the weight per unit length of a cigarette rod. 4,104,522, Cl. 250-359.000.
Reese, Paul T., to Tecumseh Products Company. Pull-rope recoil starter. 4,103,660, Cl. 123-179.00K.
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Reichel, Pavel: *See—*
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.
Reiersdal, Olav L. Device for a hydraulically driven percussion hammer. 4,103,591, Cl. 91-417.00R.
Reimann, Siegfried: *See—*
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Reizman, Fremont: *See—*
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Hamby, Russell; and Ostrander, Kenneth A., 4,104,570, Cl. 318-318.000.
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, to Bayer Aktiengesellschaft. Method for producing textured filament yarns with improved yarn qualities from preorientated polyamide 6. 4,103,480, Cl. 57-140.00R.
Remy, David C., to Merck & Co., Inc. 3-Lower alkoxycyproheptadines as serotonin inhibitors. 4,104,398, Cl. 424-267.000.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,103,786, Cl. 214-7.000.
Rengo Kabushiki Kaisha (Rengo Co., Ltd): *See—*
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Repa Feinstanzwerk GmbH: *See—*
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Fox, Jack J.; and Burchenal, Joseph H., 4,104,461, Cl. 536-23.000.
Resnick, Marvin; and Mounts, Stanley Homer, to Textile Associates, Inc. Cleaning unit. 4,103,389, Cl. 15-302.000.
Retzer, Erich, to Compur-Werk Gesellschaft mit beschrankter Haftung & Co. Method of preparing liquid samples for testing. 4,104,025, Cl. 23-230.00R.

Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, to BASF Aktiengesellschaft. Wood preservative. 4,104,374, Cl. 424-185.000.
Reuting, Hans-Werner, to Elmeg Elektro-Mechanik GmbH. Method of adjusting a permanent magnet by using a hypothetical demagnetization curve lower than the actual value. 4,104,591, Cl. 324-205.000.
Rexnord Inc.: *See—*
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Reynolds, Lionel Arthur, to A. F. Hydraulics Limited. Rotary and percussive devices. 4,103,746, Cl. 173-107.000.
Reynolds Metals Company: *See—*
Schardein, Daniel Joseph; and Lloyd, Ruth Diane, 4,104,136, Cl. 204-38.00B.
Rhode, Richard: *See—*
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Rhone-Poulenc Industries: *See—*
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Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,104,386, Cl. 424-250.000.
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Rhyne, Ralph H.; and Wise, Dan S., to Wise Industries, Inc. Method and apparatus for blending textile fibers. 4,103,398, Cl. 19-145.500.
Riblet, Henry. Adjustable scaffold bracket. 4,103,856, Cl. 248-246.000.
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Victor, Floyd Ray, 4,103,537, Cl. 73-40.50R.
Richards, Donald L., to Eaton Corporation. Safety relief valve. 4,103,704, Cl. 137-522.000.
Richardson, Bruce E.; and Oetliker, Rudy, to Labatt Breweries of Canada Limited. Bottle label removing device. 4,103,698, Cl. 134-73.000.
Richardson, Dennis C.: *See—*
Parziale, Ernest A.; and Richardson, Dennis C., 4,104,117, Cl. 176-20.00R.
Richmond, Raymond. Clamping devices. 4,103,380, Cl. 9-30.000.
Richtzenhain, Hermann: *See—*
Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,104,300, Cl. 260-544.00D.
Ricketts, Joseph H. Golf tee. 4,103,888, Cl. 273-33.000.
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Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., to Abex Corporation. Welding manganese steel. 4,104,504, Cl. 219-73.100.
Ridgway, H. Curtis, to Telsco Industries, Inc. Rotary sprinkler impact arm spring adjustment. 4,103,828, Cl. 239-206.000.
Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.
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Righter, Richard G.: *See—*
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Riker Laboratories, Inc.: *See—*
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Riordan, David B. Inflatable structure. 4,103,369, Cl. 4-172.120.
Rittenhouse, Howard E., to Liquid Controls Corporation. Safety interlock system for preset counters. 4,104,511, Cl. 235-132.00R.
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Seiler, Hartmut, 4,104,546, Cl. 307-362.000.
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Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., to United States of America, National Aeronautics and Space Administration. Method for making an aluminum or copper substrate panel for selective absorption of solar energy. 4,104,134, Cl. 204-37.00R.
Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Thermosetting additives for polyester-based molding compounds. 4,104,241, Cl. 260-40.00R.
Roberts, Sidney G., to Kaiser Aluminum & Chemical Corporation. Powder metallurgy. 4,104,061, Cl. 75-211.000.
Robin, Rollin. Apparatus for converting a measuring tape to a compass. 4,103,426, Cl. 33-27.00C.
Robinson, Bernie E., to Milwaukee Valve Company, Inc. Butterfly valve. 4,103,866, Cl. 251-151.000.
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., to Scientific-Atlanta, Inc. Modular solar collector system. 4,103,674, Cl. 126-271.000.
Robinson, John C.: *See—*
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Robnolt, Leon D., Jr.: *See—*
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Robuchon-Merovak, Romain Gabriel; and Robuchon-Merovak, Christian Romain, 4,104,031, Cl. 23-253.00R.
Robuchon-Merovak, Romain Gabriel; and Robuchon-Merovak, Christian Romain, to Readymatie S.A. Apparatus for displaying the results obtained on an agglutination support. 4,104,031, Cl. 23-253.00R.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Door hinge. 4,103,394, Cl. 16-129.000.
Rockwell-Golde G.m.b.H.: *See—*
Schlapp, Albert, 4,103,962, Cl. 296-137.00E.
Rockwell International Corporation: *See—*
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Rodzewich, Edward A.: *See—*
Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., 4,104,303, Cl. 260-570.900.
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, to Bayer Aktiengesellschaft. Halogenated 4-trifluoromethyl-4'-nitro-diphenyl-ether. 4,104,313, Cl. 260-612.00R.
Rohm GmbH: *See—*
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Rohm, Gunter Horst. Drill chuck. 4,103,914, Cl. 279-4.000.
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McNulty, Patrick J.; and Warner, Harlow L., 4,104,273, Cl. 260-294.900.
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Rollei-Werke Franke & Heidecke: *See—*
Schneider, Arthur, 4,104,707, Cl. 362-17.000.
Scholz, Erwin; and Ehlers, Albert, 4,104,667, Cl. 354-250.000.
Strauss, Karl-Peter, 4,104,655, Cl. 354-38.000.
Strauss, Karl-Peter, 4,104,656, Cl. 354-43.000.
Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, to Bergwerksverband GmbH. Process for the production of coke from pitch. 4,104,150, Cl. 208-91.000.
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Rose, David, to Henkel Kommanditgesellschaft Auf Aktien. Hair dye compositions containing 4,7-diaminoindazoles. 4,104,020, Cl. 8-10.200.
Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., to Norland Corporation. Programmed calculating input signal module for waveform measuring and analyzing instrument. 4,104,725, Cl. 364-487.000.
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Rosin, Seymour. Unit-power concentric optical systems. 4,103,989, Cl. 350-199.000.
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Rostoker, David, to Pittsburgh Corning Corporation. Pulverulent borosilicate composition and a method of making a cellular borosilicate body therefrom. 4,104,074, Cl. 106-40.00V.

- Roth, Ernst: *See—*
  - Blank, Wilhelm; and Roth, Ernst, 4,104,551, Cl. 310-88.000.
- Roth, Heinrich, to Theo Krebs AG. Flat spray nozzle head for a manually-operated spray gun. 4,103,830, Cl. 239-587.000.
- Rowbotham, Philip Martin: *See—*
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- Rowe, Blaine F., to Plastics, Inc. Device for slicing a block of cheese and the like. 4,103,579, Cl. 83-435.100.
- Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, to Erco Envirotech Ltd. Bleach plant operation. 4,104,114, Cl. 162-29.000.
- Rubin, Mae K.; Plank, Charles J.; and Rosinski, Edward J., to Mobil Oil Corporation. Organic compound conversion over ZSM-23. 4,104,151, Cl. 208-111.000.
- Ruble, Frank D.; Chang, Louis H.; and Fravel, John C., to Xerox Corporation. Control apparatus for serial printer. 4,103,766, Cl. 197-62.000.
- Rudd, Edward H., to Magni-Power Company. Accessory locking mount. 4,103,982, Cl. 339-91.00R.
- Rudy, George John: *See—*
  - Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.
- Ruggeri, Luigi. Saturable magnetic device for regulating commutating or converting an electric current from AC to DC or vice versa. 4,104,716, Cl. 363-102.000.
- Ruiter, Antonius: *See—*
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- Rupprecht, Lothar: *See—*
  - Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.
- Rusbach, Maurice, to Sarmac S.A. Projectile explosive. 4,103,620, Cl. 102-38.0PP.
- Russell, David B.: *See—*
  - Bednarski, John R.; and Russell, David B., 4,104,234, Cl. 260-33.6UA.
- Ruter, Jorn: *See—*
  - Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, 4,104,261, Cl. 260-873.000.
- Rykwalder, Stanley J.; and Zink, Frederick J., to Lebow Associates, Inc. Load cell. 4,103,545, Cl. 73-141.00A.
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- S&C Electric Company: *See—*
  - Zulaski, John A., 4,104,687, Cl. 361-17.000.
- Sabol, Albert R.; and Petrellis, Nicholas C., to Standard Oil Company a corporation of Indiana. Metal dithiophosphates and their manufacture. 4,104,291, Cl. 260-429.900.
- Sabourin, Edward T.: *See—*
  - Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
  - Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,104,281, Cl. 260-343.30R.
- Sadwith, Howard M. Apparatus and method for washing and drying reusable containers. 4,104,080, Cl. 134-23.000.
- Saint-Gobain Industries: *See—*
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- St. Louis Diecasting Corporation: *See—*
  - Krieger, George H., 4,103,412, Cl. 29-460.000.
- Saito, Takao: *See—*
  - Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
- Saito, Yuji: *See—*
  - Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, 4,104,208, Cl. 521-53.000.
- Sakamoto, Kazuo: *See—*
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- Sakamoto, Yoshimasa, to New Nippon Electric Co., Ltd. Method of manufacturing an hermatically sealed electrical terminal. 4,103,416, Cl. 29-630.00D.
- Sakazume, Takeshi, to Tokico Ltd. Reservoir in master cylinder of vehicle braking system. 4,103,492, Cl. 60-588.000.
- Salden, Leroy, to Winden Tool & Stamping, Inc. Fender flap. 4,103,918, Cl. 280-154.50R.
- Salloum, Charles R. Container handling structure. 4,103,787, Cl. 214-16.10A.
- Salmon, Jean P., to Jeumont-Schneider. Continuous speed checking process for a powered vehicle and apparatus for carrying the process into effect. 4,103,851, Cl. 246-63.00C.
- Saltzman, Ronald: *See—*
  - Wasilewski, Olgierd; Saltzman, Ronald; and Ferrara, William J., 4,104,143, Cl. 204-159.150.
- Samcoe Holding Corporation: *See—*
  - Frezza, Robert, 4,103,402, Cl. 26-74.000.
- Samuels, Michael Robert: *See—*
  - Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
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- Sanada, Noriaki: *See—*
  - Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.
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  - Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, 4,104,341, Cl. 264-9.000.
- Sanders Associates, Inc.: *See—*
  - Brodeur, Lester R., 4,104,635, Cl. 343-103.000.
  - Cann, Alfred J., 4,104,594, Cl. 325-475.000.
- Sandfort, Robert Melvin, to Monsanto Company. Method of fabricating magnetic bubble circuits. 4,104,422, Cl. 427-123.000.
- Sandl, Dieter: *See—*
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- Sandoz Ltd.: *See—*
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- Sandvik, Inc.: *See—*
  - Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., 4,103,844, Cl. 242-107.000.
- Saniga, George T.: *See—*
  - Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
- Sanno, Yasushi: *See—*
  - Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
- Santo, Philip J. Decorative waterbed frame. 4,103,375, Cl. 5-282.00R.
- Sanyei Corporation: *See—*
  - Kishida, Shizuaki; and Takahashi, Misao, 4,104,108, Cl. 156-510.000.
- Sanyo Electric Co., Ltd.: *See—*
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- Sara, Raymond Vincent, to Union Carbide Corporation. Method of chemically bonding aluminum to carbon substrates via monocarbides. 4,104,417, Cl. 427-37.000.
- Sarantakis, Dimitrios, to American Home Products Corporation. Somatostatin analogs. 4,104,267, Cl. 260-112.50S.
- Sarmac S.A.: *See—*
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- Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH): *See—*
  - Melcher, Franz Josef; and Oldendorf, Christian, 4,103,750, Cl. 177-1.000.
- Sasaya, Hideaki: *See—*
  - Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, 4,104,493, Cl. 200-61.45R.
- Sato, Hideaki: *See—*
  - Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
- Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, to Hitachi, Ltd. Overload protection apparatus for hoisting machine. 4,103,873, Cl. 254-168.000.

- Sato, Koji: *See—*
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- Sato, Shokichi: *See—*
  - Minegishi, Yukihiko; Sato, Shokichi; and Yamada, Toshikazu, 4,104,609, Cl. 340-3.00C.
- Sato, Yasuhito: *See—*
  - Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, 4,103,487, Cl. 60-282.000.
- Sato, Yuuichi: *See—*
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- Satoh, Isao; and Kato, Makoto, to Matsushita Electric Industrial Co., Ltd. Holographic memory with fringe stabilizing compensation for recording medium motion. 4,104,489, Cl. 179-100.30G.
- Satoh, Takashi, to Hitachi, Ltd. Address selecting circuitry for semiconductor memory device. 4,104,733, Cl. 365-189.000.
- Satzinger, Gerhard: *See—*
  - Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,104,380, Cl. 424-244.000.
- Sauer, Louis E.; and Miller, Orville C., to L.E. Sauer Machine Co. Die boards and method of producing cutting rule for same. 4,103,580, Cl. 83-663.000.
- Sawa, Natsuo; and Gohda, Kyoko, to Shikoku Chemicals Corporation. Novel imidazole compounds and process for preparations thereof. 4,104,473, Cl. 548-342.000.
- Sawaki, Chokei: *See—*
  - Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.
- Sawyer, Thomas C. Method and device for repairing damaged bleeder valve apertures. 4,103,762, Cl. 188-352.000.
- Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., to IDR, Inc. Interleaved processor and cable head. 4,104,681, Cl. 358-141.000.
- Scanley, Clyde: *See—*
  - Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.
- Schachinger, Martin; and Kruger, Heiko, to Siemens Aktiengesellschaft. Shut-down apparatus for conveyor belts in underground mines. 4,104,518, Cl. 250-221.000.
- Schachter, Joseph D. Crest and method of manufacture. 4,103,634, Cl. 112-439.000.
- Schade, Gerhard, to Dynamit Nobel Aktiengesellschaft. Water-dispersible ester resin containing a moiety of polyacid or bivalent alcohol containing a sulfo group. 4,104,262, Cl. 528-295.000.
- Schaefer, Daniel W., to Allis-Chalmers Corporation. Mower support for rear mounted grass catcher. 4,103,478, Cl. 56-205.000.
- Schafer, Larry C.: *See—*
  - Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.
- Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, to Hoechst Aktiengesellschaft. Production of methyldichlorophosphane. 4,104,304, Cl. 260-543.00P.
- Schafer, Stefan: *See—*
  - Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.
- Schaff, Ulrich, to Siemens Aktiengesellschaft. Stepping motor control arrangement. 4,104,574, Cl. 318-696.000.
- Schaffer, Howard Elias: *See—*
  - Bast, Bernard John; and Schaffer, Howard Elias, 4,103,473, Cl. 53-180.00M.
- Schaffernicht, Klaus: *See—*
  - Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,104,554, Cl. 313-447.000.
- Schank, Richard L.: *See—*
  - Chu, Joseph Y.; and Schank, Richard L., 4,103,616, Cl. 101-467.000.
- Schara, Robert E.: *See—*
  - Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,406, Cl. 426-99.000.
  - Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,407, Cl. 426-99.000.
- Schardein, Daniel Joseph; and Lloyd, Ruth Diane, to Reynolds Metals Company. Process for applying thin molybdenum containing coatings on aluminum for solar energy absorption. 4,104,136, Cl. 204-38.00B.
- Scharfe, Gerhard; and Wenzel, Rupert, to Bayer Aktiengesellschaft. Process for the preparation of 2-chlorobuta-1,3-diene. 4,104,316, Cl. 260-655.000.
- Scheidel, Fritz: *See—*
  - Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, 4,104,676, Cl. 357-79.000.
- Schenck, Hans-Uwe: *See—*
  - Melzer, Jaroslav; and Schenck, Hans-Uwe, 4,104,226, Cl. 260-29.6WB.
- Schenken, John E.: *See—*
  - Haas, Charles A.; and Schenken, John E., 4,103,860, Cl. 248-467.000.
- Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Method and apparatus for lapping or polishing materials. 4,104,099, Cl. 156-155.000.
- Schilling, Rainer, to Kraftwerk Union Aktiengesellschaft. Emergency feed system for cooling nuclear reactor installations. 4,104,119, Cl. 176-38.000.
- Schimmel, Karl F.: *See—*
  - Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., 4,104,230, Cl. 260-29.6NR.
- Schirmer, Henry G.: *See—*
  - Bieler, Anne C.; and Schirmer, Henry G., 4,104,404, Cl. 428-35.000.
- Schlapp, Albert, to Rockwell-Golde G.m.b.H. Sliding roof for automobiles. 4,103,962, Cl. 296-137.00E.
- Schlegel (UK) Limited: *See—*
  - Tipler, Donald Henry, 4,103,946, Cl. 292-114.000.
- Schlig, Eugene Stewart; and Stilwell, George Raymond, Jr., to International Business Machines Corporation. Writing and erasing in AC plasma displays. 4,104,563, Cl. 315-169.0TV.
- Schloemann-Siemag Aktiengesellschaft: *See—*
  - Benz, Willi, 4,103,576, Cl. 83-320.000.
- Schlott, Richard J.: *See—*
  - Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., 4,104,173, Cl. 252-8.55R.
- Schmid, Karlheinz, to Gebrueder Heller, Maschinenfabrik Gesellschaft mit beschraenkter Haftung. Crankshaft milling machine and milling tool for such machine. 4,103,588, Cl. 90-11.00A.
- Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius. Straight knitting machine. 4,103,517, Cl. 66-75.100.
- Schmidt-Dunker, Manfred; and Greb, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Compositions for preparation of aqueous solutions of low valence ^{99}technitium salts. 4,104,366, Cl. 424-1.000.
- Schmidt, Helmut. Tire valve cap with pressure indicator. 4,103,549, Cl. 73-146.800.
- Schmidt, Herbert: *See—*
  - Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.
- Schmidt, Kenneth J., to General Trailer Company, Inc. Fifth wheel scale apparatus. 4,103,752, Cl. 177-141.000.
- Schmidt, Kenneth J., to General Trailer Company, Inc. Corner mount reach clamp with hinged clamp pads. 4,103,927, Cl. 280-482.000.
- Schmidt Kranz & Co.: *See—*
  - Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, 4,104,008, Cl. 417-397.000.
- Schmidt, Robert Rudolf: *See—*
  - Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.
- Schneider, Arthur, to Rollei-Werke Franke & Heidecke. Electronic flashlight for direct and indirect flashing. 4,104,707, Cl. 362-17.000.
- Schoenfelder, James L., to Hansen, Lind, Meyer. Solar power system. 4,103,493, Cl. 60-641.000.
- Schoenleber, Donald W.: *See—*
  - Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, 4,103,444, Cl. 40-124.100.
- Schofield, John Wardman, to National Research Development Corporation. Measurement of impurity concentration in liquids. 4,104,585, Cl. 324-58.50C.
- Scholes, Gary: *See—*
  - Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.
- Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, to Ultra Centrifuge Nederland N.V. Method and device for welding cylindrical elements to one another. 4,103,816, Cl. 228-49.000.
- Scholz, Erwin; and Ehlers, Albert, to Rollei-Werke Franke & Heidecke. Mounting means for blades of photographic shutters. 4,104,667, Cl. 354-250.000.
- Scholz, Werner: *See—*
  - Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.
- Schrader, Joseph F. Viewing device for a bubble level. 4,103,430, Cl 33-348.000.
- Schramm, Jurgen: *See—*
  - Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.

Schreiber, Karl J., to Polaroid Corporation. Silver halide emulsions containing microvoids. 4,104,068, Cl. 96-3.000.

Schroder, Johann, to U.S. Philips Corporation. Latent heat accumulator. 4,104,185, Cl. 252-70.000.

Schroder, Rolf: *See—*

Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.

Schuetz, James W., to Aetna-Standard Engineering Company. Self-centering punch for billet centering machine or the like. 4,103,530, Cl. 72-312.000.

Schulte, Diethard: *See—*

Vogele, Peter; and Schulte, Diethard, 4,104,024, Cl. 21-58.000.

Schulz, Johann G.: *See—*

Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,104,281, Cl. 260-343.30R.

Schulz, Otto W.; and Pedersen, Tor Jan, to Michaelson, Randolph C. H. Hydraulic motor. 4,103,381, Cl. 15-29.000.

Schulz, Stefan, to Thyssen Industrie Aktiengesellschaft. Mixing tool. 4,104,738, Cl. 366-343.000.

Schuurmans, David M.: *See—*

Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.

Schwab, Heinrich: *See—*

Junkermann, Helmut; and Schwab, Heinrich, 4,104,162, Cl. 210-63.00R.

Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung: *See—*

Pohl, Dieter; and Redlinger, Franz, 4,104,063, Cl. 75-243.000.

Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. Antiallergic pyrido[2,1-b]quinazolin-ones. 4,104,389, Cl. 424-251.000.

Schweppe, Manfred: *See—*

Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.

Schwinn Bicycle Company: *See—*

Brilando, Frank P., 4,103,922, Cl. 280-279.000.

Scibbe, Harold R.: *See—*

Martin, Thomas F.; Nagy, James A.; and Scibbe, Harold R., 4,103,842, Cl. 242-107.40A.

Scientific-Atlanta, Inc.: *See—*

Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,103,674, Cl. 126-271.000.

Sclove, David Berhard: *See—*

Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, 4,104,308, Cl. 260-586.00R.

Scott, John Marshall William: *See—*

Fallis, Alexander Graham; Scott, John Marshall William; and Winter, June Gertrude, 4,104,286, Cl. 260-397.250.

Scott, William J., to Ideal Industries, Inc. Screw-on connector. 4,104,482, Cl. 174-87.000.

Scudder, Larry R.: *See—*

Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., 4,104,091, Cl. 148-188.000.

SEB S.A.: *See—*

Berard, Jean Claude, 4,103,604, Cl. 99-342.000.

Sechet, Maurice Henri: *See—*

Duc, Nguyen-Cong; Brehant, Jean-Louis Marie; Pons, Benoit-Joseph; and Sechet, Maurice Henri, 4,104,123, Cl. 195-31.00P.

Sedlaczek, Richard, to Edgar Pickering (Blackburn) Limited. Method for making tufted goods. 4,103,635, Cl. 112-266.000.

Seeley, David Ronald, to Pandrol Limited. Device suitable for use in a railway rail-and-fastening assembly to insulate a rail from a rail clip and from an anchorage for the clip. 4,104,483, Cl. 174-138.00R.

Seidel, Peter-Rudolf: *See—*

Boltze, Karl-Heinz; Brendler, Otfried; and Seidel, Peter-Rudolf, 4,104,278, Cl. 260-326.13A.

Seifert, Gerd W. Thermostat for coolant presented as switch specifically for combustion engines. 4,103,824, Cl. 236-34.500.

Seifert, Josef: *See—*

Kress, Willy; and Seifert, Josef, 4,103,511, Cl. 64-4.000.

Seiko Koki Kabushiki Kaisha: *See—*

Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.

Seiler, Hartmut, to Robert Bosch GmbH. Integrated circuit for use with variable voltages. 4,104,546, Cl. 307-362.000.

Sekmakas, Kazys; and Hesler, Kenneth K., to DeSoto, Inc. Pigmented latex paints having superior gloss prepared by grinding a pigment into a solution of a copolymer of an unsaturated carboxylic acid. 4,104,229, Cl. 260-29.6RW.

Selous, Percy Bruce Gordon: *See—*

Jackson, John Charles; and Selous, Percy Bruce Gordon, 4,103,577, Cl. 83-337.000.

Sempliner, Arthur T.: *See—*

Burian, Paul D.; and Sempliner, Arthur T., 4,103,694, Cl. 132-73.600.

Senchur, Robert A.: *See—*

Bucchianeri, Bernard A.; and Senchur, Robert A., 4,103,552, Cl. 73-309.000.

Sensormatic Electronics Corporation: *See—*

Humble, David Raymond; and Walters, Harry Godfrey, III, 4,103,572, Cl. 81-418.000.

Sevcon Limited: *See—*

Gurwicz, David; and Sloan, Albert Everett, 4,104,571, Cl. 318-380.000.

Sexsmith, David: *See—*

Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.

Seymour, Samuel L., to PPG Industries, Inc. Supporting glass gripping tongs during glass sheet processing. 4,104,047, Cl. 65-273.000.

Shacter, John: *See—*

Garrett, George A.; and Shacter, John, 4,104,037, Cl. 55-16.000.

Shah, Naren Chimanlal, to Harris Corporation. Analog correction system. 4,104,566, Cl. 315-371.000.

Shanbhag, Sudhakar P.; Liggett, Louis G.; and Mikovits, Adrienne C., to General Foods Corporation. Process for preparing bacon analog. 4,104,415, Cl. 426-656.000.

Shanley, Bernard J. Tilting traction apparatus. 4,103,681, Cl. 128-71.000.

Shansky, Albert: *See—*

Lapidus, Herbert; and Shansky, Albert, 4,104,021, Cl. 8-10.200.

Sharp Kabushiki Kaisha: *See—*

Kasubuchi, Takeshi, 4,104,728, Cl. 364-712.000.

Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Sharpe, Max H.: *See—*

Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,104,134, Cl. 204-37.00R.

Shaver, J. Lyle, to Allis-Chalmers Corporation. Combine with means for reducing the bounce of accelerated grain. 4,103,691, Cl. 130-24.000.

Shaw, Robert, to B & K Industries Ltd. Bale mover. 4,103,794, Cl. 214-518.000.

Shaw, William D. Method for producing tubular article. 4,104,095, Cl. 156-83.000.

Sheldon, Edward Emanuel. Apparatus with two vacuum chambers for electrophotography producing image by electrical charges. 4,104,647, Cl. 346-158.000.

Shell Oil Company: *See—*

Caruso, Gerard P., 4,104,177, Cl. 252-51.50A.

Chipman, Arthur H. Tigner, 4,103,536, Cl. 73-40.000.

Hansen, David R., 4,104,323, Cl. 260-829.000.

Kalden, Adrianus B., 4,104,611, Cl. 340-15.50F.

Orrell, Leonard; and Whittle, John, 4,103,700, Cl. 137-172.000.

Shelton, John J.: *See—*

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Shelton, Samuel V.: *See—*

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Shen, Kwan Ting: *See—*

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Shepherd Machinery Company: *See—*

Shepherd, Willard W., 4,103,883, Cl. 269-71.000.

Shepherd, Willard W., to Shepherd Machinery Company. Adjustable supporting structure. 4,103,883, Cl. 269-71.000.

Shepley, Paul E., Jr. Bow string mounting and tensioning brackets. 4,103,667, Cl. 124-24.00R.

Sheppard, Walter R., Jr. Adjustable trailer hitch with interchangeable connecting means. 4,103,928, Cl. 280-490.00R.

Sherer, Paul; and Hester, Gerald Paul, to MSI Data Corporation. Bar code reader and decoder. 4,104,514, Cl. 235-466.000.

Sherman, Michael I.; and Prough, James R., to Kamyr, Inc. Two-stage digestion with between vessel heating. 4,104,113, Cl. 162-19.000.

Shibuno, Masao: *See—*

Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.

Shibuya, Tsunenori, to Diesel Kiki Co. Ltd. Rotary compressor comprising improved rotor lubrication system. 4,104,010, Cl. 418-76.000.

Shigemori, Daizo: *See—*

Toda, Toshiharu; and Shigemori, Daizo, 4,104,693, Cl. 361-120.000.

Shih, Chun-nan: *See—*

Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.

Shijima, Shoji: *See—*

Fujimaki, Taketoshi; Shijima, Shoji; and Harada, Shunichi, 4,104,135, Cl. 204-37.00T.

Shikoku Chemicals Corporation: *See—*

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Shimada, Shinichi: *See—*

Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, 4,103,487, Cl. 60-282.000.

Shimizu, Shigehisa: *See—*

Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu, Shigehisa, 4,103,575, Cl. 83-298.000.

Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, to Toyo Kogyo Co., Ltd. Fuel supply means for rotary piston engines. 4,103,666, Cl. 123-219.000.

Shimoyama, Kunio: *See—*

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Shimozono, Akira: *See—*

Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, 4,103,908, Cl. 277-96.200.

Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., to Westinghouse Electric Corp. Circuit breaker apparatus including asymmetrical fault detector. 4,104,691, Cl. 361-96.000.

Shin, Kju Hi: *See—*

Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.

Shinagawa Refractories Co., Ltd.: *See—*

Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.

Shingyouchi, Fusao. Capsule. 4,103,774, Cl. 206-45.200.

Shinmura, Noboru: *See—*

Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.

Shinoda, Kenzo: *See—*

Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,104,432, Cl. 428-216.000.

Shirakura, Hiroshi: *See—*

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Shishido, Toshio: *See—*

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Shmidt, Rudolf Genrikhovich: *See—*

Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

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Shoofler, Renald. Barbell with collapsible load carrying chambers. 4,103,887, Cl. 272-123.000.

Showa Denko K.K.: *See—*

Ueshima, Takashi; Tanaka, Yasuzi; Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,104,325, Cl. 260-876.00R.

Sibler, Guenter W.: *See—*

Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., 4,103,529, Cl. 72-253.00A.

Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., to Barnes-Hind Pharmaceuticals, Inc. Composition and method treating soft contact lenses at elevated temperatures. 4,104,187, Cl. 252-106.000.

Sichert, Richard. Therapeutical composition. 4,104,373, Cl. 424-195.000.

Siegler, Manfred: *See—*

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Siemens Aktiengesellschaft: *See—*

Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, 4,104,524, Cl. 250-402.000.

Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, 4,104,676, Cl. 357-79.000.

Franke, Kurt, 4,104,525, Cl. 250-402.000.

Giebel, Wolfgang; and Krause, Herbert, 4,103,911, Cl. 277-210.000.

Glockner, Erhard; and Wittstadt, Anton, 4,103,763, Cl. 192-2.000.

Hagendorn, Heinrich, 4,103,864, Cl. 251-63.600.

Hofmann, Ruediger; and Von Basse, Paul-Werner, 4,104,735, Cl. 365-230.000.

Kersten, Ralf, 4,103,987, Cl. 350-96.210.

Schachinger, Martin; and Kruger, Heiko, 4,104,518, Cl. 250-221.000.

Schaff, Ulrich, 4,104,574, Cl. 318-696.000.

Silva, Patricia A. Wall-mounted directory. 4,103,980, Cl. 312-185.000.

Silverberg, Morton, to Xerox Corporation. Imaging apparatus. 4,103,995, Cl. 355-14.000.

Silverstein, Sidney, to Pearl-Wick Corporation. Container. 4,103,805, Cl. 220-331.000.

Silvey, Elmer R. Piston-cylinder seal assembly. 4,103,910, Cl. 277-165.000.

Silvey, Robert L. Toy chest. 4,103,455, Cl. 46-99.000.

Simich, Irene C. Load regulator. 4,103,881, Cl. 267-177.000.

Simmler, Werner: *See—*

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Simonides, Charlotte, executrix: *See—*

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Simonides, Heinz, deceased: *See—*

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Simons, Daniel R.: *See—*

Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., 4,103,789, Cl. 214-41.00R.

Simroth, Donald W., to Union Carbide Corporation. Liquid polymer/polyols and polyurethane elastomers based thereon. 4,104,236, Cl. 260-33.20R.

Sims, Victor A., to Air Products & Chemicals, Inc. Alkenyl 1-(2-Aminoethyl) alkyleneureido succinamates, their synthesis, and use in aqueous emulsion polymer systems. 4,104,220, Cl. 260-29.60R.

Singer, Abraham; and Minkowski, Jan M., to United States of America, Army. Bandwidth substitution method and system for absolute measurement of power at all radio frequencies. 4,104,587, Cl. 324-95.000.

Singer Company, The: *See—*

Bowles, Theodore L., 4,103,632, Cl. 112-158.00E.

Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., 4,103,633, Cl. 112-217.100.

Greenwood, Ivan Anderson, 4,104,577, Cl. 324-0.50F.

Sir James Farmer Norton & Co., Limited: *See—*

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Sleziona, Joseph; and Demarcq, Michel, to Produits Chimiques Ugine Kuhlmann. Phosphine oxides having polyfluorinated-chain and their preparation. 4,104,309, Cl. 260-606.50P.

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Smart, Albert G.: *See—*

Mayer, James W.; and Smart, Albert G., 4,103,377, Cl. 5-343.000.

Smith, David A.; and Hertrick, Thomas P. Roll-up sign. 4,103,445, Cl. 40-125.00G.

Smith, David G., to GSW Limited - GSW Limitee. Window oven door for self-cleaning oven. 4,103,671, Cl. 126-200.000.

Smith Engineering Company: *See—*

Aydelott, Max M.; Hartman, Richard L.; and York, James A., 4,103,738, Cl. 165-178.000.

Smith, Geoffrey Allan, to Dawson International Limited. Fixation of dyes and other chemicals in textile fibres. 4,104,019, Cl. 8-2.000.

Smith, Herman W., to Upjohn Company, The. 5-Oxa-13,14-didehydro-11-deoxy-17-phenyl-18,19,20-trinor-$PGF_{1\alpha}$ compounds. 4,104,474, Cl. 560-53.000.

Smith Kline & French Laboratories Limited: *See—*

Black, James Whyte; and Parsons, Michael Edward, 4,104,382, Cl. 424-247.000.

Bloch, Maurice, 4,104,370, Cl. 424-153.000.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,104,381, Cl. 424-246.000.

- Smith, Marvin L., to Dixilyn International, Inc. Drilling substructure transfer system. 4,103,503, Cl. 61-97.000.
- Smith, Norman Alfred; and Kitzing, Rainer, to Ciba-Geigy AG. Vinylsulphone hardeners. 4,104,302, Cl. 260-561.00S.
- Smith, Ray E.; and Albright, James A., to Velsicol Chemical Corporation. Durable flame retardant finishes for textile materials. 4,104,172, Cl. 252-8.100.
- Smith, Richard Hanley; and Laws, Peter Graham, to Plessey Handel und Investments AG. Converter arrangements. 4,104,714, Cl. 363-21.000.
- Smith, Roger R. Vehicle anti-roll mechanism. 4,103,920, Cl. 280-112.00A.
- Smith & Wesson Chemical Company, Inc.: *See—*
  - Litman, Alan, 4,104,614, Cl. 340-81.00R.
- Smither, Miles A., to Geosource Inc. Instantaneous floating point amplifier. 4,104,596, Cl. 330-9.000.
- SmithKline Corporation: *See—*
  - Gallagher, Gregory, Jr.; Pfeiffer, Francis R.; and Weinstock, Joseph, 4,104,379, Cl. 424-244.000.
  - Labaw, Clifford Steven; Webb, Robert Lee; and Wellman, George Robert, 4,104,472, Cl. 548-337.000.
- Smiths Industries Limited: *See—*
  - Barrett, Edward George, 4,103,515, Cl. 64-26.000.
- Smolderen, Albert Emiel, to AGFA-GEVAERT N.V. Four-cornered flat wrapping. 4,103,775, Cl. 206-455.000.
- Snavely, Kenneth E., to Phillips Petroleum Company. Rubber compositions containing polysiloxane elastomers and butadiene-styrene copolymers. 4,104,322, Cl. 260-827.000.
- Snavely, Kenneth E., to Phillips Petroleum Company. Rubber composition. 4,104,334, Cl. 260-888.000.
- Snezhnoi, Rostislav Lukyanovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Sobecks, Ronald S.: *See—*
  - Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., 4,104,507, Cl. 219-513.000.
- Societe Anonyme dite Societe Nationale Industrielle Aerospatiale: *See—*
  - Mouille, Rene Louis, 4,104,003, Cl. 416-141.000.
- Societe Anonyme Francaise du Ferodo: *See—*
  - Filderman, Rene Gabriel, 4,103,761, Cl. 188-73.500.
- Societe Generale de Mecanique et de Metallurgie: *See—*
  - Chanton, Edmond, 4,104,009, Cl. 418-48.000.
- Societe Nationale Elf Aquitaine (Production): *See—*
  - Blu, Gilbert; and Lazarre, Flavien, 4,103,707, Cl. 137-604.000.
  - Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
- Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A.: *See—*
  - Engdahl, Jean; and Matthey, Huber, 4,104,553, Cl. 310-352.000.
- Solbern Corp.: *See—*
  - Eisenberg, Bernard C., 4,103,720, Cl. 141-1.000.
- Soldatov, Viktor Alexeevich: *See—*
  - Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
- Soloviev, Petr Petrovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Sommer, Werner: *See—*
  - Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,103,517, Cl. 66-75.100.
- Sonoco Products Company: *See—*
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- Sotec, Inc.: *See—*
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- Sousa, Anthony A.: *See—*
  - Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., 4,104,043, Cl. 71-107.000.
- Soussan, Salomon: *See—*
  - Debord, Daniel; and Soussan, Salomon, 4,104,457, Cl. 526-203.000.
- Southgate, John Peter: *See—*
  - Hill, William Frank; and Southgate, John Peter, 4,104,534, Cl. 290-37.00A.
- Souza, Anthony J., to Woodstream Corporation. Repeating animal trap with side extension. 4,103,448, Cl. 43-67.000.
- Spacek, Pavel: *See—*
  - Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, 4,104,363, Cl. 423-338.000.
- Spatig, Thomas G., to Chesapeake and Ohio Railway Company, The; and Baltimore and Ohio Railroad Company, The. Railway hopper car door frame assembly. 4,103,817, Cl. 228-173.00C.
- Speed, Eugene: *See—*
  - Brooks, Bertram; and Speed, Eugene, 4,103,921, Cl. 280-267.000.
- Spencer, John Lionel: *See—*
  - Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.
- Sperry Rand Corporation: *See—*
  - Isbister, Eric J.; and Fidler, Horace E., 4,104,629, Cl. 343-6.00R.
- Spevack, Jerome S., to Deuterium Corporation. Dual temperature exchange systems. 4,104,032, Cl. 23-270.50W.
- Spitz, Erich: *See—*
  - Desormiere, Bernard; and Spitz, Erich, 4,103,988, Cl. 350-162.00R.
- Spohr, Horst, to Bautex Adolf Stover KG. Slatted blinds. 4,103,727, Cl. 160-168.00R.
- Sporlan Valve Company: *See—*
  - Lange, Harold T., 4,104,044, Cl. 62-324.000.
- Sprague Electric Company: *See—*
  - Maher, John P.; and Johnson, Theodore W., 4,104,421, Cl. 427-96.000.
- Sprague, Peter W.; and Heikes, James E., to E. R. Squibb & Sons, Inc. 1,3-Benzodithiolanes. 4,104,467, Cl. 542-442.000.
- Square D Company: *See—*
  - Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, 4,104,724, Cl. 364-477.000.
- Srinivasan, Vadake R.; and Choi, Ye-Chin, to Louisiana State University Foundation. Process for the production of single cell protein and amino acids. 4,104,124, Cl. 195-33.000.
- Stahl-Urban Company: *See—*
  - Conner, William R., Jr., 4,103,363, Cl. 2-227.000.
- Stahlecker, Fritz; and Stahlecker, Hans. Tangential belt drive mechanism for spinning rotors. 4,103,479, Cl. 57-105.000.
- Stahlecker, Hans: *See—*
  - Stahlecker, Fritz; and Stahlecker, Hans, 4,103,479, Cl. 57-105.000.
- Stama Stark Maschinenfabrik Gotthilf Stark: *See—*
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- Stanadyne, Inc.: *See—*
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- Standard Brands Incorporated: *See—*
  - Antrim, Richard Lee; and Harris, Donald Wayne, 4,104,463, Cl. 536-56.000.
- Standard Oil Company: *See—*
  - Meguerian, Garbis H.; and Rakowsky, Frederick W., 4,104,360, Cl. 423-213.200.
- Standard Oil Company a corporation of Indiana: *See—*
  - Grutsch, James F., 4,104,163, Cl. 210-80.000.
  - Hoff, Glen R., 4,104,199, Cl. 252-430.000.
  - Sabol, Albert R.; and Petrellis, Nicholas C., 4,104,291, Cl. 260-429.900.
- Stanley-Mabo S.A.: *See—*
  - Quenot, Michel, 4,103,421, Cl. 30-162.000.
- Stanley Works Pty. Ltd., The: *See—*
  - Matthews, Bruce Ernest; and Day, Ronald, 4,103,419, Cl. 30-95.000.
- Stark, Gerhard: *See—*
  - Blum, Gunther; and Stark, Gerhard, 4,103,405, Cl. 29-26.00A.
- State of Michigan: *See—*
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- Stauffer Chemical Company: *See—*
  - Fancher, Llewellyn W., 4,104,375, Cl. 424-200.000.

- Staunton, John J. J., to Perkin-Elmer Corporation, The. Aerosol-reducing slide holder system. 4,103,643, Cl. 118-50.000.
- Stech, Don W., to Raymond Lee Organization, Inc., The, a part interest. Electroplating tank having electric rinse water heating system. 4,104,148, Cl. 204-242.000.
- Stechmeyer, Frank W., to Union Oil Company of California. Method for transporting waxy oils by pipeline. 4,104,171, Cl. 252-8.300.
- Stefano, Patrick L., to Miska, Stanley M., Sr. Game devices. 4,103,891, Cl. 273-97.00R.
- Steigerwald, Conrad John, to Honeywell Information Systems Inc. Apparatus for cutting and forming flexible beam leads of an integrated circuit chip. 4,103,718, Cl. 140-105.000.
- Steil, Karl-Heinz: *See—*
  - Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
- Steinborn, Wilhelm; and Mechenbier, Alois, to Diehl; and Tip-Top-Saar Gesellschaft fur industrielle Vulkanisierung m.b.H. Plugs for bores in rocks or the like. 4,103,498, Cl. 61-45.00B.
- Steinbrecher, Lester; and Hall, Wilbur S., to Amchem Products, Inc. Process for coating metals. 4,104,424, Cl. 427-435.000.
- Steiner, Henry William. Barrel carrier. 4,103,812, Cl. 224-45.00P.
- Steiner, Peter; and Bischoff, William Frederick, to Foster Wheeler Energy Corporation. Water seal for regenerator. 4,103,902, Cl. 277-12.000.
- Stemmle, Joseph A.: *See—*
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- Stenzenberger, Volkmar: *See—*
  - Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.
- Stephan, Rudolf: *See—*
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- Stephen, John F.: *See—*
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- Sterling Drug Inc.: *See—*
  - Lesher, George Y.; and Opalka, Chester J., Jr., 4,104,385, Cl. 424-250.000.
- Sterling, John R., to John Sterling Corporation. Portable adjustable clothes drying device. 4,103,781, Cl. 211-86.000.
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- Stilwell, George Raymond, Jr.: *See—*
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- Stocker, Charles T.: *See—*
  - Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,406, Cl. 426-99.000.
  - Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,407, Cl. 426-99.000.
- Stoferle, Theodor; and Theimert, Paul Heinz. Surface hardness testing apparatus. 4,103,538, Cl. 73-81.000.
- Stoffel, Robert W.; and Berntsen, Robert A. Day-night mirror control apparatus. 4,103,560, Cl. 74-501.00M.
- Stoll, Kurt. Disconnectable coupling for conduits of deformable material. 4,103,941, Cl. 285-238.000.
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- Stone Conveyor, Inc. (Entire): *See—*
  - Jorgensen, Morell L., 4,103,769, Cl. 198-781.000.
- Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, to Air Products & Chemicals, Inc. Method of adding amines to 1,3 dienes. 4,104,471, Cl. 544-178.000.
- Stone, Myron. Folding assembled article such as a toy airplane. 4,103,454, Cl. 46-79.000.
- Storey Brothers and Company Limited: *See—*
  - Fenton, Sidney Desmond, 4,104,430, Cl. 428-175.000.
- Straub, Roger E.: *See—*
  - Mathison, Frederic N.; and Straub, Roger E., 4,103,820, Cl. 229-37.00R.
- Strauss, Carl R.: *See—*
  - Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., 4,104,241, Cl. 260-40.00R.
- Strauss, Karl-Peter, to Rollei-Werke Franke & Heidecke. Camera with automatic exposure control system. 4,104,655, Cl. 354-38.000.
- Strauss, Karl-Peter, to Rollei-Werke Franke & Heidecke. Control means for a diaphragm of a single lens reflex camera. 4,104,656, Cl. 354-43.000.
- Strax, Norman, to Charles & Stella Guttman Breast Diagnostic Institute. Automated mammography apparatus for mass screening. 4,104,528, Cl. 250-451.000.
- Strayer, Larry G., to Hawaiian Trust Company Ltd. Computer control of moving objects such as aircraft moving from one sector to another. 4,104,512, Cl. 364-439.000.
- Strike Corporation, The: *See—*
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- Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., to General Foods Corporation. Coated expanded animal food. 4,104,406, Cl. 426-99.000.
- Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., to General Foods Corporation. Expanded animal food coated with dextrin and fat. 4,104,407, Cl. 426-99.000.
- Stroucken, Klaus H. D., to Alfa-Laval AB. Centrifugal separator. 4,103,822, Cl. 233-20.00A.
- Struger, Odo J.: *See—*
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- Strussion, Thomas; and Moore, Harry D. Map display device. 4,103,436, Cl. 35-40.000.
- Studiengesellschaft Kohle mbH: *See—*
  - Eisenbach, Wilhelm; Lehmkuhl, Herbert; and Wilke, Gunther, 4,104,140, Cl. 204-78.000.
  - Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, 4,104,409, Cl. 426-386.000.
- Stutz, Robert C., to Niagara Blower Company. Method and apparatus for concentrating aqueous solutions. 4,104,112, Cl. 159-4.00R.
- Sudduth, Jerome R.; and Keyworth, Donald A., to Tenneco Chemicals, Inc. Process for the purification of gas streams. 4,104,146, Cl. 204-165.000.
- Sudo, Katsumi; and Kanazawa, Yukio, to Rank Xerox, Ltd. Device for detecting abnormal temperature in fixer. 4,104,692, Cl. 361-106.000.
- Sugahara, Kouichi: *See—*
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- Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. 5,6-Dihydroxy aminotetralol compounds. 4,104,402, Cl. 424-330.000.
- Sugimori, Shiro; and Toyoda, Kenji, to Nippon Kogaku K.K. Safety device for automatic exposure control camera having motor drive equipment. 4,104,661, Cl. 354-173.000.
- Sugiura, Yoshinori: *See—*
  - Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
- Suhm, Richard R. Vehicle safety device. 4,103,924, Cl. 280-289.00R.
- Suilene Argentina S.A.: *See—*
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- Sullivan, Ann Clare: *See—*
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- Sullivan, Paul E.: *See—*
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- Sultan, Sven Gilbert: *See—*
  - Hedblom, Mats-Olov; and Sultan, Sven Gilbert, 4,104,256, Cl. 260-45.95D.
- Sumitomo Chemical Company, Limited: *See—*
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- Sumitomo Durez Company, Ltd.: *See—*
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- Sumitomo Electric Industries, Ltd.: *See—*
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  - Okita, Koichi, 4,104,394, Cl. 264-89.000.
- Sun Chemical Corporation: *See—*
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- Sun Oil Company of Pennsylvania: *See—*
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- Sun Ventures, Inc.: *See—*
  - Angstadt, Howard P., 4,104,310, Cl. 260-610.00B.
  - Angstadt, Howard P., 4,104,311, Cl. 260-610.00B.
  - Angstadt, Howard P.; and Griffin, William P., Jr., 4,104,312, Cl. 260-610.00B.
- Sunday, Brooks R.: *See—*
  - Schwender, Charles F.; and Sunday, Brooks R., 4,104,389, Cl. 424-251.000.
- Suntech, Inc.: *See—*
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  - Norton, Richard S., 4,104,279, Cl. 260-326.00N.

Super Products Corporation: *See—*
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Surko, Walter E., Jr., to Emhart Industries, Inc. Pin tumbler lock. 4,103,526, Cl. 70-364.00A.
Sussmuth, Godehard, to Rosenthal AG. Silicon nitride-containing material with self-glazing surface and process for its production. 4,104,442, Cl. 428-428.000.
Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, to Husky Corporation. Nozzle spout coupling. 4,103,936, Cl. 285-26.000.
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Sutton, William H. Apparatus for discharging from a silo. 4,103,788, Cl. 214-17.0DA.
Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, to Fuji Photo Film Co., Ltd. Magnetic head cleaning article. 4,104,436, Cl. 428-297.000.
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Swann, David Allen. Electric switches. 4,104,494, Cl. 200-67.00G.
Swanson, Billy L., to Phillips Petroleum Company. Method for acidizing subterranean formations. 4,103,742, Cl. 166-282.000.
Sweany, Louis P.; and Burk, Michael T., to P.R. Mallory & Co. Inc. High output audible alarm device utilizing a piezoelectric transducer and voltage doubling means. 4,104,628, Cl. 340-384.00E.
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Swenson, Gordon. Remote threading flagpole. 4,103,642, Cl. 116-174.000.
Swenson, Richard F., to Milsco Manufacturing Company. Seat support assembly for a recreational vehicle. 4,103,858, Cl. 248-399.000.
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Swoboda, Johann; Stephan, Rudolf; and Heinz, Gerhard, to BASF Aktiengesellschaft. Impact resistant thermoplastic molding compositions. 4,104,328, Cl. 260-876.00R.
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Tachibana, Yoshishige, to Toyo Boseki Kabushiki Kaisha. Apparatus for successively processing continuous textile fabric. 4,103,521, Cl. 68-22.00R.
Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Contact mechanism of shutter for camera. 4,104,665, Cl. 354-226.000.
Tagawa, Masatoshi, to Trio Kabushiki Kaisha. Crystal oscillating circuit. 4,104,599, Cl. 331-116.00R.
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De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, 4,103,553, Cl. 73-425.000.
Tago, Kazuo: *See—*
Nagasawa, Mitsuru; Fujimoto, Teruo; and Tago, Kazuo, 4,104,455. Cl. 526-173.000.
Takabayashi, Yojiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electric guitar. 4,103,583, Cl. 84-291.000.
Takada, Michio: *See—*
Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.
Takaha, Noboru: *See—*
Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.
Takahashi, Junichi: *See—*
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
Takahashi, Misao: *See—*
Kishida, Shizuaki; and Takahashi, Misao, 4,104,108, Cl. 156-510.000.
Takahashi, Tsuyoshi: *See—*
Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toynaki; and Hasegawa, Eiichi, 4,104,125, Cl. 195-66.00R.
Takano, Shigeo: *See—*
Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.
Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, to Green Cross Corporation, The. Process for producing human lysozyme. 4,104,125, Cl. 195-66.00R.
Takeda Chemical Industries, Ltd.: *See—*
Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
Takeda, Setsuko: *See—*
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
Takeda, Yoshio: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
Talafuse, Larry J.: *See—*
Houlgrave, Robert C.; and Talafuse, Larry J., 4,103,863, Cl. 251-48.000.
Talbert Manufacturing, Inc.: *See—*
Weaver, Leslie A., 4,103,793, Cl. 214-506.000.
Tally, David N.: *See—*
Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., 4,104,205, Cl. 260-2.300.
Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
Tamura, Akihiko: *See—*
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,104,065, Cl. 96-1.50R.
Tanaka, Akira; and Hollowell, William M., to American Safety Equipment Corporation. Roller seat back latch mechanism. 4,103,967, Cl. 297-216.000.
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Adaptor for providing a digital signal indicating the full open F number of an interchangeable photo-taking lens in a single lens reflex camera system. 4,104,649, Cl. 354-289.000.
Tanaka, Tadashi: *See—*
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
Tanaka, Yasuzi: *See—*
Ueshima, Takashi; Tanaka, Yasuzi; Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,104,325, Cl. 260-876.00R.
Tanbara, Nobuhiko: *See—*
Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nnbuhiko, 4,103,833, Cl. 242-18.00A.
Tani, Yoshio: *See—*
Iida, Kiyonobu; Tani, Yoshio; and Sugahara, Kouichi, 4,103,664, Cl. 123-191.00L.
Tanigawa, Hisahiro: *See—*
Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.
Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, to Citizen Watch Company, Limited; and Doryokuro Kakunenryo Kaihatsu Jigyodan. Inspection machine for fuel pellets. 4,103,776, Cl. 209-73.000.
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, to Nippon Steel Corporation. Surface treatment of a tin-plate. 4,104,419, Cl. 427-46.000.
Tanimoto, Akikazu: *See—*
Nakazawa, Kiwao; and Tanimoto, Akikazu, 4,103,998, Cl. 356-152.000.
Tankus, Harry, to Crane Packing Co. Elastic positive drive bellows seal. 4,103,904, Cl. 277-42.000.
Tarullo, John A. Method for making cork wall covering. 4,104,103, Cl. 156-309.000.
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, to Konishiroku Photo Industry Co., Ltd. Process for preparation of photoconductive powders of cadmium sulfide type materials. 4,104,065, Cl. 96-1.50R.
Tasker, John: *See—*
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,104,504, Cl. 219-73.100.

Tate & Lyle Limited: *See—*
James, Kenneth, 4,104,464, Cl. 536-115.000.
Tatsutomi, Yasuo: *See—*
Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, 4,103,666, Cl. 123-219.000.
Tattersall, Edward Gunston, to Hovermarine Transport Limited. Gas-cushion vehicles. 4,103,755, Cl. 180-117.000.
Tauber, Richard N.: *See—*
Tisnne, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., 4,104,507, Cl. 219-513.000.
Taylor, Charles E.: *See—*
Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., 4,103,844, Cl. 242-107.000.
Taylor, James R., to Q-dot Corporation. Home laundry dryer. 4,103,433, Cl. 34-86.000.
Techniservice Division, Textured Yarn Co., Inc.: *See—*
List, Ralph W., 4,103,835, Cl. 242-18.00A.
Tecumseh Products Company: *See—*
Reese, Paul T., 4,103,660, Cl. 123-179.00K.
von Kaler, Roland L.; and Jolliff, Norman E., 4,103,566, Cl. 74-701.000.
Teknisk Konsult Sven Persson AB: *See—*
Persson, Sven Erik, 4,103,768, Cl. 198-778.000.
Telsco Industries, Inc.: *See—*
Ridgway, H. Curtis, 4,103,828, Cl. 239-206.000.
Tempkin, Robert M.: *See—*
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
Temple University: *See—*
Williams, John R., 4,104,204, Cl. 521-32.000.
Tencor Instruments: *See—*
Wheeler, William R.; Kren, George J.; and Urbanek, Karel, 4,103,542, Cl. 73-105.000.
Tenneco Chemicals, Inc.: *See—*
Sudduth, Jerome R.; and Keyworth, Donald A., 4,104,146, Cl. 204-165.000.
Terasaki, Wesley L.: *See—*
Brooker, Gary; Terasaki, Wesley L.; and Price, Michael G., 4,104,026, Cl. 23-230.00B.
Terlecki, Leo: *See—*
Donahue, Charles R.; and Terlecki, Leo, 4,103,981, Cl. 312-257.00A.
Terrell, Ross C., to Airco, Inc. Ether compounds. 4,104,314, Cl. 260-614.00F.
Teslya, Ivan Nikiforovich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Tetra Pak Developpement, S.A.: *See—*
Vogele, Peter; and Schulte, Diethard, 4,104,024, Cl. 21-58.000.
Texaco Inc.: *See—*
Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, 4,104,193, Cl. 252-316.000.
Chou, Kechia J.; and Hellmuth, Walter W., 4,104,182, Cl. 252-51.50A.
Cole, Edward L.; Hess, Howard V.; and Guptill, Frank E., Jr., 4,104,035, Cl. 44-51.000.
Texas Instruments Incorporated: *See—*
Armstrong, James J., 4,104,702, Cl. 361-421.000.
Hewlett, Frank Wilson, Jr., 4,104,732, Cl. 365-179.000.
Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., 4,104,697, Cl. 361-305.000.
Textile Associates, Inc.: *See—*
Resnick, Marvin; and Mounts, Stanley Homer, 4,103,389, Cl. 15-302.000.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
Theer, Anton: *See—*
Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.
Theimert, Paul Heinz: *See—*
Stoferle, Theodor; and Theimert, Paul Heinz, 4,103,538, Cl. 73-81.000.
Theo Krebs AG: *See—*
Roth, Heinrich, 4,103,830, Cl. 239-587.000.
Thermo Electron Corporation: *See—*
Poirier, Victor L., 4,104,005, Cl. 417-394.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen m.b.H. Ballast tamping machine. 4,103,622, Cl. 104-7.00R.
Thomas & Betts Corporation: *See—*
Izraeli, Hyman, 4,103,986, Cl. 339-272.0UC.
Thomas, Frank J.; and Farrow, Max W., to Martin Marietta Corporation. Line scan area signature detection method. 4,103,847, Cl. 244-3.180.
Thomas J. Lipton, Inc.: *See—*
Pooler, John Dennis, 4,104,411, Cl. 426-421.000.
Thomas, Marion V. Bicycle holder. 4,103,923, Cl. 280-289.00L.
Thomas, Paul W., to Pnlaroid Corporation. Programming cam indexing mechanism. 4,103,569, Cl. 74-816.000.
Thome, Paul. Moving sealing junction with sealing strips controlled by mechanical operators. 4,103,912, Cl. 277-226.000.
Thompson, John Douglas. Combination bag and scoop. 4,103,952, Cl. 294-1.00R.
Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,104,249, Cl. 260-45.80N.
Thompson, Paul F., to General Cable Corporation. Semiconductive filling compound for power cable with improved properties. 4,104,480, Cl. 174-23.00C.
Thompson, William S., to Elkhart Brass Manufacturing Co., Inc. Ball valve having an improved ball element design. 4,103,868, Cl. 251-283.000.
Thomsen, Hans Thomas. Wheel unit for mounting in a suitcase. 4,103,391, Cl. 16-33.000.
Thomson-CSF: *See—*
Desormiere, Bernard; and Spitz, Erich, 4,103,988, Cl. 350-162.00R
Thornburg, David D.; and Lahr, Rny J., to Xerox Corporation. Consumable credit card. 4,104,515, Cl. 235-488.000.
Thoro-Ray Inc.: *See—*
Weiss, Mortimer E., 4,104,530, Cl. 250-490.000.
Weiss, Mortimer E., 4,104,531, Cl. 250-490.000.
Weiss, Mortimer E., 4,104,532, Cl. 250-490.000.
Thuler, Oscar W., to Merz & Bentili Nuklear AG. Digitale, an indicating device containing liquid crystals. 4,104,627, Cl. 340-336.000.
Thuot, Michael E., to Westinghouse Electric Corp. Portable digital ohmmeter. 4,104,578, Cl. 324-28.0CR.
Thurner, Heinz Friedrich. Method and a device for ascertaining the degree of compaction of a bed of material with a vibratory compacting device. 4,103,554, Cl. 73-573.000.
Thyssen Industrie Aktiengesellschaft: *See—*
Schulz, Stefan, 4,104,738, Cl. 366-343.000.
Tidwell, Hubert. Wave and tide motor. 4,103,494, Cl. 60-648.000.
Tilley, Alec Roger: *See—*
Gibson, John George; and Tilley, Alec Roger, 4,104,448, Cl. 429-72.000.
Timm, Gerald W.: *See—*
Karacan, Ismet; Paulson, Larry G.; and Timm, Gerald W., 4,103,678, Cl. 128-2.05V.
Timofeev, Anatoly Filippovich: *See—*
Mikotin, Evgeny Emelyannvich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Timofeev, Boris Andreevich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Tinholt, Thomas H., to Eaton Corporation. Resilient support for coil of viscous fluid drive. 4,103,765, Cl. 192-58.00B.

- Tip-Top-Saar Gesellschaft fur industrielle Vulkanisierung m.b.H.: *See—*
  - Steinborn, Wilhelm; and Mechenbier, Alois, 4,103,498, Cl. 61-45.00B.
- Tipler, Donald Henry, to Schlegel (UK) Limited. Flush set lock for sliding doors. 4,103,946, Cl. 292-114.000.
- Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., to Design & Manufacturing Corporation. PTC heater for enhancing thermal actuator response. 4,104,507, Cl. 219-513.000.
- Titz, Siegfried: *See—*
  - Pelikan, Hans Dieter; and Titz, Siegfried, 4,104,207, Cl. 521-84.000.
- TMC Corporation: *See—*
  - Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, 4,103,916, Cl. 280-605.000.
  - Valoh, Alfons, 4,103,930, Cl. 280-614.000.
- Tochitani, Tomotada: *See—*
  - Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,104,432, Cl. 428-216.000.
- Toda, Toshiharu; and Shigemori, Daizo, to Reliable Electric Company. Gas filled surge arrester. 4,104,693, Cl. 361-120.000.
- Tokico Ltd.: *See—*
  - Sakazume, Takeshi, 4,103,492, Cl. 60-588.000.
- Tokuno, Masateru, to Rengo Co., Ltd. Board piling-up apparatus. 4,103,786, Cl. 214-7.000.
- Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, to Rengo Kabushiki Kaisha (Rengo Co., Ltd); and Nippon Riraiansu Kabushiki Kaisha (Japan Reliance Electric Ltd.). Method of controlling web cutting. 4,104,723, Cl. 364-475.000.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.
- Toledo Astronomical Association: *See—*
  - Wagoner, James E., 4,103,429, Cl. 33-270.000.
- Tollinger, James, to Ithaca Gun Company, Inc. Firearm trigger mechanism. 4,103,586, Cl. 89-144.000.
- Tolo, Incorporated: *See—*
  - Lockshaw, James J., 4,103,368, Cl. 4-172.120.
- Tomes, William L.: *See—*
  - Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.
- Tomita, Chuji; and Abe, Hiroshi, to Hitachi Medical Corporation. Scanning apparatus for cross-sectional inspection equipment. 4,104,527, Cl. 250-445.00T.
- Tomiyama, Hitoshi: *See—*
  - Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, 4,104,041, Cl. 55-90.000.
- Tompsett, David Elliott: *See—*
  - Grau, Thomas George; and Tompsett, David Elliott, 4,104,109, Cl. 156-521.000.
- Tonomura, Shinji: *See—*
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
- Tool Masters, Inc.: *See—*
  - Daigle, Milton L., 4,103,741, Cl. 166-147.000.
- Toray Industries, Inc.: *See—*
  - Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.
- Totten, Roger W., to Adolph Coors Company. In-line bottle rinser. 4,104,081, Cl. 134-23.000.
- Towsend, Marvin Stanley. Remote signaling system. 4,104,618, Cl. 340-524.000.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Date, Masakazu; and Wada, Masahiro, 4,104,222, Cl. 260-29.20E.
  - Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.
  - Tachibana, Yoshishige, 4,103,521, Cl. 68-22.00R.
- Toyo Kogyo Co., Ltd.: *See—*
  - Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, 4,103,666, Cl. 123-219.000.
- Toyo Soda Manufacturing Co., Ltd.: *See—*
  - Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, 4,104,079, Cl. 134-2.000.
  - Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, 4,104,208, Cl. 521-53.000.
  - Nagasawa, Mitsuru; Fujimoto, Teruo; and Tago, Kazuo, 4,104,455, Cl. 526-173.000.
- Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.): *See—*
  - Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,104,432, Cl. 428-216.000.
- Toyoda, Kenji; and Watanabe, Sakuji, to Nippon Kogaku K.K. Exposure control circuit for camera. 4,104,666, Cl. 354-234.000.
- Toyoda, Kenji: *See—*
  - Sugimori, Shiro; and Toyoda, Kenji, 4,104,661, Cl. 354-173.000.
- Toyoda-Koki Kabushiki-Kaisha: *See—*
  - Nishimura, Hideo; and Etoh, Kunihiko, 4,103,668, Cl. 125-11.0CD.
- Traffic Systems, Inc.: *See—*
  - DiCola, Joseph A., 4,104,562, Cl. 315-158.000.
- Trans-ACC, Inc.: *See—*
  - Francis, Walter C., 4,103,589, Cl. 90-56.00R.
- Trauner, Gerhard; and Kiripolszki, Michael, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Steerable antenna arrangement. 4,104,640, Cl. 343-765.000.
- Treasarden, Robert J., to Raymond Lee Organization, Inc., The, a part interest. Game. 4,103,890, Cl. 273-1.00E.
- Tridon-Serflex S. A.: *See—*
  - Luc, Andre R., 4,103,637, Cl. 113-116.00M.
- Trifsik, Mikhail Konstantinovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Trio Kabushiki Kaisha: *See—*
  - Tagawa, Masatoshi, 4,104,599, Cl. 331-116.00R.
- Tritter, Alan Levi: *See—*
  - Markstein, Peter Willy; and Tritter, Alan Levi, 4,104,721, Cl. 364-200.000.
- Trivedi, Bhupendra C., to Ashland Oil, Inc. Catalytic hydrogenation of fatty acids. 4,104,478, Cl. 568-885.000.
- Troponwerke Dinklage & Co.: *See—*
  - Boltze, Karl-Heinz; Brendler, Otfried; and Seidel, Peter-Rudolf, 4,104,278, Cl. 260-326.13A.
- True Temper Corporation: *See—*
  - Muchiarone, Jerome J., 4,104,639, Cl. 343-723.000.
- Trulio, John G.; and Bless, Stephan J., to Applied Theory, Inc. Stress wave generator. 4,103,756, Cl. 181-121.000.
- Trumpf Maschinen AG: *See—*
  - Herb, Eugen; and Brekle, Erich, 4,103,414, Cl. 29-568.000.
- Tsergas, Athanase N., to Merkle-Korff Gear Co. Synchronous motor structure. 4,104,552, Cl. 310-156.000.
- Tsubuko, Kazuo; and Kizu, Yasuo, to Ricoh Co., Ltd. Liquid developer for use in electrostatic photography comprising natural resins and natural resin-modified thermosetting resins combined with polymers. 4,104,183, Cl. 252-62.10L.
- Tsuchida, Eishun; and Honda, Kenji, to Tsuchida, Eishun. Polymeric metal complex and method of manufacturing the same. 4,104,466, Cl. 542-433.000.
- Tsuchikura, Toshio: *See—*
  - Kawada, Chikao; and Tsuchikura, Toshio, 4,103,451, Cl. 46-22.000.
- Tsuchiya, Tsutomu: *See—*
  - Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,104,372, Cl. 424-180.000.
- Tsuruta, Hikaru: *See—*
  - Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu, Shigehisa, 4,103,575, Cl. 83-298.000.
- Tsypin, Nekhemyan Veniaminovich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Tucker, Samuel M., to Robinson, John C.; Youngblood, Wade H.; and Briscoe, Harry H., part interest to each. Slasher vacuum cleaning system. 4,103,390, Cl. 28-173.000.
- Turin, Michel J.: *See—*
  - Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.
- Turman, Thomas Bray. Emergency opening latch actuator for sliding door. 4,103,945, Cl. 292-100.000.
- Turner, Albert Harold, to United Technologies Corporation. Rotary seal with pressurized air directed at fluid approaching the seal. 4,103,899, Cl. 277-1.000.
- Turner, Paul W.: *See—*
  - Luttrell, Edward; and Turner, Paul W., 4,104,499, Cl. 219-60.00A.
- Tyler, Harold E. Waste bag for animals. 4,103,645, Cl. 119-95.000.
- Uchida, Akinari: *See—*
  - Hachisu, Takeshi; and Uchida, Akinari, 4,104,206, Cl. 260-2.300.

- Uchida, Masao: *See—*
  - Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, 4,104,079, Cl. 134-2.000.
- Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Data printing device for camera. 4,104,658, Cl. 354-106.000.
- Uebel, Philip, to Robert Bosch GmbH. Reciprocating tamping tool. 4,104,001, Cl. 404-133.000.
- Ueda, Masaki: *See—*
  - Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, 4,104,436, Cl. 428-297.000.
- Ueda, Takeo, to NSK-Warner K.K. Take-up force eliminator for safety belt retractor. 4,103,845, Cl. 242-107.700.
- Ueda, Tomoyuki: *See—*
  - Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, 4,103,865, Cl. 251-148.000.
- Ueno, Zene; Morita, Akira; and Chida, Atushi, to Nissan Motor Company, Limited. Method of and apparatus for controlling ignition timing of an internal combustion engine. 4,103,653, Cl. 123-117.00R.
- Ueshima, Takashi; Tanaka, Yasuzi; Yokoyama, Toshiro; and Kobayashi, Shoichi, to Showa Denko K.K. Resin composition comprising cyano-substituted norborene polymers blended with graft copolymers. 4,104,325, Cl. 260-876.00R.
- Ullmann, Karl Hans, to Harnischfeger Corporation. Shovel attachment means for hydraulic excavator. 4,103,791, Cl. 214-138.00R.
- Ullmann, Werner; and Panschow, Rudolf, to A.G. fur industrielle Elektronik AGIE. Electro-erosion machine tool with compensation for operating forces, and method of operation. 4,104,502, Cl. 219-69.00W.
- Ulrich, James K.: *See—*
  - Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., 4,103,475, Cl. 56-16.400.
- Ultra Centrifuge Nederland N.V.: *See—*
  - Ijlstra, Hendrik Jan; and van den Boogaard, Gerardus Joachim Maria, 4,104,484, Cl. 174-151.000.
  - Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, 4,103,816, Cl. 228-49.000.
- Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 1-N-(α-hydroxy-ω-aminoalkanoyl) derivatives of 3'-deoxykanamycin A and the production thereof. 4,104,372, Cl. 424-180.000.
- Umezawa, Sumio: *See—*
  - Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,104,372, Cl. 424-180.000.
- Union Carbide Corporation: *See—*
  - Chiu, Herman Shin-Gee, 4,104,408, Cl. 426-135.000.
  - Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., 4,104,043, Cl. 71-107.000.
  - Grose, Robert William; and Flanigen, Edith Marie, 4,104,294, Cl. 260-448.00C.
  - Hedblom, Mats-Olov; and Sultan, Sven Gilbert, 4,104,256, Cl. 260-45.95D.
  - Pike, Roscoe A., 4,104,296, Cl. 260-448.80R.
  - Sara, Raymond Vincent, 4,104,417, Cl. 427-37.000.
  - Simroth, Donald W., 4,104,236, Cl. 260-33.20R.
- Union Oil Company of California: *See—*
  - Stechmeyer, Frank W., 4,104,171, Cl. 252-8.300.
- Union Siderurgique du Nord et de l'Est de la France: *See—*
  - Dussart, Bernard Emile Andre, 4,103,730, Cl. 164-49.000.
- Unipat Corporation of America II: *See—*
  - Witcraft, Richard L., 4,103,573, Cl. 82-93.000.
- Uniroyal, Inc.: *See—*
  - Covey, Rupert A.; and Grahame, Robert E., Jr., 4,104,401, Cl. 424-303.000.
- Unisearch Limited: *See—*
  - Frost, Richard Butler; Juhasz, Joseph Laszlo; and Wing, Barry Walter, 4,103,809, Cl. 224-5.00R.
- United States of America
  - Agriculture: *See—*
    - Gonsior, Michael J., 4,103,784, Cl. 212-94.000.
    - Zornig, Harold F., 4,103,825, Cl. 237-1.00A.
  - Air Force: *See—*
    - Ipri, Alfred C.; and Flatley, Doris W., 4,104,087, Cl. 148-1.500.
  - Army: *See—*
    - Hildebrandt, Herman F., 4,104,364, Cl. 423-481.000.
    - Rahman, Abdul R.; and Deneke, Wayne A., 4,104,414, Cl. 426-599.000.
    - Singer, Abraham; and Minkowski, Jan M., 4,104,587, Cl. 324-95.000.
  - Commerce: *See—*
    - Engen, Glenn F., 4,104,583, Cl. 324-58.00A.
  - Energy: *See—*
    - Forster, George A., 4,103,555, Cl. 73-706.000.
    - Garrett, George A.; and Shacter, John, 4,104,037, Cl. 55-16.000.
    - Luttrell, Edward; and Turner, Paul W., 4,104,499, Cl. 219-60.00A.
  - Health, Education and Welfare: *See—*
    - Walker, Elijah C., 4,103,893, Cl. 273-106.50D.
  - Interior: *See—*
    - Bradburn, Robert A., 4,104,544, Cl. 307-297.000.
    - Cole, Ernest R., Jr., 4,104,132, Cl. 204-12.000.
  - National Aeronautics and Space Administration; administrator; with respect to an invention of:
    - Friedell, Morley V. Positive isolation disconnect. 4,103,712, Cl. 137-637.050.
    - Menichelli, Vincent J. Electroexplosive device. 4,103,619, Cl. 102-28.00R.
  - National Aeronautics and Space Administration: *See—*
    - Alley, Vernon L., Jr.; and McHatton, Austin D., 4,103,550, Cl. 73-159.000.
    - Evans, John C., Jr., 4,104,084, Cl. 136-89.0CC.
    - Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., 4,104,091, Cl. 148-188.000.
    - McKay, Richard A., 4,104,018, Cl. 432-29.000.
    - Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,104,134, Cl. 204-37.00R.
  - Navy: *See—*
    - Bernett, Marianne K., 4,104,452, Cl. 526-3.000.
    - Bohli, William H., 4,104,708, Cl. 362-34.000.
    - Chu, Wesley W.; and Korff, Phillip B., 4,104,719, Cl. 364-200.000.
    - Herndon, John W., 4,103,435, Cl. 35-12.00N.
    - Holt, Lloyd J.; and Panlaqui, Clayton E., 4,103,849, Cl. 244-63.000.
    - Iverson, Myren L., 4,104,533, Cl. 250-551.000.
    - Jones, William Kinzy, 4,104,607, Cl. 338-309.000.
    - Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., 4,104,608, Cl. 340-3.0PS.
  - Transportation: *See—*
    - Vrabel, Joseph D., 4,103,547, Cl. 73-146.000.
- U.S. Philips Corporation: *See—*
  - Schroder, Johann, 4,104,185, Cl. 252-70.000.
  - Van Bokestal, Andre Marcel Alfred; and Belhomme, Charles Joseph Ghislain, 4,104,509, Cl. 219-544.000.
  - Zandveld, Paul, 4,104,085, Cl. 148-1.500.
- United States Steel Corporation: *See—*
  - Bucchianeri, Bernard A.; and Senchur, Robert A., 4,103,552, Cl. 73-309.000.
  - Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., 4,103,903, Cl. 277-27.000.
  - Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
  - Fields, Marvin C.; and Wyse, Richard F., 4,104,129, Cl. 201-17.000.
- United Technologies Corporation: *See—*
  - Beckmann, Peter V.; and Kelly, James B., 4,103,544, Cl. 73-115.000.
  - Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., 4,103,848, Cl. 244-17.130.
  - Turner, Albert Harold, 4,103,899, Cl. 277-1.000.
- Universal Electric Company: *See—*
  - Penhorwood, Herbert F., 4,104,550, Cl. 310-71.000.
- University of Virginia: *See—*
  - Brooker, Gary; Terasaki, Wesley L.; and Price, Michael G., 4,104,026, Cl. 23-230.00B.
- Unz, Hillel. Nonuniformly optimally spaced array with specified sidelobe positions in the radiation pattern. 4,104,641, Cl. 343-844.000.
- UOP Inc.: *See—*
  - Antos, George J., 4,104,317, Cl. 260-666.00A.
  - Christman, William J., 4,104,155, Cl. 208-235.000.
  - Hilfman, Lee, 4,104,152, Cl. 208-112.000.
  - Martan, Michael; and Halter, Mark A., 4,104,141, Cl. 204-78.000.
  - Mitsche, Roy T.; and Pope, George N., 4,104,154, Cl. 208-138.000.
  - Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., 4,104,149, Cl. 208-64.000.
  - Ward, Dennis J., 4,104,321, Cl. 260-677.00A.
- Upjohn Company, The: *See—*
  - Bundy, Gordon L., 4,104,476, Cl. 560-61.000.
  - Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,104,346, Cl. 264-51.000.
  - Smith, Herman W., 4,104,474, Cl. 560-53.000.
- Urbanczyk, Marvin L. Manure treating process. 4,104,048, Cl. 71-9.000.
- Urbanek, Karel: *See—*
  - Wheeler, William R.; Kren, George J.; and Urbanek, Karel, 4,103,542, Cl. 73-105.000.
- Urrea, Petronio D.: *See—*
  - Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., 4,104,187, Cl. 252-106.000.
- Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu,

- Shigehisa, to Fuji Photo Film Co., Ltd. Synchronous web cutting apparatus. 4,103,575, Cl. 83-298.000.
- Valadares, Alvaro Neff: *See—*
  - Cruz, Edmundo Novas; and Valadares, Alvaro Neff, 4,103,615, Cl. 101-120.000.
- Valcour Imprinted Papers, Inc.: *See—*
  - Collins, Frederick H., 4,104,440, Cl. 428-402.000.
- Valenti, Salvatore, to Sandoz Ltd. 1,3,4-Oxadiazolyl-(2)-vinyl stilbene optical brighteners. 4,104,468, Cl. 542-447.000.
- Valint, Paul L.: *See—*
  - Oswald, Alexis A.; and Valint, Paul L., 4,104,378, Cl. 424-225.000.
- Valmet Oy: *See—*
  - Koskimies, Ouni, 4,104,116, Cl. 162-343.000.
  - Matikainen, Martti; and Ovaska, Juhani, 4,103,565, Cl. 74-665.00L.
- Valoh, Alfons, to TMC Corporation. Heel holder for ski bindings. 4,103,930, Cl. 280-614.000.
- Van Bokestal, Andre Marcel Alfred; and Belhomme, Charles Joseph Ghislain, to U.S. Philips Corporation. Self-regulating heating element. 4,104,509, Cl. 219-544.000.
- van den Boogaard, Gerardus Joachim Maria: *See—*
  - Ijlstra, Hendrik Jan; and van den Boogaard, Gerardus Joachim Maria, 4,104,484, Cl. 174-151.000.
- Vanderlinde, William: *See—*
  - Mathis, Thomas C.; Morgan, Albert W.; and Vanderlinde, William, 4,104,233, Cl. 260-31.8HA.
- Vanek, Chester F. Autoloading pistol. 4,103,587, Cl. 89-175.000.
- Vanheerentals, Jacques Leon; Pfeifer, Josef; Klocke, Helmut; and Paulus, Rudolf, to AGFA-Gevaert, AG. Method of determining exposure times for photographic copying material. 4,104,069, Cl. 96-23.000.
- Van Niel, Clarence R., to Eaton Corporation. Monitor actuating device and reusable fastener therefor. 4,104,622, Cl. 340-572.000.
- Van Roessel, Frederik Johannes, to North American Philips Corporation. Video switching circuit. 4,104,678, Cl. 358-30.000.
- van Staveren, Hendricus Cornelis: *See—*
  - Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,103,476, Cl. 56-13.600.
- Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and by Deeva, Alexandra Ivanovna, administratrix. Portable drilling machine. 4,103,745, Cl. 173-57.000.
- Varnin, Valentin Pavlovich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Vaslas, John W. Snow shovel. 4,103,954, Cl. 294-54.000.
- Vasquez, Joe M. Z. Fly trap. 4,103,449, Cl. 43-111.000.
- Vavilov, Igor Stepanovich: *See—*
  - Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
- Veba-Chemie Aktiengesellschaft: *See—*
  - Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.
- Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., to UOP Inc. Multiple-stage hydrocarbon conversion with gravity-flowing catalyst particles. 4,104,149, Cl. 208-64.000.
- Veloz, Jaime: *See—*
  - Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.
- Velsicol Chemical Corporation: *See—*
  - Smith, Ray E.; and Albright, James A., 4,104,172, Cl. 252-8.100.
- Venus Scientific Inc.: *See—*
  - Cohen, David A.; and Lien, Charles, 4,104,564, Cl. 315-171.000.
- Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
  - Trauner, Gerhard; and Kiripolszki, Michael, 4,104,640, Cl. 343-765.000.
- Vernon, Harry Rowe: *See—*
  - Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.
- Versar, Inc.: *See—*
  - Frankel, Irwin, 4,104,395, Cl. 264-60.000.
- Verschage, Gerald C.: *See—*
  - Fisk, Bernard C.; and Verschage, Gerald C., 4,104,726, Cl. 364-518.000.
- Verzella, David J.: *See—*
  - Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., 4,103,848, Cl. 244-17.130.
- Vezzani, Luciano. Metal scrap compacting press. 4,103,610, Cl. 100-232.000.
- Victor, Floyd Ray, to Rice Hydro Equipment Manufacturing. Means and method of hydrostatic testing. 4,103,537, Cl. 73-40.50R.
- Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, to Warner-Lambert Company. Dibenzyl glycolic acid derivatives. 4,104,380, Cl. 424-244.000.
- Vik, Albam M., to Avon Enterprises, Inc. Fluid cylinder mounted lock out valve device. 4,103,699, Cl. 137-106.000.
- Vilaldach, Joseph: *See—*
  - Boujard, Claude; and Vilaldach, Joseph, 4,104,082, Cl. 134-141.000.
- Vincent, David N.; and Chang, Cheng-Hsiung, to Champion International Corporation. Pressure-sensitive copy system including ureido fluoran chromogenic compounds. 4,104,437, Cl. 428-307.000.
- Vincent, Gary A.: *See—*
  - Brooks, William T.; and Vincent, Gary A., 4,104,184, Cl. 252-63.700.
- Vinnemann, Antonius: *See—*
  - Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,103,517, Cl. 66-75.100.
- Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, to Studiengesellschaft Kohle mbH. Production of hop extracts. 4,104,409, Cl. 426-386.000.
- Vnukov, Stanislav Pavlovich: *See—*
  - Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
- Vogel, Roger F.: *See—*
  - Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
- Vogele, Peter; and Schulte, Diethard, to Tetra Pak Developpement, S.A. Process for sterilization, more particularly for sterilization of packaging materials. 4,104,024, Cl. 21-58.000.
- Vogt, Wilhelm: *See—*
  - Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,104,300, Cl. 260-544.00D.
- Vollmer, Hans-Peter: *See—*
  - Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.
- Vollmer, Robert Lee: *See—*
  - Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, 4,104,308, Cl. 260-586.00R.
- Von Basse, Paul-Werner: *See—*
  - Hofmann, Ruediger; and Von Basse, Paul-Werner, 4,104,735, Cl. 365-230.000.
- von Kaler, Roland L.; and Jolliff, Norman E., to Tecumseh Products Company. Transaxle. 4,103,566, Cl. 74-701.000.
- von Strandtmann, Maximilian: *See—*
  - Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, 4,104,274, Cl. 260-295.0AM.
- Voth, Elmer D.: *See—*
  - Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., 4,103,477, Cl. 56-202.000.
- Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, to Ceskoslovenska akademie ved. Method for preparation of perfectly spherical particles of silicagel with controlled size and controlled pore dimensions. 4,104,363, Cl. 423-338.000.
- Vrabel, Joseph D., to United States of America, Transportation. Locomotive track curvature indicator. 4,103,547, Cl. 73-146.000.
- Vukkert, Alexandr Adolfovich: *See—*
  - Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

- Vukoje, Tatjana, to Akzona Incorporated. Variable diameter yarn. 4,103,481, Cl. 57-140.00J.
- W & H Conveyor Systems, Inc.: *See—*
  - Warner, Kent F., 4,103,767, Cl. 198-366.000.
- W. R. Grace & Co.: *See—*
  - Bieler, Anne C.; and Schirmer, Henry G., 4,104,404, Cl. 428-35.000.
- W. Schlafhorst & Co.: *See—*
  - Kupper, Willi, 4,103,836, Cl. 242-35.60E.
- Wada, Masahiro: *See—*
  - Date, Masakazu; and Wada, Masahiro, 4,104,222, Cl. 260-29.20E.
- Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. 3-(Arylcycloiminoalkyl)benzisothiazole 1,1-dioxides. 4,104,387, Cl. 424-250.000.
- Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. 3-Substituted benzisothiazole, 1,1-dioxides. 4,104,388, Cl. 424-250.000.
- Wagener, Heinz-Jurgen: *See—*
  - Klingelhofer, Friedrich; and Wagener, Heinz-Jurgen, 4,103,964, Cl. 297-367.000.
- Wagner, Jerome, to Fraider, Harry. Brush tender. 4,103,779, Cl. 211-65.000.
- Wagner, Walter D.; and Gayle, Harold R., to Sun Oil Company of Pennsylvania. Pressure stabilizer device. 4,103,705, Cl. 137-544.000.
- Wagner, Wolfram: *See—*
  - Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.
- Wagoner, James E., to Toledo Astronomical Association. Sun and star time dial. 4,103,429, Cl. 33-270.000.
- Wakami, Noboru; and Deguchi, Masahiro, to Matsushita Electric Industrial Co., Ltd. Rotary head type magnetic video recording and reproducing system. 4,104,684, Cl. 360-70.000.
- Wakayama, Hideaki: *See—*
  - Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.
- Wakefield, Fancher B., to Grumman Aerospace Corporation. Self-aligning permanent fitting. 4,103,937, Cl. 285-110.000.
- Walker, Duane Hubert, to National Presto Industries, Inc. Pressure cooker with manually-operated cover interlock. 4,103,801, Cl. 220-203.000.
- Walker, Edward Piper: *See—*
  - Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, 4,104,586, Cl. 324-83.00D.
- Walker, Elijah C., to United States of America, Health, Education and Welfare. Tranquilizer dart. 4,103,893, Cl. 273-106.50D.
- Walker, James J.: *See—*
  - Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.
- Walker, Louis, to Ascani, Armand; and Piattoni, Louis J., part interest to each. Method and means for improved air distribution. 4,103,599, Cl. 98-33.00A.
- Walker, Richard Turner. Drying apparatus. 4,103,434, Cl. 34-114.000.
- Wallrabenstein, Michael: *See—*
  - del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.
- Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., to Eco-Control, Inc. Halogen complexing alkyl salts for use in halogen cells. 4,104,447, Cl. 429-15.000.
- Walt Disney Productions: *See—*
  - Hinze, George B., 4,103,892, Cl. 273-101.100.
- Walters, Harry Godfrey, III: *See—*
  - Humble, David Raymond; and Walters, Harry Godfrey, III, 4,103,572, Cl. 81-418.000.
- Wambach, Allen Dale: *See—*
  - Kochanowski, John Edward; and Wambach, Allen Dale, 4,104,242, Cl. 260-40.00R.
- Wang, Shih-Ping; Robbins, Charles D.; and Merritt, Elisha, to Diagnostic Information Inc. Direct view, panel type x-ray image intensifier tube. 4,104,516, Cl. 250-213.0VT.
- Ward, Dennis J., to UOP Inc. Process for the separation of olefins. 4,104,321, Cl. 260-677.00A.
- Ward, Gene R., to Minnesota Mining and Manufacturing Company. Method of making structural member from prepreg sheet of fusible resin microfibers and heat-resistant reinforcing fibers. 4,104,340, Cl. 264-6.000.
- Ward, Gerald Frank; and Wray, Gordon Richard, to National Research Development Corporation. Method for inserting seams in base fabric. 4,103,636, Cl. 112-266.000.
- Ward, James O.: *See—*
  - Gartshore, Peter A.; and Ward, James O., 4,103,821, Cl. 229-74.000.
- Warner, Albert Woodrow. Heat exchanger. 4,103,735, Cl. 165-39.000.
- Warner, Harlow L.: *See—*
  - McNulty, Patrick J.; and Warner, Harlow L., 4,104,273, Cl. 260-294.900.
- Warner, Kent F., to W & H Conveyor Systems, Inc. Elevating apparatus. 4,103,767, Cl. 198-366.000.
- Warner-Lambert Company: *See—*
  - Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, 4,104,274, Cl. 260-295.0AM.
  - Schwender, Charles F.; and Sunday, Brooks R., 4,104,389, Cl. 424-251.000.
  - Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,104,380, Cl. 424-244.000.
- Washausen, Roy F.: *See—*
  - Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.
- Washida, Masaaki: *See—*
  - Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, 4,103,528, Cl. 72-238.000.
- Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, to Sharp Kabushiki Kaisha. Liquid crystal display calculator construction. 4,104,727, Cl. 364-710.000.
- Wasilewski, Olgierd; Saltzman, Ronald; and Ferrara, William J., to Sun Chemical Corporation. Inks and coating compositions containing rosin-modified epoxy resins. 4,104,143, Cl. 204-159.150.
- Wass, Richard J. Heat exchanger for a freestanding heating unit. 4,103,826, Cl. 237-55.000.
- Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, to Oki Electric Industry Co., Ltd. Ink mist type high speed printer. 4,103,612, Cl. 101-1.000.
- Watanabe, Masanori: *See—*
  - Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.
- Watanabe, Masazumi: *See—*
  - Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
- Watanabe, Osamu: *See—*
  - Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, 4,104,079, Cl. 134-2.000.
- Watanabe, Sakuji: *See—*
  - Toyoda, Kenji; and Watanabe, Sakuji, 4,104,666, Cl. 354-234.000.
- Water Refining Company, Inc.: *See—*
  - Davis, Stephen H., 4,104,158, Cl. 210-25.000.
- Watson, Francis M., III: *See—*
  - Mutter, Walter F.; and Watson, Francis M., III, 4,103,535, Cl. 73-37.500.
- Watson, Theodore R.: *See—*
  - Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.
- Wear, Robert L.: *See—*
  - Kirk, James P.; and Wear, Robert L., 4,104,433, Cl. 428-245.000.
- Weaver, Charles A., to P.R. Mallory & Co. Inc. Capacitor including an electroplated layer thereover. 4,104,704, Cl. 361-433.000.
- Weaver, Gerald Q., to Norton Company. Process for making aluminum modified boron carbide and products resulting therefrom. 4,104,062, Cl. 75-238.000.
- Weaver, Leslie A., to Talbert Manufacturing, Inc. Folding gooseneck trailer with positioning system. 4,103,793, Cl. 214-506.000.
- Webb, Robert Lee: *See—*
  - Labaw, Clifford Steven; Webb, Robert Lee; and Wellman, George Robert, 4,104,472, Cl. 548-337.000.
- Weber, Karl-Heinz: *See—*
  - Nowacki, Georg; and Weber, Karl-Heinz, 4,103,974, Cl. 299-43.000.
- Wegmuller, Hans; and Haase, Jaroslav, to Ciba-Geigy Corporation. Process for the purification of industrial effluents. 4,104,160, Cl. 210-36.000.
- Weigele, Manfred: *See—*
  - Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, 4,104,367, Cl. 424-1.000.
- Weigl, Erwin: *See—*
  - Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, 4,103,916, Cl. 280-605.000.
- Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., to Westinghouse Electric Corp. Method and system for clutter blanking in a radar target processor. 4,104,631, Cl. 343-7.00A.
- Weimar, Erich: *See—*
  - Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, 4,103,459, Cl. 49-491.000.
- Weimer, Dean R.; and Durr, Albert M., to Continental Oil Company. Method for reducing PVC polymer buildup in polymerization reactors. 4,104,454, Cl. 526-62.000.
- Wein, Gary M., to Nalco Chemical Company. Method for treating

aqueous wastes containing at least 1% proteinaceous matter. 4,104,161, Cl. 210-54.000.

Weinberg, Gerd: *See—*

Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, 4,104,348, Cl. 264-121.000.

Weinstock, Joseph: *See—*

Gallagher, Gregory, Jr.; Pfeiffer, Francis R.; and Weinstock, Joseph, 4,104,379, Cl. 424-244.000.

Weir, Donald A.; and Sweet, Anthony W., to International Standard Electric Corporation. Subscriber line circuit. 4,104,488, Cl. 179-18.0FA.

Weisbeck, Roland: *See—*

Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.

Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, to E. R. Squibb & Sons, Inc. Imidazo(2,1-b)thiazole derivatives, compositions containing same, and method of treating helminthiasis. 4,104,400, Cl. 424-270.000.

Weiss, Charles M.; and Judy, Kenneth W. M., to Oratronics, Inc. Threaded self-tapping endodontic stabilizer. 4,103,422, Cl. 32-10.00A.

Weiss, Frederick A. Extensible vehicle trailer with safety locking bar and cable and hose supporting outriggers. 4,103,931, Cl. 280-656.000.

Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., to Kewanee Industries. Radiation-curable coating compositions and inks. 4,104,144, Cl. 204-159.230.

Weiss, Mortimer E., to Thoro-Ray Inc. Dental and medical X-ray apparatus. 4,104,530, Cl. 250-490.000.

Weiss, Mortimer E., to Thoro-Ray Inc. Electron beam target carrier with ceramic window for dental or medical X-ray use. 4,104,531, Cl. 250-490.000.

Weiss, Mortimer E., to Thoro-Ray Inc. Dental and medical X-ray apparatus. 4,104,532, Cl. 250-490.000.

Weitzenhof, David A.: *See—*

Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., 4,103,951, Cl. 293-71.00P.

Weitzman, Elizabeth J.: *See—*

Park, Kyu C.; and Weitzman, Elizabeth J., 4,104,418, Cl. 427-42.000.

Welge, Frederick T.: *See—*

Redmore, Derek; and Welge, Frederick T., 4,104,293, Cl. 260-438.50R.

Welkowsky, Murray S.: *See—*

Lewis, John H.; Lewis, Kathrine J.; Reizman, Fremont; and Welkowsky, Murray S., 4,104,520, Cl. 250-315.00R.

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Wenzel, Rupert: *See—*

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Werzalit-Pressholzwerk J.F. Werz Jr. KG: *See—*

Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, 4,104,348, Cl. 264-121.000.

Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, to Mannesmann Aktiengesellschaft. Method for making metal powder of low oxygen content. 4,104,342, Cl. 264-12.000.

West, Anthony Alfred: *See—*

Prouse, Ronald Ernest; West, Anthony Alfred; King, Derek Anthony; and Poulson, Roger, 4,104,115, Cl. 162-100.000.

Westberry, Wyman. Tamper prevention apparatus for watt-hour meter. 4,104,588, Cl. 324-110.000.

Westebbe, Klaus: *See—*

Dorling, Rolf; and Westebbe, Klaus, 4,103,647, Cl. 122-483.000.

Westeren, Herbert W.; and McCally, Richard P., to C. I. Hayes Inc. Apparatus for heat treating drill blanks. 4,103,880, Cl. 266-253.000.

Westinghouse Brake & Signal Co. Ltd.: *See—*

Wickham, David John, 4,103,977, Cl. 303-38.000.

Westinghouse Electric Corp.: *See—*

Bean, Lawrence M.; Edwards, Robert W.; and Wright, Theodore, 4,104,617, Cl. 340-147.00R.

Chenoweth, Terrence E.; and Yeoman, Frederick A., 4,104,238, Cl. 260-37.0EP.

Desmond, John W.; Kmec, Joseph F.; and Meyer, Charles A., 4,103,905, Cl. 277-56.000.

Dickens, Lawrence E., 4,104,673, Cl. 357-22.000.

Kuhn, Earl C., 4,103,979, Cl. 308-160.000.

Morrison, Steven; and Dorman, William J., 4,104,730, Cl. 364-815.000.

Parziale, Ernest A.; and Richardson, Dennis C., 4,104,117, Cl. 176-20.00R.

Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., 4,104,691, Cl. 361-96.000.

Thuot, Michael E., 4,104,578, Cl. 324-28.0CR.

Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.

Westvaco Corporation: *See—*

Dowd, Daniel J., 4,103,840, Cl. 242-67.30R.

Weyerhaeuser Company: *See—*

Muise, Herbert D., 4,103,819, Cl. 229-33.000.

Wheeler, Jay A.; Miszkiewicz, Henry L.; Lindberg, Ronald O. J.; and Willmore, James A., to HEI, Inc. Tactile feel device. 4,104,603, Cl. 335-306.000.

Wheeler, William R.; Kren, George J.; and Urbanek, Karel, to Tencor Instruments. Metrology instrument for measuring vertical profiles of integrated circuits. 4,103,542, Cl. 73-105.000.

Whirlpool Corporation: *See—*

Karklys, Joseph; and Yamanaka, Junji Cary, 4,104,542, Cl. 307-141.000.

Whitcomb, John F., to Minnesota Mining and Manufacturing Company. Insecticidal device. 4,103,450, Cl. 43-131.000.

White, E. Vernon. Valve guard for protecting the regulator valve on a scuba tank. 4,103,806, Cl. 222-3.000.

White, Graham Colin: *See—*

Ashworth, Roger Anderton; Pollitt, John Michael; and White, Graham Colin, 4,103,754, Cl. 180-82.00C.

White, William Joseph: *See—*

Lorenze, Robert V., Jr.; and White, William Joseph, 4,104,674, Cl. 357-30.000.

Whiteside, George D.: *See—*

Johnson, Bruce K.; and Whiteside, George D., 4,104,653, Cl. 354-27.000.

Whiting, Kenneth B.: *See—*

Gillard, Paul O.; and Whiting, Kenneth B., 4,104,634, Cl. 343-18.00C.

Whiting, Wesley W.; and Anderson, John A. Hold down plate for camper units. 4,103,959, Cl. 296-23.0MC.

Whitney, Thomas A.; and Klemann, Lawrence P., to Exxon Research & Engineering Co. Alkali metal batteries having electrolytes including alkali metal salts of complex anions containing heteroatom substituents in organic solvent. 4,104,450, Cl. 429-194.000.

Whittle, John: *See—*

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Whyel, Robert E., Jr.: *See—*

Lyon, John A.; and Whyel, Robert E., Jr., 4,103,807, Cl. 224-1.00R.

Wickerhauser, Milan, to American National Red Cross. Method for preparation of antihemophilic factor. 4,104,266, Cl. 260-112.00B.

Wickham, David John, to Westinghouse Brake & Signal Co. Ltd. Vehicle braking control valve apparatus for quick service operation. 4,103,977, Cl. 303-38.000.

Widolf, Philip R., to Woody-Widolf, Inc. Skateboard truck. 4,103,917, Cl. 280-11.280.

Wiegardt, Gordon K.: *See—*

Fletcher, Edward Horton; and Wiegardt, Gordon K., 4,103,489, Cl. 60-395.000.

Wiegers, Wilhelmus Johannen: *See—*

Hall, John B.; and Wiegers, Wilhelmus Johannen, 4,104,203, Cl. 252-522.000.

Wiegner, Georg. Sealed container with frangible partition. 4,103,772, Cl. 206-222.000.

Wiemer, Klaus C.: *See—*

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Wiezer, Hartmut; Pfahler, Gerhard; and Mayer, Norbert, to Hoechst Aktiengesellschaft. Substituted tetraalkylpiperidone-4-oximes. 4,104,251, Cl. 260-45.80N.

Wignall, Norman, to Cupa Engineering Co. Ltd. Tufting machines and method. 4,103,630, Cl. 112-79.00R.

Wilcox, DeWitt Gifford: *See—*

Gregory, Raymond A.; and Wilcox, DeWitt Gifford, 4,104,097, Cl. 156-143.000.

Wilhelm, Neil C.: *See—*

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Wilk, Louis: *See—*

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Wilke, Gunther: *See—*

Eisenbach, Wilhelm; Lehmkuhl, Herbert; and Wilke, Gunther, 4,104,140, Cl. 204-78.000.

Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, to Comm/Scope Company. Coaxial cable with improved properties and process of making same. 4,104,481, Cl. 174-28.000.

Wilkes, Alan Leonard: *See—*

Golda, Eugene; Wilkes, Alan Leonard; and Chu, Simon Long, 4,104,072, Cl. 96-68.000.

Wille, Hans J., to Naarden International N.V. Perfume compositions and process for preparing same. 4,104,202, Cl. 252-522.000.

William Kenyon & Sons, Inc.: *See—*

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Williams, Alan: *See—*

Banks, Reginald George Sinclair; Paterson, David James; and Williams, Alan, 4,104,201, Cl. 252-466.00B.

Williams, Anthony: *See—*

Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, 4,104,586, Cl. 324-83.00D.

Williams, George C., to Alden Research Foundation. Framing pulse generator for facsimile recorder. 4,104,644, Cl. 346-139.00A.

Williams, John R., to Temple University. Photosensitization of oxygen to the singlet excited state using ion exchange resin to which is attached a dye and photooxidative waste water treatment. 4,104,204, Cl. 521-32.000.

Williams, Kenneth S.: *See—*

Lista, Edwin L.; and Williams, Kenneth S., 4,103,584, Cl. 86-1.00R.

Williams, Meurig W., to Xerox Corporation. Cold pressure fix toners from polycaprolactone. 4,104,066, Cl. 96-1.0SD.

Williams, Rudolph. Cooling vent attachment for side window of aircraft. 4,103,597, Cl. 98-2.120.

Willmore, James A.: *See—*

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Wilputte Corporation: *See—*

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Wilson, Lester J. Toilet seat lift. 4,103,371, Cl. 4-251.000.

Wilson, Paul Alan: *See—*

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Wilson, Phillip Steven: *See—*

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Winden Tool & Stamping, Inc.: *See—*

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Winfree, John W., Jr. Billiards cue holder. 4,103,780, Cl. 211-68.000.

Wing, Barry Walter: *See—*

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Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, to AGFA-Gevaert, AG. Film advance mechanism for still cameras. 4,104,664, Cl. 354-213.000.

Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, to AGFA-Gevaert, AG. Motion picture camera with variable focal length lens. 4,103,993, Cl. 352-140.000.

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Fallis, Alexander Graham; Scott, John Marshall William; and Winter, June Gertrude, 4,104,286, Cl. 260-397.250.

Winzelberg, Abraham. Apparatus for use in forming a finish on a jewelry band. 4,103,882, Cl. 269-51.000.

Wise, Dan S.: *See—*

Rhyne, Ralph H.; and Wise, Dan S., 4,103,398, Cl. 19-145.500.

Wise Industries, Inc.: *See—*

Rhyne, Ralph H.; and Wise, Dan S., 4,103,398, Cl. 19-145.500.

Wiseman, Raymond L. Apparatus for rotating and discharging articles. 4,103,785, Cl. 214-6.500.

Witco Chemical Corporation: *See—*

Barker, Graham; and Barabash, Martin J., 4,104,403, Cl. 424-365.000.

Witcraft, Richard L., to Unipat Corporation of America II. Braking system for roll-cutting knife. 4,103,573, Cl. 82-93.000.

Witt, Wilbur W. Universal lead forming tool for dual-in-line integrated circuit packages. 4,103,719, Cl. 140-147.000.

Wittersheim, Adam, to Goldwell GmbH Chemische Fabrik H.E. Dotter. Originality seal for disposable receptacles. 4,103,900, Cl. 277-2.000.

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Wolfe, Henry S., to American Clearwater Corp. Marker buoy. 4,103,379, Cl. 9-8.00R.

Wolfe, James D., to Goodyear Tire & Rubber Company, The. Method of making a tire and said tire. 4,103,726, Cl. 152-330.00R.

Wolfert, Ludwig G., to Martin Marietta Corporation. Electronic alpha particle counter. 4,104,523, Cl. 250-370.000.

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Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., to Ethyl Corporation. Thioether bis phenolic antioxidants. 4,104,255, Cl. 260-45.95C.

Woo, Gar Lok; and House, Ralph, to Chevron Research Company. Ring polysulfonated alkylphenoxy alkylols as detergents. 4,104,023, Cl. 8-137.000.

Wood, Richard G. Child's telephone apparatus. 4,103,452, Cl. 46-33.000.

Woodstream Corporation: *See—*

Souza, Anthony J., 4,103,448, Cl. 43-67.000.

Woodworth, Robert N.; and Brynjestad, Ulf. Non-tracking solar energy concentrator. 4,103,673, Cl. 126-271.000.

Woody-Widolf, Inc.: *See—*

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Worley, Arthur C., to Exxon Research & Engineering Co. Nondestructive refractory erosion indicator. 4,103,539, Cl. 73-86.000.

Wortche, Rudolf: *See—*

Csutor, Endre; Mittler, Leo; and Wortche, Rudolf, 4,104,690, Cl. 361-45.000.

Wray, Gordon Richard: *See—*

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Wrubel, Richard R.: *See—*

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Wu, Kent Yengtsu; and Barron, Roger S., to Duraflame, Inc. Easy lighting fireplace log. 4,104,034, Cl. 44-10.00R.

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Wyman-Gordon Company: *See—*

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Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, to Anderson, Clayton & Co. Preparation of imitation cheese. 4,104,413, Cl. 426-582.000.

Wyse, Richard F.: *See—*

Fields, Marvin C.; and Wyse, Richard F., 4,104,129, Cl. 201-17.000.

Wyss, Georges, to Ateliers des Charmilles S.A. Device for electrical discharge machining with simultaneous relative advance and cycle translational movement of the electrodes. 4,104,500, Cl. 219-69.00V.

Wyss, Georges, to Ateliers des Charmilles S.A. Method of electrical discharge machine with simultaneous relative advance and cyclic translational movement of the electrodes. 4,104,501, Cl. 219-69.00M.

Xerox Corporation: *See—*

Bean, Lloyd F., 4,103,994, Cl. 355-3.00R.

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Fischbeck, Kenneth H., 4,104,645, Cl. 346-140.00R.

Fisk, Bernard C.; and Verschage, Gerald C., 4,104,726, Cl. 364-518.000.

Gruber, Robert J., 4,104,064, Cl. 96-1.0PE.

Kramer, Charles J., 4,103,991, Cl. 350-297.000.

Ruble, Frank D.; Chang, Louis H.; and Fravel, John C., 4,103,766, Cl. 197-62.000.

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Thornburg, David D.; and Lahr, Roy J., 4,104,515, Cl. 235-488.000.

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Yajima, Fumikazu: *See—*

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Yamada, Yu, to Canon Kabushiki Kaisha. Catadioptric wide-angle lens system for reproduction. 4,103,990, Cl. 350-199.000.

Yamaguchi, Kunihiko: *See—*

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Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Engine exhaust port liner system. 4,103,487, Cl. 60-282.000.

Yamazaki, Yasuo; Kawaguchi, Taizo; and Kimura, Kazuo, to Minolta Camera Kabushiki Kaisha. Multiple objective lens camera. 4,104,663, Cl. 354-197.000.

Yan, Tsoung Y.: *See—*
Espenscheid, Wilton F.; Heilweil, Israel J.; and Yan, Tsoung Y., 4,103,963, Cl. 299-4.000.

Yanagishima, Takayuki; and Matsumura, Akira, to Nissan Motor Company, Limited. Steering-wheel reversal driver alertness monitor. 4,104,621, Cl. 340-576.000.

Yang, Elmer Chensheng, to Pacific Scientific Company. Mechanical shock arrestor. 4,103,760, Cl. 188-1.00B.

Yanin, Viktor Gavrilovich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Yeoman, Frederick A.: *See—*
Chenoweth, Terrence E.; and Yeoman, Frederick A., 4,104,238, Cl. 260-37.0EP.

Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased (by Maaghoul, Nassrine S., administratrix); and Lund, Terry E., to Electric Power Research Institute, Inc. Apparatus and method for combusting carbonaceous fuels employing in tandem a fast bed boiler and a slow boiler. 4,103,646, Cl. 122-4.00D.

Yokohama Rubber Co., Ltd., The: *See—*
Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.

Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, to Nippon Steel Corporation. Gas pressure welding system. 4,103,815, Cl. 228-9.000.

Yokokura, Kunio: *See—*
Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.

Yokota, Hideo: *See—*
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Hosoe, Kazuya; and Yokota, Hideo, 4,104,652, Cl. 354-25.000.
Matsumoto, Seiichi; Matsuda, Mutsuhide; and Yokota, Hideo, 4,104,651, Cl. 354-25.000.
Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.

Yokoyama, Toshiro: *See—*
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Yonker, John H., to Otis Engineering Corporation. Well tool with a pawl. 4,103,740, Cl. 166-117.500.

Yoon, In Bae. Multiple occlusion ring applicator and method. 4,103,680, Cl. 128-6.000.

York, James A.: *See—*
Aydelott, Max M.; Hartman, Richard L.; and York, James A., 4,103,738, Cl. 165-178.000.

Yoshida Kogyo K.K.: *See—*
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Yoshida, Shunzo: *See—*
Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, 4,104,602, Cl. 335-61.000.

Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, to Mitsubishi Gas Chemical Company Inc. Oxygen absorbent. 4,104,192, Cl. 252-188.000.

Yoshioka, Satoshi: *See—*
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.

Yoshitomi, Toshihiko: *See—*
Minagawa, Yukinori; Kaneko, Tsugio; Yajima, Fumikazu; Yamaguchi, Kunihiko; and Yoshitomi, Toshihiko, 4,104,358, Cl. 423-21.000.

Yoshizumi, Motohiko: *See—*
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,104,549, Cl. 310-26.000.

Young, Chapman: *See—*
Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, 4,103,971, Cl. 299-17.000.

Young, David M., to Nichols Institute of Endocrinology, Inc. Non-isotopic substrate assay employing bacteriolysis products. 4,104,126, Cl. 195-103.50A.

Young, David W. Angularly adjustable force imparting tool. 4,103,409, Cl. 29-249.000.

Young, Donald R.: *See—*
DiMaria, Donelli J.; and Young, Donald R., 4,104,675, Cl. 357-54.000.

Young, Ernest V. Adjustable toilet paper holder. 4,103,838, Cl. 242-55.200.

Young, Patricia A.: *See—*
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Tucker, Samuel M., 4,103,390, Cl. 28-173.000.

Yung, Gordon H. K.: *See—*
Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., 4,104,187, Cl. 252-106.000.

Yunt, Daniel C. Latch shield. 4,103,950, Cl. 292-346.000.

Zaffaroni, Alejandro, to Dynapol. Nonabsorbable antioxidant method. 4,104,196, Cl. 252-404.000.

Zagara, Frank A.; and Nelson, John M., to Bernzomatic Corporation. Portable oxypropane torch. 4,103,829, Cl. 239-304.000.

Zahn, Wolfgang: *See—*
Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, 4,103,996, Cl. 355-32.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,104,372, Cl. 424-180.000.

Zambrano, Carl A.: *See—*
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.

Zandveld, Paul, to U.S. Philips Corporation. Method of manufacturing a semiconductor device by implanting ions through bevelled oxide layer in single masking step. 4,104,085, Cl. 148-1.500.

Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich. Centering clamping device. 4,103,915, Cl. 279-119.000.

Zeck, Walter Maria, to Mobay Chemical Corporation. Synergistic composition for the control of insects. 4,104,376, Cl. 424-216.000.

Zelinski, Robert P., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,104,332, Cl. 260-880.00B.

Zepf, Hans-Rudolf. Adjustable shovel tooth cap holder. 4,103,442, Cl. 37-142.00R.

Zhevnerov, Sergei Vasilievich. Digital device for measuring instantaneous parameter values of slowly varying processes. 4,104,590, Cl. 324-166.000.

Ziese, Joe W. Utility compartment for a travel trailer. 4,103,960, Cl. 296-37.100.

Zink, Frederick J.: *See—*
Rykwalder, Stanley J.; and Zink, Frederick J., 4,103,545, Cl. 73-141.00A.

Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing carboxylic acid chlorides of the benzene series. 4,104,300, Cl. 260-544.00D.

Zollinger, Max. Apparatus for sequentially treating one or more specimens of cellular material with a plurality of treating liquids. 4,103,722, Cl. 141-70.000.

Zornig, Harold F., to United States of America, Agriculture. Solar heated and cooled dwelling. 4,103,825, Cl. 237-1.00A.

Zuev, Anatoly Andreevich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Zulaski, John A., to S&C Electric Company. Device for detecting unbalanced conditions in a polyphase equipment bank. 4,104,687, Cl. 361-17.000.

Zuna, Jaroslav: *See—*
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Zwack, Robert R.: *See—*
Marchetti, Joseph R.; Zwack, Robert R.; and Jerabek, Robert D., 4,104,147, Cl. 204-181.00C.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1st DAY OF AUGUST, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

- Beyers, Marvin E., to Caterpillar Tractor Co. Replaceable tire tread belt and tire carcass with a buttressed sidewall. T973,006, 8-1-78, Cl. 152-176.000.
- Beyers, Marvin E., to Caterpillar Tractor Co. Replaceable tire tread belt. T973,007, 8-1-78, Cl. 152-176.000.
- Caterpillar Tractor Co.: *See—*
  - Beyers, Marvin E., T973,006, Cl. 152-176.000.
  - Beyers, Marvin E., T973,007, Cl. 152-176.000.
  - Cole, Carroll R.; and Ohms, Edward J., T973,001, Cl. 37-126.0AD.
  - Frantzreb, John G., Sr., T973,009, Cl. 164-50.000.
  - Kelly, Orson K.; and Perez, Henry J., T973,003, Cl. 70-200.000.
  - Klett, Gene R., T973,002, Cl. 37-142.00R.
  - Shyu, Tsu Pin; and Lofquist, Byron H., T973,005, Cl. 74-574.000.
- Chadwick, Julian Burrell; and Kendall, Victor George. Cathodically protected polyolefin coated pipelines. T973,015, 8-1-78, Cl. 428-36.000.
- Cole, Carroll R.; and Ohms, Edward J., to Caterpillar Tractor Co. Scraper apron assembly. T973,001, 8-1-78, Cl. 37-126.0AD.
- Ferrara, Frank I.; and Pearson, Samuel J., to Whirlpool Corporation. Combined microwave oven and refrigerator. T973,013, 8-1-78, Cl. 312-237.000.
- Frantzreb, John G., Sr., to Caterpillar Tractor Co. Apparatus and method for heating a controlled, moving wire containing treating agents. T973,009, 8-1-78, Cl. 164-50.000.
- Freilich, John Douglas: *See—*
  - Shull, Samuel Ellsworth; and Freilich, John Douglas, T973,016, Cl. 548-312.000.
- Glyco Chemicals, Inc.: *See—*
  - Shull, Samuel Ellsworth; and Freilich, John Douglas, T973,016, Cl. 548-312.000.
- Hyche, Kenneth W.; and Schick, Martin F. Compositions suitable for making floor tile. T973,012, 8-1-78, Cl. 260-23.00H.
- International Business Machines Corporation: *See—*
  - Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., T973,008, Cl. 134-3.000.
- Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., to International Business Machines Corporation. Method for removing layers of organic material. T973,008, 8-1-78, Cl. 134-3.000.
- Kelly, Orson K.; and Perez, Henry J., to Caterpillar Tractor Co. Lever locking assembly. T973,003, 8-1-78, Cl. 70-200.000.
- Kendall, Victor George: *See—*
  - Chadwick, Julian Burrell; and Kendall, Victor George, T973,015, Cl. 428-36.000.
- Klett, Gene R., to Caterpillar Tractor Co. Replaceable corner cutting edge. T973,002, 8-1-78, Cl. 37-142.00R.
- Lofquist, Byron H.: *See—*
  - Shyu, Tsu Pin; and Lofquist, Byron H., T973,005, Cl. 74-574.000.
- Mann, Horace C., Jr.: *See—*
  - Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., T973,004, Cl. 71-29.000.
- McCullough, John F.: *See—*
  - Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., T973,004, Cl. 71-29.000.
- McDonald, Kenneth Herbert. Electrical conductor systems. T973,010, 8-1-78, Cl. 191-23.00A.
- Ohms, Edward J.: *See—*
  - Cole, Carroll R.; and Ohms, Edward J., T973,001, Cl. 37-126.0AD.
- Pearson, Samuel J.: *See—*
  - Ferrara, Frank I.; and Pearson, Samuel J., T973,013, Cl. 312-237.000.
- Perez, Henry J.: *See—*
  - Kelly, Orson K.; and Perez, Henry J., T973,003, Cl. 70-200.000.
- Rambold, Adolf. Immersible bag for exhaustable substances. T973,014, 8-1-78, Cl. 426-83.000.
- Schick, Martin F.: *See—*
  - Hyche, Kenneth W.; and Schick, Martin F., T973,012, Cl. 260-23.00H.
- Shull, Samuel Ellsworth; and Freilich, John Douglas, to Glyco Chemicals, Inc. Cyanoethylation of hydantoins. T973,016, 8-1-78, Cl. 548-312.000.
- Shyu, Tsu Pin; and Lofquist, Byron H., to Caterpillar Tractor Co. Tuned viscous damper. T973,005, 8-1-78, Cl. 74-574.000.
- Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., to Tennessee Valley Authority. Production of urea-ammonium polyphosphates from urea phosphate. T973,004, 8-1-78, Cl. 71-29.000.
- Tennessee Valley Authority: *See—*
  - Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., T973,004, Cl. 71-29.000.
- Viswanathan, Nungavaram S.: *See—*
  - Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., T973,008, Cl. 134-3.000.
- Waghorn, Peter Ernest. Calenderable propylene polymer compositions. T973,011, 8-1-78, Cl. 260-23.00H.
- Whirlpool Corporation: *See—*
  - Ferrara, Frank I.; and Pearson, Samuel J., T973,013, Cl. 312-237.000.
- Zimmerman, Steven M.: *See—*
  - Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., T973,008, Cl. 134-3.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1st DAY OF AUGUST, 1978

Note—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Brockway, Richard J.: *See—*
  - Hayner, Paul F.; and Brockway, Richard J., Re. 29,714, Cl. 138-42.000.
- Caterpillar Tractor Co.: *See—*
  - Reinsma, Harold L.; and Proksch, Frederick D., Re. 29,718, Cl. 305-57.000.
- Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Method of drilling a borehole using gelled polymers. Re. 29,716, Cl. 175-65.000.
- Craddy, Richard Adrian, to Masson Scott Thrissell Engineering Limited. Rotary cutter drums. Re. 29,713, Cl. 83-674.000.
- Elkhart Brass Manufacturing Co., Inc.: *See—*
  - Thompson, William S., Re. 29,717, Cl. 239-107.000.
- Hayner, Paul F.; and Brockway, Richard J., to Sanders Associates, Inc. Fluid flow restrictor. Re. 29,714, Cl. 138-42.000.
- Hessert, James E.: *See—*
  - Clampitt, Richard L.; and Hessert, James E., Re. 29,716, Cl. 175-65.000.
- Hunter, Edward W.: *See—*
  - Richards, George B.; Swain, Leonard W.; and Hunter, Edward W., Re. 29,715, Cl. 141-226.000.

- Masson Scott Thrissell Engineering Limited: *See—*
  - Craddy, Richard Adrian, Re. 29,713, Cl. 83-674.000.
- Phillips Petroleum Company: *See—*
  - Clampitt, Richard L.; and Hessert, James E., Re. 29,716, Cl. 175-65.000.
- Proksch, Frederick D.: *See—*
  - Reinsma, Harold L.; and Proksch, Frederick D., Re. 29,718, Cl. 305-57.000.
- Reinsma, Harold L.; and Proksch, Frederick D., to Caterpillar Tractor Co. Resilient mid-pitch lug for an endless track. Re. 29,718, Cl. 305-57.000.
- Richards, George B.; Swain, Leonard W.; and Hunter, Edward W., to Richards, George B. Fluidic automatic nozzle. Re. 29,715, Cl. 141-226.000.
- Sanders Associates, Inc.: *See—*
  - Hayner, Paul F.; and Brockway, Richard J., Re. 29,714, Cl. 138-42.000.
- Shipman, Paul. Double cylinder lock bolt assembly. Re. 29,712, Cl. 70-120.000.
- Swain, Leonard W.: *See—*
  - Richards, George B.; Swain, Leonard W.; and Hunter, Edward W., Re. 29,715, Cl. 141-226.000.
- T.B.A. Industrial Products Limited: *See—*
  - Wicker, George Leonard, Re. 29,719, Cl. 260-37.00N.
- Thompson, William S., to Elkhart Brass Manufacturing Co., Inc. Automatic volume adjusting fire hose nozzle with flushing mechanism. Re. 29,717, Cl. 239-107.000.
- Wicker, George Leonard, to T.B.A. Industrial Products Limited. Thermoplastic moulding compositions reinforced with a mixture of glass and asbestos fibers. Re. 29,719, Cl. 260-37.00N.

LIST OF PLANT PATENTEES

- Chrysanthemum Breeder Association N.V.: *See—*
  - Middelburg, Nicolaas, 4,288, Cl. 74.000.
- Chrysanthemum Breeders Association N.V.: *See—*
  - Middelburg, Nicolaas, 4,287, Cl. 74.000.
- Duffett, William E.: *See—*
  - Jessel, Walter H., Jr.; and Duffett, William E., 4,286, Cl. 74.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,286, 8-1-78, Cl. 74.000.
- Middelburg, Nicolaas, to Chrysanthemum Breeders Association N.V. Chrysanthemum. 4,287, 8-1-78, Cl. 74.000.
- Middelburg, Nicolaas, to Chrysanthemum Breeder Association N.V. Chrysanthemum. 4,288, 8-1-78, Cl. 74.000.
- Yoder Brothers, Inc.: *See—*
  - Jessel, Walter H., Jr.; and Duffett, William E., 4,286, Cl. 74.000.

LIST OF DESIGN PATENTEES

- Adler, Peter: *See—*
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,711, Cl. D6-241.000.
- AMF Incorporated: *See—*
  - Uhlinger, Charles E.; and Dixon, Herbert Owen, Jr., 248,761, Cl. D15-17.000.
- Anchor Hocking Corporation: *See—*
  - Gobleck, Peter A., Jr., 248,715, Cl. D7-6.000.
- Arai, Takeyuki, to Kabushiki Kaisha Tamron. Barrel for interchangeable lens. 248,766, 8-1-78, Cl. D16-50.000.
- Astra -Sjuco AB: *See—*
  - Vallfors, Bertil Sven, 248,774, Cl. D24-54.000.
- Baldini, Giovanni, to Carrara & Matta S.p.A. Bathroom shelf. 248,702, 8-1-78, Cl. D6-132.000.
- Ball Corporation: *See—*
  - Campbell, William B., 248,742, Cl. D11-129.000.
  - Campbell, William B., 248,743, Cl. D11-140.000.
- Barr, Josef J. Diamond ring. 248,741, 8-1-78, Cl. D11-33.000.
- Bendix Corporation: *See—*
  - Hood, Edwin Elliott, 248,747, Cl. D12-205.000.
- Berg, Albert T., Jr.: *See—*
  - Langlie, Howard; and Berg, Albert T., Jr., 248,750, Cl. D13-17.000.
- Blann, Ellis L. Container bracket or the like. 248,730, 8-1-78, Cl. D8-363.000.
- Bokmiller, David J., to Falcon Enterprises, Inc. Portable combination loudspeaker and radio mount. 248,757, 8-1-78, Cl. D14-37.000.
- Brite Industries, Inc.: *See—*
  - Harris, Robert I., 248,740, Cl. D11-25.000.
- Brown, Clarence Samuel, to Usanco, Inc. Portable sanitation unit. 248,775, 8-1-78, Cl. D25-16.000.
- Broyles, Jerry C. Gimballed beverage cup holder. 248,719, 8-1-78, Cl. D7-70.000.
- Burgess, Fred R.; and Schick, George, to Consolidated Foods Corporation. Upright vacuum cleaner. 248,762, 8-1-78, Cl. D15-53.000.
- Campbell, William B., to Ball Corporation. Christmas ornament. 248,742, 8-1-78, Cl. D11-129.000.
- Campbell, William B., to Ball Corporation. Standing plaque. 248,743, 8-1-78, Cl. D11-140.000.
- Carrara & Matta S.p.A.: *See—*
  - Baldini, Giovanni, 248,702, Cl. D6-132.000.
- Castor, Frank L. Lantern holder or similar article. 248,790, 8-1-78, Cl. D48-4.00A.
- Cibie, Pierre, to Cibie Projecteurs. Automobile headlight lens. 248,792, 8-1-78, Cl. D48-32.00A.
- Cibie Projecteurs: *See—*
  - Cibie, Pierre, 248,792, Cl. D48-32.00A.
- Clowe, Robert A., to Xerox Corporation. Microfiche copier. 248,765, 8-1-78, Cl. D16-29.000.
- Combi Co., Ltd.: *See—*
  - Nakao, Shinroku, 248,786, Cl. D34-15.00V.
- Consolidated Foods Corporation: *See—*
  - Burgess, Fred R.; and Schick, George, 248,762, Cl. D15-53.000.
- Cooper, Marvin, to Dynamic Classics, Ltd. Travel bag. 248,794, 8-1-78, Cl. D87-5.00G.
- Culbertson, Richard, to General Electric Company. Combined cassette tape recorder and radio. 248,754, 8-1-78, Cl. D14-5.000.
- Dart Industries Inc.: *See—*
  - Haynes, Rodney R., Sr., 248,699, Cl. D6-63.000.
  - Haynes, Rodney R., Sr., 248,701, Cl. D6-63.000.
- Day, Edwin A. Dial for timepieces. 248,736, 8-1-78, Cl. D10-125.000.
- Day, Edwin A. Dial for timepieces. 248,737, 8-1-78, Cl. D10-125.000.
- Day, Edwin A. Dial for timepieces. 248,738, 8-1-78, Cl. D10-125.000.
- Day, Edwin A. Dial for timepieces. 248,739, 8-1-78, Cl. D10-125.000.
- Dedrick, Robert L. Combined beverage glasses and holder therefor. 248,713, 8-1-78, Cl. D7-3.000.
- Dedrick, Robert L. Combined beverage glasses and holder therefor. 248,714, 8-1-78, Cl. D7-3.000.
- Demetrovics, Eugene J., to GAF Corporation. Decorative tile. 248,779, 8-1-78, Cl. D25-86.000.
- Dixon, Herbert Owen, Jr.: *See—*
  - Uhlinger, Charles E.; and Dixon, Herbert Owen, Jr., 248,761, Cl. D15-17.000.
- Dura Plastics of New York, Inc.: *See—*
  - Korzon, Edward S., 248,710, Cl. D6-235.000.
- Dynamic Classics, Ltd.: *See—*
  - Cooper, Marvin, 248,794, Cl. D87-5.00G.
- Eckmann, John Allie; and Toth, Richard John, to Motorola, Inc. Radio pager or similar article. 248,759, 8-1-78, Cl. D14-68.000.
- Elliott, Clayton A. Cutter guide. 248,728, 8-1-78, Cl. D8-72.000.

- Fagan, Philip J.: *See—*
  - Groth, Harry E., Jr.; and Fagan, Philip J., 248,771, Cl. D24-33.000.
  - Groth, Harry E., Jr.; and Fagan, Philip J., 248,772, Cl. D24-33.000.
- Falcon Enterprises, Inc.: *See—*
  - Bokmiller, David J., 248,757, Cl. D14-37.000.
- Fort Recovery Industries, Inc.: *See—*
  - Jetter, George G., 248,769, Cl. D23-69.000.
- Frick, Berndt Ebbe. Combined sound reducing cover for teleprinter or the like and support member therefor. 248,760, 8-1-78, Cl. D14-93.000.
- GAF Corporation: *See—*
  - Demetrovics, Eugene J., 248,779, Cl. D25-86.000.
  - Sears, James W., Jr., 248,780, Cl. D25-86.000.
- Gayda, Nadine F. Storage cabinet. 248,704, 8-1-78, Cl. D6-150.000.
- General Electric Company: *See—*
  - Culbertson, Richard, 248,754, Cl. D14-5.000.
- Gitlitz, Marcia M. Eyeglass holder. 248,707, 8-1-78, Cl. D6-188.000.
- Gobleck, Peter A., Jr., to Anchor Hocking Corporation. Tumbler or similar article. 248,715, 8-1-78, Cl. D7-6.000.
- Gonzalez, Phillipp. Tricycle. 248,746, 8-1-78, Cl. D12-112.000.
- Graff, Sheldon H. Shelf unit or similar article. 248,708, 8-1-78, Cl. D6-190.000.
- Greenberg, Sylvan. Tooth brush. 248,696, 8-1-78, Cl. D4-25.000.
- Groth, Harry E., Jr.; and Fagan, Philip J. Tibial prosthesis. 248,771, 8-1-78, Cl. D24-33.000.
- Groth, Harry E., Jr.; and Fagan, Philip J. Talar prosthesis. 248,772, 8-1-78, Cl. D24-33.000.
- Guibert, Raul. Combined serving tray and covered dish. 248,712, 8-1-78, Cl. D7-3.000.
- Gunzner, Fred G. Diamond sharpening hone. 248,729, 8-1-78, Cl. D8-91.000.
- Haber, Terry M. Set of chess game pieces. 248,785, 8-1-78, Cl. D34-5.0CH.
- Hansen, Richard Ellwood: *See—*
  - Smith, David Rolfe; and Hansen, Richard Ellwood, 248,706, Cl. D6-161.000.
- Harris, Robert I., to Brite Industries, Inc. Watchband. 248,740, 8-1-78, Cl. D11-25.000.
- Haynes, James R., to Kayot, Inc. Loran receiver. 248,733, 8-1-78, Cl. D10-46.000.
- Haynes, Rodney R., Sr., to Dart Industries Inc. Sofa. 248,699, 8-1-78, Cl. D6-63.000.
- Haynes, Rodney R., Sr., to Dart Industries Inc. Sofa. 248,701, 8-1-78, Cl. D6-63.000.
- Hedlund, Per Olof; Hertsius, Lars Olov; and Lessmann, Hans Theo, to Telefonaktiebolaget L M Ericsson. Unrolling device for a cable. 248,764, 8-1-78, Cl. D15-122.000.
- Hertsius, Lars Olov: *See—*
  - Hedlund, Per Olof; Hertsius, Lars Olov; and Lessmann, Hans Theo, 248,764, Cl. D15-122.000.
- Hood, Edwin Elliott, to Bendix Corporation. Combined bicycle brake and wheel assembly. 248,747, 8-1-78, Cl. D12-205.000.
- Husserl, Robert, to Perkins Research and Manufacturing Co. Cable sheath continuity tester. 248,734, 8-1-78, Cl. D10-78.000.
- Impact Manufacturing Co., Inc.: *See—*
  - McClane, Robert A., 248,725, Cl. D8-14.000.
- Jager, Frank W. Modified delta wing supersonic aircraft. 248,745, 8-1-78, Cl. D12-71.000.
- Jetter, George G., to Fort Recovery Industries, Inc. Combined bathtub waste and overflow face plate. 248,769, 8-1-78, Cl. D23-69.000.
- Kabushiki Kaisha Tamron: *See—*
  - Arai, Takeyuki, 248,766, Cl. D16-50.000.
- Kaneko, Takuji: *See—*
  - Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, 248,720, Cl. D7-85.000.
  - Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, 248,721, Cl. D7-85.000.
- Kaufmann, Herbert O., to Swim 'N Play, Inc. Swimming pool coping. 248,778, 8-1-78, Cl. D25-74.000.
- Kayot, Inc.: *See—*
  - Haynes, James R., 248,733, Cl. D10-46.000.
- Kinnebrew, Joseph E., IV. Transit shelter. 248,776, 8-1-78, Cl. D25-18.000.
- Korzon, Edward S., to Dura Plastics of New York, Inc. Picture frame. 248,710, 8-1-78, Cl. D6-235.000.
- Krolopp, Rudolph William; and Larson, Orville Walter, to Motorola, Inc. Vehicular telephone apparatus or similar article. 248,758, 8-1-78, Cl. D14-53.000.
- Labohm, Alfonsus Bernardus Antonius, to U.S. Philips Corporation. Loudspeaker housing. 248,756, 8-1-78, Cl. D14-33.000.
- Langlie, Howard; and Berg, Albert T., Jr. Electric fence extender for T-posts. 248,750, 8-1-78, Cl. D13-17.000.
- Larson, Orville Walter: *See—*
  - Krolopp, Rudolph William; and Larson, Orville Walter, 248,758, Cl. D14-53.000.
- Lea, Melvin A., to Oneida Ltd. Spoon or similar article. 248,724, 8-1-78, Cl. D7-137.000.
- Lecal, Roger Louis. Rocking chair. 248,698, 8-1-78, Cl. D6-49.000.
- Lessmann, Hans Theo: *See—*
  - Hedlund, Per Olof; Hertsius, Lars Olov; and Lessmann, Hans Theo, 248,764, Cl. D15-122.000.
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- Little Giant Industries, Inc.: *See—*
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- Little, Thomas E. Beverage container. 248,716, 8-1-78, Cl. D7-61.000.
- Little, Thomas E. Beverage container. 248,717, 8-1-78, Cl. D7-61.000.
- Little, Thomas E. Beverage container. 248,718, 8-1-78, Cl. D7-61.000.
- Long, Steven Kenneth. Golf putterhead. 248,783, 8-1-78, Cl. D34-5.0GH.
- Lucid Lines, Inc.: *See—*
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,711, Cl. D6-241.000.
- Lundgren, Emil Vee. Horse shoes shaped support frame for rocking chair. 248,709, 8-1-78, Cl. D6-191.000.
- Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 248,723, 8-1-78, Cl. D7-137.000.
- McClane, Robert A., to Impact Manufacturing Co., Inc. Paint shield. 248,725, 8-1-78, Cl. D8-14.000.
- Mead, Gary. Peace pipe. 248,781, 8-1-78, Cl. D27-04.000.
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- Miller, James E. Stool or similar article. 248,697, 8-1-78, Cl. D6-32.000.
- Miller, James E. Concrete basketball standard. 248,784, 8-1-78, Cl. D34-5.0VV.
- Miyazaki, Masaru: *See—*
  - Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, 248,720, Cl. D7-85.000.
  - Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, 248,721, Cl. D7-85.000.
- Morgan, A. Perry, Jr. Combined and multiple candleholder unit. 248,703, 8-1-78, Cl. D6-146.000.
- Moser, Thomas F. Chair. 248,700, 8-1-78, Cl. D6-70.000.
- Motorola, Inc.: *See—*
  - Eckmann, John Allie; and Toth, Richard John, 248,759, Cl. D14-68.000.
  - Krolopp, Rudolph William; and Larson, Orville Walter, 248,758, Cl. D14-53.000.
- Muller, Albert F. Flat-plate nozzle for a vacuum cleaner. 248,763, 8-1-78, Cl. D15-63.000.
- Murray, Dennis A., to Pyramid Planter, Inc. Planter. 248,744, 8-1-78, Cl. D11-143.000.
- Nagatomo, Daizi, to Sony Corporation. Tape cassette case. 248,755, 8-1-78, Cl. D14-11.000.
- Nakamura, Toshinobu, to Shinagawa Shoko Co., Ltd. Capacitor-cover. 248,751, 8-1-78, Cl. D13-21.000.
- Nakamura, Toshinobu, to Shinagawa Shoko Co., Ltd. Capacitor-cover. 248,752, 8-1-78, Cl. D13-21.000.
- Nakao, Shinroku, to Combi Co., Ltd. Combined nestable bath toy. 248,786, 8-1-78, Cl. D34-15.00V.
- Newell, Carl W. Fishing reel clamp. 248,767, 8-1-78, Cl. D22-23.000.
- North American Philips Corporation: *See—*
  - Tsuji, Masao, 248,722, Cl. D7-88.000.
- Ogawa, Katsuyoshi Ken. Display container. 248,731, 8-1-78, Cl. D9-187.000.
- Okada, Hidekazu. Scissors. 248,726, 8-1-78, Cl. D8-57.000.
- Oneida Ltd.: *See—*
  - Lea, Melvin A., 248,724, Cl. D7-137.000.
  - Manderfield, Ellen B., 248,723, Cl. D7-137.000.
- Perkins Research and Manufacturing Co.: *See—*
  - Husserl, Robert, 248,734, Cl. D10-78.000.
- Pulse, Carl Frederick, to RCA Corporation. Record. 248,753, 8-1-78, Cl. D14-1.000.
- Pyramid Planter, Inc.: *See—*
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- Rehbein, Erwin G. Combined bathtub and shower stall. 248,768, 8-1-78, Cl. D23-49.000.
- Restaino, Anthony, to Revlon, Inc. Display stand. 248,795, 8-1-78, Cl. D96-12.00A.

- Revlon, Inc.: *See—*
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- Rockwell International Corporation: *See—*
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  - Siroonian, John, 248,749, Cl. D12-211.000.
- Ross, Tom H. Cash drawer having coin sections. 248,793, 8-1-78, Cl. D52-4.00R.
- Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, to U.S. Philips Corporation. Coffee maker. 248,720, 8-1-78, Cl. D7-85.000.
- Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, to U.S. Philips Corporation. Coffee maker. 248,721, 8-1-78, Cl. D7-85.000.
- Schaefer, E. Lowell. Orbital vibratory massager. 248,773, 8-1-78, Cl. D24-36.000.
- Schick, George: *See—*
  - Burgess, Fred R.; and Schick, George, 248,762, Cl. D15-53.000.
- Sears, James W., Jr., to GAF Corporation. Decorative tile. 248,780, 8-1-78, Cl. D25-86.000.
- Shinagawa Shoko Co., Ltd.: *See—*
  - Nakamura, Toshinobu, 248,751, Cl. D13-21.000.
  - Nakamura, Toshinobu, 248,752, Cl. D13-21.000.
- Siroonian, John, to Rockwell International Corporation. Wheel center. 248,748, 8-1-78, Cl. D12-207.000.
- Siroonian, John, to Rockwell International Corporation. Wheel. 248,749, 8-1-78, Cl. D12-211.000.
- Smith, David Rolfe; and Hansen, Richard Ellwood, to Tektronix, Inc. Desk or similar article. 248,706, 8-1-78, Cl. D6-161.000.
- Sony Corporation: *See—*
  - Nagatomo, Daizi, 248,755, Cl. D14-11.000.
- Spencer, Edward; and Wing, Harold R., to Little Giant Industries, Inc. Ladder platform. 248,777, 8-1-78, Cl. D25-68.000.
- Sperber, Robert. Sawmill attachment for a chain saw. 248,727, 8-1-78, Cl. D8-71.000.
- Swim 'N Play, Inc.: *See—*
  - Kaufmann, Herbert O., 248,778, Cl. D25-74.000.
- Tally, Joseph O., Jr. Combined lighthouse and wind direction indicator. 248,735, 8-1-78, Cl. D10-114.000.
- Tektronix, Inc.: *See—*
  - Smith, David Rolfe; and Hansen, Richard Ellwood, 248,706, Cl. D6-161.000.
- Telefonaktiebolaget L M Ericsson: *See—*
  - Hedlund, Per Olof; Hertsius, Lars Olov; and Lessmann, Hans Theo, 248,764, Cl. D15-122.000.
- Thomas, Fred L. File cabinet. 248,705, 8-1-78, Cl. D6-158.000.
- Tixier, Michel, to Regie Nationale Des Usines Renault. Lens for vehicle signal light. 248,791, 8-1-78, Cl. D48-32.00A.
- Toth, Richard John: *See—*
  - Eckmann, John Allie; and Toth, Richard John, 248,759, Cl. D14-68.000.
- Tougas, David; Adler, Peter; and Liszt, Mark, to Lucid Lines, Inc. Mirror frame. 248,711, 8-1-78, Cl. D6-241.000.
- Tsuji, Masao, to North American Philips Corporation. Hamburger cooker. 248,722, 8-1-78, Cl. D7-88.000.
- Uhlinger, Charles E.; and Dixon, Herbert Owen, Jr., to AMF Incorporated. Engine shroud for rotary lawn mower. 248,761, 8-1-78, Cl. D15-17.000.
- Ulrich Foundation, Inc.: *See—*
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,787, Cl. D48-2.000.
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,788, Cl. D48-2.000.
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,789, Cl. D48-2.000.
- Ulrich, Raymond M.; and Ulrich, Richard M., to Ulrich Foundation, Inc. Base for candle holder, lamp or similar particle. 248,787, 8-1-78, Cl. D48-2.000.
- Ulrich, Raymond M.; and Ulrich, Richard M., to Ulrich Foundation, Inc. Base for candle holder, lamp or similar article. 248,788, 8-1-78, Cl. D48-2.000.
- Ulrich, Raymond M.; and Ulrich, Richard M., to Ulrich Foundation, Inc. Base for candle holder, lamp or similar article. 248,789, 8-1-78, Cl. D48-2.000.
- Ulrich, Richard M.: *See—*
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  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,788, Cl. D48-2.000.
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,789, Cl. D48-2.000.
- U.S. Philips Corporation: *See—*
  - Labohm, Alfonsus Bernardus Antonius, 248,756, Cl. D14-33.000.
  - Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, 248,720, Cl. D7-85.000.
  - Sato, Teizo; Miyazaki, Masaru; and Kaneko, Takuji, 248,721, Cl. D7-85.000.
- Usanco, Inc.: *See—*
  - Brown, Clarence Samuel, 248,775, Cl. D25-16.000.
- Vallfors, Bertil Sven, to Astra -Sjuco AB. Surgical aspiration catheter. 248,774, 8-1-78, Cl. D24-54.000.
- Vollmar, Neithard. Collapsible tubelike container. 248,732, 8-1-78, Cl. D9-194.000.
- Wing, Harold R.: *See—*
  - Spencer, Edward; and Wing, Harold R., 248,777, Cl. D25-68.000.
- Xerox Corporation: *See—*
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CLASSIFICATION OF PATENTS

ISSUED AUGUST 1, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 110

281	4,103,627

CLASS 111

52	4,103,628

CLASS 112

79 R	4,103,629
	4,103,630
80	4,103,631
158 E	4,103,632
217.1	4,103,633
266	4,103,635
	4,103,636
439	4,103,634

CLASS 113

116 M	4,103,637

CLASS 114

144 E	4,103,638

CLASS 116

114 AH	4,103,640
117 C	4,103,641
174	4,103,642

CLASS 118

50	4,103,643
62	4,103,644

CLASS 119

95	4,103,645

CLASS 122

4 D	4,103,646
483	4,103,647

CLASS 123

30 R	4,103,648
32 EE	4,103,649
41.86	4,103,650
50 B	4,103,651
103 R	4,103,652
117 R	4,103,653
119 B	4,103,655
119 EC	4,103,654
122 D	4,103,656
127	4,103,657
133	4,103,658
148 DC	4,103,659
179 H	4,103,661
179 K	4,103,660
188 GC	4,103,662
188 S	4,103,663
191 L	4,103,664
196 R	4,103,665
219	4,103,666

CLASS 124

24 R	4,103,667

CLASS 125

11 CD	4,103,668

CLASS 126

121	4,103,669
	4,103,670
200	4,103,671
270	4,103,672
271	4,103,673
	4,103,674
	4,103,675
299 E	4,103,676

CLASS 127

46 R	4,104,078

CLASS 128

2 V	4,103,677
2.05 F	4,103,679
2.05 V	4,103,678
6	4,103,680
71	4,103,681
87 A	4,103,682
92 BA	4,103,683
173 H	4,103,684
214 R	4,103,685
	4,103,686
	4,103,687
303.17	4,103,688
350 V	4,103,689
418	4,103,690

CLASS 130	
24	4,103,691
CLASS 131	
32	4,103,692
CLASS 132	
46 R	4,103,693
73.6	4,103,694
CLASS 134	
2	4,104,079
23	4,104,080
	4,104,081
73	4,103,698
141	4,104,082
CLASS 136	
89 CC	4,104,084
89 H	4,104,083
CLASS 137	
1	4,103,695
14	4,103,696
45	4,103,697
106	4,103,699
172	4,103,700
375	4,103,701
	4,103,702
501	4,103,703
522	4,103,704
544	4,103,705
574	4,103,706
604	4,103,707
614.11	4,103,708
615	4,103,709
624.13	4,103,710
625.66	4,103,711
637.05	4,103,712
CLASS 138	
42	Re.29,714
133	4,103,713
145	4,103,800
CLASS 139	
1 C	4,103,714
33	4,103,715
54	4,103,716
383 A	4,103,717
CLASS 140	
105	4,103,718
147	4,103,719
CLASS 141	
1	4,103,720
6	4,103,721
70	4,103,722
226	Re.29,715
CLASS 144	
34 E	4,103,723
193 A	4,103,724
CLASS 148	
1.5	4,104,085
	4,104,086
	4,104,087
12 R	4,104,088
32.5	4,104,089
175	4,104,090
188	4,104,091
CLASS 149	
2	4,104,092
40	4,104,093
CLASS 151	
35	4,103,725
CLASS 152	
330 R	4,103,726
CLASS 156	
83	4,104,095
89	4,104,096
143	4,104,097
149	4,104,098
155	4,104,099
285	4,104,101
298	4,104,102
309	4,104,103
345	4,104,104
364	4,104,105
384	4,104,106
473	4,104,107
500	4,104,094
510	4,104,108
521	4,104,109
523	4,104,110
656	4,104,111
CLASS 159	
4 R	4,104,112
CLASS 160	
168 R	4,103,727
368 R	4,103,728
CLASS 162	
19	4,104,113
29	4,104,114
100	4,104,115
343	4,104,116
CLASS 164	
12	4,103,729
49	4,103,730
147	4,103,731
	4,103,732
160	4,103,733
309	4,103,734
CLASS 165	
39	4,103,735
48 R	4,103,736
80	4,103,737
178	4,103,738
CLASS 166	
105	4,103,739
117.5	4,103,740
147	4,103,741
282	4,103,742
299	4,103,743
324	4,103,744
CLASS 173	
57	4,103,745
107	4,103,746
119	4,103,747
CLASS 174	
22 R	4,104,479
23 C	4,104,480
28	4,104,481
87	4,104,482
138 R	4,104,483
151	4,104,484
CLASS 175	
61	4,103,748
65	Re.29,716
70	4,103,749
CLASS 176	
20 R	4,104,117
38	4,104,118
	4,104,119
50	4,104,120
86 L	4,104,122
86 R	4,104,121
CLASS 177	
1	4,103,750
122	4,103,751
141	4,103,752
CLASS 179	
1 HF	4,104,485
2 AM	4,104,486
6 E	4,104,487
18 FA	4,104,488
100.3 G	4,104,489
CLASS 180	
49	4,103,753
82 C	4,103,754
117	4,103,755
CLASS 181	
121	4,103,756
CLASS 182	
2	4,103,757
3	4,103,758
CLASS 184	
64	4,103,759
CLASS 188	
1 B	4,103,760
73.5	4,103,761
352	4,103,762
CLASS 192	
2	4,103,763
4 A	4,103,764
58 B	4,103,765
CLASS 195	
31 P	4,104,123
33	4,104,124
66 R	4,104,125
103.5 A	4,104,126
127	4,104,127
CLASS 197	
62	4,103,766
CLASS 198	
366	4,103,767
778	4,103,768
781	4,103,769
CLASS 200	
44	4,104,490
50 A	4,104,491
51.14	4,104,492
61.45 R	4,104,493
67 G	4,104,494
83 P	4,104,495
144 B	4,104,496
305	4,104,497
CLASS 201	
4	4,104,128
17	4,104,129
CLASS 202	
230	4,104,130
CLASS 203	
7	4,104,131
CLASS 204	
12	4,104,132
25	4,104,133
37 R	4,104,134
37 T	4,104,135
38 B	4,104,136
43 T	4,104,137
44	4,104,138
55 R	4,104,139
78	4,104,140
	4,104,141
152	4,104,142
159.15	4,104,143
159.23	4,104,144
162 R	4,104,145
165	4,104,146
181 C	4,104,147
181 R	4,104,100
242	4,104,148
CLASS 206	
45.2	4,103,774
193	4,103,770
219	4,103,771
222	4,103,772
315 B	4,103,773
455	4,103,775
CLASS 208	
64	4,104,149
91	4,104,150
111	4,104,151
112	4,104,152
138	4,104,153
	4,104,154
235	4,104,155
CLASS 209	
43	4,103,777
73	4,103,776
74 R	4,104,156
166	4,104,157
CLASS 210	
25	4,104,158
28	4,104,159
36	4,104,160
54	4,104,161
63 R	4,104,162
80	4,104,163
136	4,104,164
191	4,104,165
195 R	4,104,166
195 S	4,104,167
297	4,104,168
331	4,104,169
487	4,104,170
CLASS 211	
47	4,103,778
65	4,103,779
68	4,103,780
86	4,103,781
126	4,103,782
CLASS 212	
48	4,103,783
94	4,103,784
CLASS 214	
1 HA	4,103,831
6.5	4,103,785
7	4,103,786
16.1 A	4,103,787
17 DA	4,103,788
41 R	4,103,789
80	4,103,790
86 A	4,103,799
138 R	4,103,791
152	4,103,792
506	4,103,793
518	4,103,794
621	4,103,795
766	4,103,796
CLASS 215	
209	4,103,797
305	4,103,798
CLASS 219	
10.43	4,104,498
60 A	4,104,499
69 E	4,104,503
69 M	4,104,501
69 V	4,104,500
69 W	4,104,502
73.1	4,104,504
76.16	4,104,505
85 CM	4,104,506
513	4,104,507
521	4,104,508
544	4,104,509
CLASS 220	
203	4,103,801
258	4,103,802
270	4,103,803
281	4,103,804
331	4,103,805
CLASS 222	
3	4,103,806
CLASS 224	
1 R	4,103,807
4 D	4,103,808
5 R	4,103,809
29 R	4,103,810
45 AA	4,103,811
45 P	4,103,812
CLASS 228	
2.5	4,103,813
6 A	4,103,814
9	4,103,815
49	4,103,816
173 C	4,103,817
CLASS 229	
15	4,103,818
33	4,103,819
37 R	4,103,820
74	4,103,821
CLASS 233	
20 A	4,103,822
CLASS 235	
64.7	4,104,510
132 R	4,104,511
312	4,103,823
450	4,104,513
466	4,104,514
488	4,104,515
CLASS 236	
34.5	4,103,824
CLASS 237	
1 A	4,103,825
55	4,103,826
CLASS 239	
8	4,103,827
107	Re.29,717
206	4,103,828
304	4,103,829
587	4,103,830
CLASS 241	
38	4,103,832
CLASS 242	
18 A	4,103,833
	4,103,835
18 PW	4,103,834
35.6 E	4,103,836
46.21	4,103,837
55.2	4,103,838
56.2	4,103,839
67.3 R	4,103,840
86.2	4,103,841
107	4,103,843
	4,103,844
107.4 A	4,103,842
107.7	4,103,845
205	4,103,846
CLASS 244	
3.18	4,103,847
17.13	4,103,848
63	4,103,849
153 R	4,103,850
CLASS 246	
63 C	4,103,851
CLASS 248	
178	4,103,852
219.1	4,103,853
235	4,103,854
246	4,103,855
	4,103,856
346	4,103,857
399	4,103,858
425	4,103,859
467	4,103,860
CLASS 249	
20	4,103,861
53 R	4,103,862
CLASS 250	
204	4,104,517
213 VT	4,104,516
221	4,104,518
274	4,104,519
315 R	4,104,520
324	4,104,521
359	4,104,522
370	4,104,523
402	4,104,524
	4,104,525
403	4,104,526
445 T	4,104,527
451	4,104,528
470	4,104,529
490	4,104,530
	4,104,531
	4,104,532
551	4,104,533
CLASS 251	
48	4,103,863
63.6	4,103,864
148	4,103,865
151	4,103,866
180	4,103,867
283	4,103,868
CLASS 252	
8.1	4,104,172
8.3	4,104,171
8.55 D	4,104,174
8.55 R	4,104,173
8.57	4,104,175
12.2	4,104,176
30	4,104,178
32.7 E	4,104,179
33	4,104,180
46.7	4,104,181
51.5 A	4,104,177
	4,104,182
62.1 L	4,104,183
63.7	4,104,184
70	4,104,185
89 R	4,104,186
106	4,104,187
182.1	4,104,188
186	4,104,189
187 R	4,104,190
188	4,104,191
	4,104,192
316	4,104,193
350	4,104,195
390	4,104,194
404	4,104,196
425.3	4,104,197
429 B	4,104,198
430	4,104,199
465	4,104,200
466 B	4,104,201
522	4,104,202
	4,104,203
CLASS 254	
86 R	4,103,869
88	4,103,870
164	4,103,871
168	4,103,872
	4,103,873
CLASS 256	
24	4,103,874
59	4,103,875
CLASS 260	
2.3	4,104,205
	4,104,206
4 R	4,104,210
8	4,104,211
17.3	4,104,212
	4,104,213
17.4 CL	4,104,214
22 CB	4,104,215
23 AR	4,104,216
23 XA	4,104,217
23.7 H	4,104,218
27 BB	4,104,272
29.2 E	4,104,222
29.2 EP	4,104,223
29.2 N	4,104,221
29.4 R	4,104,224
29.6 F	4,104,225
29.6 HN	4,104,227
29.6 NR	4,104,228
	4,104,230
29.6 R	4,104,220
29.6 RB	4,104,219
29.6 RW	4,104,229
29.6 WB	4,104,226
30.8 R	4,104,231
31.6	4,104,232
31.8 HA	4,104,233
33.2 R	4,104,235
	4,104,236
33.6 UA	4,104,234
37 EP	4,104,238
37 N	Re.29,719
37 SB	4,104,237
	4,104,239
39 P	4,104,240
40 R	4,104,241
	4,104,242
42.14	4,104,243
42.41	4,104,289
45.7 R	4,104,244
	4,104,247
45.7 S	4,104,245
	4,104,246
45.8 N	4,104,248
	4,104,249
	4,104,251
45.8 NT	4,104,250
45.8 NZ	4,104,254
45.8 R	4,104,252
45.8 RW	4,104,253
45.95 C	4,104,255
45.95 D	4,104,256
112 B	4,104,266
112.5 S	4,104,267
158	4,104,268
162	4,104,269
205	4,104,270
239.57	4,104,271
294.9	4,104,273
295 AM	4,104,274
297 B	4,104,275
314.5	4,104,276
	4,104,277
326 N	4,104,279
326.13 A	4,104,278
327 B	4,104,280
343.3 R	4,104,281
345.3	4,104,282
348.43	4,104,283
378	4,104,284
397.1	4,104,285
397.25	4,104,286
404	4,104,287
412.8	4,104,288
428.5	4,104,290
429.7	4,104,292
429.9	4,104,291
438.5 R	4,104,293
448 C	4,104,294
448.2 N	4,104,295
448.8 R	4,104,296
543 P	4,104,299
	4,104,304
543 R	4,104,298
544 D	4,104,300
554	4,104,301
561 S	4,104,302
563 P	4,104,305
570.9	4,104,303
571	4,104,306
583 G	4,104,307
586 R	4,104,308
606.5 P	4,104,309
610 B	4,104,310
	4,104,311
	4,104,312
612 R	4,104,313
614 F	4,104,314
650 R	4,104,315
655	4,104,316
666 A	4,104,317
669 A	4,104,318
671 C	4,104,319
673.5	4,104,320
677 A	4,104,321
827	4,104,322
829	4,104,323
857 TW	4,104,324
873	4,104,261
876 B	4,104,326
	4,104,327
876 R	4,104,325
	4,104,328
878 R	4,104,329
880 B	4,104,330
	4,104,331
	4,104,332
885	4,104,333
888	4,104,334
897 A	4,104,335
	4,104,336
CLASS 261	
39 A	4,104,337
114 TC	4,104,338
CLASS 264	
1	4,104,339
6	4,104,340
9	4,104,341
12	4,104,342
40.1	4,104,343

42	4,104,344
43	4,104,345
51	4,104,346
60	4,104,395
89	4,104,394
113	4,104,347
121	4,104,348
153	4,104,349
225	4,104,350
236	4,104,351
250	4,104,352
255	4,104,353
	4,104,357
262	4,104,354
290 R	4,104,355
297	4,104,356
CLASS 266	
51	4,103,877
78	4,103,878
158	4,103,879
253	4,103,880
CLASS 267	
177	4,103,881
CLASS 269	
51	4,103,882
71	4,103,883
CLASS 271	
18.3	4,103,884
117	4,103,885
CLASS 272	
3	4,103,886
77	4,103,889
123	4,103,887
CLASS 273	
1 E	4,103,890
33	4,103,888
97 R	4,103,891
101.1	4,103,892
106.5 D	4,103,893
126 A	4,103,894
153 R	4,103,895
183 D	4,103,896
188 A	4,103,897
248	4,103,898
CLASS 277	
1	4,103,899
2	4,103,900
9.5	4,103,901
12	4,103,902
27	4,103,903
42	4,103,904
56	4,103,905
88	4,103,906
96.1	4,103,907
96.2	4,103,908
101	4,103,909
165	4,103,910
210	4,103,911
226	4,103,912
235 B	4,103,913
CLASS 279	
4	4,103,914
119	4,103,915
CLASS 280	
11.28	4,103,917
79.1 A	4,103,919
112 A	4,103,920
154.5 R	4,103,918
267	4,103,921
279	4,103,922
289 L	4,103,923
289 R	4,103,924
414 A	4,103,925
414 R	4,103,926
482	4,103,927
490 R	4,103,928
605	4,103,916
611	4,103,929
614	4,103,930
656	4,103,931
718	4,103,932
744	4,103,933
	4,103,934
CLASS 283	
66 R	4,103,935
CLASS 285	
26	4,103,936
110	4,103,937
136	4,103,938
137 A	4,103,939
189	4,103,940
238	4,103,941
276	4,103,942
419	4,103,943
CLASS 289	
18	4,103,944
CLASS 290	
37 A	4,104,534
52	4,104,535
54	4,104,536
CLASS 292	
100	4,103,945
114	4,103,946
194	4,103,947
256	4,103,948
342	4,103,949
346	4,103,950
CLASS 293	
71 P	4,103,951
CLASS 294	
1 R	4,103,952
19 R	4,103,953
54	4,103,954
92	4,103,955
CLASS 296	
1 S	4,103,957
10	4,103,956
23 C	4,103,958
23 MC	4,103,959
37.1	4,103,960
63	4,103,961
137 E	4,103,962
CLASS 297	
192	4,103,965
195	4,103,966
216	4,103,967
219	4,103,968
311	4,103,969
363	4,103,970
367	4,103,964
CLASS 299	
4	4,103,963
17	4,103,971
18	4,103,972
39	4,103,973
43	4,103,974
	4,103,975
CLASS 303	
38	4,103,976
	4,103,977
CLASS 305	
57	Re.29,718
CLASS 307	
58	4,104,537
64	4,104,538
	4,104,539
114	4,104,540
141	4,104,541
	4,104,542
221 D	4,104,543
297	4,104,544
351	4,104,545
362	4,104,546
	4,104,547
CLASS 308	
9	4,103,978
160	4,103,979
CLASS 310	
14	4,104,548
26	4,104,549
71	4,104,550
88	4,104,551
156	4,104,552
352	4,104,553
CLASS 312	
185	4,103,980
257 A	4,103,981
CLASS 313	
447	4,104,554
512	4,104,555
CLASS 315	
39	4,104,556
	4,104,557
	4,104,558
39.51	4,104,559
83	4,104,560
101	4,104,561
158	4,104,562
169 TV	4,104,563
171	4,104,564
178	4,104,565
371	4,104,566
387	4,104,567
394	4,104,568
408	4,104,569
CLASS 318	
318	4,104,570
380	4,104,571
631	4,104,572
640	4,104,573
696	4,104,574
CLASS 323	
4	4,104,575
102	4,104,576
CLASS 324	
0.5 F	4,104,577
28 CR	4,104,578
29	4,104,579
29.5	4,104,580
52	4,104,581
	4,104,582
58 A	4,104,583
58.5 C	4,104,585
58.5 R	4,104,584
83 D	4,104,586
95	4,104,587
110	4,104,588
158 F	4,104,589
166	4,104,590
205	4,104,591
CLASS 325	
37	4,104,592
392	4,104,593
475	4,104,594
CLASS 328	
1	4,104,595
CLASS 330	
9	4,104,596
43	4,104,597
CLASS 331	
94.5 M	4,104,598
116 R	4,104,599
CLASS 333	
79	4,104,600
CLASS 335	
6	4,104,601
61	4,104,602
306	4,104,603
CLASS 337	
248	4,104,604
CLASS 338	
2	4,104,605
198	4,104,606
309	4,104,607
CLASS 339	
91 R	4,103,982
	4,103,983
98	4,103,984
126 R	4,103,985
272 UC	4,103,986
CLASS 340	
3 C	4,104,609
3 PS	4,104,608
15	4,104,610
15.5 F	4,104,611
27 AT	4,104,612
52 D	4,104,613
81 R	4,104,614
84	4,104,615
146.3 Y	4,104,616
147 R	4,104,617
324 AD	4,104,624
324 M	4,104,626
324 R	4,104,625
336	4,104,627
384 E	4,104,628
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629	4,104,619
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CLASS 343	
6 R	4,104,629
6.5 R	4,104,630
7 A	4,104,631
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7 VM	4,104,632
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106 R	4,104,637
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CLASS 346	
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139 A	4,104,644
140 R	4,104,645
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158	4,104,647
163	4,104,648
CLASS 350	
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162 R	4,103,988
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CLASS 351	
160	4,103,992
CLASS 352	
140	4,103,993
CLASS 354	
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234	4,104,666
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289	4,104,649
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299	4,104,668
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324	4,104,670
337	4,104,671
CLASS 355	
3 R	4,103,994
14	4,103,995
32	4,103,996
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104	4,103,997
152	4,103,998
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79	4,104,676
81	4,104,677
CLASS 358	
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132	4,104,680
141	4,104,681
CLASS 360	
2	4,104,682
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70	4,104,684
84	4,104,685
132	4,104,686
CLASS 361	
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28	4,104,688
44	4,104,689
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96	4,104,691
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120	4,104,693
172	4,104,694
220	4,104,695
229	4,104,696
305	4,104,697
321	4,104,698
349	4,104,699
384	4,104,700
386	4,104,701
421	4,104,702
426	4,104,703
433	4,104,704
CLASS 362	
5	4,104,705
10	4,104,706
17	4,104,707
34	4,104,708
105	4,104,709
130	4,104,710
153	4,104,711
218	4,104,712
294	4,104,713
CLASS 363	
21	4,104,714
37	4,104,715
102	4,104,716
CLASS 364	
200	4,104,717
	4,104,718
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	4,104,720
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439	4,104,512
455	4,104,722
475	4,104,723
477	4,104,724
487	4,104,725
518	4,104,726
710	4,104,727
712	4,104,728
757	4,104,729
815	4,104,730
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CLASS 365	
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228	4,104,734
230	4,104,735
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2	4,104,736
65	4,104,737
178	4,103,876
343	4,104,738
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134	4,103,999
CLASS 403	
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CLASS 404	
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119	4,104,002
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141	4,104,003
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313	4,104,004
334	4,104,006
360	4,104,007
394	4,104,005
397	4,104,008
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48	4,104,009
76	4,104,010
121	4,104,011
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139	4,104,359
213.2	4,104,360
239	4,104,361
315	4,104,362
338	4,104,363
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269	4,104,399
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330	4,104,402
365	4,104,403
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299	4,104,012
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345	4,104,014
382.2	4,104,015
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572	4,104,412
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599	4,104,414
656	4,104,415
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37	4,104,417
42	4,104,418
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96	4,104,421
123	4,104,422
402	4,104,423
435	4,104,424
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36	4,104,426
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428	4,104,442
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32	4,104,204
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84	4,104,207
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62	4,104,454
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174	4,104,465
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203	4,104,457
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46	4,104,265
102	4,104,257
169	4,104,259
279	4,104,263
289	4,104,297
295	4,104,262
323	4,104,260
334	4,104,258
370	4,104,264
499	4,104,459
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442	4,104,467
447	4,104,468
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53	4,104,474
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122	4,104,477
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885	4,104,478

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	161	248,706
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	190	248,708
	191	248,709
	235	248,710
	241	248,711
D7—	3	248,712
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	61	248,716
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	70	248,719
	85	248,720
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	88	248,722
	137	248,723
		248,724
D8—	14	248,725
	57	248,726
	71	248,727
	72	248,728
	91	248,729
	363	248,730
D9—	187	248,731
	194	248,732
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	78	248,734
	114	248,735
	125	248,736
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	129	248,742
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	143	248,744
D12—	71	248,745
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	205	248,747
	207	248,748
	211	248,749
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D14—	1	248,753
	5	248,754
	11	248,755
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	37	248,757
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	68	248,759
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	53	248,762
	63	248,763
	122	248,764
D16—	29	248,765
	50	248,766
D22—	23	248,767
D23—	49	248,768
	69	248,769
	127	248,770
D24—	33	248,771
		248,772
	36	248,773
	54	248,774
D25—	16	248,775
	18	248,776
	68	248,777
	74	248,778
	86	248,779
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4,104,725

DESIGN PATENTS

6 : 248,734
248,744
248,745
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50 : 248,782
51 : 248,699
248,701
55 : 248,768

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54 : 4,286

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01 : T973,004
17 : T973,001

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T973,003

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T973,009

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36 : T973,008

42 : T973,016
47 : T973,012

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the Official Gazette of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Filing of PCT or EPC Format Applications in Canada

The following notice, which appeared in the July 4, 1978 issue of the Canadian Patent Office Gazette has been forwarded to the Patent and Trademark Office and is being republished for the information of United States applicants and representatives who may wish to file in Canada. The Canadian notice reads as follows:

> *"Filing of PCT or EPC Applications in Canada*
>
> The Canadian Patent Office will accept all disclosures, claims and drawings prepared in the formats required under the Patent Cooperation Treaty (PCT) or the European Patent Convention (EPC) in respect of Canadian applications for patents.
>
> In particular, the margins called for under the PCT or EPC, while not in conformity with the Canadian Rules, will be accepted for filing and considered sufficient to complete applications. Pages of specifications and drawings may be of a size A4 or 8 x 13 inches so long as the full set of papers in a single application are consistent. The spacing between typed lines may be either double or one and one-half spaces.

J. A. Brown,
Director, Patents Branch"

July 17, 1978. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,010,245, F. R. Conibear, TRAPS, **filed** Apr. 12, 1977, D.C.N.J. (Newark), Doc. 77–0692, *Woodstream Corporation v. Wilderness Corp.*

3,134,718, A. Nobile, PREGNA–1,4-DIENES AND COMPOSITIONS CONTAINING SAME, **filed** Mar. 15, 1978, D.C. Md. (Baltimore), Doc. Y–78–434, *Schering Corporation v. D-M Pharmaceuticals, Inc.*

3,290,841, M. A. Santore, APPARATUS FOR NETTING MEAT AND MEAT PRODUCTS; **3,477,860** same, METHOD FOR NETTING MEAT, **filed** Mar. 10, 1978, D.C.N.J. (Newark), Doc. 78–475, *Jetnet Corporation v. Bendler Knitting Corp.*

3,304,565, H. Fuhring, CLEANING INSTALLATIONS FOR VEHICLES, **filed** Jan. 7, 1975, D.C., N.D., Ill. (Chicago), Doc. 75c64, *The Allen Group, Inc. v. Nu-Star, Inc.* Filed Finding of Fact and Conclusions of Law. Enter judgment order. Order judgment on the complaint is entered for the defendant Nu-Star, Inc. Judgment on the counterclaim is entered for the defendant, Nu-Star, Inc., on June 14, 1977.

3,375,800, Cole and Buller, SEISMIC CABLE DEPTH CONTROL APPARATUS, **filed** July 25, 1975, D.C., S.D. Tex. (Houston), Doc. CA75–H–1288, *Continental Oil Company v. Jimmy R. Cole, doing business as Jim R. Cole & Associates and Cole Development Company, Inc.* Judgment for the defendant, July 25, 1975.

3,377,888, J. B. Sponsler, EXTENSION DEVICE FOR HAND DRILL, **filed** Mar. 22, 1978, D.C. Minn. (Minneapolis), Doc. 4–78–C 16, *John B. Sponsler v. Milwaukee Electric Tool Corporation.*

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, **filed** Jan. 14, 1977, D.C., E.D. Ill. (Chicago), Doc. 77c145, *Advance Transformer Co. v. Magic Chef, Inc.* Agreed order of dismissal, Feb. 10, 1977.

3,434,209, B. Weissman, METHOD FOR BUILDING SUPERSTRUCTURES ON DENTITION, **filed** Mar. 20, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78–904, *Ipco Hospital Supply Corporation v. Les Fils d'Auguste Maillefer S.A., Star Dental Mfg. Co.*

3,442,623, P. E. Aegidius, METHOD OF DETERMINING THE FAT CONTENT OF MILK AND RELATED PRODUCTS, **filed** Feb. 16, 1978, D.C., S.D.N.Y., Doc. 78–C–712 RLC, *A/S Foss Electric v. American Metering Systems, Inc.*

3,471,011, Iannicelli, Millman and Stone, PROCESS FOR IMPROVING THE BRIGHTNESS OF CLAYS, **filed** Jan. 27, 1977, D.C.N.J. (Newark), Doc. C–77–173, *Engelhard Minerals and Chemicals Corp. v. J. M. Huber Corp.*

3,477,860. (See 3,290,841.)

3,625,793, Sheridan and Jackson, BALLOON-TYPE CATHERERS AND METHOD OF MANUFACTURE, **filed** May 16, 1977, D.C. Del. (Wilmington), Doc. 77–178, *Mallinckrodt, Inc. v. Brunswick Corp. and Sherwood Medical Industries, Inc.*

3,792,133, R. R. Goughnour, METHOD FOR SLIP-FORMINGWALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **3,957,405**, same, SLIP FORM HAVING HINGED GATE MEANS; **4,014,633**, same, ADJUSTABLE SLIP FORM, **filed** Jan. 16, 1978, D.C., N.D. Ga. (Atlanta), Doc. C78–76A, *Gomaco Corporation v. A. C. Aukerman Co.*

3,957,405. (See 3,792,133.)

4,014,633. (See 3,792,133.)

D. 240,084, M. C. Melchior, BATHING POOL; **D. 245,541**, same; **D. 245,542**, same, **filed** Jan. 27, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–398–RF, *Hydro-Spa, Inc. v. Walter Swuyres.*

D. 245,541. (See D. 240,084.)

D. 245,542. (See D. 240,084.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,169,295, Re. S.N. 913,374, Filed Jun. 7, 1978, Cl. 432/259, PRECISION TILE SETTER, Stanley F. Paspy, Owner of Record: *Ferro Corporation, Cleveland, Ohio,* Attorney or Agent: Milton L. Simmons, Ex. Gp.: 344

3,806,192, Re. S.N. 912,233, Filed Jun. 2, 1978, Cl. 297/318, CHAIR FOR DENTAL PATIENTS, Wilhelm Ohlrogge, et al., Owner of Record: *Siemens Aktiengesellschaft, Erlangen, Germany,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 355

3,962,780, Re. S.N. 912,343, Filed Jun. 5, 1978, Cl. 29/596, METHODS AND APPARATUS FOR MAKING ELECTRICAL INTERCONNECTIONS, Alan L. Kindig, Owner of Record: *General Electric Company, Fort Wayne, Ind.*, Attorney or Agent: John M. Stoudt, et al., Ex. Gp.: 321

3,968,056, Re. S.N. 913,433, Filed Jun. 7, 1978, Cl. 252/514, RADIATION CURABLE INKS, Donald A. Bolon, et al., Owner of Record: *General Electric Company, Schenectady, N.Y.,* Attorney or Agent: John F. McDevitt, et al., Ex. Gp.: 223

4,032,523, Re. S.N. 912,947, Filed Jun. 5, 1978, Cl. 260/256.4 N, 4-AMINO OR (HYDRAZINO)-2-(PYRIDINYL) PYRIMIDINES, George Y. Lesher, et al., Owner of Record: *Sterling Drug Inc., New York, N.Y.*, Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 122

4,070,583, Re. S.N. 913,432, Filed Jun. 7, 1978, Cl. 250/483, RARE EARTH OXYHALIDE PHOSPHORS COACTIVATED WITH TERBIUM, THULIUM, Jacob G. Rabatin, Owner of Record: *General Electric Company, Schenectady, N.Y.*, Attorney or Agent: John F. McDevitt, et al., Ex. Gp.: 256

PATENT NOTICES

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Re. 29,598
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3,009,855
3,808,888
3,868,941
3,955,007
3,957,165
3,960,563
3,974,875
3,982,691
4,019,911
4,020,798
4,021,232
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4,027,448
4,035,647
4,038,326
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4,041,061
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4,066,400
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4,067,335
4,067,371
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4,067,780
4,067,946
4,067,968
4,068,035
4,068,038
4,069,109
4,069,277
4,069,924
4,070,136
4,070,171
4,070,185
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4,070,521
4,070,524
4,070,784
4,071,389
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4,077,280
4,077,315
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4,077,468
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4,077,730
4,077,750
4,077,899
4,078,044
4,078,066
4,078,130
4,078,675
4,078,731
4,078,766
4,078,790
4,078,978
4,078,984
4,078,987
4,079,212
4,079,223
4,079,260
4,079,278
4,079,354
4,079,900
4,079,004
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4,081,388
4,081,502
4,081,515
4,081,521
4,081,523
4,081,604
4,081,605
4,082,022
4,082,195
4,082,527
4,082,881
4,083,076
4,083,135
4,083,554
4,083,710
4,084,509
4,085,227
4,085,247
4,086,419

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,655,721, U. Arul, A. Faucci and A. Stocker, PROCESS FOR THE PRODUCTION OF MALONIC ACID DINITRILE AND PURIFICATION THEREOF, Interference No. 99,456, decided Mar. 10, 1078, claims 1 and 2.

Patent No. 3,766,508, T. Wada and Y. Shindo, FLAMEPROOF COATED RESISTORS, Interference No. 99,033, decided Mar. 31, 1978, claim 2.

Patent No. 3,770,928, W. P. Kornrumpf and J. D. Harnden, Jr., RELIABLE SOLID STATE INDUCTION COOKING APPLIANCE WITH CONTROL LOGIC, Interference No. 98,982, decided Apr. 13, 1978, claims 1, 8 and 10.

Patent No. 3,781,272, G. R. Flouret, TRIPEPTIDE, Interference No. 98,942, decided Jan. 31, 1978, claim 8.

Patent No. 3,799,863, R. A. Zeineh, ELECTROPHORESIS AND ELECTROFOCUSING APPARATUS, Interference No. 99,411, decided Mar. 17, 1978, claims 1, 2, 3 and 7.

Patent No. 3,827,489, H. E. McGowen, Jr., APPARATUS FOR INSTALLING AND REMOVING FLOW VALVES, Interference No. 99,092, decided Apr. 24, 1978, claims 2 and 3.

Patent No. 3,837,985, V. A. Chase, MULTI-DIRECTIONAL REINFORCED COMPOSITE AND METHOD OF MAKING THE SAME, Interference No. 99,654, decided Mar. 7, 1078, claims 0 and 15.

Patent No. 3,865,760, F. Pitts and M. H. Clubley, FLAME RETARDANT MATERIALS, Interference No. 99,548, decided Apr. 10, 1978, claims 1–4 and 7–10.

Patent No. 3,882,236, B. B. Molloy, PHARMACEUTICAL COMPOSITIONS CONTAINING SUBSTITUTED 2-OXO-INDOLINES AND THE USE THEREOF TO TREAT ANXIETY AND TENSION, Interference No. 99,425, decided Mar. 17, 1978, claims 5 and 6.

Patent No. 3,890,742, F. N. Ladd and D. G. Stacy, WINDOW REGULATOR MECHANISM, Interference No. 99,303, decided Mar. 9, 1978, claims 3 and 5.

Patent No. 3,924,111, C. R. Farris, ELECTRONIC CALCULATORS FOR NAVIGATIONAL PURPOSES, Interference No. 99,455, decided Mar. 30, 1978, claims 1, 11, 12 and 13.

Disclaimer

3,982,515.—*Cyril E. Bradshaw,* Kalamazoo, Mich. EXHAUST GAS RECIRCULATION CONTROL ASSEMBLY. Patent dated Sept. 28, 1976. Disclaimer filed June 13, 1978, by the assignee, *Eaton Corporation.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

Patents Available for Licensing or Sale

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 De Grand Ave., Teaneck, N.J. 07666.

3,701,395. RESCUE AND SAFETY VEST. Stuart J. Theobald, 3206 Paul Drive, Wheaton, Md. 20902.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,083,421. TWO SPEED MOTORCYCLE HUB TRANSMISSION. Ronald L. Van Horn, Donald R. Van Horn, and Roy B. Van Horn, 3003 Beverly Drive, Pittsburg, Calif. 94565.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The General Electric Company is prepared to grant non-exclusive licenses under the following 5 patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,002,112. COOKING APPLIANCE WITH REMOVABLE COOKING GRIDS.

4,039,777. HEATING APPARATUS FOR GLASS OR CERAMIC COOKING VESSEL.

4,056,050. COFFEEMAKER WITH BREW STRENGTH CONTROL.

D. 239,994. ELECTRIC SHAVE CREAM DISPENSER OR SIMILAR ARTICLE.

D. 241,601. DESIGN FOR COMBINED SKILLET AND CHAFING DISH OR THE LIKE.

Applications for license may be addressed to: Patent Counsel, General Electric Company, 101 East Carmel Drive, Suite 205, Carmel, Ind. 46032.

3,077,530. COOKING APPLIANCE.

3,568,935. HINGED SPRAY PLATE AND BOX FOR DISHWASHERS.

3,585,128. PRE-WASH SCRAP BASKET FOR DISHWASHER.

3,612,253. RECESSED CHAIN-TRACK ASSEMBLY FOR DISHWASHERS.

3,720,155. FRYING APPARATUS WITH REMOTE CONTROL THERMOSTAT.

3,949,772. DOOR TYPE DISHWASHER.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. S.W., Washington, D.C. 20324

Patent application 801,453. Synthesis of Fluorotrinitromethane. Filed May 26, 1977.

Patent application 856,385. Fluorocarbon Bis(o-Aminophenol) Compounds, Containing a Hydrocarbon Moiety. Filed Dec. 1, 1977.

Patent 4,074,523. Pressure Actuated Collapsible Curtain Liners for a Gas Turbine Engine Nozzle. Filed Dec. 8, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,527. Self-Contained Power Subsystem. Filed Apr. 9, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,859. Deformable Plug for an Aircraft Engine Exhaust Nozzle. Filed Nov. 10, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,075,073. Method for the Preparation of Bis(Perfluoro-t Butyl) Peroxide. Filed Feb. 23, 1977. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,075,246. 1,3-Bis(2,2,2-Fluorodinitroethoxy)-2,2-Bis(difluoramino) Propane. Filed Oct. 29, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,076,418. Film Slewing Device for Drum Type Contact Printer. Filed Apr. 5, 1976. Patented Feb. 28, 1978. Not available NTIS.

Patent 4,076,454. Vortex Generators in Axial Flow Compressor. Filed June 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,064,025. Separation of Carbon and Nitrogen Isotopes by Selective Photodissociation Azo or Diazo Compounds. Filed Feb. 24, 1976. Patented Dec. 20, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.,
Washington, D.C. 20240

Patent 4,053,775. Constant Flow Radon Gas Monitor. Filed Jan. 29, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,776. Sub-Micron Particle Detector. Filed May 25, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,055,051. Unitary Drill Bit and Roof Bolt. Filed Jan. 8, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,057,115. Flexible Shaft for a Roof Drill. Filed May 7, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,057,478. Electrochemical Gas Monitor. Filed Feb. 5, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,058,668. Cold Crucible. Filed Mar. 1, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,062,412. Flexible Shaft Drilling System. Filed Jan. 29, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,062,595. Automatic Face Transfer Linear Cutting Rotary Head Continuous Mining Machine and Method. Filed Oct. 15, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,074,778. Square Hole Drill. Filed July 14, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,779. Backwashing System for Slurry Pick-Up Used in Hydraulic Borehole Mining Devices. Filed May 9, 1977. Patented Feb. 21, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent application 840,189. Oil Level Indicator for Use With Damping Fluid Metering Pins. Filed Oct. 6, 1977.

Patent application 851,022. Digital Plotting System for Displaying Straight Line Information. Filed Nov. 11, 1977.

Patent application 851,086. Digital Plotting System for Displaying Character Information. Filed Nov. 11, 1977.

Patent application 864,286. Digital Plotting System for Graphic Information. Filed Dec. 20, 1977.

Patent Application 865,076. Digital Plotting System for Displaying Curved Line Information. Filed Dec. 20, 1977.

Patent application 880,514. Silicon-Phthalocyanine-Siloxane Polymers. Filed Feb. 23, 1978.

Patent application 880,515. Silicon-Phthalocyanine-Siloxy Monomers. Filed Feb. 23, 1978.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents	Numbers 2,067 to 2,075, inclusive

REISSUES

AUGUST 8, 1978

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,720
TIME CORRECTING APPARATUS FOR AN ELECTRONIC TIMEPIECE

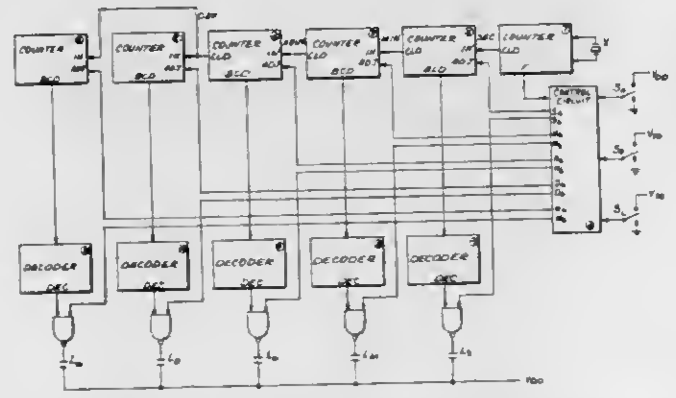
Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Original No. 3,810,356, dated May 14, 1974, Ser. No. 351,943, Apr. 17, 1973. Application for reissue May 14, 1976, Ser. No. 686,426

Claims priority, application Japan, Apr. 17, 1972, 47-38529

Int. Cl.^{2} G04C *3/00*

U.S. Cl. 58—23 R **12 Claims**



1. In an electronic timepiece having multi-stage divider timekeeping circuit means and multi-digit display means coupled to said corresponding **[**multi-stage**]** dividers *of said timekeeping circuit means* for the digital display of time, the improvement which comprises time correcting circuit means, a manually operable selecting switch means and a manually operable correcting switch means coupled to said time correcting circuit means, said time correcting circuit means being operatively coupled to the dividers of said timekeeping circuit means associated with **[**the digits**]** *each digit* of time of said display means to be corrected for **[**the**]** **[**selective sequential selection of**]** *selectively sequentially selecting* each digit of time *to be corrected* for correction by the manual operation of said selecting switch *means* and for the selective correction of **[**said**]** *a* selected digit of time by the manual operation of said correcting switch *means*, said time correction circuit means being further coupled to *at least* each digit of time of said display means *to be corrected* and adapted to dispose **[**the**]** *each* selected **[**digits**]** *digit* of time of said digital display means *to be corrected* so as to render same *visually* distinguishable from the other digits of said display means.

Re. 29,721
PLASTIC BAG AND A PROTECTIVE CONTAINER THEREFOR AND A FIXTURE FOR SECURING THE BAG IN THE CONTAINER

Luigi Ukmar; Mario Agostini, and Gianfranco Beliandi, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

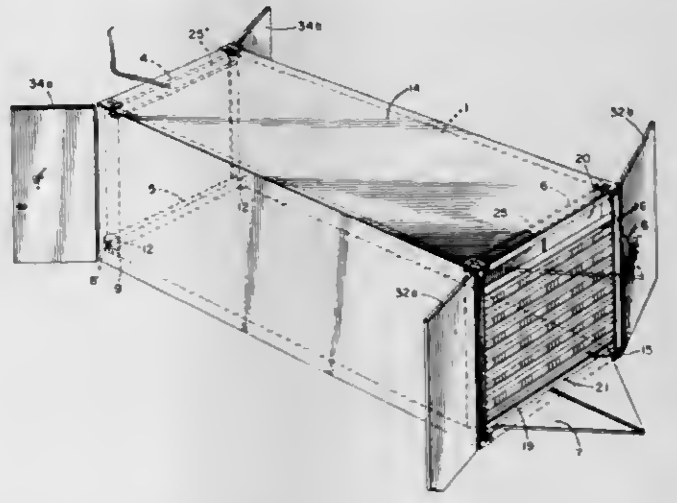
Original No. 3,904,084, dated Sep. 9, 1975, Ser. No. 397,417, Sep. 14, 1973. Application for reissue Sep. 6, 1977, Ser. No. 830,900

Claims priority, application Italy, Sep. 20, 1972, 29432 A/72

Int. Cl.^{2} B65D *33/14*

U.S. Cl. 222—105 **9 Claims**

9. A large plastic bag adapted to contain granular material while disposed in a protective container having a floor and at least one port for charging and discharging said granular material; said bag being closed by weld lines and folded to form a pair of oppositely disposed triangularly shaped integral flaps projecting outwardly; means for anchoring a first flap to the floor of the container comprising a channel member having a flap wound thereabout and means for pressing the wound flap against said channel member; means carried by said container for securing the channel member and said flap pressed thereagainst to the floor of the container; a second flap in the same plane as the first flap and adapted for emptying the bag; means for securing the second flap to the floor of the container adjacent to said port of the container while the bag is being loaded and is storing bulk material; a third flap on the same end of the bag as the emptying flap; a series of elements arranged to form a grating in the container convering said port and providing with a clearance through which loading and unloading flaps project; a cross-bar inserted above the grating for retaining the flap used for loading the bag; and means comprising a hopper secured to the unloading flap for unloading the contents of the bag when the port is open.



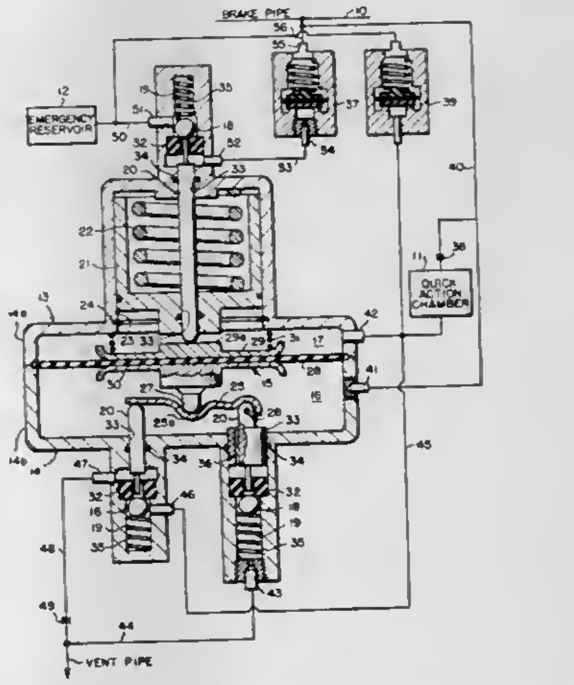
Re. 29,722
FLUID BRAKE CONTROL SYSTEM

Eugene Douglas McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Original No. 3,966,269, dated Jun. 29, 1976, Ser. No. 612,840, Sep. 12, 1975. Application for reissue May 13, 1977, Ser. No. 796,784

Int. Cl.^{2} B60T *15/30*

U.S. Cl. 303—37 **29 Claims**



29. Fluid brake control apparatus for a railway car having a *brake control pipe, a reference fluid reservoir which is at times charged from the brake pipe, an emergency fluid reservoir, and an accelerated release control device comprising:*

a. a housing having a fluid pressure differential operated abutment subject to actuation by differences in pressure between respective brake pipe and reference fluid pressure chambers acting on opposite sides of said abutment,

b. valve means of the poppet type having relatively movable seat and closure elements at least one of which is operatively connected to said abutment,

c. fluid supply means responsive to the opening of said valve means by movement of said abutment in response to an increase in brake pipe pressure to permit fluid to flow from said emergency reservoir to the brake pipe,

d. and further means being rendered active in response to the attainment of a predetermined low pressure in said reference fluid reservoir which is indicative of an emergency brake application to apply an additional force to said abutment which resists opening of said valve means in response to an increase in brake pipe pressure of a magnitude less than a predetermined amount.

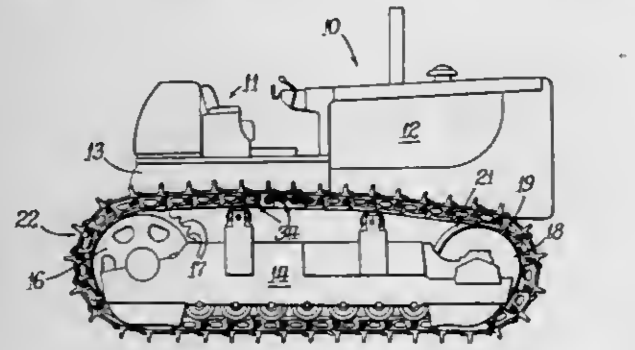
Re. 29,723
RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK

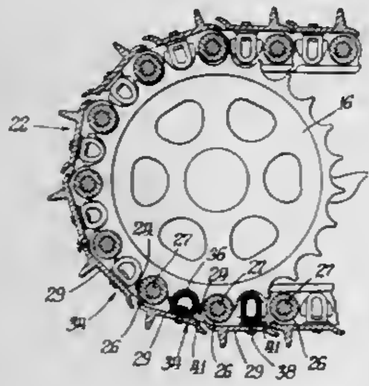
Glenn M. Haslett, Peoria, and Harold L. Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,887,244, dated Jun. 3, 1975, Ser. No. 420,720, Nov. 30, 1973. Application for reissue May 31, 1977, Ser. No. 801,717

Int. Cl.² B62D *55/08*

U.S. Cl. 305—57 **8 Claims**





1. In an endless track assembly of the type used on a vehicle provided with a drive sprocket having teeth and notches alternately disposed about the circumference of the sprocket, said track assembly comprising a pair of laterally upstanding link elements; parallel pin and bushing elements secured to and interconnecting respectively opposite ends of the links; a track shoe secured to the bottoms of said links; the improvement comprising a resilient impact lug reinforced by reinforcing means including a wear resistant material secured to the contact end of said impact lug, said lug being releasably secured to the shoe midway between the bushing elements, said impact lug having a topmost portion of greater height from the track shoe than the topmost portion of the adjacent bushings whereby initial contact is made by said lug so that impact energy is absorbed by the lug prior to engagement of an adjacent bushing.

Re. 29,724
DYEING PROCESS

Colin William Greenhalgh; David Francis Newton; Dennis Eckersley; Ian Cheetham; Duncan Adrian Sidney Phillips; Kenneth Dunkerley; Gerald Williams, and Vibhas Chokshi, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Original No. 3,953,162, dated Apr. 27, 1976, Ser. No. 453,632, Mar. 21, 1974. Application for reissue Mar. 8, 1977, Ser. No. 775,516

Claims priority, application United Kingdom, Apr. 25, 1973, 19580/73; Oct. 16, 1973, 48080/73

Int. Cl.² D06P *1/20;* **C09B** *1/00*

U.S. Cl. 8—39 B **10 Claims**

1. A process for dyeing nylon fibers by applying thereto a dyestuff of the anthraquinone series containing a dicarboxylic cyclic anhydride grouping or a dicarboxylic acid grouping such that cyclic anhydride formation can occur by loss of water therefrom, or a half-ester or half-amide of such a dicarboxylic acid grouping, any carboxylic acid group in the said dyestuff being present in free acid form or in the form of a salt with ammonia or a volatile amine, said dicarboxylic grouping not being on the anthraquinone nucleus and being either in ortho position on a benzene ring attached to said anthraquinone nucleus or in anhydride-forming position or positioned with one carboxyl group on a carbocyclic aromatic ring attached to said anthraquinone nucleus and the other in anhydride-forming position therewith on an alkyl side chain, and heating the nylon fiber until fixation of the dyestuff takes place.

Re. 29,725
ANALYTICAL TEST PACK AND PROCESS FOR ANALYSIS

Donald R. Johnson, Wilmington; Richard G. Nadeau; Gerrit Nieuweboer, both of Claymont, all of Del., and William L. Truett, Blackwood, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,476,515, dated Nov. 4, 1969, Ser. No. 545,494, Apr. 26, 1966. Application for reissue May 7, 1970, Ser. No. 35,438

Int. Cl.² G01N *33/16, 21/24*

U.S. Cl. 23—230 R **35 Claims**

19. A method of analyzing a test sample comprising: providing an analytic test pack having a reaction chamber, at least one wall of which is of pliable material, and at least one reagent compartment containing reagents and separated from said reaction chamber; introducing the test sample into said reaction chamber; releasing at least one reagent contained in at least one reagent compartment into said reaction chamber, independently of any other reagents in other reagent compartments, whereby any single reagent or combination of reagents may be introduced into said reaction chamber; mixing said test sample and said reagent; and reading out the result of the reaction between said reagent and said test sample.

Re. 29,726
METHOD OF COATING CARBON STEEL

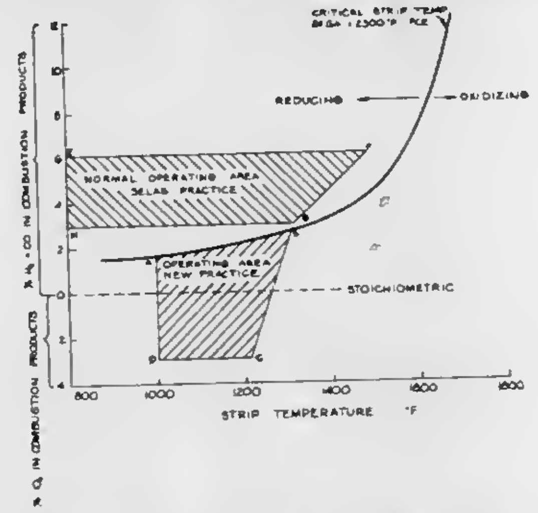
Fred Byrd, Lebanon; Marvin B. Pierson, Franklin; Thomas A. Compton, Middletown, and Frank C. Dunbar, Monroe, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Original No. 3,936,543, dated Feb. 3, 1976, Ser. No. 499,772, Aug. 22, 1974. Application for reissue Feb. 14, 1977, Ser. No. 768,111

Int. Cl.² C23C *1/00*

U.S. Cl. 427—320 **7 Claims**

1. A method of preparing carbon steel strip and sheet for fluxless hot dip metallic coating, comprising the steps of heating said strip and sheet in a furnace heated by direct combustion of fuel and air therein and [in an atmosphere containing from about 3% by volume oxygen to about 2% by volume excess combustibles in the form of hydrogen and carbon monoxide] *operated at fuel air ratios ranging from stoichiometrically equivalent to 3% by volume oxygen,* controlling the strip and sheet temperature within the range of about 540° to about 705° C, and thereafter heating said strip and sheet in a subsequent furnace containing at least about 5% hydrogen by volume and balance substantially nitrogen to a temperature of at least about 675° C.



Re. 29,727
DIGITAL DISPLAY DEVICE

Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

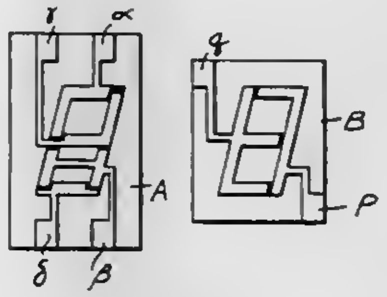
Original No. 3,781,863, dated Dec. 25, 1973, Ser. No. 209,986, Dec. 20, 1971. Application for reissue Nov. 3, 1975, Ser. No. 628,010

Claims priority, application Japan, Dec. 23, 1970, 45-116254

Int. Cl.² G02F *1/13;* **G09F** *9/32*

U.S. Cl. 340—336 **12 Claims**

7. A digital display device comprising a non-conductive first plate having thereon at least one group of seven conductive segments essentially in the conventional figure-8 arrangement, wherein selected segments of said group are electrically connected together to form sub-groups whereby all of the segments in a sub-group may be actuated together; a non-conductive second plate opposed to and spaced from said first plate and having thereon at least one conductive segmented group in figure-8 arrangement, each group on said second plate being in registry with a group on said first plate and being subdivided into sub-groups of segments, all of the segments in a sub-group being electrically connected; a material positioned intermediate said first and second plates and adapted so that regions thereof in registration with said conductive segments are displayed when an activating voltage pulse is simultaneously applied to opposed conductive segments on said first and second plates; and means for applying an activating voltage in pulsed sequence to each of the sub-groups in one group on said first plate at a repetition rate sufficiently great that digits, when displayed, appear to be continuously displayed, and for applying an activating voltage pulse to selected sub-groups of the group on said second plate, the group on said second plate being in registry with said one group on said first plate, said pulsing means being adapted to supply pulses to selected subgroups on said second plate in synchronization with said pulsed sequence applied to said one group on said first plate so as to display any selected digit for the period during which said pulsed voltage sequence is applied to the said one group on said first plate, at least one of said plates and the conductive segments on said one plate being transparent.



PLANT PATENTS

GRANTED AUGUST 8, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,289

CHRYSANTHEMUM PLANT NAMED LOYALTY

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Mar. 30, 1977, Ser. No. 783,013

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by its profuse production of deep pink flowers of medium to large size and composite and decorative form, its year around flowering ability and very dependable 9-week response to photoperiod control, and by its growth habit of producing strong and erect stems with good breaking ability and very dense foliage.

4,290

CHRYSANTHEMUM NAMED BRITISH GOLD

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Mar. 30, 1977, Ser. No. 783,012

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinctive chrysanthemum plant, substantially as herein shown and described, characterized by the golden bronze coloring of its medium size flowers the form of which does not reflex, the medium to tall vigor of the plant growth, and its spreading pot plant habit with a very good breaking ability when manually pinched.

PATENTS

GRANTED AUG. 8, 1978

ERRATA

For CLASS	See PATENT NO.
052–090 R	4,104,868
073–081	4,104,901
123–179 S.	4,104,927
400–556.2	4,105,106
297–045	4,105,244
297–149	4,105,247
521–100	4,105,594
521–159	4,105,595
521–056	4,105,596
521–159	4,105,597
521–053	4,105,598
521–131	4,105,599
521–129	4,105,600
521–095	4,105,601
521–062	4,105,616
528–176	4,105,633
526–065	4,105,634
528–126	4,105,635
528–126	4,105,636
528–241	4,105,637
528–130	4,105,638
528–177	4,105,639
528–292	4,105,640
526–071	4,105,641
528–051	4,105,642
528–051	4,105,643
528–314	4,105,644
528–313	4,105,645
528–311	4,105,646
526–033	4,105,647
526–204	4,105,648
526–271	4,105,649
544–405	4,105,661
544–294	4,105,662
544–379	4,105,663
544–378	4,105,664
568–744	4,105,698
568–744	4,105,699
568–875	4,105,700
429–152	4,105,810
235–092 SB	4,105,914
250–199	4,105,915
250–282	4,105,916
250–291	4,105,917

ERRATA—Continued

250-337	4,105,918
250-341	4,105,919
250-402	4,105,920
250-423 P	4,105,921
250-445 T	4,105,922
250-456	4,105,923
250-492 A	4,105,924
250-561	4,105,925
250-566	4,105,926
318-676	4,105,961
320-032	4,105,962
322-048	4,105,963
323-043.5 S	4,105,964
324-028 CB	4,105,965
324-113	4,105,966
324-115	4,105,967
324-133	4,105,968
324-151 R	4,105,969
324-158 P	4,105,970
324-203	4,105,971
324-220	4,105,972
325-004	4,105,973
325-021	4,105,974
325-320	4,105,975
325-404	4,105,976
325-472	4,105,977
328-058	4,105,978
328-164	4,105,979
328-165	4,105,980
329-050	4,105,981
200-061.17	4,106,004
336-185	4,106,118

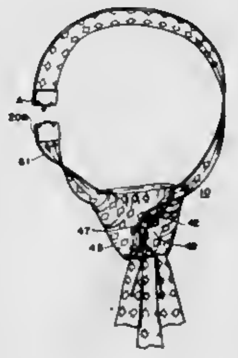
PATENTS

GRANTED AUGUST 8, 1978

GENERAL AND MECHANICAL

4,104,739
HOOK-ON NECKTIE CONVERSION KIT

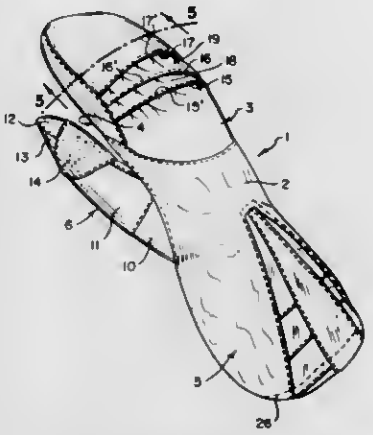
John P. Burger, Mitchell, Ind., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Apr. 6, 1977, Ser. No. 784,972
Int. Cl.² A41D *25/16*
U.S. Cl. 2—155 **1 Claim**



1. A kit for preforming a conventional necktie to a pre-knotted necktie, comprising
a pair of flexible fastener units, each of which is formed of a flat section of flexible material of U-shape in cross-section, with an adhesive coating mounted as a backing to the opposed undersurfaces of the material, with each fastener of a size to fit about the end section of a cut neck strap section of a conventional necktie, with
said fastener units each fitted with one half of a mating detachable fastener assembly, together with
a flat strip of flexible material, coated on both surfaces with adhesive material of a size to fit between two layers of a necktie knot so as to hold the knot fixed when the said two layers are each bonded to a surface of the strip by means of the said adhesive material.

4,104,740
MITTEN CONSTRUCTION

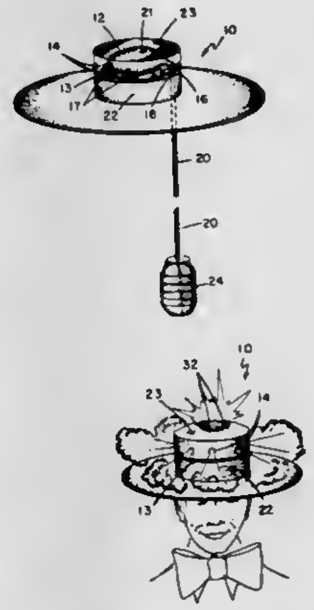
Dixie L. Rinehart, Aspen, Colo., assignor to Comfort Products, Inc., Aspen, Colo.
Filed Oct. 1, 1976, Ser. No. 728,876
Int. Cl.² A41D *19/00*
U.S. Cl. 2—158 **1 Claim**



1. A glove constructed in the form of a mitten which comprises in combination:
(A) a shell covering having a back portion, a palm portion, a gauntlet portion and a thumb portion;
(B) said back portion having a plurality of pleated joints extending across the width of the back portion;
(C) said pleated joints being formed by folding the covering and stitching the folds across the back portion in the area of finger bends of a glove wearer;
(D) an inner lining of pile-like material fixedly secured to an inner surface of said shell and configured in the form of a fingered glove having finger portions defining finger receiving pockets extending forwardly to a seam connecting the back portion and the palm portion, and
(E) said outer shell having a square front end construction at said seam.

4,104,741
NOVELTY HAT DEVICE

Lamont Shaw, 735 Cummins Hwy., Mattapan, Mass. 02126, and Aaroo O. Waire, 1066 Ellicott St., Buffalo, N.Y. 14209
Filed Apr. 15, 1977, Ser. No. 787,979
Int. Cl.² A42B *1/24*
U.S. Cl. 2—185 R **3 Claims**

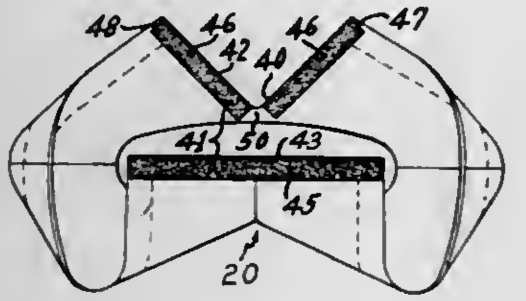


1. A novelty amusement device to be placed on the user's head comprising:
a hat having defined therein a head receiving area;
a balloon compartment positioned at the top of said hat above said head receiving area having defined therein a plurality of vent apertures around its outer circumference;
a baffle member forming the base of and separating said balloon compartment from said head receiving area and further having a tube receiving aperture defined therein;
a tube having a first and second end, said second end passing into said head receiving area and through said tube receiving aperture;
a manually operated air pump affixed to the first end of said tube;
a balloon removably affixed to the second end of said tube and positioned within said balloon compartment, said balloon being of a size to expand fully on inflation within the limits of the volume size of said balloon compartment and adapted to burst upon further inflation; and
a powder-like substance located within said balloon compartment adapted to be blown out of said vent apertures upon the bursting of said balloon after its inflation by said manually operated air pump, said balloon compartment further having defined therein a balloon entry aperture through which burst balloons can be removed and new balloons and powder inserted.

4,104,742

CONVERTIBLE GARMENT

Sarah E. Rahaim, 3300 Atlantic Blvd., Jacksonville, Fla. 32207
Filed Jan. 13, 1977, Ser. No. 758,929
Int. Cl.² A41D *1/14*
U.S. Cl. 2—213 **6 Claims**

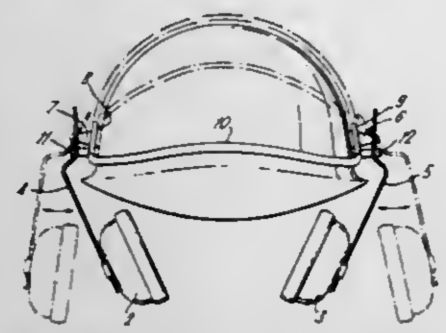


1. In an outer short pants and convertible skirt garment having leg portions and a crotch portion connecting a front edge portion to a back edge portion, the improvement comprising releaseable fastening means connecting said crotch portion, said means including an elongated hook fabric means extending along said back edge portion, said fastening means further including an elongated pile fabric means extending along said front edge portion, said hook means being connected to the outer surface of said garment and said pile means being connected to the inner surface of said garment, said hook means and pile means being in face to face adhering contact for substantially sealingly connecting said front and back portions and forming said crotch portion of said pants garment, said hook means being folded onto itself to partially connect same in an inwardly directed back pleat and said front edge portion being folded inwardly to form a front pleat, whereby said pants garment is selectively convertedinto a skirt with inwardly directed front and back pleats.

4,104,743

DEVICE FOR SAFETY-HELMET WITH EAR MUFFLERS

Erik Bøttger, Kjelsåsveien 61, Oslo 4, Norway
Filed Feb. 16, 1977, Ser. No. 769,152
Claims priority, application Norway, Mar. 10, 1976, 760835
Int. Cl.² A42B *1/24*
U.S. Cl. 2—423 **6 Claims**

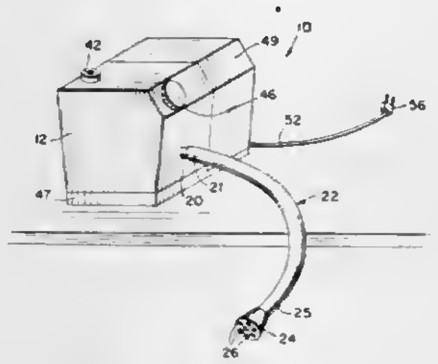


1. Device for a safety-helmet with ear mufflers, where each ear muffler is mounted on an arm which is mounted pivotally on the helmet, in a plane parallel to the longitudinal direction of the helmet, characterized in that the mufflers with arm are also pivotable in a plane across the longitudinal direction of the helmet, from a noise deadening position where the mufflers lie against the ears, to a swung-out and stopped position from the ears, and that the inner end of each muffler arm, which is fastened to the helmet, can be controlled by the end of a control bail, which stretches around the contour of the helmet, from the one fastening point for a muffler arm to the other fastening point, the bail legs of which are fastened so that they can be turned at the fastening points of the two muffler arms.

4,104,744

WASHING DEVICE

Clyde Odencrantz, 357 W. 29th St., New York, N.Y. 10001
Filed Feb. 15, 1977, Ser. No. 763,410
Int. Cl.² A45D *19/00*
U.S. Cl. 4—159 **4 Claims**

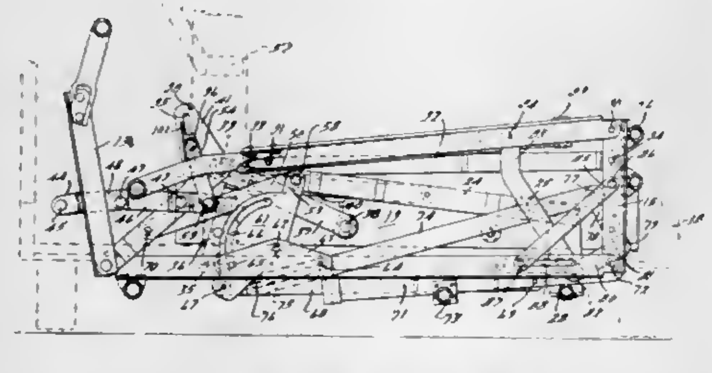


1. A washing device comprising a sealable fluid containing chamber normally partially filled with air and fillable with a liquid to a maximum given level and having an exit port disposed below the given level, said fluid chamber includes an aperture disposed above the given liquid level, means defining a filling aperture disposed in said fluid chamber above said given liquid level and a cap releasably connectable to said filling aperture and constructed to provide an air tight seal therebetween when connected, whereby said air pump provides said pressure in said chamber at levels greater than said release pressure when continuously operated, a hose having a first end connected to said exit port and a second end, means for increasing the pressure of the air to at least a given pressure including an air pump having a pressure outlet connected to said aperture and in air tight fluid communication with said fluid chamber, a pressure relief valve means settable to a predetermined release pressure greater than the given pressure and disposed to sense the pressure in said fluid chamber above the given liquid level thereby preventing the maximum pressure in said fluid chamber from exceeding the release pressure, check valve means disposed between said exit port and said second end of said hose and operable at the given pressure for allowing the passage of liquid through said hose and discharging out of said second end only when the air pressure is equal to or greater than the given pressure and whereby said liquid is maintained in said chamber when said air pressure is less than said given pressure.

4,104,745

SOFA BED WITH TV HEADREST

William Pacitti, Monroe, Mich.
Filed Feb. 25, 1977, Ser. No. 771,909
Int. Cl.² A47C *17/14*
U.S. Cl. 5—13 **12 Claims**

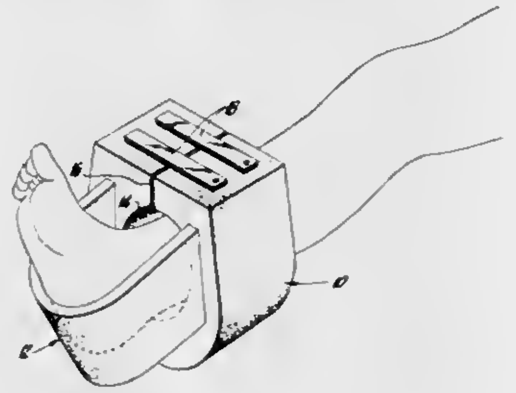


1. In a sofa bed, a sofa frame having a back, sides and a front board which forms a closed storage area, a foldable bed frame received within said area with a TV rear head section extending upwardly within the back storage area and the other sections folded and disposed rearwardly of the front board, the TV rear head section is pivoted to the rear of a rear bottom section which is pivoted to the rear of a vertical intermediate section the front of which is pivoted to a front top section, plates at the inner sides of the sofa frame, an arm pivoted to each said plate at the forward end thereof, a link pivoted to each said plate near the rear end thereof, a bellcrank having the end of one arm secured to the pivot between the TV and rear bottom sections, the other arm of the bellcrank having an extending slot therein, and pivot means joining the bellcrank near the corner between said two arms with the end of said link which is pivoted to said plate.

4,104,746

FOOT CRADLE

Verena M. Goetz, 80 Vernon Dr., Scarsdale, N.Y. 10583
Continuation of Ser. No. 696,769, Jun. 16, 1976, abandoned.
This application Sep. 12, 1977, Ser. No. 832,451
Int. Cl.² A47C *21/00*
U.S. Cl. 5—327 R **5 Claims**

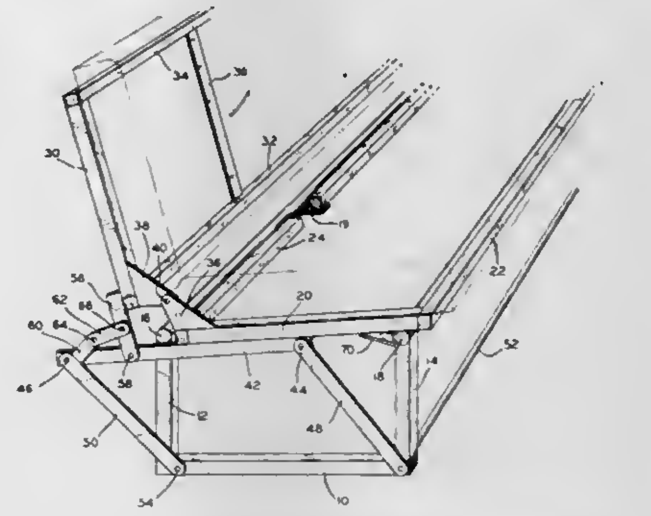


1. A foot support comprising:
a base member formed of a generally pliable yet resilient and firm material for vertically supporting a patient's leg above the level of a horizontal surface upon which the patient is lying;
said base member being formed with a generally horizontally extending opening for receiving a patient's leg and sized to prevent the horizontal removal of the patient's foot longitudinally therethrough, a slot being formed therein extending from the outer periphery of said base member to said opening so that the patient may insert his foot into said opening by passing his leg transversely through said slot;
a sling member formed of a generally pliable yet resilient and firm material attached to said base member to extend at a gradually declining angle with respect to the vertical extensions of said base member and engageable with the underside of the patient's foot to prevent said base member from moving up the patient's leg;
said opening in said base member being formed so that, when a patient's leg is disposed within said opening in a support posture, said sling member engages the underside of the patient's foot;
said sling member and said base member being sized to engage only the foot and lower leg beneath the calf of a patient when worn thereby; and
said foot support being unattached to any other structure, whereby a patient wearing said foot support may freely walk about while wearing said foot support.

4,104,747

CONVERTIBLE SOFA AND BED STRUCTURE

Richard A. Bell; Earl C. Wallace, and Ted W. Winters, all of Andrews, Ind., assignors to General Engineering and Mfg. Corporation, Andrews, Ind.
Filed Apr. 14, 1977, Ser. No. 787,447
Int. Cl.² D47C *17/17*
U.S. Cl. 5—37 R **5 Claims**



1. A convertible seat and sofa structure comprising:
a base frame;
a seat frame;
a back frame;
hinge means pivotally interconnecting said seat and back frames;
a carrier bar;
a pair of lever arms;
means pivotally securing one end of each of said lever arms to said base frame;
means pivotally securing the opposite end of each of said lever arms to said carrier bar so as to cause said carrier bar to extend for and aft with respect to said seat frame when said seat frame is in a horizontal position;
a crank arm affixed to the opposite end of one of said lever arms;
means pivotally securing said back frame to said carrier bar;
a drag link; and
means pivotally securing one end of said drag link to said crank arm at a point spaced from said lever arm and the other end of said drag link to said back frame, whereby when said carrier bar is moved to a forward position said crank arm forces said back frame to pivot about the pivotal connection between said back frame and said carrier bar to move said back frame to a horizontal position in alignment with said seat frame.

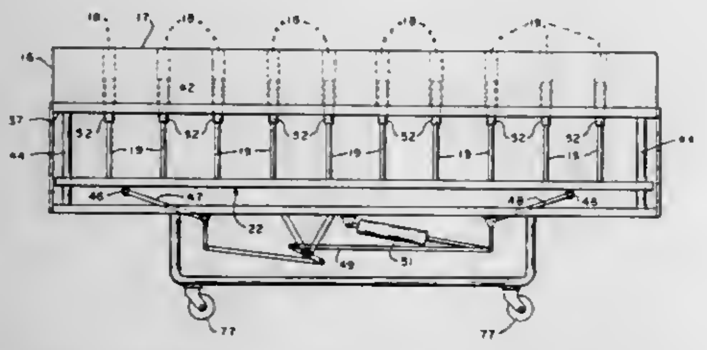
4,104,748

HOSPITAL BED AND PATIENT-HANDLING APPARATUS

Paul R. Brisco, 3402 Davis St., Oakland, Calif. 94601
Filed Apr. 8, 1977, Ser. No. 786,118
Int. Cl.² A47C *3/32;* A61G *7/00, 7/04*
U.S. Cl. 5—63 **10 Claims**

1. In combination:
a mattress formed with a plurality of longitudinally spaced transversely extending rows of passages extending between the normally upper body-supporting surface and lower mattress-supporting surface and defining access spaces between said rows;
a platform engaging and supporting said lower surface of said mattress;
a plurality of vertically set tubular guides mounted on said platform and extending into said passages;
a plurality of members mounted for reciprocation in said guides, one in each of said guides, and having body-engag-

ing ends normally positioned at or below said upper surface in a body-supporting position of said upper surface;
means for simultaneously displacing said members in said guides for extension above said upper surface for engaging and elevating a body thereon, certain of said members



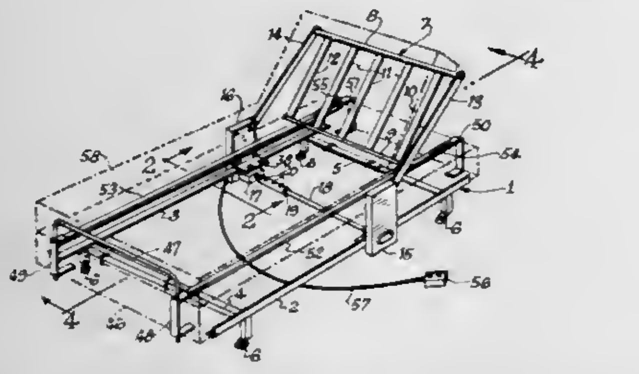
defining in their advanced body supporting position said access spaces;
means dimensioned for entering said access spaces and for positioning between an elevated body and upper mattress surface for receiving and supporting said body upon retraction of said members to said upper surface.

4,104,749

ELECTRICALLY ADJUSTABLE BED FRAME

Anthony F. Grundler, San Diego, Calif., assignor to Siesta Industries, San Diego, Calif.

Filed Sep. 6, 1977, Ser. No. 830,526
Int. Cl.^{2} A47C *3/32*
U.S. Cl. 5—76 **8 Claims**



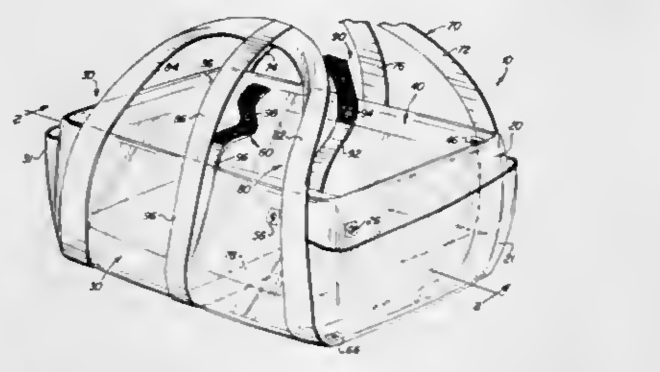
1. In a bed comprising a mattress, a foundation under the mattress and a supporting frame having two lateral horizontal elements along each side of the foundation, a device for raising the head section of the mattress to various angular positions which comprises:
a flat lifting frame inserted between the foundation and the head section of the mattress;
a pair of lifting levers at opposite sides of the bed, each having one end pivotally connected to the lifting frame whereby the lifting frame is free to rotate around a first horizontal axis joining one said end of each lifting lever to the other;
means for pivotally connecting each lifting lever to the lateral horizontal elements at points which produce a second horizontal axis of rotation extending across the width of the bed; and
means for pivotally moving the lifting levers about said second horizontal axis whereby the first horizontal axis of the lifting frame is pushed upward by the lifting levers or allowed to fall back toward the foundation.

4,104,750

INFLATABLE INFANT CRIB AND CARRIER

S. Louis Kelter, and Viviane S. Kelter, both of 1302 W. Sack Dr., Phoenix, Ariz. 85027

Filed Mar. 4, 1977, Ser. No. 774,514
Int. Cl.^{2} A47C *27/08, 9/00*
U.S. Cl. 5—93 R **5 Claims**



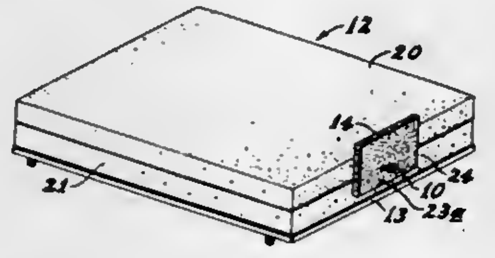
1. Inflatable crib apparatus, comprising, in combination:
inflatable wall chamber means, including
first and second inflatable end chambers spaced apart from each other and disposed substantially parallel to each other,
first and second inflatable side chambers spaced apart from each other and disposed substantially parallel to each other and secured to the first and second end chambers to define a generally rectangular peripheral wall, and
the first and second end chambers and the first and second side chambers each having a generally oval vertical cross sectional configuration providing a vertical convex wall configuration to the area within the end and side chambers;
inflatable mattress means comprising a mattress chamber secured to and disposed within the end and side chambers of the wall chamber means at a lower portion thereof and including an inner wall and an outer wall spaced apart from each other and a plurality of flexible spacers secured to both outer and inner walls for limiting the distance between the inner and outer walls to provide a generally flat surface upon which an infant is disposed;
valve means comprising at least a single valve for each of the first and second end chambers, the first and second side chambers and the mattress chamber for inflating and deflating each of said chambers and to prevent the deflation of any one chamber from resulting in the deflation of any other chamber; and
strap means secured to the wall chamber means and to the mattress means for carrying the crib apparatus.

4,104,751

ENDBOARD AUXILIARY DEVICE FOR BEDS

M. Steele Churchman, 6215 Central Ave., Indianapolis, Ind. 46220

Filed Jan. 21, 1977, Ser. No. 760,931
Int. Cl.^{2} A47C *21/02*
U.S. Cl. 5—327 R **5 Claims**



1. An endboard auxiliary device for a bed, comprising:
an endboard means;

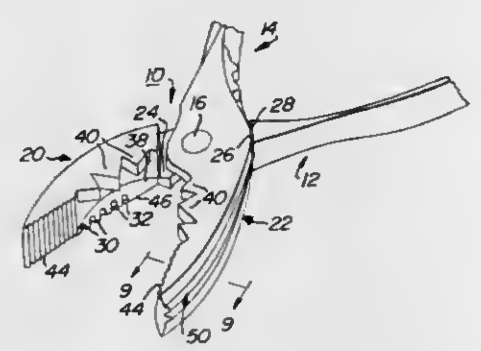
an endboard-support means;
means supportingly interconnecting the support means and the said endboard means;
the said endboard-support means being relatively long and relatively thin, in a manner providing that in installation it may be slipped under the mattress of the bed without significantly raising the mattress ~~and long~~ enough so as to be firmly held in place by the mattress-portion thereabove without being easily dislodged, and without requirement of any position-maintaining means other than the said thereabove mattress-portion and by the force reaction between it and the endboard-support means without other fasteners;
in a combination in which the said supportingly-interconnecting means provide that the said endboard means and the said endboard-supporting means are movably interconnected, and there are provided movement-blocking means which block against movement of the said endboard means relative to the said endboard-supporting means;
in which there is also provided an endboard accessory which effectively raises the height of the endboard, there being means provided which releasably secure the same to the said endboard means; and
in which the said releasable securing means of the endboard accessory and the endboard means comprise pin members extending downwardly from the said endboard accessory and fit into receiving holes provided in the upper portion of the said endboard means.

4,104,752

MULTIPURPOSE TOOL

Wayne Thomas Amrein, 1105 Apt. F. D'Long Rd., Baltimore, Md. 21228, and Stokes, Jr. Bernard E., 2639 Rayner Ave., Baltimore, Md. 21216

Filed Jan. 17, 1977, Ser. No. 759,987
Int. Cl.^{2} B25B *7/22*
U.S. Cl. 7—107 **10 Claims**



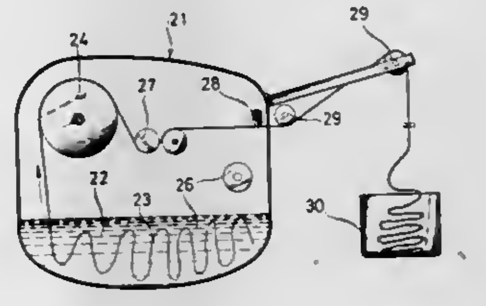
1. A multipurpose tool comprising:
(a) a pair of handle portions adapted to be gripped in the hand of a user;
(b) a pair of head portions each being formed in one piece formation with a respective handle portion, each of said handle and head portions being rotatably mounted to the other about a pivot point;
(c) wire stripping means formed in each of said head portions, said wire stripping means including at least one recess of predetermined diameter formed within each of said head portions and adapted for cutting insulation on wire when said recesses are displaced into contiguous alignment defining a closed position; and,
(d) tooth gripping means formed in each of said head portions, said tooth gripping means including at least a pair of teeth formed in each of said head portions adjacent said wire stripping means and displaced therefrom in a direction coincident with an axis line of said pivot point, said tooth gripping means and said wire stripping means being formed in one piece formation on opposing surfaces of said head portions with respect to said axis line direction, said teeth of said tooth gripping means forming an opening greater than said recess diameter when said tool is in said closed position.

4,104,753

PROCESSES AND APPARATUS FOR THE BATCH WET TREATMENT OF TEXTILE MATERIAL

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,512
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623315
Int. Cl.^{2} D06B *21/02*
U.S. Cl. 8—152 **12 Claims**



1. A process for the wet treatment of textile material comprising introducing said material to a treatment chamber containing a bath of hot treatment liquid; repeatedly immersing and removing said material in and from said liquid; subjecting said material to treatment by air following each removal of said material from said liquid to remove surplus liquid from said material; moving said material out of said chamber following a final air treatment; and spraying onto said material a fluid having a temperature lower than that of said liquid to cool said material prior to passage of said material out of said chamber.

9. Apparatus for the wet treatment of textile material comprising means forming a chamber for containing a bath of hot treatment liquid; means for moving said material through said container to repeatedly immerse and remove said material in and from said liquid; air means operable to remove surplus liquid from said material; means mounting said air means in a position to subject said material to the operation of said air means each time said material is removed from said liquid; and cooling means withn said chamber downstream from said air means for spraying said material with fluid having a temperature lower than that of said liquid to cool said material following its final removal from said liquid.

4,104,754

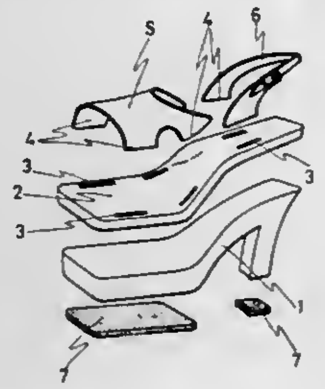
PROCESS FOR THE MANUFACTURE OF SHOES HAVING A WOODEN BASE

Jose Maria Tutusaus Almao, Diagonal 674 - 1°2°, Barcelona, Spain

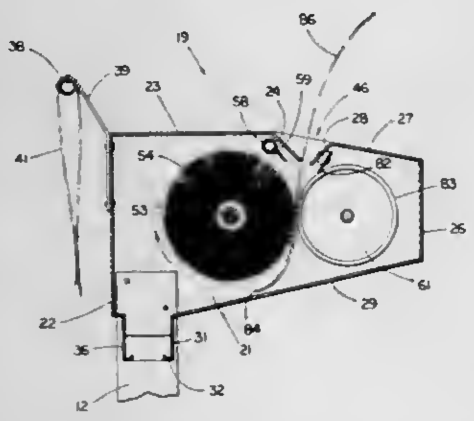
Filed Feb. 10, 1977, Ser. No. 767,634
Claims priority, application Spain, Dec. 2, 1976, 453.882
Int. Cl.^{2} A43D *9/00;* A43C *13/00;* A43B *13/08*
U.S. Cl. 12—142 S **1 Claim**

1. A process for the manufacture of shoes having a wooden base, said process comprising:
providing a wooden monopiece base member having a configuration corresponding to the desired shape of a finished shoe;
cutting said base member along a path substantially parallel to the upper surface thereof which will act as the support for the foot of the user, to thereby form a sole portion and a strip-shaped insole portion;
forming a plurality of elongated openings through said insole portion at positions therein parallel with the edge thereof;
forming recesses in the bottom surface of said insole portion

such that said recesses join said openings and extend therefrom inwardly of said insole portion;
providing front and heel shoe upper portions with flap-shaped extensions;
attaching said upper portions to said insole portion by passing each of said extensions through a corresponding said opening, and then bending the end of said extensions inwardly of said insole portion so that said extension ends are completely housed within corresponding said recesses; and
rigidly fastening said insole portion to said sole portion such that the bottom surface of said insole portion is in contiguous contact with the upper surface of said sole portion.

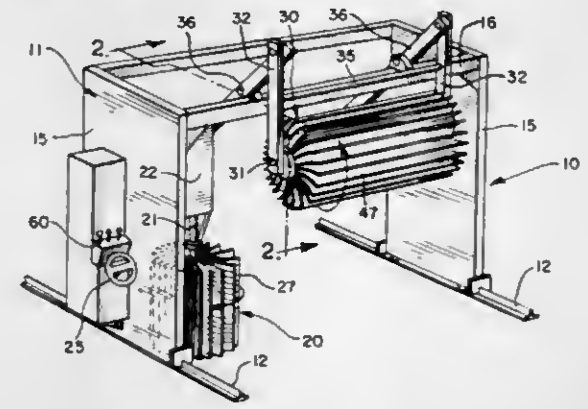


4,104,755
VEHICLE FLOOR MAT WASHER
Judson L. Smith, 5432 Lighthouse La., Tempe, Ariz. 85283
Filed Ang. 2, 1976, Ser. Nn. 710,630
Int. Cl.^{2} B08B *11/00;* A46B *13/04*
U.S. Cl. 15—40 **10 Claims**



1. A mat washer comprising:
a housing;
scrubbing roll means and support roll means enclosed in said housing and having substantially horizontal, parallel, and horizontally spaced rotational axes;
said housing having a slot at the top to admit a mat into a work area in said housing between said roll means;
motor drive means coupled to said scrubbing roll means for rotational drive thereof;
cleaning fluid dispenser means enclosed in said housing above said scrubbing roll means for applying cleaning fluid to one face of a mat admitted into said work area;
said scrubbing roll means having work contacting means thereon moving proximate a support surface of said support roll means for contacting said one face and thereby urging a mat disposed between said scrubbing roll means and said support roll means against said support surface to implement scrubbing of the mat by said work contacting means;
said dispenser means include a distribution pipe extending parallel to said axes and having a plurality of spray nozzles spaced along it above said scrubbing hole means and directed toward said support roll means for spraying cleaning liquid onto the scrubbing roll facing face of a mat passing vertically between said roll means;
said housing being constructed to drain continuously from said work area all fluid dispensed and thereby avoid accumulation of fluid around said roll means;
leg means supporting said housing; and
dispenser control means including a valve in a liquid conduit between a cleaning liquid source and said dispenser means, and a valve control pedal for operating said valve;
said valve including a flexible walled tube and a pair of cooperating tube-pinching members, one of said members being fixed to said leg means, and the other of said members being fixed to said pedal.

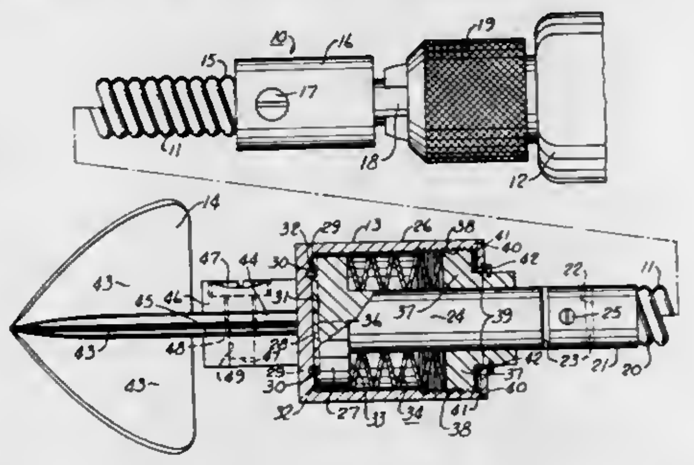
4,104,756
MACHINE FOR WAXING VEHICLES
William J. Gasser, Long Grove, Ill., and Richard H. Cooper, Genoa City, Wis., assignors to Brite-O-Matic Manufacturing, Inc., Arlington Heights, Ill.
Filed Oct. 12, 1976, Ser. No. 731,831
Int. Cl.^{2} B60S *3/06*
U.S. Cl. 15—97 B **1 Claim**



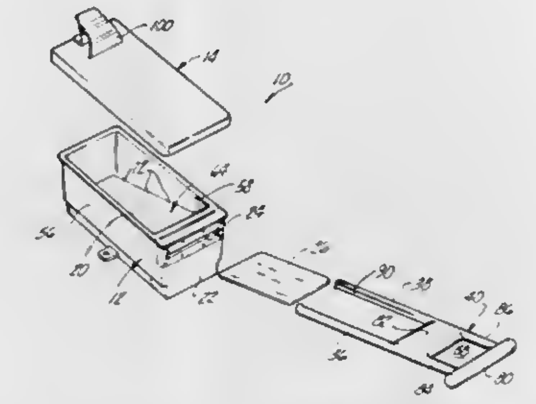
1. In a vehicle surface preparation and waxing machine having a buffing head for rotating relative to the vehicle surface and buffing such surface after wax has been applied, the improvement in buffing head construction, comprising:
a. a mounting shaft for rotating on an axis substantially parallel to the surface, and
b. a plurality of fabric pads $\frac{1}{8}$ inch thick aligned with said shaft, extending substantially radially therefrom, and having their inner ends fastened to such shaft,
c. said pads being fabricated of both wool and synthetic fibres,
d. each of such pads being slit inwardly from its outer edge at approximately $2\frac{1}{2}$ inches intervals to define a series of strips,
e. each said strip being approximately 12 inches long.
f. said pads being slit so that a strip in each pad overlaps two strips in each adjacent pad.

4,104,757
POWER DRIVEN DRAIN CLEANER WITH SAFETY OVERLOAD CLUTCH
Arthur A. Silverman, 2245 Harmain Rd., Pittsburgh, Pa. 15235
Continuation of Ser. No. 710,552, Aug. 2, 1976, abandoned. This appllcation May 5, 1977, Ser. No. 794,011
Int. Cl.^{2} B08B *9/02*
U.S. Cl. 15—104.3 SN **4 Claims**

1. In a power driven drain cleaner, the combination comprising: an elongated flexible sewer snake for attachment at one end to a rotary power drive and a sewer cleaning head secured to the other end of said snake; the improvement consisting of an overload slip clutch interposed at said other end of said snake adjacent said sewer cleaning head to permit slippage of said clutch upon application thereto of a predetermined torque created between said snake and said cleaning head, and feedback means for transmitting feedback signals to said one driven end of said snake when said clutch is slipping for detection.

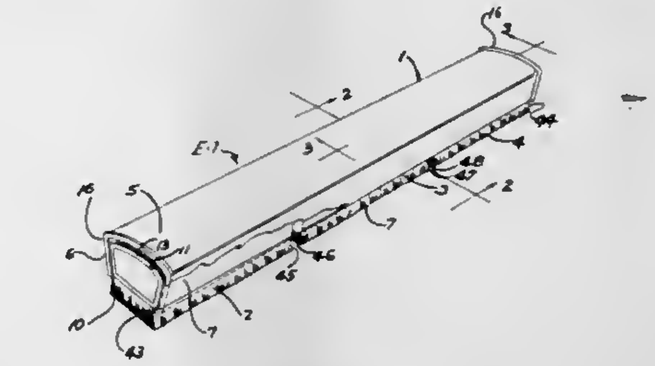


4,104,758
CREDIT CARD WASHING DEVICE
James L. Stotler, 11243 McKinney Ave., Detroit, Mich. 48224
Filed Apr. 4, 1977, Ser. No. 784,133
Int. Cl.^{2} A46B *11/00;* B08B *1/00*
U.S. Cl. 15—104.92 **5 Claims**



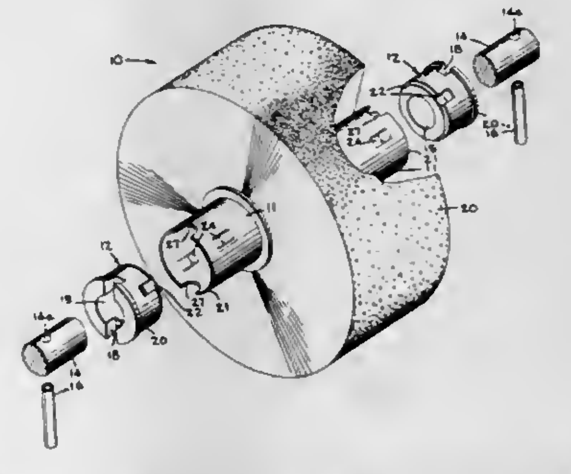
1. A device for washing credit cards and the like, said device comprising:
an enclosed housing having an aperture, said housing having a liquid holding portion below said aperture;
brush means disposed in said liquid holding portion;
a holder for supporting a credit card, said holder being insertable through said aperture;
means guiding said holder to said brush means to facilitate the cleaning of said credit card when disposed between said brush means; said holder having a body portion and handle means extending from said body portion to facilitate the gripping of said holder by a user; and
a pair of leg members extending outwardly from said holder, said leg members each having opposing longitudinal slots for receiving and supporting a credit card, the outer peripheries of said leg members having circular configurations; said legs being movable toward and away from each other; the interior walls of said housing defining said guiding means in the form of slotted portions defining guideways respectively receiving said leg members of said holder to guide said holder toward and away from said brush means; said guideways having a tapered path such that said legs are urged toward one another to tightly grip said card as said holder is inserted within said housing.

4,104,759
CUSTODIAL ERASER
Oliver R. Odhner, R.D. #2, Gerloff Rd., Schwenksville, Pa. 19473
Filed May 2, 1977, Ser. No. 792,921
Int. Cl.^{2} A46B *3/02;* B43L *21/00*
U.S. Cl. 15—176 **5 Claims**



1. A custodial eraser comprising:
an elongated handle to be gripped by the hand and guided over the board for the erasing operation, the handle being C-shaped in cross section to provide a closed side and a pair of spaced apart walls extending outwardly from the closed side, the space between the extremities of the walls forming an open side and during an erasing operation the closed side being adapted to be contacted by the palm of the hand and the walls to be contacted by the fingers;
a section of flexible foam on the inside of the closed said and being co-extensive with the handle;
a plurality of individual erasers disposed within and serially arranged along the housing, each being coupled to said foam and extending thru and outwardly of the open side;
means to maintain the individual erasers within the handle in engagement with the foam and providing for each eraser to be disengageable from the foam and handle;
the flexibility of said foam and said means providing for the individual erasers to compress the foam and independently move toward the closed side in response to hand pressure when the eraser is being moved over the board for an erasing operation and to move away from the closed side when the hand pressure is relieved.

4,104,760
ROTARY BRUSH ROLL CONSTRUCTION
Richard B. Rossean, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Feb. 9, 1976, Ser. No. 656,473
Int. Cl.^{2} A46B *13/02*
U.S. Cl. 15—179 **5 Claims**



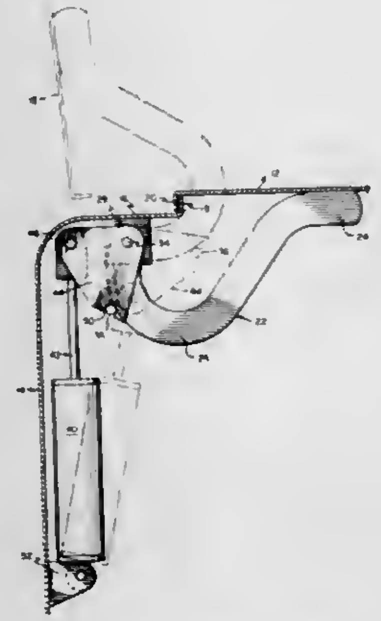
1. In a rotary brush roller comprised of a tubular open-ended metallic core of cylindrical shape having brush means secured to its outer cylindrical surface and extending radially therefrom, the improvement comprising a pair of fittings arranged

to be received in each end of said core, each of said fittings being comprised of an elastomeric material having a Shore scale A hardness within the range of from about 85 to about 100, each of said fittings having an axially extending passage therein arranged to snugly receive a rotatable driving or support means, said core at each end thereof having a plurality of radially inwardly projecting elements spaced circumferentially about the interior cylindrical wall of said core, each of said fittings having a plurality of circumferentially spaced and axially extending recessed portions arranged to be received by said inwardly projecting elements of the core when said fitting is axially slidably assembled within said core, and means for retaining said fittings in a predetermined position within the ends of said core so that said inwardly projecting elements of the core are in resilient engagement with said fittings, said inwardly projecting elements of the core being yieldably mounted with respect to said interior cylindrical wall of the core and being arranged to engage the associated fitting radially along the axially extending recessed portions thereof.

4,104,761

MOUNTING MEANS FOR DOOR-CHECK FOR TORSIONALLY BALANCED HATCHWAY DOOR

Robert J. Lyons, 1060 Ridge Rd., Hamden, Conn. 06514
Filed Jul. 13, 1977, Ser. No. 815,362
Int. Cl.^{2} E05F *3/00, 5/10*
U.S. Cl. 16—84 **4 Claims**



1. In a torsionally balanced hatchway door construction having a hatchway frame, a door hinged thereto for movement between an elevated open position and a closed position, a torsion bar for counterbalancing the weight of said door, said torsion bar having a straight portion with said terminal portion forming a hinge pin for the door and said straight portion being pivoted about the hinge axis in one direction when said door is swung to its closed position, and a fluid check member for yieldingly resisting swinging movement of the door to its closed position,

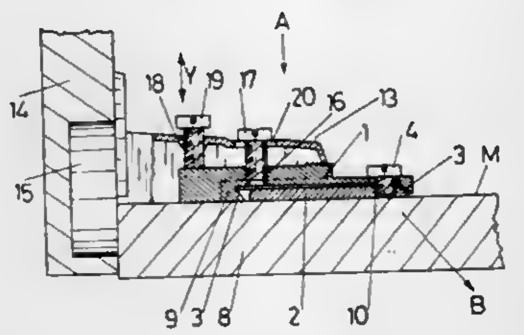
means for mounting said fluid check member comprising a bracket mounted on said torsion bar between said terminal and straight portions for pivotal movement therewith about said hinge axis,

said fluid check member being mounted on said hatchway frame and having an actuating element connected to said bracket at a point spaced from said hinge axis such that said actuating element is driven by the pivotal movement of said bracket against the resistance of said check member as the door is closed.

4,104,762

FURNITURE HINGE

Erich Röck, Küferstr. 1085, A-6973 Höchst, and Bernhard Mages, Härte 10, A-6850 Dornbirn, both of Austria
Filed Apr. 11, 1977, Ser. No. 786,678
Claims priority, application Austria, Apr. 14, 1976, 2723/76
Int. Cl.^{2} E05D *7/04*
U.S. Cl. 16—129 **7 Claims**

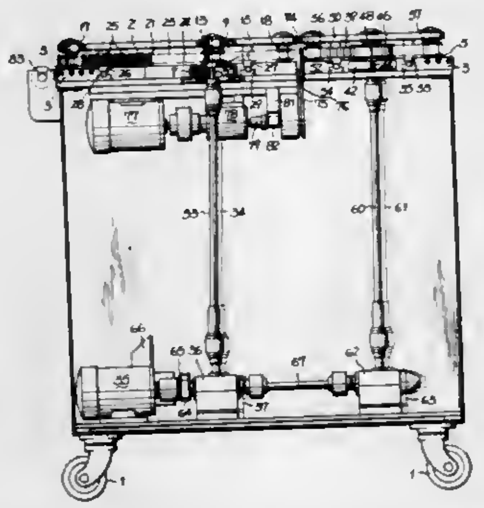


1. A hinge for fastening to a member of piece of furniture, such as a side panel, comprising: a mounting plate fixable to said member of said furniture a hinge arm carrying hinge links; an intermediate part located between said mounting plate and said hinge arm, said intermediate part and said mounting plate having oblique lateral faces parallel to a pivoting axis of the hinge, said faces corresponding to one another and being spaced from each other at least in the direction of the length of said hinge arm; screw means; said intermediate part being held in position at least on said mounting plate by said screw means; all said oblique lateral faces being inclined in the same direction so that said intermediate part is hooked onto said mounting plate by at least one of said oblique lateral faces in at least one point and at least one lateral face of said intermediate part lies atop a corresponding lateral face of said mounting plate in at least a second point, said screw means being positioned in proximity of said second lateral face.

4,104,763

APPARATUS FOR CUTTING A STRING OF SAUSAGE LINKS

Mano Tetsuro, Sanno, Japan, assignor to Totai Company Limited, Japan
Filed Dec. 6, 1976, Ser. No. 747,722
Int. Cl.^{2} A22C *11/00*
U.S. Cl. 17—1 F **7 Claims**

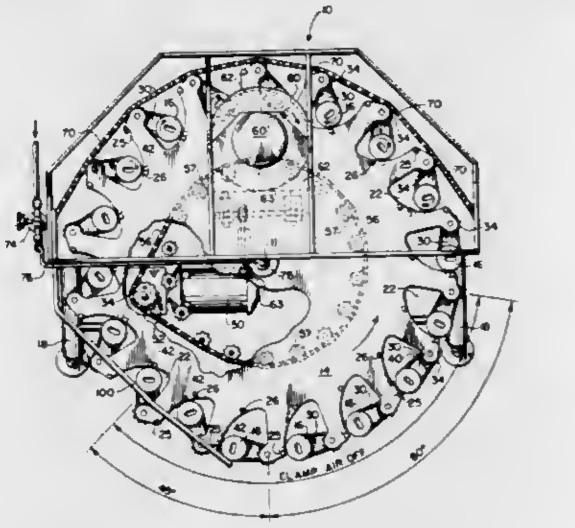


1. An apparatus for cutting a string of sausage links at a junction between links comprising, conveyor means for advancing the links at a first speed including a pair of spaced apart opposed movable roller belts defining a passageway for the links, each roller belt having a plurality of spaced rotatably mounted rollers disposed therealong engageable with respective lateral sides of the links to pinch them and advance the string as the roller belts move and drive means connected to said roller belts for moving them along said feed passageway, stretching means spaced from said conveyor means for receiving the links from said conveyor means and for further advancing the links at a second speed greater than said first speed to stretch each junction between links as it passes between said conveyor and stretching means, said stretching means including a pair of opposed movable notched members engageable with respective lateral sides of said links to pinch the links and drive means connected to said notched members to move them, cutting means disposed between said conveyor and stretching means for cutting a selected one of the stretched junctions to divide the sausage string into lengths of at least one link including a cutting member movable in the space between said conveyor and stretching means and drive means connected to said cutting member for moving it, and control means connected to said cutting means including a sensor for sensing the passage of each stretched junction and activate said cutting member drive means when a selected one of said stretched junctions passes said sensor.

4,104,764

CRUSTACEAN CLAW-PROCESSING MACHINE

John B. Coast, Rte. 6, Box 328, Baton Rouge, La. 70815
Filed Nov. 26, 1976, Ser. No. 744,958
Int. Cl.^{2} A22C *29/00*
U.S. Cl. 17—71 **16 Claims**



1. A machine for processing seafood to expose the inner meat product comprising:

a support frame;

a cutting section having at least one cutter means therein mounted on said frame;

a multiple number of seafood holders placed in juxtaposition to said cutting section for cutting the exterior of the seafood in each said holder, each said holder having a holding section for holding the seafood with respect to said cutter means while it is being cut;

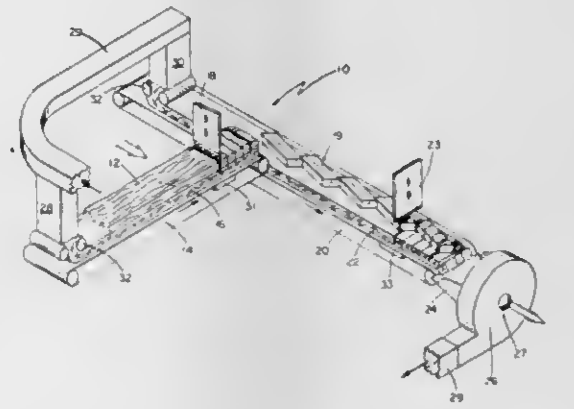
limit means for limiting the depth of cut for producing a peripheral cut in the outer portion of the seafood as the seafood is moved; and

movable, carrying means on which said holders are rotatably mounted in spaced array for carrying and moving said holders with their seafood into and out of engagement with said cutter means in sequential fashion, said carrying means being movably mounted on said frame; said movable carrying means comprising a rotary frame; said holders being also pivotably mounted around the periphery on said rotary frame, said holders being urged toward said cutter means while the seafood is being cut; the plane of rotation of said holders on said rotary frame being inclined, making a significant angle with respect to the horizontal plane, and the cutting edge of said cutter means being located totally within the area circumscribed by said rotary frame and near one vertical extreme of travel of said holders, said holders being mounted on said rotary frame by means of pivot arms which are generally freely movable, gravity being the force causing the urging of said holders toward said cutting means toward and into the interior of said rotary frame about said pivot arm, said holders being moved away from said cutter means by the rotation of said rotary frame.

4,104,765

CUTTING HARD FIBROUS MATERIAL

Peter Lehner, Hingham, Mass., assignor to Leigh Textile Company, Boston, Mass.
Filed May 31, 1977, Ser. No. 801,576
Int. Cl.^{2} D01G *1/04*
U.S. Cl. 19—0.6 **4 Claims**



1. The method of cutting longer lengths of hard fibrous material into shorter lengths comprising:

depositing a first layer of said shorter lengths on a supporting surface;

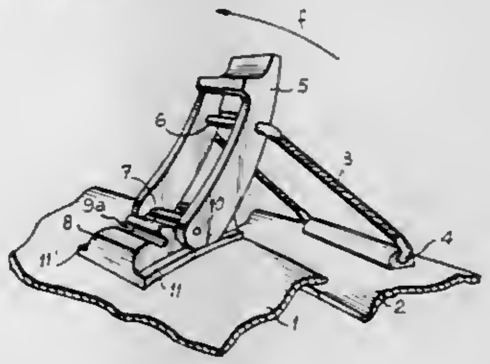
loading a second layer of said longer lengths on top of said first layer; and

moving a blade down through said first layer and into and partially through said second layer, leaving a gap between said supporting surface and said blade whereby relative movement of said fibrous material may take place in said gap.

4,104,766

CLOSING SYSTEM FOR SKI BOOTS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France
Filed Mar. 22, 1977, Ser. No. 780,180
Claims priority, application France, Mar. 29, 1976, 76 09009
Int. Cl.^{2} B27K *3/04*
U.S. Cl. 24—69 SK **14 Claims**



1. A knuckle joint-type closing system for ski boots, for bringing together first and second flaps of the boot, said system comprising: at least one lever hinged to the first boot-flap and a traction component hinged to the second boot flap and to the lever, one of the lever's hinges including a catch-pin, rack means provided with at least one notch for freely engaging said

catch-pin, the lever being capable of occupying an initial, closed position flap against the boot, a second, stable intermediate partially-open position, and a third, fully-open position in which the catch-pin is disengaged from the notch, and means for making the catch-pin automatically leave said notch when the opening lever movement is continued beyond the stable intermediate position, thereby separating the two boot-flaps.

4,104,767
SLIDING CLASP FASTENER

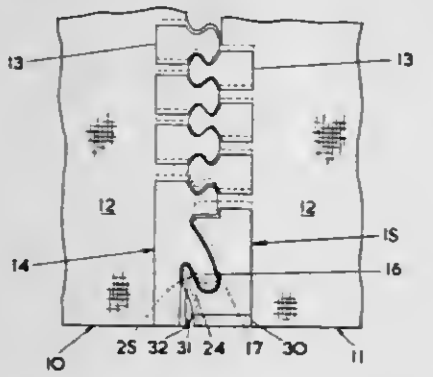
David Warren, Sutton Coldfield, England, assignor to Lightning Fasteners Limited, England

Filed Sep. 27, 1976, Ser. No. 727,385

Claims priority, application United Kingdom, Oct. 22, 1975, 43361/75

Int. Cl.² A44B *19/36*

U.S. Cl. 24—205.11 R **2 Claims**



1. A sliding clasp fastener comprising two stringers, each stringer having a series of coupling elements secured to an edge of a carrier tape, the two series of coupling elements being interengaged and disengaged by movement of a slider longitudinally of the stringers, and a pair of interengageable releasably connectable end fittings secured one to each of the carrier tapes adjacent an end of the series of coupling elements, each end fitting comprising two hooking means positioned one at each side of a plane which is substantially parallel with a plane of the carrier tapes, both hooking means of the one fitting being directed away from its associated series of coupling elements and forming two recesses to receive the hooking means of the other fitting, both hooking means of the other fitting being directed toward its associated series of coupling elements and forming two recesses to receive the hooking means of said one fitting, the hooking means of the pair of end fittings being mutually engageable in one longitudinal direction, each end fitting further comprising transversely opposed surfaces formed by side surfaces of the hooking means, the two hooking means of each end fitting being offset one from the other so that sides of the two hooking means provide said transversely opposed surfaces, the offset in the two end fittings being in opposite lateral directions when the end fittings are interengaged so that sides of the hooking means of one end fitting laterally overlap sides of the hooking means of the other end fitting, the resulting arrangement being such that, when the two series of coupling elements and the pair of end fittings are interengaged, the hooking means prevent separation of the end fittings laterally of the carrier tapes, the transversely opposed surfaces of the end fittings prevent separation thereof transversely of the plane of the carrier tapes, and the interengagement of the coupling elements prevents longitudinal separation in the opposite longitudinal direction.

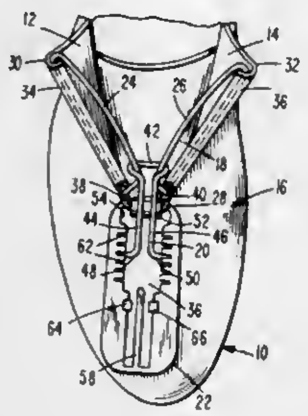
4,104,768
FASTENING DEVICE

Karl W. Labecki, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed May 25, 1977, Ser. No. 800,479

Int. Cl.² A44G *19/00*

U.S. Cl. 24—207 **1 Claim**



1. A fastening device for fastening two flaps of a closure comprising

- a bent wire grasshopper spring including a connecting portion, a pair of arms extending from the connecting portion, a pair of arm extensions extending from the arms and attached to the closure flaps and a hooked portion on each arm extension hooked onto the connecting portion,
- a yoke spring including a yoke portion looped over the arms of the glasshopper spring, a pair of legs extending in parallel from the yoke portion and a locking pin extending outwardly from each leg,
- a molded thermoplastic plate member having a longitudinally elongated yoke channel and a yoke recess both formed in its back surface with the yoke recess being at one end thereof,
- a pair of locking tabs disposed on the back surface of the plate member and extending over opposite sides of the yoke channel,
- a journal member formed on the back surface of the plate member in the yoke recess, the journal member being integrally molded around the connecting portion of the grasshopper spring so that the connecting portion is freely pivotable but is securely retained within the journal member, and
- the plate member having formed in it along the sides of the yoke channel a plurality of adjustment holes adapted to receiving the locking pins of the yoke spring, each of the adjustment holes being slotted toward the back surface of the plate member by a molded slot so that the adjustment holes can be easily formed in the plate member, the molded slots being narrower than the locking pins so that the locking pins will be retained in the adjustment holes.

4,104,769
APPARATUS FOR STRETCHING FILM

Stanley Burton Levy, and William Drake Garlington, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1976, Ser. No. 666,263

Int. Cl.² D06C *3/04*

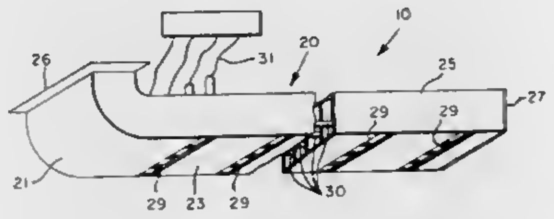
U.S. Cl. 26—92 **6 Claims**

1. An apparatus for stretching a web of thermoplastic polymeric film including:

(a) a tenter frame having a plurality of tenter frame clips carried by two endless chains and guided by tracks having parallel and diverging sections; and

(b) a heating unit for heating a web of film moving therepast to a stretching temperature, said heating unit positioned entirely between the tenter frame clips in a parallel section of the tenter frame and closely adjacent a surface of the web of film, such isolation of the heating unit allowing thicker portions of the film web to stretch more uniformly in the diverging section of the tenter frame to improve the thickness properties thereof, said heating unit including:

(i) a duct having a top wall, a bottom wall and side walls, and, further, having a plurality of intermediate walls extending parallel with the side walls and defining, with the top and bottom walls, thermally isolated zones in the duct, said bottom wall having a plurality of apertures with each aperture extending thereacross normal to said side and intermediate walls;



(ii) a heater positioned in each thermally isolated zone; and

(iii) means for varying the temperature of each heater, independently, whereby air moving through any thermally isolated zone is selectively heated and passed through the apertures in the bottom wall to heat the film web adjacent to those apertures and to minimize dissipation of heat into adjacent zones.

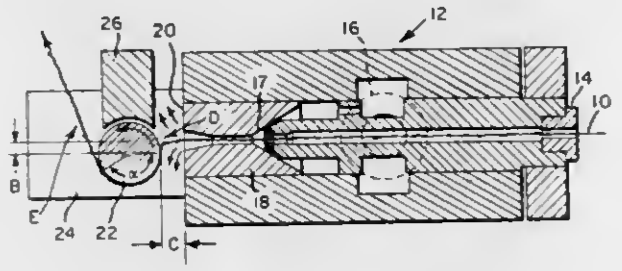
4,104,770
YARN TREATING JET MOVING A ROTATING BAFFLE AND DEFLECTOR AT ITS OUTLET AND METHOD OF OPERATION THEREOF

William Moore Massey, Jr., and Theodos Sandukas, both of Hixson, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1977, Ser. No. 801,568

Int. Cl.² D02G *1/16*

U.S. Cl. 28—257 **5 Claims**



1. In a yarn treating jet including a body having yarn inlet and outlet ends connected by a central bore along a central axis, means for introducing pressurized gas through a gas inlet into said bore between said ends to contact yarn passing through the jet, said yarn and said gas following a path from said outlet end of said jet, the improvement comprising: a freely rotatable cylinder having an axis in a plane perpendicular to said central axis positioned a fixed distance from said yarn outlet end for engaging the yarn and gas exiting therefrom, said axis of said cylinder being positioned below said central axis, said yarn engaging said cylinder and passing below and partially around the cylinder and then in an upwardly direction in said path; and a deflector positioned above and in close proximity to said cylinder, said deflector diverting gas above said cylinder away from said yarn traveling in said upwardly direction in said path.

4,104,771
METHOD OF MANUFACTURE AND RETINA FOR PYROELECTRIC VIDICON

Wellman L. Clark, Springfield; John T. Cox, Alexandria; Gerald Klauber, Fredericksburg; Ferdinand C. Petito; John B. Ramsey, Jr., both of Alexandria, and John E. Waylonis, Fairfax Station, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 647,271, Jan. 7, 1976. This application Nov. 11, 1976, Ser. No. 741,010

Int. Cl.² H01J *31/49;* B05D *5/12, 3/06, 3/12*

U.S. Cl. 29—25.14 **13 Claims**

1. A method for fabricating a retina for a pyroelectric vidicon or other optical device comprising the steps of:

- forming a wafer of pyroelectric material;
- polishing the surface of said material;
- immediately sealing said material in a vacuum chamber;
- reducing the pressure in said chamber;
- depositing a non-reflective layer of metal on one broad side of said wafer;
- depositing a layer of dielectric material on the remaining broad side of wafer.

4,104,772
STRIP-COVERED ROLL AND METHOD FOR MANUFACTURING THE SAME

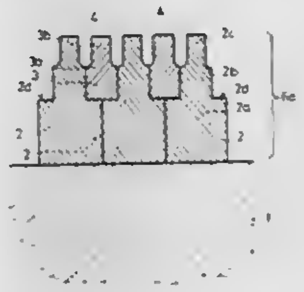
Väinö Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed May 12, 1977, Ser. No. 796,193

Claims priority, application Finland, May 17, 1976, 761390

Int. Cl.² B30B *3/00*

U.S. Cl. 29—121.4 **10 Claims**



1. In a roll of the type which is used in a paper machine, an inner body and a plurality of strips circumferentially surrounding and covering an outer surface of said inner roll body, said strips including pairs of strip portions situated one next to the other axially along the roll body with each pair of strip portions extending through 360° around the roll body and with each pair of strip portions including one strip portion which at least in part circumferentially surrounds and overlaps at least part of the other of each pair of strip portions, said one of each pair of strip portions circumferentially pressing radially inwardly against at least said part of the other of each pair of strip portions and pressing at least said other of each pair of strip portions against the outer surface of said inner roll body.

4,104,773
ROLL MANUFACTURING METHOD AND ROLL, PARTICULARLY FOR PAPER MACHINES

Väinö Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Jun. 1, 1977, Ser. No. 802,316

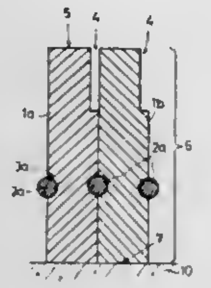
Claims priority, application Finland, Jun. 4, 1976, 761602

Int. Cl.² B30B *3/00*

U.S. Cl. 29—127 **8 Claims**

1. In a roll of the type which is adapted to be used in a paper machine, an inner roll body of cylindrical configuration having an elongated central axis and an exterior cylindrical surface, and an elongated strip having successive portions circumferen-

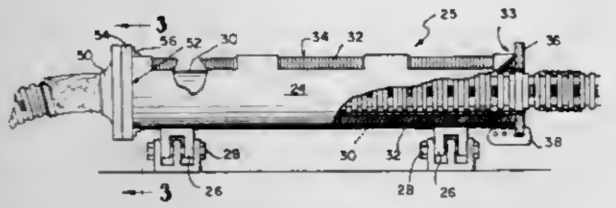
tially surrounding said inner roll body and engaging said exterior surface thereof with said circumferential portions of said strip having opposed side surfaces arranged with the side surface of one circumferential portion of said strip engaging the side surface of the next circumferential portion of said strip,



said engaging side surfaces of successive circumferential portions of said strip respectively being formed with registering grooves which cooperate to define an elongated bore circumferentially surrounding said inner roll body and spaced therefrom, and an elongated interlocking member situated in said bore.

4,104,774
APPARATUS FOR APPLYING FILTER TO A DRAINAGE TUBING

Richard C. Overmyer, Francesville, and Mario Guerra, Zionsville, both of Ind., assignors to Francesville Drain Tile Corporation, Francesville, Ind.
Division of Ser. No. 645,254, Dec. 29, 1975, Pat. No. 4,003,122. This application Sep. 15, 1976, Ser. No. 723,238
Int. Cl.² B23P *19/04*
U.S. Cl. 29—234 **14 Claims**



1. Apparatus for applying filter cloth or the like to a continuous length of flexible drainage tubing as such tubing is being installed in the ground by a laying machine, comprising

a tubular mandrel of a size to freely pass the tubing lengthwise therethrough and having an entrance end and an exit end,

a long tubular sleeve of filter cloth or the like, larger than the mandrel, gathered and packed on the mandrel, means to support said mandrel, with the packed sleeve thereon, on a laying machine in a position for passage of the tubing through the mandrel as the tubing is being laid, so that by attaching the end of the sleeve to the tubing, such sleeve will be drawn off the mandrel as the tubing passes therethrough on its way to installation,

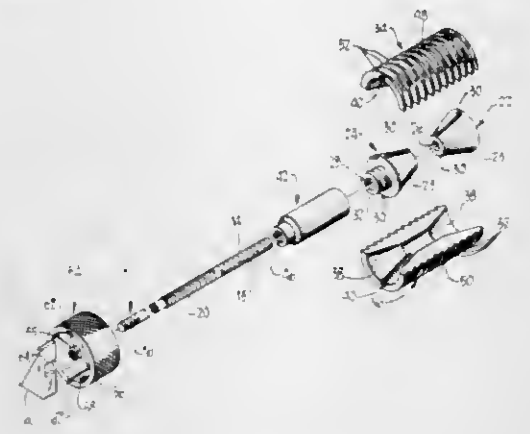
said support means receiving and supporting the mandrel for ready removal therefrom and having mandrel-stop engaging means at the entrance end of the mandrel for positioning the mandrel in a predetermined axial position,

the mandrel having mandrel-stop means at its entrance end for engaging said stop-engaging means,

and feed-controlling means mounted at the exit end of the mandrel, in predetermined relation with said mandrel-stop engaging means, for controlling the rate at which the filter sleeve is drawn off the mandrel.

4,104,775
EXTRACTION TOOL

Earl E. Lawless, P.O. Box 472, Georgetown, Calif. 95634
Filed Oct. 12, 1976, Ser. No. 731,161
Int. Cl.² B23P *19/04*
U.S. Cl. 29—265 **13 Claims**



1. An extraction tool for use in separating a pair of generally tubular members, said tool comprising:

expandable jaw means for engaging one of said tubular members, said expandable jaw means including an outer surface adapted to grip an interior surface of one of said tubular members; and

expanding means coupled to said expandable jaw means for providing substantially uniform radial expansion of said jaw means, said expanding means including a pair of oppositely disposed complementary expander heads and means connected to the expander heads for effecting relative and equal movement of each of said expander heads in opposing directions, said expanding means further including means for inhibiting relative rotation of said expandable jaw means during expansion thereof, said inhibiting means including at least one protrusion located on a surface of each of said expander heads and at least one longitudinal groove formed in said expandable jaw means adapted to slidably receive said protrusions.

4,104,776
AUTOMOTIVE PRESS

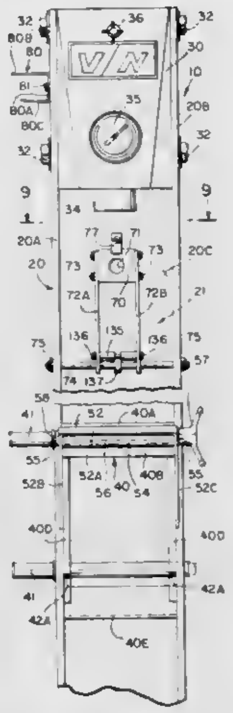
Anthony Caccioli, Longmeadow, Mass.; Philip A. Carlson, Glastonbury, Conn., and David M. Guidi, Springfield, Mass., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.
Filed Sep. 29, 1977, Ser. No. 838,031
Int. Cl.² B25B *27/14*
U.S. Cl. 29—281.3 **19 Claims**

1. A center column press for use in automotive related applications, said press comprising:

a vertical center column mounted on a base, said column having a vertically extending center wall interconnecting two vertically extending side walls to define at least one vertically extending channel on each side of said center wall;

press means contained within one of said channels, said press

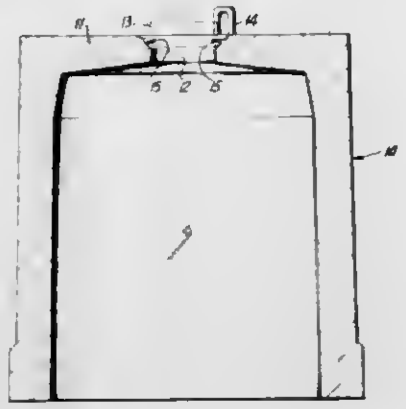
means including a moveable ram adapted to travel in a vertical direction to effect a pressing operation; and

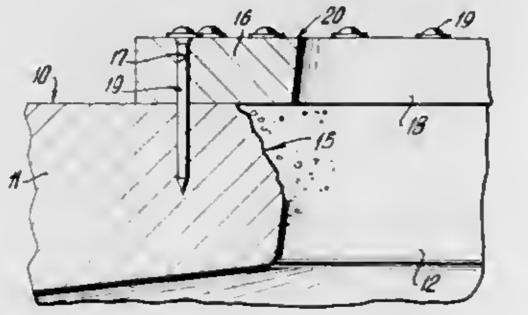


a work table adjustably mounted on said center column within said one channel between said press means and said base.

4,104,777
REPAIR OF BOTTLE TOP MOLDS

John Douglas Furness, Glamorgan, Wales, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Jun. 16, 1975, Ser. No. 586,934
Claims priority, application United Kingdom, Jun. 18, 1974, 26874/74
Int. Cl.² B23P *7/00;* **B22D** *19/10, 7/06*
U.S. Cl. 29—401 D **3 Claims**

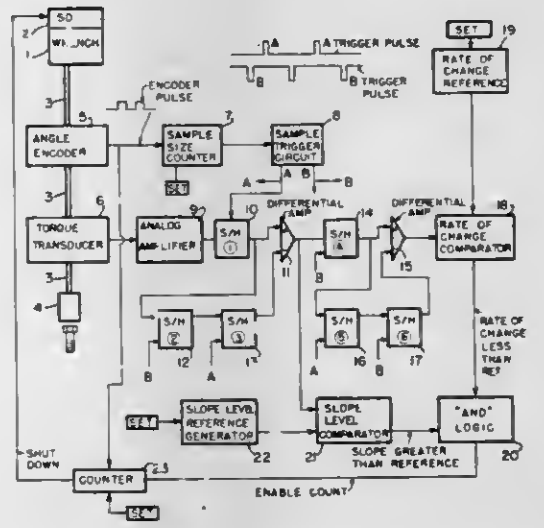




1. In a bottle top mold having an opening in the top of the mold through which molten metal is poured into the mold and a plug arranged to seat in the opening and afford an effective closure, the method of repairing an eroded surface in the opening in which the plug seats with the eroded surface preventing an effective closure of the opening by the plug, comprising positioning a ring-shaped member with an opening therein arranged to receive the plug for the mold over the eroded opening in the top of the mold and with the ring-shaped member in contact with the top of the mold and located above the eroded surface for completely covering the upper portion of the eroded surface of the opening with the central axis of the ring-shaped member in axial alignment with the central axis of the opening in the top of the mold and with the surface defining the opening in the ring-shaped member in register with the surface which originally defined the mold opening and securing the ring-shaped member to the mold so that the plug in the opening in the ring-shaped member affords an effective closure of the opening in the mold, forming the ring-shaped member with its height in the axial direction of its opening approximately one-half of its width in the radial direction, and securing the ring-shaped member to the top of the mold by explosively driving fastening members through the ring-shaped member into the top of the mold.

4,104,778
METHOD AND APPARATUS FOR FASTENER TENSIONING

Walter Carl Vliet, Landing, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Jan. 27, 1977, Ser. No. 762,988
Int. Cl.² B23Q *5/00*
U.S. Cl. 29—407 **7 Claims**



1. A method of threaded fastener tensioning comprising:

rotating the fastener;

monitoring the torque and rotation applied to the fastener to determine when the rate of change of torque increase per unit of rotation becomes a constant; and

rotating the fastener a prescribed rotary angle after said rate of change of torque increase per unit of rotation becomes a constant.

4,104,779
TIGHTENING METHOD AND SYSTEM

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.
Filed Dec. 29, 1976, Ser. No. 755,408
Int. Cl.² B25B *23/14*
U.S. Cl. 29—407 **19 Claims**

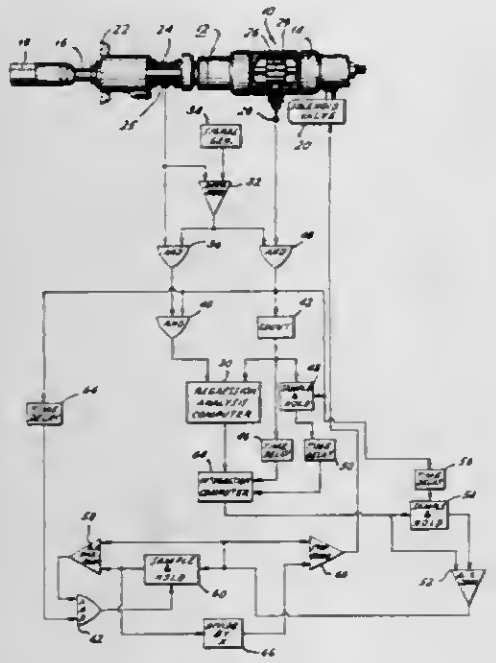
11. A method for tightening a fastener system in a joint assembly until the yield point or similarly significant point has been detected, said method comprising:

applying tightening characteristics to the fastener;

measuring a first tightening characteristic and a second tightening characteristic during the tightening cycle;

calculating the area between predetermined increments of said second tightening characteristic under the curve of said first tightening characteristic vs. said second tightening characteristic which could be plotted for said tightening characteristics;

determining the change between successive incremental areas; and,



examining changes in incremental areas and determining when the yield point has been reached.

4,104,780

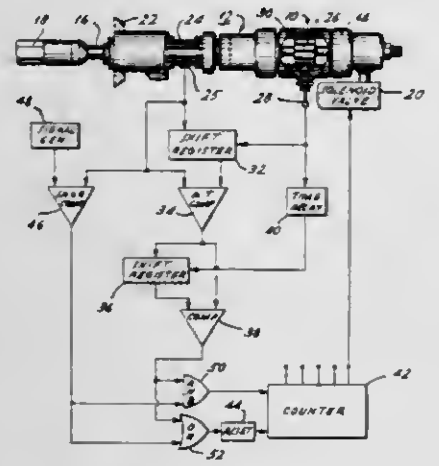
METHOD AND SYSTEM FOR TIGHTENING JOINT ASSEMBLY

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 29, 1976, Ser. No. 755,410

Int. Cl.² B25B *23/14*

U.S. Cl. 29—407 **18 Claims**



10. A method of tightening an assembly including a fastener system until the yield point or some similarly significant point has been detected, said method comprising:

applying tightening characteristics to the fastener;

measuring a first tightening characteristic and a second tightening characteristic during the tightening cycle;

determining the instantaneous slope between predetermined increments of the second tightening characteristic of the curve of said first tightening characteristic vs. said second tightening characteristic which could be plotted for said tightening characteristics for the fastener being tightened;

determining when the fastener has been tightened through a predetermined measure of said second tightening characteristic from the increment of said second tightening characteristic at which the maximum slope of the curve has been detected.

4,104,781

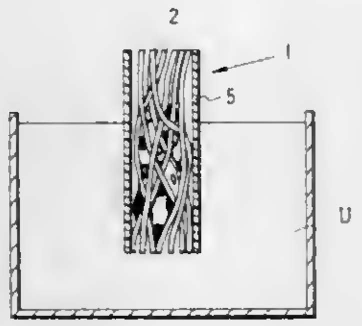
METHOD OF MANUFACTURING A MARKING PEN HAVING A NIB AND AN INK RESERVOIR INTEGRAL THEREWITH

Yoshio Midorikawa, Tokyo, Japan, assignor to Glasrock Products, Inc., Fairburn, Ga.

Filed Jun. 10, 1976, Ser. No. 694,524

Int. Cl.² B23P *17/00*

U.S. Cl. 29—419 R **3 Claims**



1. A method for producing a writing nib having an integral ink reservoir comprising:

(a) forming a plurality of fibers into a fiber bundle;

(b) forming a sheath around the outer periphery of said fiber bundle;

(c) dipping one end of the sheathed fiber bundle into a mixture of urethane prepolymer, water and a solvent for said prepolymer; then

(d) polymerizing said prepolymer in said sheathed bundle whereby the gases generated by reaction and by volatilization of the solvent form capillary passages substantially longitudinally of said bundle; and

(e) after the polymer has set, grinding the dipped end into the form of a cone.

4,104,782

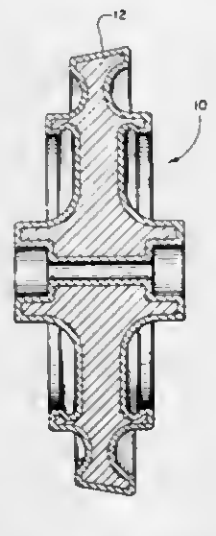
METHOD FOR CONSOLIDATING PRECISION SHAPES

Stewart J. Veeck; William R. Freeman, both of North Muskegon, and Louis E. Dardi, Muskegon, all of Mich., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Jul. 14, 1976, Ser. No. 705,087

Int. Cl.² B22D *11/126*

U.S. Cl. 29—527.2 **9 Claims**



1. In a process for producing metal shapes from powder particles wherein the particles are shaped into a self-sustaining porous preform which is subjected to a hot isostatic pressing operation consisting of locating the preform in a chamber having a surrounding gaseous atmosphere and heating the preform in said chamber to an elevated temperature while isostatic pressure is being applied, said temperature being sufficient to densify said preform and consolidate said particles through bonding thereof, the improvement comprising the steps of forming an all-encompassing porous coating on the preform prior to hot isostatic pressing, subjecting the coated preform to a vacuum whereby the preform is degasified, heating the coated preform, while maintaining the vacuum, to a temperature sufficient to fully density said coating so that the coating becomes non-porous and pressure-tight, and thereafter subjecting said preform to said hot isostatic pressing, said coating being solid during said hot isostatic pressing.

4,104,783

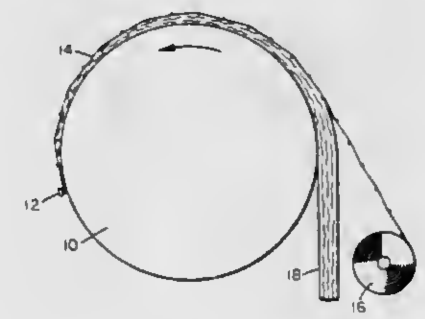
METHOD OF THERMALLY INSULATING A CRYOGENIC STORAGE TANK

Jeffrey A. Schultz, East Rochester, N.H., and Paul J. Eifel, Walnut Creek, Calif., assignors to Process Engineering, Inc., Plaistow, N.H.

Continuation of Ser. No. 741,194, Nov. 12, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 845,871

Int. Cl.² B23P *11/02*

U.S. Cl. 29—451 **5 Claims**



1. A method of insulating a cryogenic storage tank having a container vessel and an outer jacket with a space to be evacuated therebetween, comprising the steps of:

providing a fiberglass insulation means,

wrapping the insulation means about at least a section of the vessel,

providing a pervious means,

securing an end of the pervious means to the vessel,

wrapping the pervious means about the vessel with the insulation means being concurrently wrapped therewith,

securing the pervious means at another end so that the insulation means is compressed,

and fitting the jacket at least partially over the vessel.

4,104,784

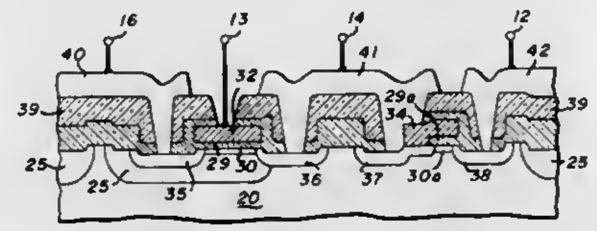
MANUFACTURING A LOW VOLTAGE N-CHANNEL MOSFET DEVICE

Thomas Klein, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 697,908, Jun. 21, 1976, abandoned. This application Apr. 1, 1977, Ser. No. 783,914

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **6 Claims**



1. The method of making a low voltage high performance MOSFET integrated circuit having an enhancement transistor connected in series with a depletion transistor, said method comprising:

depositing boron through a first mask onto a p-type silicon substrate having a resistivity in excess of about 10 ohm centimeters in the region of said enhancement transistor, said boron deposit acting to substantially lower the silicon resistivity in the region of said enhancement transistor;

growing an oxide layer over said silicon substrate in the openings in said first mask;

depositing phosphorus through a second mask onto said substrate in the regions of said enhancement transistor and said depletion transistor, said phosphorus acting to increase the silicon resistivity in the region of said enhancement transistor and to convert the conductivity type of the silicon in the region of said depletion transistor;

forming source and drain members in each region along with an overlying gate electrode to complete said enhancement and said depletion transistors; and connecting said transistors in series.

4,104,785

LARGE-SCALE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

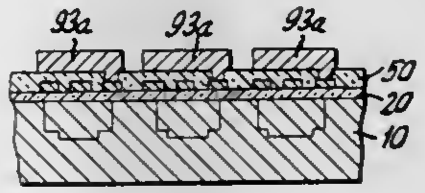
Hiroshi Shiba, and Kenji Kani, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,426

Claims priority, application Japan, Feb. 28, 1975, 50-25354

Int. Cl.² B01J *17/00*

U.S. Cl. 29—574 **20 Claims**



1. A method of fabricating a large-scale semiconductor integrated circuit device comprising the steps of forming a plurality of circuit elements in a semiconductor substrate, forming a first insulating layer having openings therein on the main surface of said substrate, forming a first layer of unit cell wirings which are connected electrically to the elements through said openings in said first insulating layer, forming a second insulating layer having openings therein and covering said first layer of unit cell wirings, forming on said second insulating layer test pads connected electrically to predetermined portions of said unit cell wirings through the openings in said second insulating layer, testing the unit cells by using said test pads, removing all of said test pads from the surface of said second insulating layer after said testing step, and forming on said second insulating layer a second layer of wirings connected to said unit cell wirings through the openings in said second insulating layer.

4,104,786

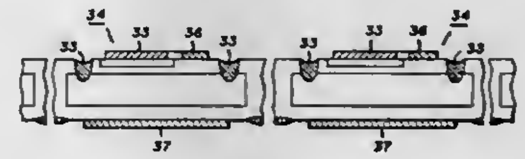
METHOD OF MANUFACTURE OF A SEMICONDUCTOR DEVICE

John K. Boah, Port Byron, and Richard W. Kennedy, Skaneateles, both of N.Y., assignors to General Electric Company, Auburn, N.Y.

Division of Ser. No. 635,747, Nov. 26, 1975, Pat. No. 4,063,272. This application Feb. 11, 1977, Ser. No. 767,946

Int. Cl.² B01J *17/00*

U.S. Cl. 29—583 **11 Claims**



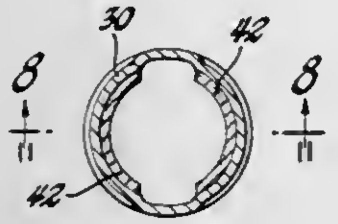
1. A method of making semiconductor devices comprising the steps of:

providing a wafer of semiconductor material, said wafer

containing a first type of impurity for imparting one conductivity type thereto;
thermomigrating through said wafer a plurality of elongated bodies of a material which is an impurity of a second type which imparts the opposite conductivity type to said semiconductor material, said thermomigrating step forming a plurality of isolation regions that separate a plurality of device regions of said given conductivity type in said wafer;
diffusing an impurity of the second type into each major surface of said wafer so that each of said device regions comprises an interior region of said one conductivity type surrounded by semiconductor material of said opposite type;
forming a peripheral groove in each of said device regions in one of said major surfaces, said groove extending into the associated interior region such that the area of said one major surface within said groove is electrically isolated from the other major surface;
passivating said groove; and
subdividing said wafer into semiconductor device pellets through said isolation regions, each containing one of said device regions.

4,104,787
FORMING CURVED WAFER THIN MAGNETS FROM RARE EARTH-COBALT ALLOY POWDERS

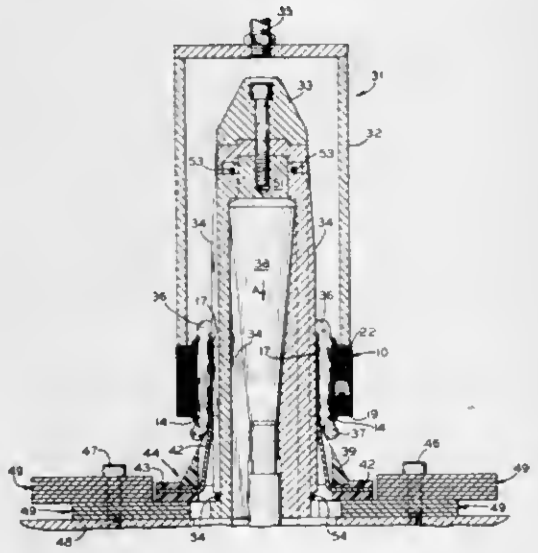
William F. Jandeska, Rochester; Charles F. Netherton, Marine City, and Charles W. Vigor, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 21, 1977, Ser. No. 779,525
Int. Cl.² H02K *15/02*
U.S. Cl. 29—596 **3 Claims**



1. A method of making a D.C. motor having thin, curved rare-earth cobalt permanent field magnets carried on the motor casing, comprising:
placing a mandrel having a working surface shaped to define the inner surface of a green powder compact of a curved magnet in a spaced apart positon adjacent to a die to form a molding cavity for said compact between the mandrel and the die,
filling the cavity with rare-earth cobalt metal powder,
magnetically aligning the powder to a radial direction with respect to the curvature of the desired permanent magnet,
compacting the aligned powder in the axial direction with respect to the curvature of the magnet to form a green compact having a pack density of at least 65% of the theoretical density of said powder,
positioning at least two such green compacts on a mandrel shaped to locate the magnets in their intended position in the motor casing and to form the interior curved surfaces of the magnets,
enclosing the assembly of the compacts and mandrel in a casing comprising a thin wall metal sheet capable of serving as the motor casing and of retaining a vacuum and excluding high temperature, high pressure gases,
evacuating the casing,
sealing the casing,
densifying the evacuated compacts under an isostatic gas pressure of from about 20 to 200 MPa at a temperature of from about 900° to 1200° C. for a time sufficient to densify the magnets and metallurgically bond them to the casing, and
removing the mandrel.

4,104,788
METHODS FOR POSITIONING INSULATING MEMBERS IN MAGNETIC CORE SLOTS

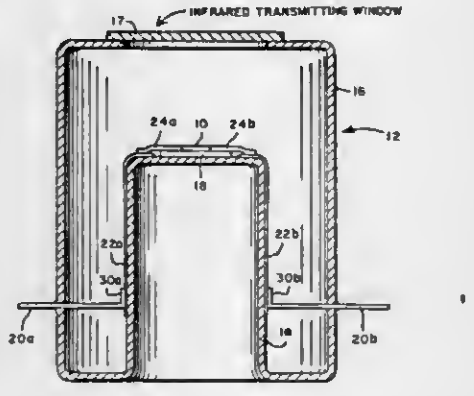
Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.
Filed Mar. 21, 1977, Ser. No. 779,777
Int. Cl.² H02K *15/10*
U.S. Cl. 29—596 **8 Claims**



1. A method of performing a preselected manufacturing operation on a stator assembly and also axially repositioning a plurality of previously placed axially extending insulators carried in slots of a magnetic core along with side turn portions of at least one winding, said method comprising: performing the preselected manufacturing operation and, while performing such operation, also axially repositioning the plurality of previously positioned insulators along slots of the magnetic core.

4,104,789
PHOTODETECTOR MOUNTING AND CONNECTING

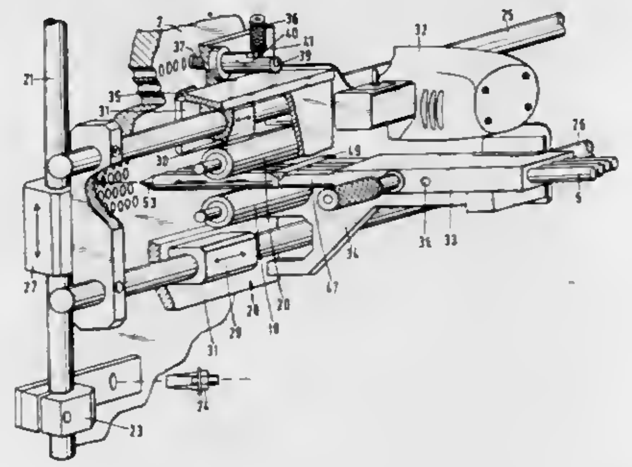
Gene A. Robillard, Stoneham, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.
Division of Ser. No. 614,804, Sep. 19, 1975, Pat. No. 4,005,288. This application Nov. 15, 1976, Ser. No. 741,573
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **6 Claims**



1. A method of providing electrical connection to a photodetector, including a photodetecting material means having an initial lateral extent in directions parallel to a detecting surface therein, in photodetector mounting apparatus of the Dewar type having an inner flask, the method comprising:
forming an electrical lead tab in a manner permitting substantially retaining the initial lateral extent of the photodetecting material means such that the electrical tab lead has a part attached to the photodetector including attached to the photodetecting material means and another part projecting unsupported beyond the photodetector;
forming a conductive path on the inner flask, the conductive path extending from the side surface on to the top surface of the inner flask;
mounting the photodetector on the top surface of the inner flask with the projecting part of the electrical lead tab aligned with a part of the conductive path; and
bonding the electrical lead tab to the conductive path.

4,104,790
PIPE INSTALLING APPARATUS FOR LARGE HEAT EXCHANGERS

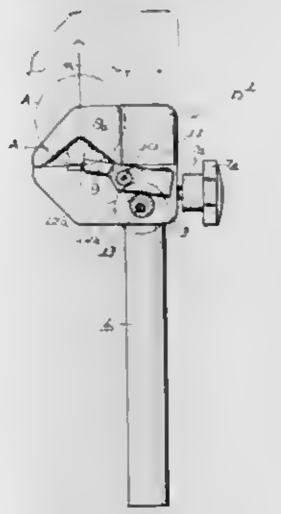
Gerhard Hindrichs, Wuesterfeld 25b, Wuppertal, Fed. Rep. of Germany
Filed May 5, 1977, Ser. No. 794,131
Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620406
Int. Cl.² B23P *19/04*
U.S. Cl. 29—707 **8 Claims**



1. Mounting apparatus for inserting tubes into holes of perforated supporting plates of large heat exchangers, such as cooling condensers in power plants, comprising:
a cross slide arrangement (16) directly mountable on one of said tube supporting plates (2) and extending over a plurality of holes in said supporting plate;
a thrust assembly (17) mounted on said cross slide arrangement (16) being shiftable along said plurality of holes;
said thrust assembly (17) being provided with one or more parallel guide channels (18) which are alignable with the holes in said tube plates for guiding the tubes that are to be inserted by an electric motor-driven pair of rollers that are attached to said thrust assembly (17) for the advancing of the tubes;
said thrust assembly (17) comprising a guide piece (33) which is disposed in said thrust assembly (17) and is shiftable in the direction of the pair of rollers (19,20);
said guide piece (33) having the said guide channels (18) for the tubes being mounted with the terminal section (47) facing the pair of rollers (19,20);
said guide piece (33) having a height which is equal to the diameter of the tubes;
a swivelable locking device (49) mounted on said guide piece (33) that can be swivelled up by the tubes passing through and lying in front of its outlet end whereby said locking device (49) may be inserted between the rollers as a residual thrust rammer; and
control means to prevent the driven rollers from scoring the tubes inserted by changing, slowing or reversing the driving of the rollers.

4,104,791
STRIPPER FOR COATED WIRES

Takatoshi Sunahara, Matsumoto, Japan, assignor to Kabushiki Kaisha Izumiseiki Seisakusho, Matsumoto, Japan
Filed Jul. 18, 1975, Ser. No. 597,133
Claims priority, application Japan, Jul. 24, 1974, 49-88714
Int. Cl.² H02G *1/12*
U.S. Cl. 30—90.1 **1 Claim**



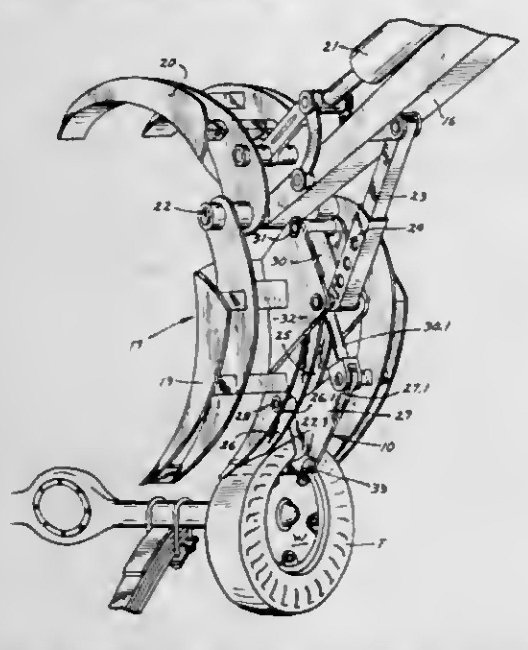
1. A tool for removing insulation from electric wires having a pair of wire-holding members movable towards and away from each other, one of said wire-holding members having a wire-contacting surface with a V-shaped wire-receiving recess in a plane perpendicular to the axis of the electric wire held between said wire-holding members, said one wire-holding member having a side surface mounting a cutter knife, said cutter knife having a middle portion pivotally connected to said side surface of said wire-holding member, the other of said wire-holding members having a planar cable-contacting surface, an edge of said cutter knife being positioned at the intersecting point of the bisector of the vertical angle of said V-shaped recess and said planar cable-contacting surface of said other wire-holding member, said edge of cutter knife being elastically urged against the insulation of the wire inserted in an opening formed between said wire-holding members, a plane including the wire-contacting surface of said other wire-holding member and perpendicular to the bisector of said V-shaped recess of the wire-holding members linearly contacting the wire held between the wire-holding members in the direcion of axis of wire; said side surface of said one wire-holding member further including a rotatable eccentric cam with an operation knob; a rear end portion of cutter knife being elastically urged against said cam; an end surface of said eccentric cam, and said side surface opposite thereto of a wire-holding member having pin means and holes engaging and disengaging to optionally set the angular position of said eccentric cam to slidingly move in the direction in which said pin means engages said holes.

4,104,792
WHEEL AND TIRE CUTTER

Roy E. LaBounty, 1607 - 8th Ave., Two Harbors, Minn. 55616
Filed Jan. 21, 1977, Ser. No. 760,840
Int. Cl.² E02F *3/28;* **B23P** *19/00*
U.S. Cl. 30—134 **9 Claims**

1. Apparatus for handling scrap metal and especially for use in removing tires and handling and reprocessing wrecked automobile bodies, comprising:
a backhoe grapple having an upper jaw and a lower jaw,
a shear for slicing through such tires including a pair of

stationary cutting anvils affixed on the back side of the lower jaw of the grapple, and



a swinging shear blade mounted between such cutting anvils and swinging therealong and independently of said upper jaw and with a shearing action.

4,104,793

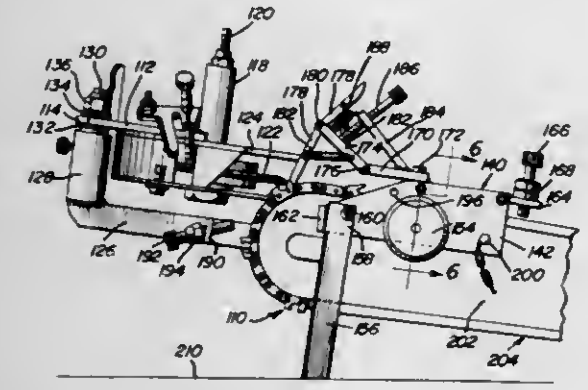
SAW CHAIN SHARPENER

Jack F. Simington, Chiloquin, Oreg., assignor to Simington Products Co., Chiloquin, Oreg.

Continuation-in-part of Ser. No. 516,129, Oct. 18, 1974, which is a continuation-in-part of Ser. No. 481,447, Apr. 29, 1975, Pat. No. 3,880,018. This application Feb. 25, 1977, Ser. No. 772,344

Int. Cl.^{2} B23D *63/16*

U.S. Cl. 30—139 **9 Claims**



1. A chain saw sharpener, said sharpener including a mount, a rotary grinding member journalled from said mount for rotation about a first upstanding axis, a generally horizontal support arm, means oscillatably mounting said mount from one end of said support arm for angular displacement about a second axis generally paralleling and spaced to one side of said first axis, the other end of said support arm including chain saw bar support structure supported therefrom a chain saw bar nose end removably supported from said support structure with said bar generally paralleling said support arm and having its nose end facing toward said second axis and with at least the upper portion of said nose end exposed and the peripheral edges of said bar sufficiently free of adjacent obstructions to allow longitudinal shifting of a saw chain along said peripheral edges, said arm including depending support means for support from a support surface below said arm and adapted to support said nose end in slightly elevated position above said support surface when the end of the chain saw remote from said nose end rests upon said surface, the spacing between said second axis and said chain saw bar nose end being greater than the spacing between said axes and such to position angularly spaced peripheral portions of the side of said rotary grinding member remote from said second axis closely adjacent said nose end, and on opposite sides thereof, when said mount is swung to positions with said first axis closely adjacent opposite sides of a plane containing said second axis and generally paralleling said arm.

4,104,794

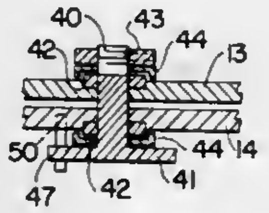
SCISSORS

Andrew C. Carroll, West Monroe, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,548

Int. Cl.^{2} B26B *13/00*

U.S. Cl. 30—268 **2 Claims**



1. A scissors the two blades of which are pivotally joined by a bolted assembly, said bolted assembly comprising

a headed screw

a pair of split ring lock washers

a pair of lockwasher covers, and

a self-locking nut,

said assembly mounted through a pivot hole in each scissors blade with the inner faces of the two blades spaced apart from each other, with a lockwasher bearing on each external face of each blade, a lockwasher cover bearing against and enclosing the sides of each lockwasher, with the head of the screw bearing against one cover and the nut, threaded to the screw, bearing against the other cover, together with means to latch the head of the screw in non-rotatable engagement with the adjacent blade.

4,104,795

ELECTRICAL CUTTING APPLIANCES

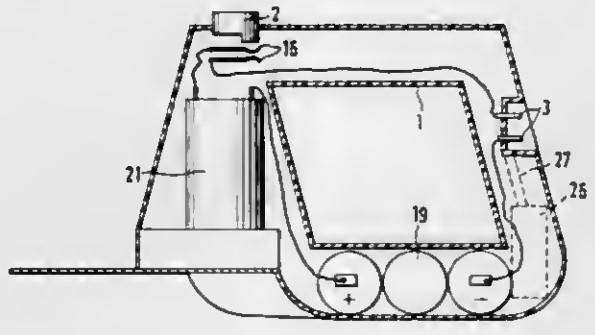
Franc Loplc, Burlafingen, Fed. Rep. of Germany, assignor to Gardena Kress & Kastner GmbH, Ulm, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,584

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545838

Int. Cl.^{2} B26B *7/00*

U.S. Cl. 30—272 A **3 Claims**



1. An electrical cutting appliance having a housing, blades, a motor for driving said blades, a primary electrical circuit incorporating said motor, a source of electrical energy within said appliance, and two pairs of switching contacts in series in said primary circuit for connecting said motor to said source of energy, one of said pairs of switching contacts being located externally of said housing, said housing having a manual grip, said external contacts being spaced from said grip a distance sufficient to insure that said contacts cannot be actuated by a single hand holding said grip, the second of said pairs of switching contacts being located internally of said housing adjacent said grip, means for actuating said internal switching contacts, and a removable electrical plug means for connecting and disconnecting said external switching contacts to each other whereby said plug means must be used for operation of said appliance.

4,104,796

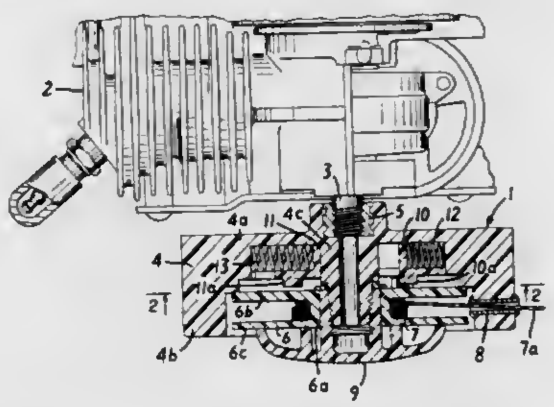
FILAMENT-TYPE TRIMMER

John D. Sheldon, Charlotte, N.C., assignor to Textron Inc., Providence, R.I.

Filed Jul. 29, 1977, Ser. No. 820,531

Int. Cl.^{2} A01D *55/18*

U.S. Cl. 30—276 **8 Claims**



1. A filament-type trimmer comprising a rotatable housing, at least one spool rotatably supported by said housing, at least one filament wound on said spool, guide means on said housing past which an end portion of said filament extends in passing from said spool to the exterior of said housing whereby said end portion of said filament is extended from said housing by centrifugal force to act as rotary cutting means upon rotation of said housing at sufficient speed, means for rotationally driving said housing, said driving means having such speed-load characteristics that the speed of rotation increases with a decrease in load, means for normally restraining rotation of said spool relative to said housing and responsive to centrifugal force upon increase in the speed of rotation of said housing upon decrease in load on said driving means upon decrease in length of the extended end portion of said filament to release said spool for rotation relative to said housing by the pull exerted by centrifugal force on said extended end portion of said filament to thereby increase the length of said extended end portion of said filament.

4,104,797

ROTARY CUTTING ASSEMBLY

George C. Ballas, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 633,456, Nov. 19, 1975, Pat. No. 4,035,912, which is a continuation-in-part of Ser. No. 321,580, Jan. 8, 1973, Pat. No. 3,826,068, which is a continuation-in-part of Ser. No. 207,198, Dec. 13, 1971, Pat. No. 3,708,967. This application Dec. 2, 1976, Ser. No. 747,004

Int. Cl.^{2} A01D *55/18;* B26B *27/00*

U.S. Cl. 30—276 **20 Claims**

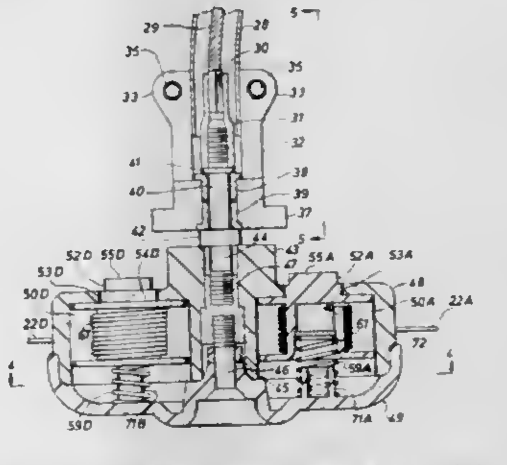
1. As a sub-assembly in apparatus for cutting vegetation and the like, means comprising

a rotary body rotatable about a concentric axis and having a plurality of internal circular compartments spaced about a concentric axis and each communicating separately with a corresponding plurality of equally spaced apart apertures each defined by spaced apart curvilinear wall portions of the periphery of said body,

said compartments in said rotary body also each communicating with one of a corresponding plurality of non-circular apertures equally spaced about said axis and between said axis and said periphery of said body,

a corresponding plurality of spool-like members each removably disposed in one of said circular compartments in said body and each having circular upper and lower flange portions rotatable in said compartments and a non-circular knob-like portion protruding from an upper flange portion and insertable in the corresponding one of said non-circular apertures in said body,

a corresponding plurality of non-metallic line members each having one end secured to and wound about one of said spool members and having its other end extending from the respective compartment through the corresponding one of said apertures and radially outwardly of the periphery of said body,



a closing member detachably fastened to said rotary body for forming with said body a rotatable housing assembly securing said spool members in said compartments,

a corresponding plurality of spring members mounted in said closing member and yieldably thrusting said non-circular knob-like portions of said spool members insertably into and through said non-circular apertures in said body, and

means for securing each of said spring members to said closing member, said securing means extending longitudinally into and along said spring member a distance greater than one third of the uncompressed length of said spring during relaxation of said spring.

4,104,798

PORCELAIN FUSED TO METAL CROWN

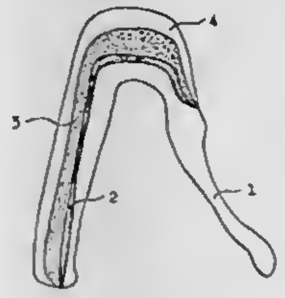
Shigeo Takahashi, and Michio Ito, both of Shioziri, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Matsumoto Dental College, Shioziri, both of Japan

Filed Jul. 21, 1976, Ser. No. 707,715

Claims priority, application Japan, Jul. 21, 1975, 50-89541; Jul. 22, 1975, 50-89781

Int. Cl.^{2} A61C *5/08*

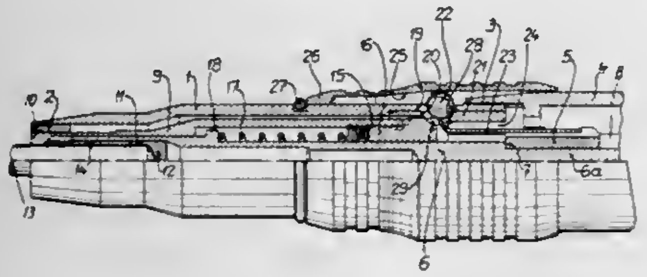
U.S. Cl. 32—12 **13 Claims**



1. A porcelain fused to metal crown having a composite structure comprising layers of a bonding agent and ceramics which are thermally sprayed around the metal crown, and a layer of fused porcelain formed on the above layers.

4,104,799
DENTAL HANDPIECE

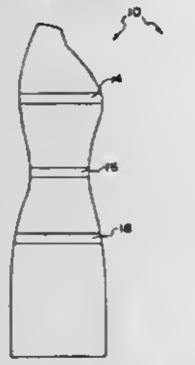
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., France
Filed Dec. 17, 1976, Ser. No. 751,999
Claims priority, application France, Dec. 22, 1975, 75 39915; Oct. 20, 1976, 76 32151
Int. Cl.² A61C *1/08*
U.S. Cl. 32—26 **9 Claims**

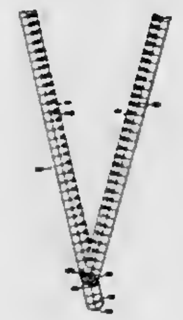


1. In a dental handpiece comprising a hollow body, a central rotary shaft rotatably mounted in the body, a tool-gripping chuck carried by a forward end of the shaft, a first chuck-actuating sleeve slidably axially mounted on the shaft between a first position corresponding to a tool-gripping position of the chuck and a second position corresponding to a tool-release position of the chuck, a first spring biasing the tool-gripping sleeve axially relative to the shaft, said sleeve having a generally conical wall, at least one radially-movable ball cooperating with said generally conical wall of the first sleeve, and an external second chuck-actuating sleeve on the body cooperating with the ball to radially inwardly move the ball to axially move the first sleeve against the action of the biasing spring, the improvement wherein said at least one ball is disposed in an opening of the body, a second spring biasing said ball radially outwardly to a rest position against an inner wall of the second sleeve and out of contact with said conical wall of the first sleeve, in which rest position of the ball the first sleeve is biased by the first biasing spring to said first position, the second sleeve being manually movable and having on its inner wall an inclined part which moves the ball radially inwardly against the action of the second spring through said opening into contact with said conical wall of the first sleeve to move the first sleeve to its second position in response to movement of the second sleeve.

4,104,800
KIT FOR DRAFTING GARMENT PATTERNS

Marjorie M. Dyal, 1934 S. Kenilworth, Berwyn, Ill. 60402
Division of Ser. No. 551,268, Feb. 20, 1975, Pat. No. 4,031,626. This application Mar. 30, 1977, Ser. No. 783,022
Int. Cl.² A41H *3/06*
U.S. Cl. 33—17 R **1 Claim**



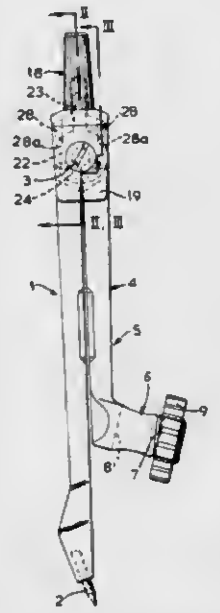


1. As an article of manufacture, a proportioned garment pattern construction kit comprising, in combination, a planar board suitable for receiving and holding pins and the like fastening means, a generally opaque and flexible sheet capable of being inscribed with a generally permanent graphical display, a first flat rule member having opposite ends and a first scale inscribed thereupon, the scale having first divisions equispaced along its length and having a row of perforations, each perforation intersected by one of said first divisions, one of said ends having secondary divisions taken along the first division adjacent said one end, said secondary divisions being spaced equally and dividing the said first division into equal quarter sections, a second flat rule member having opposite ends and a second scale inscribed thereon, said second rule member being longer than said first rule member otherwise carrying identical divisions and perforations, said first and second scales each having indicia coincident with the divisions thereof, one scale carrying different indicia than the other, said first rule member capable of being fastened to said sheet member at the location of one of said perforations carried by said first rule and pivoted alternatively 180 degrees about said location, said first and second rules capable of receiving marking means inserted through a selected one of said other perforations and thereafter the rule adapted to be pivoted about said insertion location 180 degrees, repeatedly whereby to mark off a first set of equispaced locations upon said sheet in one direction, said second rule member capable of being fastened to said sheet at one of the first set of marked-off locations and manipulated in an identical manner to manipulation of said first rule member to mark off a second set if equispaced locations upon said sheet, whereby the second set of locations extends along a line rotated 90° from a line passing through the first set of locations, said first set of locations having different spacing than the second set of equispaced locations, said first and second sets of locations being marked off to define lineal scribes therethrough whereby defining said graphical display as a plurality of identical rectangular areas defined by said linear scribes taken through said sets of locations, said flexible sheet adapted to have a light transparent sheet secured thereto superposed upon said graphical display and a curve scribing tool for scribing curvelinear representations with reference to at least a said pair of points located upon said graphical display, said curve scribing tool comprising a pair of flat arm members each carrying a quarter-inch reference scale and arranged one on the other in juxtaposed relation and pivotally secured at a location spaced from one of their ends, said arms capable of being spread by pivoting same in parallel planes, the pair of points being matched with a predetermined number along the scale of one and the other arm, one arm being pivotable in a horizontal plane relative to the other about a point represented by the pivot location juncture of the arms of the curve scribing tool when the points are matched with said predetermined number, the spacing on the reference scale being the same as the spacing of the first divisions carried by said rule members.

4,104,801
DRAWING INSTRUMENT

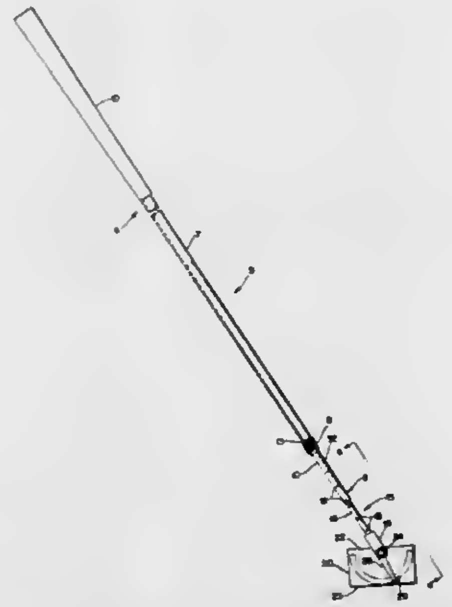
Raymond Anthony Payton, Bewdley, England, assignor to Helix International Limited, West Midlands, England
Filed Jul. 19, 1977, Ser. No. 817,104
Claims priority, application United Kingdom, Nov. 19, 1976, 48257/76
Int. Cl.² G01B *3/16*
U.S. Cl. 33—27 B **8 Claims**

1. A drawing instrument comprising:
(a) a pair of limbs including pivot holes in the inner ends thereof,
(b) a pivot received in said pivot holes and pivoting together said limbs forming an assembly at said inner ends,
(c) a bow top having an interior hole and fork limbs embracing the assembly of said inner ends of the pivoted limbs,
(d) said fork limbs including pivot holes for receiving said pivot which connects said pivoted limbs to the bow top,
(e) a centralizing member held between and keyed to said inner ends and including a portion which projects up into said interior hole,
(f) said centralizing member including an elongated pivot receiving hole,
(g) said centralizing member being effective to press against a sidewall of said hole in the bow top to cause the bow top to turn and keep central upon any angular movement of the one said pivoted limb with respect to the other said pivoted limb, and
(h) said bow top including locating means cooperable with said inner ends to prevent, during assembly of the instrument with the centralizing member keyed in place between said inner ends of the two pivoted limbs positioned together side by side but before installation of the pivot, movement of said inner ends toward the bow top beyond a position in which said pivot receiving holes in said inner ends and said bow top are aligned for receiving the pivot.



4,104,802
APPARATUS FOR USE IN MANUFACTURING AND SELECTING GOLF CLUBS

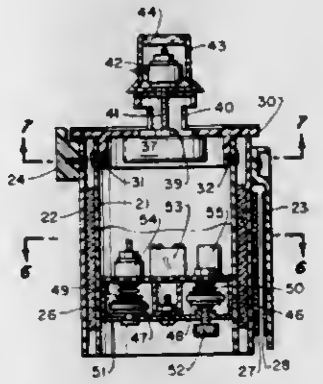
Clyde H. Johnston, 1182-15th St., Holly Hill, Fla. 32017
Filed Sep. 7, 1977, Ser. No. 831,247
Int. Cl.² G01B *5/00;* A63B *57/00, 69/36*
U.S. Cl. 33—174 F **4 Claims**



1. An apparatus for use in the manufacture or selection of a golf club best suited to a particular player comprising an elongated shaft having an extensible lower section, means for clamping said shaft in different extended positions, an extension connected to and extending from the distal end of the extensible section of said shaft and having a longitudinally extending flat portion, a plate disposed against said flat portion, means pivotally connecting said plate to the extension for pivotal movement about an axis generally orthogonal to the axis of said shaft, said plate having a straight bottom edge adapted to rest on a flat surface which supports a player gripping an upper portion of said shaft, said extension having an arm extending beyond said pivot means and disposed against one side of said plate, said arm having an indicator positioned in alignment with the axis of said shaft, said one side of the plate having angle markings thereon for use with said indicator to indicate the angle formed by the axis of the shaft and the bottom edge of said plate for indicating the correct angle of the sole of a golf club head relative to a golf club shaft of a length corresponding to the length of the adjusted shaft of the apparatus.

4,104,803
DIRECTION FINDING DEVICE AND GUIDANCE SYSTEM

Raymond W. Hoeppel, P.O. Box 997, Oak View, Calif. 93022
Filed Jan. 3, 1977, Ser. No. 756,172
Int. Cl.² G01C *17/30*
U.S. Cl. 33—352 **10 Claims**



1. A direction detecting assembly comprising a magnetic reed relay, said relay comprising a magnetic reed switch in flux coupling relationship with a solenoid, said relay being mounted rigidly on a first given framework; at least one source of magnetic bias affixed to said first given framework in flux coupling relationship with said relay; externalmeans to control at least one said source of bias; a power source; capacitive means; and electrical transducer means to indicate when switch contacts operate; said switch and solenoid being connected in circuit with said power source, capacitive means and transducer means so that the current through said solenoid and transducer means is controlled by the contacts of said switch, the flux from said solenoid opposing the flux produced by said source of bias, thus causing said switch to open and close in a vibrating manner at a rate proportional to the component of the earth's magnetic field in a direction generally parallel to the major axis of said switch, said transducer indicating the state of vibration of said contacts; position indicator means attached to said first given framework to indicate the relative orientation of said framework with respect to magnetic North; means to manually adjust the relative position of said position indicator means with respect to the major axis of said switch, so that the orientation of said first given framework will relate to true North rather than to magnetic North; and means to enable the maintainance of the major axis of said switch in a fixed position with regard to the horizontal plane of the earth at all times.

4,104,804
METHOD FOR DRYING EXPLOSIVE MATERIALS

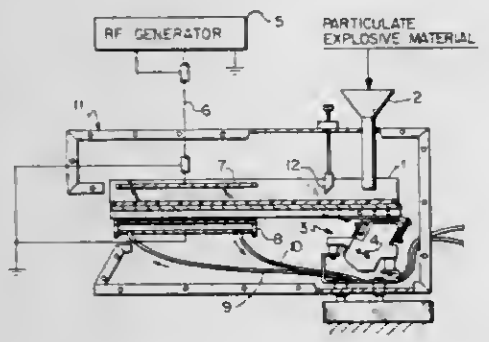
Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla. 33803
Continuation-in-part of Ser. No. 461,964, Apr. 18, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,663
Int. Cl.² F26B *3/34*
U.S. Cl. 34—1 **11 Claims**

1. The method for drying explosive materials, comprising
supplying the explosive material in particulate form to a drying zone;
passing the particulate explosive material through the drying

zone while agitating the explosive material to cause the particles thereof to move in random fashion without residing in contact with any solid surface and with no significant portion of the particulate material residing as a relatively static mass of particles;

subjecting the particulate explosive material to radio frequency radiation to heat the moisture contained within the particles while the particulate explosive material is being agitated in the drying zone;

maintaining a gaseous atmosphere in the drying zone during said steps of agitating and subjecting to radio frequency radiation,



said step of subjecting the particulate explosive material to radio frequency radiation causing moisture contained within each particle to be vaporized without substantial direct heating of the particle,

random movement of the particles of the explosive material resulting in exposure of the entire surface of each particle to said gaseous atmosphere for escape of the moisture from the particle into the atmosphere and transfer of heat from the particle to said gaseous atmosphere; and

recovering the particulate explosive material from the drying zone with the particles thereof having a reduced moisture content and a temperature which is low as compared to the ignition temperature of the particles.

4,104,805
SEQUENTIAL DRYING SYSTEM WITH ISOLATED CLOSED DRYING PATHS

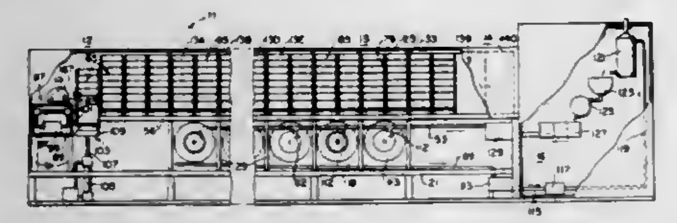
Thomas Margittai, State College, Pa., assignor to Seymour C. Yuter, Briarcliff Manor, N.Y., a part interest

Continuation of Ser. No. 444,456, Feb. 25, 1978, abandoned, which is a continuation of Ser. No. 284,209, Aug. 28, 1972, abandoned, which is a division of Ser. No. 65,400, Aug. 20, 1970, Pat. No. 3,738,016. This application Sep. 23, 1976, Ser. No. 726,166

The portion of the term of this patent subsequent to Jun. 12, 1990, has been disclaimed.

Int. Cl.² F26B *5/06, 13/30*

U.S. Cl. 34—5 **12 Claims**



11. A method of freeze drying at atmospheric pressure with a plurality of drying stations connected together to form a tunnel, comprising the steps of:

(a) separating and heat insulating the drying stations from each other, and thus enclosing their atmospheres, during drying intevals;

(b) maintaining the temperatures of some of the drying stations, during drying intervals, at different preselected temperatures below the freezing point of the material to be dried; and

(c) repeatedly circulating the enclosed atmosphere of each of the drying stations, first over the material to be dried to extract moisture therefrom, and then over a hygroscopic material to remove moisture in the circulating atmosphere.

4,104,806
METHOD OF FLUIDIZED BED DRYING

Robert J. Reusch, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jun. 2, 1977, Ser. No. 802,697

Int. Cl.² F26B *3/08*

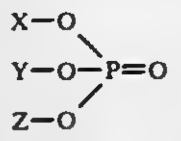
U.S. Cl. 34—10 **18 Claims**

1. In the method of drying particulate matter by fluidized bed drying the improvement comprising adding an effective amount, in the range of about 0.005 to about 0.25 parts by weight per hundred parts of particulate matter, of a fluidizing agent selected from the group consisting of:

(a) carboxylic acids and the metal salts and esters thereof, wherein the carboxylic acids are normal or branched hydrocarbon chain with the chain containing about 16 to about 30 carbon atoms,

(b) metal salts of alkyl sulfonates and alcohol sulfates wherein the hydrocarbon chain contains about 16 to about 30 carbon atoms,

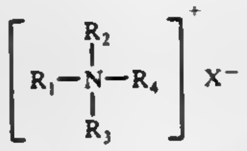
(c) phosphorus compounds represented by the formula



$$\begin{array}{l} X{-}O \\ Y{-}O{-}P{=}O \\ Z{-}O \end{array}$$

wherein X, Y and Z are hydrogen, a C_{16}–C_{30} alkyl group or a metal cation with at least one of X, Y, and Z being a C_{16}–C_{30} alkyl group,

(d) quaternary ammonium compounds represented by the formula



$$\left[\begin{array}{c} R_2 \\ | \\ R_1{-}N{-}R_4 \\ | \\ R_3 \end{array}\right]^+ X^-$$

wherein R_1 is an alkyl group containing about 16 to about 30 carbon atoms, R_2, R_3, and R_4 are alkyl groups containing from 1 to 28 carbon atoms, with the total number of carbon atoms in R_2, R_3, and R_4 being not more than 30, and wherein X is halogen or sulfate.

4,104,807
MACHINE FOR THE CONTINUOUS PREPARATION AND PACKAGING OF FREEZE-DRIED MATERIALS

Hans Braun, Ilvesheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

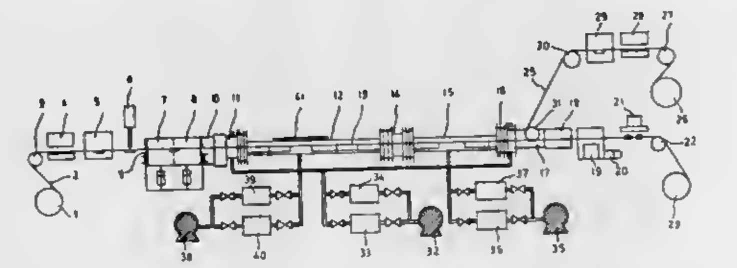
Filed Apr. 1, 1977, Ser. No. 783,896

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615815

Int. Cl.² F26B *13/28, 13/30, 15/22*

U.S. Cl. 34—92 **7 Claims**

1. In an apparatus for the continuous preparation and packing of freeze-dried material, having a horizontally movable web and successively disposed forming, freezing, freeze-drying, heat-sealing, punching and transport devices, wherein the improvement comprises the freeze-drying devices consist of two successively disposed freezers having separate refrigerant circuits, and a primary drying tunnel and a secondary drying tunnel having separate evacuating and heating systems, hermetically closable air locks located ahead of the primary drying tunnel, between the primary and secondary drying tunnels, and at the end of the secondary drying tunnel, said air locks comprising compressible and expandable walls, retractable tables and upwardly and downwardly opening slide valves for



sealing the primary drying tunnel hermetically from the secondary drying tunnel and advancing means coupled to the air locks and movable in the horizontal direction to effect the expansion and compression of the air lock walls for advancing the movable web.

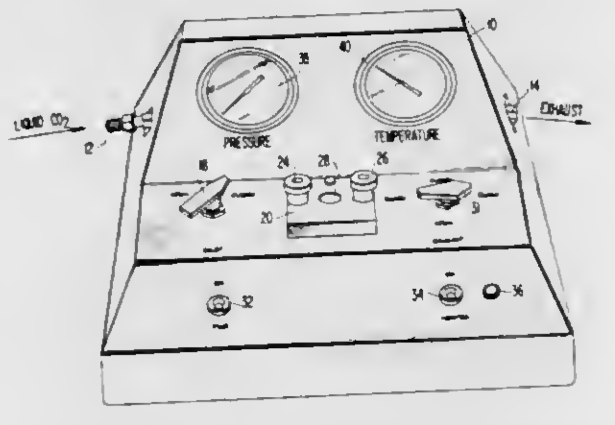
4,104,808
SEMI-AUTOMATIC CRITICAL POINT DRYING APPARATUS

John E. Horne, 6001 34th Ave., Hyattsville, Md. 20782; Stephen A. Van Albert, 12620 Springloch Ct., Silver Spring, Md. 20904, and A. J. Tousimis, 11504 Stonewood La., Rockville, Md. 20852

Filed Aug. 11, 1977, Ser. No. 823,793

Int. Cl.² F26B *19/00*

U.S. Cl. 34—243 R **3 Claims**



1. In a critical point dryer apparatus for preparing a specimen for examination by electron microscopy, said sample being saturated with a dehydrating fluid which is to be replaced by a transitional fluid which in turn is to be removed from the specimen by critical point drying while preserving the three-dimensional morphology of the specimen, said apparatus including a pressure chamber for receiving the specimen, means for precooling the chamber with the transitional fluid, means for filling the chamber with the transitional fluid in liquid form, means for purging the specimen of the dehydrating fluid, and replacing the dehydrating fluid with the transitional fluid, means for elevating the temperature and pressure of the chamber above the critical temperature and pressure of the transitional fluid, and means for removing the transitional fluid as a gas by bleeding off the chamber pressure until the chamber is at atmospheric pressure, said chamber having an inlet through which the transitional fluid enters the chamber and an outlet through which the transitional fluid leaves the chamber, the improvement comprising:

a manually controllable multi-way valve having an input port connected to the outlet of the chamber and at least a PURGE output port and a BLEED output port, and flow restriction means in communication with said PURGE and BLEED output ports for controlling the flow rates of the transitional fluid through the chamber during the purging of the specimen and the bleeding of the chamber, respectively, thereby preventing damage to the specimen by excessively high flow rates of the transitional fluid.

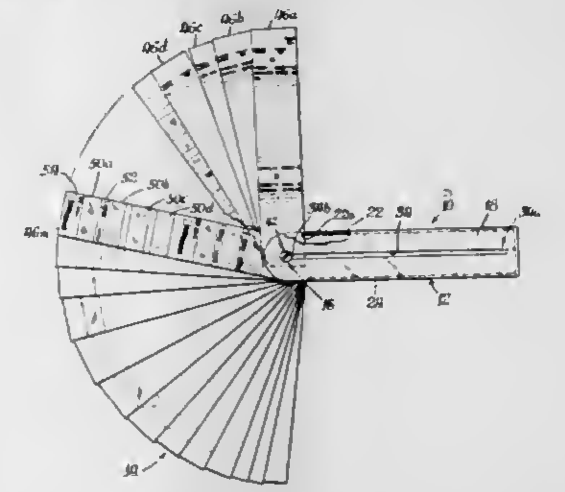
4,104,809
COLOR SAMPLE DISPLAY DEVICE

Frederick A. Day, Hanover Park, and Melvin D. Garbark, Schaumburg, both of Ill., assignors to Color Communications, Inc., Melrose Park, Ill.

Filed Sep. 30, 1976, Ser. No. 728,301

Int. Cl.² B44D *2/00*

U.S. Cl. 35—28.5 **4 Claims**



1. A color sample display device comprising, a case having an internal chamber open on at least one end and bounded by at least two side walls, said two side walls defining opposed elongated slots extending through said side walls and extending along the longitudinal lengths thereof, a support shaft having opposite ends received in and guided by said opposed slots for longitudinal movement along the lengths of said slots, said support shaft having enlarged head ends disposed outwardly of each of said slots and axially retaining said shaft within said slots, a plurality of discrete display strips pivotally carried by said support shaft, said display strips being of substantially equal size and being movable between a first position received within said internal chamber and a second position extending outwardly of said open end of said chamber, said display strips being in superimposed stacked relation when received within said chamber and being capable of movement to selectively fan one or more of said strips from the remainder of said strips when in said second position, selected ones of said strips having a plurality of color stripes disposed transversely thereon along the length thereof, said stripes on each of said selected ones of said strips being spaced from each other and identified by coded indicia, descriptive indicia on each of said selected ones of said strips adjacent each color stripe, and at least one of the uppermost of said plurality of display strips having indicia thereon indicating the particular one of the remaining strips on which a named color may be found.

4,104,810
DISPLAY DEVICE

Serge Mirman, 9 Chesham Pl., Belgrave Sq., London SW1, England

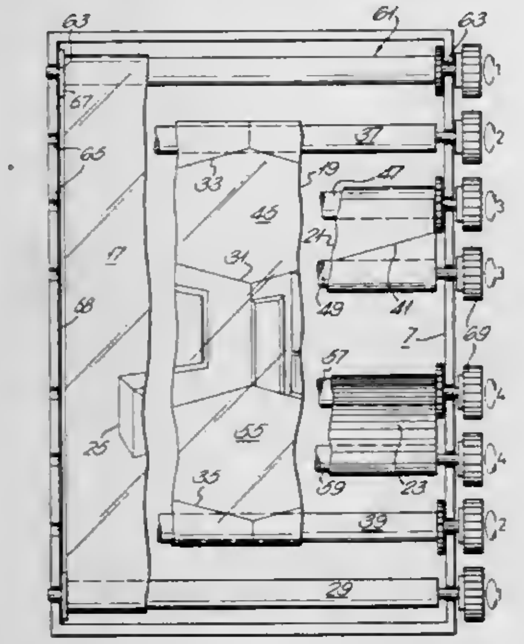
Filed Apr. 26, 1977, Ser. No. 790,957

Int. Cl.² G09B *1/20*

U.S. Cl. 35—53 **10 Claims**

1. A display device suitable for illustrating a plurality of interior design schemes or for use as a teaching aid, said device comprising a case, at least two pairs of spools rotatably mounted in said case and extending across the case from one side wall to the opposite side wall, and being capable of limited axial sliding movement relative to said side walls, a roll of material adapted to be wound upon each of said pairs of spools, one of said rolls of material bearing alternative illustrations separated by transparent portions, a plurality of illustrations

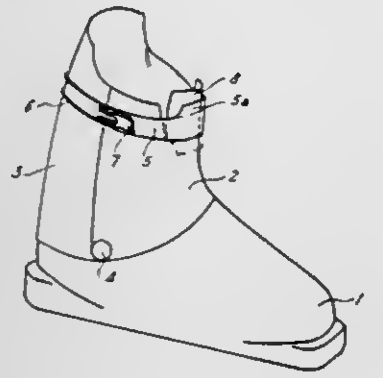
complimentary to said illustrations on said one roll on the other of said rolls, a window in a wall of said case through which the various alternative illustrations may be displayed with a chosen illustration formed on the said other roll showing through a transparent portion of said one roll and the two rolls being suitably relatively orientated so as to build up a picture visible through said window, and means for rotating each of said spools so as to advance one roll relative to the other as desired in either direction to vary the picture presented at said window, and wherein a magnetic strip is located down one side edge of the case, and a magnetically attractable disc is associated with at least one spool of each pair, the spools being axially slidable away from said magnetic strip to disconnect the magnetic locking arrangement for winding on or winding back the roll, to change the illustration, and being slidable into engagement with said magnetic strip after setting up said illustration, thereby preventing subsequent inadvertent rotation of said spools due to the natural resiliency of rolls of material thereon.



4,104,811
APPLIED TO SKI BOOTS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Filed Mar. 28, 1977, Ser. No. 782,304
Claims priority, application France, Apr. 1, 1976, 76 09439
Int. Cl.² A43B *5/04, 11/00;* A43C *11/00;* A43B *21/00*
U.S. Cl. 36—121 20 Claims

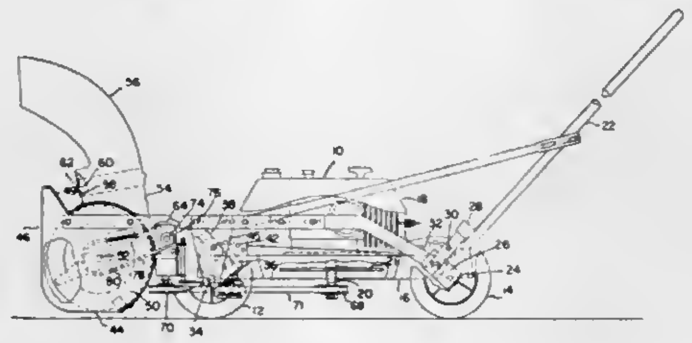


1. A ski boot comprising an upper whose stiffness is adjustable, an adjustable closure element surrounding said upper, and means for securing said closure element to said upper in one of a plurality of different positions for varying the stiffness and/or inclination of the upper respectively, said upper having a front portion with lateral edge regions, said closure element comprising a collar positioned for cooperating with said upper at the front portion thereof, said means for securing the closure element comprising means for removably attaching the collar to the upper at a selected one of a plurality of positions at said lateral edge regions.

4,104,812
SNOW BLOWER FOR POWERED LAWN MOWERS

John J. Stribiak, Jr., 18632 Poplar, Homewood, Ill. 60430, assignor to John J. Stribiak, Jr. and John Swansoo

Continuation-in-part of Ser. No. 731,950, Oct. 12, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 784,964
Int. Cl.² E01H *5/00*
U.S. Cl. 37—43 L 15 Claims

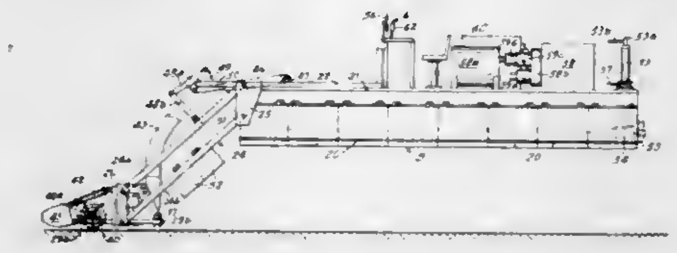


1. A snow blower adapter for use with a powered lawn mower having a pair of front wheels and and a pair of rear wheels, said adapter comprising a housing defining a forward opening adapted to receive snow therein, chute means in the housing positioned to displace snow therefrom, conveyor means in the housing to convey snow received in the central opening to the chute means and to expel snow therefrom, means to drive the conveyor means, said means to drive the conveyor means including transmission means adapted to drive the conveyor means by power received from the lawn mower and clutch means to operatively engage and disengage the transmision from the lawn mower, and mounting means for removably mounting the adapter on a powered lawn mower, said mounting means including a pair of elongate arms carrying the housing and having lawn-mower engaging means positioned opposite said housing, said engaging means including a slotted portion on said arms adapted to removably engage said rear wheels of the lawn mower to thereby secure said housing to the lawn mower.

4,104,813
MUCK DREDGING MACHINE

Duane A. Lindsey, 216 Meadowbrook Rd., Hopkins, Minn. 55343

Continuation of Ser. No. 716,141, Aug. 20, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,347
Int. Cl.² E02F *3/88*
U.S. Cl. 37—57 5 Claims



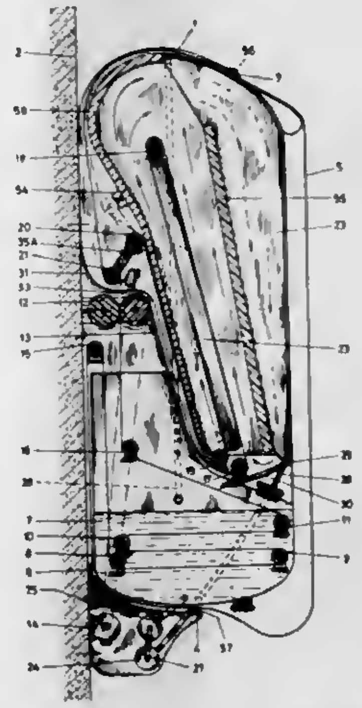
1. A machine for dredging and pumping semi-liquid material, the machine comprising:
- a floating barge;
- a boom structure pivotally mounted on the front of the barge, and extending forwardly therefrom;
- first and second laterally disposed mud digging and collecting auger elements co-axially arranged and mounted on the boom structure and delivering a material being dredged laterally inwardly from the outer ends toward the inner ends thereof;
- a pumping unit mounted on the boom structure between the first and second auger elements and disposed therebehind to receive the material collected thereby, the pumping unit comprising:
  - a housing;
  - a rotary shaft within the housing disposed substantially parallel to the axis of the first and second auger elements;
  - first and second inlet openings surrounding the rotary shaft on first and second sides of the housing, respectively, to permit material from the inner ends of the first and second auger elements to pass into the housing, the first and second inlet openings being positioned above the elevation of the bottom of the first and second auger elements at all times;
  - impeller blade means within the housing and connected to the rotary shaft in radially spaced relation;
- first and second rear mold boards mounted on opposite sides of the housing for guiding material from the first and second auger elements upward and inward to the first and second openings, respectively, each rear mold board having a lower front edge, an inside edge, an outside edge, an upper edge, and a side plate, the lower front edge being disposed behind one of the auger elements below the axis thereof, the rear mold board sloping generally upwardly and rearwardly from the lower front edge with an upper rear portion of the rear mold board forming a generally frustoconical section, with the upper edge terminating in spaced relation above and behind the lower front edge, thus providing an open material receiving front portion and a closed rear material guiding and collecting portion with the inner edge being connected to the housing of the pumping unit and extending around the inlet opening thereof and conforming generally to the shape of the rear portion of the opening thereof, the outer edge defining a smaller diameter outer portion of the frusto-conical section and being connected to the side plate;
- an elongated delivery conduit receiving the material from the pumping unit and transporting the same to a remote location; and
- means for raising and lowering the boom structure to adjust the elevation of the first and second auger elements and the pumping unit.

4,104,814
CLEAN TOWEL PRESENTING MACHINE

Leonard A. Whight, Cornelie van Zantenstraat 296, The Hague, Netherlands

Filed Feb. 1, 1977, Ser. No. 764,891
Claims priority, application Netherlands, Feb. 2, 1976, 7601031
Int. Cl.² A47K *10/30*
U.S. Cl. 38—2 7 Claims

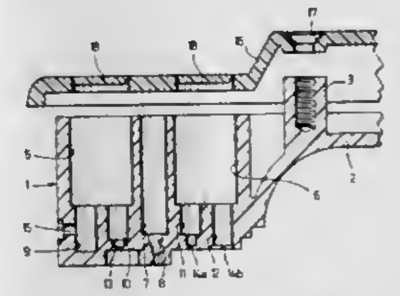
1. Automatic towel machine for cleaning, drying and gradually dispensing an endless web, comprising a substantially closed casing having at the front side a delivery slot and an intake slot for the web, said casing enclosing a web cleaning part, to be filled with cleaning liquid, a web drying part provided with at least one heating element, a condenser for condensing the vaporous cleaning agent, said condenser communicating with the cleaning part for the flow back of condensed cleaning agent to said cleaning part, and casing guide means for guiding the web from the intake slot through said cleaning part and said drying part to said delivery slot, said condenser being in an individual space separated from the drying part by a thermally insulating partition, said drying part and said condenser space communicating with each other at two spaced locations, said drying part and condenser being positioned above said cleaning part so that natural and/or forced circulation of the vaporous cleaning agent may pass through the drying part, the condenser space and said communications.

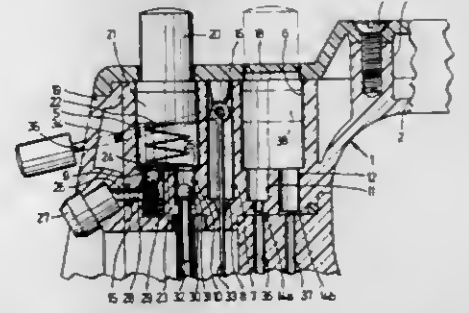


4,104,815
STEAM IRON

Urs Hammer, Oberbuchsiten, and Ernst Gislger, Niederbuchsiten, both of Switzerland, assignors to Jura Elektroapparate-Fabriken L. Henzirohs A.G., Niederbochslten, Switzerland

Filed Nov. 11, 1977, Ser. No. 850,734
Claims priority, application Switzerland, Nov. 19, 1976, 14596/76
Int. Cl.² D06F *75/18*
U.S. Cl. 38—77.5 5 Claims



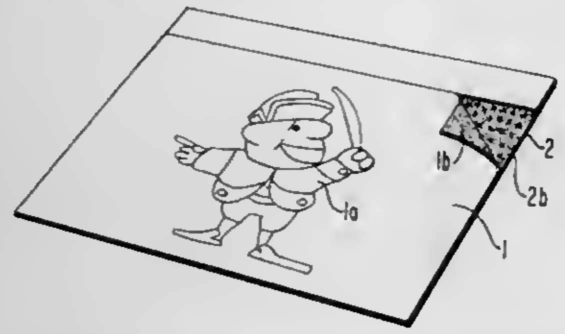


1. In a steam iron of the type having a water reservoir, a vaporization chamber, a handle, and two cylinders disposed in the portion of said handle situated nearest the front of said iron and including respective bottom portions situated nearest said water reservoir and respective top openings situated remote from said water reservoir, the improvement comprising:
- a one-piece component including said cylinders and at least parts of said handle and
- a cover element having two segments capable of being either selectively broken out of said cover element or of selectively sealing off said respective top openings of said two cylinders.

4,104,816
MULTI-FUNCTION LABEL AND CARRIER WEB

Charles Pingeton, Southbridge, Mass., assignor to Doring Labels, Inc., Danielson, Conn.

Filed Dec. 16, 1976, Ser. No. 751,316
Int. Cl.² A44C *3/00*
U.S. Cl. 40—2 R **4 Claims**

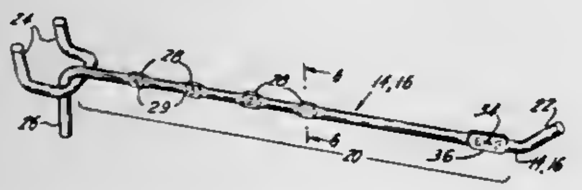


1. A multi-function label and carrier web comprising a label having indicia on one face thereof, an adhesive on the opposite face of said label, a non discardable carrier web having heat transferrable indicia on one face thereof, a release coating on the opposite face of said carrier web, said label being mounted on the carrier web with the adhesive face being superimposed on the release coating face of the web, whereby the label is adapted to be peeled from the carrier web and adhered to another surface, and the transferrable indicia is adapted to be transferred from the carrier web to yet another surface when heat is applied to the release coating face of the web, whereupon the carrier web may then be discarded.

4,104,817
INVENTORY-CONTROL MERCHANDISE DISPLAY APPARATUS

Milton W. Herzog, Valley Stream, N.Y., assignor to H. Goodman & Sons, Inc., Kearny, N.J.

Continuation of Ser. No. 580,560, May 27, 1975. This application Aug. 16, 1976, Ser. No. 714,703
The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.
Int. Cl.² A47F *5/00*
U.S. Cl. 40—19.5 **3 Claims**

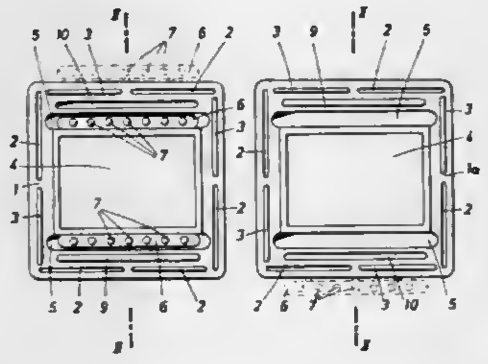


1. Merchandise display apparatus adapted for use in an inventory control system, including a support, and a metal rod of essentially uniform cross-section at least along most of its length, said rod having at one end thereof means for securing the rod to the support so that the rod projects in cantilever fashion with a free end of the rod exposed and said free end being no more than moderately larger transversely than the maximum transverse dimension of said essentially uniform cross-section of the rod for readily entering holes in a series of merchandise-bearing cards, said rod having plural swaged portions having facets and associated bumps distributed along the rod for providing a measure of the quantity of merchandise-bearing cards on the rod, any one or more of the facets and associated bumps that are not concealed by merchandise-bearing cards being readily recognized by feel in the course of taking inventory, said facets bearing a sequence of characters distributed along the rod the rod having rounded transitions between each bump and the adjoining portions of the rod for facilitating the movement of merchandise-bearing cards along the rod.

4,104,818
SLIDE FRAME

Heinrich Hrabik, Linz, Austria, assignor to Bonum-Werk Inh. Friedrich Hetzmannseder, Linz, Austria

Filed Nov. 26, 1976, Ser. No. 745,074
Claims priority, application Austria, Sep. 2, 1976, 6521/76
Int. Cl.² G09F *13/00*
U.S. Cl. 40—152 **4 Claims**



1. A slide frame comprising

(a) two component frames each defining a rectangular window having two opposite parallel sides and including means for joining the two component frames together to form the slide frame, the windows registering in the joined component frames, and the two joined component frames being adapted to clamp a slide film therebetween, the slide film having perforations on opposite sides thereof and arranged to extend along the two opposite parallel sides of the registering windows, and the perforations having edges remote from the parallel sides of the registering windows,

(b) two film spreading bars arranged between the two joined component frames along the two opposite parallel sides of the registering windows for limited longitudinal displacement in the direction of said sides, each of the bars having teeth for interengaging with the perforations in the slide film and clamping the slide film between the component frames to hold the film in a plane, and

(c) means for holding the spreading bars between the component frames with their teeth engaging the remote edges of the film perforations whereby the film is held under tension between the component frames, the holding means comprising a recess along a respective one of the sides in one of the component frames for receiving a respective one of the spreading bars, the recess having a camming surface sloping away from the one side, and the one spreading bar having a camming surface cooperating with the camming surface of the recess whereby the one spreading bar is forced away from the one side when the two component frames are joined.

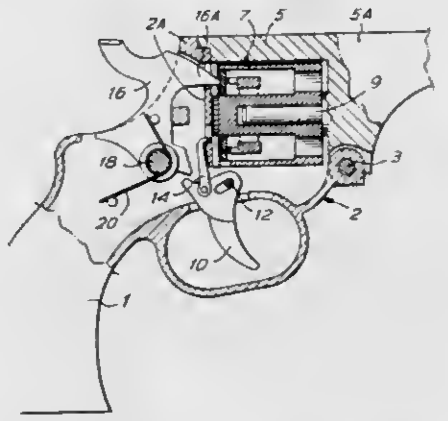
4,104,819
TOY WEAPON

Giampiero Ferri, Florence, Italy, assignor to Edison Giocattoli S.p.A., Florence, Italy

Filed Jun. 23, 1977, Ser. No. 809,401
Claims priority, application Italy, Jul. 13, 1976, 9519 A/76
Int. Cl.² F41C *3/06*
U.S. Cl. 42—58 **6 Claims**

1. In a toy weapon for use with ammunition of disc-like form containing a plurality of explosive charges, means defining a rotary magazine cylinder for the ammunition, means for advancing the cylinder, a trigger, a hammer operated by the trigger, and means defining an anvil co-operating with the hammer to cause explosion of the charges, the cylinder being such that the ammunition can be positioned in any angular

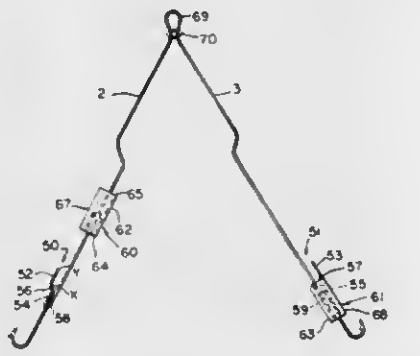
orientation, the anvil comprising an assembly of points spaced one from another by a pitch smaller than that of the charges of the ammunition, and the hammer having a dimension in the direction of spacing of the points of about three-quarters of the pitch of the charges, whereby one charge may be fired after advance of the magazine cylinder by a distance equal to the pitch of the charges.



4,104,820
FISH HOOKS

David Paul Bardebes, 12 Yatton St., Greerton, Tauranga, New Zealand

Flied May 5, 1976, Ser. No. 683,566
Claims priority, application New Zealand, Jan. 28, 1976, 179852
Int. Cl.² A01K *83/02*
U.S. Cl. 43—36 **5 Claims**

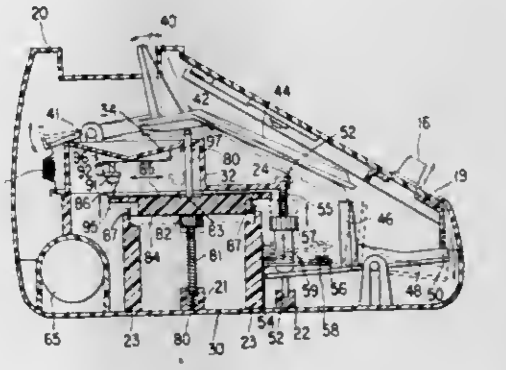


1. A fish-catching device, comprising at least two arms adapted to be biased towards each other and each having a main portion and an end portion which is turned back whereby a channel is defined between the end portion and the main portion, a plurality of fishhooks each having an eyelet at one end and a spike at the other end, the eyelets of the fishhooks being threaded over the end portions of the arms respectively and being received in the channels defined between the end portions and the main portions of the arms respectively, a plurality of elongate hook securing members mounted on the arms respectively and each formed with a hole having a horizontal component passing completely therethrough and a vertical component passing part way therethrough, the horizontal component being adapted to engage in a neat fit with the main portion and the end portion of the arm and the vertical component being adapted to engage with the eyelet of the fishhook, and actuating means adapted to cooperate with the arms such that in a first condition of the actuating means the arms are in a biassed condition and the spikes of the fishhooks are located close together whereas upon a desired force being applied to the spikes the actuating means actuate and the spikes of the fishhooks move apart.

4,104,821
TOY TELEPHONE WITH BELL AND RECORDED MESSAGES

Takamitsu Nakajima, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 1, 1976, Ser. No. 719,530
Claims priority, application Japan, Sep. 4, 1975, 50-122677
Int. Cl.² A63H *36/30*
U.S. Cl. 46—33 **4 Claims**



1. A toy telephone, comprising:

a housing provided with a cradle;

a spindle, means operatively mounting said spindle within said housing for rotation and reciprocation, said spindle being provided with a first gear, a sound disc mounted on said spindle for rotation therewith, said sound disc being provided with at least one continuous groove, and a continuous rack of teeth along the periphery thereof;

a motor and a source of energy therefor mounted within said housing, and means operatively connecting said motor and said disc for rotating said disc;

a switch mounted to said housing and means connecting said switch with said motor and said source of energy;

a pick-up arm provided with a platform within which is mounted a stylus, means mounting said arm to rotate between a first position wherein said stylus is within the beginning of said groove of said sound disc and a second position wherein said stylus is within the end of said groove of said sound disc, and means normally urging said arm to said first position;

a speaker cone mounted within said housing and provided with a rib, said platform of said pick-up arm making sliding contact with said rib during movement of said pick-up arm betwen said first and second positions;

a second gear rotatably mounted within said housing and being provided with a cam, a rocker-arm, means normally urging said rocker-arm into engagement with said cam, a bell mounted to said rocker-arm, and means mounting said rocker-arm to rotate such that said bell moves between a first non-ringing position and a second ringing position as said second gear and cam are rotated;

a third gear, means operatively mounting said third gear within said housing for rotation and reciprocation between a first position wherein said third gear engages said rack of teeth and a second position wherein said third gear is out of engagement with said rack of teeth, means attached to said third gear to ring said bell when said third gear is rotated and when said bell is in said second ringing position, means normally urging said third gear to said second position: and

means moving said sound disc out of engagement with said stylus of said pick-up arm permitting said pick-up arm to move to said first position, while simultaneously operatively connecting said first gear to said second gear, and means for moving said third gear to said first position operatively connecting said rack of teeth of said sound disc to said third gear.

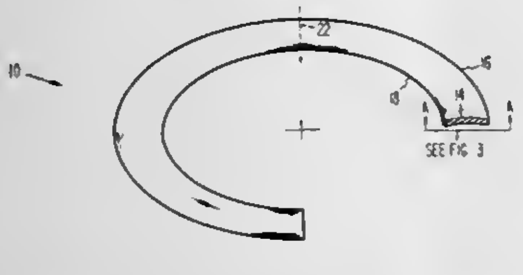
4,104,822
ROTATING CIRCULAR AIRFOIL

Henry Wendell Rodgers, 9725 W. 21st Ave., Lakewood, Colo. 80215

Filed Dec. 3, 1976, Ser. No. 747,310

Int. Cl.² A63H *27/00*

U.S. Cl. 46—74 D **14 Claims**



1. A rotating aerial device for use as a toy comprising a circular ring having an outer circumferential edge and an inner circumferential edge and a ring body defined by said outer circumferential edge and said inner circumferential edge wherein said ring body comprises:

a. a circular airfoil having an upper camber surface and a bottom camber surface and a uniform cross-section throughout and;
b. at any cross-section of said airfoil said bottom camber surface is below a reference chord line extending across said cross-section from said outer circumferential edge to said inner circumferential edge; and
c. said upper camber surface is above said chord line having a maximum height from said chord line approximately equal distance between said outer circumferential edge and said inner circumferential edge; and
d. a first curvature of said upper camber from said maximum height to said outer circumferential edge substantially identical to a second curvature of said upper camber from said maximum height to said inner circumferential edge.

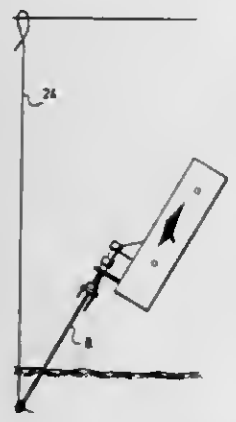
4,104,823
ARRANGEMENT FOR FIXING HOP GUIDING ROPES IN THE SOIL

Vladimir Jakl; Josef Cink, and Filip Bacovsky, all of Sumperk, Czechoslovakia, assignors to Vyzkumny ustav lykovych vlaken Sumperk and Strojni a traktorova stanice v Zatci, narodni podnik Zatec, both of Prague, Czechoslovakia

Filed Mar. 9, 1977, Ser. No. 775,845

Int. Cl.² A01G *17/04*

U.S. Cl. 47—1 R **3 Claims**



1. Apparatus for fixing guiding ropes in the soil comprising in combination:

a frame with an upper and a lower part, a number of generally vertical guiding rods on said frame, a bearing in the lower part of the frame, a support slidably mounted on said guiding rods, a driving rod rotatably supported in the upper part of the frame and passing through the bearing in the lower part thereof, a tongue and a holder provided at the lower end of the driving rod, a twisting device supported on the lower part of the frame and adapted for rotation coaxially with the driving rod, the driving rod engaging said twisting device for rotation therewith, a long point and a short point extending downwards from the twisting device, a cutting device having means for guiding a wire arranged on the frame close to the body of the twisting device, means on said cutting device for cutting said wire, means for transmitting to the support and the driving rod a generally vertical reciprocating motion along the guiding rods of the frame, and means for transmitting a rotating motion to the body of the twisting device to form a tangle including said wire on said points, said tongue and holder removing said tangle from said points and driving said tangle downward into the soil when said driving rod moves downward.

4,104,824
MULTIPHASE BLOCK AND GRAFT COPOLYMERS COMPRISING A HYDROPHILIC CONTINUOUS PHASE AND HYDROPHOBIC DOMAINS

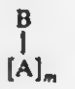
Robert D. Lundberg, Somerville, and Neville G. Thame, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 553,613, Feb. 27, 1975, Pat. No. 4,057,598, which is a continuation of Ser. No. 327,831, Jan. 29, 1973, abandoned. This application Jan. 11, 1977, Ser. No. 758,421

Int. Cl.² A01C *1/04*

U.S. Cl. 47—58 **9 Claims**

1. A method of promoting the survival and growth of plants which comprises admixing with the plant growth medium in which said plants are grown from about 25 weight percent of a thermoplastic copolymer having an average molecular weight of at least 10,000, selected from the group consisting of copolymers represented by graph copolymers having the general formula



$$\begin{array}{c}B\\ |\\ [A]_m\end{array}$$

and block copolymers having the general formula xB—[AB]$_n$—yA wherein *n* is an integer $\geqq 1$, *m* is > 1, *x* and *y* are 0 or 1, and *y* is 1 when *n* is 1, A is a thermoplastic hydrophobic polymer block having a softening point of at least 35° C and a molecular weight of at least 2,000, and B is a thermoplastic hydrophilic polymer block having a softening point of at least about 35° C and a molecular weight of at least about 6,000 and which comprises from about 30–97 weight % of said copolymer.

4,104,825
VENT

Stephen L. Hosmer, Englewood, Colo., assignor to Young Windows Inc., Conshohocken, Pa.

Filed Oct. 18, 1976, Ser. No. 733,430

Int. Cl.² E05F *11/00;* E05D *7/00*

U.S. Cl. 49—324 **18 Claims**

1. Improved vent means for a housing comprising;

an annular shaped mounting frame having mechanism for fixedly connecting the frame in an aperture of a housing, the mounting frame forming a passageway to provide for communication between the inside and outside of the housing;

an annular shaped vent frame carrying a closure;

hinge means disposed on one side of the mounting frame and having a guide section fixed to the mounting frame and a follower section fixed to the vent frame and the guide and follower being snugly, slidingly engaged and the mounting frame, the vent frame and the hinge means each being symmetrically disposed with respect to a plane bisecting said one side;

said engagement between the guide section and follower section supporting the vent frame for rotation with respect to the mounting frame about an axis normal to said plane as between a closed position wherein the vent frame and closure close off said passageway to any of a plurality of open positions wherein the vent frame and closure open said passageway;

a continuous annular seal wall on the said mounting frame;

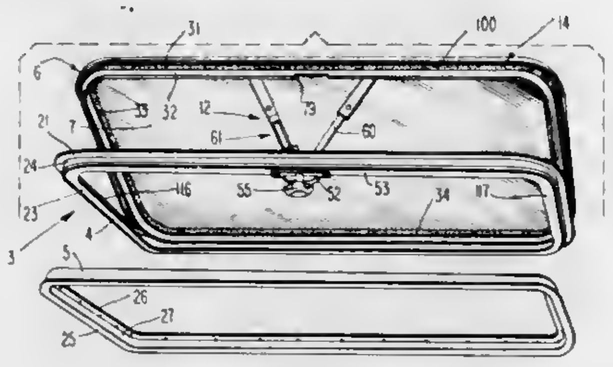
a continuous flexible seal on said vent frame and extending around adjacent the outer periphery of the vent frame;

a handle rotatably mounted on said mounting frame and positioned to be accessible from the interior of the housing when the vent means is installed in said aperture;

a pair of operating arms respectively rotatably mounted on said mounting frame;

drive means connected between said handle and said arms and providing that rotation of handle simultaneously rotates said arms in opposite directions;

a track on said vent frame;



each arm supporting a rider, the rider being mounted in said track and making a snug, sliding fit therewith and rotation of the operating arm moving the rider along the track to cause the vent frame and closure to rotate about the hinge means as between said closed and open positions and in the closed position the riders respectively being symmetrically disposed with respect to said plane;

each said operating arm having means providing for the arm to be rigid in the direction of arm rotation and flexible in a direction normal to the rotational direction;

in the closed position, said seal engaging said seal wall to form a water seal;

the riders and hinge means being disposed whereby in the closed position the riders and hinge means exert forces on the vent frame symmetrical with respect to said plane to cause said engagement between the seal and seal wall to be continuous and to prevent rattle of the vent frame; and

in any of said open positions said snug, sliding fit of the hinge means and of the riders supporting the vent frame to prevent rattle thereof.

4,104,826
DOOR ACTUATING SYSTEM

Thomas R. Wadford, 214 Osborne Ave., Baltimore, Md. 21228

Filed Mar. 28, 1977, Ser. No. 782,182

Int. Cl.² E05F *11/00*

U.S. Cl. 49—360 **10 Claims**

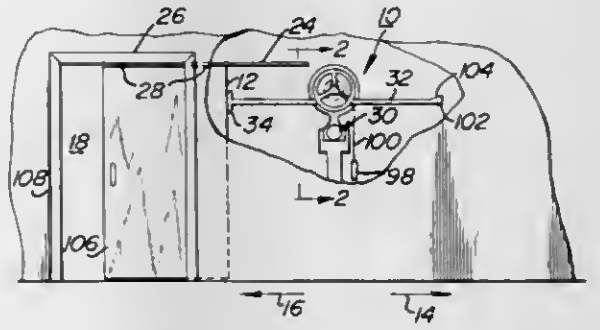
1. A door actuating system for reversibly displacing a door in a longitudinal direction, comprising:

(a) motor means;

(b) drive bar means secured to said door on a first end for displacement of said door responsive to actuation of said motor means;

(c) drive means being frictionally coupled to said drive bar means for displacing said drive bar means in a first longitudinal direction responsive to said actuation of said motor means, said drive means being rotationally actuatable about at least a first axis line and substantially stationary in said longitudinal direction; and,

(d) counterweight drive means being frictionally coupled to said drive means for displacing said drive bar means in a second longitudinal direction responsive to deactuation of said motor means, said counterweight drive means being fixedly coupled to said drive means about said first axis line for rotational actuation of said counterweight drive means to store energy for said second longitudinal displacement of said drive bar means.



4,104,827
PIVOTING AND SLIDING WINDOW

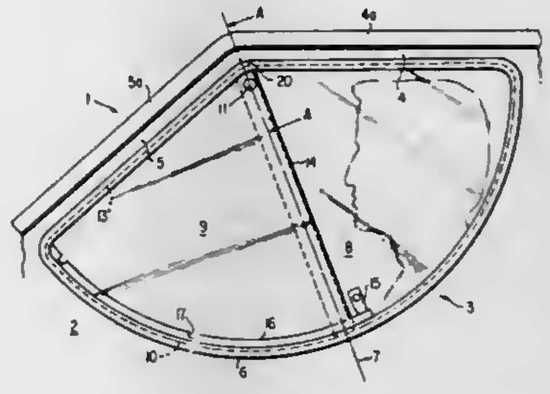
Robert Opron, Verrieres le Buisson; Philippe Bourguignon, Paris, and Claude Guelton, Maurepas, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 9, 1977, Ser. No. 767,159

Claims priority, application France, Feb. 11, 1976, 76 03716

Int. Cl.² E06D *7/00;* E06B *3/34*

U.S. Cl. 49—385 **11 Claims**



1. A window assembly, especially for automobile bodies, comprising a sliding glass window mounted in an automobile body, in the shape of a sector, wherein the window comprises first and second glass sectors connected by pivot means for movement of said first and said second glass sectors about a common axis situated in the angle formed by the junction of the straight sides of the sectors.

4,104,828
SOLID DOOR HAVING EDGES OF LAMINATED PRESSED WOOD FIBER SHEET MATERIAL

Edwin N. Naslund, and Ian MacDonald, both of Santa Rosa, Calif., assignors to Cal-Wood Door, Santa Rosa, Calif.

Filed May 26, 1977, Ser. No. 800,785

Int. Cl.² E04B *1/94;* B27K *3/18*

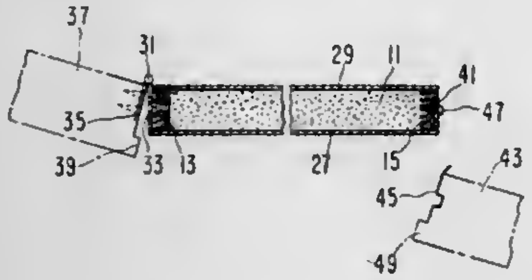
U.S. Cl. 49—399 **10 Claims**

1. A fire door, comprising:

a rectangularly shaped piece of core sheet material having a substantially uniform thickness and edges on all four sides thereof that are planar and perpendicular to major planar surfaces of said core,

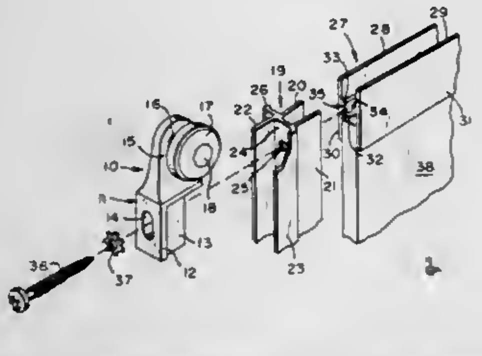
wood strips attached to at least the opposing edges of said core that are of the longest length, the thickness of said strips being substantially the same as the thickness of the core material, said strip being formed of a plurality of layers of sheet material of uniform thickness that are adhered to one another and to the edge of the core material in a manner that the surfaces of the sheet material are oriented parallel to the edge surface of the core to which it is attached, said sheet material being formed from a slurry mixture of individual wood fibers and a fire retardant chemical through the use of heat and pressure, and

facing sheet material attached to the major surfaces of said core material as extended by said wood strips, thereby to form continuous aesthetically pleasing surfaces on either side.



4,104,829
ROLLER AND HANGER ASSEMBLY FOR BY-PASS DOORS

Clarito R. Agcaoili, Glendale Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Filed May 31, 1977, Ser. No. 801,720
Int. Cl.² E05D *13/02*
U.S. Cl. 49—409 **1 Claim**



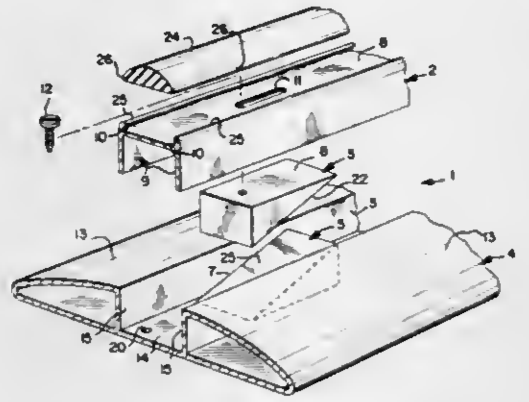
1. A slidable door and support structure comprising in combination:

(a) a supporting structure including a track,
(b) a door comprising a frame having a panel engaged therein,
(c) a pair of hanger and roller assemblies mounted one at each end of said door, each of said hangers comprising a shank recessed to define an insert member and a flange, said insert member and flange having an elongate slot provided therein and a trunnion at the end thereof having said roller rotatably mounted thereon and each of said rollers engaged by said track, and
(d) a retaining screw positioned within the elongate slot of said insert member and flange,

and wherein said frame comprises a side frame member H-form in cross-section having a pair of channels one in which said insert member is disposed, the edges of said channel engaging the flange of said shank, and the other channel engaging a panel of said door, wherein said side frame member has an aperture therein to permit said retaining screw to pass therethrough, and wherein said frame further comprises a top frame member provided with a channel for receiving said panel, and is further provided with means defining a screw-engaging channel receiving and engaging said retaining screw in self-tapping engagement, whereby said retaining screw may be loosened to permit said hanger to be raised or lowered with respect to said frame to maintain said hanger and said frame in the proper position in relation to each other.

4,104,830
ADJUSTABLE THRESHOLD

Fred Eagle, 905 W. 93rd Ter., Kansas City, Mo. 64114
Filed Jul. 11, 1977, Ser. No. 814,531
Int. Cl.² E06B *1/70*
U.S. Cl. 49—468 **8 Claims**



1. An adjustable threshold assembly, for use in a doorway having a threshold support base extending between a pair of door frame members, said threshold assembly comprising:

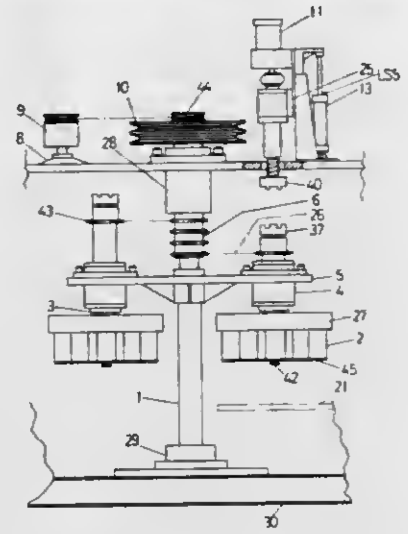
(a) an elongated threshold member having a horizontal wall, said threshold member mounted on said threshold support base;
(b) said threshold member wall having a lower surface and having a fastener receiving slot formed therein;
(c) a loosenable fastener;
(d) a top block having an inclined lower surface, said top block being removably and adjustably fastened to the lower surface of said threshold member wall by receiving said fastener through said slot; and
(e) a bottom block having an inclined upper surface of substantially equal inclination to said top block lower surface, said bottom block being fixed to said threshold support base with said bottom block upper inclined surface abutting said top block lower inclined surface, whereby horizontal translation of said top block varies the height of said threshold member relative to said threshold support base.

4,104,831
AUTOMATIC CENTRIFUGAL BARREL FINISHING MACHINE

Hisamine Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Shikishima Tipton, Nagoya, Japan
Filed Aug. 1, 1977, Ser. No. 820,940
Int. Cl.² B24B *31/04*
U.S. Cl. 51—164 A **19 Claims**

1. An automatic centrifugal barrel finishing machine of the type including a turret capable of rotating on its vertical central shaft with a high speed and carrying a plurality of barrels open at top containing therein workpieces to be treated and treating media for treatments such as surface finishing, milling, deburring, stirring, chemical processing and the like, wherein the improvement comprises:

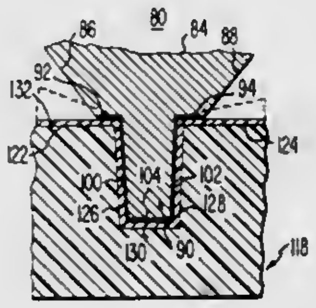
a housing;
a plurality of barrel holding plates connected to the turret rotatably and revolvably relative to the turret shaft, for holding the barrels tightly thereunder to keep the same airtight or watertight;
dual rotary shaft structure carrying said barrel holding plates therethrough, said structure comprising an outer hollow shaft for driven connection with said turret central shaft and an inner shaft having chuck means at a lower end thereof;
barrel supporting bottom plate for carrying barrels thereon, having a central barrel mounting shaft therethrough disengageably to be held by said chuck means; and



a pair of clutch means including a first clutch connected to the other upper end of said inner shaft and a fluid-operated second clutch for engaging with said first clutch.

4,104,832
METHOD FOR FORMING KEEL-TIPPED STYLUS FOR VIDEO DISC SYSTEMS

Eugene Orville Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Mar. 25, 1977, Ser. No. 781,302
Int. Cl.² B24B *1/00*
U.S. Cl. 51—281 R **8 Claims**

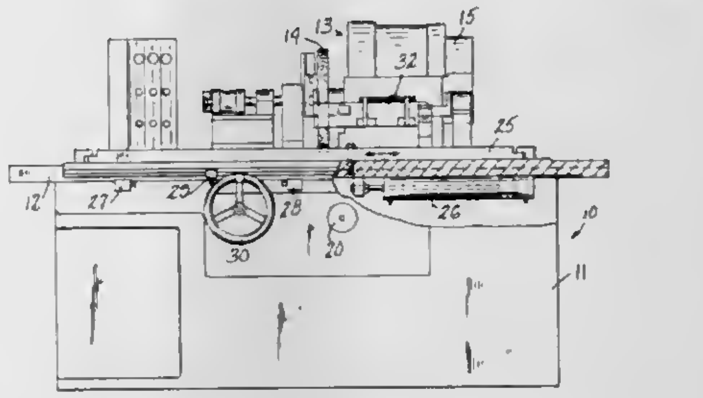


1. A method of fabricating a keel-tipped stylus by modifying a tapering support element having a tip which is defined by a prow and a substantially flat V-shaped rear surface remote from said prow; said keel-tipped stylus being suitable for playing back prerecorded signals from a disc record groove of a given width and a given pitch; said method comprising the steps of:

introducing said tip of said tapering support element in an abrasive groove having a bottom wall, substantially parallel side walls separated by a distance less than said given width and lands extending away from said side walls; while
establishing relative motion between said tapering support element and said abrasive groove along a line which is disposed in a plane substantially perpendicular to said V-shaped rear surface while holding said tapering support element in a relatively fixed orientation with respect to said abrasive groove;
said side walls of said abrasive groove forming side surfaces of a fore-and-aft constricted terminal portion of said tapering support element;
said lands of said abrasive groove forming shoulders interconnecting said constricted terminal portion with remainder of said tapering support element; and
terminating said relative motion when said constricted terminal portion reaches a given height.

4,104,833
GRINDING METHOD

John J. Glowacki, Orange, Conn., assignor to Glowacki Associates, North Branford, Conn.
Continuation of Ser. No. 568,377, Apr. 15, 1975, abandoned, which is a division of Ser. No. 386,835, Aug. 5, 1973, Pat. No. 3,975,864. This application Apr. 4, 1977, Ser. No. 784,419
Int. Cl.² B24B *1/00*
U.S. Cl. 51—281 R **5 Claims**



1. The method of repetitively removing a predetermined dimension of material from successive work where the work dresses a grinding wheel and reduces the diameter thereof and the grinding wheel removes the material from the work in successive traverses comprising the steps of infeeding the grinding wheel from a known position of the cutting surface thereof in predetermined increments while relatively moving the work past the cutting surface, sensing when the cutting surface has been infed to a predetermined position and halting infeed of said wheel at the sensed predetermined position, retracting said wheel a fixed predetermined distance from the sensed position so that the cutting surface thereof is a known distance from the sensed position, and repeating the foregoing steps on each new work.

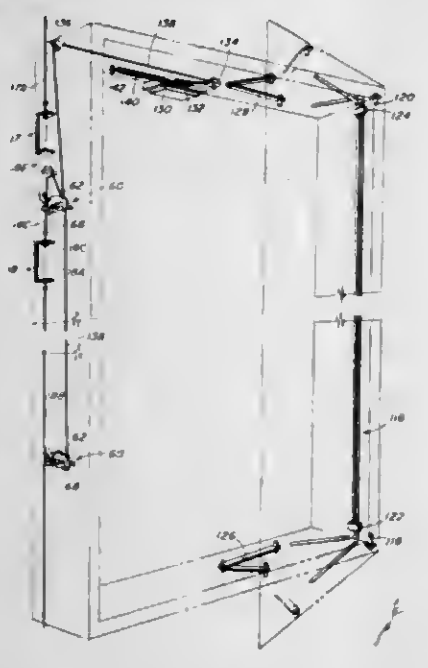
4,104,834
FIRE VENT

Joseph R. Anghinetti, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.
Division of Ser. No. 531,808, Dec. 11, 1974, Pat. No. 4,068,417, which is a division of Ser. No. 341,780, Mar. 15, 1973, abandoned. This application Sep. 27, 1976, Ser. No. 726,578
Int. Cl.² L05F *15/20*
U.S. Cl. 52—1 **8 Claims**

1. A system for venting a building having a plurality of floors, said system comprising;

a first vent disposed at one floor of the building and including a fixed frame, a movable frame adapted to fit within the fixed frame when in a closed position and panel means for insertion into said movable frame,
means for pivotally securing said movable frame to said fixed frame,
means for urging said movable frame to an open position,
latch means for maintaining said movable frame in the closed position,
a first release member mounted on the fixed frame of said first vent for releasing the latch means of the first vent to permit the movable frame to move to its open position,
another vent disposed at another floor of the building and including a fixed frame, a movable frame adapted to fit within the fixed frame when in a closed position, panel means for insertion into said movable frame, means for pivotally securing said movable frame to said fixed frame, means for urging said movable frame to an open position, and a latch means for maintaining said movable frame in the closed position,

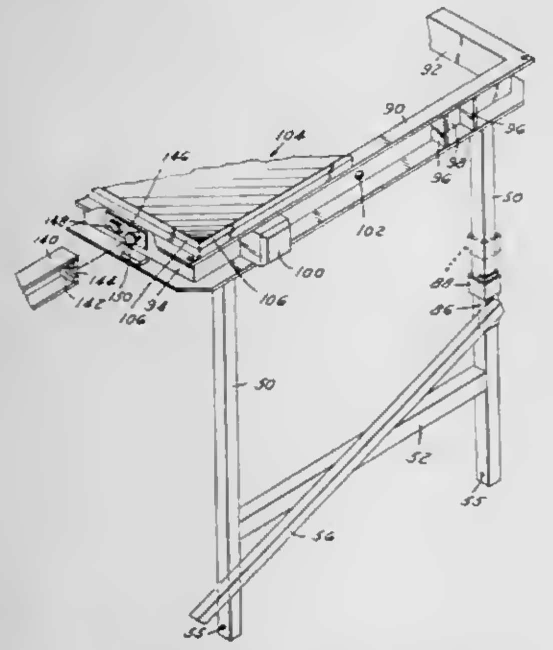
and a second release member mounted on the fixed frame of said first vent,



and means coupling from the second release member of the first vent to the said another vent for releasing the latch means of the said another vent.

4,104,835
PORTABLE STAGING EQUIPMENT

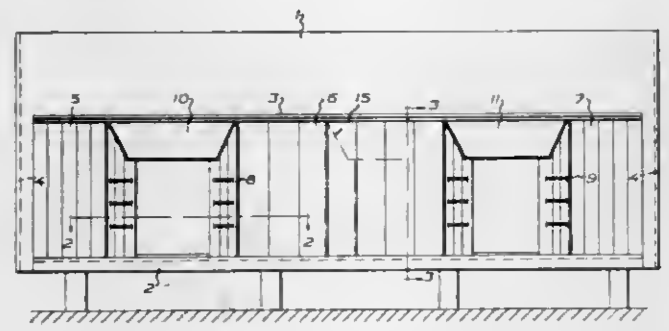
John Bardwick, III, Ypsilanti, Mich., assignor to Aztec Staging Co., Inc., Ann Arbor, Mich.
Filed Mar. 24, 1977, Ser. No. 780,703
Int. Cl.² E04H *3/28*
U.S. Cl. 52—7 **4 Claims**



1. A portable stage system which comprises:
(a) a plurality of first floor panels,
(b) stanchions movable to a position to support each of said first floor panels,
(c) means on opposite sides of said first floor panels to interengage to effect interlock of a plurality of said first floor panels on said sides in spaced aligned rows,
(d) spacer joists to lie horizontally between said spaced aligned rows in interlocking engagement with said first floor panels,
(e) a plurality of second floor panels supported on said joists to fill the space between said aligned rows to provide a continuous floor surface,
(f) said first floor panels comprising a rectangular frame of U-shaped angle members, the flanges facing outward, and a flat panel lying atop said frame and secured thereto,
(g) a bossed projection mounted between said flanges on the base of the U-shaped angle members,
(h) a joist to cooperate with said flanges and said boss comprising an elongate structural member,
(i) a cross-piece at an outer end having a slot to engage behind the head of the bossed projection,
(j) said joist having a first notched portion below said cross-piece to allow said joist end to move transversely over said boss and a second notched portion at the top to allow said joist end to move upwardly under the top flange of the angle member a distance sufficient to allow movement over the boss and to seat the boss in said slot, the bottom of the joist behind said first notched portion resting on the bottom flange of the angle member in assembly.

4,104,836
DOOR DEVICE IN GOODS DEPOTS OR THE LIKE

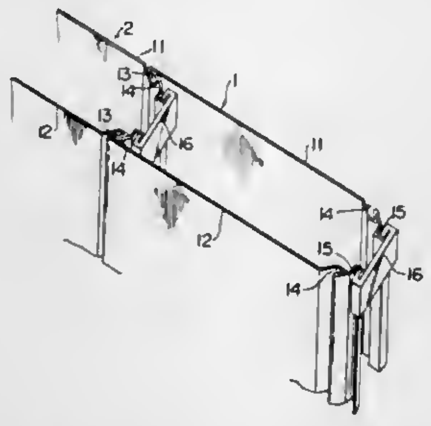
Torsten Waloddi Weibull, Torapmöllan, Brösarp, Sweden (S-270 44)
Filed Mar. 2, 1977, Ser. No. 773,742
Claims priority, application Sweden, Mar. 3, 1976, 7602972
Int. Cl.² E04B *1/343;* **E06B** *3/94*
U.S. Cl. 52—64 **4 Claims**



1. A door device in a goods depot or the like, the door device covering a substantially rectangular passage into the depot and comprising a frame intended for a door and wall portions connected to the frame and arranged on either side of the frame in the passage, wherein said frame is horizontally shiftable along said passage, and wherein the wall portions connected to said frame are disposed, irrespective of the shifting position of the frame, to cover portions of the passage located on either side of the frame.

4,104,837
WALL CONSTRUCTING METHOD AND WALL CONSTRUCTED THEREBY

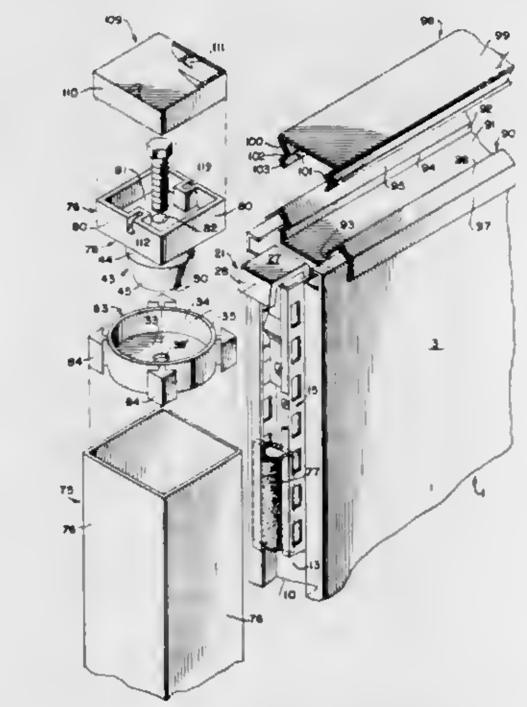
Han-Ichiro Naito, 15-1002, Wakaba-1-chome, Shinjuku-ku, Tokyo, Japan
Continuation-in-part of Ser. No. 750,042, Dec. 13, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,650
Int. Cl.² E04C *2/08;* **E04B** *1/82;* **E06B** *3/12*
U.S. Cl. 52—173 R **12 Claims**



1. A wall comprising a plurality of partition units each including a pair of wall surface forming members of small thickness disposed opposite each other with a predetermined distance therebetween to provide partition wall surfaces, connecting means including at least one connecting member for connecting said wall surface forming members together by engaging with one end thereof and normally urging the other non-connected ends of said wall surface forming members toward each other in a closing direction, each of said wall surface forming members being formed adjacent to both ends thereof with engaging means engageable with similar engaging means of mating shape formed adjacent to the associated ends of the adjoining wall surface forming member when joined together, each of said partition units being adapted to be telescoped into the internal space of another at the end provided with said connecting means, guide means for guiding drawing movement of said telescoped partition units drawn one after another, said guide means engaging with at least one end of said partition units parallel to the drawing direction of said partition units to determine the drawing direction thereof during construction of the wall by successively drawing said telescoped partition units.

4,104,838
PORTABLE WALL ASSEMBLY

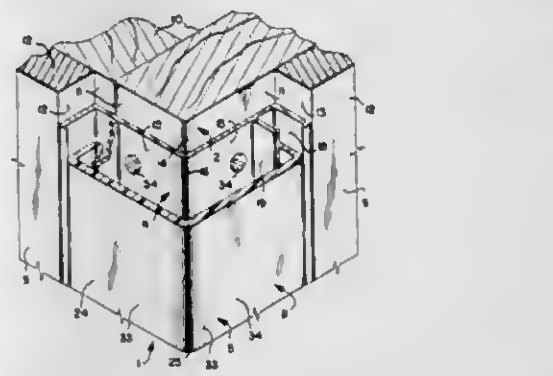
C. Herbert Hage, Poland, Ohio; Robert J. Welch, West Chicago, Ill., and Gabriel Goulish, Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio
Filed May 17, 1977, Ser. No. 797,628
Int. Cl.² E04H *1/00*
U.S. Cl. 52—239 **19 Claims**



1. A portable wall assembly including, a panel having a vertical end edge, an upright post disposed adjacent said panel end edge for supporting said panel and having an inner cavity at both ends, an edge channel attached to said panel end edge, top and bottom mounting clips each having a mounting leg insertable in the top and bottom of said channel respectively, an arm projecting outwardly from each said clip mounting leg and overlying the respective ends of said post, a tongue extending from each said clip arm into said post cavity, and retainer means releasably attached to both ends of said post and including means overlying said clip arms to secure said clip tongues within said post cavities, wherein, said top clip leg is affixed to said edge channel and said bottom clip leg is loosely disposed within said edge channel and maintained therein by said retainer overlying means.

4,104,839
WALL PROTECTION ASSEMBLY

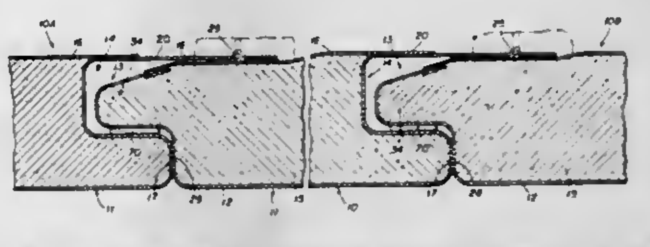
Claude P. Balzer, and Edward M. Corman, both of Wichita, Kans., assignors to Balco, Inc., Wichita, Kans.
Filed Jul. 28, 1977, Ser. No. 819,718
Int. Cl.² E04F *13/06, 19/02*
U.S. Cl. 52—288 **13 Claims**



1. A wall protection assembly for protection of a portion of a building wall intermediate of opposite boundaries thereof from damage resulting from impacts thereto comprising:
(a) an elongated, semi-resilient guard member having wall means and opposite side edges;
(b) longitudinally extending side members on each of said side edges and projecting inwardly therefrom with each having a laterally outward surface;
(c) an elongated base member having walls substantially conforming to the shape of the building wall portion to be protected and having side margins, said base member having outwardly projecting abutment members at each side margin with each having a laterally inward surface engaged by the respective lateral outward surface of the side members of the guard member for confining engagement of said guard member side members, said guard member wall means between the side members being in spaced overlying relation to said said base member walls;
(d) outwardly extending ribs on said base member walls and having shoulders facing the base member walls and spaced laterally inwardly from said abutment members; and
(e) resilient flange means on said guard member adjacent each side member thereof with each said flange having an edge engaging the shoulder of the respective adjacent rib for retaining said guard member positioned on said base member with the side members of said guard member engaging respective abutment members of said base member and resisting lateral translation of said guard member relative to said abutment members on said base member.

4,104,840
METAL BUILDING PANEL

Dennis Ronald Heintz, Oak Creek, and Arthur Bertram Thelen, Brookfield, both of Wis., assignors to INRYCO, Inc., Melrose Park, Ill.
Filed Jan. 10, 1977, Ser. No. 758,015
Int. Cl.² E04C *2/36*
U.S. Cl. 52—309.9 **10 Claims**



1. A face panel having a sheet metal skin forming a front wall and male and female longitudinal side edges thereon and having an insulating core,
a groove at the female side edge having opposing walls parallel to the panel front wall, with one groove wall and

the panel front wall portion adjacent thereto but spaced therefrom defining a tongue which ends at the top of the groove wall, and with the other groove wall constituting a sheet metal layer extending straight outwardly substantially beyond the groove top as a panel female side edge extension, said extension being parallel to the panel front wall, and

the male side edge having a longitudinal wall which projects first laterally inwardly from the panel front wall, then forwardly parallel to the panel front wall, then laterally inwardly and then extends slantedly backwardly to terminate at the panel back opposite the first lateral projection thereby defining a tongue adapted to nest in the groove at the female side edge of an adjoining identical panel.

4,104,841

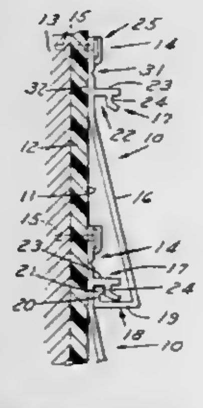
ROOFING OR SIDING SLAT ASSEMBLY WITH PROTECTIVE HINGE-FORMING GROOVE

Paul Naz, 20502 Harper, Harper Woods, Mich. 48225

Filed Jul. 7, 1977, Ser. No. 813,444

Int. Cl.^{2} E04D *1/00*

U.S. Cl. 52—519 **10 Claims**



1. An interlocking slat assembly for use as siding, roofing, and the like to cover surface areas of a building comprising:
- a generally rectangular surface-covering panel;
- an anchoring configuration adjacent an upper end portion of said panel;
- a fastening tab adjacent said anchoring configuration and adapted to be secured to said building surface by fastening elements or the like passing therethrough;
- a generally hook-like means integral with a lower portion of said panel for operatively engaging the anchoring configuration of a previously installed slat assembly for interlockingly positioning the slat assemblies one above the other in a partially overlapping manner; and
- means for interconnecting said anchoring configuration and said fastening tab and integral therewith, said interconnecting means formed of a resilient material capable of deforming in the manner of a hinge and including a lateral groove of reduced thickness relative to the thickness of said anchoring configuration for establishing a hinge-type joint between said fastening tab and said panel to isolate said panel from the effects of distortions in said fastening tab and in said building surface such as may be caused when excessive force is applied to the fastening elements securing said fastening tab to said building surface.

4,104,842

BUILDING FORM AND REINFORCING MATRIX

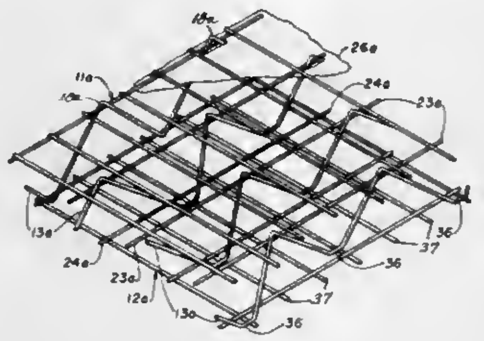
Raymond H. Rockstead, 10041 Tesla Rd., Livermore, Calif. 94550, and Wolfgang B. Fahrenbach, 3064 Rossmoor Pkwy., Walnut Creek, Calif. 94595

Filed Feb. 25, 1977, Ser. No. 771,999

Int. Cl.^{2} E04H *12/00*

U.S. Cl. 52—650 **5 Claims**

1. A building form and reinforcing matrix comprising:
- a pair of wire mesh sections having a plurality of substantially parallel longitudinally extending wires bonded to a plurality of substantially parallel transversely extending wires;
- a plurality of sinuous wire truss members extending between and secured to and supporting said sections in spaced-apart substantially parallel planes, said truss members running generally longitudinally of said sections and being spaced apart transversely of said sections;
- said truss members having angularly related sides joined in apexes with said sides mounted upon and bonded to the longitudinal wires of one of said sections at positions spaced from their connected apexes to provide an outward projection of said apexes from said longitudinal wires in a rigid triangular structure;
- the joinder of said transverse wires to said longitudinal wires being at positions spaced from the joinders of said truss members to said longitudinal wires, thereby spacing said apexes from any transversely extending wires; and
- said truss members being positioned so that the apexes of transversely adjacent truss members are offset longitudinally from each other.



4,104,843

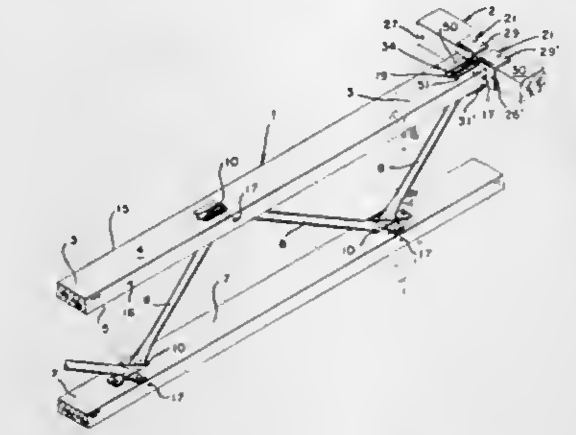
HANGER ADJUSTABLE END BEARING ASSEMBLY

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Aug. 29, 1977, Ser. No. 828,544

Int. Cl.^{2} E04C *3/02*

U.S. Cl. 52—693 **4 Claims**



1. A hanger end bearing assembly for connecting the end of a composite light series truss to an end support; said truss includes a top chord consisting of a single lumber member having upper and lower faces; a lower chord, a plurality of metal web members extending between said upper and lower chords each having an opening formed in their ends; said upper chord is formed with a plurality of slots spaced along the length thereof which extend through said lower face; said chord is formed with a plurality of cross bores extending from the inner faces of said slots outwardly toward said chord edges; and a plurality of elongated pin members dimensioned for extending through said openings in said web members, and into said cross bores in said chords; said hanger assembly comprising:

- a. the end slots in said upper chord extend to the ends of said top chord;
- b. a pair of sheet metal members placed in side by side relation each having:
  1. a generally planar side member mounted substantially vertically and extending into said end slots and formed with an opening therethrough for registration with said cross bores in said chord for receipt of said pin;
  2. a back flange integrally connected to substantially the entire length of said side member and positioned at a generally right angle to said side member and adapted for connection to said end support;
  3. a top flange integrally connected to substantially the entire length of said back flange and positioned at a generally right angle to said back flange and side member and adapted for connection to said end support; and
- c. each of said pair of sheet metal members is formed with a tab member integrally connected to said side member and positioned at right angles thereto and parallel to said top member.

4,104,844

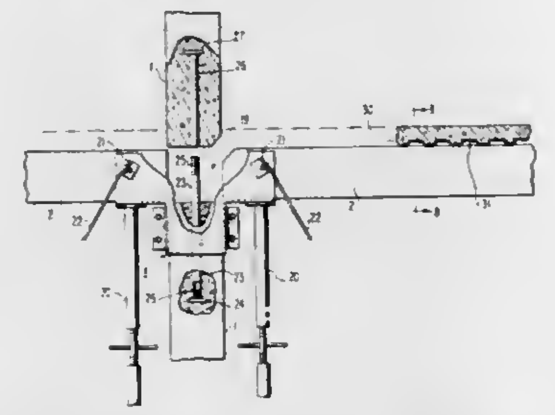
METHOD OF ERECTING A BUILDING CONSTRUCTION

Robert O. Brownlee, Knoxville, Tenn., assignor to William Clinton Reid, Lucedale, Miss. and Robert O. Brownlee, Knoxville, Tenn.

Filed Sep. 6, 1973, Ser. No. 394,771

Int. Cl.^{2} E04G *21/00;* E04B *1/16*

U.S. Cl. 52—744 **1 Claim**



1. A method of erecting a building construction of preformed concrete structural members including posts and beams, comprising erecting a preformed post in an upright position, surrounding the upper end portion of the post with a concrete form that extends above the upper end of the post, said form including a laterally extending bracket, placing preformed beams in substantially horizontal positions with inner ends of the beams at the upper end of the post above the latter and substantially flush with the walls of the post and embracing said ends of the beams with the upwardly extending portions of the concrete form thereby forming a cavity above the upper end of the post between the ends of the beams enclosed by the concrete form, and thereafter pouring concrete into the cavity between the adjacent ends of the post and beams and creating with the post and beams a monolithic structure; and extending a guy connection downwardly from the bracket at an angle to the post during the setting of the concrete.

4,104,845

METHOD AND APPARATUS FOR APPLYING SLEEVES TO NECKS OF BOTTLES AND OTHER CONTAINERS

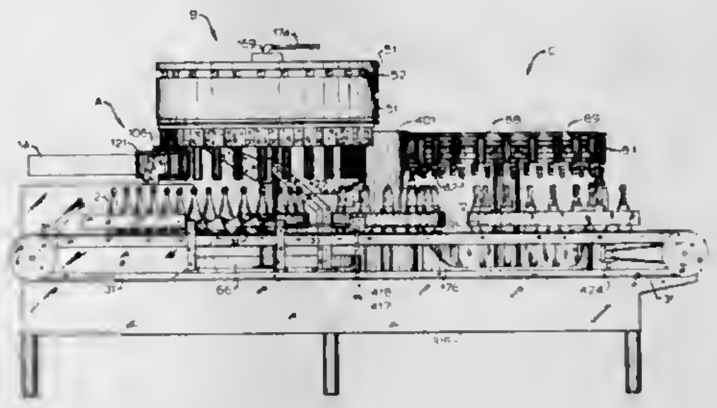
Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation-in-part of Ser. No. 471,965, May 21, 1974, abandoned. This application May 28, 1976, Ser. No. 690,943

Int. Cl.^{2} B65B *21/24;* B67B *5/00*

U.S. Cl. 53—14 **34 Claims**

1. Apparatus for applying sleeves to the neck portions of containers each having a body portion and a neck portion tapering upwardly from the junction of the neck and body, the neck having a lesser diameter than the body, comprising:
- (a) at least one cylindrical mandrel supported for rotation about its cylindrical axis and with one end free, said mandrel having an outside diameter substantially less than the diameter of the body portion of the container but sufficient to allow a sleeve formed by wrapping a sleeve material about the mandrel to fit over the neck of the container,
- (b) means for rotating the mandrel about its cylindrical axis,
- (c) means for applying one end of a segment of flexible sleeve material to the rotating mandrel,



- (d) means for then relesably adhering the segment to the rotating mandrel whereby the segment is rolled into a tube about the mandrel,
- (e) means for supporting a container in axial alignment with the mandrel with the upper end of its non-cylindrical portion close to but spaced from the free end of the mandrel,
- (f) said means (c), (d) and (e) being so arranged that said tube is spaced from the upper end of the container and so that the mandrel is at all times spaced from the upper end of the container, and
- (g) means for sliding the aforesaid tube off of the mandrel and onto the container.

4,104,846

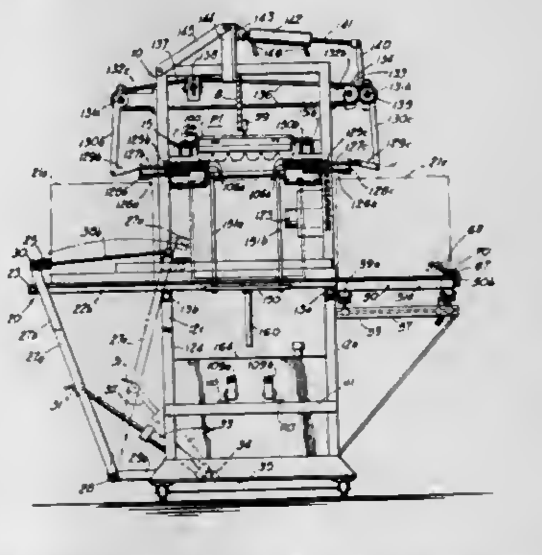
CONTAINER LOADING MACHINE AND PROCESS

John G. Waller, 140 Old Fairburn Close, SW., Atlanta, Ga. 30331

Filed Dec. 1, 1976, Ser. No. 746,412

Int. Cl.^{2} B65B *5/10, 35/44*

U.S. Cl. 53—26 **17 Claims**



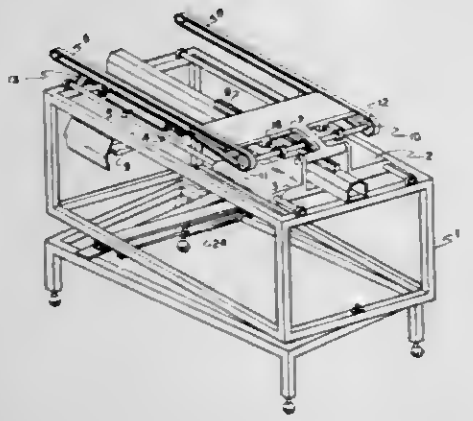
11. In an apparatus for stacking cartons of eggs of the type in which each egg carton contains a pair of spaced downwardly opening recesses defined by the sides of the downwardly protruding egg receiving cells and downwardly opening troughs between adjacent egg receiving cells outwardly of each recess, the combination of:

(a) a pair of spaced upstanding rods moveable axially in vertical paths, said rods being spaced apart by a distance approximately equal to the distance between said recesses of said egg cartons, means on said upstanding rods for supporting said cartons by respectively receiving the recesses of the cartons on the ends of said rods; and
(b) means for depositing said egg cartons onto the ends of said rods.

12. In an apparatus for stacking egg cartons of the type wherein the egg cartons are accumulated into successive layers in a storage zone and then successively stacked on each other, the combination therewith of:
(a) a pair of spaced opposed conveyor belts for conveying the egg cartons sidewise into the storage zone by their opposed end portions; and
(b) moveable support means for selectively supporting or not supporting portions of said conveyor belts, said portions of said belts being sufficiently flexible that when they are not supported they will release said cartons.

4,104,847
METHOD AND APPARATUS FOR LOADING ARTICLES INTO CONTAINERS

James L. Glandon, Greer, and Stanley D. Hall, Taylors, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.
Filed Aug. 27, 1976, Ser. No. 718,259
Int. Cl.² B65B *5/04, 67/04*
U.S. Cl. 53—35 **12 Claims**

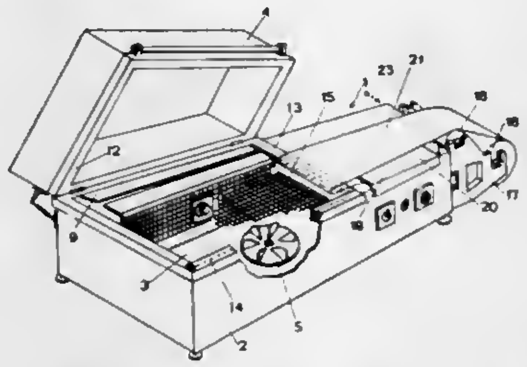


1. An apparatus for moving articles in a direction of progression toward and into a container, said apparatus comprising:
(a) a platform;
(b) a carriage moveably mounted on said platform, said carriage including a plurality of spaced apart projections;
(c) conveyor means moveably mounted on said carriage for moving articles in the direction of progression, said conveyor means including a plurality of endless belts supported by said projections;
(d) means for moving said carriage relative to said platform; and
(e) means for moving said conveyor means relative to said carriage when said carriage is moved in the direction of progression by said means for moving said carriage, whereby a container may be draped around less than all of said endless belts by being interposed within the spaced apart area.

4,104,848
PACKAGING APPARATUS FOR PACKAGING ARTICLES OF DIFFERENT KINDS WITHIN A FILM OF A HEAT-SHRINKABLE PLASTIC MATERIAL

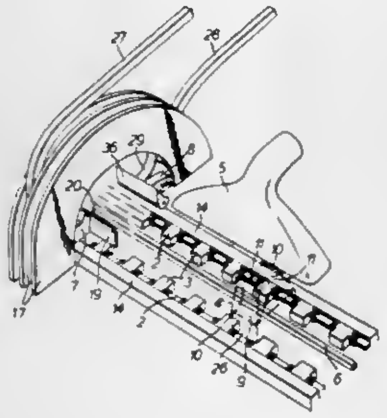
Francesco Torre, Via Bascheris, Dalmine, Bergamo, Italy
Filed Feb. 14, 1977, Ser. No. 768,319
Claims priority, application Italy, Mar. 3, 1976, 2913 A/76
Int. Cl.² B65B *53/02*
U.S. Cl. 53—184 S **4 Claims**

1. Apparatus for packaging articles within a film of heat-shrinkable plastic material comprising a housing; means within said housing defining a welding and shrinking chamber; a detachable cover for closing said chamber; means defining a heating box within said chamber; electrical resistance heating means within said heating box; at least one welding blade positioned in the area of said chamber engaged by said cover when said chamber is closed by said cover; a first control member responsive to closing and opening of said chamber by said cover for energizing and deenergizing said heating means; a second control member responsive to closing of said chamber by said cover for opening said heating box upon closing of said cover; and means for feeding heat-shrinkable film within said apparatus.



4,104,849
CONTAINER SEALING APPARATUS

Richard Wolfgang Emil Mosse, London, England, assignor to Liquid Packaging Holdings Limited, Stevenage, England
Filed Feb. 15, 1977, Ser. No. 768,887
Claims priority, application United Kingdom, Feb. 16, 1976, 6044/76
Int. Cl.² B65B *7/18, 51/14*
U.S. Cl. 53—379 **12 Claims**

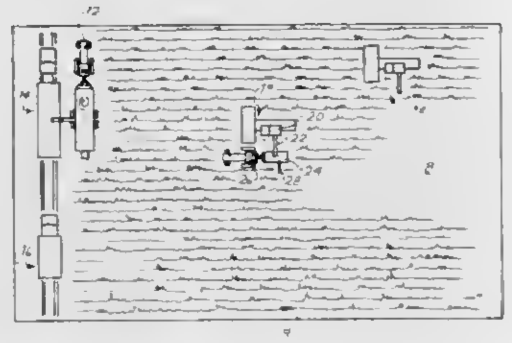


1. An apparatus for sealing a container having thermoplastic internal surfaces, comprising: advancing means for advancing said container along a path through a heating station; a panel-turning station and a sealing station; heating means situated at said heating station for heating said internal surfaces to at least a tacky consistency; panel-turning means situated at said panel-turning station being displaceable transversely of said path to bring the hot thermoplastic internal surfaces adjacent to each other while the container is stationary, said panel-turning means being turnable about respective fold axes of said panels; mounting means at said panel-turning station spaced unilaterally from the respective axes and mounting said panel-turning means for turning about the respective axes, said mounting means comprising first and second arcuate slide-in-slot arrangements concentric with said fold axes, and cooled clamping means situated at said sealing station for clamping adjacent hot thermoplastic internal surfaces together to seal said container while the container is stationary; said panel-turning

means being defined by first and second panel-turning members mounted by said respective slide-in-slot arrangements.

4,104,850
METHOD OF HARVESTING AND TRANSPORTING GRAIN

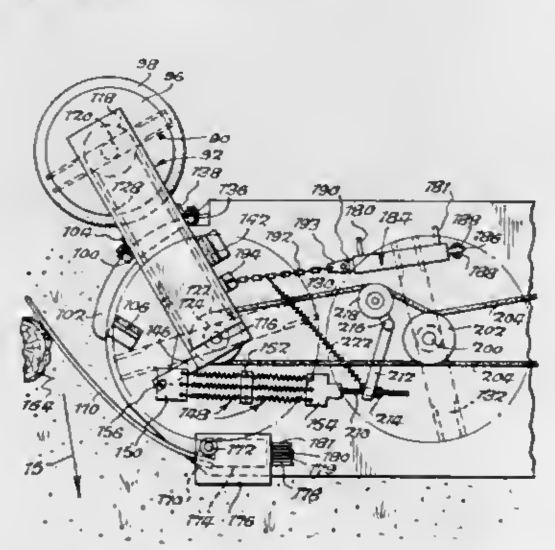
Harold D. Harris, Lubbock, Tex., assignor to Harris and Thrush Manufacturing Company, Lubbock, Tex.
Filed Aug. 30, 1976, Ser. No. 718,903
Int. Cl.² A01D *91/00*
U.S. Cl. 56—1 **6 Claims**



1. The method of harvesting and moving grain from a harvester to an elevator comprisng:
(a) harvesting the grain with a harvester, and
(b) collecting the grain in the harvester,
(c) transferring the grain to a wheeled field vehicle which is
(d) moving along side the harvester while the harvester continues to harvest the grain,
(e) moving the field vehicle to a storage bin located at the field wherein the grain is grown,
(f) transferring the grain from the wheeled field vehicle by means of equipment thereon to the storage bin,
(g) blowing air through the grain in the bin while it is therein,
(h) transferring the grain from the storage bin by means of equipment mounted thereon to a wheeled road vehicle, and
(i) moving the wheeled road vehicle to the elevator.

4,104,851
MOWING MACHINE

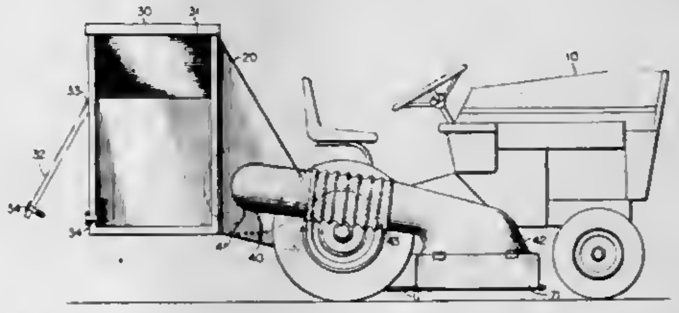
James L. Perry, 4025 Hartland Rd., Gasport, N.Y. 14067
Filed Aug. 4, 1976, Ser. No. 711,552
Int. Cl.² A01D *75/18, 55/18*
U.S. Cl. 56—10.4 **16 Claims**



1. In a mowing machine comprising a frame movable along a land surface, mowing blade means carried by said frame and drive means carried by said frame and operatively connected to said mowing blade means:
a. support arm means movably connected adjacent one end to said frame and extending outwardly therefrom;
b. additional blade means carried by said arm means and operatively connected to said blade drive means;
biasing means holding said arm means in a first position;
d. motive power means carried by said frame and operatively coupled to said arm means for moving said arm means to move said additional blade means around obstacles such as plants, trees, posts and the like; and
e. control means operatively connected to said motive power means for controlling operation of said power means, said control means comprising sensing means for detecting said obstacles and causing operation of said motive power means in response thereto.

4,104,852
LAWN CLIPPING VACUUM COLLECTOR

DeForest Tackett, P.O. Box EG-891, Melbourne, Fla. 32935
Filed Nov. 8, 1976, Ser. No. 739,733
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 **12 Claims**



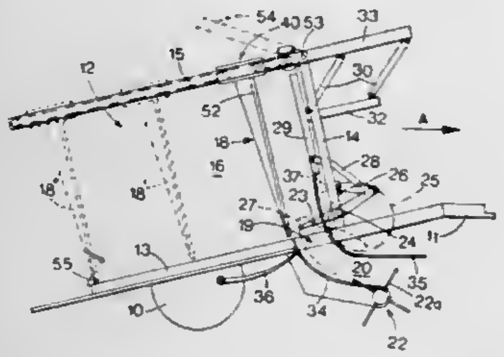
1. An vacuum loading organic refuse collector attachment for a tractor lawn mower of the type incorporated a driven, shaft supported rotary blade contained within a housing and a rear hitch mounting plate, comprising:
a refuse collection bin;
a mounting bracket affixed to said refuse collection bin and adapted to be rigidly secured to said tractor, said mounting bracket adapted to support said refuse collection bin suspended above ground level;
a blower housing incorporated in said mounting bracket;
an impeller contained within said blower housing; a power transmission adapted to couple rotary energy from said driven rotary lawn mower blade shaft to said impeller; and
a duct coupling said lawn mower blade housing to said refuse collection bin via said blower housing.

4,104,853
HAY BALER

John Arthur Howard; Bryce Ernest Randall, and David Hugh Fleming-Brown, all of Bury St. Edmands, England, assignors to Howard Machinery Limited, Bury St. Edmands, England
Filed Oct. 12, 1976, Ser. No. 731,636
Claims priority, application United Kingdom, Oct. 28, 1975, 44471/75
Int. Cl.² A01D *39/00*
U.S. Cl. 56—341 **15 Claims**

1. A baling machine comprising a mobile frame defining a bale chamber, an inlet opening at the forward end of the lower wall of the chamber, feed means for picking material to be baled from off the ground and feeding it to the inlet opening, an outlet opening at the rear end of the bale chamber through which a completed bale is discharged onto the ground while the machine is traveling, and restraining means constituting a rearward part of the bale chamber and movable between a first position in which the bale chamber is able to accept a relatively small quantity of the material and a second position in which the bale chamber is filled with the material, the restraining means offering a resistance to the movement between the first

and second positions so that material entering the chamber is compressed in the chamber, and such movement resulting in an enlargement of the bale chamber space to be occupied by the material, the restraining means on reaching the second position being movable out of the path of the baled material to enable the completed bale to be discharged through the outlet opening.



4,104,854
DYNAMIC YARN-BRAKING ARRANGEMENT FOR AN OPEN-END SPINNING MACHINE

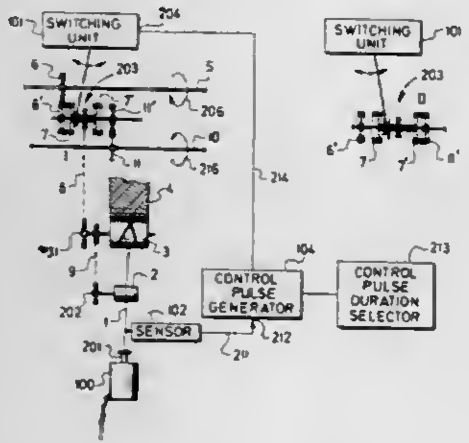
Karel Mikulecky, Chocen; Miloslav Tyl, Usti nad Orlici; Jan Janousek, Brandys nad Orlici; Frantisek Burysek, Usti nad Orlici; Stanislav Skoda, Usti nad Orlici, and Stanislav Esner, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 7, 1976, Ser. No. 730,416

Claims priority, application Czechoslovakia, Oct. 7, 1975, 6778/75

Int. Cl.² D01H *15/00, 13/16*

U.S. Cl. 57—34 R **2 Claims**



1. In an open-end spinning machine, a spinning chamber, a withdrawal tube extending downstream from the spinning chamber, first reversible draw-off roller means for normally withdrawing spun yarn from the chamber through the withdrawal tube, a take-up bobbin, a reversible yarn-distributing cylinder disposed in driving engagement with the bobbin and situated downstream of the first roller means for winding spun yarn advanced by the first roller means on the bobbin, first and second drive means rotatable in respectively opposite directions for establishing a forward direction of operation of the first roller means and the cylinder, and a reverse, spinning in, direction of operation of the first roller means and the cylinder, respectively, means including reversible clutch means selectively associated with the first and second drive means and coupled to the first roller means and the cylinder, the clutch means being selectively operable in a first, normal position coupling the first drive means to the first roller means and to the cylinder, and a second, operated position coupling the second drive means to the first roller means and the cylinder, respectively, switching means for the clutch, said switching means having an exciting input, means responsive to an actuating signal applied to the exciting input of the switching means for switching the clutch means from its first to its second position during the period of application of the actuating signal to the exciting input of the switching means, detecting means coupled to the output of the withdrawal tube for sensing a yarn breakage upstream thereof, means responsive to the detecting means for generating a control pulse upon the sensing by the detecting means of a yarn breakage, an adjustable pulse duration control means having a triggering input, said pulse duration control means adjusting the duration of the control pulse in response to the application of a signal to its triggering input, means coupled to the output of the detecting means for applying a signal therefrom to the triggering input of the pulse duration control means, and means for applying the thus adjusted control pulse from the output of the control pulse generating means to the exciting input of the switching means for a length of time sufficient to stop the forward movement of the yarn by the roller means and cylinder rotating in the reverse direction but insufficient to cause reverse movement of the broken end of the yarn in the withdrawal tube.

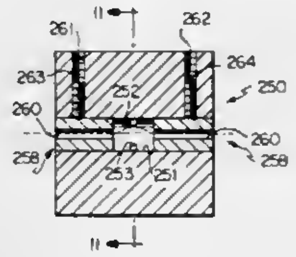
4,104,855
SELF TWIST YARN STRAND SYSTEM

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 755,671, Dec. 30, 1976, Pat. No. 4,074,511. This application Jun. 29, 1977, Ser. No. 811,379

Int. Cl.² D01H *7/92*

U.S. Cl. 57—77.3 **3 Claims**



1. A yarn twisting jet comprising
a body having an outer surface and a substantially cylindrical bore extending therethrough
an inlet orifice means extending into said body from said outer surface to said bore and intersecting said bore tangentially near the midpoint of its axial dimension, said orifice means being connectable to a source of air under pressure for establishing a generally circular flow of air in said bore;
first and second cylindrical insert members slidably adjustable coaxially along said body bore,
each of said insert members having a central axial opening through which yarn to be twisted can pass, and
the length of each of said inserts being less than one-half the length of said body bore.

4,104,856
CENTER SPACING GAUGE FOR FRICTION TWISTING UNITS

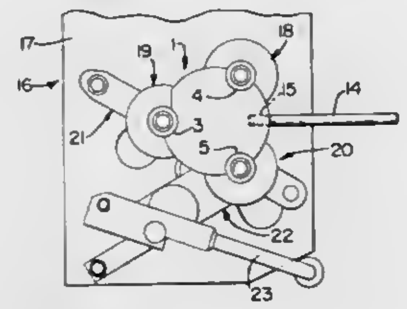
Theodore Leonard Sutton, Enka, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed May 18, 1977, Ser. No. 797,941

Int. Cl.² D01H *7/92, 13/00*

U.S. Cl. 57—77.4 **10 Claims**

1. In a yarn friction false twist device which includes at least three parallel equiangularly spaced shafts each of which has arranged thereon a plurality of rotatable disks, the improvement comprising a gauge means for center spacing of the shafts, said gauge means including a main body portion and a plurality of means disposed about the periphery of the body portion for engaging a reference surface of the respective shafts so as to adjust said shafts at a predetermined distance with respect to each other, said engaging means including at least three depressions spaced about the periphery of the body portion, at least two of said depressions having a semi-circular configuration and the third of said depressions having an obtuse arcuate configuration; and said main body portion including a convex outer surface portion disposed between said at least two depressions and a linear surface portion adjoining the third depression and a convex outer surface portion arranged between said linear surface portion and one of the at least two depressions.



4,104,857
SPINNING AND TWISTING DEVICE

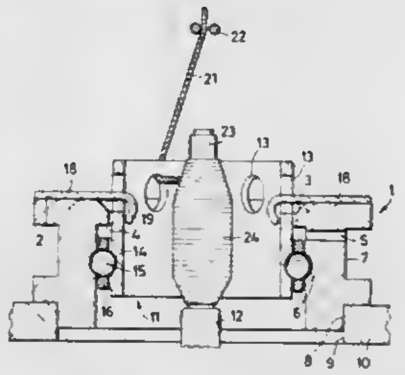
Giorgio Adolfo Grandi, Bologna, Italy, assignor to Fratelli Marzoli & C. S.p.A., Palazzolo S Oglio (Brescia), Italy

Filed May 23, 1977, Ser. No. 799,856

Claims priority, application Italy, Jun. 3, 1976, 3456 A/76

Int. Cl.² D01H *7/58*

U.S. Cl. 57—124 **7 Claims**



1. A spinning and twisting device for fitting to the ring support carriage of ring spinners as a replacement for the ring slider devices, comprising an annular stator member, an annular rotor member rotatably coupled to said stator in a manner axially aligned therewith and with the relative spindle of said machine, and provided with a passage for the thread being worked, which rotates it, and braking means disposed between said stator member and said rotor member, said braking means including blades hooked to said rotor member and acting frictionally against said stator member by the effect of the centrifugal force acting on them, part of the centrifugal force being supported by said rotor member at the region in which said blades are hooked thereto.

4,104,858
BIPOLAR LOGIC HAVING GRADED POWER

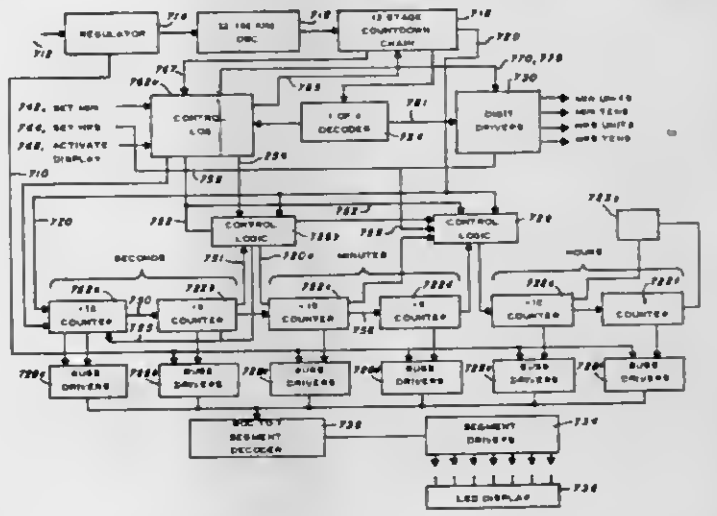
Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 443,585, Feb. 19, 1974, Pat. No. 3,986,199. This application Jul. 6, 1976, Ser. No. 703,050

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 A **7 Claims**

1. An electronic watch having a reference frequency generator means, an integrated circuit timekeeping circuit including a frequency divider coupled to said reference frequency generator and counter means coupled to said frequency divider means for producing electrical signals indicative of time, a display means coupled to said counter means for displaying time, and means for coupling a source of power to said integrated circuit and display means for providing power thereto, said integrated circuit being implemented in current injection logic including a plurality of flip-flops comprised of a plurality of cells, each cell having a lateral PNP transistor providing injection base drive into a vertical NPN transistor coupled to operate in the inverse mode, the collector of said lateral transistor and the base of said vertical transistor commonly sharing a P-type region in said integrated circuit and the base of said lateral transistor and the emitter of said vertical transistor commonly sharing an N-type region in said integrated circuit, the emitters of a plurality of said vertical transistors commonly sharing another P-type region in the integrated circuit and configured such that the vertical transistors of selected of said cells have different emitter geometries than others of said cells, whereby said selected cells are configured to receive a different amount of power from said power source than said other cells.



4,104,859
REVERSAL PREVENTING DEVICE OF ELECTRIC CLOCK

Masuo Ogihara, Chiba; Kozo Sato, Yatsukaido; Nobuo Shinozaki, Chiba; Yuzuru Takazawa, Togane, and Yoichi Seki, Shisui, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed May 13, 1976, Ser. No. 686,082

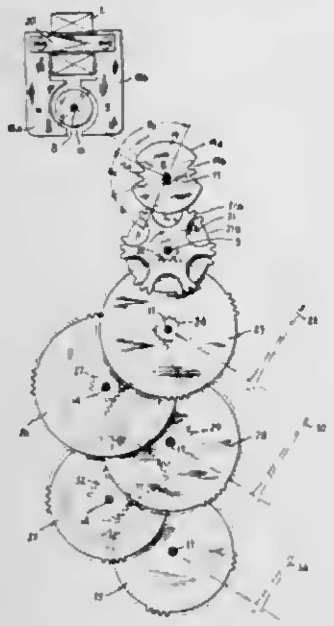
Claims priority, application Japan, May 14, 1975, 50-63777[U]

Int. Cl.² G04B *19/02;* **G04C** *3/00*

U.S. Cl. 58—23 D **6 Claims**

1. In an electronic timepiece, the combination comprising:
a stepping motor having a rotor which intermittently rotates in one direction through a predetermined angular interval to a rest position; a rotary driving member driven by said rotor to rotate in one direction during rotation of said rotor and which may develop an oscillation about a rest position after said rotor has rotated through the predetermined angular interval; indicating means including an indicator which changes position for visually indicating the value of a variable; a rotary driven member for driving said indicating means to change the indicator position; said rotary driving member and said rotary driven member together include coupling means for coupling said driving member with said driven member to rotate said driven member in a forward direction as said driving member rotates through a middle portion of its interval of angular rotation, and for disengaging said driving member from said driven member after said driving member has rotated through a middle portion of its interval of angular rotation so that said rotary driven member is intermit-

tently rotated by said rotary driving member to intermittently change the position of said indicator; and



means for preventing said driving member from rotating said driven member in a reverse direction by oscillation of said driving member at the end of the interval of rotation of said driving member.

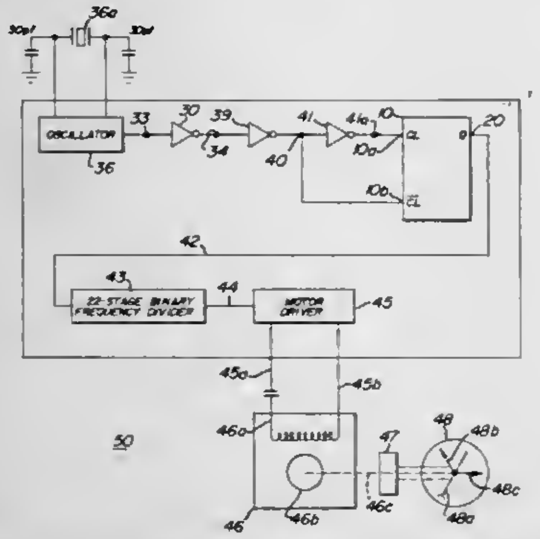
4,104,860
HIGH SPEED DYNAMIC FLIP-FLOP SYSTEM

Tedd Stickel, Chalfont, Pa., assignor to Solid State Scientific Inc., Montgomeryville, Pa.

Filed Dec. 27, 1976, Ser. No. 754,428

Int. Cl.^{2} **G04C** *3/00;* **H03K** *23/30, 3/353*

U.S. Cl. 58—23 R **15 Claims**



1. A high speed dynamic flip-flop frequency divider system controlled only by single phase clock signals having an asymmetrical clock signal cycle comprising

a cascaded asynchronous chain of flip-flops forming a frequency divider, a first flip-flop of said chain having a master and a slave flip-flop section with each of said sections having a different total propagation delay, an output of said master section being coupled to an input of said slave section and an output of said slave section being coupled to an input of said master section, and

clock means for applying said single phase clock signals both to said master and to said slave sections of said first flip-flop but not to the remainder of the flip-flops of said chain with one cycle portion of each clock signal cycle turning on said master section and the other cycle portion turning on said slave section, said one and other cycle portions respectively having time durations substantially equal to said propagation delays of said master and slave sections thereby to match the duty cycle of said clock signal to the ratio of the propagation delays of said master and slave sections.

4,104,861
ELECTRONIC STOP WATCH

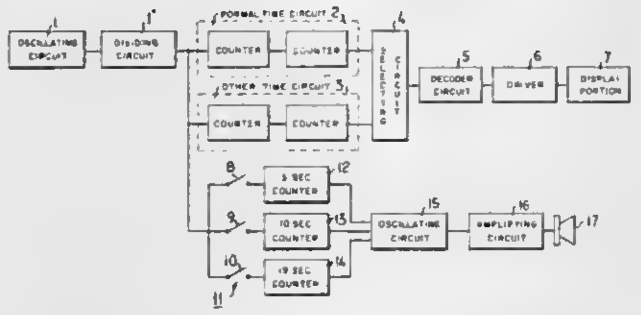
Kazuhiro Yoda, and Michiaki Nakamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 9, 1976, Ser. No. 739,857

Claims priority, application Japan, Nov. 11, 1975, 50/135557

Int. Cl.^{2} **G04B** *23/12;* **G04C** *21/34;* **G04F** *10/00*

U.S. Cl. 58—38 R **7 Claims**



1. An electronic stopwatch comprising:

time signal generating means for generating a repetitive time signal having a repetition rate defining an interval of time;

a primary counting circuit responsive to said repetitive time signal and connected to receive said repetitive time signal for counting the same and for developing a progressively increasing count representing advance of time in response to said repetitive time signal and providing a timekeeping mode of operation;

a secondary counting circuit responsive to said repetitive time signal for counting the same and for developing a progressively increasing count representing advance of time in response to said repetitive time signal;

means for applying and for terminating application of said repetitive time signal to said secondary counting circuit to enable said secondary counting circuit to develop a count representative of the time interval during which said repetitive time signal is applied to said secondary counting means for operating in a stopwatch mode;

display means cooperative with said counting circuits for selectively displaying a time represented by the count of a respective one of said counting circuits; and

alarm means connected to receive the repetitive time signal applied to said secondary counting circuit by said means for applying for generating an alarm signal after the repetitive time signal has been applied to said alarm means for a predetermined period of time.

4,104,862
APPARATUS FOR GENERATING AN ALARM SOUND

Hiroshi Yamazaki, and Minoru Izawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Apr. 28, 1977, Ser. No. 791,774

Claims priority, application Japan, Apr. 30, 1976, 51-50657

Int. Cl.^{2} **G04C** *21/28;* **G04B** *23/12*

U.S. Cl. 58—38 R **4 Claims**

1. In an electric timepiece comprising a time mechanism, apparatus for generating alarm sound comprising:

a reference switch adapted to be opened and closed by said time mechanism;

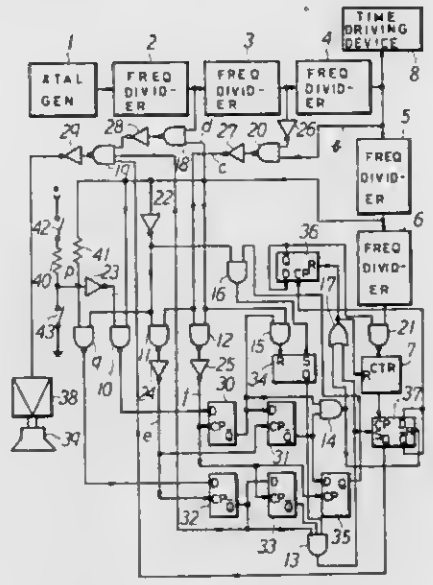
a manually operable switch;

first means adapted to produce different outputs at an output terminal in accordance with the operational statuses of said switches;

a pulse generating circuit adapted to produce a plurality of clock pulse trains;

second means adapted to store the operational statuses of said switches on the basis of an output from said output terminal and any one of said clock pulse trains and to produce different outputs in accordance with the statuses of the switches;

an alarm sound generating circuit;



and controlling means adapted to control said alarm sound generating circuit upon receipt of an output signal from at least said second means.

4,104,863
ELECTRONIC TIMEPIECE HAVING AN ALARM DEVICE

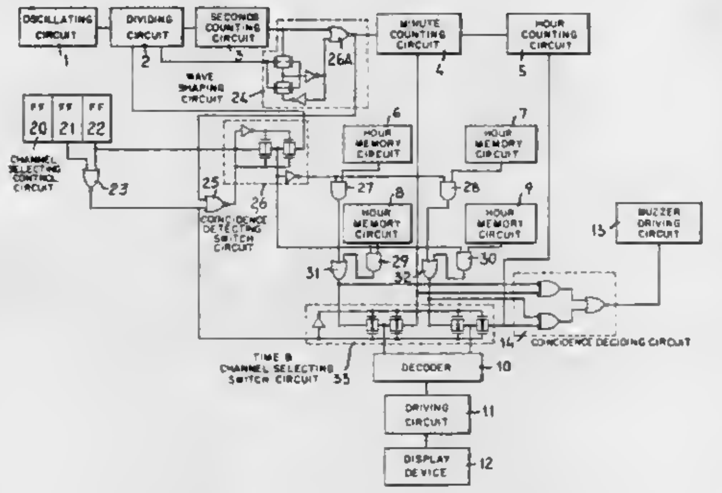
Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 19, 1976, Ser. No. 743,500

Claims priority, application Japan, Nov. 22, 1975, 50-140478

Int. Cl.^{2} **G04C** *21/00;* **G04B** *23/12*

U.S. Cl. 58—38 R **1 Claim**



1. In an electronic timepiece: a plurality of memory circuits for storing selected alarm times; an alarm responsive to an enabling signal for developing an alarm signal; a coincidence detecting circuit for detecting coincidence between a signal representative of present time and the contents of respective ones of said memory circuits and for applying an enabling signal to said alarm when coincidence is detected; and means for applying the contents of said memory circuits to said coincidence detecting circuit in a time-sharing mode to permit said coincidence detecting circuit to compare all of the alarm time with present time.

4,104,864
ELECTRONIC TIMEPIECE

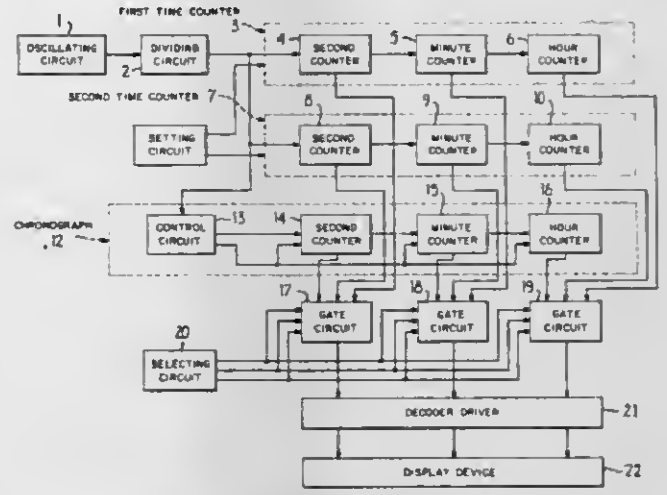
Takehiro Ishikawa; Kazumasa Yasuda; Kazuhiro Asano, and Takashi Ishijima, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 9, 1976, Ser. No. 739,855

Claims priority, application Japan, Nov. 11, 1975, 50-135565

Int. Cl.^{2} **G04F** *10/04;* **G04B** *19/22;* **G04F** *7/04*

U.S. Cl. 58—39.5 **1 Claim**



1. An electronic timepiece comprising, in combination: an oscillator circuit for generating a repetitive time standard signal having a repetition rate defining a time base; a dividing circuit connected to receive said time standard signal for dividing the same to develop a repetitive output signal having a repetition rate representing passage of time; a primary time counter of the 24 hour type connected for counting the output signal of said dividing circuit for developing a count representative of time and which advances with the passage of time; a secondary time counter of the 24 hour type connected for counting the output signal of said dividing circuit for developing a count representative of time and which advances with the passage of time; a third time counter of the 24 hour type comprised of a plurality of individual counters in cascade for counting the output signal of said dividing circuit; means for applying the output signal of said dividing circuit to selected ones of said counters comprising said third time counter at a certain time and for terminating application of the output signal of said dividing circuit to operate said third counter in a chronograph mode; a time correcting circuit cooperative with said primary and secondary time counters for setting the respective counts of said primary and secondary time counters; a display circuit responsive to the count of a respective one of said counters for displaying a time represented by the count; and time selecting means for selectively applying the count of a respective one of said counters to said display circuit for displaying a selected time and for operating the timepiece in a timekeeping mode or a chronograph mode.

4,104,865
ELECTRONIC TIMEPIECE HAVING AN ALARM DEVICE

Seikou Sasaki, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jun. 24, 1976, Ser. No. 699,360

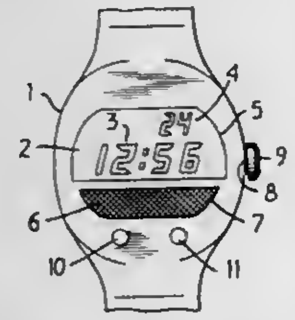
Claims priority, application Japan, Jan. 24, 1975, 50-77847

Int. Cl.^{2} **G04B** *19/24;* **G04C** *21/28;* **G04B** *23/12*

U.S. Cl. 58—58 **7 Claims**

1. An electronic timepiece having an alarm device comprising in combination: time counters comprising minute, hour and date counters: at least one channel having memory circuits corresponding respectively to said counters for setting alarm starting time: a coincidence circuit for detecting a coincidence between the output contents of said counters and the output contents of said memory circuits, an alarm generating circuit for generating an alarm signal in response to the output of said

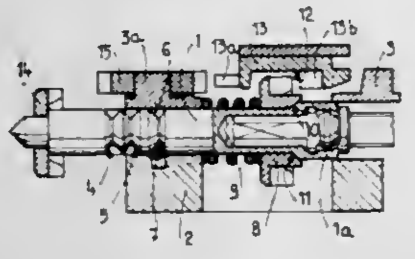
coincidence circuit: said memory circuit in said channel corresponding to said date counter having a memorizing capacity exceeding the counting capacity of said date counter, means for generating a non-set signal without a code signal corresponding to the code signal generated by said date counter, and



means for applying said non-set signal to said coincidence circuit instead of the coincidence signal between said date counter and the output contents of said memory circuit, whereby said alarm can selectively be set for a time and date or only for a time.

4,104,866
TIMEPIECE

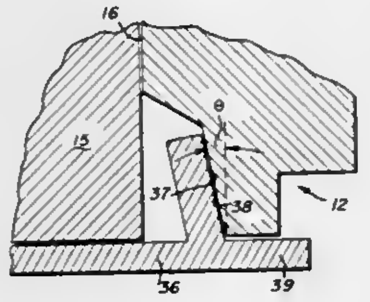
Jean-Maurice Chappatte, Hauterive, Switzerland, assignor to Ebauches Electroniques S.A., Switzerland
Filed Feb. 15, 1977, Ser. No. 768,858
Claims priority, application Switzerland, Feb. 19, 1976, 2011/76
Int. Cl.^{2} G04C *19/24;* **G04B** *27/00*
U.S. Cl. 58—85.5 **1 Claim**



1. A timepiece having at least one element intended for manual operation, said timepiece comprising, a rotatable control stem movable between at least two axial positions, a pinion having two axial faces and being loosely mounted on said stem, a coil spring positioned upon the stem and engaged between one axial face of the pinion and the frame of the timepiece, said spring being operable upon the opinion to urge the same for axial movement in one direction on the stem, said pinion having a frusto-conical recess (on the axial face) thereof opposite said one axial face, said stem having a shoulder of frusto-conical configuration adapted for mating engagement with said recess on the pinion, whereby when the stem is moved to one axial position thereof the shoulder engages the frusto-conical recess of the pinion to render the stem and pinion angularly rigid with respect to each other and the pinion is moved into meshed engagement with said element, the engagement between the stem and pinion being a friction coupling operable as a torque limitator.

4,104,867
WATER-TIGHT WATCH CASE

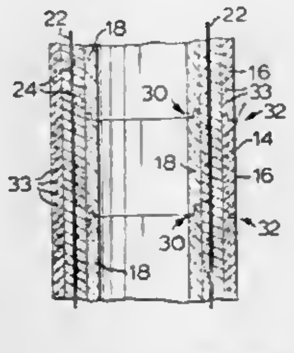
Daniel A. Worsham, San Jose, Calif., assignor to Pacific Western Systems, Mountain View, Calif.
Filed Feb. 27, 1976, Ser. No. 662,145
Int. Cl.^{2} G04B *37/00, 37/08*
U.S. Cl. 58—90 R **8 Claims**



1. In a fluid tight watch case:
case means for enclosing a timepiece in a water-tight manner;
said case means having a removable cover portion for providing physical access to the interior of said case means when said cover portion is removed; and
said case means and said cover portion thereof, each having an annular generally incompressible sealing ring surface portion formed and arranged so as to permit substantial relative axial translation therebetween for axially press fitting together in water-tight sealing engagement to form an annular water-tight seal therebetween, one of said annular sealing surfaces being disposed facing radially inwardly of said annular seal to be formed and disposed for mating with the other annular sealing surface which faces radially outwardly and wherein said inwardly facing annular sealing surface is of a truncated conically tapered configuration, said water-tight seal being made essentially solely due to an axially pressed interference-contact fit between said pair of mated annular sealing ring surface portions.

4,104,868
PRECAST CHIMNEY SYSTEM

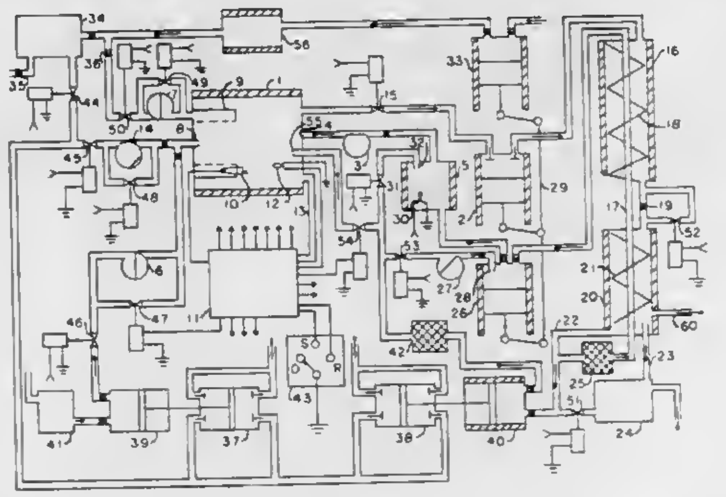
Kenneth Roy Jackson, Aylesford, Near Maidstone, England, assignor to Hankin-Baker Limited, Scarborough, Canada
Filed Jun. 17, 1977, Ser. No. 807,501
Int. Cl.^{2} E04H *12/12*
U.S. Cl. 52—743 **3 Claims**



1. A method of constructing a composite chimney having a unitary cross-section through the wall thereof, comprising the steps of:
providing an inner precast lining composed of annular segments in interfitting stacked relationship,
forming a plurality of reinforced annular segments by placing a plurality of circumferential steel hoops in each of a plurality of concrete annular segments to reinforce each of said segments against circumferential stressing,
providing a precast concrete outer wall composed of said annular reinforced segments in interfitting relationship surrounding said lining and spaced outwardly therefrom in non-contacting relationship therewith to define an interstitial gap,
providing linked longitudinal and circumferential reinforcing steel bars within said interstitial gap,
and pouring in situ concrete into said interstitial gap and allowing it to harden to integrally connect said outer wall thereby forming a multilayer chimney which is composed of at least three layers and is solid and continuous through the thickness thereof about the circumference thereof with said reinforcing bars providing longitudinal and circumferential reinforcement to said concrete.

4,104,869
STEAM ENGINE WITH STEAM HEAT RECOVERY AND STEAM COMPRESSION

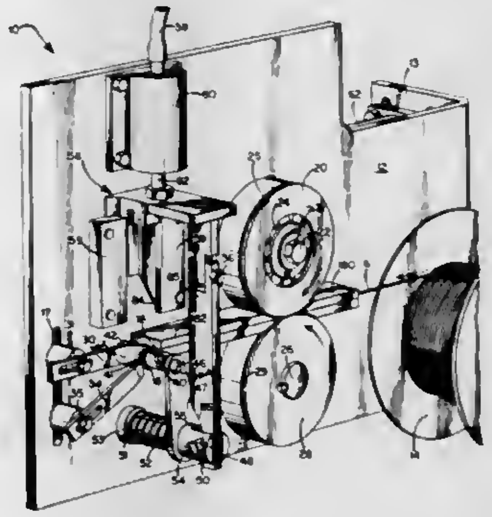
Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008
Filed Jan. 21, 1977, Ser. No. 761,350
Int. Cl.^{2} F02C *7/00*
U.S. Cl. 60—39.55 **19 Claims**



1. A steam engine comprising:
a pressurized combustion chamber means having a fuel injection device for injecting pressurized fuel, said chamber means having an oxygen port for injection of an oxygen bearing pressurized gas for oxidizing the fuel during combustion, a fuel igniting element producing heat, said chamber means having an output port, said chamber means having a water injection device for injecting pressurized water, said chamber means having a temperature sensing element and having a pressure port which is connected to a transducer via a first pipe, said chamber means having a steam port connected to the output port of a steam accumulator via a second pipe and valves for steam injection, a work means having an input that is connected to the output port of said chamber means via a third pipe and valves, said work means doing work by gas expansion, thereby transmitting work by a drive shaft, the output of said work means exhausting gases to the gas input of a heat exchanger means via a fourth pipe,
said heat exchanger means with a gas input port conducting heat from input gases to recovered water, thereby water condensing for a water output, said exchanger means exhausting waste gases to the atmosphere via an exhaust pipe, for a steam output said exchanger means heating recovered input water with input gases,
a steam compressor means having an output and having an input which is connected to the steam output of said exchanger means, said steam compressor means having a water injection device for the injection of pressurized water during compression, said compressor means receiving motivation energy from said drive shaft,
said pressurized steam accumulator means having an output port and having an input port which is connected to the output of said steam compressor means,
an air compressor means having an input connected to the atmosphere and an output connected to an air accumulator, said air compressor means receiving motivation energy from said drive shaft, the output of said air accumulator being connected to an auxiliary air tank and to said chamber means via a fifth pipe and valves,
a pressure producing fuel pump means having an input connected to a fuel tank, the output of said fuel pump means being connected to said fuel injection device via a sixth pipe and valves, said fuel pump means receiving motivation energy from said work means,
a pressure producing water pump means having an input at atmospheric pressure connected by a seventh pipe and valves to the water output of said heat exchanger means and to the output of an auxiliary water tank, the output of said water pump means being connected via an eighth pipe, a first filter, and valves to a plurality of water injection devices, said water pump means receiving motivation energy from said work means, and
an electro-mechanical control means using electronic and mechanical signals from components as input signals, said control means operating a plurality of valves in pipe lines, said control means generating output electronic signals and mechanical functions to control engine functions.

4,104,870
LINK-MAKING MACHINE AND METHOD

Albert Robbio, 16 Fyffe Ave., Cranston, R.I. 02920
Filed May 20, 1976, Ser. No. 688,350
Int. Cl.^{2} B21L *7/00*
U.S. Cl. 59—20 **11 Claims**



1. A device for forming links from a wire comprising:
(a) a frame;
(b) a first power source associated with said frame;
(c) a mandrel mounted on the frame outwardly directed from the frame and arranged to receive the wire thereon;
(d) means to form the wire adapted to the frame adjacent the mandrel, disposed to receive the wire and to direct the wire around the mandrel to form a plurality of loops thereon, the outermost of which is positioned toward one end of the mandrel and characterized by an open eccentric end portion;
(e) means to provide wire connected to said first power source, adapted to the frame and positioned to direct the wire upon the means to form the wire; and activated by said power source to move the wire from a first position to a second position closer to the means to form the distance between the positions substantially corresponding to that length of wire required for one link;
(f) means to close the outermost eccentric loop to form a link arranged to move between a position distant from the outermost eccentric loop to a position in contact with outermost eccentric loop to close the outermost eccentric loop;
(g) a cutter connected to a second power source adapted to the frame and joined to the means to close the outermost

eccentric loop which is closed before the link is cut from the wire having a blade-member connected to the power source and activated thereby to move between an open position distant from the mandrel to a closed position close to the mandrel to cut the link from the wire.

4,104,871
ENERGY CONDUCTING CHAIN

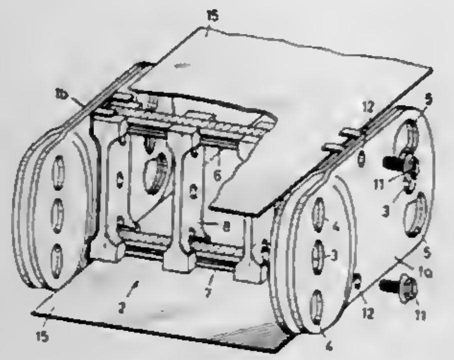
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,172

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622006

Int. Cl.² F16G *13/16*

U.S. Cl. 59—78.1 **5 Claims**



1. An energy conducting chain for the guiding of transmission lines between a moveable consumer and a stationary terminal comprising

links of the chain,

divisible stays, the latter being made of at least two belts each having a flattened cross-section and rounded narrow sides, and a plurality of separation stays arranged between said two belts, said separation stays having upper and lower ends formed with beveled recesses provided with undercuts, said belts being inserted in said recesses and held force-locked and positively without slipping with said separation stays upon twisting about a longitudinal axis thereof,

said belts having ends and being formed with threaded bores in said ends,

screw means for penetrating through said links of the chain and screwed-into said threaded bores,

reinforcement plates inserted between said belts and said links of the chain.

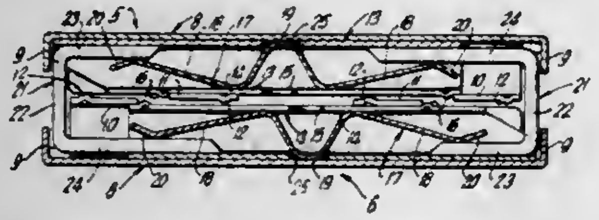
4,104,872
ADJUSTABLE EXPANSION BAND FOR WRISTWATCH

Sander G. Dukas, Kowloon, Hong Kong, assignor to Timex Corporation, Waterbury, Conn.

Filed May 12, 1977, Ser. No. 796,300

Int. Cl.² F16G *13/24;* A44C *5/08*

U.S. Cl. 59—79 R **4 Claims**



1. In an expansion band of the type having two rows of overlapping links, clip members connecting alternating links between rows, and spring members disposed within said links, the improvement comprising:

a pair of asymmetrical legs on each of said clip members disposed in the ends of alternating links, said clips arranged on opposite ends of the links, and

spring retaining means disposed within said links arranged to hold said spring members and adapted to be movable between locked and unlocked positions, said spring members each having spring arms cooperating with both of the legs of opposite clip members in the locked position and cooperating with only one leg of a clip member in the unlocked position.

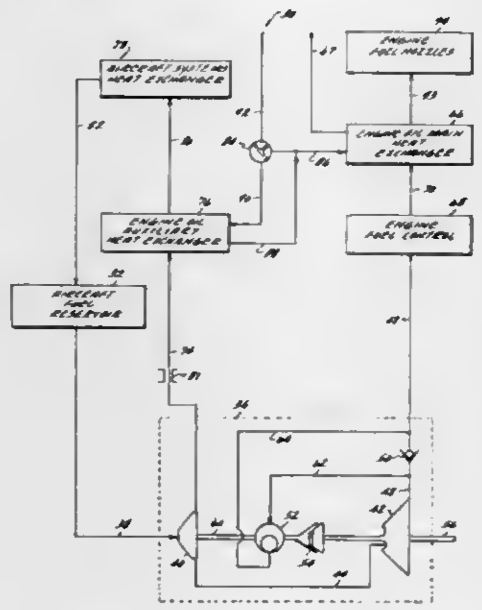
4,104,873
FUEL DELIVERY SYSTEM INCLUDING HEAT EXCHANGER MEANS

George A. Coffinberry, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 29, 1976, Ser. No. 745,766

Int. Cl.² F02C *9/06*

U.S. Cl. 60—39.28 R **15 Claims**



12. In a fluid delivery system associated with a gas turbine engine, the improvement comprising:

a fluid supply reservoir;

pump means for pressurizing a first fluid received from said first reservoir;

a pair of heat exchangers disposed in a parallel fluid receiving relationship with said pump means and receiving first fluid discharged therefrom;

valve means operative in a first mode for providing flow of a second fluid through one heat exchanger of said pair and in a second mode for bypassing said one heat exchanger.

4,104,874
DOUBLE-WALLED COMBUSTION CHAMBER SHELL HAVING COMBINED CONVECTIVE WALL COOLING AND FILM COOLING

Jacques E. J. Caruel, Dammarie les Lys, and Guy D. Stora, Melan, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 1, 1977, Ser. No. 764,655

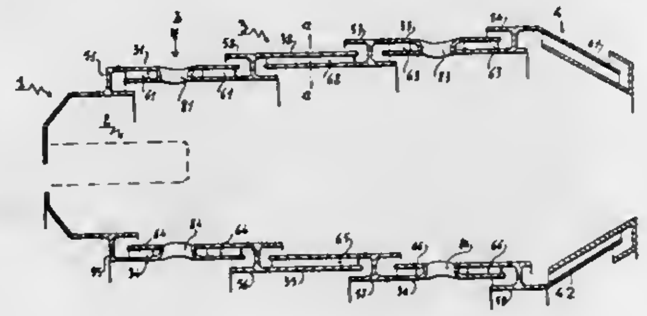
Claims priority, application France, Feb. 6, 1976, 76 03921

Int. Cl.² F02C *7/18*

U.S. Cl. 60—39.65 **3 Claims**

1. A combustion chamber shell, particularly for turbojet engines, wherein the said chamber is housed within a housing in which a current of air intended, on the one hand, to supply the combustion air and, on the other, to cool the walls of the said shell flows from front to rear and is of the type composed of sleeves whose diameters increase from front to rear and which have two facings, namely an outer one and an inner one, characterized by the fact that it contains between the sleeves

annular connecting parts of H section which consist of a web joining two cylindrical flanges, namely, an inner one and outer one, each of which has a free edge, each such free edge forming, respectively, with the outer facing of the sleeve located to the front and with the inner facing of the sleeve located to the rear, an annular intake channel section which faces frontwards and an annular discharge channel section which faces rearwards, in such a fashion that the said current of air first cools by convection the outer facing, then, after reversing direction, cools the inner facing, and finally protects the inner facing by the surface film effect.



4,104,875
ION PRIME MOVER

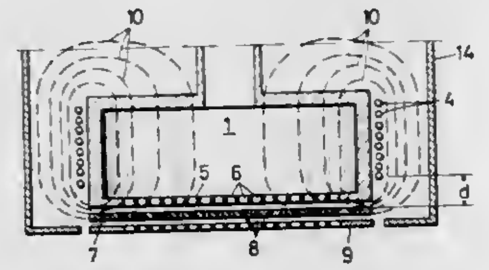
Winfried Birner, Eichenkofen; Hans Mueller, Munich; Horst Listmann, Sauerlach, and Helmut Bassner, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 23, 1976, Ser. No. 754,092

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633778

Int. Cl.² F02K *11/00;* H05H *1/16*

U.S. Cl. 60—202 **7 Claims**



1. An ion engine comprising an ionization chamber, anchor means with apertures therein for providing a plasma boundary in said ionization chamber, high frequency winding means surrounding said ionization chamber for generating a high frequency alternating electromagnetic field in said ionization chamber to ionize a gas in said ionization chamber, anode means arranged in said chamber, cathode means with apertures therein also arranged in said chamber to form an anode-cathode path for accelerating the ionized gas through said apertures in said plasma boundary anchor means and in said cathode out of said ionization chamber, said high frequency winding means being arranged in such a position above said cathode means as to maintain the field lines of said high frequency alternating electromagnetic field substantially undisturbed in the area adjacent to said plasma boundary anchor means, and to keep said field lines substantially at a right angle relative to the surface of said plasma boundary anchor means facing into said ionization chamber.

2. The ion engine of claim 1, wherein said cathode has a thickness which is proportional at least to the penetration depth "*s*" of said high frequency alternating electromagnetic field into said cathode, said depth "*s*" being determined by the formula

$$s = 1/(\pi f\, \mu_o \mu_r \kappa),$$

wherein $\pi = 3.14$; f = frequency of said electromagnetic field in Hz; $\mu_o = 1.256$ (μH/m) = absolute permeability; μ_r = relative permeability and κ = specific permeability (S m/mm^2) of the cathode mterial.

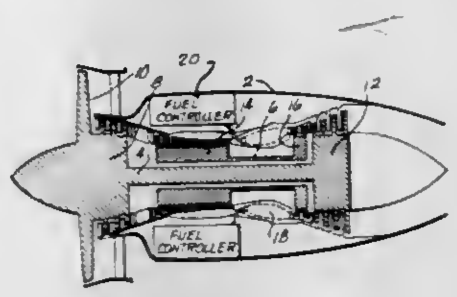
4,104,876
FAN R. P. M. CONTROL LOOP STABILIZATION USING HIGH ROTOR SPEED

Hals Norman Larsen, Redmond, and Peter Werner Kamber, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 679,594, Apr. 23, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,649

Int. Cl.² F02K *3/06;* F02C *9/04*

U.S. Cl. 60—226 R **6 Claims**



1. In a twin spool turbofan engine having a high speed spool, a fan spool, and fuel controller, a fan spool control loop stabilization system comprising:

means for generating a first speed dependent signal as a function of fan spool speed of rotation;

means for generating a second speed dependent signal as a function of the rate of change of the high speed spool speed of rotation;

signal summing means for adding said first speed dependent signal to said second speed dependent signal;

means for comparing said sum with a signal indicative of a desired fan spool speed of rotation and producing therefrom an error signal porportional to the difference therebetween; and,

means for adjusting the flow of fuel to said turbofan engine from said fuel controller in response to said difference signal such that the rotation of the fan spool is equivalent to and stable with said desired fan spool speed of rotation.

4,104,877
SUSPENSION SYSTEM FOR NOZZLE OF JET PROPELLED VEHICLE

Geoffrey Edward Bone, Crowthorne, and Peter Baguley Allen, Wokingham, both of England, assignors to Sperry Rand Limited, Bracknell, England

Filed Apr. 25, 1977, Ser. No. 790,357

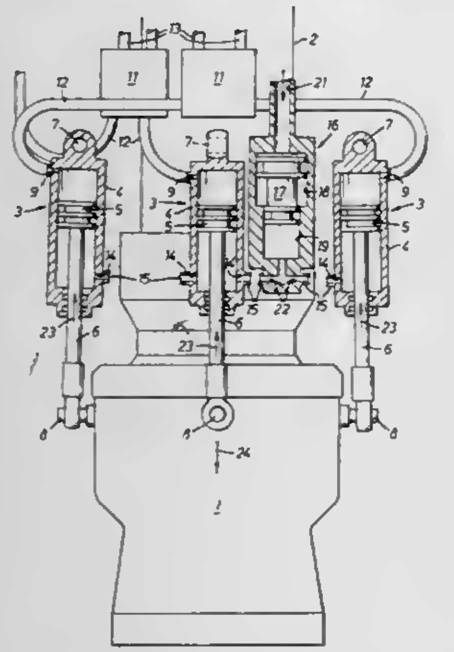
Claims priority, application United Kingdom, Apr. 30, 1976, 17637/76

Int. Cl.² F02K *9/00*

U.S. Cl. 60—230 **10 Claims**

1. A suspension system for a pivotal nozzle of a jet propelled vehicle having a gas generator operable to effect propulsion of the vehicle, the system comprising a plurality of actuators connected to the exhaust nozzle and operable to effect pivotal movement thereof to steer the vehicle in a desired direction, each actuator comprising a movable member connectible on one side to a source of fluid power to effect nozzle movement with the other side of the member being interconnected with said other side of each other actuator movable member to form

a fluid suspension for the nozzle, in use the suspension being pressurised to produce a force acting on the nozzle in a direction opposite to the load imposed on the nozzle by the gas from the gas generator acting thereon.



4,104,878

PRESSURE RESISTANT MEMBER

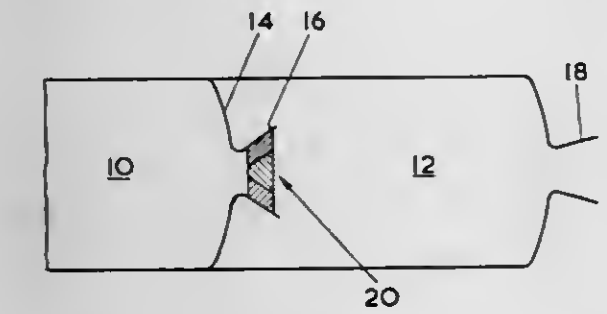
Michael John Chase, Kidderminster, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1976, Ser. No. 750,018

Claims priority, application United Kingdom, Dec. 23, 1975, 52618/75

Int. Cl.² F02K *9/04*

U.S. Cl. 60—245 **6 Claims**



1. A member for controlling flow between pressure zones comprising an assembly of discrete segments adhesively bonded together in side-by-side relationship to form a disc-like member, the assembly being adapted for location in an opening between the zones in use such that it will resist flow between the zones via the opening in one direction, but will disintegrate into bodies no larger than said discrete segments to permit flow between the zones in the opposite direction.

4,104,879

SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 22, 1976, Ser. No. 679,448

Claims priority, application Japan, Dec. 26, 1975, 50-157477

Int. Cl.² F01N *3/10*

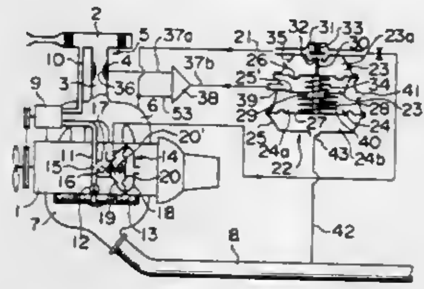
U.S. Cl. 60—290 **8 Claims**

1. A system for supplying secondary air into an exhaust system of an internal combustion engine by a flow rate substantially proportional to that of exhaust gases, comprising:

a source of secondary air;

a passage means for conducting secondary air from said source to said exhaust system of the engine;

a secondary air control valve provided in the midst of said passage means for controlling the supply of secondary air to said exhaust system depending upon a control signal pressure supplied thereto;



a pressure regulating valve for regulating the pressure of said control signal pressure;

said pressure regulating valve having a valve member; and

means positioning said valve member in accordance with a balance between a pressure representative of a carburetor venturi vacuum and the exhaust gas pressure of the engine.

4,104,880

EXHAUST GAS PURIFYING SYSTEM HAVING A DIAPHRAGM TYPE CONTROL VALVE

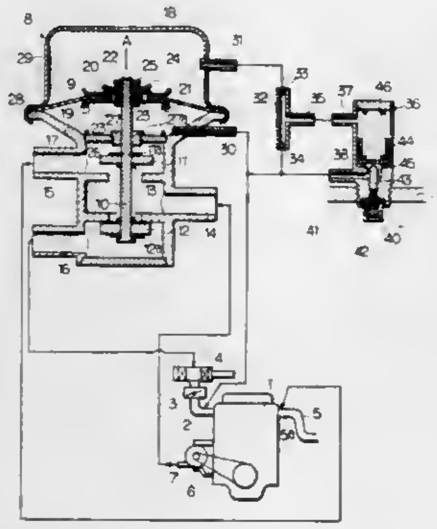
Mikiji Ito, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 28, 1976, Ser. No. 681,050

Claims priority, application Japan, Apr. 29, 1975, 50-51699

Int. Cl.² F01N *3/10;* **F02B** *75/10*

U.S. Cl. 60—290 **19 Claims**



1. An exhaust gas purifying system for an engine comprising:

a valve arrangement, having a diaphragm and a couple of chambers divided by said diaphragm, for switching on and off the air injected into an internal combustion engine in response to negative pressure introduced into one of said chambers from the engine,

means connected to said couple of chambers for passing the air from one of said chambers to the other to equalize the pressures in said both chambers in one of a plurality of predetermined different time delay periods, and

means, connected to said air passing means, for changing to another of said periods in response to a change in the temperature of the engine.

4,104,881

PREVENTION OF OVERHEATING OF CATALYTIC CONVERTER FOR ENGINE EXHAUST GASES

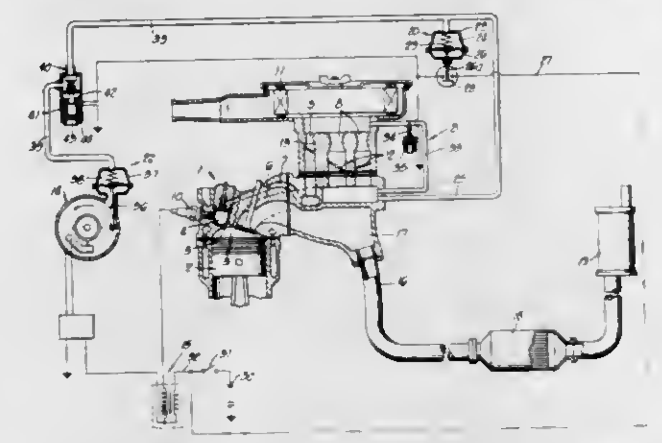
Hiroshi Kogure, and Junichi Shimada, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1976, Ser. No. 684,064

Claims priority, application Japan, May 12, 1975, 50-56433

Int. Cl.² F02B *75/10*

U.S. Cl. 60—299 **3 Claims**



1. Apparatus for preventing overheating of a catalytic converter receiving exhaust gases from an internal combustion spark-ignition engine comprising, in combination: an exhaust reaction chamber interposed between said engine and said catalytic converter, means including at least one throttle valve for supplying an air-fuel mixture leaner than the stoichiometric ratio for combustion in the engine, auxiliary means including an intake passage for supplying an air-fuel mixture richer than the stoichiometric ratio for ignition and combustion in the engine, sensing means for sensing deceleration conditions in the engine by sensing an increase in intensity of intake vacuum, means responsive to said increase for retarding the spark ignition timing, and means responsive to said increase for introducing supplemental air downstream from the throttle valve to reduce the air-fuel ratio of the mixture received for combustion by the engine during deceleration from the means including at least one throttle valve.

4,104,882

SUPER-CHARGED CARBURETOR ENGINE

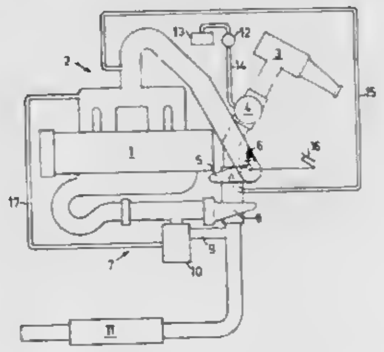
Per Sune Gillbrand, and Anders Erik Bertil Johansson, both of Enhörna, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Dec. 3, 1976, Ser. No. 747,386

Claims priority, application Sweden, Dec. 10, 1975, 7513897

Int. Cl.² F02D *23/00*

U.S. Cl. 60—600 **5 Claims**



1. In an internal combustion engine, an inlet system for taking in air, mixing the air with fuel and feeding the resulting fuel-air mixture to the engine, the inlet system including in flow sequence a throttleless carburetor for mixing fuel with air flowing in the system, a compressor positioned downstream of the carburetor for compressing the resulting fuel-air mixture, a throttle positioned downstream of the compressor for regulating the pressure of the compressed fuel-air mixture flowing in the system downstream of the carburetor, and conduit means for conducting the compressed, throttled fuel-air mixture to the engine.

4,104,883

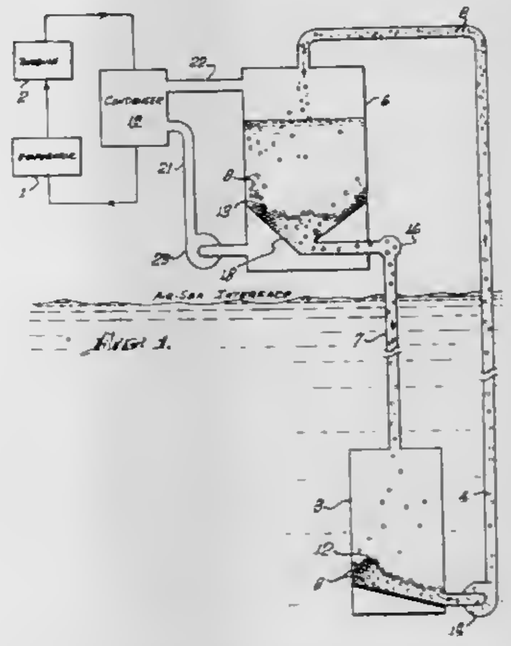
MASS TRANSPORT HEAT EXCHANGER METHOD AND APPARATUS FOR USE IN OCEAN THERMAL ENERGY EXCHANGE POWER PLANTS

Frederick E. Naef, Reston, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,180

Int. Cl.² F01K *9/00;* **F03G** *7/04*

U.S. Cl. 60—641 **12 Claims**



1. A method of condensing the working gas of an ocean thermal energy conversion system comprising:

mixing in a sub-surface tank disposed at an ocean depth a supply of temperature-sensitive phase-transformation particles with cold ambient sea water for forming a slurry having a temperature essentially equal to that of the ambient water,

delivering said cold slurry upwardly from said tank depth into a surface-disposed tank,

returning said particles from said surface tank to said sub-surface tank,

exposing at said surface level said working gas to the temperature of the surface tank slurry, and

withdrawing the sea water from said surface tank and recirculating it as an influent back into said surface tank,

said temperature-sensitive particles being of a type capable of undergoing a phase transformation at a temperature between that of said sub-surface ambient sea water and said surface tank influent.

4,104,884

INFLATABLE BARRIER

Paul Preus, Smith Rd., Toms River, N.J. 08753

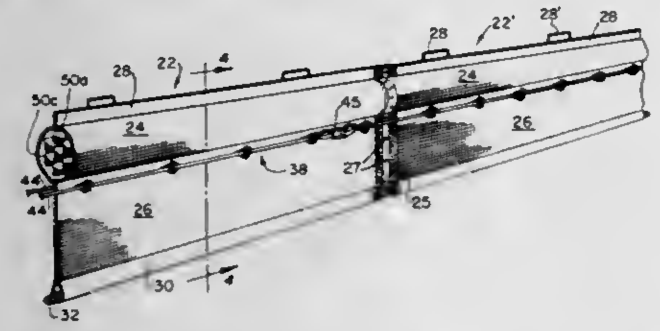
Continuation of Ser. No. 676,795, Apr. 14, 1976, abandoned. This application Apr. 13, 1977, Ser. No. 786,993

Int. Cl.² E02B *15/04*

U.S. Cl. 61—1 F **3 Claims**

1. A barrier for water carried pollutants comprising a series of end to end connectable boom sections, each boom section comprising a flexible tubular sleeve, seven inflatable tubular chambers removably insertable within said flexible tubular sleeve and extending substantially the entire length of the flexible sleeve, each of said tubular chambers terminating at least at one end of the sleeve in inflation valve means and each

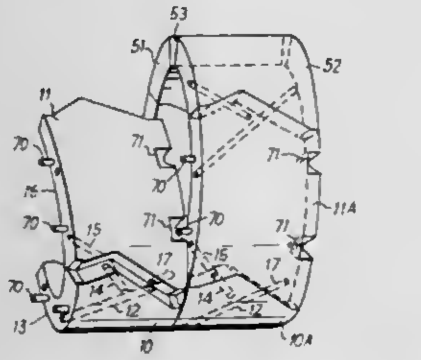
of said tubular chambers being closed at the opposite end and when said inflatable chambers are inflated said chambers comprising the primary flotation means for the boom sections, each said boom section being particularly characterized in that one



of the seven tubular chambers is positioned about the axis of the tubular sleeve and the other of said tubular chambers are positioned in an annular zone about the said one of the tubular chambers.

4,104,885
TUNNEL LINING

Norman Stanley Thomas, Stone, England, assignor to Fairclough Construction Group Limited, London, England
Filed Jan. 15, 1977, Ser. No. 806,874
Claims priority, application United Kingdom, Jun. 21, 1976, 25652/76; Aug. 13, 1976, 33798/76
Int. Cl.² E21D *11/08*
U.S. Cl. 61—45 R **18 Claims**

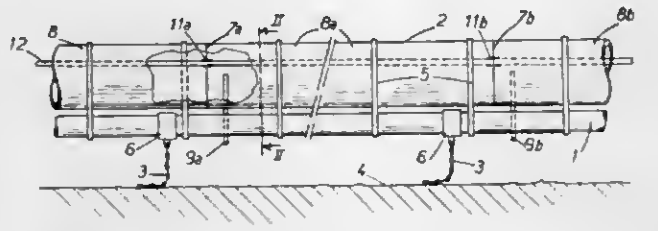


1. A concrete segment for an annulus of a tunnel lining, having an end connectable to an end of another, identical, segment of the annulus abutting thereagainst by means of connecting dowels insertable from an edge of the segment other than the abutting end thereof into at least two channels within the segments, each channel extending through an edge of the segment and in alignment with the end of and partially into said abutting segment, the channels being disposed at an angle to one another whereby the segments are held together when the dowels are in position.

4,104,886
FLOAT FOR USE IN LAYING SUBMARINE PIPELINES

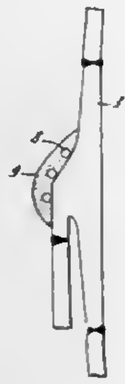
Michel Paul Dumont, Paris, and Jacques Edouard Lamy, Fontenay-aux-Roses, both of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France
Filed May 27, 1977, Ser. No. 801,362
Claims priority, application France, May 31, 1976, 76 16329; Jul. 13, 1976, 76 21430
Int. Cl.² F16L *1/00*
U.S. Cl. 61—112 **17 Claims**

1. A float device for use in laying a submarine pipeline from a launching base, comprising tubular means fixed to the pipeline and forming a plurality of compartments therealong, means isolating the compartments from each other, a liquid less dense than water filling the compartments, means opening towards the bottom for putting each compartment into communication with the sea, means for opening passages interconnecting the compartments, an opening at an end of the tubular means situated at the launching base, and means for actuating said opening means by remote control so that the water occupies the compartments progressively while driving the liquid less dense than water towards said opening.



4,104,887
PROCEDURE FOR LOADING COOLED, LIQUEFIED GASES, AND TANK FOR STORING AND/OR TRANSPORTATION OF COOLED, LIQUEFIED GASES

Rolf Kvamsdal, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Jeloy, Norway
Filed Aug. 11, 1976, Ser. No. 713,621
Claims priority, application Norway, Jun. 29, 1976, 762252
Int. Cl.² F17C *7/02*
U.S. Cl. 62—45 **8 Claims**



1. The method for loading cooled, liquefied gases in a noncooled tank which is mounted on a peripheral skirt support structure at least partially surrounding said tank and which tank includes an integral transitional support member forming a portion of the tank wall and being rigidly secured to said skirt support, said method comprising the steps of, directly cooling said transitional support member between the tank and the skirt support structure and thereafter loading liquefied gases in the tank.

4,104,888
DEFROST CONTROL FOR HEAT PUMPS

Wayne R. Reedy, Cazenovia, and Fredrick R. Eplett, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Jan. 31, 1977, Ser. No. 764,321
Int. Cl.² F25D *21/02*
U.S. Cl. 62—80 **14 Claims**

1. A control system for monitoring the operation of a vapor compression refrigeration system to detect frost accumulation on a heat exchanger coil comprising;

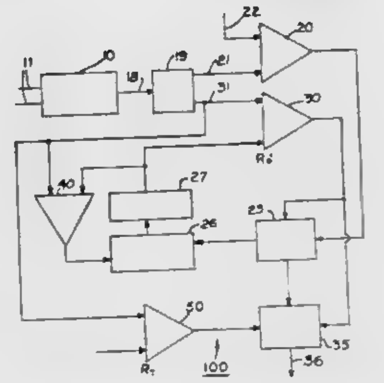
a compressor operatively connected to the coil for effecting thermal contact between two heat transfer media to effect transfer of heat from one medium to another medium,

sensor means operatively connected to said vapor compression refrigeration system for providing an output signal in response to an operational parameter of said vapor compression refrigeration system responsive to the rate of heat transfer;

means coupled to the output signal from the sensor means for generating a reference signal having a reference level dependent upon the output signal from the sensor means in response to an absence of frost on the coil;

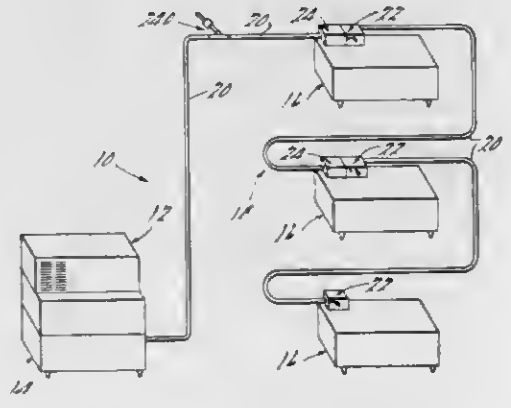
comparator means coupled to said output signal from said sensor means and to said reference signal from said means for generating a command signal in response to said output signal varying from the predetermined reference signals; and

means coupled to said command signal and operatively connected to said coil for initiating a change in the rate of heat transfer between the two heat transfer media in response to the presence of said command signal.



4,104,889
ICE TRANSPORT AND DISPENSING SYSTEM

Walter Harold Hoenisch, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.
Continuation of Ser. No. 395,712, Sep. 10, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,151
Int. Cl.² F25C *5/18*
U.S. Cl. 62—137 **38 Claims**



1. An ice transport system for selectively distributing ice from a source thereof to at least two remote stations,

said system including an ice making machine and means defining an ice flow path communicating with said stations,

a blower providing a relatively high velocity flow of air communicable with said flow path for transferring ice therealong,

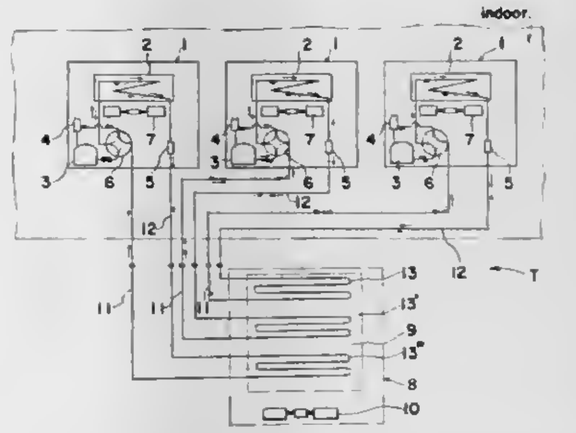
an ice diverting apparatus,

ice level sensing means at each of said stations for sensing the quantity of ice and for providing a control signal to said ice diverting apparatus, said apparatus being operable in a first mode to cause ice to be communicated from said flow path toward one of said stations and being actuatable in response to said signal to a second mode to cause ice being transferred along said path to bypass said one station and be communicated toward the other of said stations, and

an electrical control circuit operatively associated with said ice making machine, blower and said ice level sensing means for effecting deenergization of said machine and said blower when the volume of ice at said stations is at a predetermined magnitude.

4,104,890
AIR CONDITIONING APPARATUS

Ryohei Iwasaki, Fujisawa, Japan, assignor to Matsushita Seiko Co., Ltd., Osaka, Japan
Continuation of Ser. No. 692,579, Jun. 3, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 823,172
Int. Cl.² F25B *13/00, 7/00, 1/10*
U.S. Cl. 62—324 **6 Claims**



1. An air conditioning apparatus which comprises: at least one outdoor unit having therein an outdoor heat exchanger, said outdoor heat exchanger having a plurality of coils each constituted by at least one heat exchange medium pipe and acting as a condenser when the apparatus is used for cooling and as an evaporator when the apparatus is used for heating; a plurality of indoor units for air conditioning individual indoor spaces and corresponding in number to the number of said coils in said outside heat exchanger, each of said indoor units having a compressor, an indoor heat exchanger acting as an evaporator when the apparatus is used for cooling and as a condenser when the apparatus is used for heating; pipe means connecting each indoor unit with a corresponding one of said coils in said outdoor heat exchanger of said outdoor unit; and a four way valve in each indoor unit connected between said compressor and said indoor heat exchanger and said pipe means for switching flow of heat exchange medium from a flow from said compressor to said indoor heat exchanger and from said outdoor heat exchanger to said compressor to a flow from said compressor to said outdoor heat exchanger and from said indoor heat exchanger to said compressor, whereby the pressure of the heat exchange medium flowing in said pipe means is substantially uniform at a high pressure when said apparatus is used for cooling and substantially uniform at a low pressure when said apparatus is used for heating.

4,104,891
TORSIONALLY ELASTIC MECHANISM

Leonhard Geislinger, Hofelgasse 26, Salzburg, Austria
Filed Nov. 5, 1976, Ser. No. 739,111
Claims priority, application Austria, Nov. 13, 1975, 8671/75
Int. Cl.² F16D *3/14*
U.S. Cl. 64—26 **2 Claims**

1. A torsionally elastic mechanism which comprises

(a) a central portion including an inner member,

(1) the central portion defining a reservoir,

(b) an outer member elastically coupled to the inner member for rotation therewith,

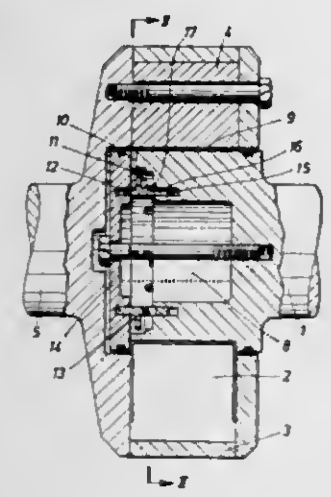
(1) the inner and outer members defining therebetween first and second chambers, and

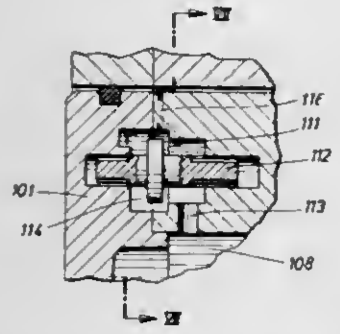
(2) gap means through which the first and second chambers communicate with each other,

(c) passage means connecting the reservoir to at least part of the chambers,

(d) a damping liquid in the reservoir and, upon the rotation of the coupled members, centrifugally flowing from the reservoir into the chambers through the passage means and filling the chambers, the passage means permitting the damping liquid to flow back into the reservoir,

(1) the inner and outer members being angularly displaceable relative to each other during the rotation and arranged to displace the liquid filling the chambers between the first and second chambers through the gap means during angular displacement so as to perform a damping action, and

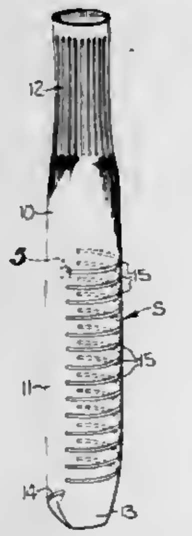




(e) sliding valve means disposed in the passage means and arranged therein for sliding from a neutral position under the liquid flow,

(1) the sliding valve means being arranged to present a lower resistance to the flow of the liquid from the reservoir into the chambers than to the flow of the liquid from the chambers into the reservoir.

4,104,892
CUSHIONED SOLE TUBE SOCK AND METHOD
James L. Thorneburg, Statesville, N.C., assignor to Thorneburg Hosiery Mill, Inc., Statesville, N.C.
Filed Nov. 15, 1976, Ser. No. 741,885
Int. Cl.^{2} A41B *11/02*
U.S. Cl. 66—185 **6 Claims**



1. A knitted heelless stretchable tube sock, said sock being characterized, due to the lack of a heel pocket, by a tendency to gather and form wrinkles in the upper instep area due to the presence of surplus fabric in such area when the sock is worn in stretched condition, said sock comprising

(a) a leg portion knit of a plurality of consecutive complete courses and having substantially the same fabric thickness throughout its length and periphery,

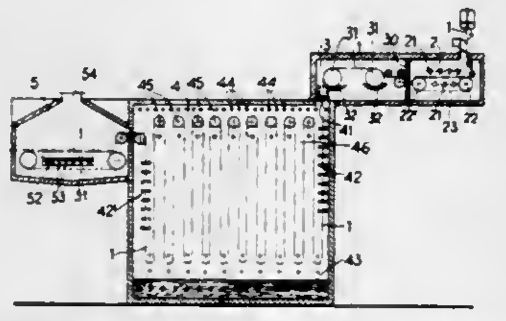
(b) a heel portion knit integral with said leg portion and having a plurality of consecutive complete courses, said heel portion being circumferentially divided into first and second fabric areas of differential fabric thickness, said first fabric area including terry loops on the inner surface and defining a heavy fabric area, said second fabric area being devoid of terry loops and defining a relatively thinner fabric area,

(c) a foot portion knit integral with said heel portion and having a plurality of consecutive complete courses, said foot portion being similarly circumferentially divided into first and second fabric areas of differential fabric thickness, said first fabric area including terry loops on the inner surface and defining a heavy fabric area, said second fabric area being devoid of terry loops and defining a relatively thinner fabric area, said first and second fabric areas of said foot portion being aligned with corresponding first and second fabric areas of said heel portion,

(d) a closed toe portion formed integral with said foot portion, and

(e) means on the outer surface of said foot portion for identifying the relative positions of said first heavy fabric areas and said second relatively thinner fabric areas of said heel and foot portions to guide the wearer in placing the sock on the foot so as to position said relatively thinner fabric areas on top of the wearer's foot and said heavy fabric areas beneath the heel and sole of the wearer's foot whereby the tendency of the surplus fabric to form wrinkles at the upper instep area of the wearer's foot is minimized by the placement of the relatively thinner fabric at that area while affording maximum comfort and protection to the heel and sole of the wearer's foot.

4,104,893
APPARATUS FOR CONTINUOUS DYEING OF TEXTILES
Bruno Marchesini, via del Colle, Trissino (Vicenza), and Fernando Martini, via Trento, Piovene Rocchette (Vicenza), both of Italy
Filed May 11, 1976, Ser. No. 685,300
Claims priority, application Italy, Aug. 4, 1975, 26062 A/75
Int. Cl.^{2} D06B *3/12, 21/00*
U.S. Cl. 68—5 E **5 Claims**



5. In an apparatus for continuously dyeing a textile fabric and comprising a chamber for preheating said fabric, a chamber for applying onto said fabric a dyestuff solvent solution, a chamber for fixing said dyestuff onto said fabric and vaporizing off from said fabric said solvent, the improvement comprising a developing chamber for fixing said dyestuff onto said fabric, said developing chamber comprising:

(a) first and second side walls;

(b) a ceiling;

(c) a flooring;

(d) an inner upper zone of superheated solvent vapor;

(e) an inner lower zone of saturated solvent vapor;

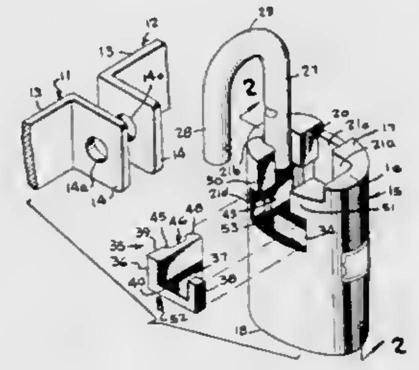
(f) a plurality of guide rollers positioned near said ceiling and said flooring for advancing said fabric from said first to said second side wall and alternately through said zones;

(g) a first group of heating means positioned near said flooring to create said saturated solvent vapor in said lower zone;

(h) second and third groups of heating means positioned at said first and second side walls, respectively, to create said superheated solvent vapor in said upper zone and to prevent condensation of said solvent on said walls; and

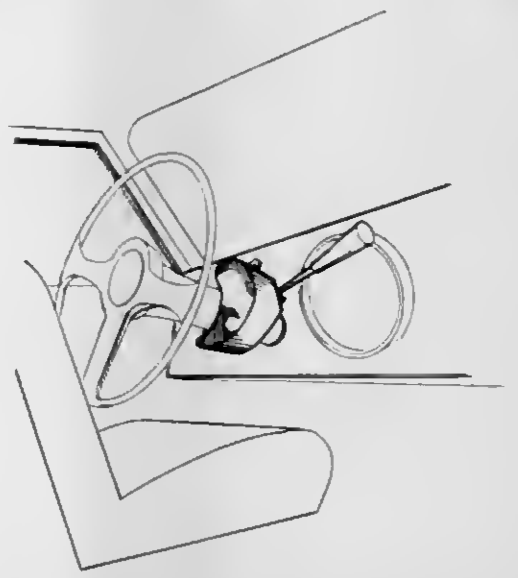
(i) a fourth group of heating means positioned near said ceiling to assist in the creation of said superheated solvent vapor in said upper zone and to prevent condensation of said solvent on said ceiling.

4,104,894
PADLOCK HAVING WEDGE DEVICE FOR RESISTING DESTRUCTIVE WEDGE ATTACK
James Clayton Miller, and Paul R. Proefrock, both of Nicholasville, Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.
Filed Oct. 3, 1977, Ser. No. 839,458
Int. Cl.^{2} E05B *67/02;* E05C *19/08*
U.S. Cl. 70—52 **15 Claims**



1. A high security padlock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in parallel, laterally alined abutment, the padlock comprising a strong penetration and distortion resistant padlock body having a rearwardly opening cavity bounded by a pair of laterally spaced vertical bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded by the padlock body against access by attacking tools directed from the front, sides, or bottom of the lock body, the padlock including a shackle having a portion movable from a locking position extending transversely through the cavity and through the apertures of the abutting hasp portions therein and a retracted position enabling withdrawal of the hasp portion from the cavity, a lock mechanism within the padlock body for locking the shackle in said locking position and releasing the same for movement to the retracted position; the improvement comprising a wedge-attack resisting collar member in said cavity for resisting destructive attack responsive to driving wedge-type attack tools in the zone located between the rear of the padlock and a rearwardly adjacent stationary surface of a portion of the locking bars or adjacent wall surface or the like by persons seeking destructive tearing of the padlock shackle forwardly through the hasp portions, the attack resisting collar member comprising integral bottom and side walls defining a hasp-receiving passage between the side walls to receive therethrough the laterally alined abutting hasp portions and one of said side walls providing a forwardly converging wedge portion located between the adjacent lateral surface of the adjacent hasp portion and the confronting bounding wall surface, said wedge portion having a contact surface adjacent the hasp portion and an opposite camming surface disposed adjacent and confronting the adjacent bounding wall surfaces, the collar member having a rear end portion projecting through said rearward opening for a predetermined distance beyond the rear of the lock body flanking the opposite sides of the alined abutting hasp portions into said zone to be engaged by the attacking tool when driven between the lock body and rearwardly adjacent surface, and said lock body having inclined ramp surface formations along the confronting bounding surface adjacent the wedge portion for imparting a predetermined component of lateral hasp gripping movement to the wedge portion toward the opposite bounding wall surface when the collar member is driven forwardly by the attacking tool and thereby bring portions of the padlock into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity.

4,104,895
VEHICLE STEERING COLUMN IGNITION LOCK PROTECTIVE DEVICE
Lawrence Tankel, West Roxbury, Mass., assignor to Car Cuf Industries, Inc., Brookline, Mass.
Filed Apr. 11, 1977, Ser. No. 786,071
Int. Cl.^{2} E05B *17/14*
U.S. Cl. 70—237 **2 Claims**



1. A vehicle steering column lock protective device comprising:

a casing having a base, first and second parallel sidewalls affixed to said base, and first and second ends affixed to said base and said sidewalls;

a u-shaped shackle having a first and second end, the first end of said shackle pivotally mounted at the first end of said casing, and at least one shackle aperture defined within said shackle in proximity to said shackle's second end;

said casing having defined therein an ignition key lock receptacle area in a central portion thereof between said sidewalls, a shackle insertion slot centrally located in the base of said casing proximal to said casing's second end, a casing insert aperture proximal to said casing's second end and adjacent to said second sidewall, a lock receipt aperture in said first sidewall proximal to said casing's second end, a female receptacle slot in said base at the bottom of said casing insert aperture, a screw aperture in said second sidewall adjacent to said casing insert aperture, and a gearshift receptacle slot formed by an angular indentation in said casing and first sidewall proximal to said casing's second end below said lock receipt aperture and to the side of said shackle insertion slot;

a casing insert adapted for insertion into said casing insert aperture;

a lock member of the push-to-lock, key release type having a lock bolt and lock flange member, said lock member adapted to be inserted within said lock receipt aperture from the direction of said casing insert aperture when said casing insert is not inserted therein, said lock bolt and lock flange facing said casing insert aperture, said lock flange adapted to be affixed to a portion of said first sidewall adjacent said casing insert aperture;

lock flange means for affixation of said lock flange to said casing, the mechanical fastening of said lock flange means for affixation effected through said screw aperture; and

said casing insert further having a male extension portion at its base adapted to mate with said female receptacle slot at the bottom of said casing insert aperture, said casing insert further having defined therein a bolt receiving aperture and a screw receipt aperture, said casing insert being adapted for insertion into said casing insert aperture so as to be spaced apart from said lock flange a distance sufficient to allow said shackle to pass there between with said bolt receiving aperture opposite said lock bolt; and after said insertion, said casing insert to be affixable in position by casing insert means of affixation inserted through said screw aperture in said second sidewall engaging into said casing insert's screw receipt aperture so that when said shackle is in a closed position and said push-to-lock, key release lock is depressed, said lock bolt passes through said shackle aperture and into said bolt receiving aperture of said casing insert thereby retaining said casing insert in said casing insert aperture when locked even if said casing insert means of affixation inserted through said casing screw aperture engaging said casing insert should otherwise be removed.

4,104,896

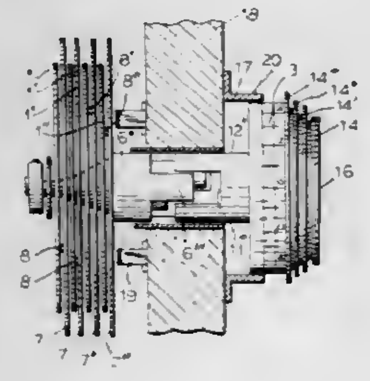
DIAL LOCK

Hee Mok Hahn, 156-36, Songbuk-dong, Songbuk-Ku, Seoul, Rep. of Korea

Filed Apr. 26, 1977, Ser. No. 791,145

Int. Cl.^{2} E05B *37/02*

U.S. Cl. 70—310 2 Claims



1. A dial type combination lock comprising a plurality of locking units, each locking unit having a locking means comprising a leading disc having a plurality of holes around the outer edge thereof corresponding to a series of indicia and a connecting shaft projecting from the center thereof, and a locking disc rotatably mounted on said connecting shaft and having a pin adjacent the periphery thereof and engaged in one of the holes in said leading disc and a bolt receiving notch in the outer periphery thereof, and each locking unit having a dial means comprising a cup-shaped dial having an upstanding wall and base, the wall defining an indicia carrying portion on the radial outer surface thereof and a further connecting shaft projecting from the base thereof and telescopically coupled with said connecting shaft on said leading disc so that the dial may move from an inner to an outer position relative to the locking means, an innermost one of said plurality of locking units being mounted on a central supporting shaft and successive locking units having the connecting shafts successively larger in diameter and concentric with each other, said connecting shafts being successively shorter the larger the diameter thereof, the walls of the cup-shaped dials on the successive locking units being nested in each other and the successive locking discs and leading discs of the locking units being side by side, a protecting case around the wall of the dial of the outermost dial means and having an index thereon, whereby the dials must be drawn out from their inner position to their outer position to expose the indicia carrying portion thereof, and at least one supporting member engaged with the locking disc on the outermost locking unit to prevent movement of the locking disc, said protecting case being adapted to be mounted on one side of a member to be locked and the supporting member being adapted to be mounted on the other side of the member to be locked.

4,104,897

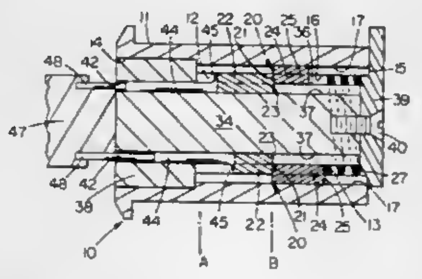
TUMBLER LOCK

Gerald A. Freedman, c/o Fish & Richardson, Ste. 2100, 28 State St., Boston, Mass. 02109

Continuation-in-part of Ser. No. 590,334, Jun. 25, 1975, abandoned. This application Jun. 21, 1976, Ser. No. 697,936

Int. Cl.^{2} E05B *29/06*

U.S. Cl. 70—363 20 Claims



1. A lock comprising:

a cylinder,

means for forming a tumbler chamber within said cylinder,

means for forming a keyway that intersects said chamber,

a plurality of lock tumblers located together within the same said chamber, said tumblers traveling therein from a constant misalignment arrangement through a plurality of variable misalignment arrangements to an alignment arrangement, wherein whenever said tumblers are misaligned the said lock cannot be operated and while said tumblers are aligned the said lock can be operated,

a key having a plurality of bits that can enter said keyway to contact said tumblers, and cause the same to variably travel toward said alignment arrangement,

means for dragging said travel of every said tumbler, wherein whenever said key causes said tumblers to travel toward said alignment arrangement said means for dragging is sufficient to prevent said tumblers from traveling beyond said alignment arrangement, and

means for collectively returning said tumblers from all said alignment and variable misalignment arrangements back to said constant misalignment arrangement whenever said key is removed from said keyway, wherein whenever said key causes said tumblers to travel toward said alignment arrangement one or more of said dragged tumblers travels to said alignment arrangement contacted with said means for returning and the remaining dragged tumbler or tumblers travels to said alignment arrangement spaced from said means for returning, in said constant misalignment arrangement said means for returning is in contact with all of said tumblers, and in any alignment or misalignment arrangement no tumbler is positioned between said means for returning and any other tumbler, said means for collectively returning comprising a coil spring.

4,104,898

LOCK SAFETY DEVICE

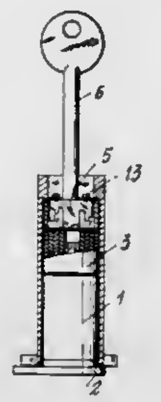
Battista Fois, via Roccella Ionica 48, Rome, Italy

Filed Mar. 7, 1977, Ser. No. 774,966

Claims priority, application Italy, Mar. 9, 1976, 20986 A/76

Int. Cl.^{2} E05B *15/08, 17/14*

U.S. Cl. 70—419 5 Claims



1. A lock safety device comprising, in combination, a rotatable lock-operating rotor having a first key slot extending transversely thereof, a non-rotatable inner member adapted for fixed securement to a door or the like; key-operable pin means interconnecting said rotor and said inner member to prevent rotation of said rotor, said pin means being operable, by a key engaged in said first key slot, to release said rotor for rotation, relative to said inner member, by the thus engaged key; a fixed outer member having a second key slot extending transversely thereof; and a rotatable diaphragm member interposed between said fixed outer member and said rotor and having a third key slot extending transversely thereof; said second and third slots normally being angularly aligned with each other and extending at an angle to said first key slot to block access to said pin members through said first key slot; said diaphragm member, upon insertion of a key through said second key slot into said third key slot, then aligned with said second key slot, being rotatable to align said third key slot with said first key slot for further insertion of the key into said first key slot to operate said pin means to release said rotor for rotation of said lock-operating rotor by the key.

4,104,899

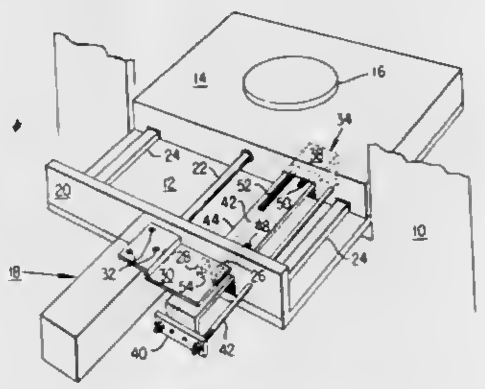
PNEUMATIC BUFFERING SYSTEM

Carlos Dean Pinkstaff, Chardon, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 587,943, Jun. 18, 1975, Pat. No. 4,033,250. This application Dec. 10, 1976, Ser. No. 749,561

Int. Cl.^{2} B21D *43/00;* **B21J** *13/08;* **F15B** *15/22*

U.S. Cl. 72—24 3 Claims



1. A pneumatic system for controllably moving a horizontal press bolster between positions of a predetermined horizontal path comprising:

a pneumatic pressure source having a predetermined pressure level;

a linear actuator having a pair of opposed pressure chambers;

a piston movable in said linear actuator in response to the pressure difference in the opposed pressure chambers of said linear actuator, said piston being coupled to the press bolster to move the press bolster with movement of said piston;

sensing means for detecting the position of the press bolster along the predetermined path and establishing control signals indicative thereof; and

valve means responsive to the control signals of said sensing means for sequentially applying said predetermined pressure level from said pressure source firstly to only one of the opposed pressure chambers of said linear actuator while exhausting the other of the opposed pressure chambers to quickly drive the press bolster through a first portion of the predetermined path, secondly applying said predetermined pressure level from said pressure source to both of the opposed pressure chambers of said linear actuator without exhausting the other of the opposed pressure chambers to buffer the speed and momentum of the press bolster through a second part of the predetermined path and thirdly exhausting only the other pressure chamber of said linear actuator to drive the press bolster through the remaining part of the predetermined path to quickly close it without causing a shock to the bolster and press.

4,104,900

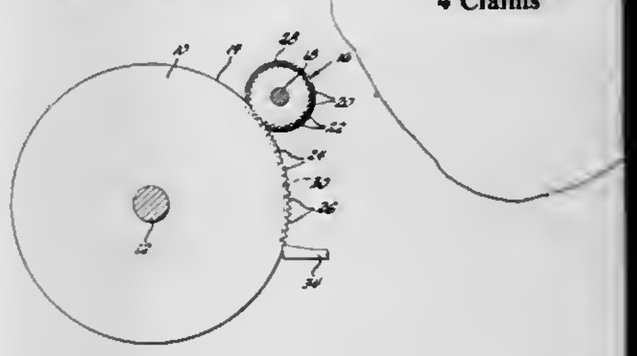
PROCESS FOR MAKING METAL FIBERS

Terry E. Nels, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1977, Ser. No. 792,918

Int. Cl.^{2} B21H *8/00*

U.S. Cl. 72—70 4 Claims



1. A method of making metal fibers of predetermined size comprising;

impressing a knurled pattern on a working surface of a metal workpiece the pattern comprising a series of alternate ridges and depressions, the length and width of said ridges corresponding respectively to the desired length and width of said fibers and the depth of said depressions being at least as great as the desired thickness of said fibers, and

shaving said ridges from said working surface at a suitable depth to form said fibers having the desired thickness and to expose a new working surface.

4,104,901

HARDNESS TESTING MACHINE

Joseph Trevor Sidaway, 138 Leavale Rd., Norton, Stourbridge West Midlands, England

Filed Oct. 14, 1976, Ser. No. 732,475

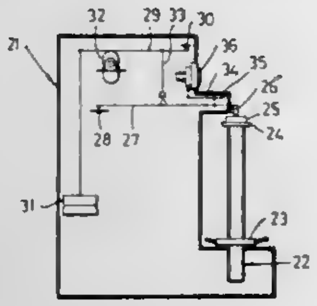
Claims priority, application United Kingdom, Oct. 16, 1975, 42405/75

Int. Cl.^{2} G01N *3/44*

U.S. Cl. 73—81 9 Claims

1. In a hardness testing machine having a support for an object which is to be tested, an indenter which, in use, forms an indentation in the object, an indenter lever on which the indenter is mounted and a mechanism for urging the indenter

against the object under test, the improvement wherein the indenter lever is arranged for applying a preliminary load to the indenter to urge same against the object, said mechanism includes means for exerting an additional load on the indenter and the machine further comprises a clamp for applying a load substantially equal to the additional load to an object on the support prior to application of the additional load to the indenter, and means operative for transferring said applied additional load from said clamp to said indenter and thereby applying the additional load by the indenter to the object and relieving the object of the load applied thereto by the clamp.



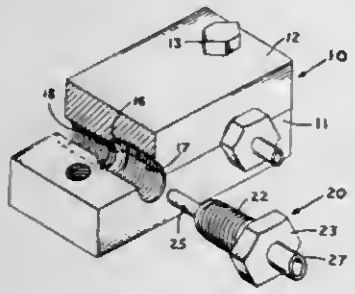
4,104,902
FERRULE FORMING ASSEMBLY

James W. Cease, Phillipsburg, N.J., assignor to Robert H. Fine, Milford, N.J.

Filed Jun. 29, 1977, Ser. No. 810,957

Int. Cl.² B21D *41/02*

U.S. Cl. 72—117 **4 Claims**



1. An assembly for forming a ferrule on a tubular member comprising,
   - a. housing means,
   - b. at least one sized transverse bore extending end to end in said housing and having at least one opening in the side of said housing to permit the tubular member to be inserted therethrough a predetermined distance so as to position the same in the transverse bore as a function of the position where the ferrule will be formed thereon,
   - c. said transverse bore has a first sized section to hold the tubular member from slipping in assembled position for forming the ferrule thereon, a second counter-bored section in alignment with said first sized section, and a fixed contoured annular die surface formed medially in said transverse bore between the first sized section and the second counter-bored section,
   - d. said second counter-bored section threaded for a portion of the length thereof a spaced distance from the fixed annular die surface,
   - e. a ferrule forming element having, an inner end, an outer end, and threaded means thereon for threadably connecting the same in the threaded section of said second counterbored section to permit movement thereof in the transverse bore towards and away from the fixed annular die surface, and said ferrule forming element in assembled position in said second counter-bored section to define a lubricant space adjacent the fixed annular die surface,
   - f. said sized section having a plurality of spaced annular channels to provide a labyrinth seal on the side of the fixed annular die surface remote from the lubricant space to limit leakage of the lubricant from the transverse bore during formation of the ferrule on the tubular member,
   - g. said ferrule forming element having a contoured mating die surface at the inner end thereof to coact with the fixed annular die surface on movement of the ferrule forming element so as to form the shaped ferrule on the tubular member, and
   - h. means at the inner end of the ferrule forming element for engaging the end, the outer surface, and the inner bore of the tubular member to permit uniform force to be exerted on the end of the tubular member during formation of the ferrule thereon.

4,104,903
APPARATUS FOR EXTRUSION OF TUBES

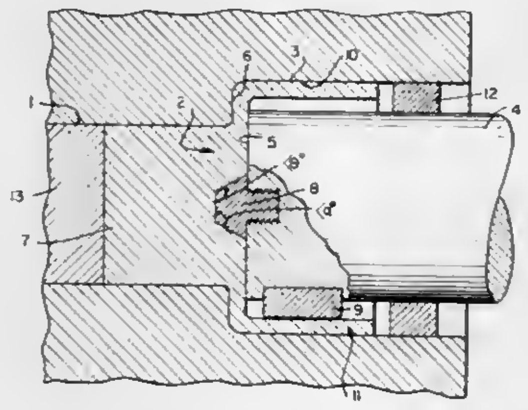
Douglas W. Rowell, Woodbury, Conn., and Werner Rethmann, Georgsmarienhuette, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,773

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613684; Mar. 31, 1976, 2613685; Mar. 31, 1976, 2613686; Apr. 30, 1976, 2619047

Int. Cl.² B21C *23/08, 25/08, 26/00*

U.S. Cl. 72—264 **4 Claims**



1. In an extrusion press for producing an extruded tube wherein said press has a billet chamber and a ram adapted to drive a billet through said billet chamber, sizing means comprising an annular die at the outlet end of the billet chamber, said die having a substantially cylindrical portion of larger diameter than the billet at the outlet end of the chamber for sizing the outside diameter of an extruded tube, and an elongated cylindrical mandrel for sizing the wall thickness of the tube, said mandrel spaced concentrically within the die and having a maximum sizing diameter situated in juxtaposition with the cylindrical portion of said die and defining with said die a horizontally extending annular aperture through which said billet is extruded, said juxtaposition of said die and said mandrel being such that said billet is extruded outwardly away from said mandrel until it abuts said cylindrical portion of said die and then forms an extruded tube having an inside diameter greater than the maximum sizing diameter of said mandrel; the improved contruction characterized by said mandrel comprising a cone shaped annular insert extending into said die from the front face of the mandrel, said mandrel further being provided with an arcuate insert mounted partially within said mandrel in the area of the lower longitudinal surface thereof, such arcuate insert being dimensioned in the circumferential direction so as to correspond to that of at least one half of the circumference of said mandrel and having a radial protrusion from the mandrel face that is supported by the inner wall of the extruded tube during the extrusion operation.

4,104,904
HIGH-ENERGY RATE FORGING MACHINE

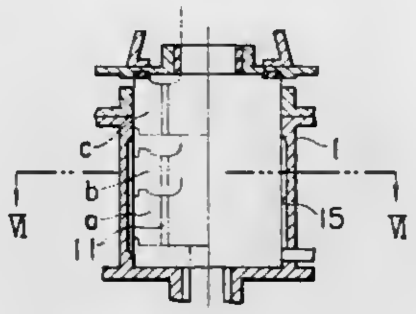
Hiroyasu Yaguchi, Muroran, and Eishiro Ono, Noboribetsu, both of Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,434

Claims priority, application Japan, Feb. 19, 1976, 51-16533

Int. Cl.² B21J *7/24*

U.S. Cl. 72—445 **2 Claims**



1. In a high-energy rate forging machine of the type including a piston fitted to reciprocate in a cylinder and having small holes longitudinally therethrough connecting the space above and below said piston within said cylinder, and means for connecting a high pressure gas with the said above space, the improvement comprising; a plurality of small groove means provided longitudinally in the inner peripheral wall of said cylinder at positions therein arranged to provide communication between said spaces at least when said piston is at the bottom of its stroke and arranged to not provide communication at least when said piston is at the top of its stroke, said groove means passing a negligable amount of gas during the downward stroke of said piston so that there is a negligable effect on stamping and, said groove means providing for equilibrium between the high-pressure chamber and the low-pressure chamber after stamping to prevent double or triple stamping, and providing a smooth upward return stroke.

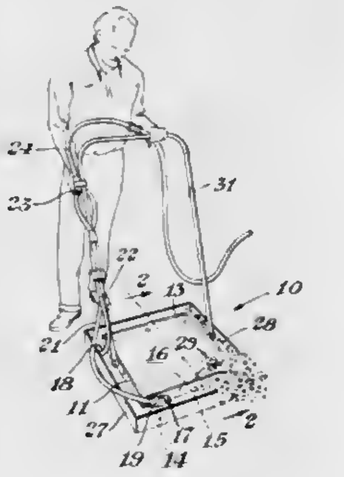
4,104,905
LEAK DETECTING APPARATUS

Richard E. Zachary, Ethel, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 13, 1976, Ser. No. 750,067

Int. Cl.² G01M *3/06*

U.S. Cl. 73—40 **6 Claims**



1. An apparatus for the testing of a generally horizontally disposed water-impermeable membrane, the apparatus comprising a hollow housing, the hollow housing having an upper end and a lower end, the upper end being closed and having an transparent portion, the lower end being open and having disposed thereabout a flexible sealing member adapted to engage a membrane being tested, the hollow housing defining an inner cavity in full communication with the open end, a gas discharge means disposed adjacent the upper end of the housing, and a water inlet means within the housing in communication with the cavity, an ejector in operative combination with the gas discharge means, a selective valving means to selectively (a) supply water to the water inlet means or (b) supply water to the ejector to thereby exhaust air from the cavity or (c) prevent flow of water to the water inlet means or the ejector, a liquid ballast receiving means being a trough peripherally disposed about and affixed to the hollow housing.

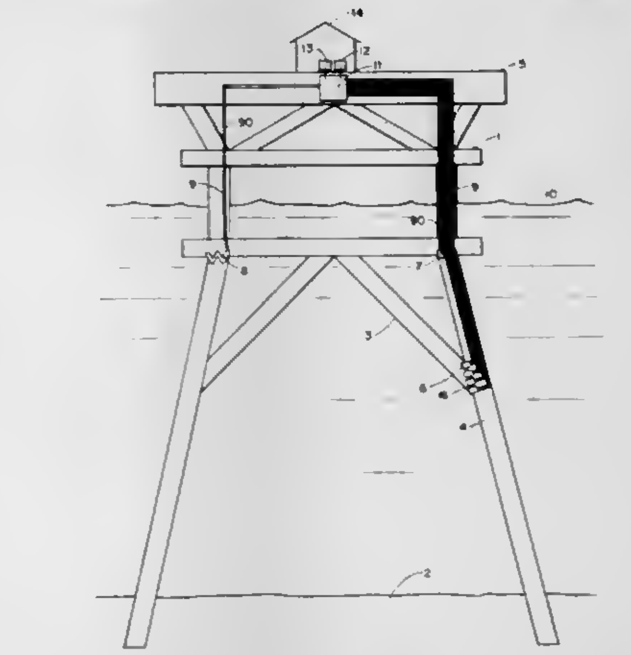
4,104,906
EARLY CRACK DETECTION WITH MULTI-PRESSURE SYSTEM

Donald H. Oertle, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 4, 1977, Ser. No. 784,193

Int. Cl.² G01M *3/02*

U.S. Cl. 73—104 **44 Claims**



33. An apparatus for the early detection of the formation of a crack in a non-permeable, structural member subject to stress before the crack traverses the member, the apparatus comprising:
- (a) a first vacuum source,
- (b) a first vacuum sensor,
- (c) a vacuum tight line connecting the first vacuum source and the vacuum sensor,
- (d) a patch sealed in vacuum tight relationship to the line, the patch comprising a first permeable cavity adjacent to the end of the first vacuum line and to the structural member, the patch further comprising a second cavity adjacent to the structural member but sealed from the first cavity, the second cavity sealed to a line providing fluid communication with a second pressure source.

4,104,907
INDICATED HORSEPOWER MEASUREMENT SYSTEM FOR PISTON ENGINES

Panayiotis J. Tsipouras, Rocky River, Ohio, assignor to Megasystems, Inc., Cleveland, Ohio

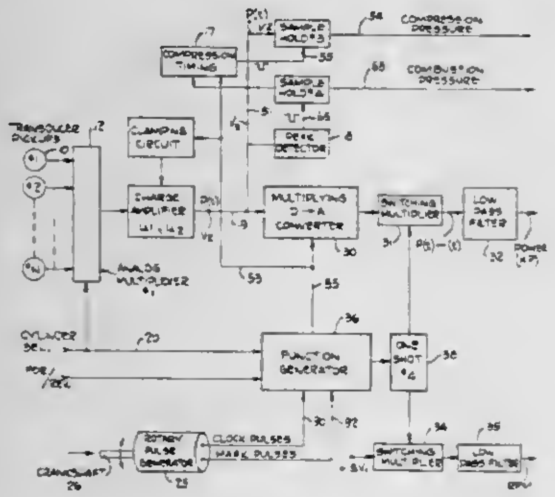
Filed Oct. 26, 1976, Ser. No. 735,591

Int. Cl.² G01M *15/00*

U.S. Cl. 73—117.3 **8 Claims**

1. An electronic measurement system for monitoring and measuring the operating parameters of a multi-cylinder engine having a cyclically drivable member connectable to all pistons of said engine, comprising transducer means for sensing the internal cylinder pressure in each cylinder of said engine and providing a first signal representative of the change in pressure therein, first circuit means for providing a first voltage signal

proportional to the pressure changes in a selected cylinder under examination, first switch means connected between said transducer means and first circuit means for sequentially connecting the transducer means of each selected cylinder to said first circuit means to enable the selected cylinder examination whereby said first voltage signal is provided for each said selected cylinder, second circuit means in circuit with said first circuit means and operable to sample the first voltage signal at predetermined intervals of time and to develop a second voltage signal which is applied to the first circuit means effective to modify the first voltage signal so that it is proportional to absolute pressure, means for continuously sensing the relative angular position of the drivable member and to provide a second signal which is indicative of said angular position, third circuit means connected to said sensing means for developing a third digital signal representative of the linear velocity of the piston of the selected cylinder, fourth circuit means connected to said first circuit means for multiplying the first voltage signal by the third digital signal to develop a fourth signal that is representative of the instantaneous horsepower of the selected cylinder, and fifth circuit means connected to said fourth circuit means for averaging the fourth signal and to provide a second voltage signal that is representative of the indicated horsepower of the selected cylinder.



4,104,908
BORE STRESS LIMIT INDEX

Dominic P. Timo; Ronald J. Placek; David C. Gonyea, all of Schenectady; Lloyd H. Johnson, Scotia, and Jens Kure-Jensen, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,965

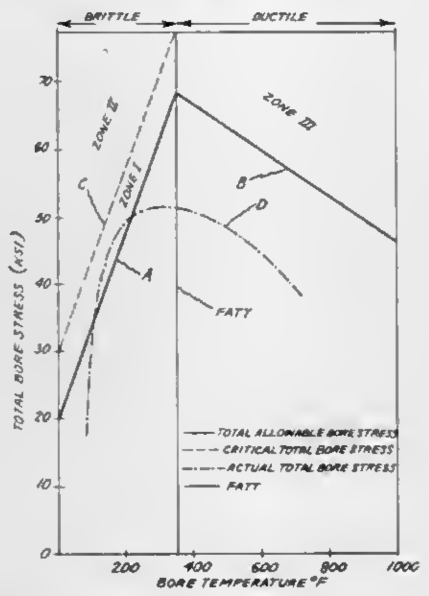
Int. Cl.^{2} G01M ***15/00***

U.S. Cl. 73—117.3 **16 Claims**

1. In a turbomachine wherein certain turbomachine parts may be assigned allowable stress values based upon the operating temperature of the turbomachine; wherein the allowable stress values are a function of whether or not the machine operating temperature is above or below a transition temperature; a method for monitoring stress excursions within the turbomachine parts wherein the actual stress value may exceed allowable stress values comprising the steps of:

comparing the turbomachine operating temperature with the transition temperature;

counting stress excursions occurring below the transition temperature in at least one counter; and,



counting stress excursions occurring above the transition temperature in at least one other counter.

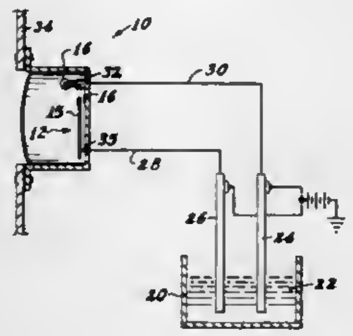
4,104,909
COMBINATION GAUGE

Wayne R. Ayers, R.R. 4, Box 218, Noblesville, Ind. 46060

Continuation-in-part of Ser. No. 740,598, Nov. 10, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,603

Int. Cl.^{2} G09F ***9/00***

U.S. Cl. 73—118 **10 Claims**



1. A combination gauge for indicating a measured condition, comprising, in combination:

a visual light means;

first response means operatively connected to the condition being sensed and to the said visual light means;

an indicator gauge means having numerals or other indicia for specifying to the user as to the quantity or other characteristic of the condition being sensed;

and second response means operatively connected to the condition being sensed and to the said indicator gauge means;

energization control means for the said visual light means, adapted to be pre-set to energize the said visual light means to illuminate the face of the indicator gauge means upon the happening of a certain condition of the condition being sensed;

the arrangement being such that the said indicator gauge means is operative to specify its sensed data to the user during various conditions of the condition being sensed, and the said visual light means is operative to be energized to give its sensed data condition signal to the user by illuminating the face of the indicator gauge means during operativity of the said indicator gauge means but only when the condition being sensed reaches a pre-selected condition which has been pre-set into the said energization control means for the said visual light means.

4,104,910
PRESSURE MEASURING METHOD

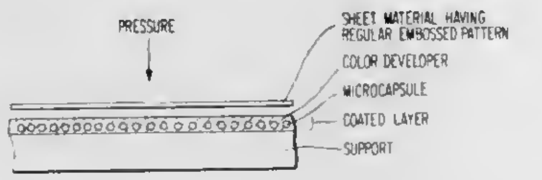
Yasuhiro Ogata, and Noburo Hibino, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami ashigara, Japan

Filed Jan. 18, 1977, Ser. No. 760,306

Claims priority, application Japan, Jan. 20, 1976, 51-5180

Int. Cl.^{2} G01L ***1/00***

U.S. Cl. 73—141 R **9 Claims**



1. In a pressure measuring method in which a pressure applied to a part or parts is detected by applying the pressure to the part or parts using a pressure-sensitive recording sheet on which the color density formed is related to the pressure applied and which is in contact with said part or parts and evaluating the color density formed, the improvement which comprises applying the pressure while interposing a sheet material having regular embossed patterns between said part and said pressure-sensitive recording sheet.

4,104,911
METHODS AND APPARATUS FOR DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

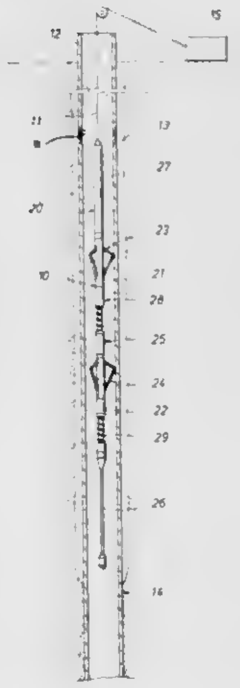
Jean C. Lavigne, Chevreuse, and Yves Nicolas, Versailles, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,194

Claims priority, application France, Sep. 28, 1976, 76 29054

Int. Cl.^{2} E21B ***47/00***

U.S. Cl. 73—151 **27 Claims**



1. A method for determining at least approximately a remote location at which a string of pipe may be stuck in a well bore and comprising:

moving a deformation-responsive sensor to a selected depth location within said pipe string and anchoringly engaging the upper end of said sensor to an upper wall surface of said pipe string which is then adjacent to said upper sensor end;

anchoringly engaging the lower end of said sensor to a lower wall surface of said pipe string which is then adjacent to said lower sensor end only after said upper sensor end has been anchoringly engaged; and

thereafter, upon application of a force to the surface end of said pipe string, monitoring output signals from said sensor for detecting whether a corresponding deformation is then being induced in the incremental length of said pipe string between said upper and lower wall surfaces thereby demonstrating that said incremental length of said pipe string is at least partially situated above said remote location.

4,104,912
SYSTEM FOR TAKING CURRENT-METERING MEASUREMENTS

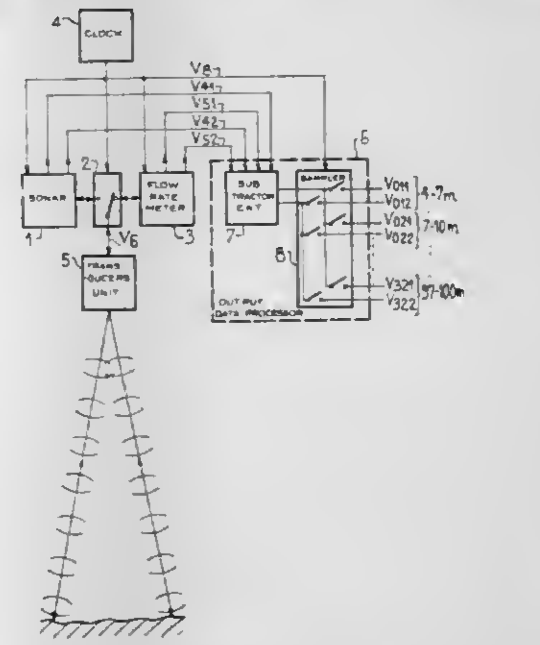
Noël Clavelloux; Francois Peynaud, and Gilles Posseme, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 700,157, Jun. 28, 1976, abandoned. This application Mar. 30, 1977, Ser. No. 782,701

Claims priority, application France, Jul. 1, 1975, 75 20646

Int. Cl.^{2} G01W ***1/00***

U.S. Cl. 73—189 **9 Claims**



8. A liquid flow rate metering system on board comprising, in cooperation:

a flow rate meter (3), based on Doppler effect for providing relative measurements of currents through a liquid medium,

a Doppler sonar system (1), for determining the speed of moving craft in relation to the liquid bottom and further for correcting said flow rate relative measurements,

a controlled switching means (2), for sequentially connecting said meter and said sonar system alternately to a single acoustic unit (5),

a control means (4) for controlling said switching means operation and for actuating sequentially in turn the meter and the sonar system actually connected to said acoustic unit,

the said acoustic unit (5) comprising groups of electroacoustic transmitting and receiving transducers mounted within a fluid medium filled sealed casing, which is inclined in relation to the vertical beam axes oriented towards acoustic waves transparent casing base in contact with craft supporting liquid medium, the velocity of acoustic waves in the filling fluid being controllable by regulated and adjustable temperature of said fluid,

whereby the difference between the measured flow rate and the determined speed of the craft provides at the output of a data processing device (6) a true flow rate in magnitude, direction and relative layer distribution.

4,104,913
APPARATUS FOR MEASURING THE MASS FLOW OF A FLUID

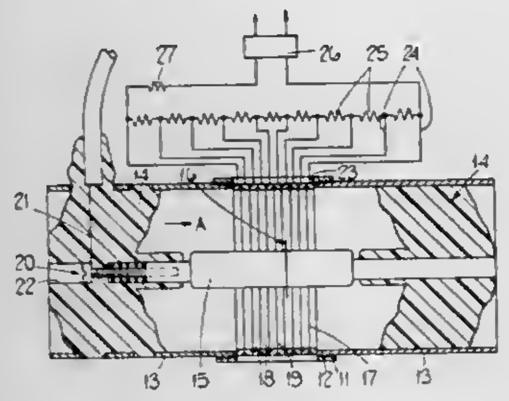
Charles Peter Cockshott, Balsall Common, and John Howard Moore, Redditch, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 22, 1977, Ser. No. 780,154

Claims priority, application United Kingdom, Apr. 8, 1976, 14233/76

Int. Cl.^{2} G01F *1/56*

U.S. Cl. 73—194 F **5 Claims**



1. Apparatus for measuring the mass flow of a fluid, comprising a first ionizing electrode which, in use, is located in the path of fluid flow and, when energized, ionizes said fluid, a second substantially cylindrical, hollow collector electrode which extends around said first electrode and to which, in use, the ions produced by the first electrode migrate, the second electrode including a plurality of conductive rings spaced apart in the direction of fluid flow with insulating material being interposed between adjacent rings and at least one ring of each pair of adjacent conductive rings overlapping the insulating material between the rings so as to prevent said insulating material being exposed to the ions migrating to the rings in use, and means responsive to the amount of ion migration to the various conductive rings for measuring the displacement of the ions by the fluid flowing past the electrodes, displacement being dependent upon the mass flow of said fluid.

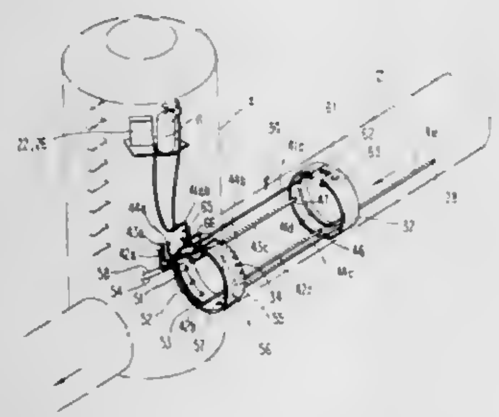
4,104,914
FLOW MONITORING

Charles A. McClure, 5 Laurel Cir., Malvern, Pa. 19355

Filed Sep. 20, 1976, Ser. No. 724,979

Int. Cl.^{2} G01F *1/00*

U.S. Cl. 73—194 F **7 Claims**



1. In a probe for sensing electrical conductivity within the open end of a conduit, the combination of support means compressible to fit within the conduit and expansible to be retained frictionally against the inside wall thereof, a plurality of conductivity sensors supported thereby at opposite sides relative to a longitudinal vertical bisector of the conduit, and jet means spaced longitudinally from the sensors for connection to electrically conductive fluid and thereby adapted to release such fluid into the conduit.

4,104,915
ULTRASONIC DEVICE FOR THE DETERMINATION OF THE RATE OF AIR FLOW IN THE INLET DUCT OF AN INTERNAL COMBUSTION ENGINE

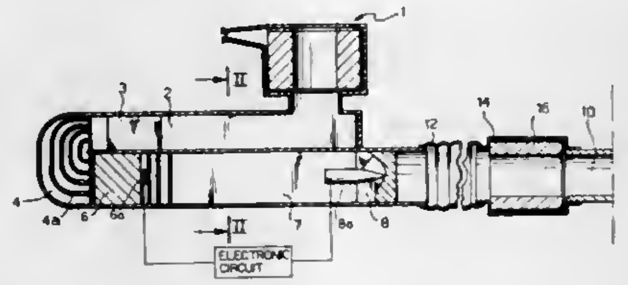
Massimo Husse, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Jul. 7, 1977, Ser. No. 813,740

Claims priority, application Italy, Jul. 9, 1976, 68718 A/76

Int. Cl.^{2} G01F *1/66*

U.S. Cl. 73—194 A **1 Claim**



1. A device for determining, by ultrasonic means, the rate of air flow in the inlet duct of an internal combustion engine, comprising:

a detector duct of generally rectangular cross section,

two piezo-electric transducers of ultrasonic type situated at respective opposite ends of said detector duct,

an electronic circuit connected to the outputs from said ultrasonic piezo-electric transducers, said electronic circuit operating to determine the air flow rate from the output signals from said ultrasonic piezo-electric transducers,

an intake duct of generally rectangular cross section extending adjacent said detector duct,

a U-shape deflector joining one end of said intake and detector ducts together,

a first acoustic filter connected to said intake duct and serving to absorb the ultrasonic frequency components of noise generated externally of said device,

a first set of fins located in said intake duct and shaped so as to render substantially uniform, across the air stream in said intake duct, both the air speed and the temperature of the air stream flowing therepast,

a second set of fins located in said U-shape deflector for diverting the air flow from said intake duct into said detector duct,

a third set of fins located in said detector duct for aligning the stream lines of fluid flowing therepast,

a flexible sleeve connected to said detector duct,

means for joining said flexible sleeve to the inlet duct of the engine, and

a second acoustic filter for absorbing the ultrasonic frequencies of noise generated by the engine itself.

4,104,916
APPARATUS FOR TEMPERATURE MEASUREMENT

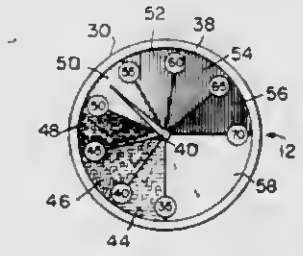
Heinz P. Hofer, South Blvd., Upper Grand View, N.Y. 10960

Filed Sep. 7, 1976, Ser. No. 720,944

Int. Cl.^{2} G01K *3/00*

U.S. Cl. 73—343 B **3 Claims**

1. A temperature measuring instrument for measuring the temperature of the contents of a bottle of wine comprising a thermometer including a hollow stem having an upper and lower end, a temperature sensing means positioned within said stem proximate the lower end thereof, and a temperature-indicating head secured proximate the upper end of said stem and having a calibrated scale and a pointer, said calibrated scale including a plurality of colored segments, the color of each segment being chosen to correspond to the color of a wine and the segments being arranged on said temperature-indicating head in a manner such that the segment indicated by said pointer corresponds to the proper temperature when the color of said wine in said bottle is the same as the color indicated by said pointer, said pointer coupled with said sensing means for indicating the temperature sensed thereby, and a thermometer storing container including a hollow base having a bottom adapted to rest on a supporting surface and an open top and a cover having depending side walls constructed and arranged to fit on and close the open top of said base and cooperating therewith to define a closed chamber for storing said thermometer stem, said cover also having a top wall formed to receive said temperature indicating head, said top wall having a cylindrical sleeve depending from said top wall having an outside diameter selected to engage and seal the inner surface of the open end of said bottle, said sleeve having an aperture therein dimensioned to engage said stem, said engagement between said stem and said sleeve providing an air-tight seal between said top wall and said thermometer stem, the temperature of the liquid in the bottle being measured by removing said thermometer and said cover from said base and inserting the lower end of said stem into said bottle so that said sleeve enters and closes said bottle opening, thus providing a fully sealed chamber for the continued storage and measurement of the contents of said bottle of wine.



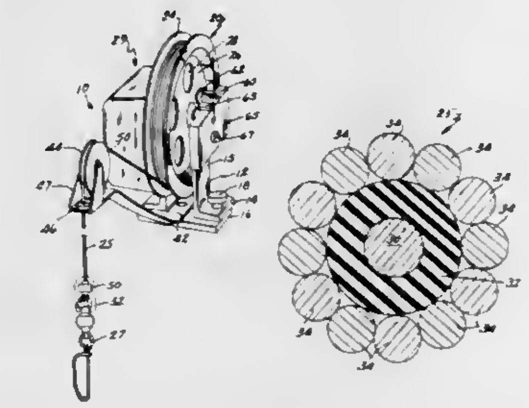
4,104,917
TROLLING WIRE

James E. Rieth, 2315 Okemos Dr. SE., Grand Rapids, Mich. 49506, and Charles J. Steffens, Wyoming, Mich., assignors to James E. Rieth, Grand Rapids, Mich.

Filed Jan. 13, 1977, Ser. No. 759,171

Int. Cl.^{2} G01K *7/00*

U.S. Cl. 73—343 R **15 Claims**



1. For use in a deep trolling apparatus including a reel for raising and lowering a weighted wire with temperature detection means at one end to be immersed in water and temperature display means at the opposite end, an improved trolling wire extending between the detection and display means comprising:

a center conductor;

an insulating layer surrounding said center conductor; and

an outer conductor shield made of a plurality of strands of stainless steel, wherein the outer diameter of said outer shield is less than 0.050 inches.

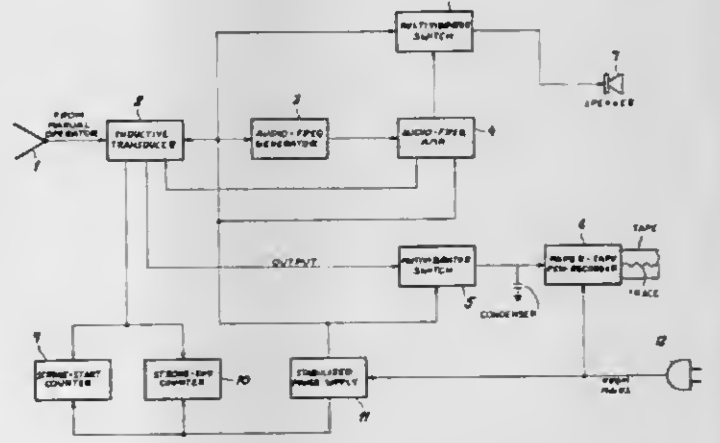
4,104,918
ELECTRODYNAMOGRAPH

Aurelian Liviu Alexandru Macoveanu, and Nicolae Grecu, both of Bucharest, Romania, assignors to Institutul de Cercetari Stiintifice Pentru Protectia Muncii, Bucharest, Romania

Filed Aug. 2, 1976, Ser. No. 710,635

Int. Cl.^{2} G01L *5/02*

U.S. Cl. 73—379 **3 Claims**



1. An electrodynamograph comprising:

a hand-driven device repeatedly squeezable and provided with a transducer;

a recorder operatively connected to said transducer for producing a trace of the output thereof as a function of time;

an audio-frequency generator producing an acoustic signal;

a multivibrator control switch connected to said audio-frequency generator for interrupting the signal produced thereby;

a loudspeaker connected to said multivibrator control switch for rendering the audio-frequency output audible to the test subject at a predetermined cadence, said cadence and the amplitude of the audio output of said multivibrator control switch being adjustable, said transducer comprising a primary coil and a secondary coil inductively coupled to said primary coil, and a metallic screen displaceable between said coils by said device, said audio-frequency generator applying said audio frequency signal to said primary coil to generate an audio-frequency current in said secondary coil;

a multivibrator switch of adjustable frequency connected between said transducer and said recorder for periodically interrupting the signal applied to said recorder to provide time markings on said trace; and

a first counter registering stroke-start operations of said device and a second counter registering stroke end operations of said device, said counters being controlled by two pairs of electrical contacts associated with said transducer whereby a first of said contacts is closed at the beginning of said stroke and the second of said contacts at the end of said stroke.

4,104,919
BALANCING MACHINE CIRCUIT FOR ELIMINATING UNBALANCES

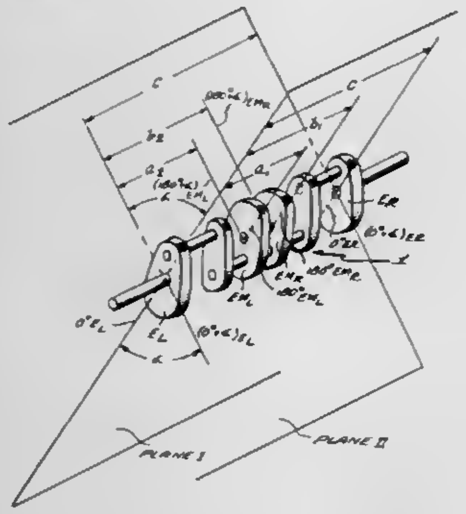
Hermann Brunneogräber, Heppenheim, Fed. Rep. of Germany, assignor to Gebr. Hofmann KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Jul. 16, 1976, Ser. No. 705,831

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1975, 2532597

Int. Cl.² G01M *1/30, 1/38*

U.S. Cl. 73—462 5 Claims



1. A circuit for a balancing machine for eliminating unbalances and a rotor which permits equalization of unbalance only in constructionally predetermined equalization planes and component angles comprising:

adjustable means for producing electrical signals indicating the distance between said equalization planes,

means for producing a signal to cause equalizing of unbalances in said rotor,

longitudinal positioning means for shifting the relative positions of said rotor and equalizing means successively in accordance with said electrical signals,

control means connecting said positioning means to said adjustable means for controlling application of said electrical signals to said positioning means,

means for generating a balance signal indicating position and angle of unbalance,

phase dependent rectifier means connected to said generating means for rectifying said balance signal and indicating non-balanceable values in equalization planes,

arithmetic circuit means connected to said rectifier means, said adjustable means, and said equalizing means for producing balance value output signals in said equalization planes and in substitute planes where balancing cannot take place in an equalization plane, and

control means connecting said arithmetic circuit means to said equalizing means for controlling said means for producing signal to cause equalizing in accordance with the output of said arithmetic circuit means.

4,104,920
PIEZOELECTRIC DAMPING MECHANISM

William Charles Albert, Boonton, and Robert Mark Hohenstein, Glen Ridge, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Apr. 1, 1977, Ser. No. 783,916

Int. Cl.² G01P *15/10*

U.S. Cl. 73—517 AV 12 Claims

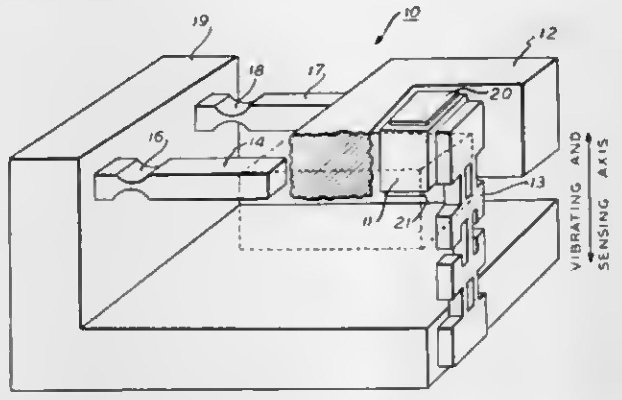
1. A vibration damping device comprising:

an evacuated housing containing said damping device,

a support,

a vibrating beam cantileveredly mounted on said support said beam being activated due to acceleration forces acting thereon,

a piezoelectric block mounted at one end to the free end of said vibrating beam and at the other end to said support for generating a source of current resulting from strain forces acting upon it due to the vibration of said vibrating beam, and



means in electrical series with said piezoelectric block for dissipating the energy released by said piezoelectric beam whereby the acceleration forces acting on said vibrating beam is effectively damped.

4,104,921
PIEZOELECTRIC ACCELERATION TRANSDUCER

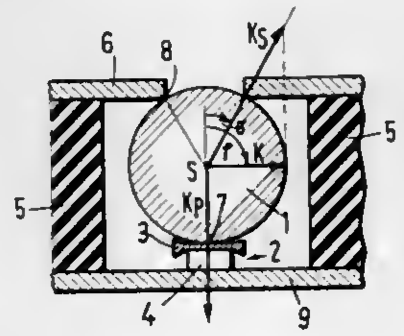
Norbert Nissl, Aresing, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,601

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556298

Int. Cl.² G01P *15/08*

U.S. Cl. 73—517 R 16 Claims



1. A piezoelectric acceleration transducer having a directional sensitivity comprising piezoelectric means having a plane surface, mass means contacting said plane surface of said piezoelectric means, support means for said mass means and for said piezoelectric means, said support means comprising substantially rigid bearing means contacting said mass means for urging said mass means in a substantially fixed position against said plane surface, said support means being arranged in such a manner that inertia forces effective on said mass means are divided between a component effective where said bearing means contact said support means and a component effective perpendicularly on said plane surface of said piezoelectric means, said bearing means between said support means and said mass means being located at directional sensitivity determining positions, wherein said support means comprise a housing including housing walls, aperture means in one of said housing walls, said aperture means having dimensions smaller than said mass means thereby forming said bearing means contacting said mass means.

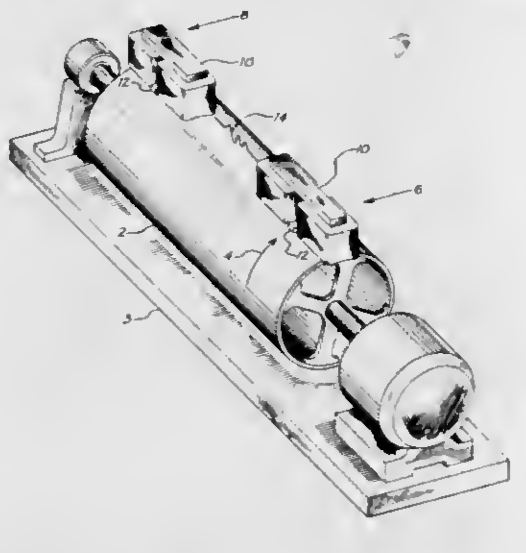
4,104,922
ELECTROMAGNETIC TRANSDUCER

George A. Alers, and Robert B. Thompson, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1977, Ser. No. 801,674

Int. Cl.² G01N *29/04*

U.S. Cl. 73—643 8 Claims



1. An electromagnetic transducer for inducing ultrasonic waves in or receiving the waves from an electrically conductive material for use in inspecting said material as the material moves relative to the transducer, comprising:

a magnet having magnetic poles for creating a magnetic field transverse to the path of the motion; and

a coil positioned between the magnetic poles and in the flux path joining the poles of said magnet and centered on the side of said magnet where said magnet and said conductive material are approaching each other.

4,104,923
ULTRASONIC RADIATION BALANCE

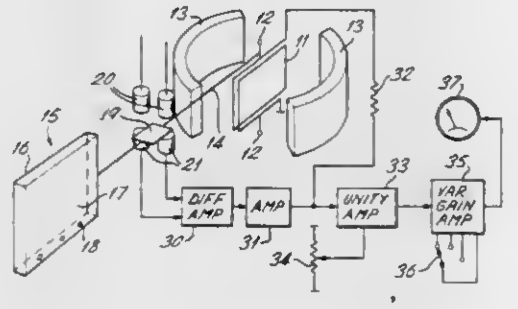
Thomas Anthony Whittingham, Newcastle-upon-Tyne, and Michael John Farmery, Peterborough, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 24, 1977, Ser. No. 827,335

Claims priority, application United Kingdom, Sep. 3, 1976, 56652/76

Int. Cl.² G01H *3/12*

U.S. Cl. 73—646 5 Claims



1. An ultrasonic radiation balance for testing the power of an ultrasonic transducer, comprising: a windowed vessel containing an ultrasonic transmission liquid; a balance mechanism housed in said vessel and wholly immersed in said liquid, said mechanism including a moving coil/magnet assembly and a radiation pressure sensitive member, with said coil and said member being connected for pivotal movement about a common substantially vertical axis, and with said member being located to receive radiation thereon from a transducer outside said vessel; and a servomechanism operable in response to said movement in said balance mechanism to energise said coil for movement to a null position.

4,104,924
PRESSURE DIFFERENCE MEASURING APPARATUS

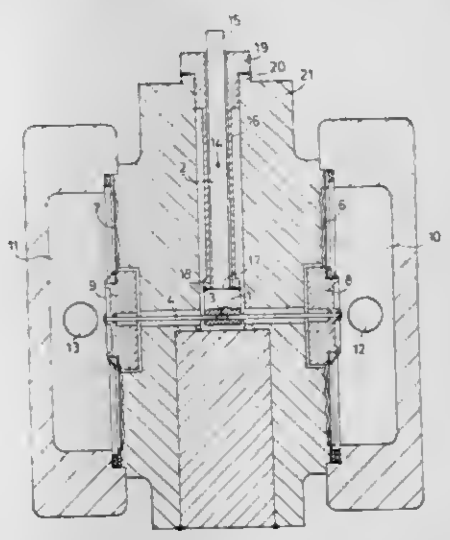
Heinz Caspar; Felix Kudritzki, and Horst Ziegler, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 13, 1977, Ser. No. 796,718

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623993

Int. Cl.² G01L *7/08*

U.S. Cl. 73—716 1 Claim



1. A pressure differential measuring apparatus comprising:

a cylindrical member comprising first and second portions, said second portion serving as a control rod and being of reduced diameter relative to said first portion so that that said first portion includes a surface portion which extends outwardly from said second portion;

and a resilient bendable tubular member extending upwardly from said surface portion of said first portion in surrounding relationship to said second portion, said tubular member being connected to said first portion at said surface portion by a circular electron-beam-welded seam.

4,104,925
PRESSURE OR PRESSURE DIFFERENCE MEASURING APPARATUS

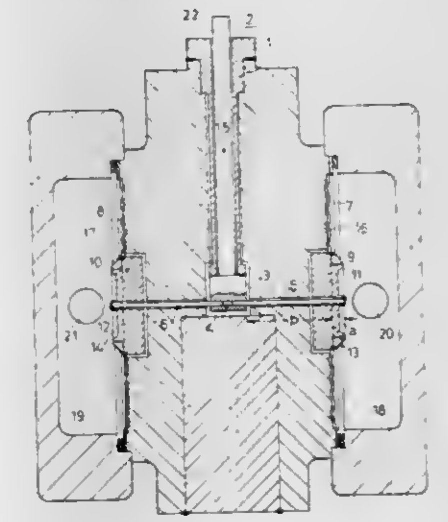
Heinz Caspar, and Felix Kudritzki, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,169

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623994

Int. Cl.² G01L *7/08*

U.S. Cl. 73—716 5 Claims



1. An apparatus for measuring one of pressure and differential pressure comprising:

at least one diaphragm which is adapted to be responsive to said one of pressure and differential pressure, said diaphragm including first and second diaphragm portions, said first diaphragm portion having opposing outer surface portions one of which defines a diaphragm plane, and said second diaphragm portion projecting outwardly from said diaphragm plane on one side thereof;

a displacement member arranged in a first plane parallel to and on the other side of said diaphragm plane and swingable about a pivot axis which lies in said first plane

and a connecting member displaced from said pivot axis, said connecting member connecting said displacement member to said diaphragm and being rigidly fastened to said outwardly projecting second diaphragm portion.

4,104,926
STARTER MOTORS

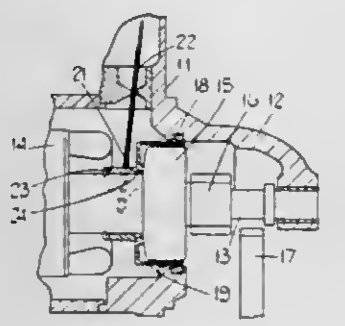
Ronald Wilson, 13 Chelmsley Lane, Marston Green, Birmingham, England

Filed Aug. 9, 1976, Ser. No. 712,809

Claims priority, application United Kingdom, Aug. 21, 1975, 34718/75

Int. Cl.² F02N *15/06*

U.S. Cl. 74—6 **2 Claims**



1. A starter motor, for an internal combustion engine, including a casing, a shaft rotatably mounted in the casing and supporting a pinion gear wheel assembly, the gear wheel assembly being rotatable with the shaft and being movable axially relative to the shaft between a rest position and an operative position, an electric motor for rotating said shaft, an annular seal secured to the casing, said seal encircling the pinion assembly a cylindrical component carried by the pinion assembly, said cylindrical component being held against rotation relative to the casing, but being movable axially with the pinion assembly, and, the inner periphery of said seal co-operating with the outer surface of said cylindrical component, said cylindrical component and said seal being so arranged that said seal remains in contact with said cylindrical component throughout the range of axial movement of the pinion assembly relative to the casing.

4,104,927
ENGINE STARTER

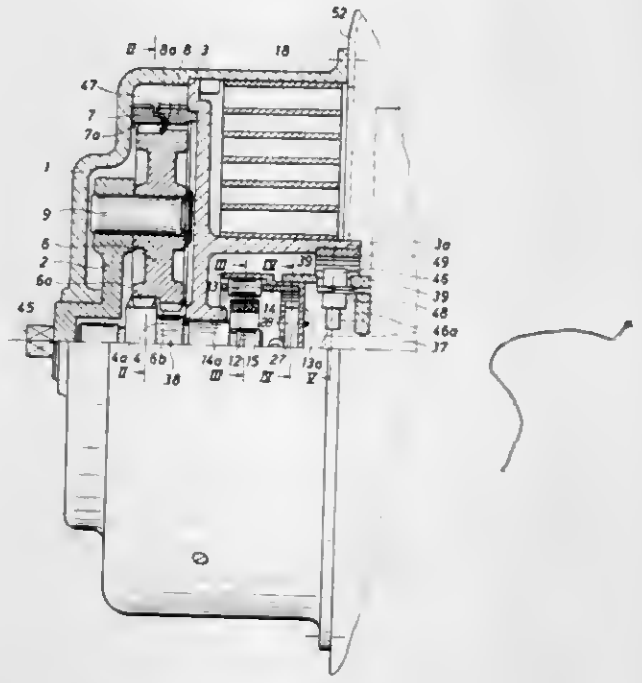
Jørn Benned Jensen, 6900 Ulfborg, and Jens Herman Jensen, Hörsholm Kongevej 1, 2970 Hörsholm, both of Denmark

Filed Nov. 29, 1976, Ser. No. 745,731

Int. Cl.² F02N *5/02*

U.S. Cl. 123—179 S **8 Claims**

1. A starter for a motor having a motor shaft, said starter comprising a stationary housing; a rotatable drum adapted to be releasably connected to the motor shaft; a spring having a first end secured to said drum and a second end secured to the inside of said housing; a planetary gear assembly including planet wheels, two internally-toothed planet rings surrounding said planet wheels, and a sun gear having a shaft section, each of said planet wheels having two toothings meshing respectively with said two planet rings, one of said planet rings connected to said housing and the other of said planet rings secured to said drum, said planetary gear assembly driving said drum; an axially extending clutch bushing adapted for permanent connection to one end of the motor shaft; and a clutch assembly including a plurality of rollers, an outer clutch portion forming a part of said clutch bushing, and a cylndrical inner clutch portion permanently connected to said sun gear shaft section, said inner clutch portion having a resilient outer friction surface, said outer clutch portion having an inner surface facing said inner clutch portion with a plurality of recesses at regular intervals for receiving said rollers, each recess comprising a relatively large inclined surface extending towards the outer cylindrical surface of said inner clutch portion so far that the distance at the narrowest place therebetween is smaller than the diameter of said rollers; said clutch assembly engaging when said clutch bushing rotates at a speed exceeding a predetermined value and disengaging when the torque of said clutch assembly exceeds a predetermined value.



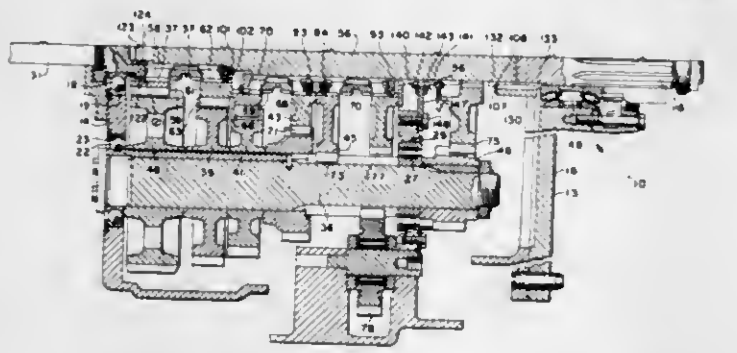
4,104,928
TRANSMISSION

John R. Vandervoort, Richland, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 20, 1976, Ser. No. 724,895

Int. Cl.² F16H *3/08, 57/00;* **F16D** *11/00*

U.S. Cl. 74—331 **8 Claims**



1. An improved change gear system having a main shaft, a plurality of countershafts arranged on fixed axes parallel with and substantially symmetrical about said main shaft, a gear encircling and clutchable to the main shaft which gear is adapted for simultaneous meshing with, and support by, gears positioned respectively on each of said countershafts whereby a driving relationship may be established between said countershafts and said main shaft, first means located adjacent one end of said main shaft for pivotally supporting same and second means for guiding the other end of said main shaft in a free floating relation relative to said one end and for movement at least in a direction transverse of a plane through the axes of two of said countershafts, the improvement comprising: third means intermediate the ends of said main shaft for restricting axial movement thereof without restricting radial movement thereof, said third means comprising a pair of closely spaced rings axially and rotationally fixed to the main shaft and a thrust plate fixed directly to the housing, said plate having an opening therethrough for receipt of said main shaft, said thrust plate closely received inbetween said rings.

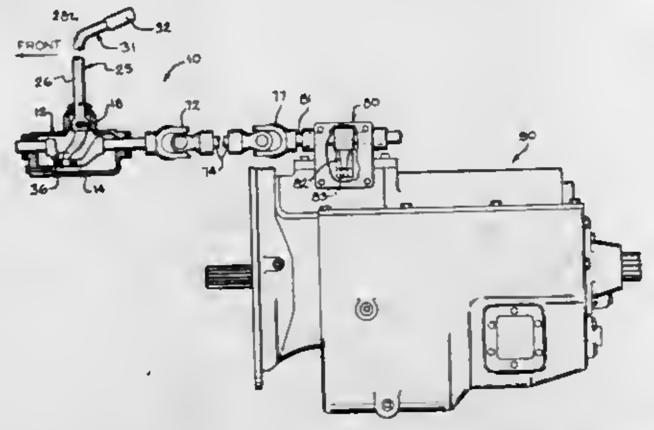
4,104,929
SHIFT MECHANISM

Leo R. Kessmar, Northwood, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed May 2, 1977, Ser. No. 793,224

Int. Cl.² G05G *9/14*

U.S. Cl. 74—473 R **24 Claims**



1. A shift mechanism for effecting engagement of transmission gears, said mechanism having a shift lever comprising:

a main shaft having a generally longitudinal axis, said main shaft rotatable about said main shaft axis, and

a projecting means adapted for operative association with said transmission gears, said projecting means rigidly attached to said main shaft.

the improvement wherein said projecting means comprises a second shaft rigidly attached to and radially spaced from said main shaft and wherein said second shaft generally extends at an angle to said main shaft axis.

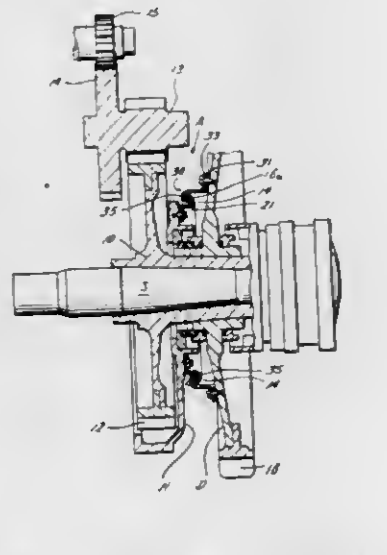
4,104,930
FINAL DRIVE GUARD

Thomas E. Sanders, 4135 Holly Hollow, Conroe, Tex. 77302

Filed Dec. 17, 1976, Ser. No. 751,606

Int. Cl.² F16P *1/00;* **G05G** *25/00*

U.S. Cl. 74—609 **3 Claims**



1. A wire guard for the final drive of a crawler tractor comprising:

an inner ring having an outwardly turned edge forming a U-shaped channel for receiving one edge of an outer ring; and

an outer ring having an inwardly turned U-shaped channel for receiving one edge of an inner ring, with one of said rings fixed and the other ring movable relative thereto whereby the rings form a pair of sleeves for protecting the final drive shaft from a built-up of pieces of wire.

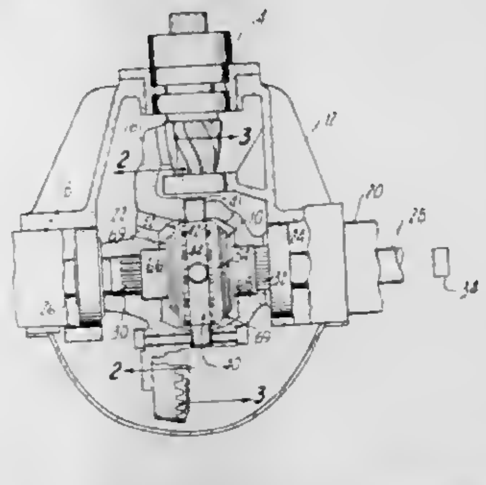
4,104,931
POSITIVE HOLD DIFFERENTIAL

Michael G. Tomich, 20519 Catalano Dr., Mt. Clemens, Mich. 48043

Filed Mar. 19, 1976, Ser. No. 668,473

Int. Cl.² F16H *35/04*

U.S. Cl. 74—650 **8 Claims**



1. A positive locking differential for compensating for the difference in driving wheel travel comprising:

a spider member having a plurality of arcuately spaced drive teeth on opposite sides thereof;

a pair of clutch members sandwiching said spider member thereinbetween, said clutch members each having a plurality of driven teeth releasably engageable with said spider member drive teeth for transmitting torque from said spider member to said clutch members;

a plurality of arcuately spaced first cams carried by said spider member;

a plurality of arcuately spaced second cams carried by each of said clutch members and axially aligned with said spider member cams for lifting said clutch member teeth out of engagement with said spider member teeth to permit relative movement between said spider member and one of said clutch members; and

a plurality of enlarged projections and mating enlarged slots carried between said spider member and clutch members for maintaining said relative movement between said spider member and one clutch member for an arcuate distance greater than the arcuate distance between adjacent spider member cams, said enlarged projections being a one-piece construction with one of said members.

4,104,932
EPICYCLIC GEAR TRAINS

Hans-Erik Hansson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Nov. 10, 1976, Ser. No. 740,522

Claims priority, application Sweden, Nov. 10, 1975, 7512553

Int. Cl.² F16H *1/28, 57/00*

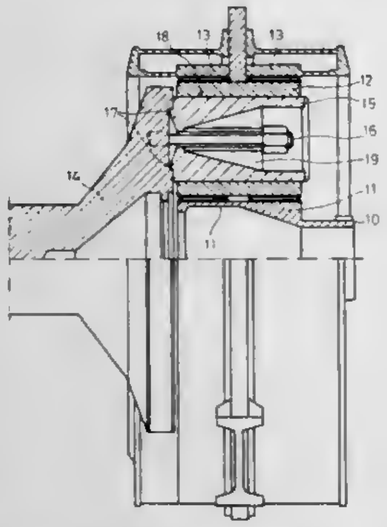
U.S. Cl. 74—801 **7 Claims**

1. An epicyclic gear train, comprising:

a plurality of planet or star wheels;

a single flange holder for said wheels;

a plurality of spindles extending from said holder and supporting said wheels for rotation on said spindles, each of said spindles having an unloaded axis, a first cross section at the end of said spindle adjacent said holder and a second different, cross section at the end of said spindle remote from said holder, each of said spindles also having a bearing surface for supporting said wheels, said bearing surface extending between said first and second cross sections, and the cross sectional area of said spindle gradually



changes therebetween whereby as said spindle deforms under tangential loading, said bearing surface between said spindle and its associated wheel deforms until it is essentially parallel to said unloaded axis.

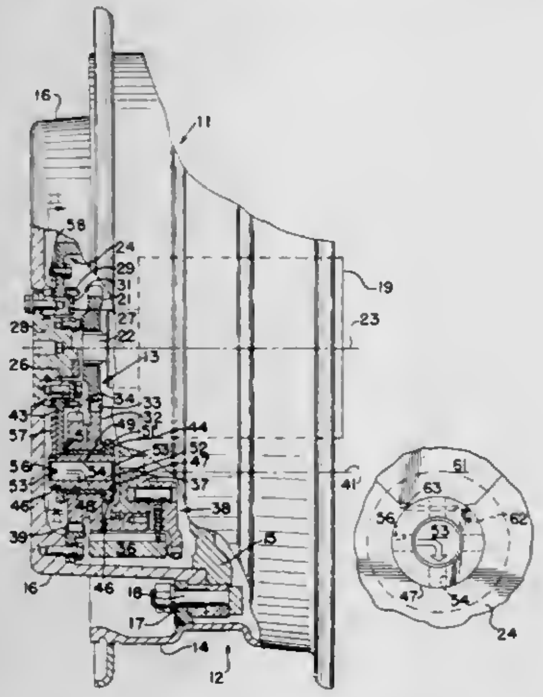
4,104,933
PLANET GEAR POSITIONING AND RETAINING MECHANISM

John J. Campbell, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1976, Ser. No. 743,383

Int. Cl.^{2} F16H ***1/28, 3/44;*** **F01M** ***9/00***

U.S. Cl. 74—801 **10 Claims**



1. Planet gear positioning and retaining means for a planetary gearing system comprising:

a planet gear carrier disposed for rotation about a primary axis and having an axle pin-receiving bore defining a secondary rotary axis which is parallel to said primary axis and spaced therefrom and which orbits around said primary axis as said carrier revolves therearound,

at least one planet gear supported on said carrier for rotation about said secondary axis and for orbiting movement around said primary axis, said planet gear having an axial bore therethrough aligned along said secondary axis,

housing means for retaining lubricant in the region of orbital movement of said planet gear,

an axle pin extending through said axle pin-receiving bore of said carrier and through said axial bore of said planet gear along said secondary axis for journaling said planet gear to said carrier, said axle pin having a lubricant passage with at least one radially directed outlet within said axial bore of said planet gear, said lubricant passage having at least one lubricant intake opening situated outside said axial bore of said planet gear and being directed away from the axis of said axle pin and towards the path of orbital motion of said axle pin around said primary axis, whereby the orbital motion of said axle pin forces a flow of lubricant into said intake opening and

a retainer element secured to said carrier and having means for limiting angular motion of said axle pin relative to said axle pin-receiving bore of said carrier to assure that said intake opening remains directed into said path of orbital motion.

4,104,934
FIXTURE FOR THREADING-ON AND SIMULTANEOUSLY TURNING THE NUTS OF SEVERAL SCREW BOLTS

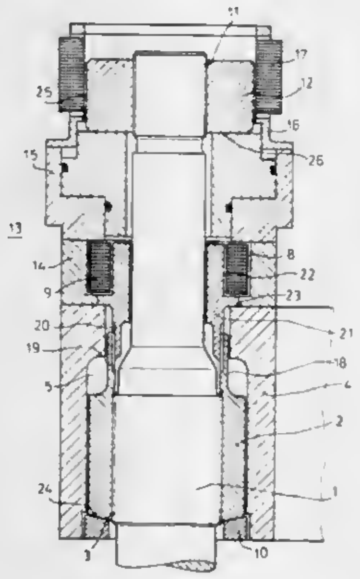
Klaus Raschke, and Volfango Festinori, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 824,097

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638688

Int. Cl.^{2} B25B ***29/02***

U.S. Cl. 81—57.38 **10 Claims**



1. In a fixture for simultaneously threading on and simultaneously turning the threaded nut means of a plurality of screw-bolts and the like, the fixture including: a support ring having recesses each of which receives a threaded nut means and its associated screw-bolt; separate rotating means for rotating each nut means attached to said support ring, each said rotating means functioning in the manner of a reversible electric motor; and hydraulic means for stretching said screw-bolts; the improvement comprising:

each said separate rotating means being associated with a particular recess and each including:

a stator part arranged in the surfaces of said particular recess which faces the nut means received by that particular recess, said stator part including an a-c winding and forming the stator portion of an asychronous-type electric motor whose rotor portion is formed by said nut means received by said particular recess.

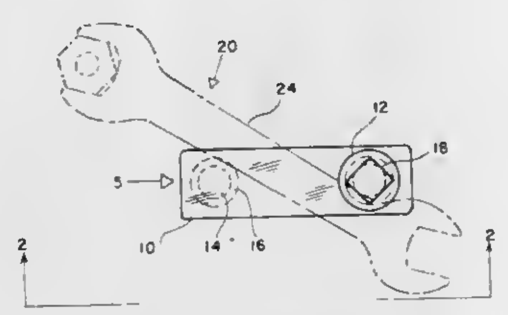
4,104,935
FLAT WRENCH EXTENDER TOOL

Roscoe D. Stoops, P.O. Box 537, Sneads, Fla. 32460

Filed Sep. 7, 1976, Ser. No. 720,757

Int. Cl.^{2} B25G ***1/00***

U.S. Cl. 81—177 A **3 Claims**



1. A tool for operatively turning a flat wrench in otherwise inaccessible regions comprising:

a short bar having post-like projections disposed at each end of one side thereof, said projections being essentially in parallel, spaced relationship to each other, each of said projections consisting of a body portion and an enlarged head portion, said head portions also being spaced from each other; and

coupling means on the opposite side of said bar for coupling said bar to a socket wrench driving device;

whereby said bar is arranged to allow coupling to the handle of the flat wrench by engaging the handle with said projections and applying torque to said bar via said coupling means so as to cause said head portions to hook over the handle thereby effectively preventing said tool from becoming disengaged from the wrench handle as long as such torque is maintained.

4,104,936
HOLDING-ON DEVICE

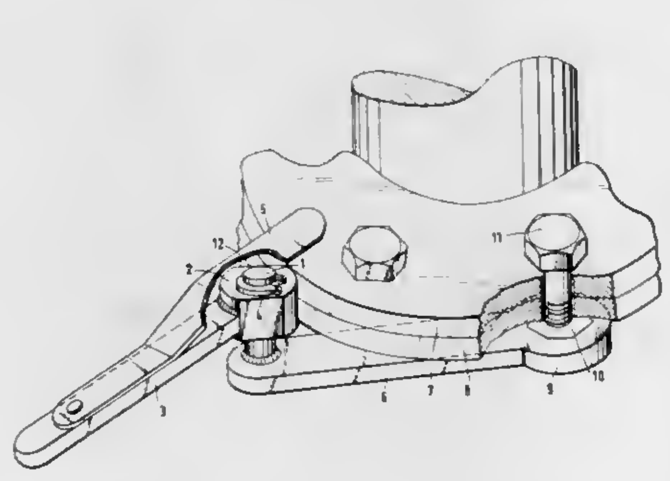
Otto Einar Sjöström, Ekedalsgatan 44 B, S-414 68 Goteborg, Sweden

Filed Oct. 26, 1976, Ser. No. 735,495

Claims priority, application Sweden, Oct. 31, 1975, 7512218

Int. Cl.^{2} B25B ***13/58***

U.S. Cl. 81—180 R **4 Claims**



1. A holding device for facilitating the tightening of a screw joint projecting from both sides of a pair of plates, which device comprises an arm, having at one end, an organ for a torque transmitting engagement with a part belonging to the screw joint, and at the other end, a lateral stop designed to abut against an edge of at least one plate, characterized by said lateral stop comprising a pin affixed to the other end of said arm and a manually pivotable eccentric journaled on said pin.

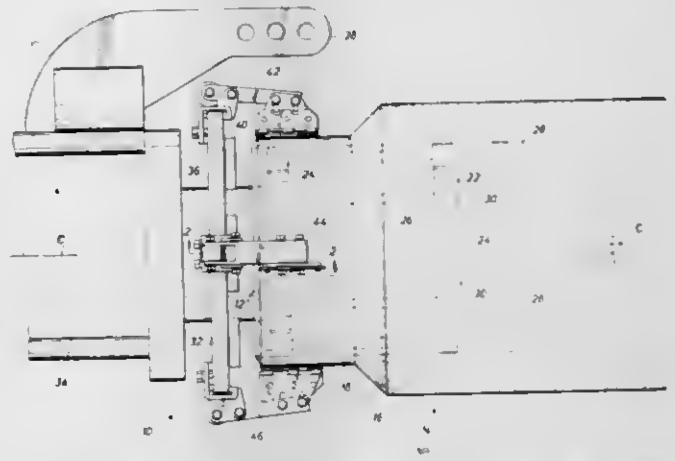
4,104,937
PIPE CLEANING BRUSH ASSEMBLY FOR PIPE FACING MACHINE

Earl J. Breaux, New Orleans, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Filed Mar. 17, 1977, Ser. No. 778,338

Int. Cl.^{2} B23B ***25/00***

U.S. Cl. 82—34 R **10 Claims**



1. In a pipe facing machine having a rotatable face plate for forming a precision machined surface on the end of a section of large diameter pipe as it is rotated with respect to the pipe, the improvement comprising:

a pipe cleaning brush assembly mounted on said face plate for rotation therewith to clean the outer surface of the pipe proximate the end simultaneously with the machining of the end, said brush assembly including

a brush arm having a brush at one end thereof and pivotally mounted with respect to said face plate at the opposite end to permit the brush to be positioned to bear against the pipe or to be retracted from the pipe surface and

a cam at the pivotally mounted end of said brush arm for maintaining the brush arm in position when the brush is in contact with the pipe.

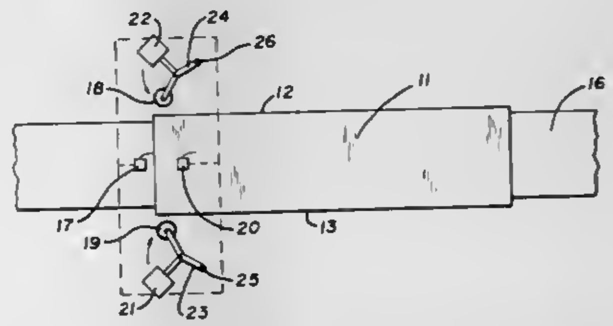
4,104,938
APPARATUS FOR KERFING GYPSUM WALLBOARD

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 580,435, May 23, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,223

Int. Cl.^{2} B26D ***3/06***

U.S. Cl. 83—5 **1 Claim**



1. An apparatus for kerfing gypsum wallboard panels along opposing edges thereof without kerfing the corners of the panels, said apparatus comprising: a moving conveyor for laterally moving gypsum wallboard panels; movable arms disposed adjacent to opposing edges of the conveyor having a

free end and a pivotally mounted end; rotatable circular saws mounted on the movable arms at the end opposite the pivot end and disposed adjacent to opposing edges of the conveyor; piston means associated with the movable arms capable of rotating the arms about the pivot end; means for sensing the movement of panels on the conveyor and in timed relationship thereto thereby actuating the piston means to rotate the movable arms causing the rotatable saws to engage and kerf the edges of the panels after the leading corners thereof have passed at least inches beyond the point of contact with the saws; and means for sensing the movement of panels on the conveyor and in timed relationship thereto thereby actuating the piston means to rotate the movable arms in a reverse manner causing the rotatable saws to discontinue kerfing of the edges at least two (2) inches prior to kerfing the trailing corners of the panels.

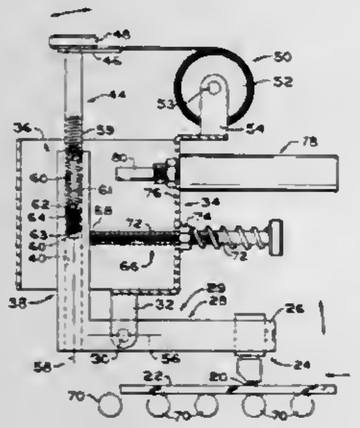
4,104,939
FORCE APPLYING DEVICE FOR SCORING WHEELS

Robert M. Bonaddio, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 669,560, Mar. 23, 1976, Pat. No. 4,027,562. This application Nov. 4, 1976, Ser. No. 738,919

Int. Cl.^{2} B26D ***3/08***

U.S. Cl. 83—7 **6 Claims**



1. A method of changing the predetermined applied force acting on tool means, comprising the steps of:

mounting the tool means adjacent an end of lever arm means to pivot the tool means in a first direction and in a second opposite direction along a reciprocating arcuate path;

applying a constant biasing force to the lever arm means to urge the tool means in the first direction under the predetermined applied force; and

dimensionally altering the lever arm means to change the applied force urging the tool means in the first direction.

4,104,940
NIBBLING MACHINE HAVING AUTOMATICALLY ADJUSTABLE FEED CONTROL

Eugen Herb, Ditzingen; Theodor Petera, Stuttgart, and Hubert Bitzel, Ditzingen, all of Germany, assignors to Trumpf Maschinen AG, Zug, Switzerland

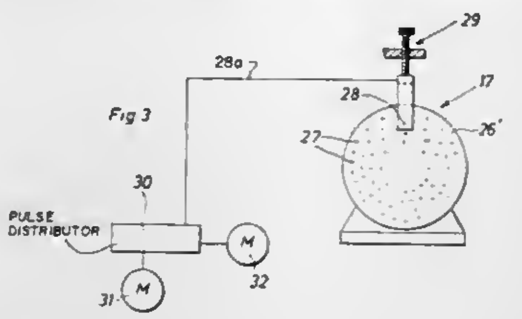
Filed Aug. 11, 1976, Ser. No. 713,495

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536524

Int. Cl.^{2} B23D ***27/00***

U.S. Cl. 83—71 **11 Claims**

1. A nibbling machine comprising workpiece support means, first drive means connected to said support means to move said support means in a longitudinal direction, second drive means connected to said support means to move said support means in a transverse direction, a punch engageable with the workpiece on said workpiece support to effect the nibbling thereof, third drive means connected to said punch to move said punch into and out of engagement with the workpiece on said support means, a control member movable in timed relationship to said third drive means, transmission means connected to said control member and respectively connected to said first and second drive means, said first and second drive means each including a drive motor, said control member having a control range of at least a portion of its movement corresponding to the time in which the punch is disengaged from the workpiece, said transmission means acting on said first and second drive means to control the starting, stopping and speed thereof during the control range of said control member for varying the magnitude and direction and amount of feeding when the punch is not engaged with the workpiece, said control member and said transmission means together providing a full control of the operation of said first and second drive means in respect to starting and stopping and speed thereof during the time in which the punch is not in engagement with the workpiece.



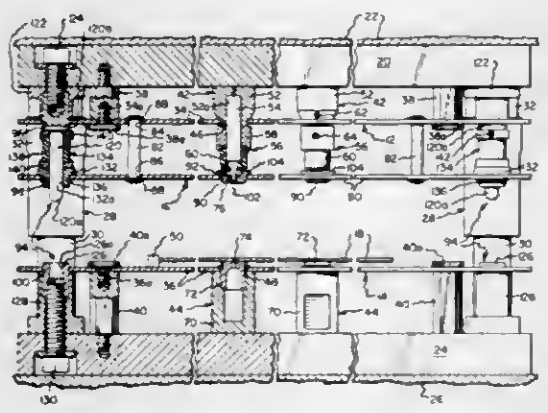
4,104,941
ASSEMBLY FOR ENABLING CLOSE TOLERANCE PUNCHING WITH A REUSABLE SYSTEM

Clarence L. Krueger, Williamsville, N.Y., assignor to S. B. Whistler & Sons, Inc., Tonawanda, N.Y.

Continuation-in-part of Ser. No. 725,259, Sep. 21, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,155

Int. Cl.^{2} B26F ***1/14***

U.S. Cl. 83—133 **6 Claims**



1. In a system for punching workpieces including:

a die set including punch and die shoes, said punch shoe being mounted for vertical movement relative to said die shoe between open and closed positions;

a punch templet in the form of a metal plate fixed to said punch shoe and having a plurality of guide openings and a plurality of retainer openings;

a die templet in the form of a metal plate fixed to said die shoe and having a plurality of guide openings and a plurality of retainer openings, the pattern and center-to-center spacing between said openings of said punch and die templets being equal and associated ones of said openings of said punch and die templets being disposed in vertical alignment;

a plurality of punch parts positionally located one within each of said punch templet retainer openings, each of said punch parts including a punch fixed within its associated punch templet retainer opening and a resiliently deformable stripper device, said punch extending towards said die templet and terminating in a punch tip;

a plurality of die parts positionally located one within each of said die templet retainer openings and associated one with each of said punch parts, each of said die parts including a die bushing formed with an opening sized and shaped to receive said punch tip of an associated punch part for effecting punching of said workpieces in alignment therewith during movement of said shoes into said closed position;

a guide templet having a plurality of guide openings and a plurality of locater openings characterized as having a pattern and center-to-center spacing equal to said guide and retainer openings of said punch and die templets;

a plurality of guide elements slidably received one within each of said locator openings for association one with each of said punch parts, each of said guide elements having an upper surface, a lower surface, a supporting portion and a guide opening sized and shaped to slidably receive said punch tip of its associated punch part, said guide elements being insertable into their associated locator openings to place said supporting portion in engagement with an upper surface of said guide templet and said lower surface relatively below a lower surface of said guide templet;

supporting means for normally suspending said guide templet from said punch shoe for vertical movement therewith while permitting movement of said punch templet relative to said guide templet when it is in a lower-operative position thereof, said guide templet being arranged horizontally intermediate said punch and die templets with each of said guide elements positionally locating said punch tip of its associated punch part within the guide opening thereof and being arranged for upper and lower surface engagement with said stripper device of its associated punch part and said workpiece arranged in alignment therewith, respectively, during movement of said punch shoe towards closed position; and

a plurality of guide assemblies, each of said guide assemblies including a guide pin having an upper end portion fixed to said punch shoe and a lower end portion, a guide sleeve fixed to said die shoe and a guide bushing, said guide sleeve and said guide bushing having centrally located guide openings sized to slidably receive said lower end portion of said guide pin, said upper end portion of said guide pin, said guide sleeve and said guide bushing being positionally located within associated ones of said guide openings of said punch, die and guide templets, respectively, characterized in that receipt of the guide pin lower end portions within their associated guide sleeve openings at least during a portion of the movement of said punch shoe towards closed position serves to vertically align said guide openings of said guide templet with said guide openings of said die templet, whereby said guide templet and said guide elements are operative to position the punch tips in vertical alignment with the openings of their associated die bushings, the improvement in combination for punching workpieces ranging in thickness up to a maximum thickness and selectivity in a single or multiple station operation:

said guide templet is in the form of a metal plate having a thickness corresponding to the thickness of said plates forming said punch and die templets, said guide templet when suspended by said supporting means spacing said upper surface of each of said guide elements from its associated stripper device through a distance essentially equal to said maximum thickness when the supporting portions of said guide elements engage with an upper surface of said guide templets,

said guide pin of each of said guide assemblies is of stepped diameter having a relatively large diameter upper end portion and a lower relatively small diameter end portion, and each of said guide assemblies additionally includes a resiliently deformable stripper device arranged for opposite end engagement with said upper end portion of said guide pin and said guide bushing, said guide bushings being engagable with their associated guide sleeves during a further portion of movement of said punch shoe towards closed position to arrest movement of said guide templet relative to said die templet to define said lower-operative position of said guide templet and to initiate deformation of said stripper device of each said guide assembly, said distance between said upper surface of each of said guide elements and its associated stripper device accommodating for engagement therebetween and initiation of resilient deformation of such stripper device during movement of said punch shoe towards closed position no sooner than initiation of deformation of the stripper devices of said guide assemblies, and said punch tips being forced to move relative to said guide elements and into said openings of their associated die bushings to effect punching of said workpiece, during a still further portion of the movement of said punch shoe into closed position.

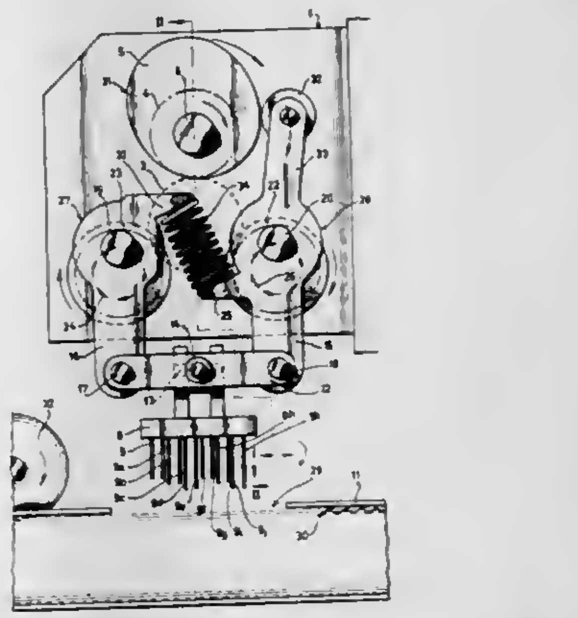
4,104,942
DEVICE FOR MANUFACTURING PERFORATED PLASTIC PIPES

Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Nov. 16, 1976, Ser. No. 742,237

Int. Cl.^{2} B26F ***1/06***

U.S. Cl. 83—327 **7 Claims**



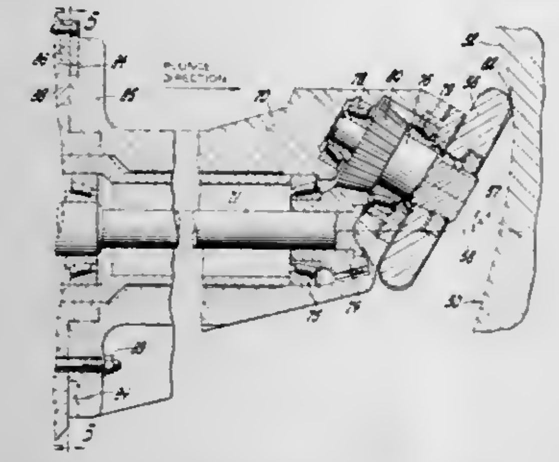
1. A device for continuously perforating plastic pipes, particularly corrugated thermoplastic pipes, comprising a tubular guide member for the plastic pipes, a pipe conveying member **(10)** for conveying the pipes, a punching member comprising a first eccentric member **(5)**, eccentrics **(15,16)** cooperating with said first eccentric member **(5)** for causing the rate of advance of the punching members to proceed uniformly at the stage of punching for punching holes in the plastic pipes moving in an orbit free from said hollow tubular tube support, an actuating member **(2)** causing the punching member to act upon the pipes to be perforated, said two eccentrics **(15,16)** being interconnected via a connecting rod **(12)** carrying one or more punching members **(9)**, said first eccentric member **(5)** being driven at the same rate, said device having punching member actuating means for causing the punching members to move at the same rate as the pipe conveying members **(10)**, at least when the punching members act upon the pipes to be perforated, and to preserve a substantially perpendicular position with respect to the conveyed pipes when the punching members are in action, eccentrics **(15,16)** carrying saddle members **(21,25)**, and a spring **(34)** being provided between the two saddle members **(21,25)**.

4,104,943

CONTOUR DIE MILLING WITH A TOROIDAL CUTTER

Sergio L. Calderoni, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1977, Ser. No. 780,923
Int. Cl.^{2} B23B *3/00*
U.S. Cl. 90—11 C **1 Claim**



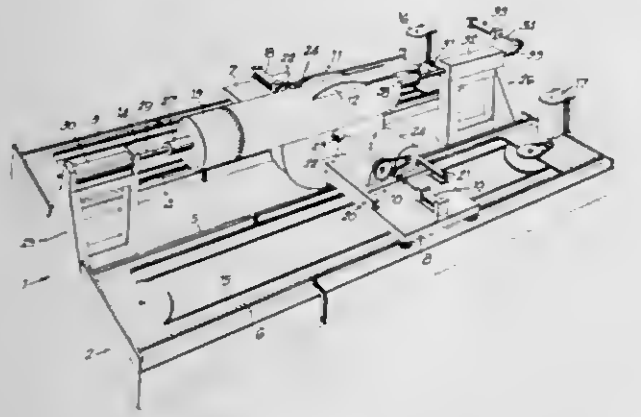
1. A method of milling an arcuately contoured die surface using a three axis milling machine in which said milling machine includes a cutter support having rotatable power output means and being movable in a direction parallel to a plunge axis and simultaneously in a direction perpendicular thereto comprising the steps of:
supporting a rotatable toroidal cutter in said cutter support with its axis substantially greater than zero degrees with respect to the plunge axis,
drivingly coupling the cutter to said power output means,
feeding said toroidal cutter into a predetermined depth of engagement with the die surface by relative movement therebetween in a direction parallel to the plunge axis, and
feeding said toroidal cutter relative to said die surface in a plurality of parallel passes across said surface in the direction of the curvature thereof at said depth of engagement therewith, whereby substantially the entire die surface is machined.

4,104,944

WOOD SAWING MACHINE

Raoul M. Janssen, Boite Postale 36, 97320 St. Laurent du Maroni, France

Filed Mar. 18, 1977, Ser. No. 779,011
Int. Cl.^{2} B27B *7/00, 31/00*
U.S. Cl. 83—471.2 **10 Claims**



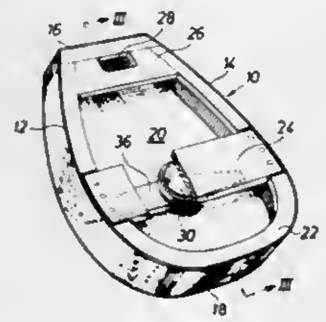
1. Wood sawing machine including a framework, at least two carriages mounted for movement on said framework, in a direction generally parallel to the longitudinal axis of said framework, control means for said carriages, at least two sleighs, each mounted for movement on a respective one of said carriages in a direction transverse to said longitudinal axis, control means for said sleighs, at least two saws each mounted on a respective one of said sleighs and having a sawing direction corresponding to said longitudinal axis, control means on each of said sleighs for driving the saw mounted thereon, two headstocks each of which is able to act upon one of the ends of a piece to be sawed, one of said headstocks being linked to a first mechanism capable of moving said one headstock along its axis and the other of said headstocks being linked to a second mechanism capable of rotating said other headstock, and a loading and unloading boom comprising a loading arm and an unloading arm mounted to rotate about a common vertical axis, said loading and unloading arms being provided with supporting means for said piece to be sawed and for a sawed piece respectively, said boom being swingable about said axis to alternately position the supporting means of said arms between said headstocks.

4,104,945

SOUND RESONATOR FOR AMPLIFYING SOUND WAVES

Gustav Georg Arne Bolin, Renstiernas gata 12, 116 31 Stockholm, Sweden

Filed Apr. 29, 1977, Ser. No. 792,371
Claims priority, application Sweden, May 13, 1976, 7605470
Int. Cl.^{2} G10H *3/00*
U.S. Cl. 84—1.15 **2 Claims**



1. A sound resonator for amplifying sound waves emanating from a sound source comprising, side and end walls defining a frame, a wooden sounding board connected to one edge of said side and end walls and defining a box having an open side, said sounding board having internal and external surfaces and having grain fiber extending from one end wall to the opposite end wall so that the grain fiber is substantially parallel with said side walls, bridge means adhesively connected to said interior surface of said sounding board and extending substantially the full width thereof, a reinforcing beam extending across the open side of said box in spaced generally parallel relationship with said bridge, an electromagnet located between said bridge and said beam, said electromagnet including a coil attached to said beam and an armature connected to said bridge, said coil being connectable to a source of sound, and a plurality of wooden strips adhered to the external surface of said sounding board, said strips extending lengthwise of the grain fiber of said sounding board, said strips diverging slightly from each other and extending substantially from one end of said frame to substantially the opposite end thereof and being located in a position substantially normal to said bridge, the outermost strips substantially parallel with said side walls.

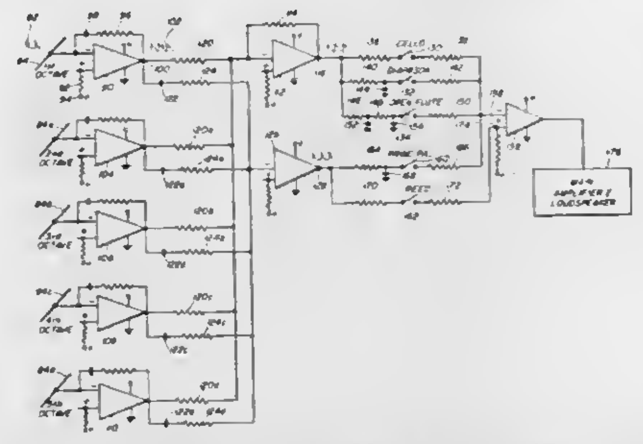
4,104,946

VOICING SYSTEM FOR ELECTRONIC ORGAN

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464

Filed Jun. 17, 1976, Ser. No. 696,981
Int. Cl.^{2} G10H *1/02*
U.S. Cl. 84—1.24 **23 Claims**

1. In a voicing system for an electronic musical instrument including sources of square wave signals having frequencies corresponding to the notes of a musical scale, apparatus for deriving from said square wave signals by operation of playing keys first and second other pulse signals of different wave shapes, both differing from a square wave, said apparatus comprising, in combination:
a plurality of player-operated keyswitches,
means including gating means connected to said sources of square wave signals for producing in response to actuation of a keyswitch a first other pulse signal of frequency corresponding to the actuated keyswitch,
means including a plurality of bus-bars each for gathering the first other pulse signals of frequencies corresponding to a selected multiplicity of notes,
a plurality of circuit means equal in number to the number of bus-bars connected one each to receive the first other pulse signals gathered at a different one of said bus-bars and operative to convert said first other pulse signals to second other pulse signals, having a different waveform, each of said circuit means being operative to produce substantially a 6 dB per octave filtering effect throughout the range of frequencies of the first other pulse signals applied thereto and to shift the phase of all harmonics of interest contained therein by substantially 90°,
a first mixing amplifier having input and output terminals, and
means for coupling all of said circuit means to the input terminal of said first mixing amplifier whereby to produce at its output terminal second other pulse signals of frequency corresponding to the played notes.

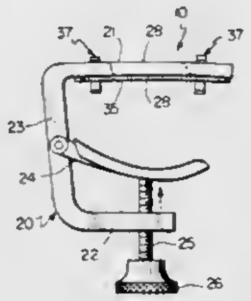


4,104,947

CAPO

Doran M. Oster, 1802 NE. 8th St., Gainesville, Fla. 32601

Filed Jan. 31, 1977, Ser. No. 764,264
Int. Cl.^{2} G10D *3/04*
U.S. Cl. 84—318 **11 Claims**



1. An apparatus for selectively adjusting the pitch of a stringed instrument including a neck having a fingerboard with a plurality of frets spaced thereon over which the strings pass, comprising bar means extended over the strings and across the fingerboard, said bar means having upper and lower surfaces and front and rear walls, clamping means for operatively forcing said bar means toward the fingerboard, resilient string engaging means disposed along said lower surface of said bar means and adjacent said front wall, fret abutting stop means mounted on said bar means and extending downwardly therefrom, said stop means having a portion substantially in alignment with said string engaging means, whereby when said portion of said stop means abuts a selected fret, said string engaging means is in a position overlying the fret.

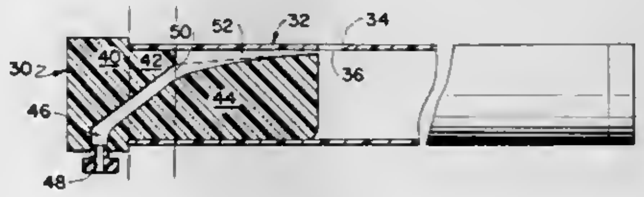
11. In a capo having string engaging means for use with a stringed instrument having a body with an elongated neck and a plurality of spaced frets, the improvement comprising stop means carried by said capo for engaging a selected fret and positioning said string engaging means in a selected position relative to a fret.

4,104,948

FIPPLE BLOCK FOR MUSICAL RECORDERS

George Bartholomew Young, 113 Forest Ave., Cranford, N.J. 07016

Filed May 23, 1977, Ser. No. 799,387
Int. Cl.^{2} G10D *7/02*
U.S. Cl. 84—380 C **4 Claims**



1. A fipple block for use in connection with a wind instrument, said wind instrument including a hollow body, a fipple lip, and a fipple opening, said fipple block being an integral mass of material having a substantially cylindrical exterior surface, said fipple block including first, second, and third sections, said first section having a larger outer diameter than said second and third sections, said first section having a first passageway formed therein and directed at a right angle to said cylindrical exterior surface of said fipple block and adapted to receive a mouthpiece, said second section having a second passageway extending therethrough, said third section including a hollowed-out portion so that when said fipple block is inserted within a hollow body of a wind instrument, there is defined a third passageway which is adapted to terminate at said fipple opening, said first, second, and third passageways being connected and defining a continuous passageway from said mouthpiece to said fipple opening for the passage of air which operates to strike said fipple lip and cause sound waves to be produced in the hollow body of the wind instrument.

4. A fipple block for use in connection with a wind instrument, said wind instrument including a hollow body, a fipple lip, and a fipple opening, said fipple block being an integral mass of material having a substantially cylindrical exterior surface, said fipple block including first and second sections, said first and second sections having substantially equal diameters and constructed to be inserted within said hollow body, said first section having a first passageway formed therein and directed at a right angle to said cylindrical exterior surface of said fipple block and adapted to receive a mouthpiece which extends through an opening of said hollow body, said second secton having a second passageway extending therethrough and adapted to terminate at said fipple opening, said first and second passageways being connected and defining a continuous passageway from said mouthpiece to said fipple opening for the passage of air which strikes said fipple lip and causes sound waves to be produced in the hollow body of said wind instrument.

4,104,949

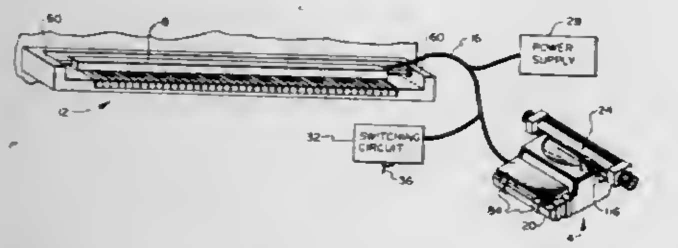
APPARATUS AND METHOD FOR TRANSCRIBING MUSICAL NOTATIONS

Timmy Clark, 5142 S. 1950 West, Roy, Utah 84067

Filed Mar. 8, 1976, Ser. No. 664,885
Int. Cl.^{2} G01G *3/02*
U.S. Cl. 84—462 **1 Claim**

1. A system for transcribing musical notations onto paper as

the corresponding notes are played on a piano, organ, or the like, said system comprising
- first means disposable on the piano above the keyboard for producing indications of the keys depressed, such indications thereby representing musical notes corresponding to the depressed keys,
- typewriter means comprising
  - a cylindrical, rotatable platen on which paper is rolled,
  - a plurality of type bars each bearing raised type representing a musical note and each actuable so that the type thereof strikes the platen at a different location thereof,
  - a plurality of type keys which, when depressed, actuate a corresponding one of said type bars, each type key representing a different musical note,
  - an electric motor, and



  - a universal bar disposed to be contacted and moved from a first position to a second position by the type keys when the type keys are depressed,
- second means disposable on said typewriter means above the keys thereof and responsive to said indications for depressing type keys corresponding to the musical notes represented by the indications,
- marking means disposed adjacent the cylindrical platen and movable longitudinally along the platen to mark paper rolled onto the platen,
- means coupled to said electric motor for causing said marking means to move from a fixed position adjacent the platen in one direction longitudinally along the platen, and
- means coupled to the universal bar for causing the marking means to return to said fixed position when the universal bar moves from the first position to the second position.

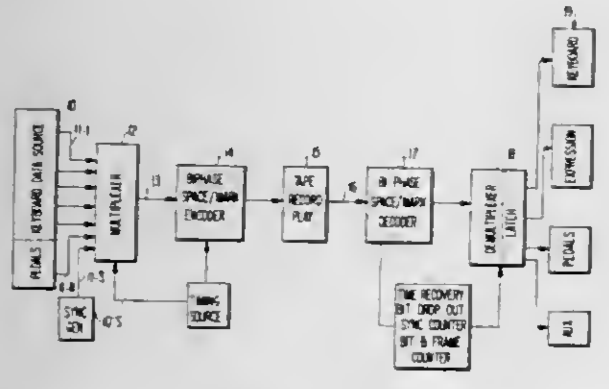
4,104,950
DEMULTIPLEX AND STORAGE SYSTEM FOR TIME DIVISION MULTIPLEXED FRAMES OF MUSICAL DATA

William Solon Finley, Lewisburg, Tenn., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Apr. 28, 1976, Ser. No. 681,098

Int. Cl.^{2} G10G *3/04*

U.S. Cl. 84—462 **3 Claims**



1. Apparatus for re-creating a musical presentation on a controlled musical instrument wherein the musical presentation is digitally recorded on magnetic tape in serial order time frames of time division multiplexed data bit cells encoded in a bi-phase mark/space code comprising:
- (a) means for decoding said bi-phase mark/space code;
- (b) counter means for counting the decoded data bit cells;
- (c) a storage shift register for storing the information in a selected sequential group of data cells within a time frame;
- (d) a plurality of multiple latch circuits means, the number of latches in each multiple latch circuit equalling the number of data cells in said sequential groups;
- (e) means operated by said counter means for producing and applying an enabling pulse to each of said plurality of multiple latch circuits in a selected sequence;
- (f) means connecting said storage register to said multiple latch circuits for simultaneously transferring the musical data stored in said storage register to said multiple latch circuits during said enabling pulse; and
- (g) means operated at the end of each time frame for operating the controls of said musical instrument according to the condition of said multiple latch circuits.

4,104,951
FIXING STUD FOR JOINING BUILDING OR CONSTRUCTIONAL ELEMENTS

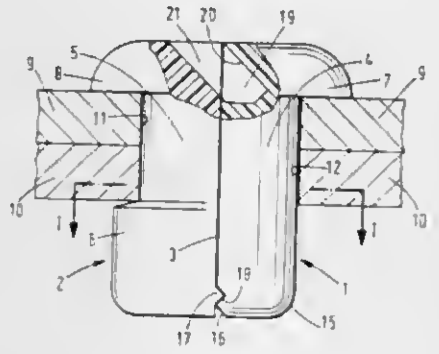
Kajetan Leitner, Öschweg 44, Eislingen, Fed. Rep. of Germany (7332)

Filed Sep. 13, 1976, Ser. No. 722,815

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1975, 2541105

Int. Cl.^{2} F16B *5/00*

U.S. Cl. 85—5 R **5 Claims**



1. In a fastener assembly, the combination comprising:
- a releasable fastening for insertion through aligned openings in plate-like structural elements from only a front-side of the elements and for securing the elements together;
- first and second parts each having a length forming a front portion for projecting from a rear side of the elements, a neck portion for extending through the aligned openings, and a rear portion for projecting from a front side of the elements;
- said front portion and said neck portion of the first part having cross sections permitting insertion of the first part into the aligned openings;
- said rear portions of the first and second parts each including a laterally extending stop for engaging the front side of the elements;
- said front portion of the first part including a laterally extending projection for engaging the rear side of the elements when the first part is in an engaging position;
- said cross section of the neck portion of the first part being reduced relative to the cross section of the front portion of the first part for allowing lateral displacement of the first part to move the first part into the engaging position;
- said first and second parts having mating side surfaces extending rectilinearly along their lengths to permit relative sliding movement of the first and second parts,
- said front portion of the second part including a locking indentation in the side surface of the second part spaced from the neck portion of the second part for mating with the locking projection when said stop on the rear portion of the second part engages the front side of the elements whereby the first and second parts are releasably locked together without tension when the neck portions of the first and second parts are in the aligned openings;

- said locking projection and said locking indentation cooperating with each other to retain the two parts in fixed longitudinal relationship defined by the laterally extending stops of the rear portions engaging the front side of the elements and the laterally extending stop on the front portion engaging the rear side of the elements; and
- said two parts being in said fixed longitudinal relationship without lateral expansion of said two parts when the locking projection is mated with the locking indentation.

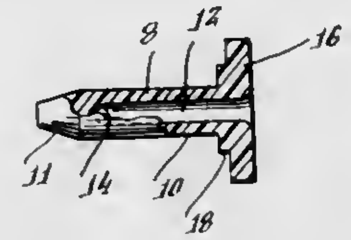
4,104,952
TOY CONSTRUCTION SYSTEM HAVING REUSABLE DISTENSIBLE JOINING MEMBERS

Robert L. Brass, Westport, Conn., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

Division of Ser. No. 660,320, Feb. 23, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,274

Int. Cl.^{2} F16B *19/00*

U.S. Cl. 85—5 R **3 Claims**



1. In a toy constructon system of the type including structural elements having preformed alignable holes through which fasteners are fitted to join the structural elements together, the improved fastener comprising:
- a reusable rivet element formed of distensible material and adapted to fit in said alignable holes to join said structural elements together, said rivet element having an elongated body of substantially uniform cross-section throughout its length with a relaxed diameter greater than the diameter of said holes in said structural elements and a diameter, when distended longitudinally, less than the diameter of said holes, an enlarged generally coaxial base at one end of sufficient rigidity to permit said base to be held during the application of a longitudinal distending force to said rivet body sufficient to produce said lesser diameter, an internal bore extending through said base and body to the opposite end of the rivet element, said opposite end being closed and of sufficient strength to receive a longitudinal distending force, applied to the rivet element through said bore, sufficient to reduce said relaxed diameter to a diameter less than that of said holes, and a shoulder on said elongated body next to said base for spacing the base a predetermined distance from a structural element.

4,104,953
MACHINE GUN BARREL FOR FIRING BLANKS

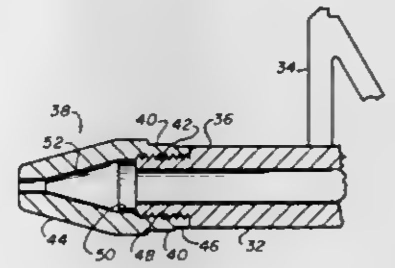
Charles L. Bard, Rock Island, Ill., and Raymond W. Pfitzenmaier, Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 608,485, Aug. 28, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,241

Int. Cl.^{2} F41F *17/08, 17/12*

U.S. Cl. 89—14 E **4 Claims**

2. The method of making a machine gun barrel for firing blanks comprising the steps of:
- a. selecting a service rejected but reclaimable barrel having a flash suppressor threadedly affixed to its outer end,
- b. providing an integral one piece construction attachment having at one end thereof a bore with a first diameter of sufficient size to fit over the outer end of the barrel, the bore having a reduced diameter at the other end of the attachment, the bore having a truncated conical surface interconnecting these ends,
- c. removing the flash suppressor and threadedly fastening said attachment to the outer end of said barrel, and



- d. replacing the serviceable barrel of a machine gun with said service rejected but reclaimable barrel with said attachment fastened thereon.

4,104,954
HYDRAULIC CONTROL SYSTEM

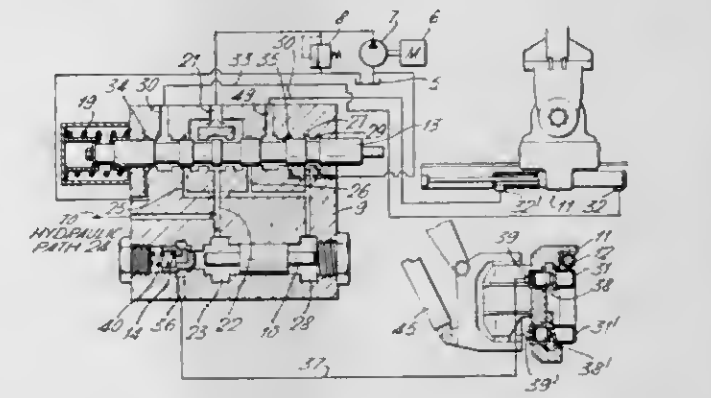
Katsuhiko Iijima, and Katsumasa Jomen, both of Sagamihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,380

Claims priority, application Japan, Oct. 31, 1973, 48-122545

Int. Cl.^{2} F15B *15/26*

U.S. Cl. 91—45 **2 Claims**



1. A hydraulic control system for an object moving and clamping arrangement that includes:
- a support;
- an object mounted on the support for movement axially therealong;
- hydraulic piston and cylinder means for moving the object along the support;
- hydraulically operated, releasable clamp means for locking the object at any selected position on the support, and which must be released to permit the object to be moved along the support;
- a source of pressurized fluid for powering said moving means, and said clamp means;
- and conduit means for communicating said source with said moving means and with said clamp means;
- said control system comprising:
- a switching valve interposed in said conduit means between said source and said moving means and clamps means;
- the switching valve including a housing and a valve body movably mounted therein between a neutral position, and at least one activating position for effecting advancement of the object along the support;
- an activator for the valve body, accessible from the exterior of the valve housing for shifting the valve body between the neutral and activating positions;
- a pilot piston;
- cylinder means housing the pilot piston for sliding movement therein between a first position and a second positon;

this cylinder means also housing a check valve body and means normally resiliently urging the check valve body to a first position, but being disposed to be moved to a second position by engagement with the pilot piston as the pilot piston is moved from the first position thereof to the second position thereof;

the check valve body being interposed in said conduit means between the switching valve body and the clamp means;

the conduit means further including, when the switching valve body is in the neutral position thereof:

(a) a hydraulic path from the source, through the housing, past the switching valve body and into the cylinder for the pilot piston at a location which tends to force the pilot piston away from the check valve and toward the first position of the pilot piston and tends to supply pressurized hydraulic fluid past the check valve to maintain the hydraulically operated clamp means pressurized and thus locked;

(b) a hydraulic path from the source, through the housing, past the switching valve body and back to said source, so as a by-pass for excess pressurized fluid;

the conduit means further including, when the switching valve body is in said activating position thereof:

(c) a hydraulic path from the source, through the housing, past the switching valve body and into the cylinder for the pilot piston at a location which tends to force the pilot piston towards the check valve, towards the second position of the pilot piston and the second position of the check valve, thereby permitting pressurized fluid to back flow from the clamp means, past the check valve and into the cylinder for the pilot piston, to depressurize and thus unlock the clamp means;

(d) a hydraulic path from the source, through the housing, past the switching valve body and to one side of the piston and cylinder means for pressurizing that side in order to move the object along the support;

(e) a hydraulic path from the other side of the piston and cylinder means and back to the source for draining hydraulic fluid from that side of the piston and cylinder means; and

(f) a hydraulic path from the source, through the housing, past the switching valve body and back to said source, as a by-pass for excess pressurized fluid,

the pilot piston thereby enabling the operation of only said activator to switch the object moving and clamping arrangement between one mode wherein the clamping means is locked and the object is disposed at a chosen, fixed location along the support, and another mode wherein the clamping means is unlocked and the object is moved along the support in a desired direction;

the object moving and clamping arrangement further includes at least one other hydraulically operated device;

the conduit means also communicating said source with said other device;

the control system further including:

said switching valve also being interposed between said source and said other device;

the conduit means further including, when the switching valve body is in the neutral position thereof:

(g) a hydraulic path from the source, through the housing, past the switching valve body, to said other device for powering said other device, and back to said source;

the hydraulic path (g) communicating with the hydraulic path (a) between the switching valve body and the cylinder for the pilot piston, whereby as the switching valve body is returned from said activating position to said neutral position, the flow of pressurized fluid to said other device upon activation thereof, will also aid to return the pilot piston to the first position thereof and ensure full pressurization and locking of the clamp means.

4,104,955

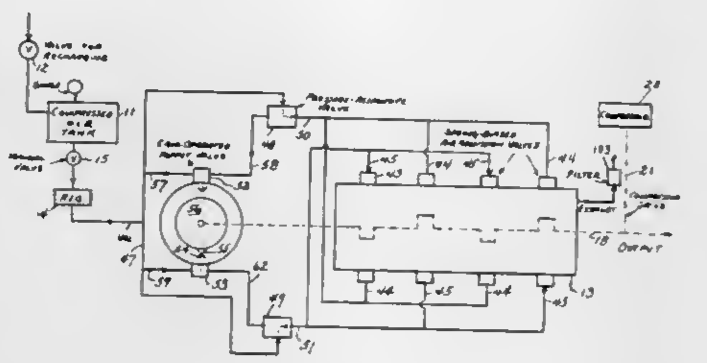
COMPRESSED AIR-OPERATED MOTOR EMPLOYING AN AIR DISTRIBUTOR

John R. Murphy, Rte. One, Smithville, Miss. 38878

Filed Jun. 7, 1977, Ser. No. 804,279

Int. Cl.^{2} F01L *15/16, 25/06;* F01B *15/00*

U.S. Cl. 91—176 **6 Claims**



1. In a compressed air engine system, a compressed air storage tank, an engine provided with opposed cylinders containing pistons and a crankshaft having crank elements connected to said pistons, and compressed air supply conduit means connecting said storage tank to said cylinders and including distributing valve means to alternately admit compressed air to the respective cylinders responsive to rotation of the crankshaft, said cylinders comprising two groups, each being arranged to act simultaneously as a group on the crankshaft, with the cylinders of one group opposing the cylinders of the other group, and wherein said distributing valve means comprises respective pressure-responsive pilot valves connected between the air storage tank and the groups of cylinders and controlling the admission of compressed air to the two groups, respective relay valves connected between the air storage tank and the pilot valves and controlling the opening of the pilot valves, and cam means on the crankshaft alternately operatively engageable with said relay valves responsive to the rotation of the crankshaft.

4,104,956

RADIAL PISTON TYPE MULTI-STROKE HYDRAULIC PUMP OR MOTOR

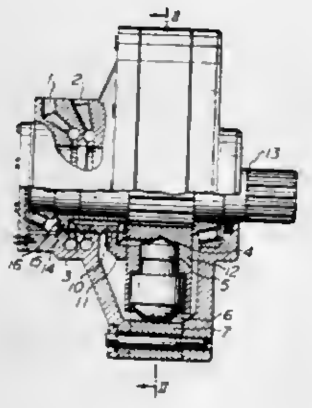
Kozo Ono, Tokyo, and Taketoshi Kato, Funabashi, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Japan

Continuation of Ser. No. 141,945, May 10, 1971, abandoned, which is a continuation of Ser. No. 830,622, Jun. 5, 1969, abandoned. This application Feb. 10, 1977, Ser. No. 767,338

Claims priority, application Japan, Jun. 10, 1969, 44-39401

Int. Cl.^{2} F01B *13/06*

U.S. Cl. 91—491 **1 Claim**



1. A radial piston type multi-stroke hydraulic pump or motor comprising a rotor having a plurality of radially extending cylinder bores arranged about the axis thereof, a plurality of

pistons each being mounted in each of said cylinder bores for reciprocal movement therein, a cam member encircling said rotor and having a cam surface consisting of a plurality of ridges each having a same configuration, said rotor being rotatable with respect to said cam member, rolling means mounted on the outer end of each of said pistons for rolling contact with said ridges of said cam surface, and valve means for controlling the flow of fluid into and out of said cylinder bores, characterized in that when said rolling means of the piston moves from the peak to the trough of each of said ridges, the radial movement of said piston has a constant acceleration section in which the velocity of said piston continuously increases from zero to maximum with a constant rate, a constant velocity section in which the velocity of said piston is maintained at said maximum, a constant deceleration section in which the velocity of said piston continuously decreases from said maximum at the end of said constant velocity section to zero with a constant rate, and in conjunction with at least either or both of the starting point of said constant acceleration section and the ending point of said constant declaration section dwell sections in which said piston is deactivated, said acceleration section being larger than said deceleration section, and characterized in that the angular displacements θac and θdc of the piston corresponding to said constant acceleration section and said constant deceleration section respectively are multiples $m \cdot n$ and m of the piston phase differential angle $\theta_p(=2\pi/M \cdot N)$, where M and N are integers, the angular displacement θcv of the piston corresponding to said constant velocity section is a multiple l, which is an integer or zero, of the piston phase differential angle θ_p, and the sum $\epsilon_1 + \epsilon_2$ of the angular displacements corresponding to said swell sections is determined in accordance with the following equation:

$$\epsilon_1 + \epsilon_2 = \{(M/2) - m(n + 1) - l\}\theta p.$$

where M is the number of pistons and N is the number of peaks of the cam.

4,104,957

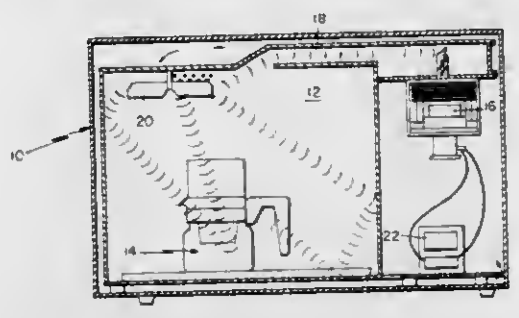
MICROWAVE COFFEE MAKER

George Freedman, Wayland, and Robert F. Bowen, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 813,035

Int. Cl.^{2} A47J *31/057*

U.S. Cl. 99—283 **10 Claims**



1. A drip-type coffee making appliance for use in a microwave oven comprising a pot having an open upper end, a microwave-transparent reservoir removably seated on the open upper end of the pot for containing water to be heated, said reservoir being transparent to microwave energy and having a bottom wall, a thermal valve sealed within an aperture in said bottom wall and including a valve seat positioned for contact by said water a container removably positioned beneath the valve for holding coffee grounds to be contacted by water passing from the reservoir through the valve to the pot, and means for shielding said thermal valve from microwave energy whereby the valve will operate only in response to changes in temperature of the water.

4,104,958

METHOD AND APPARATUS FOR PROCESSING VEGETABLE FOODSTUFFS

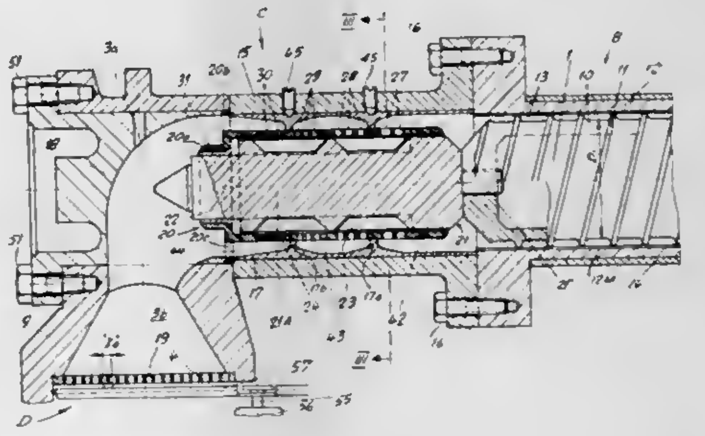
Josef Manser, Uzwil, and Friedrich Egger, Niederuzwil, both of Switzerland, assignors to Gebrueder Buehler AG, Uzwil, Switzerland

Filed Jul. 29, 1975, Ser. No. 600,112

Claims priority, application Switzerland, Aug. 1, 1974, 10612/74

Int. Cl.^{2} A23P *1/00*

U.S. Cl. 99—355 **29 Claims**



1. An apparatus for processing a foodstuff, said apparatus comprising:

a housing defining a substantially closed flow path having an upstream path end and a downstream path end;

means supplying said foodstuff in loose condition to said upstream path end;

a screw along said path having an upstream screw end at said upstream path end and a downstream screw end spaced downstream therefrom;

kneading drive means rotating said screw and thereby kneading and pressurizing said foodstuff and feeding same in kneaded and pressurized condition to said path at said downstream screw end, whereby said foodstuff in pressurized condition will fill said path and advance therealong toward said downstream path end during rotation of said screw;

a mincing unit in said housing along said path between said downstream screw end and said downstream path end, said mincing unit including

  a hollow cylindrical stator;

  a rotatable comminuting knife closely surrounded by said stator and formed with a plurality of sets of apertures spaced apart from said upstream toward said downstream path end with the furthest downstream set having a predetermined combined cross-sectional area, and

  mincing drive means connected to said knife for displacing same and comminuting the pressurized and kneaded foostuff;

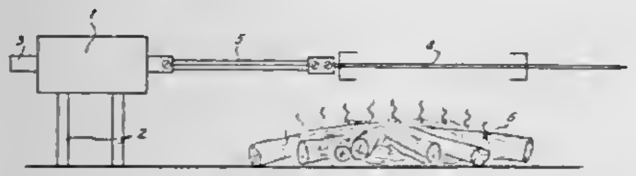
  homogenizing means in said housing along said path between said mincing unit and said downstream path end for reforming the comminuted, kneaded, and pressurized foodstuff into a homogeneous mass; and

means at said downstream path including a die for reducing the homogeneous mass to crumbs, said die being formed with a plurality of holes having a combined cross-sectional area greater than said predetermined cross-sectional area of said furthest downstream set of apertures.

4,104,959

ROASTING JACK

Jean Robert Demerson, 15, Place Royale, Versailles, France (78000)
Filed Feb. 23, 1977, Ser. No. 771,813
Claims priority, application France, Feb. 27, 1976, 76 05467; Oct. 26, 1976, 76 32164
Int. Cl.^{2} A47J *37/04*
U.S. Cl. 99—421 H **16 Claims**

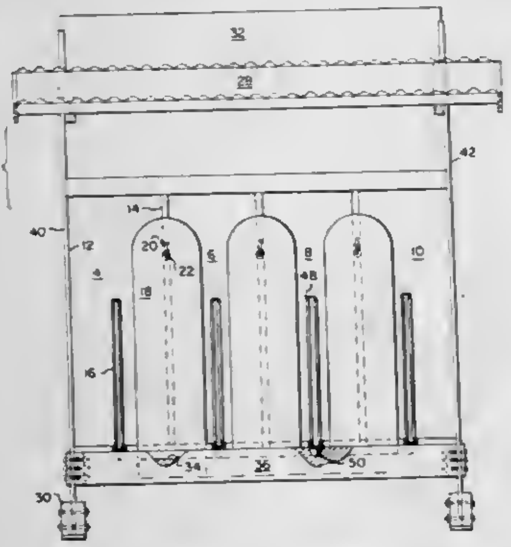


1. Turnspit moved by direct radiation from a fire, which comprises a shaft mounted in a system of bearings permitting its free rotation around its axis and, in the extension of said shaft and in an extended position in relation to said system of bearings a rotating unit, driven in rotation by said shaft, said rotating unit being made up of a first part supporting a roasting food piece, and a second metal part, located between said shaft and said first part, able to curve under the effect of the differential expansion resulting from the different temperature of the generatrix which receives the direct radiation of the fire and the generatrix opposite said fire.

4,104,960

RECYCLE PAPER COLLECTION RECEPTACLE DEVICE

W. Scott Kuhnen, P.O. Box 489, Yuba City, Calif. 95991
Filed Aug. 15, 1977, Ser. No. 824,891
Int. Cl.^{2} B65B *13/06*
U.S. Cl. 100—25 **7 Claims**



1. A recycle paper collection receptacle, comprising:

A. a longitudinally extending shelter having a base and a superposed roof structure which extends in said longitudinal direction, said shelter further including vertically extending end walls supporting said roof, said end walls extending transversely at each end of said elongated shelter; and

B. a vertically disposed center partition extending between said end walls along a longitudinal plane of symmetry for said shelter, with a plurality of vertically disposed side partitions extending transversely from either side of said center partition, thereby defining a plurality of vertically extending and outwardly open bays on either side of said center partition; wherein,

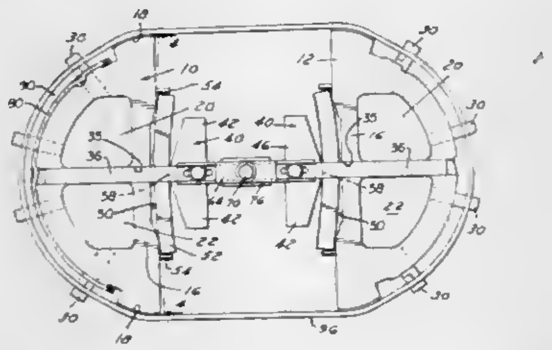
C. adjacent bays further are defined at their outward extent by removable access doors releasably mounted upon each of said transverse partitions, said doors being vertically disposed and inward of said superposed roof; wherein further,

D. each of said bays further includes an arcuate slotted channel extending inwardly from a point on said base which is exposed with said doors mounted upon said side partitions, said channel extending inwardly therefrom, to below said base through a curved transition and then vertically upward along the outwardly facing side of said center partition portion which defines each bay.

4,104,961

BRAKE SHOE LINING BONDING FIXTURE

Thomas E. Morgan, Jr., Bloomfield Hills, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.
Filed Apr. 29, 1977, Ser. No. 792,150
Int. Cl.^{2} B02C *11/08*
U.S. Cl. 100—93 PB **4 Claims**



1. In a brake shoe lining fixture for bonding brake linings on to brake shoes utilizing an arcuate brake shoe support and an encircling metal band to exert pressure on the lining against the brake shoe, that improvement which comprises:

a brake shoe support arcuate in shape having an arcuate recess to receive a brake shoe, and buffer blocks at the end of said recess having a circumferentially extended curved surface circumferentially adjacent and tangential to the outer end surface of an assembled brake lining to carry the pressure band tangentially away from the curve at the end of the brake linings, said buffer block surfaces having a radial dimension slightly less than the curvature of the assembled brake linings to protect the corner ends of the brake lining against crushing.

4,104,962

PRESS

Adolfo Castillo, Miami, Fla., assignor to Automated Building Components, Inc., Miami, Fla.
Filed Mar. 14, 1977, Ser. No. 777,090
Int. Cl.^{2} B30B *1/32*
U.S. Cl. 100—100 **12 Claims**

1. An assembly suitable for fabricating wooden panels, trusses or the like, from lumber and toothed sheet metal connector plates, said assembly comprising:

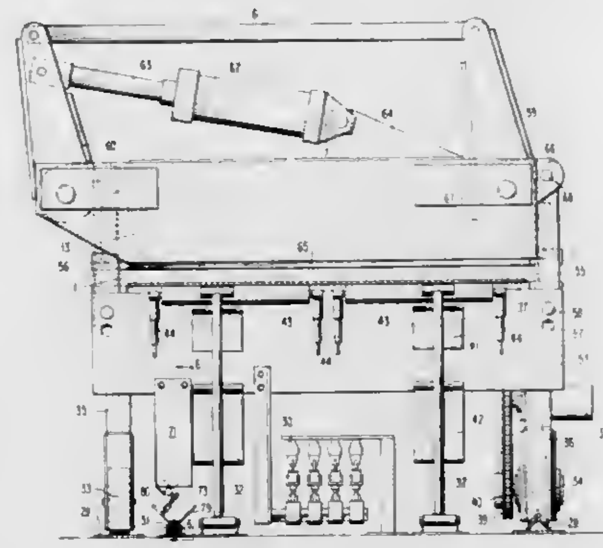
(a) a jig table means for supporting said lumber during fabrication;

(b) said jig table means including a pair of opposed jig members for holding said lumber in a predetermined position on said jig table, at least one of said jig members being horizontally retractable away from said lumber;

(c) said one jig member being clampable in position by a plurality of clamp means, said clamp means comprising fluid actuated clamp cylinder means pivotably connected at one end at a first pivot location to said jig table means, a link pivotably connected at one end at a second pivot location to the other end of said clamp cylinder means, an adjustable means pivotably connected at one end at a third pivot location to the other end of said link and adjustably fixed at the other end to said jig table, said clamp means contacting said jig member at said second pivot location, said clamp cylinder means moving said link from a first link position in clamping contact with said jig member to a second link position retracted from clamping contact with said jig member, said link and said adjustable means cooperating to provide a rigid, incompressible clamping linkage between said jig table and said jig member when said link is in said first link position;

(d) press means to press the teeth of said connector plates into said lumber, said press means comprising a base structure including a first press platen, a head including a second press platen in opposition to said first press platen, a link means supporting said head above said base structure at least two bellcrank means mounted upon said head on opposite sides of said press, a transfer bar means interconnecting said bellcrank means, a fluid actuated press cylinder means connecting said head and a bellcrank means, and guide means for guiding said second press platen in generally vertical movement above said first press platen, said bellcrank, said transfer bar means, said press cylinder means, and said guide means cooperating to move said second press platen means in the desired, generally vertical direction above said first press platen means while maintaining said platen means in a generally parallel relationship; and

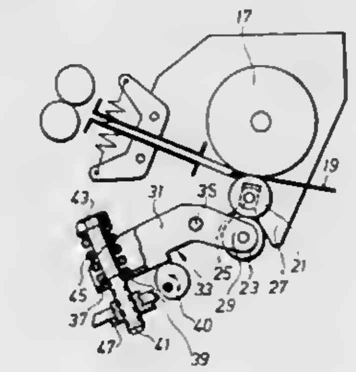
(e) moving means to move said press means relative to lumber on said jig table means.



4,104,963

DEVICE FOR THE PRESSURE FIXING OF TONERS

Hermann Fortmann, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany
Filed Feb. 23, 1977, Ser. No. 771,347
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607271
Int. Cl.^{2} B30B *3/04*
U.S. Cl. 100—176 **8 Claims**



1. In a device for the pressure fixing of a toner on a record carrier under ambient temperatures; the device including a stand; a first pressure roll of relatively large diameter rotatably and stationarily supported in the stand; a second pressure roll of relatively small diameter rotatably supported in the stand and cooperating with the first pressure roll to define therewith a roll gap; means for displaceably supporting the second pressure roll to be shiftable towards and away from the roll gap; resilient force-exerting means for urging the second pressure roll against the first pressure roll; the improvement wherein said resilient force-exerting means comprises

(a) a plurality of pressure rollers arranged in a series along the length dimension of said second pressure roll; said pressure rollers being oriented axially parallel with said second pressure roll;

(b) a separate support means for individually displaceably supporting each said pressure roller for movement towards and away from said roll gap;

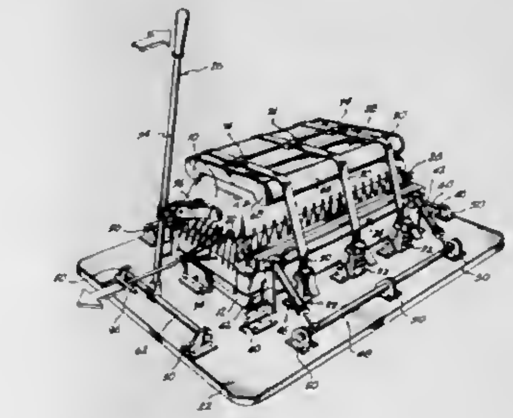
(c) a separate spring urging each said pressure roller into contact with said second pressure roll for exerting thereon a pressing force with which said first and second rolls compress a record carrier passing through said roll gap; and

(d) setting means for individually adjusting the pressing force exerted by each said pressure roller.

4,104,964

APPARATUS FOR PACKING AIRCRAFT ESCAPE DEVICES

Peter J. Larkworthy, Seattle; James A. Rose, Bothell, and Anthony J. Martin, Spokane, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Apr. 5, 1977, Ser. No. 784,831
Int. Cl.^{2} B30B *7/04;* **B65B** *63/02*
U.S. Cl. 100—232 **15 Claims**



1. Packing apparatus for shaping and contouring a compressible item, wherein said compressible item is retained in a compressed state by compression members which encircle at least a portion of said compressible item, said compression members being configured for maintaining said compressible item in a final configuration of desired size and shape, having an upper surface, a lower surface, a first and second side surface and first and second end surfaces, each of said surfaces being of a generally predetermined contour, said packing apparatus comprising:

a base plate assembly including means for receiving and retaining a partially shaped and contoured compressible item in a fixed orientation relative to said base plate assembly, said lower surface of said compressible item contacting said base plate assembly;

first compression means engageable with said base plate assembly and positionable for compressing selected regions of said first and second end surfaces and said first and second side surfaces of said compressible item; and,

second compression means positionable on said upper surface of said compressible item, said second compression means including interconnection means for interconnecting said second compression means with said base plate assembly, said interconnection means being operable for drawing said second compression means toward said base plate assembly to urge said upper surface of said compressible item inwardly toward said bottom surface of said compressible item.

4,104,965

CLUTCH FOR PERMITTING A DRIVEN MEMBER TO RUN AT DIFFERENT SPEED FROM A DRIVE MEMBER

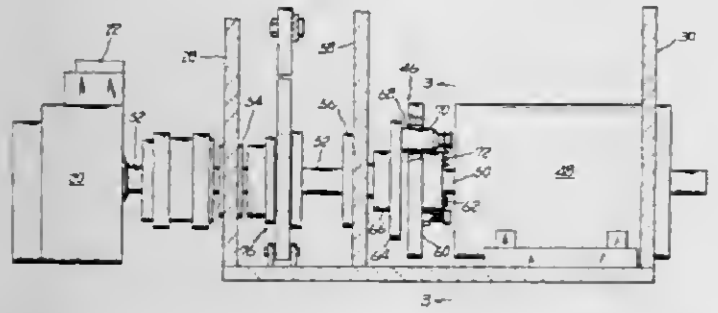
Moriaki Abe, Tokyo, Japan, assignor to E.D.M. Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,662

Claims priority, application Japan, Oct. 16, 1975, 50-140986[U]

Int. Cl.² B44B *5/02*

U.S. Cl. 101—25 **1 Claim**



1. In hot stamping apparatus wherein heated type is pressed against a printing ribbon for imprinting characters on a continuous strip of material traveling in a predetermined direction over a platen at constant speed, the type having at least one relief character on its face, the combination of:

(a) a support panel defining a ribbon travel path including thereon a rotatable payoff reel from which the printing ribbon is fed at one end of said defined travel path:

(b) a rotatable takeup reel likewise supported by said panel at the other end of said defined travel path for accumulating the printing ribbon fed from said payoff reel, the printing ribbon traveling from said payoff reel to said takeup reel generally in a direction opposite to said predetermined direction and being placed in superposition on the strip of material over said platen;

(c) a type carrier likewise supported by said support panel along said travel path between said payoff and takeup reels, having type fixedly mounted thereon and rotatable on said panel about a fixed axis over said platen, the type on said type carrier being adapted to be pressed against the printing ribbon on the strip of material over said platen;

(d) drive means coupled to said type carrier for imparting rotation to said type carrier for revolving said type at speed synchronous with the speed of the strip of material and in a direction corresponding to said predetermined direction, comprising a source of rotary power, a drive shaft rotated by said source at predetermined speed in a predetermined direction, a drive disk fixedly mounted on said drive shaft, said drive shaft having a slot formed therein in the shape of a circular arc centered about the axis of said drive shaft, a driven shaft rotatably supported in coaxial relationship to said drive shaft and having said type carrier fixedly mounted thereon, said driven shaft being rotated by the strip of material in the same direction as said drive shaft and at speed less than the predetermined rotational speed of said drive shaft while the type on said type carrier is being pressed against the printing ribbon in superposition on the strip passing over said platen, a driven disk fixedly mounted on said driven shaft in confronting relationship to said drive disk, a pin affixed eccentrically to said driven disk and received with clearance in said slot in said drive disk for movement therealong, whereby said driven disk is rotatable relative to said drive disk through an angle limited by the length of said slot, and spring means yieldably urging said pin toward the forward end of said slot with respect to the predetermined rotational direction of said drive shaft for imparting the rotation of said drive disk to said driven disk, said pin being movable toward the rearward end of said slot against the force of said spring means for permitting said driven shaft to rotate at synchronous speed with the strip of material while the type on said type carrier is being pressed against the printing ribbon in superposition on the strip over said platen;

(e) yieldable means supported on said panel between said takeup reel and said type carrier tending to hold an extra length of the printing ribbon between said platen and said takeup reel, whereby the printing ribbon is permitted to be transported a predetermined distance in said predetermined direction with the strip of material relative to said platen while being pressed by the type and, when subsequently released by the type, to return the same distance in said opposite direction relative to said platen; said yieldable means having: a pullback lever pivotally supported on said panel at a point intermediate both ends thereof, a pair of rollers rotatably mounted on both ends of said pullback lever, and, resilient means yieldably urging said pullback lever to a predetermined angular position, said pullback lever being angularly displaceable from said predetermined position against the force the force of said resilient means when the printing ribbon is transported in said predetermined direction relative to said platen;

(f) takeup reel actuating means coupled to said takeup reel for causing said takeup reel to wind up a length of the printing ribbon corresponding to the width of the character on the typeface after each time the type has been pressed against the printing ribbon; and,

(g) drawoff means for drawing the successive desired lengths of the printing ribbon from between said platen and said type carrier coupled to said yieldable means and for feeding the printing ribbon toward said takeup reel, said drawoff means including: a pair of drawoff rollers with means urging said drawoff rollers against each other via the printing ribbon under sufficient pressure to hold the ribbon frictionally arrested therebetween when the ribbon is transported in said predetermined direction by the type, and drawoff roller actuating means including a drawoff roller shaft on one of said drawoff rollers for intermittently rotating said drawoff rollers through a predetermined angle in step with the rotation of said takeup reel, said drawoff roller actuating means also including: a cam coupled to and constantly rotated by said drive means, a cam follower mounted on said cam for translating the rotary motion of said cam into reciprocal motion, said cam follower having a free end with link means at said free end, a one-way clutch coupled to said link means, said one-way clutch being operatively connected to said drawing roller shaft transmitting the reciprocal motion of said cam follower to said one drawoff roller via said one-way clutch whereby said one drawoff roller is rotated only in such a direction that the printing ribbon is fed toward said takeup reel.

4,104,966

CAPSULE ORIENTING AND TURNING APPARATUS

Charles E. Ackley, Jr., Philadelphia, and Charles E. Ackley, Sr., Oreland, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Filed Mar. 30, 1976, Ser. No. 672,017

Int. Cl.² B41F *17/36;* B65G *47/24*

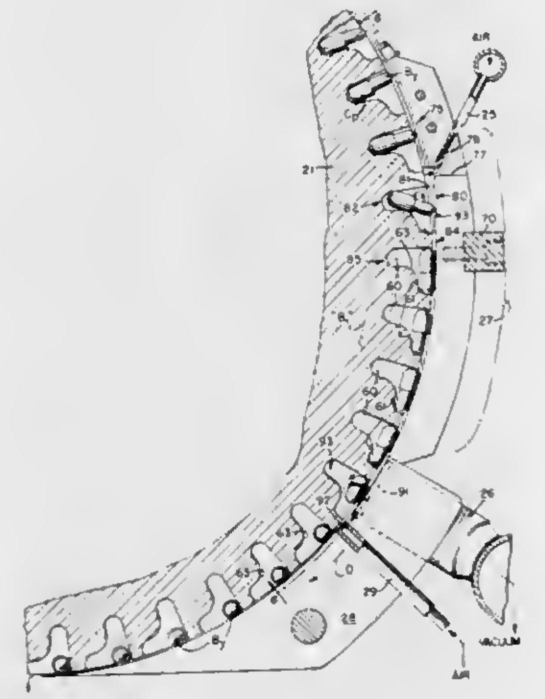
U.S. Cl. 101—40 **47 Claims**

1. In an orienting and turning apparatus for capsules having body portions and enlarged cap portions arranged along substantially a common axis, wherein a continuously movable capsule transporting means is provided having a plurality of spaced-apart pockets for the capsules, and said apparatus having a means for feeding a plurality of capsules for reception at random, caps-up and caps-down in said pockets, each said

pocket having an upright pocket portion for receiving said capsule therein with the capsule arranged in a substantially upright attitude relative to the direction of capsule movement, each said pocket also having a longitudinal pocket portion arranged to carry the capsule at an attitude with the capsule axis extending in approximately the transport direction, and each said pocket having a substantially crosswise pocket portion arranged to carry the capsule arranged in a substantially crosswise attitude relative to the direction of its movement and also substantially crosswise of said upright position,

the combination which comprises:

(a) gaging means downstream of said capsule feeding means and adjacent the path of movement of said pockets, said gaging means having spaced-apart wall members and a ceiling member having a surface extending between said wall members and extending above them in the transport direction to form an elongated gaging passageway extending in the transport direction, said gaging means being adjusted for predetermining the width of said passageway to a value greater than the outside diameter of said capsule body portion but lesser than the outside diameter of said capsule cap portion, whereby said cap portions are frictionally engaged by said wall members to maintain said caps-up capsules in a caps-up position;



(b) tilting means for tilting the caps-down capsules toward the transport direction between the wall members of said gaging means,

said upright pocket portions having surfaces arranged to engage said cups-up capsules to overcome the frictional resistance of said wall members to force said caps-up capsules along said gaging passageway while maintaining them in a caps-up attitude, and

(c) vacuum turning means downstream of said gaging means for causing all of said cap portions that are in an upright attitude and all of said cap portions which are in an attitude extending in the transport direction to swing to an attitude in a substantially crosswise direction.

4,104,967

LINE PRINTER

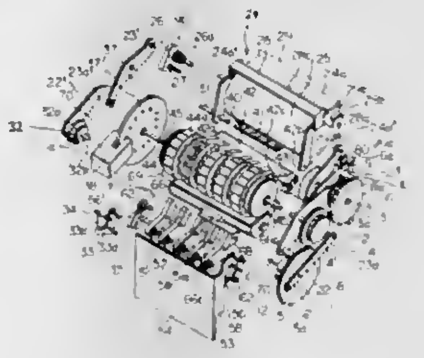
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

Continuation of Ser. No. 643,617, Dec. 22, 1975, abandoned. This application Nov. 4, 1977, Ser. No. 849,112

Claims priority, application Japan, Dec. 27, 1974, 50-148651; Dec. 27, 1974, 50-148652; Dec. 27, 1974, 50-148653; Dec. 27, 1974, 50-148654; Dec. 27, 1974, 50-148655; Apr. 23, 1975, 50-48637

Int. Cl.² B41J *1/44*

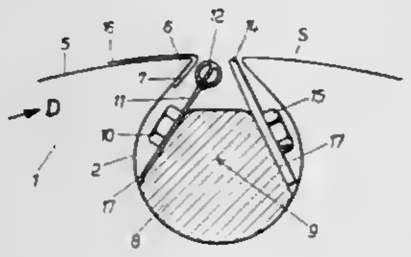
U.S. Cl. 101—99 **9 Claims**



1. A line printer having a plurality of rotatable printing rings (**44**) coaxially arranged adjacent each other and carrying on at least more than one-half of each of their peripheral surfaces a plurality of characters spaced in the circumferential direction of said rings, the printer comprising means (**45**) for rotating said rings, resilient means interposed between said rotating means and each of said rings, means providing a starting position so that one cycle of a printing operation is effected by two revolutions of said rotating means from said starting position, arresting means (**51**) for selectively engaging said rings independently from each other while said rotating means is operated so as to temporarily arrest the rotation of said rings thereby shifting the relative position of the respective ring with respect to said rotating means from a predetermined relative position thereof for simultaneously holding each selected character at a printing position, a movable roller pad (**25**) abutting against said rings at a predetermined printing position with respect to said rings, thereby permitting one of said characters to be positioned by the arresting means at the printing position and be printed simultaneously on a paper held between said roller pad and said rings so as to form a printed line on the paper, means (**15, 22 to 24, 22′, 23′, 32**) for moving said roller pad toward and away from said rings to permit said roller pad to abut against said rings, means (**25,26,40,90**) for feeding the paper after each printed line, the operation of the printer being controlled so that the printed line is formed on the paper after selection of said characters has been completed, and the paper is fed after the printed line has been formed while said rings are released from their selectively arrested positions so as to restore the same to said predetermined relative position with respect to said rotating means and to terminate one printing cycle, wherein said rings are rotated by said rotating means in the same direction within each printing cycle, further comprising a stopper member (**82**) constituted as a washer for each respective ring, each stopper member having inner and outer projections, one of said projections being engaged with said rotating means so that said stopper member is rotatable with said rotating means, said resilient means comprising a coil spring having inner and outer ends, one of said ends of the coil spring being secured to a respective said printing ring, the other end of said coil spring being engaged by the other of said projections of the associated stopper member, said means for providing a starting position comprising an arresting projection on said printing ring engagable by said other end of the coil spring thereby permitting the respective ring to be held at said predetermined relative position by said arresting means while the rotating means continues to rotate and compress said coil spring whereas when said respective ring is free from said

arresting means said ring undergoes rotation together with said rotating means, said printing ring after release by said arresting means after a printing operation rotation by the action of the compressed spring until the ring returns to said starting position, and mechanical means (3′, 4, 4′, 5, 70) for intercoupling said rotating means, said moving means and said feeding means in a predetermined time relation between the operations of said arresting means, said moving means and said feeding means being so set that the selection of said characters and the arresting of said rings as well as the printing operation are effected within the first revolution of said rotating means, while paper feeding and releasing of said rings are effected within the last half of each printing cycle so as to restore the printer to said starting position.

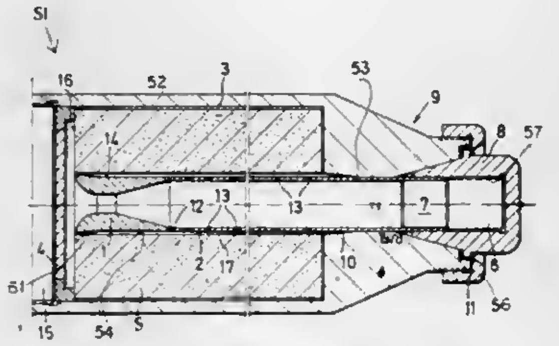
4,104,968
CLAMPING DEVICE FOR FLEXIBLE PRINTING PLATES
Manfred Schwaab, Lu-Oggersheim; Helmut Puschnerat, Worms; Fritz Kluzik; Manfred Jünger, both of Frankenthal; Ernst Wilding, Grünstadt, all of Fed. Rep. of Germany, and Hans Tittes, deceased, late of Frankenthal, Fed. Rep. of Germany, by Marga Tittes, Hans-Ulrich Tittes, Gerlach Stephan Tittes, Axel Michael Tittes, heirs, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany
Filed Jun. 3, 1976, Ser. No. 692,265
Int. Cl.^{2} B41F *27/12*
U.S. Cl. 101—415.1 **2 Claims**



1. A device for clamping flexible printing plates onto the plate cylinder of rotary printing presses, said plate cylinder having a generally cylindrical, axially-extending groove formed in its surface whereby the groove walls extend at an acute angle into the surface of the plate cylinder defining a pair of hook-like edges at the groove opening for receiving the correspondingly hook-like bent ends of the printing plate, comprising:

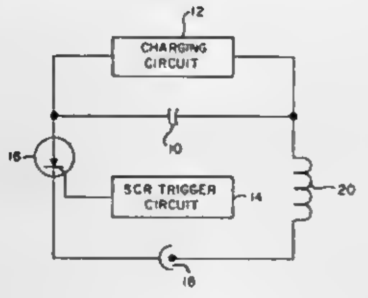
- a spindle pivotably disposed in said groove having an axis concentric with the groove, said spindle having a cylindrical base surface resting and riding upon the cylindrical surface of said groove;
- at least one spring supported on a first side of said spindle which faces a first hook-like wall edge;
- a clamping element formed at one end of said at least one spring disposed adjacent to said first hook-like edge of the plate cylinder surface for engaging the front end of the printing plate against one of said hook-like groove edges; and
- a rigid bar disposed on the opposite side of the spindle axis and rigidly mounted on said spindle, said bar having an end terminating adjacent to the plate cylinder surface for receiving the hook-like bent rear end of the printing plate, said bar being directed toward the printing plate front end, so that when the spindle is pivoted on its axis, the extending end of said bar will engage said clamping element, and, in turn, urge the clamping element against the first hook-like edge of said groove, so that said front end and said rear end of said printing plate may be securely clamped between said first hook-like edge of said groove and said clamping element, and between said clamping element and said bar, respectively.

4,104,969
ARRANGEMENT FOR IMPROVING THE BURNING EFFICIENCY OF A ROCKET-BORNE SOLID PROPELLANT CHARGE CARTRIDGE
Manfred Moll, Dusseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany
Filed Feb. 10, 1977, Ser. No. 767,379
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605768
Int. Cl.^{2} F02K *9/04*
U.S. Cl. 102—49.3 **8 Claims**



1. In a ballistic projectile, a hollow jacket having a rear wall portion radially bounding a combustion chamber, locking means releasably secured to the rear end of the rear jacket wall portion for closing one end of the chamber, a hollow propellant charge cartridge supported coaxially within the chamber and having a central aperture extending therethrough, tubular support means extending coaxially forwardly through the central aperture of the cartridge from the locking means, a nozzle coaxially and removably secured to the front end of the support tube within the central aperture of the cartridge, the outer periphery of each of the tubular support means and the nozzle being normally in radial spaced relation to the surrounding wall of the central aperture of the cartridge to permit rearward movement of the nozzle and the support means with respect to the cartridge when the locking means are released, and means associated with the interior wall of the jacket rear wall portion rearwardly of the cartridge and cooperable with the nozzle to capture the nozzle within the chamber upon a rearward axial movement of the nozzle and the support means.

4,104,970
ELECTRONIC IGNITION SYSTEM FOR LIQUID EXPLOSIVE
Gary L. Petersen, and Larry L. Liedtke, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 10, 1977, Ser. No. 767,602
Int. Cl.^{2} F42C *11/00*
U.S. Cl. 102—220 **10 Claims**



1. In an electrical ignition system for firing liquid explosives the improvement which comprises:

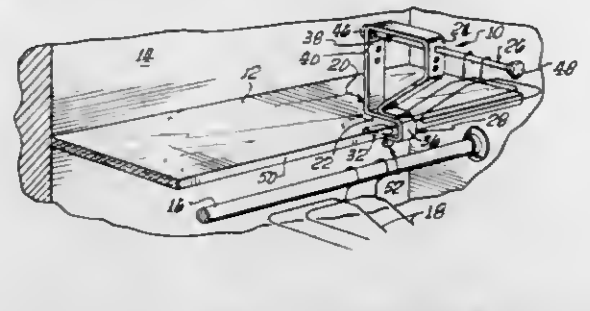
- an electro-optical isolated trigger circuit;
- a silicon controlled rectifier, SCR, activated by said trigger circuit:
- a capacitor electrically connected to discharge through said SCR when it is activated;

- a charging circuit electically connected to said capacitor for charging said capacitor;
- an inductor electrically connected to said SCR for limiting the peak current when said trigger circuit is activated; and
- an ignitor electrically connected between said trigger circuit and said inductor.

4,104,971
CAR WASH CONVEYOR BELT SAFETY PROTECTION SYSTEM
Gilbert Savard, St. Leonard, Canada, assignor to BP Canada, Canada
Filed Dec. 20, 1976, Ser. No. 752,959
Claims priority, application Canada, May 4, 1976, 251780
Int. Cl.^{2} B61B *13/00;* B65G *35/00*
U.S. Cl. 104—172 B **1 Claim**

1. In a car wash conveyor system, for use in a car wash enclosure, and including an elongated conveyor pit extending the length of the car wash enclosure; an idler sprocket pit at one end of the conveyor pit and having an idler sprocket therein; a drive sprocket pit at the second end of the conveyor pit and having a drive sprocket therein; means for rotating the drive sprocket; and a continuous chain drive extending around the sprockets and along an upper run and a lower run between the sprockets and carrying a plurality of elongated rollers extending transverse the chain drive; the improvement comprising an elongated, substantially flat-surfaced continuous safety belt having a first end anchored at the idler sprocket pit and a second end anchored at the drive sprocket pit and overlying the idler sprocket pit, the conveyor pit, and the drive sprocket pit to substantially prevent insertion of foreign objects into the path of the rollers, the belt contacting the rollers on the upper run to cause waves in the belt to move the length of the upper run as the rollers are carried by the upper run while the drive sprocket is rotated, the waves engaging automobile tires lying on the belt to rotate the tires along the belt, and thus to propel automobiles the length of the upper run.

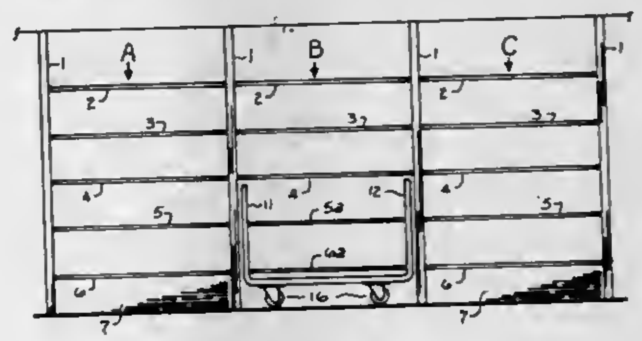
4,104,972
AUXILIARY CLOTHES HANGER SUPPORT
Harvey W. Baublitz, 15042 Rolling Ridge Dr., Chino, Calif. 91710
Filed Sep. 27, 1976, Ser. No. 726,929
Int. Cl.^{2} A47B *97/00*
U.S. Cl. 108—31 **6 Claims**



1. An auxiliary clothes hanger support for attachment to a shelf having an exposed edge comprising:

- a mounting bracket having a base surface and a normally upright front side,
- said bracket comprising a folded metal strap having a flat end portion and an adjacent flat strap portion disposed in spaced parallel relation and joined by a connecting strap portion to form a normally lower yoke shaped base for straddling said shelf edge, said base having said base surface, and a remaining strap portion extending upwardly from said adjacent strap portion, then lengthwise of said adjacent strap portion, and then back to said adjacent strap portion to form an upper generally loop shaped bracket portion above and projecting forwardly of said base and having said front bracket side and an opposite rear bracket side with aligned holes for slidably receiving a hanger support rod,
- said hanger support rod slidable endwise in said base in the fore and aft direction of the base with the rod axis parallel to said base surface for extension of said rod in the forward direction to an extended hanger supporting position wherein the front end of said rod projects beyond said front bracket side and for rearward retraction of said rod to a position wherein the front end of said rod is adjacent said front bracket side,
- means comprising said base and a clamp screw threaded in said base for mounting said bracket on said shelf adjacent said shelf edge with said bracket surface seating on the shelf and said front bracket side adjacent and facing in the same direction as said shelf edge, whereby in said extended position of said hanger support rod, said front rod end projects beyond said shelf edge to support clothes beyond said front shelf edge.

4,104,973
METHOD AND APPARATUS FOR DISPLAYING BREAD IN SUPERMARKETS
John R. Dwyer, 3660 Culpepper Dr., Erie, Pa. 16506
Filed Aug. 13, 1975, Ser. No. 604,356
Int. Cl.^{2} A47B *57/00*
U.S. Cl. 108—59 **6 Claims**



1. A display for bakery products having vertical uprights with horizontal shelves between the upper portions of the uprights open to the front of the display, a pocket between the uprights below the shelves and likewise open to the front of the display, a truck removably received in said pocket, said truck having end frames adjacent the uprights and at least one horizontal shelf extending lengthwise between the end frames and depthwise into said pocket so one horizontal edge of the shelf is at the front of the display and the other horizontal edge of the shelf is at the back of the display, said shelf being adapted for supporting a row of loaves of bread along each horizontal edge with the individual loaves side by side so that when the row at the front of the display is sold the other row may be brought to the front by moving the truck out of the pocket, turning the truck end for end and reinserting the truck in the pocket.

4,104,974
TRANQUILIZER EJECTOR FOR DISABLING ROBBERS
Max L. Robinett, U.S. Hwy. 41 North, Hanson, Ky. 42413
Filed May 19, 1977, Ser. No. 798,468
Int. Cl.^{2} E05G *5/00*
U.S. Cl. 109—2 **4 Claims**

1. A system for disabling robbers, comprising, in combination:

(a) ejector means arranged extending longitudinally along a long, narrow passageway for projecting discrete articles across the passageway in a continuous line along the length of the passageway, with at least some of the articles striking a fleeing robber; and

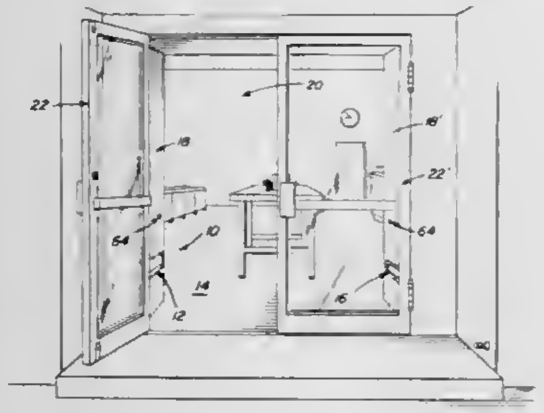
(b) receptor means disposed opposite the ejector means and spaced from the ejector means across the passageway for receiving articles projected from the ejector means, the ejector means including, in combination:

(1) a housing extending longitudinally along substantially a length of the passageway;

(2) actuator means for actuating the ejector means;

(3) a plurality of guide means disposed side-by-side in the housing along the longitudinal extent thereof for directing discrete articles from the housing, the discrete articles including a tranquilizer and having a pointed shape; and

(4) compressed fluid means connected to the guide means for propelling the discrete article in the guide means from the housing, the guide means being disposed for directing the articles toward the receptor means and including a vertically disposed magazine having a lower portion and arranged for holding a plurality of discrete articles, and an outlet bore extending from the lower portion of the magazine, with the compressed fluid means communicating with the bore, the housing has a side wall facing the receptor means and provided with a plurality of apertures, each of the apertures registering with the bore of a respective one of the guide means, the receptor means including a housing extending longitudinally coextensive with the housing of the ejector means, the housing of the receptor means having an open side facing the ejector means, with a penetrable material being disposed in the housing of the receptor means and arranged for retaining the discrete articles.



4,104,975
TRANSPLANTING APPARATUS

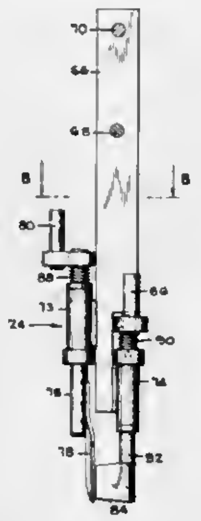
Lawrence L. Ingram, and Javier D. Infante, both of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Filed Jan. 10, 1977, Ser. No. 757,995

Int. Cl.² A01C *11/02, 9/06*

U.S. Cl. 111—3 **4 Claims**

1. Apparatus for transplanting into a trench a plant having an elongate body of root supporting media from which a plant stalk extends comprising a circular wheel, means for supporting said wheel for rotation about a horizontal axis above the trench, at least one rigid bar secured to said wheel and extending radially from the periphery thereof, first and second radially extending shafts mounted on said rigid bar, for pivotal movement about respective axes that are spaced apart from one another by an amount corresponding to the transverse dimension of said body of root supporting media, each said shaft having a distal end outward of said rigid bar and a proximal end remote from said distal end, a first gripping plate fixed to the distal end of said first shaft and a second gripping plate fixed to the distal end of said second shaft, said second gripping plate being of generally L-shaped configuration and having a portion remote from said second shaft that extends toward said first plate for spacing said plates in approximate parallel relation to grip said body of root supporting media, means remote from said plates for resiliently biasing said shafts so that said gripping plates reside in a gripping position at which said plates are substantially parallel to one another and extend approximately perpendicularly to the plane of said circular wheel, means remote from the trench for introducing a plant between said plates with the stalk extending radially inward toward said axis, and means for pivoting said shafts against said biasing means away from one another and into approximate parallelism with the plane of said circular wheel so as to reside laterally of said body, said pivoting means acting when said body resides upright in said trench.



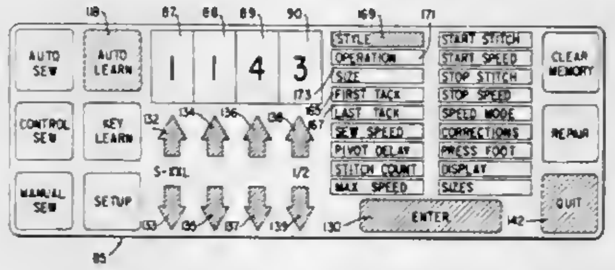
4,104,976
PROGRAMMABLE SEWING MACHINE

John Vernon Landau, Jr.; Barney Dean Hunts, both of Mountain Lakes; Frederick Alexander Rupinski, Lyndhurst, and Alfred John Zenger, Montville, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,888

Int. Cl.² D05B *19/00*

U.S. Cl. 112—121.11 **13 Claims**



1. A programmable sewing machine adapted to perform a sequence of operations on a work material, said programmable sewing machine comprising:

a sewing machine frame;

a sewing needle supported by said frame for selectively repeated movement from a down position through a work material to an up position and return to a down position;

means for counting said selectively repeated movement of said sewing needle;

a looptaker supported by said frame for cooperation with said sewing needle in the formation of stitches;

a reversible work material feed system supported by said frame and including feeding means for passing work material in a path between said needle and said looptaker;

drive means for actuating said sewing needle, said looptaker and said work material feed system in synchronism with each other;

manual regulating means for selectively actuating said drive means;

a presser device selectively movable from a position urging said work material against said feeding means to a position out of contact with said work material;

manual control means for selectively moving said presser device out of contact with said work material;

means for measuring time duration of actuation of said manual control means;

a computer having means for self directed recording once initiated of a sequence of operations of the manual actuation of said regulating means including the count from said counting means of the selectively repeated movement of said sewing needle, and of the manual actuation of said control means for selectively moving said presser device including the time duration of actuation thereof from said time duration measuring means; and,

means for enabling said sewing machine to be operated in accordance with instructions from said recording means of said computer.

4,104,977
FABRIC-FEED CONTROL FOR SEWING MACHINE

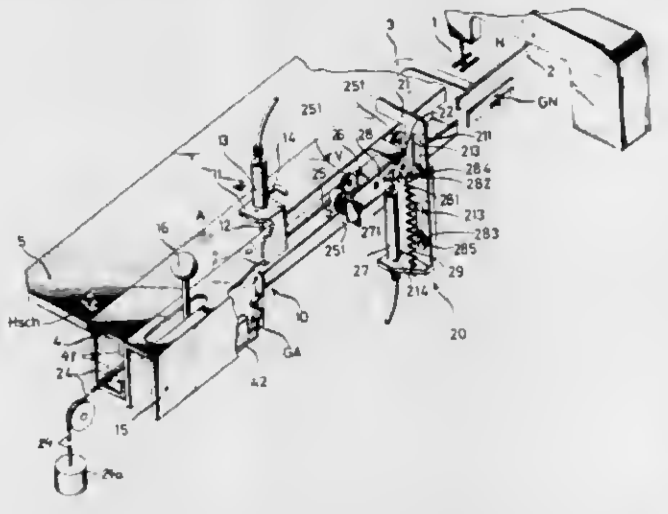
Konrad Pollmeier, Bielefeld, and Franz Hannemann, Detmold, both of Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,419

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 7614577

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **15 Claims**



1. A sewing station for seaming of material, comprising in combination:

a table;

a sewing machine having a transporting feed mechanism for advancing fabric to be sewn on said table past a needle;

an edge guide spaced from said needle on said table for automatic guiding of the fabric for advancement with its edge along said guide while the seaming operation is carried out;

separating plates ahead of said edge guide for separating layers of the fabric;

a movable clamp actuatable to grip the fabric for advancing with the fabric to be seamed, said movable clamp being guided linearly on said table toward and away from said needles;

a fixed clamp on said table remote from said needle for preparatory positioning and holding of the fabric; and

control means for alternately actuating said fixed clamp and said movable clamp to respectively grip and release the fabric.

4,104,978
PROTECTIVE DEVICE IN A MOTOR-OPERATED SEWING MACHINE

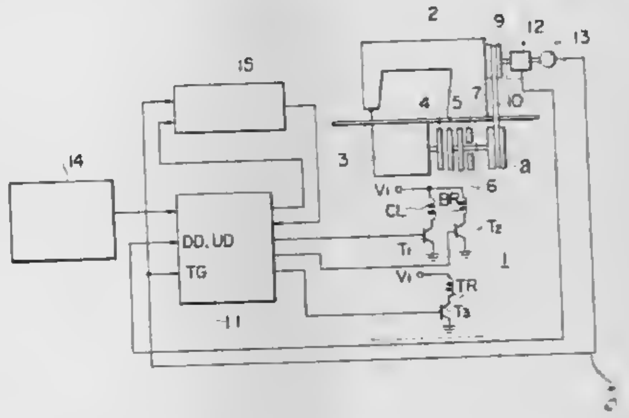
Tadashi Takahashi; Shigeki Morinaga, and Kuniaki Kubokura, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 13, 1977, Ser. No. 806,154

Claims priority, application Japan, Jun. 12, 1976, 51-68227

Int. Cl.² D05B *69/36*

U.S. Cl. 112—277 **10 Claims**



1. A protective device in a motor-operated sewing machine, comprising:

a motor, means for transmitting rotation of said motor to an output shaft through a clutch mechanism provided on a shaft of said motor, said clutch mechanism being actuated electromagnetically, and means for stopping said output shaft through a brake mechanism being actuated electromagnetically,

means for transmitting rotation of said output shaft to a sewing machine shaft and drive said sewing machine shaft at a predetermined speed,

electrical control means for electrically controlling said clutch mechanism and said brake mechanism in order to control rotation of said sewing machine shaft,

means for detecting substantial rotation of said sewing machine shaft, and

protector means for rendering the operation of said clutch mechanism ineffective through said control means when an output of the rotation detecting means has become lower than a reference value for driving the sewing machine shaft at said predetermined speed.

4,104,979
HOPPER BARGE HAVING A BOTTOM DISCHARGE OPENING CLOSED BY HOPPER DOORS

Bartele van der Werff, Medemblik, Netherlands, assignor to A. Vuyk & Zonen's Scheepswerven B.V., Capelle aan den Ijssel, Netherlands

Filed Oct. 29, 1976, Ser. No. 736,932

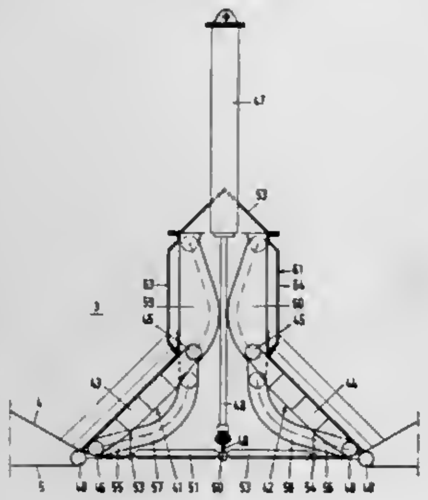
Claims priority, application Netherlands, Nov. 4, 1975, 7512915

Int. Cl.² B67D *3/00*

U.S. Cl. 114—36 **7 Claims**

1. A hopper barge comprising a hopper including opposed inclined converging bottom walls and vertical walls extending downwardly from said bottom walls to define an outlet, a center keelson box positioned above said outlet at a level above the bottom walls, a pair of pivotable doors for closing said outlet, and control means coupled to said doors to pivotably and translationally move the same from a first position in which the doors close said outlet to a second position in which the doors are suspended vertically and are substantially withdrawn into the keelson box to open said outlet, said doors in said first position extending obliquely and having respective free ends in sealed relation with said walls of the hopper, said control means including means engaging said doors at an intermediate location along the length thereof for moving the doors

pivotably and translationally between said first position in which the doors are oblique and are outside the keelson box and said second position in which said doors are suspended vertically within the keelson box.



4,104,980

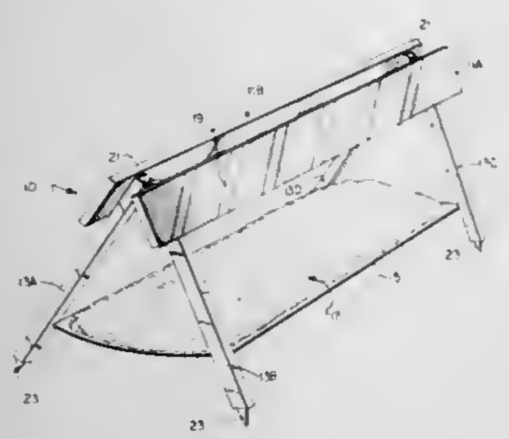
COLLAPSIBLE ROAD BARRIER

John Toomey, Alexandria, Va., assignor to Value Engineering Company, Alexandria, Va.

Filed Jun. 17, 1977, Ser. No. 807,547

Int. Cl.^{2} E01F ***13/00***

U.S. Cl. 116—63 P **11 Claims**



1. A collapsible road barrier comprising:

at least one substantially horizontal member;

four supporting legs positioned in pairs, each pair being pivotally affixed at an upper end thereof;

said pairs of supporting legs being spaced from each other and affixed at an upper end thereof to said substantially horizontal member;

a collapsible bunk positioned adjacent the lower end of the supporting legs which forms a substantial surface area upon which material such as ballast may be positioned; and

said collapsible bunk being flexible so as to readily fold when said collapsible road barrier is stored and to readily return to said substantial surface area when said collapsible road barrier is positioned for use.

4,104,981

INDICATOR USING CHANGEABLE PATH THROUGH TRANSPARENT MATERIAL

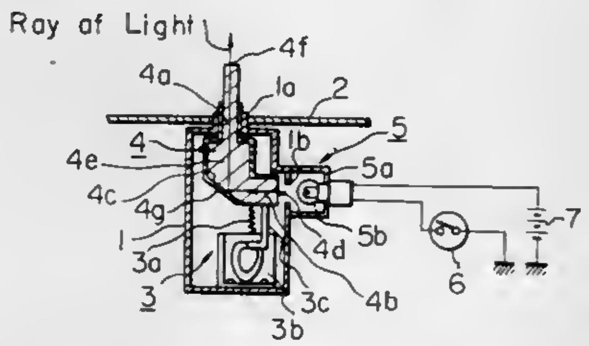
Katsutoshi Ono, Ichikawa, and Koichi Sekiguchi, Shakujii, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 30, 1976, Ser. No. 718,970

Claims priority, application Japan, Sep. 10, 1975, 50/124438[U]

Int. Cl.^{2} H01H ***9/16***

U.S. Cl. 116—124 L **5 Claims**



1. An indicator comprising: first means for emitting a ray of light; and second means having an indicating surface for receiving the ray of light to permit the ray of light to illuminate said indicating surface, said first and second means being movable relative to each other to change their relative position to vary intensity of illumination of said indicating surface, said first and second means being movable relative to each other between a first position in which the ray of light illuminates said indicating surface and a second position in which the ray of light is prevented from illuminating said indicating surface, means mounting said first means for rotation, said second means including a body made of a transparent material, said body having a reflecting surface, a light-in portion projecting from said reflecting surface and terminating in at a light-receiving surface and a light-out portion projecting from said reflecting surface and terminating in at said indicating surface so that light that passes through said light-receiving surface travels through said light-in portion to strike said reflecting surface and after being reflected it travels through said light-out portion to reach and illuminate said indicating surface, means mounting said body reciprocally movable, and having an arm operatively connected with said body and an opposite arm operatively connected with said first means, and means mounting said lever for rotation so that the reciprocal movement of said body causes rotational movement of said first means.

4,104,982

TRANSMISSION GEAR RATIO INDICATOR

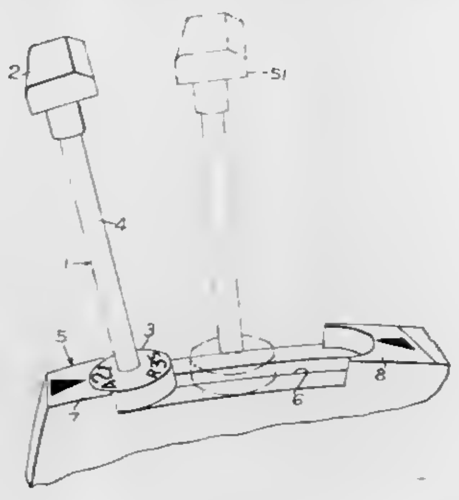
Norbert R. Hegemann, Burlington, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 11, 1977, Ser. No. 841,050

Int. Cl.^{2} F16H ***5/76***

U.S. Cl. 116—124 M **10 Claims**

1. A rotatable and pivotal shift lever and indicator for a vehicle transmission comprising, a shift lever including a handle for controlling the movement of the shift lever, means rotatably supporting said lever for rotation on a longitudinal axis, means pivotally supporting said lever for pivotal movement of said lever on a transverse axis, a control console having a gate plate defining the pivotal movement of said shift lever, a shift mechanism connected to said shift lever for shifting a vehicle transmission between gear ratios responsive to rotating and pivoting of said shift lever, an indicator on said shift lever and control console correlated with the gear ratio positions of the transmission for indicating to the operator the selected transmission gear ratio and shift lever position.



4,104,983

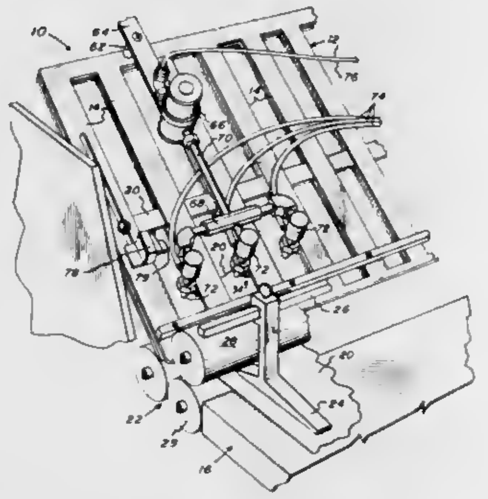
PULSATING GLUE HEAD FOR FOLDING MACHINES

Howard B. Carstedt, Rte. 1, Box 208, Loretto, Minn. 55357

Filed Aug. 18, 1976, Ser. No. 715,443

Int. Cl.^{2} B05C ***5/02***

U.S. Cl. 118—2 **5 Claims**



1. In a machine for folding printed sheets comprising sheet feeding means, at least one pair of fold rollers, and travel stop means located downstream of said pair of fold rollers in the direction of sheet movement for stopping moving sheets and initiating buckling and folding of printed sheets, the improvement comprising:

a spot glue dispenser located in the space between said pair of fold rollers and said stop means adjacent to said fold rollers, said dispenser comprising cylinder means secured to said folding machine at a vertically offset location from the path of movement of printed sheets, a piston within said cylinder means reciprocally displaceable from a rest position to an extended, glue dispensing position, and a glue output orifice on said piston normally spaced from moving sheets and movably positioned to contact a sheet and spot glue same when said piston is in said extended position; and

sensing means positioned immediately adjacent to said stop means on the upstream side thereof with respect to the direction of sheet movement, in position to be actuated by movement of the leading edge of a moving sheet, said sensing means being operable to initiate movement of said piston to said glue dispensing position, whereby said dispenser is actuated to apply a spot of glue to a sheet at the moment a sheet is stopped against said stop means.

4,104,984

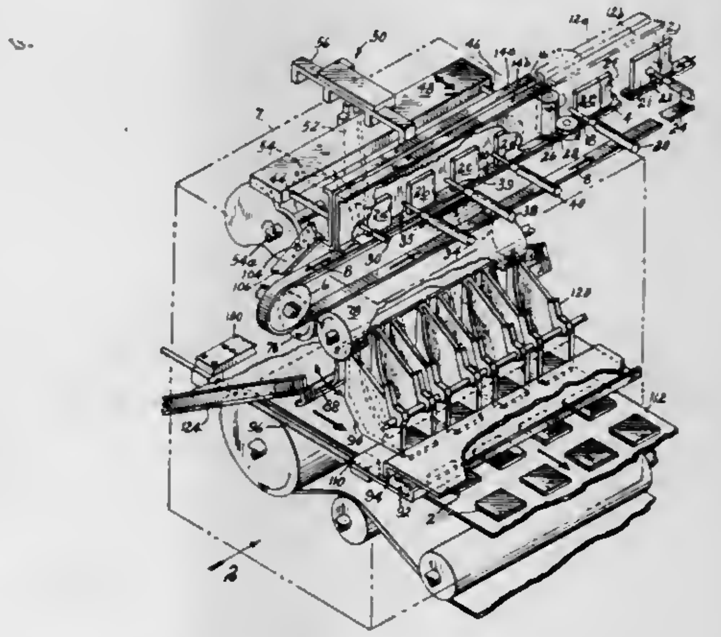
ARTICLE HANDLING AND COATING APPARATUS

Arnold LeRoy Kellermann, Goshen; David Ian McDonald, Cincinnati, both of Ohio, and Robert Joseph Grone, Covington, Ky., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 24, 1977, Ser. No. 809,799

Int. Cl.^{2} B05C ***13/00***

U.S. Cl. 118—2 **16 Claims**



1. An apparatus for precision placement of workpieces onto a transport member, comprising:

(a) a base;

(b) an infeed conveyor movable in a predetermined direction;

(c) means upon said base for aligning a plurality of workpieces in a fixed spacial relationship upon said infeed conveyor;

(d) means for effectuating relative movement between the spacially aligned workpieces and infeed conveyor transverse to the direction of the infeed conveyor movement to abandon subjacent support and permit free falling gravity biased workpiece movement;

(e) a planar surface supported upon said base, said surface being substantially horizontally disposed;

(f) means for interrupting the free falling gravity biased movement and directing workpieces onto said planer surface; and

(g) means for removing the workpieces from said planar surface for deposit upon a transport member.

4,104,985

APPARATUS FOR APPLYING MATERIAL TO A SUBSTRATE

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 527,682, Nov. 27, 1974, abandoned. This application May 7, 1976, Ser. No. 684,130

Int. Cl.^{2} B05C ***1/02***

U.S, Cl. 118—211 **4 Claims**

1. An apparatus for applying material to a selected portion of articles comprising:

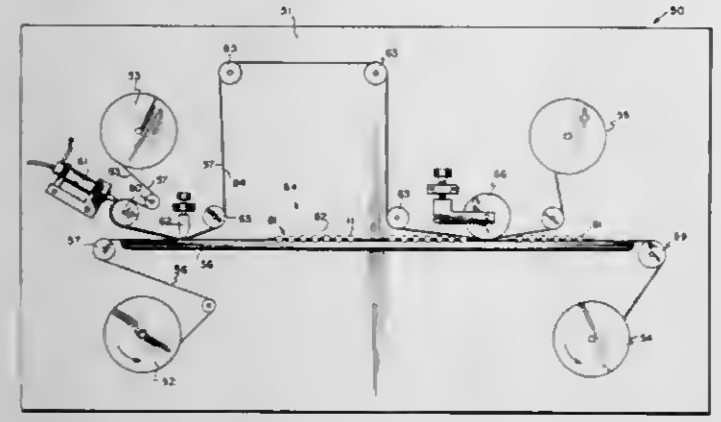
a. a first belt and first cooperating rollers providing movement to same.

b. means disposed adjacent said first belt applying a first band of material to same,

c. a second belt and second cooperating rollers providing movement to same over a loading bar,

d. means disposed above said loading bar bringing said first belt into engagement with said second belt after said first band of material has been applied so as to transfer a portion of same to said second belt and provide a second band of material thereon,

e. at least one of said first cooperating rollers disposed to separate said first belt from said second belt after said material has been transferred,

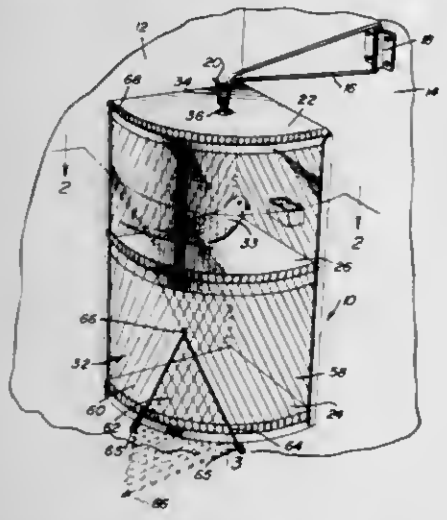


f. means holding said articles on said second belt in a position that said selected portions engage said second band after it has been provided, and

g. means returning said first belt back into engagement with said second belt and also with said selected portions so as to apply at least a portion of said first band of material to said selected portion.

4,104,986
BIRD CAGE WITH TRANSPARENT SHIELD

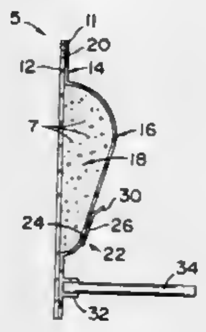
Opal Dunigan, 2204 W. Hillmont, Odessa, Tex. 79762
Filed Jun. 24, 1976, Ser. No. 699,229
Int. Cl.² A01K *31/06*
U.S. Cl. 119—17 **5 Claims**



1. A bird cage comprising a generally vertically disposed triangular configured enclosure adapted to be positioned in the corner of a room, or the like, said enclosure including a pair of vertically disposed planar side walls oriented in angular relation to each other with the intersection therebetween defining a rear corner of the enclosure, and a front wall of arcuate configuration interconnecting and extending between the outer end of the side walls, a generally triangular top imperforate member and triangular imperforate bottom member forming top and bottom closures for the area encompassed by the side walls and front wall, said enclosure including access means therein to enable ingress and egress of a bird and to enable feeding of the bird, bathing of the bird and cleaning the cage, each side wall being constructed from a plurality of generally parallel, equally spaced rods, said front wall being constructed with a spaced rod bottom portion and an imperforate transparent panel forming the top portion of the front wall, an imperforate partiton of generally triangular configuration centrally located between the top and bottom of the cage and generally aligned with the bottom edge of the imperforate transparent panel, and means removably supporting said partition in the cage for converting the cage from a single compartment cage to a two compartment cage, and providing a support for a bird inwardly of the imperforate transparent panel to protect the bird from cold air drafts and germs breathed toward the bird by human beings and the like.

4,104,987
BIRD FEEDER

Emanuel A. Winston, 190A Skokie Valley Rd., Highland Park, Ill. 60035
Filed Nov. 26, 1976, Ser. No. 744,992
Int. Cl.² A01K *39/00*
U.S. Cl. 119—51 R **14 Claims**



1. A bird feeding device for distributing bird feed, comprising in combination:

a first and a second member secured relative to one another;

said first member comprising a protruding portion forming a bird feed reservoir between said first and second members;

means for securing the device to a support;

said first member having means defining an aperture region in said bird feed reservoir adapted for at least partial removal of said means from the remainder of said first member for maintaining the bird feed in said bird feed reservoir when said region is intact and for enabling access to the bird feed in said bird feed reservoir when said region is at least partially removed;

said aperture region being located in proximity to the lower end of said bird feed reservoir enabling substantially all of the bird feed to move by action of gravity toward said aperture region as the bird feed is consumed;

perch receiving means removably receiving a perch to extend outwardly from said first member and in proximity to said aperture region enabling a bird to rest on the perch and to consume bird feed from said aperture region.

4,104,988
ARTICULATED ENCLOSURE

John Trutor, Benson, Vt.
Filed Jul. 29, 1976, Ser. No. 709,664
Int. Cl.² A01K *39/00*
U.S. Cl. 119—51 R **1 Claim**

1. An enclosure providing a feeder for birds having four walls disposed generally at right angles to each other and constructed of long flitches arranged as a cribwork with interstices between said long flitches,

short flitches disposed in said interstices filling said interstices,

the ends of said long flitches in two said walls opposite each other crossing the ends of the said long flitches forming two other said walls,

said ends of said long flitches at each corner having a hole extending therethrough,

long rods,

said long rods extending through the said holes at each said corner,

means on each said long rod securing said long flitches together at said corners,

a floor underlying said walls,

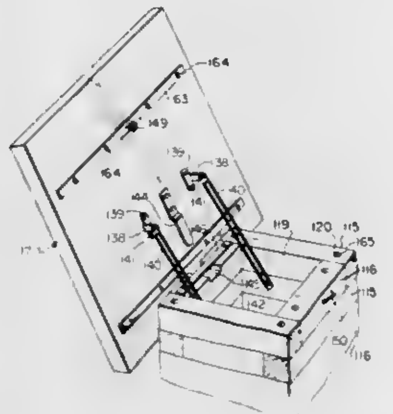
at least two short rods,

each said short rod extending through at least one of said long flitches adjacent said floor in a said wall and through said floor and means on said short rod securing said floor to said enclosure,

a cover,

hinge means swingably and slidably connecting said cover to said cribwork,

said hinge means comprising,



strap means,

said strap means being swingably connected to said cover and swingably and slidably connected to two of the walls of said enclosure,

a bracket fixed to the underside of said cover,

the rear end of said bracket means being offset and spaced downwardly from said cover,

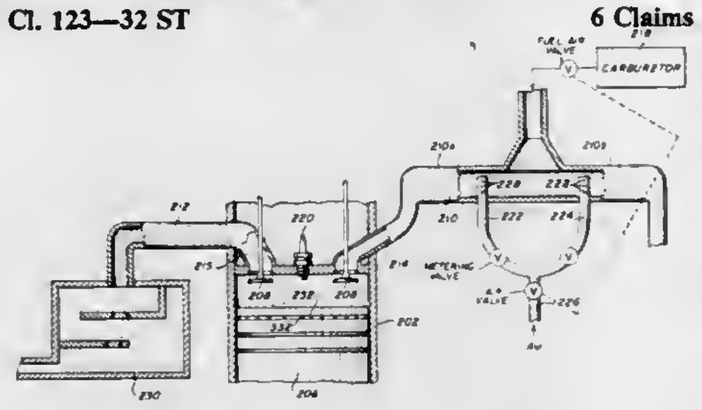
a notch in one of said enclosure walls,

said notch being adapted to receive said offset end of said bracket for holding said cover in closed position,

an opening means in said walls in said enclosure providing access to feed in said feeder by birds.

4,104,989
STRATIFIED CHARGE

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Continuation-in-part of Ser. No. 472,361, May 22, 1974, abandoned. This application Sep. 4, 1975, Ser. No. 610,420
Int. Cl.² F02B *19/10, 19/16*
U.S. Cl. 123—32 ST **6 Claims**

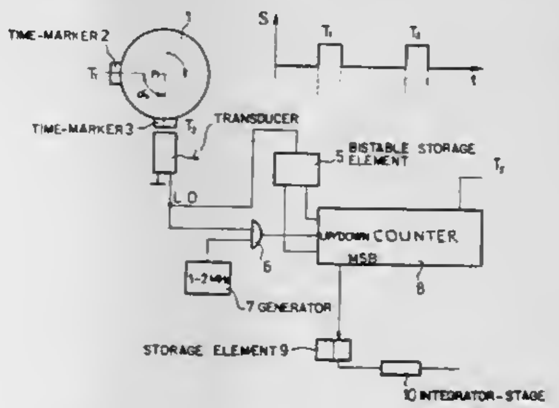


1. In an internal combustion engine having at least one cylinder with a power member and intake and outlet valves; a source of fuel-air mixture; means including a fuel-air throttle valve and an intake manifold for supplying said fuel-air mixture to said cylinder via said intake valve; and an exhaust manifold for removing exhaust gases from said cylinder via said exhaust valve;

The improvement which comprises pre-stratifying charge means including a source of air at pressure greater than the pressure in said intake manifold connected to said intake manifold through a flow control orifice having a cross sectional area of such dimensions that the quantity of air entering said intake manifold between said intake valve and said fuel-air throttle valve causes an increase of manifold pressure by about 30% and the quantity of air entering said manifold through said orifice is sufficient to fill an appropriate volume of the manifold between said intake valve and said fuel-air throttle valve thereby creating a pocket of fuel lean air/fuel mixture between said intake valve and said fuel-air throttle valve.

4,104,990
PROCESS AND APPARATUS FOR DETERMINING ENGINE OPERATION NEAR THE LEAN-RUNNING LIMIT

Wolf-Dietrich Frobenius, Asperg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 19, 1976, Ser. No. 659,539
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2507139
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **7 Claims**



1. An apparatus for providing a signal for controlling an internal combustion engine, said engine including a rotating crankshaft and an electronic fuel injection system, comprising:

marker means moving in step with the cyclic motion of said crankshaft;

transducer means, for cooperation with said marker means to generate preferably inductively a datum related to the rotational speed of said crankshaft;

frequency generator means, for generating a pulse train of constant frequency;

counter means, clocked by said pulse train and gated by said datum;

a bistable flip-flop controlled by said datum for defining the sense of counting of said counter means to provide for alternate counting in an arithmetically additive and subtractive sense;

an AND gate one of whose inputs receives said datum and the other of whose inputs is connected to receive said pulse train from said frequency generator means, the output of said AND gate being connected to the clock input of said counter means; and

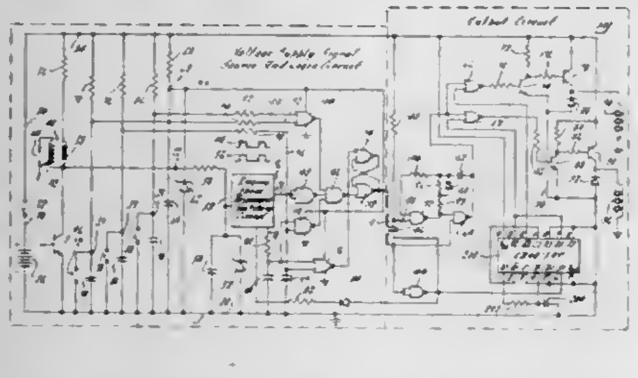
means connected to the counter means for providing an output control signal from the output of the counter means.

4,104,991

CIRCUIT FOR CONTROLLING THE OPERABILITY OF ONE OR MORE CYLINDERS OF A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Richard V. Abdoo, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 23, 1976, Ser. No. 716,865
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA 5 Claims



1. In a system for controlling the operability of one or more cylinders of a multicylinder internal combustion engine, said system including:

(a) electrically controllable means for disabling at least one cylinder of said internal combustion engine;
(b) circuit means for sensing a plurality of conditions of operation of said engine;
(c) logic circuit means, responsive to said sensing circuit means, for generating electrical signals for controlling the energization and de-energization of said disabling means; and
(d) output circuit means, coupled between said logic circuit means and said disabling means, for controlling electrical energy supplied to said disabling means in response to said electrical signals generated by said logic circuit means;

the improvement which comprises:

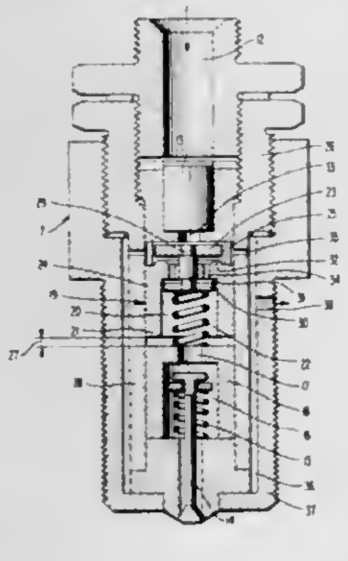
(e) means for preventing oscillatory energization and de-energization of said disabling means which may otherwise occur from transient conditions of engine operation that result from a change of said disabling means from an energized state to a de-energized state or vice versa.

4,104,992

INJECTION INSTALLATION FOR INTERNAL COMBUSTION ENGINES

Ludwig Fricker, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 13, 1976, Ser. No. 749,806
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556214
Int. Cl.² F02B *3/00, 3/04*
U.S. Cl. 123—32 JV 21 Claims



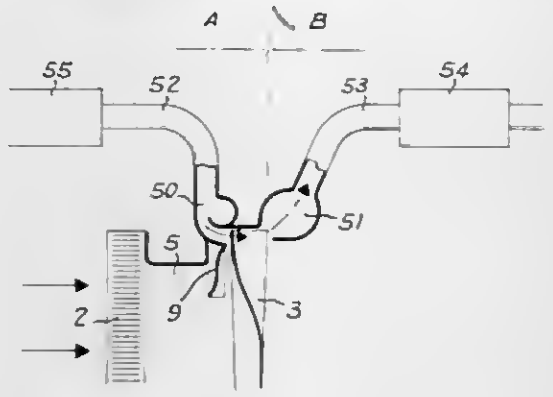
1. An injection installation for internal combustion engines, comprising injection pump means and injection valve means coordinated to the cylinders of the internal combustion engine, characterized in that a metering means is arranged in each injection valve means which is operable with a feed of the injection pump means, to feed a metered quantity of fuel to the nozzle discharge of the injection valve means, the injection pump means being so constructed that it always feeds a multiple of the metered quantity of fuel independently of load and rotational speed of the internal combustion engine, the excess quantity of fuel, thus fed from the injection pump means, being discharged back to a fuel tank adapted to be connected to the injection valve means by way of a return line.

4,104,993

ENGINE COOLING SYSTEMS

Yves Baguelio, Louveciennes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem, France

Filed Oct. 21, 1976, Ser. No. 734,379
Claims priority, application France, Oct. 30, 1975, 75 33214
Int. Cl.² F01P *7/10;* F01N *3/02;* F01P *11/10;* F28F *9/22*
U.S. Cl. 123—41.49 1 Claim



1. In an engine cooling system, a radiator, fan means inducing an air flow through the radiator, connecting tube means located between the radiator and the fan means, means forming said air flow into a main central stream and an auxiliary peripheral stream, means feeding a gas to be cooled directly into said auxiliary stream to be mixed therewith to form a gas mixture, means defining an outlet duct for said mixture wherein the gas to be cooled is formed by the exhaust gases of the engine and said fan means comprises blade means having an outer tip, and said feed means comprises means defining an inlet volute adjacent said tip of the blade means and located partly upstream of the blade means, and means defining an exhaust duct feeding the exhaust gases to the inlet volute, said system further comprising means defining an outlet volute adjacent said tip of the blade means and located partly downstream of the blade means, said outlet volute receiving said mixture and feeding said mixture to said outlet duct.

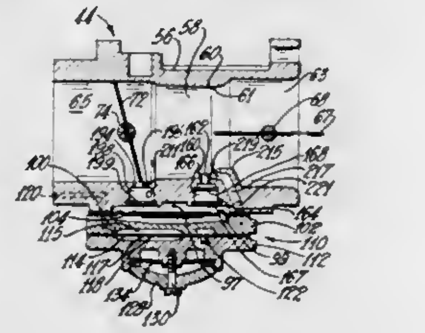
4,104,994

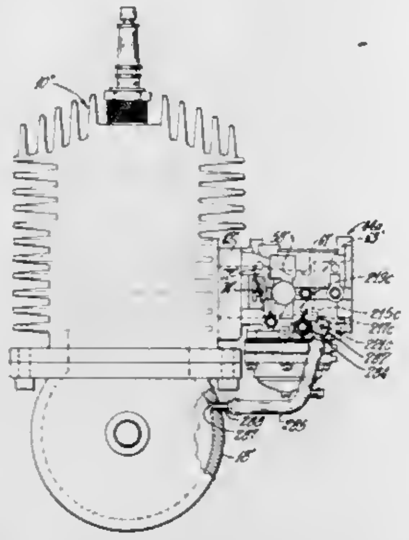
CHARGE FORMING METHOD AND APPARATUS WITH ACCELERATING SYSTEM

Bernard C. Phillips, Toledo, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 1, 1976, Ser. No. 719,456
Int. Cl.² F02B *33/04;* F02M *37/00*
U.S. Cl. 123—73 R 21 Claims

1. A method of effecting delivery of fuel through an aperture from a fuel chamber into an air and fuel mixing passage of a charge forming apparatus having a throttle valve in the mixing passage including regulating flow of liquid fuel from a supply into the fuel chamber, delivering fuel by aspiration in the mixing passage from the fuel chamber through the aperture into the air and fuel mixing passage when the air flow in the mixing passage is of sufficient velocity to aspirate fuel from the aperture, and projecting gases from a nozzle across the aperture to effect aspiration of additional fuel from the aperture into the mixing passage when the air flow in the mixing passage is at a low velocity.



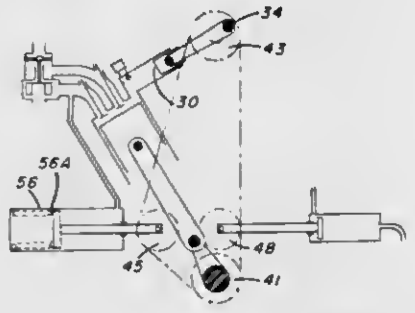


4,104,995

VARIABLE COMPRESSION ENGINE

Rolf Steinbock, 603 Lindsay Rd., Carnegie, Pa. 15106

Filed Dec. 15, 1976, Ser. No. 750,904
Int. Cl.² F02B *75/04*
U.S. Cl. 123—78 D 14 Claims



1. In an internal combustion engine, an apparatus to vary the effective compression ratio during operation of the engine, the combination comprising:

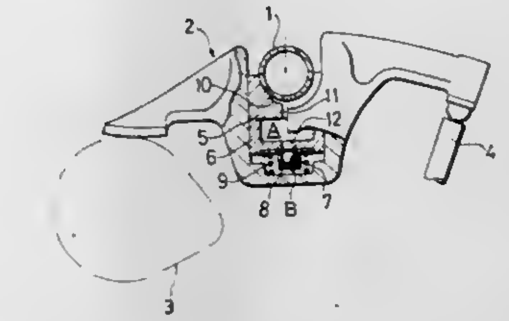
casting means defining two cylinders communicating with a common combustion chamber,
a first piston reciprocating in one of said cylinders to convert released thermal energy into mechanical energy,
a first crankshaft coupled for displacing said first piston to operate at a first fixed compression ratio in said common combustion chamber,
a second piston reciprocating in the other of said cylinders,
a second crankshaft coupled for displacing said second piston to operate at a second fixed compression ratio in said combustion chamber,
timing means to change the relative rotational phase relation between said first and second crankshafts for varying a net compression ratio formed as a composite of said first and second fixed compression ratios at which gases are compressed in said combustion chamber by both of said first and second pistons,
supercharged means to increase the pressure at which gases are introduced into at least one of said two cylinders for compression in said combustion chamber, and
control means coupled to said timing means for adjusting the compression ratio of the two crankshaft piston systems automatically in relation to the supercharged pressure.

4,104,996

GAP SELF-COMPENSATING HYDRAULIC ROCKER ARM

Akira Hosono, Toyota; Yoshihisa Isogai, Okazaki; Hitoshi Hasegawa, Nagoya, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 14, 1976, Ser. No. 732,323
Claims priority, application Japan, Aug. 10, 1976, 51-94526
Int. Cl.² F01L *1/18, 1/24*
U.S. Cl. 123—90.43 7 Claims



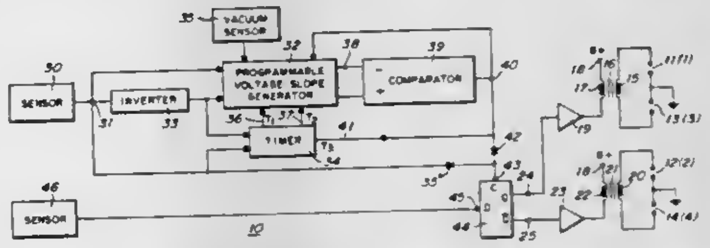
1. A gap self-compensating hydraulic rocker arm assembly for an internal combustion engine having a rocker shaft, at least one hollow rocker arm having oil passage means through the wall thereof and a valving mechanism comprising a hydraulic pressure retaining mechanism including lifter means said lifter means contacting said rocker shaft, said lifter means having a first oil chamber in fluid communication with the interior of the rocker arm, a second oil chamber located between said lifter means and a portion of the rocker arm, said second oil chamber being capable of being placed in fluid communication with said first oil chamber, a check valve in said second oil chamber for controlling the flow of oil between said first and said second oil chambers, and a return spring positioned in said second oil chamber between said lifter means and a portion of the rocker arm.

4,104,997

MULTIPLE SLOPE IGNITION SPARK TIMING CIRCUIT

Kenneth Warren Padgitt, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 20, 1976, Ser. No. 650,655
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R 37 Claims



1. A multiple slope ignition spark timing circuit for an internal combustion engine comprising:

sensor means for generating an AC input signal having a frequency proportional to the rotational speed of an engine, said input signal having alternate positive and negative cycles with respect to a predetermined reference level, each of said cycles corresponding to predetermined amounts of angular rotation of the engine;

means for receiving said AC input signal and producing a first signal, after each commencement of one of said positive and negative cycles, which is varying at a first predetermined rate of change;

means coupled to said sensor means for receiving said input signal and detecting the passage of at least a first predetermined period of time within a first predetermined amount of angular rotation of the engine after each commencement of one of said cycles, said first predetermined amount of angular rotation being at most equal to the angular rotation corresponding to one positive and one negative cycle;

means coupled to said first signal producing means for altering the rate of change of said first signal to a second predetermined rate of change in response to the occurrence of a detection of said first time period within said first amount of angular rotation; and

means, including comparison means, coupled to said first signal producing means for producing a spark timing ignition signal by utilizing the magnitude of said first signal with respect to an engine speed independent reference level to produce an engine speed variable phase difference between said spark timing signal and said input signal, a first spark timing phase difference versus engine speed relationship depending on said first rate of change existing when the engine speed is above a predetermined speed at which said first time interval equals the time required for said first predetermined amount of angular rotation of the engine, and a second relationship depending on both said first and second rates of change existing when the engine speed is below said predetermined speed.

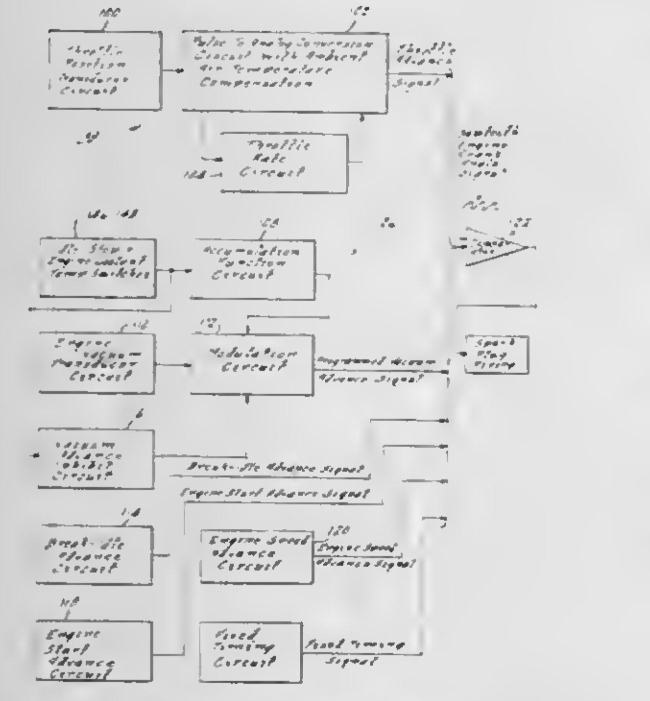
4,104,998
ENGINE CONTROL SYSTEM

Gordon William Fenn, Mt. Clemens, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 25, 1975, Ser. No. 570,671

Int. Cl.² F02P *5/04;* F02H *3/00*

U.S. Cl. 123—117 R **73 Claims**


Throttle Rate Circuit
Accumulation Function Circuit
Modulation Circuit
Advance Signal
Spark Plug Firing
Break-Idle Advance Signal
Engine Start Advance Signal
Break-Idle Advance Circuit
Engine Speed Advance Circuit
120
Engine Speed Advance Signal
Engine Start Advance Circuit
Fixed Timing Circuit
Fixed Timing Signal

1. In an internal combustion engine having throttle control means for controlling throttle position and having a spark ignition system including spark timing control means for controlling the engine angle at which spark ignition occurs relative to a fixed engine angle, the improvement comprising:

means for generating a throttle advance signal representative of throttle operation including,

transducer means directly connected to and operable by said throttle control means to provide a transducer output signal representative of throttle position,

means operatively coupled with said transducer means for generating from said transducer output signal said throttle advance signal as a function of both throttle position and rate of change of throttle position, and

means for supplying said throttle advance signal to said spark timing control means.

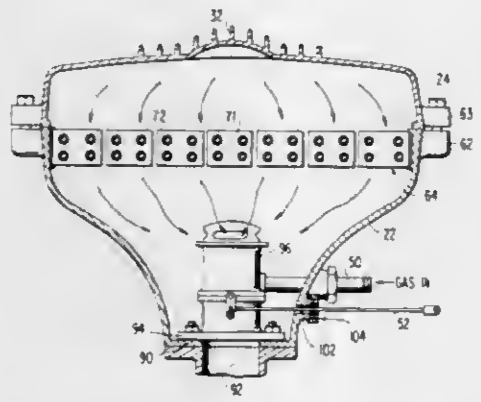
4,104,999
AFTER-COOLER ACCESSORY UNIT FOR INTERNAL COMBUSTION ENGINE HAVING A CARBURETOR

Robert L. Ullrich, P. O. Box 899, Roswell, N. Mex. 88201

Filed Apr. 8, 1977, Ser. No. 785,890

Int. Cl.² F02B *29/04*

U.S. Cl. 123—119 CD **10 Claims**



1. An after-cooler accessory unit for an internal combustion engine having a supercharger for compressing ambient air and discharging the compressed air through a discharge port to the carburetor of the engine, said unit comprising:

a housing adapted to enclose the carburetor of the engine and having an air inlet and an air outlet;

means for coupling said inlet to the discharge port of the supercharger;

means for securing said housing to the engine and sealing said outlet of said housing to the air intake of the carburetor; and

heat exchanger means mounted in said housing in the path of the compressed air for cooling the compressed air received from the supercharger.

4,105,000
FUEL INJECTION MECHANISM

Wolf Wessel, Oberriexingen, and Wolfgang Ripper, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 741,641

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607367

Int. Cl.² F02M *39/00, 11/00*

U.S. Cl. 123—139 AW **4 Claims**

1. A fuel injection mechanism for mixture compressing, externally ignited internal combustion engines for mounting within the air suction tube of the engine, comprising:

a bearing axle;

an air measuring element mounted within the air suction tube by the bearing axle;

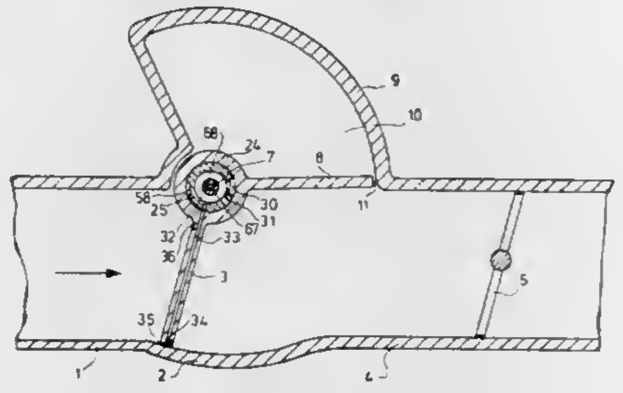
restoring force means connected to the air measuring element and the air suction tube for applying a restoring force to the air measuring element in response to displacements of the air measuring element by the air quantity flow through the air suction tube;

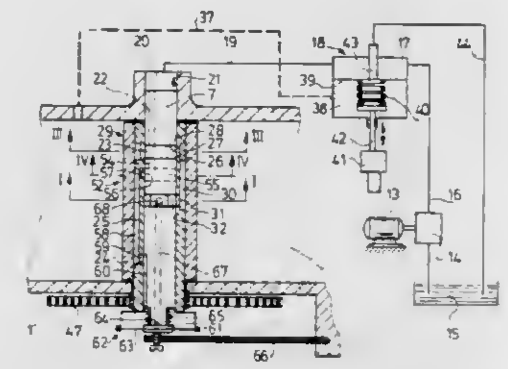
a fuel quantity apportionment valve having a movable component which is movable with the air measuring element for apportionment of a fuel quantity proportional to the air quantity flow through the air suction tube;

an auxiliary fuel valve having a movable component which is movable with the air measuring element for apportionment of an auxiliary fuel quantity proportional to the air quantity flow through the air suction tube;

fuel injection means operatively associated with the air measuring element for injecting fuel into the air suction tube;

a temperature dependently controlled pressure regulating valve connecting to the auxiliary fuel valve downstream thereof in the direction of flow of the auxiliary fuel from the auxiliary fuel valve and operative during engine warm-up to control the auxiliary fuel flow from the auxiliary fuel valve for delivery to the fuel injection means, said fuel injection means receiving and injecting the fuel apportioned by the fuel quantity apportionment valve and the auxiliary fuel valve.





4,105,001
CONTROL MECHANISM FOR OPERATION OF AN INTERNAL COMBUSTION ENGINE

Günter Hartel, Neuss-Rosellen, Germany, assignor to Pierburg GmbH & Co KG, Neuss, Germany

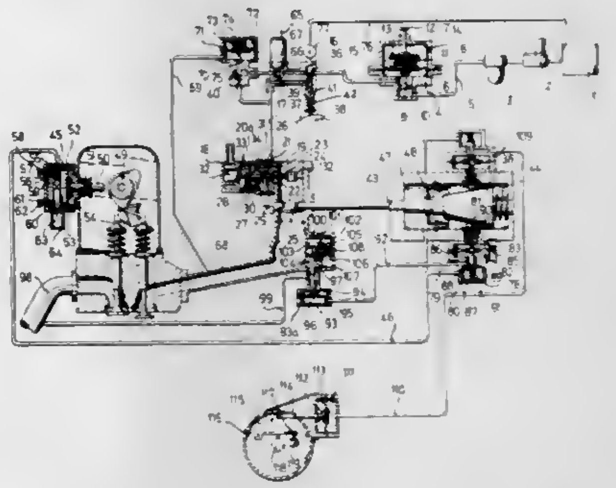
Filed Oct. 29, 1976, Ser. No. 736,934

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2548985

Int. Cl.² F02D *1/06;* F01N *3/00*

U.S. Cl. 123—140 CC **6 Claims**

1. A control mechanism for operation of an internal combustion engine having a throttle, a plurality of cylinders and a three-dimensional cam (38) formed with first and second curved surfaces (37), the first surface being dependent in cam position from a changeable operating parameter and an arbitrary change in position of the throttle, comprising a control unit (16) for determining the total fuel consumption both for the operatively warm and the operatively cold engine, an exhaust gas return valve (93*a*) and a first control valve (78) for controlling said exhaust gas return, and a firing point controller (116) and a second control valve (109) for controlling said firing point controller, said control unit (16) and said control valves (78, 109) being controlled by at least one of said curved surfaces (37), said engine including a fuel feed line (15) and a suction tube, and further comprising a first regulatory nozzle area (36) formed in said fuel feed line (15) and controlled by said three-dimensional cam (38), a magnetically controlled regulatory nozzle are (39) for enrichment of the engine's starting fuel mixture, a regulatory nozzle are (40) for fuel enrichment for the purpose of accelerating the engine and controlled through the part-vacuum in said suction tube, the latter two nozzle areas (39, 40) being formed in said fuel feed line (15) in parallel with the first nozzle area (36), a pressure regulator (18) controlled dependent on temperature of cooling water and a pre-atomizer (132) fed by said pressure regulator (18), the entire fuel being fed to said pre-atomizer (132).



4,105,002
PNEUMATIC CONTROLLER FOR AN INJECTION PUMP, ESPECIALLY FOR DIESEL ENGINES

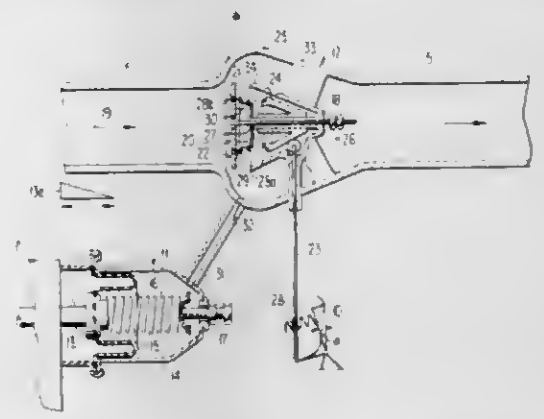
Frank Thoma, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 19, 1976, Ser. No. 650,067

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1975, 2502387

Int. Cl.² F02D *1/14*

U.S. Cl. 123—140 MP **34 Claims**

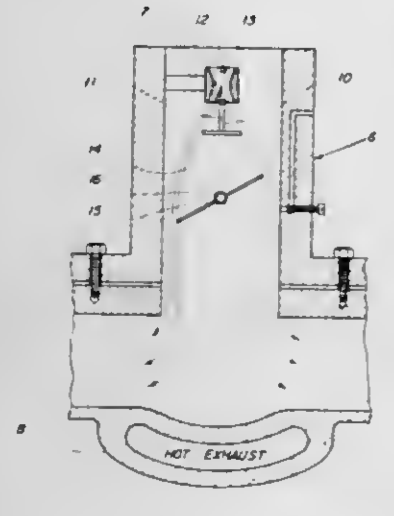


1. A pneumatic controller for an injection pump operable to vary the quantity of injected fuel and having a quantity adjusting means, the pneumatic controller comprising a pneumatic actuating means at least indirectly influencing the quantity adjusting means of the injection pump for displacing the quantity adjusting means in case of an actuation with vacuum in a direction toward smaller injection quantities, at least one force storage means for influencing at least indirectly the quantity adjusting means in a direction toward an increase of the injected quantities, and a drive lever means actuatable at will characterized in that means are provided for at least indirectly elastically connecting the drive lever means with the controller, further means are provided in the controller for supplying a correspondingly large vacuum only in accordance with respective deflected positions of the drive lever means, and in that a connection means is arranged between a vacuum con-

nection of said further means and the pneumatic actuating means acting on the quantity adjusting means.

4,105,003
FUEL DISTRIBUTION SYSTEM

Raymond E. Funk, 9 Chapman Dr., Lexington Park, Md. 20653
Filed Aug. 8, 1975, Ser. No. 603,187
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **3 Claims**



1. In a fuel distribution system having a carburetor for combining a fuel spray with air passing therethrough, the carburetor including a venturi for introducing the fuel spray into the air, the carburetor further including a cylindrical wall portion defining a passageway, the combined fuel and air passing from the venturi through the passageway, a butterfly valve being located within the passageway and operable to vary the sizes of the two openings between opposed ends of the butterfly valve and the wall portion of the carburetor on opposite sides of a diameter of the passageway in order to regulate the flow of the combined fuel and air through the passageway, the improvement comprising:

a baffle mounted to the venturi and positioned between the venturi and the butterfly valve to evenly distribute the combined fuel and air to the two openings defined by the opposed ends of the butterfly valve and the wall portion of the carburetor; and

a mounting sleeve fitted and secured to the venturi, said baffle being connected to said mounting sleeve, said mounting sleeve being positioned between the venturi and the cylindrical wall portion and being spaced inwardly from the cylindrical wall portion.

4,105,004
ULTRASONIC WAVE FUEL INJECTION AND SUPPLY DEVICE

Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan
Filed Nov. 4, 1976, Ser. No. 738,843
Claims priority, application Japan, Nov. 4, 1975, 50-132701
Int. Cl.² F02M *27/08*
U.S. Cl. 123—141 **21 Claims**

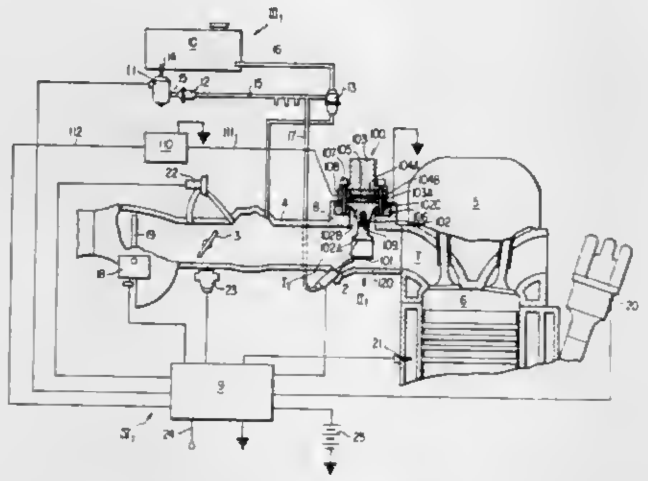
1. An ultrasonic wave fuel injection and supply device comprising:

an intake passage, for supplying an air-fuel mixture therethrough, one end of which is communicated with an air cleaner and the other end of which is communicated with a combustion chamber in an internal combustion engine;

fuel injection means having an ultrasonic wave generating means and a fuel injection nozzle means;

said ultrasonic wave generating means comprising an ultrasonic transforming means, for transforming electrical oscillations into mechanical vibrations, connected to an ultrasonic oscillator, a mechanical vibration amplifying means, for amplifying the amplitude of said mechanical vibrations, secured at one end thereof to said ultrasonic transforming means, and a vibratory member, having a hollow, cylindrically shaped body, a peripheral wall of which is secured to the other end of said mechanical vibration amplifying means, the axis of said vibratory member being positioned substantially perpendicular to the longitudinal axis of said mechanical vibration amplifying means, and said vibratory member being positioned in said intake passage and having open opposite ends so as not to hinder the flow of fluid through said intake passage;

said fuel injection nozzle means having a nozzle opening which opens toward said peripheral wall of said vibratory member for injecting liquid fuel under pressure onto said peripheral wall;



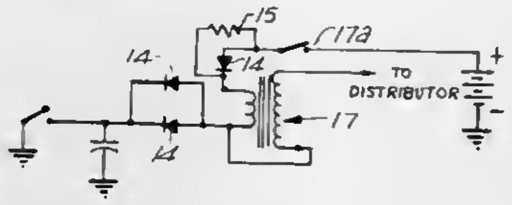
fuel supply means for introducing liquid fuel from a fuel reservoir and for supplying the same to said injection nozzle means; and

control means for controlling the amount of fuel being injected through said injection nozzle means in accordance with the running conditions of said internal combustion engine,

whereby liquid fuel injected onto said peripheral wall of said vibratory member undergoing ultrasonic vibration may be atomized and scattered due to the ultrasonic vibration thereof, the liquid fuel thus being atomized and scattered being supplied to a combustion chamber of said engine, together with air from said air cleaner.

4,105,005
ELECTRONIC IGNITION

William Phillips, 1815 Sweetbriar, Palmdale, Calif. 93550
Filed Feb. 17, 1976, Ser. No. 658,823
Int. Cl.² F02P *3/04;* **H05B** *41/392*
U.S. Cl. 123—148 E **1 Claim**



1. An ignition system consisting essentially of a distributor and battery, the negative terminal connected to ground;

an ignition coil comprising a primary and a secondary winding, a first terminal of the secondary winding connected to a first terminal of said primary winding, the second terminal of said secondary winding connected to the distributor;

a first diode, said first diode cathode connected to the second terminal of said primary winding, the first diode anode connected the positive terminal of said battery;

a set of points, one contact being grounded;

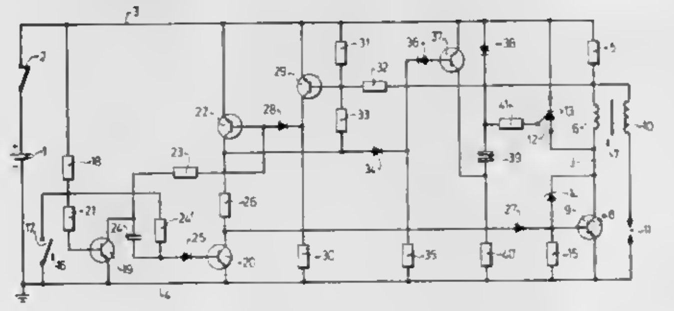
a second diode, said second diode cathode connected to the ungrounded contact of said points, the second diode anode connected to the first terminal of said secondary winding, and

a condenser in parallel with said points;

wherein diodes are connected to allow electron flow in the primary winding in one direction from the points to the battery, when the points are closed.

4,105,006
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Werner Jundt, Ludwigsburg; Peter Werner, Stuttgart; Bernd Bodig, Leinfelden; Gerbard Söhner, Remshalden-Geradstetten, and Helmut Roth, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 9, 1976, Ser. No. 703,780
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531278
Int. Cl.² F02P *3/02*
U.S. Cl. 123—148 E **13 Claims**



1. Ignition system for an internal combustion engine adapted for connection to a current supply source (1) having an ignition coil (7), a main switch (8) serially connected with the ignition coil (7) to control current flow therethrough;

a sensing resistor (5) serially connected with the primary of the coil (7) sensing current flow through the primary (6) of the ignition coil (7) and providing a respective sensing signal;

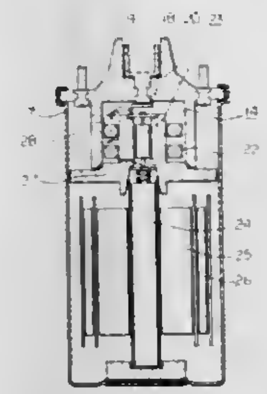
a shunt circuit comprising an auxiliary controlled switch (13) connected in shunt with the primary (6) of the ignition coil (7) and the sensing resistor (5),

control circuit means (29, 22) connected to said sensing resistor (5), responsive to said sensing signal, sensing a predetermined current flow through the coil (7) and controlling the respective switching states of the main switch (8) and of the auxiliary switch (13) to be alternatively conductive to store ignition energy in the coil during conduction of the main switch (8) and non-conduction of the auxiliary controlled switch (13) and to disconnect the primary of the coil from the power source (1) during opening of the main switch and establishment of a closed series circuit formed by said then closed auxiliary controlled switch (13), the sensing resistor (5) and the primary (6) of the ignition coil;

and an interrupt control switch (16) connected to and controlling opening of said main switch to control the timing of the ignition instant independently of sensed current flow through said sensing resistor (5).

4,105,007
DEVICE FOR SUPPRESSING IGNITION NOISE

Masayoshi Mochimaru, 25-20, Akabanedai 3 chome, Kita-ku, Tokyo, Japan
Filed Sep. 3, 1976, Ser. No. 720,381
Claims priority, application Japan, Apr. 2, 1976, 51-36132
Int. Cl.² H04B *3/28*
U.S. Cl. 123—148 P **2 Claims**



1. A device for suppressing ignition noise, inserted in series with the secondary high voltage circuit of an ignition coil, said device comprising:

(a) a cylindrical housing;

(b) a support means positioned in said housing for dividing said housing into axially aligned first and second compartments;

(c) noise suppression means mounted in said first compartment, said noise suppression means including a choke coil having an air core bobbin at the center of said support means, an inductive coil having a plurality of honey-comb sections wound on said bobbin and a resistor mounted inside of said bobbin wherein said inductive coil and said resistor are connected electrically in parallel;

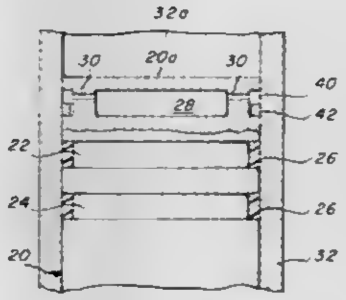
(d) a high voltage terminal positioned in said first compartment, said noise suppression means having one terminal connected to said high voltage terminal;

(e) an ignition coil means mounted in said second compartment, said ignition coil means including a core, and a primary and secondary winding wound on said core, said secondary winding being electrically connected to said core; and

(f) spring means positioned between said noise suppression means and said core for electrically connecting said secondary winding through said core to said noise suppression means.

4,105,008
ANTI-POLLUTION PISTON CONSTRUCTION

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Sep. 4, 1975, Ser. No. 610,296
Int. Cl.² F02F *1/24*
U.S. Cl. 123—191 R **2 Claims**



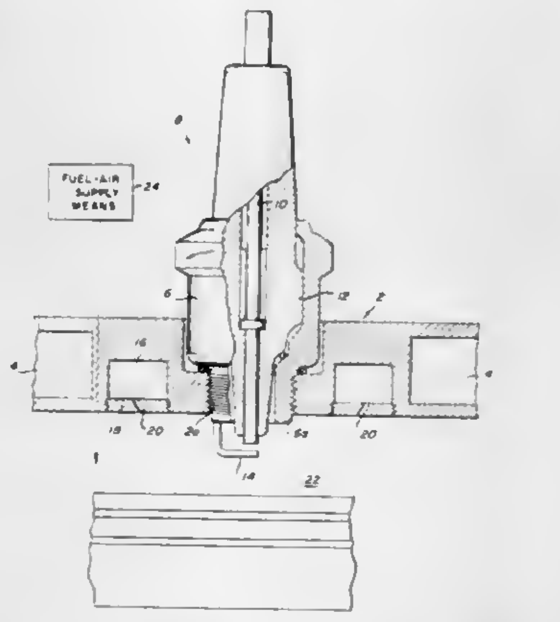
1. An anti-pollution internal combustion engine of the type

including ignition means for igniting a combustible hydrocarbon fuel-air mixture, comprising
  (a) A cylinder having an inner wall surface;
  (b) a cylindrical piston mounted for reciprocation in said cylinder, said piston having at one end an imperforate continuous end wall which cooperates with said cylinder to define a combustion chamber, and a cylindrical side wall of said piston containing at least one piston ring groove.
  (c) a piston ring mounted concentrically within said piston ring groove, the outer periphery of said piston ring being in contiguous engagement with the inner wall surface of said cylinder; and
  (d) storage means contained solely within said piston for receiving from the combustion chamber unburnt hydrocarbons during the compression stroke of the engine and for returning the unburnt hydrocarbons to the engine cylinder during the subsequent expansion stroke following ignition of the fuel, said storage means including
    (1) a second groove contained in the cylindrical side wall of said piston intermediate said piston ring groove and said imperforate end wall, said second groove being in continuous communication with said combustion chamber via the annular space between the end extremity of said piston and the wall surface of said cylinder;
    (2) at least one storage chamber contained in said piston;
    (3) means including a plurality of radial passages and orifices affording communication between said storage chamber and said second groove, whereby during the expansion stroke following ignition, the unburnt hydrocarbons are returned to the engine cylinder so that their jetting action scours the inner wall surface of said cylinder and removes additional unburnt hydrocarbons from the wall, and introduces unburnt hydrocarbons from the storage chamber and the wall into the combustion gases for mixing with the oxides of nitrogen to reduce said oxides to the equilibrium value; and
    (4) an annular seal member mounted for axial sliding movement between open and restricting positions relative to said orifices, thereby to vary the effective size of said orifices.

4,105,009
ANTI-POLLUTION ENGINE HEAD CONSTRUCTION

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Continuation of Ser. No. 610,298, Sep. 4, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 786,052
Int. Cl.^{2} F02F *1/02*
U.S. Cl. 123—193 H **6 Claims**

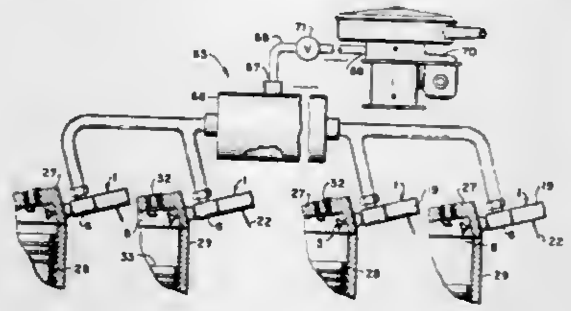
1. An anti-pollution internal combustion engine of the piston and cylinder type, comprising
  (a) means including a unitary metal head (2) cooperating with a piston and cylinder to define a working chamber (22), said head containing a threaded opening (*2a*) for receiving a spark plug (6); and
  (b) means (24) for supplying combustion fuel to said working chamber for ignition by said spark plug, said fuel supply means causing operation of the engine in a mode in which the oxides of nitrogen have an excess concentration relative to an equilibrium value determined by the pressure, temperature and composition parameters of the combustion gases;
  (c) said head containing immediately adjacent said spark plug opening a closed storage chamber (16), and passages means (20) affording continuous communication between said storage chamber and said working chamber, said storage chamber and said passage means being arranged
    (1) to receive unburnt hydrocarbons during the compression stroke of the engine, and
    (2) to return the hydrocarbons to the working chamber during the subsequent expansion stroke following combustion of the fuel for mixing with the oxides of nitrogen to reduce the same to the equilibrium value;



  (d) said head further containing cooling passage means (4) immediately adjacent said closed storage chamber.

4,105,010
FUEL SAVING APPARATUS FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINES

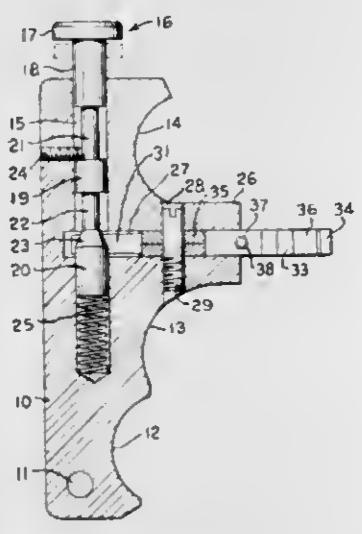
Earl W. Rand, Jr., 2101 Washington, Kansas City, Mo. 64108
Continuation-in-part of Ser. No. 646,361, Jan. 2, 1976, Pat. No. 4,018,204. This application Dec. 13, 1976, Ser. No. 750,124
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.^{2} F02D *9/00*
U.S. Cl. 123—198 F **10 Claims**



1. In a multiple cylinder internal combustion engine including a carburetor and a plurality of cylinders each of which has a piston, said cylinders respectively forming a combustion chamber clearance volume above said respective pistons, and an intake and exhaust valve associated with said respective cylinders, the improvement of a device rendering temporarily ineffective selected engine cylinders during low engine power demand periods for reducing fuel consumption, said device comprising:
  (a) an independently controlled fuel saving third valve member operably associated with at least one of the cylinders so as to provide communication between said clearance volume and a reservoir volume disposed externally thereof during the low engine demand periods;
  (b) said third valve member, when open, severely reducing cylinder intake vacuum and resultant air-fuel influx to the extent that said one cylinder is rendered temporarily ineffective during the low engine demand periods, thereby reducing engine fuel consumption.

4,105,011
ARCHERY BOWSTRING RELEASE

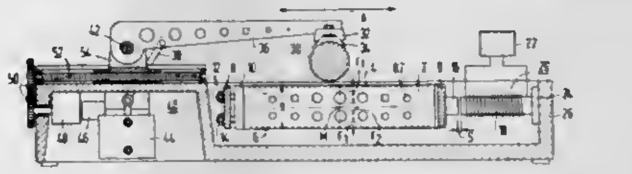
Van B. Chism, 1323 Hwy. 35, Benton, Ark. 72015
Filed Sep. 23, 1977, Ser. No. 836,179
Int. Cl.^{2} F41B *5/00*
U.S. Cl. 124—35 A **10 Claims**



1. An archery bowstring release comprising:
a generally T-shaped body member positioned in a lazy T posture and including a longitudinally extending upright portion and a forwardly projecting portion extending perpendicularly therefrom at an elevation intermediate the ends of the upright portion;
a blind bore extending downward longitudinally from the upper end of said upright portion to an elevation below its junction with said projecting portion;
a slidable plunger slip-fitted into said bore, the lower end of said plunger being positioned below said junction and an upper end portion projecting upwardly above the upper end of said upright portion;
said plunger being of circular cross section and including a plurality of longitudinally spaced coaxially aligned large and small diameter cylindrical segments and a single upstanding conical frustum segment;
a cavity extending inwardly in communication with said bore from the forward end of said projecting portion and a pair of coextensive jaw members pivotally mounted intermediate their respective ends in non-intersecting relationship on said forwardly projecting portion;
said jaw members extending rearwardly into said cavity and having their rearward end portions straddling the large diameter plunger segment adjacent to the base of said conical segment and said jaw members extending forwardly beyond said body member and having therein a pair of opposed complementary bowstring retaining notches, the outer ends of said jaws abutting for retaining a bow string in said notches;
main spring means yieldably urging said plunger upwardly from the lower end of said bore and detent means fixed to said body member in the path of upward movement of said plunger;
auxiliary spring means biasing the foward portions of said jaw members apart and concurrently biasing the rearward portions of said jaw members about said pivotal mounting into engagement with said plunger;
a small diameter segment of said plunger being positioned adjacently above the plunger engaging portions of said jaw members, said last-named segment moving downwardly between the plunger engaging portions upon the occurrence of a downward movement of the upper projecting end portion of the plunger to release a bowstring from said bowstring retaining notches.

4,105,012
APPARATUS FOR CUTTING UP HARD AND BRITTLE MATERIAL

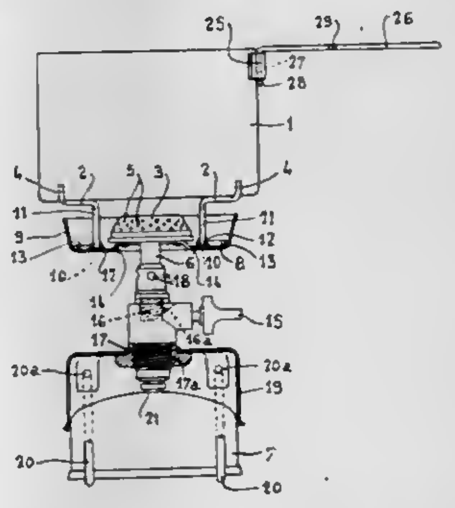
Paul Hini, Erlangen, and Helmut Foster, Neunkirchen am Brand, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 713,575, Aug. 11, 1976, abandoned. This application Oct. 19, 1977, Ser. No. 843,417
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537088
Int. Cl.^{2} B28D *1/02*
U.S. Cl. 125—16 R **10 Claims**



1. Apparatus for cutting up hard brittle material comprising
  (a) a base member;
  (b) a clamping frame;
  (c) a plurality of leaf springs supporting said frame on said base for oscillating motion along a first axis, said leaf springs disposed transversely to said first axis;
  (d) a plurality of saw blades disposed side by side in said clamping frame said saw blades extending in a direction parallel to said first axis;
  (e) means for holding material to be cut up and for bringing said material into contact with said saw blades;
  (f) first drive means for imparting a high frequency low amplitude oscillating motion to said support frame; and
  (g) second drive means for imparting a large amplitude low frequency to and fro motion to said means for holding said material to be cut up.

4,105,013
PORTABLE STOVES

Marcel Vacbe, Sainte-Foy-les-Lyon, France, assignor to Application Des Gaz, Saint Genis Laval, France
Filed Sep. 13, 1976, Ser. No. 722,901
Claims priority, application France, Sep. 23, 1975, 75 29695
Int. Cl.^{2} F24C *5/20*
U.S. Cl. 126—38 **11 Claims**



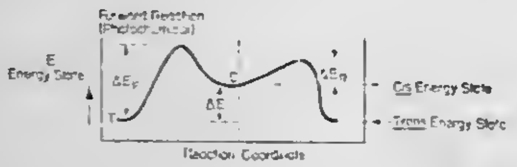
1. Portable cooking apparatus including a dismountable stove for attachment to a liquid gas cartridge, and including two telescopable saucepans within which the stove is storable when not in use, said apparatus comprising:
  a stove including a burner head supported in the center of an upwardly-opening dished wind shield member, the burner head having a connecting tube extending downwardly through a hole in the center of the shield member and

having a threaded lower end, and the stove having a downwardly opening dished cover member below the end of the tube and shaped to receive a gas cartridge therein, and the stove having a gas cock member having a threaded upper end connectable to said tube and having a lower end extending through a central hole in the cover member and into communication with the gas in the cartridge when the stove is assembled in operative configuration, and the stove having pan supporting arms carried by said wind shield member, the arms being extensible from the shield member to support a saucepan and being retractable within the peripheral contour of the shield member; and

two cylindrical wall saucepans, one telescopable within the other, and of diameter larger than the diameters of the shield member and the cover member, the saucepans being long enough to receive the assembled stove and cartridge therewithin in said operative configuration when telescoped partly together, and the stove being partly dismountable to a smaller configuration wherein the cover member is inverted to nest about said shield member with the gas cock member lying disassembled between the shield member and the cover member, and the stove thus configured being enclosable inside the saucepans which are telescoped further together.

4,105,014
CATALYTIC EXTRACTION OF STORED SOLAR ENERGY FROM PHOTOCHEMICALS

Robert E. Schwerzel; Nancy E. Klosterman; John Robert Kelly, and Louis J. Hillenbrand, all of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio
Filed Jan. 24, 1977, Ser. No. 761,912
Int. Cl.^{2} F24H *7/00*
U.S. Cl. 126—270 **8 Claims**



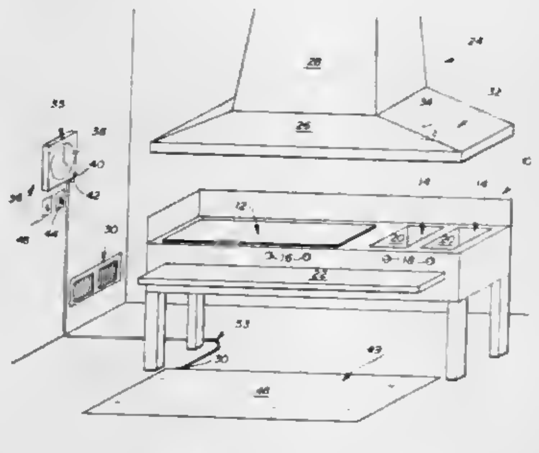
1. In the photochemical process for collection and retrieval of solar energy wherein a lower energy level isomer of an isomerizable compound, while contained in a fluid, is exposed to solar energy of a wavelength providing a higher energy level isomer of the isomerizable compound and then subsequently, while within the fluid, the higher energy level isomer is transformed to the lower energy level isomer with exothermic release of thermal energy for useful purposes, the improvement of: initiating the transforming of the higher energy level isomer to the lower energy level isomer by contacting the higher energy level isomer within the fluid with a chemical catalyst of a strong acid, or a strong base, or a mixture of strong acids, or a mixture of strong bases with the employed chemical catalyst compatible with the fluid and the isomerizable compound.

4,105,015
EXHAUST HOOD ENERGY SAVING DEVICE

William C. Isom, 9430 Folkstone, Dallas, Tex. 75220, assignor to William C. Isom, Dallas, Tex.
Filed Mar. 9, 1977, Ser. No. 775,781
Int. Cl.^{2} F24C *15/20;* F23J *11/00*
U.S. Cl. 126—299 D **15 Claims**

1. In an exhaust ventilation system for conserving energy lost by exhausting the air conditioning from the interior of a building along with the by-products generated by the process of cooking food at a cooking station, the ventilation system including a ventilation hood positioned over the cooking station and having ducting communicating with the outside environment and an exhaust fan for removing the by-products of cooking food from the area of the cooking station through the ducting of the ventilation system to the outside, the improvement comprising:

exhaust control means connected to the exhaust fan and automatically responsive to the presence and absence of a cook at the cooking station,

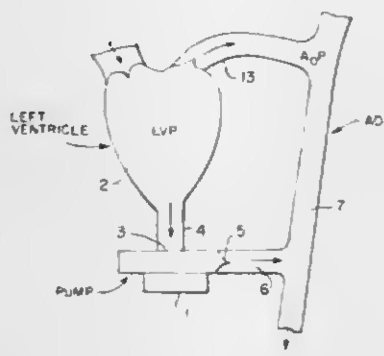


a timed switch operable in response to said control means to switch to a first position when the cook is present at the area of the cooking station and further operable to switch to a second position a predetermined period of time after the cook leaves the area of the cooking station; and

means responsive to the first position of said timed switch and connected to the exhaust fan for energizing the exhaust fan to run and responsive to the second position of said timed switch for deenergizing the exhaust fan.

4,105,016
HEART PUMP

Francis M. Donovan, Jr., 6300 Old Canton Rd., Jackson, Miss. 39211
Filed Nov. 18, 1976, Ser. No. 742,883
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 128—1 D **4 Claims**



1. A system for reducing the pressure in the left or right ventrical of a heart pump comprising:

a centrifugal pump means operated at a constant speed, said pump means having an inlet and an outlet and having a valve means placed in said outlet or inlet, said valve means being of the type commonly used for heart valves;

a first cannula having one end attached to the inlet of said pump means, the other end of said cannula being adapted to be inserted into the ventricle to be assisted;

a second cannula having one end attached to the outlet of said pump means, the other end of said second cannula being adapted to be attached to a natural artery;

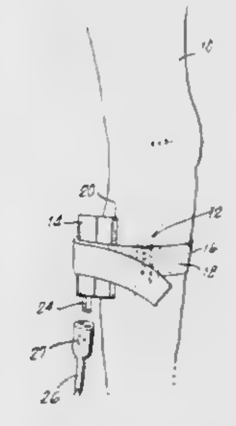
a first tube attached to said pump means;

a second inner tube placed inside of said first tube, said inner tube supplying cooling air to the motor of said pump means, said cooling air being returned to the atmosphere through said first tube; and

a pair of electrical wires placed in between said second inner tube and said first tube, said wires supplying electrical power to said motor.

4,105,017
MODIFICATION OF THE GROWTH REPAIR AND MAINTENANCE BEHAVIOR OF LIVING TISSUE AND CELLS BY A SPECIFIC AND SELECTIVE CHANGE IN ELECTRICAL ENVIRONMENT

John P. Ryaby, Essex Fells, and Arthur A. Pilla, Wyckoff, both of N.J., assignors to Electro-Biology, Inc., Fairfield, N.J.
Continuation-in-part of Ser. No. 633,408, Nov. 19, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,706
Int. Cl.^{2} A61N *1/40*
U.S. Cl. 128—1.5 **50 Claims**



1. A surgically non-invasive method of treating living tissues and/or cells comprising electromagnetically inducing voltage and concomitant current pulses of a specific frequency-amplitude relation within said tissue and/or cells, wherein said pulses satisfy the following criteria:

(a) each pulse is composed of a positive pulse-signal portion followed by a negative pulse-signal portion;

(b) each positive pulse signal portion is composed of at least three segments, of which the peak amplitude of the final segment is no less than about 25 percent of the peak amplitude of the first segment;

(c) the duration of each positive pulse signal portion is between about 200 microseconds and 1 millisecond, and is no longer than about 1/9 the duration of the following one of the negative pulse signal portions;

(d) the repetition rate of the pulses is between about 10 and 100 Hz;

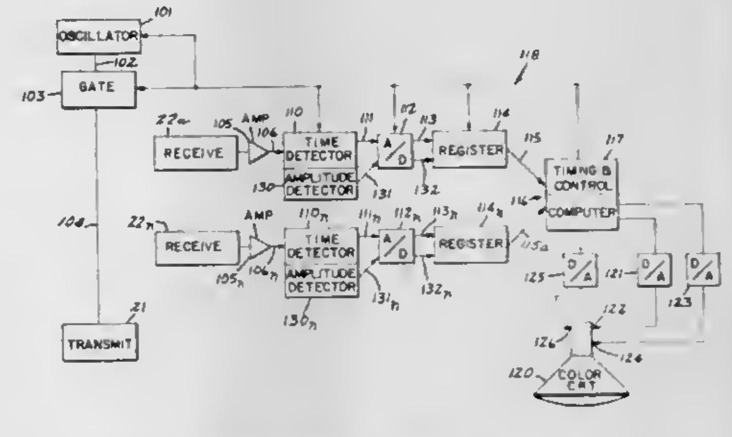
(e) each positive pulse signal portion has an average amplitude of between about 0.0001 and 0.01 volts per centimeter of treated tissue and/or cells corresponding to between about 0.1 and 10 microamperes per square centimeter of treated tissue and/or cells;

(f) each negative pulse signal portion has an average amplitude no greater than about 1/6 the average amplitude of each positive pulse signal portion;

(g) each negative pulse signal portion has a peak amplitude from which it exponentially decays to about a zero reference level, and said negative pulse signal portion peak amplitude is no greater than about ⅓ the peak amplitude of said positive pulse signal portion.

4,105,018
ACOUSTIC EXAMINATION, MATERIAL CHARACTERIZATION AND IMAGING OF THE INTERNAL STRUCTURE OF A BODY BY MEASUREMENT OF THE TIME-OF-FLIGHT OF ACOUSTIC ENERGY THERETHROUGH

James F. Greenleaf, and Steven A. Johnson, both of Rochester, Minn., assignors to University of Utah, Salt Lake City, Utah
Filed Feb. 2, 1976, Ser. No. 654,419
Int. Cl.^{2} A61B *10/00*
U.S. Cl. 128—2 V **30 Claims**



1. A method of examining the internal structure of a body comprising the steps of:

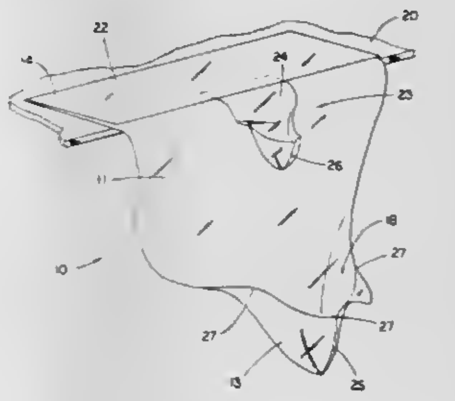
(a) transmitting acoustic energy through said body from a plurality of different directions;

(b) measuring the time-of-flight of the acoustic energy through the body; and

(c) mathematically reconstructing the acoustic velocity at a plurality of points within said body.

4,105,019
METHOD FOR COLLECTING POSTPARTUM FLUID LOSS

John N. Haswell, 607 Dubois St., Vincennes, Ind. 47591
Division of Ser. No. 657,161, Feb. 11, 1976, Pat. No. 4,076,017. This application Apr. 25, 1977, Ser. No. 790,553
Int. Cl.^{2} A61B *10/00, 19/06*
U.S. Cl. 128—2 F **4 Claims**



1. A method for collecting postpartum fluid loss which comprises:

providing a postpartum fluid loss receptacle having a first sheet of flexible material that is essentially nonabsorbent to body fluids, the first sheet having a first end portion forming a first pocket and a second end portion, the first end portion of the first sheet being folded and defining a first edge and a second edge, the edges having a common point, the first edge being sealingly attached to the second edge continuously along a line extending from the common point, the receptacle further including a second pocket smaller than the first pocket;

placing the second end portion of said first sheet of the

receptacle under the buttocks of a patient, said second pocket being positioned under the flap of said first sheet;
collecting primarily the amniotic fluid in the first pocket of said first sheet;
opening said second pocket; and
collecting primarily the blood within said second pocket.

4,105,020
BLOOD PRESSURE AND PULSE RATE MEASURING APPARATUS

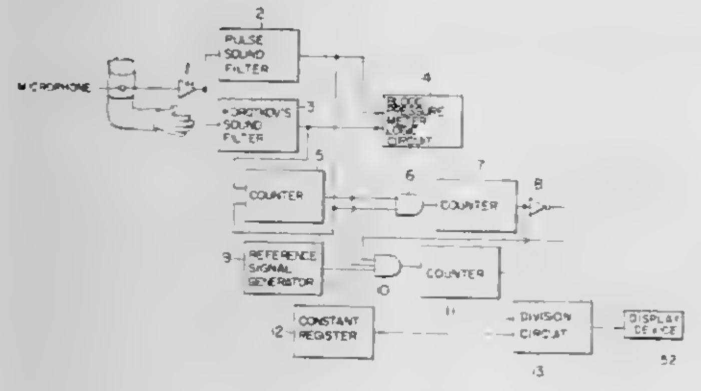
Yoshifumi Matsuoka, Yamatotakada; Takemasa Matsumura, Toyonaka; Koichi Shigematsu, Kawanishi, and Atsushi Oishi, Yaizu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1976, Ser. No. 686,395

Claims priority, application Japan, May 16, 1975, 50-58815; May 29, 1975, 50-73201[U]; May 29, 1975, 50-73202[U]

Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 A **3 Claims**



1. In a blood pressure measuring apparatus having a blood pressure meter logic circuit for determining a patient's systolic and diastolic blood pressures utilizing a Korotkoff's sound signal and a heart beat signal, the improvement which enables simultaneous measurement of blood pressure and pulse rate comprising:
a microphone associated with a cuff device for producing an electric signal containing a Korotkoff's sound signal and a pulse rate sound signal;
filter means connected to said microphone for separating said Korokoff's sound signal and said pulse rate sound signal;
count initiating means connected to receive said Korotkoff's sound signal and said pulse rate sound signal for producing a count initiating signal after at least two Korotkoff's sound signals have been counted successively in synchronism with said pulse rate sound signal;
counting means connected to said count initiating means for measuring a time period from reception of said count initiating signal until a predetermined number of pulse rate sound signals are counted;
division means connected to said counting means for calculating said pulse rate by dividing said predetermined number of pulse rate sound signals by said time period;
means for providing a signal indicating completion of a diastolic blood pressure measurement by said blood pressure meter logic;
means for providing a signal indicative of termination of counting of said predetermined number of pulse rate sound signals by said counting means;
means for generating a signal indicating completion of both the blood pressure measurement and the pulse rate measurement, said signal generating means generating said completion signal in response to receipt of said signal indicating completion of said diastolic blood pressure measurement and said signal indicating termination of counting; and,
display means connected to said division means for displaying the calculated pulse rate.

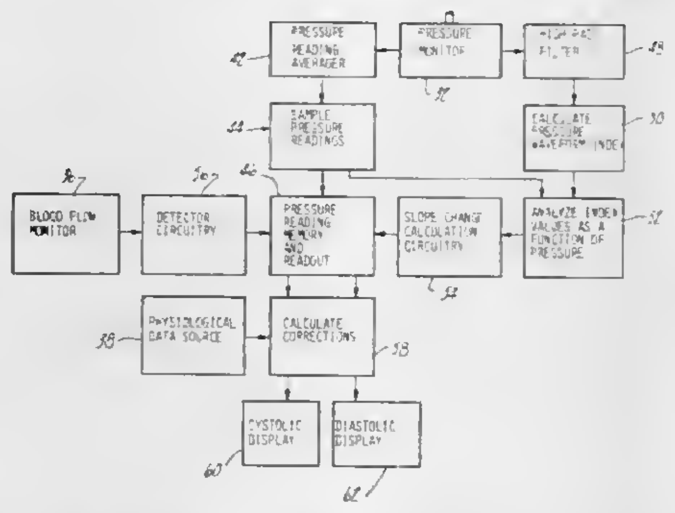
4,105,021
METHOD AND ARRANGEMENT FOR MEASURING BLOOD PRESSURE

William J. Williams, and William J. Heetderks, both of Ann Arbor, Mich., assignors to Joseph H. Allen and Leonard S. Weisman, both of Madison Heights, Mich.

Filed Aug. 13, 1976, Ser. No. 714,097

Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 A **18 Claims**


PRESSURE READING AVERAGER
42
PRESSURE MONITOR
32
HIGH PASS FILTER
48
SAMPLE PRESSURE READINGS
44
CALCULATE PRESSURE WAVEFORM INDEX
50
BLOOD FLOW MONITOR
DETECTOR CIRCUITRY
PRESSURE READING MEMORY AND READOUT
46
SLOPE CHANGE CALCULATION CIRCUITRY
ANALYZE INDEX VALUES AS A FUNCTION OF PRESSURE
52
54
PHYSIOLOGICAL DATA SOURCE
56
CALCULATE CORRECTIONS
58
SYSTOLIC DISPLAY
DIASTOLIC DISPLAY
60
62

18. An arrangement for measuring blood pressure in a subject comprising:
means for occluding blood flow in a body member, including means for applying a pressure force to said body member, said means further including means for changing said pressure force between a level wherein said blood flow is substantially occluded and a level wherein blood flow is substantially unoccluded;
means for monitoring said pressure force, during said change in levels, including means for detecting variations in said pressures induced by blood pressure pulses;
means analyzing each wave form constituted by said pressure variations over the entire course of each blood pressure pulse;
means analyzing the changes in wave form of said pressure variations produced by successive changed in pressure applied by said occluding means;
means for detecting a change in the successive changes of said wave form at said pressure level corresponding to unoccluded blood flow;
means for determining the average pressure monitored by said monitoring means at said pressure level, whereby said pressure level corresponding to diastolic pressure is measured.

4,105,022
METHOD OF DETERMINING CARDIAC OUTPUT BY THERMODILUTION PRINCIPLES AND UTILIZATION OF A CATHETER ASSEMBLY

William T. Antoshkiw, Clifton, and Thomas A. Ursic, Hasbrouck Hts., both of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

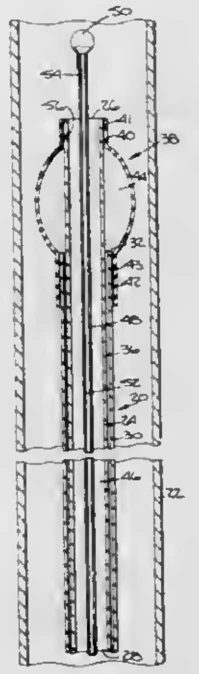
Division of Ser. No. 689,487, May 24, 1976, Pat. No. 4,024,873. This application Nov. 19, 1976, Ser. No. 743,464

Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 F **5 Claims**

1. A method for determining cardiac output by means of thermodilution principles and by utilizing a catheter assembly with a passageway therethrough comprising; introducing the catheter assembly at least into close proximity to the right heart, inserting a small balloon tipped catheter with the balloon uninflated through the passageway of the catheter assembly and with a thermistor attached thereto with the passageway of the catheter assembly forming a guideway for directing the small balloon catheter to the desired location, passing the

balloon tipped portion of the small catheter out of the passageway of the catheter assembly into the bloodstream and inflating the balloon so that the balloon is flow directed away from the catheter assembly into the heart and spaced from the catheter assembly a substantial distance to facilitate prevention of interference between the passageway through the catheter assembly and the inflated tip portion of the small catheter, providing a central lumen in the small balloon tipped catheter to effect the inflation and deflation of the balloon, injecting a fluid different in temperature from the blood stream into the annular space between the passageway of the catheter assembly and the outer surface of the inflated balloon tipped portion of the small catheter spaced therefrom whereby the thermistor of the balloon catheter detects the temperature changes in the bloodstream, and detecting the thermistor output to determine cardiac output.



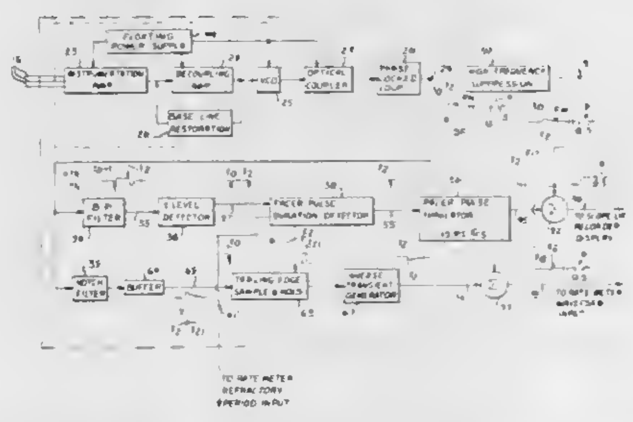
4,105,023
PACEMAKER ARTIFACT SUPPRESSION IN CORONARY MONITORING

Thomas F. Marchese, Somerville, and Rauf S. Argon, Bedford, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 19, 1977, Ser. No. 760,487

Int. Cl.^{2} A61B *5/04*

U.S. Cl. 128—2.06 B **9 Claims**



1. In a heart monitoring system including means for sensing a patient's ECG signals, means responsive to the QRS complex of sensed ECG signals for indicating the patient's heart rate, and signal suppression means for suppressing the pacer discharge pulse portion of a heart pacer signal artifact possibly appearing in the sensed ECG signal to prevent false actuation of the heart rate indicating means thereby, the pacer signal artifact being comprised of the pacer discharge pulse portion and a recharge waveform portion, the improvement wherein said suppression means additionally incudes:
means responsive to a pacer signal artifact in the sensed ECG signal for generating a recharge waveform suppression signal of opposite polarity to the recharge waveform portion of the pacer signal, and means for arithmetically summing the recharge waveform suppression signal with the sensed ECG signal to additionally suppress said recharge waveform portion, the magnitude and duration of said recharge waveform suppression signal being such as to thereby also prevent false actuation of the heart rate indicating means by said recharge waveform portion of the pacer signal artifact.

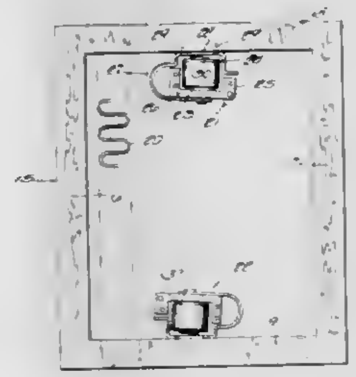
4,105,024
MASSAGING FURNITURE

Marvin J. Raffel, 9010 N. 70th St., Milwaukee, Wis. 53223

Filed May 16, 1977, Ser. No. 797,218

Int. Cl.^{2} A61H *1/00*

U.S. Cl. 128—33 **11 Claims**



1. In massaging furniture:
rigid means defining a closed path for conducting vibratory waves,
a plurality of nonrotating vibratory motors for imparting vibrations to said rigid means,
said motors each including a core, a magnet coil on said core, an armature and, means coupling said core and armature for vibrating relative to each other and for yieldingly holding them apart, one of said core and said armature of each motor being secured to said rigid means and the other being free to vibrate and impart said vibrations to said rigid means,
means for energizing the coil of one of said motors with electric signals at a first frequency to thereby produce vibratory waves at one frequency in said path in said rigid means,
means for energizing the coil of another of said motors with electric signals at a second frequency to thereby produce vibratory waves at a second frequency in said path for coacting with waves of said first frequency to result in production of interference waves in said rigid means, and
means for varying at least one of said frequencies so as to vary the frequency of the resulting interference waves and, thus, the massaging wave frequency.

4,105,025
SURGICAL SUPPORT

Yen Wang, 6883 Reynolds St., Pittsburgh, Pa. 15208, and Wen-Hsuan Chang, Gibsonia, Pa., assignors to Yen Wang, Pittsburgh, Pa.

Filed Nov. 12, 1976, Ser. No. 741,295

Int. Cl.^{2} A61F *13/04*

U.S. Cl. 128—90 **5 Claims**

1. A method of producing a supportive wrapping for a body support comprising,
impregnating a bandage substrate with a crystallizable polyurethane comprised of the reaction product of a normally crystalline polyol selected from the group consisting of a

polyester diol and a polyether diol having a melting point below 121.1° C and a molecular weight greater than 750 and a polyisocyanate present in an amount between 5 and 45 percent by weight based on the total weight of the two constituents,

said impregnated bandage substrate being impregnated with a molten polyurethane polymer that is crystallizable in a predetermined, delayed time period at temperatures tolerable to human skin,

heating said bandage material to a temperature above the melting point of said polyurethane polymer and below a temperature intolerable to human skin,

said bandage substrate impregnated with said crystallized polyurethane having self-adhesive properties at elevated temperatures,

thereafter wrapping a body member with said heated bandage so that portions of said bandage adhesively adhere to other portions of said bandage and shaping said bandage so that it conforms to the form of the body member, and

cooling said bandage to room temperature and permitting the polyurethane polymer to crystallize and harden on the bandage material to form the desired rigid supportive wrapping on the body member.

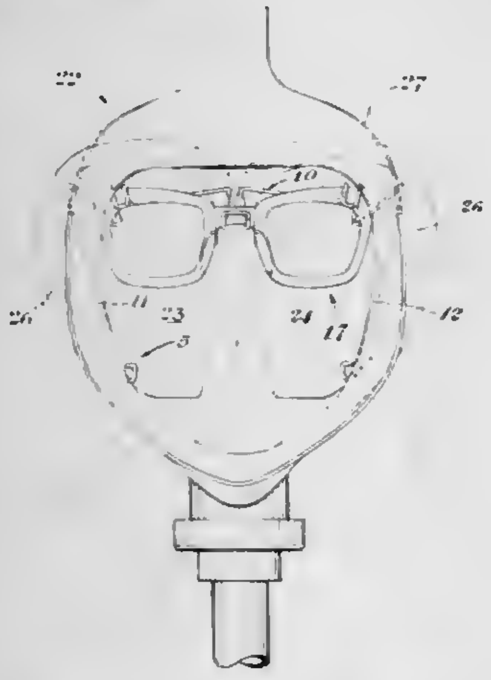
4,105,026
BOWLESS EYEGLASSES HOLDER

Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1976, Ser. No. 745,327

Int. Cl.² A62B *9/00*

U.S. Cl. 128—142.4 **6 Claims**



1. A resiliently disengageable bowless eyeglasses holder for fixing bowless eyeglasses to a mask having a mask housing, said housing having at least one transparent eye covering and inner surface means extending around the periphery of the transparent eye covering, the holder comprising at lest one elongated, resilient element having:

(a) left, right and bridging members wherein the right and left members are connected by the bridging member member form a generally planar, U-shaped configuration, the right and left members forming the legs of the U and the bridging members forming the base of the U, said bridge member and said left and right members including generally hook-shaped means for engaging the bowless eyeglasses, the left and right members having said hook shaped means for engaging the top portions of the bowless eyeglasses frame at the temple connections and the center portion of said bridging member of said holder having said hook-shaped means for engaging under the bridging member of the bowless eyeglasses frame, the hook-shaped configurations of the left and right members located adjacent the respective left and right ends of the bridging member and the hook-shaped configuration of the bridging member located at about the center thereof, and

(b) the left and right members of the holder being resilient and including end portions adapted for engaging the mask at the inner surface means of the mask housing such that the holder is within the mask housing with the base of the U extending adjacent the top of the inner surface means of the mask housing and the legs of the U extending adjacent the sides of the inner surface means of the mask housing with said end portions of said left and right members engaging said inner surface means such that the holder engages the mask in a generally fixed position and in such a manner that the engaged eyeglasses are opposed the transparent eye covering and that a wearer of the mask can effectively see simultaneously through the engaged bowless eyeglasses and the transparent eye covering.

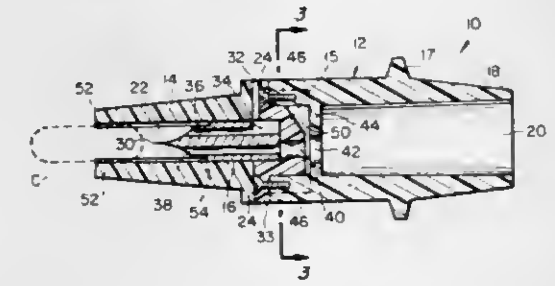
4,105,027
INHALATION DEVICE

Ingemar H. Lundquist, Oakland, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Continuation of Ser. No. 586,771, Jun. 13, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,663

Int. Cl.² A61M *15/08*

U.S. Cl. 128—206 **10 Claims**



1. A breath-actuated inhalation device for dispensing a medicament from a medicament-holding, cylindrical capsule having closed hemispherical ends, said device comprising

an elongate housing having a passageway for the movement of air therethrough, said housing having a first end and a second end, one of said ends being an output end adapted for insertion into the mouth or nasal passages of a user thereof, said passageway terminating in an emptying chamber adjacent the output end of said housing;

means for receiving a closed, medicament-holding, cylindrical capsule having closed hemispherical ends directly from the exterior of said device, said medicament-receiving means including sharply pointed piercing means to penetrate one hemispherical end of the capsule as the capsule is manually pushed thereagainst, first, communication means comprising a first passageway extending through and within said piercing means for placing the interior of the container in communication with the atmosphere surrounding said device, and second communication means comprising at least one additional passageway extending through and within said piercing means for placing the interior of the container in communication with said emptying chamber, said first and second communication means communicating with the interior of the capsule through openings near the point of said pointed piercing means, the capsule being otherwise closed to the atmosphere when said first and second communication means are in communication with the interior thereof;

whereupon, during inhalation with said piercing means penetrating the capsule, air drawn through said first communication means causes the powdered medicament to be expelled from the medicament-holding capsule through said second communication means and said emptying chamber into the nose, throat or lungs of a user thereof.

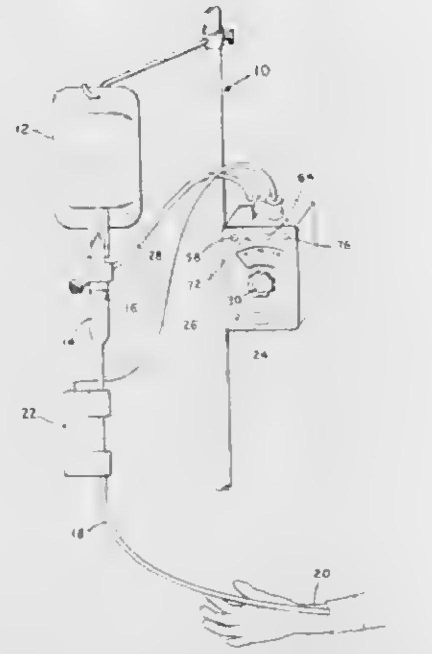
4,105,028
POSITIVE CONTROL INTRAVENOUS FLUID ADMINISTRATION

Patricia M. Sadlier, 620 Second St., Brooklyn, N.Y. 11215, and Edward Willett, 44 West End Ave., New York, N.Y. 10024

Filed Oct. 12, 1976, Ser. No. 731,771

Int. Cl.² A61M *5/16*

U.S. Cl. 128—214 E **15 Claims**



1. In the delivery of fluids parenterally by using an intravenous device which includes a drop former and a fluid conduit connected to the drop former for delivery of fluid from the drop former to a fluid delivery means, the method of controlling the volumetric flow through the fluid conduit comprising the steps of periodically opening the fluid conduit at a frequency equal to a desired rate of drop flow, detecting each drop formed in response to the opening of the fluid conduit, closing the fluid conduit each time a drop is formed and detected, determining the size of formed drops, and varying the time of subsequent openings of the fluid conduit by times relates directly responsive to the size of the formed drops whereby a desired volumetric rate is maintained.

4. In a system for delivery of fluids by means of a flow of drops, apparatus for controlling the rate of flow of the drops comprising, drop forming means for forming drops of the fluid, a fluid conduit having one end connected to said drop forming means for receiving fluid therefrom and another end for delivery of fluid, an electromechanical clamping means on said conduit, said clamping means being in a normally closed position but shifting to an open position in response to the receipt of a signal of a given level, a bistable signal generator means having input means for receiving control signals and output means connected to said electromechanical clamping means for transmitting a signal having other than the given level when in a first state and for transmitting a signal having the given level when in a second state, said input means having means for switching said bistable signal generator means to said first state upon receipt of a first control signal and for switching said bistable signal generator means to said second state upon receipt of a second control signal, source means connected to said input means for periodically generating said first control signals with a repetition rate equal to a desired drop delivery rate, drop detector means for generating one of said second control signals each time a drop is formed and delivered by said drop forming means, indicating means for giving an indication of the size of the drops detected by said drop detector means, and means for controlling the frequency of the generation of said first control signals in accordance with the indications given by said indicating means.

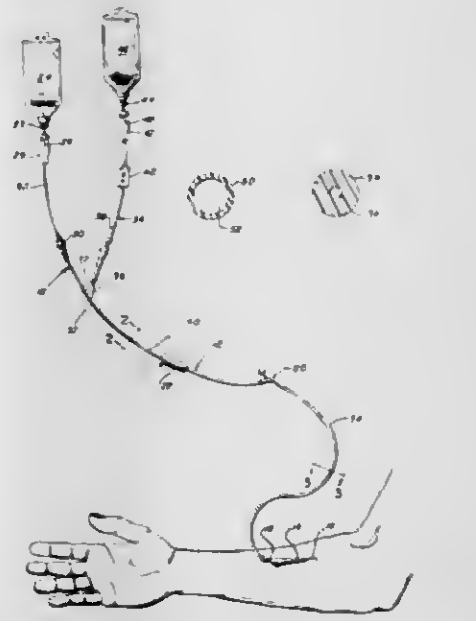
4,105,029
INTRAVENOUS SOLUTION SET HAVING AN AIR ACCESS SITE AND CONSTRICTED INNER DIAMETER PORTION

Robert A. Virag, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 602,614, Aug. 7, 1975, Pat. No. 4,034,754. This application Apr. 28, 1977, Ser. No. 791,674

Int. Cl.² A61M *5/00*

U.S. Cl. 128—214 R **4 Claims**



1. In a parenteral liquid infusion set which comprises flexible flow tubing, means for connection at one end of said flow tubing with blood vessel penetrating means, means for connection with a parenteral liquid source at the other end of said tubing, drip chamber means having a tubular, drop-forming member at an upper end thereof of reduced inner diameter relative to the inner diameter of said flow tubing, and an intermediately-positioned site providing potential access of air to the interior of said set from the exterior, said site being positioned downstream from said drip chamber, the improvement comprising, in combination: a portion of said flexible fluid flow tubing positioned downstream from said access site defining a bore of reduced diameter, when compared with the bore size of the remainder of said flow tubing, said reduced diameter bore being of a length and diameter to cause the overall frictional pressure drop of water in the portion of said set which is upstream from and including said intermediately-positioned site to be less than the frictional pressure drop of water through the portion of said set which is downstream from said intermediately-positioned site when said set is extended in a fully vertical position, and said means for connection with a parenteral liquid source is connected with a vented solution container in which the liquid level of solution in said container is no higher than the upper end of said means for connection with the parenteral liquid source, and while no outside clamping restriction to flow is applied to said set.

4,105,030
IMPLANT APPARATUS

Josef E. Kercso, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 3, 1977, Ser. No. 756,450

Int. Cl.² A61M *5/18*

U.S. Cl. 128—217 **12 Claims**

1. An apparatus suitable for subcutaneously implanting at least one pharmaceutically acceptable pellet in an animal, which apparatus comprises

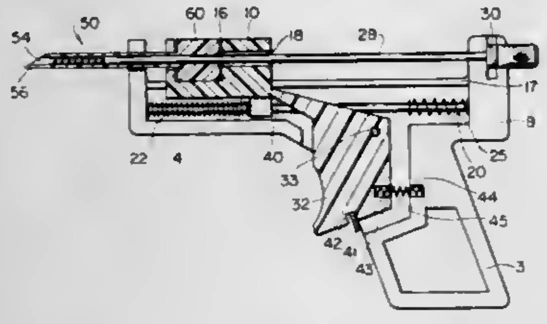
handle means for grasping said apparatus with one hand;

a track attached to said handle means and having front and rear portions, said track being suitable for a carriage to move therealong;

a carriage placed within said track and movable therealong with front and rear portions corresponding to the front and rear portions of said track, said carriage having (i) a means in the front part of said carriage which is adapted to receive and retain a detachable needle having a passageway extending longitudinally through said needle, (ii) a passageway extending the length of said carriage parallel to the length of said track and corresponding to said needle passageway when said needle is received and retained by said carriage, and (iii) means to guide and stabilize said carriage along said track;

propelling means to propel said carriage along said track from the front part to the rear part of said track;

means attached to the rear part of said track to stop said carriage when propelled rearwardly;



means attached to the front part of said track to retain said carriage;

a straight, retractable rod attached to said stopping means so that the rod extends straight through said carriage passageway;

means to retain said rod stationary or allow said rod to be retracted;

a finger actuatable trigger attached to said handle which is designed to retain said carriage in a cocked position at the front part of said track and when actuated allows said carriage to be propelled rearwardly along said track and rod by force of said propelling means while said handle is held stationary with one hand.

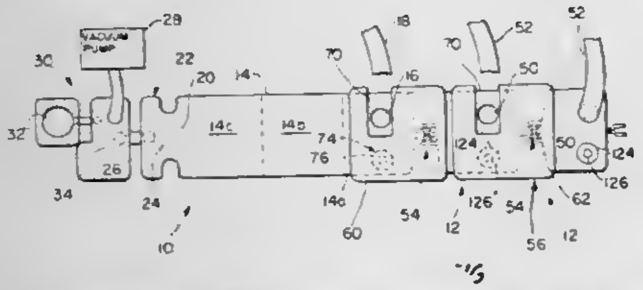
4,105,031
ATTACHABLE EXPANSION CHAMBER FOR PLEURAL DRAINAGE DEVICE

Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to Deknatel, Inc., Long Island, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,591

Int. Cl.^{2} A61M *1/00*

U.S. Cl. 128—276 **26 Claims**



1. An expansion chamber directly mountable on a drainage device for draining fluids from a cavity, the drainage device comprising a container having a collection chamber therein, which included an opening in the upper portion thereof and a puncturable diaphragm sealing said opening, and means for placing the collection chamber in fluid communication with the cavity to be drained, wherein the drainage device is adapted to be connected to a source of suction pressure for maintaining a vacuum on the cavity to be drained and is adapted for collecting liquids in the collection chamber thereof, said expansion chamber providing an additional collection chamber and comprising

a container having an internal collection chamber;

an inlet opening to said internal collection chamber adapted to be placed in fluid communication with the cavity to be drained;

means for removeably rigidly mounting said expansion chamber on the container of the drainage device such that said expansion chamber and drainage device are integral; and

means for substantially equalizing the absolute pressure in said expansion chamber with the absolute pressure in the collection chamber of the drainage device, said equalizing means including an opening in the upper portion of said expansion chamber and means for placing said expansion chamber upper opening in gaseous communication with a portion of said drainage device out of contact with the liquid being collected therein that comprises means for puncturing said diaphragm and an enclosed passageway sealingly connectable between the interior of said drainage device collection chamber through said diaphragm when punctured and said expansion chamber upper opening.

4,105,032
PACIFIER

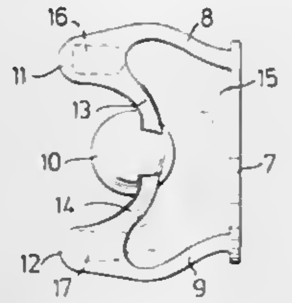
Hans C. M. Blomstedt, Stockholm, Sweden, assignor to Hans Blomstedt Handelsbolag, Stockholm, Sweden

Filed Oct. 26, 1976, Ser. No. 735,364

Claims priority, application Sweden, Oct. 31, 1975, 7512242

Int. Cl.^{2} A61J *17/00*

U.S. Cl. 128—360 **12 Claims**



1. In an infant pacifier including a shield having a surface, a spherically shaped teat, and means for attaching said teat to said surface of said shield, the improvement wherein said attaching means comprises a pair of legs, each having an end connected to said surface of said shield and extending from said surface generally parallel to each other in spaced relation and elongated arms joined at one end to said teat on opposite sides thereof to extend laterally from said teat and generally perpendicular to said legs and at their other end to the free end of said legs respectively and defining a closed gap with said teat and said shield whose spacing between said legs is of a width so as to be adapted to freely receive all of the incisors of an infant during biting of said pacifier with the portions of said legs adjacent said arms falling in the bite area of an infant's side teeth.

4,105,033
POWDERED GRAFTED CELLULOSE

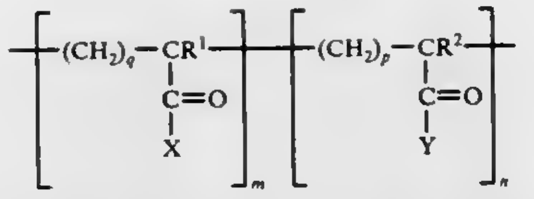
Pronoy Kumar Chatterjee, Spotswood, and Graham Kenneth Morbey, Belle Mead, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 531,149, Dec. 9, 1974, abandoned. This application Mar. 28, 1977, Ser. No. 781,916

Int. Cl.^{2} A61F *13/20*

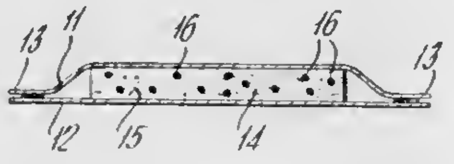
U.S. Cl. 128—285 **13 Claims**

1. An absorbent body comprising cellulose particles having grafted thereon hydrophilic chains of the general formula:

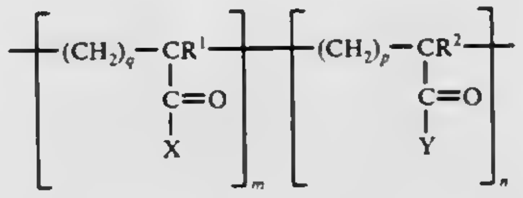


$$-\left[\begin{array}{l}(\mathrm{CH_2})_q-\mathrm{CR^1}-\\ \qquad\qquad |\\ \qquad\quad \mathrm{C{=}O}\\ \qquad\qquad |\\ \qquad\qquad \mathrm{X}\end{array}\right]_m-\left[\begin{array}{l}(\mathrm{CH_2})_p-\mathrm{CR^2}-\\ \qquad\qquad |\\ \qquad\quad \mathrm{C{=}O}\\ \qquad\qquad |\\ \qquad\qquad \mathrm{Y}\end{array}\right]_n-$$

wherein R^1 and R^2 are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, X and Y are selected from the group consisting of —OH, —O(alkali metal), and —NH_2, wherein m is an integer having a value of 0 to about 5000, n is an integer having a value of 0 to about 5000, the sum of all m and n groups is at least 500, p is an integer having a value of 0 to 1, and q is an integer having a value of 1 to 4; the individual particles of said grafted cellulose having an arithmetic average size of about 70 to about 500 microns; said grafted cellulose comprising from about 5 to about 50% by weight based on the weight of the absorbent body.



5. A catamenial device comprising an absorbent body of cellulose fibers and cellulose particles having grafted thereon hydrophilic chains of the general formula:



$$-\left[\begin{array}{l}(\mathrm{CH_2})_q-\mathrm{CR^1}-\\ \qquad\qquad |\\ \qquad\quad \mathrm{C{=}O}\\ \qquad\qquad |\\ \qquad\qquad \mathrm{X}\end{array}\right]_m-\left[\begin{array}{l}(\mathrm{CH_2})_p-\mathrm{CR^2}-\\ \qquad\qquad |\\ \qquad\quad \mathrm{C{=}O}\\ \qquad\qquad |\\ \qquad\qquad \mathrm{Y}\end{array}\right]_n-$$

where R^1 and R^2 are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, X and Y are selected from the group consisting of —OH, —O(alkali metal), and —NH_2, wherein m is an integer having a value of 0 to about 5000, n is an integer having a value of 0 to about 5000, the sum of all m and n groups is at least 500, p is an integer having a value of zero to 1, and q is an integer having a value of 1 to 4; the individual particles of said grafted cellulose having an arithmetic average size of about 70 to about 500 microns; said grafted cellulose comprising from about 5 to about 50% by weight based on the weight of the absorbent body.

4,105,034
POLY(ALKYLENE OXALATE) ABSORBABLE COATING FOR SUTURES

Shalaby W. Shalaby, Long Valley, and Dennis D. Jamiolkowski, Paterson, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 10, 1977, Ser. No. 805,501

Int. Cl.^{2} A61L *17/00*

U.S. Cl. 128—335.5 **33 Claims**

1. A synthetic, multifilament suture having improved tie-down properties, said suture being coated with from about 1 to 15 percent by weight of a composition comprising a poly(alkylene oxalate) wherein the alkylene is C_6 or a mixture of C_4- to C_{12}-alkylene moieties, said poly(alkylene oxalate) having a melting point below about 100° C and an inherent viscosity of from about 0.1 to 1.2 as determined at 25° C on a 0.1 percent solution of polymer in $CHCl_3$ or hexafluoroisopropanol.

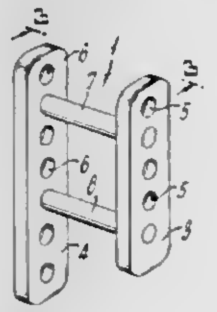
4,105,035
NASAL PROSTHESIS

Agnus Rella, c/o Pesce 160-67 23 Ave., Whitestone, N.Y. 11357

Filed Nov. 17, 1976, Ser. No. 742,627

Int. Cl.^{2} A61M *29/00*

U.S. Cl. 128—342 **3 Claims**



1. Prosthesis nasal apparatus for alleviating breathing constraints comprising

(a) a pair of elongated phable spaced apart shiftable means relative to each other,

(b) a pair of transverse pliable structural means attached to said elongated shiftable means and shiftable therewith to comprise a single flexible structure, and

(c) through spaced apart apertures on said elongated structural means for permitting free air flow when the said structure is inserted within the nasal passgeway and also permitting adjustments of the said sides relative to each other over a period of time commensurate with the users capability of withstanding discomfort and need.

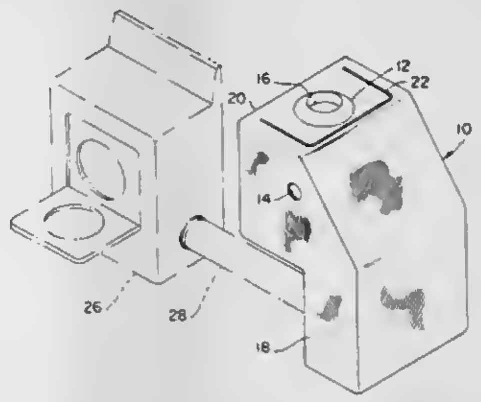
4,105,036
PORTABLE SAUNA

Joseph Michael McGrath, 51 Black Rock Pl., Holland, Pa. 18966

Filed Sep. 10, 1976, Ser. No. 722,113

Int. Cl.^{2} A61N *33/06*

U.S. Cl. 128—374 **4 Claims**



1. A portable sauna comprising a user compartment which is characterized by flexible compartment sidewalls and by the introduction of heat and moisture from an external source into the compartment interior, said compartment being pressurized by the outside source to an inflated condition; said source being clean, moist, heated air, said air being adapted to heat the compartment interior and to inflate the compartment, said external source being a conventional home clothes dryer; and means for connecting a conduit, said conduit leading the air from exteriorly of the compartment to the compartment interior.

4,105,037

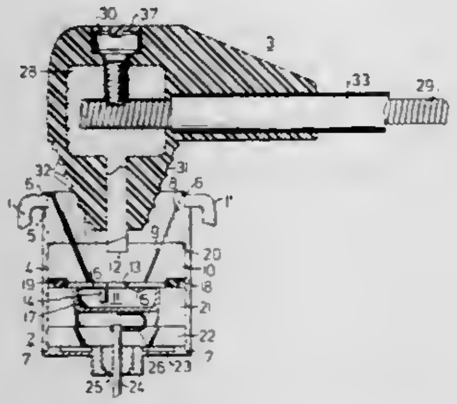
RELEASABLE ELECTRICAL CONNECTING MEANS FOR THE ELECTRODE TERMINAL OF AN IMPLANTABLE ARTIFICIAL CARDIAC PACEMAKER

Gerolf Richter, and Scott B. Shanks, both of Berlin, Fed. Rep. of Germany, assignors to Biotronik Mess- und Therapiegerate GmbH & Co., Berlin, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,659

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—419 P **27 Claims**



1. A releasable connector assembly for use in an implantable cardiac pacemaker system including an electrode, an electrode housing within which one end of the electrode is secured, a pacemaker unit, and a pacemaker housing of electrically conductive material in which the pacemaker unit is secured, said connector assembly comprising: a first member secured to the pacemaker housing and including first electrical connector means arranged to be connected to the pacemaker unit; a second member secured to the electrode housing and including second electrical connector means in conductive contact with the one electrode end and arranged to be placed in conductive contact with said first connector means; one of said members defining a recessed conical surface located between the housing and connector means associated with said one of said members, the other of said members defining a protruding conical surface formed to establish a hermetic sealing connection with said recessed conical surface and located between the housing and connector means associated with said other one of said members, and said one of said members including a body of ceramic material disposed near said connector means associated with said one member and defining part of said recessed conical surface; and securing means associated with said members for releasably connecting them together with said conical surfaces in sealing contact and said first and second connector means in conductive contact.

4,105,038

ACID TREATED POLYETHER POLYURETHANE FOAM END WRAP

David Martin Adrion, Phoenix, Ariz., and Lloyd Bruce Hartsough, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 26, 1976, Ser. No. 670,940

The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.

Int. Cl.^{2} A45D *7/00*

U.S. Cl. 132—7 **9 Claims**

1. An end wrap for use in the permanent waving process which comprises a permeable flexible wafer of open-celled polyether polyurethane foam having a thickness of from about 1/16 inch to about 1/64 inch, an average pore incidence within the range of from about 30 to 120 pores per linear inch and, contained in said end wrap, a solid, carboxylic acid having a pK_1 of from about 2.5 to about 6.0, said acid being present at a level of at least 5 milligrams of acid per cubic inch of foam.

4,105,039

SHORTENABLE UMBRELLA

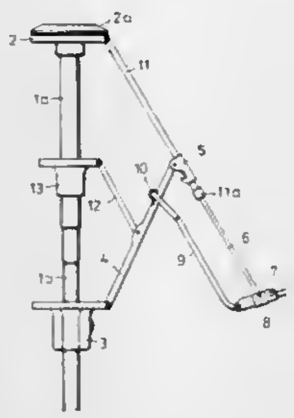
Tilmann Schultes, and Joachim Seidel, both of Solingen, Fed. Rep. of Germany, assignors to Kortenbach & Rauh Kommanditgesellschaft, Solingen, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,449

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626478

Int. Cl.^{2} A45B *19/10*

U.S. Cl. 135—25 A **8 Claims**



1. A shortenable umbrella having blades carrying the umbrella canopy, the blades being shortenable by telescoping and/or folding, and having a shortenable rod assembly and a crown secured on the shortenable rod assembly and for each innermost blade at least one fork operatively connected by means of at least one slider, the latter displaceably disposed on the shortenable rod assembly, for pivoting the blades, comprising a plurality of the following combination

- an innermost blade being pivoted on the crown,
- an outermost blade having an extension,
- a middle blade operatively connected to said innermost and outermost blades, respectively,
- a fork being operatively connected to said blades and to the slider,
- a control rod operatively connected to said extension of said outermost blade, said outermost blade being hinged foldably onto said middle blade and actuatable therefor by means of said control rod,
- said control rod having an inner end engaging behind said fork with direct contact,
- guide member means for guiding said control rod on a limited path along said fork, said inner end of said control rod being articulated on said guide member means.

4,105,040

TEMPERATURE RESPONSIVE VALVE SEAL

Arnold M. Chester, 129 Montclair Dr., West Hartford, Conn. 06107

Filed Jun. 27, 1977, Ser. No. 810,302

Int. Cl.^{2} F16K *5/06*

U.S. Cl. 137—72 **10 Claims**

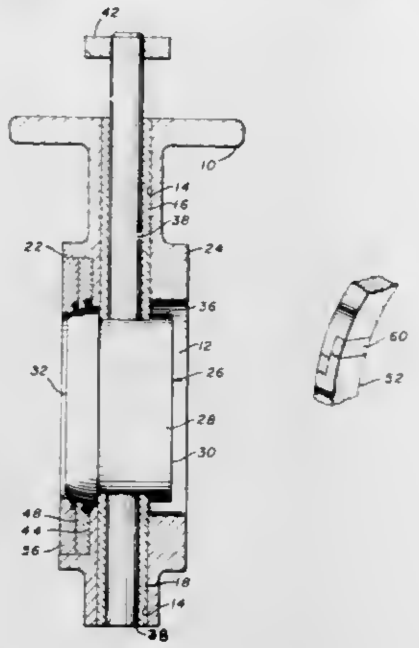
1. A valve comprising:

a. a housing including a generally cylindrical flow passage therethrough;

b. a generally disc shaped closure member including an annular peripheral sealing surface, said closure member mounted for rotation in said flow passage between a first position where said flow passage is open and a second position where said flow passage is closed;

c. a first annular sealing member formed from a resilient material and mounted on said housing whereby said first annular sealing member sealingly contacts said peripheral sealing surface of said closure member when said closure member is in said second closed position;

d. a second annular sealing member formed from non-resilient material, said second annular sealing member being mounted on said housing surrounding said peripheral sealing surface and being expandable in diameter whereby said second annular sealing member seals on said peripheral sealing surface when un-expanded and is spaced from said peripheral sealing surface when expanded; and



e. means holding said second annular sealing member in said expanded condition, said holding means being adapted to permit said second annular sealing member to return to said un-expanded position when a preselected high temperature is reached whereby said second annular sealing member seals against said peripheral sealing surface.

4,105,041

HYDRAULIC SYSTEM

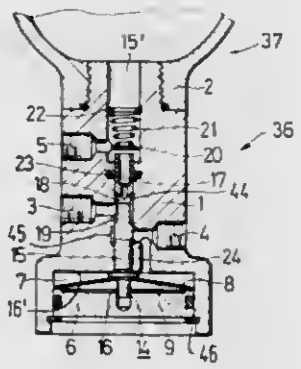
Ludwig Axthammer, Hambach, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Fed. Rep. of Germany

Filed Aug. 3, 1976, Ser. No. 711,153

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535221

Int. Cl.^{2} F16K *11/10*

U.S. Cl. 137—116 **11 Claims**



1. A hydraulic system comprising:

(a) a valve casing formed with first, second, and third ports;

(b) a valve member movable in said valve casing between a first position and a second position,

(1) said valve member and said casing defining a conduit connecting said first and third ports in said first position of said valve member, said valve member closing said conduit in said second position of said valve member;

(c) check valve means connecting said first and second ports in response to fluid pressure in said first port higher than the fluid pressure in said second port while disconnecting said first and second ports when the fluid pressure in said second port is higher than in said first port;

(d) yieldably resilient means permanently biasing said valve member to move from said first to said second position thereof; and

(e) means on said valve member responsive to pressure of fluid in said second port for moving said valve member from said second position toward the first position thereof against the biasing force of said yieldably resilient means,

(1) said force decreasing during a portion of said movement of the valve member from said second position toward said first position.

4,105,042

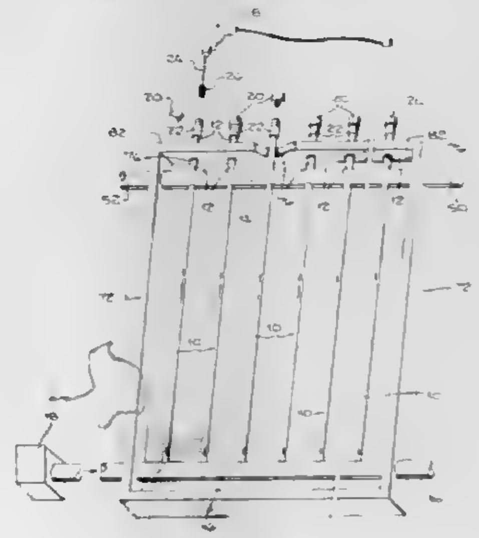
SOLAR HEATING METHOD AND APPARATUS

Franklin K. Johnston, Jr., 118 N. Almansor, Alhambra, Calif. 91801

Filed Mar. 29, 1977, Ser. No. 782,513

Int. Cl.^{2} F28G *3/04*

U.S. Cl. 137—245 **9 Claims**



1. A pipe assembly for a solar heater comprising:

a plurality of longitudinal pipe sections for conducting a fluid, with each of said pipe sections having an opening at the end thereof;

plug means adapted to be fitted through the end of each of said plurality of longitudinal pipe sections for controlling the rate of flow of fluid through the pipe assembly; and

cap means including a plurality of caps each associated with one of said longitudinal pipe sections and secured to the end thereof and removable to enable cleaning of the inside of the associated pipe section.

4,105,043

FAUCET VALVE

Hans Nicolayczik, Minheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,174

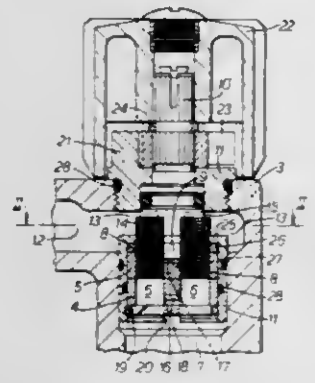
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626386

Int. Cl.^{2} F16K *25/00*

U.S. Cl. 137—454.2 **9 Claims**

1. A valve adapted for removable insertion in a valve body used for the control of flow in a plumbing fixture comprising; first and second discs in intimate movable contact with one another along a common interface, the first disc provided with at least one inlet aperture therethrough adapted to be positioned at one end in fluid communication with the inlet channel of a valve body and at the other end adjacent face of the second disc, the second disc having at least one passage aperture therethrough positioned so that relative movement between the discs will direct the apertures therein between the blocked shut-off position with the apertures out of alignment and the partially and completely overlapped positions where fluid can flow through the discs, the discs being mounted in a sleeve and the discs and sleeve being connected to one end of

a spindle, the interconnected discs, sleeve and spindle being removably mounted in a valve body, at least one outlet aperture in the sleeve adapted to be positioned in fluid communication with an outlet on a valve when mounted therein, at least one flow stabilizing insert arranged at a predetermined point in



the flow passageway between the at least one inlet aperture in the first disc and the at least one outlet aperture in the sleeve, the at least one insert being arranged in the at least one passage aperture in the second disc and extending with one end near the interface between the discs.

4,105,044

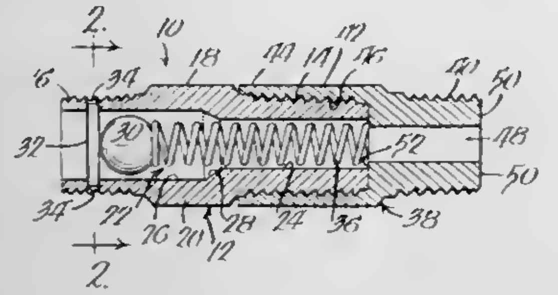
FLOW CHECK VALVE WITH BIAS SPRING REMOVAL CAPABILITY

Joseph J. Davitt, Kalamazoo, Mich., assignor to Ward Aero, Inc., Three Rivers, Mich.

Filed Nov. 15, 1976, Ser. No. 741,609

Int. Cl.² F16K *17/28*

U.S. Cl. 137—517 **1 Claim**



1. A flow check valve with on-line in-service inspection capability comprising:

a plug member housing having an orifice for passing forward fluid flow through said valve defined by a peripheral seat in the housing; said housing having a wall means with an exterior surface and an interior surface defining an interior chamber, a cylindrical exterior threaded outlet end, a hexagonal exterior middle portion, and a cylindrical exterior threaded upstream end; said interior chamber having a cylindrical upstream passage on one side of said seat and a cylindrical downstream passage on the other side of said seat and having a larger diameter than said upstream passage; said seat being a frusto-conical portion of said interior surface situated between said cylindrical upstream passage and said cylindrical downstream passage; said wall means having a pair of retaining pin holes on a diameter of said downstream passage, each hole passing through said wall means from said downstream passage radially outwardly to said exterior surface;

a spherical plug member having a diameter less than the diameter of said downstream passage, disposed within said downstream passage, and adapted for sealing against said seat to block said orifice in response to reverse fluid flow through said valve;

a solid cylindrical retaining pin disposed across the diameter of said downstream passage and received at each end within one of said retaining pin holes for retaining said plug member within said downstream passage when the plug member is displaced from said seat in response to said forward flow;

a helical compression spring disposed within said interior chamber with one end thereof extending within said upstream passage for biasing said plug member in a direction away from said seat and toward said retaining pin; and

a spring reaction support member, having a substantially cylindrical body with an exterior-threaded inlet end, a depending peripheral flange having a hexagonal exterior surface and a cylindrical inner surface threadingly engaged with said exterior-threaded upstream end of said plug member housing, and an interior cylindrical inlet passage communicating between said inlet end and said interior chamber upstream passage, said inlet passage being of smaller diameter than said upstream passage and aligned on the same longitudinal axis as said upstream passage, whereby an annular face on said spring reaction support member is defined by the area between the concentric ends of said support member inlet passage and said interior chamber upstream passage for supporting the other end of said helical compression spring.

4,105,045

DEVICE FOR MIXING LIQUID REACTION COMPONENTS

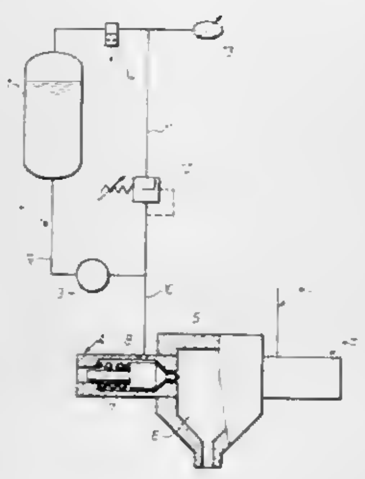
Ferdinand Althausen, Neunkirchen, and Reiner Raffel, Siegburg, both of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Jan. 2, 1976, Ser. No. 646,217

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501483

Int. Cl.² B29B *1/04*

U.S. Cl. 137—563 **2 Claims**



1. In a device for mixing liquid reaction components forming a foam after reaction comprising a storage container for each reaction component, a feed pipe leading from each storage container to a common mixing head where said pipe terminates in a pressure controlled injecting jet which points into a mixing chamber, and a return pipe containing a shut-off valve, said return pipe branching off from the pressure side section of each feed pipe, the return pipe opening out into the respective suction side section of the feed pipe, theimprovement wherein a pressure adjustable initial stress valve whose adjusted initial stress pressure is greater than the solution pressure of the gases or air contained in the reaction components but less than the opening pressure of the injection jet is located in each return pipe.

4,105,046

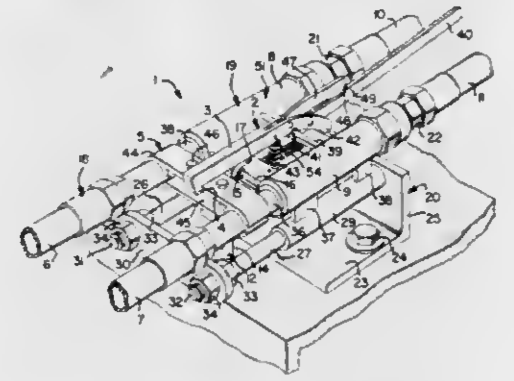
DETACHABLE FLUID COUPLING

Clifford M. Sturgis, 1213 Westmoreland, Colorado Springs, Colo. 80907

Filed Mar. 31, 1977, Ser. No. 783,494

Int. Cl.² F16L *37/12*

U.S. Cl. 137—594 **12 Claims**



1. A detachable fluid coupling for connecting a source of fluid pressure to a fluid operator, said fluid coupling comprising:

(a) a support frame mounted on a structure having a source of fluid pressure including a plurality of fluid conduits with respective free ends thereof positioned adjacent one end of said support frame;

(b) a plurality of valve members slidably mounted for simultaneous longitudinal movement on said support frame and each having a respective one of the free ends of said fluid conduits connected thereto, said valve members each detachably receiving a respective one of a plurality of fluid conduits of a fluid operator;

(c) a first lever member positioned between said valve members and having one end portion thereof pivotally mounted on at least one of said valve members;

(d) a second lever member having one end portion thereof pivotally connected to said first lever member, said one end portion of said second lever member being spaced from said one end portion of said first lever member, said second lever member having a hook portion on the other end portion thereof;

(e) holding means mounted on the plurality of fluid operator conduits for positioning same to be received in said respective valve members and engageable by said second lever hook portion for retaining said fluid operator conduits in flow permitting position;

(f) a ramp member mounted on another end of said support frame and extending therefrom, said ramp member being positioned between said valve members; and

(g) uncoupling means mounted on the plurality of valve members and engageable with said ramp member and said second lever member for moving said hook portion thereof out of engagement with said holding means in response to separation of the fluid operator from the structure having the source of fluid pressure.

4,105,047

VALVE APPARATUS

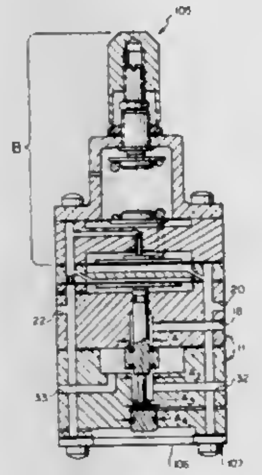
John J. Smallwood, King, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Division of Ser. No. 530,186, Dec. 6, 1974, Pat. No. 4,073,313. This application Oct. 14, 1977, Ser. No. 842,260

Int. Cl.² F16K *11/04*

U.S. Cl. 137—625.6 **1 Claim**

1. Valve apparatus comprising a valve body, said valve body having an inlet and an exhaust valve aperture and a locking piston isolation aperture, supply valve means including a locking piston member located within said valve body for controlling fluid supplied to said valve body, said supply valve means having manual resetting means for resetting of said supply valve means, means for isolating said locking piston member from the inlet when the exhaust valve aperture is closed, pressure assist means for permitting the pressure of the fluid controlled by said supply valve means to assist in the positive action of said supply valve means and for permitting the pressure of the fluid being controlled to assist in maintaining said supply valve means in the normally open position, said pressure assist means comprising the exhaust valve aperture and the locking piston isolation aperture where the area of the cross section of the exhaust valve aperture is greater than the area of the cross section of the locking piston isolation aperture, at least one signal valve associated with said valve body for controlling the operation of said supply valve means.



4,105,048

HIGH ENERGY LOSS DEVICE

Richard E. Self, Los Alamitos, Calif., assignor to Control Components, Inc., Irvine, Calif.

Division of Ser. No. 611,737, Sep. 9, 1975, Pat. No. 4,068,683. This application Feb. 3, 1977, Ser. No. 765,171

Int. Cl.² F15D *1/02, 1/14*

U.S. Cl. 138—42 **2 Claims**

1. An exhaust valve for expelling a pressurized high temperature fluid to atmosphere comprising:

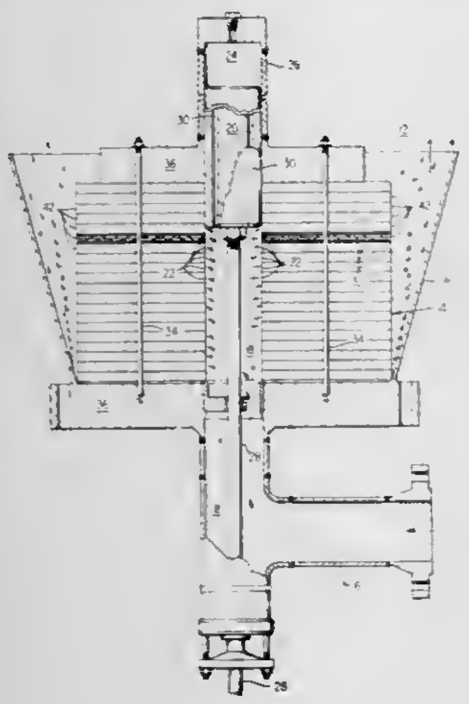
a series of elements having adjacent surfaces joined to form a rigid structure;

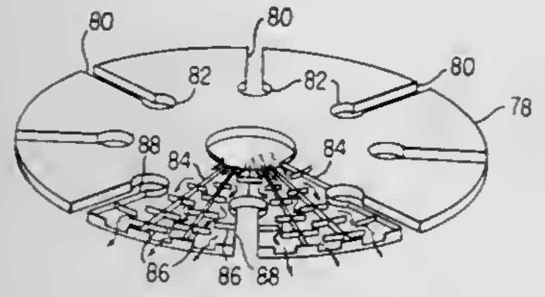
a multi-turn labyrinth formed between the adjacent surfaces of said elements to provide a pressure drop for fluid flowing therethrough;

a central aperture extending through said series of elements in a substantially perpendicular manner relative to the adjacent surfaces thereof and providing an inlet to said multi-turn labyrinth therealong;

outlet means formed along the external surface of said rigid structure to exhaust the fluid from said multi-turn labyrinth to the atmosphere; and

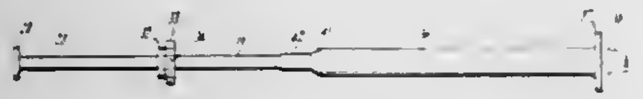
stress relief means formed along the external surface of said rigid structure to prevent splitting of said elements of said rigid structure due to a temperature difference between the high temperature fluid at the inlet and the low temperature fluid at the outlet, wherein said stress relief means includes a series of similarly spaced and cut radial cutouts formed in the adjoining surfaces of each of said elements and wherein each of said elements is oriented to have the radial cutouts of each element aligned to form a series of cutouts extending vertically through the entire rigid structure.





4,105,049
ABRASIVE RESISTANT CHOKE

Clarence E. Anderson, Edmonton, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Canada
Filed Dec. 15, 1976, Ser. No. 750,788
Int. Cl.^{2} F15D ***1/02***
U.S. Cl. 138—44 **6 Claims**



1. A choke assembly for use on producing wells and the like, comprising in combination

a flow straightening section for carrying said producing well effluent, comprising

a constant diameter straight passage therethrough having a length at least ten times said diameter, and

coupling means for the inlet and outlet ends of said straightening section,

a choke section for reducing the pressure of said well effluent, comprising

a predetermined constant diameter passage at the outlet end for providing the desired amount of choking,

a wide mouth tapered passage at the inlet end for gradually reducing said flow straightening section,

said tapered passage having an angle of taper of less than about eight degrees and having a maximum diameter the same as said flow straightening section passage, and

means for cooperating with said outlet end coupling means of said flow straightening section,

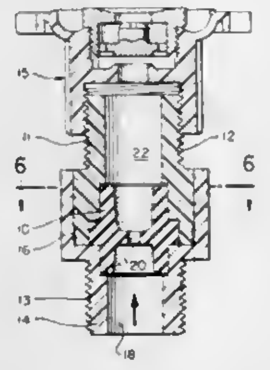
and an expansion section for receiving the effluent from said coke section, comprising

a constant diameter conduit having an inside diameter greater than the inside diameter of said flow straightening section, and

coupling means for removably joining the said outlet end of said choke section to said expansion section.

4,105,050
INTEGRAL FLANGED ELASTOMERIC FLOW RESTRICTOR

Donald W. Hendrickson, Bedford Canyon Rd., Corona, Calif. 91720, and James S. Howard, Riverside, Calif., assignors to Donald W. Hendrickson, Corona, Calif.
Filed Oct. 20, 1976, Ser. No. 734,227
Int. Cl.^{2} F16K ***15/14***
U.S. Cl. 138—45 **4 Claims**



1. An elastomeric flow restrictor for producing a relatively constant fluid volume flow over a range of input pressure comprising:

an annular main body member having defined through it an annular flow passage orifice;

said main body having annular flanges on the upstream and downstream sides of said orifice for strengthening the region in said main body around said orifice;

the inner diameter of said annular flanges exceeding the diameter of said orifice;

the exterior diameter of said flanges being less than that of the main body for defining shoulders on the main body;

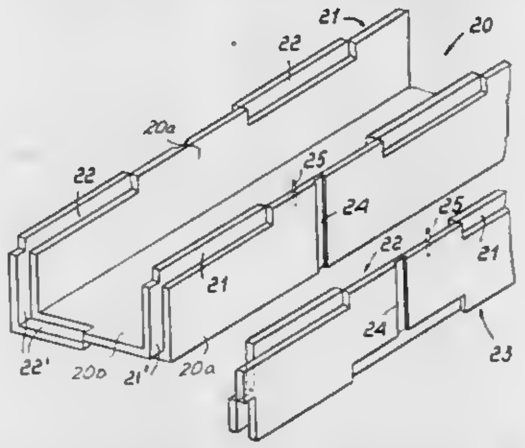
the shoulder on the downstream side being beveled slightly so that the outer perimeter is further downstream than the inner perimeter along said downstream flange; and

said main body and flanges being integrally molded as a single unit from an elastomeric compound, which deforms in response to increased fluid pressure to decrease the size of the passage orifice in response to an increase in fluid pressure by flow of material from said flanges and body member to the means defining the orifice.

4,105,051
PREFABRICATED COMPOSABLE DUCT ELEMENT

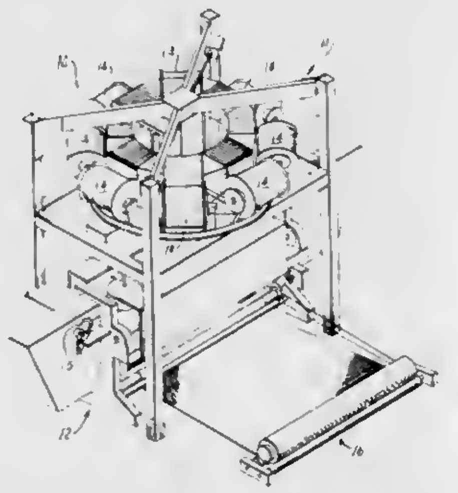
Andrea Visentin, Via IV Novembre 56, Treviso, Italy
Filed Jul. 19, 1976, Ser. No. 706,708
Claims priority, application Italy, Jul. 25, 1975, 82535 A/75
Int. Cl.^{2} F16L ***9/00***
U.S. Cl. 138—162 **5 Claims**

1. A composable duct element for piping aeriform fluids and for use in erecting concrete casting boxes, comprising two spaced apart facing walls and a wall connecting said facing walls to one another, each of said facing walls having edges including a longitudinal edge and two end edges opposite to one another and at a right angle with respect to said longitudinal edge, and said connecting wall having opposite ends, wherein said edges and said ends have notches and tongues for matching connection with further duct elements, the notches and tongues of said longitudinal edge of said facing walls being alternately arranged on the inner and on the outer side of facing walls and each of the notches provided on one side of each of said walls defining a corresponding tongue on the other side of the same wall and having a corresponding notch on the other side of the other of said walls, the notches and tongues of each of said opposite ends of said connecting wall being alternate and each having a corresponding notch and tongue on the opposite end arranged symmetrically opposite with respect to a plane half-way dividing said connecting wall longitudinally, and the notches and tongues of said end edges of said facing walls being consecutive to the respective adjacent notches and tongues of said longitudinal edges of said facing walls and the respective adjacent notches and tongues of said opposite ends of said connecting wall.



4,105,052
MODULAR CONSTRUCTION FOR TRIAXIAL WEAVING MACHINE

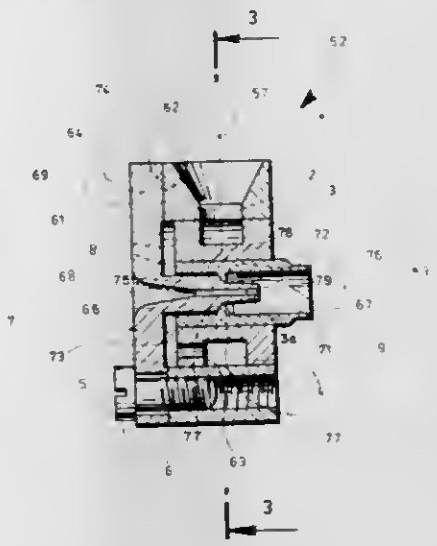
Wayne C. Trost, and Burns Darsie, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.
Continuation of Ser. No. 670,177, Feb. 24, 1976. This application Dec. 27, 1976, Ser. No. 757,773
Int. Cl.^{2} D03D ***41/00***
U.S. Cl. 139—101 **14 Claims**



1. A separable modular triaxial weaving machine comprising in selective combination a warp supply module having means for forming a plurality of warp strands into a pair of flat warp sheets moving laterally in opposite directions, and a weaving module having means for forming said oppositely moving warp sheets into sheds, said warp supply and weaving modules being individual independently mounted units, said warp supply module comprising a frame having a plurality of upright legs which straddle the weaving module and are spaced so as to provide an opening which permits movement of the weaving module therebetween, said frame mounting the warp supply above the weaving module, drive means for the weaving module, driven means for the warp supply module, and positive interconnecting means connecting the drive means with the drive means so as to insure synchronism of the operation of the modules.

4,105,053
NOZZLE ASSEMBLY FOR A HYDRAULIC JET LOOM

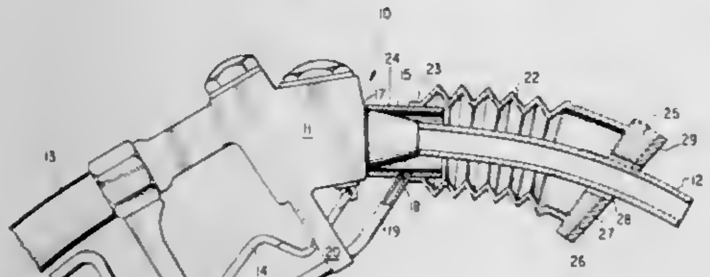
Václav Fajfr, Tyniste nad Orlici, Czechoslovakia, assignor to ELITEX, koncern textilnibo strojlrenstvi, Liberec, Czechoslovakia
Continuation-in-part of Ser. No. 716,599, Aug. 23, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,575
Claims priority, application Czechoslovakia, Oct. 2, 1975, 6664/75
lot. Cl.^{2} D03D ***47/32***
U.S. Cl. 139—435 **5 Claims**



1. In a nozzle assembly for a hydraulic jet loom, an annular housing having front and rear end surfaces transverse to its axis and a radial opening extending through the annular wall of the housing intermediate said front and rear end surfaces thereof for admitting a weft-propelling liquid, an annular insert having a hollow interior, the insert being disposed within the housing coaxially thereof, the insert having a peripheral annular recess confronting and in communication with the radial opening in the housing, a tubular nozzle having a plate-like flange at its forward end, the nozzle having a central passage therethrough adapted for the rearward propulsion of a weft extending axially therethrough, the tubular nozzle extending rearwardly into the hollow interior of the insert coaxially thereof, the radially inner rear surface of the flange and the radially inner front surface of the insert being axially spaced apart and defining between them an annular pressure chamber disposed radially outwardly of the passage in the nozzle, conduit means for selectively connecting the pressure chamber to the rear end portion of the outer peripheral surface of the nozzle to communicate with and to propel rearwardly the weft thread extending through the passage in the nozzle, and valve means interposed in said conduit means selectively closing off and opening said conduit means, the improved arrangement for reducing turbulence in the flow of hydraulic pressure pulses between the radial opening in the housing and the pressure chamber, wherein the nozzle and the insert are so positioned that the pressure chamber is axially aligned with the peripheral recess in the insert, and wherein the conduit means comprises an even number of bores extending axially forwardly through the insert from the front wall of the peripheral recess in the insert to the front surface of the insert to provide fluid communication between the peripheral recess and the pressure chamber, the number of such axial bores being at least equal to 4.

4,105,054
VAPOR SEALING MEANS FOR FUEL DISPENSING NOZZLES

Bernard E. Weidenaar, Harvey, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Continuation of Ser. No. 599,452, Jul. 28, 1975, abandoned, which is a continuation of Ser. No. 473,454, May 28, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 767,709
Int. Cl.² B65B *3/18*
U.S. Cl. 141—311 R **18 Claims**



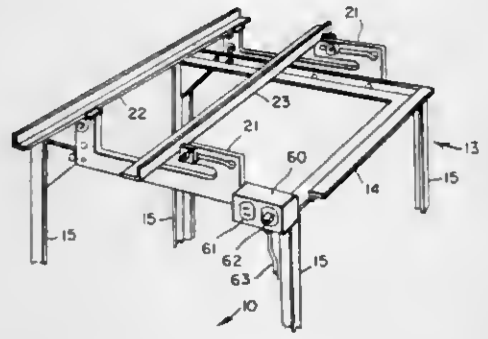
1. A liquid dispensing nozzle assembly for delivery of liquid from a liquid source to a liquid receiver having a receiver inlet and provided with means to allow for the removal of vapor during delivery of liquid to said receiver inlet from said source, said nozzle assembly comprising:

(1) a liquid dispensing nozzle having a nozzle inlet, a nozzle housing and an elongated discharge spout adapted for insertion into said receiver inlet;
(2) a vapor collector surrounding, in spaced relation thereto and forming a chamber therearound, the upper portion of said spout nearest said nozzle housing, said chamber being in fluid communication with the receiver inlet when said spout is inserted into said liquid receiver, one end of said vapor collector being sealed to said nozzle housing or said nozzle discharge spout, a magnet sealant means carried by the other end of said vapor collector and having an exposed face for forming a surface seal against the outer surface of said receiver inlet, said spout extending beyond the other end of said vapor collector; and
(3) means for allowing removal of vapor from said nozzle assembly; the improvement comprising said magnet sealant means comprising an anisotropic magnet with an exposed face comprising a resilient material selected from the group consisting of leather, polychloroprene, silicone rubber and a compressible cellular plastic material for contacting the receiver inlet, said anisotropic magnet having
  (a) a hard continuous medium, and
  (b) a strong magnetic attraction for ferrous materials in a direction substantially axially with said spout;

said material having
  (a) compressibility of the material in contact with the outer surface of the receiver inlet to allow the anisotropic magnet to urge said face against said receiver inlet when said spout is inserted into and said face contacts said receiver inlet;
  (b) substantial resistance to the liquid dispensed and vapor being removed, and;
  (c) the ability to form a seal against the outer surface of said receiver inlet and reduce the amount of vapor escaping to the atmosphere during the liquid dispensing when said spout is inserted into and said exposed face contacts the outer surface of said receiver inlet.

4,105,055
PORTABLE WORKSHOP

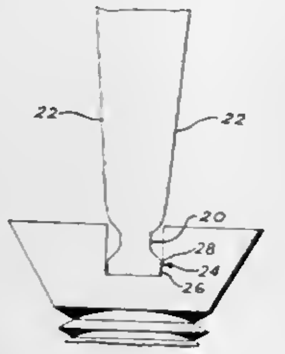
Robert Brenta, 36-31 12th St., Long Island City, N.Y. 11106, assignor to Robert Brenta, Long Island City, N.Y.
Filed Sep. 1, 1976, Ser. No. 719,411
Int. Cl.² B25H *1/04*
U.S. Cl. 144—286 R **4 Claims**



1. A portable, collapsible shop comprising, in combination, a table having a generally rectangular, horizontal frame mounted on vertical legs, a pair of brackets mounted on opposite sides of said frame, a pair of spaced apart rails mounted on said brackets transversely spanning said frame and spaced on top thereof, a plurality of conventional portable power tools including a circular saw, a jig saw, and a router, a wooden table top capable of securely fitting onto said frame, a metal table top capable of securely fitting onto said frame alternatively with said wooden top, said metal table top comprising spaced apart openings, each opening appropriately shaped to accommodate therein the operative portion of a respective one of said circular saw, said jig saw and said router, respective attachment means for said circular saw and router for alternative placement on said rails for slidable travel or rigid securement thereupon and for use in conjunction with said wooden table top, clamping means coupled to said metal table top for respectively securing said circular saw and said router to appropriate positions on the underside of said metal table top with their operative portions extending into their respective openings in said metal table top, arm means coupling said jig saw to said table and positioning it above the table with its operative portion extending into its respective opening in said metal table top, and a carrying case for carrying the tools and parts of said portable collapsible shop.

4,105,056
NONSLIP SCREW DRIVER

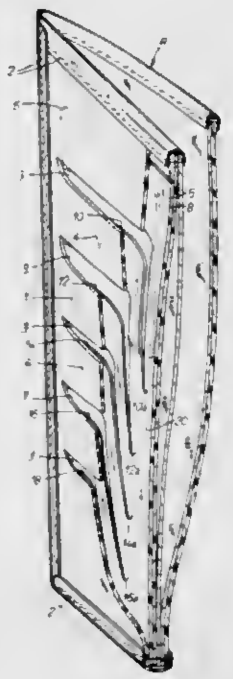
Edward T. Arnn, 505 Country La., Louisville, Ky. 40207
Continuation-in-part of Ser. No. 491,361, Jul. 24, 1974, Pat. No. 3,923,088, which is a continuation-in-part of Ser. No. 473,840, May 28, 1974, Pat. No. 3,897,812. This application Oct. 14, 1975, Ser. No. 621,735
Int. Cl.² B25B *15/00*
U.S. Cl. 145—50 A **4 Claims**



1. A screw driver for use in combination with a screw comprising: a shank portion and a blade portion integral therewith, said blade portion terminating at its free end in a foot portion, said foot portion being integral through a smooth transition portion with said blade and being generally pentagon shaped in side cross-section with one side defining a base portion lying in a plane generally perpendicular to the axis of the shank and being engagable with the bottom of a slot having generally parallel sidewalls of a preselected depth in a screw head, said foot portion further having two opposed sides defining upstanding faces adjoining the base of the foot portion and extending across the entire width of the blade, said upstanding faces being of a height less than the depth of said screw slot and thereby engagable with at least the lower portion of said parallel sidewalls of said screw slot to transmit torque thereto, said upstanding faces sloping outwardly and upwardly from the base of said foot portion and terminating respectively at inwardly sloping sidewalls which define the uppermost portion of said foot portion, said inwardly sloping sidewalls extending the entire width of said blade and being integral with said transition portion which, in turn, is integral with said blade.

4,105,057
FLEXIBLE RECEPTACLE WITH CREDIT CARD HOLDER

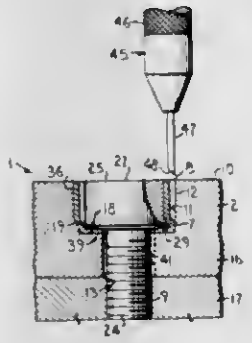
Terry F. Baumann, Milwaukee, and Gerald W. Brummer, West Bend, both of Wis., assignors to Amity Leather Products Company, West Bend, Wis.
Filed Sep. 23, 1977, Ser. No. 835,890
Int. Cl.² A45C *1/06*
U.S. Cl. 150—35 **1 Claim**



1. A flexible receptacle such as a billfold or the like and including a credit card holder for holding a series of credit cards in shingled, overlapping relationship, said receptacle comprising an outer flexible wall having a series of spaced apart parallel slits therein and which in turn define a series of parallel flaps, said card holder including a flexible liner located against a back-side of said outer flexible wall, said flexible liner having a plurality of pairs of curved slits therein, said pairs of slits being spaced apart from one another in a vertical direction in said liner, the slits of each pair of slits being spaced apart from one another in a lateral direction in said liner and defining a central portion of said liner which is unobstructed and of one-piece construction for the major portion of the height of said liner, the slits of each pair of slits curved inwardly a substantial distance and then downwardly as they approach towards one another and adjacent slits in a vertical direction are sufficiently spaced apart from one another so as to form flexible liner flaps of considerable glue area, said liner slits also having an upper portion which is located closely adjacent the corresponding said slits of said outer flexible wall so as to form a single slit therewith for the insertion of a credit card therethrough, said liner flaps glued adjacent the upper portion of said curved slits to their respective flaps of said outer wall, each of said pairs of slits having lower parallel portions which between them define said central portion, whereby when said card is inserted through the aligned slits of said outer wall and said liner, said cards are supported by said central unobstructed portion of said liner, said parallel portions terminating in lower hooked shaped ends, said hook shaped ends acting to prevent tearing of said liner when a card is inserted in said slits, said liner including a back panel hingedly mounted thereon and inserted in said receptacle and against the said back side of said outer flexible wall for guiding and rigidifying said liner.

4,105,058
SCREW LOCKING ARRANGEMENT

Stuart E. Bunn, and Herbert B. Owsley, both of Shawnee Mission, Kans., assignors to Ball Valve Company, Inc., Merriam, Kans.
Filed Mar. 31, 1977, Ser. No. 783,493
Int. Cl.² F16B *39/00*
U.S. Cl. 151—41.74 **1 Claim**



1. A screw locking arrangement comprising:

(a) an article having a top surface, and an aperture therein with first and second portions; said aperture first portion including an enlarged counterbore defined by a first side wall, and said aperture second portion having an internally threaded second side wall; said first side wall including an open slot therein, said open slot being substantially coplanar with the axis of the aperture and extending from adjacent an inner end of the counterbore through said article top surface;
(b) a screw having a threaded shank and a head with an outer marginal surface and a top surface; said shank being threadedly engaged in said article second side wall, and said head being positioned within said counterbore; said screwhead including an open slot positioned in the marginal surface thereof; said open slot in the screwhead being substantially coplanar with the axis of the screw and extending from adjacent the inner end of the screwhead through said screwhead top surface, said screwhead slot and said article slot being substantially uniform and rectangular in transverse cross-sectional shape; and
(c) a lock member having a wall with a central aperture through which the screw shank extends, said wall being positioned between the first side wall of said article counterbore and the marginal surface of said screwhead and clamped therebetween with the screw tightened in place; said clamped lock member wall being deformable and bent outwardly into said article slot and inwardly into said screwhead slot thereby positively connecting said screw and said article without indexing the same, and preventing relative rotation therebetween.

4,105,059
METHOD OF REDUCING THE CASTING WIDTH DURING CONTINUOUS CASTING

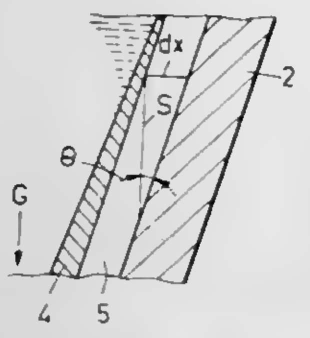
Masayuki Ohnishi; Hisashi Ohmori, and Yoshiji Yamamoto, all of Kurashiki, Japan, assignors to Kawasaki Seitetsu K.K., Kobe, Japan

Filed Sep. 20, 1977, Ser. No. 834,988

Claims priority, application Japan, Sep. 27, 1976, 51-115536

Int. Cl.² B22D *11/04*

U.S. Cl. 164—4 **2 Claims**



1. In a method of decreasing the width of a continuously cast strand, especially a steel strand, wherein at least one small side of an adjustable, oscillating continuous casting mold is displaced during the casting operation, the improvement which comprises:

intermittently moving the small side of the mold in the direction of the center of the mold at a mean velocity of $v'' \leqq f \times S \times \tan\theta$, in such a manner that there successively follow one another movement- and standstill time sections each amounting to $\frac{1}{2}f$ minutes, and wherein;

f represents the mold oscillation frequency in cycles per minute, S the double amplitude of the oscillating mold, and θ the taper angle enclosed by the short side of the mold with the vertical.

4,105,060
CHILL CASTING METHOD AND APPARATUS

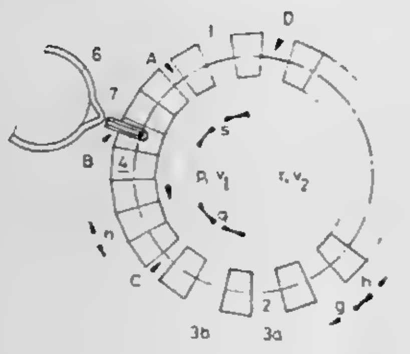
Wilhelm Hauke, Hilzingen, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Oct. 27, 1976, Ser. No. 736,139

Claims priority, application Switzerland, Oct. 31, 1975, 14104/75

Int. Cl.² B22C *9/20*

U.S. Cl. 164—130 **8 Claims**



1. A method for chill casting discrete articles by means of a set of individual separable permanent molds each having opposed front and rear joinder faces with a partial mold cavity formed therein, with abutment of the joinder faces of adjacent molds bringing said partial mold cavities together to form a completed discrete mold cavity, said method comprising the steps of individually recirculating said molds about an endless path, moving said molds along a portion of said endless path past a teeming point with part of said molds temporarily formed in a horizontal stack with the rear joinder face of each mold in abutting relationship with the front joinder face of the following mold, and moving said molds to an emptying point where said molds are temporarily accelerated away from said stack, said permanent molds being moved on their respective paths outside said stack with said joinder faces of successive molds kept spaced from each other and each being conducted in the longitudinal direction of said stack when closing up to the respective last mold of the stack.

4,105,061
PRESSURE VESSELS

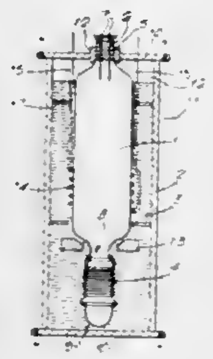
George Tunnicliffe, Newcastle-under-Lyme, England, assignor to Corning Limited, Sunderland, England

Filed Nov. 24, 1976, Ser. No. 744,853

Claims priority, application United Kingdom, Dec. 1, 1975, 49271/75

Int. Cl.² B22C *21/00*

U.S. Cl. 165—1 **19 Claims**



1. A process for storing materials under predetermined positive or negative pressure comprising inserting and sealing within an outer pressure resistant container a fragile storage container incapable of withstanding a pressure differential on opposite sides of its walls respectively greater or less than the said predetermined positive or negative pressure, and substantially filling the interspace between said two containers with a liquid, said fragile container incorporating pressure equalising means whereby the pressure on opposite sides of said fragile container wall is equalised during the creation of said predetermined positive or negative pressure within said fragile container.

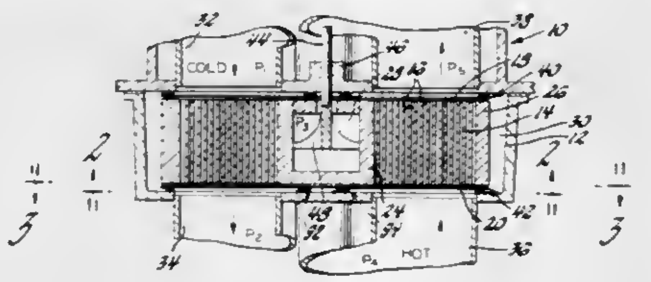
4,105,062
TWO-STAGE REGENERATOR SEAL

Albert H. Bell, III, Birmingham, and Richard M. Zeek, Farmington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 13, 1977, Ser. No. 796,688

Int. Cl.² F28D *19/00*

U.S. Cl. 165—9 **3 Claims**



3. In a regenerator assembly of the type having a rotating matrix with axial passages therethrough separated by cell walls, the improvement comprising means including a support platform with opposite faces and having a rim and a cross arm connected at opposite ends thereof to said rim to form a high pressure space and a low pressure space, a seal wear block supported on one face of said platform engageable with said matrix to separate said high pressure space from said low pressure space, a seal assembly surrounding said high pressure space including a high pressure straight seal leaf supported on said cross arm, said seal leaf including a free end portion directed toward said high pressure space, said high pressure seal assembly further including a plurality of straight rim seal leaf segments formed as chords on the rim of said platform and including fixed ends and free ends directed toward said high pressure space, said lastmentioned free ends having a smaller radius than said fixed ends, means for supporting said rim seal leaf segments on said platform to seal the outer peripheral portion of the high pressure flow path, said straight rim seal leaf segments of said high pressure rim seal being neutrally stressed upon deflection to an installed height to prevent waviness where its free end of a seal leaf is of a smaller radius than its fixed end.

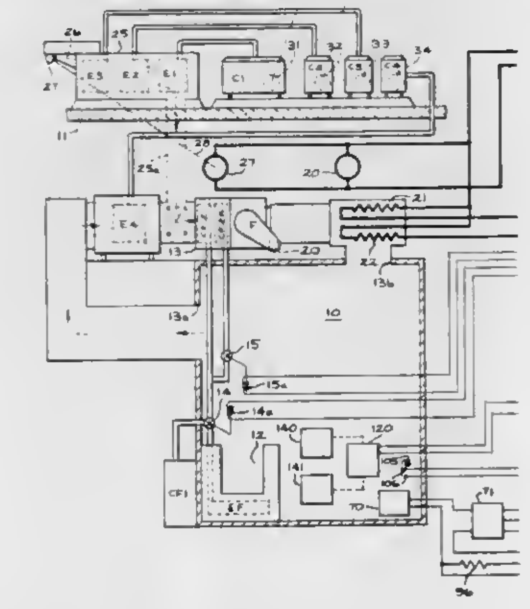
4,105,063
SPACE AIR CONDITIONING CONTROL SYSTEM AND APPARATUS

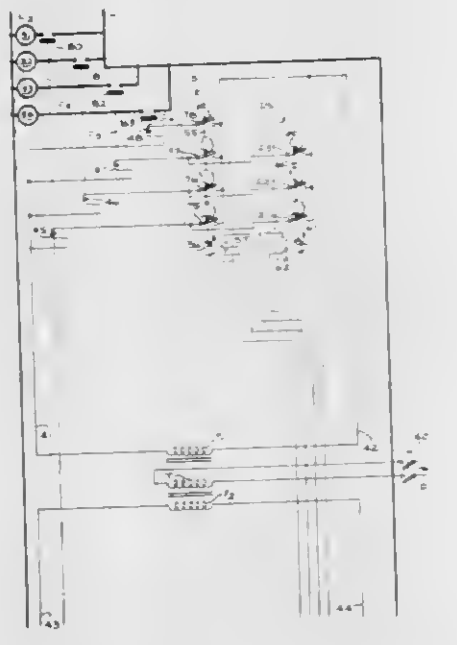
Carl Bergt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 27, 1977, Ser. No. 791,364

Int. Cl.² F24F *3/14*

U.S. Cl. 165—21 **17 Claims**





1. In a condition control system for ambient air in an enclosed space containing independently cooled moisture condensing surfaces, first switching means operable when energized to cool said air, second switching means operable when energized to heat said air, means responsive to ambient air temperature above a preselected normal range for energizing said first switching means and responsive to ambient air temperature below said range for energizing said second switching means, means responsive to absolute moisture content of said ambient air in excess of a preselected maximum value, and means operable by said moisture content responsive means for energizing said first switching means independently of said air temperature responsive means and without disabling said second switching means.

11. The method for maintaining below a predetermined maximum value the dew point temperature of ambient air in a conditioned space provided with heating and cooling apparatus which comprises, cooling said ambient air when dry bulb temperature of said air exceeds a predetermined normal range, heating said air when dry bulb temperature of said air falls below said normal range, cooling said ambient air independently of said dry bulb temperature whenever absolute moisture content of said air exceeds a predetermined maximum value, and reheating said ambient air if said dry bulb temperature falls below said normal range due to cooling in response to excessive absolute moisture content.

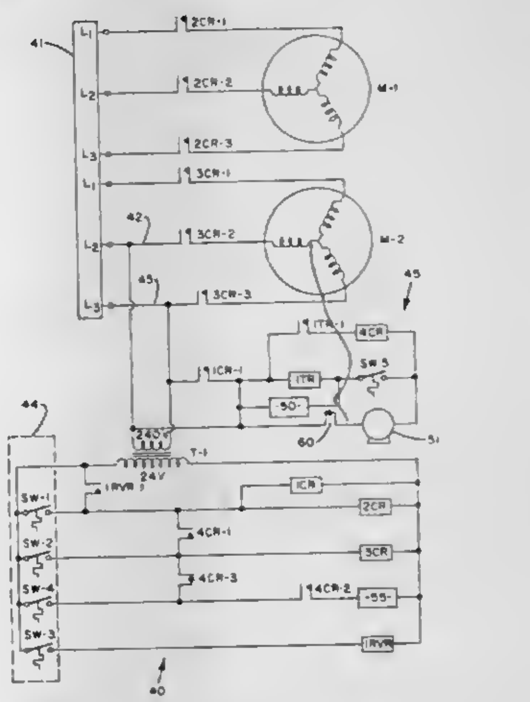
4,105,064
TWO STAGE COMPRESSOR HEATING

James J. Del Toro, Liverpool, and Rudy C. Bussjager, Minoa, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,398

Int. Cl.² F25B *13/00*

U.S. Cl. 165—29 **6 Claims**



1. In a heat pump system having more than one compressor operatively connected to an indoor heat exchanger for providing both heating and cooling within a conditioned region and an outdoor heat exchanger, defrost means arranged to remove ice from the outdoor heat exchanger, and thermostat means in the conditioned region to start the compressors in sequence as the temperature in the conditioned region rises and falls through a series of preset temperature levels, the improvement comprising

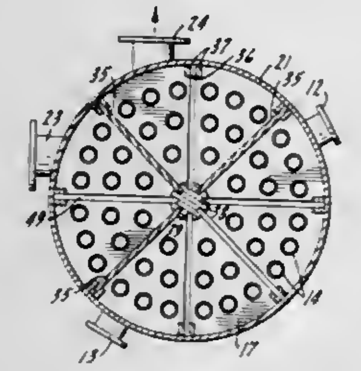
a defrost control circuit which, when compressor is energized in the heating mode of operation activates defrost means to initiate a defrost cycle and overrides the thermostat means to effect starting of at least one additional compressor regardless of the temperature within the conditioned region,

first and second contact means in the control circuit which, when enabled, causes the control circuit to be energized,

means to enable said first contact when the first compressor in the sequence is operating, and means to enable the second contact when the outdoor heat exchanger is exposed to icing conditions.

4,105,065
HEAT EXCHANGER

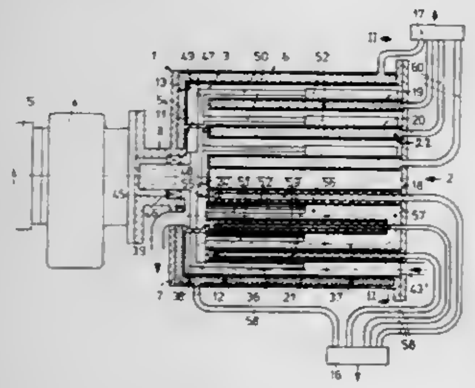
Anthony Nicholas Chirico, Short Hills, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.
Filed Mar. 7, 1977, Ser. No. 774,841
Int. Cl.² F28F *9/02*
U.S. Cl. 165—78 **11 Claims**



1. A variable pass heat exchanger comprising a a plurality of separated groups of longitudinally extending tubes anchored at each of their ends in separate tube sheets, a header at each end of said exchanger defined in part by one of said tube sheets, an inlet and an outlet in one of said headers for a fluid to be brought into heat exchanger relationship with a heat exchange fluid contacting the outside of said tubes, a plurality of longitudinally extending removable baffles in at least one of said headers for dividing said separated groups of tubes into a variable number of isolated groups of tubes having their openings segregated so that all of the first mentioned fluid passes through each such isolated group of tubes, a longitudinally extending post having one of its ends anchored to the center of the tube sheet associated with said one header, there being a plurality of radially extending slots in said post for receiving one edge of each of said baffles, and means aligned with each of said slots for receiving the opposite edge of each of said baffles.

4,105,066
HEAT EXCHANGER

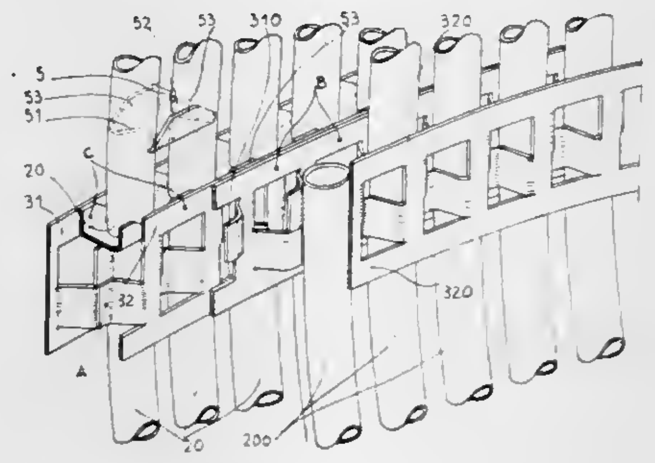
Gerhard Bühler, Rheinfelden, Fed. Rep. of Germany, assignor to FRYMA-Maschinen AG, Rheinfelden, Switzerland
Filed Nov. 2, 1976, Ser. No. 738,109
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549600
Int. Cl.² F28F *17/00;* F28G *3/10*
U.S. Cl. 165—94 **8 Claims**



1. A heat exchanger, in particular a scraping cooling arrangement for fluid matter tending to adhere to the heat-exchanging surface comprising: a pot-shaped casing; and endplate sealing said casing, said casing concentrically interchanging heat-exchanging parts with heat-exchanging agent flowing therethrough; at least three annular chambers for process matter to pass through; a power-driven stripping device having spaced stripping branches protruding axially and unsupported into said annular chambers and having scraper branches fixed and justaposed to the heat exchanger surfaces of said parts, said stripping device being rotatable about the axis of said casing, at least one annular chamber being at one end connected to a nearest outer annular chamber and being connected at the other end to a nearest inner chamber in a circuit, the annular chambers being separated, and a gasket rotating with said stripping device for forming at least one seal; insert means defined by a flanged plate for including cooling elements adapted to be loosely insertable at one end of said casing, said gasket sealing slidingly against said insert means and against the bottom of said casing, said annular chambers being arranged for process matter to flow from an inlet on said casing through one of said annular chambers and then to a bottom chamber in said casing, the process matter flowing from said bottom chamber through a second annular chamber and from said second annular chamber to a third annular chamber for exiting through an outlet of said bottom chamber.

4,105,067
DEVICE FOR LOCATING A LAYER OF TUBES IN AN ENCLOSURE

René Bovagne, Chalon-sur-Saone, France, assignor to Creusot-Loire, Paris, France
Filed Apr. 29, 1977, Ser. No. 792,302
Claims priority, application France, Jun. 16, 1976, 76 18250
Int. Cl.² F28F *1/12*
U.S. Cl. 165—159 **8 Claims**



1. An assembly comprising a layer of tubes, said tubes being substantially parallel over at least part of their length and means for locating said tubes, said means comprising a pair of parallel strips arranged one on each side of the layer of tubes in a plane transverse to the axes of the tubes, means connecting said pair of strips together including a plurality of tube-locating tongues which extend from each of said strips towards the other of said strips, said tongues being inclined relative to said strips, adjacent tongues of each strip being inclined in opposite directions such that each tube is engaged by four tongues, said tongues of said strips being connected together to locate said tubes between said strips and connect said strips together.

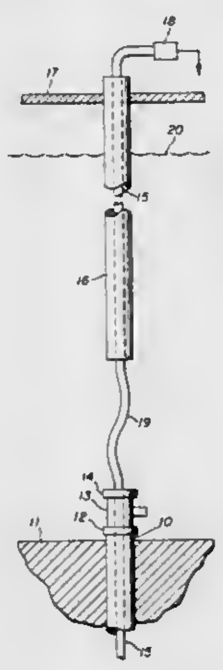
4,105,068
APPARATUS FOR PRODUCING OIL AND GAS OFFSHORE

William A. Tam, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.
Filed Jul. 29, 1977, Ser. No. 820,169
Int. Cl.² E21B *33/035*
U.S. Cl. 166—355 **9 Claims**

1. Apparatus for producing oil or gas from an offshore oil or

gas well using a production platform near or above sea-level which is laterally and vertically displaceable by the sea and wind and which permits well workover from the production platform, comprising:

a. the following elements of a Christmas tree located at about the seafloor:
a first hydraulic connector joined to the wellhead;
a lower master valve joined to the first hydraulic connector; and



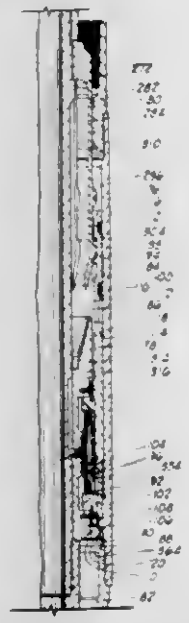
a second hydraulic connector joined to the lower master valve;
b. a production tube extending from the second hydraulic connector to the platform and having a valve means accessible from the platform for oil or gas flow regulation, said production tube having a flexible portion which accommodates lateral and vertical movement of the production tube with the platform, and
c. a production riser around the production tube and extending from the platform to near the seafloor.

4,105,069
GRAVEL PACK LINER ASSEMBLY AND SELECTIVE OPENING SLEEVE POSITIONER ASSEMBLY FOR USE THEREWITH

Eugene E. Baker, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Jun. 9, 1977, Ser. No. 805,075
Int. Cl.² E21B *33/13, 43/10*
U.S. Cl. 166—51 **10 Claims**

1. An operating tool for selectively actuating a sleeve valve of the type which includes:
- a cylindrical housing having at least one port through the wall thereof; and
- a valve sleeve telescopically disposed within said housing and having at least one port through the wall thereof and adapted to communicate with the at least one port of the housing in a first open position and, alternately, sealed from communication with the at least one port of the housing in a second closed position,

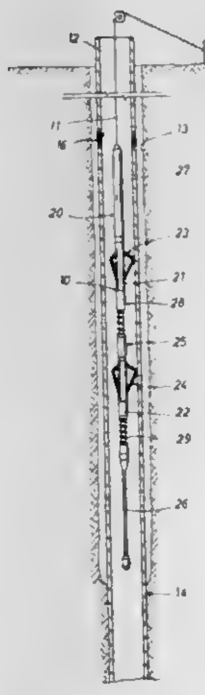
said operating tool comprising:
- opening position means movable throgh said sleeve valve in the first open position in response to movement of said opening positioner means through said sleeve valve in a first direction, said opening positioner means including at least one outwardly biased arm adapted to selectively engage the valve sleeve of said sleeve valve; and
- selective activation means for selectively activating and deactivating said opening positioner means in response to manipulation of said operating too, said selective activation means including arm retractor means adapted to selectively engage said at least one arm for engaging and forcing said at least one arm inwardly against the bias thereof to a deactivated position whereby said opening positioner means can be moved through said sleeve valve in the first direction without placing said sleeve valve in the first open position and, alternately, for disengaging



from said at least one arm and permitting said at least one arm to be moved outwardly in response to the bias thereof to an activated position whereby said opening positioner means can be moved throgh said sleeve valve in the first direction to thereby place said sleeve valve in the first open position.

4,105,070
METHODS FOR DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

Jean C. Lavigne, Chevreuse; Yves Nicolas, Versailles, and André Landaud, Maisons Alfort, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.
Filed Sep. 19, 1977, Ser. No. 834,195
Claims priority, application France, Sep. 28, 1976, 7629054
Int. Cl.² E21B *23/04, 47/00*
U.S. Cl. 166—250 **11 Claims**



1. A method for at least approximately locating the lowermost freepoint of a string of pipe disposed in a well bore and comprising the steps of:
moving a deformation-responsive electrical sensor having

first sensing means preferentially responsive to longitudinal deformations of a pipe string and second sensing means preferentially responsive to angular deformations of a pipe string and which is dependently supported by an electrical suspension cable to a selected depth location within said pipe string;

releasably anchoring only the upper end of said sensor to said pipe string at a first wall surface thereof at said selected depth location for providing a temporary support capable of carrying at least some of the weight of said suspended cable so as to avoid imposing downwardly-directed compressional forces on said sensor before its subsequent release from anchoring engagement with said first wall surface;

lowering said suspension cable for resting a slacked lower portion thereof on said upper sensor end so as to avoid imposing upwardly-directed tensional forces on said sensor should said suspension cable be moved upwardly before the subsequent release of said upper sensor end from anchoring engagement with said first wall surface;

only after said slacked portion of said suspension cable is resting on said upper sensor end, releasably anchoring the lower end of said sensor to said pipe string at a lower second wall surface below said selected depth location for enabling said sensor to be responsive to load-induced deformations in the incremental length of said pipe string then situated between said first and second wall surfaces;

monitoring said sensor for simultaneously detecting first and second electrical signals respectively produced by said first and second sensing means in response to induced longitudinal and angular deformations of said incremental length of said pipe string which may occur upon application of force to the surface end of said pipe string; and

thereafter alternately releasing said upper and lower sensor ends and repeating each of the above-specified steps at different depth locations within said pipe string until one or more electrical signals are produced by said sensor from which at least the approximate depth location of the lowermost freepoint of said pipe string can be determined.

4,105,071

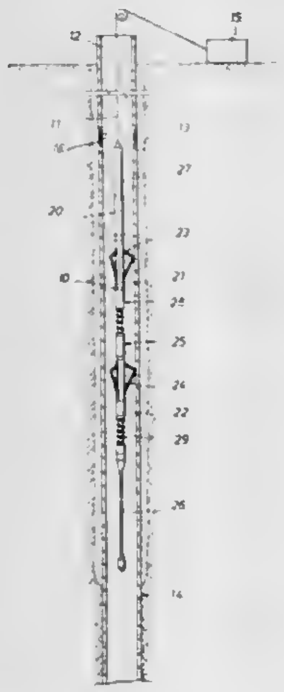
METHODS AND APPARATUS FOR DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

Yves Nicolas, Versailles, and André Landaud, Maisons Alfort, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,196

Int. Cl.^{2} E21B *47/00*

U.S. Cl. 166—250 **12 Claims**



1. A method for determining at least approximately a remote location at which a string of pipe may be stuck in a well bore and comprising:

moving a deformation-responsive sensor having first sensing means preferentially responsive to longitudinal deformations of a pipe string and second sensing means preferentially responsive to angular deformations of a pipe string to a selected depth location within said pipe string and anchoringly engaging the upper end of said sensor to an upper wall surface of said pipe string which is then adjacent to said upper sensor end;

thereafter anchoringly engaging the lower end of said sensor to a lower wall surface of said pipe string which is then adjacent to said lower sensor end; and

thereafter, upon application of force to the surface end of said pipe string, simultaneously monitoring output signals from said first and second sensing means for detecting whether a corresponding longitudinal deformation and a corresponding angular deformation are then being induced in the incremental length of said pipe string between said upper and lower wall surfaces thereby demonstrating that said incremental length of said pipe string is at least partially situated above said remote location.

6. Apparatus adapted to be suspended from an electrical cable and operated at different locations in a string of pipe to obtain measurements representative of deformations occurring therein in response to the application of forces to its upper end for determining at least the approximate location at which that string of pipe may be stuck in a well bore and comprising:

upper and lower anchoring means including upper and lower wall-engaging members adapted for respectively establishing anchoring engagement with the adjacent spatially-disposed wall surfaces of a pipe string;

control means cooperatively arranged and adapted for selectively operating said upper and lower anchoring means so that said upper wall-engaging members can establish anchoring engagement with the wall of a pipe string before said lower wall-engaging members can establish anchoring engagement therewith; and

sensor means cooperatively arranged between said upper and lower anchoring means and adapted for independently producing first and second output signals which are respectively responsive to longitudinal and angular deformations occurring in an incremental length of a pipe string then situated between such spatially-disposed wall surfaces.

4,105,072

PROCESS FOR RECOVERING CARBONACEOUS VALUES FROM POST IN SITU OIL SHALE RETORTING

Chang Yul Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Grand Junction, Colo.

Continuation-in-part of Ser. No. 748,622, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 652,335, Jan. 26, 1976, abandoned, which is a continuation of Ser. No. 504,028, Sep. 9, 1974, abandoned, and a continuation-in-part of Ser. No. 622,653, Oct. 16, 1975, Pat. No. 4,005,752, which is a continuation of Ser. No. 492,253, Jul. 26, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 763,155

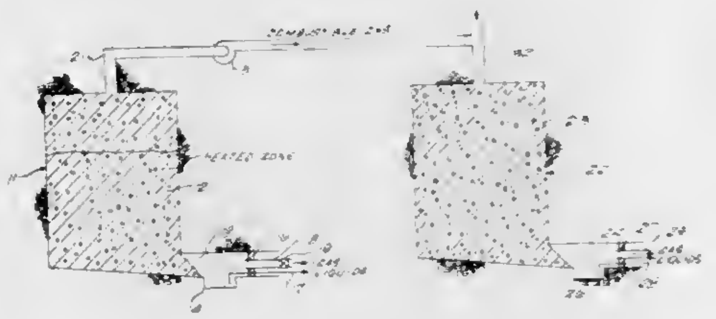
Int. Cl.^{2} E21B *43/24, 43/26*

U.S. Cl. 166—261 **45 Claims**

43. A process for recovering post-retorting off gas from an in situ oil shale retort in a subterranean formation containing oil shale, the retort containing a fragmented permeable mass of formation particles containing oil shale comprising the steps of:

establishing a heated zone in a portion of the fragmented mass, the heated zone having a temperature higher than the retorting temperature of oil shale;

for a period of normal retorting operation introducing an inlet gas to the fragmented mass on a trailing side of the heated zone for advancing the heated zone through the fragmented mass for retorting oil shale to produce liquid and gaseous products and withdrawing such liquid products and off gas including such gaseous products from the in situ retort on an advancing side of the heated zone; and thereafter



for a period of post-retorting operation substantially completely stopping introduction of gas to the in situ retort and withdrawing from the retort a post-retorting off gas comprising gaseous products from retorting oil shale.

4,105,073

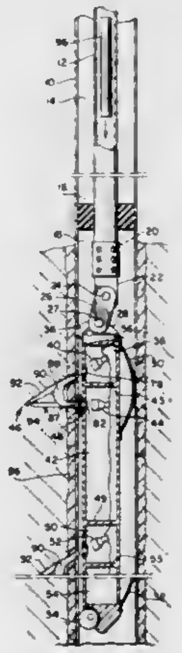
TUBING CONVEYED SAND CONSOLIDATING METHOD

Emmet F. Brieger, General Delivery, Nugal, N. Mex. 88341

Filed Sep. 26, 1977, Ser. No. 836,396

Int. Cl.^{2} E21B *43/00, 43/117*

U.S. Cl. 166—286 **13 Claims**



8. Jet perforating gun apparatus comprising an elongated main housing having a firing head, a plurality of charge containing chambers spaced from each other by a bulkhead, a shaped charge located in each said chamber, and means connected to each shaped charge and to said firing head for detonating the shaped charges;

adjacent shaped charges being oriented in the same radial direction for perforating a formation with the perforations extending back up into the formation and oriented to extend in close proximity of one another;

annular seal means positioned on the exterior of the gun in axial alignment with one of the shaped charges such that the plasma jet from a detonated charge extends through the central axis of the annular seal means;

means forcing the main housing laterally against the borehole wall to cause said annular seal means to isolate well fluids from the immediate path of the plasma jet so that when the shaped charges are fired, the chamber adjacent said annular seal means is directly connected to the perforation formed through the borehole wall thereof;

valve means in said bulkhead, said means connected to said shaped charges and to said gun firing head, extends through said valve means; said valve means includes means by which it is moved to the closed position in response to detonation of a shaped charge in one of said chambers;

so that when the charges are detonated, the pressure gradient will force well fluids to flow from the wellbore, into one perforation, out of the other perforation; through the annular seal means and into the chamber adjacent thereto thereby forcing a cavity across the two perforations.

4,105,074

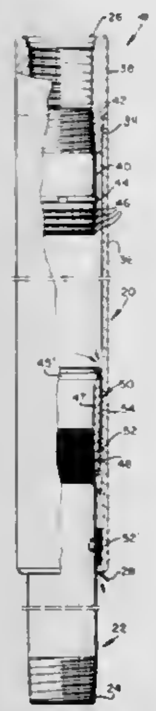
CEMENTING STAGING TOOL

Ernest E. Armstrong, 3521 Seaboard, Midland, Tex. 79701

Filed Aug. 16, 1976, Ser. No. 714,589

Int. Cl.^{2} E21B *33/14*

U.S. Cl. 166—317 **18 Claims**



1. A cementing tool which requires no drill-out after staging and which is permanently series connected into a string of casing for cementing the entire casing string within a borehole by flowing cement down the upper casing string, axially through the tool, and down through the lower casing string; and, thereafter down through the upper string, laterally through the tool, and directly into the borehole annulus, comprising:

said tool includes a sub at the upper end thereof for connecting the tool to the lower end of the upper casing string; a barrel affixed to said sub;

a mandrel having a lower end for connecting the tool to the upper end of the lower casing string, the upper marginal end of said mandrel being telescopingly received within said barrel with there being an annulus formed therebetween; means by which the mandrel releasably engages the lower end of the barrel in sealed relation therewith and is captured therewithin so that the mandrel and barrel are always attached to one another;

a fluid conducting sealed latch means having one end connected to said sub and another end which can be sealingly connected to said mandrel when the sub is moved towards the mandrel; said sub, barrel, mandrel, and fluid conducting sealed latch means being concentrically arranged respective to one another; whereby, said tool is connected in series relation within a string of casing and lowered into a borehole, cement is pumped through the entire casing string, including the tool, thereby carrying out a first cementing operation, and the upper end of the mandrel is next released from the lower end of the barrel and moved towards the sub to thereby open the annulus between the mandrel and the barrel so that cement can flow laterally away from the tool and into the borehole annulus, and said tool is thereafter again latched together to close the lateral flow path by moving the sub towards the mandrel to cause the sealed latch means to engage one another.

4,105,075

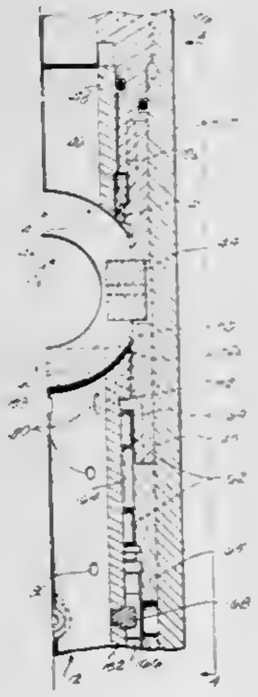
TEST VALVE HAVING AUTOMATIC BYPASS FOR FORMATION PRESSURE

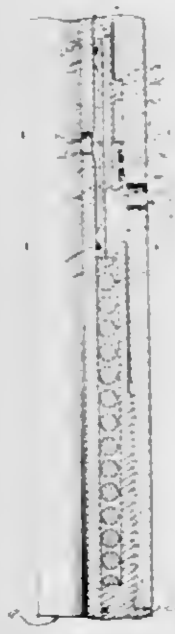
Sydney S. Helmus, London, England, assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 21, 1977, Ser. No. 817,804

Int. Cl.² E21B *43/00, 47/00*

U.S. Cl. 166—321 **15 Claims**





1. Well test apparatus having, in a well, an annulus therearound comprising:

an elongated housing having a fluid passage extending longitudinally therethrough and a fluid passage opening and closing means for such passage;

a further fluid passage through the housing to permit fluid flow from the longitudinally extending passage to the annulus; and

differential pressure responsive valve means for the further passage responsive to pressure in the longitudinally extending passage for urging the valve means open to fluid flow in the further passage from the longitudinally extending passage to the annulus and responsive to annulus pressure for urging the valve means to a closed condition for fluid flow through the further passage.

4,105,076

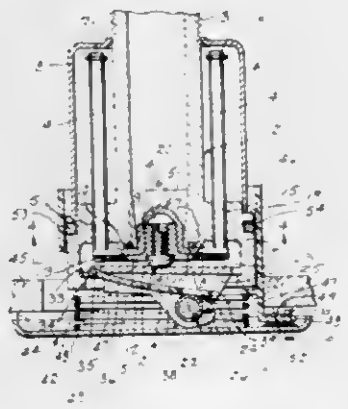
CONCEALED SPRINKLER HEAD

John R. Simons, Delavan, and John W. Fenske, Wauwatosa, both of Wis., assignors to Grunau Company Inc., Milwaukee, Wis.

Filed Nov. 22, 1976, Ser. No. 743,904

Int. Cl.² A62C *37/08*

U.S. Cl. 169—40 **25 Claims**



1. A sprinkler head, comprising a body having an inlet to be connected to a water line and having an outlet, internal abutment means disposed in the body and located downstream of the outlet, valve means to close the outlet, a lever assembly engaged with the valve means and disposed to hold the valve means in a closed position, said lever assembly including a first lever member engaged with said valve means and having one end engaged with said abutment means, temperature responsive release means carried by said first lever member and including a fusible element adapted to melt at an elevated temperature, and a second lever member having one end engaged with said abutment means and having the opposite end portion engaged with said release means, the opposite end of said first lever member being engaged with said second lever member at a location between the ends of said second lever member, manually adjustable means engaged with said first lever member for exerting a force through said second lever member on said release means in a direction to urge said release means out of engagement with said first lever member, melting of said fusible element enabling said second lever member to release the release means from engagement with said first lever member and thereby open said valve means.

4,105,077

UNIVERSALLY SUPPORTED IMPLEMENT FRAME SECTION

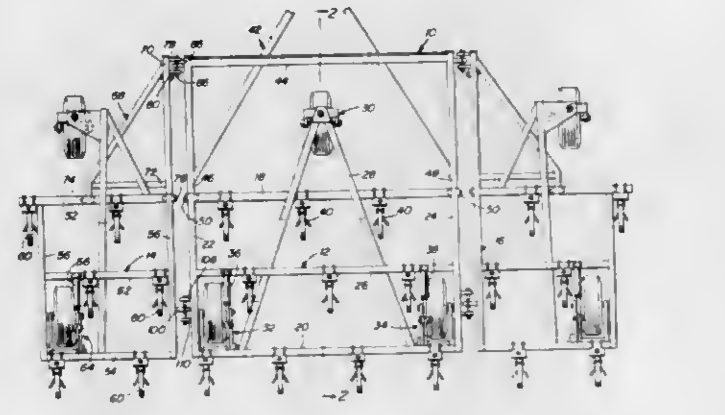
Edwin A. Seifert, Jr., Rte. 1, Box 22, Belgrade, Mont. 59714

Continuation-in-part of Ser. No. 632,687, Nov. 17, 1975, abandoned, Continuation-in-part of Ser. No. 477,320, Jun. 6, 1974, abandoned, Continuation-in-part of Ser. No. 268,782, Jul. 3, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 747,593

Int. Cl.² A01B *73/00*

U.S. Cl. 172—311 **8 Claims**

1. A ground working implement defining an intended forward path of movement and including first and second horizontal frame sections arranged in side-by-side relation to said path, said sections each including ground working elements and ground engaging support wheel means, said first section including means for coupling to a prime mover, and coupling means coupling said sections together for transferring forward thrust from said first section to the second section, limited angular displacement of said second section relative to said first section about a first horizontal axis generally normal to said path when said sections are generally horizontally disposed and upward angular displacement of said second section relative to said first section about a second horizontal axis generally paralleling said path to a raised folded transport position substantially fully supported from said first section, said coupling means includes a front to rear extending arm carried by said second section having its rear end pivotally anchored to a forward portion of said second section for limited oscillation relative thereto about a third horizontal axis generally paralleling said first axis and front and rear aligned coupling structures defining said second axis and between which the latter extends, coupling the front end of said arm to a forward portion of said first section and the rear portion of said second section to a rear portion of said first section for oscillation of said arm and second section about said second axis relative to said forward and rearward portions, respectively, of said first section, said coupling structures including means operative to allow limited angular displacement of the front end of said arm relative to said first section about a fourth horizontal axis disposed generally normal to said path and limited angular displacement of the rear portion of said second section relative to said rear portion of said first section about said first axis, said rear coupling structure including means operative to allow limited front to rear shifting of said first axis relative to said first section and said front coupling structure including means for transferring forward thrust from said first section to said arm means.



4,105,078

MOTOR GRADER BLADE SUPPORT WITH SELF-RETAINING WEAR STRIPS

Russell L. Gilbert, Kingsland, Tex., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1976, Ser. No. 746,569

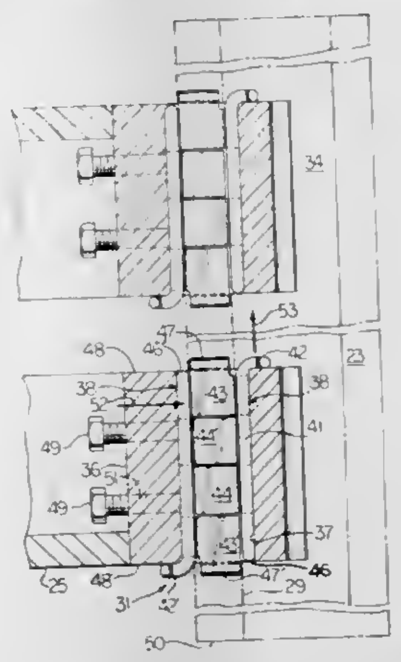
Int. Cl.² E02F *3/76*

U.S. Cl. 172—781 **14 Claims**

1. Mounting structure for attaching a blade to a grader wherein said blade has a linear slide rail secured thereto which is engaged by said mounting structure to enable sideward sliding movement of the blade relative to the mounting structure, comprising:

a bracket forming a part of said mounting structure and having opposite outwardly facing side surfaces facing away from each other and connected by a slot for receiving an edge portion of said rail,

a pair of self-retaining wear strip members disposed in said slot of said bracket, each of said wear strip members having a main body extending along said slot and further having as a fixed component element thereon a retainer portion at one end only which is angled away from said main body and said slot to extend along and abut a separate one of said opposite outwardly facing side surfaces of said bracket than that abutted by the retainer portion of the other wear strip thereby blocking movement of a first of said wear strip members along said slot in one direction and blocking movement of the second of said wear strip members in the opposite direction, said wear strip members further having abutted portions which block independent movement along said slot of one wear strip member relative to the other thereby causing said wear strips jointly to be blocked from longitudinal movement in either direction along said slot.



4,105,079

DEVICE FOR LAUNCHING PERCUSSION GROUND BORERS

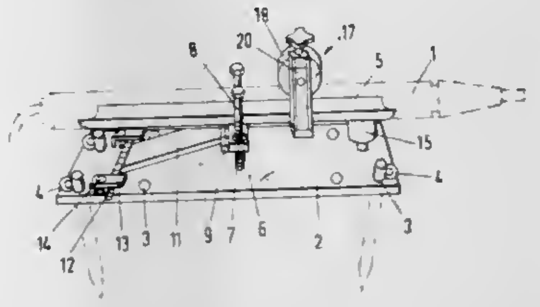
Paul Schmidt, Reiherstrasse, Lennestadt-Saalhausen, Fed. Rep. of Germany (5940)

Filed Feb. 8, 1978, Ser. No. 766,738

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2605010

Int. Cl.² E21C *5/00*

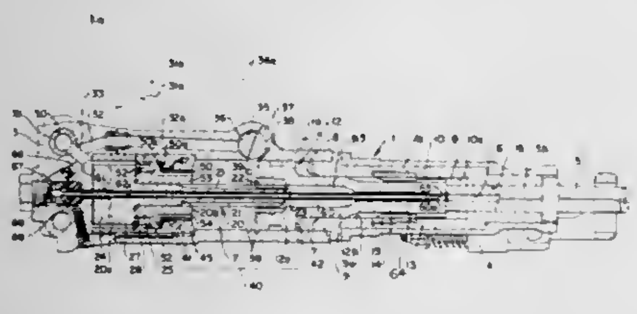
U.S. Cl. 173—42 **16 Claims**



1. A launching device for launching a percussion borer at the start of a ground boring operation, said device comprising a carrier for holding said borer, mounting means for mounting said borer on said carrier, said mounting means being adapted to permit forward movement of said borer relative to said carrier but to resist backward movement of said borer relative to said carrier, means for anchoring said carrier to said ground whereby backward impulses on said borer resulting from percussive operation of said borer are transmitted through said carrier and are counteracted by reaction forces from said ground, said carrier comprises a trough for receiving said borer, said trough having a forward end and a rearward end so that the forward movement of the borer is in the direction from the rearward end toward the forward end of said trough, a base plate adapted to be anchored to said ground, and means for adjustably supporting said trough from said base plate, said mounting means including braking means for braking movement of said borer relative to said trough to permit said forward movement but resist said backward movement to said

borer in said trough, said means for supporting said trough from said base plate includes angular adjusting means whereby said trough is angularly adjustable relative to said base plate in vertical and horizontal directions, and means adjacent the forward end of said trough forwardly of said angular adjusting means for pivotally mounting said trough on said base plate, said means adjacent the forward end limiting said forward end to angular movement about vertical and horizontal axes relative to said base plate.

4,105,080
AIR HAMMER WITH BLOW-OUT AIR SYSTEM
Samuel D. Gunning, Cleveland Heights, Ohio, assignor to Kent Air Tool Company, Kent, Ohio
Filed Nov. 29, 1976, Ser. No. 745,801
Int. Cl.^{2} B25D *17/14*
U.S. Cl. 173—66 **3 Claims**



1. In a reciprocating air hammer,

an elongated body having a front end and a rear end, and power cylinder bore;

a power piston reciprocable in the cylinder bore from a retracted starting position to an extended power delivery position, and return;

tool supporting means at the front end of the body for holding a tool for axial reciprocation in coaxial relation to said bore and in position to be struck by the piston on the power delivery stroke;

said body, at its rear end, having an air inlet passage connected to the cylinder bore and adapted for connection to a source of pressurized air, and having a lateral exhaust passage at a first location, endwise of the body, near the rear of the piston in the extended position of the piston, said exhaust passage being connected at its inlet end to the cylinder bore in said extended position of the piston;

said body having a blow out air conduit means connecting the air inlet passage with the exhaust passage;

automatic valving means between the inlet and rear of said bore and operative, when active, to cause delivery of live air from the inlet passage to the cylinder bore in a manner to drive the piston on power and return strokes, alternately in succession;

an inlet valve at the rear of the body for admitting and cutting off the delivery of live air to the inlet passage;

a settable exhaust valve separate from, and settable independently of, said inlet valve, and connected to said blow out air conduit means and said exhaust passage, and settable, selectively, in a first position in which it connects the exhaust passage to the atmosphere, and in a second position in which it disconnects the exhaust passage from the atmosphere and concurrently connects it to the blow out air conduit means;

means rendered operative by setting the exhaust valve in said first position to render the automatic valving means active;

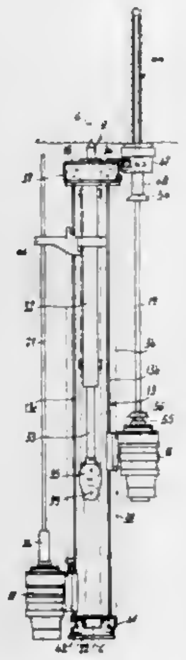
means rendered operative by setting the exhaust valve in said second position to render the automatic valving means inactive and thereby to discontinue reciprocation of the piston while continuing to admit live air to the rear of the cylinder bore, and to connect said blow out air conduit means to the cylinder bore at said first location, and thereby to deliver a flow of blow air through the automatic valve and, concurrently, a direct flow of blow out air into the power cylinder bore at first said location;

one blow air conduit means, including passage means extending through the piston from one end to the other, operative during operation of the piston, to conduct the limited air of that live air, admitted by the automatic valve to the cylinder bore, to a second location from which it can flow freely to the tool during operation of the piston in extended position of the piston;

additional blow air conduit means, extending part way through said passage means in the piston and operative, in all positions of the exhaust valve means, for conducting an additional limited flow of blow air continuously from the inlet passage to said second location in by-passing relation to, and independently of, the automatic valve means, the total of said blow air being insufficient to blow particles out of the hole being drilled; and

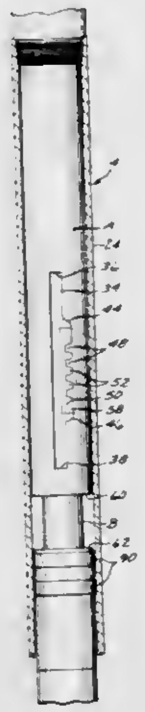
said blow out air conduit means, rendered operative by setting the exhaust valve means in said second position, conducting live blow out air continuously from the inlet passage, in by-passing relation to the additional blow air conduit means and to the automatic valving means, to and through said passage means in the piston to said second location in addition to, and in an amount greater than, the total amount of said blow air being conducted to said second location, and said amount being such that the total of blow air and blow out air can blow out coarse particles of material from a hole being drilled by the tool.

4,105,081
ROCK-DRILLING AND BOLT-SETTING APPARATUS
Raymond Jean Perraud, Villeurbanne, France, assignor to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A.S.A., Villeurbanne, France
Filed Dec. 28, 1976, Ser. No. 754,990
Claims priority, application France, Dec. 30, 1975, 75 40426
Int. Cl.^{2} E21B *9/24*
U.S. Cl. 175—122 **5 Claims**



1. A rock-drilling and bolting apparatus comprising a slide upon which can slide a first carriage for drilling a hole and a second carriage for inserting and locking a bolt in said hole, the slide being capable of pivoting around and sliding on an anchored rod so that in one position the longitudinal axis of the bolt is substantially aligned with the axis of the drilled hole, a drilling device which is coaxial with the drill bit of the first carriage and which can be used at the end of the drilling operation to widen conically the entrance of the drilled hole to facilitate the positioning of the bolt, said drilling device comprising an opening bit located around and able to rotate and move longitudinally in respect of the drill bit, and capable of being driven round and thrust forward at the same time as the bit when the first carriage comes to the end of its travel, said drilling device being carried by a stop upon which rests a collar fixed to the bit until the drilling carriage comes to the end of its travel, the bit also having opposed coupling devices which operate together when the first carriage nears the end of its travel, the coupling devices comprising a friction clutch.

4,105,082
JARRING TOOL
Alton E. Cheek, 1949 Vuelta Grande Ave., Long Beach, Calif. 90815
Continuation of Ser. No. 638,437, Dec. 8, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,713
Int. Cl.^{2} E21B *1/10*
U.S. Cl. 175—302 **15 Claims**



1. An elongated jarring tool adapted for producing jarring impacts in both longitudinal directions comprising:

a tubular section,

a stem section positioned for relative longitudinal movement with respect to said tubular section between first and second jarring positions,

a first pair of opposed shoulder means on the respective said sections engageable to define said first jarring position and a second pair of opposed shoulder means on the respective said sections engageable to define said second jarring position,

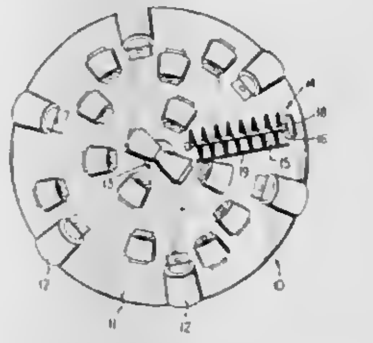
said tubular section having a longitudinal slot in a wall thereof, and said stem section having a lug member thereon projecting within said slot, said lug member being shorter than said slot in the longitudinal direction to enable relative longitudinal movement of said sections between said jarring positions,

first teeth means on said tubular section adjacent said slot and second teeth means on said lug member, said first and second teeth means being meshable with each other and being tapered so that longitudinal force in either direction between said section will tend to cam said first and second teeth means rotationally apart toward disengagement to initiate a jarring action,

locating means on said sections longitudinally locating said sections relative to each other at a position intermediate said jarring positions when said first and second teeth means are in their meshed position, and

an elongated torque means connected at one end to said stem section for rotationally biasing said first and second teeth means toward their meshed position, and clamping means for connecting the other end of said torque means in a fixed rotational position relative to said tubular section.

4,105,083
LARGE DIAMETER DRILL BIT
James H. Allen, Lakewood, Calif., assignor to Smith International, Inc., Newport Beach, Calif.
Filed Jun. 9, 1977, Ser. No. 804,881
Int. Cl.^{2} E21C *13/02*
U.S. Cl. 175—313 **15 Claims**



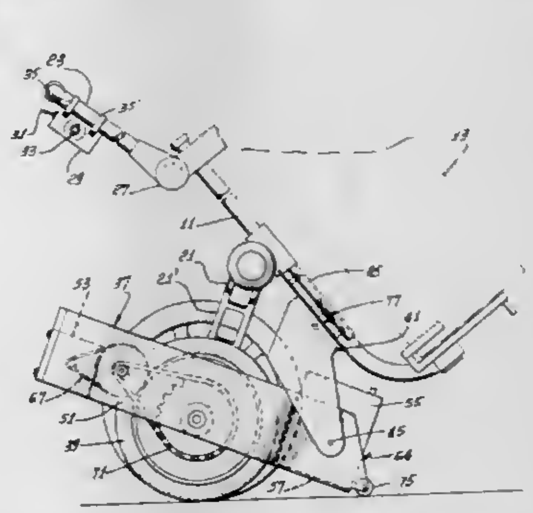
1. A rotary drill bit, adapted for connection with a drill column, for drilling large diameter shafts in the earth comprising;

a main bit body having a face across which drilling fluid is adapted to flow and a central opening adapted for communication with the interior of the drill column for enabling drilling fluid to pass therethrough;

a plurality of cutters mounted on the face of said main bit body forming a cutting plane for contacting and disintegrating the earth formation at the shaft bottom; and

means radially positioned on the face of said main bit body for enhancing the flow of drilling fluid across the face of said main bit body, said flow enhancing means includes an axial flow impeller rotating about an axis positioned on the radius of said main bit body.

4,105,084
POWER UNIT FOR GOLF CART AND THE LIKE
Albert E. Baak, 1650 San Pablo Dr., Lake San Marcos, Calif. 92069
Filed Apr. 14, 1977, Ser. No. 787,609
Int. Cl.^{2} B62D *51/04*
U.S. Cl. 180—11 **10 Claims**



5. A power unit to supply powered movement to a cart of the type having a frame and a pair of spaced and aligned support wheels, including in combination:

a manually operated control unit having switching means and a battery;

an electric motor having a drive shaft output;

a drive wheel adapted to be impelled by said dirve shaft output;

said drive shaft output of said electric motor being responsive to said manually operated control unit;

means for positioning said drive wheel intermediate and spaced from said support wheels so that the point of contact of said drive wheel with the ground is aligned with the points of contact of said support wheels with the ground;

a power frame having a forward section, a trailing section, a top edge and a bottom edge;

said drive wheel having a wheel shaft fixed to said drive wheel and rotatably mounted on said power frame so that said drive wheel protrudes below said power frame;

said motor being located in said trailing section of said power frame, said battery being located in said forward section of said frame and said wheel shaft being attached to said power frame;

a yoke having a cross-member and two approximately parallel sides,

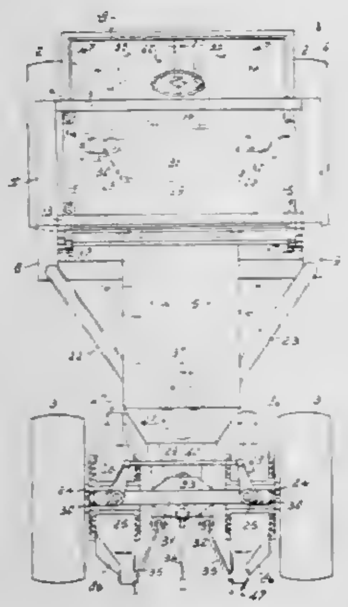
attachment means located on said cross-member for fixedly engaging said cart and having a pair of knobs, and

pivot means located in each of said sides to pivotally engage said power frame whereby said drive wheel is enabled to maintain contact with the surface of travel throughout changes in the terrain; and

a bracket mounted on the elongated portion of said cart, said bracket having a pair of slots therein spaced apart an amount equal to the spacing of said knobs whereby said knobs and said brackets form a quick connect joint for the engagement of the cart and the unit to supply powered movement at the power frame.

4,105,085
TRACTORS AND OTHER VEHICLES

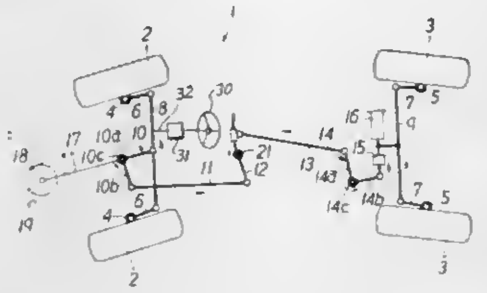
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Continuation of Ser. No. 517,068, Oct. 22, 1974, abandoned. This application Nov. 26, 1976, Ser. No. 745,204
Claims priority, application Netherlands, Oct. 22, 1973, 7314474
Int. Cl.² B60J *17/30, 17/34*
U.S. Cl. 180—43 R **20 Claims**



1. An agricultural tractor type vehicle comprising a frame and wheel structures supporting said frame, at least one of said wheel structures comprising housing means and a wheel rotatably mounted on said housing means, said one wheel structure being connected to said frame by an elongated upwardly extending pivot pin held in a sleeve assembly, a lower portion of said sleeve assembly being fixed to said housing means and a further portion of said sleeve assembly caused by the weight of said frame to abut and adjoin said lower portion at supporting interfaces, said pin being nonrotatably received in the lower portion, said further portion being fastened to said frame, said one wheel structure and lower portion upon the relative raising of said frame only being movable relative to said frame and said pin in a downward direction along the longitudinal axis of said pin and separable from the remainder of the vehicle.

4,105,086
SYSTEM FOR CONTROLLING VEHICULAR FOUR-WHEEL STEERING MECHANISMS

Takemochi Ishii, No.3-11-12, Kugayama, Suginami-ku, Tokyo; Masakazu Iguchi, No.8-1-1, Nishishinjuku, Shinjuku-ku, Tokyo, and Masaki Koshi, No.1-1-26-524, Nakameguro, Meguro-ku, Tokyo, all of Japan
Filed Nov. 11, 1976, Ser. No. 740,882
Claims priority, application Japan, Nov. 13, 1975, 50-136687
Int. Cl.² B62D *7/00*
U.S. Cl. 180—79 **8 Claims**



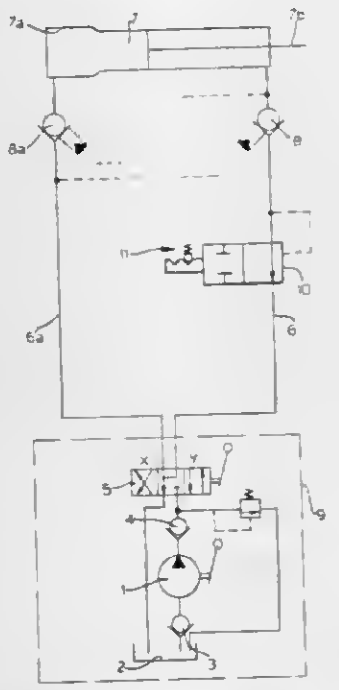
1. A system for controlling four-wheel steering mechanisms for vehicles having a pair of front wheels and a pair of rear wheels, comprising:

a steering mechanism operable in response to a steering operation to turn the front and rear wheels to angles suitable for directing the vehicle to a steered direction, including front and rear steering linkages operatively connected respectively to the front and rear wheels; and

control means interconnecting said front and rear steering linkages and responsive to the speed of the vehicle to vary the ratio of the steering angle of the rear wheels to the steering angle of the front wheels as a function of the travelling speed of said vehicle to effect four-wheel steering in low-speed operations, and to vary only front steering in high-speed operations of said vehicle.

4,105,087
HYDRAULIC CAB TILTING SYSTEMS

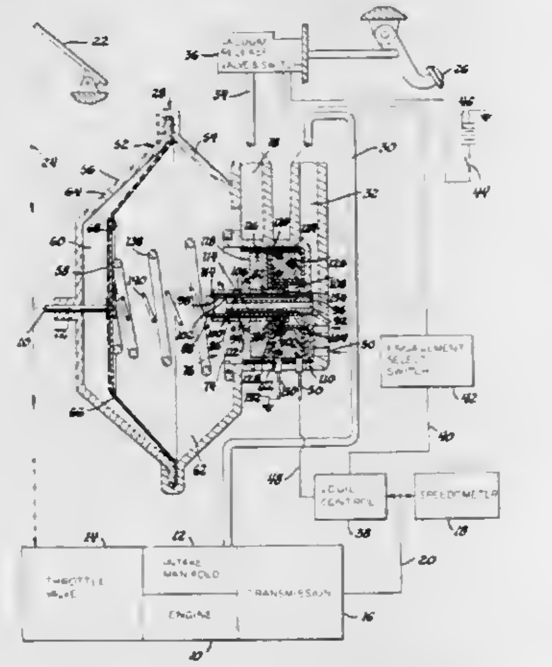
Henry John Levington, Snelland, England, assignor to Clayton Dewandre Company Limited, Titanic Works, England
Filed Apr. 4, 1977, Ser. No. 784,465
Claims priority, application United Kingdom, May 3, 1976, 17933/76
Int. Cl.² B62D *23/00*
U.S. Cl. 180—89.15 **3 Claims**



1. In a hydraulic ram system for tilting the cab of a commercial vehicle, which cab is resiliently mounted on the vehicle frame or chassis, and wherein the end of the ram cylinder in which the ram piston is located when the cab is in the lowered position is of increased bore diameter to provide enough clearance around the piston to render the ram passive in this position, the length of the increased cylinder bore being sufficient to accommodate the maximum movement of the cab on its suspension, the improvement wherein there is provided in the line to the upper end of the ram cylinder an auxiliary valve which is adapted to be held by a spring-loaded detent in the closed position and the arrangement being such that when a predetermind pressure is reached in the upper end of the ram cylinder during a cab lifting operation and occasioned by the entry of the ram piston into the smaller diameter end of said cylinder, said pressure acting on the valve overcomes the spring-loading on the detent and moves the valve to the open position.

4,105,088
SERVOMOTOR WITH POSITION FEEDBACK

Wayne A. Levijoki, Clio, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 7, 1977, Ser. No. 774,925
Int. Cl.² B60K *31/00*
U.S. Cl. 180—108 **4 Claims**



1. In a differential pressure operated servomotor comprising:

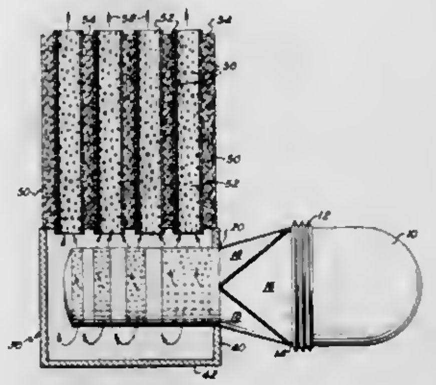
a housing having a fixed wall and a power wall cooperating therewith to define a variable pressure control chamber on one side of said power wall, the other side of said power wall being exposed to atmospheric pressure, a valve assembly having an atmospheric pressure inlet port, a subatmospheric pressure port adapted to be connected to a source of subatmospheric pressure, a valve member having a movable control port normally connecting said variable pressure chamber with said atmospheric inlet port, said valve member being movable toward said power wall to progressively close said atmospheric inlet port to achieve a poised condition and being further movable to progressively open said subatmospheric pressure port by said movable control port,

a position feedback spring acting between said power wall and said valve member to increase the spring force in inverse relationship to the distance between said power wall and said valve member,

and means mounted on said housing fixed wall and selectively urging said valve member against the force of said feedback spring in accordance with power wall position demand and position error and, when so urging doing so with a force which decreases inversely with the distance said valve member moves away from said housing fixed wall toward said power wall.

4,105,089
FLOW DISTRIBUTOR FOR GAS TURBINE SILENCERS

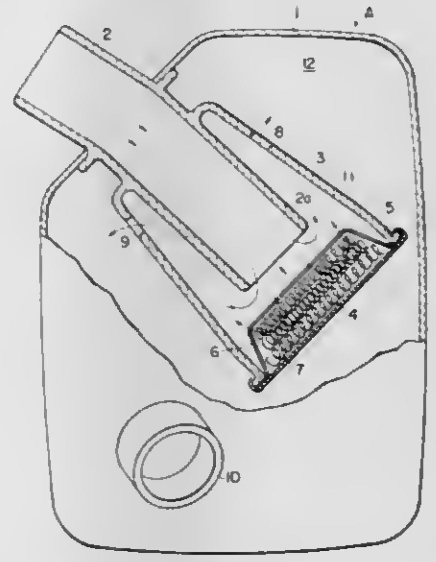
Frederick V. H. Judd, 4876 Victor St., Jacksonville, Fla. 32207
Filed Nov. 24, 1975, Ser. No. 634,848
Int. Cl.² F01N *1/08, 1/10*
U.S. Cl. 181—264 **11 Claims**



1. A gas flow distributor for exhaust gas emitted from a gas turbine comprising an elongated chamber, closed by walls on all sides and one end, having an open inlet for connecting to a gas turbine exhaust, said chamber being sized to accommodate a turbulently noisy flowing stream of combustion gas exhausted from said turbine, means for solidly coupling the open end of said flow distributor chamber to the exhaust emitted from said turbine, perforations passing through and disposed in bands about the walls of said flow distributor in number, size and spacing graduated from lower to greater gas flow restriction from said open end inlet to the lateral perforations outlets to emit the gas stream passing through said flow distributor in substantially even radial non-turbulent flow therefrom, and shielding means deflecting the exhausted gas stream emitted by said flow distributor in radial direction.

4,105,090
MUFFLER FOR EXHAUST GASES

Histaro Tachibana; Hisashi Fujii, and Tamotsu Sezaki, all of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan
Filed Aug. 9, 1976, Ser. No. 712,573
Claims priority, appreclation Japan, Aug. 9, 1975, 50-110028
Int. Cl.² F01N *7/10*
U.S. Cl. 181—265 **5 Claims**

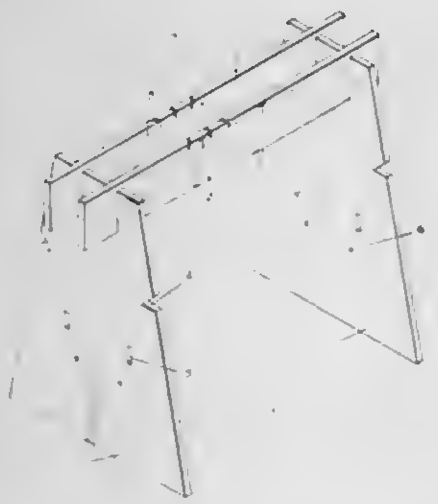


1. An exhaust gas muffler of the type having a muffler casing with an exhaust port, and an exhaust gas inlet pipe for passing exhaust gas from an engine into said muffler casing, the improvement characterized by:

a small size casing attached to and surrounding the exhaust portion of said inlet pipe within said muffler casing, said small size casing having a cross sectional area which increases progressively from the point of attachment to a termination thereof downstream of the tip of said inlet pipe, an end plate having a sound absorbing material connected therewith positioned to close the termination end of said small size casing so that said sound absorbing material faces the output tip of said inlet pipe to receive exhaust gases as they exit said inlet pipe and make a turn to flow back up said small size casing, and nozzles provided in the wall of said small size casing surrounding said inlet pipe.

4,105,091
SAWHORSE

Philip J. C. Mahan, 60 Cherokee Hills, Tuscaloosa, Ala. 35401
Filed Aug. 5, 1976, Ser. No. 711,701
Int. Cl.² F16M *11/00*
U.S. Cl. 182—181 **1 Claim**



1. A saw horse comprising two essentially vertical, trapezoidally shaped plate-type legs, connected to two parallel horizontal backs, spaced substantially apart, said connection being accomplished by opposing matched notches on said legs and backs, said notches being of sufficient depth to provide stability in the longitudinal direction of the backs and to provide a fixed dimension between the backs for the insertion of lumber and to provide a vertical space between the top surface of the back and the top edge of the legs, said backs having kerfs cut at commonly used angles in construction at the same depth as that existing between the tops of the backs and legs, and having holes cut perpendicularly to the longitudinal direction of the backs supporting removably positioned nails at a depth from the top surface of the backs generally sufficient to enclose and support lumber for mitering in the said kerfs.

4,105,092
LUBRICATING OIL SYSTEM

Günter Zeidler, Friedrichshafen, and Christian Günther, Bermatingen, both of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany
Filed Jan. 13, 1977, Ser. No. 759,173
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601133
Int. Cl.² F01M *1/18, 11/10*
U.S. Cl. 184—6.4 **24 Claims**

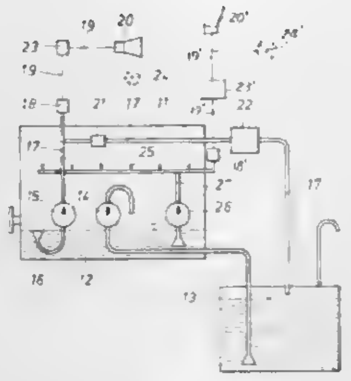
1. A lubricating system for a drive mechanism, the system including a lubricating medium storage tank means and an oil reservoir means arranged at the drive mechanism for accommodating a predetermined quantity of lubricating medium, the improvement comprising:

a first pump means arranged at the drive mechanism and operatively connected with the storage tank means and the reservoir means for constantly replenishing the oil reservoir means with a supply of lubricating medium to maintain the predetermined quantity therein during an operation of the drive mechanism,

a second pump means arranged at the drive mechanism having a higher conveying power than said first pump means and operatively connected to the oil reservoir means and the storage tank means for conveying excess lubricating medium from the reservoir means to the storage tank means,

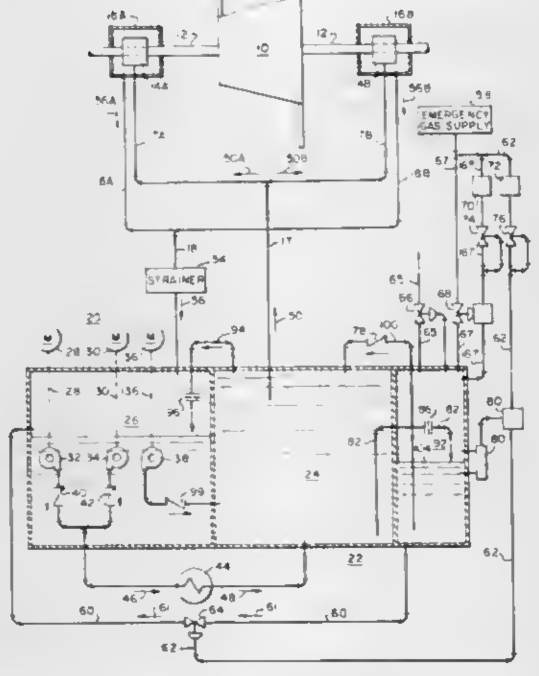
means arranged in a delivery conduit of said second pump means for monitoring a condition of the lubricating medium and for providing an output signal upon a failure in a return flow of the lubricating medium, and

means responsive to the output signal of said monitoring means for providing a warning signal of the failure in the return flow of the lubricating medium.



4,105,093
CONTROL SYSTEM FOR PRESSURIZED LUBRICATING SYSTEM

John D. Dickinson, Springfield Township, Delaware County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 3, 1977, Ser. No. 765,340
Int. Cl.² F02C *7/06*
U.S. Cl. 184—6.11 **5 Claims**



1. A method of supplying lubricant to a bearing means supporting a rotating shaft for a predetermined period of time when a primary system for applying lubrication to a bearing means is inoperative, which method comprises the steps of:

maintaining a pressurized reservoir of lubricant with a capacity large enough to supply lubricant to the bearing means for the predetermined period of time;

supplying lubricant from said pressurized reservoir to a gas storage reservoir;

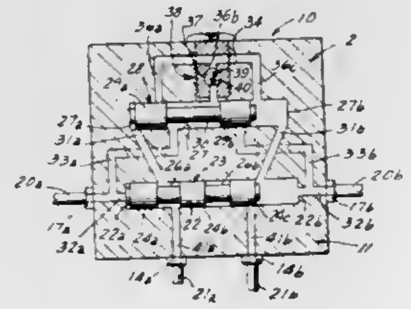
maintaining said gas storage reservoir at a pressure, under normal operating conditions, less than a pressure in said pressurized reservoir, and said gas storage reservoir having a gas-lubricant interface therein;

sensing when there is a malfunction by the pressure in said pressurized reservoir being less than the pressure in said gas storage reservoir, and

supplying lubricant to the bearings means for the predetermined period of time when the pressure in said pressurized reservoir is less than the pressure in said gas storage reservoir.

4,105,094
SINGLE LINE LUBRICANT REVERSING FEEDER

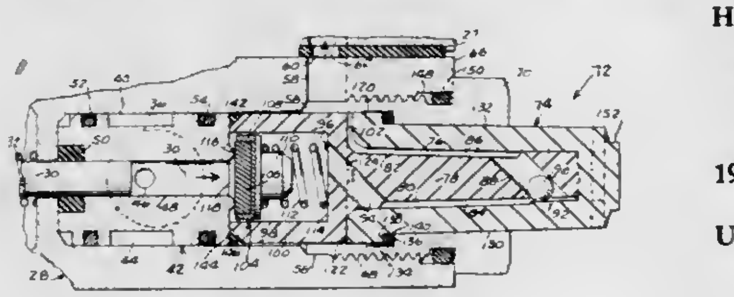
James J. Callahan, Mentor, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Dec. 14, 1976, Ser. No. 750,369
Int. Cl.² F16N *25/02*
U.S. Cl. 184—7 F **8 Claims**



2. A single line lubricant reversing feeder for metering a measured quantity of lubricant from a reversible single lubricant supply line comprising a feeder housing having means forming therein a pair of in-out ports and a pair of corresponding outlet ports, and flow means in said housing including piston means movable between first and second limiting end positions and a single check valve through which is conducted all of the lubricant which flows between said in-out ports in both limiting end positions of said piston means.

4,105,095
INJECTION LUBRICATING APPARATUS

George E. Thrasher, Jr., Pontiac, Mich., assignor to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.
Filed May 31, 1977, Ser. No. 801,529
Int. Cl.² F16N *13/16*
U.S. Cl. 184—55 A **30 Claims**



12. For a lubricator in which lubricant is moved intermittently, a visual indicator of such movement which comprises, means forming a body having a transparent region,

said body means having mounting means adapted to be mounted on a lubricator and from which said transparent region projects for visual observation,

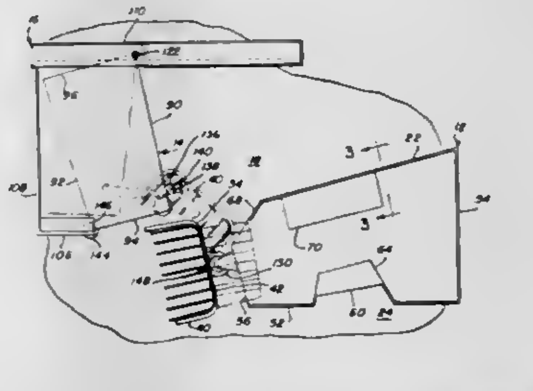
said body means being turnable relative to said mounting means about an axis,

said body means having an internal passageway extending between an inlet and an outlet and being adapted to form a flow path for lubricant, said passageway including a portion in said transparent region extending along an axis disposed at a non-perpendicular angle to said axis of turning movement,

and a bobber in said portion movable responsive to lubricant flow in said path and gravity returnable responsive to cessation of such flow.

4,105,096
CHECKSTAND

Benjamin Charles Baugh, Wichita, Kans.; Norman R. Young, and Glenmore J. Runnion, both of Oklahoma City, Okla., assignors to Unarco Industries, Inc., Chicago, Ill.
Filed May 31, 1977, Ser. No. 801,578
Int. Cl.² E04H *3/04*
U.S. Cl. 186—1 AC **29 Claims**



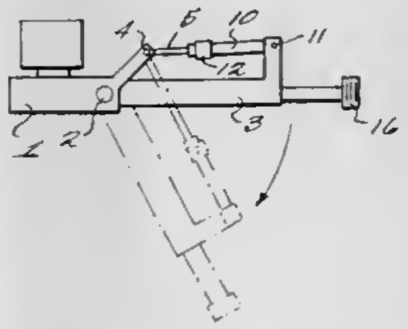
1. A checkstand for use in a grocery store or the like having a customer aisle for egress of customers and a cart aisle for passage of shopping carts, comprising:

a cash register stand for supporting a cash register-like machine at a level at which a checkout clerk can conveniently operate the cash register-like machine, said cash register stand extending from a position adjacent the floor to said level of said cash register-like machine; and

pivoting means operatively connected to said cash register stand for pivoting said cash register stand from a first position substantially blocking the cart aisle from a position adjacent the floor to said level of said cash register-like machine and in close proximity to a shopping cart during unloading of said cart, to a second position adjacent said cart aisle for freely permitting passage of said shopping cart through said cart aisle after said shopping cart has been unloaded.

4,105,097
LIFT, ESPECIALLY TWO-POST LIFT FOR MOTOR VEHICLES

Horst Hegenbart, Bensheim, Schwanbeim, Germany, assignor to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Darmstadt, Germany
Filed May 2, 1977, Ser. No. 792,503
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 7619866[U]
Int. Cl.² B66F *7/28*
U.S. Cl. 187—8.75 **2 Claims**



1. A device for releasably securing two tubular members together comprising:

a cylindrical housing member into which one of said tubular members coaxially extends;

a first plurality of first balls between said cylindrical member and said one tubular member;

second ball cages mounting said first balls for longitudinal movement;

spring means engaging said first ball cages for urging said first cages and balls into a position into which said balls prevent longitudinal motion between said cylindrical member and said one member;

a second plurality of balls between said one tubular member and the other tubular member;

second ball cages mounting said second balls for longitudinal movement;

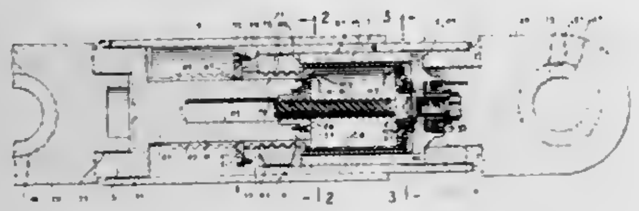
spring means for engaging said second ball cages and urging said second cages and balls into a position in which said balls prevent longitudinal motion between said tubular members;

a sleeve slidably disposed about said other tubular member and said housing member;

a plurality of pins mounted on said sleeve for sliding movement therewith, said pins engaging said first ball cages when said sleeve is moved in a first longitudinal direction to release said housing and one member and engaging said second ball cages when said sleeve is moved in the opposite direction to release said tubular members.

4,105,098
LARGE LOCKING SNUBBER

Martin K. Klimaitis, Alta Loma, Calif., assignor to Pacific Scientific Company, City of Commerce, Calif.
Filed Sep. 30, 1977, Ser. No. 838,286
Int. Cl.² F16F *7/04*
U.S. Cl. 188—1 B **26 Claims**



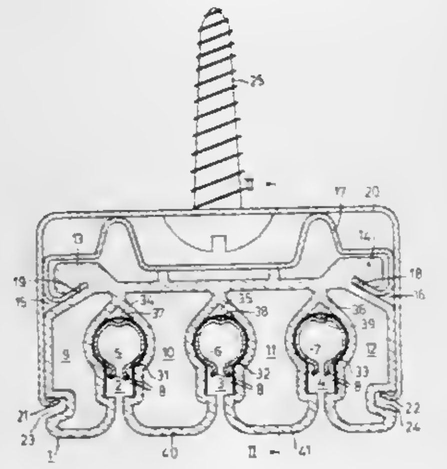
13. A mechanism for arresting linear motion between first and second relatively moveable objects, comprising:

a pair of telescoping members attached, respectively, to said first and second objects; and

means sensing the motion of said objects for limiting the telescoping of said pair of members when said motion reaches a predetermined threshold, said means comprising:
  - an overhauling lead screw for producing rotary motion proportional to said linear motion;
  - a thin walled tube driven rotationally by said overhauling lead screw; and
  - a thick walled tube driven rotationally by said thin walled tube, said thick walled tube directly interposed between said pair of telescoping members but engaging one of said pair of telescoping members only when said motion exceeds said predetermined threshold.

4,105,099
VOLTAGE RAIL

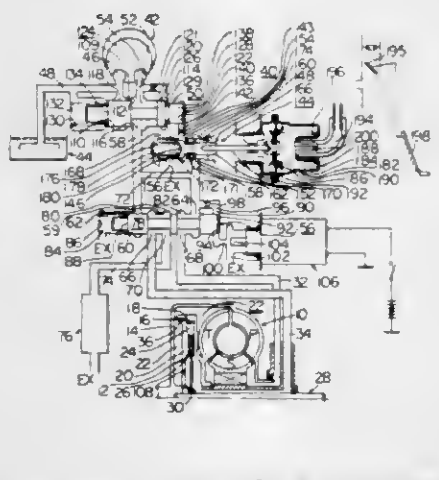
Johannes Kurt Bertrams, deceased, late of Hilden, Germany, and by Casper Antonius Henricus Mulkens, administrator, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 340,767, Mar. 13, 1973, abandoned. This application Jun. 30, 1977, Ser. No. 811,614
Claims priority, application Netherlands, Mar. 18, 1972, 7203660
Int. Cl.² B60M *1/34*
U.S. Cl. 191—29 DM **10 Claims**



9. A voltage rail comprising an elongated support of insulating synthetic material, at least two accessible slots recessed in said support, a current conductor carried in each of said slots for cooperating with contact members of a current consumer when inserted in said slots, said slots being separated by hollow sections of said support material, said hollow sections having at least one enclosed longitudinal cavity formed therein, said voltage rail further comprising a recess in the circumferential surface of said current conductor on a side thereof opposite the accessible side of said slot so as to form a gutter for receiving an adhesive.

4,105,100
HYDRAULIC CONTROL SYSTEM FOR A POWER TRANSMISSION

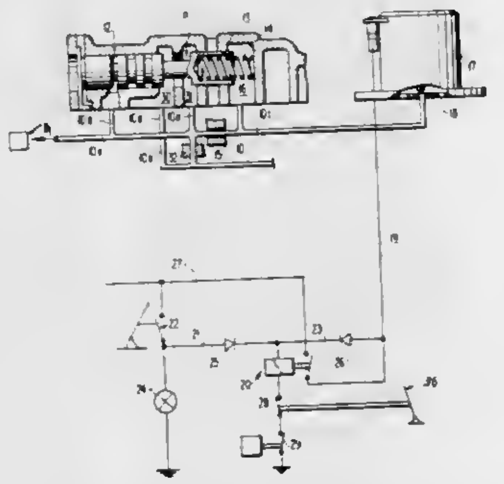
Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Japan
Filed Oct. 21, 1976, Ser. No. 734,591
Claims priority, application Japan, Oct. 22, 1975, 50-126444
Int. Cl.² F16D *23/00, 43/22*
U.S. Cl. 192—.034 **5 Claims**



1. A hydraulic control system for a power transmission of a motor vehicle, comprising means for producing a control pressure of hydraulic fluid for controlling a hydraulically operated clutch of the power transmission, regulator means for regulating said control pressure in accordance with a parameter representative of a function of the output torque of an engine of the vehicle, delay means for delaying the transmission of variation in the parameter to said regulator means, when the parameter abruptly varies and fails to represent the function, to prevent said control pressure from being varied at the same rate as that of abrupt variation in the parameter, said parameter being a vacuum prevailing in an intake passageway of the engine, said regulator means comprising a modulator valve for producing a modulator pressure varying in accordance with the intake passageway vacuum and movable in one direction to effect a decrease in said modulator pressure and in another direction to effect an increase in said modulator pressure, biasing means for moving said modulator valve in said one direction in response to a decrease in the intake passageway vacuum and in said another direction in response to an increase in the intake passageway vacuum, and a pressure regulator valve for regulating said control pressure in accordance with said modulator pressure and movable in one direction to effect a decrease in said control pressure in response to an increase in said modulator pressure and in another direction to effect an increase in said control pressure in response to a decrease in said modulator pressure, and said delay means comprising means for delaying the response of said biasing means to variation in the intake passageway vacuum when the intake passageway vacuum abruptly varies.

4,105,101
BRAKE OPERATED LOW RATIO RELEASE

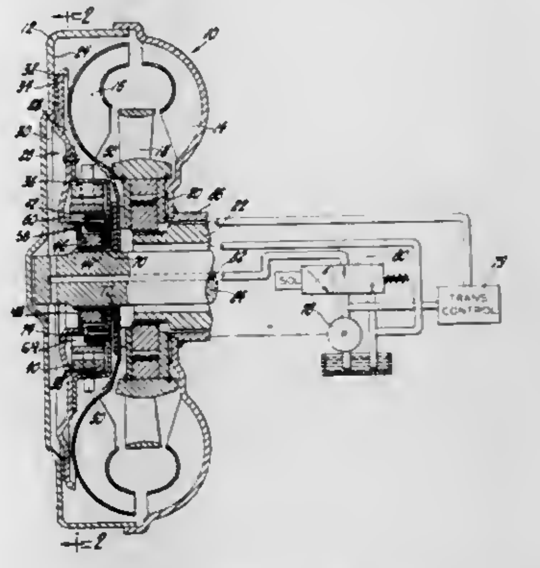
Hans-Joachim Förster, Stuttgart, and Ulrich Eltze, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed May 19, 1976, Ser. No. 687,889
Claims priority, application Fed. Rep. of Germany, May 21, 1975, 2522420
Int. Cl.² B60K *29/00*
U.S. Cl. 192—4 A **24 Claims**



1. A drive arrangement for motor vehicles with a vehicle brake, and means for raising the idling rotational speed of the driving engine during its warm-up phase comprising automatic transmission means having a drive range including a plurality of speed ratios including at least one servo means for engaging the lowest speed ratio thereof, characterized by control means operable to disengage only the servo-means for the lowest speed ratio of the drive range, in dependence on the actuation of the vehicle brake, and when the transmission means is in the remaining ratios, said ratios remain engaged when said brake is applied.

4,105,102
CLUTCH AND DAMPER ASSEMBLY

Terry E. Nels, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 15, 1977, Ser. No. 768,738
Int. Cl.² F16D *3/14*
U.S. Cl. 192—106.1 **4 Claims**



1. A clutch and damper assembly comprising; a clutch input member having a friction surface thereon; a clutch output member having an arcuate recess formed therein and a drive lug formed thereon; a retainer housing secured to said clutch input member and enclosing said clutch output member and having an arcuate opening therein into which said drive lug extends normally out of contact with said retainer housing; a first torsion spring and a second torsion spring disposed within said retainer housing and each torsion spring encircling said clutch output member, each torsion spring having first drive end means connected to said retainer housing and second drive end means drivingly connected to said clutch output member; deformable resilient means secured to said retainer housing and extending into said arcuate openings in said clutch output member; and energy absorbing friction means disposed between said clutch input member and said clutch output member; each of said torsion springs permitting a predetermined amount of relative angular movement between said clutch input member and said clutch output member at a predetermined rate, and said deformable resilient means contacting said clutch output member after said predetermined amount of said relative angular movement and thereafter permitting further relative angular movement of a second predetermined amount at a higher predetermined rate, and said drive lug contacting said retainer housing after said second predetermined amount of relative angular movement thereby providing a positive drive connection between said clutch input and output members.

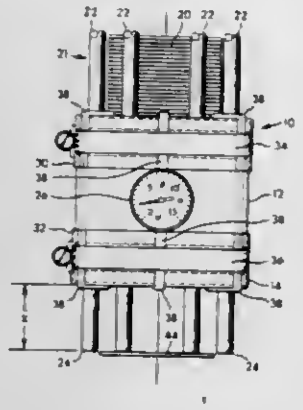
4,105,103
CONVEYOR AND FEED CONTROL APPARATUS

Stanley S. Huffman, Golden, Colo., assignor to Coors Container Company, Golden, Colo.LORADO
Filed Jun. 14, 1977, Ser. No. 806,525
Int. Cl.² B65G *11/20*
U.S. Cl. 193—32 **25 Claims**

22. Apparatus for conveying and controlling movement of disk-like conveyed articles having a circular outer peripheral portion, such as can end members or the like, comprising:

a plurality of equally circumferentially spaced elongated rigid guide means having innermost peripheral surfaces located along and defining an elongated guideway of generally circular cross-section for controlling passage of the articles therethrough;

resilient means mounted outwardly of and circumjacent to the guideway for resilient radially inward expansion into said guideway between said elongated guide means with equally circumferentially spaced portions thereof extending inwardly beyond the innermost peripheral surfaces of said elongated guide means for restrictive frictional engagement with equally circumferentially spaced outer peripheral portions of the articles in the guideway to



control the movement of the articles through the guideway; and

fluid chamber means associated with the resilient means for receiving and holding fluid pressure for forcing the resilient means into frictional engagement with the articles in the guideway.

4,105,104

COIN RELEASE DEVICE FOR COIN OPERATED GAMES

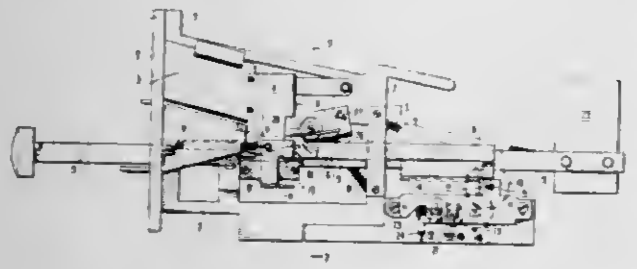
Franz Xaver Leonhart, 8381 Harburg near Pilsting, Ndb., Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,351

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617806

Int. Cl.^{2} G07F *5/04*

U.S. Cl. 194—57 **11 Claims**



1. A coin controller device for vending machines comprising a housing, a release rod mounted for longitudinal displacement in said housing, locking pawl means connected to lockingly engage said release rod to normally lock it from longitudinal displacement, a second rod mounted in said housing for independent longitudinal displacement adjacent said release rod, receiver means on said release rod adapted to receive a coin, retainer means connected to said second rod to retain a coin in said receiver means, engaging means connected on said second rod in the path of movement of the upwardly projecting portion of a coin in said receiver means and adapted to engage said coin whereby longitudinal movement of said release rod is also imparted to said second rod, a cam on said second rod connected for moving said locking pawl means out of locking engagement with said release rod on simultaneous movement of said release rod and second rod, return spring means connected to said first rod, and a time delay mechanism operatively connected to control the return movement of said second rod.

4,105,105

METHOD FOR CHECKING COINS AND COIN CHECKING APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

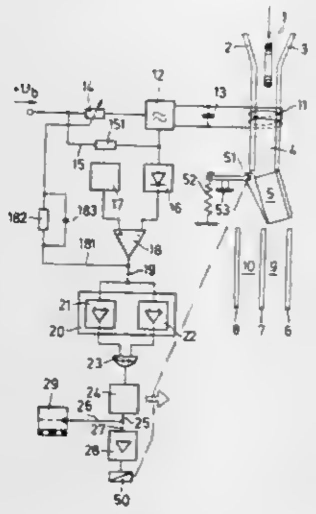
Ludwig Braum, Laufen, Germany, assignor to Libandor Trading Corporation Inc., Monrovia, Liberia

Filed Sep. 20, 1976, Ser. No. 724,768

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546685; Nov. 3, 1975, 2549093

Int. Cl.^{2} G07F *3/02*

U.S. Cl. 194—100 A **31 Claims**



1. A method of checking coins comprising the steps of: moving each coin to be checked through a constantly regulated alternating-current field of a measuring coil cooperating with an oscillator, influencing the alternating-current field by the coin to thereby form an oscillator-measuring voltage, rectifying the oscillator-measuring voltage, forming a regulation magnitude from the difference between a reference voltage and the rectified oscillator-measuring voltage, utilizing the regulation magnitude to readjust, by means of a feedback regulation circuit having a time constant and the oscillator, the oscillator-measuring voltage at the measuring coil to a constant value, employing the regulation magnitude as coin checking criterion during checking of a coin in a manner such that there is determined by means of an evaluation circuit whether such regulation magnitude has reached a value located within an upper boundary and a lower boundary, and selecting the time-constant of the regulation circuit such that there can be stabilized slow changes and the feedback regulation of the oscillator occurs sufficiently rapidly that no appreciable change occurs in the oscillator-measuring voltage so that the oscillator-measuring voltage is maintained constant when the coin moves relatively rapidly through the measuring coil and there is obtained as great as possible amplitude of the regulation magnitude for coin checking.

4,105,106

TYPEWRITER PLATEN CLUTCH MECHANISM

Heinz Geis, Frankfurt am Main, Fed. Rep. of Germany, assignor to Adlerwerke vorm. Heinrich Kleyer A.G., Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 552,105, Jul. 24, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,007

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1974, 2428944

Int. Cl.^{2} B41J *19/80*

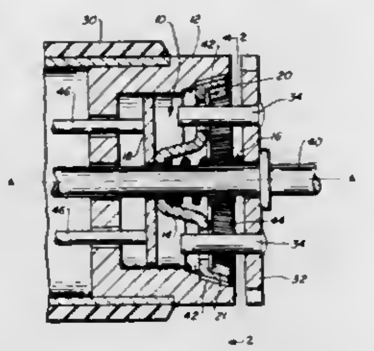
U.S. Cl. 400—556.2 **4 Claims**

1. In a typewriter having a platen fixedly supported on a center shaft and line indexing wheel rotatably supported on one end of said shaft,

and means releasably coupling said indexing wheel to said platen for selective machine controlled or manual indexing of said platen,

said coupling means comprising a first gear rotatably supported on and axially movable relative to said shaft, a second gear fixed to said platen and a spring normally axially urging said first gear into meshing engagement with said second gear,

a circular rotary motion transmitting spring secured to said first gear having radially directed notches,



and pins extending axially from said indexing wheel into said notches, said notches gripping said pins whereby rotary motion of said indexing wheel is transmitted through said spring to drive said first gear, said notches further facilitating axial disengaging movement of said first gear from engagement with said second gear guided by said pins to allow said platen to be rotated independently of said line indexing wheel.

4,105,107

FEEDING DEVICE FOR GUIDING PIECES OF LUMBER TO THE ONE OR THE OTHER OF TWO LONGITUDINAL CONVEYORS

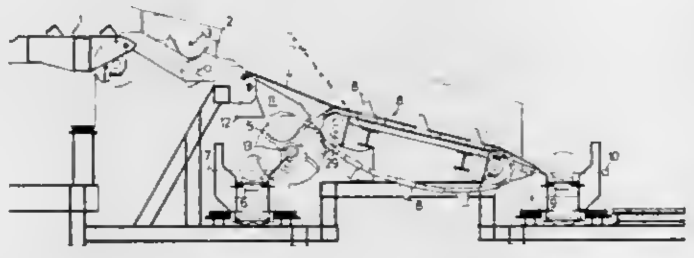
Rolf Ekholm, Nyland, Sweden, assignor to AB Hammars Mekaniska Verkstad, Nyland, Sweden

Filed Mar. 14, 1977, Ser. No. 777,048

Claims priority, application Sweden, Mar. 18, 1976, 7603385

Int. Cl.^{2} B65G *43/08*

U.S. Cl. 198—358 **5 Claims**



1. A feeding apparatus for receiving lumber from the output end of a conveyor which feeds lumber in lateral arrangement and for guiding and directing pieces of lumber fed thereto to one or the other of two longitudinal conveyors, each of which can longitudinally convey the pieces to further processing devices, characterized in that said feeding apparatus comprises: in sequence, a single piece conveyor with an associated photo cell device, a stepwise drivable winged wheel conveyor disposed immediately below the outfeed end of the single piece conveyor adapted to be located closely adjacent and offset above a first one of the longitudinal conveyors; a second photo cell device associated with the first of the longitudinal conveyors; a stepwise drivable transverse conveyor having its infeed end disposed lower than, aligned with, spaced apart from and downstream of the single piece conveyor and with its other end disposed above the other longitudinal conveyor; a third photo cell device associated with the other longitudinal conveyor; a flap having a downstream edge hinged on a horizontal axis adjacent, parallel to and aligned with the infeed end of said transverse conveyor and swingable about its axis from a bridging position between the outfeed end of said single piece conveyor and the infeed end of said transverse conveyor to a raised position creating a gap between the spaced apart single piece conveyor and the transverse conveyor; power means to raise and lower said swingable flap; power means to operate said single piece conveyor; power means to provide stepwise operation of said transverse conveyor; power means to operate said winged wheel conveyor in stepwise operation; said photo cell devices being situated adjacent their associated conveyors to detect whether or not pieces of lumber are positioned on the associated conveyor whereby automatic equipment can be used to receive condition signals from said photo cells to control the power means for the conveyors of said apparatus and to control the position of the flap depending on which longitudinal conveyor is free to receive a piece of lumber from said winged wheel conveyor and said transverse conveyor, respectively.

4,105,108

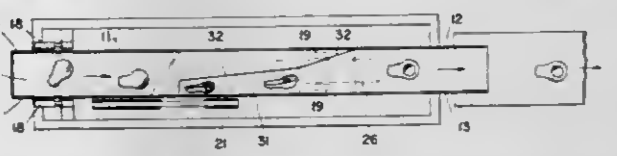
APPARATUS FOR ORIENTING HALVED FRUIT CUT SIDE UP

George E. Lauer, 6250 Melville Dr., Oakland, Calif. 94611

Filed Mar. 11, 1977, Ser. No. 776,905

Int. Cl.^{2} B65G *47/24*

U.S. Cl. 198—402 **7 Claims**



1. Apparatus for orienting halved fruit pieces cut side up, comprising a longitudinally extending table having a receiving end and a discharge end, means for defining at least one channel extending longitudinally on said table, said means including a first side wall extending along the receiving portion of said channel, a bottom panel inclined downwardly to a junction with said first wall; a second portion of said channel coextensive with said receiving portion including a trough formed in a portion of said bottom panel, said trough including generally planar, orthogonally related sides and bottom member, said trough being disposed adjacent to said first wall; a third, discharge portion of said channel including a concave bottom member coextensive with said bottom member of said trough, and means for translating said fruit pieces along said channel from said receiving portion to said discharge portion.

4,105,109

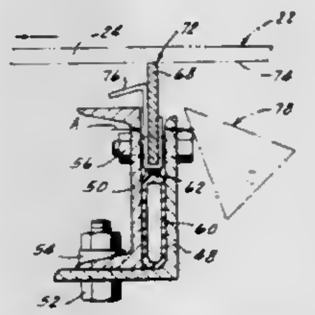
SCRAPER CLEANING APPARATUS FOR ENDLESS CONVEYOR BELT

John J. Schultz, 8405 S. Winslow Rd., Palos Park, Ill. 60464

Filed Mar. 4, 1977, Ser. No. 774,418

Int. Cl.^{2} B65G *45/00*

U.S. Cl. 198—499 **5 Claims**



1. A cleaning mechanism for an endless conveyor belt comprising support means mounted transversely of an endless conveyor belt and adjacent the carrying surface thereof, a plurality of scraper elements individually mounted on said support means substantially the length thereof and adapted when biased to engage said belt carrying surface and conform to the contour thereof, and biasing means characterized as being a flexible bladder containing a pressurized medium, said biasing means mounted on said support means and operable to

individually bias each of said scraper elements thereby to effect and maintain a uniform scraping engagement of each of said scraper elements with said belt carrying surface independent of the other said scraper elements.

4,105,110
DOUBLE CHAIN CONVEYOR CONSTRUCTION

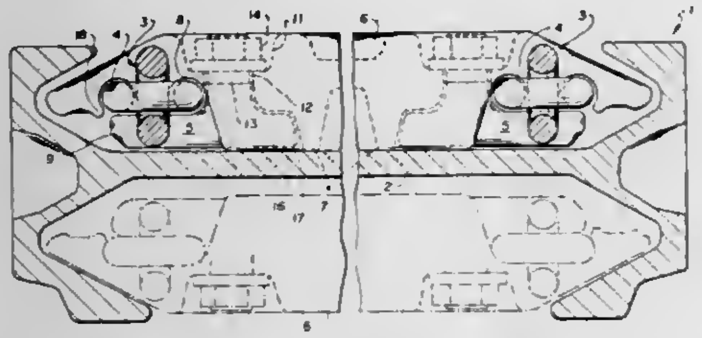
Ernst Braun, and Gert Braun, both of Essen, Germany, assignors to Halbach & Braun, Germany

Filed Mar. 23, 1977, Ser. No. 780,460

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618798

Int. Cl.² B65G *19/24*

U.S. Cl. 198—731 **5 Claims**



1. A double chain conveyor adapted to run in a conveyor trough having a trough bottom on which it is guided, comprising first and second spaced apart chains having interconnected generally horizontally and vertically arranged links and being adapted to run in a conveyor trough in spaced parallel relationships, a transversely extending driver having central seating lug means engageable on the trough bottom with a side surface extending laterally on each side and having a side portion on each side engageable over a portion of a horizontally arranged link and a portion of two adjacent vertically arranged links which are engaged with the horizontal link, said driver also having a substantially vertically extending bolt receiving opening therethrough on each side inwardly of said first and second chains, a yoke member having a bolt portion engageable in a respective bolt receiving opening on each side, each yoke member having a base portion engageable on the trough bottom with a laterally extending bracket part extending between adjacent vertically arranged links and providing a support for the horizontally arranged link, said yoke member also including a laterally extending arm portion extending in an opposite direction from said bracket part in respect to said bolt portion and having a lateral support surface engageable with a respective seating lug side surface.

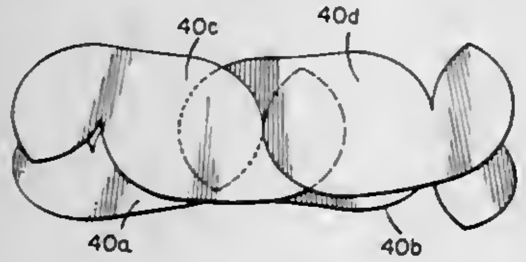
4,105,111
FLAT LINK CONVEYOR

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed May 26, 1977, Ser. No. 800,954

Int. Cl.² B65G *17/08*

U.S. Cl. 198—844 **7 Claims**



6. A multiple link conveyor composed of interleaved flat sheet members each sheet member comprising:

a central portion symmetrical about a longitudinal axis;

a first lobe contiguous with one side of the central portion along said axis and extending transversely from said axis in a first direction;

a second lobe contiguous with the opposite side of the central portion along said axis and extending transversely from said axis in a second direction opposite to said first direction;

each lobe meeting the central portion at a respective point on said axis;

each link being composed of at least one sheet member disposed with the lobes thereof oppositely extending to the corresponding lobes of adjacent links;

the lobes of each link being interleaved with oppositely extending lobes of adjacent links, the adjacent links being pivotable about the coincident meeting points of the interleaved lobes; and

means for retaining the sheet members of each link in contiguous overlapping layers.

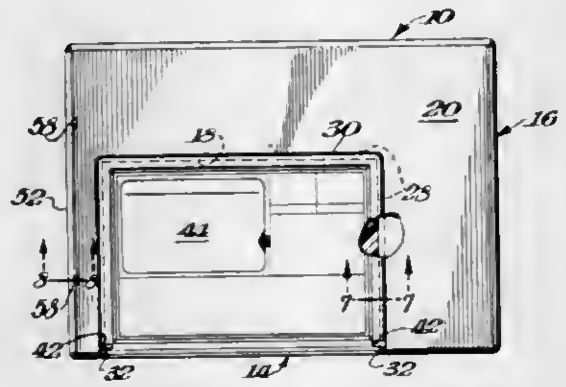
4,105,112
LOCKABLE SHIPPING BOX

John W. Graf, Montreux, Switzerland, assignor to Howmedica Inc., New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,386

Int. Cl.² B65D *55/14;* G09F *3/08;* E05B *65/52*

U.S. Cl. 206—1.5 **13 Claims**



1. A lockable shipping box comprising a tray for holding articles, a cover for the tray whereby articles in the tray are enclosed, a releasable security lock between the cover and tray for securing them together, a reversible address plate having a different address on each of the sides, a mounting means for the reversible address plate on the box constructed and arranged for receiving and holding the address plate on the box with one of its sides and the address applied thereto visibly displayed, an automatic lock between the box and reversible address plate, and the automatic locks including interengaging means on the reversible address plate which secures the reversible address plate to the box when the cover is closed over the tray, the cover has a lid and sides, one end of the cover is hinged to the tray, the hinged end of the cover being open, a pair of auxiliary guide pins extending inwardly from the inner sides of the cover adjacent its lid and open end of the cover, a pair of lower longitudinal auxiliary grooves in the lower portion of the outer sides of the tray for engagement by the inwardly extending auxiliary guide pins in the inner sides of the cover whereby the tray is helped to be guided in a sliding movement within the cover when it is rotated to an inverted position about the hinge and disposed parallel to the tray, combination rotational and slide guide pins extending outwardly from the midportion of the rear sides of the tray, longitudinal guide grooves in the middle of the inner sides of the cover for engaging with the combination rotational and slide guide pins when the tray is slid within the cover for guiding their relative sliding movement, the slide guide pins being shorter than wide, the longitudinal guide grooves having enlarged terminal hinge sockets disposed adjacent the open end of the cover which engage the width of the combination slide guide pins when the cover is rotated out of parallel with the tray whereby the cover is prevented from sliding relative to and is hinged to the tray, and a pair of arcuate guide grooves in the top of the hinged end of the sides of the tray for engaging the auxiliary slide guide pins within the inner sides of the cover when it is rotated closed upon the tray.

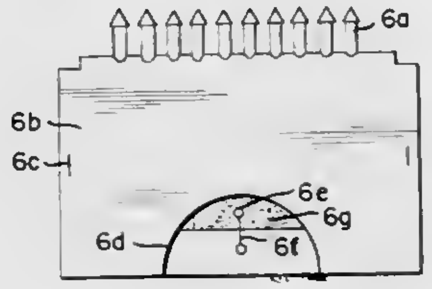
4,105,113
SAFETY MATCHPACKET COVER TO PREVENT CHILDREN FROM USING ANY MATCH

Tiburcio Coria Lopez, and Yolanda Teevin Coria, both of Jackson Heights, N.Y.

Filed Jul. 19, 1976, Ser. No. 705,331

Int. Cl.² A24F *27/00*

U.S. Cl. 206—100 **1 Claim**



1. In a match holder comprising a plurality of watertight cells each housing the substantial part of the length of a match therein, ignition means within each cell for automatically igniting a match upon the withdrawal thereof, a first cover member holding said plurality of cells in place, a polyethylene coating around the edges of said first cover member hermetically sealing said plurality of cells and insulating each of the cells from moisture and preventing sparks from exiting the cells upon ignition of a match; the improvement comprising completely enclosing said match holder in a second cover member, said second cover member including a top portion and a pair of cover portions hingedly attached to opposite sides of said top portion, one of said cover portions having a plurality of foldably connected flaps on opposed side edges thereof an the other cover portion having a finger notch therein in an edge opposite to the side connected to the top portion, an elastic member having one end thereof affixed to said one cover portion, a plurality of apertures located in said top portion in alignment with each one of said matches, said hingedly connected flaps being secured to said other cover portion to form said second cover member with said opposed cover portions being in substantial parallel relation, said match holder bein slideably received within said second cover member between said opposed cover portions with said matches in alignment with said apertures in the top portion, the other end of said elastic member being secured to said match holder so that when a user slidingly propels said match holder toward said top portion by digital access through said finger notch said matches will protrude through said apertures and, upon removal of the user's finger, the elastic member will cause the retraction of the match holder within the second cover member.

4,105,114
APPARATUS AND PROCESSES

Donald Edward Knox, Canterbury; Suleiman Mohammed Fakira, Ringwood, and Kenneth Andrew William Mitchell, Elwood, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Dec. 13, 1976, Ser. No. 750,019

Claims priority, application Australia, Dec. 30, 1975, 4427/75

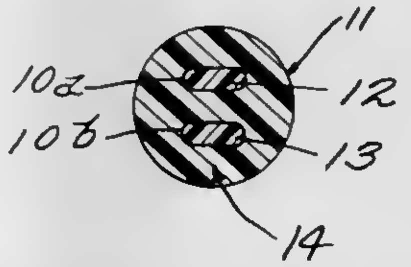
Int. Cl.² B65D *25/08*

U.S. Cl. 206—219 **17 Claims**

1. In a capsule useful for stabilizing and reinforcing rock formations and for securing elements in boreholes and having

(a) a first compartment in which an amount of a resinous composition is located and

(b) a second compartment located within said first compartment and in which there is located an amount of a hardener composition sufficient to produce a solid composition when said resinous composition and said hardener composition are admixed and wherein at least said second compartment is fabricated from a flexible frangible material,



the improvement wherein said capsule further includes (c) at least one non-supple reinforcing member located within said first compartment and attached to said first and second compartments, said reinforcing member being characterized in that it comprises solid polymerized material.

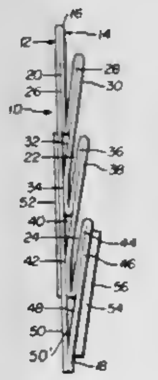
4,105,115
SUTURE AND NEEDLE HOLDER

Ralph S. Horvath, Rte. 1, Box 244B, Houghton, Mich. 49931, and Annette Moore Chapel, Massie Rd., Chassell, Mich. 49916

Filed Aug. 19, 1976, Ser. No. 715,726

Int. Cl.² A61L *17/02*

U.S. Cl. 206—370 **24 Claims**



1. A holder for surgical products comprising an elongated base member having a first planar surface and a second planar surface, an elongated facing member provided with a substantially rectangular front side and a substantially rectangular back side and secured on said back side to one of the surfaces of said base member, said facing member having a pair of longitudinal edge portions and a plurality of longitudinal intermediate portions between said edge portions, said intermediate portions being folded over adjacent portions thereof to define a plurality of longitudinally extending pockets adapted to receive surgical products, and one or more storage blocks for surgical needles, each block having a front and back surface and being secured on said back surface to the said front side of said facing member, each block being made from a resilient material and being provided on the front surface thereof with indicia to permit a person to count and store thereon surgical needles.

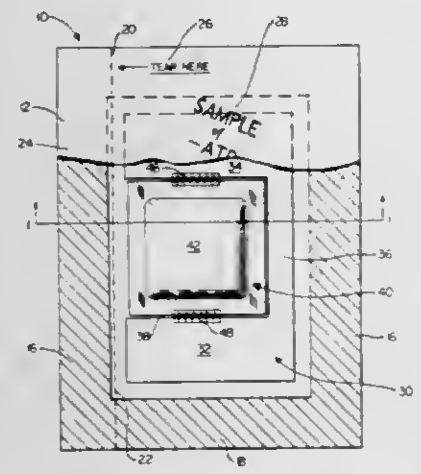
4,105,116
SAMPLE-CONTAINING ENVELOPE ASSEMBLY

John H. Jones, Westfield, and James T. Hoffman, Readington, both of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Oct. 29, 1976, Ser. No. 737,006

Int. Cl.^{2} B65D *75/00, 75/62*

U.S. Cl. 206—484 **7 Claims**



1. A sample-containing envelope assembly, comprising:
- (a) a closed envelope,
- (b) a relatively flat sample protector of thin pliable plastic material and of generally rectangular shape disposed within the envelope,
- (c) the sample protector of thin pliable plastic material having a relatively deep sample-holding pocket of a pre-selected shape,
- (d) a relatively flat and fragile sample disposed within the sample-holding pocket,
- (e) the sample having approximately the same thickness as the depth of the sample-holding pocket, and
- (f) the sample-holding pocket has a flat floor and its periphery is formed by a raised portion of the pliable sheet material which provides the required thickness to protect the sample.

4,105,117
RE-USABLE PLASTIC CONTAINERS

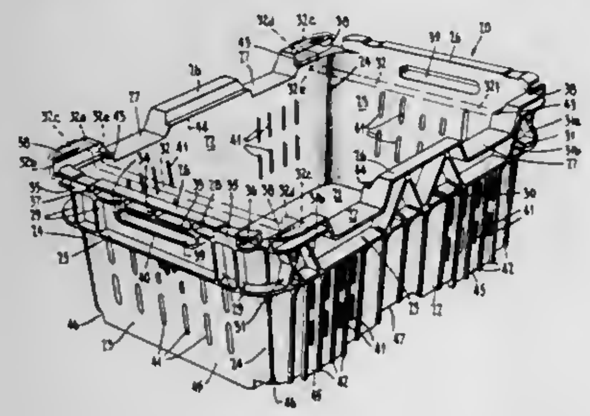
Howard Dawson Atkin, Beaumaris; Zbigniew Henryk Stachurski, Heathmont, and Brian Wilson Cherry, Glen Waverley, all of Australia, assignors to Plastic Enterprises Pty. Limited, Australia

Filed Sep. 8, 1976, Ser. No. 721,499

Claims priority, application Australia, Sep. 8, 1975, 3080/75

Int. Cl.^{2} B65D *21/06*

U.S. Cl. 206—501 **12 Claims**



1. A container defined by a base, two opposed side walls and two opposed end walls, and having an upper opening therein, at least said walls formed from a plastics material of the type having a flexural modulus within the range of 200 to 2,000 megapascals as measured by ASTM.D. 790, and which upon removal of a load has the ability substantially to recover to within 5% of its original dimensions as determined by experimental measurement within an accuracy of ± 5%, after being subjecting to a strain of at least 5%, said container including support means to support at least one further container within said upper opening to form a stack of containers, said support means comprising support wires positioned at opposite ends of the container and adapted to rest upon substantially horizontal upper flanges at or near the upper edges of said side walls to overlie or bridge the end portions of said opposed side walls, and force transfer means for transferring forces from said upper flange to a lower flange of said container side wall to distribute said forces over a wider area of said container walls, each said force transfer means comprising strengthening web groups adjacent the portions wherein said support wires rest upon said upper flanges, each said web group extending upwardly from said lower flange and including at least two upwardly converging webs the point of intersection of which is below or substantially below and adjacent the point where the respective support wire rests upon the respective upper flange.

4,105,118
LAMINATES USEFUL AS PACKAGING MATERIALS AND CONTAINER HAVING ALKALINE FLUID MEANS

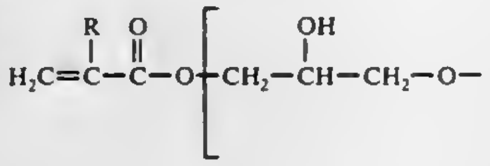
Robert Franklin Williams, Jr., Webster, and Chen-i Lu, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,758

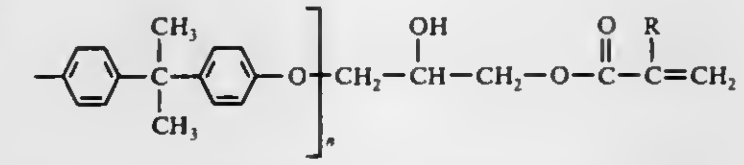
Int. Cl.^{2} B32B *27/38;* **B65D** *85/84*

U.S. Cl. 206—524.2 **18 Claims**

1. An article of manufacture comprising a container and alkaline fluid means disposed in said container, said container being at least partially constructed from a heat-sealable laminate having at least first, second and third layers, said first layer being a thermoplastic polymeric film in contact with said alkaline fluid means, said second layer being a barrier layer disposed between said first and third layers, and said third layer being a metal foil; said barrier layer being a radiation-cured layer formed by curing a radiation-curable composition in contact with both said first and third layers, said radiation-curable composition comprising an acrylic monomer and an acrylated epoxy resin of the formula:

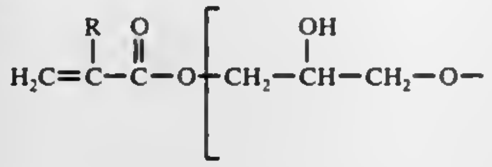


$$H_2C=\overset{R}{C}-\overset{O}{\overset{\|}{C}}-O-\left[CH_2-\overset{OH}{CH}-CH_2-O-\right.$$



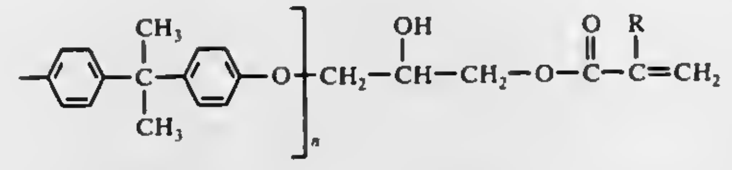
wherein R is a hydrogen atom or a methyl group and n is 1 to 20.

5. A heat-sealable laminate adapted for use as a packaging material, said laminate comprising (1) a metal foil, (2) a thermoplastic polymeric film, and (3) a radiation-cured interlayer which has been bonded to both said foil and said film by irradiation, said interlayer having been formed by irradiation of a radiation-curable composition comprising an acrylic monomer and an acrylated epoxy resin of the formula:



$$H_2C=\overset{R}{C}-\overset{O}{\overset{\|}{C}}-O-\left[CH_2-\overset{OH}{CH}-CH_2-O-\right.$$

-continued



wherein R is a hydrogen atom or a methyl group and n is 1 to 20.

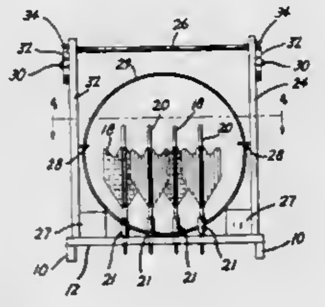
4,105,119
DART GAME HOLDER AND SCORE KEEPER

Arlis L. Cowan, 723 Marshall Ave., Medford, Oreg. 97501

Filed Aug. 12, 1977, Ser. No. 824,242

Int. Cl.^{2} B65D *69/00*

U.S. Cl. 206—579 **3 Claims**



1. An upstanding storing and score keeping frame for target rings and for pointed tip darts of distinctive colors adapted to be thrown at the target rings when the rings are placed upon the ground, said frame including
- (a) a normally horizontal lower crossbar having perforations in which the tips of vertically disposed darts are adapted to fit,
- (b) upstanding legs at opposite ends of the crossbar;
- (c) manually settable score indicating devices on the respective legs,
- (d) fixed score identifying reference members affixed to the respective legs in association with the respective score indicating devices, and
- (e) fixed fore-and-aft spaced, inwardly directed members carried by the respective legs between which the rings may be confined for storage, the dart receiving perforations in the crossbar being so spaced that the darts, themselves, will contribute to the confining of the rings in stored positions.

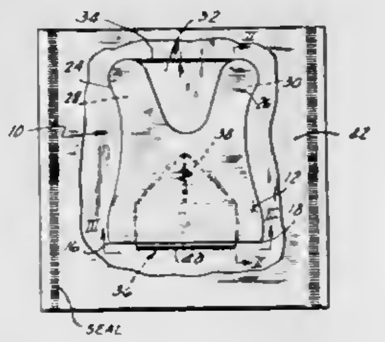
4,105,120
MINIATURE DENTAL KIT

Carl Bradberry, 1509 W. Farwell Ave., Chicago, Ill. 60626

Filed Nov. 26, 1976, Ser. No. 745,241

Int. Cl.^{2} A45D *44/18;* **A61C** *15/00*

U.S. Cl. 206—581 **1 Claim**



1. Dental hygiene kit comprising:
- a pair of sheets of biodegradeable paper material each including a pair of spaced apart arm portions shaped in the form of a tooth with said arms representing roots extending from one end of said kit, said sheets disposed in a superimposed coextending relation and bonded together along their marginal edges to form a chamber therebetween at the other end of said kit, said chamber having an opening in the marginal edge at said other end;
- a strip of dental floss permanently secured between the distal ends of said arms, said bonded sheets constuting a first handle for use in applying said dental floss to the teeth; and
- tooth scrubbing means disposed in said chamber and removable therefrom through said opening, said tooth scrubbing means including a dentifrice, a scrubbing member carrying said dentifrice and a second handle of biodegradeable material carrying said scrubbing member.

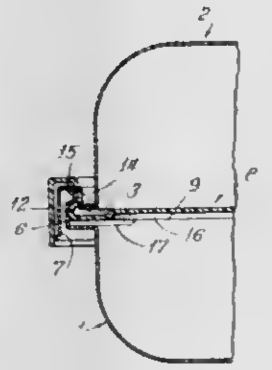
4,105,121
PACKAGE WITH MEDIAN SUPPORTING FRAME AND INTEGRAL DECORATIVE MEDIAL BAND

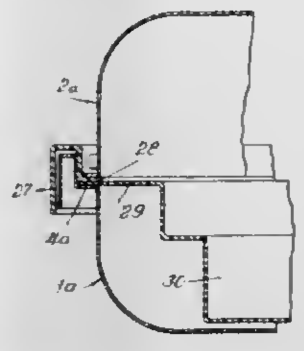
Joseph A. Mascetti, Glen Ellyn, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed May 9, 1977, Ser. No. 794,832

Int. Cl.^{2} B65D *85/30*

U.S. Cl. 206—592 **11 Claims**





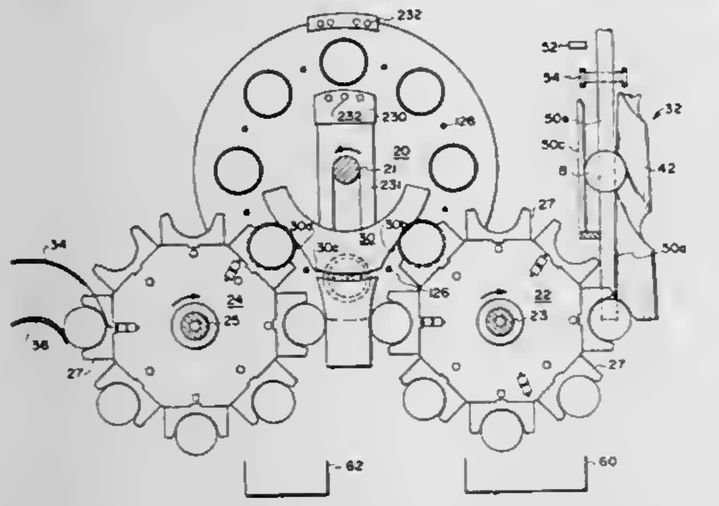
1. In a package including mutually confronting dished base and dished lid, said base and lid being mutually conforming at their peripheries, the improvements which comprise a median supporting frame conforming in size and shape to the peripheries of the base and lid and arranged therebetween and having an upstanding flange located between the overlapping peripheral portions of the base and lid, and means for latching both the base and the lid to said frame, said means comprising latching means elements on the peripheries of the base and lid and detent configurations in said upstanding flange with which said latching means elements respectively mate to latch the base and the lid respectively to said frame, said latching means elements on the periphery of the lid comprising a flange extending outwardly from the periphery of the lid and the detent configurations in the flange of the frame comprising inwardly impressed arcuate beads adapted to receive and hold said lid peripheral flange thereunder, said latching means elements on the periphery of the base comprising arcuate beads inwardly formed in the peripheral portion of the base located and shaped to mate with the inwardly impressed arcuate beads in the flange of the frame to latch the base to said frame.

4,105,122

INSPECTING CANS FOR OPENINGS WITH LIGHT

John Michael Flood; Clifford Harry Messersey, both of Randolph, N.Y.; Richard Dye, Bloomfield, N.J., and Leo Patrick O'Connor, Jamestown, N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Nov. 26, 1976, Ser. No. 745,191
Int. Cl.² B07C *5/344*
U.S. Cl. 209—73 **40 Claims**



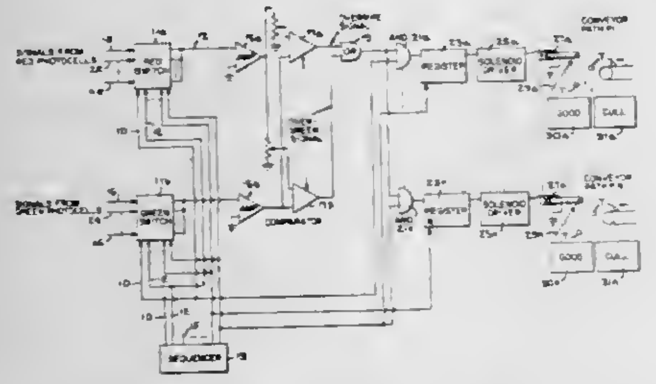
1. Apparatus for automatically inspecting open-ended containers for presence of openings in their structure comprising a rotatable shaft; plurality of photosensitive devices mounted for rotation with the shaft; plurality of holders, corresponding in number to the number of the photosensitive devices, mounted for rotation with the shaft, with each holder disposed opposite a corresponding photosensitive device; each holder includes means for yieldably maintaining a container between a holder and a photosensitive device whereby the device shuts off the open end of the container from exterior light; means for feeding containers between cooperating holders and photosensitive devices; stationary test station, including a light source for illuminating exterior of containers passing therethrough with the photosensitive devices sensing light passing through any opening that may be present in the containers; and means for sorting good container from leakers in response to signals from the photosensitive devices.

4,105,123

FRUIT SORTING CIRCUITRY

Donald W. Irving, San Jose, and Donald W. Chamberlin, Los Gatos, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jul. 22, 1976, Ser. No. 707,743
Int. Cl.² B07C *5/342*
U.S. Cl. 209—111.6 **9 Claims**



1. In a fruit sorter having a plurality of paths over which fruit may be moved, circuitry comprising:

detection means for producing a pair of continuous light reflecting signals for each of said paths, said signals being determined by the light reflected by a fruit moving in a path and being indicative of the amount of light reflected within two different bands of wavelengths of light;

a comparison means having an output and first and second inputs, said comparison means producing a reject output signal in accordance with the relative values of the signals at said inputs;

first and second electronic switches sequentially coupling said pairs of light reflecting signals one each to said first and second inputs respectively of said comparison means;

a plurality of means for providing a discharge signal in response to a reject output signal, each of said means for providing a discharge signal corresponding to one of said paths over which fruit may be moved;

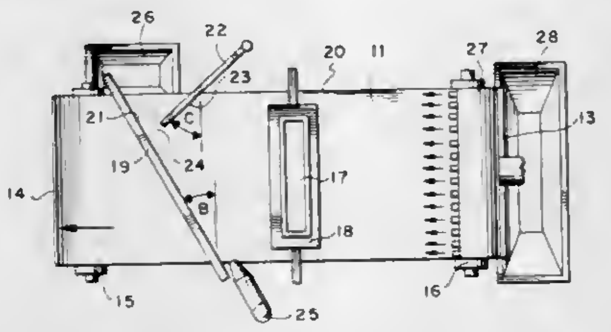
a plurality of shift registers sequentially connecting said output of said comparison means to each of said means for providing a discharge signal, and a sequencing circuit simultaneously applying a sequence of switching signals to said first and second electronic switches and enabling said plurality of shift registers in sequence so that each of said pairs of light reflecting signals determines the discharge signal for the corresponding one of said paths.

4,105,124

INCLINED CONVEYOR BELT SOLIDS SEPARATING SYSTEM WITH RESPONSIVE GAS CONTROL

James L. Skinner, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,588
Int. Cl.² B07C *1/00*
U.S. Cl. 209—114 **25 Claims**



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which tend to slide down an inclined surface comprising:

a. a conveyor belt-like member having an inclined upper surface, an upper end, and a lower end; said conveyor belt-like member being adapted to move said upper surface from said lower end to and around said upper end; said inclined upper surface of said conveyor belt-like member being inclined upward from said lower end and from horizontal along its longitudinal axis at an angle at least as great as the static roll angle of said spherically-shaped solids and less than the static slide angle of said irregularly-shaped solids;

b. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto an initial impingement portion of said inclined upper surface above said lower end;

c. first receiving means adapted to receive irregularly-shaped solids leaving said inclined upper surface at a point above said initial impingement portion of said inclined upper surface;

d. lower control means adapted and located to emit jets of gas which retard the rate of rolling of said spherically-shaped solids off said conveyor belt-like member; and

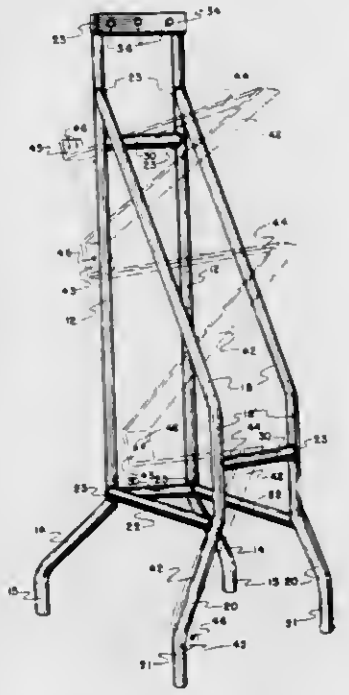
e. second receiving means adapted to receive spherially-shaped solids rolling off said conveyor belt-like member.

4,105,125

Z SHELF BRACKET STOCKING AND DISPLAY DEVICE

Albert H. Magness, 34 Lake Dr., Bel Air, Md. 21014

Filed Feb. 25, 1977, Ser. No. 772,072
Int. Cl.² A47F *7/00*
U.S. Cl. 211—13 **2 Claims**



1. A display rack for displaying shelf brackets comprising:

a. a pair of narrowly spaced parallel vertical rear posts having a horizontal integrally attached connecting member adjacent the top of the two rear posts and a second horizontal integrally attached member of substantially the same length connecting the rear post members adjacent the bottom thereof;

b. a pair of front posts spaced apart substantially the same distance as the rear posts and of substantially shorter length than the said rear posts;

c. said front posts having a pair of horizontal integrally attached members extending from each front post rearwardly to each corresponding rear post adjacent the bottom of the said front and rear posts and integrally attached to said rear posts;

d. a portion of said front posts being in a plane parallel with the back posts and the remainder of the upper portion of said front posts being angled upwardly and rearwardly in the same plane with each of the corresponding rear posts and attached thereto;

e. a connecting member for said front posts of substantially the same length as the connecting members for the rear posts and integrally attached to said front posts in a horizontal plane positioned above the horizontal plane of the connecting members of the front and rear posts and positioned within the portion of the front post running parallel with the said rear post;

f. the ends of the front and rear posts below the horizontal plane of the post connecting members connecting the front and rear posts being flared laterally outwardly to engage a supporting surface.

4,105,126

STORAGE AND DISPENSING RACK

John F. Deffner, Lisle; Donald W. Wendel, Mt. Prospect, and Russell M. Barnes, Bloomingdale, all of Ill., assignors to Visual Marketing, Inc., Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 712,074
Int. Cl.² A47F *5/01*
U.S. Cl. 211—49 D **4 Claims**

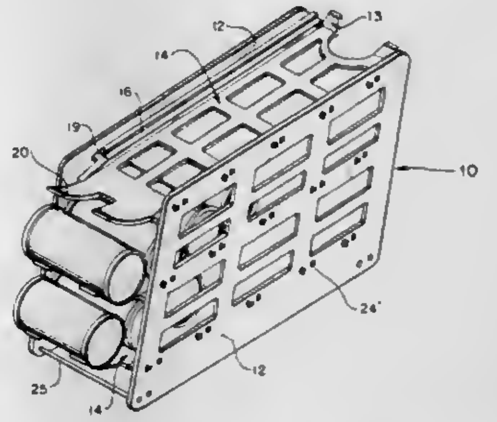
1. A rack for storing and dispensing individual containers having a substantially cylindrical side wall and ends substantially perpendicular to the axis of said side wall, said rack comprising:

at least one elongated shelf;

means for supporting said shelf on an incline to allow said containers to roll from one end of said shelf to the other end thereof;

means forming a first level of said shelf for accommodating first containers, said first level forming means comprising an inner base portion of said shelf; and

means forming at least one further level, each successively higher level accommodating containers successively taller than said first containers, said further level forming means comprising a pair of longitudinally extending rails positioned on opposite sides of said base portion, wherein each said rail has an outwardly extending stepped cross-sectional configuration, the horizontal portions of said rails forming said further levels of said shelf and the vertical portions of said rails forming means to guide said containers along said shelf, and further, wherein the uppermost horizontal portions of said rails are positioned below the uppermost edge of said shelf supporting means whereby said shelf supporting means cooperates with the ends of the tallest containers accommodated by said shelf to positively guide said tallest containers along the full length of said shelf.



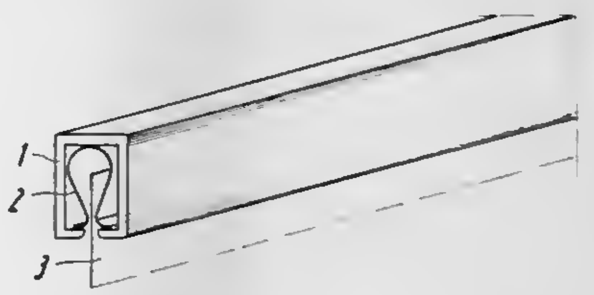
4,105,127

HOLDER BAR FOR SHEET-LIKE ARTICLES

Friedrich Höll, Freigericht, Fed. Rep. of Germany, assignor to C. Hohage & Cie. KG, Altena, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,596

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 7610411[U]; Oct. 7, 1976, 2645169
Int. Cl.² B42F *1/00*
U.S. Cl. 211—124 **6 Claims**



1. A holder bar for supporting sheet-like articles, comprising

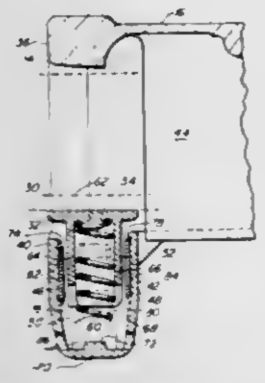
(a) an outer hollow rod of rectangular cross section formed of opposite wide side walls and opposite narrow side walls; means defining a throughgoing insertion slot along the length dimension of one of the narrow side walls medially thereof; and

(b) an inner hollow rod of generally Ω-shaped cross section arranged within said outer hollow rod and being coextensive therewith; said inner hollow rod being formed of two resiliently cooperating legs each terminating in a foot and a connecting portion attaching the two legs to one another remote from the feet; said legs, viewed from said connecting portion, converging towards one another to define an article-receiving portion; said feet being oriented in opposite directions with respect to one another and extending away from said article-receiving portion; said inner hollow rod being supported by said outer hollow rod solely by a contacting relationship between each said foot and the narrow side wall containing said slot and by a contacting relationship between the other narrow side wall and said connecting portion; said article-receiving portion being in alignment with said insertion slot for receiving and resiliently clamping a sheet-like article introduced into said insertion slot.

4,105,128

WEAR SURFACE ARRANGEMENT FOR COUPLER CARRIER ASSEMBLY

Benjamin B. Spencer, Columbus, Ohio, assignor to Buckeye International, Inc., Columbus, Ohio
Filed Aug. 16, 1976, Ser. No. 714,646
Int. Cl.^{2} B61G *9/22*
U.S. Cl. 213—61 **3 Claims**

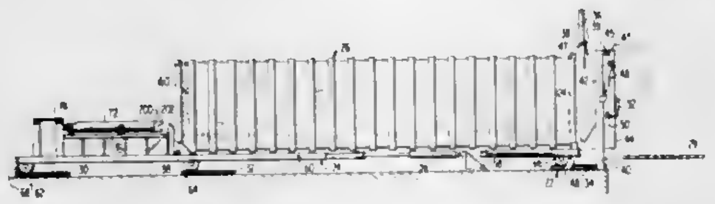


1. A railway coupler carrier assembly of the type having a spring basket defining a carrier pocket with a plurality of compression springs vertically disposed therein, and a coupler carrier having an upper horizontal plate portion for supporting a coupler and a lower portion disposed in the carrier pocket and supported on the compression springs for vertical movement in the pocket, the improvement comprising, in combination, said spring basket including front and rear vertical walls defining a carrier pocket therebetween, said vertical walls having substantially flat opposed upper wall portions approximately parallel to one another and each having a pair of upper and lower horizontal lugs projecting toward the opposite wall and defining vertically spaced substantially horizontal upper and lower locating surfaces defining a recessed area therebetween, said upper lug being disposed adjacent an upper end of its vertical wall and said lower lug being disposed approximately midway between upper and lower ends of its vertical wall, a flat wear plate disposed in each of said two recessed areas, each wear plate being engaged flat against said upper wall portion and being welded thereto with upper and lower wear plate edges adjacent said upper and lower locating surfaces, and said flat wear plates being of a thickness which exceeds the amount by which said lugs project from said upper wall portions, whereby said wear plates guide said coupler carrier during its movement in said pocket and prevent said coupler carrier from engaging said horizontal lugs.

4,105,129

METHOD FOR UNLOADING REFUSE CONTAINERS

Samuel E. Harvey, Knoxville; James Stephen Whitehead, Maryville, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.
Division of Ser. No. 641,524, Dec. 17, 1975. This application May 19, 1977, Ser. No. 798,508
Int. Cl.^{2} B60P *1/00*
U.S. Cl. 214—152 **6 Claims**



1. A method of unloading a transportable refuse container comprising the steps of:

placing a removable refuse container having refuse material therein on a carriage;

advancing the carriage and the container thereon to a container emptying position;

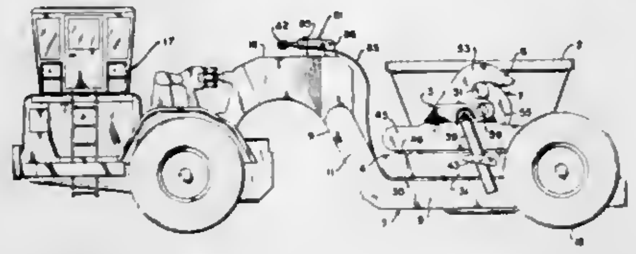
opening the refuse container while on the carriage so that a container opening is provided; extending a hydraulic cylinder to push a slidable bulkhead of the container; guiding an end of the hydraulic cylinder from a position outside the container toward the refuse container with carriage mounted guides;

pushing the slidable bulkhead of the container with the hydraulic cylinder toward the container opening to discharge the refuse material from the container opening; and guiding the end of the hydraulic cylinder within the container with container mounted guides.

4,105,130

RECEPTACLE TRANSPORTING VEHICLE

Thomas Lee Richard Hardwick, and Thomas James Hardwick, both of 1212 S. Parker, Olathe, Kans. 66061
Filed Feb. 14, 1977, Ser. No. 768,410
Int. Cl.^{2} B65G *7/00*
U.S. Cl. 214—314 **10 Claims**



1. A receptacle transporting vehicle comprising:

(a) an elongated mobile main frame having a forward end portion and a pair of side members extending rearwardly from said forward end portion and spaced transversely outwardly from a longitudinal central axis of said main frame, said side members of said main frame each having a rear end portion;

(b) an elongated dumping frame having a forward end portion and a pair of side members extending rearwardly from said forward end portion and spaced transversely outwardly from a longitudinal central axis of said dumping frame, said side members of said dumping frame each having a rear end portion thereof pivotally mounted on the rear end portion of respective side members of said main frame;

(c) an elongated scull frame having a forward end portion and a pair of side members extending rearwardly from said forward end portion and spaced transversely outwardly from a longitudinal central axis of said scull frame, said side members of said scull frame each having a rear end portion thereof pivotally mounted on the rear end portion of respective side members of said main frame;

(d) extensible means extending between said forward end portion of said main frame and each of said side members of said dumping frame for urging said dumping frame about said pivotal mounting thereof for raising and lowering said dumping frame relative to said main frame;

(e) extensible means mounted on said side members of said dumping frame and each having one end portion thereof pivotally connected to a respective one of said side members of said scull frame for effecting pivoted movement about the pivotal mounting of said scull frame between a first position for carrying a receptacle and a second position for discharging contents of the receptacle rearwardly of the vehicle, said pivotal movements of the scull frame and the dumping frame each supplementing the other in tilting the receptacle; and

(f) means on said scull frame for engaging trunnion portions of the receptacle and for retaining the receptacle in supported engagement during discharging contents of the receptacle;

(g) said extensible means between the dumping frame and scull frame being double acting hydraulic cylinders and operable to swing the scull frame through an arc in the nature of 45° relative to the dumping frame;

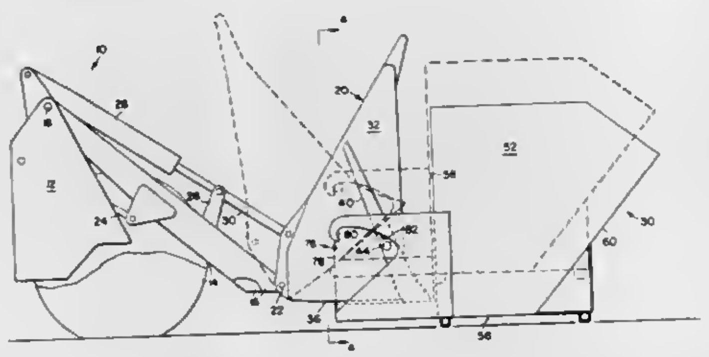
(h) said extensible means between the forward end portion of said main frame and each of the side members of said dumping frame being two stage hydraulic cylinders with one stage being double acting and one stage being single acting, said two stages hydraulic cylinders being operable to swing the dumping frame through an arc in the nature of 75° relative to the main frame and the combined movement of the dumping frame and scull frame moves the scull frame through an arc in the nature of one hundred twenty degrees relative to the main frame; and

(i) said two stage hydraulic cylinders having the double acting stage operable to retract the dumping frame to a position for the weight of the dumping frame, scull frame and empty receptacle further returns the dumping frame to the first position thereof.

4,105,131

COMBINATION FRONT-END LOADER BUCKET AND REFUSE CONTAINER

Ross Thomas Broderick, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Sep. 15, 1977, Ser. No. 833,545
Int. Cl.^{2} B65G *65/04*
U.S. Cl. 214—315 **5 Claims**

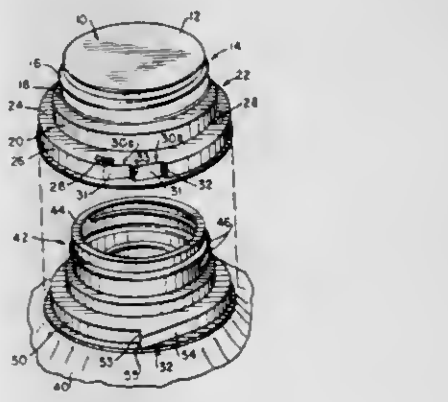


1. In a front-end loader bucket and refuse container combination wherein the container and bucket each include rear, bottom and opposite sidewalls, the container in addition includes a front wall and the bucket is adapted to be vertically pivotally connected to the front end of a loader lift arm structure for powered movement between roll-back and dump positions respectively wherein the bottom wall of the bucket, when considered from front to rear, is inclined upwardly and forwardly and is inclined downwardly and forwardly relative to a horizontal reference plane, the improvement comprising: said container having a pair of brackets fixed thereto and extending rearwardly therefrom at locations spaced transversely from each other a distance slightly greater than the distance between the opposite side walls of the bucket; said brackets each defining a downwardly facing pin guide surface and an arcuate, forwardly facing pin receptacle, with the guide surface forming a forward continuation of an upper terminus of the receptacle; abutment member means fixed between the brackets at a level below the pin receptacles; said bucket, as considered in its roll-back position, having a pair of horizontal, axially aligned pins fixed exteriorly to the opposite side walls thereof and engaged with said pin receptacles; and said abutment member means being engaged with the bottom wall of the bucket.

4,105,132

TAMPER-PROOF CLOSURE

Frederick D. Keeler, 43 Strobel Rd., Trumbull, Conn. 06611
Filed Aug. 19, 1976, Ser. No. 715,884
Int. Cl.^{2} B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—216 **12 Claims**



1. A thermoformed closure thermoformed from sheet plastic material of substantially uniform thickness and of a semi-resilient character, said thermoformed closure having a top wall, a skirt wall with fastening means thereon depending downwardly from said top wall,

a shroud ring extending outwardly from the lower end of the skirt wall, said shroud ring including a shoulder which is generally parallel to the closure top wall and a first wall depending downwardly from said shoulder, said top wall, side wall and shroud ring being of substantially the same thickness throughout except in the areas where deformed,

and at least one locking indent means deformed from said shroud ring and extending inwardly from said first wall, the first wall of said shroud ring being deformable so that the locking indent can be moved.

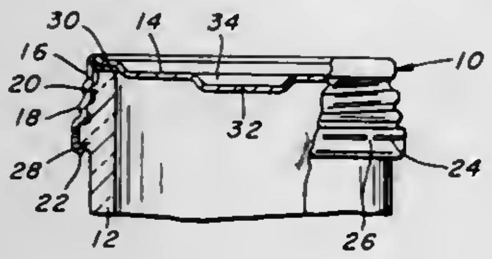
4,105,133

CONTAINER WALL WITH RUPTURABLE WEAKENING LINE

Robert L. La Barge, Ben Avon, Pa., and Robert G. Clawson, Pershing, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.
Continuation of Ser. No. 517,324, Oct. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 287,525, Sep. 8, 1972, abandoned. This application May 10, 1976, Ser. No. 684,836
Int. Cl.^{2} B65D *17/00*
U.S. Cl. 220—266 **24 Claims**

1. A container wall having a score line therein for forming an opening in the wall and an integral hollow rib in the container wall across the score line projecting from the plane of

the container at least five times the material thickness opposite the direction from which opening pressure is to be applied to stress the material in the score across the rib in tension and fracture such material.



4,105,134
PRESSURE RELEASE CLOSURES

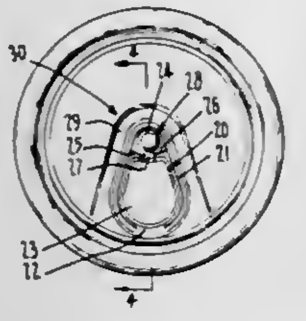
Michael Debenbam, Frankston; Allan George Dalli, Warrandyte, and Peter Louis Revell, Middle Park, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Oct. 4, 1977, Ser. No. 839,213

Claims priority, application Australia, Jun. 10, 1977, 0416/77; Jul. 14, 1977, 0848/77

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **8 Claims**



1. A sheet metal container member comprising a generally planar area of the container member, an aperture in said planar area, a push-in, pressure releasing, resealable closure integrally connected to said planar area, said aperture being closeable by said closure, said closure being integral through a connection to said planar area, said closure and said connection cooperating to permit said closure to depress into said container by flexing about said connection when push-in force is applied to said closure, said closure being generally adjacent the area immediately surrounding said aperture and being larger in diameter than said aperture to provide an area of said closure and the area immediately surrounding the aperture in sealing overlapping relationship prior to the application of said push-in force, and said connection, said closure and said planar area further cooperating to substantially prevent permanent opening of said closure by a digitally applied push-in force to cause said closure to at least substantially return to said sealing overlapping position upon the removal of said push-in force from said closure.

4,105,135
CLOSURE PLUG

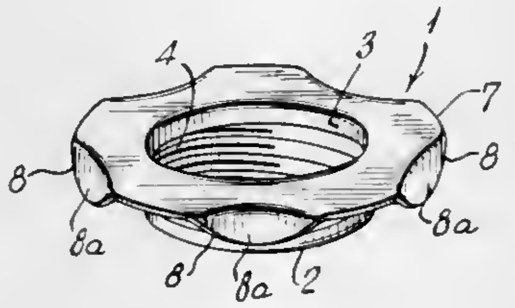
William A. Bradshaw, Weston, and Gerald Dalgleish, St. Catharines, both of Canada, assignors to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Feb. 18, 1977, Ser. No. 769,862

Int. Cl.² B65D *41/04*

U.S. Cl. 220—288 **1 Claim**

1. A container closure combination comprising a container wall opening surrounded by an internally threaded upstanding cylindrical neck terminating at its uppermost end in an outwardly curled bead, a cup shaped closure plug threadedly engaged within said opening, said plug having a bottom wall surrounded by an upstanding cylindrical threaded sidewall, an annular gasket seat at the upper end of said sidewall, a resilient sealing gasket disposed on said seat, a circumferential lip extending radially outwardly from the uppermost end of said plug sidewall terminating in a peripheral free edge portion, said peripheral free edge portion being deformed downwardly at circumferentially spaced intervals so as to form with said plug sidewall a series of downwardly opening channel shaped sections separated by remaining segments of said radially extending free edge portion, each of said sections extending downwardly to a position vertically spaced below said gasket seat and presenting a radially outwardly facing torque applying surface for convenient hand rotation of said plug, said outwardly facing torque applying surface being curved radially inwardly for effective hand gripping and forming a doubleconcave relationship with the interior of said plug sidewall.



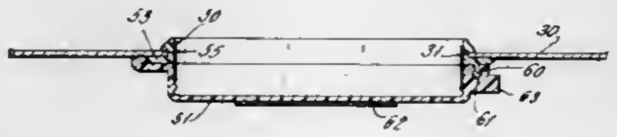
4,105,136
SNAP-IN MOLDED COVER ASSEMBLY FOR ACCESS OPENING

William E. May, Feasterville, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 28, 1977, Ser. No. 763,304

Int. Cl.² B65D *51/04, 51/18*

U.S. Cl. 220—339 **11 Claims**



1. An integral molded cover and frame for the access opening of a circuit breaker cubicle; said frame comprising a generally flat ring-shaped flange having a first surface for sealing against a flat peripheral region extending from said access opening, and an annular projection axially spaced from said flange and defining, with said first surface of said flange, an annular groove which can snap around the periphery of said access opening; said flange of said frame having a second surface; an integral hinge connecting one edge of said molded cover to one edge of said frame; said cover having an annular ring-shaped flange surface engageable in surface-to-surface, non-telescoping contact with said second surface of said flange of said frame; said cover being rotatable around said hinge between an open and closed position relative to said frame; said cover being coextensive with said frame; said cover terminating completely at its said flat ring-shaped surface; and snap closure means for holding said cover in its said closed position; said frame and said cover having generally rectangular shapes; said snap closure means being disposed only on the side of same frame which is farthest removed from said hinge.

4,105,137
PROCESS AND DEVICE FOR THE AUTOMATIC DILUTION OF SOLUTIONS

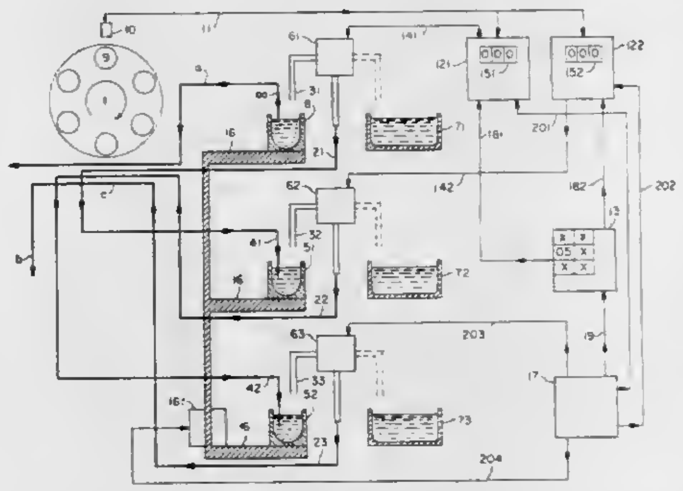
Rudolf Bernet, Zeglingen; Hans Koller, and Eugen Wachberger, both of Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 23, 1976, Ser. No. 699,014

Claims priority, application Switzerland, Jul. 7, 1975, 8837/75

Int. Cl.² G01N *1/10*

U.S. Cl. 222—1 **9 Claims**



1. Process for the automatic dilution of concentrated solutions with a diluent by means of a peristaltic pump comprising having a peristaltic pump run continuously at a constate rate in one direction thereby defining a suction end and a dispensing end of the pump and for each diluting cycle immersing the suction end alternatively, for a certain number of pump strokes, in the concentrated solution and in the diluent, wherein a dilution operation is comprised of three stages, in which the suction line is immersed in the diluent in the first and last stages and in the solution to be diluted in the middle stage.

4,105,138
APPARATUS FOR PRESETTING VOLUMES OF LIQUID

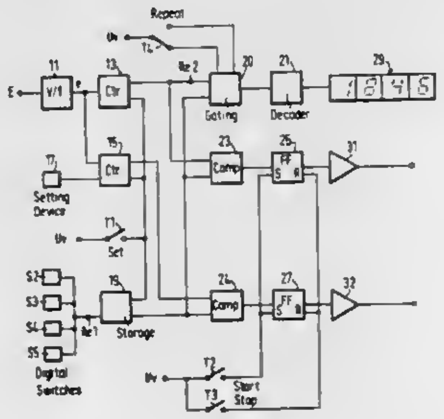
Karl-Otto Lehmann, deceased, late of Baden-Baden, Germany, by Gertrude Lehmann, heiress, and Dieter Krause, Baden-Baden, Germany, assignors to Apparatebau Hundsbach Prof. Dr.-Ing. Habil., Dr. Phil. Nat. Karl-Otto Lehmann, Nachf., GmbH, Cie., Baden-Baden, Germany

Filed Mar. 2, 1977, Ser. No. 773,656

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608995

Int. Cl.² B67D *5/30*

U.S. Cl. 222—14 **7 Claims**



1. Apparatus for metering a quantity of liquid through a line which contains therein a flow meter developing an output signal proportional to flow, means for reducing the flow in the line and means for terminating the flow therein comprising:

(a) a first counter having its input coupled to the output of the flow meter;

(b) means for storing a desired quantity to be metered;

(c) a first comparator having as inputs the outputs of said first counter and said means for storing;

(d) a second counter, said second counter also having as an input the output of the flow meter;

(e) means for presetting a lead value into said second counter;

(f) a second comparator having as inputs the output of said second counter and the output of said means for storing;

(g) a first flipflop having as an input the output of said first comparator, said flip-flop providing its output to control the means for terminating flow;

(h) a second flip-flop having as an input the output of said second comparator and providing its output; an to the means for reducing flow; and

(i) display means having an input coupled to the output of said first counter.

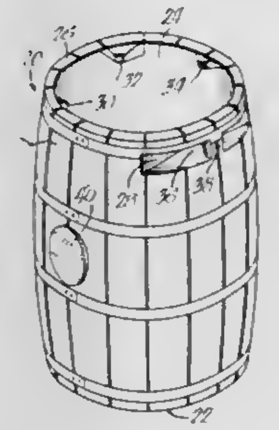
4,105,139
SHELL FOR FLEXIBLE BAG HAVING MOUNTING FOR SPOUT

William R. Scholle, Corona Del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Feb. 18, 1977, Ser. No. 770,087

Int. Cl.² B65D *33/00, 33/38*

U.S. Cl. 222—105 **21 Claims**



1. A fluent dispenser comprising an outer shell having an opening thereto; an inner flexible bag filled with fluent material inserted in said shell through said opening, said bag having a fluent dispensing spout thereon positioned in said shell adjacent said opening, and a generally planar closure for said opening, said shell having means formed integrally therewith for detachably mounting said closure in said opening to retain said bag and spout therein, said bag and spout normally being retained entirely within said shell and closure without fixed attachment thereto for safety and sanitation in shipment and handling, said closure having normally rigid but movable flaps accommodating access to and removal of said spout through said closure and mounting of said spout in fluent dispensing position.

4,105,140
WALL-MOUNTING UNIT ARRANGEMENT FOR LOCATING ABOVE A WASH BASIN AND DEFINING A SHELF WHERE OBJECTS MAY BE DEPOSITED

Eckart Roth, Rosenstrasse 41, 7272 Altensteig, Fed. Rep. of Germany

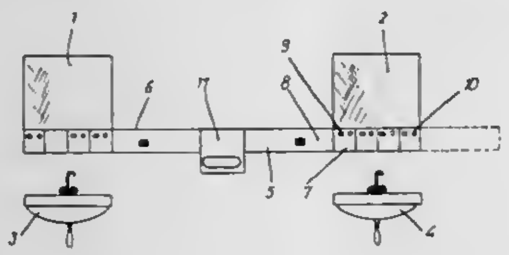
Filed Dec. 28, 1976, Ser. No. 754,999

Int. Cl.² B67D *5/60*

U.S. Cl. 222—131 **9 Claims**

1. An installation combination for fastening to a wall, for example, above a wash basin, and comprising (1) a shelf with an essentially horizontally running shelf surface for the depositing thereof of objects and (2) additional devices, for example,

medium dispensers in the form of soap, skin lotion or disinfectant dispensers which are arranged in a longitudinal direction of the shelf whereby the lower side of the shelf surface limits the top of a space receiving the additional devices, a space which is covered, at least towards the outside, within the area of the additional devices by means of a plate which can be removed from the shelf; characterized by the fact that the shelf represents, over its entire length, the cut-off length from a shelf section available in any number of meters, that the additional devices are suspended from the shelf, and that each additional device is covered by a special plate section which, viewed in its cross-section and proceeding from the front area of the shelf surface away from the wall to which the installation combination may be attached, runs towards the bottom and towards the wall by forming a recess towards the wall whereby, with a dispensing section covering a medium dispenser as an additional device, the spout of the medium dispenser penetrates through an opening in the plate section above the recess.



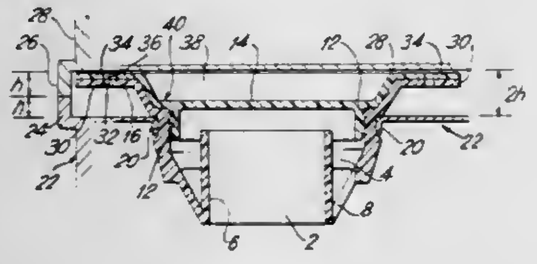
4,105,141
POURING DEVICE

Charles Anthony Lane, Richmond, and Anthony James Lucking, London, both of England, assignors to Waddington & Duval (Holdings) Limited, London, England

Filed Dec. 9, 1976, Ser. No. 749,016

Int. Cl.² B67D *3/00*

U.S. Cl. 222—143 **5 Claims**



1. A pouring device adapted to be fixed to an upper surface of a container, said device comprising

a central pouring tube mounted within a body of said device, said body having a substantially cylindrical wall in which there if provided an outer peripheral container engaging groove and air inlet structure positioned around said tube between said tube and wall, said body being extended outwardly and conically from an area adjacent said groove in a widely flared manner away from said pouring tube to a thin planar annulus forming a pouring lip whose plane is higher with respect to said groove than the outer extremity of said central pouring tube, and

a bung fitted in said device, said bung having an interior and exterior surface approximately conforming to the interior shape of said body of said device from an area adjacent said engaging groove outwardly along said conical extension and at least covering a part of said annular pouring lip, said bung having a sealing surface below said annular pouring lip, said bung being fixed to said pouring lip around an annular outer extremity of said pouring lip, and said annular outer extremity being perforated to provide a break away ring.

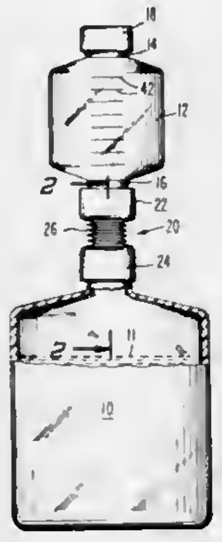
4,105,142
DISPENSING DEVICE FOR FLUID SUBSTANCES

Harold K. Morris, Jr., Rte. 4, Meadow La., Flemington, N.J. 08822

Filed Oct. 7, 1976, Ser. No. 730,482

Int. Cl.² B67D *5/38*

U.S. Cl. 222—158 **6 Claims**



1. A dispensing device for fluid substances comprising:

a. a dispensing container for holding a metered amount of fluid substance therein for dispensing, said container defining a primary opening and a secondary opening therein;

b. a capping means detachably affixable over said primary opening to selectively enclose said primary opening as well as to selectively open said primary opening to allow dispensing of a metered amount of fluid substance therethrough;

c. a hollow adapter which includes a dispenser collar being detachably affixable to said secondary opening and further including a holder collar being detachably affixable to a holder of the fluid substance to be dispensed, said holder adapter selectively providing a path of fluid flow communication between the interior of the holder and the interior of said dispensing container, said adapter further including an axially expandable sleeve interconnecting said holder collar and said dispenser collar; and

d. valve means positioned within said hollow adapter to selectively meter the flow of fluid substance through said hollow adapter, said valve means including a plug means held immovable with respect to said holder collar, said plug means positioned extending into said secondary opening of said dispensing container to prevent the passage of fluid substance into said dispensing container from said holder thereof, said plug means being disengageable from said secondary opening of said dispensing container to allow dispensing of a metered amount of fluid from the holder to said dispensing container by temporary expanding of said axially expandable sleeve and being reengageable with said secondary opening by releasing of said axially expandable sleeve.

4,105,143
DEVICE FOR DISCHARGING BULK MATERIAL

Ludwig Blinn, Spiesen, Germany, assignor to Pohlig-Heckelbleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Cologne, Zollstock, Germany

Filed Feb. 3, 1977, Ser. No. 765,312

Claims priority, application Fed. Rep. of Germany, May 2, 1976, 2604327

Int. Cl.² B65G *27/18*

U.S. Cl. 222—161 **20 Claims**

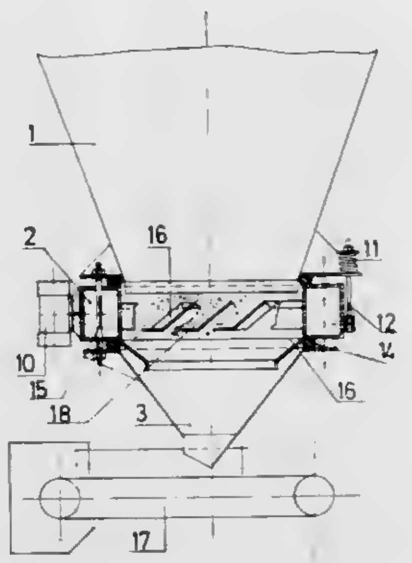
1. A device for discharging bulk material, which comprises an upper hopper adapted to receive bulk material,

a lower hopper disposed under said upper hopper and

adapted to receive bulk material from the upper hopper and to deliver said bulk material,

a substantially cylindrical rigid connecting ring disposed between and resiliently connected to said upper and lower hoppers and defining a flow path between them,

a plurality of blades, which are angularly spaced apart in a horizontal plane and supported by said connecting ring at fixed points thereof and extend substantially radially in said flow path, and



at least two vibration machines mounted on said connecting ring and operable in the same sense of rotation to impart sinusoidally varying, angular oscillations to said connecting ring.

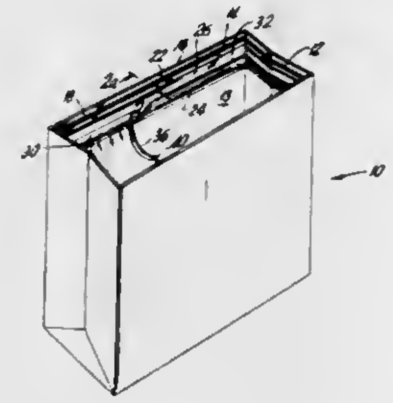
4,105,144
DISPENSER FOR INSECT OR VERMIN POISON

Feng Lin, 455 Ocean Ave., Brooklyn, N.Y. 11226

Filed Sep. 16, 1976, Ser. No. 723,784

Int. Cl.² B65D *47/10*

U.S. Cl. 222—187 **7 Claims**



1. A dispensing device for dispensing materials along a wall of a container including:

a backing plate attached along a portion of said wall;

at least one elongated member defining a chamber to hold said materials, said elongated member having a cover member with opposed longitudinal sides and an arch-like portion extending therebetween, said cover member having at least one longitudinally extending weakened area;

means to attach said opposed longitudinal sides of said cover member to said backing plate to define said chamber between said arch-like surface and said backing plate; and

a tear strip attached along the longitudinal surface of said arch-like cover member adjacent to said weakened area to rupture said member,

a strip of porous material which is adapted to absorb said material to be dispensed, said strip being attached to said backing plate beneath said cover member.

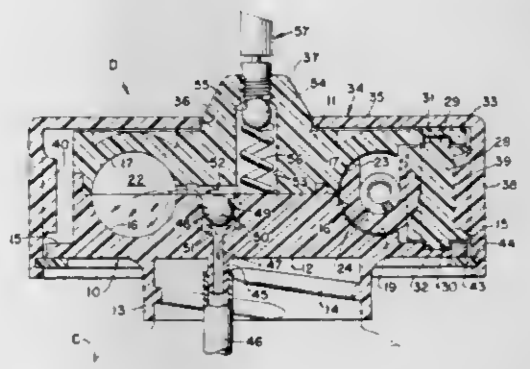
4,105,145
MECHANICALLY OPERATED DISPENSING DEVICE

Nicholas G. Capra, East Hanover, N.J., assignor to James D. Pauls and J. Claybrook Lewis, both of Miami, Fla., part interest to each

Filed Sep. 16, 1976, Ser. No. 724,006

Int. Cl.² B05B *11/00*

U.S. Cl. 222—340 **17 Claims**



1. In a manually operated dispensing device for dispensing material under pressure, wherein the dispensing device is mounted on a container and has a discharge means for discharging the material from the container, a passage means in communication with the discharge means and with material to be dispensed, movable means in communication with the passage means for pressurizing the material and moving it through the passage means to the discharge means for discharge of the material for use as desired, and manually operable means on the dispensing device and accessible from exteriorly of the device for operating the movable means, the improvement comprising gear means including drivingly interengaged gear teeth on the manually operable means and the movable means for effecting actuation of the movable means when the manually operable means is moved, said gear means including means for effecting disengagement of said gear teeth on the manually operable means from the gear means on the movable means when the manually operable means has been moved a predetermined amount, so that continued movement of the manually operable means on the dispensing device does not cause further movement of the movable means, and to enable the movable means to move in a return direction without causing movement of the manually operable means.

4,105,146
METERING DISPENSER HAVING SUCK-BACK THROUGH NOZZLE

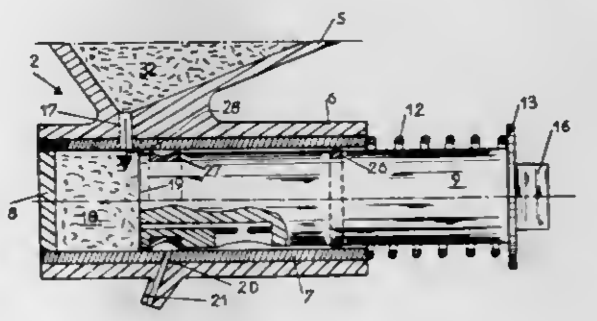
Bernard Broillard, Lieudit "Sur Avellard", Sevrier (Haute-Savoie), France

Filed Sep. 22, 1976, Ser. No. 725,893

Claims priority, application France, Sep. 26, 1975, 75 30277

Int. Cl.² B67D *5/40*

U.S. Cl. 222—383 **9 Claims**



1. A metering dispenser for supplying a metered quantity of liquid comprising:

a housing having an inlet, an outlet and a cavity interposed said inlet and outlet;

a piston having a transfer chamber therein, said piston mounted in said cavity and cooperating with the cavity to define a metering chamber; said metering chamber communicating with said inlet and outlet;

first means for sealing said metering chamber, said sealing means mounted to said piston, said first sealing means being operable to terminate communication between said inlet, and outlet with said metering chamber;

a passage within said piston, said passage having one end communicating with said metering chamber and an opposite end terminating in said transfer chamber of the piston, said transfer chamber communicating with said outlet when said piston is in a first predetermined position;

means for terminating communication between said transfer chamber of the piston and said outlet;

second means for sealing mounted to said piston adjacent said transfer chamber, said transfer chamber interposed said first and second sealing means;

a reservoir complementary with said housing, said reservoir communicating with said inlet of said housing; and

means for actuating said piston, said actuating means pivotally attached to said housing and said piston for moving said piston from a fully extended position to a fully retracted position,

wherein, when said piston is in a fully extended position and a liquid fills said metering chamber by way of said inlet while said first sealing means seals said outlet and said piston is moved from said fully extended position to said fully retracted position, said first sealing means seals said inlet so that, said piston moves said liquid from said metering chamber through said passage and into said transfer chamber of the piston,

said means for terminating communication between said transfer chamber and said outlet preventing said liquid from escaping through said outlet until said piston moves to said first predetermined position towards said fully retracted position,

said transfer chamber communicating with said outlet to expel said liquid from said dispenser after said piston moves to said first predetermined position towards said fully retracted position, said transfer chamber expelling said liquid from said metering chamber, passage and transfer chamber, while said piston is moving to said fully retracted position, said transfer chamber further communicating with said outlet to draw in ambient air to expunge said outlet, passage and transfer chamber of any liquid remaining therein while said piston moves from a fully retracted position to said first predetermined position, said metering chamber developing a vacuum when said piston moves toward said fully retracted position past said first predetermined position, said vacuum aiding the filling of said metering chamber with liquid from the reservoir through said inlet after said first sealing means moves to unseal said inlet.

4,105,147
EXTRUDER SCREW VALVE

Paul L. Stubbe, Box 111, Girard, Pa. 16417
Filed Feb. 7, 1977, Ser. No. 765,973
Int. Cl.^{2} B29F *1/04;* F16K *15/08*
U.S. Cl. 222—413 **15 Claims**

1. An injection molding unit comprising,

a barrel having a generally cylindrical bore therein,

said bore having its first end closed,

a nozzle in said closed end,

a screw having a first end and a second end,

a ram head on said first end of said screw,

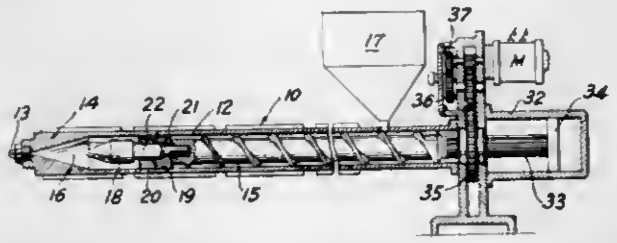
said ram head having a shoulder means adjacent to said screw,

a first valve part on the end of said screw adjacent said ram head engaging said shoulder,

an intermediate part of said ram head extending from said shoulder means to said ram head, slidably receiving a second valve part thereon,

said first valve part and said second valve part being generally cylindrical in shape and slidably and rotatably received in said barrel,

flow means in the outer periphery of said first valve part and extending axially along said outer periphery the entire length of said first valve part and cooperating with means in the outer periphery of and extending axially along the entire length of said second valve part providing a flow passage between said nozzle and said barrel,

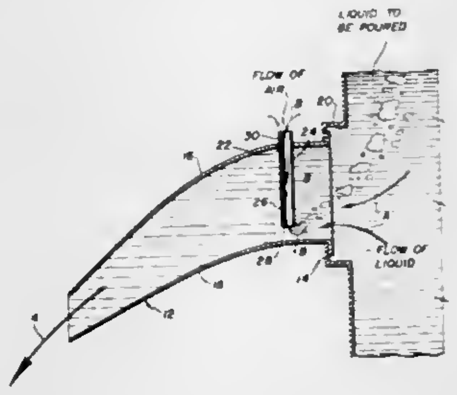


said second valve part being adapted to move into seating engagement with said first valve part when said screw is moved in a direction toward the nozzle and means on said second valve part engagable with means on said first valve part holding said flow means in said valve parts out of alignment with each other when said valve parts engage each other interrupting flow from said screw to said nozzle,

said second valve part being adapted to move away from said first valve part when said screw is moved in a direction away from said nozzle whereby material can flow from said screw into the space in said barrel adjacent said nozzle.

4,105,148
SELF-VENTING SPOUT

William D. Williams, Mahwah, N.J., assignor to Sterling Drug, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 546,329, Feb. 3, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,411
Int. Cl.^{2} B67D *3/00*
U.S. Cl. 222—478 **5 Claims**



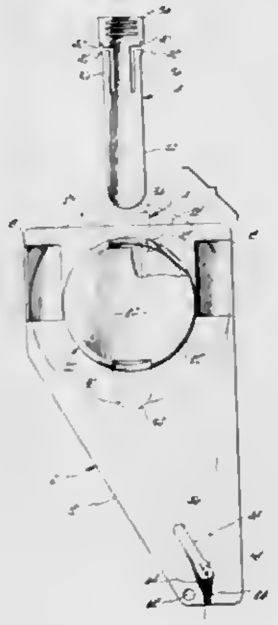
1. A self-venting spout for a closed container, said spout being attached with respect to a wall of the container, said spout having a pair of opposite walls, one of said spout walls being uppermost when the container is turned in order to pour material through the spout, and the other spout wall being lowermost,

a vent in the uppermost spout wall, a piece of substantially straight tubing associated therewith and extending for a short distance out into the atmosphere through said vent and for a major portion of its length into and across for a major part of the diameter of the spout, approaching the lowermost wall and terminating short thereof,

said spout having a pouring orifice, and the vent being remote from the orifice.

4,105,149
TAPE DISPENSING APPARATUS

Hal W. Stewart, P.O. Box 1621, Burbank, Calif. 91507
Filed Sep. 30, 1976, Ser. No. 728,039
Int. Cl.^{2} B26F *3/02*
U.S. Cl. 225—25 **5 Claims**

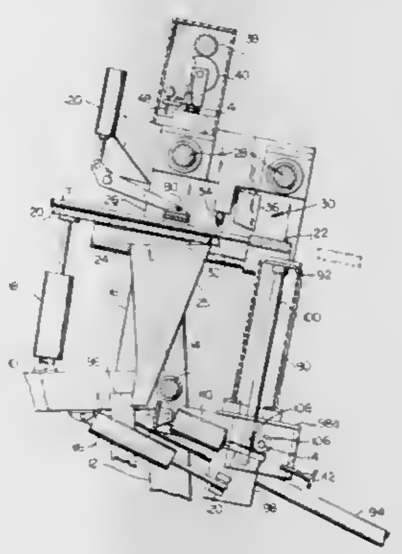


1. An apparatus adapted to be secured to the apparel of a user for dispensing a length of tape from a tape roll, said apparatus comprising a body member, means carried by said body member for securing said apparatus to the apparel of said user, a walled cylinder protruding from said body member and being adapted to have a roll of tape disposed thereon, said cylinder having a pair of diametrically disposed apertures extending therethrough adjacent the extended end thereof, a locking tab having a tongue portion adapted to extend through said apertures in said cylinder, a head portion extending from one end of said tongue portion and at least one resilient arm portion integrally formed with said tongue portion and extending substantially parallel thereto such that upon disposing said tongue portion through said aperture and over a tape roll, the portion of said walled cylinder adjacent one of said apertures is held between the head portion of said locking tab and the extended end of said resilient locking arm, means carried by said body member for supporting the extended end of said tape roll, said means having a walled channel therein, and cutting means disposed within said walled channel for severing a length of tape from said tape roll.

4,105,150
GLASS TUBE CUTTING MACHINE

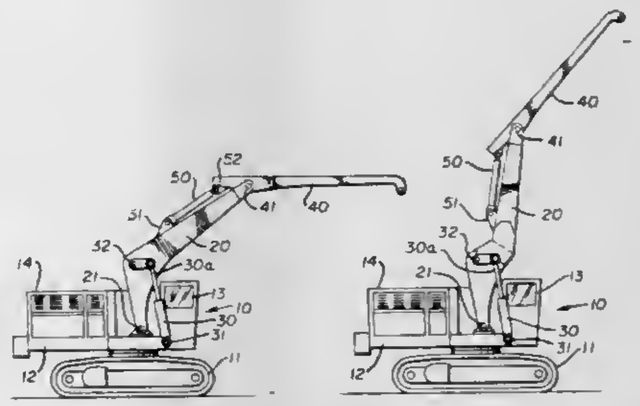
Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.
Filed May 16, 1977, Ser. No. 797,002
Int. Cl.^{2} C03B *33/06*
U.S. Cl. 225—96.5 **12 Claims**

1. A machine for cutting and storing segments of elongated members such as glass tubing, said machine comprising a fixed frame, a bed for supporting a plurality of these members in side-by-side relation, an anvil adjacent one end of said bed, means mounting said bed to said frame so that said bed is movable between a first position and a position inclined with respect to the horizontal such that the members are adapted to slide on the bed to assume positions wherein these side-by-side members overhang said anvil, stop means provided in spaced parallel relation to said anvil for engaging the overhanging ends of the members to be cut, a carriage having cutting means thereon, means for causing said carriage to traverse said bed in both said first and said inclined positions so that said cutting means moves across the members to cut them, fixed cull chute means for collecting the segments cut when said bed is in said first position, and magazine means for collecting segments when said bed is in its inclined position.



4,105,151
CRANE CONVERSION METHOD

James L. Eltzroth, 282 Westgate St., Wadsworth, Ohio 44281
Filed Aug. 11, 1977, Ser. No. 823,597
Int. Cl.^{2} B23K *31/02*
U.S. Cl. 228—170 **3 Claims**



1. A method of retrofitting a knuckle boom crane designed for excavating purposes comprising the steps of

A. cutting V-shaped notches into the sidewalls of the main boom with the apexes of the notches directed toward the bottom wall of the boom;

B. bending said boom so that the edge surfaces formed by said cutting step are in abutment with each other; and

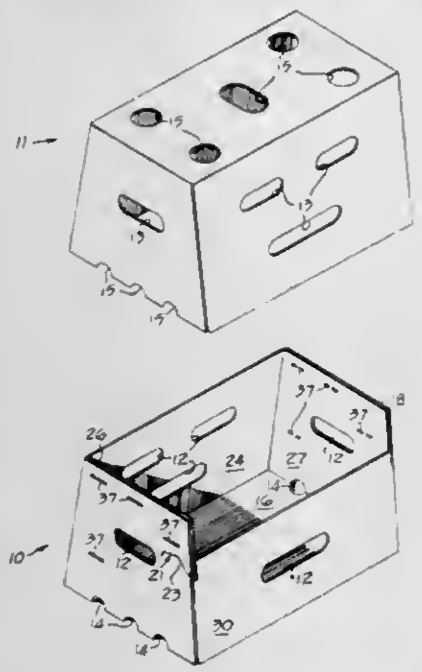
C. welding said edge surfaces together.

4,105,152
ASPARAGUS CONTAINER

John R. Elward, Novato, Calif., assignor to Fibreboard Corporation, San Francisco, Calif.
Filed Oct. 11, 1977, Ser. No. 840,990
Int. Cl.^{2} B65D *5/32*
U.S. Cl. 229—23 BT **9 Claims**

1. A container comprising an opened top receptacle adapted to retain foodstuffs or the like therein and a separate cover telescopically disposed on said receptacle, said receptacle comprising a bottom panel, a pair of laterally spaced end panels, a back panel fixedly secured to each of said bottom and end panels and a front panel hingedly mounted on said container for pivotal movement between closed and opened positions, and lock means normally locking said front panel to at least one of said end panels when said front panel is maintained in its closed position on said container, each of said end panels com-

prising a pair of superimposed first and second end panels and means securing each pair of said first and second end panels together, a slit defined by said pair of end panels and terminating at forward edges thereof and wherein said lock means comprises at least one lock flap connected to said front panel and disposed in interlocking relationship within said slit when said front panel is maintained in its closed position, said lock means including means for retaining said lock flap in said interlocking relationship.



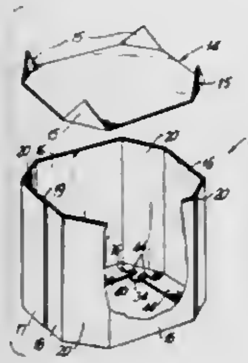
4,105,153
PAPERBOARD BULK BIN

Frank W. Locke, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 26, 1977, Ser. No. 827,944

Int. Cl.² B65D *13/04*

U.S. Cl. 229—23 R **16 Claims**



1. A paperboard bulk bin comprising:

a side wall formed from a plurality of alternating, foldably connected, substantially rectangular upstanding side and corner panels, each corner panel having a horizontally disposed stepped flap foldably connected to the bottom edge thereof, each stepped flap being of a width corresponding to the width of the associated corner panel at the bottom edge thereof and having a tongue portion of reduced width at the opposite free edge thereof; each of said side panels having a horizontally disposed, substantially rectangular locking flap, foldably connected to the bottom edge thereof, each said locking flap having opposed cut-outs on opposite side edges thereof, each said cut-out being intermediate the length of said side edge, said stepped flaps and locking flaps being in interengaged locking relationship to form a peripheral base support for the bulk bin; and

a bottom wall formed from a substantially flat, horizontally disposed panel insert having a perimeter corresponding to the bottom edges of said side and corner panels and overlying the said peripheral support base.

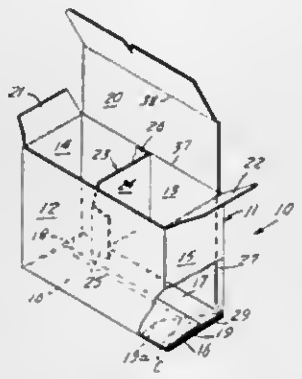
4,105,154
PACKAGING STRUCTURE AND ITS FABRICATION

George Leroy Meyers, and Donald Roy Kuehl, both of Menasah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 5, 1977, Ser. No. 784,828

Int. Cl.² B65D *5/48*

U.S. Cl. 229—27 **14 Claims**



1. In a folding, divided carton structure including a foldable sleeve-like body portion having confronting side wall panels that are relatively closely spaced in a folded mode of said carton structure and less closely spaced in a set up mode of said carton structure, and a closure portion hingedly connected to said body portion, the combination of divider means for said body portion, comprising: at least one divider panel; means defining hinged connection of each of a pair of mutually spaced regions of said divider panel to one of said confronting side wall panels; and means defining detachable interconnection between said divider panel and one of said body and closure portions in the recited folded mode of said carton structure, said means defining hinged connection and said means defining detachable interconnection being so cooperably disposed that, upon unfolding said carton structure to the recited set up mode, said divider panel is pivotable on said hingedly connected spaced regions to release said detachable interconnection and move to a position dividing the region enclosed by said sleeve-like body portion.

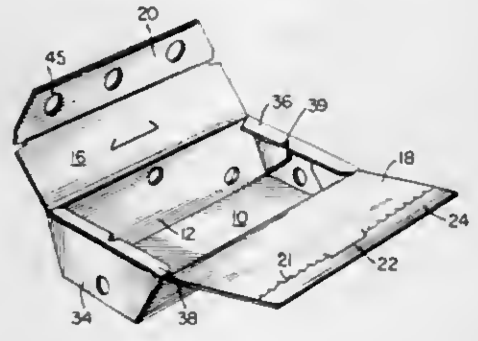
4,105,155
DIVIDED AND TAPERED FOOD CARTON

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 4, 1977, Ser. No. 839,399

Int. Cl.² B65D *5/28, 5/50*

U.S. Cl. 229—33 **1 Claim**



1. A divided food carton for packaging a plurality of individually wrapped servings of a food product such that the servings have a minimum contact with the top, bottom and side walls of the carton, said carton being prepared from a single blank of foldable sheet material into a configuration of trapezoidal cross section with angularly disposed side walls, comprising:

(a) a centrally located bottom panel;

(b) a pair of side walls foldably attached to opposite sides of said bottom panel;

(c) a pair of top closure flaps foldably attached to the ends of said side walls opposite said bottom panel;

(d) an integral divider element having a width substantially equal to the height of the carton foldably attached to the end of one of said top closure flaps, said one top closure flap having a width equal to one-half the width of said carton in the plane between the top of said angularly disposed side walls, and said remaining top closure flap having a width which permits it to overlap and be adhered to said one top closure flap when the carton is closed, and further including a single, substantially straight perforated tear line located prior to the point where the top closure flaps are adhered to one another, said tear line commencing at one edge of said remaining top closure flap and extending to the other edge thereof where there is located at least one unsecured carton opening tab;

(e) a pair of end walls foldably attached to opposite ends of said bottom panel;

(f) a top closure supporting flap foldably attached to each end closure flap at the end opposite said bottom panel, and further including a notch located substantially at the midpoint thereof for accepting and capturing the integral carton divider element when it is folded into position to divide the carton;

(g) a plurality of end closure flaps foldably attached to the ends of said side walls for securing the end walls of said carton to the adjacent side walls; and,

(h) a plurality of ventilation openings in the side and end walls, and divider element of said carton for the purpose of preserving the freshness of the packaged food products.

4,105,156
IDENTIFICATION SYSTEM SAFEGUARDED AGAINST MISUSE

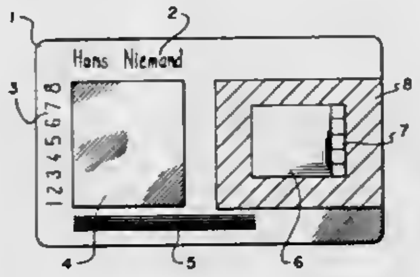
Jurgen Dethloff, Elbchaussee 239, Hamburg, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,035

Claims priority, application Austria, Sep. 6, 1976, 6599/76

Int. Cl.² G06K *19/06, 7/06*

U.S. Cl. 235—441 **27 Claims**



1. In a system, secured against misuse and counterfeiting, for effecting transactions, such as manual or mechanical delivery of commodities, services and money while using identificands, such as credit cards, check cards, cards for automatic machines, coded tokens, keys and the like, provided with identification data, processing data, or both which are readable visually, by a machine, or both, and while using a personal identifying designation, such as a personal identification number (PIN), for verifying the entitlement of the user of the identificand: the improvement comprising, in combination, an identificand having inaccessibly and integrally incorporated therein memories for entry and storage of information therein, including a personal identifying designation; at least the memory for entry and storage of the personal identifying designation being chargeable only once, and at least the contents of the memory for the personal identifying designation being available only within the identificand; verifying means operable to receive said identificand and apply an input thereto; components included in said identificand and activated, responsive to an input from said verifying means, to effect checking of the identity and entitlement of a user of said identificand; and input-output means included in said identificand for establishing communication between said identificand and said verifying means; said identificand including means preventing external access to said memories except through said input-output means when in communication with said verifying means.

4,105,157
PROGRAM READING APPARATUS

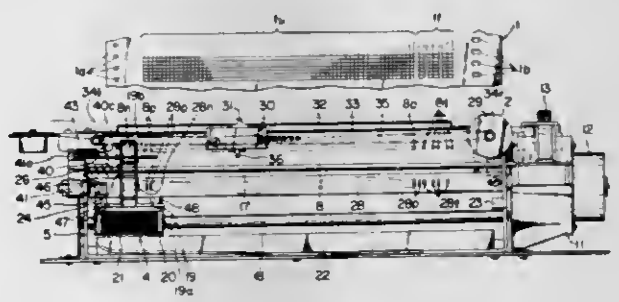
Yutaka Kagaya, Kodaira, Japan, assignor to Silver Seiko Ltd., Kodaira, Japan

Filed Aug. 4, 1977, Ser. No. 821,811

Claims priority, application Japan, Aug. 17, 1976, 51-109373[U]

Int. Cl.² G06K *13/00;* **D04B** *15/66;* **D03D** *49/00;* **G06K** *7/10*

U.S. Cl. 235—475 **13 Claims**



1. In a program reading apparatus having a movable reading head which is mounted for movement from and to a starting position along a path, the improvement comprising:

an arrester member having a first position in which it is clear of the reading head and being movable to a second position in which it is engageable with the reading head to prevent movement of the reading head from the starting position;

means for urging the arrester member from the second position to the first position; and

means responsive to the arrival of the reading head at the starting position for momentarily actuating the arrester member to move said arrester member to the second position so that said arrester member momentarily arrests the reading head from rebounding movement from the starting position.

4,105,158
PREHEATING AND WARMING APPARATUS FOR USE WITH VEHICLES

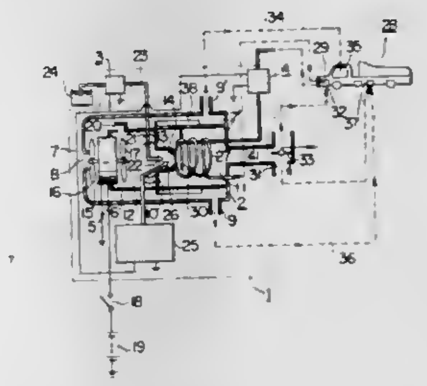
Nobutoshi Hasebe, Ibaraki; Toshiyuki Itoh, Katsuta, and Takashi Hashimoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 7, 1976, Ser. No. 748,330

Claims priority, application Japan, Jan. 19, 1976, 51-4130

Int. Cl.² B60H *1/02*

U.S. Cl. 237—12.3 C **16 Claims**



1. Preheating and warming apparatus for use with motor

vehicles and having a cabin and other accessories, such as a radiator, a battery, and an engine, said apparatus comprising:

an outer housing;

an inner housing disposed in substantial axial alignment within the outer housing, said inner housing having one common end wall with the outer housing and further having heat radiating walls;

a clean air inlet port formed in another end wall of the outer housing;

an annular chamber formed between the inside wall of the outer housing and the outside wall of the inner housing;

at least two clean air exit ports formed in the annular chamber;

a combustion gas outlet port formed in the common end wall of the inner housing with the outer housing;

a partition wall dividing the interior space of the inner housing into a clean air introduction chamber on one side thereof and into a combustion chamber on the other side thereof;

a nozzle means mounted on the partition wall for injecting fuel into the combustion chamber;

a water heating tube disposed within the combustion chamber;

a duct for delivering heated clean air from one of said clean air exit ports to a cabin of a motor vehicle;

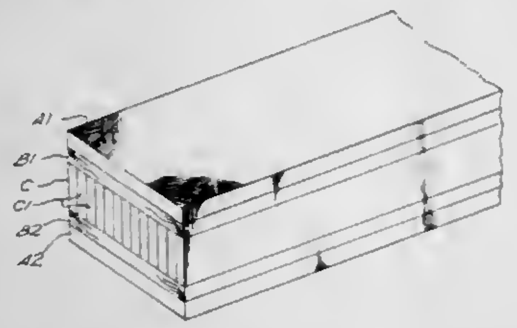
a duct for delivering heated clean air from the other of said clean air exit ports to a space surrounding an accessory of the motor vehicle;

a plurality of ducts for delivering hot combustion gas from the combustion gas outlet port to a plurality of accessories, each located at different locations of the motor vehicle; and

a water line for delivering water from a radiator of the motor vehicle to the water heating tube and for returning the water at a higher temperature from the water heating tube to the radiator.

4,105,159
COMPOSITE RAILROAD TIE

Gordon Eldred Brown, 1960 W. 25th, Eugene, Oreg. 97405
Filed Oct. 6, 1976, Ser. No. 730,188
Int. Cl.^{2} E01B *3/02*
U.S. Cl. 238—36 **1 Claim**



1. A railroad tie of composite construction, said tie comprising in combination,

uppermost and bottommost elements of rectangular section constituting the top and bottom surfaces of the tie, said elements comprised of hotpressed comminuted liqnocellulosic material having a density range of 0.75 to 1.2 grams per cc,

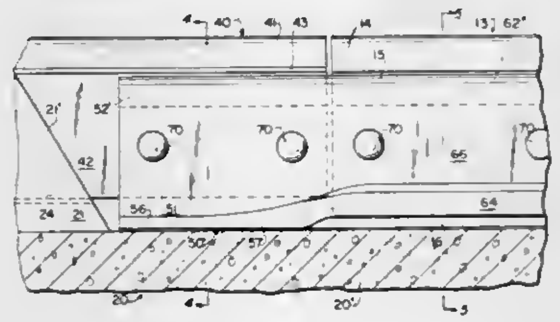
an innermost component containing the tie neutral axis at laminated hotpressed particleboard consisting of particleboard lamina, each lamina having its broad faces perpendicular to and offset from said elements, each of said particleboard lamina having its fibres substantially in parallel relationship to the lamina broad faces and thereby contributing significant horizontal shear strength to the tie,

dimensioned lumber elements extending the length of the tie and located immediately above and below said innermost component, said lumber elements having a grain direction parallel to and offset from the tie neutral axis, said dimensioned lumber elements offset remotely above and below the tie neutral axis and thereby contributing tensile strength to resist ending loads applied to the tie, and

adhesive means joining all tie components into a unitary mass.

4,105,160
RAIL JOINT BAR FOR NON-UNIFORM RAILS

James LeRoy Ramer, Rte. 1, Box 155, Sullivan, Mo. 63080
Filed May 10, 1977, Ser. No. 795,479
Int. Cl.^{2} E01B *11/16*
U.S. Cl. 238—167 **12 Claims**



1. In combination

a first rail having a head for supporting the wheels of a train and a terminal depending web extending downwardly from said head,

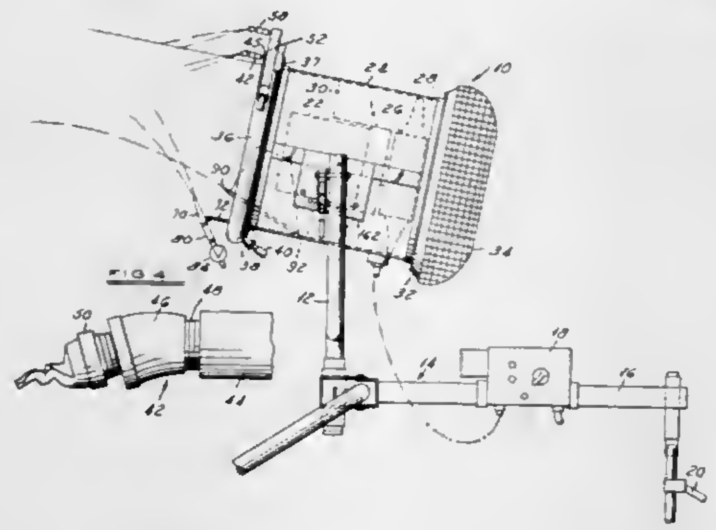
a second rail having a head, a web extending downwardly therefrom and a transverse flange at the lower end of said web, and

a joint bar comprising a first, substantially U-shaped portion having a bight at the bottom thereof aud a pair of legs, and a second portion having a pair of spaced elements extending longitudinally of said first portion, one from each of said legs,

said first rail being carried only by said first portion and said second rail being secured only between the spaced elements of said second portion.

4,105,161
METHOD AND MACHINE FOR MAKING ARTIFICIAL SNOW

Everett F. Kircher, Boyne Falls, and James L. Dilworth, Petoskey, both of Mich., assignors to Boyne Mountain Lodge, Inc., Boyne Falls, Mich.
Filed Nov. 18, 1976, Ser. No. 742,785
Int. Cl.^{2} F25C *3/04*
U.S. Cl. 239—2 S **10 Claims**



1. A method of making artificial snow comprising the steps of:

(1) generating in ambient air which is at or below a temperature of 32° F by means of a ducted fan or blower a substantially unidirectional high-volume air stream at substantially atmospheric pressure in a zone overlying an area of the ground on which the artificial snow is to be deposited,

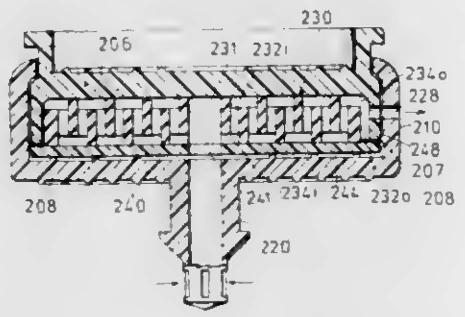
(2) directing a flow of water in spray form into said air stream solely from a zone disposed generally above said air stream in the vicinity of the maximum velocity of said air stream,

(3) directing a flow of seed crystals into said air stream solely from a zone disposed generally below said air stream, and

(4) orienting the flows of said water spray and seed crystals at respective acute angles relative to the direction of travel of said air stream such that said flows converge and intermix in said air stream downstream of the respective points of entry of said flows into said air stream.

4,105,162
REGULATED FLOW-REDUCING DEVICE PARTICULARLY USEFUL FOR DRIP IRRIGATION

Mordeki Drori, 89 Zahal St., Kiron, Israel
Filed Feb. 3, 1977, Ser. No. 765,297
Claims priority, application Israel, Oct. 10, 1976, 50650
Int. Cl.^{2} B05B *1/30*
U.S. Cl. 239—109 **6 Claims**



1. A regulated flow-reducing device particularly useful for drip irrigation, comprising: a housing having a disc-shaped end wall, a disc-shaped closure cap, a fluid inlet formed through said end wall, and a fluid outlet; a flow-retarding member disposed in said housing and having an inlet end communicating with said housing inlet, an outlet end communicating with said housing outlet, and a circuitous flow pathway between said ends and defined at least in part by recesses formed in one face thereof facing the housing inlet and in the opposed face there of facing said closure cap; and a flat disc-shaped regulator member disposed between the housing end wall and said one face of the flow-retarding member such that the face of the regulator member facing the housing end wall is subject to the fluid pressure at the inlet of the housing ; said flat regulator member being in contact with and covering said one face of the flow-retarding member except for its inlet end to provide communication between said inlet end and the housing inlet; said flow-retarding member being made of resilient material so that both its faces are deformable against the regulator member and the disc-shaped closure cap, respectively, by the inlet pressure whereby the cross-sectional area of said recesses on both faces of the flow-retarding member are varied in accordance with the inlet pressure

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4,105,163
FUEL NOZZLE FOR GAS TURBINES

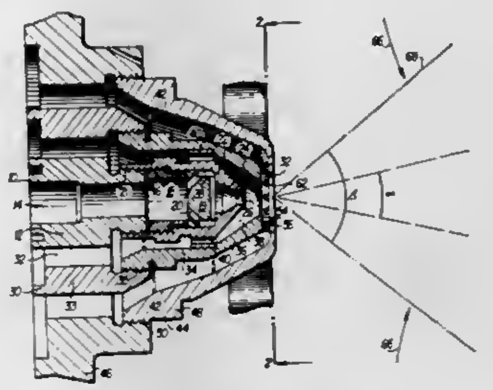
Lewis Berkley Davis, Jr., Schenectady, and Colin Wilkes, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 27, 1976, Ser. No. 736,159
Int. Cl.^{2} B05B *7/10*
U.S. Cl. 239—406 **2 Claims**

1. A fuel nozzle for a gas turbine comprising:

a. a central passage for supply of fuel, said passage terminating in an orifice for discharge of fuel;

b. a first annular passage generally surrounding and concentric with said central passage for supply of primary air, said first annular passage having a discharge opening surrounding said orifice and causing air supplied through said first annular passage to be mixed with fuel to provide a conical fuel/air spray having a predetermined spray angle; and

c. a second annular passage for supply of secondary air, said second annular passage surrounding and generally concentric with said first annular passage and having a discharge opening surrounding said first annular passage discharge opening,

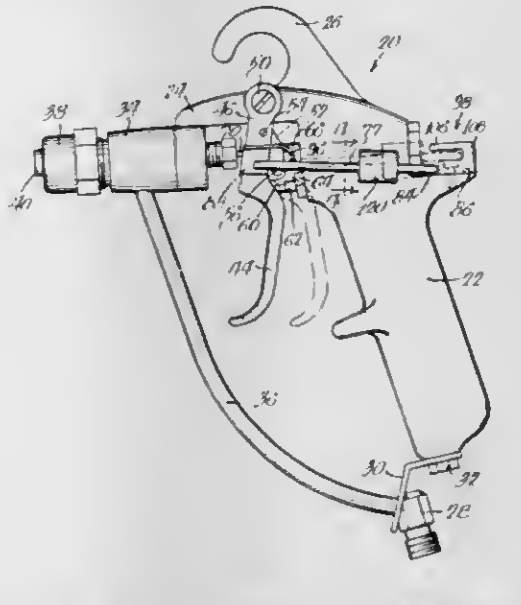


d. an annular member disposed in said discharge opening of said second annular passage; and

e. said annular member having formed therein a plurality of circumferentially spaced slots, said slots being arranged so as to deliver said secondary air therethrough as a plurality of streams tangentially disposed to said first annular passage discharge opening and in a plane generally normal to the axis of said first annular passage, whereby said secondary air is delivered substantially at the base of said fuel/air spray to develop a low pressure substantially at the base of said fuel/air spray and thereby effect an increase in said spray angle as the spray cone is developed.

4,105,164
TRIGGER LOCK MECHANISM FOR SPRAY GUNS

George W. Lau, Blue Island, and Edward J. Bujnowski, Chicago, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.
Filed Nov. 26, 1976, Ser. No. 745,294
Int. Cl.^{2} B05B *7/02*
U.S. Cl. 239—526 **10 Claims**



1. In a trigger lock mechanism for a spray gun, for controllably blocking movement of a trigger thereof from a gun off to a gun on position, an arm secured at a first end thereof to said trigger and extending at a second and opposite end thereof to a position remote from said trigger, said second end being

movable between first and second positions when said trigger is in said gun off position and normally being in said first position, and being constrained for movement generally in a first direction with said trigger upon movement thereof toward said gun on position, and means for blocking movement of said second end in said first direction when said end is in said first position, said second end when in said second position being movable in said first direction past said blocking means, whereby said trigger is blocked by said arm against movement to said gun on position when said second end is in said first position, and is movable to said gun on position when said second end is in said second position.

4,105,165

ARRANGEMENT FOR PROVIDING TRANSFER TAIL WINDINGS ON A BOBBIN

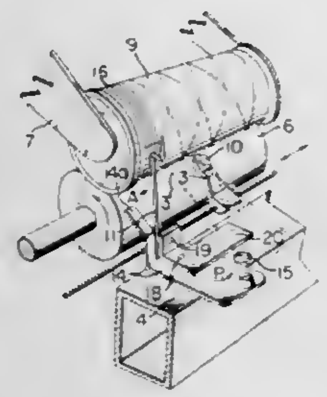
Tsutomu Miyazaki, Kariya; Toshio Yoshizawa, Chiryu; Yoshiaki Yoshida, Ohbu; Kinpei Mitsuya, Aichi, and Takeshi Ogasawara, Gamagori, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Apr. 19, 1977, Ser. No. 788,966

Claims priority, application Japan, Apr. 27, 1976, 51-48321

Int. Cl.^{2} B65H *54/02*

U.S. Cl. 242—18 PW **5 Claims**



1. A yarn winding mechanism comprising, in combination:

a bobbin holder for supporting a bobbin for rotation for winding a yarn fed from a supply thereon;

means disposed adjacent the bobbin holder for traversing the yarn fed from the supply in a predetermined width to form a cross-wound package on the bobbin;

suction duct means adjacent said traversing means and having a yarn suction opening for sucking the yarn fed from the supply through the yarn traversing means and to the bobbin into the yarn suction opening in preparation for a formation of a transfer tail winding on the bobbin before a normal yarn winding operation;

a yarn guide movably mounted between the position of the bobbin held by the bobbin holder and the yarn suction opening and movable between an operative guiding position, in which a portion thereof contacts the yarn for guiding it toward the bobbin for forming a transfer tail winding thereon, and in which position the yarn contact portion of the yarn guide is positioned close to the end of the predetermined yarn traverse width so that the yarn contact portion will be contacted by the end of the yarn package during winding due to the axially outward expansion of the package during an increase in the diameter of the package for moving the yarn guide out of the operative guiding position, and an inoperative position in which the yarn contact portion of the yarn guide is spaced from the position of the end of the fully wound yarn package and toward which the yarn guide is moved when contacted by the yarn package; and

cutting means positioned between the yarn guide and the yarn suction opening for cutting the yarn therebetween after the formation of the transfer tail winding, the cutting means being movable between an operative cutting position and an inoperative position and having a portion thereof engaged with the yarn guide for forcing the yarn guide from the inoperative position into the operative guiding position thereof when the yarn cutting means is moved from the operative cutting position to the inoperative position.

4,105,166

TEXTILE YARN OR TAPE WINDING MACHINES

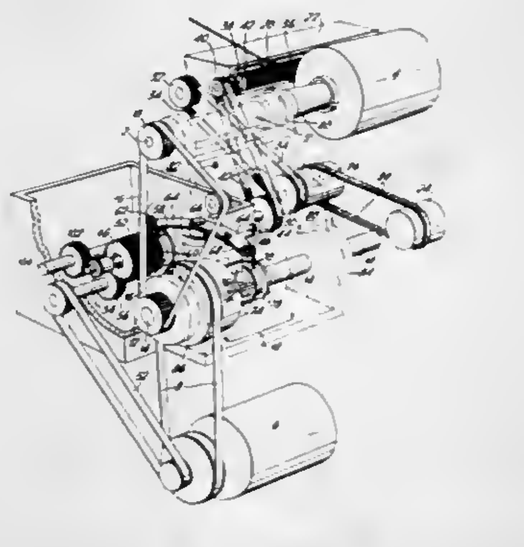
Gordon Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Apr. 23, 1976, Ser. No. 679,603

Claims priority, application United Kingdom, Apr. 28, 1975, 17590/75

Int. Cl.^{2} B65H *59/38*

U.S. Cl. 242—45 **6 Claims**



4. A textile yarn or tape winding machine comprising a take-up spindle which is connected to a variable drive including:

(a) means to sense the surface or peripheral speed of a yarn or tape package being wound;

(b) means to compare the package surface or peripheral speed with a predetermined set speed;

(c) means to vary the drive to the spindle in response to overspeed or underspeed of the actual surface or peripheral speed of the package as compared to the set speed;

(d) constant speed drive means, and

(e) means connected to said constant speed drive means for laying the yarn or tape on the package so as to produce an "open wound" package.

4,105,167

CABLE SPINNING

Hugh Stewart Geddes Knox, Croft, England, assignor to The Cleveland Bridge & Engineering Co., Ltd., Darlington, England

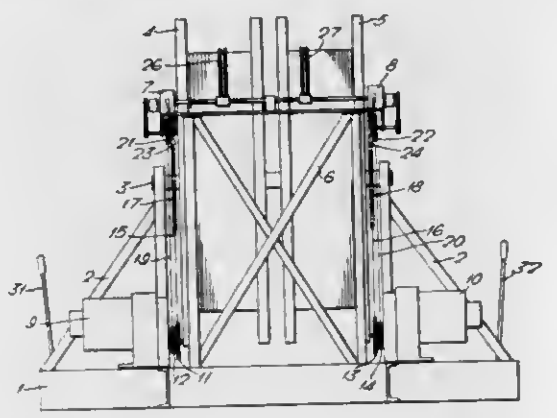
Division of Ser. No. 547,404, Feb. 5, 1975, Pat. No. 4,012,001, which is a continuation-in-part of Ser. No. 385,580, Aug. 3, 1973, abandoned. This application Dec. 8, 1976, Ser. No. 749,393

Claims priority, application United Kingdom, Aug. 4, 1972, 36617/72

Int. Cl.^{2} B65H *75/00*

U.S. Cl. 242—54 R **1 Claim**

1. In a method of forming suspension cables from wire by an aerial spinning process in the construction of a suspension bridge, the improvement comprising the steps of: unreeling wire for a suspension cable from a permanently mounted first reel of a reeling and unreeling machine by driving said first reel in a forward direction while simultaneously reeling wire onto a permanently mounted second reel of the reeling and unreeling machine by driving said second reel independently of said first reel, unreeling wire from the second reel and reeling wire onto the first reel when the first reel is emptied and the second reel is filled by driving said first and second reels independently of one another and in directions of rotation opposite to their respective initial directions of rotation, and driving said first and second reels with separate, independent and reversible drive means for each of said first and second reels.



4,105,168

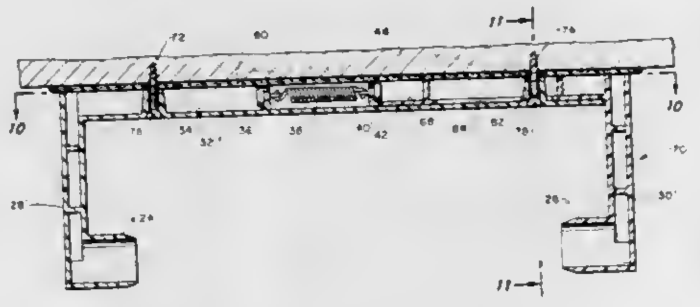
ROLLED PAPER HOLDER

Bernard R. Rutherford, 447 Moorehaven Dr., Carson, Calif. 90744

Filed Dec. 3, 1976, Ser. No. 747,236

Int. Cl.^{2} A47K *10/16*

U.S. Cl. 242—55.2 **2 Claims**



2. A rolled paper holder comprising:

a first member assembly adapted to rotatably support one end of a roll of paper;

a second member assembly adapted to rotatably support the other end of a roll of paper;

said first member including a first mounting section, said second member assembly including a second mounting section, said second mounting section being received within said first mounting section and being slideable in respect thereto between a first position and a second position, said first position being capable of rotatably supporting a roll of paper, said second position adapted to permit disassociation and inserting of a roll of paper;

biasing means interconnecting said first mounting section and said second mounting section, said biasing means exerting a continuous bias between said mounting sections tending to maintain said second mounting section in said first position;

separate wall mounting bracket assembly to facilitate attachment to both said first member assembly and said second member assembly to fixedly mount said member assemblies upon a vertical supporting surface; and

a screw fastener assembly interconnecting said first and second member assemblies to said wall mounting bracket assembly, said screw fastener assembly including a screw fastener connecting together said second member assembly and said wall mounting bracket assembly, said screw fastener functioning as a stop to limit the movement of said second member assembly with respect to said first member assembly.

4,105,169

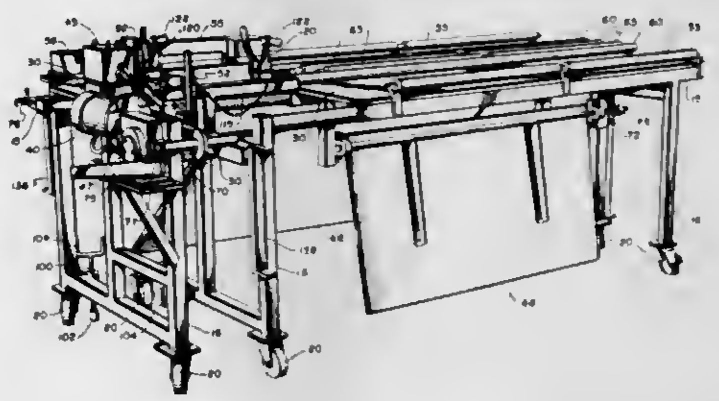
MEASURING AND CUTTING APPARATUS FOR FLOOR COVERING

Gilbert L. Alinder, 17029 Fiesta Ct., Sun City, Ariz. 85351, and Lloyd E. Anderson, 6408 76th Ave. North, Brooklyn Park, Minn. 55428

Filed Jan. 24, 1977, Ser. No. 761,639

Int. Cl.^{2} B65H *19/20*

U.S. Cl. 242—56 R **9 Claims**



1. A portable floor covering measuring and cutting machine comprising: a stand having end supports with legs having wheels thereon on each end of the same and with a flat table top extending between the end supports; roller means distributed over one edge of the flat table top; drive motor means and control means therefore mounted on one end of said flat table top; a drive mandrel for mounting a shaft mounted on one end support adjacent said drive motor; a journaled mandrel mounted on the other end support; a shaft removably mounted in said mandrels and extending therebetween for rotation by the drive mandrel; said shaft and said mandrels being positioned to the side of said one edge and below the flat table top and adapted to have the floor covering rolled thereon; a guide plate pivotally mounted on said end supports and positioned below the table top to be pivoted to a position below said shaft; lever means connected to said guide plate to pivot the same; guide means positioned across the width of the table top adjacent said drive motor; measuring means positioned on the table top adjacent said guide means and cooperating with said guide means to measure floor covering moved across the table top; a cutter guide positioned on the table top adjacent the other edge of the table top; and means distributed along the table top for aiding in the movement of floor covering through the measuring device and over the table top to said shaft.

4,105,170

PRESSURE ROLLER ARRANGEMENT

Herbert Schönmeier, Düsseldorf, Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Düsseldorf, Germany

Filed Jul. 20, 1977, Ser. No. 817,278

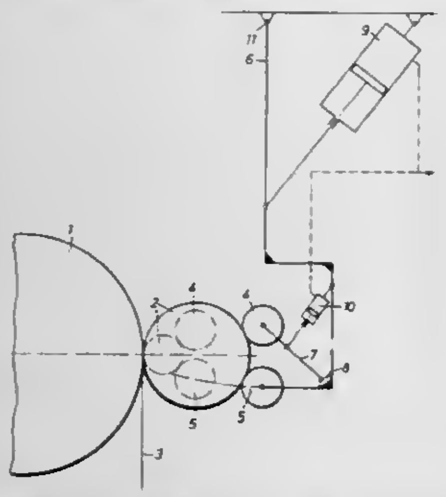
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633408

Int. Cl.^{2} B65H *17/08*

U.S. Cl. 242—65 **2 Claims**

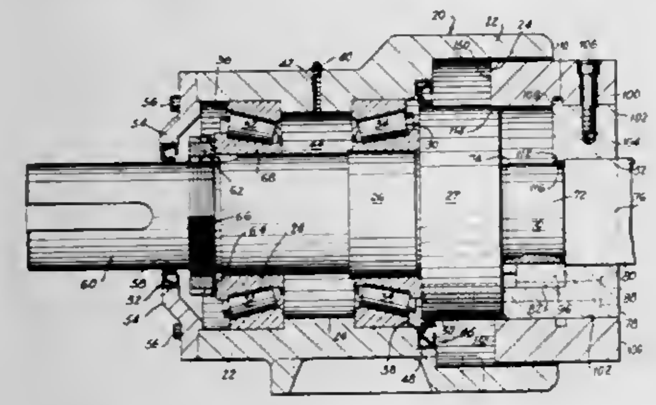
1. In a pressure roller arrangement for a winding machine for winding up strip material comprising a support drum bearing against a winding roll, said winding roll being disposed within engaging guide elements on its front sides, said winding roll having bearing thereagainst on the side averted from the support drum a pair of pressure rollers acting on said winding roll between its front sides to press said winding roll against said support drum, at least one of said pressure rolls being borne by a swiveling lever which is supported on a cylinder piston unit, the improvement wherein said device comprises a first pressure roller and a second pressure roller comprising said pair of pressure rollers, said first pressure roller being directly disposed at said swiveling lever, said second pressure

roller being pivoted at said swiveling lever by a follow-up lever so as to be movable on said pressure roller towards and away therefrom by means of a second piston unit which is supported on said swiveling lever.



4,105,171
SAFETY DRIVE CHUCK

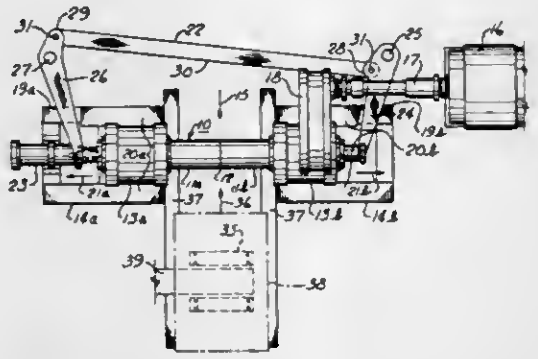
Joseph Sclola, Upper Saddle River, and Gabor Nagy, Clifton, both of N.J., assignors to Super Chuck, Inc., Paterson, N.J.
Filed Jun. 8, 1977, Ser. No. 804,624
Int. Cl.² B65H *19/02*
U.S. Cl. 242—68.4 **4 Claims**



1. A safety drive chuck for the drive of a driven shaft including, housing means, rotatable drive means comprising a rotatable, open-ended socket of a shape which is commensurate with the shape of said driven shaft to provide for the insertion of said shaft into said socket for drive by said drive means, locking means having a generally cylindrical portion and being cooperatively associated with said drive means and said housing means, said locking means being moveable relative to said drive means and said housing means between first locking means-drive means positions wherein said locking means are operable to close said socket and prevent the falling of said drive shaft therefrom, and second locking means-drive means positions wherein said socket remains open, at least two sets of cooperatively associated positioning means on said housing means and said locking means portion, respectively, said positioning means being operable to enable movement of said locking means into said second locking means-drive means position only when said open-ended socket is positioned so that said shaft cannot fall therefrom, said positioning means being spaced by less than 180° on said generally cylindrical locking means portion and on said housing means, said positioning means being disposed on the upper part of said housing means, said housing means comprising spaced, opposed tapered bearing assemblies, means for introduction of a lubricant into the space between said bearing assemblies, and first and second seal means disposed respectively to the sides of said bearings remote from said space, and wherein said drive means comprise a drive shaft which is journalled for rotation in said bearings.

4,105,172
TENSION REEL FOR STRIP COILING

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.
Filed Mar. 11, 1977, Ser. No. 776,529
Int. Cl.² B21C *47/02:* **B65H** *75/24*
U.S. Cl. 242—78.1 **7 Claims**



1. A strip coiler comprising a rigid frame, a continuous double expansible mandrel rotatably mounted at opposite ends to said frame to receive the end of a strip to be coiled and consisting of two expansible mandrel sections joined endwise in axially separable drive engagement by a plurality of interengaging axially entending projections, means operable to expand and collapse said mandrel sections, drive means connected to rotatably drive one of said mandrel sections and thereby drive both of said mandrel sections in unison for strip coiling on said double mandrel when said mandrel sections are axially joined in driving engagement, means operable to axially engage and retract said mandrel sections relative to each other, each of said expansible mandrel sections including a plurality of radially collapsable mandrel segments symmetrically positioned about respective mandrel cores, and stop means to permit independent adjustment of said mandrel segments relative to said cores to provide a perfect circle mandrel cross section of said double mandrel when said mandrel sections are expanded.

4,105,173
INFLATABLE PARACHUTE FOR USE AS ESCAPE OR SPORTING DEVICE

Henrique Oswaldo Bucker, P.O. Box 18394, Sao Paulo-Sp, Brazil
Continuation-in-part of Ser. No. 694,949, Jun. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 540,996, Jan. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 465,709, Apr. 30, 1974, abandoned. This application Aug. 5, 1977, Ser. No. 822,217
Claims priority, application Brazil, Jan. 16, 1976, 7600243; Nov. 26, 1973, 009238
Int. Cl.² B64D *17/72*
U.S. Cl. 244—146 **28 Claims**

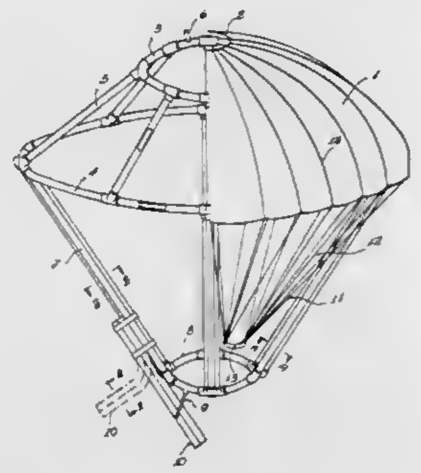
1. An escape or sporting parachute device comprising a parachute canopy having a body harness means suspended therefrom and attachable to the body of a user, an inflatable flexible tubing frame underlying said canopy and opening and supporting the canopy in a use position when inflated, said tubing frame including a pair of ring-like tubing elements beneath the parachute canopy, interconnecting tubing struts between the ring-like tubing elements, a suspended ring-like tubing element of reduced size spaced below the canopy to receive the waist of a user and in inflatable communication with the lowermost of said pair of ring-like tubing elements, and said tubing frame including an inflatable component which extends below said suspended ring-like tubing element and is bendable into contact with a verticle wall or the like to form a spring prelaunching positioning means for the device.

25. A method of ejecting an inflatable type life-saving or sport parachute from a support, said parachute having a canopy with a body harness suspended therefrom, an inflatable flexible tubing frame underlying said canopy, said canopy having a skirt portion attached to said frame to extend said canopy when said frame is straightened, comprising the steps of:

folding said inflatable frame prior to ejection,

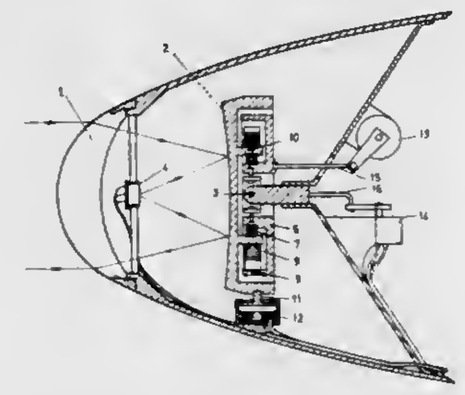
preinflating said frame with a gas while maintaining said frame folded to store potential energy, and

substantially instantaneously releasing said preinflated frame from said folded condition at the beginning of ejection from said support to expand said canopy substantially instantaneously, wherein the straightening of said frame substantially instantaneously pushes said parachute away from said support using said stored potential energy.



4,105,174
DEVICE FOR RECEIVING OR TRANSMITTING RADIATION

Åke Hugo Petrus Blomqvist, and Rolf Lennart Stålfors, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden
Continuation of Ser. No. 473,035, May 24, 1974, abandoned. This application May 17, 1976, Ser. No. 687,125
Claims priority, application Sweden, Jun. 8, 1973, 7308109
Int. Cl.² F41G *7/14. 7/00*
U.S. Cl. 244—3.16 **6 Claims**



1. Apparatus on a moving vehicle for receiving and detecting radiation transmitted from a remote source irrespective of changes in the line-of-sight between the vehicle and the source,

a support means fixedly secured to the vehicle,

optical lens means having a predetermined focal length and fixedly mounted on said support means,

a mirror,

means including a cardanic suspension for mounting said mirror on the axis of said lens means to said support means,

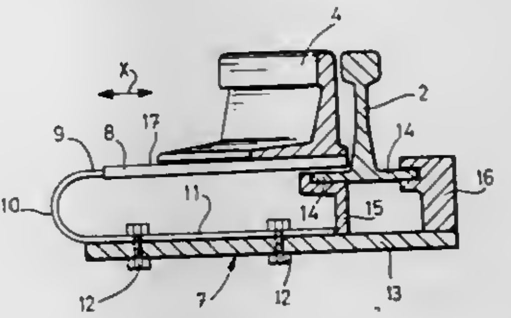
optical detection means fixedly mounted on said support means and located on the optical axis of said lens means for receiving the radiation reflected thereon by said mirror,

means for pivoting said mirror relative to the axis of said lens means about a pivot located on the axis of said lens means at a distance which is one-half the focal length of said lens means from its focal plane,

and means for rotating said mirror in its own plane to function as a gyro rotor.

4,105,175
RAILWAY SWITCHING POINTS

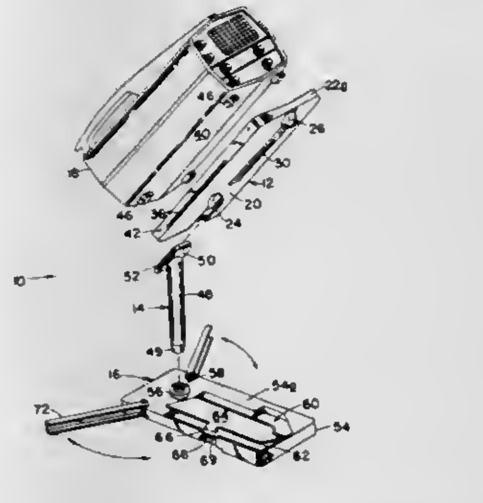
Michel R. De Spiegeleer, Hombeek, Belgium, assignor to Gestivalmo Societe Anonyme Holding, Luxembourg, Luxembourg
Filed Jun. 29, 1977, Ser. No. 811,351
Claims priority, application Luxembourg, Jul. 1, 1976, 75283
Int. Cl.² E01B *7/08*
U.S. Cl. 246—430 **13 Claims**



1. A device for a switching point of a railway track, said switching point comprising two movable tongue-rails controlled in such a manner that their ends may be brought in contact with line-rails, or be separated therefrom, by a sliding movement over bearings carried by sleepers, said device being placed in the space between two bearings and comprising a sliding part or piece supporting at least one tongue-rail by means of a self-lubricating sliding surface, said part or piece being influenced by elastic means, so as to lift the tongue-rail or rails which it supports with respect to said bearings, in such a manner that said tongue-rail or rails are not in contact with said bearings during the sliding movement of the tongue-rail or rails, but come directly into contact with the bearings under the influence of the load of a railway vehicle passing over said tongue-rail or rails.

4,105,176
KNOCKDOWN STAND FOR ELECTRONIC INSTRUMENT

James A. Hill, Aloha, and David R. Hargis, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Feb. 14, 1977, Ser. No. 768,442
Int. Cl.² F16F *15/00*
U.S. Cl. 248—13 **10 Claims**



1. A knockdown stand for use in one assembled form to support a portable electronic instrument at a certain height and attitude above a surface, which stand can be dismantled and

reassembled in another, more compact form for storage or transport, comprising

an elongate post,

an instrument support platform having upper surface means for receiving an electronic instrument to be supported by the stand, and means for removably receiving, in said one assembled form of the stand, an upper end portion of said post,

a base configured to rest on a support surface in a stable manner, said base having means for removably receiving, in said one assembled form of the stand, a lower end portion of said post and holding the post in a generally upright position, complementary configured upper surface means for receiving said platform in nested association in said other assembled form of the stand, and means defining a cavity therein for storage of said post during use of the stand in said other assembled form, and

means comprising a pair of stabilizing arms hingedly attached to the base at the opposite sides thereof for releasably locking said platform and base together in said other assembled form when the same are received in nested association, said arms being movable to and from a first, locking position wherein they are disposed adjacent the sides of said base and a second, stabilizing position where they extend outwardly at an angle therefrom and engage said support surface.

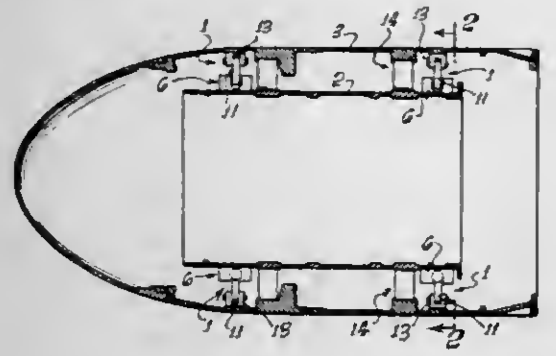
4,105,177
BREAKAWAY LINK ASSEMBLY FOR MAINTAINING A STRUCTURAL ALIGNMENT OF SHOCK-SENSITIVE EQUIPMENT

William R. Smith, Godfrey, Ill., and Robert H. Duchild, Chesterfield, Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1977, Ser. No. 833,121

Int. Cl.² F16F *15/00*

U.S. Cl. 248—15 **13 Claims**



1. A breakaway link assembly adapted to be coupled between spaced outer and inner structural members for rigidly maintaining said spacing under low level accelerating forces and for protectively yielding its rigid structural support when subjected to higher level forces comprising:

a crosshead guide member adapted to be secured to said inner structural member and formed with a longitudinally-extending guide track having a flat-walled portion,

a crosshead block member slidably mounted in said track,

plunger latch-like means transversely-carried by one of said crosshead members with a plunger-engaging detent means being formed in the other,

a link arm for pivotally coupling said outer structural member to said crosshead block member, and

pre-loaded resilient means holding said latch-like plunger means in a centrally-seated position in said detent means with a force sufficient to maintain said position under said low level structure accelerating loads whereby said structural member spacing is rigidly maintained,

said detent means being formed with a centrally-located relatively steep-walled central ramp section and peripherally with a relatively shallow ramp section; said higher level acceleration forces being sufficient to overcome said resilient pre-load force and permit a guide block displacement in which said latching plunger can ride up said ramps and onto said flat-walled track portion for breaking said rigid link support and preventing direct transmission of said accelerating forces from one structural member to another.

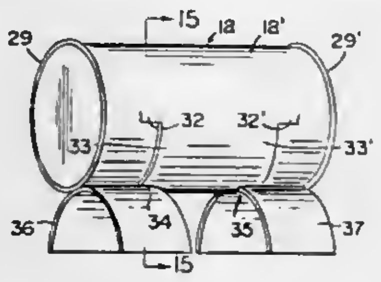
4,105,178
DRUM STAND

Harold F. Mason, P.O. Box 10139, Tampa, Fla. 33679

Continuation of Ser. No. 696,779, Jun. 16, 1976, which is a continuation-in-part of Ser. No. 583,437, May 30, 1975, abandoned. This application Mar. 30, 1977, Ser. No. 782,923

Int. Cl.² A47G *23/02*

U.S. Cl. 248—151 **4 Claims**



1. A support device in combination with a substantially cylindrical container having an external surface including indentation means formed in inset relation to the exterior surface of the container, said indentation means extending about a substantial portion of the substantially cylindrical container, said support device comprising:

first and second support leg means each having an arcuate configuration substantially corresponding to the curved surface of the substantially cylindrical container;

lip protection means secured relative to the substantially cylindrical container and disposed in relation to said indentation means to receive said first and second support leg means in a supporting and a non-supporting position;

said lip projection means securing each of said leg means relative to the container when said leg means are maintained in said supporting position to support the container thereby; and

said lip projection means securing each of said leg means within said indentation means when said leg means are maintained in said non-supporting position;

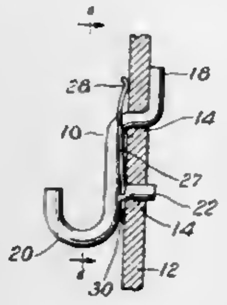
4,105,179
LOCKABLE HOOK ASEMBLY FOR PERFORATED BOARD

Kenneth A. Elliott, Reno, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,646

Int. Cl.² F16M *13/02*

U.S. Cl. 248—221.2 **4 Claims**



1. A lockable assembly for a perforated board having a plurality of spaced perforations therethrough comprising a hook member having a first, offset, board engaging portion, a shank having a second, straight, board engaging portion extending therefrom; said second portion having a notch therein; said shank terminating in a bent article suspending portion; and a lock plate having an upper and a lower board surface engaging portions, an opening through which said offset portion of said hook passes and an indentation adapted to engage said notch in a locking relation.

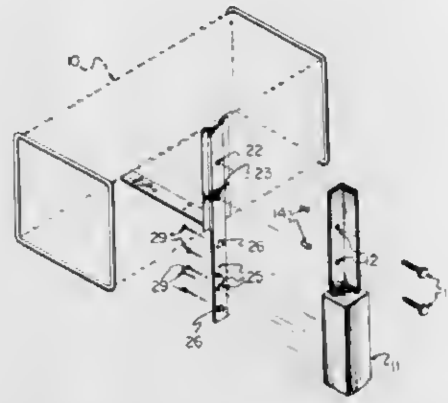
4,105,180
MOUNTING BRACKET FOR A NEWSPAPER DELIVERY BOX

Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643

Filed Jun. 27, 1977, Ser. No. 810,562

Int. Cl.² A47G *29/00*

U.S. Cl. 248—300 **2 Claims**



1. A mounting bracket for mounting a box to a support structure and adapted to be attached to the support structure, said bracket comprising an elongated rectangular base having a single rectangularly shaped corrugation formed therein along the center of said rectangular base and parallel to the elongated sides thereof, said corrugation having at least two holes therein for securing the bracket to the support structure, wherein the face of said corrugation is extended from the rectangular base to form a leg having a length sufficient to provide additional means for securing the bracing the bracket to the support structure, and an arm provided at the location where said face of the corrugation is extended from said rectangular base, said arm being positioned in perpendicular relationship to the length of the extended face of the corrugation, for supporting the bottom of a box mounted thereon.

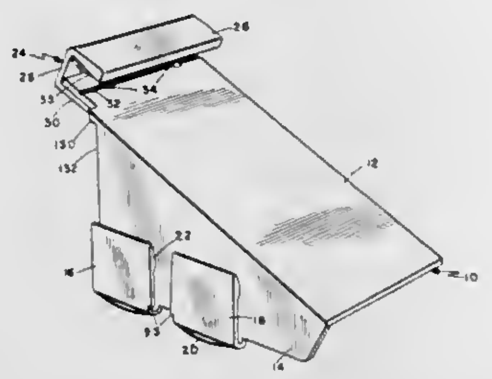
4,105,181
TELEPHONE DIRECTORY INFORMATION SUPPORT BRACKET

Elford Barnett Breitbard, San Diego, Calif., assignor to Tele-Quik, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 677,373, Apr. 15, 1976, abandoned. This application Nov. 26, 1976, Ser. No. 745,409

Int. Cl.² A47B *19/00*

U.S. Cl. 248—452 **10 Claims**



9. A telephone directory information support comprising:

a first planar member for supporting directory information,

a second planar member joined at one of its side edges to one of the side edges of said first planar member,

the opposite side edge of the second planar member having an acute angle with the line of intersection of the side edges of said first and second planar members,

said opposite side edge having securing means for securing said support to the side of a telephone with said opposite side edge being substantially horizontal and said first planar member presenting a flat, upwardly inclined surface for presenting directory information to telephone users,

retainer means positioned at the upper inclined end portion of said first planar member for retaining telephone directory information in visible position on said first planar member,

said securing means comprising at least a pair of spaced apart, upwardly directed leg members that are spaced from said second planar member and that are secured at the lower ends to the lower edge of said second planar member,

the upper end of said leg members having an enlarged end portion for contacting the side of a support member position between the enlarged end portion and the second planar member,

an adapter panel having fixed on one side a second panel that is slidably positioned in the space between said leg members and having means for being secured thereto,

and the lower portion of said panel on the side opposite said leg members having a lower ridge for coacting with a bottom wall edge of the telephone.

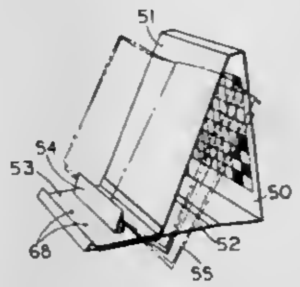
4,105,182
MULTIPLE USE STUDY DEVICE

Samuel O. Jacobson, 11255 Gaviota Ave., Granada Hills, Calif. 91344

Filed Jan. 12, 1977, Ser. No. 758,594

Int. Cl.² A47B *97/08*

U.S. Cl. 248—459 **8 Claims**



1. A multiple use study device for holding a plurality of articles comprising a single elongated blank of relatively stiff material scored along a plurality of transverse parallel lines so as to be foldable and to hingedly connect a plurality of panels at their contiguous edges, said blank having a first narrow end flap panel portion connected at one end by a first bottom-side crease to one end of a second panel portion, said second portion containing a centrally located, transverse slot, said second portion's other end connected to one end of a third panel portion by a second bottom-side crease, said third portion containing a third bottom-side crease with its other end connected to one end of a fourth panel portion by a fourth top-side crease, said fourth portion containing a centrally located slot cut therethrough, said fourth portion slot located in parallel and longitudinal alignment with said second portion slot, said fourth portion containing outwardly extending tabs at its respective sides each of which contain double bottom-side creases scored in parallel alignment with said fourth panel portion's sides, said second portion's bottom side permanently attachable to said fourth portion's bottom side to form a double thickness tray panel wherein said second portion slot is contiguous with said fourth portion slot, said tray panel reinforced with a third thickness at its sides by said tabs' bottom sides

permanently attachable to said tray panel's bottom side, said tray panel structure further reinforced by a triangular tubelike configuration through its forward end formed from said third panel portion, its other end containing a fifth top-side crease which connects to one end a rearwardly inclinable back panel, said first narrow end flap panel portion overlapping and permanently attachable to one end of said back panel's bottomside wherein said first crease is contiguous with said fifth crease, said back panel's other end connected to one end of a forwardly inclinable prop panel by a narrow panel defined by a pair of spaced bottom-side creases, said prop panel terminating at its other end in a bottom-side crease which connects to one end of a base panel, said base panel bisected with a narrow panel defined by a pair of spaced top-side creases thus permitting said base panel to be collapsible, said base panel terminating at its other end in outwardly extending, laterally inwardly directed cuts from said blank's sides to connect with one end of an outwardly extending, parallel sided, pagestop-bookshelf panel, said pagestop-bookshelf panel laterally bisected by at least two narrow panels defined by at least three spaced creases, a first bottom-side crease, a second top-side crease, and a third bottom-side crease, said pagestop-bookshelf panel terminating in an end flap panel, said pagestop-bookshelf panel foldable so that its narrow panels are insertable through said tray panel slot, said pagestop-bookshelf panel shaped so as to prevent relative lateral movement upon insertion thereof into said slotted tray panel.

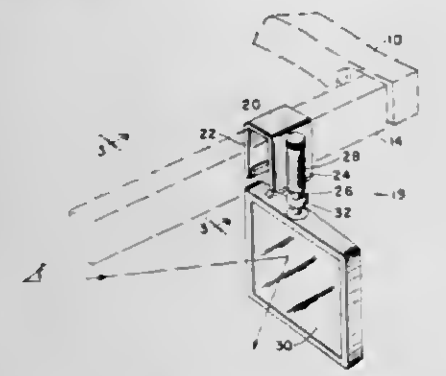
4,105,183
REAR VIEW MIRROR ASSEMBLY

Raleigh E. Clark, 7331 S. Kingston, Chicago, Ill. 60649

Filed May 20, 1976, Ser. No. 688,126

Int. Cl.² A47G ***1/24;*** **G02C** ***7/14***

U.S. Cl. 248—484 **1 Claim**



1. For use with a pair of eyeglasses having temples, a rear view mirror assembly comprising a flexible, inverted U-shaped bracket adapted to be received frictionally over one of the temples, a hollow housing mounted on and to an outer side surface of said bracket, a shaft journaled in said housing, a pivot member mounted to the lower end of said shaft, a planar member depending from and secured to said pivot member, and a reflective surface on at least one side of said planar member.

4,105,184
PLASTIC MOLDING ASSEMBLY FOR MOLDING PLASTIC PRODUCTS

Ushigoro Sumitomo, 458-43, Oaza Nishiasuma, Omiya-shi, Saitama-ken, Japan

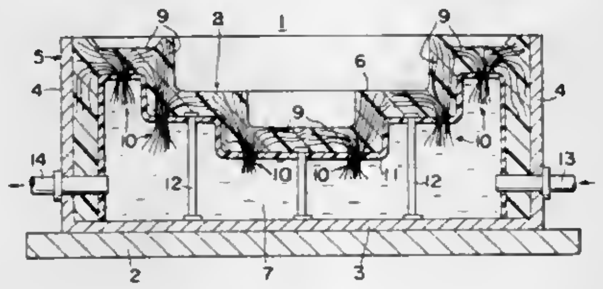
Filed Jul. 1, 1977, Ser. No. 812,256

Claims priority, application Japan, Jul. 13, 1976, 51-83351; Dec. 1, 1976, 51-144298; Dec. 1, 1976, 51-161011; Dec. 1, 1976, 51-161012

Int. Cl.² B22D ***15/00***

U.S. Cl. 249—79 **14 Claims**

1. A plastic mold for molding plastic products comprises a plastic mold body, a cooling chamber positioned adjacent to said plastic mold body for flowing a cooling medium to cool said body, and a large number of metal radiating wires of good heat conduction and easy plastic deformation buried throughout inside the plastic portion of said plastic mold body and positioned within the cooling chamber in such manner as to discharge heat into said cooling medium.



4,105,185
CONNECTION PLATE FOR PANELS OF A CONCRETE FORM

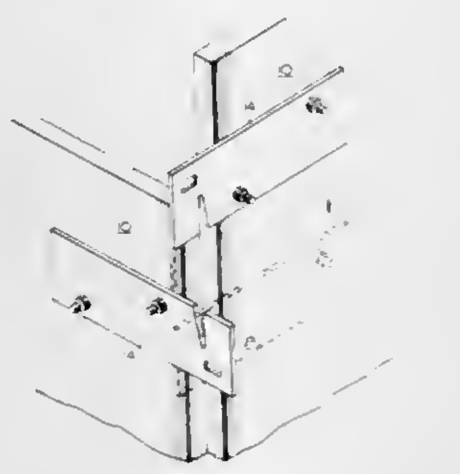
Leonard W. Cooper, Box 1389, Salmon Arm, British Columbia, Canada

Filed Apr. 6, 1977, Ser. No. 785,277

Claims priority, application Canada, Oct. 1, 1976, 262507

Int. Cl.² E04G ***17/02***

U.S. Cl. 249—194 **6 Claims**



1. A connector for panels of a form, comprising a flat metal plate of elongated rectangular shape with holes in a first longitudinal portion thereof for fixing the first portion to a panel, the plate having a second longitudinal portion having a notch communicating with one of the longer sides of the plate, the notch having a width which is greater at all points than the thickness of the plate so that said notch can interengage with a notch of an identical connector when the two connectors are fixed to mutually perpendicular panels and inverted relative to each other, with an outermost land of the notch of the first-mentioned connector providing an abutment surface which retains the other connector said abutment surface extending perpendicularly to the longer sides of said plate, and the innermost land of the notch sloping away from said outermost land to provide an enlarged entry into said notch, said second portion also having an aperture extending at least partially beyond said abutment surface, relative to the first portion, for receiving a whaler bar extending perpendicularly to the connector, said connector being free of protuberances beyond the plane thereof.

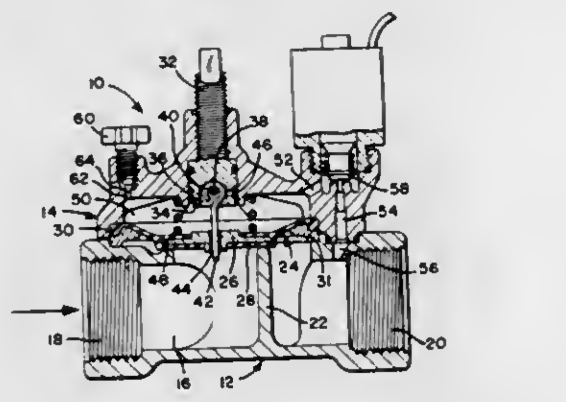
4,105,186
FLOW CONTROL VALVE

Ralph H. Eby, Metamora, Ind., assignor to Skinner Irrigation Co., Cincinnati, Ohio

Filed Sep. 27, 1976, Ser. No. 726,824

Int. Cl.² F16K ***31/126***

U.S. Cl. 251—35 **3 Claims**



1. In a flow control valve including a fluid flow path through said valve, a pressure chamber, a diaphragm separating said flow path and said pressure chamber and movable by differential pressure between open and closed positions with respect to said flow path, a flow adjustment stem projecting into said pressure chamber for limiting movement of said diaphragm from said closed position to said open position thereof, said diaphragm having an aperture therethrough to allow fluid pressure on the flow path side of said diaphragm to be transmitted to the pressure chamber side of said diaphragm, and a metering rod extending through said aperture in said diaphragm, the improvement comprising:

means defining an opening in an inner end of said flow adjustment stem,

a pressure relief port formed in said inner end of said stem and communicating with said opening in said stem,

a pin projecting through said inner end of said stem and across said opening,

means defining a loop on an end of said metering rod positioned within said pressure chamber, and

said loop on said rod loosely receiving said pin whereby said metering rod is mounted for movement about the looped end thereof to accommodate non-uniform movement of said diaphragm and prevent binding of said metering rod in said diaphragm aperture.

4,105,187
SEALING SYSTEM FOR SHUTOFF UNITS

Richard Huber, Mödling bei Vienna, Austria, assignor to Klinger AG, Zug, Switzerland

Filed Oct. 4, 1976, Ser. No. 728,961

Claims priority, application Switzerland, Oct. 9, 1975, 13142/75

Int. Cl.² F16K ***1/38***

U.S. Cl. 251—334 **3 Claims**

1. A sealing system for a shutoff unit comprising

housing and blocking members of the shutoff unit,

an annular metallic sealing element having a thin walled portion which is elastically deformable under a closing force between said housing and blocking members of said shutoff unit,

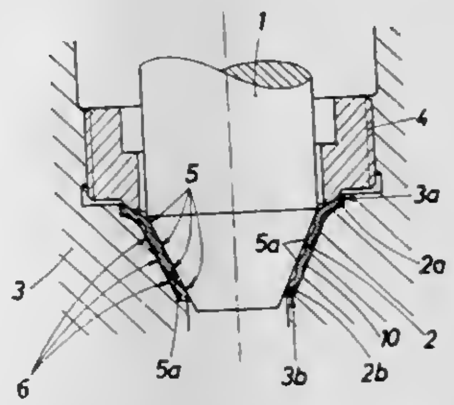
at least two annular supporting areas on each of said housing and blocking members which under the closing force make sealing linear contact with and deform said thin walled portion of said sealing element,

and free spaces for deformation of said thin walled portion therein, under the maximal closing force on opposite sides of said thin walled portion from each of said annular supporting areas and enclosed by said thin walled portion and said other member than said member making the linear contact at the annular supporting area,

said annular supporting areas adjacent each of said free spaces for deformation, and said spaces on a member extending substantially parallel to said supporting areas on said same member,

means for restricting the movement of the peripheral edges of said sealing element to prevent increasing said ring width of said sealing element including means for restrictively holding one of the peripheral edges against movement while the opposite peripheral edge extends into unattached abutting relationship with one of said members of the shutoff unit,

said sealing element having a predetermined ring width with said thin walled portion having a substantially same thickness at least along the portion extending out of the restrictively held peripheral edge.



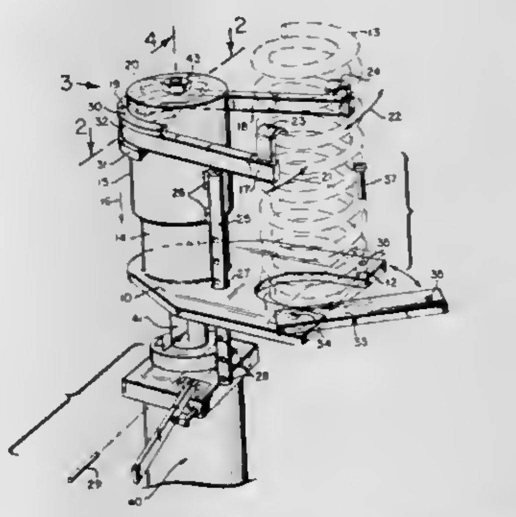
4,105,188
POWER SPRING COMPRESSOR ACCESSORY

Gregory E. Mendoza; Donald Ray Henthorn, and James Franklin Taylor, all of Simi Valley, Calif., assignors to QMA Inc., Simi Valley, Calif.

Filed Dec. 5, 1977, Ser. No. 857,127

Int. Cl.² B23P ***19/04***

U.S. Cl. 254—10.5 **7 Claims**



1. A power spring compressor accessory comprising, in combination:

(a) an horizontal base plate having forwardly extending spaced feet for insertion between adjacent lower coils of a spring to be compressed;

(b) a fixed vertical cylinder having its lower end secured to said base plate;

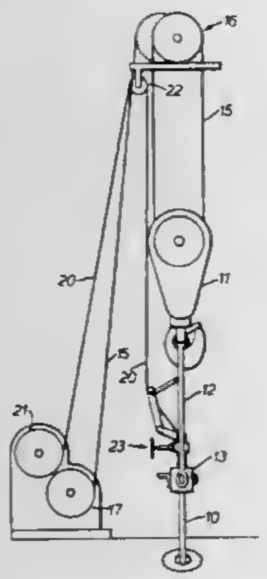
(c) a movable cylinder positioned in vertical coaxial telescoping relationship with said fixed cylinder;

(d) a pair of forwardly extending arms pivoted to said movable cylinder for swinging movement in a horizontal plane about parallel vertical axes to bring their extended ends closer or further apart; and,

(e) hook means secured to each extending end of said arms for engaging over an upper coil of said spring to be compressed, the distance between the extended ends being adjusted to correspond to the diameter of said spring whereby application of a force telescopes said movable cylinder downwardly with respect to said fixed cylinder to result in compression of a spring positioned between said feet and said arms, the telescoping action of said cylinders providing for a vertical rectilinear motion in the compression of said spring.

4,105,189
LINE DIVERTING TOOL

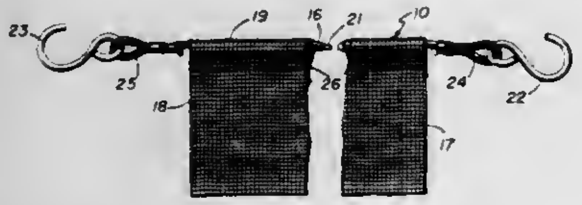
John Horace Beall, 3 Links Rd., Gorleston-on-Sea, Great Yarmouth, Norfolk, England
Filed Aug. 20, 1976, Ser. No. 716,079
Claims priority, application United Kingdom, Aug. 23, 1975, 35073/75
Int. Cl.² B66C *23/60*
U.S. Cl. 254—139 **5 Claims**



1. In combination with a drill pipe and means for supporting and axially reciprocating the drill pipe, a line diverter unit comprising a body having a bore passing therethrough from a top end to a bottom end thereof, said body including means for attaching the body to said means for supporting and axially reciprocating the drill pipe, a shut off valve in said body, a first pulley located at the top end of said body to guide a line into said bore, a second pulley for passing said line to said first pulley, and a linkage extending from said body and mounting said second pulley thereon, the linkage during reciprocation of the drill pipe and supporting means positioning said second pulley away from the axis of said bore whereby a sand line extending upwardly from said second pulley remains clear of said drill pipe supporting means.

4,105,190
SAFETY DEVICE

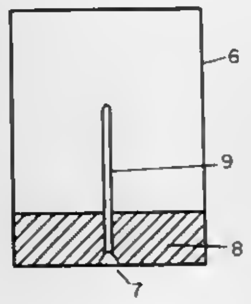
Fred J. Curtis, 7 Colby St., Northboro, Mass. 01532
Filed Feb. 10, 1977, Ser. No. 767,579
Int. Cl.² E04H *17/00*
U.S. Cl. 256—1 **4 Claims**



1. Barrier device, comprising:
(a) an elongated strip of highly-visible fabric, the fabric being fluorescent and open mesh that allows the passage of air and the strip being provided with a hollow seam along one side, and
(b) a support element consisting of a length of stretchable cord extending along one side of the strip in the seam, and extending from both ends thereof, and wherein each end of the cord is provided with an S-shaped clip, and the fabric and support element are folded along the width of the fabric and enclosed in a fabric envelope having on half of one side a clear window extending the width of the fabric.

4,105,191
CRUCIBLE FOR THE THERMAL ANALYSIS OF ALUMINUM ALLOYS

Jean Charbonnier, Herblay, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France
Filed Jun. 27, 1977, Ser. No. 810,410
Claims priority, application France, Jul. 9, 1976, 76 22441
Int. Cl.² F27D *21/00*
U.S. Cl. 266—88 **3 Claims**

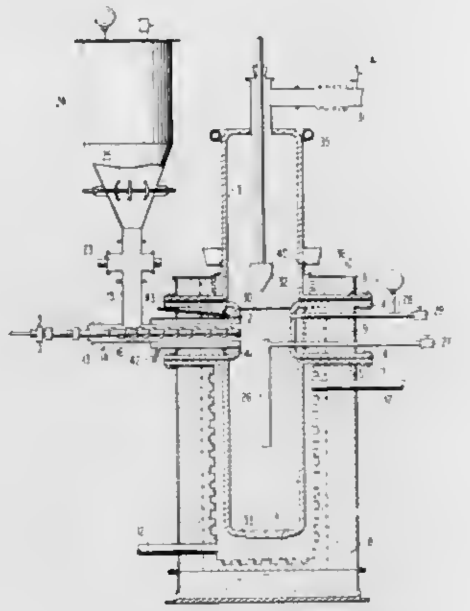


1. A crucible for the thermal analysis of aluminum alloys comprising:
a metallic cylindrical envelope having a base, the cylindrical side wall extending upwardly from said base being formed solely of a thin metal sheet, a central hole being formed in the base;
a cake of heat-insulating material at the bottom of said envelope and matching the shape thereof, said cake having an axial hole formed therein, said hole being coaxial with said central hole and forming an extension of the central hole in the base; and
a metallic thin-walled thermocouple sheath having a sealed upper end secured in the axial hole in the cake, the sealed upper end being located roughly midway along that portion of the cylindrical side wall that extends above said cake, the lower open end of said sheath being spaced from and out of contact with the metallic base of the envelope.

4,105,192
PROCESS AND APPARATUS FOR PRODUCING ZIRCONIUM SPONGE

Kazuhiko Ishimatsu, Higashi-Kurume; Takao Nakahara, Wako; Akira Murata, Tokyo, and Masami Kuroki, Urawa, all of Japan, assignors to Nippon Mining Company, Tokyo, Japan
Division of Ser. No. 631,293, Nov. 12, 1975. This application Apr. 23, 1976, Ser. No. 679,624
Claims priority, application Japan, Feb. 13, 1975, 50-17474
Int. Cl.² C22B *61/02*
U.S. Cl. 266—149 **5 Claims**

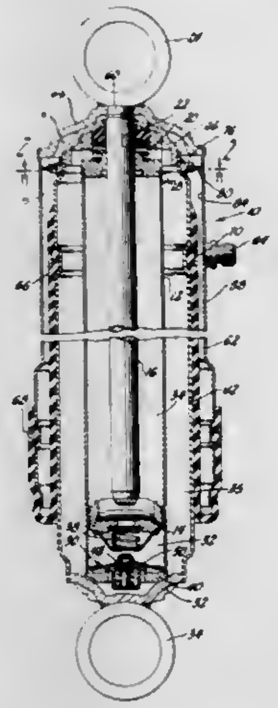
1. An apparatus for producing zirconium sponge comprising:
a reaction chamber having an outwardly turned flange at one end thereof and being closed at the opposite end by a bottom plate, said chamber being joined to a vessel also equipped with an outwardlyly turned flange at one end, a port at the other end for introducing inert gas into said vessel, and a piercing rod extending through said port parallel to the major axis of said vessel;
said chamber being joined to said vessel via a cylindrical seat means comprising outwardly turned flanges compatible with and secured to the outwardly extending flange of said vessel and said reaction chamber, respectively, an inner face projecting slightly inward of said reaction chamber having circumferentially attached thereto a circular plate sealing the inside of said reaction chamber from the inside of said vessel, and first and second pipes extending through the portion of said seat means in communication with said reaction chamber, said first pipe introducing inert gas to said reaction chamber and said second pipe having extending downwardly into said reaction chamber for introducing manganese to said chamber and discharging manganese halide from said chamber;
said apparatus further comprising a screw feeder in communication with a reservoir supplied with powdered zirconium halide, said screw feeder comprising a screw shaft mounted within a sleeve having a port therein for receiving solid zirconium halide gravitationally fed to said screw feeder from said reservoir and extending through a portion of said cylindrical seat means in communication with said reaction chamber such that upon rotation of said screw shaft solid zirconium halide is fed from said reservoir to said chamber; and
a plurality of furnaces surrounding said reaction chamber, said cylindrical seat means and a portion of said vessel, said furnace surrounding said reaction chamber defining a space between said chamber and said furnace wherein a cooling gas may be introduced for cooling said chamber.



4,105,193
SHOCK ABSORBER AND LEVELING UNIT WITH AUXILIARY DAMPING DEVICE FOR VEHICLE SUSPENSIONS

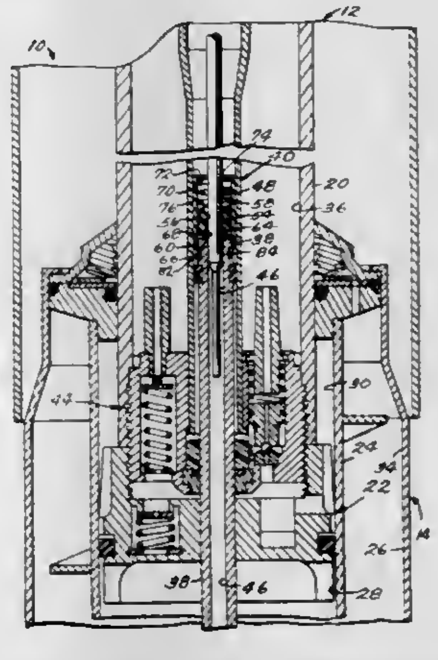
Paul J. Long, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 26, 1976, Ser. No. 744,969
Int. Cl.² F16F *9/08*
U.S. Cl. 267—64 R **5 Claims**

1. A shock absorbing and height adjusting unit for an automotive vehicle comprising a double acting shock absorber having primary piston means reciprocably mounted in an oil filled pressure cylinder having rebound and compression strokes for damping the ride motions of the vehicle, reservoir means secured to and disposed around said pressure cylinder and providing a space for receiving oil from said pressure cylinder on the compression stroke of said primary piston means, an outer cylinder fixed to said piston means radially spaced from and disposed around said reservoir means, a resilient tubular sleeve operatively connected to said outer cylinder and to said reservoir means providing a pneumatically adjustable gas chamber containing a gas and forming a gas spring for adjusting the curb height of the vehicle body, secondary piston means reciprocably movable in said gas chamber for subdividing said gas chamber into separate sections and for alternately compressing the gas in at least one of said sections in response to the compression stroke of said shock absorber and in another of said sections in response to the rebound stroke of said shock absorber thereby providing auxiliary damping means to supplement the damping action of said primary piston means.



4,105,194
PUMP MECHANISM FOR A COMBINED SELF-LEVELING SHOCK ABSORBER AND FLUID SPRING UNIT

Paul Smeltzer, Napierville; Kris Sharma, Glen Ellyn; David A. Daneck, Elgin, and Sellers B. McNally, Barriington, all of Ill., assignors to Maremont Corporation, Chicago, Ill.
Filed Jun. 1, 1977, Ser. No. 802,312
Int. Cl.² F16F *9/34;* B60G *17/00*
U.S. Cl. 267—64 R **8 Claims**



1. A self-leveling combined shock absorber and fluid spring assist unit adapted to be mounted in place of a conventional shock absorber between the sprung and unsprung masses of a vehicle having a conventional suspension system, said unit comprising:
a pair of tubular structures mounted for longitudinal movement with respect to each other in contracting and extending telescopic relation,
means on the outer ends of said tubular structures for effecting the connection thereof between the sprung and unsprung masses of the vehicle so that said tubular structures

move in contracting telescopic relation in response to the movement of said masses toward one another and said tubular structures move in extending telescopic relation in response to the movement of said masses in a direction away from each other,

said tubular structures including means defining a load bearing spring chamber including an elongated displacement member and annular wall means disposed in telescopic sliding relation to said displacement member so that said load bearing spring chamber is decreased in volume by said displacement member in response to the movement of said tubular structures in contracting telescopic relation and is increased in volume by said displacement member in response to the movement of said tubular structures in extending telescopic relation,

hydraulic fluid within said load bearing spring chamber the pressure of which increases in response to the movement of said tubular structures in contracting telescopic relation and decreases in response to the movement of said tubular structures in extending telescopic relation so as to provide a load bearing force acting on the effective area of said displacement member which varies in accordance with the relative position of movement of said tubular structures and the amount of hydraulic fluid within said load bearing spring chamber,

said displacement member being tubular and having an interior annular surface defining the exterior periphery of a pump chamber and a radially extending end surface communicating with one end of said interior annular surface,

a pump rod disposed in telescoping relation with said tubular displacement member having an exterior annular surface defining the interior periphery of the pump chamber, and

pump valve means between the end surface of said displacement member and the exterior annular surface of said rod for controlling the flow of hydraulic fluid between said pump chamber and said load bearing spring chamber, the improvement which comprises said pump valve means comprising:

an annular body of elastomeric material having an interior annular surface slidably sealingly engaging the exterior annular surface of said pump rod and terminating axially outwardly of said displacement member in a free end surface, said annular body having an opposite end surface engageable with the end surface of said displacement member for preventing flow of hydraulic fluid in direction from said load bearing spring chamber to said pump chamber.

an annular washer of rigid material embedded within said annular elastomeric body in a position to engage the end surface of said displacement member radially inwardly of the position of engagement of said elastomeric body therewith and to slidably engage the exterior annular surface of said pump rod axially inwardly with respect to the engagement of said elastomeric body therewith so as to prevent the extrusion of said elastomeric body axially inwardly between the interior annular surface of said displacement member and the exterior annular surface of said pump rod as a result of high pressure hydraulic fluid conditions within said load bearing spring chamber with respect to said pump chamber,

a rigid tubular element separate from but fixed to the exterior periphery of said displacement member and extending axially outwardly beyond the end surface thereof in surrounding relation to said elastomeric body, said rigid tubular element having an end wall spaced from the free end surface of said elastomeric body centrally apertured to receive said pump rod therethrough, and

a metallic coil spring disposed in surrounding relation to said pump rod between said apertured end wall and the free end surface of said elastomeric body so as to apply a predetermined spring force on said elastomeric body when the latter is disposed with its opposite end surface in engagement with the end surface of said displacement member.

4,105,195
GAS SPRING SUSPENSION SYSTEM FOR A VEHICLE SEAT

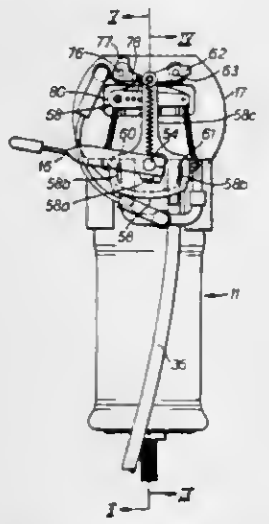
Ervins H. Lamberts, Hartwell, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 21, 1976, Ser. No. 734,587

Claims priority, application United Kingdom, Sep. 10, 1976, 37621/76

Int. Cl.^{2} A47C *7/14*

U.S. Cl. 267—131 **10 Claims**



1. A suspension system for a vehicle seat of the type comprising a seat part, a base part and guide means for guiding the seat part in upward and downward movement relative to the base part, the system comprising

a gas spring having opposite ends for connection to the base part and to the seat part respectively,

the gas spring being capable of expansion and contraction in a direction between said opposite ends of the gas spring,

valve means communicating with the gas spring and operable selectively to connect the gas spring with a source of compressed gas or with atmosphere in order to expand or contract the gas spring, and

a height adjustment device positioned internally of said gas spring comprising

an abutment member,

a height adjustment mechanism connecting said abutment member to one end of the gas spring,

an up-stop,

a down-stop spaced from said up-stop along the direction of expansion and contraction of the spring,

means securing the up-stop and down-stop to each other and to the other end of the gas spring,

said mechanism being movable between the spaced up-stop and down-stop,

spring means biassing the abutment member towards a predetermined position relative to and between said up-stop and down-stop,

the mechanism comprising two support members slidable relatively to one another along said direction,

one support member having apertures spaced apart therealong, a detent on the other support member for engagement in any selected one of the apertures to lock the support members together,

an operating handle and

means connecting the operating handle to the height adjustment mechanism and to the valve means to release the support members for relative movement therebetween by withdrawing the detent from one of said apertures prior to operation of the valve means.

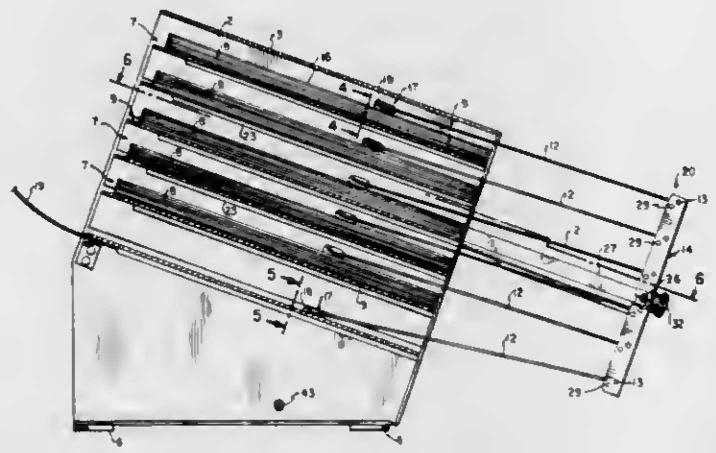
4,105,196
SHEET COLLATOR DEVICE

Raymond H. Van Wagener, Darien, Conn.; Ernest M. Raasch, Fort Lee, N.J., and Elsio J. Loos, Bronx, N.Y., assignors to Swingline Inc., Long Island, N.Y.

Continuation-in-part of Ser. No. 548,471, Feb. 10, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,263

Int. Cl.^{2} B65H *39/05*

U.S. Cl. 270—58 **9 Claims**



1. A collator comprising:

(a) a main housing including at least two bins, each of said bins adapted to receive a stack of sheets;

(b) a reciprocating member mounted on said housing for reciprocating movement;

(c) a finger associated with each of said bins and coupled to said reciprocating member for reciprocating movement therewith, each of said fingers being positioned to engage the top sheet of a stack of sheets placed in its associated bin and to move said top sheet from said bin in response to reciprocating movement of said member;

(d) a bracket associated with each of said bins and positioned with respect to said main housing for displacement toward and away from the top sheet on a stack of sheets placed within its associated bin;

(e) first biasing means for biasing each of said brackets toward a position removed from said stack of sheets;

(f) engagement means mounted on each of said brackets for curling the top sheet of a stack upon engagement therewith;

(g) operator means coupled to all of said engagement means for moving said engagement means to curl top sheets;

(h) second biasing means for biasing said engagement means toward a first position with respect to said brackets, said first biasing means being weaker than and yielding before said second biasing means when said first and second biasing means are subjected to a force by the displacement of said operator means;

(i) means for applying a reciprocating motion to said operator means to cause said displacement of said brackets and said operator means;

(j) initial displacement of said brackets and its associated engagement means bringing said engagement means into engagement with a stack of sheets in its associated bin;

(k) further displacement resulting in movement of said operator and said engagement means with respect to said brackets for separating said top sheet from said stack by curling said top sheet.

4,105,197
APPARATUS FOR FOLDING COLLAPSIBLE BOX BLANKS

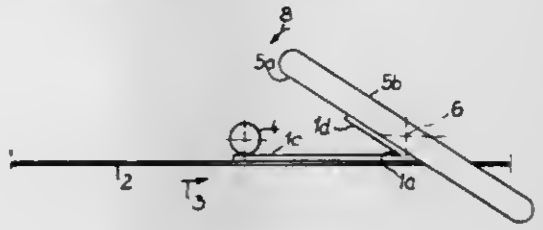
Heinz-Hermann Pott, Pottwiesenstr. 10, D-4904 Enger, Fed. Rep. of Germany

Filed Sep. 9, 1976, Ser. No. 721,747

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540649

Int. Cl.^{2} B65H *45/14*

U.S. Cl. 270—68 R **2 Claims**



1. Apparatus for folding collapsible planar box blanks about fold lines disposed transversely to a feed direction of said blanks, comprising a conveyor for transporting the blanks in said feed direction, at least one elongated folding tool disposed adjacent said conveyor and extending in a direction transverse to said feed direction, said folding tool being mounted to pivot transversely to the conveyor about an axis located above the conveyor, means for moving the conveyor and the folding tool relative to one another to transport a blank toward the folding tool in the said feed direction to cause an edge of said blank to engage and exert a force on said folding tool at a position on said tool between said conveyor and said pivot axis, the force exerted by said blank on said tool being operative to pivot said tool about said axis without the need for a separate driving mechanism to effect such pivoting of the tool, means for restraining the folding tool against pivotal movement until the force applied to the tool by the blank to be folded during feeding of said blank exceeds a predetermined minimum whereby said force causes said folding tool to pivot, the folding tool having a sliding surface facing said edge of said blank and formed as a ramp which rises from the conveyor, said edge of said blank being adapted to slide along said ramp during said folding operation, a depressor positioned adjacent said conveyor for holding down a blank on the conveyor, and means for moving said depressor in a direction substantially parallel to the direction of motion of the conveyor toward and away from the folding tool during said folding operation.

4,105,198
DISPENSER FOR SHEET-LIKE MATERIAL

Emile Frans Stievenart, Hoboken; Hugo Frans Deconinck, Deurne-Zuid, and Willy Gabriel Ceuppens, Borgerbout, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 503,077, Sep. 4, 1974, abandoned, which is a division of Ser. No. 437,701, Jan. 29, 1974, Pat. No. 3,959,654. This application Aug. 11, 1976, Ser. No. 713,492

Claims priority, application United Kingdom, Jan. 30, 1973, 4656/73

Int. Cl.^{2} B65H *5/08*

U.S. Cl. 271—14 **3 Claims**

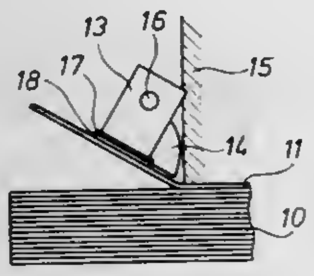
1. An apparatus for dispensing sheets one by one from the top of a pile of sheets comprising:

rockably supported sheet gripping means having means at its lower end for gripping a sheet contacted thereby,

means for moving said sheet gripping means between a delivery position spaced from said sheet pile and a gripping position contacting the top sheet adjacent one margin thereof,

fixed abutment means located adjacent said gripping position, said sheet gripping means having a rigid projection extending laterally from the lower end thereof for engaging said abutment means at the free end thereof, means for imparting a limited lateral movement away from said sheet margin to the upper part of said sheet gripping means while the latter is in said sheet gripping position and said projection engages said abutment means, whereby said gripping means is caused to rock about the point of contact of said projection and said abutment means to thereby flex the margin of said top sheet away from the underlying sheet and facilitate separation of the top sheet from said stack when the gripping means moves to said delivery position, and

sheet feeding means for receiving the sheet from said gripping means when the latter is in said delivery position.



4,105,199

PAPER FEEDER COMPRISING A SELECTIVELY DRIVABLE RESILIENT BODY IN FRICTIONAL CONTACT WITH A FEED ROLLER

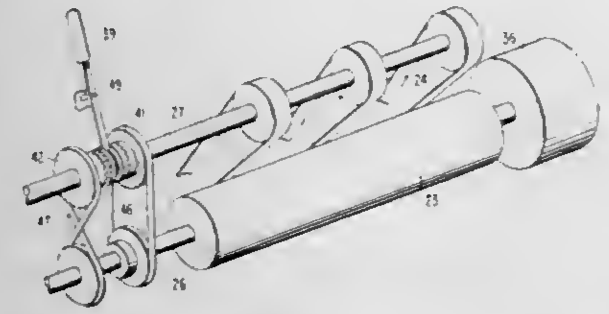
Kazukiyo Sato; Katuo Takahashi; Junjiro Kubota, and Keiji Tsuchiya, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,952

Claims priority, application Japan, Dec. 22, 1975, 50-153016; Oct. 21, 1976, 51-141732[U]

Int. Cl.^{2} B65H *3/52*

U.S. Cl. 271—122 **3 Claims**



1. A paper feeder for feeding various types of sheets of paper, one at a time, from a platform to a utilization device, said feeder comprising a feed roller rotatable around a fixed axis, first drive means for driving said roller in a first sense of rotation, a resilient body movable along a circumferential area of said feed roller in frictional contact therewith, second drive means for controllably driving said resilient body when operatively coupled thereto, and manually operable selection means for selectively operably coupling said second drive means and said resilient body in a first state to positively drive said resilient body in a second sense at said area when said sheet is of a predetermined nature and for selectively operably decoupling said second drive means and said resilient body when said sheet of paper is of a different nature, said first sense being a sense of feeding said sheet from said platform to said utilization device, said second sense being a reversed sense, wherein said manually operable means is further operative for selectively operably coupling said second drive means and said resilient body in a second state to positively drive said resilient body in said first sense at said area when said sheet comprises a ground sheet and another sheet attached thereto.

4,105,200

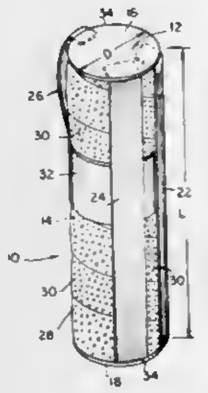
HAND AND FINGER EXERCISE DEVICE

Ann Unger, 140 Cabrini Blvd., New York, N.Y. 10033

Filed Mar. 9, 1977, Ser. No. 775,716

Int. Cl.^{2} A63B *21/30*

U.S. Cl. 272—67 **5 Claims**



1. A self-retained hand and finger exercise device adapted to be used with either the right hand or the left hand of a user and comprising a generally cylindrical main member having a side wall adapted to be grasped in the palm of a user, an elastic hand-retaining strap disposed axially and at the side wall of the member for fitting over the four fingers of the user's hand adjacent the knuckles thereof and for maintaining the member in the user's palm as the user flexes his thumb and four fingers away from the side wall, an elastic thumb receiving strap disposed axially and at the side wall of the member for receiving the thumb of the user's hand, said thumb receiving strap exerting pressure on the thumb of the user as the user flexes his thumb away from the side wall and against the elastic action of the thumb receiving strap, and an elastic flexing strap disposed axially and at the side wall of the member for fitting over the four fingers of the user's hand adjacent the fingertips thereof, said flexing strap exerting pressure on the four fingers of the user as the user flexes these fingers outwardly away from the side wall and against the elastic action of the flexing strap, said straps enabling all five fingers of the user's hand to flex outwardly while at the same time retaining the member in the user's palm.

4,105,201

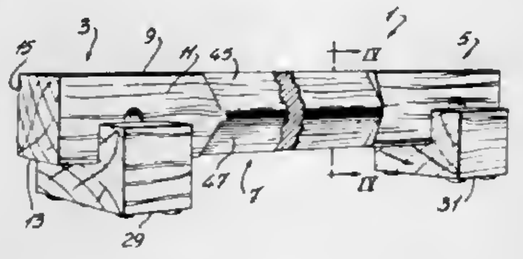
GYMNASTIC BALANCE BEAM

Camille L'Ecuyer, 651 Morin St., St. Jérôme, Quebec, and Laurent Poulin, 630 11^e rue, St. Georges-Ouest, Quebec, both of Canada

Filed Mar. 9, 1977, Ser. No. 775,790

Int. Cl.^{2} A63B *1/00*

U.S. Cl. 272—111 **3 Claims**



1. A gymnastic balance beam which comprises:

(a) an elongate body for horizontal mounting;

(b) said elongate body being terminated at both ends with a portion which is square in cross-section, said portion having four flat faces;

(c) a pair of seats;

(d) each said seat being U-shaped to define a recess adapted to receive both end portions of said elongate body;

(e) said elongate body having a means at both ends to lock the elongate body in a position which is selected by axially rotating said elongated body, said locking means including a bore formed in each said flat face and normal thereto to extend transversely into said elongate body;

(f) a dowel at the bottom of said recess to be inserted into one of said bores to selectively lock said beam in a plurality of positions which are selected by axially rotating said elongate body;

(g) main walking sections intermediate said square portions, said main walking sections having as many different widths of walking surfaces as there are positions which can be selected.

4,105,202

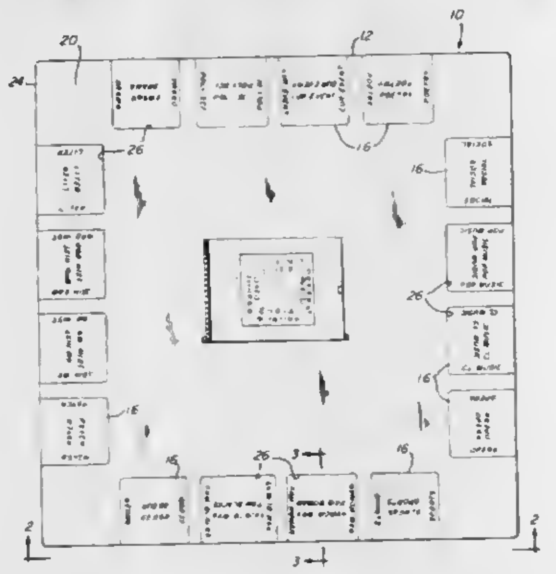
GAME APPARATUS

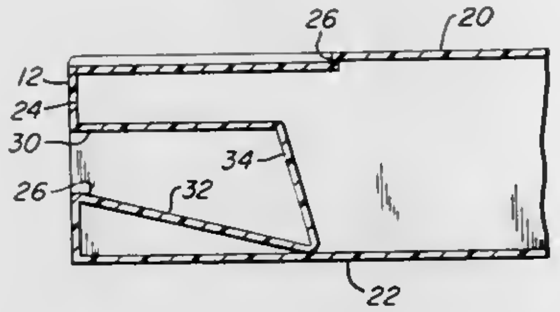
Keir McLarén, 628 Woodland Ave., and Daniel William Wagner, 419 Washington Ave., both of Oakmont, Pa. 15139

Filed Mar. 4, 1977, Ser. No. 774,336

Int. Cl.^{2} A63F *1/00, 1/10, 9/00*

U.S. Cl. 273—309 **10 Claims**





1. A game apparatus comprising: a main body member; a plurality of seating means carried by said body member and adapted to seat subject cards thereon; said seating means extending inwardly with respect to the periphery of said body member and circumferentially spaced therearound; a plurality of card receiving pockets carried by said body member with each of said pockets adapted to loosely receive a plurality of playing cards therewithin at a location no higher than the uppermost surface of said body member; and said pockets extending inwardly with respect to the periphery of said body member, in vertical alignment with respect to respective ones of said seating means and downwardly spaced from said seating means.

4,105,203

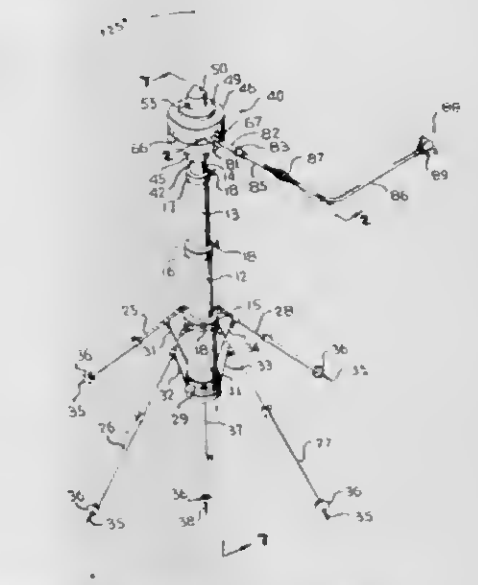
TENNIS TRAINER

Tae Han Cho, 19010 Quail Valley Blvd., Gaithersburg, Md. 20760

Filed Jan. 11, 1977, Ser. No. 758,396

Int. Cl.^{2} A63B *69/38*

U.S. Cl. 273—29 A **7 Claims**



1. Tennis training apparatus comprising:

a free-standing support structure having a vertical axis;

an arm member having first and second sections forming a generally L-shaped structure;

pivotal engagement means securing an end of said first section inside said support structure to permit rotational movement of said arm member about said vertical axis;

bias means in said support structure for biasing said arm member to a rest position and opposing rotational movement of said arm member;

spring means located in said first section of said arm member for imparting axial resiliency to said first section;

holder means located at an end of said second section for firmly holding a tennis ball in a position which is substantially centered with respect to said second section of said arm member;

whereby impact against said tennis ball in a direction axially toward said second section of said arm member is initially partially absorbed by said spring means and then partially absorbed by said bias means;

wherein said pivotal engagement means includes:

a housing having outer side walls, a top wall and a bottom wall forming an enclosure, said outer side walls being positioned to surround said vertical axis and having a horizontally-extending slot defined therein;

a hollow cylinder positioned inside said housing and coaxial with said vertical axis, said hollow cylinder being positioned for rotational movement about said vertical axis; and

means securing said one end of said first section of said arm member to said hollow cylinder such that said first section extends radially outward from said vertical axis through the slot in said outer side walls.

4,105,204

TENNIS STROKE PRACTICE DEVICE

Wilbur V. Koenig, 9891 Good Luck Rd., Lanham, Md. 20801

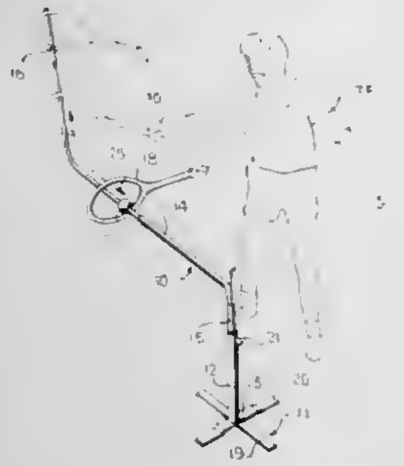
Filed May 6, 1977, Ser. No. 794,672

Int. Cl.^{2} A63B *69/38*

U.S. Cl. 273—29 A **8 Claims**

1. A tennis stroke practice device comprised of a base means, a support member positioned thereon and extending substantially vertically upward and a Z-shaped elongated member having one end secured to the upper end of said support member and its other end being free, said free end being disposed upwardly the remaining portion of said Z-shaped member

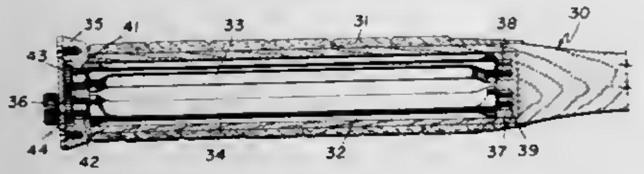
connecting said free end said secured end and being disposed substantially parallel to a ground surface, and a stringless tennis racquet positioned over said free end and adapted to be



grasped by a player whereby a tennis stroke can be practiced by guiding the racquet over the free end and said remaining portion towards the secured end.

4,105,205
RACKET

Theodore P. Theodores, Sudbury, and Lewis M. Smolin, Marlboro, both of Mass., assignors to Sudbury Engineering Corporation, Sudbury, Mass.
Continuation of Ser. No. 604,238, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 469,514, May 13, 1974, abandoned. This application Sep. 22, 1976, Ser. No. 725,404
Int. Cl.² A63B *49/08*
U.S. Cl. 273—73 J **9 Claims**

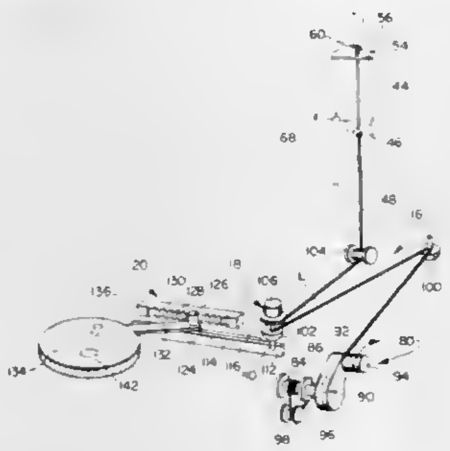


5. A racket, comprising
(a) an elongated handle,
(b) a frame rigidly connected to one end of the handle,
(c) strings tightly mounted in the frame for engagement with a game implement, and
(d) means associated with the handle for radically changing the ability of the handle to bend, wherein the handle is provided with a longitudinally-extending cavity in which the said means is carried and which is provided with a viscous damping fluid, the said means consisting of a beam which has a different bending moment in one plane than in another, the beam having a generally rectangular cross-section, and wherein the handle has a knob located at the other end, which knob is connected to the beam to produce a rotation thereof within the cavity about an axis extending longitudinally of the handle, the beam being contained in a thin metal tube which is sealed for the enclosure of the viscous damping fluid for reducing vibration after impact with a ball.

4,105,206
WEIGHTLIFTING GAME

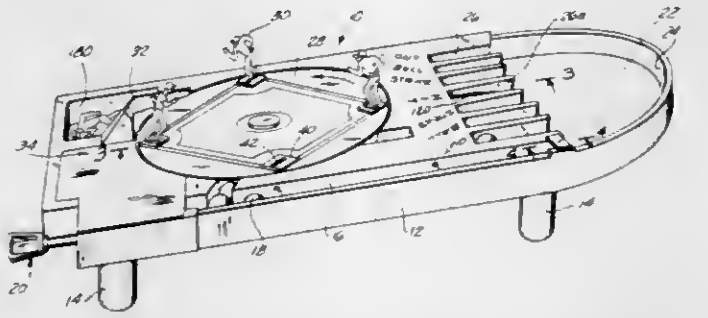
Steven T. Soulos, 55 Alfred Drowne Rd., Barrington, R.I. 02806
Filed Jan. 27, 1977, Ser. No. 763,228
Int. Cl.² A63F *9/00;* **A63H** *13/04*
U.S. Cl. 273—85 R **24 Claims**

11. A toy including a base, a figure simulating a weightlifter supported by said base, said figure having leg, torso and arm portions interconnected so as to effect simulated weightlifting motions from a rest to a lift position, said leg portions fixedly positioned with respect to said base in a generally upright disposition, said torso pivotally connected to said leg portions at a lower pivot for free arcuate movement with respect thereto from an initial position wherein said torso is angularly disposed with respect to said leg portions to a final position wherein said torso and leg portions are in general upright alignment with each other, said interconnection further comprising in part said arm portions being pivotally mounted to said torso portion at an upper pivot for arcuate movement with respect to said torso, said arm portions having means for receiving weights, means for elevating said figure, said figure elevating means including strand means means connected to said strand means for applying tension to said strand means whereby said torso portion may first be pivoted about said leg portions from said initial angular position thereof to an intermediate figure position corresponding to said generally aligned leg and torso position and thereafter upon continued application of tension to said strand means, said arm portions of said body and said weights received thereby may be arcuately pivoted about said torso portion from a rest position to said lift position wherein said arm portions are disposed above said torso.



4,105,207
PINBALL TYPE BASEBALL GAME

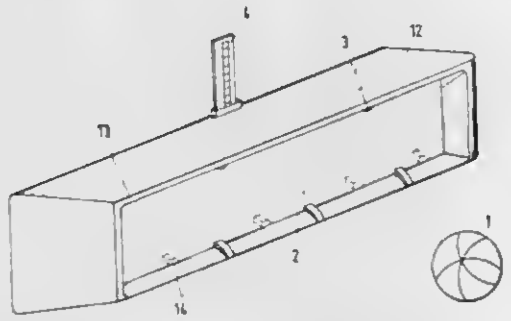
Julius Cooper, New Hyde Park; Vincent Carella, Queens Village; Edwin Nielsen, Oceanside, and Henry Nemeth, Massapequa, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Aug. 18, 1976, Ser. No. 715,277
Int. Cl.² A63F *7/06*
U.S. Cl. 273—89 **14 Claims**



7. A pinball type baseball game comprising, a frame having a ball guide track formed therein and a plurality of ball receiving pockets communicating with said track; a plurality of balls, and selectively operable means for projecting individual balls along the track towards said pockets for random entrance therein; a play surface rotatably mounted on said frame and simulating a baseball diamond; a plurality of figurines adapted to be selectively and removably mounted on said play surface at predetermined locations thereon representing the bases of said diamond; drive means in said frame for rotating said play surface, and releasable stop means operatively associated with one of said pockets for normally holding said playing surface against rotation by said drive means and for releasing said play surface for limited rotation by said drive means through an arc of varying lengths and of one revolution or less according to a predetermined and apparently random pattern in response to entrance of a ball into said one pocket; said drive means including a one way spring clutch rotatably mounted in the frame and having an output member drivingly engaged with the play surface, and means for energizing the spring of the clutch while the play surface is held against rotation by said stop means; said releasable stop means including an annular surface on said play surface having a plurality of recesses formed therein arcuately spaced from one another by 90°, a spring lever pivotally mounted in said plane having one end engaged with said annular surface and one end located in said one pocket in position to be engaged by a ball falling into the pocket and pivoted in response to engagement by the ball to move said one end thereof away from said annular surface, and means for normally biasing said one end of the lever against said surface for movement into a recess therein when a recess is moved in juxtaposition with the lever during rotation of the play surface, whereby engagement of the lever in said one pocket by a ball will release the engagement of the lever and recess in said annular surface to allow the play surface to be driven by the spring clutch; said stop means including a program cam rotatably mounted in said frame and drivingly engaged with said play surface to be rotated by the play surface when the play surface is rotated by the spring clutch; said cam having a plurality of cam protuberances and being located in the frame in a position adjacent said lever and wherein the protuberances align, in plan, with the periphery of said annular surface thereby to block the recesses which move into juxtaposition with the lever according to a predetermined pattern which produces an apparently random sequence of angular movements of the play surface of one revolution or less each time a ball enters said one pocket.

4,105,208
INDOOR FOOTBALL (SOCCER) MATCH SET

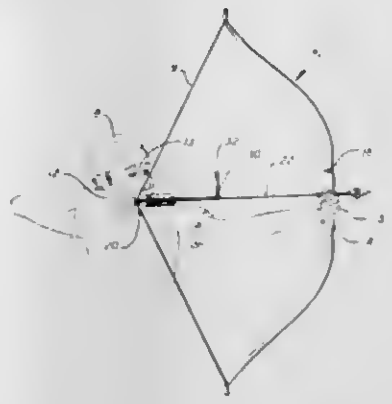
Antonius Polhuis, Oldenkotterstrasse 56, 4426 Vreden, Germany
Filed Feb. 15, 1977, Ser. No. 768,774
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606607
Int. Cl.² A63F *63/04, 71/04, 71/06*
U.S. Cl. 273—95 R **6 Claims**



1. An indoor football (soccer) match set comprising:
at least one goal;
a ball of such size as to be able to enter said goal;
a movable plate positioned within said goal;
a bar having numbered marker panels disposed one above the other, said bar having a plurality of teeth arranged one above the other; and
latch element means having latches for engaging said teeth, and having a cam engaging the rear face of said plate, said bar and said latch element means being positioned so that said bar moves downward by one marker panel with every impact of said ball against said plate.

4,105,209
ARROW MOUNTED SELF-RETRACTING SIGHT

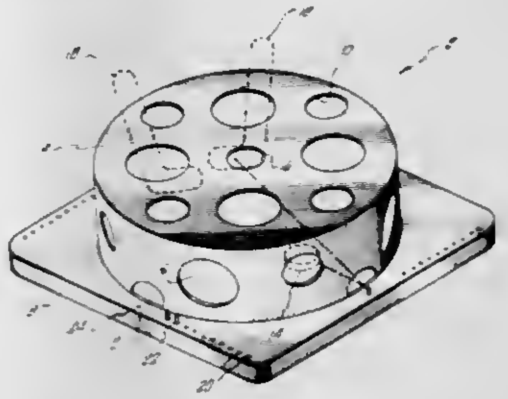
David Bizzéll, 7 Benjamin Hill Rd., Newfield, N.Y. 14867, and Eino A. Makarainen, 400 Comfort Rd., Ithaca, N.Y. 14850
Filed Jun. 17, 1977, Ser. No. 807,561
Int. Cl.² F41B *5/02*
U.S. Cl. 273—106.5 R **5 Claims**



1. A sight for use in aiming a bow and arrow, comprising;
an arrow shaft having curvature in transverse cross section;
a curved body portion which matches the curvature of said shaft in transverse cross section
means pivotally connecting said body portion to said shaft of said arrow to permit said body portion to pivot from an upright, aiming position to a folded position along said shaft when said arrow is in flight.

4,105,210
HOCKEY GAME APPARATUS

Lawrence T. Jones, Manhattan Beach, Calif., and William Jacobs, Edwardsville, Ill., assignors to California R & D Center, Culver City, Calif.
Filed Jan. 9, 1976, Ser. No. 647,923
Int. Cl.² A63F *3/00*
U.S. Cl. 273—126 R **13 Claims**

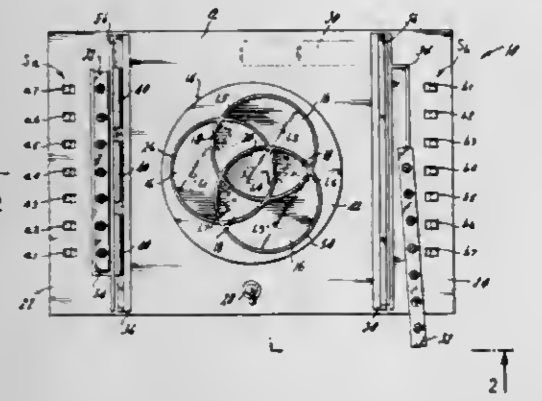


1. A hockey game apparatus for two or more players comprising:
a game projectile;
at least a pair of striking members for propelling the game projectile;
a totally planar playing surface for supporting the projectile during the game; and
a hollow shell housing having a top portion and a side member enclosing the playing surface, the top portion having a first plurality of apertures for permitting ingress and egress of the striking members through a player selected aperture to move the game projectile across the playing surface, the side member having a second plurality of apertures, some of the side member apertures being positioned above the playing surface and permitting ingress and egress of the striking members while others of the side member apertures are immediately adjacent the periphery of the playing surface and form goal positions on the

housing for receiving the game projectile to provide a score by a player.

4,105,211
GAME OF LOGIC

Fred E. Wernig, 65 Cherry St., Massapequa, N.Y. 11758
Filed Jun. 11, 1976, Ser. No. 695,010
Int. Cl.^{2} A63F *3/00*
U.S. Cl. 273—237 **10 Claims**

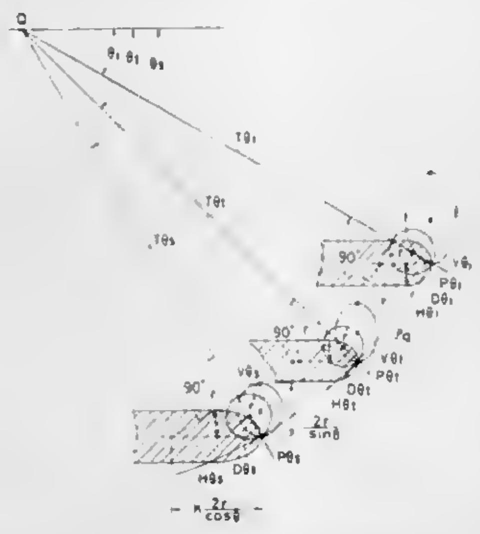


1. A game of logic for a plurality of players comprising: a first and second interdependent control console, means visually isolating said first and second control console from each other, each of said consoles including a multiplicity of switching means, each of said switching means including a single pole-double throw control element operatively connected to a corresponding switching means on said other console forming a multiplicity of interdependent pairs of switching means, an energy source, means connecting said energy source to all of said interdependent pairs of switching means, a responsive device formed in the shape of three intersecting circles and defining a multiplicity of on-off indicating segments having a corresponding activatable responsive element at each said segment and corresponding to the number of interdependent pairs of switching means, each of said activatable responsive elements responsively coupled to one of said interdependent pairs of switching means in such manner that operation of either switching means activates or deactivates said responsive element interdepending upon the operation of the other switching means of each interdependent pair of switching means and master switching means interruptably connecting said means connecting said energy source to all of said interdependent pairs of switching means, and a plurality of individual play directing playing cards mountable on said playing board.

4,105,212
REPRODUCING STYLUS FOR PHONOGRAPH RECORDS

Junshiro Ogura, Tokyo, Japan, assignor to Ogura Jewel Industry Co., Ltd., Japan
Filed Sep. 20, 1976, Ser. No. 724,757
Claims priority, application Japan, Sep. 23, 1975, 50-114324
Int. Cl.^{2} G11B *3/44*
U.S. Cl. 274—38 **11 Claims**

1. A reproducing stylus for phonograph records having an operative tip portion, with a central axis substantially perpendicular to the direction of travel along a sound groove of a record, said tip portion being formed, on lower and laterally opposite surfaces of the stylus, with arcuate edges designed to contact the walls of a sound groove in a record disk, said operative tip portion having a substantially elliptical cross-section elongated perpendicular to the direction of travel of the stylus along a sound groove; the groove-contacting portions of said operative tip portions following a curved contour line, in a section taken in a plane perpendicular to such direction of travel and including the central axis of said stylus and passing through the stylus tip, which is an arc of a circle having a center of curvature Q located in said plane; the arcuate edges of said operative tip portion tangent to and centered on said contour line, in all sections Dθ thereof in a plane Tθ, including any point Pθ thereof on said curved contour line and including said center of curvature Q, and which plane Tθ is perpendicular to a plane including said point Pθ and said central axis of said stylus, being portions of identical ellipses; the projections of said arcuate edges in said plane Tθ, projected, perpendicular to said plane Tθ, onto a plane Hθ perpendicular to said central axis of said stylus, forming part of respective ellipses having the same minor diameter and whose major diameter is

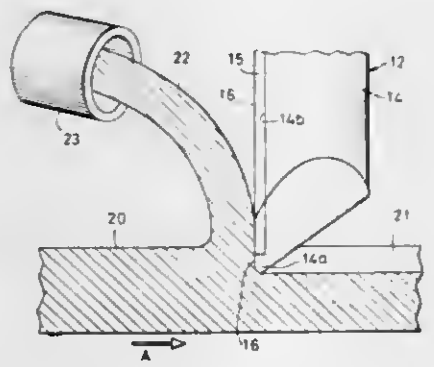


$$k\cdot(2r/\cos\theta)$$

where θ is the angle formed by said planes Tθ and Hθ, said minor diameter is 2r, and $k \geqq 1.0$.

4,105,213
DEVICE FOR CUTTING A SOUND GROOVE ON A DISC RECORDING MEDIUM

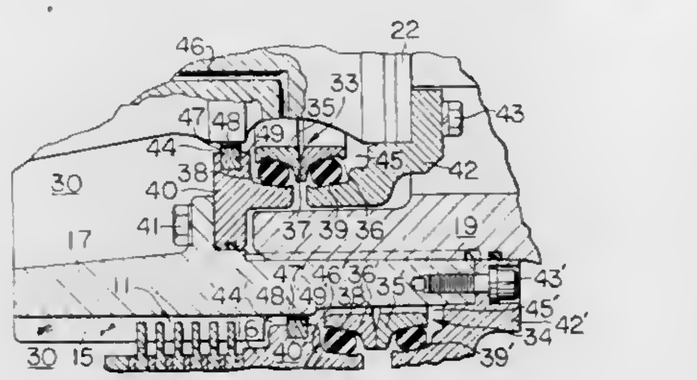
Isao Owaki; Shinji Nakamura, and Yoshiyuki Tsuchikane, all of Tokyo, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Oct. 5, 1976, Ser. No. 729,669
Claims priority, application Japan, Oct. 15, 1975, 50-139372[U]; Jan. 29, 1976, 51-9069[U]
Int. Cl.^{2} G11B *3/44*
U.S. Cl. 274—38 **5 Claims**



1. A device for cutting a sound groove on a disc recording medium comprising a diamond stylus body having a part for cutting a groove on said disc recording medium, thereby producing a chip cut from said disc recording medium, and nonconductive means made of a material which does not readily generate static electricity so that it does not readily generate static electricity when said chip is in sliding contact therewith, said nonconductive means being mounted on a mirror cutting surface of said stylus body at a position where it makes contact with said chip.

4,105,214
SEALING ARRANGEMENT FOR BRAKE HOUSING

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 15, 1974, Ser. No. 524,115
Int. Cl.^{2} F16J *15/34*
U.S. Cl. 277—74 **16 Claims**



1. In a rotary drive mechanism having means defining a chamber in which the mechanism is disposed, said chamber having an inlet and an outlet for providing a flow of lubricating coolant through the chamber for cooling the mechanism therein, and sealing structure having an annular face seal defined by a pair of yieldingly engaging seal rings and resilient biasing element sealingly closing said chamber, the improvement comprising: divider means including a buffer seal dividing said chamber into a main portion receiving said mechanism and an outlet portion confronting said face seal, said divider means having a passage therethrough for conducting pressurized lubricating coolant fluid from said chamber main portion to said chamber outlet portion for cooling and lubricating said face seal, said passage having flow restricting means for providing a preselected pressure regulating flow restriction of the coolant fluid from said chamber main portion to said chamber outlet portion; and means defining a discharge passage from said chamber outlet portion, whereby fluid is flowed from said inlet through said chamber main portion to said outlet and concurrently through said flow restricting passage to said chamber outlet portion and from said chamber outlet portion to said discharge passage for maintaining concurrently a preselected cooling of said mechanism and a preselected lubrication and cooling of said face seal.

4,105,215
WELL PACKER INCLUDING COMBINATION ANTI-EXTRUSION AND SEGMENT RING ACTUATING WASHER

Lloyd C. Rathburn, Friendswood, Tex., assignor to Loomis International, Inc., Houston, Tex.
Filed Sep. 6, 1977, Ser. No. 830,613
Int. Cl.^{2} F16L *21/04;* E21B *33/128*
U.S. Cl. 277—116.2 **5 Claims**

1. In combination with a packer assembly for sealing a well pipe, including

an upper unit,

a tool stem carried by the upper unit and depending therefrom,

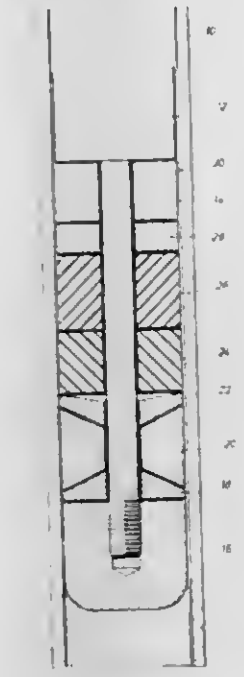
a lower unit connected to the tool stem, and

a packer unit positioned on the tool stem between said upper and lower units, said upper unit operably connected to move toward said lower unit, thereby applying pressure to the packer unit,

the improvement in a packer unit which comprises

a washer surrounding the tool stem having inward and outward conical surfaces, said washer having sufficient hardness to maintain shape integrity without breaking under packer pressure;

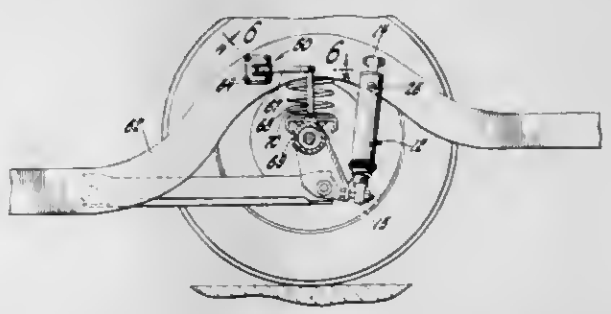
a resilient packer section having a surface adjacent the inward conical surface of said washer, which packer surface, in the absence of applied packer pressure, is closer at its outer dimension to said inward conical surface than elsewhere, applied packer pressure thereby causing said resilient packer section to tend to extrude along said inward conical surface; and



a radially expanding segmented packer ring, the outward conical surface of said washer abutting an inward conical surface of said packer ring.

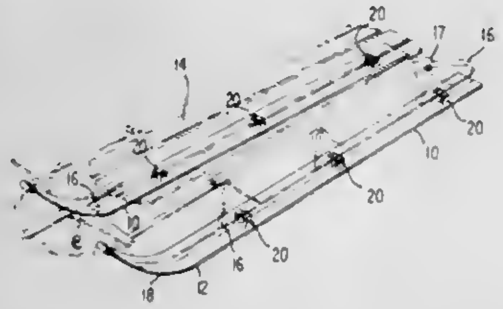
4,105,216
MOTOR VEHICLE LEVEL CONTROL CIRCUIT

Donald E. Graham, Centerville, and Paul J. Long, Jr., Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 635,258, Nov. 25, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,271
Int. Cl.^{2} B60G *17/00*
U.S. Cl. 280—6 R **5 Claims**



3. A motor vehicle level control circuit for use with motor vehicle leveling systems of the type operative to level the sprung mass of the motor vehicle within a predetermined trim band in response to respective electrical signals indicating the sprung mass to be above and below the trim band comprising: and optical coupler arrangement of the type including a pair of light sources and a pair of photosensitive signal generating devices, each optically coupled to a respective one of said pair of light sources for producing a first logic signal pair when the sprung mass is above the trim band, a second other logic signal pair when the sprung mass is below the trim band and a third other logic signal pair when the sprung mass is within the trim band; first circuit means responsive to said first logic signal pair for producing a sprung mass high signal; second circuit means responsive to said second logic signal pair for producing a sprung mass low signal; delay circuit means effective to inhibit the production of both said sprung mass high and sprung mass low signals for a predetermined time duration; means responsive to said sprung mass high signal for effecting the lowering of said sprung mass; and means responsive to said sprung mass low signal for effecting the raising of said sprung mass.

4,105,217
SKI-SLED ATTACHMENT DEVICE
Victor Metelow, 72 Rutgers Ave., and Ivan Tirenin, 36 Fourth Ave. White Head Rd., both of Trenton, N.J. 08619
Filed May 27, 1977, Ser. No. 801,190
Int. Cl.² B62B *17/02*
U.S. Cl. 280—28 **11 Claims**



11. A ski-sled attachment device for use secured to the bottom of the runners of the conventional snow sled which comprises:

(a) a base member extending longitudinally to be adapted to be detachably secured to a conventional sled runner, said base member defining a longitudinally extending channel centrally located in the upper surface thereof to facilitate firm securement of a sled runner thereto, said base member further including a forward section adapted to be sucured to the front portion of a sled runner, said front section defining a plurality of laterally extending channels in the upper surface thereof to facilitate upward flexing of said front section;

(b) a plurality of adjustable locking means positioned along the upper surface of said base member to detachably secure said base member to a conventional sled runner, said locking means comprising:

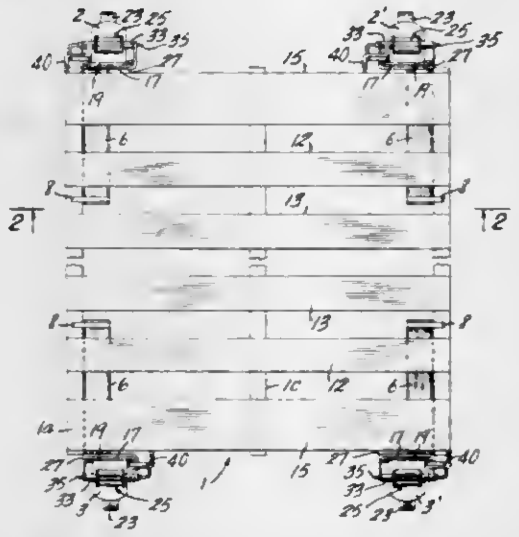
  (1) a plurality of pairs of tab members extending upwardly from the upper surface of said base member, each of said locking means including a pair of said tab members, each of said tab members defining an aperture therethrough in a transverse direction with respect to said base member, each of said apertures of a pair of said tab members being aligned laterally with respect to one another, each pair of tab means being in spaced relation with respect to one another to define a guide means therebetween for holding the sled runner within said longitudinally extending channel to facilitate a firm attachment between said base member and the sled member;

  (2) block means positionable within said guide means in between each pair of said tab members to lock a sled runner in place within said guide means, said block means defining an elongated hole means laterally therethrough being alignable with respect to said apertures, said elongated hole means oriented angularly with respect to said base member to allow adjustment in the vertical distance from said base member to said block means, said block means also defining a groove means in the lower surface thereof to snugly mate with the upwardly extending section of a conventional sled runner to facilitate securement thereof within said guide means; and

  (3) bolt means selectively locatable through said hole means and said apertures of a pair of tab members to firmly hold said block means against a sled runner with said guide means;

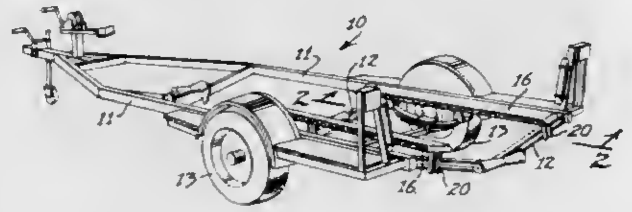
(c) two laterally spaced and forwardly extending arms at opposite lateral sides of the forward edge of said base member, said arms defining an opening therebetween and being adapted to flex upwardly to be positionable above the sled upper rail allowing the rail to pass through said opening, said arms defining orifices therethrough and including a stud means adapted for placement through said orifices to hold said arms in locked position above the sled upper rail.

4,105,218
PORTABLE PALLET CARRIERS
George Newell, 119 Helene Rd., Valley Cottage, N.Y. 10989
Filed Aug. 2, 1977, Ser. No. 821,155
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.12 **5 Claims**



1. A portable pallet carrier comprising; an elongated, rigid support arm having a free end insertable,into a pallet underlying the platform crosspieces thereof and having means on said support arm for releasably attaching the support arm to the pallet for raising and lowering the pallet as said support arm is raised and lowered; means for raising and lowering the support arm comprising a guide fixed on an end of said arm defining a guide slot normal to the longitudinal axis of said support arm and extending on opposite sides of said axis, a caster mount extending from said arm in a direction corresponding to an axial direction thereof, a caster wheel on said caster mount, a guide plate fixed to said caster mount for movement in said guide slot in opposite directions corresponding to an upward and a downward direction of movement of the caster mount, a pivot plate fixed relative to the support arm and spaced from said caster mount, an operating linkage for moving the caster mount and its guide plate guided in said slot in opposite directions, said operating linkage constituting an operating handle having an end pivoted on said pivot plate and a free end portion operable in opposite directions to two separate operative positions disposed on opposite sides of the longitudinal axis of the support plate, one operative position constituting a raised position of the handle corresponding to a lowered position of the support arm and the other operative position constituting a lowered position of the handle corresponding to a raised position of the support arm, a connecting link having a pivot connected to said handle intermediate a free end thereof and the pivoted end of the handle, a pivot pivotally connecting the connecting link to said caster mount, the pivot connected to said handle pivotally rotating about the pivot at the end of said handle as said handle is actuated, the pivots being relatively disposed for converting arcuate movement of the pivot on the handle about the pivot on the end of the handle to develop force components applied through said connecting link effective in a plane parallel to said slot for moving said caster mount to a raised and a lowered position thereby to lower and raise the support arm.

4,105,219
POSITIVE LOCKING DEVICE FOR BOAT TRAILER BOLSTER BRACKET
Fred B. Gerson, c/o Hub City Machine & Tool Co., 408 Sterling St., Jackson, Tenn. 38301
Filed Apr. 11, 1977, Ser. No. 786,654
Int. Cl.² B60P *3/10*
U.S. Cl. 280—789 **2 Claims**



1. In a boat trailer having a transverse channel frame member, and a bolster having a top boat-supporting surface and a bottom surface, a bolster mounting device comprising:

(a) an elongated support member having a plate portion substantially longer than the height of said transverse frame member, and having a top portion and a bottom portion,

(b) means attaching the top portion of said support member to the bottom surface of said bolster,

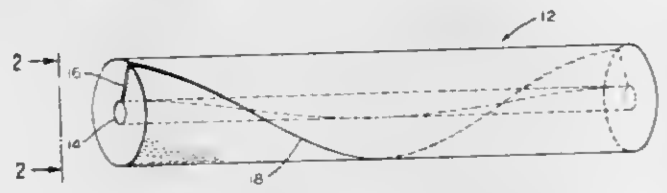
(c) an elongated slot extending through the longitudinal central portion of said plate portion and having a length substantially greater than the height of said transverse member,

(d) a U-bolt member encompassing a cross-sectional portion of the transverse frame member, having threaded end portions extending through said elongated slot, and including nuts engaging said threaded end portions and adapted to be tightened against said plate portion,

(e) a plurality of vertically spaced locking holes in said plate portion, various holes of which are located in a locking position adjacent and above a flange on said transverse frame member for various vertically adjusted positions of said support member relative to said transverse frame member, and

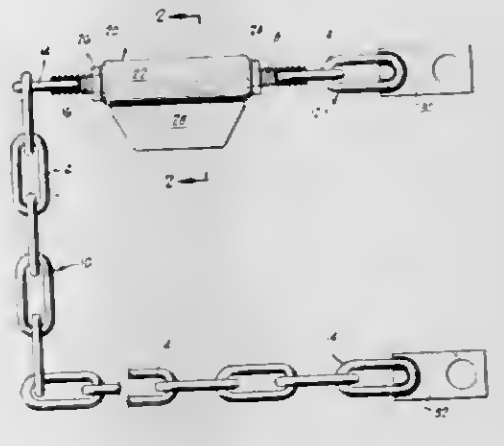
(f) a stop pin member inserted through one of said locking holes in a locking position in which said pin member rests upon the top surface of a flange of said transverse frame member.

4,105,220
IMPACT PROTECTION PAD
William L. Pacific, Somerville, Mass., assignor to Rogers Foam Corporation, Somerville, Mass.
Continuation of Ser. No. 613,063, Sep. 15, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,931
Int. Cl.² B62J *23/00, 27/00*
U.S. Cl. 280—289 E **3 Claims**



1. An impact protection pad for mounting on a vehicular handle bar of uniform circular cross section, said pad in the unmounted and unstressed state, comprising a unitary, generally cylindrical body of uniform composition comprising flexible closed cellular plastic material, said body being radially deformable upon impact and being solid except for an axial hole and a single slit both extending from end to end thereof, the hole having a substantially smaller diameter than said body, the outer periphery of the undistorted slit lying in a substantially helical line around the surface of said body and the configuration of the undistorted slit in any cross section of said body being a substantially straight line extending between said helical line and said hole, said body having sufficient resiliency to permit the slit to be opened for wrapping on to a handle bar of substantially the same diameter as said hole and sufficient stiffness to resist distortion and removal from said handle bar without added peripheral support.

4,105,221
TENSIONING LINKAGE
Ancel H. Fleming, 3715 N. Tulsa, Oklahoma City, Okla. 73112
Filed Feb. 4, 1977, Ser. No. 765,533
Int. Cl.² B60D *1/00*
U.S. Cl. 280—461 A **5 Claims**

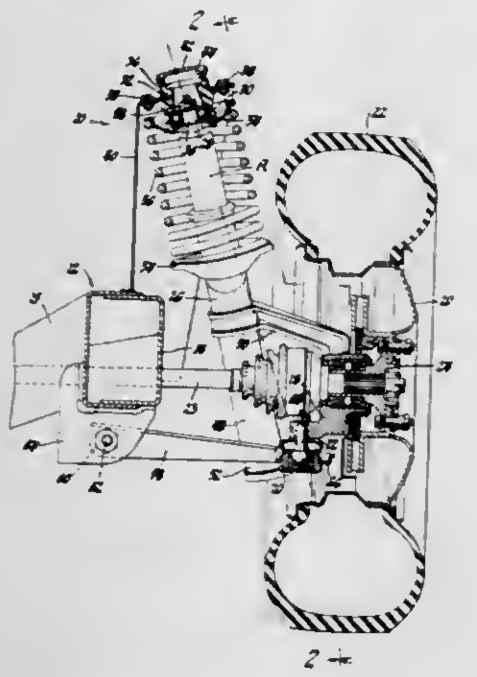


1. A tensioning linkage comprising:
a pair of elongated flexible elements;
a turnbuckle sleeve;
means threadedly connecting an end of each of said flexible elements to an end of said turnbuckle sleeve; and
a weight connected to said turnbuckle sleeve and projecting from one side thereof for opposing rotation of the turnbuckle sleeve about its longitudinal axis in a direction which causes the flexible elements to unthread from the sleeve;
wherein said weight is a trapezoidally shaped plate projecting from said sleeve in a plane containing said longitudinal axis and facilitating manual rotation of said sleeve about said longitudinal axis.

4,105,222
INDEPENDENT FRONT SUSPENSION SYSTEM
Robert M. Buchwald, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 26, 1976, Ser. No. 745,126
Int. Cl.² B60G *11/56*
U.S. Cl. 280—668 **5 Claims**

1. An independent suspension system for a front wheel drive motor vehicle having a supporting frame and a road wheel and tire, said system comprising a laterally extending control arm having its inner end pivotally connected to said frame; a steering knuckle pivotally connected to the outer end of said control arm for rotatably supporting said wheel; a shock absorber having its lower end connected to said steering knuckle and its axis inclined with respect to a vertical transverse plane at a predetermined angle for anti-dive and anti-lift characteristics, and its upper end pivotally connected to said frame forward of its lower end at a point which together with the center of the pivotal connection between the steering knuckle and the control arm defines a predetermined steering axis; a coil spring mounted around said shock absorber, the upper end thereof

being concentric with said shock absorber and the lower end thereof being eccentric with said shock absorber; and retainer



means secured to said shock absorber for retaining said upper and lower ends of said coil spring.

4,105,223
INSTRUMENT PANEL FOR A VEHICLE

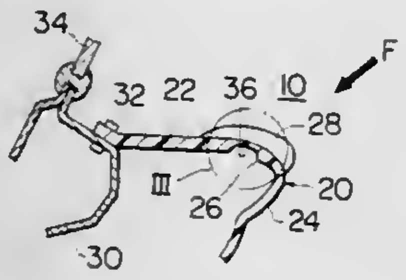
Takaaki Oda, Musashi-murayama, and Kazuo Takeuchi, Chiba, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Sep. 28, 1976, Ser. No. 727,572

Claims priority, application Japan, Oct. 31, 1975, 50/148787[U]

Int. Cl.^{2} B60K *37/00;* **B60R** *21/04*

U.S. Cl. 280—752 **5 Claims**



1. A safety instrument panel for a vehicle, comprising:
   an elongated sheet member laterally set at a front section of a passenger compartment of said vehicle;
   means for weakening the resistance to deformation of areas of said elongated sheet member and comprising a plurality of recesses having relatively substantial surface area formed in said elongated sheet member, said areas being most likely impacted by the passenger's head during a vehicle collision; and
   padding secured to outer surfaces of said enlongated sheet member so as to cover said areas.

4,105,224
NOTE PAD ASSEMBLY

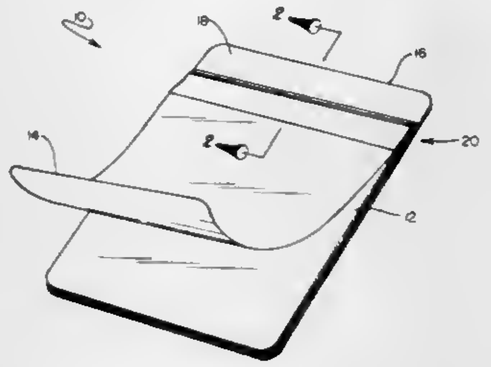
Heleo D. Rodebaugh, 1539 B Lafayette Dr., Columbus, Ohio 43220, and William C. Fowler, 226 E. Dunedin Rd., Columbus, Ohio 43214

Filed Jun. 23, 1977, Ser. No. 809,291

Int. Cl.^{2} B42D *5/00;* **B43C** *3/00*

U.S. Cl. 281—15 R **10 Claims**

1. An assemblage of paper sheets suited for recording written information thereon and a subsequent adhesive posting thereof wherein they are utilized progressively from uppermost first to lowermost last, comprising:
   a backing sheet having a generally rectangular configuration of predetermined width and height and selected having a given paper stock density;
   a plurality of said sheets, each having a generally rectangular configuration, one edge dimension of which is less than the said predetermined width or height of said backing sheet;
   said sheets being stacked in substantial edge alignment and positioned upon the upward surface of said backing sheet in an orientation exposing at least a portion of said upwardly disposed backing sheet surface;
   discrete lengths of poylmeric tape of predetermined width, each carrying an adhesive upon a downwardly disposed surface thereof, each said discrete length of tape being prestressed and affixed to and over an extent of about one half said tape predetermined width to an associated said sheet in the vicinity of one edge thereof, said tape having a portion protruding over such edge;
   said protruding portion of said length of tape which is affixed to said last sheet being adhesively affixed to said backing sheet exposed regions; and
   the said protruding portion of each successive said length of tape and associated said sheet being adhesively affixed to the upwardly disposed surface of an adjacent lower disposed said length of tape protruding portion so as to provide composite laminar assemblage of said prestressed lengths of tape protruding portions, each retaining an associated said sheet from first to last in aligned, stacked adjacency upon said backing sheet.



4,105,225
AUTOGRAPHIC REGISTER SYSTEMS

David John Neale, Waltham Cross, and Victor Herbert Perriman, London, both of England, assignors to Moore Business Forms Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 538,040, Jan. 2, 1975, abandoned. This application Aug. 8, 1975, Ser. No. 603,094

Claims priority, application United Kingdom, Jan. 10, 1974, 1194/74; Dec. 13, 1974, 53901/74

Int. Cl.^{2} B41M *5/22*

U.S. Cl. 282—27.5 **2 Claims**

1. A transfer sheet assembly for use in an autographic register assembly comprising a plurality of record webs which are adapted to be fed through an autographic register and transfer sheets alternately interleaved with the record webs in the autographic register wherein the transfer sheets each comprise a base sheet selected from paper having a barrier coating and plastics film, a porous solvent coated coating on the base sheet, said porous solvent coated coating including cellulose acetate butyrate resin and polymethyl methacrylate resin and a colourless colour former within the porous coating including para toluene sulphinate of Michler's Hydrol in castor oil and wherein the record webs carry a colour developing coating for selectively developing the colour former in the porous coating.

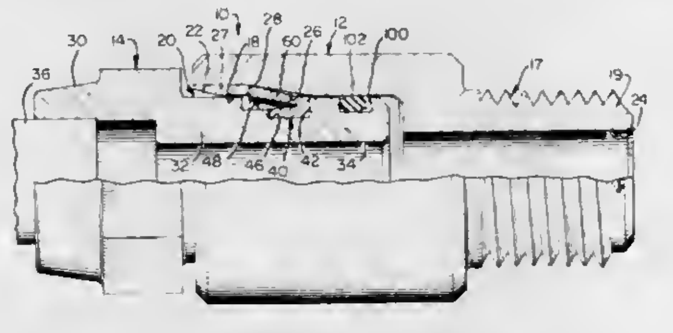
4,105,226
SNAP-IN FITTINGS AND COUPLING RING THEREFOR

William J. Frey, and Paul L. Meyer, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 691,756, Jun. 1, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,588

Int. Cl.^{2} F16L *39/00*

U.S. Cl. 285—175 **17 Claims**



1. A coupling ring for use in snap-in fittings of the type including male and female connector elements, the male connector element including a ring-retaining channel and the female connector element including a locking groove, said coupling ring comprising:
   an annular base portion including an annular axially extending outer wall, an annular axially extending inner wall spaced radially inwardly from said outer wall, and an annular radial end wall interconnecting adjacent ends of said inner and outer walls;
   an annular collar portion integral with said base portion and extending from a side of said base portion opposite said end wall, said collar portion including an annular, generally frustoconical outer wall and an annular axially extending inner wall spaced radially therefrom;
      said inner wall of said collar portion being contiguous with said inner wall of said base portion;
      said inner wall of said collar portion being adapted to seat in the retaining channel of the male connector element;
      said outer wall of said collar portion being disposed radially inwardly of the plane of said outer wall of said base portion and converging toward said inner wall of said collar portion in a direction away from said base portion; and
   an annular locking portion integral with said base portion and extending from a side thereof opposite said end wall, said locking portion being of longer length than said collar portion and including: an annular generally frustoconical outer wall, an annular generally frustoconical inner wall spaced radially therefrom, and an annular, radial terminal wall interconnecting said inner and outer walls of said locking portion;
      said inner wall of said locking portion extending from said base portion toward said terminal wall at an acute angle relative to said outer wall of said collar portion to form a vertex therewith, said terminal wall adapted to lockingly abut within the locking groove of the female connector element;
      said outer wall of said locking portion being contiguous with, and extending at an angle from, said outer wall of said base portion and being divergent relative to said inner wall of said locking portion in a direction away from said base portion;
      said vertex being disposed closer to said end wall of said base portion than is the place of intersection of said outer walls of said base and locking portions;
      said locking portion including a plurality of circumferentially spaced resiliency slots extending therethrough, one of said slots extending completely through the ring to facilitate mounting thereof on the male connector element.

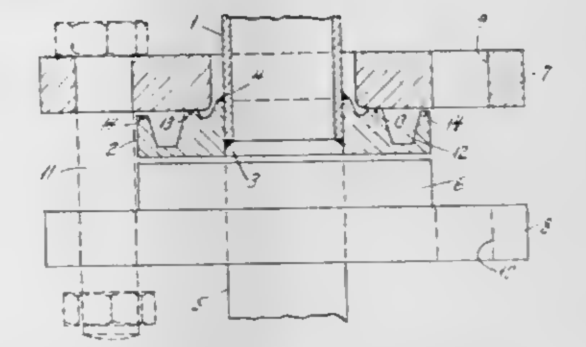
4,105,227
FLANGE JOINT BETWEEN PIPE LENGTHS

Sven Erik Ekberg, and Ove Leonard Ekberg, both of 891 23 Själevad, Sweden

Filed May 11, 1977, Ser. No. 795,883

Int. Cl.^{2} F16L *23/00*

U.S. Cl. 285—412 **2 Claims**



1. A flange joint for use in the assembly of pipings from pipe elements, comprising in combination sealing flange means mounted around and welded to the outermost end portion of each of adjacent pipe elements, the front faces and back faces of said sealing flange means of said adjacent pipe elements opposing and being turned away from each other, respectively, there being two annular concentric contact surfaces on each of said back faces separated by relatively deep circular groove means in said back faces, the radially outer one of said concentric contact surfaces being depressed in relation to the radially inner one, clamping flange means slidably mounted on each of said pipe elements and capable of engaging said concentric contact surfaces, said clamping flange means extending beyond the circumference of said sealing flange means and having a number of holes in the thusextending part thereof, and bolt and nut means received in the holes of said clamping flange means of said adjacent pipe elements for clamping said clamping flange means together thereby causing a conical deflection thereof to engage said radially outer as well as said radially inner annular concentric contact surfaces of said sealing flange means for achieving an essentially equalized distribution of pressure on said radially inner and outer annular contact surfaces and for securing efficient sealing between the opposing front faces of said sealing flange means.

4,105,228
AUTOMATIC KNOT-FORMING MACHINE FOR THE FORMATION OF THE FISHERMAN'S KNOT

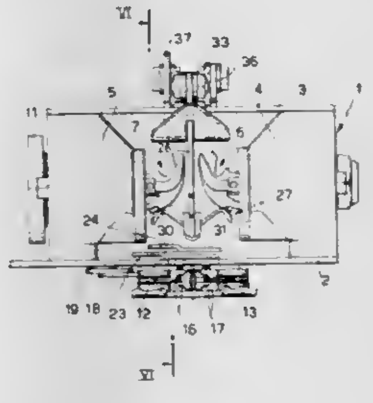
Pietro Messa, Salo' (Brescia), Italy, assignor to Mesdan S.p.A, Salo' (Brescia), Italy

Filed Nov. 1, 1977, Ser. No. 847,487

Claims priority, application Italy, Nov. 3, 1976, 29017 A/76

Int. Cl.^{2} A01D *59/04*

U.S. Cl. 289—2 **4 Claims**

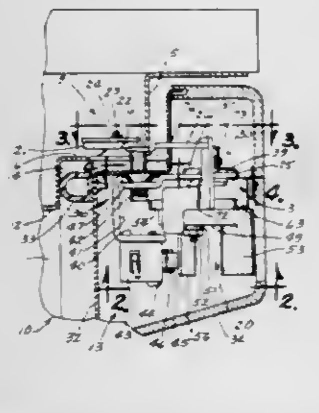


1. An automatic knot-forming machine for the formation of the fisherman's knot, particularly for coarse-count yarns and

intended to be mounted on an automatic spooler, comprising latching members for the yarns to be knotted, thread-crossing members, confrontingly mounted rotary hooks equipped with scissors for severing and holding the tails of the threads and an extractor and tensioning member for the knot, said members of latching, crossing and extractor member being controlled by cams mounted on a control shaft, characterized in that the extractor member is arranged oscillably between the rotary hooks on a plane midway vertical between an at rest lowered position and an adjustable raised position and is formed by a flat lever fulcrumed at an intermediate point and fitted in the vicinity of an end with a throat open upwards and with a transversal arm with two other throats open upwards in correspondence with the ends of said arm, at the opposite end of said lever being fulcrumed on a common pivot two control rods actuated through intermediate levers by two distinct cams mounted on the control shaft, the connection between one of these rods and the relative lever being fixed, while the connection between the other rod and the relative lever is adjustable, said cams being intended to control in two successive stages the lift of the extractor from the resting position to the raised position.

4,105,229
LATCH MECHANISM FOR APPLIANCE

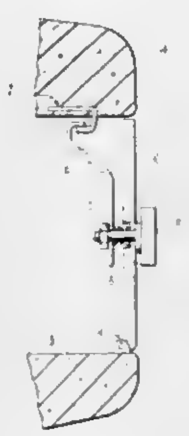
Henry J. Kaldenberg, Des Moines, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed Nov. 3, 1977, Ser. No. 848,104
Int. Cl.² E05C *5/00*
U.S. Cl. 292—113 **11 Claims**



1. A latch mechanism for an appliance having a cabinet and an access door movable between an open and a closed position, the combination comprising: strike means on one of said cabinet and said access door; latch mounting means on the other of said cabinet and said access door; and a latch assembly on said latch mounting means and operable between latched and unlatched conditions with respect to said strike means, said latch assembly including actuating means movably mounted on said latch mounting means and further including catch means having a first portion defining a hook engageable with said strike means, a second portion spaced a predetermined distance from said first portion with said latch assembly in said unlatched condition and effectively retained with respect to said actuating means in the general direction of access door movement, and displaceable means connecting said first and second portions, said catch means being responsive to movement of said actuating means toward said latched condition for movement of said hook into interlocking engagement with said strike means and then for movement of said displaceable means and said hook to change said predetermined distance and effect a drawing of said access door toward said cabinet and a latching of said access door in said closed position.

4,105,230
CLOSURE FOR PIVOTAL FLAPS, COVERS, OR THE LIKE

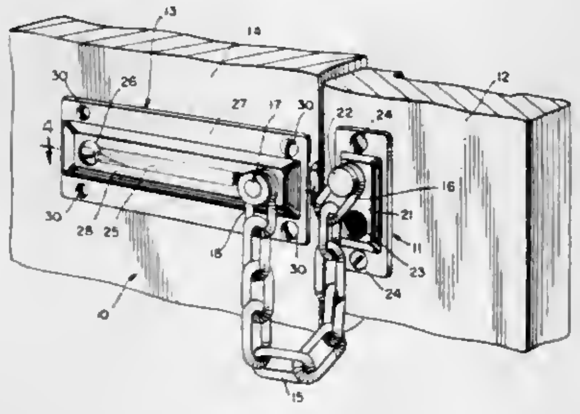
Rolf Amann, Renningen; Hans Benda, Aidlingen, and Albert Dietterle, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 3, 1976, Ser. No. 663,565
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1975, 2509299
Int. Cl.² E05C *5/00*
U.S. Cl. 292—202 **13 Claims**



1. A lock for a pivotal member, the lock comprising a curved locking member cooperating with a free end in a locking position with a free end of a fixed locking member, characterized in that the cooperating free ends of the two locking members have an approximately rectangularly bent configuration and effect upon a displacement of the pivotal member to a locking position a substantially horizontal and a substantially vertical interengagement in such a manner that a mutual support in the horizontal and vertical directions precludes a disengagement of the free ends of the locking members either in an upward direction with respect to the fixed locking member or in an opening direction of the pivotal member, the curved locking member engages with a bent-off free end with the free end of the fixed locking member from behind the fixed locking member, the curved locking member is rotatably supported at a pivotal part against the force of a spring normally urging said curved locking member into the locking position, and in that at least one of the two locking members includes an inclined slide surface means along a lateral edge thereof which cooperates with an adjacent lateral edge of the other of the two locking members so as to enable a locking of the two locking members by a simple pressing closed of the pivotal member.

4,105,231
CHAIN LOCK ASSEMBLY

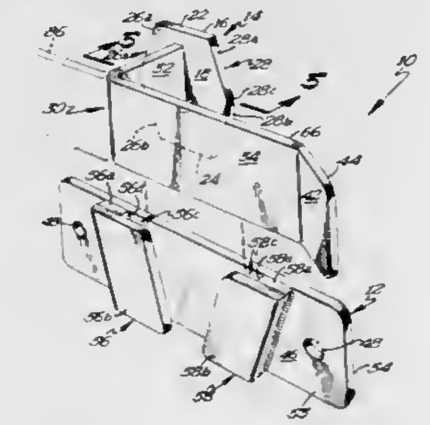
Phillip H. Huyssen, 116 Baber St., Hot Springs, Ark. 71901
Filed May 20, 1976, Ser. No. 688,153
Int. Cl.² E05C *17/36*
U.S. Cl. 292—264 **2 Claims**



1. A chain lock assembly for securing a door in a partially open position including a keeper bracket for attachment to a door frame, a chain having one end secured to said keeper bracket, a bolt connected to the other end of said chain, and a slide bracket for attachment to said door having an elongated slot for slidably receiving said bolt with said elongated slot having an enlarged opening in one end thereof to facilitate introducing said bolt into said elongated slot, said slide bracket further having a generally rectangular plate with a longitudinally extending upstanding portion terminating in said elongated slot and said enlarged opening, said generally rectangular plate having a hole provided adjacent each corner thereof to receive a screw for attaching said slide bracket to said door, wherein the improvement comprises a bolt retention means including a base member adjacent said enlarged opening and a resilient finger member integral with said base member extending away from said enlarged opening into said elongated slot to prevent disengagement of said bolt from said slide bracket, said base member being provided with a slot to register with each of said holes in the corners of said generally rectangular plate near the end of said elongated slot adjacent said enlarged opening to receive said screws for attaching said bolt retention means to said door.

4,105,232
CORNER-RETAINING LATCH APPARATUS FOR DOORS

Howard J. Miels, R.R. #2, Brook Park, Minn. 55007
Filed Jun. 10, 1977, Ser. No. 805,425
Int. Cl.² E05C *19/18*
U.S. Cl. 292—288 **4 Claims**



1. A corner retaining latch apparatus mountable on a door frame for retaining a corner of a door comprising:

a keeper including a tongue and rigid door engaging strap fixed to and extending outwardly from and laterally of said tongue, said strap including door corner retaining means for closely confronting and encompassing a corner of the door to engage the corner and arrest movement of the door toward said strap; and

a mounting bracket having an outer face and attachable to the door frame adjacent the door and including tongue retaining means to removably support said tongue in a rest position on said mounting bracket, wherein said door corner retaining means encompasses the corner of the door;

said tongue retaining means including first and second spaced apart, converging guideways fixed to said mounting bracket to slidably receive and support said tongue of said keeper, each said guideway including:

a flat spacer fixed to said outer face of said mounting bracket and extending outwardly from said outer face a distance exceeding the thickness of said tongue; and

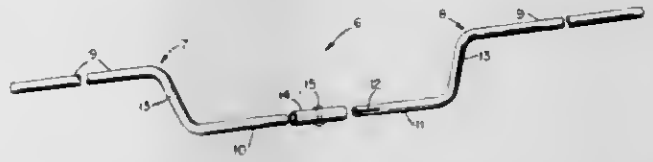
a guide plate fixed to and overlying said spacer to cooperate with said spacer and said outer face of said mounting bracket to define a track along which said tongue is slidably receivable and in which said tongue is retained when in rest position; and

said tongue being flat and movable within said tracks from said rest position to a camming position, wherein the plane of said flat tongue becomes transverse to said outer face of said mounting bracket with said tongue camming between said spacers, a said guide plate and said outer face of

said mounting bracket in response to force applied to said strap by said door being forced outwardly, thereby frictionally retaining said tongue in said tracks and resisting dislodgment of said tongue from said guide-means.

4,105,233
WINDOW AND DOOR LOCK

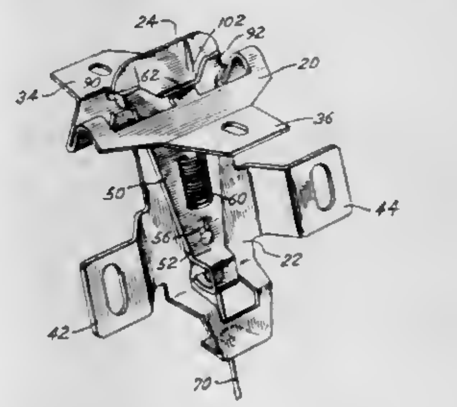
Virginius T. Levey, Sacramento, Calif., assignor to Ida M. Thompson, Sacramento, Calif.
Filed Aug. 10, 1977, Ser. No. 823,267
Int. Cl.² E05C *17/54*
U.S. Cl. 292—288 **5 Claims**



1. In combination with a closure including a horizontally elongated upright rectangular frame of inwardly opening channel-shape cross section having upright closure panels mounted therein for horizontal sliding movement toward and away from one another and a stationary panel mounted on and secured to an outer side of said frame intermediate of its ends and combining with said sliding panels for completely closing the frame when the sliding panels are located in the ends of the frame; a lock for said sliding panels comprising two rods having corresponding outer end portions engaging in top portions of the frame and resting on upper edges of said sliding panels, said rod portions having outer ends abutting the ends of the frame and being of a length somewhat greater than the horizontal length of the sliding panels, said rods having downwardly extending intermediate portions and horizontally extending inner end portions, said inner end portions terminating in slightly spaced apart relation to one another, and means retaining said inner end portions in alignment with one another to prevent any appreciable sliding movement of the rods toward one another, said intermediate portions defining stops for limiting movement of said sliding closures toward one another.

4,105,234
LATCH MECHANISM

Ray Eberhart, 317 E. Jefferson Blvd., Mishawaka, Ind. 46544
Filed Apr. 29, 1977, Ser. No. 792,198
Int. Cl.² E05C *13/02*
U.S. Cl. 292—302 **10 Claims**



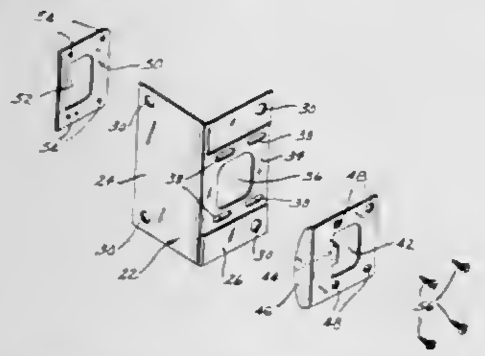
1. A latch mechanism comprising a female portion having a means defining a slot with two opposed edges and a shoulder

on the inner side of the slot, a male portion having a first member with a forward end movable into and from said slot and a shoulder thereon for engaging and interlocking with said first mentioned shoulder, and a second member connected to said first member and being movable toward and away from the forward end of said first member and into and from said slot when said first member is disposed therein and said shoulders are in engagement with one another, and means movable with said second member for disengaging said shoulders from one another when said second member is withdrawn from said slot.

4,105,235

LOCK KEEPER

Frank C. Thiel, 17 Biritz Dr., St. Louis, Mo. 63137
Filed Jun. 20, 1977, Ser. No. 808,184
Int. Cl.² E05C *21/00*
U.S. Cl. 292—341.18 **13 Claims**

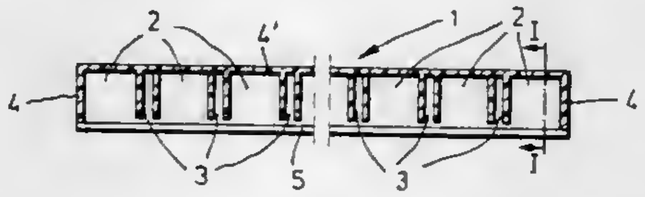


1. A lock keeper for receiving the bolt of a mortise-type lock, said keeper comprising: an angle bracket configured to fit on a door frame and including a side leg and a front leg which are positioned at a right angle with respect to each other and are joined together at a right angle corner, the angle bracket being generally unobstructed at the inside of the corner so as to be capable of fitting against a strike jamb of a door frame with the corner of the bracket being adjacent to the edge of the door frame, the side leg having a depression opening outwardly therefrom away from the front leg with the depression extending all the way to the corner and having spaced apart margins which are substantially perpendicular to the corner, the side leg also having a bolt-receiving aperture in the depression thereof, with the aperture being configured to receive a lock bolt, the side leg further having screw-receiving apertures in the depression thereof; a striker plate fitted into the depression and being capable of sliding therein generally parallel to the margins of the depression when not secured to the angle bracket, the striker plate having a bolt aperture which aligns with the bolt-receiving aperture of the side leg on the angle bracket, the striker plate further projecting beyond the corner where it turns backwardly toward the front leg so as to form a beveled lip; a lock plate located against the opposite face of the side leg and behind the depression and being configured so as not to obstruct the bolt-receiving aperture of the side leg, whereby a lock bolt can be projected completely through striker plate and side leg and past the lock plate without interfering with the lock plate; and screws extending through the striker plate and the screw-receiving apertures in the side leg and engaging the lock plate such that when loose, the striker plate is free to slide in the depression, but when tightened the striker is clamped down tightly against the side leg and will not move, whereby it is possible to adjust the position of the bolt aperture with respect to the angle bracket.

4,105,236

SHOCK ABSORBING BODY

Richard Haar, Brunswick, Germany, assignor to Volkswagenwerk Aktiengellschaft, Wolfsburg, Germany
Filed May 28, 1975, Ser. No. 581,676
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1974, 2433137
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R **5 Claims**



1. A shock absorber for an object to be protected, for example a shock-absorbing automobile bumper, comprising:

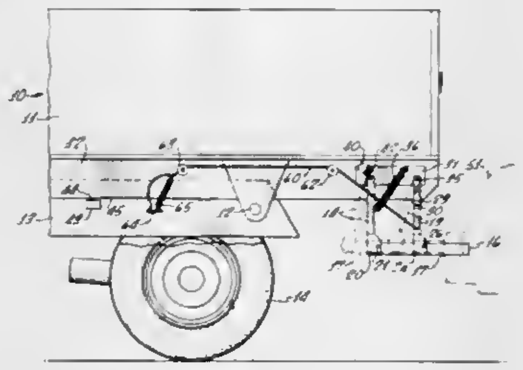
an elongated plane rigid support means; and

an elongated deformable body having outer, upper, lower and side walls connected together to form a box-like structure open on one side, said body being attached to said support means and having a hollow region in its interior which is open toward the support means, the outer wall of said body, which faces said support means, being provided with a flexible high tensile strength belt for transmitting shear forces to the material of the deformable body, said deformable body having pairs of walls as part of and extending from its outer wall in a direction substantially perpendicular to said support means, the pairs of walls additionally being attached to said upper and lower walls of the body and dividing the hollow region into first hollow spaces between the pairs of walls and second hollow spaces between the walls of each pair, the walls of each pair of walls being arranged so that the width of the first hollow spaces is greater than the width of the second hollow spaces so that the walls of each pair can brace each other during a collision.

4,105,237

VEHICLE SAFETY BRAKING SYSTEM

Charles S. Viall, Sr., 1150D S. State College Blvd., Anaheim, Calif. 92806; Charles S. Viall, Jr., 3401 Gaviota, Long Beach, Calif. 90008, and Harold S. Viall, 938 S. Chancer, Anaheim, Calif. 92806
Filed Jan. 2, 1976, Ser. No. 646,287
Int. Cl.² B60R *19/02*
U.S. Cl. 293—73 **14 Claims**



1. In combination with a vehicle having a chassis, a body, and pivot means pivotally connecting said body to said chassis for dumping a load in said body by movement of the rearward portion of said body downwardly and the forward portion of said body upwardly, said vehicle having brakes, a safety device for said vehicle comprising

a bumper assembly including an impact member adapted to engage an obstruction, and link means pivotally connecting said impact member to said body,

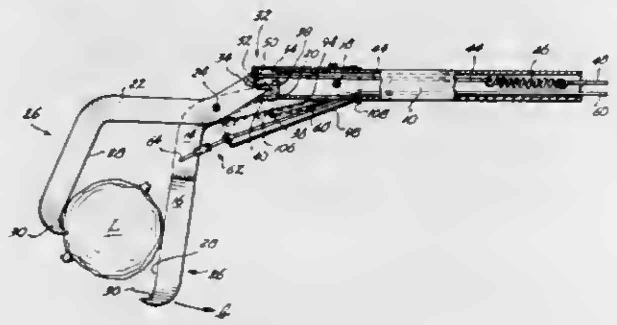
means responsive to engagement of said impact member with an obstruction for applying said brakes, and means for retracting said bumper assembly upon said movement of said body,

said retracting means including cable means attached to said bumper assembly and to said chassis for pulling upwardly relative to said body on said assembly upon said movement of said body.

4,105,238

ARTICLE HANDLING IMPLEMENT

Robert R. Stright, Village Plaza, Bainbridge, Wash. 98110
Filed Jan. 17, 1977, Ser. No. 759,766
Int. Cl.² A47J *49/14*
U.S. Cl. 294—11 **8 Claims**



1. Article handling apparatus for manipulating a fire log or the like, comprising:

a. opposed outer and inner jaw means;
b. a pivotal interconnection between said jaw means;
c. elongate handle means having a load end and an actuating end;
d. a pivotal interconnection between said inner jaw means and said handle means near said load end;
e. broken back linkage means interconnecting said outer jaw means and said handle means and situated between said pivotal interconnections; and
f. spring means normally maintaining said broken back linkage means in non-broken attitude, the tension of said spring means and the configuration of said outer and inner jaw means being such that the said jaws are relatively open and said linkage is non-broken in the absence of a log or like substantial weight between said jaws, and said jaws are maintained relatively closed and said linkage is maintained broken by the weight of a log or the like being retained by said jaws.

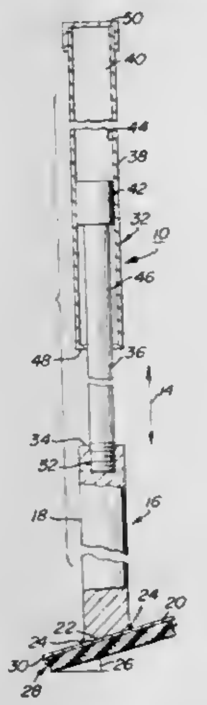
4,105,239

MAGNETIC TOOL

Joseph J. Akczinski, Sr., 317 Shipley Ave., Glen Burnie, Md. 21061
Filed Mar. 24, 1977, Ser. No. 780,773
Int. Cl.² F16C *11/04*
U.S. Cl. 294—65.5 **5 Claims**

1. A magnetic tool for releasably securing metallic members thereto, comprising:

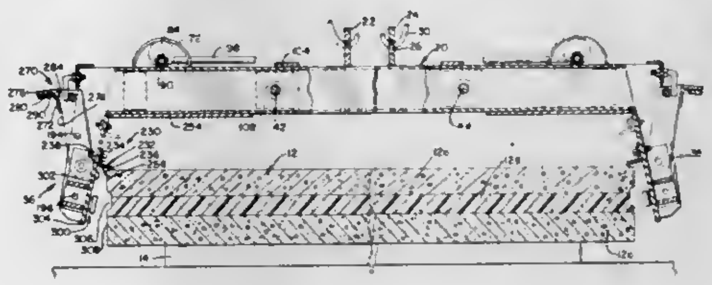
(a) first handle means adapted to be gripped in one hand of a user, said first handle means having a first rod member extendable in a longitudinal direction and a plate member secured to said lower end of said first rod member, said plate member forming a predetermined acute angle with said first rod member extension, said magnetic means being secured to said plate member;
(b) magnetic means secured to a lower end of said first handle means; and
(c) telescoping handle means releasably insertable within an upper end of said first handle means, said telescoping handle means having a second rod member releasably insertable within an upper end of said first rod member and a longitudinally extended tubular member having a passage for slidable insert of said second rod member, said passage having an extended diameter terminal end for insert of a spring snap element adapted to be compressed on insert within an upper portion of said passage and to expand within said terminal end for securement therein.



4,105,240

LIFTING DEVICE FOR LARGE PANELS

Thomas W. Steenson, Richmon Hill, and W. Donald Paton, Aurora, both of Canada, assignors to Butler Manufacturing Company, Kansas City, Mo.
Filed Jul. 26, 1977, Ser. No. 819,118
Int. Cl.² B66C *1/30*
U.S. Cl. 294—81 R **10 Claims**



1. A lifting device for lifting large panels comprising:

a main beam;

a pair of gripping jaws each connected at one end of said main beam and each including a gripping jaw frame pivotally connected to said main beam, said gripping jaws each being adapted to assume a repose position spaced from a panel to be lifted and a working position adjacent such panel;

positioning means for positioning each gripping jaw frame with respect to said main beam to establish a desired angular relationship between said each gripping jaw frame and said main beam, said positioning means including guide means on said each gripping jaw frame, gripping jaw frame moving means engaged with said guide means, and a manually operable means pivotally connected to said main beam and eccentrically connected to said frame moving means to eccentrically move said frame moving means with respect to said guide means upon operation of said manually operable means whereby said each gripping jaw is moved between said repose and working positions; and supporting means pivotally mounted on said frame for supporting a panel.

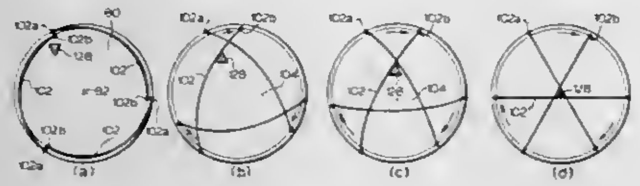
4,105,241
GRAPPLING DEVICE

Francis Herbert Arthur Mee, Aurora, Canada, assignor to Spar Aerospace Products Limited, Toronto, Canada

Filed Oct. 15, 1976, Ser. No. 732,815

Int. Cl.^{2} B66C *1/10*

U.S. Cl. 294—86 R **26 Claims**



1. A grappling device comprising
(a) a grappling head having a grappling window opening inwardly thereof along a grappling axis,
(b) at least two flexible grappling cables of a fixed length having opposite ends mounted on said grappling head at the grappling window, at least one end of each of said grappling cables being movable relative to said grappling head in the plane of said grappling window between a first position in which said grappling cables are taut and extend across the grappling window at uniformly spaced circumferential intervals to intersect one another and to provide a grappling aperture therebetween within which a component may be securely located with respect to said head by engagement with said grappling cables and a second position in which the grappling aperture is substantially enlarged without increasing the length of the grappling cables to admit a component thereto, and
(c) drive means mounted on the grappling head for moving the grappling cables between said first and second positions.

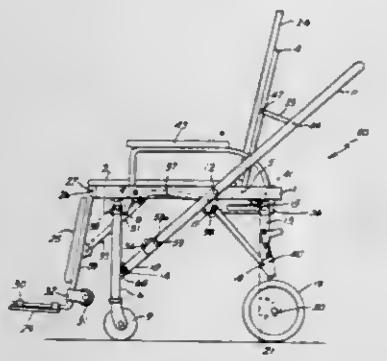
4,105,242
MOBILE CHAIR

Howard G. Terbeek, 19258 Briarwood La., Strongsville, Ohio 44136

Filed Mar. 2, 1977, Ser. No. 773,601

Int. Cl.^{2} A61G *1/02*

U.S. Cl. 296—20 **19 Claims**



1. A cart convertible between a chair position and a bed position of reduced vertical height with respect to the chair position; said cart including first and second movable supporting legs downwardly depending when the cart is in the chair position and in a retracted position when the cart is in the bed position; said first leg being positionable in said retracted position when said second leg is positioned in said downwardly depending position; said cart including an occupant support portion positionable to function as the back when the cart is in the chair position and to be in a retracted supporting position when the cart is in the bed position; said cart including a first adjustment means coupling said occupant support portion and said first leg for simultaneously moving said first leg and said occupant support portion toward the retracted positions of said first leg and said occupant support portion.

4,105,243
OUTER BODY PANEL STRUCTURE FOR VEHICLE BODIES

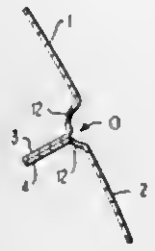
Friedrich Gelger, Boblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 233,104, Mar. 9, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,005

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1971, 2111876

Int. Cl.^{2} B62D *25/02*

U.S. Cl. 296—28 R **22 Claims**



1. A motor vehicle outer cover structure comprising a plurality of motor vehicle outer body panel means, each of said outer body panel means including a first portion and an angularly extending portion terminating in an inwardly directed edge portion, the inwardly directed edge portions of adjacent body panel means being arranged in abutting relationship with the angularly extending portions to define an intentionally visible separating place of a predetermined profile, said edge portions are directed inwardly approximately at a right angle and abut against one another, and said angularly extending portion includes grooves pressed-in diagonally with respect to the outer body panel means to form said predetermined profile.

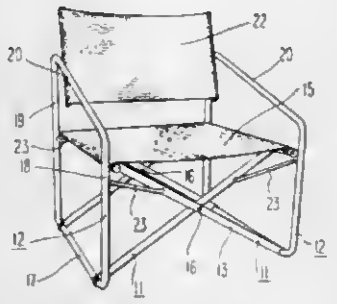
4,105,244
FOLDABLE FURNITURE UNIT

Donald Bruce Colby, Los Angeles, Calif., assignor to Brown Jordan Company, Philadelphia, Pa.

Filed Apr. 12, 1977, Ser. No. 786,888

Int. Cl.^{2} A47C *4/28*

U.S. Cl. 297—45 **3 Claims**



1. In a foldable furniture unit, a pair of upright side frames each having at least one leg portion, a pair of inclined cross frames pivotally connected intermediate their ends, each cross frame having its lower region pivotally connected to a lower region of a side frame, each cross frame including at its upper end a seat rail extending front to rear of the unit, a flexible seat having its side edges secured to the seat rails of said cross frames, the arrangement being such that when the unit is unfolded for use said seat rails are respectively in close proximity to said leg portions of said side frames and when the unit is folded for storage said seat rails are disposed above the uppermost regions of said leg portions of said side frames, said seat rails having therein longitudinal cavities reduced width access slots thereto, said seat at its side edges being provided with welts disposed in said rail cavities, a removable core disposed in each welt for preventing withdrawal of the welts through said slots, and at least one cap member on an end of each seat rail, said cap members constituting at least a partial closure for ends of said rail cavities, and at least one cap member on each seat rail having a restraining member projecting therefrom and extending closely adjacent a side frame leg portion when the unit is unfolded, said restraining members limiting fore and aft movement of said seat rails relative said side frames.

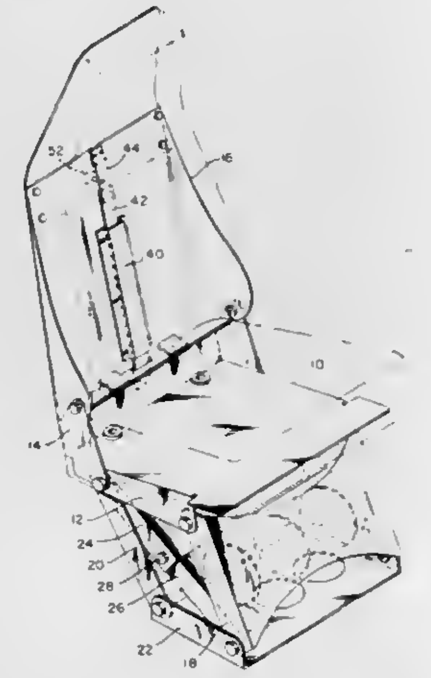
4,105,245
FORWARD, STOWABLE SEAT AND BACK

Wayne K. Simons, Federal Way, and Donald J. Teodoro, Seattle, both of Wash., assignors to Paccar Inc., Bellevue, Wash.

Filed Oct. 22, 1976, Ser. No. 735,091

Int. Cl.^{2} B60N *1/02*

U.S. Cl. 280—65 R **5 Claims**



1. A forward, stowable seat and back for the driving compartment of an automotive truck cab of the type having a forward driving compartment and a rearward sleeper compartment, including a seat, a back and a base supporting the seat and back in the driving compartment, the improvement comprising:
said base including a seat frame, a floor frame, forward and rearward upright frames pivotally mounted between the seat and floor frames for pivotal fore and aft movement of the seat and back, brace means for supporting the upright frames in their aft position with the seat and back suspended substantially rearwardly of the floor frame, and releasible latch means for holding the upright frames in the rearward position against forward or rearward movement, said upright frames when unlatched being swingable into said forward position with said seat and back being moved substantially forward of the rearward end of said floor frame whereby an occupant can stand in the compartment in the place formerly occupied by the seat and back when in the aft position, said brace means including a set of upper and lower links pivotally mounted together at overlapping ends, the lower link being pivotally mounted to a forward end of the floor frame, the upper link being pivotally mounted at a rearward end of the seat frame whereby rearward movement of the upright frames is precluded beyond said rearward position by the links but forward movement is allowed by pivoting of the links forwardly.

4. A forward, stowable seat and back having a seat frame and a pivotally mounted back for an automotive truck driver's compartment, the improvement comprising:
a single flexible locking strap rigidly secured at its lower end to said seat frame,
a slide track extending vertically along said back,
said flexible locking strap having an upper end slidably received in said track and slidable therealong when the back is pivoted forward, said lower end resiliently bending when said back is pivoted, and
detent means for releasibly locking said strap against movement in said track for precluding pivotal movement of the back.

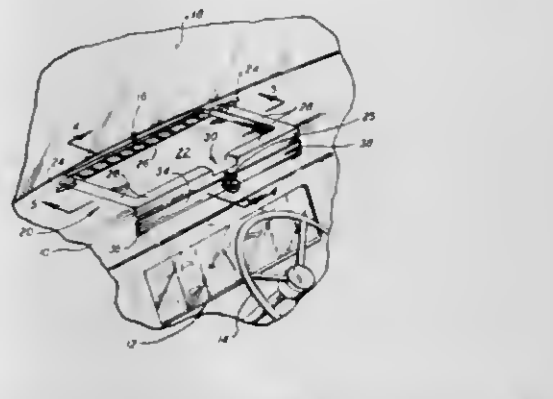
4,105,246
MULTI-PURPOSE DASHBOARD ATTACHMENT

Gerald M. Trumbull, 522 Irish Settlement Rd., Freeville, N.Y. 13068

Filed Jun. 20, 1977, Ser. No. 808,105

Int. Cl.^{2} B60J *3/00*

U.S. Cl. 296—97 E **9 Claims**



1. A multi-purpose unit for mounting upon the top of an automobile dashboard having an elongated defroster outlet adjacent the lower edge of the windshield forwardly of the steering wheel, said unit comprising, in combination:
(a) an essentially rectangular, planar panel member;
(b) hinge means mounting said panel for movement between first and second positions relative to the dashboard and windshield about an axis through one edge of said panel substantially parallel and closely adjacent to the defroster outlet;
(c) a raised lip bordering said panel on one side along the three edges thereof other than said one edge;
(d) said one edge being so arranged with respect to the dashboard and windshield that said panel lies approximately parallel to the top surface of the dashboard when in said first position and at least a major portion of said lip is in contact with the inside of the windshield when in said second position; and
(e) means defining at least one air outlet passage in said lip, whereby air from the defroster outlet is discharged into the space between the windshield and said panel when the latter is in said second position and exits from said space through said air outlet passage.

4,105,247
HIGH CHAIR WITH TRAY FASTENING

David Saint, Elverson, Pa., assignor to Graco Metal Products, Inc., Elverson, Pa.

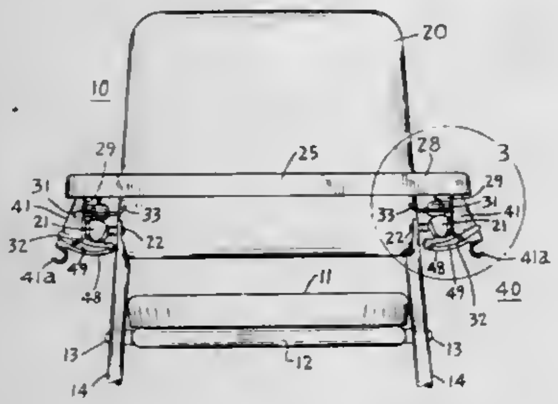
Filed Mar. 9, 1977, Ser. No. 775,890

Int. Cl.^{2} A47B *39/00*

U.S. Cl. 297—149 **5 Claims**

3. In combination with a chair having closed tubular arms and a tray for detachable connection to said arms,
the means for detachably connecting said tray which comprises
horizontally spaced mounting brackets carried by said tray and open from below for positioning on each of said arms,
locking hook members pivotally mounted on each of said

brackets on horizontal pivots parallel to said arms and each having
an operating handle portion for moving said hook members to release positions, and
a hook for swinging movement to different engaging positions beneath said arms.



said locking hook members having weight distribution effective for moving said hook to arm engaging position, and
said hooks in any of said engaging positions preventing removal of said tray.

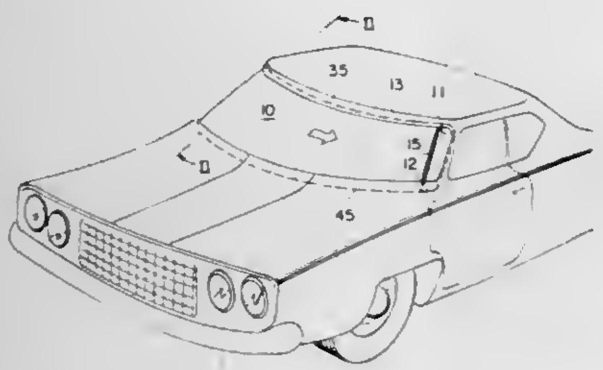
4,105,248
SAFETY WINDSHIELD

Timothy R. Lake, Walnut Creek, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,869

Int. Cl.² B60J *1/20*

U.S. Cl. 296—84 H **1 Claim**



1. A windshield for a vehicle formed of a continuous sheet of transparent flexible plastic wound in a closed loop about a pair of spaced rollers, in which
one of said roller is fitted with power means to rotate the roller, and in which
the edges of the sheet are enclosed by flexible gaskets in a frame bounding the windshield, with
a fixed wiper blade mounted externally to the frame of the windshield and located to wipe the external surface of the forward sheet of the windshield sheet, as the sheet is wound by the rollers, said wiper blade and said rollers each mounted along substantially vertical axes, with said wiper blade located externally about the mid-section of the windshield sheet, so as to wipe the forward sheet of the windshield as it is drawn past the wiper blade, together with
washer pump and spray means associated with said wiper blade to wash the forward sheet as it is drawn past the wiper blade.

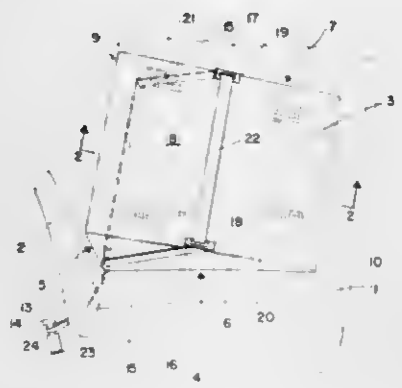
4,105,249
LOWER BACK STABILIZING DEVICE

Rotherford Van Vliet, Jr., Staten Island, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 28, 1977, Ser. No. 763,704

Int. Cl.² A47C *7/02*

U.S. Cl. 297—230 **5 Claims**



1. A lower back stabilizing device for a person seated on an independent cushion on a seat having a back rest, said back stabilizing device comprising
anchor means for securing the cushion to the seat, said anchor means including a substantially square U-shaped strap of substantially rigid material coupled to the cushion in one are thereof, said strap having a pair of spaced opposite ends, and a strap of substantially flexible material affixed to and extending between the ends of the substantially rigid strap in a spaced opposite area of said cushion.

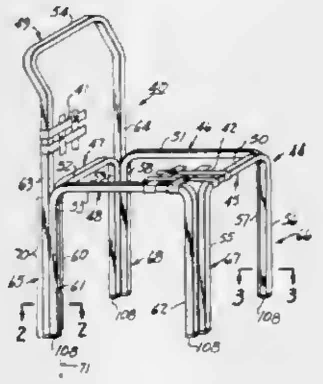
4,105,250
CLUSTER ASSEMBLY MEANS FOR ARTICLES OF FURNITURE AND ARTICLES INCORPORATING THE SAME

John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108

Filed Mar. 28, 1977, Ser. No. 781,850

Int. Cl.² A47C *1/12*

U.S. Cl. 297—445 **18 Claims**



1. Cluster assembly means for an article of furniture comprising: a plurality of rigid support elements, each having a straight portion with an axis, an inside cavity, an inner wall bounding at least part of said cavity, a slot opening onto said outer wall and into said cavity, said inner wall being adjacent to at least one edge of the slot and spaced from that part of the outer wall adjacent to the slot by a reference dimension, said slot having a dimension of width; and a straight joinder member having an axis, an axially extending web, and an axially extending flange, one at each edge of the web and projecting laterally beyond said web, the flanges having a dimension of thickness greater than the width of the slot, the web having a dimension of thickness no greater than the width of the slot and a width not less than twice the reference dimension, each flange being disposed in a respective one of said cavities with its respective

flange bearing against the respective inner wall and with its web passing through the respective slot, whereby the support elements are held in a cluster with the joinder member holding them against lateral separation from one another.

4,105,251
DISPERSION OF CATALYSTS WITH EXPLOSIVES FOR IN SITU MINING OF CARBONACEOUS MINERALS

William F. Wolff, Park Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 29, 1977, Ser. No. 820,100

Int. Cl.² E21B *43/24, 43/26;* E21C *41/10*

U.S. Cl. 299—2 **21 Claims**

1. A process for the generation of synthetic fuels from rigid or solid carbonaceous mineral deposits, such as oil shale and coal, by using an in situ mining technique to promote the conversion of hydrocarbons to a more desirable product, which comprises: using explosives to fracture and rubblize the mineral and disperse a catalyst into said mineral in such a manner that the subsequent conversion of the catalyst coated particles to recoverable product can be better controlled.

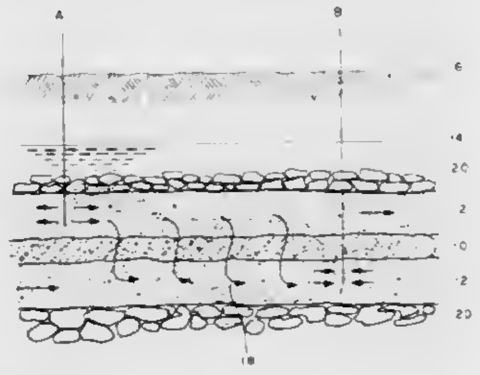
4,105,252
SOLUTION MINING OF MINERALS FROM VERTICALLY SPACED ZONES

Thomas F. Moore, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 20, 1976, Ser. No. 752,058

Int. Cl.² E21B *43/28*

U.S. Cl. 299—4 **8 Claims**



1. An improved method for the solution mining of a mineral from a subterranean formation containing same in a zone of low permeability have a zone of higher permeability both above and below it in which an injection and production well are drilled and completed, leach solution is injected through said injection well into said formation to dissolve said mineral, and said dissolved mineral is recovered via said production well, wherein the improvement comprises locating one of said wells in one high permeability zone and the other of said wells in the other high permeability zone to establish a potential difference between said high permeability zones and thereby apply a vertical component of flow of said leach solution to said zone of low permeability facilitating the recovery of said mineral present therein.

4,105,253
PROCESS FOR RECOVERY OF MINERAL VALUES FROM UNDERGROUND FORMATIONS

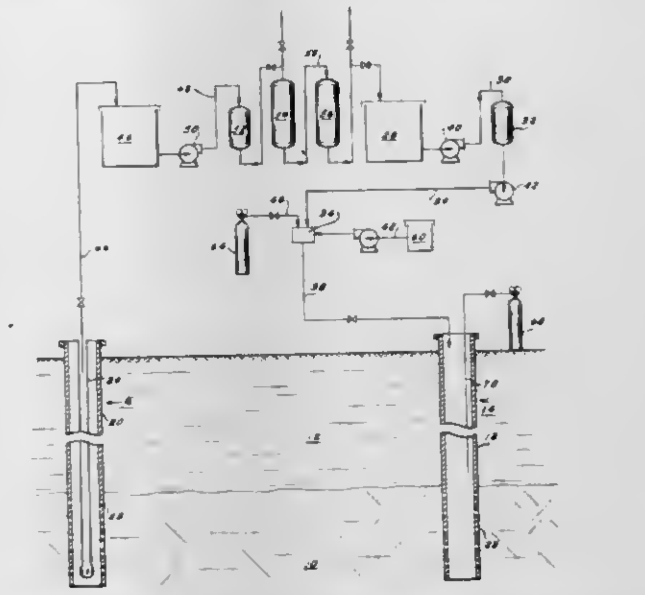
William E. Showalter, Seal Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Feb. 11, 1977, Ser. No. 767,788

Int. Cl.² E21B *43/28*

U.S. Cl. 299—4 **25 Claims**

1. In a method for the solution mining of a substance which in an oxidized state is soluble in an aqueous leaching solution, said method comprising the steps of (1) introducing an oxidant and an aqueous leaching solution into a subterranean deposit containing said substance, thereby to solubilize said substance in situ to form a pregnant liquor, (2) recovering said pregnant liquor from said deposit, and (3) separating said substance from said pregnant liquor, the improvement comprising:



utilizing as said aqueous leaching solution a solution comprising a dilute aqueous carbonic acid solution and said oxidant.

4,105,254
WHEEL WITH RIM EMBRACED BY TIRE

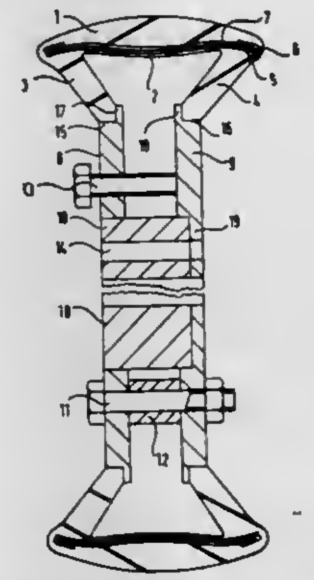
Michael Raymond Corner, Coventry, and William Lewis Jackson, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England

Filed Jul. 30, 1976, Ser. No. 710,311.

Claims priority, application United Kingdom, Aug. 8, 1975, 33137/75

Int. Cl.² B60B *3/08*

U.S. Cl. 301—63 DS **7 Claims**



1. A wheel comprising a central disc portion adapted for attachment to a vehicle, a pair of substantially continuous circumferentially and substantially axially extending tire bead seating surfaces which face radially outwardly, one for each of a pair of continuous beads of the two sidewalls of a tire, a pair of radially outwardly projecting bead locating flanges axially inboard of said seating surfaces, with each flange being adjacent to the inboard edge of a continuous bead of a tire when mounted on the wheel, said seating surfaces and said flanges being the only means retaining the tire bead to the wheel and means to force at least said flanges away from each other after a tire has been mounted with its beads on said seating surfaces, to permit the beads to be forced axially apart while they remain on said seating surfaces.

4,105,255

CAST ONE-PIECE ANNULAR RIM MEMBER FOR A VEHICLE WHEEL

Hans Kopp, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

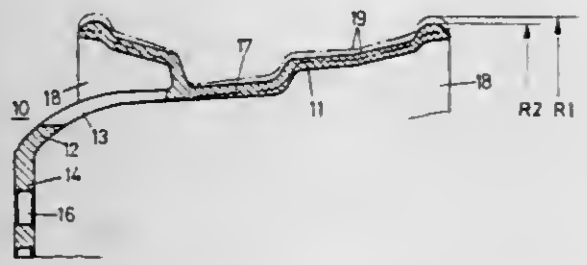
Division of Ser. No. 514,912, Oct. 15, 1974, Pat. No. 3,964,144. This application Mar. 23, 1976, Ser. No. 669,489

Claims priority, application Switzerland, Oct. 16, 1973, 14612/73

The portion of the term of this patent subsequent to Jun. 22, 1992, has been disclaimed.

Int. Cl.² B60B *21/02*

U.S. Cl. 301—97 **6 Claims**



1. An annular rim member for use in a vehicle wheel equipped with a pneumatic tire and, in particular, a tubeless tire, said annular rim being formed by the process comprising the steps of forming a mold cavity for the rim member with at least one of a radial over dimension and a radial under dimension of an amount other than the customary excess dimension provided for shrinkage or as a processing allowance, at least over an annular portion of the rim cross-section and with the outer surface of the rim member arranged to face the tire having a unitary annular area, pouring nodular cast iron melt into the mold cavity for forming the rim member with a ductile structure, removing the cast rim member from the mold cavity and radially plastic cold working the solidified cast rim member for plastically deforming the rim member during which plastic deformation the yield point of the cast ductile structure is exceeded and attains the established radial dimensions of the rim member for removing the at least one of a radial over dimension and a radial under dimension.

4,105,256

POWDER CONVEYING APPARATUS

Peter R. Parker, Downsview, and Norman G. Allen, Toronto, both of Canada, assignors to Volstatic of Canada Limited, Mississauga, Canada

Filed Nov. 4, 1976, Ser. No. 739,012

Claims priority, application Canada, Sep. 9, 1976, 260843

Int. Cl.² B65G *53/14*

U.S. Cl. 302—51 **9 Claims**

1. Powder conveying apparatus for conveying powder paint from a container to a device for applying the powder paint, said apparatus comprising:

first and second means defining first and second vertical powder flow passages, respectively,

in vertical axial alignment with the second powder flow passage positioned above the first powder flow passage;

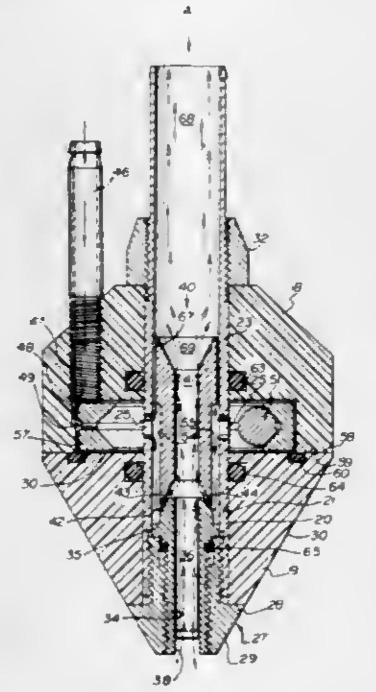
said first and second means forming first and second flow constrictors, respectively, and being axially spaced apart from one another to define an annular gap between opposed ends of said flow constrictors;

a powder inlet opening communicating with the first powder flow passage at the lowermost end of said first flow constrictor, wherein said powder inlet opening is provided at the underside of said apparatus and in axial alignment with said first and second powder flow passages;

a vertical powder outlet passage communicating with the second powder flow passage at the uppermost end of said second flow constrictor, whereby said powder inlet opening, said first and second flow passages and said powder outlet passage provide a straight-through vertical flow path;

a compressed gas supply passage communicating with said annular gap for supplying compressed gas through the latter into said second powder flow passage, whereby powder is drawn in through said powder inlet opening and entrained along said flow path;

means for effecting relative adjustable displacement of said first and second flow constrictors to adjust the size of said annular gap and thereby to adjust the rate of flow of the powder through said apparatus;



a vibrator for vibrating said apparatus to improve the powder flow therethrough, said compressed gas supply passage communicating with said annular gap through said vibrator, whereby the compressed gas both operates the vibrator and entrains the powder; and

means defining at least one fixedly open by-pass passage communicating with said compressed gas supply passage and said powder outlet and by-passing said annular gap and said second powder flow constrictor.

4,105,257

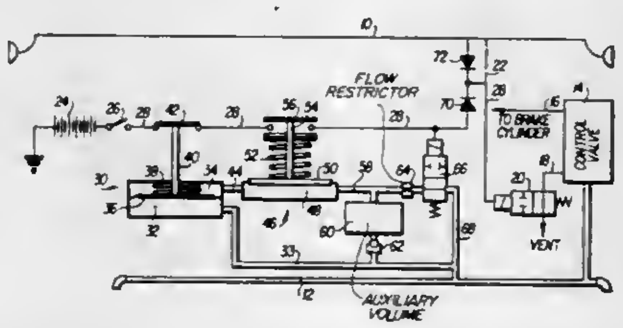
ELECTRO-PNEUMATIC APPARATUS FOR GRADUATED BRAKE RELEASE

Thomas H. Engle, Cape Vincent, N.Y., and John J. Harris, Meadville, Pa., assignors to General Signal Corporation, Rochester, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,386

Int. Cl.² B60T *13/70*

U.S. Cl. 303—15 **10 Claims**



1. Apparatus for providing graduated, pneumatically controlled brake pressure release in a rail car brake system of the type having an electrically controlled, normally open holding valve for controlling depressurization of brake cylinders of rail car brake actuators, said apparatus comprising:

a brake pipe for passing fluid pressure signals along said rail car brake system to control application and release of said brake actuators;

a source of electrical power having an output circuit connected to close said holding valve when current flows in said output circuit;

an auxiliary volume;

first normally closed switch means connected in said output circuit to conduct current from said source, for opening said output circuit when the pressure in said brake pipe exceeds the pressure in said auxiliary volume by a predetermined amount;

flow control means responsive to current flow in said output circuit for connecting said auxiliary volume to said brake pipe when said output circuit is open; and

means for maintaining the pressure in said auxiliary volume no greater than the pressure in said brake pipe,

whereby said output circuit is alternately opened and closed during repressurization of said brake pipe to signal a brake release, thereby providing graduated release of pressure in said brake cylinder pipe as said holding valve opens and closes.

4,105,258

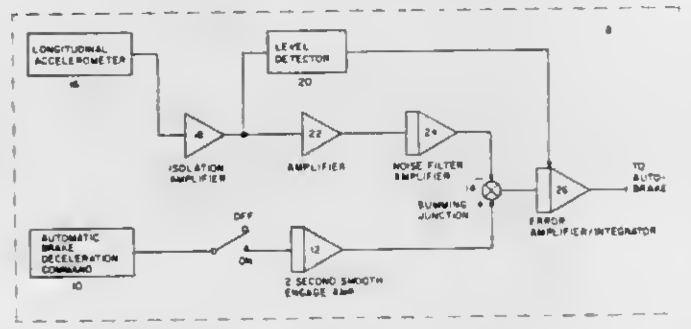
SERVO TYPE SWITCHING FOR REMOTE AUTOMATIC BRAKING SYSTEM

Jay W. Bornfleth, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 19, 1977, Ser. No. 798,413

Int. Cl.² B60T *8/12*

U.S. Cl. 303—93 **1 Claim**


LONGITUDINAL ACCELEROMETER
LEVEL DETECTOR
20
22
24
ISOLATION AMPLIFIER
AMPLIFIER
NOISE FILTER AMPLIFIER
14
SUMMING JUNCTION
26
TO AUTO-BRAKE
ERROR AMPLIFIER/INTEGRATOR
OFF
ON
12
AUTOMATIC BRAKE DECELERATION COMMAND
10
2 SECOND SMOOTH ENGAGE AMP

1. A remote automatic braking system for an aircraft vehicle with servo switching means attached to automatic brakes subject to system override if said vehicle is having thrust applied which comprises:

a command system for engaging said automatic brakes by an initial signal which serves as a triggering impulse;

a transition amplifier providing smooth engagement of said triggering from the command system, said transition amplifier positioned to receive said triggering impulse;

an error amplifier/integrator containing a summing junction input which has an output of said transition amplifier as an input;

a longitudinal accelerometer for establishing a reference signal representative of the acceleration state of said vehicle, said longitudinal accelerometer reference signal is an input to said error amplifier/integrator which is compared to said initial signal;

an isolation amplifier electrically connected between said accelerometer and said error amplifier/integrator for preventing loading of said accelerometer by feedback;

a level detector connected between said isolation amplifier and said error amplifier/integrator which is set to a predetermined level of acceleration due to thrust being applied and triggered by an output signal from said isolation amplifier which is greater than said predetermined level so that when said signal is greater than said predetermined level said level detector inputs a signal to said error amplifier/integrator to not engage said automatic brakes if said triggering impulse from said command system is received;

an amplifier connected in parallel with said level detector between said isolation amplifier and said error amplifier/integrator for boosting said isolation amplifier output signal to a predetermined level suitable for inputting to said summing juntion in said error amplifier/integrator; and

a noise filter for eliminating extraneous signals from said accelerometer prior to entry of said accelerometer amplified output signal into said summing junction of said error amplifier/integrator whose function is determined by said level detector so that for a given condition in said level detector said error amplifier/integrator amplifies or integrates.

4,105,259

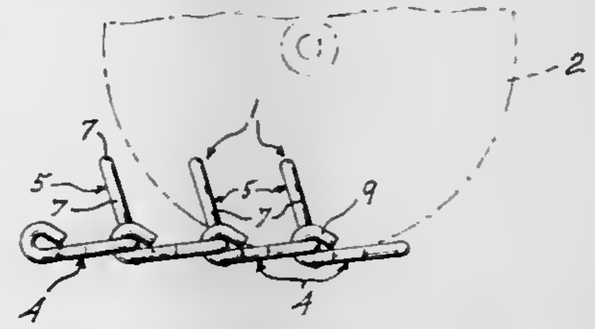
ENDLESS TRACK FOR A TRACKED VEHICLE

Rosaire Boucher, 78 St. Olaf Street, Sept-Iles, Canada (G4R 1R9)

Filed Apr. 26, 1977, Ser. No. 791,038

Int. Cl.² B62D *55/20*

U.S. Cl. 305—50 **1 Claim**



1. An endless track for a tracked vehicle toy comprising a plurality of interconnected links, each consisting of a length of wire bent into a generally U-shaped configuration when seen in top plan view, defining opposite end portions and an intermediate portion, the latter extending transversely of the endless track and being bent into a sinusoidal configuration lying in a commmon plane nearly perpendicular to the plane containing said end portions, said sinusodial configuration defining a wheel tread engaging concave central portion and a pair of similar wheel guides extending on each side of a vehicle wheel and formed by slightly diverging first legs, each leg being extended by a convex portion in turn extended by a second leg outwardly spaced from the respective first legs and in turn extended by a short pivot portion, such short pivot portions being aligned transversely of the track and located at substantially the level of said concave central portion, said opposite end portions forming extensions of said short pivot portions and extending longitudinally of the track and forming a hook at the outer end thereof, the hooks of each link pivotally engaging the respective short pivot portions of a next link, the distance between said concave portion and each of said convex portions being equal to at least 0.6 times the distance between said end portions.

4,105,260

TRACK SHOE AND BOLT RETENTION ARRANGEMENT

Dennis L. Blunier, Danvers, and Donald E. Clemens, Tremont, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

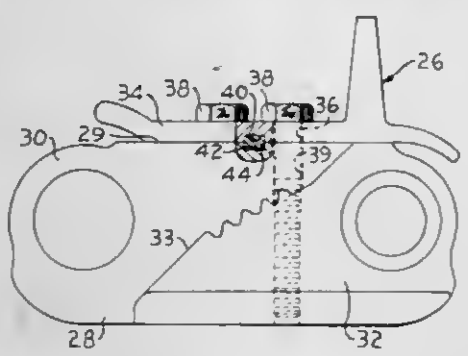
Continuation of Ser. No. 601,869, Aug. 4, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,602

Int. Cl.² B62D *55/28*

U.S. Cl. 305—54 **12 Claims**

1. In a master link having an outer surface for receiving a track shoe, said link being split into two separable parts along a generally diagonal plane relative to the length of said link, said outer surface of said link having a slot formed therein, said

track shoe having a slot in the bottom surface thereof aligned with said slot in said link, said slot in said link and said slot in said track shoe being rectangular in cross section, rectangularly-shaped key means seated in said aligned slots for bridging the parting line between said link and said track shoe, a pair of aligned openings in said track shoe and said link for receiving a pair of bolts for securing said track shoe to said link whereby tightening said bolts seats said key means in said aligned slots so that shear stress between the shoe and the link is taken by the key means.



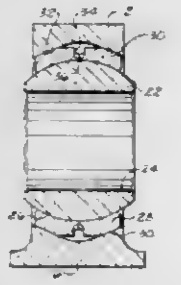
4,105,261
SPHERICAL BEARING

William N. Myers, Huntsville, Ala., and Leopold A. Hein, Fayetteville, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 736,909

Int. Cl.^{2} F16C *23/08*

U.S. Cl. 308—72 **6 Claims**



1. A spherical bearing comprising:
(a) an inner ball having an opening for receiving a shaft and a spherical outer surface;
(b) a circular outer race having an inner surface that is complementary in shape with said spherical outer surface of said inner ball;
(c) said circular outer race including a plurality of circumferentially spaced sections which extend around said inner ball snugly receiving said inner ball; and
(d) a groove extending circumferentially around said race defining a thin wall portion, said thin wall portion being substantially less than 1/2 the thickness of said race, which permits flexing about said thin wall portion of the outer portions of the race relative to said ball for maximizing the physical contact between the inner surface of the race and the spherical outer surface of said ball.

4,105,262
RELEASABLE DRILL STRING STABILIZER

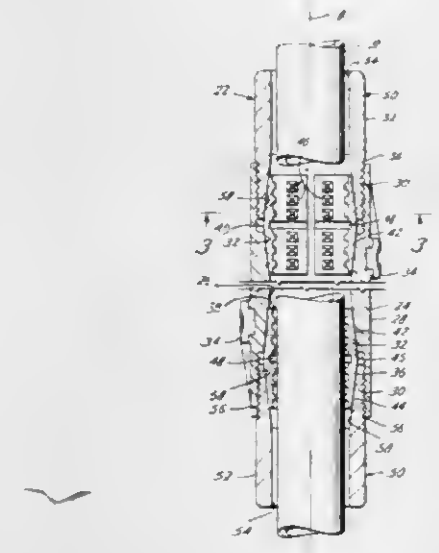
Vernon T. Richey, 3061 Los Palmas, Houston, Tex. 77027

Filed Apr. 22, 1977, Ser. No. 789,969

Int. Cl.^{2} F16C *1/26;* E21B *17/10*

U.S. Cl. 308—4 A **6 Claims**

1. A releasable stabilizer for adjustable positioning along a drill string, comprising:
(a) a body for positioning around the drill string having
  (i) female threads at each end of the body on the interior surface,
  (ii) a tapered portion of the interior surface extending outwardly to the female threads,
  (iii) blades extending from the exterior surface of the body to contact the bore hole;
(b) an end cap for each end of said body having
  (i) male threads at one end on the exterior surface,
  (ii) a tapered portion of the interior surface extending outwardly toward the end with the male threads; and
(c) at least one clamping wedge for each end of said body having



  (i) a surface formed by first and second tapered portions, the first tapered portion tapering in a direction opposite to the taper of the second tapered portion,
  (ii) a gripping surface for moving into contact with and gripping the drill string by positioning the surface of the first tapered portion of said clamping wedge against the interior surface tapered portion of said body and threadably connecting said end cap to said body, which causes the interior surface tapered portion of said end cap to move against the surface of the second tapered portion of said clamping wedge for ultimately attaching the stabilizer onto the drill string.

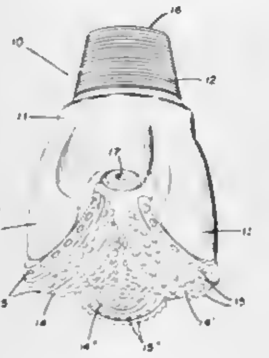
4,105,263
JOURNAL AND PILOT BEARINGS WITH ALTERNATING SURFACE AREAS OF WEAR RESISTANT AND ANTI-GALLING MATERIALS

Robert Keith Sorensen, Dallas, and Anthony T. Rallis, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex., by said Robert Keith Sorensen

Division of Ser. No. 395,880, Sep. 10, 1973, Pat. No. 3,984,158. This application Jul. 19, 1976, Ser. No. 706,338

Int. Cl.^{2} F16C *33/24*

U.S. Cl. 308—8.2 **5 Claims**



1. A bearing element, comprising:
a bearing shaft,

a rotatable member mounted on said bearing shaft,
a bearing element between said bearing shaft and said rotatable member, said bearing element having an uninterrupted matrix of pressed porous sintered ferrous alloy powder, said matrix having a surface, and
an anti-galling metal infiltrated into said pressed porous sintered ferrous alloy powder matrix substantially deeper than said surface and extending substantially throughout the entire matrix.

4,105,264
PROCESSING ROLLER HAVING REINFORCING JACKET OF HARD METAL

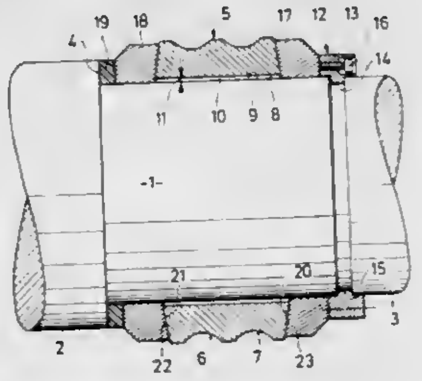
Heinz Zimmermann, and Wolfgang Martens, both of Krefeld, Fed. Rep. of Germany, assignors to Günther Hertel, Nüremberg and Karl Gustav Hertel, Fürth, both of Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,299

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618884

Int. Cl.^{2} F16C *13/00*

U.S. Cl. 308—20 **. 9 Claims**



1. In a roller for working material, which roller includes a rotatably mounted roller body, a reinforcing working jacket having the form of a hollow cylinder disposed around the roller body, clamping means mounted between the roller body and the jacket and including claming rings presenting surfaces which bear against the axial end surfaces of the jacket for applying an axial compressive prestress force to the jacket, the axial end surfaces of the jacket and the clamping ring surfaces which bear thereagainst being inclined with respect to the roller axis, the improvement wherein said roller body and working jacket define an annular gap between the inner peripheral surface of said working jacket and the outer peripheral surface of said roller body, the dimension of said annular gap in the direction between said jacket and roller body being sufficiently large to maintain the outer peripheral surface of said roller body and the inner peripheral surface of said working jacket out of contact with one another during operation of said roller at temperatures extending over its entire operating temperature range, and said roller comprises means defining a radially-extending abutment surface fixed relative to said roller body and axially spaced from one of said clamping rings, and resiliently deformable force transmitting means compressively held between said abutment surface and said one of said clamping rings.

4,105,265
VIBRATION DAMPING BEARING ARRANGEMENT

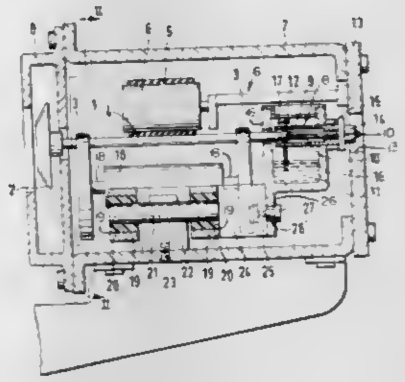
Fritz Stahlecker, Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of Germany

Filed Apr. 12, 1976, Ser. No. 676,160

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515783

Int. Cl.^{2} F16C *13/00*

U.S. Cl. 308—158 **37 Claims**



1. A bearing arrangement for a shaft in an open-end spinning unit having an end axially urged against a bearing means, guide roller means for radially supporting the shaft, a bearing block means for rotatably supporting said guide roller means, and vibration damping supporting means for mounting said bearing block means at a relatively fixed element, characterized in that means are provided for connecting the bearing means with said bearing block means such that said bearing means is supported by said bearing block means, characterized in that the shaft is connected to a spinning turbine of the spinning unit.

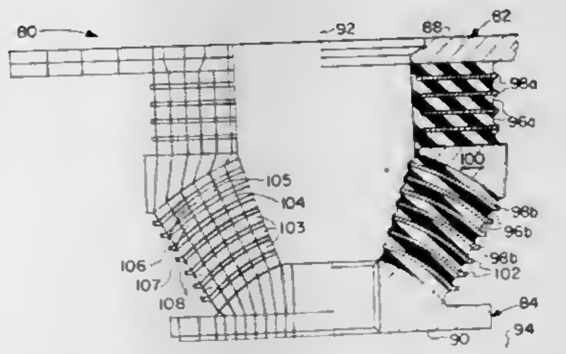
4,105,266
LAMINATED BEARING WITH PLURAL MODULUS LAYER

Robert H. Finney, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 632,423, Nov. 17, 1975, Pat. No. 4,040,690. This application Aug. 1, 1977, Ser. No. 821,003

Int. Cl.^{2} F16C *27/06*

U.S. Cl. 308—237 R **7 Claims**



1. In a laminated bearing comprising a plurality of alternating and bonded together layers of elastomeric material and substantially nonextensible material, said layers alternating along a common axis extending lengthwise of the bearing so as to permit the bearing to support compressive loads applied generally normal to the layers and to accommodate torsional loads applied about the common axis, each layer being annular and having with respect to the common axis a radially inner circumference and a radially outer circumference, the layers including at least one layer of elastomeric material which if formed to have a nominally constant modulus of elasticity throughout and if subjected to a predetermined compressive load applied generally normal to the layer would experience a

greater shear strain adjacent one of its inner and outer circumferences than adjacent the other of its inner and outer circumferences,

the improvement wherein said at least one layer of elastomeric material is formed to have a higher nominal modulus of elasticity adjacent the one of its circumferences than adjacent the other of its circumferences, the difference between said nominal moduli of elasticity being such that a ratio of shear strain due to said predetermined compressive load adjacent the one circumference of said at least one layer to shear strain due to said predetermined compressive load adjacent the other circumference of said at least one layer is less than a corresponding ratio of shear strains in said at least one layer of elastomer if formed to have said nominally constant modulus of elasticity throughout.

4,105,267

BEARING PROVIDED WITH OBLIQUE OIL GROOVES AND/OR WITH A PLURALITY OF OBLIQUELY ARRANGED ROWS OF SEMICIRCULAR INDENTATIONS

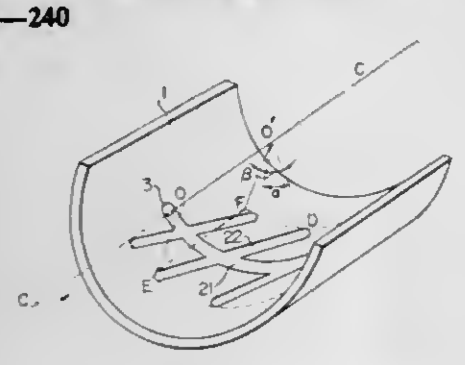
Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed Mar. 8, 1977, Ser. No. 775,497

Claims priority, application Japan, Mar. 19, 1976, 51-30216

Int. Cl.² F16C *33/66*

U.S. Cl. 308—240 **5 Claims**



1. A semicircular cylindrical bearing having axially spaced edges and circumferentially spaced edges, said bearing comprising oil grooves disposed in a direction oblique with respect to the axial direction of said bearing on the internal surface thereof, said oil grooves terminating at a substantial distance away from the circumferentially spaced edges and from the axially spaced edges of the bearing and being disposed only substantially in the region of angle of circumference between 60°-150° so that the sum of the lengths, measured on said internal surface, of said oil grooves appearing in any cross section cut in the axial direction of the bearing is 5%-50% of the width of said bearing and the apparent angle of circumference β formed between both longitudinal ends of said oil groove is greater than or equal to the angle of circumference α formed between said oil groove and the adjacent oil groove substantially parallel to that oil groove.

4,105,268

DOCUMENT HANGING SYSTEM

Abram G. Elias, 3300 Skyline Blvd., No. 205, Reno, Nev. 89510, and Peter G. Elias, 6 Wedgewood Dr., Winnipeg, Manitoba, Canada (R3T2J8)

Continuation-in-part of Ser. No. 620,569, Oct. 8, 1975, Pat. No. 4,009,784, which is a continuation-in-part of Ser. No. 514,890, Oct. 15, 1974, Pat. No. 3,923,353, which is a continuation-in-part of Ser. No. 374,007, Jun. 27, 1973, abandoned. This applicatioo Feb. 14, 1977, Ser. No. 768,360

Int. Cl.² A47B *63/00;* B42F *15/00*

U.S. Cl. 312—184 **29 Claims**

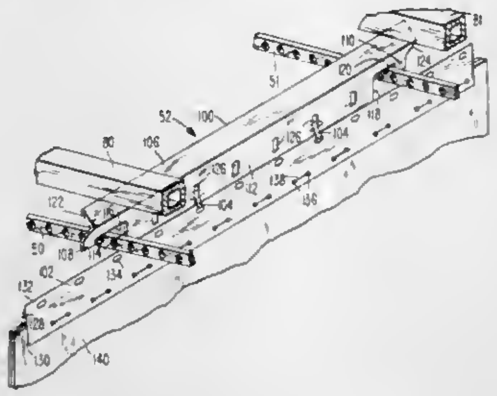
1. A document hanging system for use in hanging documents upon a pair of spaced horizontal rails, the system comprising

a rigid strip-like supporting bar having an upper load carrying portion with ends adapted to overhang and be supported by the rails,

the width of said support bar extending vertically,

said supporting bar having a lower document supporting portion with a plurality of spaced openings and extending downward between the rails,

document attachment means having a plurality of spaced openings with the same spacing as the supporting bar openings,



a plurality of flexible straps each having head portions at the opposite ends thereof and passing through the corresponding openings in both the supporting bar and document attachment means,

said head portions of each strap interlocking with at least one of the corresponding openings in the supporting bar and document attachment means, and

means for fastening a document to the document attachment means.

4,105,269

KITCHEN CUPBOARD ASSEMBLIES

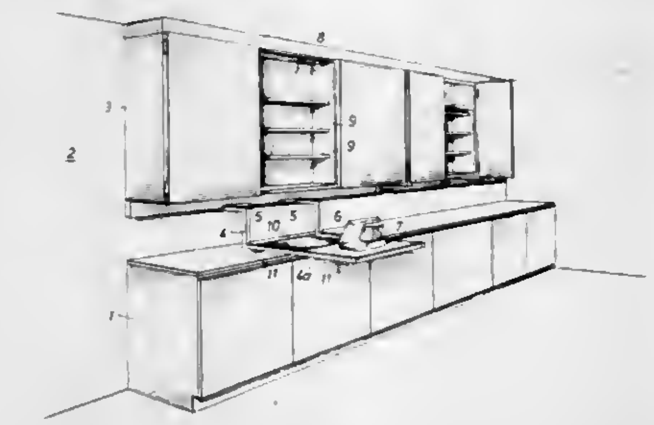
Tore Georg Palmaer, Smultronvägen 28, S-331 00 Värnamo, Sweden

Filed Feb. 25, 1977, Ser. No. 772,249

Claims priority, application Sweden, Feb. 27, 1976, 7602887

Int. Cl.² A47B *67/02*

U.S. Cl. 312—248 **4 Claims**



1. A kitchen cupboard assembly comprising, in combination:

a. a lower floor mounted cupboard unit, having an upper working surface and at least one cupboard therein;

b. an upper wall mounted cupboard unit having at least one cupboard therein, said upper wall mounted cupboard unit being spaced from the lower floor mounted cupboard unit having a vertical frontal face;

c. said latter at least one cupboard having a generally planar door, a support frame for said door extending about the periphery of said one cupboard, and hinge means for swinging said door relative to said frame about a vertical axis to open and close said at least one cupboard;

d. said frame having a bracket extension below said door and hinge means connecting the bracket extension to the lower edge of the face of said at least one cupboard, said support frame comprises a hinge means, a first portion extending away from said hinge means, a second portion perpendicular to said first portion and having a length substantially equal to the depth of said at least one cupboard, a third portion extending from said second portion parallel to said first portion, wherein said support surface is at the end of said third portion remote from said second portion for pivoting about a horizontal axis between a lower position and an upper position;

e. wherein the inside face of said door forms (i) a support surface extending horizontally in said lower position while resting against said upper working surface and (ii) a vertical cupboard door in said upper position;

f. said bracket extension being recessed within said at least one cupboard in said upper position and shaped so that in the lower position the associated frame and door rest in a horizontal plane upon the support surface of said lower floor mounted cupboard and extend cantilevered outwardly therefrom.

4,105,270

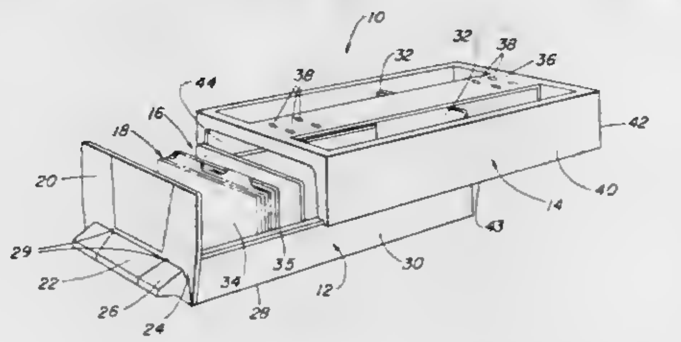
RECIPE CARD STORAGE DEVICE AND DISPLAY MEANS

Helen G. Bergkamp, and Robert L. Bergkamp, both of Rte. 2, Cheney, Kans. 67025

Continuation-in-part of Ser. No. 648,935, Jan. 4, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 782,064

Int. Cl.² A47B *63/00*

U.S. Cl. 312—330 R **3 Claims**



1. A recipe card storage device for displaying recipe cards and storing them therein, the device comprising:

a sliding drawer including:

a drawer front;

a drawer pull attached to the front of the drawer front, the drawer pull used for opening and closing said drawer, a horizontal elongated groove formed in the top of the drawer pull for recieving the bottom edge of the recipe card and displaying the recipe card therein, the drawer pull including outwardly extending protuberances in the groove for engaging the sides of the bottom edge of the recipe card and compressing the card between the pull and the drawer front;

an open drawer top for receiving recipe cards therein;

a drawer bottom attached to the drawer front and having a plurality of parallel slots disposed in a spaced relationship along the length of the drawer bottom;

drawer sides attached to the drawer bottom and the drawer top, the top of the drawer sides including outwardly extending horizontal drawer slides;

a drawer back attached to the drawer sides and the drawer bottom;

an inverted "U" shaped drawer housing including:

a horizontal housing top for attaching to the bottom of a cabinet or the like, the top including a downwardly extending stop, the stop engaging the back of said drawer when said drawer is pulled outwardly from said drawer housing;

vertical housing sides attached to the housing top, the bottom of the housing sides having inwardly extending horizontal drawer guides for receiving the horizontal drawer slides thereon and guiding said drawer in said housing;

a vertical housing back attached to the housing top and sides;

an open housing bottom;

an open housing front for receiving the drawer front of said drawer adjacent thereto; and

a "U" shaped card holder having vertical sides attached to a bottom, the bottom of said card holder having downwardly extending protuberances, said protuberances received in the parallel slots in the bottom of said drawer in a snap-fit for holding said card holder in said drawer.

4,105,271

DESKS

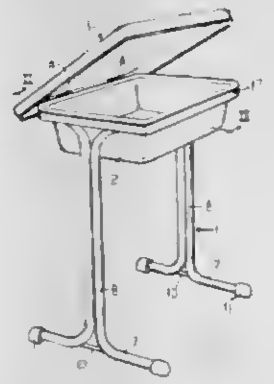
Harry Sebel, Bankstown, and Noel Sydney Davidson Wood, Hunters Hill, both of Australia, assignors to Sebel Limited, Australia

Filed Jun. 29, 1977, Ser. No. 811,389

Claims priority, application Australia, Jun. 30, 1976, 6480/76

Int. Cl.² A47B *3/00*

U.S. Cl. 312—253 **8 Claims**



1. A desk, comprising; a frame of cylindrical metal tubing, including a portion which extends around a horizontal area to provide a substantially rectangular rack; a lid having a snap-on, snap-off hinge for hingedly connecting the lid to one side of the rack; and a box having a base and four walls, at least two of the walls each having an outwardly extending flange, and the box being removably insertable within the rack and being supported by engagement of the outwardly extending flanges with sides of the rack, the hinge comprising, a tube of resilient synthetic plastics material having a substantially cylindrical inner surface and a slot longitudinally extending from one to another end of the tube, the tube being resiliently deformable to permit the slot to be passed over said one of the rack sides, whereby the tube is releasably secured to said one side, and means for securing the tube to the lid, so that the lid is pivotable from a lowered box closing position in which the lid covers the top of the box, to a raised box opening position, subject to continued rotation of the lid causing resilient deformation of the hinge tube an release thereof from said one side of the rack.

4,105,272

HIGH CURRENT GROUNDING ASSEMBLY HAVING RIGID INTERCONNECTING CONDUCTORS

Edward L. West, and Melvin E. Clutter, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Jul. 11, 1977, Ser. No. 814,285

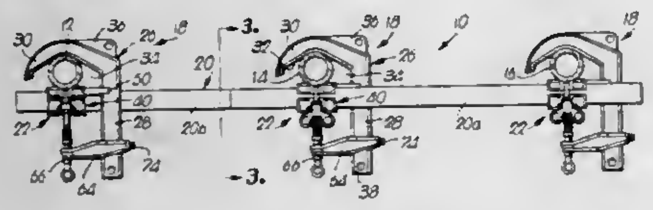
Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 L **7 Claims**

1. A grounding assembly for electrically connecting conductors and grounding the same, comprising:

a metallic, releasable, conductor-gripping clamp for each of said conductors;

means electrically interconnecting said clamps and thereby said conductors, including at least one elongated, rigid, metallic connector element, and means for mechanically securing and electrically connecting said element with said clamps; and



means for grounding said electrically interconnected conductors.

4,105,273

PLUG ASSEMBLY

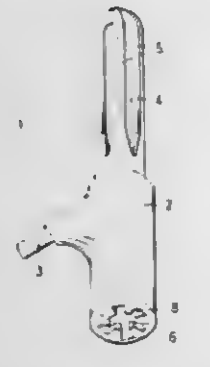
Siegfried Henschke, Erftstadt, and Albert Lindberg, Cologne Marienburg, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,662

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637513

Int. Cl.^{2} H01R *25/00*

U.S. Cl. 339—47 R 23 Claims



1. In an electric plug assembly formed of a plug having a handle part and a contact part projecting from the handle part and a socket adapted to receive, by insertion, the contact part of the plug; the socket having electric contacts arranged to engage the contact part of the plug in the inserted state, the improvement comprising a plurality of longitudinal, electrically insulating spaced ribs forming part of said plug and constituting a cage surrounding said contact part; and a plurality of electrically insulating, spaced protrusions arranged in a circular array and forming part of said socket; said protrusions being in an interleaving relationship with said ribs in the inserted state of said plug.

4,105,274

CHILD SAFETY DEVICE FOR RETAINING ELECTRICAL PLUGS

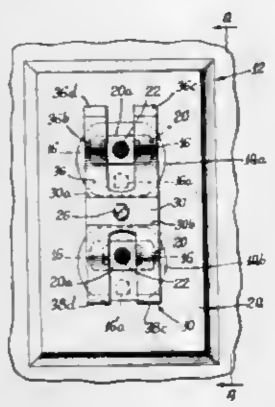
Richard W. Casey, 20 E. Cedar St., Apt. 15-C, Chicago, Ill. 60611

Filed Apr. 1, 1977, Ser. No. 783,827

Int. Cl.^{2} H01R *13/54*

U.S. Cl. 339—75 P 11 Claims

1. A safety device for use in retaining an electrical plug or the like within an electrical outlet socket, said device comprising a unitary member having a base portion adapted to be secured to an electrical outlet, and a pair of bifurcated arm portions extending away from said base portion in opposite directions therefrom, said bifurcated arm portions each having a generally arcuate side profile and defining a pair of spaced arms adapted to extend over and engage the outwardly extending portion of an electrical plug when plugged into the electrical outlet socket to which the device is secured with the cord of the plug extending between said spaced arms, said spaced arms being of sufficient rigidity to prevent unintentional withdrawal of the plug from the socket.



4,105,275

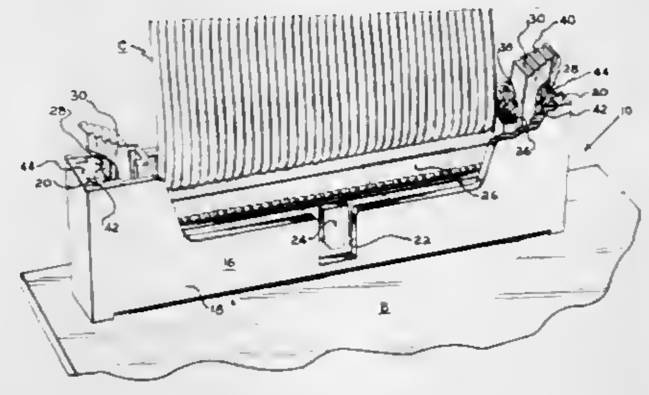
HEADER WITH INTEGRAL LATCH MEMBERS

Daniel Allen Dixon, West Chester, Pa., and George Thomas Eigenbrode, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1977, Ser. No. 825,646

Int. Cl.^{2} H01R *13/54;* H05R *1/10*

U.S. Cl. 339—91 R 4 Claims



1. A vertical header adapted to receive a connector having a plurality of electrical terminals mounted therein, said header comprising: an elongated block having a plurality of straight pins mounted therein and a generally rectangular, unitary housing surrounding said block, said header having a lower face for mounting against a surface of a circuit board, said housing having a cavity at each end of said block extending from said lower face to the top of the housing; and a latch member extending from each end of the block integrally molded with the block, each latch member including a pair of elongated arms extending from said block and a latch joining the arms at their outer ends, said latch having a latch surface extending from a side thereof toward the other latch.

4,105,276

LAMPHOLDER-SOCKET FOR CIRCLINE FLUORESCENT LAMP

Jack V. Miller, Sierra Madre, Calif., assignor to Killerwatt Corp., Los Angeles, Calif.

Filed Feb. 22, 1977, Ser. No. 770,752

Int. Cl.^{2} H01R *9/08, 33/02*

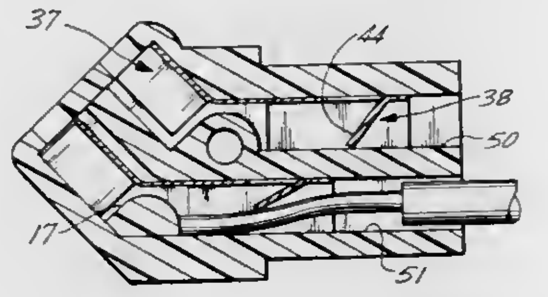
U.S. Cl. 339—95 D 21 Claims

1. An electrical socket comprising:

an electrically insulative body doglegged at approximately between 130° and 140°;

a plurality of passages extending through the body from end to end, each passage having first and second sections that join at an obtuse angle between approximately 130° and 140°;

a conductive terminal disposed in each passage, the terminal having in a one piece construction a first channel-shaped portion adapted to receive a plug pin, a second portion having a flap extending across the passage inclined toward the first portion, and a third portion connecting the first and second portions, and the third portion of each terminal being bent to permit the first portion to lie in the first section of each passage and the second portion to lie in the second section of each passage, the flap being longer than the height of the passage so as to prevent inclination of the flap away from the first portion and so as to wedge a wire inserted in the second portion between the flap and the side of the passage, thereby electrically connecting and mechanically securing the inserted wire; and



means for retaining the terminals in their respective passages.

4,105,277

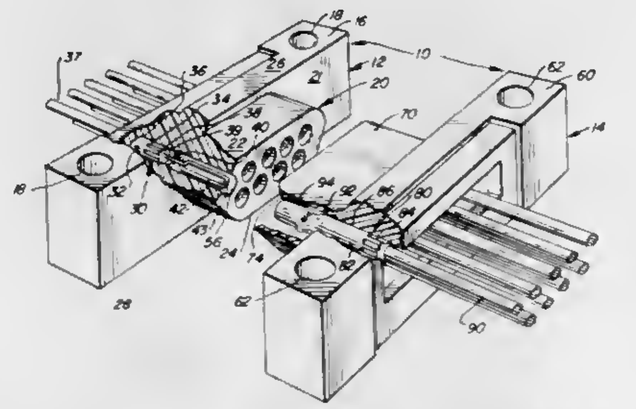
ELECTRICAL CONNECTOR

Leonard Jacobs, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 537,078, Dec. 30, 1974, abandoned. This application Jun. 2, 1976, Ser. No. 692,082

Int. Cl.^{2} H01R *13/20*

U.S. Cl. 339—95 R 9 Claims



1. A plug-in electrical connector assembly, including:

first and second base members which are maintained in predetermined mutual orientation when the components of the assembly are mated;

an electrical contact element having a portion thereof rigidly fixed to said first base member and including a free end portion extending from said first base member, said free end portion being resilient in torsion and terminating in a longitudinally elongated segment having an elongated transverse cross section; and

an electrical conductor element, rigidly fixed at a first end thereof to said second base member, comprising a hollow tube including an inner surface and an opening, at the distal end of said conductor element, for receiving said elongated segment and having a transversely elongated, narrow constriction, constituted by a continuous portion of said inner surface, having a shape substantially complementary to said cross section of said segment but oriented with its major axis at a substantial angle relative to the cross section of said segment when said base members are in such predetermined mutual orientation, said constriction being substantially displaced within said hollow tube from the respective ends thereof, and means for guiding said segment into said constriction by elastic twisting of said contact element as one of said base members is moved toward the other in said predetermined mutual orientation;

wherein said longitudinally elongated segment is of sufficient length to extend through and substantially beyond said constriction when said assembly components are mated, whereby said electrical conductor element makes contact with said segment at a point substantially displaced from the end thereof.

4,105,278

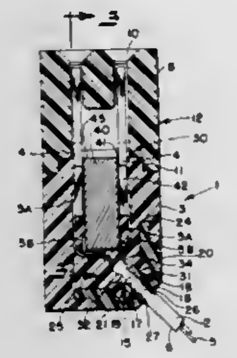
MOLDED CABLE TERMINATION ASSEMBLY WITH INSERT

Kenneth William Braund, Newbury, and John Lawrence Webster, Painesville, both of Ohio, assignors to A P Products Incorporated, Painesville, Ohio

Filed Dec. 20, 1976, Ser. No. 752,469

Int. Cl.^{2} H01R *13/58*

U.S. Cl. 339—103 M 22 Claims



1. A molded cable termination assembly, comprising

an electrical cable including a plurality of electrical conductor means for conducting electric energy and woven electrical insulation,

electrical terminating means for terminating said electrical conductor means,

housing base means molded under pressure conditions directly and integrally to and about at least part of said cable, including at least part of said conductor means and woven electrical insulation, and said electrical terminating means for firmly holding the same in relatively fixed relation, and

seal means positioned directly between at least part of said woven insulating means and part of said housing base means for impeding wicking of fluid-like material along said woven electrical insulation externally of said housing base means during molding thereof thereby to maintain the relative flexibility of said cable externally adjacent said housing base means, said seal means including means for bearing against said woven electrical insulation with a force that increases in response to such pressure during molding of said housing base means to develop a pressure seal to impede any such wicking.

4,105,279

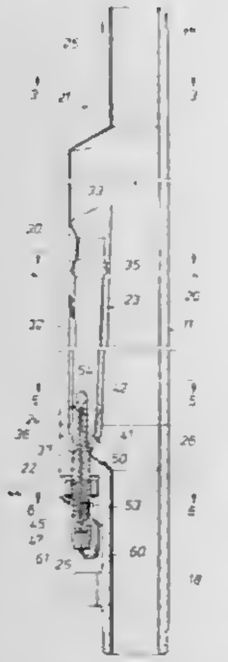
REMOVABLE DOWNHOLE MEASURING INSTRUMENTS WITH ELECTRICAL CONNECTION TO SURFACE

Bernard J. P. Glotin, Saint Maur, and Andre J. Guimard, Le Mee sur Seine, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 751,419, Dec. 16, 1976, abandoned, which is a continuation of Ser. No. 615,145, Sep. 19, 1975, abandoned, which is a division of Ser. No. 447,443, Mar. 1, 1974, Pat. No. 3,939,705. This application Dec. 2, 1977, Ser. No. 856,717

Int. Cl.^{2} H01R *3/04*

U.S. Cl. 339—117 R **7 Claims**



1. Apparatus adapted for the installation of an instrument in a well, comprising: an elongated hollow mandrel; means at each end of said mandrel arranged for connection to a production string, said mandrel having a vertical main bore extending therethrough; means in said mandrel located to the side of said main bore forming an elongated pocket having a longitudinal axis offset from said main bore and adapted to receive an instrument, the upper end of said pocket opening to the interior of said mandrel and communicating with said bore intermediate the ends of said mandrel; an opening through the wall of said mandrel into the lower end of said pocket, said opening extending to the exterior of said mandrel and being axially aligned with said longitudinal axis; and an electrical contact assembly extending through said opening and being sealably fixed to said mandrel, said contact assembly providing contact means projecting into said pocket at the lower end thereof for providing an insulated electrical connection between an instrument implanted in said pocket and an electrical cable located externally of said mandrel.

4,105,280

HIGH CURRENT DENSITY ELECTRICAL CONTACT

Lloyd E. Thompson, Jr., 158 Clark Rd., Rye, N.H. 03870

Continuation of Ser. No. 680,624, Apr. 26, 1976, abandoned. This application Mar. 30, 1977, Ser. No. 782,820

Int. Cl.^{2} H01R *7/06*

U.S. Cl. 339—273 S **9 Claims**

1. An electrical connector having a high current carrying capacity, comprising in combination

a receptacle having an open-ended cylindrical cavity formed therein;

a split sleeve slidably accommodated within said cylindrical cavity,

said split sleeve consisting of two separate halves which have slightly less than semi-circular circumferences whereby said split sleeve normally fits loosely within said cylindrical cavity,

said split sleeve having a wall thickness which decreases linearly from one end thereof to the other so as to provide said split sleeve with a tapered internal passageway therethrough and having a length which is less than the depth of said cylindrical cavity,

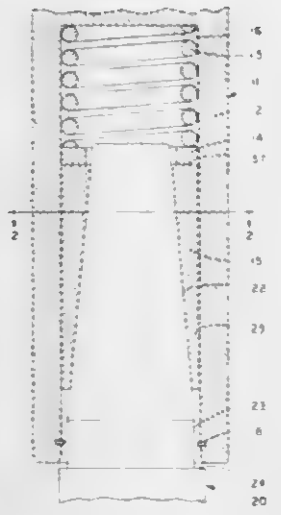
the outer wall surface of said split sleeve and the inner wall surface of said cylindrical cavity having the same curvature;

means for biasing said split sleeve to a position within said cylindrical cavity whereat one end thereof is spaced by a predetermined amount from the end closure wall of said cavity; and

a male member terminating in a truncated conical pin portion that has a taper which matches that of said internal passageway,

a length of said pin portion being disposed within said split sleeve,

said pin portion being dimensioned such that whenever said male member is inserted into said receptacle and moved to its operating position, both halves of said split sleeve are displaced axially toward the end closure wall of the cylindrical cavity and radially until the outer wall surface of said split sleeve meets the inner wall surface of said cylindrical cavity whereby contact is established between a length of the pin portion of said male member and the complete internal surface of said split sleeve and between a length portion of the inner wall surface of said cylindrical cavity and the complete external surface of said split sleeve.



4,105,281

SCANNING MINOR STABILIZER

Morris Burton Johnson, Braintree, and Charles Raymond William Richardson, Chelmsford, both of England, assignors to The Marconi Company Limited, England

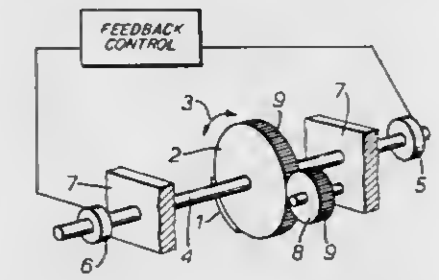
Filed Apr. 26, 1977, Ser. No. 790,956

Claims priority, application United Kingdom, May 7, 1976, 18745/76

Int. Cl.^{2} G02B *27/17*

U.S. Cl. 350—6.5 **6 Claims**

1. A mirror arrangement including a mirror arranged to view a volume of space, said mirror being carried by a support, a balance member for said mirror, and means mounting said mirror, said support and said balance member for rotation, said balance member being a rotatable mass having gear teeth meshed with gear teeth provided on said support for said mirror such that rotation of said support and mirror in one direction causes rotation of said balance member in the opposite direction whereby the inertia of said balance member tends to compensate for the inertia of said mirror.



4,105,282

OPTICAL SIGHT

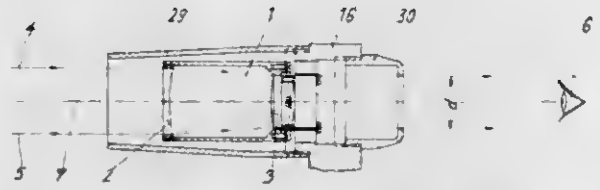
Rudi Schael, Kandinskystrasse 27, D-8000 Munich 71, Fed. Rep. of Germany

Filed Jul. 22, 1976, Ser. No. 707,493

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532930

Int. Cl.^{2} G02B *27/32*

U.S. Cl. 350—10 **19 Claims**



1. In an optical sight wherein a target is sighted through a telescope-like optical device provided with an objective portion and an ocular portion, and wherein a target mark disposed within said optical device is projected into the infinite such as to be seen in a single plane with said target, said telescope-like optical device having a convex optically effective objective first surface for converging parallel light rays emitted from the target, a concave optically effective second surface for parallel re-alignment of the converged light rays, a target mark on said second surface, and a semi-transparent mirror surface disposed in said optical device whereby said target mark is projected onto said semi-transparent mirror surface and reflected thereby, the improvement comprising said telescope-like optical device formed as a single homogeneous lens body made of light-transmitting material having said optically effective first surface formed by a frontal surface of said lens body, said semi-transparent mirror surface being disposed directly on said frontal surface, and a cylindrical barrel enclosing said lens body, said barrel being mounted on a mounting ring by means of at least one quadrangular flat spring defining a substantially square aperture coaxial with said lens optical axis.

4,105,283

COMPENSATION FOR MATERIAL DISPERSION IN OPTICAL FIBERS

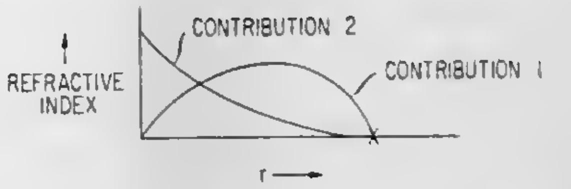
Detlef Christoph Gloge, Red Bank; Ivan Paul Kaminow, Tinton Falls, and Herman Melvin Presby, Highland Park, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 1, 1977, Ser. No. 764,549

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.31 **5 Claims**

1. An optical fiber for guiding a spectrum of electromagnetic radiation of finite bandwidth comprising a core region surrounded by a cladding region wherein said core region has a radial refractive index profile which decreases toward said cladding characterized in that said radial refractive index profile is a composite profile which substantially lessens modal dispersion near a high intensity wavelength of said spectrum within said finite bandwidth which includes both shorter and longer wavelength electromagnetic radiation of lesser intensity, said composite profile being composed of at least two contributory profiles each associated with a different index-varying contribution wherein at least two of said contributory profiles are different from said composite profile whereby the total dispersion for the said finite bandwidth is reduced relative to that resulting from a reference fiber in which the effective profile is the same as the said composite profile but in which said contributory profiles associated with said index-varying contributions are approximately the same.



4,105,284

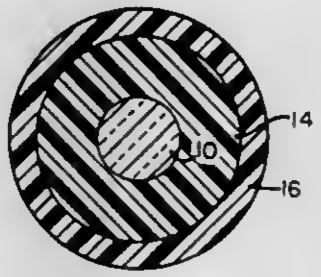
BUFFERED OPTICAL WAVEGUIDE FIBER

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 10, 1976, Ser. No. 684,650

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.33 **4 Claims**



1. A buffered optical waveguide fiber comprising

an optical waveguide fiber formed of a material having a Young's modulus E_f and having a radius R_f,

a first layer of a first plastic material having a Young's modulus E_l disposed on the external surface of said fiber, E_f being at least 10 times greater than E_l, and

a second layer of a second plastic material having a Young's modulus E_o disposed on the surface of said first layer, E_l being at least 10 times greater than E_o, the ratio of the outer radius R_l of the first layer to the outer radius R_o of the second layer being substantially the value determined by the equation

$$R_l/R_o \simeq 0.817 - K/18 - 27/32(E_fR_f^4/E_lR_o^4)$$

where K is given by the equation $K = (1-2\nu)$ and ν is the average Poisson's ratio for the first and second plastic materials, R_o is greater than 4 mils, the thickness of the second layer is at least 1 mil, and the ratio $(E_fR_f^4/E_lR_l^4)$ is less than 0.1.

4,105,285

SINGLE OPTICAL FIBER CONNECTOR

Michael Albert Bedgood, Harlow, and John Stuart Leach, Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,597

Claims priority, application United Kingdom, Mar. 16, 1976, 10461/76

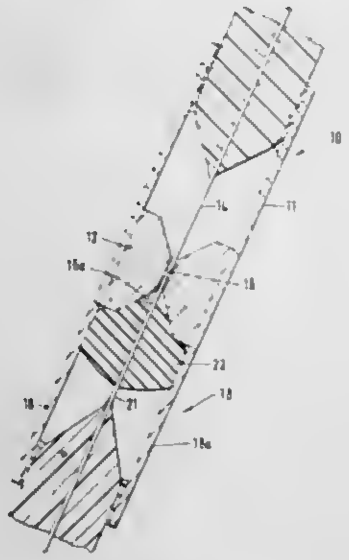
Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.21 **1 Claim**

1. A single optical fiber connector comprising:

a first connector member;

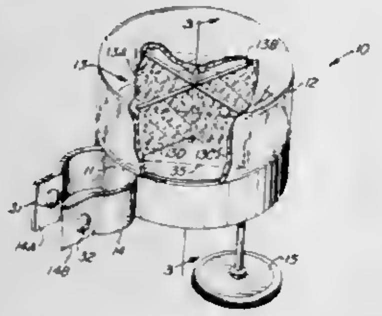
a first single optical fiber secured in said first connector member and having an unsheathed end,
a watch X-jewel fixedly mounted in said connector member having a pair of oppositely opening coaxial conical recesses therein joined by a small bore, said unsheathed fiber end extending partially into said bore;
a second connector member;
a second single optical fiber secured in said second connector member against axial movement therein and having unsheathed end;



said second connector member embodying an elastomeric nose portion having a front end and a bore therein slidably receiving said unsheathed end of said second fiber, said unsheathed end of said second fiber extending forwardly in said bore than said front end whereby said nose portion protects said fiber end; and
when said connecter members are mated, said elastomeric nose portion abuts said X-jewel and is deformed axially so as to expose said unsheathed end of said second fiber thus allowing said end to enter said bore of said jewel and couple optically with said end of said first fiber.

4,105,286
BICYCLE REFLECTOR ASSEMBLY

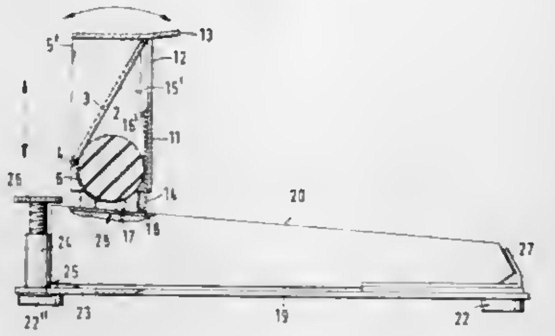
Mike H. Curran, 1738 E. Montecito, Phoenix, Ariz. 85016
Filed Jan. 27, 1977, Ser. No. 762,888
Int. Cl.² G02B *5/12*
U.S. Cl. 350—99 **4 Claims**



1. A reflector assembly for a vehicle comprising in combination:
a tubular housing having a transparent portion which is arranged to contain within said portion a rotatively mounted reflector,
means for securing said housing to a vehicle,
a reflector rotatively mounted on a shaft arranged in at least one bearing within said housing,
said shaft being substantially vertically positioned when mounted on the vehicle, and
means connected to said shaft for causing it and the associated reflector's rotation upon actuation thereof,
said means causing said shaft and associated reflector's rotation comprising a wheel means engageable with a wheel of the vehicle and rotative thereby,
said reflector comprises an open-ended structure pivotally rotatable with said shaft about its axis and comprising side plane surfaces which are exposed sequentially to light rays directed thereto for reflection thereof.

4,105,287
OPTICAL READING SYSTEM FOR ELECTRONIC POCKET CALCULATORS

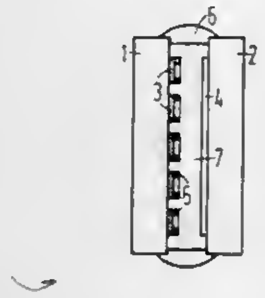
Lothar Gross, 10 Akazienweg, 7012 Fellbach, Fed. Rep. of Germany
Filed Jul. 26, 1976, Ser. No. 708,334
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2533941; Feb. 27, 1976, 2607972; Apr. 15, 1976, 2616896
Int. Cl.² G02B *17/06*
U.S. Cl. 350—113 **9 Claims**



1. An electronic pocket calculator comprising a calculator housing having a digital display, and an optical reading system with means removably securing the calculator housing, in a position above the digital display, and adjustably mounted for vertical displacement, the optical reading system including first optical reversing means positioned adjacent the digital display to reverse the image of the digital display and second optical reversing means positioned adjacent the first optical reversing means to reverse the image again thereby to provide an adjustable upright image of the digital display in an approximately vertical plane thereby to provide an upright image of the digital display, wherein the first optical reversing means consists of a cylinder of optical material and the second optical reversing means consists of a mirror arranged at an inclined angle and parallel with the longitudinal axis of the cylinder.

4,105,288
LIQUID CRYSTAL DISPLAY WITH BISTABLE CHOLESTERIC LIQUID CRYSTAL LAYER

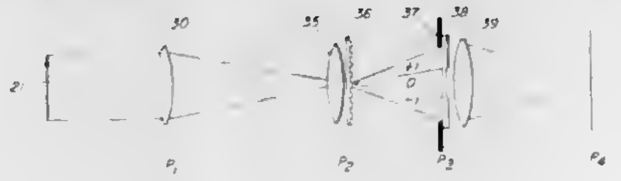
Walter Geffcken; Hans Krueger, both of Munich, and Karl-Heinz Walter, Grafing, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Sep. 14, 1976, Ser. No. 723,147
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1975, 2542189
Int. Cl.² G02F *1/13*
U.S. Cl. 350—350 **7 Claims**



1. A liquid crystal display for the representation of visual images having two carrier plates with a layer of cholesteric liquid crystal therebetween in a hermetically sealed arrangement, each of said carrier plates having an array of image conductors on its inner surface facing the other, said liquid crystal having at least in a certain frequency range a positive anisotropic susceptibility, and at field strengths equal to or greater than a first threshold value E_{cn} taking on a homeotropically-nematic texture, in which it remains as long as the applied field is greater than a second threshold value E_{nc}, E_{nc} being smaller than E_{cn}, said arrays of image conductors having at least one separately operable conductor, at least one of said arrays of image conductors being connected with boundary electrodes arranged to generate, relative to the opposite electrode in the liquid crystal layer, a field strength equal to or greater than E_{cn}, said boundary electrodes forming a narrow boundary zone completely surrounded by a visual element area, said boundary electrodes each being connected directly to the associated image conductor of said visual element area and projecting so far toward the opposite carrier plate that a minimum field strength equal to or greater than E_{cn} can prevail in said liquid crystal layer at the location of the boundary area and simultaneously a field strength less than E_{cn} and greater than E_{nc} can prevail in said visual element area.

4,105,289
APPARATUS AND METHOD FOR IMAGE SAMPLING

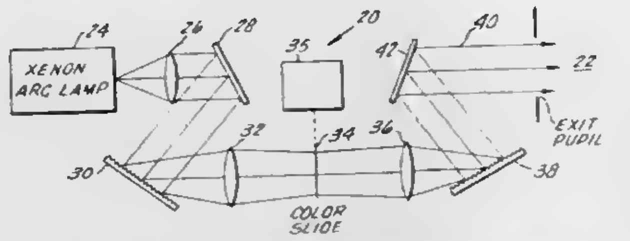
Ronald S. Hershel, Tucson, Ariz., assignor to University Patents, Inc., Stamford, Conn.
Filed Apr. 29, 1976, Ser. No. 681,469
Int. Cl.² G02B *5/18*
U.S. Cl. 350—162 SF **46 Claims**



34. Apparatus for receiving optical radiation representative of a scene and for generating a processed image having periodic spatial amplitude modulations, comprising:
a lens located at a first imaging plane and disposed to receive said optical radiation;
a phase grating positioned adjacent said lens;
a phase retarding plate spaced from said lens and phase grating, a plurality of substantially non-overlapping ordered images of the scene being formed at said phase retarding plate; and
a second lens positioned adjacent said phase retarding plate and operative to image said grating at a further plane so as to produce said processed image.

4,105,290
OPTICAL COLOR COMMUNICATION SYSTEM

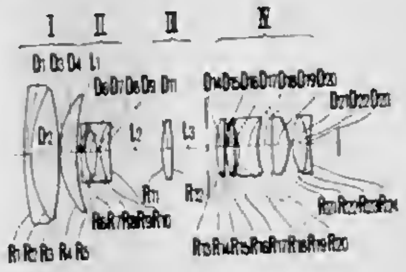
Bernard W. Quinn, Rancho Palos Verdes, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Jun. 10, 1976, Ser. No. 694,543
Int. Cl.² G02B *5/04, 5/18;* **H04B** *9/00*
U.S. Cl. 350—168 **10 Claims**



1. An optical color communication system comprising:
a transmitter including
a light source having a predetermined spectral output and adapted to provide collimated light therefrom,
a first diffraction means having said collimated light from said light source directed thereon and providing predetermined higher diffraction orders of said collimated light from said light source,
a first lens means for collecting said predetermined higher diffraction orders of said collimated light diffracted by said first diffraction means,
means adapted to be positioned in the focal plane of said first lens means and containing color information for modulating said diffracted light collected by said first lens means,
a second lens means for collecting and collimating the light modulated by said modulating means, and
a second diffraction means having said collimated light from said second lens means directed thereon and providing predetermined higher diffraction orders of said collimated light from said second lens means and which comprise an emergent collimated light beam from said transmitter; and
a receiver positioned to receive said emergent collimated light beam from said transmitter, said receiver including
a third diffraction means adapted to receive said emergent collimated light beam from said transmitter and provide predetermined higher diffraction orders of the collimated light of said beam,
a third lens means for collecting said predetermined higher diffraction orders of said collimated light diffracted by said third diffraction means, and
color sensitive means adapted to be positioned in the focal plane of said third lens means for detecting said color information of said modulating means.

4,105,291
LARGE APERTURE ZOOM LENS

Sadahiko Tsuji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 5, 1976, Ser. No. 655,542
Claims priority, application Japan, Feb. 26, 1975, 50-24317
Int. Cl.² G02B *15/18*
U.S. Cl. 350—184 **2 Claims**



1. A large aperture zoom lens comprising, from the direction of the object to be photographed, a first lens group for focusing and consisting of a positive compound lens having a negative meniscus lens and a biconvex lens and of a positive meniscus lens convex toward the object, a second lens group for variation and consisting of a negative lens and a negative compound lens having a biconcave lens and a positive lens, a third group for compensation consisting of a positive lens, said third group being movable to and fro for zooming, a fourth group for image forming and consisting of two positive lenses convex toward the object and a biconcave lens as well as a biconvex lens and a positive compound lens having a biconvex lens and a biconcave lens, said fourth group having the longest lens spacing between said biconcave lens and biconvex lens, said large aperture zoom lens satisfying the following conditions:

$$|R_1| > |R_3|$$
$$|R_{14}| > |R_{16}|$$
$$|R_{20}| > |R_{21}|$$
$$2.2\ F_{IV} > |R_{23}| > 1.5\ F_{IV}$$

wherein F_{IV} is the focal length of the fourth lens group,
$R_1 R_3$ the radii of the outer surfaces of the positive compound lens in the first lens group,
R_{14} and R_{16}, the radii of the surfaces facing the object in the positive lenses of the fourth lens group,
R_{20} and R_{21}, the radii of the surfaces of the biconvex lens in the fourth lens group.

4,105,292

OPTICAL ELEMENT TO ASSURE A MINIMUM SPACING

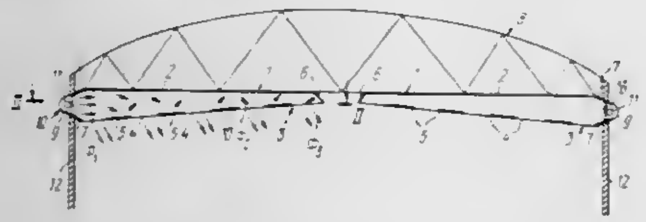
Terrence M. Conder, Stillwater, Minn., and Terence A. Jones, Columbia, Mo., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 609,428, Sep. 2, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,892
Int. Cl.^{2} G02B *3/08*
U.S. Cl. 350—211 **1 Claim**

1. An improved condensing lens system for use in an overhead projector including
a light transmissive stage element having at least one smooth surface area;
at least one light-transmissive polymeric lens element having a first surface area configured as an incremental lens and a second surface area, arranged such that a smooth surface area of said stage element is juxtaposed with said second surface of said lens element,
the improvement comprising a plurality of randomly spaced projections on said second surface of said lens element having random heights ranging from 1 to 130 microns with an average height ranging from 10 to 60 microns, and having random base areas and having a population density of approximately 100 projections per square millimeter for maintaining a minimum spacing between said stage and said lens elements.

4,105,293

LIGHTING INSTALLATION BASED ON LIGHT GUIDE

Julian Borisovich Aizenberg, ulitsa Koroleva, 3^a, kv. 84, Moscow; Inokh Borukhovich Bukhman, ulitsa Volgogradskaya, 31, kv. 151, Kiev, and Vladimir Mikhailovich Pyatigorsky, ulitsa Molodogvardeiskaya, 24, korpus 5, kv. 58, Moscow, all of U.S.S.R.
Filed Aug. 25, 1976, Ser. No. 717,554
Int. Cl.^{2} F21V *7/00*
U.S. Cl. 350—264 **11 Claims**

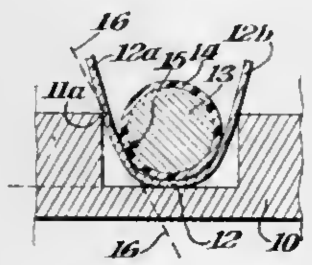


1. A lighting installation based on a light guide, which comprises:
a light guide having two surfaces;
a means for securing the light guide in a room to be lighted;
at least one light source;
at least one input device inluding an optical unit;
each of said light sources placed in said input device and directing the luminous flux of said light source into said light guide;
said first surface of said light guide reflecting said light;
said second surface of said light guide facing said lighted room and provided with alternating light transmitting and light reflective zones; and
said first and second surfaces of said light guide are positioned at an acute angle to each other, the magnitude of said angle being dependent upon the dimensions of said lighted room and the rated illumination.

4,105,294

ELECTROSTATIC DEVICE

David B. Peck, Williamstown, Mass., assignor to Dielectric Systems International, Inc., Williamstown, Mass.
Filed Aug. 4, 1976, Ser. No. 711,612
Int. Cl.^{2} G02F *1/16*
U.S. Cl. 350—269 **5 Claims**



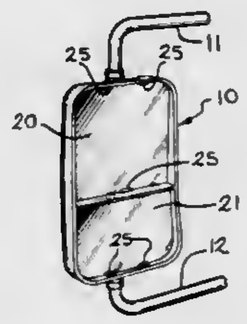
1. An electrostatic device for the gating of electromagnetic radiation in response to an electrical signal, comprising a rod shaped fixed electrode, a sheet of resilient conductive material, a film of insulative material being interposed between said fixed electrode and said resilient sheet, and a metal base having a groove therein, a central region of said resilient sheet being mounted between said fixed electrode and the bottom of said groove, two opposite end portions of said resilient sheet extending in opposite directions from said mounting and each of said end portions further extending outwardly from said groove and being spring loaded between an outer edge of said groove and a line of tangency at which said resilient sheet is tangent to said fixed electrode, said two extending end portions of said resilient sheet serving as two variable electrodes capable of being electrostatically drawn over said fixed electrode.

4,105,295

MIRROR ASSEMBLY WITH FRANGIBLE ANGULAR PROJECTIONS

Robert T. Skilliter, Jr., Genoa, Ohio, assignor to The Acme Specialty Manufacturing Company, Toledo, Ohio
Filed Jun. 22, 1977, Ser. No. 808,920
Int. Cl.^{2} G02B *5/10*
U.S. Cl. 350—303 **10 Claims**

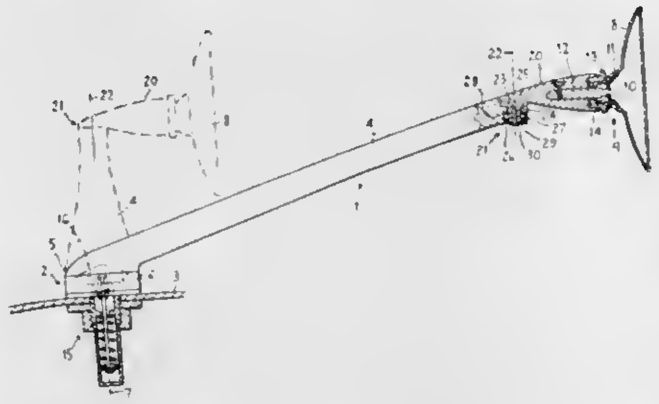
1. A mirror assembly comprising a housing having a peripheral rim, a shoulder extending inwardly of the housing from said rim below the top thereof, a plurality of thin angular projections disposed in the angle between said rim and said shoulder and formed integrally with both, a plurality of inwardly extending mirror lens engaging tabs formed integrally with said housing rim, and a mirror lens mounted within said housing rim and normally engaged between said angular projections and said tab, said angular projections being frangible upon contraction of said housing relative to said mirror lens by reason of exposure to a predetermined cold ambient temperature.



4,105,296

VEHICLE REAR-VIEW MIRROR WITH SUPPORT ARM HAVING INDEXING MEANS AT BOTH ENDS

Robert Derrick Tomlin, Hampton Hill, England, assignor to Magnatex Limited, Hounslow, England
Filed Nov. 22, 1976, Ser. No. 743,628
Int. Cl.^{2} G02B *7/18;* A47G *1/24*
U.S. Cl. 350—307 **3 Claims**

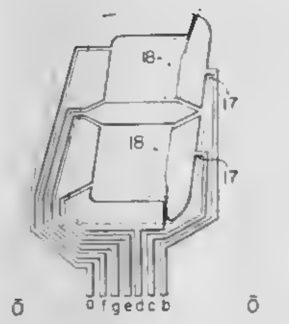


1. A vehicle rear-view mirror assembly for fitting externally to a vehicle and which is selectively adjustable to extend beyond a normal rear viewing position to a position in which a driver's field of view extends beyond a side of a trailer of greater width than the vehicle which is towing the trailer, said mirror assembly comprising:
(a) a base part comprising means for securing said base part to a front fender of a vehicle;
(b) an elongate, rigid, mirror supporting arm;
(c) means mounting said supporting arm, at one end thereof, on and extending radially of said base part for turning about a substantially vertical axis relative to the base part;
(d) interengaging surface portions on said supporting arm and base part;
(e) complementary indexing means on said interengaging portions respectively and defining a plurality of indexing positions extending around said axis and of which two indexing positions are disposed approximately at right angles to each other;
(f) means resiliently urging said interengaging portions together so that the supporting arm can be located around said axis in different ones of said indexing positions;
(g) a mirror head mounted at the free end of said arm on an end portion thereof,
(h) joint means connecting said end portion to the supporting arm proper for adjusting the mirror head about another substantially vertical axis through an angle approximately equal to the angle between said two indexing positions,
(i) said joint means being provided with indexing means defining a plurality of indexing positions for locating the arm end portion in different ones of a plurality of indexing positions with respect to the arm proper, and
(j) means for holding the mirror head in its adjusted position relative to the arm proper.

4,105,297

FIELD EFFECT TYPE LIQUID CRYSTAL DISPLAY DEVICE

Kazuhiko Shimizu, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 22, 1977, Ser. No. 770,298
Claims priority, application Japan, Feb. 26, 1976, 51-21499
Int. Cl.^{2} G02F *1/13*
U.S. Cl. 350—336 **2 Claims**

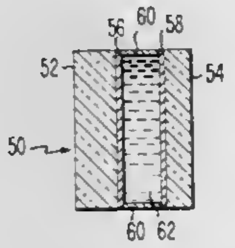


1. A field effect type liquid crystal digit displaying device including seven front electrode segments *a* to *g* and a back electrode O, a display by right edges of the front electrode segments *b* and *c* is defined by the right edges of said front electrode segments *b* and *c*, notches are formed in said rear electrode O and a display by the left edges of the front electrode segments *b* and *c* is defined by the edges of said notches in said rear electrode O.

4,105,298

ELECTRO-OPTIC DEVICES

Aaron William Levine, Lawrenceville; Grzegorz Kaganowicz, Princeton, and Pabitra Datta, Cranbury, all of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Apr. 11, 1977, Ser. No. 786,401
Int. Cl.^{2} G02F *1/13*
U.S. Cl. 350—340 **14 Claims**



1. In an electro-optic device comprising a liquid crystal composition between two electrodes, the improvement which comprises coating each of said electrodes with a perfluorinated polymer film formed from a cyclic perfluorinated monomer by glow discharge.

4,105,299

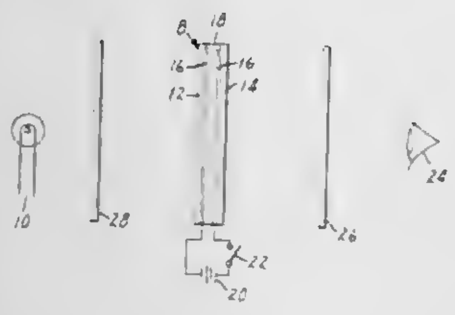
ELECTRO-OPTICAL DEVICES CONTAINING METHINE ARYLIDENE DYES

William A. Huffman, Minneapolis, and Harvey A. Brown, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

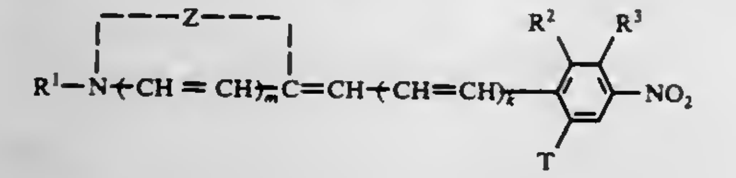
Filed Apr. 11, 1977, Ser. No. 786,488

Int. Cl.^{2} G02F *1/13;* C09K *3/34*

U.S. Cl. 350—349 **2 Claims**



1. In an electro-optical device wherein an electrical field is imposed or withdrawn from action on a cell comprising liquid crystalline material having dissolved therein a pleochroic dye between transparent-electrode coated glass plates the improvement wherein the liquid crystalling material has net positive dieelectric anissotropy and comprises at least one nematic liquid crystallinehaving positive dielectric anisotropy and the dissolved pleochroic dye has the general formula



wherein:

Z represents the atoms necessary to complete a mono- or polycyclic dihydroheterocyclic nucleus having 5 to 6 atoms in the ring including the N of the formula where R^1 is an alkyl, substituted alkyl, alkenyl, or aryl group;

m is 0 or 1;

k is 0, 1 or 2;

T is selected from CF$_3$ or CN and R^2 and R^3 are hydrogen or together constitute a condensed carbocyclic aromatic ring.

4,105,300

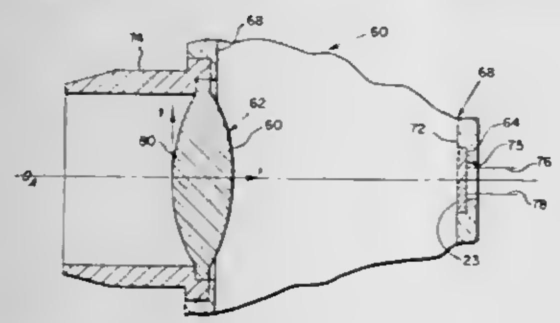
DEFOCUSED UNICELL PHOTOMETER WITH ASPHERIC ZONE

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 31, 1977, Ser. No. 763,930

Int. Cl.^{2} G01J *1/42;* H01J *3/14*

U.S. Cl. 356—225 **5 Claims**



1. A defocused unicell photometer for use in photographic apparatus comprising:

a photosensitive transducer having a photosensitive surface thereon of predetermined dimension, said transducer operating to provide an output response which varies in correspondence to the intensity of actinic radiation incident to said photosensitive surface;

a positive lens element of predetermined focal length concentrically disposed about an optical axis which axis ultimately intersects said photosensitive surface, said lens element being spaced apart from said photosensitive surface by a distance different from said lens focal length and cooperating with said photosensitive surface to define a field of view for said photometer such that said lens element operates to direct actinic radiation incident thereon from said field of view towards said photosensitive surface, said lens element additionally having at least one non-planar aspheric zone disposed on a surface of said lens element for directing a select portion of actinic radiation, from said field of view in a manner operating to change the intensity of said select portion of actinic radiation which ultimately impinges on said photosensitive surface from said zone thereby effecting a corresponding change in that portion of said output response from said transducer which is directly attributable to said select portion of actinic radiation; and

means for stationing said transducer and lens element in substantially light-tight, spaced apart relation with respect to each other.

4,105,301

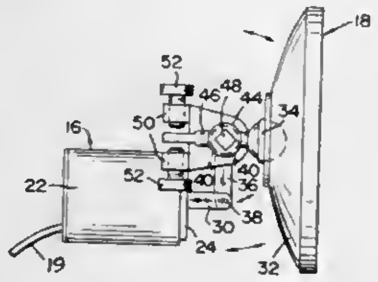
CAR MIRROR WITH U-SHAPED SLOT MEANS AND SOLENOID CONTROL

Ralph W. Doeg, 125 56th Ave. South, St. Petersburg, Fla. 33705

Filed Nov. 15, 1976, Ser. No. 741,616

Int. Cl.^{2} G02B *5/08*

U.S. Cl. 350—289 **8 Claims**



1. A vehicle mirror angling device comprising in combination:

base means connectable to the body of the vehicle;

a mirror;

pivot means pivotably mounting said mirror to said base means;

a finger mounted for movement in accordance with said mirror;

U-shaped slot means secured to said base for receiving said finger therebetween;

adjustment means coacting between said finger and said U-shaped slot for limiting the movement of said finger within said U-shaped slot between a first and a second position; and

a solenoid connection for moving said mirror upon activation of said solenoid to tilt the mirror in accordance with the movement established for said finger.

4,105,302

AUTOMATIC REFRACTION APPARATUS AND METHOD

George W. Tate, Jr., 11127 Bushire, Dallas, Tex. 75229

Filed Jun. 23, 1976, Ser. No. 699,076

Int. Cl.^{2} A61B *3/14, 3/10, 3/00*

U.S. Cl. 351—7 **12 Claims**

1. Apparatus for measuring refractive error of a subject's eye comprising:

a subjective refraction system including:

a first optical system including display means for displaying test symbols, said first optical system being continuously variable over a range of powers through which the subject views the displayed test symbols;

first control means for setting said first optical system at any selected power setting within said range of powers; and

a manual response device operable by the subject for providing a plurality of output signals;

an objective refraction system including;

pattern generating means for generating an optical pattern;

a second optical system continuously variable over said range of powers through which said optical pattern is imaged on the retina of the subject's eye;

second control means for setting said second system at any selected power setting within said range of powers;

refraction measurement means adapted to view the retinal image of the pattern through said second optical system and provide an output signal indicative of the total refraction of the eye and the second optical system; and

image quality measurement means adapted to view the retinal image of the pattern through said second optical system and to respond to contrast transmission effects in the image to provide an output signal indicative of the image quality; and

data processing system means coupled to said first and second control means, said display means, said manual response device, said refraction measurement means and said image quality measurement means and responsive to signals received from said response device, said refraction measurement means and said image quality measurement means to control said first and second control means to identically set the first and second optical systems at discrete settings of cylinder and spherical power which provide a refractive correction most desired by the subject which is consistent with refraction and image quality measurements.

4,105,303

METHOD FOR DETERMINING THE REFRACTIVE CORRECTION FOR AN EYE

David L. Guyton, 10833 Willowisp, Houston, Tex. 77035

Filed Jan. 5, 1977, Ser. No. 756,933

Int. Cl.^{2} A61B *3/00*

U.S. Cl. 351—39 **7 Claims**

1. A method for determining the refractive correction for an eye including the steps of:

providing corrective optics between a patient's eye and a target location, said corrective optics comprising variable spherical optics in combination with variable astigmatic optics, said variable astigmatic optics being equivalent to a cross cylinder having variable power and variable orientation;

providing, in alternate succession, first and second straight line targets in said target location, said first straight line target having arbitrary meridional orientation without regard to any suspected principal meridian of the astigmatism of the patient's eye, and said second straight line target having meridional orientation substantially 45° away from the orientation of said first straight line target;

adjusting separately, for each of said straight line targets, both said variable spherical optics and said variable astigmatic optics to optimize the focus of the straight line target within the patient's eye;

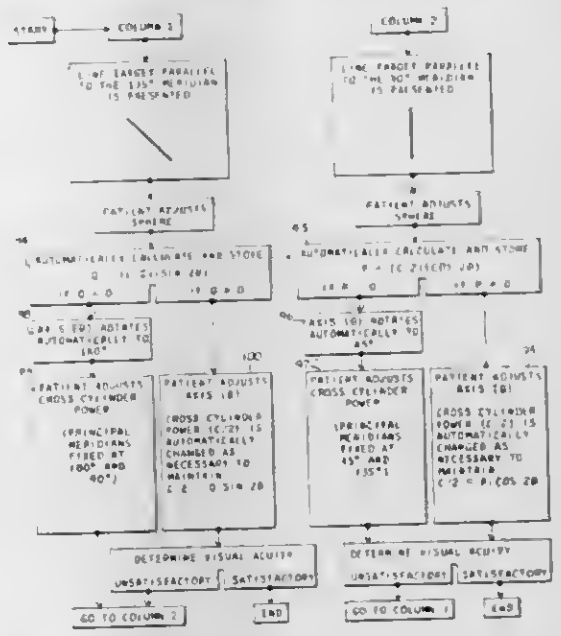
wherein the improvement comprises:

allowing the initial power and orientation of said variable astigmatic optics to have arbitrary values prior to the focusing of said first straight line target;

maintaining the power and orientation of said variable astigmatic optics at the successive adjusted-values prior to the focusing of each successive straight line target;

and accomplishing the adjustment of said variable astigmatic optics for each of said straight line targets by adjusting both the orientation and the power of the variable astigmatic optics substantially simultaneously as necessary to maintain constant the dioptric power then acting in the meridian parallel to the orientation of the straight line target being focused;

whereby said refractive correction is determined.


START
COLUMN 1
COLUMN 2
LINE TARGET PARALLEL TO THE 135° MERIDIAN IS PRESENTED
LINE TARGET PARALLEL TO THE 90° MERIDIAN IS PRESENTED
PATIENT ADJUSTS SPHERE
PATIENT ADJUSTS SPHERE
AUTOMATICALLY CALCULATE AND STORE
AUTOMATICALLY CALCULATE AND STORE
PATIENT ADJUSTS CROSS CYLINDER POWER
PATIENT ADJUSTS AXIS
PATIENT ADJUSTS CROSS CYLINDER POWER
PATIENT ADJUSTS AXIS
DETERMINE VISUAL ACUITY
UNSATISFACTORY
SATISFACTORY
GO TO COLUMN 2
END
DETERMINE VISUAL ACUITY
UNSATISFACTORY
SATISFACTORY
GO TO COLUMN 1
END

4,105,304

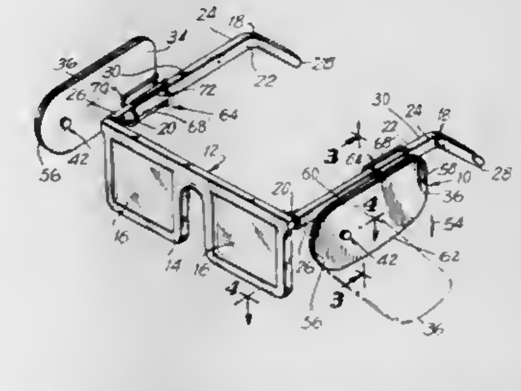
SIDE GLARE-ELIMINATING DEVICE FOR SECUREMENT TO EYEGLASSES AND OTHER SUITABLE MOUNTING STRUCTURES

Alfred Baker, 153 E. Central Ave., Pearl River, N.Y. 10965

Filed Nov. 8, 1976, Ser. No. 739,437

Int. Cl.^{2} G02C *9/04*

U.S. Cl. 351—47 **37 Claims**



1. A side glare device for attachment to a selected temple-bar of eyeglass frames or other suitable mounting means,

said device comprising a first glare shield member and a second glare shield member, said first and second members being provided with overlapping surfaces for adjustment relative to each other along a common plane to selectively vary the amount of light transmission towards the eyes of the wearer of said side glare device,

means for coupling said first and second members with respect to one another to permit relative positioning of said second member with respect to said first member along said common plane,

said coupling means being operable to permit movement of said second member with respect to said first member between a first relative superimposed coextensive orientation and a second relative non-superimposed and non-coextensive orientation and to a multiplicity of substantially non-superimposed and non-coextensive orientations between said first and second orientations, and

means for permitting removable positional securement of said first member on said temple-bar for maintaining said device at the desired position along said temple-bar.

4,105,305

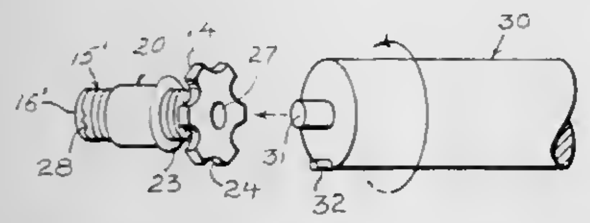
SPECTACLE FRAME WITH ANGULARLY ADJUSTABLE TEMPLES AND MEANS FOR MANUFACTURING AND ASSEMBLING SAME

Harry J. Lazarus, 36 Knox La., Englishtown, N.J. 07726

Filed Aug. 2, 1976, Ser. No. 710,788

Int. Cl.² G02C ***5/14, 5/04;*** **B25B** ***27/14***

U.S. Cl. 351—111 **5 Claims**



1. In a spectacle frame of the type including a frontal lens support incorporating a nose bridge, a pair of temples, respective hinges connecting each temple to the respective outer end of the lens support, a socket formed in one of the lens support and the temple, adjacent at least one outer end of the lens support, an internally threaded element axially aligned with each socket, and an externally threaded adjusting number threadedly engaged in each internally threaded element and having an outer and engaging the other of the lens support and the temple at a point spaced outwardly from the axis of the associated hinge, with the internally threaded element having an axial length less than the depth of the associated socket with which it is axially aligned and having an outer end which is substantially flush with the surface of that one, of the lens support and the temple, formed with the associated socket, and with the externally threaded adjusting member being constituted by a threaded rotor having an operating head on its outer end and a threaded stem extending inwardly from the head and threadedly engaged through the associated internally threaded element, and with each internally threaded element and the associated threaded rotor conjointly defining a temple adjusting assembly in which the head of the rotor is engaged with the other of the lens support and temple for adjustment of the angularity of the temple to the lens support by rotation of the associated rotor relative to the associated internally threaded element, and with the head of each rotor having a periphery formed for effecting rotation of the associated rotor by a person wearing the spectacle frame, each rotor having an axial length substantially longer than the threaded length of the associated internally threaded element whereby the rotor has a telescopic relation with the associated internally threaded element: the improvement comprising each rotor, after telescopic assembly into its associated internally threaded element having the inner end of its threaded stem formed with limiting means limiting outward movement of the rotor relative to the associated internally threaded element to a position in which the rotor remains threadedly engaged in the associated threaded element; the head of each rotor limiting inward movement of the rotor, relative to its associated internally threaded element, to a depth less than the depth of the associated socket; each internally threaded element having an area of surface engagement with that one, of the lens support and the temple, having the socket formed therein sufficient to stabilize the internally threaded element to maintain the internally threaded element in accurate axial alignment with the associated socket by resistance to off-axis stresses imposed on the internally threaded element during operation of said adjusting assembly to adjust the angularity of the temple to the lens support; each rotor being movable, by rotation thereof, through an axial distance very substantially greater that the axial extent of the threads of the associated internally threaded element before the rotation is limited by engagement of said limiting means with a portion of the associated internally threaded element spaced axially a substantial distance from the inner end of said socket; the head of each rotor having its outer surface formed with an unthreaded axially extending recess, and also being formed with a notched periphery; and a tool operatively engageable with the rotor head to axially align the rotor with the associated internally threaded element and to thread the rotor into the associated internally threaded element, by rotation thereof, to form said adjusting assembly; said tool being formed with an elongated handle and with an operating end engageable with the outer surface of the head of a rotor; said operating end having a pin extending centrally therefrom for engagement into said unthreaded axially extending recess in the rotor head and with means cooperable with said notches to effect rotation of the associated rotor, when said pin is thus engaged in said recess; whereby said tool may be engaged with a rotor to axially align the rotor with the associated internally threaded element and then to rotate the rotor to thread it through the associated internally threaded element to form said adjusting assembly, after which the inner end of the stem of the associated rotor is formed with said limiting means limiting outward movement of the rotor relative to the associated internally threaded element to maintain the rotor constantly threadedly engaged through the associated internally threaded element; said tool thereafter being operable to have said adjusting assembly mounted thereon, through engagement of said pin into said rotor recess, whereby said adjustment assembly may be accurately guided in accurate axial alignment with the associated socket during assembly of the adjusting assembly with that one, of the lens support and temple, having said socket formed therein.

4,105,306

SOUND MOVIE PROJECTOR

Jihaciro Utsumi, Yokohama, Japan, assignor to Bell Ko-On Co., Ltd., Tokyo, Japan

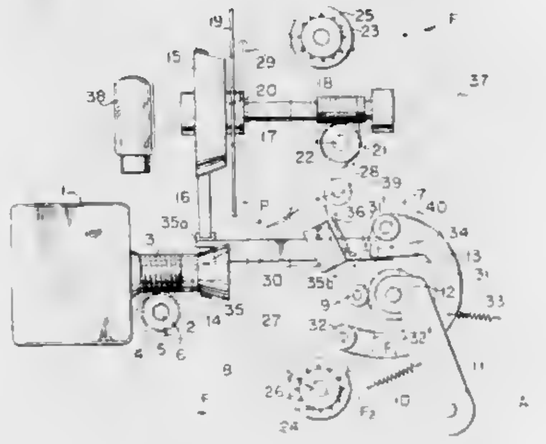
Filed Apr. 24, 1975, Ser. No. 571,064

Int. Cl.² G03B ***31/02***

U.S. Cl. 352—14 **9 Claims**

1. A sound movie projector which comprises:
(a) a first sprocket,
(b) an intermittent film advancing mechanism for advancing the film on a frame-by-frame basis at a projection gate,
(c) a sound recording and/or reproducing head assembly,
(d) a film drive roller assembly,
(e) a second sprocket,
elements (a) (b) (c) (d) (e) being disposed serially along a film threading path defined between the two sprockets,
(f) a pivotally mounted sensing lever, for measuring film length, operatively engaged with said film at a position interposed between the film drive roller assembly and the second sprocket, said film interposed between said film drive roller assembly and said second sprocket normally having a substantially rectilinear configuration,
(g) a driving motor,

(h) a stepless transmission mechanism, composed of two cone pulleys and a belt disposed therearound, for transmitting the rotation of the driving motor,
(i) a first drive mechanism which drives, by means of the output of the stepless transmission mechanism, the first sprocket, the intermittent film advancing mechanism, and the second sprocket,



(j) a second drive mechanism which transmits rotation of the driving motor to the film drive roller assembly, and
(k) a displacing mechanism for displacing the position of the belt in response to displacement of the pivotally mounted sensing lever.

4,105,307

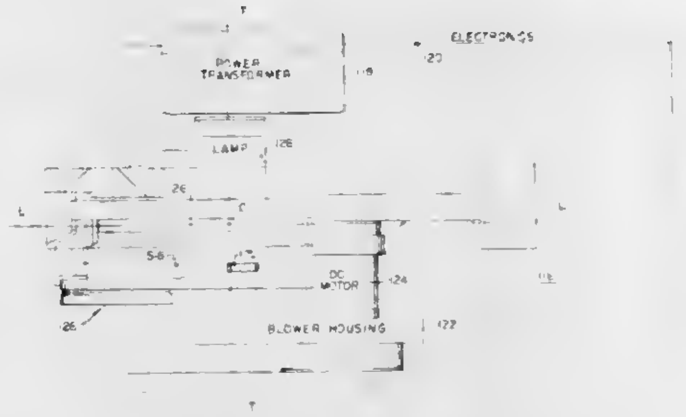
PROGRAMMABLE VIEWING SYSTEM FOR PROCESSING AND VIEWING CASSETTE CONTAINED PHOTOGRAPHIC FILM STRIPS

William A. Holmes, Marblehead, and Donald T. Scholz, Wayland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,425

Int. Cl.² G03B ***23/02, 31/02***

U.S. Cl. 352—72 **20 Claims**



1. In a programmable viewing system for a photographic film strip contained in a cassette during exposure, processing and viewing, the combination comprising:

a chassis defining an optical center at the intersection of mutually perpendicular longitudinal, transverse and horizontal planes, said chassis including a plate-like central support generally parallel to said longitudinal plane, said central support being an integral casting having an elevated first portion cantilevered forwardly of said transverse plane from a standard portion positioned rearwardly of said transverse plane;

a cassette well defined by said central support to position a cassette in registry with said optical center for processing, projection and rewinding of the film strip contained therein;

a plurality of cassette engaging components carried by said support for movement relative to said cassette well and cooperative with the cassette during the respective processing, projecting and rewinding of the film strip;

a programming cam disc rotatably carried by said central support on an axis perpendicular to said longitudinal plane;

a pair of shiftable members carried one on each side of said central support to position said cassette engaging components in response to angular orientation of said programming cam disc;

a projection lamp supported to one side of said central support on an axis defined by the intersection of said transverse and longitudinal planes and a projection lens carried by said elevated first portion of said central support below said optical center on an axis defined by the intersection of said longitudinal and transverse planes; and

a rotatable shutter supported from said casting between said cassette well and said projection lamp.

4,105,308

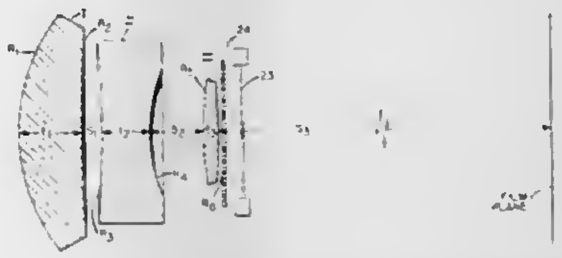
ASPHERIC PLASTIC TRIPLET

R. Calvin Owen, Jr., Acton, and William T. Plummer, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,260

Int. Cl.² G02B ***3/04, 9/14***

U.S. Cl. 350—189 **10 Claims**



1. A single element adjustable focus photographic lens system for use in camera apparatus comprising:

a single lens element defining an optical axis therethrough and having a high optical power of at least more than twice the optical power of said photographic lens system, said single lens element also including a strong aspheric surface thereon to correct low order aberrations and particularly low order sperical aberrations directly associated therewith;

optical means comprising at least two lens elements disposed along said optical axis in spaced apart optical alignment with respect to said single lens element; and

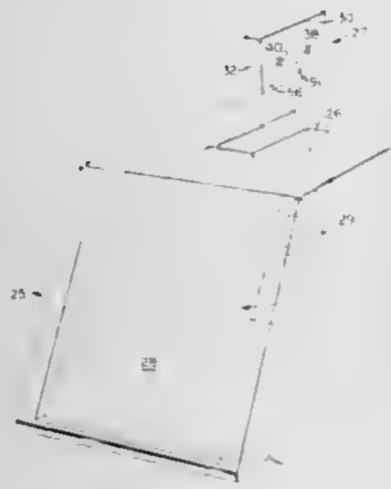
adjustable focusing means for retaining said single lens element and said lens means in spaced apart optical alignment with respect to each other and for changing the spacing between said single lens element and said optical means along said optical axis to alter the focus of said lens system in response to an adjustment of said focusing means while simultaneously maintaining a fixed determinate spacing between said lens elements of said optical means, said strong aspheric surface operating to maintain a balance in the correction of low order aberrations and particularly low order spherical aberrations directly associated with said single lens element as said spacing between said single lens element and said lens optical means along said optical axis is altered to effect a change in focus over a wide focus scale.

4,105,309

LOGIC SYSTEM FOR PHOTOGRAPHIC FILM STRIP HANDLING APPARATUS

Donald T. Scholz, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,412
Int. Cl.^{2} G03C *11/00*
U.S. Cl. 352—130 8 Claims



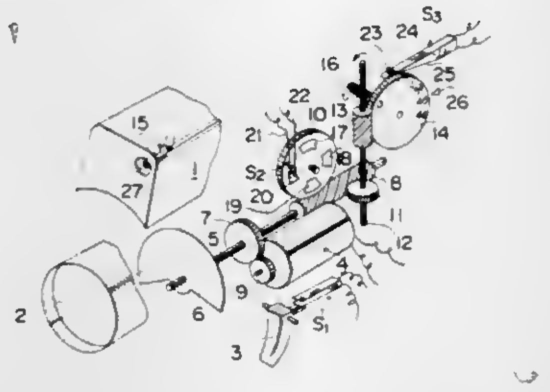
1. Apparatus for use with a cassette containing an elongated strip of material; means for receiving said cassette; drive means for advancing the elongated strip of material; a programming member mounted for displacement between first, second, and third program positions; means responsive to said programming member being in said first program position to cause said drive means to advance said elongated strip of material in a first direction and responsive to said programming member being in said second position to advance said elongated strip of material in a second direction; means to displace said programming member between said program positions proceeding from said first program position to said second program position, from said second program position to said third program position, and from said third program position to said first program position; means defining first and second cam follower tracks carried by said programming member; a cam follower operable to engage said first track or said second track as said programming member is advanced to said third program position; ejecting means operable by said cam follower to eject said cassette from said cassette receiving means; said first track being contoured to guide said cam follower to actuate said ejecting means to eject said cassette from said cassette receiving means when said programming member is advanced to said third program position; said second track being contoured to guide said cam follower in a manner to fail to actuate said ejecting means to eject said cassette from said cassette receiving means when said programming member is advanced to said third program position; and eject control means to selectively switch said cam follower from said first track to said second track at a given position of said programming member in its displacement from said first program position to said third program position whereby said programming member will advance from said second program position through said third program position without ejecting said cassette when said cam follower has been switched to said second track.

4,105,310

INDICATING DEVICE FOR MOTION PICTURE CAMERA

Hiroshi Hirata, and Takashi Koodo, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1976, Ser. No. 747,697
Claims priority, application Japan, Dec. 24, 1975, 50-175649
Int. Cl.^{2} G03B *1/60*
U.S. Cl. 352—171 8 Claims



1. In a motion picture camera including a camera housing, an electric motor, a film winding mechanism coupled with said motor to be driven for winding-up a film, and a shutter coupled with said motor to be driven for exposure of said film, an indicating device comprising:

indicating means including a first light emitting element disposed on said camera housing such that energization thereof can be recognized by a person to be photographed;

a power-supplying circuit for energizing said indicating means, said power-supplying circuit including first and second switches connected in parallel with each other for supplying electric power to said first light emitting element;

first switch actuating means coupled with said film winding mechanism for repeatedly switching said first switch from its closed position to its opened position and vice versa; and

a counter mechanism coupled with said film winding mechanism for indicating the amount of film used, said counter mechanism including second switch actuating means for switching said second switch from either its closed or opened position to the other position immediately before said film has been exhausted.

4,105,311

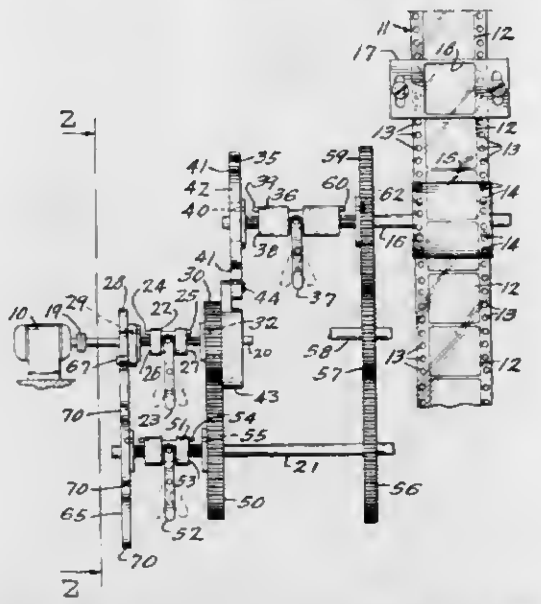
FILM TRANSPORT SYSTEM

Angelo Bondouris, Sylvania, Ohio, assignor to Eprad Incorporated, Toledo, Ohio

Filed Nov. 8, 1976, Ser. No. 739,465
Int. Cl.^{2} G03B *1/24*
U.S. Cl. 352—187 4 Claims

1. An improved transport for moving film through a gate in a motion picture projector comprising, in combination, a film engaging sprocket mounted on a drive shaft, a motor, first gear means having an intermittently rotated output for a continuously rotated input, first clutch means for selectively connecting and disconnecting said first gear means between said motor and said drive shaft, said motor intermittently rotating in one direction said drive shaft through said first gear means when said first clutch means is connected for intermittently pulling the film through the gate, second gear means having a continuously rotated output for a continuously rotated input, and second clutch means for selectively connecting and disconnecting said second gear means between said motor and said drive shaft, said motor continuously driving in an opposite

direction said drive shaft through said second gear means when said second clutch means is connected for pushing the film continuously back through the gate during rewind of the film.

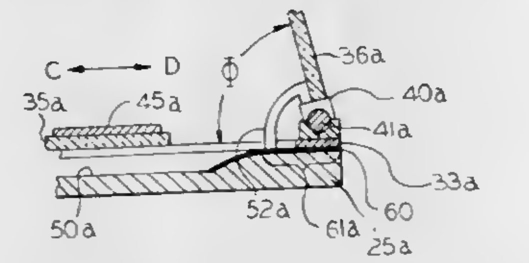


4,105,312

CARRIAGE MECHANISM FOR MICROFICHE READER

Thomas R. Wells, Des Plaines, Ill., and Theodore E. Dahleo, West Beod, Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 28, 1976, Ser. No. 700,676
Int. Cl.^{2} G03B *23/08*
U.S. Cl. 353—27 R 7 Claims



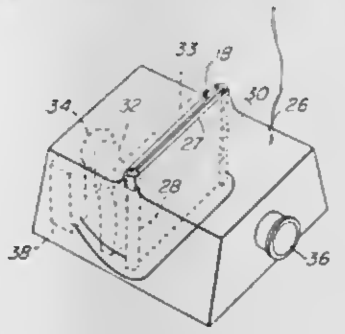
1. A microfiche film carrier comprising means for enabling said carrier to travel over a mutually perpendicular set of tracks with a rectilinear movement, each of said set of tracks including a spaced parallel pair of rails, a pair of spaced parallel glass plates mounted on said carrier to travel with said carrier over said rectilinear movement, one of said glass plates being hinged at one end to move between raised and lowered positions, operator finger means rigidly attached to said hinged glass plate and effective at one extremity of said movement for automatically lifting one of said glass plates, and cam means intermediate said rails forming one set of tracks with an inclined plane followed by a flat horizontal guide portion for guiding and directing said operator finger on said glass plate as it raises and lowers on said hinge, said inclined plane cooperating with said finger to raise said glass plate, said flat horizontal guide portion cooperating with said operator finger for enabling said glass plate to stand in a stable, substantially upright, slightly leaning position, with the center of gravity resting near said hinge, said glass plate standing stably as it moves along the entire length of the flat horizontal guide portion independently of the exact amount of said movement near the extremity of said movement, whereby the weight of said leaning plate rests upon and is supported by said hinge and the tip of said finger with the center of gravity of said glass plate resting close to said hinge, and on the side of said hinge where said finger is located.

4,105,313

DUAL PURPOSE PHOTOGRAPHIC DISPLAYS

Gerald Altman, 41 Westminster Rd., Newton, Mass. 02159

Division of Ser. No. 468,441, May 9, 1974, Pat. No. 3,989,356, and a continuation-in-part of Ser. No. 446,274, Feb. 27, 1974, which is a continuation-in-part of Ser. No. 225,187, Feb. 10, 1972, Pat. No. 3,892,884, which is a continuation of Ser. No. 734,039, Jun. 3, 1968, abandoned, which is a continuation-in-part of Ser. No. 655,714, Jul. 6, 1967, abandoned. This application Oct. 27, 1976, Ser. No. 736,249
Int. Cl.^{2} G03B *21/06*
U.S. Cl. 353—65 21 Claims



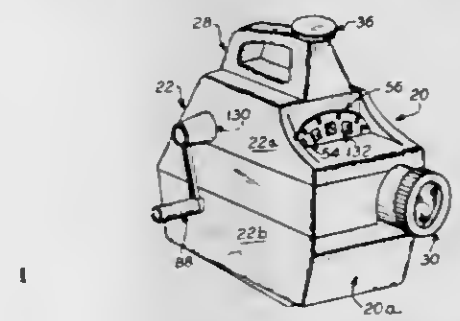
1. A photographic projection system comprising light source means, projection station means defining a projection field, mechanical guide means for constraining motion of a photographic print into and out of said projection field, said photographic print having visual image stratum means and light control stratum means, said light control stratum means being chaaracterized by incremental discontinuities in refractive index at a first energy level by which diffuse scattering of visible light occurs and by incremental continuity in refractive index at a second energy level by which specular transmission of visible light occurs, said photographic print when outside of said projection system being at said first energy level whereby said visual image stratum is observable in scattered light, energy control means for imparting to said photographic print, when in said mechanical guide means, said second energy level whereby said light control stratum is substantially clear, and objective lens means for focusing light emanating from said light source means and directed through said projection field on a viewing screen.

4,105,314

HAND CRANK GENERATOR-POWERED ROTARY SLIDE PROJECTOR

Alexander W. Hughes, Jr., 19 Wardell Circle, Oceanport, N.J. 07757

Filed Jan. 18, 1977, Ser. No. 760,294
Int. Cl.^{2} G03B *21/20, 23/10;* H02K *7/10*
U.S. Cl. 353—85 10 Claims



1. In a projector having a housing, a frame mounted in said housing, said frame having means therein defining an upwardly open pocket for removably receiving a transparency carrying disc therein having perforations for cooperation with feeding means and having evenly spaced circumferentially arranged transparencies mounted therein, a feeding lever pivotally mounted in said frame for partial rotation about an axis coincident with the center of the disc and having means thereon for

successively engaging the perforations in said disc to bring the transparencies mounted in said disc to a desired position, said housing further comprising a source of illumination mounted therein for enabling illumination of said transparency when it is in said desired position and a lens means for projecting an image of said illuminated positioned transparency, said frame being interposed between said illumination source and said lens means, said projector further comprising means on said frame defining a track extending in a plane parallel to the plane of the received disc, said feeding lever comprising a slide, said slide comprising a portion engaged in said track whereby said slide is guided for sliding movement from end to end of said track, said slide further comprising an engageable portion projecting from said frame whereby said slide may be depressed toward the lower end of said track, spring means for returning the slide to the upper end of said track when said slide is engaged and depressed and subsequently released, and means interconnecting said lever and said slide for translating movement of said slide into rotary movement of said lever to thereby rotate said disc to a different desired position for interposing a different one of said transparencies in said desired position between said illumination source and said lens means for projecting said different transparency; the improvement comprising hand crank operated generator means mounted in said housing, said generator means comprising a stator coil means capable of having a current induced therein and a magnetic rotor means rotatable within said stator coil means for producing a changing magnetic field across said stator coil means due to said rotation for inducing said current therein, said stator coil means being electrically connected to said illumination source for providing said induced current to said illumination source for enabling said illumination of said positioned transparency, crank means mechanically connected to said rotor means for enabling said rotation thereof, and gear means drivingly connected to said rotor means for enabling simultaneous rotation therewith in response to rotation of said rotor means by said crank means, said gear means having a finger means mounted thereon for simultaneous rotation therewith, said finger means bearing gear means being mounted in said housing with said finger means being in mechanical alignment with said slide means engageable portion for depressing said slide upon engagement therewith as said gear means is rotated, said slide means engageable portion having means thereon for enabling said finger means to disengage from said slide means during rotation of said gear means as said slide means approaches the lower end of said track whereby said spring means may return said slide to said upper end for subsequent reengagement by said finger means upon completion of a cycle of rotation of said gear means for changing said positioned transparency, said rotation of said crank means both providing current to illuminate said positioned transparency as well as changing said positioned transparency to a different one of said transparencies.

4,105,315
MICROFILM READING SYSTEM

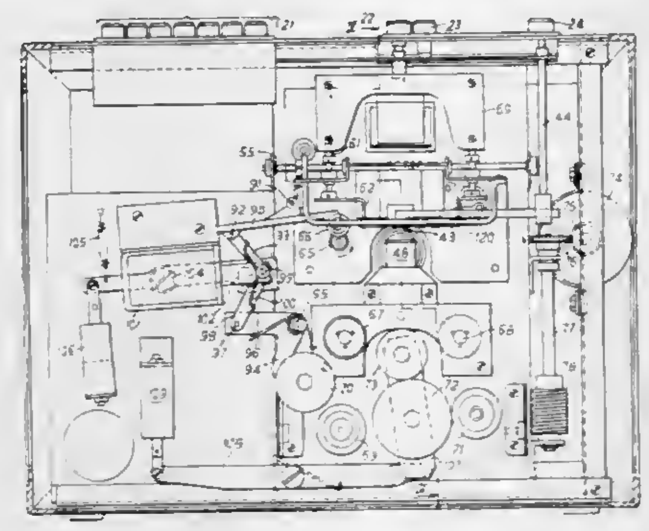
Ian Duncan Fraser, Delfield, Funtington, Chichester, Sussex PO18 96 G, England

Filed Oct. 12, 1976, Ser. No. 731,438

Int. Cl.² G09B *17/00;* G03B *1/22, 1/32*

U.S. Cl. 353—95 **5 Claims**

1. A microfilm reading system comprising a microfilm record in which reading material is arranged in one or more columns of lines of characters of no more than 26 characters per line and wherein there are illustrations at intervals interspersed with the lines of characters, viewing apparatus having an optical magnification system arranged to present an enlarged image of part of the length of a column to the reader in the appropriate orientation for reading, a drive system for imparting movement to the microfilm relative to the optical magnification system comprising first and second drive means, said first drive means operating to advance the microfilm record continuously and uninterruptedly relative to the optical system such as to enable the viewer to read the successive lines without shifting his eyes from line to line and, by virtue of the restricted length of each line, without lateral movement, and said second drive means being operable to rapidly move a illustration into a position for viewing by the optical system, and sensing means operable to sense an illustration as it appears in one of the columns for effecting operation of said second drive means, said second drive means comprising a pull-down device.



4,105,316
FILM STRIP PROJECTION APPARATUS

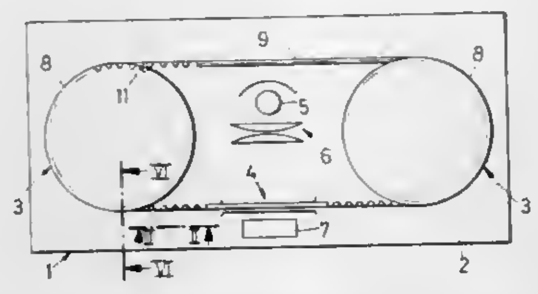
Bernward Söding, Munich, and Reinhard Freisleben, Pöring Post Zorneding, both of Fed. Rep. of Germany, assignors to Soding TV GmbH & Co. Bild & Ton International, Lochham bei Munich, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,797

Claims priority, application Fed. Rep. of Germany, May 10, 1976, 2620573; May 10, 1976, 2620564; May 10, 1976, 7614728; Aug. 30, 1976, 7627084; Aug. 30, 1976, 7627085

Int. Cl.² G03B *23/08*

U.S. Cl. 353—109 **20 Claims**



1. A film strip projector apparatus for the projection of a film strip, comprising:
- a closed substantially circular path formed in said projector apparatus about which said film strip is driven,
- an optical projection system disposed in said projector apparatus having a gate through which said film strip passes,
- said film strip being open-ended and flexible and including longitudinally extending edge portions each including perforations,
- said path including a pair of spaced apart and parallel conveyor belts mounted for circulation,
- the spacing of said conveyor belts being substantially equal to the spacing of said perforated edge portions, and
- said conveyor belts each including at least one lug for engaging said perforated edge portions to drive said openended film strip about said circular path.

4,105,317
CIRCULAR MAGAZINE FOR LINEAR MAGAZINE SLIDE PROJECTORS

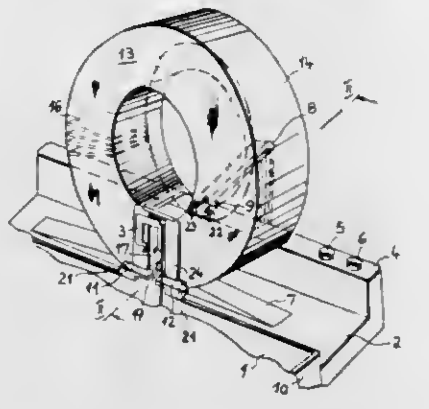
Reinhard Sobotta, Braunschweig, Mascherode, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,099

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640700

Int. Cl.² G03B *23/06;* B65D *85/48*

U.S. Cl. 353—117 **5 Claims**



1. A two-part circular magazine for a slide projector having a channel-shaped magazine guide extending parallel with a projection axis to accommodate a linear magazine, and a lifting ramp arranged in said magazine guide in the region of a slide change plane for lifting slides in a linear magazine to a predetermined height for transverse movement by a slide change device, said magazine including an annular rotor having slide storing compartments and an annular stator enclosing said rotor and having a radial slot for passage of a slide transversely relative to said magazine along a slide change plane, said magazine comprising:
- a. said stator having an exterior formed in the region of said slide passage slot to provide a generally tangential groove opening to said rotor;
- b. said groove having side walls configured to fit opposite sides of said lifting ramp;
- c. said rotor having an exterior positioned directly over the top of said lifting ramp when said magazine is mounted in said magazine guide;
- d. said stator having an inclined surface ascending toward said rotor from the region of said slot; and
- e. said inclined surface extending from beneath said top of said lifting ramp up to the level of an interior surface of said rotor above said lifting ramp.

4,105,318
PINHOLE MICROFICHE RECORDER AND VIEWER

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

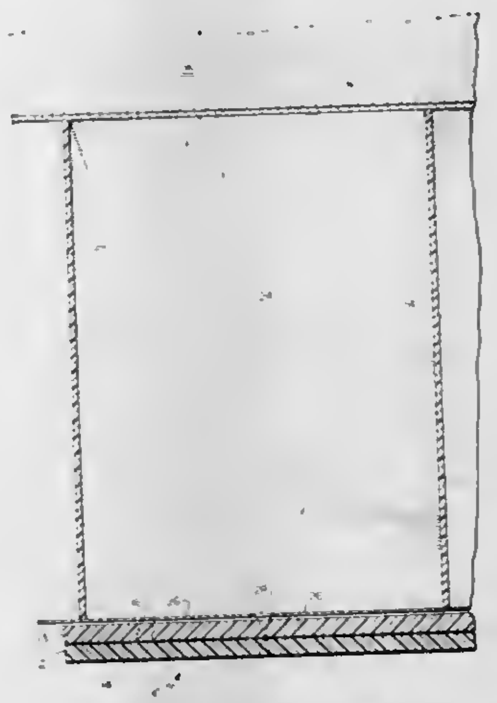
Filed May 30, 1974, Ser. No. 474,795

Int. Cl.² G03B *23/08*

U.S. Cl. 353—120 **3 Claims**

1. A microfiche adapted for use on a micro optical viewer, said microfiche including:
- a. a transparent sheet,
- b. one side of said sheet carrying stored micro optical information distributed over its area,
- c. the other surface of said sheet being opaque except for a plurality of pinholes each of which functions as a lens, said pinholes positioned on a plane parallel to said stored information,
- d. said micro optical information defined by a plurality of information sets, each information set corresponding to a unique macro scene, each information set occupying dispersed areas interlaced with but distinct from the dispersed areas occupied by any other information set, each unique macro scene corresponding to a unique set of pinholes, each of the dispersed areas of an information set having its own pinhole and being in optical correspondence therewith,

wherein each of the dispersed areas of an information set is itself defined by a triad of spaced-from-each-other optical images, each of said spaced-from-each-other optical images being in optical alignment with a pinhole, each of said pinholes of each said triad being of different radii corresponding to different optical wavelengths.



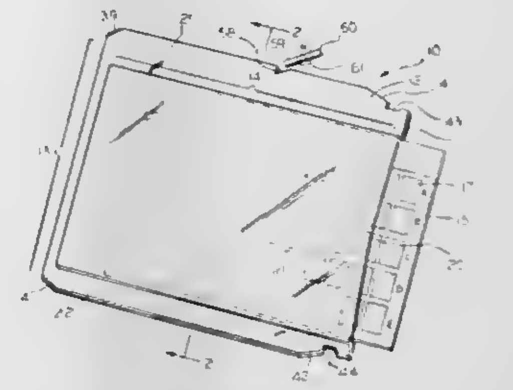
4,105,319
MICROFICHE CARRIER

Thomas R. Wells, Des Plaines, and Robert L. Kearney, Northbrook, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 532,798, Dec. 16, 1974, Pat. No. 4,006,980. This application Jun. 28, 1976, Ser. No. 700,284

Int. Cl.² G03B *21/00, 23/12*

U.S. Cl. 353—120 **21 Claims**

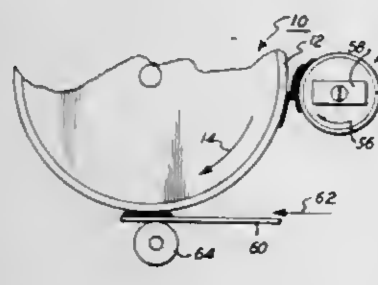


1. A microfiche film carrier for use in a library file which supports a plurality of microfiche carriers in a spaced parallel side-by-side relationship, said carrier comprising: frame means having therein a window area with dimensions substantially corresponding to dimensions of a microfiche film, said carrier frame having opposed leading and trailing edges and side rails for supporting said microfiche when in a library file, means for mounting at least a microfiche film within said window area, the edges of said side rails forming areas to support said microfiche without thickness binding between said carrier and its adjacent supporting structure in a library file, and a concave contour means formed in the width dimension of said carrier on at least one of said leading and trailing edges for guiding and

directing said carrier as it is inserted into or extracted from a library file.

4,105,320
TRANSFER OF CONDUCTIVE PARTICLES

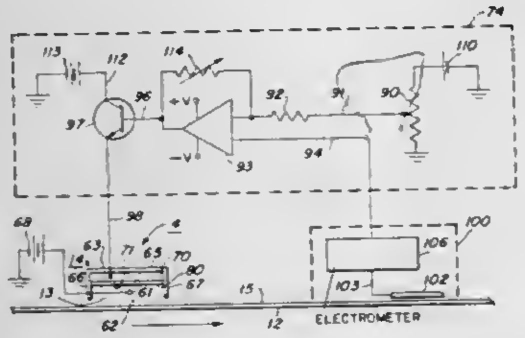
Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 5, 1977, Ser. No. 757,106
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 TR **16 Claims**



1. A reproducing machine, including:
a particle receiving member;
means for depositing charged conductive particles on said receiving member in image configuration wherein said depositing means deposits the charged particles on said receiving member in a first time interval; and
means for transferring the particles from said receiving member to a copy sheet in a second time interval less than the first time interval so as to control the charge exchange between the particles and the sheet to prevent repulsion of the particles from the sheet during the transfer of the particles thereto.

4,105,321
ILLUMINATED CHARGE CONTROL SYSTEM FOR XEROGRAPHIC MACHINES

Charles J. Urso, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 27, 1976, Ser. No. 736,033
Int. Cl.² G03G *15/02*
U.S. Cl. 355—3 CH **2 Claims**

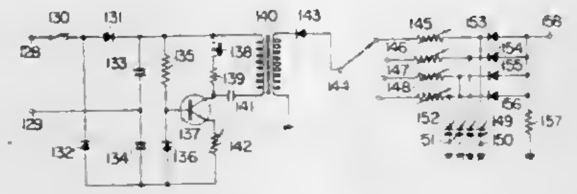


1. In an electrostatic type reproduction machine for producing copies of an original, the machine having a photoreceptor, means for charging the photoreceptor in preparation for imaging, exposure means for exposing the charged photoreceptor to the original whereby to create a latent electrostatic image of the original on the photoreceptor, developing means for developing the latent electrostatic image on the photoreceptor, and transfer means for transferring the developed image to a sheet of copy material, the combination comprising:

a. means for generating a charge level signal reflecting the charge level of said photoreceptor following charging by said charging means;
b. light means for illuminating said photoreceptor to reduce the charge level of said photoreceptor, said light means reducing the charge level on said photoreceptor in proportion to the intensity of the light produced by said light means; and
c. control means for regulating the intensity of said light means in response to said charge level signal, said light means comprising a constant light source, and variable light conducting means disposed between said light source and said photoreceptor, said control means including means for controlling the light transmissitivity of said light conducting means in response to said charge level signal.

4,105,322
ELECTROPHOTOGRAPHIC COLOR PROCESS

Motoichiro Inoue, Yokohama; Tsuyoshi Shiga, Urawa, and Nobuo Kasahara, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 10, 1976, Ser. No. 722,027
Claims priority, application Japan, Sep. 12, 1975, 50-111327; Sep. 12, 1975, 50-111328
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **2 Claims**

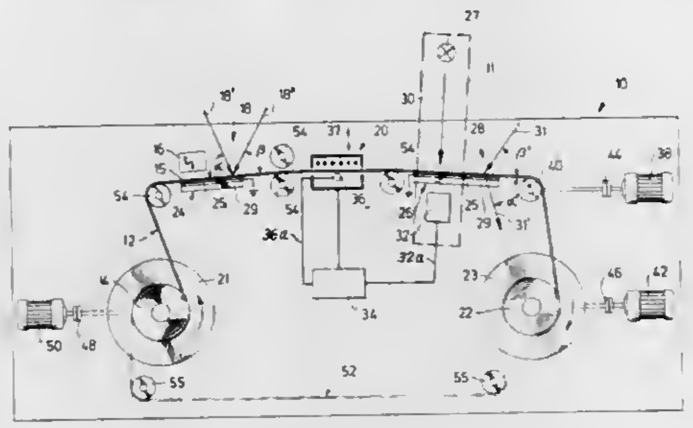


1. An electrophotographic process comprising the steps of:
(a) uniformly charging the surface of a photosensitive member;
(b) irradiating said surface with actinic radiation which is passed through a color separation filter in accordance with the image of an original for forming an electrostatic latent image of said origina on said surface, which latent image corresponds to the actinic rays passing through the color separation filter;
(c) bringing an electrostatic latent image receptive sheet into contact with the surface of the photosensitive member on which the latent image is formed for transferring the latent image thereon onto the receptive sheet;
(d) developing the transferred latent image with a developer which is chosen in dependence on the filter used in step (b); and
(e) repeating the described series of steps with different filters and with developers of corresponding colors, for producing a color copy; wherein the improvement comprises:
(f) applying a bias voltage containing a high frequency component across the photosensitive member and the receptive sheet during each of the repeated steps of transferring the latent image from the photosensitive member to the receptive sheet; and
(g) sequentially switching the high frequency component of the bias voltage to an optimum frequency for each color by selectively applying said bias voltage across respective capacitive time constant circuits during each repeated step for uniformly transferring each of said latent images.

4,105,323
PROCESS AND APPARATUS FOR RECORDING DEFORMATION IMAGES

Roland Moraw, and Günther Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Mar. 12, 1976, Ser. No. 666,406
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2510910
Int. Cl.² G03G *15/00*
U.S. Cl. 355—9 **11 Claims**

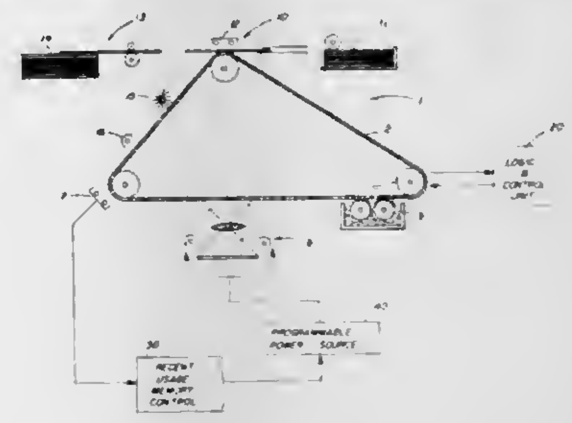
1. Apparatus for recording images by deformation on the surface of a recording material including a flexible transparent support layer, and a photoconductive thermoplastic recording layer, comprising
(a) charging means for electrostatically charging the recording material;
(b) exposure means for applying an image to the recording medium;
(c) transport means for continuously transporting the recording material from a supply reel to a take-up reel via, in succession, said charging means and said exposure means;
(d) first guide means for stabilizing the recording material during the transport thereof through said exposure means, said first guide means including a stationary conductive layer having a given potential and arranged opposite said charging and exposure means, whereby the electrostatically charged recording medium is drawn by attraction toward said conductive layer;
(e) second guide means for stabilizing the recording material against lateral displacement during the transsport thereof between said supply and take-up reels, said second guide means including guide roller means over which the recording material is transported, at least one of the guide roller means including a pair of spaced continuous lateral flanges between which the recording material is transported;
(f) stationary third guide means for stabilizing the recording material during the transport thereof between said second guide means and said take-up reel, said third guide means including a conductive layer having a given potential, whereby the electrostatically charged recording material is attracted to the conductive layer of said third guide means during continuous transport of the recording material thereby; and
(g) means supporting each of said first and third guide means for adjustment relative to the recording material, said support means including first support means for pivoting one of said first and third guide means about an axis parallel with the recording material and normal to the direction of transport of said recording material, and second support means supporting said first support means for transport in a direction normal to the recording material.



4,105,324
ELECTROPHOTOGRAPHIC APPARATUS HAVING COMPENSATION FOR REST-RUN PERFORMANCE VARIATIONS

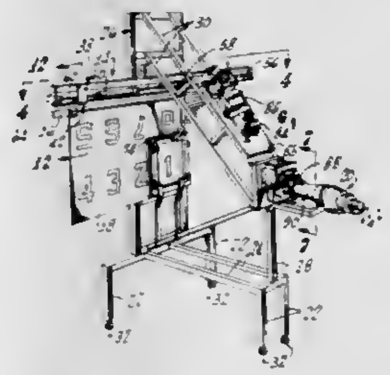
Kenneth F. Seil, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 621,914, Oct. 14, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,534
Int. Cl.² G03G *21/00*
U.S. Cl. 355—14 **6 Claims**

1. In electrophotographic apparatus of the type using a photoconductive insulative member and including charging, exposing and developing stations which are energized and function cyclically during a usage period in production of copies and which are non-energized during non-usage periods between copy production; the improvement comprising:
(a) means responsive to the cyclic function of said apparatus for storing the usage/non-usage history of said apparatus during a recent interval preceding a given copy cycle;
(b) means, responsive to said storing means, for providing an adjustment signal in accordance with the rest-run/speed-variation characteristic of said apparatus; and
(c) means for adjusting the function of at least one of said stations during said given copy cycle in response to said adjustment signal to compensate for an increase in apparatus speed during a usage period and decrease in apparatus speed after a non-usage period.



4,105,325
MICROPLATE SYSTEM

John D. McCollough, 10715 Rochester Ave., Los Angeles, Calif. 90024
Filed May 18, 1977, Ser. No. 798,123
Int. Cl.² G03B *27/44*
U.S. Cl. 355—54 **15 Claims**

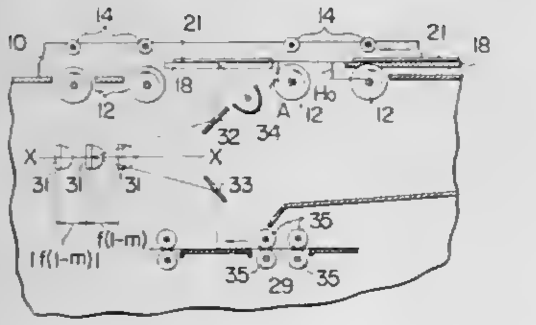


1. An apparatus for use in making printing plates comprising:
a support;
hanger means for holding a flat sheet of photo-sensitive material;
track means for attaching said hanger means to said support while permitting horizontal and vertical movement thereof;
first transport means for moving said hanger means along said track means in a first direction in discrete steps of predetermined length, said first transport means comprising a plurality of fluid-actuated telescoping cylinders connected end to end;
second transport means for moving said hanger means along said track means in a second direction perpendicular to said first direction, whereby said hanger means and said sheet are capable of assuming a plurality of predetermined exposure positions in response to actuation of said first and second transport means, each of said exposure positions corresponding to a single page of a book in accordance with a signature format;
control switch means for actuating said cylinders of said first

transport means and for actuating said second transport means; and
projection means for enlarging and projecting a prerecorded image from a transparency onto an exposure area of said sheet comprising a light source, a condenser lens, and an image forming lens.

4,105,326
ELECTROPHOTOGRAPHIC COPYING MACHINES OF VARIABLE MAGNIFICATION

Hideaki Mochimaru, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Aug. 9, 1976, Ser. No. 712,713
Claims priority, application Japan, Aug. 9, 1975, 50/97026
Int. Cl.² G03B *27/52, 27/70*
U.S. Cl. 355—55 **2 Claims**

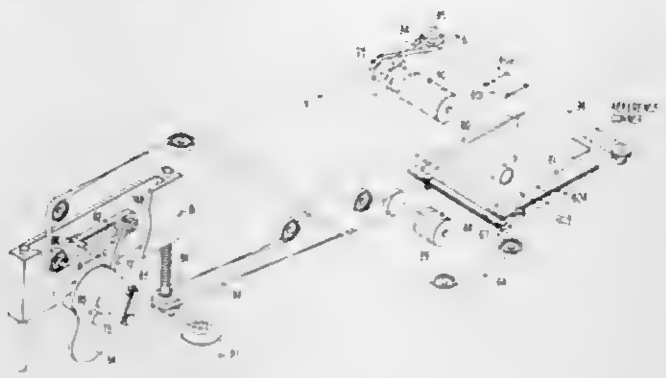


2. An electrophotographic copying machine of the variable magnification type comprising:
an optical system; and
means for moving both an original and a photosensitive member with respect to said optical system during which an image of the original is focussed onto the photosensitive member through the optical system;
the improvement wherein said moving means comprises:
conveyor means for transporting originals comprising a plurality of conveyor shafts disposed in parallel relationship to each other and all driven for rotation at a selected angular velocity, each of the shafts being formed with a plurality of portions of different diameters; and
carrier means for carrying the originals on said conveyor means and comprising:
a plurality of carriers, each comprising a receptacle means for receiving an original thereon; and
respective carriers having means thereon for supporting the carried originals at a respective distance from the optical system in accordance with a respective magnification, said supporting means comprising a pair of guide members respectively attached to opposite sides of said receptacle means, and each guide member comprising an elongated member having means thereon for cooperatingly engaging said conveyor means for transportation thereby, said cooperatingly engaging means comprising means for engaging a respective diameter portion of said conveyor shafts.

4,105,327
MULTIPLE REDUCTION INDICATORS FOR CONTINUOUSLY VARIABLE REDUCTION COPIER MACHINES

David Kent Gibson; Myrl J. Miller, both of Boulder, and Spencer Allan Snell, Lyons, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 9, 1976, Ser. No. 749,137
Int. Cl.² G03B *27/36, 27/38*
U.S. Cl. 355—59 **5 Claims**

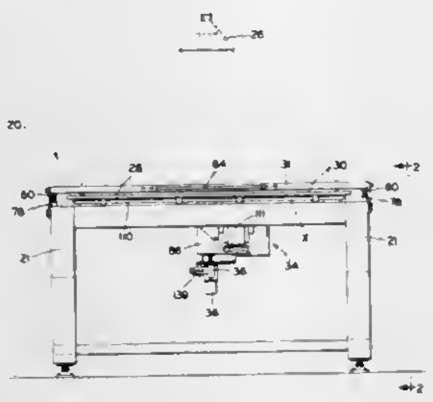
1. A document copier machine capable of continuously variable reduction of documents to a plurality of copy paper sizes, comprising:
a glass platen upon which said document to be copied is placed;
an optics system for directing illumination from said document to produce an image thereof for transfer to a selected size of copy paper;
a plurality of sets of operator-viewable, movable reduction indicators, each set associated with a particular copy paper size; and



an optics positioning system including means for adjusting the position of the multiple sets of indicators to frame areas of said glass platen, and including means for adjusting said optics system to provide an image of the framed areas of said glass platen in a size approximating the associated copy paper size,
whereby the operator can adjust the position of said indicators to achieve a copy of the document.

4,105,328
METHOD OF AND APPARATUS FOR MANIPULATING LINE WEIGHT IN AN IMAGE

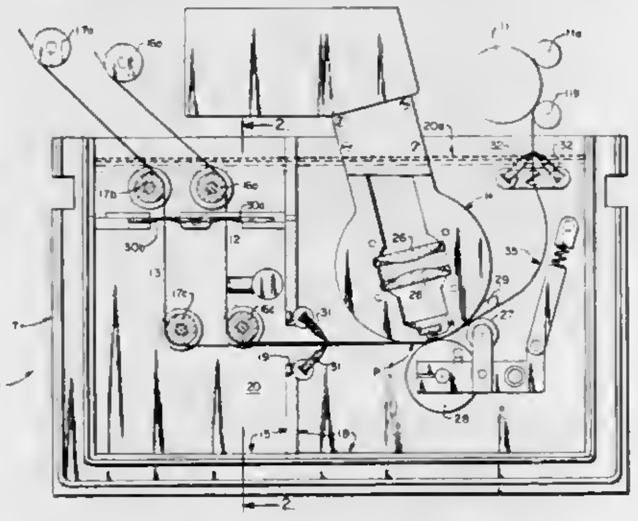
Joe R. Wasson, Boulder Creek; Joseph R. Pressley, Menlo Park; Robert W. Baker, Newark; Joseph H. Fairaizl, San Jose, and Richard J. Zorker, Santa Clara, all of Calif., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Jun. 29, 1976, Ser. No. 700,701
Int. Cl.² G03B *27/68, 27/02*
U.S. Cl. 355—78 **16 Claims**



1. An apparatus for precisely manipulating line weight in an image, comprising:
first means including a stationary frame member for supporting an image carrier;
second means including a mobile table for supporting a light-sensitive film parallel to and adjacent said image carrier;
third means for causing relative orbital movement between said film and said image carrier to cause uniform and undistorted spreading of image lines projected onto said film during an exposure as a result of an integral stepwise change of orbital diameter of said orbital movement, said third means including a horizontal platform supporting said mobile table, rotary bearing means being disposed between said table and said platform to permit rotation of said platform relative to said table; and rotor means for orbiting said table by rotating said platform about an axis of rotation thereof, a displacement of said axis of rotation of said platform with respect to an axis of rotation of said rotor means being determinative of orbit diameter;
restraining means for preventing rotation of said mobile table during rotation of said rotor means, said restraining means including first shaft means secured to said table; second shaft means secured to a stationary support, said second shaft means being orthogonal to said first shaft means; and a carriage disposed between and maintained in contact with said first and second shaft means, movement of said table being thereby limited to rectilinear movement; and
stepping motor means for controlling said stepwise change of orbital diameter to occur in a linear manner.

4,105,329
TOTAL IMMERSION TRANSFER OF PHOTOGRAPHIC IMAGES BETWEEN SPROCKET-REGISTERED STRIPS OF FILM

William D. Carter, Beverly Hills, and Martin S. Mueller, Rancho Palos Verdes, both of Calif., assignors to Carter Equipment Co., Inc., Lawndale, Calif.
Filed Apr. 26, 1977, Ser. No. 791,135
Int. Cl.² G03B *27/02, 27/10, 27/20*
U.S. Cl. 355—91 **15 Claims**

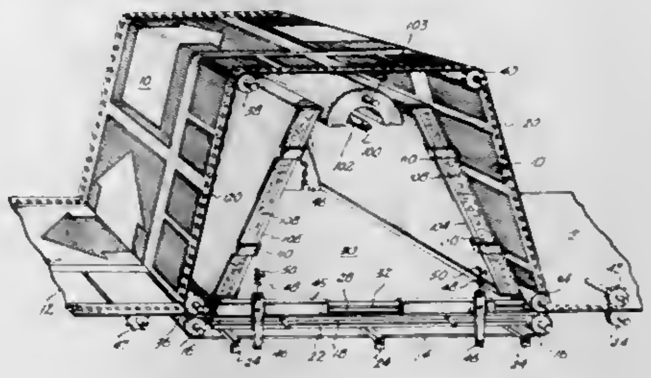


2. The method of claim 1 which includes the additional step of continuously wiping the optical surfaces of both strips of film, after they are submersed within the liquid and before their arrival at the printing sprocket, so as to remove foreign particles and air bubbles therefrom.

4,105,330
PHOTO PRINTING APPARATUS

Richie Conrad Hilton, 2/25 Noble Street, Allawah 2218, N.S.W., Australia
Continuation-in-part of Ser. No. 530,051, May 1, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,420
Int. Cl.² G03B *27/06*
U.S. Cl. 355—102 **7 Claims**

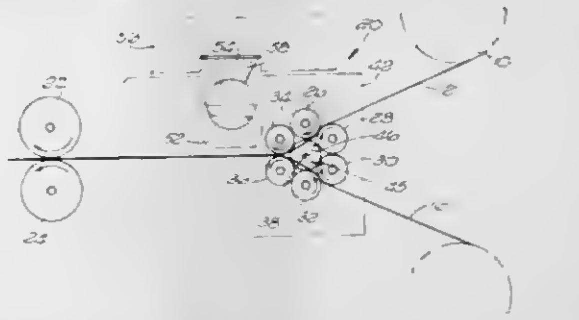
1. Photoprinting apparatus, comprising:
a housing means (20, 22, 24);
an endless carrier band (14) roller-supported in said housing means for unidirectional motion in a fixed plane established by an underlying platen (18, 22);
an endless negative copy band (10) roller-mounted in said frame above said carrier band (14) for unidirectional travel in a closed path, a portion of which is superposed to a carrier band;
rotary means for advancing a strip of photosensitive material (12) interposed between said carrier band (14) and said copy band (10) to form within said frame a sandwich assembly, said means being operable to simultaneously advance the elements of said sandwich assembly in said fixed plane;
downward-acting weighted transparent means (28, 30) within said frame and bearing on said sandwich to provide intimate contact between the elements of said sandwich above said platen (18, 22); and



a source of intense light rays above said transparent means operable to expose said photosensitive material (12) through said weighted transparent means and said negative copy band (10) to impress said photosensitive material (12) with photographic images.

4,105,331
VACUUM HEAD FOR FILM

Charles E. Wallace, Palos Verdes, and Donald J. Farmer, Pacific Palisades, both of Calif., assignors to Extek Microsystems, Inc., Van Nuys, Calif.
Filed May 26, 1977, Ser. No. 800,764
Int. Cl.² G03B *27/10, 27/02*
U.S. Cl. 355—103 **10 Claims**

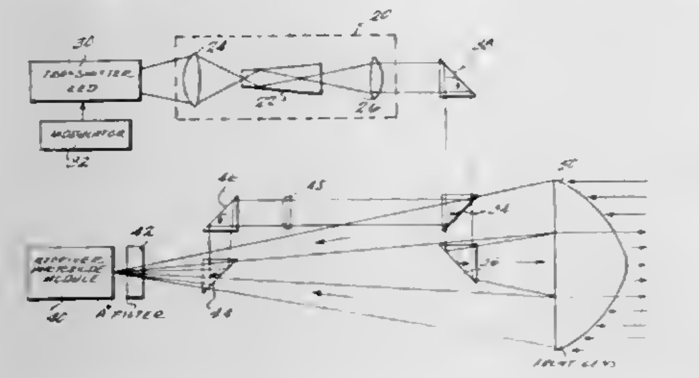


1. In an apparatus for copying of transparent film images from a moving continuous strip master to a moving continuous strip duplicate, including an exposure zone containing a light source for irradiating said master and said duplicate and means for positioning said master and duplicate during said continuous movement, the improvement according to which said positioning means comprises:
a housing;
means for insertion of said master into said housing;
means for insertion of said duplicate into said housing;
means for removal of said master and duplicate from said housing with confronting longitudinal surfaces of said master and duplicate in substantially continuous contact; and,
means for accomplishing relatively low pressure within said housing, both between said confronting surfaces and on surfaces of both said master and said duplicate which are opposite said confronting surfaces, compared to pressure outside said housing whereby as said master and duplicate pass from said housing, non-sliding contact between said confronting longitudinal surfaces is maintained by the pressure outside said housing on said surfaces at least until said contacting surfaces pass through said exposure zone.

4,105,332
APPARATUS FOR PRODUCING A LIGHT BEAM HAVING A UNIFORM PHASE FRONT AND DISTANCE MEASURING APPARATUS

Walter Hohne, Lewisburg, and Robin H. Hines, Tullahoma, both of Tenn., assignors to Precision International, Inc., Tullahoma, Tenn.

Filed Mar. 14, 1977, Ser. No. 777,441
Int. Cl.^{2} G01C *3/08;* G02B *5/14*
U.S. Cl. 356—5 7 Claims



1. An apparatus for measuring the distance between the apparatus and a remote target comprising:

a source of light;

an optical transmitting system including a tube for receiving at an input light from said diode within a given solid angle and an output, said tube having internal light reflecting surfaces which diverge from each other in the direction from input to output so that light entering at greater than a predetermined angle is reflected from said surfaces to minimize the non-uniform phase front, and increase the power;

means for modulating the light emitted from said diode;

photosensitive means for producing an electrical signal in response to incident light;

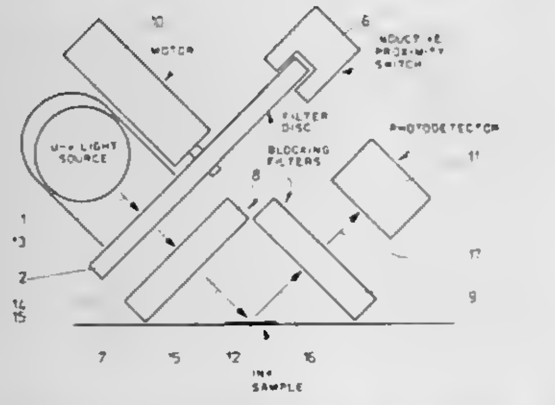
means for directing light from said tube to said target and directly to said photosensitive means and for directing light reflected from said target to said photosensitive means; and

means for determining said distance by comparing the phase of the signals produced by said photosensitive means.

4,105,333
METHOD OF IDENTIFYING FLUORESCENT MATERIALS

Wittich Kaule, and Gerhard Stenzel, both of Munich, Fed. Rep. of Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Oct. 4, 1976, Ser. No. 729,021
Claims priority, application Austria, Oct. 17, 1975, 7944/75
Int. Cl.^{2} G01N *21/52*
U.S. Cl. 356—85 17 Claims

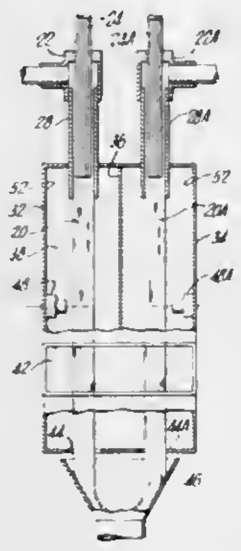


1. In a method of identifying fluorescent materials which are excited into fluorescence with light of respectively differently damped spectral radiant intensities, and in which a wide-band-radiating light source whose spectrum is selectively damped over a wide band and partially is used to irradiate the fluorescent materials, the different radiant intensities emitted by the fluorescent materials are compared, and such comparison is used for identification of a selected fluorescent material; the improvement comprising the steps of providing a neutral filter uniformly damping the radiation of said light source; providing a respective partially absorbing filter damping only the wavelengths necessary to excite the fluorescence of a selected fluorescent material; interposing said filters in the path of light rays directed from said light source onto a sample to be checked for the presence of a selected fluorescent material; measuring the respective intensities of radiation of the sample effected by said neutral filter and by each partially absorbent filter; and converting the measured intensities of radiation into output signals indicative of the presence or absence of the selected fluorescent material.

4,105,334
OPTICAL DETECTOR

Richard A. Halko, Flanders, and John J. Helgl, Short Hills, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 9, 1976, Ser. No. 712,536
Int. Cl.^{2} G01N *21/00*
U.S. Cl. 356—104 17 Claims



1. Apparatus for use in detecting a selected physical property of a flowing liquid stream comprising: a chamber having first inlet means for receiving a sample of said stream and passing said sample as a freely falling stream through said chamber; optic means for internally illuminating the freely falling sample in a substantially axial direction of flow as it passes through said chamber, whereby the light from said optic means will scatter as a function of said property; and means disposed relative to the scattered light for enabling detection of said property of said freely falling stream.

4,105,335
INTERFEROMETRIC OPTICAL PHASE DISCRIMINATION APPARATUS

Noboyoshi Tanaka; Naoki Ayata, both of Yokohama; Mitsuo Takeda; Susumu Matsumura, both of Kawasaki, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

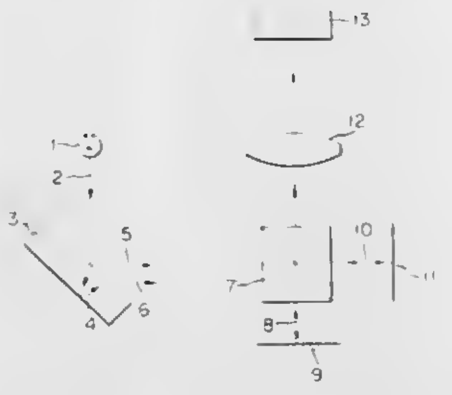
Continuation of Ser. No. 698,681, Jun. 22, 1976, abandoned.
This application Jul. 6, 1977, Ser. No. 813,298
Claims priority, application Japan, Jun. 28, 1975, 50/80635
Int. Cl.^{2} G01B *9/02;* G02B *21/06*
U.S. Cl. 356—108 11 Claims

1. An interferometric optical phase discrimination apparatus comprising:

a source of broadband radiation emitted within a predetermined spectrum for illuminating a specimen having first and second surfaces;

an interferometer to which two wave fronts coming from said first and second surfaces are directed, said interferometer having beam splitter means, tilting means and beam direction means so that said two wave fronts are each split by said beam splitter means, whereafter two of the wave fronts split by said beam splitter means are tilted by said tilting means with respect to the other two wave fronts split by said beam splitter means and all of said four split wave fronts are directed to an interference surface by said beam direction means, whereby an interference pattern appears on said interference surface; and

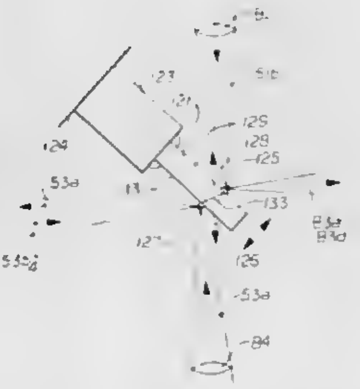
scanning means for scanning said interference pattern and for determining the distance between a predetermined point on the interference pattern and one of peaks of the interference so that the optical phase may be discriminated from said distance.



4,105,336
ELECTRO-OPTICAL DEVICE FOR USE IN IMPROVED INTERFEROMETERS

Charles Ray Pond, 2630 S. 288th, Federal Way, Wash. 98003

Filed May 25, 1976, Ser. No. 690,034
Int. Cl.^{2} G02B *9/02*
U.S. Cl. 356—113 17 Claims



1. A device for use in an interferometer, in which said interferometer an incident signal beam and an incident reference beam are produced by a common source, wherein in operation of the interferometer, the incident signal beam is directed to a target and then reflected therefrom as a returning signal beam and the incident reference beam is transmitted to the target or reference element and reflected therefrom as a returning reference beam, said device comprising:

a. plate-like means of light transmitting material;

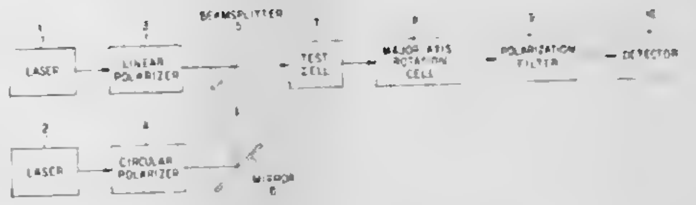
b. means supporting said plate-like means in an operative position in the interferometer, in which position the incident signal beam and the returning signal beam are incident on one exterior face of said plate-like means, and the returning reference beam is incident on the opposite exterior face of said plate-like means; and

c. first and second reflecting means positioned on the opposite exterior faces of said plate-like means in such a manner relative to each other and having such a configuration relative to the size of the areas on said plate-like means over which the incident signal beam, the returning signal beam, and returning reference beam are incident, that (1) when the incident signal beam is substantially centered on said first reflecting means, a substantial portion of the incident signal beam is reflected by said first reflecting means for subsequent transmission to the target, and (2) that when said returning signal beam is substantially centered on said first reflecting means and said returning reference beam is substantially centered on said second reflecting means, a substantial portion of said returning reference beam is reflected from the second reflecting means and combines with a substantial portion of said returning signal beam which is transmitted through said plate-like means, thereby forming a composite beam from which useful information concerning the target may be extracted, the remainders of said incident signal beam and said returning reference beam being so directed as to be substantially prevented from returning to the common source in the interferometer.

4,105,337
SELF-INDUCED ROTATION ELLIPSOMETER

Gary Carl Bjorklund, West Windsor, and Paul Foo-Hung Liao, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1977, Ser. No. 795,740
Int. Cl.^{2} G02F *1/00*
U.S. Cl. 356—114 7 Claims



1. A material detector comprising:

means for producing a first coherent optical beam at a first frequency, linearly polarized at a first angle,

means for producing a second, circularly polarized, coherent optical beam at a second frequency,

a test cell for holding a sample to be tested for the presence of said material,

means for transmitting collinearly said first and second beams through said test cell, whereby said first beam becomes elliptically polarized, having major and minor axes, when a quantity of said material is present in said test cell and the sum of said first and second frequencies is substantially equal to the frequency associated with a two-photon resonance of said material,

a major axis rotation cell containing a medium,

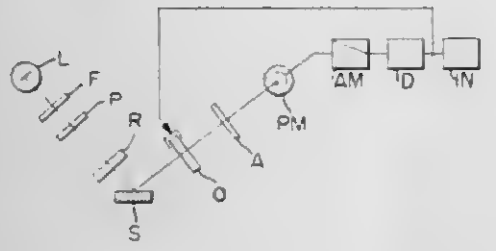
means for extracting said first beam from said test cell and for transmitting said first beam through said major axis rotation cell, whereby said major axis is rotated to a second angle by the interaction of said first beam with said medium, and

a polarization filter having an axis, intercepting said first beam after it has passed through said major axis rotation cell, which axis is oriented substantially at a right angle to said first angle, whereby said first beam is transmitted by said polarization filter only when said material is present in said test cell.

4,105,338
REFLECTION TYPE ELLIPSOMETER FOR MEASURING THIN FILM PHASE DIFFERENCE AND THICKNESS

Noboru Kuroha, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,689
Claims priority, application Japan, May 2, 1975, 50-52539
Int. Cl.² G01J *4/00*
U.S. Cl. 356—118 7 Claims



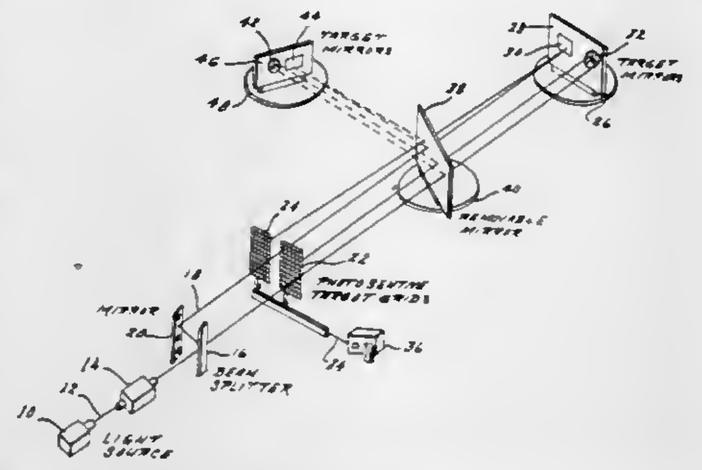
1. A reflection type ellipsometer for measuring the phase difference of a sample, comprising:
a source of monochromatic light;
a polarizer for linearly polarizing light from said light source and passing the linearly polarized light for reflection by the incidence surface of a sample with the azimuth of the polarizer being disposed at an angle of 45° with respect to the incidence surface of the sample;
an analyser disposed on the path of reflected light from the sample and at an azimuth angle of 45° with respect to the incidence surface of the sample, said angles having opposite signs;
phase difference compensating means disposed on the light path between said polarizer and said analyser and at an azimuth angle of 0° with respect to said incidence surface for eliminating a predetermined phase difference from polarized light passing therethrough;
a voltage-responsive double-refractive element on the last-mentioned path for introducing to light passing therethrough a double-refraction phase difference proportional to a control voltage applied thereto;
a photoelectric converter element for photoelectrically converting the analyser output light to an output voltage; and
control means responsive to the output voltage from said photoelectric converter element for applying to said double-refractive element a control voltage which causes said double-refractive element to introduce to light passing therethrough a compensating phase difference corresponding to the amount of deviation of the phase difference of said sample from said predetermined phase difference.

4,105,339
AZIMUTH MONITORING SYSTEM

Theodore E. Wirtanen, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

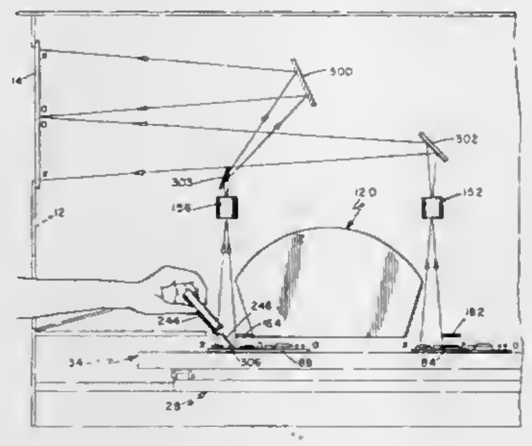
Filed Jan. 24, 1977, Ser. No. 762,079
Int. Cl.² G01B *11/26*
U.S. Cl. 356—152 5 Claims

1. A system for monitoring changes in azimuth between widely separated points comprising: a source for a beam of coherent radiation; means for collimating said beam, beam splitting means for dividing said beam into a plurality of parallel beams; mirror means for reflecting each of said plurality of beams, including a plane mirror for measuring rotational movement and a prismatic reflector for measuring translatory movement; photosensitive target means for receiving each of said beams, and recording means for receiving the output of said target means.



4,105,340
OPTICAL COMPARATOR AND INSPECTION APPARATUS

Paul S. Kempf, 703 Stratford Ct., Del Mar, Calif. 92104
Division of Ser. No. 568,866, Apr. 17, 1975, abandoned, which is a division of Ser. No. 190,187, Oct. 18, 1971, Pat. No. 3,888,593, which is a continuation-in-part of Ser. No. 63,180, Aug. 12, 1970, abandoned. This application Jul. 19, 1976, Ser. No. 706,676
Int. Cl.² G01B *9/08*
U.S. Cl. 356—168 4 Claims

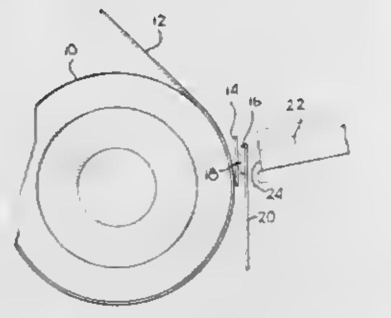


1. The method of making an optical comparison inspection of a master component and a sample component comprising the steps of:
illuminating corresponding portions of the master component and the sample component to be inspected,
moving both said master and said sample components relative to the illumination,
projecting light images of corresponding illuminated portions,
inverting one of said light images relative to the other of said light images,
displaying said light images in edge-abutting relationship so that the images appear to converge or diverge from their common edge depending on the direction of movement of said components.

4,105,341
PRINT ELEMENT HAVING FLEXIBLE CHARACTERS

Donald R. Chivens, Northridge, and Edward C. Kelm, Pasadena, both of Calif., assignors to Lexitron Corporation, Chatsworth, Calif.

Filed Aug. 10, 1977, Ser. No. 823,440
Int. Cl.² B41J *1/32*
U.S. Cl. 400—144.2 9 Claims

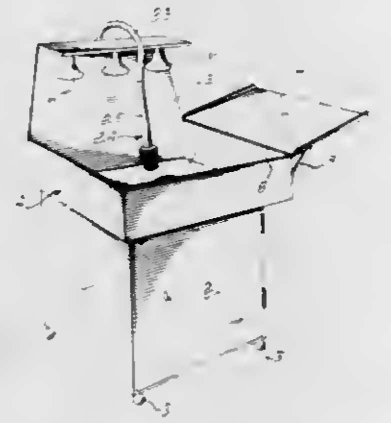


1. An improvement in high speed printing devices comprising a type character and a hammer cooperative with a platen having a curved surface;
said type character having a normally flat printing surface and being sufficiently thin to permit resilient deformation;
said hammer having an impact surface configured such that as the printing surface of the type character comes into contact with the platen the impact surface of the hammer contacts the back side of said type character at two points, near the top and near the bottom, of the type character;
said hammer being operative to propel said flat type character against the curved surface of the platen; and
said curved platen and said hammer being cooperative to deform said flat type character only during printing so as to provide it with a curved printing surface which conforms to the curvature of the platen.

4,105,342
LIQUID DECANTING AND RECYCLING MACHINE

Aimé Plourde, 2é rang Centre, Trois-Pistoles, Canada

Filed Sep. 20, 1976, Ser. No. 725,042
Claims priority, application Canada, Sep. 26, 1975, 236509
Int. Cl.² A46B *15/00;* B08B *3/00*
U.S. Cl. 401—15 9 Claims

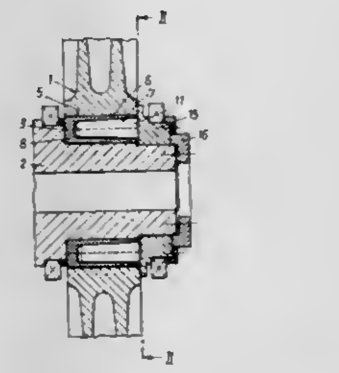


1. A liquid decanting and recycling machine comprising a reservoir for holding a liquid, a pan positioned above the reservoir, a drain operatively associated to the pan and having an outlet tube extending substantially vertically centrally into the reservoir and forming an outlet opening at its lower end adapted to be submerged in the liquid adjacent the bottom of said reservoir, a liquid circulation pump, an inlet for said pump submerged in the reservoir operatively close to the top surface of the liquid in the latter, at least two superposed spaced baffles positioned in the reservoir intermediate said outlet opening and said pump inlet and surrounding said outlet tube, said superposed baffles making liquid communication between portions of the reservoir immediately above and below the respective baffles, the communication of one baffle being at a different radial distance from said outlet tube than the communication of the other baffle, said baffles producing laterally wandering upward flow of the liquid from the outlet opening to the pump inlet, and an outlet conduit connected to the outlet of the pump and extending outwardly of the reservoir to supply a liquid flow above the pan.

4,105,343
RELEASABLE HUB-SHAFT-CONNECTION MECHANISM

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 24, 1977, Ser. No. 762,046
Claims priority, application Austria, Feb. 7, 1976, 730/76
Int. Cl.² F16D *1/06*
U.S. Cl. 403—15 11 Claims



1. In a releasable hub-shaft connection mechanism, in particular to be used in heavy machinery for transmitting strong torques, including: a shaft; a hub surrounding the shaft; at least one bore at the periphery of the shaft having an axis extending parallel to the axis of the shaft and penetrating the shaft and the hub to equal extents; a tubular bushing having a wall with a cylindrical outer face and a conical inner face, which bushing is to be accommodated in the at least one bore; and a tapering bolt axially displaceable in the bushing, the bushing being expandable by said tapering bolt, the improvement comprising:
a closed bottom provided on the end of said bushing having the smallest inner diameter;
a further bore extending through the bottom of the bushing to the outside; and
a pressure medium means for supplying a medium to said further bore under a pressure sufficient to displace the tapering bolt from a clamped position, in which the tapering bolt expands the bushing, into a release position.

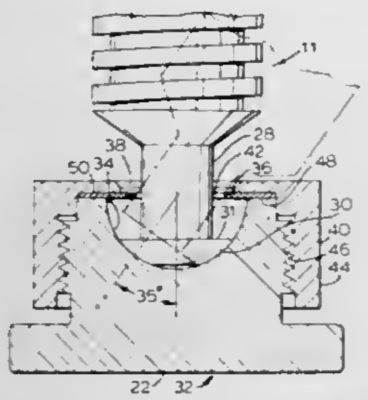
4,105,344
CONNECTOR FOR ATTACHING A SWIVEL PAD TO A SUPPORTING BOLT OF A CLAMP

Harold G. Rousom, Cambridge, Canada, assignor to James Morton Limited, Cambridge, Canada

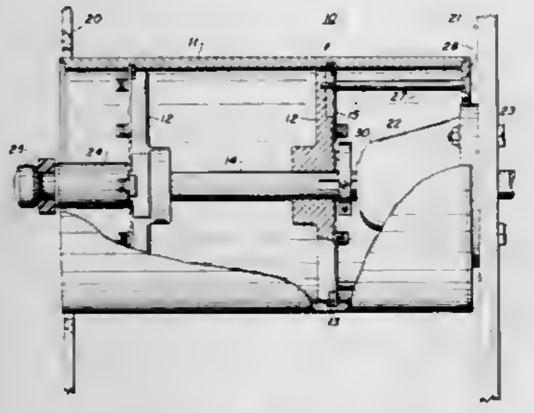
Filed Mar. 10, 1976, Ser. No. 665,461
Claims priority, application Canada, Mar. 11, 1975, 221860
Int. Cl.² F16C *11/06*
U.S. Cl. 403—24 14 Claims

1. A connector for securing a swivel pad to a bolt shank of a clamp comprising a first connecting element formed at one end of said bolt shank and a second connecting element detachably secured to said swivel pad, said first connecting element comprising a head formed at the end of the bolt shank of enlarged cross-sectional area relative to the adjacent portion of the bolt shank having a substantially spherical end surface and truncated adjacent the bolt shank to define a spherical segment having a radial thickness of about $\frac{1}{3}$ to $\frac{1}{2}$ of the radius of the head spherical end surface and an annular shoulder substantially perpendicular to the axis of the shank, the swivel pad having a socket formed in one side thereof for receiving said

bead, said socket having a radius substantially equal to the radius of the head spherical end surface, and said second connecting element comprising means detachably secured to said pad at the entrance to the socket to restrict the cross-sectional area of the entrance to the socket to prevent withdrawal of said head from said socket whereby said shoe assembly can freely pivot and swivel about the end of the shank.



4,105,345
EXPANDABLE PHOTORECEPTOR ENDBELLS
Edward Milton Van Wagner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 27, 1976, Ser. No. 662,060
Int. Cl.² F16B *2/02*
U.S. Cl. 403—24 **11 Claims**



1. In a drum support assembly including a shaft for supporting a drum thereon, the improvement comprising:

(a) a drum having outer and inner surfaces,

(b) web means adapted to be placed on said shaft, said web means comprising a plurality of individually adjustable circumferentially spaced lugs having serrated ends and located radially of said shaft, and

(c) holding means in the surface of said drum, spaced intermediate the ends thereof and operatively connected to said web means whereby said outer surface of said drum and said shaft are maintained relative to one another.

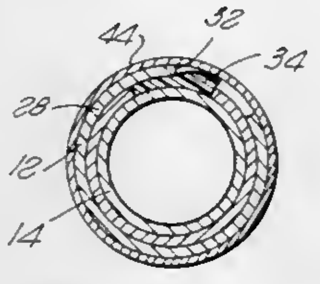
4,105,346
LOCKING SYSTEM FOR TELESCOPING MEMBERS
Ralph J. Gelinas, Northridge, Calif., assignor to Grayson, Gross, Friedman, Phillips and Rasch and Singer, Lewak, Greenbaum and Goldstein, both of Los Angeles, Calif., by Ralph J. Gelinas, a part interest to each
Filed Oct. 3, 1977, Ser. No. 838,928
Int. Cl.² F16B *7/14*
U.S. Cl. 403—104 **4 Claims**

1. A locking sleeve for a pair of telescoping members comprising:

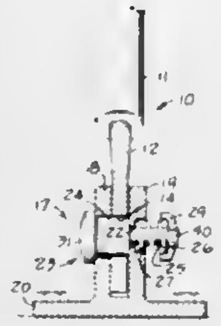
an outer telescoping leg of general cylindrical configuration and an inner telescoping leg, at least a portion of said inner leg being located within said outer leg, at least one of said legs being slidably movable with respect to the other leg along the leg axes, said outer telescoping leg having an aperture therein;

a sleeve positioned about the outer surface of said outer telescoping leg and rotatable about said outer leg, said sleeve having an aperture formed therein;

a brake lug positioned in said apertures and having a tapered thickness about said leg axes, said brake lug tapering from a thickness approximately equal to the thickness of said outer telescoping leg to a thickness greater than said outer telescoping leg, and wherein rotation of said sleeve about said outer leg causes said lug to press against said outer surface of said inner leg and prevents said leg from being movable with respect to each other along the leg axes.



4,105,347
GIN POLE CONNECTOR
Thomas M. Gossage, 39 Seaview, Daly City, Calif. 94015
Filed Apr. 27, 1977, Ser. No. 791,501
Int. Cl.² F16C *11/06*
U.S. Cl. 403—157 **8 Claims**



1. A releasable connector for releasably mounting a support member thereon comprising

a pair of upstanding and laterally spaced first and second support brackets,

means defining a first bore through said first support bracket,

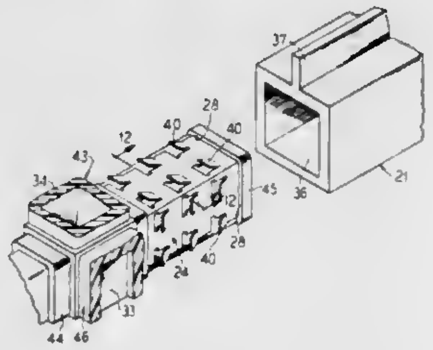
means defining a second bore through said second support bracket which is aligned with said first bore and has an inside diameter which is smaller than the inside diameter of said first bore,

retaining pin means, including a cylindrical first portion closely fitted for sliding movement within said first bore and a cylindrical second portion closely fitted for sliding movement within said second bore and having an outside diameter less than the outside diameter of said first portion, reciprocally mounted in said first and second bores for movement between an attaching condition of operation disposing the first portion of said pin means between said support brackets and a releasing condition of operation disposing the second portion of said pin means between said support brackets, and

biasing means disposed between said pin means and said second support bracket for normally urging said pin means to its attaching condition of operation,

said pin means further comprising a head formed on a first end thereof, adjacent to the first portion of said pin, providing stop means for engaging an outer surface of said first bracket when said pin means is maintained in its attaching condition of operation, an annular face formed on an end of the first portion thereof providing stop means abutting an inner surface of said second bracket when said pin means is maintained in its attaching condition of operation and an annular washer mounted on the second portion of said pin means providing stop means for engaging an outer surface of said second bracket when said pin means is maintained in its releasing condition of operation.

4,105,348
BUILDING COMPONENTS
Edwin V. Anderson, and Joseph A. Mack, both of Glenview, Ill., assignors to AMCO Engineering Company, Chicago, Ill.
Filed Jun. 9, 1977, Ser. No. 805,022
Int. Cl.² F16B *12/20*
U.S. Cl. 403—172 **10 Claims**



1. Building components for constructing frames, enclosures and the like comprising,

hollow edge struts all of uniform cross-section, the ends of each said strut providing a female joint,

interlocking members having a central member with a plurality of legs extending outwardly therefrom and at fixed angles to each other,

said legs each defining a male member adapted to be inserted in said female joints and having locking clip recesses formed therein in at least two adjacent surfaces of predetermined ones of said legs,

said locking clip recesses spanning substantially the entire width of said surfaces of said legs and substantially the entire length thereof so as to form an abutment shoulder adjacent the ends thereof and the central member,

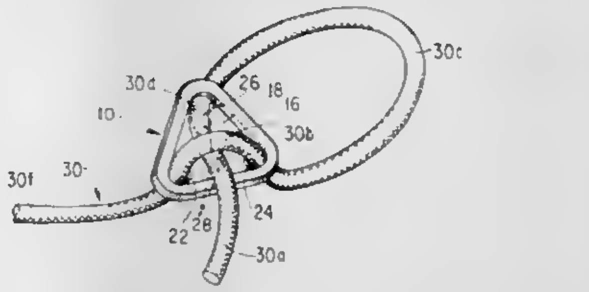
a locking clip having arms corresponding in number to and disposed within said locking clip recesses formed in said legs,

said arms each having a plurality of upstanding locking tabs formed therein and having a length and a width co-extensive with those of said locking clip recesses,

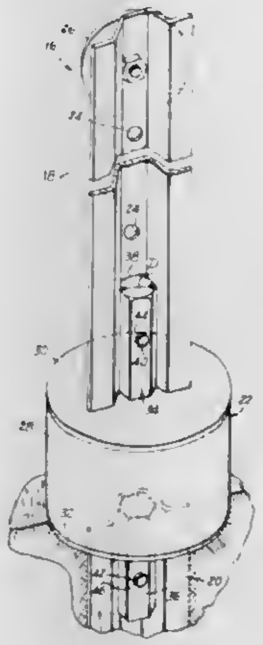
said edge struts each being cut to a specific length and interlocked together by means of said interlocking members to form said frames, enclosures and the like.

4,105,349
MECHANISM FOR FORMING A LOOP IN A ROPE OR THE LIKE
Sam Kupperman, Chicago, and Dennis I. Kupperman, Glenview, both of Ill., assignors to R B Toy Development Co., Skokie, Ill.
Filed Oct. 18, 1976, Ser. No. 733,332
Int. Cl.² F16G *11/00, 11/14*
U.S. Cl. 403—209 **4 Claims**

1. Means for securement to a flexible member, such as a rope or cord or the like, to form a loop in said flexible member with said flexible member having a free end, said means comprising an equilateral triangularly shaped locking plate having an opening therethrough adjacent each corner thereof, an upstanding border surrounding said plate and encircling said openings, a projection on said plate extending upwardly therefrom intermediate said openings, a portion of the flexible member extending over said plate between a pair of said openings and the free end of the flexible member extending through the other opening underneath the said portion of the flexible member and in contact both with the upstanding border and the projection.



4,105,350
SAFETY FLEXURE FOR ARTICULATED CHANNEL-SHAPED ROADWAY POSTS
John Francis O'Donnell, P.O. Box 3314 Glenn Ave. Stations, Peoria, Ill. 61614
Filed Feb. 17, 1977, Ser. No. 769,731
Int. Cl.² E01F *9/01*
U.S. Cl. 403—220 **16 Claims**



1. A safety flexure for an articulated roadway post of the type having a cross-sectional configuration including a substantially U-shaped channel portion, comprising

a substantially cylindrical member of resilient material,

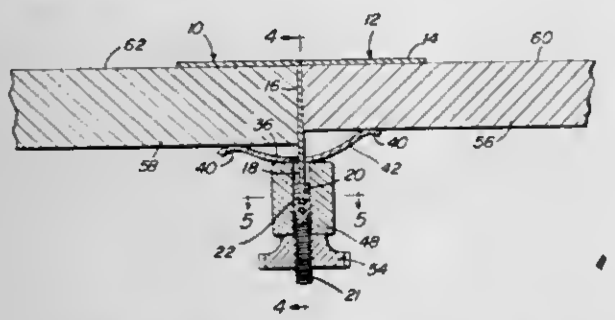
first and second metallic disc-like end caps securely bonded, respectively, to the opposite end faces of said cylindrical resilient member, and

first and second elongate rigid stud members fixedly attached, respectively, to said first and second end caps centrally thereof and perpendicular thereto, at least a portion of each of said elongate stud members being substantially complementary in size and shape with the channel portion of such articulated roadway post and being adapted to be securely but removably attached thereto,

whereby upper and lower portions of such an articulated channel-shaped roadway post may be resiliently interconnected by attachment to respective ones of said first and second stud members.

4,105,351
LEVELING CLAMP

Robert C. Anderson, Baileys Harbor, Wis. 54202
Filed Apr. 4, 1977, Ser. No. 784,624
Int. Cl.² F16B *1/00*
U.S. Cl. 403—312 **9 Claims**



1. A leveling clamp for clamping a pair of panel members together in edge-by-edge relation and with corresponding side faces of said panel members in substantially co-planar relation, said leveling clamp including a first plate, a second plate disposed generally normal and secured to said first plate centrally intermediate opposite marginal portions of said first plate with said second plate projecting outwardly from one side of said first plate and also disposed normal to a path extending between said opposite marginal portions, an elongated abutment member including opposite end portions and an intermediate portion extending between said opposite end portions, said end portions being offset to one side of said intermediate portion, said intermediate portion having a central opening formed therethrough, said second plate including an elongated endwise outwardly projecting mounting portion on its outer end remote from said first plate, said abutment member being mounted on said mounting portion with the latter loosely received through said opening and said one side of said intermediate portion opposing said one side of said first plate for movement of said abutment member on said mounting portion toward and away from said first plate and limited angular displacement of said abutment member relative to said mounting portion about an axis generally paralleling said plates, and adjustable displacement means operatively connected between said mounting portion and said abutment member intermediate portion for adjustable displacement of said abutment member along said mounting portion toward said first plate, said mounting portion including a narrow plate-like base end portion and a threaded shank outer end portion, said opening comprising a slot extending transversely of said intermediate portion through which said base end portion is slidably received, said adjustable displacement means including a thrust nut threaded on said threaded shank outer end portion, said adjustable displacement means also includes a sleeve slidably mounted on said mounting portion outwardly of said abutment member and inwardly of said thrust nut.

4,105,352
CORNER CLIP FOR A WINDOW PRODUCT

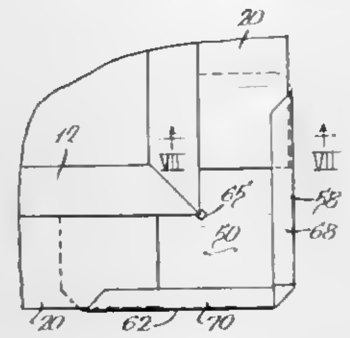
Joe W. Holdiman, Rantoul, Ill., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Jul. 12, 1977, Ser. No. 815,067
Int. Cl.² F16B *2/20*
U.S. Cl. 403—402 **8 Claims**

1. A corner clip connecting outwardly extending fins from a first and a second side of a window product comprising:

a base plate having a first leg integral with a second leg, the first leg defined by an inner and an outer side having a length the axis of which is generally parallel to the first side of the window product, the second leg defined by an inner and an outer side having a length the axis of which is parallel to the second side of the window product;

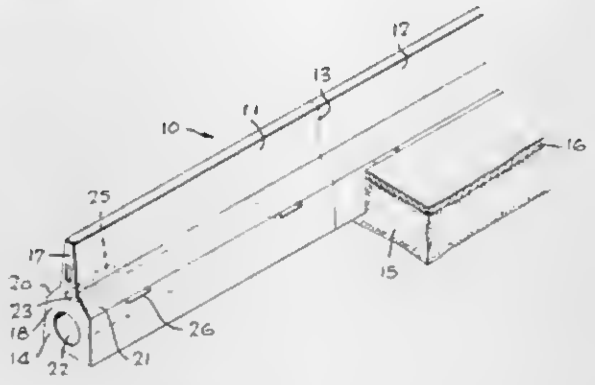
a first and a second lip extending upwardly along the inner sides of the first and the second legs from the base plate for engaging a slot formed between the fins and the first and the second side of the window product;

a first and a second channel extending along the outer side of the first and the second legs, the opening of the first and the second channel facing the first and the second lips, respectively, the channels adapted to receive the outwardly extending fins, the length of the first channel being at least as long as the length of the first lip which is engaged by the slot, the length of the second channel being at least as long as the length of the second lip which is engaged by the slot.



4,105,353
BARRIER WITH INTERNAL DRAINAGE DUCT

C. Gary Bórk, 185 E. Bixby Rd., Long Beach, Calif. 90807, and John E. Kenan, 747 Luton Dr., Glendale, Calif. 91206
Continuation of Ser. No. 622,079, Oct. 14, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,817
Int. Cl.² C01C *11/22*
U.S. Cl. 404—2 **7 Claims**



1. A barrier comprising:

a barrier having a thickened foot portion buried in ground supporting pavement for a roadway, an upstanding portion projecting above the surface of said pavement, and a tapered intermediate portion integrally interconnecting said foot portion to said upstanding portion;

said foot portion provided with an open-ended duct below said pavement and at least one passageway connecting the surface of said pavement to said duct whereby said duct is in communication exteriorly of said foot portion; and

a second open-ended duct provided in said intermediate portion in fixed parallel relationship with respect to said first mentioned duct.

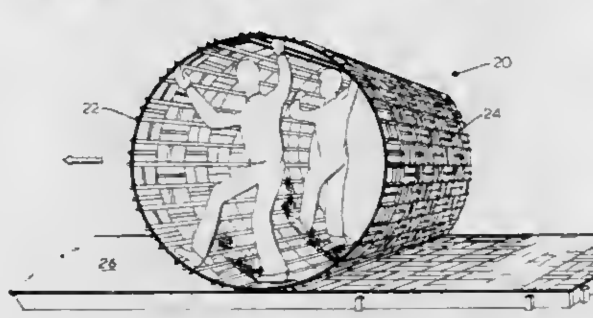
4,105,354
PATTERN FORMING WHEEL FOR UNCURED CONCRETE SURFACES

Bradshaw Bowman, P.O. Box 131, Escalante, Utah 84726
Filed Apr. 27, 1977, Ser. No. 791,574
Int. Cl.² E01C *23/02*
U.S. Cl. 404—72 **18 Claims**

18. In a method of patterning the exposed surface of an uncured concrete slab to the appearance of laid bricks, tiles, cobblestones and the like, including the steps of forming the concrete slab on the ground, floating the exposed surface of said slab to bring up the finest particles of the concrete material, and driving forming blades in a predetermined pattern conforming to the shapes of said bricks, tiles, cobblestones and the like into said exposed surface to a predetermined effective depth, the improvement comprising the steps of:

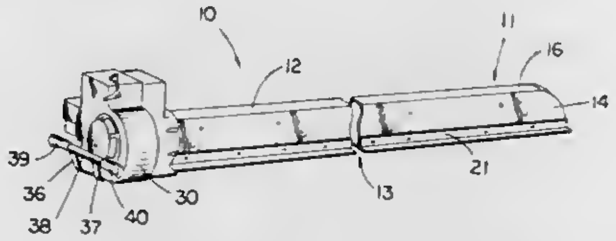
(a) providing said blades continuously along the outer area of a large, axleless generally cylindrical wheel having an inside diameter sufficient to accommodate a worker in a walking position therewithin;

(b) driving said blades into said surface to a desired depth by rotating said cylindrical wheel along a path on said surface to be patterned, said rotation of said wheel resulting from walking movements of said worker within said wheel, said blades being arcuately driven into said surface at the location of tangency of said wheel with said slab, and automatically being withdrawn from said slab after penetration by continued rotation of said wheel.



4,105,355
DEVICE FOR TAMPING AND LEVELING CONCRETE AND THE LIKE

Junior Keith King, R.R. 1, Box 106A, and Lowell W. Warden, 304 3rd St., both of Russiaville, Ind. 46979
Filed Oct. 20, 1976, Ser. No. 734,303
Int. Cl.² E01C *19/38*
U.S. Cl. 404—114 **5 Claims**



1. A device for tamping and leveling concrete and the like which comprises:

an elongated member having a substantially flat bottom surface, said member defining a downwardly-open aperture adjacent an end of said member;

a housing mounted to said member above said member;

a shaft extending parallel to the bottom surface of said member, said shaft being rotatably mounted within said housing;

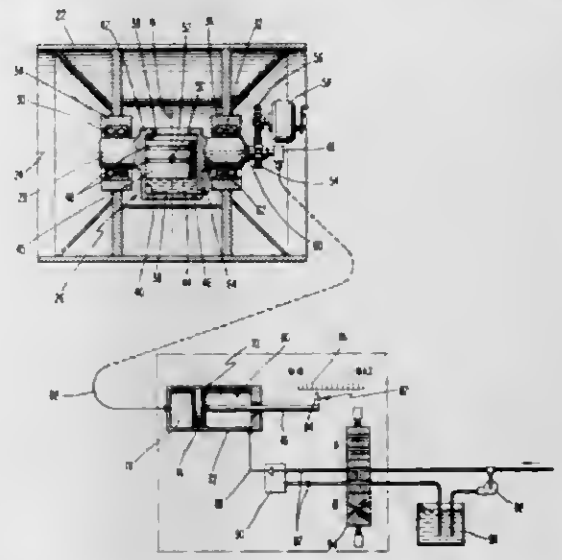
several weights eccentrically mounted upon said shaft at spaced apart locations within said housing;

drive means for rotating said shaft and said weights mounted thereupon, said drive means including a motor connected to and operable to rotate said shaft, the motor being mounted to and supported by said member and positioned adjacent an end of said member; and

handle means for permitting control of the movement of said member along a surface, said handle means including a stake received within and extending downwardly through the aperture defined by said member.

4,105,356
VIBRATORY ROLLER

Houston Lee Loveless, Springfield, Ohio, assignor to Koehring Corporation, Milwaukee, Wis.
Filed May 19, 1977, Ser. No. 798,310
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **7 Claims**



1. In vibratory compacting roller apparatus of the type having a compacting roll rotatable about a generally horizontal axis, shaft means rotatable about said axis at a speed independent of that of said roll, and an eccentric mass rotatable with said shaft means to develop forces for vibrating said roll, said eccentric mass being movable transversely of said shaft means to different positions relative to said axis to provide variable amplitude for vibrations induced thereby, the improvement comprising:

cylinder means rotatable with said shaft means and having a chamber therein for receiving said eccentric mass, said chamber being shaped to permit movement of said eccentric mass radially of said axis from an innermost limit to an outermost limit;

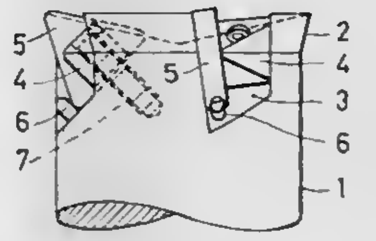
means for conducting fluid to or from an end portion of said chamber to increase or decrease the eccentricity of said eccentric mass during rotation of said shaft means;

motor means connected to said means for conducting fluid such that a constant volume of fluid is located between said eccentric mass and said motor means and so that a change in position of said motor means will be accompanied by a change in radial position of said eccentric mass; and

indicator means connected with the motor means and operable to provide a representation of the position of the eccentric mass between the maximum and minimum eccentricity positions thereof.

4,105,357
CARBIDE INSERT CUTTING TOOL

John Kehl, 2714 Westminster Blvd., Windsor, Ontario, Canada
Filed Apr. 28, 1976, Ser. No. 681,179
Int. Cl.² B26D *1/12*
U.S. Cl. 407—41 **2 Claims**



1. A cutting tool for light final stage cutting and precision

finishing only of metals and other materials in profiling machine operations, capable of continuous uninterrupted cutting in all directions and planes, because it is capable of cutting in an upward or downward direction without requiring the removal of the cutter from the work to change the direction of the cutting; comprising a solid metalic cylindrical shank which terminates at its top with a narrow flared head; a plurality of open top, open front, and equally spaced cavities located at the periphery of said head and extending into the shank, for inserting therein carbide cutters, each of said cavities having two side walls and a rear wall which extends at a downward angle to the wall of said shank to form the floor of said cavity, and a tapped hole in said rear wall extending at a right angle thereto, said side walls diverging in a plane perpendicular to the axis of said cylindrical shank toward the outer surface of said shank, said side walls also diverging in a plane parallel to the axis of said cylindrical shank toward the head end of said tool; a carbide cutter of generally triangular shape with spaced, parallel side walls in each of said cavities; a wedge located within each cavity for holding and locking said carbide cutter within said cavity; a setscrew for fastening said wedge to the cavity, while at the same time wedging the said carbide cutter against one wall of said cavity; and a short pin located in said cavity to aid in locating the said carbide cutter within the cavity, in the proper position for cutting.

4,105,358

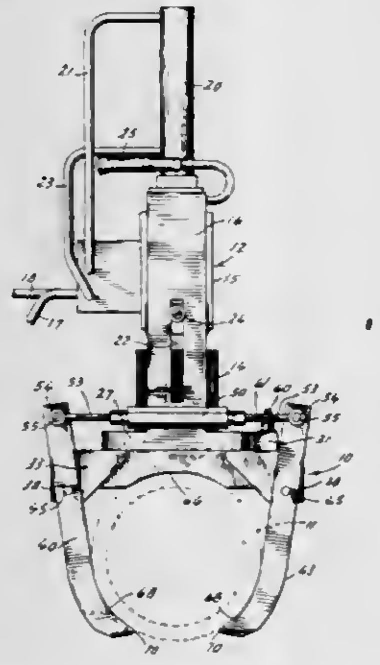
SUPPORT DEVICE FOR PIPE DRILLER

Richard J. Walker, 16805 - 93rd St., Bristol, Wis. 53104

Filed Sep. 27, 1976, Ser. No. 726,816

Int. Cl.² B23B *45/14*

U.S. Cl. 408—108 **6 Claims**



1. A support device for receiving and positioning a drilling device on a pipe surface, said drilling device having a support base presenting opposing lateral sides and a self-contained raising and lowering mechanism for the drill of said drilling device, said support device comprising a frame member defining two pairs of arm members extending from said frame member in a first and a second direction and pivotally secured thereto, means operatively connected to said arm members to move said arm members toward and away from said pipe surface, said means to move said arm members positioned in conjunction with said arm members in said first direction, said arm members extending in said second direction having arcuate portions to directly contact said pipe along a multiplicity of points, said frame member comprising opposing side members with concave portions to engage the top section of said pipe surface and clamp means defined by said opposing sides of said drilling device support base and said opposing side members of said frame member, so that said drilling device is readily received in said frame member and retained therein independently of said raising and lowering mechanism.

4,105,359

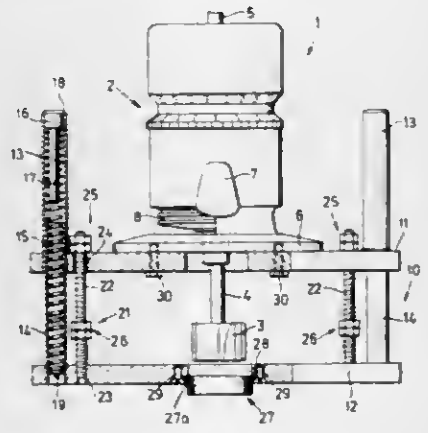
ADAPTOR FOR COUNTERSINKING DEVICE

Eberhard Schneider, Cologne, and Theodor Vitt, Porz-Eil, both of Fed. Rep. of Germany, assignors to Prameta Prazisionsmetalland Kunststofferzeugnisse G. Baumann & Co., Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,040

Int. Cl.² B23B *39/00*

U.S. Cl. 408—112 **4 Claims**



1. An adapter for a countersinking device comprising first and second plates disposed in generally parallel relationship to each other and being relatively movable in a direction generally normal to said plates, said first plate carrying a countersinking tool, said second plate being disposed below said first plate and having aperture means in alignment with said countersinking tool, means normally urging said plates toward a relative position of maximum spacing therebetween, said urging means including two pair of sleeves with a first end portion of a first sleeve of each pair of sleeves being in telescopic relationship with a first end portion of a second sleeve of each pair of sleeves, a second end portion of each first sleeve being connected to said second plate, said first end portions of said second sleeves being connected to said first plate, a spring housed within each pair of sleeves urging the plates toward the position of maximum spacing therebetween, adjustable stop means for limiting the relative movement of said plates toward both said positions of minimum and maximum spacing, said adjustable stop means being defined by a pair of threaded pins each carrying two pair of nuts, each threaded pin being connected to one of said plates and passing freely through an opening of another of said plates, a first pair of said nuts being disposed between said plates and a second pair of said nuts being disposed above said first plate, said aperture means having an axis, and an imaginary line passing through said pins being offset from the axis of said aperture means.

4,105,360

DUAL CUT BORING TOOL ASSEMBLY

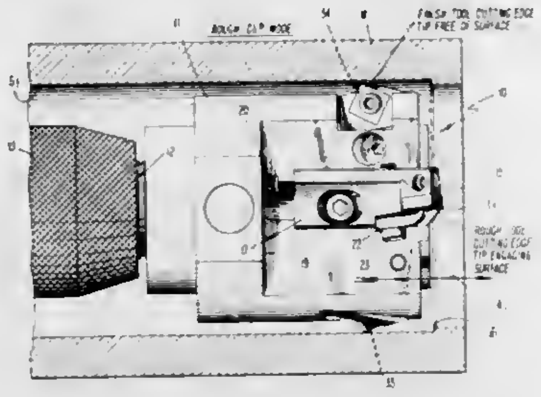
Dale L. Keller, Gettysburg, Pa., assignor to R. H. Sheppard Co., Inc., Hanover, Pa.

Filed Jun. 8, 1977, Ser. No. 804,801

Int. Cl.² B23B *39/16;* **B23G** *1/20*

U.S. Cl. 408—118 **20 Claims**

1. A tool assembly for performing rough and finish cutting operations on a workpiece having a curved surface by relative movement therewith comprising a tool support bar, first cutter means mounted on said tool bar for performing a rough cut along the curved surface, second cutter means mounted on said tool bar for performing a finish cutting operation along said curved surface, and means movably mounting said second cutter means for positioning said second cutter means alternately in a noncutting position during the rough cutting operation performed by the first cutter means and in a cutting position during the finish cutting operation.



ROUGH CUT'G EDGE
FINISH TOOL CUTTING EDGE TIP FREE OF SURFACE
ROUGH TOOL CUTTING EDGE TIP ENGAGING SURFACE

4,105,361

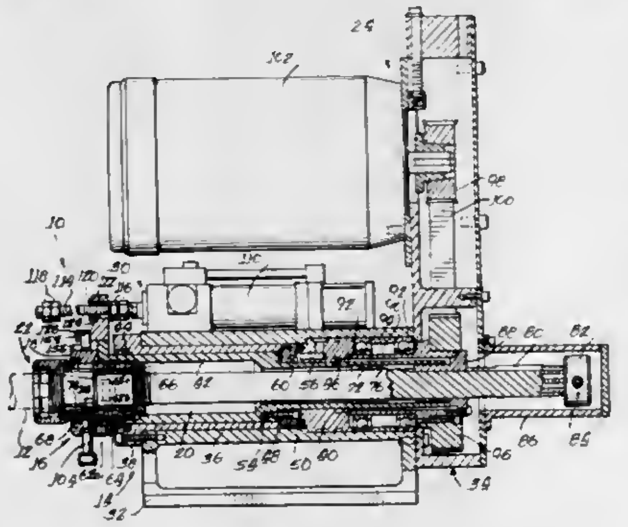
MACHINE TOOL HAVING QUILL CONTROL MEANS

Robert J. Petroff, 1703 S. Main St., Lombard, Ill. 60148

Filed Dec. 6, 1976, Ser. No. 747,531

Int. Cl.² B23B *47/22*

U.S. Cl. 408—130 **9 Claims**



1. In a machine tool adapted for controlled axial movement of a tool from a retracted position toward a workpiece, said machine tool including a housing, a quill supported by said housing and axially movable relative to said housing, a spindle rotatably carried by said quill and axially fixed thereto for movement therewith, said spindle having means at its outer end to support a tool, said quill and spindle defining forward ends thereon movable outwardly from said housing upon selective axial movement of said quill and spindle, means for rotating the spindle, and means operatively associated with said quill to effect axial movement of said quill and spindle toward said workpiece, the combination therewith comprising control means supported by said housing and operatively associated with said quill to control the speed of axial movement thereof toward said workpiece, said control means including control link means disposed eccentric to the axis of said quill, first means interconnecting said control link means to said quill adjacent its said outer end to facilitate control of the longitudinal speed thereof toward said workpiece, and second means interconnecting said first means to said housing so as to prevent exertion of a bending moment on said quill be said control link means in a direction tending to cause deviation of said spindle from its intended axial direction during longitudinal movement thereof, said first means interconnecting said control link means to said quill including a yoke member connected to said control link means, said second means having a pair of guide bars fixedly secured to said yoke member, said guide bars being longitudinally slidable within corresponding guide slots in said housing, and said yoke being connected to said quill through a sliding connection such that a resistive force applied to said yoke by said control means acts substantially axially of said quill, with bending moments created on said yoke acting on said housing through said guide bars.

4,105,362

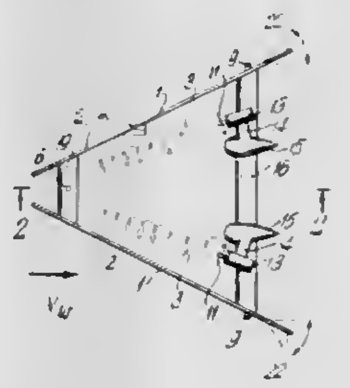
DOUBLE VORTEX AUGMENTOR WIND CONVERSION SYSTEM

Pasquale M. Sforza, Huntington, N.Y., assignor to Polytechnic Institute of New York, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 564,681, Apr. 3, 1975, Pat. No. 4,047,832. This application Jun. 6, 1977, Ser. No. 803,438

Int. Cl.² F03D *1/04*

U.S. Cl. 415—2 **8 Claims**



1. A fluid flow energy conversion system for converting diffuse flow power into useful output power, the system comprising turbine means, and a pair of edge separation vortex generators symmetrically deployed in a generally V shaped angulated configuration for driving said turbine means, said configuration including means for orienting the configuration such that the apex region thereof points upstream and the axis of symmetry substantially aligns with the direction of fluid flow and wherein the configuration is dimensioned such that each vortex generator is deployed at a desired angle of attack with respect to said fluid flow.

4,105,363

OVERSPEED CONTROL ARRANGEMENT FOR VERTICAL AXIS WIND TURBINES

John Lodewyk Loth, P.O. Box 4094, Morgantown, W. Va. 26505

Filed Jun. 14, 1976, Ser. No. 696,116

Int. Cl.² F03D *3/06, 7/06*

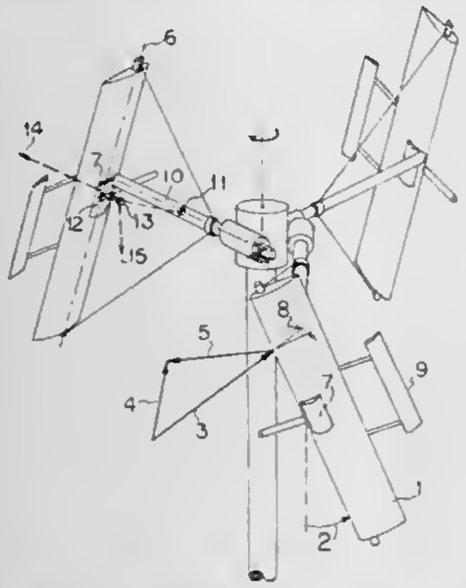
U.S. Cl. 416—41 **14 Claims**

1. In a vertical axis wind turbine having a shaft mounted along the vertical axis of said wind tubine, a rotor mounted on said shaft for rotating said shaft about the vertical axis of said wind turbine comprising:

support arm means;

mounting means for mounting said support arm means on said shaft of said wind turbine along a generally radial axis extending therefrom, said mounting means enabling said support arm means to rotate about its radial axis a predetermined amount; and

rotor blade means formed by an air foil mounted on said support arm means in a position normal to said support arm means for rotation about the vertical axis of said wind turbine in response to the interaction between the wind and said rotor blade means, said rotor blade means being generally parallel to the vertical axis of said wind turbine during normal operating speeds but, upon reaching a predetermined operating speed exceeding the normal operating speed, tilting about the radial axis of said support arm means in a swept wing configuration in response to a small component of centrifugal force acting on said



rotor blade means to thereby control the operating speed of said rotor.

4,105,364
VANE FOR A GAS TURBINE ENGINE HAVING MEANS FOR IMPINGEMENT COOLING THEREOF

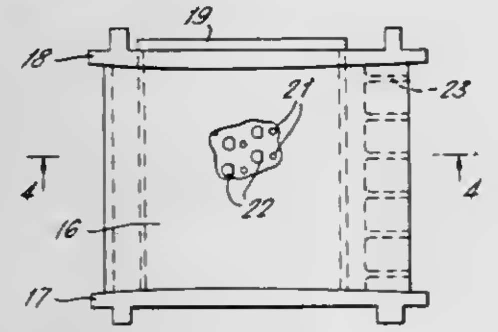
Alec George Dodd, Belper, England, assignor to Rolls-Royce Limited, London, England

Filed Dec. 7, 1976, Ser. No. 748,289

Claims priority, application United Kingdom, Dec. 20, 1975, 52293/75

Int. Cl.² F01D *5/18*

U.S. Cl. 416—97 R **4 Claims**



1. A vane for directing hot gases in a gas turbine engine comprising: at least one platform; a hollow aerofoil portion extending from said platform and having an exterior surface for contacting and directing the hot gases and an interior surface; means for impingement cooling of the interior surface of the hollow aerofoil portion of said vane, said imprignement cooling means including a cooling fluid entry tube extending within and generally spanwise of said aerofoil portion of the vane and spaced from the interior surface thereof, said cooling fluid entry tube having a plurality of apertures therein for directing jets of impingement cooling fluid onto the interior surface of the aerofoil portion; at least one exhaust slot on the trailing edge of said aerofoil portion, said at least one slot setting up a general flow path of cooling fluid in the space between the internal surface of said aerofoil portion and the cooling fluid entry tubes exterior and then exhausting the same to the exterior of the aerofoil portion; and a plurality of columnar projections extending between the interior surface of the aerofoil portion and the cooling fluid entry tubes exterior, each projection being positioned directly upstream of one of said apertures with respect to said general flow path of cooling fluid in the space between the internal surface of said aerofoil portion and the cooling fluid entry tubes exterior so that the jet of cooling fluid entering the space lies in a zone of separation of flow behind the projection whereby the jet of cooling fluid entering through the aperture is undisturbed by the general flow path of the cooling fluid in the space between the interior surface of the aerofoil portion and the cooling fluids exterior.

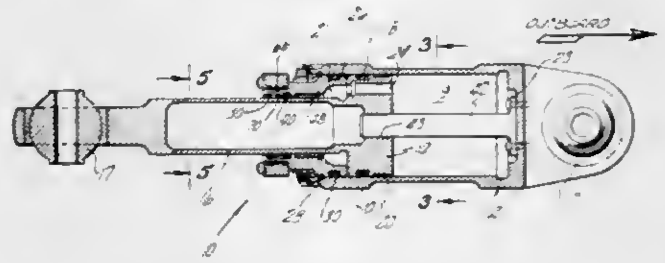
4,105,365
HELICOPTER ROTOR LEAD-LAG DAMPER

Donald Leroy Ferris, Newtown, and George Arthur Smith, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1976, Ser. No. 729,340

Int. Cl.² B64C *27/42*

U.S. Cl. 416—107 **7 Claims**



1. A helicopter rotor having:
- A. a rotatable hub,
- B. at least one blade supported by said hub for rotation therewith,
- C. a hydraulic damper for damping relative motion between said hub and blade comprising:
  1. a cylinder connected to said blade, and
  2. a piston cooperating with said cylinder for reciprocation therewithin comprising:
     - (a) a piston head within said cylinder to define hydraulic chambers on opposite sides thereof, and
     - (b) a piston rod connected to said piston head and to said hub,
  3. sealing means comprising:
     - (a) a seal ring enveloping said piston rod, and
     - (b) means to support said seal ring from said cylinder, and
- D. fluid reservoir means enveloping said piston rod adjacent said seal ring and including:
  1. a fluid reservoir, and
  2. an annulus adjacent said seal ring located on the remote side of said seal ring from said piston head, and
  3. means connecting said reservoir to said annulus to direct fluid from said reservoir to said seal ring in response to centrifugal force.

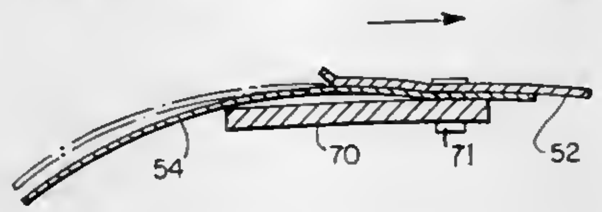
4,105,366
TWISTED FLEX FAN

Michael Thomas Spellman, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Division of Ser. No. 576,728, May 12, 1975, Pat. No. 4,012,168. This application Sep. 14, 1976, Ser. No. 723,108

Int. Cl.² F04D *29/38*

U.S. Cl. 416—132 A **4 Claims**



1. A fan blade construction adapted for use in an internal combustion engine, a flexible fan blade having a stiffened leading edge, the blade adapted to be coupled to a rotatable hub by means of mounting arms, a rigid mounting arm, the flexible blade rigidly secured to the mounting arm, said flexible blade having an abutment portion which resiliently bears against an abutment portion of said arm at a region spaced from the rigid securement of the blade to the arms, whereby upon rotation of the flexible blade air reaction forces and centrifugal forces above a predetermined amount flex the flexible blade away from its arm abutment to thereby diminish its effective pitch, said flexible blade being arcuate in cross-section with its concave side facing one side of said mounting arm, and defining a space therebetween, said arm and blade secured together in overlapped and parallel relation along one edge of said arm, at least a portion of the other edge of said arm defining said arm abutment portion.

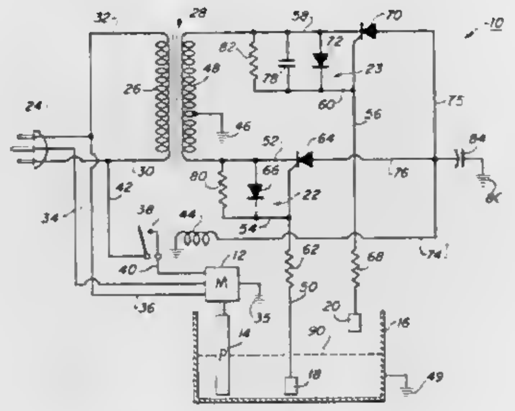
4,105,367
LIQUID LEVEL SENSING CIRCUIT

Ralph M. Francis, Jr., Racine, Wis., assignor to Sta-Rite Industries, Racine, Wis.

Filed Oct. 18, 1976, Ser. No. 733,520

Int. Cl.² F04B *49/06;* H01H *35/18*

U.S. Cl. 417—36 **3 Claims**



1. A fluid level sensing circuit comprising a probe adapted to contact a conductive fluid, an SCR having its anode-cathode circuit connected to a source of AC operating potential, the gate of said SCR being coupled to said probe, a diode coupled between said probe and the cathode of said SCR, said diode being oppositely poled with respect to the gate-cathode circuit of the SCR to permit AC conduction at the probe-fluid contact and a transformer having a primary winding and a secondary winding, and an off-set center tap electrically coupled to said secondary winding, further comprising a second probe, a second SCR having its anode-cathode circuit connected to said source, the gate of said second SCR being coupled to said second probe, and a second diode coupled between said second probe and the cathode of said second SCR, said second diode being oppositely poled with respect to said gate-cathode circuit of said second SCR to permit AC conduction at the contact of said second probe and said fluid further including a pump electrically coupled to said circuit for changing the level of said fluid, a relay for energizing said pump, first resistive means electrically coupled between said relay and said first mentioned SCR, and second resistive means electrically coupled between said relay and said second SCR.

4,105,368
FLOATING WAVE POWERED PUMP

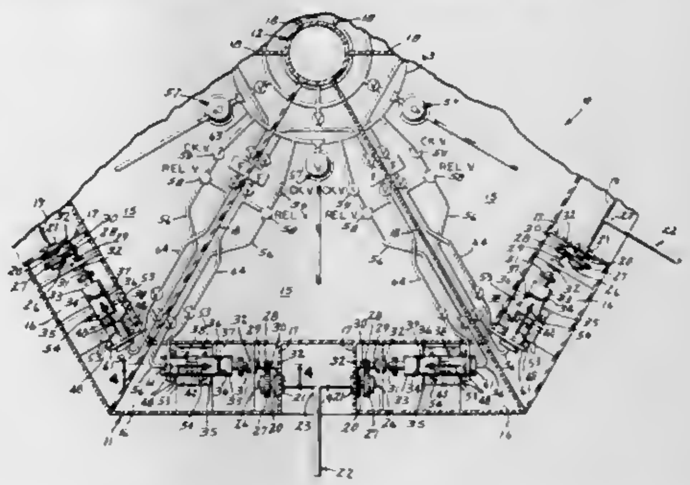
Fred L. Waters, c/o Transworld Drilling Company, Ltd. P.O. Box 25861, Oklahoma City, Okla. 73125

Filed Nov. 15, 1976, Ser. No. 742,075

Int. Cl.² F04B *17/00, 35/00;* F16H *25/12, 25/14*

U.S. Cl. 417—53 **14 Claims**

14. A method of harnessing energy generated by the wave motion of a body of water comprising the steps of:
- (a) supporting a primary float having a plurality of secondary floats attached by lever arms to rotatable shafts carried by the primary float upon a body of water;
- (b) oscillating said secondary floats relative to said primary float thereby imparting oscillatory rotary motion to the shafts;
- (c) converting the oscillatory rotary motion of the shafts to linear motion of pistons of pumps;
- (d) pumping hydraulic fluid with the pumps; and



- (e) storing the hydraulic fluid thus pumped into pressure storing devices for selective use thereafter.

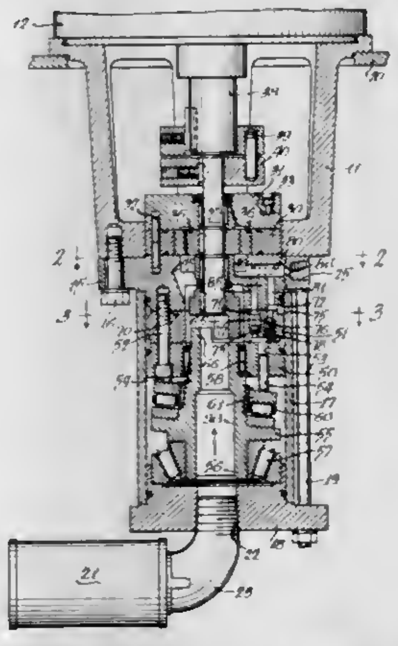
4,105,369
TWO-STAGE PUMP

Samuel B. McClocklin, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Filed Jun. 30, 1977, Ser. No. 811,560

Int. Cl.² F04B *23/12*

U.S. Cl. 417—206 **10 Claims**

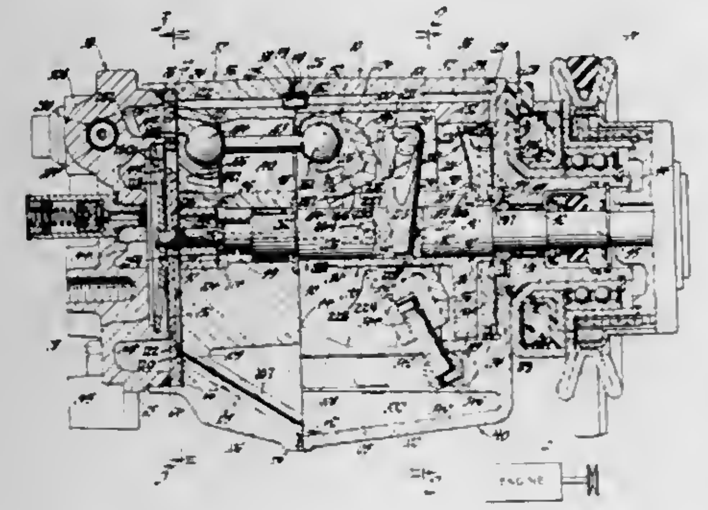


1. A two-stage pump having low and high pressure stages including a casing, a pair of pumps in said casing each having a rotatable pump element in coaxial relation, drive shaft means for rotating both of said pump elements, an outlet port from said casing, each of said pumps having a fluid inlet and a fluid outlet with the fluid outlet of one pump being in flow relation with said outlet port and the fluid inlet of the other pump, and means for supplying fluid to the fluid inlet of said one pump including a flow passage through the rotatable pump element of said other pump.

4,105,370
VARIABLE DISPLACEMENT COMPRESSOR WITH THREE-PIECE HOUSING

Byron L. Brucken, Miamisburg, and Roy E. Watt, Brookville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 19, 1977, Ser. No. 798,583
Int. Cl.^{2} F04B *1/26*
U.S. Cl. 417—222 **3 Claims**

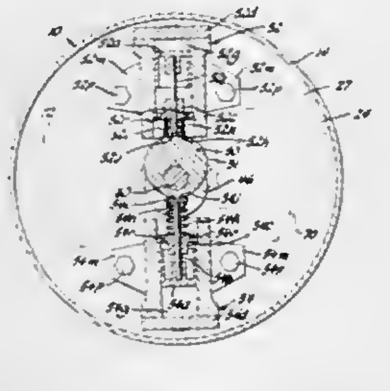


1. A variable output axial compressor of the wobble plate type including a cast three part compressor housing having a first shell-like front section defining by integral portions thereof a wobble plate mechanism cavity and an expansible chamber, a second intermediate cylinder block section and a third rear cylinder head section connected in series to form said housing, a crankcase in said housing, a drive shaft having its one end journaled in an integral end cover of said first section and the shaft other end journaled in said second section, said second section having a cylinder bore formed therein substantially parallel to the axis of said shaft, a compressor piston arranged to reciprocate in said cylinder bore, a wobble plate mechanism in said cavity operated in response to rotation of said shaft and drivingly connected to said compressor piston, one of said first and second sections terminating in a rearwardly directed peripheral edge and the other of said first and second sections terminating in a forwardly directed planar face such that said first section edge and second section face are in flush engagement at a common transverse plane, means for removably interconnecting said first, second and third sections in axial alignment, said means including means whereby said first and second sections are sealably engaged at said transverse plane, compressor output modulation means for varying the angle of the wobble plate mechanism relative to said drive shaft and thus the stroke of said compressor piston in said cylinder bore, said first section end cover including a blind bore in the center thereof open to said wobble plate cavity, a modulation piston slidably received in said end cover blind bore thereby forming an expansible chamber, oil pump means in said housing, passage means for conducting oil from said housing crankcase to the inlet of said pump means and from the outlet of said pump means to said expansible chamber for effecting movement of said modulation piston, and control means regulating the flow of oil from said crankcase to said expansible chamber for causing the travel of said modulation piston to regulate said wobble plate mechanism and thus the pumping capacity of said compressor.

4,105,371
CAM DRIVEN COMPRESSOR

Jack W. Savage, Centerville, Ohio, and Thomas J. Savage, La Grange, Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,927
Int. Cl.^{2} F04B *19/00, 1/14*
U.S. Cl. 417—238 **4 Claims**

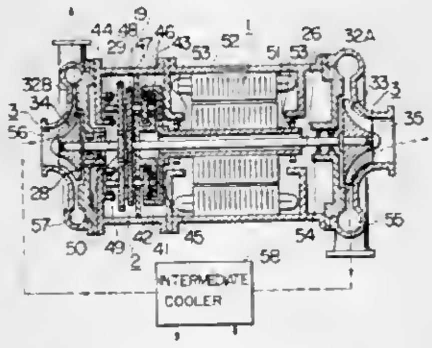


1. A compressor of selectable configuration for changing the capacity thereof, said compressor comprising an exposed mounting surface having four mounting positions thereon around a drive shaft which is normal thereto, each of said mounting positions adapted to receive interchangeably thereat one of four identical cylinder assemblies, each of said cylinder assemblies selectively mountable on said surface in any of said mounting positions singly or in multiples of two, three or four such assemblies, said drive shaft having affixed thereto an eccentric cam the periphery of which rotates in a plane parallel to said mounting surface and is exposed thereon, each of said cylinder assemblies comprising a cylinder bore selectively opened and closed at an outboard end thereof by intake and exhaust valve means and closed at an inboard end thereof by a guide member, a piston reciprocable in said cylinder bore and having a piston rod affixed at one end to said piston and slidably received in said guide member, said piston rod having an exposed cam follower affixed to the other end thereof sandwiching a spring between said cam follower and said guide member to bias said piston toward said inboard end of the cylinder bore and said cam follower against the exposed periphery of said cam when said cylinder assembly is in any of said four mounting positions.

4,105,372
FLUID ROTARY MACHINE

Haruo Mishina, Inashiki; Kazuhiro Sunobe, Urawa, and Kunio Fujie, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 20, 1976, Ser. No. 650,765
Claims priority, application Japan, Jan. 31, 1975, 50-12571
Int. Cl.^{2} F01D *1/24, 13/00*
U.S. Cl. 417—243 **21 Claims**



1. A fluid rotary machine comprising:
- a rotor electrical device including a main shaft rotatable about a main axis,

- fluid means including a plurality of impellers and casing means enclosing said impellers and defining passages for fluid to be sucked into and discharged from said impellers, said impellers having respective impeller rotational axes aligned with said main axis,
- and transmission means for operatively drivingly connecting said main shaft with said impellers, said transmission means including a plurality of output shafts which rigidly support respective ones of said impellers for rotation therewith and a gear train for gearingly connecting the main shaft with said output shafts to rotate said output shafts at respective predetermined rotational speeds as compared to the rotational speed of said main shaft, said output shafts having rotational axes aligned with said main axis,
- said gear train including an output shaft gear mounted rigidly on each of said output shafts at an end thereof for rotation therewith and at least three support gears meshed with and supporting said respective output shaft gears to thereby rotatably support said end of said respective output shafts by said support gears without the interposition of bearing means,
- wherein at least one of said impellers is disposed at each side of said rotary electric device.

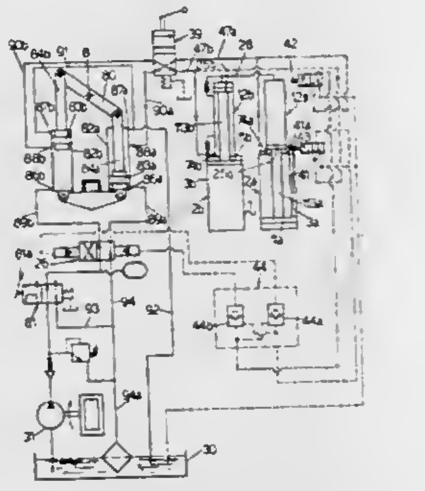
2. A fluid rotary machine according to claim 1, wherein said rotary electrical device is a drive electric motor.

8. A fluid rotary machine according to claim 2, further comprising heat exchanger means provided in a fluid passage connecting the impeller of one stage of the fluid means to the impeller of the following stage.

4,105,373
FLUID DISTRIBUTOR DEVICE FOR CONTROLLING AN APPARATUS FOR PUMPING WET CONCRETE AND THE LIKE

Sergio Calzolari, Rome, Italy, assignor to Fogt Industriemaschinenvertretung A.G., Chur, Switzerland

Continuation-in-part of Ser. No. 523,017, Nov. 12, 1974, Pat. No. 3,994,627. This application Nov. 23, 1976, Ser. No. 744,326
Claims priority, application Italy, Nov. 24, 1975, 52362 A/75
Int. Cl.^{2} F04B *9/10, 35/02, 15/02*
U.S. Cl. 417—317 **1 Claim**



1. In an apparatus for pumping wet concrete and the like comprising a pair of piston pumps mounted in parallel relation and operating in phase opposition, said piston pumps each having a reciprocating pump piston and a pump cylinder, each pump cylinder having an open end, a baffle blade valve means arranged at the open ends of said pump cylinders and having two limit positions for controlling the charging and discharging of wet concrete through respective open ends of said pump cylinders, a double-acting fluid pressure piston and cylinder arranged coaxially with each piston pump for driving said piston pumps, a common piston rod for mounting the pistons of the associated piston pump and double-acting fluid pressure piston and cylinder, a source of pressurized fluid, a fluid actuator-distributor means coupled to said baffle blade valve means and hydraulically connected between said source of pressurized fluid and said fluid pressure cylinders for controlling the position of said baffle blade valve means and for supplying pressurized fluid to and discharging pressurized fluid from said fluid pressure cylinders, said actuator-distributor means having a first operative position for first moving said baffle blade valve means to one of said two limit positions and for subsequently supplying pressurized fluid to a first one of said fluid pressure cylinders on one side of the piston associated therewith and discharging pressurized fluid from a second one of said fluid pressure cylinders and a second operative position for first moving said baffle blade valve means to the other of said two limit positions and subsequently supplying pressurized fluid to said second fluid pressure cylinder on one side of the piston associated therewith and discharging pressurized fluid from said first fluid pressure cylinder, changeover valve means connected to said actuator-distributor means for shifting said actuator-distributor means between the first and second operative positions thereof, and conduit means connected between said first and second fluid pressure cylinders on the other sides of the pistons associated therewith for hydraulically interlocking the movements of the pistons of said fluid pressure cylinders, the improvement comprising said actuator-distributor means comprising two fluid pressure pistons and cylinders operating in phase opposition, said baffle blade valve means having a spindle about which said baffle blade valve means pivots between said two limit positions, a rocking bar having ends and fixedly connected to said spindle intermediate the ends of said bar, the pistons of the actuator-distributor means each having a piston rod connected to a respective end of said rocking bar, each fluid pressure cylinder of said actuator-distributor means having closed ends and communicating with three orifices comprising a first orifice positioned adjacent one of said closed ends, the first orifices being connected by a pipe, a second orifice positioned adjacent the other of said closed ends, the second orifices being connected to one side of said changeover valve means, the other side of said changeover valve means being connected to said pressurized fluid source and a fluid reservoir and a third orifice positioned intermediate said first and second orifice such that fluid communication is established between the second and third orifice when the associated piston of the actuator-distributor means is positioned adjacent the first orifice, a respective third orifice being connected to a respective one of said first and second fluid pressure cylinders of said piston pumps for the supply and discharge of pressurized fluid thereto, said pipe connecting said first orifices being connected with said fluid reservoir.

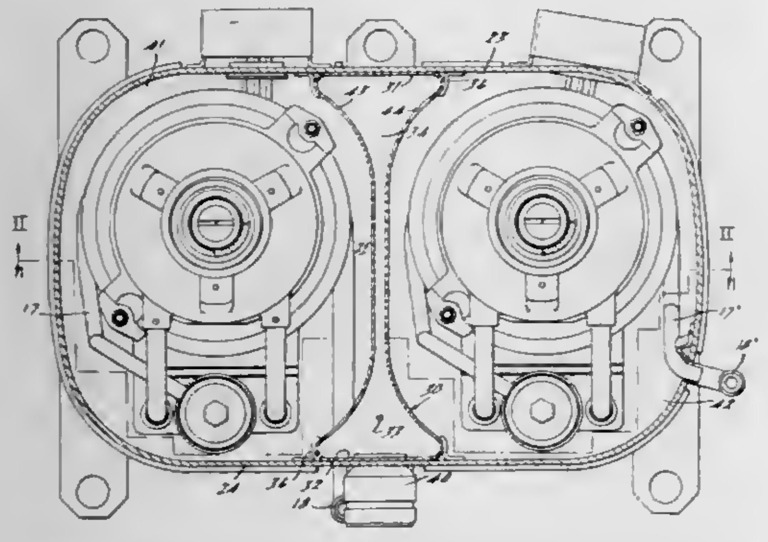
4,105,374
INTEGRATED MULTI-UNIT REFRIGERATION MOTOR-COMPRESSOR ASSEMBLY

Philip H. Scharf, Dayton, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Mar. 28, 1977, Ser. No. 781,792
Int. Cl.^{2} F04B *17/04;* **F25B** *31/02*
U.S. Cl. 417—415 **16 Claims**

1. A hermetic multi-unit refrigeration motor-compressor assembly comprising in combination with a sealed metallic housing having top, bottom and side walls, a pair of motor-compressor units in spaced parallel relation in the housing, characterized by a partitioning member extending transversely within the housing between said units to define two compartments, each of which contains one of said units, the partition-

ing member being affixed to the side walls and top wall but substantially spaced above the bottom wall of the housing,



whereby the bottom portion of the housing defines a common oil sump area.

4,105,375
ROTARY PISTON COMPRESSOR

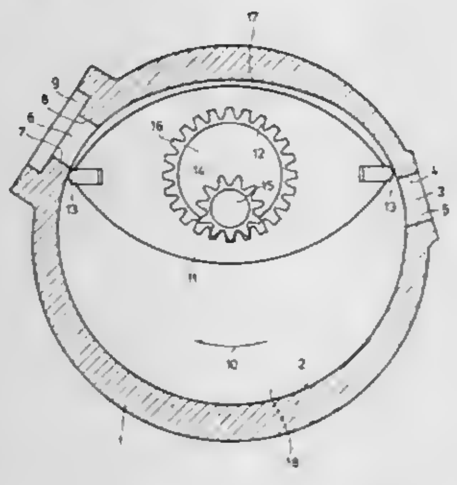
Gerhard Schindelhauer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin and Wankel GmbH, Lindau, both of Fed. Rep. of Germany

Filed Jan. 16, 1975, Ser. No. 541,438

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402084

Int. Cl.² F04C *29/08*

U.S. Cl. 418—54 **4 Claims**



1. In combination with a fast running rotary piston compressor with a housing which consists of a stationary mantle defining a running path with a surface having multiple bore trochoid form and side portions therewith including an eccentric shaft passing at right angles therethrough and having an eccentric portion with a multiple corner piston rotatably journalled thereby including a piston flank forming a compression chamber so that the piston moves with corners thereof along the inside of the mantle and so that piston movement is controlled by a drive consisting of a hollow wheel fixed on the piston and a pinion fixed on one of the side portions whereby opening and closing of inlet and outlet openings of the housing become controlled by the contours of the piston, the improvement therewith comprises when the piston has a location in the dead point position to a position resulting due to further turning of the eccentric shaft up to a few degrees, the start of an inlet passage inside the mantle being arranged directly ahead of the location where a leading corner of the piston in the direction of piston rotation engages the mantle.

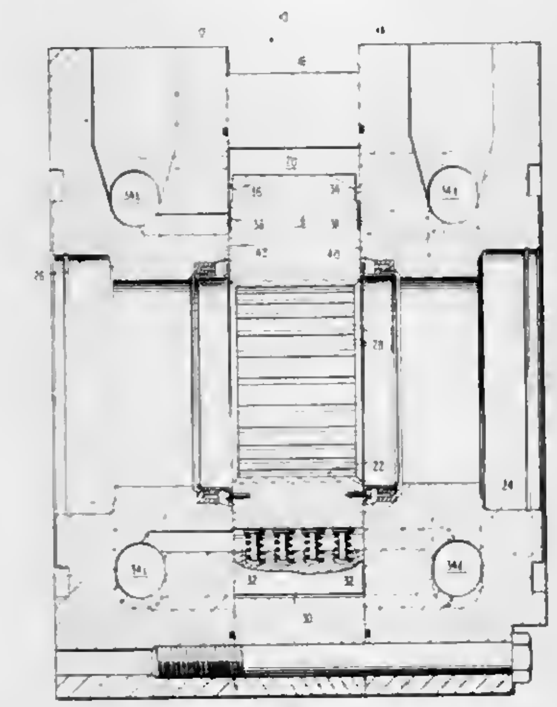
4,105,376
ROTOR FOR HYDRAULIC PUMP OR MOTOR

Allan E. Heinrich, Oconomowoc, Wis., assignor to Applied Power, Inc., Milwaukee, Wis.

Filed Feb. 3, 1977, Ser. No. 765,311

Int. Cl.² F01C *21/00;* **F03C** *3/00*

U.S. Cl. 418—77 **5 Claims**



1. In a fluid pressure motor comprising a rotor having sidewalls and peripheral edge portions, a stator ring surrounding said rotor and defining a plurality of working chambers therewith, slidable vanes received in radial slots in said rotor and normally biased into abutment with said stator ring, a housing for said rotor defining a rotor chamber having sidewall surfaces facing the sidewalls of said rotor, a central axially extending bore in said housing and said rotor and adapted to receive a shaft, for drivingly engaging said rotor with said shaft, fluid inlet and outlet means for communicating with said chambers, the improvement wherein said rotor has two stepped annular offsets in each sidewall of said rotor, the first annular offset extending inwardly from the circumferential edge of said rotor and the second annular offset extending inwardly from the first annular offset, said first offset being just deep enough to provide sufficient clearance between the rotor sidewalls and the chamber sidewalls to prevent gouging of the chamber sidewalls by the peripheral edges of said rotor and said second offset being of a depth less than first offset which is just deep enough to minimize excessive oil leakage normally associated with rotors which are offset to prevent gouging.

4,105,377
HYDRAULIC ROLLER MOTOR

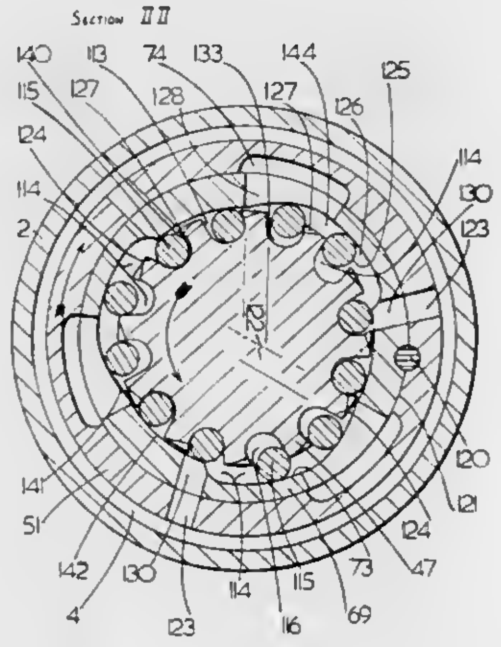
William Mayall, 17 Norfolk Ct., Chanctonbury Rd., Rustington, Sussex, England

Filed Oct. 15, 1974, Ser. No. 514,834

Int. Cl.² F01C *1/24;* **F03C** *3/00;* **F01C** *21/08;* **E21B** *3/12*

U.S. Cl. 418—173 **16 Claims**

1. A rotary positive displacement hydraulic motor comprising a cylindrical rotor embodying in its circumferencial periphery off rotor centre line axially extending angled slots, the trailing face of each slot embodying in its periphery one or more hydraulic fluid directing recesses which have a bottom surface extending obliquely from the rotor's periphery into the trailing face of the said angled slots, said fluid directing recesses acting in combination with the internally profiled housing's inlet ports to lead fluid pressure and flow via the trailing slot face and lateral slot to roller clearance to the under-belly of a roller lodged freely in the slot, said roller being slidably confined longitudinally but having a lateral clearance when retracted of probably one millimeter dependent entirely on the volume of fluid embodied in said slot which must be exhausted from underneath the roller as the roller is forced to retract into its slot as it passes through the exhaust phase of the working cycle, said rotor and rollers being mounted for free axial rotation into an internally recessed and concentrically profiled contra rotating housing, means connecting the rotor and housing together such that clockwise rotation of one will produce anti-clockwise rotation of the other, said profile being circumferentially divided into a number of equally spaced stations, each station comprising retracted sealing, fluid inlet, driving and exhaust section, inlet port fluid flow and pressure being directed at the required velocity in combination with the fluid directing recesses contained in the rotor's periphery acts to cause the retracted rollers as they pass through or almost through, the incoming inlet fluid to change from the trailing slot face to the leading slot face while still retracted causing the fluid pressure driven rollers to leave their retracted positions and to rise away from the rotor axis while remaining in constant contact with both the leading rotor slot face and the internal housing's profile and to lift their longitudinal axis above the periphery of the cylindrical rotor exposing the underbelly of the now radial extended rollers to fluid flow and pressure which holds them in their operative position in which they produce useful rotation and torque on both the rotor and profiled housing in both clockwise and anti-clockwise direction, said profiled housing embodying exhaust port means whereat the driven driving rollers change from the leading slot face to the trailing slot face acting to cause much of the fluid present under the said rollers and embodied in the external rotors axially extended slots to be exhausted through the lateral clearance gap between slots and rollers and radially in advance of the retracting rollers, said port means being radially probably as long as the pitch between any two rollers but preferably radially longer allowing two or more rollers to be exhausting into the exhaust section simultaneously as they retract into their embodying slots where they are supported in said embodying slots by an under roller cushion of high pressure mud, which mud, because of the pressure drop differential between inlet and exhaust ports, acts to hold said rollers in rolling, sliding and sealing contact between the trailing side of the rollers embodying slots and the smallest concentric periphery of the internal housing.



4,105,378
SEALING ARRANGEMENT

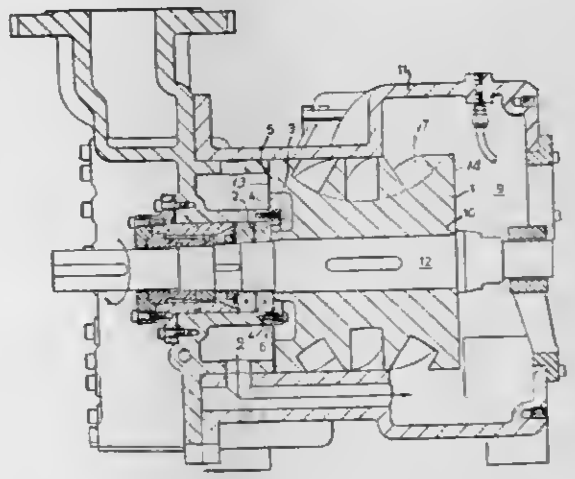
Jonathan Martin Hodge, London, England, assignor to Momovis B.V., Amsterdam, Netherlands

Filed Aug. 9, 1976, Ser. No. 712,743

Claims priority, application United Kingdom, Aug. 18, 1975, 34215/75

Int. Cl.² F04C *17/10*

U.S. Cl. 418—195 **1 Claim**



1. In a positive displacement rotary machine comprising a screw rotatable about an axis and having surface grooves formed therein which are inclined relative to that axis, the lands, serving to separate the grooves one from another, making sealing engagement with a surrounding casing whereby each groove defines, during at least a part of the rotation of the screw within the casing, a chamber, at least one gate rotor having teeth which intermesh with the grooves of the screw, each tooth being successively in sealing relationship with a groove as the intermeshing screws/rotor(s) rotate, the volume of any chamber defined by a groove and limited by a rotor tooth changing from a maximum to a minimum as the screw and rotor(s) rotate, at least a high pressure port in the casing adjacent to a high pressure end of the screw and communicating with each chamber when the volume thereof is at, or adjacent to, its minimum volume and at least a low pressure port at the low pressure end of the screw, the improvement comprising means to establish an effective seal between the screw and the casing at an end of the screw across which a pressure difference occurs, said seal means including a generally radially extending surface of the screw adjacent to the portion of the screw in sealing engagement with the surrounding casing and a part stationary with the casing of same outside diameter as said surface and closely adjacent thereto.

4,105,379
TIRE CURING PRESS

Georges Gazuit, Montlucon, France, assignor to Etablissements Zelant, Gazuit, Montlucon, France

Filed Aug. 11, 1977, Ser. No. 823,685

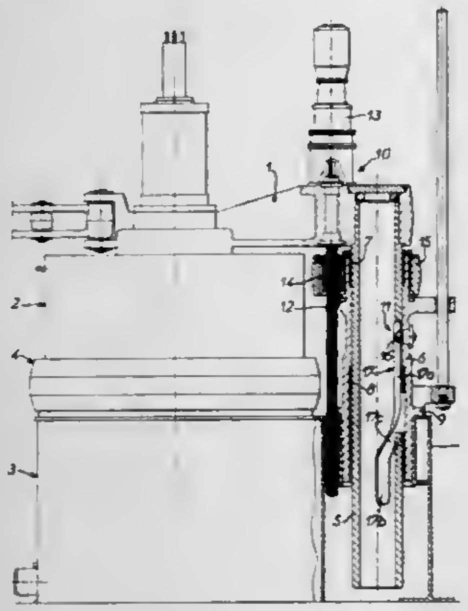
Claims priority, application France, Aug. 25, 1976, 76 25681

Int. Cl.² B29H *5/02*

U.S. Cl. 425—47 **3 Claims**

1. A tire curing press comprising a frame, a mold having an upper part and a lower part supported on said frame, a support fixed to one side of said frame and having a vertical axis, a horizontal cross-member supporting the upper part of said mold, said horizontal cross member being mounted in a cantilever fashion at one of its ends on said support and being able to both pivot about and slide along the vertical axis of the support, a single control means and guide means operatively associated with said single control means to control both the pivoting movements and the sliding movements of said horizontal cross-member, said guide means comprising a cam follower member and a groove forming a cam having two end portions

which extend vertically and which are one another offset vertically and angularly in relation to the vertical axis of the



support, and an intermediate portion progressively connecting the two end portions of the groove.

4,105,380
COOLING APPARATUS FOR AIR COOLING TUBULAR PLASTICS FILM MADE BY A FILM BLOWHEAD

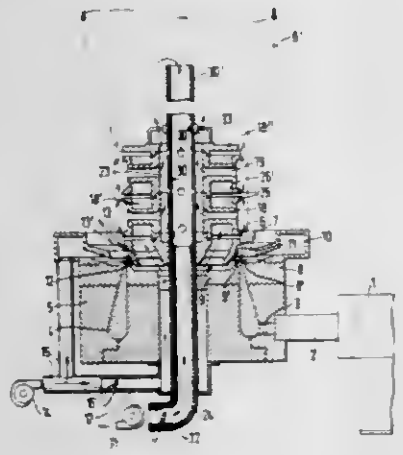
Werner Josef Zimmermann, Lengerich of Westphalia, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,051

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610818

Int. Cl.^{2} B29F *3/00*

U.S. Cl. 425—72 R **9 Claims**



1. Cooling apparatus for tubular plastics film made by a film blowhead, wherein provision is made for air cooling the tubular plastics film and removal of internal cooling air through a central aperture in the blowhead, the apparatus comprising cooling air supply rings for supporting the film on such inside and having gaplike outlet passageways facing such inside of the film for directing cooling air onto such film and axial pasageways extending axially through the air supply rings for the passage of the cooling air from the lower into the higher air supply rings and radial passageways for withdrawing the cooling air directed onto the film by such outlet passageways between the air supply rings, wherein the improvement comprises the cooling air supply rings being formed of concentric inner and outer cylindrical rings interconnected by tubular webs that define the radial passageways, the radial passageways extending between openings formed in the inner and outer rings, the air supply rings being superposed and supported on one another at least by their inner rings with their inner and outer rings bounding the axial passageways therebetween.

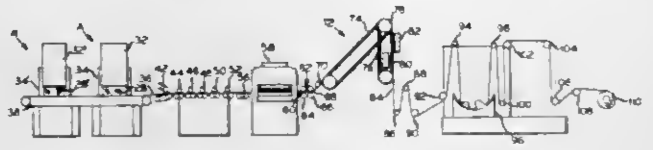
4,105,381
APPARATUS FOR THE PRODUCTION OF A NONWOVEN FABRIC

Louis Platt, Seneca; Marvin Wishman, Greenville, both of S.C.; David R. Gentry, Chamblee, Ga., and Jake E. Williams, Rockwall, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 610,899, Sep. 5, 1975, Pat. No. 4,042,655. This application Jan. 6, 1977, Ser. No. 804,021

Int. Cl.^{2} B29D *27/00;* D04H *18/00*

U.S. Cl. 425—83.1 **5 Claims**



1. Apparatus comprising:

forming means for forming a batt of fibers oriented primarily in a first direction;

carrier means for receiving said batt from said forming means and transporting said batt of fibers in a second direction, said second direction being primarily perpendicular to said first direction;

first drafting means for receiving said batt of fibers from said carrier means and drafting said batt in said second direction;

needling means for needling said drafted batt to produce a needled batt;

second drafting means for drafting said needled batt in said second direction to produce a needled, drafted batt; and

third drafting means for drafting the needled, drafted batt in said first direction.

4,105,382
APPARATUS FOR THE PRODUCTION OF FINISHED PRESTRESSED CONCRETE MEMBERS

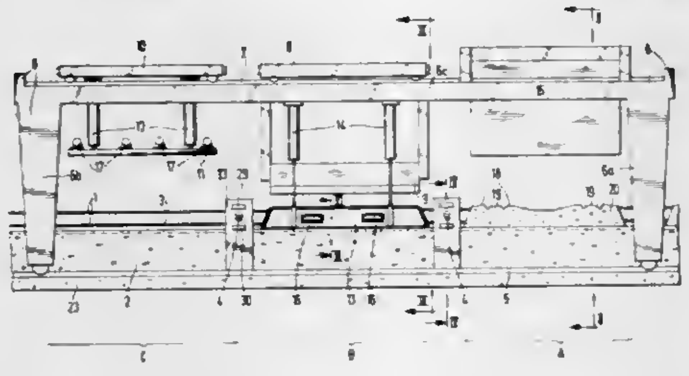
Peter Auer, Ottobrunn; Fritz Kluge, München-Grosshadern; Helmut Lieske, and Horst Wutzler, both of Munich, all of Germany, assignors to Dyckerhoff & Widmann Aktieogellschaft, Munich, Germany

Filed Mar. 22, 1977, Ser. No. 780,021

Claims priority, applicatioo Fed. Rep. of Germany, Apr. 1, 1976, 2614036

Int. Cl.^{2} B28B *3/04*

U.S. Cl. 425—88 **16 Claims**



1. An apparatus for producing finished prestressed concrete member comprising a prestressing bed on which said concrete members are produced having prestressing wires tensioned against fixed abutment members passing therethrough, a scaffold spanning said prestressing bed in gantry-like fashion, said scaffold being supported for movement in a direction parallel

to said prestressing bed, said scaffold longitudinally extending over at least two adjacent stations along said prestressing bed for producing said finished prestressed concrete members, a lower form member for each concrete member to be formed at each of said stations are mounted on said scaffold for vertical movement between a position for receiving concrete to form said concrete members and a position removed from said forming position, and an upper form member for each of said lower form members, each of said upper form members mounted on said scaffold for vertical movement into and out of cooperative engagement with its respective lower form member when in the forming position, said upper form members also being mounted for horizontal movement longitudinally along said scaffold.

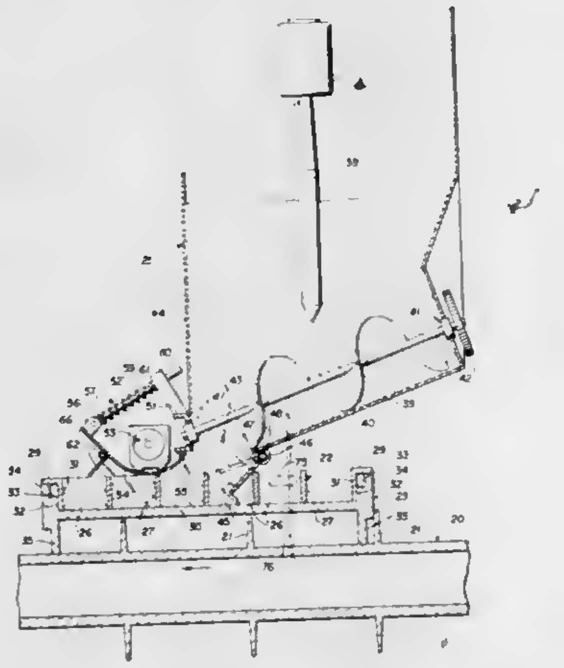
4,105,383
BRICK MOLDING MACHINE

David Jack Hanson, River Rd., Newcastle, Me. 04553

Filed Apr. 8, 1977, Ser. No. 786,339

Int. Cl.^{2} B28B *5/04*

U.S. Cl. 425—96 **10 Claims**



1. A brick molding apparatus comprising a horizontal conveyor, nesting pallets and brick forms traveling on said conveyor, a clay hopper positioned above said conveyor and having a bottom clay outlet at an elevation to deliver clay from the hopper directly into brick mold cavities of said brick forms, vibration means extending into the hopper to vibrate clay therein, clay feed means within the hopper to feed vibrating clay through said bottom clay outlet, a flapper blade pivoted to the bottom of the hopper adjacent said outlet and adapted to enter said mold cavities of the moving brick forms on the conveyor in succession and forcing the clay from said outlet into the forward part of each mold cavity before allowing the clay to fill the rear part of such cavity, said flapper blade adapted to ride over divider walls separating said mold cavities, and a vibrator means near the downstream end of the hopper for contacting each moving form in succession and imparting vibration thereto and including a strike blade element for removing excess clay from the top of each form.

4,105,384
APPARATUS FOR INSERTION OF STICKS IN ICE CREAM BODIES

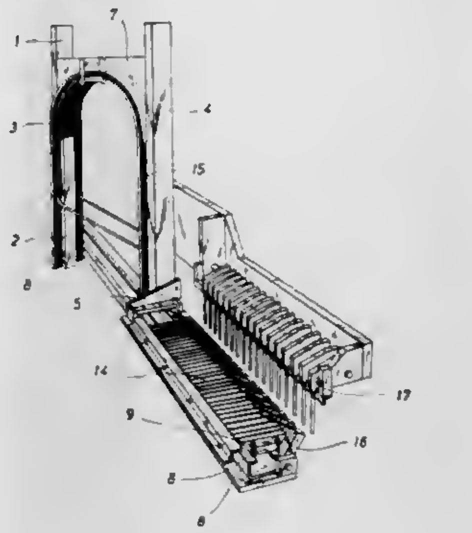
Ole Christian Mørch, Solrød Strand, Denmark, assignor to Stickma A/S, Herluf, Denmark

Filed Jan. 24, 1976, Ser. No. 699,352

Claims priority, application Denmark, Jun. 25, 1975, 2884/75

Int. Cl.^{2} A23G *9/26*

U.S. Cl. 425—126 S **8 Claims**



1. Apparatus for positioning sticks in partially frozen ice cream bodies provided in aligned mould cavities which are open at the top, said apparatus comprising a stick supply source in which a supply of sticks is maintained, a plurality of moulds each having an open-topped mould cavity, a vertically movable stick inserting apparatus mounted above said mould cavities including individual stick grasping means for grasping and holding individual sticks and vertically movable support means for said grasping means for effecting insertion movement of said individual sticks into said mould cavities, stick infeed means including a plurality of upwardly facing individual stick receiving and holding slots for receiving sticks from said stick supply source, means supporting said stick infeed means for movement of said stick receiving and holding slots to to a position beneath said stick supply source for receipt of individual sticks in said stick receiving and holding slots to a transfer position adjacent said stick inserting apparatus, transfer means mounted adjacent said stick infeed means for removing sticks from said stick infeed means when said stick infeed means is in said transfer position and positioning said sticks in a vertical removal position for engagement by said grasping means for removal from said transfer means for subsequent insertion into said mould cavities, wherein there are two stick receiving and holding slots for each of said individual stick grasping means and said transfer means consists of plural individual stick holding members equal in number to the number of said receiving and holding slots for simultaneously moving all of said sticks from said receiving and holding slots to said vertical removal position and said grasping means includes individual stick grasping members positioned to initially engage alternate ones of said sticks held by said holding members in said removal position for removal of said engaged sticks from said holding members and subsequent insertion thereof into said mould cavities and wherein said transfer means is adapted for movement to position the sticks remaining on said transfer means for subsequent engagement by said stick grasping members to effect removal of said last-mentioned sticks from said transfer means by said grasping means for subsequent insertion in mould members.

4,105,385
COMPACT DIE CLOSING UNIT FOR INJECTION MOLDING MACHINES

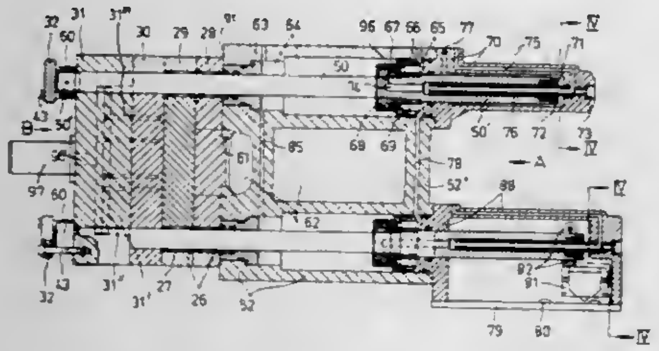
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jul. 14, 1977, Ser. No. 815,853

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631603

Int. Cl.² B29F *1/00*

U.S. Cl. 425—192 R **13 Claims**



1. In a machine for the injection molding of plastic or metallic parts and articles in an injection molding die, a die closing unit which opens and closes along a longitudinal movement axis, the die closing unit being adapted for mounting on a machine base and comprising in combination:

- a stationary die carrier member adapted for attachment to the machine base, said member having on its forward side a die mounting face extending perpendicularly to said movement axis;
- at least two hydraulic linear actuators having parallel stationary power cylinders which are solidary with the stationary die carrier member and which enclose an equal number of power pistons, each having a piston rod attached thereto, the piston rods extending forwardly through the stationary die carrier member, on opposite sides of, and parallel to said movement axis;
- a stationary die half as part of the injection molding die, said die half being constituted by at least one transversely extending stationary die plate which is clamped against the die mounting face of the stationary die carrier member, said at least one stationary die plate engaging a length portion of each piston rod with a fitted bore, so as to support and guide the piston rods;
- a movable die half as part of the injection molding die, said movable die half being likewise constituted by at least one transversely extending movable die plate, said at least one movable die plate having fitted bores engaging a forward end portion of each piston rod, so as to support the movable die half on said rods; and
- axial clamping means for releasably clamping the forward end portions of the piston rods to a forwardly facing clamping face on the front side of the movable die half.

4,105,386
APPARATUS FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF THERMOPLASTIC MATERIAL

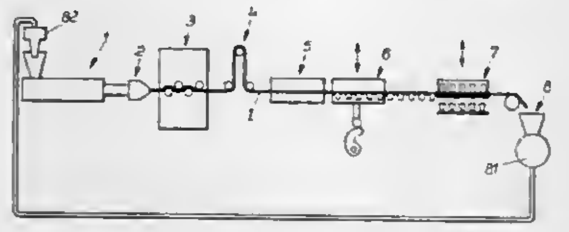
Alfons W. Thiel, Mainz, and Hans Hell, Wiesbaden, both of Germany, assignors to Bellaplast GmbH, Wiesbaden, Germany

Continuation-in-part of Ser. No. 408,083, Oct. 19, 1973, abandoned. This application Aug. 25, 1976, Ser. No. 717,751

Int. Cl.² B29C *29/00*

U.S. Cl. 425—217 **37 Claims**

1. Apparatus for manufacturing thin-walled articles comprising means including extrusion means for forming a continuous hot plastic web of thermoplastic material, means for continuously advancing said web, means defining a stabilization station through which said web passes and wherein opposite surfaces of said moving web are cooled to provide supportive outer layers therealong, means defining a thermal forming station positioned for receiving said stabilised web and wherein successive areas of said web are subjected to shaping tool operation for forming articles of desired shape in the web, means intermediate said stabilization and thermal forming stations for converting continuous motion of said web into intermittent motion for disposing successive web areas for a predetermined time at said thermal forming station, means providing a dwell station for equalizing the surface temperature conditions of said web within said successive web areas before said respective web areas are disposed at said thermal forming station and means for actuating said web moving means and the shaping tools at said thermal forming station in synchronism and in such correlation with the temperature of said web at extrusion and the speed of advance of the web that the stabilized web arrives at said thermal forming station while it retains sufficient heat for achievement of thermal forming when operated upon by said shaping tools.



4,105,387
SIDE SEALING MEANS FOR A CONTINUOUS PRESS

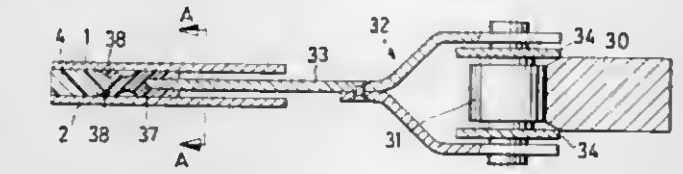
Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld-Forstwald, Fed. Rep. of Germany

Filed May 15, 1975, Ser. No. 577,877

Claims priority, application Fed. Rep. of Germany, May 24, 1974, 2425057

Int. Cl.² A01J *25/12;* **B28B** *3/12*

U.S. Cl. 425—335 **6 Claims**



1. In an apparatus for extering a flat pressure on a longitudinal section of an advancing strip such as a continuous press for the continuous production of panel materials being produced under pressure, in which the strip is conducted between endless forming bands extending across the width of the strip and circulating in the direction in which the strip advances with pressure transmitted to the endless forming bands by support structures, the improvement comprising sealing strips which are separate from the forming bands disposed between said bands near their edges and supported to move through the longitudinal section with said bands to laterally seal the space containing said advancing strip in a pressure tight manner, said sealing strips comprising endless circulating sealing strips made of an elastic material and having upper and lower sealing lips with an opening therebetween directed toward the inner space between said forming bands whereby pressure entering said opening from the material between said forming bands will act to force said lips outward to increase sealing against said forming bands, and means supporting said sealing strips such that said sealing strips engage between said forming bands before the beginning of said longitudinal section and disengage from said sealing strips being disposed between said forming bands in a zone in which the forming bands are supported by the support structure said means supporting said sealing strips including means disposed outside said forming bands for circulation in a horizontal plane at the level of the space between said forming bands such that they engage between said forming bands over said longitudinal section.

4,105,388
HYDRAULIC PRESS

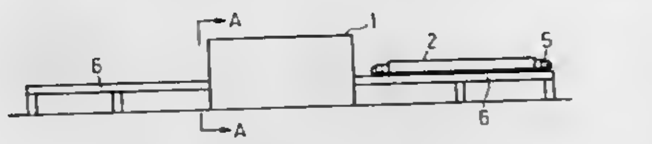
Keijo Hellgren, Vesteras, Sweden, assignor to Asea Aktiebolag, Vesteras, Sweden

Filed Dec. 20, 1976, Ser. No. 752,282

Claims priority, application Sweden, Dec. 23, 1975, 7514607

Int. Cl.² B29C *17/06*

U.S. Cl. 425—389 **6 Claims**



1. In a hydraulic press which includes wall means forming a press area therebetween, a first frame member having top and end walls to form thereby a pressure cell area positioned within said space, an elastic press pad supported against the top of said first frame member, a second frame member mounted within said pressure cell area, a bag-like elastic diaphragm positioned in said pressure cell area between said second frame member and said press pad and having an annular bead which fills an annular slot formed between said second frame member and the top wall of said first frame member, a movable trough-shaped supporting member positioned adjacent the end walls of said first frame member and said press pad such that with expansion of said press pad as a result of expansion of said elastic diaphragm said press pad moves into the trough space of said trough-shaped supporting member, there being a gap between said trough-shaped supporting member and the end walls of said first frame member, and a seal strip positioned in the gap between the end walls of said first frame member and said trough-shaped supporting member, said sealing strip being vertically movable and functioning to prevent the press pad from being pressed out of the pressure cell area through the gap when the elastic diaphragm is expanded, the improvement wherein a supporting strip is attached to the end walls of the first frame member so as to be locked against movement in a vertical direction at a point within the pressure cell area and so as to secure the press pad within the pressure cell area.

4,105,389
METHOD OF WINDING A TUBE COIL, AND AN ARRANGEMENT FOR PERFORMING SAID METHOD

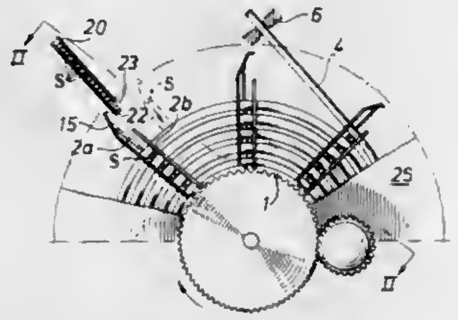
Rolf Paul Näslund, Nyköping; Kärl Bertil Ahrbom, Tystberga, and Peter Heinrich Erwin Margen, Nyköping, all of Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Jan. 14, 1976, Ser. No. 695,789

Claims priority, application Sweden, Jul. 1, 1975, 7507568

Int. Cl.² B29C *17/02*

U.S. Cl. 425—392 **12 Claims**



1. Apparatus useful for spiral winding of a plurality of flexible tubes in order to form a multiple tube coil, comprising:

- (a) a drum;
- (b) means for rotating the drum;
- (c) first tube spreaders extending substantially radially relative to the drum, for separating at least some adjacent single tube spirals in the axial direction of the drum, at least some of said first tube spreaders being arranged in groups, each of said groups comprising at least three tube spreaders disposed in two substantially parallel planes, said planes extending substantially axially relative to said drum; and
- (d) means for inserting second tube spreaders in parallel with the drum axis between at least some adjacent spiral tubes and between the first tube spreaders of a group, the interval between the first tube spreaders of the group located in two planes being not less than the thickness of a second tube spreader.

4,105,390
DIE CLOSING UNIT WITH PLATE ADJUSTMENT MECHANISM FOR INJECTION MOLDING MACHINE

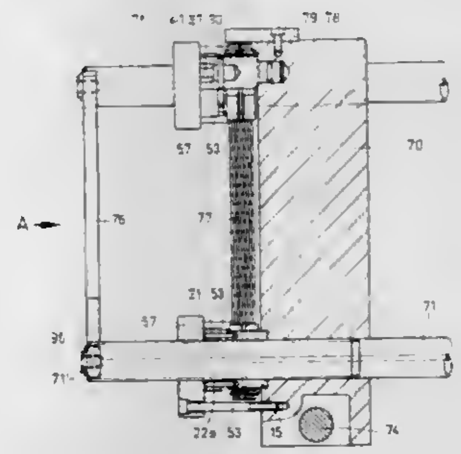
Karl Hehl, Arthur-Hehl-Strasse, 7291 Lossburg, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,578

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623392

Int. Cl.² B29C *1/16*

U.S. Cl. 425—450.1 **16 Claims**



1. An adjustable die closing unit for an injection molding machine comprising in combination:

- a stationary die carrier member having a die mounting face for the attachment thereto of a die plate of an injection molding die;
- a plurality of parallel, transversely spaced tie rods rigidly connected to the stationary die carrier member and extending perpendicularly away from its die mounting face;
- a hydraulic linear actuator having a cylinder with a stationary member which is rigidly connected to the tie rods, at a longitudinal distance from the stationary die carrier member, and a piston with a piston rod extending parallel to, and centrally between the tie rods, in the direction of the stationary die carrier member;
- a movable die carrier member arranged between the stationary die carrier member and the hydraulic linear actuator and having a die mounting face oriented towards the die mounting face of the stationary die carrier member, for the attachment thereto of another die plate of the injection molding die; the movable die carrier member being guided by the tie rods and connected to the piston rod of the linear actuator, to be moved by the latter towards and away from the stationary die carrier member, thereby closing and opening the injection molding die; and
- a position adjustment mechanism associated with the tie rods and with one of the two stationary members to which the tie rods are rigidly connected, the position adjustment mechanism including:

tie rod positioning bores in said associated member, the bores extending from its mounting face to an abutment face on the opposite side of the member;

a threaded length portion of each tie rod protruding beyond said abutment face;

threaded adjustment members seated on the protruding threaded tie rod portions and abutting against said abutment face, each adjustment member having two threaded member portions which are rotatably united, but axially displaceable relative to one another, for a thread-clamping action under an axial load;

means synchronously rotating all the adjustment members on their tie rods; and

means axially clamping the adjustment members against said abutment face, thereby blocking them against rotation, while also creating said thread-clamping action.

4,105,391
INJECTION BLOW MOLDING MACHINE

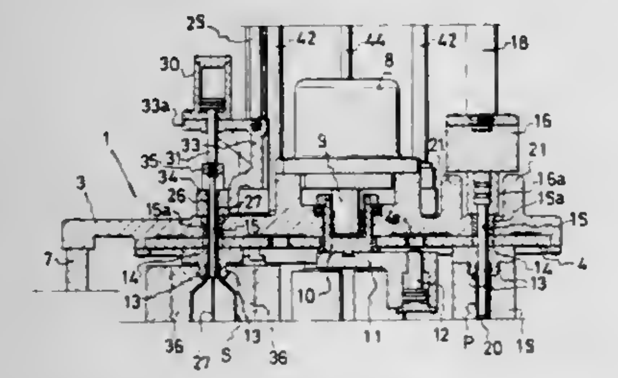
Katashi Aoki, 6037, Ohaza Minamijo, Sakakimachi, Hanishina-gun, Japan

Filed Mar. 9, 1977, Ser. No. 775,836

Claims priority, application Japan, Mar. 12, 1976, 51-026908

Int. Cl.² B29D *23/03*

U.S. Cl. 425—526 **4 Claims**



1. An injection blow molding machine comprising:

a machine bed having a substantially horizontal surface for mounting the operating stages of the molding machine thereon;

four operation stages being disposed on the horizontal surface of the machine bed, such stages being an injection molding stage, a heating stage, a stretching and blowing stage and a releasing stage;

a base plate disposed parallel to and above the horizontal surface of the machine bed;

a rotary disk rotatably attached to the under-surface of the base plate;

the rotary disk being provided with four neck molds, each of said neck molds being disposed correspondingly to one of said operation stages;

a motor secured to a middle portion of said base plate, said motor having a drive shaft which passes through the rotary disk;

an arm attached at one end thereof to the lower end of the drive shaft of the motor and at the other end thereof to a connecting pin, the connecting pin means being engagable with the rotary disk to intermittently rotate the rotary disk to respective ones of said operation stages;

a mold closing mechanism associated with the injection molding stage;

a heating core inserting mechanism associated with the heating stage to heat a parison from the injection molding stage;

a stretching and blowing mechanism associated with the stretching and blowing stage to stretch and blow the heated parison from the heating stage;

a molded product releasing mechanism associated with the releasing stage to release the stretched and blown molded product from the stretching and blowing stage;

the mold closing mechanism, heating core, stretching and blowing mechanism, and product releasing mechanism being secured on the periphery of the base plate and positioned respectively in the injection molding, heating, stretching and blowing, and releasing stages;

injection mold, blow molds and heating cylinders being disposed in the space between the machine bed and the base plate; and

hydraulic means associated with each of said mechanisms for the selective actuation thereof.

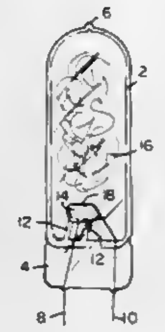
4,105,392
PHOTOFLASH LAMP

Ronald E. Sindlinger, Muncy, and Emery G. Audesse, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 633,743, Nov. 20, 1975, abandoned. This application May 17, 1977, Ser. No. 797,890

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 R **6 Claims**



1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a quantity of filamentary combustible material located within said envelope;

a combustion-supporting gas in said envelope;

an ignition means disposed in said envelope in operative relationship with respect to said combustible fill material, said ignition means including first and second lead-in wires extending into said envelope in a spaced relationship, a sleeve of insulating material extending within said envelope about said first lead-in wire, said sleeve being sealed to said envelope at one end and open at the other end of said sleeve, said first lead-in wire extending beyond the open end of said sleeve, said second lead-in wire having an integral terminating portion formed from said wire at an angle therefrom and entirely disposed substantially in a plane which overlies and is spaced from the open end of said sleeve to provide a predetermined gap between said terminating portion and the end of said first lead-in wire extended beyond said sleeve, and a mass of primer material disposed to cover the open end of said sleeve and bridge said gap.

4,105,393
FUEL BURNERS

William Frederick Boylett, Ormskirk, England, assignor to Consultant Gas Engineer Limited, England

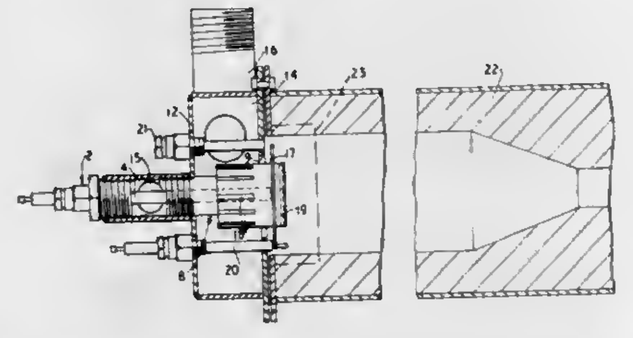
Continuation-in-part of Ser. No. 531,187, Dec. 9, 1974, abandoned. This application May 12, 1976, Ser. No. 685,677

Claims priority, application United Kingdom, Dec. 7, 1973, 56860/73

Int. Cl.² F23M *9/02*

U.S. Cl. 431—116 **6 Claims**

1. A fluent fuel burner of the industrial type operating with forced draught and operable against a back pressure, comprising a combustion chamber, a central fuel and primary air introduction means having an enlarged diameter discharge end portion, an air plenum surrounding the said means with a wall separating the air in the plenum from the combustion chamber and with a hole in said wall through which said portion penetrates with clearance, said portion having apertures putting the plenum into direct communication with the inside of the portion for the metered supply of primary air thereinto which apertures are tangentially so inclined to the axis of the enlarged end that the primary air swirls about that axis, and a flame anchor plate extending from said end portion across the hole to neighbour said wall closely and to seal said hole except for a passage around the rim of the anchor plate which passage is so narrow that secondary air from the plenum has to force its way through at a high speed, and consequentially reduced pressure, such that a suction effect is created holding the flame on the rim of the anchor plate.



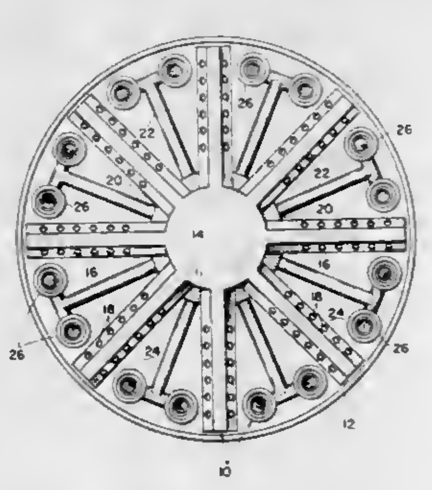
4,105,394
DUAL PRESSURE FLARE

Robert D. Reed; John S. Zink, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Oct. 18, 1976, Ser. No. 733,143

Int. Cl.² F23Q *9/00*

U.S. Cl. 431—202 **10 Claims**



1. A dual pressure burner apparatus for a flare stack, comprising a thin wall circular metal pipe, said burner apparatus comprising:

a first housing providing a first chamber having an inlet port therein for admitting low pressure gas into said chamber and having a plurality of spaced outlet ports extending through the walls thereof and spaced above the inlet port;

a plurality of hollow arms secured to the first housing, each arm being in substantial alignment with each outlet port and extending outwardly from the first housing, each arm having one end in open communication with the first chamber and the opposite end closed, each arm having spaced apertures disposed along both sides of each arm for the escape of low pressure gas said arms extending substantially to the inner surface of said stack, whereby atmospheric air is directly available for combustion of said low pressure gas over the top edge of said flare stack;

means for securing the first housing and arms concentrically inside the flare stack, near the top portion thereof;

a second housing providing a second chamber having an opening for receiving high pressure gas into said second chamber and having an outlet means for discharging said high pressure gas;

a plurality of ducts secured to the second housing in open communication with the outlet means thereof for receiving the high pressure gas, each of said ducts being interposed between adjacent pairs of the low pressure hollow arms and having outlet bore means for discharge of the high pressure gas said outlet bore means for each of said ducts comprising at least one burner having a total high pressure gas flow in close proximity to the inner surface of said flare stack, near the top thereof, whereby atmospheric air is directly available for combustion of said high pressure gas over the top edge of said flare stack;

means attached to each of said ducts in communication with the outlet bore means for burning the high pressure gas; and

means to supply low pressure air to the inside of said flare stack.

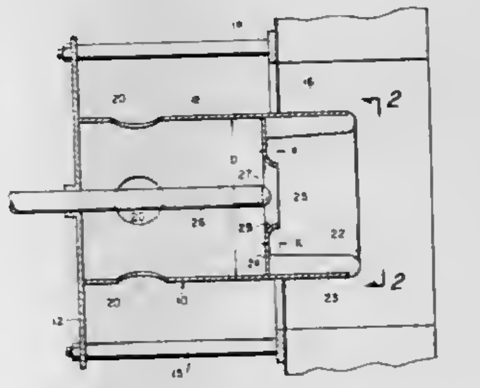
4,105,395
REGENERATIVE TILE STRUCTURE FOR FUEL BURNERS

Hershel E. Goodnight; Robert D. Reed, and Alan D. Witwer, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Nov. 19, 1976, Ser. No. 743,097

Int. Cl.² F23D *15/00*

U.S. Cl. 431—351 **5 Claims**



1. A regenerative tile structure for a fluid fuel burner, which comprises:

a substantially cylindrical shell;

an annular shaped refractory sleeve, secured to the inner periphery of the cylindrical shell, and axially disposed in a downstream portion thereof;

a flange-shaped member, secured to the inner periphery of the shell in abuttment with the upstream end of the annular refractory sleeve, and having a coaxially located orifice, the edge of the member forming said orifice projecting in a downstream direction, and having a plurality of circumferentially spaced apertures around the orifice spaced slightly inwardly from the inner periphery of the annular refractory sleeve; and

means for admitting combustion air to the shell upstream from the flange shaped member.

4,105,396
APPARATUS FOR HEAT TREATMENT OF FINE GRAINED MATERIALS

Horst Ritzmann, Enniger, Fed. Rep. of Germany, assignor to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Dec. 29, 1976, Ser. No. 755,233

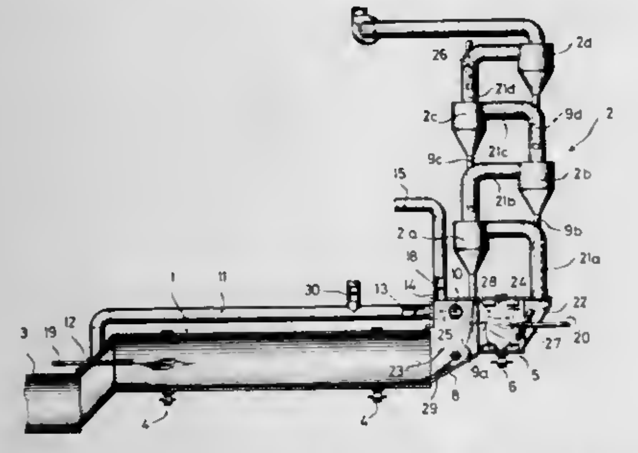
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602889

Int. Cl.² F27B *15/00, 7/02*

U.S. Cl. 432—14 **5 Claims**

4. In a heat treatment system including an open ended rotary tube furnace, a fixed material inlet housing at one end of the

furnace, a burner at the other end of the furnace, a rotary drum with material lifting members therein adjacent the inlet housing and a multi-stage material pre-heater including a first material outlet in communication with the fixed material inlet housing and a second material outlet in communication with the rotary drum, the method of heat treating fine material comprising the steps of inducing air to flow in sequence through the open ended rotary furnace, through the fixed material inlet housing, through the open ended rotary drum, and through the multi-stage material pre-heater, heating the air with the burner as it flows through the rotary furnace, rotating the rotary furnace, rotating the rotary drum at a higher rotary speed than the rotation of the rotary furnace, feeding fine material through the multi-stage pre-heater and through the first material outlet to the fixed material inlet housing and through the second material outlet to the rotary drum, and recirculating the material from the rotary drum back to the pre-heater for delivery to the fixed material inlet housing.



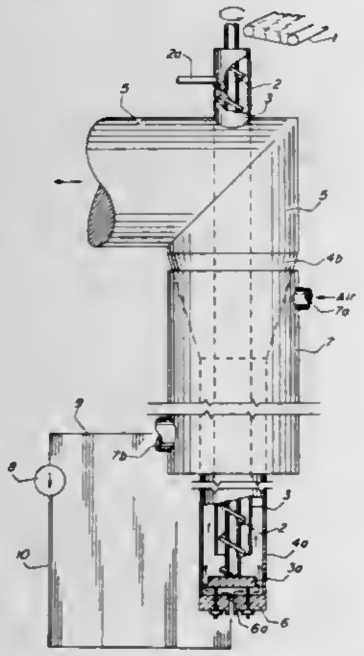
4,105,397

BARK BURNING SYSTEM

Martin T. Jasper, Mississippi State, Miss., and Peter Koch, Alexandria, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 10, 1977, Ser. No. 751,634
Int. Cl.² F27B *19/00*

U.S. Cl. 432—90 **1 Claim**



1. Apparatus for drying and burning particulate bark comprising

(a) an elongated, vertically disposed, downwardly directed feed screw;

(b) means to feed particulate bark to the upper section of said screw;

(c) a vertically-disposed cylindrical housing substantially enclosing said feed screw, said housing terminating above the bottom of said feed screw to provide an egress opening for particulate bark from said screw;

(d) a first wall concentrically disposed around said housing and said egress opening, said wall being cylindrically shaped at it lower section thereof, and being flared outwardly in the form of an inverted cone above said lower section; the annular space between said first wall and said housing defining a combustion chamber;

(e) a second wall concentrically disposed around said first wall to define an annular gas preheating chamber therebetween;

(f) openings in said second wall to permit air to enter and leave said annular preheating chamber;

(g) conduit means connected to one of said openings and to the bottom of said combustion chamber to supply preheated air to the bottom of said combustion chamber; and

(h) air metering means at the bottom of said combustion chamber to permit said preheated air to entrain particulate bark which enters said combustion chamber from said egress opening disposed below the bottom of said cylindrical housing.

4,105,398

CONTINUOUS PRODUCTION FURNACE TO HEAT RING-SHAPED WORKPIECES

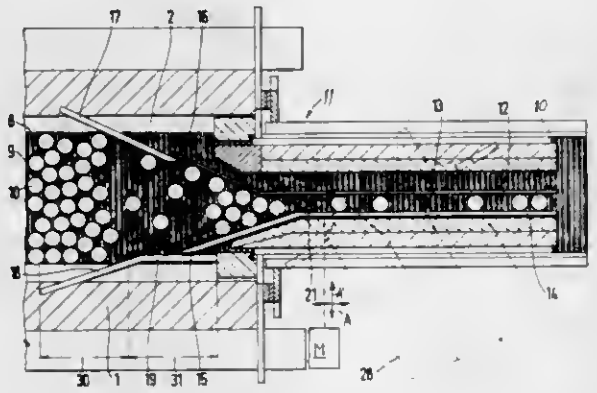
Günther Disch, Gerlingen, and Elmar Noormets, Boblingen, both of Fed. Rep. of Germany, assignors to J. Aichelin KG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,644

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2550325

Int. Cl.² F27B *9/00*

U.S. Cl. 432—121 **12 Claims**



1. Continuous production roller hearth furnace to heat circular workpieces (10) having

a furnace housing (1) defining a roller hearth furnace chamber (2) and having an inlet opening and an outlet opening,

input driven transport means extending from outside of the housing (1) through the inlet opening into the furnace chamber,

a roller hearth (8) which has a width which is a multiple of the diameter of the circular workpieces to receive a plurality of said workpieces (10) thereon randomly, adjacently positioned;

outlet transport means extending outside of the furnace chamber from the outlet opening to remove heated workpieces therefrom;

and means (11) located adjacent the outlet opening to automatically orient the workpieces in single file for removal of the heated workpieces (10) from the furnace chamber in said single file by the outlet driven transport means and for transport to a receiving station (33), comprising limit means (15–19) defining an outlet path (12) having an inlet width matched to the width of the roller hearth (8) and extending in a direction of transport of the workpieces (10) through the furnace and narrowing, funnel-shaped, to a width approximately matched to the width of the workpieces (10), said limit means including

at least one side wall (14) formed with an outwardly diverging portion (15) at the region thereof directed toward said chamber (14), located laterally with respect to said path and being cyclically movable with respect to said path (12) in a direction essentially parallel to said path (12);

means (M) coupled to said side wall (14) moving said side wall in said direction essentially parallel to said path;

and driven conveyor means (21) beneath the path to move the workpieces (10) from the chamber (2) outside thereof in single file along said path.

4,105,399

OPTICALLY BRIGHTENING WITH A SYNERGISTIC MIXTURE

Christian Luthi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 497,970, Aug. 16, 1976, Pat. No. 4,008,166.

This application Aug. 26, 1976, Ser. No. 717,846

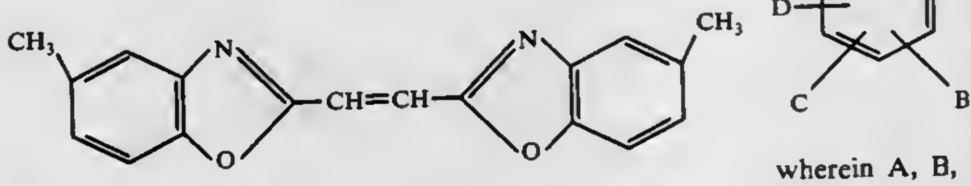
Claims priority, application Switzerland, Sep. 5, 1973, 12736/73

Int. Cl.² D06L *3/12;* **C11D** *7/26;* **C09K** *13/00*

U.S. Cl. 8—1 W **5 Claims**

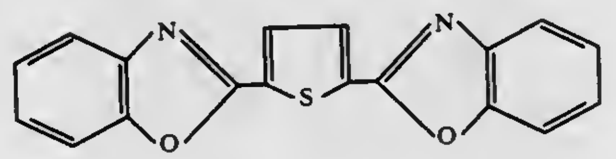
1. A process for the fluorescent brightening of synthetic and semisynthetic fibers, in particular those of polyester, polyamide or acetyl cellulose, such as cellulose triacetate or, preferably, cellulose acetate, which comprises the step of applying to said fibers an effective amount of a mixture consisting of 33% to 67% of a compound of the formula

(1)



and 67% to 33% of a compound of the formula

(2)



4,105,400

PROCESS FOR DYEING NATURAL PROTEIN FIBRES WITH METALLIC AZO DYES

Gerhard Back, Lörrach, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 460,400, Apr. 12, 1974, abandoned.

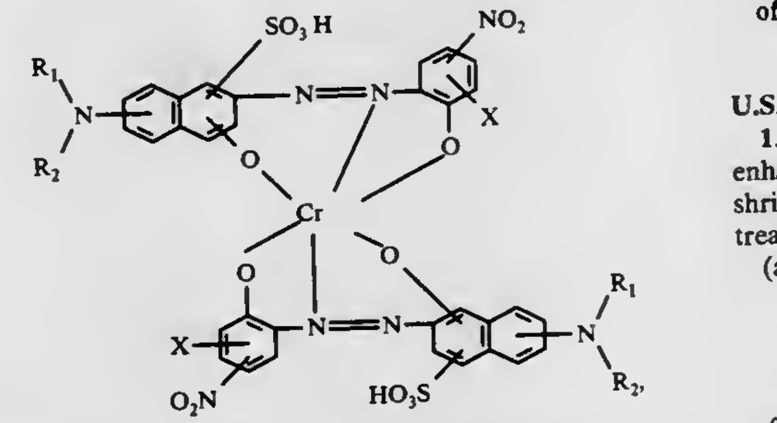
This application Mar. 29, 1976, Ser. No. 671,873

Claims priority, application Switzerland, Apr. 17, 1973, 5498/73; Feb. 28, 1974, 2829/74

Int. Cl.² C09B *62/00;* **D06P** *1/38*

U.S. Cl. 8—43 **6 Claims**

1. A process for dyeing or printing natural protein fibers in deep shades of black, brown or navy blue, comprising the step of applying to the natural protein fibers an aqueous liquor containing a levelling agent and a dye of the formula



wherein R_1 is hydrogen or methyl, R_2 is dibromopropionyl, dichloropropionyl, alpha-bromoacryloyl, alpha-chloroacryloyl or chloroacetyl, and X is hydrogen, nitro, chlorine, methoxy, acetylamino or chloroacetylamino.

4,105,401

DYE PREPARATION SOLUBLE IN COLD WATER

Zdenek Koci, Binningen, and Hans Moliet, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

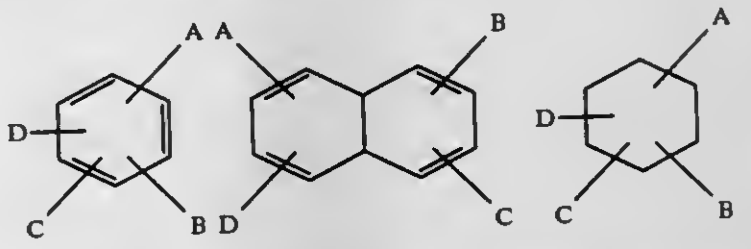
Filed Apr. 19, 1976, Ser. No. 677,945

Claims priority, application Switzerland, Apr. 23, 1975, 5201/75

Int. Cl.² C09B *67/00*

U.S. Cl. 8—79 **11 Claims**

1. A solid preparation, soluble in cold water, manufactured by a process comprising the steps of dissolving at least one anionic dyestuff or optical brightener and at least one anionic compound having hydrotropic activity, selected from the group consisting of



wherein A, B, C and D are each independently hydrogen, SO_3Na, SO_3K, COONa, COOK, OH, NO_2 or alkyl of 1 to 9 carbon atoms, provided that at least one of A, B, C and D is SO_3Na, SO_3K, COONa or COOK, in water at 20° to 95° C at a pH-value of 4.5 to 11.5, and allowing the solution to evaporate to dryness.

4,105,402

TREATMENT OF SULFIDE-LIMED PELTS IN ACID BATHS

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arbeilgen, both of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,407

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621697

Int. Cl.² C14C *1/00, 1/08*

U.S. Cl. 8—94.17 **9 Claims**

1. In the method of treating sulfide-limed pelts with an acid treating bath, the improvement werein said treating bath contains a water-soluble salt of manganese, cobalt, nickel, titanium, or zirconium and wherein said treating bath is brought into contact with oxygen.

4,105,403

KNITTED COTTON FABRIC DURABLY PATTERNED BY DIFFERENTIAL SHRINKAGE

Bethlehem K. Andrews, New Orleans; Robert J. Harper, Jr., and Norton A. Casben, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,127

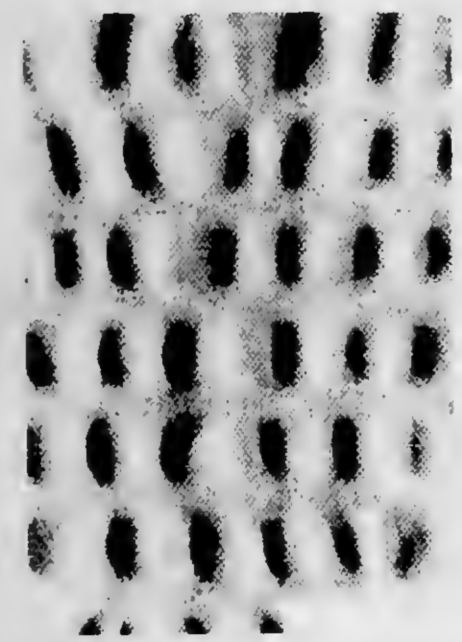
Int. Cl.² D06Q *1/02*

U.S. Cl. 8—115 **1 Claim**

1. A process for imparting to knitted cotton textiles the enhancing quality of a novel patterned effect throughout a shrinkage resistant fabric, produced by differential shrinkage in treatment, which process comprises:

(a) applying to selected areas to the surface of a knitted cotton textile, to a wet add-on of about from 20 to 90 weight percent with aqueous solution containing:
  (1) a methylol amide crosslinking agent; and
  (2) an acid catalyst;
(b) drying the moist textile from (a) at a temperature at about 70° C
(c) curing the dry textile from (b) at a temperature at about 160° C
(d) washing the cured textile from (c); and

(e) drying the washed textile from (d), wherein the application is effected by making a portion of the surface of the knitted cotton textile inaccessable to the solution of crosslinking agent by means of water-resistant adhesive tape placed on the fabric in a geometric design and applying the solution of crosslinking agent to the fabric by kiss-roll padding.



4,105,404

SUBSTITUTED THIOUREAS TO INHIBIT OZONE FADING OF DYED POLYAMIDES

Robert Alden Lofquist, and Peter Reginald Saanders, both of Richmond, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 233,792, Mar. 10, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,543

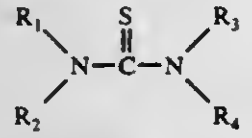
The portion of the term of this patent subsequent to Jul. 9, 1974, has been disclaimed.

Int. Cl.^{2} D06P *5/02*

U.S. Cl. 8—165 7 Claims

1. A method for improving fastness of dyes when exposed to ozone in nylon fibers dyed with anthraquinone dyes consisting of

coating said fibers with a substance consisting essentially of a compound having the formula



where R_1 is an alkyl having one to eight carbon atoms and R_2, R_3 and R_4 are independently selected from hydrogen or an alkyl having one to eight carbon atoms, said compound containing at last five carbon atoms, so that from about 0.5 to about 5% on weight of fiber of the compound remains on said fiber after subsequent water treatment to substantially reduce the rate of fading due to exposure of fabric of said dyed fiber to ozone.

4,105,405

METHOD AND COMPOSITION FOR INHIBITING CORROSION OF METALS IN CONTACT WITH WATER

Volker Wehle, Hilden, and Jürgen Reiffert, Oberhausen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 854,029

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653933

Int. Cl.^{2} C23F *11/12, 11/18, 11/16*

U.S. Cl. 21—2.7 R 14 Claims

1. A method for inhibiting corrosion of non-noble metals in contact with circulating water comprising the steps of adding to circulating water in contact with non-noble metals from 0.5 to 50 gm/m^3 of at least one cyclohexanehexacarboxylic acid and adjusting said water to a pH of from 6 to 9.

14. A corrosion inhibitory composition for use in water-conveying systems in contact with non-noble metals consisting essentially of from 10% to 90% by weight of cyclohexanehexacarboxylic acid, from 10% to 50% by weight of a water-soluble zinc salt, from 0 to 25% of a concretion prevention and dispersion agent, from 0 to 5% by weight of benzimidazole and from 0 to 2% by weight of a biocidal agent.

4,105,406

METHOD OF INHIBITING CORROSION USING A HEXAMETAPHOSPHATE AND A PHOSPHATE BUFFER

W. Bruce Murray, 7119 Sea Wind Dr., Long Beach, Calif. 90803

Filed Dec. 30, 1976, Ser. No. 755,627

Int. Cl.^{2} C09K *15/02;* C23F *9/02, 11/18*

U.S. Cl. 21—2.7 R 12 Claims

1. A method for inhibition of the corrosion of iron and steel surfaces in contact with water which consists of:
   - (a) adding to the water a limited amount of an alkali metal hexametaphosphate to provide a concentration therein up to about 30 parts per million, insufficient, used alone, to prevent said corrosion; and
   - (b) adding to the water a sufficient amount of a phosphate buffer, selected from the group consisting of orthophosphoric acid and alkali metal dihydrogen orthophosphate, to maintain the pH of said water at a value from about 6.5 to about 7.5, whereby said corrosion is inhibited.

4,105,407

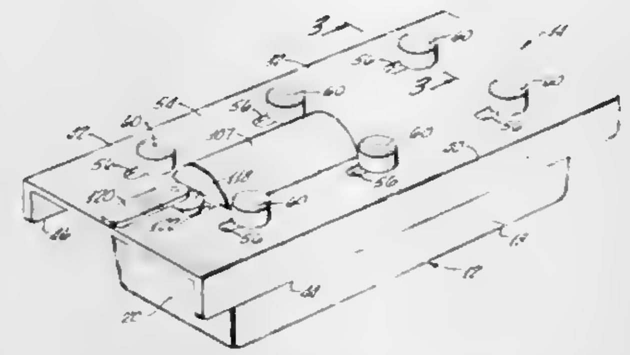
STERILIZING AND STORING MEDICAL ITEMS

Roger S. Sanderson, 24662 Santa Clara Ave., Dana Point, Calif. 92629

Continuation of Ser. No. 571,263, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 501,183, Aug. 28, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,522

Int. Cl.^{2} A61L *1/00*

U.S. Cl. 21—56 7 Claims



1. A method of sterilizing items comprising the steps of:

placing said items in a rigid reusable container which can be repeatedly subjected to steam;

placing the container in an autoclave with the container sufficiently open so that the exterior of the container is in fluid communication with the interior;

operating the autoclave to provide a sterilizing cycle including a vacuum environment to withdraw the air from the container followed by a pressure steam environment to sterilize the items, and a final vacuum environment to withdraw the steam from the container and dry the articles in the container; and

automatically sealing said container by means responsive to the environment in the autoclave after the articles have been sterilized but before the final vacuum environment is complete.

4,105,408

UREA ASSAY

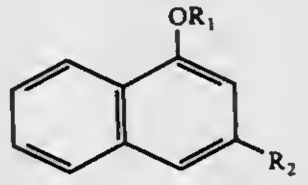
Jerry W. Denney, Carmel, Ind., assignor to American Motor Corporation, Indianapolis, Ind.

Division of Ser. No. 740,612, Nov. 10, 1976. This application Oct. 13, 1977, Ser. No. 841,655

Int. Cl.^{2} G01N *33/16*

U.S. Cl. 23—230 B 3 Claims

1. A process for the quantitation of urea in a fluid sample, in which the sample is reacted with a reagent containing an acidic solution of o-phthalaldehyde and an acidic solution of a chromogenic compound of the general class consisting of 1, or 1,3-mono- or di-substituted hydroxy or methoxy naphthalene compounds which have the following general formula:



where R_1 = —H, or $—CH_3$ and
where R_2 = —H, or —OH, or $—OCH_3$.

4,105,409

METHOD AND REAGENT FOR DETERMINING THE ETHYL ALCOHOL CONTENT OF A GAS

Denys Monnier, Chenes-Bougeries, and Pierre Bolle, Geneva, both of Switzerland, assignors to Lucien Etzlinger, Geneva; Carl Wilhelm Koelker, Baar; Claus H. Grossman, Kusnacht and Multi-Marketing Services AG., Basel, all of Switzerland

Filed Apr. 29, 1977, Ser. No. 792,168

Claims priority, application Switzerland, May 6, 1976, 5711/76

Int. Cl.^{2} G01N *31/22, 33/16*

U.S. Cl. 23—232 R 7 Claims

1. A reagent for determining the ethyl alcohol content of a gas by means of a color reaction, said reagent consisting of an intimate mixture of (1) iodine pentoxide, (2) a colorless metal nitrate or concentrated nitric acid and (3) 75 to 98% (wt./wt.) sulphuric acid, the original white color of said reagent changing to pink, brown or black depending on the ethyl alcohol content of the gas.

4,105,410

RECEPTOR COATED PLASTIC FOR ASSAY OF LIGANDS

Sidney Gotcho, Monsey; Henry McCarter, Pine Island, and Edward Chanod, Staten Island, all of N.Y., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Jul. 22, 1976, Ser. No. 707,683

Int. Cl.^{2} G01N *29/02, 31/00;* A61K *29/00*

U.S. Cl. 23—253 TP 12 Claims

1. In a process for coating a receptor for a ligand to be assayed on a plastic substrate, the improvement comprising:

effecting said coating with a solution of the receptor containing a blocking agent for the receptor sites to prevent adherence of the receptor sites to the plastic substrate and a deaggregating agent for the receptor to prevent adherence of the receptor to the plastic substrate in aggregates, said blocking agent having a cross-reactivity with the receptor of from 0.0001 to 5% and which can be displaced by the ligand to be assayed.

11. A plastic substrate having a receptor for a ligand coated thereon produced by the process of claim 1.

4,105,411

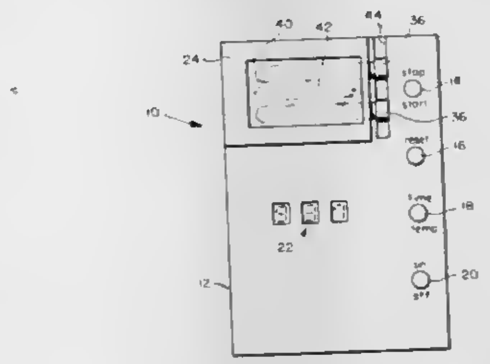
DEVICE FOR DETERMINING THE ACTIVATED CLOTTING TIME OF A BLOOD SAMPLE

William Ralph Biver, Dubuque, Iowa, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,297

Int. Cl.^{2} G01N *33/16*

U.S. Cl. 23—253 R 11 Claims



1. A device for determining the activated coagulation time of whole blood comprising:
   - (a) a hand held housing;
   - (b) an upstanding portion on said housing defining a chamber for receiving a rubber capped glass tube containing a sample of blood to be tested;
   - (c) said upstanding portion having a window to observe the tube in said chamber;
   - (d) an electric heater in said housing for maintaining the glass tube and blood sample at substantially 37° C;
   - (e) a timer in said housing; and
   - (f) means on said housing to manually start said timer when a blood sample enters the tube and to stop said timer when a clot is observed to form in the blood sample.

4,105,412

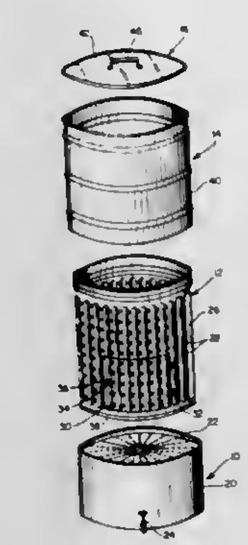
PORTABLE COMPOST CONTAINER

Manfred W. A. Petzinger, Rte. 7, Box 87, Elizabethtown, Ky. 42701

Filed Aug. 4, 1977, Ser. No. 821,684

Int. Cl.^{2} C05F *9/02*

U.S. Cl. 23—259.1 7 Claims



1. A compost container including:

(a) a base section providing a housing for receiving liquid fertilizer sap,
(b) support means within and on the upper portion of said base section,
(c) container means, including an inner perforate section into which decomposable garbage and waste is placed and an outer imperforate section removably placed over said perforate section, removably positioned on said support means whereby compost is formed in said container, said inner perforate section including access means near the lower portion thereof for removing compost therefrom, and
(d) at least a portion of the lower portion of said container means being open to permit liquid fertilizer sap to gravitate from said container means with said base section.

4,105,413

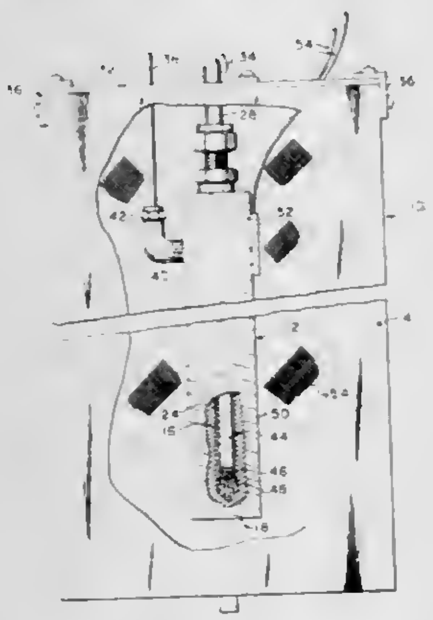
CATALYTIC CONVERTER APPARATUS, ESPECIALLY FOR OXIDES OF NITROGEN

Quade R. Stahl, Springfield, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Division of Ser. No. 562,819, Mar. 28, 1975, Pat. No. 3,979,501. This application Aug. 6, 1976, Ser. No. 712,216

Int. Cl.^{2} B01J *8/06*

U.S. Cl. 23—288 R **5 Claims**



1. Catalytic apparatus of the type described comprising a metal block having an eloongated bore open at one end and closed at the opposite end, a tube within said bore and having an outer surface defining with the inner surface of the bore a thin space therebetween, the interior of said tube containing a catalyst and communicating with said space adjacent to said opposite end of the bore, the open end of said bore being provided with a bore extension having internal threads, said tube having one end connected to and supported by an externally threaded fitting that is threaded into said internal threads and that has a passage therethrough communicating with the interior of the tube at said one end, said tube extending from said fitting and being dimensioned so that the tube can be inserted into said bore through the open end of the bore when the fitting is threaded into the bore extension, means for admitting gas to be treated to said space adjacent to said fitting, said fitting closing said bore extension so that said gas is constrained to flow along said space and then through said tube, means for exhausting said gas from said tube through said fitting passage, and means for heating said block to heat said gas flowing in said space to a desired temperature.

4,105,414

CATALYTIC MUFFLER FOR INTERNAL COMBUSTION ENGINES

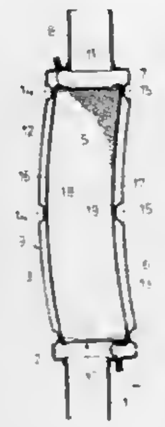
Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Dec. 17, 1976, Ser. No. 751,670

Claims priority, application Italy, Dec. 23, 1975, 30747 A/75

Int. Cl.^{2} F01N *3/15*

U.S. Cl. 23—288 F **7 Claims**



1. A catalytic muffler for an exhaust duct of an internal combustion engine of a motor vehicle, including:
(a) an outer casing in the shape of a substantially flattened cylinder, having reduced height with respect to the diameter and having a substantially vertical axis, said casing being defined by an assembly of an upper and a lower sheet metal half-shells connected to one another in a sealed tight manner along a line lying on the outer cylindrical surface and on a plane inclined with respect to the vertical axis, each half-shell being defined by only one piece of metal sheet and including an essentially planar wall of circular outline and a cylindrical side wall, of a height gradually decreasing and having a free edge lying on said inclined plane,
(b) a first gas inlet duct connected to the cylindrical side wall of the upper half-shell at the zone thereof of greatest height,
(c) a second gas discharge duct connected to the cylindrical side wall of the lower half-shell at the zone thereof of greatest height,
(d) a catalyst containing inner casing, having also substantially the shape of a flattened cylinder, namely reduced height with respect to the diameter thereof, mounted in the interior of the outer casing and coaxial therewith, a side annular wall of the inner casing being gas impervious, while upper and lower circular walls of the same are permeable to the gas, whereby the flow of the gases through the catalyst takes place predominantly along a direction which is substantially parallel to the vertical axis of the inner casing, said circular walls being provided with vertically curled edges slipped with circumferential clearance around corresponding edges of said annular wall, means being provided to hold said circular walls in yieldable contact relationship with said annular wall,
(e) a wall having inner and outer edges, said wall having an annular shape and being of corrugated metal sheet lying on the same inclined plane of the edges of said half-shells, the inner edge of said annular corrugated wall being connected to the side annular wall of the inner casing, the outer edge of the corrugated annular wall being connected to the edge of said half-shells,
(f) a chamber defined by the walls of the upper half-shell, the walls of the inner casing and the annular corrugated wall, said chamber communicating with said inlet duct and serving as a manifold for conveying the gases towards the upper circular wall of the inner casing, said chamber including an annular capacity positioned above said annular corrugated wall, said capacity having decreasing height, which is equal in every point to the height of the cylindrical side wall of the upper half-shell and further including a capacity positioned above the inner casing and having a cylindrical flattened shape, namely having a diameter like that of said inner casing and height much lower than the diameter, and

(g) a chamber defined by the walls of the lower half-shell, the walls of the inner casing and the annular corrugated wall, said chamber communicating with the discharge duct and serving as a manifold for the gases coming out of the lower circular wall of the inner casing, said chamber comprising an annular capacity positioned under the annular corrugated wall, said capacity having increasing height, which in every point is equal to the height of the cylindrical side wall of the lower half-shell, and further including a capacity positioned below the inner casing and having a cylindrical flattened shape, namely having a diameter equal to that of the inner casing, but of very reduced height with respect to the diameter.

4,105,415

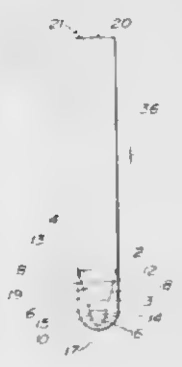
MULTI-PURPOSE TEST TUBE

Wayne D. Lovett, Rte. 1, P.O. Box 561, Columbia, S.C. 29203

Filed Apr. 21, 1976, Ser. No. 678,976

Int. Cl.^{2} B01L *3/14;* **G01N** *21/24*

U.S. Cl. 23—292 **5 Claims**



1. A tube, for use in testing specimens in a solution, comprising a tube having an open end at the top, a closed end at the bottom, an upper tube compartment and a bottom section; said bottom section comprising a plurality of vertical, transparent compartments, said transparent compartments being vertically aligned one above another, each of said vertical, transparent compartments forming a flattened section; each of said plurality of vertical, transparent compartments comprising a front piece, a right edge sloping inwardly towards the closed end, a rear piece and a left edge sloping inwardly towards the closed end, said pieces and edges being respectively attached to each other to form said compartments; the lowermost compartment having a bottom comprising a rounded inner surface; a plurality of edges slanting inwardly towards the closed end connecting said vertical, transparent compartments to one another and to the upper tube compartment; whereby sufficient light may pass through solution contained in any one of said plurality of vertical, flattened compartments for changes in said solution to be noticeable, thereby providing information about specimens to be tested.

4,105,416

PROCESS FOR REMOVING SULFUR FROM COAL

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 12, 1977, Ser. No. 786,911

Int. Cl.^{2} C10L *9/10;* **C10B** *57/00*

U.S. Cl. 44—1 R **23 Claims**

1. A process for reducing the sulfur content of coal comprising the steps of:
(1) contacting coal particles with an aqueous solution of iron complexing agent, and an oxidant to preferentially oxidize at least a portion of the sulfur in the coal;
(2) contacting the oxidized sulfur-containing coal with at least one hydrogen donor material capable of transferring hydrogen to the oxidized sulfur-containing coal under conditions such that hydrogen transfer occurs; and
(3) recovering coal particles of reduced sulfur content.

4,105,417

FUEL ADDITIVE

Marvin D. Coon, deceased, late of Vallego, Calif., and by John Hugh MacPherson, agent, 9 Anson Way, Kensington, Calif. 94707

Filed Apr. 11, 1974, Ser. No. 460,234

Int. Cl.^{2} C10L *1/22*

U.S. Cl. 44—63 **3 Claims**

1. A fuel composition comprising a major amount of a liquid hydrocarbon fuel and from 10 ppm to 4,000 ppm of a compound selected from the group consisting of hydrocarbyl phenyl urea, N-hydrocarbyl acetamide of ethylenediamine, and hydrocarbyl-1-aminoethyl oxoimidazolidone, wherein the hydrocarbyl groups contain from 30 to about 400 carbon atoms.

4,105,418

FUELS FOR INTERNAL COMBUSTION ENGINES

Dietrich Fritz Arthur Mohnhaupt, En Cardelay, 1261 Bassins, Switzerland

Continuation of Ser. No. 364,253, May 29, 1973, abandoned. This application Jun. 18, 1975, Ser. No. 588,066

Int. Cl.^{2} C10L *1/18*

U.S. Cl. 44—78 **10 Claims**

1. A liquid carburetor gasoline composition for internal combustion engines having improved combustion properties and reduced emission of carbon monoxide in the exhaust gases from the engine containing dissolved therein a surface tension lowering amount of 0.5 to 5% by volume of at least one tenside additive capable of lowering the surface tension of said fuel.

4,105,419

FLUIDIZED BED APPARATUS

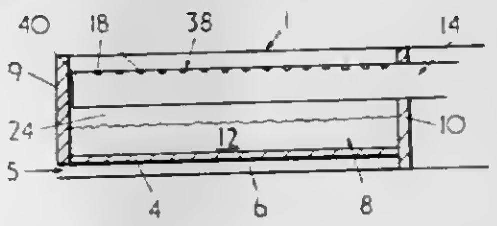
John Highley, and Michael Alan Vickers, both of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Mar. 11, 1977, Ser. No. 776,616

Claims priority, application United Kingdom, Mar. 26, 1976, 12197/76

Int. Cl.^{2} C10J *3/54*

U.S. Cl. 48—61 **7 Claims**



,1. A fluidised bed apparatus including a body, a gas-permeable support plate located within the body for supporting, in use, a fluidised bed of particulate material, a gas exit provided in the body, and a baffle assembly interposed between the gas exit and the support plate at a location in use above the fluidised bed, the baffle assembly comprising at least one duct along at least part of the length of the baffle assembly, a number of inlet means in the duct, and passage means within the duct and interconnecting the inlet means and the gas exit, whereby the at least one duct is adapted to allow flow of exit gases around the duct prior to their egress through the inlet means into the passage means.

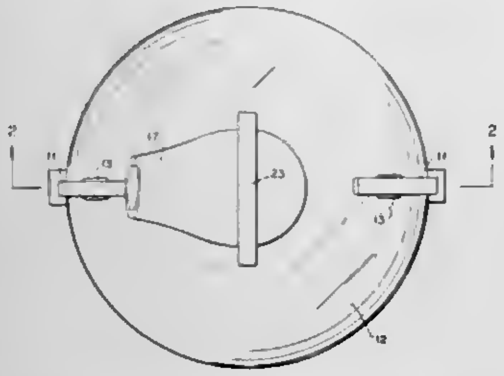
4,105,420
CANISTER VACUUM CLEANER WITH TRANSPARENT LID

Barnard J. Moore, Venice, Fla., assignor to Bayfront Carpet and Vacuum, Inc., Venice, Fla.

Filed May 23, 1977, Ser. No. 799,698

Int. Cl.² B01D *46/00*

U.S. Cl. 55—274 **8 Claims**



1. A canister-type vacuum cleaner comprising:

a metallic canister body having an opening, a porous bag for filtering dirt particles out of air drawn into said canister body through said opening, means for applying suction to draw air through said bag, a removable lid closing said canister body by being removably mounted over said opening, said lid being entirely made of transparent material, a central aperture disposed in said lid, a sweivel member defining an air passageway into said porous bag disposed in said central aperture, and oppositely disposed embossments in said lid cooperating with oppositely disposed latches on said canister body to removably maintain said lid in air-tight attachment to said canister body with the edge of said porous bag clamped between the edges of said lid and said body opening.

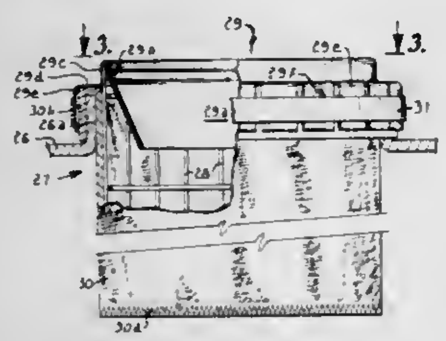
4,105,421
DISPOSABLE FILTER CARTRIDGE

Lamson Rheinfrank, Jr., Kansas City, Mo.; Richard P. Bundy, Prairie Village, Kans., and Jack T. Clements, Raytown, Mo., assignors to Standard Havens, Inc., Kansas City, Mo.

Filed May 28, 1976, Ser. No. 690,886

Int. Cl.² B01D *46/02*

U.S. Cl. 55—379 **11 Claims**



1. A cage and diffuser assembly for installation on a tube sheet collar in a baghouse as support for a fabric filter, said assembly comprising:

a cylindrical cage having an open upper end; and

an air diffuser secured to the upper end of said cage and having an open central portion projecting interiorly of said cage to direct air thereto, said diffuser further having an outside circular diameter defined by a plurality of downwardly extending flexible fingers adapted to encircle the tube sheet collar for sealing engagement therewith.

4,105,422
FILTRATION DEVICE

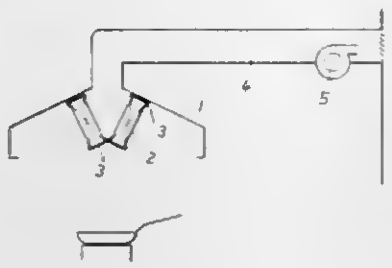
Terumasa Kiguchi, Tokyo, Japan, assignor to Kikuchi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 763,837

Claims priority, application Japan, Feb. 2, 1976, 51-10615; May 24, 1976, 51-59752; Sep. 16, 1976, 51-123405[U]

Int. Cl.² B01D *45/00*

U.S. Cl. 55—446 **12 Claims**



1. A filtration device comprising: a filtration box formed of an upper frame and a separate lower frame; said upper frame including an upper plate having a pair of upper facing sidewalls including a pair of upper flanges extending outwardly from the lower edges of said upper sidewalls respectively; said lower frame including a lower plate having a pair of lower facing sidewalls including a pair of lower flanges extending outwardly from the upper edges of said lower facing sidewall respectively; a support frame releasably securing said separate upper and lower frame together to render said pair of upper flanges in facing abutment with said pair of lower flanges and adjacent opposing upper and lower sidewalls respectively coplanar and to form said filtration box releasably mounted in said support frame; said upper and lower plates each having an array of apertures therein said arrays being offset one from the other; said lower plate having a plurality of frusto-conical intake tubes each having a wide opening mounted over and communicating with the respective aperture in said lower plate; and said upper plate having a plurality of outlet tubes each having one open end thereof mounted over and communicating with the respective aperture in said upper plate; said intake tubes extending interiorly of said filtration box toward said upper plate and said outlet tubes extending downwardly toward said lower plate into the respective spaces between adjacent intake tubes; whereby release of said filtration box from said support frame and separation of said upper and lower frames from each other provides complete access to all the surfaces of said upper and lower frames to permit cleaning thereof.

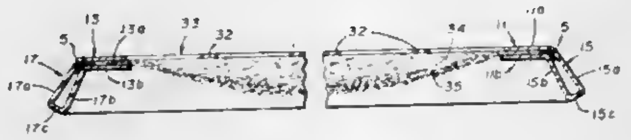
4,105,423
COMPACT AIR FILTER WITH TUBULAR FRAME

Bernard Latakas, Rosann, Ind.; John E. Copenhefer, Louisville, Ky., and Robert M. House, Wabash, Ind., assignors to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 636,388, Dec. 1, 1975, abandoned. This application May 2, 1977, Ser. No. 792,834

Int. Cl.² B01D *46/10*

U.S. Cl. 55—501 **9 Claims**



1. A compact nestable air filter having a top surface and a bottom surface comprising:

A. a generally rectangular frame formed of an integral suitably cut and scored blank comprising a plurality of interconnected frame members each comprising:
   1. a coplanar flange having bottom and top coplanar flange members in juxtaposition, and
   2. a flared flange disposed at an angle of less than 180° with respect to said coplanar flange and comprising bottom and top flared flange members both of which are disposed on the same side as and at an angle of less than 180° with respect to said coplanar flange, and an edge panel having one edge thereof integrally connected to an edge of said bottom flared flange member and the other edge thereof integrally connected to an edge of said top flared flange member,

in said frame, said bottom flared flange members being hingedly connected to said bottom coplanar flange members, and said top coplanar flange members being hingedly connected to said top flared flange members, said flared flange members and said edge panels cooperating to define flanges of tubular cross-section in which the upper flared flange member and the lower flared member converge toward each other in a direction away from the edge panel to which they are connected and means securing the edges of the bottom and top flared flange members which are opposite to those which are connected to the edge panel so that said secured edges are fixed with respect to each other,

B. means connecting the ends of adjacent flared flanges together,

C. a perforated bottom cover, and

D. a filter member retained by said coplanar flanges.

4,105,424
METHOD AND APPARATUS FOR SUPPRESSION OF POLLUTION IN MINERAL FIBER MANUFACTURE

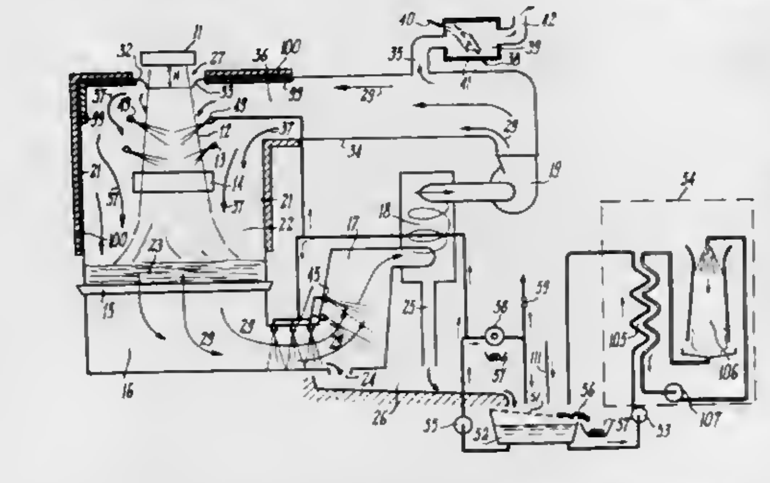
Marcel Levecque, Birchrunville, Pa., and Jean A. Battigelli, Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 456,878, Apr. 1, 1974, abandoned, and Ser. No. 557,281, Mar. 11, 1975, Pat. No. 4,052,183, which is a continuation-in-part of Ser. No. 353,983, Apr. 24, 1973, Pat. No. 3,874,886. This application Dec. 3, 1976, Ser. No. 747,433

Claims priority, application France, Oct. 22, 1976, 76 31860; Oct. 10, 1973, 73 36169; Feb. 10, 1975, 75 04039; Mar. 30, 1973, 73.11525

Int. Cl.² C03B *37/04*

U.S. Cl. 65—3 C **36 Claims**



20. In the manufacture of fibers by gas blast attenuation of thermoplastic material, the method which comprises establishing a current of the attenuating gas and the attenuated fibers in a forming section having a foraminous fiber collecting device at a boundary of the forming section through which the gas of said current passes and on which the fibers collect to form a blanket, recirculating gas from the downstream side of the collecting device to and through the forming section and the collecting device, and cooling the recirculating gas in the flow path between the collecting device and the forming section.

4,105,425
APPARATUS FOR MANUFACTURE OF MINERAL WOOL

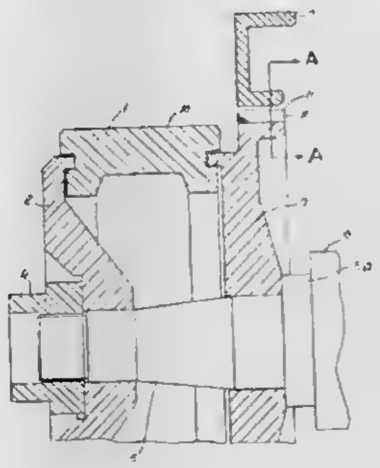
Verner Nielsen, Hellerup, and Hobert Manfred Rasmussen, Hvidovre, both of Denmark, assignors to Rockwool International A/S, Hedehusene, Denmark

Continuation of Ser. No. 716,851, Aug. 23, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,954

Claims priority, application Denmark, Sep. 1, 1975, 3916/75

Int. Cl.² C03B *37/04*

U.S. Cl. 65—14 **3 Claims**



1. In apparatus for the manufacture of mineral wool which includes at least one high speed horizontally disposed cylindrical rotor, means for directing a flow of liquid melt onto the peripheral surfaces of said rotor during rotation thereof, and an air distribution chamber including means for directing an air flow axially of and along the contour of the rotor for cooling the fibers formed and for transporting said fibers to collecting means; the improvement which comprises providing an annular slot adjacent to, concentric with and radially outwardly of the peripheral surface of each rotor, positioning a plurality of blades in said slot in substantially parallel disposition with each other and with the axis of the rotor and mounted to be rotatable therewith, the blades being thus positioned to provide a series of air flows having axial velocity as well as tangential velocity in the rotational direction of the rotor at the points of introduction thereto equal to the peripheral velocity of the rotor, the distance between the blades being such that the series of air flows integrate to thereby form the cooling and transporting air flow.

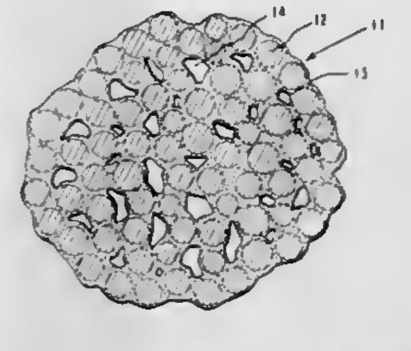
4,105,426
PROCESS FOR MANUFACTURE OF MACROPOROUS MICROSPHEROIDS

Ralph Kingsley Iler, and Joseph Jack Kirkland, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 693,111, Jun. 15, 1976, Pat. No. 4,070,286. This application Aug. 22, 1977, Ser. No. 826,900

Int. Cl.² C03C *17/00*

U.S. Cl. 65—18 **4 Claims**

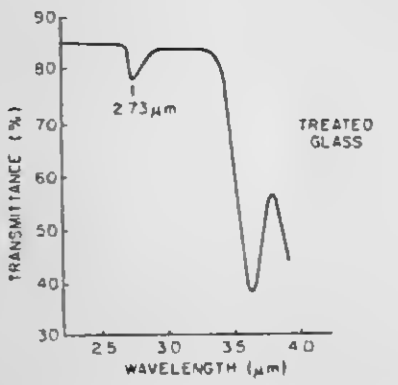


1. A process of producing a powder of discrete, macroporous, microspheroids comprising the steps of:

(a) forming a powder of microspheroids, each having an average diameter in the range of about 2 to about 50 microns, each microspheroid being a coherent aggregate of:
(1) a plurality of large colloidal particles having an average diameter in the range of about 0.1 to about 1.0 micron and each having a surface of silica and a core of material selected from the group consisting of silica and acid-insoluble refractory metal oxides, and
(2) a plurality of small colloidal silica particles having an average diameter of about 1.0 to about 10.0 nanometers, the average diameter of said small colloidal particles being less than or equal to about one-tenth the average diameter of said large colloidal particles, and
(b) heating the microspheroids so formed to a temperature in the range of about 650° to about 1050° C. until the small colloidal particles have sintered to each other and to the large colloidal particles forming a nonporous silica coating joining and cementing together the large colloidal particles.

4,105,427
PROCESS FOR DEWATERING POROUS GLASS

Thomas H. Elmer, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 25, 1977, Ser. No. 790,707
Int. Cl.^{2} C03C *15/00*
U.S. Cl. 65—30 R **6 Claims**

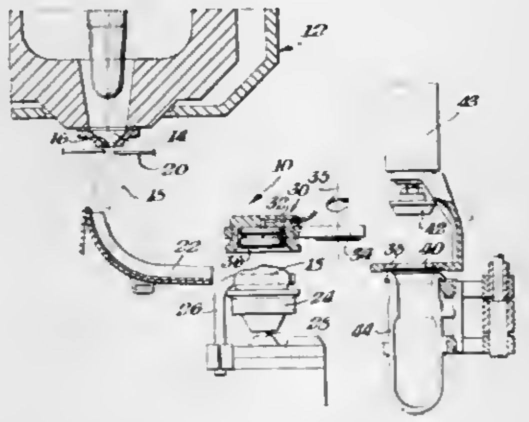


1. A process for dewatering porous 96% silica glass which comprises the steps of:
(a) contacting the porous glass with water vapor at a temperature ranging from about 30°–150° C. below the annealing point of the glass for a time at least sufficient to enhance the hydroxyl release characteristics of the glass;
(b) heating the porous glass in a dry environment at a temperature below the consolidation temperature thereof for a time at least sufficient to expel hydroxyl groups therefrom; and
(c) consolidating the porous glass to non-porous glass.

4,105,428
BLOW MOLDED GLASS ARTICLE MANUFACTURE

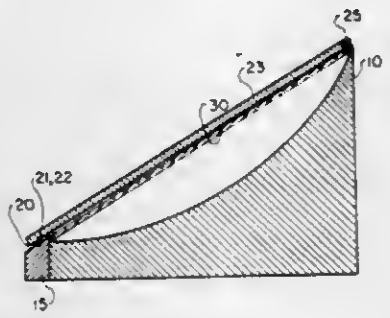
Terry L. Adams, Orange, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Jan. 31, 1977, Ser. No. 764,384
Int. Cl.^{2} C03B *9/14, 23/18, 9/00*
U.S. Cl. 65—77 **5 Claims**

1. A process for forming diverse decorative patterns on the inner surface of diverse blow molded glass articles with the utilization of the same basic equipment comprising forming a discrete gob of molten glass, transporting the gob to an anvil, removably attaching a pattern forming insert on a die, disposing the die in line with the anvil with the removably attached pattern thereon corresponding to the decorative pattern, moving the anvil and die relatively toward each other until the die contacts the gob and the pattern on the die imprints a corresponding pattern on one generally flat horizontal surface of the gob to form a parison therefrom, forming the parison in a generally flat form, transporting the parison to a blow molding station, blowing against the generally flat horizontal imprinted surface of the parison to form a glass article of non-uniform thickness with the imprinted surface comprising the inner surface of the article, detaching the pattern forming insert when a different decorative pattern is to be formed, removably attaching to the die a different pattern forming insert corresponding to the different pattern, and repeating the gob forming and transporting steps and the anvil and die contacting and parison transporting and blowing steps.



4,105,429
METHOD AND APPARATUS FOR PRECISION FORMING OF PLASTIC MATERIALS SUCH AS GLASS TO PRECISE DIMENSIONS FROM SHEET MATERIAL

Manuel M. Delgado, 12624 Ocaso, La Mirada, Calif. 90638
Filed May 2, 1977, Ser. No. 792,773
Int. Cl.^{2} C03B *23/02*
U.S. Cl. 65—107 **7 Claims**

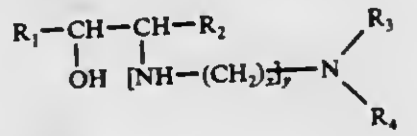


1. Apparatus for sag forming of thermoplastic materials comprising;
a mold member defining an inclined cavity into which a blank of thermoplastic material may be sag formed including a stop at a lower edge thereof;
a weight member supportable above said cavity in part by contact with a lower portion of said mold member;
said weight member including an elongated edge portion for engaging an upper edge of a blank positioned over said cavity to apply edge pressure thereto;
said elongated edge of said weight member extending into contact with the surface of said mold member defining said cavity to move downward along said mold member responsive to gravitational force.
6. The process for sag forming thermoplastic shapes from substantially planar blanks comprising:
positioning a mold cavity on an incline;
laying a thermoplastic blank over the mold cavity with the lowermost edge thereof restrained from movement responsive to gravitational force;
applying the pressure of a weight to substantially the entire edge of the blank opposite the lowermost edge while heating said blank, said weight being in slidable engagement with the mold cavity whereby the blank sags into the cavity under its own weight plus the edge pressure applied thereto by said weight; and
cooling the formed blank.

4,105,430
FERTILIZER COMPOSITIONS CARRYING AN AMINOALKANOL AS ANTICAKE AGENT

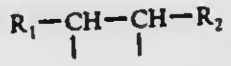
Karlheinz Koch, Haan, and Wolfgang Rupilius, Dusseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of Fed. Rep. of Germany
Filed May 5, 1976, Ser. No. 683,321
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1975, 2525568
Int. Cl.^{2} C05C *1/00*
U.S. Cl. 71—59 **16 Claims**

1. A composition in particulate, free-flowing form consisting essentially of a hygroscopic salt component which normally cakes on storage having a uniformly distributed, effective surface content as anti-caking agent of from 0.05% to 0.2% by weight of said hygroscopic salt component of an aminoalkanol material selected from the group consisting of
(1) a mixture of fatty vicinal aminoalkanols of the formula:



$$R_1-\underset{OH}{\underset{|}{CH}}-\underset{[NH-(CH_2)_x]_y-N\begin{smallmatrix}R_3\\ R_4\end{smallmatrix}}{\underset{|}{CH}}-R_2$$

wherein R_1 and R_2 each represent a substituent selected from the group consisting of H and unbranched alkyl having from 1 to 18 carbon atoms, and the sum of the carbon atoms in R_1 and R_2 is from 9 to 18; R_3 and R_4 each represent a substituent selected from the group consisting of H, C_{1-4} alkyl and C_{2-4} hydroxyalkyl; and x represents a value from 2 to 6 and y represents a value from 0 to 1, inclusive, the



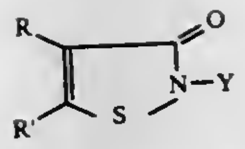
$$R_1-\underset{|}{CH}-\underset{|}{CH}-R_2$$

units in the aminoalkanols of said mixture being of at least two different chain lengths in the range from 11 to 20 carbon atoms; and
(2) salts of said aminoalkanols.
7. A composition according to claim 1 wherein said hygroscopic salt component is a water-soluble, inorganic salt fertilizer.

4,105,431
3-ISOTHIAZOLONES AS BIOCIDES

Sheldon N. Lewis, Willow Grove; George A. Miller, Glenside, and Andrew B. Law, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Continuation-in-part of Ser. No. 836,660, Jun. 25, 1969, Pat. No. 3,761,488, which is a continuation-in-part of Ser. No. 672,437, Oct. 3, 1967, Pat. No. 3,523,121, which is a continuation-in-part of Ser. No. 621,780, Mar. 9, 1967, abandoned. This application Jun. 8, 1973, Ser. No. 368,168
Int. Cl.^{2} A01N *9/22*
U.S. Cl. 71—67 **27 Claims**

1. A composition for inhibiting the growth of bacteria, fungi, or algae comprising an agronomically-acceptable carrier and, in an amount which is effective to adversely affect the growth of bacteria, fungi, or algae, a compound of the formula

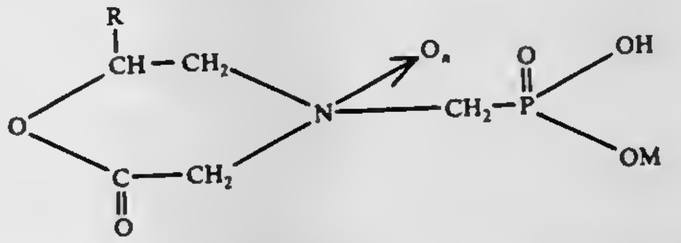


wherein Y is (1) an unsubstituted alkyl group of 1 to 18 carbon atoms,
(2) a substituted alkyl group having at least one hydrogen atom replaced by hydroxy, halo, cyano, alkylamino, dialkylamino, phenylamino, halophenylamino, carboxy, carbalkoxy, alkoxy, aryloxy, or carbamoxy, wherein the total number of carbon atoms in the substituted alkyl group does not exceed 18,
(3) an unsubstituted or halo-substituted alkenyl group of 2 to 18 carbon atoms,
(4) unsubstituted or halo-substituted alkynyl group of 2 to 18 carbon atoms,
(5) an unsubstituted or alkyl-substituted cycloalkyl group having a 3 to 6 carbon atom ring and up to 12 carbon atoms,
(6) an unsubstituted or a halo-, lower alkyl-, or lower alkoxy-substituted aralkyl group wherein the total number of carbon atoms in the aralkyl group does not exceed 10, or
(7) an unsubstituted or a halo-, nitro-, lower alkyl-, or lower carbalkoxy-, substituted aryl group wherein the total number of carbon atoms in the aryl group does not exceed 10,
R is hydrogen, halogen, or a (C_1-C_4)alkyl group, and
R' is hydrogen, halogen, or a (C_1-C_4)alkyl group or a salt of a compound of the above formula with a strong acid.

4,105,432
CYCLIZED DERIVATIVES OF N-(2-HYDROXYALKYL)-N-PHOSPHONOMETHYLGLYCINE COMPOUNDS

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jul. 18, 1977, Ser. No. 816,616
Int. Cl.^{2} C07F *9/38;* A01N *9/36*
U.S. Cl. 71—86 **30 Claims**

1. A compound of the formula

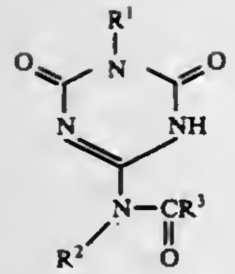


wherein *n* is zero or one, M is hydrogen or alkali metal, and R is hydrogen, methyl, ethyl, hydroxymethyl, lower alkoxymethyl or lower alkenoxymethyl.
11. A herbicidal composition comprising an inert adjuvant and a herbicidally effective amount of a compound of claim 1.

4,105,433
SELECTIVE HERBICIDES

David John Collins, Ascot; Ian Trevor Kay, Wokingham, and John Walter Slater, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England
Filed Jan. 20, 1976, Ser. No. 650,754
Claims priority, application United Kingdom, Feb. 5, 1975, 4885/75
Int. Cl.^{2} A01N *9/22*
U.S. Cl. 71—93 **6 Claims**

1. A process of selectively controlling the growth of graminaceous weeds in a non-graminaceous crop, which comprises applying to the locus of said crop a triazine-dione compound of the formula:



or a herbicidally effective salt thereof wherein R^1 is an alkyl radical of 3 to 5 carbon atoms in which the carbon atom attached to the ring nitrogen atom is a secondary or tertiary carbon atom; R^2 is an alkyl radical of from 3 to 5 carbon atoms, the alkyl radical being such that no carbon atom of the radical is linked through a linear sequence of more than two carbon atoms to the nitrogen atom to which R^2 is attached; and R^3 is a methyl, ethyl or cyclopropyl group, the amount of the triazinedione compound applied being sufficient to control the growth of the graminaceous weeds, but insufficient to substantially damage the crop.

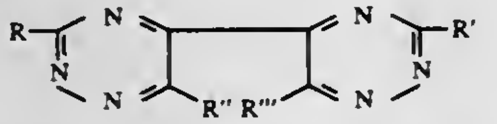
4,105,434
HERBICIDAL 5,5'-BIS-1,2,4-TRIAZINYLS

William W. Pandler, Tuscaloosa, Ala.; Robert E. Moser, Mentor, and Norman M. Pollack, University Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 760,033
Int. Cl.² C07D *253/06;* A01N *9/22*

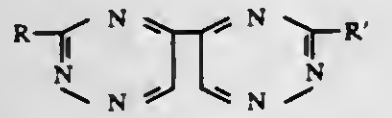
U.S. Cl. 71—93 **21 Claims**

1. A method for controlling undesired plant life which comprises applying to the situs thereof a herbicidally effective amount of at least one active compound of the formula:



wherein R and R' are the same or different and represent hydrogen, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylamino, di-(C_1-C_4-alkyl) amino, C_1-C_4 alkylsulfonyl, azido, or a group —OA wherein A is a cation, R'' and R''' are the same or different and represent hydrogen or C_1-C_4 alkyl, the alkyl moieties of said R, R', R'' and R''' being branched or straight chain and the N-oxide derivatives thereof.

16. A compound of the formula:



wherein R and R' are the same and selected from propoxy, butoxy, azido, alkali metal hydroxide, methylamino, dimethylamino or methylsulfonyl; or wherein R and R' are different and independently selected from methylthio and methoxy; or wherein R and R' are the same and selected from dimethylamino or dimethoxy and the 1,1'-hetero nitrogen atoms are substituted by oxygen to form the N-oxides thereof.

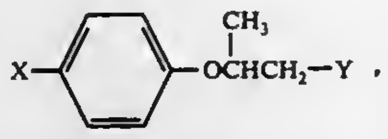
4,105,435
HERBICIDAL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME, AND METHOD OF USE THEREOF

Ryuzo Nishiyama, Takatsuki; Ryohei Takahashi, Tokyo; Kanichi Fujikawa, Kyoto; Rikuo Nasu, and Nobuyuki Sakashita, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Oct. 22, 1976, Ser. No. 734,913
Claims priority, application Japan, Oct. 29, 1975, 50/129313; Apr. 23, 1976, 51/46800; Jul. 30, 1976, 51/90315
Int. Cl.² A01N *9/22;* C07D *405/04*

U.S. Cl. 71—94 **11 Claims**

1. A compound having the general formula (I):



(I)

wherein X is a 5-halopyridyl-2-oxy group or a 3,5-dihalopyridyl-2-oxy group; and Y is a member selected from the group consisting of a halogen atom, a hydroxy group, a (C_1-C_4) alkoxy group in which the alkyl moiety thereof may be substituted with one or more hydroxy groups, and a (C_1-C_4) alkylcarbonyloxy group.

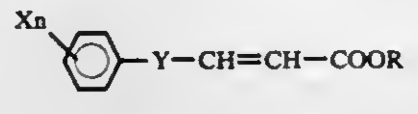
4,105,436
HERBICIDE

Tsuneyuki Takeno; Tetsuji Iwasaki, both of Wakayama; Norioki Miyamoto; Kyozaburo Tachibana, both of Sakura, and Masamoto Matsukane, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,548
Claims priority, application Japan, Oct. 18, 1976, 51/124602
Int. Cl.² A01N *9/14*

U.S. Cl. 71—103 **9 Claims**

1. A method of controlling weeds which comprises applying thereto an effective amount of at least one compound of the formula;



wherein X represents a halogen atom or an alkyl sulfinyl or alkyl sulfonyl group having 1 to 3 carbon atoms, *n* represents an integer of 0 to 3, Y represents SO or SO_2, and R represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms.

4,105,437
METHOD AND APPARATUS FOR RECOVERING METALS

Hsin Liu, 40-25 Hampton St., Elmhurst, N.Y. 11373

Division of Ser. No. 507,153, Sep. 18, 1974, Pat. No. 3,944,412. This application Nov. 17, 1975, Ser. No. 632,769
Int. Cl.² C22D *7/00*

U.S. Cl. 75—10 R **28 Claims**

1. A method for producing a stabilized plasma comprising the steps of:

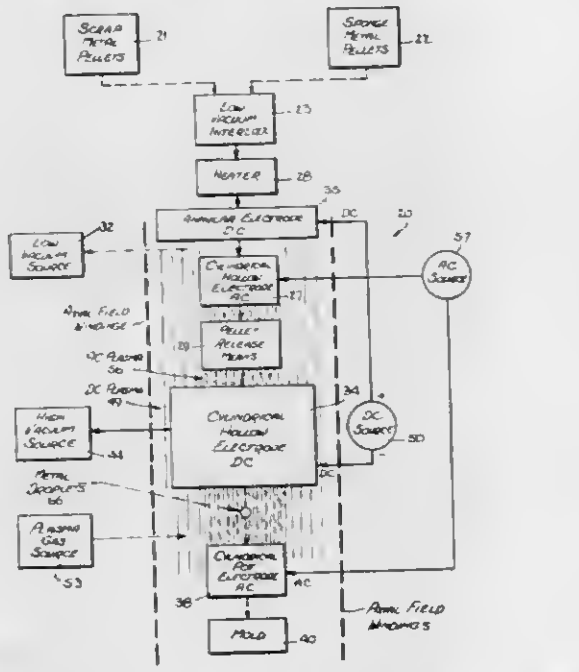
(a) establishing a predetermined high level vacuum condition within the interior of an enclosure;

(b) establishing a level of background gas within the interior of the enclosure;

(c) applying a direct current potential to a first pair of electrodes spaced apart from one another to form a direct current plasma extending adjacent the electrodes, the electrodes of the pair being spaced apart from one another substantially along the central axis of the enclosure extending along the length thereof, the direct current plasma formed adjacent the electrodes being in a substantially cylindrical configuration of predetermined maximum diameter extending along the central axis of the enclosure;

(d) applying an alternating current potential to a second pair of electrodes spaced apart from one another along the central axis of the enclosure to form an alternating current plasma extending adjacent the electrodes, the alternating current plasma formed adjacent the second pair of electrodes being in a substantially cylindrical configuration extending along the central axis of the enclosure and occupying a portion of the same space as occupied by the direct current plasma along substantially the entire extent of the direct current plasma, the plasma intensity of said alternating current plasma extending radially to the sides of said second pair of electrodes, at least one of said second pair of electrodes being of a smaller radial dimension than either of said first pair of electrodes, whereby the cylindrical radius of said direct current plasma is greater than the cylindrical radius of said alternating current plasma substantially along the length of the enclosure, the direct current plasma and alternating current plasma thereby being spacially superimposed on one another to the outer edge of said radius of said cylindrical alternating current plasma; and

(e) providing an axial magnetic field extending substantially along the central axis of the enclosure and substantially enclosing the superimposed plasmas, whereby the alternating current plasma has a positive voltage versus current relationship.

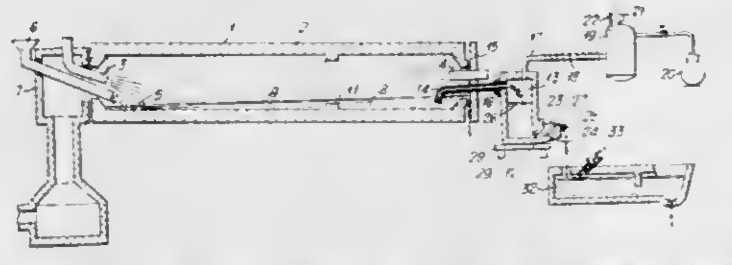


4,105,438
CONTINUOUS METAL MELTING, WITHDRAWAL AND DISCHARGE FROM ROTARY FURNACES

William Lyon Sherwood, 6968 Ash St., Vancouver, British Columbia, Canada

Filed Apr. 19, 1977, Ser. No. 788,995
Int. Cl.² C21C *7/10*

U.S. Cl. 75—49 **10 Claims**



1. In a method for continuous melting and refining in a rotary furnace in which a charge of liquid metal is confined within the furnace by retaining it behind an annular dam restriction of the discharge opening at the furnace discharge end; the combination of the following steps:

(a) maintaining an external metal withdrawal vessel proximate to discharge end of said rotary furnace incorporating an enclosed chamber as part of said vessel;

(b) maintaining a discharge siphon tube inserted down into the metal within the rotary furnace and extending out laterally through the discharge opening to connect into said enclosed chamber;

(c) externally applying a negative suction pressure to said enclosed chamber, also thereby providing for evacuation of any dissolved gases emanating from the molten metal within the chamber as a result of said negative pressure;

(d) allowing the molten metal to flow from the metal bath within the furnace through the opening of said siphon tube into the metal inlet of said enclosed chamber at a rate controlled hy the magnitude of said negative suction pressure;

(e) controlling the rate of metal flow through said inlet by controlling the magnitude of said negative suction pressure; and

(f) allowing the metal to flow out and discharge concurrently from a submerged opening in the enclosed chamber under the influence of gravity, and this flow taking place at an average rate corresponding to the rate of withdrawal from the furnace through said siphon tube.

4,105,439
METHOD FOR PRODUCTION OF REFINED STEEL

Thomas Malcolm Barnes, Bulter, Pa., assignor to Harsco Corporation, Harrisburg, Pa.

Filed May 31, 1977, Ser. No. 801,786
Int. Cl.² C21B *3/04;* C21C *5/00*

U.S. Cl. 75—51 **11 Claims**

1. In a method of producing successive heats of refined steel wherein successive charges of molten, impure iron are refined by oxygen in the presence of at least one flux to form molten, refined steel and liquid slag, followed by the separation of said molten, refined steel and liquid slag, the improvement wherein a liquid slag from one of said refining operations is brought into contact with and caused to react with a batch of molten, impure iron prior to its being charged in a subsequent refining operation, such that at least some of the free and combined iron contained in said slag is substantially reduced and dissolved into said molten, impure iron, and such that the molten, impure iron is at least partially refined prior to being charged in said subsequent refining operation, said successive refining operation being coordinated with said reactions of molten, impure iron with liquid slag such that the molten, impure iron comprising the charge for a refining operation $(N + y)$ is reacted with the liquid slag from a prior refining operation $(N - x)$ during at least one of the refining operations in the sequence $(N - x + 1, \ldots, N, \ldots, N + y - 1)$, wherein:

N represents any one of the refining operations in the succession,
x is any whole integer equal to or greater than 1 and
y is any whole integer equal to or greater than 1.

4,105,440
PROCESS FOR REDUCING METAL HALIDES BY REACTION WITH CALCIUM CARBIDE

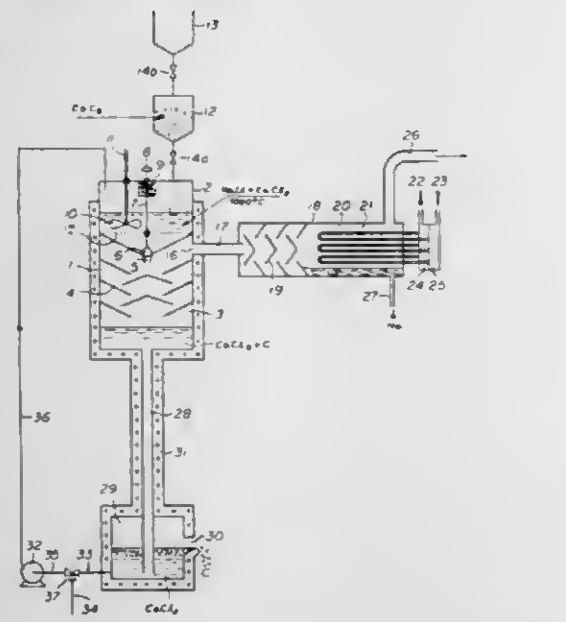
Claude Gentaz, Grand-Lancy, Switzerland, and Gérard Bienvenu, Annemasse, France, assignors to Battelle Memorial Institute, Caronge, Switzerland

Continuation-in-part of Ser. No. 69,719, Sep. 4, 1970, abandoned. This application Jan. 2, 1974, Ser. No. 429,704
Claims priority, application Switzerland, Sep. 5, 1969, 13482/69; Aug. 7, 1970, 11907/70
Int. Cl.² C22B *27/00*

U.S. Cl. 75—66 **3 Claims**

1. A process for obtaining a desired alkali metal, selected from the group which consists of sodium, potassium, rubidium and caesium, from a halide thereof, comprising the steps of:

forming a solvent bath by melting a mixture of said halide of the desired alkali metal and a halide of at least one alkaline-earth metal selected from the group which consists of calcium, strontium and barium;



homogenizing the molten mixture;

dissolving calcium carbide in the homogenized mixture; and

reacting the dissolved calcium carbide in said bath with said halide of the desired alkali metal for a period and at a temperature sufficient to bring about a reduction of the last-mentioned halide.

4,105,441
COMPOSITION FOR THE DECOMPOSITION OF SODIUM-MERCURY AMALGAM

Harshad M. Patel, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 11, 1976, Ser. No. 666,027

Int. Cl.² C22B *43/00*

U.S. Cl. 75—81 12 Claims

1. Granular packing for decomposing sodium-mercury amalgam comprised of a solid mixture of a thermally stable porous polymer matrix having embedded therein discrete particles of a surface active composition, wherein said surface active composition is selected from the group consisting of iron, cobalt, nickel, graphite, molybdenum, vanadium and mixtures thereof, wherein the proportion of said thermally stable polymer to said particles of surface active composition is in the range from about 20 to about 80% by volume of the resulting dispersion, wherein said thermally stable polymer is selected from the group consisting of polyphenylene sulfide, polyphenylene oxide, phenolic resins, polymers of furfuryl alcohols, imid polymers, silicone polymers, epoxy polymers, furan polymers, urethane polyphenylene sulfides, polyvinylidene fluorides, polyacrylonitrile, and polyvinyl alcohol, and wherein the particle size of said surface active composition is in the range from about 75 to about 1,000 microns.

4,105,442
SEPARATION AND PURIFICATION OF RUTHENIUM

Monika M. Fleberg, Johannesburg, and Roderick I. Edwards, Honeydew, both of South Africa, assignors to The National Institute for Metallurgy, South Africa

Filed Jun. 15, 1977, Ser. No. 806,819

Claims priority, application South Africa, Jun. 21, 1976, 76/3680

Int. Cl.² C01G *55/00*

U.S. Cl. 75—101 BE 14 Claims

1. A process for the recovery of ruthenium from solutions thereof which are substantially free from platinum, palladium and gold said process comprising the successive steps of:

(1) boiling the solution together with an oxidant to cause any osmium present to be driven off as osmium tetroxide in the vapor phase;
(2) treating the resulting solution with a reducing agent in the presence of nitric acid to form a solution containing a nitrosylruthenium complex;
(3) adding hydrochloric acid to the solution containing the nitrosylruthenium complex to form the chlorocomplexes of the ruthenium and any iridium and rhodium present;
(4) reducing any iridium present in the resultant chloroplex-containing solution to reduce Ir(IV) to Ir(III);
(5) contacting the resulting solution with an anion exchanger in the solid or liquid form transferring the nitrosylruthenium chlorocomplex onto the anion exchanger;
(6) contacting the anion exchanger with a solution to extract the nitrosylruthenium chloro-complex from the anion exchanger into said solution; and
(7) recovering the ruthenium from the solution resulting from step (6) above.

4,105,443
METAL-FORMING DIES

Geoffrey Dearnaley, Abingdon, and Nicholas Edmund Whittam Hartley, Chilton, both of England, assignors to United Kingdom Atomic Energy Authority, England

Filed Jan. 25, 1977, Ser. No. 762,252

Claims priority, application United Kingdom, Jan. 28, 1976, 3421/76

Int. Cl.² B05D *3/06*

U.S. Cl. 75—238 19 Claims

1. A method of treating a metal working tool element made of cemented carbide materials, as hereinbefore described, comprising the operation of implanting into a working surface of the tool element ions of a material such as to interact with the matrix metal of the tool element in such a way as substantially to prevent adhesion between the matrix metal of the cemented carbide tool element and a metal being worked by the tool element.

8. A cemented carbide, as hereinbefore described, metal-working tool element having a working surface into which has been implanted ions of a material such as to interact with the matrix metal of the cemented carbide tool element in such a way as substantially to prevent adhesion between the matrix metal of the cemented carbide tool element and a metal being worked by the tool element.

4,105,444
AIR FLOW METHOD OF CLEANING ION MODULATION PHOTOSENSITIVE SCREEN DURING CORONA CHARGING

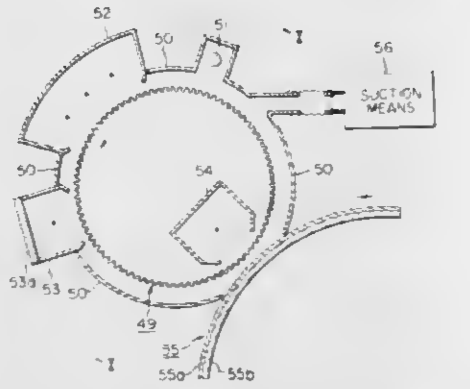
Yukimasa Shinohara, Yokohama; Katsunobu Ohara, Kawasaki, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,692

Claims priority, application Japan, Oct. 15, 1975, 50-124002

Int. Cl.² G03G *13/00, 15/02, 15/22*

U.S. Cl. 96—1 R 19 Claims



1. In a method of forming an electrostatic latent image on a photosensitive screen drum, which method includes applying corona discharge by a corona discharger to the photosensitive screen drum having a number of fine openings through its circumferential wall, the corona discharger being disposed in facing relationship with the outer surface of said screen drum, the improvement comprising:

providing a supply of air to the inside of said screen drum, via a longitudinal end of said screen drum, without passing said supply of air inwardly through the fine openings of said screen drum, and

causing said supply of air to flow outwardly from the inside of the screen drum through the fine openings thereof, at least adjacent to and towards the corona discharger, to prevent foreign matter from being deposited on the screen drum while the corona discharger applies corona to said screen drum from the outside of said screen drum.

4,105,445
RESILIENT ARCUATE SURFACE CONTAINING PHOTOCONDUCTOR

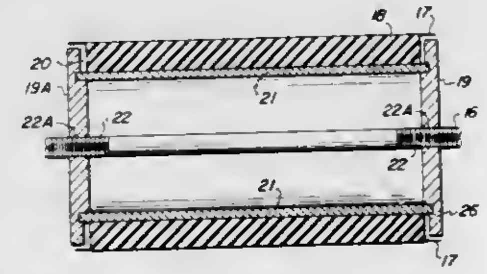
Lional Agustin Wilson, Redbourn; John Wales, Bishop's Stortford, and William Ernest George Plumtree, Ware, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,575

Claims priority, application United Kingdom, May 29, 1974, 23709/74

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 R 8 Claims



1. A resilient arcuate member which comprises a rigid support member, a flexible arcuate imaging member comprising a photoconductive material coated on a conductive flexible substrate, a resilient member which separates said support and said imaging member and a means for tensioning the resilient member in such a way that separation results in a spacing dimension reduced in an amount sufficient to allow easy movement of the flexible surface with respect to the resilient member.

4,105,446
ORGANIC PHOTOCONDUCTIVE COATING COMPOSITIONS CONTAINING TRICYANOVINYL COMPOUNDS FOR ELECTROPHOTOGRAPHY

Lyong Sun Pu, Minami-ashigara, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

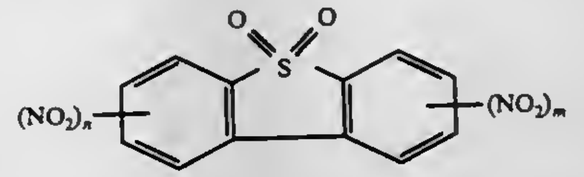
Filed Jan. 15, 1976, Ser. No. 649,545

Claims priority, application Japan, Jan. 21, 1975, 50-008339; Jan. 21, 1975, 50-008340

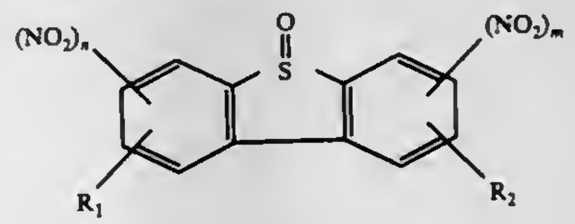
Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 R 5 Claims

1. An electrophotographic element comprising a support and an organic photoconductive layer formed on said support, said photoconductive layer consisting essentially of (a) an organic photoconductive material, (b) about 0.001 to about 1.20 moles of a nitro derivative selected from the group consisting of a nitro derivative of dibenzothiophenedioxide having the following general formula



wherein *m* and *n* are independent integers and $1 \leqq m+n \leqq 4$, and a nitro derivative of dibenzothiophenesulfoxide having the following general formula



wherein *m* and *n* are independent integers and $1 \leqq m+n \leqq 4$, and R_1 and R_2 are independently hydrogen, an alkyl group containing from 1 to 7 carbon atoms, a phenyl group,an acetyl group, a carboxyl group, a cyano group or a halogen atom, and (c) about 0.001 to about 1 mole of a tricyanovinyl compound, substances (b) and (c) each being based on 1 mole of the organic photoconductive material or 1 mole of the starting monomer when a polymeric material is used as the organic photoconductive material.

4,105,447
PHOTOCONDUCTIVE INSULATING COMPOSITIONS INCLUDING POLYARYL HYDROCARBON PHOTOCONDUCTORS

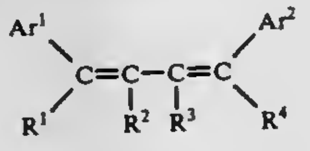
Charles J. Fox, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1975, Ser. No. 595,955

Int. Cl.² G03G *5/06, 5/09*

U.S. Cl. 96—1.6 14 Claims

1. A photoconductive insulating composition comprising an admixture of an electrically insulating polymeric binder, a photoconductor having the formula



$$\begin{matrix} Ar^1 & & & & Ar^2 \\ & \diagdown & & \diagup & \\ & C{=}C{-}C{=}C & & & \\ & \diagup \quad | & | & \diagdown & \\ R^1 & R^2 & R^3 & & R^4 \end{matrix}$$

wherein Ar^1 and Ar^2, which can be the same or different, each represents a phenyl or a naphthyl group which is unsubstituted or substituted with alkyl or alkoxy having 1 to 10 carbon atoms; R^1, R^2, R^3 and R^4, which can be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or a phenyl group and, when both R^1 and R^4 are hydrogen, both R^2 and R^3 are phenyl groups, and

from about 0.001 to about 30% by weight of the total composition weight of a sensitizer for the photoconductor selected from the group consisting of a pyrylium dye salt and a Lewis acid.

4,105,448
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE LAYER AND MARKING METHOD

Hajime Miyatuka; Takashi Saida, and Satoru Honjo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 25, 1975, Ser. No. 607,521

Claims priority, application Japan, Aug. 23, 1974, 49-96193

Int. Cl.² G03G *5/087*

U.S. Cl. 96—1.8 **12 Claims**

1. A material to be marked and machined comprising a conductive base having coated thereon an electrophotographic photosensitive layer comprising finely divided photoconductive powders and a resin binder consisting essentially of a mixture of an acrylic resin and an epoxy ester resin in a ratio by volume of the acrylic resin to the epoxy ester resin of about 10:90 to 70:30, wherein said acrylic resin is a copolymer of an acrylic acid alkyl ester or a methacrylic acid alkyl ester with at least one copolymerizable monomer selected from the group consisting of crotonic acid, acrylic acid, itaconic acid, maleic anhydride, a hydroxyalkyl acrylate or methacrylate, a dihydroxyalkyl acrylate or methacrylate, an aminoalkyl acrylate or methacrylate, a dialkylaminoalkyl acrylate or methacrylate, a glycidyl acrylate or methacrylate, or styrene.

4,105,449
EXTRUDED ELECTROPHOTOGRAPHIC RECORDING MATERIAL

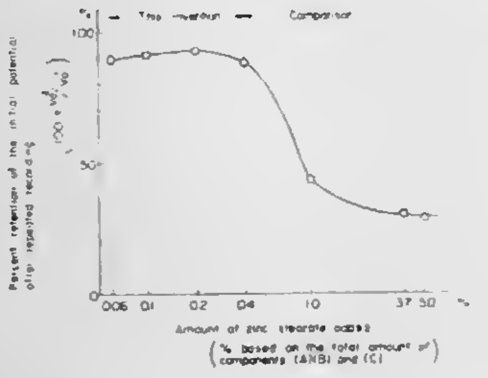
Tadayoshi Tanel, Nagaokakyo; Shigeki Nakamura, and Masahiro Hotta, both of Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 450,241, Mar. 11, 1974, abandoned. This application Jun. 21, 1977, Ser. No. 808,776

Claims priority, application Japan, Aug. 17, 1973, 48/92682

Int. Cl.² G03G *5/087*

U.S. Cl. 96—1.8 **10 Claims**



1. An electrophotographic recording material formed by extrusion, which comprises

(A) a blended olefin resin composition consisting essentially of
  (a) an olefin resin having a melt index of 0.1 to 20 g/10 minutes, and
  (b) an olefin resin having a melt index of 30 to 300 g/10 minutes,
  the weight ratio of olefin resin (a) to olefin resin (b) ranging from 5:95 to 95:5,

(B) 0.025 to 40 parts by weight, per 100 parts by weight of the blended olefin resin composition (A), of at least one light-sensitizing organic compound selected from the group consisting of organic dye compounds, electron accepting organic compounds and electron-donating organic compounds,

(C) 200 to 600 parts by weight, per 100 parts by weight of the blended olefin resin composition (A), of particulate photoconductive zinc oxide having an average particle diameter of 0.1 to 5 microns,

(D) 0.06 to 0.4 part by weight, per 100 parts by weight of the total of the components (A), (B) and (C), of a salt formed between a saturated or unsaturated fatty acid containing 12 to 20 carbon atoms and a metal of Group IIa, IIb or IVb (except radium) of the periodic table, and

(E) 1 to 20 parts by weight, per 100 parts by weight of the blended olefin resin composition (A), of a silicone polymer,

the components (B), (C), (D) and (E) being uniformly dispersed in the component (A), and the light-sensitizing organic compound (B) being adsorbed onto the surface of the particulate photoconductive zinc oxide (C).

4,105,450
SPECTRALLY SENSITIZED POSITIVE LIGHT-SENSITIVE O-QUINONE DIAZIDE CONTAINING COMPOSITION

Fumiaki Shinozaki, and Tomoaki Ikeda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Continuation of Ser. No. 492,816, Jul. 29, 1974, abandoned. This application May 25, 1976, Ser. No. 689,874

Claims priority, application Japan, Jul. 27, 1973, 48-85332

Int. Cl.² G03F *7/08;* G03C *1/54*

U.S. Cl. 96—33 **8 Claims**

1. A process for producing a positive image from a light-sensitive element comprising a lithographic support having thereon a coated layer of a positive light-sensitive composition containing (a) an o-quinonediazide type, positive light-sensitive substance selected from the group consisting of o-quinonediazide sulfonic acid esters and amides and o-quinonediazide sulfones and in admixture therewith in an effective amount to enhance sensitivity of the o-quinonediazide (b) at least one compound selected from the group consisting of (1) 5-methylthiazoline-2-thione; and R_4 represents a hydrogen atom, an alkyl group or a cycloalkyl group; and (2) o-benzoic acid sulfimide to form a planographic printing plate said process comprising image-wise exposing of the planograhic printing plate to actinic radiation and treating the exposed planograhic printing plate with the developer solution containing at least one alkali material, thereby obtaining a positive oleophilic image for planographic printing.

5. A positive light-sensitive composition containing: (a) an o-quionediazide type, positive light-sensitive substance selected from the group consisting of o-quinonediazide sulfonic acid esters and amides and o-quinonediazide sulfones and in admixture therewith in an effective amount to enhance sensitivity of the o-quinonediazide (b) at least one compound selected from the group consisting of:

(1) 5-methylthiazoline-2-thione wherein R_3 represents a hydrogen atom, an alkyl group, an aralkyl group, and R_4 represents a hydrogen atom, an alkyl group or a cycloalkyl group; and

(2) o-benzoic acid sulfimide.

4,105,451
PHOTOTHERMOGRAPHIC MATERIAL, COMPOSITION AND PROCESS

James George Smith, Rochester, and Ralph Clyde Reed, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

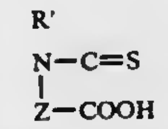
Filed Dec. 22, 1976, Ser. No. 753,391

Int. Cl.² G03C *1/02, 1/72, 1/34*

U.S. Cl. 96—66 T **39 Claims**

1. A method of preparing a photothermographic composition comprising sequentially mixing the following components:

(1) a dispersion comprising a 2-mercaptobenzothiazole, 2-mercaptobenzimidazole, 2-mercaptobenzoxazole or 2-mercaptobenzoselenazole compound and a silver salt of a heterocyclic thione represented by the formula:



$$\begin{array}{l} R' \\ N-C=S \\ | \\ Z-COOH \end{array}$$

wherein R′ represents atoms completing a five-member heterocyclic nucleus and Z is alkylene containing 1 to 30 carbon atoms,

(2) a reducing agent solution comprising a reducing agent,

(3) a binder, and

(4) a silver halide photosensitive composition containing a spectral sensitizing dye.

4,105,452
MULTI-LAYERED COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

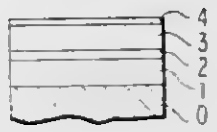
Keisuke Shiba; Toshiaki Aono; Seiiti Kubodera; Takeshi Hirose; Reiichi Ohi, and Tadao Shishido, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 494,955, Aug. 5, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 672,922

Claims priority, application Japan, Aug. 3, 1973, 48-87723

Int. Cl.² G03C *3/00, 1/06, 7/00*

U.S. Cl. 96—74 **5 Claims**



1. A multi-layered color photographic light-sensitive material which provides a negative image upon exposure to an original and subsequent development, said material comprising a support having thereon at least two light-sensitive silver halide emulsion layers which provide images having substantially different hues, wherein at least one of said light-sensitive silver halide emulsion layers or a colloidal layer of said light-sensitive material contains (1) a hydroquinone derivative or a hydroquinone precursor, said derivative and said precursor being substituted with both a heterocyclic monothio group and at least one member selected from the group consisting of an aliphatic monothio group and an aryl monothio group, and said derivative and said precursor having a ballasting group containing 8 or more carbon atoms; and (2) a 2-equivalent coupler and/or a 4-equivalent anilino-pyrazolone coupler.

4,105,453
COLORED LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH COATING ADDITIVE

Yasumasa Numata; Kunio Ito; Keiichi Mori, and Yoshitami Ōno, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

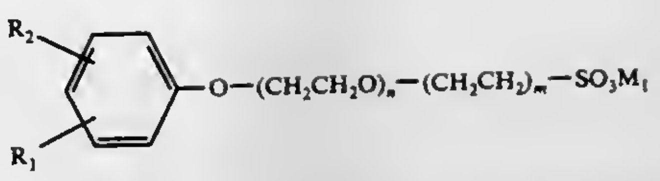
Filed Mar. 11, 1977, Ser. No. 776,743

Claims priority, application Japan, Mar. 29, 1976, 51-33544

Int. Cl.² G03C *1/38, 1/02, 1/78, 1/76*

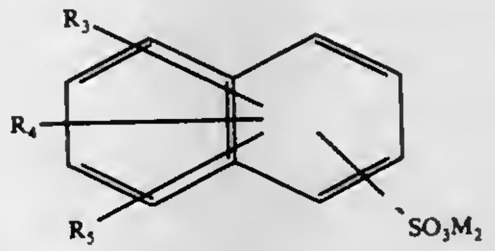
U.S. Cl. 96—114.5 **8 Claims**

1. In a light-sensitive silver halide photographic material which comprises a hydrophilic colloid layer containing a basic mordant and an acidic dye and an adjacent layer thereto, the improvement which comprises a hydrophilic colloid layer containing a compound having the following formula (I) and the adjacent layer containing a compound having the following formula (II):



(I)

wherein R_1 and R_2 each represent hydrogen, alkyl having 1 to 18 carbon atoms or phenyl which may be substituted; *n* represents 1 to 20; *m* represents zero or 1; and M_1 represents a cation;



(II)

wherein R_3, R_4 and R_5 each represent hydrogen, alkyl having 1 to 12 carbon atoms, provided that the combined carbon number of R_3, R_4 and R_5 is not more than 18; and M_2 represents a cation.

4,105,454
SILVER HALIDE PHOTOGRAPHIC EMULSION SPECTRALLY SENSITIZED WITH MEROCYANINE DYES

Tadaaki Tani, Minami-ashigara, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 2, 1977, Ser. No. 765,023

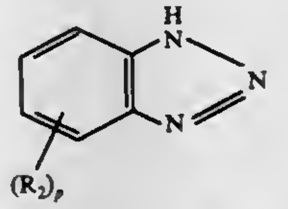
Claims priority, application Japan, Feb. 5, 1976, 51 11730

Int. Cl.² G03C *1/08*

U.S. Cl. 96—122 **10 Claims**

1. A supersenzitized silver halide photographic emulsion which contains, in supersensitizing amounts, a combination of (1) at least one merocyanine dye free of acidic groups and (2) at least one benzotriazole compound which can produce a slightly soluble silver salt by reaction with silver ion, where the solubility product of the resulting silver salt is smaller than that of silver chloride wherein:

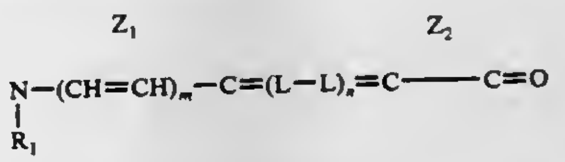
said benzotriazole compound has the following general formula (II):



(II)

wherein *p* represents an integer from 1 to 4; and R_2 represents a halogen atom or an alkyl group containing from 1 to 3 carbon atoms;

said merocyanine dye free of acidic groups has the following general formula (I):



$$\begin{array}{l} \quad Z_1 \qquad\qquad\qquad\qquad\qquad\qquad Z_2 \\ N-(CH=CH)_m-C=(L-L)_n=C——C=O \\ | \\ R_1 \end{array}$$

(I)

wherein *m* represents an integer of 0 or 1; *n* represents an integer of 0 to 2; R_1 represents an aliphatic group or an aryl group; Z_1 represents the non-metallic atoms necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic ring; Z_2 represents the non-metallic atoms necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic ring; and L represents a methine group; and wherein the amount of said merocyanine dye ranges from about 10^{-6} mol to 10^{-2} mol per mol of said silver halide and the molar ratio of said benzotriazole compound (2) to said merocyanine dye (1) ranges from about 2:1 to 100:1.

4,105,455

METHOD OF PRODUCING DENSE SINTERED SILICON CARBIDE BODY FROM POLYCARBOSILANES

Kazunori Koga, and Saburo Nagano, Kyoto, both of Japan, assignors to Kyoto Ceramic Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 12, 1977, Ser. No. 824,062

Claims priority, application Japan, Aug. 17, 1976, 51-98292; Feb. 16, 1977, 52-16543

Int. Cl.^{2} C04B *35/56*

U.S. Cl. 106—44 **21 Claims**

1. A method of producing a dense sintered silicon carbide body from polycarbosilane comprising the steps of:
- (A) Polymerizing an organosilicon compound to yield polycarbosilane, said polycarbosilane being insoluble and unmeltable;
- (B) Pulverizing said polycarbosilane so as to form a powder; and
- (C) Hot pressing said powder so as to produce said dense sintered silicon carbide body by charging said powder into a hot press mold, heating said powder in a nonoxidizing atmosphere to thereby decompose said powder thus producing silicon carbide, and sintering said silicon carbide under pressure.

4,105,456

CERAMIC MATERIAL OF LOW THERMAL EXPANSION COEFFICIENT AND METHOD OF MANUFACTURING THE SAME

Toshiaki Murakami, Hino; Shigeru Waku, Tokyo; Akira Demura, Tokorozawa, and Toshiaki Fujishiro, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Nippon Tsushin Kogyo Kabushiki Kaisha, Kawasaki, both of Japan

Filed Jan. 12, 1977, Ser. No. 758,813

Claims priority, application Japan, Feb. 4, 1976, 51-10417

Int. Cl.^{2} C04B *33/26*

U.S. Cl. 106—46 **8 Claims**

1. A process for preparing a ceramic material having a thermal expansion coefficient close to that of silicon comprising:
- (a) forming a mixture of powders consisting essentially of:
  - (i) zircon;
  - (ii) 5.00 – 30.00% by weight of a calcined clay selected from the group consisting of calcined ball clay, calcined kaolin clay and mixtures thereof; and
  - (iii) an additive selected from the group consisting of
    - 1.00 – 5.00% by weight of Li_2O,
    - 1.00 – 10.00% by weight of TiO_2, and
    - 2.00 – 10.00% by weight of $ZnZrSiO_5$, calculated on a Zno basis;
- (b) molding the mixture; and
- (c) firing the molded mixture at a temperature in the range of 1200° to 1450° C.

5. A process for preparing a ceramic material having a thermal expansion coefficient close to that of silicon comprising:
- (a) forming a mixture of powders consisting essentially of:
  - (i) zircon;
  - (ii) 5.00 – 30.00% by weight of a calcined clay selected from the group consisting of calcined ball clay, calcined kaolin clay and mixtures thereof;
  - (iii) a first additive selected from the group consisting of
    - 1.00 – 5.00% by weight of Li_2CO_3, calculated on a Li_2O basis,
    - 1.00 – 10.00% by weight of TiO_2, and
    - 2.00 – 10.00% by weight of ZnO; and
  - (iv) a second additive selected from the group consisting of
    - 2.00 – 15.00% by weight of CoO,
    - 2.00 – 15.00% by weight of Co_2O_3,
    - 2.00 – 15.00% by weight of Co_3O_4, and
    - 1.00 – 5.00% by weight of MgO;
- (b) molding the mixture; and
- (c) firing the molded mixture at a temperature in the range of 1200° to 1450° C.

4,105,457

BRIQUET AND METHOD OF MAKING SAME

Wolfgang B. Pietsch, Matthews, N.C., and Charles A. Schroer, De Bordieux Colony, S.C., assignors to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 682,418, May 3, 1976, Pat. No. 4,032,352. This application Jan. 22, 1977, Ser. No. 808,929

Int. Cl.^{2} C04B *35/16*

U.S. Cl. 106—78 **6 Claims**

1. A metallized iron briquet consisting essentially of from about 85 percent to about 95 percent directly reduced metallized iron and from about 5 percent to about 15 percent of a binder comprising:
- (a) from about 15 to about 40 percent hydrated lime,
- (b) from about 15 to about 45 percent liquid sodium silicate, and
- (c) up to 60 percent water.

4,105,458

ROAD SURFACES

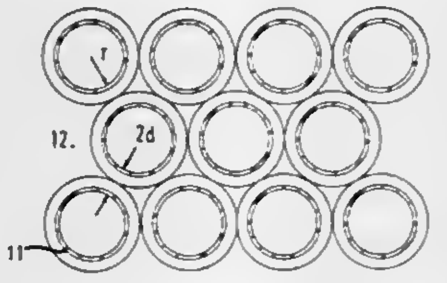
Geoffrey Lees, Stratford upon Avon; Arthur Roger Williams, Birmingham, and Robert Bond, Lichfield, all of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 510,702, Sep. 30, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,655

Claims priority, application United Kingdom, Oct. 9, 1973, 47060/73

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—97 **4 Claims**



1. In a road surface comprising a blend of at least two aggregate materials disposed in a binder matrix and having different rates of wear as judged by the aggregate abrasion test B.S. 812 1967, each aggregate material having a surface micro-texture defined by asperity heights in the range 5 to 500 microns, at least a portion of the particles of the slower wearing aggregate being of larger size than any of the particles of the faster wearing aggregate, the improvement wherein each aggregate particle is of a size such that it would be retained on a British Standard ¼ inch sieve, or its metric equivalent, and would pass through a British Standard ¾ inch sieve or its metric equivalent, and wherein the individual aggregate particles are disposed in the binder matrix so that the shortest distance between any two adjacent particles is 1 to 6 mm and the texture depth of the aggregate particles in the binder matrix is between 1 and 5 mm.

4,105,459

SILICEOUS ASHES AND HYDRAULIC CEMENTS PREPARED THEREFROM

Povindar Kumar Mehta, El Cerrito, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 437,068, Jan. 28, 1974, abandoned, which is a division of Ser. No. 276,133, Jul. 28, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,893

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—98 **1 Claim**

1. A relatively anhydrous composition comprising from 10 – 50% by weight of portland cement, said portland cement having from about 60 to 69% by weight of combined and uncombined CaO; and from about 32 to about 90% by weight of SiO_2 in the form of a highly reactive, amorphous anhydrous silica material derived from organic agricultural matter, having an initial silica content expressed as SiO_2 of up to about 28%, said silica material comprising from about 49 to about 98% SiO_2, characterized by complete absence of crystalline silica as determined by x-ray diffraction analysis; balance being minor impurities and residual carbon, said carbon removable upon prolonged heating to give a composition containing from about 0.3 to about 2% residual carbon, and from 1.0 to about 5% minor impurities, other than CaO.

4,105,460

PROCESS FOR THE ENDOTHERMIC CALCINATION OF RAW MATERIAL

Steven Gottlieb, No. 9 "Karoola", 442-446 Edgecliff Rd., Edgecliff, New South Wales 2027, Australia

Filed Jan. 19, 1977, Ser. No. 760,289

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—100 **7 Claims**

1. A process for the endothermic calcination of raw material, which is performed at a temperature lower than that required for a sintering step or a chemical reaction performed in a following rotary kiln, comprising the steps of
- pelletizing the raw material,
- feeding the thus formed pellets downward through a vertical calciner in the form of a bed consisting of packed pellets,
- supplying heat from an axially disposed burner through the calciner in a downward stream,
- supplying the flue gases of the rotary kiln to the calciner for forming an upwards directed countercurrent flow turbulently passing at a high velocity through the interstices between the closely packed pellets, and
- introducing air through a discharge grate provided at the lower end of the calciner by means of a flap provided at a duct leading to the rotary kiln such that a substantial portion of the fuel injected into the calciner will initially be gasified within the calciner and will then be brought to combustion by means of said air.

4,105,461

THICKENING COMPOSITIONS CONTAINING XANTHAN GUM, GUAR GUM AND STARCH

Joseph S. Racciato, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 26, 1976, Ser. No. 717,844

Int. Cl.^{2} C08L *3/00, 5/00*

U.S. Cl. 106—205 **9 Claims**

1. A thickening composition consisting essentially of from about 5 to about 90 weight % of xanthan gum, from about 5 to about 90 weight % of guar gum, and from about 5 to about 90 weight % of starch ether, the xanthan gum being unmodified by a polyvalent cation and being unmodified by heating in a dry state before blending with the guar gum, the composition exhibiting a synergistic increase in viscosity compared to the additive viscosities of the individual components.

4,105,462

NON-CRYSTALLIZING ROSIN

Theologos E. Thanos, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,303

Int. Cl.^{2} C08L *93/04*

U.S. Cl. 106—218 **6 Claims**

1. A hard, non-crystallizing rosin composition comprising a distilled tall oil rosin containing less than 5% by weight fatty acids and an amount of hard rosin ester sufficient to prevent crystallization wherein said hard rosin ester is produced by mixing and reacting a composition consisting essentially of rosin and a member of the group consisting of pentaerythritol, trimethylolpropane and glycerol, said hard, non-crystallizing rosin having approximately the properties of the starting rosin.

4,105,463

LIME-FLY ASH-AGGREGATE-SLUDGE PAVING MATERIAL

Donald Irvin Angelbeck, Perrysburg, Ohio, assignor to The University of Toledo, Toledo, Ohio

Filed Dec. 11, 1975, Ser. No. 639,893

Int. Cl.^{2} C04B *1/00*

U.S. Cl. 106—120 **4 Claims**

1. In a pozzolanic paving material consisting essentially of lime, fly ash, aggregate, and water; the improvement consisting of from 0.5 to 4 percent by weight, based on said lime, fly ash and aggregate, of a water treatment sludge consisting essentially of at least one compound selected from the group consisting of calcium oxide and calcium carbonate, and at least one compound selected from the group consisting of the oxides and hydroxides of aluminum and iron.

4,105,464

PROCESS FOR THE PRODUCTION OF PIGMENT-SYNTHETIC RESIN CONCENTRATES

Günter Osswald, Hanau, and Hans Gräf, Rodenbach, both of Germany, assignors to Deutsche Gold- and Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Jul. 3, 1975, Ser. No. 592,861

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1974, 2433562

Int. Cl.^{2} C08K *3/04*

U.S. Cl. 106—307 **36 Claims**

1. A process for the production of a carbon black containing pigment-synthetic resin concentrate comprising coagulating an aqueous polyethylene lyophilic sol containing dispersed carbon black pigment, said lyophilic sol being either (a) alkaline or (b) acid, said coagulation being carried out with intensive mixing by an addition of an electrolyte which shifts the pH, said electrolyte being acid reacting when said sol is alkaline and said electrolyte being alkaline reacting when said sol is acid, separating the coagulate from the aqueous phase and drying the coagulate.

4,105,465

TREATED HYDRATED ALUMINA

Sidney Ethan Berger, Rye, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 727,670, Sep. 29, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,391

Int. Cl.^{2} C09C *1/40*

U.S. Cl. 106—308 Q **6 Claims**

1. A composition comprising alumina trihydrate particles containing on their surfaces a silane, its hydrolyzates or resulting condensate, which silane possesses at least two to abou three hydrolyzable groups bonded to the silicon thereof and an organic group which contains a polyalkylene oxide group, said silane being present on the surfaces of said particles in an amount from about 0.25 weight percent to 5 weight percent o the composition.

4,105,466

METHOD FOR REDUCING THE VISCOSITY AND FOR REFINING KAOLIN CLAYS

Albert C. Kunkle, and Carl E. Kollmar, Jr., both of Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 731,141, Oct. 12, 1976, Pat. No. 4,030,941, which is a continuation-in-part of Ser. No. 591,737, Jun. 30, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,241

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.^{2} C09C *1/42*

U.S. Cl. 106—309 **20 Claims**

1. A method for increasing the brightness of crude kaolin clay ores for producing clay pigments comprising contacting a clay/water slurry of said crude kaolin clay with an inorganic polymer complex having the general formula:

$[Al(OH)_yA_{3-y}]_x$

wherein $x = 6$ to 24, $y = 1.0$ to 2.75 and A is selected from the group consisting of Cl^-,$(SO_4^{--})_{0.5}$ and NO_3^-; subjecting the crude clay/water slurry to a high shear mixing action or kneading; fractionating the crude clay/water slurry to form coarse and fine fractions of said clay; and leaching the fine fraction of the classified clay/water slurry with from 2 to 3 lbs. of zinc hydrosulfite per ton of clay.

4,105,467

PROCESS FOR TWO-STAGE DIGESTION OF NATURAL PRODUCTS CONTAINING XYLANE, IN ORDER TO OBTAIN XYLOSE

Hans Buckl, Freising-Tümtenhausen; Bernd Brenner, Moosburg, and Wolfgang Eisenschmid, Au, Hallertau, all of Germany, assignors to Sud-Chemie Aktiengellschaft, Munich, Germany

Filed Oct. 4, 1976, Ser. No. 729,231

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545111

Int. Cl.^{2} C13K *13/00, 1/02;* **C07C** *29/00*

U.S. Cl. 127—37 **8 Claims**

1. In a process for the production of xylose or xylitol wherein a vegetable material is contacted with a basic substance and the solid residue is thereafter treated with an acid, the improvement which comprises:
(a) employing as the vegetable material stone nut shells;
(b) employing as the basic substance a 1.5 to 6 molar alkali metal hydroxide at a temperature of 10° to 50° C.;
(c) thereafter diluting the resultant digestion mass to an alkali metal hydroxide content of no greater than 0.75 molar and further digesting the stone nut shells at a temperature of greater than 60° C.

4,105,468

METHOD FOR REMOVING DEFECTS FROM CHROMIUM AND CHROMIUM OXIDE PHOTOMASKS

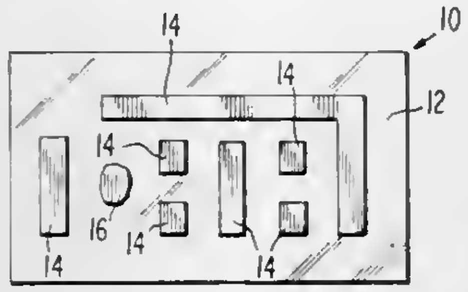
Robert Andrew Geshner, Warren, and Joseph Mitchell, Jr., Kinnelon, both of N.J., assignors to RCA Corp., New York, N.Y.

Continuation of Ser. No. 684,965, May 10, 1976, abandoned. This application Jan. 9, 1977, Ser. No. 805,153

Int. Cl.^{2} C23G *1/02*

U.S. Cl. 134—3 **12 Claims**

6. A method for removing portions of material from a substrate comprising the steps of:
(a) selecting a substrate having applied thereon an opaque material selected from the group consisting of chromium and chromium oxide;
(b) electrically isolating areas which are to be removed from other areas of said opaque material which are to remain;
(c) applying acid at least adjacent the portions of the materials which are to be removed; and
(d) contacting only those portions which are to be removed by a metallic probe.



11. The method of claim **6** wherein electrically isolating the material to be removed is carried out by a laser and material removed by said laser has a width not greater than the beam width of the laser.

4,105,469

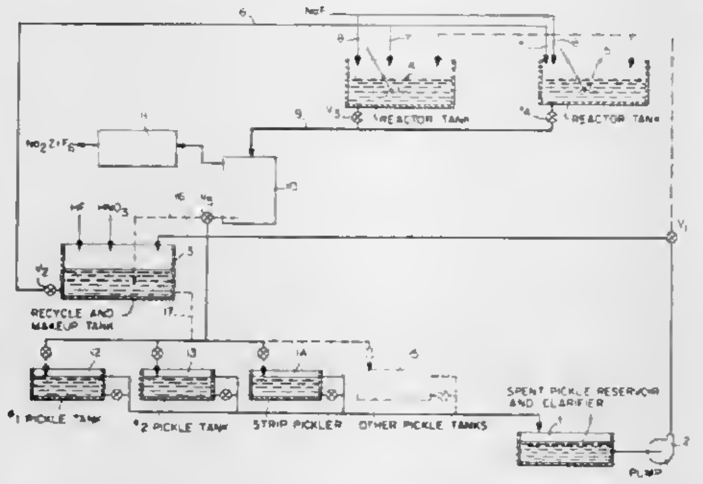
PROCESS FOR REGENERATING A PICKLE ACID BATH

Joseph Allen Megy, Corvallis, and Richard Lee Propst, Scio, both of Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 11, 1977, Ser. No. 767,993

Int. Cl.^{2} B08B *3/10*

U.S. Cl. 134—3 **5 Claims**



1. In a process of pickling a metal selected from the group consisting of zirconium and zirconium alloys by contacting the metal with a $HF-HNO_3$ pickle acid, recovering spent pickle acid, regenerating the spent pickle acid, and subsequently recycling the regenerated acid for further pickling, the improvement comprising regenerating the spent pickle acid hy adding thereto sodium fluoride in an amount sufficient to produce a pickle acid containing from 3–7gZr/l.

4,105,470

DYE-SENSITIZED SCHOTTKY BARRIER SOLAR CELLS

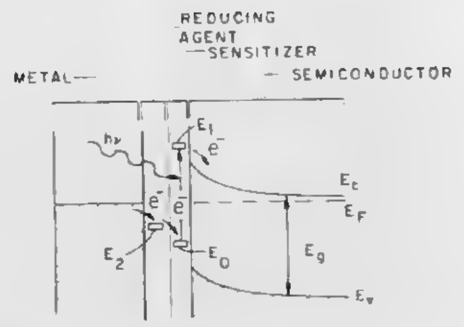
Terje A. Skotheim, Berkeley, Calif., assignor to The United States Government as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1977, Ser. No. 802,399

Int. Cl.^{2} H01L *31/06*

U.S. Cl. 136—89 SJ **8 Claims**

1. A solar cell comprised of:
a semiconductor formed to have two faces;
an ohmic contact on one of said faces;
a sensitizer layer on the other of said semiconductor faces, said sensitizer layer having a ground state within the bandgap of the semiconductor and a first excited state above the conduction band edge of the semiconductor;
a reducing agent layer over said sensitizer layer, said reducing agent having a ground state that is above the ground state of said sensitizer layer; and a metal layer over said reducing agent layer.



4,105,471

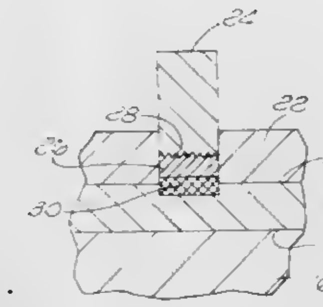
SOLAR CELL WITH IMPROVED PRINTED CONTACT AND METHOD OF MAKING THE SAME

John W. Yerkes, Granada Hills, and James E. Avery, Burbank, both of Calif., assignors to Arco Solar, Inc., Chatsworth, Calif.

Filed Jun. 8, 1977, Ser. No. 804,688

Int. Cl.^{2} H01L *31/06*

U.S. Cl. 136—89 CC **7 Claims**



1. The method of manufacturing a solar cell comprising:
(A) providing a silicon semiconductor body having a P/N junction at a shallow depth of less than approximately 0.5 microns formed in a first surface thereof;
(B) applying a layer of metal to said first surface and coextensive therewith;
(C) printing a pattern of electrically conductive material included in a paste having a glass frit therein on said metal layer;
(D) heating said body in the presence of oxygen to a temperature of at least approximately 600° C and for a time sufficient to oxidize said metal layer and form an anti-reflective coating on said first surface except where it is covered by said contact material and to form an ohmic contact and bond between said printed electrically conductive material and said first surface without destroying said P/N junction; and
(E) cooling said body.

7. A silicon solar cell made by the method of:
(A) providing a P-type silicon semiconductor body having a P/N junction at a shallow depth of less than approximately 0.5 microns formed in a first surface thereof and an ohmic contact on the opposite surface of said body;
(B) applying a layer of metal having a thickness approximately 450 Angstroms and selected from the group consist of tantalum and niobium to said first surface and coextensive therewith;
(C) printing a pattern of electrically conductive material including a paste having a glass frit therein on said metal layer;
(D) heating said body in the presence of oxygen to a temperature of at least 600° C and for a time sufficient to oxidize said metal layer and form an anti-reflective coating on said first surface except where it is covered by said contact material and to form a layer of the silicide of said metal at the interface with said first surface to provide an ohmic contact and bond between said printed electrically conductive material and said first surface without destroying said P/N junction; and
(E) cooling said body.

4,105,472

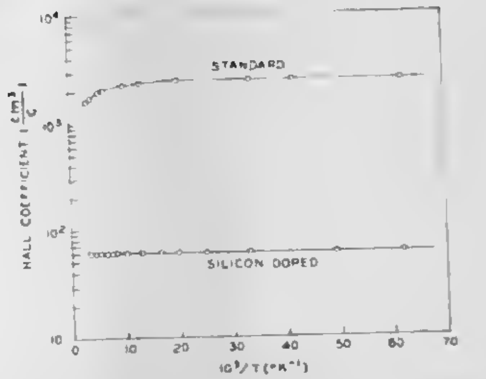
PREPARATION OF SILICON DOPED MERCURY CADMIUM TELLURIDE

Robert A. Lancaster, Brookline, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 757,270, Jan. 6, 1977, Pat. No. 4,087,293. This application Feb. 6, 1978, Ser. No. 875,267

Int. Cl.^{2} H01L *21/02*

U.S. Cl. 148—1.5 **5 Claims**



HALL COEFFICIENT VERSUS INVERSE TEMPERATURE FOR SILICON DOPED AND STANDARD SAMPLES OF MERCURY CADMIUM TELLURIDE

1. In a method of bulk growing crystals of mercury cadmium telluride to form a semiconductor body, the improvement comprising:
the step of adding a quantity of silicon to said mercury cadmium telluride prior to formation of said body.

4,105,473

METHOD OF PROTECTING AN ALUMINUM BRAKING SURFACE

Arnold E. Anderson, Livonia, and Marvin H. Weintraub, Oak Park, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1977, Ser. No. 833,328

Int. Cl.^{2} F16D *69/02*

U.S. Cl. 148—6 **3 Claims**

1. A method of protecting an aluminum braking surface of a brake system including a braking surface and a brake lining, and for using the system for a plurality of braking actions, which method comprises the steps of:
forming the braking surface of the braking system from aluminum;
forming the brake lining of a brake lining material which includes as a part of the composition thereof an additive selected from the group consisting of sodium fluoride and cryolite (Na_3A1F_3);
subjecting the brake system to repeated braking actions whereby said additive of the brake lining reacts with a surface layer of said aluminum braking surface to form a tenacious, wear resistant layer on said aluminum braking surface; and
further subjecting the brake system to braking actions in which said tenacious, wear resistant surface layer serves as a braking surface and as a self-healing, protective layer to protect freshly exposed aluminum as the braking surface wears over its useful life.

4,105,474

PROCESS FOR PRODUCING A HIGH TENSION STEEL SHEET PRODUCT HAVING AN EXCELLENT LOW-TEMPERATURE TOUGHNESS WITH A YIELD POINT OF 40 KG/MM² OR HIGHER

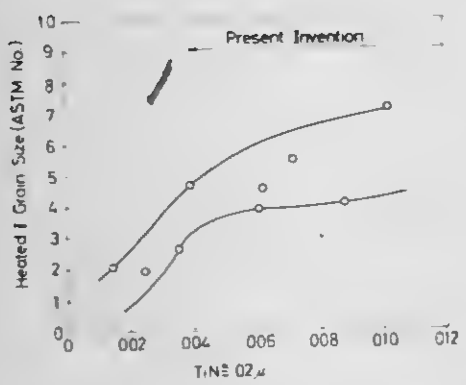
Hajime Nakasugi; Hiroaki Masui; Hiroshi Tamehiro; Tetuo Takeda, and Seiji Eiro, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,946

Claims priority, application Japan, Apr. 12, 1976, 51-40258

Int. Cl.² C21D *7/14*

U.S. Cl. 148—12 F **4 Claims**



1. A process for producing a high tension steel sheet having excellent low-temperature toughness with a yield point not lower than 40 kg/mm² which comprises heating a steel ingot or slab to a temperature not higher than 1150° C, and rolling the steel ingot or slab thus heated with a total reduction amount not less than 50% in a temperature range not higher than 930° C and a finishing temperature not higher than 830° C,

said steel ingot or slab containing 0.01 to 0.13% C, 0.1 to 1.0% Si, 0.7 to 2.0% Mn, not more than 0.1% total Al, 0.004 to 0.03% Ti, 0.001 to 0.009% total N, 0.01 to 0.10% Nb, 0.01 to 0.15% V, 0.05 to 0.40% Mo, with the balance being unavoidable impurities and Fe, in which (Nb%) × (C%) $\leqq 5 \times 10^{-3}$ and TiN not larger than 0.02μ is not less than 0.004%.

4,105,475

EPITAXIAL METHOD OF FABRICATING SINGLE IGFET MEMGRY CELL WITH BURIED STORAGE ELEMENT

Fredrick Benjamin Jenne, Los Gatos, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 624,868, Oct. 23, 1975, Pat. No. 4,003,036.

This application Oct. 1, 1976, Ser. No. 728,906

Int. Cl.² H01L *21/467, 27/04, 29/78*

U.S. Cl. 148—175 **5 Claims**

1. A method for making a semiconductor memory device having an array of single IGFET memory cells comprising the steps of:

providing a substrate of semiconductor material having a preselected impurity concentration;

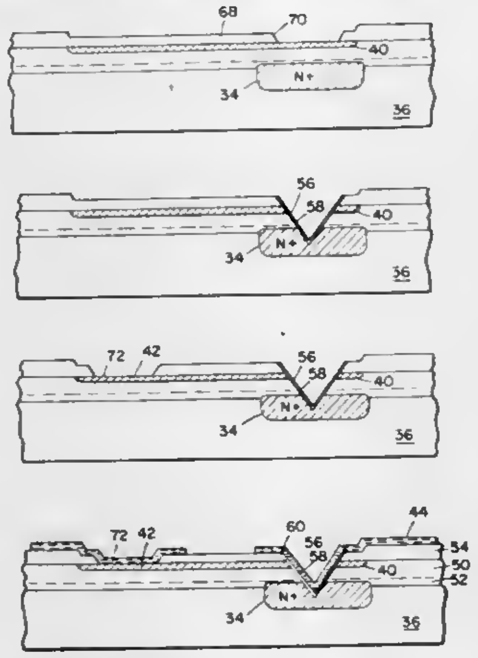
forming a plurality of spaced apart diffused first regions on the upper surface of and having the opposite polarity from said substrate;

forming an epitaxial layer of material on said substrate that covers said first regions and has the same polarity as said substrate material;

forming in said epitaxial layer a plurality of second regions of material having the same polarity as and spaced directly above said first regions while also forming conductive paths that interconnect aligned groups of said second regions to provide bit lines for said memory device; forming a recess for each said cell that extends through said second region and into said first region;

forming a gate oxide layer having a thickness of 500Å – 1000Å on the wall of said recess extending between said first and second regions; and

forming a layer of conductive material on said gate oxide layer to provide a gate means for each said cell within said recess and extending between said cells to provide address lines for said memory device.



4,105,476

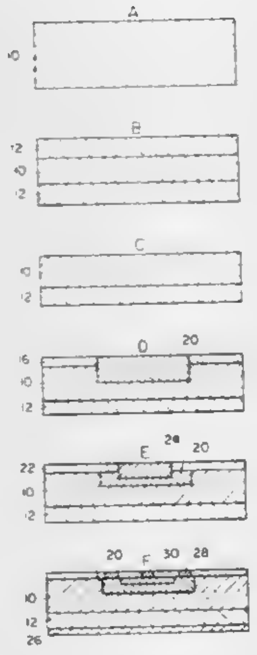
METHOD OF MANUFACTURING SEMICONDUCTORS

Fawzi J. Hamzawi, Riviera Beach, Fla., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed May 2, 1977, Ser. No. 793,190

Int. Cl.² H01L *21/225*

U.S. Cl. 148—187 **1 Claim**



1. In the manufacture of a semiconductive device the steps of:

exposing a silicon wafer of P type conductivity to a diborane impurity atmosphere by passing the wafer through a furnace containing such atmosphere at a temperature of 1050° C over a 4 hour period to deposit said diborane impurity about said wafer as a glassy layer;

passing said wafer through a furnace after depositing said diborane impurity for a period of two more hours while raising its temperature to and holding it thereat 1200° C to diffuse the diborane impurity into the wafer;

cooling the wafer gradually to avoid thermal gradients between the glassy layer and the wafer;

stripping the glassy layer from one surface;

passing the wafer after the stripping through a furnace to heat it to and hold it at 1275° C for a period of 48 hours to provide a P+ depth of approximately 4 mils in from the other surface of the wafer;

lapping the one surface;

chemo-mechanically polishing the other surface to leave a P+ surface; and

using oxide masking to provide other areas of impurity concentration for the semiconductive device and appropriate contacts therewith.

4,105,477

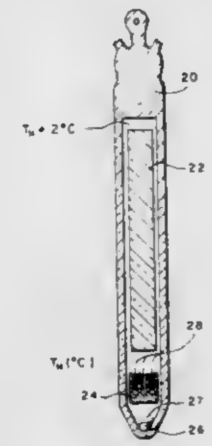
DOPING OF (Hg,Cd)Te WITH A GROUP VA ELEMENT

Eric Shanks Johnson, and Joseph Lawrence Schmit, both of Minnetonka, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 757,266, Jan. 6, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 846,739

Int. Cl.² H01L *21/04*

U.S. Cl. 148—187 **20 Claims**



1. A method of adjusting the acceptor concentration in a body of mercury cadmium telluride, comprising the steps of:

contacting a body of mercury cadmium telluride with a quantity of acceptor material selected from the group consisting of phosphorus, arsenic and antimony; and

heating said body at a temperature of at least 550° C for a sufficient time to distribute said acceptor material within said body.

4,105,478

DOPING HgCdTe WITH Li

Eric S. Johnson, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

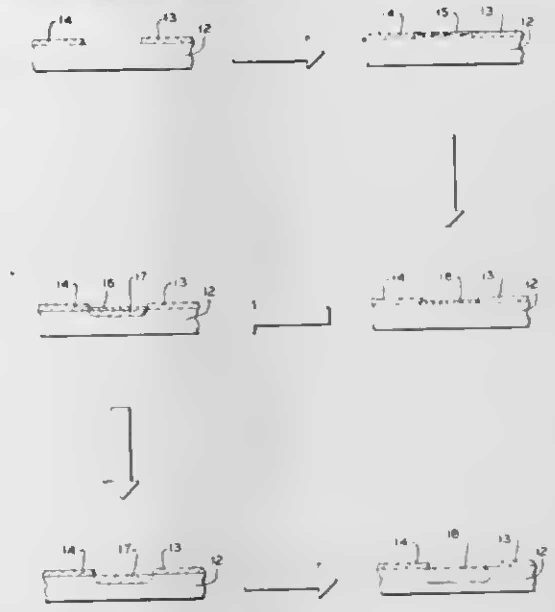
Division of Ser. No. 757,265, Jan. 6, 1977, Pat. No. 4,087,294. This application Feb. 3, 1978, Ser. No. 875,033

Int. Cl.² H01L *21/04*

U.S. Cl. 148—188 **16 Claims**

1. A method of adjusting the acceptor concentration in a body of mercury cadmium telluride, comprising the steps of:

contacting said body of mercury cadmium telluride with a quantity of lithium; and



heating said body for a time sufficient to distribute said lithium within said body.

4,105,479

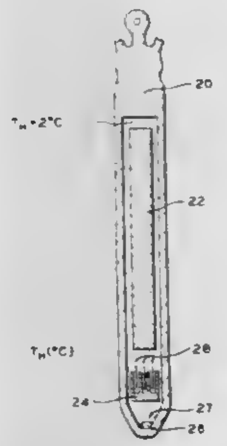
PREPARATION OF HALOGEN DOPED MERCURY CADMIUM TELLURIDE

Eric Shanks Johnson, and Joseph Lawrence Schmit, both of Minnetonka, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 757,271, Jan. 6, 1977, Pat. No. 4,086,106. This application Feb. 6, 1978, Ser. No. 875,266

Int. Cl.² H01L *21/04*

U.S. Cl. 148—189 **18 Claims**



1. A method of adjusting the donor concentration in a body of mercury cadmium telluride, comprising the steps of:

contacting a body of mercury cadmium telluride with a quantity of donor materials selected from the group consisting of bromine and iodine; and

heating said body at a temperature of at least 550° C for a sufficient time to distribute said donor material within said body.

4,105,480

FLASHLAMP COMPOSITION

Vaughn C. Sterling, East Cleveland, and Lewis J. Schupp, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 567,576, Apr. 14, 1975. This application May 2, 1977, Ser. No. 792,753

Int. Cl.² C06B *33/12*

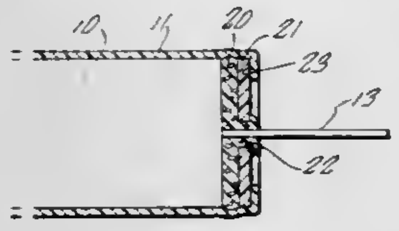
U.S. Cl. 149—40 **6 Claims**

1. A shorting primer material for a high voltage activated

flashlamp which comprises a solid mixture containing in weight percent about 40–90% powdered combustible metal fuel, 5–15% of an oxidizer for said combustible metal fuel, 5–15% of a combustion supporting oxide which is converted to a non-conductive residue upon combustion of the mixture, and 10–20% of a combustion supporting oxide which is converted to a conductive residue upon combustion of the mixture.

4,105,481
ENCAPSULATION METHOD FOR ELECTRICAL ELEMENTS

Clyde A. Lofdahl, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 737,278, Nov. 1, 1976. This application Jun. 7, 1977, Ser. No. 804,397
Int. Cl.^{2} B29C *27/20;* B32B *5/20, 31/20*
U.S. Cl. 156—79 **16 Claims**



1. In a process for encapsulating a cylindrical electrical element having lead wires emanating therefrom comprising enveloping said element in a heat-shrinkable polymeric tubular member whereby said lead wires extend out through the open ends of said tubular member and heating said tubular member causing it to conformingly recover around said element, the improvement comprising:

(a) threading each of said outwardly extending lead wires through a separate hole in a laminated disc, said disc comprising a layer of polymeric material and a substantially copolar contiguous layer of heat foamable adhesive, said threading being effected such that the adhesive layer is disposed towards the element;

(b) inserting the said disc with the lead wires threaded therethrough within the open end of said tubular member; and

(c) applying sufficient heat to cause:

(i) the tubular member to conformingly recover around said element and said disc, and

(ii) the foamable adhesive layer of said disc to foam and seal the interface between the periphery of said disc and the inside surface of said recovered tubular member and also the interface between each hole and the lead wire passing therethrough.

4,105,482
METHOD OF VULCANIZING A PREVULCANIZED TREAD

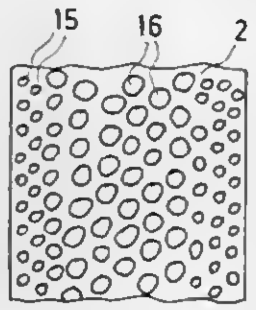
Friedrich-Wilhelm Wapelhorst, Lauben, and Heinz-Dieter Kalkoff, Witten, both of Germany, assignors to Lieselotte Trappe, Wetter, Germany
Filed Apr. 28, 1975, Ser. No. 571,441
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1974, 2420220
Int. Cl.^{2} B29H *17/00, 17/37*
U.S. Cl. 156—96 **24 Claims**

1. A method for retreading a tire carcass having an arcuate tread engaging crown with a prevulcanized annular tread having a pattern of ribs and grooves on its exterior road enaging surface and a substantially flat interior cross sectional configuration when in the unstressed state; said method comprising:

(a) applying the tread to the crown of the carcass with an unvulcanized bonding rubber intermediate layer therebetween, the tread being elastically deformed to conform to the carcass crown, the application of the tread to the carcass being effected in such a manner that the occlusion of air between the tread and the carcass is avoided;

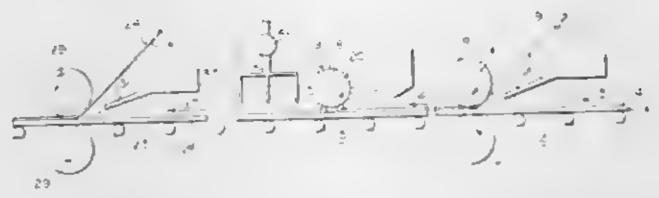
(b) securing a stressing belt annularly around the assembled tread and carcass, said stressing belt being an elongated endless band extending annularly around the road engaging surface of the assembled tread with its longitudinal direction running in the same direction as the tread and its width corresponding at least to that of the tread, the belt having openings to allow a surrounding fluid to pass therethrough to at least some of the road engaging surface of the tread so that the pressure of the fluid is transmitted to all of the ribs and grooves of the tread, said belt further being elastic, secured annularly around the tire and pressed thereagainst by shrinkage in its longitudinal direction under the influence of heat and moisture thereby providing around the longitudinal direction of the tread a uniform, radially inwardly directed stress to hold the elastically deformed tread on the carcass, said belt further being capable of withstanding elevated temperatures and pressures sufficient to vulcanize said bonding rubber intermediate layer;

(c) vulcanizing the intermediate layer of bonding rubber by subjecting the tread and carcass assembly with the fluid-permeable, shrinkable and elastic stressing belt therearound to the action of heat and pressure in an enclosed chamber whereby as the adhesive power of the intermediate layer of bonding rubber decreases during heating prior to vulcanization, the tread is held securely in position and distortion of the carcass or of the bonding rubber layer is avoided.



4,105,483
PRINTING INK TRANSFER PROCESS

Liang-Chuan Lin, Taipei, Taiwan, assignor to Globe Industries Corporation, Taipei, Taiwan
Filed Feb. 14, 1977, Ser. No. 768,453
Int. Cl.^{2} B32B *31/22, 31/12, 31/20*
U.S. Cl. 156—154 **14 Claims**



1. A process for transferring printed information alone from a printed surface of a printed paper to a substrate having at least one smooth substantially non-porous surface, the printed information consisting of printing ink imprinted on the paper without any intermediate layer of material therebetween, comprising the steps of:

a. applying transparent adhesive to the printed surface to form a coating of adhesive thereon;

b. applying transparent adhesive to the smooth surface to form a coating of adhesive thereon;

c. when said coatings of adhesive are dry, applying an adhesive solvent to at least one of the coated surfaces of the printed paper and the substrate;

d. when the solvent has activated the exposed surface of the adhesive coating to which the solvent has been applied and before the entire coating to which the solvent has been applied has been penetrated by the solvent, pressing the activated surfaces together to unite the adhesive coatings and to squeeze any excess solvent from between the coatings; and

e. when the united adhesive is dry, applying a paper solvent to the paper and removing the dissolved paper thereby leaving the printed information attached to the substrate by means of said adhesive.

14. A process for transferring printed information alone, from a printed surface of a printed paper to a substrate having at least one smooth substantially non-porous suface, the printed information consisting of printing ink imprinted on the paper without any intermediate layer of material therebetween comprising the steps of:

a. applying transparent adhesive to at least said printed surface to form a coating of adhesive thereon;

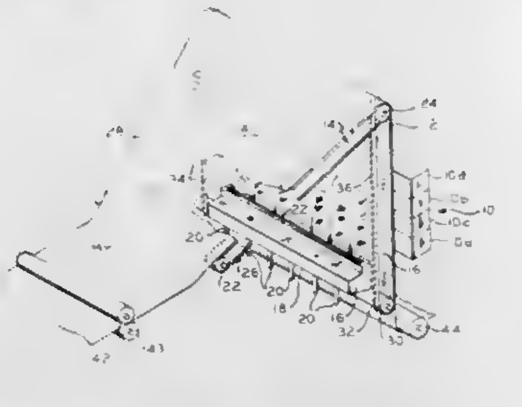
b. when said adhesive is set, applying a solvent for the adhesive to at least one said surface;

c. pressing said surfaces together to unite them by means of the adhesive and to squeeze any excess solvent from between the surfaces before the entire thicknes of the adhesive has been penetrated by the solvent; and

d. when the adhesive is set, applying a paper solvent to the paper and removing the dissolved paper thereby leaving the printed information attached to the substrate by means of said adhesive.

4,105,484
INFRARED APPARATUS FOR PRODUCING A FUSED FABRIC

Richard C. Newton, and Gerald A. Romanek, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 16, 1977, Ser. No. 797,213
Int. Cl.^{2} B32B *19/02, 31/00*
U.S. Cl. 156—380 **10 Claims**



1. Apparatus comprising, in combination,

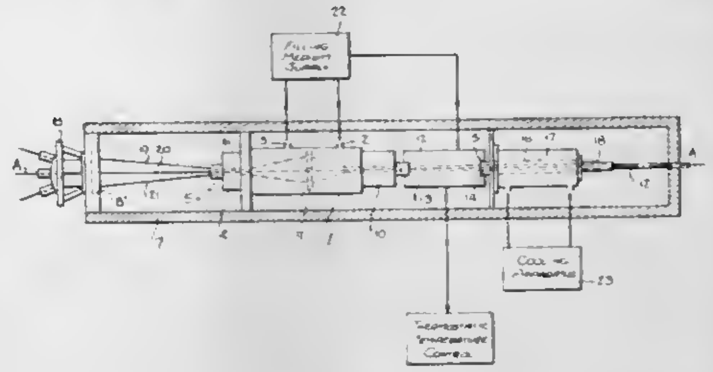
infrared heating means,

conveying means suitable for transporting a fabric adjacent to and spaced a distance from said infrared heating means, suitable for transporting the fabric so that the surfaces of the fabric are unrestricted, and suitable for grasping the edges of the fabric, and

fluid-contacting means for forcing a fluid in contact with the surface of the fabric immediately opposite the surface of the fabric positioned adjacent to and spaced a distance from said infrared heating means.

4,105,485
APPARATUS FOR IMPREGNATING STRANDED WIRES DURING STRANDING THEREOF

Antonio Portinari, Sesto San Giovanni (Milan), and Piero Lavezzari, Desio (Milan), both of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy
Division of Ser. No. 569,806, Apr. 21, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,004
Claims priority, application Italy, May 28, 1974, 23225 A/74
Int. Cl.^{2} H01B *13/30*
U.S. Cl. 156—382 **6 Claims**



1. In apparatus for manufacturing a grouped strand for a fully-filled electric cable, said strand comprising a plurality of electrically conductive components of elongated shape stranded together with the spaces between said components filled with, and the exterior of said strand coated by, a water-impermeable and electrically insulating filling medium having a predetermined dropping point temperature, said apparatus comprising:

a chamber having an inlet opening and an outlet opening spaced from said inlet opening for circulating said medium under a pressure above atmospheric pressure and at a temperature at least 5° C above said dropping point temperature through said chamber and having an inlet die at one portion of said chamber and an outlet die at another portion of said chamber spaced from said one portion, each said die having an opening therethrough of a size for closely receiving, while permitting the passage therethrough of, all said components in abutting relation and the opening of said outlet die being aligned with the opening of said outlet die and said chamber being substantially liquid-tight except for the opening in each die, and said inlet opening and said outlet opening;

a spreading element mounted in said chamber, between said inlet die and outlet die, and extending transversely of a line between said opening of said inlet die and said opening of said outlet die and intermediate and being spaced from both said inlet die and said outlet die, said spreading element having a plurality of apertures therein spaced from each other and from said line for individually receiving said components and permitting the passage of a said component through an aperture, each of said apertures being spaced from the others of said apertures by a distance greater than the distance between said abutting components as they pass through said inlet die to cause said components to be forced apart after they leave said inlet die; so that after passage through said apertures, the entire outer surface of each component is in contact with said filling medium for impregnation thereby

means connected to said inlet opening and said outlet opening and supplying said medium to said inlet opening under pressure above atmospheric pressure and at a temperature at least 5° C above said dropping point temperature and withdrawing said medium through said outlet opening;

a tank receiving said medium at atmospheric pressure and at a temperature at least 5° C above said dropping point temperature, said tank having a first wall at said outlet die with an opening therethrough aligned with said opening in said outlet die and having a second wall spaced from said first wall with an opening therethrough aligned with said opening in said first wall, said tank having the level of the medium therein above said opening in said first wall and said opening in said second wall;

a sizing tube for said medium extending from said second wall and aligned with opening in said second wall, said tube having an inner size substantially equal to but larger than the cross-section of said strand; and

means for cooling said tube.

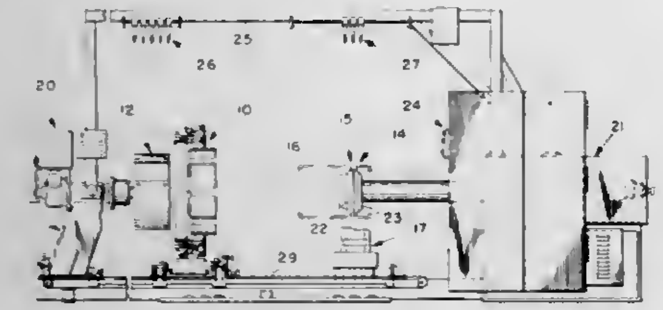
4,105,486
TIRE COMPONENT TRANSFER

Armindo Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Mar. 30, 1977, Ser. No. 782,990

Int. Cl.^{2} B29H *17/20. 17/37*

U.S. Cl. 156—405 R **15 Claims**



1. A tire component transfer comprising a set of circular sectors each having the same radius of curvature, the radially inner surface of said set of circular sectors combining to form one circular support surface made up in circumferential segments by said circular sectors, each sector including a radially extending stem, support means mounting said stems for movement radially to open and close said sectors, and means connecting said support means to the same side of each stem with fasteners projecting from the opposite side of each stem whereby said set may readily be removed and replaced by another set of sectors each having another same radius of curvature, and wherein said support means includes parallelogram link means connected to the same side of each stem.

4,105,487
PROCESS OF AND AN APPARATUS FOR PRODUCING GREEN TIRES

Masayoshi Suzuki, Higashiyamato; Tatuo Oojimi, Kodaira; Toshinori Yabe, Kodaira, and Shoji Takahashi, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,496

Claims priority, application Japan, Dec. 27, 1975, 50-157534; Dec. 29, 1975, 50-157768

Int. Cl.^{2} B29H *17/14*

U.S. Cl. 156—405 R **9 Claims**

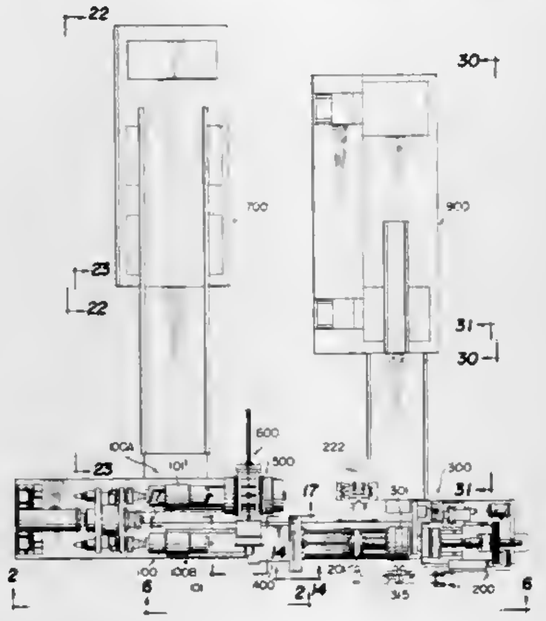
1. An apparatus for producing green tires, comprising in combination:

a tire band building mechanism including a revolvable member revolvable around it own axis to be indexed at first and second rotation positions, a pair of collapsible tire band building drums mounted on said revolvable member in spaced apart and parallel relation with each other to assume first and second station when said revolvable member is revolved and indexed at the respective first and second rotation positions, each of said tire band building drums being rotatable around its own axis, a revolving means for intermittently revolving and indexing said revolvable member into the first and second stations, and a pair of tire band building drum rotating means for rotating said tire band building drums;

a belt building mechanism including a collapsible belt building drum disposed in coaxial and spaced apart relation with said tire band building drum occupying said second station and rotatable around its own axis, and a belt building drum rotating means for rotating said belt building drum;

a tire building drum mechanism including a tire building drum disposed between and in coaxial relation with said tire band building drum occupying said second station and said belt building drum to be deformable between a cylindrical form and a toroidal form, and a tire building drum rotating means for rotating said tire building drum; and

a transfer ring mechanism including a movable base structure movable to assume first, second and third positions, first and second transferring arrangements mounted on said movable base structure in spaced relation with each other along the axes of said tire band building drum, said belt building drum and said tire building drum with a distance between the mid-circumferential planes of said transferring arrangements substantially equal to a distance between the mid-circumferential planes of said tire building drum and said belt building drum, said first transferring arrangement surrounding said tire band building drum when said movable base structure is moved to the first position, said first transferring arrangement surrounding said tire building drum to transfer a green case thereon to said tire building drum and said second transferring arrangement surrounding said belt building drum to receive and endless belt from said belt building drum when said movable base structure is moved to said second position, said second transferring arrangement surrounding said tire building drum to transfer the endless belt, received on said second transferring arrangement, onto the green case on said tire building drum when said movable base structure is moved to the third position.



4,105,488
RAW EDGE V-BELT BUILDING APPARATUS

Richard H. Hayes, Tallmadge; Lellan L. McFarland, Wadsworth; George L. Schrum, Tallmadge, and Robert S. Vanderzee, Akron, all of Ohio, assignors to Akron Standard, Division of Eagle-Picher Industries, Inc., Akron, Ohio

Filed Feb. 3, 1976, Ser. No. 654,845

Int. Cl.^{2} B29H *7/22*

U.S. Cl. 156—425 **4 Claims**

2. Apparatus for building a raw edge V-belt carcass comprising,

a drum for receiving plies of material and wrapping them about said drum to form a cylindrical carcass,

means for rotating said drum,

a cord let-off mechanism for applying a cord in a helix around said carcass,

said cord let-off mechanism including a let-off roll for said cord, a variable speed direct current motor driving said let-off roll,

a resolver having a movable element located in the path of cord for said let-off mechanism to said winding head and engageable with said cord to detect tension variations in said cord, said resolver supplying a signal to said motor which varies with the tension on said cord and causes the speed of said motor to vary with the tension on said cord,

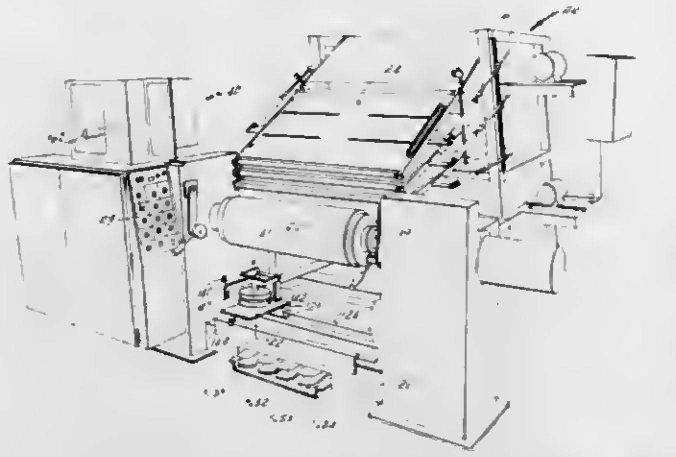
a series of idler pulleys over which said cord passes, the movable element of said resolver being an arm pivoted at one end and carrying a movable idler pulley at the other end, said cord passing around said movable idler pulley to form a loop,

means biasing said arm to swing in a direction opposite to that which the tension on the cord causes it to swing,

said resolver detecting the position of said arm and signaling said motor to supply cord at a rate which will tend to maintain said arm at a preselected operative position,

said idler pulley having sequentially

- a. a first range of positions in which said cord supplying means is caused to operate in a reverse direction to withdraw cord,
- b. a second position in which said supplying means is inoperative,
- c. a third range of positions in which said supplying means supplies cord at a rate dependent on the position of said idler pulley within said range, and
- d. a fourth range of positions in which said drum is caused to rotate more slowly.



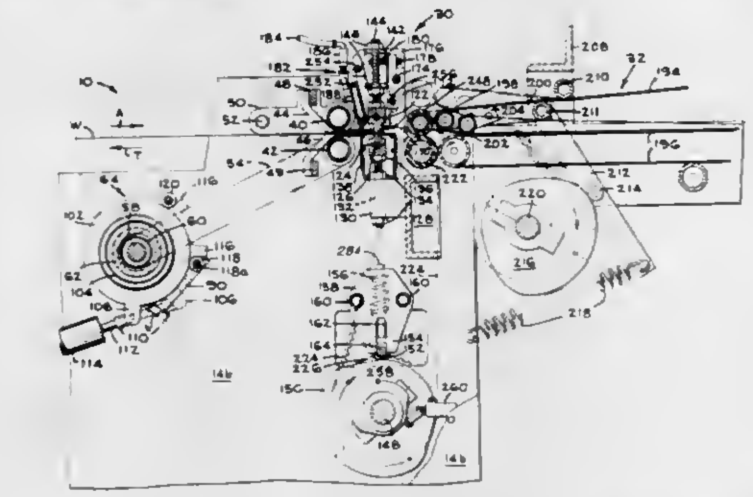
4,105,489
APPARATUS FOR MAKING BOTTOM SEAL THERMOPLASTIC BAGS

Ronald L. Lotto, Bonduel, Wis., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 198,282, Nov. 12, 1971, abandoned. This application Jul. 25, 1973, Ser. No. 382,607

Int. Cl.^{2} B32B *31/00;* B30B *15/34*

U.S. Cl. 156—510 **6 Claims**



1. In a bag machine of the type for making bags from an elongate web of thermoplastic material including intermittently operable web draw rolls for feeding the leading portion of the web a distance equal to the length of a bag and transversely extending weld bars associated with a cutter for severing and welding the web at intervals equal to the feed length, said machine comprising means for intermittently driving said draw rolls including an input shaft which is continually rotated in opposite directions, drive means for reciprocating one of said weld bars relative to the other to effect transverse welding of the web portion located between said weld bars, said weld bars being operable to engage and weld the web when said input shaft is rotating in one of said opposite directions whereby said draw rolls are held against rotation, and means responsive to said weld bar drive means for initiating rotation of said draw rolls in one and then the other of said opposite directions.

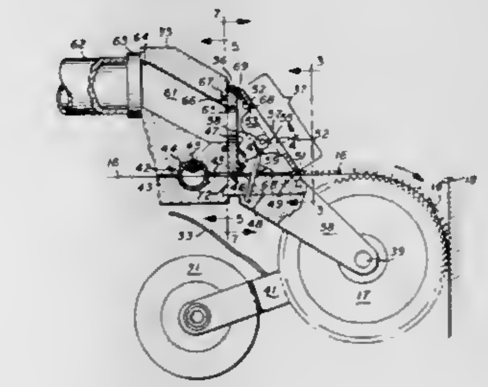
4,105,490
DRY WALL TAPING MACHINE HAVING AN IMPROVED DRY WALL CEMENT DISPENSING BOX

Harold M. Lass, San Jose, Calif., assignor to Corban Industries, Inc., San Jose, Calif.

Filed Nov. 8, 1976, Ser. No. 739,517

Int. Cl.^{2} B32B *31/00;* B44C *7/00;* B05C *3/02*

U.S. Cl. 156—526 **21 Claims**



1. In a dry wall taping machine:

main body means to be grasped by the operator for applying dry wall tape from a tape supply over a seam between adjacent sections of dry wall;

said main body means having a tape applicator head portion to be disposed adjacent the seam to be taped for applying dry wall cement to the tape and for applying the cement laden tape to the wall and for severing the tape upon completion of the taping of a seam;

means for feeding tape from a supply thereof through said applicator head portion onto the seam to be taped;

said tape applicator head portion including a dry wall cement dispensing means for dispensing dry wall cement onto the face of the tape which is to face the wall being taped;

said dry wall cement dispensing means including chamber means for containing dry wall cement therein, conduit means for feeding fluid dry wall cement into said chamber means, inlet and outlet tape port means in said chamber means for passage of the tape through said chamber means for dispensing dry wall cement onto the tape, and sealing lip means for pressing against the tape and for sealing said tape inlet port means against flow of the dry wall cement outwardly of said chamber through said tape inlet port means in the up-tape direction while permitting passage of the tape into said chamber means through said sealing lip means; and

quick disconnect means for quickly disconnecting said dry wall cement dispensing means from said head portion of said dry wall taping machine.

4,105,491

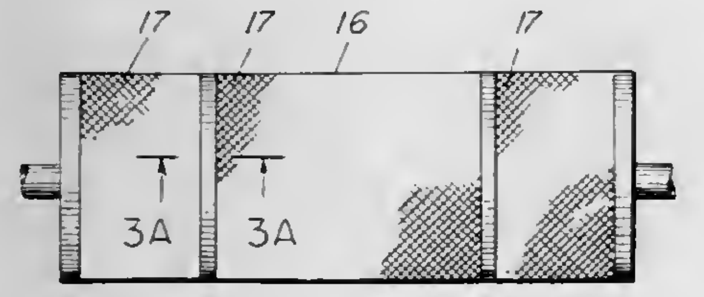
PROCESS AND APPARATUS FOR THE MANUFACTURE OF EMBOSSED FILM LAMINATIONS

Donald A. Haase, Penfield, and Robert E. Reed, Canandaigua, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 551,799, Feb. 21, 1975, abandoned, which is a division of Ser. No. 13,171, Feb. 20, 1970, abandoned, which is a continuation of Ser. No. 580,302, Sep. 19, 1966, abandoned. This application Mar. 9, 1977, Ser. No. 776,082

Int. Cl.² B32B *31/20*

U.S. Cl. 156—553 **1 Claim**



1. In an apparatus for preparing a two layer embossed thermoplastic laminate comprising a roller having a raised pattern surface, said pattern surface being infra-red absorbent, means to pass two layers of film concurrently over said roller and means to apply heat to said infra-red absorbent raised pattern surface:

the improvement wherein said raised pattern surface comprises helically extending and intersecting circumferential bands about the surface of said roller, interrupted by longitudinally extending circumferential bands having smooth infra-red reflecting metallic surfaces and associated means for cooling said smooth surfaces, said smooth surfaced bands being coextensive in height with said raised pattern surfaces.

4,105,492

TREATED GLASS FIBERS

Kevin M. Foley, Maumee; Anil K. Rastogi, and Joseph P. Rynd, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 680,325, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 461,326, Apr. 16, 1974, abandoned. This application Aug. 29, 1977, Ser. No. 828,377

Int. Cl.² C03C *25/06;* B32B *13/02*

U.S. Cl. 156—629 **7 Claims**

1. A method of preparing a cementitious matrix reinforced with glass fibers having on their surfaces a uniform coating at least monomolecular in thickness of zirconium dioxide comprising the steps of applying an aqueous solution of ammonium zirconyl carbonate to the surfaces of glass fibers, keeping the fibers wetted under etching conditions for a period of time to effect ion exchange with water extractable ions in the surface of the glass, evaporating the water from the resulting coating on the surfaces of the glass fibers, and incorporating the resulting coated glass fibers into a cementitious matrix.

4,105,493

PRODUCTION OF SHAVING FOIL

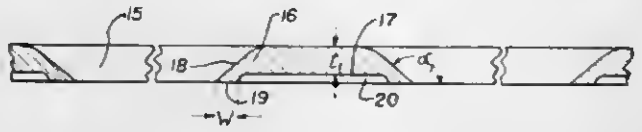
Jean-Daniel Chauvy, Chaumont, Switzerland, assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 699,040, Jun. 23, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,968

Claims priority, application United Kingdom, Jul. 5, 1975, 28426/75

Int. Cl.² C23F *1/02*

U.S. Cl. 156—644 **8 Claims**



1. A method of producing a shearing foil for a dry shaver from a sheet of metal, said foil having a front face and a back face, and exhibiting desired perforations extending through the sheet from said front face to said back face with bars between the perforations, the bars being dished in transverse cross-sectional profile to provide a substantially flat recessed base of substantially uniform thickness, the dished profile having edges extending at an angle to the base to terminate with substantially coplanar surfaces on the back face disposed substantially parallel to the base, which method comprises applying a layer of a photosensitive material to each face of the sheet of metal, exposing the photosensitive material on the front face to radiation through a mask having a hole pattern corresponding to the desired perforations of the shaving foil, exposing the photosensitive material on the back face to radiation through a mask having a pattern corresponding to the recessed base of the dished profile, developing the exposed photosensitive material on said faces in order to generate a respective pattern of unprotected regions on each face of the metal sheet, etching said unprotected regions of the front face, and of the back face, removing the photosensitive layer from only the front face, and carrying out a further etching of the front face until a predetermined quantity of metal is removed providing the bars with smoothly rounded ridges and edges extending at an obtuse angle to the base.

4,105,494

PROCESS OF GAS-PHASE BLEACHING HIGH CONSISTENCY FINELY DISINTEGRATED PULP

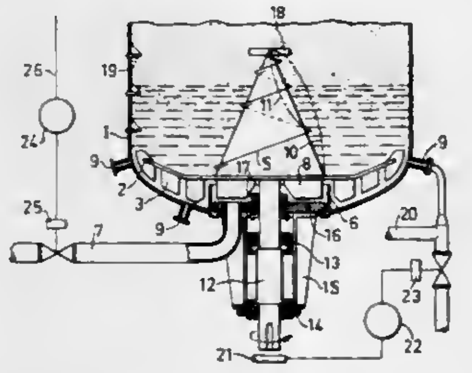
Bengt Edvard Pettersson, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Division of Ser. No. 426,437, Dec. 20, 1973. This application Apr. 29, 1976, Ser. No. 681,483

Claims priority, application Sweden, Jan. 5, 1973, 73001471

Int. Cl.² D21C *9/10, 7/12, 3/24, 7/00*

U.S. Cl. 162—19 **3 Claims**



1. In a continuous process for gas-phase bleaching, at high consistency, of finely disintegrated gas-pervious fibrous material, which comprises

establishing and maintaining a generally vertical column of fibrous material of a high consistency of from about 18 to about 40%, in an elongated generally vertical chamber, said column of high consistency being spaced from the upper and lower extremities of the chamber wherein there is a gas space with an atmosphere containing gaseous bleaching agent above, and a dilution space beneath, between said column and said dilution space there being a consistency gradient space;

continuously showering fluffed finely disintegrated fibrous material into the chamber at the upper end thereof through said atmosphere containing gaseous bleaching agent and onto the top of said column while simultaneously maintaining substantially constant the height of said column by continuously removing fibrous material from the lower end of said column through said consistency gradient space and into said dilution space;

continuously introducing dilution liquid into said dilution space to establish and maintain therein a body of diluted fibrous material;

the fibrous material during its continuous removal from the lower end of said column being guided downwardly and outwardly by rotating a rotatable hub body extending from adjacent the bottom of the tower upwardly through said dilution space and into said consistency gradient space, said hub body having a progressively greater cross-sectional area from top to bottom thereof;

maintaining substantially constant the torque required for rotating said hub body by substantially continuously measuring the actual variations from a predetermined normal torque and varying the rate of introduction of dilution liquid inversely with variation in said torque, thereby maintaining substantially constant the consistency of the diluted fibrous material as withdrawn from the bottom of the tower; and

continuously measuring the height of the column, and varying the rate of withdrawal of diluted fibrous material from the bottom of the tower so as to maintain substantially constant the height of said column.

4,105,495

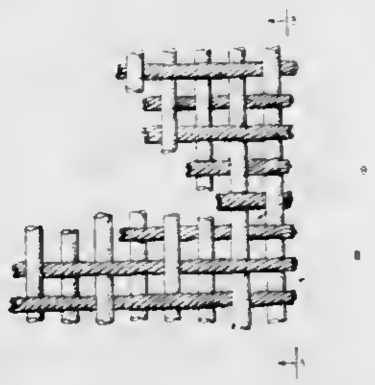
STRETCH-RESISTANT PAPERMAKERS BELTS HAVING NON-POROUS SYNTHETIC CABLES

Karnire S. Pai, Greeneville, Tenn., assignor to Huyck Corporation, Wake Forest, N.C.

Filed Dec. 8, 1975, Ser. No. 638,391

Int. Cl.² D21F *1/10;* D03D *15/00*

U.S. Cl. 162—348 **5 Claims**



1. A stretch resistant papermakers' fabric for use on a papermaking machine comprising nonporous synthetic cables which extend in the longitudinal direction of said fabric and comprising synthetic yarns which extend in the transverse direction of said fabric and, wherein each of said cables comprise at least three yarns and each of said yarns of said cables comprising two or more monofilaments which are circular in cross section and have a diameter of at least 3 mils and wherein said yarns which comprise said cables comprise monofilaments of polyester and include ultra high modulus multifilaments.

3. A fabric as recited in claim 1 wherein said yarns of said cables include multifilament poly (para-phenylene terephthalamide), and said cables are resin coated.

4,105,496

METHOD AND DEVICE FOR ELECTRONIC CONTROL WITH POSITIVE SAFETY

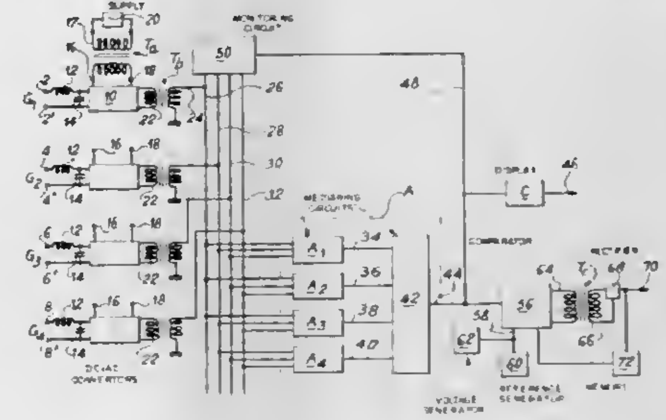
Jean-Paul Therond, Versailles, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 5, 1975, Ser. No. 638,207

Claims priority, application France, Dec. 11, 1974, 74 40769

Int. Cl.² G21C *17/00;* G06G *7/14*

U.S. Cl. 176—19 R **6 Claims**



1. An electronic device for positive safety control which serves to carry out a method of control of a protection system, in particular for a nuclear reactor, in which N measurements of either one or a number of physical quantities are taken and processed by N matching and/or computation units, wherein the median of the N signals corresponding to the N measurements is selected, said signals being obtained at the output of said units, and wherein the value of the median is compared with a reference value so that the comparison initiates the desired protection action, and wherein said device comprises:

N inputs derived from the N matching and computation devices which deliver direct-current signals,

N direct-current to alternating-current converters, each converter being connected in series with each input for converting the direct-current input signal to a periodic signal having a frequency *f* and an amplitude which is proportional to the direct-current input quantity,

a supply A' which delivers a periodic signal having a frequency f into the N converters by means of an isolation transformer,

an alternating current median-determination circuit A containing means for selecting the median of the amplitudes of the periodic signals delivered by the converters, and

an alternating current comparator for comparing said value Vm of the amplitude of the median with a predetermined direct-current reference value Vr and delivering by means of an isolation transformer a logical signal +1 when Vm − Vr>0, and 0 when Vm − Vr<0, each of the elements of the device being designed for positive safety.

4,105,497

Patent Not Issued For This Number

4,105,498

ANEROBIC SPECIMEN TRANSPORT SYSTEM

William Hertl, and William S. Ramsey, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 19, 1977, Ser. No. 798,659

Int. Cl.² C12K *1/08*

U.S. Cl. 195—59 **10 Claims**

1. A method of maintaining a specimen of an anaerobic microbe under conditions which are substantially anaerobic and which enhance the anaerobicity of the specimen, the method comprising immersing the specimen in a water-immiscible, inert, substantially non-nutritive, sterile, deoxygenated oil-like fluid having an oxygen activity coefficient less than that of water.

4,105,499

HEART ATTACK SCREENING METHOD, APPARATUS AND KIT FOR SAME

John Y. Kiyasu, 94 Meadow St., Garden City, N.Y. 11530

Filed Oct. 6, 1976, Ser. No. 730,102

Int. Cl.² G01N *31/08*

U.S. Cl. 195—103.5 R **9 Claims**

1. A rapid laboratory test method for detection of heart attacks in human patients which comprises the steps of (1) passing a sample of 1.5 ml. of patient blood serum containing a green food color concentrate through a chromatographic column, (2) passing a first buffer solution of pH about 7.9 through said column, (3) passing an approximate total of 3.0 ml of a second buffer solution of pH about 6.9 in two portions through said column, (4) thereby isolating and identifying by means of said green food color concentrate the major portion of the creatine phosphokinease-MB isoenzyme from the resulting eluate, (5) continuing to pass said second buffer solution through said column, and (6) thereafter continuing to repeat, in consecutive order said steps 1, 2, 3, 4, and 5, thereby reusing the column for subsequent heart attack detection tests for separate individual patients.

4,105,500

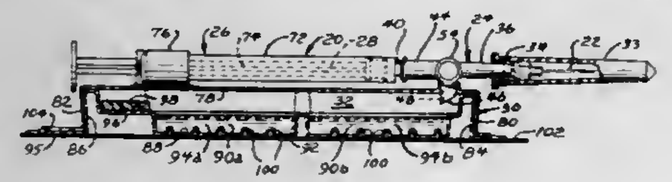
DIAGNOSTIC DEVICE FOR A LIQUID SAMPLE AND METHOD

Gary Libman, Des Plaines, and Frank K. Villari, Oak Park, both of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 634,110, Nov. 21, 1975, Pat. No. 4,040,909, and Ser. No. 495,978, Aug. 29, 1974. This application Mar. 4, 1977, Ser. No. 774,358

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 M **2 Claims**



1. A method of preparing a sample for diagnosis, comprising the steps of:

pumping a predetermined amount of sterile liquid through a swab to a sample site while the swab is located at the site;

mixing the liquid with the sample by the swab at the site for suspension of the sample in the liquid; and

aspirating the suspended sample from the sample site through the swab while the swab is located at the site after said mixing step and pumping the withdrawn sample to a culture medium without passage through the swab for inoculation of the medium.

4,105,501

METHOD FOR PRODUCING METALLURGICAL COKE

Gyoichi Suzuki, Tokyo; Mitsutoshi Miura, Yokohama; Takashi Miyazu; Taro Matsushita, both of Tokyo, and Yasuo Okuyama, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 730,975

Claims priority, application Japan, Oct. 23, 1975, 50/126869

Int. Cl.² C10B *53/04, 53/00, 47/10*

U.S. Cl. 201—6 **8 Claims**

1. A method for producing a high-strength metallurgical formed coke in a slight mutual agglomeration, which comprises:

forming green briquettes serving as an inner core material, said green briquettes comprising blended raw material coal fines having a maximum fluidity of up to 20 d.d.p.m.;

covering said green briquettes with an outer envelope material to a thickness of from 0.5 to 10 mm, said outer envelope material consisting essentially of coal fines having a maximum fluidity of at least 30 d.d.p.m. and an A.P. index of at least 70%;

charging the resulting green composite briquettes into a horizontal coke oven battery; and

carbonizing said green composite briquettes in said battery.

4,105,502

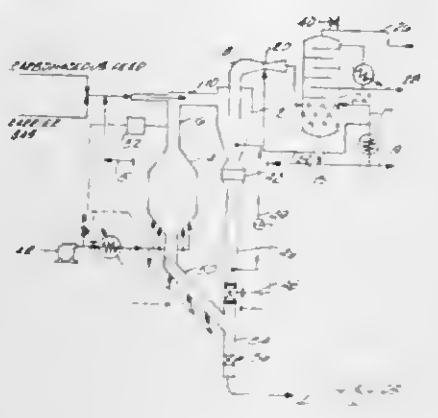
SIMPLIFIED LIQUEFACTION PYROLYSIS PROCESS AND APPARATUS THEREFOR

Charles K. Choi, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,009

Int. Cl.² C10B *49/16, 55/08;* C10G *1/00*

U.S. Cl. 201—12 **19 Claims**



1. A process for the pyrolysis of carbonaceous materials which comprises:

(a) introducing, at a high velocity, to the tangential inlet of a cyclone reaction-separation zone having a vapor outlet at one end and a solids outlet at the opposed end, a stream of carbonaceous material to be pyrolyzed with a particulate solid source of heat, at a temperature above the pyrolysis temperature, contained in a carrier gas essentially free of oxygen to form a high velocity mixture of the carbonaceous material and particulate solid source of heat and pyrolyzing the carbonaceous material in the mixture by heat transfer from the particulate solid source of heat to carbonaceous material, the best transfer being sufficent to achieve a pyrolysis temperature of at least about 600° F to yield a pyrolytic vapor containing normally condensible and noncondensible hydrocarbons and a carbon containing solid residue while simultaneously centrifugally separating within the cyclone reaction-separation zone, the particulate solid source of heat and carbon containing solid residue of pyrolysis from the carrier gas and pyrolytic vapor;

(b) removing the centrifugally separated carrier gas and pyrolytic vapor from the vapor outlet of the cyclone reaction-separation zone and cooling the separated carrier gas and pyrolytic vapors to condense hydrocarbons therefrom;

(c) removing a mixture of the particulate solid source of heat and the carbon containing solid residue of pyrolysis from the solids outlet;

(d) passing at least a portion of the mixture of particulate solid source of heat and carbon containing solid residue of pyrolysis to a combustion zone to combust carbon therein in the presence of source of oxygen to form the particulate solid source of heat at a temperature required for feed to the cyclone reaction-separation zone, and the carrier gas essentially free of oxygen for feed to the cyclone reactor-separator.

4,105,503

METHOD AND APPARATUS FOR EMISSION CONTROL OF BY-PRODUCT COKE OVENS

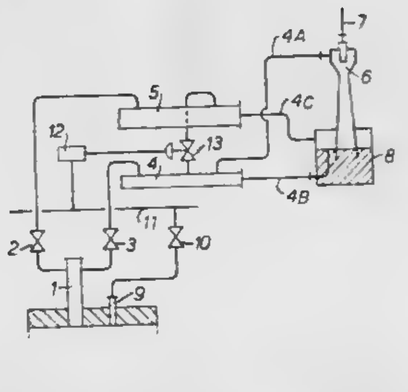
John McNicol Bruce, Chesterfield, England, assignor to British Steel Corporation (Chemicals) Limited, Great Britain

Filed Jul. 29, 1976, Ser. No. 709,722

Claims priority, application United Kingdom, Aug. 8, 1975, 33138/75

Int. Cl.² C10B *27/04*

U.S. Cl. 201—40 **11 Claims**



1. A method for controlling emissions from a coke oven during the charging of the oven wherein a hydraulic main is connected to the head of the coke oven during coking, comprising disconnecting the hydraulic main from the oven prior to charging the oven and connecting the head of the oven to a fluid energized venturi ejector to draw a vacuum at the head of the oven and withdraw emissions therefrom, maintaining the supply of energizing fluid to the ejector substantially constant, sensing the degree of vacuum at the head of the oven during charging and introducing gases from a source of gases under higher pressure into the withdrawn emissions in response to an increase in the level of sensed vacuum above a predetermined level to thereby gas load the ejector and decrease the degree of vacuum drawn at the head of the oven being charged.

4,105,504

APPARATUS FOR PRODUCING FORM COKE

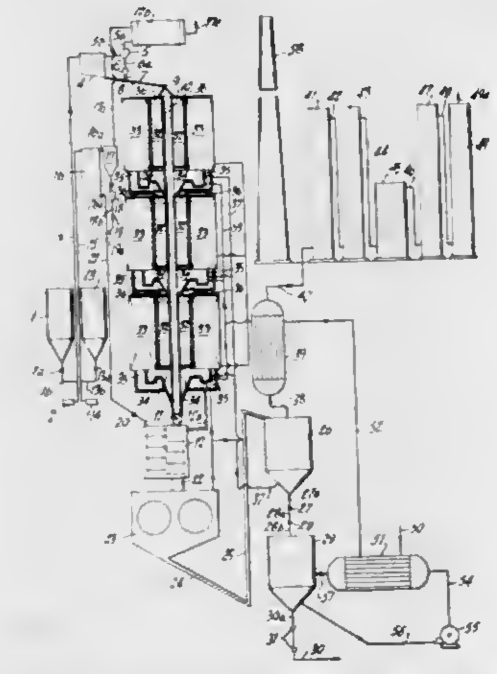
Kurt Lorenz, Hattingen, Germany, assignor to Firma Carl Still, Germany

Continuation of Ser. No. 667,153, Mar. 15, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 775,200

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1974, 2439014

Int. Cl.² C10B *45/02*

U.S. Cl. 202—91 **4 Claims**



1. A device for producing formed coke, comprising a vertically elongated shaft furnace, heating gas flue means defined around said shaft furnace along its height for directing heating gases into contact with the exterior of said shaft furnace, inlet means adjacent the top of said furnace, fine coal supply means connected to said inlet means for feeding fine coal through said inlet means into said furnace at a rate to effect the free fall of said fine coal therein and into the bottom of said shaft furnace, said fine coal being gasified by heat radiated through the wall of said shaft furnace from said heating gas flue means, outlet means adjacent the bottom of said shaft furnace for the discharge of the degasification fine coal, decomposition gas offtake means connected into said shaft furnace at spaced vertical locations along its height and having a passage for the offtake of the degasification gases generated in said shaft furnace by the heating of the fine coal, said passage extending upwardly and away from said shaft furnace, a mixer connected to the outlet of said shaft furnace, means for delivering a caking coal to said mixer for mixing with the degasified fine coal, and a press connected to said mixer for receiving the mixture and compressing it into individual briquettes, a portion of said heating gas flue means surrounding said degasification offtake means, and an air supply passage exteriorly of the heating gas flue means which surrounds said decomposition gas offtake means and being connected into said heating gas flue means, the connection between said air supply means to said heating gas flue means which surrounds said decomposition gas offtake means includes a plurality of nozzles directed into said heating gas flue means and a slide brick cover associated with said nozzles for varying the opening size thereof, and means for conducting degasification gases from said mixer to said degasification offtake means.

4,105,505

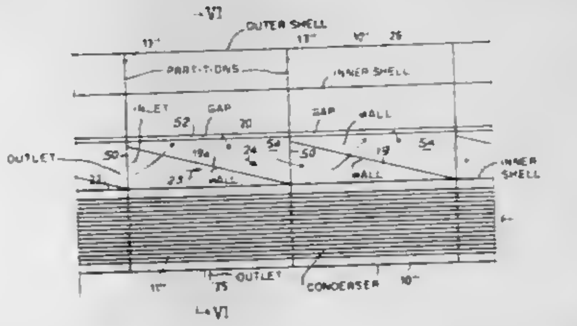
FLASH EVAPORATORS

Risto Saari, Harjula, 02440 Looma, Finland

Filed Jun. 25, 1976, Ser. No. 699,936

Int. Cl.² B01D *1/26, 3/06*

U.S. Cl. 202—173 **10 Claims**



1. In an evaporator, elongated, liquid-conveying shell means having a substantially horizontal attitude and having a hollow interior for conveying a liquid in a given direction along said hollow interior of said shell means, a plurality of transverse partition means distributed longitudinally along said shell means and fixed to and extending transversely across said shell means for dividing the latter into a plurality of evaporator stages arranged one after the other in said direction in which liquid is conveyed by said shell means in the hollow interior thereof, each of said partition means being formed with an opening situated at the interior of said shell means and each opening defining an outlet for one stage and an inlet for the next stage, so that each pair of successive partition means define between themselves an evaporator stage having an inlet at an upstream partition means and an outlet at a downstream partition means, and wall means situated in each evaporator stage extending between the upstream and downstream partition means thereof, said wall means having in each evaporator stage a pair of wall portions which are spaced from each other and define between themselves an elongated narrow gap the length of which is substantially greater than the width of said shell means with said gap defining an orifice through which liquid is compelled to flow while travelling from the inlet to

the outlet of each stage, said wall means defining with said shell means from said inlet to said gap in each stage an upstream liquid flow path through which liquid is compelled to flow from said inlet to said gap and said wall means providing for said upstream flow path a cross section which decreases as the liquid flows along said upstream flow path in each stage, and said wall means defining between said gap and said outlet of each stage a downstream flow path extending from said gap to said outlet of each stage, and said wall means providing for said downstream flow path in each stage a cross section which increases as the liquid flows along said downstream flow path in each stage from said gap to said outlet thereof, each of said evaporator stages having in its interior a space communicating with the downstream flow path for receiving a vapor in each stage downstream of said gap, condenser means at each evaporator stage communicating with said space thereof for condensing said vapor, and collector means situated beneath said condenser means for collecting distillate resulting from condensation of said vapor by said condenser means, said condenser means being situated at an elevation lower than an upper free surface of liquid flowing along said downstream flow path in each stage, said shell means having an elongated open top extending longitudinally of said shell means, with said shell means otherwise being closed and forming an inner shell means of the evaporator, and said evaporator having an outer shell means surrounding and spaced from said inner shell means and defining therewith said space which communicates through said open top of said inner shell means with liquid at each downstream flow path, said condenser means being situated in said outer shell means beneath said inner shell means, so that vapor flows from said inner shell means through said open top thereof downwardly around opposite sides of said inner shell means along opposed inner side surface regions of said outer shell means to reach said condenser means at opposite sides thereof, while due to centrifugal force droplets of liquid entrained in said vapor will deposit themselves against said inner surface regions of said outer shell means, and a pair of troughs respectively situated along said inner surface regions of said outer shell means while being spaced from said inner shell means and situated at an elevation lower than said open top thereof for collecting said droplets.

4,105,506

POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Feb. 24, 1977, Ser. No. 771,438

Int. Cl.² B01D *3/34;* C07C *15/10*

U.S. Cl. 203—9 **11 Claims**

1. A process for inhibiting the polymerization of a readily polymerizable vinyl aromatic compound at elevated temperatures, which comprises subjecting said compound to said elevated temperatures in the presence of a polymerization inhibitor comprising 2,6-dinitro-p-cresol.

4,105,507

METHOD AND SYSTEM FOR INSTANTANEOUSLY DETERMINING THE OXYGEN ACTIVITY IN MOLTEN METALS

Otto VonKrusenstierna; Anders Persson, and Marja Widell, all of Vasteras, Sweden, assignors to Asea Aktiebolag, Vasteras, Sweden

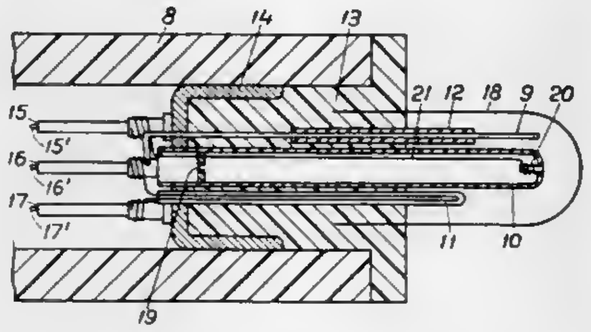
Filed Aug. 12, 1971, Ser. No. 171,128

Claims priority, application Sweden, Aug. 27, 1970, 11627/70

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**

1. A system for instantaneously determining the oxygen activity in molten metals in an electrically heated furnace where the potential of the melt usually deviates from earth potential comprising a measuring probe (1) having an electrochemical voltage-producing cell (9,10) disposed in the electrically heated furnace for contacting the melt, a thermoelement (11) and contact devices (15,16,17), a measuring lance (2) carrying the probe, a preamplifier (3) mounted on the lance, the lance having corresponding contact devices and connections for transferring values from the measuring probe to the preamplifier, a calculating unit (4) connected to the preamplifier to convert the EMF of the electro-chemical cell and the EMF of the thermoelement to magnitudes representing the oxygen activity and temperature, and an indicating instrument (5) for these magnitudes, and means to maintain the potential of the melt as the zero potential in the system.



4,105,508

METHOD AND DEVICE FOR ANALYSIS OF A MIXTURE OF HYDROCHLORIC ACID AND ORGANOCHLORINE COMPOUNDS CONTAINED IN GASES DERIVED IN PARTICULAR FROM THE INCINERATION OF ORGANOCHLORINE COMPOUNDS

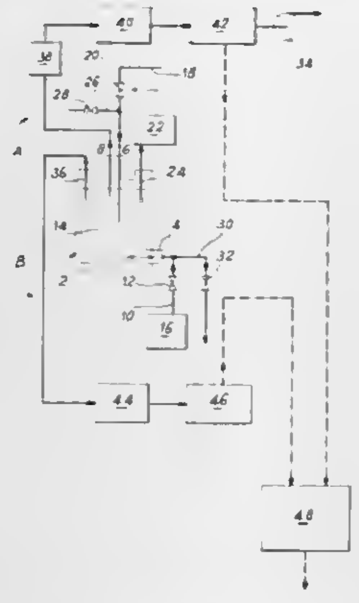
Jean Arod, Pierrevert; Michèle Ganthier, Aix en Provence, and Roger Platzer, Chatillon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 24, 1977, Ser. No. 780,717

Claims priority, application France, Apr. 2, 1976, 76 09625

Int. Cl.² G01N *27/42, 31/12*

U.S. Cl. 204—1 T **33 Claims**



1. A method for evaluating the extent of destruction by incineration of organochlorine compounds comprising the steps of:

passing gases derived from said incineration through a first alkaline solution which is capable of dissolving hydrochloric acid within said gases;

measuring the quantity of chloride ions, Q, contained in said first solution by coulometry to provide a value for the quantity of hydrochloric acid liberated at the time of said incineration;

absorbing the hydrochloric acid and the chlorine which are present in said incineration derived gases after they have passed through said first solution;

initiating combustion of the remaining gases subsequent to said absorption of the hydrochloric acid and the chlorine therefrom in order to burn the entire quantity of organochlorine compounds contained in said remaining gases;

passing the gases produced by combustion of the remaining gases through a second solution which is capable of dissolving the hydrochloric acid liberated by the organochlorine compounds at the time of said combustion of remaining gases;

measuring the quantity of chloride ions, *q*, contained in said second solution by coulometry;

calculating the ratio *q*/Q.

4,105,509

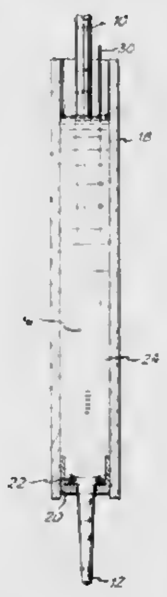
COMBINATION MEASURING AND REFERENCE POTENTIAL ELECTRODE AND METHOD OF MEASURING PH IN SAMPLES SUBJECT TO LARGE VOLTAGE GRADIENTS

Philip R. Jangck, Horsham, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Continuation of Ser. No. 554,287, Feb. 28, 1975, abandoned. This application Sep. 7, 1977, Ser. No. 831,216

Int. Cl.² G01N *27/30*

U.S. Cl. 204—1 T **12 Claims**



2. A method for measuring with a pH measuring instrument the pH of a sample having large voltage gradients which comprises the steps of:

immersing in said sample a combination pH electrode having;
- a measuring electrode with a body portion closed off at one end with a pH sensing glass, and
- a reference electrode whose body portion surrounds the body portion of the measuring electrode forming a cavity therebetween filled with a gel electrolyte which is retained therein by an annular porous element providing a relatively large area of contact between said element and said sample so that the electrolyte can diffuse into the sample forming a reference junction concentric with the pH sensing glass of the measuring electrode to provide a uniform low resistance over all segments of the reference junction; and

detecting the pH of the sample by connecting said instrument across the combination electrode.

3. A combination potentiometric electrode comprising;

a measuring electrode having a body portion closed at one end with a sensing member; and

a reference electrode having,
- a body portion positioned to surround the body portion of said measuring electrode,
- a saturated gel electrolyte in the cavity formed between the measuring and reference electrodes, and
- an annular element of substantially uniform porous material positioned between the body portions of said measuring and reference electrodes to close said cavity and provide a large area exposed for diffusion of said electrolyte into a sample to thereby form a reference junction.

4,105,510

PROCESS FOR REMOVING WATER FROM WATER SOLUBLE POLYMER

Atsuo Tago; Ryoichi Yamanaka, and Susumu Matsumoto, all of Kitakyushu, Japan, assignors to Kyoritsu Yuki Co., Ltd. and Mitsubishi Chemical Industries Ltd., both of Tokyo, Japan

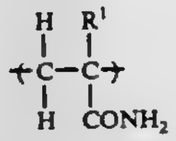
Filed Nov. 24, 1976, Ser. No. 744,817

Claims priority, application Japan, Nov. 26, 1975, 50-141267

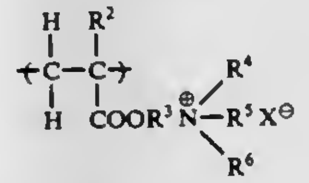
Int. Cl.² C07B *5/00*

U.S. Cl. 203—14 **12 Claims**

1. A process for removing water and producing a dry polymer from an aqueous gel of a high molecular weight water soluble polymer having, as major components, repeating units shown in formulae (1) and/or (2)



$$\left(\begin{array}{cc} \mathrm{H} & \mathrm{R^1} \\ | & | \\ \mathrm{C}- & \mathrm{C} \\ | & | \\ \mathrm{H} & \mathrm{CONH_2} \end{array}\right) \qquad (1)$$



$$\left(\begin{array}{cc} \mathrm{H} & \mathrm{R^2} \\ | & | \\ \mathrm{C}- & \mathrm{C} \\ | & | \\ \mathrm{H} & \mathrm{COOR^3\overset{\oplus}{N}(R^4)(R^5)(R^6)\,X^{\ominus}} \end{array}\right) \qquad (2)$$

wherein R^1 and R^2 denote hydrogen or methyl group, R^3 denotes an alkylene group having 1-3 carbon atoms, R^4, R^5 and R^6 denote the same or different lower alkyl group having 1-3 carbon atoms or benzyl group, and $X^{\ominus}$ denotes an anion; which comprises removing water from the aqueous gel of said polymer in the presence of at least one water soluble substance selected from the group consisting of water soluble polyhydric phenols, benzoquinones and derivatives thereof until a dry polymer is obtained.

4,105,511

PROCESS FOR TREATING THE SURFACE OF ALUMINUM OR ALUMINUM ALLOY

Norio Nikaido; Shinji Shirai; Mototaka Iihashi; Sueo Umemoto, and Kisaku Suzuki, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Continuation-in-part of Ser. No. 646,760, Jun. 6, 1976, abandoned, which is a continuation of Ser. No. 482,663, Jun. 24, 1974, abandoned. This application Jun. 13, 1977, Ser. No. 806,061

Claims priority, application United Kingdom, Jul. 4, 1973, 75989/73

Int. Cl.² C25D *11/06*

U.S. Cl. 204—38 A **11 Claims**

1. A process for treating the surface of aluminum or aluminum alloy comprising the steps of:
- (i) contacting aluminum or aluminum alloy with hot water or steam to form an aluminum oxide layer thereon, and
- (ii) conducting electrolysis using the resulting aluminum or aluminum alloy as an anode by applying direct current in an aqueous solution containing no free acid consisting essentially of a water-soluble salt of at least one oxyacid selected from the group of silicic acid, phosphoric acid, molybdic acid, vanadic acid, permanganic acid, stannic acid, and tungstic acid.

4,105,512
METHOD FOR THE MANUFACTURE OF A SUPERCONDUCTIVE NB$_3$SN LAYER ON A NIOBIUM SURFACE FOR HIGH FREQUENCY APPLICATIONS

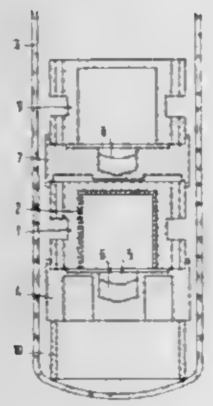
Hans Martens, deceased, late of Erlangen, Fed. Rep. of Germany, by Hildegard Martens; Harald Martens, legal heir; Rainer Martens, legal heir, both of Erlangen, Fed. Rep. of Germany; Hans-Wolfgang Martens, legal heir, Aachen, Fed. Rep. of Germany; Günter Martens, legal heir, Buckenhof, Fed. Rep. of Germany; Sigrid Martens, legal heir, Nuremberg, Fed. Rep. of Germany; Hannelore Martens, legal heir, and Helmut Martens, legal heir, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 15, 1977, Ser. No. 768,831

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608089

Int. Cl.^{2} C25D *11/02, 5/50;* H01L *39/24*

U.S. Cl. 204—38 A **16 Claims**



1. In a method for the manufacture of a superconductive Nb$_3$Sn layer on a niobium surface for high frequency applications in which tin is diffused into the niobium surface at an elevated temperature, the improvement comprising:

(a) first anodically oxidizing the niobium surface to be provided with the Nb$_3$Sn layer;
(b) placing said oxidized niobium surface in an evacuable reaction chamber;
(c) evacuating said chamber;
(d) then, after evacuation, exposing the niobium oxide layer so produced to a tin vapor atmosphere in such a manner that a tin layer is formed on the niobium oxide layer; and finally,
(c) heating the niobium surface to a temperature of between 930 and about 1400° C for forming the Nb$_3$Sn layer.

4,105,513
SOLID ELECTROLYTE CAPACITOR HAVING METALLIC CATHODE COLLECTOR IN DIRECT CONTACT WITH MANGANESE DIOXIDE ELECTROLYTE AND METHOD OF PRODUCING SAME

Atsushi Nishino; Hayashi Hayakawa; Akihiko Yoshida, and Junichiro Umeda, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Limited, Japan

Filed Nov. 3, 1976, Ser. No. 738,574

Claims priority, application Japan, Nov. 8, 1975, 50-13427

Int. Cl.^{2} C25D *11/34;* H01G *9/02*

U.S. Cl. 204—38 A **16 Claims**

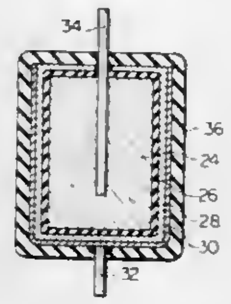
1. A solid electrolyte capacitor comprising:

an anode body of a valve metal;

a dielectric oxide layer anodically formed on the surface of said anode body;

a solid electrolyte layer of manganese dioxide on said dielectric oxide layer formed by pyrolytic decomposition of an aqueous solution of manganese nitrate applied to the surface of said dielectric oxide layer, at least an outmost portion of said solid electrolyte layer consisting of densely accumulated manganese dioxide particles of about 0.1 to about 50 μm in particle size formed by performing said pyrolytic decomposition in a semi-closed heating chamber of a radiant furnace, said heating chamber being in communication with the atmosphere exclusively through at least one vent which is formed in the wall of said heating chamber and has a predetermined total area such that said pyrolytic decomposition proceeds under a positive pressure of a small magnitude solely attributable to a resistance offered by said at least one vent to the outflow from said heating chamber of gaseous substances generated upon said pyrolytic decomposition; and

a cathode collector layer formed by plasma spraying of a metal powder on and in intimate contact with said solid electrolyte layer.



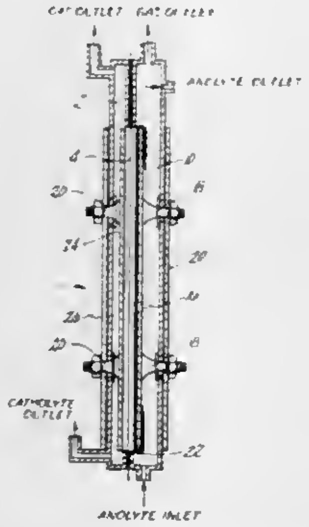
4,105,514
PROCESS FOR ELECTROLYSIS IN A MEMBRANE CELL EMPLOYING PRESSURE ACTUATED UNIFORM SPACING

David D. Justice; Byung K. Ahn, and Ronald L. Dotson, all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 27, 1977, Ser. No. 810,135

Int. Cl.^{2} C25B *1/16, 1/26, 13/00*

U.S. Cl. 204—98 **27 Claims**



1. A process for electrolysis in an electrolytic cell comprising an anode compartment containing a foraminous anode and an anolyte solution, a cathode compartment containing a foraminous metal cathode and a catholyte solution, a hydraulically impermeable membrane separating said anode compartment from said cathode compartment, spacing means interposed between said anode and said hydraulically impermeable membrane to space apart said anode from said hydraulically impermeable membrane, wherein the process comprises providing a positive pressure differential between said cathode compartment and said anode compartment to maintain contact between said hydraulically impermeable membrane and said spacing means to provide uniform spacing between said anode and said hydraulically impermeable membrane, said positive differential pressure being sufficient to maintain said membrane against said spacing means.

4,105,515
PROCESS FOR ELECTROLYSIS OF ALKALI HALIDE

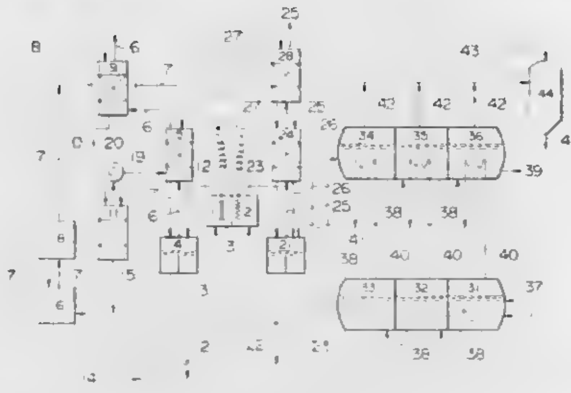
Shinsaku Ogawa, and Muneo Yoshida, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1977, Ser. No. 811,277

Claims priority, application Japan, Jul. 5, 1976, 51-78895

Int. Cl.^{2} C25B *1/16, 1/26*

U.S. Cl. 204—98 **9 Claims**



1. In a process for electrolysis of an aqueous alkali halide solution in an electrolytic cell having anode and cathode chambers separated by a cation exchange membrane by feeding an aqueous alkali halide solution into the anode chamber to produce halogen gas in the anode chamber and caustic alkali and hydrogen gas in the cathode chamber, the improvement which comprises carrying out electrolysis while maintaining the pressure in the electrolytic cell at a pressure which is above 1 atm. but not above 7 atm. and maintaining the partial gas pressure in the electrolytic cell within the range from a critical partial gas pressure to five times the critical gas pressure.

4,105,516
METHOD OF ELECTROLYSIS

Aleksandrs Martinsons, Wadsworth, and Harlan B. Johnson, Rittman, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 11, 1977, Ser. No. 814,767

Int. Cl.^{2} C25B *1/16, 1/26, 1/02*

U.S. Cl. 204—98 **24 Claims**

1. In the method of electrolyzing sodium chloride brine in an electrolytic cell by passing an electrical current from an anode of the electrolytic cell, in an aqueous sodium chloride anolyte liquor, through a permeable barrier to an iron cathode of the electrolytic cell, in an aqueous alkaline sodium hydroxide catholyte liquor, evolving chlorine at the anode, and evolving hydrogen at the cathode, the improvement comprising adding a compound of an electrolytic hydrogen evolution catalyzing transition metal to the aqueous sodium hydroxide catholyte liquor of the electrolytic cell while passing an electrical current from the anode to the cathode.

4,105,517
SOLAR PHOTOLYSIS OF WATER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Porter R. Ryason, La Canada, Calif.

Filed Sep. 30, 1977, Ser. No. 838,336

Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—157.1 R **15 Claims**

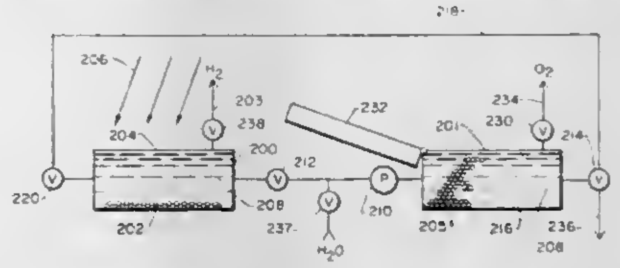
1. A method of photolyzing water comprising the steps of:

applying solar radiation to water in the presence of a photo-oxidizable reagent material which absorbs strongly in the solar range at ground level and is capable of photolyzing water to produce hydrogen with a quantum efficiency exceeding 0.1% and generating hydrogen while forming spent reagent;

contacting the spent reagent with a transition metal ligand complex regenerated in a photoexcited state to reduce and regenerate the reagent;

supporting the reagent or the regenerant on a solid support and dissolving the regenerant or the reagent in water; and

flowing the solution past the solid support during regeneration.



4,105,518
ULTRAVIOLET CURING OF ELECTROCOATING COMPOSITIONS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 480,738, Jun. 19, 1974, Pat. No. 4,039,414. This application Apr. 14, 1977, Ser. No. 787,515

Int. Cl.^{2} C08F *8/00;* C25D *13/00*

U.S. Cl. 204—159.14 **4 Claims**

1. An electrocoating composition dispersed within an aqueous electrocoating bath for electrocoating a paint film onto a cathode substrate, the electrocoating composition comprising an ethylenically unsaturated polymer containing ethylenically unsaturated groups selected from acrylyl, acrylamide, and allyl, the improvement comprising:

said polymer containing at least about 2 percent by weight of an ultraviolet sensitizer attached to the polymer structure;

said polymer having pendent acrylyl unsaturation reacted with a secondary amine selected from morpholine, diethanolamine, methylethanol amine, and diallylamine prior to solubilizing and dispersing said polymer in water;

said secondary amine groups being neutralized with a proton donating solubilizing salt or acid for dispersing said polymer within water;

said polymer being electrocoatable onto a cathode substrate and reactive to ultraviolet energy to cross-link the ethylenic unsaturation and provide a cured paint film.

4,105,519
POLYMERIZATION METHOD USING ULTRAVIOLET LIGHT

Horst Pennewiss, Darmstadt-Neu-Kranichstein; Hermann Plainer, Darmstadt; Peter Quis, Darmstadt-Neu-Kranichstein; Hans Trabitzsch, Seeheim; Juergen Masanek, Pfungstadt, and Juergen Jakob, Lorsch, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 5, 1976, Ser. No. 729,677

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2545290

Int. Cl.^{2} C08F *2/50, 4/00*

U.S. Cl. 204—159.23 **6 Claims**

1. A method for the free radical polmerization or copolymerization of at least one unsaturated water-soluble monomer or monomer mixture, alone or in admixture with non-polymerizable inert materials, said monomer or monomers having a content of from 0.2 - 2 equivalents of polymerizable double bonds per 100 grams of the material to be polymerized, which comprises irradiating said monomer or monomers with ultraviolet light while in a layer thickness between 2 and 100 mm, at a temperature between 0° C. and 100° C. and in the presence of atmospheric oxygen, the material to be polymerized further containing at least 1 ppm of a water-soluble anthraquinone substituted in at least the 2-position and unsubstituted in the

1,4,5 and 8-positions and at least 10 ppm of dissolved chloride ions.

4,105,520
METHOD FOR PRODUCING ADIPIC ACID AND PRECURSORS THEREOF

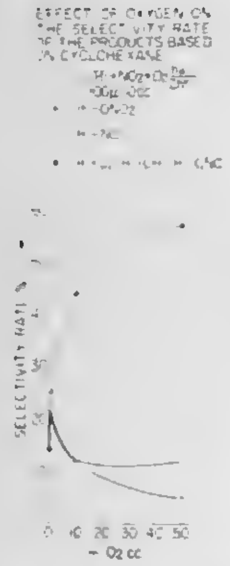
Wataru Ando, Sakura, and Ichiro Nakaoka, Machida, both of Japan, assignors to Kabushiki Kaisha Pollution Preventing Research Laboratory, Tokyo, Japan

Continuation-in-part of Ser. No. 717,179, Aug. 24, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,666

Claims priority, application Japan, Feb. 26, 1977, 52-19819; Apr. 9, 1976, 51-39270

Int. Cl.² B01J *1/10*

U.S. Cl. 204—162 R **8 Claims**



1. the method for producing adipic acid and precursors thereof which comprises reacting cyclohexane with nitrogen dioxide under irradiation of visible rays or ultraviolet rays in the presence of oxygen characterized in that cyclohexane reacts with the stoichiometric quantity or a quantity less than stoichiometry of nitrogendioxide and a quantity less than stoichiometry of oxygen.

4,105,521
CLINICAL PROCEDURE FOR MEASURING LIPOPROTEIN CHOLESTEROLS

Tipton Golias, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Sep. 21, 1977, Ser. No. 835,387

Int. Cl.² G01N *27/26*

U.S. Cl. 204—180 S **12 Claims**

1. A method of simultaneously determining the concentrations of high density lipoprotein cholesterol, very low density lipoprotein cholesterol and low density lipoprotein cholesterol in a sample of body fluid, comprising the steps of:

(a) applying a small sample of said body fluid to be tested to a solid electrophoresis support media strip,

(b) applying a direct current for a predetermined period of time to said support media until the high density, very low density and low density lipoprotein cholesterols have separated on the media,

(c) applying a developing substrate sensitive to small concentrations of cholesterol and cholesterol esters to the electrophoresed lipoprotein cholesterol strip, and

(d) quantitatively determining the concentrations of high density lipoprotein, very low density lipoprotein and low density lipoprotein cholesterols in said body fluid sample from the developed electrophoresed sample.

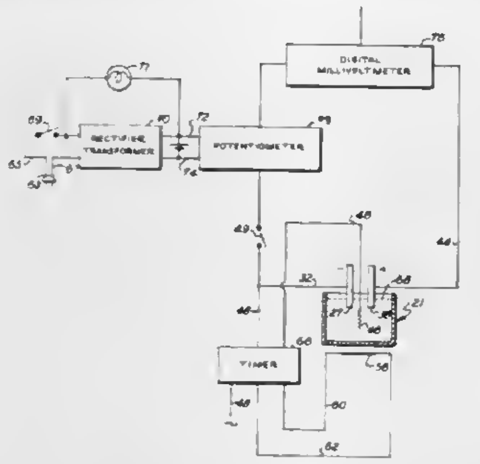
4,105,522
GLUCOSE LEVEL TEST APPARATUS

Robert M. Friedenberg, 8792 Oxwell La., Laurel, Md. 20810; John L. Yoscak, 2893 Balmoral Dr., Rockville, Md. 20850, and Stephen E. Noren, 1813 Mt. Pisgah La., No. 124, Silver Spring, Md. 20903

Division of Ser. No. 370,238, Jun. 13, 1973, Pat. No. 3,947,328. This application Apr. 21, 1975, Ser. No. 570,092

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 B **11 Claims**



1. Apparatus for measuring the glucose level of body fluids comprising means for heating and reacting a small measured liquid quantity of a solution comprising a test fluid body sample and oxidizing agent disposed in a container in quantity to oxidize said sample to a fully oxidized form and leave a measurable remainder of oxidizing agent in said solution, means for controlling the temperature and timing of the oxidation reaction of said solution including means to trigger a timing circuit to hold the temperature at a selected value for a predetermined period, metallic electrodes suspended into contact with the liquid in said container as a primary cell, each of said electrodes having a surface area in direct liquid contact with the said oxidized body fluid whereby to pass the current developed in the reaction product solution electrolytically to said electrodes, means for setting the output circuit of said cell to null voltage and means for measuring the electrical output of said cell in millivolts as redox potential developed in said cell by said oxidized body fluid reaction products.

4,105,523
BIOCHEMICAL OXYGEN DEMAND MEASURING DEVICE

Larry G. Stolarczyk, Raton, N. Mex., assignor to A. R. F. Products, Inc., Raton, N. Mex.

Filed Mar. 31, 1976, Ser. No. 672,514

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 B **7 Claims**

1. Apparatus for measuring biochemical oxygen demand of a sample of a given volume comprising, in combination:

a vessel having a volume substantially greater than the volume of the sample adapted to contain the sample thereby providing a space above the sample;

an electrolysis cell having a first chamber and a second chamber and containing an electrolyte in the first and second chambers, said chambers communicating with each other at a level below the level of the electrolyte, said second chamber being closed and providing a closed space above the level of the electrolyte and the first chamber being open to the ambient atmosphere, the closed space of the second chamber being connected to and communicating with the space of said vessel;

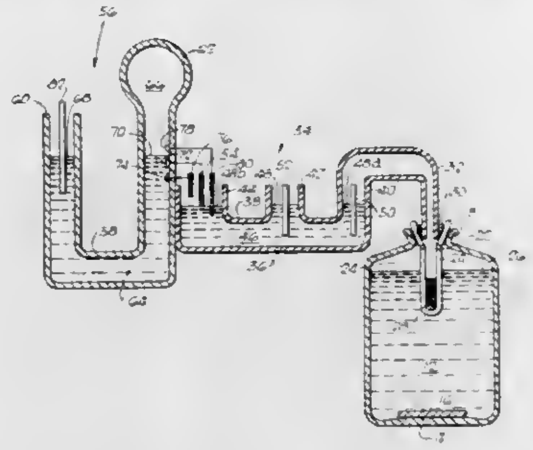
a sensing electrode extending in said first chamber to a predetermined level;

a negative electrode immersed in said electrolyte in said first chamber at a level below said predetermined level;

a positive electrode immersed in said electrolyte in said second chamber;

a constant frequency pulse source of uniform duration and current having a positive output terminal electrically connected to the positive electrode and a negative output terminal electrically connected to the negative electrode;

control means electrically connected to the pulse source for controlling the period of activation of the pulse source,



said control means being electrically coupled to the sensing electrode and activating the pulse source during periods when the level of the electrolyte is below the sensing electrode and deactivating the pulse source during periods when the level of the electrolyte is in contact with the sensing electrode;

and a counter responsive to electrical pulses electrically connected to the pulse source.

4,105,524
OXYGEN CONCENTRATION SENSOR FOR HEATED GASEOUS MIXTURE

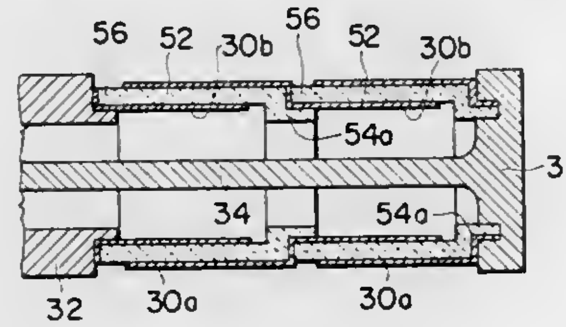
Takeshi Fujishiro, Yokohama; Kiyoshi Wazawa, Fujisawa, and Takeshi Oguro, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 559,925, Mar. 19, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,698

Claims priority, application Japan, Apr. 17, 1974, 49/43121

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **2 Claims**



1. A device for sensing differences in oxygen partial pressure between a heated gaseous mixture in a vessel and a reference gas outside the vessel, the device comprising:

(a) an assembly of two identically shaped solid electrolyte oxygen concentration cells,

each of said cells having an open-ended tubular body of a solid oxygen-ion electrolyte ceramic composed of ZrO_2 and CaO, said body having a straight major portion including one end thereof and a cross-sectionally smaller minor end portion which also is straight and includes the other end of the tubular body, and two porous and electrically conductive films of platinum deposited respectively on the outer and inner surfaces of said tubular body, the outside of said minor portion being entirely covered with the outer conductive film,

said cells being joined axially and hermetically with each other such that said minor portion of said tubular body fits into the inside of said major portion of an adjacent tubular body and that the outer conductive film is joined with the inner conductive film of the adjacent cell at each joint between two adjacent cells to give a series electrical connection, so that said assembly has generally the shape of a hollow and straight cylinder which is open at both ends;

(b) a first conductor member fixed to said cylinder to hermetically close one end of said cylinder and electrically connected with a first one of said two conductive films of one of said cells providing said one end of said cylinder, said first conductor member having a rod-shaped portion extending axially through said cylinder;

(c) a second conductor member hermetically fixed to one of said cells providing the other end of said cylinder and electrically connected with a second one of said two conductive films of the cell providing said other end, said second conductor member having a bore exclusively providing communication between the interior space of said cylinder and an exterior atmosphere and allowing said rod-shaped portion of said first conductor member to pass therethrough;

said first conductor member and said second conductor member being made of a corrosion-resistant metal which has a thermal coefficient close to the thermal expansion coefficient of said solid electrolyte and selected from stainless steels and ironchromium alloys; and

said cylinder being disposed in use entirely in said vessel.

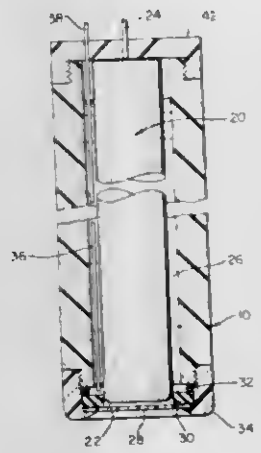
4,105,525
INTERNAL STANDARD ELECTROLYTE FOR AMMONIA SENSOR

John C. Synnott, Belmont, and James W. Ross, Jr., Hull, both of Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,622

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **1 Claim**

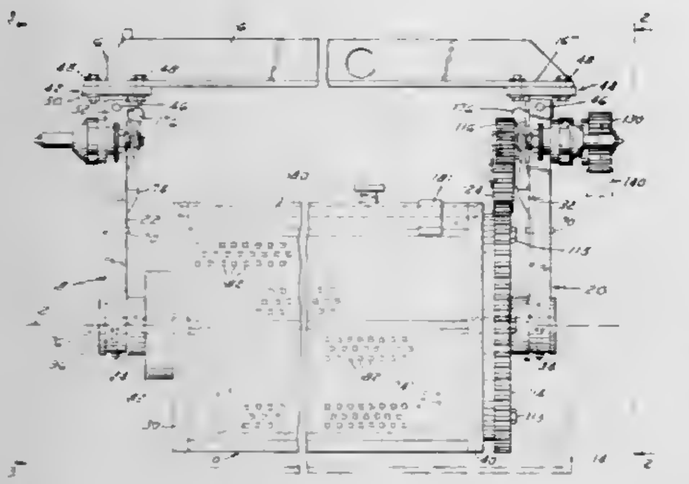


1. In an electrochemical cell for measuring the ammonia content of a sample, said cell including a potentiometric hydrogen ion-sensitive electrode and a reference electrode both in contact with an internal standard electrolyte, said cell having an ammonia-permeable filter arranged to separate the sample from the electrodes and the electrolyte such that ammonia from the sample can pass through the filter into the electrolyte to affect the hydrogen ion activity of the electrolyte, the improvement wherein the internal standard electrolyte comprises a saturated aqueous solution of 5,5'-Nitrilodibarbituric acid ammonium salt.

4,105,526
PROCESSING BARREL WITH STATIONARY U-SHAPED HANGER ARM AND COLLAR BEARING ASSEMBLIES

Wendell G. Lewellen, Jr., Ann Arbor, and Loran A. Lankford, Redford, both of Mich., assignors to Imperial Industries, Inc., Belleville, Mich.

Filed Apr. 28, 1977, Ser. No. 791,669
Int. Cl.² C25D *17/04, 17/20*
U.S. Cl. 204—213 5 Claims



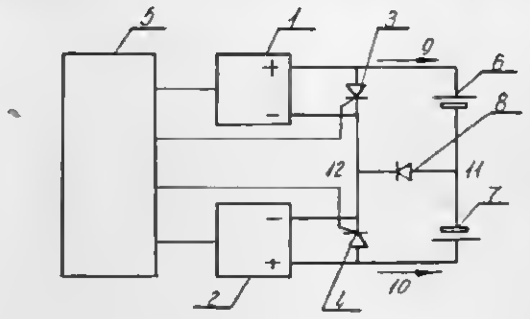
1. A processing apparatus comprising an elongated barrel having a rotatable axis and including openings in the ends thereof through which the axis extends, a pair of generally stationary collar bearings having inner and outer portions, with the inner portions of said collar bearings being received in said barrel openings and upon which said barrel is adapted to rotate, the outer portions of said collar bearings having circumferentially extending annular grooves surrounding the axis, a stationary cross bar located above and being spaced from said barrel, said cross bar having a length greater than the length of said barrel, with the end portions of said cross bar extending beyond the ends of said barrel, mounting lugs depending from and being secured to the end portions of said cross bar, said mounting lugs being mounted above and being spaced from the grooves of said collar bearings, a pair of stationary rigid hanger arms located beyond the ends of said barrel for suspending said barrel from said cross bar, each hanger arm being in the form of an elongated rigid strap of U-shape configuration and of generally rectangular cross-section throughout its longitudinal extent, the ends of each rigid strap engaging opposing surfaces of one of the mounting lugs, with the bottoms of the U-shape rigid straps being received in said grooves and wrapped around said collar bearings, first fastening means securing the ends of each rigid strap to the corresponding mounting lug, and second fastening means securing the bottom of each of said U-shape rigid strap to the corresponding stationary collar bearing.

4,105,527
ELECTRIC SYSTEM FOR ELECTRIC EXTRACTION OF NON-FERROUS METALS FROM THEIR SOLUTIONS

Ivan Dimitrov Enchev; Elieser Persiado Ilel; Nikola Tzanov Kunchev; Kiril Georgiev Harizanov, all of Plovdiv; Vladimir Vetov Genevski, Sofia; Nedelcho Draganov Draganov; Alexander Minchev Alexandrov, both of Plovdiv; Georgi Alexandrov Haralampiev, Sofia; Todor Ivanov Smilenov, and Yossif Genchev Stoyanov, both of Plovdiv, all of Bulgaria, assignors to Nipki po Tzvetna Metalurgia, Plovdiv, Bulgaria

Division of Ser. No. 593,777, Jul. 7, 1975, Pat. No. 4,024,035. This application Jan. 8, 1976, Ser. No. 647,573
Int. Cl.² C25C *1/08, 1/16;* **C25B** *15/02*
U.S. Cl. 204—228 1 Claim

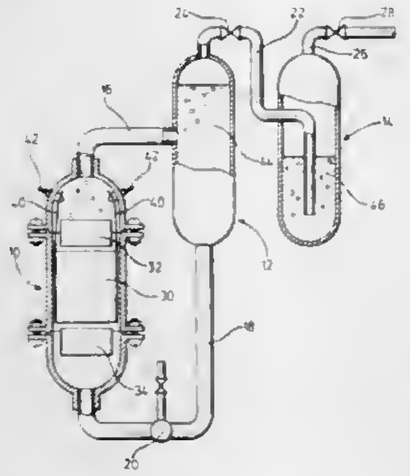
1. In an apparatus for the electric extraction of non-ferrous metals from first and second electrolytic baths each having anode and cathode electrodes associated therewith, a diode, first and second thyratron-like gating elements each having a control electrode and a transconductive path, first and second normally unexcited DC sources each having a control electrode excitable for energizing the associated source, means for connecting like electrodes of the diode and of the first and second baths to a common junction, means for connecting the transconductive path of the first gating means between the other electrode of the first bath and the other electrode of the diode and between the output terminals of the first DC source, means for connecting the transconductive path of the second gating means and said other electrode of the diode and between the output terminals of the second DC source, and switching means individually coupled to the control electrodes of the first and second gating means and of the first and second DC sources for exciting selected ones of said control electrodes in timed relation.



4,105,528
APPARATUS FOR DECOMPOSITION OF AQUEOUS LIQUID

Shigeta Hasebe, Yokokoshi, Japan, assignor to Haruji Hosoda, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,250
Claims priority, application Japan, Feb. 28, 1976, 51-21344
Int. Cl.² C25B *15/00*
U.S. Cl. 204—237 7 Claims

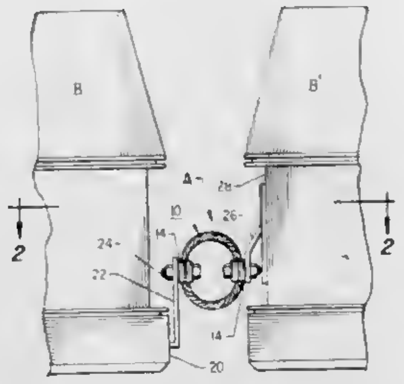


1. Apparatus for the decomposition of aqueous liquid whereby gas is formed comprising a cell, having an inlet at one end and an outlet at the other, positive and negative electrodes mounted within said cell between said inlet and outlet connected to a source of electric current, said electrodes being wound about each other in substantially coaxial helices to form a vortex transverse to the flow of liquid, and magnetic means mounted with said cell at each of the axial ends of said electrodes.

4,105,529
HELICAL INTERCELL CONNECTOR FOR ELECTROLYTIC CELLS

Gerald R. Pohto, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 31, 1977, Ser. No. 801,579
Int. Cl.² C25B *9/04*
U.S. Cl. 204—267 14 Claims



1. In an electrically connected series of electrolytic cells, comprising a plurality of adjacent, series-connected cells each having an anode portion and a cathode portion and anode and cathode connectors extending respectively therefrom, said anode connector of one cell positioned so as to extend generally in the direction of said cathode connector of an adjacent cell, an intercell connector means for establishing series electrical connection between said anode and adjacent cathode connectors comprising:

a helical member having a plurality of loops and a helical axis disposed between said anode and cathode connectors;

a pair of connecting means engaging said helical member having a longitudinal axis parallel to said helical axis, and

fastening means for establishing positive connection of each of said anode and cathode connectors to an adjacent one of said connecting means.

4,105,530
CORROSION RESISTANT ELECTRODES FOR ELECTROCHEMICAL USE

Alan Stanley William Johnson, Wantage, and Alfred Chan Chung Tseung, London, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 10, 1973, Ser. No. 423,286
Claims priority, application United Kingdom, Dec. 13, 1972, 57397/72
Int. Cl.² C25B *11/00*
U.S. Cl. 204—290 R 11 Claims

1. A method of making a corrosion-resistant electrochemical electrode using a substrate of electrically conducting base material which comprises:

applying to the surface of said substrate a layer of a mixture of an acid-resistant, semi-conducting oxide material and an acid-resistant glass of melting point below that of said oxide material and said base material, said oxide material and said glass being selected to cause said coating to be substantially non-porous while being semi-conducting and

causing the glass in said mixture at some stage of application thereof on the surface of said substrate to become molten whereby a non-porous coating consisting of said glass and oxide material becomes adhered to said substrate.

11. A method of making a corrosion-resistant electrode which comprises:

charging a flame spray gun with a mixture of powdered semi-conducting metal oxide selected from the group consisting of ferric oxide and tin oxide and powdered glass selected from the group consisting of soda-glass and borosilicate glass, said glass constituting up to 30 percent by weight of said metal oxide,

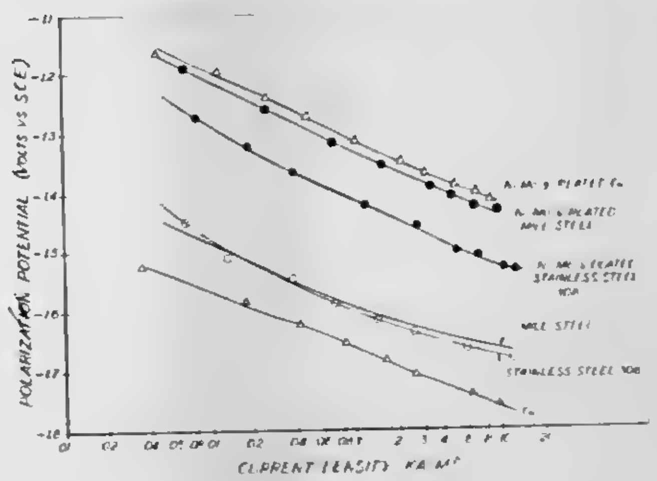
positioning a substrate formed of electrically conducting ferrous metal in a position to receive material sprayed from said spray gun, and

flame spraying said mixture from said spray gun onto said substrate forming on at least a part of the surface thereof an adherent, substantially pore-free layer up to substantially 1 mm. thickness of semi-conducting metal oxide in a matrix of fused glass.

4,105,531
PLATED METALLIC CATHODE

Han C. Kuo; Ronald L. Dotson, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 660,847, Feb. 24, 1976, Pat. No. 4,033,837. This application Jul. 1, 1977, Ser. No. 812,210
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.² C25B *1/34, 11/04*
U.S. Cl. 204—290 R 9 Claims



1. A cathode for use in electrolytic cells comprising:

(a) a copper substrate,

(b) a plating on said copper substrate,

(c) said plating being an alloy of vanadium, molybdenum and nickel,

(d) wherein said plating is applied to said cathode structure by electrodeposition using a bath comprising an aqueous solution of the following:

nickel sulfate	50 to 100 g/l
nickel chloride	5 to 30 g/l
sodium molybdate	1 to 20 g/l
vanadium sulfate	0.1 to 1 g/l

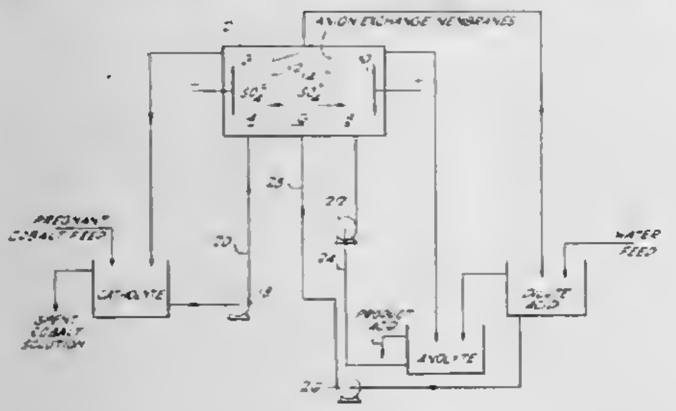
4,105,532
IMPROVEMENTS IN OR RELATING TO THE ELECTROWINNING OF METALS

Kendrick Peter Haines, Havant, England, and Roy Duncan MacPherson, Luxembourg, Luxembourg, assignors to Parel Societe Anonyme, Luxembourg, Luxembourg

Filed Jan. 8, 1976, Ser. No. 647,636
Claims priority, application United Kingdom, Jan. 9, 1975, 1014/75
Int. Cl.² C25C *1/06, 1/08, 7/00, 7/04*
U.S. Cl. 204—301 6 Claims

1. In a plant for the recovery of a metal from a material selected from the group consisting of ores, concentrates, mattes and alloys at a cathode of an electrolytic cell in an electrowinning circuit of said plant, the improvement which comprises an electrolytic cell having an anode compartment including an anode, a cathode compartment including a cathode, and an intermediate compartment interposed between the anode compartment and the cathode compartment, the bound-

aries between the anode compartment and the intermediate compartment and between the cathode compartment and the intermediate compartment, each including a separator which is permeable to at least one ionic species which, during operation of said cell, is present in at least one of the compartments bounded by the respective separators, the separator contiguous with the cathode compartment being permeable to anions; means for circulating catholyte around a first circuit which includes the cathode compartment; means for circulating anolyte around a second circuit which includes the anode compartment and which has no direct communication with said first circuit; means for circulating a solution around a third circuit including the intermediate compartment in which some of the circulated solution is transferred to one of said first and second circuits; and means for removing from one of said second and third circuits acid which is produced by operation of the electrolytic cell.



4,105,533

ELECTRODIALYSIS CELL AND METHOD FOR PRODUCING CATIONIC PERMEABLE MEMBRANES USED THEREIN

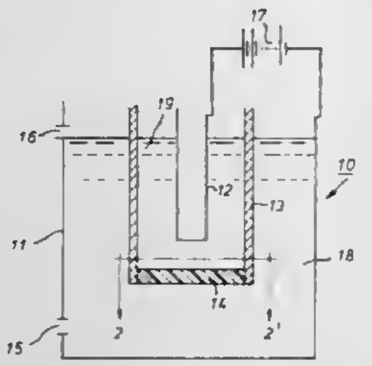
Maurice Antoine de Ramaix, Hove, and Aloijsius Gerardus Somers, Lier, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 9, 1976, Ser. No. 694,436

Claims priority, application United Kingdom, Jan. 12, 1975, 25223/75

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 15 Claims



1. In an electrodialysis cell having a cationic permeable membrane, the improvement wherein at least an operative portion of said membrane comprises a relatively low porosity interior region constituted of asbestos fibers contained in a cement matrix, opposite exterior strata each having a relatively high porosity micro-sponge structure with a substantial amount of exposed asbestos fibers and a substantially reduced cement content compared to said exterior region, and intervening regions in which the proportion of cement gradually increases toward said interior from said reduced exterior level with a corresponding gradual decrease in porosity.

4,105,534

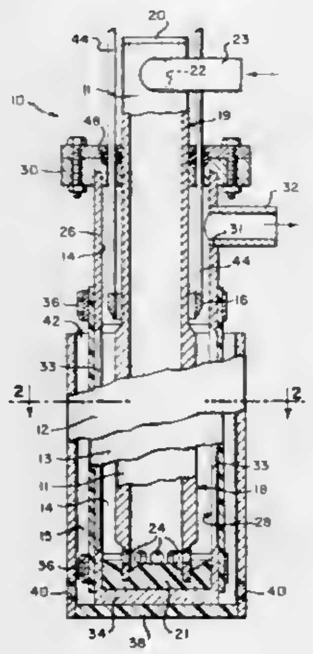
APPARATUS FOR REMOVING IMPURITIES FROM ELECTROLYTE SOLUTIONS

John C. Beatty, III, Ann Arbor, Mich., assignor to John L. Raymond, Fairfield and Robert Z. Reath, Easton, both of Conn.

Filed Aug. 29, 1977, Ser. No. 828,638

Int. Cl.² B01D *13/02*

U.S. Cl. 204—301 19 Claims



1. Apparatus for removing ionic impurities from an electrolyte solution by electrodialysis of the solution which comprises an electrolytic cell having an innermost generally tubular electrode that is adapted to be mounted so that the longitudinal axis thereof is substantially vertically disposed, a generally tubular permselective membrane disposed concentrically with respect to the innermost generally tubular electrode and spaced radially outwardly from the outer surface thereof, an outermost generally tubular electrode disposed concentrically with respect to the innermost generally tubular electrode and the generally tubular permselective membrane and spaced radially outwardly from the outer surface of said permselective membrane, and longitudinally movable scraper means for removing precipitated particulate matter from the surface of one of said generally tubular electrodes facing the permselective membrane, the innermost generally tubular electrode and the permselective membrane together defining a generally annular innermost electrolyte compartment through which a first electrolyte solution can be circulated, and the outermost generally tubular electrode and the permselective membrane together defining a generally annular outermost electrolyte compartment through which a second electrolyte solution can be circulated.

4,105,535

CONVERSION OF COAL-DERIVED LIQUIDS WITH A CRYSTALLINE ALUMINOSILICATE ZEOLITE CATALYST

Alan W. Peters, Morrestown, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,019

Int. Cl.² C10G *1/04, 13/02, 1/08*

U.S. Cl. 208—8 18 Claims

8. The process of claim 5 wherein the hydrogenation metal assicated with the crystalline aluminosilicate zeolite is nickel.

4,105,536

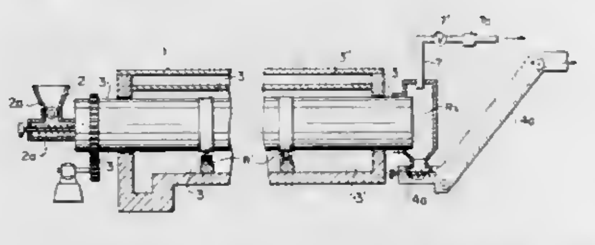
PROCESSES INCLUDING THE PRODUCTION OF NON-CONGEALING SHALE OIL FROM OIL SHALES

Jacque C. Morrell, 4501 Connecticut Ave., NW., Apt. 516, Washington, D.C. 20008

Continuation-in-part of Ser. No. 679,315, Apr. 23, 1976, abandoned, which is a contiouation-in-part of Ser. No. 455,074, Mar. 27, 1974, Pat. No. 3,954,597. This application Feb. 18, 1977, Ser. No. 769,885

Int. Cl.² C10G *1/02*

U.S. Cl. 208—11 R 9 Claims



1. A continuous process for the production of the shale oil and other products from oil shale which includes removing a relatively large to major amount of the water present in oil shale prior to recovery of the oil by retorting the same to facilitate the rate of recovery of the oil therefrom in the retorting step of the process and to substantially increase the capacity of the latter step in the process which comprises subjecting the said oil shale in subdivided form to heat treatment in a partial dehydration step under relatively milder temperature conditions than that of the retorting step, said partial dehydration step being conduct while rotating the oil shale in a substantially horizontal cylindrical vessel collecting the vapors and gases from the partial dehydration step in the temperature range up to about 550° F to 650° F to remove relatively large to major amounts of free and combined water from the oil shale, and thereafter passing the heated partially dehydrated oil shale to the retorting step for further heat treatment at a substantially higher temperature than that of the dehydration step, in the approximate range of about 800° F to 1000° F, said heat treatments in the partial dehydration and retorting steps, being effected by indirect heat exchange with hot gas, said further heat treatment being conducted while rotating the partially dehydrated oil shale in a substantially horizontal cylindrical vessel withdrawing the vapors and gaseous products resulting from the heat treatment of the same partial dehydration and retorting steps of the process from said rotating substantially horizontal cylindrical vessels, fractionating the vapors withdrawn from the retort whereby there is removed a light overhead product comprising vapors of low boiling hydrocarbons, water, hydrocarbon gases and ammonia and wherein the heavier conversion oil products from the oil shale are condensed and separated as a liquid for further treatment and use.

4,105,537

SYSTEM FOR HANDLING THE UNDERFLOW FROM A PRIMARY SEPARATION VESSEL IN THE TAR SAND HOT WATER PROCESS

Stanley McQuitty, Ft. McMurray, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of Canada

Filed Mar. 7, 1977, Ser. No. 774,927

Int. Cl.² B01D *12/00;* C10G *1/04*

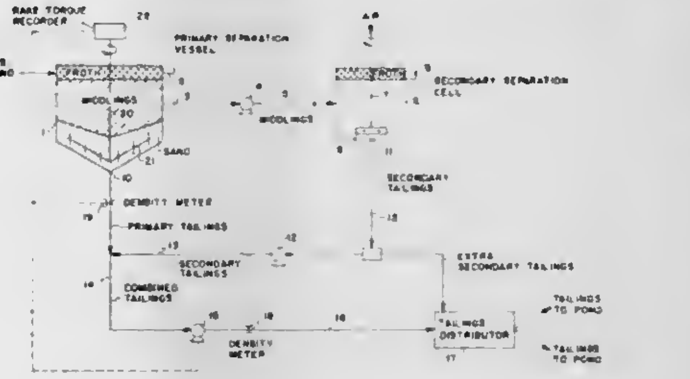
U.S. Cl. 208—11 LE 2 Claims

1. In the hot water process for recovering bitumen from tar sand wherein aqueous tar sand slurry is fed to a primary separation vessel having a tailings outlet and discharge conduit, through which is produced a relatively dry primary tailings stream mainly comprising coarse solids combined with minor amounts of water and bitumen, and a middlings outlet, through which is produced an aqueous middlings stream which is treated in a secondary recovery flotation cell to produce a relatively fluid secondary tailings stream mainly comprising water containing fine solids, at least part of said secondary tailings stream being combined with said primary tailings stream,

the improvement comprising the steps of:

monitoring the solids content of the primary tailings stream;

pumping at least part of the secondary tailings stream with a variable speed first pump through a first conduit which joins the primary separation vessel discharge conduit to combine said secondary tailings stream with the primary tailings stream;



pumping the combined tailings stream through a second conduit with a variable-speed close-coupled pump to deliver it to a tailings distribution system;

monitoring the solids content of the combined tailings stream;

controlling the close-coupled pump responsive to the solids content of the primary tailings stream to maintain said solids content at a high level to reduce bitumen loss; and

controlling the first pump responsive to the solids content of the combined tailings stream to maintain said solids content at a pumpable level.

4,105,538

PROCESS FOR THE REFINING OF USED MOTOR OILS AND PRODUCTS THEREOF

William J. Mattox, 612 S. Lakeshore Dr., Baton Rouge, La. 70808

Filed Jan. 21, 1977, Ser. No. 761,080

Int. Cl.² C10M *11/00*

U.S. Cl. 208—18 10 Claims

1. A process for selectively refining used motor oil containing contaminants developed in use, comprising contacting said motor oil with an amine soluble in the oil, said amine being selected from the group consisting of dicyclohexylamine, trihutylamine, di-2-ethylhexylamine and tripropylamine and having an activity which renders a first portion of said contaminants which does not have corrosion inhibiting properties physically removable but leaves another portion of said contaminants having corrosion inhibiting properties in solution in the oil and physically removing said first portion.

4,105,539

DEWAXING WITH A POLYMERIZED POLYOL ESTER DEWAXING AID

Hans Borst, Oosterbeek, Netherlands; Reginald David Owen Evans, and John Arthur Rand, both of Bromborough, England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Netherlands

Filed Nov. 17, 1976, Ser. No. 742,606

Claims priority, application United Kingdom, Nov. 18, 1975, 47477/75

Int. Cl.^{2} C10G *43/06, 43/08*

U.S. Cl. 208—33 **9 Claims**

1. A process for the separation of wax from mineral oil, comprising the steps of forming a solution of an effective amount of a blend of polymerized polyol esters in a waxy mineral oil, and subsequently cooling the solution to a crystallization temperature to separate out wax and at least some of the ester from the solution, in which process:

(a) the amount of polymerized polyol ester is sufficient to modify the crystal structure of the separated wax and

(b) the polyol esters are of C_8 to C_{24} fatty acids containing at least 5 esterified hydroxyl groups per molecule.

4,105,540

PHOSPHORUS CONTAINING COMPOUNDS AS ANTIFOULANTS IN ETHYLENE CRACKING FURNACES

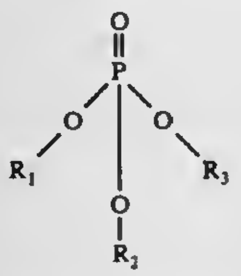
Billy W. Weinland, Conroe, Tex., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 15, 1977, Ser. No. 860,793

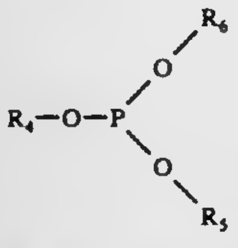
Int. Cl.^{2} C10G *9/16;* **C07C** *11/04*

U.S. Cl. 208—48 AA **5 Claims**

1. A method for reducing fouling in ethylene cracking furnaces using petroleum feedstocks comprising treating the petroleum feedstocks with at least 10 ppm of a compound chosen from the group consisting of phosphite and phosphate esters, said phosphate esters being characterized by the general formula:



where: R_1, R_2, and R_3 are each independently selected from the group consisting of hydrogen, an addition complex of hydrogen with an amine, alkyl, aryl, alkaryl, cycloalkyl, alkenyl, and aralkyl, provided that in any given such phosphate ester at least one and not more than two of each of R_1, R_2, and R_3 are each hydrogen or an addition complex of hydrogen with an amine, and said phosphite esters characterized by the general formula:



where: R_4, R_5 and R_6 are each independently selected from the group consisting of hydrogen, an addition complex of hydrogen and an amine, alkyl, aryl, alkaryl, cycloalkyl, alkenyl, and aralkyl, provided that in any given such phosphite ester at least one and not more than two of each of R_4, R_5, and R_6 are each hydrogen or an addition complex of hydrogen with an amine.

4,105,541

HYDROCARBON CONVERSION OVER ZSM-38

Charles J. Plank, Woodbury, N.J.; Mae K. Rubin, Bala Cynwyd, Pa., and Edward J. Rosinski, Pedricktown, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 808,202, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 560,412, Mar. 20, 1975, Pat. No. 4,046,859, which is a continuation-in-part of Ser. No. 528,060, Nov. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 393,767, Sep. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 358,192, May 7, 1973, abandoned. This application Nov. 14, 1977, Ser. No. 850,876

Int. Cl.^{2} B01J *8/24;* **C07C** *15/02;* **C01B** *29/28*

U.S. Cl. 208—111 **29 Claims**

1. A process for effecting catalytic conversion of a hydrocarbon compound charge which comprises contacting said charge under catalytic conversion conditions with a catalyst comprising a synthetic crystalline aluminosilicate zeolite having a composition expressed in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.3\text{–}2.5)R_2O:(0\text{–}0.8)M_2O:Al_2O_3:(x)SiO_2$$

wherein R is an organic cation, M is an alkali metal cation and x is greater than 8 and having an X-ray powder diffraction pattern substantially as shown in Table 1 of the specification, or a thermal decomposition product thereof.

4,105,542

METHOD FOR REMOVING SLUDGE FROM OIL

Morton Fainman, 11200 Homedale St., Los Angeles, Calif. 90049

Filed Dec. 30, 1976, Ser. No. 755,638

Int. Cl.^{2} C10M *11/00*

U.S. Cl. 208—180 **36 Claims**

1. A method for purifying used oil such as lubricating oil, said used oil having sludge, metal containing compounds, other undesirable components and mixtures thereof contained therein by the steps of:

(a) mixing said used oil with a hydrocarbon diluent so as to dilute said used oil;

(b) mixing said diluted used oil with a water-alcohol mixture comprising (i) a water miscible alcohol, (ii) water, and (iii) a water soluble acid;

(c) heating the resultant mixture formed from steps (a) and (b) to a temperature of from about 40° to 80° C; and

(d) permitting the now-heated resultant mixture to settle for a sufficient length of time so as to cause a phase separation with the sludge and metal containing compounds in one phase and the now-purified diluted oil in another phase.

4,105,543

METHOD FOR SCREENING PAPER FIBER STOCK

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 496,160, Aug. 9, 1974, abandoned, which is a continuation of Ser. No. 288,293, Sep. 12, 1972, abandoned. This application May 14, 1976, Ser. No. 686,490

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.^{2} B07B *1/20*

U.S. Cl. 209—240 **3 Claims**

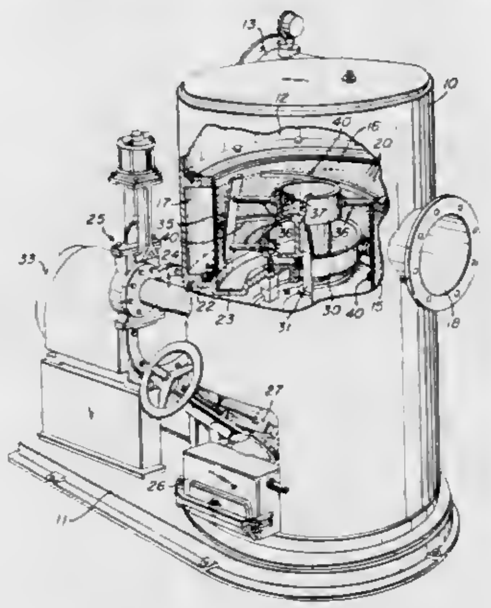
1. The method of screening a dilute suspension of paper fiber stock in a screen comprising a supply chamber having as one wall thereof a cylindrical screen member having multiple substantially circular perforations therethrough, a rotor mounted for rotation coaxially with said screen member, and a plurality of vanes carried by said rotor in said supply chamber in angularly spaced relation with each other, said method comprising the steps of

(a) establishing said vanes at a predetermined uniform spacing from said screen member in the range of 3/16 to ½ inch so that upon rotation of said rotor with said chamber filled with stock, said vanes will cause the stock to form a tubular layer immediately adjacent said screen member which is of a thickness equal to said predetermined spacing,

(b) continuously supplying feed stock to one end of said supply chamber at a rate sufficient to maintain said chamber full,

(c) maintaining a pressure difference from said supply chamber to the accepts side of said screen member to cause passage of accepted stock through said perforations,

(d) continuously driving said rotor to move said vanes at a sufficiently high speed to create a substantially tangentially oriented steady hydraulic shear field in said tubular layer of stock with shear rates sufficiently high to cause elongated contaminant particles to be aligned generally tangentially of said screen member and thereby to flow past rather than through said perforations,



(e) controlling the speed of said rotor to cause said vanes to travel at a predetermined speed in the range of substantially 3,000 to 12,000 feet per minute which has substantially the same relative position in said speed range as the relative position of the thickness of said tubular layer in said thickness range of 3/16 to ½ inch,

(f) maintaining the consistency of said feed stock in substantially the same relative position in a range of 0.5–5.0% solids as the relative position of the thickness of said tubular layer in said thickness range,

(g) continuously removing from the other end of said supply chamber a portion of said stock including such contaminant particles, and

(h) continuously recirculating stock from said other end of said supply chamber to said one end thereof.

4,105,544

GRAVEL PROCESSING SYSTEM

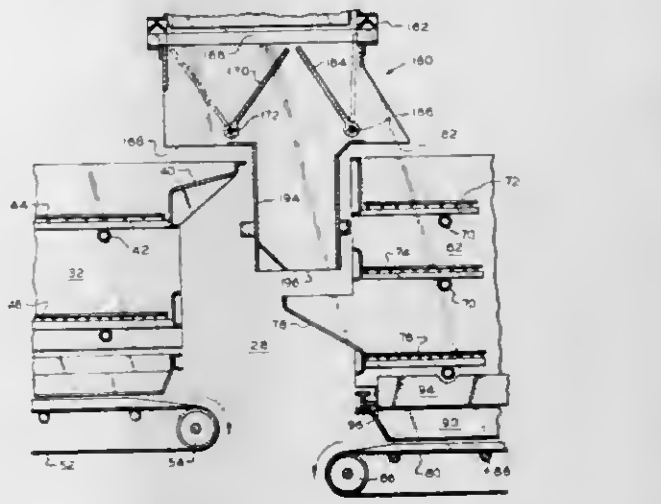
Ronald A. Stevick, 1100 S. Jackson Rd., Cement City, Mich. 49233

Filed Apr. 26, 1977, Ser. No. 791,156

Int. Cl.^{2} B07B *9/00*

U.S. Cl. 209—317 **14 Claims**

1. A gravel processing apparatus for screening and separating gravel comprising, in combination, a frame having a top, bottom, first and second ends, first and second lateral sides and a vertically extending central region, a first vibrating screen mounted on said frame located between said lateral sides, central region and first end, a second vibrating screen mounted on said frame located between said lateral sides, central region and second end, motor means mounted on said frame drivingly connected to said screens for producing vibration thereof, a top loading hopper mounted on said frame at said central region having an upper inlet and first and second outlets vertically located below said inlet, said first outlet selectively communicating with said first screen adjacent said central region and said second outlet selectively communicating with said second screen adjacent said central region, adjustable flow control means within said hopper selectively controlling flow through said outlets, said first screen having an oversize particle discharge adjacent said first end, said second screen having an oversize particle discharge adjacent said second end, a first conveyor mounted on said frame below said first screen receiving the gravel passing therethrough, a second conveyor mounted on said frame below said second screen receiving the gravel flowing therethrough, drive means mounted on said frame selectively driving said conveyors whereby ungraded gravel introduced into said hopper inlet may be selectively introduced onto said screens and graded gravel removed from said discharges and from said conveyors, said first screen including a first vibratory box resiliently supported on said frame, said second screen including a second vibratory box resiliently mounted upon said frame, said first and second conveyors being mounted below said first and second boxes, respectively, a third screen mounted on said first box directly below said first screen, a fourth screen mounted on said second box directly below said second screen, said first and second conveyors being below said third and fourth screens, respectively, said third screen having an oversize particle discharge adjacent and below said first screen discharge, and said fourth screen having an oversize particle discharge adjacent and below said second screen discharge.



4,105,545

PROCESS FOR REMOVING CYANIDE-CONTAINING COMPONENTS FROM AQUEOUS MEDIA

Albert Muller, Lebanon, N.J., and John M. Schreiner, Brewster, N.Y., assignors to Treadwell Corp., New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,205

Int. Cl.^{2} C02B *1/38*

U.S. Cl. 210—15 **6 Claims**

1. A process for removing components from an aqueous effluent derived from the treatement of coke-oven gases to remove tars, ammonia, light oils and which has been further treated to remove oil, grease and suspended solids, said effluent containing phenols and simple and metal complexed cyanides and thiocyanates comprising:

(a) bio-oxidizing said effluent to substantially remove said phenol content;

(b) adding to said effluent a surface active compound, said surface active compound being cationic or having a chelating moiety bonded thereto, and

introducing a gas into said effluent to form gas bubbles, the amount of added surface active compound and gas being sufficient to remove from 30% to 90% of the metal complexed and simple cyanides and as a foam atop said effluent, the pH of said effluent contacted with said bubbles being in the range of from about 6 to about 11;

(c) separating said foam from said effluent; and

(d) contacting the separated effluent with ozone to substantially remove the remaining simple and metal complexed cyanides and thiocyanates from said effluent.

4,105,546
METHOD OF TREATING WASTE WATER WITH ACTIVATED SLUDGE

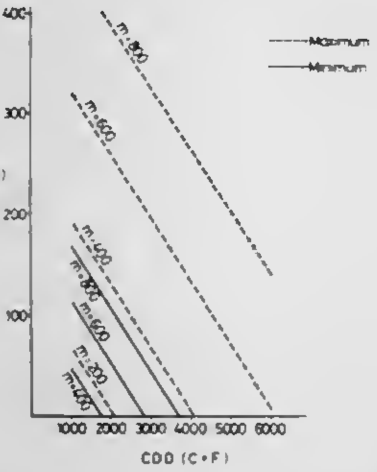
Yasushi Kobayashi; Minoru Iwata, both of Himeji; Sadao Yoshida, Ichihara, and Hisashi Akatuka, Himeji, all of Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 590,061, Jun. 25, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,174

Claims priority, application Japan, Jun. 29, 1974, 49-74698

Int. Cl.^{2} C02C *1/06*

U.S. Cl. 210—11 **5 Claims**



1. A method of treating an oil-containing waste water with an activated sludge in an aeration tank which comprises adding a mineral oil hydrocarbon to the waste water in an amount satisfying the formula:

$$6.25\times10^{-5}\times m\times T-6\times10^{-2}\times C\times F>V>2.75\times10^{-5}\times m\times T-6\times10^{-2}\times C\times F$$

wherein V is the amount of added hydrocarbon in liters per day; m is concentration of from about 1000 to about 8000 ppm of the activated sludge, T is capacity of the aeration tank in which the waste water is so treated in 1000 cubic meters per flow rate F; C is Chemical Oxygen Demand concentration of from about 30 to about 65 ppm in the waste water; and F is flow rate of the waste water of from about 50 to about 140 cubic meters per hour of the waste water; and wherein the hydrocarbon is a hydrocarbon fraction containing hydrocarbons having from 4 to 20 carbon atoms per molecule, aerating the mixture of waste water, mineral oil hydrocarbon, and activated sludge for a time effective in reducing said chemical oxygen demand, and passing said mixture to a sedimentation tank to produce a settled sludge and treated waste water.

4,105,547
FILTERING PROCESS

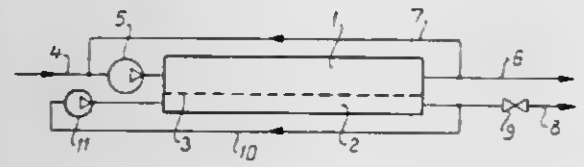
Robert Mauritz Sandblom, Farsta, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Dec. 17, 1975, Ser. No. 641,769

Claims priority, application Sweden, Dec. 23, 1974, 7416257

Int. Cl.^{2} B01D *13/00, 31/00*

U.S. Cl. 210—22 R **7 Claims**



1. A filtering process, especially for ultra-filtration, which comprises flowing a filterable fluid under pressure through a filtering passage extending along one side of a filter, passing one part of said fluid through the filter while discharging an unfiltered part of said fluid from an outlet of said passage, said flow through the filtering passage being provided with a sufficiently high velocity to create a substantial pressure drop along the filter area in the flow direction through said passage, providing a fluid flow in the same said direction in a filtrate passage extending generally parallel to the opposite side of said filter, said passage communicating with each other through the filter, and maintaining in said filtrate passage a pressure drop of the same magnitude and in the same direction as said substantial pressure drop in the filtering passage, whereby the pressure difference between both sides of the filter is maintained substantially constant throughout the entire filter area.

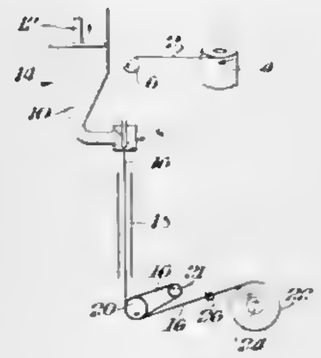
4,105,548
SEPARATION DEVICE OF RIGID POROUS INORGANIC HOLLOW FILAMENT AND USE THEREOF

Richard Anson Baker, Newark, Del.; George Daniel Forsythe, Landenberg, Pa.; Kewal Krishan Likhyani, Wilmington, Del.; Robert Earl Roberts, Kennett Square, Pa., and David Charles Robertson, Bear, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 22, 1977, Ser. No. 770,461

Int. Cl.^{2} B01D *13/00*

U.S. Cl. 210—23 H **5 Claims**



1. A process for separating material from a liquid, comprising flowing liquid through a separation device having greater permeability for said liquid than said material and comprising a three-dimensional network of rigid, criss-crossing, porous inorganic hollow filament through the thickness dimension of the network, the criss-cross pattern of the hollow filament extending in the length width dimensions of the network, the flow of liquid being through the thickness dimension of said network, the network defining tortuous paths for said liquid flowing through its thickness dimension, whereby liquid having reduced concentration of said material permeates through the wall of said hollow filament, collecting the permeated liquid from the interior of said hollow filament, and separately collecting the resultant concentrate of said material.

4,105,549
METHOD AND APPARATUS FOR PURIFICATION OF WATER

Yoshiaki Kakumoto, Chigasaki; Mamoru Kanegawa; Takashi Iwaizumi, both of Yokohama, and Nobuo Matsumoto, Tokyo, all of Japan, assignors to Ebara Infilco Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 548,723, Feb. 10, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,405

Int. Cl.^{2} C02B *1/14;* B01D *15/02*

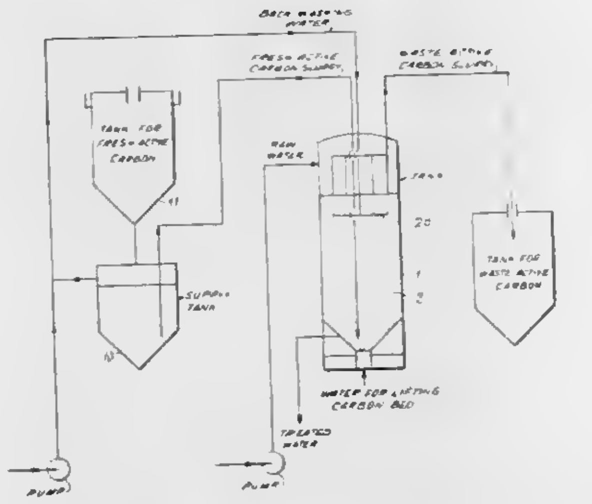
U.S. Cl. 210—33 **16 Claims**

1. A method for purifying water or waste water fluid by passing it through a packed bed of active carbon, said packed bed being contained in a tank including an upper columnar section and a lower frustoconical section, comprising the steps of:

(1) supplying said fluid to the upper side of said packed bed, allowing the fluid to flow downwardly through the packed bed, and to leave said bed proximate the lower portion thereof;

(2) preparing a slurry of active carbon by mixing active carbon with a liquid;

(3) periodically interrupting the supply of said fluid to the upper side of said bed and lifting said bed in piston-like fashion by the injection of water at a controlled rate beneath said bed, said water being injected at the region of substantially smallest cross-sectional area of said lower frustoconical section of said tank;


BACK WASHING WATER
FRESH ACTIVE CARBON SLURRY
WASTE ACTIVE CARBON SLURRY
TANK FOR FRESH ACTIVE CARBON
RAW WATER
TANK
11
20
1
3
SUPPLY TANK
13
TANK FOR WASTE ACTIVE CARBON
WATER FOR LIFTING CARBON BED
TREATED WATER
PUMP
PUMP

(4) supplying the active carbon slurry periodically into the space beneath said packed bed, said space being formed by lifting said bed;

(5) periodically slurrying the upper portion of the packed bed; and

(6) periodically withdrawing the active carbon slurry formed from the upper portion of the packed bed in an amount corresponding to the amount of the active carbon slurry supplied to the lower portion of the packed layer.

whereby the active carbon constituting the packed bed is intermittently moved upwardly counter-current to the fluid and the active carbon is caused to have a counter-current contact with the fluid, for purposes of purification of said water or waste water by adsorption and filtration.

4,105,550
PREPARATION OF STERILE PRODUCTS

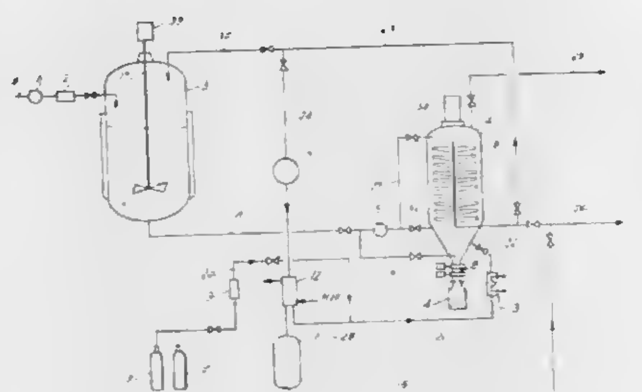
Hans Müller, Im Allmendli, Erlenbach, Zurich, Switzerland

Continuation of Ser. No. 428,345, Dec. 26, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,875

Claims priority, application Switzerland, Dec. 23, 1972, 18976/72

Int. Cl.^{2} B01D *17/00*

U.S. Cl. 210—50 **4 Claims**



1. A process for obtaining a solid pharmaceutical substance in sterile form comprising the steps, in succession, of

(1) passing a solution of the substance through a sterilizing filter;

(2) then passing the sterilized solution directly from the sterilizing filter into a presterilized precipitation tank where the solution is brought in contact with a precipitating medium so as to form a solids-containing suspension;

(3) thereupon passing the suspension directly from the precipitation tank to a presterilized rotary disk filter where the solids are deposited on the disks as filter cake while the liquid medium is passed out of the filter as the filtrate;

(4) continuously recycling said filtrate into said precipitation tank until it is free of all residual solids;

(5) passing a heated inert gas or heated air through a sterilizing filter and thereafter into the rotary disk filter to completely dry said filter cake;

(6) then passing the wet gas or air out of the filter and into a condenser where the residual filtrate is separated from the gas or air;

(7) continuously recirculating the recovered gas, into the precipitation tank;

(8) applying a vacuum to the disk filter to complete the drying;

(9) subjecting the filter disks to a centrifugal action whereby the deposited solid substance constituting the said filter cake is detached from said disks of the rotary filter, and

(10) finally passing the separated sterile, completely dry solid substance out of the disk filter and into a presterilized collection vessel for future use, all passages between said sterilizing filter, precipitation tank, rotary disk filter, gas or air sterilizating filter and collection vessel as well as all recirculation ducts between said disk filter and precipitation tank and between the disk filter, condenser and precipitation tank being sterilized prior to the operation, and the said sterilizing filter for the solution, precipitation tank, disk filter, gas or air filter and collection vessel together with connecting ducts thus forming a closed sterile system.

4,105,551
TREATMENT OF AQUEOUS SYSTEMS

Malcolm John Smith, Rose Hill; Peter Miles, Bramhall; Norman Richardson, Middleton, and Michael Anthony Finan, Macclesfield, all of England, assignors to Ciba Geigy (UK) Limited, London, England

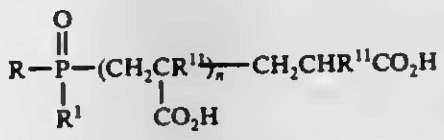
Division of Ser. No. 582,402, May 29, 1975, Pat. No. 4,046,707. This application Dec. 29, 1976, Ser. No. 755,604

Claims priority, application United Kingdom, Jun. 11, 1974, 25853/74

Int. Cl.^{2} C02B *5/06*

U.S. Cl. 210—58 **6 Claims**

1. A method of inhibiting the precipitation of the scale forming salts of calcium, magnesium, barium and strontium from aqueous systems comprising adding to the aqueous system a scale inhibiting amount in the range of 1-200 ppm of a product comprising a telomeric compound of the formula:



$$R-\underset{R^1}{\overset{O}{\overset{\|}{\underset{|}{P}}}}-(CH_2\underset{CO_2H}{\underset{|}{C}}R^{11})_n-CH_2CHR^{11}CO_2H \qquad I$$

or salts thereof, wherein R^{11} is hydrogen or a methyl or ethyl residue and n is a positive integer of at most 100, R is a residue —OX wherein X is a straight or branched alkyl residue having from 1 to 4 carbon atoms, and R^1 is a residue —OX wherein X has its previous significance.

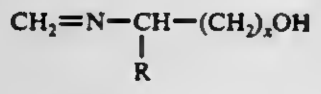
4,105,552
METHOD OF CONTROLLING THE GROWTH OF MICROORGANISMS

Jerry Hoyt Hunsucker, and James R. Selleck, Jr., both of Terre Haute, Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed May 16, 1977, Ser. No. 796,942
Int. Cl.^{2} C02B *3/06*

U.S. Cl. 210—64 **5 Claims**

1. A method of controlling the growth of microorganisms by applying to them or to the environment inhabited by them a compound represented by the formula



$$CH_2{=}N{-}\underset{\displaystyle R}{\underset{|}{CH}}{-}(CH_2)_xOH$$

where R can be hydrogen, methyl or ethyl and *x* is 1 or 2.

4,105,553
OIL-CONTAINING EFFLUENT TREATMENT BY GRAVITY SEPARATION

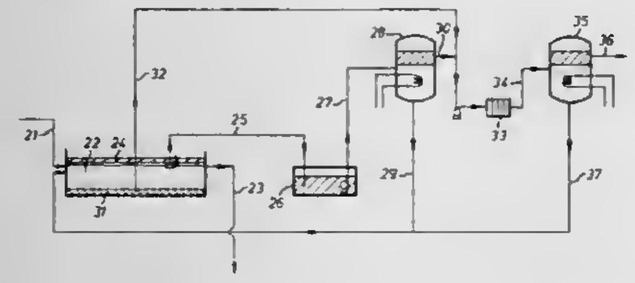
Guy Franklin Oldham, London, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 30, 1977, Ser. No. 783,046

Claims priority, application United Kingdom, Apr. 8, 1976, 14294/76

Int. Cl.^{2} B01D *23/00*

U.S. Cl. 210—73 W **5 Claims**



1. A method for the treatment of oil-containing aqueous effluent which method comprises the steps of:
(1) passing the effluent through a gravity separator and obtaining (a) a wet oil fraction, (b) an aqueous fraction of reduced oil content and (c) a wet oily sludge,
(2) heating Fraction (a),
(3) combining the heated Fraction (a) with Fraction (c),
(4) passing the resulting mixture through a filter in such a manner that solids are retained and oil and water are passed through, and
(5) passing the oil and water to a separator and recovering a reusable oil fraction and a water fraction.

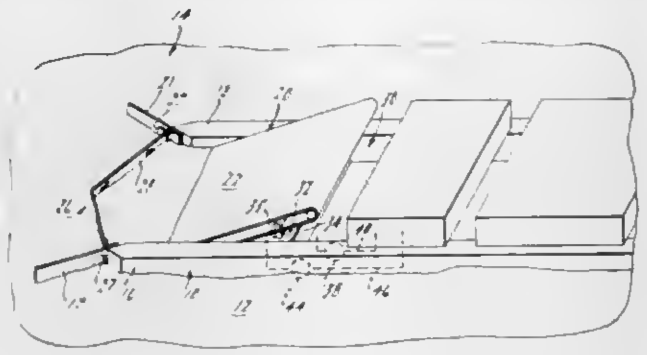
4,105,554
OIL SPILL RETRIEVAL SYSTEM

John J. Janson, 14103 Blackburn, Livonia, Mich. 48154

Filed May 31, 1977, Ser. No. 802,026
Int. Cl.^{2} E02B *15/04*

U.S. Cl. 210—96 R **13 Claims**

1. An oil retrieval system for retrieving oil spills and the like from bodies of water such as seas, lakes or the like and being operable from a boat, said system comprising: collecting means operatively connected with the boat for collecting the oil from the surface of the water, said collecting means collecting a mixture of oil and water, receiving tank means located on the boat for receiving the mixture of oil and water, separating means operatively connected with said receiving tank means for separating the oil and water, storage means for receiving and holding the separated oil, discharge means for discharging the water back to the body of water, monitor means for analyzing the water to be discharged and providing a first signal when the quantity of oil in the water is at a preselected low level and a second signal when the quantity of oil in the water is above said low level, said discharge means operable for discharging the water in response to said first signal and response to said second signal for transmitting the water to said separating means for an additional cycle, said boat being of a twin hull construction and with said collecting means located between said twin hulls, screen means including a screen structure located in front of said collecting means to block out debris from said collecting means, said screen means further comprising guide means for providing a funnel like construction for guiding the fluid in between said twin hulls and to said screen structure, said guide means having at least one gate and with said screen structure defining a V-shape and cooperating with said one gate for directing debris thereto whereby debris can be exited.

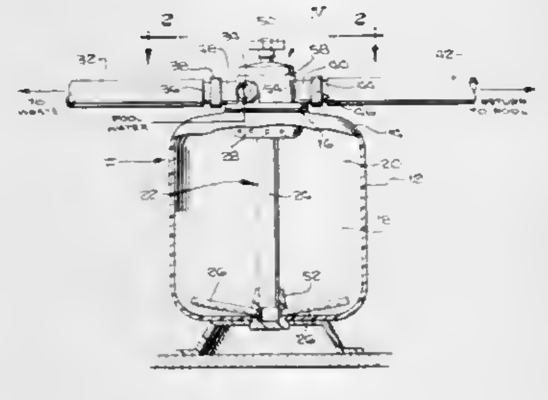


4,105,555
MULTI-PORT VALVE

Leroy I. Pease, Diamond Bar, Calif., assignor to Tolo, Incorporated, Santa Ana, Calif.

Filed Dec. 6, 1976, Ser. No. 747,596
Int. Cl.^{2} B01D *23/24*

U.S. Cl. 210—136 **33 Claims**



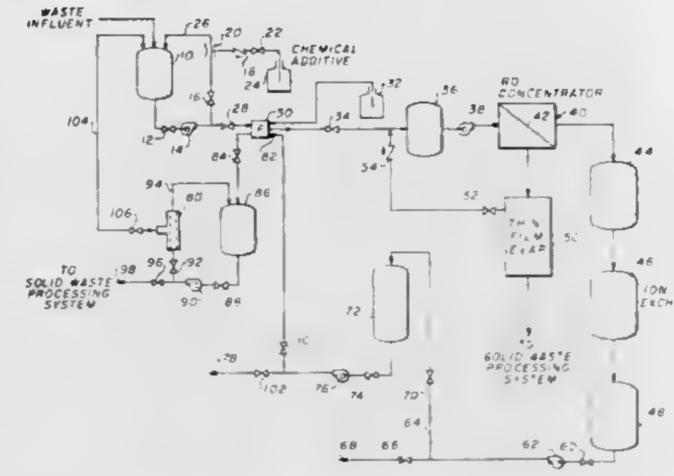
1. Multiple use mode non-plug valve for a swimming pool filter of the type passing water under pressure through a backwash regenerable filtering medium disposed in a filter tank, said valve comprising interfitting and relatively rotatable inner and outer circular sections having nested and coaxially tapered annular respective wall members, said outer section wall member defining plural outer ports in circular series including an inlet port for water pumped from the pool to be filtered; a first outlet port for filtered water returned to the pool; and a second outlet port for waste water; said inner section wall member normally seating within said outer section in sealing response to filter tank water pressure and defining inwardly thereof an interior space in open unobstructed communication with said tank to eliminate pressure imbalances across said inner section, said inner section wall member having a plurality of vertically disposed inner ports coplanar with said circular series of outer ports and circularly spaced to alternate communicate in water passing relation two of said outer ports in registering response to relative rotation of said wall members while blocking water passage through the other outer port.

4,105,556
LIQUID WASTE PROCESSING SYSTEM

Eugene Raymond D'Amaddio, Enfield, and David Norman Enegess, Broad Brook, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 18, 1976, Ser. No. 659,053
Int. Cl.^{2} B01D *35/00*

U.S. Cl. 210—152 **4 Claims**



1. An apparatus for producing very pure liquids from influent liquids containing high concentrations of impurities while at the same time producing an impurity concentrate of very high concentrations and low volume, wherein the apparatus comprising in combination:
a. a reverse osmosis concentrator having a semipermeable membrane and having an inlet for receiving a stream of waste fluid, an outlet for discharging purified permeate which has passed through said semipermeable membrane, and an outlet for discharging a concentrate;
b. a thin-film evaporator connected to said reverse osmosis concentrator's concentrate outlet, said thin-film evaporator having an outlet for discharging a distillate and an outlet for discharging a concentrate having a high solids content;
c. means upstream of said reverse osmosis concentrator for filtering the stream of waste fluid, said filter means including a means for back-flushing said filtering means with a cleaning fluid; and
d. means upstream of said filtering means for introducing chemicals into the stream of waste fluid, said chemical introduction means including:
  1. a hold-up tank for collecting the stream of waste fluid;
  2. a pump in fluid communication with said hold-up tank;
  3. a recirculation line connecting said pump and said hold-up tank;
  4. an eductor in said recirculation line, said eductor having a primary inlet and a secondary inlet, said primary inlet being in fluid communication with said pump; and
  5. a source of chemical additive, said source being connected to said secondary inlet of said eductor such that the chemicals from said chemical source are selectively entrained in the flow of fluid passing through said eductor.

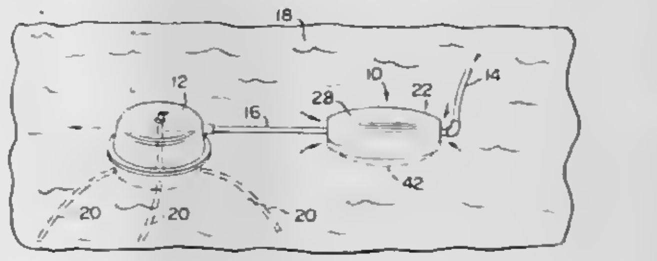
4,105,557
POOL SKIMMER

Brian R. Weatherbolt, P.O. Box 4027, Bay Pines, Fla. 33504

Filed Mar. 9, 1977, Ser. No. 775,973
Int. Cl.^{2} E04H *3/20*

U.S. Cl. 210—169 **9 Claims**

1. A pool skimming device in combination with a pool sweeping device having a flexible hose interconnecting the pool sweeping device to a source of water pressure, the sweeping device comprising a surface unit and a plurality of flexible sweeping arms connected to the surface unit to propel the pool sweeping device within the pool, the improvement comprising in combination:
a body member for said pool skimming device having a specific gravity substantially less than one enabling said body member to provide buoyancy for said combination;
said body member having a central cavity communicating with an open bottom in said body member;
mounting means for rigidly mounting said body member to the surface unit of the pool sweeping device to provide floatation to the surface unit of the pool sweeping device and for moving said body member in accordance with the movement of the pool sweeping device;



filter means established relative to said open bottom of said body member;
a plurality of water input means communicating with said central cavity of said body member to enable surface water of the pool to enter said central cavity and to exit through said open bottom with said filter means collecting debris accompanying the surface water upon movement of the pool sweeping device; and
said plurality of water input means including one-way gate means located on opposed sides of said body member.

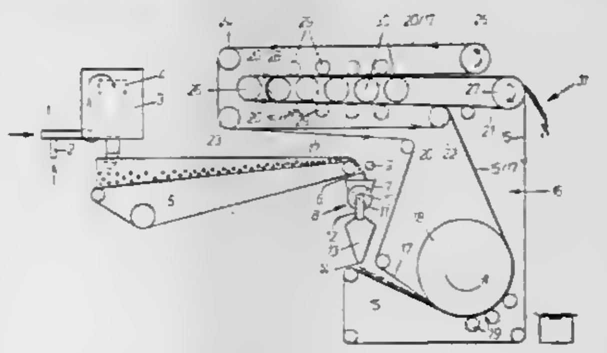
4,105,558
APPARATUS FOR DRAINING OF MUDDY LIQUIDS

Hans J. Heinrich, Wilhelmshoherstr. 129, 5828 Ennepetal; Bernd Koslowsky, Theodor-Heuss-Str. 50, and Egon Hoffmann, Funckstr. 63, both of 56 Wuppertal 1, all of Germany Division of Ser. No. 656,181, Feb. 9, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,680

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2515162

Int. Cl.^{2} C02C *3/00;* **B01D** *3/14*

U.S. Cl. 210—199 **5 Claims**



1. Apparatus for draining of muddy liquids comprising:
an inlet feedline through which a muddy liquid passes to empty into a first coagulating chamber;
a dosing device communicating with said inlet feedline to add a charged ionic coagulant selected from the group consisting of flocculating inorganic ionization agents and cationic coagulating agents into said inlet feedline;
a first coagulating chamber communicating with said feedline fitted with an overflow funnel for mixing of ionic coagulant and muddy liquid entering from said feedline and in which thickening occurs to form a thick slurry which flows out of said overflow funnel and deposits onto

an endless revolving screen belt where it is strained and dewatered;

a revolving screen belt below said funnel having a scraper knife at its remote discharge end for aiding removal of strained and dewatered slurry onto a receiving funnel and thereafter into a second mixing and coagulating chamber by means of a screen conveyor means;

a receiving funnel to receive the strained and dewatered slurry;

a spray dosing device mounted over said receiving funnel which contains a second charged ionic coagulant opposite in charge to said first ionic coagulant;

a spray dosing inlet pipe means into which said second charged ionic coagulant enters for later addition to the strained and dewatered slurry from the revolving screen belt to carry out a mixing in a second coagulating chamber;

said second coagulant selected from the group consisting of coagulating inorganic ionization agents, anionic coagulating agents, and cationic coagulating agents;

screw conveyor means conveying the mixtures of dewatered slurry and second charged coagulant to a second coagulating chamber for a second thickening;

a second coagulating chamber which communicates with said spray dosing inlet pipe means for carrying out a second coagulation with the second coagulant and the strained and dewatered slurry;

slit means below said second coagulating chamber for discharging thickened sludge;

a receiving belt below said slit means wherein the slit of said slit means is transverse to the running direction of said belt to facilitate moving the second thickened slurry toward a two step screening belt for further dewatering by pressing and filtering;

a two step screening belt assembly which is series connected to said receiving belt, said assembly comprising two screening belts coming together at a nip into which the second slurry enters from said receiving belt, a perforated drum about which said two screening belts wind and press towards each other, a drain and contact rollers pressing and belts towards each other adjacent to the exit side of said drain; and

a series of longitudinally disposed supporting rollers for said two step screening belt assembly on opposite sides of said belts for progressively pressing the two belts with said sludge therebetween at greater pressures than said constant rollers of said perforated drum whereby a dry filter cake is discharged at the end of said two step screening belt assembly, the first step of said pressing occurring at the underside of some of the supporting rollers in one direction and the second step of said pressing occuring at the top side of the same supporting rollers in the other direction.

4,105,559
PLATE-TYPE FILTER PRESS

Oswald Busse, and Hugo Klesper, both of Aarbergen, Fed. Rep. of Germany, assignors to Passavant-Werke Michelbacher Hutte, Aarbergen, Fed. Rep. of Germany

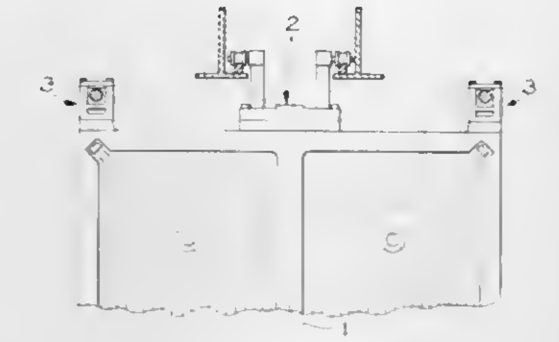
Continuation-in-part of Ser. No. 701,081, Jun. 30, 1976, Pat. No. 4,076,033. This application Apr. 4, 1977, Ser. No. 784,611

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618437

Int. Cl.² B01D *25/32*

U.S. Cl. 210—225 **5 Claims**

1. A plate-type filter press comprising vertically extending filter plates suspended by centrally disposed upper support means for horizontal stepwise movement to define a space between adjacent filter plates, a flushing device having horizontally arranged spray nozzles and mounted for movement from a position below said filter plates into and within the confines of said space between adjacent filter plates, guide means carried by at least one upper corner of each filter plate, and an elongated guide member extending horizontally and parallel to said upper support means adjacent said upper corner in position to engage said guide means and prevent the filter plates from swinging laterally and back and forth relative to said support means.



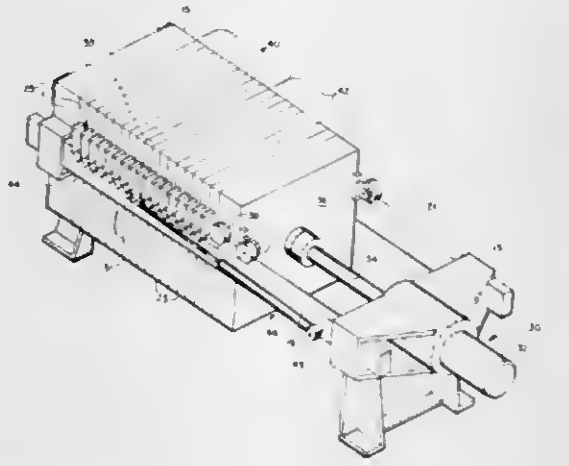
4,105,560
FILTER PLATE SHIFTER

William L. Fismer, Verona, N.J., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Feb. 14, 1977, Ser. No. 768,018

Int. Cl.² B01D *25/14*

U.S. Cl. 210—230 **12 Claims**



7. A filter press for mechanically separating solids from liquid, slurries, suspensions and the like, comprising:

a. a rigid frame including a first stationary end member which is a filter press head, a second stationary end member, and a pair of elongated side rail members which extend horizontally and parallel to each other and which are supported at their opposite ends by said stationary end members;

b. a first set of filter plate members mounted for sliding movement on said side rail members;

c. one or more additional sets of filter plate members mounted for sliding movement on said side rail members and disposed between said first set of filter plate members and said second stationary end member;

d. a last set of filter plate members mounted for sliding movement on said side rail members and disposed between said second stationary end member and the set of said one or more additional sets which is farthest from said first set;

e. means interconnecting the plates in each of said sets to allow limited travel of the interconnected plates away from one another while also allowing adjacent plates to move into abutting relationship with one another;

f. a slide head member slidably mounted on said side rail members between said second stationary end member and the first plate of said last set of filter plate members;

g. means connecting said slide head to said first plate of said last set of filter plate members;

h. ram means fixed to said second stationary end member and connected to said slide head member to reciprocatively move said slide head member in one direction of travel to separate the filter plates of said last set of filter plate members by action of said connecting means between said slide head member and the first filter plate of said last set of filter plate members and in the opposite direction of travel to force the filter plates of said sets into abutting relationship;

i. a first piston and cylinder assembly pivotably fixed at one of its ends to one of said side rail members and at its other end to the first plate of said first set of filter plates; and

j. one or more additional piston and cylinder assemblies each fixed at one of its ends to one of said side rail members and at its other end to the first plate of one of said one or more additional sets of filter plate members.

4,105,561
DIRECTIONAL FILTER

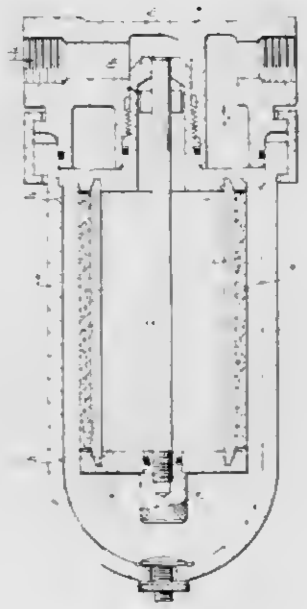
Keith Raphael Domnick, East Boldon, England, assignor to Domnick Hunter Engineers Limited, United Kingdom

Filed Feb. 6, 1975, Ser. No. 547,454

Claims priority, application United Kingdom, Feb. 16, 1974, 7163/74

Int. Cl.² B01D *25/02*

U.S. Cl. 210—232 **11 Claims**



1. A filter device comprising in combination: a self-supporting tubular microporous layer of a filter medium wherein the filter medium includes fibers providing a plurality of pores within a range of pore sizes substantially less than 50 microns; a binding material reinforcing said fibers; end caps of which each end cap defines an annular channel within a wall face thereof; one of said caps being at one end and another of said caps being at an opposite end of the tubular microporous layer mounted thereon; each end of the tubular microporous layer being held in a respective one of said annular channel against the channel-defining wall face thereof, of the end caps at opposite ends of the tubular microporous layer; each end cap comprising at least one impermeable member, each channel having a tapering cross-section which constricts towards a floor of the annular channel, adapted such that on assembly, end regions of the tubular microporous layer are compressed within the channels against the channel-defining wall faces of the end caps; and the filter medium layer forming an impermeable compression seal with the respective channel-defining walls of the end caps.

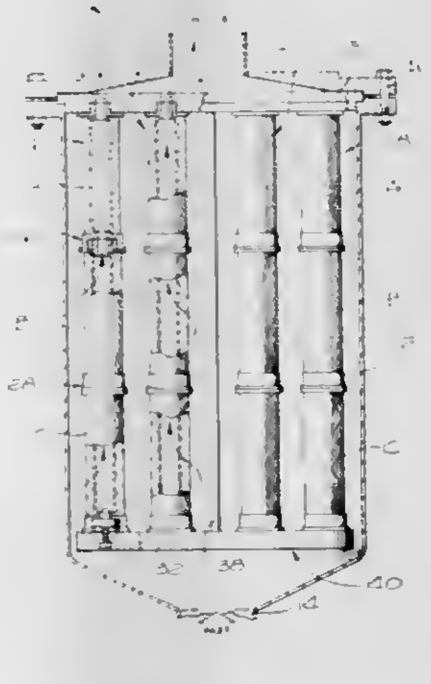
4,105,562
FILTERING APPARATUS WITH MODULAR FILTER ELEMENTS

Stephen J. Kaplan, Woodland Hills, and Rodolfo Gaba, Simi Valley, both of Calif., assignors to Textron Inc., Providence, R.I.

Continuation of Ser. No. 683,880, May 6, 1976, abandoned. This application May 9, 1977, Ser. No. 794,890

Int. Cl.² B01D *29/24*

U.S. Cl. 210—232 **9 Claims**



1. Filter apparatus constructed of metallic tubular modular interchangeable filter elements for filtering fluids having a high viscosity, a high temperature and a high pressure comprising:

A. a plurality of filter means including a plurality of tandemly threadably interconnected metallic tubular modular filter elements, each of said metallic tubular modular filter elements including:
   1. a metallic filter member including a perforate tubular member and a filter media of metallic fiber;
   2. a first metal end fitting having a first metal surface and being permanently affixed to one end of said tubular member, and having male threads formed of a first type of stainless steel;
   3. a second metal end fitting having a second metal surface and being permanently affixed to the other end of said tubular member, and having female threads formed of a second type of stainless steel;
   4. said first and second end fittings adapted for threadably mating with each other with said first and second metal surfaces on adjacent elements in metal-to-metal sealing engagement when said modular filter elements are tandemly interconnected to form a filter means, said metal-to-metal seal being the only seal between adjacent modular filter elements; and
   5. said threaded portions of said first and second fittings being constructed of dissimilar stainless steel non-galling metals;

B. a metal header assembly defining a plurality of threaded recesses adapted for threadably receiving said first end fitting on one of said modular elements;

C. a metal base assembly including plug means adapted for receiving and retaining said second end fitting on another of said modular elements; and

D. a metal housing surrounding said header and base assemblies with said plurality of filter means supported therebetween.

4,105,563

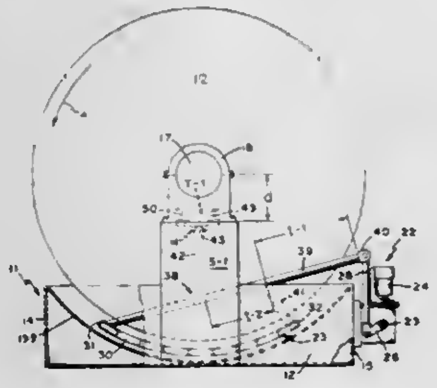
CONTINUOUS DRUM FILTER WITH IMPROVED AGITATOR STRUCTURE

Vaino J. Kosonen, West Redding, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jun. 6, 1977, Ser. No. 788,265

Int. Cl.^{2} B01D *33/34*

U.S. Cl. 210—383 **21 Claims**



1. In a continuous rotary drum filter unit comprising a rotary filter drum having a pair of end trunnions, a filter vat having feed means for supplying feed suspension to the vat, to be subjected to filtration by said drum, a pair of main bearings for the respective trunnions, associated with respective ends of the vat in fixed relationship therewith, whereby the filter drum is rotatably supported with the lower portion thereof immersed in the bath of feed suspension in the vat,

the provision of an agitator mechanism for maintaining feed solids in suspension in the vat, which mechanism comprises an agitator frame structure having a curved frame shaped so as to conform substantially to the circular curvature of the filter drum at the underside thereof, and in radially spaced relationship therewith, said agitator frame structure extending within the vat substantially from end to end of the filter drum,

a pair of rubber torsion bearings disposed below the respective trunnsions and aligned so as to define an oscillatory axis for said agitator frame structure, extending parallel to, and spaced vertically downwardly from the trunnions axis,

support means for said torsion bearings, fixedly associated with the respective ends of the vat, said torsion bearings comprising a center vearing pin fixed relative to said support means, a rubber filler in the form of a thick walled annular member surrounding the center pin and secured thereon against rotational slippage, and a housing surrounding said annular rubber member sufficiently tight to prevent slippage between the rubber member and the housing when torque is applied to the housing relative to the fixed center pin, by oscillatory movements imparted to the agitator frame structure,

an end suspension structure extending rigidly from each end of the curved frame towards the respective torsion bearing, and in a plane perpendicular to the oscillatory axis,

a hinge connection between said bearing housing and the associated end suspension structure of the agitator frame structure, with a hinge axis extending at right angles to the trunnion axis,

and actuating means for imparting said oscillating movements to the agitator frame structure.

4,105,564

PAINT STRAINER

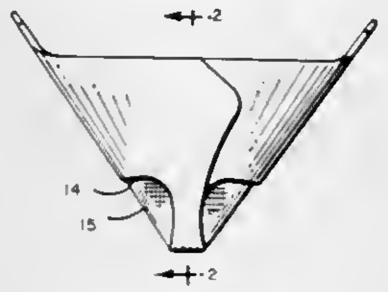
James P. Whelan, Plymouth, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.

Filed May 14, 1976, Ser. No. 686,302

Int. Cl.^{2} B01D *29/10*

U.S. Cl. 210—497 R **1 Claim**

1. A wide-mouthed, conical paint strainer comprised of stiff paperboard constituting a shape-retaining supporting structure for holding a quantity of paint, said structure having an upper open mouth, a downwardly tapering conical side wall and a truncated lower end containing an upwardly concave imperforate bottom which forms interiorly of the structure at the bottom an imperforate elevation bounded by an annular gutter, said side wall containing in its lower half, openings, the lower edges of which coincide with the bottom of the gutter below the apex of the elevation and a cloth covering mesh secured to the side wall at the inner side over said opening and the interior imperforate elevation, said mesh constituting the outer side and bottom of the gutter and said imperforate elevation constituting the inner side of the gutter.



4,105,565

PRODUCTION OF CALCIUM HYPOCHLORITE COMPOSITIONS FROM QUICKLIME AND DICHLORINE MONOXIDE

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 1, 1977, Ser. No. 820,669

Int. Cl.^{2} C09K *3/00;* **C01B** *11/06*

U.S. Cl. 252—1 **10 Claims**

1. A process for the production of a calcium hypochlorite composition which comprises reacting solid granular quicklime and a gaseous mixture of dichlorine monoxide and an inert gas to form a reaction mixture, agitating said reaction mixture and recovering a calcium hypochlorite composition having an available chlorine content of at least 50 percent therefrom, said gaseous mixture containing from 1 to about 30 percent by volume of said dichlorine monoxide.

4,105,566

DISPERSION FOR TIMBER TREATMENT

Glynn Miller, Oldbury, and James E. Stephenson, Birmingham, both of England, assignors to Albright & Wilson Limited, Warley, England

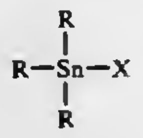
Filed Nov. 1, 1976, Ser. No. 737,333

Claims priority, application United Kingdom, Nov. 4, 1975, 45843/75

Int. Cl.^{2} C09K *3/28;* **B27K** *3/50*

U.S. Cl. 252—8.1 **28 Claims**

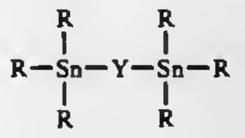
1. An aqueous composition comprising from 0.01% to 2.0% by weight of an organotin compound of the formula I or II



$$\begin{array}{c} R \\ | \\ R-Sn-X \\ | \\ R \end{array}$$

I

or

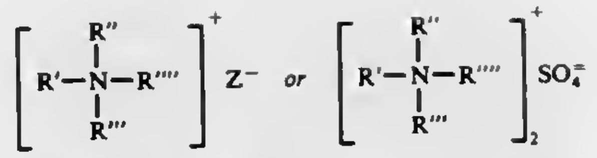


$$\begin{array}{c} R \qquad\quad R \\ | \qquad\quad\; | \\ R-Sn-Y-Sn-R \\ | \qquad\quad\; | \\ R \qquad\quad R \end{array}$$

II

wherein each R is the same or different alkyl groups having from 1 to 10 carbon atoms, Y is an oxygen atom or a sulphur atom, and X is a halogen atom, an acetate group or an acrylate or methacrylate group;

from 0.02% to 15.0% by weight of a quaternary ammonium salt having the formula



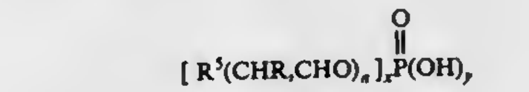
$$\left[\begin{array}{c} R'' \\ | \\ R'-N-R'''' \\ | \\ R''' \end{array}\right]^{+} Z^{-} \quad or \quad \left[\begin{array}{c} R'' \\ | \\ R'-N-R'''' \\ | \\ R''' \end{array}\right]^{+}_{2} SO_4^{=}$$

wherein R" and R''' are selected from the group consisting of alkyl groups having from 1 to 6 carbon atoms, R' is a benzyl group, a nuclear alkylated benzyl group having an alkyl substituent containing from 8 to 15 carbon atoms, or an alkyl group having from 8 to 20 carbon atoms, R'''' is a phenyl oxyalkylene group containing from 1 to 6 oxyalkylene groups or an alkyl group having from 8 to 18 carbon atoms, and Z is a halide;

from 0.1% to 55% by weight of a mixture of the ammonium salts of a plurality of polyphosphoric acids which mixture has been produced by the neutralization of an aqueous solution comprising from 80 to 86% by weight of phosphorus pentoxide with ammonia or a basic derivative thereof at a temperature of from 15 to 70° C and a pH of from 4 to 12 to substantially avoid any hydrolysis of the polyphosphoric acid species present;

from 0.05% to 30% by weight of a derivative of carbamic acid selected from the group consisting of urea, dicyandiamide and quanidine;

from 0.02% to 3.0% by weight of one or more hydrotropes selected from the group consisting of (i) phosphate esters of the formula



$$[R^5(CHR_1CHO)_n]_x\overset{O}{\overset{\|}{P}}(OH)_y$$

wherein R_1 is a hydrogen atom or a methyl group, n has an average value in the range 5.0 to 9.0, R^5 is the same or different branched or straight chain alkyl group or alkyl substituted aromatic hydrocarbon group having from 8 to 15 carbon atoms, x is 1 or 2, $x+y=3$ and the molar ratio of the compounds wherein x has a value of 1 to those wherein x has a value of 2 is in the range 1.3 : 1 to 10.0 : 1, and (ii) the alkali metal or ammonium salts of a xylene sulphonic acid (all weights being expressed on the dry weight of the dispersion); and

at least 55% by weight of water (based on the weight of the aqueous dispersion).

4,105,567

ORGANOSILICON COMPOUNDS AND TEXTILE FIBER FINISHES CONTAINING THEM

Götx Koerner, Essen, and Hans-Jürgen Patzke, Gelsenkirchen-Resse, both of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

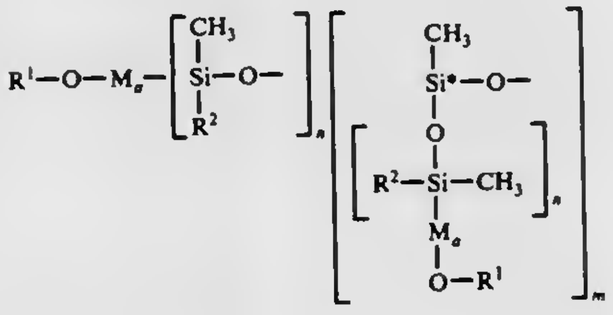
Filed Jan. 4, 1977, Ser. No. 756,681

Claims priority, application United Kingdom, Feb. 12, 1976, 05602/76

Int. Cl.^{2} D06M *13/10*

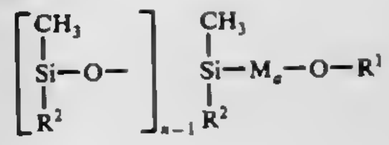
U.S. Cl. 252—8.6 **13 Claims**

1. Compounds of the general formula



$$R^1-O-M_a-\left[\begin{array}{c} CH_3 \\ | \\ Si-O- \\ | \\ R^2 \end{array}\right]_n \left[\begin{array}{c} CH_3 \\ | \\ Si^*-O- \\ | \\ \left[\begin{array}{c} O \\ | \\ R^2-Si-CH_3 \end{array}\right]_n \\ | \\ M_a \\ | \\ O-R^1 \end{array}\right]_m$$

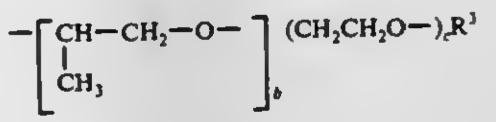
-continued



$$\left[\begin{array}{c} CH_3 \\ | \\ Si-O- \\ | \\ R^2 \end{array}\right]_{n-1} \begin{array}{c} CH_3 \\ | \\ Si-M_a-O-R^1 \\ | \\ R^2 \end{array}$$

in which

R^1 is an alkylated phenyl residue,



$$-\left[\begin{array}{l} CH-CH_2-O- \\ | \\ CH_3 \end{array}\right]_b (CH_2CH_2O-)_cR^3$$

in which

R^3 is an alkyl residue with 1 to 16 carbon atoms, an acyl residue with 1 to 12 carbon atoms, or a hydrocarbon substituted aryl residue,

b has a value of 0 to 2, and

c has a value of 1 to 30, or

a trimethylsilyl residue,

and wherein the average molecule contains 5 to 40 Si atoms, of which at most 20 mole percent are Si* atoms and 0.2 to 5 are alkylated phenyl residues which are linked directly to Si atoms via M_a-O bonds, and 0.2 to 5 polyether blocks, and

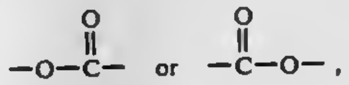
M is a bivalent substituted hydrocarbon residue, the indices

n is 2.5 to 20,

m is 0 to 5, and

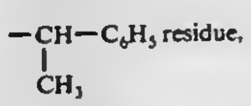
a is 0 or 1,

R^2 is a substituted alkyl residue with 1 to 16 carbon atoms, whose carbon chain may be interrupted by the groupings



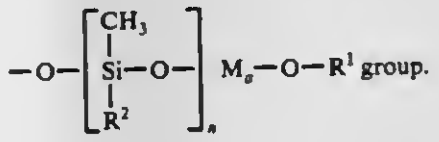
$$-O-\overset{O}{\overset{\|}{C}}- \quad or \quad -\overset{O}{\overset{\|}{C}}-O-,$$

the M_a-O-R^1 residue, or the



$$\begin{array}{l} -CH-C_6H_5 \text{ residue,} \\ \;\; | \\ \;\; CH_3 \end{array}$$

R^4 is an alkyl residue with 1 to 16 carbon atoms, or the



$$-O-\left[\begin{array}{c} CH_3 \\ | \\ Si-O- \\ | \\ R^2 \end{array}\right]_n M_a-O-R^1 \text{ group.}$$

4,105,568

FINISH FOR POLYESTER FILAMENTARY YARNS

Robert Moore Marshall, Chester, and Kimon Constantine Darboufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

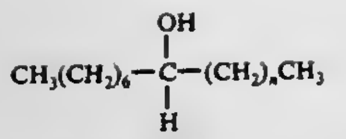
Division of Ser. No. 653,974, Jan. 30, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,719

Int. Cl.^{2} D06M *13/52*

U.S. Cl. 252—8.6 **1 Claim**

1. A two-part liquid finish particularly for application to polyethylene terephthalate filamentary yarn prepared by a process involving spinning and drawing steps, comprising:

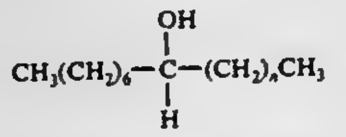
(a) a first composition consisting essentially of about 10 to 20 weight percent of said composition of refined coconut oil, about 10 to about 20 weight percent of said composition of a stearic acid ester prepared from a mixture of secondary alcohols having the general chemical structure



$$\mathrm{CH_3(CH_2)_6{-}\overset{OH}{\underset{H}{C}}{-}(CH_2)_nCH_3}$$

where *n* is 5–6, about 3.0 to about 6.0 weight percent of said composition of ethoxylated tallow amine, about 10 to about 20 weight percent of said composition of ethoxylated lauryl alcohol, about 8.0 to about 12.0 weight percent of said composition of sodium salt of alkylarylsulfonate, about 1.0 to about 3.0 weight percent of said composition of dinonyl-sodium-sulfo-succinate, and about 35 to 50 weight percent of said composition of white mineral oil having a boiling point of between 510° and 620° F., said first composition being applied to said yarn as a spinning finish prior to drawing said yarn; and

(b) a second composition consisting essentially of about 13 to about 25 weight percent of said composition of a compound selected from the group consisting of glycerol monooleate and decaglycerol tetraoleate with ethoxylated tall oil fatty acids, about 12 to about 20 weight percent of said composition of a compound selected from the group consisting of sulfated glycerol trioleate and ethoxylated tallow amine, and about 55 to about 75 weight percent of said composition of a stearic acid ester prepared from a mixture of secondary alcohols having the general chemical structure



$$\mathrm{CH_3(CH_2)_6{-}\overset{OH}{\underset{H}{C}}{-}(CH_2)_nCH_3}$$

where *n* is 5–6, said second composition being applied to said yarn after drawing said yarn, whereby said yarn provides improved performance when said yarn is used in tire cord in pneumatic tires.

4,105,569
YARN FINISH FORMULATION

Roger J. Crossfield, Matthews, N.C., assignor to George A. Goulston Co., Ltd., Monroe, N.C.

Filed Feb. 7, 1977, Ser. No. 766,281

Int. Cl.^{2} D06M *13/10*

U.S. Cl. 252—8.6 **26 Claims**

1. In a yarn finish formulation comprising a major amount of a mineral oil and a minor viscosity improvement amount of a long molecular chain polymeric viscosity index improver, the improvement comprising a minor surface tension and mist reduction amount of a polysiloxane present in said yarn finish formulation.

4,105,570
OIL RECOVERY BY SURFACTANT WATERFLOODING

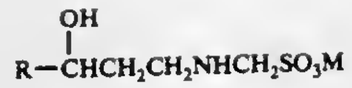
Stamoulis Stournas, Flemington, N.J., and Joseph J. Dickert, Jr., Lower Makefield Township, Bucks County, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,594

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 252—8.55 D **4 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous liquid containing a water-soluble anionic surfactant characterized by the formula



$$\mathrm{R{-}\overset{OH}{C}HCH_2CH_2NHCH_2SO_3M}$$

wherein

R is an aliphatic hydrocarbon group or an aliphatic-substituted aryl hydrocarbon group providing a lipophilic base, and

M is an alkali metal, ammonium, or substituted ammonium ion.

4,105,571
LUBRICANT COMPOSITION

Harold Shaub, New Providence, and Walter E. Waddey, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 22, 1977, Ser. No. 826,544

Int. Cl.^{2} C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E **19 Claims**

1. A storage stable lubricating oil composition comprising a major portion of lubricating oil, from about 0.01 to about 5.0 parts by weight of zinc dihydrocarbyl dithiophosphate, from about 0.01 to about 1.0 parts by weight of an ester of a polycarboxylic acid with a glycol and from about 0.1 to about 30 parts by weight of an ashless dispersant containing a high molecular weight aliphatic hydrocarbon oil solubilizing group attached thereto, all weights based on 100 parts by weight of said lubricating oil.

4,105,572
FERROMAGNETIC TONER CONTAINING WATER-SOLUBLE OR WATER-SOLUBILIZABLE RESIN(S)

Emery John Gorondy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1976, Ser. No. 672,554

Int. Cl.^{2} H01F *1/00, 1/26;* **G03G** *9/08*

U.S. Cl. 252—62.1 P **54 Claims**

1. Ferromagnetic toner for magnetically printing a substrate, said toner comprising:
(a) at least one ferromagnetic component;
(b) at least one member of the group consisting of dye and chemical treating agent, said agent being selected from the group consisting of flame-retarding agent, biocide, ultraviolet light absorber, fluorescent brightener, dyeability modifier, soil-release agent and water-proofing agent; and
(c) a readily fusible, aqueous scour-removable water-soluble or water-solubilizable resin which substantially encapsulates (a) and (b).

4,105,573
DISHWASHER DETERGENT COMPOSITION

Ronald Lowell Jacobsen, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 1, 1976, Ser. No. 728,579

Int. Cl.^{2} C11D *7/56*

U.S. Cl. 252—99 **6 Claims**

1. An automatic dishwashing composition consisting essentially of:
(a) from about 10 to about 90% by weight of alkaline detergency builders selected from the group consisting of sodium and potassium, orthophosphates, pyrophosphates, tripolyphosphates, carbonates, bicarbonates, hydroxides, silicates, water insoluble aluminosilicates, citrates, nitrilotriacetates, ethylenediamintetraacetates, oxydisuccinates, and mellitates;
(b) from 0 to about 90% by weight of an inert filler material selected from the group consisting of sodium sulfate, potassium sulfate, and starch;
(c) from 0 to about 10% by weight of chlorine-yielding bleach on an anhydrous basis selected from the group

consisting of sodium and potassium dichlorocyanurates and chlorinated trisodium phosphate;
(d) from about 0.1 to about 5% by weight of sodium or potassium random alkyl phosphonate wherein the alkyl chain contains from about 10 to 24 carbon atoms;
(e) from about 1 to about 15% by weight of a surfactant selected from the group consisting of a condensation product of fatty alcohol containing from 14 to 15 carbon atoms and from about 8 to 10 moles of ethylene oxide per mole of alcohol; condensation product of fatty alcohol containing from 12 to 13 carbon atoms with from about 6 to about 12 moles of ethylene oxide per mole of alcohol; and mixtures thereof;
(f) up to about 60% by weight water or low molecular weight water-soluble organic solvent, which is a short chain alcohol containing from about 1 to about 4 carbon atoms the pH of the composition at usage concentrations being from 8.5 to about 11 said automatic dishwashing composition being prepared by a process wherein components (d) and (e) are thoroughly premixed prior to adding these ingredients to the remainder of the composition.

4,105,574
PROCESS FOR FORMULATING A NON-CAUSTIC OVEN CLEANER WHICH WILL REMOVE PYROLYZED FAT EFFICACIOUSLY

Vincent Culmone, Passaic, and Thaddeus J. Kaniecki, Pompton Plains, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 543,844, Jan. 24, 1975, abandoned. This application May 10, 1976, Ser. No. 685,037

Int. Cl.^{2} B08B *3/08;* **C11D** *3/12, 3/14, 3/20*

U.S. Cl. 252—154 **2 Claims**

1. A non-caustic alkaline, water-based oven cleaner composition capable of removing substantially all of baked on organic matter, said composition consisting essentially by weight, of about 0.3 to 5 percent of a synthetic, hydrous sodium magnesium silicate of the following composition: 57.4% SiO_2, 25.4% MgO, 0.95%Li_2O, 2.78% Na_2O, 0.04% Fe_2O_3, 0.26% Al_2O_3, 0.05% CaO, 0.4% SO_3, 0.3% CO_2, 5% H_2O; about 5 to 15 percent monoethanolamine, about 5 to 15 percent of an etherfied alkylene glycol solvent, about 1 to 5 percent of at least one anionic surfactant and about 0.5 to 5 percent of at least one nonionic surfactant, the balance being water, said composition being capable of forming a stable foam barrier on the surface to be cleaned, whereby there is substantially no flow of said cleaner on vertical surfaces.

4,105,575
PARTIAL RESOLUTION OF PENTAERYTHRITOL WASTE LIQUORS

Paul Engene Eckler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 12, 1976, Ser. No. 731,191

Int. Cl.^{2} C07C *31/24*

U.S. Cl. 252—182 **7 Claims**

1. A method for partially resolving the components of a pentaerythritol waste liquor which contains pentaerythritol, polypentaerythritols, organic syrups, water and is substantially saturated with an alkali metal formate, comprising the steps of:
acidifying the waste liquor with an acid selected from the group consisting of sulfuric acid, phosphoric acid, hydrochloric acid, and nitric acid at a concentration of from about 90% to about 125% of an amount equivalent to the alkali metal formate, thereby converting the alkali metal formate to formic acid and a partially precipitated alkali metal salt;
adding to the acidified waste liquor a lower organic alcohol of from 1 to about 3 carbon atoms in an amount sufficient to react with the formic acid to form a formate ester and to precipitate substantially all of the alkali metal salt which was not precipitated in the acidification step; thereby forming an alcoholic waste liquor;
removing the formate ester from the alcoholic waste liquor by distillation to form a formate-free waste liquor; and
removing the precipitated alkali metal salt from the formate-free waste liquor.

4,105,576
SPILL CONTROL COMPOSITION AND USE THEREOF

James W. Seldenberger, Bethlehem, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Feb. 4, 1977, Ser. No. 765,798

Int. Cl.^{2} C09K *3/00*

U.S. Cl. 252—190 **6 Claims**

1. An essentially homogeneous graular composition useful for the control and cleanup of liquid caustic spills comprising: from about 51.0 to about 81.0% by weight citric acid, about 12.0 to about 21.0% by weight expanded perlite, about 12.0 to about 12.0% by weight flour, about 1.2 to about 2.1% by weight fumed silica, about 0.01 to about 0.50% by weight of a pH indicator changing color in the range of about pH 6.0 to 8.0 and about 1.0 to about 3.0% by weight water and wherein the flour is selected from the group consisting of wheat, gluten, rye, barley, oat, arrowroot and tapioca flour.

4,105,577
FILTER GLASS

Toshiharu Yamashita, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,895

Claims priority, application Japan, Dec. 2, 1976, 51/145150

Int. Cl.^{2} C03C *3/16, 3/30;* **F21V** *9/08;* **G02B** *5/22*

U.S. Cl. 252—300 **1 Claim**

1. A filter glass which absorbs light of wavelengths in the range of about 400 to about 500 mμ when NiO is present alone and which additionally absorbs light of wavelengths in the range of about 400 to about 500 mμ and about 600 to about 700 mμ when both NiO and CuO are present, consisting essentially of
(a) 100 parts by weight of a base glass consisting of, by weight, 65 to 85% of P_2O_5; 3 to 10% of Al_2O_3; 0 to 18% of MgO, 0 to 25% of CaO, 0 to 30% of ZnO, with the total proportion of MgO + CaO + ZnO being 10 to 30%; 0 to 15% of SrO and/or BaO; 0 to 10% of PbO; 0 to 10% of at least one of Li_2O, Na_2O and K_2O; and 0 to 5% of B_2O_3, ZrO_2, TiO_2 or La_2O_3;
(b) 0.01 to 1.0 part by weight of NiO; and
(c) 0 to 2.0 parts by weight of CuO.

4,105,578
ORGANOPHILIC CLAY HAVING ENHANCED DISPERSIBILITY

Claude Malcolm Finlayson, and John W. Jordan, both of Houston, Tex., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 749,323, Dec. 10, 1976, which is a continuation-in-part of Ser. No. 573,967, May 2, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,099

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—316 **5 Claims**

1. An organophilic clay gellant having enhanced dispersibility in organic systems and capable of increasing the viscosity of a liquid organic system without the addition of a polar organic dispersant, comprising the reaction product of a methyl benzyl dialkyl ammonium compound, wherein the compound contains 20 to 35% alkyl groups having 16 carbon atoms and 60 to 75% alkyl groups having 18 carbon atoms, and a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay, and wherein the amount of said ammonium compound is from 100 to 120 milliequivalents per 100 grams of said clay, 100% active clay basis.

4,105,579
PROCESS FOR PRODUCING PHARMACEUTICAL GRADE ALUMINUM HYDROXIDE GELS

Green Bateman Glasscock, Lewes, Del., assignor to Barcroft Company, Lewes, Del.

Filed Mar. 4, 1976, Ser. No. 663,652

Int. Cl.² B01J *13/00*

U.S. Cl. 252—317 **5 Claims**

1. A process for producing aluminum hydroxide gels which comprises combining water, a water soluble salt of aluminum selected from the group consisting of aluminum chloride, aluminum sulfate and aluminum nitrate, and a water insoluble alkaline earth carbonate under heterogeneous reaction conditions while maintaining a reaction pH between 4.7 and 5.5 and isolating the aluminum hydroxide gel.

4,105,580
POLYGLYCEROL NON-IONIC SURFACE ACTIVE AGENTS AND PROCESS FOR PREPARING THE SAME FROM CRUDE GLYCIDOL

Henri Sebag, Paris, and Guy Vanlerberghe, Commune de Villevaude, both of France, assignors to L'Oreal, Paris, France

Filed Oct. 20, 1976, Ser. No. 734,367

Claims priority, application Luxembourg, Oct. 23, 1975, 73632

Int. Cl.² B01F *17/22*

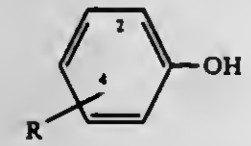
U.S. Cl. 252—351 **10 Claims**

1. A two stage process for preparing a water-soluble non-ionic surface active agent comprising, in a first stage (a) reacting glycerol monochlorohydrin with a strong base in the presence of a solvent at a temperature between 10° and 35° C for a period ranging from 15 minutes to 1 hour to produce a solution of crude glycidol; (b) neutralizing the said solution of crude glycidol with a strong acid whereby a salt is formed, separating a major portion of the thus formed salt from the said solution of crude glycidol, the said solution of crude glycidol containing from 0 to 0.1 mole of unreacted glycerol monochlorohydrin per mole of glycidol present in said solution; and in a second stage (c) condensing the said solution of crude glycidol resulting from step (b) with an organic compound containing an active hydrogen in the presence of an effective amount of an alkaline catalyst to produce said non-ionic surface active agent, said organic compound being selected from the group consisting of

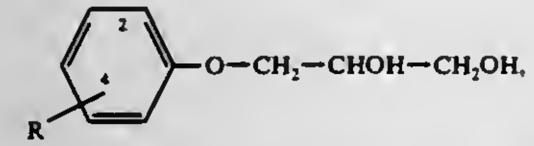
(1) alkyl mercaptan having the formula R_1SH wherein R_1 represents alkyl having from 8 to 18 carbon atoms,

(2) glycerol alkyl thioether having the formula $R_1—S—CH_2—CHOH—CH_2OH$ wherein R_1 represents alkyl having from 8 to 18 carbon atoms,

(3) alkyl phenol having the formula



or glycerol alkyl phenyl ether having the formula



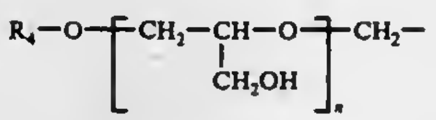
wherein one of the carbon atoms in the 2- and 4- positions is linked to R wherein R is alkyl having from 8 to 18 carbon atoms and the other of said carbon atoms is linked to a member selected from the group consisting of alkyl having from 1–8 carbon atoms and hydrogen,

(4) 1,2-α-diol of the formula $R_2—CHOH—CH_2OH$ wherein R_2 is selected from the group consisting of

(i) straight chain alkyl having 6–16 carbon atoms or a mixture thereof,

(ii) $R_3—CHOH—S—CH_2—$,

(iii) $R_3—CHOH—CH_2—O—CH_2—$,



$$R_4-O-\left[CH_2-\underset{\displaystyle CH_2OH}{\underset{|}{CH}}-O\right]_n-CH_2-$$

(v) a mixture of (ii) to (iv),

wherein R_3 represents alkyl having 8–18 carbon atoms or a mixture thereof, R_4 represents a member selected from the group consisting of alkyl having 8–18 carbon atoms or a mixture thereof and a mixture of aliphatic and alicyclic radicals having up to 30 carbon atoms and being derived from lanolin alcohols, and *n* represents a whole or decimal number from 0 to 2, said number representing a definite value or a statistical average value, and

(5) fatty acid diglycolamide having the formula $R_5—CONH—CH_2—CH_2—O—CH_2—CH_2OH$ wherein R_5 represents alkyl or alkenyl having 7–17 carbon atoms or a mixture thereof.

4,105,581
CORROSION INHIBITOR

David R. Sexsmith, Kinnelon, N.J., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Feb. 18, 1977, Ser. No. 769,918

Int. Cl.² C09K *3/00*

U.S. Cl. 252—389 A **14 Claims**

1. In a corrosion inhibitor including a corrosion inhibiting amount of (a) a water soluble polyphosphate or alkali metal phosphate and (b) a water soluble phosphonate or salt thereof, the improvement comprising:

said composition further including a corrosion inhibiting amount of (c) a polymer selected from the group consisting of the homopolymers of maleic acid and maleic anhydride and mixtures thereof.

4,105,582
COMPOSITION FOR THE CONTROL OF CORROSION AND FOAMING IN THE ACRYLONITRILE PLANTS

Yoshiharu Oguro, Tsu, Japan, assignor to Nalco-Hakuto Chemical Company, Tokyo, Japan

Filed Jun. 23, 1977, Ser. No. 809,480

Int. Cl.² C09K *3/00*

U.S. Cl. 252—392 **2 Claims**

1. A method for the inhibition of corrosion in acrylonitrile production systems of the type wherein propylene is reacted with ammonia in the presence of oxygen and a catalyst which comprises adding to the process stream after it has made contact with the catalyst from 1–100ppm of a composition comprising:

A. From 1–40% by weight water;

B. From 1–40% by weight of an ethylene glycol monoalkylether;

C. From 5–50% by weight of a polypropylene glycol having a molecular weight of from 2,500 to 5,000; and,

D. From 10–55% by weight of a glyoxalidine salt of a dicarboxylic acid in which the glyoxalidine portion of the molecule is obtained by reacting an aliphatic polyamine from the group consisting of amino ethanol amine, diethylene triamine, and triethylene tetraamine with a fatty acid containing 6–22 carbon atoms.

4,105,583
THERMOCHROMIC PAINT FOR USE ON PLASTIC SUBSTRATES

Leon C. Glover, Los Altos, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 460,124, Apr. 11, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 635,951

Int. Cl.² C09K *3/00;* **G01K** *11/12;* **C09D** *5/08, 5/26*

U.S. Cl. 252—408 **9 Claims**

1. In a thermochromic paint for use on a plastic substrate and containing a thermochromic pigment, said pigment being a metallic compound and being dispersed in a suitable binder, the improvement being the addition to the paint of a non-thermochromic compound in amounts effective to inhibit degradation of the substrate by the thermochromic pigment, said non-thermochromic compound being selected from the group consisting of the sulfates, hydrated sulfates and nitrides of boron, aluminum, tin, lead, arsenic, antimony, bismuth, zinc and phosphorus; the sulfides and hydrated sulfides of boron, aluminum, bismuth and phosphorus; the oxides and hydrated oxides of boron, arsenic, and antimony; the salts, organic derivatives and free acids of the oxyanions of boron, arsenic, and antimony; and the oxides, and salts and organic derivatives of. the oxyanions of phosphorus.

4,105,584
PROCESS FOR PREPARING A DISPERSION

Håkan Nils Norbäck, and Benkt Göran Rurik Asp, both of Stockholm, Sweden, assignors to KemaNobel AB, Stockholm, Sweden

Filed Jul. 13, 1976, Ser. No. 704,868

Claims priority, application Sweden, Jul. 29, 1975, 7508603

Int. Cl.² B01J *31/02, 27/20*

U.S. Cl. 252—426 **3 Claims**

1. A process for the preparation of stable aqueous dispersions of solid peroxydicarbonates having unchanged active peroxide content, characterized in that a slurry of water, dispersing agent and peroxydicarbonate is dispersed in an ultrasonic homogenizer, said solid peroxydicarbonate being selected from the group consisting of dialkyl peroxydicarbonates and cycloalkyl peroxydicarbonates.

4,105,585
POLYMERISATION CATALYST

Ian Alastair Matheson, Edinburgh, Scotland, assignor to BP Chemicals Limited, London, England

Filed May 18, 1977, Ser. No. 798,178

Claims priority, application United Kingdom, May 24, 1976, 21332/76

Int. Cl.² C08F *4/64, 4/66*

U.S. Cl. 252—429 B **9 Claims**

1. A process for making a Ziegler catalyst comprising reacting together magnesium metal and a titanium compound having the general formula $Ti(OR)_{4-n}X_n$ wherein *n* has a value from 4 to 1 inclusive, X is halogen and R is a hydrocarbon group, in the presence of an aliphatic alcohol having 1 to 6 carbon atoms, said titanium compound being employed in an amount of from about 3 to 0.5 moles per gramme atom of magnesium metal and said alcohol being present in an amount of from about 0.1 to 5 moles per gramme atom of magnesium metal.

4,105,586
OXIDATION CATALYSTS AND PROCESS FOR PREPARING ANHYDRIDE FROM ALKANES

Ralph O. Kerr, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Feb. 10, 1977, Ser. No. 767,499

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.² B01J *27/14;* **C07D** *307/60*

U.S. Cl. 252—437 **7 Claims**

1. A catalyst composition for use in the partial oxidation of C_4 to C_{10} alkane hydrocarbons to anhydride consisting of vanadium, phosphorus, oxygen and a modifying component consisting of

I. (a) the elements Nb, Cu, Mo, Ni, Co and Cr, and

(b) one or more elements selected from the group consisting of Y, Sm, Tb and Eu, or

II. (a) the elements Nb, Cu, Mo, Ni, Co and Cr,

(b) one or more of the elements selected from the group consisting of Ce, Nd, Ba, Hf, U, Ru, Re, Li and Mg, and

(c) one or more elements selected from the group consisting of Y, Sm, Tb and Eu,

wherein the atomic ratio of vanadium:phosphorus:Nb:Cu:Mo:Ni:Co:Ce:Nd:Cr:Ba:Hf:U:Ru:Re:Li:Mg:Y:Sm:Tb:Eu is 1:0.90 to 1.3:0.001 to 0.125:0.022 to 0.201: 0.0025 to 0.40: 0.0022 to 0.045: 0.004 to 0.066: 0.0054 to 0.20: 0.0022 to 0.20: 0.0003 to 0.003: 0.0023 to 0.0585:0.0023 to 0.0409:0.0033 to 0.0993: 0.0002 to 0.02015: 0.0002 to 0.0074: 0.0072 to 0.179:0.0088 to 0.222: 0.0001 to 0.02: 0.0001 to 0.02: 0.0001 to 0.02: 0.0001 to 0.02, respectively, the total atomic ratio of NB, Cu, Mo, Ni, Co, Ce, Nd, Cr, Ba, Hf, U, Ru, Re, Li, Mg, Y, Sm, Tb and Eu being in the range of 0.033 to 0.4.

4,105,587
PROCESS FOR PRODUCING A PARTICLE PACK COMPOSITION COMPRISING ALUMINA AND THE RESULTING ATTRITION RESISTANT COMPOSITION

Donald W. Blakely, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 16, 1977, Ser. No. 852,016

Int. Cl.² B01J *21/04, 23/84, 27/04, 27/10*

U.S. Cl. 252—439 **11 Claims**

1. In a process for producing a rigidly interconnected pack of pulverable particles having average diameters in the range below about 1.3 mm and comprising aluminum oxide by steps, including (1) drying a dough-like mixture comprising said particles, water and an organic hydrocolloid-forming compound and (2) calcining said dried mixture, the improvement comprising, prior to said calcining, dry steaming said dough-like mixture and/or said dried mixture at a temperature in the range of from about 100° C to 175° C for a period in the range of from about 0.3 to 24 hours, wherein the resulting rigidly interconnected particle pack, relative to a comparable particle pack produced without said steaming, exhibits a substantially improved attrition resistance.

4,105,588
PREPARATION OF COPPER AND SILVER PARTICLES FOR ETHYLENE PURIFICATION

Agostino Balducci, San Donato Milanese; Margherita Corbellini, Milan; Vittorio Mormino, San Donato Milanese; Bruno Notari, San Donato Milanese, and Luigi Rivola, San Donato Milanese, all of Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 574,910, May 6, 1975, abandoned, which is a division of Ser. No. 422,743, Dec. 7, 1973, abandoned. This application Jun. 7, 1977, Ser. No. 804,382

Claims priority, application Italy, Dec. 20, 1972, 33278 A/72

Int. Cl.² B01J *29/00, 29/06, 21/00*

U.S. Cl. 252—454 **3 Claims**

1. The process of preparing a contact material adapted for use in the purification of ethylene said contact material consist-

ing of from 1 to 50% by weight of particles of a finely divided elemental metal selected from Cu and Ag homogeneously dispersed on a carrier selected from the group consisting of zeolites, spheroidal alumina, silica gel, Kieselguhr and colloidal silica, which comprises forming a solution or suspension of a reducible compound of said metal, mixing said carrier therewith, atomizing said mixture at a temperature of from 100° to 500° C so that particles having sizes of from 1 to 250 μ are produced, granulating said particles, and then reducing said compound of said metal to said elemental metal.

4,105,589

HYDRODESULFURIZATION CATALYST

William R. Moser, Wayland, Mass., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 646,632, Jan. 5, 1976. This application Dec. 16, 1976, Ser. No. 751,400

Int. Cl.² B01J *23/10, 23/76, 23/72, 27/04*

U.S. Cl. 252—462 **10 Claims**

1. A hydrodesulfurization catalyst consisting essentially of a hydrogenation component and a refractory oxide support, said hydrogenation component consisting essentially of from about 1 to about 15 weight percent of a rare earth metal component, said rare earth metal component being selected from the group consisting of at least one elemental metal selected from the group having atomic numbers 58 to 71, (a) metal oxides selected from the group consisting of oxides of Pr, Nb, Sm, Eu, Dy, Er and Yb or a metal sulfide of a rare earth metal selected from the group having atomic numbers 58 to 71 and from about 1 to about 5 weight percent of a non-rare earth metal component, said non-rare earth metal component being selected from the group consisting of at least one elemental metal, metal oxide and metal sulfide of a non-rare earth metal selected from the group consisting of Group IB, Group IIB, indium, Group VIB, and iron, cobalt and nickel of Group VIII of the Periodic Table of Elements.

4,105,590

CATALYSTS AND THE PROCESS FOR THEIR PRODUCTION

Edgar Koberstein, Alzenau, and Eduard Lakatos, Rheinfelden, both of Germany, assignors to Deutsche Goldund Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation of Ser. No. 610,033, Sep. 3, 1975, abandoned, which is a continuation of Ser. No. 344,459, Mar. 23, 1973, abandoned. This application Nov. 22, 1976, Ser. No. 744,079

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1972, 2214604

Int. Cl.² B01J *21/04, 23/60, 23/64, 23/74*

U.S. Cl. 252—464 **48 Claims**

1. In an improved process for preparing a catalyst, said process comprising preparing a homogeneous, particulate mixture comprising catalytically active eta- and gamma- alumi- num oxide and more than 50% by weight of at least two metal oxides, one of said metal oxides being chromium oxide and the other metal oxide being selected from the group consisting of titanium oxide, vanadium oxide, manganese oxide, iron oxide, cobalt oxide, nickel oxide, copper oxide and zinc oxide, wherein the improvement comprises impregnating said mixture with a solution of at least one salt of a noble metal selected from the group consisting of palladium, platinum, rhodium, iridium and ruthenium, drying the resulting impregnated composition, and rendering the noble metal impregnant catalytically active by: (a) thermal decomposition in air, (b) oxidation, or (c) reduction; wherein said catalyst contains less than 2 weight percent noble metal component.

4,105,591

METHOD OF PREPARING AND FILTERING COPRECIPITATED NICKEL-ALUMINA CATALYSTS

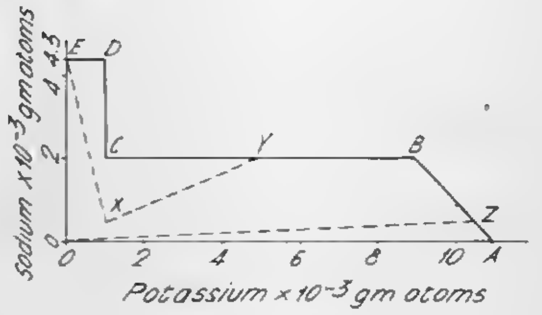
Reginald George Sinclair Banks, and Alan Williams, both of Solihull, England, assignors to British Gas Corporation, England

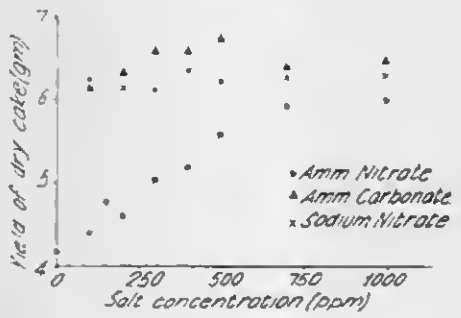
Filed Jul. 12, 1976, Ser. No. 704,410

Claims priority, application United Kingdom, Sep. 29, 1975, 39724/75

Int. Cl.² B01J *21/04, 23/78, 37/02;* **C01B** *2/14*

U.S. Cl. 252—466 J **11 Claims**





1. In a process for the production of nickel-alumina coprecipitated catalyst composition which process comprises producing a slurry of mixed precipitates of water insoluble compounds of nickel and aluminium by coprecipitation from water solution utilizing sodium or potassium precipitants in the essential absence of chemical species having a deleterious effect upon the performance of the catalyst, then washing and filtering the slurry a plurality of times, drying the finally filtered slurry to produce a filter cake and thereafter calcining the cake, the improvement comprising facilitating the washing and filtering of the slurry when the same contains very low levels of sodium and potassium by, during the last washing and filtering operations at least, using as a washing liquor a mixture of water and about 100 ppm of a filtering aid selected from the group consisting of sodium or potassium carbonate or nitrate or about 200 ppm of a filtering aid consisting of ammonium carbonate.

4,105,592

LIQUID DETERGENT COMPOSITIONS

Jerome H. Collins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 481,726, Jan. 21, 1974, abandoned. This application Nov. 6, 1974, Ser. No. 521,414

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.² C11D *1/83, 3/26*

U.S. Cl. 252—545 **11 Claims**

1. A liquid detergent composition consisting essentially of:

(a) from about 20% to about 50% by weight of a nonionic surfactant produced by the condensation of from about 2 moles to about 12 moles of ethylene oxide with one mole of a C_9 to C_{12} alcohol, said nonionic surfactant being characterized by an HLB of from about 8 to about 15, or mixtures thereof;

(b) an anionic surfactant which is a mixture of an alkanolamine and an alkali metal salt of an alkyl benzene sulfonic acid wherein the alkyl group contains from about 9 to about 15 carbon atoms, and wherein said alkanolamine is selected from the group consisting of mono-, di- and triethanolamines, and said alkali metal is selected from the group consisting of sodium and potassium at a weight ratio of nonionic surfactant to anionic surfactant of from about 1.8:1 to about 8:1 based on the free acid form of the anionic surfactant;

(c) at least 1% by weight of free alkanolamine selected from the group consisting of mono-, di- and triethanolamines;

(d) from about 0.15% to about 2% by weight of a C_{10}–C_{22} fatty acid, or mixtures thereof;

(e) from about 1.0% to about 2.5% of an alkali metal base selected from the group consisting of sodium and potassium hydroxides; and

(f) the balance being water or a water-alcohol carrier liquid wherein said alcohol is a monohydric alcohol containing from 1 to about 5 carbon atoms.

4,105,593

METHOD OF RECLAIMING WASTE SHEET FLOORING

Stavros C. Stavrinou, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 8, 1977, Ser. No. 814,129

Int. Cl.² C08J *11/04*

U.S. Cl. 260—2.3 **2 Claims**

1. A process for recovering scrap sheet floor covering material which is composed of at least a felted fibrous backing cured to a non-fibrous resin surface, the steps comprise:

a. dicing said scrap sheet floor covering to reduce it to small pieces,

b. masticating the sheet floor covering pieces in the presence of a plasticizer with a high shear stress blender, moving the mix in the blender not under pressure in a continuous circular path due to centrifugal action, and breaking up the pieces of floor covering and dispersing all its ingredients, and

c. discharging the resulting mix from the blender for use as part of a new mix which can be formed into a floor covering product.

4,105,594

HIGHLY FILLED POLYUREA FOAMS

Dieter Dieterich, Leverkusen, and Peter Markusch, Cologne, both of Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Filed May 18, 1976, Ser. No. 687,579

Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524191

Int. Cl.² C08G *18/10, 18/14;* **C08K** *3/36*

U.S. Cl. 521—100 **8 Claims**

1. A process for the production of highly filled hydrophobic, hard polyurea foams with gross densities of from 10 to 100 Kg/M³ comprising reacting

(a) a polyisocyanate, said polyisocyanate being a liquid water insoluble polyisocyanate, free from ionic groups or groups which are capable of forming ionic groups during the process, said polyisocyanate having a viscosity of more than 200 cP at 25° C, a functionality of greater than 2.1, and an NCO-content of from 20 to 32% by weight, said polyisocyanate being selected from the group consisting of

- (i) phosgenation products of condensates of aniline or anilines alkyl substituted on the nucleus with aldehydes or ketones,
- (ii) solutions of distillation residues accumulating during the production of tolylene diisocyanate, diphenylmethane diisocyanate, or hexamethylene diisocyanate, in monomeric polyisocyanates or in organic solvents,
- (iii) mixtures of said distillation residues,
- (iv) modified polyisocyanates containing carbodiimide groups, allophanate groups, isocyanurate groups, urea groups, or biuret groups, said modified polyisocyanate prepared by modifying polyisocyanates thermally or catalytically by air, water, urethanes, alcohols, amides or amines,
- (v) semi-prepolymers obtained by reacting polyisocyanates (i) through (iv) with glycols or polyols, said semi-prepolymer polyisocyanates containing less than 10% by weight of polyols;

(b) a aqueous suspension of inert minerals or hydraulic binders, said suspension having a solids content of from 30 to 80% by weight, at least 50% by weight of the suspended fillers having the particle size of less than 50 microns;

(c) in the presence of a polyether/polysiloxane foam stabilizer, and in the presence of a tertiary amine catalyst, the weight ratio of component (b) to component (a) being between 1:2 and 6:1, the pH value of the aqueous suspension, together with the tertiary amine catalyst, being above 8.

4,105,595

PROCESS FOR THE PRODUCTION OF HIGHLY ELASTIC POLYURETHANE FOAMS

Karl Heinz Eisenmann, Bergisch-Neukirchen, and Karl Heinz Broch, Leichlingen, both Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Continuation of Ser. No. 610,196, Sep. 4, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 803,717

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1974, 2444331

Int. Cl.² C08G *18/14*

U.S. Cl. 521—159 **3 Claims**

1. In the process for the production of cold hardening polyurethane foams by the reaction of modified polyisocyanates with polyethers containing predominant amounts of primary OH groups and molecular weights in the range from 400 to 10,000 in the presence of water and/or organic blowing agents and optionally catalysts, foam stabilizers, cross-linking agents with active hydrogen atoms and molecular weights in the range from 30 to 400, and other additives, the improvement wherein the mixing head used for the mixing of the foam reactants is preceded by another mixing head for mixing the starting components for said modified polyisocyanates and the catalyst or catalyst mixtures which are necessary for the production of such modified polyisocyanates, and by a reaction zone for carrying out the production of the modified polyisocyanates within a time of from 0.1 seconds to 20 minutes befor forming.

4,105,596

PRODUCTION OF EXPANDABLE BEADS FROM THE THERMOPLASTIC MATERIALS

Jorgen Petersen, Sundsvall, Sweden, assignor to KemaNobel AB, Stockholm, Sweden

Filed Dec. 6, 1977, Ser. No. 858,122

Claims priority, application Sweden, Dec. 10, 1976, 7613937

Int. Cl.² E08J *9/20*

U.S. Cl. 521—56 **4 Claims**

1. In the known process for preparing expandable thermoplastic beads by introducing an aqueous suspension of at least one unsaturated monomer and a blowing agent into a polymerization vessel under polymerization conditions and carrying out polymerization, the improvement which comprises keeping the entire volume of the polymerization vessel filled with liquid throughout the polymerization so as to leave no space for the accumulation of gas in the polymerization vessel.

4,105,597
POLYURETHANE FOAM FROM AN OXYALKYLATED PRODUCT

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 590,332, Jun. 25, 1975, and Ser. No. 590,333, Jun. 25, 1975, Pat. No. 4,052,345, each is a division of Ser. No. 425,524, Dec. 17, 1973, Pat. No. 3,957,922. This application Aug. 15, 1977, Ser. No. 824,279

Int. Cl.^{2} C08G *18/14, 18/48, 18/50*

U.S. Cl. 521—159 **7 Claims**

1. A polyurethane foam system which comprises, based on the total weight of ingredients, two components, the first component comprising
- (A) 20 to about 100 parts of an oxyalkylation polyol product prepared by the process of
  - (1) providing a reaction mixture containing
    - (a) a phenol, at least in an amount sufficient to form a complex with aluminum or iron substances in the mixture,
    - (b) a non-phenolic active hydrogen compound having from 2 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000, and
    - (c) a substance containing aluminum or iron which will form a complex with the phenol (a), in an amount sufficient to form a complex with the phenol (a),
  - (2) heating the mixture to a temperature in the range of from about 80° to about 250° C., and
  - (3) oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product,
- (C) 0.2 to about 2 parts of a polymerization catalyst,
- (D) 0.15 to about 3 parts of a wetting agent, and
- (E) 5 to about 30 parts of a blowing agent, the second (B) components comprising 40 to about 60 parts of a polyarylpolyalkylene polyisocyanate having a functionality of about 2.2 to about 3.3 or of an isocyanate-terminated prepolymer derived from the reaction of a stoichiometric excess of said polyarylpolyalkylene polyisocyanate with said oxyalkylated polyol; wherein the catalyst residues from the production of polyol (A) are not removed prior to use of said polyol in said foam system.

4,105,598
CELL SPECIFIC, VARIABLE DENSITY, POLYMER MICROSPHERES

Shiao-Ping S. Yen; Alan Rembaum, both of Altadena, and Robert S. Molday, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 634,929, Nov. 24, 1975. This application Feb. 3, 1977, Ser. No. 765,453

Int. Cl.^{2} C08F *226/00, 218/00*

U.S. Cl. 521—53 **13 Claims**

1. A method of separating of a specific conjugatible protein from a mixture comprising the steps of:
- covalently binding a conjugate of the specific protein to polymeric beads having an average diameter below 5 microns, having a density less than 1.5 g/cc or greater than 1.30 g/cc and comprising the cross-linked product of an ethylenically unsaturated monomer mixture including at least 10% by weight of a first ethylenically monounsaturated acrylic monomer containing at least one substituent selected from hydroxyl, carboxyl or amino, at least 25% by weight of a second ethylenically monounsaturated comonomer having a density differing from the first monomer by at least 15% selected from vinyl fluorides, vinyl ketones, vinyl ethers, vinyl iodides, vinyl bromides and vinyl siloxanes, and 1-20% of a polyunsaturated cross-linking agent.

4,105,599
PROCESS FOR PRODUCING RIGID POLYURETHANE FOAM

Reishi Naka, and Toshikazu Narahara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 654,914

Claims priority, application Japan, Feb. 21, 1975, 50-20987

Int. Cl.^{2} C08G *18/14, 18/50*

U.S. Cl. 521—131 **8 Claims**

1. A process for producing a rigid polyurethane foam according to one-shot method which comprises reacting a polyol with a polyfunctional organic isocyanate, said polyol having a mixture having an OH number of 420 to 530 which comprises 35 to 65 parts by weight of a reaction product of sucrose with an alkylene oxide and 65 to 35 parts by weight of a reaction product of a trihydroxyalkylamine with an alkylene oxide, and said mixture being free from a phosphorus-containing polyol, in the presence of at least two foaming agents consisting of at least one fluorochlorinated hydrocarbon having 1 to 2 carbon atoms and 0.2 to 2 parts by weight of water per 100 parts by weight of said polyol to form a rigid polyurethane foam having a density of 0.025 gm/cm^3 or less.

4,105,600
NITROGEN CONTAINING CHEMICAL COMPOUNDS AND A PROCESS FOR MAKING POLYURETHANES WITH THE NEW COMPOUNDS AS A CATALYST

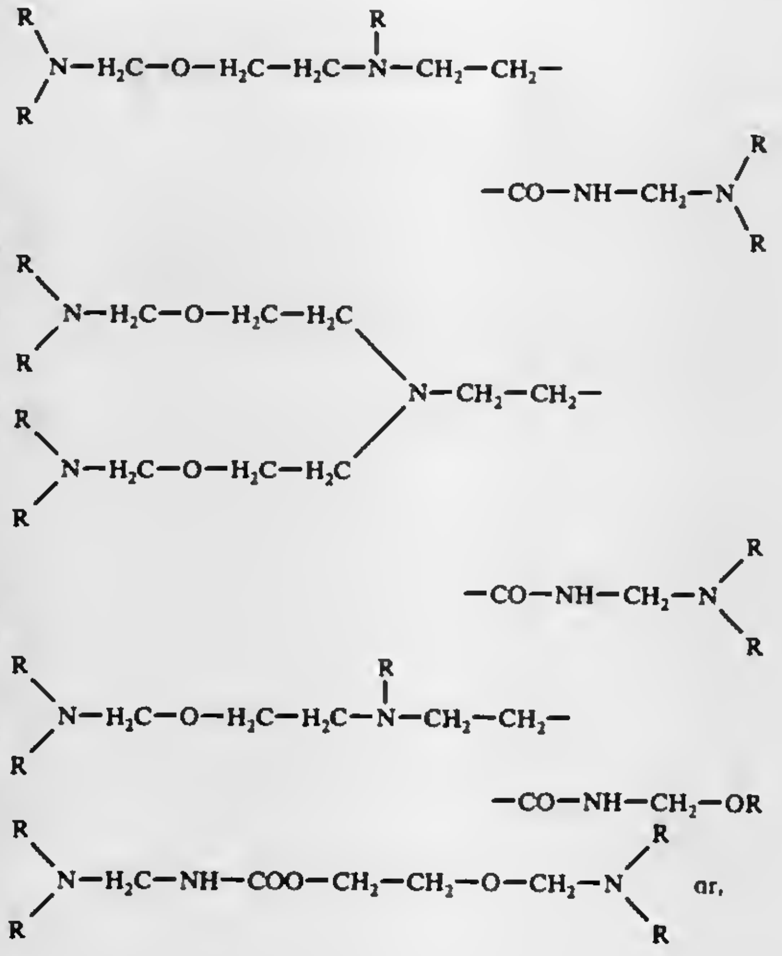
Erwin Müller, and Heinz Thomas, both of Leverkusen, Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Continuation of Ser. No. 466,657, May 3, 1974, abandoned. This application Jan. 12, 1977, Ser. No. 758,536

Int. Cl.^{2} C08G *18/18*

U.S. Cl. 521—129 **8 Claims**

1. In a process for making a polyurethane wherein an organic polyisocyanate is reacted with an organic compound having at least two reactive hydrogen atoms determinable by the Zerewitinoff method, the improvement which comprises including in the reaction mixture a compound having the formula:



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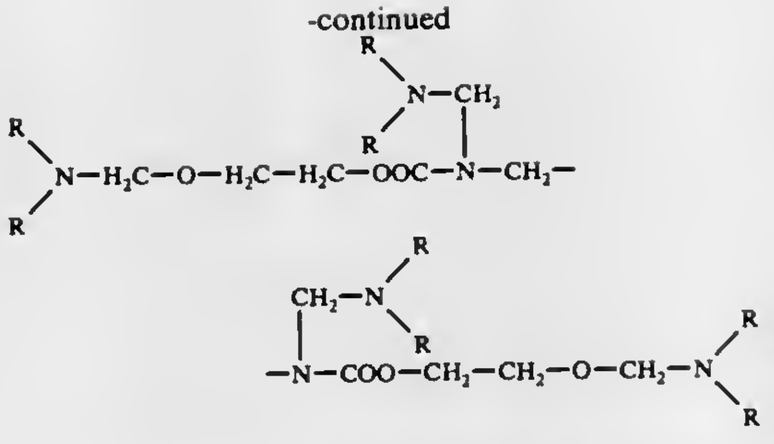


wherein R is an alkyl radical having up to six carbon atoms.

4,105,601
3,3′-CARBONYLBIS(CARBAZATES) AS BLOWING AGENTS

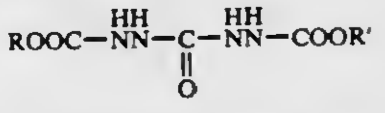
Byron Alexander Hunter, Woodbridge, and Franklin Herbert Barrows, Beacon Falls, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,673

Int. Cl.^{2} C08J *9/10*

U.S. Cl. 521—95 **9 Claims**

1. A method of making a gas-expanded polymeric material which comprises blending a carbonylbis(organocarbazate) having the general formula



$$\mathrm{ROOC-\overset{HH}{NN}-\underset{\underset{O}{\|}}{C}-\overset{HH}{NN}-COOR'}$$

or dihydrates thereof wherein R and R′ are the same or different and are C_1 to C_6 alkyl, C_5 to C_6 cycloalkyl, phenyl or benzyl, with gas-expandable polymeric material and heating the resultant blend to a temperature sufficiently to decompose said carbonylbis(organocarbazate).

4,105,602
SYNTHESIS OF PEPTIDES WITH PARATHYROID HORMONE ACTIVITY

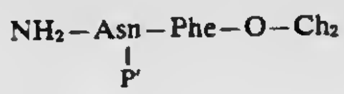
Robert L. Colescott, Bourbonnais, Ill., and Geoffrey W. Tregear, Hawthorne, Australia, assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Feb. 10, 1975, Ser. No. 548,718

Int. Cl.^{2} C08L *37/00;* **C07C** *103/52*

U.S. Cl. 260—8 **9 Claims**

1. A resin peptide having the structure:



$$\mathrm{NH_2-\underset{\underset{P'}{|}}{Asn}-Phe-O-Ch_2-}\textcircled{R}$$

wherein:

R is an insoluble polystyrene resin; and

P′ is hydrogen, xanthydryl or benzhydryl.

4,105,603
PEPTIDES WHICH EFFECT RELEASE OF HORMONES

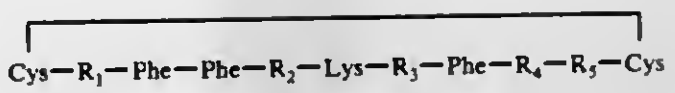
Wylie W. Vale, Jr.; Jean E. F. Rivier, and Marvin R. Brown, all of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Mar. 28, 1977, Ser. No. 781,580

Int. Cl.^{2} C08L *37/00;* **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—8 **7 Claims**

1. A peptide selected from those of the formulae:



$$\mathrm{\overline{Cys-R_1-Phe-Phe-R_2-Lys-R_3-Phe-R_4-R_5-Cys}} \qquad \text{I}$$

$$\mathrm{Cys\text{-}R_1\text{-}Phe\text{-}Phe\text{-}R_2\text{-}Lys\text{-}R_3\text{-}Phe\text{-}R_4\text{-}R_5\text{-}Cys} \qquad \text{II}$$

$$\mathrm{X\text{-}Cys\text{-}(X^1)\text{-}R_1\text{-}Phe\text{-}Phe\text{-}R_2\text{-}Lys(X^2)\text{-}R_3(X^3)\text{-}Phe\text{-}R_4(X^4)\text{-}R_5(X^5)\text{-}Cys\ (X^6)\text{-}R_6} \qquad \text{III}$$

wherein R_1 is selected from the group consisting of Asn and desR_1; R_2 is selected from the group consisting of Trp and D-Trp; R_3 is selected from the group consisting of Phe and Thr; R_4 is selected from group consisting of Thr and desR_4; R_5 is selected from the group consisting of Ser, Phe and desR_5, provided that at least one of R_1, R_4 and R_5 is deleted; X is selected from the group consisting of H, and an alpha-amino protecting group; X^1 and X^6 are selected from the group consisting of H and a protecting group for Cys selected from S-p-methoxybenzyl, S-acetamidomethyl, S-trityl and S-benzyl; X^2 is selected from the group consisting of H and a side chain amino protecting group; X^3, X^4 and X^5 are selected from the group consisting of H and a hydroxyl protecting group selected from the group consisting of acetyl, benzoyl, tert-butyl, trityl, benzyl and benzyloxycarbonyl; with the proviso that at least one of X, X^1, X^2, X^3, X^4, X^5, and X^6 is other than hydrogen; and R_6 is selected from the group consisting of hydroxy, methoxy, and an anchoring bond used in solid phase synthesis linked to a solid resin support selected from the group consisting of —O—CH_2-polystyrene resin support and O—CH_2-benzylpolystyrene resin support.

4,105,604
MOULDING COMPOSITIONS CONTAINING A NOVOLAK PHENOLIC RESIN AND AN AMINE-BORIC ACID STABILIZER-CATALYST

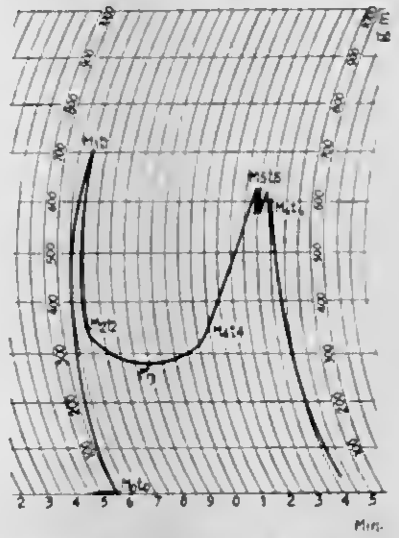
Silvio Vargiu, Casatenovo (Como); Pier Luigi Manzoni, Codogno (Milan); Mario Bernasconi, Maleo (Milan), and Antonio Parodi, Monza (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 15, 1976, Ser. No. 750,933

Claims priority, application Italy, Dec. 19, 1975, 30494 A/75

Int. Cl.^{2} C08L *1/02*

U.S. Cl. 260—17.2 **25 Claims**



1. A thermosetting injection molding composition comprising:
- (a) from 15 to 50 wt.% of Novolak phenolic resin;
- (b) from 3 to 10 wt.% of hexamine;
- (c) from 1 to 4 wt.% of a stabilizing-catalyzing mixture consisting of an amine selected from the group consisting of aliphatic compounds having two or more amino groups, aromatic compounds having one amino group linked to an aromatic ring and aromatic compounds having two or more amino groups linked to one or more aromatic rings, and orthoboric or metaboric acid, wherein the ratio between said amino groups and the number of

acid equivalents in said mixture is from 0.001:1 to 0.3:1;
(d) from 0.5 to 2 wt.% of alkaline earth metal oxide; and
(e) one or more inert fillers.

4,105,605
SULFOMETHYLATED GRAFT COPOLYMERS OF XANTHAN GUM AND POLYACRYLAMIDE

Ian W. Cottrell, Solana Beach, Calif.; Richard A. Empey, Okmulgee, Okla., and Joseph S. Racciato, San Diego, Calif., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Dec. 21, 1976, Ser. No. 753,057
Int. Cl.^{2} C08L *5/00*
U.S. Cl. 260—17.4 GC **10 Claims**

1. A water-soluble graft copolymer of xanthan gum and polyacrylamide containing from about 1 part by weight of xanthan gum to from about 0.3 to about 10 parts by weight of polyacrylamide wherein at least about 10% of the amide functions of the polyacrylamide portion of the copolymer are sulfomethylated.

4,105,606
ADHESIVE FOR THE MANUFACTURE OF PLYWOOD, PARTICLE BOARDS, FIBER BOARDS AND SIMILAR PRODUCTS

Kaj G. Forss, and Agneta G. M. Fuhrmann, both of Helsinki, Finland, assignors to Keskuslaboratorio-Centrallaboratorium Ab, Finland
Continuation-in-part of Ser. No. 604,114, Aug. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 395,901, Sep. 10, 1973, abandoned. This application Jul. 14, 1977, Ser. No. 815,673
Claims priority, application Finland, Sep. 14, 1972, 2527/72; Jan. 28, 1975, 752289; Jan. 28, 1975, 751/74
Int. Cl.^{2} C08L *97/00, 61/14*
U.S. Cl. 260—17.5 **19 Claims**

1. An adhesive for the manufacture of wood products, comprising the combination of (a) a lignin derivative selected from the group consisting of lignosulfonates and alkali salts of alkali lignins, a minimum of 65% by weight of the lignosulfonates and a minimum of 40% by weight of the alkali lignins having a relative molecular weight as determined by gel chromatography in excess of that of glucagon, and (b) a phenol formaldehyde resin.

4,105,607
MODIFIED AIR-DRYING ALKYD RESINS

Hannes Fischer, Taunusstein, and Gerhard Werner, Glashutten, both of Germany, assignors to Hoechst Aktiengellschaft, Frankfurt, Germany
Filed Apr. 28, 1977, Ser. No. 792,054
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618629
Int. Cl.^{2} C09D *3/56, 3/66, 5/08*
U.S. Cl. 260—22 CB **12 Claims**

1. A modified air-drying alkyl resin based on a polycarboxylic acid, a polyhydric alcohol, and a monocarboxylic acid having at least 7 carbon atoms, and additionally at least one chemically incorporated copolymer of (A) dicyclopentadiene or an alkyl derivative thereof and (B) at least one unsaturated compound selected from the group consisting of (B1) an olefinically unsaturated carboxylic acid and a derivative thereof, and (B2) an olefinically unsaturated alcohol,

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4,105,608
HIGH IMPACT COMPOSITION OF RING-OPENING POLYMERIZATION PRODUCT

Junichi Nakamura, Yokohama; Hiroshi Konuma, Kawasaki; Shiro Kokuryo; Takashi Ueshima, both of Yokohama, and Chutatsu Tsuge, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan
Filed May 6, 1975, Ser. No. 574,932
Claims priority, application Japan, May 8, 1974, 49-50219
Int. Cl.^{2} C08L *91/00*
U.S. Cl. 260—23 R **7 Claims**

1. Compositions having high impact strength comprising (A) 100 parts by weight of at least one ring-opening polymerization product selected from the group consisting of (a) ring-opening polymerization homopolymers of norbornene derivatives containing at least one nitrile group or substituent including a nitrile group, (b) ring-opening polymerization homopolymers of norbornene derivatives containing at least one ester group or substituent including an ester group, (c) ring-opening polymerization copolymers of combination of said norbornene derivatives, and (d) other ring-opening polymerization copolymers of any of said norbornene derivatives and 50 mol% at most of unsaturated cyclic compounds; and(B) 0.05 to 10 parts by weight of metal salts of fatty acids selected from the group consisting of metal salts of saturated mono- and dibasic fatty acids containing 6 to 20 carbon atoms, metal salts of unsaturated fatty acids containing 11 to 24 carbon atoms and hydroxy and halogen derivatives of said metal salts of saturated and unsaturated fatty acids.

4,105,609
DEACTIVATION OF CATALYSTS OF THE ZIEGLER TYPE USED FOR THE PREPARATION OF POLYETHYLENE IN HIGH PRESSURE, HIGH TEMPERATURE PROCESSES

Jean-Pierre Machon, Bethune; Bernard Levresse, Lillebonne, and Pierre Gloriod, Lillebonne, all of France, assignors to Societe Chimique des Charbonnages, Paris, France
Filed Feb. 25, 1976, Ser. No. 661,414
Claims priority, application France, Feb. 28, 1975, 75 06436
Int. Cl.^{2} C08F *6/02*
U.S. Cl. 260—23 H **10 Claims**

1. In a continuous process for the polymerization and copolymerization of ethylene which comprises contacting a reaction mixture comprising ethylene with a Ziegler catalyst comprising a transition metal derivative and an organic derivative of aluminum in a reactor maintained at a pressure of greater than about 500 bars and a temperature of greater than about 160° C., and withdrawing said reaction mixture from said reactor through a reactor outlet valve into a separator for separating said ethylene from polymer formed in said reactor, the improvement which comprises terminating said polymerization by injecting into said reaction mixture a salt which upon a reaction with said Ziegler catalyst will form reaction products which remain with said polymer, said salt being selected from the group consisting of alkali metal salts and alkaline earth metal salts of carboxylic acid and mixtures thereof, said salt being present in an amount sufficient to deactivate said Ziegler catalyst.

4,105,610
REACTION PRODUCTS OF POLYDIOLEFINS, PHENOLS AND UNSATURATED CARBOXYLIC ACIDS

Albert Jung, Taunusstein; Kurt Hultzsch, Wiesbaden-Biebrich; Rolf Zimmermann, Wiesbaden-Sonnenberg, and Johannes Reese, Wiesbaden-Biebrich, all of Germany, assignors to Hoechst Aktiengellschaft, Frankfurt, Germany
Continuation of Ser. No. 422,565, Dec. 6, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,530
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1973, 2358722; Nov. 20, 1973, 2357762; Dec. 9, 1972, 2260376
Int. Cl.^{2} C08L *93/00;* **C08F** *8/46*
U.S. Cl. 260—27 BB **29 Claims**

1. An ungelled conjoint reaction product derived from a single step reaction of I. a diolefin polymer having a molecular weight up to 100,000 or its components with II. a phenol and III. an olefinically unsaturated carboxylic acid or its anhydride wherein I. is a reaction component selected from the group consisting of

(a) a homopolymer of a diene having 4 to 10 carbon atoms,
(b) a copolymer of at least two dienes of (a),
(c) a copolymer of at least one diene of (a) with a minor molar amount of at least one copolymerisable olefinically unsaturated monomer and
(d) a combination of at least two of (a) to (c); wherein the amount of phenol is in the range from 2 to 40% by weight and the amount of the unsaturated carboxylic acid or its anhydride is in the range from 2 to 55% by weight, always referred to the starting polymer I.

4,105,611
ADHESIVE COMPOSITION AND BINDING METHOD

George Otto Orth, Jr., Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.
Filed Aug. 5, 1976, Ser. No. 711,740
Int. Cl.^{2} C08L *93/00*
U.S. Cl. 260—27 EV **9 Claims**

1. A hot melt adhesive composition, having a viscosity of less than 5,000 centipoise at 250° F, comprising by weight: 30% to 40% of an ethylene-vinyl acetate copolymer; 25% to 35% of a wax; 20% to 40% of a modified rosin; and 10% to 30% of a tackifier which is fluid at room temperature.

4,105,612
ASPHALT COMPOSITION AND ITS MANUFACTURE

Donald Royal Cushman, Wenonah; Charles Anthony Pagen, West Deptford; John William Schick, Cherry Hill, all of N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Jun. 3, 1977, Ser. No. 803,093
Int. Cl.^{2} C08L *91/00*
U.S. Cl. 260—27 EV **7 Claims**

1. An asphaltic composition comprising a major proportion of straight-run asphalt, a minor proportion of Syntower bottoms topped to 650° F., a minor proportion of a copolymer of ethylene and vinyl acetate, and, optionally, a minor proportion of a terpenic resin.

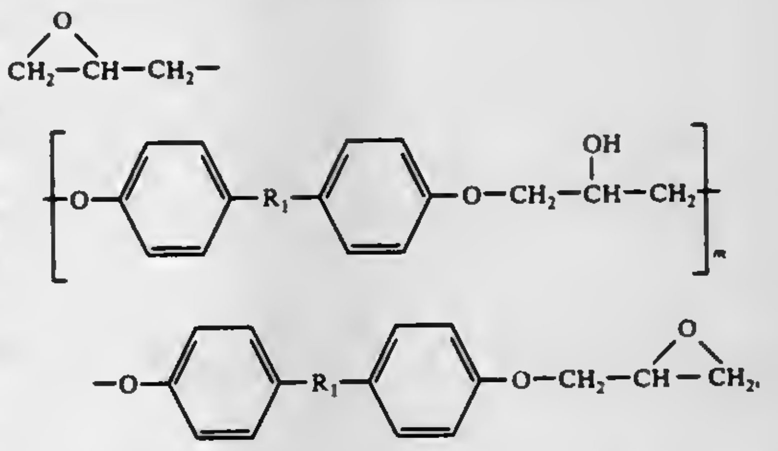
4,105,613
EPOXY HYDROXOL PRIMER

Richard W. Clope, Waukegan, and Milton A. Glaser, Glenco, both of Ill., assignors to The Dexter Corporation, Windsor Lock, Conn.
Filed Aug. 16, 1976, Ser. No. 714,393
Int. Cl.^{2} C08L *61/24, 63/02*
U.S. Cl. 260—29.4 R **29 Claims**

1. An aqueous-based, heat-curable primer coating composition suitable for metal and the like, having a pH of at least about 9, and being substantially free of organic solvents, which comprises:

(a) from about 30% to about 75% by weight of a binder resin which is a mixture of (i) from about 10% to about 60% by weight of finely divided epoxy resin having an average particle size of less than about 15 microns, and (ii) from about 5% to about 30% by weight of dispersible, methylated methoxymethyl urea resin,

said epoxy resin being of the structural formula



wherein R_1 is an alkylene group of 1–4 carbon atoms and *m* is a positive integer sufficient to provide a weight average molecular weight of from about 900 to about 8000 and epoxide equivalent weight of from about 450 to about 4000,

said methylated methoxymethyl urea resin being a crosslinking agent and having a formaldehyde:urea molar ratio of 2.2–2.8:1 and a methanol:urea molar ratio of 1.3–2.0:1 and a toluene tolerance of a least 50%; and,

(b) from about 25% to about 70% by weight of water.

4,105,614
STORAGE STABLE WATER-DILUTABLE EPOXY BASED COATING FOR METAL FOOD CONTACT SURFACES

Kenneth G. Davis, Ross Township, Allegheny County; George B. Dué, Pittsburgh, and Albert H. Lund, McCandless, all of Pa., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 29, 1976, Ser. No. 736,984
Int. Cl.^{2} C08L *63/02*
U.S. Cl. 260—29.4 R **11 Claims**

1. A water solubilizable resin that comprises an adduct of a bisphenol and a diglycidyl ether of a bisphenol having an epoxy equivalent weight between about 180 and about 2500, using a molar ratio of bisphenol to diglycidyl ether between about 2:1 and about 9:8, further adducted with a polycarboxylic acid anhydride in an amount sufficient to provide an acid number between about 35 and about 150.

4,105,615
INTERPOLYMERS, METHOD OF PREPARING THE SAME AND EMULSIONS THEREOF, AND METAL CANS COATED WITH THE INTERPOLYMERS

Sergio E. Balatan, Westland, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.
Division of Ser. No. 715,063, Aug. 17, 1976, abandoned. This application Jul. 20, 1977, Ser. No. 817,215
Int. Cl.^{2} C08L *33/02, 33/08, 33/12, 33/24*
U.S. Cl. 260—29.6 T **18 Claims**

1. A method of preparing aqueous coating composition of hydrophobic copolymers comprising of the steps of

(a) polymerizing monomers in organic solvent in the presence of about 0.5% to about 6% by weight of a free radical initiator based on the weight of the monomers and in which the total weight of the monomers is about 60% to about 80% by weight of the total charge, said monomers consisting of
15 to 60% of aromatic vinyl monomer
20 to 50% of a long chain acrylate ester monomer
3 to 30% of an alkoxyalkyl(meth)acrylamide
0 to 12% of an unsaturated carboxylic acid monomer
(b) emulsification of the resultant copolymer solution in

water using about 0.25% to about 3% by weight of surfactant based on the weight of the copolymer and adjusting pH of the resulting emulsion with amines to about 6.5 to 10.

4,105,616
HETEROCYCLIC POLYMER SOLUTIONS AND PRODUCTS THEREFROM

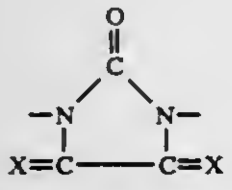
Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 26, 1977, Ser. No. 845,566
Int. Cl.² C08K *5/15*
U.S. Cl. 521—62 26 Claims

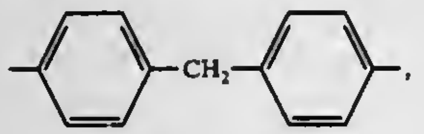
1. A solution of polymer having the repeating unit:

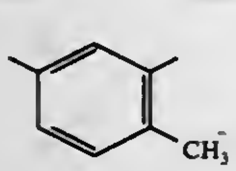
$$-\!\left[Q-R\right]_n\!-$$

wherein Q is

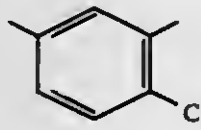


wherein X is O or NH, provided that at least one X is O, R is selected from the group consisting of

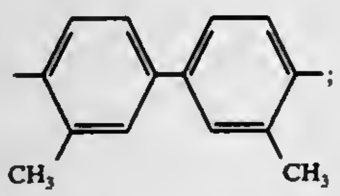

(1)


(2)

(3) mixtures of (1) and (2), and (4) 50 to 70 mole percent



and 30 to 50 mole percent



and *n* is sufficiently large to produce a solid product in a solvent selected from the group consisting of epichlorohydrin, epibromohydrin, and glycidyl acrylate.

4,105,617
ORGANIC SOLVENT DISPERSIONS OF SILICONE ELASTOMERS

William H. Clark, and Charles E. Skinner, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 578,707, May 19, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,786
Int. Cl.² C08K *5/09*
U.S. Cl. 260—31.2 N 10 Claims

1. A silicone elastomeric composition obtained by mixing ingredients consisting essentially of
(A) 100 parts by weight of a benzene soluble hydroxyl endblocked polydimethylsiloxane having a viscosity of at least 100,000 cps. at 25° C.,
(B) from 12 to 35 parts by weight of a soluble ethylpolysilicate,
(C) from 8 to 20 parts by weight of a silane of the formula

$$RSi(O-N{=}CR'R^2)_3$$

in which R is selected from the group consisting of methyl and vinyl, and R' and R^2 are each selected from the group consisting of methyl and ethyl,
(D) from 0.1 to 2 parts by weight of organotin carboxylate,
(E) from 10 to 150 parts by weight of an extending filler, and
(F) sufficient organic solvent to provide a solvent content of from 15 to 95 weight percent solvent based on the total weight of the composition, said organic solvent being selected from the group consisting of aliphatic hydrocarbons, chlorinated aliphatic hydrocarbons, aromatic hydrocarbons, ketones, esters, ethers and mixtures thereof wherein said organic solvent being a solvent for the silicon containing species and alcohols can be present in the organic solvent in amounts which do not exceed 10 weight percent of the total solvent, the combined parts by weight of (B) and (C) being from 20 to 50 parts by weight based on 100 parts by weight of (A) and the weight ratio of (B) to (C) being from 1.0 to 3.0.

4,105,618
CONTROL OF INCOMPETENT FORMATIONS WITH THICKENED COMPOSITIONS CONTAINING BASE-SETTABLE RESIN

Thomas R. Sifferman, and Derry D. Sparlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 760,251, Jan. 17, 1977. This application Aug. 25, 1977, Ser. No. 827,488
Int. Cl.² E21B *33/138*
U.S. Cl. 260—33.6 UA 9 Claims

1. A composition for positioning a base-settable polymeric material having particulate matter disposed therein in contact with a subterranean formation penetrated by a wellbore, the composition consisting essentially of:
(a) a substantially neutral hydrocarbon oil;
(b) a carboxy vinyl polymer selected from the group consisting of: an essentially linear polymer of an alpha, beta-monoolefinically, terminally unsaturated carboxylic acid having 3 to 4 carbon atoms and having an average molecular weight of about 5000 to about 500,000; a cross-linked interpolymer of said monocarboxylic acid and about 0.25 to 2.5 percent by weight of a polyunsaturated compound having at least two alkenyl groups and copolymerizable therewith, the interpolymer having an average molecular weight greater than about 200,000; and the aforesaid polymer and interpolymer containing up to 20 mole percent of copolymerized alkyl ester of the monocarboxylic acid wherein the alkyl group of the ester has 1 to 8 carbom atoms, the carboxy vinyl polymer being present in the composition in an amount sufficient to produce an apparent viscosity in the composition of at least 50 cps, but less than 5000 cps at the injection temperature and pressure and an apparent minimum viscosity at bottom hole conditions of at least 25 cps;
(c) a neutralizing agent for the carboxy vinyl polymer;
(d) a miscible polar solvent for the carboxy vinyl polymer;
(e) finely-divided solid particulate material in an amount equal to about 0.25 to about 22 parts of particulate matter per gallon of the oil; and
(f) a base-settable liquid thermosetting resin in an amount equal to about 0.1 to about 5.0 gallons per cubic foot of the particulate material.

4,105,619
CABLE FILLER

John Joseph Kaufman, Parker, Pa., and Thomas Emil Luisi, Plainview, N.Y., assignors to Witco Chemical Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,977
Int. Cl.² C08K *5/01*
U.S. Cl. 260—33.6 PQ 9 Claims

1. A cable filling and flooding composition comprising at least about 90% by weight of petrolatum; about 5–7% by weight of polybutene-1; about 0.5–2.0% by weight of polyethylene; and about 0.5–2.0% by weight of an ethylene propylene rubber.

4,105,620
STABILIZATION OF BARIUM, STRONTIUM AND CALCIUM COMPLEXES OF POLYTEREPHTHALOYL OXALAMIDRAZONE AND POLYDIPHENYLETHER-DICARBOXYLIC ACID-4,4'-OXALAMIDRAZONE

Joachim Behnke, Amorbach, Fed. Rep. of Germany; Dieter Frank, Naperville, Ill., and Michael Wallrabenstein, Wörth, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 24, 1977, Ser. No. 780,834
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612669
Int. Cl.² C08G *73/08;* **C08L** *79/06*
U.S. Cl. 260—37 N 11 Claims

1. A process for stabilizing a polymer selected from the class consisting of the barium, strontium and calcium complexes of polyterephthaloyl oxalamidrazone and polydiphenylether dicarboxylic acid-4,4'-oxalamidrazone, which process comprises treating said polymer in an aqueous solution having a pH range of 1 to 7 of a stabilizing amount of an acid or salt compound selected from the group consisting of oxalic acid, alkali oxalate, alkali sulfite, alkali hydrogen sulfite, alkali dithionite and alkali hydrogen sulfate.

4,105,621
THERMOPLASTIC POLYAMIDE COMPOSITION

John Maslen, Hoddesdon, and William Hunter Taylor, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,700
Claims priority, application United Kingdom, Feb. 20, 1976, 6796/76
Int. Cl.² C08L *77/00*
U.S. Cl. 260—37 N 14 Claims

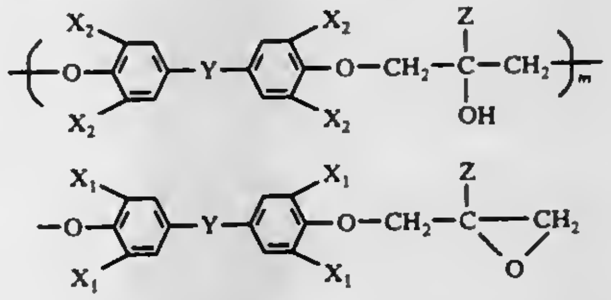
1. A reinforced polyamide composition comprising:
from 30 to 74.95% of a normally flammable polyamide,
from 15 to 59% of a reinforcing agent,
from 5 to 30% of a halogenated flame retardant,
containing at least 20% by weight of the flame retardant of halogen,
together with a synergist system for the flame retardant comprising a mixture of
from 5 to 30% by weight of a zinc borate that is thermally stable at the processing temperatures of the polyamide, and
from 0.05 to 1.5% of an oxide selected from the group consisting of antimony oxide, zinc oxide, lead oxide, ferrous oxide, ferric oxide, stannous oxide, stannic oxide, cadmium oxide and a mixture thereof,
wherein all percentages of all ingredients are by weight of the total weight of composition.

4,105,622
PROCESS FOR THE PREPARATION OF FLAME RETARDANT THERMOPLASTIC RESIN COMPOSITIONS

Hitoshi Izutu, Osaka, and Ryoichi Ishikawa, Takaishi, both of Japan, assignors to Dainippon Inc. & Chemicals Inc., Tokyo, Japan

Filed Sep. 7, 1976, Ser. No. 721,327
Claims priority, application Japan, Mar. 22, 1976, 51-29867
Int. Cl.² C08G *18/34;* **C08K** *3/40, 3/10, 3/34*
U.S. Cl. 260—37 N 20 Claims

1. A process for preparing a flame retardant thermoplastic resin composition which comprises heat mixing and kneading 100 parts by weight of a mixture consisting of a hydroxyl-terminated low molecular weight thermoplastic polyester (A) selected from the group consisting of polyethylene terephthalate, polypropylene terephthalate and polybutylene terephthalate having a hydroxyl value of from 7 to 40 and an intrinsic viscosity, as measured in a 6:4 solvent mixture of phenol and tetrachloroethane at 30° C, of 0.15–0.6 dl/g and a polyfunctional isocyanate (B), or a reaction product of (A) and (B), with 1.5–25 parts by weight, calculated as halogen, of a halogenated epoxy compound of the formula



wherein X_1 is either hydrogen, chlorine or bromine, with the proviso that when *l* and *m* are zero, it is either chlorine or bromine, X_2 is either chlorine or bromine, Y is selected from the group consisting of an alkylidene group of 1–6 carbon atoms, cycloalkylidene, —S—, —SO—, $—SO_2—$ and —O—, Z is selected from the group consisting of hydrogen or methyl, and *n* is a number from 0–15, 0.3–15 parts by weight, calculated as antimony, of an antimony compound, 0.10 parts by weight of asbestos, and 0–60% by weight, based on the total weight of the resin composition obtained of glass fibers.

4,105,623
METHOD OF MAKING MOLDING COMPOUNDS AND MATERIALS MADE THEREBY

Richard F. Shannon, Lancaster, and Douglas L. Denton, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 17, 1976, Ser. No. 751,568
Int. Cl.² C08K *7/14*
U.S. Cl. 260—38 23 Claims

1. A new and improved method of producing molding compounds comprising: mixing an inorganic filler with monomers for producing an aldehyde condensate utilizing a mole ratio of the monomers that provides a deficiency of the aldehyde, reacting the monomers insitu under acid conditions to produce an exotherm and generally B-stage the reactants, mixing sufficient gas producing crosslinking agent into the mixture for C-staging the reactants at a later time, spreading the mixture in a thin sheet, embedding inorganic fibers into the sheet, partially reacting the materials to liberate gases but without carrying the reaction to the C-stage, stopping the reaction, and

aging the sheet to cause a thickening reaction which provides a solid handleable sheet molding compound.

4,105,624
REINFORCED VINYL CHLORIDE POLYMER COMPOSITIONS CONTAINING POLY-NEOPENTYLENE TEREPHTHALATE

Klaus Boehlke, Hessheim; Martin Welz, Bad Duerkheim; Peter Föerster, Ludwigshafen; Hans-Josef Sterzel, Dannstadt-Schauernheim; Rolf Wurmb, Heidelberg, and Hans Geörg Matthies, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,820

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621724

Int. Cl.^{2} C08K *7/14, 7/20*

U.S. Cl. 260—40 R **6 Claims**

1. A reinforced vinyl chloride polymer composition containing

(A) from 99 to 50 parts by weight of a homopolymer of vinyl chloride or a copolymer of vinyl chloride with up to 30 percent by weight of one or more copolymerizable monomers,

(B) from 1 to 50 parts by weight of a linear terephthalic acid-neopentylglycol polyester which is solid at room temperature and is compatible with the vinyl chloride polymer, with the proviso that the sum of A and B is 100,

(C) from 10 to 50 percent by weight, based on the sum of A and B, of a reinforcing agent and

(D) from 0 to 90 percent by weight, based on the sum of A and B, of one or more other fillers.

4,105,625
2,2,6,6-TETRAMETHYL-4-PIPERIDYL CARBOXYLIC ACID ESTERS OF HYDROXY ALIPHATIC DI- AND TRI-CARBOXYLIC ACIDS AS LIGHT STABILIZERS FOR SYNTHETIC POLYMERS

Motonobn Minagawa, Kosigaya; Naohiro Knbota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

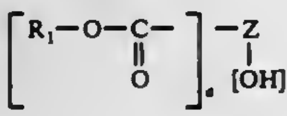
Filed Feb. 22, 1977, Ser. No. 770,475

Claims priority, application Japan, Mar. 19, 1976, 51/30349

Int. Cl.^{2} C08K *5/34;* **C07D** *211/06*

U.S. Cl. 260—45.8 N **24 Claims**

1. A 2,2,6,6-tetramethyl-4-piperidyl carboxylic acid ester of an aliphatic di- or tri-carboxylic acid having the general formula:

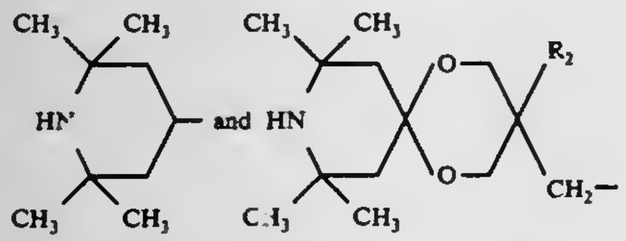


$$\left[R_1-O-\underset{\underset{O}{\|}}{C}-\right]_a-\underset{[OH]_m}{\underset{|}{Z}}$$

I

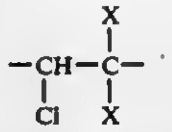
wherein:

R$_1$ is selected from the group consisting of



R$_2$ is CH$_3$ or C$_2$H$_5$;
a is selected from the group consisting of 2 and 3;
m is selected from the group consisting of 1, 2, 3 and 4; and
Z is a divalent or trivalent aliphatic radical having from two to about eight carbon atoms.

16. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group:



$$-\underset{\underset{Cl}{|}}{CH}-\overset{\overset{X}{|}}{\underset{\underset{X}{|}}{C}}-$$

and having a chloride content in excess of 40%, where X is either hydrogen or chlorine; and a compound in accordance with claim 1.

4,105,626
DERIVATIVES OF 4-OXOPIPERIDINES AND THEIR USE AS POLYMER STABILIZERS

Heimo Brunetti, Reinach; Jean Rody, Basel, both of Switzerland; Nobuo Soma, and Tomoyuki Kurumada, both of Tokyo, Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Sankyo Company, Limited, Tokyo, Japan

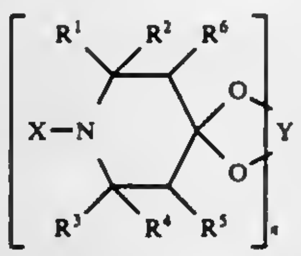
Filed May 19, 1976, Ser. No. 687,774

Claims priority, application United Kingdom, May 28, 1975, 23228/75

Int. Cl.^{2} C08K *5/34, 5/35;* **C07D** *491/10*

U.S. Cl. 260—45.8 NZ **24 Claims**

1. Compounds of the formula 1



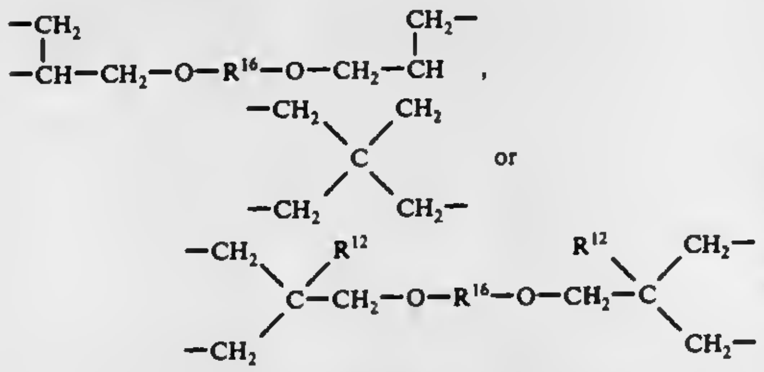
I

or mixtures of isomers thereof or acid addition salts thereof, wherein
n is 1 or 2,
R^1 is ethyl,
R^2 is alkyl having 1–6 C-atoms,
R^3 is ethyl, phenyl, benzyl or phenethyl,
R^4 is alkyl having 1–6 C-atoms, or
R^3 and R^4 together with the C-atom to which they are attached represent a cyclopentyl or cyclohexyl group,
R^5 is alkyl having 1–5 C-atoms, alkenyl or alkinyl having 3–4 C-atoms or aralkyl having 7–8 C-atoms,
R^6 is hydrogen, alkyl having 1–5 C-atoms, alkenyl or alkinyl having 3–4 C-atoms, aralkyl having 7–8 C-atoms
and R^5 and R^6 are interchangeable,
X is hydrogen, the oxyl radical, alkyl having 1–8 C-aroms, alkenyl having 3–6 C-atoms, alkinyl having 3–6 C-atoms, alkoxyalkyl having 2–21 C-atoms, aralkyl having 7–8 C-atoms, the 2,3-epoxypropyl group, an aliphatic acyl group having 1–12 C-atoms, or one of the groups —CH-$_2$COOR^7, —CH$_2$—CH(R^8)—OR^9 or —COOR^{10} wherein
R^7 is alkyl having 1–12 C-atoms, alkenyl having 3–6 C-atoms, phenyl, aralkyl having 7–8 C-atoms or cyclohexyl,
R^8 is H, CH$_3$ or phenyl,
R^9 is H or an aliphatic, aromatic, araliphatic, or alicyclic acyl group having up to 18 C-atoms, which may optionally be substituted in its aryl moiety with chlorine, alkyl having 1–4 C-atoms, alkoxy having 1–8 C-atoms and/or hydroxy,
R^{10} is alkyl having 1–12 C-atoms, benzyl, phenyl or cyclohexyl and if *n* is 1,
Y is one of the groups

—C(R^{11}) (R^{12})—CH(R^{13})—, o-phenylene,
—CH(R^{11})—CH$_2$—C(R^{12}) (R^{13})—, —CH(R^{12})—CH$_2$—C(R^{11}) (R^{13})—,
—CH$_2$—C(R^{11}) (R^{12})—CH(R^{13})—,

wherein R^{11} is hydrogen, methyl or —CH$_2$OR^{14},

R^{12} is hydrogen, methyl or ethyl,
R$_{13}$ is hydrogen, methyl or ethyl,
R^{14} is hydrogen or a monovalent acyl residue derived from an aliphatic, cycloaliphatic, aromatic or araliphatic monocarboxylic acid having up to 18 C-atoms, which may be substituted in its aryl moiety with halogen, hydroxy and-/or lower alkyl groups, or R^{14} is alkyl having 1–4 C-atoms, alkenyl having 3 or 4 C-atoms, benzyl or a carbamoyl residue —CO—NH—R^{15} wherein R^{13} is alkyl having 1–12 C-atoms, cyclohexyl, aralkyl having 7 or 8 C-atoms or aryl having 6–12 C-atoms,
and if *n* is 2
Y is one of the groups



wherein R^{16} is a divalent acyl residue derived from an aliphatic, aromatic or araliphatic dicarboxylic acid having up to 12 C-atoms or R^{16} is a dicarbamoyl residue —CONH—R^{17}—NH-CO—, wherein R^{17} is alkylene having 2–8 C-atoms, arylene having 6–12 C-atoms, xylylene or methanediphenylene.

13. A method of stabilizing organic polymers against light-induced deterioration, consisting in the addition of 0.01 to 5% by weight of a compound of formula I as defined in claim 1 to the polymer.

4,105,627
MERCAPTOHETEROCYCLIC RESIN STABILIZERS

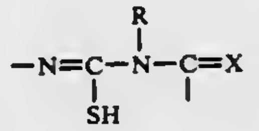
Tetsuo Sekiguchi, Hasuda; Masami Abe, Tokorozawa; Kouji Tsuruga, Ohmiya, and Nobuhide Tominaga, Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Sep. 20, 1976, Ser. No. 725,356

Int. Cl.^{2} C08K *5/34, 5/37, 5/52;* **C09K** *3/00*

U.S. Cl. 260—45.8 N **20 Claims**

1. A stabilizer composition capable of improving the initial clarity and resistance to deterioration when heated at 350° F of halogen-containing resins of the class consisting of polyvinyl fluoride and vinyl chloride polymers, consisting essentially of (A) at least one heterocyclic nitrogen compound having as part of a heterocyclic ring of 5 to 6 members having 2 to 3 nitrogen atoms when five-membered and 3 nitrogen atoms when six-membered the group



$$-N=\underset{\underset{SH}{|}}{C}-\overset{\overset{R}{|}}{N}-\underset{|}{C}=X$$

in which R is selected
from the group consisting of hydrogen, aryl, and alkyl having from 1 to about 12 carbon atoms, and X is selected from the group consisting of oxygen and sulfur; and (B) for each part by weight of (A) from 1 to 500 parts by weight of at least one compound selected from the group consisting of 1,2-epoxides having 18 to about 150 carbon atoms, organic phosphites having at least one organic radical attached to phosphorus through oxygen, and stannous tin, zinc, and aluminum salts of non-nitrogenous monocarboxylic acids having from 6 to 24 carbon atoms.

4,105,628
HALOGEN-CONTAINING AROMATIC ETHER-ESTER FIRE-RETARDANTS FOR PLASTICS

Egon Norbert Petersen, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

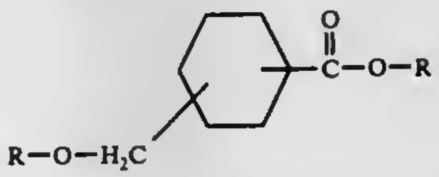
Filed Sep. 30, 1976, Ser. No. 728,097

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544513

Int. Cl.^{2} C07C *69/76;* **C08K** *5/41, 5/10, 5/36*

U.S. Cl. 260—45.85 R **12 Claims**

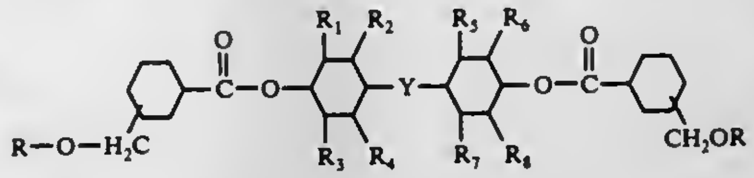
1. Aryloxymethylbenzoic acid phenyl ester of the formula



wherein each R represents the residue of a mononuclear phenol substituted by at least one of chlorine and bromine.

5. Plastic composition containing the ester of claim 1 in an amount effective to render the composition fire resistant.

9. Aryloxymethylbenzoic acid phenyl ester of the formula



wherein:
each R represents the residue of a mononuclear phenol substituted by at least one of chlorine and bromine,
Y is nothing, a methylene group, a dialkylmethylene group, a chalcogen atom, -SO-, or a sulfone group, and
each of R$_1$ to R$_8$ represents hydrogen or halogen.

11. Plastic composition containing the ester of claim 9 in an amount effective to render the composition fire resistant.

4,105,629
SYNTHETIC RESIN STABILIZER COMPRISING A THIOETHER ESTER AND HINDERED PHENOLIC CARBONATE

Motonobu Minagawa, Koshigaya; Yntaka Nakahara, Iwatsuki, and Tohru Haruna, Okegawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

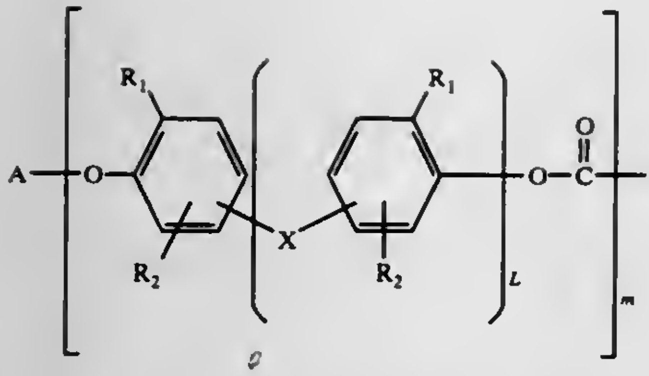
Filed Oct. 13, 1976, Ser. No. 732,038

Claims priority, application Japan, Oct. 14, 1975, 50-123711

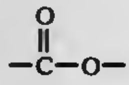
Int. Cl.^{2} C08K *5/13, 5/36*

U.S. Cl. 260—45.8 NT **18 Claims**

1. A stabilizer composition useful in synergistically increasing the resistance of a synthetic resin to deterioration when heated comprising in combination (a) at least one thioether ester of a polyhydric alcohol having 5 to 15 carbon atoms and 3 to 8 primary hydroxyl groups with a 3-alkylthiopropionic acid having 4 to about 34 carbon atoms, and (b) at least one 400 to 4000 molecular weight carbonate ester terminating in a phenolic hydroxyl, alkyl carbonate, or phenyl carbonate group, and having the formula:

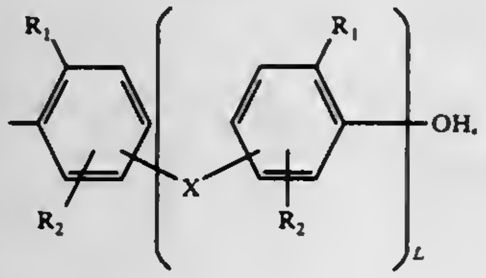


wherein independently at each occurrence R_1 denotes an alkyl, cycloalkyl or arylalkyl radical, R_2 denotes a hydrogen atom, or an alkyl, cycloalkyl or arylalkyl radical, A is a hydrogen atom or

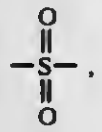


$$-\overset{O}{\overset{\|}{C}}-O-R,$$

R is an alkyl or phenyl radical or

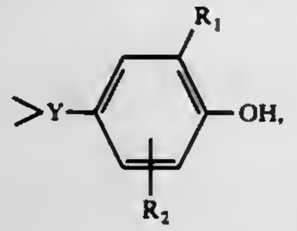


X is a direct bonding, -O-, -S-,

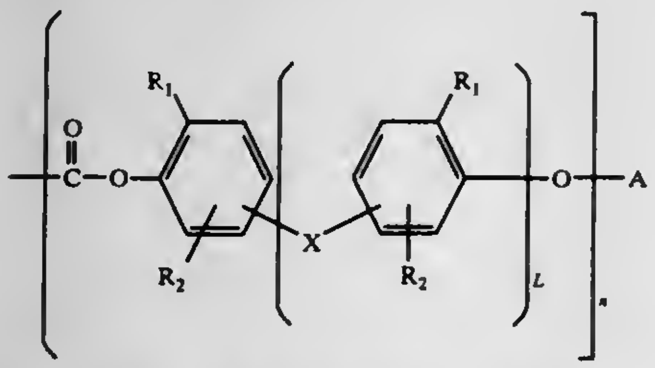


$$-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-,$$

$-CH_2SCH_2-$, a divalent hydrocarbon radical or



where Y is a trivalent hydrocarbon radical, B is selected from the group consisting of hydrogen and



L is 0 or 1, *m* is 1 to about 20, and *n* is 0.1 to about 20.

15. A stabilized synthetic resin composition comprising a synthetic resin and a stabilizing amount of stabilizer composition according to claim 1.

4,105,630

EPOXY RESINS FLAMEPROOFED WITH 1,2-OXAPHOSPHOLANES

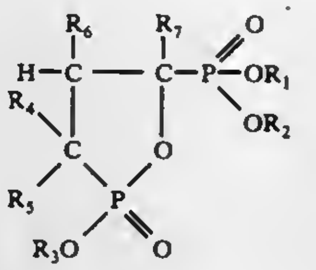
Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 614,403, Sep. 18, 1975, Pat. No. 4,042,649. This application Jun. 2, 1977, Ser. No. 802,923

Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.8 R **12 Claims**

9. A cured flameproof epoxy resin which contains from 2 to 30% by weight based on the resin of at least one compound of the Formula I



(I)

wherein each of R_1, R_2 and R_3 independently denotes alkyl of 1 to 18 carbon atoms; each of R_4, R_5 and R_6 independently denotes hydrogen or methyl; and R_7 denotes alkyl of 1 to 8 carbon atoms or when R_4 is methyl, R_6 is hydrogen, R_5 together with R_7 can denote 2,2-dimethyl-1,3-trimethylene.

4,105,631

MULTICHROMOPHORIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 626,521, Oct. 28, 1975, Pat. No. 4,043,973, which is a division of Ser. No. 511,570, Oct. 2, 1974, Pat. No. 3,936,419. This application Jun. 2, 1977, Ser. No. 802,924

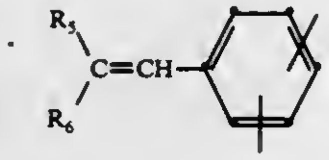
Int. Cl.² C08K *5/45, 5/34, 5/15*

U.S. Cl. 260—45.8 A **7 Claims**

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of a composition of matter comprising compounds having the formula:

$$(A\text{-}B)_2\,C$$

wherein A is a group having the structure



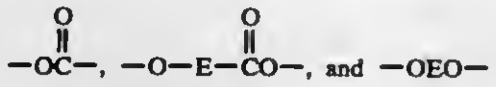
1

wherein

I is hydrogen, fluoro, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, aryloxy, substituted amino, cyano, or carboalkoxy;

R_5 and R_6 are cyano, carbonylalkoxy, carbonylaryloxy, alkylsulfonyl, alkylcarbonyl, arylsulfonyl, arylcarbonyl, carboxamide or sulfonamide;

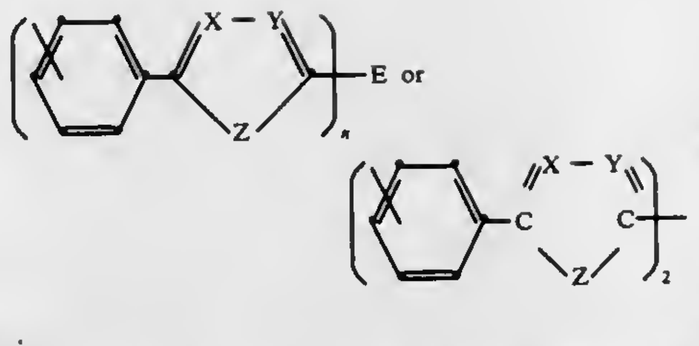
B is a linking group connecting A and C and can have the structure



$$-O\overset{O}{\overset{\|}{C}}-,\quad -O-E-\overset{O}{\overset{\|}{C}}O-,\ \text{and}\ -OEO-$$

where E is lower alkylene or substituted lower alkylene;

C group is a heterocyclic group having the structure



wherein

X and Y are a carbon atom, a carbon atom containing an alkyl group containing 1 to 12 carbon atoms, a carbon atom containing an aryl group containing 6 to 18 carbon atoms, or a nitrogen atom; Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms; E is a substituted or unsubstituted, branched or unbranched alkylene containing 1 to 12 carbon atoms or arylene containing 6 to 18 carbon atoms; and

n is an integer from 1 to 6.

4,105,632

FLAME RETARDED ABS POLYMERIC COMPOSITIONS CONTAINING A MIXED HALO BISPHENOXY ALKANE FLAME RETARDANT AND ENHANCING AGENT

Arnold L. Anderson, Antioch, Ill., and Robert J. Nulph, Ypsilanti, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

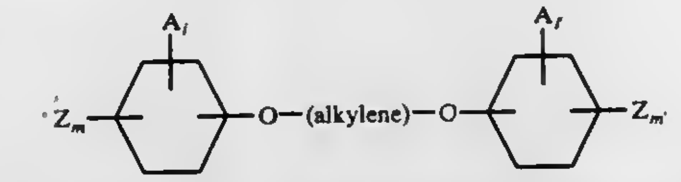
Continuation-in-part of Ser. No. 330,837, Feb. 8, 1973, Pat. No. 4,051,105, which is a continuation-in-part of Ser. No. 260,240, Jun. 6, 1972, abandoned. This application Jun. 8, 1977, Ser. No. 804,667

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.² C08L *9/02*

U.S. Cl. 260—45.75 D **18 Claims**

1. A plastic composition containing acrylonitrile-butadiene-styrene having incorporated therein (1) an effective amount of a flame retardant which is a bis-phenoxy compound having the formula:



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine; and (2) an enhancing agent which is antimony, arsenic, bismuth, tin or zinc-containing compound.

4,105,633

ALTERNATING COPOLYESTERCARBONATE RESINS

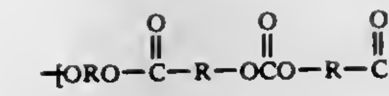
Daniel J. Swart, and Jacqueline S. Kelyman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1977, Ser. No. 795,978

Int. Cl.² C08G *63/62*

U.S. Cl. 528—176 **10 Claims**

1. A normally solid alternating copolyestercarbonate consisting essentially of repeating units of the formula:



$$-\!\!\left[ORO-\overset{O}{\overset{\|}{C}}-R-O\overset{O}{\overset{\|}{C}}O-R-\overset{O}{\overset{\|}{C}}\right]\!\!-$$

wherein each R is independently aromatic hydrocarbylene or inertly substituted aromatic hydrocarbylene.

4,105,634

PRODUCTION OF THERMOSETTING RESINOUS POLYEPOXIDES

Harry T. Hanson, Millburn, and Marvin Gordon, Succasunna, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 11, 1976, Ser. No. 713,622

Int. Cl.² C08G *59/02*

U.S. Cl. 526—65 **12 Claims**

1. In a process for advancing the molecular weight of thermosetting resinous polyepoxides wherein a dihydric phenol and a resinous polyepoxide containing 1,2-epoxy groups are reacted in the presence of a catalyst to produce a molecular weight advanced thermosetting resinous polyepoxide, the improvement comprising, after a first catalytic amount of the catalyst is introduced into the mixture of the dihydric phenol and the polyepoxide and the reaction has been maintained for a first period of time sufficient to produce a molecular weight advanced polyepoxide, introducing a second catalytic amount of the catalyst into the mixture while at a reaction temperature to further advance the molecular weight of the polyepoxide the ratio of the first catalytic amount to the second catalytic amount constituting from about 10:1 to about 1:10.

4,105,635

MANUFACTURE OF AROMATIC POLYMERS CONTAINING KETONE AND SULPHONE GROUPS

John Leslie Freeman, St. Neots, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed Jun. 28, 1977, Ser. No. 810,728

Claims priority, application United Kingdom, Jul. 12, 1976, 28841/76

Int. Cl.² C08G *65/40*

U.S. Cl. 528—126 **10 Claims**

1. A process for the production of an aromatic polyethersulphone and/or ketone comprising distilling off the water from a substantially equimolar mixture of a finely divided hydrated dialkali metal salt of a bisphenol and an aromatic dihalide in which the halogen atoms are activated by $-SO_2-$ or $-CO-$ groups ortho or para thereto in the presence of an aromatic sulphone solvent and thereafter heating at a temperature in the range 250° to 400° C to effect polymerisation.

4,105,636

PRODUCTION OF AROMATIC POLYETHERS

Ian Charles Taylor, Bengeo, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 11, 1977, Ser. No. 814,667

Claims priority, application United Kingdom, Jul. 28, 1976, 31453/76

Int. Cl.² C08G *65/40, 75/23*

U.S. Cl. 528—126 **9 Claims**

1. A process for the production of an aromatic polyether comprising boiling an inert organic sulphoxide or sulphone solvent containing (i) a substantially equimolar mixture of (a) at least one bisphenol and (b) at least one dihalobenzenoid compound, or (ii) at least one halophenol, in which dihalobenzenoid compound or halophenol the halogen atoms are activated by $-SO_2-$ or $-CO-$ groups ortho or para thereto, and an alkali metal carbonate, the amount of said carbonate being such that there is at least one alkali metal atom for each phenol group present, and removing water by distillation in the absence of an azeotrope forming solvent.

4,105,637

PROCESS FOR PRODUCING A POLYACETAL POLYMER

Michael Semanchik, Lebanon, and David M. Braunstein, Fanwood, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 11, 1974, Ser. No. 514,146

Int. Cl.^{2} C08G *2/10*

U.S. Cl. 528—241 **18 Claims**

1. In a process for producing a polyacetal polymer in which a polyacetal forming polymerization mixture is introduced into a polymerization reaction zone, the mixture polymerized to form polyacetal polymer and withdrawing said polyacetal polymer from said polymerization reaction zone, the improvement which comprises pulverizing and grinding said polyacetal polymer by means of a plurality of inter-meshing elliptical shape plates provided on each shaft of a pair of shafts, said plates having flattened edges at the major axis which mesh to wipe the surface of its mating plate to form a finely divided solid polyacetal polymer which is then withdrawn from said reaction zone.

4,105,638

PROCESS FOR IMPROVING THE STABILITY OF ETHERIFIED ACETAL HOMOPOLYMERS

Pierino Radici, Turate (Como); Sergio Custro; Mario Ermoni, both of Goria Minore (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 16, 1976, Ser. No. 751,299

Claims priority, application Italy, Dec. 23, 1975, 30687 A/75

Int. Cl.^{2} C08G *2/36*

U.S. Cl. 528—130 **15 Claims**

1. A method for eliminating the unstable polyoxymethylene chains of an etherified acetal homopolymer, which comprises forming a suspension of said etherified acetal homopolymer, a basic compound and a polar liquid diluent, said polar liquid diluent consisting of water or a mixture of at least 20% water and a polar organic compound, said suspension containing 10 to 40 weight % of said homopolymer and 0.05 to 20 weight % based on the weight of the liquid diluent of said basic compound and said suspension having a pH of from 9 to 11;

and heat-treating said suspension at a temperature of from 100° to 160° C and below the melting point of said polymer and at a pressure such as to maintain said diluent in liquid form, for a period of time such as to ensure substantially complete degradation of said unstable chains.

4,105,639

WATER SOLUBLE POLYESTER RESIN

Deno Laganis, Schenectady, and Paul M. Begley, Scotia, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed May 11, 1977, Ser. No. 795,907

Int. Cl.^{2} C08G *63/68*

U.S. Cl. 528—177 **18 Claims**

1. A thermosetting polyester which is soluble in water in the presence of an amine or in a mixture of water with up to 30% of a water miscible polar solvent in the presence of an amine, said polyester having a molecular weight of 800 to 1300, an OH/COOH ratio of 1.8:1 to 3:1 and being prepared from reactants consisting essentially of

- (1) (a) an aromatic dicarboxylic acid with 0 to 50% based on the total dicarboxylic acid of a cycloaliphatic dicarboxylic acid,
- (b) tris(2-hydroxyethyl)isocyanurate or an aliphatic polyhydric alcohol containing at least three hydroxyl groups,
- (c) a primary dihydric alcohol,
- (d) a monohydric alcohol, or
- (2) (a), (b) and (c), the molar ratio of (c) to (b) being from 75:25 to 40:60 when (d) is not present and the molar ratio of (c) plus (d) to (b) when (d) is present being 75:25 to 40:60.

4,105,640

POLYCONDENSATION THERMOPLASTIC ELASTOMERS COMPOSED BY ALTERNATINGLY ARRANGED COPOLYESTERAMIDES

Giorgio Della Fortuna, Milan, and Luciano Zotteri, San Donato Milanese (Milan), both of Italy, assignors to ANIC, S.p.A., Mendrisio Stazione, Switzerland

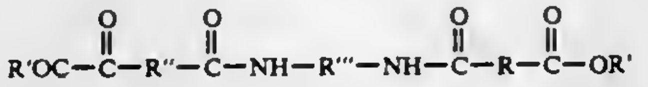
Filed Jun. 22, 1977, Ser. No. 809,129

Claims priority, application Italy, Jul. 21, 1976, 25548 A/76; May 18, 1977, 23701 A/77

Int. Cl.^{2} C08G *63/68*

U.S. Cl. 528—292 **6 Claims**

I. An elastomer of thermoplastic orderly arranged copolyesteramide composed by segments of macromolecule containing diol having a molecular weight lower than 250 and segments containing polyhydroxyalkyleneglycols of average molecular weight comprised between 400 and 3,500, such segments being united to each other by ester bonds, with the intermediary of a radical deriving from a diesterdiamide containing preformed amide bonds having the general formula:



$$R'OC-\overset{\overset{O}{\|}}{C}-R''-\overset{\overset{O}{\|}}{C}-NH-R'''-NH-\overset{\overset{O}{\|}}{C}-R-\overset{\overset{O}{\|}}{C}-OR'$$

in which R' is an alkyl radical having from 1 to 8 carbon atoms and/or an aryl radical having from 6 to 10 carbon atoms and/or a cycloalkyl radical having from 4 to 10 carbon atoms, and R'' and R''' are bivalent hydrocarbon radicals having from 2 to 30 carbon atoms.

4,105,641

PROCESS FOR THE PREPARATION OF ALIPHATIC POLYCARBONATES AND POLYURETHANES THEREFROM

Hans-Josef Buysch; Heinrich Krimm, and Hans Rudolph, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 687,565, May 18, 1976, abandoned. This application Mar. 17, 1977, Ser. No. 778,659

Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523352

Int. Cl.^{2} C08G *18/44, 18/08*

U.S. Cl. 526—712 **14 Claims**

I. A transesterification process for the preparation of polycarbonates containing aliphatically bound hydroxyl end groups comprising:

- (a) reacting
  - (i) aliphatic dihydroxyl compounds with
  - (ii) glycol carbonate, in the presence of
  - (iii) inert solvents selected from the group of compounds consisting of toluene, xylene, ethylbenzene, cumene, 1,2,4-trimethylbenzene, mesitylene, tetramethylbenzene, cymene, diethylbenzene, diisopropylbenzene, chlorotoluene, bromobenzene, tetralin, propenylbenzene, allylbenzene, α-methylstyrene, dibutylether, diisobutylether, diamylether, anisole, phenetole, cresol methyl ether, dibutyl ketone, di-tert.-butyl ketone and diamyl ketone, in which ethylene glycol is substantially immiscible, said inert solvents being capable of forming azeotropes with the ethylene glycol to permit selective azeotropic separation of said ethylene glycol; and
- (b) simultaneously separating the ethylene glycol by fractional distillation.

4,105,642

PREPARATION OF CARBODIIMIDE IN PRESENCE OF PHOSPHOLENE CATALYSTS

Curtis P. Smith, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

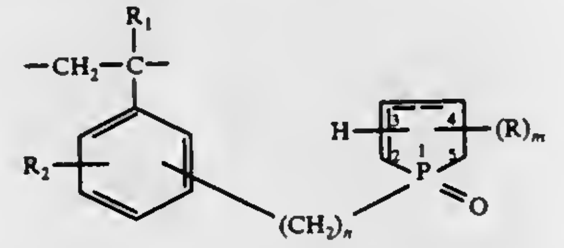
Division of Ser. No. 764,375, Jan. 31, 1977, Pat. No. 4,068,055.

This application Oct. 31, 1977, Ser. No. 846,973

Int. Cl.^{2} C08F *8/18, 8/24, 8/40, 12/32*

U.S. Cl. 528—51 **2 Claims**

1. In a process for the preparation of a carbodiimide by heating the appropriate organic isocyanate in the presence of a catalyst, the improvement which comprises employing as said catalyst a polymer characterized by the presence therein of a recurring unit having the formula:



wherein the broken lines in the phospholene nucleus indicate a double bond located between the carbon atom at position 3 and one of the carbon atoms at positions 2 and 4, the H atom is attached to whichever carbon atom at positions 2 and 4 is not part of said double bond, R is a substituent selected from the class consisting of halogen, alkoxy from 1 to 6 carbon atoms, inclusive, phenoxy, hydrocarbyl from 1 to 18 carbon atoms, inclusive, and halohydrocarbyl from 1 to 18 carbon atoms, inclusive, *m* is a whole number from 0 to 3, *n* is 0 or 1 and RS_1 is selected from the class consisting of hydrogen and methyl and R_2 represents hydrocarbyl said hydrocarbyl being free of substituents which are reactive with isocyanate.

4,105,643

PREPARATION OF CARBODIIMIDE IN PRESENCE OF PHOSPHOLENE CATALYSTS

Curtis P. Smith, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

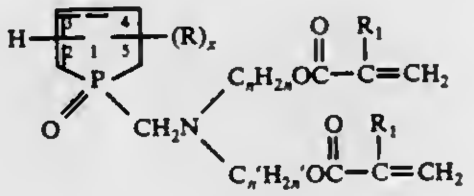
Division of Ser. No. 764,374, Jan. 31, 1977, Pat. No. 4,068,065.

This application Nov. 1, 1977, Ser. No. 847,658

Int. Cl.^{2} C08F *18/22, 4/00*

U.S. Cl. 528—512 **2 Claims**

1. In a process for the preparation of a carbodiimide by heating the appropriate organic isocyanate in the presence of a catalyst, the improvement which comprises employing as said catalyst a polymer selected from the class consisting of (i) homopolymer of compounds of the formula



wherein the broken lines in the phospholene nucleus indicate a double bond located between the carbon atom at position 3 and one of the carbon atoms at positions 2 and 4, the H atom is attached to whichever carbon atom at positions 2 and 4 is not part of said double bond, R is selected from the group consisting of halogen, lower-alkoxy, phenoxy, hydrocarbyl from 1 to 18 carbon atoms, inclusive, and halohydrocarbyl from 1 to 18 carbon atoms, inclusive, *x* is 0 to 3, C_nH_{2n} and $C_{n'}H_{2n'}$ are each independently alkylene from 2 to 6 carbon atoms, and R_1 is selected from the class consisting of hydrogen, methyl, halo and cyano and (ii) copolymers of the compounds of the above formula with at least one acrylate selected from the class consisting of the lower-alkyl esters of acrylic, methacrylic, 2-haloacrylic and 2-cyanoacrylic acids.

4,105,644

ANIONIC POLYMERIZATION OF CAPROLACTAM AT A TEMPERATURE BELOW THE MELTING POINT OF POLYCAPROLACTAM

Zbyněk Bukač; Jan Šebenda, both of Prague, and Miloslav Loyda, Neratovice, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jul. 1, 1976, Ser. No. 701,906

Claims priority, application Czechoslovakia, Jul. 8, 1975, 4847/75

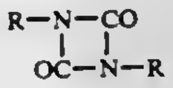
Int. Cl.^{2} C08G *69/18*

U.S. Cl. 528—314 **2 Claims**

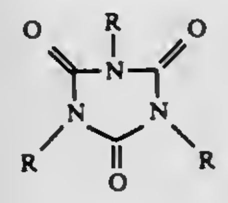
1. A method for manufacturing moldable and extrudable anionic polycaprolactam having a low content of water extractable compounds and a highly stable molecular weight using known basic initiators and known activators of the general formulae I-VII,

R—NCO

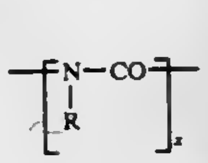
I



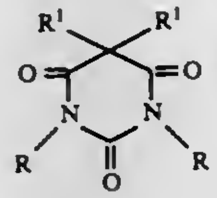
II



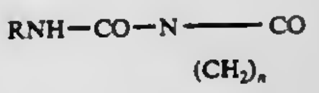
III



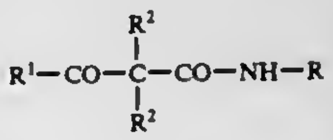
IV



V



VI

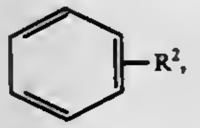


$$R^1-CO-\overset{R^2}{\underset{R^2}{C}}-CO-NH-R$$

VII

where

R is the aromatic residue



R^1 is R or alkyl with 1 to 4 carbon atoms, cycloalkyl or allyl,

R^2 is alkyl with 1 to 4 carbon atoms, or H atom,

n is an integer from 3 to 11,

x is an integer larger than 3, which comprises, in a first stage, subjecting a polymerization mixture of caprolactam, activator and strong base catalyst, wherein the ratio of said activator to said catalyst is 2.6 to 4.2, to a temperature of 150°-200° C. for at most 10 minutes, shaping the resulting polycaprolactam and thereafter, in a second stage, subjecting said shaped polycaprolactam to a further temperature of 150°-200° C for at most 90 minutes to produce a polycaprolactam having a monomer content very close to the equilibrium amount corresponding to the temperature of this second stage of polymerization.

4,105,645

POLYMERIZATION OF 2-PYRROLIDONE WITH ALKALINE CATALYST AND SO_2 CHAIN INITIATOR

Arthur C. Barnes, and Carl E. Barnes, both of New Canaan, Conn., assignors to Barson Corp., New Canaan, Conn.

Filed Aug. 30, 1976, Ser. No. 718,410

Int. Cl.² C08G *69/24*

U.S. Cl. 528—313 **15 Claims**

1. A process for the polymerization of 2-pyrrolidone comprising the polymerization of substantially anhydrous monomeric 2-pyrrolidone at a temperature of from 30° to 45° C. in the presence of a primary catalyst and an activator consisting essentially of sulfur dioxide, the concentration of sulfur dioxide varying with the temperature used and not exceeding a sulfur dioxide concentration bounded by an approximate straight line drawn on a semi-log graph having a logarithmic scale of sulfur dioxide concentration along the ordinate in terms of mols of sulfur dioxide per mol of 2-pyrrolidone monomer and having polymerization temperature along the abscissa, said line being drawn on said graph from the vicinity of the point at 30° C. temperature and 0.024 mols of sulfur dioxide per mol of monomer to the vicinity of the point at 45° C. temperature and 0.004 mols of sulfur dioxide per mol of monomer, the sulfur dioxide concentration being at least about 0.002 mols of sulfur dioxide per mol of pyrrolidone monomer with the polymerization taking place at a substantially constant temperature, whereby the polypyrrolidone formed is of a viscosity capable of being melt spun.

4,105,646

α,β-UNSATURATED SCHIFF-BASE CHAIN EXTENSION REACTIONS FOR HIGH TEMPERATURE POLYMERS

Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

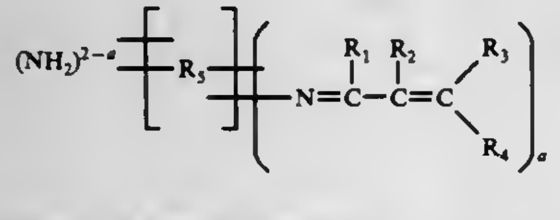
Division of Ser. No. 427,976, Dec. 26, 1973, Pat. No. 3,979,350. This application Sep. 3, 1976, Ser. No. 720,181

Int. Cl.² C08G *73/12*

U.S. Cl. 528—311 **10 Claims**

1. A composition of matter consisting essentially of
(a) a compound of the formula

(I)

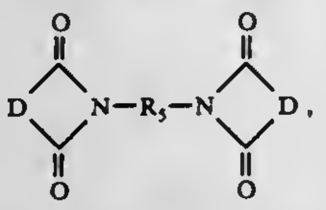


$$(NH_2)^{2-a}\left[R_5\right]\left(N=\overset{R_1}{C}-\overset{R_2}{C}=C\begin{matrix}R_3\\R_4\end{matrix}\right)_a$$

wherein a is a number from 0.1 to 2,
- R_1, R_2, R_3 and R_4 are independently hydrogen or a monovalent aliphatic, cycloaliphatic or aromatic radical or a combination of such radicals, and
- R_5 is a divalent organic radical containing from 2 to 30 carbon atoms and selected from the group consisting of aromatic, aliphatic, alkylaromatic and cycloaliphatic radicals combinations of these, and radicals with hetero-atom containing bridging groups where the hetero-atom in the bridge is selected from the group consisting of oxygen, sulfur, nitrogen, phosphorus and silicon, and

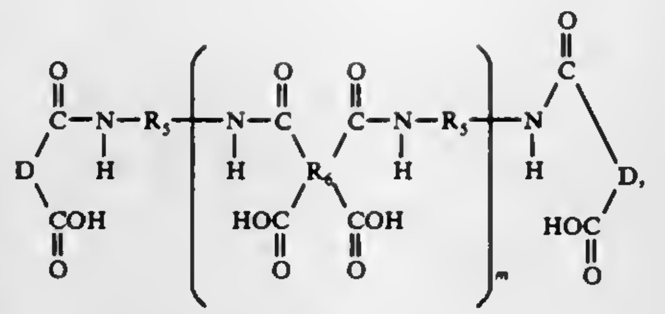
(b) from about 1 to 10 mole equivalents per mole equivalent of (a) of a bis-dienophile selected from the group consisting of
(1) a compound of the formula

XII



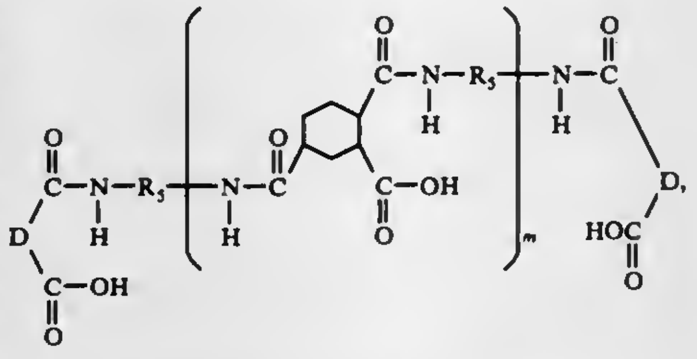
(2) a polyamide-acid of the formula

XIII



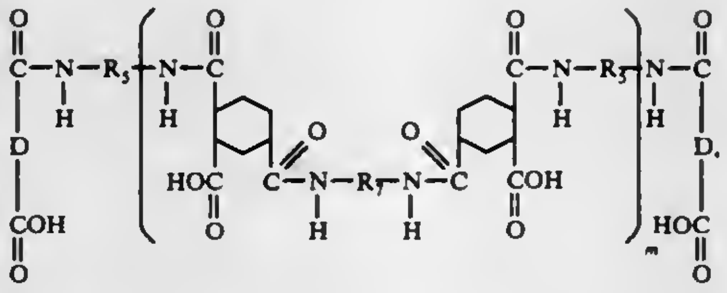
its corresponding polyimide,
(3) a polyamide-amide acid of the formula

XV

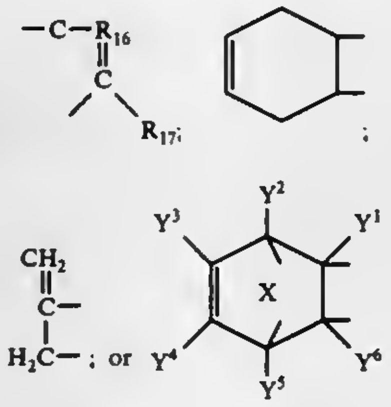


its corresponding polyamide-imide, and
(4) a polyamide-amide acid of the formula

XVI



and its corresponding polyamide-imide,
wherein
- R_5 and R_7 are the same or different and each is defined as R_5 above,
- R_6 is a tetravalent aliphatic, cycloaliphatic, aromatic or heterocyclic radical containing at least 2 carbon atoms or a combination of aromatic and aliphatic radicals,
- m is a number from 1 to 20, and
- D is a divalent radical containing olefinic unsaturation selected from a group having the formula



wherein
- R_{16} is hydrogen, methyl, bromo or chloro;
- R_{17} is hydrogen, bromo or chloro;
- Y^1–Y^6 inclusive is selected from the group consisting of hydrogen, bromine, chlorine, nitro, phenyl, and alkyl of from 1 to 6 carbon atoms; and
- X is carbonyl, oxygen, sulfur, chloro or bromo substituted methylene, alkylidene of from 1 to 6 carbon atoms, and benzylidene.

10. A glass fabric or fiber impregnated with the composition according to claim 1.

4,105,647

PROCESS FOR SULFONATING POLYMERS

Charles P. O'Farrell, Clark, and Edward N. Kresge, Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 445,890, Feb. 26, 1974, abandoned, which is a continuation of Ser. No. 208,384, Dec. 15, 1971, abandoned. This application Jan. 31, 1977, Ser. No. 764,515

Int. Cl.² C08F *8/36*

U.S. Cl. 526—33 **4 Claims**

1. A process for sulfonating polymers prepared by solution process, said polymers being selected from the group consisting of Butyl rubber, EPDM terpolymers, polybutadiene, olefinically unsaturated polymers or styrene butadiene, which comprises:
- (a) dissolving monomer reactants in a solvent and polymerizing said reactants in the presence of a Friedel-Crafts or Ziegler type catalyst thereby forming a reactor effluent containing polymer, unreacted light monomer, active catalyst, and solvent;
- (b) treating such reactor effluent to remove therefrom substantially all unreacted light monomers; and
- (c) simultaneously sulfonating said polymer and quenching said catalyst by treating with an acyl sulfate sulfonating quenching agent, said acyl sulfate having the formula:

$$R—(COOSO_3H)_n$$

wherein n is an integer from 1 to 3 and wherein R is an organic radical having a carbon number range from about 1 to about 30 and being selected from the group consisting of straight and branched chain alkyls, cycloakyls, alkylated cycloalkyls, and cycloalkylated alkyls, ethers, thioethers, esters, thioesters, ketones and thioketones.

4,105,648

CROSSLINKED POLYACRYLAMIDES CONTAINING SILYL GROUPS

Urs Gruber, Arlesheim; Gerd Greber, Binningen, and Hans-Peter Kriemler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

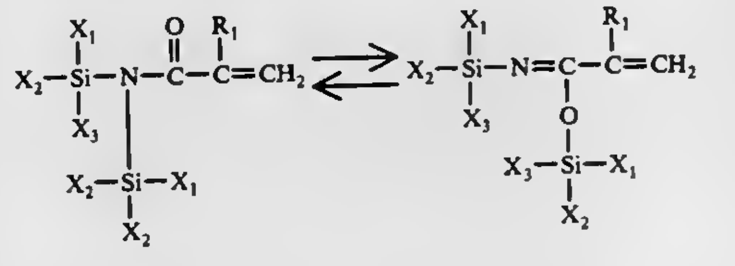
Continuation of Ser. No. 610,203, Sep. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 403,359, Oct. 4, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,408

Claims priority, application Switzerland, Oct. 27, 1972, 015731/72

Int. Cl.² C08F *30/08*

U.S. Cl. 526—204 **9 Claims**

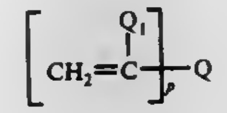
1. A crosslinked polyacrylamide containing silyl groups which is prepared by polymerising a silylated acrylic acid amide, of formula I*a* or I*b*



(Ia) (Ib)

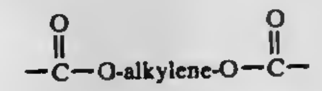
wherein
- X_1, X_2 and X_3 independently of one another represent hydrogen, alkyl having 1 or 2 carbon atoms, alkoxy having 1 to 4 carbon atoms, cyclohexyl, phenyl, phenoxy or benzyl, and
- R_1 is hydrogen or alkyl having 1 to 4 carbon atoms, in the presence of from about 5 to 250 mole%, based on the silylated acrylic acid amide, of a crosslinking agent of formula II

(II)



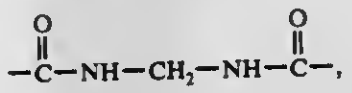
$$\left[CH_2=\overset{Q_1}{C}\right]_p-Q$$

wherein
- p represents the number 2 or 3,
- Q_1 represents hydrogen or methyl,
- Q, when $p = 2$, represents —SO_2—, phenylene,



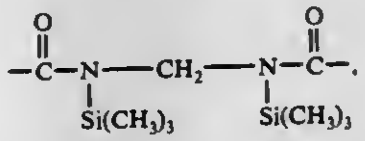
$$-\overset{O}{\overset{\|}{C}}-\text{O-alkylene-O}-\overset{O}{\overset{\|}{C}}-$$

with 2 to 4 carbon atoms in the alkylene moiety,



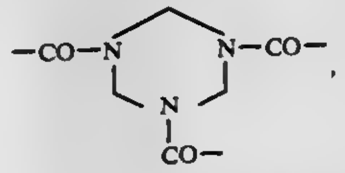
$$-\overset{O}{\overset{\|}{C}}-NH-CH_2-NH-\overset{O}{\overset{\|}{C}}-,$$

or, when X_1, X_2 and X_3 are each methyl, also represents



$$-\overset{O}{\overset{\|}{C}}-\underset{Si(CH_3)_3}{N}-CH_2-\underset{Si(CH_3)_3}{N}-\overset{O}{\overset{\|}{C}}-.$$

or, when $p = 3$, Q represents the group of the formula



the polymerisation being carried out at a temperature between about 20° and 120° C.

4,105,649

AQUEOUS POLYMERIC THICKENING AGENTS

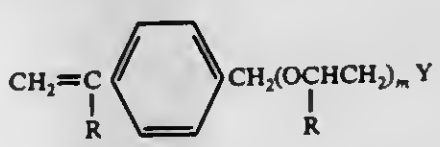
Syamalarao Evani, and Frederick P. Corson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 267,570, Jun. 29, 1972, Pat. No. 4,008,202. This application Oct. 7, 1974, Ser. No. 512,780

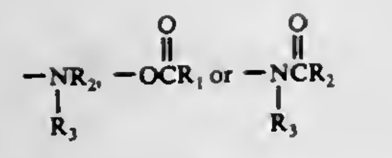
Int. Cl.² C08F *222/08, 220/06, 228/04*

U.S. Cl. 526—271 **8 Claims**

1. A polymer comprising
(a) about 0.2 to 15 mole percent of a vinyl benzyl ether monomer having the formula



wherein R is hydrogen or methyl, m is about 10 to 100 and Y is —SR_1,



$$-\underset{\substack{|\\R_3}}{N}R_2,\ -O\overset{\overset{O}{\|}}{C}R_1 \text{ or } -\underset{\substack{|\\R_3}}{N}\overset{\overset{O}{\|}}{C}R_2$$

where R_1 is an alkyl, aralkyl or alkaryl hydrophobic group of 10 to about 22 carbon atoms, R_2 is an alkyl group of 1 to about 22 carbon atoms and R_3 is hydrogen or an alkyl group of 1 to about 22 carbon atoms, provided R_2 and R_3 in combination have at least 10 carbon atoms.

(b) the balance to make 100 mole percent of one or more copolymerizable ethylenically unsaturated monomers provided a water solubilizing amount of at least one monomer having a carboxylic acid group, an anhydride group, a sulfate group, a sulfonate group or a hydroxyl group is present.

4,105,650

METHOD OF PRESERVING BLOOD PLASMA 1

Edward Shanbrom, Santa Ana, and Robert C. Bishop, Los Angeles, both of Calif., assignors to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation of Ser. No. 567,371, Apr. 11, 1975, abandoned. This application May 16, 1977, Ser. No. 796,924

Int. Cl.² A23J *1/06*

U.S. Cl. 260—112 B **1 Claim**

1. The method of preserving blood plasma coagulation factors and other proteins thereafter comprising the steps of:

(a) adding to whole, fresh blood plasma a preservative solution consisting essentially of polyethylene glycol to a concentration of from about 0.1 to about 25 grams of polyethylene glycol per liter of plasma;

(b) thereafter freezing the blood plasma containing said preservative; and

(c) thereafter thawing the frozen blood plasma containing the preservative solution to recover therefrom plasma cryoprecipitate from which plasma proteins can be recovered in improved yield.

4,105,651

PURIFICATION OF ENKEPHALIN, AN ENDOGENOUS COMPOSITION IN THE HUMAN BODY AND SYNTHESIS OF SAME

John Hughes, Aberdeen, Scotland, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 666,647

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **5 Claims**

1. A process for recovering and purifying from mammalian brain tissue an endogenous composition having morphine agonist properties consisting of a mixture of two pentapeptides (a) H-Tyr-Gly-Gly-Phe-Met-OH and (b) H-Tyr-Gly-Gly-Phe-Leu-OH wherein the ratio of *a:b* is from 3:1 to 4:1 and wherein said mammalian brain tissue is extracted with acetone, filtered, transferred to the aqueous phase and separated from lipid impurities by extraction with ether/ethyl acetate at an acid pH of about 3.

4,105,652

SYNTHESIS OF HUMAN β-ENDORPHIN

Johannes Arnold Meienhofer, Upper Montclair, and Su-Sun Wang, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 5, 1977, Ser. No. 822,120

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **14 Claims**

1. A compound of the formula

R^1-Try(R^2)-Gly-Gly-Phe-Met-Thr(R^3)-S
er(R^8)-Glu(OR^4)-Lys(R^5)-Ser(R^8)-Gln(R^6)-Thr(R^3
)-Pro-Leu-Val-Thr(R^3)-Leu-Phe-Lys(R^5)-Asn(R^6)-
Ala-Ile-Ile-Lys(R^5)-Asn(R^6)-Ala-Tyr(R^2)-Lys(R^5)-
Lys(R^5)-Gly-Glu((OR^4)-OR^7

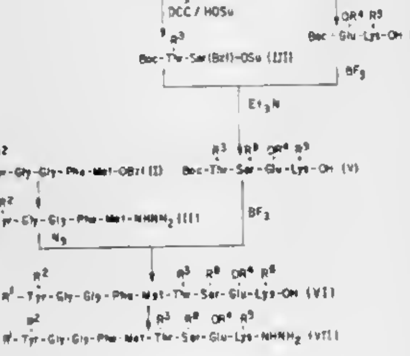
where R^1 is a conventional α-amino protecting group, R^2 is hydrogen or a conventional protecting group for the phenolic hydroxyl group of the tyrosine residue, R^3 is hydrogen or a conventional protecting group for the hydroxyl group of the threonine residue, R^4 is hydrogen or a conventional carboxyl protecting group, R^5 is a conventional ω-amino protecting group, R^6 is hydrogen or a conventional protecting group for the carboxamide group, R^7 is hydrogen or a conventional carboxyl protecting group and R^8 is hydrogen or a conventional protecting group for the hydroxyl group of the serine residue.

14. A process for the preparation of human β-endorphin which process comprises in combination:

(A) reacting a protected nonapeptide of the formula

R^1-Try(R^2)-Gly-Gly-Phe-Met-Thr(R^3)-Ser(R^8)-
Glu(OR^4)-Lys(R^5)-OH,

where R^1 is a conventional α-amino protecting group, R^2 is hydrogen or a conventional protecting group for the phenolic hydroxyl group of the tyrosine residue, R^3 is hydrogen or a conventional protecting group for the hydroxyl group of the threonine residue, R^4 is hydrogen or a conventional carboxyl protecting group, R^5 is a conventional ω-amino protecting group and R^8 is hydrogen or a conventional protecting group for the hydroxyl group of the serine residue with a 22 amino acid partially protected peptide amine of the formula



Boc-Thr-OSu
H-Ser(Bzl)-OH
Et₃N
DCC / HOSu
Boc-Thr-Ser(Bzl)-OSu (III)
Boc-Glu-OSu
H-Lys(Z)-OH
Et₃N
Boc-Glu-Lys-OH (IV)
BF₃
Et₃N
R¹-Tyr-Gly-Gly-Phe-Met-OBzl (I)
Boc-Thr-Ser-Glu-Lys-OH (V)
R¹-Tyr-Gly-Gly-Phe-Met-NHNH₂ (II)
N₃
BF₃
R¹-Tyr-Gly-Gly-Phe-Met-Thr-Ser-Glu-Lys-OH (VI)
R¹-Tyr-Gly-Gly-Phe-Met-Thr-Ser-Glu-Lys-NHNH₂ (VII)

H_2N-Ser(R^8)-Gln(R^6)-Thr(R^3)-P
ro-Leu-Val-Thr(R^3)-Leu-Phe-Lys(R^5)-Asn(R^6)-
Ala-Ile-Ile-Lys(R^5)-Asn(R^6)-Ala-Tyr(R^2)-Lys(R^5)-
Lys(R^5)-Gly-Glu(OR^4)-OR^7

where R^1, R^2, R^3, R^4, R^5 and R^8 are as above and R^6 is hydrogen or a conventional protecting group for the carboxamide group and R^7 is hydrogen or a conventional carboxyl protecting group

under peptide bond forming conditions consisting of treatment with dicyclohexylcarbodiimide/1-hydroxybenzotriazole so as to produce a compound of the formula

R^1-Tyr(R^2)-Gly-Gly-Phe-Met-Thr(R^3)-S
er(R^8)-Glu(OR^4)-Lys(R^5)-Ser(R^8)-Gln(R^6)-Thr(R^3
)-Pro-Leu-Val-Thr(R^3)-Leu-Phe-Lys(R^5)-Asn(R^6)-
Ala-Ile-Ile-Lys(R^5)-Asn(R^6)-Ala-Tyr(R^2)-Lys(R^5)-
Lys(R^5)-Gly-Glu(OR^4)-OR^7

where R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are as above; and

(B) removing the protective groups with strong acid so as to yield the desired human β-endorphin.

4,105,653

HETERYL-AZO-PHENYL DISPERSE DYESTUFFS CONTAINING A Z-SUBSTITUTED BENZOLYLOXYALKYL RADICAL, WHEREIN Z IS 2-CYANOVINYL 2-CYANOETHYL OR 2-CHLORO-2-CYANOETHYL

Claude Marie Henri Emile Brouard, Sotteville les Rouen; Bernard Dupont, Roussillon; Jean-Marie Louis Leroy, Saint Etienne du Rouvray, and Jean-Pierre Henri Stiot, Saint Pierre les Elbeuf, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

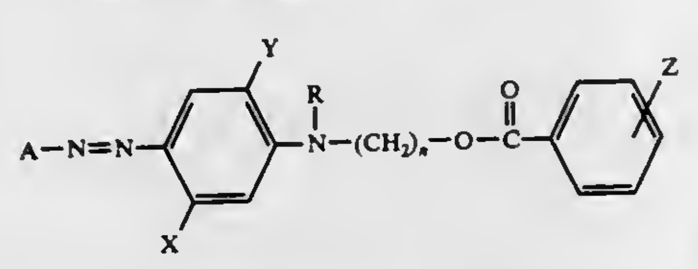
Division of Ser. No. 495,718, Aug. 6, 1974, Pat. No. 3,987,027. This application Apr. 27, 1976, Ser. No. 680,649

Claims priority, application France, Aug. 8, 1973, 73 28972

Int. Cl.² C09B *29/08, 29/26;* **D06P** *3/42, 3/54*

U.S. Cl. 260—158 **6 Claims**

1. A dyestuff of the formula:



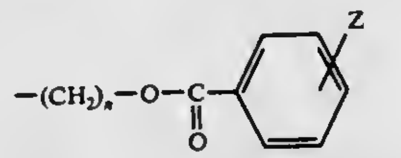
in which

A is thiazolyl, isothiazolyl, benzothiazolyl, benzisothiazolyl, thiadiazolyl, thienyl, or imidazolyl which is unsubstituted or substituted by one to three substituents selected from chlorine, bromine, methyl, phenyl, nitro, cyano, thiocyano, acetyl, carbalkoxy containing 2 to 5 carbon atoms and alkylsulfonyl containing 1 to 4 carbon atoms;

X is hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, formylamino, acetylamino, propanoylamino, benzoylamino or cinnamoylamino;

Y is hydrogen, methyl, ethyl, methoxy or ethoxy;

R is hydrogen, alkyl containing 1 to 4 carbon atoms or the group of formula:



said alkyl being unsubstituted or substituted by one hydroxy, alkoxy containing 1 to 4 carbon atoms, phenoxy, acetyloxy, cyano, alkylsulfonyl containing 1 to 4 carbon atoms, carbalkoxy containing 2 to 5 carbon atoms or alkoxycarbonyloxy containing 2 to 5 carbon atoms;

n is equal to 1, 2, or 3; and

Z is 2-cyanovinyl, 2-cyanoethyl or 2-chloro-2-cyanoethyl.

4,105,654

LIQUID CRYSTALLINE 4″-CYANO- OR 4″-NITROBENZYLIDENE-4′-(N,N-DIALKYLAMINO)-1-AMINOAZABENZENE DYES

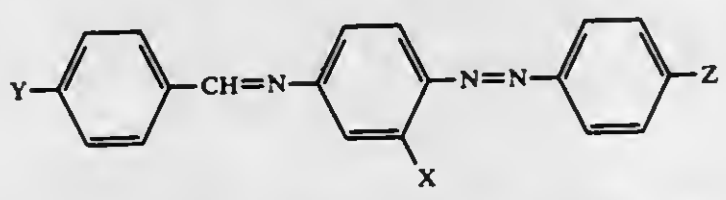
Allen Bloom, East Windsor, and Ling Kong Hang, Edison, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,538

Int. Cl.² C07C *107/06;* **C09B** *29/08;* **C09K** *3/34*

U.S. Cl. 260—205 **5 Claims**

1. A compound having the formula:



wherein Y and Z are different, one is nitro or cyano and the other is $-N(R)_2$ wherein R is alkyl or alkylene of 1 to 8 carbon atoms, and X is hydrogen, methyl, fluoro or chloro.

4,105,655

PHENYL-AZO-ANILINO DYESTUFF

Alois Gottschlich, and Klaus Leverenz, both of Leverkusen, Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

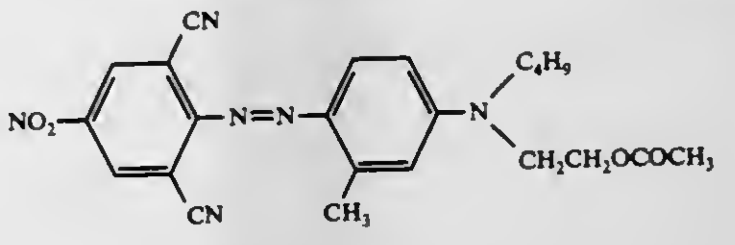
Continuation of Ser. No. 382,063, Jul. 24, 1973, abandoned, which is a division of Ser. No. 361,603, May 18, 1973, Pat. No. 3,962,209, which is a continuation of Ser. No. 28,247, Apr. 17, 1970, abandoned, which is a continuation of Ser. No. 615,898, Feb. 14, 1967, abandoned. This application Mar. 1, 1976, Ser. No. 662,880

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1966, 1648454; Jan. 12, 1967, 1751232; Feb. 17, 1966, 1648455

Int. Cl.² C09B *29/06;* **D06P** *1/18, 3/26, 3/54*

U.S. Cl. 260—207.1 **1 Claim**

1. Dyestuff having the formula



4,105,656

PROCESS FOR PREPARING 3-N-MONOSUBSTITUTED AMINO-4-SUBSTITUTED-5-PYRAZOLONES

Kotaro Nakamura; Seiji Ichijima; Nobuo Furutachi, and Yosio Kosuge, all of ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

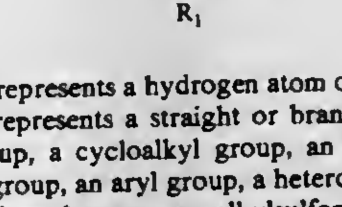
Filed Jan. 31, 1977, Ser. No. 764,481

Claims priority, application Japan, Jan. 30, 1976, 51-8988

Int. Cl.² C07D *231/16*

U.S. Cl. 260—239.9 **5 Claims**

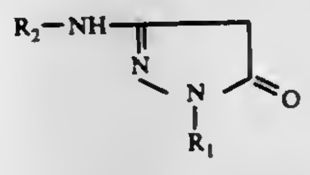
1. A process for preparing a 3-N-mono-substituted amino-4-substituted-5-pyrazolone represented by the formula (VI)



(VI)

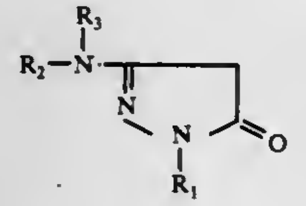
wherein R_1 represents a hydrogen atom or has up to 35 carbon atoms and represents a straight or branched alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, an acyl group, a thioacyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group or a thiocarbamoyl group; R_2 represents a hydrogen atom or has up to 35 carbon atoms and represents an alkyl group, an aryl group or a heterocyclic group; and Q represents a group of nonmetallic atoms necessary to form a 5-membered or 6-membered heterocyclic ring containing two or more nitrogen atoms;

which comprises replacing the hydrogen atom of the N-H group in the 3-position of a compound represented by the formula (I)



(I)

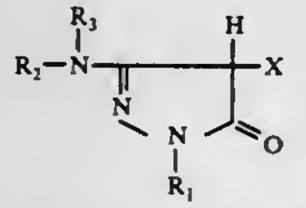
wherein R_1 and R_2 are as described above; with a protective group to prepare a compound represented by the formula (II)



(II)

wherein R_1 and R_2 are as described above, and R_3 has up to 35 carbon atoms and represents a formyl group, an alkyl carbonyl group, an aryl carbonyl group, an alkyl sulfonyl group, an arylsulfonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, a sulfamoyl group or a thiocarbamoyl group;

halogenating the resulting compound represented by the formula (II) to prepare a compound represented by the formula (III)



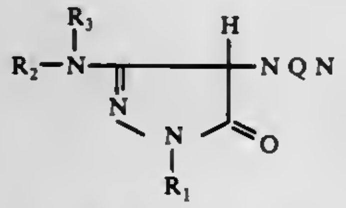
(III)

wherein R_1, R_2 and R_3 are as described above, and X represents a halogen atom;

reacting the resulting compound represented by the formula (III) with a nitrogen-containing heterocyclic compound represented by the formula (IV)

$$HNQN \quad \text{(IV)}$$

wherein Q is as described above; to prepared a compound represented by the formula (V)



(V)

wherein R_1, R_2, R_3 and Q are as described above; and converting the resulting compound of the represented by the formula (V) into a compound represented by said formula (VI).

4,105,657

PRODUCTION OF N-ALKYL DERIVATIVES OF CYCLIC ALKYLENIMINES

Toni Dockner, Meckenheim; Herbert Toussaint, Frankenthal, and Martin Decker, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

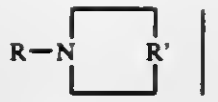
Continuation of Ser. No. 605,238, Aug. 8, 1975, abandoned, which is a continuation of Ser. No. 330,243, Feb. 7, 1973, abandoned. This application Apr. 8, 1977, Ser. No. 786,116

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1972, 2205597

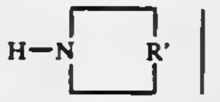
Int. Cl.² C07D *295/02, 265/30*

U.S. Cl. 260—239 B **4 Claims**

1. In a process for the production of an N-alkylated cyclic amine of the formula



wherein R is an alkyl radical selected from the group consisting of methyl, ethyl and isopropyl, by reacting in the gas phase at a temperature of from 150° to 350° C an alcohol selected from the group consisting of methanol, ethanol and isopropanol or an ether selected from the group consisting of dimethyl ether, diethyl ether and diisopropyl ether with a cyclic amine of the formula



said latter amine being selected from the group consisting of pyrrolidine, 1-methylimidazolidine, oxazolidine, thiazolidine, dihydroisoindole, piperidine, 3-propylpiperidine, piperazine, N-methylpiperazine, perhydro-(1,3)-oxazine, perhydro-(1,3)-thiazine, hexamethylenimine, perhydrothiazepine, decamethylenimine, 3,5-dimethylmorpholine, and morpholine, in the presence of a catalyst containing a phosphorus compound on a carrier, the improvement which comprises carrying out said reaction in the presence of a silicon dioxide catalyst having a specific surface area of from 50 to 500 m²/g and containing from 0.1 to 20% by weight of phosphoric acid, said catalyst being obtained by converting an aqueous colloidal sodium silicate solution by addition of sulfuric acid to a silicic acid hydrogel, desalting said hydrogel with ammoniacal water, adding oxalic acid and an appropriate amount of phosphoric acid, milling the mixture so obtained until peptization takes place and spray drying to give a particulate powder.

4,105,658

NEOTHRAMYCIN ANTIBIOTICS

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Masa Hamada, Hoya; Shinichi Kondo, Yokohama; Masaaki Ishizuka, and Hiroshi Naganawa, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

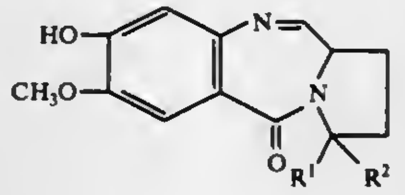
Continuation-in-part of Ser. No. 556,985, Mar. 10, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,319

Claims priority, application Japan, Mar. 12, 1974, 49-2767; Oct. 15, 1975, 50-123256

Int. Cl.² C07D *487/14;* **C12B** *1/08;* **C12D** *9/16*

U.S. Cl. 260—239.3 T **7 Claims**

1. A pharmaceutically acceptable salt of a hydroxyl group of a compound of the formula



wherein

R^1 is hydrogen, hydroxyl or methoxyl,

R^2 is hydrogen, hydroxyl or methoxyl, and one but only one of R^1 and R^2 is hydrogen.

4,105,659

1,2,3,4,5,6-HEXAHYDRO-2,6-METHANO-3-BENZAZOCINES

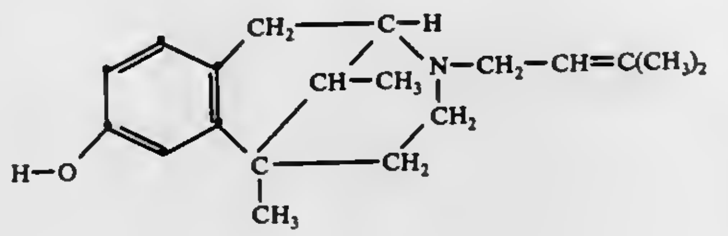
Sydney Archer, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 72,844, Dec. 1, 1960, abandoned, Ser. No. 239,777, Nov. 23, 1962, Pat. No. 3,372,165 and Ser. No. 251,721, Jan. 16, 1963 Pat. No. 3,250,678. This application Feb. 5, 1964, Ser. No. 342,768

Int. Cl.² C07D *221/26*

U.S. Cl. 260—293.54 **9 Claims**

1. 1,2,3,4,5,6-Hexahydro-3-(3-methyl-2-butenyl)-6,11-dimethyl-8-hydroxy-2,6-methano-3-benzazocine having the structural formula



4,105,660

PREPARATION OF 3β-HYDROXY-27-NORCHOLEST-5,7-DIEN-25-ONE

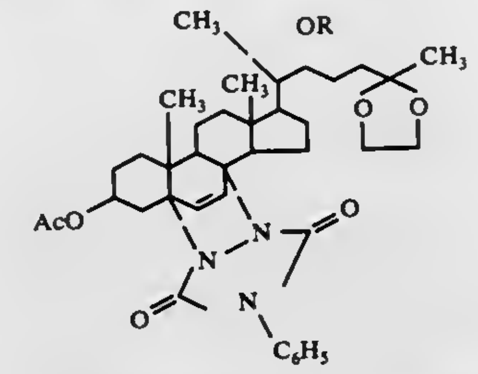
Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1977, Ser. No. 811,403

Int. Cl.² C07J *9/00, 21/00*

U.S. Cl. 260—239.55 C **2 Claims**

2. A compound of structural formula:



wherein R is a member selected from the group consisting of hydroxy and mesyl.

4,105,661

2-MERCAPTO, ALKYL, ACETYL AND FURFURYL-SULFIDE PYRAZINES

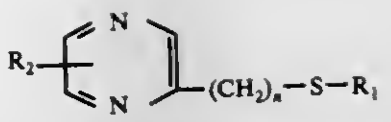
Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Nlantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,819, Jun. 24, 1974, Pat. No. 4,038,435, which is a division of Ser. No. 243,866, Apr. 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sep. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, Apr. 18, 1966, which is a continuation-in-part of Ser. No. 452,342, Apr. 30, 1965. This application Mar. 23, 1977, Ser. No. 780,558

Int. Cl.² C07D *241/12, 241/18, 405/12*

U.S. Cl. 544—405 **11 Claims**

1. A compound of the formula



wherein n is 0, 1 or 2, R_1 is hydrogen, methyl, ethyl, acetyl or furfuryl and R_2 is hydrogen or methyl with the proviso that R_1 and R_2 cannot both be methyl if n is 0.

4,105,662

ANTRAQUINONE DYESTUFFS

Klaus von Oertzen, Cologne, Fed. Rep. of Germany; Hans Samuel Bien, deceased, late of Burscheld, Fed. Rep. of Germany (by Else Bien, legal representative), and by Gabriele Bien, legal representative, Burscheld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

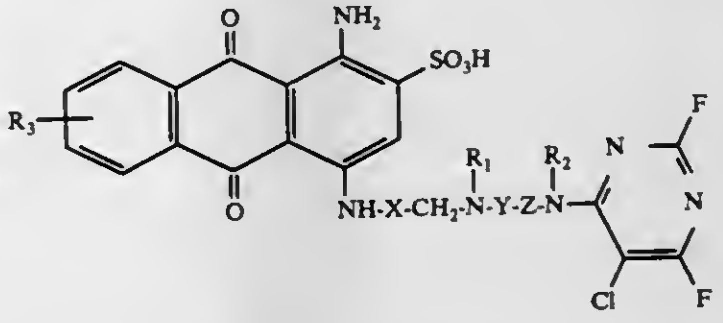
Filed Mar. 9, 1977, Ser. No. 775,894

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610158

Int. Cl.² C09B *1/20*

U.S. Cl. 544—294 **4 Claims**

1. Reactive dyestuff of the formula



wherein

R_1, R_2 and R_3 are hydrogen;

X is phenylene or phenylene substituted with C_1-C_4-alkyl, with or without one sulfo groups;

Y is CO or SO_2; and

Z is phenylene.

4,105,663

THIOPHENE ETHANOLAMINES

Jehan F. Bagli, Kirkland, and Eckhardt Ferdinandi, St. Laurent, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 569,509, Apr. 18, 1975, Pat. No. 4,024,156. This application Feb. 16, 1977, Ser. No. 768,936

Claims priority, application Canada, Apr. 18, 1974, 197896

Int. Cl.² C07D *409/02*

U.S. Cl. 544—379 **6 Claims**

1. A compound of the formula

$$ArCHOR^1CHR^2NR^3R^4$$

in which Ar is selected from the group consisting of 2-thienyl, 5-(lower alkyl)-2-thienyl, 5-phenyl-2-thienyl and 4,5-dichloro-2-thienyl; R^1 is hydrogen or lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 together with the nitrogen to which they are joined form a 4-(4-methoxyphenyl)-or 4-(o-tolyl)piperazin-1-yl group, or the acid addition salts thereof with pharmaceutically acceptable acids.

4,105,664

DIBENZ[b,f]OXEPIN DERIVATIVES

Max Gerecke; Emilio Kyburz, both of Reinach, Switzerland, and Jean-Pierre Kaplan, Le Plessis Robinson, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

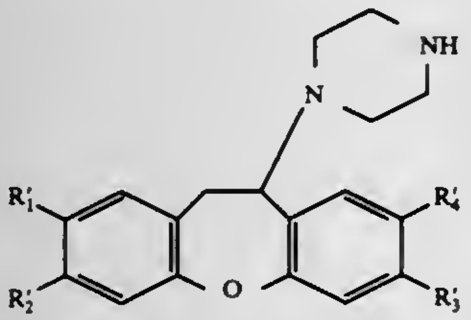
Division of Ser. No. 534,033, Dec. 18, 1974, Pat. No. 4,032,525. This application Mar. 18, 1977, Ser. No. 779,196

Claims priority, application Switzerland, Jan. 4, 1974, 62/74; Nov. 20, 1974, 15369/74

Int. Cl.² C07D *405/04*

U.S. Cl. 544—378 **3 Claims**

1. A compound of the formula



wherein one of R'_1 and R'_2 is hydrogen and the other is halogen, lower alkyl, lower alkoxy, lower alkylthio, or trifluoromethyl, and one of R'_3 and R'_4 is hydrogen and the other is halogen, lower alkyl, lower alkoxy, lower alkylthio, or trifluoromethyl.

4,105,665

MONOMETHINE DYESTUFFS

Horst Harnisch, Cologne-Buchheim, Germany, assignor to Bayer Aktiengellschaft, Leverkusen, Germany

Continuation of Ser. No. 558,647, Mar. 17, 1975, Pat. No. 4,018,796. This application Nov. 3, 1976, Ser. No. 738,356

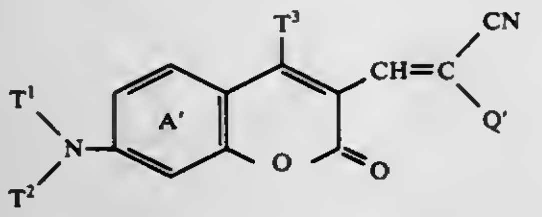
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413371

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² C09B *23/04*

U.S. Cl. 260—289 C **6 Claims**

1. Monomethine dyestuff of the formula



wherein

T^1 and T^2 independently of one another are unsubstituted C_1–C_5-alkyl uninterrupted or interrupted by —O—; C_1–C_4-alkyl monosubstituted or disubstituted by hydroxyl or chlorine; C_1–C_4 alkyl monosubstituted by bromine, nitrile, C_1–C_4-alkoxycarbonyl, aminocarbonyl, phenoxy, benzyloxy, cyclohexyloxy, cyclohexyl, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkylcarbonyloxy, acetylamino, C_1–C_4-alkylsulphonylamino, aminocarbonyloxy, di-(C_1–C_4-alkyl) amino, carboxyl or sulpho; cyclohexyl; phenyl-C_1–C_3-alkyl; hydrogen; C_1–C_4-alkyl uninterrupted or interrupted by —O— and substituted by benzyloxycarbonyl, phenoxycarbonyl, phenoxy substituted by 1–5 chlorine atoms, C_1–C_4-alkylsulphonyl, benzylsulphonyl, phenylsulphonyl, benzylcarbonyloxy, benzoyloxy, C_1–C_4-alkoxycarbonyl-benzoyloxy, phenoxycarbonyloxy, tri-(C_1–C_4-alkyl) ammonium, benzoylamino, phenylaminocarbonylamino, phenylsulphonylamino or toluenesulphonylamino; or ethylene or 1,3-propylene unsubstituted or substituted with C_1–C_3-alkyl and connected to the 6- or 8-position of the coumarin ring;

T^3 is hydrogen or methyl;

Q' is CN or COOR;

R is C_1–C_6-alkyl; C_1–C_4-alkyl substituted by hydroxyl, C_1–C_4-alkoxy, nitrile, chlorine, bromine, benzyloxy, phenoxy, cyclohexyloxy, di-(C_1–C_4-alkyl)amino, N-tri-(C_1–C_4-alkyl) ammonium, or phenyl; or is allyl, cyclohexyl or phenyl; and

the ring A' is unsubstituted or substituted by methoxy, methyl or chloromethyl.

4,105,666

PIPERIDINE DERIVATIVES

Terence James Ward, Slough, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

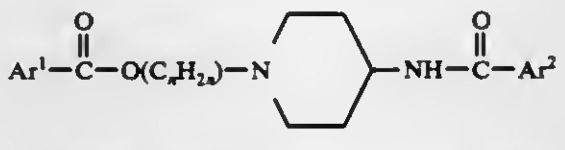
Filed Jul. 13, 1977, Ser. No. 815,131

Claims priority, application United Kingdom, Jul. 16, 1976, 29419/76

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.77 **3 Claims**

1. A compound selected from those having the formula I



and their pharmaceutically acceptable acid addition salts, wherein Ar^1 and Ar^2 are independently selected from the group consisting of phenyl and phenyl substituted by one or two substituents selected from halogen, lower alkyl, lower alkoxy, nitro, trifluoromethyl and di(lower alkyl) amino; and *n* represents an integer from 2 to 6.

4,105,667

IMIDAZOLE TYPE CURING AGENTS

Karl Friedrich Thom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 17, 1970, Ser. No. 55,981

Int. Cl.² C07F *15/00, 3/00, 1/00*

U.S. Cl. 260—299 **5 Claims**

1. A compound of the formula

$$ML_n(O—SO_2—R_f)_m$$

wherein

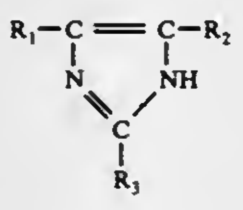
M is a metal selected from Groups VIII, IB and IIB of the Periodic Table,

n is a coordination number of M ranging from 2 to 8,

R_f is a perfluorinated alkyl or cycloalkyl group of 1 – 18 carbon atoms,

m is the valence of M, and

L is an imidazole of the formula



wherein

R_1, R_2, and R_3 are the same or different and are selected from the group consisting of hydrogen, phenyl, methyl, benzyl and ethyl.

4,105,668

PROCESS FOR 6-AMINO-2,2-DIMETHYL-3-(5-TETRAZOLYL)PENAM

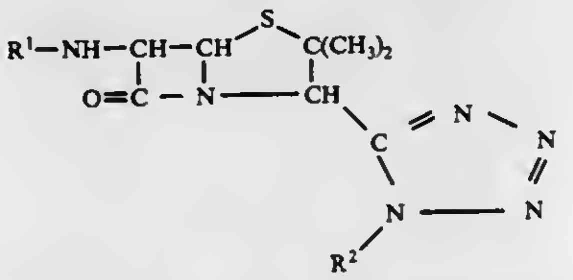
Susumu Nakanishi, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 540,127, Jan. 10, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,021

Int. Cl.² C07D *499/08*

U.S. Cl. 260—306.7 R **10 Claims**

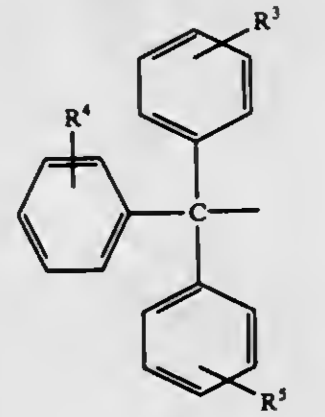
1. A process for the preparation of 6-amino-2,2-dimethyl-3-(5-tetrazolyl)penam, or an acid-addition salt thereof, which comprises reacting a compound of formula



or an acid-addition salt thereof, with hydrogen fluoride, at a temperature within the range from about −20° C. to about 20° C;

wherein

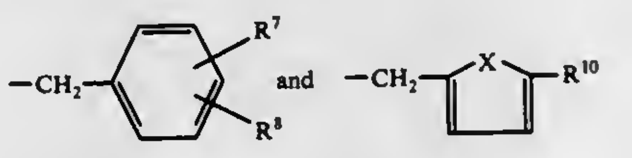
R^1 is selected from the group consisting of hydrogen and



wherein

R^3, R^4, and R^5 are each selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms and phenyl;

and R^2 is selected from the group consisting of



wherein

R^7 is at the 3-, 4- or 5-position and it is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, alkyl having from one to six carbon atoms, alkoxy having from one to six carbon atoms, benzyloxy and phenyl;

R^8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, unbranched-alkyl having from one to six carbon atoms and unbranched-alkoxy having from one to six carbon atoms;

R^{10} is selected from the group consisting of hydrogen and methyl;

and X is selected from the group consisting of oxygen and sulfur;

provided that at least one of R^7 and R^8 is selected from the group consisting of 2-hydroxy, 4-hydroxy, 4-alkoxy having from one to six carbon atoms, 2-(unbranched-alkoxy) having from one to six carbon atoms and 4-benzyloxy .

4,105,669

MANUFACTURE OF 2-AMINO-1-ALCOHOLS

Walter Himmele, Walldorf; Leopold Hupfer, Friedelsheim; Herbert Toussaint, Frankenthal, and Gerhard Paul, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Pfalz, Fed. Rep. of Germany

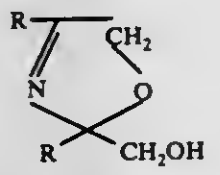
Division of Ser. No. 730,828, Oct. 8, 1976. This application Jun. 20, 1977, Ser. No. 807,925

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547654

Int. Cl.² C07D *263/14;* **C07C** *85/145, 85/20*

U.S. Cl. 260—307 F **2 Claims**

1. A compound of the formula



where R is methyl, ethyl, n-propyl or n-butyl.

4,105,670

SPIRO[CYCLOPROPANE-1,2'-INDOLIN]-3'-ONES

Shunsaku Noguchi, Minoo; Saburo Takei, Tokyo, and Yasuhiko Kawano, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

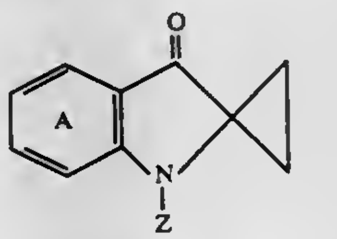
Filed Nov. 19, 1976, Ser. No. 743,404

Claims priority, application Japan, Nov. 26, 1975, 50-141748

Int. Cl.² C07D *209/04*

U.S. Cl. 260—326.11 R **32 Claims**

1. A spiro[cyclopropane-1,2'-indolin]-3'-one compound represented by the formula:



wherein the ring A is unsubstituted or substituted with an alkyl of 1 to 4 carbon atoms, an alkoxy having 1 to 4 carbon atoms, an alkylenedioxy having 1 to 4 carbon atoms, hydroxyl, nitro, amino, formylamino, an alkylcarbonyl amino having 2 to 5 carbon atoms, an arylcarbonyl amino having 7 to 11 carbon atoms or halogen; and Z is selected from the group consisting of

(A) hydrogen;

(B) a substituted or unsubstituted alkyl of 1 to 4 carbon atoms, wherein the substituent is selected from the group consisting of an aryl group of 6 to 10 carbon atoms, which aryl group may be further substituted with halogen, an alkyl group of 1 to 4 carbon atoms or an alkoxy group of 1 to 4 carbon atoms; an alkylcarbonyl group having 2 to 5 carbon atoms; formyl; a halogen-substituted or unsubstituted arylcarbonyl group having 7 to 11 carbon atoms; an alkoxy group having 1 to 4 carbon atoms; hydroxyl; an alkoxycarbonyl group having 2 to 5 carbon atoms; carboxyl; an N-substituted or unsubstituted carbamoyl group of the formula -CONPQ wherein each of P and Q is hydrogen or an alkyl group having 1 to 4 carbon atoms; or an amino or a mono- or di-alkylamino group, wherein each alkyl has 1 to 4 carbon atoms; and

(C) an unsubstituted acyl group of the formula: R^1CO-, R^2SO_2- or R^3R^4NCO in which R^1 is hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having

1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms and R^2 is an alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms, and each of R^3 and R^4 is hydrogen, an alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 10 carbon atoms, or a substituted acyl group thereof wherein the substituent of the acyl group is amino; a mono- or di-alkylamino wherein the alkyl has 1 to 4 carbon atoms; halogen; an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms, or

pharmaceutically acceptable salts of said compound.

4,105,671
INSECTICIDAL N-METHYLPYRROLIDINONYLACETANILIDES

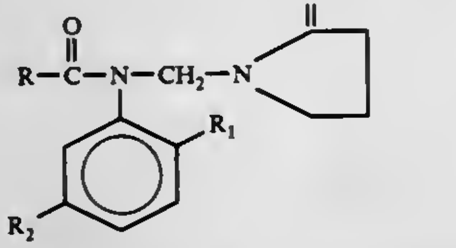
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 13, 1977, Ser. No. 796,520

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.43 **5 Claims**

1. Insecticidal N-acyl-N-(N'-methylenepyrrolidonyl) -2,5 dialkylanilines having the formula:



where R_1 and R_2 are both lower alkyl, and R is selected from alkyl, alkenyl and haloalkenyl having from 2 to 12 carboo atoms.

4,105,672
PROCESS FOR THE PRODUCTION OF CYCLIC DIESTERS OF DODECANEDIOIC ACID

Joern Rueter; Klaus Burzin; Karl-Heinz Magosch, and Roland Feinauer, all of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

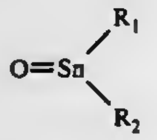
Filed Oct. 19, 1976, Ser. No. 734,013

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547267

Int. Cl.² C07D *321/00*

U.S. Cl. 260—340.2 **14 Claims**

1. In a process for the production of a cyclic ester of dodecanedioic acid and an aliphatic diol of 2-12 carbon atoms and substituted by up to two alkyl of 1-4 carbon atoms, by thermolysis of a corresponding linear polyester under reduced pressure in the presence of a catalyst, the improvement which comprises conducting the thermolysis at a temperature of from 200° to 300° C., and employing as the catalyst a mixture of an organotin compound of the formula



wherein R_1 and R_2 are each alkyl of 1-18 carbon atoms, or aryl or aralkyl of 6-36 carbon atoms, and an O,O-dialkyl-(3,5-di-tert.-butyl-4-hydroxybenzyl)phosphonate wherein each alkyl is of 2-18 carbon atoms.

4,105,673
PROCESS FOR THE PREPARATION OF LACTONES

Teruaki Mukaiyama; Masahiro Usui, both of Tokyo, and Kazuhiko Saigo, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

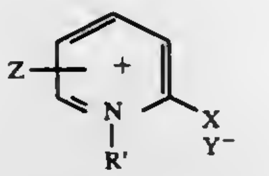
Filed Sep. 20, 1976, Ser. No. 724,845

Claims priority, application Japan, Jan. 13, 1976, 51-3557

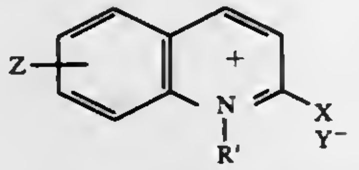
Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **6 Claims**

1. A process for producing a lactone which comprises subjecting a hydroxy acid of the formula R-COOH wherein R is a saturated or olefinically unsaturated hydroxy acyclic group optionally substituted with cycloalkyl to intramolecular condensation by reacting said hydroxy acid with a 1-substituted-2-halopyridinium salt of the formula



wherein R' is $C_{1\text{-}C6}$ alkyl, allyl, C_3–C_6 cycloalkyl-(C_1–C_2) alkyl, 2-oxo-(C_2–C_6)alkyl, phenyl-(C_1–C_6)alkyl or phenyl-substituted 2-oxo-(C_2–C_6)alkyl; X is halogen; Y^- is a halide ion, a methylsulfate ion, a p-toluenesulfonate ion, a perchlorate ion or a tetrafluoroborate ion; and Z is C_1–C_6 alkyl, nitro, halogen or C_1–C_6 alkoxy, or a 1-substituted-2-haloquinolinium salt of the formula



wherein R', X, Y^- and Z are as defined above, as a condensing agent in the presence of an acid captor for acids having an anion selected from the group consisting of halogen, methylsulfate, p-toluenesulfonate, perchlorate and tetrafluoroborate in an anhydrous organic solvent at a temperature from 0° C to the boiling point of said solvent.

4,105,674
PRODUCTION OF GAMMA-BUTYROLACTONE FROM MALEIC ANHYDRIDE WITH A HYDROGENATION CATALYST

Waldo De Thomas, Parsippany, and Eugene Victor Hort, Wayne, both of N.J., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 716,111, Aug. 20, 1976. This application Mar. 9, 1977, Ser. No. 775,792

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **9 Claims**

1. A process for producing gamma-butyrolactone, comprising contacting a feed compound selected from the group consisting of maleic acid, succinic acid, maleic anhydride, succinic anhydride, mixtures thereof, and mixtures of any of the foregoing with butyrolactone; in the vapor phase, with a stoichiometric excess of hydrogen at a pressure ranging from atmospheric to about 50 atmospheres and at a temperature between about 150° C. and about 350° C. in the presence of an elemental copper-elemental metal catalyst comprising about 3 - 100 percent by weight of an admixture of elemental copper and an elemental metal selected from the group consisting of palladium and platinum, the weight ratio of copper to said elemental metal ranging from about 10:1 to about 500:1, the rest of said admixture being a non-acidic carrier.

4,105,675
METHOD FOR MAKING 3-DEOXYANTHOCYANIDINS

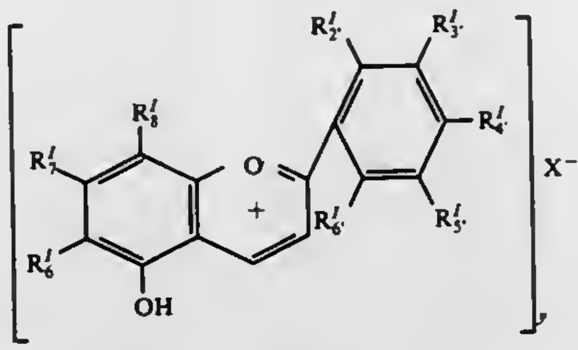
Guillermo A. Iacobucci, and James G. Sweeny, both of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 1, 1976, Ser. No. 662,742

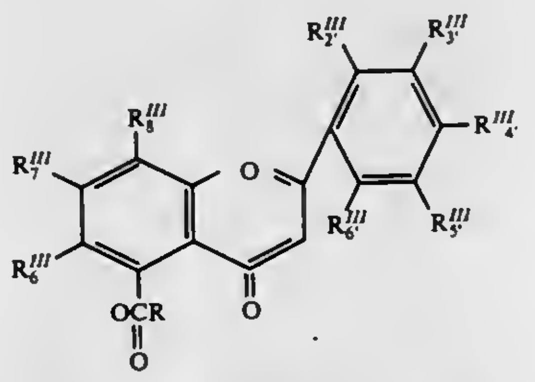
Int. Cl.² C07D *311/60*; A23L *1/275*

U.S. Cl. 260—345.2 **56 Claims**

1. A method for preparing a 3-deoxyanthocyanidin salt of the formula:



wherein $R_{6\text{-}8,3'\text{-}5'}{}^{I}$ are substituents selected from the group consisting of H, non-vicinal OH and lower alkoxy, at least one of $R_7{}^{I}$ and $R_{4'}{}^{I}$, is OH, $R_{2'}{}^{I}$ and $R_{6'}{}^{I}$, are substituents selected from the group consisting of H and lower alkoxy, X is an anion and y corresponds to the valence of the anion, from an acylated flavanone of the formula:



wherein $R_{6\text{-}8,2'\text{-}6'}{}^{III}$ are the same as $R_{6\text{-}8,2'\text{-}6'}{}^{I}$ except that those $R_{6\text{-}8,3'\text{-}5'}{}^{III}$ corresponding to those $R_{6\text{-}8,3'\text{-}5'}{}^{I}$ which are OH are

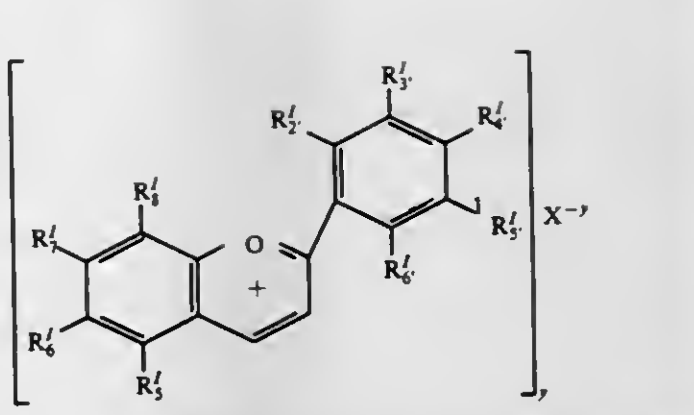
$$\underset{\underset{\mathrm{O}}{\|}}{\mathrm{OCR}}$$

and is selected from the group consisting of lower alkyl and phenyl, said method comprising:

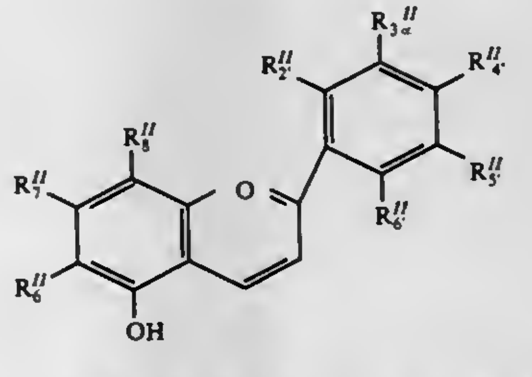
(a) reducing said acrylated flavanone in an organic solvent medium by reaction with an alkali borohydride to form a flavan not having a 4-OH substituent and

(b) oxidizing said flavan or an acylated or hydrolyzed derivative thereof in a solvent medium by reaction with a halogenated benzoquinone in the presence of a strong acid to form said 3-deoxyanthocyanidin salt, said solvent medium of this step and said strong acid together forming an aqueous protic medium.

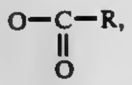
36. A method for preparing a 3-deoxyanthocyanidin said of the formula:



wherein $R_{5\text{-}8,3'\text{-}5'}{}^{I}$ are substituents selected from a group consisting of H, non-vicinal OH and lower alkoxy, at least one of $R_7{}^{I}$ and $R_{4'}{}^{I}$ is OH, $R_{2'}{}^{I}$ and $R_{6'}{}^{I}$ are substituents selected from a group consisting of H and lower alkoxy, X is an anion and y corresponds to the valence of the anion from a flavan of the formula:



wherein $R_{5\text{-}8,2'\text{-}6'}{}^{II}$ are the same as $R_{5\text{-}8,2'\text{-}6'}{}^{I}$ except that those $R_{5\text{-}8,3'\text{-}5'}{}^{II}$ corresponding to those $R_{5\text{-}8,3'\text{-}5'}{}^{I}$ which are OH are OH or



$$\mathrm{O-}\underset{\underset{\mathrm{O}}{\|}}{\mathrm{C}}\mathrm{-R},$$

R is selected from the group consisting of lower alkyl and phenyl, said method comprising

oxidizing said flavan in a solvent medium by reaction with a halogenated benzoquinone in the presence of a strong acid to form said 3-deoxyanthocyanidin salt, said solvent medium and said strong acid together forming an aqueous protic medium.

4,105,676
STEROID TOTAL SYNTHESIS PROCESS UTILIZING A CYANOALKYL A-RING PRECURSOR

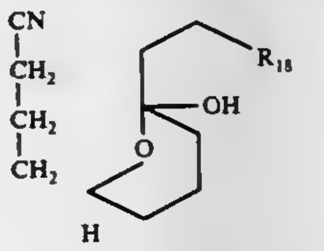
Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 642,817, Dec. 22, 1975, Pat. No. 4,045,452, which is a division of Ser. No. 450,701, Mar. 18, 1974, Pat. No. 3,991,084, which is a division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application May 10, 1977, Ser. No. 795,577

Int. Cl.² C07D *309/06*

U.S. Cl. 260—345.9 S **2 Claims**

1. A compound of the formula



where R_{16} is lower alkoxy.

4,105,677

PRODUCTION OF TETRAHYDROFURAN

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,355

Int. Cl.^{2} C07D *307/08*

U.S. Cl. 260—346.11 **3 Claims**

1. A process for converting acrolein into tetrahydrofuran which comprises (1) forming 2-vinyl-5-methyl-1,3-dioxane by the acid-catalyzed condensation of acrolein with 2-methyl-1,3-propanediol; (2) hydroformylation of the 2-vinyl-5-methyl-1,3-dioxane with carbon monoxide and hydrogen in the presence of a hydroformylation catalyst at a temperature between about 25° and 200° C and a pressure between about 15 and 300 psi to produce a mixture of 2-(5′-methyl-1′,3′-dioxane)propionaldehyde and 3-(5′-methyl-1′,3′-dioxane)propionaldehyde; and (3) hydrogenating said mixture of propionaldehydes with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce a product mixture of tetrahydrofuran and 2-methyl-1,3-propanediol, and recovering the tetrahydrofuran from the product mixture.

3. A process for converting acrolein into tetrahydrofuran which comprises (1) forming 2-vinyl-5-methyl-1,3-dioxane by the acid-catalyzed condensation of acrolein with 2-methyl-1,3-propanediol; (2) hydroformylation of the 2-vinyl-5-methyl-1,3-dioxane with carbon monoxide and hydrogen in the presence of a hydroformylation catalyst at a temperature between about 80° and 120° C and a pressure between about 300 and 3000 psi to produce a mixture of 2-(5′-methyl-1′,3′-dioxane)propionaldehyde and 3-(5′-methyl-1′,3′-dioxane)propionaldehyde, and increasing the temperature into the range between about 150° and 225° C to convert the propionaldehydes into a mixture of 2-(5′-methyl-1′,3′-dioxane)propanol and 3-(5′-methyl-1′,3′-dioxane)propanol; and (3) hydrogenating said mixture of propanols with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce a product mixture of tetrahydrofuran and 2-methyl-1,3-propanediol, and recovering the tetrahydrofuran from the product mixture.

4,105,678

SYNTHESIS OF TETRAHYDROFURAN

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,343

Int. Cl.^{2} C07D *307/08*

U.S. Cl. 260—346.11 **4 Claims**

1. A process which comprises contacting 3-(5′-alkyl-1′,3′-dioxane)propionaldehyde with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° C and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce tetrahydrofuran, and recovering the said tetrahydrofuran from the reaction mixture.

4. A process which comprises contacting a mixture of 3-(5′-methyl-1′,3′-dioxane)propanol and 2-(5′-methyl-1′,3′-dioxane)-propanol with hydrogen in the presence of a hydrogenation catalyst at a temperature between about 180° and 225° C and a pressure between about 100 and 1000 psi in an aqueous medium maintained at a pH between about 0.2 and 3 with a water-soluble acid to produce a product mixture of tetrahydrofuran and 2-methyl-1,3-propanediol, and recovering the tetrahydrofuran from the product mixture.

4,105,679

PROCESS FOR PRODUCING A CYLIC ETHER FROM AN ACETIC ESTER OF A 1,4-GLYCOL

Yasuo Tanabe, Kurashiki, Japan, assignor to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,715

Claims priority, application Japan, Feb. 4, 1976, 51-11077; Mar. 16, 1976, 51-28451

Int. Cl.^{2} C07D *307/08*

U.S. Cl. 260—346.11 **13 Claims**

1. A process for producing a cyclic ether by reacting an acetic ester of 1,4-butanediol or 1,4-dihydroxybutene-2 and water in the presence of a non-volatile liquid acid catalyst and recovering the cyclic ether from the reaction product by distillation, which process comprises the steps of:

(a) effecting the reaction at a temperature from 110° C. to 180° C. in a plurality of reaction zones connected in series,
(b) supplying the liquid acetic ester to the first reaction zone, while supplying water to the last reaction zone,
(c) recycling the gaseous mixture of cyclic ether, water and acetic acid discharged from each of the zones to the preceding reaction zone, while supplying a liquid fraction containing unreacted raw material acetic ester of each of the zones to the succeeding reaction zone, and intimately contacting the gaseous mixture and the liquid fraction in each reaction zone,
(d) removing the liquid fraction from the last reaction zone,
(e) supplying the gaseous mixture of cyclic ether water and acetic acid discharged from the first reaction zone to a distillation column,
(f) recycling the gaseous mixture of cyclic ether and water discharged from the distillation column to a predetermined reaction zone,
(g) removing the bottom residue containing cyclic ether substantially free from water discharged from the distillation column, and
(h) recovering the cyclic ether from the bottom residue by distillation.

4,105,680

PROCESS FOR THE PREPARATION OF 1-AMINOANTHRAQUINONES

Rack H. Chung, Clifton Park, N.Y., assignor to GAF Corporation, New York, N.Y.

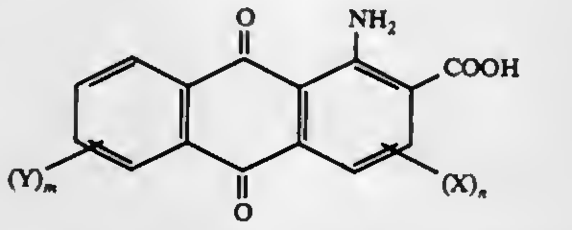
Filed Sep. 20, 1977, Ser. No. 834,994

Int. Cl.^{2} C09B *1/22;* **C07C** *49/68, 25/00*

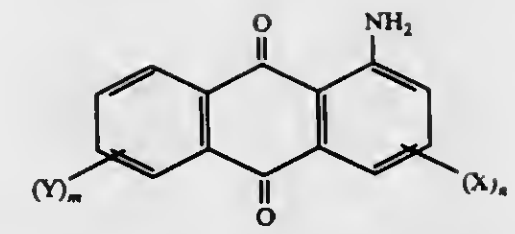
U.S. Cl. 260—378 **9 Claims**

1. A process for selectively producing a 1-aminoanthraquinone which comprises:

(a) forming an alkali metal hydroxide solution of a 1-aminoanthraquinone-2-carboxylic acid having the formula:



wherein X is hydroxy, alkoxy of from 1 to 4 carbon atoms, halo, amino or —SO_3H; Y is hydroxy, alkoxy of from 1 to 4 carbon atoms, halo, amino or —SO_3H; and m and n independently represent a value of from 0 to 2;
(b) contacting the resulting alkali metal hydroxide solution from (a) with between about 0.75 mole and about 3 moles of an alkali metal hydrosulfite, per mole of 1-aminoanthraquinone-2-carboxylic acid to effect decarboxylation at an elevated temperature; and
(c) recovering the corresponding product of the process having the formula:



wherein the substituents X and Y and subscripts *m* and *n* are the same as defined above.

4,105,681

9-PHENYL 5,6-DIMETHYL-NONA-2,4,6,8-TETRAEONIC ACID COMPOUNDS

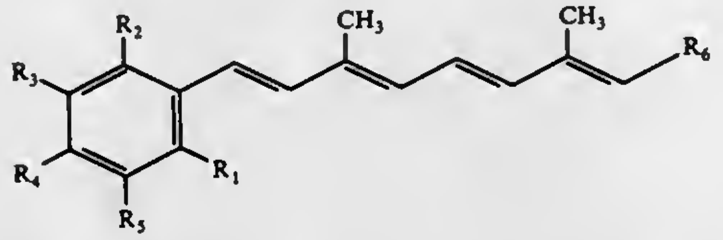
Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 601,148, Aug. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,007, Mar. 22, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,170

Int. Cl.^{2} C09F *5/00*

U.S. Cl. 260—404 **18 Claims**

1. A compound of the formula



wherein R_1 and R_2 are lower alkyl; R_3 is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, nitro, halo, amino, lower alkylamino, lower alkanoylamino R_4 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, lower alkanoyloxy, amino, lower alkylamino R_5 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, halo, amino, lower alkanoylamino, lower alkylamino with the proviso that at least one of R_3, R_4 and R_5 is other than hydrogen; with the further proviso that when R_3 or R_5 is halogen, R_4 is other than alkoxy; and R_6 is carboxyl and pharmaceutically acceptable salts thereof.

4,105,682

13,14-DIHYDRO-9-DEOXY-PGF$_2$ COMPOUNDS

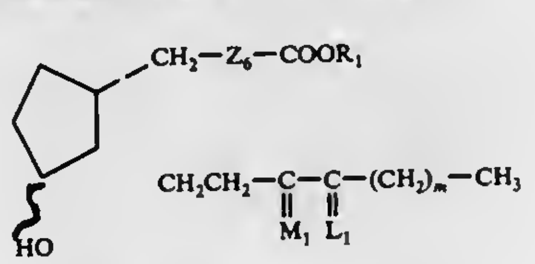
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Apr. 11, 1977, Ser. No. 786,699

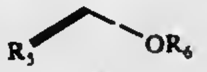
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—408 **25 Claims**

1. A prostaglandin analog of the formula

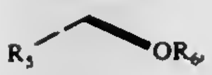


wherein m is one to 5, inclusive; wherein M_1 is



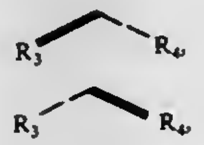
or

-continued

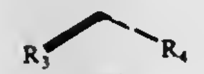


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

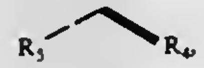
wherein L_1 is



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_6 is

(1) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CF$_2$— or
(2) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CH$_2$—,

wherein *g* is one, 2, or 3.

4,105,683

METHOD OF PREPARATION OF TRIVALENT PLUTONIUM FORMIATE

Michel Germain, Marcoussis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 17, 1977, Ser. No. 797,796

Claims priority, application France, May 25, 1976, 76 15826

Int. Cl.^{2} C07F *5/00*

U.S. Cl. 260—429.1 **10 Claims**

1. A method of preparation of trivalent plutonium formiate, wherein a nitric acid solution having a nitric acid concentration within the range of 0.01 to 15M and containing plutonium(III) ions and/or plutonium(IV) ions is reacted with a formic acid solution in order to obtain a precipitate of plutonium(III) formiate.

4,105,684

PROCESS FOR THE PREPARATION OF ORGANOTIN TRIHALIDES

Ronald E. Hutton, Southport; Vincent Oakes, St. Helens, and Joseph Burley, New Brighton, all of England, assignors to Akzo N.V., Arnhem, Netherlands

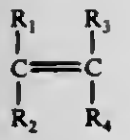
Division of Ser. No. 613,434, Sep. 15, 1975. This application May 3, 1977, Ser. No. 793,363

Claims priority, application Netherlands, Sep. 16, 1974, 7412230

Int. Cl.^{2} C07F *7/22*

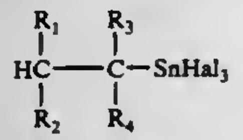
U.S. Cl. 260—429.7 **5 Claims**

1. A process for the preparation of organotin trihalides which comprises reacting in a polar solvent a
stannous halide,
hydrogen halide and
an olefin of the formula



$$\begin{array}{ccc} R_1 & & R_3 \\ | & & | \\ C & = & C \\ | & & | \\ R_2 & & R_4 \end{array}$$

where R_1, R_2, R_3 and R_4 represent an alkyl group with 1–18 carbon atoms, an oxygen-containing hydrocarbon group or a hydrogen atom, provided that at least one of R_1 and R_2 contains a carbonyl group adjacent to the olefinic double bond, and thereafter isolating the reaction product with the formula



$$\begin{array}{cccl} R_1 & & R_3 & \\ | & & | & \\ HC & — & C & —SnHal_3 \\ | & & | & \\ R_2 & & R_4 & \end{array}$$

from the medium.

4,105,685

AGENT FOR THE REGULATION OF PLANT GROWTH

Werner Fory, Basel, and Hanspeter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardlsey, N.Y.

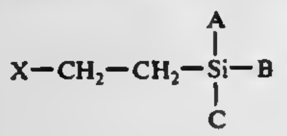
Continuation-in-part of Ser. No. 336,572, Feb. 28, 1973, abandoned. This application Sep. 5, 1974, Ser. No. 503,429

Claims priority, application Switzerland, Mar. 2, 1972, 3048/72

Int. Cl.^{2} C07F *7/10, 7/18, 7/08*

U.S. Cl. 260—448.2 N **14 Claims**

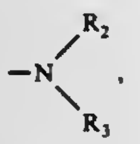
1. A β-halogenoethyl-silane of formula I



$$\begin{array}{c} \qquad\qquad\qquad A \\ \qquad\qquad\qquad | \\ X—CH_2—CH_2—Si—B \\ \qquad\qquad\qquad | \\ \qquad\qquad\qquad C \end{array} \qquad (I)$$

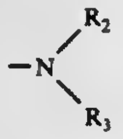
wherein

A represents a radical —S—R_1 or



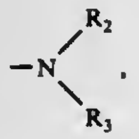
,

B represents a radical —SR_1,



or —OR_4,

C represents a radical —SR_1,



,

—OR_4 the methyl or benzyl group, and

X represents chlorine or bromine,

whereby the radical R_1 represents C_1–C_{18} alkyl; C_1–C_{18} alkyl substituted by C_1–C_8 alkoxycarbonyl, phenyl or C_3–C_{12} cycloalkyl; C_3–C_{18} alkenyl; C_3–C_8 alkynyl; C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkenyl; phenyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio or halogen; and benzyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio or halogen; R_3 represents C_1–C_{18} alkyl which can be substituted by C_1–C_8 alkoxy, C_1–C_8 alkylthio, phenyl or C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkenyl; C_3–C_{18} alkenyl, C_3–C_8 alkynyl; phenyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio or halogen; and benzyl optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkyloxy, C_1–C_8 alkylthio or halogen; R_2 represents hydrogen or the same as R_3; R_4 represents C_1–C_{18} alkyl; C_1–C_{18} alkyl substituted by halogen, C_1–C_8 alkoxy C_1–C_8 alkoxyalkoxy, C_3–C_6 alkenyloxy, phenoxy, C_3–C_{12} cycloalkyl, C_1–C_8 alkylthio or C_1–C_8 alkoxycarbooyl; C_3–C_{18} alkenyl; C_3–C_{18} halogenoalkenyl; C_3–C_8 alkynyl; C_3–C_{12} cycloalkyl; C_3–C_{12} cycloalkenyl; phenyl radicals optionally mono- or polysubstituted by cyano, nitro, C_1–C_8 alkyl, C_1–C_6 halogenoalkyl, C_1–C_8 alkoxy, C_1–C_8 alkylthio, or C_1–C_8 alkoxycarbonyl; and benzyl radicals optionally mono- or polysubstituted by C_1–C_8 alkyl, C_1–C_8 alkoxy or halogen.

4,105,686

PROCESS FOR DEACTIVATING TOLUENE DIISOCYANATE DISTILLATION RESIDUE

Maurice C. Raes, Branford, and Pierrepont Adams, Darien, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 15, 1977, Ser. No. 806,806

Int. Cl.^{2} C07C *119/048*

U.S. Cl. 260—453 PH **11 Claims**

1. A process for converting into an inert solid the residue which is obtained from the distillation of the product of phosgenating toluene diamine to the corresponding toluene diisocyanate, which process comprises mixing said residue, at a temperature from about 120° C to about 180° C, with an effective amount of organic acid selected from the group consisting of oxalic acid, citric acid, and a monocarboxylic acid represented by the formula:

RCOOH

wherein R is hydrogen or an alkyl group having from 1 to 8 carbon atoms.

4,105,687

CYANOETHYLATION OF GLYCOLIC ESTERS

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 27, 1977, Ser. No. 763,279

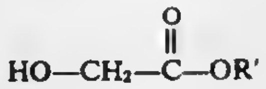
Int. Cl.^{2} C07C *120/00, 121/16*

U.S. Cl. 260—465.4 **7 Claims**

1. A process for preparing a compound of the formula

$N{\equiv}C\text{-}CH_2\text{-}CH_2\text{-}O\text{-}CH_2COOR'$

wherein R′ is an alkyl group of 1 to 10 carbon atoms, a cycloalkyl group of 5 to 10 carbon atoms, an aryl group of 6 to 12 carbon atoms, an aralkyl group of 7 to 10 carbon atoms, or R″ and R″ is any of the groups defined by R′ containing one or more substituents selected from halogen atoms, hydroxy groups, alkoxy groups of 1 to 4 carbon atoms, or hydroxy alkoxy groups of 1 to 4 carbon atoms, which comprises contacting a glycolate compound of the formula



$$HO—CH_2—\overset{\overset{\displaystyle O}{\|}}{C}—OR'$$

wherein R′ is as defined above, with acrylonitrile in the presence of a metallic alkoxide under anhydrous conditions.

4,105,688

PROCESS FOR THE PRODUCTION OF MALONIC ACID DINITRILE AND PURIFICATION THEREOF

Urs Arni, Brig; Adriano Faucci, and August Stocker, both of Visp, all of Switzerland, assignors to Lonza, Ltd., Valais, Switzerland

Division of Ser. No. 822,724, May 7, 1969, Pat. No. 3,655,721. This application Apr. 26, 1971, Ser. No. 137,592

Claims priority, application Switzerland, May 9, 1968, 6964/68; Jun. 18, 1968, 9059/68; Jun. 24, 1968, 9383/68

Int. Cl.^{2} C07C *120/00, 121/22;* **B01D** *3/34*

U.S. Cl. 260—465.8 R **14 Claims**

1. A method for purifying malononitrile containing as contaminants similarly boiling dienophiles formed in the preparation thereof containing a mixture of maleic acid dinitrile and fumaric acid dinitrile which comprises contacting the impure malononitrile with a member selected from the group consisting of butadiene, isoprene, dimethylbutadiene, piperylene, anthracene, perylene, furan and sorbic acid to effect adduction of said dienophiles and thereupon distilling the adduction reaction mixture to recover an overhead malononitrile fraction having a substantially reduced content of said dienophiles.

2. A method in accordance with claim 1 wherein said impure molononitrile is in the crude form thereof resulting from the reaction of acetonitrile and cyanogen chloride.

4,105,689

PRODUCTION OF N-SUBSTITUTED 2-CARBAMOYL PHOSPHINIC ACIDS

Eberhard Auer; Alexander Ohorodnik, both of Erftstadt, and Paul Stutzke, Bornheim-Walberberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

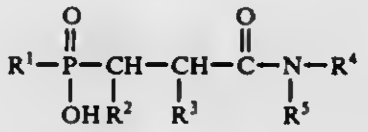
Filed Oct. 25, 1977, Ser. No. 845,349

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648005

Int. Cl.^{2} C07F *9/30, 9/34*

U.S. Cl. 260—502.5 **6 Claims**

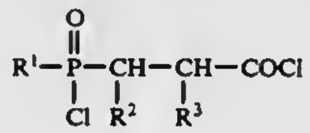
1. A process for making N-substituted 2-carbamoyl phosphinic acids of the general formula:



$$\begin{array}{ccccccccccc} & & O & & & & & & O & & \\ & & \| & & & & & & \| & & \\ R^1 & — & P & — & CH & — & CH & — & C & — & N—R^4 \\ & & | & & | & & | & & & & | \\ & & OH & & R^2 & & R^3 & & & & R^5 \end{array} \qquad (I)$$

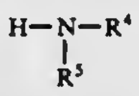
in which R^1 stands for an alkyl group having 1 to 4 carbon atoms or an aryl group; R^2 and R^3 stand independently of each other for an alkyl group having 1 to 4 carbon atoms, an aryl group or a hydrogen atom; R^4 stands for an alkyl group having 1 to 18 carbon atoms, an aryl group or a hydrogen atom; and R^5 stands for an alkyl group having 1 to 18 carbon atoms or an aryl group, which process comprises:

reacting, at a temperature of 120° to 170° C, a 2-chloroformyl phosphinic acid chloride of the general formula



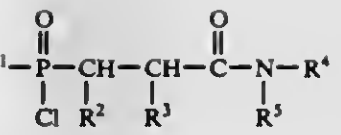
$$\begin{array}{ccccccc} & & O & & & & \\ & & \| & & & & \\ R^1 & — & P & — & CH & — & CH—COCl \\ & & | & & | & & | \\ & & Cl & & R^2 & & R^3 \end{array} \qquad (II)$$

with an amine of the general formula



$$\begin{array}{c} H—N—R^4 \\ | \\ R^5 \end{array} \qquad (III)$$

and hydrolyzing with water the resulting N-substituted 2-carbamoyl phosphonic acid chloride of the general formula



$$\begin{array}{ccccccccccc} & & O & & & & & & O & & \\ & & \| & & & & & & \| & & \\ R^1 & — & P & — & CH & — & CH & — & C & — & N—R^4 \\ & & | & & | & & | & & & & | \\ & & Cl & & R^2 & & R^3 & & & & R^5 \end{array}$$

the latter compound being obtained while hydrogen chloride is split off.

4,105,690

PROCESS FOR MANUFACTURING N-ACYL DERIVATIVES OF HYDROXY-ARYLGLYCINES

Yani Christidis, Paris, and Alain Schouteten, Villiers le Bel, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

Filed Sep. 10, 1976, Ser. No. 722,284

Claims priority, application France, Sep. 12, 1975, 75 28151; Jan. 16, 1976, 76 01178

Int. Cl.^{2} C07C *102/00, 103/30, 103/46, 103/66*

U.S. Cl. 260—519 **7 Claims**

1. In a process of manufacturing N-acyl derivatives of hydroxyarylglycines by condensation of the adduct product of glyoxylic acid and amides with hydroxyaryl compounds having at least one free hydroxyl group and with at least one free position at the ortho or para position to the hydroxyl group, the improvement

wherein said process comprises first reacting with heating at a temperature below about 60° C an aliphatic amide having at most 4 carbon atoms, with an aqueous solution of glyoxylic acid;

then, after the addition of acetic acid and gaseous hydrochloric acid, condensing at low temperature below about 35° C the product resulting from the first step, which is the carboxamidoglycolic acid, with an excess of said hydroxyaryl compound; and

isolating the resulting N-acyl hydroxyarylglycine derivative.

4,105,691

PROCESS FOR THE PRODUCTION OF CHLOROFLUORINATED CARBOXYLIC ACIDS

Richard F. Sweeney, Elma; James O. Peterson, Snyder; Bernard Sukornick, Williamsville; Henry R. Nychka, East Aurora; Richard E. Eibeck, Orchard Park, all of N.Y., and Morris B. Berenbaum, Summit, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Flied Dec. 22, 1975, Ser. No. 642,834

Int. Cl.^{2} C07C *51/24, 51/26*

U.S. Cl. 260—530 R **52 Claims**

1. The process for the production of chlorofluorinated carboxylic acids which comprises reacting a gaseous mixture of a starting material selected from a saturated, aliphatic, carboxy containing compound, a saturated aliphatic carboxylic acid halide and a saturated aliphatic aldehyde in which all atoms are selected from C, H and O, and corresponding hydrohalogenated compounds in which the halo atoms are selected from chloro and fluoro, or mixtures thereof, oxygen in an oxygen-containing gas, HCl or Cl_2 and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6–20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact line of from about 0.1–20 seconds.

4,105,692

PROCESS FOR THE PREPARATION OF BENZENESULPHONYL CHLORIDE

Heinz Ulrich Blank, Odenthal, Germany, assignor to Bayer Aktiengellschaft, Leverkusen, Germany

Filed Jul. 19, 1977, Ser. No. 817,464

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635281

Int. Cl.^{2} C07C *143/26*

U.S. Cl. 260—543 R **18 Claims**

1. In a process for the preparation of benzenesulphonic acid chloride by contacting benzenesulphonic acid with thionyl chloride, the improvement which comprises carrying out the process in the presence of an electrophilic sulphonating agent.

4,105,693

PROCESS FOR PRODUCING 2-ALKYLBENZANILIDE

Isao Chiyomaru, Shimizu; Seigo Kawada, Fujieda, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

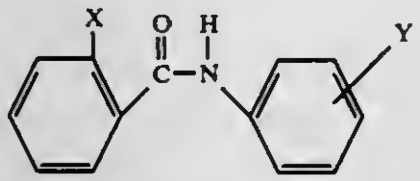
Continuation-in-part of Ser. No. 605,050, Aug. 15, 1975, Pat. No. 3,985,804, which is a division of Ser. No. 489,412, Jul. 11, 1974, Pat. No. 3,937,840. This application Apr. 22, 1976, Ser. No. 679,370

Claims priority, application Japan, Aug. 18, 1973, 48-92702

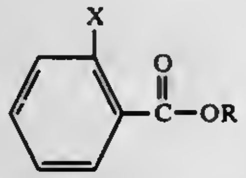
Int. Cl.^{2} C07C *103/78*

U.S. Cl. 260—558 P **20 Claims**

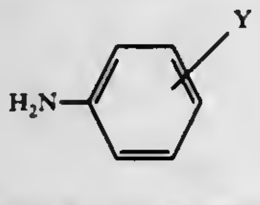
1. In a process for producing 2-alkylbenzanilide having the formula:



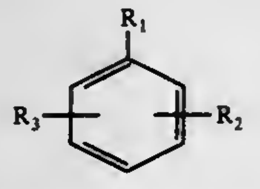
wherein X represents a C_{1-4} alkyl group and Y represents hydrogen, alkoxy, alkenyloxy, alkinyloxy, benzyloxy or halobenzyloxy, with the liberation of alcohol and N-alkylbenzanilide by-products, by reacting an alkyl 2-alkylbenzoate of the formula:



wherein R is a C_2-C_4 alkyl group and X is as defined above with an aniline compound of the formula:

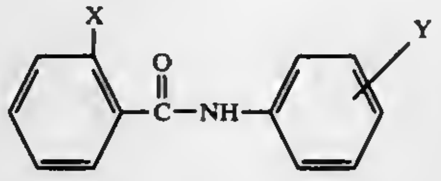


wherein Y is as defined above, the improvement comprising: reacting said benzoate with said aniline compound in an organic solvent of the formula:

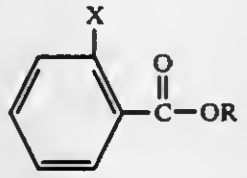


or R_4—O—R_5, wherein R_1 is lower alkyl or halogen; R_2 and R_3 are hydrogen, halogen or lower alkyl and R_4 and R_5 represent alkyl of more than 5 carbon atoms, in the presence of an alkali metal or alkaline earth metal alcoholate excluding methylate as an alcoholate, with the proviso that toluene is excluded from said organic solvent and with the proviso that when R is n-propyl, said solvent excludes o-, m-, and p-xylene and chlorobenzene; when R is n-butyl, said solvent excludes o-, m-, and p-xylene, ethylbenzene and chlorobenzene and when R is iso-butyl, said solvent excludes o-xylene, ethylbenzene and chlorobenzene, such that said reaction occurs without azeotropic separation of said solvent and the alcohol by-product released in said reaction and with the inhibition of the formation of said N-alkylbenzanilide.

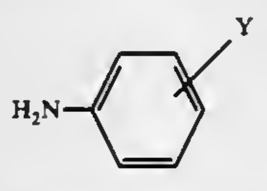
11. In a process for producing 2-alkylbenzanilide having the formula:



wherein X represents a C_{1-4} alkyl group and Y represents hydrogen, alkoxy, alkenyloxy, alkinyloxy, benzyloxy or halobenzyloxy, with the liberation of alcohol and N-alkylbenzanilide by-products, by reacting an alkyl 2-alkylbenzoate of the formula:

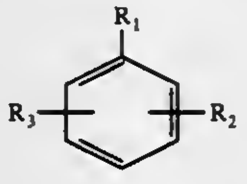


wherein R is a C_2-C_4 alkyl group and X is as defined above with an aniline compound of the formula:



wherein Y is as defined above, the improvement comprising:

(a) reacting said aniline compound in an organic solvent of the formula:



or R_4—O—R_5, wherein R_1 is lower alkyl or halogen; R_2 and R_3 are hydrogen, halogen or lower alkyl and R_4 and R_5 represent alkyl of more than 5 carbon atoms with an alkali metal or alkaline earth metal alcoholate excluding methylate as an alcoholate, with the proviso that toluene is excluded from the organic solvent and with the proviso that when R is n-propyl, said solvent excludes o-, m-, and p-xylene and chlorobenzene; when R is n-butyl, said solvent excludes o-, m-, and p-xylene, ethylbenzene and chlorobenzene and when R is iso-butyl, said solvent excludes o-xylene, ethylbenzene and chlorobenzene; and

(b) preparing said 2-alkylbenzanilide product by reacting said alkyl 2-alkylbenzoate with the reaction product of step (a) such that said reaction occurs without azeotropic separation of said solvent and the alcohol by-product released in said reaction and with the inhibition of the formation of said N-alkylbenzanilide.

4,105,694

PROCESS FOR MAKING TRIMETHYLAMINE ACRYLIMIDE

Avinash C. Mehta, Belmont; Donald O. Rickter, Arlington, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 22, 1976, Ser. No. 753,521

Int. Cl.^{2} C07B *29/00, 102/04*

U.S. Cl. 260—561 H **2 Claims**

1. The process which comprises the steps of condensing a mixture of 3-chloropropionyl chloride, 3-chloropropionic acid and trimethylhydrazinium p-toluenesulfonate, adjusting the pH to about 8 and converting the thus formed intermediate to trimethylamine acrylimide by thermal rearrangement and then a deprotonation step.

4,105,695

2-AMINO-1-(2,5-DIMETHOXYPHENYL)-BUTANES

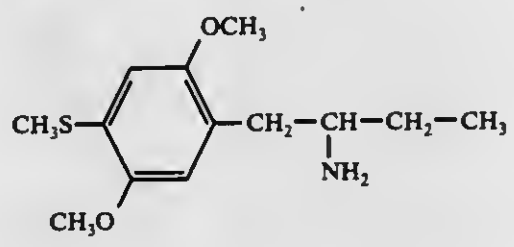
Richard Anthony Partyka, Liverpool; Robert Ted Standridge, Cazenovia; Henry George Howell, East Syracuse, all of N.Y., and Alexander Theodore Shulgin, Lafayette, Calif., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 639,676, Dec. 11, 1975, abandoned. This application May 11, 1977, Ser. No. 795,699

Int. Cl.^{2} C07C *87/28*

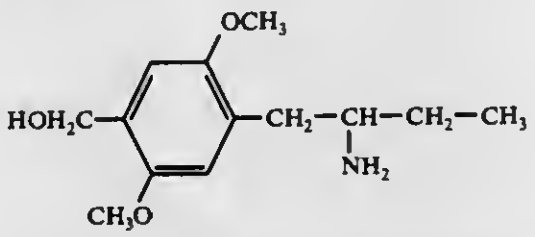
U.S. Cl. 260—570.8 R **4 Claims**

1. The compound of the formula



or a pharmaceutically acceptable nontoxic acid addition salt thereof.

2. The compound of the formula



or a pharmaceutically acceptable nontoxic acid addition salt thereof.

4,105,696

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

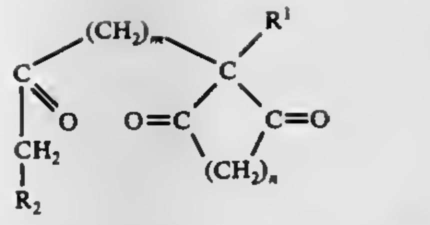
David Richard Parrish, Glen Ridge, and Zoltan George Hajos, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 467,356, May 6, 1974, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 7, 1976, Ser. No. 720,717

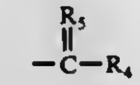
Int. Cl.^{2} C07C *45/00, 49/36, 49/54, 49/82*

U.S. Cl. 260—586 F **26 Claims**

1. The process for the preparation of optically active compounds utilizing as the starting material as optically inactive compound of the formula

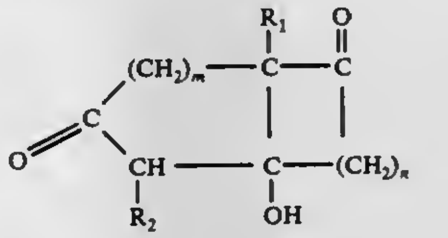


where R_1 is lower alkyl, aryl, aralkyl, lower alkenyl, lower alkynyl; R_2 is hydrogen, lower alkyl, aryl, aralkyl and —$CH_2)_pR_3$ where p is an integer between 0 and 2 inclusive and R_3 is



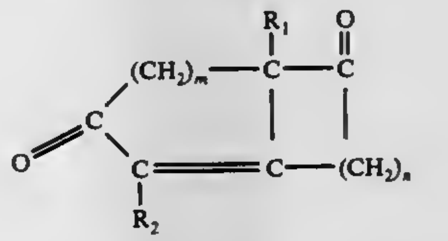
$$-\overset{\overset{R_5}{\|}}{C}-R_4$$

where R_4 is hydrogen or lower alkyl and R_5 is lower alkylenedioxy or arylenedioxy; n is an integer between 1 and 5 inclusive and m is an integer between 1 and 4 inclusive which process comprises cyclizing said optically inactive compound in the presence of an optically active α- or β-aminoalcohol or α- or β aminoacid to produce an optically active compound as product of the formula



II

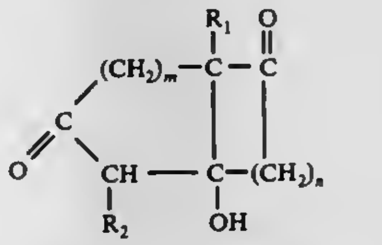
and



III

where R_1, R_2, *m* and *n* are as above having one more ring than said starting material.

22. Compounds of the formula



II

where R_1 is lower alkyl; R_2 is hydrogen or lower alkyl; *n* is an integer between 1 and 5 inclusive and *m* is an integer between 1 and 4 inclusive.

4,105,697

PROCESS FOR THE PREPARATION OF α, β-ETHYLENIC ALDEHYDES

Pierre Chabardes, Sainte-Foy les Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

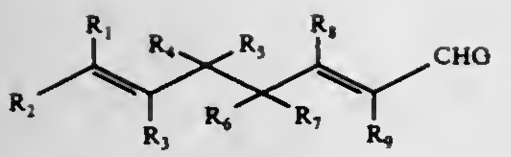
Filed Jul. 6, 1976, Ser. No. 702,850

Claims priority, application France, Jul. 18, 1975, 75 22558

Int. Cl.^{2} C07C *47/20, 45/00*

U.S. Cl. 260—601 R **16 Claims**

1. A process for the preparation of α,β-ethylenic aldehydes of the general formula:


(I)

in which

R$_1$, R$_2$ and R$_4$ represent a member of the group consisting of hydrogen, and:

(a) alkyl radicals containing from 1 to 25 carbon atoms; and

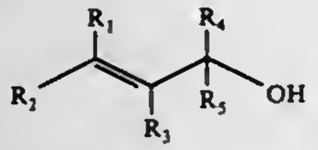
(b) alkenyl radicals containing from 2 to 30 carbon atoms; and

R$_3$ and R$_5$ are members of the group consisting of hydrogen and alkyl or alkenyl radicals having from 1 to 8 carbon atoms;

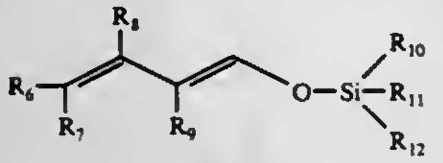
R$_6$ is a member of the group consisting of hydrogen and a lower alkyl radical;

R$_7$ is a member of the group consisting of hydrogen and an alkyl radical containing from 1 to 20 carbon atoms; an alkenyl radical containing from 2 to 20 carbon atoms, and

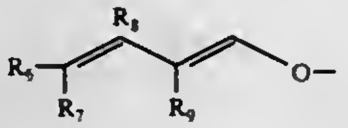
R$_8$ and R$_9$ are members of the class consisting of hydrogen and lower alkyl radicals, by reacting, at elevated temperatures of between about 50° and 350° C., an allyl alcohol of the general formula:


(It)

in which R$_1$ to R$_5$ have the meaning given above, with a dienoxy compound containing two conjugated ethylenic double bonds, wherein said dienoxy compound is a dienoxy triorganosilane of the general formula:


(III)

in which R$_{10}$, R$_{11}$ and R$_{12}$, represent alkyl radicals containing from 1 to 10 carbon atoms, cycloalkyl radicals containing from 5 to 8 carbon atoms, two at most of R$_{10}$, R$_{11}$ and R$_{12}$ radicals representing a group of the formula:



and R$_6$ to R$_9$ have the meaning given for the formula (I).

4,105,698
PREPARATION OF CINNAMYL-SUBSTITUTED PHENOLS

Charles M. Starks, and Allan J. Lundeen, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1977, Ser. No. 769,080

Int. Cl.^{2} C07C *39/17*

U.S. Cl. 568—744 **8 Claims**

1. A process for preparing orthosubstituted cinnamyl phenols wherein the process comprises heating an admixture of phenol and cinnamyl alcohol in the liquid phase and at a temperature in the range of about 125° to about 250° C. in the presence of an effective amount of activated alumina, which is α alumina monohydrate, catalyst.

4,105,699
PREPARATION OF O-BENZYLPHENOL

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1977, Ser. No. 769,083

Int. Cl.^{2} C07C *39/17*

U.S. Cl. 568—744 **9 Claims**

1. An improved process of preparing o-benzylphenol by the reaction of phenol and benzyl alcohol wherein the improved process comprises contacting an admixture of phenol and benzyl alcohol at a temperature in the range of about 125° to about 300° C. in the liquid phase in the presence of an effective amount of activated alumina, which is α-alumina monohydrate, catalyst.

4,105,700
PROCESS FOR PREPARING STEREOSPECIFIC NEROLIDOL AND ESTER THEREOF

Yoshiji Fujita, Kurashiki; Yoshiaki Omura, Okayama; Takashi Nishida, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Company, Ltd., Tokyo, Japan

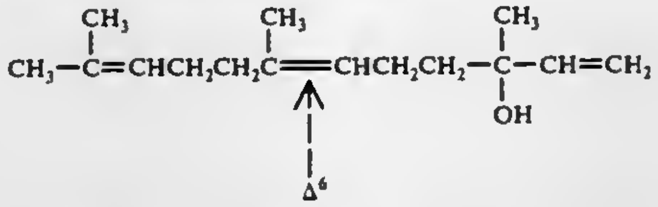
Continuation-in-part of Ser. No. 605,455, Aug. 18, 1975, Pat. No. 4,028,385. This application Mar. 17, 1977, Ser. No. 778,730

Claims priority, application Japan, Mar. 12, 1976, 51-100631; Mar. 12, 1976, 51-100632; Mar. 23, 1976, 51-100633; Mar. 12, 1976, 51-100634; Mar. 19, 1976, 51-100635; Mar. 19, 1976, 51-104062; Apr. 26, 1976, 51-119797; Apr. 26, 1976, 51-119798

Int. Cl.^{2} C07C *29/24*

U.S. Cl. 568—875 **20 Claims**

1. A process for obtaining a stereospecific nerolidol at the Δ^6 position thereof and having the formula:


(III)

$$\mathrm{CH_3-\overset{CH_3}{\overset{|}{C}}=CHCH_2CH_2\overset{CH_3}{\overset{|}{C}}\underset{\underset{\Delta^6}{\uparrow}}{=}CHCH_2CH_2-\underset{OH}{\overset{CH_3}{C}}-CH=CH_2}$$

which comprises rectifying a mixture of Δ^6-cis-nerolidol and Δ^6-trans-nerolidol in a rectification column having from 10 to 100 theoretical plates with a reflux ratio of from 2 to 200 at a temperature below 230° C. under reduced pressure of from 0.1 to 5 mm Hg at the top of said column to separate each stereospecific nerolidol from said mixture.

4,105,701
PURIFICATION OF MATERIALS CONTAINING CARBONYL CONTAMINANTS

Donald R. Larkin, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,238

Int. Cl.^{2} C07C *17/38, 67/48, 29/24*

U.S. Cl. 260—650 R **5 Claims**

1. A method for removing an aldehyde contaminant from a liquid member of the group consisting of monochlorobenzene; the propanediols; the butanediols; vinyl acetate; glycerine; bis-(hydroxyethyl) terephthalate; and mixtures of bis-(hydroxyethyl) terephthalate with an inert solvent, which method comprises passing said liquid through a liquid-permeable bed of solids consisting essentially of polyvinyl alcohol and adsorbing said aldehyde upon said solids at a temperature which is between that at which said polyvinyl alcohol begins to soften and that at which said liquid solidifies.

4,105,702
METHOD FOR PREPARING HALOGENATED ALKANES AND ALKENES

Charles R. Mullin, Sault St. Marie, Mich., and Donald J. Perettie, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 309,418, Nov. 24, 1972, abandoned, which is a division of Ser. No. 807,116, Mar. 13, 1969, Pat. No. 3,726,932. This application Feb. 23, 1977, Ser. No. 769,483

Int. Cl.^{2} C07C *17/00*

U.S. Cl. 260—658 R **3 Claims**

1. A method for preparing halogenated alkanes and alkenes which comprises reacting, by contacting in the absence of or in the presence of an inert diluent N for 0.005 to 0.1 second at a temperature of from about 675° C to 850° C, a halogenating agent of the formula CCl_xBr_{4-x}, wherein x is an integer from 0 to 4, with a compound of the formula R_2CH_2, wherein one R is H, Cl or Br and the other R is Cl or Br; and wherein the mole ratio of R_2CH_2+N/CCl_xBr_{4-x} is from at least 2/1 to 100/1 when N is absent and from 10/1 to 100/1 when N is present.

4,105,703
CONTINUOUS PROCESS FOR THE PRODUCTION OF CYCLOHEXYL MAGNESIUM HALIDES

Raimondo Motta, Pero (Milan), Italy, assignor to Oxon Italia S.p.A., Milan, Italy

Continuation of Ser. No. 692,506, Jun. 3, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,988

Claims priority, application Italy, Jun. 6, 1975, 24100 A/75

Int. Cl.^{2} C07F *3/02*

U.S. Cl. 260—665 G **5 Claims**

1. Continuous process for the production of cyclohexyl magnesium halide (Grignard reagent) characterized in that, cyclohexyl halide in a solution of tetrahydrofuran is fed from the bottom, at a constant rate, into a thermostatized column containing magnesium shavings fed from the top of the column itself, and the desired cyclohexyl magnesium halide is recovered in the top part of the column.

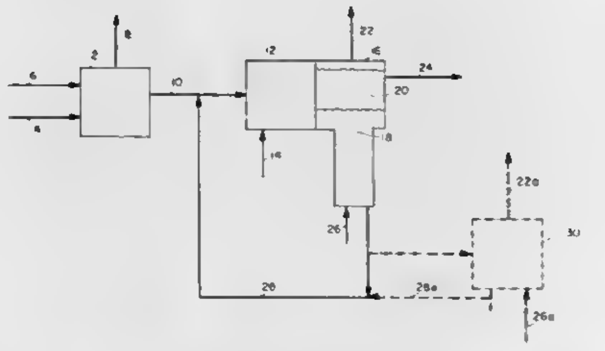
4,105,704
METHOD FOR PREPARING AND USING A SOLUBLE METAL PENTAFLUORIDE-HYDROGEN FLUORIDE CATALYST

Geoffrey R. Say, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 29, 1976, Ser. No. 758,054

Int. Cl.^{2} C07C *3/52, 5/24*

U.S. Cl. 260—666 P **15 Claims**



1. A process for preparing and using a homogeneous liquid phase catalyst containing a metal pentafluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride and mixtures thereof and hydrogen fluoride, the mole ratio of HF to metal pentafluoride being between 5 and 40, which comprises the steps of

(1) contacting tantalum metal, niobium metal or mixtures thereof with substantially anhydrous liquid HF at a temperature ranging from 0° to 105° C for a time sufficient to form a homogeneous liquid phase catalyst having a mole ratio of HF to metal pentafluoride between about 100/1 to 50/1, said contacting being effected in the absence of an organic solvent,

(2) contacting the catalyst formed in step (1) with a hydrocarbon feedstock in a hydrocarbon conversion process, thereby forming an acid catalyst phase and a hydrocarbon product phase,

(3) stripping HF from the acid catalyst phase formed in step (2) with a gas containing molecular hydrogen, thereby forming a homogeneous liquid phase acid catalyst having a mole ratio of HF to metal pentafluoride less than that of the acid catalyst formed in step (1), and

(4) passing the acid catalyst formed in step (3) to the hydrocarbon conversion process of step (2) until a homogeneous liquid phase catalyst having a mole ratio of HF to metal pentafluoride between 5 and 40 is obtained.

4,105,705
SYMMETRICAL BIARYL SYNTHESIS VIA RHODIUM CATALYZED DIMERIZATION OF ARYL MERCURIC SALTS

Richard Craig Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 681,783, Apr. 30, 1976, Pat. No. 4,026,957. This application Dec. 27, 1976, Ser. No. 754,116

Int. Cl.^{2} C07C *15/00*

U.S. Cl. 260—668 R **16 Claims**

1. A method of preparing symmetrical biaryl compounds, said method comprising,

dimerizing an aryl mercuric compound selected from the group consisting of aryl mercuric halide salts and diaryl mercuric compounds by contacting said aryl mercuric compound with a catalytically effective dimerization inducing amount of a rhodium catalyst.

4,105,706
C_8 ALKYL BENZENE ISOMERIZATION PROCESS

James P. Gallagher, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Nov. 8, 1976, Ser. No. 739,894

Int. Cl.^{2} C07C *5/24, 5/30*

US. Cl. 260—668 A **10 Claims**

1. In a process for isomerizing C_8 alkyl benzene isomers which includes (1) contacting a hydrocarbon feedstock containing at least one C_8 alkyl benzene isomer in at least one reaction zone in the presence of added free molecular hydrogen with solid particles comprising about 25% to about 99% by weight of a carrier and about 1% to about 75% by weight of at least one crystalline aluminosilicate capable of promoting isomerization of said isomer at C_8 alkyl benzene isomerization conditions to isomerize said isomer and to form deactivating carbonaceous deposits on said solid particles; and (2) recovering a mixture of at least two C_8 alkyl benzene isomers from the reaction zone effluent, the improvement which comprises:

increasing the amount of hydrogen added to said reaction zone as said contacting progresses to maintain or increase the hydrogen to hydrocarbon molar ratio entering said reaction zone thereby providing for improved catalytic isomerization activity of said solid particles.

4,105,707
COMBINATION ALKYLATION-REFORMING PROCESS

Donald M. Little, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,904

Int. Cl.^{2} C07C *3/54*

U.S. Cl. 260—683.48 **10 Claims**

1. A process for the production of high octane motor fuel which comprises:

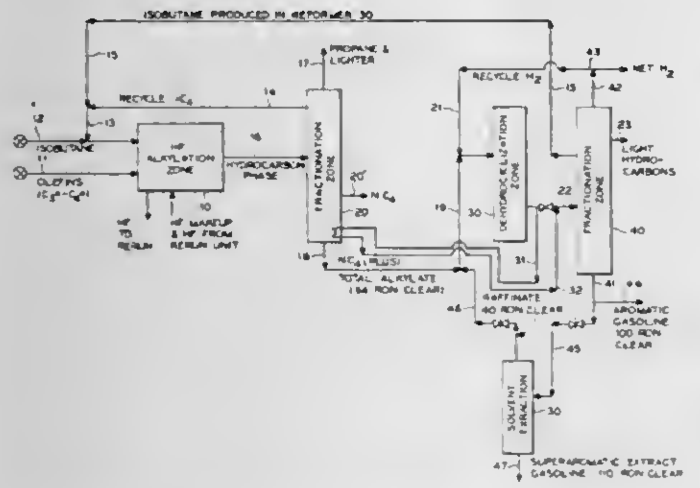
(a) alkylating in an alkylation zone isobutane and at least one olefin in the presence of an alkylation acid catalyst;

(b) separating the alkylation effluent into a catalyst phase and a hydrocarbon phase;

(c) fractionating said hydrocarbon phase obtained in (b) into a fraction comprising isobutane, a fraction comprising propane and lighter materials, and a total alkylate fraction which includes at least a portion of the normal butane present in said alkylation effluent;

(d) passing all of said total alkylate fraction in (c) to a reforming zone and therein subjecting same to dehydrocyclization and isomerization reforming conditions of temperature and pressure in the presence of hydrogen and a suitable reforming catalyst to isomerize normal butane to isobutane and to dehydrocyclize isoparaffins to aromatics and thereby increase the aromatic content of said alkylate; and

(e) recovering from step (d) isobutane and an alkylate product of improved gasoline characteristics having an increased aromatic content and an octane number (RON clear) of about 100.



4,105,708

DIMETHOXYMETHYL DIETHOXYMETHYL GLYCOLURIL AND COATING COMPOSITIONS CONTAINING THE SAME AS A CROSS-LINKING AGENT

Girish Girdhar Parekh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 7, 1976, Ser. No. 721,008

Int. Cl.² C08G *12/28;* **C08L** *61/26*

U.S. Cl. 260—849 **3 Claims**

2. A composition of matter comprising a blend of from about 2% to about 50% by weight of a normally liquid, substantially fully mixed-alkylated, substantially fully methylolated glycoluril derivative which is essentially dimethoxymethyl diethoxymethyl glycoluril and correspondingly between about 98% and 50%, by weight of a non-gelled, polymeric material carrying an anionic charge, said polymeric material containing at least one class of reactive groups selected from the group consisting of carboxyl groups, alcoholic hydroxyl groups and amide groups, the amount of said groups in said polymeric material being at least about 0.5%, by weight, and not more than about 20%, by weight, based on the total weight of said polymeric material; said groups being reactive with said glycoluril derivative and said percentages of said glycoluril derivative and said polymeric material being based on the total weight of said glycoluril derivative and said polymeric material, said composition also containing from about 0.5% to about 5.0%, by weight, based on the total weight of said glycoluril derivative and said polymeric material, of an acid catalyst.

4,105,709

POLYAMIDE COMPOSITIONS

Isamu Iwami; Hiroobu Kawasaki, and Atsuro Kodama, all of Kawasaki, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,743

Claims priority, application Japan, Apr. 3, 1975, 75-39755

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 L **15 Claims**

1. A composition comprising (A) 50 to 95 parts by weight of a polyamide and (B) 50 to 5 parts by weight of an ethylenic copolymer of ethylene, (a) an alkyl ester of unsaturated carboxylic acid, (b) an unsaturated carboxylic acid, an (c) a metal salt of unsaturated carboxylic acid, the proportion of ethylene in the copolymer being from 90% to 98% by mole and the monomeric units (a), (b) and (c) having the following relationship in terms of the number of moles a, b, and c, respectively:

$a/(a + b + c) \times 100 = 5 - 50\%$ and

$c/(a + b + c) \times 100 = 5 - 90\%$.

4,105,710

FLAME-RETARDANT COPOLYMERS

James L. Thomas, Hamilton Square, and Gert P. Volpp, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 12, 1975, Ser. No. 631,239

Int. Cl.² C08L *67/06*

U.S. Cl. 260—869 **4 Claims**

1. A flame-retardant thermosetting vinyl-unsaturated composition comprising a thermosetting vinyl-unsaturated polymer capable of further polymerization to the thermoset stage of the group consisting of unsaturated polyester and diallyl phthalate prepolymers containing as a flame-retarding agent from 5 to 50%, by weight of total polymerizable material, of diallyl tetrabromophthalate, the composition being distinguished not only by its flame resistance but by good high temperature performance.

4,105,711

PVC MOULDING COMPOUNDS WITH HIGH DIMENSIONAL STABILITY TO HEAT

Dietrich Hardt, Cologne; Volker Serini; Hugo Vernaleken, both of Krefeld, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 540,982, Jan. 14, 1975, abandoned. This application Oct. 28, 1975, Ser. No. 626,354

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402176

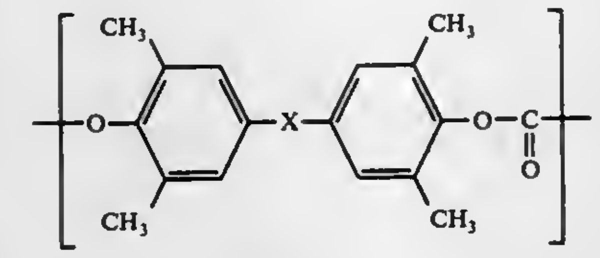
Int. Cl.² C08L *69/00, 27/06, 7/00, 9/00*

U.S. Cl. 260—873 **9 Claims**

1. A polymer mixture comprising:

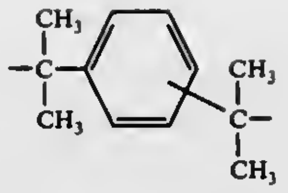
(a) from 20 - 90% by weight, based on the mixture of (a) and (b), of a vinyl chloride polymer;

(b) from 10 - 80% by weight, based on the mixture of (a) and (b), of a polycarbonate having at least 50% by weight of structural units of the formula



(I)

wherein X is a single bond, —O—, —CO—, —SO_2—, C_1–C_{10} alkylene, C_1–C_{10} alkylidene, C_5–C_{10} cycloalkylene, C_5–C_{15} cycloalkylidene, C_5–C_{20} cycloalkyl-alkylidene or the group



4,105,712

FLAME-RESISTANT POLYCARBONATE MOLDING COMPOSITIONS

Dieter Margotte, Krefeld-Bockum, and Hugo Vernaleken, Krefeld, both of Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Germany

Division of Ser. No. 458,620, Apr. 8, 1974, Pat. No. 3,946,090. This application Nov. 24, 1975, Ser. No. 634,983

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1973, 2321055

Int. Cl.² C08L *67/06*

U.S. Cl. 260—873 **4 Claims**

1. A molding composition having an oxygen index of greater than 0.30 according to ASTM D-2863/70 consisting essentially of an aromatic polycarbonate containing 1–5% by weight of a polyacrylonitrile fiber which is stable in a melt of polycarbonate.

4,105,713

POLYMERS AND COPOLYMERS OF INDENE

Pierre Sigwalt, St. Michel-sur-Orge; Alain Polton, Paris; Cecile Baudin, Kremlin Bicetre, and Mihajlo (Michel) Miskovic, Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 14, 1975, Ser. No. 631,991

Claims priority, application France, Nov. 18, 1974, 74 37856

Int. Cl.² C08F *279/02, 259/02*

U.S. Cl. 260—879 **17 Claims**

1. Elastomers with thermoplastic properties consisting of a chlorobutyl rubber elastomeric chain having graft polymerized thereon a mixture of indene and a styrene derivative selected from the group consisting of α-methyl styrene and para-alkylstyrene.

4,105,714

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

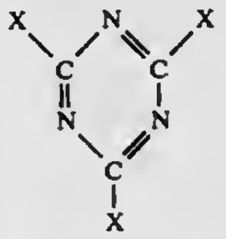
William J. Trepka, and Alvin C. Rothlisberger, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1976, Ser. No. 678,095

Int. Cl.² C08F *8/18, 8/30, 8/04*

U.S. Cl. 260—879 **18 Claims**

6. A process for the production of a polymer comprising reacting an alkali metal-terminated polymer having the formula M—Z wherein M represents an alkali metal and Z represents polymer and copolymer chains of one or more alkadienes having 4 to 12 carbon atoms and/or copolymer chains of at least one alkadiene having 4 to 12 carbon atoms and at least one monovinyl-substituted arene having 8 to 18 carbon atoms having the vinyl radical attached to an arene ring carbon atom, said polymer and copolymer chains Z being unhydrogenated or having at least a portion of the olefinic unsaturation thereof removed by hydrogenation, with a trihalo-s-triazine coupling agent having the formula



wherein X is selected from the group of halogens consisting of chlorine, bromine, and iodine.

4,105,715

CYANOACRYLATE ADHESIVE PASTE COMPOSITIONS

Edward Roger Gleave, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jul. 11, 1977, Ser. No. 814,581

Claims priority, application Ireland, Jul. 14, 1976, 1553/76

Int. Cl.² C08L *33/00*

U.S. Cl. 260—881 **5 Claims**

1. A thixotropic, curable adhesive composition comprising:

(a) a monomeric ester of 2-cyanoacrylic acid,

(b) for each 100 parts by weight of monomeric ester, about 5 to about 100 parts by weight of a polyvinylidene fluoride powder.

4,105,716

PROCESS FOR PRODUCING TETRAFLUOROETHYLENE/HEXAFLUOROPROPYLENE COPOLYMER BLENDS

Shoji Sakai, Settsu, and Masahiro Okuda, Amagasaki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 11, 1977, Ser. No. 767,967

Claims priority, application Japan, Feb. 17, 1976, 51-16639

Int. Cl.² C08F *214/26*

U.S. Cl. 260—884 **6 Claims**

1. A process for producing a tetrafluoroethylene/hexafluoropropylene copolymer having a hexafluoropropylene content of 8 to 20% by weight by polymerizing tetrafluoroethylene and hexafluoropropylene in the presence of a polymerization initiator, which comprises polymerizing the monomers with an amount of hexafluoropropylene monomer of about 54 to 88% by weight and the balance of polymerizable monomer being tetrafluoroethylene in the polymerization system under conditions whereby the hexafluoropropylene content of the copolymer produced in the later stage is in the range of 10 to 20% by weight and is at least 2% higher than it was at the end of the first stage.

4,105,717

NAILABLE VINYL CHLORIDE-BASED INJECTION-MOLDING COMPOUND

David J. Burkey, Millersville, and Clifford M. Rosenau, Willow Street, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed May 18, 1976, Ser. No. 687,494

Int. Cl.² C08L *9/06, 23/04, 47/00*

U.S. Cl. 260—889 **16 Claims**

1. A polyvinyl chloride composition comprising

(a) as the major component a vinyl chloride polymer component selected from the group consisting of a copolymer comprising vinyl chloride as a predominant comonomer and a minor amount of propylene as a comonomer, and vinyl chloride homopolymer,

(b) as a minor component, chlorinated polyethylene,

(c) as a minor component a predominantly styrene copolymer of styrene and acrylonitrile, and

(d) as a minor component a styrene-butadiene copolymer thermoplastic elastomer,

said composition being characterized by resistance to splitting as the result of being nailed when such compositions are formed into molded articles by injection-molding processes.

4,105,718
PEROXIDE TREATED SUBSTANTIALLY AMORPHOUS POLYOLEFIN/HYDROCARBON RUBBER BLENDS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

Doyle A. Weemes, Greeneville, and Richard L. McConnell, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,376
Int. Cl.² C08F *8/06*

U.S. Cl. 260—889 **12 Claims**

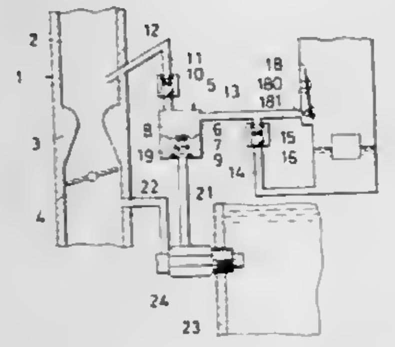
1. A process for preparing tacky modified amorphous polyolefin/hydrocarbon rubber compositions useful as pressure sensitive adhesives which comprises reacting a blend comprising at least one hydrocarbon rubber selected from the group consisting of ethylene/propylene copolymer rubber, ethylene/propylene/diene terpolymer or blends of such hydrocarbon rubbers and up to 50 weight percent of at least one substantially amorphous polyolefin selected from the group consisting of substantially amorphous homopolymers of 1-olefins containing 3 to 5 carbon atoms, substantially amorphous copolymers prepared from either ethylene and 1-olefins containing 3 to 5 carbon atoms or propylene and 1-butene, and substantially amorphous propylene or 1-butene/higher 1-olefin copolymers containing less than 40 mole percent of at least one higher 1-olefin of the group consisting essentially of 1-hexene, 1-heptene, 1-octene, 1-nonene, and 1-decene having a melt viscosity of about 100 to 200,000 cp. at 190° C. with about 2 to 25 weight percent of at least one peroxide selected from the group consisting of ditertiarybutyl peroxide, 2,5-dimethyl-2,5-di(tertiarybutylperoxy)hexane, dicumyl peroxide, and cumene hydroperoxide at a temperature of 150° C. to 250° C. to provide a low viscosity, permanently tacky hot-melt pressure sensitive adhesive.

4,105,719
CARBURETOR WITH AUXILIARY ACCELERATOR-PUMP SYSTEM

Haruhiko Saito, Nagoya, and Michio Morishita, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1977, Ser. No. 777,577
Claims priority, application Japan, Nov. 12, 1976, 51-135205
Int. Cl.² F02M *7/08*

U.S. Cl. 261—34 B **11 Claims**



1. A carburetor having a primary accelerator pump and a separate auxiliary accelerator-pump system adapted to be operated only at low ambient temperatures, said auxiliary accelerator-pump comprising:

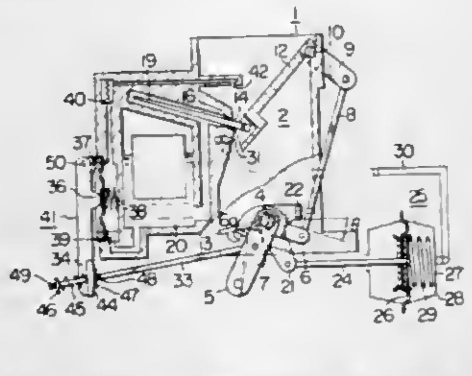
- an intake passage including a venturi portion and a throttle valve;
- a fuel reservoir or bowl;
- an auxiliary acceleration pump including a fuel chamber and a vacuum chamber which are separated by a spring-loaded diaphragm, said fuel chamber being communicated by way of a first check valve to a pump jet opening into said intake passage upstream of said venturi portion and by way of a second check valve to said fuel reservoir, said fuel chamber being further communicated with a portion of said fuel reservoir above the fuel level therein; and said vacuum chamber being communicated with a portion of said intake passage downstream of said throttle valve by way of a temperature sensitive valve between said vacuum chamber and said intake passage; and
- a temperature responsive valve means to open communication between said fuel chamber and the portion of said fuel reservoir above the fuel level therein, only when the ambient temperature exceeds a given level.

4,105,720
VARIABLE STAGE TYPE CARBURETOR

Yukio Hohsho; Kimiji Karino; Masakichi Momono; Yoshishige Oyama; Teruo Yamauchi, all of Katsuta, and Takao Teranishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 713,989, Aug. 12, 1976, abandoned.
This application Aug. 29, 1977, Ser. No. 828,670
Claims priority, application Japan, Aug. 15, 1975, 50-98631
Int. Cl.² F02M *9/08*

U.S. Cl. 261—34 A **3 Claims**



1. In a variable stage type carburetor including: an intake passage; a throttle valve positioned in said intake passage; a movable venturi vane positioned upstream of said throttle valve in said intake passage, said venturi vane being cooperative with the inner wall of said intake passage for providing a variable venturi; and means for operatively connecting said venturi vane to said throttle valve by the medium of a resilient member, whereby said venturi vane may be angularly displaced commensurate to an opening of said throttle valve; the improvements comprising:

- a vane controller for forcedly decreasing an opening of said movable vane, when a venturi negative pressure is lowered in response to a negative pressure in said venturi portion at such an opening of said throttle valve, which is greater than a given opening;
- a fuel supply pump for additionally supplying fuel into said intake passage;
- a connecting means for operably connecting said throttle valve to said fuel supply pump so as to operate said fuel supply pump in response to an opening action of said throttle valve, said connecting means being so designed that said pump may be operated throughout the entire stroke thereof, during the time in which said throttle valve is opened from its closed position to said given opening.

4,105,721
VENTURI FITTING FOR THE AERATION OF WATER

Rae D. Schliebe, 34 Diamond Dr., Livermore, Calif. 94550

Filed Jun. 16, 1975, Ser. No. 586,952
Int. Cl.² B01F *3/04*

U.S. Cl. 261—76 **5 Claims**

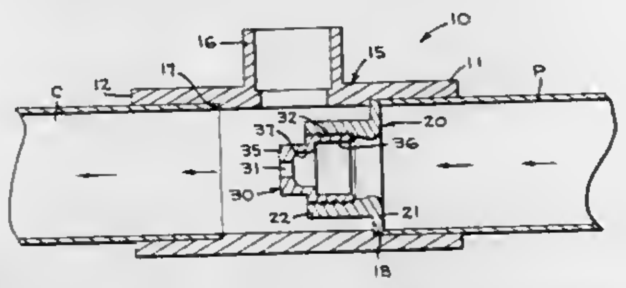
1. A fitting for aerating water comprising:

(a) means for conducting water from a source;

(b) a conduit through which water flow communicating with said means for the passage of water thereinto, said conduit being formed with an air inlet for introducing air under pressure into said conduit for aerating the water flowing therethrough;

(c) an adapter disposed in said conduit in fixed relation thereto and forming a passage in said conduit through which water flowing in said conduit is conducted; and

(d) an insert removably secured to said adapter and disposed within said conduit, said insert being formed with a discharge orifice, said insert being arranged to provide a passage for the flow of water advancing through said adapter for discharge through said discharge orifice within said conduit, the diameter of the passage provided by said insert for the flow of water advancing through said adapter being lesser than the diameter of the passage formed by said adapter through which water is conducted, said insert being formed with a nut-like projection directed in the direction of flow of said water through said conduit,



(e) said adapter including an outer wall fixed to an inner wall of said conduit in water-tight relation and an internally threaded cylindrical wall, said insert being formed with an externally threaded cylindrical wall for threaded engagement with said internally threaded wall of said adapter, said nut-like projection of said insert projecting from said threaded wall of said insert, said discharge orifice being formed in said nut-like projection.

4,105,722
LIGHTWEIGHT, CLOSED-CELL FOAM ELASTOMERIC ELEMENTS FOR USE IN COUNTERCURRENT GAS-LIQUID CONTACT OPERATIONS

Paul H. Sorenson, Fairfield, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 562,603, Mar. 27, 1975, abandoned.
This application Jul. 15, 1977, Ser. No. 816,065
Int. Cl.² B01F *3/04*

U.S. Cl. 261—94 **5 Claims**

1. A method of contacting gas and liquid streams in a floating bed scrubber comprising countercurrently contacting said gas and liquid streams in the presence of an aerated mass of lightweight, mobile elements of spheroidal form, said mobile elements comprising closed-cell elastomeric foam formed from the molding and post curing of a blend consisting essentially of a nitrile polymer and polyvinyl chloride utilized in conjunction with a blowing agent, said closed-cell foam extending throughout the entire cross-section of said spheroidal elements, said mobile elements, after said post curing, having a relatively smooth, self-skinned surface, said mobile elements being of a resilience to preclude breakage thereof and of a softness and flexibility to effect self-cleaning characteristics, said mobile elements permitting uniform wear without breakage or liquid absorption during said contacting of said gas and liquid streams.

4,105,723
VAPOR-LIQUID CONTACTING

Thomas W. Mix, Wellesley, Mass., assignor to Merix Corporation, Wellesley, Mass.

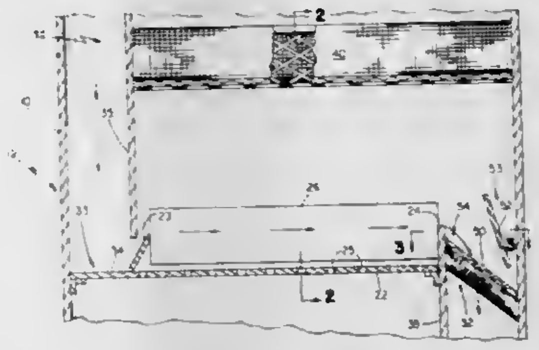
Filed May 24, 1976, Ser. No. 689,178
Int. Cl.² B01J *10/00;* **B01D** *3/22*

U.S. Cl. 261—105 **67 Claims**

1. In a vapor-liquid contacting process comprising supplying vapor through an orificed tray in a contacting and separating stage of the cross-flow type having vapor and liquid inlets thereto, wherein said tray is mounted in effective communication with both said inlets to permit vapor to rise through said tray to contact said liquid thereabove and produce a two phase dispersion of vapor and liquid supported on said tray, and wherein the maximum permissible throughput of vapor through said stage is limited by a flooding point associated with said stage, that improvement comprising

- raising said flooding point by providing a multiplicity of spaced, generally vertical baffles above said tray, said baffles extending generally in the direction of liquid flow across said tray and being sufficiently close together to substantially reduce the amplitude of vertical oscillations in said dispersion having a wavelength which is small relative to the width of said tray, said tray being orificed between each pair of said baffles, and
- increasing the superficial vapor velocity through said stage to a value corresponding to vapor throughput exceeding said maximum permissible throughput associated with said stage in the absence of said baffles.

15. In a vapor-liquid contacting apparatus of the cross-flow type having a column housing and at least one contact stage in said housing, said apparatus including liquid and vapor inlets to said stage and an orificed tray mounted in effective communication with both said inlets to permit vapor to rise through said tray to contact said liquid thereabove and produce a two phase dispersion of vapor and liquid supported on said tray, and wherein the minimum permissible effective height of said stage is limited by a flooding point associated with said stage, that improvement wherein



- a multiplicity of spaced, generally vertical baffles are arranged above said tray, said baffles extending generally in the direction of liquid flow across said tray and being sufficiently close together to raise said flooding point by substantially reducing the amplitude of vertical oscillations in said dispersion having a wavelength which is small relative to the width of said tray, and
- the effective height of said stage is less than said minimum permissible height associated with said stage in the absence of said baffles
- wherein said baffles are corrugated to provide liquid flow channels sloping downwardly and in the direction of liquid flow across the tray.

4,105,724
CONTACT PACKING

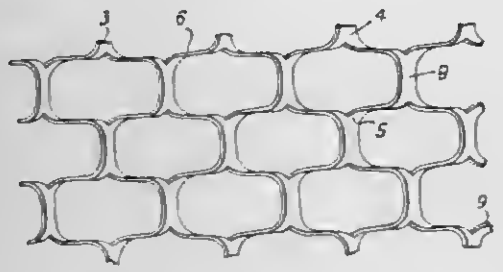
Edward Butterfield Talbot, London, England, assignor to Rückluft Patent AG., Lucern, Switzerland

Filed Oct. 8, 1975, Ser. No. 620,714
Claims priority, application United Kingdom, Nov. 13, 1974, 49181/74
Int. Cl.² B01D *39/16, 47/00;* **B29C** *17/02*

U.S. Cl. 261—112 **3 Claims**

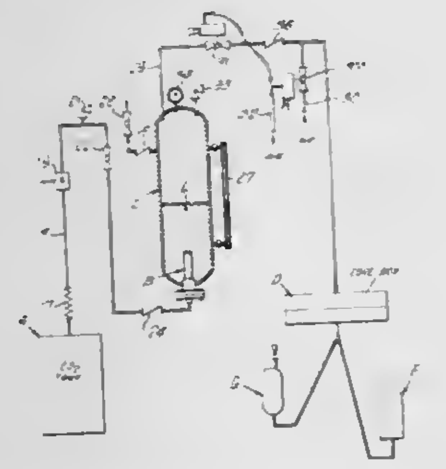
1. A cellular contact packing material produced from a planar sheet of material which has an initial thickness within the range of 0.003 inch to 0.2 inch and is capable of setting in a desired configuration by a process which comprises cutting in the said sheet separate linear slits, each having an equal length of from 0.25 inch to 6.0 inches, in a series of substantially parallel linear rows to form an array wherein each of the slits in a given row is out of phase with each of the slits in the adjacent row in a regular pattern as illustrated in FIG. 1 of the

drawings, subsequently subjecting the sheet to tension in a direction perpendicular to the linear rows of slits, maintaining the tension until the slits have opened up to form a three-dimensional integral array comprising a plurality of cells of substantially rectangular configuration when viewed in plan wherein each of the opposite side walls of each cell in a longitudinal direction has an intermediate point of inflexion and each of the opposite side walls of each cell in a transverse direction has a thickness equal to the sum of thickness of each portion of the longitudinal side walls about the point of inflexion, and causing the resulting cellular material to harden in the substantially rectangular configuration, wherein the resulting cellular material has an overall thickness of from 0.0625 inch to 2.0 inches.



4,105,725
SATURATED LIQUID/VAPOR GENERATING AND DISPENSING

Edward Alan Ross, Willowdale, Canada, assignor to Liquid Carbonic Canada Ltd., Montreal, Canada
Filed Aug. 27, 1973, Ser. No. 392,080
Claims priority, application United Kingdom, Nov. 21, 1972, 53767/72; Canada, Jun. 29, 1973, 175275
Int. Cl.² B01F *3/04*
U.S. Cl. 261—122 **22 Claims**



1. A process for generating in a pressure vessel a ready supply of a saturated vapor of a normally liquid active substance in an inert carrier gas under pressure and dispensing vapor intermittently from the supply, comprising,

providing in the vessel a body of said active liquid substance and an overlying atmosphere of vapor in a space above said liquid,

dispensing the vapor from the vapor space in a continuous series of intermittent bursts each producing a pressure drop within the vessel intervened by a short non-dispensing period,

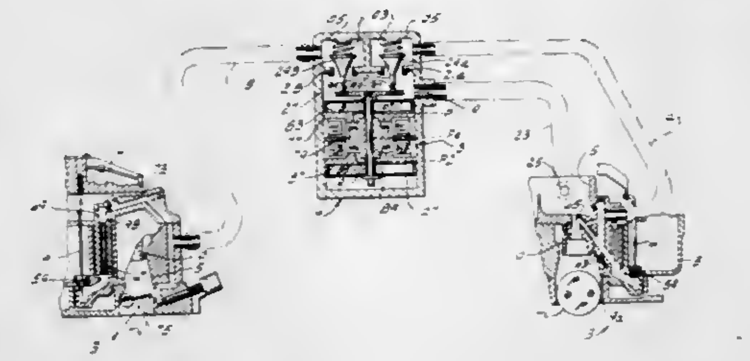
responsive immediately to the pressure drop caused by each burst introducing carrier gas under pressure into a bottom zone of the vessel during each non-dispensing period until equilibrium pressure is restored therein and the vapor lost in said burst is replaced by the introduction of additional gas,

finely dividing said carrier gas as it is introduced to form in said liquid a mass of minute bubbles effective to provide intimate contact between gas and liquid whereby a saturated vapor is formed to the exclusion of entrained liquid and conveyed to the vapor space during each non-dispensing period,

maintaining a relationship between the depth of the vapor space, the head of liquid above the introduction zone, the relative volume of each burst to that of the vapor space, and the initial size of the bubbles so as to ensure the presence in the vapor space of a true saturated vapor substantially free of entrained liquid.

4,105,726
SOLENOID APPARATUS

Allen W. Lindberg, Kirkwood, Mo., assignor to ACF Industries, Inc., New York, N.Y.
Filed Feb. 11, 1977, Ser. No. 767,874
Int. Cl.² F02M *7/24*
U.S. Cl. 261—121 B **2 Claims**



1. Solenoid Apparatus for metering the quantity of air supplied to a fuel system in a carburetor for an internal combustion engine, said carburetor having at least one air passageway therein through which air is drawn into eingine, fuel from a source thereof being supplied to said carburetor through said fuel system and mixed with air as it passes through the carburetor and the carburetor having a conduit through which air is introduced into said fuel system, the apparatus comprising:

a chamber having an air inlet in communication with the air passageway of the carburetor and an air outlet in communication with the conduit;

first and second electrical windings to which current is supplied, current flow through each of said windings inducing respective magnetic fields the strengths of which are functions of the average current flow therethrough and the magnetic fields combining to produce a net magnetic field;

an armature movable in either of two directions between a first position and a second position;

means biasing the armature toward a position intermediate the first and second positions constituting a reference position, the position of the armature at any one time being determined by the net magnetic field and a force on the armature produced by the biasing means, said biasing means comprising first and second springs acting on respective ends of the armature to bias the armature in one direction away from said first position and in the opposite direction away from said second position, the forces exerted by said springs being balanced by the net magnetic field when the armature is at said reference position, and said armature having a shaft extending axially through the springs and movable therewith, each spring being a scroll spring comprised of a disk of resilient material having a central opening therethrough in which an end of said shaft is disposed and a plurality of slots cut in a predetermined pattern such that each spring is flexible in either direction of armature movement for linear movement of the armature from one position to another;

metering means disposed in said air outlet and movable with the armature as it moves between said first and second positions to more fully open or close the air outlet depending upon the direction of armature movement;

means for supplying current to said windings; and

control means to which the current supply means is responsive for varying the average current flow in each winding, each variation in the average current flow produced by the control means resulting in movement of the armature and changing of the position of the metering means relative to the air outlet thereby to change the quantity of air supplied to the fuel system through the conduit.

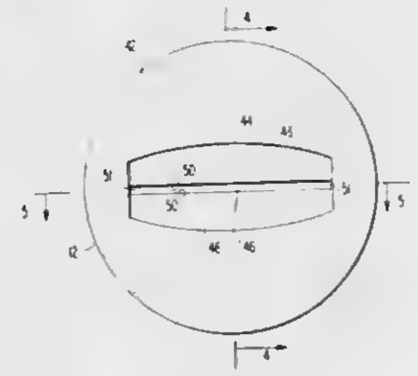
4,105,727
PROCESS FOR PREPARING FIBRILS FOR USE IN THE MANUFACTURE OF PAPER

Giuseppe Zanella, and Luciano Mancini, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy
Filed Nov. 10, 1976, Ser. No. 740,678
Claims priority, application Italy, Nov. 11, 1975, 29189 A/75
Int. Cl.² B02C *18/00;* **C08F** *6/00*
U.S. Cl. 264—12 **3 Claims**

1. A process for preparing polypropylene fibers which are directly usable, without cutting or reducing operations, as substitutes, in whole or in part, for cellulose fibers in the manufacture of paper and paper-like articles, said process consisting in extruding through an orifice a solution or dispersion of polypropylene in n-hexane under conditions such that the solvent is evaporated practically immediately in the extrusion environment, and in conveying against the extruded solution or dispersion a gaseous fluid jet having a high velocity and an angular direction with respect to the direction of extrusion of the polypropylene solution or dispersion, and being characterized in that the polypropylene solution or dispersion extruded contains from 2 to 25 moles of monomeric propylene per 100 moles of hexane-propylene solution and in that the solution or dispersion is extruded at a temperature comprised between 180° C and 235° C.

4,105,728
SPINNING METHOD AND APPARATUS

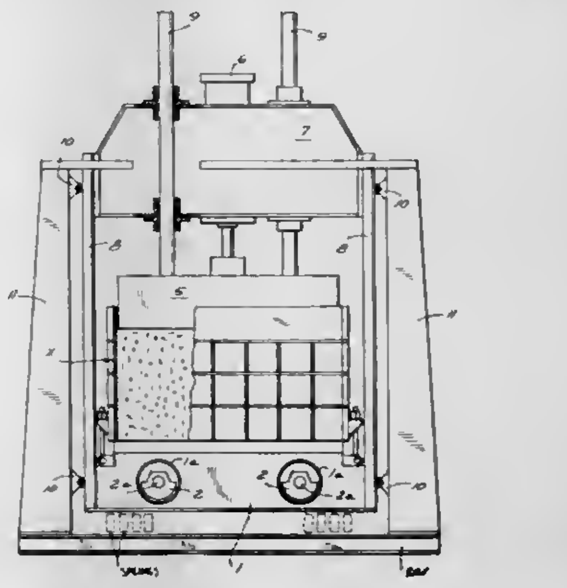
Wei-Kuo Lee, Millburn, N.J., assignor to Celanese Corporation, New York, N.Y.
Filed Sep. 22, 1976, Ser. No. 725,212
Int. Cl.² B28B *21/54*
U.S. Cl. 264—40.7 **42 Claims**



1. In a method of forming tape from fiber-forming liquid polymeric material wherein the material is passed through an elongate exit slit of a die and drawn to a solidification zone, the improvement comprising establishing a condition of flow of liquid material through the slit to enforce a ratio of the extensional strain rate to the shear strain of the liquid material leaving the slit of not less, at any location along the slit length, than that ratio adjacent the center of the slit.

4,105,729
METHOD OF MAKING SHAPED BODIES

Gunter Helmrich, Grevenbroich, and Fritz Wülfing, Rheydt, both of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany
Division of Ser. No. 854,184, Aug. 29, 1969, abandoned. This application Jul. 29, 1971, Ser. No. 167,126
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.² B28B *1/04;* **B29G** *1/00*
U.S. Cl. 264—71 **1 Claim**



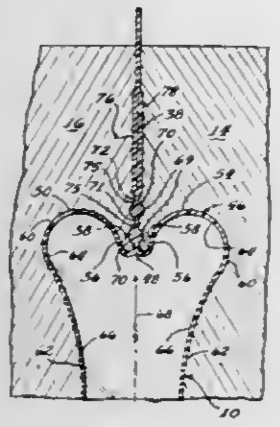
1. In a method of producing coherent bodies from coherable granular material, the steps comprising: providing a vibratory compacting device including a mold mounted for vibratory movement; confining a mass of granular material in said mold; resting a cover weight freely on top of said granular material; vibrating said mold at a first frequency while said cover weight rests freely on said granular material until partial compacting of said granular material is effected, said first frequency being accommodated to the resonance characteristics of said granular material; thereafter applying a substantial force to said cover weight to brace it against said partially compacted granular material; and vibrating said mold at a second frequency substantially higher than said first frequency while said cover plate is braced against said granular material, said second higher frequency being at least a multiple of said first frequency and being a function of the resonance characteristics of the vibrating system with said cover weight braced against said granular mass.

4,105,730
METHOD OF MAKING A FLEXIBLE, COLLAPSIBLE CONTAINER FOR LIQUIDS WITH IMPROVED TAIL SEAL

Frank Cammarata, III, Wheeling; Joe Alan Miller, Lake Zurich, both of Ill., and Jerry D. Martin, Kenosha, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jan. 12, 1976, Ser. No. 648,603
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **10 Claims**

1. The method of sealing the end of a heat-softened plastic tubular parison in a mold which results in a finished container having a wall thickness of no more than 0.05 inch adjacent the area to be sealed, which comprises closing said mold about said parison, collapsing the end of said tubular parison together across its entire width, whereby opposite sides of said parison combine to form a flat plastic piece; pressing a segment of said flat plastic piece with force sufficient to cause said plastic to flow; and causing said flowing plastic to move in opposite axial directions relative to the heat-softened plastic parison to form a pair of spaced rod members positioned in said plastic piece

transversely to said axial directions and exending across the entire width of the resulting container, and to correspondingly cause the flat plastic piece between said rod members to be



reduced in thickness, and blow molding said parison to form the container, whereby the resulting container exhibits a generally uniform wall thickness adjacent said flat plastic piece.

4,105,731

METHOD OF EMBEDDING AN END OF A BUNDLE OF THREAD-LIKE BODIES IN A MOLDING MATERIAL AND CONTROLLING CAPILLARY ACTION BY SAID MATERIAL

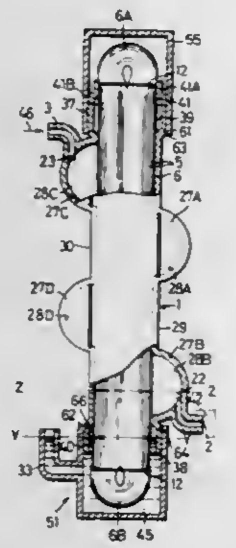
Masahiro Yamazaki, Kamakura, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 679,988, Apr. 26, 1976, Pat. No. 4,049,765. This application Jul. 1, 1977, Ser. No. 812,166

Claims priority, application Japan, May 2, 1975, 50-53614

Int. Cl.² B29C *5/00;* **B29D** *3/00*

U.S. Cl. 264—94 **10 Claims**



1. A method for setting an end portion of a bundle of thread-like bodies so that capillary action is reduced between said bodies, comprising the steps of:

A. dipping an end portion of a bundle of threadlike bodies into a solidifiable liquid, said bodies being so disposed that capillaries exist between said bodies;

B. contacting at least that part of said bundle which is immediately adjacent said end portion with a second liquid more wettable to said bundle and lighter than said solidifiable liquid; said contacting step occuring prior to exposure of that adjacent part to said solidifiable liquid whereby said second liquid acts to prevent said capillary action; and

C. permitting said solidifiable liquid to solidify.

4,105,732

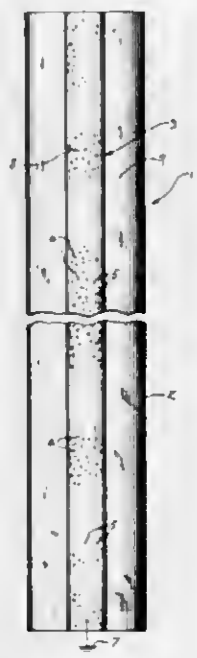
RADIOGRAPHIC OPAQUE AND CONDUCTIVE STRIPED MEDICAL TUBES

Eugene L. Slingluff, East Troy, Wis., assignor to Krandex Corp., Milwaukee, Wis.

Division of Ser. No. 634,075, Nov. 21, 1975, Pat. No. 4,027,659. This application Feb. 25, 1977, Ser. No. 772,192

Int. Cl.² A61M *25/00*

U.S. Cl. 264—104 **2 Claims**



1. The method of making a thermoplastic medicosurgical tubing which is radiographically opaque and conductive, comprising the steps of incorporating with a flexible, waterproof thermoplastic material which is non-conductive and which passes X-rays a mixture of a finely divided non-conductive radiographic opaque material and a finely divided radiographic transparent conductive material to form a thermoplastic composition, and forming a tubing of separate flexible, waterproof thermoplastic material which is non-conductive and which passes X-rays and of said thermoplastic composition with the thermoplastic composition located as an integral narrow strip extending longitudinally throughout the length of the tubing.

4,105,733

METHOD FOR THE PRODUCTION OF A SYNTHETIC MATERIAL HAVING A MOTHER-OF-PEARL LOOK

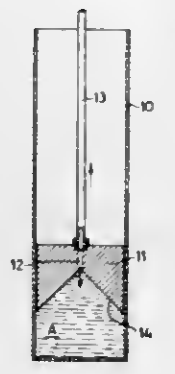
Ottavio Bonfanti, Via Canova 8, Milan, Italy

Filed Aug. 23, 1976, Ser. No. 716,956

Claims priority, application Italy, May 18, 1976, 23375 A/76

Int. Cl.² B29D *31/00*

U.S. Cl. 264—108 **5 Claims**



1. A method for obtaining a bar-like product with a mother-of-pearl look from a hardenable mixture of a fluid synthetic material having a viscosity between 50 and 35,000 centipoises and of a further material for displaying a mother-of-pearl look when oriented in a preferential direction within the synthetic material, said method comprising the steps of:

(a) providing a vessel having disposed therein a movable wall with the movable wall and a portion of the vessel in combination defining a variable volume mixture receiving chamber;

(b) passing the hardenable mixture through a restricted orifice through the movable wall of the mixture receiving chamber while continuously moving the wall to progressively increase the volume of the chamber at a speed which is chosen between 0.5 and 1.200 cm/min and is directly related to the flow speed of the mixture through the restricted orifice to maintain the increasing volume of the chamber substantially equal to the volume of the dispensed mixture;

(c) hardening the dispensed mixture in the chamber to a viscosity at which the mixture maintains its own shape;

(d) removing the hardened mixture from the chamber.

4,105,734

MARBLE-PATTERNED BATHTUB, BASIN OR SINK

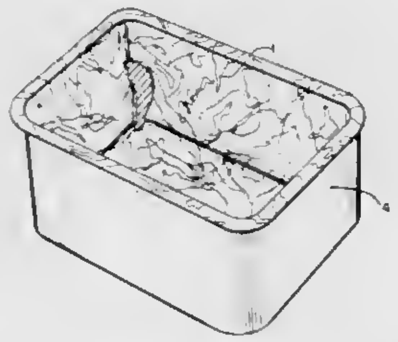
Yasuharu Nakagawa, Suita, Japan, assignor to Topla, Inc., Osaka, Japan

Division of Ser. No. 631,076, Nov. 12, 1975. This application May 27, 1976, Ser. No. 690,545

Claims priority, application Japan, Apr. 25, 1975, 50-51041

Int. Cl.² B29C *9/00, 13/00, 17/00*

U.S. Cl. 264—132 **6 Claims**



1. A method of fabricating a rigid molded article having the appearance of natural marble which comprises heat transferring a printed facsimile of marble from a photograph of natural marble which is imprinted on a transfer printing sheet with a printing ink onto the back of a generally flat sheet of acrylic resin, molding said imprinted acrylic resin sheet into a desired configuration, applying to the back of the printed facsimile an intermediate layer of unsaturated polyester, and then applying a layer of fiber glass reinforced unsaturated polyester resin to the back of the intermediate layer and curing said layers to provide reinforcement and rigidity to said article.

4,105,735

PROCESS FOR FLAMEPROOFING PLASTICS

Franz-Josef Dany, Erftstadt Lechenich; Karl Maier, Augsburg; Tomas Riedel, Biberbach, and Joachim Wortmann, Türnich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 550,942, Feb. 19, 1975, abandoned. This application Sep. 28, 1976, Ser. No. 727,461

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408488

Int. Cl.² C09K *3/28*

U.S. Cl. 264—143 **3 Claims**

1. Process for the flameproofing of a plastic selected from the group consisting of polycaprolactam, polyethylene and polystyrene with a flameproofing agent, which process comprises mixing pulverulent plastic with 5-40% by weight thereof of the flameproofing agent, plasticising and extruding the mixture at elevated temperature and granulating the extruded material, a flameproofing agent being a homogeneous granulate of

10–97% by weight of red phosphorus with a particle size of up to about 100 microns,

3–50% by weight of a binder selected from the group consisting of

(a) the esterification product of ethylene glycol with a wax acid mixture obtained by subjecting crude montana wax to chromic acid oxidation,

(b) a polyethylene wax having a molecular weight of about 2000 and

(c) the glycerol-fatty acid partial ester having a dropping point of 58° C, an acid number of 3 and a saponification number of 180, and

up to 87% by weight of an addend which is melamine, polyacrylonitrile amidosulfonic acid, ammonium bisulfate, copper(II)oxide, Al_2O_3, PbO,MgO, dibromoneopentyl glycol, or a mixture thereof.

4,105,736

SYSTEM FOR THE PRODUCTION OF FINISHED HOLLOW OBJECTS, FORMED FROM A STRIP OF PLASTICS MATERIAL BY HEAT MOULDING

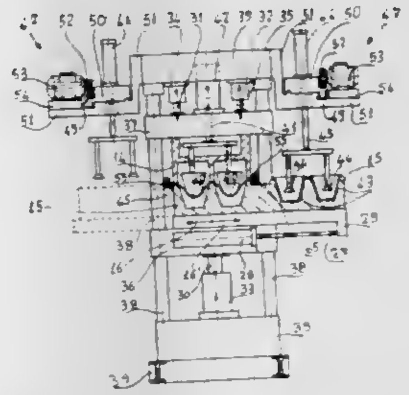
Pietro Padovani, Verona, Italy, assignor to O.M.V. S.p.A., Verona, Italy

Filed Oct. 7, 1976, Ser. No. 730,354

Claims priority, application Italy, Oct. 9, 1975, 84957 A/75

Int. Cl.² B29C *17/02, 17/04*

U.S. Cl. 264—153 **9 Claims**



1. A process for the production of hollow finished objects from a strip of plastic material by heat moulding at a moulding station, said process comprising the steps of:

heating the strip;

feeding the heated strip to the moulding station;

heat moulding at least one object;

cutting the moulded object from the strip at said station;

opening the mould only a distance sufficient to allow further feeding of the strip upon completion of said heat moulding and cutting steps;

further feeding the strip such that the portion of the strip from which the object was removed is out of the moulding station and a further heated portion of the strip is in the moulding station, said further feeding step commencing as soon as the mould is open;

moving a portion of the mould containing the moulded object out of the moulding station and moving a similar portion of the mould into the moulding station simultaneously with said further feeding step;

repeating said heat moulding and cutting steps to form at least one further object upon completion of said further feeding step;

removing the first-mentioned object from the portion of the mould after the expiration of a predetermined stabilization period, said stabilization period beginning with the completion of said heat moulding step and ending during said repeating step.

4,105,737

PROCESS FOR PRODUCING POROUS POLYMER FILM

Takashi Suzuki, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 477,262, Jun. 7, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,674

Claims priority, application Japan, Jan. 11, 1973, 48-66660; Feb. 6, 1974, 49-15789

Int. Cl.^{2} B29D *27/00, 7/24*

U.S. Cl. 264—154 **1 Claim**

1. A process for producing a porous polymer film which comprises the steps of:

a. forming many fine cracks in a stretchable polymer having a fine phase separation structure containing a material which is in a fluid state at the stretching temperature and a developed spherulite structure,

b. heating said polymer composition to its stretching temperature under tension so that the said fine cracks may not disappear, said stretching temperature being at a temperature lower than the melting point of the composition and higher than the temperature at which cracks are formed on deformation, and

c. enlarging the fine cracks by plural-axial stretching the polymer composition at the stretching temperature.

4,105,738

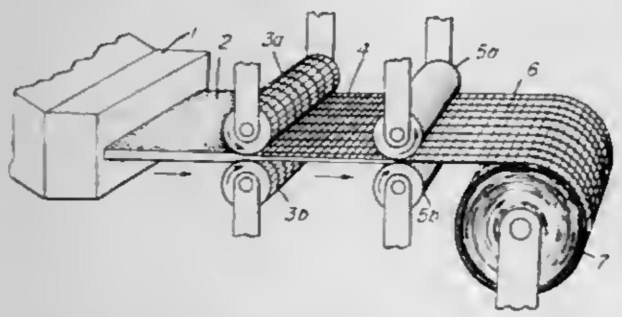
FLEXIBLE PLASTIC FOAM

Charles L. Rohn, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,236

Int. Cl.^{2} B29D *27/00*

U.S. Cl. 264—163 **9 Claims**



1. A process for increasing the flexibility and reducing the thickness of plastic foam sheet, said process comprising:

(a) positioning a sheet of foam plastic material between two rigid surfaces, at least one of said rigid surfaces containing means for fracture of a substantial portion of the cells at the surface of the foam adjacent to said means;

(b) compressing said foam sheet between said rigid surfaces to reduce the thickness of said sheet and rupture by said cell fracturing means a substantial portion of the cells at the surface of said foam sheet; and

(c) removing the compressed foam sheet from between said rigid surfaces, said compressed foam sheet being of reduced thickness and improved flexibility relative to the foam sheet of step (a) above.

4,105,739

CONSTRUCTIONAL ELEMENTS OF CONCRETE

Nalinkumar Jayantilal Dave, Rochdale, England, assignor to University of Salford, England

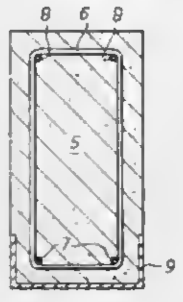
Continuation-in-part of Ser. No. 487,291, Jul. 10, 1974, abandoned. This application Aug. 3, 1976, Ser. No. 711,283

Int. Cl.^{2} B28B *1/16*

U.S. Cl. 264—256 **10 Claims**

1. A method of reinforcing a reinforced concrete structural element having a tensile reinforcing member therein adjacent one surface portion to resist tensile stresses developed in said surface portion under a working load, the method comprising the steps of covering and fixedly joining to said one surface portion an external reinforcing layer of a cement composition incorporating reinforcing fibres disposed in the layer in a random two-dimensional distribution.

3. A method of manufacturing a structure incorporating a reinforced concrete structural element which in use will have at least part of one surface thereof subject to tensile stresses, the method including the steps of casting said element including a tensile reinforcing member adjacent said one surface to resist tensile stress developed in said one surface integrally with a preformed external reinforcing layer of a cement composition containing reinforcing fibres disposed in the layer with their major axes lying substantially parallel to the surface of the layer in otherwise random orientation, selecting the location and dimensions of said layer so that it covers only that part of the one surface which in use will be subject to tensile stresses, and incorporating said element into the structure so that said part of said one surface is subject to tensile stresses.



4,105,740

PROCESS FOR THE PRODUCTION OF POLYESTER FIBER

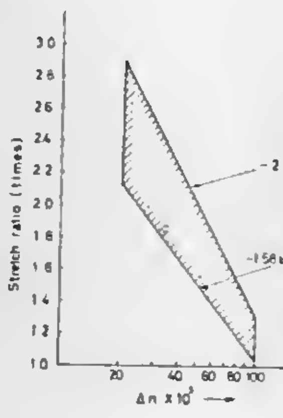
Hiroshi Yasuda, Otsu; Katsuya Tani, Shiga, and Jiro Nagatamo, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Dec. 26, 1974, Ser. No. 536,644

Claims priority, application Japan, Dec. 26, 1973, 48-3896

Int. Cl.^{2} D02J *1/22*

U.S. Cl. 264—290 T **12 Claims**



1. A process for the production of polyster fiber, which comprises melt-spinning a polyethylene terephthalate to form oriented filaments such that the birefringence Δn of the unstretched filaments after spinning is 0.020 to 0.100, bundling the resulting filaments into the form of a tow of at least several tens × 10,000 deniers, and subjecting the tow to stretching at a temperature greater than 100° C and at a stretch ratio satisfying the formula

$$-1.58 \log (\Delta n \times 10^3) + 4.18 \leqq DR \leqq -2.32 \log (\Delta n \times 10^3) + 5.93$$

wherein Δn represents the birefringence of the unstretched filaments and DR represents the stretch ratio, the tow takeup speed after stretching being greater than 150 m/min.

4,105,741

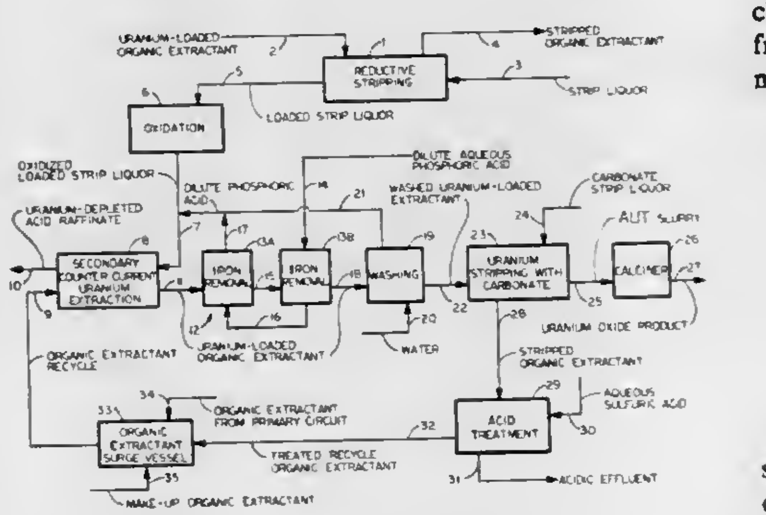
PROCESS FOR RECOVERY OF URANIUM FROM WET PROCESS PHOSPHORIC ACID

Tadeusz Karol Wiewiorowski, New Orleans, and Willis Lee Thornsberry, Jr., Gretna, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,996

Int. Cl.^{2} B01D *11/04*

U.S. Cl. 423—10 **11 Claims**


URANIUM-LOADED ORGANIC EXTRACTANT
2
1
REDUCTIVE STRIPPING
4
STRIPPED ORGANIC EXTRACTANT
3
STRIP LIQUOR
5
6
OXIDATION
LOADED STRIP LIQUOR
OXIDIZED LOADED STRIP LIQUOR
DILUTE AQUEOUS PHOSPHORIC ACID
DILUTE PHOSPHORIC ACID
14
21
WASHED URANIUM-LOADED EXTRACTANT
CARBONATE STRIP LIQUOR
URANIUM-DEPLETED ACID RAFFINATE
7
17
13A
13B
19
24
23
AUT SLURRY
26
8
SECONDARY COUNTER CURRENT URANIUM EXTRACTION
11
IRON REMOVAL
15
IRON REMOVAL
18
WASHING
URANIUM STRIPPING WITH CARBONATE
CALCINER
27
10
9
12
16
20
22
25
28
URANIUM OXIDE PRODUCT
ORGANIC EXTRACTANT RECYCLE
URANIUM-LOADED ORGANIC EXTRACTANT
WATER
STRIPPED ORGANIC EXTRACTANT
34
33
29
AQUEOUS SULFURIC ACID
ORGANIC EXTRACTANT FROM PRIMARY CIRCUIT
32
ORGANIC EXTRACTANT SURGE VESSEL
ACID TREATMENT
30
TREATED RECYCLE ORGANIC EXTRACTANT
35
31
ACIDIC EFFLUENT
MAKE-UP ORGANIC EXTRACTANT

1. Process for removing iron from an extractant containing uranium values and comprising a dialkylphosphoric acid and a trialkylphosphine oxide dissolved in a water-immiscible organic solvent and having dissolved therein trivalent iron which comprises contacting said extractant with dilute aqueous phosphoric acid containing less than 0.3% by weight of iron at least once to transfer said trivalent iron to said dilute aqueous phosphoric acid and disengaging the dilute aqueous phosphoric acid containing the transferred trivalent iron from said extractant.

8. A process for the recovery of uranium from a wet process phosphoric acid solution derived from the acidulation of uraniferous phosphate ores which comprises

(a) contacting said solution with an organic extractant comprising a dialkylphosphoric acid and a trialkylphosphine oxide dissolved in a water-immiscible organic solvent,

(b) reductively stripping the extractant of uranium with a strip solution in which ferrous iron is used to reduce uranyl ions in the extractant to tetravalent uranium ions in the strip solution,

(c) disengaging the strip solution from the organic phase,

(d) contacting said strip solution with an oxidizer which converts tetravalent uranium to hexavalent form,

(e) contacting the resultant oxidizer-treated solution with an organic extractant having the composition described above,

(f) contacting the resulting extractant with dilute aqueous phosphoric acid containing about 10 to about 40 weight % P_2O_5 and less than 0.3 weight % of iron at least once to transfer said trivalent iron to said dilute aqueous phosphoric acid and disengaging the dilute aqueous phosphoric acid containing the transferred trivalent iron from said extractant, and

(g) stripping the uranium from the organic phase with an aqueous solution of ammonium carbonate to produce a product comprising ammonium uranyl tricarbonate.

4,105,742

SEPARATION AND PURIFICATION OF PLATINUM AND PALLADIUM

Roderick I. Edwards, Honeydew, and Michael J. Nattrass, Randburg, both of South Africa, assignors to The National Institute for Metallurgy, South Africa

Filed Jun. 15, 1977, Ser. No. 806,816

Claims priority, application South Africa, Jun. 21, 1976, 76/3679

Int. Cl.^{2} C01G *55/00*

U.S. Cl. 423—22 **9 Claims**

1. A process for the selective separation of platinum, palladium or both from an aqueous acid solution thereof, wherein the platinum and palladium are present in the form of the chlorocomplexes thereof, the solution being substantially gold free and having an acid concentration of about 0.01 to about 2 molar, the process including the steps of:

(1) contacting said solution with an organic solvent extractant solution which is substantially water insoluble to form an aqueous phase and an organic phase, the solvent extractant solution consisting essentially of an organic liquid solvent having dissolved therein a solvent extractant having functional groups of the formula:

$R_2N—CH_2COOH$

were each R, which may be the same or different, is a C_8–C_{16} alkyl group,

said solvent extract having a high capacity and distribution coefficient for both platinum and palladium, facilitating transfer of the platinum chlorocomplex and palladium chlorocomplex to the solvent extractant solution:

(2) separating the solvent extractant solution as an organic phase from the aqueous solution phase;

(3) contacting the thus separated organic solvent extractant solution with a concentrated aqueous hydrochloric acid solution transferring the platinum and palladium to the aqueous hydrochloric acid solution; and thereafter,

(4) recovering the platinum and palladium from the aqueous acid solution.

4,105,743

SELECTIVELY EXTRACTING COPPER, ZINC, NICKEL FROM A MIXTURE OF METAL HYDROXIDES

Hans Reinhardt, Västra Frölunda; Harald Daniel Ottertun, Mölndal, and Sven Otto Sigbert Andersson, Källered, all of Sweden, assignors to Mx-Processer Reinhardt & Co. AB, Mölndal, Sweden

Filed Jan. 15, 1977, Ser. No. 806,939

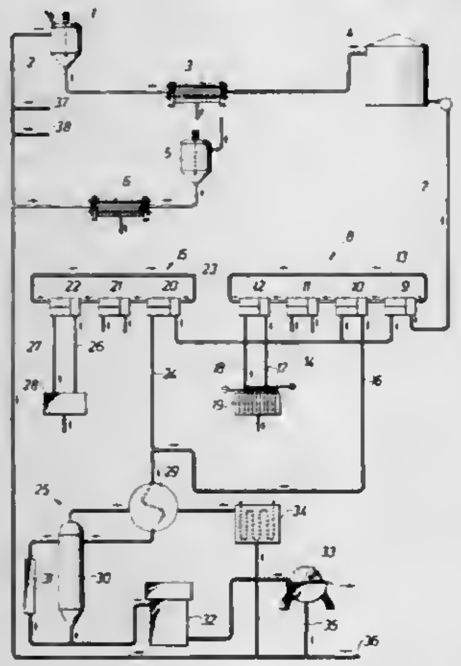
Claims priority, application Sweden, Jan. 15, 1976, 7606818

Int. Cl.^{2} C01G *3/14, 9/00, 53/12*

U.S. Cl. 423—24 **2 Claims**

1. A process for extracting metals from a mixture of metal hydroxides containing at least one hydroxide of the metals selected from the group consisting of nickel, copper and zinc, and at least one hydroxide of the metals selected from the group consisting of iron and chromium, said process comprising (a) leaching the metal hydroxide mixture with an ammoniacal carbonate solution to dissolve nickel, copper and zinc, said ammoniacal carbonate solution containing free ammonia and ammonium ions in a total content of 3–7 moles per liter and carbonate and hydrogen carbonate ions in a total content of 1–3 moles per liter, (b) recovering by a liquid-liquid extraction process, at least one metal compound from the ammoniacal leaching solution thus obtained, (c) returning the ammoniacal solution to the ammoniacal leaching process, (d) leaching the

solid leaching residue with sulphuric acid at a pH of 1.5–3 to dissolve a further amount of nickel, copper and zinc, and (e) passing the acidic leaching solution thus obtained to the ammoniacal leaching process.



4,105,744
METHOD OF NEUTRALIZING INDUSTRIAL WASTE GASES

Emerich Erdoess; Josef Marecek; Karel Mocek; Rudolf Camr; Julius Holovacky, and Jiri Prokupek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jun. 12, 1975, Ser. No. 586,261

Claims priority, application Czechoslovakia, Jun. 12, 1974, 4159-74; Aug. 2, 1974, 5512-74

Int. Cl.² B01J *8/00;* C01L *21/00;* C01B *7/00, 17/00*

U.S. Cl. 423—239 **10 Claims**

1. In a method of remaining acidic pollutants comprising oxides of nitrogen and sulfur and silicon tetrafluoride from humid industrial waste gases by producing from a starting material a bed of an active carbonate and thereafter passing the humid waste gases to be treated through the bed, the improvement wherein the producing step employs as a starting material at least one member selected from the group consisting of $MeHCO_3$, $MeHCO_3 . MgCO_3 . y H_2O$, $xMeHCO_3 . Me_2CO_3 . y H_2O$, and $xMeHCO_3 . Me_2CO_3$, where Me represents an alkaline metal, x is an integer from 1 to 3 and y is an integer from 0 – 4, wherein the producing step comprises heating said starting material to a temperature in the range of 30° – 200° C by contact with a stream of gas having a maximum partial pressure of water vapor defined by the equation.

$$\log P_{H_2O}(\text{Torr}) = 10.825 - \frac{3000}{t^\circ\,C + 273}$$

until a substantially hydrate-free active carbonate of the alkaline metal is formed by thermal decomposition of the starting material, and wherein the step of passing the humid waste gases through the bed is accomplished at a temperature in the range of 100° – 200° C.

4,105,745
CATALYST AND PROCESS FOR REDUCING NITROGEN OXIDES

Junji Takenchi; Shigeru Itou, both of Ube, and Kousuke Itou, Yamaguchi, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Nov. 17, 1975, Ser. No. 632,528

Int. Cl.² C01B *21/00;* B01J *27/02, 23/16, 23/84*

U.S. Cl. 423—239 **13 Claims**

9. A process for catalytically reducing nitrogen oxides with ammonia, comprising mixing nitrogen oxide-containing gas with ammonia gas and bringing said mixture gas into contact with a catalyst which comprises a catalyst base consisting essentially of the oxides of iron and chromium and 0.1 through 20% of aluminum sulfate based on the weight of the said catalyst base, at a temperature of 150° C or higher.

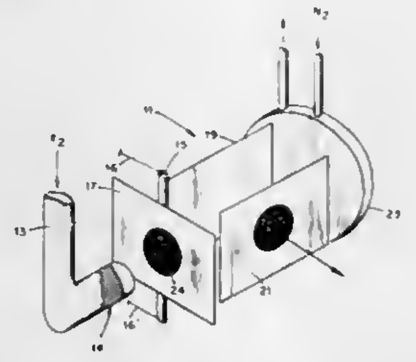
4,105,746
METHOD AND APPARATUS FOR PROVIDING NEGATIVE IONS OF ACTINIDE-METAL HEXAFLUORIDES

Robert N. Compton, Oak Ridge; Paul W. Reinhardt, Kingston, and William R. Garrett, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 7, 1977, Ser. No. 766,278

Int. Cl.² C01G *43/06, 56/00*

U.S. Cl. 423—251 **11 Claims**



1. A method for providing gaseous, negatively charged metal-hexafluoride ions comprising:
in an evacuated zone reacting gaseous fluorine with an actinide-metal body, said metal being selected from the group consisting of uranium, plutonium, neptunium, and americium, to convert at least part of said body to gaseous negative ions of the corresponding metal hexafluoride; and
applying an electric field to the evacuated zone to extract said ions therefrom.

4,105,747
METHOD FOR DEHYDRATING METAL CHLORIDES

Judith A. Eisele, Verdi, and Donald J. Bauer, Reno, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 10, 1977, Ser. No. 805,378

Int. Cl.² C01F *5/34, 7/58, 17/00;* C01G *9/04*

U.S. Cl. 423—263 **1 Claim**

1. A method for dehydrating a hydrated metal salt, from the group consisting of $ZnCl_2$, $MnCl_2$, $PrCl_3$ $AlCl_3$, $MgCl_2$ and $FeCl_3$, comprising:
dissolving said hydrated metal salt in an organic solvent consisting essentially of a lower aliphatic alcohol,
contacting the resulting solution with a crystalline aluminosilicate molecular sieve having a pore size of about 3 to 5 angstroms, sufficient to permit absorption of water molecules but not solvent molecules, at ambient temperature and for a time sufficient to permit substantially complete absorption of water from the hydrated metal salt, and
separating the resulting organic solvent solution of substantially anhydrous metal salt from the molecular sieve.

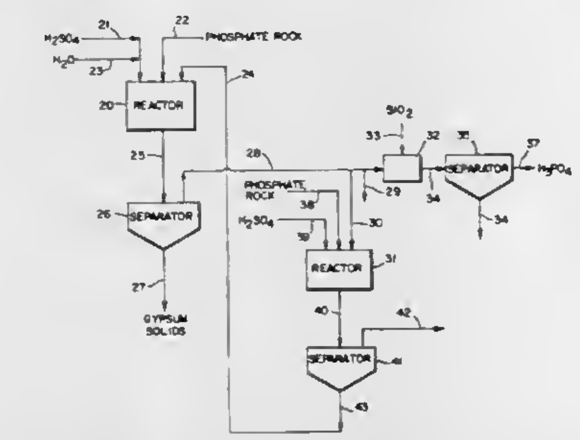
4,105,748
METHOD OF PRODUCING PHOSPHORIC ACID AND POTASSIUM DIHYDROGEN PHOSPHATE FROM PHOSPHATE ROCK IN THE SUBSTANTIAL ABSENCE OF FLUORINE EVOLUTION

Erhart Karl Drechsel, Houston, Tex., and John B. Sardisco, Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Division of Ser. No. 696,290, Jun. 15, 1976, Pat. No. 4,055,626. This application Apr. 7, 1977, Ser. No. 785,772

Int. Cl.² C01B *25/16*

U.S. Cl. 423—320 **7 Claims**



1. A continuous method for the preparation of phosphoric acid and a solution of KH_2PO_4 in phosphoric acid in the substantial absence of fluorine evolution, by the steps which comprise:
(a) reacting in a first acidulation reactor, a fluorine-containing phosphate rock with sufficient sulfuric acid to effect acidulation of the rock, said reaction being conducted in the presence of:
(1) potassium ion provided hy addition of a member selected from the group consisting of KH_2PO_4, $KHSO_4$, K_2SO_4, KOH and mixtures thereof in sufficient amounts to combine with the fluorine liberated from the phosphate rock during acidulation and in a sufficient excess amount that the phosphoric acid recovered from the reaction will contain about 0.5 to 1.0 weight percent potassium ion as K_2O; and
(2) in the presence of a sufficient amount of silicon dioxide to combine with the fluorine liberated during acidulation of the rock and a sufficient excess amount of the silicon dioxide to provide about 0.003 to 0.015 parts of silicon dioxide per part of P_2O_5 in the phosphoric acid recovered, said reaction being continued until acidulation of the phosphate rock is substantially complete and adequate gypsum crystal growth is achieved;
(b) forming a resulting mixture of precipitated gypsum and other solids including K_2SiF_6 in phosphoric acid and removing the mixture from the acidulation reactor;
(c) separating the precipitate from the phosphoric acid solution;
(d) dividing the phosphoric acid solution into two portions and recovering one portion of phosphoric acid;
(e) reacting in a second acidulation reactor the other portion of phosphoric acid solution with phosphate rock and a member selected from the group consisting of $KHSO_4$, K_2SO_4 and mixtures thereof, to produce a solution of KH_2PO_4 in H_3PO_4 containing precipitated gypsum and other solids including K_2SiF_6; and
(f) separating the precipitated gypsum and other solids from the solution and recycling the solution to the first acidulation reactor so as to provide potassium ion, silicon dioxide and phosphoric acid thereto.

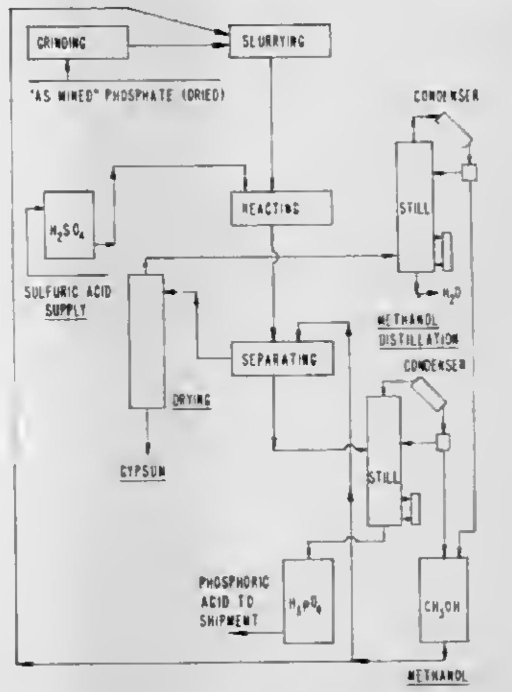
4,105,749
PHOSPHORIC ACID MANUFACTURE FROM PHOSPHATE MATRIX

Robert A. Wilson, Winter Haven, and David J. Raden, Fort Meade, both of Fla., assignors to Swift Agricultural Chemicals Corporation, Chicago, Ill.

Continuation of Ser. No. 668,715, Mar. 22, 1976, abandoned. This application May 5, 1977, Ser. No. 794,311

Int. Cl.² C01B *25/16*

U.S. Cl. 423—320 **10 Claims**



1. A method for recovering P_2O_5 values directly from phosphate matrix, comprising mixing unbeneficiated phosphate matrix with a methanol solvent in an amount such that the weight ratio of methanol solvent to matrix is within the range of about 0.6 to 1 to about 2 to 1, so as to form a slurry of said matrix and a single liquid phase comprising said methanol solvent, adding sulfuric acid to said slurry, said sulfuric acid reacting with the matrix in the slurry to extract P_2O_5 values from the matrix and into the liquid phase of the slurry, said liquid phase being primarily P_2O_5 values and methanol, and separating the liquid phase from the solid phase of the slurry.

4,105,750
PRODUCTION OF CARBON BLACKS

John H. Horn, Vizcaya, Spain; William R. Morehead; Ronald C. Hurst, both of Pampa, Tex.; Dennis J. Potter, Milford, Mass., and Clyde D. Schaub, Tulsa, Okla., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 696,771, Jun. 16, 1976, abandoned. This application Nov. 22, 1976, Ser. No. 743,963

Int. Cl.² C01B *31/02;* C09C *1/48, 1/56*

U.S. Cl. 423—456 **10 Claims**

1. A modular process for producing furnace carbon blacks having lowered structure characteristics as represented by lowered DBP values of the blacks and increased extrusion shrinkage values of rubber formulations containing said blacks without significantly increasing the particle size of the blacks which comprises (a) reacting a fuel and an oxidant in a first stage so as to provide a stream of combustion gases having a combustion ranging from about 1.25 to about 0.33 equivalence ratio and possessing sufficient energy to convert a carbon black-yielding liquid hydrocarbon feedstock to carbon black; (b) propelling the combustion gas stream in a downstream direction at a high linear velocity into a second stage where the liquid hydrocarbon make is injected in the form of a plurality of coherent jets into the gaseous stream substantially transversely from the periphery of the combustion gas stream and under sufficient pressure to achieve the degree of penetration required for proper shearing and mixing; (c) introducing the

resultant gaseous reaction mixture in a downstream direction into a third zone, the reaction zone, wherein oxidant in an amount of from about 5 to about 45% of the total amount of oxidant required for production of the desired carbon black is injected together with an amount of hydrocarbon sufficient to achieve an equivalence ratio ranging from about 1.25 to 0; (d) terminating the reaction by quenching and recovering the carbon black, the overall combustion of the process ranging from at least 6.67 to about 2.50 equivalence ratio.

4,105,751
PROCESS AND INSTALLATION FOR THE MANUFACTURE OF CHLORINE DIOXIDE

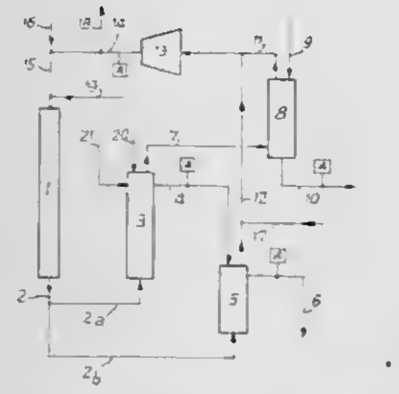
Alain Caillol, Paris, France, assignor to Societe d'Etudes Chimiques, France

Filed Mar. 21, 1977, Ser. No. 779,613

Claims priority, application France, Mar. 24, 1976, 76 08479; Mar. 7, 1977, 77 06634

Int. Cl.² C01B *11/02*

U.S. Cl. 423—478 **30 Claims**



1. In the process for the manufacture of chlorine dioxide which comprises reducing an alkali metal chlorate in an acidic medium by means of a gaseous or liquid reducing agent, in at least one production reaction zone to obtain a liquid effluent and a gaseous effluent, the gaseous effluent containing chlorine dioxide, passing said gaseous effluent through cooled water in a column, and absorbing said chlorine dioxide in said water, recycling the gaseous effluent, referred to as "tail gas" which contains chlorine issuing from said absorption column to said production reaction zone, in order to dilute the chlorine dioxide produced, the improvement which comprises a) contacting said tail gas containing chlorine with an excess of the gaseous or liquid reducing agent, in the presence of water, in an auxiliary reduction zone, thus converting substantially all the chlorine to hydrochloric acid and b) recycling the product from step a) containing hydrochloric acid to said production reaction zone in a recycling circuit.

22. An apparatus for the production of chlorine dioxide which comprises:

(1) an auxiliary reactor for carrying out the reduction of the tail gas containing chlorine, said reactor being equipped with inlet means for feeding respectively said tail gas, a reducing agent and water and outlet means for the gaseous product,

(2) a main reactor for carrying out the reduction of an alkali metal chlorate with an acid to produce chlorine dioxide, means for introducing therein the gaseous product issuing from the outlet means of said auxiliary reactor through the bottom thereof, the main reactor additionally comprising an alkali metal chlorate solution inlet, an acid inlet,

(3) a secondary reactor equipped with inlet means at the bottom for a portion of the gaseous product issuing from the auxiliary reactor, an inlet means for the liquid effluent issuing from the main reactor, an outlet for discharging the residual liquid, an outlet for the residual gas,

(4) a packed absorption column comprising an inlet for the gaseous effluent issuing from the main reactor, a cooled water inlet, whereby chlorine dioxide is dissolved in water, an outlet for discharging the aqueous chlorine dioxide solution, an outlet for discharging the non-absorbed residual gas,

(5) compressing means for the non-absorbed residual gas issuing from the outlet of the absorption column and means for recycling said compressed gas to the inlet of the auxiliary reduction reactor.

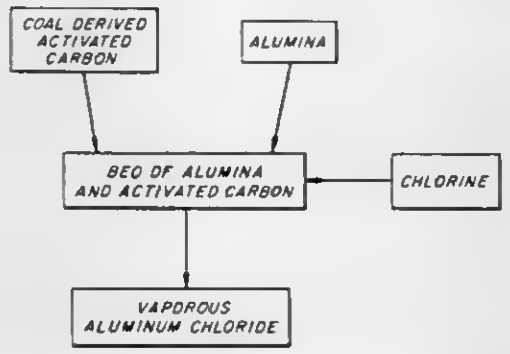
4,105,752
ALUMINUM CHLORIDE PRODUCTION

Aaron J. Becker, Monroeville, and Subodh K. Das, Natrona Heights, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,544

Int. Cl.² C01F *7/56;* **C01B** *31/20*

U.S. Cl. 423—496 **6 Claims**


COAL DERIVED ACTIVATED CARBON
ALUMINA
BED OF ALUMINA AND ACTIVATED CARBON
CHLORINE
VAPOROUS ALUMINUM CHLORIDE

1. A process for the production of aluminum chloride from a source of alumina, coal-derived activated carbon and chlorine comprising:

(a) providing a fluidized mixture of coal-derived activated carbon and a source of alumina, the carbon having a size range similar to or larger than the alumina, said activated carbon prepared by:

(i) contacting coal with a leaching solution to remove impurities therefrom, the solution being employed at a temperature of 20° to 100° C and at a ratio of solution in milliliters to coal in grams in the range of 5:1 to 20:1;

(ii) removing the leaching solution from the coal and leaving therein residual leaching solution; and

(iii) calcining the coal at a temperature in the range of 550° to 775° C to provide activated carbon having a dry bulk density in the range of 0.25 to 0.95 gms/cc.

(b) maintaining the mixture at a temperature in the range of 500° to 775° C;

(c) bubbling a source of chlorine through the mixture thereby reacting said chlorine with said alumina to produce aluminum chloride vapor; and

(d) condensing said aluminum chloride vapor.

4,105,753
METHOD FOR SELECTIVE PRODUCTION OF BROMINE

Lothar Schulz, Bad Soden am Taunus, and Hans-Jürgen Arpe, Fischbach, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengsellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 28, 1975, Ser. No. 544,915

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404335

Int. Cl.² C01B *7/10, 21/02*

U.S. Cl. 423—502 **16 Claims**

1. A process for the selective production of bromine directly from ammonium bromide which consists essentially of contacting ammonium bromide and an oxygen containing gas with an inorganic oxidation catalyst containing at least one element selected from the group consisting of copper, vanadium, chromium, molybdenum, uranium, manganese, iron, cobalt and rare earth elements of atomic numbers 57 to 71, and mixtures

thereof, reacting said ammonium bromide and oxygen in the presence of said catalyst at about ambient pressure and a temperature of from 200° to 800° C and a reaction time of more than 0.1 second to produce a reaction gas product consisting essentially of bromine, nitrogen and H_2O, and recovering the bromine from said gaseous reaction product.

4,105,754
PRODUCTION OF HIGH PURITY CALCIUM THIOSULFATE

James W. Swaine, Jr., Manlius; William W. Low, Syracuse, and Samuel L. Bean, Jamesville, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 25, 1977, Ser. No. 845,013

Int. Cl.² C01B *17/64*

U.S. Cl. 423—514 **15 Claims**

1. A process for producing high purity calcium thiosulfate which comprises the steps of:

(a) contacting an aqueous solution of ammonium thiosulfate with greater than 1.0 and less than 1.10 of a stoichiometric amount of calcium oxide or calcium hydroxide to form a reaction mixture;

(b) maintaining the reaction mixture at a temperature between about 25° C and the boiling point of the reaction mixture for a period of at least about 3 hours;

(c) continuously removing the formed ammonia from the reaction mixture; and

(d) recovering the high purity calcium thiosulfate product.

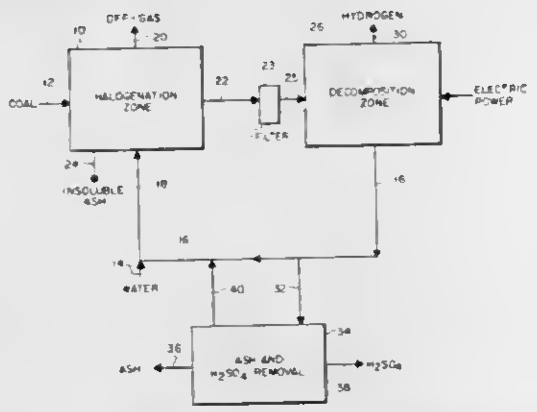
4,105,755
HYDROGEN PRODUCTION

Alfred J. Darnell, and William E. Parkins, both of Woodland Hills, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 716,320, Aug. 20, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,202

Int. Cl.² C01B *1/03*

U.S. Cl. 423—648 R **14 Claims**



1. A method of producing hydrogen comprising the steps of:

(a) reacting an ash containing carbonaceous material, water and at least one halogen selected from the group consisting of chlorine, bromine, and iodine to form reaction products including CO_2, a corresponding hydrogen halide, and ash constituents substantially free of carbonaceous material and containing a minor amount of said halogen;

(b) decomposing the hydrogen halide to produce separate streams of hydrogen and halogen;

(c) recovering the halogen and returning it to step (a) for reaction with additional carbonaceous material and water; and

(d) treating the ash constituents with sulfuric acid to react with said halogen and form a hydrogen halide for recycle to step (b).

4,105,756
INHIBITION OF DENTAL CALCULUS

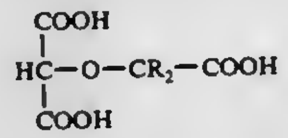
David R. Dyroff, Creve Coeur, Mo., and Walton F. Suchanek, Jr., Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1976, Ser. No. 744,484

Int. Cl.² A61K *7/16, 7/24, 9/68, 31/19*

U.S. Cl. 424—48 **20 Claims**

1. An oral composition effective in inhibiting formation of dental calculus, said composition comprising (1) a carboxyalkoxy-propanedioic acid compound selected from the group consisting of acids having the structural formula:



$$\begin{array}{l} \text{COOH} \\ | \\ \text{HC}-\text{O}-\text{CR}_2-\text{COOH} \\ | \\ \text{COOH} \end{array}$$

wherein each R is hydrogen or lower alkyl, and pharmaceutically acceptable salts of said acids and (2) a carrier suitable for use in the oral cavity, said compound being present in said composition in amount and concentration sufficient to substantially inhibit formation of dental calculus.

4,105,757
AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS FOR COSMETIC OR DENTIFRICE USE AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 285,966, Sep. 5, 1972, Pat. No. 3,928,541. This application Feb. 18, 1975, Ser. No. 550,324

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **4 Claims**

1. A visually clear toothpaste comprising a binder effective to prevent separation of the solid and liquid phases, a particulate solid polishing agent and an aqueous liquid phase containing an humectant and having substantially the same refractive index as the polishing agent, characterized in that the polishing agent consists essentially of an amorphous precipitated silicic acid having a wet cake moisture content of less than 70%, an oil adsorption of less than about 125 ccs/100 grams, a surface area of less than 100 m^2/g, a pack density of greater than about 12 lb./cu.ft., and a valley abrasion of greater than about 5 mg. wire loss, said precipitated silicic acid being non-opalescent silica aggregates grown to a larger controlled particle size and being present in an amount of from about 15 to about 50 percent by weight of the toothpaste and effective to function to remove stains, food, debris and plaque from the human tooth surface by providing ideal cleaning action at acceptable abrasion levels without imparting undesirable opacity to the toothpaste, thickening said toothpaste, or affecting the viscosity of the toothpaste; said controlled larger particle size of said silica aggregates being thereby free of precipitated silicas which have substantially no cleaning ability on human teeth, have initially small particle sizes, and are free of the ease of breakdown into small particle sizes thus resulting in full cleaning ability.

4,105,758
ORAL COMPOSITIONS CONTAINING AN ANTICALCULUS AGENT

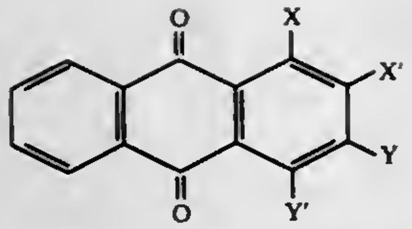
Ronald Stanley Schreiber, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,777

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **9 Claims**

1. An oral preparation comprising a humectant vehicle containing a dental-calculus inhibiting amount of an anticalculus agent selected from the group consisting of compounds having the structural formula:



wherein X, X', Y, and Y' are selected from the group consisting of H, OH, SO_3Na, and $CH_2N(CH_2COOH)_2$ and wherein at least two of the substituents X, X', Y, and Y' are OH, and at least one of the further substituents are selected from the group consisting of OH, SO_3Na, and $CH_2N(CH_2COOH)_2$.

4,105,759
AMINE MONOFLUOROPHOSPHATES IN DENTIFRICES

Ronald Stanley Schreiber, Highland Park, N.J., and Edward John Duff, Sandbach, England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,114
Int. Cl.² C07F *9/26;* **A61K** *7/18*
U.S. Cl. 424—52 **9 Claims**

1. A bislong chain amine monofluorophosphate which is a substantive, slow release fluoride agent and which has the structural formula:

$(RNH_3)_2PO_3F$

wherein R is a unsaturated saturated alkyl or unsaturated alkenyl group containing 8–18 carbon atoms.

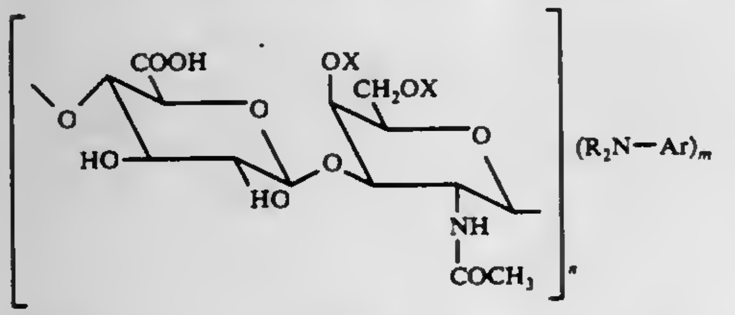
4. An anticaries pharmaceutically acceptable oral composition containing an effective amount of the substantive, slow release fluoride agent defined in claim 1 admixed with a pharmaceutical carrier.

4,105,760
LOCAL ANAESTHETIC SALTS OF CHONDROITINSULFATE COMPOUNDS

József Szejtli, Endrödi Sándor u. 38–40; Éva Dósa, Bimbó u. 131/a, both of Budapest, Hungary (1026); Edömér Tassönyi, Keszkeno u. 37, Budapest, Hungary (1138), Ágoston Dávid, Bem rkp. 56, Budapest, Hungary (1027), and Zsuzsanna Vagy Née Biró u. 70/c, Budapest, Hungary (1122)

Filed Dec. 15, 1976, Ser. No. 750,851
Claims priority, application Hungary, Dec. 18, 1975, CI 1630
Int. Cl.² A61K *31/73;* **C08B** *37/08*
U.S. Cl. 424—180 **3 Claims**

1. A chondroitinsulfate compound of the formula:



(I)

wherein *n* is 10 to 70; *m* is *n* to 2*n;* X is $—SO_3M$ or —M in which M is hydrogen or an alkali metal, provided that at least one X group is $—SO_3M$; and (R_2N—Ar) represents a compound selected from the group consisting of

(−)-3β-benzoyloxytropane-2β-carboxylic acid methyl ester,
2-(cyclohexylamino)-1-methyl-ethyl-benzoate,
3-(2-methyl-piperidino)-propylbenzoate,
2-(diethylaminoacetylamino)-3-methyl-benzoic acid methyl ester,
4-amino-2-chloro-benzoic acid-β-diethylaminoethyl ester,
4-amino-benzoic acid-β-diethylaminoethyl ester,
4-butylamino-benzoic acid-β-diethylaminoethyl ester,
n-butylamino-2-chloro-6-methyl-acetanilide,
4-amino-3-butoxy-benzoic acid-β-diethylaminoethyl ester,
N-(2-diethylaminoethyl)-2-butoxy-cinconinamide,
α-Diethylamino-2,6-dimethyl-acetanilide,
1,2',6'-trimethyl-pipecolinanilide,
2-methyl-α-propylamino-propionanilide and
1-n-butyl-2',6'-dimethyl-pipecolinanilide.

2. A local anaesthetic pharmaceutical composition comprising an effective amount of a compound according to claim 1 and an inert, pharmaceutically acceptable solid or liquid carrier.

4,105,761
ANABOLISANT-ANDROGENIC COMPOUNDS

André Pierdet, Noisy-le-Sec, and Geneviéve Azadian, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 26, 1975, Ser. No. 553,249
Claims priority, application France, Sep. 20, 1974, 74 31840
Int. Cl.² A61K *31/56*
U.S. Cl. 424—243 **2 Claims**

1. An androgenic and anabolisant composition comprising an effective amount to obtain androgenic and anabolic activity of 17β-n-amyloxy-$\Delta^{4,9,11}$-estratriene-3-one and an oral pharmaceutical carrier.

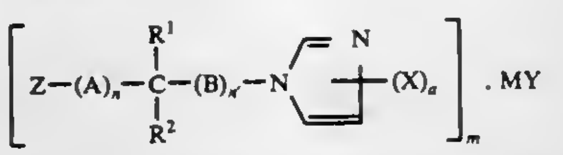
2. A method of inducing androgenic and anabolisant activity in humans and other warm-blooded animals comprising orally administering to humans and other warm-blooded animals an androgenic and anabolisant effective amount of 17β-n-amyloxy-$\Delta^{4,9,11}$-estratriene-3-one.

4,105,762
METAL SALT COMPLEXES OF 1-SUBSTITUTED ARALKYL IMIDAZOLES, AND METHODS AND COMPOSITIONS FOR CONTROLLING PHYTOPATHOGENIC FUNGI USING THEM

George A. Miller, Maple Glen, and Harold E. Carley, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 547,291, Feb. 5, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 642,041
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.² A01N *9/22;* **C07F** *3/00, 15/00;* **C07D** *233/56*
U.S. Cl. 424—245 **9 Claims**

1. A metal salt complex of the formula:



wherein Z is (C_6–C_{14}) aryl or (C_6–C_{14}) aryl substituted with up to three substituents selected from the group consisting of (C_1–C_4) alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; R^1 is hydrogen, (C_1–C_{10}) alkyl, (C_3–C_7) cycloalkyl, (C_2–C_{12}) alkenyl, (C_5–C_7) cycloalkenyl, (C_7–C_9) aralkyl or phenyl, or (C_7–C_9) aralkyl or phenyl substituted with up to two substituents selected from the group consisting of (C_1–C_4) alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; R^2 is (C_1–C_{10}) alkyl, (C_3–C_7) cycloalkyl, (C_2–C_{12}) alkenyl, (C_5–C_7) cycloalkenyl, (C_7–C_9) aralkyl or phenyl or (C_7–C_9) aralkyl or phenyl substituted with up to two substituents selected from the group consisting of (C_1–C_4) alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; R^1 and R^2 taken together form (C_3–C_8) cycloalkyl; A and B are divalent (C_1–C_5) alkylene groups; X is (C_1–C_4) alkyl, halogen or nitro; *a* is 0 to 3; *n* is 0 or 1; *n'* is 0 or 1; and *n* plus *n'* is 1 or 2; provided that when Z is unsubstituted phenyl, R^1 is hydrogen, A is methylene and *n'* is 0, then R^2 is (C_4–C_{10}) alkyl, (C_3–C_7) cycloalkyl, (C_2–C_{12}) alkenyl, (C_5–C_7) cycloalkenyl, (C_7–C_9) aralkyl or phenyl, or (C_7–C_9) aralkyl or phenyl substituted with up to two substituents selected from the group consisting of (C_1–C_4) alkyl, methoxy, ethoxy, chloro, fluoro, bromo, iodo, nitro, amino and methylthio; *m* is 1 to 4; M is a metal salt cation selected from the group consisting of calcium, magnesium, manganese, copper, nickel, zinc, iron, cobalt, tin, cadmium, mercury, chromium, lead and barium; and Y is a solubilizing anion counterion selected from the group consisting of chloride, bromide, iodide, sulfate, bisulfate, phosphate, nitrate, perchlorate, carbonate, bicarbonate, hydrosulfide, hydroxide, acetate, oxalate, malate, and citrate.

6. A method for controlling phytopathogenic fungi which consists of applying to a plant, to plant seed or to the plant habitat an effective amount of a complex of claim 2.

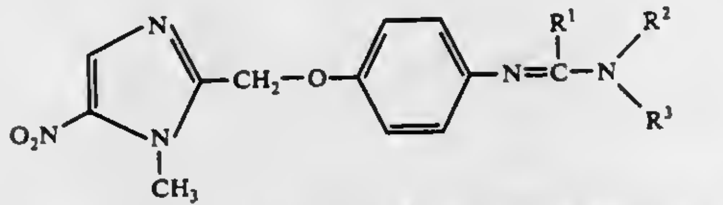
9. A fungicidal composition for controlling phytopathogenic fungi which comprises an agronomically acceptable carrier and, as the active ingredient, an effective amount of a complex of claim 1.

4,105,763
1-METHYL-2-(PHENYL-OXYMETHYL)-5-NITRO-IMIDAZOLES

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1976, Ser. No. 734,765
Int. Cl.² A61K *31/415;* **C07D** *233/95;* **A61K** *31/535;* **C07D** *413/12*
U.S. Cl. 424—246 **6 Claims**

1. A 1-methyl-2-(phenyl-oxymethyl)-5-nitro-imidazole of the formula I



(I)

wherein R^1, R^2, R^3 are identical or different and represent hydrogen, straight-chain or branched alkyl of from 1 to 4 carbon atoms, or in which R^1 and R^2 represent an alkylene chain which, together with the nitrogen and carbon atoms to which it is attached, forms a pyrrolidine, piperidine or hexamethylene-imine ring, or in which R^2 and R^3 together with the nitrogen atom to which they are attached, form a pyrrolidine, piperidine, morpholine or thiomorpholine ring, as well as the salts thereof with a physiologically tolerable acid.

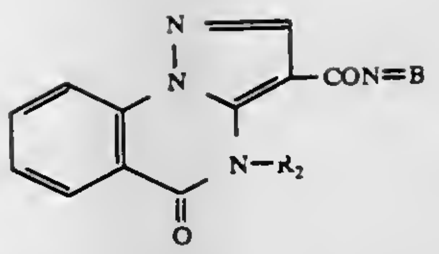
6. A method for the treatment of protozoa, helminths and ectoparasites in mammals which comprises administering an effective amount of a compound of the formula I as claimed in claim 1.

4,105,764
4,5-DIHYDRO-5-OXOPYRAZOLO[1,5-A]QUINAZOLINE-3-CARBOXAMIDES

E. John Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

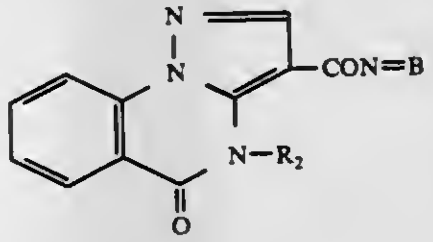
Filed Aug. 19, 1977, Ser. No. 826,162
Int. Cl.² A61K *31/505;* **C07D** *487/14, 405/14*
U.S. Cl. 424—248.54 **16 Claims**

1. A compound having the formula:



where:
R_2 is lower-alkyl or lower-alkenyl; and
N=B is di-lower-alkylamino, morpholino or pyrrolidino.

16. A composition for the treatment of excess stomach acidity comprising an effectve anti-secretory amount of a compound according to claim 1 having the formula:



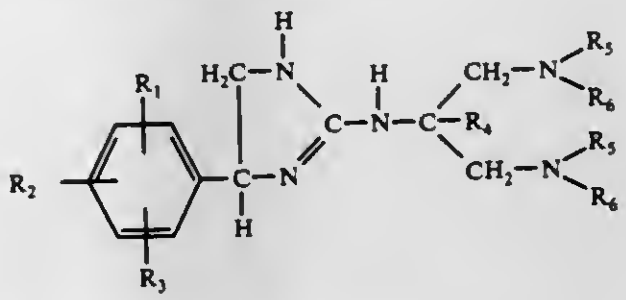
where:
R_2 is lower-alkyl or lower-alkenyl; and
N=B is di-lower-alkylamino, morpholino or pyrrolidino in a pharmaceutical carrier.

4,105,765
2-(N-(1,3-DIAMINO-ISOPROPYL)-AMINO)-4-PHENYL-2-IMIDAZOLINES AND SALTS THEREOF

Werner Kummer; Helmut Stahle; Herbert Koppe, all of Ingelheim am Rhein; Walter Haarmann, Biberach an der Riss, and Richard Reichl, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 692,325, Jun. 3, 1976, Pat. No. 4,058,616. This application Sep. 29, 1977, Ser. No. 837,692
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2525725
Int. Cl.² C07D *413/14;* **A61K** *31/415, 31/495, 31/535*
U.S. Cl. 424—248.56 **6 Claims**

1. A compound of the formula



wherein
R_1 is chlorine, bromine, fluorine or methyl;
R_2 and R_3 are each hydrogen, chlorine or methyl;
R_4 is hydrogen, methyl or ethyl; and
R_5 and R_6, together with each other and the nitrogen atom to which they are attached, are morpholino, piperazino or N-methyl-piperazino;
or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

5. An antithrombotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,105,766

4,5-DIHYDRO-5-OXOPYRAZOLO[1,5-A]QUINAZOLINE-3-CARBOXYLIC ACID DERIVATIVES

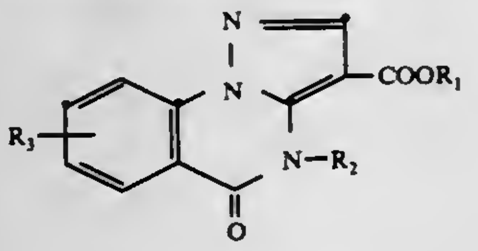
E. John Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 19, 1977, Ser. No. 826,163

Int. Cl.² A61K *31/505;* **C07D** *487/14*

U.S. Cl. 424—251 **53 Claims**

1. A compound having the formula:



where:

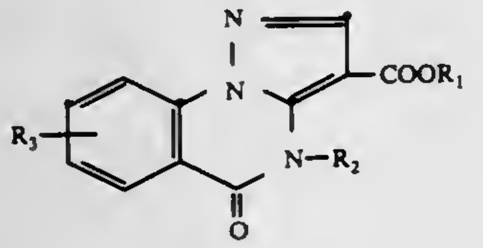
R_1 is hydrogen or an alkali metal cation;

R_2 is methyl, ethyl, lower-alkenyl or cyclopropylmethyl; and

R_3 is hydrogen or 7- or 8-halo,

except that when R_1 is hydrogen and R_2 is methyl, R_3 is not 7-fluoro.

52. A composition for the treatment of allergic conditions comprising a pharmaceutical carrier together with an anti-allergically effective amount of a compound having the formula:



where:

R_1 is hydrogen, lower-alkyl or pivaloyloxymethyl;

R_2 is hydrogen, methyl, ethyl, lower-alkenyl or cyclopropylmethyl; and

R_3 is hydrogen, 7- or 8-methyl, 7- or 8-halo or 7-nitro,

except that (a) when R_1 is lower-alkyl and R_2 is hydrogen, R_3 is not 8-methyl or 7-fluoro, (b) when R_1 is lower-alkyl and R_2 is methyl, R_3 is not 7-methyl or 7-bromo, and (c) when R_1 is hydrogen and R_2 is methyl, R_3 is not 7-fluoro.

4,105,767

IMIDAZO[1,2-a] PYRIDINES SUBSTITUTED WITH A THIENYL, THIAZOLYL, OR THIADIAZOLYL GROUP

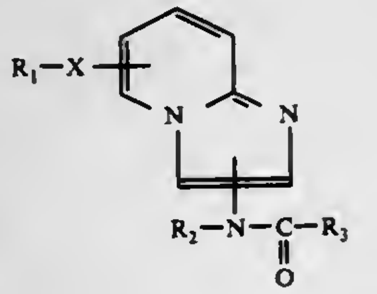
Richard J. Bochis, East Brunswick, and Richard L. Tolman, Berkley Heights, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 28, 1977, Ser. No. 781,902

Int. Cl.² A61K *31/44;* **C07D** *471/04*

U.S. Cl. 424—256 **9 Claims**

1. A compound having the formula:



wherein

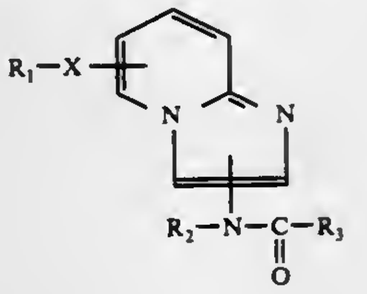
X is oxygen, thio, sulfinyl or sulfonyl;

R_1 is thienyl, thiazolyl or thiadiazolyl, which are optionally substituted with a loweralkyl, amino or phenyl group;

R_2 is hydrogen or loweralkyl; and

R_3 is loweralkoxy.

9. An anthelmintic composition which comprises an inert carrier and a compound having the formula:



wherein

X is oxygen, thio, sulfinyl or sulfonyl;

R_1 is thienyl, thiazolyl or thiadiazolyl, which are optionally substituted with a loweralkyl, amino or phenyl group;

R_2 is hydrogen or loweralkyl; and

R_3 is lower alkoxy.

4,105,768

HYPOTENSIVE SUBSTITUTED 1,2,4-TRIAZOLES

Hans Erik Eriksson, Sandsvall, and Gösta Lennart Florvall, Södertälje, both of Sweden, assignors to Astra Läkemedel Aktiebolag, Södertälje, Sweden

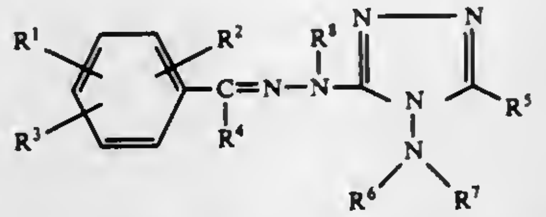
Continuation-in-part of Ser. No. 637,664, Dec. 4, 1975, abandoned, which is a division of Ser. No. 478,228, Jun. 11, 1974, Pat. No. 3,959,476, and a continuation-in-part of Ser. No. 635,140, Nov. 25, 1975, Pat. No. 4,022,905. This application Mar. 21, 1977, Ser. No. 779,582

Claims priority, application Sweden, Jun. 14, 1973, 7308365; Norway, Dec. 11, 1974, 744468/74

Int. Cl.² A61K *31/44;* **C09B** *23/16, 55/00*

U.S. Cl. 424—263 **12 Claims**

1. A compound of the formula



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or a pharmaceutically acceptable salt thereof wherein R^1, R^2 and R^3 are the same or different and each represents a hydrogen atom, a lower alkyl group or a halogen atom, R^4 represents a pyridyl group, and R^5, R^6, R^7 and R^8 are the same or different and each represents a hydrogen atom or a lower alkyl group.

5. A hypotensive pharmaceutical preparation which comprises as active ingredient a therapeutically effective amount of at least one compound according to claim 1, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutically acceptable carrier.

4,105,769

INHIBITION OF INDOLEAMINE-N-METHYL TRANSFERASE BY 2-IMINOPYRIDINES

Clarence S. Rooney, Beaconsfield; Joshua Rokach, Laval, both of Canada, and Edward J. Cragoe, Jr., Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

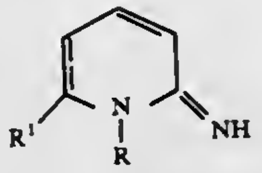
Filed Jan. 24, 1977, Ser. No. 761,748

Int. Cl.² A61K *31/44;* **C07D** *211/72*

U.S. Cl. 424—263 **4 Claims**

1. A method of inhibiting indoleamine-N-methyl-transferase which comprises administering to a patient in need of such

treatment an effective enzyme-inhibiting amount of a compound of formula:



or a pharmaceutically acceptable salt thereof, wherein

R is lower alkyl,

R^1 is hydrogen or amino, and the broken line represents saturation or unsaturation.

4. The compound, 2-imino-1-methyl-1,2,5,6-tetrahydropyridine.

4,105,770

HETEROCYCLOMETHYLSULPHINYLETHYL DERIVATIVES OF N-CYANOGUANIDINES, THIOUREAS AND 2-AMINO-1-NITROETHYLENE

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, England; Torben Hesselbo, North Berwick, Scotland, and George Raymond White, Harpenden, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

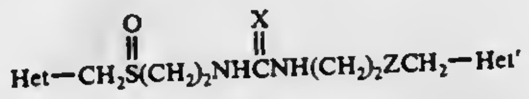
Division of Ser. No. 704,871, Jul. 13, 1976, Pat. No. 4,038,408. This application Apr. 13, 1977, Ser. No. 787,245

Claims priority, application United Kingdom, Jul. 31, 1975, 31969/75

Int. Cl.² C07D *417/02, 403/02;* **A61K** *31/44*

U.S. Cl. 424—263 **10 Claims**

1. A compound of the formula:



$$\mathrm{Het{-}CH_2\overset{O}{\overset{\|}{S}}(CH_2)_2NH\overset{X}{\overset{\|}{C}}NH(CH_2)_2ZCH_2{-}Het'}$$

wherein Het and Het' are each selected from imidazole optionally substituted by methyl or bromo and pyridine optionally substituted by methoxy, hydroxy, chlorine or bromine or when one of Het and Het' is pyridine optionally substituted by methoxy, hydroxy, chlorine or bromine, the other of Het or Het' may be selected from thiazole and isothiazole; Z is sulphur, SO or methylene; X is sulphur, $CHNO_2$ or NCN.

9. A method of blocking histamine H_2-receptors which comprises administering to an animal in an amount effective to block said receptors a compound of claim 1.

4,105,771

1-AMINOALKYLPIPERIDINE DERIVATIVES

John Lebeap Archibald, Windsor, and Terence James Ward, Cippenham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

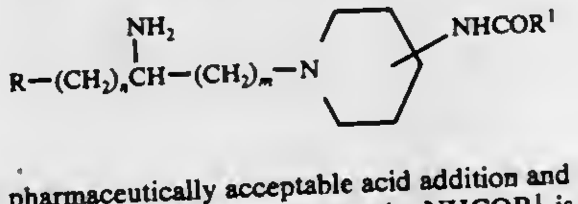
Filed Jun. 9, 1977, Ser. No. 805,203

Claims priority, application United Kingdom, Jun. 23, 1976, 26099/76

Int. Cl.² C07D *211/58*

U.S. Cl. 424—267 **6 Claims**

1. A compound having the formula



and the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein $NHCOR^1$ is in the 4-position; R represents phenyl or phenyl substituted by halogen, lower alkyl, hydroxy, trifluoromethyl or lower alkoxy; *n* represents 0 or 1 and *m* represents 2 or 3 with the proviso that *n* plus *m* equals 3; and R^1 represents phenyl or phenyl substituted by halogen, lower alkyl, lower alkoxy, trifluoromethyl or hydroxy.

4,105,772

3-NITROPYRAZOLE COMPOUNDS AND ANTI-MICROBIAL COMPOSITIONS

Herbert Berger, Mannheim-Käfertal; Rudi Gall, Hirschberg-Grossachsen, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldorf, Germany, by Werner Plattner, administrator; Max Thiel, Mannheim, Germany, and Wolfgang Vömel, Mannheim, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Nov. 22, 1976, Ser. No. 744,215

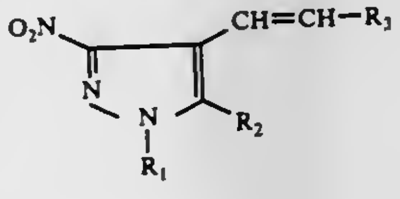
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558117

Int. Cl.² A61K *31/41;* **C07D** *231/10*

U.S. Cl. 424—269 **11 Claims**

1. 3-Nitropyrazole compound of the formula:

(I)



wherein

R_1 is lower alkyl;

R_2 is hydrogen or lower alkyl;

R_3 is cyano, carboxyl, or lower alkoxycarbonyl; and pharmaceutically acceptable salts thereof.

9. Method of combatting microbial infections which method comprises administering to the afflicted subject anti-microbially effective amounts of a 3-nitropyrazole compound as claimed in claim 1.

4,105,773

4-AMIDO-2-ALKOXY THIAZOLES AND COMPOSITION

Roger Crossley, Reading, and David George Hill, Cookham, both of United Kingdom, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed May 23, 1977, Ser. No. 799,820

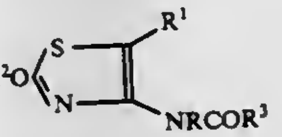
Claims priority, application United Kingdom, Jun. 10, 1976, 24162/76

Int. Cl.² A61K *31/425;* **C07D** *277/02*

U.S. Cl. 424—270 **12 Claims**

1. A compound of formula I,

(I)



wherein R is hydrogen, alkyl of 1–6 carbon atoms, or COR^3 where R^3 is hydrogen, alkyl of 1–5 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, or cycloalkyl of 3 to 5 carbon atoms, R^1 is hydrogen or alkyl of 1–6 carbon atoms, R^2 is alkyl of 1–6 carbon atoms and R^3 is as above defined.

10. A pharmaceutical composition for use in the treatment of ulcers or hypersecretion which comprises a therapeutically effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

4,105,774

HYDANTOIN COMPOUNDS AND METHODS OF USE THEREOF

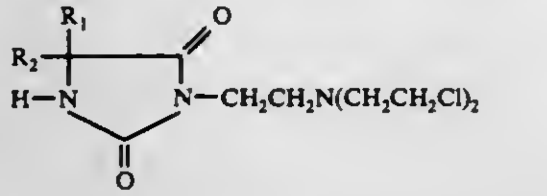
John S. Driscoll, Rockville, Md.; Victor E. Marquez, Caracas, Venezuela, and Geoffrey Peng, Chicago, Ill., assignors to The United States of America as represented by the Secretary of State, Washington, D.C.

Filed Jul. 28, 1975, Ser. No. 599,602

Int. Cl.^{2} H61K *31/415;* **C07D** *233/20*

U.S. Cl. 424—273 R **3 Claims**

1. A compound selected from the group consisting of



wherein R$_1$ and R$_2$ together are —CH$_2$CH$_2$CH$_2$ CH$_2$CH$_2$—, and pharmaceutically acceptable salts thereof.

2. A composition for treating transplanted mouse tumors consisting essentially of an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier.

4,105,775

FUNGICIDAL DISPERSIONS OF 2-BENZIMIDAZOLE-METHYL-CARBAMATE

Konrad Albrecht, Fischbach, Taunus; Heinz Frensch, Frankfurt am Main, and Kurt Hartel, Hofheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 634,658, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 519,040, Oct. 29, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,497

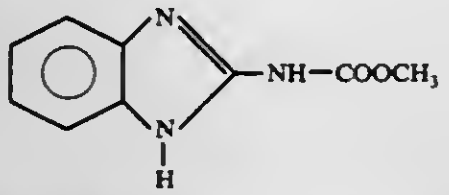
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1973, 2354468

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—273 R **2 Claims**

1. A fungicidally active composition of

(a) about 5 to 30 percent by weight of the compound of the formula



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(b) dispersed in about 60 to 85 percent by weight of a liquid diester of an aliphatic or alicyclic (C$_1$–C$_{12}$) monoalcohol and phthalic acid,

(c) about 2 to 10 percent by weight of a combination of octylphenol polyglycol ether and castor oil polyglycol ether, said octylphenol polyglycol ether having from 5 to 14 glycol units and said castor oil polyglycol ether comprising 1.5 to 3 percent by weight of said combination and having from 30 to 50 glycol units and

(d) about 0.1 to 5 percent by weight of Ca-(C$_8$–C$_{15}$)-monoalkyl benzene sulfonate.

4,105,776

PROLINE DERIVATIVES AND RELATED COMPOUNDS

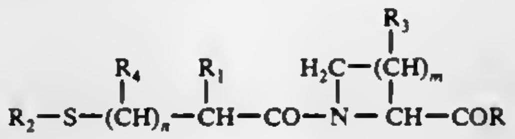
Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 698,432, Jun. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,792, Feb. 13, 1976, Pat. No. 4,046,889. This application Dec. 22, 1976, Ser. No. 751,851

Int. Cl.^{2} H61K *31/40;* **C07D** *403/12, 207/16*

U.S. Cl. 424—274 **42 Claims**

1. A compound of the formula

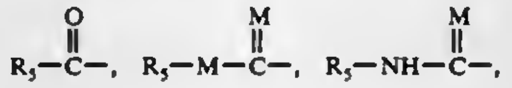


wherein

R is hydroxy, NH$_2$ or lower alkoxy;

R$_1$ and R$_4$ each is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl;

R$_2$ is hydrogen, lower alkyl, phenyl, substituted phenyl wherein the phenyl substituent is halo, lower alkyl or lower alkoxy, phenyl-lower alkyl, diphenyl-lower alkyl, triphenyl-lower alkyl, lower alkylthiomethyl, phenyl-lower alkylthiomethyl, lower alkanoylaminomethyl,



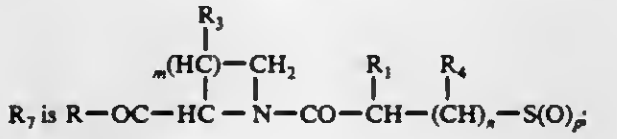
$$R_5—\overset{O}{\overset{\|}{C}}—,\quad R_5—M—\overset{M}{\overset{\|}{C}}—,\quad R_5—NH—\overset{M}{\overset{\|}{C}}—,$$

R$_6$—S— or R$_7$;

R$_3$ is hydrogen, hydroxy or lower alkyl;

R$_5$ is lower alkyl, phenyl or phenyl-lower alkyl;

R$_6$ is lower alkyl, phenyl, substituted phenyl, wherein the phenyl substituent is halo, lower alkyl or lower alkoxy, hydroxy-lower alkyl or amino(carboxy)lower alkyl;



M is O or S;

m is 2;

n and *p* each is 0, 1 or 2; and basic salts thereof, said lower alkoxy, lower alkyl and lower alkanoyl groups having up to seven carbon atoms.

35. A method for reducing blood pressure which comprises administering a composition comprising a compound having the formula in claim 1 or a physiologically acceptable salt thereof and a pharmaceutically acceptable vehicle therefor.

4,105,777

INDOLES

André Allais, Gagny; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

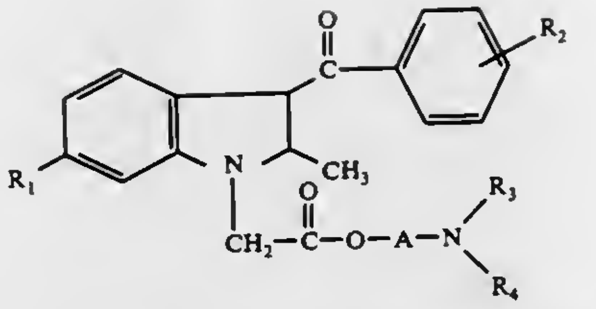
Filed Jan. 12, 1977, Ser. No. 758,633

Claims priority, application France, Jan. 21, 1976, 76 01560; Oct. 1, 1976, 76 29652

Int. Cl.^{2} A61K *31/40;* **C07D** *209/20*

U.S. Cl. 424—274 **19 Claims**

1. A compound selected from the group consisting of indoles of the formula



wherein R$_1$ is selected from the group consisting of hydrogen, halogen, —CF$_3$, alkyl of 1 to 8 carbon atoms and alkoxy of 1 to 8 carbon atoms, R$_2$ is in the 2, 3 or 4 position and is selected from the group consisting of halogen, —CF$_3$ and alkyl, alkoxy and alkylthio of 1 to 8 carbon atoms, A is selected from the group consisting of branched alkylene of 3 to 5 carbon atoms and —(CH$_2$)$_n$— and *n* is a number of 2 to 5 and R$_3$ and R$_4$ are alkyl of 1 to 8 carbon atoms and their non-toxic, pharmaceutically acceptable acid additions salts.

16. An analgesic composition comprising an analgesically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

18. A method of relieving pain in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound of claim 1.

4,105,778

FUSED γ-PYRONE-2-CARBOXYLIC ACID DERIVATIVES AND PROCESS THEREFOR

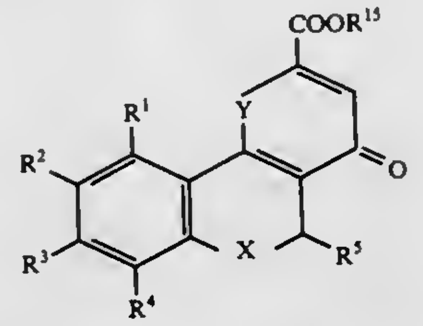
Adolph H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Division of Ser. No. 649,113, Jan. 14, 1976, Pat. No. 4,060,619. This application Sep. 8, 1977, Ser. No. 831,448

Int. Cl.^{2} A61K *31/38*

U.S. Cl. 424—275 **20 Claims**

1. A compound of formula I



I

in which R^1, R^2, R^3 and R^4 are the same or different selected from the group consisting of hydrogen halogen and lower alkyl; R^5 is hydrogen or lower alkyl; R^{15} is hydrogen or lower alkyl; X is O, S, SO or SO$_2$; and Y is O or a pharmaceutically acceptable salt thereof.

9. 9-(1-Methylpropyl)-4-oxo-4H,5H-[1]benzothiopyrano[4,3-b]pyran-2-carboxylic acid, as claimed in claim 1.

4,105,779

ANTHELMINTIC PROCESS FOR DOMESTIC ANIMALS

Hidetoshi Kobayashi, and Kohei Araki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 544,609, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 122,183, Mar. 8, 1971, abandoned. This application Jan. 24, 1977, Ser. No. 762,077

Claims priority, application Japan, Mar. 10, 1970, 45-19722

Int. Cl.^{2} A61K *31/74, 31/745, 31/66*

U.S. Cl. 424—78 **10 Claims**

1. A process for combatting gastro-intestinal worms in poultry or warm-blooded domestic animals which comprises orally administering to said poultry or warm-blooded domestic animals an anthelmintic effective amount of a composition comprising a complex chemical compound of the calcium salt of O-methyl-O-(2,2-dichlorovinyl)phosphoric acid with O,O-dimethyl-O-(2,2-dichlorovinyl)phosphate and a thermoplastic resin comprising a co-polymer obtained by copolymerizing 30 to 60 wt. parts of a conjugated diene compound selected from the group consisting of butadiene, isoprene and chloroprene with 70 to 40 wt. parts of a monovinyl monomer compound copolymerizable with said diene compound and selected from the group consisting of ethylene, propylene, styrene, vinyl chloride, vinyl acetate, acrylonitrile, methyl acrylate, vinyl butyl ether, vinylidene chloride, methacrylaonitrile, alpha-methylstyrene, and methacrylate, in the presence of from 0.5 to 5.0 wt. parts of divinylbenzene as a cross-linking agent.

4,105,780

INSECTICIDAL AND ACARICIDAL M-PHENOXYBENZYL ESTERS OF 2,2-DIFLUORO-1,3-BENZODIOXOLE-5-(α-ALKYL)ACETIC ACIDS

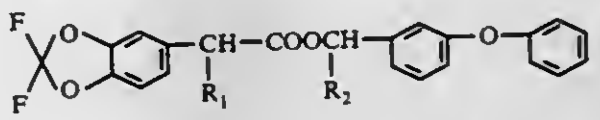
Gerald Berkelhammer, Princeton, N.J., and Venkatamaran Kameswaran, Levittown, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 3, 1977, Ser. No. 774,090

Int. Cl.^{2} A01N *9/28;* **C07D** *317/44*

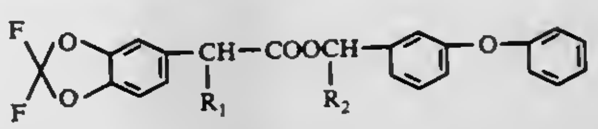
U.S. Cl. 424—282 **15 Claims**

1. A compound having the formula:



wherein R$_1$ is ethyl, n-propyl or i-propyl and R$_2$ is hydrogen or cyano.

15. An insecticidal/acaricidal composition comprising
an insecticidally or acaricidally effective amount of a compound having the formula



wherein R$_1$ is ethyl, n-propyl or i-propyl and R$_2$ is hydrogen or cyano;

an emulsifying agent,
a surfactant and
solvent.

4,105,781

CHROMONE COMPOUNDS AND PREPARATION THEREOF

Suminori Umio, Kawanishi; Shizuo Maeno, Osaka; Ikno Ueda, Yao; Yoshinari Sato, Takaishi, and Masaaki Matsuo, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 679,140, Apr. 22, 1976, Pat. No. 4,049,664, which is a division of Ser. No. 213,180, Dec. 28, 1971, Pat No. 3,965,122.

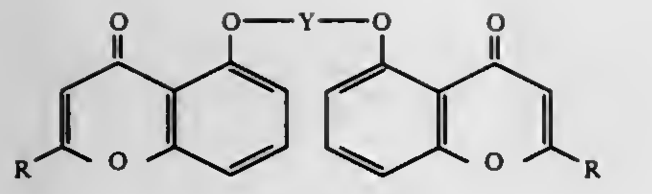
This application Apr. 19, 1977, Ser. No. 788,735

Claims priority, application Japan, Dec. 30, 1970, 45-129469; Dec. 30, 1970, 45-129470

Int. Cl.^{2} C07D *407/14;* **A61K** *31/34*

U.S. Cl. 424—283 **4 Claims**

1. A chromone compound selected from the group consisting of



[I]

wherein R is furyl and Y is hydroxy (lower) alkylene.

4. A pharmaceutical composition comprising, as an active ingredient, the compound of claim 1 and a pharmaceutically acceptable carrier.

4,105,782

TREATMENT OF ACNE AND DANDRUFF

Rney J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 556,423, Mar. 7, 1975, Pat. No. 3,988,470, and Ser. No. 556,424, Mar. 7, 1975, Pat. No. 3,984,566, each is a division of Ser. No. 445,231, Feb. 25, 1974, Pat. No. 3,920,835, which is a continuation-in-part of Ser. No. 394,269, Sep. 4, 1973, Pat. No. 3,879,537. This application Sep. 7, 1976, Ser. No. 720,787

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.^{2} A61K *31/35*

U.S. Cl. 424—283 **9 Claims**

1. A method for alleviating the symptoms of acne or dandruff in humans: topically applying to involved areas of the body an effective amount of a composition comprising: a therapeutically effective amount of a product prepared by reacting, in aqueous or alcoholic aqueous solution at least one member selected from the group consisting of citric acid, glycolic acid, glucuronic acid, galacturonic acid, glucuronolactone, gluconolactone, α-hydroxy-butyric acid, α-hydroxyisobutyric acid, malic acid, pyruvic acid, β-phenyllactic acid, β-phenylpyruvic acid, saccharic acid, mandelic acid, tartaric acid, tartronic acid and β-hydroxybutyric acid and a base selected from the group consisting of ammonium hydroxide, an organic primary, secondary, or tertiary alkylamine, alkanol amine, diamine, dialkylamine, .dialkanolamine, alkylalkanol amine, trialkylamine, trialkanol amine, dialkyl alkanol amine, or alkyl dialkanolamine wherein the alkyl or alkanol substituent has from 1 to 8 carbon atoms in a pharmaceutically acceptable vehicle.

4,105,783

THERAPEUTIC TREATMENT OF DRY SKIN

Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Seweli La., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 598,224, Jul. 23, 1975, Pat. No. 4,021,572. This application Sep. 7, 1976, Ser. No. 720,835

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.^{2} A61K *31/35*

U.S. Cl. 424—283 **15 Claims**

1. A non-irritating method for alleviating the symptoms of dry skin in humans comprising: topically applying to involved areas of the body an effective amount of a composition comprising: a therapeutically effective amount of a product prepared by reacting, in aqueous or alcoholic aqueous solution at least one member selected from the group consisting of citric acid, glycolic acid, glucuronic acid, galacturonic acid, glucuronolactone, gluconolactone, α-hydroxybutyric acid, α-hydroxyisobutyric acid, lactic acid, malic acid, mandelic acid, mucic acid, pyruvic acid, methyl pyruvate, ethyl pyruvate, β-phenyllactic acid, β-phenylpyruvic acid, saccharic acid, tartaric acid, tartronic acid, and β-hydroxybutyric acid and a base selected from the group consisting of ammonium hydroxide, an organic primary, secondary, or tertiary alkylamine, alkanolamine, diamine, dialkylamine, dialkanolamine, alkylalkanolamine, trialkylamine, trialkanol amine, dialkyl alkanol amine, or alkyl dialkanolamine wherein the alkyl or alkanol substituent has from 1 to 8 carbon atoms in a pharmaceutically acceptable vehicle.

4,105,784

PLANT VIRAL DISEASE INHIBITOR

Fumio Okada, Shizuoka, Japan, assignor to Director of National Research Institute of Tea, Japan

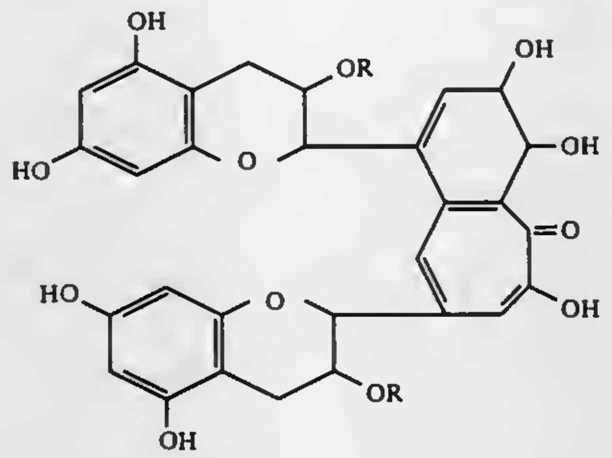
Filed Jul. 18, 1977, Ser. No. 816,517

Claims priority, application Japan, Jul. 23, 1976, 51-87248

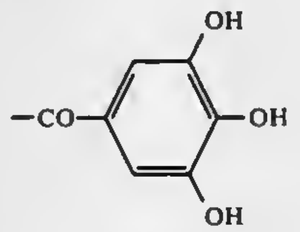
Int. Cl.^{2} A01N *9/23, 9/08;* C07D *311/02*

U.S. Cl. 424—283 **7 Claims**

1. A method for inhibiting viral diseases in plants comprising the steps of applying a plant viral disease inhibitor thereto, said inhibitor comprising a substance selected from the group consisting of theoflavin and its derivatives represented by the general formula:



wherein R is hydrogen or



4,105,785

ANTI-DEPRESSIVE 2-METHYL-4-[(3'-DIMETHYLAMINO)PROPYLIDINE]-9,10-DIHYDROBENZO [4,5]CYCLOHEPTA[1,2b] FURAN COMPOUNDS

Roland Yves Mauvernay, Riom; Norbert Busch, la Tourette, and Jacques Moleyre, Menetrol, all of France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

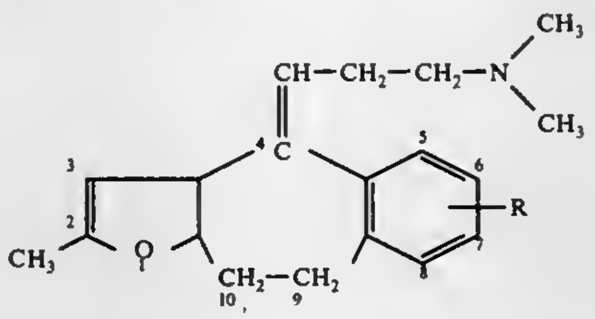
Filed Mar. 16, 1977, Ser. No. 778,239

Claims priority, application France, Mar. 17, 1976, 76 07698

Int. Cl.^{2} A61K *31/335;* C07D *307/93*

U.S. Cl. 424—285 **3 Claims**

1. Tricyclic compounds comprising a furan ring, which correspond to the formula:



wherein R is hydrogen or a lower alkyl radical.

3. A method of treatment of depressive syndromes which

comprises administering to a host in need thereof a therapeutically effective amount of a compound of claim 1.

4,105,786

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

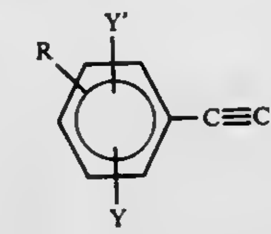
Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,257, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Jan. 11, 1977, Ser. No. 758,461

Int. Cl.^{2} A61K *31/255;* C07C *147/06*

U.S. Cl. 424—303 **14 Claims**

1. A method of treating inflammation, pain or fever in warm-blooded animals which comprises administering to a warm-blooded animal an effective amount of an active agent which is a compound of the formula



where

R is selected from the group consisting of hydrogen, alkyl of 1 to 7 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, 1 to 7 carbon atoms alkyl substituted cycloalkyl of 5 to 7 carbon atoms, phenyl or substituted phenyl where the substituent is Y";

Y and Y' are each selected from the group consisting of hydrogen, alkylsulfinyl of 1 to 7 carbon atoms, and alkylsulfonyl of 1 to 7 carbon atoms,

Y" is selected from the group consisting of Y, lower alkyl of 1 to 7 carbon atoms, and trifluoromethyl,

with the proviso that at least one of Y and Y' is other than hydrogen.

4,105,787

DIACYLATED DERIVATIVES OF γ-GLUTAMYL DOPAMINE

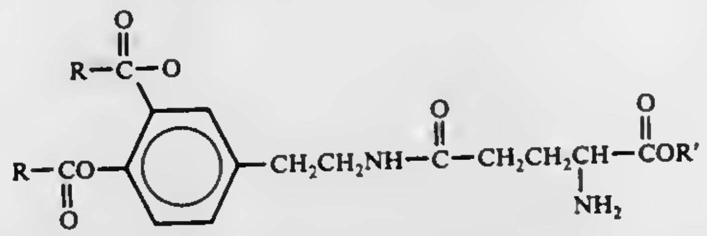
Peter Hadley Jones, Lake Forest; Carroli Wayne Ours, Zion, and Jaroslav Kyncl, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 612,511, Sep. 11, 1975, Pat. No. 4,031,242. This application May 3, 1977, Ser. No. 793,467

Int. Cl.^{2} A61K *31/24;* C07C *69/76*

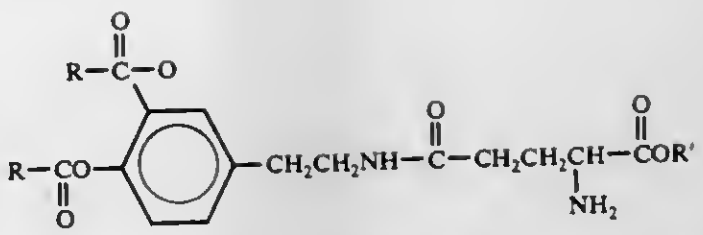
U.S. Cl. 424—309 **10 Claims**

1. A diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



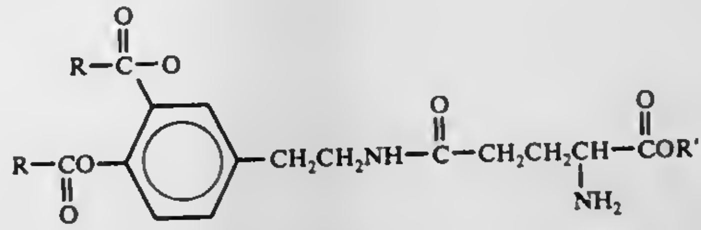
where R is a phenyl ring or benzyl and R' is H or a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

7. A method of increasing renal blood flow of warm-blooded animals which comprises administering to said mammals at least an effective amount of a renal vasodilator compound comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a phenyl ring or benzyl and R' is H or a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

9. The pharmaceutical composition in unit dosage form effective in increasing renal blood flow which comprises an active portion comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a phenyl ring or benzyl and R' is H or a C_1–C_7 alkyl, and a pharmaceutically acceptable carrier.

4,105,788

DIACYLATED DERIVATIVES OF GAMMA GLUTAMYL DOPAMINE

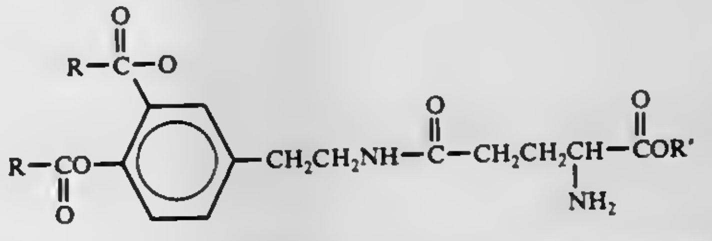
Peter Hadley Jones, Lake Forest; Carroli Wayne Ours, Zion, and Jaroslav Kyncl, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 612,511, Sep. 11, 1975, Pat. No. 4,031,242. This application May 3, 1977, Ser. No. 793,468

Int. Cl.^{2} A61K *31/24;* C07C *101/24*

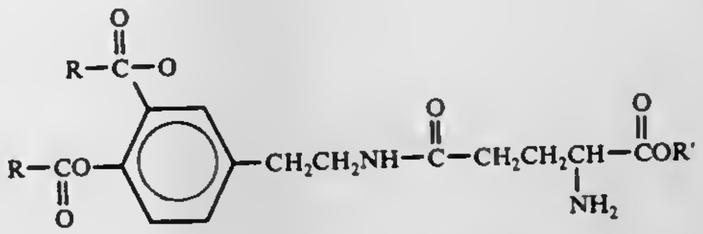
U.S. Cl. 424—309 **8 Claims**

1. A diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical, and R' is a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

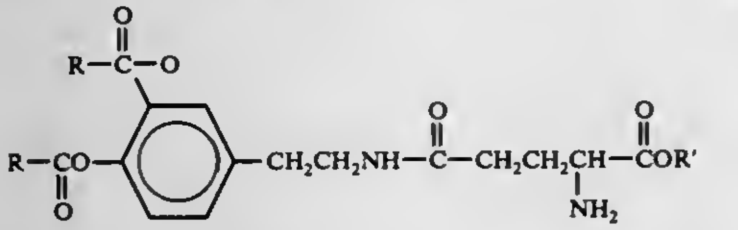
5. A method of increasing renal blood flow of warm-blooded animals which comprises administering to said mammals at least an effective amount of a renal vasodilator compound comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical, and R' is a C_1–C_7 alkyl, and a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition in unit dosage form effective in increasing renal blood flow which comprises an active

portion comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical, and R' is a C_1–C_7 alkyl, and a pharmaceutically acceptable carrier.

4,105,789
CARBOXYALKYLACYLAMINO ACIDS

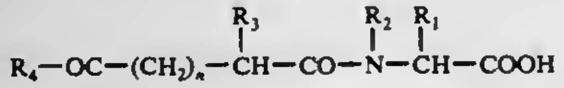
Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1976, Ser. No. 684,605

Int. Cl.² A61K *31/195, 31/215;* **C07C** *103/84*

U.S. Cl. 424—309 **10 Claims**

1. A compound of the formula



$$R_4-OC-(CH_2)_n-\overset{R_3}{CH}-CO-\overset{R_2}{N}-\overset{R_1}{CH}-COOH$$

and physiologically acceptable salts thereof, wherein

R_1 is hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene or carbamoyl-lower alkylene;
R_2 is hydrogen or lower alkyl;
R_3 is phenyl-lower alkylene;
R_4 is hydroxy or lower alkoxy; and
n is 1 or 2.

4,105,790
α-MINO KETONE DERIVATIVES

Clifford Ronald Hughes; Stephen John Jackson; John Preston, and Peter Leslie Walton, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 9, 1976; Ser. No. 740,195

Claims priority, application United Kingdom, Nov. 25, 1975, 48402/75

Int. Cl.² A61K *31/24;* **C07C** *101/04*

U.S. Cl. 424—309 **7 Claims**

1. An α-aminoketone derivative of the formula:

$$R^1NH.CHR^2.CO.Ar.X.A.CO.R^3 \qquad I$$

wherein R^1 is hydrogen; R^2 is hydrogen; R^3 is a hydroxy or C_{1-8}-alkoxy radical; and wherein Ar is a p-phenylene radical; X is oxygen; and A is a methylene radical; or a pharmaceutically acceptable acid addition salt or a metal complex thereof of an α-aminoketone derivative of formula I wherein R^1 is hydrogen; or a pharmaceutically-acceptable base addition salt of an α-aminoketone derivative of formula I wherein R^3 is a hydroxy radical.

4,105,791
HYPOLIPIDEMIC CYCLOALKYLAMINOBENZOIC ACIDS

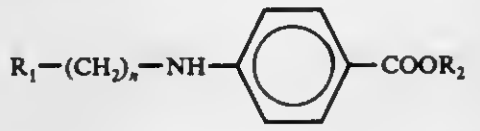
Eugene R. Wagner, and Donald P. Matthews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1976, Ser. No. 668,887

Int. Cl.² A61K *31/245;* **C07C** *101/60, 101/62*

U.S. Cl. 424—310 **30 Claims**

1. A compound of the formula



wherein

R_1 is a monocyclic cycloalkyl radical having from 7 to 10 carbon atoms or a polycyclic cycloalkyl radical selected from the group consisting of octahydromethanoindenyl and tricyclooctanyl,
n is an integer of from 0 to 4, and
R_2 is a lower alkyl group of from one to about three carbon atoms or hydrogen and further including the pharmaceutically-acceptable salts thereof.

4,105,792
PROSTANE DERVATIVES

Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Walter Elger; Olaf Loge, and Eckehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

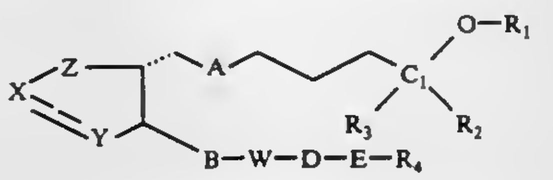
Filed May 25, 1976, Ser. No. 689,849

Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523676; Apr. 12, 1976, 2616304

Int. Cl.² C07C *69/34, 177/00;* **A61K** *31/225*

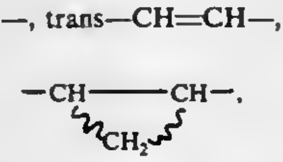
U.S. Cl. 424—313 **9 Claims**

1. Prostane derivatives of the formula

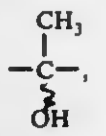


wherein

R_1 is the monovalent acyl radical of a hydrocarbon dicarboxylic acid of up to 15 carbon atoms; R_2 and R_3 each are hydrogen or alkyl of 1–4 carbon atoms;
A is —CH_2—CH_2—, cis—CH=CH— or trans—CH=CH—;
B is —CH_2—CH_2—, trans—CH=CH—, —C≡C— or



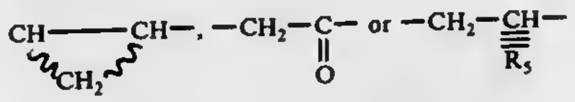
wherein the methylene group is in either the α- or β- position;
W is hydroxymethylene, carbonyl, or



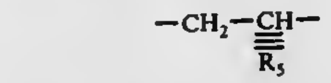
$$-\underset{OH}{\overset{CH_3}{C}}-,$$

wherein the OH—group is in either the α- or β- position;
D and E together form a covalent bond, or D is a straight-chain or branched alkylene group of 1–5 carbon atoms or a —C≡C—group and E is oxygen, sulfur or a covalent bond;

R_4 is alkyl of 1–10 carbon atoms or cycloalkyl of 4–10 carbon atoms;
Z is carbonyl or hydroxymethylene;
X==Y is



wherein R_5 is lower alkyl or hydroxyl when Z is hydroxymethylene, and X==Y is —CH=CH— or



$$-CH_2-\underset{\underset{R_5}{\equiv}}{CH}-$$

wherein R_5 is lower alkyl or hydroxyl when Z is carbonyl.

8. A pharmaceutical composition comprising an abortion-inducing amount of a compound according to claim 1 per unit dosage, in admixture with a pharmaceutically acceptable carrier.

9. In a method for inducing abortion in pregnant mammals, the improvement which comprises administering a safe and effective amount of a compound according to claim 1 to a pregnant mammal effective to induce abortion therein.

4,105,793
MULTIFUNCTIONAL ACRYLATES AS FOLIAR FUNGICIDES

Arthur L. Gross, Stockton, Calif., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,557

Int. Cl.² A01N *9/24*

U.S. Cl. 424—314 **13 Claims**

6. A method for the control of leaf rust of wheat comprising applying to uninfected wheat foliage an effective amount to inhibit the growth of leaf rust of a polyol acrylate ester selected from the group consisting of pentaerythritol tetraacrylate, pentaerythritol triacrylate and trimethylol propane triacrylate.

4,105,794
PROCESS OF MITIGATING CHOLELITHIASIS

William Drell, and John Kingsley Pollard, Jr., both of La Jolla, Calif., assignors to Calbiochem-Behring Corp., La Jolla, Calif.

Filed Aug. 4, 1977, Ser. No. 821,804

Int. Cl.² A61K *31/205, 31/535, 31/495*

U.S. Cl. 424—317 **4 Claims**

1. A method of mitigating cholelithiasis in humans comprising administering a therapeutically effective amount of 3-hydroxy-3-methylglutaric acid or a pharmaceutically acceptable salt thereof.

4,105,795
ANTISPASMODIC SUBSTITUTED SULPHOXIMIDES

Manfred Haake, Marburg-Cappel; Reinhold Pothmann, Buergeln; Kurt H. Ahrens, Schwaig, and Edgar Fritschi, Roethenbach, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH., Nuremburg, Fed. Rep. of Germany

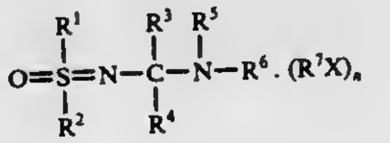
Filed Sep. 2, 1976, Ser. No. 719,970

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539220

Int. Cl.² A61K *31/16, 31/40, 31/445, 31/535;* **C07C** *145/00;* **C07D** *295/08*

U.S. Cl. 424—320 **54 Claims**

1. Compounds of the general formula I



(I)

$$O{=}\underset{R^2}{\overset{R^1}{S}}{=}N-\underset{R^4}{\overset{R^3}{C}}-\overset{R^5}{N}-R^6\,.\,(R^7X)_n$$

wherein

R^1 represents a group selected from the group consisting of straight chain alkyl groups; branched chain alkyl groups; aryl groups; and aryl groups mono- or di- substituted by halogen, trifluoromethyl, alkoxy of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms;
R^2 represents an alkyl group;
R^3 and R^4 independently represent groups selected from the group consisting of hydrogen; straight chain alkyl groups; branched chain alkyl groups; aryl groups and aryl groups mono- or di- substituted by halogen, trifluoromethyl, alkoxy of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms;
R^5 and R^6 are alkyl or together with the nitrogen atom form a piperidine, morpholine, or pyrrolidine ring, the group
R^7 represents a group selected from the group consisting of hydrogen; straight chain alkyl groups and branched chain alkyl groups;
X represents an anion of a physiologically acceptable acid and
n represents a number selected from the group consisting of 0 and 1.

50. Method of treating a patient suffering from spasms by administering an antispasmodical'y effective amount of a compound according to claim 1.

4,105,796
PHARMACEUTICAL COMPOSITIONS CONTAINING RACEMIC OR OPTICALLY ACTIVE 1-(2,6-DIMETHYL-PHENOXY)-2-METHYLAMINO-PROPANE AND METHOD OF USE

Herbert Köppe; Werner Kummer; Helmut Stähle; Richard Reichl, all of Ingelheim am Rhein, and Rolf Giesemann, Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 688,105

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1975, 2524363

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **2 Claims**

1. An anticonvulsive or antiarrhythmic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anticonvulsive or antiarrhythmic amount of racemic or optically active 1-(2',6'-dimethylphenoxy)-2-methylamino-propane or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,105,797
FUNGICIDAL 3-AMINO-6-TRIFLUOROMETHYL-2,4-DINITRODIPHENYLETHERS

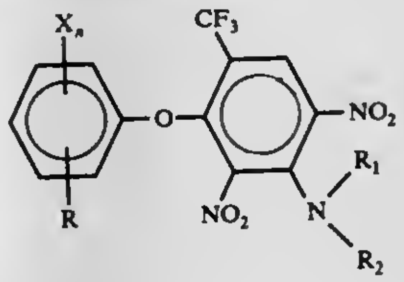
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,258

Int. Cl.² A01N *9/20, 9/24;* **C07C** *91/16, 91/28*

U.S. Cl. 424—330 **12 Claims**

1. A compound of the formula:

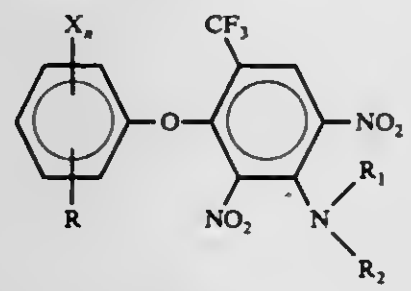


(I)

where
R is H or lower alkyl,
X is halogen,
n is 0,1,2 or 3, and

R_1 and R_2 are selected from H and lower alkyl.

11. A method of controlling undesired fungi comprising applying thereto a fungicidally effective amount of a compound of the formula:



where

R is H or lower alkyl,
X is halogen,
n is 0, 1, 2 or 3, and
R_1 and R_2 are selected from H and lower alkyl.

4,105,798
PERFLUORO POLYCYCLIC COMPOUNDS FOR USE AS SYNTHETIC BLOOD AND PERFUSION MEDIA

Robert E. Moore, Wilmington, Del., and Leland C. Clark, Jr., Cincinnati, Ohio, assignors to Sun Ventures, Inc., Radnor, Pa. and Children's Hospital Medical Center, Cincinnati, Ohio

Continuation-in-part of Ser. No. 706,315, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,766, May 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 530,791, Dec. 9, 1974, abandoned. This application Aug. 22, 1977, Ser. No. 826,288

Int. Cl.² A61K *31/025;* **C12B** *3/00, 9/00*

U.S. Cl. 424—352 **26 Claims**

1. An artificial blood comprising an emulsion of a non-aromatizable perfluorinated material in water, the amount of water being greater than 40% by volume, said emulsion containing a non-toxic emulsifier and a perfluorinated C_9–C_{18} polycyclic hydrocarbon containing at least two bridgehead carbon atoms linked through a bridge containing at least one carbon atom.

4,105,799
PROCESS FOR THE PRODUCTION OF A CASEIN SUBSTITUTE

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 13, 1976, Ser. No. 685,735

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.² A23J *3/00;* **A23L** *1/36*

U.S. Cl. 426—44 **16 Claims**

1. A process for producing a proteinaceous mixture of modified plant protein and unmodified protein, said mixture having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

a. making an aqueous slurry of a carbohydrate containing plant protein material containing at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 18 percent by weight:
b. fermenting the slurry with yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33° to 90° F. for from four hours to ninety-six hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*
c. adding an alkali metal hydroxide or ammonium hydroxide to the slurry in amount sufficient to form a carbonate and to make a first pH adjustment of the carbonate containing slurry to a pH within the range from of about 7.0 to about 10.5;
d. heating the aqueous slurry to react the carbonate with the protein;
e. making a second pH adjustment to the slurry to produce a pH in the range of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali;
f. admixing the slurry with from about 0.3 percent to about 2.0 percent by weight peroxide per pound of protein in the slurry;
g. heating the slurry to a temperature within the range of from 60° to 150° F. under a vacuum to remove steam volatile flavor substances;
h. drying the slurry to remove a substantial portion of the water therein; and
i. admixing from 1 to 15 parts by weight of the dried pH adjusted slurry with from 1 to 30 parts by weight unmodified proteinaceous material.

4,105,800
IMMOBILIZED ENZYME METHOD TO ASSESS FISH QUALITY

Frederick D. Jahns, Peacedale, and Arthur G. Rand, Jr., Kingston, both of R.I., assignors to Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Filed Jul. 26, 1976, Ser. No. 708,618

Int. Cl.² G01N *33/12;* **A22C** *25/00;* **C07G** *7/02*

U.S. Cl. 426—61 **5 Claims**

1. An article of manufacture of assessing the quality of fish comprising an elongated support supporting two carriers, one carrier being impregnated with a freeze dried mixture consisting essentially of resazurin, xanthine oxidase, a stabilizer for xanthine oxidase, and a buffer and the other carrier being impregnated with a freeze dried mixture consisting essentially of resazurin, diamine oxidase, a stabilizer for diamine oxidase and a buffer.

4,105,801
COATED EDIBLE PRODUCT AND PROCESS FOR MAKING SAME

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy

Filed Feb. 18, 1977, Ser. No. 770,146

Claims priority, application Italy, Mar. 5, 1976, 67534 A/76

Int. Cl.² A23G *3/00*

U.S. Cl. 426—99 **24 Claims**

1. A dragee comprising a core and shell of edible material enveloping the core and adhering to the latter, wherein the shell is formed by an intimate mixture of microcrystals of xylitol with a normally solid fatty substance selected from the group consisting of mono-, di- and triglycerides of palmitic-, stearic- and oleic acids and cocoa butter, in a proportion of 0.5 to 15 parts by weight of the fatty substance to each 100 parts by weight of xylitol.

4,105,802
PROCESS FOR PRODUCING CARBONATED COFFEE DRINK

Kichinosuke Cho, Funabashi, and Tsutomn Watanabe, Tokyo, both of Japan, assignors to Kabushiki Kaisha Art Coffee, Tokyo, Japan

Continuation of Ser. No. 661,115, Feb. 25, 1976, abandoned, which is a continuation of Ser. No. 506,689, Sep. 17, 1974, abandoned. This application Jan. 14, 1977, Ser. No. 759,489

Claims priority, application Japan, Sep. 20, 1973, 48-126086

Int. Cl.² A23F *1/00*

U.S. Cl. 426—329 **8 Claims**

1. A process for preserving the natural body, taste and flavor of packaged freshly brewed coffee liquid without removing or degrading the colloidal material present therein which comprises preparing an aqueous coffee extract from roasted and ground coffee beans, adding to and dispersing in said coffee extract an effective amount of a propylene glycol fatty acid ester as an anti-foaming agent or a mixture of said propylene glycol fatty acid ester and a second anti-foaming agent selected from the group consisting of glycerin fatty acid esters, sorbitan fatty acid esters, and silicone resin; carbonating said coffee extract by impregnating the same with carbon dioxide under pressure and packaging said carbonated coffee extract in a sealed container; said amount being effective to reduce the foaming when said container is opened.

4,105,803
SOYBEAN-CHEESE WHEY FOOD PRODUCT

Andrew C. Peng, Columbus, Ohio, assignor to Ohio Agricultural Research and Development Center, Wooster, Ohio

Filed May 2, 1977, Ser. No. 793,048

Int. Cl.² A23C *21/00;* **A23J** *1/14, 1/20*

U.S. Cl. 426—583 **19 Claims**

1. A method for producing a bland nutritional food product from soybeans and sweet cheese whey consisting essentially of the steps of:

comminuting soybeans in the presence of water to provide an aqueous dispersion thereof in water exhibiting a soybean material weight to water volume ratio selected between about 0.05 and 0.15;
heating said aqueous dispersion at a temperature and over an interval selected for deactivating trypsin inhibitor;
filtering said aqueous dispersion to remove non-suspended particulate matter;
providing an aqueous dispersion of proteinaceous sweet cheese whey material in water exhibiting a whey material weight-to-water volume ratio selected between about 0.05 and 0.15;
mixing said sweet cheese whey aqueous dispersion with said soybean aqueous dispersion following said trypsin inhibitor deactivation in about 1:1 ratio to provide an aqueous soybean-cheese whey mixture;
heating said aqueous mixture to a temperature less than about 110° C; and
precipitating a soybean-whey curd from said aqueous mixture by the addition thereto of a precipitant including as its principal ingredient, glucono-delta-lactone.

4,105,804
METHOD FOR SEPARATION OF BACTERIA CELLS FROM CULTURE BROTH

Gyozo Terui, 8-26, Tanabe-Nishinocho, Higashisumiyoshi-ku, Osaka; Nobuo Takada, Neyagawa, and Shuzo Sawada, Tokyo, all of Japan, assignors to Gyozo Terui, Osaka, Japan

Continuation-in-part of Ser. No. 544,649, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 437,726, Jan. 30, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,528

Claims priority, application Japan, Jan. 31, 1973, 48/13116

Int. Cl.² A23J *1/00*

U.S. Cl. 426—656 **6 Claims**

1. A method for separating bacteria cells from a culture broth, which comprises adjusting the pH of said culture broth in the form of a suspension to less than 6 and adding thereto, before or after pH adjustment, a sufficient amount of a solution of casein or alkali-soluble soybean proteins to precipitate the bacteria cells.

4,105,805
FORMATION OF METAL NITRIDE OXIDE SEMICONDUCTOR (MNOS) BY ION IMPLANTATION OF OXYGEN THROUGH A SILICON NITRIDE LAYER

William Bernard Glendinning, Red Bank, and Albert Mark, Toms River, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1976, Ser. No. 757,550

Int. Cl.² B05D *3/06, 5/12*

U.S. Cl. 427—38 **18 Claims**

1. Method of treating a silicon substrate including the steps of

(A) placing the silicon substrate in a reaction chamber and then purging the chamber with an inert gas to remove oxygen and water vapor;
(B) etching the top surface of the substrate with hydrogen chloride gas to remove impurities and other contaminants from the silicon surface;
(C) depositing a layer of silicon nitride of about 300 to 700 angstroms in thickness on the top surface of the silicon substrate;
(D) forming a mask provided with windows representing device structures over the silicon nitride layer;
(E) implanting oxygen through the window portion of the silicon nitride layer into the silicon nitride/silicon interface region at room temperature for about 30 minutes and at an accelerating potential of 30 to 60 kv to obtain a concentration of 2 to 5 (10^{16}) oxygen atoms per square centimeter at the silicon nitride silicon interface during the oxygen implantation to form a tunneling insulator interface layer of silicon dioxide;
(F) removing the mask from the silicon nitride; and
(G) annealing the oxygen implanted silicon in a flowing atmosphere of nitrogen at about 1000° C. for about 30 minutes to obtain the structure silicon nitride/silicon dioxide/silicon.

4,105,806
PHOTOINITIATOR FREE INKS AND METHOD

William R. Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 19, 1976, Ser. No. 743,132

Int. Cl.² B05D *3/06*

U.S. Cl. 427—44 **20 Claims**

1. A method for producing a multilayer coating which comprises:

1. applying as a first layer to a substrate a composition comprising at least one epoxide or acrylic material that is normally radiation-curable in the presence of a photoinitiator which releases an active catalyst effective to initiate curing of said material upon exposure to radiation, the composition in said first layer being substantially free of said photoinitiators;
2. without drying or actively effecting curing of said first layer, applying to said first layer a radiation-curable composition comprising at least one epoxide material cationically polymerizable to a higher molecular weight and a photoinitiator which initiates curing of said material upon exposure to radiation; said first layer composition being devoid of components that act to substantially inhibit or retard the action of the photoinitiator in said second layer; and
3. exposing the coated substrate to irradiation to produce a hardened, multilayered coated substrate.

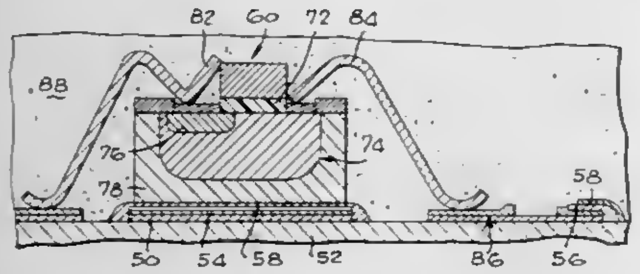
4,105,807
PRODUCTION OF THIN, STABLE, SOLID ELECTROLYTE FILMS OF HIGH IONIC CONDUCTIVITY

Mulk Raj Arora, Kirkland, Canada, assignor to Unican Electrochemical Products Ltd., Montreal, Canada

Filed Jul. 28, 1975, Ser. No. 599,897

Int. Cl.^{2} C23C *15/00, 11/08*

U.S. Cl. 427—126 **22 Claims**



1. A process for depositing thin films of complex silver iodo solid electrolytes on a substrate, said electrolytes having good ionic conductivity at room temperature, which comprises evaporating an electrolyte material selected from the group consisting of (a) a stoichiometric complex silver iodo solid electrolyte material and (b) a mixture of the components in stoichiometric proportions of said solid electrolyte material, by flash evaporation, and wherein the vaporized products include silver-containing and iodine-containing constituents, and depositing said constituents on a heated substrate while maintaining the temperature of said heated substrate at a sufficiently elevated temperature to maintain the original stoichiometric ratio of said constituents as they recombine and deposit on said substrate to form the original solid electrolyte material.

4,105,808
PAINT COMPOSITION

Eugene L. McKenzie, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 188,448, Oct. 12, 1971, abandoned, which is a continuation of Ser. No. 547,450, May 4, 1966, abandoned. This application Jan. 11, 1976, Ser. No. 695,053

Int. Cl.^{2} C08L *77/08;* **C09D** *5/00*

U.S. Cl. 427—137 **13 Claims**

9. A method for forming a paint marking on a roadway that bears traffic rapidly after application comprising

- (I) beating in a closed system to a predetermined elevated temperature that is above the range of normal ambient temperatures of 40° F to 110° F but is less than 500° F a paint composition that comprises
  - (A) in mixture as two phases
    - (1) a paint vehicle that includes a nonvolatile organic film-forming paint binder and that
      - (a) is a liquid at said normal ambient temperatures, but
      - (b) forms a durable adherent unified tough non-tacky paint film when applied as a thin coating and exposed to said normal ambient temperatures and
    - (2) a film-forming thermoplastic substantially neutral polyamide reaction product of a polymerized fatty acid and a polyamine mixed in said paint vehicle and accounting for at least about 5 weight-percent of the nonvolatile organic ingredients of the paint composition, which polyamide
      - (a) is a solid at said normal ambient temperatures,
      - (b) is insoluble in the paint vehicle at said normal ambient temperatures,
      - (c) dissolves in said paint vehicle at said predetermined elevated temperature to form a sprayable solution having a viscosity of less than 5000 centipoises, and
      - (d) forms, in combination with said paint vehicle, a firm nontacky adherent film rapidly after said solution of the two is applied at said elevated temperature as a thin coating to a substrate that is a a said normal ambient temperature; and
  - (B) pigments in an amount sufficient to color the paint composition; and
- (II) coating the paint composition on the roadway while it is at said elevated temperature.

4,105,809
PROCESS FOR DEMISTING TRANSPARENT MATERIALS

Toshiaki Ohno, Fussa, and Kiyoshi Niizeki, Itsukaichimachi, both of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,270

Int. Cl.^{2} C03C *17/32;* **B05D** *7/04, 1/36*

U.S. Cl. 427—164 **16 Claims**

1. A process for demisting a transparent material comprising the steps of:

- (1) coating onto a surface of the transparent material a copolymer obtained by subjecting 2-hydroxyethyl methacrylate to solution polymerization;
- (2) graft-copolymerizing an allyl alcohol tribasic acid ester onto the coating; and
- (3) curing the resulting grafted copolymer by heating.

4,105,810
CHEMICAL VAPOR DEPOSITION METHODS OF DEPOSITING ZINC BORO-SILICATED GLASSES

Takeo Yamazaki; Yoko Wakui, both of Hitachi, and Tetuo Kosugi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 3, 1976, Ser. No. 692,369

Claims priority, application Japan, Jun. 6, 1975, 50/67559

Int. Cl.^{2} C23C *11/08*

U.S. Cl. 427—248 C **14 Claims**

1. A method of producing a zinc borosilicate glass through chemical vapor deposition comprising allowing dinenyl an alkyl or alkenyl compound of zinc in liquid phase at room temperature, at least one organic compound of boron selected from the group consisting of alkyl and alkoxyl compounds of boron and at least one compound of silicon selected from the group consisting of alkyl and alkoxyl compounds of silicon in liquid phase at room temperature to react in an oxidizing at at a temperature of 300° to 700° C in the presence of a substrate, thereby depositing a zinc borosilicate glass on the substrate.

4,105,811
METHOD OF PROTECTIVELY COATING METALLIC ALUMINUM CONTAINING SUBSTRATE

Carl Horowitz; Michael Dichter, both of Brooklyn, and Duryodhan Mangaraj, Staten Island, all of N.Y., assignors to Poly-Gulf Associates, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,819

Int. Cl.^{2} B05D *3/02, 3/10*

U.S. Cl. 427—302 **9 Claims**

1. The method of applying a protective coating to a metallic aluminum containing substrate comprising the steps of:

- A. cleaning the substrate;
- B. grafting one or more polymerizable and crosslinkable monomers and prepolymers from a solution onto said substrate in the presence of
  - 1. a small but effective amount of silver ion as an initiator for in situ graft polymerization of said monomers and prepolymers,
  - 2. and a peroxide type catalyst,
  - said monomers and prepolymers being selected from the group consisting of polyfunctional
  - vinyl monomers; epoxy compositions selected from the group consisting of aliphatic, cycloaliphatic and aromatic epoxy prepolymers having more than one epoxy group per molecule and a curing and cross-linking agent for each epoxy prepolymer; and polyurethane prepolymers;
- C. and then polymerizing and curing said monomers and prepolymers on said substrate to cross link said components to provide a protective coating bonded to the aluminum containing substrate.

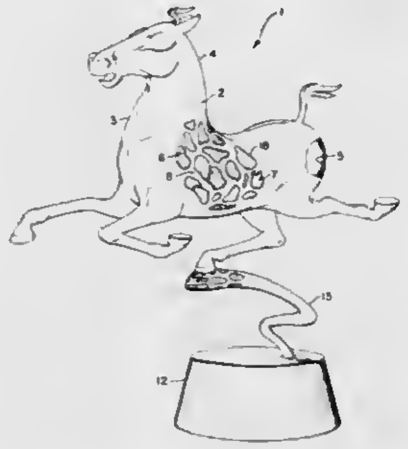
4,105,812
SURFACE FINISH FOR STATUARY

E. Calvin Campbell, Jr., 261 - 17th St., West Babylon, Long Island, N.Y. 11704

Filed Feb. 14, 1977, Ser. No. 768,405

Int. Cl.^{2} B44C *3/06*

U.S. Cl. 428—15 **13 Claims**



1. In combination, a decorative article and a means forming a surface finish therefor, said combination comprising:

- (a) a decorative article body having an outer surface and a thin wall constructed of a ferrous metal;
- (b) a plurality of brass nodules in brazed engagement with selected, generally randomly located portions of said outer surface in a dispersed and irregular manner and forming a rough finished exterior surface of variegated coloration; said selected portions collectively defining a first area of said outer surface, and the remainder of said outer surface defining a second area thereof; and
- (c) a plurality of scorched outer surface regions disposed in an irregular manner upon said second area and generally randomly associated with marginal portions of said nodules and presenting a relatively smooth exterior surface of variegated coloration; said first and second areas cooperatively presenting a complex, irregular blend of multi-variegated coloration, finish and depth over a substantial extent.

4,105,813
TREATMENT OF FABRICS IN MACHINE DRYERS

William G. Mizuno, St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 526,697, Nov. 25, 1974, abandoned, which is a division of Ser. No. 254,054, May 17, 1972, Pat. No. 3,870,145. This application Jun. 24, 1976, Ser. No. 699,611

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.^{2} B32B *5/18;* **F26B** *3/00*

U.S. Cl. 428—76 **5 Claims**

1. An article of manufacture comprising:

- a. an impregnated sponge having an average pore size of 0.05 to 4 millimeters which has been impregnated from its surface into its interior with about 0.3 to about 0.7 gram, per cubic centimeter of unimpregnated sponge, of a heat-softenable fabric conditioning agent comprising a quaternary ammonium salt, said fabric conditioning agent having a softening point range of at least 10 Centigrade degrees and being in the softened state in the range of 50° to 90° C., and
- b. a porous material at a surface of said impregnated sponge, said porous material comprising permeable material which is permeable to the fabric conditioning agent under the conditions of use; said permeable material being selected and arranged to release said agent from the impregnated sponge to a surface of the porous material when the fabric conditioner is softened by the heat of the dryer; said permeable material being also selected and arranged to permit said impregnated sponge to act as a reservoir for said agent, releasing a minor amount of said agent in each of at least about 10 drying cycles of said machine dryer.

4,105,814
PROFILE STRIP OF U-SHAPED CROSS-SECTION, IN PARTICULAR AN EDGE PROTECTION STRIP FOR AUTOMOBILE

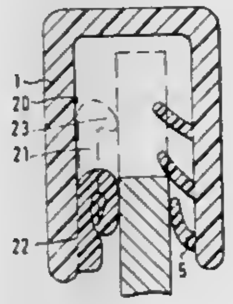
Frank Eggert, Hamburg, Fed. Rep. of Germany, assignor to Schlegel GmbH, Hamburg, Fed. Rep. of Germany

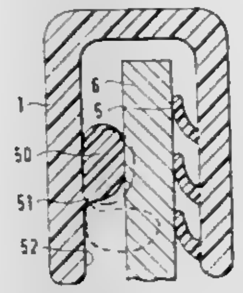
Filed Mar. 24, 1977, Ser. No. 780,919

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631568; Mar. 27, 1976, 2613193

Int. Cl.^{2} B32B *3/02;* **E04C** *2/38*

U.S. Cl. 428—122 **15 Claims**





1. A profile strip of U-shaped cross-section having two spaced apart arms and a base connecting said arms, said arms and said base together defining a chamber for receiving a flange through the mouth of said chamber;

- an adhesion element on at least one of said arms, said adhesion element being held against the flange when the profile strip is mounted thereon;
- a support surface connected to said at least one of said arms having said adhesion element, said support surface arranged to cooperate with said adhesion element to exert

increasing pressure on the flange during removal of the profile strip from the flange wherein (1) said adhesion element is designed to roll on said support surface, and (2) the cross-sectional shapes of said support surface and said adhesion element are such that during rolling movement of said adhesion element towards said mouth of said chamber said adhesion element tends to describe a path approaching the arm opposite said at least one of said arms.

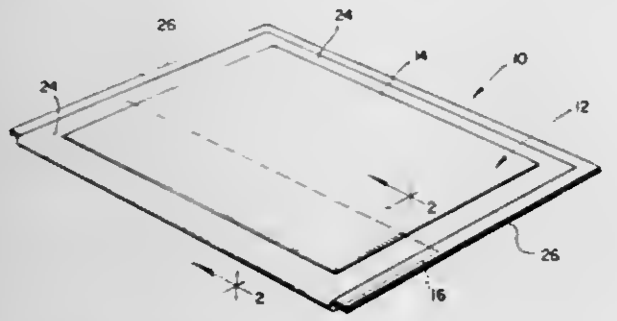
4,105,815
FLAT BATTERY WITH ELECTRODES IN SLURRY FORM

Sheldon A. Buckler, Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 495,681, Aug. 8, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,871

Int. Cl.^{2} H01M *6/46*

U.S. Cl. 429—152 **23 Claims**



1. A thin flat laminar battery comprising series connected Leclanche cells in each of which cells there is a zinc anode and a cathode, said cathode comprising a slurry dispersion of MnO$_2$ and carbon in an electrolyte solution containing zinc chloride, ammonium chloride and from about 23 to about 30 percent of water, based on the weight of dispersion, said dispersion containing a polymeric dispersing agent.

4,105,816
DECORATIVE RELIEF FINISH PROCESS

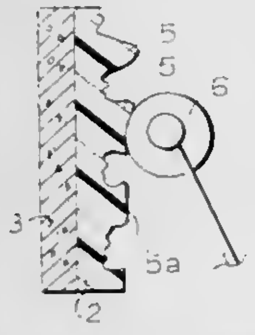
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed May 23, 1975, Ser. No. 580,342

Claims priority, application Japan, Jan. 17, 1975, 50-8145

Int. Cl.^{2} B32B *3/30;* **B05D** *3/12, 5/02*

U.S. Cl. 428—159 **29 Claims**



1. A process of making a decorative relief finish, said process comprising:

forming on the surface of an object on which a decorative relief finish is to be formed a partially hardened layer of coating material having an uneven surface with a plurality of projections of different heights;

providing a pressing roll having a surface which is made of a material which is resinous, has a continuous pore structure, is at least semi-hard, and has the properties of water absorption and water retention;

impregnating said pressing roll with a liquid which is capable of being evenly distributed through the pores of said roller material, which will not damage said roller material, and which has an affinity to said coating material; and

pressing and rolling said pressing roll, while impregnated with said liquid, against the top portions of those of said projections above a predetermined height, thereby flattening said projections to said height, the remainder of said projections below said given height being left unflattened, thus forming a decorative relief finish having both flattened and roughened areas.

4,105,817
MULTI-CHAMBERED CELLULAR STRUCTURE

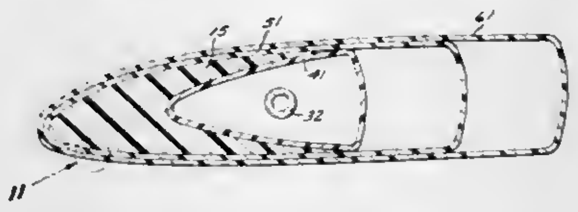
Edmond O. Dunahoo, Long Beach, Calif., assignor to Fiber Science, Inc., Gardena, Calif.

Division of Ser. No. 465,323, Apr. 29, 1974, Pat. No. 3,962,506. This application Jun. 7, 1976, Ser. No. 693,558

The portion of the term of this patent subsequent to Jun. 8, 1993, has been disclaimed.

Int. Cl.^{2} B32B *3/26*

U.S. Cl. 428—188 **18 Claims**



1. A fiber-reinforced plastic article of manufacture having a multi-chambered, cellular structure with an outer shell and an inner shell for use as part of a fluid foil structure, said inner shell extending between at least two generally opposite interior walls of said outer shell and being coupled thereto, thereby defining at least two chambers within said article, the wall of each of said shells being composed of a plastic having embedded therein at least one layer of continuous roving of a fibrous reinforcement material, said at least one layer in each of said shells being continuous and unbroken around each of said shells.

4,105,818
GAS BARRIER PACKAGING MATERIAL

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Continuation-in-part of Ser. No. 370,594, Jun. 18, 1973, abandoned. This application Jul. 21, 1975, Ser. No. 597,761

Int. Cl.^{2} B32B *3/02*

U.S. Cl. 428—192 **1 Claim**

1. A packaging material having improved gas barrier properties consisting of a plurality of separate and distinct, superimposed, contiguous plies of polymer film bonded together around their edges, said plies being formed of the same film and the film being selected from the class of films having a permeability to gases of about 10 or less cc per 100 square inches per mil thickness over a 24 hour period at one atmosphere pressure at 73° F and 50% R.H., said polymer film being selected from the class consisting of polyvinylidene chloride, polyvinylidene chloride and polyethylene film laminates, polyamides, biaxially oriented polypropylene, polyvinyl chloride, vinylidene chloride - vinyl chloride copolymers, polyacrylonitrile, acrylonitrile styrene copolymers, polyesters, and cellophane, said plies each having a thickness of 0.5 to 4.5 mils and together having a permeability to oxygen and carbon dioxide materially less than the permeability of a single ply of the film divided by the number of plies in said material.

4,105,819
LAMINATED SHEETS PARTICULARLY FOR CRYOGENIC ENCLOSURES, PIPES, AND THE LIKE

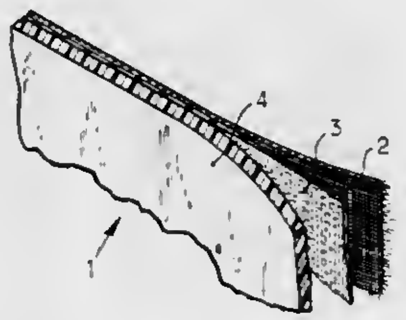
Michel Kotcharian, Paris, France, assignor to Technigaz, Paris, France

Filed Mar. 1, 1976, Ser. No. 662,414

Claims priority, application France, Mar. 4, 1975, 75 06732; Feb. 20, 1976, 76 04810

Int. Cl.^{2} B32B *15/08, 15/14, 15/20;* **B65D** *25/18*

U.S. Cl. 428—213 **15 Claims**



1. A laminated sheet material particularly adapted for use in conjunction with a heat-insulating material of a cryogenic enclosure or pipe for receiving a cold fluid such as liquified natural gas, methane, or the like, said laminated sheet material comprising at least three but not more than four layers secured to each other for defining between themselves a pair of interfaces situated respectively between two of said layers and a third, intermediate layer, the latter intermediate layer being in the form of a thin, flexible metal sheet forming a fluid-impervious film, skin, or foil the material of which is selected from the group consisting of aluminum, stainless steel, and Invar, while one of said two layers at one of said interfaces is a flexible glass-fiber fabric while being only thick enough to protect and support said metallic layer and provide a secure connection to a heat-insulating material, the other of said two layers at the other interface being selected from the group consisting of said glass-fiber fabric and a fluid-tight elastomeric material only thick enough to directly contact a cold fluid while protecting said metallic layer, said elastomeric material being selected from the group consisting of a polyuretnane elastomer and a silicon elastomer, said intermediate metallic layer being thinner than the other two layers and all three layers together having a total thickness small enough to achieve sufficient flexibility to serve as a primary or secondary sealing barrier in a cryogenic enclosure or as an inner lining or outer wrapping in a cryogenic pipe when used in connection with a heat-insulating material of such an enclosure or pipe, while the other of said two layers also cooperates with said metallic layer and said one glass-fiber fabric layer to afford sufficient resilience and yieldability to transmit forces through said three laminated layers to the heat-insulating material without minimizing the fluid-imperviousness of said metallic layer.

4,105,820
WEATHERPROOF AND MECHANICALLY STABLE LAMINATE FOR ENCASING THERMAL INSULATION

Gerhard Antoni, Mannheim, Germany, assignor to Th. Goldschmidt AG, Essen, Germany

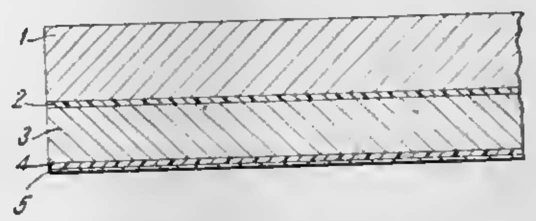
Filed Dec. 8, 1975, Ser. No. 639,001

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 7440815[U]

Int. Cl.^{2} B32B *7/02, 15/08*

U.S. Cl. 428—213 **2 Claims**

1. A laminate which is weatherproof and mechanically stable for encasing thermally insulated objects which comprises in the following order, an outer layer of aluminum sheet having a thickness of about 200 to 800 μ, a first layer of polyethylene film, a layer of a kraft paper, a second layer of polyethylene film, and a final sheet of aluminum foil having a thickness of 8 to 20 μ, said layers being bound to the next adjacent layer.



4,105,821
SILICON OXIDE COATED METAL HAVING IMPROVED CORROSION RESISTANCE

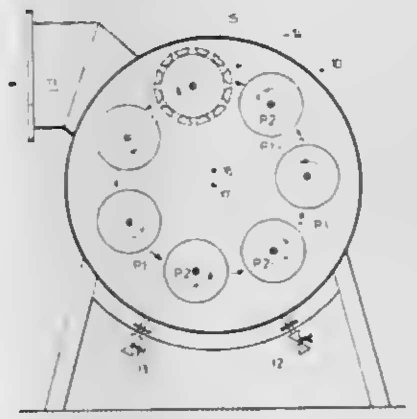
Bernhard Blaich, Stuttgart; Ernst Zehender, Ottenbronn, and Karl Kerner, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Aug. 5, 1976, Ser. No. 711,842

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536013

Int. Cl.^{2} B32B *7/02, 15/04*

U.S. Cl. 428—215 **13 Claims**



1. In the process of producing a protective transparent layer of silicon oxide of a thickness between about 10 and 50 nm by vapor deposition on a metal surface comprising vapor depositing silicon oxide from a gaseous mixture of at least one material selected from the group consisting of silicon and silicon oxide, and oxygen in a vacuum chamber under vacuum conditions, at room temperature the improvement comprising including as a gaseous component of said vacuum chamber, an organosilicon compound having a vapor pressure of at least 10^{-3} mbar at room temperature, said organosilicon compound containing at least one reactive group or atom which can readily react with —OH groups and at least one hydrophobic group to produce a hydrophobic silicon oxide layer between about 10 and 50 nm thick incorporating said hydrophobic groups.

4. A composite article comprising a light reflector comprising a substrate having a reflective metalized layer between about 40 and 200 nm thick with a protective transparent hydrophobic silicon oxide layer between about 10 and 50 nm thick coating said metalized layer, said hydrophobic layer having been formed by vapor deposition of a silicon oxide layer incorporating reaction product hydrophobic groups from a gaseous mixture comprising silicon, oxygen, and an organosilicon compound having formula A_mSiX_{4-m} wherein *m* is 1, 2 or 3; each X is a reactive group or element selected from the group consisting of —OR, —N(H)R, —N(R)R; —N(R')C(O)R, and H, wherein R and R' are each an alkyl containing 1–7 carbon atoms; and each A is a hydrophobic group selected from the group consisting of alkyls, alkenyls and aryls containing from 1 to 7 carbon atoms.

4,105,822

METHOD FOR THE APPLICATION OF A SPECTRAL-SELECTIVE COATING ON A PLATE

Jan De Jong, Rijswijk Z.H., Netherlands, assignor to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Apr. 1, 1976, Ser. No. 672,677

Claims priority, application Netherlands, Apr. 10, 1975, 7504277

Int. Cl.^{2} F24J *3/02;* **B05D** *1/02, 1/38*

U.S. Cl. 428—216 **6 Claims**

1. A method for the application of a spectral-selective coating on a metal plate comprising the steps of providing a black enamel layer on the metal plate and subsequently applying a thin layer of a semi-conducting material, the conducting mechanism of which displays a metallic character, on the black enamel layer by spraying indium chloride against the enamel layer at a temperature of the enamel above 500° C. to obtain a layer of indium oxide of a thickness of approximately 0.3 micron.

4,105,823

MICROCAPSULES, METHOD FOR THEIR PREPARATION, AND SHEET MATERIAL CARRYING MICROCAPSULES

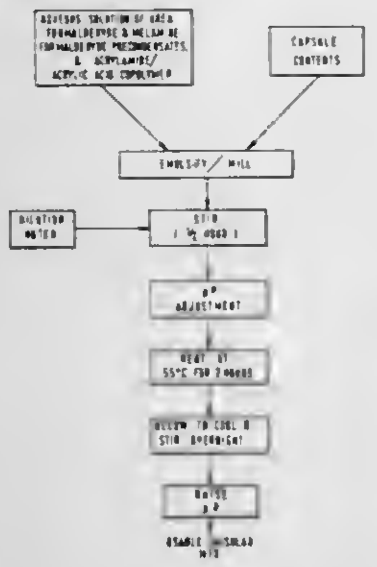
David John Hasler, Caddington, and Thomas Allan McGhee, St. Albans, both of England, assignors to Wiggins Teape Limited, England

Filed Nov. 15, 1976, Ser. No. 742,216

Claims priority, application United Kingdom, Nov. 26, 1975, 48616/75

Int. Cl.^{2} B32B *3/26;* **B01J** *13/02*

U.S. Cl. 428—307 **23 Claims**



1. A method of encapsulating a finely divided material to produce microcapsules in which the material is surrounded by polymeric shells, comprising the steps of

(a) providing a dispersion of said material in an aqueous medium containing a water soluble urea-formaldehyde precondensate, a water soluble melamine-formaldehyde precondensate, and a water-soluble polymer which is capable of being cross-linked by said precondensates; and

(b) condensing said precondensates by acid catalysis with an acid to achieve cross-linking of said polymer about said material, thereby to form said polymeric shells.

18. The method of claim 1 wherein the aqueous medium is made alkaline after microcapsule formation.

19. A sheet material carrying microcapsules prepared in accordance with claim 18.

4,105,824

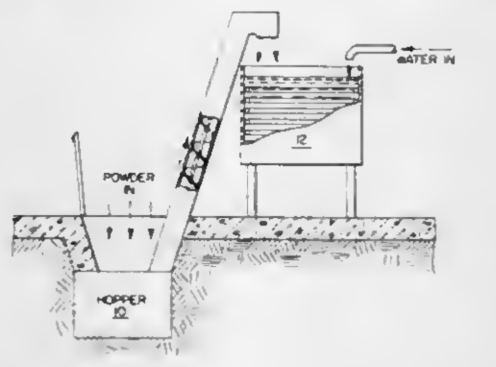
STARCH-DEXTRINE-POLYACRYLAMIDE ADHESIVE AND TAPE

Robert W. Monte, South Merrimack, N.H., assignor to Nashua Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 607,680, Aug. 25, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,460

Int. Cl.^{2} C09J *7/04;* **C08L** *3/12*

U.S. Cl. 428—355 **18 Claims**



8. A water activatable adhesive tape suitable to be wound as a roll without premature bonding and without loss of adhesive strength which comprises a paper backing having coated on one surface thereof an adhesive composition comprising:

water, starch, dextrine and a polyacylamide, said starch being a waxy-maze variety of corn starch and containing 95 weight percent amylopectin and having a molecular weight between the range of 20,000 and 50,000 and having a low viscosity such that when dissolved in sufficient water to produce a mixture having a 45% solid content will result in a solution with a viscosity of 12,000 to 16,000 centiposes at 160° F as measured by a Brookfield viscosity, No. 3 spindle at 30 rpm and being present in an amount such that the final dry adhesive will have an amylopectin content between 55 and 75% dry weight, said dextrine having a cold water solubility of at least 90% (77° F) and being employed in amounts such that a final dry adhesive will have a dextrine content between about 15 and 40% dry weight, said polyacrylamide having an "Oswald viscosity" of at least 2.5 centiposes and a "Brookfield viscosity" no greater than 700 Centiposes, said polyacrylamide also having a low degree of hydrolysis in that only 5% or less of the original carboxamide group in the polyacrylamide has been hydrolysized to the carboxylic group, said polyacrylamide being employed in amounts such that the final dry adhesive will have a polyacrylamide content between about 2 and about 6% dry weight.

4,105,825

POLYOLEFIN WITH PHOSPHORYLATED NOVOLAC FLAME RETARDANT, PEROXIDE CURED, AS METALLIC INSULATOR

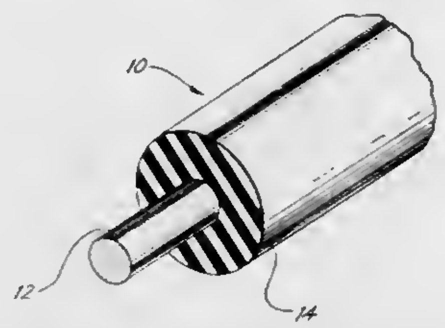
Darrell Richard Heath, Schofield, Wis.; Fred Frank Holub, Schenectady, N.Y., and Edward Vincent Wilkus, Trumbull, Conn., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 574,188, Feb. 5, 1975, abandoned. This application Jul. 2, 1976, Ser. No. 702,042

Int. Cl.^{2} B32B *15/08;* **C08L** *23/08*

U.S. Cl. 428—379 **18 Claims**

1. A flame-resistant polyolefin compound comprising the peroxide crosslink cured combination of an ethylene-containing polymer selected from the group consisting of polyethylene, copolymers of ethylene and other polymerizable materials, and blends of such polymers, and phosphorylated novolac phenol-formaldehyde resin, said phosphorylated novolac phenol-formaldehyde resin having been formed with a pentavalent organic phosphate.



4,105,826

HIGH-TEMPERATURE GLASS COMPOSITION

George L. Thomas, Bay Village, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 708,949, Jul. 27, 1976, Pat. No. 4,060,423. This applicatioo Jul. 28, 1977, Ser. No. 819,848

Int. Cl.^{2} H01K *1/38;* **C03C** *3/04*

U.S. Cl. 428—379 **5 Claims**

1. In a glass-to-metal seal between a molybdenum body and a seal glass composition, the improvement wherein the seal glass composition consists essentially of oxides in approximate percent by weight 55–68 SiO_2, 15–18 Al_2O_3, 7–13 CaO and 6–16 BaO, along with minor amounts of incidental impurities, residual fluxes, and refining agents, wherein the weight ratio of Al_2O_3 to combined weight ratio of CaO and BaO is about in the range 0.6:1 to 1:1 so as to reside in the eutectic region of this aluminosilicate system, said glass composition having a liquidus temperature no greater than about 1250° C, a strain point of at least about 725° C, and an average coefficient of linear thermal expansion in the 0–300° C temperature range between about 42×10^{-7} cm/cm/° C to about 48×10^{-7} cm/cm/°C.

4,105,827

PARTICULATE PEROXYGEN COMPOUNDS COATED WITH SODIUM SESQUICARBONATE OR $Na_2SO_4MNa_2CO_3$

Jean Brichard, Vilvoorde; Jean-Claude Colery, and Fernand Meuret, both of Brussels, all of Belgium, assignors to Interox, Brussels, Belgium

Continuation of Ser. No. 461,283, Apr. 15, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,634

Claims priority, application Luxembourg, Apr. 20, 1973, 67482; Nov. 19, 1973, 68831

Int. Cl.^{2} C11D *7/38*

U.S. Cl. 428—403 **16 Claims**

1. In a process for stabilizing particulate peroxygen compound selected from alkali metal percarbonates, perpyrophosphates, pertripolyphosphates and peroxymonosulphates by coating said particulate peroxygen compound with a coating agent to provide an hermetic coating, the improvement which comprises using as said coating agent a mixed salt selected from sesquicarbonate having the formula $Na_2CO_3.NaHCO_3.2H_2O$ and mixed compounds obtained by crystallization of sodium sulfate and sodium carbonate of formula $Na_2SO_4.nNa_2CO_3$ where n is a number from 0.3 to 3.

4,105,828

LOW-CURRENT CONTACT CONSTRUCTION

Lothar Borchert, Haar, and Karl-Jörg Stenzel, Söcking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 763,104

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2604291

Int. Cl.^{2} H01H *1/02;* **B32B** *15/04*

U.S. Cl. 428—665 **16 Claims**

1. A contact structure, more particularly for telecommunications relay contacts, said contact structure consisting of:

(a) a substrate of suitable conducting and/or magnetizable material;

(b) a first layer bonded to said substrate, said first layer composed of a refractory metal selected from the group consisting of rhenium, tungsten, molybdenum and alloys thereof, having a thickness of from 0.02 to 0.08 mm; and

(c) a second layer bonded to said first layer by diffusion annealing, said second layer composed of an alloy consisting of silver and palladium having a 10 to 50% palladium content and a thickness of from 0.005 to 0.2 mm.

4,105,829

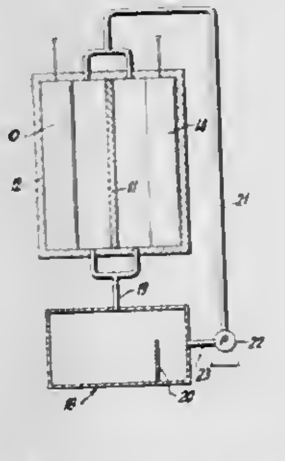
METAL HALOGEN BATTERIES AND METHOD OF OPERATING SAME

Agustin F. Venero, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 7, 1976, Ser. No. 674,583

Int. Cl.^{2} H01M *8/08, 4/60*

U.S. Cl. 429—15 **14 Claims**



1. An electrochemical cell having a metal bromine couple comprising:

an electrode structure on which to deposit the metal of the metal bromine couple;

an inert counterelectrode structure at which to generate the bromine of the metal bromine couple;

an aqueous electrolyte containing a metal bromide and a bromine complexing agent, the metal of said metal bromide being selected from zinc and cadmium, said bromine complexing agent being selected from water soluble organic quaternary ammonium compounds and mixtures of quaternary ammonium compounds with water soluble organic solvents which in the presence of bromine and at temperatures in the range of about 10° C to about 60° C form a substantially water immiscible liquid;

means for circulating said electrolyte between said electrode structures during charging of the cell;

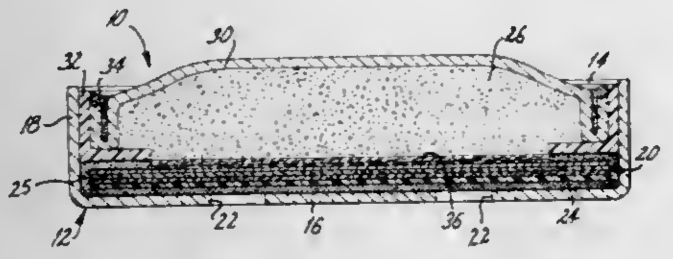
a separation zone communicating with said cell whereby bromine complex formed during charging of the cell is separated from said aqueous electrolyte; and,

means for circulating separated bromine complex from said separation zone to said cell during discharge of said cell.

4,105,830

AIR DEPOLARIZED CELL

Karl Victor Kordesch, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 1, 1977, Ser. No. 820,616
Int. Cl.² H01M *8/00*
U.S. Cl. 429—27 **13 Claims**

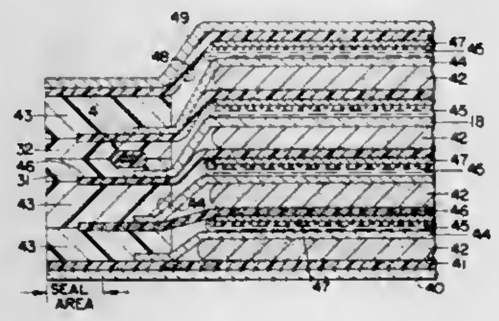


1. An air depolarized cell comprising:
an anode confined within a first container;
a cathode assembly comprising an air cathode having one surface juxtaposed in close relationship to said anode and a nonporous thin film membrane lying adjacent an opposite surface of said air cathode for controlling the flow of oxygen thereto;
separator means disposed between said cathode assembly and said anode;
a second container disposed about said cathode assembly and having at least one air passageway, said air passageway being spaced apart from said nonporous thin film membrane and being of sufficient size to provide said membrane with substantially unrestricted access to the atmosphere;
said nonporous thin film membrane permitting oxygen to pass therethrough exclusively by gas solubility and with its permeability to oxygen selected to correspond to a predetermined average current density for said cell;
an electrolyte solution contained within said cell; and
means for sealing said first and second container to prevent electrolyte leakage from said cell.

4,105,831

VENTED FLAT BATTERY

Paul A. Plasse, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jan. 24, 1977, Ser. No. 761,649
Int. Cl.² H01M *2/12*
U.S. Cl. 429—86 **5 Claims**

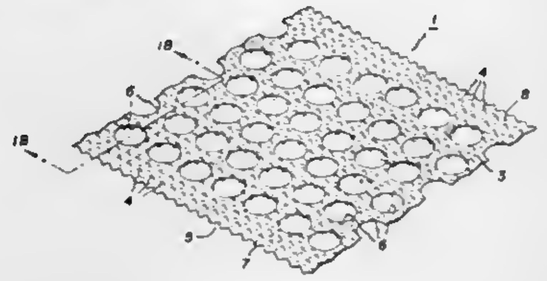


1. In a thin flat laminar battery comprising laminar electrodes, separators and intercell connectors in a gas-permeable central region and means forming a liquid-impermeable seal surrounding said gas-permeable central region, a vent tube extending through said seal into said gas-permeable region, said tube comprising a hydrogen-permeable liquid-impervious tube filled with fiber to form a gas diffusion passage of substantially uniform cross section and having at least one end exposed to the environment outside of said seal and no opening inside said seal.

4,105,832

AN ELECTRO-CHEMICAL BATTERY COMPRISING A PLATE HAVING STIPPLED SUBSTRATE

Raymond Kazimir Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.
Continuation of Ser. No. 577,419, May 14, 1979, abandoned, which is a continuation of Ser. No. 413,589, Nov. 7, 1973, abandoned. This application Aug. 16, 1977, Ser. No. 825,046
Int. Cl.² H01M *10/30*
U.S. Cl. 429—94 **5 Claims**



1. A nickel-cadmium electrolytic cell comprising:
(a) a casing;
(b) a coil disposed in said casing, said coil comprising:
  1. A positive plate and a negative plate, at least one of said plates comprising
    a. a thin conductive sheet with opposed major surfaces and having continuous uninterrupted edges,
    b. an array of spaced perforations extending through said sheet, intermediate said uninterrupted edges,
    c. an array of continuous, relatively smooth, closely spaced bosses in said sheet intermediate said edges and said perforations, each said boss comprised of a projection extending from one of said surfaces, said bosses in said array forming a pattern of alternating projections and recesses in each said surface intermediate said edges and intermediate said perforations, said bosses and said perforation being dimensioned at said surfaces such that the ratio of the cross-sectional dimensions of said perforations to said bosses is substantially greater than 1,
    d. a paste comprised of a binder and active material substantially covering said surfaces between said edges and extending through said perforations, and
  2. a separator disposed between said positive and negative plates; and
(c) an electrolyte in said casing.

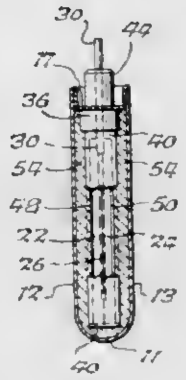
4,105,833

LITHIUM-BROMINE CELL

Wilson Greatbatch, Clarence; Ralph T. Mead, Kenmore; Robert L. McLean, Clarence; Frank W. Rudolph, Depew, and Norbert W. Frenz, North Tonawanda, all of N.Y., assignors to Eleanor & Wilson Greatbatch Foundation, Akron, N.Y.
Filed Sep. 16, 1976, Ser. No. 722,653
Int. Cl.² H01M *4/36*
U.S. Cl. 429—104 **10 Claims**

1. A lithium-bromine cell comprising:
(a) a casing of electrically conducting material;
(b) anode means positioned within said casing and comprising a lithium element having an exposed surface portion and another surface portion;
(c) anode electrical conductor means operatively connected to said other surface portion of said lithium element and extending from said casing;
(d) means for sealing said conductor means from the remainder of said cell;
(e) a bromine cathode within said casing and in operative contact with said exposed surface portion of said lithium element and with said casing in a manner such that said casing serves as a cathode current collector;
(f) cathode terminal means on said casing and comprising a hollow element of electrical conducting material having an internal passage in communication with the interior of said casing and means closing said passage whereby prior to closing said passage said element functions to allow introduction of bromine to the interior of said casing into operative relationship with said lithium anode element and after closing said passage said element functions as an electrical terminal and an electrical potential difference exists between said terminal and said conductor means during operation of said cell; and
(g) a solid lithium bromide electrolyte formed between said lithium anode and said bromine cathode.

8. A lithium-bromine cell comprising:
(a) a casing of electrically conducting material;

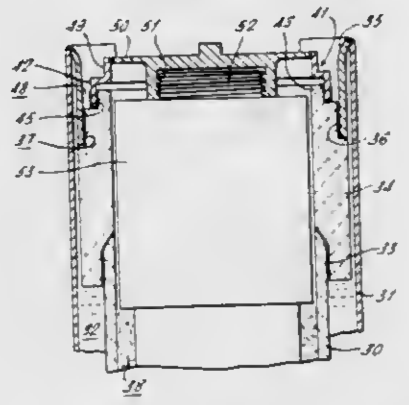


(b) anode means positioned within said casing and comprising a lithium element having an exposed surface portion and another surface portion;
(c) electrical conductor means operatively connected to said other surface portion of said lithium element and extending from said casing;
(d) means for sealing said conductor means from the remainder of said cell;
(e) a bromine cathode within said casing and in operative contact with said exposed surface portion of said lithium element and with said casing in a manner such that said casing serves as a cathode current collector; and
(f) a solid lithium bromide electrolyte formed between said lithium anode and said bromine cathode.

4,105,834

ELECTRIC CELLS

Derrick John Baker, and Roger John Bones, both c/o United Kingdom Atomic Energy Authority, 11 Charles II St., London, England (S.W.1)
Filed Oct. 3, 1977, Ser. No. 839,021
Claims priority, application United Kingdom, Oct. 14, 1976, 42811/76
Int. Cl.² H01M *10/39*
U.S. Cl. 429—104 **8 Claims**

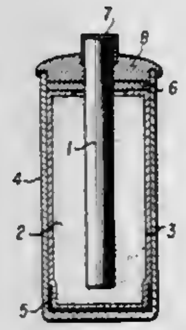


1. An electric cell having an anode, a liquid cathode, and a ceramic solid electrolyte member which defines at least in part on one side thereof a compartment for the liquid anode and on the other side thereof a compartment for the liquid cathode, wherein the improvement comprises,
(a) a ceramic support member joined by a glass seal to the solid electrolyte member so as to support the solid electrolyte member,
(b) a first metallic closure member closing the anode compartment and joined to the ceramic support member by a brazed joint which is resistant to the anode material, and
(c) a second metallic closure member closing the cathode compartment and joined by a glass seal to either the ceramic support member or to the solid electrolyte member, the first and second metallic closure members being electrically insulated from each other.

4,105,835

SOLID-DEPOLARIZER ELECTRIC CELLS

Jacques Guitton, St-Ismier, and Christian Jacques Maurice Charles Alexis Payn, Barbazan, both of France, assignors to ETAT FRANCAIS rep by Del. Min pour l'Armement, France
Continuation of Ser. No. 622,872, Oct. 16, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,607
Claims priority, application France, Oct. 31, 1974, 74 36359
Int. Cl.² H01M *6/04*
U.S. Cl. 429—133 **5 Claims**



1. An electric cell useful in a temperature range of −20° C to +60° C which is perfectly tightly sealed and has a long storage life after which the cell is still operable, comprising: a zinc anode; a solid cathodic depolarizer; a separator between the anode and cathodic depolarizer; and an electrolyte consisting of an aqueous solution of LiCl in a concentration between about 1.5 to 2.5 moles per liter and another material consisting of $Mg(ClO_4)_2$ without $Mg(OH)_2$ present in a concentration between 0.75 and 1.25 moles per liter; wherein said electrolyte does not involve risks of corrosion of the zinc anode as great as the risks in known cells.

4,105,836

HIGH ENERGY DENSITY LITHIUM CELL

Achille L. Almerini, Middletown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 8, 1977, Ser. No. 804,684
Int. Cl.² H01M *6/14*
U.S. Cl. 429—194 **11 Claims**

1. A lithium-organic electrolyte electrochemical cell comprising lithium as the anode, a fluorographite of the formula C_xF wherein x has a value no less than one and no greater than 4.5 as the cathode, and a solution of about 0.5 molar to 1.5 molar of an inorganic lithium salt in a lower alkyl acetate selected from the group consisting of methyl acetate, and propyl acetate as the electrolyte.

4,105,837

CONVERSION OF STEREOREGULAR POLYPROPYLENE TO ATACTIC POLYPROPYLENE

Thomas John Prosser, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Oct. 6, 1976, Ser. No. 730,094
Int. Cl.^{2} C08F *8/04*
U.S. Cl. 526—26 **27 Claims**

1. A process for treating a polymer of propylene containing stereoregular polypropylene components whereby at least a portion of the stereoregular polypropylene components are converted to the atactic form, said process comprising contacting the polymer with a hydrogenation catalyst at an elevated temperature above 200° C.

4,105,838

METHOD FOR THE POLYMERIZATION OF VINYL CHLORIDE

Hajime Kitamura, and Toshihide Shimizu, both of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan
Filed Oct. 28, 1975, Ser. No. 626,328
Claims priority, application Japan, Oct. 31, 1974, 49/125976
Int. Cl.^{2} C08F *14/06*
U.S. Cl. 526—62 **20 Claims**

1. Method of polymerization of a vinyl chloride monomer or a monomeric mixture composed mainly of vinyl chloride in the presence of a polymerization initiator which comprises placing said mixture into a polymerization vessel fitted with an agitator and other attachments and having inner walls of metal, forming layers of a metal complex with a polar organic compound or an organic dye on the inner walls of the polymerization vessel and the surfaces of the agitator and other attachments coming into contact with the monomer of monomeric mixture, said metal complex being formed by mixing said polar organic compound or organic dye with a metal compound in a ratio ranging from 100:5 to 100:300 by weight, and said complex being used in the form of a solution in an organic solvent to form said layers, subject to subsequent drying.

4,105,839

METHOD FOR POLYMERIZING ETHYLENICALLY UNSATURATED MONOMERS IN ORDER TO ELIMINATE POLYMER DEPOSITION

Shunichi Koyanagi; Hajime Kitamura; Toshihide Shimizu, and Kenji Fushimi, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Aug. 12, 1976, Ser. No. 713,894
Claims priority, application Japan, Aug. 14, 1975, 50-98784
Int. Cl.^{2} C08F *2/16, 2/00*
U.S. Cl. 526—62 **13 Claims**

1. In a method for polymerizing at least one ethylenically unsaturated monomer other than vinyl chloride in a heterogeneous phase, the improvement comprising coating, prior to the introduction of a polymerization mixture into a polymerization reactor, the surface coming into contact with the monomer with a reaction product produced by reacting at least one compound selected from group (A) consisting of aromatic polycyclic hydrocarbons, polyene compounds having more than two double bonds, amine compounds, thiazine compounds, thiazole compounds, sulfides, oxazine compounds, basic quinoneimine dyes, triphenylmethane dyes, diphenylmethane dyes, xanthene dyes, thiazole dyes, phthalocyanine dyes, cyanine dyes, higher aliphatic mercaptans, higher aliphatic thioesters, polysulfides, ethers, and group (B) consisting of quinone compounds, organic sulfonic acids and salts thereof, halogen-substituted aromatic polycyclic compounds, carboxylic acids and salts or anhydrides thereof, organic nitro compounds, organic cyano compounds, esters of phosphoric and polyphosphoric acids and salts thereof, acid azo dyes, acid mordant dyes, direct azo dyes, anthraquinone mordant dyes, acid anthraquinone dyes, anthraquinone vat dyes, naphthoquinone or benzoquinone vat dyes, indigozol or anthrasol dyes, indigo dyes, nitro dyes, nitroso dyes, sulfide dyes, acid triphenylmethane dyes, acid quinonemine dyes, oil-soluble azo dyes, oil-soluble xanthene dyes, reactive dyes, and quinoline dyes, with a compound selected from group (C) consisting of aromatic nitro compounds, p-benzoquinone and substituted benzoquinone compounds, organic peroxides, inorganic peroxides, halogeno-oxoacid salts, persulfates, permanganates, nitrates, amine compounds, sulfur-containing organic compounds, reducing carbohydrates, aldehydes, ethers, phenolic compounds, inorganic sulfides, nitrites, phosphites, sulfites, hydrides, hydrazine, ammonia, metal hydroxides, and basic metal salts, at a temperature of between about 50° C and 100° C for more than 10 minutes.

4,105,840

INTERNALLY COATED REACTION VESSEL FOR USE IN OLEFINIC POLYMERIZATION

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Jun. 20, 1977, Ser. No. 807,957
Int. Cl.^{2} C08F *2/18, 14/06*
U.S. Cl. 526—62 **11 Claims**

1. In a polymerization method for the production of polymers and copolymers of vinyl and vinylidene halides, when polymerized alone or with other vinylidene monomers having a terminal $CH_2{=}C<$ group or with polymerizable polyolefinic monomers, said polymerization being conducted in a polymerization vessel, wherein the improvement comprises the steps of coating the internal surfaces of said vessel prior to polymerization with an aqueous solution containing 0.03 to about 5% by weight tannin, said tannin being selected from the group consisting of hydrolyzable tannins, condensed tannins, ammonium tannates and tannins complexed with metal ions and rinsing the coated surface with tap water whereby undesirable polymer build up is reduced.

4,105,841

TREATMENT OF INTERIOR SURFACES OF POLYMERIZATION REACTORS TO RETARD POLYMER BUILDUP

William J. Settineri, Midland, and Milton C. Tolly, Hope, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 684,225, May 7, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 773,090
Int. Cl.^{2} C08F *10/00*
U.S. Cl. 526—62 **5 Claims**

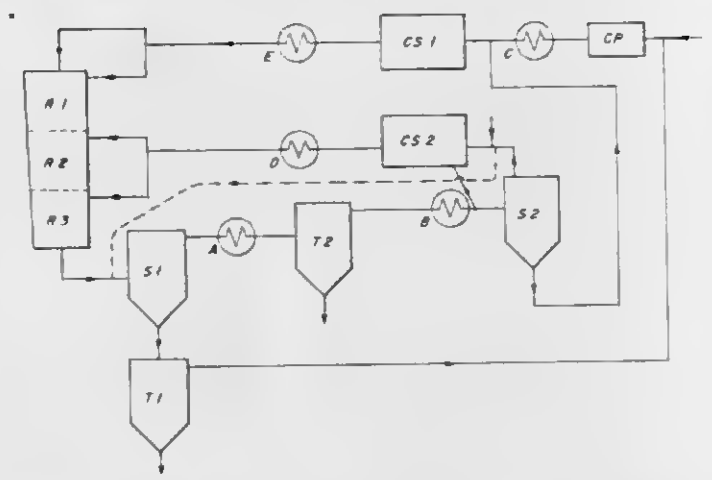
1. In a process for retarding undesirable buildup of polymeric material on the internal surfaces of reactors used in the polymerization of substantially water-insoluble ethylenically unsaturated monomer the steps comprising, (1) precoating said internal surfaces with an adherent, substantially water-insoluble polymeric coating, then (2) introducing sulfur trioxide into the precoated reactor prior to addition of the polymerization ingredients in an amount suffficient to provide at least about 0.045 gram of sulfur trioxide per gallon of reactor volume, then (3) flushing said reactor with water.

4,105,842

HIGH PRESSURE ETHYLENE POLYMERIZATION USING CATALYSTS OF THE ZIEGLER TYPE

Adrien Nicco, and Jean-Pierre Machon, both of Bethune, France, assignors to Societe Chimique des Charbonnages-CdF Chimie, Mazingarbe, France
Filed Mar. 23, 1977, Ser. No. 780,452
Claims priority, application France, Mar. 31, 1976, 76 09353
Int. Cl.^{2} C08F *2/02, 4/34, 4/64, 10/02*
U.S. Cl. 526—65 **12 Claims**

1. In a process for the polymerisation of a reaction mixture comprising ethylene, in the presence of hydrogen, at a temperature of 180° to 340° C under a pressure of 1,000 to 2,500 bars in the presence of a catalyst in at least one stirred reactor comprising at least one first reaction zone and at least one second reaction zone, which process comprises releasing the pressure and passing the reaction mixture to a first separator under a pressure of 80 to 400 bars to form a gas phase and a liquid phase, passing the liquid phase coming from the first separator to a first funnel under a pressure of 1 to 15 bars to form a polymer and a gas phase, recovering the polymer coming from the first funnel, and recompressing the gas phase coming from the first funnel and passing it to the first reaction zone, the improvement comprising passing the gas phase coming from the first separator to a second funnel via a first condenser to form a liquid phase and a gas phase, recovering the liquid phase from the second funnel, partially liquifying at least a part of the gas phase coming from the second funnel at a temperature of −50 to +20° C by means of a second condenser, releasing the pressure to a value of 10 to 60 bars and separating the flow from the second condenser in a second separator to form a liquid and a gas phase, recompressing the gas phase coming from the second separator and passing the recompressed gas phase from the second separator to the second reaction zone, mixing the liquid phase coming from the second separator with the gas phase coming from the first funnel, recompressing said mixture of liquid phase and gas phase, and passing said recompressed mixture to the first reaction zone.



4,105,843

PROCESS FOR PRODUCING HYDROCARBON RESINS HAVING IMPROVED COLOR AND THERMAL STABILITY BY HEAT TREATMENT WITH AN α,β-UNSATURATED ANHYDRIDE

Yoshiyuki Iwase; Shigeru Katayama, both of Iwakuni, and Takayuki Nakano, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan
Filed Apr. 11, 1977, Ser. No. 786,243
Claims priority, application Japan, Apr. 15, 1976, 51-41874; Dec. 15, 1976, 51-149829
Int. Cl.^{2} C08F *24/00, 4/14, 20/08*
U.S. Cl. 526—77 **16 Claims**

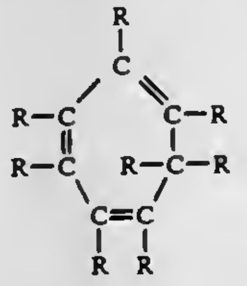
1. A process for producing a hydrocarbon resin having improved color and thermal stability, which comprises heat-treating a petroleum cracking or reforming fraction containing cationically polymerizable hydrocarbons and having a boiling range of from 140° C to 280° C, with an α,β-unsaturated dicarboxylic acid anhydride at a temperature of from 50° C to 250° C, and polymerizing said heat-treated petroleum fraction in the presence of a polymerization catalyst.

4,105,844

CYCLOHEPTATRIENE ADJUVANT FOR CHROMIUM OXIDE CATALYST

Max Paul McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 31, 1977, Ser. No. 829,369
Int. Cl.^{2} C08F *4/24, 10/00, 10/02*
U.S. Cl. 526—106 **9 Claims**

1. A polymerization process which comprises contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in the presence of a liquid diluent with a catalyst system comprising (1) a calcined support containing chromium in the form of chromium oxide, and (2) a compound of the formula



where R is selected from H and 1 to 6 carbon atom alkyl groups.

4,105,845

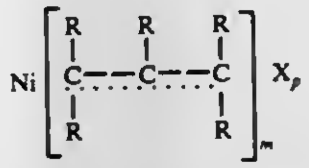
COPOLYMERIZATION OF ISOMONOOLEFINS WITH CONJUGATED DIENES

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Feb. 27, 1974, Ser. No. 446,427
Int. Cl.^{2} C08F *4/80, 4/82, 210/12, 236/04*
U.S. Cl. 526—117 **38 Claims**

1. A polymerization process which comprises polymerizing at least one isomonoolefin and at least one polymerizable conjugated diene under polymerization conditions employing a catalyst system comprising (A) a nickel source complex with (B) a titanium or vanadium compound,

wherein said (A) nickel source complex is represented by

(II)



$$\mathrm{Ni}\left[\begin{array}{ccc} R & R & R \\ | & | & | \\ C & \cdots C & \cdots C \\ | & & | \\ R & & R \end{array}\right]_m X_p$$

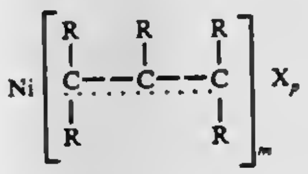
wherein m is an integer of 1 or 2, p is equal to 2-m, X is halogen, and R is hydrogen, or a hydrocarbyl alkyl, cycloalkyl, or cycloalkenyl radical, and wherein two hydrocarbyl R groups can be bound into a carbocyclic ring system containing 3 to 12 ring members, and where other than carbocyclic, said R groups can contain up to 10 carbon atoms per R group with up to a total of 20 carbon atoms per ligand radical,

wherein said (B) titanium or vanadium compound is represented by TiY_4, VY_4, or VOY_3, wherein Y is chlorine, fluorine, bromine, acetylacetonate, or alkoxyl -OR′ in which R′ is a hydrocarbyl radical of 1 to 8 carbon atoms.

13. Copolymers of isomonoolefins and polymerizable conjugated dienes prepared by the process comprising polymerizing at least one said isomonoolefin with at least one said polymerizable conjugated diene under polymerization conditions employing a (A) nickel source complex with (B) a titanium or vanadium compound;

wherein said (A) nickel source complex is represented by

(II)



$$\mathrm{Ni}\left[\begin{array}{ccc} R & R & R \\ | & | & | \\ C & \cdots C & \cdots C \\ | & & | \\ R & & R \end{array}\right]_m X_p$$

wherein m is an integer of 1 or 2, p is equal to 2-m, X is halogen, R is hydrogen or a hydrocarbyl alkyl, cycloalkyl, cycloakenyl radical, and wherein two hydrocarbyl R groups can be bound into a carbocyclic ring system containing 3 to 12 ring members, and where other than carbocyclic, said R groups can contain up to 10 carbon atoms per R group with up to a total of 20 carbon atoms per ligand radical,

wherein said (B) titanium or vanadium compound is represented by TiY_4, VY_4, or VOY_3, wherein Y is chlorine, fluorine, bromine, acetylacetonate, or alkoxyl-OR′ in which R′ is a hydrocarbyl radical of 1 to 8 carbon atoms.

4,105,846

INCREASING THE PARTICLE SIZE OF AS FORMED POLYETHYLENE OR ETHYLENE COPOLYMER

Glen R. Hoff, Naperville, Ill.; Peter Fotis, Jr., Highland, Ind., and David E. Boone, Lisle, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 25, 1977, Ser. No. 827,566

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—124 **8 Claims**

1. A process for increasing the particle size of as formed polyethylene or copolymers thereof with up to fifteen mol percent of a C_3 to C_8 olefin comprising:

(a) Mixing Mg $(OR)_2$ and $Ti(OR)_4$, wherein R is an alkyl group containing between one and about six carbon atoms at elevated temperature;

(b) mixing $RAlCl_2$ in the presence of an inert diluent above about −20° C with the product of (a) in at least two stages, the second stage following the first stage after an aging period of at least four hours and any subsequent stage following the previous stage by at least two hours; and

(c) polymerizing ethylene or a mixture of ethylene and said olefin with a polymerization effective amount of the solid part of the product of (b) and an alkylaluminum compound promoter to form said polyethylene or copolymer thereof in particulate form.

4,105,847

METHOD FOR POLYMERIZATION OF ETHYLENE

Akira Ito, and Kenji Iwata, both of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,134

Claims priority, application Japan,

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—125 **8 Claims**

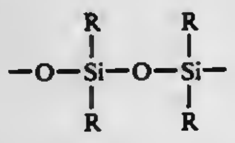
1. A process for polymerizing ethylene which comprises polymerizing or copolymerizing ethylene at a temperature of 20°-300° C. and a pressure of from normal pressure to 200 atm. in the presence of a catalyst consisting essentially of

(A) a co-comminuted composition of the following components:

(a) at least one component selected from the group consisting of titanium tetrachloride and titanium trichloride, said titanium tetrachloride comprising 1-35% by weight and said titanium trichloride comprising 1-80% by weight of component (A);

(b) magnesium dihalide comprising 15-90% by weight of component (A); and

(c) a siloxane polymer selected from the group consisting of an alkylsiloxane polymer, an arylsiloxane polymer and an alkarylsiloxane polymer having the following recurring unit



$$-O-\underset{\underset{R}{|}}{\overset{\overset{R}{|}}{Si}}-O-\underset{\underset{R}{|}}{\overset{\overset{R}{|}}{Si}}-$$

wherein R represents alkyl containing from 1 to 15 carbon atoms or aryl containing from 6 to 15 carbon atoms, said siloxane polymer comprising 5-50% by weight of component (A); and

(B) an organoaluminum compound.

4,105,848

PROCESS FOR THE PRODUCTION OF DIHYDROOXADIAZINONE COMPOUNDS

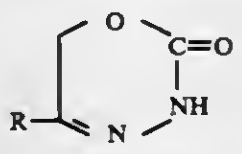
Robert Bruce Ehlinger, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 27, 1976, Ser. No. 754,221

Int. Cl.² C07D *273/04*

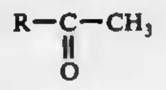
U.S. Cl. 544—68 **8 Claims**

1. A process for the production of a dihydrooxadiazinone compound of the formula



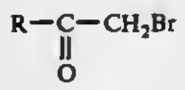
wherein R is aryl; said process comprising:

(a) brominating a compound of the formula



$$R-\underset{\underset{O}{\|}}{C}-CH_3$$

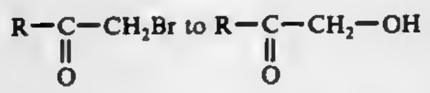
to form a mixture of



$$R-\underset{\underset{O}{\|}}{C}-CH_2Br$$

and HBr:

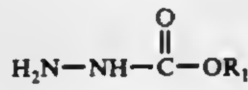
(b) adding to the reaction mixture of (a) an amount of an aqueous alkali metal formate that is sufficient to hydrolyze the



$$R-\underset{\underset{O}{\|}}{C}-CH_2Br \text{ to } R-\underset{\underset{O}{\|}}{C}-CH_2-OH$$

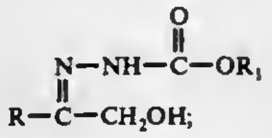
and to neutralize the HBr to formic acid and alkali metal bromide;

(c) adding to the reaction mixture of (b) a carbazate of the formula



$$H_2N-NH-\overset{\overset{O}{\|}}{C}-OR_1$$

wherein R_1 is lower alkyl of 1 to 8 carbon atoms to form a hydrazone compound of the formula



$$\begin{array}{l}N-NH-\overset{\overset{O}{\|}}{C}-OR_1\\ \|\\ R-C-CH_2OH;\end{array}$$

and

(d) cyclizing the hydrazone of step (c) under basic conditions to form the dihydrooxadiazinone compound.

4,105,849

[(SUBSTITUTED)PHENYL]PHENYLMETHYL-1-(DIALKYLAMINOALKYL)PIPERIDINES

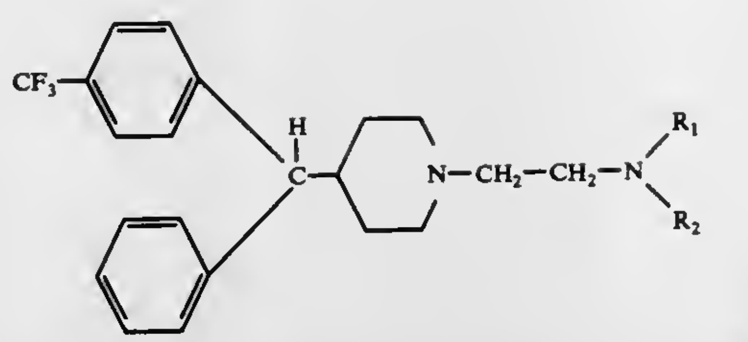
Robert W. Hamilton, Wilmette, and Kurt J. Rorig, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 30, 1974, Ser. No. 510,745

Int. Cl.² C07D *413/06, 211/28;* **A61K** *31/535, 31/445*

U.S. Cl. 544—129 **5 Claims**

1. A compound of the formula



wherein R_1 and R_2 represent lower alkyl having 1-7 carbon atoms or R_1 and R_2 together with N represent piperidino or morpholino and the pharmaceutically acceptable acid addition salts thereof.

4,105,850

1-AMINO-3-(4-CHLOROPHENYL)-2-IMIDAZOLIDINONE

Thomas J. Schwan, and Ralph L. White, Jr., both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed May 13, 1977, Ser. No. 796,611

Int. Cl.² C07D *233/46*

U.S. Cl. 548—319 **1 Claim**

1. The compound 1-Amino-3-(4-chlorophenyl)-2-imidazolidinone.

4,105,851

1,3,8-TRIMETHYLIMIDAZOPYRAZOLODIAZEPINE COMPOUNDS

Horace A. De Wald, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

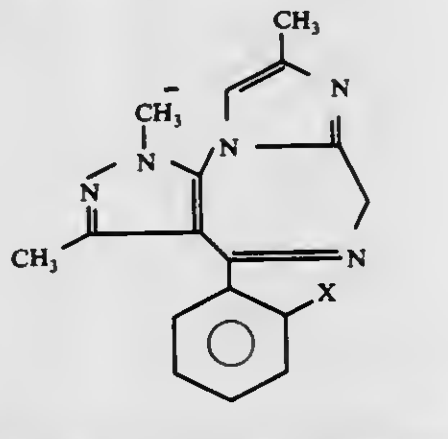
Continuation-in-part of Ser. No. 611,042, Sep. 8, 1975, abandoned. This application Jun. 17, 1976, Ser. No. 696,951

Int. Cl.² C07D *487/14*

U.S. Cl. 548—324 **3 Claims**

1. A compound of the formula

I



and acid-addition salts thereof; where X is fluorine or chlorine.

4,105,852

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Eaton Ford, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

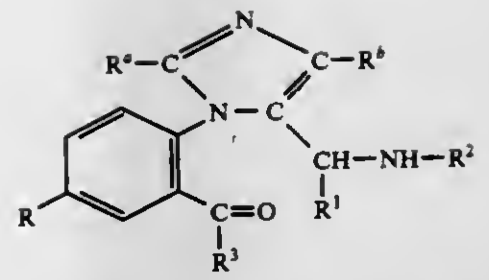
Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219. This application Nov. 11, 1976, Ser. No. 741,001

Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75

Int. Cl.² C07D *233/64*

U.S. Cl. 548—342 **4 Claims**

1. A compound of formula



wherein R^a is selected from the group consisting of a hydrogen atom, lower alkyl and a hydroxymethyl group; R^b is selected from the group consisting of a hydrogen atom, lower alkyl and hydroxymethyl; R is selected from the group consisting of a halogen atom, nitro and trifluoromethyl; R^1 is a hydrogen atom or lower alkyl; R^2 is an acyl group formed by removal of the hydroxy moiety from the α-carboxyl group of a naturally occurring amino acid and R^3 is selected from the group consisting of phenyl, halophenyl and 2-pyridyl and pharmaceutically acceptable salts thereof.

4,105,853

TRANS-N-ACYL-N-ALKYL-1-AMINO-1,3-BUTADIENES, TRANS-N-ACYL-N-ARYL-1-AMINO-1,3-BUTADIENES AND PREPARATION THEREOF

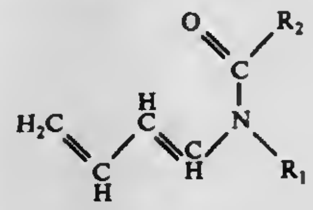
Wolfgang Oppolzer, Thônex, Switzerland, assignor to CHON Corporation, Cambridge, Mass.

Division of Ser. No. 647,049, Jan. 7, 1976, Pat. No. 4,065,496. This application Sep. 21, 1977, Ser. No. 835,325

Int. Cl.² C07C *101/18*

U.S. Cl. 560—24 **3 Claims**

1. A trans-compound of the formula



wherein R_1 is aryl and R_2 is alkoxy or aryloxy, wherein R_1 and R_2 each contain 1 to about 8 carbon atoms.

4,105,854

PROSTANOIC ACID DERIVATIVES

Keith Hopkinson Gibson, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 31, 1975, Ser. No. 563,454

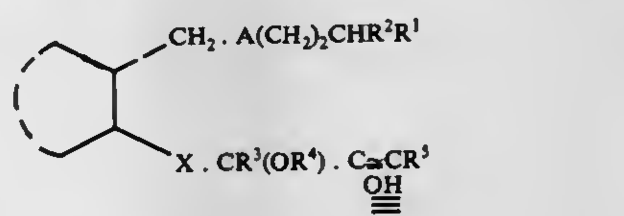
Claims priority, application United Kingdom, Apr. 22, 1974, 17497/74

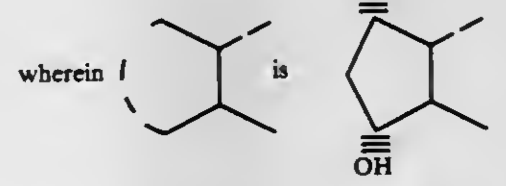
Int. Cl.² C07C *177/00*

U.S. Cl. 560—55 **7 Claims**

1. A prostanoic acid derivative of the formula:

I





R^1 is carboxy or alkoxycarbonyl of 2 to 12 carbon atoms, A is ethylene or vinylene, X is ethylene or trans-vinylene, R^2, R^3 and R^4 which may be the same or different are each hydrogen or alkyl of 1 to 5 carbon atoms and R^5 is phenyl or naphthyl, which is unsubstituted or is substituted by alkyl, alkoxy or halogenoalkyl each of 1 to 5 carbon atoms, halogen, or hydroxy and for those derivatives wherein R^1 is carboxy the pharmaceutically or veterinarily acceptable base addition salts thereof.

4,105,855

MANUFACTURE OF SYMMETRICAL CAROTENOIDS

Bernhard Schulz, Schwetzingen; Joachim Paust, Neuhofen, and Joachim Schneider, Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 26, 1976, Ser. No. 652,190

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1975, 2505869

Int. Cl.² C07C *3/00, 13/28, 67/00*

U.S. Cl. 560—190 **8 Claims**

1. A process for the manufacture of symmetrical carotenoids from triarylphosphonium salts of the half-molecules of these symmetrical carotenoids, wherein triarylphosphonium salts of the half-molecules are reacted with from 0.8 to 5 times the molar amount of a peroxide, a peroxo compound or a peroxy compound in the presence of a base in water or an aqueous solvent mixture at temperatures of from −50° to +100° C, the half-molecules dimerizing with the formation of a double bond and the elimination of triarylphosphine oxide.

4,105,856

RECOVERY PROCESS FOR AQUEOUS WASTE STREAMS IN ADIPIC ACID SYSTEMS

Cecil A. Newton, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Sep. 29, 1970, Ser. No. 76,624

Int. Cl.² C07C *69/34, 69/42, 69/44*

U.S. Cl. 560—191 **4 Claims**

1. In a process for the treatment of the mother liquor resulting from the nitric acid oxidation of cyclohexanol and/or cyclohexanone and the recovery of valuable components therefrom, which mother liquor is a mixture comprising from about 3 to 10 weight percent succinic acid, from about 8 to 35 weight percent glutaric acid, from about 3 to 6 weight percent adipic acid, from about 6 to 20 weight percent nitric acid, and from about 1 to 3 weight percent vanadium and copper metal catalyst values, the improved process which comprises:

(a) contacting said mother liquor with an organic alcohol of the formula ROH wherein R is an alkyl of 4 to about 20 carbon atoms which will create esters which are substantially immiscible with the resulting aqueous solution and in a sufficient amount to esterify at least a portion of the aliphatic dibasic acids present, said contact being at a temperature ranging from room temperature up to about the boiling point of the alcohol employed;

(b) allowing the organic esters to form a separate organic phase from an aqueous phase;

(c) separating said organic phase from said aqueous phase;

(d) distilling said organic phase to recover the esters of the dibasic acids therefrom, and

(e) concentrating the aqueous phase to recover a concentrated nitric acid solution containing the metallic catalyst values.

4,105,857

PROCESS FOR PREPARING PHENYL TRICHLORO-ETHANES

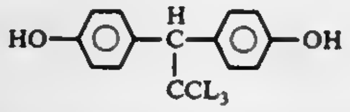
John R. Campbell, and Howard J. Klopfer, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,345

Int. Cl.² C07C *37/00*

U.S. Cl. 568—726 **2 Claims**

1. The process for making a trichloro-ethane of the formula



which comprises reacting under condensation conditions phenol and chloral in a solvent medium consisting essentially of methylene chloride and aqueous sulfuric acid of a concentration of from 90–98%.

4,105,858

QUATERNARY SALTS OF METHACRYLIC OR ACRYLIC ESTERS AND CATIONIC QUATERNARY POLYELECTROLYTES AND ION EXCHANGE RESINS THEREOF

Milan Benes, and Jan Peska, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

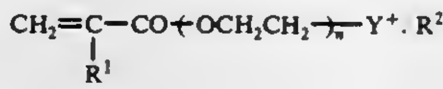
Division of Ser. No. 302,897, Nov. 1, 1972, Pat. No. 4,011,204. This application Jan. 28, 1976, Ser. No. 700,308

Claims priority, application Czechoslovakia, Nov. 2, 1971, 7687-71; Nov. 2, 1971, 7688-71

Int. Cl.² C07C *9/54*

U.S. Cl. 560—222 **5 Claims**

1. Method for producing cationic quaternary salts, based upon methacrylic or acrylic ester and having the general formula II

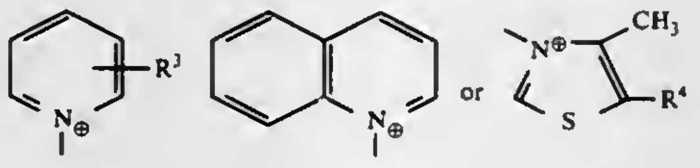


$$CH_2{=}\underset{\displaystyle R^1}{\underset{|}{C}}{-}CO\left(OCH_2CH_2\right)_n{-}Y^+ .\ R^2SO_3^- \qquad \text{II}$$

where
- R^1 is H or CH_3
- R^2 is CH_3, C_6H_5 or p-$CH_3C_6H_4$
- n is 1 or 2

and

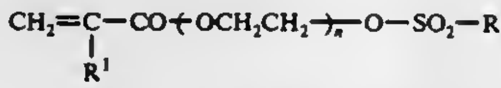
Y^+ is either aliphatic, $-N^+(CH_3)_3$ or $-N^+(CH_3)_2CH_2CH_2OH$, or heterocyclic



where
- R^3 is H, CH_3, $CONH_2$, CHO, $COCH_3$

and
- R^4 is H or CH_2CH_2OH,

which consists in the reaction of sulfoesters of the general formula III



$$CH_2{=}\underset{\displaystyle R^1}{\underset{|}{C}}{-}CO\left(OCH_2CH_2\right)_n{-}O{-}SO_2{-}R^2 \qquad \text{III}$$

where R^1, R^2 and n have the same meaning as in the formula II, with the corresponding tertiary amine the molar ration of amine to sulfoester being 1 to 1.3 and the reaction being at a temperature between 25°–90° C for between 1 to 40 hours.

ELECTRICAL

4,105,859

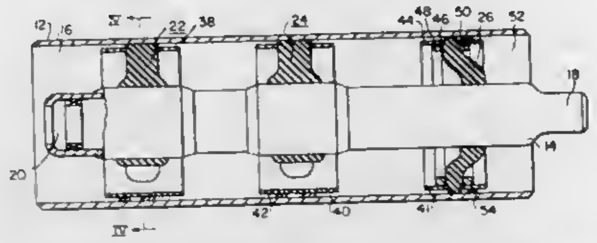
COMPARTMENTALIZED GAS INSULATED TRANSMISSION LINE

Alan H. Cookson, Southboro; George A. Kemeny, Sudbury, and Philip C. Bolin, Northboro, all of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1976, Ser. No. 720,330

Int. Cl.² H01B *9/04*

U.S. Cl. 174—14 R **8 Claims**



1. A gas insulated transmission line section comprising:
- an elongated outer sheath at low potential;
- an elongated inner conductor at high potential with respect to said outer sheath disposed within, and spaced apart from, said outer sheath;
- an insulating gas disposed within said outer sheath and electrically insulating said inner conductor from said outer sheath;
- a support insulator disposed within said outer sheath for insulatably supporting said inner conductor within said outer sheath, said support insulator comprising:
  - a central portion having a bore therethrough, said inner conductor being disposed within said bore; and
  - three legs secured to said central portion and extending radially outwardly to said outer sheath, said legs being disposed about said central portion;
- a first spacer ring secured to said legs and disposed adjacent said outer sheath, said first spacer ring and said outer sheath forming a low potential region therebetween, said first spacer ring having a plurality of apertures therethrough for the trapping of particles within said low potential region;
- a barrier insulator supporting said inner conductor within said outer sheath, said barrier insulator substantially filling in the cross-sectional area between said inner conductor and said outer sheath so as to substantially prevent arc product migration past said barrier insulator; and
- a second spacer ring secured to said barrier insulator and disposed adjacent said outer sheath, said second spacer ring and said outer sheath forming a low potential region therebetween, said second ring having a plurality of apertures therethrough for the trapping of particles within said low potential region.

4,105,860

ELECTRICAL CABLE INSTALLATIONS WITH COOLING MEANS

Edmund Hugh Ball, Southampton, England, assignor to Pirelli General Cable Works Ltd., London, England

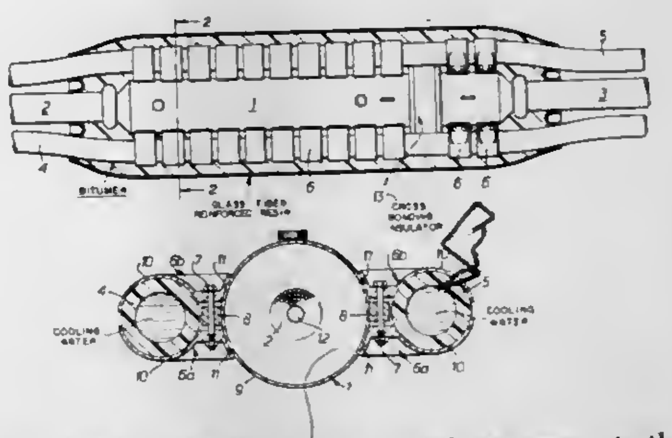
Filed Nov. 26, 1976, Ser. No. 745,370

Claims priority, application United Kingdom, Dec. 5, 1975, 50072/75

Int. Cl.² H02G *9/02, 15/08;* **H01B** *7/34*

U.S. Cl. 174—15 C **8 Claims**

1. An electrical power cable installation including a cable run incorporating at least one accessory (such as a cable joint) subject to increased heating as compared with other parts of the cable run, at least one conduit extending alongside the cable but spaced therefrom throughout the cable run, the conduit serving for the forced passage of coolant to cool the cable run throughout the length thereof by conductive transfer of heat from the cable to coolant in the conduit, and thermally conducting bridging members provided solely between the conduit and the said accessory and maintained in heat transfer relationship therewith for providing preferential access for greater conductive transfer of heat from the accessory to the coolant in the conduit than from other parts of the cable run.



4,105,861

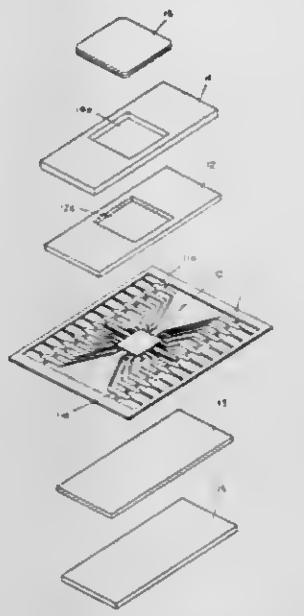
HERMETICALLY SEALED CONTAINER FOR SEMICONDUCTOR AND OTHER ELECTRONIC DEVICES

Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.

Filed Sep. 29, 1975, Ser. No. 617,494

Int. Cl.² H05K *5/06*

U.S. Cl. 174—52 FP **6 Claims**



1. An hermetically sealed container for electronic devices comprising:
- a supporting pad for an electronic device;
- a conductive lead frame surrounding said pad;
- a sheet of homogeneous plastic material extending over and fused to each face of said frame and its conductive leads, at least one of said sheets having an aperture dimensioned and disposed to surround said supporting pad and a portion of the adjacent leads of said lead frame;
- upper and lower cover plates of material impervious to moisture and air fused to said plastic sheets, one of said plates having an opening in registry with the aperture in the adjacent one of said plastic sheets for receiving an electronic device to be supported on said pad;
- and means for hermetically sealing said opening in said one of said plates.

4,105,862

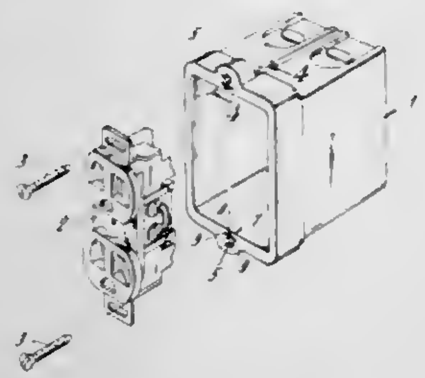
OUTLET BOX HAVING SCREW MOUNTING MEANS

Rudolph H. Hoehn, Queens, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Division of Ser. No. 384,012, Jul. 30, 1973, Pat. No. 3,955,463, which is a continuation-in-part of Ser. No. 170,052, Aug. 9, 1971, abandoned. This application Aug. 12, 1975, Ser. No. 603,928

Int. Cl.² H02G *3/08*

U.S. Cl. 174—53 **13 Claims**



1. An electrical junction box comprising:

a unitary molded plastic enclosure having a bottom and upstanding opposite side and end walls defining an open face at their upper ends; and

boss means on said box at opposite walls for mounting a bracket to said box, said boss means housing quick fastener means for reception of a threaded fastener,

said boss means including a passageway and internal abutment means at said passageway and said quick fastener means comprising insert means in said passageway including means engaging said internal abutment means and means for engaging a threaded fastener,

said passageway including a slot generally parallel to an enclosure wall and said insert means comprising a relatively thin metal clip receivable in said slot having oppositely bent tabs, one of said tabs adapted to engage a threaded fastener.

4,105,863

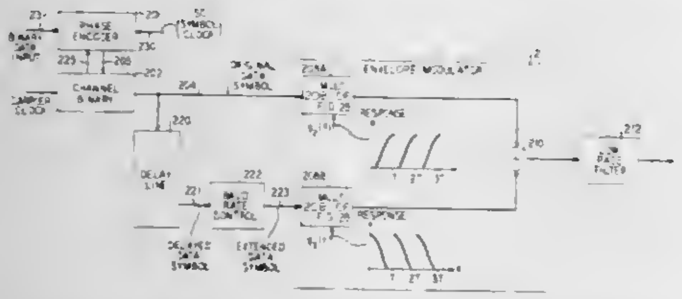
ARRANGEMENT FOR COMBINING DATA SYMBOLS IN ACCORDANCE WITH A PREDETERMINED WEIGHTING FUNCTION

George John Kustka, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1976, Ser. No. 752,066

Int. Cl.² H04L *27/24*

U.S. Cl. 178—67 **10 Claims**



1. In an arrangement for combining original data symbols, a circuit for shaping the amplitude of symbols in accordance witha predetermined weighting function, each data symbol being a signal modulated into one of a plurality of discrete states for a time interval, comprising:

means responsive to the original data symbols for generating extended data symbols;

means for generating segments of the predetermined weighting function;

means for regulating the amplitude of said original data symbols in accordance with one of the generated segments of the predetermined weighting function; and

means for regulating the amplitude of said extended data symbols in accordance with another segment of the predetermined weighting function.

4,105,864

STEREO AND SPACIOUSNESS REVERBERATION SYSTEM USING RANDOM ACCESS MEMORY AND MULTIPLEX

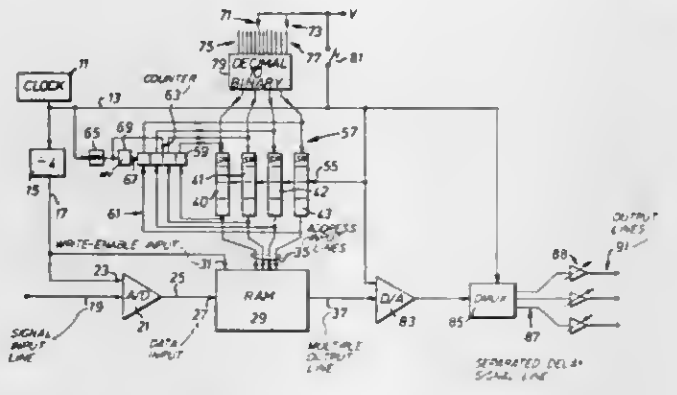
Robert A. Berkovitz, Lexington, Mass., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 16, 1976, Ser. No. 706,011

Claims priority, application United Kingdom, Jul. 17, 1975, 30009/75; Sep. 4, 1975, 36442/75

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 J **14 Claims**



1. A sound reproduction arrangement comprising:

(a) a listening area;

(b) at least a first primary loudspeaker located in said listening area and connected to be driven in response to a first audio frequency signal;

(c) input means responsive to said first audio frequency signal to provide input signal data as a function thereof;

(d) signal delay means connected to receive said input signal data and provide a plurality of delayed signals each corresponding to the said input signal data delayed by a respective delay constant, said delay means including means conditioned and arranged to multiply each of the said delayed signals by a respective pre-selected gain constant, a plurality of output channels each supplied with at least a respective one of said delayed signals, addressable data storage means for storing successive sampled values of the said input signal data, control means arranged for response to a periodic clock signal to supply a preselected sequence of address instructions to said data storage means so as to produce successive cycles of record/recall operations in each of which at least a respective one of the said successive sampled values is recorded, and a plurality of stored sampled values which sampled values have each been recorded a respective pre-selected numbers of cycles previously, are recalled sequentially, and a demultiplexer means connected for response to the data output by said data storage means and arranged to assign the recalled values to respectively pre-selected ones of said output channels, whereby in use the said data output by said data storage means comprises a plurality of time division multiplexed components each associated with a respective one of the said pre-selected numbers, the said delayed signals being formed by respective ones of the said components and the said delay constants being related, respectively, with associated ones of said pre-selected numbers; and

(e) a plurality of secondary loudspeakers disposed at respective locations spaced around the perimeter of said listening area and each connected to be driven by a respective one of said output channels, the delay constant and secondary loudspeaker for each of said delayed signals being selected so that the delay and direction of the sound produced in the listening area in response thereto substantially corresponds to those of a sound corresponding to said first audio frequency signal reflected from the boundary of an enclosure of substantially greater size than that of the listening area, thus obtaining a sensation of spaciousness.

4,105,865

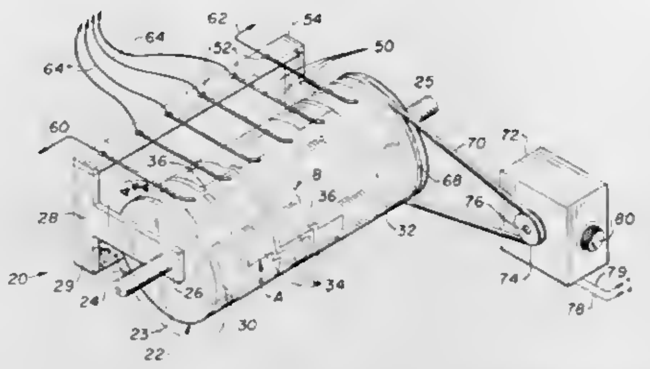
AUDIO DISTRIBUTOR

Henry Guillory, 186 Day St., San Francisco, Calif. 94131

Filed May 20, 1977, Ser. No. 799,071

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 G **7 Claims**



1. A device for sequentially distributing an audio electrical signal to at least a pair of a plurality of sound reproducing elements, comprising:

first circuit means having the audio electrical signal applied thereto;

a number of second circuit means, each second circuit means corresponding to and in electrical communication with one of the plurality of sound reproducing elements, said first and second circuit means being mounted in spaced relation relative to one another;

a pair of substantially non-resistive, electrical conductive elements mounted to a support member and in electrical communication with the first circuit means, each one of the conductive elements defining a first segment and a plurality of second segments, there being at least one of the second segments for each one of the second circuit means, said support member being situated proximate the first and the second circuit means; and

means for cyclically moving the support member to place the conductive elements in electrical communication with the first circuit means and each one of the second circuit means, the plurality of second segments being arranged relative to the second circuit means to establish electrical communication between the first circuit means and at least a pair of the second circuit means at any one moment in time so that the audio electrical signal will be distributed to the pair of the sound reproducing elements in sequential, serial fashion.

4,105,866

TELEPHONE ANSWERING MACHINE BUSY SIGNAL DETECTION DEVICES WITH SWITCHING MEANS

Padraig Anthony Henehan, Bracknell, and Michel George Bazil Farkouh, Camberly, both of England, assignors to Ansafone Limited, London, England

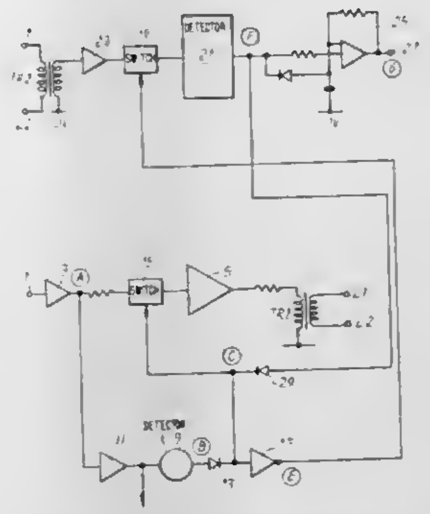
Filed May 24, 1976, Ser. No. 689,466

Claims priority, application United Kingdom, May 28, 1975, 23231/75

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 R **3 Claims**

1. A device for causing an interruption in the transmission of electrical signals representing a message recorded in a telephone answering machine associated with the device so as to enable detection of an incoming shutdown signal, the device comprising a detector which is sensitive to an incoming shutdown signal having a predetermined frequency within the audio range and an amplitude lower than the maximum amplitude of said electrical signals, switching means adapted, when actuated, to effect first and second switching operations, and means for sensing the amplitude of the said electrical signals representing telephone answering machine recorded messages and for actuating the switching means when the amplitude of the said electrical signals falls below a predetermined level and remains below that level for a predetermined short interval of time within the period during which a recorded message is being transmitted, the switching means comprising a first switch adapted, when the switching means is actuated, to effect the first switching operation, which causes transmission of the said electrical signals to be interrupted, and a second switch which is then adapted to effect the second switching operation which enables the detector to sense the said incoming shutdown signal of predetermined frequency and to generate an output signal for disconnecting the machine from the telephone line.



4,105,867

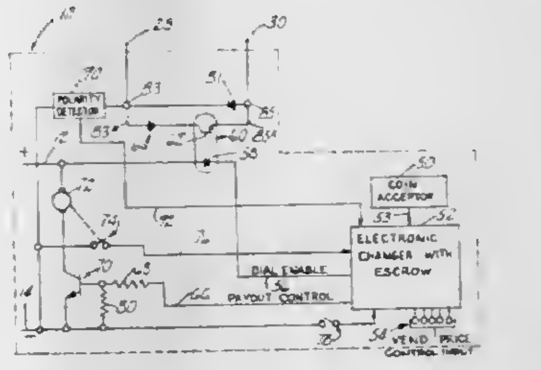
CONTROL CIRCUIT FOR PAY TELEPHONES AND THE LIKE

Joseph L. Levasseur, and William A. Seiter, both of St. Louis County, Mo., assignors to H. R. Electronics Company, High Ridge, Mo.

Filed Feb. 7, 1977, Ser. No. 765,931

Int. Cl.² H04M *17/02*

U.S. Cl. 179—6.3 R **47 Claims**



1. Control means for electrically communicating a transmission control of a pay telecommunications station to a telecommunications system, comprising coin controlled means including a coin deposit unit for accepting coins of one or more denominations and producing a deposit signal representative of the value of each coin accepted during a telecommunications station operation, price control means for establishing a reference signal representative of the cost charge for effecting said electrical communication, entry means having a first input means connected to said coin deposit unit to receive each deposit signal and a second input means connected to said price

control means to receive said reference signal, said entry means producing an output when the value of one or more coins accepted equals or exceeds the cost charge, output control means having an input connected to said entry means to receive said output, said output control means including switch means having a first connection to the transmission control and a second connection to said telecommunications system, said awitch means including means for responding to said output to effect an electrical communication between said first and said second connections, and refund means operatively connected to said entry means, said refund means being operable independently of the specific coins deposited during that telecommunications station operation, and including means responsive to said output to effect exact payback of any excess amount accepted.

4,105,868

AM STEREOPHONIC TRANSMISSION SYSTEM

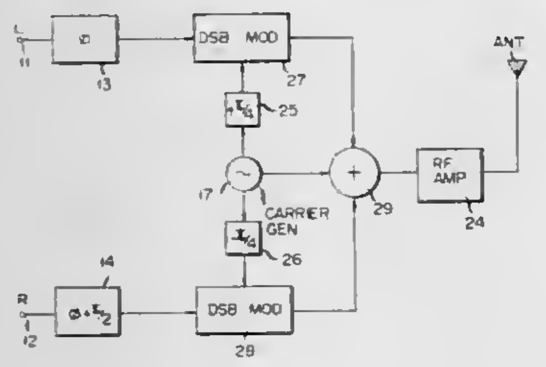
Susumu Takahashi, and Hirotaka Kurata, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

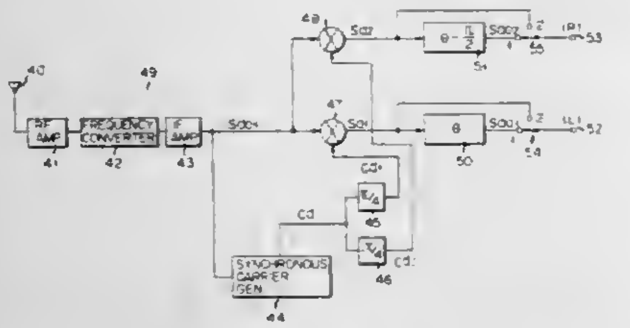
Filed Dec. 22, 1976, Ser. No. 753,299

Claims priority, application Japan, Dec. 26, 1975, 51-158605; Dec. 26, 1975, 51-158607

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **15 Claims**





1. A method of producing a broadcast signal for an AM stereophonic transmission system for transmitting stereophonically related first and second audio information signals by an amplitude modulation system, including the steps of:

generating a first carrier component;

generating a first double-sideband component of a second carrier component which is suppressed-carrier amplitude-modulated by said first audio information signal, said second carrier component having the same frequency as that of said first carrier component and being advanced in phase by substantially 45° with respect to said first carrier component; and

generating a second double-sideband component of a third carrier component which is suppressed-carrier amplitude-modulated by a second audio information signal phase-shifted by substantially 90° relative to said first audio information signal, said third carrier component having the same frequency as that of said first carrier component and being retarded in phase by substantially 45° with respect to said first carrier component.

6. A receiver for reproducing stereophonically related first and second audio information signals from a broadcast signal including a first carrier component, a first double sideband component of a second carrier component suppressed-carrier, amplitude-modulated by the first audio information signal, said second carrier component being advanced in phase by substantially 45° with respect to said first carrier component, and a second double-sideband component of a third carrier component being suppressed-carrier amplitude-modulated by the second audio information phase-shifted by substantially 90° relative to the first audio information signal, said third carrier component being retarded in phase by substantially 45° with respect to said first carrier component, said receiver comprising:

synchronous carrier generating means for generating synchronous carriers in response to the broadcast signal received by an antenna; and

means for demodulating said first and second audio information signals in response to said synchronous carriers from said synchronous carrier generating means and said braodcast signal received by the antenna,

said means for demodulating comprising:

phase-shift means for phase shifting a first synchronous carrier from said synchronous carrier generating means to produce a second and third synchronous carriers, said second and third synchronous carrier being advanced and retarded in phase by 45° with respect to said first synchronous carrier, respectively;

first demodulation means for demodulating said first audio information signal in response to the broadcast signal received by the antenna and said second synchronous carrier; and

second demodulation means for demodulating the second audio information signal phase-shifted by substantially 90° relative to said first audio information signal in response to said third synchronous carrier and the broadcast signal.

4,105,869

TIME-DIVISION MULTIPLEX DIGITAL TRANSMISSION SYSTEM WITH INTERMEDIATE STATIONS ADAPTED TO TRANSIT INSERT AND EXTRACT DIGITAL CHANNELS

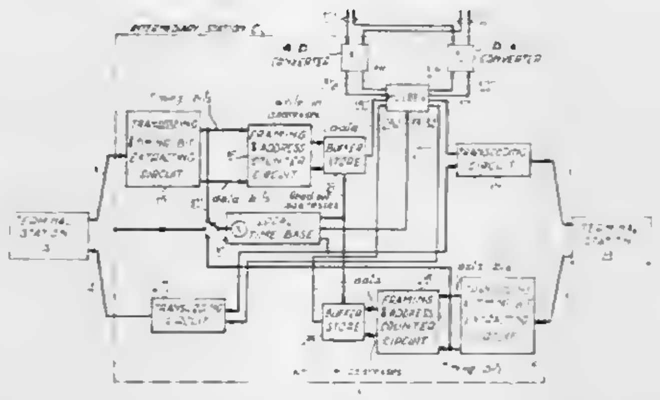
André A. Aveneau, Longpont sur Orge, and Xavier N. Barbier, Le Plessis Trevise, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Dec. 5, 1977, Ser. No. 857,813

Claims priority, application France, Dec. 10, 1976, 76 37357

Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 BD **3 Claims**



1. A time-division multiplex digital transmission system having two terminal stations and at least one intermediate station connecting said terminal stations by first and second multi-channel digital multiplex lines corresponding to both of the transmission directions through the intermediate stations, each digital channel of each multiplex line being allocated to a recurrent time slot of a frame whereby the system is adapted, in each intermediate station, to transit digital channels allocated to corresponding time slots of the multiplex lines as well as to extract digital channels from one of the multiplex lines for a local line of the intermediate station and to insert from the local line to other multiplex lines the digital channels allocated to corresponding time slots according to the two transmission directions or the reverse, each of said intermediate stations further comprising:

means for emitting local channels from said local lines to said multiplex lines;

means for receiving local channels from said multiplex lines to said local lines;

first means for extracting timing signals from digital channels transmitted on said first multiplex line;

second means for extracting timing signals from digital channels transmitted on said second multiplex line;

a single time base controlled by said timing signals from said first or second extraction means but said time base being able to oscillate freely in absence of timing signals;

first storing means for receiving digital channels from said first multiplex line;

first means for addressing said first storing means for write-in by said first extracting means and for read-out by said time base;

second storing means for receiving digital channels from said second multiplex line;

second means for addressing said second storing means for write-in by said second extraction means and for read-out by said time base;

one channel multiplexer and demultiplexer;

said first and second storing means and said local channel emitting means being connected to inputs of said multiplexer;

the digital channel emitting output to said first and second multiplex lines and said channel receiving means being connected to outputs of said demultiplexer; and

said demultiplexer being adapted to extract and to transmit digital channels from said first or second multiplex line to said local channel receiving means, respectively, when said multiplexer simultaneously inserts and transmits local channels from said local channel emmitting means to said second or first multiplex line, respectively.

4,105,870

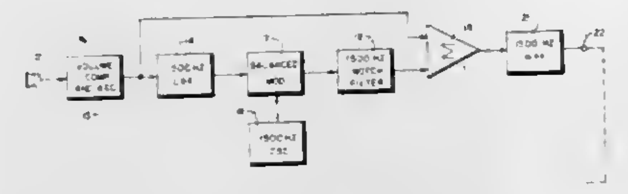
NARROW BAND TRANSMISSION SYSTEM AND METHOD

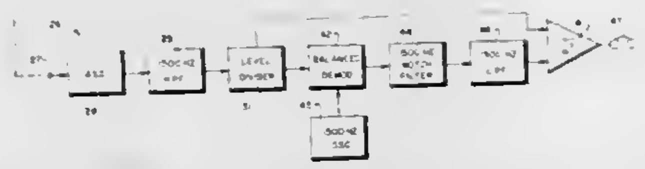
Herman P. Miller, III, P.O. Box 2163, Stockton, Calif. 95201

Filed Nov. 23, 1976, Ser. No. 744,305

Int. Cl.² H04B *1/66*

U.S. Cl. 179—15.55 R **15 Claims**





1. In a method for transmitting signals having high and low frequency components which are displaced in time in such manner that only one of the components is present at a significant energy level at any instant of time, the steps of: continuously translating a first one of the components to the frequency range of the second component with no switching of the first component, combining the translated component with the first and second components with no switching of any of said components, and removing the first component from the combined signal to provide an output signal consisting of the second component and the translated first component.

4,105,871

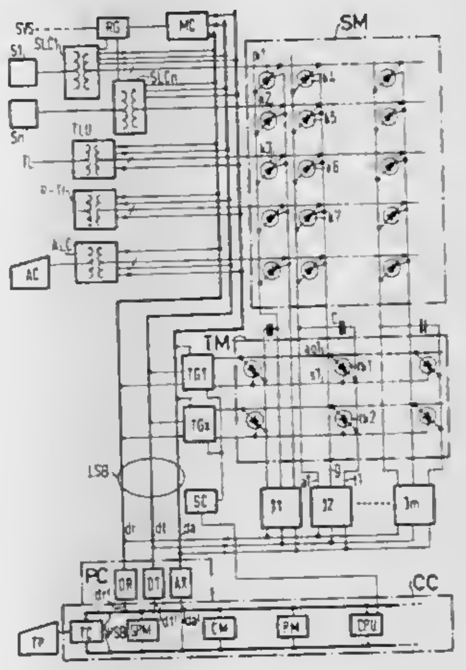
ELECTRONIC TELEPHONE SYSTEM FEATURING A CUSTOMER MEMORY WITHIN A CENTRAL CONTROL UNIT CONNECTED BY BUS LINES

Edwin Rowland Ely, Marlton, N.J.; David Moore Weigand, West Chester, and Hans Herbert Treichel, Philadelphia, both of Pa., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,309

Int. Cl.² H04Q *3/52*

U.S. Cl. 179—18 AD **1 Claim**



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for applying signal tones to said peripheral units, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through connections between said peripheral units, having control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit and to said program, customer and scratch pad memories, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

means connecting said customer memory to receive data, command and address signals via said bus lines, said means carrying faster rise time pulses than said othe bus lines, for enabling control by said central control means,

circuit means for coupling the data, command and address signals in the form of changing potentials to said customer memory including capacitor means coupling said circuit means to said customer memory, and

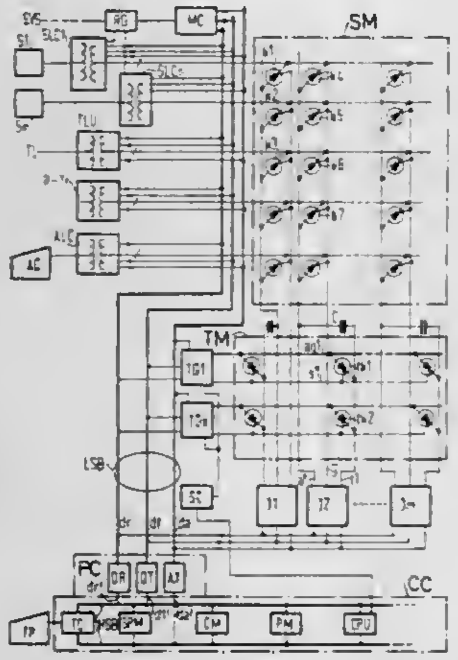
alternately activated plural transistor switches responsive to differing potentials from said data, command and address signals for supplying potentials to said capacitor means

4,105,872

ELECTRONIC TELEPHONE SYSTEM INCLUDING INTEREXCHANGE TRUNK REPEATERS FOR TRAFFIC WITH OTHER SYSTEMS

James Louis Parise, Cherry Hill; Carl Michael Schneider, Cinnaminson, and John Francis Farrell, Mt. Laurel, all of N.J., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,310
Int. Cl.² H04Q *3/52*
U.S. Cl. 179—18 AD 2 Claims



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral circuits, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

means in said trunk line circuits connected between tip and ring conductors for receiving different kinds of incoming seizure signals, as well as for controlling ring and dial signals, said means comprising:

a bridge rectifier circuit having terminals of one diagonal connected to said tip and ring conductors for receiving incoming seizure and ring signals and forming a current loop for those signals, and

means comprising a plurality of parallel-connected circuits for regulating the loop current, including first circuit means for transmitting outgoing seizure signals connected across the other diagonal of said bridge rectifier circuit,

second circuit means for transmitting supervisory signals connected across the other diagonal of said bridge rectifier circuit, and

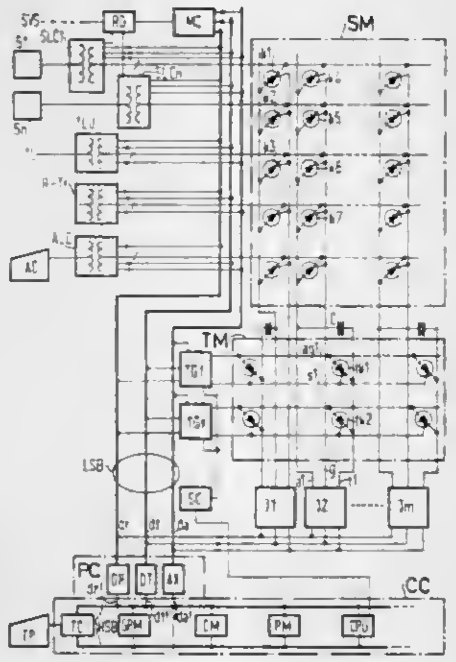
third circuit means for transmitting dial signals connected across the other diagonal of said bridge rectifier circuit.

4,105,873

ELECTRONIC TELEPHONE SWITCHING SYSTEM COMPRISING A SPEECH PATH SWITCHING MATRIX AND TONE-CONNECTING SWITCHING MATRIX AND EMPLOYING ELECTRONIC CROSSPOINT SWITCHES

Frederick William Schimmel, Gibbsboro, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,311
Int. Cl.² H04Q *3/52;* H04M *3/00*
U.S. Cl. 179—18 AD 2 Claims



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral circuits, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said peripheral units and to interconnect said tone generators to through-connections between said peripheral units, said matrices each including cross points, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

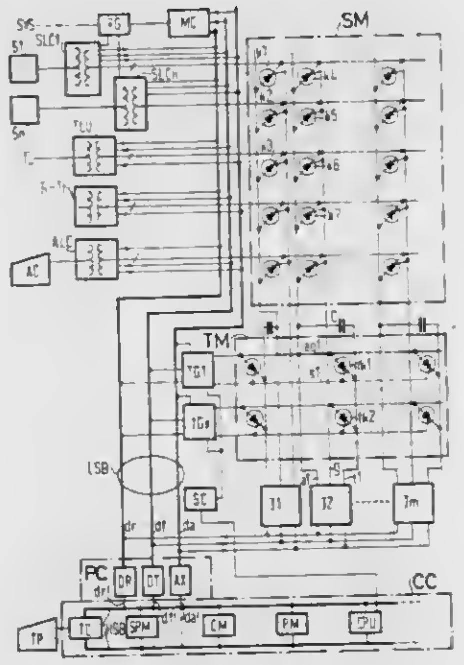
a plurality of three-terminal electronic switch means connected as cross point switches at respective cross points of said matrices, one of the terminals of each of said switch means in said speech path matrix being coupled to said central control means for regulating the attenuation of a speech path wire forming a through-connection.

4,105,874

CENTRALLY CONTROLLED ELECTRONIC TELEPHONE SYSTEM HAVING A CUSTOMER MEMORY FOR STORING INFORMATION ON TWO OR MORE DIFFERENT SUBSCRIBER STATIONS AND PERIPHERAL EQUIPMENT-SPECIFIC INFORMATION

Edwin Rowland Ely, Marlton, N.J.; David Moore Weigand, West Chester, and Hans Herbert Treichel, Philadelphia, both of Pa., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,313
Int. Cl.² H04Q *3/52*
U.S. Cl. 179—18 AD 2 Claims



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral circuits, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

a plurality of registers in said customer memory for receiving and storing information regarding individual ones of said peripheral units; and

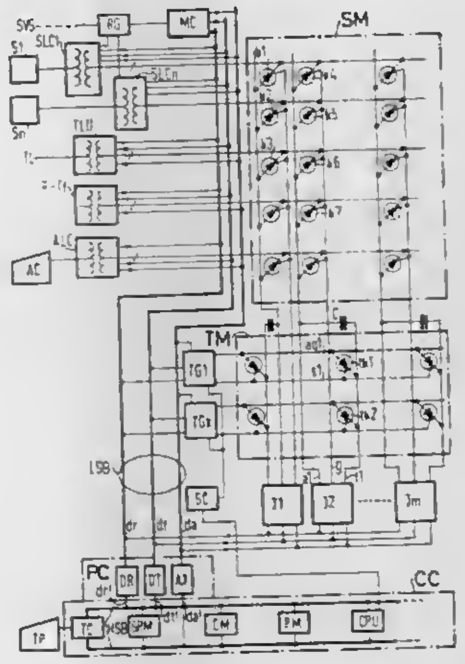
additional memory means for controlling the writing, reading and erasing of information stored in said plurality of registers.

4,105,875

ELECTRONIC TELEPHONE SWITCHING SYSTEM COMPRISING A SPEECH-PATH SWITCHING MATRIX AND TONE-CONNECTING MATRIX AND EMPLOYING ELECTRONIC CROSSPOINT SWITCHING DEVICES

Carl Michael Schaelder, Cinnaminson; Frederick William Schimmel, Gibbsboro, and John Francis Farrell, Mt. Laurel, all of N.J., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,314
Int. Cl.² H04Q *3/52*
U.S. Cl. 179—18 GF 4 Claims



1. In an electronic telephone switching system having peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators, having speech path and tone switching matrices for interconnecting said peripheral units and for connecting said tone generators to a through-connection between ones of said peripheral units, having a central control means constituted by a plurality of components including a central processing unit, program memory, customer memory and a scratch pad memory, having system timing means, and having bus lines interconnecting the components of said central control means for transmitting information pulses therebetween and other bus lines connecting said peripheral units to said central control means, the improvement comprising:

said speech path and said tone switching matrices being formed as one-wire switching matrices,

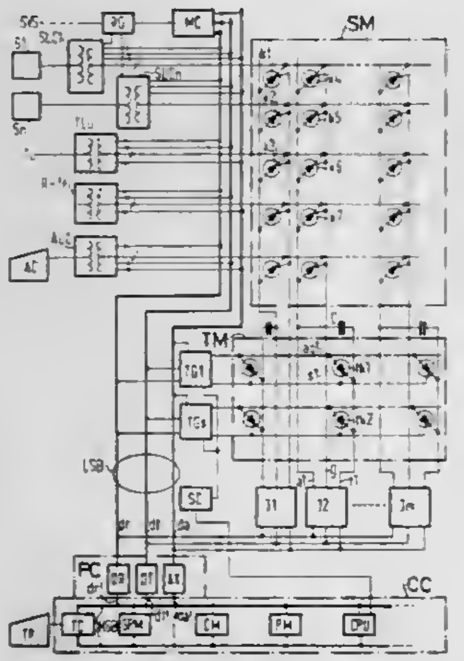
a plurality of electronic crosspoint switch means, a switch means being located at each crosspoint of said switching matrices, each said switch means having a conducting path terminated by first and second terminals and a control terminal for controlling the state of conduction of said conducting path,

said first and control terminals of said switch means in each coordinate in a first direction of said speech path matrix being connected in parallel to said link circuit, said second terminals of said speech path matrix switch means being connected, respectively, to coordinates in a second direction thereof,

said first and control terminals of said switch means in each second direction coordinates of said tone matrix being connected in parallel to a said tone generator, said second terminals of said tone matrix switch means being connected, respectively, to first direction coordinates therein, said tone matrix first direction coordinates being coupled, respectively, to said first direction coordinates of said speech path matrix to which said first terminals of said speech path matrix are connected, means for polling different ones of said peripheral units and of said link control circuits for defining the coordinates of given crosspoints in the speech path and tone matrices.

4,105,876
ELECTRONIC TELEPHONE SYSTEM FEATURING PERIODIC SCANNING OF ALL PERIPHERAL UNITS AND POLLING OF SPECIFIC PERIPHERAL UNITS FOR TRANSMISSION OF STATUS AND/OR INSTRUCTION INFORMATION

John Francis Farrell, Mt. Laurel, N.J., and Hans Herbert Treichel, Philadelphia, Pa., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Mar. 1, 1977, Ser. No. 773,315
Int. Cl.² H04Q *3/52*
U.S. Cl. 179—18 AD **2 Claims**



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral units, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and to interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

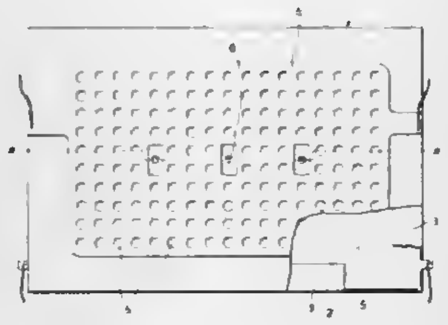
said bus lines including means carrying information pulses having fast rise times;

said other bus lines including means carrying information pulses having rise times which are slow compared to the rise times of information pulses being carried by the first-mentioned bus lines, the information pulses of the first-mentioned bus lines and on said other bus lines having the same speed of transmission; and

interface means for connecting the first-mentioned bus lines to said other bus lines at said central control means.

4,105,877
ELECTROSTATIC LOUDSPEAKER HAVING ELASTIC DIAPHRAGM SPACER ELEMENTS CURED IN SITU

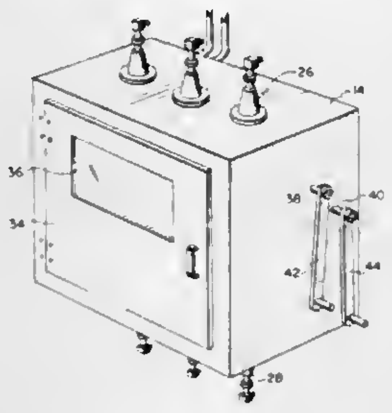
Bernardus Gradus Peters, 428 Houtsnijdershorst, Apeldoorn, Netherlands
Filed Apr. 25, 1977, Ser. No. 790,579
Int. Cl.² H04R *19/02*
U.S. Cl. 179—111 R **4 Claims**



1. An electrostatic loudspeaker which includes in combination: a diaphragm having two opposite sides, a frame supporting said diaphram and provided with substantially rigid walls respectively arranged on opposite sides of and spaced from said two opposite sides of said diaphragm and provided with means for permitting air to pass therethrough, electrodes respectively mounted on said walls, and means for elastically supporting said diaphragm comprising an elastic mass interconnecting at least one of said walls and said diaphragm, wherein said elastic mass adheres to said diaphragm and does not exert pressure thereon, said elastic mass being in a state prior to the elastic mass state when located in position initially.

4,105,878
VACUUM INTERRUPTER AND DISCONNECT COMBINATION

Kazuo H. Date, and Ronald A. Wainio, both of South Milwaukee, Wis., assignors to McGraw-Edison Company, Elgin, Ill.
Filed Jan. 17, 1977, Ser. No. 759,656
Int. Cl.² H01H *33/12, 33/66*
U.S. Cl. 200—146 R **12 Claims**



1. In a circuit interrupter and visible break disconnect combination which includes support means, an interrupter operating means mounted on the support means, and a disconnect operating means mounted on the support means, at least one switching assembly comprising:

first and second spaced apart electrical insulator support members, affixed to the support means;

a first electrically conductive terminal member affixed to one end of the first insulator support member;

a second electrically conductive terminal member affixed to one end of the second insulator support member;

an elongated, electrically insulative disconnect support member, pivotably mounted at one end thereof to the second terminal member for rotation about an axis of the second terminal member between a close and an open position;

a third electrically conductive terminal member, affixed to an opposite end of the disconnect support member, which is engaged with the first terminal member when the disconnect support member is in its close position, and is disengaged and spaced from the first terminal member when the disconnect support member is in its open position;

an insulative disconnect connecting link means, having one end pivotably attached to a median portion of the disconnect support member and another end attached to the disconnect operating means, for connecting the disconnect support member for pivotal movement by the disconnect operating means, between the open and close positions of the disconnect support member corresponding to respective open and close positions of the disconnect operating means;

a circuit interrupter carried by the disconnect support member and comprising a first electrically conductive interrupting contact member affixed to the third terminal member, and a second electrically conductive interrupting contact member which is movable relative to the first interrupting contact member between a closed position at which the second interrupting contact member engages the first interrupting contact member, and a tripped position at which the second interrupting contact member is disengaged and spaced from the first interrupting contact member;

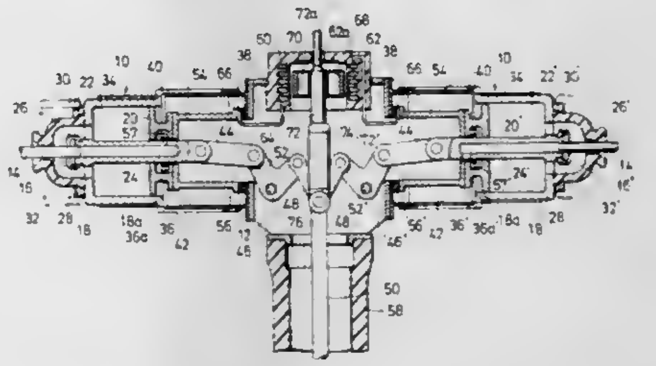
an electrically conductive bell crank pivotably mounted to the second terminal member, for rotation between a closed and a tripped position, said bell crank having one of its two arms pivotably connected to the second interrupting contact member so that the closed and tripped positions of the second interrupting contact member corresponds respectively to the closed and tripped position of the bell crank, and the pivotal axis of the second interrupting contact member about the bell crank arm coincides with the pivotal axis of the disconnect support member about the second terminal member when the bell crank is disposed in its tripped position;

an insulative interrupter connecting link means having one end pivotably attached to the other arm of the bell crank and another end attached to the interrupter operating means, for connecting the bell crank for rotation by the interrupter operating means between the tripped and closed positions of the bell crank, corresponding to respective tripped and closed positions of the interrupter operating means.

4,105,879
MAGNETIC PUFFER TYPE GAS CIRCUIT BREAKER

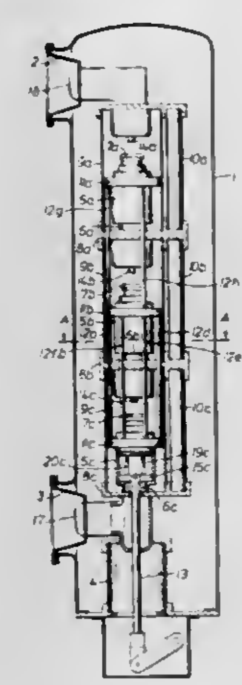
Masanori Tsukushi, Hitachi; Katsuichi Kashimura, Takahagi; Kunio Hirasawa, and Yoshio Yoshioka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Mar. 7, 1977, Ser. No. 775,196
Claims priority, application Japan, Mar. 12, 1976, 51-26160
Int. Cl.² H01H *33/88*
U.S. Cl. 200—148 A **15 Claims**

7. A magnetic puffer type gas circuit breaker comprising at least one pair of contacts mounted for movement into and out of contact with each other; a puffer unit including a puffer cylinder and a puffer piston responsive to opening of said contacts for compressing an arc-extinguishing gas and blowing it against arcs produced between said opening contacts; operating means for effecting opening and closing of said contacts; an electromagnetic driving unit for aiding the opening operation of said operating means and the operation of said puffer unit including an electromagnetic coil connected to receive the current to-be-interrupted, and an electromagnetic repulsive member electromagnetically coupled with said electromagnetic coil and connected to said operating means for movement in a closing direction and a breaking direction to produce an electromagnetic repulsive force aiding the opening operation of said operating means; and commutation unit which commutates the current to-be-interrupted to said electromagnetic coil upon opening of said contacts; said electromagnetic repulsive member being so constructed that a closed portion of said contacts, the electromagnetic neutral position of said member deviates slightly on the closing side with respect to the electromagnetic center of said electromagnetic coil, and that absolute values of the electromagnetic forces of said electromagnetic coil and said electromagnetic repulsive member at points equally distant from a point at which the electromagnetic center of said electromagnetic coil and the electromagnetic neutral position of said electromagnetic repulsive member are coincident become smaller on the closing side than on a breaking side.



4,105,880
ARC BLOW-OUT SWITCH

Günter Rapp, Kassel-Be, and Marcel Celestin Konrad, Kassel-Wilh, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany
Filed Jan. 12, 1977, Ser. No. 758,870
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601857
Int. Cl.² H01H *33/88*
U.S. Cl. 200—148 A **5 Claims**



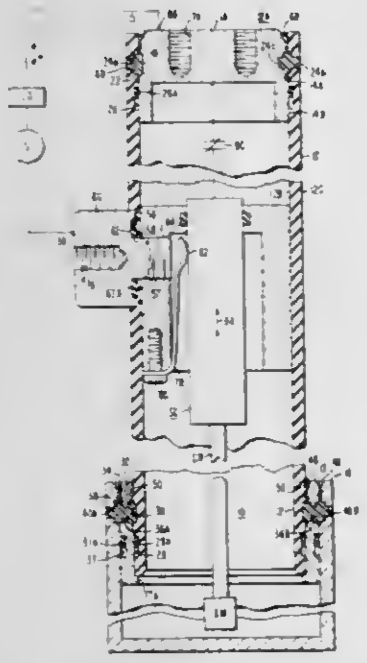
1. In an arc blow-out switch having a central switch unit and two outer switch units arranged in tandem; means for supporting the switch units; each switch unit including a movable compression cylinder and a stationary compression piston arranged in the compression cylinder; axially aligned insulating cylinders surrounding each switch unit; actuator rod means connected to the compression cylinders for moving them as a

unit to effect circuit making and circuit breaking operations, and a switch drive arranged adjacent one of the outer switch units for driving the actuator rod means; the improvement wherein said actuator rod means couple said switch drive to the compression cylinders of the three switch units and comprise a total of six actuator rods each affixed to the compression cylinder of said one of said outer switch units and to the compression cylinder of said central switch unit; said actuator rod means further comprising a total of three actuator rods each affixed to the compression cylinder of said central switch unit and the compression cylinder of the other of said outer switch units.

4,105,881
CIRCUIT BREAKER APPARATUS WITH STATIC PRESSURE LOCK

Peter M. Kowalik, Penn Township, Allegheny County, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1976, Ser. No. 709,848
Int. Cl.² H01H *33/64*
U.S. Cl. 200—148 B **28 Claims**



1. Circuit interrupter apparatus, comprising:

a. a vessel for containing pressurized gas at the time of current interruption and having an opening therein, said vessel having a plurality of indentations on a portion thereof proximate to said opening;

b. cover means for protruding into and closing said opening, said cover means having a plurality of indentations on the portion thereof which protrudes into said opening and which align with an equal number of said indentations in said vessel;

c. a mass of hardened material disposed originally as fluid material in each of a sufficient number of said cover means indentations and said aligned vessel indentations to key said cover means to said vessel to prevent substantial movement of said cover means away from said vessel under the pressure of said gas;

d. separable contact means disposed within said vessel for making and breaking an electrical circuit in a gaseous atmosphere;

e. operating means interconnected mechanically with said separable contact means for opening and closing said separable contact means; and

f. electrical terminal means disposed upon said vessel in electrical relationship with said separable contact means and adapted to interconnect said contact means with said electrical circuit.

25. A method for covering an opening in a gas containing vessel with cover means, comprising the steps of:

a. placing a plurality of keying indentations on a portion of said vessel proximate to said opening;

b. placing a plurality of keying indentations on a portion of said cover means;

c. placing a gasket indentation on a portion of said vessel, wherein said vessel keying indentations are closer to the opened end of said vessel than said gasket indentation is;

d. disposing said cover means in said opening at a distance therein which is further from said opening than either said vessel keying indentations or said gasket indentations;

e. inserting a gasket in said gasket indentation;

f. moving said cover means towards said opening to overlap said gasket and align an equal number of vessel keying indentations and cover means keying indentations;

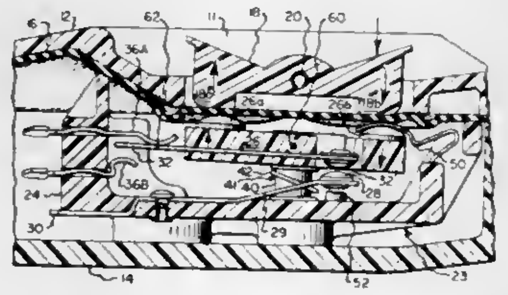
g. disposing fluid material which may be subsequently hardened in each of a sufficient number of cover means keying indentations and aligned vessel keying indentations to subsequently key said cover means to said vessel; and

h. hardening said fluid material into a mass to key said cover means to said vessel to prevent substantial movement of said cover means relative to said vessel.

4,105,882
CONTROL STATION SWITCH

Otmar M. Ulbing, Webster, and Edmund R. Koval, Tonawanda, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Mar. 3, 1977, Ser. No. 773,975
Int. Cl.² H01H *21/10*
U.S. Cl. 200—157 **23 Claims**



1. A pressure actuated switching apparatus, wherein said switching apparatus comprising:

a. a base having first and second electrical base contact means longitudinally spaced and electrically insulated from one another;

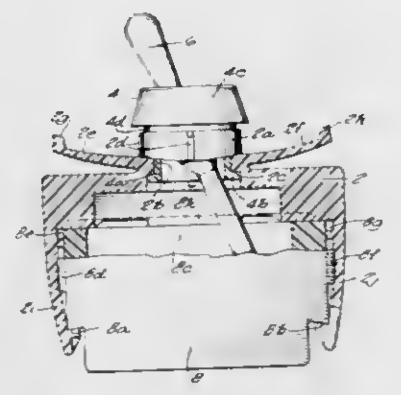
b. an armature having a longitudinal axis and having first and second electrical armature contacts longitudinally spaced from one another, said first and second electrical armature contacts being connected by an electrical conductor;

c. means acting between said base and said armature for resiliently mounting said armature laterally of said base with said first and second electrical armature contacts adjacent to said first and second electrical base contact means respectively, said mounting means permitting rotational movement of said armature about a plurality of axes transverse to the longitudinal axis of said armature, whereby a laterally directed force applied to either of said first or second ends of said armature tends to produce rotational movement of said armature about one of said plurality of axes, said axes including at least a first and a second transverse axis, said first transverse axis positioned intermediate said first and second electrical contacts of said armature, said second transverse axis positioned at the point of contact between said first armature contact and said first base contact means; whereby pressure applied at one end of said armature tends to produce a first rotation about said first axis until said first armature contact and said first base contact means are brought into electrical contact and whereby continued pressure on said armature tends to produce a second rotation about said second axis until said second armature contact and said second base contact means are brought into electrical contact with one another.

4,105,883
ELECTRIC SWITCH HAVING A FRAME WITH IMPROVED SNAP-IN BASE RETENTION MEANS

Jerome K. Hastings, Sussex, and Earl T. Piber, Oconomowoc, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 9, 1976, Ser. No. 694,389
Int. Cl.² H01H *9/00*
U.S. Cl. 200—296 **8 Claims**



1. An electric switch comprising:

a switch housing comprising a base enclosing switch contacts and a frame overlying said base and having an aperture;

an actuator mounted to said frame and extending through said aperture for operating the switch contacts within said base;

and means for snap-in mounting said frame and base to one another comprising:

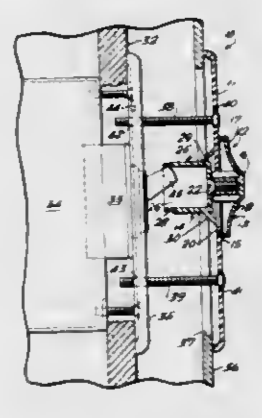
undercut portions on opposite ends of said base;

a pair of spaced, depending legs on said frame curving gradually inwardly toward one another and tapering downwardly toward their lower ends for even stress distribution and having hooks at their lower ends; said legs being flexible to afford spreading thereof to receive said base therebetween so that said hooks snap-in to grip said undercut portions while said hooks and the upward and inward stresses or forces in said legs resulting from the forced partial unrolling of the curvature in said legs provide inward and upward bias on said base to secure it rigidly to said frame while taking up small dimensional tolerances in said base.

4,105,884
ELECTRICAL TOGGLE SWITCH LEVER EXTENDER

Arnold M. Damsky, 821 83rd St., Miami Beach, Fla. 33141

Filed Apr. 4, 1977, Ser. No. 784,042
Int. Cl.² H01H *3/20*
U.S. Cl. 200—331 **5 Claims**

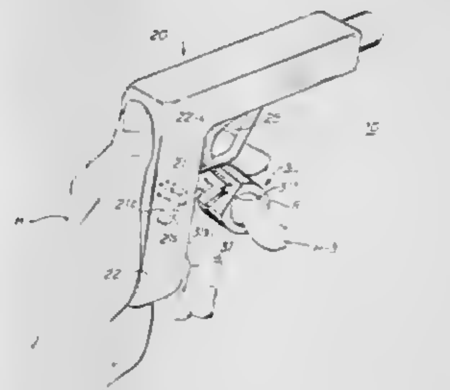


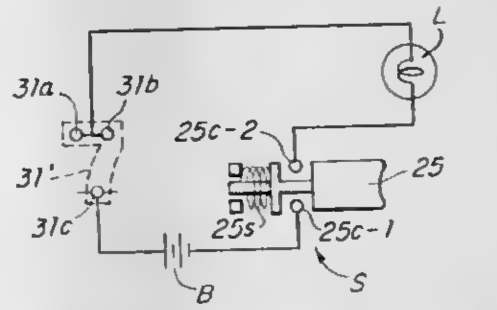
1. In an electrical toggle switch lever extender for use in association with a toggle switch cover plate of the type having an elongated opening for the passage of a toggle switch lever, the improvement comprising, an actuating member receivable in said elongated opening in the cover plate for reciprocative motion with respect thereto in the direction of the major axis of said elongated opening, said actuating member comprising a knob portion at the outside of the cover plate and a recessed carrier portion at the inside of the the cover plate for the reception of an electrical toggle switch lever to be extended, said actuating member knob portion comprising a knob member integrally formed with slide abutment means receivable in the cover plate opening for constraining said knob member to rectilinear sliding movement therein, said recessed carrier portion comprising a separate carrier member, and means for removably attaching said carrier member with respect to said knob member at zones thereof within said cover plate opening, said carrier member comprising a hollow rectangular body portion having a terminal end portion defining said recess opening, said carrier member body portion being integrally formed, at the inner end thereof, with a pair of opposed, angularly-outwardly-extending wing portions, said wing portions projecting beyond the outer surface of the inside of said body portion and terminating in a plane parallel with the plane of said body portion outer surface.

4,105,885
HAND OPERATED INSTRUMENTS HAVING NON-MAGNETIC SAFETY SWITCH

Henry Orenstein, Verona, N.J., assignor to Consumer Concepts, Inc., Union, N.J.

Filed Jun. 22, 1976, Ser. No. 698,713
Int. Cl.² H01H *35/00, 9/06;* F41C *19/12;* A44C *13/00*
U.S. Cl. 200—52 R **10 Claims**





1. A hand operated instrument which comprises

a housing;

a recess in a hand holdable portion of said housing;

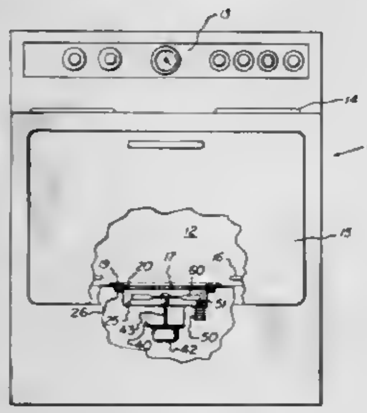
said recess having fixed configuration contact means therein;

said contact means being engagable by a non-magnetic bridging contactor on an outer peripheral face of a ring worn by the operator of said instrument; and

said bridging contactor being insertable in said recess and engages said contact means whereby said instrument becomes operational.

4,105,886
MICROWAVE ENERGY FEED SYSTEM FOR COMBINATION COOKING APPARATUS

David Alan Baron, Edina, and James Ronald Hampton, Brooklyn Center, both of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Filed Jul. 6, 1976, Ser. No. 702,489
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 E **1 Claim**



1. A domestic cooking appliance having surface heating elements and an oven cavity, said oven cavity adapted to cook foods with either microwave energy alone or thermal energy alone or both simultaneously, thermal heating means mounted in said oven cavity, said cavity having a portion cut away from the bottom wall thereof;

microwave energy feed means subjacent said cavity in energy transmitting communication therewith through said cut-away portion, said feed means comprising a box-like housing of substantially smaller size and dimensions than said oven cavity mounted to the underside of said cavity, the perimeter dimensions of said housing substantially matching those of said cut away portion, a magnetron having an antenna portion extending directly into said housing, and energy deflecting means rotatably mounted in said housing;

covering means across said cut-away portion and covering said housing to prevent the egress of food materials from said cavity into said housing, said covering means being substantially transparent to microwave energy and able to withstand temperatures normally encountered in cooking.

4,105,887
WELDING APPARATUS AND METHOD

Denis John Marshall, Ware, and Terry Martin Mohin, Woodgate End Nr Broxted, both of England, assignors to BOC Limited, London, England
Filed Jan. 27, 1976, Ser. No. 652,742
Claims priority, application United Kingdom, Nov. 18, 1975, 47498/75
Int. Cl.² B23K *9/16*
U.S. Cl. 219—72 **2 Claims**

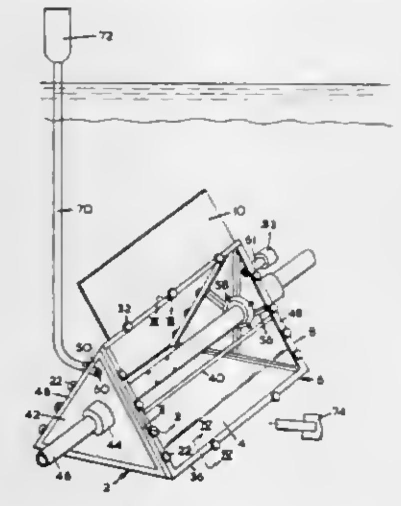
1. A chamber in which underwater welding is able to be performed, having:

(a) means to secure said chamber to an underwater structure;

(b) walls and an open base, whereby when the chamber is secured to the structure and when gas is passed into the chamber, water is displaced therefrom through the open base and a gas space is created therein;

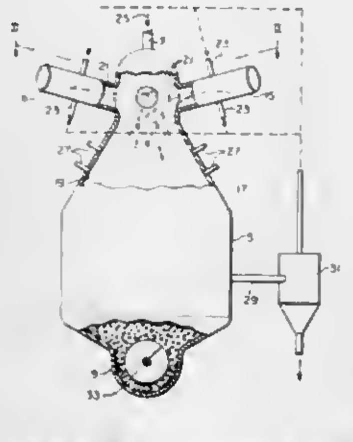
(c) a frame including at least two spaced apart upwardly extending channel members facing each other;

(d) panels engaged in a gas-tight manner with the frame so as to form the walls of the chamber; at least one of the panels being of transparent material and forming a side of the chamber being slidably movable within said channels relative to the frame to make an opening in the frame through which a welding rod or welding gun is able to be inserted into the space within the chamber.



4,105,888
ARC HEATER APPARATUS FOR PRODUCING ACETYLENE FROM HEAVY HYDROCARBONS

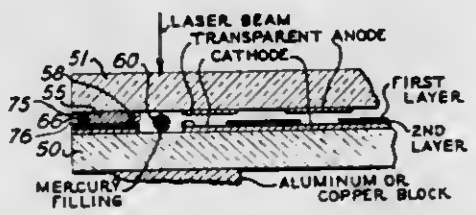
Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 9, 1976, Ser. No. 703,740
Int. Cl.² H05B *7/18*
U.S. Cl. 219—121 P **3 Claims**



1. Arc heater apparatus for producing acetylene from heavy hydrocarbon, comprising walls forming a plenum chamber having a substantially vertical axis, a plurality of arc heaters at the upper end of the chamber and including a pair of axially spaced substantially cylindrical electrodes forming a narrow gap therebetween and adapted to be connected to a source of potential to produce an arc therebetween, the electrodes defining an arc chamber that communicates with the plenum chamber, the axes of the arc chambers of the arc heaters being inclined upwardly from the vertical axis, gas inlet means communicating with the gap for introducing a non-conductive reducing gas into the arc chamber, the arc heaters being productive of an arc heated plasma gas to effect a downstream reaction zone in a plenum chamber, second inlet means upstream of the arc heaters for introducing heavy hydrocarbon material into the reaction zone, and the walls forming the plenum chamber diverging downwardly and outwardly from the location of the arc heaters so that deposits of solid reaction products on the walls are minimized.

4,105,889
LASER METHOD OF INTRODUCING MERCURY TO GAS DISCHARGE DISPLAY PANELS

George A. Kupsky, State College, Pa., assignor to Owens-Illinois, Inc., Toldeo, Ohio
Division of Ser. No. 492,992, Jul. 30, 1974, Pat. No. 4,009,407. This application Nov. 16, 1976, Ser. No. 742,327
Int. Cl.² B23K *26/00*
U.S. Cl. 219—121 LM **2 Claims**



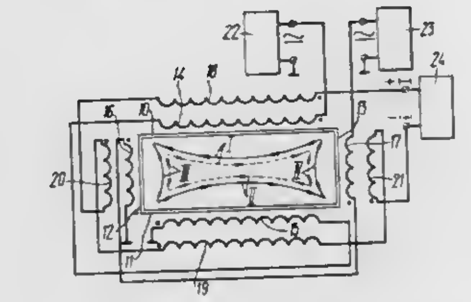
1. A process of introducing mercury in a flat, tubulationless, gas discharge display panel device having a pair of spaced opposed laser transparent windows in glass plates forming said device, said windows being outside the information display area of said discharge device, a laser activatable mercury giver located in the discharge gas medium in the space between said laser transparent windows, comprising

placing a thermally conductive, not highly reflective metal block on the exterior surface of one of said windows,

directing a beam of laser energy through the other of said windows onto said laser activatable giver to cause elemental mercury to be released within the gas medium in said device.

4,105,890
DEVICE FOR ELECTRON-BEAM HEATING OF MATERIALS

Boris Alexeevich Movchan, ulitsa Darvina, 7, kv. 7; Viktor Alexandrovich Timashov, Vozdukhoflotsky prospekt, 5, kv. 10, and Konstantin Nikolaevich Kljnev, ulitsa Shota Rustavell, 30, kv. 13, all of Kiev, U.S.S.R.
Filed May 2, 1977, Ser. No. 792,981
Claims priority, application U.S.S.R., May 3, 1976, 2355080
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 EB **2 Claims**



1. A device for electron-beam heating of materials comprising:

an electron gun for producing an electron beam;

an electromagnetic system for controlling said electron beam having

a closed rectangular magnetic circuit provided with four rods;

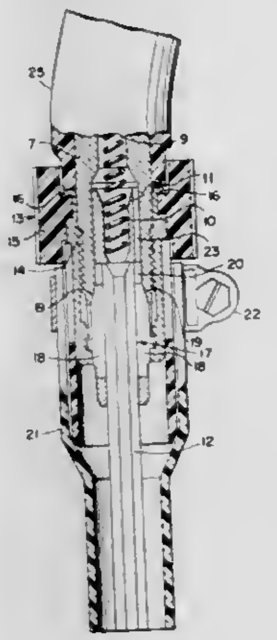
at least two beam deflection windings arranged on opposite rods of said magnetic circuit and intended to deflect said electron beam in a plane normal to the plane of said beam;

at least two beam correction and spreading windings arranged on the other two opposite rods of said magnetic circuit and intended to deflect said electron beam on the surface of a material being heated; and

at least four windings, each being arranged on a respective rod of said magnetic circuit, the magnetic fields created by the current flowing through said windings forming a magnetic quadrupole lens.

4,105,891
METAL-INERT-GAS WELDING TORCH

Clifford W. Hill; Donald W. Carkhuff, and Frank J. Pilia, all of Florence, S.C., assignors to Union Carbide Corporation, New York, N.Y.
Continuation of Ser. No. 540,456, Jan. 13, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,350
Int. Cl.² B23K *9/16*
U.S. Cl. 219—137.43 **7 Claims**



1. In a gas shielded consumable electrode arc welding torch including a torch handle, a torch body having a gas passage therein fitting into said handle, a wire guide assembly fastened at one end thereof to said torch body and having a gas passage communicating with the gas passage in said torch body, a tubular contact tip removably attached to the forward end of said wire guide assembly and an insulated nozzle assembly mounted around said contact tip, the improvement of which comprises:

a collet member fitted over said contact tip and having a plurality of resilient spidered sections at one end thereof terminating in tapered portions which seat with mating tapered portions on the forward end of said wire guide assembly whereby said collet member and said contact tip are maintained in alignment with said wire guide assembly, said resilient spidered sections defining a plurality of gas passages adjacent to said contact tip;

a collet nut rotatably fastened to the forward end of said wire guide assembly and engaging said collet member in a manner whereby to permit said collet member to rotate within the forward end of said wire guide assembly when said collet nut is rotatably fastened thereto;

means affixed to said collet nut for rotating said collet nut when fastened onto the forward end of said wire guide assembly and for tightening the engagement between the mating tapered portions of said collet member and wire guide assembly whereby said resilient spidered sections are caused to tightly grasp said contact tip;

means forming a plenum chamber communicating with the gas passage in said wire guide assembly and said plurality of gas passages defined by said resilient spidered sections whereby gas is allowed to pass at least along a portion of said contact tip; and

means for independently securing said insulating nozzle assembly onto said collet nut.

4,105,892

THIN RESISTOR FILM TYPE THERMAL HEAD FOR PRINTING ON HEAT-SENSITIVE PAPER

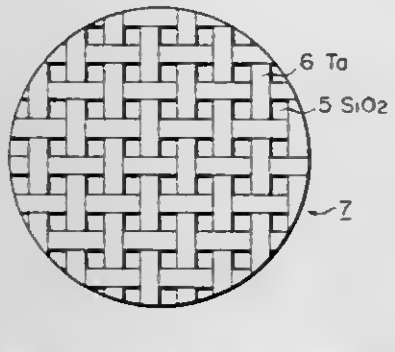
Mitsuhiko Tashiro, Kawasaki; Shouzon Takeno, Yokohama; Kakuo Mihara, Yokohama, and Tadayoshi Kinoshita, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 15, 1977, Ser. No. 816,144

Claims priority, application Japan, Jul. 19, 1976, 51-85008

Int. Cl.² H05B *1/00*

U.S. Cl. 219—216 **4 Claims**



1. A thermal head for printing on heat-sensitive paper which comprises a thin heat-generating resistor film prepared from at least one system selected from the group consisting of Ta—SiO_2 and Ta—N—SiO_2, wherein the content of SiO_2 in each system is 7 to 53 mol %.

4,105,893

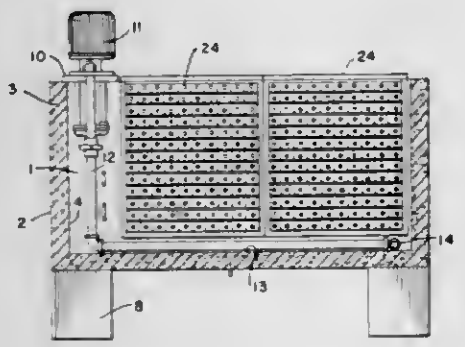
APPARATUS AND METHOD FOR TREATING SUGAR CANE STUMPS

Wilson Marcelo Da Silva, Sao Paulo, Brazil, assignor to Cooperativa Central Dos Productores de Acucar e Alcool do Estado de Sao Paulo, Sao Paulo, Brazil

Filed Oct. 29, 1976, Ser. No. 737,105

Int. Cl.² H05B *1/00*

U.S. Cl. 219—316 **3 Claims**



1. In a thermotherapeutic apparatus using water for the treatment of sugar cane stumps left after cutting, a tank of a given depth having upright peripheral walls and a bottom wall, said walls being provided with a layer of material for thermal insulation, said bottom wall having a drain provided with a valve, supporting feet connected with said tank, a supporting plate mounted on one end of the tank, an electric immersion pump mounted on said plate, an upright central tube extending from said pump, a tube extending from said upright tube disposed along the length of the tank near its bottom, and connected, at its opposite end, with a transverse tube near the opposite end of the tank, said tubes being provided with holes for the passage of water, two U-shaped electric resistance heating elements mounted on one lateral wall of the tank and accessable from the outside by means of an opening with a lid in said wall, a thermostat comprising a thermometer mounted on said plate provided with an immersion rod, a box containing a relay mounted on said supporting plate, said relay being controlled by said thermostat to control said resistance heating elements and said pump.

4,105,894

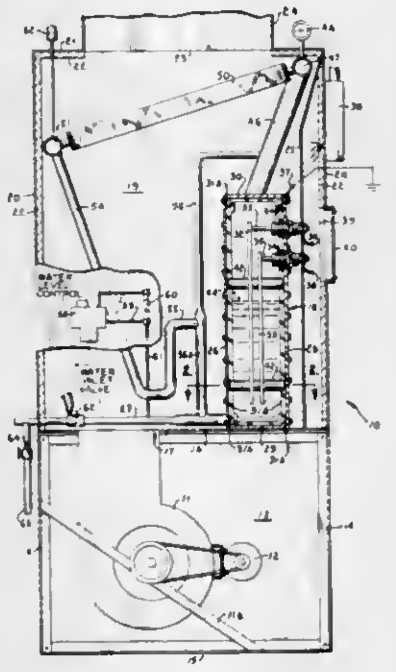
STEAM HEATED HOT AIR FURNACE HAVING AN ELECTRIC STEAM BOILER

John Allen Parks, 5932 Charlotte, Kansas City, Mo. 64110

Filed Jan. 14, 1976, Ser. No. 648,961

Int. Cl.² H05B *3/60;* F24H *3/08;* F22B *1/30;* F24D *13/04*

U.S. Cl. 219—365 **6 Claims**



1. A furnace comprising:

a furnace housing having an air inlet;

a boiler located within said housing for containing water;

water level control means for maintaining a predetermined water level within said boiler;

electrical insulation coating the entire inside surfaces of said boiler;

a single pair of electrodes supported within said boiler in spaced relation;

means for applying a voltage differential between said electrodes to effect heating of water in said boiler to the boiling point;

a steam conduit in said housing extending from the top of said boiler to receive steam therefrom;

a heat exchanger in said housing coupled to said steam conduit to receive steam therefrom;

blower means in said housing for forcing a flow of air past said heat exchanger to heat the flowing air by heat exchange with the steam in said steam conduit;

an outlet duct from said housing to direct the heated air out of the housing;

an equalizer line having upper and lower ends, said upper end connected to said steam conduit at the top of said boiler and said lower end connected to said boiler near the bottom thereof;

a Hartford loop located remote from said boiler and being, in vertical elevation, located above the bottom of said boiler but below the water level within the boiler, said Hartford loop having one end connected to said equalizer line intermediate the upper and lower ends thereof; and

a condensate return line interconnecting said heat exchanger and the other end of said Hartford loop whereby condensate from the heat exchanger flows through said return line and through said Hartford loop to said equalizer line for return to said boiler.

4,105,895

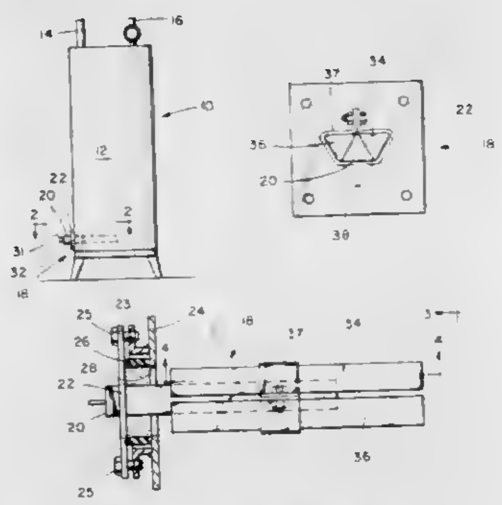
ELECTRIC WATER HEATER UTILIZING A HEAT PIPE

James E. Kennedy, Crofton, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Feb. 2, 1976, Ser. No. 654,483

Int. Cl.² F24H *1/20;* F28D *15/00;* H05B *3/78*

U.S. Cl. 219—326 **11 Claims**



1. A heating device for applying heat to the interior of a substantially closed container containing a liquid therein to be heated, comprising a separate, elongate, cartridge-type electric heating unit, separate, elongate heat transfer means for transferring heat between the ends thereof, said heat transfer means having a heat absorbing end and a heat transmitting end and having high conductivity with a low temperature differential between the ends thereof, means for attaching said heating unit adjacent said heat absorbing end of said heat transfer means, and means for securing said heating device in a fluid-tight manner in a wall of a container with said heat transmitting end of said heat transfer means positioned within the container to apply heat to a liquid in the container, said securing means including a mounting flange having an aperture therein for receiving said cartridge-type electric heating unit, means for holding said heating unit in a fluid-tight manner in said aperture and means for fastening said flange in a fluid-tight manner to the wall of the container about an opening therein.

4,105,896

ROTARY DEVICE FOR PRODUCING AND/OR PROCESSING WEBS, PIECES, FOILS AND COMPOSITE MATERIALS

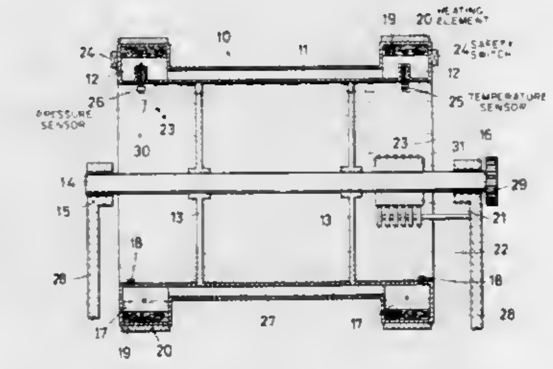
Wolfgang Schuster, Kalletal, Germany, assignor to Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Germany

Filed Dec. 3, 1975, Ser. No. 637,431

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543806

Int. Cl.² B21B *27/10;* D06C *15/08;* H05B *3/00*

U.S. Cl. 219—470 **7 Claims**



1. A rotary device for producing and/or processing webs, pieces, foils and composite materials, more particularly, for processing textile webs and pieces in the field of manufacturing ready-to-wear clothing and for producing and processing foils and composite materials in the field of processing synthetic materials, said rotary device comprising a double-walled hollow cylinder including radially inner and outer spaced walls, end plates at the ends of said walls and defining a vapor condensation chamber such that the radially outer wall is heated by means of vapors condensing thereon, said condensation chamber carrying a liquid for vaporization and condensation, the improvement comprising:

one of said walls including radial projections at opposed ends and defining with said end plates annular compartments of increased radial size relative the portion of said chamber interposed between said annular compartments,

heating elements mounted to said double walled hollow cylinder at said annular compartments, and

a steel wool packing carried within each annular compartment and extending in a continuous, annular manner throughout each compartment such that said vaporizable liquid is distributed by said steel wool packing throughout said compartment for effective vaporization by energization of said heating elements.

4,105,897

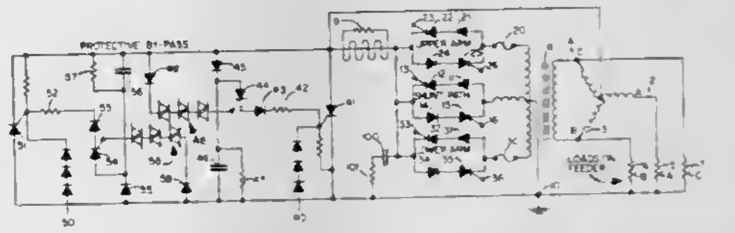
CYCLOCONVERTER APPARATUS AND METHOD FOR WORKING INTO AN ACTIVE LOAD

Lawrence J. Stratton, Lexington; Dennis C. Jeffreys, Bedford; Albert W. Welz, Jr., Westford, and Reed H. Johnston, Wellesley, all of Mass., assignors to New England Power Service Company, Westborough, Mass.

Filed Apr. 13, 1976, Ser. No. 676,468

Int. Cl.² H02J *3/02*

U.S. Cl. 307—3 **27 Claims**



1. A naturally commutated cycloconverter for the use with an external, alternating current power source that supplies power to at least one active impedance, said cycloconverter comprising:

(a) a plurality of selectively controlled, unidirectional current path means arranged in pairs with each pair of unidirectional current path means providing for bidirectional current flow, said pairs being connected in parallel with each other and connected with the external, alternating current power source and said at least one active impedance so that the magnitude and phase of the current supplied to said at least one active impedance from said external, alternating current power source through the plurality of unidirectional current path means are determined by the voltage of the external, alternating current path source and by the said at least one active impedance that is supplied power by said external, alternating current power source;

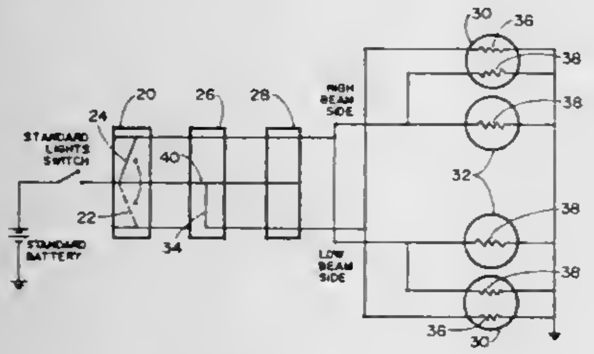
(b) means for supplying an input wave for each of said pairs of a plurality of selectively controlled, unidirectional current path means; and

(c) means for selectively controlling the conduction states of the unidirectional current path means in each pair.

4,105,898
MULTI-BEAM LIGHT SWITCH

Buist A. Farler, 568 Brewer Dr., Nashville, Tenn. 37211, and Billy F. Vanderpool, 112 Fairway Dr., Nashville, Tenn. 37214

Filed Sep. 19, 1975, Ser. No. 614,970
Int. Cl.² B62D *45/00;* H02G *3/00*
U.S. Cl. 307—10 LS **5 Claims**



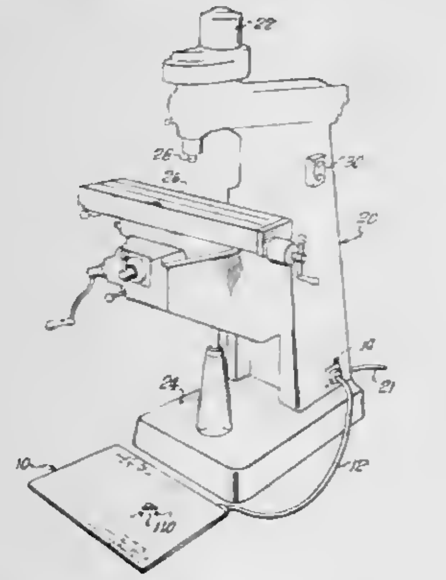
1. An improved headlight system for motor vehicles having at least two sealed beam headlamps providing high and low beam illumination, a floor dimmer switch having at least two operable positions, energizing circuit means connected to said high beam in one position of said switch or said low beam in another position of said switch, wherein the improvement comprises:

(a) an adaptor having a body of insulating material;
(b) means on said body connecting said floor dimmer switch thereto;
(c) means on said body connecting said energizing circuit means thereto; and
(d) means in said body connecting said floor dimmer switch and said energizing circuit means to illuminate the low beam in one position of said floor dimmer switch and to illuminate both the high and low beams simultaneously in another position of said floor dimmer switch.

4,105,899
SAFETY MAT SWITCH FOR MACHINE TOOLS AND THEIR LIKE

Joseph M. Velosa, 515 N. Lone Hill, San Dimas, Calif. 91773

Filed Jan. 12, 1977, Ser. No. 758,508
Int. Cl.² H01H *3/14*
U.S. Cl. 307—115 **8 Claims**



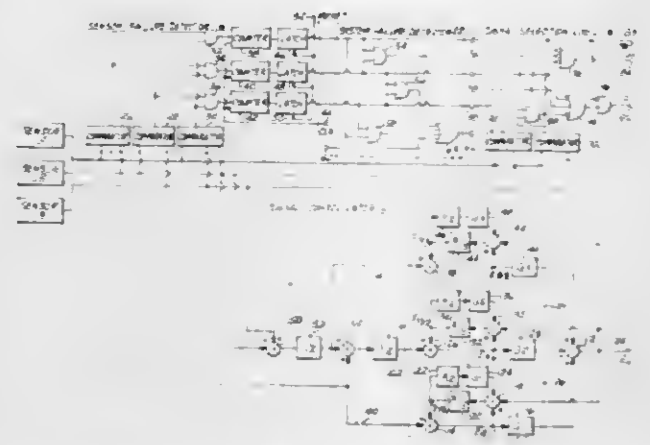
1. A safety device for a machine equipped with an electrically operated primary controller for the prime mover thereof, comprising:

a mat switch, including electrical switching elements reciprocable between an open and a closed position, with said closed position attained upon the sensing of the weight of an operator on the mat, and the open position regained upon the removal of such weight,
quick-disconnect connector means, with a socket affixed to said machine and a plug electrically interconnected with said switching elements by means of insulated conductors passing through a flexible cable,
a source of low-voltage electrical current,
a relay-operated, normally open, control switch, with the coil thereof electrically interconnected with said source through said connector means and said mat switch, and
conductor means, operatively interconnecting said primary controller with the normally open switch contacts of said control switch, whereby said primary controller is energized while the switching elements of said mat switch remain in the closed condition during the presence of the operator on the mat, with said socket and said plug conductively engaged in said connector means.

4,105,900
SIGNAL SELECTION APPARATUS FOR REDUNDANT SIGNAL SOURCES

Donald L. Martin, Bellevue, and David B. Yanke, Seatle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 16, 1977, Ser. No. 769,395
Int. Cl.² H03K *17/00;* G05B *9/03*
U.S. Cl. 307—219 **16 Claims**



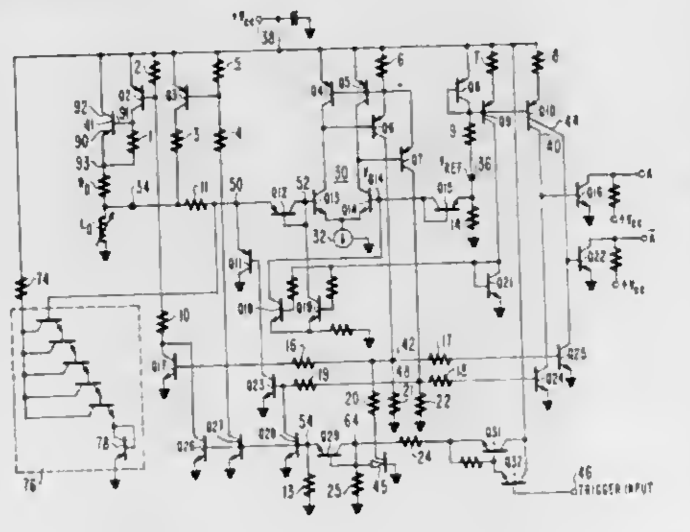
1. Signal selection apparatus for supplying an output signal derived from a plurality of redundant signals supplied by a plurality of signal sources, each of said redundant signals representing substantially identical information with one of said signal sources being a precision signal source supplying more precise signal information than the remaining ones of said signal sources, said signal selection apparatus comprising:

signal selection means responsive to a signal source failure signal associated with each of said signal sources, each of said signal source failure signals indicating when the signal source associated therewith is operational and indicating when the signal source associated therewith operates in a failure state, said signal source selection means further responsive to said plurality of redundant signals, said signal source selection means including logic means for comparing said more precise signal supplied by said precision signal source with the signals supplied by the remaining signal sources, said logic means including means for supplying a first selection signal having a first predetermined value when the magnitude of said more precise signal exceeds the magnitude of each of the redundant signals supplied by said remaining signal sources by a first predetermined amount and having a second predetermined value when the magnitude of said more precise signal does not exceed the magnitude of each of said redundant signals supplied by said remaining signal sources by said first predetermined amount, said logic means further including means for supplying a second selection signal when said first selection signal is of said second predetermined value and said failure signal associated with said precision signal source indicates said precision signal source is operational; and
signal consolidation means responsive to said redundant signals and responsive to said first and second selection signals for supplying said output signal, said signal consolidation means including means for supplying said more precise signal as said output signal when said signal selection means supplies said second selection signal, said signal consolidation means including means responsive to said signal source failure signal associated with said precision signal source for supplying said output signal as a mathematically weighted average of said signals supplied by said remaining signal sources whenever said signal source failure signal associated with said precision signal source indicates said precision signal source is operating in said failure state, said signal consolidation means further including means responsive to said first selection signal for supplying said output signal as a mathematically weighted average of at least said signals supplied by said remaining signal sources whenever said first selection signal is said first predetermined value.

4,105,901
MONOSTABLE CIRCUIT

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,140
Claims priority, application United Kingdom, May 21, 1976, 21208/76
Int. Cl.² H03K *3/284*
U.S. Cl. 307—273 **10 Claims**



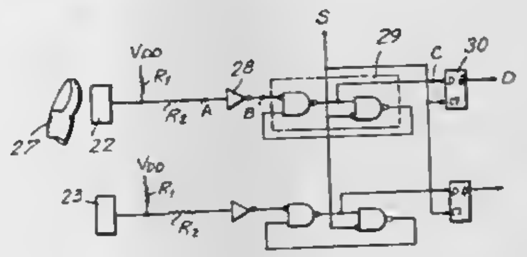
1. In combination:

a comparator having first and second input terminals, said first terminal receptive of a voltage at a reference level and said second terminal for receiving a signal voltage which is to be compared with the reference voltage, said comparator having an output terminal and producing at said output terminal a voltage at one level when the voltage at said first terminal is greater than that at said second terminal and a voltage at a second level when the voltage at said first terminal is less than that at said second terminal;
means for applying to said second terminal a signal voltage which initially is at a level lower than said reference level, which then increases in amplitude to a level higher than said reference level, which then again reduces in amplitude to a level lower than said reference level, and which later abruptly increases in amplitude to a level which tends to exceed said reference level; and
means for conditioning said circuit, when said signal voltage reduces in amplitude to a level lower than said reference level, to respond to said tendency of said signal voltage later abruptly to increase in amplitude to a level which exceeds said reference level, for clamping said second terminal to a voltage lower than said reference level.

4,105,902
TOUCH SENSITIVE INPUT FOR ELECTRONIC WRISTWATCH AND/OR ELECTRONIC CALCULATOR

Yuichiro Iwai; Akio Shimoi, and Yoshikazu Kawamura, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 730,763
Claims priority, application Japan, Oct. 8, 1975, 50-121591; Oct. 17, 1975, 50-125021; Dec. 1, 1975, 50-143505
Int. Cl.² H03K *3/26;* G08B *21/00;* G04C *3/00*
U.S. Cl. 307—308 **11 Claims**



1. A touch sensitive input for an electronic utilization device comprising a voltage source referenced to a first potential, touch sensitive contact means, said touch sensitive contact means including a conductive resistive contact member for connection to ground through the skin resistance of a user upon engagement thereof by the user; and detector circuit means including a C-MOS inverter input stage having an input to which said touch sensitive contact member is connected and an output, a resistor coupled intermediate said voltage source and said C-MOS inverter stage input, said resistor being selected to have a value substantially greater than the value of the average skin resistance of a likely user so that the input of said inverter stage of said detector circuit means is normally referenced to said first potential for producing a detector circuit output signal representative of said first potential, said touch sensitive contact means selectively referencing said detector circuit means input to a second potential in response to engagement of said touch sensitive contact member to ground through the skin resistance of a user, said detector circuit means producing at its output a detector circuit output signal representative of the second potential in response to application of said second potential to the input thereof.

4,105,903
SAFETY LID INTERLOCK CIRCUIT FOR CENTRIFUGES

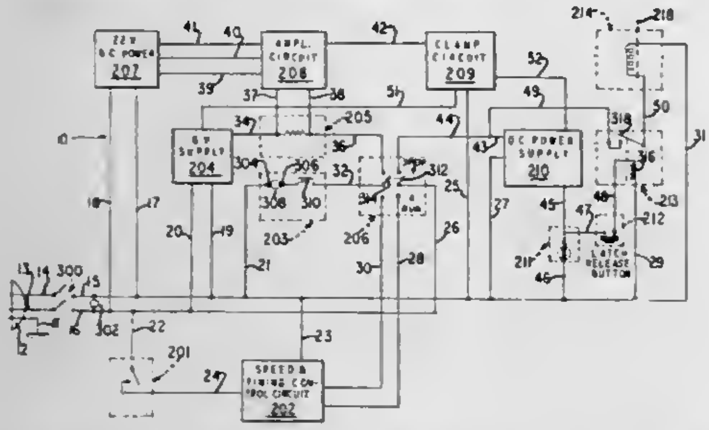
Gustavus W. Shaw, Havertown, and Raymond P. Walker, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,032
Int. Cl.² H01H *83/00*
U.S. Cl. 307—328 **5 Claims**

1. In a centrifuge of the type having a housing retaining a lid in a closed position and an armature having brushes operatively connected to the rotating portions of the centrifuge, the improved combination comprising:

a. a latch mounted on the housing;
b. an enclosure mounted on the housing and adapted to surround the latch and render it tamper-proof in the closed position;
c. a solenoid mounted on the housing and having a plunger and a spring to push said plunger into engagement with said latch when said solenoid is not actuated thereby preventing opening of said lid;
d. means to actuate said solenoid thereby moving said plunger out of engagement with said latch and permitting opening of said lid;

- e. means to supply a current through the brushes of the armature;
- f. means to detect a signal and a signal so detected proportional to variations in the current flow through said brushes caused by rotation of the armature;



- g. a clamp circuit responsive to said signal to inactivate said solenoid actuating means thereby preventing opening of the lid when the armature is rotating,

whereby the lid may not be opened when the armature is rotating regardless of whether the power is on or off.

4,105,904

ELECTROMAGNETIC ACTUATORS

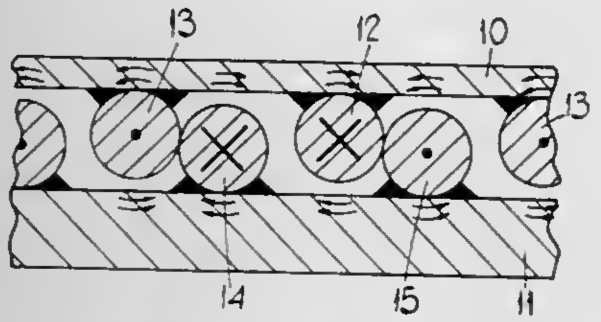
Alec Harry Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 27, 1976, Ser. No. 754,409

Claims priority, application United Kingdom, Jan. 22, 1976, 2523/76

Int. Cl.^{2} H02K *33/12*

U.S. Cl. 310—27 **7 Claims**



1. An electromagnetic actuator comprising first and second relatively movable non-magnetic support members, said members each having a surface which is presented to but spaced from the surface of the other member, electrical conductors mounted on said surfaces respectively, each of said conductors defining a portion which partially overlaps and is disposed in side by side relationship with the portion defined hy the other conductor so that when electric current is passed through the conductors the magnetic fields generated about said portions of the conductors interact to cause attraction or repulsion of said conductors depending on the directtion of current flow in the conductors.

4,105,905

AUXILIARY COOLING DEVICE

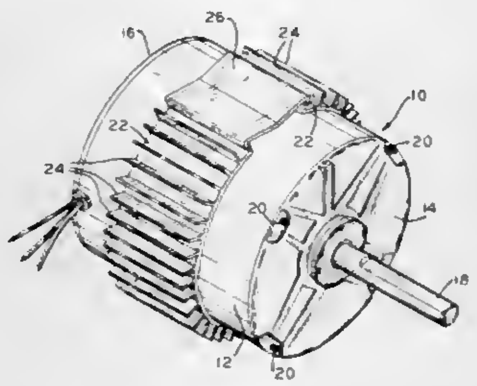
Victor D. Barcus, Churubusco, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jan. 8, 1975, Ser. No. 539,583

Int. Cl.^{2} H02K *9/00*

U.S. Cl. 310—59 **5 Claims**

1. An assembly comprising a dynamoelectric machine including a stationary structure having a finished outer peripheral surface, and a cooling arrangement assembled on the finished outer peripheral surface without press fitting or preheating, the cooling arrangement comprising: a first cooling member and at least a second cooling member positioned adjacent to the outer peripheral surface of the dynamoelectric machine; the first cooling member and the at least a second cooling member each having a plurality of projections extending radially away from the outer peripheral surface to establish cooling fins; and at least two locking members to retain the first cooling member and the at least a second cooling member in a predetermined axial position on the dynamoelectric machine; the cooling arrangement being capable of assembly on the finished outer peripheral surface of the dynamoelectric machine without defacing the finished outer peripheral surface, and the locking members permitting thermal expansion of the first and second cooling members in a circumferential direction around the outer peripheral surface while maintaining the cooling arrangement under hoop tension on the outer peripheral surface.



4,105,906

ARMATURE FOR A MOTOR IN A PUMP FOR LIQUIDS

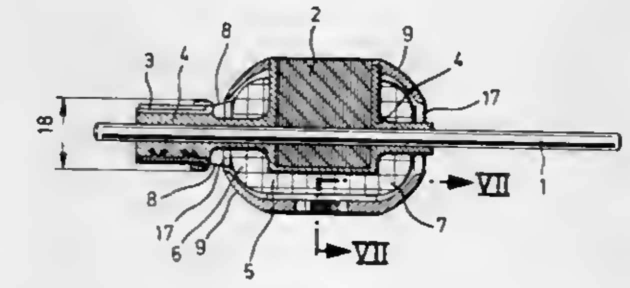
Rolf Ade; Karl-Friedrich Schubert, both of Bietigheim-Bissingen, and Manfred Staller, Hessigheim, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,767

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555529

Int. Cl.^{2} H02K *5/12*

U.S. Cl. 310—87 **4 Claims**



1. An armature for a motor in a pump for liquids comprising, in combination:

an armature shaft;

a plurality of armature plates mounted on said shaft and having a plurality of radially extending winding slots therein, said plates being concentrically arranged about said shaft to provide a core having a plurality of longitudinally extending grooves formed by the walls of said slots;

an armature coil wound between said plates within said grooves and forming oppositely extending coil ends disposed about said shaft;

first and second symmetrical end covers respectively disposed on opposite ends of said shaft and enclosing said coil ends, each of said covers having a plurality of circumferentially spaced and longitudinally extending webs respectively received in said grooves, wherein the circumferential width of the radially outer portion of each of said webs

is significantly less than the corresponding width of said groove and wherein said covers are circumferentially offset relative to one another so that said webs axially overlap one another in side by side nesting relationship therebetween; and,

wherein each of said webs includes means for respectively interlocking said webs within said grooves.

4,105,907

SLIP RING STRUCTURE FOR DYNAMO ELECTRIC MACHINES, PARTICULARLY AUTOMOTIVE-TYPE ALTERNATORS

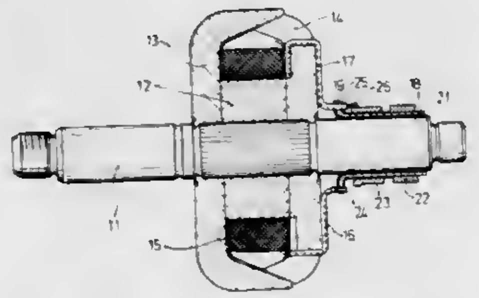
Walter Hagenlocher, Stuttgart; Karl-Heinz Neumann, Warmbronn; Martin Müller, Ludwigsburg; Karl Kleebaur, Allmersbach; Günter Sokol, Esslingen, and Jürgen Molt, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1976, Ser. No. 717,529

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539091

Int. Cl.^{2} H02K *39/08*

U.S. Cl. 310—232 **12 Claims**



1. Slip ring structure for assembly to a shaft of a dynamo electric machine comprising

a support carrier (18) of electrically conductive material and having a circular cross section secured to the shaft (11) of the machine;

a plurality of cylindrical slip rings (22, 23) secured to the support carrier (18), one of said slip rings being attached directly to the electrically conductive material (18) of the support carrier, said support carrier forming one electrical connection for a first slip ring (22), and an insulating layer (21) interposed between said electrically conductive material of the support carrier and a second slip ring (23) insulating said second slip ring (23) with respect to the electrically conductive material of the support carrier (18).

4,105,908

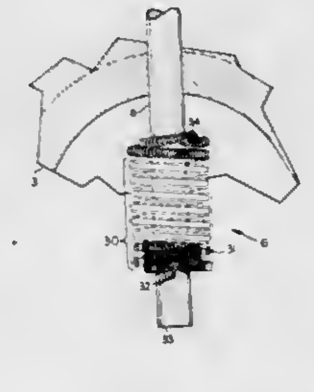
METAL HALIDE LAMP HAVING OPEN TUNGSTEN COIL ELECTRODES

Thomas J. Harding, Aurora, and Wayne R. Hellman, Twinsburg, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,790

Int. Cl.^{2} H01J *61/068, 61/18*

U.S. Cl. 313—217 **10 Claims**



1.An arc tube for a metal halide lamp comprising a light-transmitting envelope having electrodes sealed into opposite ends and containing an ionizable fill including metal halide, thorium within said envelope, one of said electrodes comprising a tungsten shank of a size adequate in current-carrying capacity for said lamp projecting into said envelope and an open tungsten wire coil wrapped around the distal end of said shank and spaced from its tip, said coil being made of a composite tungsten wire comprising primary turns of an overwind wire of not more than 4 mils wrapped snugly around a mandrel wire of not more than 5 mils at a winding pitch leaving gaps between turns of at least about the same width as the overwind wire, the composite wire being substantially closewound on the shank into secondary turns and said coil comprising at least two layers of said secondary turns.

4,105,909

PENETRATION PHOSPHORS FOR DISPLAY DEVICES

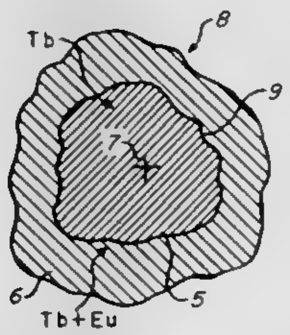
Stanley F. Ignasiak, Holliston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 669,426, Mar. 22, 1976, Pat. No. 4,071,640. This application Oct. 27, 1977, Ser. No. 845,995

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.^{2} H01J *29/20, 29/28, 31/20*

U.S. Cl. 313—473 **6 Claims**



1. A cathodo-luminescent particle for use in an electron tube comprising:

a central region consisting of La_2O_2S with Tb_2O_2S uniformly distributed therethrough which produces a green, narrow-bandwidth emission upon electron excitation thereof, and

a peripheral region surrounding said central region and comprised of $La_2O_2SO_4$ with a distribution of $Tb_2O_2SO_4$ therethrough for providing a harrier layer with respect to said central region which must be penetrated by said electrons before substantial emission emanates from said central region and wherein the concentrations of Tb_2O_2S and $Tb_2O_2SO_4$ are substantially smaller than the respective concentrations of La_2O_2S and $La_2O_2SO_4$.

4,105,910

FLUORESCENT LAMP WITH AN INTEGRAL FAIL-SAFE AND AUXILIARY-AMALGAM COMPONENT

George S. Evans, Caldwell, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 23, 1976, Ser. No. 679,598

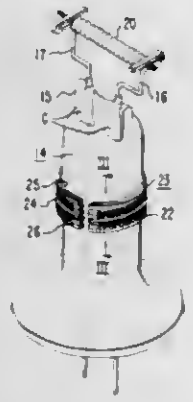
Int. Cl.^{2} H01J *61/28, 61/42*

U.S. Cl. 313—490 **7 Claims**

6. In a low-pressure type electric discharge lamp having a sealed light-transmitting envelope that contains spaced thermionic electrodes and an ionizable medium including mercury and has a re-entrant wall portion with an associated pair of lead-in conductors which are sealed through said wall portion and protrude therefrom into the envelope and are connected to one of said electrodes,

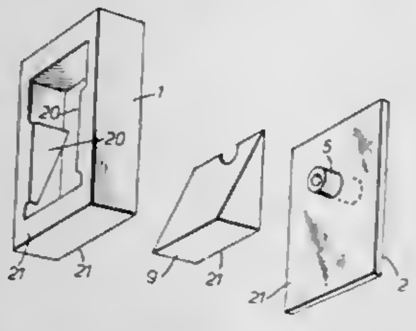
integral means for rapidly providing mercury vapor within the lamp under cold-start conditions and, at the end of the useful life of said lamp, automatically initiating its failure in a safe manner, said means comprising an adherent coating which is disposed on the inner surface of the re-entrant wall portion of said envelope and contains (a) a metal that combines with some of the mercury within the lamp to form an amalgam, and (b) an additive which renders the coating semiconductive, as formed,

said coating being located on a part of the re-entrant wall portion of said envelope that is proximate to a sealed-in segment of at least one of said lead-in conductors and is adjacent to the associated electrode, and said coating also extending into overlapping and contacting relationship with said one lead-in conductor at the point where it emerges from said re-entrant wall portion and thereby being adapted, when rendered conductive by sputtered metallic deposits from the associated electrode and lead-in conductors at the end of the useful life of the lamp, to then provide an electrically-conductive path along a predetermined part of said re-entrant wall portion.



4,105,911
TRAVELLING WAVE TUBES

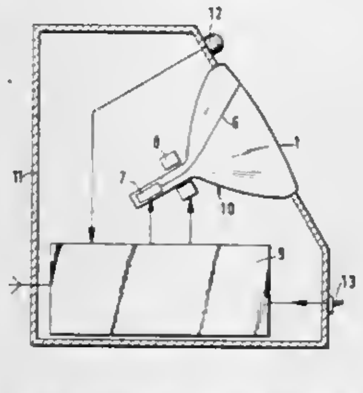
Robin Charles Moorhouse King, and Maurice Esterson, both of Chelmsford, England, assignors to English Electric Valve Company Limited, England
Filed Nov. 30, 1976, Ser. No. 746,123
Int. Cl.^{2} H01J *25/34*
U.S. Cl. 315—3.5 **8 Claims**



1. A coupled cavity travelling wave tube having a sever which includes a termination wedge, a sever pole piece, a drift tube in said pole piece and a termination cavity member defining a rectangular waveguide, said rectangular waveguide having an inner surface which bears projections, which projections are shaped and dimensioned to engage with said termination wedge whereby said termination wedge is sandwiched between said projections and said sever pole piece.

4,105,912
RADAR VIEWING DEVICE

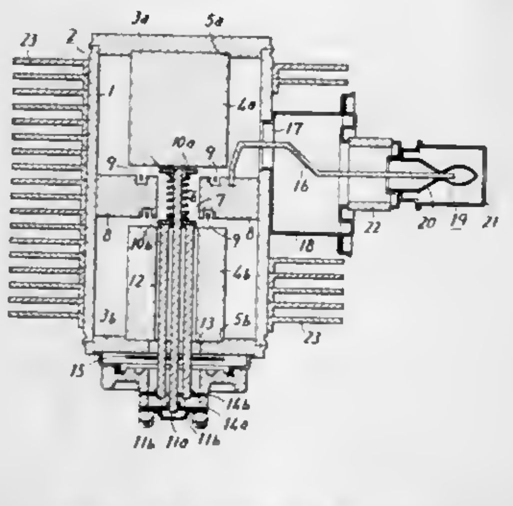
Hans-Jurgen Senger, Norderstedt, Fed. Rep. of Germany, assignor to Elna, GmbH, Rellingen, Fed. Rep. of Germany
Filed May 11, 1976, Ser. No. 684,404
Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2520505
Int. Cl.^{2} 343 *6 TV;* H01J *31/26*
U.S. Cl. 315—10 **5 Claims**



1. A radar viewing apparatus comprising a cathode ray tube housing an electron beam gun providing an electron beam the characteristics of which are dependent on the voltage applied to the anode of the gun, said cathode ray tube having a viewing screen and a pair of image producing, afterglowing layers luminescing in different colors, said layers luminescing responsive to different anode voltage levels in said electron beam gun; and photosensitive means adjacent said viewing screen responsive to the ambient light surrounding said apparatus, said means being coupled to said electron beam gun for altering the anode voltage of said gun and the color of the image on said screen responsive to ambient light levels.

4,105,913
CORE MAGNETRON AND METHOD OF MANUFACTURING PERMANENT MAGNETS THEREFOR WITH LOW GAS EMISSION

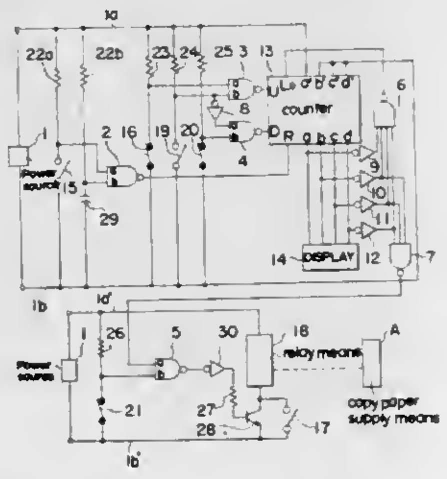
Masaru Yamano, Hirakata, and Toshio Iemura, Kyoto, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Jul. 20, 1976, Ser. No. 707,010
Claims priority, application Japan, Aug. 11, 1975, 50-111250
Int. Cl.^{2} H01J *25/50*
U.S. Cl. 315—39.71 **17 Claims**



1. A core type magnetron comprising a vacuum envelope including a cathode, anode vanes surrounding said cathode and a permanent magnet for applying a magnetic field in the vicinity of said cathode, wherein said permanent magnet has been manufactured by a process to substantially reduce the emission of gases from said permanent magnet when the magnetron is operating including; the steps of melting source materials as required for a hard magnet having high retentivity in a vacuum at an elevated temperature of more than 1300° C, casting the melt in a vacuum, and thereafter hot forging the same at another elevated temperature before finishing with conventional known steps.

4,105,914
PRESETTING COUNTER DEVICE

Tomoji Murata, Toyokawa; Kenji Shibazaki, Aichi; Yoshihiro Nakamura, and Matsuo Kuse, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 669,452, Mar. 22, 1976, abandoned. This application Jun. 21, 1977, Ser. No. 808,773
Claims priority, application Japan, Apr. 1, 1975, 50/44291
Int. Cl.^{2} G06B *27/06;* G06M *3/04*
U.S. Cl. 235—92 SB **12 Claims**

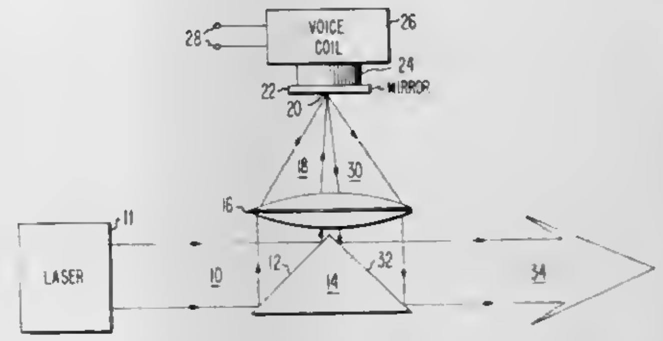


1. A presettable counter device for use in a mechanical apparatus comprising:
- an electrical power supply to be connected with said apparatus, an up-down counter means coupled to said power supply and able to store numerical information, the content of which counter means is incremented to a predetermined number in order to set operational times for said mechanical apparatus and decremented by "1" for each input signal produced according to the operation of said mechanical apparatus;
- a display means coupled to said counter means for indicating the content of said counter means as a decimal representation thereof;
- a reset means coupled to said counter means and actuable to set the content of said counter means to "1";
- operation start means for starting operation of said mechanical apparatus to initiate decrementation of said numerical information stored in said counter means;
- an actuation means coupled to said counter means and said mechanical apparatus for stopping continuous operations of said mechanical apparatus and for setting the content of said counter means to "1" when one cycle of operation has been performed after the content of said counter means becomes "1"; and
- a set means coupled to said counter means for setting the content of said counter to "1" when said mechanical apparatus is initially connected with said power supply after having been disconnected from the power supply.

4,105,915
DEFLECTION-TYPE MODULATOR OF LASER BEAM FOR COMMUNICATIONS

Burton Ross Clay, Wayland, and Douglas Alan Gore, Billerica, both of Mass., assignors to RCA Corporation, New York, N.Y.
Filed Aug. 19, 1976, Ser. No. 715,859
Int. Cl.^{2} H04R *1/44*
U.S. Cl. 250—199 **1 Claim**

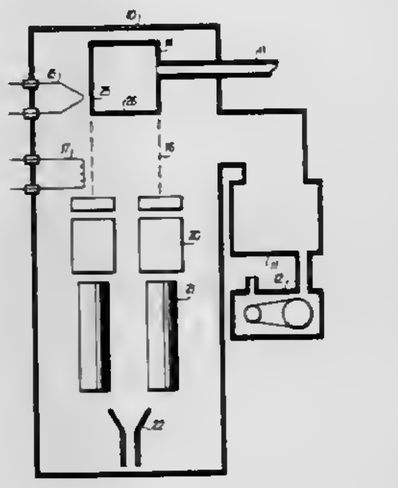
1. Means to transmit intelligence from a local point to a remote point, comprising
- a lens,
- a right-angle prism disposed in proximity with said lens,
- a mirror normally spaced the focal length distance from said lens,
- a laser directing a light beam to said prism for reflection at a right-angle through half of said lens to said mirror, and back through the other half of the lens to the prism for reflection at a right-angle to the remote point,



- an electromechanical transducer connected with said mirror to reciprocate it toward and away from said lens to deflect the beam in accordance with intelligence, and
- two photosensors at the remote point positioned in spaced relation so that the light beam from the laser at the local point normally passes between photosensors, and is deflected back and forth between said photosensors when the mirror is reciprocated.

4,105,916
METHODS AND APPARATUS FOR SIMULTANEOUSLY PRODUCING AND ELECTRONICALLY SEPARATING THE CHEMICAL IONIZATION MASS SPECTRUM AND THE ELECTRON IMPACT IONIZATION MASS SPECTRUM OF THE SAME SAMPLE MATERIAL

Melvin W. Siegel, Pittsburgh, Pa., assignor to Extranuclear Laboratories, Inc., Pittsburgh, Pa.
Filed Feb. 28, 1977, Ser. No. 772,905
Int. Cl.^{2} H01J *37/08*
U.S. Cl. 250—282 **44 Claims**



1. A method for simultaneously producing and electronically separating a chemical ionization mass spectrum and an electron impact ionization mass spectrum of the same sample material, the method comprising the steps of:
- placing a chemical ionization enclosure and an electron ionization space in tandem proximate the entrance of a mass spectrometer with said space interposed between the outlet of said enclosure and said entrance;
- introducing the same sample material in said enclosure and said space;
- ionizing said sample material in said enclosure and said space;

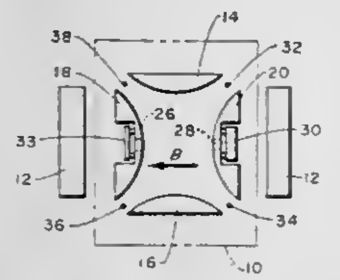
alternately electronically suppressing ions from discharging from said enclosure and from said space for receipt by said mass spectrometer by changing the potential surrounding said space alternately above and below the potential of said enclosure;

filtering and detecting the charge of said ions alternately received from said enclosure and said space by said mass spectrometer, and separating signals detected from said enclosure from those alternately received from said space and registering said signals separately.

4,105,917
METHOD AND APPARATUS FOR MASS SPECTROMETRIC ANALYSIS AT ULTRA-LOW PRESSURES

Robert T. McIver, Jr., and Edward B. Ledford, Jr., both of Irvine, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 26, 1976, Ser. No. 670,767
Int. Cl.² B01D *59/44*
U.S. Cl. 250—291 **21 Claims**



1. In an ion cyclotron resonance mass spectrometer analyzer cell in which ions are formed from a sample during an ionizing period the improvement comprising:

- magnetic means for producing a constant, substantially homogeneous magnetic field in said cell;
- a first set of electrodes for producing a quadrupolar electrostatic field in said cell which prevents the escape of ions from said cell in the direction parallel to the magnetic field;
- a second set of electrodes for producing an electrostatic field to prevent the drift of ions out of the ends of the analyzer cell in a direction perpendicular to the magnetic field;
- irradiation means for irradiating said cell with an alternating electric field to excite and accelerate ions of selected mass-to-charge ratios; and
- sensing means for detecting ions which have been selectively accelerated by the alternating electric field.

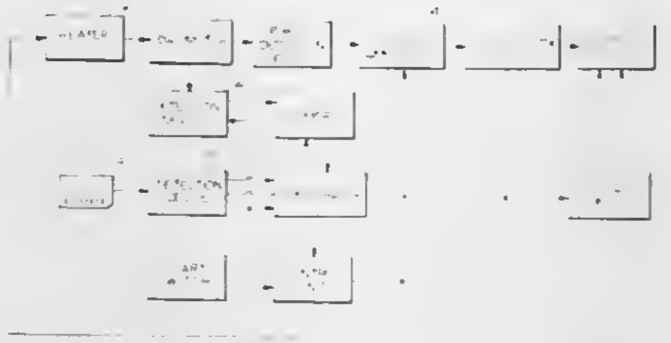
4,105,918
THERMOLUMINESCENT TYPE RADIATION DOSIMETER READOUT APPARATUS

Katsuhiko Miyagawa; Hidenori Kunishige, both of Osaka; Hirotaka Otsuka, Hirakata, and Fusafumi Nakao, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 28, 1976, Ser. No. 727,699
Claims priority, application Japan, Sep. 30, 1975, 50/118537
Int. Cl.² G01T *1/115*
U.S. Cl. 250—337 **5 Claims**

1. A thermoluminescent type radiation dosimeter readout apparatus comprising:

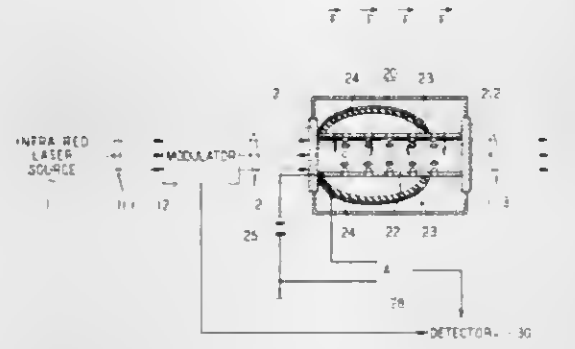
- means to hold a thermoluminescent type radiation dosimeter, means for heating the dosimeter held by said holding means, means for measuring the thermoluminant rays emitted from the heated dosimeter;
- a first detecting means associated with said dosimeter holding means for detecting indicia on the held dosimeter and producing a first signal corresponding thereto;
- a card holding means for receiving a personal identification card having indicia thereon and retaining it at a predetermined position;
- a second detecting means associated with said card holding means for detecting the indicia on the received personal identification card and producing a second signal corresponding thereto;
- a collating means coupled to said first and second detecting means for collating the first detected signal and the second detected signal, and generating a starting signal when said signals are in a predetermined relation; and
- a control means connected with said collating means and for controlling the operation of the apparatus for carrying out a measurment only when said starting signal is supplied thereto.



4,105,919
SPECTROPHONE WITH FIELD TUNING OF ABSORPTION CELL

Thomas James Bridges, Holmdel, and Ernest Gardner Burkhardt, Wall, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 25, 1977, Ser. No. 790,460
Int. Cl.² G01J *1/00, 3/42*
U.S. Cl. 250—341 **11 Claims**



1. In combination:

(a) an optical absorption cell containing a gas medium to be analyzed for an impurity;

(b) means for forming a modulated beam of optical radiation containing a first optical wavelength, said beam modulated at a first acoustic frequency, in order to form a modulated optical beam incident on the absorption cell;

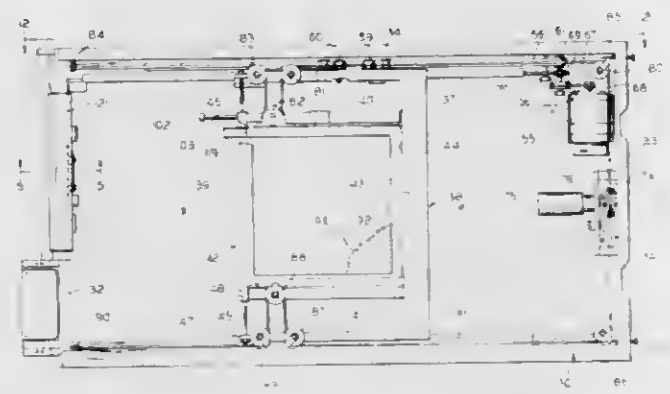
(c) means for producing a static field in the gas medium having a field strength suitable for increasing the absorption by the impurity in the gas medium of energy at said first wavelength from the modulated beam; and

(d) means, coupled to said gas medium, for detecting the pressure variations at said acoustic frequency of said gas medium in response to the said beam in the presence of said static field.

4,105,920
X-RAY SPOT FILM DEVICE

Thomas Pury, Brookfield; Floyd L. Gray, Hales Corners; Marvin L. Sivertsen, Milwaukee; Robert L. Konle, New Berlin, and Richard E. Stebr, Hartland, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,574
Int. Cl.² G03B *41/16*
U.S. Cl. 250—402 **10 Claims**



3. For use with a diagnositic x-ray table including a table body, an x-ray source in the body and a table top for supporting an examination subject in the path of an x-ray beam from the source, a spot film device adapted to be located on a side of the table top remote from the source, said spot film device comprising:

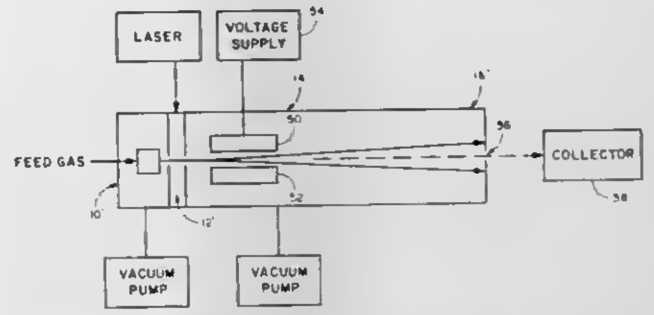
- support means for extending crosswise of said table top,
- carriage means mounted for translating on said support means between an inactive position and an active radiographic position,
- means for holding a radiographic cassette on said carriage means,
- mask means mounted on said support means for being translated crosswise of said table top selectively into and out of the path of the beam from said x-ray source, said mask means having an aperture for defining the beam impinging on a cassette in said means for holding a cassette,
- reversible motor means,
- drive pulley means driven by said motor means,
- idler pulley means spaced from said drive pulley means, belt means translating said mask means and running on said drive pulley and idler pulley means, said belt means having opposite end portions connected to said mask means,
- stop means for limiting the movement of said mask means,
- said belt means having an elastic characteristic for enabling said belt means to yield and absorb shock and allow overtravel by said motor means when said mask means is stopped abruptly by said stop means,
- means responding to said mask means reaching a position near said stop means by reducing the electric power supplied to said servo motor means and then maintaining said reduced power for holding said mask means against said stop means.

4,105,921
ISOTOPE SEPARATION

Rodney J. Bartlett, and John R. Morrey, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1976, Ser. No. 727,560
Int. Cl.² H01J *27/00*
U.S. Cl. 250—423 P **8 Claims**

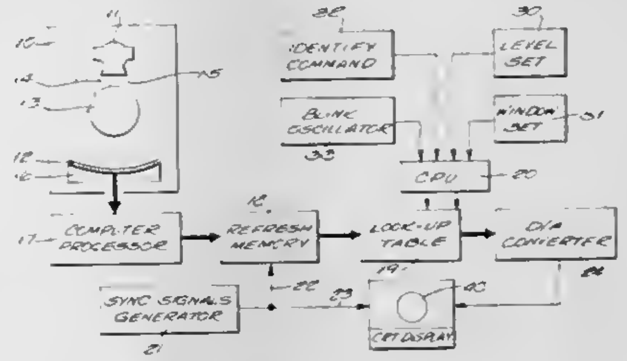
1. A method for separating molecules of a gas containing a first isotope of an element from molecules of the same gas containing a second isotope of said element, all of said molecules being at the same initial electronic state, wherein said molecules are not decomposed nor ionized during said separating, comprising continuously flowing a stream of gas molecules containing said first and second isotopes along a first path, continuously selectively exciting gas molecules in said stream containing one of said isotopes to a different electronic state; continuously flowing said stream containing said excited and non-excited gas molecules through an inhomogeneous deflecting field, continuously deflecting by said inhomogeneous deflecting field the gas molecules containing one of said isotopes from said first path to a second path; and, without further excitation, continuously collecting gas molecules containing one of said isotopes traveling along one of said paths, wherein said collected gas molecules are of the same composition as the gas molecules before said exciting to a different electronic state.



4,105,922
CT NUMBER IDENTIFIER IN A COMPUTED TOMOGRAPHY SYSTEM

Thomas W. Lambert, Dousman, and James Edward Blake, New Beriln, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,528
Int. Cl.² A61B *6/02;* G01N *23/08*
U.S. Cl. 250—495 T **5 Claims**



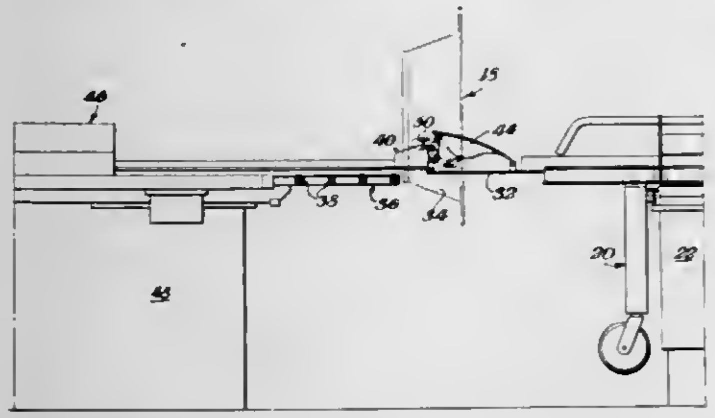
1. In a computed tomography system including means for producing first electric signals having a large range of values corresponding respectively with the X-ray attenuation and CT numbers of volume elements in a layer of a body; a memory matrix for storing said signals; display means for displaying a visual image depending on said stored signals comprising an intensity modulatable scanning cathode ray tube and means for modulating the intensity of said tube in correspondence with the values of successive signals; means for selecting from said large range of signal values signals lying within a window comprised of a smaller range of values defined by upper and lower limits and a level value centered between said limits; means for converting said signals within said window to signals for modulating said cathode ray tube; and, improved means for identifying the CT numbers corresponding with selected zones in said displayed image comprising:

- means for selecting signals in a narrow band corresponding substantially with the CT number values of said level within the selected window;
- means for activating said selecting means; and
- means for causing said selected signals to modulate only those zones in said displayed image which have CT numbers corresponding substantially with said selected level

to an intensity corresponding with said level and alternately in quick succession to higher intensity whereby to enable identification of the CT numbers.

4,105,923
PATIENT HANDLING SYSTEM AND APPARATUS FOR TOMOGRAPHIC SCANNING

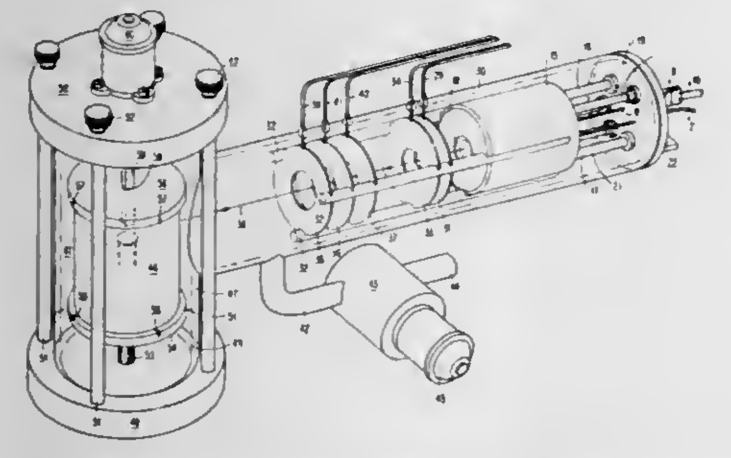
John L. Hynes, Jr., Columbia, Md., assignor to Pfizer Inc., New York, N.Y.
Filed Apr. 1, 1977, Ser. No. 783,556
Int. Cl.^{2} A61B *6/04;* A61G *13/00*
U.S. Cl. 250—456 **21 Claims**



15. An apparatus for handling patients to be X-rayed on a tomographic scanner having a vertically-adjustable island having precision longitudinally-traversing drive means disposed adjacent the scanner comprising a cart for of transporting the patient to and from the island, the cart having a longitudinally movable patient-supporting pallet section, an under-portion of the cart being constructed and arranged for disposition over the island when the island is disposed in its lowest position, the under-portion being constructed and arranged for engaging the island with the under-portion of the cart when the island is to be elevated, securing means on the island and cart for locking the under-portion of the cart to the island when it is engaged therewith, coordinating means on the cart for engaging the pallet with the precision longitudinal traversing drive means in the island, and control means on the cart for operating the precision longitudinal-traversing drive means to adjust the longitudinal position of the pallet and patient upon it.

4,105,924
APPARATUS FOR MAKING A RASTERED PHOTOCONDUCTIVE LAYER

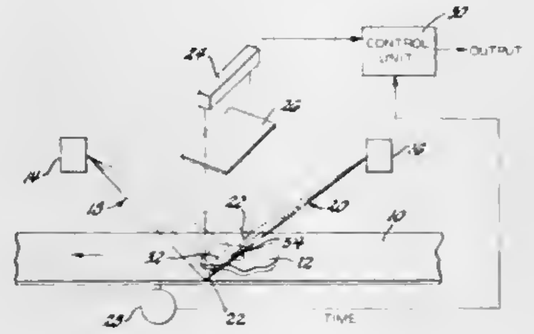
Holger Hinkel, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 11, 1976, Ser. No. 741,083
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557685
Int. Cl.^{2} H01J *37/00*
U.S. Cl. 250—492 A **3 Claims**



1. Apparatus for providing a rastered photoconductive layer on a selenium-coated photoconductor drum for achieving an improved representation of black areas, said apparatus comprising
housing means including a transparent vacuum-sealed cylinder that has an axial length substantially longer than that of the drum,
spindle means carried by said housing means and extending coaxially into the cylinder and into screw-threaded engagement with said drum,
an ion implantation device mounted to project an ion beam of arsenic to impinge on the periphery of the drum and implant arsenic in the selenium coating, and
means for selectively rotating the drum to cause it to move axially relative to the cylinder while the ion beam is generated by said implantation device, thereby to produce at least one spiral-shaped raster track on the photoconductive layer, each such track being constituted by uniformly spaced convolutions, wherein the convolutions defining one of the spiral-shaped tracks are uniformly spaced a preselected distance apart during axial movement of the drum in one direction and the convolutions defining another spiral-shaped track are disposed between the convolutions of said one track and uniformly spaced said preselected distance apart during movement of the drum in the opposite direction.

4,105,925
OPTICAL OBJECT LOCATOR

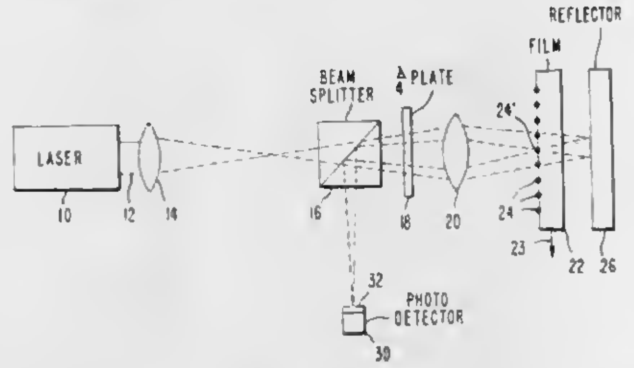
Lothar Rossol, Sterling Heights; Joseph T. Olsztyn, Madison Heights; Robert Dewar, Warren, and Steven W. Holland, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 14, 1977, Ser. No. 777,011
Int. Cl.^{2} G01N *21/30*
U.S. Cl. 250—561 **2 Claims**



1. An electro optical locator device for determining the position of an object on a conveyor comprising
first and second light sources fixed in space above the said conveyor and emitting light in sheet form in first and second planes defining a dihedral angle with its apex substantially on the conveyor transverse to the movement thereof and each plane being at an acute angle in relation to the conveyor for projecting onto the conveyor a single line of light transverse to the conveyor motion, wherein an object carried by the conveyor intercepts the light above the surface of the conveyor at positions laterally spaced from the apex of the dihedral angle so that the single line of light is projected onto the conveyor only outside the boundaries of the said object,
a linear photosensor array of photo elements responsive to light in a plane perpendicular to the conveyor aligned with the apex of the dihedral angle for viewing the single line of light projected onto the conveyor outside an object boundary, the illumination of individual photo elements being dependent on the position of the boundaries of the object with respect to the conveyor and
means responsive to the respective photosensor elements effective to determine the pattern of illumination of said photosensor array at a particular conveyor position to determine the position of the boundaries of the object relative to the conveyor.

4,105,926
ON-AXIS FILM SCANNER WITH REFLECTED ILLUMINATION

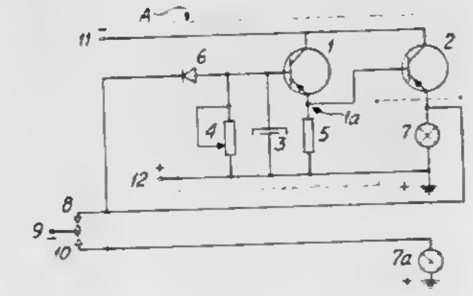
Charles William Reno, Haddonfield, and Donald George Herzog, Collingswood, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Jun. 30, 1977, Ser. No. 811,869
Int. Cl.^{2} G06K *7/10*
U.S. Cl. 250—566 **11 Claims**



1. Apparatus for reading indicia elements on transparent film, comprising
a source of a light beam,
a reflector, and
means to direct said light beam from said source through said film to said reflector, and back to a point on said film, said beam when initially passing through said film having a much larger cross sectional dimension than indicia elements on the film and much larger than it is when returned back to said point on said film.

4,105,927
DEVICE FOR ADJUSTING THE LEVEL OF BRIGHTNESS EMITTED BY A LAMP

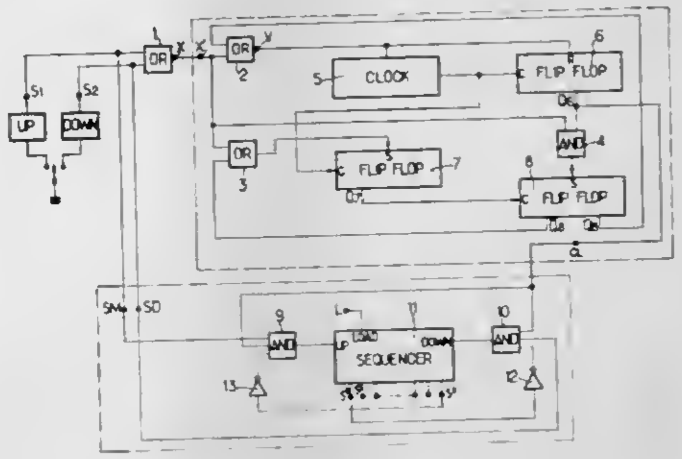
Oscar Wilje, Sturegatan 44, 791 00 Falun, Sweden
Filed Apr. 23, 1976, Ser. No. 679,779
Claims priority, application Sweden, Apr. 24, 1975, 7504725
Int. Cl.^{2} B60Q *1/02*
U.S. Cl. 315—82 **8 Claims**



1. A device for causing the brightness of a headlight lamp in a headlamp assembly of a vehicle to diminish gradually during the simultaneous switching from headlight to dimlight, said device comprising:
(a) a headlight and a dimlight;
(b) switching means connected to said headlight and to said dimlight to supply current to said dimlight or to said headlight by alternately connecting said dimlight and said headlight to an electrical potential source; and
(c) control means connected to said headlight and dimlight for causing the brightness of said headlight to diminish gradually upon connection of said potential source by said switching means from headlight to dimlight, said control means comprising:
(i) a first transistor having its base connected to storage means for storing electrical energy,
(ii) said switching means being arranged to also supply current to said storage means when supplying current to said headlight, and
(iii) a second transistor connected in series with said headlight for controlling the current flowing through said headlight, the conduction of said second transistor being controlled by said first transistor, said storage means discharging a gradually diminishing current to gradually diminish conduction of said first transistor and to decrease the level of brightness of said headlight when said switching means is activated to supply current to said dimlight.

4,105,928
SEQUENTIAL CONTROL CIRCUIT CAPABLE OF SEQUENCING THROUGH A NUMBER OF STABLE STATES IN A PREDETERMINED ORDER

Gilles Leconte, Rueil-Malmaison, France, assignor to Regie Nationale des Usines Renault, France
Filed Nov. 19, 1976, Ser. No. 743,377
Claims priority, application France, Nov. 21, 1975, 75 35636
Int. Cl.^{2} B60Q *1/08;* H03K *17/28*
U.S. Cl. 315—82 **22 Claims**



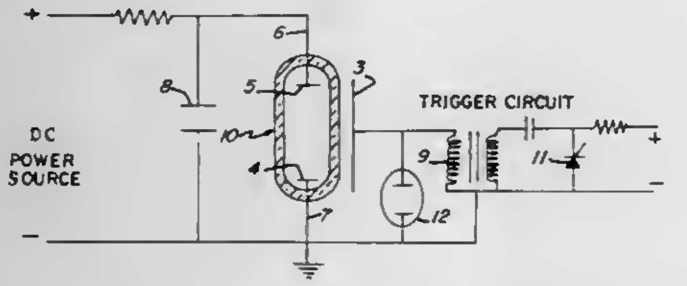
1. A sequential control circuit capable of sequencing through a number of stable states in a predetermined order, starting from a predetermined stable state and sequencing in either of two opposite directions, said circuit comprising a contact maker normally assuming a first position and capable alternatively of assuming either of two transient positions of contact, said contact maker when in one of the transient positions generating a transient signal indicative of the particular transient position assumed; timing means coupled to said contact maker for providing a timer signal in response to generation of a transient signal by said contact maker; and a logic circuit coupled to said contact maker and to said timing means and capable of sequencing through a number of output conditions corresponding with the stable states, said logic circuit, during presence of the timer signal, being responsive to a transient signal to sequence to another output condition, the direction of sequencing of said logic circuit being dependent upon the transient position assumed by said contact maker, said logic circuit including means responsive to initial application of voltage to said logic circuit for setting said logic circuit to a predetermined one of the output conditions.

12. A sequential control circuit as claimed in claim 1, adapted for controlling the outside lighting of an automobile, in which said logic circuit includes a two-position switch having a first position for removing voltage from said logic circuit and a second position for applying voltage to said logic circuit.

4,105,929
SHUNT TRIGGERED FLASHTUBE HAVING SAFETY FEATURE

Robert J. Cosco, Amesbury, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jun. 30, 1976, Ser. No. 701,381
Int. Cl.^{2} H05B *41/30;* **H02H** *7/20*
U.S. Cl. 315—125 **1 Claim**

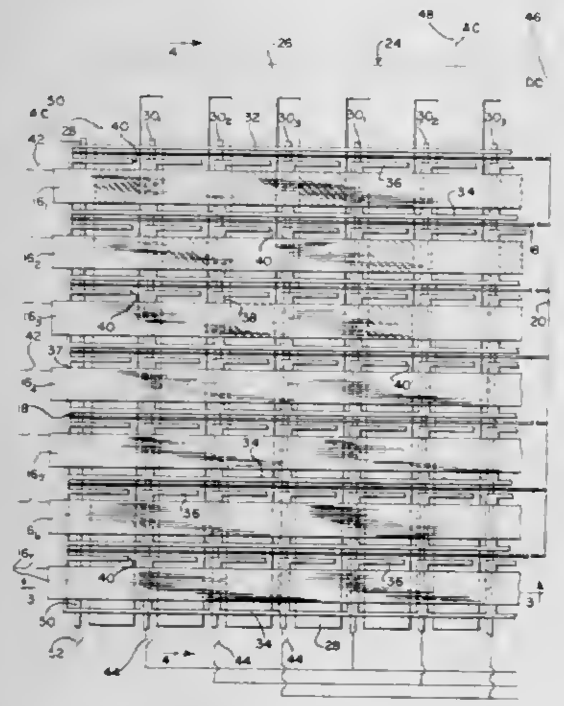


1. In the circuit for a flashtube having an hermetically sealed glass envelope containing an inert gas and a pair of electrodes between which an arc discharge path is defined during lamp operation and having an external trigger wire which is insulated from the ambient atmosphere, the improvement which comprises an enclosed spark gap connected to the trigger wire, the breakdown voltage of the spark gap being higher than that of the normal flashtube but lower than that of the flashtube when air has leaked thereinto, thereby preventing an external arc from occurring when the flashtube becomes cracked or broken.

4,105,930
LOAD AND HOLD MEANS FOR PLASMA DISPLAY DEVICES

William E. Coleman, St. Charles, Ill., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 19, 1976, Ser. No. 706,578
Int. Cl.^{2} H05B *39/00*
U.S. Cl. 315—169 TV **19 Claims**

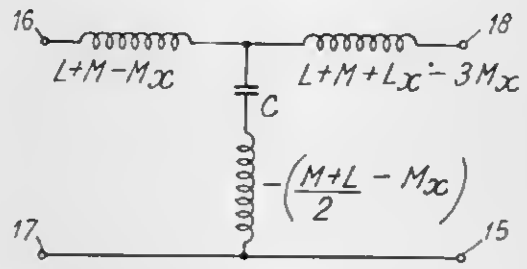


1. In a plasma discharge device of the type having a walled structure containing an ionization medium, electrodes disposed on opposite sides of the walled structure, and means for applying potential differences between adjacent electrodes whereby the medium will emit light proximate the adjacent electrodes, the improvement wherein said electrodes include a first AC electrode on one wall surface, a second AC electrode on an opposed wall surface and crossing the first electrode, and means for developing a DC discharge at selected locations in the vicinity of said first and second electrodes, said DC discharge means including a first DC electrode on one wall surface and a second DC electrode on the opposed wall surface crossing the first DC electrode at a location in the vicinity of the first and second electrodes for developing a DC discharge at the crossing location, said DC discharge, combined with the development of a potential difference between said AC electrodes at the crossing thereof resulting in the ionization of said gas proximate the AC electrode crossing.

4,105,931
INDUCTOR STRUCTURES FOR ELECTRICAL DISCHARGE LAMP CIRCUITS

Eric Harry Pritchard, and Thomas Rivers Passmore, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed Sep. 27, 1976, Ser. No. 726,622
Claims priority, application United Kingdom, Oct. 3, 1975, 40630/75
Int. Cl.^{2} H05B *41/16*
U.S. Cl. 315—278 **4 Claims**



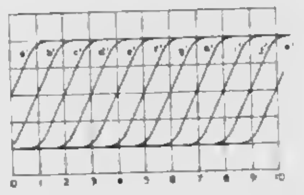
1. An inductor structure comprising:
magnetic core means;
a first conducting foils means wound around at least part of the said core means and insulated from the said core means;
a second conducting foil means would around at least part of the said core means and interwound with the said first conducting foil means;
dielectric means separating and insulating said foil means from one another, said first and second foil means being provided with respective different numbers of turns, and that one of the conducting foil means providing the greater number of turns being so wound that those of its turns which are in excess of those of its turns which are equalled by the other conducting foil means are wound in the opposite direction to the turns of the said other conducting foil means and the said equalled turns of the said one of the conducting foil means.

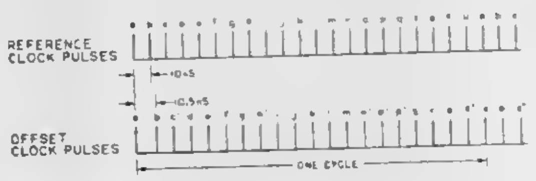
4,105,932
"SLEWED PULSE" SCOPE SWEEP CALIBRATOR

Edward Joseph Cleary, Jr., Beaverton, and Michael Goodwin Reiney, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 24, 1976, Ser. No. 744,559
Int. Cl.^{2} G01R *13/30*
U.S. Cl. 315—377 **14 Claims**

2. A system for providing sweep rate calibration signals for a display device, comprising:
timing reference means for generating a reference signal having a predetermined frequency; and
means responsive to said reference signal for producing trigger signals and display signals in timed relationship wherein the period of said display signals is greater than the period of said trigger signals by a predetermined interval so that each successive display signal is incrementally delayed with respect to said trigger signals, each of said trigger signals initiating a time-base sweep against which a said successive display signal is displayed.

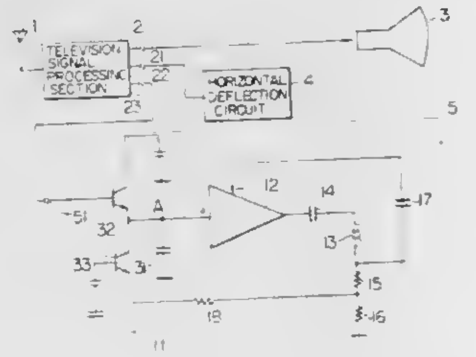




4,105,933
VERTICAL DEFLECTION CIRCUIT

Fumio Inoue, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 28, 1977, Ser. No. 763,665
Claims priority, application Japan, Feb. 2, 1976, 51-9374
Int. Cl.^{2} H01J *29/70, 29/72*
U.S. Cl. 315—387 **5 Claims**


1
2
3
TELEVISION SIGNAL PROCESSING SECTION
21
22
23
HORIZONTAL DEFLECTION CIRCUIT
4
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51
32
A
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33
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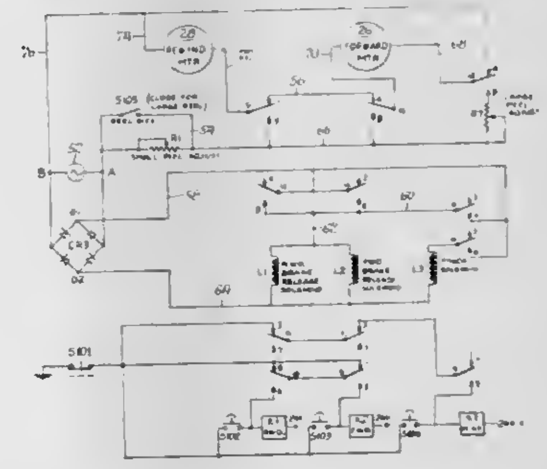
46
19
11

1. A vertical deflection circuit comprising:
a capacitor across which a saw-tooth wave voltage is to be generated;
a current source connected to said capacitor for supplying a substantially constant current to said capacitor during a vertical scan period to produce a linearly increasing or decreasing charge voltage across said capacitor;
capacitor charge voltage control means including a switch which is controlled by a vertical synchronizing signal to be turned on during a vertical blanking period and turned off during the vertical scan period, said capacitor charge voltage control means supplying a current to said capacitor during the vertical blanking period to restore the charge voltage of said capacitor from a voltage level corresponding to the end of the vertical scan period to a voltage level corresponding to the start of the vertical scan period;
a vertical deflection coil;
means for amplifying the saw-tooth wave voltage developed across said capacitor to feed a saw-tooth wave current to said vertical deflection coil; and
feedback circuit means connected between said vertical deflection coil and said current source for controlling the current supplied to said capacitor from said current source; said feedback circuit means including detection means coupled to said vertical deflection coil to produce a voltage waveform which is analogous to the saw-tooth wave current and supply means for supplying the voltage produced in said detection means to said current source thereby to control the current magnitude thereof for compensating for non-linearity of said saw-tooth wave current.

4,105,934
MAGNETIC TAPE REPRODUCER WITH SERIES INTERCONNECTED TORQUE MOTORS IN PLAY MODE

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Apr. 16, 1976, Ser. No. 677,539
Int. Cl.^{2} B65H *77/00*
U.S. Cl. 318—7 **8 Claims**



1. In transducing apparatus for a magnetic tape trained between forward and rewind reels for movement past a transducing head and between a rotatable capstan and a pressure roller movable toward and away from the capstan, tape drive means including a capstan motor for rotating the capstan at constant speed and forward and rewind torque motors operating at normal voltage connected to the forward and rewind reels to move the tape in forward and rewind directions respectively, control means including a transducing mode circuit selected to place the apparatus in transducing mode in which both torque motors are simultaneously energized to rotate the reels in opposite directions to tension the tape across the head and the pressure roller is moved to press the tape into frictional speed-limiting driving engagement with the capstan, the control means further including a fast mode circuit selective to place the apparatus in a fast mode in which the pressure roller is moved to free the tape from the capstan while only one of the torque motors is energized at a predetermined voltage to wrap the tape at fast speed onto its corresponding reel while the other torque motor is deenergized to enable the tape to unwrap freely from the other reel, the improvement comprising:
means included in said transducing mode circuit for connecting said torque motors in series across said predetermined voltage to reduce the current through both motors during said transducing mode to limit the tension applied to said tape.

4,105,935
MOTOR SPEED CONTROL APPARATUS

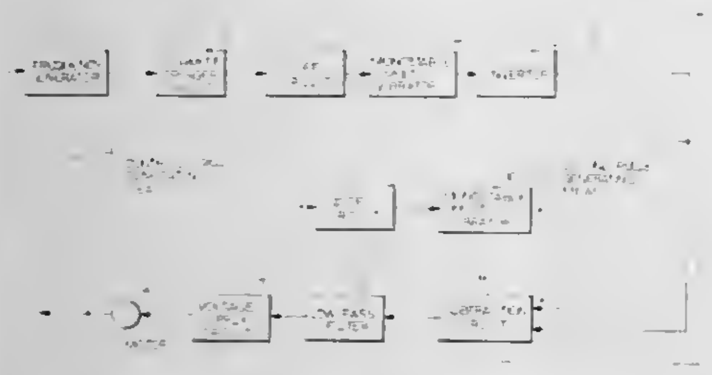
Kazuo Arai; Yoshiaki Igarashi, both of Neyagawa; Masaki Suzuki, Hirakata; Nobuya Sano, Ikoma, and Toshikazu Yosumi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 15, 1976, Ser. No. 733,023

Claims priority, application Japan, Oct. 22, 1975, 50-127819; Oct. 24, 1975, 50-128733

Int. Cl.^{2} H02P *5/10*

U.S. Cl. 318—314 **7 Claims**



1. A motor speed control apparatus comprising: frequency generating means coupled to the motor to be controlled for generating a frequency signal, the frequency of which is proportional to the rotational speed of said motor; and control signal generating means coupled to said frequency generating means for generating a control signal for controlling the torque of said motor, said control signal generating means comprising (a) first pulse generating means for generating, in dependence on said frequency signal, a first pulse train having a period the same as that of said frequency signal, each pulse having a pulse width which is shorter than the period of said frequency signal and which decreases as the frequency of said frequency signal increases; (b) second pulse train generating means for generating in dependence on said frequency signal a second pulse train of pulses, one edge of each of which coincides in time with the corresponding edge of each pulse of said first pulse train, each pulse of said second pulse train having a constant pulse width which is in a range from the same width to nearly the same width as that of said each pulse of said firt pulse train obtained by the motor rotation at a predetermined speed; and (c) subtraction means coupled to said first and second pulse generating means for producing a third pulse train of pulses which is the difference between said first pulse train and said second pulse train, each of which has a pulse width corresponding to the difference between said pulse width of said pulses of said first pulse train and said pulse width of said pulses of said second pulse train and has a first polarity when the pulse width of said pulses of said first pulse train exceeds the pulse width of said pulses of said second pulse train and has an opposite polarity when the pulse width of said pulses of said second pulse train exceeds the pulse width of said pulses of said first pulse train, whereby a motor torque corresponding to said third pulse train can be generated when said third pulse train is supplied to said motor as the driving signal therefor.

4,105,936
VARIABLE SPEED TAPE TRANSPORT APPARATUS

Isao Matsumoto, Tokyo, and Haruhisa Yamaguchi, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,077

Int. Cl.^{2} H02P *1/04*

U.S. Cl. 318—328 **11 Claims**

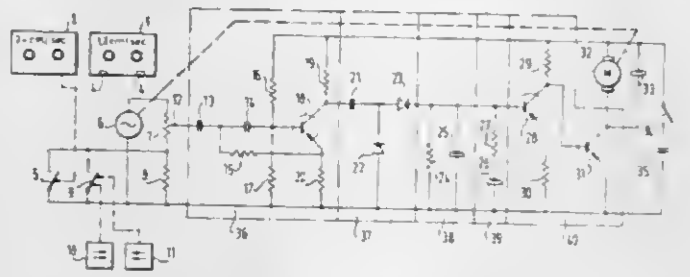
1. A variable speed tape transport apparatus for transporting tape in a cassette at a substantially constant speed, said speed being selected from plural predetermined speeds, comprising:

a variable speed motor for driving said tape;

means responsive to the speed of said motor for generating a signal whose amplitude and frequency both are proportional to said speed so that the generated signal is within a frequency range corresponding to said plural predetermined speeds;

control means for producing a motor speed control signal as a function of said generated signal, said control means including filter means for receiving said generated signal and having a filter characteristic with a rolloff portion that at least encompasses said frequency range of said generated signal to selectively attenuate the amplitude of said generated signal, the attenuation being inversely related to the frequency of said generated signal, said control signal being derived from said selectively attenuated generated signal;

sensing means coupled to said cassette for sensing predetermined speed indications on said cassette, each said indication representing a respective normal tape speed;



level determining means for supplying a selectable level of said generated signal to said filter means;

switch means actuable in response to the speed indications sensed by said sensing means for controlling said level determining means to determine the level of said generated signal supplied to said filter means, such that said generated signal is supplied to said filter means at a first level in response to a first sensed speed indication whereby said motor is driven at a relatively lower normal speed and said generated signal is supplied to said filter means at a second level in response to at least a second sensed speed indication whereby said motor is driven at at least one relatively higher normal speed; and

selector means coupled to said control means and operable to vary said control signal to drive said motor at a fast speed at least equal to said relatively higher normal speed.

4,105,937
TEACH-IN METHOD AND APPARATUS FOR USE IN AN INDUSTRIAL ROBOT

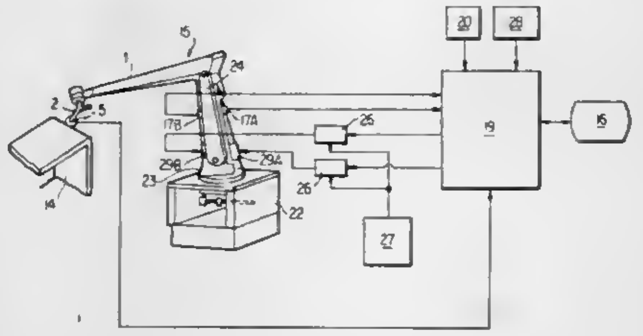
Goro Tuda; Katsuhiko Shimizu, both of Kobe; Tudoi Murakami, Ashiya, and Syouzi Nasu, Akashi, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 24, 1976, Ser. No. 689,125

Claims priority, application Japan, May 23, 1975, 50-62239; Jan. 9, 1976, 51-2217

Int. Cl.^{2} G05B *19/24*

U.S. Cl. 318—568 **3 Claims**



1. A teach-in method for use in an industrial robot, wherein the teaching is accomplished by manually guiding the tracing tip of a robot arm along a desired path, which method comprises the steps of:

attaching, to the end of the arm, the tracing tip having at least a displacement pulse oscillator, which consists of a projector and a phototransistor, and a roller provided with gaps such as holes or slits, said projector and said phototransistor being disposed at concentric positions with respect to the respective gaps of said roller so as to form an optical axis between the two optical elements;

moving the tracing tip along a desired path, so that a location signal of the tracing tip may be obtained by the displacement pulse oscillator whenever the roller is rotated a predetermined distance as a result of the movement of the tracing tip through respective degrees of freedom, and memorizing said location signal in a memory device;

exchanging the tracing tip for a working tip at the end of the arm;

playing back said location signal, such that the working tip is automatically traced along the predetermined desired path by means of the memorized location signal; and,

independently controlling the velocity of the working tip with respect to the teaching velocity of the tracing tip.

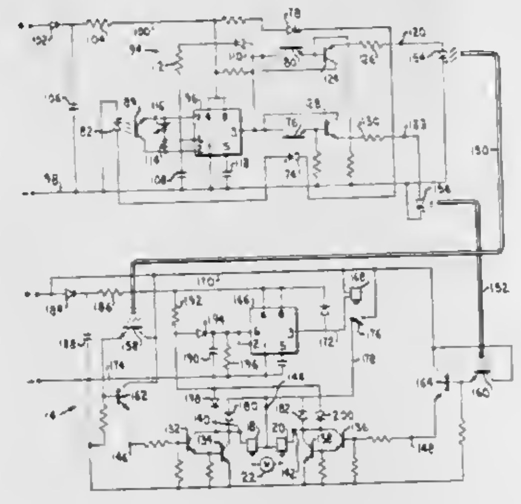
4,105,938
PROPORTIONAL PULSE CONTROLLER

Victor M. Mathews, Jr., Leawood, Kans., assignor to MKC Electronics Corporation, Kansas City, Kans.

Filed Aug. 20, 1976, Ser. No. 716,099

Int. Cl.^{2} G05B *11/01, 11/28*

U.S. Cl. 318—599 **13 Claims**



1. Apparatus for controlling the excitation of an electrical actuator such as a solenoid or motor having a current-carrying winding, said apparatus comprising:

output terminal means adapted to be connected to said actuator for supplying electrical excitation thereto;

circuitry for producing a train of output voltage pulses and delivering said pulses to said terminal means, each of said pulses having an amplitude selected to apply a desired, full operating voltage to said actuator,

said circuitry including control means for varying the duty cycle of said pulse train between a predetermined minimum and maximum, said predetermined minimum having a value sufficient to overcome the starting hysteresis of said actuator; and

a controller having an off condition and an on condition and, in said on condition, providing a range of excitation for said actuator from said minimum to said maximum duty cycle,

said controller including switch means coupled with said circuitry for selectively effecting delivery or interruption of delivery of said pulse train to said terminal means, and a shiftable operating member associated with said switch means and said control means and having an off position corresponding to said off condition of the controller,

said member operating the switch means to effect delivery of said pulse train to said terminal means when the member is shifted in a direction corresponding to the on condition of the controller, and selectively operating said control means to set the duty cycle of said pulse train at a desired level of excitation dependent upon the degree of displacement of the member in said direction away from said off position,

said controller further including means mounting said member for movement away from said off position through an initial, relatively small displacement to operate said switch means, and through a range of control movement thereafter to selectively operate said control means.

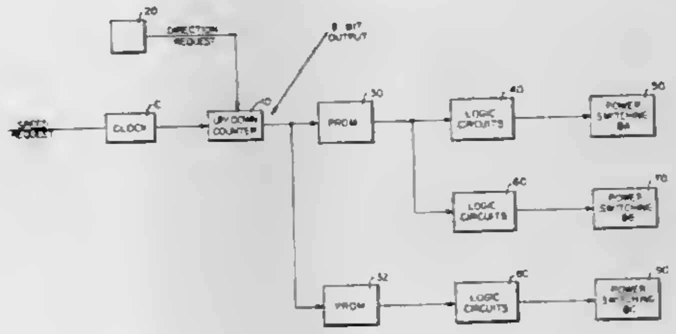
4,105,939
DIRECT DIGITAL TECHNIQUE FOR GENERATING AN AC WAVEFORM

Charles H. Culbertson, Towson, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1976, Ser. No. 713,177

Int. Cl.^{2} G05B *11/28*

U.S. Cl. 318—599 **4 Claims**



1. Apparatus for direct digital conversion of DC voltage to an AC output waveform without the use of an AC reference waveform, comprising,

pulse generator means for producing clock pulses,

counter means connected to said pulse generator means and being incremented by said clock pulses and producing a digital output indicative of the count value produced by said clock pulses,

a programmable read only memory means responsive to said digital output of said counter means to develop a pair of logic control signals corresponding to combinations of logic ONES and ZEROS in a pattern sequence indicative of a preprogrammed AC waveform, said programmable read only memory means including a predetermined number of stored words, each incremental change in the count value of said counter means producing a digital output from said counter means which addresses a different stored word, each stored word producing a predetermined pair of logic control signals, and

logic circuit means operatively coupling said programmable read only memory means to a DC voltage power stage consisting of a plurality of power switching devices,

said logic circuit means responding to said logic control signals by controlling the conduction of said power switching devices to produce a pulse width modulated output from said DC voltage power stage corresponding to said preprogrammed AC waveform.

4,105,940
POSITION CONTROL DEVICE

Hans Kühnlein, Nürnberg-Grossgründlach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,703

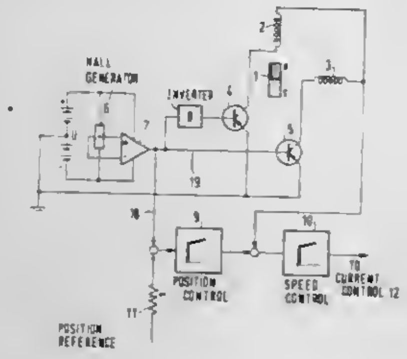
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 2553119

Int. Cl.^{2} G05B *1/06*

U.S. Cl. 318—653 **2 Claims**

1. In a position control device driving a speed controlled motor with a tachometer generator coupled to the motor

providing velocity feedback information for speed control, the drive system including a position controller having as inputs a desired position voltage and an actual position feedback voltage, and a speed controller at the input of which the position controller output is summed with the feedback velocity, the improvement comprising the tachometer generator being a

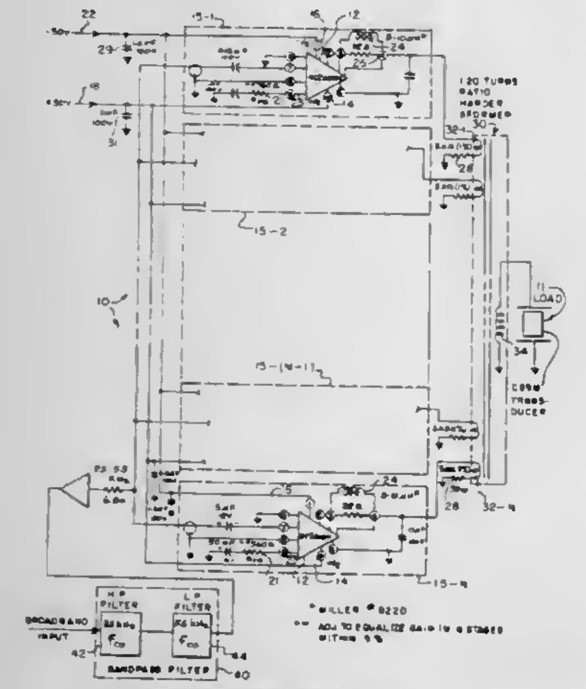


brushless tachometer generator generating a dc voltage proportional to the actual speed and having at least one position transmitter in the form of a Hall effect generator associated with its rotor, the Hall voltage obtained in said position transmitter being coupled to the position controller as the position feedback to indicate the actual value of position.

4,105,941
DRIVER FOR REACTIVE LOAD

Claude C. Routh, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 11, 1977, Ser. No. 823,792
Int. Cl.² H03F *3/68*
U.S. Cl. 330—124 R **7 Claims**



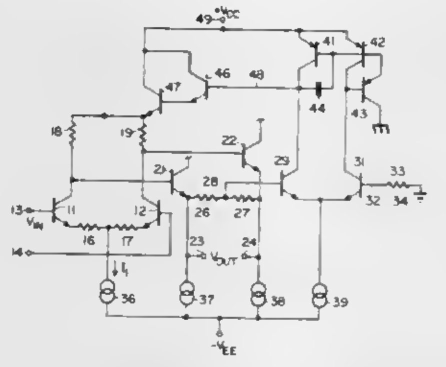
APPARATUS FOR DRIVING A REACTIVE LOAD

1. Apparatus for driving a reactive load, comprising:
a plurality of N multi-input circuit elements, N ≧ 2, connected in parallel, capable of amplifying a band of frequencies, two inputs of each element being connectable to sources of direct-current voltage, each circuit element and elements connected to its inputs defining a circuit stage;
N means, each means connected to at least one of the inputs of the circuit elements, capable of equalizing the gain of each of the N stages within a prescribed percentage;
a transformer having N primary, intput, windings and one secondary, output, winding, which is connectable to the load, each of the N primary windings having their inputs connected to one of the outputs of the circuit elements;
the transformer being so designed that its impedance, whether capacitive or inductive, as seen from the load, balances the inductive or capacitive load, respectively to be connected to it, over the band pass of interest.

4,105,942
DIFFERENTIAL AMPLIFIER CIRCUIT HAVING COMMON MODE COMPENSATION

Paul Michael Henry, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1976, Ser. No. 750,477
Int. Cl.² H03F *3/45*
U.S. Cl. 330—261 **10 Claims**



1. An open loop common mode amplifier circuit, comprising: a differential amplifier having inputs, outputs and requiring a supply voltage; control means for changing the supply voltage to the differential amplifier, the control means being coupled to the differential amplifier; sensor means for sensing an output from the differential amplifier, the sensor means being coupled to outputs of the differential amplifier; and means for amplifying any common mode offset voltage which may exist on the output of the differential amplifier, the means for amplifying having an input and an output, the input being coupled to the sensor means, and the output of the means for amplifying being coupled to the control means to change the supply voltage to the differential amplifier to drive any common mode offset voltage which may exist to a minimum level.

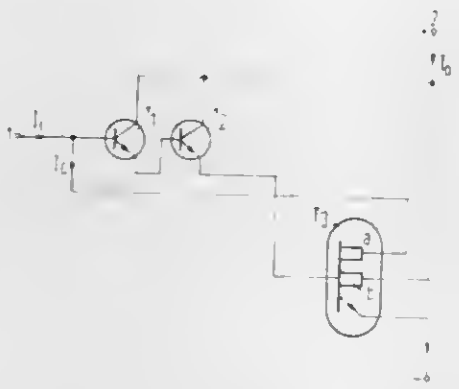
4,105,943
INTEGRATED AMPLIFIER WITH NEGATIVE FEEDBACK

Gerhard Krause, Rosenheim, Egarten, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 731,432, Oct. 12, 1976. This application Aug. 10, 1977, Ser. No. 823,402

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641551

Int. Cl.² H03F *3/14*
U.S. Cl. 330—290 **3 Claims**



1. An integrated current amplifier having negative feedback comprising: at least two amplifier stages, a negative feedback arm connected from the amplifier output to the amplifer input, and the output circuit of an active element of a last amplifier stage is divided so as to produce a division of the output current such that a portion of the current is conveyed into the negative feedback arm and a portion of the current is conveyed into the amplifier output, and d.c. input current means associated with the amplifier stages, the value of an input d.c. current supplied by the current means which determines the amplifier operating point being selected such that the dynamic amplifier input impedance is matched to the characteristic impedance of a line which supplies an input signal, the amplifier input current (I_i) being governed by the equation

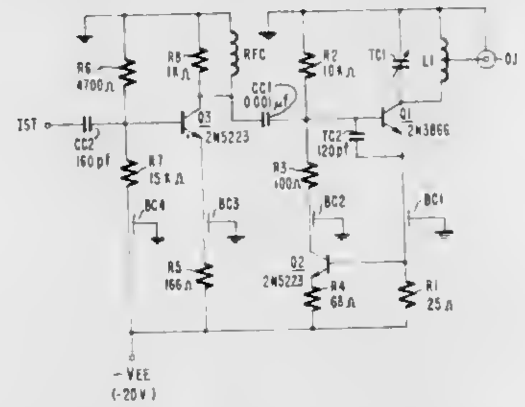
$$I_i = kT/eZ$$

where
k is the Boltzmann constant,
T is the absolute temperature
e is the elementary charge and
Z is the characteristic impedance of the line which supplies the signal to be amplified.

4,105,944
QUIESCENT BIASING OF R-F POWER TRANSISTORS FOR OTHER THAN CLASS A OPERATION

Wendell Goundrey Anderson, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,586
Int. Cl.² H03F *3/19*
U.S. Cl. 330—290 **8 Claims**



1. In an r-f amplifier including at least one common-emitter r-f amplifier transistor, each said r-f amplifier transistor in addition to having an emitter electrode having a base electrode connected for receiving at least a portion of an r-f drive signal, the supply of which is susceptible to interruption, and having a collector electrode for connection to a load, the improvement for avoiding undesirable quiescent base-input impedance conditions in each r-f amplifier transistor comprising:
respective current feedback means connected to each r-f amplifier transistor for regulating its emitter current to a prescribed value during interruption of r-f drive signal, each current feedback means including a respective emitter degeneration resistance for its r-f amplifier transistor, a respective auxiliary transistor being of the same conductivity type as its r-f amplifier transistor and having base and emitter and collector electrodes and having emitter-base and collector-base junctions, respective means for applying the quiescent potential drop across its emitter degeneration resistance to a respective circuit including the emitter-base junction of its auxiliary transistor, and means for connecting the collector electrode of its auxiliary transistor to the base electrode of its r-f amplifier transistor; and
means responsive to r-f signal being supplied for disabling said respective current feedback means.

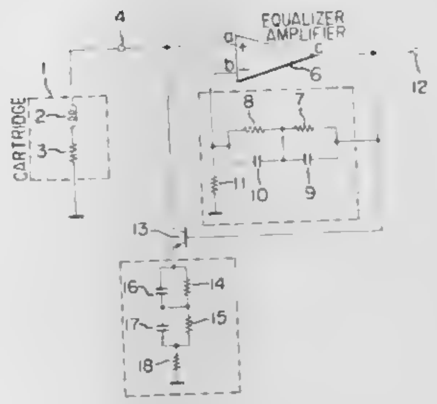
4,105,945
ACTIVE LOAD CIRCUITS

Nobuya Sano, Nara; Hiroshi Goto, Katano, and Yutaka Hirota, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,148

Claims priority, application Japan, Mar. 16, 1976, 51-28718; Mar. 17, 1976, 51-29495

Int. Cl.² H03F *1/34*
U.S. Cl. 330—294 **16 Claims**

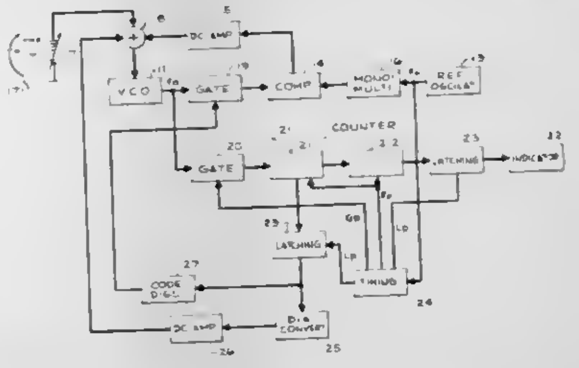


1. An active load circuit comprising
(a) an amplifier having an input terminal, an output terminal and a feedback terminal and a feedback circuit interconnected between the output and feedback terminals,
(b) a circuit having an impedance frequency characteristic similar to that as viewed from one point in said feedback circuit including the output terminal toward the feedback terminal, and
(c) an active circuit for causing said circuit defined in (b) to convert the voltage at one point in said feedback circuit into current which in turn is applied to the input terminal of said amplifier.

4,105,946
FREQUENCY SYNTHESIZER WITH PHASE LOCKED LOOP AND COUNTER

Yuji Ikeda, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,313
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **20 Claims**



1. In a frequency synthesizer device having a phase locked loop comprising voltage controlled oscillator means, reference frequency oscillator means and phase comparator means for comparing a phase difference between outputs from the voltage controlled oscillator means and the reference frequency oscillator means to apply the compared output to the voltage controlled oscillator means to stabilize the oscillating frequency thereof, an improvement comprising;
means for generating a series of harmonic waves from the reference signal from said reference frequency oscillator means, said series of harmonic waves being applied to said

phase comparator means for phase comparing with the output from said voltage controlled oscillator means,

means for coarsely changing the output frequency of said voltage controlled oscillator means to a desired frequency,

first gate means coupled with the output of said voltage controlled oscillator means,

counter means for counting the number of output waves from said voltage controlled oscillator means through said first gate means,

first latching means coupled with an output of said counter means which provides the least significant digit of a decimal number of a count by said counter means,

second gate means connected in a closed loop comprising said voltage controlled oscillator means and said phase comparator means,

means for providing a gate signal to make said second gate means conductive at a time when the number from said first latching means is within a predetermined range,

second latching means coupled with said counter means,

first indicator means for indicating the desired frequency value correspondingly to the counted number through said second latching means,

and means coupled with the output from said reference frequency oscillator means for providing a gate pulse to make said first gate means conductive, latching signals to operate said first and second latching means and a reset signal to reset said counter means, said gate pulse having a pulse width predetermined correspondingly to the reference frequency and being repeatedly generated with a constant period, said latching signals being provided just after each one of said gate pulses ends, and said reset signal being generated after said latching signals but before next gate pulse.

4,105,947

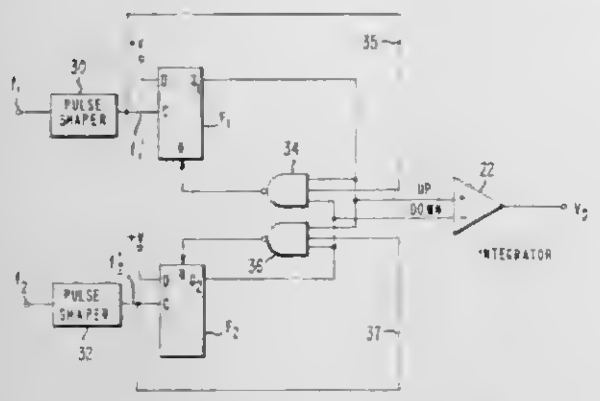
PULSE WAVE PHASE AND FREQUENCY DETECTOR

Albert Timothy Crowley, Somerdale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,750

Int. Cl.^{2} H03B *3/04*

U.S. Cl. 331—1 A **6 Claims**



1. A phase and frequency detector, comprising

first and second flip-flops each having a leading edge trigger input, an output and a reset input,

means to apply a first pulse wave to the trigger input of said first flip-flop,

means to apply a second pulse wave to the trigger input of said second flip-flop, and

gate means responsive to outputs of said flip-flops and to said first and second pulse waves to apply reset signals to reset inputs of both flip-flops solely during the times that the first and second pulses overlap in time.

4,105,948

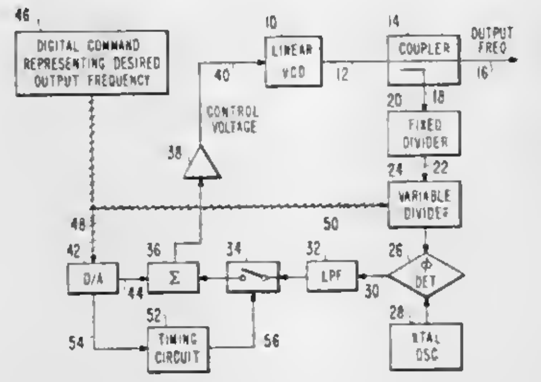
FREQUENCY SYNTHESIZER WITH RAPIDLY CHANGEABLE FREQUENCY

Herbert J. Wolkstein, Livingston, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,328

Int. Cl.^{2} H03B *3/04*

U.S. Cl. 331—14 **5 Claims**



1. A frequency synthesizer capable of rapidly changing its output frequency from one value to another value, comprising

a phase locked loop including a voltage-controlled oscillator, a phase detector, a variable-frequency divider coupling an output of the voltage-controlled oscillator to an input of the phase detector, a source of a reference oscillation coupled to the other input of the phase detector, and a path for a first control voltage from the output of the phase detector to the control input of the voltage-controlled oscillator,

a source of an output frequency command signal coupled to the control input of said variable-frequency divider,

converter means responsive to said output frequency command signal to apply a corresponding second control voltage to the control input of said voltage-controlled oscillator, and

timing and switch means responsive to a change in said desired output frequency command signal to momentarily interrupt said path for the first control voltage.

4,105,949

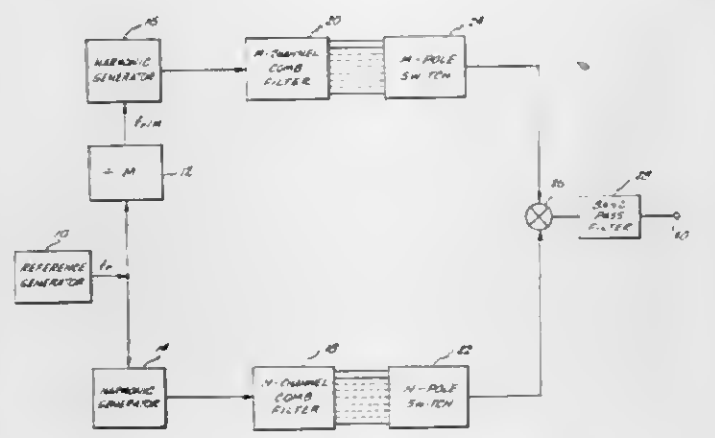
FREQUENCY SYNTHESIZER APPARATUS

Robert H. Hardin, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 15, 1977, Ser. No. 787,869

Int. Cl.^{2} H03B *21/00, 21/02*

U.S. Cl. 331—37 **17 Claims**



9. Frequency synthesizer apparatus responsive to an applied signal having a frequency f_r for supplying a substantially single frequency output signal at a frequency selectable from a plurality of output frequencies, said plurality of output frequencies including a number of frequencies numerically equal to the mathematical product of M times N, where M and N are preselected integers, said output frequencies being spaced-apart from one another in the frequency domain by a frequency interval equal to f_r/M, said frequency synthesizer apparatus comprising:

frequency divider means responsive to said applied signal for supplying a first signal having a frequency f_r/M

first harmonic generator means responsive to said first signal for supplying a second signal having a plurality of at least M signal components, said M signal components being at the frequencies jf_r/M, $(j+1)\ f_r/M\ .\ .\ .\ (j+M-1)\ f_r/M$ where j is a preselected non-zero integer that is greater than the quantity $M(N-1)/2$;

first harmonic selector means responsive to said second signal for supplying a first selected signal at a frequency corresponding to the frequency of a selected one of said M signal components of said second signal;

second harmonic generator means responsive to said applied signal for supplying a third signal having a plurality of at least N signal components, said N signal components being at the frequencies kf_r, $(k+1)\ f_r\ .\ .\ .\ (k+N-1)\ f_r$ where k is a preselected non-zero integer;

second harmonic selector means responsive to said third signal for supplying a second selected signal at a frequency corresponding to the frequency of a selected one of said N signal components of said third signal;

a single mixer means responsive to said first selected signal and responsive to said second selected signal, said mixer means supplying a signal having a first signal component at a frequency equal to the sum of the frequencies of said first and second selected signals and having a second signal component at a frequency equal to the difference between the frequencies of said first and second selected signals; and

a single filter means responsive to said signal supplied by said mixer means for supplying said substantially single frequency output signal at said selectable output frequency, said filter means having a passband including a predetermined one of said first and second signal components for each first and second selected signal supplied by said first and second harmonic selector means, said passband substantially excluding signals at the other one of said first and second signal components of said signal supplied by said mixer means.

4,105,950

VOLTAGE CONTROLLED OSCILLATOR (VCO) EMPLOYING NESTED OSCILLATING LOOPS

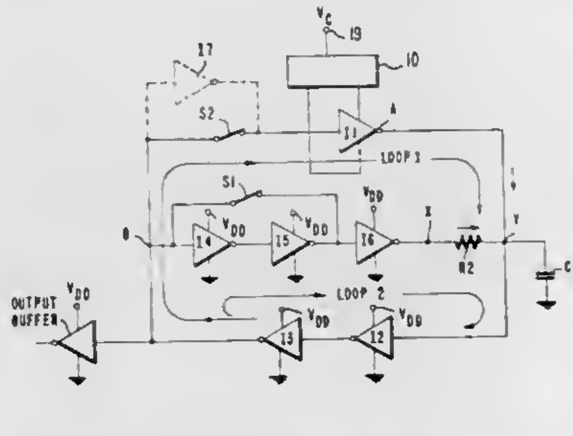
Andrew Gordon Francis Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,285

Claims priority, application United Kingdom, Sep. 13, 1976, 37853/76

Int. Cl.^{2} H03B *3/04, 5/24;* H03K *3/282*

U.S. Cl. 331—57 **6 Claims**



5. A voltage controlled oscillator comprising:

M inverters connected in cascade, and N inverters connected in cascade; where M and N are integers;

means connecting the output of the Mth of said M inverters to the input of the first one of said M inverters for forming a loop normally oscillating at a predetermined frequency;

means connecting the input of the first of said N inverters to the output of one of said M inverters, and means connecting the output of the Nth of said N inverters to the output of a different one of said M inverters for forming a second loop; and

means responsive to an input control voltage connected to at least one of said N inverters for altering its conductivity in response to said control voltage and thereby altering said predetermined frequency of oscillation.

4,105,951

MULTIPACTOR DISCHARGE ARRANGEMENTS

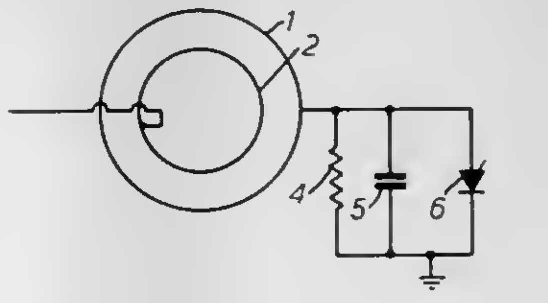
Alan Hugh Pickering, Springfield; Michael Barry Clive Brady, Maldon, and Peter Frederick Lewis, Chelmsford, all of England, assignors to English Electric Valve Company Limited, England

Filed Oct. 22, 1976, Ser. No. 734,883

Claims priority, application United Kingdom, Oct. 24, 1975, 43704/75

Int. Cl.^{2} H01P *1/14;* H03B *9/10*

U.S. Cl. 331—90 **13 Claims**



1. A multipactor discharge arrangement comprising a source of radio frequency energy, two multipactor discharge electrodes arranged such that one surrounds the other to form a co-axial waveguide which is coupled to said source of radio frequency energy whereby, in operation, in a multipactor discharge condition a net current flows from one of said multipactor discharge electrodes to the other, and means connected to utilize such net current to create a self-bias voltage on one of the electrodes.

4,105,952

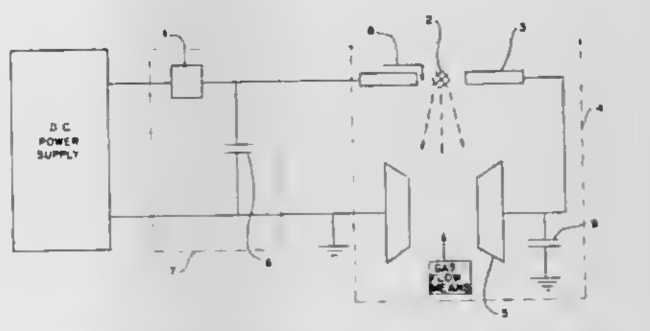
HIGH REPETITION RATE PULSED LASER DISCHARGE SYSTEM

John Tulip, 11823 87th Ave., Edmonton, Alberta, Canada

Filed May 21, 1976, Ser. No. 688,927

Int. Cl.^{2} H01S *3/097*

U.S. Cl. 331—94.5 PE **6 Claims**



1. An apparatus for producing a pulsed electric glow discharge comprising:

a high voltage energy storage capacitor circuit,

a first pair of spaced electrodes for providing a glow discharge therebetween in response to being connected in circuit with said high voltage energy storage capacitor circuit,

an ionizable gaseous medium disposed between said first pair of spaced electrodes within which said glow discharge may be established,

means for switching said high voltage energy storage capacitor circuit in circuit with said first pair of spaced electrodes to initiate said glow discharge, said means for switching including a second pair of spaced electrodes forming a switching spark gap located adjacent said first pair of electrodes and electrically connected in series with said first pair of electrodes,

means for providing a transverse flow of gas between said first pair of electrodes, and

means for initiating a spark discharge across said second pair of electrodes, said spark discharge providing ionization of said gaseous medium between said first pair of electrodes for suppression of arcs therebetween and further serving to switch said high voltage energy storage capacitor circuit in circuit with said first pair of electrodes.

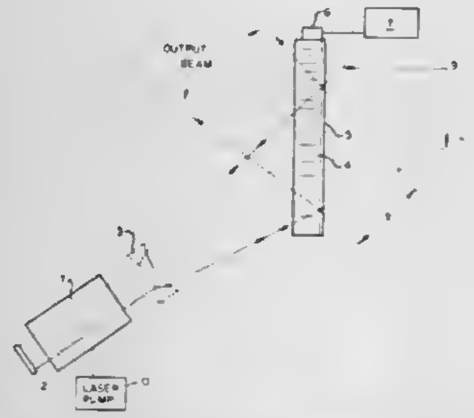
4,105,953
CHIRPED ACOUSTO-OPTIC Q SWITCH

James L. Jernigan, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,831

Int. Cl.^{2} H01S *3/11*

U.S. Cl. 331—94.5 Q **5 Claims**



1. An acousto-optic Q-switch for switching a laser beam from a laser beam source to an output from a high Q condition wherein laser energy is input along an optical path to the Q-switch and reflected back along the same optical path to its source, comprising:

a cell of acousto-optic material placed in said optical path;

a highly reflective surface disposed on said acousto-optic material so that said laser energy input passes through the acoustic-optic material to strike the reflective surface such that said cell of acousto-optical material appears to be twice its actual thickness; and

means for introducing a chirped acoustic pulse to said cell, such that said acoustic pulse is adjacent to said highly reflective surface and travels parallel to said reflective surface and propagates in said cell at the Bragg angle to laser energy traveling through said cell for all portions of the chirped acoustic pulse during the high Q condition, whereby the chirped acoustic pulse diffracts the laser energy input causing the highly reflective surface to reflect the laser energy input back to its source when the chirped pulse is totally within the cell.

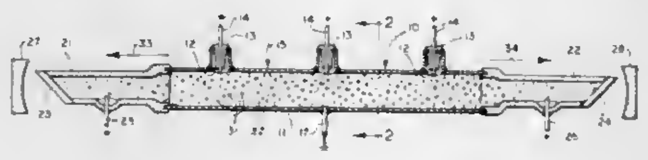
4,105,954
DOUBLE-CONFINED MULTIPLE ANODE HOLLOW CATHODE LASER

Sbing Chung Wang, Temple City, and Randolph W. Hamerdinger, Glendale, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1976, Ser. No. 701,472

Int. Cl.^{2} H01S *3/00*

U.S. Cl. 331—94.5 PE **6 Claims**



1. Apparatus for promoting the emission of radiation by utilizing electrical energy to raise metal vapor material from an initial state to an excited state comprising:

enclosed means, including an elongated body section defining a first electrode and a pair of end sections terminating in means for transmitting radiation, for enveloping a space occupied by said material;

a plurality of second electrodes each being substantially equally spaced, in electrically insulated relationship with said first electrode, longitudinally along the exterior of said body section; each of said second electrodes communicating with the space enveloped by said enclosed means, and being adapted to receive electrical energy for substantially uniform distribution through said space to said first electrode to substantially uniformly raise said material as distributed in said space from said initial state to said excited state; and

cataphoretic means disposed along each of said end sections for establishing an electrical field within said space to accelerate said material away from the nearest one of said radiation transmission means and toward said first electrode.

4,105,955
HETEROSTRUCTURE LASER HAVING A STRIPE REGION DEFINED IN AN ACTIVE LAYER BY A DIFFERENCE IN IMPURITY

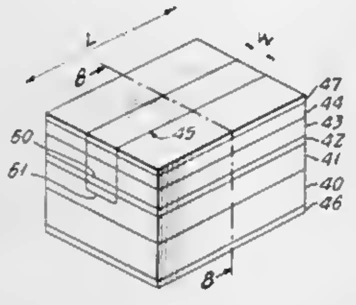
Izuo Hayashi, and Roy Lang, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1977, Ser. No. 775,839

Claims priority, application Japan, Mar. 11, 1976, 51-26440

Int. Cl.^{2} H01S *3/19*

U.S. Cl. 331—94.5 H **18 Claims**



1. In a stripe geometry heterostructure semiconductor laser comprising a multiple heterojunction semiconductor crystal having a pair of principal surfaces, a pair of end surfaces transversely of said principal surfaces, and a pair of side surfaces transversely of said principal and said end surfaces, a pair of reflection surfaces on the respective end surfaces, and a pair of electrodes on the respective principal surfaces, said crystal including only one active layer bounded by a pair of heterojunction interfaces and said end and said side surfaces, said active layer comprising a stripe region extending between said

end surfaces and a contiguous region between said stripe region and at least one of said side surfaces, said interfaces being substantially parallel to each other at least at their portions defining said stripe region, said stripe region being in substantial coincidence with an oscillation producing region where laser oscillation takes place, said oscillation producing region being restricted by said interfaces in a first direction perpendicular to said interfaces, said stripe region and said contiguous region having different impurity characteristics such that said stripe region has a higher dielecric constant than said contiguous region, whereby said oscillation producing region is restricted to said stripe region in a second direction parallel to said interfaces and said laser oscillation is stabilized to a single fundamental transverse mode.

4,105,956
Q-SWITCHED LASER AND LASER ROD

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 6, 1976, Ser. No. 730,038

Int. Cl.^{2} H01S *3/111*

U.S. Cl. 331—94.5 Q **19 Claims**

1. In a Q-switched laser which includes a front, partially transmissive mirror, a rotating rear mirror switching means, spaced-apart from said front mirror, for causing a rear mirror to be optically aligned for precise retro-reflection with the front mirror only when a laser pulse is desired, and a flash tube for providing pumping power for said laser, an improved laser rod member, positioned between said front mirror and said rear mirror switching means, which comprises:

an elongated, solid, rod like member made from a material containing a lasable element, said rod like member including front and rear polished faces, said rod like member further including pulse suppression means for preventing the passage of shallow angle reflected or refracted beams through said rod like member, said pulse suppression means being integrally formed on the edge of one of said polished faces and extending towards the center of said polished face an extent great enough to allow interception of said shallow angle beams.

4,105,957
FULL WAVE BRIDGE POWER INVERTER

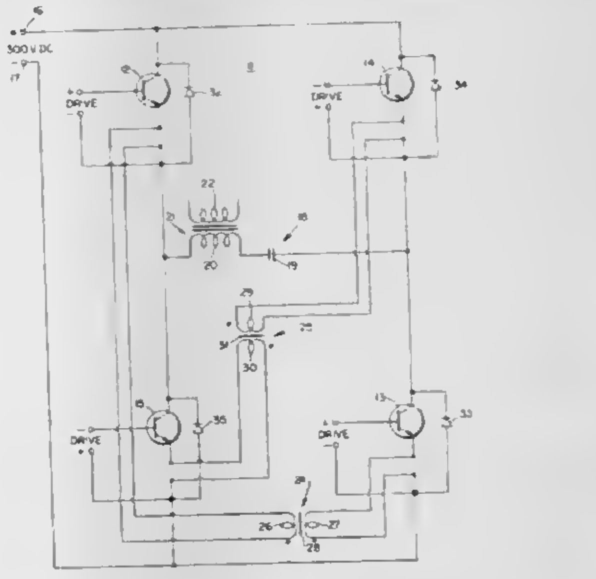
Frank Catbell, San Diego, Calif., assignor to Qualidyne Systems, Inc., Chula Vista, Calif.

Filed Sep. 21, 1977, Ser. No. 835,403

Int. Cl.^{2} H02M *7/537;* H03K *3/30*

U.S. Cl. 331—110 **7 Claims**

1. An inverter for converting power from a DC source to AC power that is supplied to a load comprising first, second, third and fourth switches, each of said switches having a control terminal, an input terminal and an output terminal, each of the switches being activated into conducting and non-conducting states between the input and output terminals in response to the voltage magnitude between the control and input terminals having values in first and second ranges, respectively; means for connecting said switches in a bridge circuit with the source and load, said bridge circuit including an apex to which the load is adapted to be connected; the input and output terminals of said first and second switches being in a first series circuit with each other, terminals for the source, and the apex, so that current flows in a first direction through the apex and between the input and output terminals of the first and second switches in response to the first and second switches both being closed; the input and output terminals of said third and fourth switches being connected in a second series circuit with each other, the source terminals, and the apex, so that current flows in a second direction through the apex and between the input and output terminals of the third and fourth switches in response to the third and fourth switches being closed; first means for simultaneously activating the first and second switches into conducting and cut-off states during a first time interval, second means for simultaneously activating the third and fourth switches into conducting and cut-off states during a second time interval; said first activating means including: (a) first means for respectively biasing the control terminals of the first and second switches relative to the input terminals of the first and second switches, said first and second switches being likely to have dissimilar characteristics in response to the voltages biasing the control terminals thereof so that one of the first and second switches has a tendency to conduct and cut off prior to the other one in response to the biasing voltages therefor, and (b) second means for coupling currents between the input terminals of the first and second switches, said second means being arranged so that in response to either of the first or second switches being rendered into the current conducting and cut-off states, the other switch is supplied with a voltage tending to activate it into a like state and substantially overcome the tendency for the first and second switches to conduct and cut off at different times; said second activating means including: (a) third means for respectively biasing the control terminals of the third and fourth switches relative to the input terminals of the third and fourth switches, and said third and fourth switches being likely to have dissimilar characteristics in response to the voltages biasing the control terminals thereof so that one of the third and fourth switches has a tendency to conduct and cut off prior to the other one in response to the biasing voltages therefor, and (b) fourth means for coupling currents between the input terminals of the third and fourth switches, said fourth means being arranged so that in response to either of the third or fourth switches being rendered into the current conducting and cut-off states, the other switch is supplied with a voltage tending to activate it into a like state and substantially overcome the tendency for the third and fourth switches to conduct and cut off at different times.



4,105,958
LARGE DELAY SPREAD CHANNEL SIMULATOR

John Norman Pierce, Lexington, and Steen Allan Parl, Belmont, both of Mass., assignors to Signatron, Inc., Lexington, Mass.

Filed Feb. 2, 1976, Ser. No. 654,511

Int. Cl.^{2} H03H *7/14, 7/22, 7/28, 7/30*

U.S. Cl. 333—29 **19 Claims**

1. Apparatus for simulating the characteristics of a signal channel and responsive to a channel input signal to produce a simulated channel output signal, said apparatus comprising

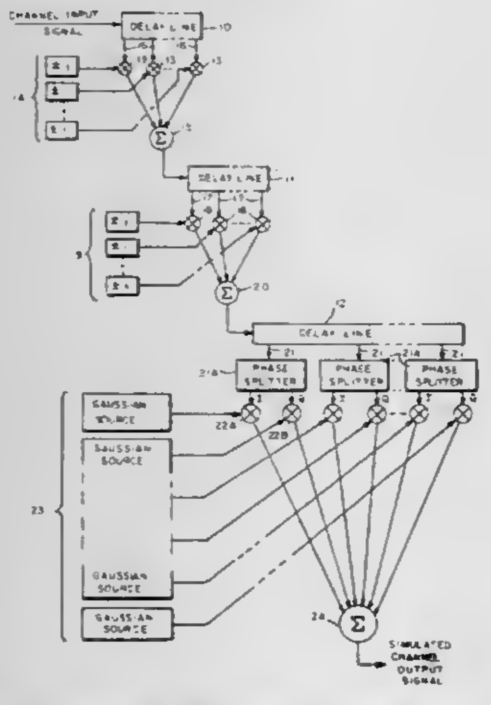
at least two cascade-connected delay line means, each responsive to a delay line input signal and having a selected number of tap outputs for providing a plurality of tap output signals therefrom;

first means associated with all but a selected one of said delay line means for generating a plurality of randomly characterized signals;

first further means associated with each of said all but one of said delay line means and responsive to the plurality of said tap output signals associated therewith and to said plurality of randomly characterized signals associated therewith for producing a plurality of intermediate signals from each of said all but one of said delay line means;

first summing means associated with each of said all but one of said delay line means and responsive to said plurality of intermediate signals associated therewith for providing a delay line output signal representing the sum thereof;

second means associated with said selected one of said delay line means for generating a plurality of Gaussian characterized signals;



second further means associated with said selected one of said delay line means and responsive to the plurality of tap output signals associated therewith and to said Gaussian characterized signals for producing a plurality of intermediate signals from said selected one of said delay line means;

second summing means associated with said selected one of said delay line means and responsive to said plurality of intermediate signals for providing a delay line output signal representing the sum thereof;

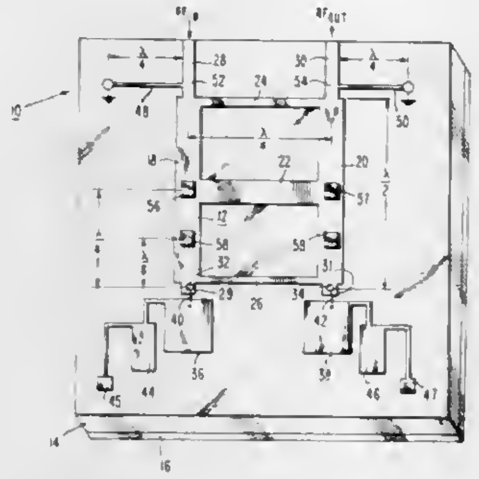
the delay line input signal to the first of said cascade-connected delay line means being the channel input signal, the delay line signal from the last of said cascade-connected delay line means being the simulated channel output signal, and the delay line input signals of all of said delay line means other than said first delay line means being the delay line output signal from the immediately preceding delay line means of said cascaded delay line means.

4,105,959
AMPLITUDE BALANCED DIODE PHASE SHIFTER

Vitaly Stachejko, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,290
Int. Cl.^{2} H01P *3/08, 1/18, 1/22*
U.S. Cl. 333—31 R **6 Claims**

1. A phase shifter for selectively introducing a predetermined phase shift in a microwave frequency signal, said phase shifter being of the reflection type including a pair of transmission lines of substantially equal length, the length of each transmission line being a function of the signal wavelength and at least one quarter wavelength long, said pair of lines being interconnected by at least two branch transmission lines approximately one quarter wavelength apart and of the order of one quarter wavelength in length, an RF input terminal and an RF output terminal connected to one extremity of said pair of transmission lines, respectively, switching means connected to the other extremity of said pair of transmission lines for switching each of said transmission lines from an open termination to a shorted termination, means for biasing said switching means by a first voltage in a first direction and then by a second voltage in a reverse direction whereby the reflection coefficient phase angle shifts substantially a given amount providing a given amount of phase shift of said microwave frequency signal and whereby a first and second insertion loss is produced at said first and second bias voltages respectively, wherein the improvement comprises:

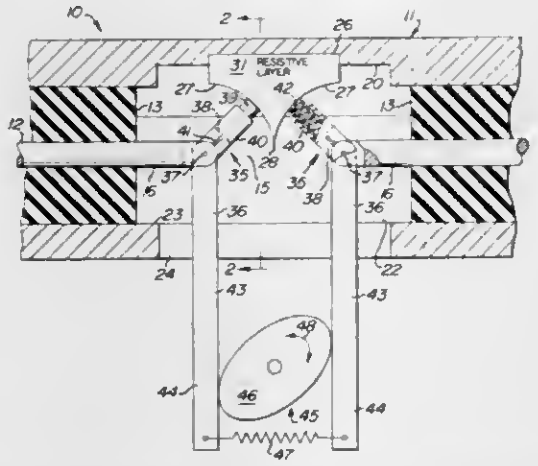


resistive means disposed on each of said pair of transmission lines at a spacing approximately one quarter wavelength from said switching means such that at said first bias voltage said resistive means is decoupled from said RF power and at said second bias voltage said resistive means is coupled to said RF power at a predetermined value to attenuate said power, whereby the difference in the insertion loss over a predetermined frequency range at said first and second bias voltages is negligible.

4,105,960
BROAD-BAND CONTINUOUSLY VARIABLE ATTENUATOR

Helmut Bacher, 771 Quince Orchard #11, Gaithersburg, Md. 20760

Filed Dec. 20, 1976, Ser. No. 752,209
Int. Cl.^{2} H01P *1/22*
U.S. Cl. 333—81 A **13 Claims**

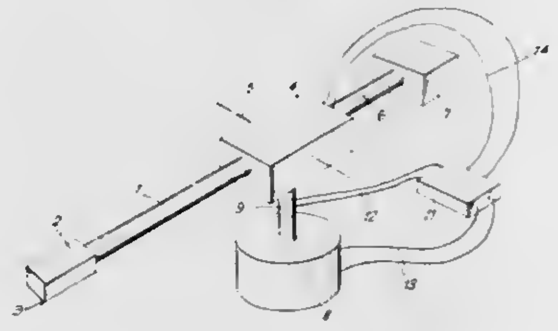


1. A variable microwave attenuator comprising an outer conductive member, an inner conductive member extending longitudinally of said outer conductive member and combining therewith to define a microwave transmission line, said inner conductive member being interrupted to provide a pair of spaced inner conductor member ends, a single resistive member electrically connected to said outer conductive member and extending transversely therefrom toward the space between said inner conductor member ends, and an electrical connector means extending from each of said inner conductive member ends to a respective region of said resistive member to provide attenuation series and shunt current paths through said resistive and outer conductive members, at least one of said electrical connector means being continuously movable relative to and in contacting engagement with said resistive member to selectively vary the resistances of said series and shunt paths for selecting the desired attenuation.

4,105,961
PHONOGRAPH PICK-UP ARM CONTROL ARRANGEMENT

Dexter Robert Plummer, Ongar, and Roderick Frank Jones, London, both of England, assignors to Strathearn Audio Limited, Belfast, Northern Ireland

Filed Nov. 25, 1975, Ser. No. 635,268
Claims priority, application United Kingdom, Nov. 27, 1974, 51446/74
Int. Cl.^{2} G05B *11/01*
U.S. Cl. 318—676 **4 Claims**



1. A circuit arrangement for use in controlling the movement of a pivoted tone arm for a phonograph arm in first and second planes including first and second motors controlling the movement of the arm in the respective planes, a drive element in each motor, means including terminals to connect the drive elements to a source of power, first adjustable means comprising a first potentiometer connected between a terminal of the connection means and the drive elements to determine the total amount of power fed respectively to each of the drive elements from the source of power, and second adjustable means comprising a second potentiometer connected to said first potentiometer and to said drive elements for varying the ratio of the power fed to the two respective elements, the pivot axes of the arm in the first and second planes passing through one of the motors.

4,105,962
BATTERY CHARGER

Donald K. Scott, Jr., Waynesboro, and Michael D. McIntosh, South Mountain, both of Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Continuation of Ser. No. 560,947, Mar. 21, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,681
Int. Cl.^{2} H02J *7/04*
U.S. Cl. 320—32 **4 Claims**

1. A constant voltage battery charger comprising

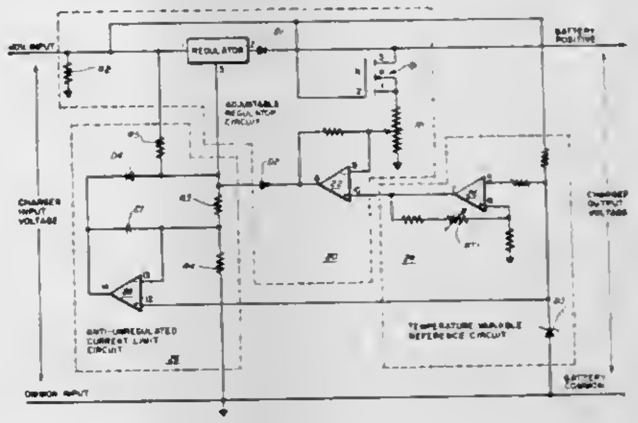
a three terminal voltage regulator having input, output and reference terminals adapted to be supplied with D.C. voltage having a predetermined, constant level,

means for continuously varying the reference voltage with the amount of charge required to establish a constant charging voltage whereby the rate of charge of a battery will be continuously variable with the state of charge of the battery,

said continuously varying means including,

an operational amplifier,

means for supplying a predetermined voltage to the noninverting input of said operational amplifier comprising a second operational amplifier and means for selectively varying the gain of said second operational amplifier as a function of temperature,

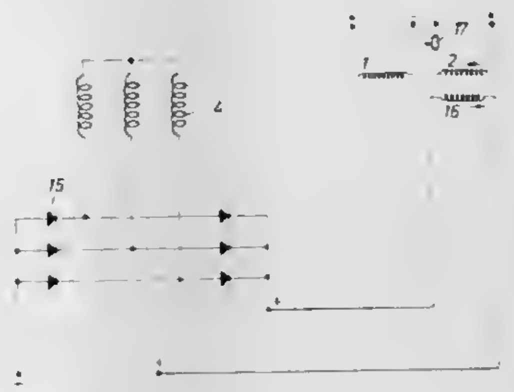

REGULATOR
ADJUSTABLE REGULATOR CIRCUIT
BATTERY POSITIVE
CHARGER INPUT VOLTAGE
CHARGER OUTPUT VOLTAGE
ANTI-UNREGULATED CURRENT LIMIT CIRCUIT
TEMPERATURE VARIABLE REFERENCE CIRCUIT
BATTERY COMMON
COMMON INPUT

means for supplying voltage as a function of regulator output voltage to the inverting of said operational amplifier, said inverting input voltage supplying means including means for selectively varying said inverting input voltage over a given range so that a predetermined output voltage can be defined at a selected ambient temperature, and means for supplying the output voltage of said operational amplifier to said reference terminal.

4,105,963
BRUSHLESS WELDING GENERATOR

Aurel Dobranis, Leverkusen, Germany, assignor to J. U. W. Muller, Maschinen-und Armaturenfabric GmbH, Leverkusen, Germany

Filed Jun. 2, 1977, Ser. No. 803,117
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624904; May 17, 1977, 2722199
Int. Cl.^{2} H02P *9/30*
U.S. Cl. 322—48 **12 Claims**



1. Brushless welding generator with a homopolar machine supplying welding current, comprising: winding-free rotors with several pole rings each forming an air gap of varying size around its periphery with the stator, said homopolar machine being divided into two electromagnetic parts each having an exciting winding for forming an exciting field controlled in one of said two electromagnetic parts in opposition to the welding current.

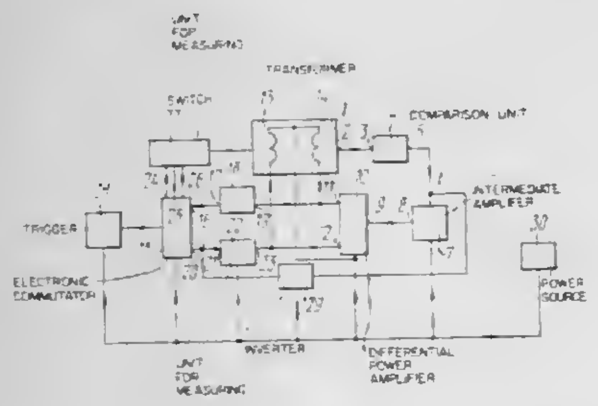
4,105,964
VOLTAGE REGULATION AND STABILIZATION DEVICE

Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Jury Dmitrievich Gupalo, ulitsa Anri Barbjusa, 22-26, kv. 25; Vladimir Alexandrovich Troitsky, ulitsa Bratislavskaya, 8, kv. 86; Nikolai Grigorievich Bely, ulitsa Stepana Razina, 3, kv. 10; Vladimir Alexandrovich Nagaitsev, ulitsa Stroitelei, 26, kv. 6; Boris Vladimirovich Nudelman, ulitsa Filatova, 1/22, kv. 87, all of Kiev; Alexandr Ivanovich Krasnov, Molodezhny bulvar, 4, kv. 7, Tolyatti Kuibyshevskoi oblasti; Jury Iosifovich Borju, Stavropolskaya ulitsa, 23, kv. 6, Tolyatti Kuibyshevskoi oblasti; Dmitry Nikolaevich Parshin, Kommunistisheskaya ulitsa, 55, kv. 80, Tolyatti Kuibyshevskoi oblasti; Pavel Andreevich Zhinzhikov, ulitsa Kostycheva, 41, kv. 195, Bryansk, and Alexandr Nikolaevich Korneev, Promyshlennaya ulitsa, 69, kv. 23, TolyattiKuibyshevskoi oblasti, all of U.S.S.R.

Filed Nov. 30, 1976, Ser. No. 746,007

Int. Cl.^{2} G05F *1/20*

U.S. Cl. 323—43.5 S 33 Claims



1. A voltage regulation and stabilization device comprising:
(a) a transformer with power windings on its magnetic circuit legs, said power windings having taps, yokes of said transformer being arranged between said magnetic circuit legs, some of said yokes having control windings for direct current magnetization of said yokes, a portion of said power windings' turns being arranged in a window formed by the yokes, whereupon there are mounted said control windings;
(b) a switch connected to the power windings' taps of said transformer; and
(c) at least one control circuit comprising: a comparison unit having an input and an output, said input being connected to said transformer; an intermediate amplifier having an input and a reversible output, said input of said intermediate amplifier being connected to said output of said comparison unit; a differential power amplifier having an input and output, said input being connected to said reversible output of said intermediate amplifier, each of said outputs being connected to one of said control windings of said transformer's yokes; a plurality of units for measuring the voltage regulation margin, each having an input and an output, said input of each of said units for measuring the voltage regulation margin being connected to one of said outputs of said differential amplifier; an electronic commutator comprising flip-flops logical NOR circuits and logical NAND circuits, inverters and delay units and having inputs and outputs, said inputs being connected to respective outputs of said units for measuring the voltage regulation margin, said outputs of said electronic commutator being connected to said switch connected to the power windings' taps of said transformer; and
a power source for the control circuit's units to which there is connected said comparison unit, said intermediate amplifier, said differential power amplifier, said electronic commutator and said units for measuring the voltage regulation margin.

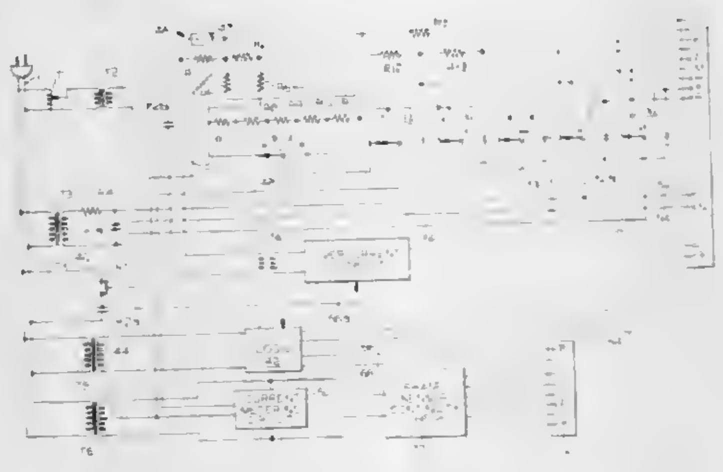
4,105,965
STATIC TRIP CIRCUIT BREAKER TEST SET

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,628

Int. Cl.^{2} G01R *31/02*

U.S. Cl. 324—28 CB 17 Claims



1. A field test set for circuit breakers having phase current monitoring current transformers normally individually connected to supply phase current signals to separate phase signal inputs of a static trip unit for processing to determine the existence of an overcurrent condition, the trip unit including a power supply connected to the phase signal inputs for deriving trip unit operating power from the phase current signals and further including an output connected to supply tripping current for energizing a trip solenoid pursuant to initiating a trip function, said test set including, in combination:
A. a variable source of test signal current;
B. a current meter;
C. a calibration circuit connected to receive said test signal current and having a voltage divider network developing a test signal voltage proportional to said test signal current for application to said current meter;
D. test selector switch means operating to selectively route said test signal current from said calibrating circuit to one of the trip unit phase signal inputs;
E. a power source supplying test power current to directly power up the trip unit power supply independently of the phase signal inputs; and
F. test logic circuitry operating to signal a successful execution of a test trip function in response to the receipt of an effective magnitude of tripping current generated at the trip unit output, said test logic circuitry further operating to coordinate the application of said test signal current and said test power current to the trip unit.

4,105,966
REMOTE LIGHTNING MONITOR SYSTEM

Carl L. Lennon, and Thomas O. Britt, both of Merritt Island, Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

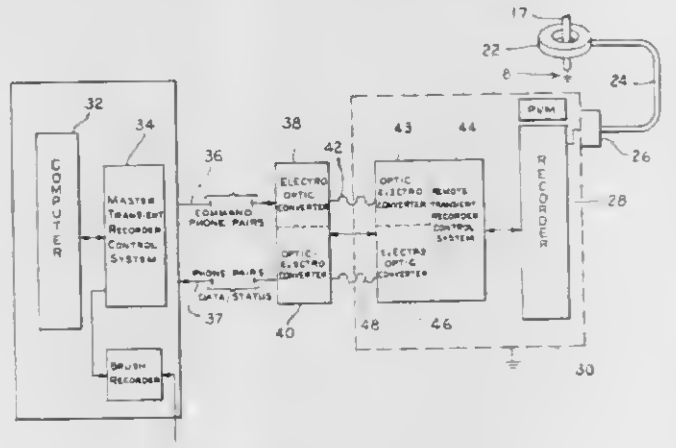
Filed Mar. 29, 1977, Ser. No. 782,482

Int. Cl.^{2} G01R *13/04. 19/16*

U.S. Cl. 324—113 6 Claims

1. An apparatus for monitoring lightning strikes comprising:
(a) an electrically conductive elongated member located in the vicinity where said lightning strikes are to be monitored so that electrical currents are generated in said elongated member proportional to the intensity of said lightning strikes;
(b) means for sensing the change in current flowing through said elongated member and generating a voltage responsive thereto;
(c) an on-site transient recorder control system;
(d) an on-site recorder means for converting said generated voltages to digital signals and storing said digital signals;

(e) an radio frequency interference proof environmental housing enclosing said recorder means and said recorder control system;
(f) a remotely located control means for generating electrical command signals for controlling storing and transmitting of said digitial signals in and from said recorder means;
(g) cables extending between said remotely located control means and said housing;
(h) an optical/electrical interface means interposed between said cables and said transient recorder control system for providing communication from outside said housing to said recorder control system located in said housing;



(i) means for transmitting said command signals to said recorder control system and said transient recorder means causing said recorder means to record said digital information, and
(j) means for transmitting information from said on site recorder means and said recorder control system to said remotely located control means representing the change in current produced by lightning strikes;

whereby by enclosing said recorder control system and said recorder means within said housing and providing communication therewith from said control means through said optical electrical interface electrical isolation therebetween is provided.

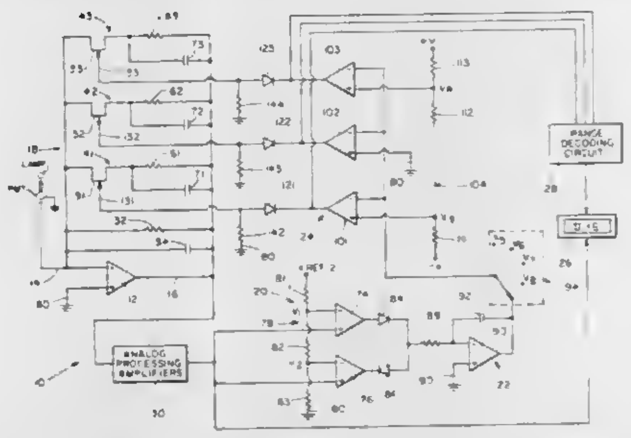
4,105,967
AUTOMATIC RANGE SELECTION CIRCUIT

James H. Macemon, Glen Burnie, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 1, 1976, Ser. No. 728,689

Int. Cl.^{2} G01R *15/08;* H03F *1/36;* G01J *3/30*

U.S. Cl. 324—115 10 Claims



1. An automatic range selection circuit, which comprises:
an amplifier;
adjustable impedance means coupled between an input and an output of said amplifier for controlling the gain of said amplifier;
analog means for comparing the signal at said output from said amplifier with an upper voltage level and a lower voltage level, said analog comparing means including an under-range comparator, an over-range comparator and an integrator, each of said comparators being coupled to the output of said amplifier and having and output coupled to said integrator;
said analog comparing means being operable to generate a positive or negative control signal at an output of said integrator when the signal at said amplifier output is higher than said upper voltage level or lower than said lower voltage level; and
analog control means coupled to said adjustable impedance means and responsive to said control signal from said comparing means for automatically increasing or decreasing the amount of impedance coupled across said amplifier until the level of the signal at said output of said amplifier is between said upper and lower voltage levels.

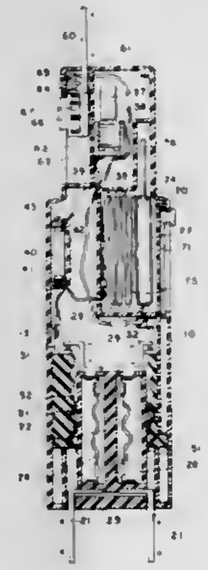
4,105,968
ELECTRICAL TESTER HAVING RETRACTABLE PRONGS AND A RETRACTABLE TEST ROD FOR INDICATING PRESENCE OF A VOLTAGE

Robert L. Mobley, and Della Mobley, both of Henry, Tenn., assignors to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 786,990

Int. Cl.^{2} G01R *19/16. 31/02. 1/06*

U.S. Cl. 324—133 1 Claim

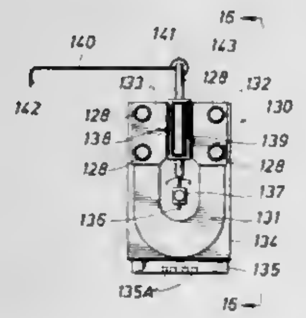


1. An electrical test unit for alternatively indicating voltage in the female contacts of a wall outlet or at two remote electrical contacts, comprising
a housing in which a pair of electrical male prongs are mounted to a slidable block positioned to extend the two prongs beyond the housing in a first fully extended position or to retract the two prongs within the housing in a second retracted position,
an electrical light bulb electrically connected to a pair of contact clips, each of which is mounted in the housing so as to connect to an individual contact means, each contact means being detachably engaged by a separate terminal mounted on said slidable block and electrically connected to a respective one of said prongs in the first fully extended position of the prongs so as to electrically connect a said prong to a said contact clip, together with
an interior chamber located in the housing in which a flexible test lead is stored, said chamber blocked by a door in a wall of the housing, said housing also fitted with a slidable metal test rod slidably mounted to extend beyond the housing in a first fully extended position and to slidably retract within the housing in a second retracted position,
said test rod detachably engaged to contact means, in the first fully extended position, which contact means are electrically connected to one of the contact clips of the light bulb, said contact means fixed to the interior of the housing, and said test lead connected internally to a second of the contact clips of the light bulb, in which

the metal prongs are electrically disengaged from their contact means when moved from the first fully extended position towards the second retracted position, and in which the test rod is electrically disengaged from its contact means when moved from the first fully extended position towards the second retracted position, such that neither of the metal prongs nor the test rod are electrically connected to the internal circuitry of the tester except when in a fully extended position.

4,105,969
GALVANOMETER MECHANISM MOUNTED ON PRINTED CIRCUIT BOARD HAVING PLUG PORTION FOR INSERTION INTO CONTROL CONSOLE RECEPTACLE

Leon Harlan Ivy, Box 1325, Alvin, Tex. 77511
Division of Ser. No. 599,177, Jul. 25, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,221
Int. Cl.^{2} G01R *1/04, 5/02;* G01D *15/24*
U.S. Cl. 324—151 R **3 Claims**

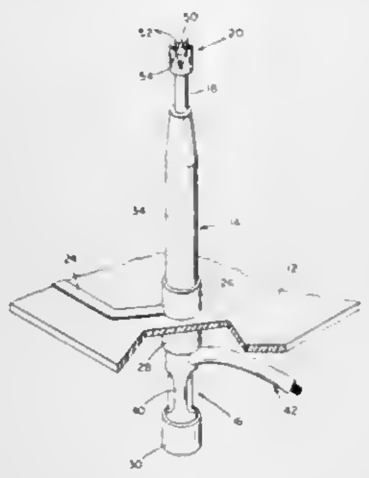


1. A galvanometer mechanism for providing a printed display of electrical signals, said galvanometer mechanism comprising:
- a circuit board having an electrical circuit printed thereon and defining a plug portion;
- a plurality of electrical contacts being defined on said plug portion of said circuit board and being electrically connected to said printed electrical circuit, said plug portion being adapted for insertion into a galvanometer control console receptacle for connection to appropriate galvanometer actuating circuitry;
- a magnet being fixed to said circuit board and having a pair of spaced legs defining the poles of the magnet;
- a torsion bar being secured between the legs of said magnet;
- electrical coil means connected to said printed electrical circuit, said coil means being supported by said torsion bar and being rotated against the restraining force of said torsion bar responsive to the electrical signal being applied to said coil; and
- printing apparatus being operatively connected to said coil means for movement in response to said electrical signal and being positioned relative to print receiving apparatus by said coil means.

4,105,970
TEST PIN

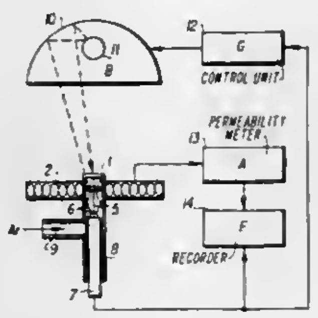
Jonathon H. Katz, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.
Filed Dec. 27, 1976, Ser. No. 757,778
Int. Cl.^{2} G01R *1/06, 31/02;* H01H *1/06*
U.S. Cl. 324—158 P **10 Claims**

1. A test pin comprising:
a body,
a slide, and
a spring,
said spring being carried in said body and engaging said slide to yieldingly bias said slide away from said spring, and
said slide terminating away from said spring in a crown formed from an integral body of conductive material, said crown including a multiplicity of spaced sharp contacts, said multiplicity of spaced sharp contacts including a central sharp contact and a multiplicity of sharp contacts spaced therearound in a contact set, each contact of said set being separated from adjacent contacts of said set by continuous radial grooves extending uninterruptedly at an angle to define two of said sharp contacts of said set and allow self-cleaning,
said contact set being longitudinally positioned toward said spring from said central contact.



4,105,971
PERMEABILITY RESPONSIVE OSCILLATOR FOR DETECTING PHASE TRANSFORMATIONS AT VARIOUS COOLING RATES

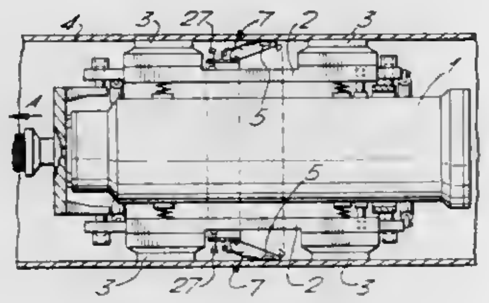
Harri Nevalainen, Terästehdas B 99, 55100 Imatra 1, Finland (55100)
Filed Sep. 13, 1976, Ser. No. 722,475
Claims priority, application Finland, Sep. 11, 1975, 752545
Int. Cl.^{2} G01R *33/12*
U.S. Cl. 324—203 **11 Claims**



1. A device for detecting phase transformations in a magnetic permeable material as a function of temperature change comprising:
- test sample holding means;
- heating means for automatically effecting a variety of elevated temperatures in the sample being tested;
- means for automatically and rapidly controlling the cooling rate of said test sample after it has been heated to said elevated temperature;
- means for detecting phase transformations of said sample being tested as a function of temperature by changes in the magnetic property of said test sample as said sample cools from its elevated temperature, said detecting means including a coil operatively coupled to said test sample, a harmonic oscillator operatively coupled to said coil, said coil constituting the frequency determining inductance of said oscillator;
- means for automatically sensing the temperature of said sample as it cools;
- whereby phase changes in the test sample cause changes of the magnetic properties of said magnetic permeable material which in turn cause changes in the oscillator frequency of said harmonic oscillator, said frequency being detected along with the temperature to yield information for use in preparing continuous cooling phase transformation diagrams.

4,105,972
PIPELINE INSPECTION VEHICLE FOR DETECTING DEFECTS IN PIPELINE WALLS

Ian Smith, Asbington, England, assignor to British Gas Corporation, England
Filed Apr. 5, 1977, Ser. No. 784,911
Claims priority, application United Kingdom, Apr. 9, 1976, 14555/76
Int. Cl.^{2} G01R *33/12*
U.S. Cl. 324—220 **9 Claims**



1. A pipeline inspection vehicle for detecting defects in pipeline walls, having a system for supporting a plurality of detector modules for detecting said defects, which system comprises, a plurality of sledge units each carrying one of said detector modules, a floating ring member disposed around but spaced from the vehicle, means for connectig said ring member about the body of said vehicle, and means for pivotally connecting the sledge units to said ring member in circumferential side-by-side relationship with each other around said ring member, each sledge unit comprising two or more links connected together for pivotal movement with respect to each other, one of said links being arranged to carry a detector module whilst the link remote from said detector module-carrying link being connected to said ring member by pivotal connecting means, and spring means connected respectively to the remote link and to the detector carrying link and arranged independently to urge the leading trailing edges of the detector module-carrying link outwardly so as to resiliently engage the inner surface of the pipeline wall.

4,105,973
MULTIBEAM, DIGITALLY MODULATED, TIME DIVISION, SWITCHED SATELLITE COMMUNICATIONS SYSTEM

Hamilton Webster Arnold, Tinton Falls; LeRoy Conrad Tillotson, Harrison, both of N.J., and James Arthur Young, Jr., Brazilia, Brazil, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 15, 1976, Ser. No. 732,994
Int. Cl.^{2} H04B *7/20*
U.S. Cl. 325—4 **18 Claims**

7. In a multibeam, digitally modulated, time division switched radio communication system including a plurality of ground terminal stations distributed among n spaced ground station areas and a remote repeater, each ground terminal station comprising a transmitter, a receiver and a clock circuit for controlling the bit transmission frequency of the transmitter, the remote repeater comprising n transponders, and a master clock circuit for controlling the system transmissions, a method of synchronizing and switching the signals from the n ground station areas through the repeater comprising the steps of:

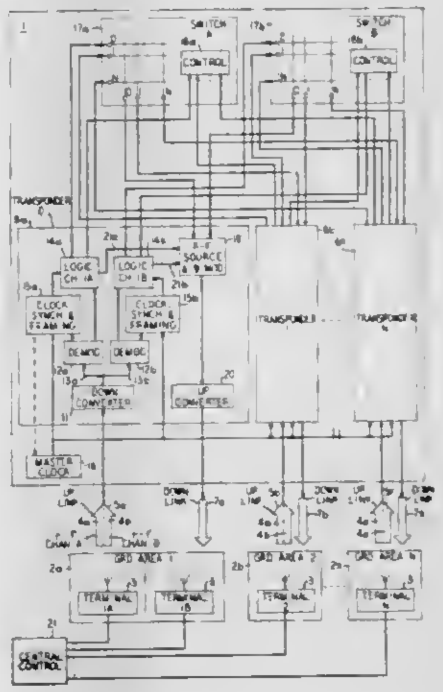
(a) generating at each transponder in response to signals from the repeater master clock a first and a second digital code in predetermined bits of a first section of a first repetitive digital subframe sequence with each subframe comprising w bits, the first digital code providing an indication of the start of each subframe sequence and the second digital code providing an indication of the subframe number within a frame of s subframes;

(b) generating at each ground terminal station for transmission to the repeater a series of N second digital synchronizing subframes, each subframe comprising y bits, where y is a submultiple of $w-1$, and including both a first section of comparative length to said first section of said first subframe sequence comprising said first and second digital codes in corresponding bits positions within said first section and a second section comprising a third digital code for sequentially identifying each of the second subframes within said series of N second subframes, the number of bits necessary for the first and second subframe series to be repeated being determined by the equation

$$M \times sw = N \times y$$

where M is the number of frames of said first subframe series;

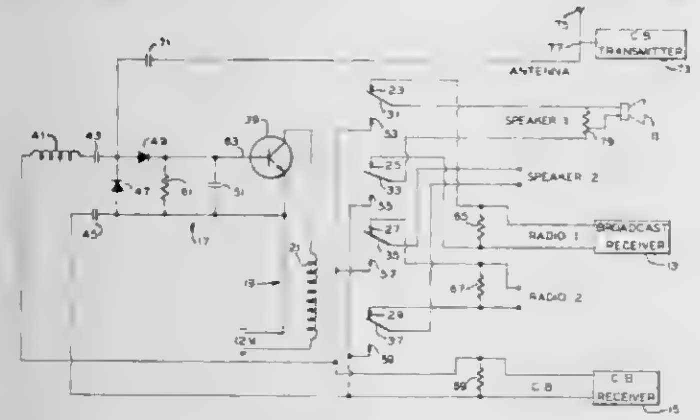
(c) at each transponder, transmitting back to the associated ground terminal station a sequence of w bits comprising the transponder generated digital codes for the first and second portions of said first subframe section followed by the received synchronizing subframe series in said second section whenever the transponder detects both a match between the transponder generated digital code for the first portion of each first subframe section and the synchronous bits in the received bitstream and a mismatch between the transponder generated digital code for the second portion of each first subframe section and the synchronous bits in the received bitstream;



(d) determining at each ground terminal station from the signals received from the associated repeater transponder the number T of the first synchronizing subframe in said received second subframe section causing said repeater transmission in step (c) coincident with the normal reception at the repeater of the first subframe in said frame of s subframes in the first subframe series in accordance with the digital code in the second portion of each first subframe section; and

(e) incrementing a bit counter maintaining a count of the transmitted bits in the second subframe series by a value equal to $(N-t) \times y$ to effect frame and subframe synchronization at each ground terminal station.

4,105,974
PRIORITY INTERRUPT CIRCUIT
Edwin F. Rogers, P.O. Box 186, Syracuse, Ind. 46567
Filed Oct. 14, 1975, Ser. No. 621,823
Int. Cl.² H04B *1/38*
U.S. Cl. 325—21 **11 Claims**



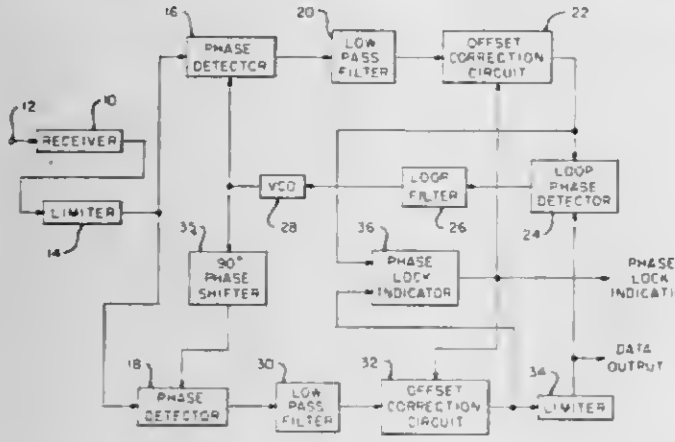
5. In a system including a radio frequency transmitter, an electroacoustic transducer, and an audio signal source for supplying audio frequency signals to the transducer, the improvement comprising:

means monitoring the transmitter for the presence of radio frequency output signals, the means for monitoring including a capacitor, and diode means coupled between the radio frequency transmitter and the capacitor for charging the capacitor when the radio frequency transmitter is producing radio frequency output signals;

means coupled to the monitoring means and operable when enabled thereby to diminish the magnitude of the audio frequency signals supplied to the transducer; and

an intermittent audio frequency signal source, radio frequency choke means coupling the diode means to the intermittent audio frequency signal source whereby the occurence of an audio frequency signal will also diminish the magnitude of the audio frequency signals supplied from the audio signal source to the transducer, the radio frequency choke means preventing the loading of the radio frequency transmitter output by the intermittent audio frequency signal source.

4,105,975
OFFSET CORRECTION CIRCUIT FOR PHASE DETECTORS
David E. Sanders, St. Petersburg; Ramon P. Chambers, Clearwater, and Robert S. Gordy, Largo, all of Fla., assignors to NCR Corporation, Dayton, Ohio
Filed Feb. 1, 1977, Ser. No. 764,604
Int. Cl.² H04L *27/22*
U.S. Cl. 325—320 **8 Claims**



1. An error correction circuit comprising:

a phase detector means for providing a signal at its output indicative of a relationship between signals on its inputs;

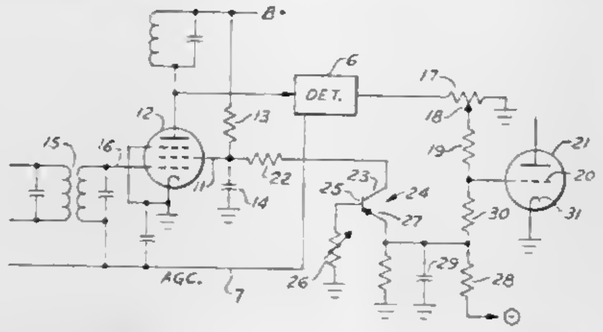
means for providing a correction signal, which signal is a positive going signal in response to one state of a control signal and a negative going signal in response to another state of the control signal;

a comparison means for comparing said correction signal with the signal present at the output of said phase detector to generate said control signal, the state of which is said one state when said correction signal is below the signal at the output of said phase detector and of said another state when said correction signal is above the signal at the output of said phase detector;

means for subtracting said correction signal from the signal provided by said phase detector means to provide an error corrected signal for correcting errors inherent in said phase detector means; and

means for maintaining said correction signal substantially constant during a selected operating condition of said phase detector means.

4,105,976
AUTOMATIC GAIN CONTROL
Floyd Payden, 312 W. State St., Fremont, Ohio 43429
Filed Dec. 1, 1976, Ser. No. 746,259
Int. Cl.² H04B *1/16*
U.S. Cl. 325—404 **2 Claims**



1. An automatic gain control system for a radio receiver comprising, in combination, an intermediate frequency amplifier, a detector connected to the intermediate frequency amplifier, an automatic gain control lead from the detector connected to the intermediate frequency amplifier to vary the amplification generally inversely as the amplitude of the signal applied to the detector, a potentiometer connected to the detector to serve as a volume control, an audio frequency amplifier having an input terminal, a resistor connecting the input terminal to the slider of the potentiometer, an element of the intermediate frequency amplifier having a potential that varies with the potential on the automatic gain control lead, a voltage divider comprising a first resistor and a variable resistor connected between said element and a circuit ground, a semiconductor breakdown device and a second resistor in series connected in parallel with said variable resistor, a third resistor connecting said input terminal to the junction of said semiconductor breakdown device and second resistor, and a fourth resistor connecting said junction to a source of negative potential, whereby the potential of said input terminal varies with the amplitude of the signal of the intermediate amplifier to maintain a constant audio signal from said audio frequency amplifier.

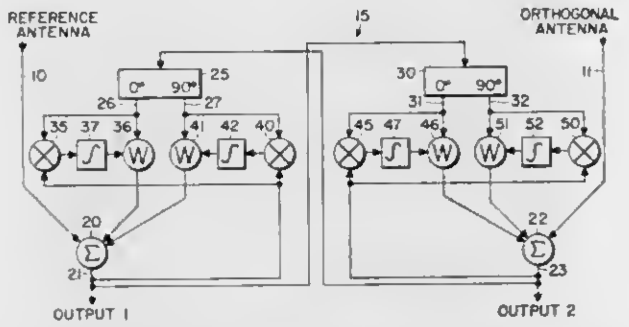
4,105,977
ADAPTIVE UNDESIRED SIGNAL CANCELLER
Robert C. Fitting, and Gregory H. Piesinger, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 10, 1977, Ser. No. 776,141
Int. Cl.² H04B *1/12*
U.S. Cl. 325—472 **6 Claims**

3. An adaptive undesired signal canceller comprising:

a. first summing means adapted to receive a first signal accompanying a portion of a second signal;

b. second summing means adapted to receive the second signal accompanying a portion of the first signal;

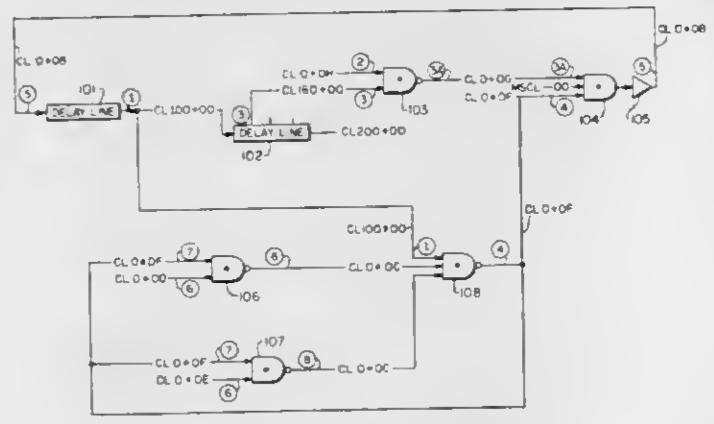
c. first means coupling a portion of a signal from the output of said second summing means to said first summing means for substantially cancelling the portion of the second signal accompanying the first signal therein;



d. second means coupling a portion of a signal from the output of said first summing means to said second summing means for substantially cancelling the portion of the first signal accompanying the second signal therein; and

e. said first and second means each including quadrature means for splitting signals applied thereto into an in-phase and quadrature component and weighting means for adjusting the amplitude of each component.

4,105,978
STRETCH AND STALL CLOCK
Gary J. Goss, Acton, and Thomas F. Joyce, Burlington, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Aug. 2, 1976, Ser. No. 710,540
Int. Cl.² H03K *5/04, 1/18*
U.S. Cl. 328—58 **9 Claims**



1. A stretch and stall clock circuit means comprising:

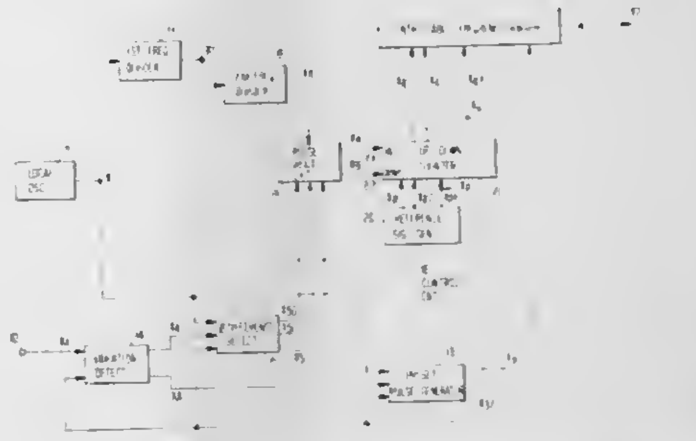
(a) a first electronic means for delaying an electronic signal by a first pre-determined amount of time;

(b) a second electronic means coupled to said first electronic means for delaying the electronic signal by a second pre-determined amount of time;

(c) a third electronic means coupled to said first electronic means for generating first alternating square wave signals having a pre-determined time period T_1; and

(d) a fourth electronic means coupled to said first, second, and third electronic means and responsive to a first request signal for increasing the time period T_1 of the first alternating square wave signals by a pre-determined amount.

4,105,979
CLOCK REGENERATOR COMPRISING A FREQUENCY DIVIDER CONTROLLED BY AN UP-DOWN COUNTER
Kouzou Kage, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan
Filed May 2, 1977, Ser. No. 792,952
Claims priority, application Japan, May 10, 1976, 51-53424
Int. Cl.² H03K *5/01, 3/64*
U.S. Cl. 328—164 **5 Claims**



1. In a clock regenerator responsive to an input data signal taking one of a first and a second state during at least one bit period for producing a regenerated clock signal of a regenerated clock period phase-synchronized with said bit period, comprising a local oscillator for generating a local signal of a frequency substantially equal to an integral multiple of the bit frequency of said input data signal, a controllable frequency divider for frequency dividing said local signal at a frequency division ratio into said regenerated clock signal, first means responsive to said input data and regenerated clock signals for producing an incoincidence signal when a point of variation between said first and second states appears during one of the successive regenerated clock periods in said input data signal, second means responsive to said input data and regenerated clock signals for producing a phase difference signal representative of a phase difference between each of the successive bit periods and a corresponding one of the successive regenerated clock periods, and third means responsive to said incoincidence and phase difference signals for controlling said frequency division ratio, the improvement wherein said third means comprises

pulse group means responsive to said phase difference signal for producing a pulse group of at least one pulse of a number indicative of said phase difference, and

control means responsive to said pulse group and the incoincidence signal produced within the regenerated clock period for which said pulse group is produced for controlling said frequency division ratio.

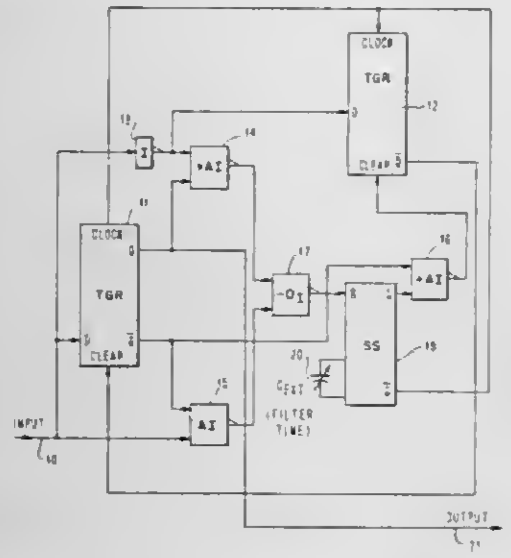
4,105,980
GLITCH FILTER CIRCUIT
Robert Lewis Cowardin, Cary, and George Joseph Laurer, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 27, 1977, Ser. No. 809,965
Int. Cl.² H03K *13/32*
U.S. Cl. 328—165 **4 Claims**

1. A filter circuit for removing glitches which may include dropouts or noise spikes from a pulse-like input signal comprising:

a delay circuit responsive to the leading and trailing edges of the said pulse-like input signal for providing a first control signal a predetermined time after the said leading and trailing edges of the pulse-like input signal;

a first trigger circuit responsive to the input signal and the control signal for providing a first output when the input signal is in a first state at receipt of the first control signal;

a second trigger circuit responsive to the input signal and the control signal for assuming a first state and providing a second control signal when the input signal is in a second state at receipt of the first control signal;



means for applying the second control signal to said first trigger circuit to cause said first trigger circuit to provide a second output, said first and second outputs being a filtered replica of the input signal; and

means responsive to the inverse of the second output and the first control signal for resetting said second trigger circuit to a second state.

4,105,981
SYNCHRONOUS DEMODULATION DEVICE

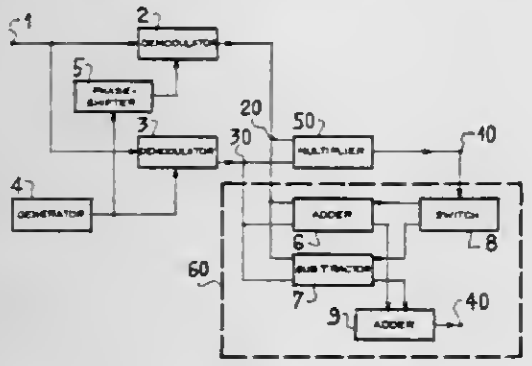
René Lechevin, and Henri Butin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1977, Ser. No. 842,324

Claims priority, application France, Oct. 19, 1976, 76 31354

Int. Cl.² H03D ***3/18***

U.S. Cl. 329—50 **3 Claims**



1. A synchronous demodulation device for demodulating a double sideband amplitude-modulated signal and comprising: two synchronous demodulators having respective signal inputs for receiving in parallel said signal, auxiliary inputs, and outputs; a local generator having an output for supplying in phase quadrature said auxiliary inputs with a signal whose frequency is equal to that of the carrier of said signal; means for adding and subtracting the output signals from said two demodulators, means for determining the sign of the product of said output signals and means for controlling, as a function of said sign, said adding and subtracting means whose output constitutes the output of said device.

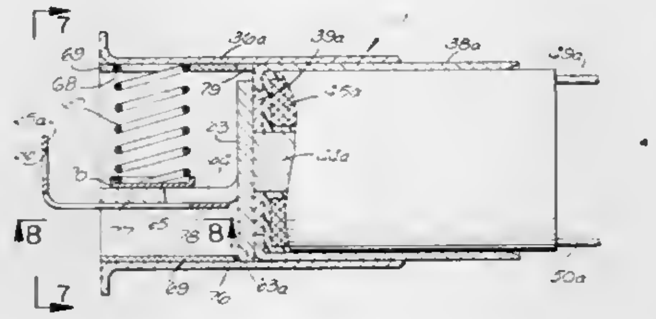
4,105,982
VACUUM RELAY WITH REDUCED SENSITIVITY TO MANUFACTURING TOLERANCES AND OPTIONAL LATCHING FEATURE

Joseph E. Oeschger, Palo Alto, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,681

Int. Cl.² H01H ***1/66***

U.S. Cl. 335—151 **3 Claims**



1. A relay comprising:

an axially elongated enclosure having a longitudinally extending axis and including at least one internally disposed fixed contact and a fixed external terminal conductively connected to said contact, said enclosure having a flexible conductive diaphragm at one end thereof;

a conductive switching rod member passing through said disphragm generally normal to the plan thereof and being mechanically and electrically connected thereto, said rod member extending externally and also generally axially within said enclosure, said rod member providing switching action in cooperation with said fixed contact as a function of variation of the angular position of said rod member with respect to said axis of said enclosure;

an actuator device connected to the portion of said rod member external to said enclosure to control said angular position of said rod member to effect switching action between said rod member and said fixed contact;

means within said actuator including at least a first electromagnet, a clapper of magnetic material arranged to assume a predetermined magnetically induced first position in response to energization of said first electromagnet, and a mechanical linkage arranged for transferring motion of said clapper to angular motion of said rod member substantially about the point of passage of said rod member through said diaphragm as a fulcrum;

means within said mechanical linkage comprising a projection attached to said clapper and extending generally parallel to said longitudinally extending axis when said clapper is in said first magnetically induced position;

first resilient means comprising a leaf spring associated with said projection for maintaining a residual resilient force retaining said rod member in a first position with respect to said fixed contact while said clapper is in said first magnetically induced position, said leaf spring having an orthogonally turned second end with a hole therethrough receiving said rod member, said leaf spring being arranged to deflect with respect to said projection, thereby maintaining residual resilient force against said rod member in its first position when said clapper is in said magnetically induced position;

and second resilient means associated with said mechanical linkage for maintaining a residual resilient force retaining said rod member in a second position with respect to said fixed contact while said clapper is in a second position corresponding to deenergization of said electromagnet, said second resilient means also serving to separate said clapper from the pole piece of said electromagnet.

4,105,983
STATIC CONVERGENCE UNIT, AND A COLOR DISPLAY TUBE COMPRISING A CONVERGENCE UNIT HAVING PERMANENT MAGNETS

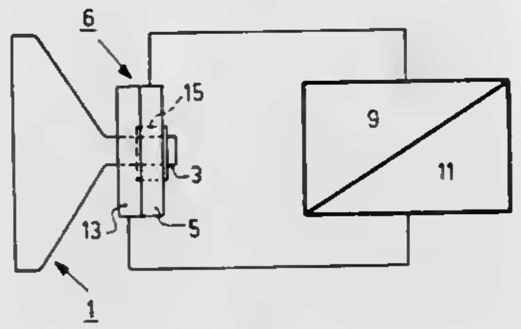
Piet Gerard Joseph Barten, and Jan Bijma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,487

Claims priority, application Netherlands, Apr. 1, 1975, 75 03830

Int. Cl.² H01F ***1/00***

U.S. Cl. 335—212 **4 Claims**



1. An in-line color display tube comprising a neck, an electron gun means disposed in said neck for generating in-line electron beams, and a non-mechanically adjustable device means for the static convergence of the three electron beams, the device comprising at the most two permanent magnetic rings disposed proximate said neck, said device means generating a multiple magnetic field before any deflection of said beams, magnetic intensity and polarization being adapted to correct for convergence errors occurring in the electron beams of the in-line display tube to be converged.

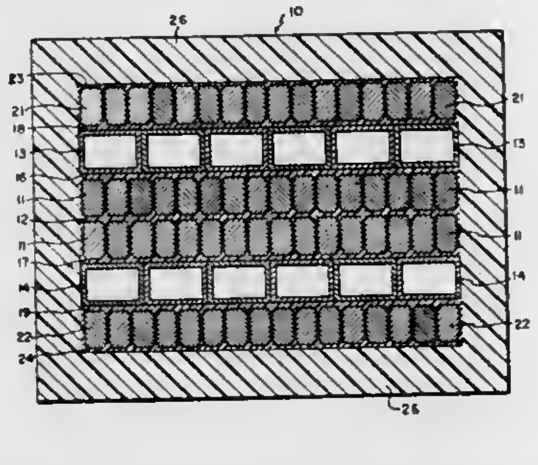
4,105,984
HIGH VOLTAGE DEVICE CONTAINING A FLEXIBLE PREPREG

James D. B. Smith, Turtle Creek, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 372,719, Jun. 22, 1973, Pat. No. 3,960,803. This application Mar. 2, 1976, Ser. No. 663,036

Int. Cl.² H01F ***27/08, 27/30***

U.S. Cl. 336—60 **7 Claims**



1. A high voltage electrical device comprising a plurality of high voltage coil strips having a groundwall insulation therearound, said coils having adjacent thereto and being bonded together by at least one prepreg comprising a fibrous mat containing an ungelled prepreg resin comprising epoxy resin having an epoxy equivalent weight greater than about 350 and at least one sterically hindered anhydride, and said groundwall having impregnated therethrough a styrene-epoxy-anhydride impregnating resin, the groundwall contacting at least a portion of said prepreg, said prepreg resin comprising from 25 wt.% to 500 wt.% of the prepreg and being compatible with the impregnating resin, so that the prepreg resin and the impregnating resin can be finally cured to integrally bond the prepreg and the groundwall together without delamination.

4. A high voltage electrical device comprising a plurality of high voltage coil strips and inner-cooling channels having a groundwall insulation therearound, said coils and channels having adjacent thereto and being bonded together by at least one prepreg comprising a fibrous mat material containing an ungelled prepreg resin consisting essentially of epoxy resin having an epoxy equivalent weight greater than about 350 and at least one sterically hindered anhydride which is substantially unreactive with the epoxy resin at ambient temperatures, and said groundwall having impregnated therethrough a styrene-epoxy-anhydride impregnating resin, the groundwall contacting at least a portion of said prepreg, said prepreg resin comprising from 25 wt.% to 500 wt.% of the prepreg and being compatible with the impregnating resin, so that the prepreg resin and the impregnating resin can be finally cured to integrally bond the prepreg and the groundwall together without delamination.

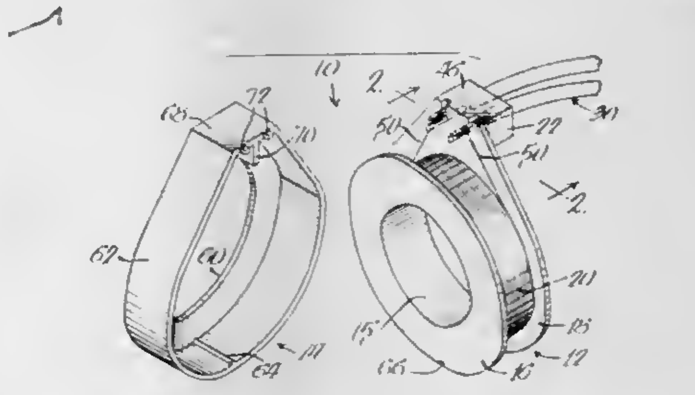
4,105,985
LEAD ATTACHMENT MEANS AND METHOD FOR MAKING ELECTRICAL COILS

James P. Plunkett, West Dundee, Ill., assignor to Coils, Inc., Huntley, Ill.

Filed Feb. 24, 1977, Ser. No. 771,686

Int. Cl.² H01F ***15/10***

U.S. Cl. 336—90 **6 Claims**



1. In an electrical coil including a bobbin having central portion and a pair of spaced parallel flanges extending radially from said central portion with a coil of wire wound upon said central portion between said flanges, said coil of wire having opposite free exposed ends, a terminal block extending from a surface of one flange and having a pair of elongated openings extending through said block and said one flange, said terminal block having a pair of holes respectively located adjacent the respective openings, a pair of terminal leads respectively received in said openings and each having an exposed conductor portion located between said flanges with said conductor portions respectively connected to respective free exposed ends of said wire, and a pair of metal rods respectively located in said holes and extending from said block to have free ends located between said flanges, said metal rods being located in juxtaposed relation to the respective exposed conductor portions and secured thereto to maintain said terminal leads in said openings.

4,105,986

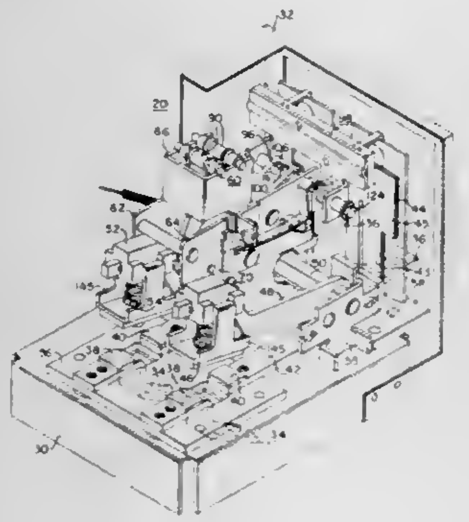
DISTRIBUTION TRANSFORMER SECONDARY CIRCUIT INTERRUPTER HAVING AN IMPROVED BIMETAL

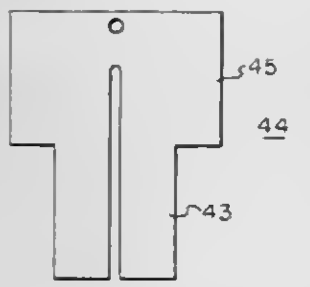
Theodore Gogniat, Monroeville, Pa., and John F. Cotton, Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 582,562, May 30, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,860

Int. Cl.^{2} H01H *37/52, 71/16*

U.S. Cl. 337—3 **6 Claims**





1. A circuit interrupter comprising:

a first stationary contact;

a second stationary contact separated from said first stationary contact;

bridging contact means;

an elongated contact arm having said bridging contact means attached thereto and being pivotal about an axis between a closed position wherein said bridging contact means completes an electric circuit between said first stationary contact and said second stationary contact and an open position wherein said bridging contact means is spaced apart from said first stationary contact and said second stationary contact;

primary latch means connected to said elongated contact arm and, when in a latching position, latching said elongated contact arm in the closed position;

a secondary latch when in a latching position keeping said primary latch means in the latching position; and,

planar bimetal actuating means comprising an elongated planar bimetal held relatively stationary at one end and being responsive to current flow therethrough and ambient oil temperature to deflect at the other end and unlatch said secondary latch when current flow through the circuit interrupter exceeds a trip level, said elongated planar bimetal being constructed to have a higher power dissipation in proximity to the relatively stationary end than in proximity to the deflecting end.

4,105,987

POTENTIOMETERS

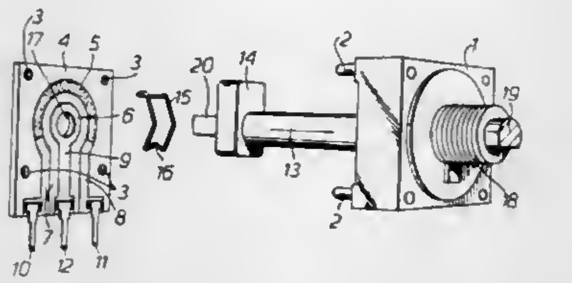
Gordon Spence, Swindon; Cecil Godfrey Hemmens, Purton, and Alan Godfrey, Down Ampney, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Dec. 10, 1976, Ser. No. 749,370

Claims priority, application United Kingdom, Dec. 12, 1975, 50992/75; Dec. 12, 1975, 50993/75; Jan. 27, 1976, 2992/76

Int. Cl.^{2} H01C *10/16*

U.S. Cl. 338—130 **6 Claims**



1. A potentiometer comprising a housing having one open end, an insulating board closing said one end of said housing, said insulating board comprising silk-screen printed resistive and highly conductive tracks applied at a surface of said board, an actuating spindle rotatably supported by said housing and including a hollow wiper-carrying part, a saddle-shaped springy metal wire wiper loosely accommodated partially within said hollow wiper-carrying part of the actuating spindle wherein said wiper-carrying part is positioned adjacent said insulating board so that the wiper bridges between said resistive and highly conductive tracks, said wiper comprising at one end thereof overlapping ends of wire which define twin contact positions for engaging said insulating board.

4,105,988

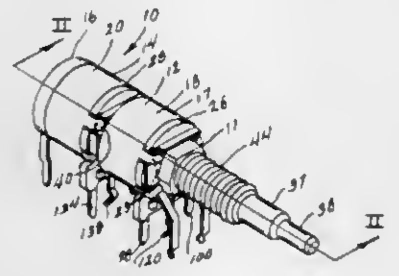
TANDEM ELECTRICAL CONTROL

John D. VanBenthuysen, Elkhart, Ind.; Thomas W. Flanders, Edwardsburg, Mich., and John R. Gietzen, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Dec. 22, 1976, Ser. No. 753,477

Int. Cl.^{2} H01C *10/16*

U.S. Cl. 338—132 **29 Claims**



1. An electrical control which comprises a shaft support and base unit having a mounting face, having an end distal from said mounting face, having a first unreduced cylindrical bore portion that intercepts said end and that extends orthogonally toward said mounting face, having a first reduced cylindrical bore portion that is smaller in diameter than said first cylindrical bore portion and that coaxially extends from said first unreduced cylindrical bore portion through said mounting face, and having a first shoulder that is concentrically disposed intermediate of said first unreduced and first reduced cylindrical bore portions;

a shaft having a first unreduced diameter portion that is rotatably and supportively carried in said first unreduced cylindrical bore portion, having a first reduced diameter portion that is rotatably and supportively carried in said first reduced cylindrical bore portion and that extends through said mounting face, and having a second shoulder that is concentrically disposed intermediate of said first reduced and first unreduced diameter portions and that rotatably engages said first shoulder to limit axial movement of said shaft in a first direction;

a driver having front and rear faces, having a driving aperture orthogonally intercepting said front face, being assembled onto said first reduced diameter portion with said front face proximal to said mounting face, and being drivingly secured to said first reduced diameter portion;

means for defining an elongated resistance element along an arcuate path on said mounting face that is substantially concentric with said second cylindrical bore portion;

an arcuate collector member having contacting and back surfaces, being interposed between said unit and said driver, being disposed substantially concentrically inside said arcuate resistance element, and being attached to said unit with said back surface proximal to said mounting face;

a contactor member having contacting and mounting surfaces, being drivingly secured to said driver with said mounting surface proximal to said front face thereof, including first contactor means for wipingly contacting said arcuate resistance element, and including second contactor means for wipingly contacting said collector member;

terminal means, being connected to said resistance element and to said collector member, for connecting said resistance element and said collector member to an electrical circuit; and

means, including said driver, for limiting axial movement of said shaft in a second direction.

4,105,989

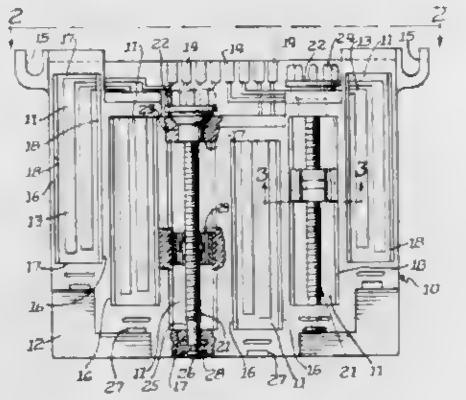
UHF SUBSTRATE TUNER POTENTIOMETER

Branimir Kesic, Park Ridge, and Charles P. Pytlarz, Elmwood Park, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 8, 1976, Ser. No. 740,162

Int. Cl.^{2} H01C *10/40*

U.S. Cl. 338—180 **3 Claims**



1. A potentiometer assembly comprising:

a housing having an elongated compartment, said compartment including a pair of opposed longitudinal side walls and a pair of opposed transversely extending end walls, each of said side walls including a longitudinal rib extending between said end walls and projecting within said compartment;

a resistive element associated with said compartment;

a replaceable carriage member slidably maintained within said compartment and carrying a contact member for engaging said resistive element, said carriage member comprising an outer generally U-shaped portion having a base and a pair of flexible arms extending therefrom, each of said flexible arms having an exterior longitudinal groove coacting with one of said ribs such that a uniform transverse force is exerted against said flexible arms by said ribs causing a slight inward flexing thereof for supporting and stabilizing the position of said carriage member relative to said compartment; and

a threaded shaft removably associated with and longitudinally disposed within said compartment, said threaded shaft being operable for driving said carriage member within said compartment whereby, said contact member is displaced along said resistive element.

4,105,990

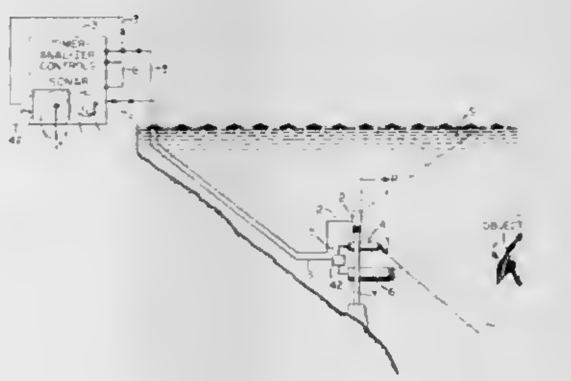
PROCESS OF AND APPARATUS FOR EXPLORING OBJECTS DETECTED BY DIFFERENT ENERGY SOURCES

Robert H. Rines, Boston, and Duane Marshall, Lexington, both of Mass., assignors to The Academy of Applied Science Inc., Boston, Mass.

Filed Sep. 13, 1976, Ser. No. 719,381

Int. Cl.^{2} G01S *9/66, 7/60*

U.S. Cl. 340—3 R **35 Claims**



1. A process of exploring the presence of objects in a medium propagating one type of energy more facilely than a second type of energy, that comprises, directing energy of said one type into the medium to reflect and scatter the same from objects in said medium, indicating and analyzing the reflected and scattered energy, determining when the analyzed reflected and scattered energy matches predetermined characteristics corresponding to a particular type of object, and responding to such match by thereupon directing the second type of energy toward said object to reflect and scatter the second type of energy therefrom, indicating the second type of energy reflected and scattered from said object, and correlating the indications of said object obtained by both the first and second types of energy.

4,105,991

ACOUSTIC WAVE TRANSMITTER-RECEIVER

Robert Delignieres, Mareil Marly, France, assignor to Institut Francais du Petrole, France

Filed Jun. 24, 1976, Ser. No. 699,331

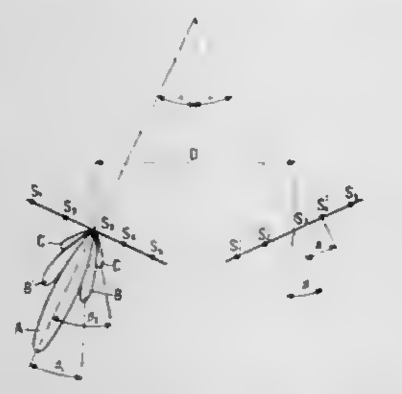
Claims priority, application France, Jul. 7, 1975, 75 21495

Int. Cl.^{2} G01S *9/66;* **H04R** *1/40*

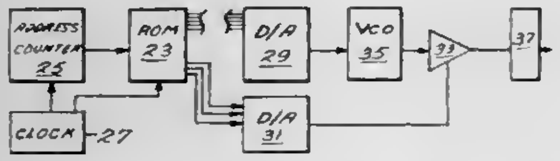
U.S. Cl. 340—3 D **8 Claims**

1. An acoustic wave transmitter-receiver device comprising at least one pair of transducer assemblies for transmitting and receiving acoustic waves, the transducers of each assembly being regularly spaced and having their main transmission axes oriented in a direction parallel to a common axis, and the common axes of the two assemblies being arranged symmetrically with respect to a vertical axis, the spacing between the transducers of each assembly being so selected that the projection length of said spacing on the vertical axis is equal to a

whole number of wave lengths of the transmitted acoustic waves, means for generating transmission signals, and means for transmitting said transmission signals, in phase opposition, to the two transducer assemblies.



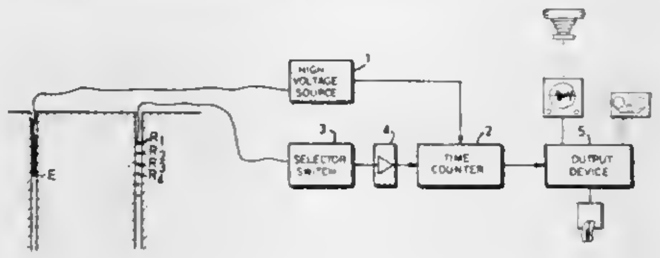
4,105,992
ANIMAL ATTRACTION METHOD AND APPARATUS
David P. Luciano, One Renwick Pl., Ithaca, N.Y. 14850
Filed Jun. 21, 1976, Ser. No. 698,216
Int. Cl.^{2} H04B *11/00*
U.S. Cl. 340—15 **4 Claims**



1. An apparatus for attracting mature lactating female animals of a predetermined species comprising:
a digital memory having stored in predetermined locations therein a binary coded digital representation of signals indicative of vocalized sounds given off by young animals for the purpose of attracting mature lactating female animals of said species;
means for generating digital signals indicative of the contents of sequential memory locations and for selectively applying predetermines ones of said signals to first and second converting means;
said first converting means being responsive to selected ones of said digital signals and generating an output signal having a frequency in accordance with the instantaneously applied digital signal; and
said second converting means being responsive to said first converting means output signal and selected ones of said digital signals, for varying the amplitude of said first converter means output signal in accordance with the instantaneously applied digital signal.

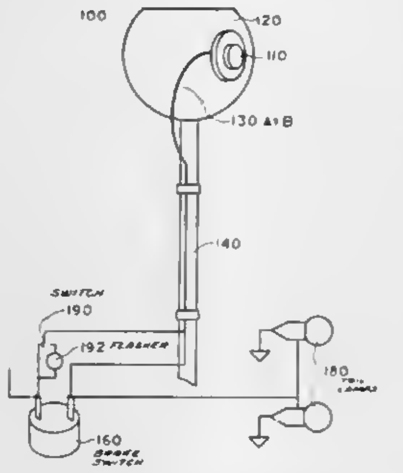
4,105,993
METHOD FOR DETERMINING ELASTIC CONSTANTS OF GEOLOGICAL FORMATIONS
Robert Grassy, Bouvron; Dominique Apert, Blain, and Arnaud Etchecopar, Montpellier, all of France, assignors to Services et Instruments de Geophysique, Bouvron, France
Filed Sep. 7, 1976, Ser. No. 720,700
Claims priority, application France, Sep. 9, 1975, 75 27594
Int. Cl.^{2} G01V *1/22, 1/28*
U.S. Cl. 340—15.5 CP **10 Claims**

1. A method for determing the wave propagation velocities of "P" waves and "S" waves through a geological formation from a first bore hole to a second bore hole, the method comprising the steps of:
(a) positioning in the first bore hole a single transmitter for transmitting both "P" and "S" waves,
(b) positioning in the second bore hole a series of receivers for receiving "P" waves, at least one of said receivers being arranged to also receive "S" waves, the receivers being positioned in vertical arrangement at known distances from each other,
(c) transmitting at least one "P" wave from the transmitter and measuring the time for propagation of the "P" wave from the transmitter to each receiver,



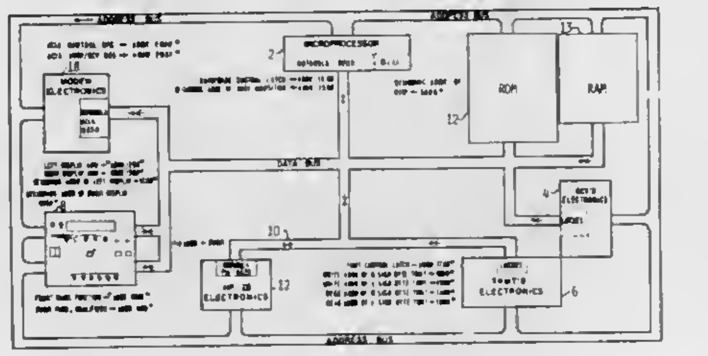
(d) calculating the distance between the transmitter and the at least one receiver arranged to also receive "S" waves,
(e) transmitting at least one "S" wave from the transmitter and measuring the time for propagation of the "S" wave from the transmitter to the at least one receiver arranged to also receive "S" waves, and
(f) calculating the propagation velocities of the "P" and "S" waves.

4,105,994
MANUAL DOWNSHIFT DEACCELERATION WARNING LIGHT SYSTEM
Gustave J. Chicoine, 1052 Cumberland Pl., San Jose, Calif. 95125
Division of Ser. No. 659,223, Feb. 19, 1976. This application Jan. 24, 1977, Ser. No. 762,310
Int. Cl.^{2} B60Q *1/26;* H01H *3/16, 9/06, 21/10*
U.S. Cl. 340—71 **10 Claims**



1. A device which permits a driver to manually activate vehicle braking indicators during transmission downshift deacceleration while repositioning the shift lever via a shift knob releaseably mounted on the threaded end portion of the shift lever, comprising:
a shift knob having an elongated opening and interior cavity adapted to receive the threaded end portion of the shift lever;
a manually operated switch mounted on the shift knob for activating the vehicle braking indicators;
threaded means adapted to releaseably engage the threaded end portion of the shift lever for securing the shift knob thereto permitting the shift knob to be rotated about the axis of the threaded end portion of the shift lever and to be tilted by sliding the threaded end portion along the elongated opening.

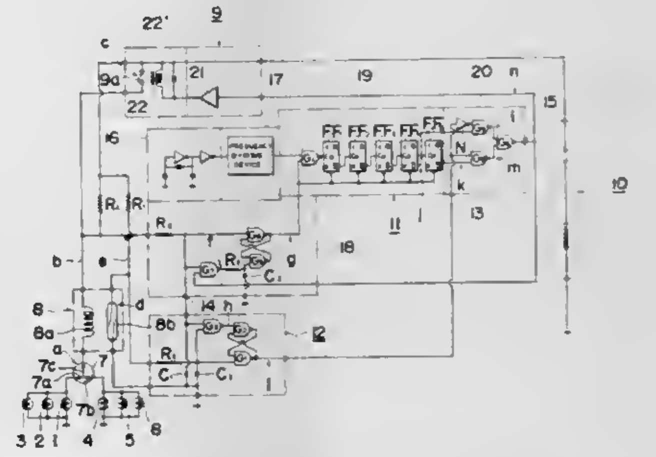
4,105,995
DIGITALLY CONTROLLED TRANSMISSION IMPAIRMENT MEASURING APPARATUS
Delwin L. Bothof, Cupertino; Richard G. Fowles, San Jose; Johann J. Heinzl, Cupertino; David R. Novotny, San Jose; Robert L. Weisickle, San Jose; John H. Wetzel, Santa Clara, and Paul G. Winninghoff, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 16, 1976, Ser. No. 697,071
Int. Cl.^{2} G08C *25/00;* G06F *11/00*
U.S. Cl. 340—146.1 E **26 Claims**



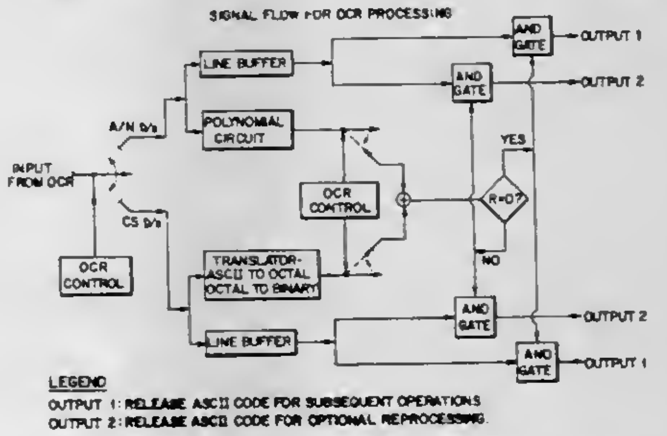
1. Communication channel measuring apparatus comprising: two processor controlled machines, each having means for being selectively placed in a master mode and a slave mode and each machine comprising:
a. a bus;
b. control means for generating control code word corresponding to the master mode and the slave mode selection and to a desired measurement function and applying the code word to the bus;
c. a first memory coupled to the bus for storing digital information;
d. a second memory having stored microinstructions and coupled to the bus;
e. a processing unit coupled to the bus for performing operations in response to the microinstructions stored in the second memory, digital information stored in the first memory, the control code word and parallel digital information appearing on the bus;
f. first means coupled to the bus for receiving parallel digital information and converting the parallel digital information to a serial bit stream;
g. a transmitter coupled to the first means to receive the serial bit stream from the first means and to a communication channel for applying a signal to the channel in response to the serial bit stream;
h. second means for receiving a serial bit stream and converting the serial bit stream to parallel digital information;
i. a receiver coupled to the communication channel and to the second means for applying a serial bit stream to the second means in response to receiving a signal on the channel; and
means for coupling each of the processor controlled machines to distal ends of a communication channel to be measured.

4,105,996
DISCONNECTION INDICATING APPARATUS FOR AUTOMOBILES
Akio Shimizu, Tone, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan
Filed Jan. 19, 1977, Ser. No. 760,717
Claims priority, application Japan, Aug. 3, 1976, 51/27261
Int. Cl.^{2} G08B *21/00*
U.S. Cl. 340—73 **1 Claim**

1. A disconnection indicating apparatus for use as an initial activating and turn signal lamp out indicator for automobiles, said apparatus comprising;
turn signal selecting switch for activating a plurality of selected turn signal lamps;
pulse generation means for generating a continuous stream of electrical pulses at a specified selected frequency;
switch detection means for detecting the operation of said turn signal select switch and thereafter activating said pulse generation means;
intermittent switching means connected to a source of power and adapted to receive said pulses to intermittently switch said power at the frequency of said pulses to intermittently energize said selected turn signal lamps;
current detection means adapted to monitor the flow of current to said selected lamps and to generate a specified frequency selecting signal in response to changes in said current flow; and
initial flash frequency switching means adapted to select an initial frequency pulse signal from said pulse generation means for a specified period of time following the initial activation of said turn signal select switch and to thereafter respond to said frequency selecting signal from said current detection means to switch between a plurality of stable operational states to select a particular frequency pulse signal from said pulse generation means.



4,105,997
METHOD FOR ACHIEVING ACCURATE OPTICAL CHARACTER READING OF PRINTED TEXT
James W. McGinn, Wheaton, Md., assignor to United States Postal Service, Washington, D.C.
Filed Jan. 12, 1977, Ser. No. 758,742
Int. Cl.^{2} G06K *9/18*
U.S. Cl. 340—146.3 ED **9 Claims**


SIGNAL FLOW FOR OCR PROCESSING
INPUT FROM OCR
A/N S/s
CS S/s
LINE BUFFER
POLYNOMIAL CIRCUIT
OCR CONTROL
OCR CONTROL
TRANSLATOR-ASCII TO OCTAL OCTAL TO BINARY
LINE BUFFER
R=0?
YES
NO
AND GATE
AND GATE
AND GATE
AND GATE
OUTPUT 1
OUTPUT 2
OUTPUT 2
OUTPUT 1
LEGEND
OUTPUT 1: RELEASE ASCII CODE FOR SUBSEQUENT OPERATIONS
OUTPUT 2: RELEASE ASCII CODE FOR OPTIONAL REPROCESSING.

1. A method of adding check symbols to lines of printed text during the printing process which improves the accuracy of optical character reading of each line of information which comprises:
(a) generating an electrical signal which represents the USASC II code for each alpha-numeric character produced during the printing of a line of text,
(b) assembling the sequence of USASC II code signals so generated in a correctable line buffer,
(c) adding, deleting and replacing USASC II code signals as

appropriate in the correctable line buffer for alphanumeric characters added, deleted and replaced as appropriate in the production of a corrected line of text,

(d) unloading the USASC II code signals in the line buffer by actuating an end of the line gate at the completion of the printing and correction as appropriate of a line of text as a serial bit stream input to a generating polynomial coding circuit,

(e) operating the generating polynomial code circuit to obtain a unique 24-bit remainder,

(f) translating the 24-bit remainder as a sequence of eight octal numerals, and

(g) printing the sequence of octal numerals so obtained as check symbols in the right margin space adjacent to the line of printed text.

4,105,998
PATTERN RECOGNITION PROCESSING SYSTEM

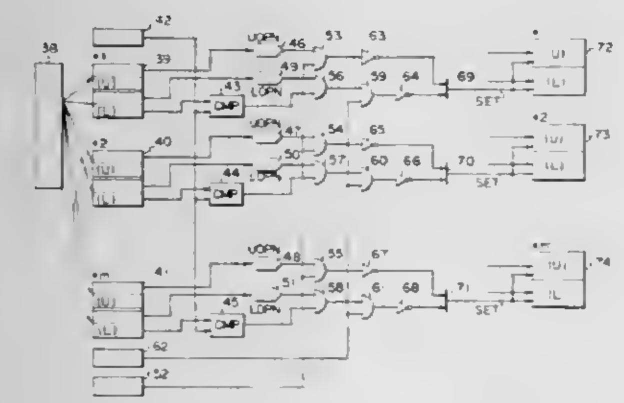
Masumi Yoshida, Kawasaki; Kiyoshi Iwata; Eiichiro Yamamoto, both of Yokohama; Takeshi Masui, Kawasaki, and Yukikazu Kabuyama, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 22, 1977, Ser. No. 780,111

Claims priority, application Japan, Mar. 30, 1976, 51-34672; Mar. 30, 1976, 51-34678

Int. Cl.^{2} G06K *9/12*

U.S. Cl. 340—146.3 AC **10 Claims**



1. A pattern recognition processing system in which a pattern to be recognized is scanned to extract, as an imaginary segment, a white area defined between figure strokes and between the pattern stroke and circumscribed frame for the recognition of the pattern, said system comprising segment extracting means for extracting the starting and terminating endpoints of the segment and detecting whether the endpoints are in contact with the pattern stroke, and open endpoint extension processing means for extending the segment from the endpoints if the endpoint is an open endpoint out of contact with the pattern stroke, whereby to extract the segment that the extension of at least one of the open endpoints of the extracted segment is not blocked by the pattern stroke.

4,105,999
PARALLEL-PROCESSING ERROR CORRECTION SYSTEM

Katsuhiro Nakamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,923

Claims priority, application Japan, Jan. 12, 1976, 51-2586

Int. Cl.^{2} G06F *11/12*

U.S. Cl. 340—146.1 AL **6 Claims**

1. A parallel-processing error correction system for a data transmission system employing a cyclic error correcting code comprising:

a plurality of data input lines;

a plurality of null input lines;

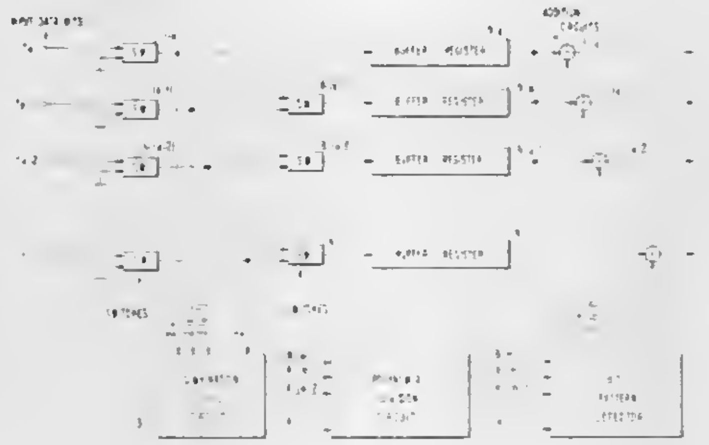
a plurality of first switches, each having first and second inputs connected respectively to said data input lines and said null input lines, and having outputs;

a plurality of second switches, each having first and second inputs and an output, the first inputs of said second switches being connected to corresponding first switch outputs;

a plurality of serial buffer registers having inputs connected to said second switch output lines for storing a bit train fed in parallel therethrough, and having outputs connected to each of said second switches second inputs;

a combination logic circuit for converting said bit train into bit patterns of a length determined depending on the number of redundant bits in the code employed having inputs and outputs, said inputs of said combination logic circuit being connected to said first switch output lines;

a code-polynomial division circuit employing a parallel-input serial-feedback shift register having inputs connected to said combination logic circuit outputs, and having outputs;



a bit pattern detector having inputs connected to said code-polynomial division circuit outputs for detecting particular bit patterns out of the output of the division circuit, and having outputs;

a correcting circuit connected to said buffer register outputs and to said bit-pattern detector outputs for correcting the bit sequence read out in parallel with the buffer registers in synchronism with the output of said detector;

wherein said first switches are operable to selectively connect either one of the data input lines or one of said null input lines to the combination circuit; and

said second switches are each operable to selectively connect either one of the output lines from the first switches or one of the output lines of the buffer registers to said switch output line;

whereby the system is effectively operable even where the number of parallel input bits are changed simply by the operation of the first and second switches depending upon the change in the number of parallel input bits.

4,106,000
ANTI-THEFT DEVICE WITH DISABLING MEANS

Jean Maillot, Paris, France, assignor to Paulette Guterman, Gif sur Yvette, France

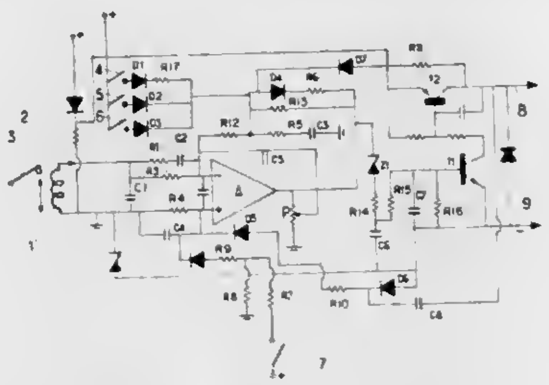
Filed Apr. 9, 1976, Ser. No. 675,514

Claims priority, application France, Dec. 23, 1975, 75 39551

Int. Cl.^{2} G08B *13/00*

U.S. Cl. 340—530 **13 Claims**

1. A detector device, in particular an anti-theft device, comprising a sensing means connected to the input of an electronic circuit for triggering a signalling means at the output of the device, the device being characterized in that the electronic circuit comprises a difference amplifier whose two input terminals (−) and (+) are connected to the sensing means, said input terminals also being connected by means of at least two switching means to voltage sources in such a way that, by closing one of the switching means, the polarity of the input terminal in question is reversed, to disable the detector device, and, by closing the other switching means, there is an increase, with the same sign, in the polarity of the input terminal in question, for triggering the signalling means.



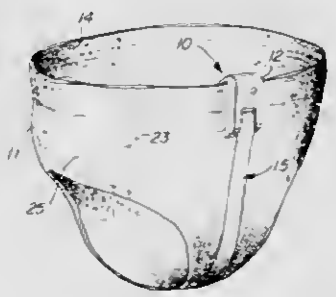
4,106,001
MOISTURE DETECTOR

Kurt Mahoney, 2600 E. Southern Ave., Tempe, Ariz. 85282

Filed May 12, 1977, Ser. No. 796,130

Int. Cl.^{2} G08B *21/00*

U.S. Cl. 340—604 **8 Claims**



1. A device for detecting unintentional urination comprising:

a housing for attaching to an undergarment,

said housing containing an audio alarm means and having an outer surface thereof contoured to provide an indentation for receiving therein in surface contact therewith one end of a strip of flexible material,

an elongated narrow strip of flexible, electrically insulating material having an inner face and an outer face,

said strip containing a pair of spaced conductors extending longitudinally thereof along at least a part of its length with a surface of each conductor being exposed on the inner face of said strip,

adhesive means on said inner face of said strip along at least a part of its length

for adhering to the outer surface of the contour of said housing,

a pair of contacts extending from within said housing through said surface of the contour for each engaging the exposed surface of a different one of said conductors, and

means mounted within said housing for connection to said contacts and to said alarm means and actuated by urine occurring on the adhesive side of said strip bridging said electrodes which energizes said alarm means to provide an audible sound.

4,106,002
TOURNIQUET PRESSURE MONITOR

Robert J. Hogue, Jr., 1809 NW. 47th St., Gainesville, Fla. 32605

Filed Dec. 6, 1976, Ser. No. 747,938

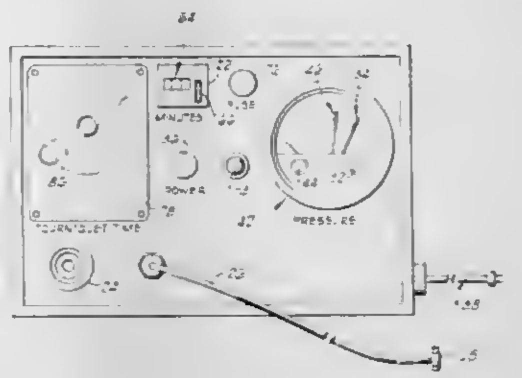
Int. Cl.^{2} G08B *19/00;* A61B *17/12*

U.S. Cl. 340—626 **2 Claims**

1. A monitor adapted for use with a pneumatic tourniquet having a pressure supply line, the monitor comprising:

low pressure sensing means connected to the pressure supply line, the low pressure sensing means sensing the pressure in the pressure supply line and providing a low pressure signal when the sensed pressure is below a predetermined minimum pressure and a minimum pressure signal when the sensed pressure is at least equal to the predetermined minimum pressure;

high pressure sensing means connected to the pressure supply line, the high pressure sensing means sensing the pressure in the pressure supply line and providing a high pressure signal when the sensed pressure is above a predetermined maximum pressure;



elapsed time indicating means connected to the low pressure sensing means, the elapsed time indicating means receiving the minimum pressure signal and providing a perceivable elapsed time indication indicative of the total time during which the minimum pressure signal has been received; and

alarm means connected to the low pressure sensing means and to the high pressure sensing means, the alarm means receiving the low pressure signal and the high pressure signal and providing a perceivable output indication in response to receiving at least one of the low pressure signal and the high pressure signal.

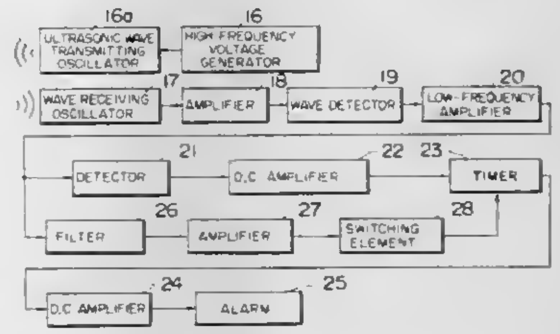
4,106,003
SIGNAL TREATMENT CIRCUIT FOR BURGLAR ALARMS

Hiroaki Otani, Kawasaki, Japan, assignor to Nippon Prosensor Co., Ltd., Kawasaki, Japan

Filed Dec. 6, 1976, Ser. No. 747,997

Int. Cl.^{2} G08B *13/24*

U.S. Cl. 340—530 **7 Claims**



1. In burglar alarms in which a wave receiving oscillator is so arranged to receive an ultrasonic wave signal transmitted from a wave transmitting oscillator when the latter signal is reflected by an object and alarms will ring immediately after obtaining an output by virtue of an input signal caused by a disturbance in a received signal characteristic of an illegal intruder, a signal processing circuit provided with a timer to provide an output only when the above-mentioned input signal continues for longer than a predetermined time, said signal processing circuit further being provided with a switching

element which will be activated by a high-frequency component in an input signal and is operative to extend said predetermined time.

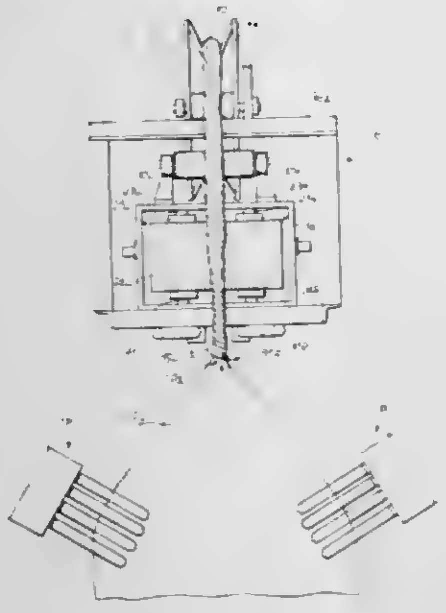
4,106,004
TWIST DETECTING DEVICE

Mitura Kuroda, 16, Momoyama Mizuno Sakon Higashimachi, Fushimi-ku, Kyoto, Japan (612)

Filed Feb. 16, 1977, Ser. No. 769,321

Int. Cl.^{2} G08B *21/00*

U.S. Cl. 200—61.17 **8 Claims**



1. A twist detecting device for use in a detwisting apparatus for a roped web of knit or woven fabric in a fabric processing system comprising: a pair of sensing drums each having a plurality of axial grooves formed on at least a portion of the circumferential surface thereof, and a rod fixed to another portion of said circumferential surface of each said drum so as to extend laterally therefrom perpendicularly to the axis thereof; said drums being arranged side by side with their respective axes extending in parallel with each other and said grooved surfaces facing in the same direction and said rods extending side by side in parallel with each other; said drums being separated by a space between said grooved surfaces so that said roped web passes through said space in a direction generally parallel with said grooves; means for supporting said drums rotatably about their respective axes so that as said twist in said rope is tightened, engagement of said twisted rope with said grooves on said drums causes simultaneous rotation of said drums and consequently swinging of said rods in the same direction; an actuating bar pivotally connected to said rods so that upon simultaneous swinging of said rods said actuating bar is moved generally axially in either direction, whereby the direction of the twist in said roped web is detected by the direction of movement of said bar; and means for detecting the direction of movement of said bar to produce a corresponding electrical signal.

4,106,005
APPARATUS FOR DETECTING ELONGATION OF A JOINT OF A CONVEYOR BELT

Akira Asakawa, Toyonaka, Japan, assignor to Nippon Konbeya Kabushiki Kaisha, Daito, Japan

Continuation-in-part of Ser. No. 686,667, May 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,814, Jul. 21, 1975, abandoned. This application May 13, 1977, Ser. No. 796,829

Int. Cl.^{2} G08B *21/00;* B65G *43/00*

U.S. Cl. 340—676 **6 Claims**

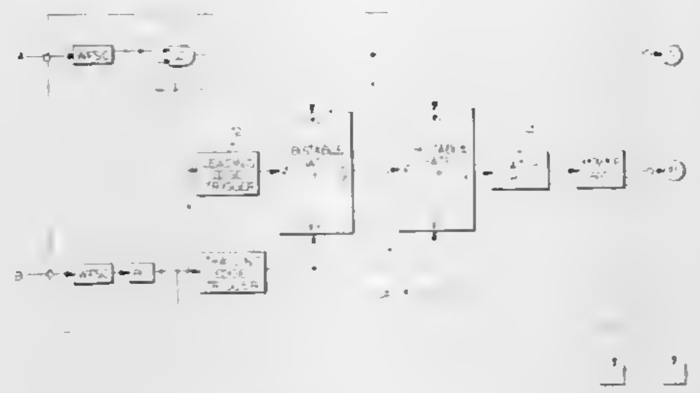
1. An apparatus for detecting elongation of the joint of a conveyor belt, comprising:

a pair of sensors, each of which comprises an iron core having a coil winding therearound and said sensors being spaced at a predetermined distance from each other parallel with the conveyor belt and which distance is greater than the length of the joint along the belt, and said sensors being spaced a predetermined distance from one of the edges of the underside of the belt;

a pair of magnetic elements fixed to the underside surface of the belt, said magnetic elements being spaced from each other a distance equal to the distance between said sensors which the joint is unelongated so that said sensors and elements are aligned during movement of said conveyor belt past said sensors;

a waveform shaping circuit coupled to each of said sensors;

a pulse generator coupled to one sensor which is spaced from the other sensor in the direction of movement of said conveyor belt for generating a pulse in response to the output of said sensor having a duration corresponding to the maximum permissible elongation of the joint of the conveyor belt;



logic circuit means coupled to the outputs of said pulse generator and the waveform shaping circuit coupled to said other sensor including means for activating said logic circuit means when the first magnetic element passes said other sensor and for deactivating the logic circuit means after the first magnetic element passes the one sensor and before the second magnetic element passes said one sensor, and further including means for producing an output when a delay which is longer than the delay corresponding to the maximum permissible elongation of the joint occurs between the output of the waveform shaping circuits; and

means coupled to the logic circuit means and actuated by the output of the logic circuit means for responding to an elongation of the joint which is greater than the maximum permissible elongation.

4,106,006
DUAL-FREQUENCY INDUCTION-KEYED CONTROL CIRCUIT WITH KEYING NETWORK HAVING VARIABLE RESONANT FREQUENCY

Carl E. Atkins, Mnntclair, N.J., assignor to Wagner Electric Corporation, Parslppany, N.J.

Filed Jan. 26, 1976, Ser. No. 652,465

Int. Cl.^{2} H04Q *3/00*

U.S. Cl. 340—543 **8 Claims**

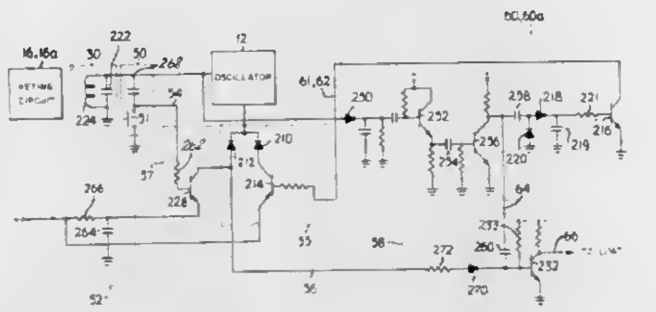
1. In a multiple-channel induction-keyed control circuit of the type having

a plurality of passive keying network means, each of said passive keying network means including a tuned circuit having a current — and voltage — controlled variable capacitance, said variable capacitance being operative to vary the resonant frequency of its respective tuned circuit between upper and lower limits, each of said plurality of passive keying networks being resonant at a different frequency from every other of said passive keying networks,

keyable circuit means operative to generate at least first and second constant output signals which, when coupled to a correctly tuned set of said passive keying networks, is operative in cooperation with said passive keying networks to generate at least first and second modulated output signals where the improvement comprises:

(a) said first constant output signal being generated without said second constant output being generated;

(b) means for generating said first modulated output signal is response to at least one of said passive keying networks coupled to said keyable circuit being tuned to said first constant output signal;



(c) means responsive to said first modulated output signal for turning on said second constant output signal;

(d) means for generating said second modulated output signal in response to at least one of said passive keying networks coupled to said keyable control circuit being tuned to said second constant output signal; and

(e) keying means responsive to said second modulated output for generating a keying signal.

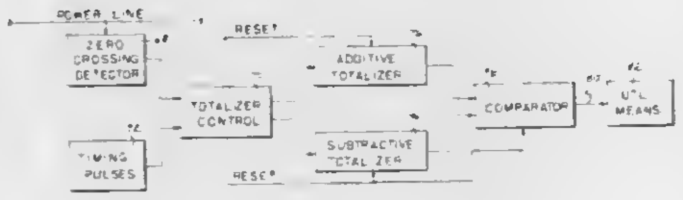
4,106,007
METHOD AND APPARATUS FOR TRANSMITTING INTELLIGENCE OVER A CARRIER WAVE

Reed H. Johnstnn, Wellesley; Dennis C. Jeffreys, Bedford, and Lawrence J. Stratton, Lexington, all of Mass., assignors to New England Power Service Company, Westborough, Mass.

Continuation-in-part of Ser. No. 489,450, Jul. 17, 1974, abandoned. This application Jul. 1, 1975, Ser. No. 590,941

Int. Cl.^{2} H04B *3/54*

U.S. Cl. 340—310 A **73 Claims**



60. A method for modulating a pre-existing alternating voltage wave on a power line, said method comprising the steps of:

1. generating at least first and second signal waves; and,
2. combining said at least first and second signal waves and said pre-existing alternating voltage wave on a power line together in a phase relationship which produces a composite voltage wave having peak amplitudes which depart minimally from the peak amplitudes of said pre-existing alternating voltage wave, said composite voltage wave having a recognizable pattern of variations in the durations of the intervals defined by preselected locations in said composite voltage wave with said pattern of variations representing digital intelligence which is modulated on said pre-existing alternating voltage wave on a power line.

4,106,008
METHOD AND APPARATUS FOR PRODUCING A VERTICAL CENTER LINE AND HORIZONTAL SYNCHRONIZATION SIGNALS FOR TELEVISION TYPE GAME MACHINE

Hiroshi Sakurai, Funabashi, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1976, Ser. No. 747,332

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—324 AD **6 Claims**

1. Apparatus for producing a center line pulse between horizontal synchronizing pulses for a television type display device which includes a horizontal oscillator generating a horizontal synchronizing frequency and horizontal synchronizing pulses to create a raster scan, said apparatus comprising:

means for supplying a square wave signal synchronized in frequency with said horizontal synchronizing frequency;

first gate means for producing said center line pulse, said first gate means being switchable between a first state providing a relatively high output signal level and a second state providing a relatively low output level signal;

second gate means for producing said horizontal synchronization pulses, said second gate means being switchable between a first state providing a relatively high output signal level and a second state providing a relatively low output signal level;

first means for differentiating said square wave signal and providing positive and negative output signals indicative of the positive going edge and the negative going edge of said square wave at each respective occurrence, said first differentiating means being electrically connected to the input of said first gate means so as to normally bias said first gate means to said first state and also to provide said differentiated square wave output signal to said first gate means;

second means for differentiating said square wave signal and providing positive and negative output signals indicative of the positive going edge and the negative going edge of said square wave at each respective occurrence, said second differentiating means being electrically connected to the input of said second gate means so as to normally bias said second gate means to said second state and also to provide said differentiated square wave output signal to said second gate means; and

means for electrically combining said output signals of said first gate means and said second gate means into a single output signal as a composite of said center line pulses and said horizontal synchronizing pulses.

4,106,009
SINGLE SUBSTRATE AC PLASMA DISPLAY

George Wilmer Dick, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 17, 1977, Ser. No. 759,892

Int. Cl.^{2} H01J *17/48*

U.S. Cl. 340—343 **15 Claims**

1. Display apparatus comprising,
a body of ionizable gas,
a dielectric layer adjacent said gas,
at least first and second elongate electrodes embedded in said layer, said electrodes being separated by a gap comprising a region of said layer, and
signal means for creating a series of glow discharges in said gas in the vicinity of said electrodes, said signal means including means for establishing in said gap a series of electric fields initially centered at said gap, individual flux lines of each field having potential drops which exceed the gas striking voltages respectively associated with those lines.
characterized in that at least a portion of each of said electrodes is located substantially further away from said gap than is any point on the longest of said lines.

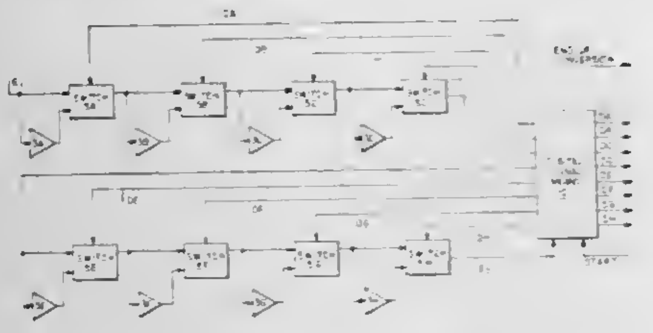
4,106,010
LOGARITHMIC ANALOG-TO-DIGITAL CONVERTER

Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 5, 1976, Ser. No. 683,450

Int. Cl.^{2} H03K *13/02*

U.S. Cl. 340—347 AD **4 Claims**



1. A logarithmic analog-to-digital converter comprising receiving means for receiving an analog signal, programmable amplifier means connected to the receiving means and responsive to digital signals for providing an analog signal, and corresponding to a received analog signal, said programmable amplifier means includes a plurality of amplifiers having a first amplifier and a last amplifier, each amplifier having an input, an output and a different predetermined fixed gain of unity or greater; and said first amplifier having its input connected to the receiving means; and a plurality of switching means, having a first switching means and a last switching means, each switching means having two inputs and one output and being controlled by a different digital signal from the digital signal means to pass a signal applied to one input from the one input to the output or to pass another signal applied to the other input from the other input to the output, the one input of each means being connected to the output of a corresponding amplifier and the other input of each switching means, except the first switching means, being connected to the output of a corresponding switching means, the other input of the first switching means being connected to the receiving means, and the output of the last switching means being connected to the digital signal means, so that all the switching means control the amplification of a received analog signal; and digital signal means connected to the programmable amplifier means for providing the digital signals to the programmable amplifier means and as digital outputs corresponding logarithmically to the received analog signal in accordance with the analog signal from the programmable amplifier means, said digital signal means includes a pulse generator providing a pulse signal when an end of conversion signal is at a low logic level and not providing pulses when the end of conversion signal is at a high logic level, a shift register connected to the pulse source and responsive to the pulse signal for providing a plurality of pulses occurring in sequence and providing the end of conversion signal at a low level while providing the pulses and providing the end of conversion signal at a high logic level upon the completion of a sequence, a comparator receiving the analog signal from the programmable amplifier means, switching means connected to the shift register, to the comparator and to ground and receiving a reference voltage for providing a ground connection to the comparator during the occurrence of a first pulse provided by the shift register during the sequence and providing the reference voltage to the comparator during the occurrence of the remaining pulses provided by the shift register, a plurality of flip-flop means, each flip-flop means being connected to the shift register for being responsive to a different pulse provided by the shift register and to the output from the comparator to provide a digital signal to a corresponding switching means in the programmable amplifier so that upon the completion of a sequence the plurality of flip-flop means provides digital signals corresponding logarithmically to the analog input signal.

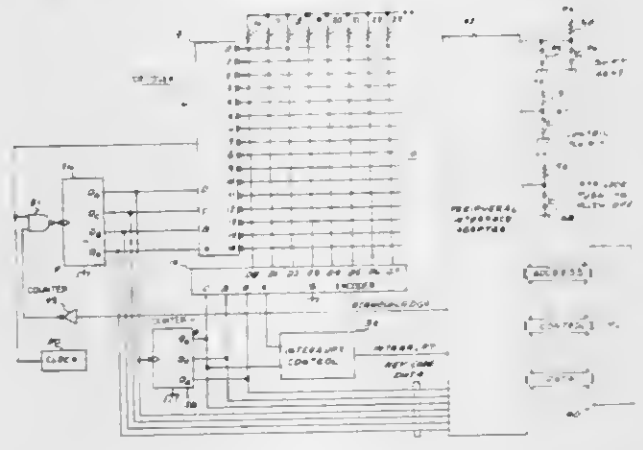
4,106,011
KEYBOARD CIRCUIT

John Laurence Melanson, Boulder, Colo.; Richard Allen Springer, Beaverton, Oreg.; Jack Duane Grimes, Tualatin, Oreg., and Jack Arthur Gilmore, Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 24, 1975, Ser. No. 625,611

Int. Cl.^{2} G08C *25/00*

U.S. Cl. 340—365 E **4 Claims**



1. A keyboard circuit for an associated data processing device, comprising:
an array of keys;
means for scanning cyclically said array of keys in a predetermined sequence and generating parallel keycode data corresponding to each key;
interrupt control means for sensing a key depressed for two successive scans and generating an interrupt signal in response thereto; and
means responsive to said interrupt signal for generating an acknowledge signal to stop said scanning at said depressed key on the second of said two successive scans and for reading and storing keycode data corresponding to said depressed key.

4,106,012
MONITORING IDENTIFIED ELECTRICAL SWITCH CONTACTS

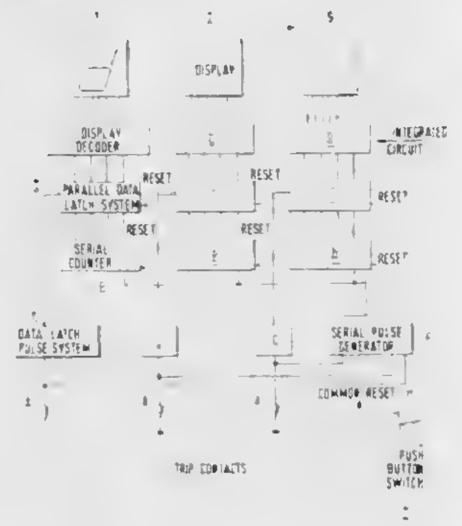
Harry Wilson Knight, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,626

Claims priority, application United Kingdom, Sep. 3, 1975, 36275/75

Int. Cl.^{2} G08B *23/00;* **G06M** *3/06*

U.S. Cl. 340—523 **2 Claims**



1. A system for monitoring a plurality of identified electric signals and the order in which they occur, comprising in combination:
(a) an electric pulse generator capable of generating an electric pulse in response to the receipt of each of the said electric signals,
(b) a plurality of serial counters each capable of being incremented on receipt of an electric pulse from the said electric pulse generator,
(c) a plurality of a data latch pulse systems each associated with one of the said electric signals and adapted to operate on receipt of the said electric signal,
(d) a plurality of a parallel data latch systems each operable by one of the said data latch pulse systems, and adapted to accept and hold the serial data held in the said serial counter following the receipt of the said electric signal,
(e) a plurality of a display decoders each connected to the output of one of the said parallel data latch systems, and
(f) a plurality of display units connected to the said display decoder and each associated with one of said signals and capable of displaying a representation of the number held in the parallel data latch following receipt of the said electric signal.

4,106,013
ELECTRIC POWER CONTROL SYSTEM WITH LOAD MANAGEMENT PROGRAMMING

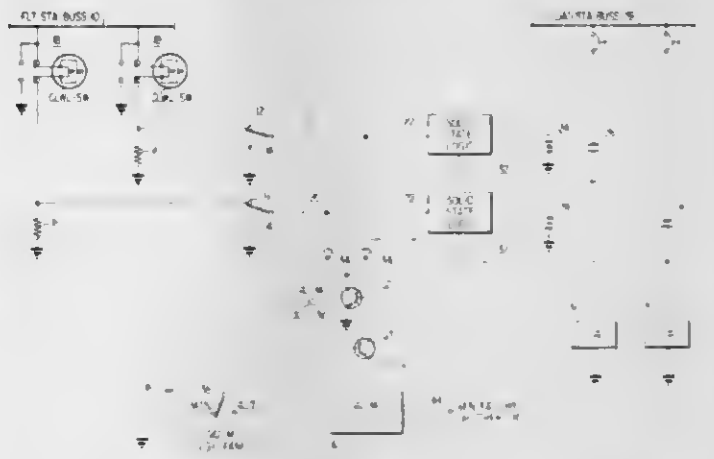
Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 30, 1976, Ser. No. 755,656

Int. Cl.^{2} G08B *21/00*

U.S. Cl. 340—27 R **9 Claims**

1. An electric power control system comprising:
a source of power;
a plurality of electrical loads;
a controller circuit associated with each of said electrical loads and responsive to a control signal to connect the associated one of said plurality of electrical loads to said source of power;
control means remote from said loads for selectively applying control signals to individual ones of said plurality of controller circuits; and,
load management means operable in response to a predetermined condition to cancel the application of a control signal from said control means to a preselected plurality of said controllers as a group and thereby disconnect the corresponding electrical loads from said source of power.



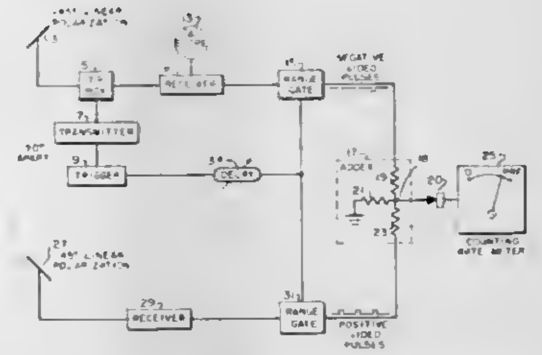
4,106,014
RADAR SET SENSITIVE TO TARGET SHAPE

Ralph L. Dunn, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1967, Ser. No. 650,156

Int. Cl.^{2} G01S *9/02*

U.S. Cl. 343—5 SA **2 Claims**



1. A pulse radar set comprising; a transmitter and a first receiver which share a common antenna, said first antenna being oriented so as to both launch and receive radar waves plane polarized at an angle of 45° to the earth's surface, a second receiver including a receiving antenna adapted to receive radar waves polarized orthogonally to those transmitted and received by said common antenna, and means connected to the outputs of said receivers to compare the video target echo amplitudes of the two receivers, and wherein said means comprises an adder to which the oppositely polarized outputs of said receivers are applied, and a counting rate meter connected to the output of said adder via a diode.

4,106,015
RADAR SYSTEM WITH CIRCULAR POLARIZED TRANSMISSION AND ADAPTIVE RAIN DEPOLARIZATION COMPENSATION

Daniel E. Beguin, Saint-Prix; Henri J. Bosc, and Jean-Marie H. Colin, both of Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,460

Int. Cl.^{2} G01S *9/60*

U.S. Cl. 343—5 W **11 Claims**

1. An adaptive device for the suppression of the rain echoes

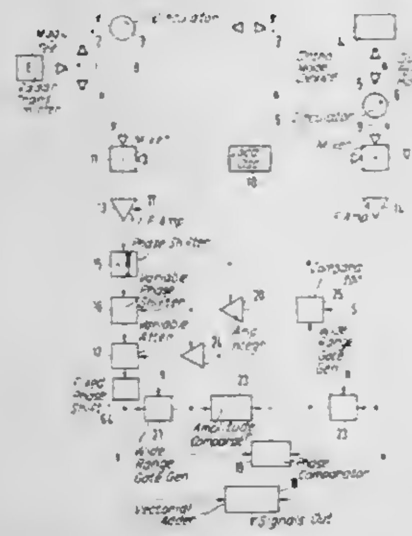
in a radar system transmitting a circularly polarized wave, comprising:

a pair of separate receiving channels which receive, respectively, the mutually orthogonal components V and H of the reflected wave;

first means including a $\pi/2$ phase shifter placed in one of said receiving channels so that the two components V and H of the received circularly polarized waves are nominally oppositely phased;

second means including a variable phase shifter and a variable attenuator placed in at least one of said two receiving channels, and controlled, respectively, by a phase correction loop, of the second order and amplitude correction loop, of the second order, said phase correction loop comprising a phase comparator whose inputs are connected, respectively, through wide range rain gates, to channel V and to channel H, one of which is corrected, with the output of said phase comparator delivering a phase error signal which is a function of the phase shift $\Delta\phi$ with respect to $\pi/2$ of the components V and H of received rain echo;

and a vectorial adder receiving the components V and H respectively from said second means, one of which is corrected for phase and amplitude, and delivering the useful target echo signal to the conventional radar circuits.



4,106,016

DEVICES FOR DETERMINING ERRORS OF SITING, ESPECIALLY IN RADAR SYSTEMS

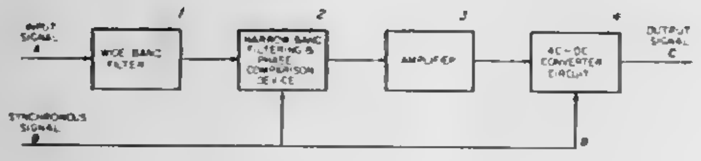
Raffaele Cerra, Via S. Domenico a Corso Europa, 29, and Michele Scherillo, Via Massimo Stanzione, 18, both of 80100 - Naples, Italy

Filed Jul. 29, 1976, Ser. No. 709,803

Claims priority, application Italy, Jul. 30, 1975, 50719 A/75

Int. Cl.^{2} G01S *7/02*

U.S. Cl. 343—7.4 **7 Claims**



1. A device for determining aim errors in radar systems through correlation between the radar echo signal and a signal synchronous with the rotation of the antenna comprising,

a first wide-band filtering means which receives the radar echo input signal,

a second means for filtering and phase comparison driven by the antenna rotation signal and being connected in series with said first filtering means and providing a narrow band filtering of said input signal for eliminating noise components whose frequency is different from that of the antenna rotation signal, and for providing phase comparison between said input signal and said antenna rotation signal, and

for generating an output signal that is correlated to the phase difference between said input signal and said antenna rotation signal,

an AC amplifier means connected to said second means for amplifying the output signal,

an AC-DC converter means connected to said AC amplifier means for converting the amplified output signal into two voltage levels having the same value and opposite signs, and

a differential amplifier connected to said AC-DC converter for receiving the two voltage level signals and transmitting an amplified error signal.

4,106,017

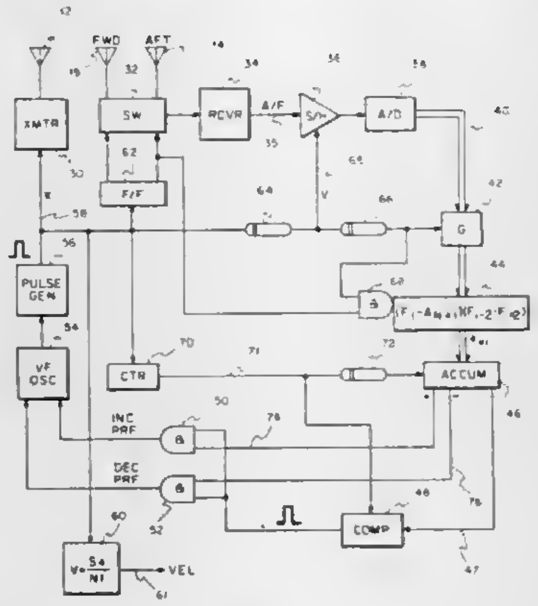
SYSTEM FOR SENSING VELOCITY THROUGH THE USE OF ALTIMETRY SIGNALS

Allan W. Roeder, Whitesboro, and Richard M. Kimball, New Hartford, both of N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,606

Int. Cl.^{2} G01S *9/44*

U.S. Cl. 343—8 **8 Claims**



1. A system for determining the relative velocity of two objects in a direction substantially transverse to a line between them comprising, in combination:

transmitting means provided on a first of said objects for illuminating the second of said objects with periodic pulses of wave energy;

receiving means also provided on said first object for receiving and detecting pulses reflected from said second object, said receiving means being adapted to receive reflected energy at a pair of phase center locations spaced apart in said transverse direction;

amplitude correlating means for comparing the amplitude characteristics of each reflected pulse received at a first of said phase center locations with the amplitude characteristics of the reflected pulse received at the other of said phase center locations N pulse repetition intervals earlier in time, said amplitude characteristics being dependent upon the spatial position of each phase center at a time determined by a pulse transmit time and a pulse sample time, said pulse sample time being the time at which the amplitude sample is taken, where the spatial position of the phase center can be modified by modifying the pulse transmit and pulse sample time, said correlating means generating an output signal indicating the degree of correlation between said pulses as determined by the results of said comparisons wherein said correlating means includes means for generating a correlation output signal representing the error in alignment between the spatial position of said first phase center location and the spatial position of said other phase center location N pulse repetition intervals earlier in time;

control means to adjust the pulse transmit and pulse sample time of said first phase center relative to the transmit time of the said other phase center location N pulses earlier in time, said adjustment being determined by the level of said output signal controlling a variable frequency oscillator to modify the pulse repetition frequency of said transmitting means; and

means for determining said relative velocity based on the quotient of said phase-center separation distance and N multiplied by said pulse repetition interval.

4,106,018

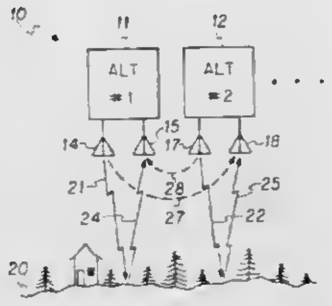
METHOD AND APPARATUS FOR REDUCING INTERFERENCE BETWEEN PLURAL RADIO ALTIMETERS

Paul P. Chibak, Atkins, and Charles H. Wehage, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 18, 1977, Ser. No. 788,374

Int. Cl.^{2} G01S *9/24*

U.S. Cl. 343—12 A **15 Claims**



14. A method of reducing the interference between redundant simultaneously operating CWFM ratio altimeters of the type which transmit a signal and receive a reflection of the transmitted signal, comprising:

detecting a frequency approaching interference signal transmitted by one of said altimeters and received by at least another of said altimeters outside of the bandpass of desired altitude indicating signals of said another of said altimeters, and

stepping a transmitter frequency of said at least another of said altimeters in response to detecting a frequency approaching interference signal.

4,106,019

RANGE RESOLVING DOPPLER RADAR SYSTEM

Thomas F. Alexander, Rolling Hills Estates, and Gary J. Griff, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 5, 1972, Ser. No. 298,094

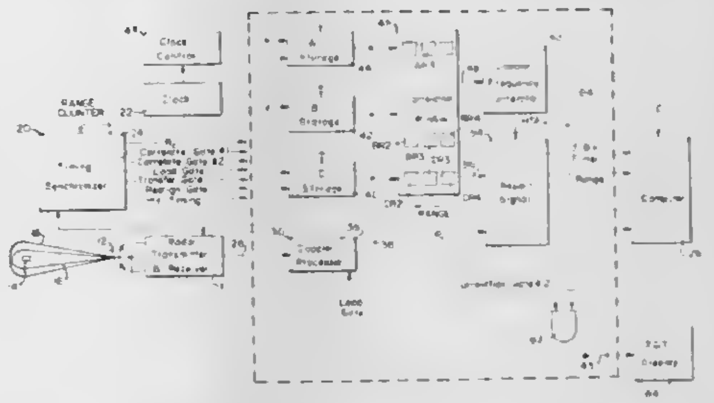
Int. Cl.^{2} G01S *7/44*

U.S. Cl. 343—9 **15 Claims**

1. A range determining system responsive to a doppler filter bank having a plurality of doppler filters, said system receiving radar transmission signals for a plurality of dwells over a plurality of range bins, said filter bank providing a filter number signal when a target return signal occurs in a doppler filter, each filter number signal identifying a doppler filter of said bank comprising:

first, second and third storage registers responsive to the doppler filters to store the filter number signals in each range bin for three radar dwells;

recirculating control means coupled to said storage registers for controlling said registers to recirculate the stored filter number signals in said first, second and third registers to unfold target information; and



correlator means having a plurality of correlators responsive to said stored filter number signals in said storage registers for detecting an unfolded target signal.

4,106,020

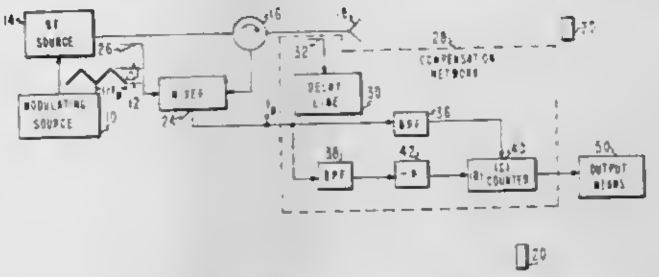
FM-CW RADAR RANGING SYSTEM

Henry Charles Johnson, Neshanic, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,686

Int. Cl.^{2} G01S *9/24*

U.S. Cl. 343—14 **11 Claims**



1. In a frequency modulated continuous wave ranging system of the type including: first means for generating a continuous wave interrogation signal, said interrogation signal being frequency modulated in accordance with a desired waveform having predetermined parameters enabling measurement of the range, R, of a target of interest, at least one of said parameters being subject to undesired changes in value which change the measured range; second means for transmitting said interrogation signal to a target and receiving reflected signals from said target; and third means for deriving difference signals indicative of the frequency difference of said reflected signals from the instantaneous frequency of said interrogation signal, said difference signals being indicative of said range; the improvement comprising:

fourth means also responsive to said interrogation signal and said undesired changes therein for deriving difference signals indicative of the distance of a target at a known distance;

fifth means responsive to said difference signals from said third means for determining a parameter of the same representative of target range and responsive to the signals from said fourth means for scaling said parameter.

4,106,021

POLAR TO RECTANGULAR COORDINATE CONVERTER

Kazuo Katagi, Woodland Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,363

Int. Cl.^{2} G01S *7/44, 9/60*

U.S. Cl. 343—5 SC **10 Claims**

1. A polar to rectangular coordinate converter which produces, for azimuth values and range values in a polar coordi-

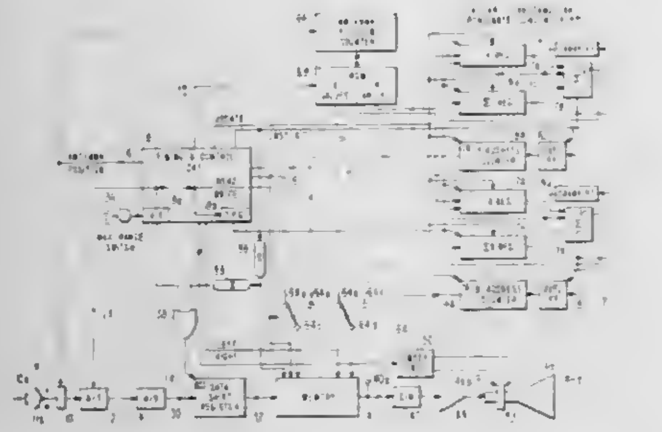
nate system, corresponding row and column values in a rectangular coordinate matrix comprising in combination:

means receptive of a signal indicative of a desired one of said azimuth values for producing fractional trigonometric sine and cosine values corresponding thereto;

first and second storage means;

first summing means receptive of said sine value and the value in said first storage means for computing the sum thereof and for storing the fractional part of said sum in said first storage means and for producing a pulse indicative of the integer part, if any, of said sum and for repeating said sum computing operation with said sum and said sine value a number of times corresponding to the number of ranges of interest for said desired azimuth;

first counter means responsive to said integer indicative pulses for counting the same, the count in said counter at the completion of each sum computing operation representing the value of one of said row and column;



second summing means receptive of said cosine value and value in said second storage means for computing the sum thereof and for storing the fractional part of said sum in said second storage means and for producing a pulse indicative of the integer part, if any, of said sum and for repeating said sum computing operation with said sum and said cosine value a number of times corresponding to the number of ranges of interest for said desired azimuth; and

second counter means responsive to said integer indicative pulses from said second summing means for counting the same, the count in said counter at the completion of each sum computing operation representing the value of the other of said row and said column.

4,106,022

RADIO POSITION-DETERMINING SYSTEM

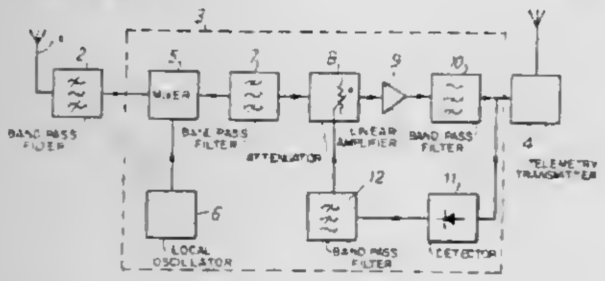
James David Last, Llanfairfechan/Gorddinog, Wales, assignor to University College of North Wales, Bangor, Wales

Continuation-in-part of Ser. No. 496,203, Aug. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,060, May 14, 1973, abandoned. This application Jun. 23, 1976, Ser. No. 699,048

Claims priority, application United Kingdom, May 15, 1972, 22775/72

Int. Cl.^{2} G01S *1/30*

U.S. Cl. 343—105 R **18 Claims**



7. A method of location of at least one mobile comprising: transmitting in a fixed phase relation in a cyclic sequence from only one radio navigation transmitter at a time among a set of at least three radio navigation transmitters located at known positions a radio signal at a frequency f_{rf}, receiving said transmitted radio signals at the mobile; generating a signal at a frequency f_o for use at the mobile; mixing the signals at the frequency f_{rf} and the frequency f_o at the mobile to produce a signal at a frequency f, where f is an audio frequency; transmitting by means of a radio transmitter the signal at the frequency f from the mobile to a control station; and analysing the signals of frequency f received at the control station to determine the position of the mobile.

4,106,023

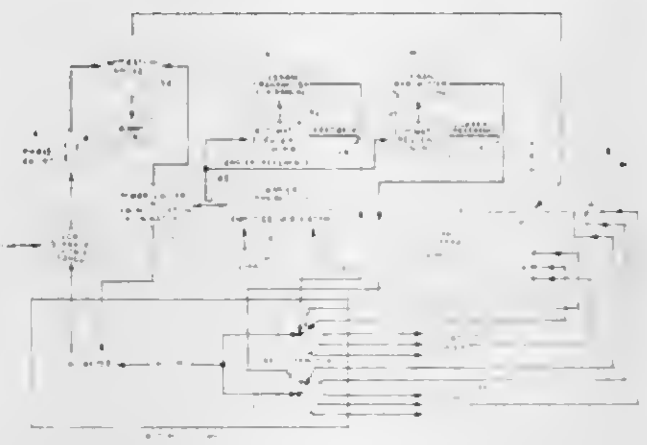
NAVIGATION AID SYSTEM

Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193

Filed Feb. 24, 1975, Ser. No. 552,568

Int. Cl.^{2} G01S *1/38, 1/16, 3/52*

U.S. Cl. 343—106 D **42 Claims**



41. A method of radiating carrier waves from a location, said carrier waves having a frequency modulation dependent on an angle of propagation of the carrier waves from the location, comprising the steps of:

providing a position from which carrier waves are radiated; and,

moving the radiating position along a substantially straight line of motion, the radiating position being repetitively moved at a substantially uniform speed along the line of motion, and the direction of motion being reversed at the ends of the line of motion; whereby an angle of propagation of the carrier waves is determinable solely responsively to the amplitude of the frequency shift in the radiated carrier wave induced by the change in the direction of the motion of the radiating position.

4,106,024

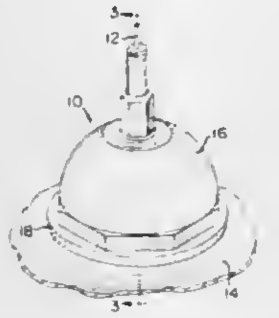
ANTENNA MOUNTING BASE

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 28, 1977, Ser. No. 781,737

Int. Cl.^{2} H01Q *1/32, 1/50*

U.S. Cl. 343—715 **12 Claims**



1. A base for mounting a mobile antenna on a support plate and for connecting said antenna to a coaxial cable, comprising:

an electrically conductive mounting nut including a longitudinally extending bore to receive a coaxial cable and means at one end thereof for securing said nut to a support plate;

a dielectric cap to receive and house said mounting nut and including a longitudinally extending bore to receive the central conductor of said coaxial cable;

means cooperating with said cap bore to electrically connect said central conductor to said antenna; and

a clamping element interposed between said mounting nut and said cap to mechanically secure and electrically connect the outer conductor of said coaxial cable to said mounting nut, the frictional engagement between said clamping element and said cap being less than the frictional engagement between said clamping element and said mounting nut with the outer conductor therebetween.

4,106,025

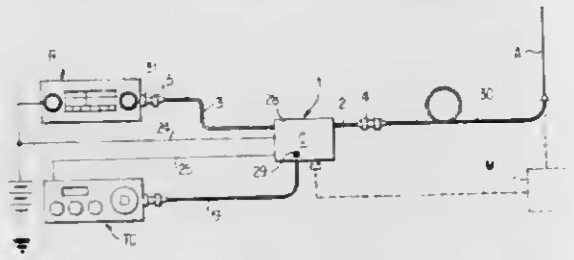
COUPLING CONVERTER FOR VEHICLE ANTENNAS

Sidney Katz, 2113 Fort Worth Ave., Alexandria, Va. 22304

Filed Oct. 22, 1976, Ser. No. 735,039

Int. Cl.^{2} H01Q *1/32, 3/00*

U.S. Cl. 343—715 **10 Claims**



1. A coupling conversion unit for connecting a citizens band transceiver in a broadcast-receiving installation having a broadcast receiver, a broadcast antenna and shielded cable between the antenna and the receiver, said coupling conversion unit comprising:

(a) a base member having

(b) intermediate lead means for connection between said shielded cable and said receiver, said intermediate lead means including

(c) a shielded antenna lead member for connection with said shielded cable and

(d) a shielded receiver lead member for connection with said broadcast receiver,

(e) auxiliary lead means for connection with said citizens band transceiver, said auxiliary lead means including,

(f) impedance matching means and,

(g) a shielded auxiliary lead member;

(h) the shielding conductors of said auxiliary lead member and said antenna and receiver lead members being connected in common,

(i) priority switch means, relay means and overload preventing means responsive to a flow of current to the transceiver to give the transceiver priority over the receiver by immediately electrically connecting exclusively said antenna lead member to the transceiver via said auxiliary lead means whenever the transceiver is activated, said priority switch means including

(j) connecting means for selectively connecting and disconnecting the center conductors of said antenna lead member and said receiver lead member,

(k) positioning means connected to said connecting means for controlling the position of said connecting means whereby the center conductor of said antenna lead member is connected with the center conductor of said auxiliary lead member when the center conductor of said antenna lead member and said receiver lead member are disconnected so that said receiver lead member is electrically isolated from said auxiliary lead member and said antenna lead member whenever the transceiver is activated.

4,106,026

CORRUGATED HORN WITH A LOW STANDING WAVE RATIO

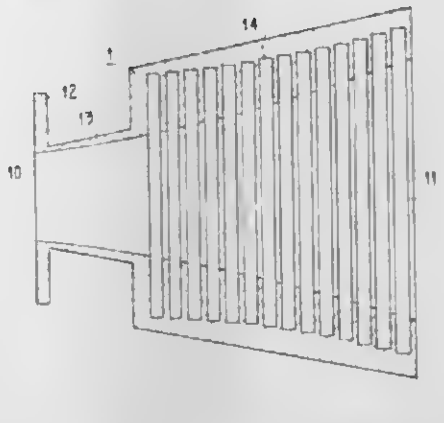
Nhu Bui-Hai, and Alain Bourgeois, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 1, 1976, Ser. No. 737,795

Claims priority, application France, Nov. 4, 1975, 75 33698

Int. Cl.^{2} H01Q *13/02*

U.S. Cl. 343—786 **2 Claims**



1. A corrugated horn of the exponential type, wherein the depth of the corrugations decreases exponentially from the throat of the horn towards its mouth, the extreme depth values of said corrugations are respectively $\lambda/2$ and $\lambda/4$, λ being a wavelength corresponding to a mean frequency of the operational frequency band, and the width of the corrugations varies exponentially from the throat of the horn towards its mouth.

4,106,027

INK FOR THE INK JET PROCESS

Klaus Hoffmann; Rudolf Meyer, both of Leverkusen, and Hans Ohlschlager, Schildgen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,352

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2543092

Int. Cl.^{2} G01D *15/18;* **B41J** *27/00;* **C09D** *11/00*

U.S. Cl. 346—1 **7 Claims**

1. A process for the recording of information on a support by the ink jet method in which a jet of writing liquid having a viscosity of less than 5 cP and an electric conductivity greater than 10^{-4} Ohm^{-1}cm^{-1} is ejected from a nozzle by the application of pressure and is directed to a receiving surface having a relative component of movement transverse to the direction of jet and in which the jet of writing liquid breaking up into droplets is electrically charged and is modulated according to the information to be recorded, wherein the improvement comprises depositing on a hydrophobic, non-absorbent receiving surface a writing liquid consisting essentially of a dye in a liquid medium consisting of from 85 to 100% of an organic solvent having an evaporation index of less than 11, from 0 to 15% by weight of solvent having an evaporation index greater than 11, **whereby the writing liquid rapidly dries on the hydrophobic surface without causing blockage in the nozzle.**

4,106,028

METHOD AND APPARATUS FOR FORMING MAGNETIC IMAGES BY PIEZOELECTRIC COUPLING BETWEEN AN OPTICAL IMAGE AND A MAGNETOSTRICTIVE IMAGING COMPONENT

Frederick John Jeffers, Escondido; Richard John McClure, San Diego, and James Underwood Lemke, Del Mar, all of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,878

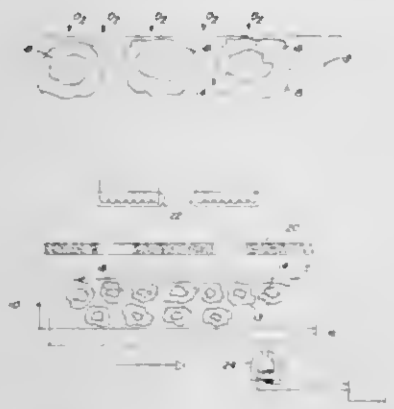
Int. Cl.^{2} G03G *19/00;* **G11B** *5/00*

U.S. Cl. 346—74.1 **9 Claims**

1. A method for forming a magnetic image on a composite recording layer that includes a photoconductive, piezoelectric

component adapted for converting incident illumination into mechanical strain and a magnetostrictive component rigidly coupled therewith and adapted for varying its coercivity in accordance with communicated mechanical strain comprising the steps of:

forming a surface depletion layer in the surface region of the photoconductive, piezoelectric component;



selectively reducing the depth of said depletion layer in an imagewise pattern; and

magnetizing the magnetostrictive component in the recording layer while said depletion layer is selectively reduced, said magnetization providing a selective magnetic pattern corresponding to said selectively reduced depletion layer pattern, thereby to form a magnetic image.

4,106,029
DEVICE FOR RECORDING MEASURING VALUES

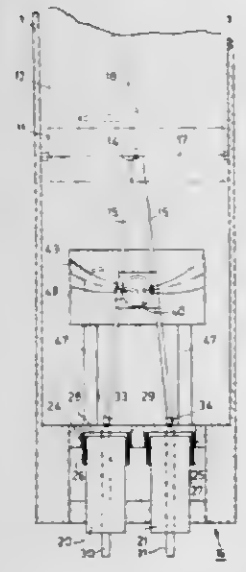
Scato Albarda; Willem Van Der Hoek, both of Eindhoven, Netherlands, and Dominique Yves Marie Taupin, Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,905

Claims priority, application Netherlands, Jun. 15, 1976, 7606436

Int. Cl.² G01D *15/16*

U.S. Cl. 346—117 A 4 Claims



1. A device for recording measuring values, comprising a transport mechanism for transporting a strip-shaped record carrier in its longitudinal direction, a recording pin which is displaceable in accordance with the variation of the measuring value to be recorded, by means of an electromagnetic drive along a straight line parallel to the surface of the record carrier and perpendicular to the transport direction thereof, and a signal generator which is capable of generating a signal which is dependent of the position of the recording pin, characterized in that the drive (16) is formed by two linear motors, the operating directions of which are approximately parallel, each motor comprising a static portion and a moving portion, the moving portion (26, 27) of each motor being pivotably connected to an arm (15) the said arms being connected to a recording head (14) which comprises the recording pin, the signal generator being adapted to generate signals in dependence of the position of the recording pin in the direction of the said line (17) as well as in the transport direction of the record carrier (12), a control circuit (60) being provided which is adapted to control the drive so that substantially no undesired displacement of the recording pin occurs in the transort direction.

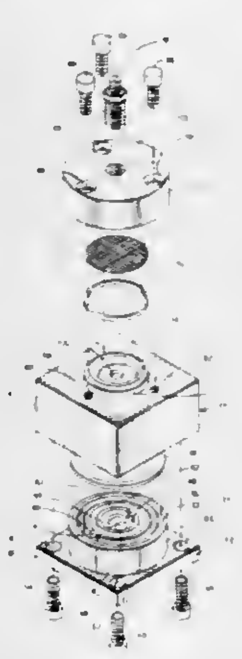
4,106,030
INK JET PRINTER INK HEATER

Perry Dwaine Hampton, Dallas, and Jimmie Lee Tobey, Garland, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Feb. 14, 1977, Ser. No. 768,518

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R 4 Claims



1. A fluid temperature control apparatus for an ink jet printer comprising:

a. a structure enclosing a cavity;

b. fluid under pressure circulating into and out of said cavity;

c. a heating element thermally engaged with said fluid within said structure for selectively applying heat to said fluid;

d. a temperature sensing device thermally engaged with said fluid within said structure; and

e. control means responsive to said temperature sensing device at a certain predetermined temperature and connected to said heating element for actuating said heating element to maintain said predetermined temperature, and wherein said structure includes a plurality of circular and concentric flanges extending across said cavity, each flange being provided with a slot to allow said fluid to pass there through, the slot of one flange being located radially opposite of slots of said flanges adjacent thereto.

4,106,031
AUTOMATIC DRAFTING DEVICE

Walter Jozat, Bad Bramstedt, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Mar. 25, 1977, Ser. No. 781,394

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613440

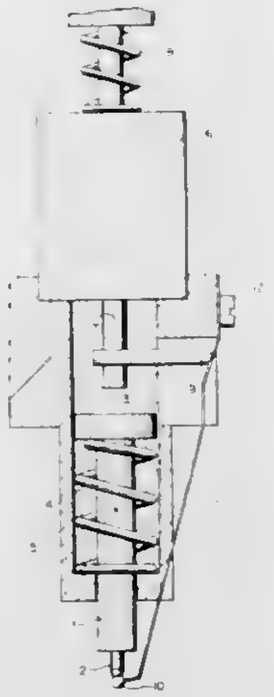
Int. Cl.² G01D *15/16*

U.S. Cl. 346—140 R 10 Claims

1. In an automatic drafting device of the type adjustably supporting a tubular writing pen with writing tip in both a lowered writing position with the pen tip contacting the writing surface and a raised rest position with the pen tip out of contact with the writing surface, the improvment comprising:

A. A housing support for said tubular pen;

B. A rest mode mechanism mounted upon said housing and engaging said pen, so as to urge said pen inwardly of said housing into a raised rest position;



C. A writing mode mechanism mounted upon said housing and engaging said pen, so as to urge said pen outwardly of said housing in a lowered writing position; and

D. A sealing element supported upon said housing, so as to engage the writing tip of said pen in the raised rest position and so as to disengage laterally from the writing tip in a lowered writing position.

4,106,032
APPARATUS FOR APPLYING LIQUID DROPLETS TO A SURFACE BY USING A HIGH SPEED LAMINAR AIR FLOW TO ACCELERATE THE SAME

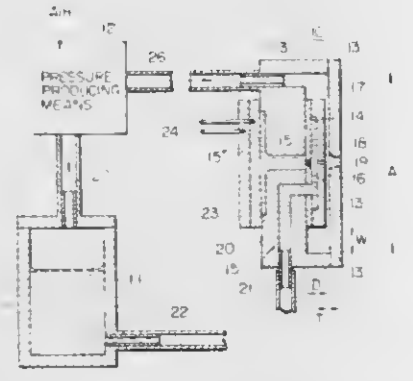
Masayoshi Miura; Kiyoshi Yamamori, and Akira Mizoguchi, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Limited, Japan

Continuation-in-part of Ser. No. 616,636, Sep. 25, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,170

Claims priority, application Japan, Sep. 26, 1974, 49-111279; Mar. 20, 1975, 50-34109; Jun. 13, 1975, 50-72555; Jun. 16, 1975, 50-73469

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R 10 Claims



1. Apparatus for applying liquid droplets to a surface comprising, a housing including a first liquid chamber for containing a liquid to be applied to a surface and having an associated piezoelectric device for generating short-duration rises of the pressure of liquid in the first liquid chamber, a second liquid chamber communicating with the first chamber through a connecting channel and having a first discharge channel for droplets of said liquid to leave the apparatus, the first discharge channel being in alignment with the connecting channel and in close proximity thereto so that a short-diration pressure rise in the first liquid chamber causes a series of liquid droplets of decreasing size to be expelled through the first discharge channel, the second liquid chamber having a first intake channel connected to a liquid supply source, a pneumatic chamber substantially divided into an inner, disc-like portion formed with a second discharge channel and an outer, annular portion formed with a second intake channel connected to a source of pressurized air, the second discharge channel being in alignment with the first discharge channel and in close proximity thereto, means for providing communication for the liquid supply source with the air supply source to increase the pressure in the liquid in the first discharge channel relative to the pressure at an exit thereof so that the pressurized air is admitted firstly into the annular portion of the pnuematic chamber, then into the disc-like portion thereof and expelled through the second discharge channel in the form of a laminar jet stream, whereby droplets of said liquid of smaller size when expelled through the first discharge channel are accelerated by the jet stream of air at higher speeds than droplets of large size so that said series of droplets lands on said surface substantially at the same instant of time, and means for humidifying the air in the pneumatic chamber to maintain the liquidity of the liquid in the first discharge channel.

4,106,033
SYSTEM FOR INDICATING PHOTOGRAPHING CONDITIONS

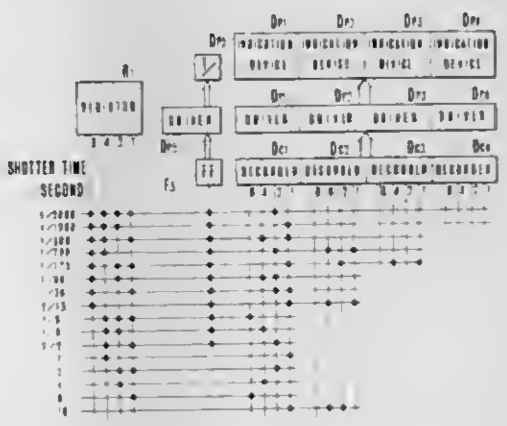
Soichi Nakamoto, Machida; Nobuaki Sakurada, Yokohama; Tadashi Ito, Yokohama; Fumio Ito, Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 514,895, Oct. 15, 1974, abandoned. This application Jun. 17, 1976, Ser. No. 697,108

Claims priority, application Japan, Oct. 17, 1973, 48-116577

Int. Cl.² G03B *7/08, 17/20*

U.S. Cl. 354—23 D 4 Claims



1. A photographic information displaying apparatus for a camera comprising:

a register for storing photographic information in digital form, said register generating binary coded signals corresponding to the stored contents;

a decoder for decoding the content of said register, said decoder converting the binary coded signals into decimal-coded signals;

a first indication means for indicating in numerical figures a value corresponding to the output of said decoder;

a second indication means for indicating a fractional sign;

means for detecting whether or not the output signal of the register corresponds to a time shorter than one-half second of the shutter time, said means for hinging the indication means into an indicating state when the output of signal of the register corresponds to a time shorter than one-half second of shutter time;

whereby the first indication means indicates a fraction in cooperation with the second indication means when the second indication means is indicated, and the first indication means alone indicates an integer when the second indication means is not indicated.

4,106,034

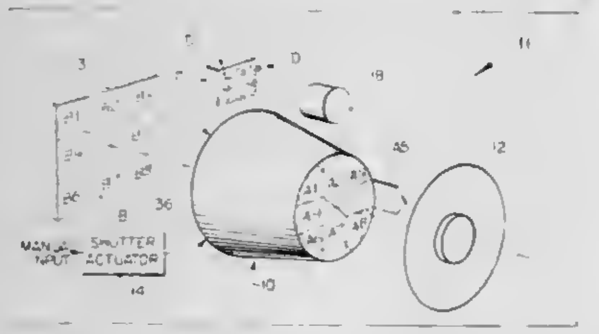
CAMERA HAVING MULTIZONE SHUTTER MECHANISM

Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,431

Int. Cl.² G03B *7/08, 9/46*

U.S. Cl. 354—31 5 Claims



1. In a camera having a lens for directing and focusing image-carrying rays from photographic scene to film material located at the camera focal plane, a shutter mechanism actuatable for blocking or unblocking the transmission of image-carrying rays to said focal plane, photosensitive means for sensing the brightness of spatially oriented areas of said scene, and selectively operable means for actuating said camera to expose said film material, the improvement wherein said shutter mechanism includes:

a plurality of opaque shutter elements mounted for displacement independently of each other between a closed position wherein each said element is in blocking relation to light from a respective area of said scene and an open position wherein each said element is in unblocking relation to its respective area of said scene to thereby transmit light therefrom to a respective elemental area of said film material;

means for biasing said shutter elements toward their said closed positions;

means responsive to said selectively operable means for substantially simultaneously displacing said shutter elements to their said open positions to initiate an exposure interval, said displacing means including a member mounted around said shutter elements and adapted for circumferential displacement with respect thereto, said member carrying a plurality of cam surfaces, each operatively coupled to a respective one of said shutter elements such that upon displacement of said member each said shutter element is displaced to its said open position; and

means responsive to said brightness sensing means for retaining each said shutter element in its said open position and for subsequently releasing each said shutter element for displacement to its said closed position after an interval related to the brightness of its respective scene area to provide an exposure interval for each elemental area in relation to its respective scene area.

4,106,035

PHOTOMETRIC CIRCUIT

Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,587

Claims priority, application Japan, Apr. 25, 1975, 50-50470

Int. Cl.² G03B *7/08*

U.S. Cl. 354—51 2 Claims

1. A photometric circuit for electronically determining proper exposure time based on scene brightness, film sensitivity and aperture settings, said circuit being of the type having a photoelectric transducer for developing a current dependent upon scene brightness, a first transistor having its collector connected to said photoelectric transducer and its base connected to its collector by a high input impedance collector-to-base feedback circuit for developing a base-to-emitter voltage related to the apex indication value B_v of the brightness B of the scene, a pair of variable resistors for setting the film speed and aperture values into the circuit, respectively, and a second transistor for developing an exposure control current at its collector in dependance upon the voltage applied between its base and emitter, the improvement comprising:

said variable resistors being connected in series with each other and in the feedback circuit between collector and base of the first transistor; constant current source means connected to said series connection of said variable resistors for providing a constant current to said variable resistors having a value which causes the voltages across said resistors to be related to the apex indication values S_v and A_v, respectively; said second transistor having its base-emitter circuit connected in a circuit loop with said variable resistors and said base-emitter circuit of said first transistor, said constant current source means providing a current having a value such that the temperature characteristics of the voltages thereby created across the variable resistors per one step of the exposure determining factors, respectively, substantially satisfy $(KT/q)\log_e 2$, where K is Boltzmann's constant, q is the electric charge of an electron, and T is an absolute temperature; said constant current source means comprising a third transistor having its collector connected to said series connected variable resistors, its emitter connected to a source of reference potential; and means for providing a voltage dependent upon the absolute temperature connected to its base, comprising a diode and a self biased FET connected in series across a power supply, the junction between said FET and said diode being connected to the base of said third transistor.

4,106,036

ACCESSORY UNIT FOR PHOTOGRAPHIC APPARATUS

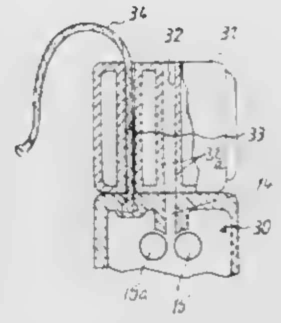
Richard Wick; Otto Stemme, both of Munich; Peter Lermann, Narring, and Karl-Heinz Schultheiss, Taufkirchen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,795

Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622604

Int. Cl.² G03B *17/50, 15/02*

U.S. Cl. 354—83 19 Claims



1. An accessory unit for use with a photographic apparatus, comprising a housing; means for connecting said housing to a photographic apparatus; and at least one slot-shaped passage in said housing for passage therethrough of a camera strap associated with the photographic apparatus.

2. An accessory unit for use with a photographic apparatus, comprising a housing; means for connecting said housing to a photographic apparatus; and at least one slot-shaped passage in said housing for passage therethrough of a film sheet which is to be ejected from the photographic apparatus.

4,106,037

FLASH DEVICE FOR USE WITH A CAMERA

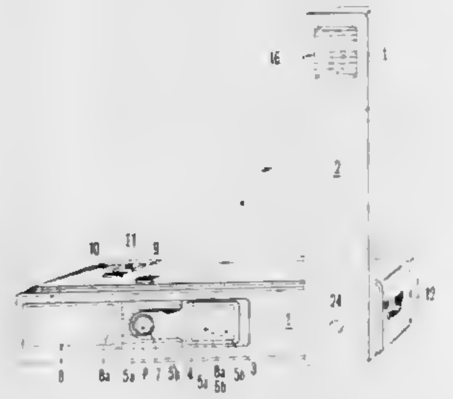
Zenzo Nakamura, Urawa, and Goro Hasegawa, Fuchu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,174

Claims priority, application Japan, Dec. 27, 1975, 50/177067

Int. Cl.² G03B *15/03, 17/02*

U.S. Cl. 354—128 8 Claims



1. A photographic camera comprising:

(A) a box-shaped light-tight camera housing having a flat frontal surface provided with a first opening for exposing film and a second opening for view finding;

(B) a shutter device disposed behind said first opening within said housing;

(C) a synchronous signal generating means, within said housing for generating a synchronous signal with operation of said shutter device;

(D) connector means within said housing for receiving and electrically connecting an electrical power source;

(E) a first terminal means disposed on a portion of said frontal surface of the housing and electrically connected with said synchronous signal generating means and said connector means;

(F) a box-shaped shielding means for shielding said first and second openings of the frontal surface of the camera housing, said shielding means having a flat rear surface corresponding to said frontal surface of the camera housing and a frontal surface facing an object to be photographed and attached to the camera housing and movable within a plane substantially parallel to the frontal surface of the camera housing between a first and second openings of the frontal surface of the camera housing by said rear surface and a second position at which the shielding means exposes the first and second openings; said frontal surface of the shielding means being provided with a third opening and said rear surface of the shielding means being provided with a fourth opening;

(G) a releasable fixing means for selectively fixing said shielding means against the camera housing at said first and second positions respectively;

(H) a flash device for emitting a flash with the electrical power supplied from said electrical power source and in response to the synchronous signal generated by said synchronous signal generating means, said flash device being disposed within said shielding means and comprising:

  (H-1) a flash lamp disposed within the shielding means at a position corresponding to said third opening of the frontal surface so as to emit the flash light to the object through the third opening; and

  (H-2) indication means for indicating the state of preparation of the flash device for flash light emission, said indication means being disposed within the shielding means at a position corresponding to said fourth opening of the rear surface so that the indicating of the indication means is observable from the outside of the shielding means;

(I) second terminal means for electrically connecting said flash device with said electrical power source and said synchronous signal generating means, said second terminal means being disposed on a portion of the rear surface of the shielding means at such a position as to be contacted with said first terminal means when the shielding means is set to said second position; and

(J) manually operable switch means for controlling the electrical power supply to the flash device from said electrical power source, said switch means being inserted and connected between said second terminal means and the flash device and operable manually from the outside of the shielding means.

4,106,038

INDICATOR IN A FINDER

Yukimasa Kawakita, and Youichi Okuno, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 482,896, Jun. 25, 1974, abandoned, which is a continuation of Ser. No. 393,185, Aug. 30, 1973, abandoned. This application May 24, 1976, Ser. No. 688,964

Claims priority, application Japan, Sep. 4, 1972, 47/88545

Int. Cl.² G03B *19/12*

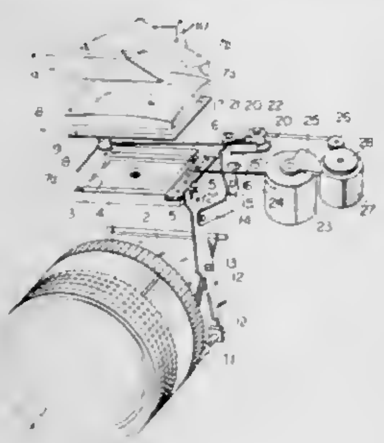
U.S. Cl. 354—155 11 Claims

1. A single lens reflex camera having an objective lens, an eyepiece,

a focusing screen on which an image formed by the light transmitted by the objective lens is focused, said screen having first and second faces, said focusing screen having a first zone in which the image is formed and a second zone adjacent thereto, said screen having a plurality of projections on one of the faces in the first zone, a portion protruding beyond the projection from one of the faces of the focusing screen and completely surrounding the first zone and separating the first zone from the second zone;

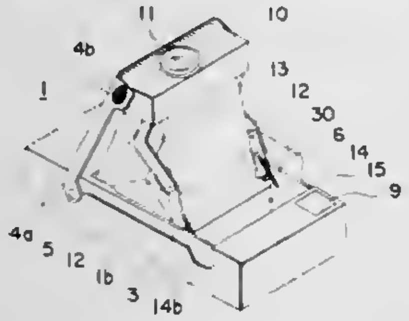
a movable exposure information indication member positioned in the second zone of the focusing screen, and a light guide means including a pentaroof prism for guiding the light from the first and second zones of the focusing screen to the eyepiece,

characterized in that said protruding portion is integral with said one of the faces of the focussing screen and that said protruding portion and said screen is composed of a single unitary continuous homogeneous material, and light transmitting means including a transparent member cover said portion and form a dust tight space over the first zone.



4,106,039
SIDE-FOLDING BELLOWS ELEMENT FOR FOLDING CAMERA

Susumu Fukuda, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Nov. 10, 1976, Ser. No. 740,460
Claims priority, application Japan, Nov. 10, 1975, 50/135528
Int. Cl.^{2} G03B *17/04*
U.S. Cl. 354—193 **3 Claims**



1. In a folding camera comprising a main body of rectangular box-like configuration having a first housing section which is formed with an exposure opening in a forward wall thereof facing a forward side of the main body in terms of the object being photographed so as to accommodate therein a film container in such a manner that an exposure opening of the film container coincides with said exposure opening of said first housing section and a second housing section being formed in a position adjacent to said first housing section and between said forward side and a rear side of said main body, lens supporting means having exposure means incorporated therein, a cover plate member pivotably connected at one end thereof to said main body in a position corresponding to said second housing section with said exposure opening of said first housing section being located therebetween, for rotation between a first position to cover said forward side of said main body and a second position whereat said lens supporting means is held in photographing position, with the other end of said cover plate member pivotably connected to an adjacent corner portion of the sidewall of said lens supporting means for covering, at said first position, said forward side of said main body into which said lens supporting means is housed, a pair of folding link levers, each pair having first and second lever members pivotably connected at their ends to each other for being folded in one direction with one end of the first lever member of each of the pairs being pivotably connected to said main body and one end of the second lever member of each of said pairs being pivotably connected to the corner portion diametrically opposite to said adjacent corner portion of the sidewall of said lens supporting means for pivotably supporting said lens supporting means together with said cover plate member, during rotation thereof between said first and second positions, and a collapsible light-shielding bellows having one peripheral edge secured around said exposure opening of said first housing section, and the other peripheral edge thereof fixed around the rear face of said lens supporting means with said bellows being expanded at said second position and folded into a flat state at said first position, the improvement wherein said main body first housing section forms an exposure compartment, said lens supporting means comprises a lens mount and said main body second housing section constitutes a lens mount housing, said bellows comprises a side folding bellows element made of opaque material and comprising a first wall which is nearest to said lens mount housing, and a second wall which is parallel to said first wall, and identical third and fourth walls which extend between and are integrally attached to opposite side edge portions of said first and second walls, the front edges of said first, second, third, and fourth walls being fixedly attached to the rear surface of said lens mount and together therewith defining an opening through which image-wise light directed towards the interior of said camera by said lens assembly may freely pass, the rear edges of said first, second, third, and fourths walls being fixedly attached to the front surface of said first housing section at said exposure compartment together therewith defining an opening which permits free impingement of said image-wise light on said film material, said first wall having defined therein a forward-end fold-in line portion which is a short distance from and is parallel to the front edge of said wall and extends between opposite side edges of said wall and a generally central rear end fold-in line portion which extends between opposite side edges of said first wall and is parallel to said first forward-end fold-in line portion of said first wall, said second wall defining a forward-end fold-in line portion which is a short distance from and is parallel to the front edge of said second wall and extends between opposite side edges of said second wall, and each of said third and fourth walls defining a first fold-out line portion which extends from a first corner portion thereof which adjoins a rear corner portion of said second wall to a point at which said forward-end fold-in line portion of said first wall meets an edge of said third and fourth walls, and subsidiary fold-in and fold-out line portions in the areas defined between said first fold-out line portion and edge portions of said third and fourth walls.

4,106,040
CAMERA HAVING IMPROVED MECHANISM FOR SHUTTER ACTUATION AND FILM WINDING

Fumio Ito; Tadashi Ito, both of Yokohama; Akio Sunouchi, Kawasaki, and Kanehiro Sorimachi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 558,731, Mar. 17, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,969
Claims priority, application Japan, Mar. 20, 1974, 49/31741; Mar. 20, 1974, 49/31742; Apr. 16, 1974, 49/43052
Int. Cl.^{2} G03B *17/42, 17/38*
U.S. Cl. 354—205 **6 Claims**

1. A camera of the type having an electromagnetically controllable shutter release mechanism including latching means arranged to hold shutter release means in a shutter-tensioned position, magnet means cooperative with said latching means upon actuation thereof to release it from the latching position to the releasing position, a control circuit for electromagnetically controlling the operation of said magnet means, and film winding and shutter tensioning mechanisms which are operatively connected to each other by a single operating member, said film winding mechanism comprising:

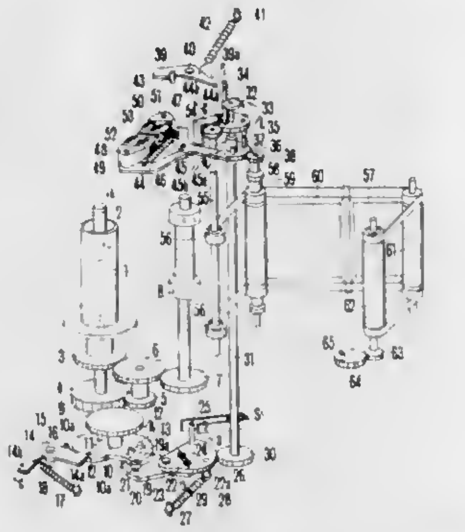
(a) drive means arranged to be rotatable in only one direction in response to a predetermined motion of the single operating member;

(b) reciprocative rotary means arranged to be turned in a direction for bringing said shutter release means to the latched position, and after completion of the shutter tensioning operation to be turned in the opposite direction to the starting position;

(c) swingable means engaging with said rotary means and arranged to be brought into engagement with said drive means during a rotation of said drive means to a predetermined angular extent for transmitting the motion of the single operating member to said rotary means to effect the setting of said shutter release means to the latched position, and after completion of the shutter tensioning operation, to be returned in disengagement with said drive means;

said swingable means being provided with an actuator positioned adjacent a switch of said control circuit so that during the shutter tensioning operation said switch is opened to eliminate the force of said magnet means; and

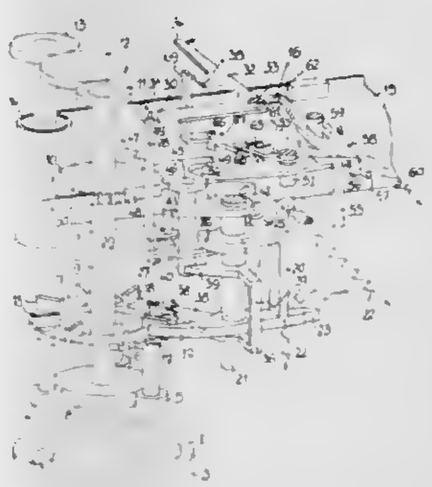
wherein said drive means and said swingable means are provided with first and second cam arrangements made at the interconnection therebetween and complementary with each other so that as soon as the first cam arrangement is disengaged, the second cam arrangement is established through which the motion of said drive means is transmitted to said swingable means.



4,106,041
FILM-TRANSPORT AND SHUTTER-CONTROL SYSTEM FOR CAMERAS

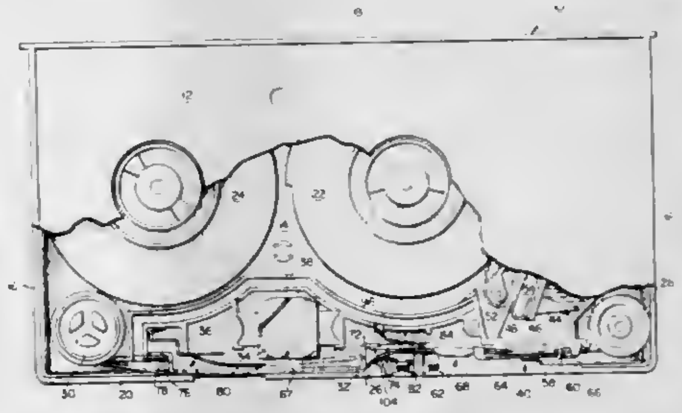
Karl Heinz Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate Und Kunststoff GmbH & Co., KG., Fed. Rep. of Germany
Filed Nov. 9, 1976, Ser. No. 740,268
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553501
Int. Cl.^{2} G03B *17/42*
U.S. Cl. 354—206 **9 Claims**

1. In a camera, shutter-control means and support means supporting said shutter-control means for movement between a pair of end positions one of which is a release end position where said shutter-control means releases a camera shutter and other of which is a cocked end position where a shutter of the camera is cocked and ready to be released, film-transporting means for transporting film, drive means operatively connected with said shutter-control means for driving the latter from said release end position to said cocked end position thereof, said drive means also being operatively connected with said film-transporting means for operating the latter to transport film, and drive-control means operatively connected with said drive means for automatically controlling the latter for first transmitting a drive to said shutter-control means while preventing transmission of a drive to said film-transporting means until said shutter-control means reaches said cocked end position thereof, and for then, during continued unidirectional operation of said drive means, transmitting a drive to said film-transporting means while said shutter-control means remains in said cocked end position thereof without any further transmission of a drive thereto.



4,106,042
MULTIPURPOSE FILM CASSETTE HAVING A PROCESSOR DISABLING VALVE RETENTION ARRANGEMENT

Frank M. Czumak, Derry, N.H., and Joseph A. Stella, Peabody, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 26, 1977, Ser. No. 791,034
Int. Cl.^{2} G03D *5/00*
U.S. Cl. 354—317 **6 Claims**



1. A photographic film handling cassette for use with other apparatus for treating a strip of exposed photographic film material with processing fluid to develop viewable images on the film strip, said cassette comprising:

a housing for retaining the film strip;

means responsive to drive means of said other apparatus for advancing the film in a given path within said housing;

film processing means for depositing a layer of processing fluid on the exposed film strip, said processing means including a nozzle opening configured for releasing processing fluid to the film strip;

selectively operable means for disabling said film processing means following deposit of said fluid layer, said disabling means comprising a valve member slidably mounted within said cassette for movement, responsive to film advancement in a given direction, in said given direction from a first position adjacent said nozzle opening to a second position wherein said valve member is in blocking engagement with said nozzle opening, said valve member further comprising a leaf spring member forming a part thereof and extending from said valve member in a direction opposite and angularly oriented from said given direction of advancement of said film strip; and

cassette structure presenting an engaging surface facing in a direction substantially opposite to said given direction and configured to cooperate with at least a portion of said leaf spring member facing in said given direction when said valve is in said first position, said leaf spring member being further configured to deflect out of engagement with said engaging surface when said valve member is moved from said first position to said second position responsive to film advancement in said given direction.

4,106,043
ZENER DIODES

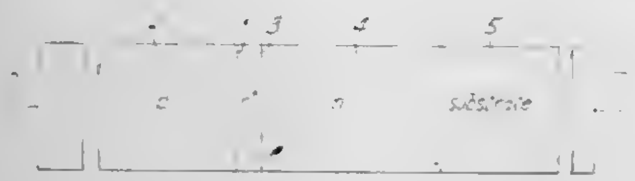
Brian Culshaw, Amersham, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 710,156, Jul. 30, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,405

Claims priority, application United Kingdom, Jul. 31, 1975, 3207/75

Int. Cl.^{2} H01L *29/90*

U.S. Cl. 357—13 **5 Claims**



1. A zener diode comprising a pn junction having two successive n-type layers on one side of the junction which two layers are differently doped to each other, the layer adjacent the junction being of such thickness and of higher concentration than the other n-type layer so that breakdown in said adjacent layer is due at least in part to a tunnelling mechanism and in part to avalanche multiplication to cause current flow through said junction so that said adjacent layer determines the temperature co-efficient of the breakdown voltage and the other layer contributing to the total value of the breakdown voltage.

4,106,044
FIELD EFFECT TRANSISTOR HAVING UNSATURATED CHARACTERISTICS

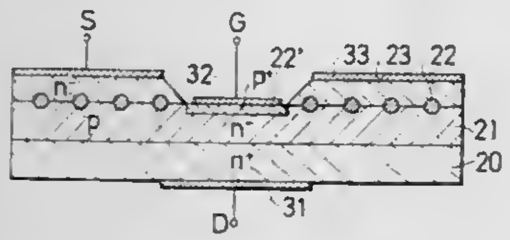
Takashi Yoshida, Hamamatsu; Masao Kosugi, Hamakita, and Takeshi Matsuyama, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 558,697, Mar. 17, 1975, abandoned. This application May 27, 1977, Ser. No. 801,248

Claims priority, application Japan, Mar. 16, 1974, 49-29616; Apr. 6, 1974, 49-38473

Int. Cl.^{2} H01L *29/78*

U.S. Cl. 357—22 **12 Claims**



1. A field effect transistor comprising:

a source electrode, a gate electrode and a drain electrode,

a first semiconductor region of a first conductivity type connecting said source and drain electrodes, and

at least two gate semiconductor regions of a second conductivity type relatively disposed in said first semiconductor region such that a common plane passes centrally through said gate region with said gate regions extending outwardly on either side of said plane a predetermined distance, adjacent boundaries of said gates being separated in said plane by a distance ranging from 15 to 2.0μm,

said gate regions defining a channel region within said first semiconductor region,

said channel region being those portions of said first semiconductor region located between adjacent ones of said gate regions and extending outwardly on either side of said plane said predetermined distance, the width of said channel region being defined by the separation in said plane of said adjacent gate region boundaries and the length of said channel region being defined by said predetermined distance on either side of said plane,

said channel region having an impurity concentration of from 1×10^{13} to 1×10^{15} atoms/cc, and

a depletion layer growing from the junction between said gate semiconductor region and said first semiconductor region to almost close said channel region when no gate bias voltage is applied to said gate electrode to cause the transistor to provide an unsaturated drain current versus drain voltage characteristic.

4,106,045
FIELD EFFECT TRANSISTORS

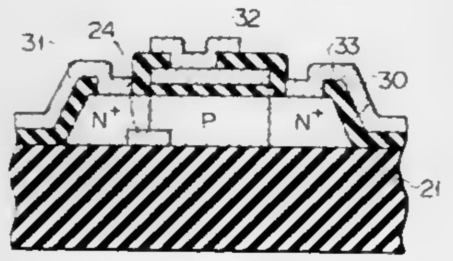
Yoshio Nishi, Yokohama, Japan, assignor to The President of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,537

Claims priority, application Japan, May 20, 1975, 50-59298

Int. Cl.^{2} H01L *29/78*

U.S. Cl. 357—23 **5 Claims**



1. A field effect transistor comprising:

an insulating substrate,

a semiconductor layer having a prescribed height, formed on said substrate,

source, gate and drain regions formed in said semiconductor layer in the height direction of said semiconductor layer entirely over said prescribed height thereof,

said source and drain regions each having a high impurity concentration of one conductivity type and said gate region having an impurity concentration of the other conductivity type, said source and drain regions forming a junction with said gate region which is situated between said source and drain regions,

a gate electrode provided on said gate region for inducing a channel in said gate region, and

a buried layer formed in the gate region mounted on the insulating substrate and abutting on the junction between said source and gate regions, and having the same conductivity type as that of said gate region and a higher impurity concentration than said gate region, said buried layer being out of contact with said drain region and having a height not more than half the height of said source and drain regions.

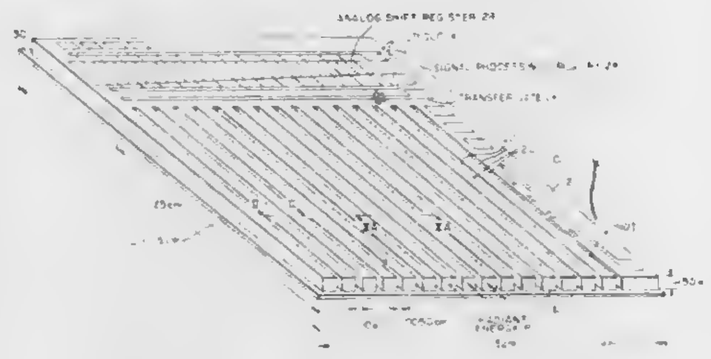
4,106,046
RADIANT ENERGY SENSOR

Harvey C. Nathanson, Pittsburgh, and Michael M. Sopira, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1977, Ser. No. 762,544

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **13 Claims**



1. A sensor for converting radiant energy into electrical signals comprising:

a crystalline substrate having a predetermined crystalline orientation, an upper and lower substrate surface and an end surface, said end surface suitable for receiving radiant energy;

said substrate including a plurality of elongated detectors for generating electronic charge in response to the passing of radiant energy through said end surface and said detector; and

one of said elongated detectors including conductive electrodes on said upper and lower substrate surface for placing a voltage potential between said upper and lower surface and having portions thereof physically separated from adjacent detectors by grooves in said substrate, said grooves extending from the upper surface towards the lower surface and having side walls bounded by selected crystalline planes of said substrate for electrically and optically isolating said detector and adjacent detectors.

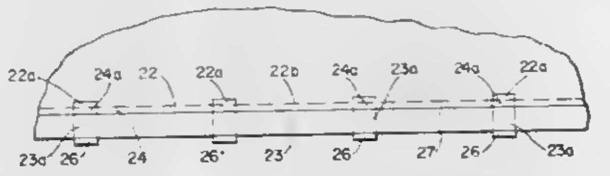
4,106,047
SOLAR CELL WITH DISCONTINUOUS JUNCTION

Joseph Lindmayer, 1335 Piccard Dr., Rockville, Md. 20850

Filed Mar. 28, 1977, Ser. No. 775,961

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **6 Claims**



1. A solar energy cell capable of maintaining a substantially constant voltage, comprising a wafer having opposed front and back surfaces, said front surface being adapted to absorb light impinging thereon, rectifying junction formed in said wafer at said front surface and another electrical junction formed in said wafer at said back surface, said back junction being discontinuous and thereby forming portions thereof enhancing and opposing the action of the front junction, said enhancing portions in their entirety comprising substantially less than the area of said wafer at said back junction, said enhancing portions forming a step junction with said wafer.

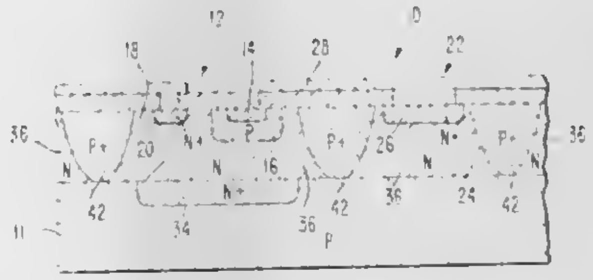
4,106,048
INTEGRATED CIRCUIT PROTECTION DEVICE COMPRISING DIODE HAVING LARGE CONTACT AREA IN SHUNT WITH PROTECTED BIPOLAR TRANSISTOR

Heshmat Khajezadeb, Somerville, N.J., assignor to RCA Corp., New York, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,424

Int. Cl.^{2} H01L *27/02*

U.S. Cl. 357—40 **9 Claims**



1. An integrated circuit protection device for a transistor having a collector region, a base region, and an emitter region, said emitter region forming with said base region a PN junction comprising:

(a) a diode having one electrode connected to a first area on a first region of said diode, said electrode also being connected to a second area on said emitter, said first region having the same conductivity type as said emitter;

(b) a second region of the diode having opposite conductivity type to said first region, a PN junction formed between said first region and said second region of said diode, and means for making electrical contact to said second region, said first area being much larger than said second area.

4,106,049
SEMICONDUCTOR DEVICE

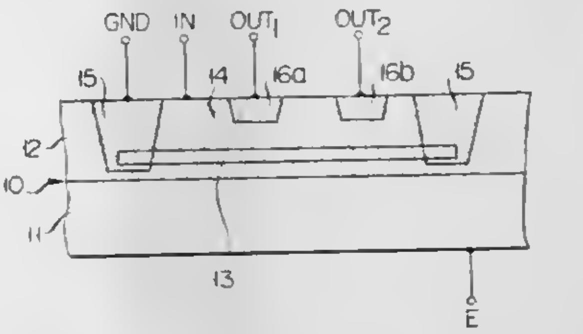
Satoshi Shinozaki; Yoshio Nishi, both of Yokobama, and Yoshihisa Mizutani, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Feb. 22, 1977, Ser. No. 770,270

Claims priority, application Japan, Feb. 23, 1976, 51-18713; Feb. 23, 1976, 51-18714

Int. Cl.^{2} H01L *27/02*

U.S. Cl. 357—46 **12 Claims**



1. A semiconductor device comprising:

a D.C. voltage supply region comprising a semiconductor substrate of one conductivity type having at least a surface layer of high impurity concentration,

a first layer of the same conductivity type as that of the voltage supply region provided on said surface layer and having an impurity concentration lower than that of the surface layer,

a thin second layer of the opposite conductivity type to said one conductivity formed completely in the first layer and having an impurity concentration intermediate that of said substrate and said first layer,

a grounding region of said opposite conductivity type formed in the first layer and surrounding a specified region thereof, which extends from the outside surface of the first layer to the second layer and provides a signal input region as defined by the surrounded specified region, and

at least one signal output region provided in the surface of the signal input region at a position spaced apart from the grounding region and constituting a diode therewith,

wherein the surface layer, the second layer and the signal input region constitute a vertical transistor of one polarity, and the second layer, the signal input region and the signal output region constitute a vertical transistor of the opposite polarity.

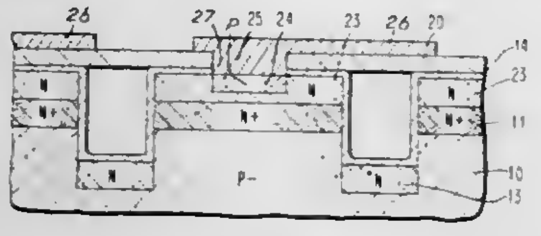
4,106,050
INTEGRATED CIRCUIT STRUCTURE WITH FULLY ENCLOSED AIR ISOLATION

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1976, Ser. No. 719,888

Int. Cl.^{2} H01L *27/04*

U.S. Cl. 357—49 **5 Claims**



1. An integrated circuit member structure comprising:

a semiconductor substrate having formed therein a pattern of cavities extending from one surface of said substrate into the substrate,

a plurality of pockets of semiconductor material extending from said surface laterally surrounded and electrically insulated by said cavities,

a planar layer of electrically insulative material over said surface,

said cavities being fully enclosed by the combination of said substrate and said planar layer, and

a metallization pattern formed on said layer of insulative material and selectively connected to a plurality of said pockets.

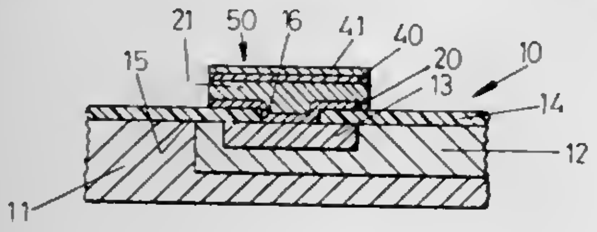
4,106,051
SEMICONDUCTOR DEVICES

Leslie Dormer, Stockport, and Roy Nuttall, Cheadle, both of England, assignors to Ferranti Limited, Hollinwood, England

Division of Ser. No. 413,894, Nov. 8, 1973, Pat. No. 3,881,242. This application Jan. 22, 1975, Ser. No. 543,181

Int. Cl.^{2} H01L *23/48*

U.S. Cl. 357—71 **4 Claims**



1. A semiconductor device comprising a passivating layer of silicon oxide on at least one surface of a monocrystalline silicon semiconductor body and an ohmic contact extending both to a part of said surface of the semiconductor body exposed through an aperture in the passivating layer and on portions of the passivating layer adjacent to the aperture, including a first polycrystalline silicon layer on the passivating layer and extending within the aperture in the passivating layer, a layer of a metal selected from the group consisting of tungsten and molybdenum on the first polycrystalline layer, and a second polycrystalline silicon layer on the metal layer, at least one of the polycrystalline layers including a finite resistance, the thickness of said at least one layer being in the range 200 A to 500 A such that the resistance is obtained by an impurity concentration in the layer to provide for the satisfactory operation of the semiconductor device, and the ohmic contact further including on said second polycrystalline silicon layer a further metal layer selected from the group consisting of gold and aluminum to facilitate making electrical connection to the ohmic contact.

4,106,052
SEMICONDUCTOR RECTIFIER UNIT HAVING A BASE PLATE WITH MEANS FOR MAINTAINING INSULATING WAFERS IN A DESIRED POSITION

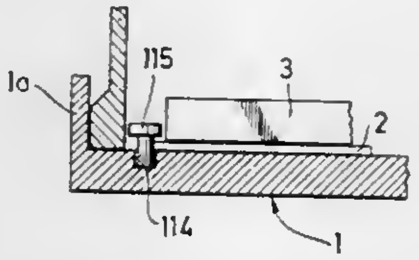
Winfried Schierz, Roth, Fed. Rep. of Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nuremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 677,851, Apr. 16, 1976, Pat. No. 4,047,197. This application Sep. 1, 1977, Ser. No. 829,911

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1975, 7512573

Int. Cl.^{2} H01L *23/28, 23/02, 23/12*

U.S. Cl. 357—72 **14 Claims**



1. In a semiconductor rectifier unit comprising: a metal base plate; a pair of spaced electrical contact plates each fastened to a surface of said base plate via a wafer of electrically insulating, thermally conductive material; a pair of semiconductor rectifier devices, each having at least one pn junction and a connecting contact on each of its two opposite major surfaces, each of said semiconductor devices being mounted on and having one of its said connecting contacts electrically connected to a respective one of said electrical contact plates; conductive means for electrically connecting one connecting contact of one of said semiconductor rectifier devices to one connecting contact of the other of said semiconductor rectifier devices to connect said semiconductor devices in a series circuit; first, second and third current conducting terminals connected to the input of said series circuit, to the output of said series circuit, and to said conductive means, respectively, said first, second and third current conducting terminals being arranged in a row with each of the two outer current conducting terminals of said row being electrically conductively connected to a respective one of said electrical contact plates; and a housing for said series circuit, including its connecting parts, formed by a hollow plastic member and said base plate; the improvement wherein: said base plate is trough-shaped, has a planar outer bottom surface, has a laterally extending flange on the side walls thereof, and is formed of a material which permits a permanently firm connection with components made of copper used to produce said series circuit as well as with components made of aluminum used to cool the unit;

means are provided on the bottom inner surface of said base plate, on which said series circuit is mounted, for maintaining said wafer of insulating material in a desired position on said base plate during production of said unit; and

the edge portion of said plastic housing member which is adjacent said base plate is provided with a shaped region which matingly engages said flange to firmly connect said plastic housing member to said base plate.

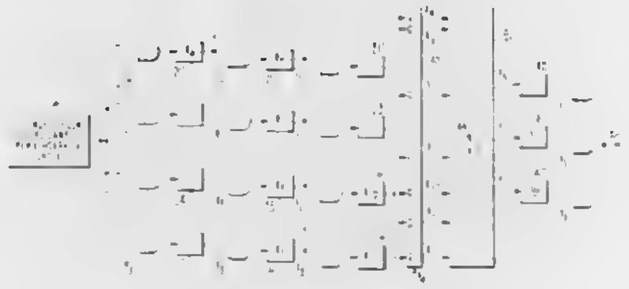
4,106,053
DIGITAL SAMPLING RATE CONVERSION OF COLOR TV SIGNAL

Nicholas Frank Maxemchuk, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,933

Int. Cl.^{2} H04N *9/32*

U.S. Cl. 358—13 **5 Claims**



1. A converter to translate a color television video signal consisting of four digital samples during each cycle of the color subcarrier to a corresponding signal consisting of three digital samples during each cycle of the color subcarrier, comprising

a plurality of input registers connected to receive a respective plurality of successive digital samples,

three output registers for three output digital samples per cycle of the color subcarrier,

means to couple the contents of one of said input registers to one of said three output registers,

means to weight and combine the contents of predetermined ones of said input registers and couple the result to a second one of said three output registers,

means to weight and combine the contents of predetermined ones of said input register and couple the result to a third one of said three output registers, and

means to couple the contents of said three output registers in sequence at the cycle rate to an output channel.

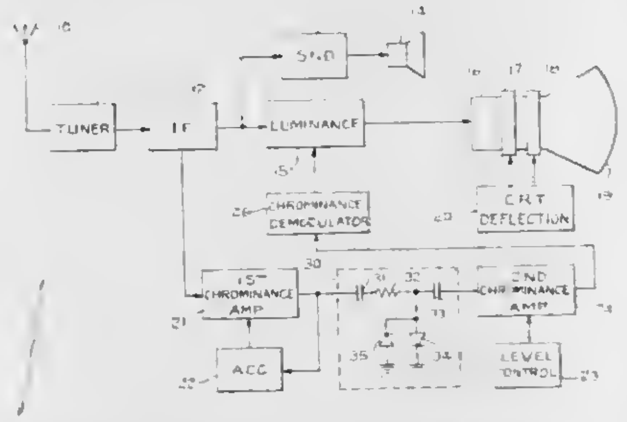
4,106,054
AUTOMATIC CHROMA LEVEL SYSTEM

George J. Tzakis, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 19, 1977, Ser. No. 760,777

Int. Cl.^{2} H04N *9/535*

U.S. Cl. 358—27 **8 Claims**



1. In a color television receiver having a luminance channel for processing luminance information; a chrominance channel for processing an amplitude and phase modulated chrominance signal; and display means, including a viewing screen, for forming a picture image the color saturation of which for any given luminance level is determined by the amplitude of said chrominance signal; the improvement comprising:

amplitude limiting means within said chrominance channel, operative upon said chrominance signal and having a non-linear gain characteristic which decreases with increased chrominance signal amplitude and producing progressively smaller increases in color saturation of said image in response to corresponding chrominance signal amplitude increases, said amplitude limiting means including:

threshold means having a pair of semiconductor junctions attenuating opposite sense excursions of said chrominance signals to provide symmetrical limiting thereof and causing said amplitude limiting means to exhibit said non-linear gain characteristic solely for chrominance signals having amplitudes in excess of a predetermined threshold level.

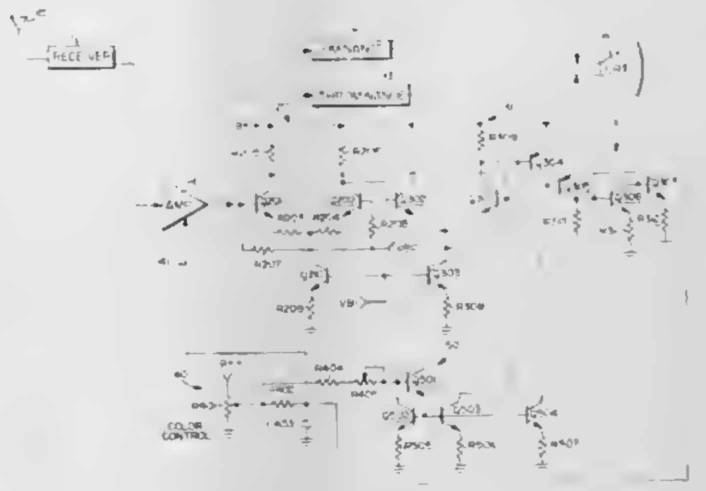
4,106,055
AUTOMATIC COLOR LEVEL CONTROL SYSTEM WITH THRESHOLD TRACKING

Kenneth John Burdick, Wyoming; Douglas William Constable, Batavia, and Robert Charles Wheeler, Elba, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 813,086

Int. Cl.^{2} H04N *9/537*

U.S. Cl. 358—27 **14 Claims**



1. In a color television receiver, an automatic color level control system comprising:

a DC-controlled amplifier having chrominance information for an input and an output coupled to the receiver's chrominance channel, said amplifier having a gain determined by the control voltage present at a control terminal;

a detecting means responsive to the output signals of said DC-controlled amplifier having an amplitude greater than a predetermined threshold level; and

a summing network comprising a variable control resistor and a discharge capacitor, said summing network providing said control voltage to the control terminal of said DC-controlled amplifier in proportion to the voltage on the wiper arm of said variable control resistor and the output of said detecting means, and

a control tracking means having an input connected to said summing network and a first output coupled to said detecting means so that said pre-determined threshold level varies in accordance with said control voltage.

4,106,056
SOLID STATE CCD CAMERAS HAVING PHASE ADJUSTMENT OF LUMINANCE AND CHROMINANCE COMPONENTS

Fumio Nagumo, Yokohama, and Seisuke Yamanaka, Mitaka, both of Japan, assignors to Sony Corporation, Japan

Filed May 24, 1977, Ser. No. 800,013

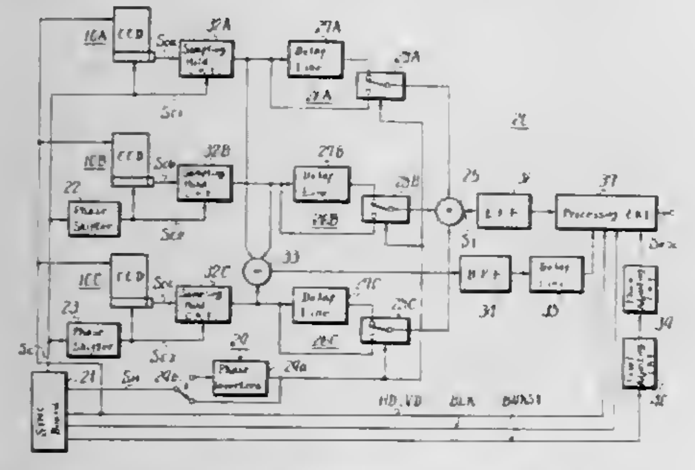
Claims priority, application Japan, May 28, 1976, 51-62081

Int. Cl.^{2} H04N *9/09, 9/07*

U.S. Cl. 358—50 **10 Claims**

1. A solid state color camera of a type in which a composite color video signal of the NTSC System is obtained without using a specific color encoder, comprising:

(A) Solid state image sensing means having a plurality of image sensing cells aligned in both vertical and horizontal directions for converting a light information of an object into an electric signal information in association with said image sensing cells;
(B) Color filter means disposed in a light path of said light information of the object for modifying said electric signal information in accordance with color components included in said light information;
(C) Read out register means adapted to receive said electric signal information of one horizontal scanning period line by line from said solid state image sensing means and to supply an output video signal in a serial form;
(D) Means for separating a luminance signal component and chrominance signal component out of said output video signal from said read-out register means;

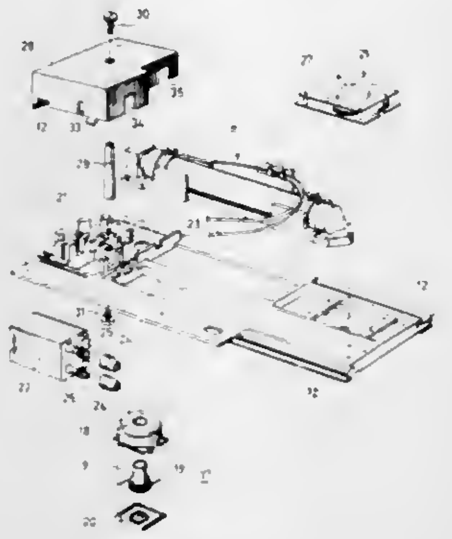


(E) Means for adding said separated luminance signal components and chrominance signal components;
(F) Means for deriving at a system output a composite color video signal acceptable in the NTSC color system;
(G) Means for supplying vertical and horizontal scanning signals to said solid state image sensing means;
(H) Means for supplying read-out pulses to said read-out register means, a frequency of said read out pulses being selected to $M/N \times f_S$, where N and M are both integers and f_S is a frequency of subcarrier of the NTSC color system; and
(I) Means for adjusting phase conditions of said luminance signal components at said system output so that they become equal to said alignment states of said image sensing cells of said solid state image sensing means.

4,106,057
DUST PROOF OPTICAL SYSTEM FOR OPTICALLY READING AND WRITING ON A ROTATING RECORD WITH THE AID OF A RADIATION BEAM

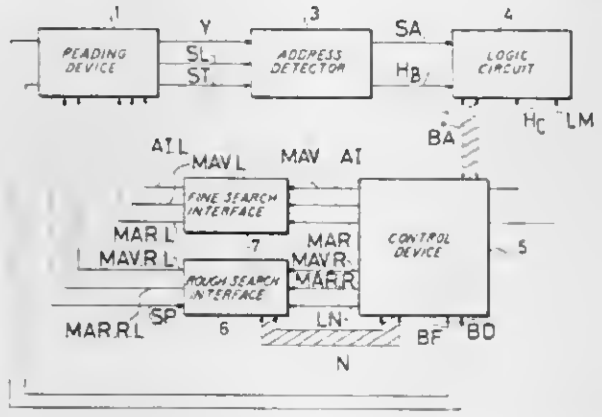
Petrus Adrianus Wilhelmus Van Vroenhoven, Indhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 18, 1976, Ser. No. 715,310
Claims priority, application Netherlands, May 20, 1976, 7605374
Int. Cl.^{2} H04N *5/76;* G11B *7/12*
U.S. Cl. 358—128 **3 Claims**

1. An improved apparatus for optically reading a rotating record with the aid of a radiaton beam, comprising:
a housing,
a rotating record spindle,
a radiation source for producing at an end thereof the radiation beam,
a number of optical elements which include a movable objective which with a part which faces the outside of the housing is movably mounted in a slot in a wall of the housing and which serves for focussing the radiation beam at a record to be read,
a number of electrical means which co-operate with the optical means, including at least one radiation-sensitive electronic component for converting a radiation beam modulation into an electrical modulation, and at least one control coil for controlling controllably movable optical elements such as the objective, and
a carriage which is movable inside the housing, transversely to the rotatable record spindle, on which carriage the said optical and electronic elements are mounted, the improvement wherein a part of the objective facing the interior of the housing and all other of said optical elements are jointly accommodated in an enclosure which is secured to the carriage and which provides protection against dust which is present in the interior of the housing, and wherein the end of the radiation source from which the radiation is emitted is sealed within the enclosure.



4,106,058
DATA DISC OPTICAL READER CONTAINING A DEVICE FOR AUTOMATIC DATA ACCESS

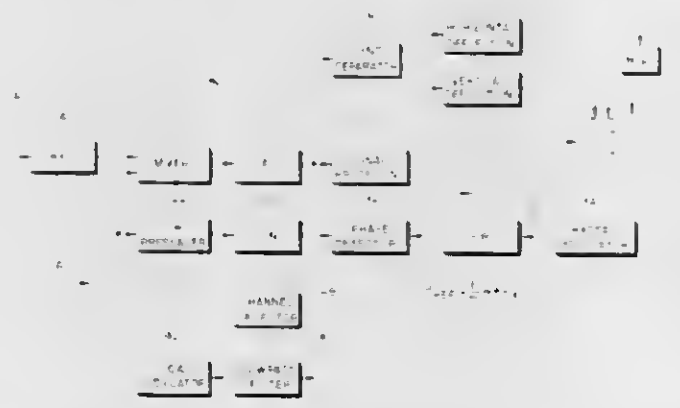
René Romeas, and Michel Thomas, both of Paris, France, assignors to Thomson-Brandt, Paris, France
Filed Apr. 19, 1977, Ser. No. 788,923
Claims priority, application France, Apr. 23, 1976, 76 12067
Int. Cl.^{2} G11B *7/12;* H04N *5/76;* G11B *19/14, 21/08*
U.S. Cl. 358—128 **21 Claims**



1. An optical reader for data carrier disc, said data being recorded along a track formed of concentric grooves, said track containing a succession of alternate elements optically detectable, adresses for said grooves formed by coded numbers being recorded at the same time as said data on each corresponding groove, said optical reader comprising a radiating source, a reading head intended to receive the radiation and to focus it on said track, a rotating device causing said disc to rotate, a detecting device for detecting the radiation coming from said track and supplying an electrical signal, a demodulation device, for demodulation said electrical signal, having an output delivering a demodulated signal and a device for automatic access to the data recorded on said disc, said automatic access device comprising an address detection device intended to supply a detected address formed by a coded number, a rough search device to position said reading head from an initial groove to a predetermined distance from the track groove required, said required groove being identified by the recording of its address a_x in a memory logic circuit, and a fine search device intended to make the said recorded address a_x and the detected coincide.

4,106,059
PHASE LOCKED LOOP TELEVISION TUNING SYSTEM

John Goodchilde Norie Henderson, and Charles Martin Wine, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 718,455, Aug. 30, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 779,126
Int. Cl.^{2} H04N *5/44*
U.S. Cl. 358—191 **12 Claims**

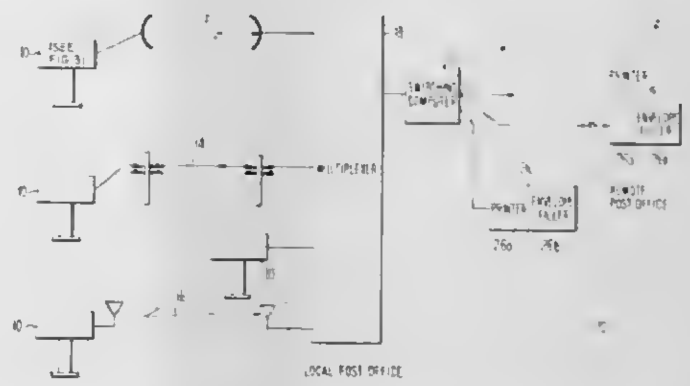


1. A tuning system for a television receiver including an image reproducing means and means for scanning said image reproducing means along lines in a predetermined direction at a first rate H, a predetermined number L of said lines being scanned to form a field, two sequential fields being scanned at a second rate V/2, comprising:
controlled oscillator means for generating a local oscillator signal for tuning said television receiver to a selected channel in response to the amplitude of a control signal;
means for generating a reference frequency signal; and
means coupled to said reference frequency generating means and coupled to said controlled oscillator means for generating said control signal, said control signal representing the phase and frequency relationship between said local oscillator signal and said reference frequency signal, said control signal having amplitude components occurring at said reference frequency;
said reference frequency signal having a frequency related to said scanning rates in a predetermined manner so that visible effects of video components generated in response to said amplitude modulated components of said control signal are substantially cancelled on a field to field basis as said image reproducing means is scanned;
said frequency of said reference frequency signal being less than or equal to the highest frequency said means for generating said control signal is capable of processing.

4,106,060
ELECTRONIC MAIL BOX

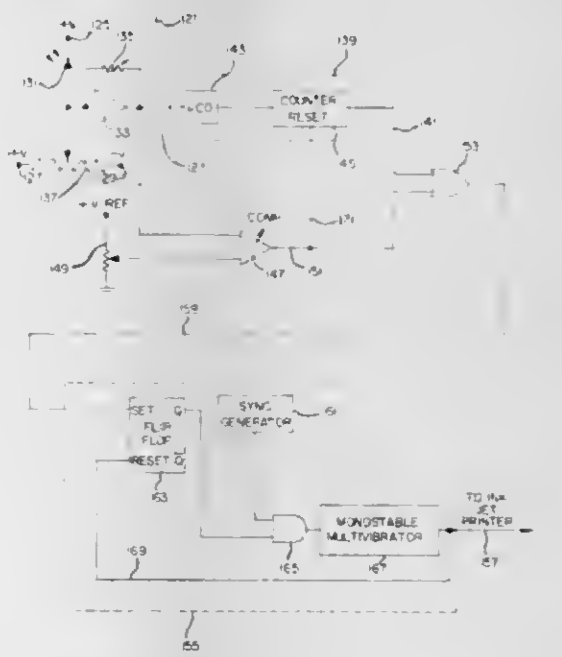
Herbert Hill Chapman, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 15, 1975, Ser. No. 641,137
Int. Cl.^{2} H04B *1/50*
U.S. Cl. 358—256 **6 Claims**

1. Apparatus for electronically mailing a document comprising in combination:
means for receiving said document containing information in printed form to be transmitted to a remote point;
means for reading said information and converting it to electronic signals;
keyboard means permitting entry by an operator of the address to which said information is to be transmitted, said address being manifested as electronic address signals;
storage means receptive of said information electronic signals and said electronic address signals for storing the same;
means coupled to said storage means and responsive to said signals stored therein for transmitting to said remote point, determined by said electronic address signals corresponding to an address entered into said keyboard, said electronic address signals and said information electronic signals;
wherein said address includes postal zip code, city and state of the addressee, and wherein said apparatus for electronically mailing a document further includes means for verifying that said city and state correspond to said zip code and means for prohibiting said transmission to said remote point in the absence of said correspondence and further including means for notifying said operator of at least one of the lack or presence of said correspondence; and
means for producing a signal indicative of the determination that said electronic address signals and said information electronic signals are stored in said storage means and wherein said transmitting means includes means for permitting said transmission only when said determination indicating signal has been produced.



4,106,061
DENSITY CONTROL FOR INK JET COPIER

James E. Burnett, Xenia, Ohio, assignor to The Mead Corporatinn, Dayton, Ohio
Filed Mar. 3, 1977, Ser. No. 774,154
Int. Cl.^{2} H04N *1/22, 1/40*
U.S. Cl. 358—296 **11 Claims**



1. An optical encoding device for measuring the tone of a

master along a scan line and for producing an image signal pulse train, the frequency of the pulses in the pulse train being directly related to the tone of the master along the scan line, comprising:
- photosensitive means providing a signal level at its output which is dependent upon the light which strikes it,
- means for illuminating the master,
- optical means for scanning the master along the scan line and directing light reflected from successive portions along the scan line to said photosensitive means,
- variable oscillator means, responsive to the output of said photosensitive means, for providing an output signal of a frequency which is dependent on the output of said photosensitive means,
- overflow counter means, responsive to the output signal of said variable oscillator means, for repetitively counting the oscillations of the output signal of said variable oscillator means and for providing a first enabling signal each time a predetermined number of oscillations are counted,
- level detector means, responsive to the output from said photosensitive means, for providing a second enabling signal when the output from said photosensitive means exceeds a predetermined signal level, and
- gate means, responsive to the output of said counter means and said level detector means, for providing an image signal upon receipt of either of said first and second enabling signals.

4,106,062

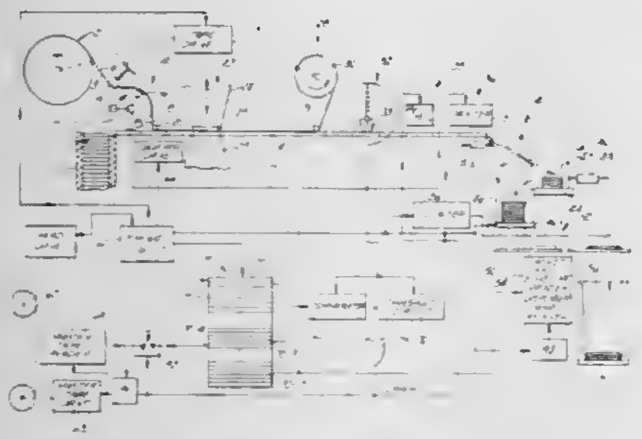
APPARATUS FOR PRODUCING MAGNETICALLY ENCODED ARTICLES

Francis C. Foote, Huntsburg, Ohio, assignor to Addressograph Multigraph Corp., Cleveland, Ohio

Filed May 12, 1976, Ser. No. 685,923

Int. Cl.² G11B *5/86, 25/04, 15/20*

U.S. Cl. 360—15 **13 Claims**



1. A system for producing articles bearing magnetic data, said system comprising:
- an elongated web comprising a carrier element with magnetic material thereon,
- means for advancing said web from a supply station, along a path past a recording station and a transfer station, to a take-up station, said recording station being located between said supply station and said transfer station,
- means for recording magnetic data on selected segments of said web at said recording station,
- means for transporting each of said articles past said transfer station,
- means for transferring said magnetic material with data recorded thereon from a said segment of said web to a corresponding article at said transfer station, and
- control means including means for timing operation of said web advance means with operation of said transport means whereby each said segment is brought into general alignment with a corresponding one of said articles at said transfer station to allow transfer of said magnetic material thereto.

4,106,063

CIRCUIT ARRANGEMENT FOR A DROPOUT DETECTOR

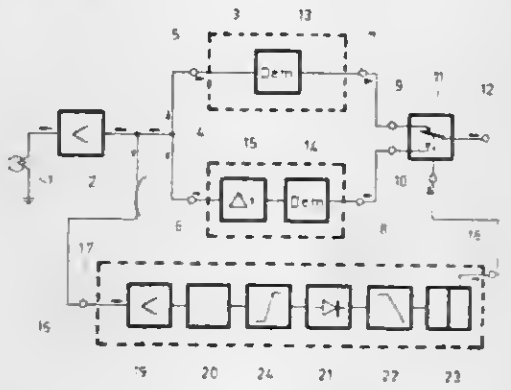
Robert Lackner; Harald Melwisch, and Helfried Kurzmann, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,250

Claims priority, application Austria, Jul. 10, 1975, 5346/75

Int. Cl.² H04N *5/78*

U.S. Cl. 360—38 **6 Claims**



1. A circuit arrangement for detecting dropouts in the reproduction of signals which are recorded on a record carrier, comprising a threshold device means switchable from a first stable state to a second stable state in response to an input signal exceeding a first predetermined signal level and switchable to a second stable state in response to a signal falling below a second predetermined signal level for providing a different output signal in each of said stable states, and an amplitude discriminator means connected to an input of said threshold device means and receiving said reproduced recorded signals for amplifying said reproduced recorded signals in a signal range between said first and second predetermined signal levels to a much greater extent that said reproduced recorded signals outside said signal range.

4,106,064

CASSETTE-TYPE RECORDING AND/OR REPRODUCING APPARATUS WITH INADVERTENT ERASE PREVENTING DEVICE

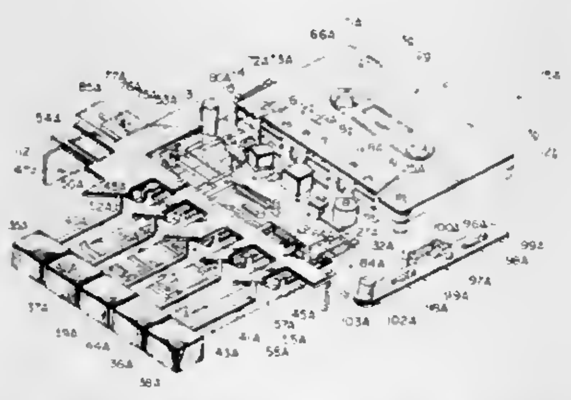
Mutsuo Hoshido, Kashiwa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,169

Claims priority, application Japan, Dec. 25, 1975, 50-174372[U]

Int. Cl.² G11B *15/04, 21/20*

U.S. Cl. 360—60 **22 Claims**



1. An apparatus for recording and/or reproducing signals on a magnetic tape contained in a tape cassette having at least one aperture which is alternatively obstructed or unobstructed to respectively indicate that signals may be recorded on the tape contained on such cassette or that the contained tape already has signals recorded thereon which are not to be erased: said apparatus comprising
- cassette holding means for supporting a tape cassette in an operative position;
- mechanical detecting means engageable with a tape cassette in said operative position at said aperture of the cassette and having first and second states in dependence on whether the aperture is obstructed or unobstructed, respectively;
- a record push-button actuable from a rest position to an operative position to mechanically establish the recording mode of said apparatus, said record push-button being actuable to said operative position thereof with said mechanical detecting means in each of said first and second states thereof;
- mechanical change-over means mechanically associated with said record push-button and said mechanical detecting means for changing-over said apparatus to a recording mode of operation thereof upon actuation of said record push-button to its operative position with said detecting means in said first state thereof; and
- mechanical means for preventing said changing-over of the apparatus to said recording mode of operation when said record push-button is actuated to its operative position with said detecting means in said second state of the latter.

4,106,065

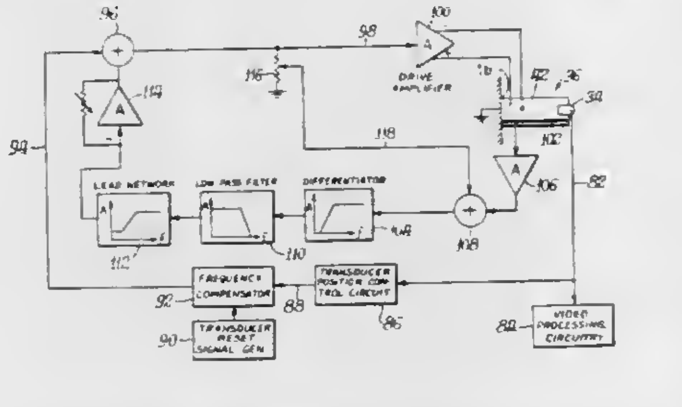
DRIVE CIRCUITRY FOR CONTROLLING MOVABLE VIDEO HEAD

Raymond Francis Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 668,581, Mar. 19, 1976, abandoned. This application Apr. 16, 1976, Ser. No. 677,828

Int. Cl.² G11B *5/52, 21/10, 21/18*

U.S. Cl. 360—109 **17 Claims**



1. A piezoelectric bimorph and driver therefor, comprising:
- a bimorph having a pair of electrically poled piezo-ceramic elements bonded to a common substrate between said elements and aligned in a common poling direction, the bonded pair of elements having a cantilevered end portion and an opposite end portion which is free to deflect; and,
- means for applying to each piezo-ceramic element a deflection voltage having a polarity which is in the poling direction of the piezo-ceramic element to which it is applied, whereby a large degree of deflection of the bimorph in either direction can be effected without depolarizing either piezo-ceramic element.

4,106,066

MAGNETIC DISC CARTRIDGE

Ryosuke Kudo, Yokohama, Japan, assignor to Fujitsu Limited, Japan

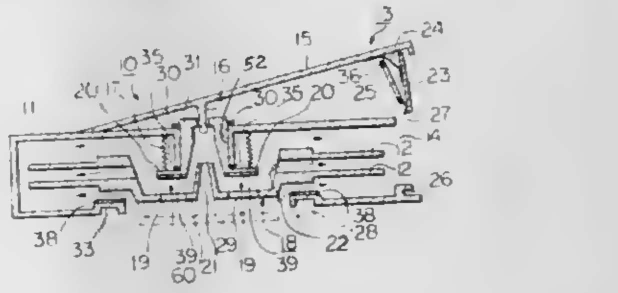
Filed Dec. 15, 1976, Ser. No. 750,821

Claims priority, application Japan, Dec. 22, 1975, 50-151916

Int. Cl.² G11B *23/02*

U.S. Cl. 360—133 **11 Claims**

1. A magnetic disc cartridge of the type having
- a support disc which carries at least one magnetic disc on its circumference, has a center mortise which fits with a rotatable spindle of a magnetic disc driving unit, and has a hub containing at least one hole through which circulating clean air can flow;
- a magnetic disc housing case having an opening in its side wall through which at least a magnetic head enters;
- a closure mechanism comprising a top member which is resiliently secured to said case at one end of the member and has a closure member at the other end thereof for covering said opening of said case, said closure member including means cooperating with said magnetic disc drive unit for lifting said top member from a closed to an open position when said cartridge is set into said driving unit and for restoring said top member to its closed position when said cartridge is out of said driving unit; and
- a holding mechanism which holds said support disc down on a base member of said housing case when said closure mechanism closes, wherein the improvement comprises:
- a cover for said at least one hole in said hub; and
- means operationally connected to said top member of said closure mechanism for lifting said cover to open said at least one hole when said cartridge is set into said driving unit and depressing said cover to close said at least one hole when said cartridge is out of said driving unit.



4,106,067

MAGNETIC HEAD CLEANING JACKET

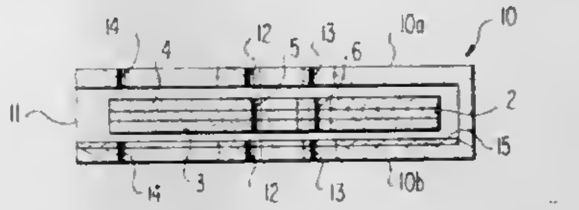
Kenichi Masuyama; Tsutomu Sugisaki; Tatsuji Kitamoto, and Yasuyuki Yamada, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 17, 1976, Ser. No. 724,430

Claims priority, application Japan, Sep. 19, 1975, 50-128741[U]

Int. Cl.² G11B *5/00, 5/10, 23/02*

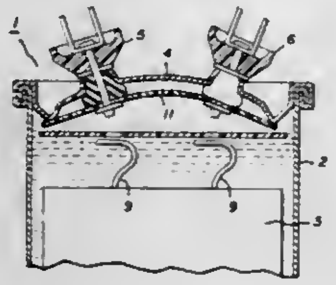
U.S. Cl. 360—137 **5 Claims**



1. A cleaning jacket for a magnetic head used for a flexible disc comprising a cleaning sheet and a sheet retaining jacket, wherein the cleaning sheet comprises a flexible and non-magnetizable support, on at least one surface of which is provided an antistatic layer and on the other surface of which is provided a cleaning layer of a fibrous material, said antistatic layer comprising carbon black or graphite dispersed in a binder and said cleaning layer being made of non-woven fabric, the retaining jacket having the shape of a flat casing and defining a space in which the cleaning sheet can be kept in such a manner that it can rotate freely therein, said retaining jacket further having a lubricating layer provided on the inner wall thereof facing the antistatic layer of the cleaning sheet, said lubricating layer being made of non-woven fabric in which silicone oil or silicone resin is impregnated.

4,106,068
PRESSURE SENSITIVE INTERRUPTER

Robert J. Flanagan, Hudson Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.
Filed Jan. 27, 1977, Ser. No. 763,091
Int. Cl.^{2} H02H *7/16*
U.S. Cl. 361—15 **5 Claims**

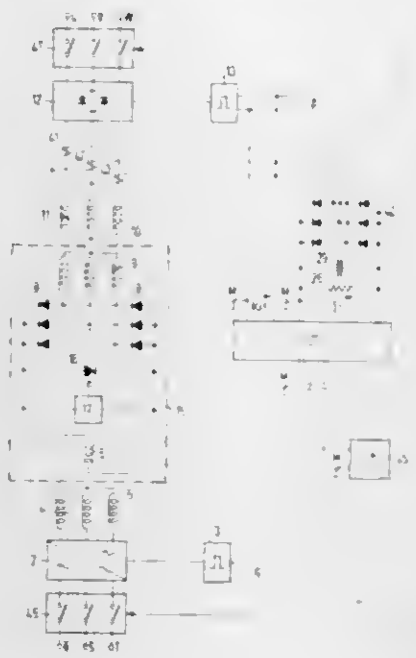


1. An electrical capacitor comprising in combination,
a. a capacitor can having a capacitor section sealed therein,
b. a cover member sealingly attached to said can to seal said capacitor section therein in liquid tight relationship,
c. a pair of terminal means in said cover and extending there through, said terminal means being spaced equidistantly on opposite sides of the center of said cover,
d. an electrical tab member for each of said terminals for connection of said tabs to said capacitor section,
e. a predeterminedly flexible insulating strip bridge member adjacent the underside of said cover,
f. a pair of fulcrum members adjacent the outer extremity of said cover member and restraining said bridge member from upward movement,
g. said bridge member extending across said fulcrum members and having a pair of apertures therethrough in alignment with the terminal means,
h. a stud member in said terminal members extending through said apertures,
i. a pair of tab members electrically connected to said capacitor section and extending up to said bridge member at said apertures,
j. each said tab being formed to prevent axial movement thereof through its said aperture,
k. a welded electrical shear connection joining said tab members to said stud members below said bridge member,
l. said bridge member being characterised by having significant transverse flexibility between said fulcrums so that when said cover member bulges due to increased pressure in said casing, the resulting movement of said terminals and their connection to said tabs flexes the bridge member in the direction of the bulging of the cover until a predetermined stress is encountered in said shear connections and such connections are broken and the bridge member returns to its unflexed condition.

4,106,069
PROTECTION ARRANGEMENT FOR A BRUSHLESS SYNCHRONOUS MACHINE

Jürgen Trautner, Erlangen, and Peter Kolbe, Nüremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed May 11, 1977, Ser. No. 795,875
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622309
Int. Cl.^{2} H02H *7/08*
U.S. Cl. 361—30 **12 Claims**

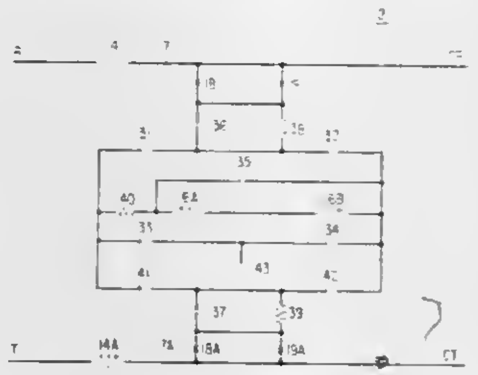
1. In a protection arrangement for protecting a brushless synchronous machine against overvoltages at a field winding which is connected to a rotating excitation rectifier fed from an exciter machine which includes a solid state switching element for short circuiting the field winding if overvoltages occur, the improvement comprising:
a. means for forming a first input voltage proportional, by a first proportionality constant, to the primary voltage of the exciter machine;
b. means for forming a second input voltage proportional, by a second proportionality constant, to the primary current of the exciter machine, the two proportionality constants being chosen so that the absolute value of the second input voltage in normal operation of the synchronous machine is lower and, if the field winding is short circuited, is higher than the first input voltage; and



c. voltage comparison means having said first and second voltages as input and providing at its output an indicating signal.

4,106,070
HAZARDOUS VOLTAGE PROTECTOR FOR TELEPHONE LINE

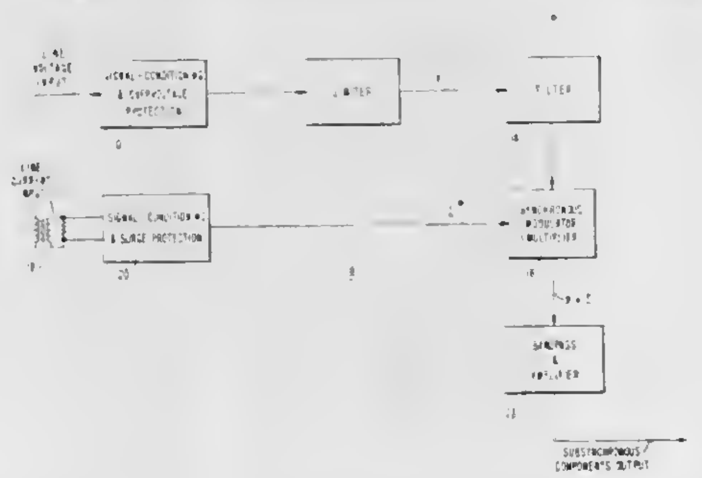
Alan Mayer Gordon, Matawan Borough; Edward Francis Mazurek, Spotswood, and Arden Bernard Wright, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Feb. 1, 1977, Ser. No. 764,594
Int. Cl.^{2} H02H *3/28*
U.S. Cl. 361—42 **5 Claims**



1. A high voltage protector circuit for providing an interface between terminal equipment having tip and ring leads and a telephone line including tip and ring conductors connected to a central office, the circuit comprising:
tip and ring paths for connecting the tip and ring leads of the terminal equipment to the tip and ring conductors of the telephone line;
means for detecting a current imbalance in the tip and ring paths; and
means responsive to the detecting means for disconnecting the terminal equipment from the telephone line and for restoring the connection only upon removal of the current imbalance, the disconnecting and restoring means including
a first relay comprising a coil having one end for connection to ground, make contacts connecting the other end of the coil to the tip and ring paths, and break contacts in the tip and ring paths on the central office side of the make contacts, and
means in the circuit from the tip and ring paths to the coil for blocking the flow of current from one path to the other.

4,106,071
APPARATUS FOR PROTECTION AGAINST SUBSYNCHRONOUS CURRENTS IN A POWER SYSTEM

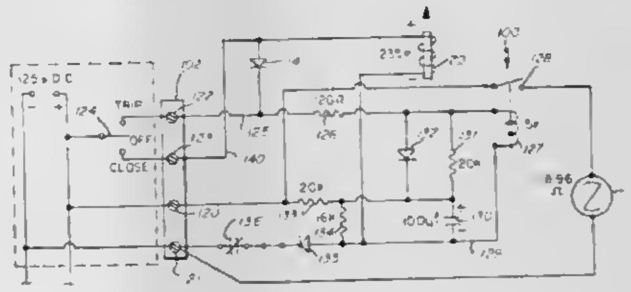
Shan C. Sun, Bell Township, Alleghany County, and Larry L. Church, Washington Township, Washington County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 6, 1977, Ser. No. 757,178
Int. Cl.^{2} H02H *3/38*
U.S. Cl. 361—79 **12 Claims**



1. Apparatus for monitoring a power system for subsynchronous current oscillations having a predetermined frequency range of interest over a predetermined period of evaluation, said apparatus comprising:
first circuit means operably coupled to the power system for developing a signal representative of the subsynchronous current therein;
second circuit means operably coupled to said first circuit means for performing a full wave rectification of the subsynchronous current signal;
third circuit means operably coupled to said second circuit means for receiving said rectified signal and for detecting each pulse therein, said third circuit means being adapted to hold a predetermined pulse and to recognize and hold only those subsequent pulses which are greater in value than the held pulse by at least a predetermined magnitude, and for holding the value of each such recognized pulse at its output, said third circuit means being further adapted to be reset upon receipt of an appropriate resetting signal to discharge said held pulse and begin the detection of new pulses;
first comparator circuit means operably coupled to said third circuit means, including a first voltage reference threshold, for generating a first output signal whenever the value of said held pulse at the start of the period of evaluation reaches a predetermined level with respect to said first threshold;
fourth circuit means operably coupled to said third circuit means and said first comparator circuit means for comparing the value of said held pulse with a subsequent pulse, and for generating a pulse recognition signal whenever the magnitude of the subsequent pulse reaches a predetermined level with respect to the held pulse and a first signal is received from said first comparator circuit means;
second comparator circuit means operably coupled to said third circuit means, including a second voltage reference threshold, for generating a second output signal whenever the instantaneous value of said held pulse reaches a predetermined level with respect to said second threshold;
third comparator circuit means operably coupled to said third circuit means, including a third voltage reference threshold, for generating a third output signal whenever the value of said held pulse at the finish of the period of evaluation reaches a predetermined level with respect to said third threshold;
first timing circuit means operably coupled to said third and fourth circuit means to receive said pulse recognition signal and having a first timing period corresponding to the frequency at the low end of the subsynchronous frequency range of interest for generating a first resetting signal for said third circuit means whenever two successive recognizable pulses are separated in time of occurrence by a period less than said first timing period and for inhibiting generation of said first resetting signal whenever two successive recognizable pulses are separated in time of occurrence by a period greater than said first timing period;
second timing circuit means operably coupled to said third and fourth circuit means to receive said pulse recognition signal and having a second timing period corresponding to the frequency at the high end of the subsynchronous frequency range of interest for generating a second resetting signal for said third circuit means whenever two successive recognizable pulses are separated in time of occurrence by a period greater than said second timing period and for inhibiting generation of said second resetting signal whenever two successive recognizable pulses are separated in time of ocurrence by a period less than said second timing period;
third timing circuit means operably coupled to said first and second timing circuit means and having a third timing period equal to the predetermined period of evaluation for generating a fourth output signal whenever two successive recognizable pulses are separated in time of occurrence by a period greater than said first timing period and less than said second timing period at the conclusion of said third timing period; and
logic circuit means operably coupled to said first, second, and third comparator circuit means and said third timing circuit means for generating an output signal whenever said first, second, third and fourth output signals reach a predetermined logical relationship.

4,106,072
CONTROL SWITCH RELAY AND CONTROL CIRCUIT MEANS

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corp., Weymouth, Mass.
Division of Ser. No. 591,170, Jun. 27, 1975, Pat. No. 4,001,740.
This application Oct. 4, 1976, Ser. No. 729,114
Int. Cl.^{2} H01H *47/22*
U.S. Cl. 361—156 **7 Claims**



1. A control circuit means for providing rapid actuation and slow release of a rotary solenoid,
said control circuit comprising,
a first circuit means for charging a capacitor while actuating a relay to actuate said rotary solenoid,

second circuit means for causing slow discharge of said capacitor to maintain said relay over a slow release period,

a second output means connected to said control circuit in parallel with said first means for charging said capacitor through a unilateral conduction device,

and switch means for selectively passing different levels of current to said second output means or directly to said capacitor.

4,106,073

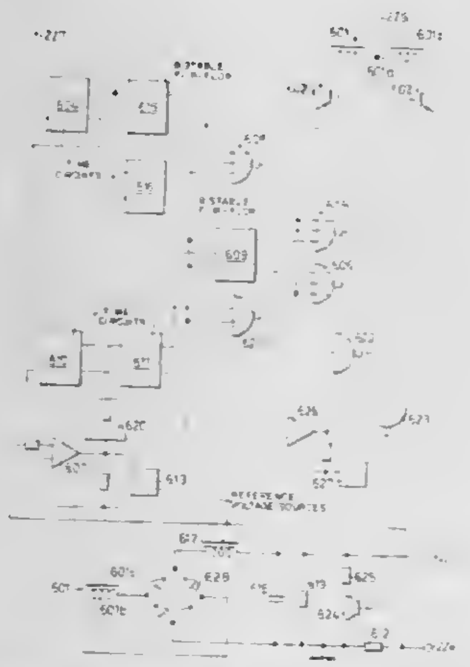
APPARATUS FOR IGNITING THE MATCH HEADS OF ELECTRIC DETONATORS

John Bengt Göran Hedberg, Fregattgatan 13, Västra Frölunda, Sweden

Continuation of Ser. No. 409,242, Oct. 24, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,154

Int. Cl.² F42B *3/10*

U.S. Cl. 361—248 **5 Claims**



1. An apparatus for igniting the match heads of a plurality of series-connected electric detonators, comprising a dischargeable electric energy source electrically connected to the ends of the series of detonators and supplying the requisite amount of energy for simultaneous firing of the maximum number of detonators for which said apparatus is dimensioned during the period of discharge of said energy source, means electrically connected to said source and said detonators for regulating the current through the detonator match heads during the energy source discharge period so as to retain a substantially constant pre-determined current value irrespective of the number of detonators served by said apparatus, and means for initiating the discharge of said source, said current regulation means including means for interrupting the passage of current through the detonator match head before discharging the energy source to an extent sufficient to fire any of the detonators, should the energy stored in the energy source be insufficient for firing of all detonators connected to said source.

4,106,074

TRIGGERING HEAD FOR DEVICES CONTROLLED BY AN ELECTRIC POWER INPUT

Robert H. Conne, Geneva, Switzerland, assignor to Brevetor S.A., Vaduz, Switzerland

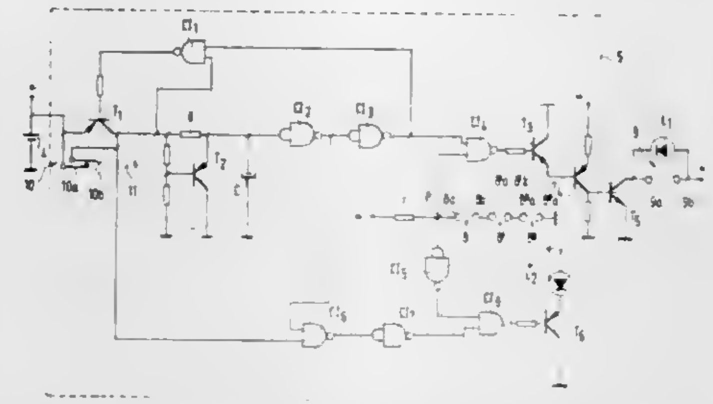
Filed Mar. 23, 1976, Ser. No. 669,472

Claims priority, application Switzerland, Oct. 23, 1975, 13729/75

Int. Cl.² F42B *3/10*

U.S. Cl. 361—248 **12 Claims**

1. A triggering head for devices of the type operated by an electric power input comprising a case separate from the device to be operated containing at least one electric battery, a control circuit fed by the or each battery, and an electronic switching device connected to the control circuit for delivering the electric energy of the or each battery to a device to be triggered, the control circuit comprising an externally actuated starting switch and at least one double-pole input, the potential difference appearing across the end poles of which determines the state of the electronic switching device through the control circuit when the starting switch has been actuated, and wherein the case comprises an output plug for at least electrically connecting the triggering head to the device to be triggered, and the control circuit comprises a logic triggering circuit having a plurality of interconnected logic gates with stable switching levels and two inputs controlled respectively by the state of the starting switch and the potential difference across said end poles of the input, said interconnected logic gates exhibiting a high input impedance to the input poles, said triggering head including a delay circuit connected between said starting switch and the corresponding input of said triggering logic circuit, a control light, and first and second control logic circuits, the control light being controlled by means of said first control logic circuit, said first control logic circuit having two inputs controlled respectively by the potential difference across said end poles of the input and the state of the second control logic circuit, said second logic circuit having two inputs respectively controlled by the state of the starting switch and the state of the delay circuit.



4,106,075

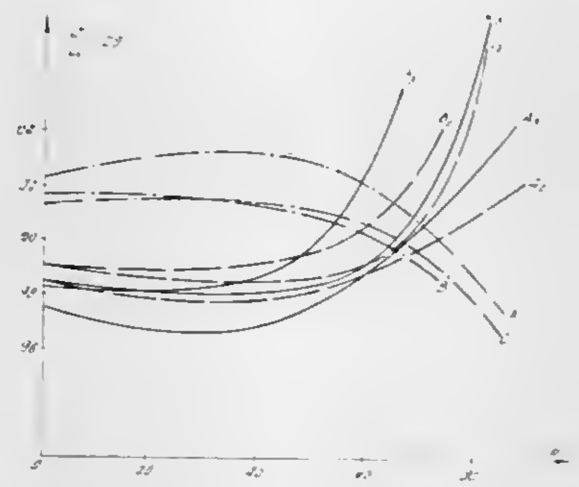
CERAMIC CAPACITOR

Georg Baumann, Selb, and Helmut Hoffmann, Thiersheim, both of Germany, assignors to Draloric Electronic GmbH, Germany

Filed Mar. 17, 1976, Ser. No. 667,612

Int. Cl.² H01G *4/12*

U.S. Cl. 361—320 **11 Claims**



1. A densely sintered ceramic dielectric with a loss factor of less than or equal to 10^{-3} and a substantially linear temperature dependence of the capacitance based on at least one member of the group consisting of TiO_2, ZrO_2, and the compounds of (a) TiO_2, ZrO_2, SnO_2, Nb_2O_5 or Ta_2O_5, with (b) oxides of the alkali, alkaline earths or rare earths, characterized in that the chemical composition is between 50 and 97% by weight of a ceramic base material having a substantially linear temperature dependence of the dielectric constant and between 50 and 3% of at least one (y_iB_i,z_iM_i) wherein the coefficients y_i and z_i represent integers of 1 to 5 and are in a stoichimetric relationship, B_i are oxides of the metal or alkaline earth metals of the groups II, IV*b* or V of the periodic system, and M_i represents at least one glass former selected from the group consisting of B_2O_3, P_2O_5 and SiO_2.

4,106,076

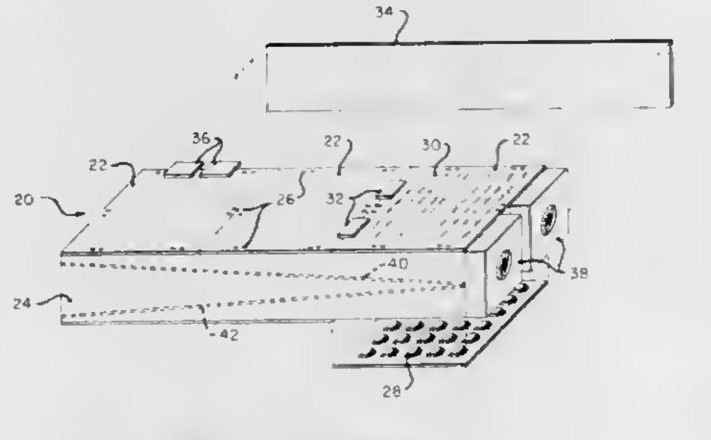
CIRCUIT MODULE

Robert Miller, Poway, and Paul L. Grundy, San Diego, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 12, 1976, Ser. No. 704,597

Int. Cl.² H05K *7/20*

U.S. Cl. 361—394 **10 Claims**



1. A circuit module comprising

a framework including first and second end bus elements having flanges on both sides for connecting printed circuit boards thereto, a central bus element having flanges on both sides thereof for connecting printed circuit boards thereto, a pair of connecting elements connecting one end bus element in spaced relation to each side of said central bus element, and means for electrically isolating the end bus elements from the central bus element;

at least one circuit board extending on each side between the end bus elements; and

means structurally and electrically connecting each circuit board to the flanges of each end bus element and the central bus element,

whereby electrical potential levels on each end bus element and the central bus element are applied to the circuit board through the connecting means.

4,106,077

TOP MOUNTED PHOTOFLASH ATTACHMENT FOR CAMERAS WITH SELF-DEVELOPING FILM

Dymetro P. Furda, Irvington, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 664,772, Mar. 8, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,566

Int. Cl.² G03B *15/02, 15/03*

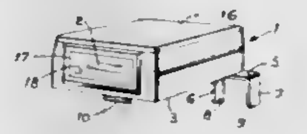
U.S. Cl. 362—8 **3 Claims**

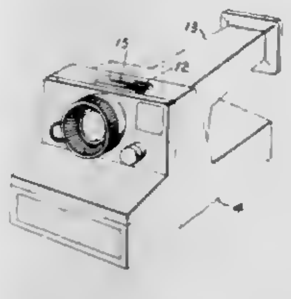
1. An improved photoflash attachment for use with a camera of the type having a flash bar receptacle and a view finder positioned at the top of said camera and offset from the center thereof, said view finder being substantially rectangular in at least a portion thereof and having a predetermined height and a predetermined width in said rectangular portion, said attachment comprising in combination:

a flash lamp and a power pack mounted in a unitary housing, support means for supporting said housing on said camera, said support means including a U-shaped support member having a base portion and a pair of resilient support arms extending from said base portion, said pair of support arms being spaced from each other a distance substantially equal to said predetermined width of said view finder,

said base portion connected to the bottom of said housing so that said support arms extend downwardly from the bottom of said housing and offset from the center of said housing to clamp onto said view finder to support said housing, and

an electrical contact member protruding from the bottom of said housing and positioned to be inserted into said flash bar receptacle on said camera when said photoflash unit is mounted on the top of said camera.





4,106,078

LIGHT SOURCE SYSTEM

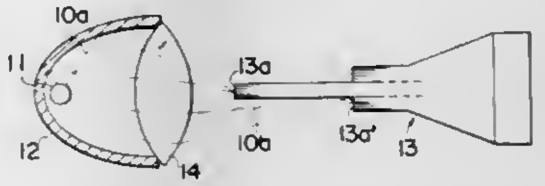
Yasuo Inoue, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,946

Claims priority, application Japan, Dec. 27, 1975, 51-157115

Int. Cl.² F21V *7/04*

U.S. Cl. 362—32 **3 Claims**



1. A light source system comprising a concave reflecting mirror of semi-elliptical and cylindrical shape, a linear light emitter arranged at one focus position of the mirror, a cylindrical condenser lens arranged at the opening position of the mirror, a bundle of optical fibers, one part of one end surface of the fiber bundle being arranged at a condensing position of the portion of the light from the emitter reflected by the mirror and refracted by the condenser lens and the other part of one end surface of the fiber bundle being arranged at a condensing position of the portion of the light from the emitter directly refracted by the condenser lens without reflection from the mirror.

4,106,079

ILLUMINATED DRUM STICK, BATON

Lynn F. Drury, Stroud, Okla., assignor to John Eaton Wilkinson, Oklahoma City, Okla.

Filed Jan. 24, 1977, Ser. No. 761,851

Int. Cl.² F21K *2/00*

U.S. Cl. 362—34 **8 Claims**

1. An article adapted to be selectively illuminated and comprising body means constructed from a suitable transparent material, internal chamber means provided in said body means

and accessible from the exterior thereof for selectively receiving a suitable self-contained chemiluminescent capsule therein whereby said body may be manipulated for selectively activating said capsule for emitting lumination from the body.

4,106,080
PHOTO FLASH DEVICE
Hans Karey, Frankfurt; Robert Oberheim, Neu Isenburg, and Hans-Eberhard Heintke, Wachtersbach, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 25, 1975, Ser. No. 616,852

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1974, 2446024

Int. Cl.^{2} G03B *15/02*

U.S. Cl. 362—18 **14 Claims**

1. In a photo flash device, a combination comprising housing means; a cylindrical reflector unit mounted for turning about its axis in said housing means, said reflector unit comprising a reflector, a cylindrically curved wall member embracing said reflector and said flash lamp and having at least two different light-emitting regions of different optical characteristics, and means for rotating said wall member; and a flash lamp positioned in said housing means so that flashes emitted by said lamp are reflected by said reflector unit in respective positions thereof.

4,106,081
DETACHABLE LAMP ASSEMBLY FOR DUAL TRAILER TRUCKS
Gaeton Ben Turturici, 6130 Monterey Rd., San Jose, Calif. 95111

Filed Jun. 20, 1977, Ser. No. 807,877

Int. Cl.^{2} B60Q *1/00*

U.S. Cl. 362—61 **20 Claims**

1. A detachable lamp assembly for a truck trailer and successively attachable first and second trailers, said tractor comprising an electrical power system with headlamps, said first trailer comprising a rearwardly facing electrical connector, said electrical connector being electrically connected to the electrical power system of said tractor for receiving electrical power therefrom in response to the illumination of said headlamps, said electrical connector being formed with a plurality of electrical contacts, said second trailer being electrically connected to said first trailer through said electrical connector in response to said second trailer being attached to said first trailer, said detachable lamp assembly comprising:

(a) an electrical source of light; and

(b) a lamp assembly connector connected to said electrical source of light, said lamp assembly connector being mated with at least one of said contacts of said electrical connector of said first trailer to energize said electrical source of light in response to the illumination of said headlamps.

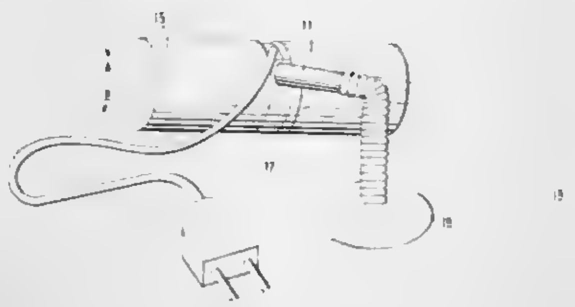
4,106,082
HOODS FOR RECORD PLAYERS AND OTHER SOUND RECORDING OR REPRODUCING APPARATUS
Rudolf Laeng; Benedikt A. Strausak, Merianweg 19, and Josef Vavrina, Steinhofstrasse 9, all of 3400 Burgdorf, Schweiz, Switzerland

Filed Aug. 18, 1976, Ser. No. 715,389

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537084

Int. Cl.^{2} G11B *1/04*

U.S. Cl. 362—87 **2 Claims**



1. A hood for record players comprising in combination:

a lid having an inside surface,

a flexible gooseneck secured at one end to said lid inside surface,

a stroboscopic lamp comprising a housing and a mounting ring at least partially encircling said housing, said ring being secured to the other end of said gooseneck,

a slit tube fixedly connected to said lid inside surface,

said lamp including a connecting lead disposed within said slit tube,

said lamp housing being rotatably received in said mounting ring so as to be rotatable with respect to said lid, and

tilt actuated switch means mounted within said housing and arranged so as to be actuated when said lid is raised and alternatively to be actuated when said lamp housing is rotated relative to said ring.

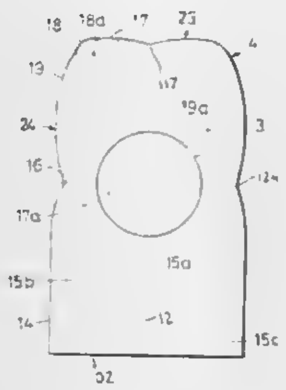
4,106,083
REFLECTOR FOR USE IN SUNLAMPS OR THE LIKE
Friedrich Wolff, Bertholdstrasse 18, Frankfurt, Fed. Rep. of Germany

Filed Aug. 20, 1976, Ser. No. 716,254

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1975, 2537855

Int. Cl.^{2} F21V *7/00*

U.S. Cl. 362—217 **34 Claims**



1. The combination of a rod-shaped radiation source, particularly a source of ultraviolet rays, with a substantially trough-shaped reflector having two halves which are substantially mirror symmetrical to each other with reference to a plane including the axis of said source, said reflector comprising a rear wall located behind said source and having a front surface facing said source, two side walls extending forwardly from said rear wall and flanking said source, said side walls having front portions which define an exit opening for the rays issuing from said source and rear portions adjacent to said rear wall and having concave inner surfaces facing each other, and two intermediate walls located between said rear portions and said rear wall and having concave inner surfaces merging into said front surface and into the inner surfaces of the respective rear portions, at least the major part of said source being located between said opening and said rear wall and each of said side walls defining with said source a relatively narrow gap.

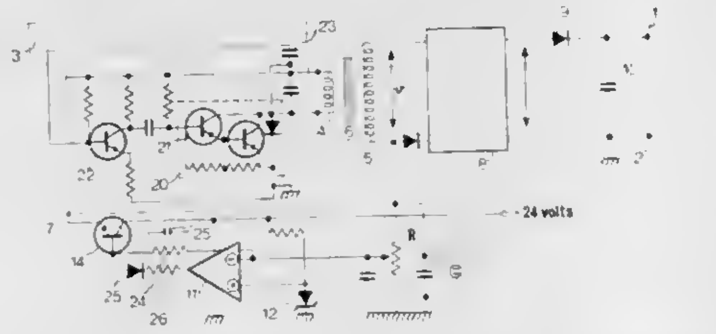
4,106,084
MEANS FOR CONTROLLING THE ELECTRIC CURRENT DENSITY OF A HIGH TENSION DIRECT CURRENT SOURCE
Alain Gibert, Gan, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Jan. 7, 1976, Ser. No. 647,086

Claims priority, application France, Jan. 10, 1975, 75 00644

Int. Cl.^{2} H02M *3/335*

U.S. Cl. 363—21 **1 Claim**



1. A current regulated with high voltage power supply, comprising:

a transformer having a low voltage primary winding and a high voltage secondary winding:

a current sampling circuit coupled to said secondary winding for providing a first D.C. voltage dependent upon the current flowing through said secondary winding:

rectifying and filtering means for coupling said secondary winding to a high voltage load:

means for comparing said first voltage with a reference voltage to produce a current control signal at a control terminal thereof which varies in accordance with the difference between said first and reference voltages;

a transistor oscillator having at least one power supply terminal and including a resonant circuit having inductive and capacitive elements, the primary winding of said transformer comprising the inductive element of said resonant circuit, said oscillator including a transistor amplifier having an output terminal DC coupled to said resonant circuit and an input terminal coupled to said resonant circuit via a feedback capacitor connected between said input terminal and said power supply terminal, the current through said primary and secondary windings being dependent upon the amplitude of oscillations developed by said oscillator; and

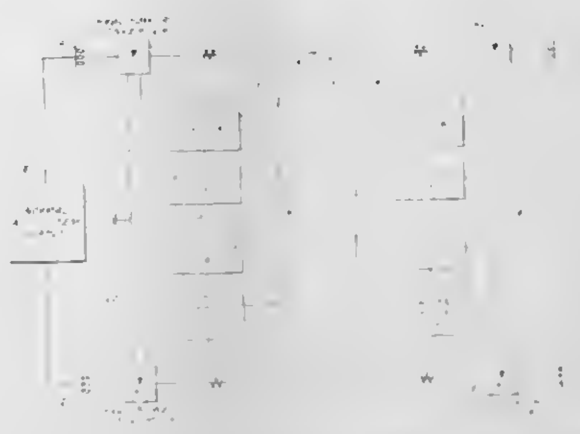
a variable transistor power supply circuit including a variable impedance control transistor having two main electrodes coupled in series between a fixed voltage supply terminal and said power supply terminal and a control electrode coupled to said control terminal for varying the supply voltage to said oscillator in accordance with said current control signal to thereby vary the amplitude of said oscillations so as to maintain the current flowing through said secondary winding at a desired value.

4,106,085
HVDC FLOATING CURRENT ORDER SYSTEM
Donald M. Demarest, Wallingford, and Bernard D. Leete, Newtown Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 27, 1976, Ser. No. 754,475

Int. Cl.^{2} H02M *5/45*

U.S. Cl. 363—51 **34 Claims**



1. In an HVDC electric power delivery system including power converter means at each terminal of the system; each converter means comprising: a plurality of controllable electric valves connected between alternating current and direct current electric power conductors, means for cyclically firing said valves in a predetermined sequence and at firing angles measured with respect to the alternating voltage that can be varied to control the flow of power between said alternating current and direct current power conductors, and regulator means for comparing a plurality of control signals which respectively represent different operating characteristics of the HVDC system during operation and for deriving an output error control signal for controlling the firing angle of said valves, the regulator means associated with one of said converter means receiving as one input a current order control signal for controlling the current transmitted by said system; the improvement comprising:

(a) floating current order control means coupled to the regulator means of the power converter means not in control of current for the HVDC system for supplying to said latter regulator means as one of its input control signals a floating current order control signal for controlling the current ordered from said latter converter means,

(b) said floating current order control signal being responsive to and dependent upon the magnitude of the direct current flowing through said direct current power conductor plus a current margin signal having a predetermined magnitude and a positive polarity with power flow in the system in one direction and a negative polarity with the power flow in the system in the opposite direction, and

(c) said floating current order control means and the regulator means associated therewith being capable of acting to control the current ordered from said latter converter means without relying upon receipt of said current order control signal at said latter converter means.

4,106,086
VOLTAGE MULTIPLIER CIRCUIT
Mark Denton Holbrook, Belle Mead, and Richard Plumh Fillmore, Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

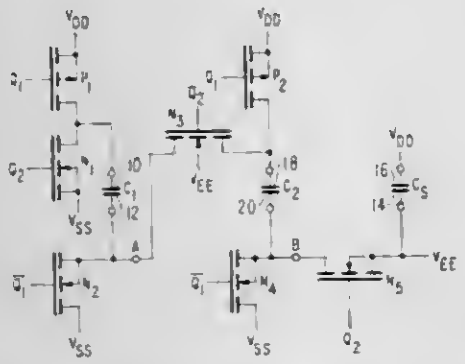
Filed Dec. 29, 1976, Ser. No. 755,612

Int. Cl.^{2} H02M *7/00*

U.S. Cl. 363—60 **1 Claim**

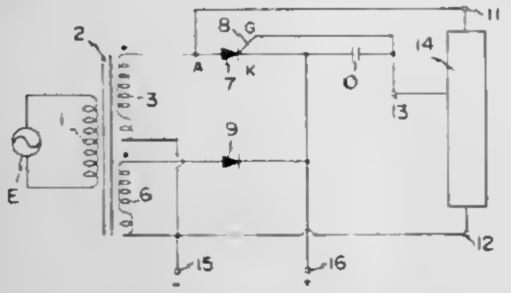
1. In a voltage multiplier circuit comprising a source of input voltage, a storage capacitor across which output voltage that is a multiple of input voltage is made available, at least one booster capacitor, control signal generator means for cyclically generating a first control signal followed by a second control signal, said first and said second control signals for

governing charging and dumping portion of an operating cycle respectively, a first set of electronically controlled switch means conductive responsive to said first control signal to connect each booster capacitor across said source of input voltage for charging and being otherwise non-conductive, and a second set of electronically controlled switch means conductive responsive to said second control signal to connect each booster capacitor in series with said source of input voltage across said storage capacitor for transferring charge to said storage capacitor and being otherwise non-conductive, the improvement wherein said control signal generator is of a type for providing an interval between said first and second control signals in each cycle and for providing an interval between said second control signal in each cycle and the first control signal in the succeeding cycle.



4,106,087
POWER-SUPPLY DEVICE FOR WORKING MACHINE SUCH AS A SPARK-EROSION MACHINE

Tomonori Kawasaki, 4-3 Momoyama-cho, Dairi, Moji-ku, Kitakyushu-shi, Fukuoka-ken, Japan
Filed Nov. 3, 1976, Ser. No. 738,253
Claims priority, application Japan, Nov. 5, 1975, 50-133443
Int. Cl.^{2} H02M *7/08, 7/155*
U.S. Cl. 363—70 **5 Claims**



1. Power-supply device for a working machine such as a spark-erosion machine, arc welding machine or the like comprising:

(1) a power transformer having a main secondary circuit and an auxiliary secondary circuit, said main secondary circuit and said auxiliary secondary circuit being respectively provided with additional normal and inverse turns in addition to the desired number of normal turns which generates desired output current,

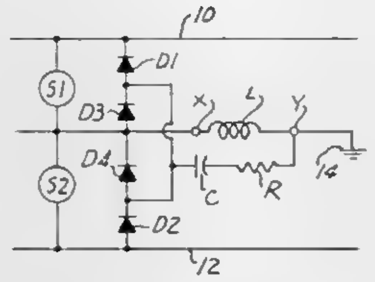
(2) a thyrister rectifying circuit having a first thyrister, said thyrister rectifying circuit being connected to said main secondary circuit,

(3) a diode rectifying circuit connected to said auxiliary secondary circuit parallel to said thyrister rectifying circuit, and

(4) a first trigger circuit for triggering said first thyrister of said thyrister rectifying circuit.

4,106,088
CURRENT DRIVE CIRCUITS

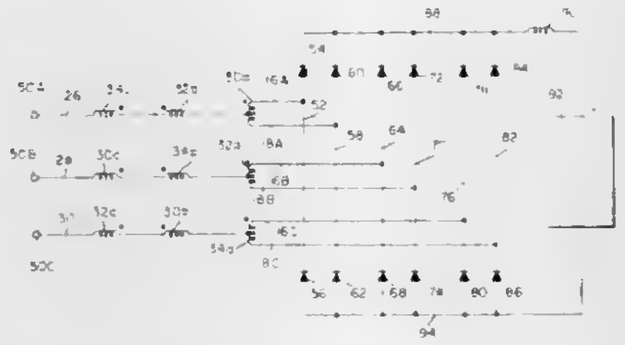
Kenneth N. Bergan, Minnetonka, Minn., assignor to Control Data Corporation, Minneapolis, Minn.
Filed Sep. 15, 1977, Ser. No. 833,534
Int. Cl.^{2} H02M *7/00*
U.S. Cl. 363—132 **4 Claims**



1. A current drive circuit for an inductive load comprising: first conductor means for connection to a source of positive voltage; second conductor means for connection to a source of negative voltage; first output means for connection to one side of said inductive load; second output means for connection to the opposite side of said inductive load; first switch means connected between said first conductor means and said first output means; second switch means connected between said second conductor means and said first output means; first diode means having its cathode connected to said first conductor means; second diode means having its anode connected to said second conductor means; third diode means having its cathode connected to the anode of said first diode means and having its anode connected to said first output means; fourth diode means having its anode connected to the cathode of said second diode means and having its cathode connected to said first output means; time delay means; first circuit means connecting one side of said time delay means to the junction between said first and third diode means and to the junction between said second and fourth diode means; and second circuit means connecting the opposite side of said time delay means to said second output means.

4,106,089
ALTERNATING CURRENT POWER DIVIDING OR COMBINING SYSTEM

Paul I. Fettinger, Garden Grove, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Sep. 10, 1976, Ser. No. 722,184
Int. Cl.^{2} H02M *5/14*
U.S. Cl. 363—153 **5 Claims**



1. A transformer of relatively low VA rating for converting an N phase input waveform to an M phase output waveform wherein M is an integer and N is an integer not less than three, said transformer comprising:

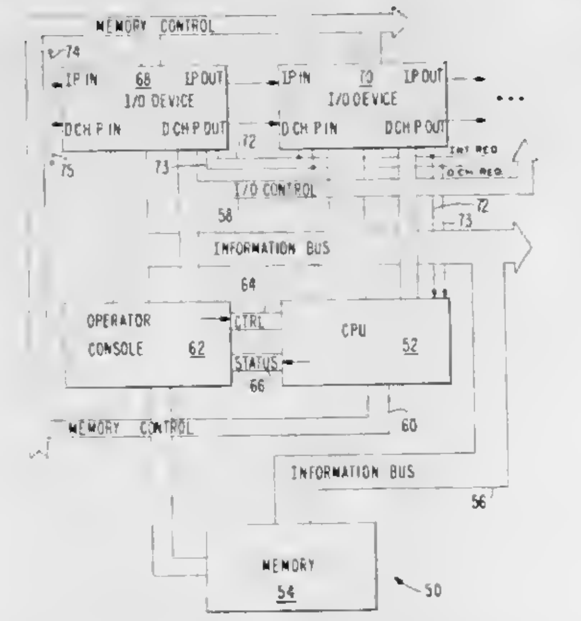
primary winding means having at least two coils operatively associated with each phase;

secondary coil means operatively associated with each phase and having a center connection and end connections; and

means for connecting one of said primary winding means coils of a first phase to one of said primary winding means coils of a second phase in series opposition and to said center connection of said secondary coil means of a third phase.

4,106,090
MONOLITHIC MICROCOMPUTER CENTRAL PROCESSOR

Charles R. Erickson, Fremont; Hemraj K. Hingarh; Robert Moeckel, both of Santa Clara, and Dan Wilnai, Sunnyvale, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Jan. 17, 1977, Ser. No. 760,063
Int. Cl.^{2} G06F *7/48*
U.S. Cl. 364—200 **5 Claims**



1. For use in a computing system which includes a processing unit, at least one memory unit external to the processing unit for storing a program and data to be processed in said processing unit in response to said program, and peripheral equipment operably connected to said system for access with the processing unit,

a monolithic semiconductor integrated central processing unit comprising:

(a) an information bus for bidirectionally communicating instructions and data between said central processing unit and the memory unit and peripheral equipment;

(b) first storage means operably connected to said information bus for receiving and storing program instructions to be executed;

(c) first multiplexer means operably connected to said first storage means to receive memory address information;

(d) second storage means operably connected to said information bus for receiving and storing data and address information;

(e) second multiplexer means operably connected to said second storage means for receiving the stored data and address information to be processed;

(f) control means including a program logic array and sequence state logic and operably connected to said first storage means for receiving a program instruction by said program logic array and generating a plurality of microprogram control codes for controlling processor operation in executing said program instruction;

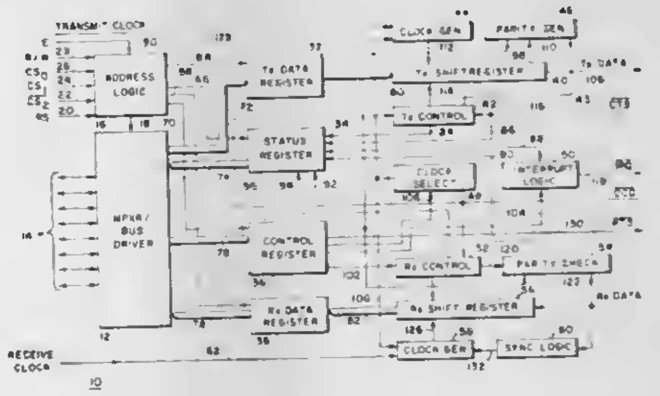
(g) a program counter means operably connected to said program logic array of said control means and which is operative to receive the memory addresses of the next program instructions to be executed and including incrementing means to obtain the address of subsequent instructions which are to be executed;

(h) a time multiplexed arithmetic logic unit operably connected to said first multiplexer means and said second multiplexer means for receiving memory address information and generating real memory addresses and for receiving data to be processed, said arithmetic logic unit operably connected to said control means for receiving control signals for data manipulation, and said arithmetic logic unit having means operably connected to said program counter to provide said next program instruction memory addresses; and

(i) accumulator means including a plurality of shift registers operably connected to receive and store processed information from said arithmetic logic unit and transfer said processed information to said first and second multiplexer means for subsequent processing.

4,106,091
INTERRUPT STATUS INDICATION LOGIC FOR POLLED INTERRUPT DIGITAL SYSTEM

Edward C. Hepworth, Apache Junction, and Rodney J. Means, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 550,340, Feb. 18, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,180
Int. Cl.^{2} G06F *3/00*
U.S. Cl. 364—200 **5 Claims**



1. An interface adaptor for interfacing between a peripheral device and a processor means, said interface adaptor being coupled to said processor means with a first external data bus and to said peripheral device with a second external data bus, said interface adaptor comprising:

a plurality of first data bus terminals for coupling said interface adaptor to said first external data bus;

a first internal data bus coupled to said first data bus terminals;

a plurality of second data bus terminals for coupling said interface adaptor to said second external data bus;

a second internal data bus coupled to said second data bus terminals;

first register storage means coupled to said second internal data bus for receiving first serial data from said peripheral device;

first circuit means coupled to said first register storage means for detecting when said first register storage means is full;

status register storage means comprising a plurality of status bits, said status register storage means being coupled to said first internal data bus and responsive to said first circuit means for storing first information indicative of whether said first register storage means is full as a first status bit therein, said status register storage means being addressable by said processor means and including means for transferring said first information to said processor means via said first internal data bus, said first data bus terminals, and said first external data bus upon interrogation by said processor means;

address means responsive to said processor means and coupled to said status register storage means for effecting said addressing of said status register means;

- an interrupt request conductor coupled to said processor means;
- interrupt means responsive to said status register storage means and coupled to said status register storage means and to said interrupt request conductor for generating an interrupt request signal on said interrupt request conductor in response to said storing of said first information.

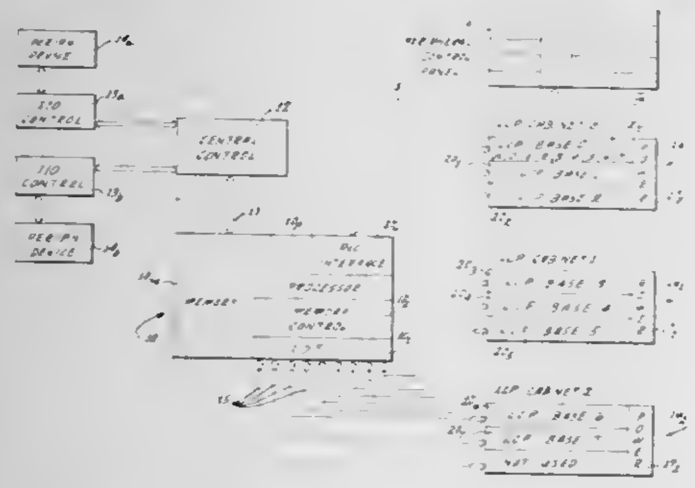
4,106,092
INTERFACE SYSTEM PROVIDING INTERFACES TO CENTRAL PROCESSING UNIT AND MODULAR PROCESSOR-CONTROLLERS FOR AN INPUT-OUTPUT SUBSYSTEM

Donald Alexander Millers, II., San Clemente, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 728,455, Sep. 30, 1976, abandoned. This application Sep. 29, 1977, Ser. No. 837,918

Int. Cl.^{2} G06F *3/04, 9/06, 13/00, 15/20*

U.S. Cl. 364—200 **17 Claims**



1. In a digital processing system for controlling the transfer of data between a plurality of peripheral units and a main host system which includes a main memory and main processor, wherein each peripheral unit is controlled by a Line Control Processor, and a plurality of Line Control Processers are organized into a Base Module, and a plurality of such Base Modules are connected to said main host system through individual message level interfaces, an input-output translator interface unit in said main system for interfacing said plurality of Base Modules and Line Control Processors, said input-output translator interface comprising:

- (a) means to receive a plurality of input-output instructions from said processor and main memory and to receive address signals for selecting a particular Base Module and particular Line Control Processor for establishing communcations with a particular peripheral unit; ·
- (b) connection means to establish a data path from said main system to an addressed Line Control Processor;
- (c) data transfer means to transfer control data and information data between main memory and an addressed Line Control Processor;
- (d) means to assemble a descriptor link signal to serve as an identifier for each specific input-output data transfer cycle instruction from said main procesor;
- (e) scratchpad memory means having a particular portion of its memory reserved for each Line Control Processor, said scratchpad memory storing the beginning and ending addresses of any given data field in main memory plus reserved scratchpad memory sections in each portion for signal information as to the status of each input-output transfer cycle command initiated by said main processor.

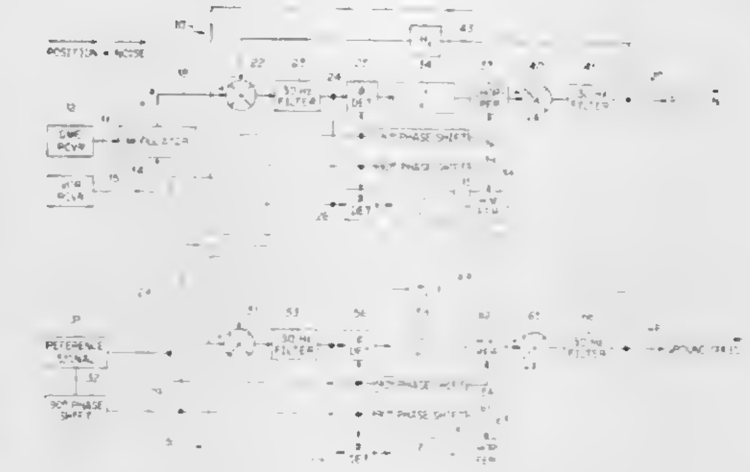
4,106,093
GROUND SPEED DERIVING CIRCUIT

Donald K. Grimm, Cedar Rapids, Iowa; Wayne A. Savold, Satellite Beach, and Allen R. Walter, Melbourne, both of Fla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 24, 1977, Ser. No. 809,596

Int. Cl.^{2} G06G *7/78*

U.S. Cl. 364—424 **5 Claims**



3. A circuit for generating a signal proportional to the ground speed and ground track angle of an aircraft from a vector signal representing the position of the aircraft relative to a known point, comprising:

- A. a first filter having an input to which said vector signal is applied and a position indicating output, including:
  - 1. means for separating said vector signal into first and second signal components,
  - 2. first and second integrators for respectively integrating the first and the second signal components,
  - 3. means for adding the integrated signal components to constitute the position indicating output,
  - 4. means for feeding back the position indicating output to the input of said first filter,
- B. and a second filter having an input connected to sample an input to said integrators to produce a signal proportional to the ground speed of the aircraft.

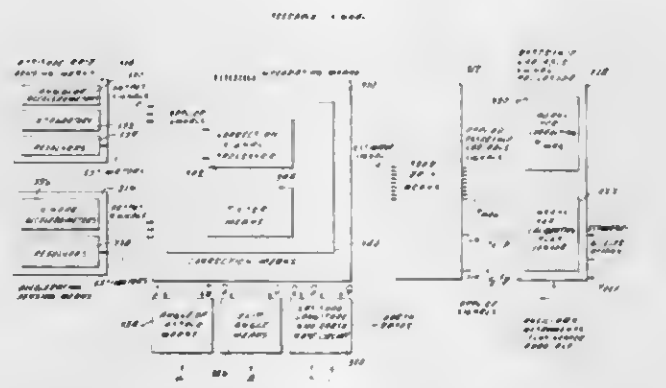
4,106,094
STRAP-DOWN ATTITUDE AND HEADING REFERENCE SYSTEM

Robert Perry Land, Los Angeles, Calif., assignor to Turpin Systems Company, Van Nuys, Calif.

Filed Dec. 13, 1976, Ser. No. 749,928

Int. Cl.^{2} G06F *15/50;* **G06G** *7/78;* **G05D** *1/00*

U.S. Cl. 364—453 **19 Claims**



1. An attitude and heading reference system for use in a moving vehicle to provide signals representing estimates of earth-oriented motion-related variables, and to correct predetermined ones of those estimator signals by comparing them with corresponding applied reference variable signals, said attitude and heading reference system comprising:

- attitude rate sensing means for producing output signals representing components of the angular velocity of the vehicle about a set of earth-oriented axes;
- acceleration sensing means for producing output acceleration signals reepresenting linear accelerations of the vehicle along earth-oriented axes;
- integrating means connected to said attitude rate sensing means and said acceleration sensing means for integrating their output signals to produce estimator signals representing estimates of predetermined earth-oriented motion-related variables;
- feedback means responsive to the applied reference variable signals and connected to said integrating means for comparing each estimator signal with a corresponding reference variable signal and for generating a feedback signal dependent on their difference and applying the feedback signal to said integrating means to cause the estimator signal to become substantially equal to its correponding reference variable signal;
- said feedback means further comprising means responsive to a predetermined one of the feedback signals applied to said integrating means to modify an estimator signal representing a linear velocity to produce a feedback signal and to apply it to said integrating means to modify a predetermined estimator signal representing an attitude angle.

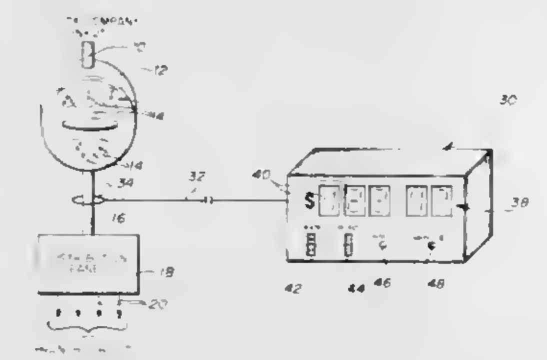
4,106,095
ELECTRICAL USAGE DISPLAY SYSTEM

Grover A. Yarbrough, Lewisville, Tex., assignor to Electronic Data Systems, Inc., Dallas, Tex.

Filed May 31, 1977, Ser. No. 801,721

Int. Cl.^{2} G01R *13/00;* **H04M** *11/04*

U.S. Cl. 364—464 **28 Claims**



1. A system for displaying a cumulative indication of electricity usage to a consumer comprising:

- inductive coil means for being disposed adjacent an electrical supply line for generating a signal representative of the current flowing through the electrical supply line;
- means for periodically generating digital signals representative of the magnitude of said signal;
- computing means for receiving said digital signals and for generating periodic output signals representative of a cumulative number of said digital signals; and
- display means connected to said computing means for displaying to the comsumer a cumulative indication of the electricity usage.

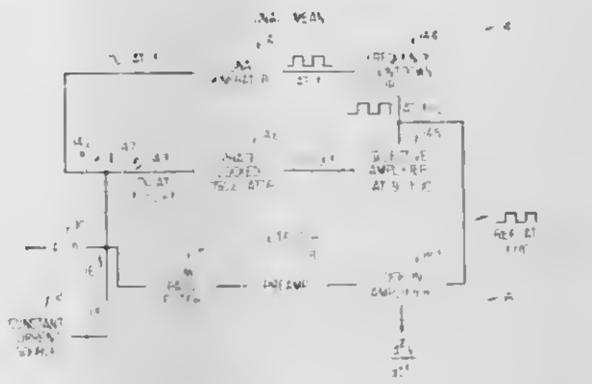
4,106,096
DERIVATIVE MEASUREMENT BY FREQUENCY MIXING

Thomas Lee Paoli, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 30, 1976, Ser. No. 718,403

Int. Cl.^{2} G06G *7/18;* **G01R** *19/00*

U.S. Cl. 364—481 **5 Claims**



1. A method of generating the n-th order ($n \geqq 2$) derivative of a parameter of a nonlinear device comprising the steps of:

- applying to the device a first sinusoidal signal at a first frequency f_1
- applying to the device a second sinusoidal signal at a second frequency f_2 phase-locked to the first signal at f_1, and
- detecting a third signal corresponding to a difference frequency f_d of f_1 and f_2, the third signal being proportional to the n-th order derivative.

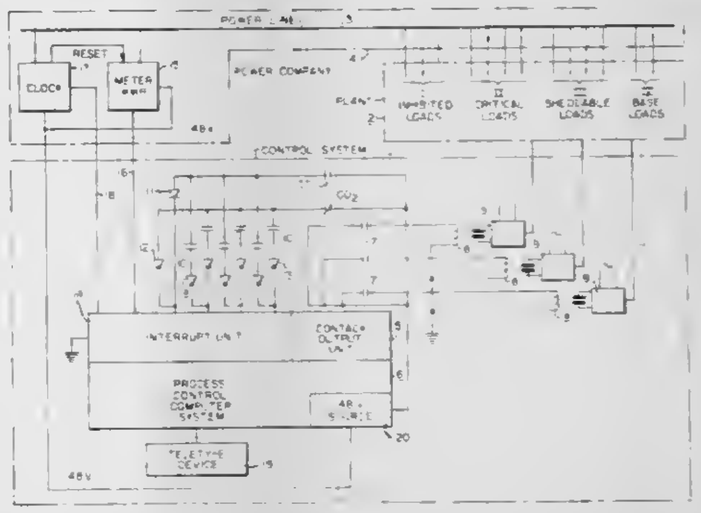
4,106,097
ENERGY CONSERVATION CONTROL METHOD

Richard Q. Fox, Orlando; James I. Millholen, Winter Park, both of Fla., and John H. McWhirter, Penn Hills, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1977, Ser. No. 791,741

Int. Cl.^{2} G06F *15/06;* **G05B** *15/00*

U.S. Cl. 364—492 **7 Claims**



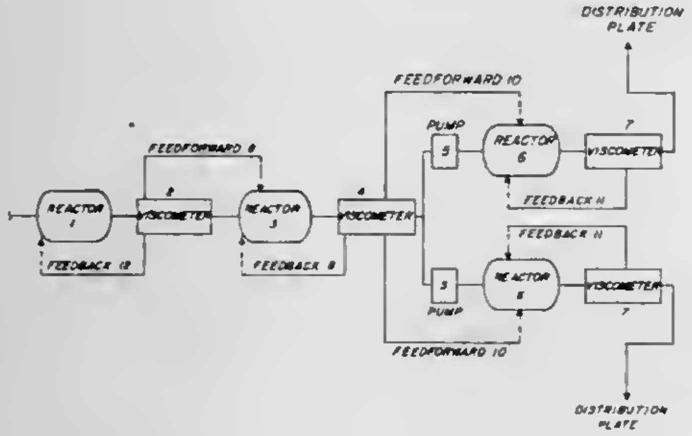
1. A method of controlling the operating status of the loads in a plant facility having production loads and nonproduction loads supplied with energy from a utility company, with said production loads being capable of being switched selectively in accordance with a desired production activity level and said nonproduction loads being operative under selected constraints, comprising the steps of:

- deriving as a function of time an indication of the actual demand of energy by said plant facility; and
- altering said constraints in relation to the derived indication of the actual demand of energy to establish constraints compatible with different levels of production activity in said plant facility.

4,106,098
COMPUTER CONTROLLED APPARATUS FOR PREPARATION OF POLYETHYLENE TEREPHTHALATE

Asa Carlyle Moody, Jr., Colonial Heights; Richard George Kenward, Richmond, and James William Shiver, Midlothian, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 2, 1977, Ser. No. 764,795
Int. Cl.^{2} G06F *15/46*
U.S. Cl. 364—500 **3 Claims**



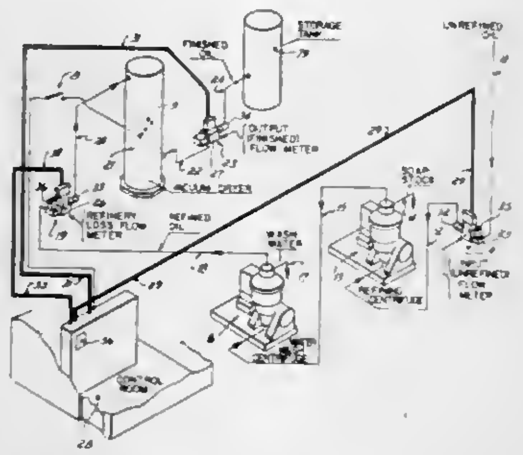
1. Apparatus comprising three reactors (**1, 3, 6**) connected in series arrangement for polycondensation of molten polyethylene terephthalate polyester, each reactor having a final control valve (**28**) for setting the vapor pressure therein, in combination with control apparatus for automatically controlling intrinsic viscosity of the polyethylene terephthalate polyester exiting from said reactors comprising:

- (a) a digital computer (**30**) having an analog input section (**23**) for accepting analog input signals; a central processor (**24**) for processing said analog input signals by relating said input signals to an anticipatory control program; and a digital to analog converter (**25**) for generating analog output signals;
- (b) viscometers (**2, 4, 7**) following each reactor for sensing melt viscosity and temperature of the polyester polymer, said viscometers having connecting lines (**8, 9, 10, 11, 12**) for transmitting analog input signals representing said melt viscosity and temperature to said computer, whereby the computer controls the vapor pressure in each reactor;
- (c) a pressure transmitter (**20**) connected by an air line to an air to current transducer (**21**) which is connected to a resistor network (**22**), for generating analog input signals to said computer representing reactor vapor pressure for each reactor; and
- (d) a voltage to air transducer (**26**) for adjusting the vapor pressure setting of said final control valve (**28**) in each reactor to a set point determined by currently existing intrinsic viscosity calculated by the computer (**30**) from melt viscosity and temperature of said polymer, compared to the last previous determination of intrinsic viscosity of said polymer; and by last previous calculated vapor pressure set point, constants for proportional gain, integral time and derivative time, and desired intrinsic viscosity of exiting polymer minus intrinsic viscosity of exiting polymer at last two previous times of measurement, and by time intervals between measurements and currently existing set point for vapor pressure within said reactor, these relations being solved by said computer which thereupon generates signals to which said vapor pressure final control valve (**28**) is responsive.

4,106,099
REFINERY AND PIPELINE MONITORING SYSTEM

Peter F. Elliott, and Kenneth D. Elliott, both of P.O. Box 31227, Cincinnati, Ohio 45231

Continuation-in-part of Ser. No. 704,538, Jul. 12, 1976. This application Jul. 8, 1977, Ser. No. 814,132
Int. Cl.^{2} G01M *3/28;* G01F *1/00;* G06F *15/46*
U.S. Cl. 364—510 **6 Claims**



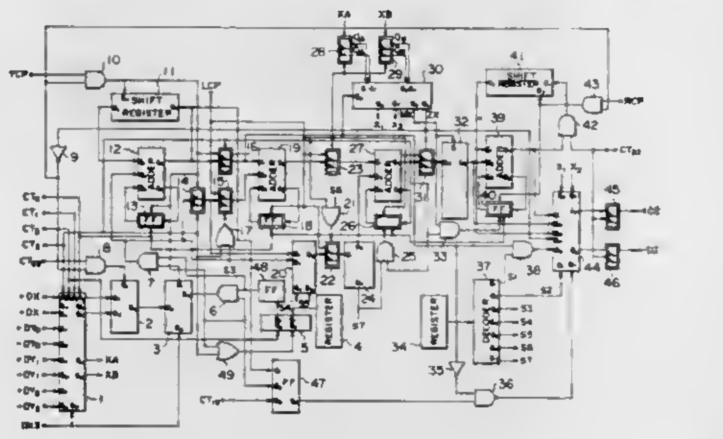
1. Apparatus for monitoring losses in a fluid flow system, such as a refinery or pipeline, comprising:

at least two measurement stations located at separate positions along a fluid flow path, each said measurement station having means for measuring data related to fluid flowing through said fluid flow path at said separate positions during a series of intervals of operation of said fluid flow system,
said data including a gross amount of fluid which has flowed past each said measurement station during each interval of said series of intervals of operation,
memory means for storing information related to accuracy of operation of said data measuring means and information related to physical properties of said fluid,
sample number selector means for entering a preselected non-zero number,
net fluid calculation means responsive to said data and information for calculating a net amount of fluid,
net fluid amount accumulator means for accumulating a net amount of fluid which has flowed past each of said at least two measurement stations during each interval of said series of intervals of operation,
current loss calculation means for subtracting said accumulated net amount of fluid for one of said at least two measurement stations from said accumulated net amount of fluid for the other of said at least two measurement stations to signify a current loss when said accumulated net amount of fluid for said other measurement station exceeds a predetermined minimum sample amount,
reset means for resetting said net fluid amount accumulator means to zero after calculation of said current loss,
first means for entering said current loss as a reference loss during a first interval of operation,
said reference loss signifying a loss indication for said first interval of operation,
increment calculation means responsive to said preselected number for dividing said current loss by said preselected number to signify an increment during subsequent intervals of operation,
loss indication calculation means for adding said increment to said reference loss during said subsequent intervals of operation to signify a loss indication for each of said subsequent intervals of operation, and
means for displaying said loss indications,
whereby a surge in the operation of said fluid·flow system which occurs during any of said subsequent intervals of operation is distributed over a number of intervals of operation equal to said preselected number so as to smooth each said surge over a series of loss indications.

4,106,100
DIGITAL DIFFERENTIAL ANALYZER

Kunihiro Okada; Yoshiharu Itatsuda; Takeyuki Endoh; Shigeru Yabuuchi, all of Tokyo, and Norio Yokozawa, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of, Japan

Filed Mar. 23, 1977, Ser. No. 780,457
Claims priority, application Japan, Mar. 24, 1976, 51-31338
Int. Cl.^{2} G06J *1/02;* G06F *7/38*
U.S. Cl. 364—702 **14 Claims**



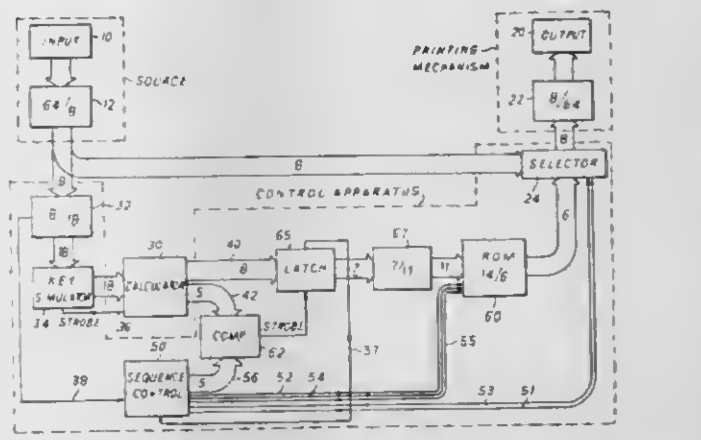
12. A digital differential analyzer comprising:
input means for successively applying input data;
first arithmetic operation means for performing an arithmetic operation in response to the input data from said input means;
memory means connected to said first arithmetic operation means for temporarily storing the result of the arithmetic operation by said first arithmetic operation means;
second arithmetic operation means connected to said memory means for performing an arithmetic operation in response to the contents of said memory means; and
control means connected to said first and second arithmetic operation means for controlling said first and second arithmetic operation means so that, during a period when said second arithmetic operation means performs an arithmetic operation related to preceding input data, said first arithmetic operation means performs an arithmetic operation related to subsequent input data.

4,106,101
TYPEWRITER-CALCULATOR COMBINATION FOR THE PHYSICALLY DISABLED

Leslie Herbert Raymond Harrison, Wimborne, England, assignor to Possum Controls Limited, England

Filed Dec. 1, 1976, Ser. No. 746,606
Int. Cl.^{2} G06F *3/02, 3/10*
U.S. Cl. 364—709 **4 Claims**

1. Apparatus comprising in combination an electric typewriter, an electronic calculator, a source of operator-selectable signals representative of alpha-numberic characters and operator-selectable signals representative of calculator command signals including at least the command signals "CLEAR", "+", "−", "X", "÷", "DECIMAL POINT" and "ANSWER", and control apparatus coupled to said source, said calculator and said typewriter, said source including a first code-converter to convert operator-selected alpha-numeric and calculator command signals into a secondary coded form, said typewriter including a second code-converter to convert signals in said secondary coded form into signals to operate said typewriter, and said control apparatus comprising a selector coupled on the one hand between the output of said first code-converter and the input of said second code-converter and on the other hand between the output of said calculator and the input of said second code-converter, said selector having a first normal setting in which signals from the output of the first code-converter are applied to the input of the second code-converter while preventing application of output from said calculator to the input of said second code-converter, and having a second setting selectable by said operator-selected "ANSWER" command signal to couple the output of said calculator to the input of said second code-converter and enabling the output from said calculator to be automatically typed by said typewriter, and said control apparatus further comprising means coupling the output of said first code-converter to a key-simulator responsible to said operator-selectable signals representative of numeric characters and calculator command signals as encoded by said first code-converter for simulating calculatorkey-signals and applying the last said signals to said calculator through connections individual to the digits ϕ and **1** through **9** and at least the command signals "DECIMAL POINT", "+", "−", "X", "÷", "CLEAR" and "=", whereby the conventional calculations of addition, subtraction, multiplication, and division can be effected under direct operator control and the result automatically typed when the "ANSWER" command signal is selected by the operator.



4,106,102
SELF-ADAPTIVE DIGITAL FILTER FOR NOISE AND PHASE JITTER REDUCTION

André Eugène Desblache, Nice, France, assignor to International Business Machines Corporation, Armonk, N.Y.

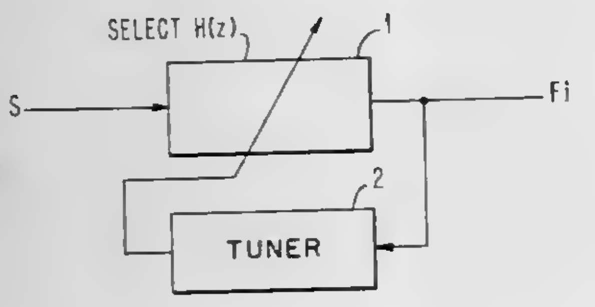
Filed Nov. 15, 1976, Ser. No. 742,150
Claims priority, application France, Dec. 18, 1975, 75 39629
Int. Cl.^{2} G06F *15/34*
U.S. Cl. 364—724 **3 Claims**

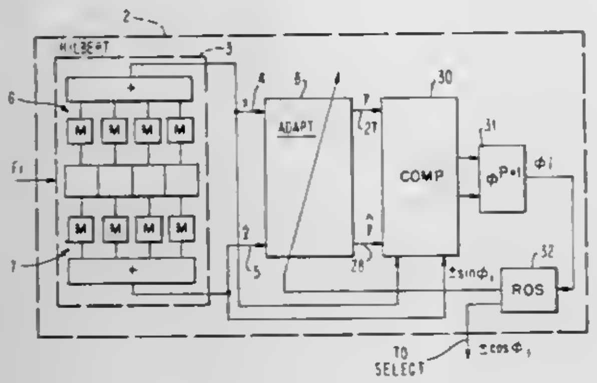
1. An auto-adaptive digital filter for tracking a sinusoidal component F*i* of a frequency which may vary within a given frequency range, said auto-adaptive digital filter being of the type which includes a narrow bandwidth tunable filter, a feedback loop comprising a tuning circuit which controls the shifting of the center frequency of the passband of said narrow bandwidth tunable filter so as to track said sinusoidal component F*i*, said tuning circuit including:

input means for receiving a signal passed through said narrow bandwidth tunable filter;
a narrow band Hilbert type filter connected to said input means and producing two in-quadrature components x and x;
a variable bandwidth filtering means connected to said narrow band Hilbert type filter to receive said in-quadrature components x and x and to produce two in-quadrature signals y and y, said variable bandwidth filtering means having a z-transfer function in the form

$$\frac{z - e^{j\phi i}}{z - de^{j\phi i}}$$

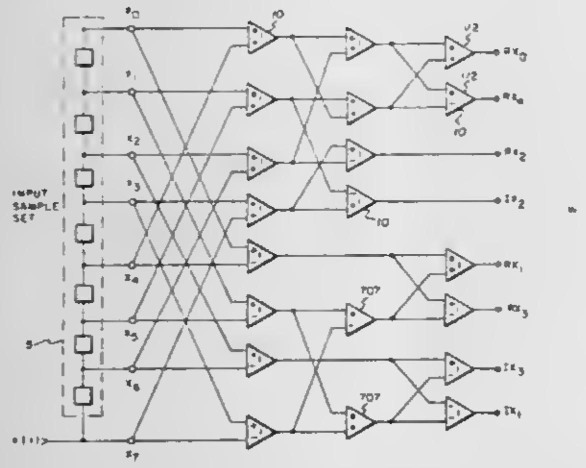
where
$\phi i = 2\pi fiT$,
T is the period of the digital samples fed to the input of said variable bandwidth filtering means, and
d is a constant close to "1," computing means connected to receive the outputs of said narrow band filter and of said variable bandwidth filtering means for determining an average error from factors x, x, y, and y; and
an adjusting means connected to the output of said computing means to receive the information supplied by said computing means and acting to adjust said variable bandwidth filtering means and said narrow bandwidth tunable filter so as to minimize said average error.





4,106,103
DERIVATION OF DISCRETE FOURIER TRANSFORM COMPONENTS OF A TIME DEPENDENT SIGNAL

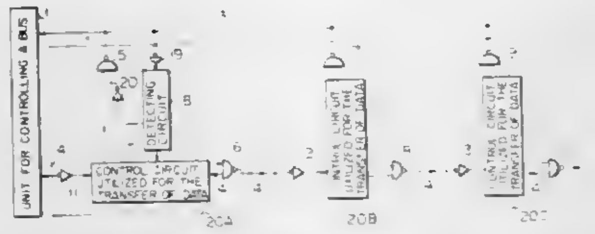
Donald A. Perreault, Thousand Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 19, 1976, Ser. No. 706,702
Int. Cl.² G06F *7/38*
U.S. Cl. 364—827 **20 Claims**



1. Apparatus for providing the discrete Fourier transform (DFT) components of a time dependent signal $x(t)$ comprising:
(a) means for sampling said signal $x(t)$ to provide a plurality of sets, i, of sample values x_k, $k = 0, 1 \ldots N-1$, said values x_k corresponding to components of samples of the signal $x(t)$ time displaced by an amount T/N from one another where T is a sample time frame and N is an even integer,
(b) said sampling means providing the i^{th} sample set time delayed from the i-1^{th} sample set by an amount t_0 where $0 < t_0 \leqq T/N$, thereby providing an overlapping sliding window sampling of said signal $x(t)$, and
(c) means for generating the DFT components X_n corresponding to each sample set of values x_k of said plurality of sample sets for n belonging to one of the groups $n = 0, 1 \ldots N/2$ and $n = 0, N/2, N/2 + 1, N/2 + 2, \ldots N-1$.

4,106,104
DATA TRANSFERRING SYSTEM WITH PRIORITY CONTROL AND COMMON BUS

Atsushi Nitta, Kawasaki, and Hirotoshi Haida, Yokohama, both of Japan, assignors to Panafacom Limited, Kawasaki, Japan
Filed Nov. 4, 1976, Ser. No. 738,959
Claims priority, application Japan, Nov. 11, 1975, 50-135508
Int. Cl.² G06F *3/04, 9/18;* **H04Q** *3/00, 5/00*
U.S. Cl. 364—900 **1 Claim**


UNIT FOR CONTROLLING A BUS
CONTROL CIRCUIT UTILIZED FOR THE TRANSFER OF DATA
DETECTING CIRCUIT
20A
20B
20C

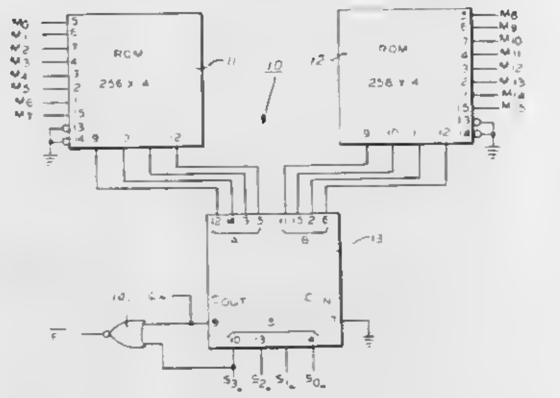
1. A data transferring system comprised of a plurality of devices which use a common bus, each of said devices providing a requesting signal to a requesting signal line for requesting a transfer of data, and means associated with said devices for assigning a priority order to the transference of the data; and a control unit commonly provided for said plurality of devices so as to control said common bus, said control unit receiving said requesting signal on said requesting signal line and then sending an acknowledging signal for said transfer of data, each of said plurality of devices receiving said acknowledging signal so that the device which sends out said requesting signal carries out the transfer of data, at least one of said plurality of devices, except for the device having the highest priority order, including a detecting circuit for detecting said requesting signal on said requesting signal line, wherein said device providing said detecting circuit detects said requesting signal so that said device providing said detecting circuit prevents the sending out of said requesting signal from its own device and said device which is prevented from sending out said requesting signal by said detecting circuit transfers said acknowledging signal to a following device; and at least one of said plurality of said devices, except for the device having said detecting circuit, is placed on the opposite side of said control unit with respect to said device having said detecting circuit.

4,106,105
ZERO DETECTOR

John William Pross, Jr., Newfoundland, N.J., assignor to The Singer Company, Little Falls, N.J.
Filed Feb. 28, 1977, Ser. No. 772,708
Int. Cl.² G11C *7/00*
U.S. Cl. 364—900 **10 Claims**

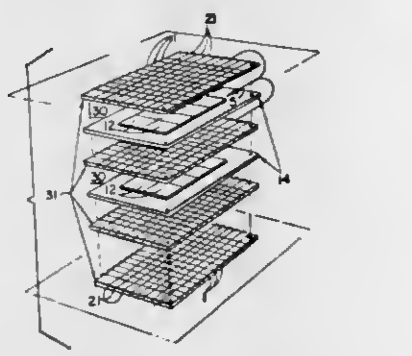
1. A zero detector comprising:
means for encoding an input data word containing a number of zero and one bits into two sets of output data bits containing zero and one bits each of said sets of output data bits being a lesser number of bits than the number of bits in said input data word, said sets of output data bits representing the number of zero bits in said input data word,

means for summing said bits in each set of output data bits, and
means responsive to said summing means for determining whether the total number of zeros in said input data words equals or exceeds the number of one bits.



4,106,106
UNIFORM ROTATING FIELD NETWORK STRUCTURE TO EFFICIENTLY PACKAGE A MAGNETIC BUBBLE DOMAIN MEMORY

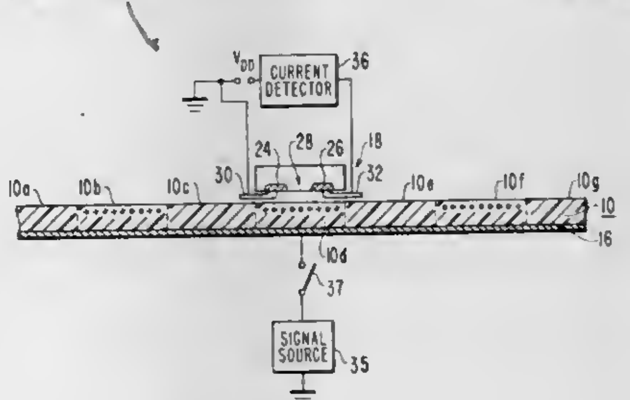
Ronald G. Wolfshagen, Newport Beach; John E. Ypma, Anaheim; Glen W. Murray, Irvine, and Thomas T. Chen, Yorba Linda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Continuation-in-part of Ser. No. 548,943, Feb. 11, 1975, abandoned. This application Mar. 16, 1976, Ser. No. 667,338
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **16 Claims**



1. An open coil field network comprising:
at least first and second core means aligned in substantially adjacent planes with respect to one another;
coil means having terminal means,
said coil means wound respectively around each of said first and second core means;
said terminal means adapted to receive a signal to energize said coil means and thereby induce a magnetic field between said adjacent first and second core means having a planar direction substantially coincident with that of said core means; and
at least one magnetic bubble domain device disposed in the induced magnetic field between said adjacent first and second core means.

4,106,107
MIS READOUT DEVICE WITH DIELECTRIC STORAGE MEDIUM

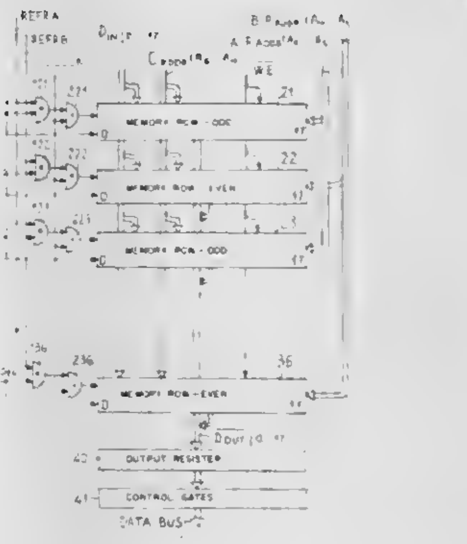
Alvin Malcolm Goodman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Feb. 3, 1977, Ser. No. 765,293
Int. Cl.² G11C *7/00, 11/34*
U.S. Cl. 365—191 **10 Claims**



1. A device comprising:
a dielectric storage medium having a first surface and a second opposite surface, said storage medium being capable of holding an electrostatic charge;
an electrically conductive sheet disposed adjacent said first surface;
a substrate of semiconductive material having a source region and a drain region formed therein and with a channel region therebetween, said second surface being removably placed adjacent to said substrate;
means for applying an interrogation signal to said conductive sheet; and
means for detecting a current flow between said source region and said drain region.

4,106,108
SEMICONDUCTOR DYNAMIC MEMORY AND RELATED REFRESHING SYSTEM

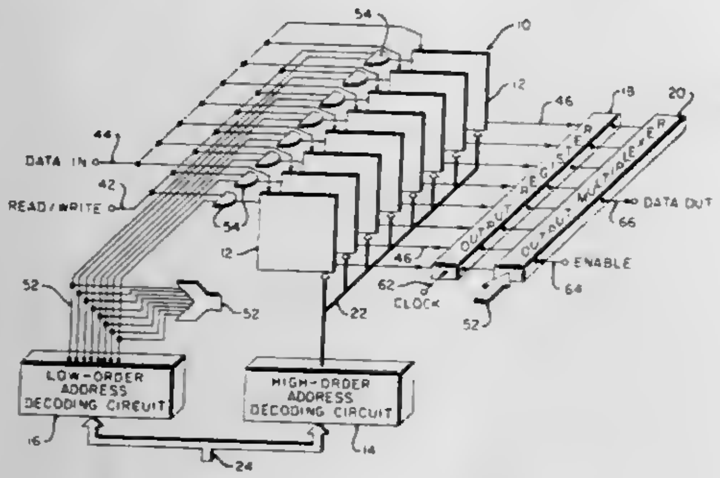
Ezio Cislaghi, Ossona (Mi); Alessandro Scotti, Cornaredo (Mi), and Renzo Pederzini, Melegnano (Mi), all of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy
Filed Aug. 13, 1976, Ser. No. 714,177
Claims priority, application Italy, Aug. 20, 1975, 26447 A/75
Int. Cl.² G11C *7/00*
U.S. Cl. 365—222 **7 Claims**



1. A rechargeable memory comprising a plurality of individually addressable storage positions organized into rows and columns; said memory being organized into a pair of blocks each including a plurality of said rows; first circuit means for addressing a selected storage position to perform a read-write operation therein; second circuit means for sequentially ad-

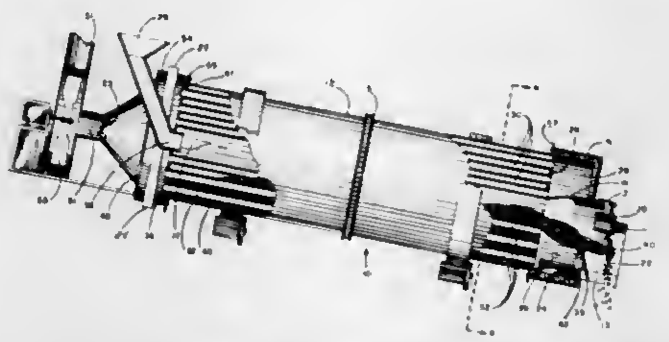
dressing said rows of storage positions in a first one of said pair of blocks; third circuit means for sequentially addressing said rows of storage positions in the second one of said pair of blocks; first control means for performing a refresh operation in one of said pair of blocks on a row of storage positions selected by the corresponding one of said second or third circuit means and for simultaneously performing a read-write operation in the other one of said pair of blocks in a storage position selected by said first circuit means; timing means adapted to define periodic timing cycles; a reversible counter register corresponding to each of said pair of blocks adapted to provide an information signal representative of the difference between the number of elapsed cycles and the number of refresh operations carried out in each block during said elapsed cycles; and second control means for generating a first type of refresh interrupt signal when said information signal in at least one of said registers reaches a first predetermined value.

4,106,109
RANDOM ACCESS MEMORY SYSTEM PROVIDING HIGH-SPEED DIGITAL DATA OUTPUT
Charles J. Fassbender, Plano, Tex., assignor to NCR Corporation, Dayton, Ohio
Filed Feb. 1, 1977, Ser. No. 764,603
Int. Cl.² G11C *8/02, 7/00*
U.S. Cl. 365—238 **6 Claims**



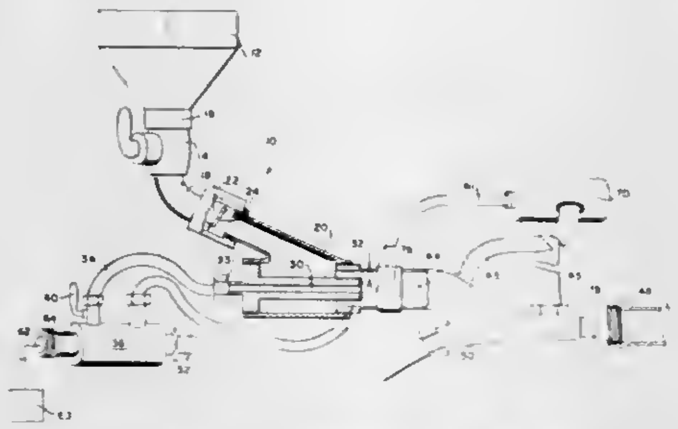
1. A random access memory for digital data comprising:
- a data input line;
- a memory matrix for storing digital data at addressable locations;
- first address means for addressing a selected location of said memory matrix for directing data from said data input line to said selected location;
- second address means for addressing said memory matrix to access data stored at a plurality of selected locations in said memory matrix;
- output register means operatively connected to said memory matrix for simultaneously receiving and addressably storing the data addressed by said second address means; and
- an output multiplexer means responsive to said first address means and operatively connecting a data output terminal to an addressed storage location of said output register means in response to the address dictated by said first address means and an enabling signal.

4,106,110
APPARATUS AND METHOD FOR PRODUCING ASPHALT-AGGREGATE COMPOSITIONS
Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102
Continuation of Ser. No. 487,928, Jul. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 286,613, Sep. 5, 1972, abandoned. This application Aug. 19, 1976, Ser. No. 715,870
Int. Cl.² B28C *5/20*
U.S. Cl. 366—2 **9 Claims**



1. A method of treating an asphalt-aggregate composition comprising the steps:
- introducing a composition comprising aggregate and asphalt into an input end of a mixing chamber;
- mixing and gradually increasing the temperature of the composition without exposure to flame or hot gases of combustion by continuously passing it between a plurality of heated pipes while drawing the composition toward the opposite end of said mixing chamber; and
- withdrawing volatile hydrocarbon gaseous mixture given off by the heated composition at the output end of the mixing chamber into a heating chamber into which a flame is introduced and directing the hot gases into the pipes.

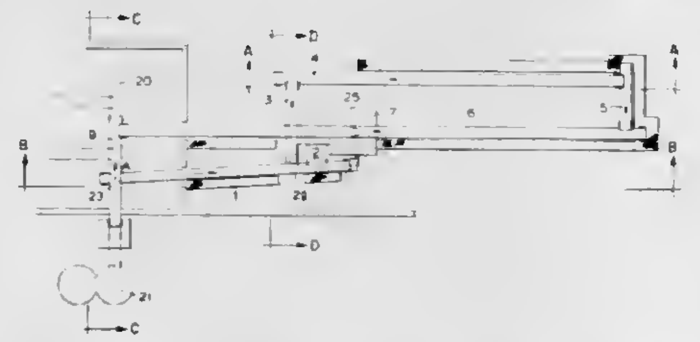
4,106,111
CONCRETE MAKING AND TRANSMISSION
Leo J. Rose, Reston, Va. 22091
Filed Apr. 7, 1977, Ser. No. 785,716
Int. Cl.² B28C *5/38*
U.S. Cl. 366—3 **8 Claims**



1. Concrete making and transmission apparatus comprising a chamber, a hopper for receiving a blend of cement mix, water and aggregate in an amount to produce a setting of the cement, conduit means for conveying the blend of cement from the hopper to said chamber, a nozzle, a transmission conduit coupling said nozzle to said chamber, said chamber having a Venturi means having an orifice and centrally extending within said chamber with its orifice disposed at a location for exiting of the blend of cement from said chamber to said transmission conduit leading to said nozzle, an air compressor means, an air pump means for receiving air from said air compressor means, said air pump having first conveyance means connected thereto for feeding air to said Venturi means for the admixture of air and said blend of cement, a second conveyance means connected to said air pump for feeding air to said transmission conduit leading to the nozzle for pushing and aiding the conveyance of the admixture of air and said blend of cement along the transmission conduit leading to the nozzle, a vibrator element for mechanically vibrating the transmission conduit leading to the nozzle, and a third conveyance means connected to said air pump for feeding air from said air pump for driving said vibrator element.

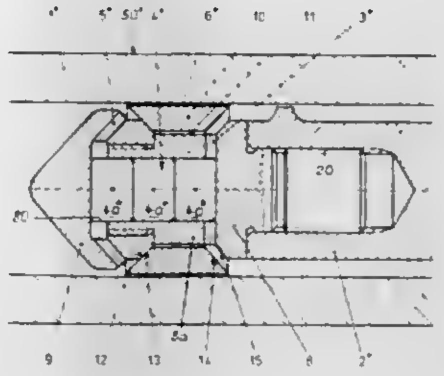
8. Improved method of making and transmitting concrete comprising receiving a blend of cement mix, water and aggregate in an amount to produce a setting of the cement, conveying the blend of cement to a chamber, said chamber having a Venturi means having an orifice and centrally extending within said chamber with its orifice disposed at a location for exiting of the blend of cement from said chamber to a transmission conduit leading to a nozzle, pumping compressed air by means of an air pump and a first conveyance means connected to said air pump to said Venturi means for the admixture of air and said blend of cement, passing the admixture to said transmission conduit, pumping compressed air by means of said air pump and a second conveyance means connected to said air pump to said transmission conduit for pushing and aiding the conveyance of the admixture of air and said blend of cement along said transmission conduit leading to the nozzle, and pumping compressed air by means of said air pump and a third conveyance means connected to said air pump to a vibrator element connected to said transmission conduit for driving said vibrator element to mechanically vibrate said transmission conduit.

4,106,112
HANDLING AND COOLING FOUNDRY SAND
Leonard Leslie Jones, Aldridge, England, assignor to Mechandex Engineering (Wolverhampton) Ltd., Wolverhampton, West Midlands, England
Filed May 9, 1977, Ser. No. 795,281
Claims priority, application United Kingdom, May 14, 1976, 198 95/76
Int. Cl.² B22C *5/16*
U.S. Cl. 366—4 **8 Claims**



1. A process for cooling and handling sand comprising the steps of: mixing hot used sand with cool sand for cooling the hot used sand; circulating the mixed sand on conveyor means for cooling the mixed sand; and separating the mixed sand cooled on the conveyor means to provide a first cool sand fraction for discharce to successive milling and moulding stages, and a second cool sand fraction for said mixing with hot used sand.

4,106,113
FEEDING SCREW ASSEMBLY OF A MOLDING MACHINE FOR PLASTICIZING MASSES, PARTICULARLY, FOR PLASTICS OR RUBBER
Friedrich Laimer, Reichenburg, and Bernhard Roth, Mollis, both of Switzerland, assignors to Netstal-Maschinen AG, Switzerland
Filed Nov. 4, 1976, Ser. No. 739,003
Claims priority, application Switzerland, Nov. 5, 1975, 14336/75
Int. Cl.² A21C *1/06;* **B29B** *1/10;* **B29H** *1/10*
U.S. Cl. 366—79 **5 Claims**

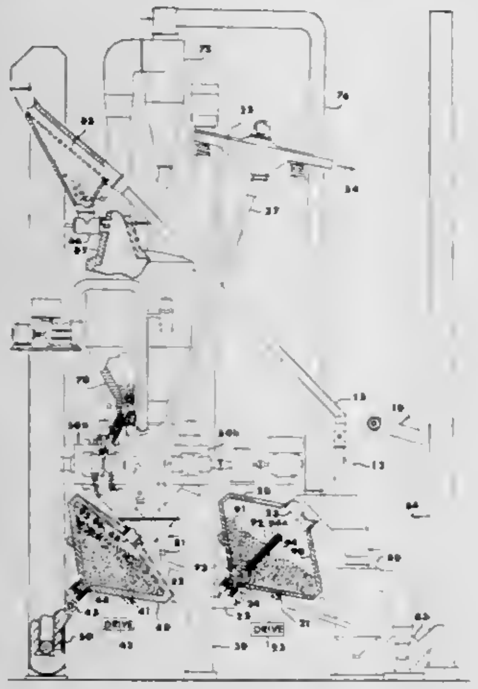


1. In a plasticizer comprising a cylinder having a bore the improvement comprising a feed screw adapted to be rotatably supported within this bore, said feed screw having a forward end with a passage portion, an annular non-return locking ring disposed around said passage portion and defining a ceiling gap clearance therebetween, said screw having a cap portion disposed ahead of said passage portion, a bore extending through said passage portion defining a mixing passage for the material being fed, means in said mixing passage for causing the diversion and intermixing of the material passing therethrough, said screw having a continuous thread on its periphery for advancing material through the bore of the cylinder upon rotation of said screw, a first feed passage defined in said screw at the juncture of said cap portion and said locking ring, and a second feed passage defined alongside the opposite end of said locking ring and extending radially inwardly from the periphery of said screw to said mixing passage, said locking ring being slideable after initial feeding by said screw rotation to at least partially close off one of said first and second feed passages.

4,106,114
INCLINED CONICAL ROTARY VESSELS FOR STORAGE AND TUMBLING OF MATERIALS TO ACCOMPLISH MIXING AND HEAT TRANSFER
James E. Moore, 1401 Meadow La., Glenview, Ill. 60025
Filed Apr. 18, 1977, Ser. No. 788,638
Int. Cl.² B01F *15/02, 15/06, 9/02*
U.S. Cl. 366—131 **23 Claims**

1. In a tumbler assembly for mixing, storing and feeding particulate materials and for transferring heat between different materials, the combination comprising a tumbler having a lower portion in the form of a hollow inverter lower cone enclosed by a circular cover, the cover having an axial inlet and the cone having an axial outlet, means for orienting the tumbler with its axis inclined at an angle of 30° to 75° with respect to the horizontal, the included angle of the cone lying within the range of 80° to 135°, means for supporting the tumbler for rotation about its axis, driving means for rotating the tumbler at a speed lying within the range of a fraction of a revolution per minute up to several revolutions per minute, and means at the outlet for controlling the rate of flow so that a body of material is maintained in the tumbler with mixing thereof by cascading of material added at the inlet across the surface of the body and with the body of materials being continually mixed as the individual particles traverse the body along a multiplicity of paths by intermittent movements at

constantly changing rates and in constantly changing directions, generally from the inlet toward the outlet, as the paths precess orbitally through the mass by reason of the conical shape, inclined axis and rotation of the tumbler.



4,106,115
MIXING APPARATUS

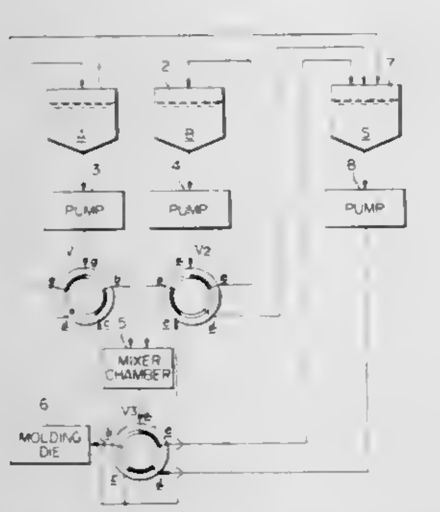
Akio Takahashi, Yokohama, and Hirokichi Saito, Shimizu, both of Japan, assignors to Ihara Chemical Industry Co. Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,933

Claims priority, application Japan, Feb. 20, 1976, 51/16923; Aug. 5, 1976, 51/92794

Int. Cl.² B01F *15/02, 15/04*

U.S. Cl. 366—138 **6 Claims**



1. A material mixing apparatus comprising at least two tanks (1, 2; 41, 42) for starting materials, a corresponding number of material switching means (V1, V2; V41, V42) respectively connected with said tanks through pumps (3, 4; 43, 44), a mixer chamber (5; 45) connected to outlets (*b*) of said switching means, additional switching means (V3; V43) connected to an outlet of said mixer chamber, and a tank (7; 47) for feeding a liquid rinsing agent through a pump (8; 48) to an inlet of at least one (V3, F43) of said switching means; wherein said switching and said additional switching means each include a valve body (9) provided with five openings (*a . . . e*) and a switching element (10) for switchably maintaining two neighboring pairs of said openings in a mutually communicating relationship in each pair, while closing the remaining fifth opening.

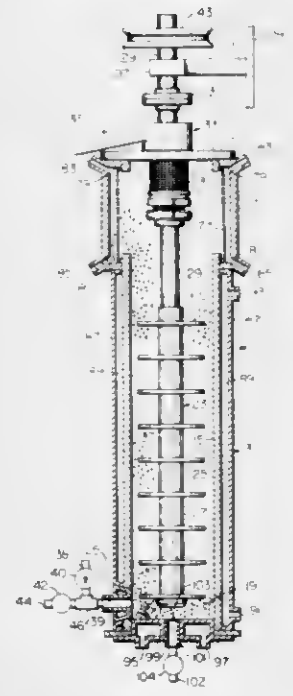
4,106,116
DISPERSING APPARATUS

Malcolm H. MacKay, 140 French Lea Rd., West Seneca, N.Y. 14224

Filed Jan. 7, 1977, Ser. No. 757,737

Int. Cl.² B01F *7/26, 15/02*

U.S. Cl. 366—144 **22 Claims**



1. An apparatus for continuously dispersing a particulate solid material in a liquid vehicle by means of a dispersing media which comprises a vessel having an inlet for a mixture of such particulate material and the liquid vehicle in which it is to be dispersed and an outlet for such particulate material dispersed in the liquid vehicle, an agitator for agitating the particulate material, the liquid vehicle therefor and the media to break up any agglomerates of the particulate material and to disperse such material in the liquid vehicle, said agitator including a rotatable shaft, a stationary screen in the vessel at an inner location at an end thereof and defining a volume, through which screen and into which volume the dispersion of particulate material in liquid vehicle therefor passes to exit from the vessel through the outlet thereof and through which the media cannot pass, said screen being located about the shaft, and a bearing in the vessel and upstream of the screen for holding the shaft in position while permitting the rotation thereof, said bearing having moving and stationary surfaces and a clearance, space between them which is small enough to prevent the media from entering into such clearance space, said clearance space communicating the vessel interior upstream of the screen with the volume defined by the screen.

4,106,117
APPARATUS FOR MIXING PARTICULATE MATERIAL IN A LIQUID

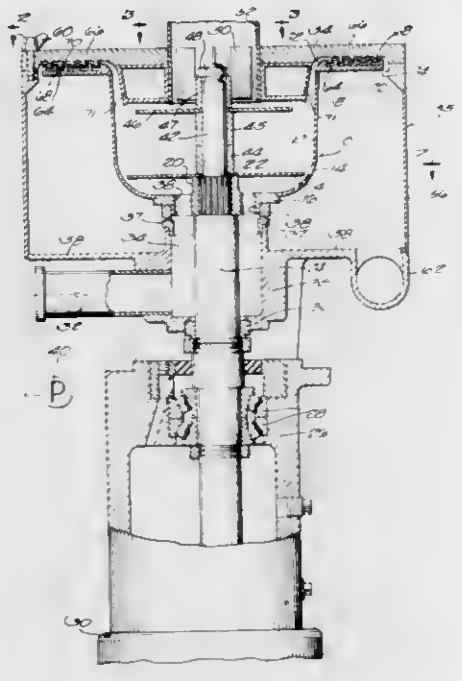
Henry R. Cloots, Summit, Wis., assignor to Waukesha Foundry Company, Inc., Waukesha, Wis.

Continuation-in-part of Ser. No. 684,423, May 7, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,696

Int. Cl.² B01F *9/18, 15/02*

U.S. Cl. 366—154 **16 Claims**

1. Apparatus for mixing liquid and particulate matter comprising a mixing bowl having a vertical axis, means for rotating said bowl about its axis at a speed sufficient to cause a liquid therein to be moved by centrifugal force up the inner surface of the bowl to the rim thereof, means for introducing a liquid into said bowl at a rate that permits an unbroken film of liquid to form on the inner surface of the bowl, means for introducing particulate material in a path having a component of radial motion into said film of liquid and above the place where said liquid enters said bowl, and means for collecting the mixed liquid and particulate material at the rim of said bowl.



4,106,118
FOOD PROCESSING APPARATUS

Richard D. Hoover, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,456

Int. Cl.² B01F *7/16*

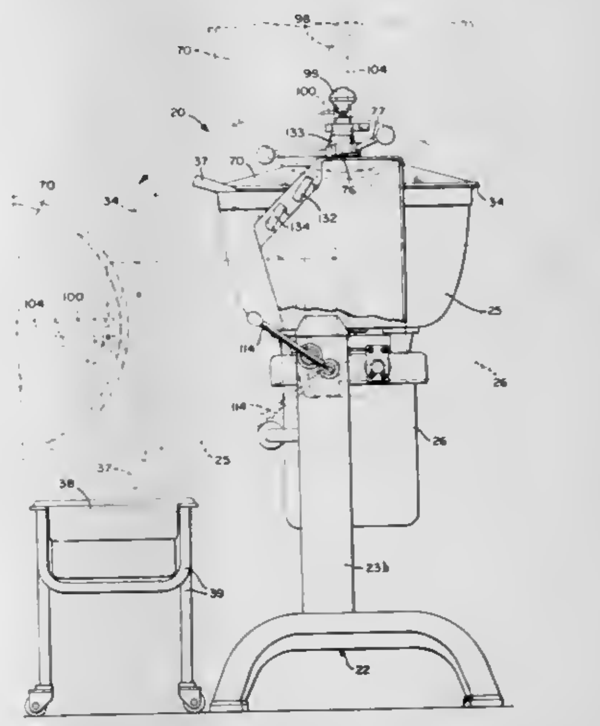
U.S. Cl. 366—185 **4 Claims**

1. A raised height pouring system for an apparatus for processing foodstuffs, the apparatus including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, and a cover system including a lid for closing the top of the bowl, comprising:

(a) a stand,

(b) pivot means supporting the bowl on the stand and defining an axis of rotation for the bowl for pivoting the bowl in a pouring direction from an upright, food processing position to a tilted pouring position, said axis being substantially horizontal and located between the center line of the bowl and the edge of the bowl toward which it is tilted when rotated to the pouring position, to provide a greater pouring height than if the axis passed through the center line of the bowl, and

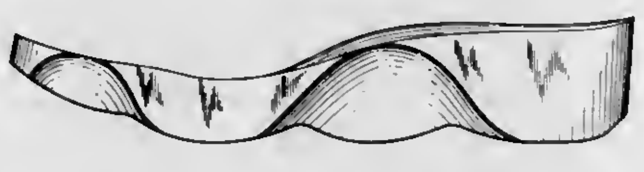
(c) a counterbalance spring assembly including means operative through said pivot means between said stand and the bowl for counterbalancing the apparatus during tilting thereof.



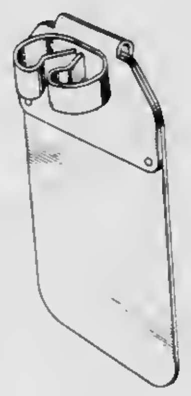
DESIGNS

AUGUST 8, 1978

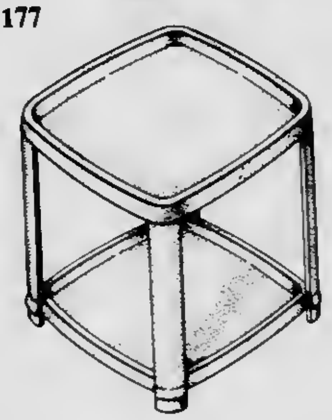
248,796
SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Jun. 11, 1976, Ser. No. 695,138
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322



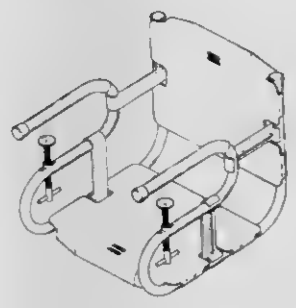
248,797
HOLSTER
Theodore Sanders, Newport Beach, Calif., assignor to Pacific Handy Cutter, Inc.
Filed Jul. 19, 1976, Ser. No. 706,767
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



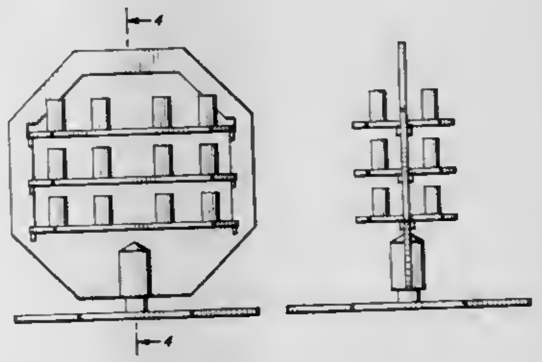
248,798
TABLE
James R. Driscoll, 404 Winston Ave., Dayton, Ohio 45403
Filed Sep. 9, 1976, Ser. No. 721,884
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



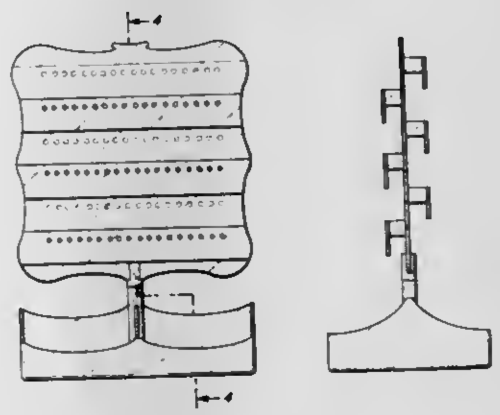
248,799
PORTABLE HIGH CHAIR
Donald Gilbert Adams, R.R. 1, Box 557, High Ridge, Mo. 63049
Filed Jul. 22, 1976, Ser. No. 707,609
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



248,800
RING AND THIMBLE HOLDER
Eddie Tafoya, 518 Chapman Ct., Santa Clara, Calif. 90505
Filed Jan. 7, 1977, Ser. No. 757,743
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—24

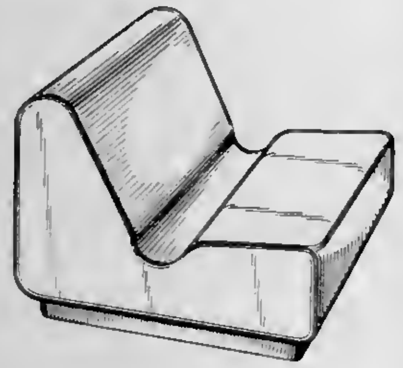


248,801
COMBINED EARRING AND JEWELRY HOLDER
Eddie Tafoya, 518 Chapman Ct., Santa Clara, Calif. 90505
Filed Jan. 21, 1977, Ser. No. 761,548
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—25



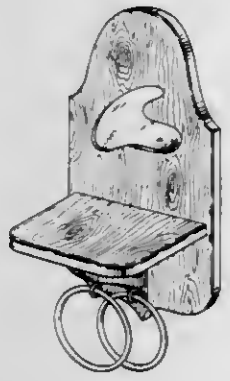
248,802
ADULT'S CHAIR

R. Duane Iselin, Flourtown, Pa., assignor to Mobi Corporation, Philadelphia, Pa.
Filed Apr. 27, 1976, Ser. No. 680,683
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



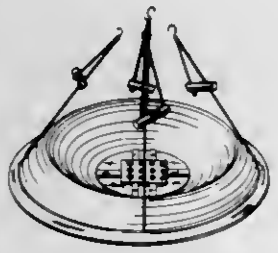
248,803
COMBINED SHELF AND TOWEL RINGS

Geral H. Newton, 3165 Aroba Way, San Jose, Calif. 95118
Filed May 4, 1977, Ser. No. 793,896
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—91



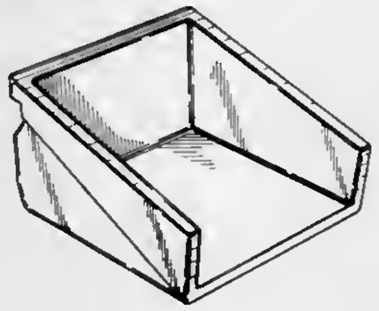
248,804
CUT TREE HOLDER

James M. Budd, 518 N. 7th St., Osage, Iowa 50461
Filed Apr. 7, 1976, Ser. No. 674,499
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—105



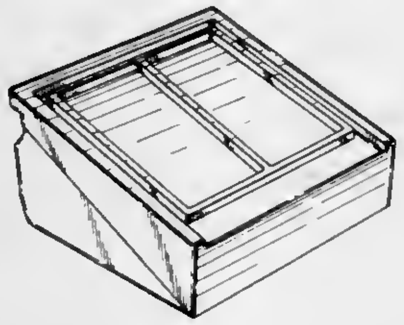
248,805
WALL MOUNTED MODULAR TRAY

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Jan. 17, 1977, Ser. No. 760,089
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—136



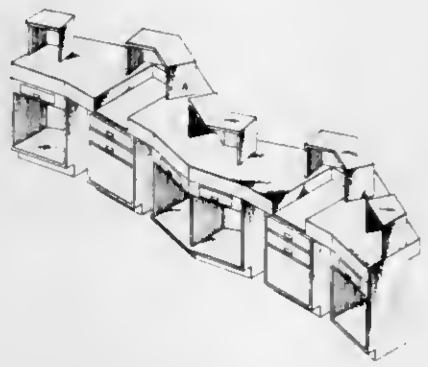
248,806
WALL MOUNTED MODULAR TRAY

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Jan. 17, 1977, Ser. No. 760,091
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—136



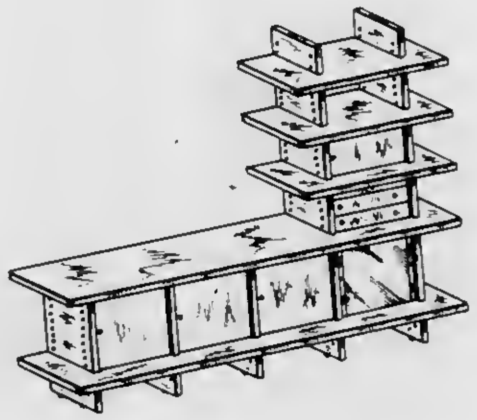
248,807
MULTIPLE STATION SERVICE COUNTER

Vernon C. Canfield, P.O. Box 7291, Rt. 7, Bainbridge Island, Wash. 98110, and Charles F. Anderson, 1265 Old Mill Rd., San Marino, Calif. 91108
Filed Aug. 30, 1976, Ser. No. 718,933
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



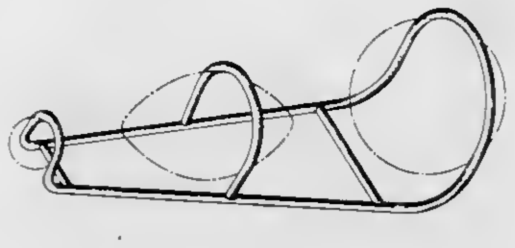
248,808
COMBINED SHELF AND CABINET UNIT

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti
Division of Ser. No. 595,406, Jul. 14, 1975. This application Oct. 26, 1976, Ser. No. 735,533
Claims priority, application Italy, Jan. 15, 1975, 60904/75; Jan. 15, 1975, 60905/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169



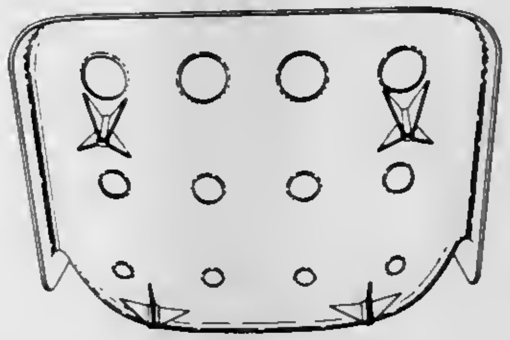
248,809
DISPLAY RACK

John C. Kailey, 9261 Elben Pl., Sun Valley, Calif. 91352
Filed Aug. 9, 1976, Ser. No. 712,531
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—188



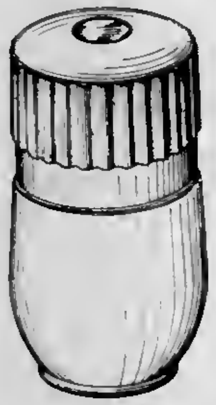
248,810
CHAIR SHELL

Ronald Henry Day, London, England, assignor to Hille International Limited, Watford, England
Filed Oct. 10, 1975, Ser. No. 621,345
Claims priority, application United Kingdom, Jun. 6, 1975, 971367/75
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



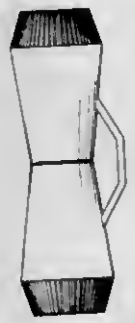
248,811
PEPPER MILL OR THE LIKE

Walter Schlessel, Lawrence, N.Y., assignor to Gemco-Ware Inc.
Filed Aug. 15, 1975, Ser. No. 604,940
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—53



248,812
DOUBLE ENDED VACUUM BOTTLE

John H. Eiserman, 1616 16th St., Monroe, Wis. 53566
Filed Oct. 18, 1976, Ser. No. 733,457
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—77



248,813

HAMBURGER COOKER

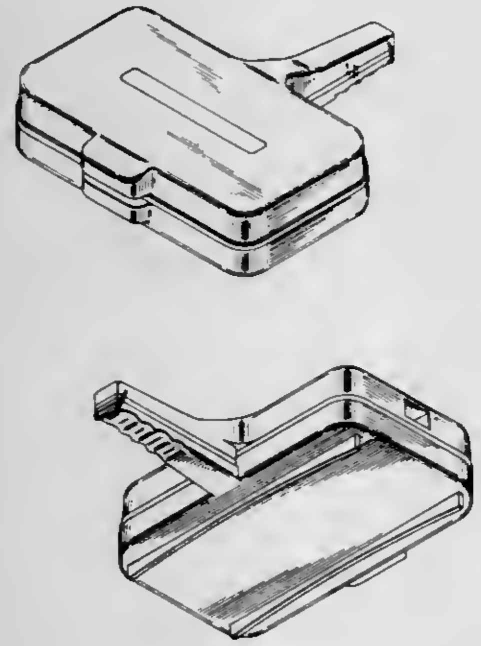
Tetsuro Mizoguchi, Fort Lee, N.J., assignor to Sanyei Corporation, Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 677,568

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—88



248,814

NUT CRACKER

Peter Kingsley Bayly, Eltham North, Australia, assignor to Wiltshire Cutlery Company Proprietary Ltd., South Melbourne, Australia

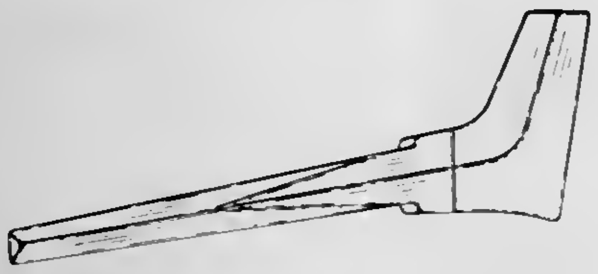
Filed Jul. 16, 1976, Ser. No. 705,902

Claims priority, application Australia, Feb. 13, 1976, 68606

Term of patent 14 years

Int. Cl. D7—*06*

U.S. Cl. D7—98



248,815

GRILL PLATE FOR A COOKING UTENSIL

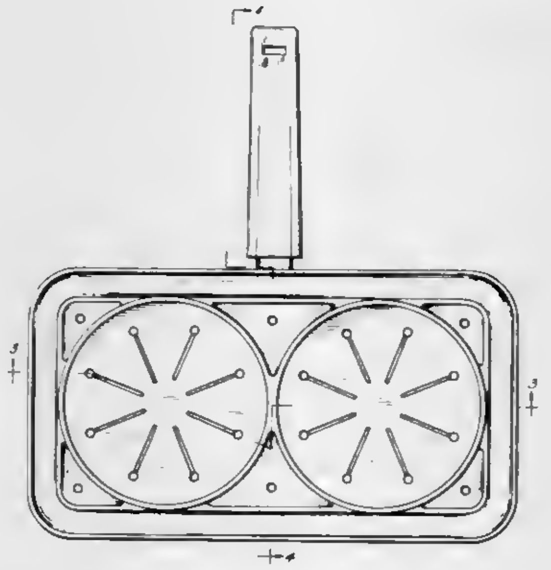
Tetsuro Mizoguchi, Fort Lee, N.J., assignor to Sanyei Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 677,568, Apr. 16, 1976. This application Jul. 12, 1976, Ser. No. 704,418

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—129



248,816

RETRACTABLE SHOE CLEANER

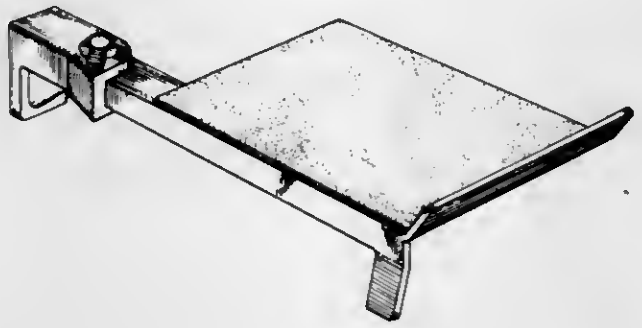
Victor K. Futami, 319 N. Vancouver Ave., Los Angeles, Calif. 90022

Filed Feb. 14, 1977, Ser. No. 768,374

Term of patent 14 years

Int. Cl. D7—*05;* D12—*16*

U.S. Cl. D7—182



248,817

PHONOGRAPH RECORD CLEANER

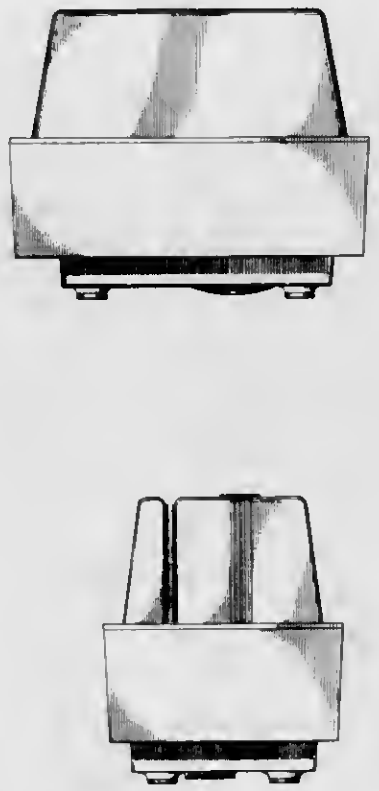
Richard O. Spencer, 18 Viejo, Irvine, Calif. 92715

Filed Mar. 24, 1977, Ser. No. 781,030

Term of patent 14 years

Int. Cl. D7—*05;* D4—*01*

U.S. Cl. D7—161



248,818

FIRE GRATE

Norman F. Dacey, Box 545, Port Hope, Ontario, Canada (L1A 3Z4)

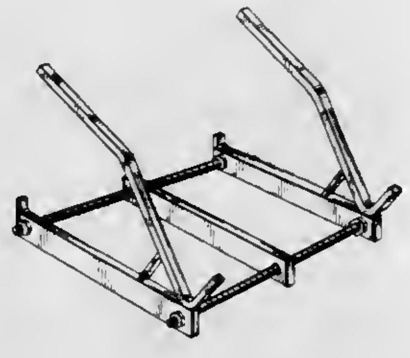
Filed Apr. 22, 1977, Ser. No. 790,067

Claims priority, application Canada, Apr. 15, 1977, 15-04-77-4

Term of patent 14 years

Int. Cl. D7—*08*

U.S. Cl. D7—207



248,819

CONTOUR HOE

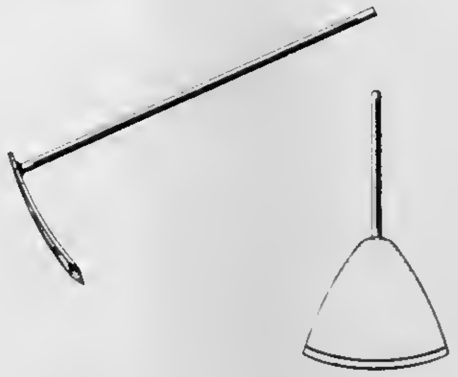
Kenneth H. Hare, 4938 Sharp St., Dallas, Tex. 75247

Filed May 3, 1976, Ser. No. 682,498

Term of patent 14 years

Int. Cl. D8—*01*

U.S. Cl. D8—11



248,820

IMPACT WRENCH

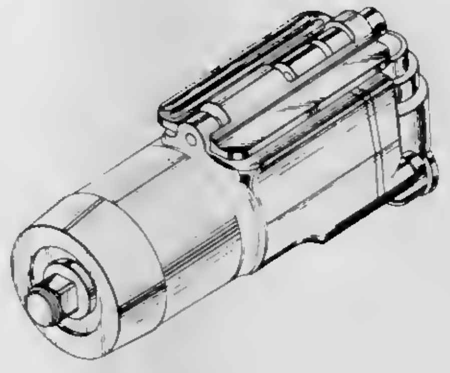
Robert D. Roth, Utica, and Raymond J. Schaedler, Hartford, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Feb. 17, 1977, Ser. No. 769,708

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—61



248,821

HANDLE FOR A POWER TOOL OR SIMILAR ARTICLE

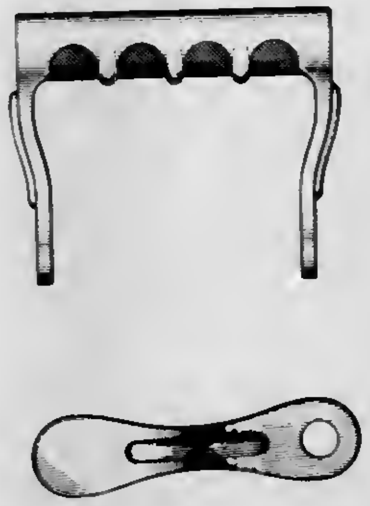
H. Gerald Poe, Fort Worth, Tex., assignor to F & B Manufacturing, Inc., Odessa, Tex.

Filed Oct. 12, 1976, Ser. No. 731,562

Term of patent 14 years

Int. Cl. D8—*06*

U.S. Cl. D8—107



248,822

REINFORCEMENT BRACKET

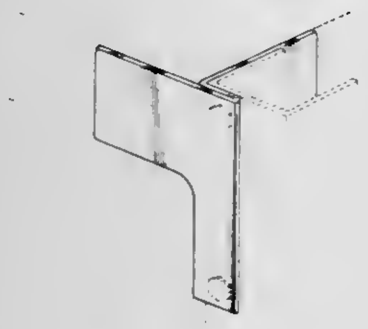
Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Kumamoto, Japan

Filed Mar. 25, 1977, Ser. No. 781,494

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—354



248,823

ROOM DIVIDER CONNECTOR OR SIMILAR DEVICE

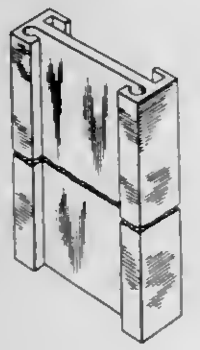
Austin Eckerline, Ladysmith, Wis., assignor to Conwed Corporation, St. Paul, Minn.

Filed Jul. 16, 1976, Ser. No. 706,006

Term of patent 14 years

Int. Cl.^{2} D8—*08*

U.S. Cl. D8—382



248,824

BOLT

Yoshio Imai, Abiko, and Katsumi Koizumi, Koshigaya, both of Japan, assignors to Kabushiki Kaisha Sannohashi Seisakusho, Japan

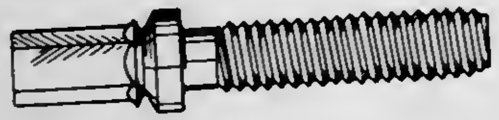
Filed Aug. 11, 1976, Ser. No. 713,600

Claims priority, application Japan, Jun. 4, 1976, 51-20773

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—387



248,825

MESSAGE HOLDER

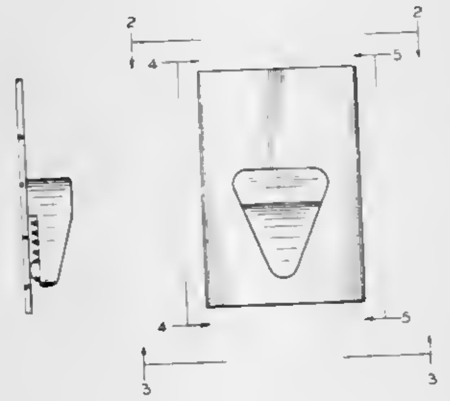
Wilbert W. Redmer, 71 Northeast 11th Way, Deerfield Beach, Fla. 33441

Filed Apr. 30, 1976, Ser. No. 681,800

Term of patent 14 years

Int. Cl. 19—*02;* 14—*99*

U.S. Cl. D8—395



248,826

LINK UNIT FOR A CONVEYOR CHAIN

Erkki Topias Lehtola, Kaskinen, Finland, assignor to Oy Tähkä AB, Finland

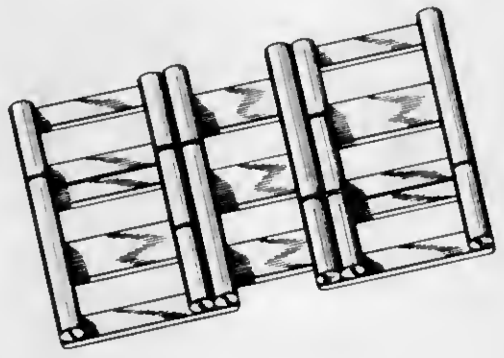
Filed Jun. 9, 1976, Ser. No. 694,297

Claims priority, application Finland, Dec. 9, 1975, 653/75

Term of patent 14 years

Int. Cl. D8—*99;* D12—*05*

U.S. Cl. D8—499



248,827

COMBINED BOTTLE AND BREAKAWAY CLOSURE

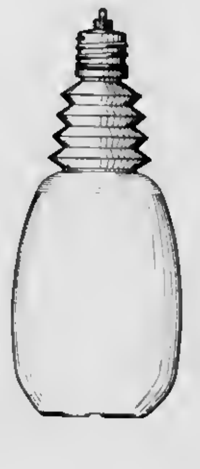
Willfred Goldschmidt, Weston, and Wiley Alan Kittrell, Greenwich, both of Conn., assignors to Beecham, Inc., Clifton, N.J.

Filed Nov. 26, 1976, Ser. No. 745,195

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—2



248,828

BOTTLE

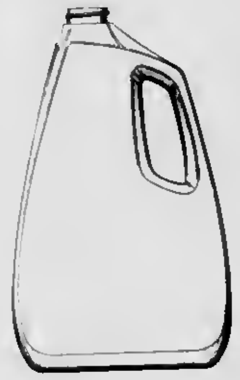
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.

Filed Dec. 27, 1976, Ser. No. 754,781

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—42



248,829

JUG

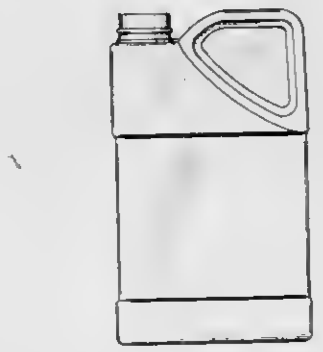
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 8, 1976, Ser. No. 730,902

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—44



248,830

JUG

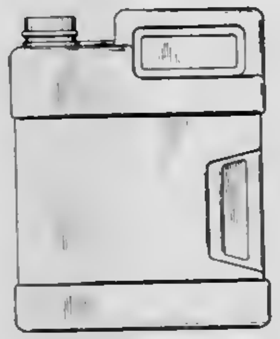
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 8, 1976, Ser. No. 730,903

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—52



248,831

JUG

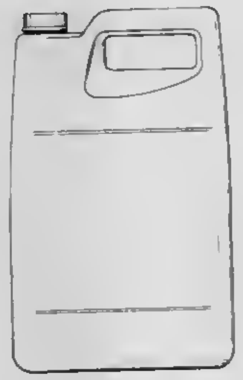
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 8, 1976, Ser. No. 731,054

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—52



248,832

BOTTLE

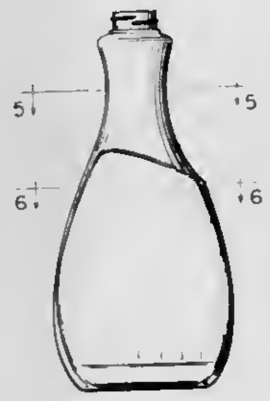
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.

Filed Nov. 22, 1976, Ser. No. 743,742

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—60

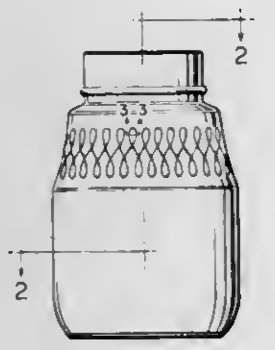


248,833

BOTTLE

Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Mar. 22, 1976, Ser. No. 669,140
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—101

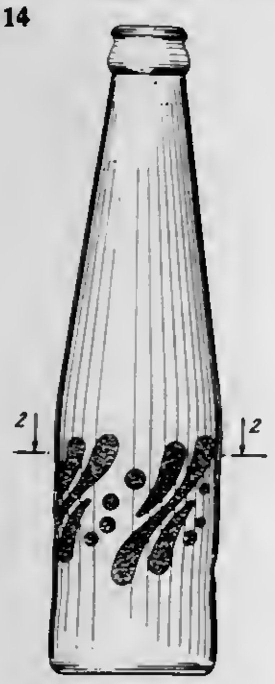


248,834

BOTTLE

Fred Ferdinand Morgan, Blonay, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Switzerland
Filed Sep. 2, 1975, Ser. No. 609,575
Claims priority, application Switzerland, Mar. 5, 1975, 60596/75
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—114

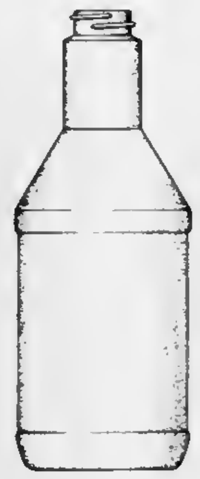


248,835

BOTTLE OR THE LIKE

Fred B. Korsmeyer, Madison, Conn., assignor to FBK Industries, Inc., New Haven, Conn.
Filed Oct. 6, 1976, Ser. No. 730,268
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—159

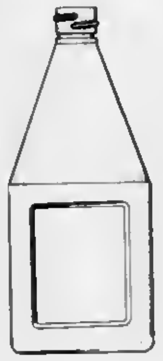


248,836

BOTTLE

Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 730,923
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—167

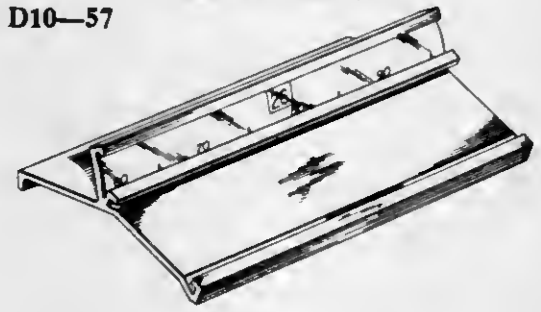


248,837

DESK THERMOMETER

James E. Hutten, Mason, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio
Filed Sep. 22, 1976, Ser. No. 725,658
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D10—57

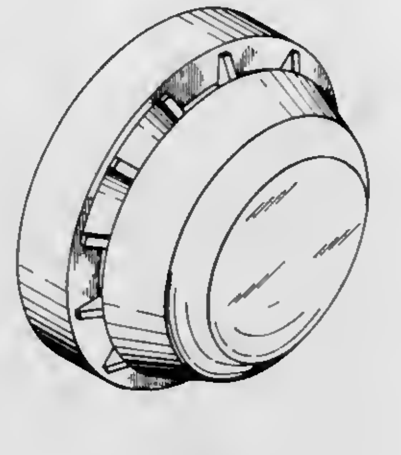


248,838

ROUND THERMOSTAT GUARD

Ralph E. Pasquarette, Jordan, and Norbert Thomas Wolfe, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 9, 1976, Ser. No. 694,513
Term of patent 14 years
Int. Cl. D10—*07*

U.S. Cl. D10—60

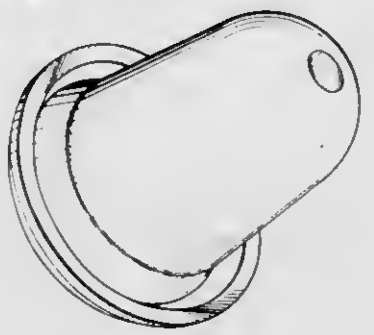


248,839

END CAP FOR A THERMOMETER PROBE COVER

Robert B. Turner, Weymouth, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Sep. 16, 1976, Ser. No. 723,854
Term of patent 14 years
Int. Cl. D10—*07*

U.S. Cl. D10—60

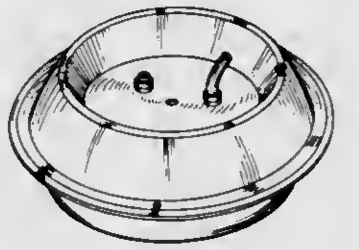


248,840

BUOY

Harold Aesch, Sr., 626 W. Oak Ridge Rd.; Harold Aesch, Jr., 820 E. Buchanon Ave., both of Orlando, Fla. 32809, and Darrell N. Welch, 3305 Arnel Ct., Winter Park, Fla. 32789, assignors to Harold W. Aesch, Sr.; Harold W. Aesch, Jr.; Darrell N. Welch; Asis K. Saha and John B. Pollet, part interest to each
Filed Jun. 11, 1976, Ser. No. 695,208
Term of patent 14 years
Int. Cl. D10—*06*

U.S. Cl. D10—107

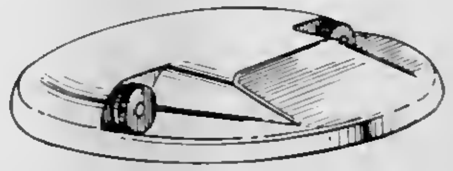


248,841

REFLECTIVE PAVEMENT MARKER

Joseph W. Montigny, 2441 Merced, South El Monte, Calif. 91733
Filed Jun. 9, 1976, Ser. No. 694,298
Term of patent 14 years
Int. Cl. D10—*06*

U.S. Cl. D10—113

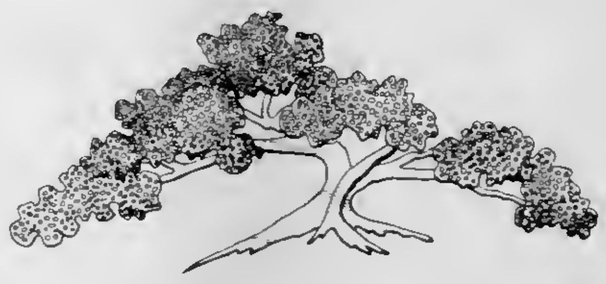


248,842

SPREADING TREE PLAQUE

Donald R. Ditto, 4938 Sharp St., Dallas, Tex. 75247
Filed May 24, 1976, Ser. No. 689,140
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D11—118

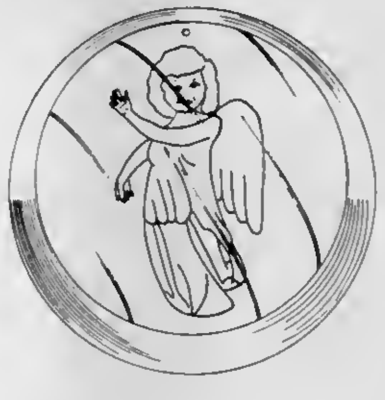


248,843

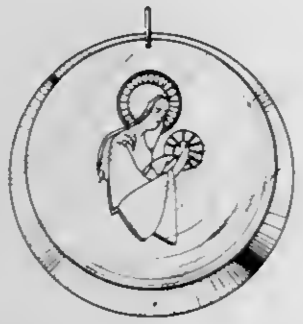
CHRISTMAS ORNAMENT

William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,520
Term of patent 14 years
Int. Cl. D11—*05*

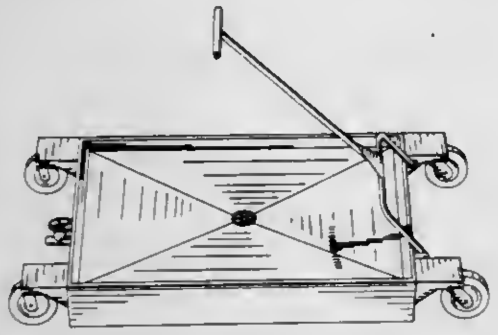
U.S. Cl. D11—127



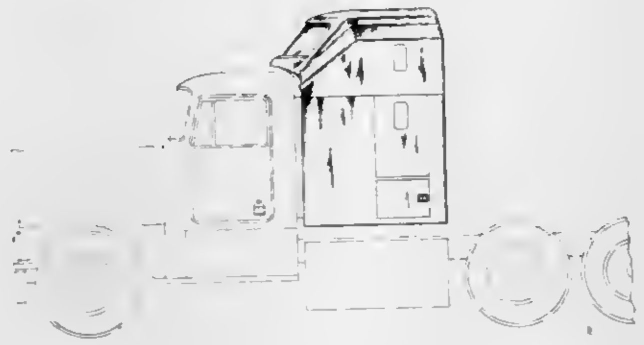
248,844
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,621
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

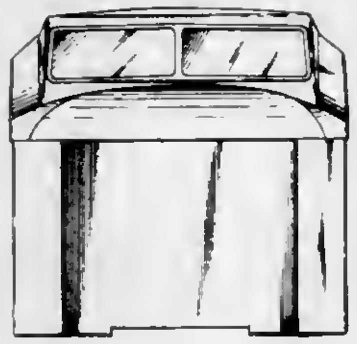


248,845
MOBILE DRAIN PAN FOR LIQUID STORAGE AND RECOVERY
Robert E. White, 3717 S. Taft Hill Rd. # 252, and Brice E. Bergquist, 5416 S. County Rd. # 7, both of Fort Collins, Colo. 80521
Filed Jan. 28, 1977, Ser. No. 763,237
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25

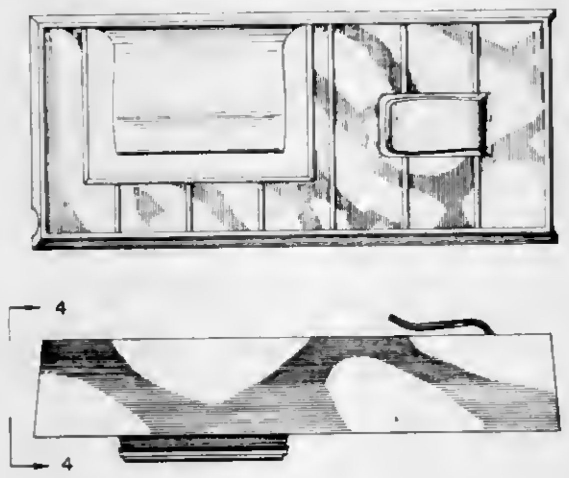


248,846
TRUCK SLEEPER COMPARTMENT
James C. Stage, Seattle; Albert B. Bliveo, Reoton, and James E. Wohlhueter, Auburn, all of Wash., assignors to PACCAR Inc., Bellevue, Wash.
Filed Oct. 27, 1976, Ser. No. 736,214
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

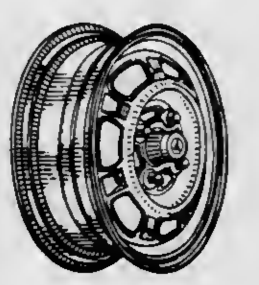




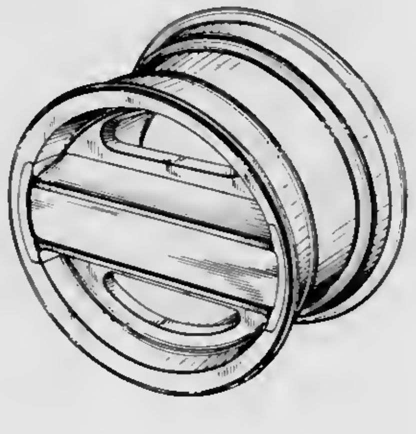
248,847
AUTOMOBILE VISOR ATTACHMENT
Dwight N. Wooters, LaGrange, Ga., assignor to Rubbermaid Specialty Products Inc., LaGrange, Ga.
Filed Mar. 23, 1977, Ser. No. 780,659
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191



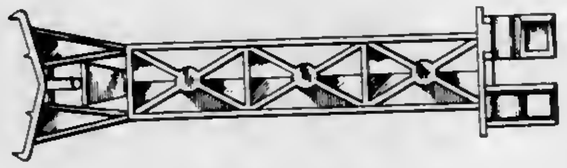
248,848
WHEEL
Hirotsune Taitani, Seto, and Yoshihiro Hamasaki, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jun. 29, 1977, Ser. No. 811,366
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



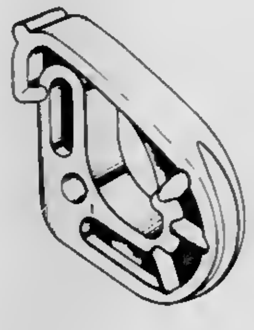
248,849
WHEEL
Edward A. Kozloski, Babylon, N.Y., assignor to Fiat Motors of North America, Montvale, N.J.
Division of Ser. No. 719,721, Sep. 2, 1976, Pat. No. Des. 246,239. This application Jul. 18, 1977, Ser. No. 816,283
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



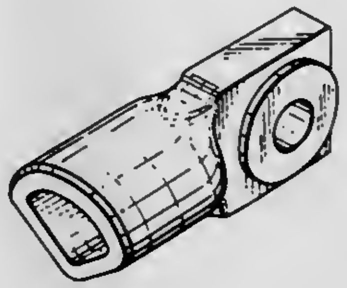
248,850
ELECTRIC FENCE EXTENDER FOR WOODEN POSTS
Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026
Filed Apr. 25, 1977, Ser. No. 790,563
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17



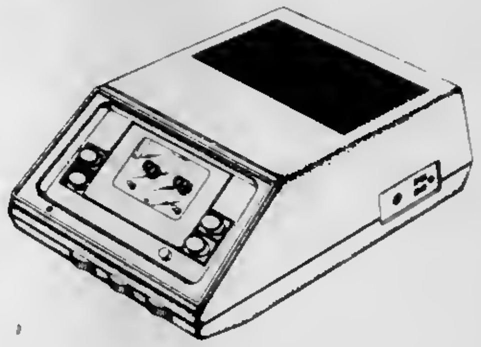
248,851
CORNER INSULATOR FOR ELECTRIC FENCES
Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed Jul. 29, 1976, Ser. No. 709,884
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—18



248,852
ELECTRICAL TERMINAL
John Iceton, Ewell Rd., Surbiton, Surrey, England
Filed Jan. 22, 1976, Ser. No. 651,658
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



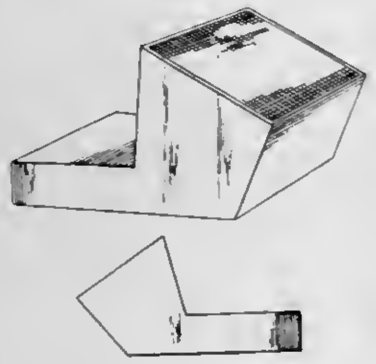
248,853
TRANSCRIBER
David K. Walz, Stone Mountain, Ga., and Toshihiko Kadota, Hachioji, Japan, assignors to Lanier Business Products, a Division of Oxford Industries Inc., Atlanta, Ga. and Olympus Optical Company Ltd., Tokyo, Japan
Filed Apr. 5, 1976, Ser. No. 673,749
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3



248,854
SPEAKER ENCLOSURE

Warren Ripple, 2839 Sterling La., Sarasota, Fla. 33581
Division of Ser. No. 550,089, Feb. 14, 1975, Pat. No. Des. 244,696. This application Jul. 6, 1976, Ser. No. 714,935
Term of patent 14 years
Int. Cl. D14—*01*

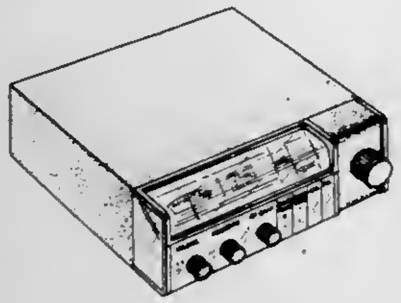
U.S. Cl. D14—30



248,855
C. B. RADIO

James T. Asaki, Fair Haven, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.
Filed Aug. 17, 1976, Ser. No. 715,345
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D14—75

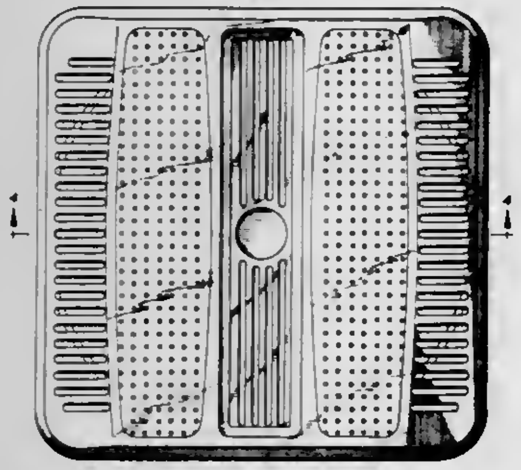


248,856
SPEAKER GRILL

Jack R. Saidel, 1618 Heather-Hill Crescent, Flossmoor, Ill. 60422
Filed Oct. 22, 1976, Ser. No. 734,714
Term of patent 7 years
Int. Cl. D14—*01, 99*

U.S. Cl. D14—39

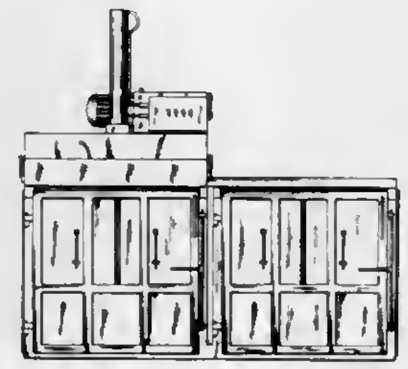
FIG 1



248,857
PAPER PRESS FOR WASTE

Bengt Andersson, Gyllensvardsgatan 11, S-302 34 Halmstad, Sweden
Filed Aug. 16, 1976, Ser. No. 714,888
Claims priority, application Sweden, Feb. 16, 1976, 760355
Term of patent 14 years
Int. Cl. D15—*09*

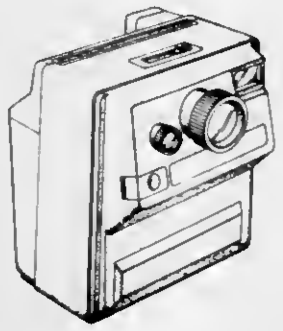
U.S. Cl. D15—123



248,858
CAMERA

Hiroshi Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Jan. 21, 1977, Ser. No. 761,035
Claims priority, application Japan, Jul. 20, 1976, 51-28259
Term of patent 14 years
Int. Cl. D16—*01*

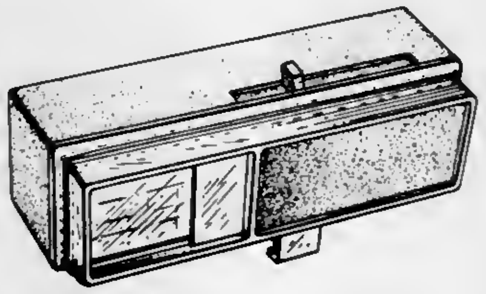
U.S. Cl. D16—06



248,859
PHOTOFLASH ATTACHMENT FOR CAMERAS

James T. Asaki, Fair Haven, N.J., assignor to International Telephone & Telegraph Corporation
Filed Jul. 21, 1976, Ser. No. 707,162
Term of patent 14 years
Int. Cl. D16—*05*

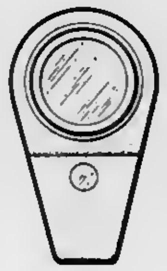
U.S. Cl. D16—42

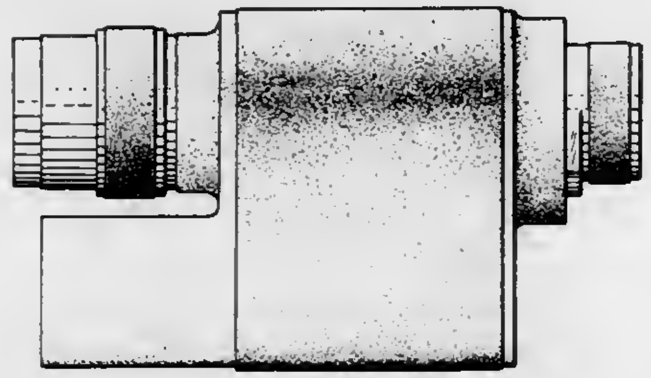


248,860
NIGHT VISION POCKETSCOPE

Douglas M. Spranger, Brooklyn; Malcolm J. Brookes, and Peter O. Schmidt, both of New York, all of N.Y., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.
Filed Mar. 11, 1976, Ser. No. 665,984
Term of patent 14 years
Int. Cl. D16—*06*

U.S. Cl. D16—62

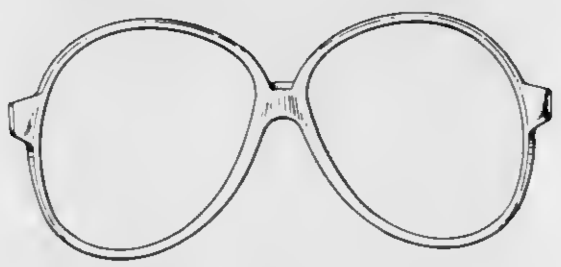




248,861
SPECTACLES FRAME FRONT

David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 21, 1977, Ser. No. 779,449
Term of patent 14 years
Int. Cl. D16—*06*

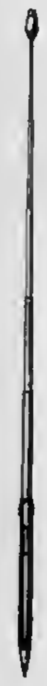
U.S. Cl. D16—65

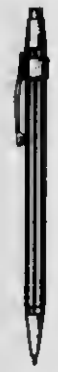


248,862
COMBINED MECHANICAL PENCIL AND POINTER

Naoyoshi Miyamoto, 12-23, 3-chome, Isobe, Annaka-shi, Gunma-ken, Japan
Filed Jun. 9, 1976, Ser. No. 694,226
Term of patent 14 years
Int. Cl. D19—*06*

U.S. Cl. D19—36

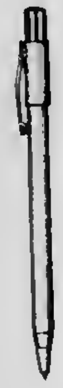


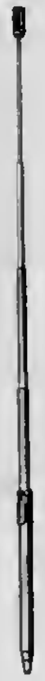


248,863
COMBINED BALL POINT PEN AND POINTER

Naoyoshi Miyamoto, 12-23, 3-chome, Isobe, Annaka-shi, Gunma-ken, Japan
Filed Jun. 9, 1976, Ser. No. 694,227
Term of patent 14 years
Int. Cl. D19—*06*

U.S. Cl. D19—36

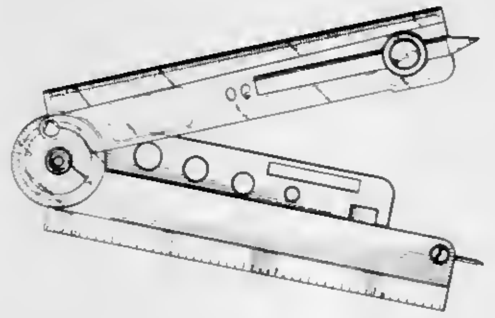




248,864
COMBINED MEASURING AND DRAWING INSTRUMENT

Watson Yen, 1525 N. Hayworth Ave., Apt. 301, Los Angeles, Calif. 90046
Filed Sep. 10, 1976, Ser. No. 722,239
Term of patent 14 years
Int. Cl. D19—*06*

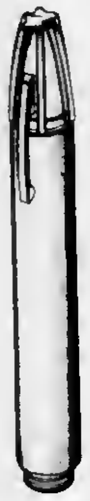
U.S. Cl. D19—36



248,865
MARKING PEN

Philip Sussman, Orlando, and Francis Andrews, Apopka, both of Fla., assignors to Mark-Tex Corporation, Englewood, N.J.
Filed Mar. 16, 1977, Ser. No. 778,055
Term of patent 14 years
Int. Cl. D19—*06*

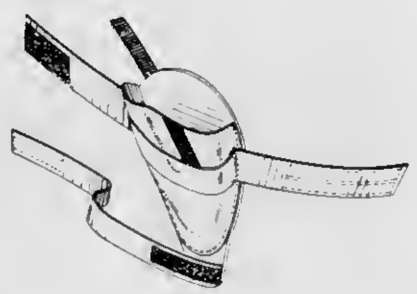
U.S. Cl. D19—43



248,866
LEG HOLSTER

Rafael L. Gonzales, 919 San Francisco, San Antonio, Tex. 78201
Filed Sep. 17, 1976, Ser. No. 724,165
Term of patent 14 years
Int. Cl. D3—*02*

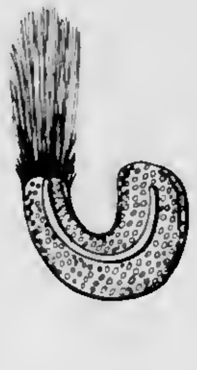
U.S. Cl. D22—13



248,867
ARTIFICIAL FISHING LURE

William O. Williams, Jr., 1309 Lynhurst Dr., Gastonia, N.C. 28052
Filed Nov. 24, 1976, Ser. No. 744,625
Term of patent 14 years
Int. Cl. D22—*05*

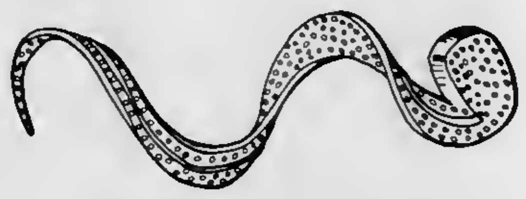
U.S. Cl. D22—27



248,868
ARTIFICIAL FISHING LURE

William O. Williams, Jr., 1309 Lynhurst Dr., Gastonia, N.C. 28052
Filed Dec. 2, 1976, Ser. No. 746,784
Term of patent 14 years
Int. Cl. D22—*05*

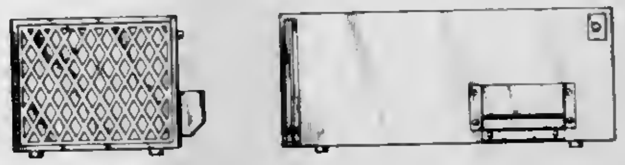
U.S. Cl. D22—27



248,869
AIR PURIFIER

Charles J. Risher, 3641 Pillsbury, Minneapolis, Minn. 55402
Filed Jan. 14, 1977, Ser. No. 759,372
Term of patent 7 years
Int. Cl. D23—*04*

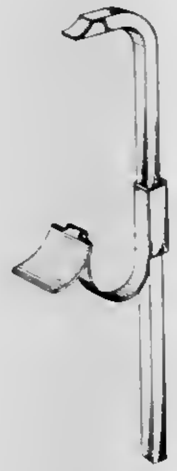
U.S. Cl. D23—149



248,870
DENTAL LOCATOR FOR POSITIONING DENTURE

Martin A. Hass, 11704 Wilshire Blvd. Suite 222, Los Angeles, Calif. 90025
Filed Apr. 18, 1977, Ser. No. 788,441
Term of patent 14 years
Int. Cl. D24—*02*

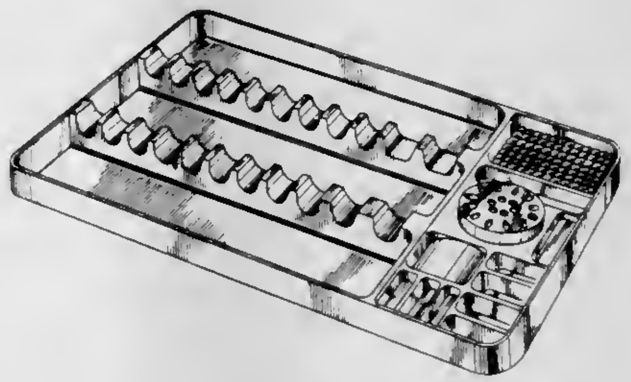
U.S. Cl. D24—10



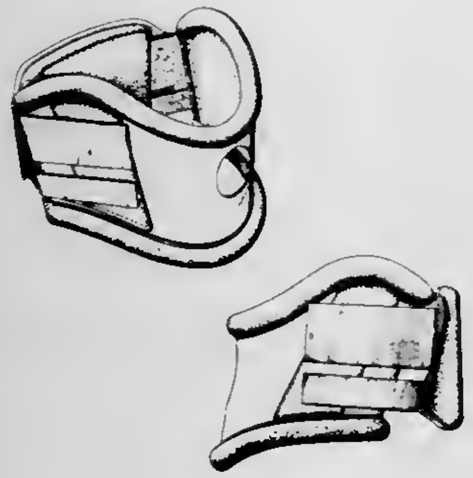
248,871
SURGICAL INSTRUMENT TRAY

Tore Alexander Forsman, Sveavägen, and Christer Odvik, Djursholm, both of Sweden, assignors to Toringe Consult AB, Saltsjöbaden and Christer Odvik AB, Djursholm, both of, Sweden
Filed Apr. 6, 1976, Ser. No. 674,272
Claims priority, application Sweden, Oct. 7, 1975, 7500201
Term of patent 14 years
Int. Cl. D24—*04*

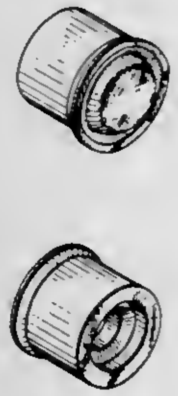
U.S. Cl. D24—31



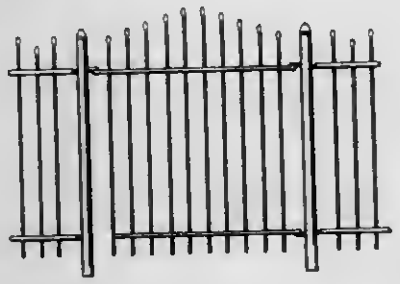
248,872
CERVICAL COLLAR
Morton I. Thomas, 101 Gedney St., Nyack, N.Y. 10960
Filed Nov. 17, 1976, Ser. No. 742,487
Term of patent 14 years
Int. Cl. D24—*04;* D2—*01*
U.S. Cl. D24—64



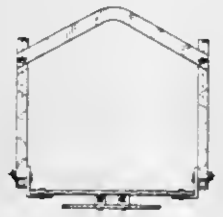
248,873
BLOOD GAS SYRINGE STOPPER
Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Keene, N.H.
Filed Jul. 1, 1976, Ser. No. 701,609
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

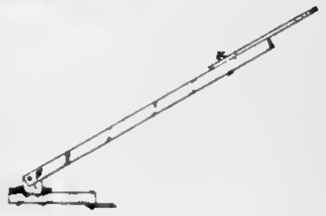


248,874
COMBINED FENCE AND GATE
Dan Prause, Rte. #2, Box 159, Alleyton, Tex. 78935
Filed Apr. 5, 1977, Ser. No. 784,922
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—39

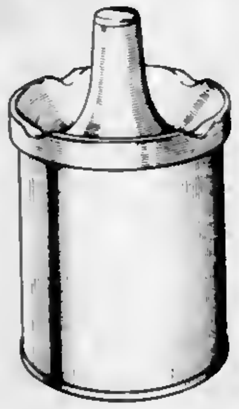


248,875
TREE CLIMBER AND SEAT OR THE LIKE
Alvin E. Warren, 1115 Lane Ave., North, Jacksonville, Fla. 32205, and George B. Sweat, 4121 Aldington Dr., Jacksonville, Fla. 32210
Filed Dec. 10, 1976, Ser. No. 749,459
Term of patent 14 years
Int. Cl.^{2} D25—*99*
U.S. Cl. D25—62

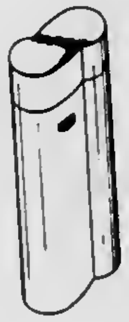




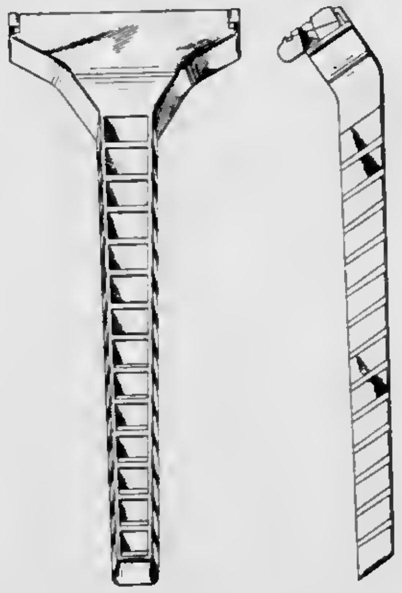
248,876
ASHTRAY
Åke Albin Hultberg, Box 57, S-150 30 Mariefred, Sweden
Filed Nov. 22, 1976, Ser. No. 743,714
Claims priority, application Sweden, Aug. 4, 1976, 761541
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—27



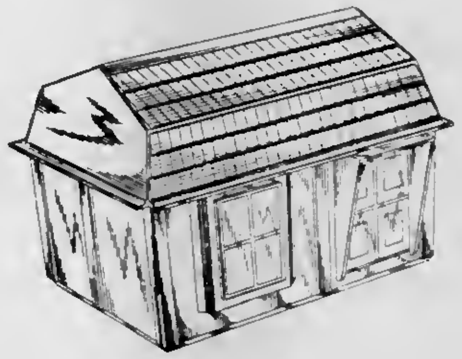
248,877
LIGHTER
Anthony Roberts Harris, Hanworth, England, assignor to Dunhill Lighters Limited, London, England
Filed Apr. 4, 1975, Ser. No. 565,264
Claims priority, application United Kingdom, Oct. 22, 1974, 968366/74
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36



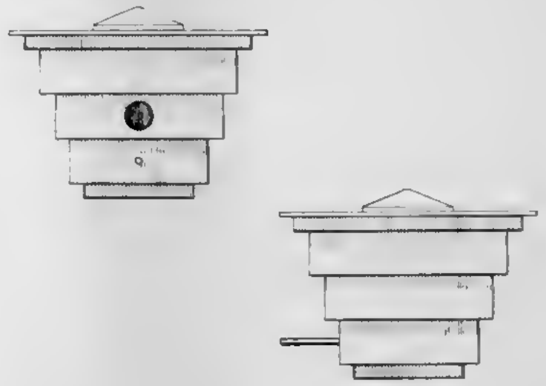
248,878
RAZOR
Hans Halm, Castroper Strasse 34, 4650 Herne 1, Fed. Rep. of Germany
Filed Sep. 7, 1976, Ser. No. 720,845
Claims priority, application United Kingdom, Mar. 10, 1976, 974850/76
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



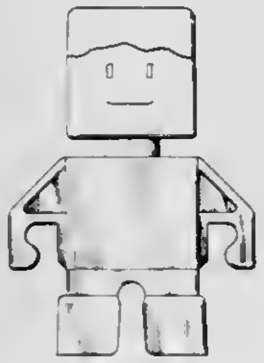
248,879
PET HOUSE
David E. Hill, Gardner, Kans. 66030
Filed Aug. 6, 1976, Ser. No. 757,647
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—1



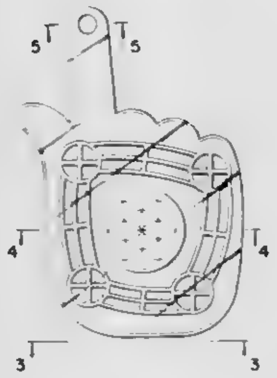
248,880
BIRDHOUSE
Walter H. Podjan, 1500 Rocky Gap, Benton Harbor, Mich. 49022
Filed Mar. 14, 1977, Ser. No. 776,831
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—3



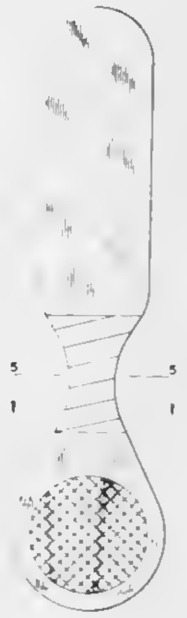
248,881
TOY FIGURE
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91345; Erwin Benkoe, deceased, late of Encino, Calif. by Elizabeth Benkoe, executrix; Delmar K. Everitt, Woodland Hills, Calif.; Ronald F. Chesley, La Crescenta, Calif., and Richard D. Friedrich, Canoga Park, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif. and Elizabeth Benkoe, Encino, Calif., executrix of the estate of Erwin Benkoe
Filed Feb. 18, 1977, Ser. No. 770,221
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



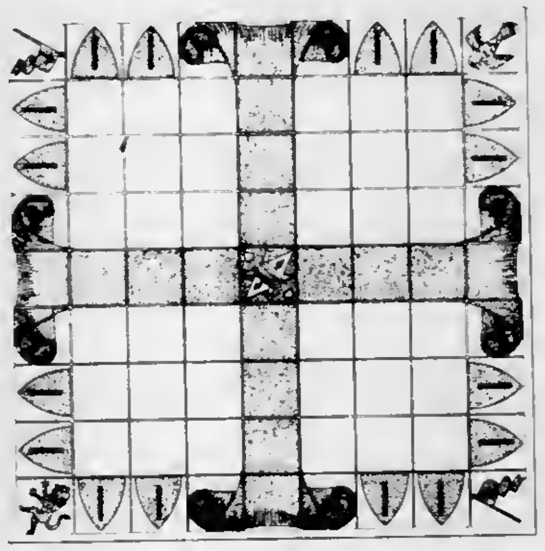
248,882
HAND POINTER FOR A GAME OR SIMILAR ARTICLE
Ziva Grushevsky Rosen, 100 W. 57th St., New York, N.Y. 10019, and Jacob Benjamin Burke, 6771 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Mar. 8, 1976, Ser. No. 664,577
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



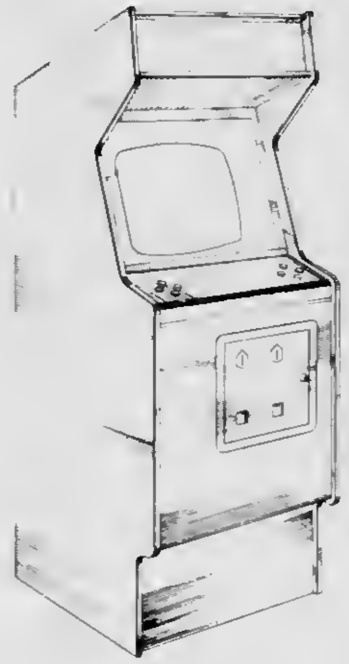
248,883
COMBINED PADDLE AND BAT
Jack G. McAllister, 2701 N. Douglas Dr., Apt. 328, Minneapolis, Minn. 55422
Filed Jul. 26, 1976, Ser. No. 708,414
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SP



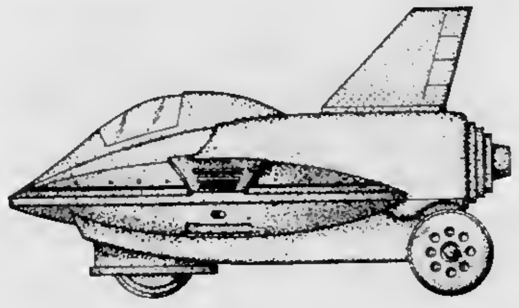
248,884
GAME BOARD
Theodore David Foxworthy, 520 W. 122nd St., New York, N.Y. 10027
Filed Sep. 27, 1976, Ser. No. 727,213
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



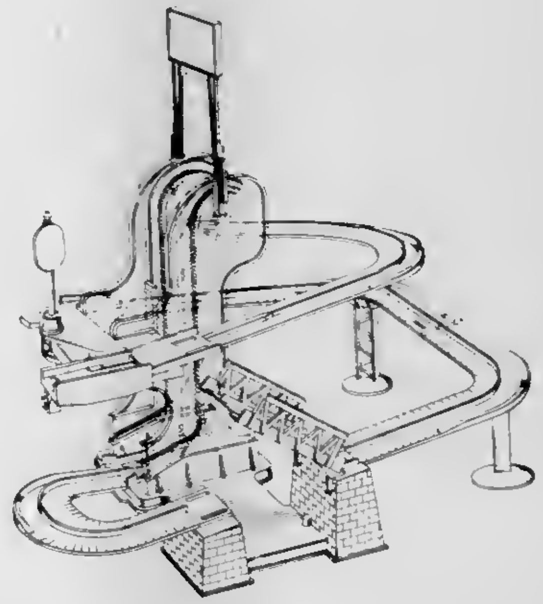
248,885
VIDEO GAME CABINET
Lonnie C. Pogue, San Diego, Calif., assignor to Gremlin Industries, Inc.
Filed Dec. 13, 1976, Ser. No. 749,787
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



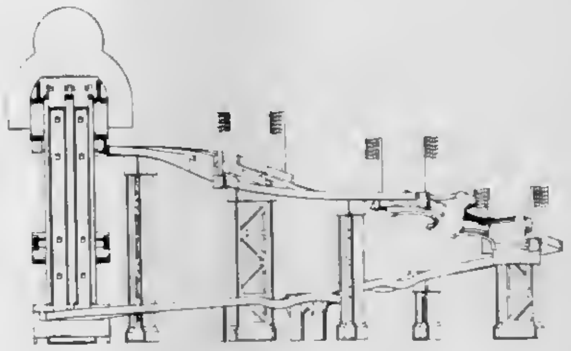
248,886
TOY VEHICLE
Yuji Kato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 7, 1976, Ser. No. 730,684
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



248,887
TOY TRACKWAY
Yutaka Tanaka, Saitama, Japan, assignor to Toytown Corporation, Tokyo, Japan
Filed Nov. 30, 1976, Ser. No. 746,171
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K

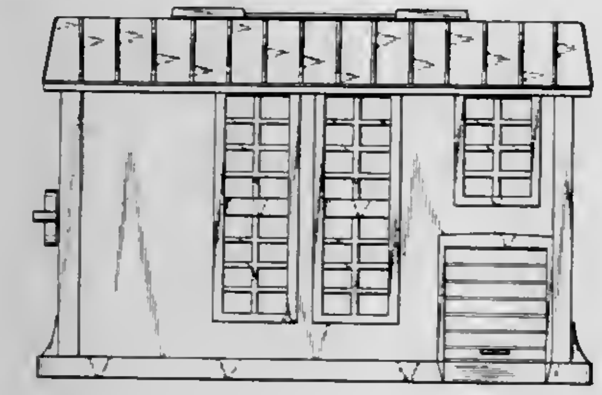


248,888
TOY VEHICLE TRACKWAY
Katsumi Sato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 9, 1976, Ser. No. 748,812
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K



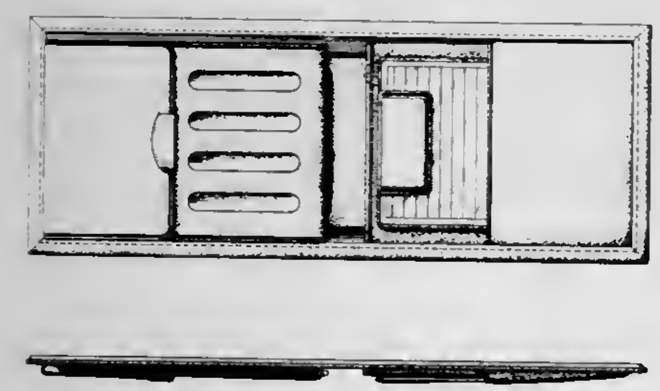
248,889
TOY BUILDING

Duane E. Spengler, West Falls, and Ralph W. Crawford, East Aurora, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 9, 1976, Ser. No. 749,004
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



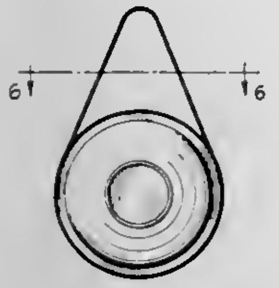
248,890
BILLFOLD

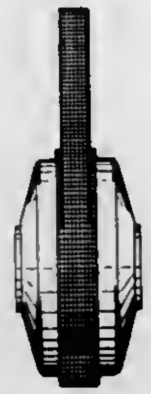
Charles B. Wright, Sr., 311 N. Lindbergh Blvd., St. Louis, Mo. 63141
Filed Nov. 23, 1976, Ser. No. 744,358
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A



248,891
PURSE

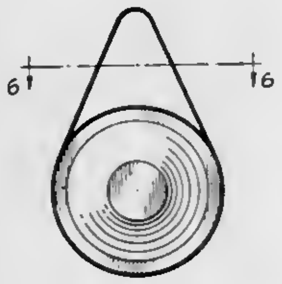
Marilyn J. Pfleger, 5303 Clark Ave., Cleveland, Ohio 44102
Filed Jun. 1, 1976, Ser. No. 691,520
The portion of the term of this patent subsequent to Aug. 8, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

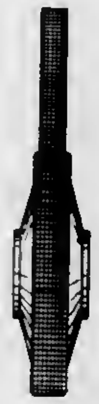




248,892
PURSE

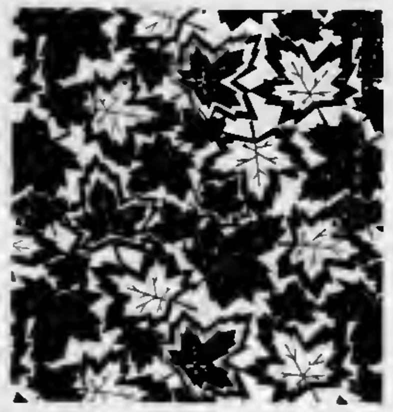
Marilyn J. Pfleger, 5303 Clark Ave., Cleveland, Ohio 44102
Filed Jun. 1, 1976, Ser. No. 691,382
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F





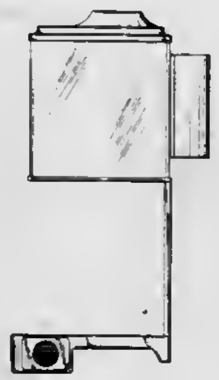
248,893
FABRIC

Leo John Comensoli, Dural, and Gloria Dawn Smythe, Potts Point, both of Australia, assignors to Speedo Knitting Mills Pty Ltd.
Filed Oct. 27, 1976, Ser. No. 736,043
Claims priority, application Australia, Apr. 27, 1976, 69071/76; Apr. 27, 1976, 69072/76
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 K



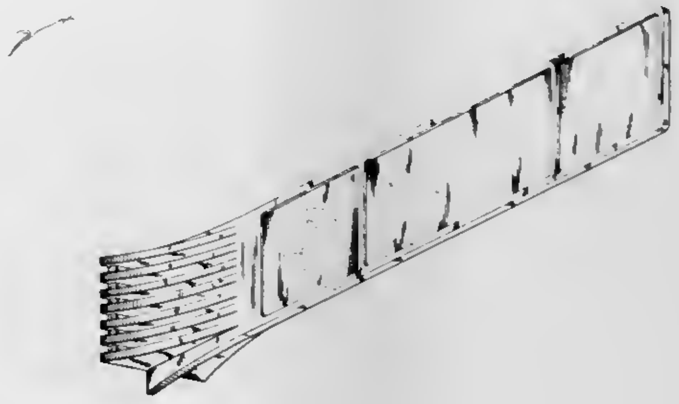
248,894
COMBINED MENU AND TRAY SUPPORT OR THE LIKE

Sidney A. Long, 7809 NW. 27th, Bethany, Okla. 73008
Filed Sep. 10, 1976, Ser. No. 722,014
Term of patent 14 years
Int. Cl. D6—*04;* D20—*03*
U.S. Cl. D96—12 R



248,895
SURFACE MOUNT INDICIA DISPLAY APPARATUS

William G. Frick, 2240 White Oak Dr., Northbrook, Ill. 60062
Filed Jan. 4, 1977, Ser. No. 756,620
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
West, Edward L.; and Clutter, Melvin E., 4,105,272, Cl. 339-14.00L.

A P Products Incorporated: *See—*
Braund, Kenneth William; and Webster, John Lawrence, 4,105,278, Cl. 339-103.00M.

A. R. F. Products, Inc.: *See—*
Stolarczyk, Larry G., 4,105,523, Cl. 204-195.00B.

A. Vuyk & Zonen's Scheepswerven B.V.: *See—*
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AB Bofors: *See—*
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AB Hammars Mekaniska Verkstad: *See—*
Ekholm, Rolf, 4,105,107, Cl. 198-358.000.

Abbott Laboratories: *See—*
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,787, Cl. 424-309.000.
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,788, Cl. 424-309.000.

Abdoo, Richard V., to Ford Motor Company. Circuit for controlling the operability of one or more cylinders of a multicylinder internal combustion engine. 4,104,991, Cl. 123-32.0EA.

Abe, Masami: *See—*
Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, 4,105,627, Cl. 260-45.80N.

Abe, Moriaki, to E.D.M. Co., Ltd. Clutch for permitting a driven member to run at different speed from a drive member. 4,104,965, Cl. 101-25.000.

Academy of Applied Science Inc., The: *See—*
Rines, Robert H.; and Marshall, Duane, 4,105,990, Cl. 340-3.00R.

ACF Industries, Inc.: *See—*
Lindberg, Allen W., 4,105,726, Cl. 261-121.00B.

Ackley, Charles E., Jr.; and Ackley, Charles E., Sr., to R. W. Hartnett Company. Capsule orienting and turning apparatus. 4,104,966, Cl. 101-40.000.

Ackley, Charles E., Sr.: *See—*
Ackley, Charles E., Jr.; and Ackley, Charles E., Sr., 4,104,966, Cl. 101-40.000.

Acme Specialty Manufacturing Company, The: *See—*
Skilliter, Robert T., Jr., 4,105,295, Cl. 350-303.000.

Ad-Tec Products, Inc.: *See—*
Whelan, James P., 4,105,564, Cl. 210-497.00R.

Adams, Pierrepont: *See—*
Raes, Maurice C.; and Adams, Pierrepont, 4,105,686, Cl. 260-453.0PH.

Adams, Terry L., to Anchor Hocking Corporation. Blow molded glass article manufacture. 4,105,428, Cl. 65-77.000.

Addressograph Multigraph Corp.: *See—*
Foote, Francis C., 4,106,062, Cl. 360-15.000.

Ade, Rolf; Schubert, Karl-Friedrich; and Staller, Manfred, to ITT Industries, Inc. Armature for a motor in a pump for liquids. 4,105,906, Cl. 310-87.000.

Adlerwerke vorm. Heinrich Kleyer A.G.: *See—*
Geis, Heinz, 4,105,106, Cl. 400-556.200.

Adrion, David Martin; and Hartsough, Lloyd Bruce, to Procter & Gamble Company, The. Acid treated polyether polyurethane foam end wrap. 4,105,038, Cl. 132-7.000.

Agcaoili, Clarito R., to United States Gypsum Company. Roller and hanger assembly for by-pass doors. 4,104,829, Cl. 49-409.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.

Agency of Industrial Science and Technology, The President of the: *See—*
Nishi, Yoshio, 4,106,045, Cl. 357-23.000.

AGFA-Gevaert AG: *See—*
Hoffmann, Klaus; Meyer, Rudolf; and Ohlschlager, Hans, 4,106,027, Cl. 346-1.000.
Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, 4,106,036, Cl. 354-83.000.

AGFA-GEVAERT N.V.: *See—*
de Ramaix, Maurice Antoine; and Somers, Aloijsius Gerardus, 4,105,533, Cl. 204-301.000.
Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, 4,105,198, Cl. 271-14.000.

Ahn, Byung K.: *See—*
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Ahrbom, Karl Bertil: *See—*
Naslund, Rolf Paul; Ahrbom, Karl Bertil; and Margen, Peter Heinrich Erwin, 4,105,389, Cl. 425-392.000.

Ahrens, Kurt H.: *See—*
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.

Ahrweiler, Karl-Heinz, to Kusters, Eduard. Side sealing means for a continuous press. 4,105,387, Cl. 425-335.000.

Aizenberg, Julian Borisovich; Bukhman, Inokh Borukhovich; and Pyatigorsky, Vladimir Mikhailovich. Lighting installation based on light guide. 4,105,293, Cl. 350-264.000.

Akatuka, Hisashi: *See—*
Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, 4,105,546, Cl. 210-11.000.

Akczinski, Joseph J., Sr. Magnetic tool. 4,105,239, Cl. 294-65.500.

Akron Standard, Division of Eagle-Picher Industries, Inc.: *See—*
Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., 4,105,488, Cl. 156-425.000.

Aktiebolaget Atomenergi: *See—*
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Akzo N.V.: *See—*
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Akzona Incorporated: *See—*
Behnke, Joachim; Frank, Dieter; and Wallrabenstein, Michael, 4,105,620, Cl. 260-37.00N.
Sutton, Theodore Leonard, 4,104,856, Cl. 57-77.400.

Albarda, Scato; Van Der Hoek, Willem; and Taupin, Dominique Yves Marie, to U.S. Philips Corporation. Device for recording measuring values. 4,106,029, Cl. 346-117.00A.

Albert-Frankenthal AG: *See—*
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.

Albert, William Charles; and Hohenstein, Robert Mark, to Singer Company, The. Piezoelectric damping mechanism. 4,104,920, Cl. 73-517.0AV.

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Fungicidal dispersions of 2-benzimidazole-methylcarbamate. 4,105,775, Cl. 424-273.00R.

Albright & Wilson Limited: *See—*
Miller, Glynn; and Stephenson, James E., 4,105,566, Cl. 252-8.100.

Alers, George A.; and Thompson, Robert B., to Rockwell International Corporation. Electromagnetic transducer. 4,104.922, Cl. 73-643.000.

Alexander, E. John, to Sterling Drug Inc. 4,5-Dihydro-5-oxopyrazolo[1,5-A]quinazoline-3-carboxamides. 4,105,764, Cl. 424-248.540.

Alexander, E. John, to Sterling Drug Inc. 4,5-Dihydro-5-oxopyrazolo[1,5-a]quinazoline-3-carboxylic acid derivatives. 4,105,766, Cl. 424-251.000.

Alexander, Thomas F.; and Griff, Gary J., to Hughes Aircraft Company. Range resolving doppler radar system. 4,106,019, Cl. 343-9.000.

Alexandrov, Alexander Minchev: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Alfa-Laval AB: *See—*
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Alinder, Gilbert L.; and Anderson, Lloyd E. Measuring and cutting apparatus for floor covering. 4,105,169, Cl. 242-56.00R.

Allais, Andre; Meier, Jean; and Deraedt, Roger, to Roussel Uclaf. Indoles. 4,105,777, Cl. 424-274.000.

Allen, James H., to Smith International, Inc. Large diameter drill bit. 4,105,083, Cl. 175-313.000.

Allen, Joseph H.: *See—*
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Allied Chemical Corporation: *See—*
Lofquist, Robert Alden; and Saunders, Peter Reginald, 4,105,404, Cl. 8-165.000.
Marshall, Robert Moore; and Darboufas, Kimon Constantine, 4,105,568, Cl. 252-8.600.
Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, 4,106,098, Cl. 364-500.000.

  - Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., 4,105,754, Cl. 423-514.000.
  - Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.
- Allis-Chalmers Corporation: *See—*
  - Hegemann, Norbert R., 4,104,982, Cl. 116-124.00M.
- Almerini, Achille L., to United States of America, Army. High energy density lithium cell. 4,105,836, Cl. 429-194.000.
- Althausen, Ferdinand; and Raffel, Reiner, to Maschinenfabrik Hennecke GmbH. Device for mixing liquid reaction components. 4,105,045, Cl. 137-563.000.
- Altman, Gerald. Dual purpose photographic displays. 4,105,313, Cl. 353-65.000.
- Aluminum Company of America: *See—*
  - Becker, Aaron J.; and Das, Subodh K., 4,105,752, Cl. 423-496.000.
  - La Barge, Robert L.; and Clawson, Robert G., 4,105,133, Cl. 220-266.000.
- Amann, Rolf; Benda, Hans; and Dietterle, Albert, to Daimler-Benz Aktiengesellschaft. Closure for pivotal flaps, covers, or the like. 4,105,230, Cl. 292-202.000.
- AMCO Engineering Company: *See—*
  - Anderson, Edwin V.; and Mack, Joseph A., 4,105,348, Cl. 403-172.000.
- American Can Company: *See—*
  - Meyers, George Leroy; and Kuehl, Donald Roy, 4,105,154, Cl. 229-27.000.
  - Watt, William R., 4,105,806, Cl. 427-44.000.
- American Cyanamid Company: *See—*
  - Berkelhammer, Gerald; and Kameswaran, Venkatamaran, 4,105,780, Cl. 424-282.000.
  - Culmone, Vincent; and Kaniecki, Thaddeus J., 4,105,574, Cl. 252-154.000.
  - Parekh, Girish Girdhar, 4,105,708, Cl. 260-849.000.
- American Flange & Manufacturing Co. Inc.: *See—*
  - Bradshaw, William A.; and Dalgleish, Gerald, 4,105,135, Cl. 220-288.000.
- American Home Products Corporation: *See—*
  - Bagli, Jehan F.; and Ferdinandi, Eckhardt, 4,105,663, Cl. 544-379.000.
  - Shaw, Gustavus W.; and Walker, Raymond P., 4,105,903, Cl. 307-328.000.
- American Microsystems, Inc.: *See—*
  - Jenne, Fredrick Benjamin, 4,105,475, Cl. 148-175.000.
- American Motor Corporation: *See—*
  - Denney, Jerry W., 4,105,408, Cl. 23-230.00B.
- American Optical Corporation: *See—*
  - Marchese, Thomas F.; and Argon, Rauf S., 4,105,023, Cl. 128-2.06B.
- American Standard Inc.: *See—*
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- Amity Leather Products Company: *See—*
  - Baumann, Terry F.; and Brummer, Gerald W., 4,105,057, Cl. 150-35.000.
- Ampex Corporation: *See—*
  - Ravizza, Raymond Francis, 4,106,065, Cl. 360-109.000.
- Amrein, Wayne Thomas; and Stokes, Jr. Bernard E. Multipurpose tool. 4,104,752, Cl. 7-107.000.
- Anchor Hocking Corporation: *See—*
  - Adams, Terry L., 4,105,428, Cl. 65-77.000.
- Anderson, Arnold E.; and Weintraub, Marvin H., to Ford Motor Company. Method of protecting an aluminum braking surface. 4,105,473, Cl. 148-6.000.
- Anderson, Arnold L.; and Nulph, Robert J., to Velsicol Chemical Corporation. Flame retarded ABS polymeric compositions containing a mixed halo bisphenoxy alkane flame retardant and enhancing agent. 4,105,632, Cl. 260-45.75D.
- Anderson, Clarence E., to Texaco Exploration Canada Ltd. Abrasive resistant choke. 4,105,049, Cl. 138-44.000.
- Anderson, Edwin V.; and Mack, Joseph A., to AMCO Engineering Company. Building components. 4,105,348, Cl. 403-172.000.
- Anderson, Lloyd E.: *See—*
  - Alinder, Gilbert L.; and Anderson, Lloyd E., 4,105,169, Cl. 242-56.00R.
- Anderson, Robert C. Leveling lamp. 4,105,351, Cl. 403-312.000.
- Anderson, Wendell Goundrey, to RCA Corporation. Quiescent biasing of r-f power transistors for other than class A operation. 4,105,944, Cl. 330-290.000.
- Andersson, Sven Otto Sigbert: *See—*
  - Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, 4,105,743, Cl. 423-24.000.
- Ando, Wataru; and Nakaoka, Ichiro, to Kabushiki Kaisha Pollution Preventing Research Laboratory. Method for producing adipic acid and precursors thereof. 4,105,520, Cl. 204-162.00R.
- Ando, Yujiro: *See—*
  - Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, 4,105,444, Cl. 96-1.00R.
- Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., to United States of America, Agriculture. Knitted cotton fabric durably patterned by differential shrinkage. 4,105,403, Cl. 8-115.000.
- Angelbeck, Donald Irvin, to University of Toledo, The. Lime-fly ash-aggregate-sludge paving material. 4,105,463, Cl. 106-120.000.
- Anghinetti, Joseph R.; and Couture, Paul A., to Wasco Products, Inc. Fire vent. 4,104,834, Cl. 52-1.000.
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- Antoni, Gerhard, to Th. Goldschmidt AG. Weatherproof and mechanically stable laminate for encasing thermal insulation. 4,105,820, Cl. 428-213.000.
- Antoshkiw, William T.; and Ursic, Thomas A., to Becton, Dickinson and Company. Method of determining cardiac output by thermodilution principles and utilization of a catheter assembly. 4,105,022, Cl. 128-2.05F.
- Aoki, Katashi. Injection blow molding machine. 4,105,391, Cl. 425-526.000.
- Aono, Toshiaki: *See—*
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- Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, to Matsushita Electric Industrial Co., Ltd. Motor speed control apparatus. 4,105,935, Cl. 318-314.000.
- Araki, Kohei: *See—*
  - Kobayashi, Hidetoshi; and Araki, Kohei, 4,105,779, Cl. 424-78.000.
- Archer, Sydney, to Sterling Drug Inc. 1,2,3,4,5,6-Hexahydro-2,6-methano-3-benzazocines. 4,105,659, Cl. 260-293.540.
- Archibald, John Leheup; and Ward, Terence James, to John Wyeth & Brother Limited. 1-Aminoalkylpiperidine derivatives. 4,105,771, Cl. 424-267.000.
- Arco Solar, Inc.: *See—*
  - Yerkes, John W.; and Avery, James E., 4,105,471, Cl. 136-89.0CC.
- Argon, Rauf S.: *See—*
  - Marchese, Thomas F.; and Argon, Rauf S., 4,105,023, Cl. 128-2.06B.
- Argus Chemical Corporation: *See—*
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,105,625, Cl. 260-45.80N.
  - Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,105,629, Cl. 260-45.8NT.
  - Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, 4,105,627, Cl. 260-45.80N.
- Armour Pharmaceutical Company: *See—*
  - Colescott, Robert L.; and Tregear, Geoffrey W., 4,105,602, Cl. 260-8.000.
- Armstrong Cork Company: *See—*
  - Burkey, David J.; and Rosenau, Clifford M., 4,105,717, Cl. 260-889.000.
  - Stavrinou, Stavros C., 4,105,593, Cl. 260-2.300.
- Armstrong, Ernest E. Cementing staging tool. 4,105,074, Cl. 166-317.000.
- Arni, Urs; Faucci, Adriano; and Stocker, August, to Lonza, Ltd. Process for the production of malonic acid dinitrile and purification thereof. 4,105,688, Cl. 260-465.80R.
- Arnn, Edward T. Nonslip screw driver. 4,105,056, Cl. 145-50.00A.
- Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., to Bell Telephone Laboratories, Incorporated. Multibeam, digitally modulated, time division, switched satellite communications system. 4,105,973, Cl. 325-4.000.
- Arod, Jean; Gauthier, Michele; and Platzer, Roger, to Commissariat a l'Energie Atomique. Method and device for analysis of a mixture of hydrochloric acid and organochlorine compounds contained in gases derived in particular from the incineration of organochlorine compounds. 4,105,508, Cl. 204-1.00T.
- Arora, Mulk Raj, to Unican Electrochemical Products Ltd. Production of thin, stable, solid electrolyte films of high ionic conductivity. 4,105,807, Cl. 427-126.000.
- Arpe, Hans-Jurgen: *See—*
  - Schulz, Lothar; and Arpe, Hans-Jurgen, 4,105,753, Cl. 423-502.000.
- Asahi-Dow Limited: *See—*
  - Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, 4,105,709, Cl. 260-857.00L.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
  - Ogawa, Shinsaku; and Yoshida, Muneo, 4,105,515, Cl. 204-98.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
  - Kawasaki, Masahiro; and Sawada, Yoshio, 4,106,035, Cl. 354-51.000.
- Asai, Kiyokazu; and Takeuchi, Akihiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Ultrasonic wave fuel injection and supply device. 4,105,004, Cl. 123-141.000.
- Asakawa, Akira, to Nippon Konbeya Kabushiki Kaisha. Apparatus for detecting elongation of a joint of a conveyor belt. 4,106,005, Cl. 340-676.000.
- Asano, Kazuhiro: *See—*
  - Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, 4,104,864, Cl. 58-39.500.

- Asea Aktiebolag: *See—*
  - Hellgren, Keijo, 4,105,388, Cl. 425-389.000.
  - VonKrusenstierna, Otto; Persson, Anders; and Widell, Marja, 4,105,507, Cl. 204-1.00T.
- Asp, Benkt Goran Rurik: *See—*
  - Norback, Hakan Nils; and Asp, Benkt Goran Rurik, 4,105,584, Cl. 252-426.000.
- Astra Lakemedel Aktiebolag: *See—*
  - Eriksson, Hans Erik; and Florvall, Gosta Lennart, 4,105,768, Cl. 424-263.000.
- Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, to Plastic Enterprises Pty. Limited. Re-usable plastic containers. 4,105,117, Cl. 206-501.000.
- Atkins, Carl E., to Wagner Electric Corporation. Dual-frequency induction-keyed control circuit with keying network having variable resonant frequency. 4,106,006, Cl. 340-543.000.
- Atlantic Richfield Company: *See—*
  - Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,105,416, Cl. 44-1.00R.
  - Gallagher, James P., 4,105,706, Cl. 260-668A.
  - Moore, Thomas F., 4,105,252, Cl. 299-4.000.
  - Skinner, James L., 4,105,124, Cl. 209-114.000.
  - Weidenaar, Bernard E., 4,105,054, Cl. 141-311.00R.
- Audesse, Emery G.: *See—*
  - Sindlinger, Ronald E.; and Audesse, Emery G., 4,105,392, Cl. 431-95.00R.
- Auer, Eberhard; Ohorodnik, Alexander; and Stutzke, Paul, to Hoechst Aktiengesellschaft. Production of N-substituted 2-carbamoyl phosphinic acids. 4,105,689, Cl. 260-502.500.
- Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus for the production of finished prestressed concrete members. 4,105,382, Cl. 425-88.000.
- Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., to BASF Wyandotte Corporation. Polyurethane foam from an oxyalkylated product. 4,105,597, Cl. 521-159.000.
- Automabed Building Components, Inc.: *See—*
  - Castillo, Adolfo, 4,104,962, Cl. 100-100.000.
- Aveneau, Andre A.; and Barbier, Xavier N., to Societe Anonyme de Telecommunications. Time-division multiplex digital transmission system with intermediate stations adapted to transit insert and extract digital channels. 4,105,869, Cl. 179-15.0BD.
- Avery, James E.: *See—*
  - Yerkes, John W.; and Avery, James E., 4,105,471, Cl. 136-89.0CC.
- Axthammer, Ludwig, to Fichtel & Sachs AG. Hydraulic system. 4,105,041, Cl. 137-116.000.
- Ayata, Naoki: *See—*
  - Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
- Ayers, Wayne R. Combination gauge. 4,104,909, Cl. 73-118.000.
- Ayerst, McKenna & Harrison, Ltd.: *See—*
  - Philipp, Adolph H.; and Jirkovsky, Ivo L., 4,105,778, Cl. 424-275.000.
- Azadian, Genevieve: *See—*
  - Pierdet, Andre; and Azadian, Genevieve, 4,105,761, Cl. 424-243.000.
- Aztec Staging Co., Inc.: *See—*
  - Bardwick, John, III, 4,104,835, Cl. 52-7.000.
- B. F. Goodrich Company, The: *See—*
  - Cohen, Louis, 4,105,840, Cl. 526-62.000.
- B & H Manufacturing Company, Inc.: *See—*
  - Hoffmann, Wolfgang, 4,104,845, Cl. 53-14.000.
- Baak, Albert E. Power unit for golf cart and the like. 4,105,084, Cl. 180-11.000.
- Babcock & Wilcox Company, The: *See—*
  - Pinkstaff, Carlos Dean, 4,104,899, Cl. 72-24.000.
- Bacher, Helmut. Broad-band continuously variable attenuator. 4,105,960, Cl. 333-81.00A.
- Back, Gerhard, to Ciba-Geigy Corporation. Process for dyeing natural protein fibres with metallic azo dyes. 4,105,400, Cl. 8-43.000.
- Bacovsky, Filip: *See—*
  - Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,104,823, Cl. 47-1.00R.
- Baghdady, Elie J. Navigation aid system. 4,106,023, Cl. 343-106.00D.
- Bagli, Jehan F.; and Ferdinandi, Eckhardt, to American Home Products Corporation. Thiphene ethanolamines. 4,105,663, Cl. 544-379.000.
- Baguelin, Yves, to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem. Engine cooling systems. 4,104,993, Cl. 123-41.490.
- Baird, William C., Jr.: *See—*
  - Say, Geoffrey R.; and Baird, William C., Jr., 4,105,704, Cl. 260-666.00P.
- Baker, Alfred. Side glare-eliminating device for securement to eyeglasses and other suitable mounting structures. 4,105,304, Cl. 351-47.000.
- Baker, Derrick John; and Bones, Roger John. Electric cells. 4,105,834, Cl. 429-104.000.
- Baker, Eugene E., to Halliburton Company. Gravel pack liner assembly and selective opening sleeve positioner assembly for use therewith. 4,105,069, Cl. 166-51.000.
- Baker International Corporation: *See—*
  - Helmus, Sydney S., 4,105,075, Cl. 166-321.000.
- Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, to Du Pont de Nemours, E. I., and Company. Separation device of rigid porous inorganic hollow filament and use thereof. 4,105,548, Cl. 210-23.00H.
- Baker, Robert W.: *See—*
  - Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.
- Balatan, Sergio E., to M&T Chemicals Inc. Interpolymers, method of preparing the same and emulsions thereof, and metal cans coated with the interpolymers. 4,105,615, Cl. 260-29.60T.
- Balco, Inc.: *See—*
  - Balzer, Claude P.; and Corman, Edward M., 4,104,839, Cl. 52-288.000.
- Balda-Werke Photographische Gerate Und Kunststoff GmbH & Co., KG.: *See—*
  - Lange, Karl Heinz, 4,106,041, Cl. 354-206.000.
- Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, to Snam Progetti, S.p.A. Preparation of copper and silver particles for ethylene purification. 4,105,588, Cl. 252-454.000.
- Ball, Edmund Hugh, to Pirelli General Cable Works Ltd. Electrical cable installations with cooling means. 4,105,860, Cl. 174-15.00C.
- Ball Valve Company, Inc.: *See—*
  - Bunn, Stuart E.; and Owsley, Herbert B., 4,105,058, Cl. 151-41.740.
- Ballas, George C.; to Weed Eater, Inc. Rotary cutting assembly. 4,104,797, Cl. 30-276.000.
- Balzer, Claude P.; and Corman, Edward M., to Balco, Inc. Wall protection assembly. 4,104,839, Cl. 52-288.000.
- Banks, Reginald George Sinclair; and Williams, Alan, to British Gas Corporation. Method of preparing and filtering coprecipitated nickel-alumina catalysts. 4,105,591, Cl. 252-466.00J.
- Barber-Colman Company: *See—*
  - Trost, Wayne C.; and Darsie, Burns, 4,105,052, Cl. 139-101.000.
- Barbier, Xavier N.: *See—*
  - Aveneau, Andre A.; and Barbier, Xavier N., 4,105,869, Cl. 179-15.0BD.
- Barcroft Company: *See—*
  - Glasscock, Green Bateman, 4,105,579, Cl. 252-317.000.
- Barcus, Victor D., to General Electric Company. Auxiliary cooling device. 4,105,905, Cl. 310-59.000.
- Bard, Charles L.; and Pfitzenmaier, Raymond W., to United States of America, Army. Machine gun barrel for firing blanks. 4,104,953, Cl. 89-14.00E.
- Bardebes, David Paul. Fish hooks. 4,104,820, Cl. 43-36.000.
- Bardwick, John, III, to Aztec Staging Co., Inc. Portable staging equipment. 4,104,835, Cl. 52-7.000.
- Barnes, Arthur C.; and Barnes, Carl E., to Barson Corp. Polymerization of 2-pyrrolidone with alkaline catalyst and SO_2 chain initiator. 4,105,645, Cl. 528-313.000.
- Barnes, Carl E.: *See—*
  - Barnes, Arthur C.; and Barnes, Carl E., 4,105,645, Cl. 528-313.000.
- Barnes, Russell M.: *See—*
  - Deffner, John F.; Wendel, Donald W.; and Barnes, Russell M., 4,105,126, Cl. 211-49.00D.
- Barnes, Thomas Malcolm, to Harsco Corporation. Method for production of refined steel. 4,105,439, Cl. 75-51.000.
- Baron, David Alan; and Hampton, James Ronald, to Litton Systems, Inc, Microwave energy feed system for combination cooking apparatus. 4,105,886, Cl. 219-10.55E.
- Barrows, Franklin Herbert: *See—*
  - Hunter, Byron Alexander; and Barrows, Franklin Herbert, 4,105,601, Cl. 521-95.000.
- Barson Corp.: *See—*
  - Barnes, Arthur C.; and Barnes, Carl E., 4,105,645, Cl. 528-313.000.
- Barten, Piet Gerard Joseph; and Bijma, Jan, to U.S. Philips Corporation. Static convergence unit, and a color display tube comprising a convergence unit having permanent magnets. 4,105,983, Cl. 335-212.000.
- Bartlett, Rodney J.; and Morrey, John R., to United States of America, Energy. Isotope separation. 4,105,921, Cl. 250-423.00P.
- BASF Aktiengesellschaft: *See—*
  - Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.
  - Dockner, Toni; Toussaint, Herbert; and Decker, Martin, 4,105,657, Cl. 260-239.00B.
  - Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.
  - Schulz, Bernhard; Paust, Joachim; and Schneider, Joachim, 4,105,855, Cl. 560-190.000.
- BASF Wyandotte Corporation: *See—*
  - Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.
- Bassner, Helmut: *See—*
  - Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.
- Battelle Development Corporation: *See—*
  - Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.
- Battelle Memorial Institute: *See—*
  - Gentaz, Claude; and Bienvenu, Gerard, 4,105,440, Cl. 75-66.000.
- Battigelli, Jean A.: *See—*
  - Levecque, Marcel; and Battigelli, Jean A., 4,105,424, Cl. 65-3.00C.
- Baublitz, Harvey W. Auxiliary clothes hanger support. 4,104,972, Cl. 108-31.000.
- Baudin, Cecile: *See—*
  - Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.

- Bauer, Donald J.: *See—*
  - Eisele, Judith A.; and Bauer, Donald J., 4,105,747, Cl. 423-263.000.
- Baugh, Benjamin Charles; Young, Norman R.; and Runnion, Glenmore J., to Unarco Industries, Inc. Checkstand. 4,105,096, Cl. 186-1.0AC.
- Baumann, Georg; and Hoffmann, Helmut, to Draloric Electronic GmbH. Ceramic capacitor. 4,106,075, Cl. 361-320.000.
- Baumann, Terry F.; and Brummer, Gerald W., to Amity Leather Products Company. Flexible receptacle with credit card holder. 4,105,057, Cl. 150-35.000.
- Baxter Travenol Laboratories, Inc.: *See—*
  - Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,105,730, Cl. 264-89.000.
  - Macemon, James H., 4,105,967, Cl. 324-115.000.
  - Virag, Robert A., 4,105,029, Cl. 128-214.00R.
- Bayer Aktiengesellschaft: *See—*
  - Blank, Heinz Ulrich, 4,105,692, Cl. 260-543.00R.
  - Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,105,641, Cl. 526-712.000.
  - Dieterich, Dieter; and Markusch, Peter, 4,105,594, Cl. 521-100.000.
  - Eisenmann, Karl Heinz; and Broch, Karl Heinz, 4,105,595, Cl. 521-159.000.
  - Gottschlich, Alois; and Leverenz, Klaus, 4,105,655, Cl. 260-207.100.
  - Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
  - Harnisch, Horst, 4,105,665, Cl. 260-289.00C.
  - Margotte, Dieter; and Vernaleken, Hugo, 4,105,712, Cl. 260-873.000.
  - Muller, Erwin; and Thomas, Heinz, 4,105,600, Cl. 521-129.000.
  - von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
- Bayfront Carpet and Vacuum, Inc.: *See—*
  - Moore, Barnard J., 4,105,420, Cl. 55-274.000.
- Beall, John Horace. Line diverting tool. 4,105,189, Cl. 254-139.000.
- Bean, Lloyd F., to Xerox Corporation. Transfer of conductive particles. 4,105,320, Cl. 355-3.0TR.
- Bean, Samuel L.: *See—*
  - Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., 4,105,754, Cl. 423-514.000.
- Beatrice Foods Co.: *See—*
  - Jones, John H.; and Hoffman, James T., 4,105,116, Cl. 206-484.000.
- Beatty, John C., III, to Raymond, John L.; and Reath, Robert Z. Apparatus for removing impurities from electrolyte solutions. 4,105,534, Cl. 204-301.000.
- Becker, Aaron J.; and Das, Subodh K., to Aluminum Company of America. Aluminum chloride production. 4,105,752, Cl. 423-496.000.
- Becton, Dickinson and Company: *See—*
  - Antoshkiw, William T.; and Ursic, Thomas A., 4,105,022, Cl. 128-2.05F.
  - Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, 4,105,410, Cl. 23-253.0TP.
- Bedgood, Michael Albert; and Leach, John Stuart, to International Standard Electric Corporation. Single optical fiber connector. 4,105,285, Cl. 350-96.210.
- Begley, Paul M.: *See—*
  - Laganis, Deno; and Begley, Paul M., 4,105,639, Cl. 528-177.000.
- Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., to International Standard Electric Corporation. Radar system with circular polarized transmission and adaptive rain depolarization compensation. 4,106,015, Cl. 343-5.00W.
- Behnke, Joachim; Frank, Dieter; and Wallrabenstein, Michael, to Akzona Incorporated. Stabilization of barium, strontium and calcium complexes of polyterephthaloyl oxalamidrazone and polydiphenylether-dicarboxylic acid-4,4'-oxalamidrazone. 4,105,620, Cl. 260-37.00N.
- Bell, Albert H., III; and Zeek, Richard M., to General Motors Corporation. Two-stage regenerator seal. 4,105,062, Cl. 165-9.000.
- Bell & Howell Company: *See—*
  - Wells, Thomas R.; and Dahlen, Theodore E., 4,105,312, Cl. 353-27.00R.
  - Wells, Thomas R.; and Kearney, Robert L., 4,105,319, Cl. 353-120.000.
- Bell Ko-On Co., Ltd.: *See—*
  - Utsumi, Jihaciro, 4,105,306, Cl. 352-14.000.
- Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., to General Engineering and Mfg. Corporation. Convertible sofa and bed structure. 4,104,747, Cl. 5-37.00R.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., 4,105,973, Cl. 325-4.000.
  - Bjorklund, Gary Carl; and Liao, Paul Foo-Hung, 4,105,337, Cl. 356-114.000.
  - Bridges, Thomas James; and Burkhardt, Ernest Gardner, 4,105,919, Cl. 250-341.000.
  - Dick, George Wilmer, 4,106,009, Cl. 340-343.000.
  - Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,105,283, Cl. 350-96.310.
  - Gordon, Alan Mayer; Mazurek, Edward Francis; and Wright, Arden Bernard, 4,106,070, Cl. 361-42.000.
  - Kustka, George John, 4,105,863, Cl. 178-67.000.
  - Paoli, Thomas Lee, 4,106,096, Cl. 364-481.000.
- Bellaplast GmbH: *See—*
  - Thiel, Alfons W.; and Hell, Hans, 4,105,386, Cl. 425-217.000.
- Bely, Nikolai Grigorievich: *See—*
  - Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
- Benda, Hans: *See—*
  - Amann, Rolf; Benda, Hans; and Dietterle, Albert, 4,105,230, Cl. 292-202.000.
- Benes, Milan; and Peska, Jan, to Ceskoslovenska akademie ved. Quaternary salts of methacrylic or acrylic esters and cationic quaternary polyelectrolytes and ion exchange resins thereof. 4,105,858, Cl. 560-222.000.
- Berenbaum, Morris B.: *See—*
  - Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.
- Bergan, Kenneth N., to Control Data Corporation. Current drive circuits. 4,106,088, Cl. 363-132.000.
- Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased (by Plattner, Werner, administrator); Thiel, Max; and Vomel, Wolfgang, to Boehringer Mannheim GmbH. 3-Nitropyrazole compounds and anti-microbial compositions. 4,105,772, Cl. 424-269.000.
- Berger, Sidney Ethan, to Union Carbide Corporation. Treated hydrated alumina. 4,105,465, Cl. 106-308.00Q.
- Bergkamp, Helen G.; and Bergkamp, Robert L. Recipe card storage device and display means. 4,105,270, Cl. 312-330.00R.
- Bergkamp, Robert L.: *See—*
  - Bergkamp, Helen G.; and Bergkamp, Robert L., 4,105,270, Cl. 312-330.00R.
- Bergt, Carl, to General Electric Company. Space air conditioning control system and apparatus. 4,105,063, Cl. 165-21.000.
- Berkelhammer, Gerald; and Kameswaran, Venkatamaran, to American Cyanamid Company. Insecticidal and acaricidal m-phenoxybenzyl esters of 2,2-difluoro-1,3-benzodioxole-5-(α-alkyl)acetic acids. 4,105,780, Cl. 424-282.000.
- Berkovitz, Robert A., to Teledyne Industries, Inc. Stereo and spaciousness reverberation system using random access memory and multiplex. 4,105,864, Cl. 179-1.00J.
- Bernasconi, Mario: *See—*
  - Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.
- Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, to Hoffmann-La Roche Inc. Process and device for the automatic dilution of solutions. 4,105,137, Cl. 222-1.000.
- Bertrams, Johannes Kurt, deceased; and by Mulkens, Casper Antonius Henricus, administrator, to U.S. Philips Corporation. Voltage rail. 4,105,099, Cl. 191-29.0DM.
- Bidwell, Robert E.: *See—*
  - Kurtz, Leonard D.; and Bidwell, Robert E., 4,105,031, Cl. 128-276.000.
- Bien, Else, legal representative: *See—*
  - von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
- Bien, Gabriele, legal representative: *See—*
  - von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
- Bien, Hans Samuel, deceased: *See—*
  - von Oertzen, Klaus; Bien, Hans Samuel, deceased; and Bien, Gabriele, legal representative, 4,105,662, Cl. 544-294.000.
- Bienvenu, Gerard: *See—*
  - Gentaz, Claude; and Bienvenu, Gerard, 4,105,440, Cl. 75-66.000.
- Bijma, Jan: *See—*
  - Barten, Piet Gerard Joseph; and Bijma, Jan, 4,105,983, Cl. 335-212.000.
- Binks Manufacturing Company: *See—*
  - Lau, George W.; and Bujnowski, Edward J., 4,105,164, Cl. 239-526.000.
- Biotronik Mess- und Therapiegerate GmbH & Co.: *See—*
  - Richter, Gerolf; and Shanks, Scott B., 4,105,037, Cl. 128-419.00P.
- Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, to Messerschmitt-Boelkow-Blohm GmbH. Ion prime mover. 4,104,875, Cl. 60-202.000.
- Bishop, Robert C.: *See—*
  - Shanbrom, Edward; and Bishop, Robert C., 4,105,650, Cl. 260-112.00B.
- Bitzel, Hubert: *See—*
  - Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, 4,104,940, Cl. 83-71.000.
- Biver, William Ralph, to Sybron Corporation. Device for determining the activated clotting time of a blood sample. 4,105,411, Cl. 23-253.00R.
- Bizzell, David; and Makarainen, Eino A. Arrow mounted self-retracting sight. 4,105,209, Cl. 273-106.50R.
- Bjorklund, Gary Carl; and Liao, Paul Foo-Hung, to Bell Telephone Laboratories, Incorporated. Self-induced rotation ellipsometer. 4,105,337, Cl. 356-114.000.
- Black Clawson Company, The: *See—*
  - Seifert, Peter, 4,105,543, Cl. 209-240.000.
- Blaich, Bernhard; Zehender, Ernst; and Kerner, Karl, to Robert Bosch GmbH. Silicon oxide coated metal having improved corrosion resistance. 4,105,821, Cl. 428-215.000.
- Blake, James Edward: *See—*
  - Lambert, Thomas W.; and Blake, James Edward, 4,105,922, Cl. 250-495.00T.
- Blakely, Donald W., to Chevron Research Company. Process for producing a particle pack composition comprising alumina and the resulting attrition resistant composition. 4,105,587, Cl. 252-439.000.

- Blank, Heinz Ulrich, to Bayer Aktiengesellschaft. Process for the preparation of benzenesulphonyl chloride. 4,105,692, Cl. 260-543.00R.
- Blinn, Ludwig, to Pohlig-Heckelbleichert Vereinigte Maschinenfabriken Aktiengesellschaft. Device for discharging bulk material. 4,105,143, Cl. 222-161.000.
- Blomqvist, Ake Hugo Petrus; and Stalfors, Rolf Lennart, to AB Bofors. Device for receiving or transmitting radiation. 4,105,174, Cl. 244-3.160.
- Blomstedt, Hans C. M., to Hans Blomstedt Handelsbolag. Pacifier. 4,105,032, Cl. 128-360.000.
- Bloom, Allen; and Hung, Ling Kong, to RCA Corporation. Liquid crystalline 4"-cyano- or 4"-nitrobenzylidene-4'-(N,N-dialkylamino)-1-aminoazabenzene dyes. 4,105,654, Cl. 260-205.000.
- Blunier, Dennis L.; and Clemens, Donald E., to Caterpillar Tractor Co. Track shoe and bolt retention arrangement. 4,105,260, Cl. 305-54.000.
- Boah, John K.; and Kennedy, Richard W., to General Electric Company. Method of manufacture of a semiconductor device. 4,104,786, Cl. 29-583.000.
- BOC Limited: *See—*
  - Marshall, Denis John; and Mohin, Terry Martin, 4,105,887, Cl. 219-72.000.
- Bochis, Richard J.; and Tolman, Richard L., to Merck & Co., Inc. Imidazo[1,2-a] pyridines substituted with a thienyl, thiazolyl, or thiadiazolyl group. 4,105,767, Cl. 424-256.000.
- Bodig, Bernd: *See—*
  - Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, 4,105,006, Cl. 123-148.00E.
- Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, to BASF Aktiengesellschaft. Reinforced vinyl chloride polymer compositions containing poly-neopentylene terephthalate. 4,105,624, Cl. 260-40.00R.
- Boehringer Ingelheim GmbH: *See—*
  - Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
  - Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.
- Boehringer Mannheim GmbH: *See—*
  - Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
  - Braun, Hans, 4,104,807, Cl. 34-92.000.
- Boeing Company, The: *See—*
  - Hardin, Robert H., 4,105,949, Cl. 331-37.000.
  - Larkworthy, Peter J.; Rose, James A.; and Martin, Anthony J., 4,104,964, Cl. 100-232.000.
  - Larsen, Hals Norman; and Kamber, Peter Werner, 4,104,876, Cl. 60-226.00R.
  - Martin, Donald L.; and Yanke, David B., 4,105,900, Cl. 307-219.000.
- Bolin, Gustav Georg Arne. Sound resonator for amplifying sound waves. 4,104,945, Cl. 84-1.150.
- Bolin, Philip C.: *See—*
  - Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., 4,105,859, Cl. 174-14.00R.
- Boling, Norman L., to Owens-Illinois, Inc. Q-switched laser and laser rod. 4,105,956, Cl. 331-94.50Q.
- Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. 9-Phenyl 5,6-dimethyl-nona-2,4,6,8-tetraeonic acid compounds. 4,105,681, Cl. 260-404.000.
- Bolle, Pierre: *See—*
  - Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
- Bonaddio, Robert M., to PPG Industries, Inc. Force applying device for scoring wheels. 4,104,939, Cl. 83-7.000.
- Bond, Robert: *See—*
  - Lees, Geoffrey; Williams, Arthur Roger; and Bond, Robert, 4,105,458, Cl. 106-97.000.
- Bone, Geoffrey Edward; and Allen, Peter Baguley, to Sperry Rand Limited. Suspension system for nozzle of jet propelled vehicle. 4,104,877, Cl. 60-230.000.
- Bones, Roger John: *See—*
  - Baker, Derrick John; and Bones, Roger John, 4,105,834, Cl. 429-104.000.
- Bonfanti, Ottavio. Method for the production of a synthetic material having a mother-of-pearl look. 4,105,733, Cl. 264-108.000.
- Bonum-Werk Inh. Friedrich Hetzmannseder: *See—*
  - Hrabik, Heinrich, 4,104,818, Cl. 40-152.000.
- Boone, David E.: *See—*
  - Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., 4,105,846, Cl. 526-124.000.
- Borchert, Lothar; and Stenzel, Karl-Jorg, to Siemens Aktiengesellschaft. Low-current contact construction. 4,105,828, Cl. 428-665.000.
- Borden, Inc.: *See—*
  - Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, 4,105,122, Cl. 209-73.000.
- Borg-Warner Corporation: *See—*
  - Phillips, Bernard C., 4,104,994, Cl. 123-73.00R.
- Borju, Jury Iosifovich: *See—*
  - Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
- Bork, C. Gary; and Kenan, John E. Barrier with internal drainage duct. 4,105,353, Cl. 404-2.000.
- Bornfleth, Jay W., to United States of America, Navy. Servo type switching for remote automatic braking system. 4,105,258, Cl. 303-93.000.
- Borsig GmbH: *See—*
  - Schindelhauer, Gerhard, 4,105,375, Cl. 418-54.000.
- Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, to Internationale Octrooi Maatschappij "Octropa" B.V. Dewaxing with a polymerized polyol ester dewaxing aid. 4,105,539, Cl. 208-33.000.
- Bosc, Henri J.: *See—*
  - Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., 4,106,015, Cl. 343-5.00W.
- Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., to Hewlett-Packard Company. Digitally controlled transmission impairment measuring apparatus. 4,105,995, Cl. 340-146.10E.
- Bottger, Erik. Device for safety-helmet with ear mufflers. 4,104,743, Cl. 2-423.000.
- Boucher, Rosaire. Endless track for a tracked vehicle. 4,105,259, Cl. 305-50.000.
- Boudouris, Angelo, to Eprad Incorporated. Film transport system. 4,105,311, Cl. 352-187.000.
- Bourgeois, Alain: *See—*
  - Bui-Hai, Nhu; and Bourgeois, Alain, 4,106,026, Cl. 343-786.000.
- Bourguignon, Philippe: *See—*
  - Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, 4,104,827, Cl. 49-385.000.
- Bovagne, Rene, to Creusot-Loire. Device for locating a layer of tubes in an enclosure. 4,105,067, Cl. 165-159.000.
- Bowen, Robert F.: *See—*
  - Freedman, George; and Bowen, Robert F., 4,104,957, Cl. 99-283.000.
- Bowman, Bradshaw. Pattern forming wheel for uncured concrete surfaces. 4,105,354, Cl. 404-72.000.
- Boylett, William Frederick, to Consultant Gas Engineer Limited. Fuel burners. 4,105,393, Cl. 431-116.000.
- Boyne Mountain Lodge, Inc.: *See—*
  - Kircher, Everett F.; and Dilworth, James L., 4,105,161, Cl. 239-2.00S.
- BP Canada: *See—*
  - Savard, Gilbert, 4,104,971, Cl. 104-172.00B.
- BP Chemicals Limited: *See—*
  - Matheson, Ian Alastair, 4,105,585, Cl. 252-429.00B.
- Bradberry, Carl. Miniature dental kit. 4,105,120, Cl. 206-581.000.
- Bradshaw, William A.; and Dalgleish, Gerald, to American Flange & Manufacturing Co. Inc. Closure plug. 4,105,135, Cl. 220-288.000.
- Brady, Michael Barry Clive: *See—*
  - Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,105,951, Cl. 331-90.000.
- Braese, Hans-Eberhard: *See—*
  - Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
- Brass, Robert L., to General Mills Fun Group, Inc. Toy construction system having reusable distensible joining members. 4,104,952, Cl. 85-5.00R.
- Braum, Ludwig, to Libandor Trading Corporation Inc. Method for checking coins and coin checking apparatus for the performance of the aforesaid method. 4,105,105, Cl. 194-100.00A.
- Braun Aktiengesellschaft: *See—*
  - Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, 4,106,080, Cl. 362-18.000.
- Braun, Ernst; and Braun, Gert, to Halbach & Braun. Double chain conveyor construction. 4,105,110, Cl. 198-731.000.
- Braun, Gert: *See—*
  - Braun, Ernst; and Braun, Gert, 4,105,110, Cl. 198-731.000.
- Braun, Hans, to Boehringer Mannheim GmbH. Machine for the continuous preparation and packaging of freeze-dried materials. 4,104,807, Cl. 34-92.000.
- Braunl, Kenneth William; and Webster, John Lawrence, to A P Products Incorporated. Molded cable termination assembly with insert. 4,105,278, Cl. 339-103.00M.
- Braunstein, David M.: *See—*
  - Semanchik, Michael; and Braunstein, David M., 4,105,637, Cl. 528-241.000.
- Breaux, Earl J., to J. Ray McDermott & Co., Inc. Pipe cleaning brush assembly for pipe facing machine. 4,104,937, Cl. 82-34.00R.
- Breitbard, Elford Barnett, to Tele-Quik, Inc. Telephone directory information support bracket. 4,105,181, Cl. 248-452.000.
- Brenner, Bernd: *See—*
  - Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, 4,105,467, Cl. 127-37.000.
- Brenta, Robert, to Brenta, Robert. Portable workshop. 4,105,055, Cl. 144-286.00R.
- Brevetor S.A.: *See—*
  - Conne, Robert H., 4,106,074, Cl. 361-248.000.
- Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, to Interox. Particulate peroxygen compounds coated with sodium sesquicarbonate or $Na_2SO_4mNa_2CO_3$. 4,105,827, Cl. 428-403.000
- Bridges, Thomas James; and Burkhardt, Ernest Gardner, to Bell Telephone Laboratories, Incorporated. Spectrophone with field tuning of absorption cell. 4,105,919, Cl. 250-341.000.
- Bridgestone Tire Company Limited: *See—*
  - Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, 4,105,487, Cl. 156-405.00R.
- Brieger, Emmet F. Tubing conveyed sand consolidating method. 4,105,073, Cl. 166-286.000.

- Brisco, Paul R. Hospital bed and patient-handling apparatus. 4,104,748, Cl. 5-63.000.
- Bristol-Myers Company: *See—*
  - Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.
- Brite-O-Matic Manufacturing, Inc.: *See—*
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- British Gas Corporation: *See—*
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  - Smith, Ian, 4,105,972, Cl. 324-220.000.
- British Petroleum Company Limited, The: *See—*
  - Oldham, Guy Franklin, 4,105,553, Cl. 210-73.00W.
- British Steel Corporation (Chemicals) Limited: *See—*
  - Bruce, John McNicol, 4,105,503, Cl. 201-40.000.
- Britt, Thomas O.: *See—*
  - Lennon, Carl L.; and Britt, Thomas O., 4,105,966, Cl. 324-113.000.
- Broch, Karl Heinz: *See—*
  - Eisenmann, Karl Heinz; and Broch, Karl Heinz, 4,105,595, Cl. 521-159.000.
- Broderick, Ross Thomas, to Deere & Company. Combination front-end loader bucket and refuse container. 4,105,131, Cl. 214-315.000.
- Broillard, Bernard. Metering dispenser having suck-back through nozzle. 4,105,146, Cl. 222-383.000.
- Broken Hill Proprietary Company Limited, The: *See—*
  - Debenham, Michael; Dalli, Allan George; and Revell, Peter Louis, 4,105,134, Cl. 220-268.000.
- Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, to Produits Chimiques Ugine Kuhlmann. Heteryl-azo-phenyl disperse dyestuffs containing a Z-substituted benzolyloxyalkyl radical, wherein Z is 2-cyanovinyl 2-cyanoethyl or 2-chloro-2-cyanoethyl. 4,105,653, Cl. 260-158.000.
- Brown, Gordon Eldred. Composite railroad tie. 4,105,159, Cl. 238-36.000.
- Brown, Harvey A.: *See—*
  - Huffman, William A.; and Brown, Harvey A., 4,105,299, Cl. 350-349.000.
- Brown Jordan Company: *See—*
  - Colby, Donald Bruce, 4,105,244, Cl. 297-45.000.
- Brown, Marvin R.: *See—*
  - Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,105,603, Cl. 260-8.000.
- Brownlee, Robert O., to Reid, William Clinton; and Brownlee, Robert O. Method of erecting a building construction. 4,104,844, Cl. 52-744.000.
- Bruce, John McNicol, to British Steel Corporation (Chemicals) Limited. Method and apparatus for emission control of by-product coke ovens. 4,105,503, Cl. 201-40.000.
- Brucken, Byron L.; and Watt, Roy E., to General Motors Corporation. Variable displacement compressor with three-piece housing. 4,105,370, Cl. 417-222.000.
- Bruckner Apparatebau GmbH: *See—*
  - Schuierer, Manfred, 4,104,753, Cl. 8-152.000.
- Brummer, Gerald W.: *See—*
  - Baumann, Terry F.; and Brummer, Gerald W., 4,105,057, Cl. 150-35.000.
- Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, to Ciba-Geigy Corporation; and Sankyo Company, Limited. Derivatives of 4-oxopiperidines and their use as polymer stabilizers. 4,105,626, Cl. 260-45.8NZ.
- Brunnengraber, Hermann, to Gebr. Hofmann KG, Maschinenfabrik. Balancing machine circuit for eliminating unbalances. 4,104,919, Cl. 73-462.000.
- Buchwald, Robert M., to General Motors Corporation. Independent front suspension system. 4,105,222, Cl. 280-668.000.
- Bucker, Henrique Oswaldo. Inflatable parachute for use as escape or sporting device. 4,105,173, Cl. 244-146.000.
- Buckeye International, Inc.: *See—*
  - Spencer, Benjamin B., 4,105,128, Cl. 213-61.000.
- Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, to Sud-Chemie Aktiengesellschaft. Process for two-stage digestion of natural products containing xylane, in order to obtain xylose. 4,105,467, Cl. 127-37.000.
- Buckler, Sheldon A., to Polaroid Corporation. Flat battery with electrodes in slurry form. 4,105,815, Cl. 429-152.000.
- Bud Antle, Inc.: *See—*
  - Ingram, Lawrence L.; and Infante, Javier D., 4,104,975, Cl. 111-3.000.
- Buhler, Gerhard, to FRYMA-Maschinen AG. Heat exchanger. 4,105,066, Cl. 165-94.000.
- Bui-Hai, Nhu; and Bourgeois, Alain, to Thomson-CSF. Corrugated horn with a low standing wave ratio. 4,106,026, Cl. 343-786.000.
- Bujnowski, Edward J.: *See—*
  - Lau, George W.; and Bujnowski, Edward J., 4,105,164, Cl. 239-526.000.
- Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, to Ceskoslovenska akademie ved. Anionic polymerization of caprolactam at a temperature below the melting point of polycaprolactam. 4,105,644, Cl. 528-314.000.
- Bukhman, Inokh Borukhovich: *See—*
  - Aizenberg, Julian Borisovich; Bukhman, Inokh Borukhovich; and Pyatigorsky, Vladimir Mikhailovich, 4,105,293, Cl. 350-264.000.
- Bundy, Gordon L., to Upjohn Company, The. 13,14-Dihydro-9-deoxy-PGF_2 compounds. 4,105,682, Cl. 260-408.000.
- Bundy, Richard P.: *See—*
  - Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., 4,105,421, Cl. 55-379.000.
- Bunker Ramo Corporation: *See—*
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- Bunn, Stuart E.; and Owsley, Herbert B., to Ball Valve Company, Inc. Screw locking arrangement. 4,105,058, Cl. 151-41.740.
- Burdick, Kenneth John; Constable, Douglas William; and Wheeler, Robert Charles, to GTE Sylvania Incorporated. Automatic color level control system with threshold tracking. 4,106,055, Cl. 358-27.000.
- Burger, John P., to Raymond Lee Organization, Inc., The. Hook-on necktie conversion kit. 4,104,739, Cl. 2-155.000.
- Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,105,416, Cl. 44-1.00R.
- Burkey, David J.; and Rosenau, Clifford M., to Armstrong Cork Company. Nailable vinyl chloride-based injection-molding compound. 4,105,717, Cl. 260-889.000.
- Burkhardt, Ernest Gardner: *See—*
  - Bridges, Thomas James; and Burkhardt, Ernest Gardner, 4,105,919, Cl. 250-341.000.
- Burley, Joseph: *See—*
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- Burnett, James E., to Mead Corporation, The. Density control for ink jet copier. 4,106,061, Cl. 358-296.000.
- Burroughs Corporation: *See—*
  - Millers, Donald Alexander, II., 4,106,092, Cl. 364-200.000.
- Burysek, Frantisek: *See—*
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- Burzin, Klaus: *See—*
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- Busch, Norbert: *See—*
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- Busse, Oswald; and Klesper, Hugo, to Passavant-Werke Michelbacher Hutte. Plate-type filter press. 4,105,559, Cl. 210-225.000.
- Bussjager, Rudy C.: *See—*
  - Del Toro, James J.; and Bussjager, Rudy C., 4,105,064, Cl. 165-29.000.
- Butin, Henri: *See—*
  - Lechevin, Rene; and Butin, Henri, 4,105,981, Cl. 329-50.000.
- Butler Manufacturing Company: *See—*
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- Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for the preparation of aliphatic polycarbonates and polyurethanes therefrom. 4,105,641, Cl. 526-712.000.
- C. Hohage & Cie. KG: *See—*
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- Cabot Corporation: *See—*
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- Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., to Gulf & Western Manufacturing Company. Automotive press. 4,104,776, Cl. 29-281.300.
- Caillol, Alain, to Societe d'Etudes Chimiques. Process and installation for the manufacture of chlorine dioxide. 4,105,751, Cl. 423-478.000.
- Cal-Wood Door: *See—*
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- Calbiochem-Behring Corp.: *See—*
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- Calderoni, Sergio L., to General Motors Corporation. Contour die milling with a toroidal cutter. 4,104,943, Cl. 90-11.00C.
- Caldwell, John W. Cluster assembly means for articles of furniture and articles incorporating the same. 4,105,250, Cl. 297-445.000.
- California Institute of Technology: *See—*
  - Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,105,598, Cl. 521-53.000.
- California R & D Center: *See—*
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- Callahan, James J., to Houdaille Industries, Inc. Single line lubricant reversing feeder. 4,105,094, Cl. 184-7.00F.
- Calzolari, Sergio, to Fogt Industriemaschinenvertretung A.G. Fluid distributor device for controlling an apparatus for pumping wet concrete and the like. 4,105,373, Cl. 417-317.000.
- Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., to Baxter Travenol Laboratories, Inc. Method of making a flexible, collapsible container for liquids with improved tail seal. 4,105,730, Cl. 264-89.000.
- Campbell, E. Calvin, Jr. Surface finish for statuary. 4,105,812, Cl. 428-15.000.
- Campbell, John J., to Caterpillar Tractor Co. Planet gear positioning and retaining mechanism. 4,104,933, Cl. 74-801.000.
- Campbell, John R.; and Klopfer, Howard J., to General Electric Company. Process for preparing phenyl trichloro-ethanes. 4,105,857, Cl. 568-726.000.
- Camr, Rudolf: *See—*
  - Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.

- Canada-Cities Service, Ltd.: *See—*
  - McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
- Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
  - McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
- Canon Kabushiki Kaisha: *See—*
  - Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.
  - Kawakita, Yukimasa; and Okuno, Youichi, 4,106,038, Cl. 354-155.000.
  - Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
  - Nakamura, Zenzo; and Hasegawa, Goro, 4,106,037, Cl. 354-128.000.
  - Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, 4,105,444, Cl. 96-1.00R.
  - Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
  - Tsuji, Sadahiko, 4,105,291, Cl. 350-184.000.
- Cantarutti, Armindo, to NRM Corporation. Tire component transfer. 4,105,486, Cl. 156-405.00R.
- Capra, Nicholas G., to Pauls, James D.; and Lewis, J. Claybrook, part interest to each. Mechanically operated dispensing device. 4,105,145, Cl. 222-340.000.
- Car Cuf Industries, Inc.: *See—*
  - Tankel, Lawrence, 4,104,895, Cl. 70-237.000.
- Carella, Vincent: *See—*
  - Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.
- Carkhuff, Donald W.: *See—*
  - Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., 4,105,891, Cl. 219-137.430.
- Carl Still, Firma: *See—*
  - Lorenz, Kurt, 4,105,504, Cl. 202-91.000.
- Carley, Harold E.: *See—*
  - Miller, George A.; and Carley, Harold E., 4,105,762, Cl. 424-245.000.
- Carlson, Philip A.: *See—*
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- Carrier Corporation: *See—*
  - Del Toro, James J.; and Bussjager, Rudy C., 4,105,064, Cl. 165-29.000.
  - Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., 4,105,129, Cl. 214-152.000.
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- Carroll, Andrew C., to Raymond Lee Organization, Inc., The. Scissors. 4,104,794, Cl. 30-268.000.
- Carstedt, Howard B. Pulsating glue head for folding machines. 4,104,983, Cl. 118-2.000.
- Carter Equipment Co., Inc.: *See—*
  - Carter, William D.; and Mueller, Martin S., 4,105,329, Cl. 355-91.000.
- Carter, William D.; and Mueller, Martin S., to Carter Equipment Co., Inc. Total immersion transfer of photographic images between sprocket-registered strips of film. 4,105,329, Cl. 355-91.000.
- Caruel, Jacques E. J.; and Stora, Guy D., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Double-walled combustion chamber shell having combined convective wall cooling and film cooling. 4,104,874, Cl. 60-39.650.
- Casey, Richard W. Child safety device for retaining electrical plugs. 4,105,274, Cl. 339-75.00P.
- Cashen, Norton A.: *See—*
  - Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., 4,105,403, Cl. 8-115.000.
- Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, to Siemens Aktiengesellschaft. Pressure difference measuring apparatus. 4,104,924, Cl. 73-716.000.
- Caspar, Heinz; and Kudritzki, Felix, to Siemens Aktiengesellschaft. Pressure or pressure difference measuring apparatus. 4,104,925, Cl. 73-716.000.
- Castillo, Adolfo, to Automabed Building Components, Inc. Press. 4,104,962, Cl. 100-100.000.
- Caterpillar Tractor Co.: *See—*
  - Blunier, Dennis L.; and Clemens, Donald E., 4,105,260, Cl. 305-54.000.
  - Campbell, John J., 4,104,933, Cl. 74-801.000.
  - Gilbert, Russell L., 4,105,078, Cl. 172-781.000.
  - Schexnayder, Lawrence F., 4,105,214, Cl. 277-74.000.
- Cathell, Frank, to Qualidyne Systems, Inc. Full wave bridge power inverter. 4,105,957, Cl. 331-110.000.
- Cease, James W., to Fine, Robert H. Ferrule forming assembly. 4,104,902, Cl. 72-117.000.
- Celanese Corporation: *See—*
  - Frey, William J.; and Meyer, Paul L., 4,105,226, Cl. 285-175.000.
  - Gross, Arthur L., 4,105,793, Cl. 424-314.000.
  - Hanson, Harry T.; and Gordon, Marvin, 4,105,634, Cl. 526-65.000.
  - Larkin, Donald R., 4,105,701, Cl. 260-650.00R.
  - Lee, Wei-Kuo, 4,105,728, Cl. 264-40.700.
  - Semanchik, Michael; and Braunstein, David M., 4,105,637, Cl. 528-241.000.
  - Taylor, Paul D., 4,105,677, Cl. 260-346.110.
  - Taylor, Paul D., 4,105,678, Cl. 260-346.110.
- Centre Europeen de Recherches Mauvernay: *See—*
  - Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, 4,105,785, Cl. 424-285.000.
- Cerra, Raffaele; and Scherillo, Michele. Devices for determining errors of siting, especially in radar systems. 4,106,016, Cl. 343-7.400.
- Ceskoslovenska akademie ved: *See—*
  - Benes, Milan; and Peska, Jan, 4,105,858, Cl. 560-222.000.
  - Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, 4,105,644, Cl. 528-314.000.
  - Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
- Ceuppens, Willy Gabriel: *See—*
  - Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, 4,105,198, Cl. 271-14.000.
- Cha, Chang Yul, to Occidental Oil Shale. Process for recovering carbonaceous values from post in situ oil shale retorting. 4,105,072, Cl. 166-261.000.
- Chabardes, Pierre, to Rhone-Poulenc Industries. Process for the preparation of α, β-ethylenic aldehydes. 4,105,697, Cl. 260-601.00R.
- Chamberlin, Donald W.: *See—*
  - Irving, Donald W.; and Chamberlin, Donald W., 4,105,123, Cl. 209-111.600.
- Chambers, Ramon P.: *See—*
  - Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,105,975, Cl. 325-320.000.
- Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Self twist yarn strand system. 4,104,855, Cl. 57-77.300.
- Champion International Corporation: *See—*
  - Chambley, Phillip W.; and Norris, Alan H., 4,104,855, Cl. 57-77.300.
  - Locke, Frank W., 4,105,153, Cl. 229-23.00R.
- Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for the production of a casein substitute. 4,105,799, Cl. 426-44.000.
- Chang, Wen-Hsuan: *See—*
  - Wang, Yen; and Chang, Wen-Hsuan, 4,105,025, Cl. 128-90.000.
- Chanod, Edward: *See—*
  - Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, 4,105,410, Cl. 23-253.0TP.
- Chapel, Annette Moore: *See—*
  - Horvath, Ralph S.; and Chapel, Annette Moore, 4,105,115, Cl. 206-370.000.
- Chapman, Herbert Hill, Jr., to RCA Corporation. Electronic mail box. 4,106,060, Cl. 358-256.000.
- Chappatte, Jean-Maurice, to Ebauches Electroniques S.A. Timepiece. 4,104,866, Cl. 58-85.500.
- Charbonnier, Jean, to Societe de Vente de l'Aluminium Pechiney. Crucible for the thermal analysis of aluminum alloys. 4,105,191, Cl. 266-88.000.
- Chase, Michael John, to Imperial Chemical Industries Limited. Pressure resistant member. 4,104,878, Cl. 60-245.000.
- Chatterjee, Pronoy Kumar; and Morbey, Graham Kenneth, to Personal Products Company. Powdered grafted cellulose. 4,105,033, Cl. 128-285.000.
- Chauvy, Jean-Daniel, to Gillette Company, The. Production of shaving foil. 4,105,493, Cl. 156-644.000.
- Cheek, Alton E. Jarring tool. 4,105,082, Cl. 175-302.000.
- Chemische Werke Huels Aktiengesellschaft: *See—*
  - Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.
- Chen, Thomas T.: *See—*
  - Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., 4,106,106, Cl. 365-2.000.
- Cherry, Brian Wilson: *See—*
  - Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, 4,105,117, Cl. 206-501.000.
- Chester, Arnold M. Temperature responsive valve seal. 4,105,040, Cl. 137-72.000.
- Chevron Research Company: *See—*
  - Blakely, Donald W., 4,105,587, Cl. 252-439.000.
  - Suzuki, Shigeto, 4,105,687, Cl. 260-465.400.
- Chicago Bridge & Iron Company: *See—*
  - Tam, William A., 4,105,068, Cl. 166-355.000.
- Chicoine, Gustave J. Manual downshift deacceleration warning light system. 4,105,994, Cl. 340-71.000.
- Chihak, Paul P.; and Wehage, Charles H., to Rockwell International Corporation. Method and apparatus for reducing interference between plural radio altimeters. 4,106,018, Cl. 343-12.00A.
- Children's Hospital Medical Center: *See—*
  - Moore, Robert E.; and Clark, Leland C., Jr., 4,105,798, Cl. 424-352.000.
- Chirico, Anthony Nicholas, to Ecodyne Corporation. Heat exchanger. 4,105,065, Cl. 165-78.000.
- Chism, Van B. Archery bowstring release. 4,105,011, Cl. 124-35.00A.
- Chivens, Donald R.; and Kelm, Edward C., to Lexitron Corporation. Print element having flexible characters. 4,105,341, Cl. 400-144.200.
- Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, to Kumiai Chemical Industry Co., Ltd. Process for producing 2-alkylbenzanilide. 4,105,693, Cl. 260-558.00P.
- Cho, Kichinosuke; and Watanabe, Tsutomu, to Kabushiki Kaisha Art Coffee. Process for producing carbonated coffee drink. 4,105,802, Cl. 426-329.000.
- Cho, Tae Han. Tennis trainer. 4,105,203, Cl. 273-29.00A.
- Choi, Charles K., to Occidental Petroleum Corporation. Simplified liquefaction pyrolysis process and apparatus therefor. 4,105,502, Cl. 201-12.000.
- CHON Corporation: *See—*
  - Oppolzer, Wolfgang, 4,105,853, Cl. 560-24.000.
- Christidis, Yani; and Schouteten, Alain, to Nobel Hoechst Chimie.

Process for manufacturing N-acyl derivatives of hydroxy-arylglycines. 4,105,690, Cl. 260-519.000.

Chrysler Corporation: *See—*

Fenn, Gordon William, 4,104,998, Cl. 123-117.00R.

Chung, Rack H., to GAF Corporation. Process for the preparation of 1-aminoanthraquinones. 4,105,680, Cl. 260-378.000.

Church, Larry L.: *See—*

Sun, Shan C.; and Church, Larry L., 4,106,071, Cl. 361-79.000.

Churchman, M. Steele. Endboard auxiliary device for beds. 4,104,751, Cl. 5-327.00R.

Ciba-Geigy Corporation: *See—*

Back, Gerhard, 4,105,400, Cl. 8-43.000.

Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.

Fory, Werner; and Fischer, Hanspeter, 4,105,685, Cl. 260-448.20N.

Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, 4,105,648, Cl. 526-204.000.

Koci, Zdenek; and Mollet, Hans, 4,105,401, Cl. 8-79.000.

Luthi, Christian, 4,105,399, Cl. 8-1.00W.

Winter, Roland A. E., 4,105,630, Cl. 260-45.80R.

Winter, Roland A. E., 4,105,646, Cl. 528-311.000.

Ciba Geigy (UK) Limited: *See—*

Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,105,551, Cl. 210-58.000.

Cincinnati Milacron Inc.: *See—*

Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, 4,104,984, Cl. 118-2.000.

Cink, Josef: *See—*

Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,104,823, Cl. 47-1.00R.

Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, to Honeywell Information Systems Italia. Semiconductor dynamic memory and related refreshing system. 4,106,108, Cl. 365-222.000.

Clark, Leland C., Jr.: *See—*

Moore, Robert E.; and Clark, Leland C., Jr., 4,105,798, Cl. 424-352.000.

Clark, Raleigh E. Rear view mirror assembly. 4,105,183, Cl. 248-484.000.

Clark, Timmy. Apparatus and method for transcribing musical notations. 4,104,949, Cl. 84-462.000.

Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., to United States of America, Army. Method of manufacture and retina for pyroelectric vidicon. 4,104,771, Cl. 29-25.140.

Clark, William H.; and Skinner, Charles E., to Dow Corning Corporation. Organic solvent dispersions of silicone elastomers. 4,105,617, Cl. 260-31.20N.

Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, to Thomson-CSF. System for taking current-metering measurements. 4,104,912, Cl. 73-189.000.

Clawson, Robert G.: *See—*

La Barge, Robert L.; and Clawson, Robert G., 4,105,133, Cl. 220-266.000.

Clay, Burton Ross; and Gore, Douglas Alan, to RCA Corporation. Deflection-type modulator of laser beam for communications. 4,105,915, Cl. 250-199.000.

Clayton Dewandre Company Limited: *See—*

Levington, Henry John, 4,105,087, Cl. 180-89.150.

Cleary, Edward Joseph, Jr.; and Reiney, Michael Goodwin, to Tektronix, Inc. "Slewed pulse" scope sweep calibrator. 4,105,932, Cl. 315-377.000.

Clemens, Donald E.: *See—*

Blunier, Dennis L.; and Clemens, Donald E., 4,105,260, Cl. 305-54.000.

Clements, Jack T.: *See—*

Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., 4,105,421, Cl. 55-379.000.

Cleveland Bridge & Engineering Co., Ltd., The: *See—*

Knox, Hugh Stewart Geddes, 4,105,167, Cl. 242-54.00R.

Cloots, Henry R., to Waukesha Foundry Company, Inc. Apparatus for mixing particulate material in a liquid. 4,106,117, Cl. 366-154.000.

Clope, Richard W.; and Glaser, Milton A., to Dexter Corporation, The. Epoxy hydroxol primer. 4,105,613, Cl. 260-29.40R.

Clutter, Melvin E.: *See—*

West, Edward L.; and Clutter, Melvin E., 4,105,272, Cl. 339-14.00L.

Coal Industry (Patents) Limited: *See—*

Highley, John; and Vickers, Michael Alan, 4,105,419, Cl. 48-61.000.

Coast, John B. Crustacean claw-processing machine. 4,104,764, Cl. 17-71.000.

Coca-Cola Company, The: *See—*

Iacobucci, Guillermo A.; and Sweeny, James G., 4,105,675, Cl. 260-345.200.

Cockshott, Charles Peter; and Moore, John Howard, to Lucas Industries Limited. Apparatus for measuring the mass flow of a fluid. 4,104,913, Cl. 73-194.00F.

Coffinberry, George A., to United States of America, National Aeronautics and Space Administration. Fuel delivery system including heat exchanger means. 4,104,873, Cl. 60-39.28R.

Cohen, Louis, to B. F. Goodrich Company, The. Internally coated reaction vessel for use in olefinic polymerization. 4,105,840, Cl. 526-62.000.

Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing a cyanoalkyl A-ring precursor. 4,105,676, Cl. 260-345.90S.

Coils, Inc.: *See—*

Plunkett, James P., 4,105,985, Cl. 336-90.000.

Colby, Donald Bruce, to Brown Jordan Company. Foldable furniture unit. 4,105,244, Cl. 297-45.000.

Coleman, William E., to NCR Corporation. Load and hold means for plasma display devices. 4,105,930, Cl. 315-169.0TV.

Colery, Jean-Claude: *See—*

Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, 4,105,827, Cl. 428-403.000.

Colescott, Robert L.; and Tregear, Geoffrey W., to Armour Pharmaceutical Company. Synthesis of peptides with parathyroid hormone activity. 4,105,602, Cl. 260-8.000.

Colgate-Palmolive Company: *See—*

Schreiber, Ronald Stanley, 4,105,758, Cl. 424-49.000.

Schreiber, Ronald Stanley; and Duff, Edward John, 4,105,759, Cl. 424-52.000.

Colin, Jean-Marie H.: *See—*

Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., 4,106,015, Cl. 343-5.00W.

Collins, David John; Kay, Ian Trevor; and Slater, John Walter, to Imperial Chemical Industries Limited. Selective herbicides. 4,105,433, Cl. 71-93.000.

Collins, Jerome H., to Procter & Gamble Company, The. Liquid detergent compositions. 4,105,592, Cl. 252-545.000.

Colombo, Paolo: *See—*

Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.

Color Communications, Inc.: *See—*

Day, Frederick A.; and Garbark, Melvin D., 4,104,809, Cl. 35-28.500.

Columbus McKinnon Corporation: *See—*

Ulbing, Otmar M.; and Koval, Edmund R., 4,105,882, Cl. 200-157.000.

Combustion Engineering, Inc.: *See—*

D'Amaddio, Eugene Raymond; and Enegess, David Norman, 4,105,556, Cl. 210-152.000.

Comfort Products, Inc.: *See—*

Rinehart, Dixie L., 4,104,740, Cl. 2-158.000.

Commissariat a l'Energie Atomique: *See—*

Arod, Jean; Gauthier, Michele; and Platzer, Roger, 4,105,508, Cl. 204-1.00T.

Germain, Michel, 4,105,683, Cl. 260-429.100.

Therond, Jean-Paul, 4,105,496, Cl. 176-19.00R.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris": *See—*

Dumont, Michel Paul; and Lamy, Jacques Edouard, 4,104,886, Cl. 61-112.000.

Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., to United States of America, Energy. Method and apparatus for providing negative ions of actinide-metal hexafluorides. 4,105,746, Cl. 423-251.000.

Conder, Terrence M.; and Jones, Terence A., to Minnesota Mining and Manufacturing Company. Optical element to assure a minimum spacing. 4,105,292, Cl. 350-211.000.

Conne, Robert H., to Brevetor S.A. Triggering head for devices controlled by an electric power input. 4,106,074, Cl. 361-248.000.

Constable, Douglas William: *See—*

Burdick, Kenneth John; Constable, Douglas William; and Wheeler, Robert Charles, 4,106,055, Cl. 358-27.000.

Consultant Gas Engineer Limited: *See—*

Boylett, William Frederick, 4,105,393, Cl. 431-116.000.

Consumer Concepts, Inc.: *See—*

Orenstein, Henry, 4,105,885, Cl. 200-52.00R.

Continental Oil Company: *See—*

Oertle, Donald H., 4,104,906, Cl. 73-104.000.

Reusch, Robert J., 4,104,806, Cl. 34-10.000.

Sifferman, Thomas R.; and Sparlin, Derry D., 4,105,618, Cl. 260-33.6UA.

Starks, Charles M.; and Lundeen, Allan J., 4,105,698, Cl. 568-744.000.

Starks, Charles M., 4,105,699, Cl. 568-744.000.

Control Components, Inc.: *See—*

Self, Richard E., 4,105,048, Cl. 138-42.000.

Control Data Corporation: *See—*

Bergan, Kenneth N., 4,106,088, Cl. 363-132.000.

Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., to Westinghouse Electric Corp. Compartmentalized gas insulated transmission line. 4,105,859, Cl. 174-14.00R.

Coon, Marvin D., deceased; and by MacPherson, John Hugh, agent. Fuel additive. 4,105,417, Cl. 44-63.000.

Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, to Ideal Toy Corporation. Pinball type baseball game. 4,105,207, Cl. 273-89.000.

Cooper, Leonard W. Connection plate for panels of a concrete form. 4,105,185, Cl. 249-194.000.

Cooper, Richard H.: *See—*

Gasser, William J.; and Cooper, Richard H., 4,104,756, Cl. 15-97.00B.

Cooperativa Central Dos Productores de Acucar e Alcool do Estado de Sao Paulo: *See—*

Da Silva, Wilson Marcelo, 4,105,893, Cl. 219-316.000.

Coors Container Company: *See—*

Huffman, Stanley S., 4,105,103, Cl. 193-32.000.

Copal Company Limited: *See—*

Okabe, Katsuhiko, 4,104,967, Cl. 101-99.000.

Copeland Corporation: *See—*

Scharf, Philip H., 4,105,374, Cl. 417-415.000.

Copenhefer, John E.: *See—*

Latakas, Bernard; Copenhefer, John E.; and House, Robert M., 4,105,423, Cl. 55-501.000.

Corban Industries, Inc.: *See—*

Lass, Harold M., 4,105,490, Cl. 156-526.000.

Corbellini, Margherita: *See—*

Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.

Coria, Yolanda Teevin: *See—*

Lopez, Tiburcio Coria; and Coria, Yolanda Teevin, 4,105,113, Cl. 206-100.000.

Corman, Edward M.: *See—*

Balzer, Claude P.; and Corman, Edward M., 4,104,839, Cl. 52-288.000.

Cornell Research Foundation, Inc.: *See—*

Resler, Edwin L., Jr., 4,104,989, Cl. 123-32.0ST.

Resler, Edwin L., Jr., 4,105,008, Cl. 123-191.00R.

Resler, Edwin L., Jr., 4,105,009, Cl. 123-193.00H.

Corner, Michael Raymond; and Jackson, William Lewis, to Dunlop Limited. Wheel with rim embraced by tire. 4,105,254, Cl. 301-63.0DS.

Corning Glass Works: *See—*

Elmer, Thomas H., 4,105,427, Cl. 65-30.00R.

Hertl, William; and Ramsey, William S., 4,105,498, Cl. 195-59.000.

Olshansky, Robert, 4,105,284, Cl. 350-96.330.

Corning Limited: *See—*

Tunnicliffe, George, 4,105,061, Cl. 165-1.000.

Corson, Frederick P.: *See—*

Evani, Syamalarao; and Corson, Frederick P., 4,105,649, Cl. 526-271.000.

Cosco, Robert J., to GTE Sylvania Incorporated. Shunt triggered flashtube having safety feature. 4,105,929, Cl. 315-125.000.

Cosden Technology, Inc.: *See—*

Watson, James M., 4,105,506, Cl. 203-9.000.

Cotton, John F.: *See—*

Gogniat, Theodore; and Cotton, John F., 4,105,986, Cl. 337-3.000.

Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., to Merck & Co., Inc. Sulfomethylated graft copolymers of xanthan gum and polyacrylamide. 4,105,605, Cl. 260-17.4GC.

Couture, Paul A.: *See—*

Anghinetti, Joseph R.; and Couture, Paul A., 4,104,834, Cl. 52-1.000.

Cowan, Arlis L. Dart game holder and score keeper. 4,105,119, Cl. 206-579.000.

Cowardin, Robert Lewis; and Laurer, George Joseph, to International Business Machines Corporation. Glitch filter circuit. 4,105,980, Cl. 328-165.000.

Cox, John T.: *See—*

Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.

Cragoe, Edward J., Jr.: *See—*

Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,105,769, Cl. 424-263.000.

Creusot-Loire: *See—*

Bovagne, Rene, 4,105,067, Cl. 165-159.000.

Cronin, Michael Joseph, to Lockheed Aircraft Corporation. Electric power control system with load management programming. 4,106,013, Cl. 340-27.00R.

Crossfield, Roger J., to George A. Goulston Co., Ltd. Yarn finish formulation. 4,105,569, Cl. 252-8.600.

Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. 4-Amido-2-alkoxy thiazoles and composition. 4,105,773, Cl. 424-270.000.

Crowley, Albert Timothy, to RCA Corporation. Pulse wave phase and frequency detector. 4,105,947, Cl. 331-1.00A.

CTS Corporation: *See—*

VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., 4,105,988, Cl. 338-132.000.

Culbertson, Charles H., to Westinghouse Electric Corp. Direct digital technique for generating an AC waveform. 4,105,939, Cl. 318-599.000.

Culmone, Vincent; and Kaniecki, Thaddeus J., to American Cyanamid Company. Process for formulating a non-caustic oven cleaner which will remove pyrolyzed fat efficaciously. 4,105,574, Cl. 252-154.000.

Culshaw, Brian, to National Research Development Corporation. Zener diodes. 4,106,043, Cl. 357-13.000.

Curran, Mike H. Bicycle reflector assembly. 4,105,286, Cl. 350-99.000.

Curtis, Fred J. Safety device. 4,105,190, Cl. 256-1.000.

Cushman, David W.: *See—*

Ondetti, Miguel Angel; and Cushman, David W., 4,105,776, Cl. 424-274.000.

Ondetti, Miguel Angel; and Cushman, David W., 4,105,789, Cl. 424-309.000.

Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Asphalt composition and its manufacture. 4,105,612, Cl. 260-27.0EV.

Custro, Sergio: *See—*

Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.

Cutler-Hammer, Inc.: *See—*

Hastings, Jerome K.; and Piber, Earl T., 4,105,883, Cl. 200-296.000.

Czumak, Frank M.; and Stella, Joseph A., to Polaroid Corporation. Multipurpose film cassette having a processor disabling valve retention arrangement. 4,106,042, Cl. 354-317.000.

Dahlen, Theodore E.: *See—*

Wells, Thomas R.; and Dahlen, Theodore E., 4,105,312, Cl. 353-27.00R.

Daido Metal Company, Ltd.: *See—*

Mori, Sanae, 4,105,267, Cl. 308-240.000.

Daikin Kogyo Co., Ltd.: *See—*

Sakai, Shoji; and Okuda, Masahiro, 4,105,716, Cl. 260-884.000.

Daimler-Benz Aktiengesellschaft: *See—*

Amann, Rolf; Benda, Hans; and Dietterle, Albert, 4,105,230, Cl. 292-202.000.

Forster, Hans-Joachim; and Eltze, Ulrich, 4,105,101, Cl. 192-4.00A.

Fricker, Ludwig, 4,104,992, Cl. 123-32.0JV.

Geiger, Friedrich, 4,105,243, Cl. 296-28.00R.

Thoma, Frank, 4,105,002, Cl. 123-140.0MP.

Dainippon Inc. & Chemicals Inc.: *See—*

Izutu, Hitoshi; and Ishikawa, Ryoichi, 4,105,622, Cl. 260-37.00N.

Dalgleish, Gerald: *See—*

Bradshaw, William A.; and Dalgleish, Gerald, 4,105,135, Cl. 220-288.000.

Dalli, Allan George: *See—*

Debenham, Michael; Dalli, Allan George; and Revell, Peter Louis, 4,105,134, Cl. 220-268.000.

D'Amaddio, Eugene Raymond; and Enegess, David Norman, to Combustion Engineering, Inc. Liquid waste processing system. 4,105,556, Cl. 210-152.000.

Damsky, Arnold M. Electrical toggle switch lever extender. 4,105,884, Cl. 200-331.000.

Dana Corporation: *See—*

Kessmar, Leo R., 4,104,929, Cl. 74-473.00R.

Daneck, David A.: *See—*

Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.

Dany, Franz-Josef; Maier, Karl; Riedel, Tomas; and Wortmann, Joachim, to Hoechst Aktiengesellschaft. Process for flameproofing plastics. 4,105,735, Cl. 264-143.000.

Darboufas, Kimon Constantine: *See—*

Marshall, Robert Moore; and Darboufas, Kimon Constantine, 4,105,568, Cl. 252-8.600.

Dardi, Louis E.: *See—*

Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., 4,104,782, Cl. 29-527.200.

Darnell, Alfred J.; and Parkins, William E., to Rockwell International Corporation. Hydrogen production. 4,105,755, Cl. 423-648.00R.

Darsie, Burns: *See—*

Trost, Wayne C.; and Darsie, Burns, 4,105,052, Cl. 139-101.000.

Das, Subodh K.: *See—*

Becker, Aaron J.; and Das, Subodh K., 4,105,752, Cl. 423-496.000.

Da Silva, Wilson Marcelo, to Cooperativa Central Dos Productores de Acucar e Alcool do Estado de Sao Paulo. Apparatus and method for treating sugar cane stumps. 4,105,893, Cl. 219-316.000.

Date, Kazuo H.; and Wainio, Ronald A., to McGraw-Edison Company. Vacuum interrupter and disconnect combination. 4,105,878, Cl. 200-146.00R.

Datta, Pabitra: *See—*

Levine, Aaron William; Kaganowicz, Grzegorz; and Datta, Pabitra, 4,105,298, Cl. 350-340.000.

Dave, Nalinkumar Jayantilal, to University of Salford. Constructional elements of concrete. 4,105,739, Cl. 264-256.000.

David, Agoston: *See—*

Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.

Davis, Kenneth G.; Due, George B.; and Lund, Albert H., to Mobil Oil Corporation. Storage stable water-dilutable epoxy based coating for metal food contact surfaces. 4,105,614, Cl. 260-29.40R.

Davis, Lewis Berkley, Jr.; and Wilkes, Colin, to General Electric Company. Fuel nozzle for gas turbines. 4,105,163, Cl. 239-406.000.

Davitt, Joseph J., to Ward Aero, Inc. Flow check valve with bias spring removal capability. 4,105,044, Cl. 137-517.000.

Day, Frederick A.; and Garbark, Melvin D., to Color Communications, Inc. Color sample display device. 4,104,809, Cl. 35-28.500.

Dearnaley, Geoffrey; and Hartley, Nicholas Edmund Whittam, to United Kingdom Atomic Energy Authority. Metal-forming dies. 4,105,443, Cl. 75-238.000.

Debenham, Michael; Dalli, Allan George; and Revell, Peter Louis, to Broken Hill Proprietary Company Limited, The. Pressure release closures. 4,105,134, Cl. 220-268.000.

Decker, Martin: *See—*

Dockner, Toni; Toussaint, Herbert; and Decker, Martin, 4,105,657, Cl. 260-239.00B.

Deconinck, Hugo Frans: *See—*

Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, 4,105,198, Cl. 271-14.000.

Deere & Company: *See—*

Broderick, Ross Thomas, 4,105,131, Cl. 214-315.000.

Deffner, John F.; Wendel, Donald W.; and Barnes, Russell M., to Visual Marketing, Inc. Storage and dispensing rack. 4,105,126, Cl. 211-49.00D.

De Jong, Jan, to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek. Method for the application of a spectral-selective coating on a plate. 4,105,822, Cl. 428-216.000.

Deknatel, Inc.: *See—*

Kurtz, Leonard D.; and Bidwell, Robert E., 4,105,031, Cl. 128-276.000.

Delgado, Manuel M. Method and apparatus for precision forming of plastic materials such as glass to precise dimensions from sheet material. 4,105,429, Cl. 65-107.000.

Delignieres, Robert, to Institut Francais du Petrole. Acoustic wave transmitter-receiver. 4,105,991, Cl. 340-3.00D.

Del Toro, James J.; and Bussjager, Rudy C., to Carrier Corporation. Two stage compressor heating. 4,105,064, Cl. 165-29.000.

Demarest, Donald M.; and Leete, Bernard D., to General Electric Company. HVDC Floating current order system. 4,106,085, Cl. 363-51.000.

Demerson, Jean Robert. Roasting jack. 4,104,959, Cl. 99-421.00H.

Demura, Akira: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Denka Chemical Corporation: *See—*
Kerr, Ralph O., 4,105,586, Cl. 252-437.000.

Denney, Jerry W., to American Motor Corporation. Urea assay. 4,105,408, Cl. 23-230.00B.

Denton, Douglas L.: *See—*
Shannon, Richard F.; and Denton, Douglas L., 4,105,623, Cl. 260-38.000.

Deraedt, Roger: *See—*
Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,105,777, Cl. 424-274.000.

de Ramaix, Maurice Antoine; and Somers, Aloijsius Gerardus, to AGFA-GEVAERT N.V. Electrodialysis cell and method for producing cationic permeable membranes used therein. 4,105,533, Cl. 204-301.000.

Desblache, Andre Eugene, to International Business Machines Corporation. Self-adaptive digital filter for noise and phase jitter reduction. 4,106,102, Cl. 364-724.000.

De Spiegeleer, Michel R., to Gestivalmo Societe Anonyme Holding. Railway switching points. 4,105,175, Cl. 246-430.000.

Dethloff, Jurgen. Identification system safeguarded against misusé. 4,105,156, Cl. 235-441.000.

De Thomas, Waldo; and Hort, Eugene Victor, to GAF Corporation. Production of gamma-butyrolactone from maleic anhydride with a hydrogenation catalyst. 4,105,674, Cl. 260-343.600.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 4,105,590, Cl. 252-464.000.
Koch, Karlheinz; and Rupilius, Wolfgang, 4,105,430, Cl. 71-59.000.
Osswald, Gunter; and Graf, Hans, 4,105,464, Cl. 106-307.000.

De Wald, Horace A., to Parke, Davis & Company. 1,3,8-Trimethylimidazopyrazolodiazepine compounds. 4,105,851, Cl. 548-324.000.

Dewar, Robert: *See—*
Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.

Dexter Corporation, The: *See—*
Clope, Richard W.; and Glaser, Milton A., 4,105,613, Cl. 260-29.40R.

Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,105,786, Cl. 424-303.000.

Diamond Shamrock Corporation: *See—*
Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., 4,105,434, Cl. 71-93.000.
Pohto, Gerald R., 4,105,529, Cl. 204-267.000.

Dichter, Michael: *See—*
Horowitz, Carl; Dichter, Michael; and Mangaraj. Duryodhan, 4,105,811, Cl. 427-302.000.

Dick, George Wilmer, to Bell Telephone Laboratories, Incorporated. Single substrate ac plasma display. 4,106,009, Cl. 340-343.000.

Dickert, Joseph J., Jr.: *See—*
Stournas, Stamoulis; and Dickert, Joseph J., Jr., 4,105,570, Cl. 252-8.55D.

Dickinson, John D., to Westinghouse Electric Corp. Control system for pressurized lubricating system. 4,105,093, Cl. 184-6.110.

Dielectric Systems International, Inc.: *See—*
Peck, David B., 4,105,294, Cl. 350-269.000.

Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Highly filled polyurea foams. 4,105,594, Cl. 521-100.000.

Dietterle, Albert: *See—*
Amann, Rolf; Benda, Hans; and Dietterle, Albert, 4,105,230, Cl. 292-202.000.

Dilworth, James L.: *See—*
Kircher, Everett F.; and Dilworth, James L., 4,105,161, Cl. 239-2.00S.

Dingwall, Andrew Gordon Francis, to RCA Corporation. Voltage controlled oscillator (VCO) employing nested oscillating loops. 4,105,950, Cl. 331-57.000.

Director of National Research Institute of Tea: *See—*
Okada, Fumio, 4,105,784, Cl. 424-283.000.

Disch, Gunther; and Noormets, Elmar, to J. Aichelin KG. Continuous production furnace to heat ring-shaped workpieces. 4,105,398, Cl. 432-121.000.

Dixon, Daniel Allen; and Eigenbrode, George Thomas, to Du Pont de Nemours, E. I., and Company. Header with integral latch members. 4,105,275, Cl. 339-91.00R.

Dobranis, Aurel, to J. u. W. Muller, Maschinen-und Armaturenfabrik GmbH. Brushless welding generator. 4,105,963, Cl. 322-48.000.

Dockner, Toni; Toussaint, Herbert; and Decker, Martin, to BASF Aktiengesellschaft. Production of N-alkyl derivatives of cyclic alkylenimines. 4,105,657, Cl. 260-239.00B.

Dodd, Alec George, to Rolls-Royce Limited. Vane for a gas turbine engine having means for impingement cooling thereof. 4,105,364, Cl. 416-97.00R.

Doeg, Ralph W. Car mirror with U-shaped slot means and solenoid control. 4,105,301, Cl. 350-289.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Coated edible product and process for making same. 4,105,801, Cl. 426-99.000.

Domnick Hunter Engineers Limited: *See—*
Domnick, Keith Raphael, 4,105,561, Cl. 210-232.000.

Domnick, Keith Raphael, to Domnick Hunter Engineers Limited. Directional filter. 4,105,561, Cl. 210-232.000.

Donovan, Francis M., Jr. Heart pump. 4,105,016, Cl. 128-1.00D.

Doring Labels, Inc.: *See—*
Pingeton, Charles, 4,104,816, Cl. 40-2.00R.

Dormer, Leslie; and Nuttall, Roy, to Ferranti Limited. Semiconductor devices. 4,106,051, Cl. 357-71.000.

Dorr-Oliver Incorporated: *See—*
Kosonen, Vaino J., 4,105,563, Cl. 210-383.000.

Dosa, Eva: *See—*
Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.

Dotson, Ronald L.: *See—*
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., 4,105,514, Cl. 204-98.000.
Kuo, Han C.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,105,531, Cl. 204-290.00R.

Dow Chemical Company, The: *See—*
Evani, Syamalarao; and Corson, Frederick P., 4,105,649, Cl. 526-271.000.
Hay, Robert A., II, 4,105,026, Cl. 128-142.400.
Mullin, Charles R.; and Perettie, Donald J., 4,105,702, Cl. 260-658.00R.
Settineri, William J.; and Tolly, Milton C., 4,105,841, Cl. 526-62.000.
Swart, Daniel J.; and Kelyman, Jacqueline S., 4,105,633, Cl. 528-176.000.
Wagner, Eugene R.; and Matthews, Donald P., 4,105,791, Cl. 424-310.000.
Zachary, Richard E., 4,104,905, Cl. 73-40.000.

Dow Corning Corporation: *See—*
Clark, William H.; and Skinner, Charles E., 4,105,617, Cl. 260-31.20N.

Draganov, Nedelcho Draganov: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Draloric Electronic GmbH: *See—*
Baumann, Georg; and Hoffmann, Helmut, 4,106,075, Cl. 361-320.000.

Drechsel, Erhart Karl; and Sardisco, John B., to Pennzoil Company. Method of producing phosphoric acid and potassium dihydrogen phosphate from phosphate rock in the substantial absence of fluorine evolution. 4,105,748, Cl. 423-320.000.

Drell, William; and Pollard, John Kingsley, Jr., to Calbiochem-Behring Corp. Process of mitigating cholelithiasis. 4,105,794, Cl. 424-317.000.

Dresser Industries, Inc.: *See—*
Sorensen, Robert Keith; and Rallis, Anthony T. (said Robert Keith Sorensen assors. to), 4,105,263, Cl. 308-8.200.

Drew Chemical Corporation: *See—*
Sexsmith, David R., 4,105,581, Cl. 252-389.00A.

Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, to United States of America, State. Hydantoin compounds and methods of use thereof. 4,105,774, Cl. 424-273.00R.

Drori, Mordeki. Regulated flow-reducing device particularly useful for drip irrigation. 4,105,162, Cl. 239-109.000.

Drury, Lynn F., to Wilkinson, John Eaton. Illuminated drum stick, baton. 4,106,079, Cl. 362-34.000.

Duchild, Robert H.: *See—*
Smith, William R.; and Duchild, Robert H., 4,105,177, Cl. 248-15.000.

Due, George B.: *See—*
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,105,614, Cl. 260-29.40R.

Duff, Edward John: *See—*
Schreiber, Ronald Stanley; and Duff, Edward John, 4,105,759, Cl. 424-52.000.

Dukas, Sander G., to Timex Corporation. Adjustable expansion band for wristwatch. 4,104,872, Cl. 59-79.00R.

Dumont, Michel Paul; and Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris". Float for use in laying submarine pipelines. 4,104,886, Cl. 61-112.000.

Dunahoo, Edmond O., to Fiber Science, Inc. Multi-chambered cellular structure. 4,105,817, Cl. 428-188.000.

Dunigan, Opal. Bird cage with transparent shield. 4,104,986, Cl. 119-17.000.

Dunlop Limited: *See—*
Corner, Michael Raymond; and Jackson, William Lewis, 4,105,254, Cl. 301-63.0DS.
Lees, Geoffrey; Williams, Arthur Roger; and Bond, Robert, 4,105,458, Cl. 106-97.000.

Dunn, Ralph L., to United States of America, Army. Radar set sensitive to target shape. 4,106,014, Cl. 343-5.0SA.

Dupont, Bernard: *See—*
Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Du Pont de Nemours, E. I., and Company: *See—*
Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, 4,105,548, Cl. 210-23.00H.
Dixon, Daniel Allen; and Eigenbrode, George Thomas, 4,105,275, Cl. 339-91.00R.
Gorondy, Emery John, 4,105,572, Cl. 252-62.10P.
Iler, Ralph Kingsley; and Kirkland, Joseph Jack, 4,105,426, Cl. 65-18.000.
Levy, Stanley Burton; and Garlington, William Drake, 4,104,769, Cl. 26-92.000.
Massey, William Moore, Jr.; and Sandukas, Theodos, 4,104,770, Cl. 28-257.000.

Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, to Smith Kline & French Laboratories Limited. Heterocyclomethylsulphinylethyl derivatives of N-cyanoguanidines, thioureas and 2-amino-1-nitroethylene. 4,105,770, Cl. 424-263.000.

Durkoppwerke GmbH: *See—*
Pollmeier, Konrad; and Hannemann, Franz, 4,104,977, Cl. 112-121.260.

Dwyer, John R. Method and apparatus for displaying bread in supermarkets. 4,104,973, Cl. 108-59.000.

Dyal, Marjorie M. Kit for drafting garment patterns. 4,104,800, Cl. 33-17.00R.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,105,382, Cl. 425-88.000.

Dye, Richard: *See—*
Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, 4,105,122, Cl. 209-73.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Petersen, Egon Norbert, 4,105,628, Cl. 260-45.85R.

Dyroff, David R.; and Suchanek, Walton F., Jr., to Monsanto Company. Inhibition of dental calculus. 4,105,756, Cl. 424-48.000.

E.D.M. Co., Ltd.: *See—*
Abe, Moriaki, 4,104,965, Cl. 101-25.000.

E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel Angel; and Cushman, David W., 4,105,776, Cl. 424-274.000.
Ondetti, Miguel Angel; and Cushman, David W., 4,105,789, Cl. 424-309.000.

Eagle, Fred. Adjustable threshold. 4,104,830, Cl. 49-468.000.

Eastman Kodak Company: *See—*
Fox, Charles J., 4,105,447, Cl. 96-1.600.
Seil, Kenneth F., 4,105,324, Cl. 355-14.000.
Smith, James George; and Reed, Ralph Clyde, 4,105,451, Cl. 96-66.00T.
Wang, Richard H. S.; and Irick, Gether, Jr., 4,105,631, Cl. 260-45.80A.
Weemes, Doyle A.; and McConnell, Richard L., 4,105,718, Cl. 260-889.000.
Williams, Robert Franklin, Jr.; and Lu, Chen-i, 4,105,118, Cl. 206-524.200.

Eastman Technology, Inc.: *See—*
Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, 4,106,028, Cl. 346-74.100.

Eaton Corporation: *See—*
Vandervoort, John R., 4,104,928, Cl. 74-331.000.

Ebara Infilco Kabushiki Kaisha: *See—*
Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.

Ebauches Electroniques S.A.: *See—*
Chappatte, Jean-Maurice, 4,104,866, Cl. 58-85.500.

Eberhart, Ray. Latch mechanism. 4,105,234, Cl. 292-302.000.

Eby, Ralph H., to Skinner Irrigation Co. Flow control valve. 4,105,186, Cl. 251-35.000.

Eckler, Paul Eugene, to IMC Chemical Group, Inc. Partial resolution of pentaerythritol waste liquors. 4,105,575, Cl. 252-182.000.

Ecodyne Corporation: *See—*
Chirico, Anthony Nicholas, 4,105,065, Cl. 165-78.000.

Economics Laboratory, Inc.: *See—*
Mizuno, William G., 4,105,813, Cl. 428-76.000.

Edison Giocattoli S.p.A.: *See—*
Ferri, Giampiero, 4,104,819, Cl. 42-58.000.

Edward Shanbrom, Inc.: *See—*
Shanbrom, Edward; and Bishop, Robert C., 4,105,650, Cl. 260-112.00B.

Edwards, Roderick I.; and Nattrass, Michael J., to National Institute for Metallurgy, The. Separation and purification of platinum and palladium. 4,105,742, Cl. 423-22.000.

Edwards, Roderick I.: *See—*
Fieberg, Monika M.; and Edwards, Roderick I., 4,105,442, Cl. 75-101.0BE.

Egger, Friedrich: *See—*
Manser, Josef; and Egger, Friedrich, 4,104,958, Cl. 99-355.000.

Eggert, Frank, to Schlegel GmbH. Profile strip of U-shaped cross-section, in particular an edge protection strip for automobile. 4,105,814, Cl. 428-122.000.

Ehlinger, Robert Bruce, to General Electric Company. Process for the production of dihydrooxadiazinone compounds. 4,105,848, Cl. 544-68.000.

Eibeck, Richard E.: *See—*
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

Eifel, Paul J.: *See—*
Schultz, Jeffrey A.; and Eifel, Paul J., 4,104,783, Cl. 29-451.000.

Eigenbrode, George Thomas: *See—*
Dixon, Daniel Allen; and Eigenbrode, George Thomas, 4,105,275, Cl. 339-91.00R.

Eiro, Seiji: *See—*
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.

Eisele, Judith A.; and Bauer, Donald J., to United States of America, Interior. Method for dehydrating metal chlorides. 4,105,747, Cl. 423-263.000.

Eisenmann, Karl Heinz; and Broch, Karl Heinz, to Bayer Aktiengesellschaft. Process for the production of highly elastic polyurethane foams. 4,105,595, Cl. 521-159.000.

Eisenschmid, Wolfgang: *See—*
Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, 4,105,467, Cl. 127-37.000.

Ekberg, Ove Leonard: *See—*
Ekberg, Sven Erik; and Ekberg, Ove Leonard, 4,105,227, Cl. 285-412.000.

Ekberg, Sven Erik; and Ekberg, Ove Leonard. Flange joint between pipe lengths. 4,105,227, Cl. 285-412.000.

Ekholm, Rolf, to AB Hammars Mekaniska Verkstad. Feeding device for guiding pieces of lumber to the one or the other of two longitudinal conveyors. 4,105,107, Cl. 198-358.000.

El Paso Products Company: *See—*
Newton, Cecil A., 4,105,856, Cl. 560-191.000.

Eleanor & Wilson Greatbatch Foundation: *See—*
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.

Electro-Biology, Inc.: *See—*
Ryaby, John P.; and Pilla, Arthur A., 4,105,017, Cl. 128-1.500.

Electro Switch Corp.: *See—*
MacLean, Alexander, 4,106,072, Cl. 361-156.000.

Electro-Therm, Inc.: *See—*
Kennedy, James E., 4,105,895, Cl. 219-326.000.

Electronic Data Systems, Inc.: *See—*
Yarbrough, Grover A., 4,106,095, Cl. 364-464.000.

Elger, Walter: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Elias, Abram G.; and Elias, Peter G. Document hanging system. 4,105,268, Cl. 312-184.000.

Elias, Peter G.: *See—*
Elias, Abram G.; and Elias, Peter G., 4,105,268, Cl. 312-184.000.

ELITEX, koncern textilniho strojirenstvi: *See—*
Fajfr, Vaclav, 4,105,053, Cl. 139-435.000.

Elliott, Kenneth A., to Raymond Lee Organization, Inc., The. Lockable hook asembly for perforated board. 4,105,179, Cl. 248-221.200.

Elliott, Kenneth D.: *See—*
Elliott, Peter F.; and Elliott, Kenneth D., 4,106,099, Cl. 364-510.000.

Elliott, Peter F.; and Elliott, Kenneth D. Refinery and pipeline monitoring system. 4,106,099, Cl. 364-510.000.

Elmer, Thomas H., to Corning Glass Works. Process for dewatering porous glass. 4,105,427, Cl. 65-30.00R.

Elna, GmbH: *See—*
Senger, Hans-Jurgen, 4,105,912, Cl. 315-10.000.

Eltze, Ulrich: *See—*
Forster, Hans-Joachim; and Eltze, Ulrich, 4,105,101, Cl. 192-4.00A.

Eltzroth, James L. Crane conversion method. 4,105,151, Cl. 228-170.000.

Elward, John R., to Fibreboard Corporation. Asparagus container. 4,105,152, Cl. 229-23.0BT.

Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, to Siemens Aktiengesellschaft. Electronic telephone system featuring a customer memory within a central control unit connected by bus lines. 4,105,871, Cl. 179-18.0AD.

Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, to Siemens Aktiengesellschaft. Centrally controlled electronic telephone system having a customer memory for storing information on two or more different subscriber stations and peripheral equipment-specific information. 4,105,874, Cl. 179-18.0AD.

Empey, Richard A.: *See—*
Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., 4,105,605, Cl. 260-17.4GC.

Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, to Nipki po Tzvetna Metalurgia. Electric system for electric extraction of non-ferrous metals from their solutions. 4,105,527, Cl. 204-228.000.

Endoh, Takeyuki: *See—*
Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.

Enegess, David Norman: *See—*
D'Amaddio, Eugene Raymond; and Enegess, David Norman, 4,105,556, Cl. 210-152.000.

Engle, Thomas H.; and Harris, John J., to General Signal Corporation. Electro-pneumatic apparatus for graduated brake release. 4,105,257, Cl. 303-15.000.

English Electric Valve Company Limited: *See—*
King, Robin Charles Moorhouse; and Esterson, Maurice, 4,105,911, Cl. 315-3.500.
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,105,951, Cl. 331-90.000.
Envirotech Corporation: *See—*
Fismer, William L., 4,105,560, Cl. 210-230.000.
Eplett, Fredrick R.: *See—*
Reedy, Wayne R.; and Eplett, Fredrick R., 4,104,888, Cl. 62-80.000.
Epoch Company, Ltd.: *See—*
Sakurai, Hiroshi, 4,106,008, Cl. 340-324.0AD.
Eprad Incorporated: *See—*
Boudouris, Angelo, 4,105,311, Cl. 352-187.000.
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, to Ceskoslovenska akademie ved. Method of neutralizing industrial waste gases. 4,105,744, Cl. 423-239.000.
Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, to Fairchild Camera and Instrument Corporation. Monolithic microcomputer central processor. 4,106,090, Cl. 364-200.000.
Eriksson, Hans Erik; and Florvall, Gosta Lennart, to Astra Lakemedel Aktiebolag. Hypotensive substituted 1,2,4-triazoles. 4,105,768, Cl. 424-263.000.
Ermoni, Mario: *See—*
Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.
Esner, Stanislav: *See—*
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
Esterson, Maurice: *See—*
King, Robin Charles Moorhouse; and Esterson, Maurice, 4,105,911, Cl. 315-3.500.
Etablissements Zelant, Gazuit: *See—*
Gazuit, Georges, 4,105,379, Cl. 425-47.000.
ETAT FRANCAIS rep by Del. Min pour l'Armement: *See—*
Guitton, Jacques; and Payn, Christian Jacques Maurice Charles Alexis, 4,105,835, Cl. 429-133.000.
Etchecopar, Arnaud: *See—*
Grassy, Robert; Apert, Dominique; and Etchecopar, Arnaud, 4,105,993, Cl. 340-15.5CP.
Ethicon, Inc.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,105,034, Cl. 128-335.500.
Etzlinger, Lucien: *See—*
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
Evani, Syamalarao; and Corson, Frederick P., to Dow Chemical Company, The. Aqueous polymeric thickening agents. 4,105,649, Cl. 526-271.000.
Evans, George S., to Westinghouse Electric Corp. Fluorescent lamp with an integral fail-safe and auxiliary-amalgam component. 4,105,910, Cl. 313-490.000.
Evans, Reginald David Owen: *See—*
Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, 4,105,539, Cl. 208-33.000.
Extek Microsystems, Inc.: *See—*
Wallace, Charles E.; and Farmer, Donald J., 4,105,331, Cl. 355-103.000.
Extranuclear Laboratories, Inc.: *See—*
Siegel, Melvin W., 4,105,916, Cl. 250-282.000.
Exxon Research & Engineering Co.: *See—*
Halko, Richard A.; and Heigl, John J., 4,105,334, Cl. 356-104.000.
Lundberg, Robert D.; and Thame, Neville G., 4,104,824, Cl. 47-58.000.
Moser, William R., 4,105,589, Cl. 252-462.000.
O'Farrell, Charles P.; and Kresge, Edward N., 4,105,647, Cl. 526-33.000.
Patton, Tad L., 4,105,616, Cl. 521-62.000.
Say, Geoffrey R.; and Baird, William C., Jr., 4,105,704, Cl. 260-666.00P.
Shaub, Harold; and Waddey, Walter E., 4,105,571, Cl. 252-32.70E.
Venero, Agustin F., 4,105,829, Cl. 429-15.000.
Fahrenbach, Wolfgang B.: *See—*
Rockstead, Raymond H.; and Fahrenbach, Wolfgang B., 4,104,842, Cl. 52-650.000.
Fainman, Morton. Method for removing sludge from oil. 4,105,542, Cl. 208-180.000.
Fairaizl, Joseph H.: *See—*
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.
Fairchild Camera and Instrument Corporation: *See—*
Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, 4,106,090, Cl. 364-200.000.
Fairchild Industries, Inc.: *See—*
Smallwood, John J., 4,105,047, Cl. 137-625.600.
Fairclough Construction Group Limited: *See—*
Thomas, Norman Stanley, 4,104,885, Cl. 61-45.00R.
Fajfr, Vaclav, to ELITEX, koncern textilniho strojirenstvi. Nozzle assembly for a hydraulic jet loom. 4,105,053, Cl. 139-435.000.
Fakira, Suleiman Mohammed: *See—*
Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, 4,105,114, Cl. 206-219.000.
Farkouh, Michel George Bazil: *See—*
Henehan, Padraig Anthony; and Farkouh, Michel George Bazil, 4,105,866, Cl. 179-6.00R.
Farler, Buist A.; and Vanderpool, Billy F. Multi-beam light switch. 4,105,898, Cl. 307-10.0LS.
Farmer, Donald J.: *See—*
Wallace, Charles E.; and Farmer, Donald J., 4,105,331, Cl. 355-103.000.
Farmery, Michael John: *See—*
Whittingham, Thomas Anthony; and Farmery, Michael John, 4,104,923, Cl. 73-646.000.
Farrell, John Francis; and Treichel, Hans Herbert, to Siemens Aktiengesellschaft. Electronic telephone system featuring periodic scanning of all peripheral units and polling of specific peripheral units for transmission of status and/or instruction information. 4,105,876, Cl. 179-18.0AD.
Farrell, John Francis: *See—*
Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, 4,105,872, Cl. 179-18.0AD.
Schneider, Carl Michael; Schimmel, Frederick William; and Farrell, John Francis, 4,105,875, Cl. 179-18.0GF.
Fassbender, Charles J., to NCR Corporation. Random access memory system providing high-speed digital data output. 4,106,109, Cl. 365-238.000.
Faucci, Adriano: *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August, 4,105,688, Cl. 260-465.80R.
Feinauer, Roland: *See—*
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.
Fenn, Gordon William, to Chrysler Corporation. Engine control system. 4,104,998, Cl. 123-117.00R.
Fenske, John W.: *See—*
Simons, John R.; and Fenske, John W., 4,105,076, Cl. 169-40.000.
Ferdinandi, Eckhardt: *See—*
Bagli, Jehan F.; and Ferdinandi, Eckhardt, 4,105,663, Cl. 544-379.000.
Ferranti Limited: *See—*
Dormer, Leslie; and Nuttall, Roy, 4,106,051, Cl. 357-71.000.
Ferri, Giampiero, to Edison Giocattoli S.p.A. Toy weapon. 4,104,819, Cl. 42-58.000.
Ferris, Donald Leroy; and Smith, George Arthur, to United Technologies Corporation. Helicopter rotor lead-lag damper. 4,105,365, Cl. 416-107.000.
Festinori, Volfango: *See—*
Raschke, Klaus; and Festinori, Volfango, 4,104,934, Cl. 81-57.380.
Fettinger, Paul I., to Garrett Corporation, The. Alternating current power dividing or combining system. 4,106,089, Cl. 363-153.000.
Fey, Maurice G., to Westinghouse Electric Corp. Arc heater apparatus for producing acetylene from heavy hydrocarbons. 4,105,888, Cl. 219-121.00P.
FIAT Societa per Azioni: *See—*
Husse, Massimo, 4,104,915, Cl. 73-194.00A.
Fiber Science, Inc.: *See—*
Dunahoo, Edmond O., 4,105,817, Cl. 428-188.000.
Fibreboard Corporation: *See—*
Elward, John R., 4,105,152, Cl. 229-23.0BT.
Fichtel & Sachs AG: *See—*
Axthammer, Ludwig, 4,105,041, Cl. 137-116.000.
Fieberg, Monika M.; and Edwards, Roderick I., to National Institute for Metallurgy, The. Separation and purification of ruthenium. 4,105,442, Cl. 75-101.0BE.
Fillmore, Richard Plumb: *See—*
Holbrook, Mark Denton; and Fillmore, Richard Plumb, 4,106,086, Cl. 363-60.000.
Finan, Michael Anthony: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,105,551, Cl. 210-58.000.
Fine, Robert H.: *See—*
Cease, James W., 4,104,902, Cl. 72-117.000.
Finlayson, Claude Malcolm; and Jordan, John W., to N L Industries, Inc. Organophilic clay having enhanced dispersibility. 4,105,578, Cl. 252-316.000.
Finley, William Solon, to Teledyne, Inc. Demultiplex and storage system for time division multiplexed frames of musical data. 4,104,950, Cl. 84-462.000.
Finney, Robert H., to Lord Corporation. Laminated bearing with plural modulus layer. 4,105,266, Cl. 308-237.00R.
Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Fischer, Hannes; and Werner, Gerhard, to Hoechst Aktiengesellschaft. Modified air-drying alkyd resins. 4,105,607, Cl. 260-22.0CB.
Fischer, Hanspeter: *See—*
Fory, Werner; and Fischer, Hanspeter, 4,105,685, Cl. 260-448.20N.
Fismer, William L., to Envirotech Corporation. Filter plate shifter. 4,105,560, Cl. 210-230.000.
Fitting, Robert C.; and Piesinger, Gregory H., to Motorola, Inc. Adaptive undesired signal canceller. 4,105,977, Cl. 325-472.000.
Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Flanagan, Robert J., to General Electric Company. Pressure sensitive interrupter. 4,106,068, Cl. 361-15.000.
Flanders, Thomas W.: *See—*
VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., 4,105,988, Cl. 338-132.000.
Fleming, Ancel H. Tensioning linkage. 4,105,221, Cl. 280-461.00A.

Fleming-Brown, David Hugh: *See—*
Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, 4,104,853, Cl. 56-341.000.
Fletcher-Terry Company, The: *See—*
Insolio, Thomas A., 4,105,150, Cl. 225-96.500.
Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, to Borden, Inc. Inspecting cans for openings with light. 4,105,122, Cl. 209-73.000.
Florvall, Gosta Lennart: *See—*
Eriksson, Hans Erik; and Florvall, Gosta Lennart, 4,105,768, Cl. 424-263.000.
FMC Corporation: *See—*
Irving, Donald W.; and Chamberlin, Donald W., 4,105,123, Cl. 209-111.600.
Lotto, Ronald L., 4,105,489, Cl. 156-510.000.
Rosseau, Richard B., 4,104,760, Cl. 15-179.000.
Thomas, James L.; and Volpp, Gert P., 4,105,710, Cl. 260-869.000.
Foerster, Peter: *See—*
Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.
Fogt Industriemaschinenvertretung A.G.: *See—*
Calzolari, Sergio, 4,105,373, Cl. 417-317.000.
Fois, Battista. Lock safety device. 4,104,898, Cl. 70-419.000.
Foley, Kevin M.; Rastogi, Anil K.; and Rynd, Joseph P., to Owens-Corning Fiberglas Corporation. Treated glass fibers. 4,105,492, Cl. 156-629.000.
Foote, Francis C., to Addressograph Multigraph Corp. Apparatus for producing magnetically encoded articles. 4,106,062, Cl. 360-15.000.
Forbes, Hampton E., Jr., to Westvaco Corporation. Divided and tapered food carton. 4,105,155, Cl. 229-33.000.
Ford Motor Company: *See—*
Abdoo, Richard V., 4,104,991, Cl. 123-32.0EA.
Anderson, Arnold E.; and Weintraub, Marvin H., 4,105,473, Cl. 148-6.000.
Forss, Kaj G.; and Fuhrmann, Agneta G. M., to Keskuslaboratorio-Centrallaboratorium Ab. Adhesive for the manufacture of plywood, particle boards, fiber boards and similar products. 4,105,606, Cl. 260-17.500.
Forster, Hans-Joachim; and Eltze, Ulrich, to Daimler-Benz Aktiengesellschaft. Brake operated low ratio release. 4,105,101, Cl. 192-4.00A.
Forster, Helmut: *See—*
Hini, Paul; and Forster, Helmut, 4,105,012, Cl. 125-16.00R.
Forsythe, George Daniel: *See—*
Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, 4,105,548, Cl. 210-23.00H.
Fortmann, Hermann, to Olympia Werke AG. Device for the pressure fixing of toners. 4,104,963, Cl. 100-176.000.
Fortuna, Giorgio Della; and Zotteri, Luciano, to ANIC, S.p.A. Polycondensation thermoplastic elastomers composed by alternatingly arranged copolyesteramides. 4,105,640, Cl. 528-292.000.
Fory, Werner; and Fischer, Hanspeter, to Ciba-Geigy Corporation. Agent for the regulation of plant growth. 4,105,685, Cl. 260-448.20N.
Fotis, Peter, Jr.: *See—*
Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., 4,105,846, Cl. 526-124.000.
Fowler, William C.: *See—*
Rodebaugh, Helen D.; and Fowler, William C., 4,105,224, Cl. 281-15.00R.
Fowles, Richard G.: *See—*
Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.
Fox, Charles J., to Eastman Kodak Company. Photoconductive insulating compositions including polyaryl hydrocarbon photoconductors. 4,105,447, Cl. 96-1.600.
Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., to Westinghouse Electric Corp. Energy conservation control method. 4,106,097, Cl. 364-492.000.
Francesville Drain Tile Corporation: *See—*
Overmyer, Richard C.; and Guerra, Mario, 4,104,774, Cl. 29-234.000.
Francis, Ralph M., Jr., to Sta-Rite Industries. Liquid level sensing circuit. 4,105,367, Cl. 417-36.000.
Frank, Dieter: *See—*
Behnke, Joachim; Frank, Dieter; and Wallrabenstein, Michael, 4,105,620, Cl. 260-37.00N.
Fraser, Ian Duncan. Microfilm reading system. 4,105,315, Cl. 353-95.000.
Fratelli Marzoli & C. S.p.A.: *See—*
Grandi, Giorgio Adolfo, 4,104,857, Cl. 57-124.000.
Freedman, George; and Bowen, Robert F., to Raytheon Company. Microwave coffee maker. 4,104,957, Cl. 99-283.000.
Freedman, Gerald A. Tumbler lock. 4,104,897, Cl. 70-363.000.
Freeman, John Leslie, to Imperial Chemical Industries Limited. Manufacture of aromatic polymers containing ketone and sulphone groups. 4,105,635, Cl. 528-126.000.
Freeman, William R.: *See—*
Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., 4,104,782, Cl. 29-527.200.
Freeport Minerals Company: *See—*
Wiewiorowski, Tadeusz Karol; and Thornsberry, Willis Lee, Jr., 4,105,741, Cl. 423-10.000.
Freisleben, Reinhard: *See—*
Soding, Bernward; and Freisleben, Reinhard, 4,105,316, Cl. 353-109.000.
Frensch, Heinz: *See—*
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,105,775, Cl. 424-273.00R.
Frenz, Norbert W.: *See—*
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.
Frey, William J.; and Meyer, Paul L., to Celanese Corporation. Snap-in fittings and coupling ring therefor. 4,105,226, Cl. 285-175.000.
Fricker, Ludwig, to Daimler-Benz Aktiengesellschaft. Injection installation for internal combustion engines. 4,104,992, Cl. 123-32.0JV.
Friedenberg, Robert M.; Yoscak, John L.; and Noren, Stephen E. Glucose level test apparatus. 4,105,522, Cl. 204-195.00B.
Friedman, Leonard: *See—*
Morgan, Thomas E., Jr., 4,104,961, Cl. 100-93.0PB.
Fritschi, Edgar: *See—*
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.
Frobenius, Wolf-Dietrich, to Robert Bosch GmbH. Process and apparatus for determining engine operation near the lean-running limit. 4,104,990, Cl. 123-32.0EA.
FRYMA-Maschinen AG: *See—*
Buhler, Gerhard, 4,105,066, Cl. 165-94.000.
Fuhrmann, Agneta G. M.: *See—*
Forss, Kaj G.; and Fuhrmann, Agneta G. M., 4,105,606, Cl. 260-17.500.
Fuji Photo Film Co., Ltd.: *See—*
Fukuda, Susumu, 4,106,039, Cl. 354-193.000.
Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, 4,106,067, Cl. 360-137.000.
Miyatuka, Hajime; Saida, Takashi; and Honjo, Satoru, 4,105,448, Cl. 96-1.800.
Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.
Ogata, Yasuhiro; and Hibino, Noburo, 4,104,910, Cl. 73-141.00R.
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.
Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,105,450, Cl. 96-33.000.
Tani, Tadaaki, 4,105,454, Cl. 96-122.000.
Fuji Xerox Co., Ltd.: *See—*
Pu, Lyong Sun, 4,105,446, Cl. 96-1.50R.
Fujie, Kunio: *See—*
Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, 4,105,372, Cl. 417-243.000.
Fujii, Hisashi: *See—*
Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, 4,105,090, Cl. 181-265.000.
Fujikawa, Kanichi: *See—*
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.
Fujishiro, Takeshi; Wazawa, Kiyoshi; and Oguro, Takeshi, to Nissan Motor Company, Ltd. Oxygen concentration sensor for heated gaseous mixture. 4,105,524, Cl. 204-195.00S.
Fujishiro, Toshiaki: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Company, Ltd. Process for preparing stereospecific nerolidol and ester thereof. 4,105,700, Cl. 568-875.000.
Fujitsu Limited: *See—*
Kudo, Ryosuke, 4,106,066, Cl. 360-133.000.
Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.
Fukuda, Susumu, to Fuji Photo Film Co., Ltd. Side-folding bellows element for folding camera. 4,106,039, Cl. 354-193.000.
Funk, Raymond E. Fuel distribution system. 4,105,003, Cl. 123-141.000.
Furda, Dymetro P., to International Telephone and Telegraph Corporation. Top mounted photoflash attachment for cameras with self-developing film. 4,106,077, Cl. 362-8.000.
Furness, John Douglas, to Hilti Aktiengesellschaft. Repair of bottle top molds. 4,104,777, Cl. 29-401.00D.
Furutachi, Nobuo: *See—*
Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.
Fushimi, Kenji: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.
G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Kaule, Wittich; and Stenzel, Gerhard, 4,105,333, Cl. 356-85.000.
G. D. Searle & Co.: *See—*
Hamilton, Robert W.; and Rorig, Kurt J., 4,105,849, Cl. 544-129.000.
Gaba, Rodolfo: *See—*
Kaplan, Stephen J.; and Gaba, Rodolfo, 4,105,562, Cl. 210-232.000.
Gaertner, Van R., to Monsanto Company. Cyclized derivatives of N-(2-hydroxyalkyl)-N-phosphonomethylglycine compounds. 4,105,432, Cl. 71-86.000.
GAF Corporation: *See—*
Chung, Rack H., 4,105,680, Cl. 260-378.000.

  De Thomas, Waldo; and Hort, Eugene Victor, 4,105,674, Cl. 260-343.600.
  Schneider, Louis; and Graham, David E., 4,105,671, Cl. 260-326.430.
  Schneider, Louis; and Graham, David E., 4,105,797, Cl. 424-330.000.
Gall, Rudi: *See—*
  Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
Gallagher, James P., to Atlantic Richfield Company. C_8 alkyl benzene isomerization process. 4,105,706, Cl. 260-668A.
Ganellin, Charon Robin: *See—*
  Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,105,770, Cl. 424-263.000.
Garbark, Melvin D.: *See—*
  Day, Frederick A.; and Garbark, Melvin D., 4,104,809, Cl. 35-28.500.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Catalytic muffler for internal combustion engines. 4,105,414, Cl. 23-288.00F.
Gardena Kress & Kastner GmbH: *See—*
  Lopic, Franc, 4,104,795, Cl. 30-272.00A.
Garlington, William Drake: *See—*
  Levy, Stanley Burton; and Garlington, William Drake, 4,104,769, Cl. 26-92.000.
Garrett Corporation, The: *See—*
  Fettinger, Paul I., 4,106,089, Cl. 363-153.000.
Garrett, William R.: *See—*
  Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., 4,105,746, Cl. 423-251.000.
Gasser, William J.; and Cooper, Richard H., to Brite-O-Matic Manufacturing, Inc. Machine for waxing vehicles. 4,104,756, Cl. 15-97.00B.
Gauthier, Michele: *See—*
  Arod, Jean; Gauthier, Michele; and Platzer, Roger, 4,105,508, Cl. 204-1.00T.
Gautschi, Fritz: *See—*
  Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Gazuit, Georges, to Etablissements Zelant, Gazuit. Tire curing press. 4,105,379, Cl. 425-47.000.
Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik: *See—*
  Hegenbart, Horst, 4,105,097, Cl. 187-8.750.
Gebr. Hofmann KG, Maschinenfabrik: *See—*
  Brunnengraber, Hermann, 4,104,919, Cl. 73-462.000.
Gebrueder Buehler AG: *See—*
  Manser, Josef; and Egger, Friedrich, 4,104,958, Cl. 99-355.000.
Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, to Siemens Aktiengesellschaft. Liquid crystal display with bistable cholesteric liquid crystal layer. 4,105,288, Cl. 350-350.000.
Geiger, Friedrich, to Daimler-Benz Aktiengesellschaft. Outer body panel structure for vehicle bodies. 4,105,243, Cl. 296-28.00R.
Geis, Heinz, to Adlerwerke vorm. Heinrich Kleyer A.G. Typewriter platen clutch mechanism. 4,105,106, Cl. 400-556.200.
Geislinger, Leonhard. Torsionally elastic mechanism. 4,104,891, Cl. 64-26.000.
Gelinas, Ralph J., to Grayson, Gross, Friedman, Phillips and Rasch; and Singer, Lewak, Greenbaum and Goldstein, by Ralph J. Gelinas, a part interest to each. Locking system for telescoping members. 4,105,346, Cl. 403-104.000.
General Electric Company: *See—*
  Barcus, Victor D., 4,105,905, Cl. 310-59.000.
  Bergt, Carl, 4,105,063, Cl. 165-21.000.
  Boah, John K.; and Kennedy, Richard W., 4,104,786, Cl. 29-583.000.
  Campbell, John R.; and Klopfer, Howard J., 4,105,857, Cl. 568-726.000.
  Davis, Lewis Berkley, Jr.; and Wilkes, Colin, 4,105,163, Cl. 239-406.000.
  Demarest, Donald M.; and Leete, Bernard D., 4,106,085, Cl. 363-51.000.
  Ehlinger, Robert Bruce, 4,105,848, Cl. 544-68.000.
  Flanagan, Robert J., 4,106,068, Cl. 361-15.000.
  Harding, Thomas J.; and Hellman, Wayne R., 4,105,908, Cl. 313-217.000.
  Heath, Darrell Richard; Holub, Fred Frank; and Wilkus, Edward Vincent, 4,105,825, Cl. 428-379.000.
  Kindig, Alan L., 4,104,788, Cl. 29-596.000.
  Lambert, Thomas W.; and Blake, James Edward, 4,105,922, Cl. 250-495.00T.
  Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402,000.
  Roeder, Allan W.; and Kimball, Richard M., 4,106,017, Cl. 343-8.000.
  Russell, Ronald R., 4,105,965, Cl. 324-28.0CB.
  Sterling, Vaughn C.; and Schupp, Lewis J., 4,105,480, Cl. 149-40.000.
  Sugalski, Raymond Kazimir, 4,105,832, Cl. 429-94.000.
  Thomas, George L., 4,105,826, Cl. 428-379.000.
  Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
General Engineering and Mfg. Corporation: *See—*
  Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., 4,104,747, Cl. 5-37.00R.
General Mills Fun Group, Inc.: *See—*
  Brass, Robert L., 4,104,952, Cl. 85-5.00R.
General Motors Corporation: *See—*
  Bell, Albert H., III; and Zeek, Richard M., 4,105,062, Cl. 165-9.000.
  Brucken, Byron L.; and Watt, Roy E., 4,105,370, Cl. 417-222.000.
  Buchwald, Robert M., 4,105,222, Cl. 280-668.000.
  Calderoni, Sergio L., 4,104,943, Cl. 90-11.00C.
  Graham, Donald E.; and Long, Paul J., Jr., 4,105,216, Cl. 280-6.00R.
  Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,104,787, Cl. 29-596.000.
  Levijoki, Wayne A., 4,105,088, Cl. 180-108.000.
  Long, Paul J., Jr., 4,105,193, Cl. 267-64.00R.
  Nels, Terry E., 4,104,900, Cl. 72-70.000.
  Nels, Terry E., 4,105,102, Cl. 192-106.100.
  Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.
  Savage, Jack W.; and Savage, Thomas J., 4,105,371, Cl. 417-238.000.
General Signal Corporation: *See—*
  Engle, Thomas H.; and Harris, John J., 4,105,257, Cl. 303-15.000.
Genevski, Vladimir Vetov: *See—*
  Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
Gentaz, Claude; and Bienvenu, Gerard, to Battelle Memorial Institute. Process for reducing metal halides by reaction with calcium carbide. 4,105,440, Cl. 75-66.000.
Gentry, David R.: *See—*
  Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,105,381, Cl. 425-83.100.
Georg Fischer Aktiengesellschaft: *See—*
  Hauke, Wilhelm, 4,105,060, Cl. 164-130.000.
  Kopp, Hans, 4,105,255, Cl. 301-97.000.
George A. Goulston Co., Ltd.: *See—*
  Crossfield, Roger J., 4,105,569, Cl. 252-8.600.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, to Hoffmann-La Roche Inc. Dibenz[b,f]oxepin derivatives. 4,105,664, Cl. 544-378.000.
Germain, Michel, to Commissariat a l'Energie Atomique. Method of preparation of trivalent plutonium formiate. 4,105,683, Cl. 260-429.100.
Gerson, Fred B. Positive locking device for boat trailer bolster bracket. 4,105,219, Cl. 280-789.000.
Geshner, Robert Andrew; and Mitchell, Joseph, Jr., to RCA Corporation. Method for removing defects from chromium and chromium oxide photomasks. 4,105,468, Cl. 134-3.000.
Gestivalmo Societe Anonyme Holding: *See—*
  De Spiegeleer, Michel R., 4,105,175, Cl. 246-430.000.
GF Business Equipment, Inc.: *See—*
  Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, 4,104,838, Cl. 52-239.000.
Gibert, Alain, to Societe Nationale des Petroles d'Aquitaine. Means for controlling the electric current density of a high tension direct current source. 4,106,084, Cl. 363-21.000.
Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, to International Business Machines Corporation. Multiple reduction indicators for continuously variable reduction copier machines. 4,105,327, Cl. 355-59.000.
Gibson, Keith Hopkinson, to Imperial Chemical Industries Limited. Prostanoic acid derivatives. 4,105,854, Cl. 560-55.000.
Giesemann, Rolf: *See—*
  Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
Gietzen, John R.: *See—*
  VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., 4,105,988, Cl. 338-132.000.
Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Hanger adjustable end bearing assembly. 4,104,843, Cl. 52-693.000.
Gilbert, Russell L., to Caterpillar Tractor Co. Motor grader blade support with self-retaining wear strips. 4,105,078, Cl. 172-781.000.
Gillbrand, Per Sune; and Johansson, Anders Erik Bertil, to Saab-Scania Aktiebolag. Super-charged carburetor engine. 4,104,882, Cl. 60-600.000.
Gillette Company, The: *See—*
  Chauvy, Jean-Daniel, 4,105,493, Cl. 156-644.000.
Gilmore, Jack Arthur: *See—*
  Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
Gisiger, Ernst: *See—*
  Hammer, Urs; and Gisiger, Ernst, 4,104,815, Cl. 38-77.500.
Glandon, James L.; and Hall, Stanley D., to W. R. Grace & Co. Method and apparatus for loading articles into containers. 4,104,847, Cl. 53-35.000.
Glaser, Milton A.: *See—*
  Clope, Richard W.; and Glaser, Milton A., 4,105,613, Cl. 260-29.40R.
Glasrock Products, Inc.: *See—*
  Midorikawa, Yoshio, 4,104,781, Cl. 29-419.00R.
Glasscock, Green Bateman, to Barcroft Company. Process for producing pharmaceutical grade aluminum hydroxide gels. 4,105,579, Cl. 252-317.000.
Gleave, Edward Roger, to Loctite (Ireland) Limited. Cyanoacrylate adhesive paste compositions. 4,105,715, Cl. 260-881.000.
Glendinning, William Bernard; and Mark, Albert, to United States of America, Army. Formation of metal nitride oxide semiconductor (MNOS) by ion implantation of oxygen through a silicon nitride layer. 4,105,805, Cl. 427-38.000.
Globe Industries Corporation: *See—*
  Lin, Liang-Chuan, 4,105,483, Cl. 156-154.000.

Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, to Bell Telephone Laboratories, Incorporated. Compensation for material dispersion in optical fibers. 4,105,283, Cl. 350-96.310.
Gloriod, Pierre: *See—*
  Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, 4,105,609, Cl. 260-23.00H.
Glotin, Bernard J. P.; and Guimard, Andre J., to Schlumberger Technology Corporation. Removable downhole measuring instruments with electrical connection to surface. 4,105,279, Cl. 339-117.00R.
Glover, Leon C.; and Lopez, Eugene F., to Raychem Corporation. Thermochromic paint for use on plastic substrates. 4,105,583, Cl. 252-408.000.
Glowacki Associates: *See—*
  Glowacki, John J., 4,104,833, Cl. 51-281.00R.
Glowacki, John J., to Glowacki Associates. Grinding method. 4,104,833, Cl. 51-281.00R.
Godfrey, Alan: *See—*
  Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, 4,105,987, Cl. 338-130.000.
Goetz, Verena M. Foot cradle. 4,104,746, Cl. 5-327.00R.
Gogniat, Theodore; and Cotton, John F., to Westinghouse Electric Corp. Distribution transformer secondary circuit interrupter having an improved bimetal. 4,105,986, Cl. 337-3.000.
Goldman, Irving M.: *See—*
  Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.
Golias, Tipton, to Helena Laboratories Corporation. Clinical procedure for measuring lipoprotein cholesterols. 4,105,521, Cl. 204-180.00S.
Gonyea, David C.: *See—*
  Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
Goodman, Alvin Malcolm, to RCA Corporation. MIS readout device with dielectric storage medium. 4,106,107, Cl. 365-191.000.
Goodnight, Hershel E.; Reed, Robert D.; and Witwer, Alan D., to John Zink Company. Regenerative tile structure for fuel burners. 4,105,395, Cl. 431-351.000.
Goranson, Paul L.: *See—*
  Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., 4,105,129, Cl. 214-152.000.
Gordon, Alan Mayer; Mazurek, Edward Francis; and Wright, Arden Bernard, to Bell Telephone Laboratories, Incorporated. Hazardous voltage protector for telephone line. 4,106,070, Cl. 361-42.000.
Gordon, Marvin: *See—*
  Hanson, Harry T.; and Gordon, Marvin, 4,105,634, Cl. 526-65.000.
Gordy, Robert S.: *See—*
  Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,105,975, Cl. 325-320.000.
Gore, Douglas Alan: *See—*
  Clay, Burton Ross; and Gore, Douglas Alan, 4,105,915, Cl. 250-199.000.
Gorondy, Emery John, to Du Pont de Nemours, E. I., and Company. Ferromagnetic toner containing water-soluble or water-solubilizable resin(s). 4,105,572, Cl. 252-62.10P.
Goss, Gary J.; and Joyce, Thomas F., to Honeywell Information Systems Inc. Stretch and stall clock. 4,105,978, Cl. 328-58.000.
Gossage, Thomas M. Gin pole connector. 4,105,347, Cl. 403-157.000.
Goto, Hiroshi: *See—*
  Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,105,945, Cl. 330-294.000.
Gottlieb, Steven. Process for the endothermic calcination of raw material. 4,105,460, Cl. 106-100.000.
Gottschlich, Alois; and Leverenz, Klaus, to Bayer Aktiengesellschaft. Phenyl-azo-anilino dyestuff. 4,105,655, Cl. 260-207.100.
Gould Inc.: *See—*
  May, William E., 4,105,136, Cl. 220-339.000.
Goulish, Gabriel: *See—*
  Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, 4,104,838, Cl. 52-239.000.
Graco Metal Products, Inc.: *See—*
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Graf, Hans: *See—*
  Osswald, Gunter; and Graf, Hans, 4,105,464, Cl. 106-307.000.
Graf, John W., to Howmedica Inc. Lockable shipping box. 4,105,112, Cl. 206-1.500.
Graham, David E.: *See—*
  Schneider, Louis; and Graham, David E., 4,105,671, Cl. 260-326.430.
  Schneider, Louis; and Graham, David E., 4,105,797, Cl. 424-330.000.
Graham, Donald E.; and Long, Paul J., Jr., to General Motors Corporation. Motor vehicle level control circuit. 4,105,216, Cl. 280-6.00R.
Grandi, Giorgio Adolfo, to Fratelli Marzoli & C. S.p.A. Spinning and twisting device. 4,104,857, Cl. 57-124.000.
Grassy, Robert; Apert, Dominique; and Etchecopar, Arnaud, to Services et Instruments de Geophysique. Method for determining elastic constants of geological formations. 4,105,993, Cl. 340-15.5CP.
Gray, Floyd L.: *See—*
  Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
Grayson, Gross, Friedman, Phillips and Rasch: *See—*
  Gelinas, Ralph J., 4,105,346, Cl. 403-104.000.
Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., to Eleanor & Wilson Greatbatch Foundation. Lithium-bromine cell. 4,105,833, Cl. 429-104.000.
Greber, Gerd: *See—*
  Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, 4,105,648, Cl. 526-204.000.
Grecu, Nicolae: *See—*
  Macoveanu, Aurelian Liviu Alexandru; and Grecu, Nicolae, 4,104,918, Cl. 73-379.000.
Greenleaf, James F.; and Johnson, Steven A., to University of Utah. Acoustic examination, material characterization and imaging of the internal structure of a body by measurement of the time-of-flight of acoustic energy therethrough. 4,105,018, Cl. 128-2.00V.
Griff, Gary J.: *See—*
  Alexander, Thomas F.; and Griff, Gary J., 4,106,019, Cl. 343-9.000.
Grimes, Jack Duane: *See—*
  Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
Grimm, Donald K.; Savold, Wayne A.; and Walter, Allen R., to Rockwell International Corporation. Ground speed deriving circuit. 4,106,093, Cl. 364-424.000.
Grone, Robert Joseph: *See—*
  Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, 4,104,984, Cl. 118-2.000.
Gross, Arthur L., to Celanese Corporation. Multifunctional acrylates as foliar fungicides. 4,105,793, Cl. 424-314.000.
Gross, Lothar. Optical reading system for electronic pocket calculators. 4,105,287, Cl. 350-113.000.
Grossman, Claus H.: *See—*
  Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, to Ciba-Geigy Corporation. Crosslinked polyacrylamides containing silyl groups. 4,105,648, Cl. 526-204.000.
Grunau Company Inc.: *See—*
  Simons, John R.; and Fenske, John W., 4,105,076, Cl. 169-40.000.
Grundler, Anthony F., to Siesta Industries. Electrically adjustable bed frame. 4,104,749, Cl. 5-76.000.
Grundy, Paul L.: *See—*
  Miller, Robert; and Grundy, Paul L., 4,106,076, Cl. 361-394.000.
GTE Sylvania Incorporated: *See—*
  Burdick, Kenneth John; Constable, Douglas William; and Wheeler, Robert Charles, 4,106,055, Cl. 358-27.000.
  Cosco, Robert J., 4,105,929, Cl. 315-125.000.
  Sindlinger, Ronald E.; and Audesse, Emery G., 4,105,392, Cl. 431-95.00R.
Guelton, Claude: *See—*
  Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, 4,104,827, Cl. 49-385.000.
Guerra, Mario: *See—*
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Guidi, David M.: *See—*
  Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., 4,104,776, Cl. 29-281.300.
Guillory, Henry. Audio distributor. 4,105,865, Cl. 179-1.00G.
Guimard, Andre J.: *See—*
  Glotin, Bernard J. P.; and Guimard, Andre J., 4,105,279, Cl. 339-117.00R.
Guitton, Jacques; and Payn, Christian Jacques Maurice Charles Alexis, to ETAT FRANCAIS rep by Del. Min pour l'Armement. Solid-depolarizer electric cells. 4,105,835, Cl. 429-133.000.
Gulf Oil Canada Limited: *See—*
  McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
Gulf & Western Manufacturing Company: *See—*
  Caccioli, Anthony; Carlson, Philip A.; and Guidi, David M., 4,104,776, Cl. 29-281.300.
Gunning, Samuel D., to Kent Air Tool Company. Air hammer with blow-out air system. 4,105,080, Cl. 173-66.000.
Gunther, Christian: *See—*
  Zeidler, Gunter; and Gunther, Christian, 4,105,092, Cl. 184-6.400.
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  Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, to Becton, Dickinson and Company. Receptor coated plastic for assay of ligands. 4,105,410, Cl. 23-253.0TP.
Guterman, Paulette: *See—*
  Maillot, Jean, 4,106,000, Cl. 340-530.000.
Guyton, David L. Method for determining the refractive correction for an eye. 4,105,303, Cl. 351-39.000.
H. Goodman & Sons, Inc.: *See—*
  Herzog, Milton W., 4,104,817, Cl. 40-19.500.
H. R. Electronics Company: *See—*
  Levasseur, Joseph L.; and Seiter, William A., 4,105,867, Cl. 179-6.30R.
Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, to Ludwig Heumann & Co. GmbH. Antispasmodic substituted sulphoximides. 4,105,795, Cl. 424-320.000.
Haar, Richard, to Volkswagenwerk Aktiengesellschaft. Shock absorbing body. 4,105,236, Cl. 293-71.00R.
Haarmann, Walter: *See—*
  Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.
Haase, Donald A.; and Reed, Robert E., to Mobil Oil Corporation.

Process and apparatus for the manufacture of embossed film laminations. 4,105,491, Cl. 156-553.000.

Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, to GF Business Equipment, Inc. Portable wall assembly. 4,104,838, Cl. 52-239.000.

Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, to Robert Bosch GmbH. Slip ring structure for dynamo electric machines, particularly automotive-type alternators. 4,105,907, Cl. 310-232.000.

Hahn, Hee Mok. Dial lock. 4,104,896, Cl. 70-310.000.

Haida, Hirotoshi: *See*—

Nitta, Atsushi; and Haida, Hirotoshi, 4,106,104, Cl. 364-900.000.

Haines, Kendrick Peter; and MacPherson, Roy Duncan, to Parel Societe Anonyme. Improvements in or relating to the electrowinning of metals. 4,105,532, Cl. 204-301.000.

Hajos, Zoltan George: *See*—

Parrish, David Richard; and Hajos, Zoltan George, 4,105,696, Cl. 260-586.00F.

Halbach & Braun: *See*—

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Halko, Richard A.; and Heigl, John J., to Exxon Research & Engineering Co. Optical detector. 4,105,334, Cl. 356-104.000.

Hall, Stanley D.: *See*—

Glandon, James L.; and Hall, Stanley D., 4,104,847, Cl. 53-35.000.

Halliburton Company: *See*—

Baker, Eugene E., 4,105,069, Cl. 166-51.000.

Hamada, Masa: *See*—

Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.

Hamerdinger, Randolph W.: *See*—

Wang, Shing Chung; and Hamerdinger, Randolph W., 4,105,954, Cl. 331-94.5PE.

Hamilton, Robert W.; and Rorig, Kurt J., to G. D. Searle & Co. [(Substituted)phenyl]phenylmethyl-1-(dialkylaminoalkyl)piperidines. 4,105,849, Cl. 544-129.000.

Hammer, Urs; and Gisiger, Ernst, to Jura Elektroapparate-Fabriken L. Henzirohs A.G. Steam iron. 4,104,815, Cl. 38-77.500.

Hampton, James Ronald: *See*—

Baron, David Alan; and Hampton, James Ronald, 4,105,886, Cl. 219-10.55E.

Hampton, Perry Dwaine; and Tobey, Jimmie Lee, to Recognition Equipment Incorporated. Ink jet printer ink heater. 4,106,030, Cl. 346-140.00R.

Hamzawi, Fawzi J., to Solitron Devices, Inc. Method of manufacturing semiconductors. 4,105,476, Cl. 148-187.000.

Hankin-Baker Limited: *See*—

Jackson, Kenneth Roy, 4,104,868, Cl. 52-743.000.

Hann, Paul D.: *See*—

Little, Donald M.; and Hann, Paul D., 4,105,707, Cl. 260-683.480.

Hannemann, Franz: *See*—

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Hans Blomstedt Handelsbolag: *See*—

Blomstedt, Hans C. M., 4,105,032, Cl. 128-360.000.

Hanson, David Jack. Brick molding machine. 4,105,383, Cl. 425-96.000.

Hanson, Harry T.; and Gordon, Marvin, to Celanese Corporation. Production of thermosetting resinous polyepoxides. 4,105,634, Cl. 526-65.000.

Hansson, Hans-Erik, to Stal-Laval Turbin AB. Epicyclic gear trains. 4,104,932, Cl. 74-801.000.

Haralampiev, Georgi Alexandrov: *See*—

Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Hardin, Robert H., to Boeing Company, The. Frequency synthesizer apparatus. 4,105,949, Cl. 331-37.000.

Harding, Thomas J.; and Hellman, Wayne R., to General Electric Company. Metal halide lamp having open tungsten coil electrodes. 4,105,908, Cl. 313-217.000.

Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. PVC moulding compounds with high dimensional stability to heat. 4,105,711, Cl. 260-873.000.

Hardwick, Thomas James: *See*—

Hardwick, Thomas Lee Richard; and Hardwick, Thomas James, 4,105,130, Cl. 214-314.000.

Hardwick, Thomas Lee Richard; and Hardwick, Thomas James. Receptacle transporting vehicle. 4,105,130, Cl. 214-314.000.

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Harizanov, Kiril Georgiev: *See*—

Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Harnisch, Horst, to Bayer Aktiengesellschaft. Monomethine dyestuffs. 4,105,665, Cl. 260-289.00C.

Harper, Robert J., Jr.: *See*—

Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., 4,105,403, Cl. 8-115.000.

Harris, Harold D., to Harris and Thrush Manufacturing Company. Method of harvesting and transporting grain. 4,104,850, Cl. 56-1.000.

Harris, John J.: *See*—

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Harris and Thrush Manufacturing Company: *See*—

Harris, Harold D., 4,104,850, Cl. 56-1.000.

Harrison, Leslie Herbert Raymond, to Possum Controls Limited. Typewriter-calculator combination for the physically disabled. 4,106,101, Cl. 364-709.000.

Harsco Corporation: *See*—

Barnes, Thomas Malcolm, 4,105,439, Cl. 75-51.000.

Hartel, Gunter, to Pierburg GmbH & Co KG. Control mechanism for operation of an internal combustion engine. 4,105,001, Cl. 123-140.0CC.

Hartel, Kurt: *See*—

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,105,775, Cl. 424-273.00R.

Hartley, Nicholas Edmund Whittam: *See*—

Dearnaley, Geoffrey; and Hartley, Nicholas Edmund Whittam, 4,105,443, Cl. 75-238.000.

Hartman, Robert J.: *See*—

Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Hartsough, Lloyd Bruce: *See*—

Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,105,038, Cl. 132-7.000.

Haruna, Tohru: *See*—

Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,105,629, Cl. 260-45.8NT.

Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., to Carrier Corporation. Method for unloading refuse containers. 4,105,129, Cl. 214-152.000.

Hascoe, Norman, to Semi-Alloys, Inc. Hermetically sealed container for semiconductor and other electronic devices. 4,105,861, Cl. 174-52.0FP.

Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, to Hitachi, Ltd. Preheating and warming apparatus for use with vehicles. 4,105,158, Cl. 237-12.30C.

Hasebe, Shigeta, to Hosoda, Haruji. Apparatus for decomposition of aqueous liquid. 4,105,528, Cl. 204-237.000.

Hasegawa, Goro: *See*—

Nakamura, Zenzo; and Hasegawa, Goro, 4,106,037, Cl. 354-128.000.

Hasegawa, Hitoshi: *See*—

Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.

Hashimoto, Takashi: *See*—

Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, 4,105,158, Cl. 237-12.30C.

Hasler, David John; and McGhee, Thomas Allan, to Wiggins Teape Limited. Microcapsules, method for their preparation, and sheet material carrying microcapsules. 4,105,823, Cl. 428-307.000.

Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,105,852, Cl. 548-342.000.

Hastings, Jerome K.; and Piber, Earl T., to Cutler-Hammer, Inc. Electric switch having a frame with improved snap-in base retention means. 4,105,883, Cl. 200-296.000.

Haswell, John N. Method for collecting postpartum fluid loss. 4,105,019, Cl. 128-2.00F.

Hauke, Wilhelm, to Georg Fischer Aktiengesellschaft. Chill casting method and apparatus. 4,105,060, Cl. 164-130.000.

Hay, Robert A., II, to Dow Chemical Company, The. Bowless eyeglasses holder. 4,105,026, Cl. 128-142.400.

Hayakawa, Hayashi: *See*—

Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.

Hayashi, Izuo; and Lang, Roy, to Nippon Electric Co., Ltd. Heterostructure laser having a stripe region defined in an active layer by a difference in impurity. 4,105,955, Cl. 331-94.50H.

Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., to Akron Standard, Division of Eagle-Picher Industries, Inc. Raw edge V-belt building apparatus. 4,105,488, Cl. 156-425.000.

Heath, Darrell Richard; Holub, Fred Frank; and Wilkus, Edward Vincent, to General Electric Company. Polyolefin with phosphorylated novolac flame retardant, peroxide cured, as metallic insulator. 4,105,825, Cl. 428-379.000.

Hedberg, John Bengt Goran. Apparatus for igniting the match heads of electric detonators. 4,106,073, Cl. 361-248.000.

Heetderks, William J.: *See*—

Williams, William J.; and Heetderks, William J., 4,105,021, Cl. 128-2.05A.

Hegemann, Norbert R., to Allis-Chalmers Corporation. Transmission gear ratio indicator. 4,104,982, Cl. 116-124.00M.

Hegenbart, Horst, to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik. Lift, especially two-post lift for motor vehicles. 4,105,097, Cl. 187-8.750.

Hehl, Karl. Compact die closing unit for injection molding machines. 4,105,385, Cl. 425-192.00R.

Hehl, Karl. Die closing unit with plate adjustment mechanism for injection molding machine. 4,105,390, Cl. 425-450.100.

Heigl, John J.: *See*—

Halko, Richard A.; and Heigl, John J., 4,105,334, Cl. 356-104.000.

Hein, Leopold A.: *See*—

Myers, William N.; and Hein, Leopold A., 4,105,261, Cl. 308-72.000.

Heinrich, Allan E., to Applied Power, Inc. Rotor for hydraulic pump or motor. 4,105,376, Cl. 418-77.000.

Heinrich, Hans J.; Koslowsky, Bernd; and Hoffmann, Egon. Apparatus for draining of muddy liquids. 4,105,558, Cl. 210-199.000.

Heintke, Hans-Eberhard: *See*—

Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, 4,106,080, Cl. 362-18.000.

Heintz, Dennis Ronald; and Thelen, Arthur Bertram, to INRYCO, Inc. Metal building panel. 4,104,840, Cl. 52-309.900.

Heinzl, Johann J.: *See*—

Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

Helena Laboratories Corporation: *See*—

Golias, Tipton, 4,105,521, Cl. 204-180.00S.

Helix International Limited: *See*—

Payton, Raymond Anthony, 4,104,801, Cl. 33-27.00B.

Hell, Hans: *See*—

Thiel, Alfons W.; and Hell, Hans, 4,105,386, Cl. 425-217.000.

Hellgren, Keijo, to Asea Aktiebolag. Hydraulic press. 4,105,388, Cl. 425-389.000.

Hellman, Wayne R.: *See*—

Harding, Thomas J.; and Hellman, Wayne R., 4,105,908, Cl. 313-217.000.

Helmrich, Gunter; and Wulfing, Fritz, to Vereinigte Aluminium-Werke Aktiengesellschaft. Method of making shaped bodies. 4,105,729, Cl. 264-71.000.

Helmus, Sydney S., to Baker International Corporation. Test valve having automatic bypass for formation pressure. 4,105,075, Cl. 166-321.000.

Hemmens, Cecil Godfrey: *See*—

Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, 4,105,987, Cl. 338-130.000.

Henderson, John Goodchilde Norie; and Wine, Charles Martin, to RCA Corporation. Phase locked loop television tuning system. 4,106,059, Cl. 358-191.000.

Hendrickson, Donald W.; and Howard, James S., to Hendrickson, Donald W. Integral flanged elastomeric flow restrictor. 4,105,050, Cl. 138-45.000.

Henehan, Padraig Anthony; and Farkouh, Michel George Bazil, to Ansafone Limited. Telephone answering machine busy signal detection devices with switching means. 4,105,866, Cl. 179-6.00R.

Henkel Kommanditgesellschaft auf Aktien: *See*—

Koch, Karlheinz; and Rupilius, Wolfgang, 4,105,430, Cl. 71-59.000.

Wehle, Volker; and Reiffert, Jurgen, 4,105,405, Cl. 21-2.70R.

Henry, Paul Michael, to Motorola, Inc. Differential amplifier circuit having common mode compensation. 4,105,942, Cl. 330-261.000.

Henschke, Siegfried; and Lindberg, Albert, to Leybold-Heraeus GmbH & Co. KG. Plug assembly. 4,105,273, Cl. 339-47.00R.

Henthorn, Donald Ray: *See*—

Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, 4,105,188, Cl. 254-10.500.

Hepworth, Edward C.; and Means, Rodney J., to Motorola, Inc. Interrupt status indication logic for polled interrupt digital system. 4,106,091, Cl. 364-200.000.

Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See*—

McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.

Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, to Trumpf Maschinen AG. Nibbling machine having automatically adjustable feed control. 4,104,940, Cl. 83-71.000.

Herbert Kannegiesser Kommanditgesellschaft: *See*—

Schuster, Wolfgang, 4,105,896, Cl. 219-470.000.

Hercules Incorporated: *See*—

Prosser, Thomas John, 4,105,837, Cl. 526-26.000.

Hershel, Ronald S., to University Patents, Inc. Apparatus and method for image sampling. 4,105,289, Cl. 350-162.0SF.

Hertel, Gunther: *See*—

Zimmermann, Heinz; and Martens, Wolfgang, 4,105,264, Cl. 308-20.000.

Hertel, Karl Gustav: *See*—

Zimmermann, Heinz; and Martens, Wolfgang, 4,105,264, Cl. 308-20.000.

Hertl, William; and Ramsey, William S., to Corning Glass Works. Anerobic specimen transport system. 4,105,498, Cl. 195-59.000.

Herzog, Donald George: *See*—

Reno, Charles William; and Herzog, Donald George, 4,105,926, Cl. 250-566.000.

Herzog, Milton W., to H. Goodman & Sons, Inc. Inventory-control merchandise display apparatus. 4,104,817, Cl. 40-19.500.

Hesselbo, Torben: *See*—

Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,105,770, Cl. 424-263.000.

Hewlett-Packard Company: *See*—

Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

Hibino, Noburo: *See*—

Ogata, Yasuhiro; and Hibino, Noburo, 4,104,910, Cl. 73-141.00R.

Highley, John; and Vickers, Michael Alan, to Coal Industry (Patents) Limited. Fluidized bed apparatus. 4,105,419, Cl. 48-61.000.

Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., to Union Carbide Corporation. Metal-inert-gas welding torch. 4,105,891, Cl. 219-137.430.

Hill, David George: *See*—

Crossley, Roger; and Hill, David George, 4,105,773, Cl. 424-270.000.

Hill, James A.; and Hargis, David R., to Tektronix, Inc. Knockdown stand for electronic instrument. 4,105,176, Cl. 248-13.000.

Hillenbrand, Louis J.: *See*—

Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.

Hilti Aktiengesellschaft: *See*—

Furness, John Douglas, 4,104,777, Cl. 29-401.00D.

Hilton, Richie Conrad. Photo printing apparatus. 4,105,330, Cl. 355-102.000.

Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, to BASF Aktiengesellschaft. Manufacture of 2-amino-1-alcohols. 4,105,669, Cl. 260-307.00F.

Hindrichs, Gerhard. Pipe installing apparatus for large heat exchangers. 4,104,790, Cl. 29-707.000.

Hines, Robin H.: *See*—

Hohne, Walter; and Hines, Robin H., 4,105,332, Cl. 356-5.000.

Hingarh, Hemraj K.: *See*—

Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, 4,106,090, Cl. 364-200.000.

Hini, Paul; and Forster, Helmut, to Siemens Aktiengesellschaft. Apparatus for cutting up hard and brittle material. 4,105,012, Cl. 125-16.00R.

Hinkel, Holger, to International Business Machines Corporation. Apparatus for making a rastered photoconductive layer. 4,105,924, Cl. 250-492.00A.

Hirasawa, Kunio: *See*—

Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.

Hirata, Hiroshi; and Kondo, Takashi, to Minolta Camera Kabushiki Kaisha. Indicating device for motion picture camera. 4,105,310, Cl. 352-171.000.

Hirose, Takeshi: *See*—

Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.

Hirota, Yutaka: *See*—

Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,105,945, Cl. 330-294.000.

Hitachi Construction Machinery Co., Ltd.: *See*—

Ono, Kozo; and Kato, Taketoshi, 4,104,956, Cl. 91-491.000.

Hitachi Denshi Kabushiki Kaisha: *See*—

Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.

Hitachi, Ltd.: *See*—

Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, 4,105,158, Cl. 237-12.30C.

Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.

Inoue, Fumio, 4,105,933, Cl. 315-387.000.

Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, 4,105,372, Cl. 417-243.000.

Naka, Reishi; and Narahara, Toshikazu, 4,105,599, Cl. 521-131.000.

Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.

Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, 4,104,978, Cl. 112-277.000.

Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.

Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, 4,105,810, Cl. 427-248.00C.

Hobart Corporation: *See*—

Hoover, Richard D., 4,106,118, Cl. 366-185.000.

Hodge, Joel W. Mounting bracket for a newspaper delivery box. 4,105,180, Cl. 248-300.000.

Hodge, Jonathan Martin, to Momovis B.V. Sealing arrangement. 4,105,378, Cl. 418-195.000.

Hoechst Aktiengesellschaft: *See*—

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,105,775, Cl. 424-273.00R.

Auer, Eberhard; Ohorodnik, Alexander; and Stutzke, Paul, 4,105,689, Cl. 260-502.500.

Dany, Franz-Josef; Maier, Karl; Riedel, Tomas; and Wortmann, Joachim, 4,105,735, Cl. 264-143.000.

Fischer, Hannes; and Werner, Gerhard, 4,105,607, Cl. 260-22.0CB.

Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.

Moraw, Roland; and Schadlich, Gunther, 4,105,323, Cl. 355-9.000.

Schulz, Lothar; and Arpe, Hans-Jurgen, 4,105,753, Cl. 423-502.000.

Winkelmann, Erhardt; and Raether, Wolfgang, 4,105,763, Cl. 424-246.000.

Hoehn, Rudolph H., to Slater Electric Inc. Outlet box having screw mounting means. 4,105,862, Cl. 174-53.000.

Hoenisch, Walter Harold, to King-Seeley Thermos Co. Ice transport and dispensing system. 4,104,889, Cl. 62-137.000.

Hoeppel, Raymond W. Direction finding device and guidance system. 4,104,803, Cl. 33-352.000.

Hofer, Heinz P. Apparatus for temperature measurement. 4,104,916, Cl. 73-343.00B.

Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., to Standard Oil Company (Indiana). Increasing the particle size of as formed polyethylene or ethylene copolymer. 4,105,846, Cl. 526-124.000.

Hoffman, James T.: *See*—

Jones, John H.; and Hoffman, James T., 4,105,116, Cl. 206-484.000.

- Hoffmann, Egon: *See—*
  - Heinrich, Hans J.; Koslowsky, Bernd; and Hoffmann, Egon, 4,105,558, Cl. 210-199.000.
- Hoffmann, Helmut: *See—*
  - Baumann, Georg; and Hoffmann, Helmut, 4,106,075, Cl. 361-320.000.
- Hoffmann, Klaus; Meyer, Rudolf; and Ohlschlager, Hans, to AGFA-Gevaert AG. Ink for the ink jet process. 4,106,027, Cl. 346-1.000.
- Hoffmann-La Roche Inc.: *See—*
  - Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, 4,105,137, Cl. 222-1.000.
  - Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,105,681, Cl. 260-404.000.
  - Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,105,676, Cl. 260-345.90S.
  - Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,105,664, Cl. 544-378.000.
  - Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
  - Meienhofer, Johannes Arnold; and Wang, Su-Sun, 4,105,652, Cl. 260-112.50R.
  - Parrish, David Richard; and Hajos, Zoltan George, 4,105,696, Cl. 260-586.00F.
- Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Method and apparatus for applying sleeves to necks of bottles and other containers. 4,104,845, Cl. 53-14.000.
- Hogue, Robert J., Jr. Tourniquet pressure monitor. 4,106,002, Cl. 340-626.000.
- Hohenstein, Robert Mark: *See—*
  - Albert, William Charles; and Hohenstein, Robert Mark, 4,104,920, Cl. 73-517.0AV.
- Hohne, Walter; and Hines, Robin H., to Precision International, Inc. Apparatus for producing a light beam having a uniform phase front and distance measuring apparatus. 4,105,332, Cl. 356-5.000.
- Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, to Hitachi, Ltd. Variable stage type carburetor. 4,105,720, Cl. 261-34.00A.
- Holbrook, Mark Denton; and Fillmore, Richard Plumb, to RCA Corporation. Voltage multiplier circuit. 4,106,086, Cl. 363-60.000.
- Holdiman, Joe W., to Scovill Manufacturing Company. Corner clip for a window product. 4,105,352, Cl. 403-402.000.
- Holl, Friedrich, to C. Hohage & Cie. KG. Holder bar for sheet-like articles. 4,105,127, Cl. 211-124.000.
- Holland, Steven W.: *See—*
  - Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.
- Holmes, William A.; and Scholz, Donald T., to Polaroid Corporation. Programmable viewing system for processing and viewing cassette contained photographic film strips. 4,105,307, Cl. 352-72.000.
- Holovacky, Julius: *See—*
  - Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
- Holub, Fred Frank: *See—*
  - Heath, Darrell Richard; Holub, Fred Frank; and Wilkus, Edward Vincent, 4,105,825, Cl. 428-379.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See—*
  - Kogure, Hiroshi; and Shimada, Junichi, 4,104,881, Cl. 60-299.000.
- Honeywell, Inc.: *See—*
  - Johnson, Eric S., 4,105,478, Cl. 148-188.000.
  - Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,105,477, Cl. 148-187.000.
  - Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,105,479, Cl. 148-189.000.
  - Lancaster, Robert A., 4,105,472, Cl. 148-1.500.
  - Robillard, Gene A., 4,104,789, Cl. 29-628.000.
- Honeywell Information Systems Inc.: *See—*
  - Goss, Gary J.; and Joyce, Thomas F., 4,105,978, Cl. 328-58.000.
- Honeywell Information Systems Italia: *See—*
  - Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, 4,106,108, Cl. 365-222.000.
- Honjo, Satoru: *See—*
  - Miyatuka, Hajime; Saida, Takashi; and Honjo, Satoru, 4,105,448, Cl. 96-1.800.
- Hoover, Richard D., to Hobart Corporation. Food processing apparatus. 4,106,118, Cl. 366-185.000.
- Hori, Kiyoshi, to Nippon Paint Co., Ltd. Decorative relief finish process. 4,105,816, Cl. 428-159.000.
- Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., to Cabot Corporation. Production of carbon blacks. 4,105,750, Cl. 423-456.000.
- Horne, John E.; Van Albert, Stephen A.; and Tousimis, A. J. Semi-automatic critical point drying apparatus. 4,104,808, Cl. 34-243.00R.
- Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, to Poly-Gulf Associates. Method of protectively coating metallic aluminum containing substrate. 4,105,811, Cl. 427-302.000.
- Hort, Eugene Victor: *See—*
  - De Thomas, Waldo; and Hort, Eugene Victor, 4,105,674, Cl. 260-343.600.
- Horvath, Ralph S.; and Chapel, Annette Moore. Suture and needle holder. 4,105,115, Cl. 206-370.000.
- Hoshido, Mutsuo, to Sony Corporation. Cassette-type recording and/or reproducing apparatus with inadvertent erase preventing device. 4,106,064, Cl. 360-60.000.
- Hosmer, Stephen L., to Young Windows Inc. Vent. 4,104,825, Cl. 49-324.000.
- Hosoda, Haruji: *See—*
  - Hasebe, Shigeta, 4,105,528, Cl. 204-237.000.
- Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gap self-compensating hydraulic rocker arm. 4,104,996, Cl. 123-90.430.
- Hotta, Masahiro: *See—*
  - Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, 4,105,449, Cl. 96-1.800.
- Houdaille Industries, Inc.: *See—*
  - Callahan, James J., 4,105,094, Cl. 184-7.00F.
- House, Robert M.: *See—*
  - Latakas, Bernard; Copenhefer, John E.; and House, Robert M., 4,105,423, Cl. 55-501.000.
- Howard, James S.: *See—*
  - Hendrickson, Donald W.; and Howard, James S., 4,105,050, Cl. 138-45.000.
- Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, to Howard Machinery Limited. Hay baler. 4,104,853, Cl. 56-341.000.
- Howard Machinery Limited: *See—*
  - Howard, John Arthur; Randall, Bryce Ernest; and Fleming-Brown, David Hugh, 4,104,853, Cl. 56-341.000.
- Howell, Henry George: *See—*
  - Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.
- Howlett, Donald L., to Texaco Inc. Logarithmic analog-to-digital converter. 4,106,010, Cl. 340-347.0AD.
- Howmedica Inc.: *See—*
  - Graf, John W., 4,105,112, Cl. 206-1.500.
- Howmet Turbine Components Corporation: *See—*
  - Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., 4,104,782, Cl. 29-527.200.
- Hoya Corporation: *See—*
  - Yamashita, Toshiharu, 4,105,577, Cl. 252-300.000.
- Hoya Lens Corporation: *See—*
  - Ohno, Toshiaki; and Niizeki, Kiyoshi, 4,105,809, Cl. 427-164.000.
- Hrabik, Heinrich, to Bonum-Werk Inh. Friedrich Hetzmannseder. Slide frame. 4,104,818, Cl. 40-152.000.
- Huber, Richard, to Klinger AG. Sealing system for shutoff units. 4,105,187, Cl. 251-334.000.
- Huffman, Stanley S., to Coors Container Company. Conveyor and feed control apparatus. 4,105,103, Cl. 193-32.000.
- Huffman, William A.; and Brown, Harvey A., to Minnesota Mining and Manufacturing Company. Electro-optical devices containing methine arylidene dyes. 4,105,299, Cl. 350-349.000.
- Hughes Aircraft Company: *See—*
  - Alexander, Thomas F.; and Griff, Gary J., 4,106,019, Cl. 343-9.000.
- Hughes, Alexander W., Jr. Hand crank generator-powered rotary slide projector. 4,105,314, Cl. 353-85.000.
- Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, to Imperial Chemical Industries Limited. Alpha-amino ketone derivatives. 4,105,790, Cl. 424-309.000.
- Hughes, John, to United States of America, Health, Education and Welfare. Purification of enkephalin, an endogenous composition in the human body and synthesis of same. 4,105,651, Cl. 260-112.50R.
- Hultzsch, Kurt: *See—*
  - Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.
- Hung, Ling Kong: *See—*
  - Bloom, Allen; and Hung, Ling Kong, 4,105,654, Cl. 260-205.000.
- Hunsucker, Jerry Hoyt; and Selleck, James R., Jr., to IMC Chemical Group, Inc. Method of controlling the growth of microorganisms. 4,105,552, Cl. 210-64.000.
- Hunter, Byron Alexander; and Barrows, Franklin Herbert, to Uniroyal, Inc. 3,3'-Carbonylbis(carbazates) as blowing agents. 4,105,601, Cl. 521-95.000.
- Hunts, Barney Dean: *See—*
  - Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.
- Hupfer, Leopold: *See—*
  - Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.
- Hurst, Ronald C.: *See—*
  - Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.
- Husse, Massimo, to FIAT Societa per Azioni. Ultrasonic device for the determination of the rate of air flow in the inlet duct of an internal combustion engine. 4,104,915, Cl. 73-194.00A.
- Hutton, Ronald E.; Oakes, Vincent; and Burley, Joseph, to Akzo N.V. Process for the preparation of organotin trihalides. 4,105,684, Cl. 260-429.700.
- Huyck Corporation: *See—*
  - Pai, Karnire S., 4,105,495, Cl. 162-348.000.
- Huyssen, Phillip H. Chain lock assembly. 4,105,231, Cl. 292-264.000.
- Hyldon, Roy G.: *See—*
  - Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'-Mahony, John P., 4,105,799, Cl. 426-44.000.
- Hynes, John L., Jr., to Pfizer Inc. Patient handling system and apparatus for tomographic scanning. 4,105,923, Cl. 250-456.000.
- Iacobucci, Guillermo A.; and Sweeny, James G., to Coca-Cola Company, The. Method for making 3-deoxyanthocyanidins. 4,105,675, Cl. 260-345.200.

- Ichijima, Seiji: *See—*
  - Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.
- ICI Australia Limited: *See—*
  - Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, 4,105,114, Cl. 206-219.000.
- Ideal Toy Corporation: *See—*
  - Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.
- Idemitsu Kosan Company, Ltd.: *See—*
  - Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, 4,105,546, Cl. 210-11.000.
- Iemura, Toshio: *See—*
  - Yamano, Masaru; and Iemura, Toshio, 4,105,913, Cl. 315-39.710.
- Igarashi, Yoshiaki: *See—*
  - Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.
- Ignasiak, Stanley F., to Sperry Rand Corporation. Penetration phosphors for display devices. 4,105,909, Cl. 313-473.000.
- Iguchi, Masakazu: *See—*
  - Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, 4,105,086, Cl. 180-79.000.
- Ihara Chemical Industry Co. Ltd.: *See—*
  - Takahashi, Akio; and Saito, Hirokichi, 4,106,115, Cl. 366-138.000.
- Iihashi, Mototaka: *See—*
  - Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
- Iijima, Katsuhiko; and Jomen, Katsumasa, to Mitsubishi Jukogyo Kabushiki Kaisha. Hydraulic control system. 4,104,954, Cl. 91-45.000.
- Iijima, Tetsuya, to Nissan Motor Company, Ltd. Hydraulic control system for a power transmission. 4,105,100, Cl. 192-.034.
- Ikeda, Tomoaki: *See—*
  - Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,105,450, Cl. 96-33.000.
- Ikeda, Yuji, to Sansui Electric Co., Ltd. Frequency synthesizer with phase locked loop and counter. 4,105,946, Cl. 331-1.00A.
- Ilel, Elieser Persiado: *See—*
  - Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
- Iler, Ralph Kingsley; and Kirkland, Joseph Jack, to Du Pont de Nemours, E. I., and Company. Process for manufacture of macroporous microspheroids. 4,105,426, Cl. 65-18.000.
- IMC Chemical Group, Inc.: *See—*
  - Eckler, Paul Eugene, 4,105,575, Cl. 252-182.000.
  - Hunsucker, Jerry Hoyt; and Selleck, James R., Jr., 4,105,552, Cl. 210-64.000.
- Imperial Chemical Industries Limited: *See—*
  - Chase, Michael John, 4,104,878, Cl. 60-245.000.
  - Collins, David John; Kay, Ian Trevor; and Slater, John Walter, 4,105,433, Cl. 71-93.000.
  - Freeman, John Leslie, 4,105,635, Cl. 528-126.000.
  - Gibson, Keith Hopkinson, 4,105,854, Cl. 560-55.000.
  - Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.
  - Knight, Harry Wilson, 4,106,012, Cl. 340-523.000.
  - Maslen, John; and Taylor, William Hunter, 4,105,621, Cl. 260-37.00N.
  - Taylor, Ian Charles, 4,105,636, Cl. 528-126.000.
- Imperial Industries, Inc.: *See—*
  - Lewellen, Wendell G., Jr.; and Lankford, Loran A., 4,105,526, Cl. 204-213.000.
- Imperial Oil Limited: *See—*
  - McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.
- Industrie Pirelli Societa per Azioni: *See—*
  - Portinari, Antonio; and Lavezzari, Piero, 4,105,485, Cl. 156-382.000.
- Infante, Javier D.: *See—*
  - Ingram, Lawrence L.; and Infante, Javier D., 4,104,975, Cl. 111-3.000.
- Ingersoll-Rand Company: *See—*
  - Vliet, Walter Carl, 4,104,778, Cl. 29-407.000.
- Ingram, Lawrence L.; and Infante, Javier D., to Bud Antle, Inc. Transplanting apparatus. 4,104,975, Cl. 111-3.000.
- Inoue, Fumio, to Hitachi, Ltd. Vertical deflection circuit. 4,105,933, Cl. 315-387.000.
- Inoue, Motoichiro; Shiga, Tsuyoshi; and Kasahara, Nobuo, to Ricoh Company, Ltd. Electrophotographic color process. 4,105,322, Cl. 355-4.000.
- Inoue, Yasuo, to Olympus Optical Company Limited. Light source system. 4,106,078, Cl. 362-32.000.
- INRYCO, Inc.: *See—*
  - Heintz, Dennis Ronald; and Thelen, Arthur Bertram, 4,104,840, Cl. 52-309.900.
- Insolio, Thomas A., to Fletcher-Terry Company, The. Glass tube cutting machine. 4,105,150, Cl. 225-96.500.
- Institut Francais du Petrole: *See—*
  - Delignieres, Robert, 4,105,991, Cl. 340-3.00D.
- Institutul de Cercetari Stiintifice Pentru Protectia Muncii: *See—*
  - Macoveanu, Aurelian Liviu Alexandru; and Grecu, Nicolae, 4,104,918, Cl. 73-379.000.
- International Business Machines Corporation: *See—*
  - Cowardin, Robert Lewis; and Laurer, George Joseph, 4,105,980, Cl. 328-165.000.
  - Desblache, Andre Eugene, 4,106,102, Cl. 364-724.000.
  - Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, 4,105,327, Cl. 355-59.000.
  - Hinkel, Holger, 4,105,924, Cl. 250-492.00A.
  - Riseman, Jacob, 4,106,050, Cl. 357-49.000.
- International Standard Electric Corporation: *See—*
  - Bedgood, Michael Albert; and Leach, John Stuart, 4,105,285, Cl. 350-96.210.
  - Beguin, Daniel E.; Bosc, Henri J.; and Colin, Jean-Marie H., 4,106,015, Cl. 343-5.00W.
- International Tapetronics Corporation: *See—*
  - Jenkins, John P., 4,105,934, Cl. 318-7.000.
- International Telephone and Telegraph Corporation: *See—*
  - Furda, Dymetro P., 4,106,077, Cl. 362-8.000.
  - Oeschger, Joseph E., 4,105,982, Cl. 335-151,000.
- Internationale Octrooi Maatschappij "Octropa" B.V.: *See—*
  - Borst, Hans; Evans, Reginald David Owen; and Rand, John Arthur, 4,105,539, Cl. 208-33.000.
- Interox: *See—*
  - Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, 4,105,827, Cl. 428-403.000.
- Iowa State University Research Foundation, Inc.: *See—*
  - Larock, Richard Craig, 4,105,705, Cl. 260-668.00R.
- Irick, Gether, Jr.: *See—*
  - Wang, Richard H. S.; and Irick, Gether, Jr., 4,105,631, Cl. 260-45.80A.
- Irving, Donald W.; and Chamberlin, Donald W., to FMC Corporation. Fruit sorting circuitry. 4,105,123, Cl. 209-111.600.
- Ishihara Sangyo Kaisha Ltd.: *See—*
  - Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.
- Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki. System for controlling vehicular four-wheel steering mechanisms. 4,105,086, Cl. 180-79.000.
- Ishijima, Takashi: *See—*
  - Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, 4,104,864, Cl. 58-39.500.
- Ishikawa, Ryoichi: *See—*
  - Izutu, Hitoshi; and Ishikawa, Ryoichi, 4,105,622, Cl. 260-37.00N.
- Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,104,864, Cl. 58-39.500.
- Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, to Nippon Mining Company. Process and apparatus for producing zirconium sponge. 4,105,192, Cl. 266-149.000.
- Ishizuka, Masaaki: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
- Isogai, Yoshihisa: *See—*
  - Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.
- Isom, William C., to Isom, William C. Exhaust hood energy saving device. 4,105,015, Cl. 126-299.00D.
- Itatsuda, Yoshiharu: *See—*
  - Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, 4,106,100, Cl. 364-702.000.
- Ito, Akira; and Iwata, Kenji, to Mitsui Toatsu Chemicals Inc. Method for polymerization of ethylene. 4,105,847, Cl. 526-125.000.
- Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, to Canon Kabushiki Kaisha. Camera having improved mechanism for shutter actuation and film winding. 4,106,040, Cl. 354-205.000.
- Ito, Fumio: *See—*
  - Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
- Ito, Kunio: *See—*
  - Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yosbitami, 4,105,453, Cl. 96-114.500.
- Ito, Michio: *See—*
  - Takahashi, Shigeo; and Ito, Michio, 4,104,798, Cl. 32-12.000.
- Ito, Mikiji, to Nippondenso Co., Ltd. Exhaust gas purifying system having a diaphragm type control valve. 4,104,880, Cl. 60-290.000.
- Ito, Tadashi: *See—*
  - Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.
  - Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
- Itoh, Toshiyuki: *See—*
  - Hasebe, Nobutoshi; Itoh, Toshiyuki; and Hashimoto, Takashi, 4,105,158, Cl. 237-12.30C.
- Itoi, Kazuo: *See—*
  - Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.
- Itou, Kousuke: *See—*
  - Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, 4,105,745, Cl. 423-239.000.
- Itou, Shigeru: *See—*
  - Takeuchi, Junji; Itou, Sbigeru; and Itou, Kousuke, 4,105,745, Cl. 423-239.000.
- ITT Industries, Inc.: *See—*
  - Ade, Rolf; Schubert, Karl-Friedrich; and Staller, Manfred, 4,105,906, Cl. 310-87.000.
- Ivy, Leon Harlan. Galvanometer mechanism mounted on printed circuit board having plug portion for insertion into control console receptacle. 4,105,969, Cl. 324-151.00R.
- Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, to Kabushiki

- Kaisha Suwa Seikosha. Touch sensitive input for electronic wristwatch and/or electronic calculator. 4,105,902, Cl. 307-308.000.
- Iwaizumi, Takashi: *See—*
  - Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo. 4,105,549, Cl. 210-33.000.
- Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, to Asahi-Dow Limited. Polyamide compositions. 4,105,709, Cl. 260-857.00L.
- Iwasaki, Ryohei, to Matsushita Seiko Co., Ltd. Air conditioning apparatus. 4,104,890, Cl. 62-324.000.
- Iwasaki, Tetsuji: *See—*
  - Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
- Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, to Mitsui Petrochemical Industries Ltd. Process for producing hydrocarbon resins having improved color and thermal stability by heat treatment with an α,βunsaturated anhydride. 4,105,843, Cl. 526-77.000.
- Iwata, Kenji: *See—*
  - Ito, Akira; and Iwata, Kenji, 4,105,847, Cl. 526-125.000.
- Iwata, Kiyoshi: *See—*
  - Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.
- Iwata, Minoru: *See—*
  - Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, 4,105,546, Cl. 210-11.000.
- Izawa, Minoru: *See—*
  - Yamazaki, Hiroshi; and Izawa, Minoru, 4,104,862, Cl. 58-38.00R.
- Izon Corporation: *See—*
  - Yevick, George J., 4,105,318, Cl. 353-120.000.
- Izutu, Hitoshi; and Ishikawa, Ryoichi, to Dainippon Inc. & Chemicals Inc. Process for the preparation of flame retardant thermoplastic resin compositions. 4,105,622, Cl. 260-37.00N.
- J. Aichelin KG: *See—*
  - Disch, Gunther; and Noormets, Elmar, 4,105,398, Cl. 432-121.000.
- J. M. Huber Corporation: *See—*
  - Kunkle, Albert C.; and Kollmar, Carl E., Jr., 4,105,466, Cl. 106-309.000.
  - Wason, Satish K., 4,105,757, Cl. 424-49.000.
- J. Ray McDermott & Co., Inc.: *See—*
  - Breaux, Earl J., 4,104,937, Cl. 82-34.00R.
- J. T. Baker Chemical Company: *See—*
  - Seidenberger, James W., 4,105,576, Cl. 252-190.000.
- J. u. W. Muller, Maschinen-und Armaturenfabrik GmbH: *See—*
  - Dobranis, Aurel, 4,105,963, Cl. 322-48.000.
- Jackson, Kenneth Roy, to Hankin-Baker Limited. Precast chimney system. 4,104,868, Cl. 52-743.000.
- Jackson, Stephen John: *See—*
  - Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.
- Jackson, William Lewis: *See—*
  - Corner, Michael Raymond; and Jackson, William Lewis, 4,105,254, Cl. 301-63.0DS.
- Jacobs, Leonard, to TRW Inc. Electrical connector. 4,105,277, Cl. 339-95.00R.
- Jacobs, William: *See—*
  - Jones, Lawrence T.; and Jacobs, William, 4,105,210, Cl. 273-126.00R.
- Jacobsen, Ronald Lowell, to Procter & Gamble Company, The. Dishwasher detergent composition. 4,105,573, Cl. 252-99.000.
- Jacobson, Samuel O. Multiple use study device. 4,105,182, Cl. 248-459.000.
- Jagenberg-Werke Aktiengesellschaft: *See—*
  - Schonmeier, Herbert, 4,105,170, Cl. 242-65.000.
- Jahns, Frederick D.; and Rand, Arthur G., Jr., to State of Rhode Island, Board of Regents for Education of the. Immobilized enzyme method to assess fish quality. 4,105,800, Cl. 426-61.000.
- Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, to Vyzkumny ustav lykovych vlaken Superk; and Strojni a traktorova stanice v Zatci, narodni podnik Zatec. Arrangement for fixing hop guiding ropes in the soil. 4,104,823, Cl. 47-1.00R.
- Jakob, Juergen: *See—*
  - Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.
- James Mackie & Sons Limited: *See—*
  - Mackie, Gordon, 4,105,166, Cl. 242-45.000.
- James Morton Limited: *See—*
  - Rousom, Harold G., 4,105,344, Cl. 403-24.000.
- Jamiolkowski, Dennis D.: *See—*
  - Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,105,034, Cl. 128-335.500.
- Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., to General Motors Corporation. Forming curved wafer thin magnets from rare earth-cobalt alloy powders. 4,104,787, Cl. 29-596.000.
- Janousek, Jan: *See—*
  - Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
- Janson, John J. Oil spill retrieval system. 4,105,554, Cl. 210-96.00R.
- Janssen, Raoul M. Wood sawing machine. 4,104,944, Cl. 83-471.200.
- Japan Steel Works, Ltd., The: *See—*
  - Yaguchi, Hiroyasu; and Ono, Eishiro, 4,104,904, Cl. 72-445.000.
- Jasper, Martin T.; and Koch, Peter, to United States of America, Agriculture. Bark burning system. 4,105,397, Cl. 432-90.000.
- Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, to Eastman Technology, Inc. Method and apparatus for forming magnetic images by piezoelectric coupling between an optical image and a magnetostrictive imaging component. 4,106,028, Cl. 346-74.100.
- Jeffreys, Dennis C.: *See—*
  - Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,106,007, Cl. 340-310.00A.
  - Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., 4,105,897, Cl. 307-3.000.
- Jenkins, John P., to International Tapetronics Corporation. Magnetic tape reproducer with series interconnected torque motors in play mode. 4,105,934, Cl. 318-7.000.
- Jenne, Fredrick Benjamin, to American Microsystems, Inc. Epitaxial method of fabricating single igfet memory cell with buried storage element. 4,105,475, Cl. 148-175.000.
- Jensen, Jens Herman: *See—*
  - Jensen, Jorn Benned; and Jensen, Jens Herman, 4,104,927, Cl. 123-179.00S.
- Jensen, Jorn Benned; and Jensen, Jens Herman. Engine starter. 4,104,927, Cl. 123-179.00S.
- Jernigan, James L., to United States of America, Navy. Chirped acousto-optic Q switch. 4,105,953, Cl. 331-94.50Q.
- Jirkovsky, Ivo L.: *See—*
  - Philipp, Adolph H.; and Jirkovsky, Ivo L., 4,105,778, Cl. 424-275.000.
- Johansson, Anders Erik Bertil: *See—*
  - Gillbrand, Per Sune; and Johansson, Anders Erik Bertil, 4,104,882, Cl. 60-600.000.
- John Wyeth & Brother Limited: *See—*
  - Archibald, John Leheup; and Ward, Terence James, 4,105,771, Cl. 424-267.000.
  - Crossley, Roger; and Hill, David George, 4,105,773, Cl. 424-270.000.
  - Ward, Terence James, 4,105,666, Cl. 260-293.770.
- John Zink Company: *See—*
  - Goodnight, Hershel E.; Reed, Robert D.; and Witwer, Alan D., 4,105,395, Cl. 431-351.000.
  - Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., 4,105,394, Cl. 431-202.000.
- Johnson, Alan Stanley William; and Tseung, Alfred Chan Chung, to National Research Development Corporation. Corrosion resistant electrodes for electrochemical use. 4,105,530, Cl. 204-290.00R.
- Johnson, Eric S., to Honeywell, Inc. Doping HgCdTe with Li. 4,105,478, Cl. 148-188.000.
- Johnson, Eric Shanks; and Schmit, Joseph Lawrence, to Honeywell, Inc. Doping of (Hg,Cd)Te with a Group VA element. 4,105,477, Cl. 148-187.000.
- Johnson, Eric Shanks; and Schmit, Joseph Lawrence, to Honeywell, Inc. Preparation of halogen doped mercury cadmium telluride. 4,105,479, Cl. 148-189.000.
- Johnson, Harlan B.: *See—*
  - Martinsons, Aleksandrs; and Johnson, Harlan B., 4,105,516, Cl 204-98.000.
- Johnson, Henry Charles, to RCA Corporation. FM-CW Radar ranging system. 4,106,020, Cl. 343-14.000.
- Johnson, Lloyd H.: *See—*
  - Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
- Johnson, Morris Burton; and Richardson, Charles Raymond William, to Marconi Company Limited, The. Scanning minor stabilizer. 4,105,281, Cl. 350-6.500.
- Johnson, Steven A.: *See—*
  - Greenleaf, James F.; and Johnson, Steven A., 4,105,018, Cl. 128-2.00V.
- Johnson, William Henry: *See—*
  - Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
- Johnston, Clyde H. Apparatus for use in manufacturing and selecting golf clubs. 4,104,802, Cl. 33-174.00F.
- Johnston, Franklin K., Jr. Solar heating method and apparatus. 4,105,042, Cl. 137-245.000.
- Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., to New England Power Service Company. Method and apparatus for transmitting intelligence over a carrier wave. 4,106,007, Cl. 340-310.00A.
- Johnston, Reed H.: *See—*
  - Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., 4,105,897, Cl. 307-3.000.
- Jomen, Katsumasa: *See—*
  - Iijima, Katsuhiko; and Jomen, Katsumasa, 4,104,954, Cl. 91-45.000.
- Jones, Howard, to Merck & Co., Inc. Preparation of 3β-hydroxy-27-norcholest-5,7-dien-25-one. 4,105,660, Cl. 260-239.55C.
- Jones, John H.; and Hoffman, James T., to Beatrice Foods Co. Sample-containing envelope assembly. 4,105,116, Cl. 206-484.000.
- Jones, Lawrence T.; and Jacobs, William, to California R & D Center. Hockey game apparatus. 4,105,210, Cl. 273-126.00R.
- Jones, Leonard Leslie, to Mechandex Engineering (Wolverhampton) Ltd. Handling and cooling foundry sand. 4,106,112, Cl. 366-4.000.
- Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, to Abbott Laboratories. Diacylated derivatives of γ-glutamyl dopamine. 4,105,787, Cl. 424-309.000.
- Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, to Abbott Laboratories. Diacylated derivatives of gamma-glutamyl dopamine. 4,105,788, Cl. 424-309.000.
- Jones, Roderick Frank: *See—*
  - Plummer, Dexter Robert; and Jones, Roderick Frank, 4,105,961, Cl. 318-676.000.

- Jones, Terence A.: *See—*
  - Conder, Terrence M.; and Jones, Terence A., 4,105,292, Cl. 350-211.000.
- Jordan, John W.: *See—*
  - Finlayson, Claude Malcolm; and Jordan, John W., 4,105,578, Cl. 252-316.000.
- Joyce, Thomas F.: *See—*
  - Goss, Gary J.; and Joyce, Thomas F., 4,105,978, Cl. 328-58.000.
- Jozat, Walter, to Koh-I-Noor Rapidograph, Inc. Automatic drafting device. 4,106,031, Cl. 346-140.00R.
- Judd, Frederick V. H. Flow distributor for gas turbine silencers. 4,105,089, Cl. 181-264.000.
- Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, to Robert Bosch GmbH. Ignition system for internal combustion engine. 4,105,006, Cl. 123-148.00E.
- Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, to Hoechst Aktiengesellschaft. Reaction products of polydiolefins, phenols and unsaturated carboxylic acids. 4,105,610, Cl. 260-27.0BB.
- Jungck, Philip R., to Leeds & Northrup Company. Combination measuring and reference potential electrode and method of measuring pH in samples subject to large voltage gradients. 4,105,509, Cl. 204-1.00T.
- Junger, Manfred: *See—*
  - Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
- Jura Elektroapparate-Fabriken L. Henzirohs A.G.: *See—*
  - Hammer, Urs; and Gisiger, Ernst, 4,104,815, Cl. 38-77.500.
- Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., to Olin Corporation. Process for electrolysis in a membrane cell employing pressure actuated uniform spacing. 4,105,514, Cl. 204-98.000.
- Kabel-und Metallwerke Gutehoffnungshuette AG: *See—*
  - Rowell, Douglas W.; and Rethmann, Werner, 4,104,903, Cl. 72-264.000.
- Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
  - Moritz, Werner, 4,104,871, Cl. 59-78.100.
- Kabushiki Kaisha Art Coffee: *See—*
  - Cho, Kichinosuke; and Watanabe, Tsutnmu, 4,105,802, Cl. 426-329.000.
- Kabushiki Kaisha Daini Seikosha: *See—*
  - Ishikawa, Takehiro; Yasuda, Kazumasa; Asano, Kazuhiro; and Ishijima, Takashi, 4,104,864, Cl. 58-39.500.
  - Kondo, Kenichi, 4,104,863, Cl. 58-38.00R.
  - Sasaki, Seikou, 4,104,865, Cl. 58-58.000.
  - Yoda, Kazuhiro; and Nakamura, Michiaki, 4,104,861, Cl. 58-38.00R.
- Kabushiki Kaisha Izumiseiki Seisakusho: *See—*
  - Sunahara, Takatoshi, 4,104,791, Cl. 30-90.100.
- Kabushiki Kaisha Pollution Preventing Research Laboratory: *See—*
  - Ando, Wataru; and Nakaoka, Ichiro, 4,105,520, Cl. 204-162.00R.
- Kabushiki Kaisha Seikosha: *See—*
  - Yamazaki, Hiroshi; and Izawa, Minoru, 4,104,862, Cl. 58-38.00R.
- Kabushiki Kaisha Shikishima Tipton: *See—*
  - Kobayashi, Hisamine, 4,104,831, Cl. 51-164.00A.
- Kabushiki Kaisha Suwa Seikosha: *See—*
  - Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, 4,105,902, Cl. 307-308.000.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
  - Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.
- Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
  - Asai, Kiyokazu; and Takeuchi, Akihiro, 4,105,004, Cl. 123-141.000.
- Kabuyama, Yukikazu: *See—*
  - Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.
- Kaganowicz, Grzegorz: *See—*
  - Levine, Aaron William; Kaganowicz, Grzegorz; and Datta, Pabitra, 4,105,298, Cl. 350-340.000.
- Kagaya, Yutaka, to Silver Seiko Ltd. Program reading apparatus. 4,105,157, Cl. 235-475.000.
- Kage, Kouzou, to Nippon Electric Co., Ltd. Clock regenerator comprising a frequency divider controlled by an up-down counter. 4,105,979, Cl. 328-164.000.
- Kakumoto, Ynshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, to Ebara Infilco Kabushiki Kaisha. Method and apparatus for purification of water. 4,105,549, Cl. 210-33.000.
- Kaldenberg, Henry J., to Maytag Company, The. Latch mechanism for appliance. 4,105,229, Cl. 292-113.000.
- Kalkoff, Heinz-Dieter: *See—*
  - Wapelhorst, Friedrich-Wilhelm; and Kalkoff, Heinz-Dieter, 4,105,482, Cl. 156-96.000.
- Kamber, Peter Werner: *See—*
  - Larsen, Hals Norman; and Kamber, Peter Werner, 4,104,876, Cl. 60-226.00R.
- Kameswaran, Venkatamaran: *See—*
  - Berkelhammer, Gerald; and Kameswaran, Venkatamaran, 4,105,780, Cl. 424-282.000.
- Kaminow, Ivan Paul: *See—*
  - Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,105,283, Cl. 350-96.310.
- Kanegawa, Mamoru: *See—*
  - Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.
- Kani, Kenji: *See—*
  - Shiba, Hiroshi; and Kani, Kenji, 4,104,785, Cl. 29-574.000.
- Kaniecki, Thaddeus J.: *See—*
  - Culmone, Vincent; and Kaniecki, Thaddeus J., 4,105,574, Cl. 252-154.000.
- Kansai Paint Company, Limited: *See—*
  - Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemnto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
- Kao Soap Co., Ltd.: *See—*
  - Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
- Kaplan, Jean-Pierre: *See—*
  - Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,105,664, Cl. 544-378.000.
- Kaplan, Stephen J.; and Gaba, Rodolfo, to Textron Inc. Filtering apparatus with modular filter elements. 4,105,562, Cl. 210-232.000.
- Karch, John A.: *See—*
  - Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,105,416, Cl. 44-1.00R.
- Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, to Braun Aktiengesellschaft. Photo flash device. 4,106,080, Cl. 362-18.000.
- Karino, Kimiji: *See—*
  - Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
- Kasahara, Nobuo: *See—*
  - Inoue, Motoichiro; Shiga, Tsuyoshi; and Kasahara, Nobuo, 4,105,322, Cl. 355-4.000.
- Kashimura, Katsuichi: *See—*
  - Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, 4,105,879, Cl. 200-148.00A.
- Katagi, Kazuo, to RCA Corporation. Polar to rectangular coordinate converter. 4,106,021, Cl. 343-5.0SC.
- Katayama, Shigeru: *See—*
  - Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, 4,105,843, Cl. 526-77.000.
- Kato, Taketoshi: *See—*
  - Ono, Kozo; and Kato, Taketoshi, 4,104,956, Cl. 91-491.000.
- Katz, Jonathon H., to Teradyne, Inc. Test pin. 4,105,970, Cl. 324-158.00P.
- Katz, Sidney. Coupling converter for vehicle antennas. 4,106,025, Cl. 343-715.000.
- Kauffman, Robert N.: *See—*
  - Smith, James D. B.; and Kauffman, Robert N., 4,105,984, Cl. 336-60.000.
- Kaufman, John Joseph; and Luisi, Thomas Emil, to Witco Chemical Corporation. Cable filler. 4,105,619, Cl. 260-33.6PQ.
- Kaule, Wittich; and Stenzel, Gerhard, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Method of identifying fluorescent materials. 4,105,333, Cl. 356-85.000.
- Kawada, Seigo: *See—*
  - Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 4,105,693, Cl. 260-558.00P.
- Kawakita, Yukimasa; and Okuno, Youichi, to Canon Kabushiki Kaisha. Indicator in a finder. 4,106,038, Cl. 354-155.000.
- Kawamura, Yoshikazu: *See—*
  - Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, 4,105,902, Cl. 307-308.000.
- Kawano, Yasuhiko: *See—*
  - Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, 4,105,670, Cl. 260-326.11R.
- Kawasaki, Hironobu: *See—*
  - Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, 4,105,709, Cl. 260-857.00L.
- Kawasaki Jukogyo Kabushiki Kaisha: *See—*
  - Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, 4,105,090, Cl. 181-265.000.
- Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometric circuit. 4,106,035, Cl. 354-51.000.
- Kawasaki Seitetsu K.K.: *See—*
  - Ohnishi, Masayuki; Ohmori, Hisashi; and Yamamoto, Yoshiji, 4,105,059, Cl. 164-4.000.
- Kawasaki, Tomonori. Power-supply device for working machine such as a spark-erosion machine. 4,106,087, Cl. 363-70.000.
- Kay, Ian Trevor: *See—*
  - Collins, David John; Kay, Ian Trevor; and Slater, John Walter, 4,105,433, Cl. 71-93.000.
- Kearney, Robert L.: *See—*
  - Wells, Thomas R.; and Kearney, Robert L., 4,105,319, Cl. 353-120.000.
- Keeler, Frederick D. Tamper-proof closure. 4,105,132, Cl. 215-216.000.
- Kehl, John. Carbide insert cutting tool. 4,105,357, Cl. 407-41.000.
- Keizer, Eugene Orville, to RCA Corporation. Method for forming keel-tipped stylus for video disc systems. 4,104,832, Cl. 51-281.00R.
- Keller, Dale L., to R. H. Sheppard Co., Inc. Dual cut boring tool assembly. 4,105,360, Cl. 408-118.000.
- Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, to Cincinnati Milacron Inc. Article handling and coating apparatus. 4,104,984, Cl. 118-2.000.
- Kelly, John Robert: *See—*
  - Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.
- Kelm, Edward C.: *See—*
  - Chivens, Donald R.; and Kelm, Edward C., 4,105,341, Cl. 400-144.200.
- Kelter, S. Louis; and Kelter, Viviane S. Inflatable infant crib and carrier. 4,104,750, Cl. 5-93.00R.

- Kelter, Viviane S.: *See—*
  - Kelter, S. Louis; and Kelter, Viviane S., 4,104,750, Cl. 5-93.00R.
- Kelyman, Jacqueline S.: *See—*
  - Swart, Daniel J.; and Kelyman, Jacqueline S., 4,105,633, Cl. 528-176.000.
- KemaNobel AB: *See—*
  - Norback, Hakan Nils; and Asp, Benkt Goran Rurik, 4,105,584, Cl. 252-426.000.
  - Petersen, Jorgen, 4,105,596, Cl. 521-56.000.
- Kemeny, George A.: *See—*
  - Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., 4,105,859, Cl. 174-14.00R.
- Kempf, Paul S. Optical comparator and inspection apparatus. 4,105,340, Cl. 356-168.000.
- Kenan, John E.: *See—*
  - Bork, C. Gary; and Kenan, John E., 4,105,353, Cl. 404-2.000.
- Kendall Company, The: *See—*
  - Libman, Gary; and Villari, Frank K., 4,105,500, Cl. 195-103.50M.
- Kennedy, James E., to Electro-Therm, Inc. Electric water heater utilizing a heat pipe. 4,105,895, Cl. 219-326.000.
- Kennedy, Richard W.: *See—*
  - Boah, John K.; and Kennedy, Richard W., 4,104,786, Cl. 29-583.000.
- Kent Air Tool Company: *See—*
  - Gunning, Samuel D., 4,105,080, Cl. 173-66.000.
- Kenward, Richard George: *See—*
  - Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, 4,106,098, Cl. 364-500.000.
- Kereso, Josef E., to Syntex (U.S.A.) Inc. Implant apparatus. 4,105,030, Cl. 128-217.000.
- Kerner, Karl: *See—*
  - Blaich, Bernhard; Zehender, Ernst; and Kerner, Karl, 4,105,821, Cl. 428-215.000.
- Kerr, Ralph O., to Denka Chemical Corporation. Oxidation catalysts and process for preparing anhydride from alkanes. 4,105,586, Cl. 252-437.000.
- Kesic, Branimir; and Pytlarz, Charles P., to Zenith Radio Corporation. UHF Substrate tuner potentiometer. 4,105,989, Cl. 338-180.000.
- Keskuslaboratorio-Centrallaboratorium Ab: *See—*
  - Forss, Kaj G.; and Fuhrmann, Agneta G. M., 4,105,606, Cl. 260-17.500.
- Kessmar, Leo R., to Dana Corporation. Shift mechanism. 4,104,929, Cl. 74-473.00R.
- Khajezadeh, Heshmat, to RCA Corporation. Integrated circuit protection device comprising diode having large contact area in shunt with protected bipolar transistor. 4,106,048, Cl. 357-40.000.
- Kiguchi, Terumasa, to Kikuchi Kogyo Kabushiki Kaisha. Filtration device. 4,105,422, Cl. 55-446.000.
- Kikuchi Kogyo Kabushiki Kaisha: *See—*
  - Kiguchi, Terumasa, 4,105,422, Cl. 55-446.000.
- Killerwatt Corp.: *See—*
  - Miller, Jack V., 4,105,276, Cl. 339-95.00D.
- Kimball, Richard M.: *See—*
  - Roeder, Allan W.; and Kimball, Richard M., 4,106,017, Cl. 343-8.000.
- Kindig, Alan L., to General Electric Company. Methods for positioning insulating members in magnetic core slots. 4,104,788, Cl. 29-596.000.
- King, Junior Keith; and Warden, Lowell W. Device for tamping and leveling concrete and the like. 4,105,355, Cl. 404-114.000.
- King, Robin Charles Moorhouse; and Esterson, Maurice, to English Electric Valve Company Limited. Travelling wave tubes. 4,105,911, Cl. 315-3.500.
- King-Seeley Thermos Co.: *See—*
  - Hoenisch, Walter Harold, 4,104,889, Cl. 62-137.000.
- Kinoshita, Tadayoshi: *See—*
  - Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
- Kircher, Everett F.; and Dilworth, James L., to Boyne Mountain Lodge, Inc. Method and machine for making artificial snow. 4,105,161, Cl. 239-2.00S.
- Kirkland, Joseph Jack: *See—*
  - Iler, Ralph Kingsley; and Kirkland, Joseph Jack, 4,105,426, Cl. 65-18.000.
- Kitamoto, Tatsuji: *See—*
  - Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, 4,106,067, Cl. 360-137.000.
- Kitamura, Hajime; and Shimizu, Toshihide, to Shin-Etsu Chemical Co., Ltd. Method for the polymerization of vinyl chloride. 4,105,838, Cl. 526-62.000.
- Kitamura, Hajime: *See—*
  - Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.
- Kiyasu, John Y. Heart attack screening method, apparatus and kit for same. 4,105,499, Cl. 195-103.50R.
- Klauber, Gerald: *See—*
  - Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.
- Kleebaur, Karl: *See—*
  - Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
- Klein, Gerhart P., to P. R. Mallory & Co. Inc. Apparatus for applying material to a substrate. 4,104,985, Cl. 118-211.000.
- Klein, Thomas, to National Semiconductor Corporation. Manufacturing a low voltage *n*-channel MOSFET device. 4,104,784, Cl. 29-571.000.
- Klesper, Hugo: *See—*
  - Busse, Oswald; and Klesper, Hugo, 4,105,559, Cl. 210-225.000.
- Klimaitis, Martin K., to Pacific Scientific Company. Large locking snubber. 4,105,098, Cl. 188-1.00B.
- Klinger AG: *See—*
  - Huber, Richard, 4,105,187, Cl. 251-334.000.
- Kljuev, Konstantin Nikolaevich: *See—*
  - Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Kljuev, Konstantin Nikolaevich, 4,105,890, Cl. 219-121.0EB.
- Klopfer, Howard J.: *See—*
  - Campbell, John R.; and Klopfer, Howard J., 4,105,857, Cl. 568-726.000.
- Klosterman, Nancy E.: *See—*
  - Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., 4,105,014, Cl. 126-270.000.
- Kluge, Fritz: *See—*
  - Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,105,382, Cl. 425-88.000.
- Kluzik, Fritz: *See—*
  - Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
- Knight, Harry Wilson, to Imperial Chemical Industries Limited. Monitoring identified electrical switch contacts. 4,106,012, Cl. 340-523.000.
- Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, to ICI Australia Limited. Apparatus and processes. 4,105,114, Cl. 206-219.000.
- Knox, Hugh Stewart Geddes, to Cleveland Bridge & Engineering Co., Ltd., The. Cable spinning. 4,105,167, Cl. 242-54.00R.
- Kobayashi, Hidetoshi; and Araki, Kohei, to Kureha Kagaku Kogyo Kabushiki Kaisha. Anthelmintic process for domestic animals. 4,105,779, Cl. 424-78.000.
- Kobayashi, Hisamine, to Kabushiki Kaisha Shikishima Tipton. Automatic centrifugal barrel finishing machine. 4,104,831, Cl. 51-164.00A.
- Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatuka, Hisashi, to Idemitsu Kosan Company, Ltd. Method of treating waste water with activated sludge. 4,105,546, Cl. 210-11.000.
- Kobe Steel, Ltd.: *See—*
  - Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.
- Koberstein, Edgar; and Lakatos, Eduard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalysts and the process for their production. 4,105,590, Cl. 252-464.000.
- Koch, Karlheinz; and Rupilius, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Fertilizer compositions carrying an aminoalkanol as anticake agent. 4,105,430, Cl. 71-59.000.
- Koch, Peter: *See—*
  - Jasper, Martin T.; and Koch, Peter, 4,105,397, Cl. 432-90.000.
- Koci, Zdenek; and Mollet, Hans, to Ciba-Geigy Corporation. Dye preparation soluble in cold water. 4,105,401, Cl. 8-79.000.
- Kodama, Atsuro: *See—*
  - Iwami, Isamu; Kawasaki, Hironobu; and Kodama, Atsuro, 4,105,709, Cl. 260-857.00L.
- Koehring Corporation: *See—*
  - Loveless, Houston Lee, 4,105,356, Cl. 404-117.000.
- Koelker, Carl Wilhelm: *See—*
  - Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
- Koenig, Wilbur V. Tennis stroke practice device. 4,105,204, Cl. 273-29.00A.
- Koerner, Gotz; and Patzke, Hans-Jurgen, to Th. Goldschmidt AG. Organosilicon compounds and textile fiber finishes containing them. 4,105,567, Cl. 252-8.600.
- Koga, Kazunori; and Nagano, Saburo, to Kyoto Ceramic Kabushiki Kaisha. Method of producing dense sintered silicon carbide body from polycarbosilanes. 4,105,455, Cl. 106-44.000.
- Kogure, Hiroshi; and Shimada, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Prevention of overheating of catalytic converter for engine exhaust gases. 4,104,881, Cl. 60-299.000.
- Koh-I-Noor Rapidograph, Inc.: *See—*
  - Jozat, Walter, 4,106,031, Cl. 346-140.00R.
- Kokuryo, Shiro: *See—*
  - Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
- Kolbe, Peter: *See—*
  - Trautner, Jurgen; and Kolbe, Peter, 4,106,069, Cl. 361-30.000.
- Koller, Hans: *See—*
  - Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, 4,105,137, Cl. 222-1.000.
- Kollmar, Carl E., Jr.: *See—*
  - Kunkle, Albert C.; and Kollmar, Carl E., Jr., 4,105,466, Cl. 106-309.000.
- Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha, JPX. Electronic timepiece having an alarm device. 4,104,863, Cl. 58-38.00R.
- Kondo, Shinichi: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
- Kondo, Takashi: *See—*
  - Hirata, Hiroshi; and Kondo, Takashi, 4,105,310, Cl. 352-171.000.
- Konishiroku Photo Industry Co., Ltd.: *See—*
  - Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.

- Konle, Robert L.: *See—*
  - Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
- Konrad, Marcel Celestin: *See—*
  - Rapp, Gunter; and Konrad, Marcel Celestin, 4,105,880, Cl. 200-148.00A.
- Konuma, Hiroshi: *See—*
  - Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
- Kopp, Hans, to Georg Fischer Aktiengesellschaft. Cast one-piece annular rim member for a vehicle wheel. 4,105,255, Cl. 301-97.000.
- Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing racemic or optically active 1-(2,6-dimethyl-phenoxy)-2-methylamino-propane and method of use. 4,105,796, Cl. 424-330.000.
- Koppe, Herbert: *See—*
  - Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.
- Kordesch, Karl Victor, to Union Carbide Corporation. Air depolarized cell. 4,105,830, Cl. 429-27.000.
- Korneev, Alexandr Nikolaevich: *See—*
  - Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
- Kortenbach & Rauh Kommanditgesellschaft: *See—*
  - Schultes, Tilmann; and Seidel, Joachim, 4,105,039, Cl. 135-25.00A.
- Koshi, Masaki: *See—*
  - Ishii, Takemochi; Iguchi, Masakazu; and Koshi, Masaki, 4,105,086, Cl. 180-79.000.
- Koslowsky, Bernd: *See—*
  - Heinrich, Hans J.; Koslowsky, Bernd; and Hoffmann, Egon, 4,105,558, Cl. 210-199.000.
- Kosonen, Vaino J., to Dorr-Oliver Incorporated. Continuous drum filter with improved agitator structure. 4,105,563, Cl. 210-383.000.
- Kosuge, Yosio: *See—*
  - Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, 4,105,656, Cl. 260-239.900.
- Kosugi, Masao: *See—*
  - Yoshida, Takashi; Kosugi, Masao; and Matsuyama, Takeshi, 4,106,044, Cl. 357-22.000.
- Kosugi, Tetuo: *See—*
  - Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, 4,105,810, Cl. 427-248.00C.
- Kotcharian, Michel, to Technigaz. Laminated sheets particularly for cryogenic enclosures, pipes, and the like. 4,105,819, Cl. 428-213.000.
- Koval, Edmund R.: *See—*
  - Ulbing, Otmar M.; and Koval, Edmund R., 4,105,882, Cl. 200-157.000.
- Kowalik, Peter M.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Circuit breaker apparatus with static pressure lock. 4,105,881, Cl. 200-148.00B.
- Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, to Shin-Etsu Chemical Co., Ltd. Method for polymerizing ethylenically unsaturated monomers in order to eliminate polymer deposition. 4,105,839, Cl. 526-62.000.
- Krandex Corp.: *See—*
  - Slingluff, Eugene L., 4,105,732, Cl. 264-104.000.
- Krasnov, Alexandr Ivanovich: *See—*
  - Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
- Krause, Dieter: *See—*
  - Lehmann, Karl-Otto, deceased; and Krause, Dieter, 4,105,138, Cl. 222-14.000.
- Krause, Gerhard, to Siemens Aktiengesellschaft. Integrated amplifier with negative feedback. 4,105,943, Cl. 330-290.000.
- Kresge, Edward N.: *See—*
  - O'Farrell, Charles P.; and Kresge, Edward N., 4,105,647, Cl. 526-33.000.
- Kriemler, Hans-Peter: *See—*
  - Gruber, Urs; Greber, Gerd; and Kriemler, Hans-Peter, 4,105,648, Cl. 526-204.000.
- Krimm, Heinrich: *See—*
  - Buysch, Hans-Josef; Krimm, Heinrich; and Rudolph, Hans, 4,105,641, Cl. 526-712.000.
- Krohn, Antonin: *See—*
  - Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
- Krueger, Clarence L., to S. B. Whistler & Sons, Inc. Assembly for enabling close tolerance punching with a reusable system. 4,104,941, Cl. 83-133.000.
- Krueger, Hans: *See—*
  - Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, 4,105,288, Cl. 350-350.000.
- Kubodera, Seiiti: *See—*
  - Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.
- Kubokura, Kuniaki: *See—*
  - Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, 4,104,978, Cl. 112-277.000.
- Kubota, Junjiro: *See—*
  - Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
- Kubota, Naohiro: *See—*
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,105,625, Cl. 260-45.80N.
- Kudo, Ryosuke, to Fujitsu Limited. Magnetic disc cartridge. 4,106,066, Cl. 360-133.000.
- Kudritzki, Felix: *See—*
  - Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, 4,104,924, Cl. 73-716.000.
  - Caspar, Heinz; and Kudritzki, Felix, 4,104,925, Cl. 73-716.000.
- Kuehl, Donald Roy: *See—*
  - Meyers, George Leroy; and Kuehl, Donald Roy, 4,105,154, Cl. 229-27.000.
- Kuhnen, W. Scott. Recycle paper collection receptacle device. 4,104,960, Cl. 100-25.000.
- Kuhnlein, Hans, to Siemens Aktiengesellschaft. Position control device. 4,105,940, Cl. 318-653.000.
- Kumar, Surinder: *See—*
  - Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.
- Kumiai Chemical Industry Co., Ltd.: *See—*
  - Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 4,105,693, Cl. 260-558.00P.
- Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, to Boehringer Ingelheim GmbH. 2-(N-(1,3-diamino-isopropyl)-amino)-4-phenyl-2-imidazolines and salts thereof. 4,105,765, Cl. 424-248.560.
- Kummer, Werner: *See—*
  - Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.
- Kunchev, Nikola Tzanov: *See—*
  - Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
- Kunishige, Hidenori: *See—*
  - Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.
- Kunkle, Albert C.; and Kollmar, Carl E., Jr., to J. M. Huber Corporation. Method for reducing the viscosity and for refining kaolin clays. 4,105,466, Cl. 106-309.000.
- Kuo, Han C.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., to Olin Corporation. Plated metallic cathode. 4,105,531, Cl. 204-290.00R.
- Kupperman, Dennis I.: *See—*
  - Kupperman, Sam; and Kupperman, Dennis I., 4,105,349, Cl. 403-209.000.
- Kupperman, Sam; and Kupperman, Dennis I., to R B Toy Development Co. Mechanism for forming a loop in a rope or the like. 4,105,349, Cl. 403-209.000.
- Kupsky, George A., to Owens-Illinois, Inc. Laser method of introducing mercury to gas discharge display panels. 4,105,889, Cl. 219-121.0LM.
- Kuraray Company, Ltd.: *See—*
  - Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.
- Kurata, Hirotaka: *See—*
  - Takahashi, Susumu; and Kurata, Hirotaka, 4,105,868, Cl. 179-15.0BT.
- Kure-Jensen, Jens: *See—*
  - Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.
- Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Kobayashi, Hidetoshi; and Araki, Kohei, 4,105,779, Cl. 424-78.000.
- Kuroda, Mitura. Twist detecting device. 4,106,004, Cl. 200-61.170.
- Kuroha, Noboru, to Nippon Kogaku K.K. Reflection type ellipsometer for measuring thin film phase difference and thickness. 4,105,338, Cl. 356-118.000.
- Kuroki, Masami: *See—*
  - Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, 4,105,192, Cl. 266-149.000.
- Kurtz, Leonard D.; and Bidwell, Robert E., to Deknatel, Inc. Attachable expansion chamber for pleural drainage device. 4,105,031, Cl. 128-276.000.
- Kurumada, Tomoyuki: *See—*
  - Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.
- Kurzmann, Helfried: *See—*
  - Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, 4,106,063, Cl. 360-38.000.
- Kuse, Matsuo: *See—*
  - Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.
- Kusters, Eduard: *See—*
  - Ahrweiler, Karl-Heinz, 4,105,387, Cl. 425-335.000.
- Kustka, George John, to Bell Telephone Laboratories, Incorporated.

Arrangement for combining data symbols in accordance with a predetermined weighting function. 4,105,863, Cl. 178-67.000.

Kvamsdal, Rolf, to Moss Rosenberg Verft A/S. Procedure for loading cooled, liquefied gases, and tank for storing and/or transportation of cooled, liquefied gases. 4,104,887, Cl. 62-45.000.

Kyburz, Emilio: *See—*

Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,105,664, Cl. 544-378.000.

Kyncl, Jaroslav: *See—*

Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,787, Cl. 424-309.000.

Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,788, Cl. 424-309.000.

Kyoritsu Yuki Co., Ltd.: *See—*

Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, 4,105,510, Cl. 203-14.000.

Kyoto Ceramic Kabushiki Kaisha: *See—*

Koga, Kazunori; and Nagano, Saburo, 4,105,455, Cl. 106-44.000.

La Barge, Robert L.; and Clawson, Robert G., to Aluminum Company of America. Container wall with rupturable weakening line. 4,105,133, Cl. 220-266.000.

Labecki, Karl W., to Textron Inc. Fastening device. 4,104,768, Cl. 24-207.000.

LaBounty, Roy E. Wheel and tire cutter. 4,104,792, Cl. 30-134.000.

Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, to U.S. Philips Corporation. Circuit arrangement for a dropout detector. 4,106,063, Cl. 360-38.000.

Laeng, Rudolf; Strausak, Benedikt A.; and Vavrina, Josef. Hoods for record players and other sound recording or reproducing apparatus. 4,106,082, Cl. 362-87.000.

Laganis, Deno; and Begley, Paul M., to Schenectady Chemicals, Inc. Water soluble polyester resin. 4,105,639, Cl. 528-177.000.

Laimer, Friedrich; and Roth, Bernhard, to Netstal-Maschinen AG. Feeding screw assembly of a molding machine for plasticizing masses, particularly, for plastics or rubber. 4,106,113, Cl. 366-79.000.

Laitram Corporation, The: *See—*

Lapeyre, James M., 4,105,111, Cl. 198-844.000.

Lakatos, Eduard: *See—*

Koberstein, Edgar; and Lakatos, Eduard, 4,105,590, Cl. 252-464.000.

Lake, Timothy R., to Raymond Lee Organization, Inc., The. Safety windshield. 4,105,248, Cl. 296-84.00H.

Lambert, Thomas W.; and Blake, James Edward, to General Electric Company. CT number identifier in a computed tomography system. 4,105,922, Cl. 250-495.00T.

Lamberts, Ervins H., to UOP Inc. Gas spring suspension system for a vehicle seat. 4,105,195, Cl. 267-131.000.

Lamy, Jacques Edouard: *See—*

Dumont, Michel Paul; and Lamy, Jacques Edouard, 4,104,886, Cl. 61-112.000.

Lancaster, Robert A., to Honeywell, Inc. Preparation of silicon doped mercury cadmium telluride. 4,105,472, Cl. 148-1.500.

Land, Robert Perry, to Turpin Systems Company. Strap-down attitude and heading reference system. 4,106,094, Cl. 364-453.000.

Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, to Singer Company, The. Programmable sewing machine. 4,104,976, Cl. 112-121.110.

Landaud, Andre: *See—*

Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, 4,105,070, Cl. 166-250.000.

Nicolas, Yves; and Landaud, Andre, 4,105,071, Cl. 166-250.000.

Landis Tool Company: *See—*

Scott, Donald K., Jr.; and McIntosh, Michael D., 4,105,962, Cl. 320-32.000.

Lane, Charles Anthony; and Lucking, Anthony James, to Waddington & Duval (Holdings) Limited. Pouring device. 4,105,141, Cl. 222-143.000.

Lang, Roy: *See—*

Hayashi, Izuo; and Lang, Roy, 4,105,955, Cl. 331-94.50H.

Lange, Karl Heinz, to Balda-Werke Photographische Gerate Und Kunststoff GmbH & Co., KG. Film-transport and shutter-control system for cameras. 4,106,041, Cl. 354-206.000.

Lankford, Loran A.: *See—*

Lewellen, Wendell G., Jr.; and Lankford, Loran A., 4,105,526, Cl. 204-213.000.

Lapeyre, James M., to Laitram Corporation, The. Flat link conveyor. 4,105,111, Cl. 198-844.000.

Larkin, Donald R., to Celanese Corporation. Purification of materials containing carbonyl contaminants. 4,105,701, Cl. 260-650.00R.

Larkworthy, Peter J.; Rose, James A.; and Martin, Anthony J., to Boeing Company, The. Apparatus for packing aircraft escape devices. 4,104,964, Cl. 100-232.000.

Larock, Richard Craig, to Iowa State University Research Foundation, Inc. Symmetrical biaryl synthesis via rhodium catalyzed dimerization of aryl mercuric salts. 4,105,705, Cl. 260-668.00R.

Larsen, Hals Norman; and Kamber, Peter Werner, to Boeing Company, The. Fan R. P. M. control loop stabilization using high rotor speed. 4,104,876, Cl. 60-226.00R.

Lass, Harold M., to Corban Industries, Inc. Dry wall taping machine having an improved dry wall cement dispensing box. 4,105,490, Cl. 156-526.000.

Last, James David, to University College of North Wales. Radio position-determining system. 4,106,022, Cl. 343-105.00R.

Latakas, Bernard; Copenhefer, John E.; and House, Robert M., to United States Gypsum Company. Compact air filter with tubular frame. 4,105,423, Cl. 55-501.000.

Lau, George W.; and Bujnowski, Edward J., to Binks Manufacturing Company. Trigger lock mechanism for spray guns. 4,105,164, Cl. 239-526.000.

Lauer, George E. Apparatus for orienting halved fruit cut side up. 4,105,108, Cl. 198-402.000.

Laurer, George Joseph: *See—*

Cowardin, Robert Lewis; and Laurer, George Joseph, 4,105,980, Cl. 328-165.000.

Lavezzari, Piero: *See—*

Portinari, Antonio; and Lavezzari, Piero, 4,105,485, Cl. 156-382.000.

Lavigne, Jean C.; and Nicolas, Yves, to Schlumberger Technology Corporation. Methods and apparatus for determining the stuck point of a conduit in a borehole. 4,104,911, Cl. 73-151.000.

Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, to Schlumberger Technology Corporation. Methods for determining the stuck point of a conduit in a borehole. 4,105,070, Cl. 166-250.000.

Law, Andrew B.: *See—*

Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., 4,105,431, Cl. 71-67.000.

Lawless, Earl E. Extraction tool. 4,104,775, Cl. 29-265.000.

Lazarus, Harry J. Spectacle frame with angularly adjustable temples and means for manufacturing and assembling same. 4,105,305, Cl. 351-111.000.

Leach, John Stuart: *See—*

Bedgood, Michael Albert; and Leach, John Stuart, 4,105,285, Cl. 350-96.210.

Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich. Voltage regulation and stabilization device. 4,105,964, Cl. 323-43.50S.

Lechevin, Rene; and Butin, Henri, to Thomson-CSF. Synchronous demodulation device. 4,105,981, Cl. 329-50.000.

Leconte, Gilles, to Regie Nationale des Usines Renault. Sequential control circuit capable of sequencing through a number of stable states in a predetermined order. 4,105,928, Cl. 315-82.000.

L'Ecuyer, Camille; and Poulin, Laurent. Gymnastic balance beam. 4,105,201, Cl. 272-111.000.

Ledford, Edward B., Jr.: *See—*

McIver, Robert T., Jr.; and Ledford, Edward B., Jr., 4,105,917, Cl. 250-291.000.

Lee, Wei-Kuo, to Celanese Corporation. Spinning method and apparatus. 4,105,728, Cl. 264-40.700.

Leeds & Northrup Company: *See—*

Jungck, Philip R., 4,105,509, Cl. 204-1.00T.

Lees, Geoffrey; Williams, Arthur Roger; and Bond, Robert, to Dunlop Limited. Road surfaces. 4,105,458, Cl. 106-97.000.

Leete, Bernard D.: *See—*

Demarest, Donald M.; and Leete, Bernard D., 4,106,085, Cl. 363-51.000.

Lehmann, Gertrude, heiress: *See—*

Lehmann, Karl-Otto, deceased; and Krause, Dieter, 4,105,138, Cl. 222-14.000.

Lehmann, Karl-Otto, deceased (by Lehmann, Gertrude, heiress); and Krause, Dieter, to Apparatebau Hundsbach Prof. Dr.-Ing. Habil., Dr. Phil. Nat. Karl-Otto Lehmann, Nachf., GmbH, Cie. Apparatus for presetting volumes of liquid. 4,105,138, Cl. 222-14.000.

Lehner, Peter, to Leigh Textile Company. Cutting hard fibrous material. 4,104,765, Cl. 19-0.600.

Leidich, Arthur John, to RCA Corporation. Monostable circuit. 4,105,901, Cl. 307-273.000.

Leigh Textile Company: *See—*

Lehner, Peter, 4,104,765, Cl. 19-0.600.

Leitner, Kajetan. Fixing stud for joining building or constructional elements. 4,104,951, Cl. 85-5.00R.

Leloùx, Arnoldus Willem Jan, to Wavin B.V. Device for manufacturing perforated plastic pipes. 4,104,942, Cl. 83-327.000.

Lemke, James Underwood: *See—*

Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, 4,106,028, Cl. 346-74.100.

Lennon, Carl L.; and Britt, Thomas O., to United States of America, National Aeronautics and Space Administration. Remote lightning monitor system. 4,105,966, Cl. 324-113.000.

Leonard, Henri, to Micro-Mega S.A. Dental handpiece. 4,104,799, Cl. 32-26.000.

Leonhart, Franz Xaver. Coin release device for coin operated games. 4,105,104, Cl. 194-57.000.

Lermann, Peter: *See—*

Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, 4,106,036, Cl. 354-83.000.

Leroy, Jean-Marie Louis: *See—*

Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Levasseur, Joseph L.; and Seiter, William A., to H. R. Electronics Company. Control circuit for pay telephones and the like. 4,105,867, Cl. 179-6.30R.

Levecque, Marcel; and Battigelli, Jean A., to Saint-Gobain Industries. Method and apparatus for suppression of pollution in mineral fiber manufacture. 4,105,424, Cl. 65-3.00C.

Leverenz, Klaus: *See—*

Gottschlich, Alois; and Leverenz, Klaus, 4,105,655, Cl. 260-207.100.

Levey, Virginius T., to Thompson, Ida M. Window and door lock. 4,105,233, Cl. 292-288.000.

Levijoki, Wayne A., to General Motors Corporation. Servomotor with position feedback. 4,105,088, Cl. 180-108.000.

Levine, Aaron William; Kaganowicz, Grzegorz; and Datta, Pabitra, to RCA Corporation. Electro-optic devices. 4,105,298, Cl. 350-340.000.

Levington, Henry John, to Clayton Dewandre Company Limited. Hydraulic cab tilting systems. 4,105,087, Cl. 180-89.150.

Levis, William W., Jr.: *See—*

Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Levresse, Bernard: *See—*

Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, 4,105,609, Cl. 260-23.00H.

Levy, Stanley Burton; and Garlington, William Drake, to Du Pont de Nemours, E. I., and Company. Apparatus for stretching film. 4,104,769, Cl. 26-92.000.

Lewellen, Wendell G., Jr.; and Lankford, Loran A., to Imperial Industries, Inc. Processing barrel with stationary U-shaped hanger arm and collar bearing assemblies. 4,105,526, Cl. 204-213.000.

Lewis, J. Claybrook: *See—*

Capra, Nicholas G., 4,105,145, Cl. 222-340.000.

Lewis, Peter Frederick: *See—*

Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,105,951, Cl. 331-90.000.

Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., to Rohm and Haas Company. 3-Isothiazolones as biocides. 4,105,431, Cl. 71-67.000.

Lexitron Corporation: *See—*

Chivens, Donald R.; and Kelm, Edward C., 4,105,341, Cl. 400-144.200.

Leybold-Heraeus GmbH & Co. KG: *See—*

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Liao, Paul Foo-Hung: *See—*

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Libandor Trading Corporation Inc.: *See—*

Braum, Ludwig, 4,105,105, Cl. 194-100.00A.

Libman, Gary; and Villari, Frank K., to Kendall Company, The. Diagnostic device for a liquid sample and method. 4,105,500, Cl. 195-103.50M.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*

Rapp, Gunter; and Konrad, Marcel Celestin, 4,105,880, Cl. 200-148.00A.

Liedtke, Larry L.: *See—*

Petersen, Gary L.; and Liedtke, Larry L., 4,104,970, Cl. 102-220.000.

Lieske, Helmut: *See—*

Auer, Peter; Kluge, Fritz; Lieske, Helmut; and Wutzler, Horst, 4,105,382, Cl. 425-88.000.

Lightning Fasteners Limited: *See—*

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Likhyani, Kewal Krishan: *See—*

Baker, Richard Anson; Forsythe, George Daniel; Likhyani, Kewal Krishan; Roberts, Robert Earl; and Robertson, David Charles, 4,105,548, Cl. 210-23.00H.

Lin, Feng. Dispenser for insect or vermin poison. 4,105,144, Cl. 222-187.000.

Lin, Liang-Chuan, to Globe Industries Corporation. Printing ink transfer process. 4,105,483, Cl. 156-154.000.

Lindberg, Albert: *See—*

Henschke, Siegfried; and Lindberg, Albert, 4,105,273, Cl. 339-47.00R.

Lindberg, Allen W., to ACF Industries, Inc. Solenoid apparatus. 4,105,726, Cl. 261-121.00B.

Lindmayer, Joseph. Solar cell with discontinuous junction. 4,106,047, Cl. 357-30.000.

Lindsey, Duane A. Muck dredging machine. 4,104,813, Cl. 37-57.000.

Liquid Carbonic Canada Ltd.: *See—*

Ross, Edward Alan, 4,105,725, Cl. 261-122.000.

Liquid Packaging Holdings Limited: *See—*

Mosse, Richard Wolfgang Emil, 4,104,849, Cl. 53-379.000.

Listmann, Horst: *See—*

Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.

Little, Donald M.; and Hann, Paul D., to Phillips Petroleum Company. Combination alkylation-reforming process. 4,105,707, Cl. 260-683.480.

Litton Systems, Inc.: *See—*

Baron, David Alan; and Hampton, James Ronald, 4,105,886, Cl. 219-10.55E.

Liu, Hsin. Method and apparatus for recovering metals. 4,105,437, Cl. 75-10.00R.

Locke, Frank W., to Champion International Corporation. Paperboard bulk bin. 4,105,153, Cl. 229-23.00R.

Lockheed Aircraft Corporation: *See—*

Cronin, Michael Joseph, 4,106,013, Cl. 340-27.00R.

Loctite (Ireland) Limited: *See—*

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Lofdahl, Clyde A., to Raychem Corporation. Encapsulation method for electrical elements. 4,105,481, Cl. 156-79.000.

Lofquist, Robert Alden; and Saunders, Peter Reginald, to Allied Chemical Corporation. Substituted thioureas to inhibit ozone fading of dyed polyamides. 4,105,404, Cl. 8-165.000.

Loge, Olaf: *See—*

Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Long, Paul J., Jr., to General Motors Corporation. Shock absorber and leveling unit with auxiliary damping device for vehicle suspensions. 4,105,193, Cl. 267-64.00R.

Long, Paul J., Jr.: *See—*

Graham, Donald E.; and Long, Paul J., Jr., 4,105,216, Cl. 280-6.00R.

Lonza, Ltd.: *See—*

Arni, Urs; Faucci, Adriano; and Stocker, August, 4,105,688, Cl. 260-465.80R.

Loomis International, Inc.: *See—*

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Loos, Elsio J.: *See—*

Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., 4,105,196, Cl. 270-58.000.

Lopez, Eugene F.: *See—*

Glover, Leon C.; and Lopez, Eugene F., 4,105,583, Cl. 252-408.000.

Lopez, Tiburcio Coria; and Coria, Yolanda Teevin. Safety matchpacket cover to prevent children from using any match. 4,105,113, Cl. 206-100.000.

Lopic, Franc, to Gardena Kress & Kastner GmbH. Electrical cutting appliances. 4,104,795, Cl. 30-272.00A.

Lord Corporation: *See—*

Finney, Robert H., 4,105,266, Cl. 308-237.00R.

L'Oreal: *See—*

Sebag, Henri; and Vanlerberghe, Guy, 4,105,580, Cl. 252-351.000.

Lorenz, Kurt, to Carl Still, Firma. Apparatus for producing form coke. 4,105,504, Cl. 202-91.000.

Loth, John Lodewyk. Overspeed control arrangement for vertical axis wind turbines. 4,105,363, Cl. 416-41.000.

Lotto, Ronald L., to FMC Corporation. Apparatus for making bottom seal thermoplastic bags. 4,105,489, Cl. 156-510.000.

Loveless, Houston Lee, to Koehring Corporation. Vibratory roller. 4,105,356, Cl. 404-117.000.

Lovett, Wayne D. Multi-purpose test tube. 4,105,415, Cl. 23-292.000.

Low, William W.: *See—*

Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., 4,105,754, Cl. 423-514.000.

Loyda, Miloslav: *See—*

Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, 4,105,644, Cl. 528-314.000.

Lu, Chen-i: *See—*

Williams, Robert Franklin, Jr.; and Lu, Chen-i, 4,105,118, Cl. 206-524.200.

Lucas Industries Limited: *See—*

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Seilly, Alec Harry, 4,105,904, Cl. 310-27.000.

Luciano, David P. Animal attraction method and apparatus. 4,105,992, Cl. 340-15.000.

Lucking, Anthony James: *See—*

Lane, Charles Anthony; and Lucking, Anthony James, 4,105,141, Cl. 222-143.000.

Ludwig Heumann & Co. GmbH.: *See—*

Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.

Luisi, Thomas Emil: *See—*

Kaufman, John Joseph; and Luisi, Thomas Emil, 4,105,619, Cl. 260-33.6PQ.

Lund, Albert H.: *See—*

Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,105,614, Cl. 260-29.40R.

Lundberg, Robert D.: and Thame, Neville G., to Exxon Research & Engineering Co. Multiphase block and graft copolymers comprising a hydrophilic continuous phase and hydrophobic domains. 4,104,824, Cl. 47-58.000.

Lundeen, Allan J.: *See—*

Starks, Charles M.; and Lundeen, Allan J., 4,105,698, Cl. 568-744.000.

Lundquist, Ingemar H., to Syntex Puerto Rico, Inc. Inhalation device. 4,105,027, Cl. 128-206.000.

Luthi, Christian, to Ciba-Geigy Corporation. Optically brightening with a synergistic mixture. 4,105,399, Cl. 8-1.00W.

Lyons, Robert J. Mounting means for door-check for torsionally balanced hatchway door. 4,104,761, Cl. 16-84.000.

M&T Chemicals Inc.: *See—*

Balatan, Sergio E., 4,105,615, Cl. 260-29.60T.

MacDonald, Ian: *See—*

Naslund, Edwin N.; and MacDonald, Ian, 4,104,828, Cl. 49-399.000.

Macemon, James H., to Baxter Travenol Laboratories, Inc. Automatic range selection circuit. 4,105,967, Cl. 324-115.000.

Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, to Societe Chimique des Charbonnages. Deactivation of catalysts of the Ziegler type used for the preparation of polyethylene in high pressure, high temperature processes. 4,105,609, Cl. 260-23.00H.

Machon, Jean-Pierre: *See—*

Nicco, Adrien; and Machon, Jean-Pierre, 4,105,842, Cl. 526-65.000.

Mack, Joseph A.: *See—*

Anderson, Edwin V.; and Mack, Joseph A., 4,105,348, Cl. 403-172.000.

MacKay, Malcolm H. Dispersing apparatus. 4,106,116, Cl. 366-144.000.

Mackie, Gordon, to James Mackie & Sons Limited. Textile yarn or tape winding machines. 4,105,166, Cl. 242-45.000.

- MacLean, Alexander, to Electro Switch Corp. Control switch relay and control circuit means. 4,106,072, Cl. 361-156.000.
- Macoveanu, Aurelian Liviu Alexandru; and Grecu, Nicolae, to Institutul de Cercetari Stiintifice Pentru Protectia Muncii. Electrodynamograph. 4,104,918, Cl. 73-379.000.
- MacPherson, John Hugh, agent: *See—*
  - Coon, Marvin D., deceased; and MacPherson, John Hugh, agent, 4,105,417, Cl. 44-63.000.
- MacPherson, Roy Duncan: *See—*
  - Haines, Kendrick Peter; and MacPherson, Roy Duncan, 4,105,532, Cl. 204-301.000.
- Maeno, Shizuo: *See—*
  - Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.
- Mages, Bernhard: *See—*
  - Rock, Erich; and Mages, Bernhard, 4,104,762, Cl. 16-129.000.
- Magnatex Limited: *See—*
  - Tomlin, Robert Derrick, 4,105,296, Cl. 350-307.000.
- Magness, Albert H. Z shelf bracket stocking and display device. 4,105,125, Cl. 211-13.000.
- Magosch, Karl-Heinz: *See—*
  - Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,105,672, Cl. 260-340.200.
- Mahan, Philip J. C. Sawhorse. 4,105,091, Cl. 182-181.000.
- Mahoney, Kurt. Moisture detector. 4,106,001, Cl. 340-604.000.
- Maier, Karl: *See—*
  - Dany, Franz-Josef; Maier, Karl; Riedel, Tomas; and Wortmann, Joachim, 4,105,735, Cl. 264-143.000.
- Maillot, Jean, to Guterman, Paulette. Anti-theft device with disabling means. 4,106,000, Cl. 340-530.000.
- Makarainen, Eino A.: *See—*
  - Bizzell, David; and Makarainen, Eino A., 4,105,209, Cl. 273-106.50R.
- Mancini, Luciano: *See—*
  - Zanella, Giuseppe; and Mancini, Luciano, 4,105,727, Cl. 264-12.000.
- Mangaraj, Duryodhan: *See—*
  - Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, 4,105,811, Cl. 427-302.000.
- Manser, Josef; and Egger, Friedrich, to Gebrueder Buehler AG. Method and apparatus for processing vegetable foodstuffs. 4,104,958, Cl. 99-355.000.
- Manzoni, Pier Luigi: *See—*
  - Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.
- Marchese, Thomas F.; and Argon, Rauf S., to American Optical Corporation. Pacemaker artifact suppression in coronary monitoring. 4,105,023, Cl. 128-2.06B.
- Marchesini, Bruno; and Martini, Fernando. Apparatus for continuous dyeing of textiles. 4,104,893, Cl. 68-5.00E.
- Marconi Company Limited, The: *See—*
  - Johnson, Morris Burton; and Richardson, Charles Raymond William, 4,105,281, Cl. 350-6.500.
- Marecek, Josef: *See—*
  - Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
- Maremont Corporation: *See—*
  - Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.
- Margen, Peter Heinrich Erwin: *See—*
  - Naslund, Rolf Paul; Ahrbom, Karl Bertil; and Margen, Peter Heinrich Erwin, 4,105,389, Cl. 425-392.000.
- Margittai, Thomas, to Yuter, Seymour C., a part interest. Sequential drying system with isolated closed drying paths. 4,104,805, Cl. 34-5.000.
- Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Flame-resistant polycarbonate molding compositions. 4,105,712, Cl. 260-873.000.
- Mark, Albert: *See—*
  - Glendinning, William Bernard; and Mark, Albert, 4,105,805, Cl. 427-38.000.
- Markusch, Peter: *See—*
  - Dieterich, Dieter; and Markusch, Peter, 4,105,594, Cl. 521-100.000.
- Marquez, Victor E.: *See—*
  - Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, 4,105,774, Cl. 424-273.00R.
- Marshall, Denis John; and Mohin, Terry Martin, to BOC Limited. Welding apparatus and method. 4,105,887, Cl. 219-72.000.
- Marshall, Duane: *See—*
  - Rines, Robert H.; and Marshall, Duane, 4,105,990, Cl. 340-3.00R.
- Marshall, Robert Moore; and Darboufas, Kimon Constantine, to Allied Chemical Corporation. Finish for polyester filamentary yarns. 4,105,568, Cl. 252-8.600.
- Martens, Gunter, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Hannelore, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Hans, deceased (by Martens, Hildegard); Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, to Siemens Aktiengesellschaft. Method for the manufacture of a superconductive Nb_3Sn layer on a niobium surface for high frequency applications. 4,105,512, Cl. 204-38.00A.
- Martens, Hans-Wolfgang, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Harald, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Helmut, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Hildegard: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Rainer, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Sigrid, legal heir: *See—*
  - Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
- Martens, Wolfgang: *See—*
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- Martin, Anthony J.: *See—*
  - Larkworthy, Peter J.; Rose, James A.; and Martin, Anthony J., 4,104,964, Cl. 100-232.000.
- Martin, Donald L.; and Yanke, David B., to Boeing Company, The. Signal selection apparatus for redundant signal sources. 4,105,900, Cl. 307-219.000.
- Martin, Jerry D.: *See—*
  - Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,105,730, Cl. 264-89.000.
- Martini, Fernando: *See—*
  - Marchesini, Bruno; and Martini, Fernando, 4,104,893, Cl. 68-5.00E.
- Martinsons, Aleksandrs; and Johnson, Harlan B., to PPG Industries, Inc. Method of electrolysis. 4,105,516, Cl. 204-98.000.
- Masanek, Juergen: *See—*
  - Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.
- Mascetti, Joseph A., to Plastofilm Industries, Inc. Package with median supporting frame and integral decorative medial band. 4,105,121, Cl. 206-592.000.
- Maschinenfabrik Hennecke GmbH: *See—*
  - Althausen, Ferdinand; and Raffel, Reiner, 4,105,045, Cl. 137-563.000.
- Maslen, John; and Taylor, William Hunter, to Imperial Chemical Industries Limited. Thermoplastic polyamide composition. 4,105,621, Cl. 260-37.00N.
- Mason, Harold F. Drum stand. 4,105,178, Cl. 248-151.000.
- Massey, William Moore, Jr.; and Sandukas, Theodos, to Du Pont de Nemours, E. I., and Company. Yarn treating jet moving a rotating baffle and deflector at its outlet and method of operation thereof. 4,104,770, Cl. 28-257.000.
- Master Pneumatic-Detroit, Inc.: *See—*
  - Thrasher, George E., Jr., 4,105,095, Cl. 184-55.00A.
- Masui, Hiroaki: *See—*
  - Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.
- Masui, Takeshi: *See—*
  - Yoshida, Masumi; Iwata, Kiyoshi; Yamamoto, Eiichiro; Masui, Takeshi; and Kabuyama, Yukikazu, 4,105,998, Cl. 340-146.3AC.
- Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Magnetic head cleaning jacket. 4,106,067, Cl. 360-137.000.
- Matheson, Ian Alastair, to BP Chemicals Limited. Polymerisation catalyst. 4,105,585, Cl. 252-429.00B.
- Mathews, Victor M., Jr., to MKC Electronics Corporation. Proportional pulse controller. 4,105,938, Cl. 318-599.000.
- Matsukane, Masamoto: *See—*
  - Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
- Matsumoto Dental College: *See—*
  - Takahashi, Shigeo; and Ito, Michio, 4,104,798, Cl. 32-12.000.

- Matsumoto, Isao; and Yamaguchi, Haruhisa, to Sony Corporation. Variable speed tape transport apparatus. 4,105,936, Cl. 318-328.000.
- Matsumoto, Kazuya: *See—*
  - Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
- Matsumoto, Nobuo: *See—*
  - Kakumoto, Yoshiaki; Kanegawa, Mamoru; Iwaizumi, Takashi; and Matsumoto, Nobuo, 4,105,549, Cl. 210-33.000.
- Matsumoto, Susumu: *See—*
  - Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, 4,105,510, Cl. 203-14.000.
- Matsumura, Susumu: *See—*
  - Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
- Matsumura, Takemasa: *See—*
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- Matsuo, Masaaki: *See—*
  - Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.
- Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, to Matsushita Electric Industrial Co., Ltd. Blood pressure and pulse rate measuring apparatus. 4,105,020, Cl. 128-2.05A.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.
  - Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.
  - Miura, Masayoshi; Yamamori, Kiyoshi; and Mizoguchi, Akira, 4,106,032, Cl. 346-140.00R.
  - Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.
  - Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.
  - Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, 4,105,945, Cl. 330-294.000.
  - Shimizu, Kazuhiko, 4,105,297, Cl. 350-336.000.
  - Suzuki, Takashi, 4,105,737, Cl. 264-154.000.
- Matsushita Seiko Co., Ltd.: *See—*
  - Iwasaki, Ryohei, 4,104,890, Cl. 62-324.000.
- Matsushita, Taro: *See—*
  - Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.
- Matsuyama, Takeshi: *See—*
  - Yoshida, Takashi; Kosugi, Masao; and Matsuyama, Takeshi, 4,106,044, Cl. 357-22.000.
- Matthews, Donald P.: *See—*
  - Wagner, Eugene R.; and Matthews, Donald P., 4,105,791, Cl. 424-310.000.
- Matthies, Hans Georg: *See—*
  - Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.
- Mattox, William J. Process for the refining of used motor oils and products thereof. 4,105,538, Cl. 208-18.000.
- Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, to Centre Europeen de Recherches Mauvernay. Anti-depressive 2-methyl-4-[(3'-dimethylamino)propylidine]-9,10-dihydrobenzo [4,5]cyclohepta[1,2b]furan compounds. 4,105,785, Cl. 424-285.000.
- Maxemchuk, Nicholas Frank, to RCA Corporation. Digital sampling rate conversion of color TV signal. 4,106,053, Cl. 358-13.000.
- May, William E., to Gould Inc. Snap-in molded cover assembly for access opening. 4,105,136, Cl. 220-339.000.
- Mayall, William. Hydraulic roller motor. 4,105,377, Cl. 418-173.000.
- Maytag Company, The: *See—*
  - Kaldenberg, Henry J., 4,105,229, Cl. 292-113.000.
- Mazurek, Edward Francis: *See—*
  - Gordon, Alan Mayer; Mazurek, Edward Francis; and Wright, Arden Bernard, 4,106,070, Cl. 361-42.000.
- McCarter, Henry: *See—*
  - Gutcho, Sidney; McCarter, Henry; and Chanod, Edward, 4,105,410, Cl. 23-253.0TP.
- McClocklin, Samuel B., to Owatonna Tool Company. Two-stage pump. 4,105,369, Cl. 417-206.000.
- McClure, Charles A. Flow monitoring. 4,104,914, Cl. 73-194.00F.
- McClure, Richard John: *See—*
  - Jeffers, Frederick John; McClure, Richard John; and Lemke, James Underwood, 4,106,028, Cl. 346-74.100.
- McCollough, John D. Microplate system. 4,105,325, Cl. 355-54.000.
- McConnell, Richard L.: *See—*
  - Weemes, Doyle A.; and McConnell, Richard L., 4,105,718, Cl. 260-889.000.
- McDaniel, Max Paul, to Phillips Petroleum Company. Cycloheptatriene adjuvant for chromium oxide catalyst. 4,105,844, Cl. 526-106.000.
- McDonald, David Ian: *See—*
  - Kellermann, Arnold LeRoy; McDonald, David Ian; and Grone, Robert Joseph, 4,104,984, Cl. 118-2.000.
- McDonnell Douglas Corporation: *See—*
  - Quinn, Bernard W., 4,105,290, Cl. 350-168.000.
- McFarland, Lellan L.: *See—*
  - Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., 4,105,488, Cl. 156-425.000.
- McGhee, Thomas Allan: *See—*
  - Hasler, David John; and McGhee, Thomas Allan, 4,105,823, Cl. 428-307.000.
- McGinn, James W., to United States Postal Service. Method for achieving accurate optical character reading of printed text. 4,105,997, Cl. 340-146.3ED.
- McGinniss, Vincent D., to SCM Corporation. Ultraviolet curing of electrocoating compositions. 4,105,518, Cl. 204-159.140.
- McGrath, Joseph Michael. Portable sauna. 4,105,036, Cl. 128-374.000.
- McGraw-Edison Company: *See—*
  - Date, Kazuo H.; and Wainio, Ronald A., 4,105,878, Cl. 200-146.00R.
- McIntosh, Michael D.: *See—*
  - Scott, Donald K., Jr.; and McIntosh, Michael D., 4,105,962, Cl. 320-32.000.
- McIver, Robert T., Jr.; and Ledford, Edward B., Jr., to University of California, The Regents of the. Method and apparatus for mass spectrometric analysis at ultra-low pressures. 4,105,917, Cl. 250-291.000.
- McKenzie, Eugene L., to Minnesota Mining and Manufacturing Company. Paint composition. 4,105,808, Cl. 427-137.000.
- McLaren, Keir; and Wagner, Daniel William. Game apparatus. 4,105,202, Cl. 273-309.000.
- McLean, Robert L.: *See—*
  - Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.
- McNally, Sellers B.: *See—*
  - Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.
- McQuitty, Stanley, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. System for handling the underflow from a primary separation vessel in the tar sand hot water process. 4,105,537, Cl. 208-11.0LE.
- McWhirter, John H.: *See—*
  - Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., 4,106,097, Cl. 364-492.000.
- Mead Corporation, The: *See—*
  - Burnett, James E., 4,106,061, Cl. 358-296.000.
- Mead, Ralph T.: *See—*
  - Greatbatch, Wilson; Mead, Ralph T.; McLean, Robert L.; Rudolph, Frank W.; and Frenz, Norbert W., 4,105,833, Cl. 429-104.000.
- Means, Rodney J.: *See—*
  - Hepworth, Edward C.; and Means, Rodney J., 4,106,091, Cl. 364-200.000.
- Mechandex Engineering (Wolverhampton) Ltd.: *See—*
  - Jones, Leonard Leslie, 4,106,112, Cl. 366-4.000.
- Mee, Francis Herbert Arthur, to Spar Aerospace Products Limited. Grappling device. 4,105,241, Cl. 294-86.00R.
- Megasystems, Inc.: *See—*
  - Tsipouras, Panayiotis J., 4,104,907, Cl. 73-117.300.
- Megy, Joseph Allen; and Propst, Richard Lee, to Teledyne Industries, Inc. Process for regenerating a pickle acid bath. 4,105,469, Cl. 134-3.000.
- Mehta, Avinash C.; Rickter, Donald O.; and Taylor, Lloyd D., to Polaroid Corporation. Process for making trimethylamine acrylimide. 4,105,694, Cl. 260-561.00H.
- Mehta, Povindar Kumar, to University of California, The Regents of the. Siliceous ashes and hydraulic cements prepared therefrom. 4,105,459, Cl. 106-98.000.
- Meienhofer, Johannes Arnold; and Wang, Su-Sun, to Hoffmann-La Roche Inc. Synthesis of human β-endorphin. 4,105,652, Cl. 260-112.50R.
- Meier, Jean: *See—*
  - Allais, Andre; Meier, Jean; and Deraedt, Roger, 4,105,777, Cl. 424-274.000.
- Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, to Tektronix, Inc. Keyboard circuit. 4,106,011, Cl. 340-365.00E.
- Meloy Laboratories, Inc.: *See—*
  - Stahl, Quade R., 4,105,413, Cl. 23-288.00R.
- Melwisch, Harald: *See—*
  - Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, 4,106,063, Cl. 360-38.000.
- Mendenhall, Robert L. Apparatus and method for producing asphalt-aggregate compositions. 4,106,110, Cl. 366-2.000.
- Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, to QMA Inc. Power spring compressor accessory. 4,105,188, Cl. 254-10.500.
- Merck & Co., Inc.: *See—*
  - Bochis, Richard J.; and Tolman, Richard L., 4,105,767, Cl. 424-256.000.
  - Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., 4,105,605, Cl. 260-17.4GC.
  - Jones, Howard, 4,105,660, Cl. 260-239.55C.
  - Racciato, Joseph S., 4,105,461, Cl. 106-205.000.
  - Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,105,769, Cl. 424-263.000.
- Merix Corporation: *See—*
  - Mix, Thomas W., 4,105,723, Cl. 261-105.000.

Mesdan S.p.A: *See—*
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Messa, Pietro, to Mesdan S.p.A. Automatic knot-forming machine for the formation of the fisherman's knot. 4,105,228, Cl. 289-2.000.
Messerschmitt-Boelkow-Blohm GmbH: *See—*
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Messervey, Clifford Harry: *See—*
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Mesta Machine Company: *See—*
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Metelow, Victor; and Tirenin, Ivan. Ski-sled attachment device. 4,105,217, Cl. 280-28.000.
Meuret, Fernand: *See—*
Brichard, Jean; Colery, Jean-Claude; and Meuret, Fernand, 4,105,827, Cl. 428-403.000.
Meyer, Paul L.: *See—*
Frey, William J.; and Meyer, Paul L., 4,105,226, Cl. 285-175.000.
Meyer, Rudolf: *See—*
Hoffmann, Klaus; Meyer, Rudolf; and Ohlschlager, Hans, 4,106,027, Cl. 346-1.000.
Meyers, George Leroy; and Kuehl, Donald Roy, to American Can Company. Packaging structure and its fabrication. 4,105,154, Cl. 229-27.000.
Micro-Mega S.A.: *See—*
Leonard, Henri, 4,104,799, Cl. 32-26.000.
Midorikawa, Yoshio, to Glasrock Products, Inc. Method of manufacturing a marking pen having a nib and an ink reservoir integral therewith. 4,104,781, Cl. 29-419.00R.
Midrex Corporation: *See—*
Pietsch, Wolfgang B.; and Schroer, Charles A., 4,105,457, Cl. 106-78.000.
Miels, Howard J. Corner-retaining latch apparatus for doors. 4,105,232, Cl. 292-288.000.
Mihara, Kakuo: *See—*
Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, to Vyzkumny ustav bavlnarsky. Dynamic yarn-braking arrangement for an open-end spinning machine. 4,104,854, Cl. 57-34.00R.
Miles, Peter: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,105,551, Cl. 210-58.000.
Milianowicz, Stanislaw A.: *See—*
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Miller, George A.; and Carley, Harold E., to Rohm and Haas Company. Metal salt complexes of 1-substituted aralkyl imidazoles, and methods and compositions for controlling phytopathogenic fungi using them. 4,105,762, Cl. 424-245.000.
Miller, George A.: *See—*
Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., 4,105,431, Cl. 71-67.000.
Miller, Glynn; and Stephenson, James E., to Albright & Wilson Limited. Dispersion for timber treatment. 4,105,566, Cl. 252-8.100.
Miller, Herman P., III. Narrow band transmission system and method. 4,105,870, Cl. 179-15.55R.
Miller, Jack V., to Killerwatt Corp. Lampholder-socket for circline fluorescent lamp. 4,105,276, Cl. 339-95.00D.
Miller, James Clayton; and Proefrock, Paul R., to Sargent & Greenleaf, Inc. Padlock having wedge device for resisting destructive wedge attack. 4,104,894, Cl. 70-52.000.
Miller, Joe Alan: *See—*
Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,105,730, Cl. 264-89.000.
Miller, Myrl J.: *See—*
Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, 4,105,327, Cl. 355-59.000.
Miller, Robert; and Grundy, Paul L., to NCR Corporation. Circuit module. 4,106,076, Cl. 361-394.000.
Millers, Donald Alexander, II., to Burroughs Corporation. Interface system providing interfaces to central processing unit and modular processor-controllers for an input-output subsystem. 4,106,092, Cl. 364-200.000.
Millholen, James I.: *See—*
Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., 4,106,097, Cl. 364-492.000.
Mills, Loring K., to Polaroid Corporation. Camera having multizone shutter mechanism. 4,106,034, Cl. 354-31.000.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetramethyl-4-piperidyl carboxylic acid esters of hydroxy aliphatic di- and tri-carboxylic acids as light stabilizers for synthetic polymers. 4,105,625, Cl. 260-45.80N.
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Synthetic resin stabilizer comprising a thioether ester and hindered phenolic carbonate. 4,105,629, Cl. 260-45.8NT.
Minnesota Mining and Manufacturing Company: *See—*
Conder, Terrence M.; and Jones, Terence A., 4,105,292, Cl. 350-211.000.
Huffman, William A.; and Brown, Harvey A., 4,105,299, Cl. 350-349.000.
McKenzie, Eugene L., 4,105,808, Cl. 427-137.000.
Thom, Karl Friedrich, 4,105,667, Cl. 260-299.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hirata, Hiroshi; and Kondo, Takashi, 4,105,310, Cl. 352-171.000.
Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.
Mirman, Serge. Display device. 4,104,810, Cl. 35-53.000.
Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, to Hitachi, Ltd. Fluid rotary machine. 4,105,372, Cl. 417-243.000.
Miskovic, Mihajlo (Michel): *See—*
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.
Mitchell, Joseph, Jr.: *See—*
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Mitchell, Kenneth Andrew William: *See—*
Knox, Donald Edward; Fakira, Suleiman Mohammed; and Mitchell, Kenneth Andrew William, 4,105,114, Cl. 206-219.000.
Mitsubishi Chemical Industries Ltd.: *See—*
Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, 4,105,510, Cl. 203-14.000.
Tanabe, Yasuo, 4,105,679, Cl. 260-346.110.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Iijima, Katsuhiko; and Jomen, Katsumasa, 4,104,954, Cl. 91-45.000.
Mitsui Petrochemical Industries Ltd.: *See—*
Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, 4,105,843, Cl. 526-77.000.
Mitsui Toatsu Chemicals Inc.: *See—*
Ito, Akira; and Iwata, Kenji, 4,105,847, Cl. 526-125.000.
Mitsuya, Kinpei: *See—*
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.
Miura, Masayoshi; Yamamori, Kiyoshi; and Mizoguchi, Akira, to Matsushita Electric Industrial Co., Limited. Apparatus for applying liquid droplets to a surface by using a high speed laminar air flow to accelerate the same. 4,106,032, Cl. 346-140.00R.
Miura, Mitsutoshi: *See—*
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.
Mix, Thomas W., to Merix Corporation. Vapor-liquid contacting. 4,105,723, Cl. 261-105.000.
Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, to Matsushita Electric Industrial Co., Ltd. Thermoluminescent type radiation dosimeter readout apparatus. 4,105,918, Cl. 250-337.000.
Miyamoto, Norioki: *See—*
Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
Miyatuka, Hajime; Saida, Takashi; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Electrophotographic photosensitive layer and marking method. 4,105,448, Cl. 96-1.800.
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Arrangement for providing transfer tail windings on a bobbin. 4,105,165, Cl. 242-18.0PW.
Miyazu, Takashi: *See—*
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.
Mizoguchi, Akira: *See—*
Miura, Masayoshi; Yamamori, Kiyoshi; and Mizoguchi, Akira, 4,106,032, Cl. 346-140.00R.
Mizuno, William G., to Economics Laboratory, Inc. Treatment of fabrics in machine dryers. 4,105,813, Cl. 428-76.000.
Mizutani, Yoshihisa: *See—*
Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, 4,106,049, Cl. 357-46.000.
MKC Electronics Corporation: *See—*
Mathews, Victor M., Jr., 4,105,938, Cl. 318-599.000.
Mobil Oil Corporation: *See—*
Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, 4,105,612, Cl. 260-27.0EV.
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,105,614, Cl. 260-29.40R.
Haase, Donald A.; and Reed, Robert E., 4,105,491, Cl. 156-553.000.
Peters, Alan W., 4,105,535, Cl. 208-8.000.
Plank, Charles J.; Rubin, Mae K.; and Rosinski, Edward J., 4,105,541, Cl. 208-111.000.
Rohn, Charles L., 4,105,738, Cl. 264-163.000.
Stournas, Stamoulis; and Dickert, Joseph J., Jr., 4,105,570, Cl. 252-8.55D.
Mobley, Della: *See—*
Mobley, Robert L.; and Mobley, Della, 4,105,968, Cl. 324-133.000.
Mobley, Robert L.; and Mobley, Della, to Raymond Lee Organization, Inc., The. Electrical tester having retractable prongs and a retractable test rod for indicating presence of a voltage. 4,105,968, Cl. 324-133.000.
Mocek, Karel: *See—*
Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.
Mochimaru, Hideaki, to Ricoh Company, Ltd. Electrophotographic copying machines of variable magnification. 4,105,326, Cl. 355-55.000.
Mochimaru, Masayoshi. Device for suppressing ignition noise. 4,105,007, Cl. 123-148.00P.

Moeckel, Robert: *See—*
Erickson, Charles R.; Hingarh, Hemraj K.; Moeckel, Robert; and Wilnai, Dan, 4,106,090, Cl. 364-200.000.
Mohin, Terry Martin: *See—*
Marshall, Denis John; and Mohin, Terry Martin, 4,105,887, Cl. 219-72.000.
Mohnhaupt, Dietrich Fritz Arthur. Fuels for internal combustion engines. 4,105,418, Cl. 44-78.000.
Molday, Robert S.: *See—*
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,105,598, Cl. 521-53.000.
Moleyre, Jacques: *See—*
Mauvernay, Roland Yves; Busch, Norbert; and Moleyre, Jacques, 4,105,785, Cl. 424-285.000.
Moll, Manfred, to Rheinmetall GmbH. Arrangement for improving the burning efficiency of a rocket-borne solid propellant charge cartridge. 4,104,969, Cl. 102-49.300.
Mollet, Hans: *See—*
Koci, Zdenek; and Mollet, Hans, 4,105,401, Cl. 8-79.000.
Molt, Jurgen: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
Momono, Masakichi: *See—*
Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
Momovis B.V.: *See—*
Hodge, Jonathan Martin, 4,105,378, Cl. 418-195.000.
Monnier, Denys; and Bolle, Pierre, to Etzlinger, Lucien; Koelker, Carl Wilhelm; Grossman, Claus H.; and Multi-Marketing Services AG. Method and reagent for determining the ethyl alcohol content of a gas. 4,105,409, Cl. 23-232.00R.
Monsanto Company: *See—*
Dyroff, David R.; and Suchanek, Walton F., Jr., 4,105,756, Cl. 424-48.000.
Gaertner, Van R., 4,105,432, Cl. 71-86.000.
Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Treatment of sulfide-limed pelts in acid baths. 4,105,402, Cl. 8-94.170.
Monte, Robert W., to Nashua Corporation. Starch-dextrine-polyacrylamide adhesive and tape. 4,105,824, Cl. 428-355.000.
Montedison S.p.A.: *See—*
Zanella, Giuseppe; and Mancini, Luciano, 4,105,727, Cl. 264-12.000.
Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, to Allied Chemical Corporation. Computer controlled apparatus for preparation of polyethylene terephthalate. 4,106,098, Cl. 364-500.000.
Moore, Barnard J., to Bayfront Carpet and Vacuum, Inc. Canister vacuum cleaner with transparent lid. 4,105,420, Cl. 55-274.000.
Moore Business Forms Inc.: *See—*
Neale, David John; and Perriman, Victor Herbert, 4,105,225, Cl. 282-27.500.
Moore, James E. Inclined conical rotary vessels for storage and tumbling of materials to accomplish mixing and heat transfer. 4,106,114, Cl. 366-131.000.
Moore, John Howard: *See—*
Cockshott, Charles Peter; and Moore, John Howard, 4,104,913, Cl. 73-194.00F.
Moore, Robert E.; and Clark, Leland C., Jr., to Sun Ventures, Inc.; and Children's Hospital Medical Center. Perfluoro polycyclic compounds for use as synthetic blood and perfusion media. 4,105,798, Cl. 424-352.000.
Moore, Thomas F., to Atlantic Richfield Company. Solution mining of minerals from vertically spaced zones. 4,105,252, Cl. 299-4.000.
Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Process and apparatus for recording deformation images. 4,105,323, Cl. 355-9.000.
Morbey, Graham Kenneth: *See—*
Chatterjee, Pronoy Kumar; and Morbey, Graham Kenneth, 4,105,033, Cl. 128-285.000.
Morch, Ole Christian, to Stickma A/S. Apparatus for insertion of sticks in ice cream bodies. 4,105,384, Cl. 425-126.00S.
Morehead, William R.: *See—*
Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.
Morgan, Thomas E., Jr., to Friedman, Leonard. Brake shoe lining bonding fixture. 4,104,961, Cl. 100-93.0PB.
Mori, Keiichi: *See—*
Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.
Mori, Sanae, to Daido Metal Company, Ltd. Bearing provided with oblique oil grooves and/or with a plurality of obliquely arranged rows of semicircular indentations. 4,105,267, Cl. 308-240.000.
Morinaga, Shigeki: *See—*
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Morishita, Michio: *See—*
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Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Energy conducting chain. 4,104,871, Cl. 59-78.100.
Mormino, Vittorio: *See—*
Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.
Morrell, Jacque C. Processes including the production of non-congealing shale oil from oil shales. 4,105,536, Cl. 208-11.00R.
Morrey, John R.: *See—*
Bartlett, Rodney J.; and Morrey, John R., 4,105,921, Cl. 250-423.00P.
Morris, Harold K., Jr. Dispensing device for fluid substances. 4,105,142, Cl. 222-158.000.
Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J.; and White, Ralph L., Jr., 4,105,850, Cl. 548-319.000.
Moser, Robert E.: *See—*
Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., 4,105,434, Cl. 71-93.000.
Moser, William R., to Exxon Research & Engineering Co. Hydrodesulfurization catalyst. 4,105,589, Cl. 252-462.000.
Moss Rosenberg Verft A/S: *See—*
Kvamsdal, Rolf, 4,104,887, Cl. 62-45.000.
Mosse, Richard Wolfgang Emil, to Liquid Packaging Holdings Limited. Container sealing apparatus. 4,104,849, Cl. 53-379.000.
Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Zeidler, Gunter; and Gunther, Christian, 4,105,092, Cl. 184-6.400.
Motorola, Inc.: *See—*
Fitting, Robert C.; and Piesinger, Gregory H., 4,105,977, Cl. 325-472.000.
Henry, Paul Michael, 4,105,942, Cl. 330-261.000.
Hepworth, Edward C.; and Means, Rodney J., 4,106,091, Cl. 364-200.000.
Padgitt, Kenneth Warren, 4,104,997, Cl. 123-117.00R.
Motta, Raimondo, to Oxon Italia S.p.A. Continuous process for the production of cyclohexyl magnesium halides. 4,105,703, Cl. 260-665.00G.
Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Kljuev, Konstantin Nikolaevich. Device for electron-beam heating of materials. 4,105,890, Cl. 219-121.0EB.
Mueller, Hans: *See—*
Birner, Winfried; Mueller, Hans; Listmann, Horst; and Bassner, Helmut, 4,104,875, Cl. 60-202.000.
Mueller, Martin S.: *See—*
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Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, to Sumitomo Chemical Company, Limited. Process for the preparation of lactones. 4,105,673, Cl. 260-343.000.
Mulkens, Casper Antonius Henricus, administrator: *See—*
Bertrams, Johannes Kurt, deceased; and Mulkens, Casper Antonius Henricus, administrator, 4,105,099, Cl. 191-29.0DM.
Muller, Albert; and Schreiner, John M., to Treadwell Corp. Process for removing cyanide-containing components from aqueous media. 4,105,545, Cl. 210-15.000.
Muller, Erwin; and Thomas, Heinz, to Bayer Aktiengesellschaft. Nitrogen containing chemical compounds and a process for making polyurethanes with the new compounds as a catalyst. 4,105,600, Cl. 521-129.000.
Muller, Hans. Preparation of sterile products. 4,105,550, Cl. 210-50.000.
Muller, Martin: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
Mullin, Charles R.; and Perettie, Donald J., to Dow Chemical Company, The. Method for preparing halogenated alkanes and alkenes. 4,105,702, Cl. 260-658.00R.
Multi-Marketing Services AG.: *See—*
Monnier, Denys; and Bolle, Pierre, 4,105,409, Cl. 23-232.00R.
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, to Nippon Telegraph & Telephone Public Corporation; and Nippon Tsushin Kogyo Kabushiki Kaisha. Ceramic material of low thermal expansion coefficient and method of manufacturing the same. 4,105,456, Cl. 106-46.000.
Murakami, Tudoi: *See—*
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.
Murata, Akira: *See—*
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Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, to Minolta Camera Kabushiki Kaisha. Presetting counter device. 4,105,914, Cl. 235-92.0SB.
Murphy, John R. Compressed air-operated motor employing an air distributor. 4,104,955, Cl. 91-176.000.
Murray, Glen W.: *See—*
Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., 4,106,106, Cl. 365-2.000.
Murray, W. Bruce. Method of inhibiting corrosion using a hexametaphosphate and a phosphate buffer. 4,105,406, Cl. 21-2.70R.
Mx-Processer Reinhardt & Co. AB: *See—*
Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, 4,105,743, Cl. 423-24.000.
Myers, William N.; and Hein, Leopold A., to United States of America, National Aeronautics and Space Administration. Spherical bearing. 4,105,261, Cl. 308-72.000.
N L Industries, Inc.: *See—*
Finlayson, Claude Malcolm; and Jordan, John W., 4,105,578, Cl. 252-316.000.
Naef, Frederick E., to United States of America, Navy. Mass transport heat exchanger method and apparatus for use in ocean thermal energy exchange power plants. 4,104,883, Cl. 60-641.000.

Nagaitsev, Vladimir Alexandrovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Naganawa, Hiroshi: *See—*
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Nagano, Saburo: *See—*
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Nagatamo, Jiro: *See—*
Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, 4,105,740, Cl. 264-290.00T.

Nagumo, Fumio; and Yamanaka, Seisuke, to Sony Corporation. Solid state CCD cameras having phase adjustment of luminance and chrominance components. 4,106,056, Cl. 358-50.000.

Nagy, Gabor: *See—*
Sciola, Joseph; and Nagy, Gabor, 4,105,171, Cl. 242-68.400.

Nagy, Nee Zsuzsanna: *See—*
Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.

Naito, Han-Ichiro. Wall constructing method and wall constructed thereby. 4,104,837, Cl. 52-173.00R.

Naka, Reishi; and Narahara, Toshikazu, to Hitachi, Ltd. Process for producing rigid polyurethane foam. 4,105,599, Cl. 521-131.000.

Nakagawa, Yasuharu, to Topla, Inc. Marble-patterned bathtub, basin or sink. 4,105,734, Cl. 264-132.000.

Nakahara, Takao: *See—*
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Nakahara, Yutaka: *See—*
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Nakajima, Takamitsu, to Tomy Kogyo Co., Inc. Toy telephone with bell and recorded messages. 4,104,821, Cl. 46-33.000.

Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. System for indicating photographing conditions. 4,106,033, Cl. 354-23.00D.

Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, to Showa Denko K.K. High impact composition of ring-opening polymerization product. 4,105,608, Cl. 260-23.00R.

Nakamura, Katsuhiro, to Nippon Electric Co., Ltd. Parallel-processing error correction system. 4,105,999, Cl. 340-146.1AL.

Nakamura, Kotaro; Ichijima, Seiji; Furutachi, Nobuo; and Kosuge, Yosio, to Fuji Photo Film Co., Ltd. Process for preparing 3-N-monosubstituted amino-4-substituted-5-pyrazolones. 4,105,656, Cl. 260-239.900.

Nakamura, Michiaki: *See—*
Yoda, Kazuhiro; and Nakamura, Michiaki, 4,104,861, Cl. 58-38.00R.

Nakamura, Shigeki: *See—*
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Nakamura, Shinji: *See—*
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Nakamura, Yoshihiro: *See—*
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Nakamura, Zenzo; and Hasegawa, Goro, to Canon Kabushiki Kaisha. Flash device for use with a camera. 4,106,037, Cl. 354-128.000.

Nakanishi, Susumu, to Pfizer Inc. Process for 6-amino-2,2-dimethyl-3-(5-tetrazolyl)penam. 4,105,668, Cl. 260-306.70R.

Nakano, Takayuki: *See—*
Iwase, Yoshiyuki; Katayama, Shigeru; and Nakano, Takayuki, 4,105,843, Cl. 526-77.000.

Nakao, Fusafumi: *See—*
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Nakaoka, Ichiro: *See—*
Ando, Wataru; and Nakaoka, Ichiro, 4,105,520, Cl. 204-162.00R.

Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, to Nippon Steel Corporation. Process for producing a high tension steel sheet product having an excellent low-temperature toughness with a yield point of 40 kg/mm^2 or higher. 4,105,474, Cl. 148-12.00F.

Nalco Chemical Company: *See—*
Weinland, Billy W., 4,105,540, Cl. 208-48.0AA.

Nalco-Hakuto Chemical Company: *See—*
Oguro, Yoshiharu, 4,105,582, Cl. 252-392.000.

Narahara, Toshikazu: *See—*
Naka, Reishi; and Narahara, Toshikazu, 4,105,599, Cl. 521-131.000.

Nashua Corporation: *See—*
Monte, Robert W., 4,105,824, Cl. 428-355.000.

Naslund, Edwin N.; and MacDonald, Ian, to Cal-Wood Door. Solid door having edges of laminated pressed wood fiber sheet material. 4,104,828, Cl. 49-399.000.

Naslund, Rolf Paul; Ahrbom, Karl Bertil; and Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Method of winding a tube coil, and an arrangement for performing said method. 4,105,389, Cl. 425-392.000.

Nasu, Rikuo: *See—*
Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.

Nasu, Syouzi: *See—*
Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.

Nathanson, Harvey C.; and Sopira, Michael M., to Westinghouse Electric Corp. Radiant energy sensor. 4,106,046, Cl. 357-30.000.

National Institute for Metallurgy, The: *See—*
Edwards, Roderick I.; and Nattrass, Michael J., 4,105,742, Cl. 423-22.000.
Fieberg, Monika M.; and Edwards, Roderick I., 4,105,442, Cl. 75-101.0BE.

National Research Development Corporation: *See—*
Culshaw, Brian, 4,106,043, Cl. 357-13.000.
Johnson, Alan Stanley William; and Tseung, Alfred Chan Chung, 4,105,530, Cl. 204-290.00R.
Whittingham, Thomas Anthony; and Farmery, Michael John, 4,104,923, Cl. 73-646.000.

National Semiconductor Corporation: *See—*
Klein, Thomas, 4,104,784, Cl. 29-571.000.

Nattrass, Michael J.: *See—*
Edwards, Roderick I.; and Nattrass, Michael J., 4,105,742, Cl. 423-22.000.

Naylor, Floyd E., to Phillips Petroleum Company. Copolymerization of isomonoolefins with conjugated dienes. 4,105,845, Cl. 526-117.000.

Naz, Paul. Roofing or siding slat assembly with protective hinge-forming groove. 4,104,841, Cl. 52-519.000.

NCR Corporation: *See—*
Coleman, William E., 4,105,930, Cl. 315-169.0TV.
Fassbender, Charles J., 4,106,109, Cl. 365-238.000.
Miller, Robert; and Grundy, Paul L., 4,106,076, Cl. 361-394.000.
Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,105,975, Cl. 325-320.000.

Neale, David John; and Perriman, Victor Herbert, to Moore Business Forms Inc. Autographic register systems. 4,105,225, Cl. 282-27.500.

Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek: *See—*
De Jong, Jan, 4,105,822, Cl. 428-216.000.

Nels, Terry E., to General Motors Corporation. Process for making metal fibers. 4,104,900, Cl. 72-70.000.

Nels, Terry E., to General Motors Corporation. Clutch and damper assembly. 4,105,102, Cl. 192-106.100.

Nelsson, Nels, to United States Gypsum Company. Apparatus for kerfing gypsum wallboard. 4,104,938, Cl. 83-5.000.

Nemeth, Henry: *See—*
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.

Netherton, Charles F.: *See—*
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,104,787, Cl. 29-596.000.

Netstal-Maschinen AG: *See—*
Laimer, Friedrich; and Roth, Bernhard, 4,106,113, Cl. 366-79.000.

Neumann, Karl-Heinz: *See—*
Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.

Nevalainen, Harri. Permeability responsive oscillator for detecting phase transformations at various cooling rates. 4,105,971, Cl. 324-203.000.

New England Power Service Company: *See—*
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,106,007, Cl. 340-310.00A.
Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., 4,105,897, Cl. 307-3.000.

Newell, George. Portable pallet carriers. 4,105,218, Cl. 280-43.120.

Newton, Cecil A., to El Paso Products Company. Recovery process for aqueous waste streams in adipic acid systems. 4,105,856, Cl. 560-191.000.

Newton, Richard C.; and Romanek, Gerald A., to Phillips Petroleum Company. Infrared apparatus for producing a fused fabric. 4,105,484, Cl. 156-380.000.

Nicco, Adrien; and Machon, Jean-Pierre, to Societe Chimique des Charbonnages-CdF Chimie. High pressure ethylene polymerization using catalysts of the ziegler type. 4,105,842, Cl. 526-65.000.

Nicolas, Yves; and Landaud, Andre, to Schlumberger Technology Corporation. Methods and apparatus for determining the stuck point of a conduit in a borehole. 4,105,071, Cl. 166-250.000.

Nicolas, Yves: *See—*
Lavigne, Jean C.; and Nicolas, Yves, 4,104,911, Cl. 73-151.000.
Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, 4,105,070, Cl. 166-250.000.

Nicolayczik, Hans, to American Standard Inc. Faucet valve. 4,105,043, Cl. 137-454.200.

Nielsen, Edwin: *See—*
Cooper, Julius; Carella, Vincent; Nielsen, Edwin; and Nemeth, Henry, 4,105,207, Cl. 273-89.000.

Nielsen, Verner; and Rasmussen, Hobert Manfred, to Rockwool International A/S. Apparatus for manufacture of mineral wool. 4,105,425, Cl. 65-14.000.

Niizeki, Kiyoshi: *See—*
Ohno, Toshiaki; and Niizeki, Kiyoshi, 4,105,809, Cl. 427-164.000.

Nijman, John Peter, to Bunker Ramo Corporation. Antenna mounting base. 4,106,024, Cl. 343-715.000.

Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, to Kansai Paint Company, Limited. Process for treating the surface of aluminum or aluminum alloy. 4,105,511, Cl. 204-38.00A.

Niles Parts Co., Ltd.: *See—*
Shimizu, Akio, 4,105,996, Cl. 340-73.000.

Nipki po Tzvetna Metalurgia: *See—*
Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Nippon Electric Co., Ltd.: *See—*
Hayashi, Izuo; and Lang, Roy, 4,105,955, Cl. 331-94.50H.
Kage, Kouzou, 4,105,979, Cl. 328-164.000.
Nakamura, Katsuhiro, 4,105,999, Cl. 340-146.1AL.
Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
Shiba, Hiroshi; and Kani, Kenji, 4,104,785, Cl. 29-574.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yoshida, Takashi; Kosugi, Masao; and Matsuyama, Takeshi, 4,106,044, Cl. 357-22.000.

Nippon Kogaku K.K.: *See—*
Kuroha, Noboru, 4,105,338, Cl. 356-118.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.

Nippon Konbeya Kabushiki Kaisha: *See—*
Asakawa, Akira, 4,106,005, Cl. 340-676.000.

Nippon Mining Company: *See—*
Ishimatsu, Kazuhiko; Nakahara, Takao; Murata, Akira; and Kuroki, Masami, 4,105,192, Cl. 266-149.000.

Nippon Paint Co., Ltd.: *See—*
Hori, Kiyoshi, 4,105,816, Cl. 428-159.000.

Nippon Prosensor Co., Ltd.: *See—*
Otani, Hiroaki, 4,106,003, Cl. 340-530.000.

Nippon Steel Corporation: *See—*
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.

Nippon Telegraph & Telephone Public Corporation: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Nippon Tsushin Kogyo Kabushiki Kaisha: *See—*
Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.

Nippon Zeon Co., Ltd.: *See—*
Yamazaki, Masahiro, 4,105,731, Cl. 264-94.000.

Nippondenso Co., Ltd.: *See—*
Ito, Mikiji, 4,104,880, Cl. 60-290.000.

Nishi, Yoshio, to Agency of Industrial Science and Technology, The President of the. Field effect transistors. 4,106,045, Cl. 357-23.000.

Nishi, Yoshio: *See—*
Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, 4,106,049, Cl. 357-46.000.

Nishida, Takashi: *See—*
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.

Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, to Matsushita Electric Industrial Co., Limited. Solid electrolyte capacitor having metallic cathode collector in direct contact with manganese dioxide electrolyte and method of producing same. 4,105,513, Cl. 204-38.00A.

Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha Ltd. Herbicidal compound, herbicidal composition containing the same, and method of use thereof. 4,105,435, Cl. 71-94.000.

Nissan Motor Company, Ltd.: *See—*
Fujishiro, Takeshi; Wazawa, Kiyoshi; and Oguro, Takeshi, 4,105,524, Cl. 204-195.00S.
Iijima, Tetsuya, 4,105,100, Cl. 192-.034.
Oda, Takaaki; and Takeuchi, Kazuo, 4,105,223, Cl. 280-752.000.
Ono, Katsutoshi; and Sekiguchi, Koichi, 4,104,981, Cl. 116-124.00L.

Nissl, Norbert, to Messerschmitt-Boelkow-Blohm GmbH. Piezoelectric acceleration transducer. 4,104,921, Cl. 73-517.00R.

Nitta, Atsushi; and Haida, Hirotoshi, to Panafacom Limited. Data transferring system with priority control and common bus. 4,106,104, Cl. 364-900.000.

Nobel Hoechst Chimie: *See—*
Christidis, Yani; and Schouteten, Alain, 4,105,690, Cl. 260-519.000.

Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, to Takeda Chemical Industries, Ltd. Spiro[cyclopropane-1,2'-indolin]-3'-ones. 4,105,670, Cl. 260-326.11R.

Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air supply system for an internal combustion engine. 4,104,879, Cl. 60-290.000.

Noormets, Elmar: *See—*
Disch, Gunther; and Noormets, Elmar, 4,105,398, Cl. 432-121.000.

Norback, Hakan Nils; and Asp, Benkt Goran Rurik, to KemaNobel AB. Process for preparing a dispersion. 4,105,584, Cl. 252-426.000.

Noren, Stephen E.: *See—*
Friedenberg, Robert M.; Yoscak, John L.; and Noren, Stephen E., 4,105,522, Cl. 204-195.00B.

Norfin, Inc.: *See—*
Orth, George Otto, Jr., 4,105,611, Cl. 260-27.0EV.

Norris, Alan H.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,104,855, Cl. 57-77.300.

Notari, Bruno: *See—*
Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.

Novotny, David R.: *See—*
Bothof, Delwin L.; Fowles, Richard G.; Heinzl, Johann J.; Novotny, David R.; Weisickle, Robert L.; Wetzel, John H.; and Winninghoff, Paul G., 4,105,995, Cl. 340-146.10E.

NRM Corporation: *See—*
Cantarutti, Armindo, 4,105,486, Cl. 156-405.00R.

Nudelman, Boris Vladimirovich: *See—*
Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Nulph, Robert J.: *See—*
Anderson, Arnold L.; and Nulph, Robert J., 4,105,632, Cl. 260-45.75D.

Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, to Konishiroku Photo Industry Co., Ltd. Colored light-sensitive silver halide photographic material with coating additive. 4,105,453, Cl. 96-114.500.

Nuttall, Roy: *See—*
Dormer, Leslie; and Nuttall, Roy, 4,106,051, Cl. 357-71.000.

Nychka, Henry R.: *See—*
Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

O.M.V. S.p.A.: *See—*
Padovani, Pietro, 4,105,736, Cl. 264-153.000.

Oakes, Vincent: *See—*
Hutton, Ronald E.; Oakes, Vincent; and Burley, Joseph, 4,105,684, Cl. 260-429.700.

Oberheim, Robert: *See—*
Karey, Hans; Oberheim, Robert; and Heintke, Hans-Eberhard, 4,106,080, Cl. 362-18.000.

Occidental Oil Shale: *See—*
Cha, Chang Yul, 4,105,072, Cl. 166-261.000.

Occidental Petroleum Corporation: *See—*
Choi, Charles K., 4,105,502, Cl. 201-12.000.

O'Connor, Leo Patrick: *See—*
Flood, John Michael; Messervey, Clifford Harry; Dye, Richard; and O'Connor, Leo Patrick, 4,105,122, Cl. 209-73.000.

Oda, Takaaki; and Takeuchi, Kazuo, to Nissan Motor Company, Ltd. Instrument panel for a vehicle. 4,105,223, Cl. 280-752.000.

Odencrantz, Clyde. Washing device. 4,104,744, Cl. 4-159.000.

Odhner, Oliver R. Custodial eraser. 4,104,759, Cl. 15-176.000.

O'Donnell, John Francis. Safety flexure for articulated channel-shaped roadway posts. 4,105,350, Cl. 403-220.000.

Oertle, Donald H., to Continental Oil Company. Early crack detection with multi-pressure system. 4,104,906, Cl. 73-104.000.

Oeschger, Joseph E., to International Telephone and Telegraph Corporation. Vacuum relay with reduced sensitivity to manufacturing tolerances and optional latching feature. 4,105,982, Cl. 335-151.000.

O'Farrell, Charles P.; and Kresge, Edward N., to Exxon Research & Engineering Co. Process for sulfonating polymers. 4,105,647, Cl. 526-33.000.

Ogasawara, Takeshi: *See—*
Miyazaki, Tsutomu; Yoshizawa, Toshio; Yoshida, Yoshiaki; Mitsuya, Kinpei; and Ogasawara, Takeshi, 4,105,165, Cl. 242-18.0PW.

Ogata, Yasuhiro; and Hibino, Noburo, to Fuji Photo Film Co., Ltd. Pressure measuring method. 4,104,910, Cl. 73-141.00R.

Ogawa, Shinsaku; and Yoshida, Muneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of alkali halide. 4,105,515, Cl. 204-98.000.

Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Reversal preventing device of electric clock. 4,104,859, Cl. 58-23.00D.

Ogura Jewel Industry Co., Ltd.: *See—*
Ogura, Junshiro, 4,105,212, Cl. 274-38.000.

Ogura, Junshiro, to Ogura Jewel Industry Co., Ltd. Reproducing stylus for phonograph records. 4,105,212, Cl. 274-38.000.

Oguro, Takeshi: *See—*
Fujishiro, Takeshi; Wazawa, Kiyoshi; and Oguro, Takeshi, 4,105,524, Cl. 204-195.00S.

Oguro, Yoshiharu, to Nalco-Hakuto Chemical Company. Composition for the control of corrosion and foaming in the acrylonitrile plants. 4,105,582, Cl. 252-392.000.

Ohara, Katsunobu: *See—*
Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, 4,105,444, Cl. 96-1.00R.

Ohi, Reiichi: *See—*
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.

Ohio Agricultural Research and Development Center: *See—*
Peng, Andrew C., 4,105,803, Cl. 426-583.000.

Ohlschlager, Hans: *See—*
Hoffmann, Klaus; Meyer, Rudolf; and Ohlschlager, Hans, 4,106,027, Cl. 346-1.000.

Ohmori, Hisashi: *See—*
Ohnishi, Masayuki; Ohmori, Hisashi; and Yamamoto, Yoshiji, 4,105,059, Cl. 164-4.000.

Ohnishi, Masayuki; Ohmori, Hisashi; and Yamamoto, Yoshiji, to Kawasaki Seitetsu K.K. Method of reducing the casting width during continuous casting. 4,105,059, Cl. 164-4.000.

Ohno, Toshiaki; and Niizeki, Kiyoshi, to Hoya Lens Corporation. Process for demisting transparent materials. 4,105,809, Cl. 427-164.000.

Ohorodnik, Alexander: *See—*

Auer, Eberbard; Ohorodnik, Alexander; and Stutzke, Paul, 4,105,689, Cl. 260-502.500.

Oishi, Atsushi: *See—*

Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.

Okabe, Katsuhiko, to Copal Company Limited. Line printer. 4,104,967, Cl. 101-99.000.

Okada, Fumio, to Director of National Research Institute of Tea. Plant viral disease inhibitor. 4,105,784, Cl. 424-283.000.

Okada, Kunihiro; Itatsuda, Yoshiharu; Endoh, Takeyuki; Yabuuchi, Shigeru; and Yokozawa, Norio, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Digital differential analyzer. 4,106,100, Cl. 364-702.000.

Okuda, Masahiro: *See—*

Sakai, Shoji; and Okuda, Masahiro, 4,105,716, Cl. 260-884.000.

Okuno, Youichi: *See—*

Kawakita, Yukimasa; and Okuno, Youichi, 4,106,038, Cl. 354-155.000.

Okuyama, Yasuo: *See—*

Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, 4,105,501, Cl. 201-6.000.

Oldham, Guy Franklin, to British Petroleum Company Limited, The. Oil-containing effluent treatment by gravity separation. 4,105,553, Cl. 210-73.00W.

Olin Corporation: *See—*

Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., 4,105,514, Cl. 204-98.000.

Kuo, Han C.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,105,531, Cl. 204-290.00R.

Patel, Harshad M., 4,105,441, Cl. 75-81.000.

Raes, Maurice C.; and Adams, Pierrepont, 4,105,686, Cl. 260-453.0PH.

Wojtowicz, John A., 4,105.565, Cl. 252-1.000.

Olshansky, Robert, to Corning Glass Works. Buffered optical waveguide fiber. 4,105,284, Cl. 350-96.330.

Olsztyn, Joseph T.: *See—*

Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., 4,105,925, Cl. 250-561.000.

Olympia Werke AG: *See—*

Fortmann, Hermann, 4,104,963, Cl. 100-176.000.

Olympus Optical Company Limited: *See—*

Inoue, Yasuo, 4,106,078, Cl. 362-32.000.

O'Mahony, John P.: *See—*

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.

Omura, Yoshiaki: *See—*

Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,105,700, Cl. 568-875.000.

Ondetti, Miguel Angel; and Cushman, David W., to E. R. Squibb & Sons, Inc. Proline derivatives and related compounds. 4,105,776, Cl. 424-274.000.

Ondetti, Miguel Angel; and Cushman, David W., to E. R. Squibb & Sons, Inc. Carboxyalkylacylamino acids. 4,105,789, Cl. 424-309.000.

Ono, Eishiro: *See—*

Yaguchi, Hiroyasu; and Ono, Eishiro, 4,104,904, Cl. 72-445.000.

Ono, Katsutoshi; and Sekiguchi, Koichi, to Nissan Motor Company, Ltd. Indicator using changeable path through transparent material. 4,104,981, Cl. 116-124.00L.

Ono, Kozo; and Kato, Taketoshi, to Hitachi Construction Machinery Co., Ltd. Radial piston type multi-stroke hydraulic pump or motor. 4,104,956, Cl. 91-491.000.

Ono, Yoshitami: *See—*

Numata, Yasumasa; Ito, Kunio; Mori, Keiichi; and Ono, Yoshitami, 4,105,453, Cl. 96-114.500.

Ontario Energy Corporation: *See—*

McQuitty, Stanley, 4,105,537, Cl. 208-11.0LE.

Ooimi, Tatuo: *See—*

Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, 4,105,487, Cl. 156-405.00R.

Oppolzer, Wolfgang, to CHON Corporation. Trans-N-acyl-N-alkyl-1-amino-1,3-butadienes, trans-N-acyl-N-aryl-1-amino-1,3-butadienes and preparation thereof. 4,105,853, Cl. 560-24.000.

Opron, Robert; Bourguignon, Philippe; and Guelton, Claude, to Regie Nationale des Usines Renault. Pivoting and sliding window. 4,104,827, Cl. 49-385.000.

Orenstein, Henry, to Consumer Concepts, Inc. Hand operated instruments having non-magnetic safety switch. 4,105,885, Cl. 200-52.00R.

Orion Research Incorporated: *See—*

Synnott, John C.; and Ross, James W., Jr., 4,105,525, Cl. 204-195.00P.

Orth, George Otto, Jr., to Norfin, Inc. Adhesive composition and binding method. 4,105,611, Cl. 260-27.0EV.

Osswald, Gunter; and Graf, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of pigment-synthetic resin concentrates. 4,105,464, Cl. 106-307.000.

Oster, Doran M. Capo. 4,104,947, Cl. 84-318.000.

Otani, Hiroaki, to Nippon Prosensor Co., Ltd. Signal treatment circuit for burglar alarms. 4,106,003, Cl. 340-530.000.

Otsuka, Hirotaka: *See—*

Miyagawa, Katsuhiko; Kunishige, Hidenori; Otsuka, Hirotaka; and Nakao, Fusafumi, 4,105,918, Cl. 250-337.000.

Ottertun, Harald Daniel: *See—*

Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, 4,105,743, Cl. 423-24.000.

Ours, Carroll Wayne: *See—*

Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,787, Cl. 424-309.000.

Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,105,788, Cl. 424-309.000.

Overmyer, Richard C.; and Guerra, Mario, to Francesville Drain Tile Corporation. Apparatus for applying filter to a drainage tubing. 4,104,774, Cl. 29-234.000.

Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, to Victor Company of Japan, Ltd. Device for cutting a sound groove on a disc recording medium. 4,105,213, Cl. 274-38.000.

Owatonna Tool Company: *See—*

McClocklin, Samuel B., 4,105,369, Cl. 417-206.000.

Owen, R. Calvin, Jr.; and Plummer, William T., to Polaroid Corporation. Aspheric plastic triplet. 4,105,308, Cl. 350-189.000.

Owens-Corning Fiberglas Corporation: *See—*

Foley, Kevin M.; Rastogi, Anil K.; and Rynd, Joseph P., 4,105,492, Cl. 156-629.000.

Shannon, Richard F.; and Denton, Douglas L., 4,105,623, Cl. 260-38.000.

Owens-Illinois, Inc.: *See—*

Boling, Norman L., 4,105,956, Cl. 331-94.50Q.

Kupsky, George A., 4,105,889, Cl. 219-121.0LM.

Owsley, Herbert B.: *See—*

Bunn, Stuart E.; and Owsley, Herbert B., 4,105,058, Cl. 151-41.740.

Oxon Italia S.p.A.: *See—*

Motta, Raimondo, 4,105,703, Cl. 260-665.00G.

Oyama, Yoshishige: *See—*

Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.

P. Ferrero & C. S.p.A.: *See—*

Dogliotti, Amilcare, 4,105,801, Cl. 426-99.000.

P. R. Mallory & Co. Inc.: *See—*

Klein, Gerhart P., 4,104,985, Cl. 118-211.000.

Paccar Inc.: *See—*

Simons, Wayne K.; and Teodoro, Donald J., 4,105,245, Cl. 280-65.00R.

Pacific Scientific Company: *See—*

Klimaitis, Martin K., 4,105,098, Cl. 188-1.00B.

Pacific Western Systems: *See—*

Worsham, Daniel A., 4,104,867, Cl. 58-90.00R.

Pacific, William L., to Rogers Foam Corporation. Impact protection pad. 4,105,220, Cl. 280-289.00E.

Pacitti, William. Sofa bed with TV headrest. 4,104,745, Cl. 5-13.000.

Padgitt, Kenneth Warren, to Motorola, Inc. Multiple slope ignition spark timing circuit. 4,104,997, Cl. 123-117.00R.

Padovani, Pietro, to O.M.V. S.p.A. System for the production of finished hollow objects, formed from a strip of plastics material by heat moulding. 4,105,736, Cl. 264-153.000.

Pagen, Charles Anthony: *See—*

Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, 4,105,612, Cl. 260-27.0EV.

Pai, Karnire S., to Huyck Corporation. Stretch-resistant papermakers belts having non-porous synthetic cables. 4,105,495, Cl. 162-348.000.

Palmaer, Tore Georg. Kitchen cupboard assemblies. 4,105,269, Cl. 312-248.000.

Panafacom Limited: *See—*

Nitta, Atsushi; and Haida, Hirotoshi, 4,106,104, Cl. 364-900.000.

Paoli, Thomas Lee, to Bell Telephone Laboratories, Incorporated. Derivative measurement by frequency mixing. 4,106,096, Cl. 364-481.000.

Parekh, Girish Girdhar, to American Cyanamid Company. Dimethoxymethyl diethoxymethyl glycoluril and coating compositions containing the same as a cross-linking agent. 4,105,708, Cl. 260-849.000.

Parel Societe Anonyme: *See—*

Haines, Kendrick Peter; and MacPherson, Roy Duncan, 4,105,532, Cl. 204-301.000.

Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, to Siemens Aktiengesellschaft. Electronic telephone system including interexchange trunk repeaters for traffic with other systems. 4,105,872, Cl. 179-18.0AD.

Parke, Davis & Company: *See—*

De Wald, Horace A., 4,105,851, Cl. 548-324.000.

Parker, Peter R.; and Allen, Norman G., to Volstatic of Canada Limited. Powder conveying apparatus. 4,105,256, Cl. 302-51.000.

Parkins, William E.: *See—*

Darnell, Alfred J.; and Parkins, William E., 4,105,755, Cl. 423-648.00R.

Parks, John Allen. Steam heated hot air furnace having an electric steam boiler. 4,105,894, Cl. 219-365.000.

Parl, Steen Allan: *See—*

Pierce, John Norman; and Parl, Steen Allan, 4,105,958, Cl. 333-29.000.

Parodi, Antonio: *See—*

Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.

Parrish, David Richard; and Hajos, Zoltan George, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,105,696, Cl. 260-586.00F.

Parshin, Dmitry Nikolaevich: *See—*

Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.

Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, to Bristol-Myers Company. 2-Amino-1-(2,5-dimethoxyphenyl)-butanes. 4,105,695, Cl. 260-570.80R.

Passavant-Werke Michelbacher Hutte: *See—*

Busse, Oswald; and Klesper, Hugo, 4,105,559, Cl. 210-225.000.

Passmore, Thomas Rivers: *See—*

Pritchard, Eric Harry; and Passmore, Thomas Rivers, 4,105,931, Cl. 315-278.000.

Patel, Harshad M., to Olin Corporation. Composition for the decomposition of sodium-mercury amalgam. 4,105,441, Cl. 75-81.000.

Paton, W. Donald: *See—*

Steenson, Thomas W.; and Paton, W. Donald, 4,105,240, Cl. 294-81.00R.

Patton, Tad L., to Exxon Research & Engineering Co. Heterocyclic polymer solutions and products therefrom. 4,105,616, Cl. 521-62.000.

Patzke, Hans-Jurgen: *See—*

Koerner, Gotz; and Patzke, Hans-Jurgen, 4,105,567, Cl. 252-8.600.

Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., to Diamond Shamrock Corporation. Herbicidal 5,5'-bis-1,2,4-triazinyls. 4,105,434, Cl. 71-93.000.

Paul, Gerhard: *See—*

Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.

Pauls, James D.: *See—*

Capra, Nicholas G., 4,105,145, Cl. 222-340.000.

Paust, Joachim: *See—*

Schulz, Bernhard; Paust, Joachim; and Schneider, Joachim, 4,105,855, Cl. 560-190.000.

Payden, Floyd. Automatic gain control. 4,105,976, Cl. 325-404.000.

Payn, Christian Jacques Maurice Charles Alexis: *See—*

Guitton, Jacques; and Payn, Christian Jacques Maurice Charles Alexis, 4,105,835, Cl. 429-133.000.

Payton, Raymond Anthony, to Helix International Limited. Drawing instrument. 4,104,801, Cl. 33-27.00B.

Pease, Leroy I., to Tolo, Incorporated. Multi-port valve. 4,105,555, Cl. 210-136.000.

Peck, David B., to Dielectric Systems International, Inc. Electrostatic device. 4,105,294, Cl. 350-269.000.

Pederzini, Renzo: *See—*

Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, 4,106,108, Cl. 365-222.000.

Peng, Andrew C., to Ohio Agricultural Research and Development Center. Soybean-cheese whey food product. 4,105,803, Cl. 426-583.000.

Peng, Geoffrey: *See—*

Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, 4,105,774, Cl. 424-273.00R.

Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, to Rohm GmbH. Polymerization method using ultraviolet light. 4,105,519, Cl. 204-159.230.

Pennzoil Company: *See—*

Drechsel, Erhart Karl; and Sardisco, John B., 4,105,748, Cl. 423-320.000.

Perettie, Donald J.: *See—*

Mullin, Charles R.; and Perettie, Donald J., 4,105,702, Cl. 260-658.00R.

Perraud, Raymond Jean, to Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A.S.A. Rock-drilling and bolt-setting apparatus. 4,105,081, Cl. 175-122.000.

Perreault, Donald A., to Xerox Corporation. Derivation of discrete Fourier transform components of a time dependent signal. 4,106,103, Cl. 364-827.000.

Perriman, Victor Herbert: *See—*

Neale, David John; and Perriman, Victor Herbert, 4,105,225, Cl. 282-27.500.

Perry, James L. Mowing machine. 4,104,851, Cl. 56-10.400.

Personal Products Company: *See—*

Chatterjee, Pronoy Kumar; and Morbey, Graham Kenneth, 4,105,033, Cl. 128-285.000.

Persson, Anders: *See—*

VonKrusenstierna, Otto; Persson, Anders; and Widell, Marja, 4,105,507, Cl. 204-1.00T.

Peska, Jan: *See—*

Benes, Milan; and Peska, Jan, 4,105,858, Cl. 560-222.000.

Petera, Theodor: *See—*

Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, 4,104,940, Cl. 83-71.000.

Peters, Alan W., to Mobil Oil Corporation. Conversion of coal-derived liquids with a crystalline aluminosilicate zeolite catalyst. 4,105,535, Cl. 208-8.000.

Peters, Bernardus Gradus. Electrostatic loudspeaker having elastic diaphragm spacer elements cured in situ. 4,105,877, Cl. 179-111.00R.

Petersen, Egon Norbert, to Dynamit Nobel Aktiengesellschaft. Halogen-containing aromatic ether-ester fire-retardants for plastics. 4,105,628, Cl. 260-45.85R.

Petersen, Gary L.; and Liedtke, Larry L., to United States of America, Navy. Electronic ignition system for liquid explosive. 4,104,970, Cl. 102-220.000.

Petersen, Jorgen, to KemaNobel AB. Production of expandable beads from the thermoplastic materials. 4,105,596, Cl. 521-56.000.

Peterson, James O.: *See—*

Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

Peterson, Richard H. Voicing system for electronic organ. 4,104,946, Cl. 84-1.240.

Petito, Ferdinand C.: *See—*

Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.

Petroff, Robert J. Machine tool having quill control means. 4,105,361, Cl. 408-130.000.

Petros, Andrew J., to Mesta Machine Company. Tension reel for strip coiling. 4,105,172, Cl. 242-78,100.

Pettersson, Bengt Edvard, to Sunds Aktiebolag. Process of gas-phase bleaching high consistency finely disintegrated pulp. 4,105,494, Cl. 162-19.000.

Petzinger, Manfred W. A. Portable compost container. 4,105,412, Cl. 23-259.100.

Peynaud, Francois: *See—*

Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, 4,104,912, Cl. 73-189.000.

Pfitzenmaier, Raymond W.: *See—*

Bard, Charles L.; and Pfitzenmaier, Raymond W., 4,104,953, Cl. 89-14.00E.

Pfizer Inc.: *See—*

Hynes, John L., Jr., 4,105,923, Cl. 250-456.000.

Nakanishi, Susumu, 4,105,668, Cl. 260-306.70R.

Pfleiderer, Ernst: *See—*

Monsheimer, Rolf; and Pfleiderer, Ernst, 4,105,402, Cl. 8-94.170.

Philipp, Adolph H.; and Jirkovsky, Ivo L., to Ayerst, McKenna & Harrison, Ltd. Fused γ-pyrone-2-carboxylic acid derivatives and process therefor. 4,105,778, Cl. 424-275.000.

Phillips, Bernard C., to Borg-Warner Corporation. Charge forming method and apparatus with accelerating system. 4,104,994, Cl. 123-73.00R.

Phillips Petroleum Company: *See—*

Little, Donald M.; and Hann, Paul D., 4,105,707, Cl. 260-683.480.

McDaniel, Max Paul, 4,105,844, Cl. 526-106.000.

Naylor, Floyd E., 4,105,845, Cl. 526-117.000.

Newton, Richard C.; and Romanek, Gerald A., 4,105,484, Cl. 156-380.000.

Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,105,381, Cl. 425-83.100.

Trepka, William J.; and Rothlisberger, Alvin C., 4,105,714, Cl. 260-879.000.

Phillips, William. Electronic ignition. 4,105,005, Cl. 123-148.00E.

Piber, Earl T.: *See—*

Hastings, Jerome K.; and Piber, Earl T., 4,105,883, Cl. 200-296.000.

Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, to English Electric Valve Company Limited. Multipactor discharge arrangements. 4,105,951, Cl. 331-90.000.

Pierburg GmbH & Co KG: *See—*

Hartel, Gunter, 4,105,001, Cl. 123-140.0CC.

Pierce, John Norman; and Parl, Steen Allan, to Signatron, Inc. Large delay spread channel simulator. 4,105,958, Cl. 333-29.000.

Pierdet, Andre; and Azadian, Genevieve, to Roussel Uclaf. Anabolisant-androgenic compounds. 4,105,761, Cl. 424-243.000.

Piesinger, Gregory H.: *See—*

Fitting, Robert C.; and Piesinger, Gregory H., 4,105,977, Cl. 325-472.000.

Pietsch, Wolfgang B.; and Schroer, Charles A., to Midrex Corporation. Briquet and method of making same. 4,105,457, Cl. 106-78.000.

Pilia, Frank J.: *See—*

Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., 4,105,891, Cl. 219-137.430.

Pilla, Arthur A.: *See—*

Ryaby, John P.; and Pilla, Arthur A., 4,105,017, Cl. 128-1.500.

Pingeton, Charles, to Doring Labels, Inc. Multi-function label and carrier web. 4,104,816, Cl. 40-2.00R.

Pinkstaff, Carlos Dean, to Babcock & Wilcox Company, The. Pneumatic buffering system. 4,104,899, Cl. 72-24.000.

Pirelli General Cable Works Ltd.: *See—*

Ball, Edmund Hugh, 4,105,860, Cl. 174-15.00C.

Pizzini, Louis C.: *See—*

Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,105,597, Cl. 521-159.000.

Placek, Ronald J.: *See—*

Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, 4,104,908, Cl. 73-117.300.

Plainer, Hermann: *See—*

Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.

Plank, Charles J.; Rubin, Mae K.; and Rosinski, Edward J., to Mobil Oil Corporation. Hydrocarbon conversion over ZSM-38. 4,105,541, Cl. 208-111.000.

Plasse, Paul A., to Polaroid Corporation. Vented flat battery. 4,105,831, Cl. 429-86.000.

Plastic Enterprises Pty. Limited: *See—*

Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, 4,105,117, Cl. 206-501.000.

Plastofilm Industries, Inc.: *See—*

Mascetti, Joseph A., 4,105,121, Cl. 206-592.000.

Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., to Phillips Petroleum Company. Apparatus for the production of a nonwoven fabric. 4,105,381, Cl. 425-83.100.

Plattner, Werner, administrator: *See—*

Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.

Platzer, Roger: *See—*

Arod, Jean; Gauthier, Michele; and Platzer, Roger, 4,105,508, Cl. 204-1.00T.

Plessey Handel und Investments AG: *See—*

Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, 4,105,987, Cl. 338-130.000.

Plourde, Aime. Liquid decanting and recycling machine. 4,105,342, Cl. 401-15.000.

Plummer, Dexter Robert; and Jones, Roderick Frank, to Strathearn Audio Limited. Phonograph pick-up arm control arrangement. 4,105,961, Cl. 318-676.000.

Plummer, William T., to Polaroid Corporation. Defocused unicell photometer with aspheric zone. 4,105,300, Cl. 356-225.000.

Plummer, William T.: *See—*

Owen, R. Calvin, Jr.; and Plummer, William T., 4,105,308, Cl. 350-189.000.

Plumtree, William Ernest George: *See—*

Wilson, Lional Agustin; Wales, John; and Plumtree, William Ernest George, 4,105,445, Cl. 96-1.50R.

Plunkett, James P., to Coils, Inc. Lead attachment means and method for making electrical coils. 4,105,985, Cl. 336-90.000.

Pohlig-Heckelbleichert Vereinigte Maschinenfabriken Aktiengesellschaft: *See—*

Blinn, Ludwig, 4,105,143, Cl. 222-161.000.

Pobto, Gerald R., to Diamond Shamrock Corporation. Helical intercell connector for electrolytic cells. 4,105,529, Cl. 204-267.000.

Polaroid Corporation: *See—*

Buckler, Sheldon A., 4,105,815, Cl. 429-152.000.

Czumak, Frank M.; and Stella, Joseph A., 4,106,042, Cl. 354-317.000.

Holmes, William A.; and Scholz, Donald T., 4,105,307, Cl. 352-72.000.

Mehta, Avinash C.; Rickter, Donald O.; and Taylor, Lloyd D., 4,105,694, Cl. 260-561.00H.

Mills, Loring K., 4,106,034, Cl. 354-31.000.

Owen, R. Calvin, Jr.; and Plummer, William T., 4,105,308, Cl. 350-189.000.

Plasse, Paul A., 4,105,831, Cl. 429-86.000.

Plummer, William T., 4,105,300, Cl. 356-225.000.

Scholz, Donald T., 4,105,309, Cl. 352-130.000.

Polhuis, Antonius. Indoor football (soccer) match set. 4,105,208, Cl. 273-95.00R.

Pollack, Norman M.: *See—*

Paudler, William W.; Moser, Robert E.; and Pollack, Norman M., 4,105,434, Cl. 71-93.000.

Pollard, John Kingsley, Jr.: *See—*

Drell, William; and Pollard, John Kingsley, Jr., 4,105,794, Cl. 424-317.000.

Pollmeier, Konrad; and Hannemann, Franz, to Durkoppwerke GmbH. Fabric-feed control for sewing machine. 4,104,977, Cl. 112-121.260.

Polton, Alain: *See—*

Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), 4,105,713, Cl. 260-879.000.

PolyGulf Associates: *See—*

Horowitz, Carl; Dichter, Michael; and Mangaraj, Duryodhan, 4,105,811, Cl. 427-302.000.

Polysius AG: *See—*

Ritzmann, Horst, 4,105,396, Cl. 432-14.000.

Polytechnic Institute of New York: *See—*

Sforza, Pasquale M., 4,105,362, Cl. 415-2.000.

Pond, Charles Ray. Electro-optical device for use in improved interferometers. 4,105,336, Cl. 356-113.000.

Portinari, Antonio; and Lavezzari, Piero, to Industrie Pirelli Societa per Azioni. Apparatus for impregnating stranded wires during stranding thereof. 4,105,485, Cl. 156-382.000.

Posseme, Gilles: *See—*

Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, 4,104,912, Cl. 73-189.000.

Possum Controls Limited: *See—*

Harrison, Leslie Herbert Raymond, 4,106,101, Cl. 364-709.000.

Pothmann, Reinhold: *See—*

Haake, Manfred; Pothmann, Reinhold; Ahrens, Kurt H.; and Fritschi, Edgar, 4,105,795, Cl. 424-320.000.

Pott, Heinz-Hermann. Apparatus for folding collapsible box blanks. 4,105,197, Cl. 270-68.00R.

Potter, Dennis J.: *See—*

Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.

Poulin, Laurent: *See—*

L'Ecuyer, Camille; and Poulin, Laurent, 4,105,201, Cl. 272-111.000.

PPG Industries, Inc.: *See—*

Bonaddio, Robert M., 4,104,939, Cl. 83-7.000.

Martinsons, Aleksandrs; and Johnson, Harlan B., 4,105,516, Cl. 204-98.000.

Prameta Prazisonsmetallund Kunststofferzeugnisse G. Baumann & Co.: *See—*

Schneider, Eberhard; and Vitt, Theodor, 4,105,359, Cl. 408-112.000.

Precision International, Inc.: *See—*

Hohne, Walter; and Hines, Robin H., 4,105,332, Cl. 356-5.000.

Presby, Herman Melvin: *See—*

Gloge, Detlef Christoph; Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,105,283, Cl. 350-96.310.

Pressley, Joseph R.: *See—*

Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.

Preston, John: *See—*

Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.

Preus, Paul. Inflatable barrier. 4,104,884, Cl. 61-1.00F.

Pritchard, Eric Harry; and Passmore, Thomas Rivers, to Thorn Electrical Industries Limited. Inductor structures for electrical discharge lamp circuits. 4,105,931, Cl. 315-278.000.

Process Engineering, Inc.: *See—*

Schultz, Jeffrey A.; and Eifel, Paul J., 4,104,783, Cl. 29-451.000.

Procter & Gamble Company, The: *See—*

Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,105,038, Cl. 132-7.000.

Collins, Jerome H., 4,105,592, Cl. 252-545.000.

Jacobsen, Ronald Lowell, 4,105,573, Cl. 252-99.000.

Produits Chimiques Ugine Kuhlmann: *See—*

Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Proefrock, Paul R.: *See—*

Miller, James Clayton; and Proefrock, Paul R., 4,104,894, Cl. 70-52.000.

Prokupek, Jiri: *See—*

Erdoess, Emerich; Marecek, Josef; Mocek, Karel; Camr, Rudolf; Holovacky, Julius; and Prokupek, Jiri, 4,105,744, Cl. 423-239.000.

Propst, Richard Lee: *See—*

Megy, Joseph Allen; and Propst, Richard Lee, 4,105,469, Cl. 134-3.000.

Pross, John William, Jr., to Singer Company, The. Zero detector. 4,106,105, Cl. 364-900.000.

Prosser, Thomas John, to Hercules Incorporated. Conversion of stereoregular polypropylene to atactic polypropylene. 4,105,837, Cl. 526-26.000.

Pu, Lyong Sun, to Fuji Xerox Co., Ltd. Organic photoconductive coating compositions containing tricyanovinyl compounds for electrophotography. 4,105,446, Cl. 96-1.50R.

Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., to General Electric Company. X-ray spot film device. 4,105,920, Cl. 250-402.000.

Puschnerat, Helmut: *See—*

Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.

Pyatigorsky, Vladimir Mikhailovich: *See—*

Aizenberg, Julian Borisovich; Bukhman, Inokh Borukhovich; and Pyatigorsky, Vladimir Mikhailovich, 4,105,293, Cl. 350-264.000.

Pytlarz, Charles P.: *See—*

Kesic, Branimir; and Pytlarz, Charles P., 4,105,989, Cl. 338-180.000.

QMA Inc.: *See—*

Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, 4,105,188, Cl. 254-10.500.

Quaker Oats Company, The: *See—*

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,105,799, Cl. 426-44.000.

Qualidyne Systems, Inc.: *See—*

Cathell, Frank, 4,105,957, Cl. 331-110.000.

Quinn, Bernard W., to McDonnell Douglas Corporation. Optical color communication system. 4,105,290, Cl. 350-168.000.

Quis, Peter: *See—*

Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.

R B Toy Development Co.: *See—*

Kupperman, Sam; and Kupperman, Dennis I., 4,105,349, Cl. 403-209.000.

R. H. Sheppard Co., Inc.: *See—*

Keller, Dale L., 4,105,360, Cl. 408-118.000.

R. W. Hartnett Company: *See—*

Ackley, Charles E., Jr.; and Ackley, Charles E., Sr., 4,104,966, Cl. 101-40.000.

Raasch, Ernest M.: *See—*

Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., 4,105,196, Cl. 270-58.000.

Racciato, Joseph S., to Merck & Co., Inc. Thickening compositions containing xanthan gum, guar gum and starch. 4,105,461, Cl. 106-205.000.

Racciato, Joseph S.: *See—*

Cottrell, Ian W.; Empey, Richard A.; and Racciato, Joseph S., 4,105,605, Cl. 260-17.4GC.

Raden, David J.: *See—*

Wilson, Robert A.; and Raden, David J., 4,105,749, Cl. 423-320.000.

Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, to Societa' Italiana Resine S.I.R. S.p.A. Process for improving the stability of etherified acetal homopolymers. 4,105,638, Cl. 528-130.000.

Raduchel, Bernd: *See—*

Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.

Raes, Maurice C.; and Adams, Pierrepont, to Olin Corporation. Process for deactivating toluene diisocyanate distillation residue. 4,105,686, Cl. 260-453.0PH.

Raether, Wolfgang: *See—*

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Rapp, Gunter; and Konrad, Marcel Celestin, to Licentia Patent-Verwaltungs-G.m.b.H. Arc blow-out switch. 4,105,880, Cl. 200-148.00A.

Raschke, Klaus; and Festinori, Volfango, to Siemens Aktiengesellschaft. Fixture for threading-on and simultaneously turning the nuts of several screw bolts. 4,104,934, Cl. 81-57.380.

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Rathburn, Lloyd C., to Loomis International, Inc. Well packer including combination anti-extrusion and segment ring actuating washer. 4,105,215, Cl. 277-116.200.

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Goodman, Alvin Malcolm, 4,106,107, Cl. 365-191.000.

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Stachejko, Vitaly, 4,105,959, Cl. 333-31.00R.

Wolkstein, Herbert J., 4,105,948, Cl. 331-14.000.

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Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., to John Zink Company. Dual pressure flare. 4,105,394, Cl. 431-202.000.

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Reinhardt, Hans; Ottertun, Harald Daniel; and Andersson, Sven Otto Sigbert, to Mx-Processer Reinhardt & Co. AB. Selectively extracting copper, zinc, nickel from a mixture of metal hydroxides. 4,105,743, Cl. 423-24.000.

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Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Stratified charge. 4,104,989, Cl. 123-32.0ST.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Anti-pollution piston construction. 4,105,008, Cl. 123-191.00R.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Anti-pollution engine head construction. 4,105,009, Cl. 123-193.00H.

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Rinehart, Dixie L., to Comfort Products, Inc. Mitten construction. 4,104,740, Cl. 2-158.000.

Rines, Robert H.; and Marshall, Duane, to Academy of Applied Science

- Inc., The. Process of and apparatus for exploring objects detected by different energy sources. 4,105,990, Cl. 340-3.00R.
- Ripper, Wolfgang: *See—*
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- Riseman, Jacob, to International Business Machines Corporation. Integrated circuit structure with fully enclosed air isolation. 4,106,050, Cl. 357-49.000.
- Ritzmann, Horst, to Polysius AG. Apparatus for heat treatment of fine grained materials. 4,105,396, Cl. 432-14.000.
- Rivier, Jean E. F.: *See—*
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- Rivola, Luigi: *See—*
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- Robbio, Albert. Link-making machine and method. 4,104,870, Cl. 59-20.000.
- Robert Bosch GmbH: *See—*
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  - Frobenius, Wolf-Dietrich, 4,104,990, Cl. 123-32.0EA.
  - Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokôl, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.
  - Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, 4,105,006, Cl. 123-148.00E.
  - Wessel, Wolf; and Ripper, Wolfgang, 4,105,000, Cl. 123-139.0AW.
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- Robertson, David Charles: *See—*
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- Robillard, Gene A., to Honeywell, Inc. Photodetector mounting and connecting. 4,104,789, Cl. 29-628.000.
- Robinett, Max L. Tranquilizer ejector for disabling robbers. 4,104,974, Cl. 109-2.000.
- Rock, Erich; and Mages, Bernhard. Furniture hinge. 4,104,762, Cl. 16-129.000.
- Rockstead, Raymond H.; and Fahrenbach, Wolfgang B. Building form and reinforcing marix. 4,104,842, Cl. 52-650.000.
- Rockwell International Corporation: *See—*
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  - Chihak, Paul P.; and Wehage, Charles H., 4,106,018, Cl. 343-12.00A.
  - Darnell, Alfred J.; and Parkins, William E., 4,105,755, Cl. 423-648.00R.
  - Grimm, Donald K.; Savold, Wayne A.; and Walter, Allen R., 4,106,093, Cl. 364-424.000.
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- Rockwool International A/S: *See—*
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- Rodebaugh, Helen D.; and Fowler, William C. Note pad assembly. 4,105,224, Cl. 281-15.00R.
- Rodgers, Henry Wendell. Rotating circular airfoil. 4,104,822, Cl. 46-74.00D.
- Rody, Jean: *See—*
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- Roeder, Allan W.; and Kimball, Richard M., to General Electric Company. System for sensing velocity through the use of altimetry signals. 4,106,017, Cl. 343-8.000.
- Rogers, Edwin F. Priority interrupt circuit. 4,105,974, Cl. 325-21.000.
- Rogers Foam Corporation: *See—*
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- Rohm GmbH: *See—*
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  - Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.
- Rohm and Haas Company: *See—*
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  - Miller, George A.; and Carley, Harold E., 4,105,762, Cl. 424-245.000.
- Rohn, Charles L., to Mobil Oil Corporation. Flexible plastic foam. 4,105,738, Cl. 264-163.000.
- Rokach, Joshua: *See—*
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- Rolls-Royce Limited: *See—*
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- Romanek, Gerald A.: *See—*
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- Romeas, Rene; and Thomas, Michel, to Thomson-Brandt. Data disc optical reader containing a device for automatic data access. 4,106,058, Cl. 358-128.000.
- Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Inhibition of indoleamine-N-methyl transferase by 2-iminopyridines. 4,105,769, Cl. 424-263.000.
- Rorig, Kurt J.: *See—*
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- Rose, James A.: *See—*
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- Rose, Leo J. Improved concrete making and transmission. 4,106,111, Cl. 366-3.000.
- Rosenau, Clifford M.: *See—*
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- Rosenberger, Michael: *See—*
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- Rosinski, Edward J.: *See—*
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- Ross, Edward Alan, to Liquid Carbonic Canada Ltd. Saturated liquid/vapor generating and dispensing. 4,105,725, Cl. 261-122.000.
- Ross, James W., Jr.: *See—*
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- Rosseau, Richard B., to FMC Corporation. Rotary brusb roll construction. 4,104,760, Cl. 15-179.000.
- Rossol, Lothar; Olsztyn, Joseph T.; Dewar, Robert; and Holland, Steven W., to General Motors Corporation. Optical object locator. 4,105,925, Cl. 250-561.000.
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- Roth, Eckart. Wall-mounting unit arrangement for locating above a wash basin and defining a shelf where objects may be deposited. 4,105,140, Cl. 222-131.000.
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- Rothlisberger, Alvin C.: *See—*
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- Rousom, Harold G., to James Morton Limited. Connector for attaching a swivel pad to a supporting bolt of a clamp. 4,105,344, Cl. 403-24.000.
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  - Pierdet, Andre; and Azadian, Genevieve, 4,105,761, Cl. 424-243.000.
- Routh, Claude C., to United States of America, Navy. Driver for reactive load. 4,105,941, Cl. 330-124.00R.
- Rowell, Douglas W.; and Rethmann, Werner, to Kabel-und Metallwerke Gutehoffnungshuette AG. Apparatus for extrusion of tubes. 4,104,903, Cl. 72-264.000.
- Rubin, Mae K.: *See—*
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- Rudolph, Frank W.: *See—*
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- Rudolph, Hans: *See—*
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- Ruegg, Rudolf: *See—*
  - Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,105,681, Cl. 260-404.000.
- Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, to Chemische Werke Huels Aktiengesellschaft. Process for the production of cyclic diesters of dodecanedioic acid. 4,105,672, Cl. 260-340.200.
- Runnion, Glenmore J.: *See—*
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- Rupilius, Wolfgang: *See—*
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- Rupinski, Frederick Alexander: *See—*
  - Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.
- Russell, Ronald R., to General Electric Company. Static trip circuit breaker test set. 4,105,965, Cl. 324-28.0CB.
- Rutherford, Bernard R. Rolled paper holder. 4,105,168, Cl. 242-55.200.
- Ryaby, John P.; and Pilla, Arthur A., to Electro-Biology, Inc. Modification of the growth repair and maintenance behavior of living tissue and cells by a specific and selective change in electrical environment. 4,105,017, Cl. 128-1.500.
- Ryason, Porter R.: *See—*
  - United States of America, National Aeronautics and Space Administration; and Ryason, Porter R., 4,105,517, Cl. 204-157.10R.
- Rynd, Joseph P.: *See—*
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- Ryser, Gottlieb: *See—*
  - Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,105,681, Cl. 260-404.000.

- S. B. Whistler & Sons, Inc.: *See—*
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- Saab-Scania Aktiebolag: *See—*
  - Gillbrand, Per Sune; and Johansson, Anders Erik Bertil, 4,104,882, Cl. 60-600.000.
- Saari, Risto. Flash evaporators. 4,105,505, Cl. 202-173.000.
- Sadlier, Patricia M.; and Willett, Edward. Positive control intravenous fluid administration. 4,105,028, Cl. 128-214.00E.
- Saida, Takashi: *See—*
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- Saigo, Kazuhiko: *See—*
  - Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, 4,105,673, Cl. 260-343.000.
- Sailas, Vaino, to Valmet Oy. Strip-covered roll and method for manufacturing the same. 4,104,772, Cl. 29-121.400.
- Sailas, Vaino, to Valmet Oy. Roll manufacturing method and roll, particularly for paper machines. 4,104,773, Cl. 29-127.000.
- Saint, David, to Graco Metal Products, Inc. High chair with tray fastening. 4,105,247, Cl. 297-149.000.
- Saint-Gobain Industries: *See—*
  - Levecque, Marcel; and Battigelli, Jean A., 4,105,424, Cl. 65-3.00C.
- Saito, Haruhiko; and Morishita, Michio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor with auxiliary accelerator-pump system. 4,105,719, Cl. 261-34.00B.
- Saito, Hirokichi: *See—*
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- Sakai, Shoji; and Okuda, Masahiro, to Daikin Kogyo Co., Ltd. Process for producing tetrafluoroethylene/hexafluoropropylene copolymer blends. 4,105,716, Cl. 260-884.000.
- Sakashita, Nobuyuki: *See—*
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- Sakurada, Nobuaki: *See—*
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- Sakurai, Hiroshi, to Epoch Company, Ltd. Method and apparatus for producing a vertical center line and horizontal synchronization signals for television type game machine. 4,106,008, Cl. 340-324.0AD.
- Salk Institute for Biological Studies, The: *See—*
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- Salomon, Georges Pierre Joseph, to S.A. des Etablissements Francois Salomon & Fils. Closing system for ski boots. 4,104,766, Cl. 24-69.0SK.
- Salomon, Georges Pierre Joseph, to S.A. des Etablissements Francois Salomon & Fils. Applied to ski boots. 4,104,811, Cl. 36-121.000.
- Sandblom, Robert Mauritz, to Alfa-Laval AB. Filtering process. 4,105,547, Cl. 210-22.00R.
- Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., to NCR Corporation. Offset correction circuit for phase detectors. 4,105,975, Cl. 325-320.000.
- Sanders, Thomas E. Final drive guard. 4,104,930, Cl. 74-609.000.
- Sanderson, Roger S. Sterilizing and storing medical items. 4,105,407, Cl. 21-56.000.
- Sandukas, Theodos: *See—*
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- Sankyo Company, Limited: *See—*
  - Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.
- Sano, Nobuya; Goto, Hiroshi; and Hirota, Yutaka, to Matsushita Electric Industrial Co., Ltd. Active load circuits. 4,105,945, Cl. 330-294.000.
- Sano, Nobuya: *See—*
  - Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.
- Sansui Electric Co., Ltd.: *See—*
  - Ikeda, Yuji, 4,105,946, Cl. 331-1.00A.
  - Takahashi, Susumu; and Kurata, Hirotaka, 4,105,868, Cl. 179-15.0BT.
- Sanyo Electric Co., Ltd.: *See—*
  - Yamano, Masaru; and Iemura, Toshio, 4,105,913, Cl. 315-39.710.
- Sardisco, John B.: *See—*
  - Drechsel, Erhart Karl; and Sardisco, John B., 4,105,748, Cl. 423-320.000.
- Sargeant, Ralph G. Method for drying explosive materials. 4,104,804, Cl. 34-1.000.
- Sargent & Greenleaf, Inc.: *See—*
  - Miller, James Clayton; and Proefrock, Paul R., 4,104,894, Cl. 70-52.000.
- Sasaki, Seikou, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece having an alarm device. 4,104,865, Cl. 58-58.000.
- Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, to Nippon Electric Co., Ltd. Paper feeder comprising a selectively drivable resilient body in frictional contact with a feed roller. 4,105,199, Cl. 271-122.000.
- Sato, Kozo: *See—*
  - Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
- Sato, Yoshinari: *See—*
  - Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.
- Saucy, Gabriel: *See—*
  - Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,105,676, Cl. 260-345.90S.
- Saunders, Peter Reginald: *See—*
  - Lofquist, Robert Alden; and Saunders, Peter Reginald, 4,105,404, Cl. 8-165.000.
- Savage, Jack W.; and Savage, Thomas J., to General Motors Corporation. Cam driven compressor. 4,105,371, Cl. 417-238.000.
- Savage, Thomas J.: *See—*
  - Savage, Jack W.; and Savage, Thomas J., 4,105,371, Cl. 417-238.000.
- Savard, Gilbert, to BP Canada. Car wash conveyor belt safety protection system. 4,104,971, Cl. 104-172.00B.
- Savold, Wayne A.: *See—*
  - Grimm, Donald K.; Savold, Wayne A.; and Walter, Allen R., 4,106,093, Cl. 364-424.000.
- Sawada, Shuzo: *See—*
  - Terui, Gyozo; Takada, Nobuo; and Sawada, Shuzo, 4,105,804, Cl. 426-656.000.
- Sawada, Yoshio: *See—*
  - Kawasaki, Masahiro; and Sawada, Yoshio, 4,106,035, Cl. 354-51.000.
- Say, Geoffrey R.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Method for preparing and using a soluble metal pentafluoride-hydrogen fluoride catalyst. 4,105,704, Cl. 260-666.00P.
- Schadlich, Gunther: *See—*
  - Moraw, Roland; and Schadlich, Gunther, 4,105,323, Cl. 355-9.000.
- Schael, Rudi. Optical sight. 4,105,282, Cl. 350-10.000.
- Scharf, Philip H., to Copeland Corporation. Integrated multi-unit refrigeration motor-compressor assembly. 4,105,374, Cl. 417-415.000.
- Schaub, Clyde D.: *See—*
  - Horn, John H.; Morehead, William R.; Hurst, Ronald C.; Potter, Dennis J.; and Schaub, Clyde D., 4,105,750, Cl. 423-456.000.
- Schenectady Chemicals, Inc.: *See—*
  - Laganis, Deno; and Begley, Paul M., 4,105,639, Cl. 528-177.000.
- Scherillo, Michele: *See—*
  - Cerra, Raffaele; and Scherillo, Michele, 4,106,016, Cl. 343-7.400.
- Schering Aktiengesellschaft: *See—*
  - Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.
- Schexnayder, Lawrence F., to Caterpillar Tractor Co. Sealing arrangement for brake housing. 4,105,214, Cl. 277-74.000.
- Schick, John William: *See—*
  - Cushman, Donald Royal; Pagen, Charles Anthony; Schick, John William; and Yan, Tsoung-Yuan, 4,105,612, Cl. 260-27.0EV.
- Schierz, Winfried, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Semiconductor rectifier unit having a base plate with means for maintaining insulating wafers in a desired position. 4,106,052, Cl. 357-72.000.
- Schillinger, Eckehard: *See—*
  - Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.
- Schimmel, Frederick William, to Siemens Aktiengesellschaft. Electronic telephone switching system comprising a speech path switching matrix and tone-connecting switching matrix and employing electronic crosspoint switches. 4,105,873, Cl. 179-18.0AD.
- Schimmel, Frederick William: *See—*
  - Schneider, Carl Michael; Schimmel, Frederick William; and Farrell, John Francis, 4,105,875, Cl. 179-18.0GF.
- Schindelhauer, Gerhard, to Borsig GmbH; and Wankel GmbH. Rotary piston compressor. 4,105,375, Cl. 418-54.000.
- Schlegel GmbH: *See—*
  - Eggert, Frank, 4,105,814, Cl. 428-122.000.
- Schliebe, Rae D. Venturi fitting for the aeration of water. 4,105,721, Cl. 261-76.000.
- Schlumberger Technology Corporation: *See—*
  - Glotin, Bernard J. P.; and Guimard, Andre J., 4,105,279, Cl. 339-117.00R.
  - Lavigne, Jean C.; and Nicolas, Yves, 4,104,911, Cl. 73-151.000.
  - Lavigne, Jean C.; Nicolas, Yves; and Landaud, Andre, 4,105,070, Cl. 166-250.000.
  - Nicolas, Yves; and Landaud, Andre, 4,105,071, Cl. 166-250.000.
- Schmidt, Manfred: *See—*
  - Riegler, Ernst; and Schmidt, Manfred, 4,105,343, Cl. 403-15.000.
- Schmidt, Paul. Device for launching percussion ground borers. 4,105,079, Cl. 173-42.000.
- Schmit, Joseph Lawrence: *See—*
  - Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,105,477, Cl. 148-187.000.
  - Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,105,479, Cl. 148-189.000.
- Schneider, Carl Michael; Schimmel, Frederick William; and Farrell, John Francis, to Siemens Aktiengesellschaft. Electronic telephone switching system comprising a speech-path switching matrix and tone-connecting matrix and employing electronic crosspoint switching devices. 4,105,875, Cl. 179-18.0GF.
- Schneider, Carl Michael: *See—*
  - Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, 4,105,872, Cl. 179-18.0AD.
- Schneider, Eberhard; and Vitt, Theodor, to Prameta Prazisonsmetallund Kunststofferzeugnisse G. Baumann & Co. Adaptor for countersinking device. 4,105,359, Cl. 408-112.000.
- Schneider, Joachim: *See—*
  - Schulz, Bernhard; Paust, Joachim; and Schneider, Joachim, 4,105,855, Cl. 560-190.000.
- Schneider, Louis; and Graham, David E., to GAF Corporation. Insecticidal N-methylpyrrolidinonylacetanilides. 4,105,671, Cl. 260-326.430.

Schneider, Louis; and Graham, David E., to GAF Corporation. Fungicidal 3-amino-6-trifluoromethyl-2,4-dinitrodiphenylethers. 4,105,797, Cl. 424-330.000.
Scholle Corporation: *See—*
  Scholle, William R., 4,105,139, Cl. 222-105.000.
  Scholle, William R., 4,105,818, Cl. 428-192.000.
Scholle, William R., to Scholle Corporation. Shell for flexible bag having mounting for spout. 4,105,139, Cl. 222-105.000.
Scholle, William R., to Scholle Corporation. Gas barrier packaging material. 4,105,818, Cl. 428-192.000.
Scholz, Donald T., to Polaroid Corporation. Logic system for photographic film strip handling apparatus. 4,105,309, Cl. 352-130.000.
Scholz, Donald T.: *See—*
  Holmes, William A.; and Scholz, Donald T., 4,105,307, Cl. 352-72.000.
Schonmeier, Herbert, to Jagenberg-Werke Aktiengesellschaft. Pressure roller arrangement. 4,105,170, Cl. 242-65.000.
Schouteten, Alain: *See—*
  Christidis, Yani; and Schouteten, Alain, 4,105,690, Cl. 260-519.000.
Schreiber, Ronald Stanley, to Colgate-Palmolive Company. Oral compositions containing an anticalculus agent. 4,105,758, Cl. 424-49.000.
Schreiber, Ronald Stanley; and Duff, Edward John, to Colgate-Palmolive Company. Amine monofluorophosphates in dentifrices. 4,105,759, Cl. 424-52.000.
Schreiner, John M.: *See—*
  Muller, Albert; and Schreiner, John M., 4,105,545, Cl. 210-15.000.
Schroer, Charles A.: *See—*
  Pietsch, Wolfgang B.; and Schroer, Charles A., 4,105,457, Cl. 106-78.000.
Schrum, George L.: *See—*
  Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., 4,105,488, Cl. 156-425.000.
Schubert, Karl-Friedrich: *See—*
  Ade, Rolf; Schubert, Karl-Friedrich; and Staller, Manfred, 4,105,906, Cl. 310-87.000.
Schuierer, Manfred, to Bruckner Apparatebau GmbH. Processes and apparatus for the batch wet treatment of textile material. 4,104,753, Cl. 8-152.000.
Schultes, Tilmann; and Seidel, Joachim, to Kortenbach & Rauh Kommanditgesellschaft. Shortenable umbrella. 4,105,039, Cl. 135-25.00A.
Schultheiss, Karl-Heinz: *See—*
  Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, 4,106,036, Cl. 354-83.000.
Schultz, Jeffrey A.; and Eifel, Paul J., to Process Engineering, Inc. Method of thermally insulating a cryogenic storage tank. 4,104,783, Cl. 29-451.000.
Schultz, John J. Scraper cleaning apparatus for endless conveyor belt. 4,105,109, Cl. 198-499.000.
Schulz, Bernhard; Paust, Joachim; and Schneider, Joachim, to BASF Aktiengesellschaft. Manufacture of symmetrical carotenoids. 4,105,855, Cl. 560-190.000.
Schulz, Lothar; and Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Method for selective production of bromine. 4,105,753, Cl. 423-502.000.
Schupp, Lewis J.: *See—*
  Sterling, Vaughn C.; and Schupp, Lewis J., 4,105,480, Cl. 149-40.000.
Schuster, Wolfgang, to Herbert Kannegiesser Kommanditgesellschaft. Rotary device for producing and/or processing webs, pieces, foils and composite materials. 4,105,896, Cl. 219-470.000.
Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased (by Tittes, Marga, Hans-Ulrich Tittes, Gerlach Stephan Tittes, Axel Michael Tittes, heirs), to Albert-Frankenthal AG. Clamping device for flexible printing plates. 4,104,968, Cl. 101-415.100.
Schwan, Thomas J.; and White, Ralph L., Jr., to Morton-Norwich Products, Inc. 1-Amino-3-(4-chlorophenyl)-2-imidazolidinone. 4,105,850, Cl. 548-319.000.
Schwartz, Robert E.: *See—*
  Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., 4,105,394, Cl. 431-202.000.
Schwerzel, Robert E.; Klosterman, Nancy E.; Kelly, John Robert; and Hillenbrand, Louis J., to Battelle Development Corporation. Catalytic extraction of stored solar energy from photochemicals. 4,105,014, Cl. 126-270.000.
Sciola, Joseph; and Nagy, Gabor, to Super Chuck, Inc. Safety drive chuck. 4,105,171, Cl. 242-68.400.
SCM Corporation: *See—*
  McGinniss, Vincent D., 4,105,518, Cl. 204-159.140.
Scott, Donald K., Jr.; and McIntosh, Michael D., to Landis Tool Company. Battery charger. 4,105,962, Cl. 320-32.000.
Scotti, Alessandro: *See—*
  Cislaghi, Ezio; Scotti, Alessandro; and Pederzini, Renzo, 4,106,108, Cl. 365-222.000.
Scovill Manufacturing Company: *See—*
  Holdiman, Joe W., 4,105,352, Cl. 403-402.000. .
Sebag, Henri; and Vanlerberghe, Guy, to L'Oreal. Polyglycerol nonionic surface active agents and process for preparing the same from crude glycidol. 4,105,580, Cl. 252-351.000.
Sebel, Harry; and Wood, Noel Sydney Davidson, to Sebel Limited. Desks. 4,105,271, Cl. 312-253.000.
Sebel Limited: *See—*
  Sebel, Harry; and Wood, Noel Sydney Davidson, 4,105,271, Cl. 312-253.000.
Sebenda, Jan: *See—*
  Bukac, Zbynek; Sebenda, Jan; and Loyda, Miloslav, 4,105,644, Cl. 528-314.000.
Seidel, Joachim: *See—*
  Schultes, Tilmann; and Seidel, Joachim, 4,105,039, Cl. 135-25.00A.
Seidenberger, James W., to J. T. Baker Chemical Company. Spill control composition and use thereof. 4,105,576, Cl. 252-190.000.
Seifert, Edwin A., Jr. Universally supported implement frame section. 4,105,077, Cl. 172-311.000.
Seifert, Peter, to Black Clawson Company, The. Method for screening paper fiber stock. 4,105,543, Cl. 209-240.000.
Seiko Koki Kabushiki Kaisha: *See—*
  Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
Seil, Kenneth F., to Eastman Kodak Company. Electrophotographic apparatus having compensation for rest-run performance variations. 4,105,324, Cl. 355-14.000.
Seilly, Alec Harry, to Lucas Industries Limited. Electromagnetic actuators. 4,105,904, Cl. 310-27.000.
Seiter, William A.: *See—*
  Levasseur, Joseph L.; and Seiter, William A., 4,105,867, Cl. 179-6.30R.
Seki, Yoichi: *See—*
  Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
Sekiguchi, Koichi: *See—*
  Ono, Katsutoshi; and Sekiguchi, Koichi, 4,104,981, Cl. 116-124.00L.
Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, to Argus Chemical Corporation. Mercaptoheterocyclic resin stabilizers. 4,105,627, Cl. 260-45.80N.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
  Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, 4,105,449, Cl. 96-1.800.
Self, Richard E., to Control Components, Inc. High energy loss device. 4,105,048, Cl. 138-42.000.
Selleck, James R., Jr.: *See—*
  Hunsucker, Jerry Hoyt; and Selleck, James R., Jr., 4,105,552, Cl. 210-64.000.
Semanchik, Michael; and Braunstein, David M., to Celanese Corporation. Process for producing a polyacetal polymer. 4,105,637, Cl. 528-241.000.
Semi-Alloys, Inc.: *See—*
  Hascoe, Norman, 4,105,861, Cl. 174-52.0FP.
Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See—*
  Schierz, Winfried, 4,106,052, Cl. 357-72.000.
Senger, Hans-Jurgen, to Elna, GmbH. Radar viewing device. 4,105,912, Cl. 315-10.000.
Serini, Volker: *See—*
  Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
Services et Instruments de Geophysique: *See—*
  Grassy, Robert; Apert, Dominique; and Etchecopar, Arnaud, 4,105,993, Cl. 340-15.5CP.
Settineri, William J.; and Tolly, Milton C., to Dow Chemical Company, The. Treatment of interior surfaces of polymerization reactors to retard polymer buildup. 4,105,841, Cl. 526-62.000.
Sexsmith, David R., to Drew Chemical Corporation. Corrosion inhibitor. 4,105,581, Cl. 252-389.00A.
Sezaki, Tamotsu: *See—*
  Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, 4,105,090, Cl. 181-265.000.
Sforza, Pasquale M., to Polytechnic Institute of New York. Double vortex augmentor wind conversion system. 4,105,362, Cl. 415-2.000.
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Poly(alkylene oxalate) absorbable coating for sutures. 4,105,034, Cl. 128-335.500.
Shanbrom, Edward; and Bishop, Robert C., to Edward Shanbrom, Inc. Method of preserving blood plasma I. 4,105,650, Cl. 260-112.00B.
Shanks, Scott B.: *See—*
  Richter, Gerolf; and Shanks, Scott B., 4,105,037, Cl. 128-419.00P.
Shannon, Richard F.; and Denton, Douglas L., to Owens-Corning Fiberglas Corporation. Method of making molding compounds and materials made thereby. 4,105,623, Cl. 260-38.000.
Sharma, Kris: *See—*
  Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., 4,105,194, Cl. 267-64.00R.
Shaub, Harold; and Waddey, Walter E., to Exxon Research & Engineering Co. Lubricant composition. 4,105,571, Cl. 252-32.70E.
Shaw, Gustavus W.; and Walker, Raymond P., to American Home Products Corporation. Safety lid interlock circuit for centrifuges. 4,105,903, Cl. 307-328.000.
Shaw, Lamont; and Waire, Aaron O. Novelty hat device. 4,104,741, Cl. 2-185.00R.
Sheldon, John D.; and Textron Inc. Filament-type trimmer. 4,104,796, Cl. 30-276.000.
Sherwood, William Lyon. Continuous metal melting, withdrawal and discharge from rotary furnaces. 4,105,438, Cl. 75-49.000.
Shiba, Hiroshi; and Kani, Kenji, to Nippon Electric Co., Ltd. Large-scale semiconductor integrated circuit device. 4,104,785, Cl. 29-574.000.
Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Multi-layered color photographic light-sensitive material. 4,105,452, Cl. 96-74.000.

Shibata, Toshihiro: *See—*
  Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,105,625, Cl. 260-45.80N.
Shibazaki, Kenji: *See—*
  Murata, Tomoji; Shibazaki, Kenji; Nakamura, Yoshihiro; and Kuse, Matsuo, 4,105,914, Cl. 235-92.0SB.
Shiga, Tsuyoshi: *See—*
  Inoue, Motoichiro; Shiga, Tsuyoshi; and Kasabara, Nnbuo, 4,105,322, Cl. 355-4.000.
Shigematsu, Koichi: *See—*
  Matsuoka, Yoshifumi; Matsumura, Takemasa; Shigematsu, Koichi; and Oishi, Atsushi, 4,105,020, Cl. 128-2.05A.
Shimada, Junichi: *See—*
  Kogure, Hiroshi; and Shimada, Junichi, 4,104,881, Cl. 60-299.000.
Shimizu, Akio, to Niles Parts Co., Ltd. Disconnection indicating apparatus for automobiles. 4,105,996, Cl. 340-73.000.
Shimizu, Katsuhiko: *See—*
  Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, 4,105,937, Cl. 318-568.000.
Shimizu, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Field effect type liquid crystal display device. 4,105,297, Cl. 350-336.000.
Shimizu, Toshihide: *See—*
  Kitamura, Hajime; and Shimizu, Toshihide, 4,105,838, Cl. 526-62.000.
  Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.
Shimoi, Akio: *See—*
  Iwai, Yuichiro; Shimoi, Akio; and Kawamura, Yoshikazu, 4,105,902, Cl. 307-308.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
  Kitamura, Hajime; and Shimizu, Toshihide, 4,105,838, Cl. 526-62.000.
  Koyanagi, Shunichi; Kitamura, Hajime; Shimizu, Toshihide; and Fushimi, Kenji, 4,105,839, Cl. 526-62.000.
Shinoda, Nobuhiko: *See—*
  Nakamoto, Soichi; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,106,033, Cl. 354-23.00D.
Shinohara, Yukimasa; Ohara, Katsunobu; and Ando, Yujiro, to Canon Kabushiki Kaisha. Air flow method of cleaning ion modulation photosensitive screen during corona charging. 4,105,444, Cl. 96-1.00R.
Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Spectrally sensitized positive light-sensitive o-quinone diazide containing composition. 4,105,450, Cl. 96-33.000.
Shinozaki, Nobuo: *See—*
  Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device. 4,106,049, Cl. 357-46.000.
Shirai, Shinji: *See—*
  Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
Shishido, Tadao: *See—*
  Shiba, Keisuke; Aono, Toshiaki; Kubodera, Seiiti; Hirose, Takeshi; Ohi, Reiichi; and Shishido, Tadao, 4,105,452, Cl. 96-74.000.
Shiver, James William: *See—*
  Moody, Asa Carlyle, Jr.; Kenward, Richard George; and Shiver, James William, 4,106,098, Cl. 364-500.000.
Showa Denko K.K.: *See—*
  Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
Showalter, William E., to Union Oil Company of California. Process for recovery of mineral values from underground formatioos. 4,105,253, Cl. 299-4.000.
Shulgin, Alexander Theodore: *See—*
  Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.
Sidaway, Joseph Trevor. Hardness testing machine. 4,104,901, Cl. 73-81.000.
Siegel, Melvin W., to Extranuclear Laboratories, Inc. Methods and apparatus for simultaneously producing and electronically separating the chemical ionization mass spectrum and the electron impact ionization mass spectrum of the same sample material. 4,105,916, Cl. 250-282.000.
Siemens Aktiengesellschaft: *See—*
  Borchert, Lothar; and Stenzel, Karl-Jorg, 4,105,828, Cl. 428-665.000.
  Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, 4,104,924, Cl. 73-716.000.
  Caspar, Heinz; and Kudritzki, Felix, 4,104,925, Cl. 73-716.000.
  Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,871, Cl. 179-18.0AD.
  Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,874, Cl. 179-18.0AD.
  Farrell, John Francis; and Treichel, Hans Herbert, 4,105,876, Cl. 179-18.0AD.
  Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, 4,105,288, Cl. 350-350.000.
  Hini, Paul; and Forster, Helmut, 4,105,012, Cl. 125-16.00R.
  Krause, Gerhard, 4,105,943, Cl. 330-290.000.
  Kuhnlein, Hans, 4,105,940, Cl. 318-653.000.
  Martens, Hans, deceased; Martens, Harald, legal heir; Martens, Rainer, legal heir; Martens, Hans-Wolfgang, legal heir; Martens, Gunter, legal heir; Martens, Sigrid, legal heir; Martens, Hannelore, legal heir; and Martens, Helmut, legal heir, 4,105,512, Cl. 204-38.00A.
  Parise, James Louis; Schneider, Carl Michael; and Farrell, John Francis, 4,105,872, Cl. 179-18.0AD.
  Raschke, Klaus; and Festinori, Volfango, 4,104,934, Cl. 81-57.380.
  Schimmel, Frederick William, 4,105,873, Cl. 179-18.0AD.
  Schneider, Carl Michael; Schimmel, Frederick William; and Farrell, John Francis, 4,105,875, Cl. 179-18.0GF.
  Trautner, Jurgen; and Kolbe, Peter, 4,106,069, Cl. 361-30.000.
Siesta Industries: *See—*
  Grundler, Anthony F., 4,104,749, Cl. 5-76.000.
Sifferman, Thomas R.; and Sparlin, Derry D., to Continental Oil Company. Control of incompetent formations with thickened compositions containing base-settable resin. 4,105,618, Cl. 260-33.6UA.
Sigmund, Jerry A., to SPS Technologies, Inc. Tightening method and system. 4,104,779, Cl. 29-407.000.
Sigmund, Jerry A., to SPS Technologies, Inc. Method and system for tightening joint assembly. 4,104,780, Cl. 29-407.000.
Signatron, Inc.: *See—*
  Pierce, John Norman; and Parl, Steen Allan, 4,105,958, Cl. 333-29.000.
Sigwalt, Pierre; Polton, Alain; Baudin, Cecile; and Miskovic, Mihajlo (Michel), to Agence Nationale de Valorisation de la Recherche (ANVAR). Polymers and copolymers of indene. 4,105,713, Cl. 260-879.000.
Silver Seiko Ltd.: *See—*
  Kagaya, Yutaka, 4,105,157, Cl. 235-475.000.
Silverman, Arthur A. Power driven drain cleaner with safety overload clutch. 4,104,757, Cl. 15-104.3SN.
Simington, Jack F., to Simington Products Co. Saw chain sharpener. 4,104,793, Cl. 30-139.000.
Simington Products Co.: *See—*
  Simington, Jack F., 4,104,793, Cl. 30-139.000.
Simons, John R.; and Fenske, John W., to Grunau Company Inc. Concealed sprinkler head. 4,105,076, Cl. 169-40.000.
Simons, Wayne K.; and Teodoro, Donald J., to Paccar Inc. Forward, stowable seat and back. 4,105,245, Cl. 280-65.00R.
Simpson Manufacturing Co., Inc.: *See—*
  Gilb, Tyrell T., 4,104,843, Cl. 52-693.000.
Sindlinger, Ronald E.; and Audesse, Emery G., to GTE Sylvania Incorporated. Photoflash lamp. 4,105,392, Cl. 431-95.00R.
Singer Company, The: *See—*
  Albert, William Charles; and Hohenstein, Robert Mark, 4,104,920, Cl. 73-517.0AV.
  Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.
  Pross, John William, Jr., 4,106,105, Cl. 364-900.000.
Singer, Lewak, Greenbaum and Goldstein: *See—*
  Gelinas, Ralph J. (Ralph J. Gelinas, a part interest to each assors. to), 4,105,346, Cl. 403-104.000.
Sivertsen, Marvin L.: *See—*
  Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.
Sjostrom, Otto Einar. Holding-on device. 4,104,936, Cl. 81-180.00R.
Skilliter, Robert T., Jr., to Acme Specialty Manufacturing Company, The. Mirror assembly with frangible angular projections. 4,105,295, Cl. 350-303.000.
Skinner, Charles E.: *See—*
  Clark, William H.; and Skinner, Charles E., 4,105,617, Cl. 260-31.20N.
Skinner Irrigation Co.: *See—*
  Eby, Ralph H., 4,105,186, Cl. 251-35.000.
Skinner, James L., to Atlantic Richfield Company. Inclined conveyor belt solids separating system with responsive gas control. 4,105,124, Cl. 209-114.000.
Skoda, Stanislav: *See—*
  Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
Skotheim, Terje A., to United States of America, Energy. Dye-sensitized Schottky barrier solar cells. 4,105,470, Cl. 136-89.0SJ.
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, to Schering Aktiengesellschaft. Prostane dervatives. 4,105,792, Cl. 424-313.000.
Slater Electric Inc.: *See—*
  Hoehn, Rudolph H., 4,105,862, Cl. 174-53.000.
Slater, John Walter: *See—*
  Collins, David John; Kay, Ian Trevor; and Slater, John Walter, 4,105,433, Cl. 71-93.000.
Slingluff, Eugene L., to Krandex Corp. Radiographic opaque and conductive striped medical tubes. 4,105,732, Cl. 264-104.000.
Smallwood, John J., to Fairchild Industries, Inc. Valve apparatus. 4,105,047, Cl. 137-625.600.
Smeltzer, Paul; Sharma, Kris; Daneck, David A.; and McNally, Sellers B., to Maremont Corporation. Pump mechanism for a combined self-leveling shock absorber and fluid spring unit. 4,105,194, Cl. 267-64.00R.
Smilenov, Todor Ivanov: *See—*
  Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.
Smith, Curtis P., to Upjohn Company, The. Preparation of carbodiimide in presence of phospholene catalysts. 4,105,642, Cl. 528-51.000.

Smith, Curtis P., to Upjohn Company, The. Preparation of carbodiimide in presence of phospholene catalysts. 4,105,643, Cl. 528-512.000.

Smith, George Arthur: *See—*

Ferris, Donald Leroy; and Smith, George Arthur, 4,105,365, Cl. 416-107.000.

Smith, Ian, to British Gas Corporation. Pipeline inspection vehicle for detecting defects in pipeline walls. 4,105,972, Cl. 324-220.000.

Smith International, Inc.: *See—*

Allen, James H., 4,105,083, Cl. 175-313.000.

Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. High voltage device containing a flexible prepreg. 4,105,984, Cl. 336-60.000.

Smith, James George; and Reed, Ralph Clyde, to Eastman Kodak Company. Photothermographic material, composition and process. 4,105,451, Cl. 96-66.00T.

Smith, Judson L. Vehicle floor mat washer. 4,104,755, Cl. 15-40.000.

Smith Kline & French Laboratories Limited: *See—*

Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,105,770, Cl. 424-263.000.

Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, to Ciba Geigy (UK) Limited. Treatment of aqueous systems. 4,105,551, Cl. 210-58.000.

Smith, William R.; and Duchild, Robert H., to United States of America, Navy. Breakaway link assembly for maintaining a structural alignment of shock-sensitive equipment. 4,105,177, Cl. 248-15.000.

Smithen, Carey Ernest: *See—*

Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.

Smolin, Lewis M.: *See—*

Theodores, Theodore P.; and Smolin, Lewis M., 4,105,205, Cl. 273-73.00J.

Snam Progetti, S.p.A.: *See—*

Balducci, Agostino; Corbellini, Margherita; Mormino, Vittorio; Notari, Bruno; and Rivola, Luigi, 4,105,588, Cl. 252-454.000.

Snell, Spencer Allan: *See—*

Gibson, David Kent; Miller, Myrl J.; and Snell, Spencer Allan, 4,105,327, Cl. 355-59.000.

Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Circular magazine for linear magazine slide projectors. 4,105,317, Cl. 353-117.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*

Radici, Pierino; Custro, Sergio; Ermoni, Mario; and Colombo, Paolo, 4,105,638, Cl. 528-130.000.

Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, 4,105,604, Cl. 260-17.200.

Societe Anonyme de Telecommunications: *See—*

Aveneau, Andre A.; and Barbier, Xavier N., 4,105,869, Cl. 179-15.0BD.

Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem: *See—*

Baguelin, Yves, 4,104,993, Cl. 123-41.490.

S.A. des Etablissements Francois Salomon & Fils: *See—*

Salomon, Georges Pierre Joseph, 4,104,766, Cl. 24-69.0SK.

Salomon, Georges Pierre Joseph, 4,104,811, Cl. 36-121.000.

Societe Chimique des Charbonnages: *See—*

Machon, Jean-Pierre; Levresse, Bernard; and Gloriod, Pierre, 4,105,609, Cl. 260-23.00H.

Societe Chimique des Charbonnages-CdF Chimie: *See—*

Nicco, Adrien; and Machon, Jean-Pierre, 4,105,842, Cl. 526-65.000.

Societe de Vente de l'Aluminium Pechiney: *See—*

Charbonnier, Jean, 4,105,191, Cl. 266-88.000.

Societe d'Etude et de Construction de Machines pour Toutes Industries S.E.C.O.M.A.S.A.: *See—*

Perraud, Raymond Jean, 4,105,081, Cl. 175-122.000.

Societe d'Etudes Chimiques: *See—*

Caillol, Alain, 4,105,751, Cl. 423-478.000.

Societe Nationale des Petroles d'Aquitaine: *See—*

Gibert, Alain, 4,106,084, Cl. 363-21.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*

Caruel, Jacques E. J.; and Stora, Guy D., 4,104,874, Cl. 60-39.650.

Soding, Bernward; and Freisleben, Reinhard, to Soding TV GmbH & Co. Bild & Ton International. Film strip projection apparatus. 4,105,316, Cl. 353-109.000.

Soding TV GmbH & Co. Bild & Ton International: *See—*

Soding, Bernward; and Freisleben, Reinhard, 4,105,316, Cl. 353-109.000.

Sohner, Gerhard: *See—*

Jundt, Werner; Werner, Peter; Bodig, Bernd; Sohner, Gerhard; and Roth, Helmut, 4,105,006, Cl. 123-148.00E.

Sokol, Gunter: *See—*

Hagenlocher, Walter; Neumann, Karl-Heinz; Muller, Martin; Kleebaur, Karl; Sokol, Gunter; and Molt, Jurgen, 4,105,907, Cl. 310-232.000.

Solid State Scientific Inc.: *See—*

Stickel, Tedd, 4,104,860, Cl. 58-23.00R.

Solitron Devices, Inc.: *See—*

Hamzawi, Fawzi J., 4,105,476, Cl. 148-187.000.

Soma, Nobuo: *See—*

Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,105,626, Cl. 260-45.8NZ.

Somers, Aloijsius Gerardus: *See—*

de Ramaix, Maurice Antoine; and Somers, Aloijsius Gerardus, 4,105,533, Cl. 204-301.000.

Sony Corporation: *See—*

Hoshido, Mutsuo, 4,106,064, Cl. 360-60.000.

Matsumoto, Isao; and Yamaguchi, Haruhisa, 4,105,936, Cl. 318-328.000.

Nagumo, Fumio; and Yamanaka, Seisuke, 4,106,056, Cl. 358-50.000.

Sopira, Michael M.: *See—*

Nathanson, Harvey C.; and Sopira, Michael M., 4,106,046, Cl. 357-30.000.

Sorensen, Robert Keith; and Rallis, Anthony T., to Dresser Industries, Inc., by said Robert Keith Sorensen. Journal and pilot bearings with alternating surface areas of wear resistant and anti-galling materials. 4,105,263, Cl. 308-8.200.

Sorenson, Paul H., to Universal Oil Products Company. Lightweight, closed-cell foam elastomeric elements for use in countercurrent gas-liquid contact operations. 4,105,722, Cl. 261-94.000.

Sorimachi, Kanehiro: *See—*

Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.

Soulos, Steven T. Weightlifting game. 4,105,206, Cl. 273-85.00R.

Spar Aerospace Products Limited: *See—*

Mee, Francis Herbert Arthur, 4,105,241, Cl. 294-86.00R.

Sparlin, Derry D.: *See—*

Sifferman, Thomas R.; and Sparlin, Derry D., 4,105,618, Cl. 260-33.6UA.

Spellman, Michael Thomas, to Wallace Murray Corporation. Twisted flex fan. 4,105,366, Cl. 416-132.00A.

Spence, Gordon; Hemmens, Cecil Godfrey; and Godfrey, Alan, to Plessey Handel und Investments AG. Potentiometers. 4,105,987, Cl. 338-130.000.

Spencer, Benjamin B., to Buckeye International, Inc. Wear surface arrangement for coupler carrier assembly. 4,105,128, Cl. 213-61.000.

Sperry Rand Corporation: *See—*

Ignasiak, Stanley F., 4,105,909, Cl. 313-473.000.

Sperry Rand Limited: *See—*

Bone, Geoffrey Edward; and Allen, Peter Baguley, 4,104,877, Cl. 60-230.000.

Springer, Richard Allen: *See—*

Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.

SPS Technologies, Inc.: *See—*

Sigmund, Jerry A., 4,104,779, Cl. 29-407.000.

Sigmund, Jerry A., 4,104,780, Cl. 29-407.000.

Sta-Rite Industries: *See—*

Francis, Ralph M., Jr., 4,105,367, Cl. 417-36.000.

Stach, Kurt, deceased: *See—*

Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.

Stachejko, Vitaly, to RCA Corporation. Amplitude balanced diode phase shifter. 4,105,959, Cl. 333-31.00R.

Stachurski, Zbigniew Henryk: *See—*

Atkin, Howard Dawson; Stachurski, Zbigniew Henryk; and Cherry, Brian Wilson, 4,105,117, Cl. 206-501.000.

Stahl, Quade R., to Meloy Laboratories, Inc. Catalytic converter apparatus, especially for oxides of nitrogen. 4,105,413, Cl. 23-288.00R.

Stahle, Helmut: *See—*

Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Reichl, Richard; and Giesemann, Rolf, 4,105,796, Cl. 424-330.000.

Kummer, Werner; Stahle, Helmut; Koppe, Herbert; Haarmann, Walter; and Reichl, Richard, 4,105,765, Cl. 424-248.560.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Vibration damping bearing arrangement. 4,105,265, Cl. 308-158.000.

Stahlecker, Hans: *See—*

Stahlecker, Fritz, 4,105,265, Cl. 308-158.000.

Stal-Laval Turbin AB: *See—*

Hansson, Hans-Erik, 4,104,932, Cl. 74-801.000.

Stalfors, Rolf Lennart: *See—*

Blomqvist, Ake Hugo Petrus; and Stalfors, Rolf Lennart, 4,105,174, Cl. 244-3.160.

Staller, Manfred: *See—*

Ade, Rolf; Schubert, Karl-Friedrich; and Staller, Manfred, 4,105,906, Cl. 310-87.000.

Standard Havens, Inc.: *See—*

Rheinfrank, Lamson, Jr.; Bundy, Richard P.; and Clements, Jack T., 4,105,421, Cl. 55-379.000.

Standard Oil Company (Indiana): *See—*

Hoff, Glen R.; Fotis, Peter, Jr.; and Boone, David E., 4,105,846, Cl. 526-124.000.

Wolff, William F., 4,105,251, Cl. 299-2.000.

Standridge, Robert Ted: *See—*

Partyka, Richard Anthony; Standridge, Robert Ted; Howell, Henry George; and Shulgin, Alexander Theodore, 4,105,695, Cl. 260-570.80R.

Starks, Charles M.; and Lundeen, Allan J., to Continental Oil Company. Preparation of cinnamyl-substituted phenols. 4,105,698, Cl. 568-744.000.

Starks, Charles M., to Continental Oil Company. Preparation of o-benzylphenol. 4,105,699, Cl. 568-744.000.

State of Rhode Island, Board of Regents for Education of the: *See—*

Jahns, Frederick D.; and Rand, Arthur G., Jr., 4,105,800, Cl. 426-61.000.

Stavrinou, Stavros C., to Armstrong Cork Company. Method of reclaiming waste sheet flooring. 4,105,593, Cl. 260-2.300.

Steenson, Thomas W.; and Paton, W. Donald, to Butler Manufacturing Company. Lifting device for large panels. 4,105,240, Cl. 294-81.00R.

Steffens, Charles J.: *See—*

Rieth, James E.; and Steffens, Charles J., 4,104,917, Cl. 73-343.00R.

Stehr, Richard E.: *See—*

Pury, Thomas; Gray, Floyd L.; Sivertsen, Marvin L.; Konle, Robert L.; and Stehr, Richard E., 4,105,920, Cl. 250-402.000.

Steinbock, Rolf. Variable compression engine. 4,104,995, Cl. 123-78.00D.

Stella, Joseph A.: *See—*

Czumak, Frank M.; and Stella, Joseph A., 4,106,042, Cl. 354-317.000.

Stemme, Otto: *See—*

Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, 4,106,036, Cl. 354-83.000.

Stenzel, Gerhard: *See—*

Kaule, Wittich; and Stenzel, Gerhard, 4,105,333, Cl. 356-85.000.

Stenzel, Karl-Jorg: *See—*

Borchert, Lothar; and Stenzel, Karl-Jorg, 4,105,828, Cl. 428-665.000.

Stephenson, James E.: *See—*

Miller, Glynn; and Stephenson, James E., 4,105,566, Cl. 252-8.100.

Sterling Drug Inc.: *See—*

Alexander, E. John, 4,105,764, Cl. 424-248.540.

Alexander, E. John, 4,105,766, Cl. 424-251.000.

Archer, Sydney, 4,105,659, Cl. 260-293.540.

Williams, William D., 4,105,148, Cl. 222-478.000.

Sterling, Vaughn C.; and Schupp, Lewis J., to General Electric Company. Flashlamp composition. 4,105,480, Cl. 149-40.000.

Sterzel, Hans-Josef: *See—*

Boehlke, Klaus; Welz, Martin; Foerster, Peter; Sterzel, Hans-Josef; Wurmb, Rolf; and Matthies, Hans Georg, 4,105,624, Cl. 260-40.00R.

Stevick, Ronald A. Gravel processing system. 4,105,544, Cl. 209-317.000.

Stewart, Hal W. Tape dispensing apparatus. 4,105,149, Cl. 225-25.000.

Stickel, Tedd, to Solid State Scientific Inc. High speed dynamic flip-flop system. 4,104,860, Cl. 58-23.00R.

Stickma A/S: *See—*

Morch, Ole Christian, 4,105,384, Cl. 425-126.00S.

Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, to AGFA-GEVAERT N.V. Dispenser for sheet-like material. 4,105,198, Cl. 271-14.000.

Stiot, Jean-Pierre Henri: *See—*

Brouard, Claude Marie Henri Emile; Dupont, Bernard; Leroy, Jean-Marie Louis; and Stiot, Jean-Pierre Henri, 4,105,653, Cl. 260-158.000.

Stocker, August: *See—*

Arni, Urs; Faucci, Adriano; and Stocker, August, 4,105,688, Cl. 260-465.80R.

Stokes, Jr. Bernard E.: *See—*

Amrein, Wayne Thomas; and Stokes, Jr. Bernard E., 4,104,752, Cl. 7-107.000.

Stolarczyk, Larry G., to A. R. F. Products, Inc. Biochemical oxygen demand measuring device. 4,105,523, Cl. 204-195.00B.

Stoll, Max: *See—*

Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,105,661, Cl. 544-405.000.

Stoops, Roscoe D. Flat wrench extender tool. 4,104,935, Cl. 81-177.00A.

Stora, Guy D.: *See—*

Caruel, Jacques E. J.; and Stora, Guy D., 4,104,874, Cl. 60-39.650.

Stotler, James L. Credit card washing device. 4,104,758, Cl. 15-104.920.

Stournas, Stamoulis; and Dickert, Joseph J., Jr., to Mobil Oil Corporation. Oil recovery by surfactant waterflooding. 4,105,570, Cl. 252-8.55D.

Stoyanov, Yossif Genchev: *See—*

Enchev, Ivan Dimitrov; Ilel, Elieser Persiado; Kunchev, Nikola Tzanov; Harizanov, Kiril Georgiev; Genevski, Vladimir Vetov; Draganov, Nedelcho Draganov; Alexandrov, Alexander Minchev; Haralampiev, Georgi Alexandrov; Smilenov, Todor Ivanov; and Stoyanov, Yossif Genchev, 4,105,527, Cl. 204-228.000.

Strathearn Audio Limited: *See—*

Plummer, Dexter Robert; and Jones, Roderick Frank, 4,105,961, Cl. 318-676.000.

Stratton, Lawrence J.; Jeffreys, Dennis C.; Welz, Albert W., Jr.; and Johnston, Reed H., to New England Power Service Company. Cycloconverter apparatus and method for working into an active load. 4,105,897, Cl. 307-3.000.

Stratton, Lawrence J.: *See—*

Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,106,007, Cl. 340-310.00A.

Strausak, Benedikt A.: *See—*

Laeng, Rudolf; Strausak, Benedikt A.; and Vavrina, Josef, 4,106,082, Cl. 362-87.000.

Stribiak, John J., Jr., to Stribiak, John J., Jr.; and Swanson, John. Snow blower for powered lawn mowers. 4,104,812, Cl. 37-43.00L.

Stright, Robert R. Article handling implement. 4,105,238, Cl. 294-11.000.

Strojni a traktorova stanice v Zatci, narodni podnik Zatec: *See—*

Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,104,823, Cl. 47-1.00R.

Stubbe, Paul L. Extruder screw valve. 4,105,147, Cl. 222-413.000.

Sturgis, Clifford M. Detachable fluid coupling. 4,105,046, Cl. 137-594.000.

Stutzke, Paul: *See—*

Auer, Eberhard; Ohorodnik, Alexander; and Stutzke, Paul, 4,105,689, Cl. 260-502.500.

Suchanek, Walton F., Jr.: *See—*

Dyroff, David R.; and Suchanek, Walton F., Jr., 4,105,756, Cl. 424-48.000.

Sud-Chemie Aktiengesellschaft: *See—*

Buckl, Hans; Brenner, Bernd; and Eisenschmid, Wolfgang, 4,105,467, Cl. 127-37.000.

Sudbury Engineering Corporation: *See—*

Theodores, Theodore P.; and Smolin, Lewis M., 4,105,205, Cl. 273-73.00J.

Sugalski, Raymond Kazimir, to General Electric Company. An electrochemical battery comprising a plate having stippled substrate. 4,105,832, Cl. 429-94.000.

Sugisaki, Tsutomu: *See—*

Masuyama, Kenichi; Sugisaki, Tsutomu; Kitamoto, Tatsuji; and Yamada, Yasuyuki, 4,106,067, Cl. 360-137.000.

Sukornick, Bernard: *See—*

Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,105,691, Cl. 260-530.00R.

Sumitomo Chemical Company, Limited: *See—*

Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, 4,105,673, Cl. 260-343.000.

Takahashi, Shigeo; and Ito, Michio, 4,104,798, Cl. 32-12.000.

Sumitomo, Ushigoro. Plastic molding assembly for molding plastic products. 4,105,184, Cl. 249-79.000.

Sun, Shan C.; and Church, Larry L., to Westinghouse Electric Corp. Apparatus for protection against subsynchronous currents in a power system. 4,106,071, Cl. 361-79.000.

Sun Ventures, Inc.: *See—*

Moore, Robert E.; and Clark, Leland C., Jr., 4,105,798, Cl. 424-352.000.

Sunahara, Takatoshi, to Kabushiki Kaisha Izumiseiki Seisakusho. Stripper for coated wires. 4,104,791, Cl. 30-90.100.

Sunds Aktiebolag: *See—*

Pettersson, Bengt Edvard, 4,105,494, Cl. 162-19.000.

Sunobe, Kazuhiro: *See—*

Mishina, Haruo; Sunobe, Kazuhiro; and Fujie, Kunio, 4,105,372, Cl. 417-243.000.

Sunouchi, Akio: *See—*

Ito, Fumio; Ito, Tadashi; Sunouchi, Akio; and Sorimachi, Kanehiro, 4,106,040, Cl. 354-205.000.

Super Chuck, Inc.: *See—*

Sciola, Joseph; and Nagy, Gabor, 4,105,171, Cl. 242-68.400.

Sutton, Theodore Leonard, to Akzona Incorporated. Center spacing gauge for friction twisting units. 4,104,856, Cl. 57-77.400.

Suzuki, Gyoichi; Miura, Mitsutoshi; Miyazu, Takashi; Matsushita, Taro; and Okuyama, Yasuo, to Nippon Kokan Kabushiki Kaisha. Method for producing metallurgical coke. 4,105,501, Cl. 201-6.000.

Suzuki, Kisaku: *See—*

Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.

Suzuki, Masaki: *See—*

Arai, Kazuo; Igarashi, Yoshiaki; Suzuki, Masaki; Sano, Nobuya; and Yosumi, Toshikazu, 4,105,935, Cl. 318-314.000.

Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, to Bridgestone Tire Company Limited. Process of and an apparatus for producing green tires. 4,105,487, Cl. 156-405.00R.

Suzuki, Shigeto, to Chevron Research Company. Cyanoethylation of glycolic esters. 4,105,687, Cl. 260-465.400.

Suzuki, Takashi, to Matsushita Electric Industrial Co., Ltd. Process for producing porous polymer film. 4,105,737, Cl. 264-154.000.

Swaine, James W., Jr.; Low, William W.; and Bean, Samuel L., to Allied Chemical Corporation. Production of high purity calcium thiosulfate. 4,105,754, Cl. 423-514.000.

Swanson, John: *See—*

Stribiak, John J., Jr., 4,104,812, Cl. 37-43.00L.

Swart, Daniel J.; and Kelyman, Jacqueline S., to Dow Chemical Company, The. Alternating copolyestercarbonate resins. 4,105,633, Cl. 528-176.000.

Sweeney, Richard F.; Peterson, James O.; Sukornick, Bernard; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., to Allied Chemical Corporation. Process for the production of chlorofluorinated carboxylic acids. 4,105,691, Cl. 260-530.00R.

Sweeny, James G.: *See—*

Iacobucci, Guillermo A.; and Sweeny, James G., 4,105,675, Cl. 260-345.200.

Swift Agricultural Chemicals Corporation: *See—*

Wilson, Robert A.; and Raden, David J., 4,105,749, Cl. 423-320.000.

Swingline Inc.: *See—*

Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., 4,105,196, Cl. 270-58.000.

Sybron Corporation: *See—*

Biver, William Ralph, 4,105,411, Cl. 23-253.00R.

Synnott, John C.; and Ross, James W., Jr., to Orion Research Incorporated. Internal standard electrolyte for ammonia sensor. 4,105,525, Cl. 204-195.00P.

Syntex Puerto Rico, Inc.: *See—*

Lundquist, Ingemar H., 4,105,027, Cl. 128-206.000.

Syntex (U.S.A.) Inc.: *See—*

Kercso, Josef E., 4,105,030, Cl. 128-217.000.

Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna. Local anaesthetic salts of chondroitinsulfate compounds. 4,105,760, Cl. 424-180.000.

Tachibana, Histaro; Fujii, Hisashi; and Sezaki, Tamotsu, to Kawasaki Jukogyo Kabushiki Kaisha. Muffler for exhaust gases. 4,105,090, Cl. 181-265.000.

- Tachibana, Kyozaburo: *See—*
  - Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, 4,105,436, Cl. 71-103.000.
- Tackett, DeForest. Lawn clipping vacuum collector. 4,104,852, Cl. 56-202.000.
- Tago, Atsuo; Yamanaka, Ryoichi; and Matsumoto, Susumu, to Kyoritsu Yuki Co., Ltd.; and Mitsubishi Chemical Industries Ltd. Process for removing water from water soluble polymer. 4,105,510, Cl. 203-14.000.
- Takada, Nobuo: *See—*
  - Terui, Gyozo; Takada, Nobuo; and Sawada, Shuzo, 4,105,804, Cl. 426-656.000.
- Takahashi, Akio; and Saito, Hirokichi, to Ihara Chemical Industry Co. Ltd. Mixing apparatus. 4,106,115, Cl. 366-138.000.
- Takahashi, Katuo: *See—*
  - Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
- Takahashi, Ryohei: *See—*
  - Nishiyama, Ryuzo; Takahashi, Ryohei; Fujikawa, Kanichi; Nasu, Rikuo; and Sakashita, Nobuyuki, 4,105,435, Cl. 71-94.000.
- Takahashi, Shigeo; and Ito, Michio, to Sumitomo Chemical Company, Limited; and Matsumoto Dental College. Porcelain fused to metal crown. 4,104,798, Cl. 32-12.000.
- Takahashi, Shoji: *See—*
  - Suzuki, Masayoshi; Ooimi, Tatuo; Yabe, Toshinori; and Takahashi, Shoji, 4,105,487, Cl. 156-405.00R.
- Takahashi, Susumu; and Kurata, Hirotaka, to Sansui Electric Co., Ltd. AM stereophonic transmission system. 4,105,868, Cl. 179-15.0BT.
- Takahashi, Tadashi; Morinaga, Shigeki; and Kubokura, Kuniaki, to Hitachi, Ltd. Protective device in a motor-operated sewing machine. 4,104,978, Cl. 112-277.000.
- Takazawa, Yuzuru: *See—*
  - Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,104,859, Cl. 58-23.00D.
- Takeda Chemical Industries, Ltd.: *See—*
  - Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, 4,105,670, Cl. 260-326.11R.
- Takeda, Mitsuo: *See—*
  - Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, 4,105,335, Cl. 356-108.000.
- Takeda, Tetuo: *See—*
  - Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.
- Takei, Saburo: *See—*
  - Noguchi, Shunsaku; Takei, Saburo; and Kawano, Yasuhiko, 4,105,670, Cl. 260-326.11R.
- Takeno, Shouzou: *See—*
  - Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
- Takeno, Tsuneyuki; Iwasaki, Tetsuji; Miyamoto, Norioki; Tachibana, Kyozaburo; and Matsukane, Masamoto, to Kao Soap Co., Ltd. Herbicide. 4,105,436, Cl. 71-103.000.
- Takeuchi, Akihiro: *See—*
  - Asai, Kiyokazu; and Takeuchi, Akihiro, 4,105,004, Cl. 123-141.000.
- Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, to Ube Industries, Ltd. Catalyst and process for reducing nitrogen oxides. 4,105,745, Cl. 423-239.000.
- Takeuchi, Kazuo: *See—*
  - Oda, Takaaki; and Takeuchi, Kazuo, 4,105,223, Cl. 280-752.000.
- Takeuchi, Tomio: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
- Takita, Kiyoshi: *See—*
  - Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 4,105,693, Cl. 260-558.00P.
- Talbot, Edward Butterfield, to Ruckluft Patent AG. Contact packing. 4,105,724, Cl. 261-112.000.
- Tam, William A., to Chicago Bridge & Iron Company. Apparatus for producing oil and gas offshore. 4,105,068, Cl. 166-355.000.
- Tamehiro, Hiroshi: *See—*
  - Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; Takeda, Tetuo; and Eiro, Seiji, 4,105,474, Cl. 148-12.00F.
- Tanabe, Yasuo, to Mitsubishi Chemical Industries Ltd. Process for producing a cylic ether from an acetic ester of a 1,4-glycol. 4,105,679, Cl. 260-346.110.
- Tanahashi, Toshio: *See—*
  - Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.
- Tanaka, Nobuyoshi; Ayata, Naoki; Takeda, Mitsuo; Matsumura, Susumu; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Interferometric optical phase discrimination apparatus. 4,105,335, Cl. 356-108.000.
- Tanei, Tadayoshi; Nakamura, Shigeki; and Hotta, Masahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Extruded electrophotographic recording material. 4,105,449, Cl. 96-1.800.
- Tani, Katsuya: *See—*
  - Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, 4,105,740, Cl. 264-290.00T.
- Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion spectrally sensitized with merocyanine dyes. 4,105,454, Cl. 96-122.000.
- Tankel, Lawrence, to Car Cuf Industries, Inc. Vehicle steering column ignition lock protective device. 4,104,895, Cl. 70-237.000.
- Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, to Tokyo Shibaura Electric Co., Ltd. Thin resistor film type thermal head for printing on heat-sensitive paper. 4,105,892, Cl. 219-216.000.
- Tassonyi, Edomer: *See—*
  - Szejtli, Jozsef; Dosa, Eva; Tassonyi, Edomer; David, Agoston; and Nagy, Nee Zsuzsanna, 4,105,760, Cl. 424-180.000.
- Tate, George W., Jr. Automatic refraction apparatus and method. 4,105,302, Cl. 351-7.000.
- Taupin, Dominique Yves Marie: *See—*
  - Albarda, Scato; Van Der Hoek, Willem; and Taupin, Dominique Yves Marie, 4,106,029, Cl. 346-117.00A.
- Taylor, Ian Charles, to Imperial Chemical Industries Limited. Production of aromatic polyethers. 4,105,636, Cl. 528-126.000.
- Taylor, James Franklin: *See—*
  - Mendoza, Gregory E.; Henthorn, Donald Ray; and Taylor, James Franklin, 4,105,188, Cl. 254-10.500.
- Taylor, Lloyd D.: *See—*
  - Mehta, Avinash C.; Rickter, Donald O.; and Taylor, Lloyd D., 4,105,694, Cl. 260-561.00H.
- Taylor, Paul D., to Celanese Corporation. Production of tetrahydrofuran. 4,105,677, Cl. 260-346.110.
- Taylor, Paul D., to Celanese Corporation. Synthesis of tetrahydrofuran. 4,105,678, Cl. 260-346.110.
- Taylor, William Hunter: *See—*
  - Maslen, John; and Taylor, William Hunter, 4,105,621, Cl. 260-37.00N.
- Technigaz: *See—*
  - Kotcharian, Michel, 4,105,819, Cl. 428-213.000.
- Tektronix, Inc.: *See—*
  - Cleary, Edward Joseph, Jr.; and Reiney, Michael Goodwin, 4,105,932, Cl. 315-377.000.
  - Hill, James A.; and Hargis, David R., 4,105,176, Cl. 248-13.000.
  - Melanson, John Laurence; Springer, Richard Allen; Grimes, Jack Duane; and Gilmore, Jack Arthur, 4,106,011, Cl. 340-365.00E.
- Tele-Quik, Inc.: *See—*
  - Breitbard, Elford Barnett, 4,105,181, Cl. 248-452.000.
- Teledyne, Inc.: *See—*
  - Finley, William Solon, 4,104,950, Cl. 84-462.000.
- Teledyne Industries, Inc.: *See—*
  - Berkovitz, Robert A., 4,105,864, Cl. 179-1.00J.
  - Megy, Joseph Allen; and Propst, Richard Lee, 4,105,469, Cl. 134-3.000.
- Teodoro, Donald J.: *See—*
  - Simons, Wayne K.; and Teodoro, Donald J., 4,105,245, Cl. 280-65.00R.
- Teradyne, Inc.: *See—*
  - Katz, Jonathon H., 4,105,970, Cl. 324-158.00P.
- Teranishi, Takao: *See—*
  - Hohsho, Yukio; Karino, Kimiji; Momono, Masakichi; Oyama, Yoshishige; Yamauchi, Teruo; and Teranishi, Takao, 4,105,720, Cl. 261-34.00A.
- Terbeek, Howard G. Mobile chair. 4,105,242, Cl. 296-20.000.
- Terui, Gyozo; Takada, Nobuo; and Sawada, Shuzo, to Terui, Gyozo. Method for separation of bacteria cells from culture broth. 4,105,804, Cl. 426-656.000.
- Tetsuro, Mano, to Totai Company Limited. Apparatus for cutting a string of sausage links. 4,104,763, Cl. 17-1.00F.
- Texaco Exploration Canada Ltd.: *See—*
  - Anderson, Clarence E., 4,105,049, Cl. 138-44.000.
- Texaco Inc.: *See—*
  - Howlett, Donald L., 4,106,010, Cl. 340-347.0AD.
- Texas Instruments Incorporated: *See—*
  - Williams, Clark R., 4,104,858, Cl. 58-23.00A.
- Textron Inc.: *See—*
  - Kaplan, Stephen J.; and Gaba, Rodolfo, 4,105,562, Cl. 210-232.000.
  - Labecki, Karl W., 4,104,768, Cl. 24-207.000.
  - Sheldon, John D.; and Textron Inc., 4,104,796, Cl. 30-276.000.
- Th. Goldschmidt AG: *See—*
  - Antoni, Gerhard, 4,105,820, Cl. 428-213.000.
  - Koerner, Gotz; and Patzke, Hans-Jurgen, 4,105,567, Cl. 252-8.600.
- Thame, Neville G.: *See—*
  - Lundberg, Robert D.; and Thame, Neville G., 4,104,824, Cl. 47-58.000.
- Thanos, Theologos E., to Westvaco Corporation. Non-crystallizing rosin. 4,105,462, Cl. 106-218.000.
- Thelen, Arthur Bertram: *See—*
  - Heintz, Dennis Ronald; and Thelen, Arthur Bertram, 4,104,840, Cl. 52-309.900.
- Theodores, Theodore P.; and Smolin, Lewis M., to Sudbury Engineering Corporation. Racket. 4,105,205, Cl. 273-73.00J.
- Therond, Jean-Paul, to Commissariat a l'Energie Atomique. Method and device for electronic control with positive safety. 4,105,496, Cl. 176-19.00R.
- Thiel, Alfons W.; and Hell, Hans, to Bellaplast GmbH. Apparatus for the manufacture of thin-walled shaped articles of thermoplastic material. 4,105,386, Cl. 425-217.000.
- Thiel, Frank C. Lock keeper. 4,105,235, Cl. 292-341.180.
- Thiel, Max: *See—*
  - Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
- Thom, Karl Friedrich, to Minnesota Mining and Manufacturing Company. Imidazole type curing agents. 4,105,667, Cl. 260-299.000.
- Thoma, Frank, to Daimler-Benz Aktiengesellschaft. Pneumatic controller for an injection pump, especially for diesel engines. 4,105,002, Cl. 123-140.0MP.
- Thomas, George L., to General Electric Company. High-temperature glass composition. 4,105,826, Cl. 428-379.000.

- Thomas, Heinz: *See—*
  - Muller, Erwin; and Thomas, Heinz, 4,105,600, Cl. 521-129.000.
- Thomas, James L.; and Volpp, Gert P., to FMC Corporation. Flame-retardant copolymers. 4,105,710, Cl. 260-869.000.
- Thomas, Michel: *See—*
  - Romeas, Rene; and Thomas, Michel, 4,106,058, Cl. 358-128.000.
- Thomas, Norman Stanley, to Fairclough Construction Group Limited. Tunnel lining. 4,104,885, Cl. 61-45.00R.
- Thomas, William Anthony: *See—*
  - Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,105,852, Cl. 548-342.000.
- Thompson, Ida M.: *See—*
  - Levey, Virginius T., 4,105,233, Cl. 292-288.000.
- Thompson, Lloyd E., Jr. High current density electrical contact. 4,105,280, Cl. 339-273.00S.
- Thompson, Robert B.: *See—*
  - Alers, George A.; and Thompson, Robert B., 4,104,922, Cl. 73-643.000.
- Thomson-Brandt: *See—*
  - Romeas, Rene; and Thomas, Michel, 4,106,058, Cl. 358-128.000.
- Thomson-CSF: *See—*
  - Bui-Hai, Nhu; and Bourgeois, Alain, 4,106,026, Cl. 343-786.000.
  - Clavelloux, Noel; Peynaud, Francois; and Posseme, Gilles, 4,104,912, Cl. 73-189.000.
  - Lechevin, Rene; and Butin, Henri, 4,105,981, Cl. 329-50.000.
- Thorn Electrical Industries Limited: *See—*
  - Pritchard, Eric Harry; and Passmore, Thomas Rivers, 4,105,931, Cl. 315-278.000.
- Thorneburg Hosiery Mill, Inc.: *See—*
  - Thorneburg, James L., 4,104,892, Cl. 66-185.000.
- Thorneburg, James L., to Thorneburg Hosiery Mill, Inc. Cushioned sole tube sock and method. 4,104,892, Cl. 66-185.000.
- Thornsberry, Willis Lee, Jr.: *See—*
  - Wiewiorowski, Tadeusz Karol; and Thornsberry, Willis Lee, Jr., 4,105,741, Cl. 423-10.000.
- Thrasher, George E., Jr., to Master Pneumatic-Detroit, Inc. Injection lubricating apparatus. 4,105,095, Cl. 184-55.00A.
- Tillotson, LeRoy Conrad: *See—*
  - Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., 4,105,973, Cl. 325-4.000.
- Timashov, Viktor Alexandrovich: *See—*
  - Movchan, Boris Alexeevich; Timashov, Viktor Alexandrovich; and Kljuev, Konstantin Nikolaevich, 4,105,890, Cl. 219-121.0EB.
- Timex Corporation: *See—*
  - Dukas, Sander G., 4,104,872, Cl. 59-79.00R.
- Timo, Dominic P.; Placek, Ronald J.; Gonyea, David C.; Johnson, Lloyd H.; and Kure-Jensen, Jens, to General Electric Company. Bore stress limit index. 4,104,908, Cl. 73-117.300.
- Tirenin, Ivan: *See—*
  - Metelow, Victor; and Tirenin, Ivan, 4,105,217, Cl. 280-28.000.
- Tittes, Hans, deceased: *See—*
  - Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
- Tittes, Marga, Hans-Ulrich Tittes, Gerlach Stephan Tittes, Axel Michael Tittes, heirs: *See—*
  - Schwaab, Manfred; Puschnerat, Helmut; Kluzik, Fritz; Junger, Manfred; Wilding, Ernst; and Tittes, Hans, deceased, 4,104,968, Cl. 101-415.100.
- Tobey, Jimmie Lee: *See—*
  - Hampton, Perry Dwaine; and Tobey, Jimmie Lee, 4,106,030, Cl. 346-140.00R.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Shinozaki, Satoshi; Nishi, Yoshio; and Mizutani, Yoshihisa, 4,106,049, Cl. 357-46.000.
  - Tashiro, Mitsuhiko; Takeno, Shouzou; Mihara, Kakuo; and Kinoshita, Tadayoshi, 4,105,892, Cl. 219-216.000.
- Tolly, Milton C.: *See—*
  - Settineri, William J.; and Tolly, Milton C., 4,105,841, Cl. 526-62.000.
- Tolman, Richard L.: *See—*
  - Bochis, Richard J.; and Tolman, Richard L., 4,105,767, Cl. 424-256.000.
- Tolo, Incorporated: *See—*
  - Pease, Leroy I., 4,105,555, Cl. 210-136.000.
- Tomich, Michael G. Positive hold differential. 4,104,931, Cl. 74-650.000.
- Tominaga, Nobuhide: *See—*
  - Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, 4,105,627, Cl. 260-45.80N.
- Tomlin, Robert Derrick, to Magnatex Limited. Vehicle rear-view mirror with support arm having indexing means at both ends. 4,105,296, Cl. 350-307.000.
- Tomy Kogyo Co., Inc.: *See—*
  - Nakajima, Takamitsu, 4,104,821, Cl. 46-33.000.
- Toomey, John, to Value Engineering Company. Collapsible road barrier. 4,104,980, Cl. 116-63.00P.
- Topla, Inc.: *See—*
  - Nakagawa, Yasuharu, 4,105,734, Cl. 264-132.000.
- Torre, Francesco. Packaging apparatus for packaging articles of different kinds within a film of a heat-shrinkable plastic material. 4,104,848, Cl. 53-184.00S.
- Totai Company Limited: *See—*
  - Tetsuro, Mano, 4,104,763, Cl. 17-1.00F.
- Tousimis, A. J.: *See—*
  - Horne, John E.; Van Albert, Stephen A.; and Tousimis, A. J., 4,104,808, Cl. 34-243.00R.
- Toussaint, Herbert: *See—*
  - Dockner, Toni; Toussaint, Herbert; and Decker, Martin, 4,105,657, Cl. 260-239.00B.
  - Himmele, Walter; Hupfer, Leopold; Toussaint, Herbert; and Paul, Gerhard, 4,105,669, Cl. 260-307.00F.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, 4,105,740, Cl. 264-290.00T.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Hosono, Akira; Isogai, Yoshihisa; Hasegawa, Hitoshi; and Tanahashi, Toshio, 4,104,996, Cl. 123-90.430.
  - Nohira, Hidetaka, 4,104,879, Cl. 60-290.000.
  - Saito, Haruhiko; and Morishita, Michio, 4,105,719, Cl. 261-34.00B.
- Trabitzsch, Hans: *See—*
  - Pennewiss, Horst; Plainer, Hermann; Quis, Peter; Trabitzsch, Hans; Masanek, Juergen; and Jakob, Juergen, 4,105,519, Cl. 204-159.230.
- Trappe, Lieselotte: *See—*
  - Wapelhorst, Friedrich-Wilhelm; and Kalkoff, Heinz-Dieter, 4,105,482, Cl. 156-96.000.
- Trautner, Jurgen; and Kolbe, Peter, to Siemens Aktiengesellschaft. Protection arrangement for a brushless synchronous machine. 4,106,069, Cl. 361-30.000.
- Treadwell Corp.: *See—*
  - Muller, Albert; and Schreiner, John M., 4,105,545, Cl. 210-15.000.
- Tregear, Geoffrey W.: *See—*
  - Colescott, Robert L.; and Tregear, Geoffrey W., 4,105,602, Cl. 260-8.000.
- Treichel, Hans Herbert: *See—*
  - Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,871, Cl. 179-18.0AD.
  - Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,874, Cl. 179-18.0AD.
  - Farrell, John Francis; and Treichel, Hans Herbert, 4,105,876, Cl. 179-18.0AD.
- Trepka, William J.; and Rothlisberger, Alvin C., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,105,714, Cl. 260-879.000.
- Troitsky, Vladimir Alexandrovich: *See—*
  - Lebedev, Vladimir Konstantinovich; Gupalo, Jury Dmitrievich; Troitsky, Vladimir Alexandrovich; Bely, Nikolai Grigorievich; Nagaitsev, Vladimir Alexandrovich; Nudelman, Boris Vladimirovich; Krasnov, Alexandr Ivanovich; Borju, Jury Iosifovich; Parshin, Dmitry Nikolaevich; Zhinzhikov, Pavel Andreevich; and Korneev, Alexandr Nikolaevich, 4,105,964, Cl. 323-43.50S.
- Trost, Wayne C.; and Darsie, Burns, to Barber-Colman Company. Modular construction for triaxial weaving machine. 4,105,052, Cl. 139-101.000.
- Trumbull, Gerald M. Multi-purpose dashboard attachment. 4,105,246, Cl. 296-97.00E.
- Trumpf Maschinen AG: *See—*
  - Herb, Eugen; Petera, Theodor; and Bitzel, Hubert, 4,104,940, Cl. 83-71.000.
- Trutor, John. Articulated enclosure. 4,104,988, Cl. 119-51.00R.
- TRW Inc.: *See—*
  - Jacobs, Leonard, 4,105,277, Cl. 339-95.00R.
- Tseung, Alfred Chan Chung: *See—*
  - Johnson, Alan Stanley William; and Tseung, Alfred Chan Chung, 4,105,530, Cl. 204-290.00R.
- Tsipouras, Panayiotis J., to Megasystems, Inc. Indicated horsepower measurement system for piston engines. 4,104,907, Cl. 73-117.300.
- Tsuchikane, Yoshiyuki: *See—*
  - Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, 4,105,213, Cl. 274-38.000.
- Tsuchiya, Keiji: *See—*
  - Sato, Kazukiyo; Takahashi, Katuo; Kubota, Junjiro; and Tsuchiya, Keiji, 4,105,199, Cl. 271-122.000.
- Tsuge, Chutatsu: *See—*
  - Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
- Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Large aperture zoom lens. 4,105,291, Cl. 350-184.000.
- Tsukushi, Masanori; Kashimura, Katsuichi; Hirasawa, Kunio; and Yoshioka, Yoshio, to Hitachi, Ltd. Magnetic puffer type gas circuit breaker. 4,105,879, Cl. 200-148.00A.
- Tsuruga, Kouji: *See—*
  - Sekiguchi, Tetsuo; Abe, Masami; Tsuruga, Kouji; and Tominaga, Nobuhide, 4,105,627, Cl. 260-45.80N.
- Tuda, Goro; Shimizu, Katsuhiko; Murakami, Tudoi; and Nasu, Syouzi, to Kobe Steel, Ltd. Teach-in method and apparatus for use in an industrial robot. 4,105,937, Cl. 318-568.000.
- Tulip, John. High repetition rate pulsed laser discharge system. 4,105,952, Cl. 331-94.5PE.
- Tunnicliffe, George, to Corning Limited. Pressure vessels. 4,105,061, Cl. 165-1.000.
- Turpin Systems Company: *See—*
  - Land, Robert Perry, 4,106,094, Cl. 364-453.000.
- Turturici, Gaeton Ben. Detachable lamp assembly for dual trailer trucks. 4,106,081, Cl. 362-61.000.
- Tutusaus Almao, Jose Maria. Process for the manufacture of shoes having a wooden base. 4,104,754, Cl. 12-142.00S.

- Tyl, Miloslav: *See—*
  - Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
- Tzakis, George J., to Zenith Radio Corporation. Automatic chroma level system. 4,106,054, Cl. 358-27.000.
- Ube Industries, Ltd.: *See—*
  - Takeuchi, Junji; Itou, Shigeru; and Itou, Kousuke, 4,105,745, Cl. 423-239.000.
- Ueda, Ikuo: *See—*
  - Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,105,781, Cl. 424-283.000.
- Ueshima, Takashi: *See—*
  - Nakamura, Junichi; Konuma, Hiroshi; Kokuryo, Shiro; Ueshima, Takashi; and Tsuge, Chutatsu, 4,105,608, Cl. 260-23.00R.
- Ulbing, Otmar M.; and Koval, Edmund R., to Columbus McKinnon Corporation. Control station switch. 4,105,882, Cl. 200-157.000.
- Ullrich, Robert L. After-cooler accessory unit for internal combustion engine having a carburetor. 4,104,999, Cl. 123-119.0CD.
- Umeda, Junichiro: *See—*
  - Nishino, Atsushi; Hayakawa, Hayashi; Yoshida, Akihiko; and Umeda, Junichiro, 4,105,513, Cl. 204-38.00A.
- Umemoto, Sueo: *See—*
  - Nikaido, Norio; Shirai, Shinji; Iihashi, Mototaka; Umemoto, Sueo; and Suzuki, Kisaku, 4,105,511, Cl. 204-38.00A.
- Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Neothramycin antibiotics. 4,105,658, Cl. 260-239.30T.
- Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, to Fujisawa Pharmaceutical Co., Ltd. Chromone compounds and preparation thereof. 4,105,781, Cl. 424-283.000.
- Unarco Industries, Inc.: *See—*
  - Baugh, Benjamin Charles; Young, Norman R.; and Runnion, Glenmore J., 4,105,096, Cl. 186-1.0AC.
- Unger, Ann. Hand and finger exercise device. 4,105,200, Cl. 272-67.000.
- Unican Electrochemical Products Ltd.: *See—*
  - Arora, Mulk Raj, 4,105,807, Cl. 427-126.000.
- Union Carbide Corporation: *See—*
  - Berger, Sidney Ethan, 4,105,465, Cl. 106-308.00Q.
  - Hill, Clifford W.; Carkhuff, Donald W.; and Pilia, Frank J., 4,105,891, Cl. 219-137.430.
  - Kordesch, Karl Victor, 4,105,830, Cl. 429-27.000.
- Union Oil Company of California: *See—*
  - Showalter, William E., 4,105,253, Cl. 299-4.000.
- Uniroyal, Inc.: *See—*
  - Hunter, Byron Alexander; and Barrows, Franklin Herbert, 4,105,601, Cl. 521-95.000.
- United Kingdom Atomic Energy Authority: *See—*
  - Dearnaley, Geoffrey; and Hartley, Nicholas Edmund Whittam, 4,105,443, Cl. 75-238.000.
- United States Gypsum Company: *See—*
  - Agcaoili, Clarito R., 4,104,829, Cl. 49-409.000.
  - Latakas, Bernard; Copenhefer, John E.; and House, Robert M., 4,105,423, Cl. 55-501.000.
  - Nelsson, Nels, 4,104,938, Cl. 83-5.000.
- United States of America
  - Agriculture: *See—*
    - Andrews, Bethlehem K.; Harper, Robert J., Jr.; and Cashen, Norton A., 4,105,403, Cl. 8-115.000.
    - Jasper, Martin T.; and Koch, Peter, 4,105,397, Cl. 432-90.000.
  - Air Force: *See—*
    - Wirtanen, Theodore E., 4,105,339, Cl. 356-152.000.
  - Army: *See—*
    - Almerini, Achille L., 4,105,836, Cl. 429-194.000.
    - Bard, Charles L.; and Pfitzenmaier, Raymond W., 4,104,953, Cl. 89-14.00E.
    - Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,104,771, Cl. 29-25.140.
    - Dunn, Ralph L., 4,106,014, Cl. 343-5.0SA.
    - Glendinning, William Bernard; and Mark, Albert, 4,105,805, Cl. 427-38.000.
  - Energy: *See—*
    - Bartlett, Rodney J.; and Morrey, John R., 4,105,921, Cl. 250-423.00P.
    - Compton, Robert N.; Reinhardt, Paul W.; and Garrett, William R., 4,105,746, Cl. 423-251.000.
    - Skotheim, Terje A., 4,105,470, Cl. 136-89.0SJ.
  - Health, Education and Welfare: *See—*
    - Hughes, John, 4,105,651, Cl. 260-112.50R.
  - Interior: *See—*
    - Eisele, Judith A.; and Bauer, Donald J., 4,105,747, Cl. 423-263.000.
    - Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.
  - National Aeronautics and Space Administration; administrator; with respect to an invention of:
    - Ryason, Porter R. Solar photolysis of water. 4,105,517, Cl. 204-157.10R.
  - National Aeronautics and Space Administration: *See—*
    - Coffinberry, George A., 4,104,873, Cl. 60-39.28R.
    - Lennon, Carl L.; and Britt, Thomas O., 4,105,966, Cl. 324-113.000.
    - Myers, William N.; and Hein, Leopold A., 4,105,261, Cl. 308-72.000.
  - Navy: *See—*
    - Bornfleth, Jay W., 4,105,258, Cl. 303-93.000.
    - Jernigan, James L., 4,105,953, Cl. 331-94.50Q.
    - Naef, Frederick E., 4,104,883, Cl. 60-641.000.
    - Petersen, Gary L.; and Liedtke, Larry L., 4,104,970, Cl. 102-220.000.
    - Routh, Claude C., 4,105,941, Cl. 330-124.00R.
    - Smith, William R.; and Duchild, Robert H., 4,105,177, Cl. 248-15.000.
  - State: *See—*
    - Driscoll, John S.; Marquez, Victor E.; and Peng, Geoffrey, 4,105,774, Cl. 424-273.00R.
- U.S. Philips Corporation: *See—*
  - Albarda, Scato; Van Der Hoek, Willem; and Taupin, Dominique Yves Marie, 4,106,029, Cl. 346-117.00A.
  - Barten, Piet Gerard Joseph; and Bijma, Jan, 4,105,983, Cl. 335-212.000.
  - Bertrams, Johannes Kurt, deceased; and Mulkens, Casper Antonius Henricus, administrator, 4,105,099, Cl. 191-29.0DM.
  - Lackner, Robert; Melwisch, Harald; and Kurzmann, Helfried, 4,106,063, Cl. 360-38.000.
  - Van Vroenhoven, Petrus Adrianus Wilhelmus, 4,106,057, Cl. 358-128.000.
- United States Postal Service: *See—*
  - McGinn, James W., 4,105,997, Cl. 340-146.3ED.
- United Technologies Corporation: *See—*
  - Ferris, Donald Leroy; and Smith, George Arthur, 4,105,365, Cl. 416-107.000.
- Universal Oil Products Company: *See—*
  - Sorenson, Paul H., 4,105,722, Cl. 261-94.000.
- University College of North Wales: *See—*
  - Last, James David, 4,106,022, Cl. 343-105.00R.
- University of California, The Regents of the: *See—*
  - McIver, Robert T., Jr.; and Ledford, Edward B., Jr., 4,105,917, Cl. 250-291.000.
  - Mehta, Povindar Kumar, 4,105,459, Cl. 106-98.000.
- University of Salford: *See—*
  - Dave, Nalinkumar Jayantilal, 4,105,739, Cl. 264-256.000.
- University of Toledo, The: *See—*
  - Angelbeck, Donald Irvin, 4,105,463, Cl. 106-120.000.
- University of Utah: *See—*
  - Greenleaf, James F.; and Johnson, Steven A., 4,105,018, Cl. 128-2.00V.
- University Patents, Inc.: *See—*
  - Hershel, Ronald S., 4,105,289, Cl. 350-162.0SF.
- UOP Inc.: *See—*
  - Lamberts, Ervins H., 4,105,195, Cl. 267-131.000.
- Upjohn Company, The: *See—*
  - Bundy, Gordon L., 4,105,682, Cl. 260-408.000.
  - Smith, Curtis P., 4,105,642, Cl. 528-51.000.
  - Smith, Curtis P., 4,105,643, Cl. 528-512.000.
- Ursic, Thomas A.: *See—*
  - Antoshkiw, William T.; and Ursic, Thomas A., 4,105,022, Cl. 128-2.05F.
- Urso, Charles J., to Xerox Corporation. Illuminated charge control system for xerographic machines. 4,105,321, Cl. 355-3.0CH.
- Usui, Masahiro: *See—*
  - Mukaiyama, Teruaki; Usui, Masahiro; and Saigo, Kazuhiko, 4,105,673, Cl. 260-343.000.
- Utsumi, Jihaciro, to Bell Ko-On Co., Ltd. Sound movie projector. 4,105,306, Cl. 352-14.000.
- Vache, Marcel, to Application Des Gaz. Portable stoves. 4,105,013, Cl. 126-38.000.
- Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., to Salk Institute for Biological Studies, The. Peptides which effect release of hormones. 4,105,603, Cl. 260-8.000.
- Valmet Oy: *See—*
  - Sailas, Vaino, 4,104,772, Cl. 29-121.400.
  - Sailas, Vaino, 4,104,773, Cl. 29-127.000.
- Value Engineering Company: *See—*
  - Toomey, John, 4,104,980, Cl. 116-63.00P.
- Van Albert, Stephen A.: *See—*
  - Horne, John E.; Van Albert, Stephen A.; and Tousimis, A. J., 4,104,808, Cl. 34-243.00R.
- VanBenthuysen, John D.; Flanders, Thomas W.; and Gietzen, John R., to CTS Corporation. Tandem electrical control. 4,105,988, Cl. 338-132.000.
- Van Der Hoek, Willem: *See—*
  - Albarda, Scato; Van Der Hoek, Willem; and Taupin, Dominique Yves Marie, 4,106,029, Cl. 346-117.00A.
- van der Lely, Cornelis. Tractors and other vehicles. 4,105.085, Cl. 180-43.00R.
- Vanderpool, Billy F.: *See—*
  - Farler, Buist A.; and Vanderpool, Billy F., 4,105,898, Cl. 307-10.0LS.
- Vandervoort, John R., to Eaton Corporation. Transmission. 4,104,928, Cl. 74-331.000.
- van der Werff, Bartele, to A. Vuyk & Zonen's Scheepswerven B.V. Hopper barge having a bottom discharge opening closed by hopper doors. 4,104,979, Cl. 114-36.000.
- Vanderzee, Robert S.: *See—*
  - Hayes, Richard H.; McFarland, Lellan L.; Schrum, George L.; and Vanderzee, Robert S., 4,105,488, Cl. 156-425.000.
- Vanlerberghe, Guy: *See—*
  - Sebag, Henri; and Vanlerberghe, Guy, 4.105,580, Cl. 252-351.000.

- Van Scott, Eugene J.: *See—*
  - Yu, Ruey J.; and Van Scott, Eugene J., 4,105,782, Cl. 424-283.000.
  - Yu, Ruey J.; and Van Scott, Eugene J., 4,105,783, Cl. 424-283.000.
- Van Vliet, Rutherford, Jr., to Raymond Lee Organization, Inc., The, a part interest. Lower back stabilizing device. 4,105,249, Cl. 297-230.000.
- Van Vroenhoven, Petrus Adrianus Wilhelmus, to U.S. Philips Corporation. Dust proof optical system for optically reading and writing on a rotating record with the aid of a radiation beam. 4,106,057, Cl. 358-128.000.
- Van Wagener, Raymond H.; Raasch, Ernest M.; and Loos, Elsio J., to Swingline Inc. Sheet collator device. 4,105,196, Cl. 270-58.000.
- Van Wagner, Edward Milton, to Xerox Corporation. Expandable photoreceptor endbells. 4,105,345, Cl. 403-24.000.
- Vargiu, Silvio; Manzoni, Pier Luigi; Bernasconi, Mario; and Parodi, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Moulding compositions containing a Novolak phenolic resin and an amine-boric acid stabilizer-catalyst. 4,105,604, Cl. 260-17.200.
- Vavrina, Josef: *See—*
  - Laeng, Rudolf; Strausak, Benedikt A.; and Vavrina, Josef, 4,106,082, Cl. 362-87.000.
- Veeck, Stewart J.; Freeman, William R.; and Dardi, Louis E., to Howmet Turbine Components Corporation. Method for consolidating precision shapes. 4,104,782, Cl. 29-527.200.
- Velosa, Joseph M. Safety mat switch for machine tools and their like. 4,105,899, Cl. 307-115.000.
- Velsicol Chemical Corporation: *See—*
  - Anderson, Arnold L.; and Nulph, Robert J., 4,105,632, Cl. 260-45.75D.
- Venero, Agustin F., to Exxon Research & Engineering Co. Metal halogen batteries and method of operating same. 4,105,829, Cl. 429-15.000.
- Vereinigte Aluminium-Werke Aktiengesellschaft: *See—*
  - Helmrich, Gunter; and Wulfing, Fritz, 4,105,729, Cl. 264-71.000.
- Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
  - Riegler, Ernst; and Schmidt, Manfred, 4,105,343, Cl. 403-15.000.
- Vernaleken, Hugo: *See—*
  - Hardt, Dietrich; Serini, Volker; Vernaleken, Hugo; and Braese, Hans-Eberhard, 4,105,711, Cl. 260-873.000.
  - Margotte, Dieter; and Vernaleken, Hugo, 4,105,712, Cl. 260-873.000.
- Viall, Charles S., Jr.: *See—*
  - Viall, Charles S., Sr.; Viall, Charles S., Jr.; and Viall, Harold S., 4,105,237, Cl. 293-73.000.
- Viall, Charles S., Sr.; Viall, Charles S., Jr.; and Viall, Harold S. Vehicle safety braking system. 4,105,237, Cl. 293-73.000.
- Viall, Harold S.: *See—*
  - Viall, Charles S., Sr.; Viall, Charles S., Jr.; and Viall, Harold S., 4,105,237, Cl. 293-73.000.
- Vickers, Michael Alan: *See—*
  - Highley, John; and Vickers, Michael Alan, 4,105,419, Cl. 48-61.000.
- Victor Company of Japan, Ltd.: *See—*
  - Owaki, Isao; Nakamura, Shinji; and Tsuchikane, Yoshiyuki, 4,105,213, Cl. 274-38.000.
- Vigor, Charles W.: *See—*
  - Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,104,787, Cl. 29-596.000.
- Villari, Frank K.: *See—*
  - Libman, Gary; and Villari, Frank K., 4,105,500, Cl. 195-103.50M.
- Vincent, Ogden W. Steam engine with steam heat recovery and steam compression. 4,104,869, Cl. 60-39.550.
- Virag, Robert A., to Baxter Travenol Laboratories, Inc. Intravenous solution set having an air access site and constricted inner diameter portion. 4,105,029, Cl. 128-214.00R.
- Visentin, Andrea. Prefabricated composable duct element. 4,105,051, Cl. 138-162.000.
- Visual Marketing, Inc.: *See—*
  - Deffner, John F.; Wendel, Donald W.; and Barnes, Russell M., 4,105,126, Cl. 211-49.00D.
- Vitt, Theodor: *See—*
  - Schneider, Eberhard; and Vitt, Theodor, 4,105,359, Cl. 408-112.000.
- Vliet, Walter Carl, to Ingersoll-Rand Company. Method and apparatus for fastener tensioning. 4,104,778, Cl. 29-407.000.
- Volkswagenwerk Aktiengesellschaft: *See—*
  - Haar, Richard, 4,105,236, Cl. 293-71.00R.
- Volpp, Gert P.: *See—*
  - Thomas, James L.; and Volpp, Gert P., 4,105,710, Cl. 260-869.000.
- Volstatic of Canada Limited: *See—*
  - Parker, Peter R.; and Allen, Norman G., 4,105,256, Cl. 302-51.000.
- Vomel, Wolfgang: *See—*
  - Berger, Herbert; Gall, Rudi; Stach, Kurt, deceased; Thiel, Max; and Vomel, Wolfgang, 4,105,772, Cl. 424-269.000.
- VonKrusenstierna, Otto; Persson, Anders; and Widell, Marja, to Asea Aktiebolag. Method and system for instantaneously determining the oxygen activity in molten metals. 4,105,507, Cl. 204-1.00T.
- von Oertzen, Klaus; Bien, Hans Samuel, deceased (by Bien, Else, legal representative); and by Bien, Gabriele, legal representative, to Bayer Aktiengesellschaft. Antraquinone dyestuffs. 4,105,662, Cl. 544-294.000.
- Vorbruggen, Helmut: *See—*
  - Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,105,792, Cl. 424-313.000.
- Vyzkumny ustav bavlnarsky: *See—*
  - Mikulecky, Karel; Tyl, Miloslav; Janousek, Jan; Burysek, Frantisek; Skoda, Stanislav; and Esner, Stanislav, 4,104,854, Cl. 57-34.00R.
- Vyzkumny ustav lykovych vlaken Superk: *See—*
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- W. R. Grace & Co.: *See—*
  - Glandon, James L.; and Hall, Stanley D., 4,104,847, Cl. 53-35.000.
- Wachberger, Eugen: *See—*
  - Bernet, Rudolf; Koller, Hans; and Wachberger, Eugen, 4,105,137, Cl. 222-1.000.
- Waddey, Walter E.: *See—*
  - Shaub, Harold; and Waddey, Walter E., 4,105,571, Cl. 252-32.70E.
- Waddington & Duval (Holdings) Limited: *See—*
  - Lane, Charles Anthony; and Lucking, Anthony James, 4,105,141, Cl. 222-143.000.
- Wadford, Thomas R. Door actuating system. 4,104,826, Cl. 49-360.000.
- Wagner, Daniel William: *See—*
  - McLaren, Keir; and Wagner, Daniel William, 4,105,202, Cl. 273-309.000.
- Wagner Electric Corporation: *See—*
  - Atkins, Carl E., 4,106,006, Cl. 340-543.000.
- Wagner, Eugene R.; and Matthews, Donald P., to Dow Chemical Company, The. Hypolipidemic cycloalkylaminobenzoic acids. 4,105,791, Cl. 424-310.000.
- Wainio, Ronald A.: *See—*
  - Date, Kazuo H.; and Wainio, Ronald A., 4,105,878, Cl. 200-146.00R.
- Waire, Aaron O.: *See—*
  - Shaw, Lamont; and Waire, Aaron O., 4,104,741, Cl. 2-185.00R.
- Waku, Shigeru: *See—*
  - Murakami, Toshiaki; Waku, Shigeru; Demura, Akira; and Fujishiro, Toshiaki, 4,105,456, Cl. 106-46.000.
- Wakui, Yoko: *See—*
  - Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, 4,105,810, Cl. 427-248.00C.
- Wales, John: *See—*
  - Wilson, Lional Agustin; Wales, John; and Plumtree, William Ernest George, 4,105,445, Cl. 96-1.50R.
- Walker, Raymond P.: *See—*
  - Shaw, Gustavus W.; and Walker, Raymond P., 4,105,903, Cl. 307-328.000.
- Walker, Richard J. Support device for pipe driller. 4,105,358, Cl. 408-108.000.
- Wallace, Charles E.; and Farmer, Donald J., to Extek Microsystems, Inc. Vacuum head for film. 4,105,331, Cl. 355-103.000.
- Wallace, Earl C.: *See—*
  - Bell, Richard A.; Wallace, Earl C.; and Winters, Ted W., 4,104,747, Cl. 5-37.00R.
- Wallace Murray Corporation: *See—*
  - Spellman, Michael Thomas, 4,105,366, Cl. 416-132.00A.
- Waller, John G. Container loading machine and process. 4,104,846, Cl. 53-26.000.
- Wallrabenstein, Michael: *See—*
  - Behnke, Joachim; Frank, Dieter; and Wallrabenstein, Michael, 4,105,620, Cl. 260-37.00N.
- Walter, Allen R.: *See—*
  - Grimm, Donald K.; Savold, Wayne A.; and Walter, Allen R., 4,106,093, Cl. 364-424.000.
- Walter, Karl-Heinz: *See—*
  - Geffcken, Walter; Krueger, Hans; and Walter, Karl-Heinz, 4,105,288, Cl. 350-350.000.
- Walton, Peter Leslie: *See—*
  - .Hughes, Clifford Ronald; Jackson, Stephen John; Preston, John; and Walton, Peter Leslie, 4,105,790, Cl. 424-309.000.
- Wang, Richard H. S.; and Irick, Gether, Jr., to Eastman Kodak Company. Multichromophoric ultraviolet stabilizers and their use in organic compositions. 4,105,631, Cl. 260-45.80A.
- Wang, Shing Chung; and Hamerdinger, Randolph W., to Xerox Corporation. Double-confined multiple anode hollow cathode laser. 4,105,954, Cl. 331-94.5PE.
- Wang, Su-Sun: *See—*
  - Meienhofer, Johannes Arnold; and Wang, Su-Sun, 4,105,652, Cl. 260-112.50R.
- Wang, Yen; and Chang, Wen-Hsuan, to Yen Wang. Surgical support. 4,105,025, Cl. 128-90.000.
- Wankel GmbH: *See—*
  - Schindelhauer, Gerhard, 4,105,375, Cl. 418-54.000.
- Wapelhorst, Friedrich-Wilhelm; and Kalkoff, Heinz-Dieter, to Trappe, Lieselotte. Method of vulcanizing a prevulcanized tread. 4,105,482, Cl. 156-96.000.
- Ward Aero, Inc.: *See—*
  - Davitt, Joseph J., 4,105,044, Cl. 137-517.000.
- Ward, Terence James, to John Wyeth & Brother Limited. Piperidine derivatives. 4,105,666, Cl. 260-293.770.
- Ward, Terence James: *See—*
  - Archibald, John Leheup; and Ward, Terence James, 4,105,771, Cl. 424-267.000.
- Warden, Lowell W.: *See—*
  - King, Junior Keith; and Warden, Lowell W., 4,105,355, Cl. 404-114.000.
- Warren, David, to Lightning Fasteners Limited. Sliding clasp fastener. 4,104,767, Cl. 24-205.11R.

Wasco Products, Inc.: *See—*
  Anghinetti, Joseph R.; and Couture, Paul A., 4,104,834, Cl. 52-1.000.
Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments for cosmetic or dentifrice use and methods for their production. 4,105,757, Cl. 424-49.000.
Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., to United States of America, Interior. Method of and apparatus for manipulating line weight in an image. 4,105,328, Cl. 355-78.000.
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  Cho, Kichinosuke; and Watanabe, Tsutomu, 4,105,802, Cl. 426-329.000.
Waters, Fred L. Floating wave powered pump. 4,105,368, Cl. 417-53.000.
Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,105,506, Cl. 203-9.000.
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  Brucken, Byron L.; and Watt, Roy E., 4,105,370, Cl. 417-222.000.
Watt, William R., to American Can Company. Photoinitiator free inks and method. 4,105,806, Cl. 427-44.000.
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Weemes, Doyle A.; and McConnell, Richard L., to Eastman Kodak Company. Peroxide treated substantially amorphous polyolefin/hydrocarbon rubber blends useful as pressure-sensitive adhesives. 4,105,718, Cl. 260-889.000.
Wehage, Charles H.: *See—*
  Chihak, Paul P.; and Wehage, Charles H., 4,106,018, Cl. 343-12.00A.
Wehle, Volker; and Reiffert, Jurgen, to Henkel Kommanditgesellschaft auf Aktien. Method and composition for inhibiting corrosion of metals in contact with water. 4,105,405, Cl. 21-2.70R.
Weibull,. Torsten Waloddi. Door device in goods depots or the like. 4,104,836, Cl. 52-64.000.
Weidenaar, Bernard E., to Atlantic Richfield Company. Vapor sealing means for fuel dispensing nozzles. 4,105,054, Cl. 141-311.00R.
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  Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,871, Cl. 179-18.0AD.
  Ely, Edwin Rowland; Weigand, David Moore; and Treichel, Hans Herbert, 4,105,874, Cl. 179-18.0AD.
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  Anderson, Arnold E.; and Weintraub, Marvin H., 4,105,473, Cl. 148-6.000.
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  Hage, C. Herbert; Welch, Robert J.; and Goulish, Gabriel, 4,104,838, Cl. 52-239.000.
Wells, Thomas R.; and Dahlen, Theodore E., to Bell & Howell Company. Carriage mechanism for microfiche reader. 4,105,312, Cl. 353-27.00R.
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Welz, Albert W., Jr.: *See—*
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Wernig, Fred E. Game of logic. 4,105,211, Cl. 273-237.000.
Wessel, Wolf; and Ripper, Wolfgang, to Robert Bosch GmbH. Fuel injection mechanism. 4,105,000, Cl. 123-139.0AW.
West, Edward L.; and Clutter, Melvin E., to A. B. Chance Company. High current grounding assembly having rigid interconnecting conductors. 4,105,272, Cl. 339-14.00L.
Westinghouse Electric Corp.: *See—*
  Cookson, Alan H.; Kemeny, George A.; and Bolin, Philip C., 4,105,859, Cl. 174-14.00R.
  Culbertson, Charles H., 4,105,939, Cl. 318-599.000.
  Dickinson, John D., 4,105,093, Cl. 184-6.110.
  Evans, George S., 4,105,910, Cl. 313-490.000.
  Fey, Maurice G., 4,105,888, Cl. 219-121.00P.
  Fox, Richard Q.; Millholen, James I.; and McWhirter, John H., 4,106,097, Cl. 364-492.000.
  Gogniat, Theodore; and Cotton, John F., 4,105,986, Cl. 337-3.000.
  Kowalik, Peter M.; and Milianowicz, Stanislaw A., 4,105,881, Cl. 200-148.00B.
  Nathanson, Harvey C.; and Sopira, Michael M., 4,106,046, Cl. 357-30.000.
  Smith, James D. B.; and Kauffman, Robert N., 4,105,984, Cl. 336-60.000.
  Sun, Shan C.; and Church, Larry L., 4,106,071, Cl. 361-79.000.
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Whelan, James P., to Ad-Tec Products, Inc. Paint strainer. 4,105,564, Cl. 210-497.00R.
Whight, Leonard A. Clean towel presenting machine. 4,104,814, Cl. 38-2.000.
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Whittingham, Thomas Anthony; and Farmery, Michael John, to National Research Development Corporation. Ultrasonic radiation balance. 4,104,923, Cl. 73-646.000.
Wick, Richard; Stemme, Otto; Lermann, Peter; and Schultheiss, Karl-Heinz, to AGFA-Gevaert AG. Accessory unit for photographic apparatus. 4,106,036, Cl. 354-83.000.
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Wiewiorowski, Tadeusz Karol; and Thornsberry, Willis Lee, Jr., to Freeport Minerals Company. Process for recovery of uranium from wet process phosphoric acid. 4,105,741, Cl. 423-10.000.
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Wilson, Ronald. Starter motors. 4,104,926, Cl. 74-6.000.
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Winter, Roland A. E., to Ciba-Geigy Corporation. Epoxy resins flameproofed with 1,2-oxaphospholanes. 4,105,630, Cl. 260-45.80R.
Winter, Roland A. E., to Ciba-Geigy Corporation. α,β-Unsaturated schiff-base chain extension reactions for high temperature polymers. 4,105,646, Cl. 528-311.000.
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Wolff, Friedrich. Reflector for use in sunlamps or the like. 4,106,083, Cl. 362-217.000.
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  Urso, Charles J., 4,105,321, Cl. 355-3.0CH.
  Van Wagner, Edward Milton, 4,105,345, Cl. 403-24.000.
  Wang, Shing Chung; and Hamerdinger, Randolph W., 4,105,954, Cl. 331-94.5PE.
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Yamazaki, Hiroshi; and Izawa, Minoru, to Kabushiki Kaisha Seikosha. Apparatus for generating an alarm sound. 4,104,862, Cl. 58-38.00R.
Yamazaki, Masahiro, to Nippon Zeon Co., Ltd. Method of embedding an end of a bundle of thread-like bodies in a molding material and controlling capillary action by said material. 4,105,731, Cl. 264-94.000.
Yamazaki, Takeo; Wakui, Yoko; and Kosugi, Tetuo, to Hitachi, Ltd. Chemical vapor deposition methods of depositing zinc boro-silicated glasses. 4,105,810, Cl. 427-248.00C.
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Yarbrough, Grover A., to Electronic Data Systems, Inc. Electrical usage display system. 4,106,095, Cl. 364-464.000.
Yasuda, Hiroshi; Tani, Katsuya; and Nagatamo, Jiro, to Toyo Boseki Kabushiki Kaisha. Process for the production of polyester fiber. 4,105,740, Cl. 264-290.00T.
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Yerkes, John W.; and Avery, James E., to Arco Solar, Inc. Solar cell with improved printed contact and method of making the same. 4,105,471, Cl. 136-89.0CC.
Yevick, George J., to Izon Corporation. Pinhole microfiche recorder and viewer. 4,105,318, Cl. 353-120.000.
Yoda, Kazuhiro; and Nakamura, Michiaki, to Kabushiki Kaisha Daini Seikosha. Electronic stop watch. 4,104,861, Cl. 58-38.00R.
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- Yoshioka, Yoshio: *See—*
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- Yoshizawa, Toshio: *See—*
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- Yosumi, Toshikazu: *See—*
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- Young, George Bartholomew. Fipple block for musical recorders. 4,104,948, Cl. 84-380.00C.
- Young, James Arthur, Jr.: *See—*
  - Arnold, Hamilton Webster; Tillotson, LeRoy Conrad; and Young, James Arthur, Jr., 4,105,973, Cl. 325-4.000.
- Young, Norman R.: *See—*
  - Baugh, Benjamin Charles; Young, Norman R.; and Runnion, Glenmore J., 4,105,096, Cl. 186-1.0AC.
- Young Windows Inc.: *See—*
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- Ypma, John E.: *See—*
  - Wolfshagen, Ronald G.; Ypma, John E.; Murray, Glen W.; and Chen, Thomas T., 4,106,106, Cl. 365-2.000.
- Yu, Ruey J.; and Van Scott, Eugene J. Treatment of acne and dandruff. 4,105,782, Cl. 424-283.000.
- Yu, Ruey J.; and Van Scott, Eugene J. Therapeutic treatment of dry skin. 4,105,783, Cl. 424-283.000.
- Yuter, Seymour C.: *See—*
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- Zachary, Richard E., to Dow Chemical Company, The. Leak detecting apparatus. 4,104,905, Cl. 73-40.000.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
  - Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,105,658, Cl. 260-239.30T.
- Zanella, Giuseppe; and Mancini, Luciano, to Montedison S.p.A. Process for preparing fibrils for use in the manufacture of paper. 4,105,727, Cl. 264-12.000.
- Zeek, Richard M.: *See—*
  - Bell, Albert H., III; and Zeek, Richard M., 4,105,062, Cl. 165-9.000.
- Zehender, Ernst: *See—*
  - Blaich, Bernhard; Zehender, Ernst; and Kerner, Karl, 4,105,821, Cl. 428-215.000.
- Zeidler, Gunter; and Gunther, Christian, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Lubricating oil system. 4,105,092, Cl. 184-6.400.
- Zenger, Alfred John: *See—*
  - Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,104,976, Cl. 112-121.110.
- Zenith Radio Corporation: *See—*
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  - Tzakis, George J., 4,106,054, Cl. 358-27.000.
- Zhinzhikov, Pavel Andreevich: *See—*
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- Ziegler, Horst: *See—*
  - Caspar, Heinz; Kudritzki, Felix; and Ziegler, Horst, 4,104,924, Cl. 73-716.000.
- Zimmermann, Heinz; and Martens, Wolfgang, to Hertel, Gunther; and Hertel, Karl Gustav. Processing roller having reinforcing jacket of hard metal. 4,105,264, Cl. 308-20.000.
- Zimmermann, Rolf: *See—*
  - Jung, Albert; Hultzsch, Kurt; Zimmermann, Rolf; and Reese, Johannes, 4,105,610, Cl. 260-27.0BB.
- Zimmermann, Werner Josef, to Windmoller & Holscher. Cooling apparatus for air cooling tubular plastics film made by a film blowhead. 4,105,380, Cl. 425-72.00R.
- Zink, John S.: *See—*
  - Reed, Robert D.; Zink, John S.; and Schwartz, Robert E., 4,105,394, Cl. 431-202.000.
- Zorker, Richard J.: *See—*
  - Wasson, Joe R.; Pressley, Joseph R.; Baker, Robert W.; Fairaizl, Joseph H.; and Zorker, Richard J., 4,105,328, Cl. 355-78.000.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1978

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- Armco Steel Corporation: *See—*
  - Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.
- Bellandi, Gianfranco: *See—*
  - Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, Re. 29,721, Cl. 222-105.000.
- Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., to Armco Steel Corporation. Method of coating carbon steel. Re. 29,726, Cl. 427-320.000.
- Caterpillar Tractor Co.: *See—*
  - Haslett, Glenn M.; and Reinsma, Harold L., Re. 29,723, Cl. 305-57.000.
- Cheetham, Ian: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.
- Chokshi, Vibhas: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibbas, Re. 29,724, Cl. 8-39.00B.
- Compton, Thomas A.: *See—*
  - Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.
- Dunbar, Frank C.: *See—*
  - Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.
- Dunkerley, Kenneth: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.
- Eckersley, Dennis: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.
- Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Time correcting apparatus for an electronic timepiece. Re. 29,720, Cl. 58-23.00R.
- Fujita, Kinji, to Kabushiki Kaisha Suwa Seikosha. Digital display device. Re. 29,727, Cl. 340-336.000.
- General Signal Corporation: *See—*
  - McEathron, Eugene Douglas, Re. 29,722, Cl. 303-37.000.
- Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, to Imperial Chemical Industries Limited. Dyeing process. Re. 29,724, Cl. 8-39.00B.
- Haslett, Glenn M.; and Reinsma, Harold L., to Caterpillar Tractor Co. Resilient mid-pitch lug for an endless track. Re. 29,723, Cl. 305-57.000.
- Imperial Chemical Industries Limited: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.
- Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., to Du Pont de Nemours, E. I., and Company. Analytical test pack and process for analysis. Re. 29,725, Cl. 23-230.00R.
- Kabushiki Kaisha Suwa Seikosha: *See—*
  - Fujita, Kinji, Re. 29,720, Cl. 58-23.00R.
  - Fujita, Kinji, Re. 29,727, Cl. 340-336.000.
- McEathron, Eugene Douglas, to General Signal Corporation. Fluid brake control system. Re. 29,722, Cl. 303-37.000.
- Montedison S.p.A.: *See—*
  - Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, Re. 29,721, Cl. 222-105.000.
- Nadeau, Richard G.: *See—*
  - Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.
- Newton, David Francis: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.
- Nieuweboer, Gerrit: *See—*
  - Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.
- Phillips, Duncan Adrian Sidney: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.
- Pierson, Marvin B.: *See—*
  - Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., Re. 29,726, Cl. 427-320.000.
- Reinsma, Harold L.: *See—*
  - Haslett, Glenn M.; and Reinsma, Harold L., Re. 29,723, Cl. 305-57.000.
- Truett, William L.: *See—*
  - Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., Re. 29,725, Cl. 23-230.00R.
- Ukmar, Luigi; Agostini, Mario; and Bellandi, Gianfranco, to Montedison S.p.A. Plastic bag and a protective container therefor and a fixture for securing the bag in the container. Re. 29,721, Cl. 222-105.000.
- Williams, Gerald: *See—*
  - Greenhalgh, Colin William; Newton, David Francis; Eckersley, Dennis; Cheetham, Ian; Phillips, Duncan Adrian Sidney; Dunkerley, Kenneth; Williams, Gerald; and Chokshi, Vibhas, Re. 29,724, Cl. 8-39.00B.

LIST OF PLANT PATENTEES

- Pan-American Plant Company: *See—*
  - Shoesmith, Leonard H., 4,289, Cl. 76.000.
  - Shoesmith, Leonard H., 4,290, Cl. 78.000.
- Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum plant named Loyalty. 4,289, 8-8-78, Cl. 76.000.
- Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named British Gold. 4,290, 8-8-78, Cl. 78.000.

LIST OF DESIGN PATENTEES

- Adams, Donald Gilbert. Portable high chair. 248,799, 8-8-78, Cl. D6-9.000.
- Aesch, Harold, Jr.: *See—*
  - Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.
- Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., to Aesch, Harold W., Sr.; Aesch, Harold W., Jr.; Welch, Darrell N.; Saha, Asis K.; and Pollet, John B., part interest to each. Buoy. 248,840, 8-8-78, Cl. D10-107.000.
- Aesch, Harold W., Jr.: *See—*
  - Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.
- Aesch, Harold W., Sr.: *See—*
  - Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.
- Aladdin Industries, Incorporated: *See—*
  - Bridges, John A., 248,805, Cl. D6-136.000.
  - Bridges, John A., 248,806, Cl. D6-136.000.
- American Optical Corporation: *See—*
  - Johnsen, David W., 248,861, Cl. D16-65.000.
- American Thermometer Co., Inc.: *See—*
  - Hutten, James E., 248,837, Cl. D10-57.000.
- Anderson, Charles F.: *See—*
  - Canfield, Vernon C.; and Anderson, Charles F., 248,807, Cl. D6-157.000.
- Anderson, Victor F., to Shell Oil Company. Jug. 248,829, 8-8-78, Cl. D9-44.000.
- Anderson, Victor F., to Shell Oil Company. Jug. 248,830, 8-8-78, Cl. D9-52.000.
- Anderson, Victor F., to Shell Oil Company. Jug. 248,831, 8-8-78, Cl. D9-52.000.
- Anderson, Victor F., to Shell Oil Company. Bottle. 248,836, 8-8-78, Cl. D9-167.000.
- Andersson, Bengt. Paper press for waste. 248,857, 8-8-78, Cl. D15-123.000.
- Andrews, Francis: *See—*
  - Sussman, Philip; and Andrews, Francis, 248,865, Cl. D19-43.000.
- Asaki, James T., to International Telephone & Telegraph Corporation. C. B. Radio. 248,855, 8-8-78, Cl. D14-75.000.
- Asaki, James T., to International Telephone & Telegraph Corporation. Photoflash attachment for cameras. 248,859, 8-8-78, Cl. D16-42.000.
- Ball Corporation: *See—*
  - Campbell, William B., 248,843, Cl. D11-127.000.
  - Campbell, William B., 248,844, Cl. D11-128.000.
- Bayly, Peter Kingsley, to Wiltshire Cutlery Company Proprietary Ltd. Nut cracker. 248,814, 8-8-78, Cl. D7-98.000.
- Beecham, Inc.: *See—*
  - Goldschmidt, Willfred; and Kittrell, Wiley Alan, 248,827, Cl. D9-2.000.
- Benkoe, Elisabeth, executrix: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- Benkoe, Erwin, deceased: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- Berg, Albert T., Jr.; and Langlie, Howard. Electric fence extender for wooden posts. 248,850, 8-8-78, Cl. D13-17.000.
- Berg, Albert T., Jr.: *See—*
  - Langlie, Howard; and Berg, Albert T., Jr., 248,851, Cl. D13-18.000.
- Bergquist, Brice E.: *See—*
  - White, Robert E.; and Bergquist, Brice E., 248,845, Cl. D12-25.000.
- Bliven, Albert B.: *See—*
  - Stage, James C.; Bliven, Albert B.; and Wohlhueter, James E., 248,846, Cl. D12-156.000.
- Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modular tray. 248,805, 8-8-78, Cl. D6-136.000.
- Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modular tray. 248,806, 8-8-78, Cl. D6-136.000.
- Brookes, Malcolm J.: *See—*
  - Spranger, Douglas M.; Brookes, Malcolm J.; and Schmidt, Peter O., 248,860, Cl. D16-62.000.
- Budd, James M. Cut tree holder. 248,804, 8-8-78, Cl. D6-105.000.
- Burke, Jacob Benjamin: *See—*
  - Rosen, Ziva Grushevsky; and Burke, Jacob Benjamin, 248,882, Cl. D34-5.0MM.
- Campbell, William B., to Ball Corporation. Christmas ornament. 248,843, 8-8-78, Cl. D11-127.000.
- Campbell, William B., to Ball Corporation. Christmas ornament. 248,844, 8-8-78, Cl. D11-128.000.
- Canfield, Vernon C.; and Anderson, Charles F. Multiple station service counter. 248,807, 8-8-78, Cl. D6-157.000.
- Cbesley, Ronald F.: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- Chicago Pneumatic Tool Company: *See—*
  - Roth, Robert D.; and Schaedler, Raymond J., 248,820, Cl. D8-61.000.
- Christer Odvik AB: *See—*
  - Forsman, Tore Alexander; and Odvik, Christer, 248,871, Cl. D24-31.000.
- Comensoli, Leo; and Smythe, Gloria Dawn, to Speedo Knitting Mills Pty Ltd. Fabric. 248,89J, 8-8-78, Cl. D92-1.00K.
- Concord Laboratories: *See—*
  - Raitto, Russell G., 248,873, Cl. D24-99.000.
- Conwed Corporation: *See—*
  - Eckerline, Austin, 248,823, Cl. D8-J82.000.
- Crawford, Ralph W.: *See—*
  - Spengler, Duane E.; and Crawford, Ralph W., 248,889, Cl. D34-15.0LL.
- Dacey, Norman F. Fire grate. 248,818, 8-8-78, Cl. D7-207.000.
- Day, Ronald Henry, to Hille International Limited. Chair shell. 248,810, 8-8-78, Cl. D6-197.000.
- Ditto, Donald R. Spreading tree plaque. 248,842, 8-8-78, Cl. D11-118.000.
- Driscoll, James R. Table. 248,798, 8-8-78, Cl. D6-177.000.
- Dunhill Lighters Limited: *See—*
  - Harris, Anthony Roberts, 248,877, Cl. D27-36.000.
- Eckerline, Austin, to Conwed Corporation. Room divider connector or similar device. 248,823, 8-8-78, Cl. D8-382.000.
- Eiserman, John H. Double ended vacuum bottle. 248,812, 8-8-78, Cl. D7-77.000.
- Estate of Erwin Benkoe: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Cbesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- Everitt, Delmar K.: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- F & B Manufacturing, Inc.: *See—*
  - Poe, H. Gerald, 248,821, Cl. D8-107.000.
- Famolare, Inc.: *See—*
  - Famolare, Joseph P., Jr., 248,796, Cl. D2-322.000.
- Famolare, Joseph P., Jr., to Famolare, Inc. Shoe sole. 248,796, 8-8-78, Cl. D2-322.000.
- FBK Industries, Inc.: *See—*
  - Korsmeyer, Fred B., 248,835, Cl. D9-159.000.
- Fiat Motors of North America: *See—*
  - Kozloski, Edward A., 248,849, Cl. D12-209.000.
- Forsman, Tore Alexander; and Odvik, Christer, to Toringe Consult AB; and Christer Odvik AB. Surgical instrument tray. 248,871, 8-8-78, Cl. D24-31.000.
- Foxworthy, Theodore David. Game board. 248,884, 8-8-78, Cl. D34-5.0SS.
- Fratelli Saporiti: *See—*
  - Offredi, Giovanni, 248,808, Cl. D6-169.000.
- Frick, William G. Surface mount indicia display apparatus. 248,895, 8-8-78, Cl. D96-12.00R.
- Friedrich, Richard D.: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- Fuji Photo Film Co., Ltd.: *See—*
  - Fukuda, Hiroshi, 248,858, Cl. D16-06.000.
- Fukuda, Hiroshi, to Fuji Photo Film Co., Ltd. Camera. 248,858, 8-8-78, Cl. D16-06.000.
- Futami, Victor K. Retractable shoe cleaner. 248,816, 8-8-78, Cl. D7-182.000.
- Gemco-Ware Inc.: *See—*
  - Schlessel, Walter, 248,811, Cl. D7-53.000.
- Goldfarb, Adolph: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 248,881, Cl. D34-4.00R.
- Goldfarb, Adolph E.; Benkoe, Erwin, deceased (Benkoe, Elisabeth, executrix); Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., to Goldfarb, Adolph; and Estate of Erwin Benkoe. Toy figure. 248,881, 8-8-78, Cl. D34-4.00R.
- Goldschmidt, Willfred; and Kittrell, Wiley Alan, to Beecham, Inc. Combined bottle and breakaway closure. 248,827, 8-8-78, Cl. D9-2.000.
- Gonzales, Rafael L. Leg holster. 248,866, 8-8-78, Cl. D22-13.000.
- Gremlin Industries, Inc.: *See—*
  - Pogue, Lonnie C., 248,885, Cl. D34-5.00L.
- Halm, Hans. Razor. 248,878, 8-8-78, Cl. D28-46.000.
- Hamasaki, Yoshihiro: *See—*
  - Taitani, Hirotsune; and Hamasaki, Yoshihiro, 248,848, Cl. D12-209.000.
- Hare, Kenneth H. Contour hoe. 248,819, 8-8-78, Cl. D8-11.000.
- Harris, Anthony Roberts, to Dunhill Lighters Limited. Lighter. 248,877, 8-8-78, Cl. D27-36.000.
- Hass, Martin A. Dental locator for positioning denture. 248,870, 8-8-78, Cl. D24-10.000.
- Hill, David E. Pet house. 248,879, 8-8-78, Cl. D30-1.000.
- Hille International Limited: *See—*
  - Day, Ronald Henry, 248,810, Cl. D6-197.000.
- Honeywell Inc.: *See—*
  - Pasquarette, Ralph E.; and Wolfe, Norbert Thomas, 248,838, Cl. D10-60.000.

- Hultberg, Ake Albin. Ashtray. 248,876, 8-8-78, Cl. D27-27.000.
- Hutten, James E., to American Thermometer Co., Inc. Desk thermometer. 248,837, 8-8-78, Cl. D10-57.000.
- Iceton, John. Electrical terminal. 248,852, 8-8-78, Cl. D13-24.000.
- Imai, Yoshio; and Koizumi, Katsumi, to Kabushiki Kaisha Sannohashi Seisakusho. Bolt. 248,824, 8-8-78, Cl. D8-387.000.
- International Telephone & Telegraph Corporation: *See—*
  - Asaki, James T., 248,855, Cl. D14-75.000.
  - Asaki, James T., 248,859, Cl. D16-42.000.
  - Spranger, Douglas M.; Brookes, Malcolm J.; and Schmidt, Peter O., 248,860, Cl. D16-62.000.
- Iselin, R. Duane, to Mobi Corporation. Adult's chair. 248,802, 8-8-78, Cl. D6-66.000.
- Johnsen, David W., to American Optical Corporation. Spectacles frame front. 248,861, 8-8-78, Cl. D16-65.000.
- Johnson & Johnson: *See—*
  - Turner, Robert B., 248,839, Cl. D10-60.000.
- Kabushiki Kaisha Sannohashi Seisakusho: *See—*
  - Imai, Yoshio; and Koizumi, Katsumi, 248,824, Cl. D8-387.000.
- Kadota, Toshihiko: *See—*
  - Walz, David K.; and Kadota, Toshihiko, 248,853, Cl. D14-3.000.
- Kailey, John C. Display rack. 248,809, 8-8-78, Cl. D6-188.000.
- Kato, Yuji, to Tomy Kogyo Co., Inc. Toy vehicle. 248,886, 8-8-78, Cl. D34-15.0AJ.
- Kittrell, Wiley Alan: *See—*
  - Goldschmidt, Willfred; and Kittrell, Wiley Alan, 248,827, Cl. D9-2.000.
- Koizumi, Katsumi: *See—*
  - Imai, Yoshio; and Koizumi, Katsumi, 248,824, Cl. D8-387.000.
- Kongo Co., Ltd.: *See—*
  - Taniwaki, Genshi, 248,822, Cl. D8-354.000.
- Korsmeyer, Fred B., to FBK Industries, Inc. Bottle or the like. 248,835, 8-8-78, Cl. D9-159.000.
- Kozloski, Edward A., to Fiat Motors of North America. Wheel. 248,849, 8-8-78, Cl. D12-209.000.
- Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 248,833, 8-8-78, Cl. D9-101.000.
- Langlie, Howard; and Berg, Albert T., Jr. Corner insulator for electric fences. 248,851, 8-8-78, Cl. D13-18.000.
- Langlie, Howard: *See—*
  - Berg, Albert T., Jr.; and Langlie, Howard, 248,850, Cl. D13-17.000.
- Lanier Business Products, a Division of Oxford Industries Inc.: *See—*
  - Walz, David K.; and Kadota, Toshihiko, 248,853, Cl. D14-3.000.
- Lehtola, Erkki Topias, to Oy Tahka AB. Link unit for a conveyor chain. 248,826, 8-8-78, Cl. D8-499.000.
- Long, Sidney A. Combined menu and tray support or the like. 248,894, 8-8-78, Cl. D96-12.00R.
- Mark-Tex Corporation: *See—*
  - Sussman, Philip; and Andrews, Francis, 248,865, Cl. D19-43.000.
- MB Royal Group, Inc.: *See—*
  - Redmer, Wilbert W., 248,825, Cl. D8-395.000.
- McAllister, Jack G. Combined paddle and bat. 248,883, 8-8-78, Cl. D34-5.0SP.
- Miyamoto, Naoyoshi. Combined mechanical pencil and pointer. 248,862, 8-8-78, Cl. D19-36.000.
- Miyamoto, Naoyoshi. Combined ball point pen and pointer. 248,863, 8-8-78, Cl. D19-36.000.
- Mizoguchi, Tetsuro, to Sanyei Corporation. Hamburger cooker. 248,813, 8-8-78, Cl. D7-88.000.
- Mizoguchi, Tetsuro, to Sanyei Corporation. Grill plate for a cooking utensil. 248,815, 8-8-78, Cl. D7-129.000.
- Mobi Corporation: *See—*
  - Iselin, R. Duane, 248,802, Cl. D6-66.000.
- Montigny, Joseph W. Reflective pavement marker. 248,841, 8-8-78, Cl. D10-113.000.
- Morgan, Fred Ferdinand, to Societe d'Assistance Technique pour Produits Nestle S.A. Bottle. 248,834, 8-8-78, Cl. D9-114.000.
- Newton, Geral H. Combined shelf and towel rings. 248,803, 8-8-78, Cl. D6-91.000.
- Odvik, Christer: *See—*
  - Forsman, Tore Alexander; and Odvik, Christer, 248,871, Cl. D24-31.000.
- Offredi, Giovanni, to Fratelli Saporiti. Combined shelf and cabinet unit. 248,808, 8-8-78, Cl. D6-169.000.
- Olympus Optical Company Ltd.: *See—*
  - Walz, David K.; and Kadota, Toshihiko, 248,853, Cl. D14-3.000.
- Owens-Illinois, Inc.: *See—*
  - Kretz, Edward J., 248,833, Cl. D9-101.000.
  - Weckman, Richard L., 248,828, Cl. D9-42.000.
  - Weckman, Richard L., 248,832, Cl. D9-60.000.
- Oy Tahka AB: *See—*
  - Lehtola, Erkki Topias, 248,826, Cl. D8-499.000.
- PACCAR Inc.: *See—*
  - Stage, James C.; Bliven, Albert B.; and Wohlhueter, James E., 248,846, Cl. D12-156.000.
- Pacific Handy Cutter, Inc.: *See—*
  - Sanders, Theodore, 248,797, Cl. D2-400.000.
- Pasquarette, Ralph E.; and Wolfe, Norbert Thomas, to Honeywell Inc. Round thermostat guard. 248,838, 8-8-78, Cl. D10-60.000.
- Pfleger, Marilyn J. Purse. 248,891, 8-8-78, Cl. D87-3.00F.
- Pfleger, Marilyn J. Purse. 248,892, 8-8-78, Cl. D87-3.00F.
- Podjan, Walter H. Birdhouse. 248,880, 8-8-78, Cl. D30-3.000.
- Poe, H. Gerald, to F & B Manufacturing, Inc. Handle for a power tool or similar article. 248,821, 8-8-78, Cl. D8-107.000.
- Pogue, Lonnie C., to Gremlin Industries, Inc. Video game cabinet. 248,885, 8-8-78, Cl. D34-5.00L.
- Pollet, John B.: *See—*
  - Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.
- Prause, Dan. Combined fence and gate. 248,874, 8-8-78, Cl. D25-39.000.
- Quaker Oats Company, The: *See—*
  - Spengler, Duane E.; and Crawford, Ralph W., 248,889, Cl. D34-15.0LL.
- Raitto, Russell G., to Concord Laboratories. Blood gas syringe stopper 248,873, 8-8-78, Cl. D24-99.000.
- Redmer, Wilbert W., to MB Royal Group, Inc. Message holder. 248,825, 8-8-78, Cl. D8-395.000.
- Ripple, Warren. Speaker enclosure. 248,854, 8-8-78, Cl. D14-30.000.
- Risher, Charles J. Air purifier. 248,869, 8-8-78, Cl. D23-149.000.
- Rosen, Ziva Grushevsky; and Burke, Jacob Benjamin. Hand pointer for a game or similar article. 248,882, 8-8-78, Cl. D34-5.0MM.
- Roth, Robert D.; and Schaedler, Raymond J., to Chicago Pneumatic Tool Company. Impact wrench. 248,820, 8-8-78, Cl. D8-61.000.
- Rubbermaid Specialty Products Inc.: *See—*
  - Wooters, Dwight N., 248,847, Cl. D12-191.000.
- Saha, Asis K.: *See—*
  - Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.
- Saidel, Jack R. Speaker grill. 248,856, 8-8-78, Cl. D14-39.000.
- Sanders, Theodore, to Pacific Handy Cutter, Inc. Holster. 248,797, 8-8-78, Cl. D2-400.000.
- Sanyei Corporation: *See—*
  - Mizoguchi, Tetsuro, 248,813, Cl. D7-88.000.
  - Mizoguchi, Tetsuro, 248,815, Cl. D7-129.000.
- Sato, Katsumi, to Tomy Kogyo Co., Inc. Toy vehicle trackway. 248,888, 8-8-78, Cl. D34-15.00K.
- Schaedler, Raymond J.: *See—*
  - Roth, Robert D.; and Schaedler, Raymond J., 248,820, Cl. D8-61.000.
- Schlessel, Walter, to Gemco-Ware Inc. Pepper mill or the like. 248,811, 8-8-78, Cl. D7-53.000.
- Schmidt, Peter O.: *See—*
  - Spranger, Douglas M.; Brookes, Malcolm J.; and Schmidt, Peter O., 248,860, Cl. D16-62.000.
- Shell Oil Company: *See—*
  - Anderson, Victor F., 248,829, Cl. D9-44.000.
  - Anderson, Victor F., 248,830, Cl. D9-52.000.
  - Anderson, Victor F., 248,831, Cl. D9-52.000.
  - Anderson, Victor F., 248,836, Cl. D9-167.000.
- Smythe, Gloria Dawn: *See—*
  - Comensoli, Leo; and Smythe, Gloria Dawn, 248,893, Cl. D92-1.00K.
- Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
  - Morgan, Fred Ferdinand, 248,834, Cl. D9-114.000.
- Speedo Knitting Mills Pty Ltd.: *See—*
  - Comensoli, Leo; and Smythe, Gloria Dawn, 248,893, Cl. D92-1.00K.
- Spencer, Richard O. Phonograph record cleaner. 248,817, 8-8-78, Cl. D7-161.000.
- Spengler, Duane E.; and Crawford, Ralph W., to Quaker Oats Company, The. Toy building. 248,889, 8-8-78, Cl. D34-15.0LL.
- Spranger, Douglas M.; Brookes, Malcolm J.; and Schmidt, Peter O., to International Telephone & Telegraph Corporation. Night vision pocketscope. 248,860, 8-8-78, Cl. D16-62.000.
- Stage, James C.; Bliven, Albert B.; and Wohlhueter, James E., to PACCAR Inc. Truck sleeper compartment. 248,846, 8-8-78, Cl. D12-156.000.
- Sussman, Philip; and Andrews, Francis, to Mark-Tex Corporation. Marking pen. 248,865, 8-8-78, Cl. D19-43.000.
- Sweat, George B.: *See—*
  - Warren, Alvin E.; and Sweat, George B., 248,875, Cl. D25-62.000.
- Tafoya, Eddie. Ring and thimble holder. 248,800, 8-8-78, Cl. D6-24.000.
- Tafoya, Eddie. Combined earring and jewelry holder. 248,801, 8-8-78, Cl. D6-25.000.
- Taitani, Hirotsune; and Hamasaki, Yoshihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wheel. 248,848, 8-8-78, Cl. D12-209.000.
- Tanaka, Yutaka, to Toytown Corporation. Toy trackway. 248,887, 8-8-78, Cl. D34-15.00K.
- Taniwaki, Genshi, to Kongo Co., Ltd. Reinforcement bracket. 248,822, 8-8-78, Cl. D8-354.000.
- Thomas, Morton I. Cervical collar. 248,872, 8-8-78, Cl. D24-64.000.
- Tomy Kogyo Co., Inc.: *See—*
  - Kato, Yuji, 248,886, Cl. D34-15.0AJ.
  - Sato, Katsumi, 248,888, Cl. D34-15.00K.
- Toringe Consult AB: *See—*
  - Forsman, Tore Alexander; and Odvik, Christer, 248,871, Cl. D24-31.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Taitani, Hirotsune; and Hamasaki, Yoshihiro, 248,848, Cl. D12-209.000.
- Toytown Corporation: *See—*
  - Tanaka, Yutaka, 248,887, Cl. D34-15.00K.
- Turner, Robert B., to Johnson & Johnson. End cap for a thermometer probe cover. 248,839, 8-8-78, Cl. D10-60.000.
- Walz, David K.; and Kadota, Toshihiko, to Lanier Business Products, a Division of Oxford Industries Inc.; and Olympus Optical Company Ltd. Transcriber. 248,853, 8-8-78, Cl. D14-3.000.
- Warren, Alvin E.; and Sweat, George B. Tree climber and seat or the like. 248,875, 8-8-78, Cl. D25-62.000.
- Weckman, Richard L., to Owens-Illinois, Inc. Bottle. 248,828, 8-8-78, Cl. D9-42.000.

Weckman, Richard L., to Owens-Illinois, Inc. Bottle. 248,832, 8-8-78, Cl. D9-60.000.

Welch, Darrell N.: *See—*
  Aesch, Harold, Sr.; Aesch, Harold, Jr.; and Welch, Darrell N., 248,840, Cl. D10-107.000.

White, Robert E.; and Bergquist, Brice E. Mobile drain pan for liquid storage and recovery. 248,845, 8-8-78, Cl. D12-25.000.

Williams, William O., Jr. Artificial fishing lure. 248,867, 8-8-78, Cl. D22-27.000.

Williams, William O., Jr. Artificial fishing lure. 248,868, 8-8-78, Cl. D22-27.000.

Wiltshire Cutlery Company Proprietary Ltd.: *See—*
  Bayly, Peter Kingsley, 248,814, Cl. D7-98.000.

Wohlhueter, James E.: *See—*
  Stage, James C.; Bliven, Albert B.; and Wohlhueter, James E., 248,846, Cl. D12-156.000.

Wolfe, Norbert Thomas: *See—*
  Pasquarette, Ralph E.; and Wolfe, Norbert Thomas, 248,838, Cl. D10-60.000.

Wooters, Dwight N., to Rubbermaid Specialty Products Inc. Automobile visor attachment. 248,847, 8-8-78, Cl. D12-191.000.

Wright, Charles B., Sr. Billfold. 248,890, 8-8-78, Cl. D87-3.00A.

Yen, Watson. Combined measuring and drawing instrument. 248,864, 8-8-78, Cl. D19-36.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 8, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
155	4,104,739
158	4,104,740
185 R	4,104,741
213	4,104,742
423	4,104,743
CLASS 4	
159	4,104,744
CLASS 5	
13	4,104,745
37 R	4,104,747
63	4,104,748
76	4,104,749
93 R	4,104,750
327 R	4,104,746
	4,104,751
CLASS 7	
107	4,104,752
CLASS 8	
1 W	4,105,399
39 B	Re.29,724
43	4,105,400
79	4,105,401
94.17	4,105,402
115	4,105,403
152	4,104,753
165	4,105,404
CLASS 12	
142 S	4,104,754
CLASS 15	
40	4,104,755
97 B	4,104,756
104.3 SN	4,104,757
104.92	4,104,758
176	4,104,759
179	4,104,760
CLASS 16	
84	4,104,761
129	4,104,762
CLASS 17	
1 F	4,104,763
71	4,104,764
CLASS 19	
0.6	4,104,765
CLASS 21	
2.7 R	4,105,405
	4,105,406
56	4,105,407
CLASS 23	
230 B	4,105,408
230 R	Re.29,725
232 R	4,105,409
253 R	4,105,411
253 TP	4,105,410
259.1	4,105,412
288 F	4,105,414
288 R	4,105,413
292	4,105,415
CLASS 24	
69 SK	4,104,766
205.11 R	4,104,767
207	4,104,768
CLASS 26	
92	4,104,769
CLASS 28	
257	4,104,770
CLASS 29	
25.14	4,104,771
121.4	4,104,772
127	4,104,773
234	4,104,774
265	4,104,775
281.3	4,104,776
401 D	4,104,777
407	4,104,778
	4,104,779
	4,104,780
419 R	4,104,781
451	4,104,783
527.2	4,104,782
571	4,104,784
574	4,104,785
583	4,104,786
596	4,104,787
	4,104,788
628	4,104,789
707	4,104,790
CLASS 30	
90.1	4,104,791
134	4,104,792
139	4,104,793
268	4,104,794
272 A	4,104,795
276	4,104,796
	4,104,797
CLASS 32	
12	4,104,798
26	4,104,799
CLASS 33	
17 R	4,104,800
27 B	4,104,801
174 F	4,104,802
352	4,104,803
CLASS 34	
1	4,104,804
5	4,104,805
10	4,104,806
92	4,104,807
243 R	4,104,808
CLASS 35	
28.5	4,104,809
53	4,104,810
CLASS 36	
121	4,104,811
CLASS 37	
43 L	4,104,812
57	4,104,813
CLASS 38	
2	4,104,814
77.5	4,104,815
CLASS 40	
2 R	4,104,816
19.5	4,104,817
152	4,104,818
CLASS 42	
58	4,104,819
CLASS 43	
36	4,104,820
CLASS 44	
1 R	4,105,416
63	4,105,417
78	4,105,418
CLASS 46	
33	4,104,821
74 D	4,104,822
CLASS 47	
1 R	4,104,823
58	4,104,824
CLASS 48	
61	4,105,419
CLASS 49	
324	4,104,825
360	4,104,826
385	4,104,827
399	4,104,828
409	4,104,829
468	4,104,830
CLASS 51	
164 A	4,104,831
281 R	4,104,832
	4,104,833
CLASS 52	
1	4,104,834
7	4,104,835
64	4,104,836
173 R	4,104,837
239	4,104,838
288	4,104,839
309.9	4,104,840
519	4,104,841
650	4,104,842
693	4,104,843
743	4,104,868
744	4,104,844
CLASS 53	
14	4,104,845
26	4,104,846
35	4,104,847
184 S	4,104,848
379	4,104,849
CLASS 55	
274	4,105,420
379	4,105,421
446	4,105,422
501	4,105,423
CLASS 56	
1	4,104,850
10.4	4,104,851
202	4,104,852
341	4,104,853
CLASS 57	
34 R	4,104,854
77.3	4,104,855
77.4	4,104,856
124	4,104,857
CLASS 58	
23 A	4,104,858
23 D	4,104,859
23 R	Re.29,720
	4,104,860
38 R	4,104,861
	4,104,862
	4,104,863
39.5	4,104,864
58	4,104,865
85.5	4,104,866
90 R	4,104,867
CLASS 59	
20	4,104,870
78.1	4,104,871
79 R	4,104,872
CLASS 60	
39.28 R	4,104,873
39.55	4,104,869
39.65	4,104,874
202	4,104,875
226 R	4,104,876
230	4,104,877
245	4,104,878
290	4,104,879
	4,104,880
299	4,104,881
600	4,104,882
641	4,104,883
CLASS 61	
1 F	4,104,884
45 R	4,104,885
112	4,104,886
CLASS 62	
45	4,104,887
80	4,104,888
137	4,104,889
324	4,104,890
CLASS 64	
26	4,104,891
CLASS 65	
3 C	4,105,424
14	4,105,425
18	4,105,426
30 R	4,105,427
77	4,105,428
107	4,105,429
CLASS 66	
185	4,104,892
CLASS 68	
5 E	4,104,893
CLASS 70	
52	4,104,894
237	4,104,895
310	4,104,896
363	4,104,897
419	4,104,898
CLASS 71	
59	4,105,430
67	4,105,431
86	4,105,432
93	4,105,433
	4,105,434
94	4,105,435
103	4,105,436
CLASS 72	
24	4,104,899
70	4,104,900
117	4,104,902
264	4,104,903
445	4,104,904
CLASS 73	
40	4,104,905
81	4,104,901
104	4,104,906
117.3	4,104,907
	4,104,908
118	4,104,909
141 R	4,104,910
151	4,104,911
189	4,104,912
194 A	4,104,915
194 F	4,104,913
	4,104,914
343 B	4,104,916
343 R	4,104,917
379	4,104,918
462	4,104,919
517 AV	4,104,920
517 R	4,104,921
643	4,104,922
646	4,104,923
716	4,104,924
	4,104,925
CLASS 74	
6	4,104,926
331	4,104,928
473 R	4,104,929
609	4,104,930
650	4,104,931
801	4,104,932
	4,104,933
CLASS 75	
10 R	4,105,437
49	4,105,438
51	4,105,439
66	4,105,440
81	4,105,441
101 BE	4,105,442
238	4,105,443
CLASS 81	
57.38	4,104,934
177 A	4,104,935
180 R	4,104,936
CLASS 82	
34 R	4,104,937
CLASS 83	
5	4,104,938
7	4,104,939
71	4,104,940
133	4,104,941
327	4,104,942
471.2	4,104,944
CLASS 84	
1.15	4,104,945
1.24	4,104,946
318	4,104,947
380 C	4,104,948
462	4,104,949
	4,104,950
CLASS 85	
5 R	4,104,951
	4,104,952
CLASS 89	
14 E	4,104,953
CLASS 90	
11 C	4,104,943
CLASS 91	
45	4,104,954
176	4,104,955
491	4,104,956
CLASS 96	
1 R	4,105,444
1.5 R	4,105,445
	4,105,446
1.6	4,105,447
1.8	4,105,448
	4,105,449
33	4,105,450
66 T	4,105,451
74	4,105,452
114.5	4,105,453
122	4,105,454
CLASS 99	
283	4,104,957
355	4,104,958
421 H	4,104,959
CLASS 100	
25	4,104,960
93 PB	4,104,961
100	4,104,962
176	4,104,963
232	4,104,964
CLASS 101	
25	4,104,965
40	4,104,966
99	4,104,967
415.1	4,104,968
CLASS 102	
49.3	4,104,969
220	4,104,970
CLASS 104	
172 B	4,104,971
CLASS 106	
44	4,105,455
46	4,105,456
78	4,105,457
97	4,105,458
98	4,105,459
100	4,105,460
120	4,105,463
205	4,105,461
218	4,105,462
307	4,105,464
308 Q	4,105,465
309	4,105,466
CLASS 108	
31	4,104,972
59	4,104,973
CLASS 109	
2	4,104,974
CLASS 111	
3	4,104,975
CLASS 112	
121.11	4,104,976
121.26	4,104,977
277	4,104,978
CLASS 114	
36	4,104,979
CLASS 116	
63 P	4,104,980
124 L	4,104,981
124 M	4,104,982
CLASS 118	
2	4,104,983
	4,104,984
211	4,104,985
CLASS 119	
17	4,104,986
51 R	4,104,987
	4,104,988
CLASS 123	
32 EA	4,104,990
	4,104,991
32 JV	4,104,992
32 ST	4,104,989
41.49	4,104,993
73 R	4,104,994
78 D	4,104,995
90.43	4,104,996
117 R	4,104,997
	4,104,998
119 CD	4,104,999
139 AW	4,105,000
140 CC	4,105,001
140 MP	4,105,002
141	4,105,003
	4,105,004
148 E	4,105,005
	4,105,006
148 P	4,105,007
179 S	4,104,927
191 R	4,105,008
193 H	4,105,009
198 F	4,105,010
CLASS 124	
35 A	4,105,011
CLASS 125	
16 R	4,105,012
CLASS 126	
38	4,105,013
270	4,105,014
299 D	4,105,015
CLASS 127	
37	4,105,467
CLASS 128	
1 D	4,105,016
1.5	4,105,017
2 F	4,105,019
2 V	4,105,018
2.05 A	4,105,020
	4,105,021
2.05 F	4,105,022
2.06 B	4,105,023
33	4,105,024
90	4,105,025
142.4	4,105,026
206	4,105,027
214 E	4,105,028
214 R	4,105,029
217	4,105,030
276	4,105,031
285	4,105,033
335.5	4,105,034
342	4,105,035
360	4,105,032
374	4,105,036
419 P	4,105,037
CLASS 132	
7	4,105,038
CLASS 134	
3	4,105,468
	4,105,469
CLASS 135	
25 A	4,105,039
CLASS 136	
89 CC	4,105,471
89 SJ	4,105,470
CLASS 137	
72	4,105,040
116	4,105,041
245	4,105,042
454.2	4,105,043
517	4,105,044
563	4,105,045
594	4,105,046
625.6	4,105,047
CLASS 138	
42	4,105,048
44	4,105,049
45	4,105,050
162	4,105,051
CLASS 139	
101	4,105,052
435	4,105,053

CLASS 141

311 R	4,105,054

CLASS 144

286 R	4,105,055

CLASS 145

50 A	4,105,056

CLASS 148

1.5	4,105,472
6	4,105,473
12 F	4,105,474
175	4,105,475
187	4,105,476
	4,105,477
188	4,105,478
189	4,105,479

CLASS 149

40	4,105,480

CLASS 150

35	4,105,057

CLASS 151

41.74	4,105,058

CLASS 156

79	4,105,481
96	4,105,482
154	4,105,483
380	4,105,484
382	4,105,485
405 R	4,105,486
	4,105,487
425	4,105,488
510	4,105,489
526	4,105,490
553	4,105,491
629	4,105,492
644	4,105,493

CLASS 162

19	4,105,494
348	4,105,495

CLASS 164

4	4,105,059
130	4,105,060

CLASS 165

1	4,105,061
9	4,105,062
21	4,105,063
29	4,105,064
78	4,105,065
94	4,105,066
159	4,105,067

CLASS 166

51	4,105,069
250	4,105,070
	4,105,071
261	4,105,072
286	4,105,073
317	4,105,074
321	4,105,075
355	4,105,068

CLASS 169

40	4,105,076

CLASS 172

311	4,105,077
781	4,105,078

CLASS 173

42	4,105,079
66	4,105,080

CLASS 174

14 R	4,105,859
15 C	4,105,860
52 FP	4,105,861
53	4,105,862

CLASS 175

122	4,105,081
302	4,105,082
313	4,105,083

CLASS 176

19 R	4,105,496

CLASS 178

67	4,105,863

CLASS 179

1 G	4,105,865
1 J	4,105,864
6 R	4,105,866
6.3 R	4,105,867
15 BD	4,105,869
15 BT	4,105,868
15.55 R	4,105,870
18 AD	4,105,871
	4,105,872
	4,105,873
	4,105,874
	4,105,876
18 GF	4,105,875
111 R	4,105,877

CLASS 180

11	4,105,084
43 R	4,105,085
79	4,105,086
89.15	4,105,087
108	4,105,088

CLASS 181

264	4,105,089
265	4,105,090

CLASS 182

181	4,105,091

CLASS 184

6.11	4,105,093
6.4	4,105,092
7 F	4,105,094
55 A	4,105,095

CLASS 186

1 AC	4,105,096

CLASS 187

8.75	4,105,097

CLASS 188

1 B	4,105,098

CLASS 191

29 DM	4,105,099

CLASS 192

4 A	4,105,101
034	4,105,100
106.1	4,105,102

CLASS 193

32	4,105,103

CLASS 194

57	4,105,104
100 A	4,105,105

CLASS 195

59	4,105,498
103.5 M	4,105,500
103.5 R	4,105,499

CLASS 198

358	4,105,107
402	4,105,108
499	4,105,109
731	4,105,110
844	4,105,111

CLASS 200

52 R	4,105,885
61.17	4,106,004
146 R	4,105,878
148 A	4,105,879
	4,105,880
148 B	4,105,881
157	4,105,882
296	4,105,883
331	4,105,884

CLASS 201

6	4,105,501
12	4,105,502
40	4,105,503

CLASS 202

91	4,105,504
173	4,105,505

CLASS 203

9	4,105,506
14	4,105,510

CLASS 204

1 T	4,105,507
	4,105,508
	4,105,509
38 A	4,105,511
	4,105,512
	4,105,513
98	4,105,514
	4,105,515
	4,105,516
157.1 R	4,105,517
159.14	4,105,518
159.23	4,105,519
162 R	4,105,520
180 S	4,105,521
195 B	4,105,522
	4,105,523
195 P	4,105,525
195 S	4,105,524
213	4,105,526
228	4,105,527
237	4,105,528
267	4,105,529
290 R	4,105,530
	4,105,531
301	4,105,532
	4,105,533
	4,105,534

CLASS 206

1.5	4,105,112
100	4,105,113
219	4,105,114
370	4,105,115
484	4,105,116
501	4,105,117
524.2	4,105,118
579	4,105,119
581	4,105,120
592	4,105,121

CLASS 208

8	4,105,535
11 LE	4,105,537
11 R	4,105,536
18	4,105,538
33	4,105,539
48 AA	4,105,540
111	4,105,541
180	4,105,542

CLASS 209

73	4,105,122
111.6	4,105,123
114	4,105,124
240	4,105,543
317	4,105,544

CLASS 210

11	4,105,546
15	4,105,545
22 R	4,105,547
23 H	4,105,548
33	4,105,549
50	4,105,550
58	4,105,551
64	4,105,552
73 W	4,105,553
96 R	4,105,554
136	4,105,555
152	4,105,556
169	4,105,557
199	4,105,558
225	4,105,559
230	4,105,560
232	4,105,561
	4,105,562
383	4,105,563
497 R	4,105,564

CLASS 211

13	4,105,125
49 D	4,105,126
124	4,105,127

CLASS 213

61	4,105,128

CLASS 214

152	4,105,129
314	4,105,130
315	4,105,131

CLASS 215

216	4,105,132

CLASS 219

10.55 E	4,105,886
72	4,105,887
121 EB	4,105,890
121 LM	4,105,889
121 P	4,105,888
137.43	4,105,891
216	4,105,892
316	4,105,893
326	4,105,895
365	4,105,894
470	4,105,896

CLASS 220

266	4,105,133
268	4,105,134
288	4,105,135
339	4,105,136

CLASS 222

1	4,105,137
14	4,105,138
105	Re.29,721
	4,105,139
131	4,105,140
143	4,105,141
158	4,105,142
161	4,105,143
187	4,105,144
340	4,105,145
383	4,105,146
413	4,105,147
478	4,105,148

CLASS 225

25	4,105,149
96.5	4,105,150

CLASS 228

170	4,105,151

CLASS 229

23 BT	4,105,152
23 R	4,105,153
27	4,105,154
33	4,105,155

CLASS 235

92 SB	4,105,914
441	4,105,156
475	4,105,157

CLASS 237

12.3 C	4,105,158

CLASS 238

36	4,105,159
167	4,105,160

CLASS 239

2 S	4,105,161
109	4,105,162
406	4,105,163
526	4,105,164

CLASS 242

18 PW	4,105,165
45	4,105,166
54 R	4,105,167
55.2	4,105,168
56 R	4,105,169
65	4,105,170
68.4	4,105,171
78.1	4,105,172

CLASS 244

3.16	4,105,174
146	4,105,173

CLASS 246

430	4,105,175

CLASS 248

13	4,105,176
15	4,105,177
151	4,105,178
221.2	4,105,179
300	4,105,180
452	4,105,181
459	4,105,182
484	4,105,183

CLASS 249

79	4,105,184
194	4,105,185

CLASS 250

199	4,105,915
282	4,105,916
291	4,105,917
337	4,105,918
341	4,105,919
402	4,105,920
423 P	4,105,921
456	4,105,923
492 A	4,105,924
495 T	4,105,922
561	4,105,925
566	4,105,926

CLASS 251

35	4,105,186
334	4,105,187

CLASS 252

1	4,105,565
8.1	4,105,566
8.55 D	4,105,570
8.6	4,105,567
	4,105,568
	4,105,569
32.2 E	4,105,571
62.1 P	4,105,572
99	4,105,573
154	4,105,574
182	4,105,575
190	4,105,576
300	4,105,577
316	4,105,578
317	4,105,579
351	4,105,580
389 A	4,105,581
392	4,105,582
408	4,105,583
426	4,105,584
429 B	4,105,585
437	4,105,586
439	4,105,587
454	4,105,588
462	4,105,589
464	4,105,590
466 J	4,105,591
545	4,105,592

CLASS 254

10.5	4,105,188
139	4,105,189

CLASS 256

1	4,105,190

CLASS 260

2.3	4,105,593
8	4,105,602
	4,105,603
17.2	4,105,604
17.4 GC	4,105,605
17.5	4,105,606
22 CB	4,105,607
23 H	4,105,609
23 R	4,105,608
27 BB	4,105,610
27 EV	4,105,611
	4,105,612
29.4 R	4,105,613
	4,105,614
29.6 T	4,105,615
31.2 N	4,105,617
33.6 PQ	4,105,619
33.6 UA	4,105,618
37 N	4,105,620
	4,105,621
	4,105,622
38	4,105,623
40 R	4,105,624
45.75 D	4,105,632
45.8 A	4,105,631
45.8 N	4,105,625
	4,105,627
45.8 NT	4,105,629
45.8 NZ	4,105,626
45.8 R	4,105,630
45.85 R	4,105,628
112 B	4,105,650
112.5 R	4,105,651
	4,105,652
158	4,105,653
205	4,105,654
207.1	4,105,655
239 B	4,105,657
239.3 T	4,105,658
239.55 C	4,105,660
239.9	4,105,656
289 C	4,105,665
293.54	4,105,659
293.77	4,105,666
299	4,105,667
306.7 R	4,105,668
307 F	4,105,669
326.11 R	4,105,670
326.43	4,105,671
340.2	4,105,672
343	4,105,673
343.6	4,105,674
345.2	4,105,675
345.9 S	4,105,676
346.11	4,105,677
	4,105,678
	4,105,679
378	4,105,680
404	4,105,681
408	4,105,682
429 J	4,105,683
429.7	4,105,684
448.2 N	4,105,685
453 PH	4,105,686
465.4	4,105,687
465.8 R	4,105,688
502.5	4,105,689
519	4,105,690
530 R	4,105,691
543 R	4,105,692
558 P	4,105,693
561 H	4,105,694
570.8 R	4,105,695
586 F	4,105,696
601 R	4,105,697
650 R	4,105,701
658 R	4,105,702
665 G	4,105,703
666 P	4,105,704
668 R	4,105,705
668 A	4,105,706
683.48	4,105,707
849	4,105,708
857 L	4,105,709
869	4,105,710
873	4,105,711
	4,105,712
879	4,105,713
	4,105,714
881	4,105,715
884	4,105,716
889	4,105,717
	4,105,718

CLASS 261

34 A	4,105,720
34 B	4,105,719
76	4,105,721
94	4,105,722
105	4,105,723
112	4,105,724
121 B	4,105,726
122	4,105,725

CLASS 264

12	4,105,727
40.7	4,105,728
71	4,105,729
89	4,105,730
94	4,105,731
104	4,105,732
108	4,105,733
132	4,105,734
143	4,105,735
153	4,105,736
154	4,105,737
163	4,105,738
256	4,105,739
290 T	4,105,740

CLASS 266

88	4,105,191
149	4,105,192

CLASS 267

64 R	4,105,193
	4,105,194
131	4,105,195

CLASS 270

58	4,105,196
68 R	4,105,197

CLASS 271

14	4,105,198
122	4,105,199

CLASS 272

67	4,105,200
111	4,105,201

CLASS 273

29 A	4,105,203
	4,105,204
73 J	4,105,205
85 R	4,105,206
89	4,105,207
95 R	4,105,208
106.5 R	4,105,209
126 R	4,105,210
237	4,105,211
309	4,105,202

CLASS 274

38	4,105,212
	4,105,213

CLASS 277

74	4,105,214
116.2	4,105,215

CLASS 280

6 R	4,105,216
28	4,105,217
43.12	4,105,218
65 R	4,105,245
289 E	4,105,220
461 A	4,105,221
668	4,105,222
752	4,105,223
789	4,105,219

CLASS 281

15 R	4,105,224

CLASS 282

27.5	4,105,225

CLASS 285

175	4,105,226
412	4,105,227

CLASS 289

2	4,105,228

CLASS 292

113	4,105,229
202	4,105,230
264	4,105,231
288	4,105,232
	4,105,233
302	4,105,234
341.18	4,105,235

CLASS 293

71 R	4,105,236
73	4,105,237

CLASS 294

11	4,105,238
65.5	4,105,239
81 R	4,105,240
86 R	4,105,241

CLASS 296

20	4,105,242
28 R	4,105,243
84 H	4,105,248
97 E	4,105,246

CLASS 297

45	4,105,244
149	4,105,247
230	4,105,249
445	4,105,250

CLASS 299

2	4,105,251
4	4,105,252
	4,105,253

CLASS 301

63 DS	4,105,254
97	4,105,255

CLASS 302

51	4,105,256

CLASS 303

15	4,105,257
37	Re.29,722
93	4,105,258

CLASS 305

50	4,105,259
54	4,105,260
57	Re.29,723

CLASS 307

3	4,105,897
10 LS	4,105,898
115	4,105,899
219	4,105,900
273	4,105,901
308	4,105,902
328	4,105,903

CLASS 308

4 A	4,105,262
8.2	4,105,263
20	4,105,264
72	4,105,261
158	4,105,265
237 R	4,105,266
240	4,105,267

CLASS 310

27	4,105,904
59	4,105,905
87	4,105,906
232	4,105,907

CLASS 312

184	4,105,268
248	4,105,269
253	4,105,271
330 R	4,105,270

CLASS 313

217	4,105,908
473	4,105,909
490	4,105,910

CLASS 315

3.5	4,105,911
10	4,105,912
39.71	4,105,913
82	4,105,927
	4,105,928
125	4,105,929
169 TV	4,105,930
278	4,105,931
377	4,105,932
387	4,105,933

CLASS 318

7	4,105,934
314	4,105,935
328	4,105,936
568	4,105,937
599	4,105,938
	4,105,939
653	4,105,940
676	4,105,961

CLASS 320

32	4,105,962

CLASS 322

48	4,105,963

CLASS 323

43.5 S	4,105,964

CLASS 324

28 CB	4,105,965
113	4,105,966
115	4,105,967
133	4,105,968
151 R	4,105,969
158 P	4,105,970
203	4,105,971
220	4,105,972

CLASS 325

4	4,105,973
21	4,105,974
320	4,105,975
404	4,105,976
472	4,105,977

CLASS 328

58	4,105,978
164	4,105,979
165	4,105,980

CLASS 329

50	4,105,981

CLASS 330

124 R	4,105,941
261	4,105,942
290	4,105,943
	4,105,944
294	4,105,945

CLASS 331

1 A	4,105,946
	4,105,947
14	4,105,948
37	4,105,949
57	4,105,950
90	4,105,951
94.5 H	4,105,955
94.5 PE	4,105,952
	4,105,954
94.5 Q	4,105,953
	4,105,956
110	4,105,957

CLASS 333

29	4,105,958
31 R	4,105,959
81 A	4,105,960

CLASS 335

151	4,105,982
212	4,105,983

CLASS 336

60	4,105,984
90	4,105,985

CLASS 337

3	4,105,986

CLASS 338

130	4,105,987
132	4,105,988
180	4,105,989

CLASS 339

14 L	4,105,272
47 R	4,105,273
75 P	4,105,274
91 R	4,105,275
95 D	4,105,276
95 R	4,105,277
103 M	4,105,278
117 R	4,105,279
273 S	4,105,280

CLASS 340

3 D	4,105,991
3 R	4,105,990
15	4,105,992
15.5 CP	4,105,993
27 R	4,106,013
71	4,105,994
73	4,105,996
146.1 AL	4,105,999
146.1 E	4,105,995
146.3 AC	4,105,998
146.3 ED	4,105,997
310 A	4,106,007
324 AD	4,106,008
336	Re.29,727
343	4,106,009
347 AD	4,106,010
365 E	4,106,011
523	4,106,012
530	4,106,000
	4,106,003
543	4,106,006
604	4,106,001
626	4,106,002
676	4,106,005

CLASS 343

5 SA	4,106,014
5 SC	4,106,021
5 W	4,106,015
7.4	4,106,016
8	4,106,017
9	4,106,019
12 A	4,106,018
14	4,106,020
105 R	4,106,022
106 D	4,106,023
715	4,106,024
	4,106,025
786	4,106,026

CLASS 346

1	4,106,027
74.1	4,106,028
117 A	4,106,029
140 R	4,106,030
	4,106,031
	4,106,032

CLASS 350

6.5	4,105,281
10	4,105,282
96.21	4,105,285
96.31	4,105,283
96.33	4,105,284
99	4,105,286
113	4,105,287
162 SF	4,105,289
168	4,105,290
184	4,105,291
189	4,105,308
211	4,105,292
264	4,105,293
269	4,105,294
289	4,105,301
303	4,105,295
307	4,105,296
336	4,105,297
340	4,105,298
349	4,105,299
350	4,105,288

CLASS 351

7	4,105,302
39	4,105,303
47	4,105,304
111	4,105,305

CLASS 352

14	4,105,306
72	4,105,307
130	4,105,309
171	4,105,310
187	4,105,311

CLASS 353

27 R	4,105,312
65	4,105,313
85	4,105,314
95	4,105,315
109	4,105,316
117	4,105,317
120	4,105,318
	4,105,319

CLASS 354

23 D	4,106,033
31	4,106,034
51	4,106,035
83	4,106,036
128	4,106,037
155	4,106,038
193	4,106,039
205	4,106,040
206	4,106,041
317	4,106,042

CLASS 355

3 CH	4,105,321
3 TR	4,105,320
4	4,105,322
9	4,105,323
14	4,105,324
54	4,105,325
55	4,105,326
59	4,105,327
78	4,105,328
91	4,105,329
102	4,105,330
103	4,105,331

CLASS 356

5	4,105,332
85	4,105,333
104	4,105,334
108	4,105,335
113	4,105,336
114	4,105,337
118	4,105,338
152	4,105,339
168	4,105,340
225	4,105,300

CLASS 357

13	4,106,043
22	4,106,044
23	4,106,045
30	4,106,046
	4,106,047
40	4,106,048
46	4,106,049
49	4,106,050
71	4,106,051
72	4,106,052

CLASS 358

13	4,106,053
27	4,106,054
	4,106,055
50	4,106,056
128	4,106,057
	4,106,058
191	4,106,059
256	4,106,060
296	4,106,061

CLASS 360

15	4,106,062
38	4,106,063
60	4,106,064
109	4,106,065
133	4,106,066
137	4,106,067

CLASS 361

15	4,106,068
30	4,106,069
42	4,106,070
79	4,106,071
156	4,106,072
248	4,106,073
	4,106,074
320	4,106,075
394	4,106,076

CLASS 362

8	4,106,077
18	4,106,080
32	4,106,078
34	4,106,079
61	4,106,081
87	4,106,082
217	4,106,083

CLASS 363

21	4,106,084
51	4,106,085
60	4,106,086
70	4,106,087
132	4,106,088
153	4,106,089

CLASS 364

200	4,106,090
	4,106,091
	4,106,092
424	4,106,093
453	4,106,094
464	4,106,095
481	4,106,096
492	4,106,097
500	4,106,098
510	4,106,099
702	4,106,100
709	4,106,101
724	4,106,102
827	4,106,103
900	4,106,104
	4,106,105

CLASS 365

2	4,106,106
191	4,106,107
222	4,106,108
238	4,106,109

CLASS 366

2	4,106,110
3	4,106,111
4	4,106,112
79	4,106,113
131	4,106,114
138	4,106,115
144	4,106,116
154	4,106,117
185	4,106,118

CLASS 400

144.2	4,105,341
556.2	4,105,106

CLASS 401

15	4,105,342

CLASS 403

	4,105,343
24	4,105,344
	4,105,345
104	4,105,346
157	4,105,347
172	4,105,348
209	4,105,349
220	4,105,350
312	4,105,351
402	4,105,352

CLASS 404

2	4,105,353
72	4,105,354
114	4,105,355
117	4,105,356

CLASS 407

41	4,105,357

CLASS 408

108	4,105,358
112	4,105,359
118	4,105,360
130	4,105,361

CLASS 415

2	4,105,362

CLASS 416

41	4,105,363
97 R	4,105,364
107	4,105,365
132 A	4,105,366

CLASS 417

36	4,105,367
53	4,105,368
206	4,105,369
222	4,105,370
238	4,105,371
243	4,105,372
317	4,105,373
415	4,105,374

CLASS 418

54	4,105,375
77	4,105,376
173	4,105,377
195	4,105,378

CLASS 423

10	4,105,741
22	4,105,742
24	4,105,743
239	4,105,744
	4,105,745
251	4,105,746
263	4,105,747
320	4,105,748
	4,105,749
456	4,105,730
478	4,105,751
496	4,105,752
502	4,105,753
514	4,105,754
648 R	4,105,755

CLASS 424

48	4,105,756
49	4,105,757
	4,105,758
52	4,105,759
78	4,105,779
180	4,105,760
243	4,105,761
245	4,105,762
246	4,105,763
248.54	4,105,764
248.56	4,105,765
251	4,105,766
256	4,105,767
263	4,105,768
	4,105,769
	4,105,770
267	4,105,771
269	4,105,772
270	4,105,773
273 R	4,105,774
	4,105,775
274	4,105,776
	4,105,777
275	4,105,778
282	4,105,780
283	4,105,781
	4,105,782
	4,105,783
	4,105,784
285	4,105,785
303	4,105,786
309	4,105,787
	4,105,788
	4,105,789
	4,105,790
310	4,105,791
313	4,105,792
314	4,105,793
317	4,105,794
320	4,105,795
330	4,105,796
	4,105,797
352	4,105,798

CLASS 425

47	4,105,379
72 R	4,105,380
83.1	4,105,381
88	4,105,382
96	4,105,383
126 S	4,105,384
192 R	4,105,385
217	4,105,386
335	4,105,387
389	4,105,388
392	4,105,389
450.1	4,105,390
526	4,105,391

CLASS 426

44	4,105,799
61	4,105,800
99	4,105,801
329	4,105,802
583	4,105,803
656	4,105,804

CLASS 427

38	4,105,805
44	4,105,806
126	4,105,807
137	4,105,808
164	4,105,809
248 C	4,105,810
302	4,105,811
320	Re.29,726

CLASS 428

15	4,105,812
76	4,105,813
122	4,105,814
159	4,105,816
188	4,105,817
192	4,105,818
213	4,105,819
	4,105,820
215	4,105,821
216	4,105,822
307	4,105,823
355	4,105,824
379	4,105,825
	4,105,826
403	4,105,827
665	4,105,828

CLASS 429

15	4,105,829
27	4,105,830
86	4,105,831
94	4,105,832
104	4,105,833
	4,105,834
133	4,105,835
152	4,105,815
194	4,105,836

CLASS 431

95 R	4,105,392
116	4,105,393
202	4,105,394
351	4,105,395

CLASS 432

14	4,105,396
90	4,105,397
121	4,105,398

CLASS 521

53	4,105,598
56	4,105,596
62	4,105,616
95	4,105,601
100	4,105,594
129	4,105,600
131	4,105,599
159	4,105,595
	4,105,597

CLASS 526

26	4,105,837
33	4,105,647
62	4,105,838
	4,105,839
	4,105,840
	4,105,841
65	4,105,634
	4,105,842
77	4,105,843
106	4,105,844
117	4,105,845
124	4,105,846
125	4,105,847
204	4,105,648
271	4,105,649
712	4,105,641

CLASS 528

51	4,105,642
126	4,105,635
	4,105,636
130	4,105,638
176	4,105,633
177	4,105,639
241	4,105,637
292	4,105,640
311	4,105,646
313	4,105,645
314	4,105,644
512	4,105,643

CLASS 544

68	4,105,848
129	4,105,849
294	4,105,662
378	4,105,664
379	4,105,663
405	4,105,661

CLASS 548

319	4,105,850
324	4,105,851
342	4,105,852

CLASS 560

24	4,105,853
55	4,105,854
190	4,105,855
191	4,105,856
222	4,105,858

CLASS 568

726	4,105,857
744	4,105,698
	4,105,699
875	4,105,700

CLASSIFICATION OF DESIGNS

D2—	322	248,796		88	248,813		52	248,830		191	248,847			248,864		3	248,880
	400	248,797		98	248,814			248,831		209	248,848		43	248,865	D34—	4 R	248,881
D6—	9	248,799		129	248,815		60	248,832			248,849	D22—	13	248,866		5 L	248,885
	24	248,800		161	248,817		101	248,833	D13—	17	248,850		27	248,867		5 MM	248,882
	25	248,801		182	248,816		114	248,834		18	248,851			248,868		5 SP	248,883
	66	248,802		207	248,818		159	248,835		24	248,852	D23—	149	248,869		5 SS	248,884
	91	248,803	D8—	11	248,819		167	248,836	D14—	3	248,853	D24—	10	248,870		15 AJ	248,886
	105	248,804		61	248,820	D10—	57	248,837		30	248,854		31	248,871		15 K	248,887
	136	248,805		107	248,821		60	248,838		39	248,856		64	248,872			248,888
		248,806		354	248,822			248,839		75	248,855		99	248,873		15 LL	248,889
	157	248,807		382	248,823		107	248,840	D15—	123	248,857	D25—	39	248,874	D87—	3 A	248,890
	169	248,808		387	248,824		113	248,841	D16—	06	248,858		62	248,875		3 F	248,891
	177	248,798		395	248,825	D11—	118	248,842		42	248,859	D27—	27	248,876			248,892
	188	248,809		499	248,826		127	248,843		62	248,860		36	248,877	D92—	1 K	248,893
	197	248,810	D9—	2	248,827		128	248,844		65	248,861	D28—	46	248,878	D96—	12 R	248,894
D7—	53	248,811		42	248,828	D12—	25	248,845	D19—	36	248,862	D30—	1	248,879			248,895
	77	248,812		44	248,829		156	248,846			248,863						

CLASSIFICATION OF PLANTS

P.—	76	4,289		78	4,290												

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,105,091
	4,105,261
4 :	4,104,750
5 :	4,105,231
6 :	4,104,749
	4,104,867
	4,104,869
	4,104,922
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	4,104,794
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26 :	4,104,745
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	4,105,825
	4,105,878
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	4,105,920
	4,105,922
	4,106,117

DESIGN PATENTS

6 :	248,809
	248,816
8 :	248,845
06 :	248,797
	248,800
	248,801
	248,803
	248,817
	248,841
	248,870
	248,881
	248,885
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	248,892
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	248,821
	248,842
	248,866
	248,874
53 :	248,807
	248,846
55 :	248,812
	248,823

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General and Mechanical (4,106,119) 939
Chemical (4,106,895) 1205
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of June 1978

Affirmed	214
Affirmed in Part	10
Reversed	70
Total	303

Registration to Practice

The following list contains the names of persons applying for registrations to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before October 6, 1978.

Ball, William E., 8352 Wagon Wheel Rd., Alexandria, Va. 22309
Benman, William J., Jr., 2018 Sherman, Evanston, Ill. 60201
Benson, Joel W., 2109 N. Brandywine St., Arlington, Va. 22207
Gwinnel, Harry J., 6803 Bellamy Ave., Springfield, Va. 22152
Hagen, Timothy W., 2590 Timber Grove, Annapolis, Md. 21401
Kopchinsky, Grigory, 360 Lexington Ave., New York, N.Y. 10017
McClung, Guy, Bank of the Southwest Bldg., Houston, Tex. 77002
Mitchard, Leonard C., 4106 Maryland Ave., Bethesda, Md. 20016
Parada, Nikolay, 3045 Ocean Pkwy., #4G, Brooklyn, N.Y. 11235
Pecora, Robin J., 204 E. Preston St., Baltimore, Md. 21202
Sadowski, Jeffrey A., 25156 Fortuna, Roseville, Mich. 48066
Samanta, Mrinmay, P.O. Box 2322, Washington, D.C. 20013
Schulte, Timothy R., 705 A. Lexington Ave., China Lake, Calif. 93555
Slade, Elizabeth O., Phillips Petroleum Co., 410 TRW Bldg., Bartlesville, Okla. 74003
VonBodungen, Raymond C., 1009 Opelousas Ave., New Orleans, La. 70014
Wilson, Harold H., 1500 Elm St., San Carlos, Calif. 94070

July 20, 1978. LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Commercial Success and Other Considerations Bearing on Obviousness

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are being made in the Manual of Patent Examining Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy. *Graham v. John Deere Co.,* 383 U.S. 1, 148 USPQ 459 (1966); *In re Palmer,* 172 USPQ 126, 451 F.2d 1100 (CCPA 1971); *In re Fielder and Underwood,* 176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham v. John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida v. Ag Pro,* 425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc. v. Pavement Salvage Co., Inc.,* 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co. v. Supermarket Corp.,* 340 U.S. 147 87 USPQ 303 (1950). See *Dann v. Johnston,* 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States v. Adams,* 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin,* 448 F.2d, 791, 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate, to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli et al.* 176 USPQ 305, (CCPA 1973)]; [*In re Noznick et al.* 178 USPQ 43, (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved *needs and* failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co. v. Electronics Corp. of America,* 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

July 10, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Delay in Printing and Distribution of Patents

The printing and distribution of patents that have been issued, as indicated by their publication in the OFFICIAL GAZETTE, have been subject to serious delays since earlier this year. No delays have occurred in the publication of the OFFICIAL GAZETTE. Unfortunately the patent printing delays are expected to continue for several more months. These delays do not affect the availability to the public of the patented files for granted patents, which can be reviewed from the date of grant of the patent.

The delays stem from difficulties encountered in keeping up with the printing workload by a contractor for the U.S. Government Printing Office. That Office handles all of the printing and distribution of printed patents. The Patent and Trademark Office has been urging the elimination of this delay for some months as earlier indicated in a notice dated April 18, 1078 (970 O.G. 10). As a result of recent meetings with the Patent and Trademark Office, the Public Printer is taking additional steps to eliminate the delays. It will, however, still take at least three months to catch up with the printing backlog.

The Patent and Trademark Office has understandably received numerous complaints about the delays. The serious difficulties and inconveniences that the delays are causing are sincerely regretted.

July 25, 1978. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,368,837, Re. S.N. 905,818, Filed May 15, 1978, Cl. 294/74, FABRIC LOAD LIFTING SLING, Roy Norton, Owner of Record: *M.H.S. Ltd. d.b.a. Wear Flex Slings, Chicago, Ill.,* Attorney or Agent: Ira Milton Jones, Ex. Gp.: 313

3,393,117, Re. S.N. 915,946, Filed Jun. 15, 1978, Cl. 428/236, COPPER-CLAD GLASS REINFORCED THERMOSET RESIN PANEL, Fred U. Zolg, et al., Owner of Record: *Cincinnati Milacron Inc., Cincinnati, Ohio,* Attorney or Agent: Jack J. Earl, et al., Ex. Gp.: 164

3,487,800, Re. S.N. 910,564, Filed May 30, 1978, Cl. 114/39, WIND-PROPELLED APPARATUS, Henry Hoyle Schweitzer, et al., Owner of Record: *Inventor,* Attorney or Agent: Billy A. Robbins, et al., Ex. Gp.: 315

3,500,509, Re. S.N. 917,392, Filed Jun. 19, 1978, Cl. 24/202, REINFORCED BUTTONHOLE, James R. Moden, Owner of Record: *AMH Corporation, Barrington, R.I.,* Attorney or Agent: Elliot A. Salter, et al., Ex. Gp.: 351

3,570,014, Re. S.N. 915,451, Filed Jun. 14, 1978, Cl. 3/1, STENT FOR HEART VALVE, Warren D. Hancock, Owner of Record: *Hancock Laboratories Inc., Anaheim, Calif.,* Attorney or Agent: Richard F. Carr, et al., Ex. Gp.: 337

3,643,430, Re. S.N. 912,891, Filed Jun. 5, 1978, Cl. 39/65, SMOKE REDUCTION COMBUSTION CHAMBER, John M. G. Emory Jr., et al., Owner of Record: *United Aircraft Corporation, East Hartford, Conn.,* Attorney or Agent: Norman Friedland, et al., Ex. Gp.: 343

3,797,218, Re. S.N. 903,383, Filed May 5, 1978, Cl. 57/58.89, METHOD AND APPARATUS FOR SPINNING SILVER, Hans Landwehrkamp, et al., Owner of Record: *Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, West Germany,* Attorney or Agent: Ralph Bailey, et al., Ex. Gp.: 244

3,801,130, Re. S.N. 867,795, Filed Jan. 9, 1978, Cl. 280/240, BICYCLE WITH A PIVOTABLE REAR WHEEL, Ralph A. Belden, Owner of Record: *Ralph A. Belden, Philip P. Brasseur and Eugene V. H. Brasseur, all of Spokane, Wash.,* Attorney or Agent: Richard J. St. John, et al., Ex. Gp.: 316

3,823,522, Re. S.N. 915,445, Filed Jun. 14, 1978, Cl. 52/641, HINGED CONNECTOR PLATE, John Calvin Jureit, et al., Owner of Record: *Automated Building Components, Inc., Miami, Fla.,* Attorney or Agent: Robert E. LeBlanc, et al., Ex. Gp.: 354

3,878,419, Re. S.N. 916,278, Filed Jun. 16, 1978, Cl. 310/156, PRECISION BASE MERCURY VAPOR LAMP, Carlo F. LaFiandra, Owner of Record: *Perkin-Elmer, Norwalk, Conn.,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 212

3,940,606, Re. S.N. 915,683, Filed Jun. 14, 1978, Cl. 362/263, HIGH INTENSITY SPOTLIGHT, Thomas M. Lemons, Owner of Record: *Starlight Associates, Salem, Mass.,* Attorney or Agent: Stanley J. Yavner, Ex. Gp.: 212

3,948,515, Re. S.N. 893,350, Filed Apr. 4, 1978, Cl. 272/69, ROUND TRAMPOLINE, Harold L. McNeil, Owner of Record: *Temple Baptist Church, Tallahassee, Fla.,* Attorney or Agent: Harvey B. Jacobson, Ex. Gp.: 334

3,973,839, Re. S.N. 907,838, Filed May 19, 1978, Cl. 352/5, SPECIAL EFFECTS GENERATION AND CONTROL SYSTEM FOR MOTION PICTURES, Richard J. Stumpf, et al., Owner of Record: *MCA Systems, Inc., Universal City, Calif.,* Attorney or Agent: Gilbert G. Kovelman, Ex. Gp.: 211

3,984,801, Re. S.N. 914,464, Filed Jun. 12, 1978, Cl. 337/252, REJECTION-TYPE FUSE CLIP, Stephen A. Mrenna, et al., Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: F. E. Blake, Ex. Gp.: 212

3,984,801, Re. S.N. 914,691, Filed Jun. 12, 1978, Cl. 337/252, REJECTION-TYPE FUSE CLIP, Stephen A. Mrenna, Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: F. E. Blake, Ex. Gp.: 212

3,992,632, Re. S.N. 914,660, Filed Jun. 12, 1978, Cl. 250/423 R, MULTICONFIGURATION IONIZATION SOURCE, William P. Kruger, et al., Owner of Record: *Hewlett-Packard Company, Palo Alto, Calif.,* Attorney or Agent: Michael L. Sherrard, Ex. Gp.: 256

3,995,676, Re. S.N. 914,092, Filed Jun. 9, 1978, Cl. 152/410, RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION, Robert Casey, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, Ex. Gp.: 314

4,007,835, Re. S.N. 915,087, Filed Jun. 13, 1978, Cl. 206/411, FUSE AND FOLD FABRIC, William M. Klothe, Owner of Record: *Pellon Corporation, New York, N.Y.,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 241

4,010,395, Re. S.N. 914,091, Filed Jun. 9, 1978, Cl. 313/188, GAS DISCHARGE DISPLAY PANEL WITH CELL-FIRING MEANS HAVING GLOW SPREADING ELECTRODE, George E. Holz, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

4,015,111, Re. S.N. 912,074, Filed Jun. 5, 1978, Cl. 362/34, INFLATABLE, CHEMI-LUMINESCENT ASSEMBLY, Donald Spector, Owner of Record: *Inventor,* Attorney or Agent: Michael Ebert, Ex. Gp.: 221

4,020,516, Re. S.N. 871,127, Filed Jan. 19, 1978, Cl. 11/1 A, APPARATUS FOR BINDING LOOSE SHEETS, Albert Gomez, Owner of Record: *Spiral Binding Company, Inc., New York, N.Y.,* Attorney or Agent: John J. Hart, et al., Ex. Gp.: 334

4,042,457, Re. S.N. 912,861, Filed Jun. 5, 1978, Cl. 195/1.8, PREPARATION OF CELL PROLIFERATION AND TISSUE INVASION INHIBITOR AND METHOD OF TREATMENT UTILIZING THE INHIBITOR, Klaus E. Kuettner, et al., Owner of Record: *Rush Presbyterian Saint Luke's Medical Center, Chicago, Ill.,* Attorney or Agent: William E. Anderson, Ex. Gp.: 125

4,043,006, Re. S.N. 905,928, Filed May 15, 1978, Cl. 24/90 R, BUTTON LOCKING DEVICE, Ben Williams, et al., Owner of Record: *Inventors,* Attorney or Agent: Joseph P. House Jr., Ex. Gp.: 351

4,056,091, Re. S.N. 913,849, Filed Jun. 8, 1978, Cl. 126/121, VORTICAL FLOW AEROTHERMODYNAMIC FIREPLACE UNIT, Alexander John Moncrieff Yeates, Owner of Record: *Inventor,* Attorney or Agent: Charles M. Leedom, Jr., et al., Ex. Gp.: 344

4,074,998, Re. S.N. 917,820, Filed Jun. 22, 1978, Cl. 71/66, METHOD OF CONTROLLING AQUATIC WEEDS, William B. Lacefield, Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 124

PATENT NOTICES

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National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW.
Washington, D.C. 20324

Patent application 785,481. Method for Fabricating MNOS Memory Circuits. Filed Apr. 7, 1977.

Patent application 787,677. Catadioptric Objective. Filed Apr. 14, 1977.

Patent application 854,449. Microwave Yttrium Iron Garnet Power Limiter Using Electrically Thin Iris. Filed Nov. 23, 1977.

Patent application 855,501. Signal Dynamic Range Enhancement System. Filed Nov. 28, 1977.

Patent application 877,937. Apparatus for, and Method of, Plunge Grinding. Filed Feb. 15, 1978.

Patent 4,074,563. In-situ Measurement Apparatus. Filed Oct. 12, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,568. Fluidic Oscillating Jet for High Frequency Gust Tunnel. Filed May 7, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,908. Double Acting Dynamic Seal With E-Shaped Spring and L-Shaped Seals. Filed Mar. 9, 1977. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,074,030. Coaxial Optical System. Filed Jan. 28, 1976. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,075,929. Three Stage Thrusting Device. Filed Jan. 28, 1976. Patented Feb. 28, 1978. Not available NTIS.

Patent 4,076,454. Vortex Generators in Axial Flow Compressor. Filed June 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 400 7th St. SW.
Washington, D.C. 20590

Patent 4,055,074. Window Method for Measuring Leakage. Filed Dec. 30, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,070,906. Modified Roof Strain Indicator. Filed Dec. 15, 1976. Patented Jan. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 834,739. A Shock-Mounted, Liquid Cooled Cold Plate Assembly. Filed Sept. 19, 1977.

Patent application 837,342. High-Accuracy Analog Multipliers. Filed Sept. 28, 1977.

Patent application 849,910. An Acoustic Periodic Structure. Filed Nov. 7, 1977.

Patent application 860,670. Composite Low Frequency Transducer. Filed Dec. 12, 1977.

Patent application 861,148. A Two-Phase Control System. Filed Dec. 12, 1977.

Patent application 863,362. Method for Determining Conduction-Band Edge and Electron Affinity in Semiconductors. Filed Dec. 22, 1977.

Patent application 863,363. Electro-Chemical Sensors for Gas Detection in Electron Tubes. Filed Dec. 22, 1977.

Patent application 868,361. Access Coupler and Duplex Coupler for Single Multimode Fiber Transmission Line. Filed Jan 10, 1978.

Patent application 868,364. Investigation of Near-Surface Electronic Properties in Semiconductors by Electron Beam Scanning. Filed Dec. 22, 1977.

Patent application 871,573. Corner Fed Electric Microstrip Dipole Antenna. Filed Jan. 23, 1978.

Patent application 878,629. Analog and Digital Circuit Tester. Filed Feb. 17, 1978.

Patent application 879,025. Flexible Printed Circuit Board Assembly. Filed Feb. 22, 1978.

Patent application 883,569. Optical Image Modifier. Filed Mar. 6, 1978.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
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GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
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RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
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DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents	Numbers 2,067 to 2,075, inclusive

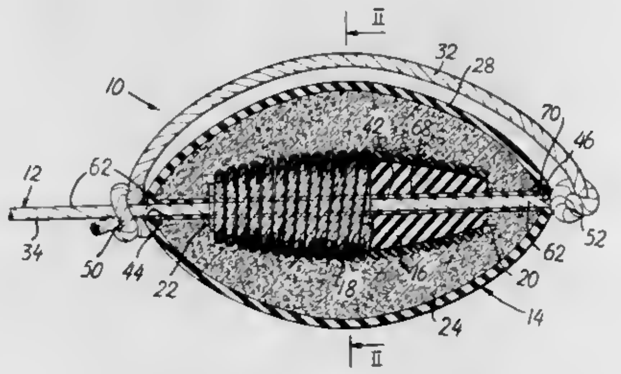
REISSUES

AUGUST 15, 1978

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,728
LIFESAVING DEVICE

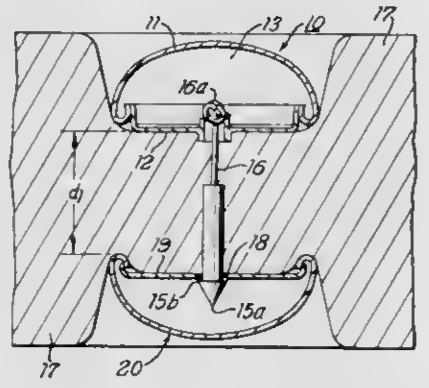
Robert S. Franklin, 12 Blakely Cir., Randolph, Mass. 02368
Original No. 3,974,536, dated Aug. 17, 1976, Ser. No. 580,743, May 27, 1975. Application for reissue Jan. 25, 1977, Ser. No. 762,328
Int. Cl.^{2} B63C *9/00*
U.S. Cl. 9—14 **10 Claims**



13. A life-saving device of ellipsoidal shape resembling a football and adapted to be gripped and thrown like one towards a person in distress in a body of water, comprising
- *(a) a central core of predetermined weight and a mass of solid buoyant material with a yielding and waterproof exterior surrounding said core, to impart to the entire device a specific gravity lower than 1.0 so that it has the combined capability of floating on the body of water and being thrown as far and as accurately as a football,*
- *(b) said device having a central passage extending therethrough along its longitudinal axis, and*
- *(c) a rope lifeline having one end thereof extending through said passage for secure attachment to said device, which upon grasping by said person permits pulling of the person from the opposite end of said lifeline.*

Re. 29,729
BUTTONING MEANS

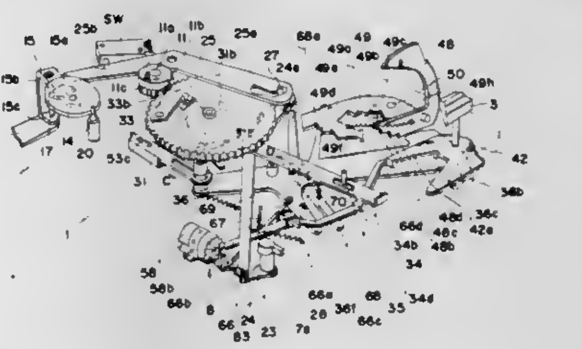
Peter David Benmax, 22 Mare St., London E.G., England
Original No. 3,942,224, dated Mar. 9, 1976, Ser. No. 425,733, Dec. 18, 1973. Application for reissue Mar. 10, 1977, Ser. No. 776,449
Claims priority, application United Kingdom, Jan. 9, 1973, 1187/73
Int. Cl.^{2} A44B *1/18*
U.S. Cl. 24—90 B **3 Claims**



1. A buttoning means comprising in combination a pair of hollow tufting buttons at least one of which has an interior wall and each of which are provided with base plate members, said base plate members being provided with centrally disposed apertures capable of being aligned on opposite side portions of material to be tufted, a substantially rigid, elongated shank having a major portion extending to one end of uniform diameter slidably arranged in one of said apertures, a cord secured to one end of said shank and having an enlarged terminal portion positioned on one side of said apertured base plate member adjacent said interior wall, terminal portion being larger than said one aperture to prevent total removal of said cord, said shank means further including at its opposite free end a pointed end, adjacent said pointed end an abutment positioned outwardly from said shank having a greater transverse extent than said one aperture for permanent insertion in said aperture of said other button upon the pointed end end being forced through said material to be tufted, said major portion of said shank being movable completely out of said one aperture.

Re. 29,730
AUTOMATIC RECORD PLAYER

Seizo Miyoshi, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Original No. 3,827,697, dated Aug. 6, 1974, Ser. No. 249,109, May 1, 1972. Application for reissue Aug. 3, 1976, Ser. No. 711,378
Claims priority, application Japan, May 3, 1971, 46-29165
Int. Cl.^{2} G11B *17/16*
U.S. Cl. 274—10 R **6 Claims**



5. An automatic record player comprising a turntable drive motor; a switch for said turntable drive motor; means for operating the switch to energize the drive motor; a tone arm having a rotatable shaft; a turntable having a turntable gear thereon and a spindle projecting therefrom; a gear wheel having a substantially heart-shaped groove farmed therein, said gear wheel being engageable with the turntable gear; an actuating member operatively coupled to said gear wheel to bring said gear wheel into engagement with said turntable gear; an actuating lever for operating said actuating member; a driving plate having first and second ends and having an upright boss at said first end, which upright boss engages said gear wheel and is moved reciprocally in engagement with said heart-shaped groove formed in said gear wheel; an arm on said second end of said driving plate, said arm being adapted to move said tone arm vertically and horizontally; a positioning mechanism for selecting the dropping position of said tone arm; means for restricting the horizontal swinging movement of the tone arm to inhibit the latter from swinging to a position above the lead-in groove of a record; and a cycle adjusting mechanism including a repeat number setting member having a plurality of sawteeth thereon and a recess defined therein, a plurality of digit characters equal in number to the number of said sawteeth, said digit characters being in the form of a series of numbers 1, 2, 3, 4 ... and n (n being an integer) each representative of the desired number of records to be played by the player, another digit character in the form of a zero number which is adapted to be displayed *when the recess in the setting member is brought to a predetermined position, thereby warning that the desired number of records has been completed, means successively engageable with said sawteeth on the setting member in response to the reciprocal movement of the driving plate for intermittently moving said setting member towards a position where said zero number can be displayed, and a second member engageable into the recess in the setting member, irrespective of the presence and absence of the records on the spindle, when the setting member is brought to said predetermined position, whereby when said second member is engaged into the recess in the setting member held in said predetermined position, said restricting means is brought into operation to inhibit said tone arm from swinging horizontally to a position above the lead-in groove of a record, thereby interrupting the operation of the player irrespective of the presence and absence of the records on the spindle.*

Re. 29,731

METAL OXIDE VOLTAGE-VARIABLE RESISTOR COMPOSITION

Herbert Fishman, and James S. Kresge, both of Pittsfield, Mass., assignors to General Electric Company

Original No. 3,928,245, dated Dec. 23, 1975, Ser. No. 377,218, Jul. 9, 1973. Application for reissue Aug. 8, 1977, Ser. No. 822,623

Int. Cl.^{2} H01B *1/08*

U.S. Cl. 252—521 **5 Claims**

6. An improved zinc oxide varistor composition of the type containing silicon dioxide as an impurity the improvement which comprises:

the addition of an effective amount up to 0.3 molar percent each of barium oxide and boron oxide impurities.

Re. 29,732

TRIPEPTIDE

George Rogelio Flouret, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Original No. 3,781,272, dated Dec. 25, 1973, Ser. No. 237,877, Mar. 24, 1972. Application for reissue Jan. 31, 1977, Ser. No. 763,787

Int. Cl.^{2} C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **7 Claims**

1. The optically active L-form of the tripeptide Y-(N^{ω}-R')Arg-Pro-Gly-R wherein R is [hydroxy, methoxy or] amino, R' is nitro, p-nitrobenzyloxycarbonyl, tetrachloroisopropyloxyphthaloyl or p-tolylsulfonyl, and wherein Y is hydrogen, tert.-butoxycarbonyl, o-nitrophenylsulfenyl, 2-(diphenyl)isopropyloxycarbonyl, benzyloxycarbonyl or phthalyl.

Re. 29,733

TELEPHONE ANSWERING APPARATUS

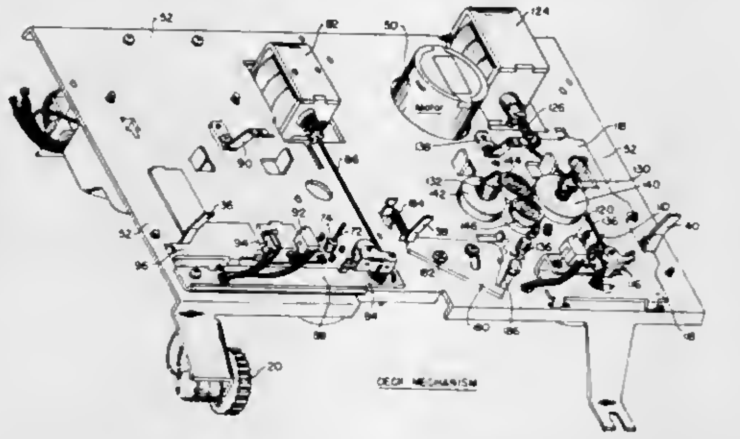
James R. Darwood, Anaheim, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.

Original No. 3,968,329, dated Jul. 6, 1976, Ser. No. 548,413, Feb. 10, 1975. Application for reissue Feb. 4, 1977, Ser. No. 765,546

Int. Cl.^{2} G11B *15/68, 5/54*

U.S. Cl. 179—6 R **6 Claims**

10. A telephone answering apparatus including in combination: a housing; means mounted in said housing for receiving a removable magnetic announcement tape unit; first capstan drive means mounted in said housing on one side of the path of the tape in said removable tape unit for driving the tape; a first pinch roller assembly mounted in said housing on the opposite side of the path of said tape; first solenoid means mechanically coupled to said first pinch roller assembly for selectively causing the first pinch roller assembly to be drawn against the tape to move the tape into driving engagement with the first capstan drive means; means mounted in said housing for receiving a removable cassette-type magnetic message tape unit; a second capstan drive means mounted in said housing on one side of the path of the tape in the message tape unit for driving the message tape; a second pinch roller assembly mounted in said housing on the opposite side of the path of the tape in said message tape unit; second solenoid means mechanically coupled to said second pinch roller assembly for selectively moving said second pinch roller assembly toward the second capstan drive means to move the tape in said message tape unit into driving engagement with the capstan drive means; a drive motor mounted in the housing and mechanically coupled to the first and second capstan drive means; first and second spindle means mounted in the housing for receiving the cassette-type message tape unit; mechanical coupling means for selectively coupling the drive motor to the first and second spindle means to drive the tape in the message tape unit selectively in a forward and a rewind direction; third solenoid means connected to said coupling means for changing the coupling of the drive motor from one of the spindle means to the other whenever the third solenoid means is energized; a plate slidably mounted in said housing between a first position and a second position for supporting said second pinch roller assembly; electromagnetic transducer means mounted on said plate, said second solenoid means being mechanically coupled to said plate for selectively moving said plate from its first position to its second position to move said second pinch roller assembly and said electromagnetic transducer means into operating relationship with respect to the tape in said message tape unit; resilient means coupling said second solenoid means to said plate to permit said plate to be pulled back to its first position, and the pinch roller assembly and electromagnetic transducer means to be pulled back from the tape in said message tape unit, while the second solenoid means is energized; a second plate slidably mounted in the apparatus adjacent said message tape unit and movable between a first and a second position; magnetic erase means mounted on the second plate; resilient means for normally biasing the magnetic erase means to a first position away from the tape in said message tape unit; lever means coupled to the second plate for manually moving the second plate from its first position to its second position against the force of the resilient means to bring the erase means into operating relationship with the tape in said message tape unit; and means mounted on at least one of the first and second plates for causing the first plate to hold the second plate in its second position upon prior movement of the second plate to its second position, and for causing the first plate to prevent movement of the second plate upon prior movement of the first plate to its second position.



Re. 29,734

WELL BORE DATA-TRANSMISSION APPARATUS WITH DEBRIS CLEARING APPARATUS

Kenneth G. Manning, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Original No. 3,764,970, dated Oct. 9, 1973, Ser. No. 263,024, Jun. 15, 1972. Application for reissue Jul. 29, 1977, Ser. No. 820,187

Int. Cl.^{2} G01V *1/40*

U.S. Cl. 340—18 NC **27 Claims**

1. Apparatus adapted for transmitting data signals from a well bore to the surface and comprising:

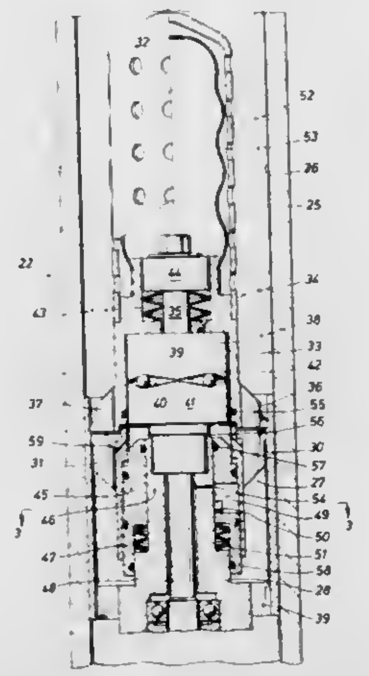
a body adapted for connection in a pipe string and having a fluid passage arranged to carry debris-bearing fluids between the surface and well bore;

a first signal-producing member cooperatively arranged in said fluid passage for directing at least a portion of a fluid flowing therethrough along at least one selected flow path;

first means including a second signal-producing member cooperatively arranged in said fluid passage adjacent to said first member for rotation at a selected speed in a plane transverse to said flow path for repetitively obstructing said flow path at periodic intervals to cyclically produce acoustic data signals in a fluid flowing through said fluid passage;

second means operable upon at least slowing of said second member below said selected speed in response to an increase in driving torque on said second member for momentarily separating one of said signal-producing members to allow fluid-borne solids flowing through said fluid passage to pass downstream of said signal-producing members; and

third means operable upon at least slowing of said second member in response to an increased pressure differential across said signal-producing members for momentarily separating the other of said signal-producing members from said one signal-producing member to allow fluid-borne solids flowing through said fluid passage to pass downstream of said signal-producing members.



Re. 29,735

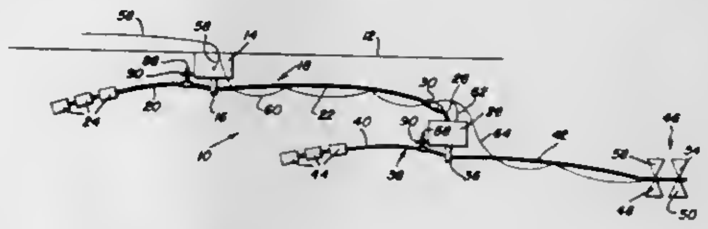
ROTATIONAL LIGHTING SYSTEM

Murray Tovi, New York, N.Y., assignor to Murray Tovi Designs, Inc., New York, N.Y.

Original No. 3,924,119, dated Dec. 2, 1975, Ser. No. 496,191, Aug. 9, 1975. Application for reissue May 6, 1976, Ser. No. 683,773

Int. Cl.^{2} F21V *21/20*

U.S. Cl. 362—401 **16 Claims**



15. A horizontal, remotely controlled system in which a source of energy can hover over substantially any given region of an area, the system comprising: a first motor element adapted to be fixedly mounted relative to said area, said first motor element having a first rotatable motor shaft; a first elongated support arm having first and second ends, said first support arm being mounted on said first motor shaft intermediate its first and second ends, for rotation with said first motor shaft, and in a substantially horizontal plane; a second motor element suspended from the first end of said first support arm, said second motor element having a second rotatable motor shaft; a second elongated support arm having first and second ends, said second support arm being mounted on said second motor shaft intermediate its first and second ends, for rotation with said second motor shaft, and in a substantially horizontal plane; energy means mounted at the first end of said second support shaft; counterweight means mounted at the second end of said second support arm, weighted and positioned so that said second support arm, said counterweight means and said energy means are in substantial horizontal balance about said second motor shaft; second counterweight means mounted at the second end of said first support arm, weighted and positioned so that said first support arm, carrying the associated second motor element, second support arm, second counterweight means and energy means, is in substantial horizontal balance about said first motor shaft; and control means for independently controlling the operation of said first and second motor elements and thereby the respective rotatable motor shafts, and said energy means; and wherein the distance between the first end of said first support arm and the first motor shaft is substantially equal to the distance between the first end of said second support arm and said second motor shaft.

PLANT PATENTS

GRANTED AUGUST 15, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,291

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,510

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, many petalled coral pink blooms borne both in sprays and singly supported erect on sturdy peduncles with petals reflexing and quilling symmetrically on opening which are long lasting on the plant and as cut flowers.

4,292

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,511

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by hybrid tea-like high centered, blooms of orange-red to bronze-yellow coloring borne primarily singly to a stem, deepening in tonality upon aging.

4,293

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,513

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by the unusual coloring which contrasts scarlet red petals of quickly opening flowers with yellow coloring at the base of the petals that, together with dark yellow stamens produce a yellow eye on a vigorous, compact growing plant that blooms profusely.

4,294

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 854,514

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by coral pink high centered, recurrent flowers of persistent coloring borne primarily singly to a stem, with reflexing petals folding individually along the entire margin as they mature and are long lasting on the plant.

PATENTS

GRANTED AUG. 15, 1978

ERRATA

For CLASS	See PATENT NO.
308–172	4,106,192
400–144.2	4,106,611
296–023 C	4,106,732
273–080 B	4,106,777
074–108	4,106,925
260–326.5 B	4,107,074
521–032	4,107,097
521–025	4,107,098
521–030	4,107,099
521–137	4,107,100
521–137	4,107,101
521–163	4,107,102
528–072	4,107,103
521–171	4,107,104
521–080	4,107,105
521–164	4,107,106
521–106	4,107,107
521–085	4,107,108
521–154	4,107,140
528–093	4,107,142
528–176	4,107,143
526–212	4,107,144
528–108	4,107,145
528–168	4,107,146
528–172	4,107,147
528–273	4,107,148
528–309	4,107,149
528–307	4,107,150
528–054	4,107,151
528–068	4,107,152
528–322	4,107,153
528–312	4,107,154
528–373	4,107,155
544–313	4,107,162
423–263	4,107,163
544–380	4,107,164
568–875	4,107,219
428–304	4,107,327
260–306.8 D	4,107,377
179–084	4,107,495

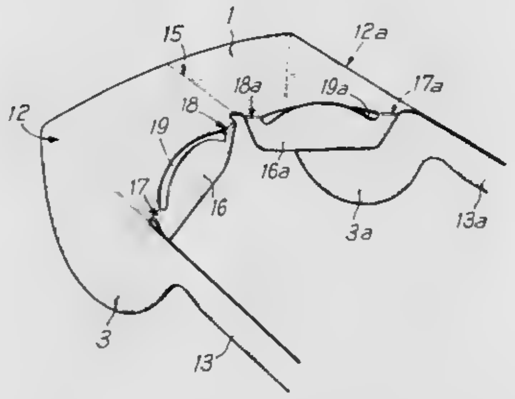
PATENTS

GRANTED AUGUST 15, 1978

GENERAL AND MECHANICAL

4,106,119
EYE-SHADES

Jean-Paul Taupin, Le Vivier, 58140 Urzy, France
Filed Nov. 5, 1974, Ser. No. 521,204
Claims priority, application France, Nov. 8, 1973, 73 39794
Int. Cl.^{2} A61F *9/04*
U.S. Cl. 2—12 **2 Claims**



1. An eye-shade comprising a one piece blank defining a substantially flat brow member having a fold line in a central portion thereof allowing the brow member to be folded in half, a pair of temple members respectively connected to the brow member along a pair of laterally spaced fold lines at opposite sides of the brow member, and a pair of intergral arms respectively extending from said temple members along another pair of fold lines to free ends, said free ends defining cooperating means for securing said arms together thereby to provide a head-encompassing member interconnecting said temple members to cause said brow member to extend outwardly in a substantially horizontal attitude above the wearer's eyes in the position of use with said temple members assuming a substantially vertical attitude; said brow member including an inner edge between said arms and a pair of integral forehead strips forming part of said one piece blank and being foldably connected to said brow member on each side of the fold line in the brow member along a pair of angularly related fold lines, said blank having an opening formed therein along each of said angularly related fold lines to allow said forehead strips to be folded downwardly with respect to said brow member and deform to adapt to the curvature of the wearer's forehead; said brow member and said temple members defining a field of vision within the three sidewalls defined by said members.

4,106,120
REVERSIBLE SURGICAL GOWN

Charles Edward Zurbrigg, London, and William Douglas Sulman Keenan, Komoka, both of Canada, assignors to Lac-Mac Limited, London, Canada
Continuation-in-part of Ser. No. 625,229, Oct. 23, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,571
Claims priority, application Canada, Mar. 24, 1975, 222941
Int. Cl.^{2} A41D *13/00*
U.S. Cl. 2—51 **11 Claims**

1. A reversible surgeon's gown, comprising:

a front panel having first and second front panel side margins;

a first back panel extending laterally from said first front panel side margin and having a first back panel side margin;

a second back panel extending laterally from said second front panel side margin and having a second back panel side margin;

a first back flap extending laterally from said first back panel side margin and terminating in a first distal side edge;

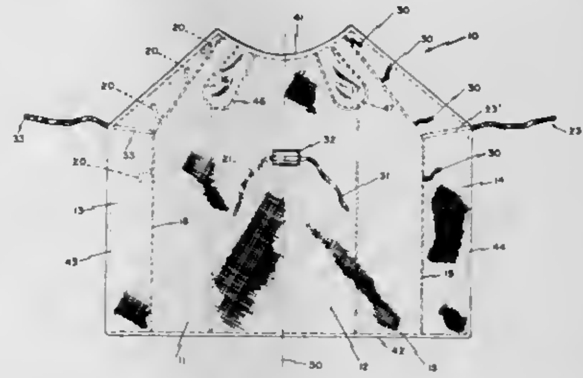
a second back flap extending laterally from said second back panel side margin and terminating in a second distal side edge;

a first sleeve member attached between said front panel and said first back panel; a second sleeve member attached between said front panel and said second back panel;

first securing means attached at said first back panel side margin on one surface of said gown;

second securing means attached at said second back panel side margin on the opposite surface of said gown, said first and second securing means being adapted to secure said first back panel side margin to said second back panel side margin to provide secured first and second side margins at the back of the wearer;

first retaining means attached at said first distal side edge;



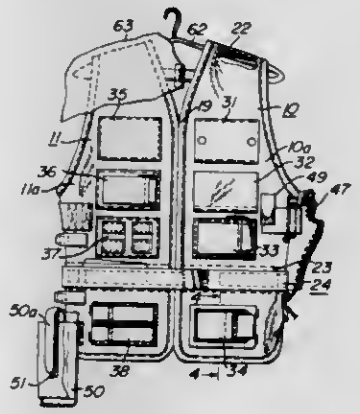
second retaining means attached at said second distal side edge;

third retaining means attached on said front panel on said one surface of the gown; and

fourth retaining means attached on said front panel on said opposite surface of the gown, said first and fourth retaining means being adapted to retain said first back flap over said secured first and second back panel side margins when said opposite surface is the outside surface of the gown, and said second and third retaining means being adapted to retain said second back flap over said secured first and second back panel side margins when said one surface is the outside surface of the gown.

4,106,121
TACTICAL LOAD BEARING VEST

Gary W. Belson, 25 First St., Barnegat, N.J. 08005
Filed Nov. 29, 1976, Ser. No. 745,964
Int. Cl.^{2} A41D *1/04*
U.S. Cl. 2—102 **11 Claims**



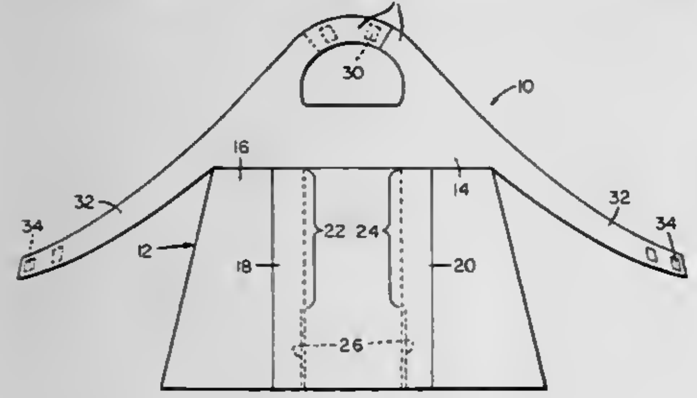
1. A snug fitting tactical vest comprising a left vest section and a right vest section, each section having inside and outside surfaces and a front and a rear longitudinal edge,

means for separably connecting together a portion of said front edges of said left and right vest sections,
means for adjustably connecting in accordance with the fit of the wearer at least a portion of the rear edges of said left and right vest sections,
at least one removable supply pouch having a rear surface, and
hook and mesh fastening means comprising at least one fastening strip of hook devices and at least one fastening strip of mesh devices, at least one fastening strip of one device type being secured to said rear surface of said pouch, at least one fastening strip of the other device type being secured to said outside surface of said vest for engaging the pouch fastening strip thereby to releasably secure the entirety of said pouch to said vest.

4,106,122
HALTERED COVER GARMENT FOR NURSING MOTHERS

Laura M. Dodd, 815 Captain Frank Rd., New Albany, Ind. 47150

Filed Jul. 14, 1977, Ser. No. 815,522
Int. Cl.² A41D *1/20*
U.S. Cl. 2—104 **14 Claims**



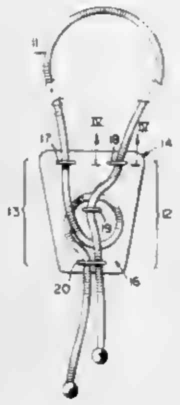
1. A haltered cover garment for nursing mothers comprising a bib having
- an upper portion defining a neck halter, and
- a lower portion extending from said neck halter downward across the chest of the wearer a distance at least sufficient to cover her breasts, said lower portion containing a pair of flaps extending across the breasts and overlying a pair of openings formed through said bib in the areas of each breast, said lower portion further comprising
  - a pair of side pieces of material, the outside edges of which terminate along the sides of the wearer, and
  - a central rectangular piece of material, the sides of which overlap the inside edges of said side pieces to form said flaps.

4,106,123
ARTICLE OF JEWELRY

Melvin H. Freedman, 200 E. 27th St., New York, N.Y. 10016

Filed Nov. 15, 1977, Ser. No. 851,626
Int. Cl.² A41D *25/14*
U.S. Cl. 2—152 R **3 Claims**

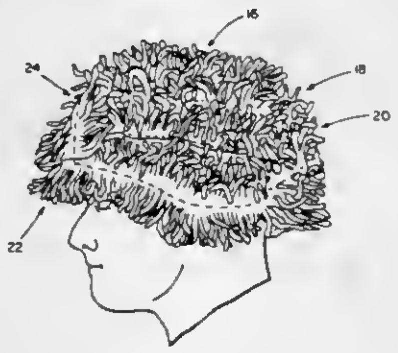
1. An article of jewelry operable to encircle a portion of the body comprising (a) a length of flexible material of uniform cross-section and (b) a slide operable to adjustably engage two portions of said length, said slide having disposed on its rear surface (i) a pair of upper engagement hoops, (ii) an intermediate engagement hoop and (iii) at least one lower engagement hoop, each of said hoops defining an opening having a height greater than the cross-section of said flexible material but less than twice said cross-section, a first of said portions of flexible material passing through one of said upper hoops, around said intermediate hoop, crossing over or under itself so as to form a loop and out through said lower hoop and the other portion of said flexible material passing through the second of said upper hoops, over an area of the loop formed by said first portion, through said intermediate hoop, over a second area of said loop and out through a lower engagement hoop.

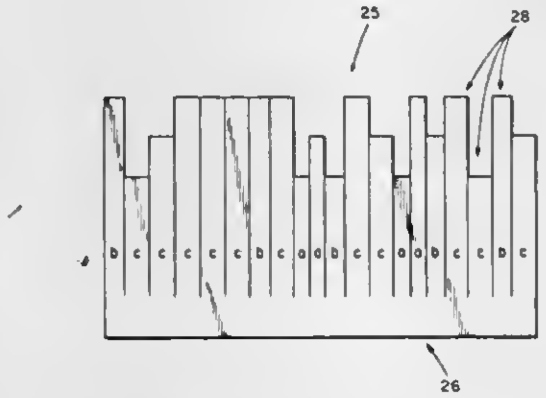


4,106,124
SNAGPROOF HELMUT CAMOUFLAGE COVER

Charles Emmons Green, Deland, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 9, 1977, Ser. No. 775,925
Int. Cl.² A42B *1/24;* A42C *5/00*
U.S. Cl. 2—187 **12 Claims**



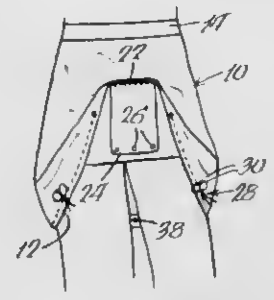


1. A camouflage disrupter element comprising
(a) a band of flexible material having a top and a bottom lateral edge,
(b) a plurality of substantially snagproof blade-like elements extending from both lateral edges of said band in random direction forming a downward extending and an upward extending three dimensional grass-like pattern, and
(c) said blade-like elements being resilient and capable of substantial recovery of shape upon being disarranged.

4,106,125
CONVERTIBLE GARMENT

Angeline Palumbo, 3511 N. Narragansett, Chicago, Ill. 60634

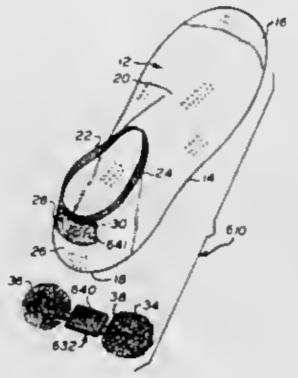
Filed Oct. 20, 1976, Ser. No. 734,344
Int. Cl.² A41D *1/14*
U.S. Cl. 2—213 **6 Claims**



1. A garment made of material and convertible between a skirt-like garment comprising a skirt having a lower margin and a front and rear side, a central crotch means secured at one end to said skirt near the lower margin thereof, the other end of said crotch means being free and movable from a concealed position inside said skirt to a connecting position extending between said front and rear sides, means on an interior surface of said skirt spaced from the secured end of said crotch means for releasably securing the free end of said crotch means in said concealed position, and means on said skirt for releasably gathering the material of said skirt and drawing said crotch means around the legs of the wearer near the bottom margin of said skirt, said gathered material and crotch means together defining leg portions of the garment.

4,106,126
WITHIN-THE-SHOE SOCK HAVING REMOVABLE RETAINING DEVICE

William J. Traenkle, 61 Old Ox Rd., Manhasset, N.Y. 11030
Continuation-in-part of Ser. No. 589,444, Jun. 23, 1975, Pat. No. 4,055,858. This application Aug. 11, 1977, Ser. No. 823,623
Int. Cl.² A41B *11/00;* A43B *3/10;* A43C *9/00*
U.S. Cl. 2—240 **9 Claims**

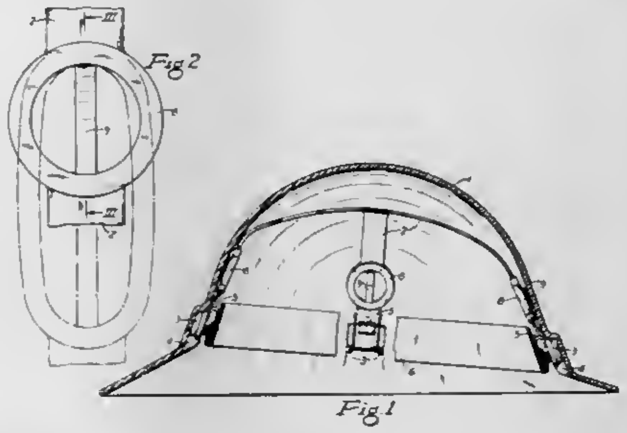


1. A within-the-shoe sock construction comprising a sock having a foot opening adapted to receive a foot therethrough, the height of said sock being substantially coextensive with the height of a shoe to be worn with said sock whereby the upper rear edge of the sock is substantially coterminous with the upper rear edge of the shoe; retaining means detachably secured to said sock and engagable with the rear edge of a shoe for retaining said sock in position on the foot of the wearer, said retaining means comprising an enlarged member, and a relatively narrow support member connected to said enlarged member; and a press-on peel-off separable fastener on said sock and said support member for detachably connecting said retaining means to said sock.

4,106,127
ENERGY ABSORBING SUSPENSION ELEMENT

Roy D. Marangoni, Pittsburgh, and Harry W. Austin, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 25, 1976, Ser. No. 699,998
Int. Cl.² A42B *3/02*
U.S. Cl. 2—416 **3 Claims**

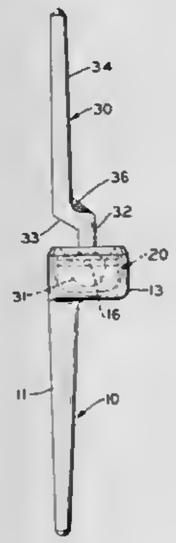


1. A suspension element for suspending a load and absorbing energy of the load is increased above a predetermined minimum, comprising a normally rigid molded nonbrittle plastic ring and means for connecting only two diametrically opposite areas of the ring to a support and a load, the ring being permanently deformable under an applied load above said minimum, the opposite sides of the ring between said two areas being free of any connecting means and bulging away from each other and said connecting means, and said bulging opposite sides of the ring being subject to being pulled toward each other permanently and straightened if the load suspended by the ring increases beyond said predetermined minimum and reduces the width of the ring by elongating the ring in the direction of the load, whereby the energy required to thus deform the ring is absorbed by the ring.

4,106,128
ENDOPROSTHETIC BONE JOINT

A. Seth Greenwald, 2235 Tudor Dr., Cleveland Heights, Ohio 44106; Derek S. Porritt, 3263 Granger Rd., Medina, Ohio 44256, and Mary-Blair Matejczyk, 3617 Randolph Rd., Cleveland Heights, Ohio 44121

Filed Dec. 6, 1976, Ser. No. 747,502
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **4 Claims**



3. A wrist joint comprising:
a. a first radial component having a tapered intramedullary stem;
b. a cup fixedly connected thereto and offset to one side;

c. a socket fitted within the cup and further having a spherical surface covering substantially more than a hemisphere;

d. a metacarpal component having a ball, a neck portion and an intramedullary stem;

e. said radial component and said metacarpal stem being coextensive;

f. said ball fitted within said spherical surface of said socket, and further having an offset in the neck portion; and

g. said socket having a frusto-conical surface extending outwardly from the spherical surface adapted to engage the neck of the metacarpal component to relieve the stress in the socket.

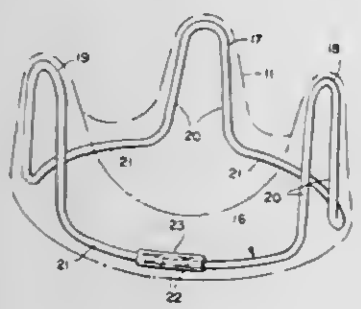
4,106,129
SUPPORTED BIOPROSTHETIC HEART VALVE WITH COMPLIANT ORIFICE RING

Alain F. Carpentier, Paris, France, and Ernest Lane, Huntington Beach, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 647,900, Jan. 9, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 827,961

Int. Cl.² A61F *1/22*

U.S. Cl. 3—1.5 **29 Claims**



16. A flexible stent for supporting a valvular graft, said stent having an annular frame formed of spring wire, said frame including a triad of axially-projecting circumferentially-spaced commissure supports, each commissure support being of inverted U-shaped configuration having wire legs normally spaced substantially apart, the lower end portions of said legs merging smoothly with arcuate connecting segments of said frame extending circumferentially between and joining the adjacent legs of adjoining commissure supports, said U-shaped commissure supports and said connecting segments being formed integrally from the same piece of spring wire, each of said arcuate connecting segments having a major portion of the length thereof extending along a plane normal to the axis of said stent.

4,106,130
ENDOPROSTHETIC BONE JOINT DEVICES

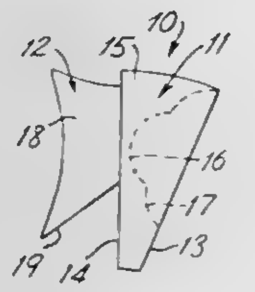
John Tracy Scales, Stanmore, England, assignor to National Research Development Corporation, London, England

Filed Feb. 11, 1977, Ser. No. 767,949

Claims priority, application United Kingdom, Feb. 20, 1976, 6803/76

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **9 Claims**



1. An endoprosthetic bone joint device comprising two components respectively adapted for securement to different bones of the relevant joint, and respectively including male and female bearing parts in mutual articulatory engagement, the male part having a rounded convex bearing surface, the female part having a compound concave bearing surface including a cupped area bounded by an annular troughed area, and the curvature of said cupped area and the transverse curvature of said troughed area each being no greater than the curvature of said convex surface.

4,106,131
WATER DISTRIBUTOR FOR SIPHON CLOSET

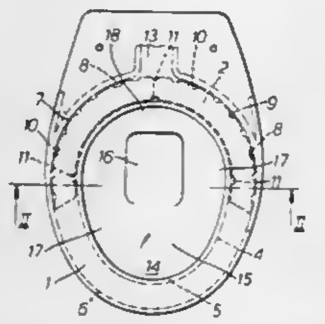
Wilfried Delker, Bonn-Beuel, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,245

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616742

Int. Cl.² A47K *17/00;* E03D *11/00*

U.S. Cl. 4—1 **6 Claims**



1. A water distributor adapted for use in a siphon closet of the type having an open flush rim, the distributor comprising:

a strip of relatively rigid, generally flat but sufficiently flexible material adapted to be inserted and positioned under tension in a siphon closet to at least partially close the open flush rim therein, said strip being arcuately formed and having a generally larger radius of curvature in its unflexed position than said flush rim and said strip having an arrangement of apertures formed therein to provide passageways from the at least partially closed flush rim.

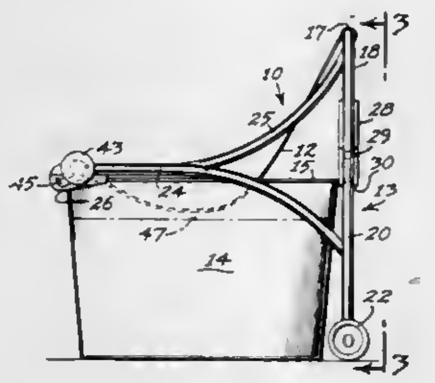
4,106,132
SITZ BATH

Albert D. Warren, New Hydes Ferry Pike, Nashville, Tenn. 37218

Filed Mar. 7, 1977, Ser. No. 774,961

Int. Cl.² A47K *3/22*

U.S. Cl. 4—6 **4 Claims**



1. A sitz bath comprising:

(a) a seat support frame having a front portion and a back portion,

(b) said back portion comprising a rear transverse member,

(c) an elongated, flexible seat member having a front end portion and a rear end portion, the longitudinal axis of said seat member extending front-to-rear,

(d) rear securing means stationarily securing the rear end portion of said seat member to said rear transverse member,

(e) windlass means including a rotary spindle rotatably mounted on said front portion spaced in front of, below, and substantially parallel to said rear transverse member,

(f) front securing means securing the front end portion of said seat member to said rotary spindle for winding and unwinding said seat member suspended between said rear transverse member and said rotary spindle,

(g) means for holding said spindle in a non-rotary position, to hold said seat member at different adjusted elevated positions relative to said frame device, so that the legs of a person seated lengthwise of the longitudinal axis of said seat member extend over said spindle,

(h) a liquid-receiving receptacle, and

(i) means on said seat support frame detachably connecting said receptacle below said seat member, and within which said seat member is adapted to be suspended in various adjusted elevated positions.

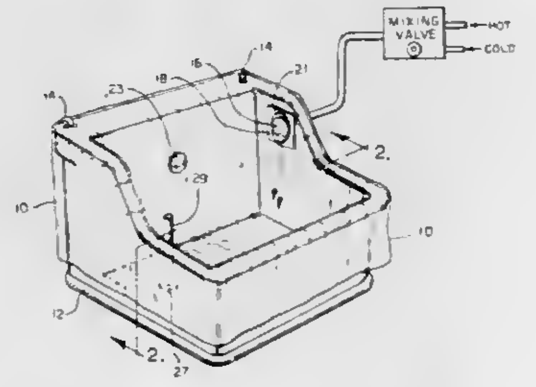
4,106,133
CONTAMINATION PREVENTION DEVICE FOR SITZ BATH

Thomas J. Roberts, 1233 Somerset La., Elk Grove, Ill. 60007

Filed May 9, 1977, Ser. No. 795,408

Int. Cl.² A47K *3/22*

U.S. Cl. 4—6 **1 Claim**



1. A sitz bath arrangement comprising:

a sitz bath having sidewalls and a bottom;

a drain in the bottom of said sitz bath;

a water inlet extending through one of the sidewalls of said sitz bath;

a generally elliptical shaped diverter mounted on and surrounding said water inlet on the inside of the sitz bath and adjacent to the sidewall through which the inlet extends, said diverter being oriented such that its major axis is generally vertically aligned and said diverter being dished so that its two end portions extend away from the adjacent sidewall;

a disposable, flexible water-tight liner, made of plastic film, for lining the inside of said sitz bath and having a hole which permits the liner to be placed over the water inlet and hung on said diverter, said liner being placed behind both end portions of said diverter to insure that the incoming water, which may flow continuously through said water inlet, runs into the lined sitz bath and not behind said liner,

said liner providing a barrier to block the transmission of bacteria between the water and sitz bath to preclude cross-infections between the various patients that use the sitz bath;

a plastic collar attached to and surrounding a drain opening in said liner and having a depending cylindrical section that extends into the sitz bath's drain in order to communicate the liner's drain opening with the bath's drain, an annular ring being formed on the external surface of said cylindrical section to provide a sealing ring,

said cylindrical section having a circumferential lip extending around its internal cylindrical surface to provide a support;

and a removable plastic standpipe which is inserted into said collar and is supported on said circumferential lip,

the water, which flows constantly into the lined sitz bath, being drained off at the top of said standpipe, the water level in the bath thereby being determined by the height of the standpipe.

4,106,134
LIFTING FLOORS FOR SWIMMING POOLS

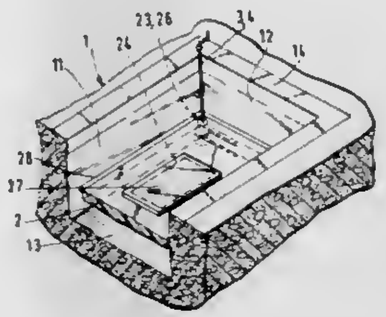
Klaus Schiron, Nelkenstrasse 2, 3100 Celle, and Hans Friedrich Rupprath, Am goldenen Acker 35, 3001 Bennigsen, both of Fed. Rep. of Germany

Filed Dec. 22, 1976, Ser. No. 753,208

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557881

Int. Cl.² E04H *3/19*

U.S. Cl. 4—172.13 **11 Claims**



1. A swimming pool in combination with a lifting floor, comprising:

said swimming pool having integrally joined bottom, longitudinal and transverse walls forming an upwardly opening bathing enclosure, and a generally horizontal rim extending peripherally around the entire upper edges of said longitudinal and transverse walls;

said lifting floor being mounted within said enclosure without permanent attachment to said enclosure, said lifting floor including a self supporting floor generally overlying said bottom wall, a plurality of lifting columns extending through said floor immediately adjacent and generally parallel to said longitudinal and transverse walls, said lifting columns supportingly resting on said bottom wall to extend vertically upward towards said rim, driving means mechanically connected only between each of said lifting columns and that portion of the floor adjacent the corresponding lifting column independently of said longitudinal and transverse walls for selectively changing the elevation of said floor with respect to said bottom wall while supporting the entire weight of said floor on said lifting columns, each of said lifting columns being braced against said floor to prevent said lifting columns from tipping inwardly away from said longitudinal and transverse walls, means only slidably engaging the adjacent portions of said longitudinal and transverse walls without permanent modification of said longitudinal and transverse walls for preventing outward tipping of said floor and columns, and said floor lifting columns and driving means being unconnected with said longitudinal and transverse walls.

4,106,135
WATER CLOSET BASIN ASSEMBLY

Daniel J. Mannheim, Corona, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

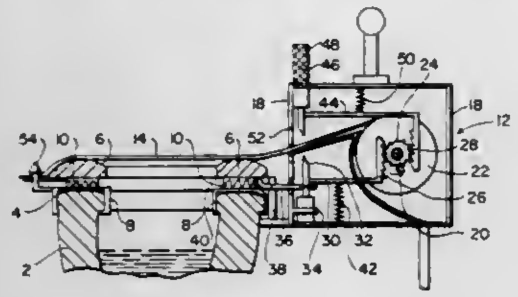
Filed Aug. 30, 1977, Ser. No. 828,985

Int. Cl.² A47K *13/18*

U.S. Cl. 4—247 **10 Claims**

1. Water closet basin assembly comprising a basin having an

endless upper edge, a basin seat shape complementarily to said edge and adapted to overlie said edge, bracket means fixed to said edge and having an elastomeric portion adapted to be disposed between said edge and said basin seat, said elastomeric portion being compressible when subjected to pressure and expandable to its original shape when said pressure is removed, and dispenser means proximate said basin and operative to dispense paper suitable for disposition overlying said seat, dispensing of said paper being responsive to movement of said elastomeric portion.



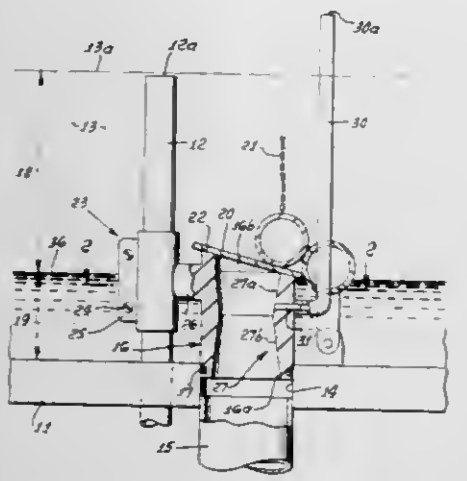
4,106,136
TOILET FLUSH FLOW ACCELERATOR

Richard L. Lippincott, Sr., 22122 Wood Island, Huntington Beach, Calif. 92646

Filed May 23, 1977, Ser. No. 799,514

Int. Cl.² E03D *1/06*

U.S. Cl. 4—368 **7 Claims**



1. In combination with a toilet flush tank having a bottom wall drain opening, the improvement comprising:

(a) a tubular body adjustably located in drain communication with said opening and having an inlet spaced above the level of said opening so that only tank water above the level of said inlet will flow downward through said body during the toilet flush cycle,

(b) the body containing a venturi to accelerate said flow, the venturi located in direct vertically aligned communication with said drain opening, and below said inlet,

(c) there being ducting in communication with said venturi via the side thereof for passing air to water flow through the venturi, the ducting having an inlet for air at atmospheric pressure.

4,106,137
SOFA BED

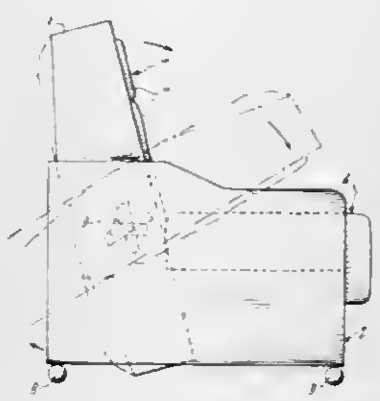
Réal Leclerc, 241 St. Vallier St., West, Quebec, Canada (G1R 3B5)

Filed Apr. 13, 1977, Ser. No. 787,282

Claims priority, application United Kingdom, Apr. 14, 1976, 76/15204

Int. Cl.² A47C *17/04*

U.S. Cl. 5—24 **4 Claims**



1. A sofa-bed comprising a base having a top seating portion, a pair of opposite end structures fixedly secured to the opposite ends respectively of the base and upwardly projecting therefrom, a backrest-bed unit having a box-shaped periperal frame construction and a rigid panel fixed to the peripheral frame construction and cooperatively forming therewith a rectangular cavity within the peripheral frame construction, a mattress removably mounted in said rectangular cavity, and a pair of single pivot connections pivotally connecting the backrest-bed unit to the opposite end structures at the opposite ends respectively of said unit and defining a single pivot axis extending above said base, each of said single-pivot connections including a pair of pivot members, one of said pivot members constitutes a plate rigidly secured to one of said opposite end structures and having a central portion bulging away from the corresponding opposite end structure and having a slot therein inwardly extending downward from the top edge thereof and constituting a pivot recess and the other of said pivot members rigidly secured to the end of said backrest-bed unit and including a pivot pin projecting endwise relative to said backrest unit and laterally engageable and pivotable into the slot of the corresponding one pivot member.

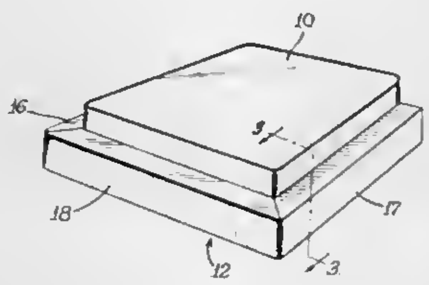
4,106,138
PLATFORM BED

Timothy P. Murphy, Chatham, N.J., assignor to Simmons Company, Atlanta, Ga.

Filed Sep. 28, 1977, Ser. No. 837,392

Int. Cl.² A47B *22/00;* **A47C** *17/86*

U.S. Cl. 5—181 **5 Claims**



1. A bed platform for supporting a mattress, comprising a resilient mattress foundation and a sectional bolster structure flanking the foundation in abutting relation, each bolster section having a flat base to support the same upon the floor and a body portion rising from the base alongside the foundation, said base extending sidewardly from said body portion to underlie the adjacent edge of the base frame of the foundation, said foundation resting upon the base extensions of said bolster sections to maintain the assembly of said sections therewith.

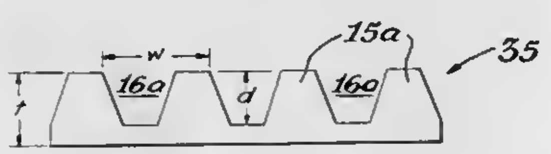
4,106,139
MATTRESS FOUNDATION

Robert W. Southard, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 19, 1975, Ser. No. 633,540

Int. Cl.² A47C *23/00*

U.S. Cl. 5—186 R **9 Claims**



1. A mattress foundation comprising in cooperative combination a generally rectangular slab-like cushioning element, the cushioning element having a first or upper major surface and a second or lower major surface, the cushioning element defining a plurality of corrugations on the second surface and the first surface being of a generally planar configuration, a support member disposed adjacent the second surface and in contact with at least a portion thereof, the support member adapted to maintain the cushioning element at a desired height above a support plane such as a floor, said mattress foundation having a thickness "*t*," a frequency of corrugation "*w*," and a depth of corrugation "*d*," wherein *d* is from about 0.4 to 0.95T.

4,106,140
BODY SUPPORTING FURNITURE FRAME

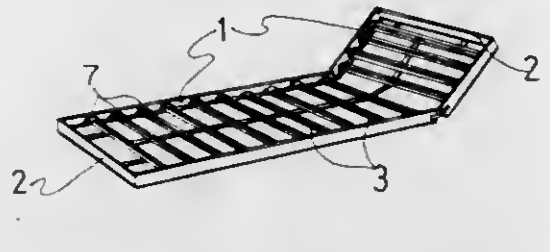
Anton Kievits, Brussels, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Feb. 11, 1977, Ser. No. 767,965

Claims priority, application Belgium, Feb. 18, 1976, 838669

Int. Cl.² E03B *1/00*

U.S. Cl. 5—191 **6 Claims**



1. In a body supporting furniture frame having two opposite longitudinal girders and a plurality of mutually parallel cross-girders disposed therebetween and wherein at least the edges of the cross-girders are provided with a lengthwise aperture in which a wire or bar is loosely inserted, and said wires or bars are bent convexly upward in the longitudinal direction, the improvement in accordance with which the cross-section of each lengthwise aperture and the cross-section of the corresponding wire or bar are designed with a mutually cooperating structural configuration such that the wire or bar is blocked in the lengthwise aperture against rotation through an angle exceeding 90°.

4,106,141
BED FRAME

Joe Bryan Hooker, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 24, 1977, Ser. No. 780,720

Int. Cl.² A47C *19/00*

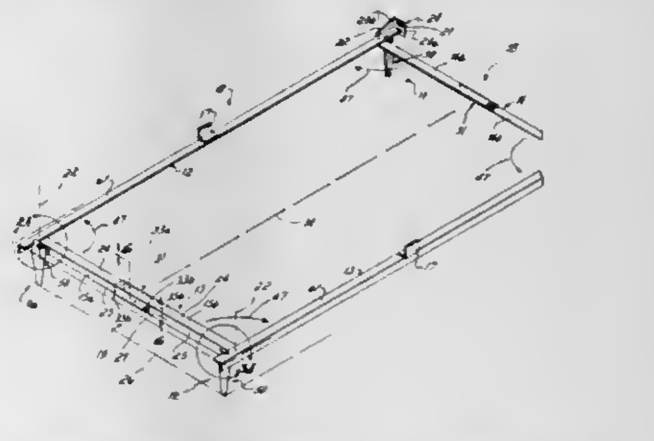
U.S. Cl. 5—201 **13 Claims**

1. A novel leg structure for a bed frame, said bed frame being of the type that includes a right angle rail and a leg rail pivotally connected to that right angle rail for swinging movement between a storage position in which the leg rail is oriented parallel to the right angle rail, and a use position where the leg rail is oriented normal to the right angle rail, said leg structure comprising

a leg member mountable to said leg rail at a location adjacent the pivotal connection of said leg rail with said right angle rail,

a latch tab connected with said leg member by a neck having a width less than the width of said latch tab, said latch tab extending normal to said leg member's longitudinal center plane, and said latch tab being spaced above said leg member's top edge, and

said latch tab and neck cooperating to define two slots, said two slots being in a slot plane normal to said leg member's longitudinal center plane, said two slots being disposed in generally mirror relation one to the other on opposite sides of said leg member's longitudinal plane, said two slots being oriented to open away from one another in that mirror relation, said right angle rail's horizontal web being receivable in one of said slots as said leg rail is pivoted from the storage attitude to the use attitude for locating said right angle rail's horizontal web beneath said latch tab to support said leg rail relative to said right angle rail when the bed frame is erected, and said latch tab and neck structure permitting said leg member to be mounted to said leg rail at any bed frame corner defined by said leg rail and said right angle rail without regard to left hand side or right hand side of said leg rail.



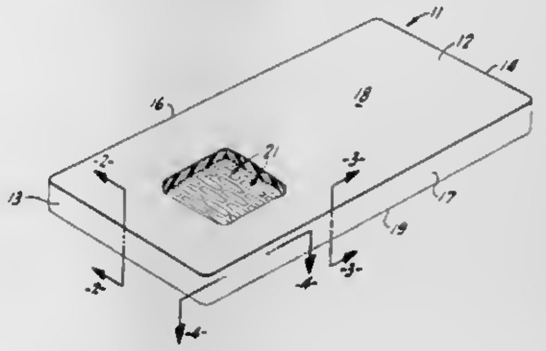
4,106,142
MATTRESS CONSTRUCTION

Paul S. Schuder, Rte. 1, Box 1155, Woodland, Calif. 95695

Filed Sep. 26, 1977, Ser. No. 836,717

Int. Cl.² A47C *21/00*

U.S. Cl. 5—345 R **3 Claims**



1. A mattress construction comprising:

a. a rectangular, normally horizontal, resilient foam material body extending longitudinally between opposite ends, transversely between opposite sides, and vertically between a top surface and a bottom surface;

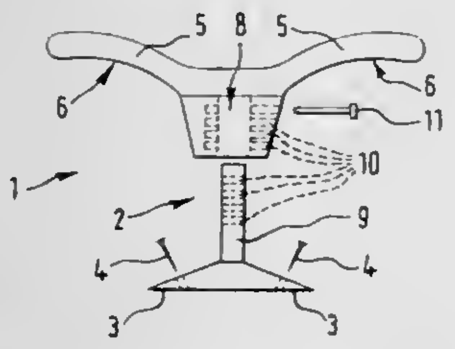
b. a plurality of discrete elongated upper plates embedded in said body and disposed in a upper, normally horizontal plane located a predetermined distance below said top surface, said upper plates being arranged in a plurality of transversely extending separated upper rows with the long dimension of said upper plates aligned with said upper rows;

c. a plurality of discrete elongated middle plates embedded in said body and disposed in a central, normally horizontal plane located equi-distant between said top surface and said bottom surface, said middle plates being arranged in a plurality of transversely extending separated middle rows with the long dimension of said middle plates aligned with said middle rows, said upper rows being vertically above said middle rows and the end portions of said upper plates being in overlapping relation with respect to the end portions of said middle plates below said upper plates; and,

d. a plurality of discrete elongated lower plates embedded in said body and disposed in a lower, normally horizontal plane located a distance above said bottom surface substantially equal in amount to said predetermined distance, said lower plates being arranged in a plurality of transversely extending separated lower rows with the long dimension of said lower plates aligned with said lower rows, said lower plates being in vertical register with said upper plates.

4,106,143
KNEE BRACE

Gareth Douglas Lucas, Lower House Farm, Llantwit Major, Glamorgan, Wales
Filed Jul. 8, 1977, Ser. No. 813,853
Claims priority, application United Kingdom, Jul. 8, 1976, 28482/76
Int. Cl.² B63B *29/00*
U.S. Cl. 9—1.7 **3 Claims**



1. A surf-ski wherein there is a hull, a deck secured to the hull, a cockpit area in the deck and brace means, said brace means projecting from said cockpit generally amidships of said surf-ski and comprising support means integral with said surf-ski, brace members projecting laterally of said support means at a position spaced above said cockpit at a height such that said brace members can be gripped by the upper surfaces of the thighs of a user of said surf-ski to transmit thrust of the user into the brace means during propulsion of the surf-ski, and means for adjusting the position of said brace members relative to said surf-ski.

4,106,144
SEA RESCUE CHAMBER AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Bernard T. Chabot, 18235 Woodbine, Detroit, Mich. 48219
Filed Jan. 27, 1977, Ser. No. 762,849
Int. Cl.² B63C *9/06*
U.S. Cl. 9—4 R **7 Claims**

1. A buoyant sea rescue chamber comprising:

a substantially enclosed hull portion;

first means for releasably securing said hull portion to a suitable section of a ship to secure said hull portion in a stored position;

at least one water-sealed door disposed in said hull portion;

said hull portion being provided with adjustable counterweight means adjacent an exterior surface thereof for selectively controllably stabilizing said hull portion when it is afloat;

second means for adjusting the relative position of said counterweight means with respect to said exterior surface of said hull portion;

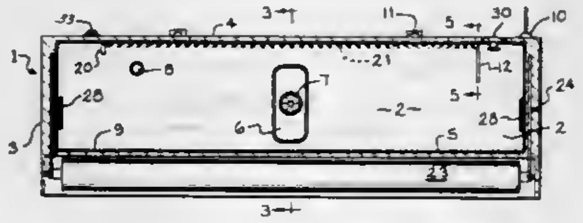
third means for selectively ventilating said hull portion;

said hull portion being adapted to be releasably secured to the cabin section of a ship;

said hull portion having disposed coextensive with the interior surface thereof a layer of insulating material;

said hull portion being defined by a substantially horizontal top wall and bottom wall and substantially vertical side walls;

said counterweight means comprising a weighted shaft member;



said weighted shaft member being adjustably disposed adjacent the exterior surface of said bottom wall;

said second means comprising retractable support members depending downwardly from said hull portion and being secured to said shaft member;

said hull portion having a substantially rectangular cross section;

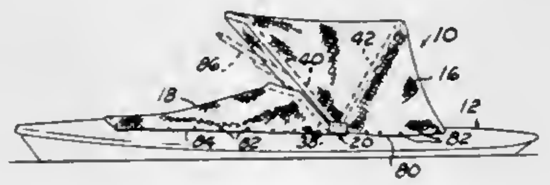
two of said retractable support members being provided, each of said support members being secured to an end portion of said weighted shaft member;

said two support members depending downwardly from opposite side walls of said hull portion; and

said first means permitting said chamber to be released from said cabin section when said hull portion is buoyed upwardly by water contacting said bottom wall.

4,106,145
BOAT MOUNTED GAME BLIND

John E. Gillen, and Gary C. Odom, both of P.O. Box 756, Tioga, La. 71477
Filed Jul. 25, 1977, Ser. No. 819,012
Int. Cl.² B63B *35/00*
U.S. Cl. 9—5 **1 Claim**



1. In a hunting blind in combination with a small open boat having gunwales, the improvement comprising:

a pair of brackets respectively secured to each gunwale in transversely aligned relation,

each bracket of said pair of brackets comprising a pair of plates vertically disposed edgewise in parallel spaced relation;

a plurality of inverted U-shaped bow means extending between and secured to said pairs of plates for forward and rearward vertical pivoting movement about a horizontal axis between a first blind closed position and a second blind opened position,

said bow means comprising a forward bow, a door bow and a rearward bow having depending leg end portions disposed, respectively, between the forward, intermediate and rearward portions of said pairs of plates;

a forward stop pin extending through each pair of said pairs of plates forwardly of said forward bow for normally maintaining said forward bow in said first position;

a rearward stop pin extending through each pair of said plates rearwardly of said door bow for normally preventing rearward movement of said door bow beyond said second position;

a forward fabric covering having a marginal edge portion overlying a portion of the upper surface of the forward end portion of said boat and having a rearward end portion secured to said forward bow;

a rearward fabric covering having a marginal edge portion overlying a portion of the upper surface of the rearward end portion of said boat,

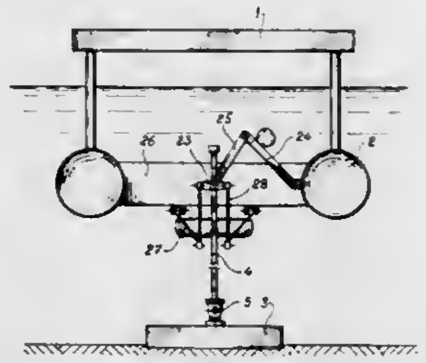
said rearward fabric covering projecting toward the forward end of said boat in overlying relation with respect to and secured to said rearward and door bows,

whereby said forward and rearward fabric coverings normally conceal a hunter when seated in said boat and forms an upwardly and forwardly open space at least partially exposing the hunter when said door and rearward bows are pivoted to said second position; and,

fastening means securing said fabric coverings marginal edge portions to said boat.

4,106,146
CONNECTING ARRANGEMENT BETWEEN A FLOATING STRUCTURE AND AN ANCHOR

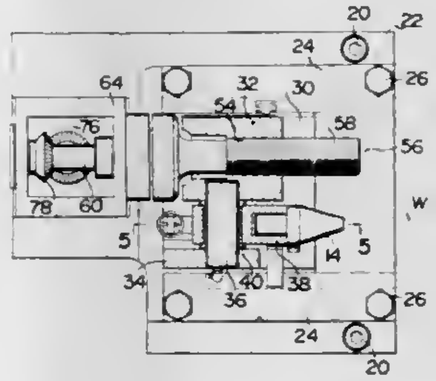
Roger Maari, Roquebrune Cap Martin, France, assignor to Single Buoy Moorings Inc., Fribourg, Switzerland
Filed Feb. 15, 1977, Ser. No. 768,894
Claims priority, application Netherlands, Oct. 29, 1976, 7612046
Int. Cl.² B63B *21/52*
U.S. Cl. 9—8 P **7 Claims**



1. In a connecting arrangement between a floating structure and an anchor, comprising an upwardly extending connecting means connected at its lower end to an anchor by means of a pair of horizontal perpendicular pivot axes, and an arm extending transversely to the upwardly extending connecting means and having one end connected for vertical swinging movement about a horizontal axis to the floating structure and having an opposite end adjacent to and connected for swivelling movement about the upwardly extending connecting means; the improvement in which there are plural said arms extending in different directions away from the upwardly extending connecting means, said plural arms being connected to the floating structure for vertical swinging movement relative to each other about different horizontal axes, and links having one end pivotally interconnected to the ends of the arms adjacent the upwardly extending connecting means, for vertical swinging movement relative to each other and relative to said arms about different horizontal axes, and having opposite ends remote from said arms universally connected to said upwardly extending connecting means.

4,106,147
STOP MECHANISM FOR SHEARING APPARATUS

Takashi Furuto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Mar. 21, 1977, Ser. No. 779,567
Claims priority, application Japan, Mar. 19, 1976, 51-29310
Int. Cl.² B26D *7/16*
U.S. Cl. 10—25 **2 Claims**



1. An apparatus with a fixed and a movable shear element for shearing a workpiece of wire or rod shape into desired lengths in which the workpiece is fed intermittently in a predetermined direction along the axis thereof through the fixed shear element, a stop device comprising, in combination of:

(a) frame means for defining a guideway extending in said predetermined direction;

(b) a carriage mounted on said frame means movable along said guideway toward and away from said fixed shear element;

(c) a stop member having at the distal end thereof a stop surface facing and abutting against a sheared face of the workpiece and mounted on said carriage in a manner such that pivotal movement is permitted about an axis extending perpendicular to said predetermined direction, said stop member being rotated about said axis in one direction by receiving the reaction of the shearing operation thereby absorbing the shock of shearing operation;

(d) resilient means mounted on said carriage for always biasing said stop means in a direction opposite to said one direction;

(e) means for limiting the pivotal movement of said stop member in the direction opposite to said one direction so as to restrain the bias of said resilient means, said limiting means being mounted on said carriage;

(f) means for defining in said carriage a threaded hole extending in said predetermined direction;

(g) a first shaft rotatably mounted on said frame means and extending through said threaded hole, said first shaft being at least partly threaded externally for engagement with the thread of said threaded hole;

(h) manually actuable means mounted on said frame means for imparting rotation to said first shaft so as to adjustably moving said carriage along said guideway toward and away from said fixed shear element;

(i) a second shaft rotatably mounted on said frame means;

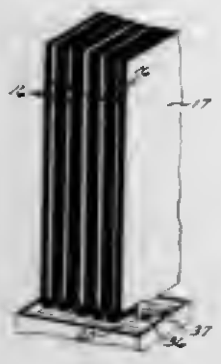
(j) handle means for manually rotating said second shaft relative to said frame means;

(k) gearing means for transmitting the rotation of said second shaft to the first shaft; and

(l) means for locking said second shaft against rotation in a desired angular position.

4,106,148
METHOD OF BINDING PAPERS

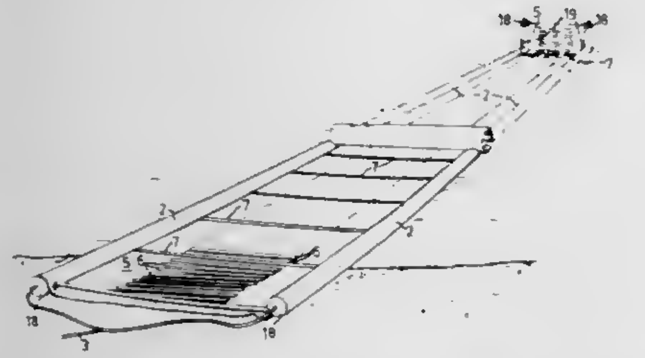
Herbert R. Axelrod, 211 W. Sylvania Ave., Neptune, N.J. 07753
Filed Nov. 29, 1976, Ser. No. 745,872
Int. Cl.^{2} B42C *19/00*
U.S. Cl. 11—1 AD **12 Claims**



1. A method of binding a plurality of papers arranged in sheaves within a backing comprising
  - cutting a straight line of apertures in a plurality of papers to remove material therefrom in linear patterns across each paper;
  - position said papers in juxtaposition with patterns of apertures of said papers mutually aligned in a straight line and at least partially linearly offset from each other;
  - folding said papers along said straight line of apertures to expose layers of material of each of said papers between said apertures for access by an adhesive applicator from one side of said plurality of papers;
  - applying an adhesive substance to said exposed layers of material in a single step; and
  - contacting a backing with said adhesive to bond said backing to said exposed layers of material of each of said papers.

4,106,149
INFLATABLE FLOATING BRIDGE, LAID OUT BY INFLATING LONGITUDINAL HOSES IN THE BRIDGE

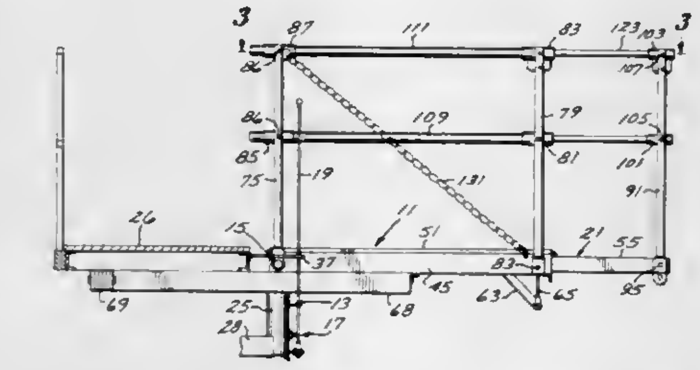
Erik Johan Larsson, Gamleby, Sweden, assignor to Barracudaverken AB, Sweden
Filed Jun. 7, 1977, Ser. No. 804,470
Claims priority, application Sweden, Jun. 18, 1976, 7607048
Int. Cl.^{2} E01D *15/14*
U.S. Cl. 14—27 **13 Claims**



1. An inflatable floating bridge which can be rolled up or folded up when it is not inflated, comprising at least two inflatable hoses, arranged in generally parallel spaced relationship with each other, said hoses having means connectable to a source of gas under pressure for inflating said hoses and laying out the bridge, said hoses in an inflated condition constituting buoyant longitudinal side supporting means of the bridge, a sheet constituting a bridgeway extending between said hoses, each side edge portion of the sheet being joined in fluid-tight relationship to one of the hoses; a plurality of at least partially flexible load distributing means extending transversely across a major portion of said sheet, the distal ends of said load distributing means being spaced from said hoses along lines defining longitudinally extending marginal portions of said sheet adjacent said hoses; and longitudinally separated spacing means for separating the hoses so that, when a load is imposed on said sheet and said load distributing means, loaded portions of said sheet are depressed below the lower limits of said hoses with said marginal portions extending generally upwardly from said sheet to said hoses to form, with said sheet, a hull-like displacement volume for supporting the load.

4,106,150
ELEVATED LOADING PLATFORM

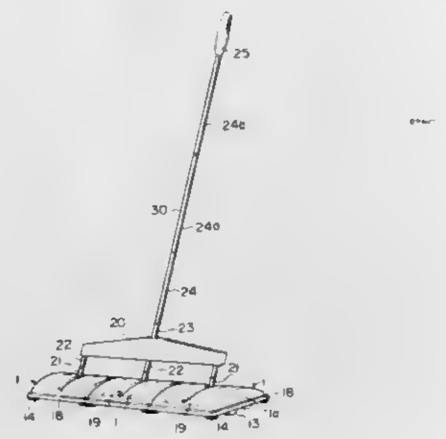
Robert M. Irwin, 3249 Cherry Ave., Long Beach, Calif. 90807
Filed Oct. 25, 1977, Ser. No. 844,891
Int. Cl.^{2} E01D *1/00*
U.S. Cl. 14—71.3 **12 Claims**



1. An elevated loading platform to be suspended from an elevated walkway adjacent a loading station for receiving a railroad tank car or the like and comprising:
  - a retractable ramp extendable to a position over said loading station;
  - swivel means mounted on said walkway and pivotable about a vertical axis;
  - pivot means mounted on said swivel means and cantilever-ally mounting said retractable ramp for pivoting between a lowered position projecting over said loading station and an elevated position elevated above said swivel means and projecting upwardly adjacent said walkway;
  - ramp limit means mounted from said walkway for limiting downward travel of said ramp past said lowered position;
  - swing locater means mounted on said swing means and including a handle accessable from said ramp for actuating said locater means to lock said swing means in a selected position locating said ramp in a desired orientation over said loading station;
  - counterbalance means coupled with said ramp and said pivot means for counterbalancing said ramp to its elevated position;
  - a ramp extension; and
  - slide means carrying said ramp extension from said ramp for selective extension thereof relative to said ramp whereby said car may be pulled into said location and a workman on said walkway may push the upper extremity of said ramp outwardly to pivot downwardly toward said lowered position and said workman may walk outwardly onto said ramp to weight it down to said lowered position, said ramp then swing to the desired angular location, said locater means activated to lock it there, and said extension then extended to extend said extension to the desired position over said locating station.

4,106,151
CARPET SWEEPER

Ray Cowdery, Burnsville, and Johan M. Larsen, Edina, both of Minn., assignors to Hukuba Kogyo Kabushiki Kaisha, Japan
Filed Feb. 10, 1977, Ser. No. 767,632
Claims priority, application Japan, Oct. 25, 1976, 51-143311[U]
Int. Cl.^{2} A47L *11/32*
U.S. Cl. 15—42 **5 Claims**

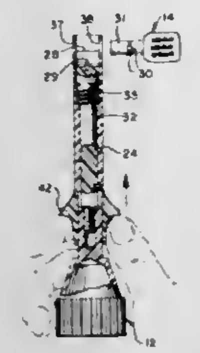


1. A carpet sweeper comprising:
  - a plurality of sweeper units, each said sweeper unit comprising a frame cover having an arcuate top plate with a groove therein, a fitting rod resiliently supported to extend outwardly through said groove, cushion material surrounding and extending outwardly from the outer sides of said frame cover, a pair of dust receptacles, a rotary brush supported between said dust receptacles, driven roller means integral with said brush, and rolling wheels supported to be in contact with said driven roller means, such that as said sweeper unit is moved over a floor surface, said rolling wheels roll by contact with the floor surface and thereby drive said driven roller means and said rotary brush;
  - an intermediate member comprising a main body, a single arm extending outwardly from said main body in a first direction, a plurality, equal to the number of said sweeping units, of legs extending outwardly from said main body in a second direction, and said main body having thickened convex portions mechanically reinforcing said main body;
  - a handle comprising a plurality of elements adapted to be connected together to form an elongated handle having first and second ends, and a grip attached to said first end of said handle; and
  - said plurality of sweeper units, said intermediate member, and said handle being removably assembled in a manner such that said plurality of sweeper units are aligned in side-by-side relationship with said cushion material of adjacent sweeping units in friction contact, each of said fitting rods are connected to a respective said leg of said intermediate member, and said arm is connected to said second end of said elongated handle.

4,106,152
TOOTHBRUSH

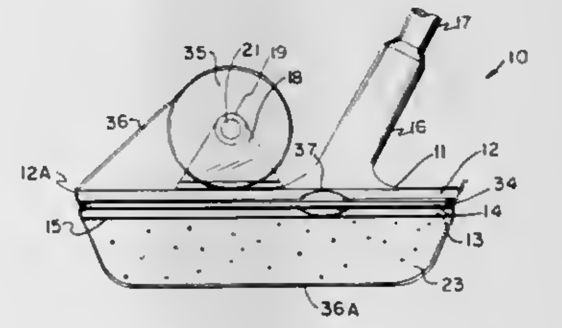
Joseph Hadary, 5405 Linden Ct., Bethesda, Md. 20014
Continuation-in-part of Ser. No. 674,438, Apr. 7, 1976, Pat. No. 4,033,007, which is a continuation-in-part of Ser. No. 564,074, Apr. 1, 1975, Pat. No. 3,994,039. This application Apr. 19, 1977, Ser. No. 788,938
Int. Cl.^{2} A46B *9/10*
U.S. Cl. 15—172 **10 Claims**

1. A toothbrush, comprising: an elongate handle means having opposite end portions, one of said end portions comprising a hollow, diametrically enlarged base capable of supporting the toothbrush in an upright position and of a size to receive and store a bristle head therein, the other end of the handle means including an elongate shaft fixed at one end thereof to one end of the base and extending axially therefrom; a sleeve telescopically received over the shaft and axially slidable relative thereto, said sleeve and shaft being approximately the same length; a bristle head adjustably carried by the handle means at said other end thereof and including a bristle head shaft projecting therefrom, said bristle head shaft extending at approximately a right angle to the axis of the handle means and releasably adjustably engaged with the handle means to support the bristle head in adjusted positions on the handle means; bristles on the bristle head extending in a direction mutually perpendicular to the axis of the handle means and the axis of the bristle head shaft; and a thumb engaging sleeve actuator axially slidable on the handle means for engaging and moving the sleeve axially to release the bristle head.



4,106,153
CLEANING APPLIANCE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of Ser. No. 596,052, Jul. 15, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,137
Int. Cl.^{2} A47L *13/20*
U.S. Cl. 15—231 **1 Claim**



1. A cleaning and wiping appliance comprising:
  - a cleaning head having a substantially rectangular support having a base portion,
  - said base portion having a flat upper surface and circumscribing walls including front, rear, and connecting side walls formed of a rigid plastic material,
  - said side walls defining opposed edge portions,
  - a handle retaining means on said flat upper wall,
  - an elongated handle secured to said handle retaining means,
  - a flexible foam slab connected to the under surface of said base portion,
  - said flexible foam slab being confined within the perimeter defined by said circumscribing walls,
  - a pair of opposed brackets connected to said flat upper surface in opposed spaced apart relationship, said brackets extending upwardly above said upper surface, and
  - said brackets having bearing portions defined thereby,
  - a shaft means supported between the bearing portions of said brackets,
  - a roll of fiber reinforced absorbant paper supported on said shaft to permit the free end of said paper to be played out from said roll and threaded about said slab, said reinforced

paper including reinforcing fibers extending transversely and longitudinally of said paper to form an lattice reinforcement for said paper, said slab defining a resilient backing for said fiber reinforced paper, and said roll of paper being remotely disposed from the floor area to be cleaned, said brackets frictionally engaging the ends of said roll of paper for maintaining said paper tensioned,

retaining means to fixedly secure said fiber reinforced paper about said slab by clampingly engaging spaced apart portions of said fiber reinforced paper so as to retain said fiber reinforced paper in place over said slab when the cleaning head is disposed against a surface to be wiped or mopped with said fiber reinforced paper,

said retaining means including a circumscribing, rectangular frame member for snugly embracing said front and rear walls of said base portion whereby said fiber reinforced paper is clamped in position between said front and rear walls and said circumscribing member,

and means for releaseably securing said circumscribing member to said base portion whereby said member is displaced relative to said front and rear walls to facilitate the drawing of said fiber reinforced paper over said slab so that a clean section of said paper can be substituted for a preceeding soiled portion of said paper.

4,106,154

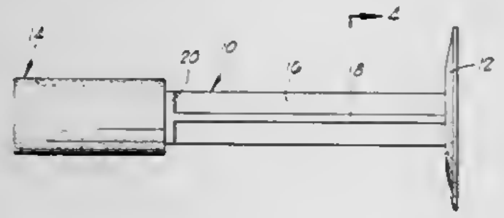
ADHESIVE APPLICATOR DEVICE

Charles W. Forsberg, Shaker Heights, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed May 13, 1976, Ser. No. 686,136

Int. Cl.² A47L *13/46;* B05C *17/00*

U.S. Cl. 15—244 R **4 Claims**



3. A device for applying adhesive to a cylindrical surface comprising:

an elongated shaft bifurcated at one end thereof and further including rearwardly directed barbs projecting into the bifurcation at said one end of the shaft with the barbs on opposite sides of the bifurcation staggered and in overlapping relation to each other;

an abutment plate interposed between said bifurcated end and the remaining portion of said shaft extending to the end thereof opposite said bifurcation, said abutment plate lying substantially in a plane extending normal to the axis of said shaft;

a handle integrally formed with the shaft on its end opposite its bifurcated end; and

a panduriform applicator pad retained in the bifurcation of the shaft and flaring out around the shaft adjacent said bifurcated end, said pad being impaled upon said barbs and abutting said abutment plate.

4,106,155

APPARATUS FOR WASHING CONTAMINATED LABORATORY CONTAINERS

Egil Fosslien, Tampa, Fla., assignor to Cortex Research Corporation, Tampa, Fla.

Filed Oct. 6, 1976, Ser. No. 729,962

Int. Cl.² A74L *7/00;* B08B *9/08*

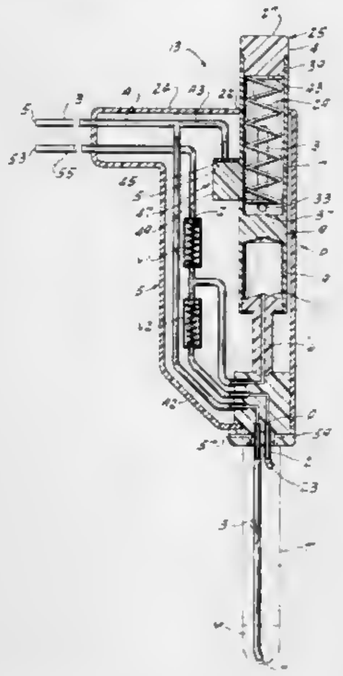
U.S. Cl. 15—321 **18 Claims**

1. Apparatus for washing contaminated laboratory containers such as test tubes, flasks and the like comprising:

a tube, one end of which is connected to a source of negative pressure and the other end of which is inserted into a contaminated container and having a length sufficient to reach the bottom thereof thereby to remove by aspiration created by said source of negative pressure material in the container;

a pump connected to a source of washing material and to said container and which, when actuated, delivers washing material from said sources into the container; and

means responsive to actuation of said pump to interrupt said aspiration during delivery of washing material, said washing material thus delivered to the container and contaminants being withdrawn by aspiration from the container after the pump is deactuated.



4,106,156

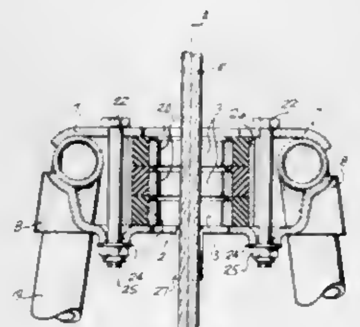
SEGMENTED GUIDE EYE

Sidney L. Fisher, 3115 Mt. View Dr., and Harry S. Fisher, 14233 183rd Ave. SE., both of Renton, Wash. 98055

Continuation of Ser. No. 747,394, Dec. 3, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,306

Int. Cl.² F16L *11/10*

U.S. Cl. 16—2 **8 Claims**



1. For use in an installation wherein a tensioned wire rope or the like may bend as it passes through a guide eye and in so doing will bear heavily against a side of the guide eye, an improved guide eye comprising:

a plurality of ring members, each having an axial length that is substantially smaller than its diameter, and each comprising a hard metal inner ring portion of stainless steel or the like and a concentric outer ring portion of elastomeric material; and

support means engaging said elastomeric material and holding said ring members in a stacked relationship with the open centers of the hard metal inner ring portions normally aligned, said support means permitting the elastomeric outer ring portions to distort when a tensioned wire rope or the like passing through the hole bears sideways against the hard metal inner ring portions, an amount sufficient to allow said hard metal inner ring portions to move angularly and make a generally rounded bent line contact with a tensioned wire rope or the like passing through the guide eye.

4,106,157

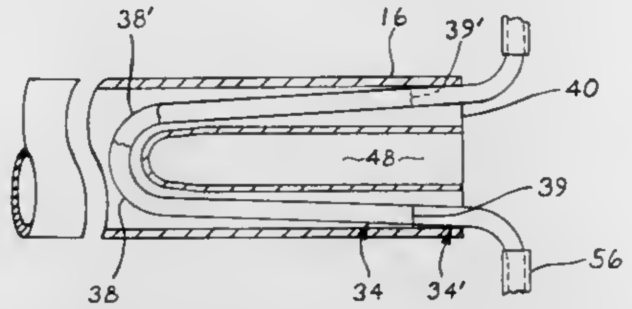
SWIMMING POOL SKIMMER AND THE LIKE

Thomas E. Baker, 4000 Davana Rd., Sherman Oaks, Calif. 91423

Filed Aug. 4, 1977, Ser. No. 821,769

Int. Cl.² B65D *25/28*

U.S. Cl. 16—112 **14 Claims**



13. An appliance comprising:

a handle having at least one hollow end section, said handle being compressed along said one hollow end section to form a crimped wall and an opposing generally flat wall having an inner surface; and

a substantially non-resilient frame having a pair of U-shaped end sections extending laterally outwardly therefrom and disposed within said one hollow end section in mutually overlying relation upon one another with one of said U-shaped end sections lying against said inner surface of said flat wall, said frame being locked against movement within said handle by the compression of said handle against said U-shaped end sections.

4,106,158

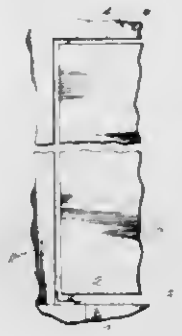
ADJUSTABLE HEIGHT DOOR PIVOT

Kenneth K. Kellems, Costa Mesa, and Robert Brydolf, Pasadena, both of Calif., assignors to Acme General Corporation, San Dimas, Calif.

Division of Ser. No. 522,022, Nov. 8, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,299

Int. Cl.² E05D *7/04*

U.S. Cl. 16—129 **18 Claims**



1. A lower pivot assembly for a swinging door comprising:

a jamb bracket connectable in the corner between a door jamb and the floor;

a slot along a portion of the jamb bracket parallel to the floor;

a plurality of serrations along each side of the slot extending laterally inwardly towards each other;

a sleeve connectable to the bottom of a door and having a female thread;

a threaded pin in the sleeve for adjusting door height by rotating the pin in the sleeve;

an enlarged, generally round, head integral with the lower end of the pin and having a lower portion narrower than the slot and an upper portion wider than the slot, at least the lower portion of said head having a plurality of splines extending in the same general direction as the length of the pin and complementary to the serrations along the edges of the slot so that when the splines on the enlarged head on the lower end of the pin engage the serrations along each edge of the slot both rotation of the pin about its axis and translation of the pin along the jamb bracket are prevented.

4,106,159

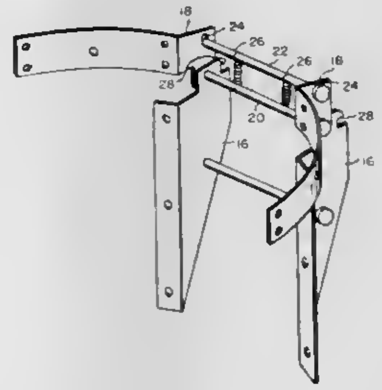
LATCHING HINGE FOR KILNS

Ronald Janney Cook, Dubuque, Iowa, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,515

Int. Cl.² E05D *11/10*

U.S. Cl. 16—146 **1 Claim**



1. A latching hinge for retaining a kiln lid in an open position in relation to a kiln container, comprised of:

at least one bracket secured to said container;

at least one tab secured to said lid;

a pivot connecting said bracket and said tab while allowing rotation of said tab when said lid is being opened or closed;

said tab having a slot;

a latching rod retained by said slot;

at least one spring biasing said rod towards said bracket; and

said bracket having a notch along its periphery arranged so that when said lid is in an open position said latching rod engages said notch.

4,106,160

APPARATUS FOR VOLUME DOSING COMPRESSIBLE, LUMPY MATERIAL

Hans G. Jentsch, Daimlerstrasse 4, Essen 1, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,221

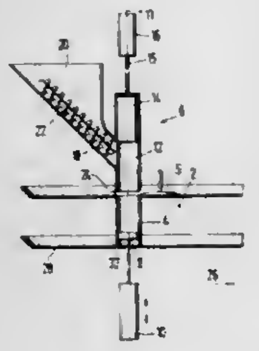
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620677

Int. Cl.² B05B *1/38;* B65B *63/02*

U.S. Cl. 17—32 **12 Claims**

1. Apparatus for the volume portioning of compressible, lumpy material, especially pieces of meat and prepared foods, said apparatus comprising a receiving apparatus with at least one passage opening of constant cross section which laterally defines a portioning chamber; a portioning piston with a cross sectional surface complementary to the cross section of the passage opening, which piston can be pushed into the portioning chamber at a first end, is displaceable axially and fixable in

at least one position within the latter in order to establish the volume of the portioning chamber formed in the passage opening; a filling apparatus disposed on the fill side of the receiving apparatus, opposite the portioning piston, said filling apparatus having a discharge orifice aligned with the second open end of the passage opening and one compressing piston displaceable coaxially to the portioning piston at least in the filling operation; a slot provided between the second opening end of the passage opening and the discharge aperture of the filling apparatus; a bladed cutting means which is mounted for movement transversely of the axis of movement of the two pistons and can be introduced into the slot such that it substantially snugly closes off the second open end of the passage opening; means for the ejection of the portioned material; and moving means which move at least one of the receiving and filling apparatus relative to the other such that the portioned material in the portioning chamber can be ejected.

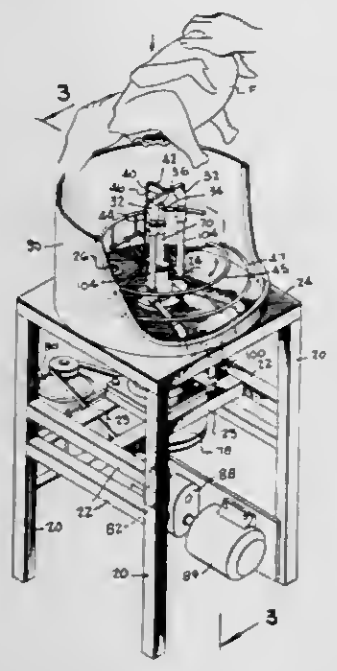


4,106,161
POULTRY CLEANING APPARATUS AND METHOD

Paul L. Niccolls, Springfield, Mo., assignor to Empire Foods, Inc., Springfield, Mo.

Filed Jun. 3, 1977, Ser. No. 803,412
Int. Cl.^{2} A22B *3/08*

U.S. Cl. 17—11 **20 Claims**



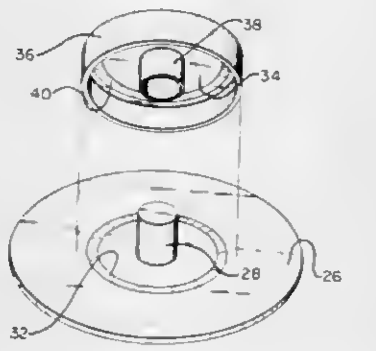
1. A poultry cavity washer comprising a source of pressurized water, a movable central nozzle means, side nozzle means respectively positioned adjacent said central nozzle means on opposite sides thereof, fowl supporting and positioning rack means positioned over sadi nozzle means dimensioned and shaped so that the surface of the abdominal cavity of a fowl positioned over said supporting and positioning rack means has the kidney area closely adjacent and facing said nozzle means, conduit means connecting said source of pressurized water to said nozzle means for providing pressurized water thereto and power drive means for moving said movable central nozzle means with respect to said side nozzle means for discharging a moving jet of water progressively across a portion of the surface of the abdominal cavity of a fowl on said supporting and positioning rack for washing and cleaning of the abdominal cavity of said fowl.

4,106,162
MOLD FOR FORMING A HAMBURGER PATTY

Herve L. Fournier, 95 Curtis Ave., South Attleboro, Mass. 02703

Filed Jun. 29, 1977, Ser. No. 810,911
Int. Cl.^{2} A22C *7/00*

U.S. Cl. 17—32 **2 Claims**



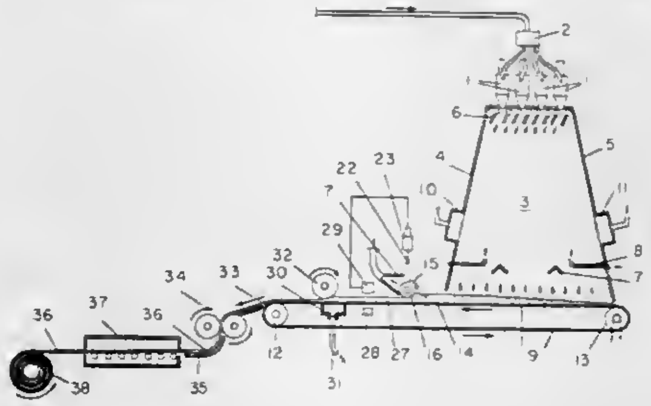
1. A mold for forming a hamburger patty comprising a lower mold member in the form of an annular flat disc of larger diameter than the desired patty, and an upper mold member comprising an annular disc of the same size as the desired patty, said upper disc having a depending wall portion, and telescoping means at the center of said members for guiding said members and for forming a large central opening in the patty, said telescoping means comprising a hollow member extending from the center of the surface of one of said mold members, and having a diameter $\frac{1}{4}$ to $\frac{1}{3}$ the diameter of the upper disc, and a complementary solid member extending from the center of the surface of the other of said mold members, said solid member having an outer diameter slightfy smaller than the inner diameter of said hollow member, said solid member being slidable into said hollow member to guide said mold members toward each other and to provide the meat patty with a large central opening and a doughnut shape.

4,106,163
APPARATUS FOR THE DRY PRODUCTION OF NON-WOVEN WEBS

Jean Desverchère, Lyons, France, assignor to Cefilac, Paris, France

Division of Ser. No. 653,665, Jan. 30, 1976. This application Jul. 28, 1976, Ser. No. 709,510
Claims priority, application France, Mar. 11, 1975, 75 08312
Int. Cl.^{2} D04H *1/00*

U.S. Cl. 19—296 **12 Claims**



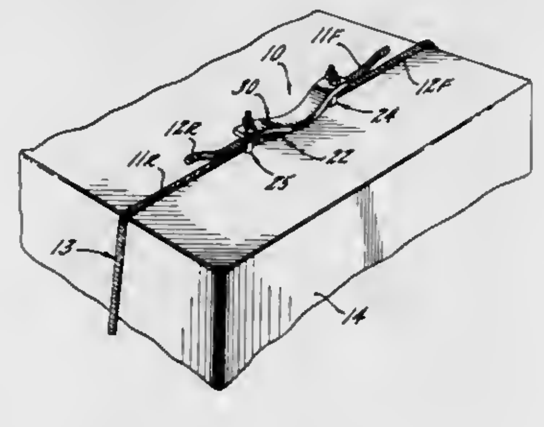
1. An apparatus for the dry production of non-woven uniform webs comprising: first means for the formation of an initial aerated, homogeneous and isotropic layer of particles with more than 95% empty space, and second means for reducing the thickness of the layer while maintaining the homogeneous and isotropic nature thereof, said first means including a conveyor belt with a specific direction of movement, a particle discharge unit, and means below the discharge unit for distributing the particles from the discharge unit onto the conveyor belt at a vertical speed less than free fall speed and in a manner achieving isotropic orientation of the particles, said means for distributing the particles comprising a cowl having an upper end directly communicated with the particle discharge unit, and an enlarged lower end overlying the conveyor belt along a length of the conveyor belt, said cowl including a pair of walls spaced along the conveyor belt in the direction of movement thereof, said walls extending transversely of the conveyor and flaring outward relative to each other toward the lower end of the cowl, the inclination of the walls in relation to the horizontal being between 60° and 90°, said means for distributing the particles further including turbulence inducing means for providing zones of local turbulence within said cowl.

4,106,164
DEVICE FOR ABSORBING SHOCK IN A CABLE

Ellsworth W. Lapp, c/o Lapp Engineering, 6060 11th St., Rockford, Ill. 61109

Filed Oct. 26, 1976, Ser. No. 735,371
Int. Cl.^{2} B65D *63/00*

U.S. Cl. 24—16 R **6 Claims**



1. A shock absorbing clamp for securing together the two end portions of a cable, said clamp comprising first and second U-bolts each adapted to receive the end portions of the cable, an elongated strap overlying the end portions of the cable and having first and second end portions formed with holes for receiving the legs of the respective U-bolts, said strap being made of resiliently yieldable material and having an intermediate portion which is bowed downwardly away from the end portions of the strap and toward the end portions of the cable, and nuts threaded onto the legs of said U- bolts above said strap for clamping the end portions of the cable between the U-bolts and the strap with the underside of the strap disposed in engagement with the cable, the bowed portion of said strap flexing upwardly when said cable is subjected to a high tensile shock load and enabling elongation of said cable when such shock load occurs.

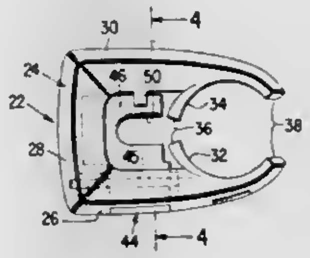
4,106,165
RETRACTABLE CORD GUIDING AND LOCKING DEVICES

Earl R. Clowers, Anderson, and John C. Davis, Greenwood, both of S.C., assignors to The Singer Company, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,154
Int. Cl.^{2} F16G *11/00;* A47L *9/00*

U.S. Cl. 24—134 R **1 Claim**

1. A cord guiding and locking device for gripping and releasing a cord for an electrically actuated upright suction cleaner having an elongated tubular handle, a flexible electrical power cord with a plug, and a cord reel at the lower portion of the handle biased to retract the cord, said device comprising an integral hollow housing having side walls defining first and second internal cavities open at the top and bottom, said second cavity opening into said first cavity, the walls of a first of said cavities substantially conforming to the external contour of said handle for mounting thereon, means for securing said walls of said first cavity to the upper portion of said handle, means defining an opening in a wall of the second cavity, a locking member having first and second legs disposed angularly to one another, a first of said legs having a through slot therein of a size to allow the cord but not the plug to pass therethrough when the plane of the slot is substantially perpendicular thereto but to frictionally grip the cord when the plane of the slot is not substantially perpendicular thereto, said slot being opened at one end facing said first cavity, means for pivotably mounting said member in the opening with said first leg positioned in the second cavity and said second leg accessible at the opening for depression by an operator, said cord being positioned in the slot intermediate the reel and the plug, stop means within said second cavity for restraining the first leg and the slot to substantial perpendicularity when the cord is being extended and when the second leg is depressed, whereby frictional contact of the cord with the sides of the slot upon retraction of said cord is effective to pivot the member to tilt the plane of the slot away from perpendicularity with the cord to frictionally grip the cord and to perpendicularly align the slot and the cord to release the cord upon extension of the cord and upon depression of the second leg.

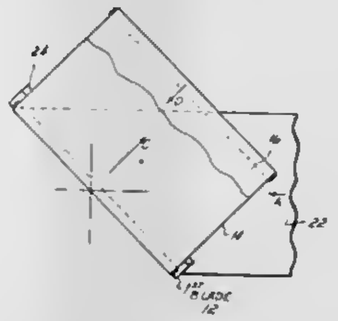


4,106,166
METHOD FOR EXPANDING THE WIDTH OF PREFORMED FIBROUS WEBS

John C. Henning, Cincinnati, Ohio, assignor to The Stearns & Foster Company, Cincinnati, Ohio

Filed Mar. 10, 1976, Ser. No. 665,618
Int. Cl.^{2} D04H *01/74*

U.S. Cl. 28—103 **10 Claims**



1. A method for expanding the width of a continuous length of preformed fibrous web comprising the steps of moving said web in a lengthwise direction, feeding said web to a blade edge, extending said web past said edge, at least a portion of said edge lying at an angle to said lengthwise direction, abruptly changing the direction of travel of said web at said edge from said lengthwise direction to a second direction, locking web fibers at said edge, turning web fibers in said second direction while expanding the width, controlling the uniformity of fiber orientation throughout the width of web

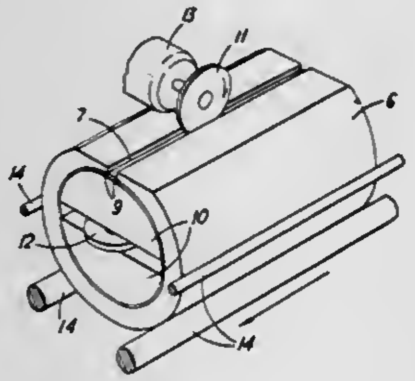
expansion, and taking said web having an expanded width off said edge in said second direction.

10. A method for expanding the width of a continuous length of preformed fibrous web having a predominant fiber orientation in the lengthwise direction comprising the steps of moving said web in said lengthwise direction feeding said web to a blade edge, extending said web past said edge, at least a portion of said edge lying at an angle to said lengthwise direction, abruptly changing the direction of travel of said web at said edge from said lengthwise direction to a second direction, locking web fibers at said edge, turning web fibers in said second direction to maintain said predominant fiber orientation in said lengthwise direction while expanding said width, controlling the uniformity of fiber orientation throughout the width of web expansion, and taking said web having an expanded width off said edge in said second direction.

4,106,167

FRICTIONAL METHOD AND MACHINE FOR SEAMING TUBULAR SECTIONS

Penelope Jane Vesey Luc, 18, rue Fourcroy, Paris 17ᵉ, France
Division of Ser. No. 486,844, Jul. 9, 1974, Pat. No. 3,949,896, which is a continuation of Ser. No. 190,700, Oct. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 830,831, Jun. 5, 1969, abandoned. This application Oct. 30, 1975, Ser. No. 627,274
Claims priority, application United Kingdom, Oct. 23, 1970, 50494/70; Dec. 14, 1970, 59366/70
Int. Cl.^{2} B21C *37/06*
U.S. Cl. 29—33 D 7 Claims



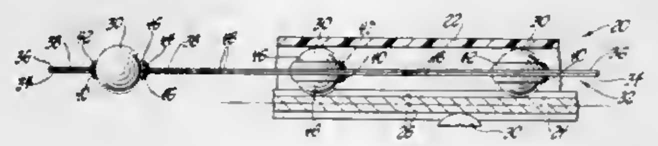
1. An apparatus for producing a metallurgically homogenous continuous seam in overlapping elements formed from metal sheets of the elements being portions of a tubular metal container, the apparatus comprising:

(i) means for overlapping portions of metal sheet elements comprising means for forming a metal sheet into a tube in which parallel edge portions of the metal sheet elements overlap, the seam being formed at the overlap,
(ii) means for exerting sufficient pressure upon the overlapping elements to bring the interfacing surfaces of the elements into intimate contact,
(iii) means for subjecting an exposed portion of one of the elements adjacent to the interfacing surfaces to a frictional treatment comprising:
(a) a hard, smooth friction wheel and
(b) means for rotating said wheel at high speed while said wheel is in contact with the exposed portion; and
(iv) means for relatively traversing the overlapping portions of elements with the frictional treatment.

4,106,168

METHOD AND APPARATUS FOR ASSEMBLING A BALL CAGE OF THE TYPE UTILIZED IN A MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

William H. Parsons, Lansdale, Pa., assignor to Teleflex Incorporated, Limerick, Pa.
Filed Mar. 26, 1976, Ser. No. 670,750
Int. Cl.^{2} B21D *53/12;* B21H *1/12;* B23P *21/00*
U.S. Cl. 29—148.4 C **41 Claims**

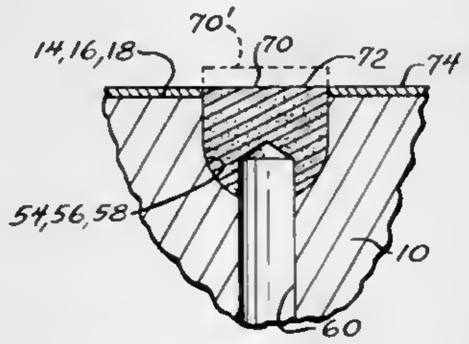


1. A method of assembling a ball cage of the type including a pair of coextensive strips having pocket portions defining ball retaining pockets having openings therein for rotatably retaining balls between the strips while exposing the balls and utilized in a conduit of a motion transmitting remote control assembly for facilitating the movement of a motion transmitting core element therein, said method comprising; simultaneously indexing the pair of strips successively through at least one station, forming the pocket portions in each of the strips, securing the strips together adjacent different ball retaining pockets with balls therein each time the strips are indexed, and longitudinally aligning the strips along the length thereof having the ball retaining pocket adjacent which the strips are secured together prior to and during the securing of the strips together by said securing means and aligning such lengths each time the strips are indexed.

4,106,169

SEAL LUBRICATION IN A ROTARY ENGINE

Myron R. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Sep. 12, 1975, Ser. No. 612,600
Int. Cl.^{2} B23P *15/00;* F01C *21/04*
U.S. Cl. 29—156.4 R **4 Claims**



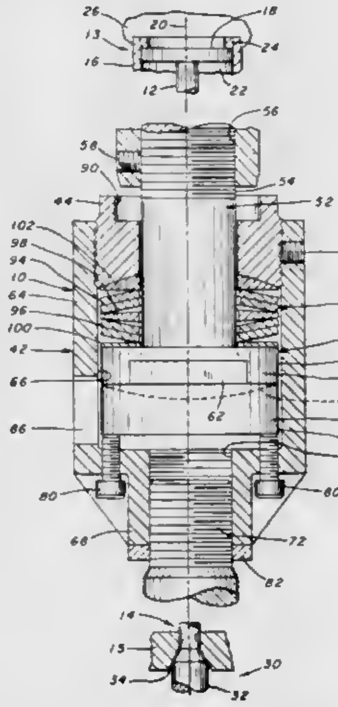
1. A method of forming a lubrication outlet for lubricating a seal carried by a rotor in a rotary mechanism having a housing defining an operating chamber having a wall engaged by the seal, comprising the steps of

(a) forming a recess in the wall,
(b) filling the recess with an insert formed of sintered metal and of a size sufficient to extend into the operating chamber,
(c) securing the insert in the recess,
(d) hardening the wall, and
(e) finish machining the wall and the insert.

4,106,170

METHOD OF ASSEMBLING A COUPLING

E. Frederick Schoeneweis, Coraopolis, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Nov. 3, 1976, Ser. No. 738,634
Int. Cl.^{2} B23P *15/00;* F16K *31/50*
U.S. Cl. 29—157.1 R **7 Claims**



1. A method of applying a predetermined loading between axially translatable first and second members having individual axial stop positions, comprising the steps of:

(a) forming a coupling having first and second fittings respectively axially adjustably connectable to said first and second members and independently relatively axially movable between spaced surfaces of a lost motion connection, said coupling having spring means in said lost motion connection providing a predetermined loading when deflected a predetermined distance;
(b) deflecting the spring means said predetermined distance by deflecting means camed by and engaging one of the fittings;
(c) axially connecting one of the fittings to one of the members;
(d) axially connecting the other of the fittings to the other of the members;
(e) axially adjusting the fittings relative to the members to vary the distance therebetween until the members engage their respective stops positions and;
(f) further axially adjusting the fittings relative to the members to further vary the distance until the deflecting means disengages.

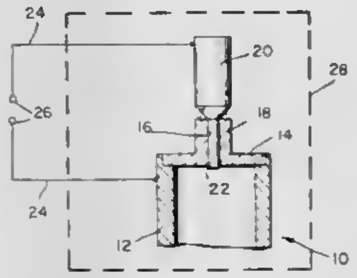
4,106,171

METHOD FOR CLOSURE OF HEAT PIPES AND DEVICE FABRICATED THEREBY

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Nov. 29, 1974, Ser. No. 528,173
Int. Cl.^{2} B23P *15/26*
U.S. Cl. 29—157.3 R **10 Claims**

1. A method for closure of a heat pipe having a liquid metal working fluid therein comprising the steps of:

assembling means for defining the heat pipe and enclosure therefor, with the working fluid therein and with means for defining an opening in the heat pipe enclosure for having enabled placement of the working fluid therein;
inserting a plunger comprising the same material as that of the heat pipe enclosure into the opening means;
before or after said assembling and inserting steps, establishing an environment in the heat pipe and enclosure means in an atmosphere which is non-reactive with the liquid metal working fluid for assuring purity thereof;
heating the plunger and the heat pipe enclosure adjacent thereto to a temperature above the saturation temperature of the working fluid but below the melting point of the material of the heat pipe and the plunger while maintaining the environment for a time sufficient for evaporating

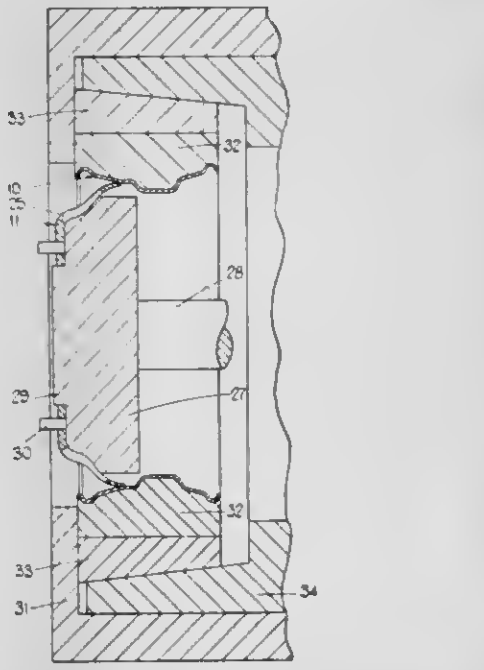


any of the working fluid from means for defining a gap between the plunger and the opening means, for preventing the working fluid from condensing across the gap means, and for allowing escape of any non-condensible gases therefrom; and
thereafter melting at least the plunger into the opening means while maintaining the environment for sealing the heat pipe enclosure and the working fluid therein.

4,106,172

VEHICLE WHEELS

William Harry Bache, Cookley, near Kidderminster, England, assignor to Steel Stampings Limited, England
Filed Apr. 5, 1977, Ser. No. 784,820
Claims priority, application United Kingdom, Apr. 7, 1976, 14041/76; May 15, 1976, 20178/76; Jun. 1, 1976, 22670/76
Int. Cl.^{2} B23K *19/00;* B21H *1/10;* B21K *1/38*
U.S. Cl. 29—159.01 **27 Claims**



1. A method of producing a vehicle wheel constructed with at least two components to be friction welded together, the method comprising forming said components of the wheel separately, placing them in assembled relationship with respective surfaces thereon to be friction welded together in axial and radial proximity to one another, causing relative rotation between said components about an axis coincident with the axis of the finished wheel, maintaining at least said surfaces to be friction welded together against axial movement during rotation, creating concentric radial movement of one of the surfaces towards the other surface to bring them into contact to generate heating at these surfaces and then stopping the rela-

tive rotation of the components to produce a friction weld between the said surfaces.

4,106,173

METHOD OF MANUFACTURING MAGNETIC HEADS

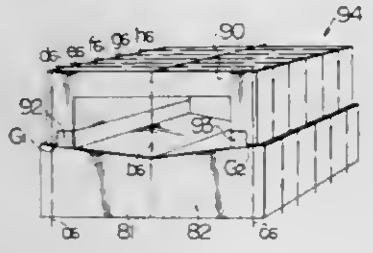
Tadashi Morokuma, Tokyo, and Naotsune Tsuda, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1976, Ser. No. 692,671

Claims priority, application Japan, Jun. 13, 1975, 50-71782; Jul. 30, 1975, 50-92736; Nov. 10, 1975, 50-135540

Int. Cl.² G11B *5/42*

U.S. Cl. 29—603 **10 Claims**



1. A method of manufacturing magnetic heads comprising the steps of providing a first core block piece having a pair of gap defining surfaces adjacent to its opposite sides, the gap defining surfaces being parallel to each other and projecting to different elevations, providing a second core block piece having a pair of gap defining surfaces which correspond to the gap defining surfaces of the first core block piece, disposing the first and second core block pieces in abutting relationship so that the associated gap defining surfaces are located opposite to each other, the differential elevations of the gap defining surfaces of the first core block piece causing the first core block piece to assume an inclined position, causing a molten gap forming material to permeate into a wedge-shaped clearance region formed between the gap defining surfaces, causing the gap forming material to solidify to provide a core block, and thereafter dividing the core block into a plurality of cores each having a predetermined size.

4,106,174

DEVICE FOR REMOVING MEAT HANGERS FROM MEAT

Laurence James Ilines, Edmonton, Canada, assignor to C.A. Pemberton & Co. Limited, Toronto, Canada

Filed May 25, 1977, Ser. No. 800,340

Int. Cl.² B23P *19/04*

U.S. Cl. 29—239 **10 Claims**

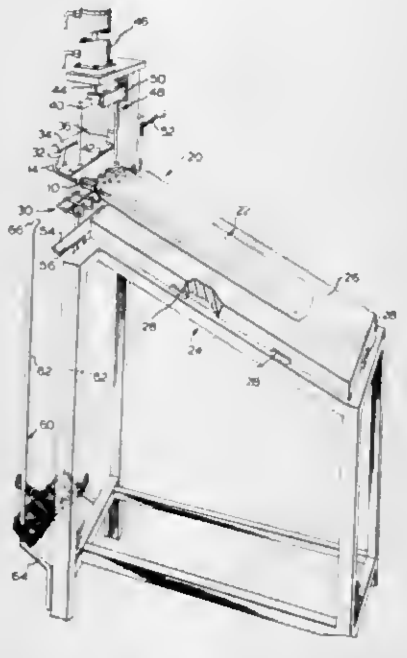
1. A device for removing meat hangers from meat such as bacon or the like, said meat hangers consisting of a body portion having a suspension hook at one end thereof and a plurality of meat penetrating needles at the other end thereof, the meat penetrating needles being inclined with respect to the body portion in a penetrating direction towards said suspension hook, said device comprising:

(a) a frame having a stripping station located therein,

(b) first support means at a first side of said stripping station for supporting a hanger,

(c) second support means at a second side of said station opposite said first side for supporting said body of meat with said hanger extending across said stripping station with its needles oriented in a first direction with respect to said stripping station,

(d) stripper means mounted for movement with respect to said frame to extend into said stripping between said first and second supports to engage said meat hanger and drive said needles in a second direction opposite said first direction to remove said needles from said meat in said second direction,



(e) drive means for driving said stripper member with respect to said frame.

4,106,175

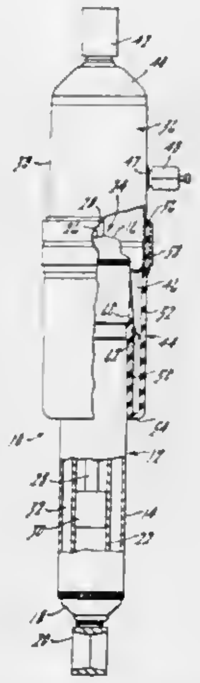
METHOD AND APPARATUS FOR MANUFACTURING COMBINATION SHOCK ABSORBERS AND LEVELING STRUTS

Robert R. Meyer, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 424,294, Dec. 13, 1973, Pat. No. 3,967,363. This application Mar. 22, 1976, Ser. No. 668,916

Int. Cl.² B23P *19/08*

U.S. Cl. 29—243.52 **5 Claims**



1. In the assembly of a combination shock absorber-leveling unit of the type including a shock absorber having a piston and piston rod supported for reciprocal movement in a body member, a dirt shield connected to the piston rod and a diaphragm defining a flexible partition between the body member and the dirt shield, an apparatus for crimping a clamping ring premounted to the diaphragm comprising:

a support structure for coaxially and axially supporting the clamping ring, diaphragm and portion of the shock absorber unit to which the ring and diaphragm are to be attached;

a plurality of crimping dies supported by said structure, each of said dies having a first position spaced a preselected distance from said clamping ring and a second clamping position, each of said dies having a concave-shaped working face, the faces substantially fully encircling the ring when said dies are in said second position; and

actuating means including roller means guidably supporting a portion of said combination unit for displacing each of said dies from said first position to said second position wherein said faces compressively circumferentially engage said clamping ring and whereby said diaphragm is fixedly secured to said portion of said unit and in fluidtight engagement therewith.

4,106,176

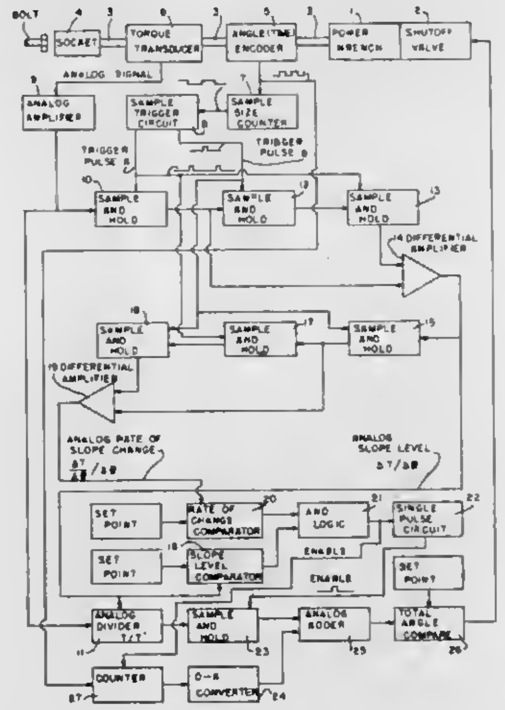
METHOD AND APPARATUS FOR FASTENER TENSIONING

Edwin Eugene Rice, Ann Arbor, Mich., and Walter Carl Vliet, Landing, N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 6, 1977, Ser. No. 785,026

Int. Cl.² B23Q *5/00*

U.S. Cl. 29—407 **21 Claims**



1. A method of fastener tensioning in a joint system comprising:

rotating the fastener;

monitoring a tension-related function applied to the fastener and a function of rotation applied to the fastener;

determining the rate of change of the tension-related function per unit of the function of rotation;

determining when the rate of change of the tension-related function per unit of the function of rotation becomes a constant;

determining the constant rate;

determining a starting point for rotation based on a linear projection of the constant rate determined and an instantaneous value of the tension-related function, said starting point corresponding to the zero value of the tension-related function intercept of the function of rotation;

rotating the fastener a proportionally determined amount of rotation from said starting point; and

stopping the rotation of the fastener in response to the fastener being rotated the proportionally determined amount.

4,106,177

METHOD OF WITHDRAWING ELONGATE TUBULAR MEMBERS

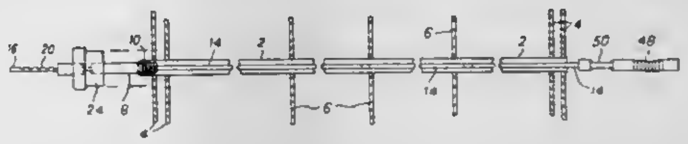
James Henry Beard; Cyril Lea, and Bernard William Ludwig, all of Melton Mowbray, England

Filed Jan. 23, 1976, Ser. No. 651,811

Claims priority, application United Kingdom, Jan. 24, 1975, 3106/75; Aug. 24, 1975, 34891/75; Aug. 23, 1975, 35110/75; Jan. 24, 1975, 3107/75

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **7 Claims**



1. Apparatus for withdrawing an elongated tubular member from a bore in a support member, said apparatus comprising an adapter means having means for fixedly securing the same on a leading end portion only of the tubular member so as to form an extension thereof, and gripping means for initially gripping said adapter means and effecting pulling of said adapter means therethrough and the the tubular member in an axial direction through the bore in the support member, said gripping means including means for gripping both said adapter means and the tubular member in sequence to continue the pulling of the tubular member through said gripping means after said adapter means has passed through said gripping means.

4,106,178

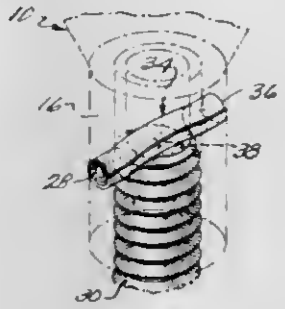
THREADED STUD DRIVING TOOL

James P. Seletyn, P.O. Box 207, Scarbro, W. Va. 25917

Filed Dec. 10, 1976, Ser. No. 749,382

Int. Cl.² B25B *13/50*

U.S. Cl. 29—428 **11 Claims**



11. A method of using an internally threaded stud driving tool having a resilient abutment bar provided therein so as to extend across the threaded portion for driving threaded studs into holes comprising the steps of:

inserting one end of the threaded stud within the drive tool until the drive end surface of the stud engages the resilient bar;

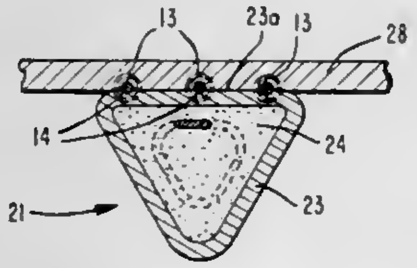
inserting the other end of the stud into the hole;

applying a driving torque to the drive tool sufficient to drive the stud into the hole and simultaneously bending the resilient bar so that it bends along its length thereby changing the degree of contact between the drive end surface of the stud and the resilient abutment with contact being greater at the periphery than at the center of the drive end surface so that oppositely positioned inclined shoulders are formed in the end wall of the stud along which the resilient bar moves;

disengaging the resilient abutment from the drive end surface of the driven stud by applying torque to the drive coupling in a direction opposite to the driving torque thereby allowing the resilient bar to return to its original undeformed condition while simultaneously sliding in an opposite direction along the inclined shoulders so that the drive coupling can be removed from the stud without back rotating the driven stud.

4,106,179
METHOD OF COLD-JOINING METAL PARTS

Richard Bleckmann, Imbergstrasse 24, Salzburg, Austria
Continuation-in-part of Ser. No. 487,633, Jul. 11, 1974, Pat. No. 4,008,845. This application Sep. 30, 1976, Ser. No. 728,060
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1973, 2336149
Int. Cl.^{2} B23P *11/00*
U.S. Cl. 29—432 **24 Claims**

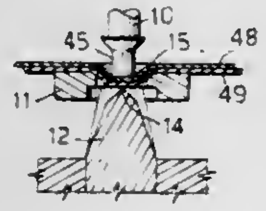


1. A method of cold-joining metal parts together comprising the steps of, providing two metal parts having contact surfaces, providing at least one insert comprising a wire coil having a predetermined pitch in accordance with the material of said metal parts and said wire coil and said wire coil having a hardness greater than the hardness of the metal of both of said metal parts, positioning said insert between said metal parts with oppositely disposed portions of said insert in engagement with the contact surface on said metal parts, moving said metal parts together with said insert therebetween and compressing said metal parts together to cause the metal of said metal parts to flow around the associated portions of said insert for anchoring said insert to said metal parts with said contact surfaces in abutting engagement and with said metal parts in a securely bonded relationship.

22. A method of cold-joining metal portions together comprising the steps of, providing a metal sheet having a tubular configuration with longitudinally extending edge portions, arranging said edge portions in adjacent relationship, providing at least one insert of metal having a hardness greater than the hardness of the metal sheet, positioning said insert between said edge portions in sandwiched relationship therewith, and compressing said edge portions together to cause the metal of said edge portions to flow around the associated portions of said insert to secure said edge portions together with said insert therebetween and anchored therein to thereby form said sheet into a tubular conduit.

4,106,180
METHOD AND APPARATUS FOR RIVETING

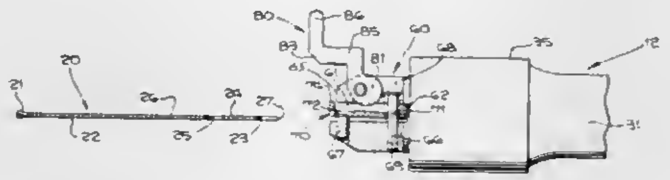
Ralph Fuhrmeister, Tarragindi, Australia, assignor to Furma Manufacturing Co. Pty. Ltd., Coopers Plains, Australia
Filed Apr. 18, 1977, Ser. No. 788,645
Claims priority, application Australia, Apr. 20, 1976, PC5632
Int. Cl.^{2} B21J *15/04;* **B23P** *11/00*
U.S. Cl. 29—432.1 **3 Claims**



1. A method of riveting metal pieces including the steps of: driving a rivet to deform parts of said pieces into a female die having a greater diameter than a shank portion of the rivet for engagement of the pieces with a cutter in the die;
continuing the forward movement of the rivet through the die causing the cutter to cut a plurality of cuts radiating from a point through the pieces; and
further driving the rivet and punching a hole centered on said point through the pieces with the radiating cuts therein for urging the penetrating end of the rivet shank to be cut into a number of sections by the cutter, and causing said sections to be spread apart by the cutter.

4,106,181
QUICK RELEASE MECHANISM FOR OSCILLATING SAW BLADE

Terry M. Mattchen, Van Nuys, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.
Filed Aug. 9, 1976, Ser. No. 712,730
Int. Cl.^{2} B23P *11/02;* **A61B** *17/14*
U.S. Cl. 29—450 R **19 Claims**



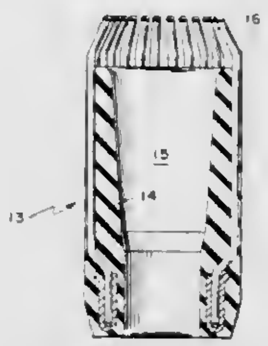
1. In an oscillating head having a quick release mechanism for securing and releasing a blade to the oscillating head, and including slot means in the head for inserting the blade therein, the slot means having top and bottom walls, shaft means extending through the slot means for preventing movement of a rear portion of the blade adjacent the shaft means in a plane parallel to the oscillations, the blade having means for cooperating with the shaft means, pin means extending partially into the slot means from the bottom wall thereof for preventing movement of a central portion of the blade in the plane coincident to the oscillations and permitting insertion and removal of the blade over the end of the pin means into and out of the slot means, cam means and means for mounting the cam means for rotation in the slot means for camming the blade against the bottom wall of the slot means and for moving the central portion of the blade onto the pin means to prevent movement of the blade relative to the head, and locking means for locking the cam means in the location holding the blade to the bottom of the slot means and on the pin means, the improvement comprising the provision of the locking means comprising:
stop means on the head for stopping rotation of the cam means to prevent rotation of the cam means beyond a certain point, and means for mounting the stop means such that when the stop means intersects the cam means, the line of force on the cam means is directed to one side of the axis of rotation of the cam means to urge the cam means against the stop means.

4,106,182
METHOD OF MANUFACTURING AN OILWELL SWAB CUP

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Dec. 27, 1976, Ser. No. 754,705
Int. Cl.^{2} B23P *3/00, 19/04*
U.S. Cl. 29—460 **8 Claims**

8. A method of forming an oil well swab cup bushing, said method comprising:
locating vertical arm means in an annular unitary base means having two concentric vertical wall sections;

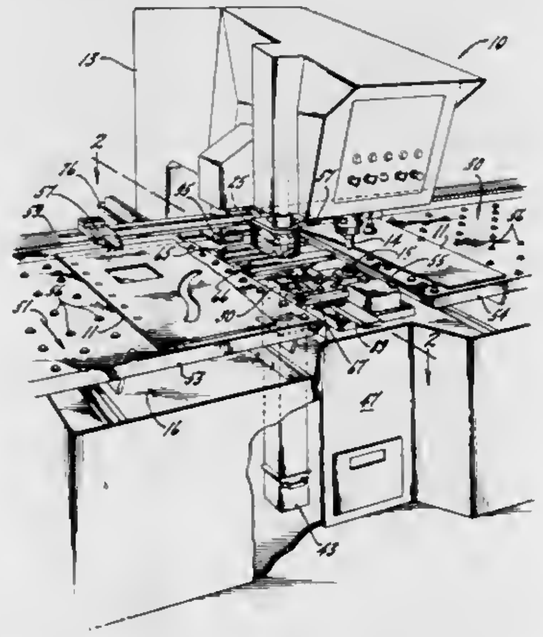
securing said arm means between said concentric vertical wall sections in tightly secured relationship; and,



molding an elastomeric body to said vertical arm means and said annular unitary base means.

4,106,183
COMBINED PUNCH PRESS AND CUTTING TORCH WITH WORKPIECE SUPPORTING MEANS

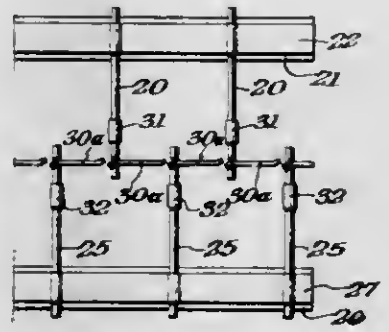
Theodore F. Brolund, Rockford; William B. Scott, Rochelle, and Merle R. Pauley, Rockford, all of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.
Filed Dec. 27, 1976, Ser. No. 754,826
Int. Cl.^{2} B27P *23/06;* **B26B** *7/06;* **B23S** *3/00*
U.S. Cl. 29—564 **3 Claims**



1. A punch press comprising a frame and a vertically reciprocable punch, a die on said frame in underlying relation with said punch and adapted to coact with said punch to form a hole in an intervening workpiece when said punch is advanced downwardly, a metal cutting tool mounted in a horizontally stationary position on said frame in transversely spaced relation with said punch and operable to emit downwardly directed energy for melting said workpiece, an upright duct on said frame beneath said workpiece and alined with said tool whereby molten metal from said workpiece is directed downwardly into said duct, a table for supporting said workpiece and movable back and forth in a fore-and-aft direction on said frame to locate said workpiece in various fore-and-aft positions beneath said punch and said tool, said table being formed by a first section located on one side of said die and said duct and by a conjointly movable second section located on the opposite side of said die and said duct, there being a fore-and-aft extending throat between said table sections to permit said table to move forwardly to positions in which said table sections straddle said die and said duct, first and second platforms each having an upper surface for supporting said workpiece, each of said platforms being disposed between said table sections and located within said throat in at least some positions of said table, said first platform being located rearwardly of said die and said duct, said second platform being located between said die and said duct, abutment means on the rear portion of said table and successively engageable with said first and second platforms as said table is moved forwardly, and means mounting each platform on said frame for movement relative to said table and said frame and permitting each platform to move out of the way of said abutment means when said platform is engaged by said abutment means.

4,106,184
METHOD FOR MAKING FUSED SOLID ELECTROLYTE CAPACITOR ASSEMBLAGES AND A FUSED CAPACITOR MADE THEREBY

Lawrence E. Fournier, Penacook, N.H.; Theodore M. Jasiewicz, Westborough, Mass., and William M. Milton, Dover, N.H., assignors to Sprague Electric Company, North Adams, Mass.
Filed May 16, 1977, Ser. No. 797,204
Int. Cl.^{2} B01J *17/00*
U.S. Cl. 29—570 **16 Claims**



1. A method for making fused solid electrolyte capacitor assemblages comprising holding at regular intervals a plurality of solid electrolyte capacitor bodies by their anode leads; holding at said regular intervals one group of mutually parallel cathode lead wires, each lead wire being held at one end portion thereof; placing a continuous bi-metallic exothermically alloyable fuse strand over the other end portions of said lead wires so as to intersect each of said lead wires; forming a joint at each of said intersections; cutting said fuse strand in each space between the adjacent of said joints so that a segment of said fuse strand extends from each of said lead wires, respectively; registering said held group of cathode lead wires with said held plurality of capacitor bodies so that said other end portion of each lead wire lies adjacent to one of said bodies; providing an insulative layer between each of said bodies and said adjacent lead wire; and connecting the free end of each of said fuse segments to the cathode counterelectrode of the adjacent of said bodies, respectively.

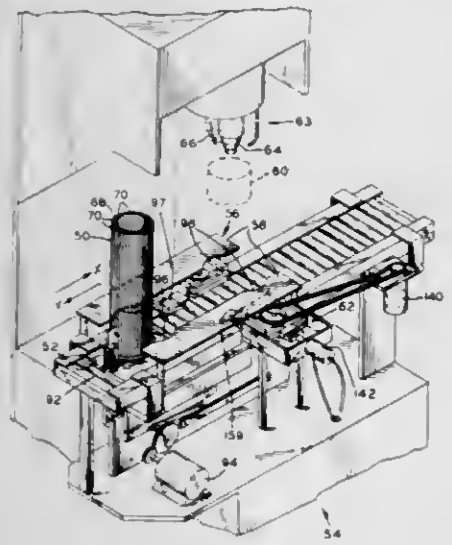
4,106,185
MOTOR MANUFACTURING METHOD, SYSTEM AND METHOD, SYSTEM AND COMPONENTS

Richard E. Lauer, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Filed Jun. 13, 1977, Ser. No. 805,701
Int. Cl.^{2} H02K *15/06*
U.S. Cl. 29—596 **23 Claims**

1. A method of fabricating winding turns on a dynamoelectric machine magnetic core having a bore therein and a plurality of axially extending winding turn accommodating core slots, the method comprising:
supporting coil injection tooling with winding turns thereon and the magnetic core on transporting means at a first location;
moving the transporting means with the winding turns, injection tooling, and core supported thereon to a second location;
transferring the injection tooling with the winding turns

thereon from the transporting means to a coil injection machine;

aligning the magnetic core with the previously transferred injection tooling and relatively moving the injection tooling and core so that at least part of the injection tooling protrudes into the bore of the core;



transferring the winding turns from the injection tooling into turn accommodating core slots by moving winding turn portions axially along such slots;

relatively moving the injection tooling and core whereby the injection tooling is removed from the bore of the core; and

transferring the injection tooling from the coil injection machine to transporting means.

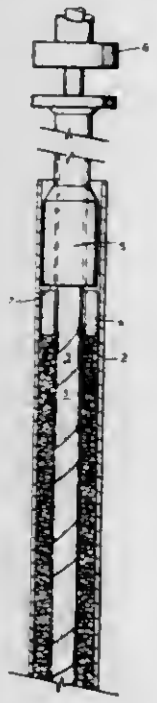
4,106,186
BORON NITRIDE INSULATING MATERIAL

Chester S. Morgan, Jr., Oak Ridge; O. Burl Cavin, Knoxville; Reginald W. McCulloch, Concord, all of Tenn., and David L. Clark, Clearwater, Fla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,494

Int. Cl.^{2} H01C *1/03*

U.S. Cl. 29—616 **11 Claims**



1. A method for fabricating an electric heater comprising a cylindrical housing and a concentric heating element disposed within said housing and spaced apart from said housing to define an annular region therebetween, said annular region containing boron nitride for providing electrical resistance and thermal conductivity between said housing and said heating element, said fabrication method comprising the steps of:

(a) cold pressing boron nitride powder at a pressure of 20–80,000 psig and a dwell time of at least 0.1–3 seconds to provide hollow cylindrical preforms of suitable dimensions for insertion into said annular region, said boron nitride powder having a tap density of about 0.6–1.1 g/cm^3 and an orientation ratio of at least about 100/3.5;

(b) inserting said preforms into said annular region; and

(c) crushing said preforms in place.

4,106,187
CURVED RIGID PRINTED CIRCUIT BOARDS

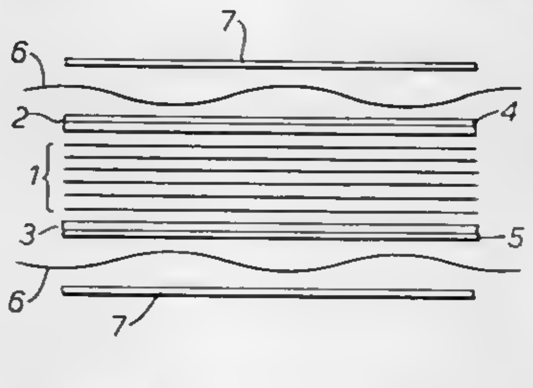
Brian Roger Smith, Bicknacre; Charles Richard Jarvis, Hockley; Stephen Martin Payne, Chelmsford; Robert John Potts, Maldon, and Frank Wallis, Chelmsford, all of England, assignors to The Marconi Company Limited, England

Filed Jan. 16, 1976, Ser. No. 649,673

Claims priority, application United Kingdom, Jan. 18, 1975, 2264/75

Int. Cl.^{2} H05K *3/06*

U.S. Cl. 29—625 **9 Claims**



1. A method of making a curved printed circuit board including the following sequence of steps:

(a) placing a flexible glass cloth impregnated with uncured or partially cured epoxide resin between two thin flexible lamina, the outer face of each of which lamina carries a copper foil;

(b) imparting a curve to the laminate so formed;

(c) heating said laminate while curved as in step (b) to cure said epoxide resin and to form a unitary board thereby;

(d) forming registration holes through said board;

(e) using the registration holes of step (d) to permit registration therewith of a printed visible pattern formed on one surface of the board and which indicates the locations at which plated-through holes are to be formed to provide electrical connection between the two faces of the board and then forming holes at said locations; and

(f) selectively removing regions of said copper foils to produce desired printed circuits on both surfaces of said board and in registration with each other.

4,106,188
TRANSISTOR COOLING BY HEAT PIPES

Kalwant S. Sekhon, Fullerton; Lloyd A. Nelson, Villa Park, and John E. Fritz, Jr., Anaheim, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 678,336, Apr. 19, 1976, Pat. No. 4,047,198. This application Jul. 1, 1977, Ser. No. 812,038

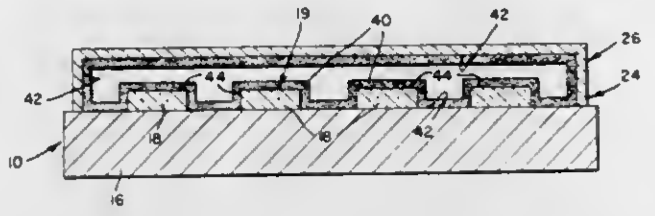
Int. Cl.^{2} H01B *19/00*

U.S. Cl. 29—631 **7 Claims**

1. A method for fabricating a microelectronic package capable of operating with power densities extending at least to 10 kW/cm^2 comprising the steps of:

fabricating means for defining electronic devices and circuitry and a sealed enclosure therefor, with leads extending from the electronic devices and circuitry to connection points on the exterior of the enclosure;

adhering dielectric powder to substantially all interior surfaces of the enclosure and to substantially all exposed surfaces of the electronic devices and circuitry for defining a heat pipe wick substantially completely and conformally coating the interior and exposed surfaces; and



inserting dielectric working fluid into the enclosure for intimate contact with all of the interior and exposed surfaces, thereby for minimizing the occurrence of local hot spots on the electronic devices and circuitry and for maximizing heat transfer therefrom to an external heat sink.

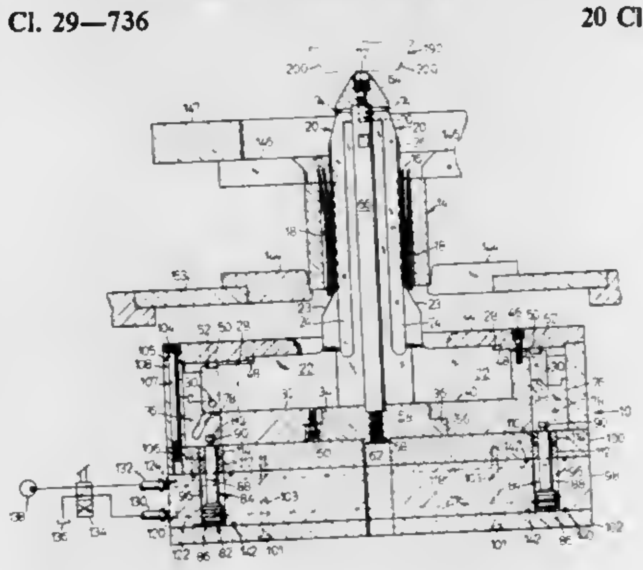
4,106,189
STATOR COIL PRESS

Robert W. Peters, 9036 N. 75th St., Milwaukee, Wis. 53233

Filed Feb. 28, 1977, Ser. No. 772,764

Int. Cl.^{2} H02K *15/06*

U.S. Cl. 29—736 **20 Claims**



1. A stator coil forming device for forming the coils in the slots of a stator, said device comprising:

a slide plate,

a plurality of coil setting blades supported for radial movement on said slide plate,

and means for independently moving each of said blades radially outwardly, at least two of said blades moving different distances, to press the coils into the slots of the stator.

4,106,190
HAIR CLIPPER

Edmund Maurice Buras, Jr., Silver Spring, and Allan Carl Harper, Gaithersburg, both of Md., assignors to The Gillette Company, Boston, Mass.

Filed Dec. 13, 1976, Ser. No. 750,211

Int. Cl.^{2} B26B *19/20*

U.S. Cl. 30—43.7 **8 Claims**

1. A hair clipper comprising:

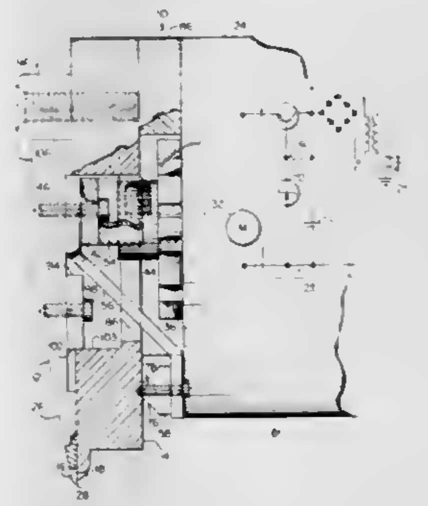
a housing;

a first cutter having a plurality of teeth;

a second cutter having a plurality of teeth, said second cutter being assembled between said housing and said first cutter with said first cutter teeth projecting beyond said second cutter teeth;

means for flexibly holding said first cutter against said second cutter including a spring member having one end connected to said first cutter and means for slidably coupling a spring member end opposite said one end to a slot in said second cutter; and

means for reciprocally moving said first cutter teeth against a skin surface and against said second cutter in a lateral direction substantially parallel to extreme edges of said second cutter teeth for raising hairs for cutting between said first and second cutter teeth.



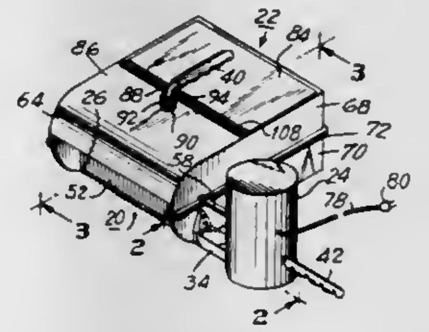
4,106,191
COMBINATION HEDGE TRIMMER AND CLIPPINGS COLLECTOR

Larry A. Haralambou, 299 Horseblock Rd., Farmingville, N.Y. 11738

Filed Jun. 6, 1977, Ser. No. 803,550

Int. Cl.^{2} B26B *19/38*

U.S. Cl. 30—132 **17 Claims**



1. A combination hedge trimmer and clippings collector which comprises a substantially linear hedge trimmer, said hedge trimmer consisting essentially of a plurality of juxtaposed blades together with means to reciprocate said blades, so that said blades are movable relative to stationary vegetation whereby at least a portion of the vegetation may be severed from connection to ground, a generally cylindrical brush means, the central axis of said brush means being substantially parallel to said hedge trimmer, means to rotate said brush means about said central axis, a baffle, one edge of said baffle being juxtaposed with said hedge trimmer, said baffle being disposed about a portion of the circular path of motion of the terminal ends of said brush means so that said terminal ends are contiguous with said baffle during a portion of the rotation of said brush means, an enclosure about and extending from the terminus of said baffle, so that said severed portion of the vegetation is directed by said brush means to a disposition first adjacent to and then contiguous with said baffle and thereafter said severed portion of the vegetation is discharged by said brush means from juxtaposition with said baffle and into said enclosure, means to periodically remove severed portions of the vegetation from said enclosure, and means to manipulate said hedge trimmer so that said plurality of juxtaposed blades are brought in contact with further portions of stationary vegetation.

4,106,192

SHAFT BEARING ARRANGEMENT

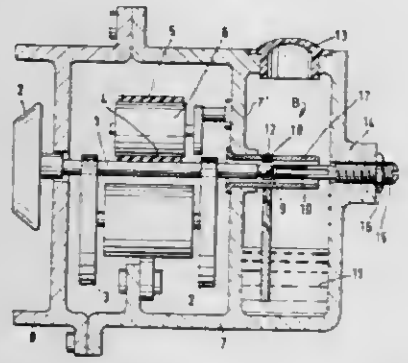
Fritz Stahlecker, Josef-Neldhart-Str. 18, D-7341 Bad Überkingen, assignor to Fritz Stahlecker and Hans Stahlecker, Germany

Filed Apr. 5, 1976, Ser. No. 673,521

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514734

Int. Cl.^{2} F16C *1/24*

U.S. Cl. 308—172 **41 Claims**



1. A bearing arrangement for a shaft connected to a spinning turbine of an open-end spinning unit, the arrangement comprising:

a ball means,
an oscillatable holding means for freely rotatably holding said ball means in an abutting relationship with an end of the shaft, said holding means extending generally in the direction of the shaft rotational axis,
means for fixedly clamping only a first end of said holding means to a relatively fixed member, and
accommodating means provided at a free end of said holding means, opposite said first end, for at least partially accommodating said ball means, said accommodating means being formed as a socket partially encompassing the ball means,
wherein the end of the shaft abutting said ball means is configured without socket means and in such a manner as to permit radial displacement of said ball means from its central position with respect to said end of the shaft, whereby said ball means can be moved by said oscillatable holding means to enhance utilization of the ball means as a bearing surface.

4,106,193

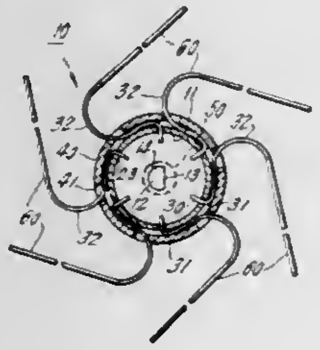
ROTARY SCRAPER WITH NON-GOUGING FINGER ARRAY

Leonard Fisher, 42 Spriteview Ave., Westport, Conn. 06880, and James E. Richardson, 28 Ladder Hill Rd., Weston, Conn. 06883

Filed Apr. 27, 1977, Ser. No. 791,307

Int. Cl.^{2} A47L *13/08;* A22C *25/02*

U.S. Cl. 30—172 **7 Claims**



1. A rotary scraper comprising a spool and a shaft
said spool being secured to said shaft
a plurality of sets of relatively flat fingers secured to said spool and extending radially therefrom
said sets of fingers being substantially parallel to each other and being spaced radially about said spool;
each set of fingers extending in a region parallel to said axis of said shaft;
said shaft being rotatable in a predetermined angular direction;
said fingers being inclined in said region so that their ends trail the points of connection to said spool during rotation;
the spool being provided with a plurality of slots substantially parallel to the shaft;
the base of each finger being received in one of said slots and being held therein;
a cover member being secured over said spool;
said cover member having a plurality of slots equal to the number of slots in said spool and displaced circumferentially from said spool slots;
each finger having a base section entering a spool slot, a section extending substantially circumferentially of said spool and a section bent out radially into and through the corresponding cover slot.

4,106,194

CUTTING MEANS

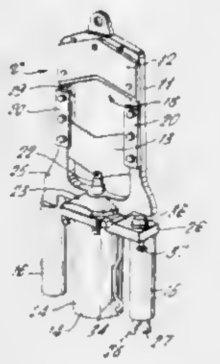
Trevor Ashton Steed, Sydney, Australia, assignor to Harry M. Miller Attractions Pty. Limited, Kings Cross, Australia

Filed Feb. 28, 1977, Ser. No. 772,826

Claims priority, application Australia, Feb. 27, 1976, 5021/76

Int. Cl.^{2} B26B *15/00*

U.S. Cl. 30—228 **3 Claims**



2. Cutting means comprising a frame; a pair of opposed blades mounted on the frame; one of the blades being movable relative to the other between an open position in which cutting edges on the blades are spaced apart and a closed position in which the said edges are juxtaposed; a hydraulic or pneumatic double acting ram mounted on the frame and adapted, when connected to a hydraulic or pneumatic power source, to effect movement of the said movable blade between the open and closed positions; and a pair of handles on the frame, one of the handles containing longitudinally extending hydraulic or pneumatic fluid and inlet and outlet ducts being rotatable within a bore in the frame to selectively direct hydraulic or pneumatic fluid from the inlet duct to the ram to either move the movable blade to or away from the closed position, the handle being so positioned relative to the frame that when only the said one handle is held by an operator the weight of the cutting means will cause it to rotate relative to the handle until the hydraulic or pneumatic fluid from the inlet duct is directed to the ram to move the movable blade to the open position.

4,106,195

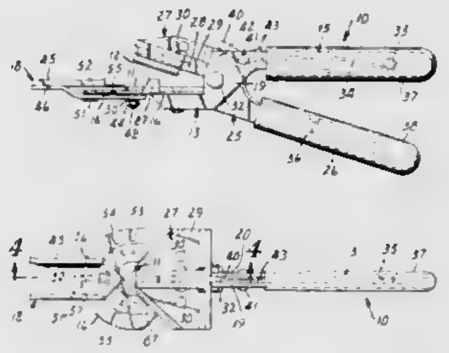
HAND TOOL FOR CUTTING AND FORMING AESTHETIC ENDS ON DECORATIVE MOLDING

Jack V. Berg, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 23, 1977, Ser. No. 799,200

Int. Cl.^{2} B26B *29/00*

U.S. Cl. 30—293 **1 Claim**



1. A hand tool for cutting preformed continuous flexible strips of decorative molding material and forming terminal leading and trailing ends on the cut strips, said tool comprising

an anvil support member having a support surface shaped to support a surface of said molding material,
a cutting knife having a V-shape for cutting said molding material when disposed on said anvil, said cutting knife being adapted to cut a predetermined notched pattern in the molding material,
a support member for supporting said anvil and including a first handle,
a support for said knife including a second handle pivoted to said first handle,
a guide member comprising an elongate channel-shaped member adapted to support a length of said molding material, said guide member being pivotally mounted to said anvil support member about a pivot axis perpendicular to said anvil support surface to afford adjustment about a pivot axis, and
indexing means on said guide member and on said anvil support member for placing said guide member and a length of molding material at various predetermined fixed positions on said anvil surface in relationship to said knife said indexing means including two notches formed in the anvil support surface, one notch positioned on a line bisecting the V-shape of said blade and the other at ninety degrees with respect to said one notch to form a symmetrical cut on the molding material and an insert, pairs of notches to the right hand and left hand sides of said anvil support surface and said one notch at symmetrical locations for cutting left and right hand pointed leading ends from the molding material and the mating inserts, and
pins means on said pivoted guide member spaced from said pivot axis to be received in a selected one of said notches for accurately locating said molding material with respect to said V-shaped blade.

4,106,196

COIN WRAPPER CUTTING DEVICE

John P. Smithline, Columbia, Md., assignor to Pacific Handy Cutter, Inc., Costa Mesa, Calif.

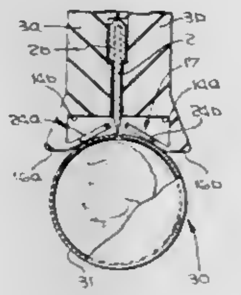
Filed May 5, 1977, Ser. No. 794,001

Int. Cl.^{2} B26B *29/00;* B25F *3/00*

U.S. Cl. 30—294 **2 Claims**

1. A cutting device for longitudinally slitting generally cylindrical objects comprising the provision of:

body means for supporting a cutting element;
alignment means for positioning said cutting element relative to said body means such that said cutting element projects beyond and in a plane perpendicular to a bottom surface of said body means;
bearing shoulder means comprising shoulder elements formed integral of said body means parallel to, on each side of, and offset from said projecting cutting element for longitudinally aligning a cylindrical object with respect to said cutting element, positioning said object such that a surface thereof contacts said cutting element and supporting said cylindrical object relative to said cutting element such that protrusion of said cutting element through said surface of said cylindrical object is controlled and any slitting of said cylindrical body by said cutting element is generally along the longitudinal extent of said cylindrical body; and
protective means comprising thin flexible sheet-like members extending from said bearing shoulder means to said plane of said cutting element and parallel to and spaced from said bottom surface of said body means a distance at least equal to the distance said cutting element projects beyond said bottom surface.



4,106,197

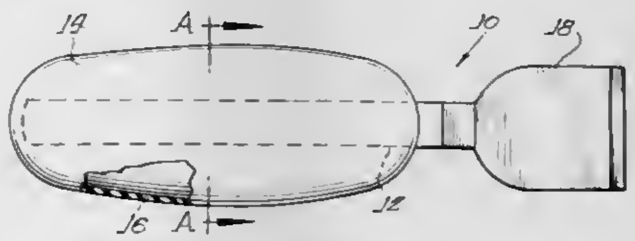
ICE CREAM SPOON

Charles E. Russell, 5N343 Powis Rd., Wayne, Ill. 60184

Filed May 5, 1977, Ser. No. 793,823

Int. Cl.^{2} A47J *43/28*

U.S. Cl. 30—324 **1 Claim**

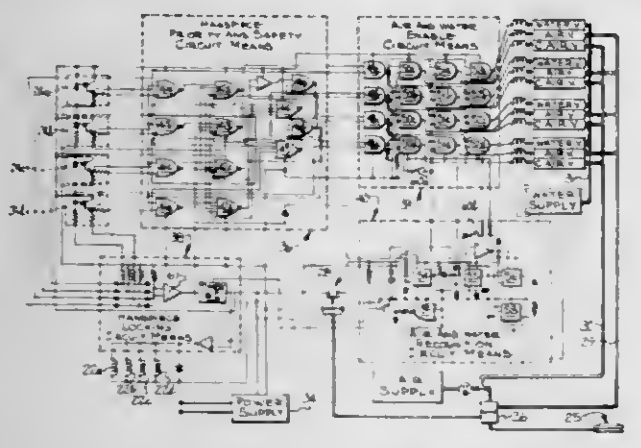


1. An ice cream spoon, particularly for rapidly and effortlessly cutting serving portions from a block of hard frozen ice cream, comprising

a. a blade or scoop member of stainless steel,
b. an elongate shaft or tang member of stainless steel extending outwardly from said blade member and forming with the same a solid unit of highly heat-conducting characteristics throughout all sections thereof,
c. a handle made from a lightweight material of high heat accumulating capacity, surrounding said shaft member and being rigidly and securely attached thereto in free heat-conducting relationship therewith, said handle being of maximum size for convenient gripping with one hand, and
d. a thin heat-insulating layer hermetically enclosing said handle to protect the user's hand from excessive heat, whereby the entire spoon may be briefly immersed in a hot water bath and thereby heated, with a great proportion of the heat stored in said handle material for subsequent conduction to said blade portion of the spoon upon removal of the spoon from said hot water bath.

4,106,198
CONTROL ARRANGEMENT FOR HANDPIECE INSTRUMENT

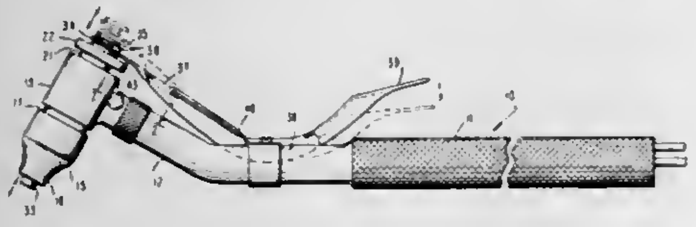
Bobby Belton Childress, Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,385
Int. Cl.^{2} A61C *19/02*
U.S. Cl. 32—22 **12 Claims**


HANDPIECE PRIORITY AND SAFETY CIRCUIT MEANS
AIR AND WATER ENABLE CIRCUIT MEANS
WATER SUPPLY
AIR SUPPLY
POWER SUPPLY

8. In an apparatus having a plurality of instrument handpieces, console means for receiving the plurality of handpieces, flexible hose means respectively attached to the handpieces and extensible from the console means upon selection and removal of corresponding ones of the plurality of handpieces from the console means, detector means for sensing the removal of each handpiece from the console means, supply means for selectively delivering at least one of a plurality of fluids through the flexible hose means to each of the plurality of handpieces, and foot controller means actuatable for governing the delivery of fluid to the handpieces; the combination therewith of a control apparatus comprising: means operatively connected with and responsive to the detector means and the foot controller means and operatively connected with the supply means (a) for identifying a handpiece which has been selected by an operator and removed from the console for use, (b) for distinguishing among varying patterns of actuation of the foot controller means indicative of selection of certain fluid for delivery, and (c) for enabling delivery of selected fluid to a selected handpiece only.

4,106,199
AMALGAMATOR

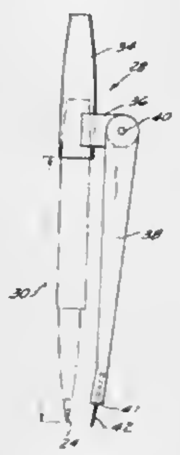
Carmine Gaccione, John Jay Pl., Rye, N.Y. 10580
Filed Dec. 6, 1976, Ser. No. 748,065
Int. Cl.^{2} A61C *5/06*
U.S. Cl. 32—40 A **3 Claims**



1. A dental amalgam triturating and dispensing tool which comprises:
a housing member including means defining a bore extending transversely through said member and having an opening therefrom on one side of said member,
an amalgamator receptacle defining a closed chamber, said receptacle being slidably positioned in said bore and adapted for reciprocating movement therein with an end portion of said receptacle exposed through said opening of said bore, and a restricted passageway communicating with said chamber interior extending through said end portion of said receptacle,
valve means including a pin having a tamping-head portion at one end thereof, said pin being mounted in said chamber for reciprocating movement between a first position with said tamping-head portion extending outwardly of said chamber through said passageway thereby sealing said passageway and projecting therebeyond and a second position with said tamping-head portion withdrawn into said chamber, thereby permitting communication between said chamber and the exterior of said receptacle through said passageway,
drive means in said member for reciprocating said amalgamator receptacle through a limited distance in said bore, and means for moving said pin between said first and second positions thereof, said drive means including a cam, rotatable shaft means in said member for rotating said cam, and a recess in the exterior of said receptacle, said cam being positioned adjacent the wall of said bore engaging said recess.

4,106,200
MARKER COMPASS

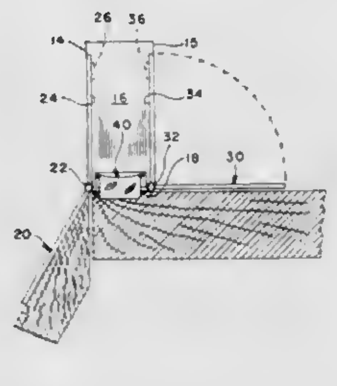
David Maxwell, 6035 Broadway, New York, N.Y. 10471
Continuation-in-part of Ser. No. 654,210, Feb. 2, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 774,751
Int. Cl.^{2} B43L *9/20, 9/24*
U.S. Cl. 33—27 B **2 Claims**



1. A marker compass assembly comprising:
A leg of fixed length, a resilient plastic cross-arm pivotally mounted to one end of the leg with a limited amount of frictional interengagement therebetween so that they retain their respective positions unless subjected to a predetermined amount of force, means at the other end of the leg to facilitate positioning of the leg at a desired location on a surface to be marked, a resilient plastic retainer/cap affixed to the end of the cross-arm distal from the leg and having a closed end and a tapered recess in the other end, the surfaces forming the recess having a larger diameter at the point distal from the closed end and gradually tapering toward the closed end, the retainer/cap having a generally cylindrical external configuration and dimensionally conforming to the shape and size of a cap for a conventional size, hand-held, desktype writing marker, the cross-arm due to its resilience can be coupled with a variety of different size conventional retainer/caps without alteration in structure of the cross-arm or the retainer/caps, a conventional size, hand-held, desk-type writing marker body of fixed length and generally cylindrical configuration containing marking material subject to relatively rapid evaporation, the marker body having a closed end and a writing tip at the other end, the marker body requiring substantially zero force to accomplish the writing function when the tip is applied to the writing force, the marker body being reversably mounted in the recess of the retainer/cap and having tapered surfaces on both ends of the marker body generally conforming to the tapered recess to permit tight frictional interengagement therebetween, whereupon insertion of the closed end of the marker body into the recess will produce automatic retention of the marker body in position for use as part of the marker compass with the writing tip exposed and in fixed position for use and, reversal of the marker body and insertion of the writing tip into the retainer/cap will produce automatic retention of the marker body in position for sealing protection of the writing tip when not in use to avoid evaporation of the marking material without the necessity of an additional protective cap, the leg having a predetermined length corresponding to the length of the marker body when the marker body is held in the retainer/cap with the tip exposed so that when the leg is positioned at the desired location on the writing surface the marker tip will be in position to write on the surface and application of the predetermined amount of force to pivot the cross-arm will permit adjustment of the marker tip relative to the positioned end of the leg on the surface thereby determining the radius of the arc that is to be drawn, and a limited amount of frictional interengagement being adequate to retain the relative pivotal position of the marker body with respect to the leg during rotation of the marker compass since no force need be applied to the marker tip for writing purposes during use.

4,106,201
TAPE MEASURE

Owen P. Hansen, 1200 Grand Ave., #4, Spring Valley, Calif. 92077
Filed Apr. 13, 1977, Ser. No. 786,972
Int. Cl.^{2} B43L *7/00;* **G01B** *3/10*
U.S. Cl. 33—75 R **9 Claims**

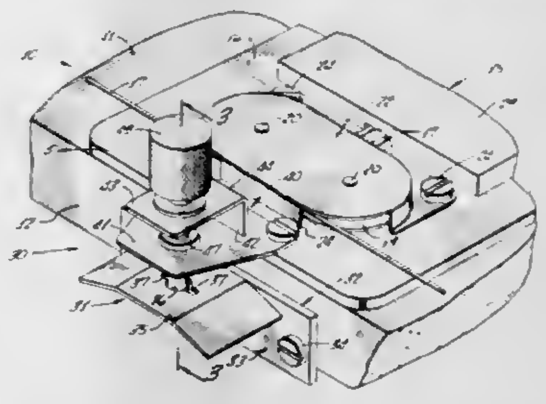


1. An improved tape measure comprising:
a casing having a retractable measuring tape coiled therein; said casing comprising a front wall, two side walls, and a bottom wall;
carpenter's square blade means pivotally secured to said casing at the intersection of said bottom wall and one of said side walls, the axis about which said blade means pivot extending substantially along the length of the edge of the casing that is formed by the intersection of said bottom wall and one of said side walls;
said carpenter's square blade means being pivotally moveable into and out of engagement with at least one of said side walls whereby a line can easily be scribed perpendicular to the longitudinal axis of said measuring tape by running a marking instrument along the forward edge of said carpenter's square blade means on the surface to be scribed.

4,106,202
APPARATUS FOR INDICATING THE ANGLE OF A DRAFTING PARALLEL

Joseph W. James, 501 W. Whiting, Fullerton, Calif. 92632
Filed Nov. 8, 1977, Ser. No. 849,680
Int. Cl.^{2} B43L *13/02*
U.S. Cl. 33—80 **7 Claims**

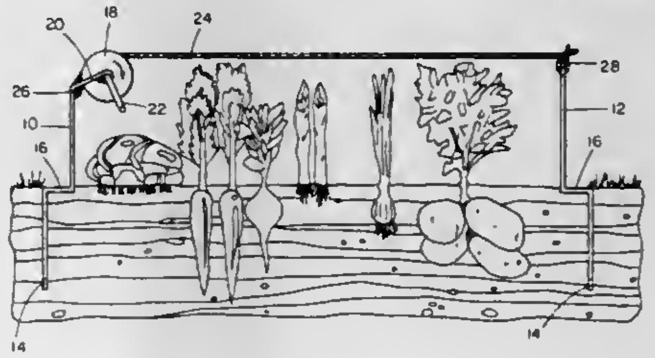
1. Apparatus for use with a drafting board and a drafting parallel of the type including a straight edge suspended by cables on one surface of said board for parallel movement therealong, comprising:
means for releasably locking one end of said straight edge in a fixed position relative to said drafting board so as to permit pivotable movement only of said straight edge; and



an angle scale connectable to said board adjacent the other end of said straight edge for indicating the amount of angular rotation of said straight edge.

4,106,203
GARDEN ROW MARKER

William J. Sikma, 307 S. Line St., and Ronald J. Pease, 707 Jeffery Ct., both of Columbia City, Ind. 46725
Filed Sep. 16, 1977, Ser. No. 833,741
Int. Cl.^{2} B43L *7/00*
U.S. Cl. 33—86 **8 Claims**



1. A garden row marker comprising:
(a) a supply of marking cord,
(b) a pair of stakes having pointed lower ends for inserting into the ground,
(c) a reel rotatably attached to the upper end of one of said stakes for storing said cord thereon,
(d) means for securing the free end of said cord to the upper portion of the other of said stakes,
(e) a reversing roll provided on the upper end of said one stake positioned beneath said reel, said roll adapted to permit the free end of said cord to pass downwardly from said reel and around said roll, back up to said reel for engagement with the remaining cord supply on said reel, and finally to the securing means on said other stake,
whereby the cord may be unwound from said reel to define a straight line of a desired length between said pair of stakes, said reel being secured against further unwinding by said engagement between the unwound portion of said cord and said remaining supply on said reel.

4,106,204

DUAL READOUT DIAL-TYPE CALIPER

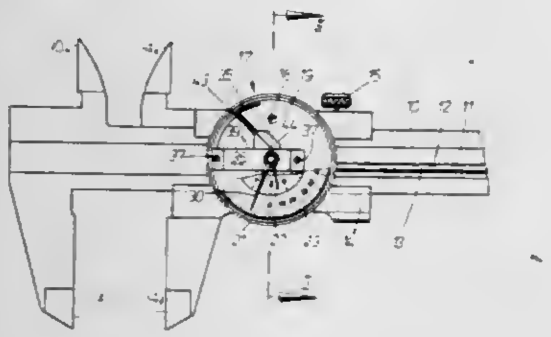
Karl Schäder, Niedernhall-Giebelheide Fed. Rep. of Germany, assignor to Schneider & Kern, Niedernhall, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,418

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625976

Int. Cl.^{2} G01B *3/20, 5/02*

U.S. Cl. 33—147 T **19 Claims**



1. A caliper comprising:

an elongated beam provided with at least one longitudinally extending rack;

a slider displaceable longitudinally along said beam;

a mechanism holder pivoted on said slider about a transverse pivot axis and having front and rear sides forming respective front and rear journals together defining an arbor axis generally parallel to and offset from said pivot axis;

an arbor rotatable in said journals about said arbor axis and having front and rear ends projecting respectively from said front and rear sides of said holder;

a pinion on said rear end meshing with said rack, whereby displacement of said slider along said beam rotates said arbor;

indicator means including a scale carried on said slider and a pointer on said front end of said arbor for indicating the relative positions of said slider and said beam;

spring means connected to said slider and bearing on said holder for urging same pivotally in a direction pressing said pinion into tight mesh with said rack; and

a mounting plate carrying a pin defining said pivot axis, said indicator means including a back plate formed with a throughgoing mounting hole at least partially receiving said holder and with a recess adjacent said mounting hold and receiving said mounting plate.

4,106,205

APPARATUS FOR MEASURING INSIDE AND OUTSIDE CHAMFERS ON WORKPIECES

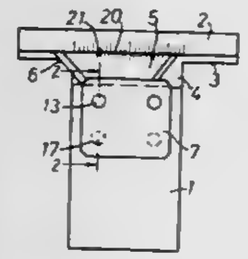
Hans Wiederkehr, Ifangstrasse 107, Rumlang, Switzerland

Filed Jun. 3, 1976, Ser. No. 692,437

Claims priority, application Switzerland, Jun. 13, 1975, 7698/75

Int. Cl.^{2} G01B *3/56*

U.S. Cl. 33—174 E **5 Claims**



1. An apparatus for measuring inside and outside chamfers on workpieces, said apparatus comprising:

a substantially flat rectangular body having a first stop edge along one side thereof and at least one guide slot formed in said body and opening into said first stop edge;

a measuring tongue having a single second stop edge on one end thereof slideably mounted within said guide slot with said second stop edge arranged to protrude through said first stop edge a distance depending upon the position of said measuring tongue in said guide slot, said second stop edge being inclined with respect to the direction of motion of said tongue in said guide slot to also form an angle with said first stop edge generally corresponding to the angle of the chamfer to be measured;

means for releasably securing said measuring tongue to said body within said guide slot; and

an arm extending outwardly from said one side of said body forming an angle of substantially 90° with said first stop edge where, by movement of said tongue, said second stop edge forms an angle between both said arm and said first stop edge, said arm being formed with a third stop edge defining one side of the angle between said arm and said first stop edge on said body.

4,106,206

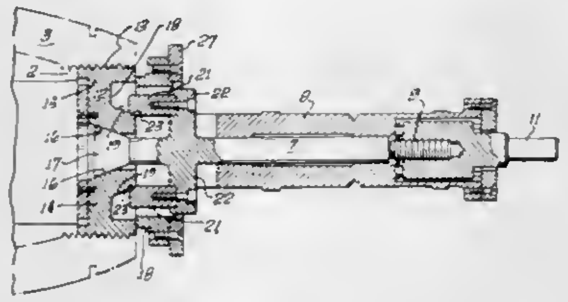
POSITIVELY EXPANDABLE AND RETRACTABLE THREAD MEASURING GAGE

Otto W. Piehl, deceased, late of Corona Del Mar, Calif., by Julia A. Piehl, legal representative, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,739

Int. Cl.^{2} G01B *5/16*

U.S. Cl. 33—199 R **5 Claims**



1. A positively expandable and retractable thread-measuring gage apparatus comprising:

an elongate housing member provided with an axial bore,

an elongate shaft member reciprocably mounted in said bore and having a forwardly disposed driving end,

means for reciprocably moving said shaft member axially in said bore,

a first inclined-surface cam means carried by said driving end of the shaft member,

a second inclined-surface cam means also carried by said shaft member in a position disposed radially outwardly of and in close proximity to said first cam means, and

a cam follower member carried by said housing, said member being formed of a plurality of segments extending radially outwardly of said housing bore with each having a first inclined surface slidably engaging the inclined surface of one of said cam means and a second inclined surface disposed radially outwardly of said first inclined surface in slidable engagement with the inclined surface of the other cam means, said slidable engagements being disposed in diametrical opposition for supporting said segments and for exerting radially opposite forces on said segments to the extent that when said shaft is moved in one axial direction one of said engagements radially expands said followers while the other permits said expansion and when the shaft is moved in the other direction the other engagement contracts the followers with said one engagement permitting the retraction,

each of said radially extending segments having an arcuate portion provided with threads matching said threads to be measured, said arcuate portions geometrically forming a circle whereby said gage can be disposed with its threaded segments radially aligned with the threads to be measured and its shaft member moved in opposite directions for expanding and contracting the threaded segments into and out of contact with said threads.

4,106,207

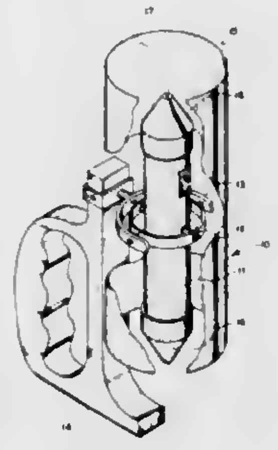
POINT TO POINT SELF-LEVELING PLUMBING DEVICE

Vernon Hugo Boyett, 310 Lakeshire Dr., Daly City, Calif. 94015, and Robert W. Devine, 743 Montezuma Dr., Pacifica, Calif. 94044

Filed Aug. 9, 1976, Ser. No. 712,868

Int. Cl.^{2} G01C *15/02, 15/10*

U.S. Cl. 33—286 **5 Claims**



1. A point to point, self-leveling plumbing device comprising: a stand, an elongated hollow body having opposed open ends mounted on said stand, said stand including means forming a handle for holding said body at various distances above and below a first and a second surface, respectively, said distances including distances which may require focusing of either or both of said upper and said lower light beams with respect to said first and second surfaces, a gimbal system mounted on the stand and disposed within said hollow body, an elongated, pendulous housing suspended on the stand by the gimbal system, the housing having axially aligned openings at its upper and lower ends in general proximity to said opposed ends, said stand being shaped and configured to support said hollow body in a generally vertical orientation on a horizontal surface, means disposed within the housing for emitting an upper and a lower light through the aligned openings such that the upper light beam is aligned with the lower light beam, means for individually adjustably focusing said upper and lower light beams with respect to said first and second surfaces; and said hollow body defining on one side thereof a smooth, uninterrupted surface capable of making at least line contact with a planar surface.

4,106,208

METHOD OF AND APPARATUS FOR DETERMINING VEHICLE WHEEL ALIGNMENT

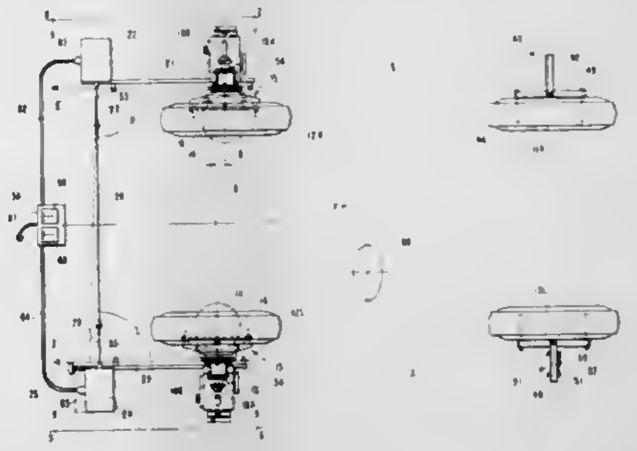
Lee Hunter, 13501 Ladue Rd., Ladue, Mo. 63141

Filed Apr. 9, 1976, Ser. No. 675,347

Int. Cl.^{2} G01B *07/315, 19/295, 11/275*

U.S. Cl. 33—288 **5 Claims**

3. Vehicle wheel alignment determining apparatus for vehicles having at least four wheels arranged in sets spaced apart longitudinally of the vehicle and the wheels of each set being on opposite sides of a common longitudinal center line for the vehicle and from which alignment is to be determined, said apparatus comprising: elongated support means connected to each of a first set of wheels in a position to be parallel with the plane of wheel rotation and to project beyond the wheel perimeter to an outer end; electrically operable wheel position monitoring means mounted on each of said elongated support means in positions adjacent the outer ends so as to be beyond said first set of wheels, said monitoring means including movable elements operatively interconnected so as to be automatically and simultaneously responsive to a change in the angular alignment position of the plane of rotation of said first set of wheels relative to the vehicle center line; means for moving one of the monitoring means forwardly and rearwardly on its elongated support means while each monitoring means continues to monitor the position of the wheel with which it is associated; target means positioned adjacent each of a second set of wheels so as to be spaced longitudinally of the vehicle from said first set of wheels, said target means each having alignment measuring scales with indicia thereon; target sighting means mounted on each of said elongated support means connected to an associated one of said first set of wheels, and each having a line of sight fixed so as to be substantially and continually parallel to the plane of rotation of the associated wheel of said first set of wheels and in position to view the alignment measuring scale indicia on the associated target means adjacent to the second set of wheels, each target sighting means being movable with its associated wheel to follow a change in the angular alignment position of said first set of wheels, whereby said alignment measuring scale indicia on said target means are viewed by said sighting means in determining the straight ahead alignment characteristics of said first set of wheels; and display means located remote from said elongated support means and monitoring means and being connected to said monitoring means to continuously display the response of each monitoring means as angular alignment adjustments are made on the first set of wheels and also as said one monitoring means is moved forwardly and rearwardly on its support means.



5. Vehicle wheel alignment determining apparatus for a vehicle having a pair of front and a pair of rear wheels, said apparatus comprising: target means disposed adjacent the faces of each of a first pair of vehicle wheels, said target means having similar scale indicia thereon presented to face toward the second pair of vehicle wheels; sighting means carried by each of said second pair of vehicle wheels in parallel to the plane thereof and directed to scan said scale indicia on the associated target means and align with selected indicia on said target means; and computer means operatively carried by one of said target means to combine the selected indicia and automatically indicate the value of the average of said selected indicia.

4,106,209

DRYING VENEER WITH JETS OF SUPERHEATED SOLVENT VAPOR

Frederick L. Brown, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

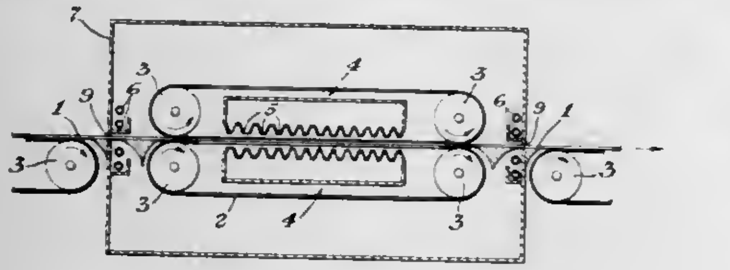
Filed Apr. 21, 1977, Ser. No. 789,386

Int. Cl.^{2} F26B *3/04*

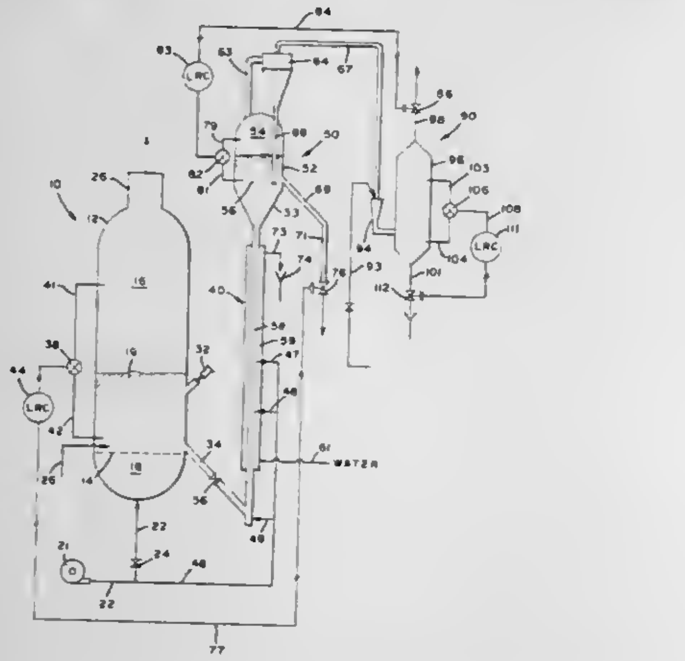
U.S. Cl. 34—9.5 **9 Claims**

1. A process for drying a green veneer sheet which comprises contacting at least one surface of said sheet with multiple

spaced jets of the superheated vapor of a water-immiscible organic liquid, recovering the vapor of said liquid after contacting the veneer sheet, and recycling the recovered vapor to the process.



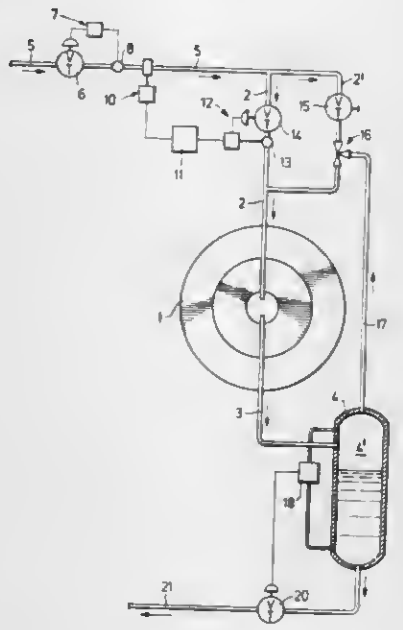
4,106,210
SOLIDS DISCHARGE SYSTEM WITH COOLING MEANS FOR PRESSURIZED FLUID BED REACTORS
Walfred Wilhelm Jukkola, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.
Filed Jan. 6, 1977, Ser. No. 757,430
Int. Cl.² F26B *3/08*
U.S. Cl. 34—10 8 Claims



8. A process for continuously discharging hot particulate solids from a pressurized fluid bed reactor to cool and depressurize said solids comprising:

a. elevating particulate solids discharged from a first pressurized fluidized bed in a fluidized column to a level substantially above said first pressurized fluidized bed to effect a first increment of depressurization,
b. disposing said elevated particulate solids in a secondary pressurized fluidized bed operating at a substantially lower pressure than that of said first pressurized bed to effect additional cooling,
c. establishing a plug of solids of predetermined length for discharge from said secondary pressurized fluidized bed,
d. permitting continuous gas flow through said plug and
e. continuously discharging solids from said plug at an inhibited rate to maintain said plug length and thereby depressurize said solids to essentially ambient pressure.

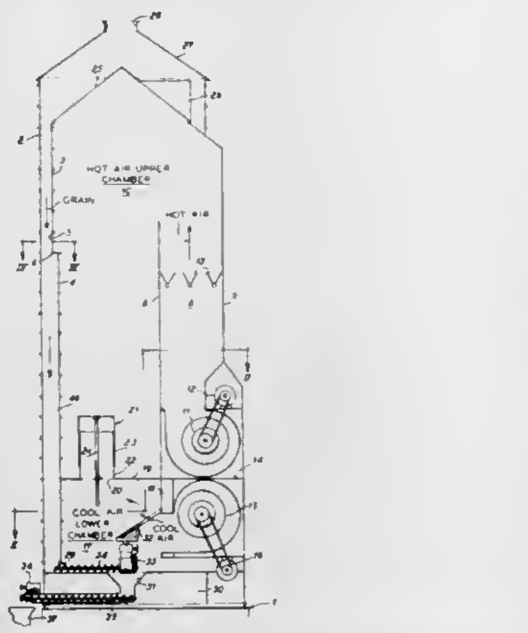
4,106,211
APPARATUS FOR OPERATING A DRYING CYLINDER OF A PAPER MAKING MACHINE
Herbert Holik, Ravensburg, Germany, assignor to Escher Wyss GmbH, Ravensburg, Germany
Filed May 5, 1976, Ser. No. 683,426
Claims priority, application Switzerland, Jun. 17, 1975, 7806/75
Int. Cl.² F26B *11/04*
U.S. Cl. 34—48 4 Claims



1. The combination of
a drying cylinder for a paper making machine,
supply means for delivering a supply of steam to the interior of said drying cylinder,
a quantity measuring means for determining the amount of steam being supplied to said drying cylinder per unit of time and for emitting a measurement signal in response thereto,
a pressure-regulating means for regulating the pressure prevailing in said drying cylinder, and
a signal-emitter for receiving said measurement signal from said quantity-measuring means for transmitting a control signal to said pressure-regulating means as a function of said measurement signal of said quantity-measuring means to vary the pressure of the steam delivered to said drying cylinder.

4,106,212
GRAIN DRYER SIDEWALL CONSTRUCTION AND METHOD OF DRYING GRAIN
Elmo L. Batterton, and Melvin J. Lonsdale, both of Morton, Ill., assignors to Meyer Morton Co., Morton, Ill.
Filed Jul. 14, 1976, Ser. No. 705,159
Int. Cl.² F26B *19/00*
U.S. Cl. 34—65 6 Claims

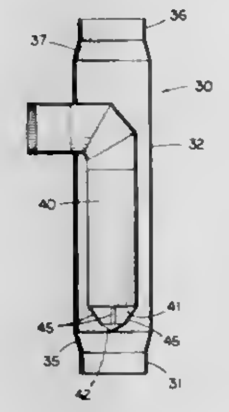
1. A continuous flow grain dryer of the upright type having a pair of spaced inner and outer walls having perforations therein and defining a path for the flow of grain therebetween with partition means defining the space in the inner wall into a hot air upper chamber and a cool air lower chamber, and means to supply hot air to the upper chamber and cool air to the lower chamber with means to control the admission of cool air through said partition into the lower portion of said upper chamber, wherein the improvement comprises:
the upper part of the inner wall defining a greater interior transverse area than the lower part of said wall, and transverse means connecting the two parts of said inner wall to provide a grain path of constant width above said transverse means, and a grain path of greater constant width below said transverse means.



4,106,213
EXHAUST RECIRCULATION SYSTEM FOR CLOTHES DRYER
Earl L. Witte, Rte. 6, Clinton Rd., Paducab, Ky. 42001
Filed Apr. 11, 1977, Ser. No. 786,621
Int. Cl.² F26B *21/08*
U.S. Cl. 34—79 6 Claims

1. A device adapted to be attached to an exhaust vent pipe of a clothes dryer for recirculating exhausted air within a room, comprising: ,
a length of tubing formed with a substantially right angled bend, one end of said tubing having a circular cross section and a diameter substantially equal to the diameter of said vent pipe for mounting to said vent pipe, the opposite end of said tubing extending parallel to an outer surface of the clothes dryer and adapted to be located adjacent an upstanding wall;
a filter bag;
means for releasably securing said filter bag on said opposite end of said tubing;
said filter bag being adapted to extend outwardly between the dryer and the wall, said opposite end of said tubing having an approximately elliptical cross section with the major axis thereof oriented parallel to said wall,
said filter bag having a circumference approximately equal to the circumference of said opposite end of said tubing, thereby enabling said dryer to be positioned closely adjacent said wall; and
means for supporting said device on said dryer vent pipe.

4,106,214
DRYER ATTACHMENT
Robert H. Schmidt, 6223 E. 56th St., Indianapolis, Ind. 46226
Continuation-in-part of Ser. No. 593,759, Jul. 7, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,681
Int. Cl.² F26B *19/00*
U.S. Cl. 34—86 9 Claims

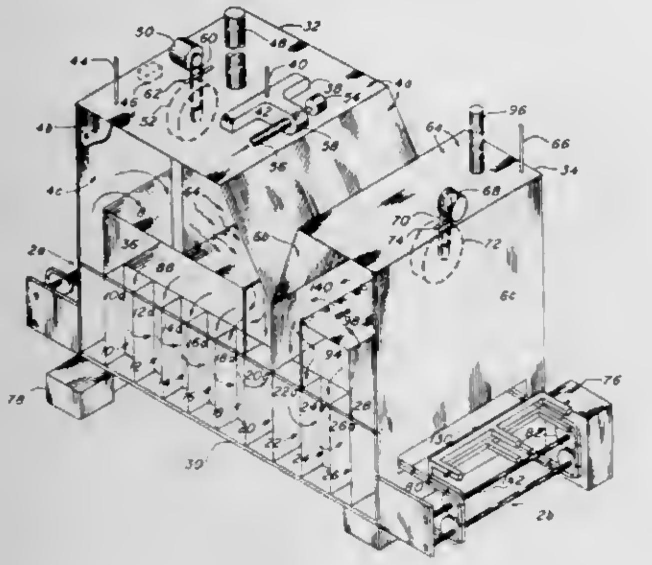


1. A heat reclaimer for use with a clothes dryer of the type including a heat chamber means, an intermediate chamber means including rotary drum dryer means, an outlet chamber means, a discharge stack leading upwardly away from said outlet chamber means, and a blower for moving air through said outlet chamber means and discharge stack, said heat reclaimer comprising a conduit positioned at and extending along a central section of said discharge stack and leading through the wall of said stack and adapted to be coupled into said upper heat chamber means, said stack having an enlarged diameter at the conduit-containing portion of said stack;
in a combination in which the heat reclaimer conduit has at its upstream end a downwardly pointing conical deflector, which directs the air to the outer wall so that lint and moisture carried in the discharge stack air upstream will bypass the said reclaimer conduit rather than re-cycle back through the reclaimer;
and in which the heat reclaimer conduit has its downwardly pointing conical deflector located in the region of the discharge stack in which the diameter thereof increases to its said enlarged diameter.

4,106,215
WOOD IMPINGEMENT DRYER
Howard N. Rosen, Carbondale, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Jul. 14, 1976, Ser. No. 705,230
Int. Cl.² F26B *19/00, 25/06*
U.S. Cl. 34—217 5 Claims

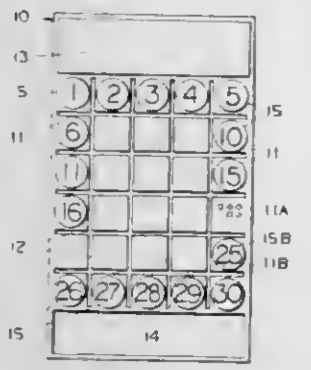
1. An apparatus for the continuous drying and seasoning of lumber comprising:
an elongated drying section,
an elongated steam condition section sequentially communicating with said drying section,
a housing structure encompassing said drying section and said steam conditioning section,
means for continuous transportation of lumber longitudinally and sequentially through said drying and steam conditioning sections,

means for the impingement of hot air onto lumber being transported through said drying section,



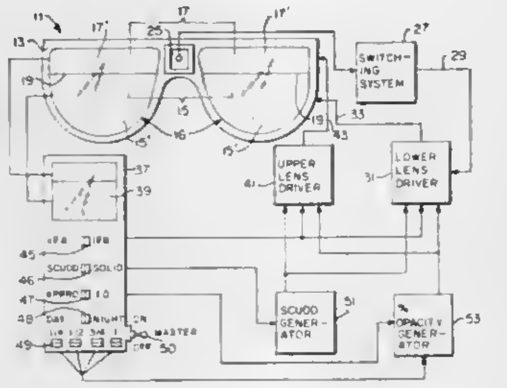
means for impinging steam onto lumber being transported through said steam conditioning section.

4,106,216
POSITIONING SYSTEM UTILIZING BINARY CODE
Edward A. Boehm, Apt. #1, 2361 Ecuadorian Way, Clearwater, Fla. 33515
Filed Feb. 16, 1977, Ser. No. 769,396
Int. Cl.^{2} G09B *1/10*
U.S. Cl. 35—9 R **8 Claims**



1. A positioning system utilizing a binary type code including in combination, a base having a plurality of first coupling portions each having one of a first configuration representing a binary "0" digit of the code and a second different configuration representing a binary "1" digit, and a member adapted to be coupled to said base and having a plurality of second coupling portions, each having one of a first configuration representing a binary "0" digit and a second different configuration representing a binary "1" digit, said second coupling portions which have said first configuration being shaped to couple only with one of said first coupling portions which have said first configuration, and said second coupling portions which have said second configuration being shaped to couple only with one of said first coupling portions which have said second configuration, said second coupling portions of said member representing a given binary number and mating with said first coupling portions of said base which represent the same binary number.

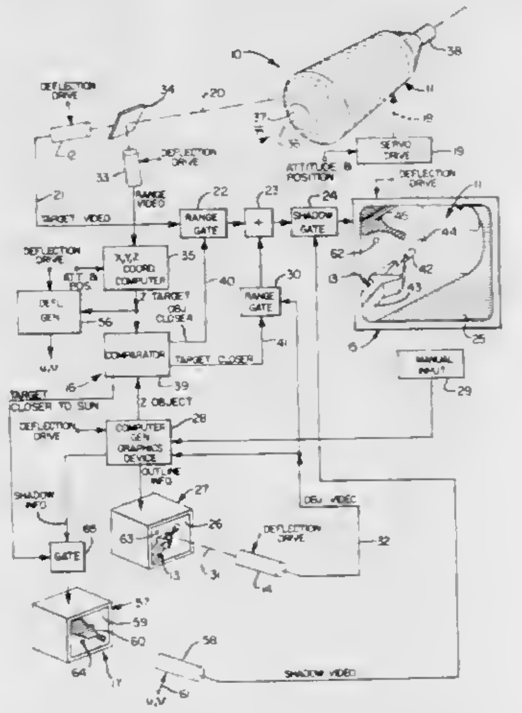
4,106,217
HEAD MOUNTED FLIGHT TRAINING APPARATUS
Frank A. Witt, Rte. #4, Hidden Acres, Lexington, S.C. 29072
Continuation-in-part of Ser. No. 659,906, Feb. 20, 1976, Pat. No. 4,021,935. This application Feb. 15, 1977, Ser. No. 768,941
Int. Cl.^{2} G09B *9/08*
U.S. Cl. 35—12 B **15 Claims**



12. Flight training apparatus operable for affecting a pilot's vision out through the windshield of his aricraft, comprising:
- voltage controlled lens means having a first state of transparency permitting visual communication therethrough and operable to a second state of percentage opacity for affecting visual communication, said second state of percentage opacity for simulating distance of visibility to the pilot;
- means for suitably securing said lens means in a transverse relationship with respect to lines of sight of a pilot;
- vision checking means for checking the pilot's vision through said lens means with respect to a peripheral-view-direction to a predetermined line of sight to engage movement of the pilot's head for a greater peripheral viewing along said peripheral-view-direction;
- means for monitoring the relative position of said predetermined line of sight with respect to the windshield, said means indicating when said predetermined line of sight passes through said windshield; and
- electrical circuitry means cooperable with said monitoring means for actuating said lens means to said second state responsive to said monitoring means indicating said predetermined line of sight is passing through said windshield, said lens means otherwise remaining in said first state, whereby a flight training apparatus is provided operable to affect the pilot's visual communication when the pilot views outside the craft to simulate distance of visibility, and operable to unobstructed clear visual communication as the pilot turns to view the instrument control panel of his craft.

4,106,218
SIMULATOR METHOD AND APPARATUS FOR PRACTICING THE MATING OF AN OBSERVER-CONTROLLED OBJECT WITH A TARGET
Walter K. Polstorff, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Continuation-in-part of Ser. No. 590,183, Jun. 25, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,165
Int. Cl.^{2} G09B *9/02*
U.S. Cl. 35—12 C **20 Claims**

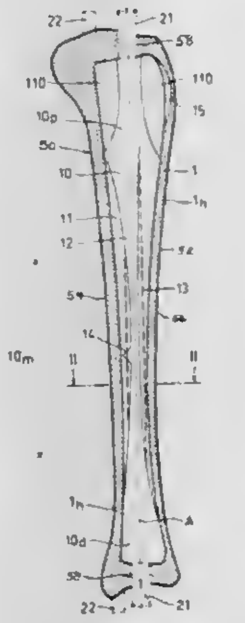
1. A simulator for practicing the mating of an observer-controlled object with a target comprising:
- a. means for generating a first video signal representative of a scene containing the target as viewed from a target vantage point;
- b. means for generatiing a second video signal representative of a scene containing the object as viewed from an object vantage point;
- c. range means for generating, for each picture element of the scene containing the target, a target range signal representative of the range of the contents of the last-mentioned picture element to the target vantage point, and for generating for each picture element of the scene containing the object, an object range signal representative of the range of the contents of the last-mentioned picture element to the object vantage point;
- d. comparator means for comparing the target and object range signals of corresponding picture elements of the target and object scenes to identify which of said elements has its contents closer to its vantage point;
- e. a television monitor having a viewing screen; and
- f. gate means responsive to the comparator means for controlling the application to the monitor of the first and second video signals whereby both the target and the object are simultaneously reproduced on the screen with the object appearing to block the target when the object is closer to the object vantage point than the target is to the target vantage point.



20. A method for practicing the mating of an observer-controlled object with a target comprising the following steps:
- (a) generating on a television monitor a composite view of both the target and the object with the object occluding the target when the object is closer than the target to the viewer;
- (b) generating the shadow of the object on the target; and
- (c) determining engagement of a point on the object with the target by the spacing between said point and the shadow.

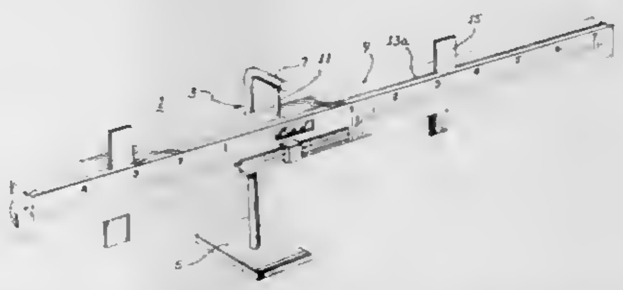
4,106,219
PLASTIC BONE USED FOR TRAINING PURPOSES BY SURGEONS
Urs Schneider, Kronbühl, and Rudolf Heller, Zurich, both of Switzerland, assignors to Synthes AG Chur, Chur and Contraves AG, Zurich, both of, Switzerland
Filed Nov. 19, 1976, Ser. No. 743,393
Claims priority, application Switzerland, Dec. 5, 1975, 15841/75
Int. Cl.^{2} G09B *23/32*
U.S. Cl. 35—17 **4 Claims**

1. A plastic bone useful as a training device for surgeons for the mechanical joining of broken pieces of a bone fracture, comprising:
- a molded plastic bone having a size and shape essentially corresponding to a shaft bone of a limb of a human being;
- said molded plastic bone having an internal hollow cavity;
- said internal hollow cavity including a marrow cavity located at the central region of the molded plastic bone;
- said internal hollow cavity of the molded plastic bone being provided at said central region with a narrowmost substantially uniform and profiled cross-section having recesses extending between inwardly protruding ribs;
- said internal hollow cavity extending past the marrow cavity towards both ends of the molded plastic bone into the region of spongy structured bone lacunae (spongiosa) of the natural bone and widening at such locations to form widened portions;



- said molded plastic bone having a wall structure which essentially corresponds to the solid wall regions (compacta) of the natural structure as to weight, strength and mechanical machinability.

4,106,220
MATHEMATICAL TEACHING AID
Deane E. Hurd, 5034 W. Kalen Cir., Glendale, Ariz. 85301
Filed Jan. 17, 1977, Ser. No. 759,840
Int. Cl.^{2} G09B *19/02*
U.S. Cl. 35—31 R **8 Claims**

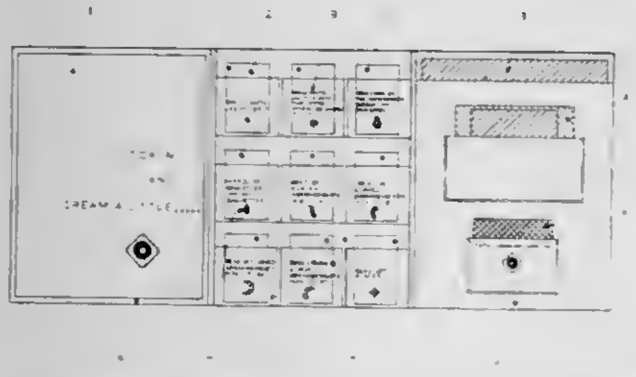


1. An apparatus for illustrating and verifying mathematical operations involving integral and nonintegral numbers, comprising:
- a. a base;
- b. a balance arm having a center of gravity and graduations disposed on a face of said balance arm at predetermined longitudinally spaced intervals;
- c. suspension means for pivotably suspending said balance arm from said base to permit rotation of said balance arm in a vertical plane and for preventing rotation of said balance arm in a horizontal plane;
- d. at least two area-weights for performing mathematical problems in conjunction with said balance arm, said area-weights comprising a uniform density, uniform thickness sheet material, whereby the area of said area-weights is proportional to their weight and thereby permitting mathematical computations relating to areas, weights and area versus weight; and
- e. attachment means for securely attaching said area-weights to said balance arm at any location along the length of said balance arm, said attachment means including means for

securing said area-weights to said balance arm independent of the force of gravity to maintain said attachment means operative.

4,106,221
TWO-DIMENSIONAL VISUALIZATION AID FOR THE RETAIL JEWELRY TRADE

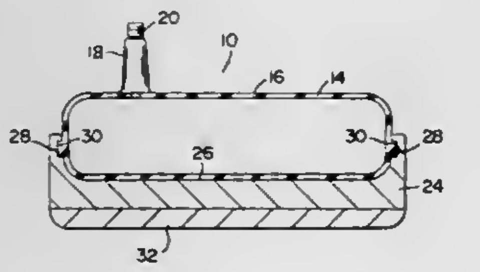
Michael David Seloo, 301 Wisconsin, Oak Park, Ill. 60302
Filed Feb. 2, 1977, Ser. No. 765,092
Int. Cl.^{2} B44F *1/06*
U.S. Cl. 35—53 **3 Claims**



1. Apparatus for aiding the two dimensional visualization of what a jewelry customer's faceted stones will look like as a finished piece of jewelry comprising: a three-part electronically heat sealed folder housing a large number of separate transparent Mylar cards with different two-color permanently printed two dimensional images of different sizes, shapes, and arrangements of the stones; a two color lithographed and offset printed catalog of different blank jewelry settings; a black vinyl square viewing frame; wherein a selection of the large number of separate Mylar cards are manipulatable over the individual pictures of blank jewelry settings, isolated by the black frame, so as to present a two dimensional image to a retail customer of what their faceted stones will look like as a finished piece of jewelry.

4,106,222
INFLATABLE PODIATRIC DEVICE

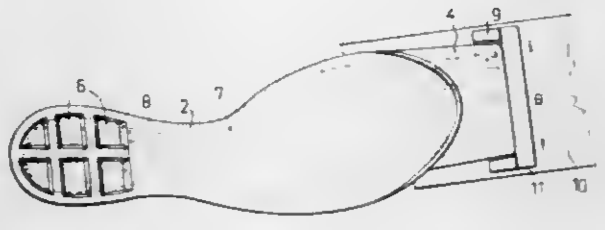
Randall G. Houck, 721 Unity Dr., Indian Harbor, Fla. 32937
Filed Aug. 1, 1977, Ser. No. 820,610
Int. Cl.^{2} A43B *3/12, 13/20*
U.S. Cl. 36—29 **17 Claims**



1. An inflatable podiatric device comprising:
a sole including an inflatable envelope formed of a flexible material having a first surface adapted to conform to a foot of a wearer thereof;
means extending through said envelope along said first surface for inflating said envelope; and wherein
said inflating means extends substantially above said first surface whereby said inflating means is engagable between adjacent toes of said wearer.

4,106,223
SKI BOOT

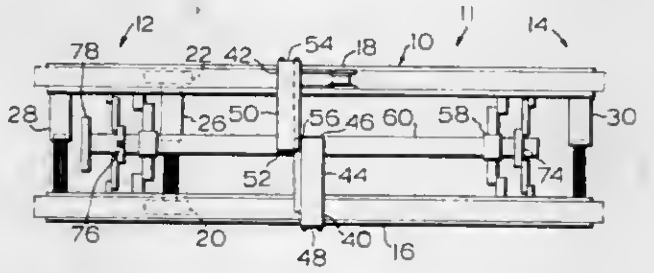
Hans Benseler, Hemmingen, Fed. Rep. of Germany, assignor to PUMA-Sportschunfabriken Rudolf Dassler KG., Nuremberg, Fed. Rep. of Germany
Filed Mar. 22, 1977, Ser. No. 780,039
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613266
Int. Cl.^{2} A43B *5/04*
U.S. Cl. 36—117 **11 Claims**



1. In combination with a long run ski, a boot including a toe and comprising therewith: a sole having a longitudinal axis and a forward projection which extends substantially beyond the toe of said boot;
fastening means for fastening only said forward projection of said sole to a ski;
and an insert arranged exclusively within said sole and extending particularly into said forward projection of said sole at least as far as said fastening means to prevent any damaging break within said forward projection, at least that portion of said insert which is in said forward projection of said sole being flexible simultaneously to allow a sufficient turn resistance assured with loading arising transverse to the longitudinal axis.

4,106,224
CUTTING ASSEMBLY

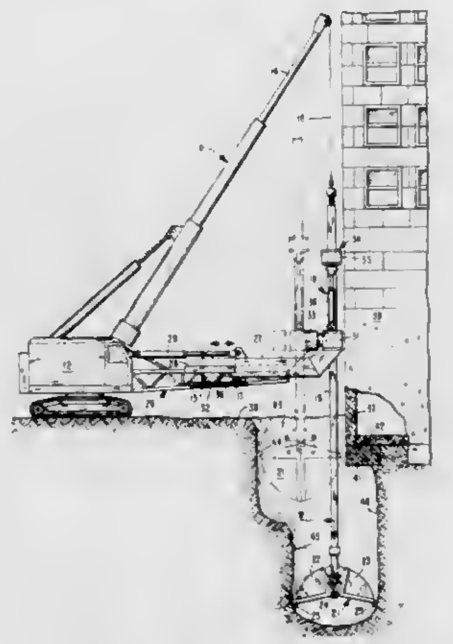
Francisco De La Cruz Cuevas, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 16, 1977, Ser. No. 778,203
Int. Cl.^{2} E02F *5/02*
U.S. Cl. 37—80 A **11 Claims**



1. A cutting assembly comprising:
a support element;
a first cutting element having an outer end and extending generally laterally in one direction and being generally movable about the support element;
a second cutting element having an outer end and extending generally laterally in an opposed direction and being generally movable about the support element, said outer end being laterally spaced a preselected distance from the outer end of said first element, said first and second elements overlapping one another and being movable between a first position at which the distance between the outer ends of said elements is maximum and a second position at which the distance between said outer ends is minimum; and
means for releasably connecting said cutting elements, for controlled movement of the cutting elements generally perpendicular to said support element to a preselected position and maintaining the preselected position for making a single cut of substantially uniform width.

4,106,225
METHOD AND APPARATUS FOR EXCAVATING UNDERPINNING HOLES

Harry Schnabel, Jr., Bethesda, Md., assignor to Schnabel Foundation Company, Washington, D.C.
Filed Mar. 7, 1977, Ser. No. 775,115
Int. Cl.^{2} B66C *3/02;* E02D *5/00*
U.S. Cl. 37—184 **14 Claims**

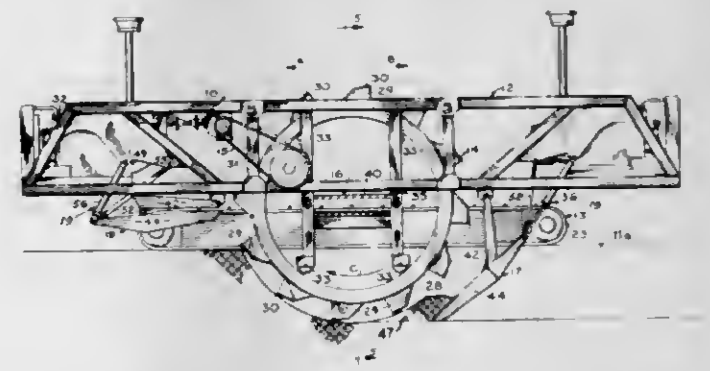


1. An excavator for digging and removing earth from a hole extending beside and at least partially under a structure to be underpinned which comprises:
a vertical rod;
earth removing digger means affixed to the bottom of said rod;
means for suspending said rod above the hole and for moving the rod vertically to permit said digger means to descend into and ascend out of the hole;
said digger means having a substantial horizontal reach from said rod to extend a substantial distance under the structure when suspended in the hole with the rod adjacent the structure;
reciprocable means engaging said rod to move said rod and said digger means linearly in a horizontal direction toward and away from the structure;
said digger means including a digging element movable in the direction of said horizontal reach; and
means to position said digger means relative to said reciprocable means and the structure so that the direction of said linear horizontal movement of said rod and said digger means is parallel to the direction of said horizontal reach.

4,106,226
BIDIRECTIONAL ROTARY EXCAVATOR

Raymond A. Hanson, c/o R.A. Hanson Co., P.O. Box 7400, Spokane, Wash. 99207
Filed Feb. 18, 1977, Ser. No. 769,932
Int. Cl.^{2} E02F *3/24*
U.S. Cl. 37—190 **1 Claim**

1. A bidirectional excavating machine, comprising:
a rigid framework;
means carrying the framework for movement along a ground surface in a forward or rearward direction along a selected path;
an excavator wheel mounted to the framework for rotation about an axis transverse to said path;
drive means on said framework operatively connected to the excavator wheel for rotating it about said axis;
conveying means on said framework, said conveying means being located within the confines of the excavator wheel for receiving excavated material from the excavator wheel and for moving the material to one side of the machine;
said excavator wheel having a plurality of peripheral bucket members for engaging and lifting the material upward upon rotation of the wheel and for subsequently dropping the lifted material onto the conveyor means;
first crumbing blade means pivotally mounted to the framework at a location forwardly adjacent to said excavator wheel about axes parallel to the rotational axis of the excavator wheel;
first lift means operatively connected between the framework and said first crumbing blade means for moving said first crumbing blade means between a lowered operative position and a raised inoperative position;
second crumbing blade means pivotally mounted to the framework rearwardly adjacent to the excavator wheel about axes parallel to the rotational axis of the excavator wheel;
second lift means operatively connected between the framework and said second crumbing blade means for moving said second crumbing blade means between a lowered operative position and a raised inoperative position;



the lowered inoperative position of each of said crumbing blade means being directed angularly downward substantially tangential to the periphery of the excavator wheel;
the raised inoperative position of each of said crumbing blade means being substantially horizontal;
each crumbing blade means including an elongated crumbing shoe that, in the lower operative position, is located adjacent the horizontal plane tangential to the bottom portion of the excavator wheel and closely adjacent the peripheral surface thereof, and that, in the raised inoperative position, is elevationally raised a substantial distance above its operative position so as to provide clearance for the excavator wheel;
each of said lift means comprising spaced rigid links pivotally connected to both the framework and crumbing blade means about parallel axes, the effective lengths of the respective links differing from one another so as to impart an angular folding motion to said crumbing blade means as they are moved between their operative and inoperative positions.

4,106,227
SPREADING APPARATUS FOR SHEET FEEDER

William W. Allen, Plantation; Charles E. Sweeney, Margate; Alvin G. Lundquist, Jr., Ft. Lauderdale, and Raymond T. Hersh, Coral Springs, all of Fla., assignors to Jensen Corporation, Ft. Lauderdale, Fla.
Filed Oct. 3, 1977, Ser. No. 838,750
Int. Cl.^{2} D06F *67/04*
U.S. Cl. 38—143 **22 Claims**

1. In an apparatus having a conveyor for receiving laundry flat pieces, said apparatus including first, second and third pairs of clamps for releasably gripping respective laundry flat pieces at adjacent corners along a top edge thereof, the improvement which comprises:
means for normally positioning the first pair of clamps close to each other at a first loading station midway across the

apparatus for the insertion of said corners of a first laundry piece into said first pair of clamps by a first operator stationed there;

means for spreading said first pair of clamps apart laterally in opposite directions away from the centerline of the conveyor while said first pair of clamps continue to grip said first laundry piece;

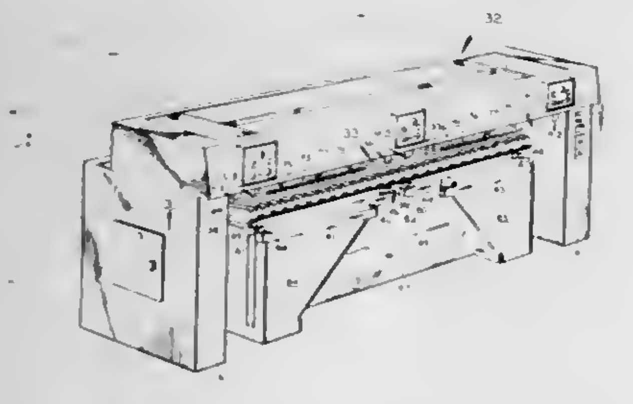
means for actuating said first pair of clamps to release said first laundry piece after said first pair of clamps have been spread apart;

means operable after the release of said first laundry piece for returning said first pair of clamps to their normal positions close to each other midway across the apparatus;

means for normally positioning said second pair of clamps close to each other at a second loading station near one end of the apparatus at one side of the centerline of the conveyor for the insertion of said corners of a second laundry flat piece into said second pair of clamps by an operator stationed there;

means for moving said second pair of clamps simultaneously from said second loading station laterally in one direction to positions close to each other midway across the apparatus while continuing to grip said adjacent corners of the second laundry flat piece;

means operable thereafter to spread said second pair of clamps apart laterally in opposite directions away from the centerline of the conveyor while said second pair of clamps continue to grip said adjacent corners of the second laundry flat piece, whereby to return one clamp of the second pair toward said second loading station while moving the other clamp of the second pair farther away from said second loading station;



means for actuating said second pair of clamps to release the second laundry flat piece after they have been spread apart;

means operable thereafter for returning said other clamp of the second pair to said second loading station close to said one clamp of the second pair;

means for normally positioning said third pair of clamps close to each other at a third loading station near the opposite end of the apparatus at the opposite side of the centerline of the conveyor for the insertion of said corners of the third laundry flat piece into said third pair of clamps by a third operator stationed there;

means for moving said third pair of clamps simultaneously from said third loading station laterally in the opposite direction to positions close to each other midway across the apparatus while continuing to grip said adjacent corners of the third laundry flat piece;

means operable thereafter to spread said third pair of clamps apart laterally in opposite directions away from the centerline of the conveyor while said third pair of clamps continue to grip said adjacent corners of the third laundry piece, whereby to return one clamp of said third pair toward said third loading station while moving the other clamp of said third pair farther away from said third loading station;

means for actuating said third pair of clamps to release said third laundry flat piece after they have been spread apart;

means operable thereafter for returning said other clamp of said third pair to said third loading station close to said one clamp of said third pair;

and means to prevent any one of said pairs of clamps from movement away from the corresponding loading station before a previously operated pair of clamps has released its laundry piece.

4,106,228

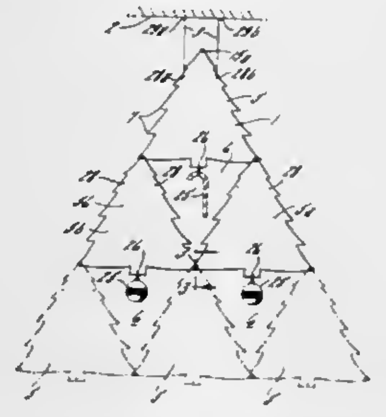
SUSPENSIBLE ORNAMENTAL DISPLAY

Jack Gibrich, 2953 Briarwood Dr. W., Arlington Heights, Ill. 60005

Filed Apr. 19, 1977, Ser. No. 788,802

Int. Cl.^{2} G09F *7/00*

U.S. Cl. 40—605 **6 Claims**



1. A suspensible ornamental display comprising:

a plurality of rigid, substantially flat members, each of said members having the same shape and being of the same size, said members being arrayed in accordance with a regular pattern to form an assemblage wherein adjacent members are in partially overlapping relationship and openings are defined by said adjacent members, said openings having a shape substantially similar to said members, said assemblage being capable of enlargement to an assemblage of similar shape by increasing the number of members arrayed in said assemblage, said assemblage has a shape substantially similar to the shape of said members, said members are generally triangular in shape, and said similarly shaped openings are inverted; means for fastening together the overlapping portions of the members in said assemblage to form a rigid display that can be suspended; an ornamental device is suspended in at least one of said openings, said ornamental device being suspended from one of the members which define said opening; and means for suspending said ornamental display attached to the periphery of one of said members.

4,106,229

VEHICLE SIGN HOLDER

Hans F. Schmid, Verona, N.J., assignor to Mar-Kal Products Corporation, Montclair, N.J.

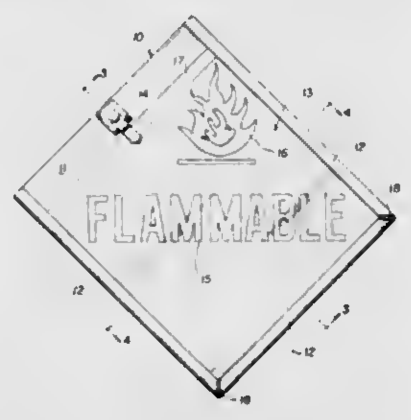
Filed Feb. 23, 1977, Ser. No. 771,263

Int. Cl.^{2} G09F *7/00*

U.S. Cl. 40—611 **1 Claim**

1. A holder for rectangular placards of the type having a central indicia bearing area and a continuous marginal border surrounding said area and being of a uniform width, said marginal border being of a single color which contrasts with the background color of the central indicia bearing area of the placard, said holder comprising a substantially flat plate body of a size and shape to substantially register with a placard placed thereon, and integral marginal flanges on the plate body extending substantially around three sides thereof, the placard and plate body being rectangular, the flanges being of equal

width with the placard marginal border and overlapping one face of the plate body and registering with said marginal border on three sides of the placard with the fourth side of the marginal border of the placard uncovered and exposed to view, and said flanges of the plate body having the color of the marginal border to create the optical illusion to a distant viewer that the complete marginal border of the placard is exposed and uncovered, and a clip means on the plate body engaging the placard to secure the same releasably in the holder.



4,106,230

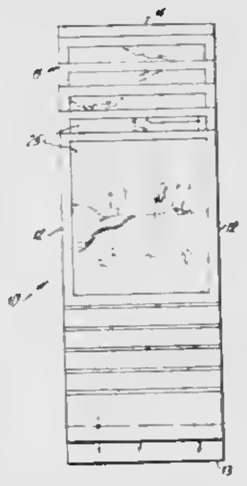
PHOTO ALBUM

Eugene E. Martinez, Woodbine Rd., Irvington-On-Hudson, N.Y. 10533, assignor to Robert H Reikel, Irvington-On-Hudson, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,503

Int. Cl.^{2} G09F *1/10*

U.S. Cl. 40—158 R **20 Claims**



1. An album comprising a backing member, a plurality of similar, parallel flexible elongated strips, said strips each having a first longitudinal section attached to a surface of said backing member by means of pressure sensitive adhesive coating on said first section of said strip, each strip having a second pressure sensitive adhesive coated section extending from the first adhesive coated section of said strip and swingable away from said backing member, and a plurality of elongated ribbons of sheet material, adjacent said strips, there being one ribbon associated with each strip, respectively, each strip extending to one side of said ribbon associated therewith, in a direction toward the upper end of the backing member, each ribbon having a first section adhered only to the second adhesive coated section of the strip associated with said ribbon, and a second section extending from the first section of said ribbon, beyond the strip to which it is adhered, said second section of each of said ribbons being uncoated with adhesive and providing a pull tab which may be grasped by the user to facilitate pulling the ribbon off the second adhesive coated section of said strip, to which it is adhered, the attachment of said ribbons to said strips being less resistant to detachment of said ribbons from the strips than to detachment of said strips from the backing member, whereby said ribbons can be pulled off said strips without pulling the strip off the backing member, and to uncover the adhesive coated second section of the strip associated therewith, so that a photographic snapshot can be attached to said uncovered coated second section of said strip, by pressing a portion of the snapshot against said uncovered adhesive coating of the second section of said strip, the second section of each ribbon overlapping the strip next adjacent to the strip associated with the ribbon but located on the other side of said ribbon in a direction toward the lower end of said backing member, but not extending therebeyond.

4,106,231

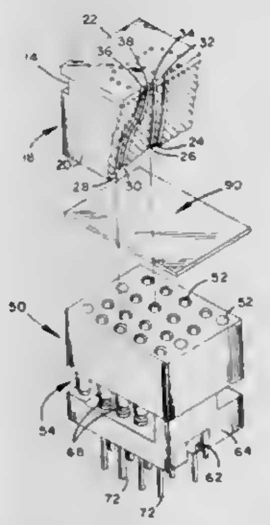
LOW LEVEL LIGHT INDICATOR

Douglas K. MacNiel, Costa Mesa, Calif., assignor to Master Specialties Company, Costa Mesa, Calif.

Filed Dec. 6, 1976, Ser. No. 747,613

Int. Cl.^{2} G09F *13/18*

U.S. Cl. 40—547 **11 Claims**



1. The improvement in a readout having a light source therein and means for conducting said light from said source to a display surface comprising:

a source of light comprising a plurality of incandescent lamps;

means for holding said source of light; means for connecting said incandescent bulbs to a power source;

a plurality of narrow elongated solid light pipes in proximate relationship to said light source that serve to receive light from said light source;

a relatively thin diffuser film between said source of light and said light pipes comprising a substrate of translucent material to permit the passage of light from said light source therethrough while at the same time modulating the light by diffusion;

a matrix cast around said light pipes for holding said light pipes; and,

a surface at which said light pipes terminate to provide a display in the form of the terminal portions of said light pipes at said surface.

4,106,232

TOY GLIDER

Daniel B. Higgins, 303 Cedar Crook Rd., Naperville, Ill. 60540

Filed Sep. 8, 1976, Ser. No. 721,522

Int. Cl.^{2} A63H *27/00*

U.S. Cl. 46—79 **5 Claims**

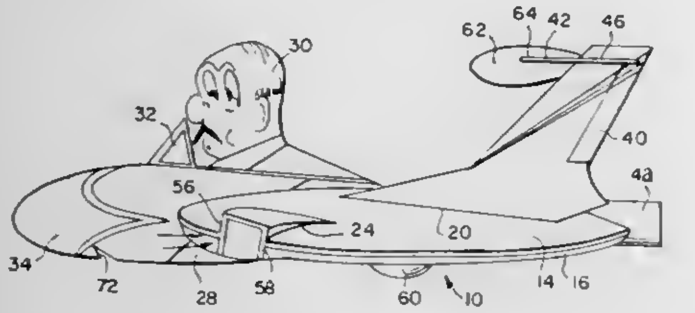
1. A kit for assembling a toy glider comprising:

at least one planar sheet of material having a pattern of parts from which said glider is to be assembled, said parts including

a pair of oval-shaped discs adapted to be superimposed one above the other and connected along complemental edges except at the front and at the rear center thereof,

means adapted to be inserted between said discs at the front thereof to form an air chamber between said discs,

means adapted to be inserted between said discs at the rear center thereof to receive air therethrough flowing from said chamber while said glider is in flight,



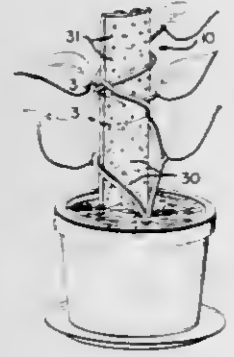
a fuselage adapted to be connected to the front edge of said superimposed discs, and

at least one tailpiece adapted to be connected to one of said discs.

4,106,233

IMITATION BARK BOARD FOR THE SUPPORT OF CLIMBING PLANTS

Alvin E. Horowitz, 2320 SW. 23rd Ave., Miami, Fla. 33145
Filed Aug. 1, 1977, Ser. No. 820,886
Int. Cl.² A01G *9/12*
U.S. Cl. 47—44 **1 Claim**

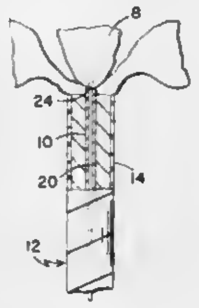


1. An imitation bark board member for the support of climbing ornamental plants and the like comprising, in combination, an integrally formed, elongated, substantially rectangular body portion, one side of said body portion having a three-dimensional surface texture simulating the texture of natural wood bark, and interlock means for removably interfittingly connecting a plurality of the imitation bark board members in end-to-end relation, said interlock means comprising a pair of prongs extending outwardly of one end of said body portion and a pair of sockets at the other end of said body portion, said prongs of one of the bark board members being receivable one each in the sockets of another bark board member, means for removably interconnecting a plurality of the bark board members along abutting longitudinal edge portions thereof, said longitudinal edge interconnecting means comprising a circular bead formed along one edge of said body portion and a recess of semi-circular cross-sectional configuration formed along the other longitudinal edge of said body portion, said body portion being of arcuate transverse cross-sectional shape and formed with a plurality of uniformly spaced, circular protuberances serving as anchoring means for the tendrils of climbing plants, said recess of semi-circular cross-sectional configuration being open to the other side of said substantially rectangular body portion to permit a pair of the bark board members to be interconnected back-to-back along their opposing longitudinal edge portions.

4,106,234

ARTIFICIAL STEM ASSEMBLY FOR A SHORT STEM CUT FLOWER

Joseph Sebato Gallo, 58 Peach St., Walpole, Mass. 02081
Filed Jul. 21, 1976, Ser. No. 707,317
Int. Cl.² A01G *5/00*
U.S. Cl. 47—55 **1 Claim**



1. An artificial stem for a natural short stem cut flower having, in combination,

a self supporting exterior tube which is straight throughout its length, and which has a diameter greater than the diameter of the stem of the flower;

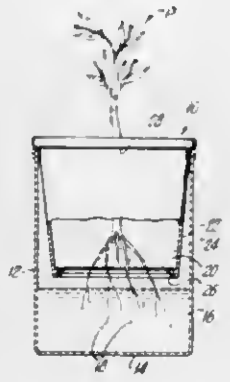
a loose wrapping of an absorbent wick material slideably received within said tube; and

a flocked wire contained within said wick material providing a central core for said artificial stem, said flocked wire extending out of the end of said tube at both ends, one end of said flocked wire being connected to a flower, passing completely through the short stem of the cut flower and into the base of the flower in a direction substantially along the axis of said stem, the lower end of said wire and the wrapping being bent sharply, upwardly over the lower rim of said tube to hold the flower, the flocked wire, and the wick in position relative to said tube.

4,106,235

HORTICULTURAL IMPROVEMENTS

Walton J. Smith, P.O. Box 461, Wilton, Conn. 06897
Continuation of Ser. No. 712,806, Aug. 9, 1976, abandoned, which is a continuation of Ser. No. 571,853, Apr. 25, 1975, abandoned, which is a continuation of Ser. No. 184,234, Sep. 27, 1971, abandoned, which is a cootinuation of Ser. No. 850,121, Aug. 11, 1969, abandoned. This application Sep. 22, 1977, Ser. No. 835,809
Int. Cl.² A01G *31/00*
U.S. Cl. 47—59 **2 Claims**

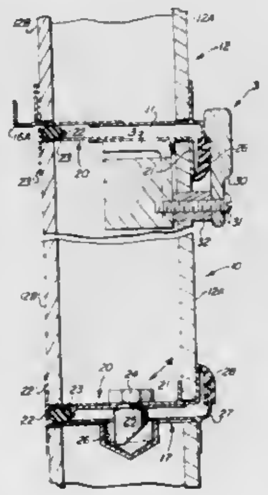


1. A portable planter for house plants comprising an upper plant holder means received in a lower vessel containing water for the plant such that the lower vessel is effectively closed to prevent loss of water vapor, the water level being below the bottom of the plant holder means, the bottom of said plant holder means including a support means comprising crossing reinforcing ribs supporting a removable aluminum window screen, said bottom being at least 34% open and holding fine particulate plant-supporting material at least directly on said screen and accomodating a substantial root system, said screen having openings at least 1/36 inch and smaller than about 150 inch in the largest dimensions.

4,106,236

FIRE DOOR FOR TRAILERS

Howard G. Oliphant, Sparks, Nev., assignor to H. W. Kochs, Jr.; R. M. Geer, both of Medina, Ohio and Lois Jean Cason, Reno, Nev.
Filed Mar. 30, 1977, Ser. No. 782,632
Int. Cl.² E05C *15/02*
U.S. Cl. 49—141 **2 Claims**



1. A fire door comprising a casing forming a door opening, said casing comprising side members, header and a sill, said sill being provided with an opening therein,

a fire door mounted within said door opening and having a frame extending around its periphery,

engagement means extending from the side of said frame juxtapositioned to said sill and within said opening forming a loose fit therewith,

said engagement means comprising a bolt means,

the end of said bolt means fitting into said opening being tapered for aiding in its movement out of said opening when the door is pushed away from its casing from a latch side thereof,

a rotatable latch means mounted on said door for detachably interlocking with said header in a given position and when rotated to another position releasing said fire door from said casing,

said side members, header and sill each being provided with a flange extending over the edge of said fire door on the latch-mounted side thereof,

a resilient finger mounted on the edge of said flanges for engaging the surface of said fire door on the latch-mounted side thereof, and

resilient means mounted on the edge of said frame adjacent said sill forming a pivot for said fire door,

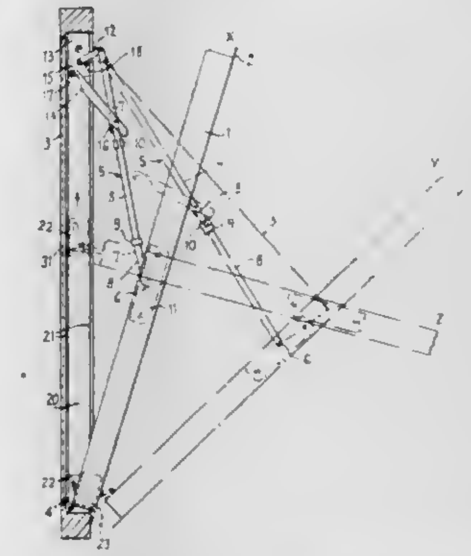
whereby a push on said fire door near said latch means will cause said fire door to rotate about an edge of said sill means causing said engagement means to move out of said opening and said fire door to drop away from said casing.

4,106,237

WINDOW ASSEMBLIES

Johannes Harald Bierlich, 15 Oresundshoj, Charlottenlund, Denmark
Filed Jan. 25, 1977, Ser. No. 762,292
Claims priority, application United Kingdom, Feb. 2, 1976, 4059/76
Int. Cl.² E05D *7/06*
U.S. Cl. 49—249 **6 Claims**

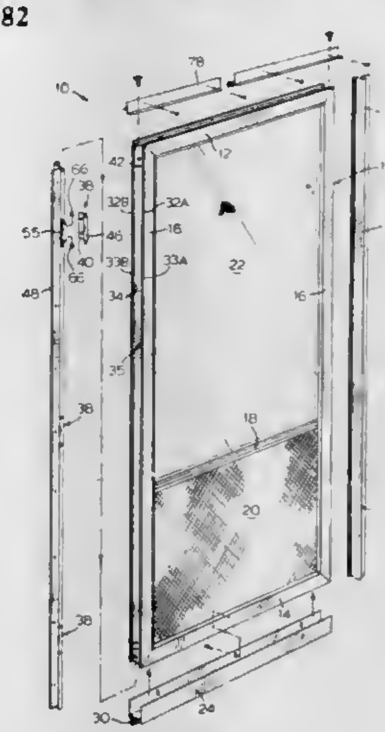
1. A window assembly comprising a substantially rectangular sash mounted in a window frame for opening by inward swinging movement about hinge means providing a horizontal axis which is adjacent the bottom of the sash, said hinge means being slidable in upright guides on the stiles of the window frame, and two extensible stays each respectively connected by pivot connections to the approximate midpoint of a side of the sash and to a point adjacent the top of the corresponding stile of the frame, said stays in their fully extended positions permitting the sash to be tilted about the said midpoint pivots with simultaneous sliding movement of the hinge means up and down the respective guides, the said hinge means comprising two first members slidable in the upright guides on the frame stiles respectively, two second members respectively fixed to the two sides of the sash and each having pivot means on said horizontal axis, a first lever interconnecting each said pivot means with its associated first member and a lever arrangement co-acting with said first lever for displacing said pivot means and said horizontal axis inwardly of the window frame upon initial opening of the sash and in the reverse direction upon closing the sash.



4,106,238

INTERCHANGEABLE STORM DOORS

Alfred Bonello, Islington, Canada, assignor to Indal Product Limited, Weston, Canada
Filed Oct. 26, 1976, Ser. No. 735,401
Int. Cl.² E05D *7/02*
U.S. Cl. 49—382 **9 Claims**



1. A door assembly including a door having a top, bottom and side rails along each longitudinal edge of the door, at least one hinge to be secured to the door, and means, secured to the

at least one hinge, to be secured to a door frame to mount the door, the side rails having channels running along a substantial length of the door opening at the top or bottom, of the door, the said channels being of a configuration to accommodate the at least one hinge, the at least one hinge having a hinge flange being adapted to be secured to, or removed from, the door only by sliding it from the top or bottom portion of the channel into position, and fastening means for securing the flange of the at least one hinge to the bottom of the channel upon being driven through said flange and the bottom of the channel into the door, when said flange is positioned in the channel.

4,106,239

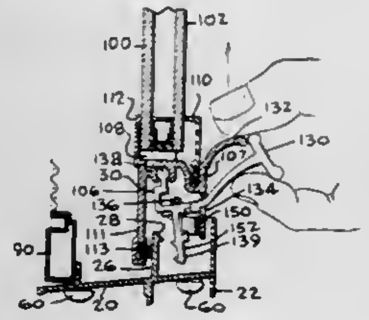
LOCKABLE WINDOW CONSTRUCTION

Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.

Filed Mar. 15, 1977, Ser. No. 777,603

Int. Cl.^{2} E05D *13/04*

U.S. Cl. 49—449 **33 Claims**



1. A lockable window comprising a supporting frame, a movable vent pane frame mounted for movement on said supporting frame between an open position and a closed position, movable latch means for locking said movable vent pane frame in said closed position, a movable hand operated latch actuator connected to said movable latch means for unitary movement therewith, latch support means on said movable vent pane frame supporting said movable latch means and latch actuator for both pivotable and linear movement on said movable vent pane frame so that the movable latch is pivotable to a locking position in which said latch means engages retaining means on said supporting frame to lock said movable vent pane frame in its closed position and is linearly movable into a holding position while in said locking position in which a portion of said latch actuator engages a portion of said movable vent pane frame to prevent pivotable movement of said latch actuator from said locking position.

4,106,240

APPARATUS FOR PRECISELY INDEXING THE ORIENTATION OF A PORTION OF A DEVICE WITH RESPECT TO A SUPPORT STRUCTURE OF THE DEVICE

Paul 1. De Bartolo, 21 Sylvan Pl., New Rochelle, N.Y. 10801

Filed Jan. 10, 1977, Ser. No. 758,165

Int. Cl.^{2} B24B *9/16*

U.S. Cl. 51—125 **11 Claims**

1. An apparatus for precisely indexing the orientation of a portion of a device with respect to a rigid support structure of the device,

comprising incombination,

a first reference lever;

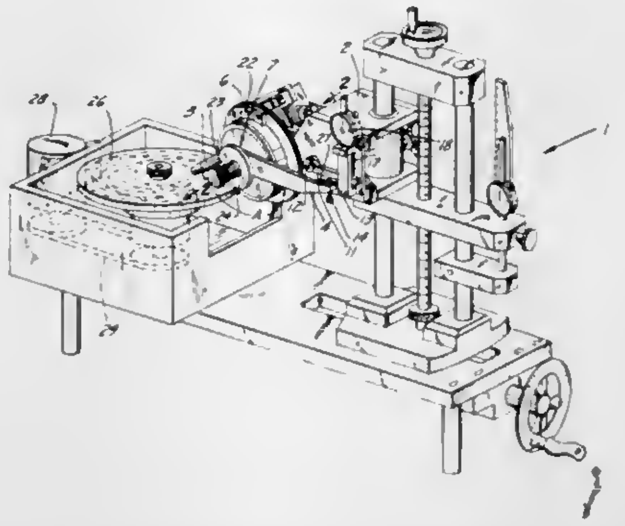
digital angle setting means operable to lock said reference lever and said portion together at any one of a predetermined number of angles relative to each other to form a rigid configuration;

said support structure including a first pivot means pivotably supporting said rigid configuration in substantially a first plane whereby said rigid configuration is constrained to rotate about said first pivot means;

a second reference lever;

second pivot means mounted on said rigid support in fixed special relation to said first pivot means, and pivotably supporting said second reference lever to constrain said second reference lever to rotate in a second plane substantially parallel to said first plane;

said first reference lever including a section projecting into said second plane and intersecting said second reference lever at a predetermined first place whereby rotational movement of said first reference lever is transmitted to said second reference lever, the non-pivotably secured end of the second reference lever extending beyond said first place;



relative position indicating means operably connected to said rigid structure is fixed spacial relation to both said pivot means and to a second place defined on the portion of the second reference lever extending beyond said first place, to indicate relative rotational motion of said second reference lever to said rigid structure.

4,106,241

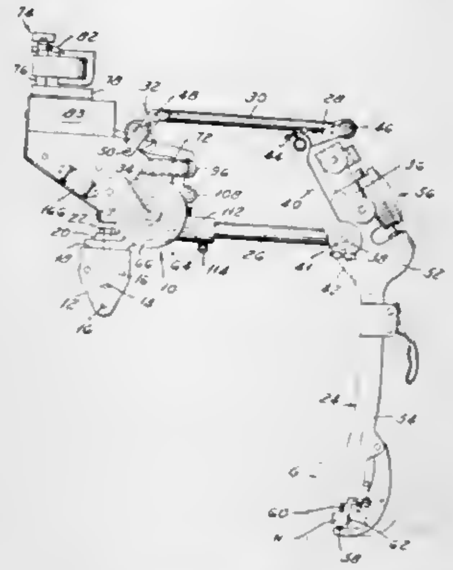
GRINDING GAUGE SUPPORT

James C. Fisk, G-3219 E. Bristol Rd., Burton, Mich. 48529

Filed Oct. 28, 1976, Ser. No. 736,515

Int. Cl.^{2} B24B *49/04*

U.S. Cl. 51—165.74 **27 Claims**



1. A gauge support for a machine tool which has a workpiece holding means and means engagable with the workpiece when so held for performing work thereon including, in combination:

an elongated arm pivotally connectable at one end thereof to a machine tool and supporting a workpiece measuring gauge adjacent to its opposite end for bodily movement toward and away from the workpiece;

a carriage mounted for reciprocal motion along a fixed track and carrying means abuttably engagable with a part of the elongated arm adjacent to its pivotally connectable end and operable upon carriage movement in one direction on its track to swing the arm about the pivotally connected end and cause bodily translational movement of the gauge toward the workpiece;

a cam track carried by the carriage having at least a portion of its length inclined to the fixed track;

a member pivotal about a stationary axis and having one end thereof riding on the cam track with the result that when said riding end travels that portion of the cam track inclined to the carriage track the member is rocked about its pivotal axis; and

means responding to said rocking motion of the pivotal member for imparting lateral motion to the gauge relative to the gauge supporting arm.

4,106,242

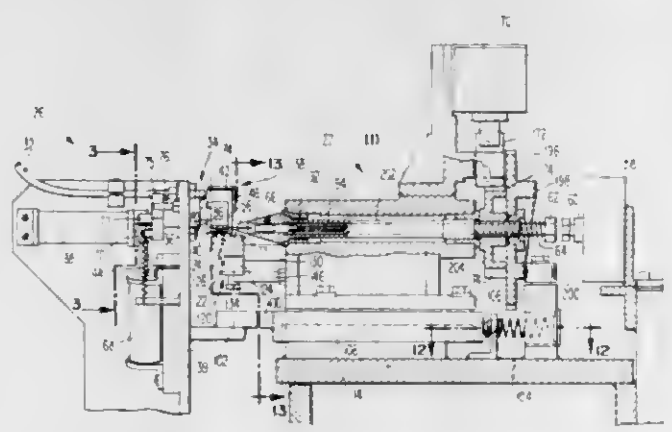
WORKHEAD FOR AN AUTOMATIC BUR GRINDING MACHINE

William McCandless, Toledo; Robert F. Leu, Delta, both of Ohio; Ernest A. Kroder, Felton, Pa., and Charles J. Tomecek, Curtice, Ohio, assignors to Dentsply Research & Development Corp., Milford, Del.

Division of Ser. No. 666,848, Mar. 15, 1976, Pat. No. 4,052,821. This application May 2, 1977, Ser. No. 793,204

Int. Cl.^{2} B24B *3/06*

U.S. Cl. 51—225 **6 Claims**



1. A work head for a bur grinding machine to support and index bur blanks to be ground by grinding units on said machine, said work head comprising in combination, a base member adapted to be slidably supported by a rotatable table, an elongated bearing member attached to said base member and having an elongated bearing bore extending longitudinally of said bearing member, a spindle rotatably supported within said elongated bore, a multi-jaw collet supported by said spindle and the jaws of said collet projecting beyond one end of said spindle to receive and support therein a bur blank to be ground by said machine, a cam rotatably mounted on the end of said bearing member opposite that from which the nose end of the collet projects and having a cam face operable for engagement with a cam follower on said bur grinding machine, whereby said cam will move said work head axially and correspondingly move a bur blank when mounted in said collet relative to a grinding head of a bur grinding machine, said cam having a gear connected thereto for rotation therewith, another gear mounted on said work head adjacent said rotatable cam and meshing with said gear on said cam to drive the same for rotation about the axis of said bearing member and adapted to be interengaged by a gear rack on a grinding machine when the work head is mounted therein for rotation of said gear and thereby rotate said collet and spindle while said cam moves said collet and spindle axially to produce helical flutes and teeth on a bur blank, an index wheel mounted on said bearing member adjacent said gear on said cam and coaxial therewith, said index wheel being fixed to said spindle and having a plurality of notches therein spaced evenly around the circumference thereof and corresponding in number to the flutes to be ground in a bur blank, and an indexing dog mounted on said gear on said cam and engageable with the notches in said index wheel to interconnect said gear on said cam and spindle to effect rotation of said spindle by said another gear when the same is rotated by said rack.

4,106,243

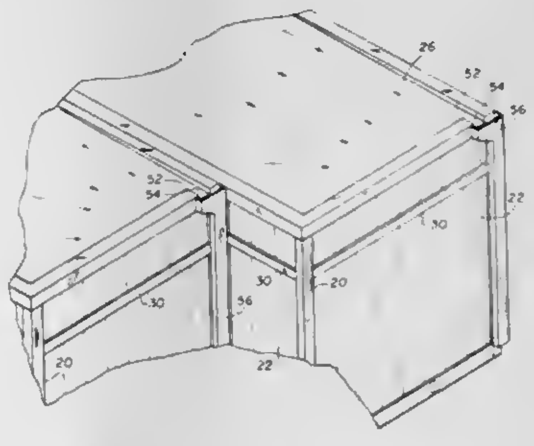
SLOPED ROOF CONSTRUCTION FOR MODULAR BUILDING STRUCTURES

John J. Horn, El Toro, Calif., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Jan. 25, 1977, Ser. No. 762,283

Int. Cl.^{2} E04H *1/00*

U.S. Cl. 52—16 **6 Claims**



1. In a mobile modular building structure having a length, width and height, with ends being defined by the shorter dimensioned sides which extend the width of the structure, and sides being defined by the longer dimensioned sides which extend the length of the structure, including a floor portion; upstanding wall members; a generally horizontal roof structure which is substantially rectangular in configuration; and a ceiling extending below said horizontal roof structure defining a space therebetween, the improvement comprising; parapets extending along the upper external edge of said generally horizontal roof structure so as to form a depressed planar upper roof surface therebetween, said planar roof surface being sloped downwardly from a high-sided end thereof towards the opposite low-sided end of said roof structure so as to thereby provide at least one drainage flow passageway extending toward said low-sided end of said roof structure, a drainage gutter being formed along the lower end edge of said sloped roof surface, said parapet including portions covering said gutter and at least one downspout communicating with said gutter for drainage of liquids collected on said upper roof surface, electrical power and utility supply conduits, air conditioning, heating equipment and the like being arranged in said space between the ceiling and roof proximate the low-sided end of said planar roof structure, and vents being provided in the modular building structure proximate the utility equipment in said space in the low-sided end to provide the modular building structure the flexibility of being placed end to end with a second, similar building structure with the high-sided ends adjoining, whereby the open ends are always the low-sided ends having the utilities and vents therein.

4,106,244

COOLING TOWER

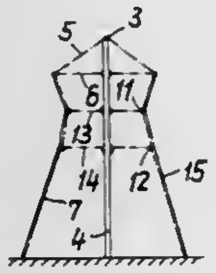
Erich Kessler, Krefeld; Georg Hassemer, Bickenbach, and Paul Weber, Goddelau, all of Fed. Rep. of Germany, assignors to Fried. KRUPP Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 16, 1972, Ser. No. 281,106

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1971, 2142491

Int. Cl.² E04H *5/12*

U.S. Cl. 52—63 **4 Claims**



1. A cooling tower having an exit opening and comprising in combination:
- (a) a foundation and a post mounted thereon,
- (b) a rigid upper spacer ring below the top of said post surrounding the exit opening,
- (c) cable means under tension on said post projecting downwardly and over the exit opening and having said rigid upper spacer ring suspended thereby,
- (d) one smaller spacer ring arranged below said upper spacer ring,
- (e) cables guided from fastening locations on said upper spacer ring to fastening locations on said lower spacer ring and to fastening locations on said foundation spaced outwardly from said post a greater distance than said lower spacer ring,
- (f) whereby the fastening locations on said lower spacer ring have a smaller distance from said post than the fastening locations on said upper spacer ring and than the fastening locations on said foundation,
- (g) radial cable-type connection means provided between said spacer rings and said post that are capable of being loaded only under tension exclusively and then are preloaded under tension only for resistance against wind forces,
- (h) a non-self-supporting mantle laced in at said lower spacer ring particularly to withstand wind forces as supported by said cables and extending downwardly from said upper spacer ring to leave an opening through said upper and lower rings.

4,106,245

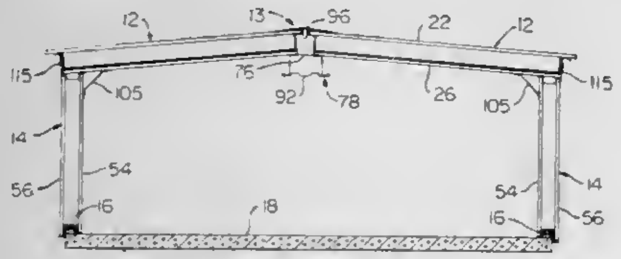
FRAMELESS METAL BUILDING

Colin F. Lowe, P.O. Box 128, Hutsonville, Ill. 62433

Filed Sep. 9, 1977, Ser. No. 831,781

Int. Cl.² E04B *7/02*

U.S. Cl. 52—90 **22 Claims**



1. A frameless metal building comprising a plurality of generally rectangular roof panels and wall panels, each of said roof and wall panels including parallel spaced longitudinally extending sheet metal spacer members rigidly connected by laterally extending sheet metal spacer members, each of said roof and wall panels including inner and outer sheet metal skins rigidly secured to the corresponding said spacer members, said wall panels being secured together in adjacent relation to form parallel spaced opposite side walls and said roof panels being secured together in adjacent relation to form a roof extending from said opposite side walls to a ridge extending parallel between said side walls, means including an inner ridge member extending along said ridge and rigidly connecting said spacer members and said inner skins of said roof panels on opposite sides of said ridge and being effective to transfer tension forces therebetween, means including an outer ridge member extending along said ridge and rigidly connecting said outer skins of said roof panels on opposite sides of said ridge and effective to transfer compressive forces therebetween, and means for rigidly connecting said spacer members and said skins of said roof panels to said spacer members and skins of said wall panels for transferring loads from said roof panels through said wall panels to a base supporting said wall panels and for utilizing said wall panels to resist bending of said roof panels.

4,106,246

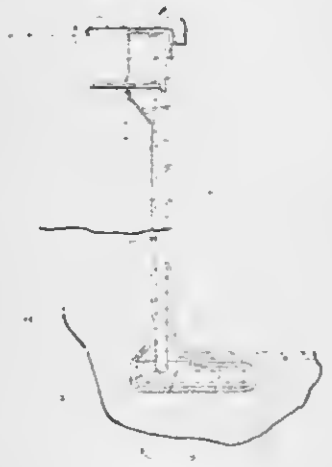
SWIMMING POOL CONSTRUCTION

Leonard Howard LaFountaine, Rte. No. 1 Box 348, Curtice, Ohio 43412

Filed Jul. 14, 1977, Ser. No. 815,695

Int. Cl.² E04H *3/16*

U.S. Cl. 52—169.7 **12 Claims**



1. A pool construction of the below ground level type and having a bottom wall and marginally connected, vertically upstanding linear side and end walls disposed to, in concert, define a polygonal, water-tight enclosure for the water in said pool, said side and end walls each having a lower edge defining a seam with said bottom wall and an upper edge, said side and end walls including:
- a center core formed of a plurality of planar members arranged in mutual edge-to-edge aligned abutment to form the linear extent of said walls and
- a layer of resin-impregnated fiber glass bonded to each planar opposed surface of said wall in a manner to completely encapsulate said linear array of core panels to provide a water proof barrier and means for sealing said seams.

4,106,247

LINTEL FOR SUPPORTING E.G. ARCHES OVER WALL OPENINGS, FACADE COVERINGS AND SIMILAR

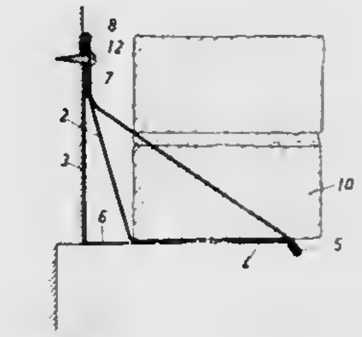
Lennart Svensson, Tallbacken2, Kungsbacka, Sweden (434 00)

Filed May 31, 1977, Ser. No. 802,188

Claims priority, application Sweden, Jun. 1, 1976, 7606131; Feb. 15, 1977, 7701629

Int. Cl.² E06B *1/04*

U.S. Cl. 52—204 **9 Claims**



1. A lintel for supporting the first course at the walling of e.g. arches over wall openings, brick facades and similar, said lintel having a substantially L-shaped cross section, wherein the lintel comprises a relatively thin plate profile or similar, the horizontal leg of which at its end is provided with a flanged portion or throating forming an attachment for at least some tension bands arranged in the butt joints between the bricks of the first course, said tension bands at their opposite ends being connected to the end part of the second leg of the lintel, said second leg making an angle with the horizontal leg and said tension bands being displaceable along the lintel for adjustment in a correct position between two bricks.

4,106,248

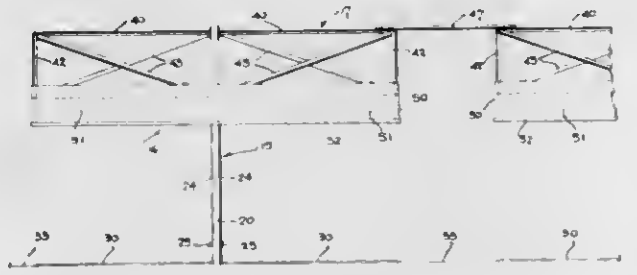
DEMOUNTABLE MODULAR DISPLAY SYSTEM FOR FURNITURE AND THE LIKE

Gerald A. Zapara, Santa Ana, Calif., assignor to National Storage Systems, Inc., Newport Beach, Calif.

Filed Feb. 7, 1977, Ser. No. 766,428

Int. Cl.² E04H *3/04;* **A47F** *10/00*

U.S. Cl. 52—234 **5 Claims**



1. In a walk-through display area incorporating an existing floor and a pre-determined area for viewing merchandise under a ceiling and in front of an upright background panel without any structural obstacles along the front and side boundaries of the walk-through display area, a modular construction system for carrying the background panels and the ceiling comprising:
- a plurality of vertical posts mountable on the floor and each having a lower portion below a ceiling reference point for carrying the background panels and an upper portion above the ceiling reference point;
- a separate truss member attachable to and cantilevered from the upper portion of each post over the walk-through display area and including a plurality of coplanar support beams extending forwardly to carry the ceiling under the truss member and overlying the walk-through display area; and
- single brace means connectable between adjacent truss members from the rear of one truss member to the front of another truss member to cover an enlarged display area by positioning the vertical posts and their corresponding truss members in side-by-side relationship.

4,106,249

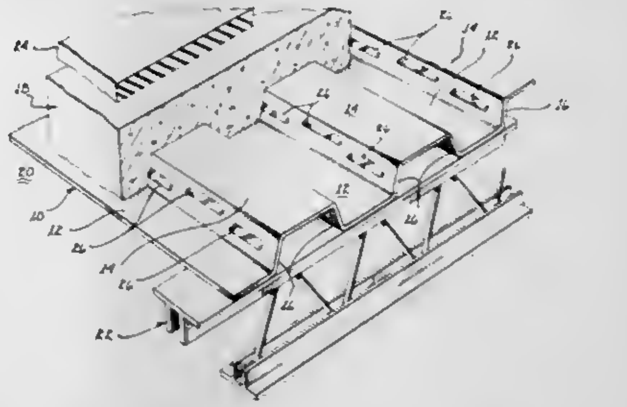
METHOD AND APPARATUS FOR INTERLOCKING AND VENTING A STRUCTURAL DIAPHRAGM

Virgil R. Morton, Redondo Beach, Calif., assignor to Verco Manufacturing, Inc., Phoenix, Ariz.

Filed Jun. 30, 1977, Ser. No. 811,607

Int. Cl.² E04B *1/16*

U.S. Cl. 52—336 **19 Claims**



1. A diaphragm for resisting horizontal shear loads imposed upon buildings, said diaphragm comprising:
- a. a fluted deck secured to the framework of a building, said fluted deck including impervious top and bottom flutes and webs alternately interconnecting said top and said bottom flutes;
- b. a moldable hardenable material deposited upon said fluted deck while said material is flowable;
- c. louvers disposed in at least some of said webs in a vertically non-overlapping relationship for venting the louvered ones of said webs to promote curing of said material and for interlocking said cured material with the louvered ones of said webs of said fluted deck, said louvers being downwardly oriented to minimize loss of said material while it is flowable;

whereby, the horizontal shear load resistance of said top and bottom flutes remains unimpaired by apertures therein and curing by ventilation of said material in said fluted deck to lock said material therein is encouraged by said louvers while loss of said material through said louvers is minimized.

4,106,250

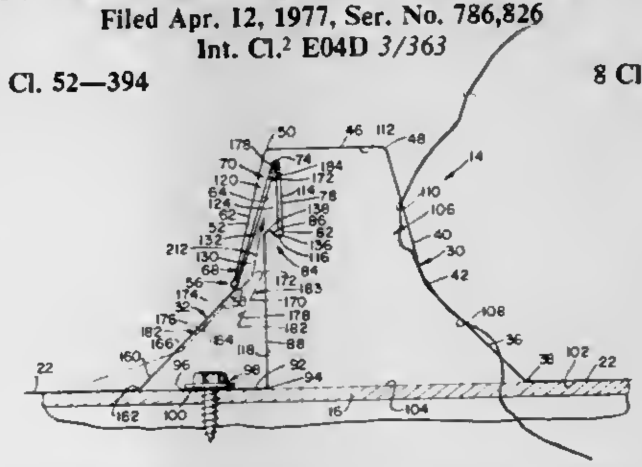
SELF-INTERLOCKING STANDING SEAM FOR A BUILDING PANEL

Gary Eugene Cummings, Cape Coral; Gary Lee Harvey, and Charles Wallace Dean, both of Fort Myers, all of Fla., assignors to Dean Steel Buildings, Inc., Fort Myers, Fla.

Filed Apr. 12, 1977, Ser. No. 786,826

Int. Cl.² E04D *3/363*

U.S. Cl. 52—394 **8 Claims**



1. A pair of elongate roof panel members comprising:
a male element on a longitudinal side edge of one member,

said male element including a "V" shaped extension member which opens toward a roof on which said one member is mounted and has one leg thereof being connected to the one member, and the other leg thereof having an edge defining portion thereon;

a female element on the other panel member including a first channel defining portion on one longitudinal side edge thereof defining a channel which opens toward a roof on which said other panel member is mounted, said other member further including a double wall skirt member having one wall thereof connected to said first channel defining portion so that said skirt extends outwardly of said first channel defining portion and toward the roof on which said other panel member is mounted, said skirt having an end portion with the other wall thereof connected to said one wall at said end portion, said other member further including a first planar segment and a second channel defining portion connected to said skirt member other wall, said skirt defining one wall of said first channel, said second channel defining portion having a planar bottom segment connected to said skirt member other wall and having a lip portion offsettingly connecting said bottom segment to said first planar segment with said bottom segment being off-set from said first planar segment toward a center of said other member to define a second channel, said skirt extending over said second channel so that said skirt covers said second channel and said lip;

said male element "V" shaped extension member being wedged between said skirt and said lip with said edge defining portion being located between said lip and said bottom planar segment and captured between said lip and said bottom planar segment when said male element extension member other leg is located in said second channel to lock the engageable members together; and

attaching means attaching one of said elements to a roof.

4,106,251

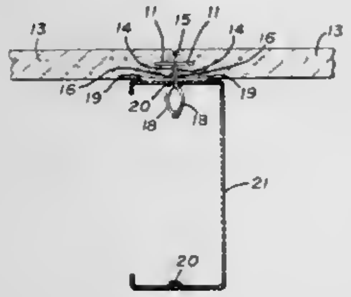
RELOCATABLE WALL MOUNTING SYSTEM

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 23, 1975, Ser. No. 580,454

Int. Cl.^{2} E04B *2/58, 2/76*

U.S. Cl. 52—765 **3 Claims**



1. A unique relocatable wall mounting which comprises in combination, (1) a first panel having attached thereto, (2) a first half-clip, (3) a second panel having attached thereto, (4) a second half-clip, said first and said second half-clips characterized by having, (5) first shoulder sections adapted to be driven into the respective ends of the first panel and second panel to secure them thereto, (6) base sections extending from the first shoulder sections along the ends of the panels to the outer corners of the panels, (7) second shoulder sections extending beyond the base section, said second shoulder section of said first half-clip extending along a back face of the first panel, and said second shoulder sections of said second half-clip extending along a corresponding back face of the second panel, (8) curved spring arms extending first arcuately from the base sections outward from the panels and then arcuately inward toward the base section with the curved sping arms opposing one another and acting in conjunction to form a full spring clip, and (9) a slotted support member for engaging the full spring clip formed by mounting the first panel with the first half-clip thereon end-to-end adjacent to the second panel with the second half-clip thereon and said full clip is inserted into a slot in the support member by compressing the opposing curved spring arms of the half-clips forcing them together to the point that they are essentially flat as they pass through the slot in the support member whereupon they opposingly spring back to their original arcuate shape thereby attaching the mounted panels to the slotted support member.

4,106,252

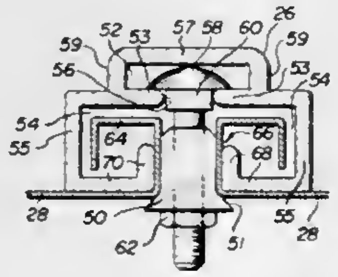
BUILDING STRUCTURE

Peter T. Rutten, Plainfield, Ill., assignor to Railoc Company, Inc., Plainfield, Ill.

Filed Jan. 27, 1977, Ser. No. 763,109

Int. Cl.^{2} E04D *3/00;* **E04B** *7/00*

U.S. Cl. 52—762 **3 Claims**



1. A joint construction for joining at least two adjacent panel members of a building roof construction or the like, to provide a substantially waterproof joint between said panels, which joint can be assembled from the interior of said construction, said joint construction comprising: at least two panel members having edges formed to reverse a bent configuration; a rigid rafter member receiving said reverse bent edges; and holding means for maintaining said edges in assembled relation with said rafters; said rafter member including a first elongate channel extending the length thereof for receiving said panel edges, said channel being defined by an intermediate wall section, a pair of spaced side walls, and L-shaped end wall sections extending from said side walls in facing relation, and having the free ends thereof spaced apart and disposed substantially parallel to each other to define an elongate opening through which said panel edge portions extend into said first channel, a second channel provided by an elongate, generally U-shaped wall portion formed integral with said intermediate wall to provide a fully enclosed second channel, and elongate passage means formed in said intermediate wall interconnecting said first channel and said second channel; said holding means comprising a plurality of bolt and nut assemblies, with each bolt including an enlarged head portion disposed in said channel, and a polygonal shaped portion engaged in said elongate passage means, and a threaded end to which said nut is engaged extending through said first channel and outwardly of said opening, and wedge member engaged over each said bolt and drawn interiorly of said first channel to force and maintain said reverse bent edge portion in engagement with the free ends of said L-shaped end wall sections said rafter member, said rafter being disposable exteriorly of said roof construction, with the integral nature of said U-shaped section providing a substantially waterproof joint with said nut and bolt assemblies and said wedge members housed within said rafter member.

4,106,253

TILING SYSTEM FOR ROOFS

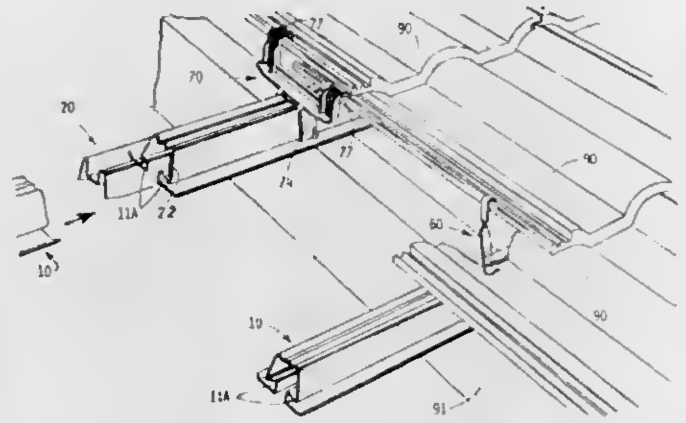
Raymond Joseph Aarons, Jindalee, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia

Filed Dec. 21, 1976, Ser. No. 753,109

Claims priority, application Australia, Dec. 24, 1975, PC4388

Int. Cl.^{2} E04D *1/34*

U.S. Cl. 52—547 **9 Claims**



1. A tiling system for roofs including a sheet metal tiling batten, a bracket attaching said batten to a roof-rafter, said batten being formed with a top, side-walls and a groove extending inwardly below each side-wall, said bracket carrying an upstanding lug shaped to fit within said batten between its top and said grooves and to extend downwardly between said grooves to below said batten and a tile clip engaging said batten and holding overlapping adjacent roof tiles against said batten, said tile clip comprising two spaced hooks extending upwardly and of different height engaging respective side edges of the overlapping adjacent roof tiles, and opposed lower hooks engaging in both grooves of said batten.

4,106,254

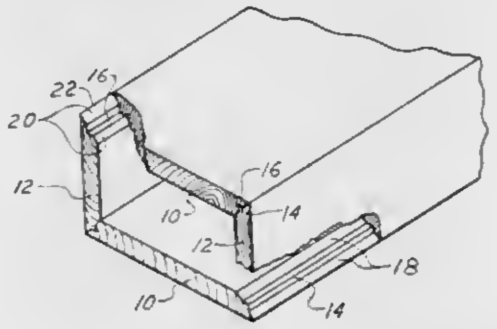
ASSEMBLY MITER JOINT

Clyde A. Jack, 131 Ford St., Youngsville, Pa. 16371, and Evander E. Dargan, P.O. Box 826, Florence, S.C. 29501

Filed Jan. 6, 1977, Ser. No. 757,371

Int. Cl.^{2} E04C *1/04*

U.S. Cl. 52—574 **3 Claims**



1. Wooden boards for intimately contacting lengthwise miter joint assembly in pluralities thereof for selectively forming angular, U, hollow box or beam, and flat cross-sectional assembly configurations thereof, comprising opposite side edges extending between the parallel flat sides of said boards, said side edges being suitably shaped to form miter joints, forming basically isosceles trapezoid cross-sections of said boards with the parallel flat sides thereof, having tongues and grooves thereat for mating contact in said joints for causing registered alignment thereof during said intimately contacting assembly thereof, and having one of said tongues in one said edge of each said board and one of said grooves in the other said edge thereof, each of said tongues and grooves being of effective V-shape, of symmetrical shape in cross-section at the mating portions thereof about the widthwise center of its respective miter surface, of effective included angle in cross-section at the mating portions thereof permitting said assembly and disassembly of any said board to and from two said boards each in said intimately contacting assembly therewith at said opposite side edges thereof by a single rectilinear board motion of said any said board perpendicular to the flat sides thereof, and of lengthwise extent along its respective said board.

4,106,255

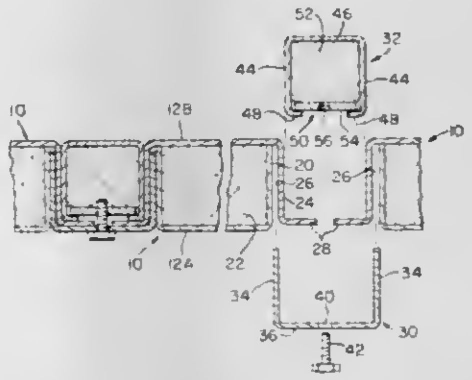
WALL PANEL ASSEMBLIES

Alan Eckel, Westford, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.

Filed Sep. 6, 1977, Ser. No. 830,385

Int. Cl.^{2} E04C *1/10*

U.S. Cl. 52—582 **17 Claims**



1. A modular wall assembly comprising in combination:

at least two panels each including a substantially flat body, a tongue at an edge of said body extending substantially parallel to and spaced from said body so as to form a channel therebetween, and a flange portion carried by said tongue and extending away from said channel, said panels being aligned and oriented so that said edges are in mutually confronting and spaced relationship;

a first connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, each of said side plates extending within a corresponding one of said channels and making a snug fit with the adjacent tongue and flat body;

a second connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, the side plates of said second connector extending between and making a snug fit with said tongues; and

means associated with said first and second connector members for securing said members together so as to clamp said flange portions therebetween.

4,106,256

ADJUSTABLE SHORING APPARATUS

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 1, 1976, Ser. No. 746,314

Int. Cl.^{2} E04H *12/18*

U.S. Cl. 52—646 **8 Claims**

1. Adjustable shoring apparatus which comprises

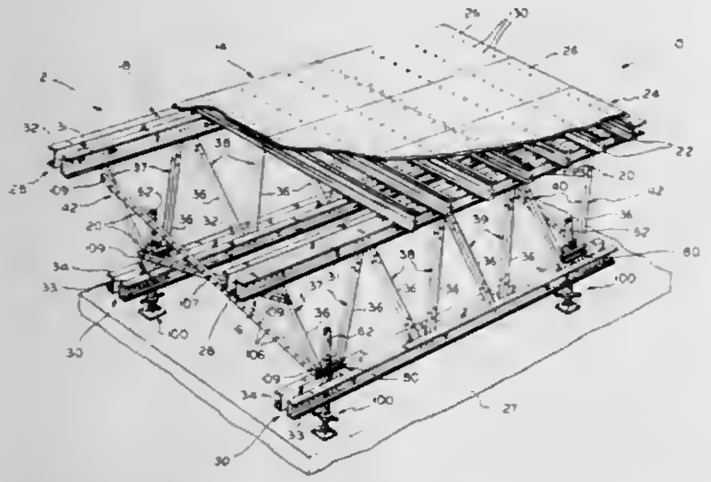
upper and lower pairs of spaced apart parallel chords having horizontally extending longitudinal axes, the chords in said lower pair being spaced beneath and vertically aligned with respective chords in said upper pair,

a plurality of struts extending obliquely from said upper chord pair to said lower chord pair and between the chords in each pair in a continuous longitudinal series of strut pairs of like substantially V-shaped configuration having their apices at said lower chord pair, the center lines of successive strut pairs being uniformly spaced apart,

means connecting the upper and lower ends of said struts respectively to the chords of said upper and lower pairs in a truss-like structure constructed essentially of said struts and said chords and adapted for supporting a load on the chords of said upper pair,

a plurality of vertically extending elongated legs each having a vertical series of support pin holes which extend transversely therethrough, said legs having upper portions inserted between the chords in said lower pair and lower portions extending below said structure to provide support therefor, and said legs being vertically reciprocally movable relative to said structure for adjusting the combined height thereof,

the strut pairs in said series each being adapted for inserting one of said legs between the struts of and at the apex of the strut pair, said legs being inserted between said struts in

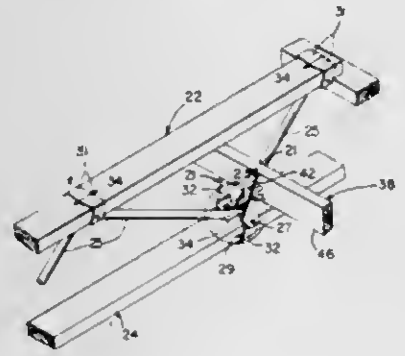


respective selected strut pairs and being insertable alternatively between the struts of other strut pairs and at other locations along the length of said structure for supporting the structure alternatively at said other locations,

and means for supporting said structure on said legs adjustably at varying elevations including means carried by the chords in said lower pair and defining support pin holes, said hole-defining means being adapted for disposing the pin holes thereof on opposite sides of each leg for registry with said leg pin holes successively in any of said locations of the leg, and a support pin removably insertable through a selected one of said pin holes in each leg and through the pin holes of said hole-defining means in registry therewith for transferring the load forces from said hole-defining means to said legs.

4,106,257
COMPOSITE TRUSS BEARING CLIP

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.
Filed Jun. 24, 1977, Ser. No. 809,529
Int. Cl.^{2} E04C *3/02*
U.S. Cl. 52—693 **5 Claims**



1. A bridging clip for connecting composite trusses to a wood lateral brace and preventing rotation of the bottom chord wherein said trusses include a wood bottom chord, metal webs formed with a pin opening therethrough, and metal pins connected to said chords and extending through said web pin openings, said pins extend transversely to said chords and extend beyond both edges of said chords, said wood lateral brace is located parallel to said pins, within the intersecting metal webs and extend at right angles to said trusses; said clip comprises:

a. first and second identical elongated metal members each formed with a pin opening therethrough at a first end adapted for receiving and connection to opposite ends of said metal pin therethrough for transmitting loads from said wood brace to said chords and metal webs of said truss and for resisting rotation of said bottom chord from moment forces imposed by said metal webs on said metal pin; and a surface adjacent said opening adapted for engaging opposite edges of said wood chord;

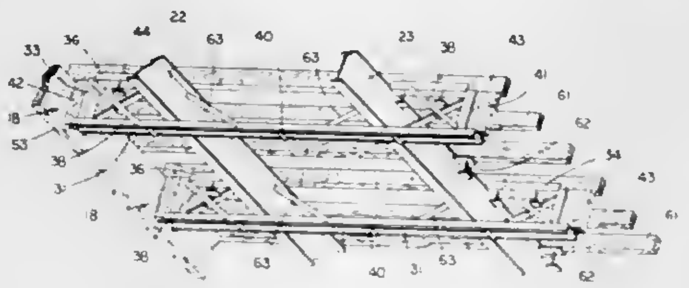
b. each of said elongated clip members includes a second end formed with a plurality of fastener openings adapted for receiving fasteners for connecting said clips to said wood bracing member, and each member has a surface adjacent said fastener openings adapted for engaging opposite sides of said wood brace;

c. seat means formed in each of said clips adapted for engaging the lower edge of said wood brace; and

d. each of said elongated clip members extends from an end of said pin at substantially right angles thereto and said second ends of said clips are connected to said wood bracing member substantially vertically above the side edges of said chord.

4,106,258
MOBILE BUILDING FLOOR JOIST ASSEMBLY

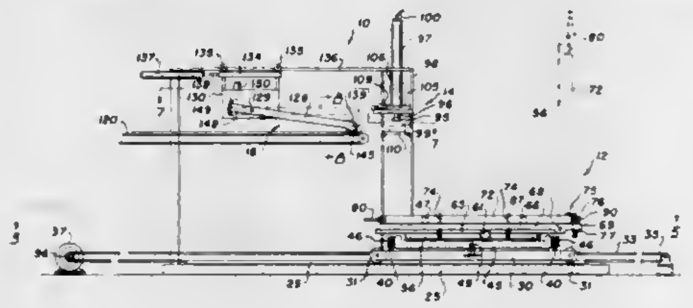
Fredrick H. Lindsay, Rte. 1 Box 71, Darwin, Minn. 55324
Filed Jul. 5, 1977, Ser. No. 813,003
Int. Cl.^{2} E04C *3/02*
U.S. Cl. 52—693 **2 Claims**



1. A composite wood and steel joist assembly comprising a horizontal steel channel member defining the lower margin of said joist assembly, upright steel channel members extending vertically from said horizontal member adjacent each of its ends, upper steel channel members extending a relatively short distance inwardly from each of said upright members, said upper members being axially aligned and parallel to said horizontal member, all of said steel channel members having their open side facing outwardly, a first unitary wooden member of rectangular cross-section nested within the bight of said horizontal channel member and extending beyond the ends thereof, a second unitary wooden member of rectangular cross-section spanning the upper channel members nested within the bight of said upper channel members and extending beyond the outer ends thereof, said first and second unitary members having slightly differing lengths to thereby laterally space their end margins and thus strengthen their juncture with adjacent structural members against vertical loading, and vertical wooden members nested within the bight of said upright channel members and disposed between the extending end portions of said first and second wooden members, whereby wood surfaces for accepting fasteners are presented outwardly around the complete perimeter of the joist assembly.

4,106,259
AUTOMATIC APPARATUS FOR LAYING BLOCK UNITS

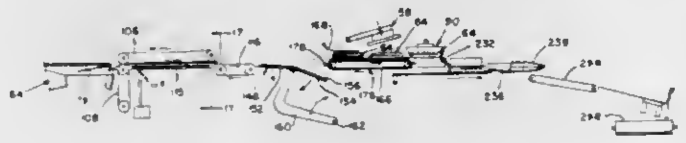
Ernest J. Taylor-Smitb, 2905 W. 37th Ave., Vancouver, B. C., Canada (V6N 2T8)
Filed Oct. 18, 1976, Ser. No. 733,155
Int. Cl.^{2} E04G *21/22*
U.S. Cl. 52—749 **26 Claims**



1. Apparatus for automatically laying block units to form a wall-like structure, comprising a table mounted for lateral movement and movement normal to said lateral movement and having a block unit receiving surface, means for moving block units in succession to a predetermined position near said table surface and respectively depositing said block units on the receiving surface at said position, means connected to the table to shift said table in said lateral movement a sufficient distance after each block unit is placed thereon to enable a course of block units to be formed on the table, and means connected to the table to shift said table in said normal movement a sufficient distance after each course of block units has been completed to enable a plurality of adjacent substantially parallel courses of said block units to be formed on the table.

4,106,260
ARTICLE FOLDING AND PACKAGING SYSTEM

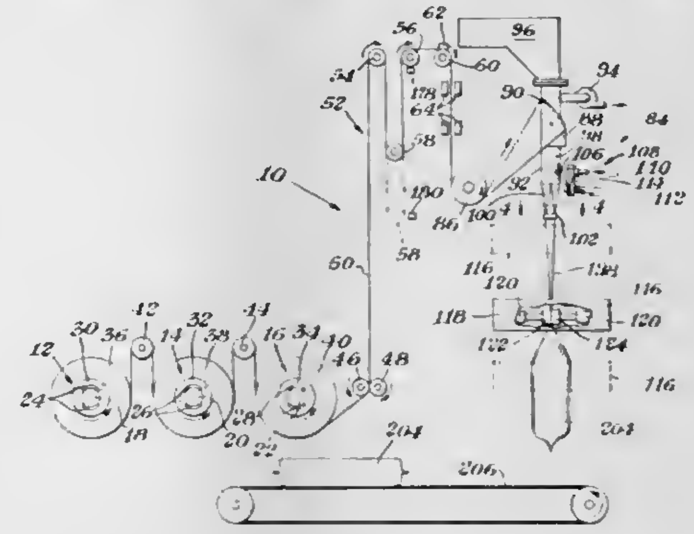
J. Fraok King, Winston-Salem, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.
Filed Sep. 29, 1976, Ser. No. 727,756
Int. Cl.^{2} B65B *63/04, 63/08;* **B65H** *45/18, 45/30*
U.S. Cl. 53—21 FW **12 Claims**



1. The method of folding an article about an insert as the article is advanced along a prescribed path comprising the steps of; initially positioning at rest a relatively flat flexible article having a first portion in generally parallel superposed spaced relation above an insert positioned at rest, and having a second portion depending below the insert, simultaneously initiating displacement of and advancing the article and insert at different rates generally along the prescribed path of travel while retaining the article first portion in superposed spaced relation above the insert to feed an edge of the insert into contact with the article second portion to initiate folding of the article transversely of the prescribed path of travel, feeding the insert and transversely folded article along the prescribed path of travel while folding the article longitudinally of said path of travel, and subsequently folding the article about the insert transversely of the prescribed path of travel.

4,106,261
METHOD OF FORMING, FILLING, AND SEALING SCRIM REINFORCED PLASTIC BAGS

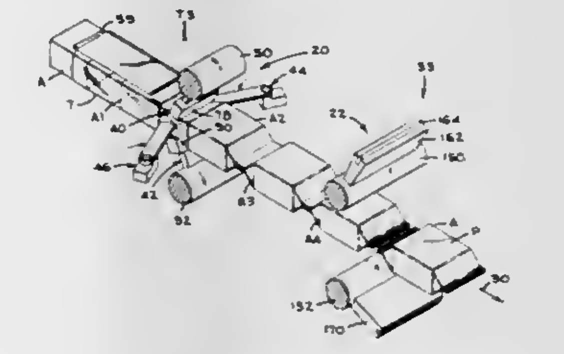
Eddie Lee Greenawalt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Aug. 8, 1977, Ser. No. 822,481
Int. Cl.^{2} B65B *9/12, 41/16*
U.S. Cl. 53—27 **5 Claims**



1. The method of preparing filled industrial size bags by the steps comprising: converting a scrim reinforced composite web into a tube having overlapped marginal edges, sealing the marginal edges together securing the scrim in the seal, thereafter periodically filling the tube with product and sealing the tube transversely about each successive product fill, securing the scrim also in the transverse seals, combined therewith, the further steps of preparing the composite web in line with the foregoing steps, and comprising the steps of unwinding a carrier ply comprising a plastic film from a wound up supply roll and training the carrier ply about the surface of revolution of a wound up roll of a continuous reinforcing scrim ply, drawing the carrier ply forward and causing it to travel about the surface of revolution of the scrim roll substantially without slippage, thereby tying the carrier ply by frictional surface contact to the scrim ply to provide substantially equal lengths of the scrim ply and the carrier plies in combined form, and applying a second plastic film to the opposite side of the scrim ply, said process being further characterized by the carrier ply comprising a ply of said filled industrial size bags.

4,106,262
WRAPPING MACHINE AND METHOD WITH FOUR SIDE ROTARY TUCKER

Joho S. Aterianus, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.
Division of Ser. No. 581,993, May 29, 1975. This application Feb. 17, 1976, Ser. No. 658,448
Int. Cl.^{2} B65B *9/10*
U.S. Cl. 53—28 **1 Claim**



1. In the method of packaging articles by continuously forming a strip of flat heat sealable material into a tube in which

equally longitudinally spaced articles are inserted and transported by the tube, the tube defining top, bottom and side walls whose unoccupied longitudinally spaced portions are deflected toward the central axis of the tube by tucking members; the improvement in said method comprising the steps of simultaneously creasing the side walls of the tube inwardly at unoccupied portions of the tube substantially at the midplane of the tube, said creasing step leaving the creased side walls of the tube spaced by a minimum spacing at a single transverse zone, substantially concurrently deflecting the top and bottom walls of the tube into engagement at said zone along a single, narrow transverse central area that is slightly shorter than the minimum spacing between the creased side walls of the tube, bonding said top and bottom walls together along said single, narrow transverse central area when said upper and lower walls are deflected into engagement, applying longitudinally moving, frictional web feeding forces before, during and after said creasing steps to transversely opposed sides of the web side walls and the articles therein both upstream and downstream of said single bonding area with said web feeding frictional forces moving at differential speeds, the tube shortening action of said creasing and bonding steps being resisted by said frictional web feeding forces for rendering the creased portions of said tube taut at both sides of said bonded area during the creasing step, said web feeding frictional forces downstream of said bonding area accommodating longitudinal movement of the downstream article toward the upstream article during said creasing step, feeding the creased and bonded area to a position downstream of the position at which the creasing and bonding steps were performed, and transversely bonding and severing the entire width of the tube through the creased and previously bonded area between articles that have been fed to said downstream position.

4,106,263

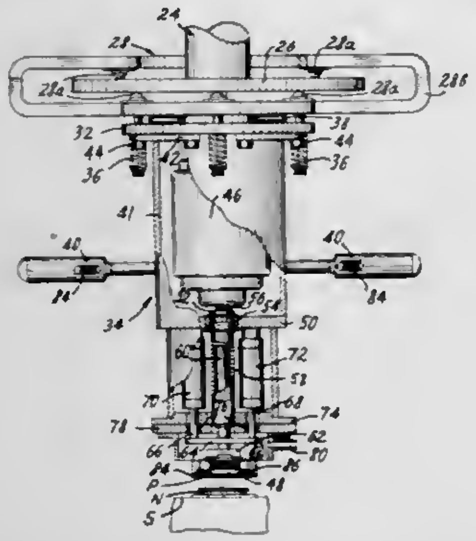
APPARATUS FOR PRESSURE TESTING OF CONTAINERS

William A. Conrad, Pinole, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,654

Int. Cl.² B65B *31/02;* G01M *3/32*

U.S. Cl. 53—97 **8 Claims**



1. In combination, in apparatus for use in testing leakage in a container having a surface including a pour opening: housing means for sealably engaging said container surface and for issuing pressurized air through said pour opening into said container; means for releasably retaining a closure member and supported for movement in said housing means; actuator means for translating such closure member retaining means toward said pour opening on preselected pressurization of said container and drive means responsive to predetermined pressure-induced force on said closure member in such translation thereof and energizable thereby for imparting further movement to said closure member retaining means to secure said closure member to said pour opening.

4,106,264

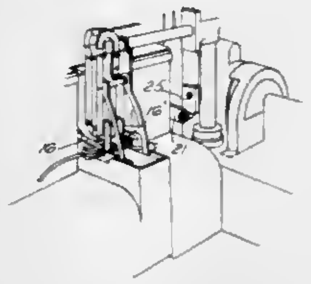
APPARATUS FOR COMPRESSING AND HOLDING A HANKED PACKAGE OF FLEXIBLE MATERIAL DURING FASTENING

Harris F. Hanscom, Barrington, R.I., assignor to H. F. Hanscom & Company, Inc., Providence, R.I.

Filed Oct. 22, 1976, Ser. No. 735,028

Int. Cl.² B65B *13/20*

U.S. Cl. 53—124 D **9 Claims**



1. In a packaging mechanism, means for compressing a package comprising an upright stand, a pair of package engaging means pivoted on said stand with arms on one side of the pivot to engage the package and a second arm extending from the other side of the pivot, a bell crank lever pivoted on said stand and at a location spaced from the pivot of said package engaging means and having legs extending from its pivot, resilient means extending from said second arm to one of the legs, the other leg of the bell crank lever being engageable to swing it and move said second arm and the package engaging means into engagement with the package, hook means to hold said lever in package engaging position, means to wrap the package while engaged, means actuatable to release said hook means from engaging position and means to return said bell crank lever to preswung position.

4,106,265

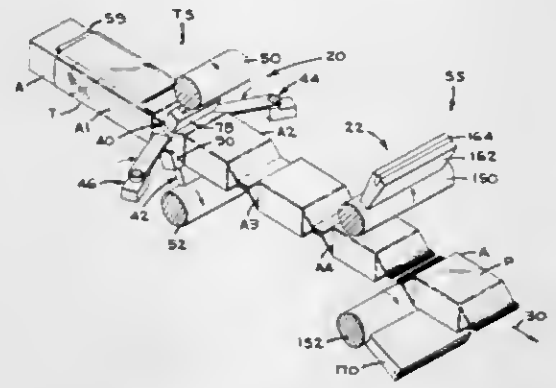
WRAPPING MACHINE AND METHOD WITH FOUR SIDE ROTARY TUCKER

John S. Aterianus, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed May 29, 1975, Ser. No. 581,993

Int. Cl.² B65B *9/10, 51/30*

U.S. Cl. 53—180 R **1 Claim**



1. In a wrapping machine wherein a series of longitudinally spaced articles are inserted in a moving tube of wrapping material formed from a flat strip of thermoplastic material, said tube having top and bottom walls and side walls and being laden with such longitudinally spaced articles, means for feeding the laden tube along a longitudinal path, means for tucking the side walls of the tube portions between articles toward the longitudinal axis of the tube, rotary vertically spaced shafts located above and below the path of the tube, top and bottom tube wall deflecting and bonding means mounted on said shafts, means for simultaneously rotating said shafts and tube deflecting and bonding means in opposite directions for simultaneously deflecting and bonding the top and bottom walls of the tube being fed therebetween at portions of the tube between articles, and means for transversely severing the tube at the bond; the improvement wherein said top and bottom tube wall deflecting and bonding means comprises upper and lower elongate, generally rectangular shoes respectively secured to said shafts, said shoes each having a single tube deflecting and bonding foot that cooperate at each bond, said feet each having convexly curved central tube bonding portions flanked by radially inwardly recessed portions at each side of the bonding portion to thereby cooperatively define end slots in the feet as the central tube bonding portions deflect the top and bottom walls of the tube, said slots being completely open and un-confined by said shoes at their ends and at their upstream and downstream edges, means for heating said feet to effect bonding of the deflected top and bottom walls of the tube by the central tube bonding foot portions along a single, relatively narrow transverse central area, said side wall tucking means comprising simultaneously rotatable shafts located adjacent opposite side walls of said tube, thin blade-like tucking shoes secured to and projecting from said shafts and rotating in a plane containing said slots, said tucking shoes having free end portions for simultaneously passing through their respective slots to tuck the tube side walls so that the innermost portion of each tuck is adjacent the ends of the associated central tube bonding portions of said feet substantially concurrently with the bonding operation, said tucking shoes being positioned so that a single end portion enters its respective slot during the deflection and bonding of the tube by the central portions of said feet, said tube feeding means comprising means for tensioning the unoccupied tube portions between articles for providing controlled deflection and tucking thereof, said tensioning means comprising longitudinally spaced pairs of laterally opposed belts making frictional contact with opposed walls of the tube, one pair of said belts being located upstream of said upper and lower tube wall deflecting and bonding means while the other pair is located downstream thereof, and means for driving said pairs of belts at different speeds for maintaining tension of said unoccupied tube portions between spaced articles and rendering said tube portions taut both upstream and downstream of the tucking and bonding means during the tucking and bonding operations at said tube portions, said downstream belts accommodating longitudinal movement of the downstream article toward the upstream article during said tube deflecting and tucking operations, said tucked side portions and said top and bottom wall portions of the tube being unconfined between the zone of said tucking shoes and bonding shoe portions and the ends of articles disposed directly upstream and downstream thereof during the aforesaid action of said tucking shoes and bonding shoe portions, said tube severing means being disposed downstream of said tube deflecting and bonding means and including means for bonding the tube walls entirely across the width of the tube.

4,106,266

ANIMAL HALTER

William T. Hibbert, Rte. 2, Box 44, Breckenridge, Tex. 76024

Filed Aug. 13, 1976, Ser. No. 714,140

Int. Cl.² B68B *1/02*

U.S. Cl. 54—24 **9 Claims**

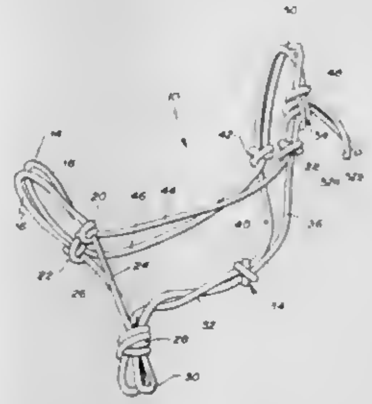
1. An animal halter, comprising:

a plurality of fixed length segments being formed from a single continuous length of line, said fixed length segments being formed and joined together by a plurality of non-slip knots;

an adjustable neck band segment being formed from said length of line and being joined together by an adjustable knot;

a lead loop being formed from said length of line for attaching a lead to the halter; and

said fixed length segments and said non-slip knots including a nose segment joined to a pair of frontal segments and a pair of cheek segments by two nose piece knots, said frontal segments extending to and being joined together by a lead knot, said lead knot being formed to include said lead loop, a chin segment extending from said lead knot to a chin knot to form said chin segment, a pair of throatlatch segments extending from said chin knot, each of said throatlatch segments extending to and being joined to one of said cheek segments at the end of said cheek segment distal from said nose segment, and said throatlatch segments being joined together by said adjustable neck band segment.



4,106,267

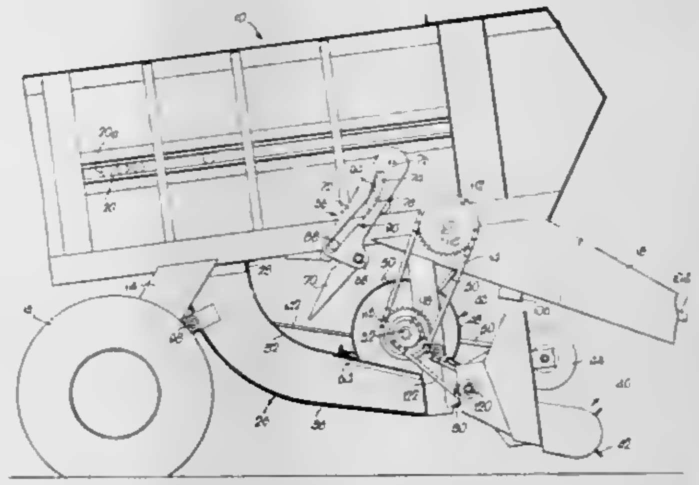
BALER LOADING METHOD AND APPARATUS

Allen Andrew White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 675,529, Apr. 9, 1976. This application Mar. 16, 1977, Ser. No. 778,246

Int. Cl.² A01D *91/00*

U.S. Cl. 56—1 **9 Claims**



1. In a baling method, the improvement of:

in alternating steps, stuffing successive charges of predetermind size and density into a baling chamber and compacting the same within said chamber;

temporarily interrupting at least said stuffing if the charge to be stuffed and compacted is less than said predetermined size and density;

resuming said alternate stuffing and compacting when the deficiency in the charge is eliminated,

said steps being carried out while the baling chamber is advancing; and

the additional step of continuously picking up material from the ground for charging the chamber as the latter advances.

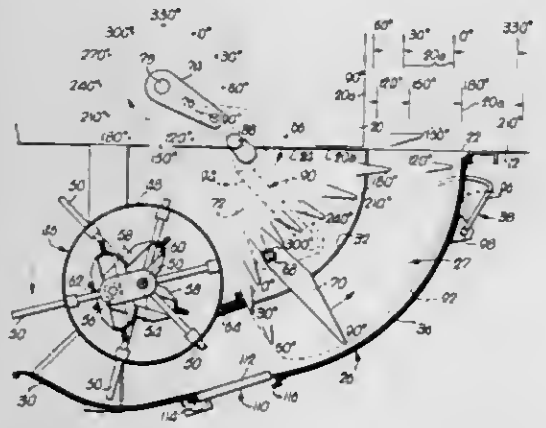
4,106,268
METHOD FOR LOADING AND BALING CROP MATERIAL

Allen A. White, Peabody; Cecil L. Case, Newton; Thomas W. Ankenman, Hesston, and George Yatcilla, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Nov. 1, 1976, Ser. No. 737,472

Int. Cl.² A01D *91/00*

U.S. Cl. 56—1 **5 Claims**



1. In a method of baling a volume of material supplied at an irregular rate, the steps of:

continuously reciprocating a compacting plunger in a baling chamber;

stuffing successive charges of the material into the chamber in timed relation to reciprocation of the plunger and at the rate of one stuffing stroke per each cycle of the plunger;

checking the size and density of the next charge before each stuffing stroke; and

if the next charge has not yet reached a predetermined size and density, skipping one or more stuffing strokes relative to the continuously moving plunger until the desired size and density have been achieved.

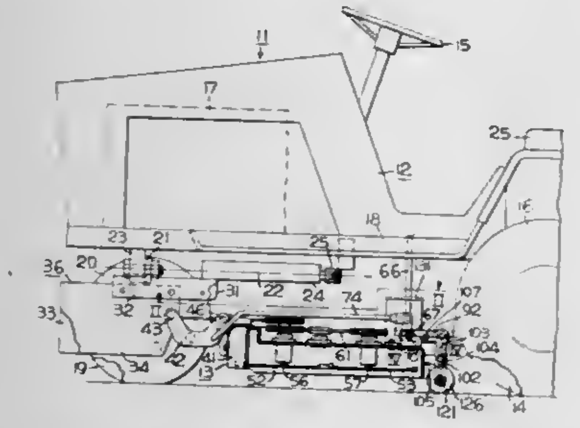
4,106,269
ADJUSTABLE GROUND ROLLER FOR MOWER

Henry T. Knudson, Grafton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1976, Ser. No. 755,464

Int. Cl.² A01D *55/32*

U.S. Cl. 56—15.8 **5 Claims**



1. In combination with a mower including a housing for blade means, a side-to-side leveling mechanism comprising

a rock shaft mounted on said housing for pivotal movement about an axis extending transverse to the direction of movement of said housing during a mowing operation,

a manual control level connected to said rock shaft,

transversely spaced ground rollers adjacent one of the fore and aft sides of said housing,

a pair of arms secured to transversely spaced points of said rock shaft for swinging movement therewith and connected to said rollers, one of said arms having first and second angularly adjustable parts in side-by-side relation to one another, said first part being rigidly secured to said rock shaft, and

fastening means releasably securing said parts together, said parts being angularly adjustable relative to one another upon loosening of said fastening means.

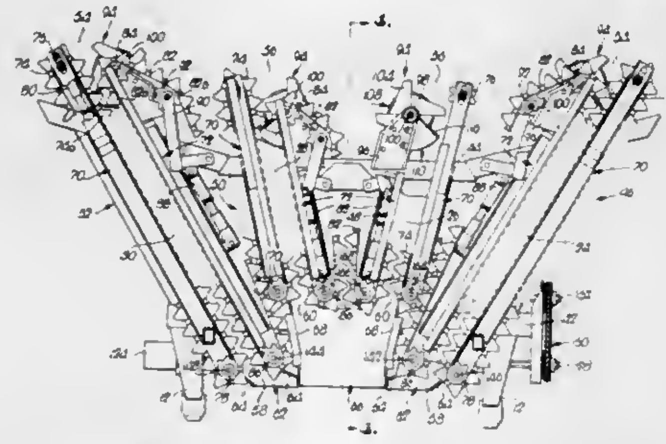
4,106,270
FOUR ROW FORAGE HARVESTER

Rex Olen Weigand, Newton; Kenneth Ray McMillen, Canton; Ronald Dean Fulk, Hesston; Daniel Ray Prichard, and Jack Merriel Kountz, both of Wichita, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 20, 1976, Ser. No. 678,674

Int. Cl.² A01D *45/02*

U.S. Cl. 56—98 **17 Claims**



1. In a forage harvesting header having a lower front end and an upper rear end with respect to the normal direction of travel of the header:

structure defining a crop discharge zone at said upper rear end of the header;

a pair of elongated, outer, crop-gathering units diverging downwardly and forwardly from said structure for conveying stalks of severed crop material upwardly and rearwardly to said zone from the front end of the header;

at least one middle crop-gathering unit between said outer units and extending downwardly and forwardly from said structure,

said units each having generally fore-and-aft extending, laterally separated, cooperating conveying elements at one level and defining a crop-conveying passage therebetween that follows the longitudinal axis of its unit,

each passage having a standing crop inlet adjacent said front end of the header and a severed crop outlet adjacent said rear end of the header;

crop cutter means located adjacent said inlets of the passages for severing standing crops entering the same during advancement of the header,

said passage of the middle unit having its outlet to said zone spaced forwardly from the outlets of the passages of said outer units, and said elements of the outer units being disposed above and at least partially overlapping elements of said middle unit adjacent said outlet of the middle unit; and

means associated with said units for leaning back the severed stalks of all units as they approach said zone and for leaning inwardly toward one another the severed stalks of said outer units as they approach said zone whereby to assist in the clog-free conveyance of the severed stalks in a butt-first attitude through said zone.

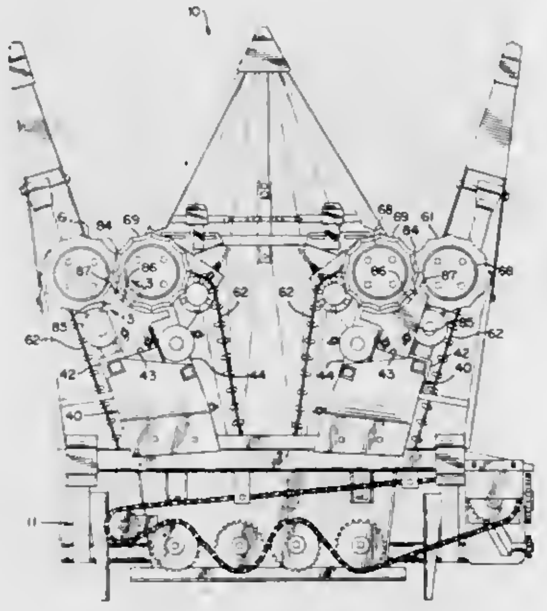
4,106,271
ROTARY KNIFE STRIPPER

Thomas A. Carey, Plainfield, and George W. Ridge, La Grange, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 6, 1977, Ser. No. 785,131

Int. Cl.² A01D *45/00*

U.S. Cl. 56—119 **5 Claims**



1. In a row crop harvesting header, said header comprising a frame structure defining at least one crop gathering passage opening forwardly along the line of travel of said header, crop cutting means and crop conveying means for severing a crop stalk from the ground and moving it rearwardly in said passage to the rearward portion of said header, said crop cutting means including upper and lower rotary cutting disks mounted respectively on each side of said passage, a portion of said upper disk overlapping a portion of said lower disk to define a crop cutting nip, the improvement comprising a stripper plate mounted on said frame structure rearwardly of said cutting nip, said stripping plate having an arcuate stripping edge closely adjacent to but spaced from the periphery of said lower disk and extending from a forward portion underlapping said upper disk to a point outside of said crop passage.

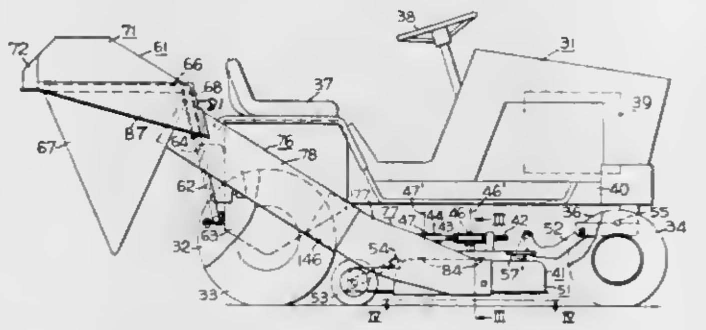
4,106,272
GRASS COLLECTING MULTIPLE BLADE MOWER WITHOUT AUXILIARY BLOWER MEANS

James F. Peterson, Cedarburg; Edward Freier, Jr., Port Washington, and Gerald C. Burmesch, Belgium, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 6, 1976, Ser. No. 747,694

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **9 Claims**



1. In combination with a tractor, having traction wheels for moving the tractor in a forward direction,

a downwardly opening, mower housing suspended from said tractor having top, front and rear walls, a sidewall at one lateral side thereof and a lateral discharge opening in the other lateral side thereof,

a pair of horizontally disposed blades rotatably mounted on said housing for rotation about laterally spaced vertical axes, said axis disposed closest to said discharge opening being spaced rearward of the other axis, said blades having lift portions to generate air movement,

a grass catcher supported on the rear of said tractor including vent means permitting a high volume flow of air therefrom, and

conduit means interconnecting said discharge opening and said grass catcher including walls defining an elbow part having a laterally facing intake opening at its front end in generally aligned relation to said discharge opening of said housing, the major dimension of said intake opening being in a longitudinal, horizontal direction and the minor dimension of said intake opening being in a generally vertical direction,

said wall defining said elbow part sloping upwardly, laterally outwardly and rearwardly immediately from said intake opening to present a rearward facing opening, said elbow part having an elliptical cross-section from a portion thereof relatively near its intake opening through a predetermined number of degrees constituting a major portion of its curvature and wherein the major axis of said elliptical cross-section slopes upwardly in a radially outward direction at a gradually increasing pitch from a cross-section near said intake opening to a cross-section at said predetermined number of degrees therefrom.

4,106,273
MOWER

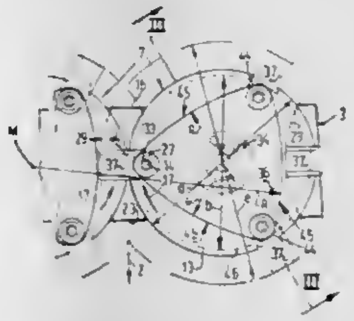
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Mar. 3, 1977, Ser. No. 774,052

Claims priority, application Japan, Mar. 17, 1976, 51-02802

Int. Cl.² A01D *55/18*

U.S. Cl. 56—295 **3 Claims**



1. A mower comprising a housing extending transversely of the direction of movement of the mower, a plurality of cutting members rotatably journalled on said housing and a driving gear assembly accommodated within said housing and adapted to drive the cutting members, each cutting member comprising at least one lower ring sweeping over the housing, an upper ring arranged above the lower ring, and three pins extending between said upper and lower rings and circumferentially spaced thereabout, and three cutters fastened each to a pin between the upper ring and the lower ring, the cutters of neighbouring cutting members being relatively off-set in the circumferential direction, whilst at the area of the path of each cutter of a neighbouring cutting member the lower ring of each cutting member is not covered, characterized in that the upper ring has essentially the shape of a triangle having rounded-off corners, in which the cutters are secured.

4,106,274

YARN TEXTURING MACHINE

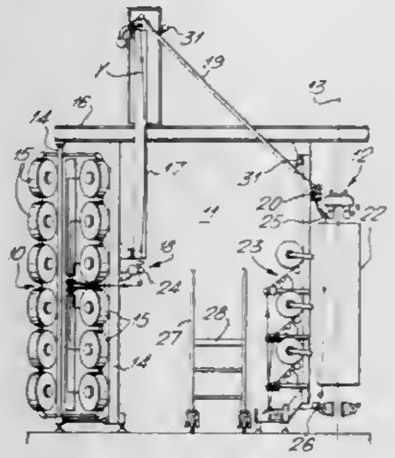
Ronald Spencer Eaves, Chapel-en-le-Frith, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Mar. 21, 1977, Ser. No. 779,938

Claims priority, application United Kingdom, Mar. 23, 1976, 11595/76

Int. Cl.² D01H *13/28;* D02G *1/02*

U.S. Cl. 57—34 HS **3 Claims**



1. In a yarn texturing machine, a combination comprising a creel section comprising at least one upright row of yarn supply packages, said row having an upper and a lower end; a texturing section comprising package winders and at least one false twister, said false twister being located not higher than said upper end and said texturing section being on the same level as and transversely spaced from said creel section and defining therewith an operator aisle; at least one upright setting heater mounted adjacent to said creel section and having an outlet upwardly spaced from said upper end and an inlet located substantially midway between said upper and lower ends so that yarn from the supply packages above said inlet runs down to the same and yarn from the supply packages below said inlet runs up to the same; and at least one elongated yarn stabilizing and cooling guide spanning said aisle and extending from the vicinity of said outlet downwardly to said false twister, whereby the overall height of said machine is less than the combined heights of said row and said heater and the yarn is positively guided over substantially the entire distance from said inlet to said false twister.

4,106,275

PROCESS AND DEVICE FOR HIGH SPEED THREADING OF YARN INTO A FALSE-TWISTING SPINDLE

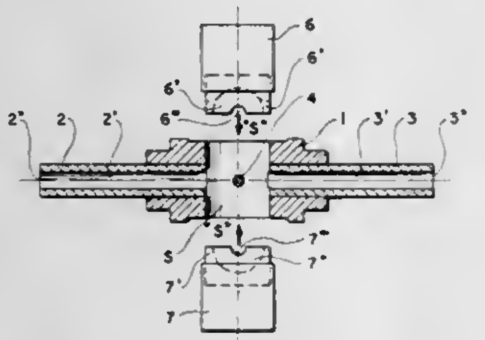
Josef Fitzner, Erlenbach, and Lothar Löw, Elsenfeld, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jul. 18, 1977, Ser. No. 816,565

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634492

Int. Cl.² D01H *13/04;* D02G *1/04*

U.S. Cl. 57—77.33 **2 Claims**



2. A thread in device for a false-twist spindle having a rotor body and an upstream pipe and downstream pipe, a twisting pin aligned in the rotor body with the upstream and downstream pipe, a cylindrical threading aperture through the rotor and in perpendicular alignment with the threading pin, the upstream and downstream pipes forming yarn guiding ducts to the twisting pin, comprising first and second pistons (6 and 7), each piston having a lug section with its outer surface matching the cylindrical threading aperture, the first piston (6) having a clearance groove (6''') for the twisting pin and parallel grooves (6'') in the end face of the lug section, the second piston having a matching clearance groove (7''') for the twisting pin and a connecting groove (7'') in the end face of the lug section, said first and second pistons forming, when joined together in the threading aperture, a closed helical yarn path around the twisting pin connecting the upstream and downstream yarn guiding ducts.

4,106,276

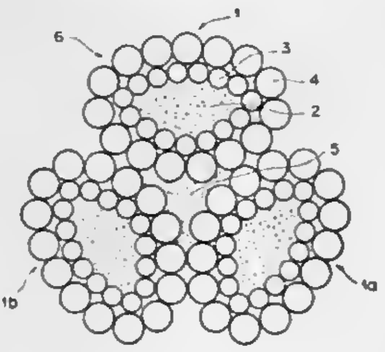
NON-ROTATING ROPE

Kiyoshi Hosoya, Tokyo, Japan, assignor to Tokyo Rope Mfg. Co. Ltd., Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,337

Int. Cl.² D07B *1/08*

U.S. Cl. 57—147 **4 Claims**



1. A clam-shaped-strand non-rotating rope in which three strands, each composed of plural layers of wires stranded in the same direction around a core made of flexible material, are arranged in a single layer around the periphery of a core made of the same material as that of said core and closed in a direction opposite to the direction of lay of said strands, which have clam-shaped sections in the planes normal to the rope axis and principal axes on the equiangularly spaced radial lines, and which are so disposed equidistantly from the rope center as to be in contact with one another at each side thereof with the apex and base of each clam directed inwards and outwards respectively thereby reducing the pitch radius R_s of each strand and making the rotational moment M_w of the wires of each strand approximate the rotational moment M_s of the strand, said rope further defined by having a relatively small pitch radius and individual strands making up the rope have relatively small pitch radii.

4,106,277

WRISTWATCH SETTING SYSTEM

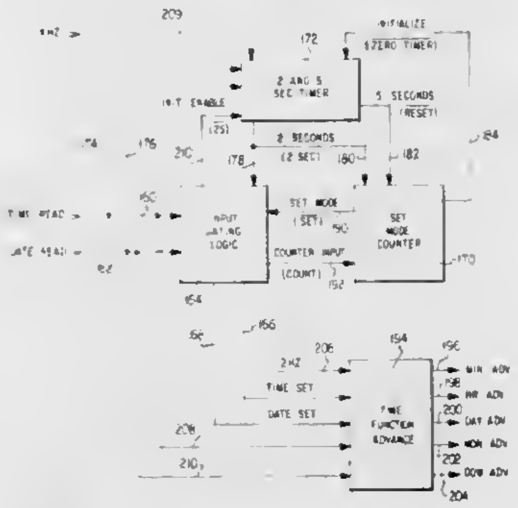
Donald W. Garrison, Lancaster, and James T. Hartman, Reading, both of Pa., assignors to Time Computer, Inc., Lancaster, Pa.

Filed Feb. 23, 1977, Ser. No. 771,096

Int. Cl.² G04B *19/24, 27/00;* G04C *19/00*

U.S. Cl. 58—4 A **20 Claims**

1. A solid state wristwatch comprising a source of substantially constant frequency electrical signals, a divider coupled to said source for reducing the frequency of the electrical signals, a display actuator coupled to said divider for producing both time and date electrical signals, an active digital display coupled to said actuator, a manually operated time demand switch in said watch for coupling time information from said actuator to said display, a manually operated date demand switch in said watch for coupling date information from said actuator to said display, a source of setting signals in said watch, and means responsive to multiple actuations of at least one of said switches within a predetermined time period for coupling said source of setting signals to said display.



4,106,278

ELECTRONIC TIMEPIECE UTILIZING SEMICONDUCTOR-INSULATING SUBSTRATE INTEGRATED CIRCUITRY

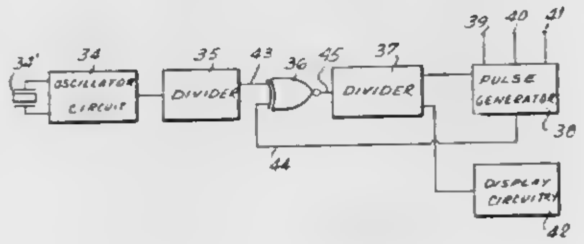
Hirofumi Yasuda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 642,047

Claims priority, application Japan, Dec. 18, 1974, 49-146043

Int. Cl.² G04C *3/00;* H01L *27/02*

U.S. Cl. 58—23 A **18 Claims**



1. An electronic timepiece comprising oscillator means including a quartz crystal vibrator high frequency time standard having a resonant frequency of vibration of at least 500 KHz and an inverter stage coupled to said high frequency time standard, said oscillator means producing a high frequency time standard signal, divider means including a plurality of series-connected divider stages for producing a low frequency timekeeping signal in response to said high frequency time standard signal, and display means for displaying time in response to said timekeeping signal, a plurality of divider stages forming said divider means defining a high frequency divider portion, each of said plurality of divider stages being formed of at least one complementary coupled pair of P-channel and N-channel conductive field-effect transistors having a semiconductor-insulating substrate construction, said high frequency time standard signal being coupled to respectively commonly coupled drain and gate terminals of a P-channel and N-channel pair of transistors defining the inverter stage, and a feedback resistor means coupled in parallel with said quartz crystal vibrator, said oscillator means including capacitance means coupled between said commonly coupled gate and drain terminals of said P-channel and N-channel transistor pairs, and a reference potential, said inverter stage including source resistance means coupled intermediate the source electrode of each P-channel and N-channel transistor and a reference potential.

4,106,279

WRIST WATCH INCORPORATING A THERMOELECTRIC GENERATOR

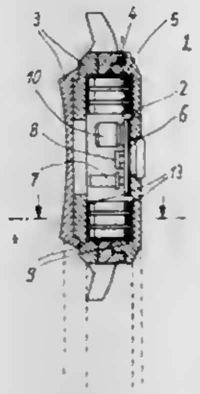
Jean-Claude Martin, and Christian Piguet, both of Neuchatel, Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed May 6, 1976, Ser. No. 683,949

Claims priority, application Switzerland, May 7, 1975, 5879/75

Int. Cl.² G24C *5/00*

U.S. Cl. 58—23 BA **9 Claims**



1. An electric wrist watch comprising a case, a display device, a time-keeping unit, an electrical energy storage device and a thermoelectric generator, said wrist watch including at least two parts separated from each other by a thermally insulating joint and connected to the thermoelectric generator, the said at least two parts being arranged to be at least temporarily at different temperatures from one another and comprising portions of said case, the first of said parts forming a thermal exchanger serving as a cold source and positioned to be in contact with the ambient air when the wrist watch is worn, the second of said parts forming a thermal exchanger serving as a hot source and positioned to be in contact with the wrist of the wearer when the wrist watch is worn, the watch further including means within said case defining a ring-shaped space, said thermoelectric generator being mounted within the ring-shaped space, one surface of said thermoelectric generator being in thermal contact with an upper part of said case, the other surface of said thermoelectric generator being in thermal contact with the lower portion of said case.

4,106,280

METHOD AND APPARATUS FOR SYNCHRONIZING A MECHANICAL OSCILLATING SYSTEM TO THE ACCURACY OF A QUARTZ STANDARD

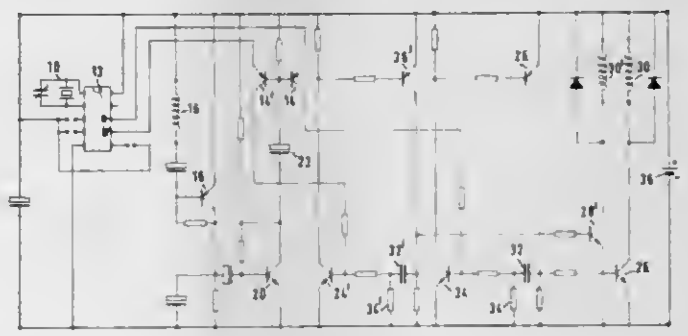
Hansrichard Schulz, Obere Waldstr. 2a, D-7730 VS-Villingen, and Herbert Hummel, Am Hummelberg 16, D-7732 Niedereschach, both of Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 670,003

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513583; Sep. 6, 1975, 2539774; Jan. 22, 1976, 2602226

Int. Cl.² G04C *3/02, 3/04, 5/00*

U.S. Cl. 58—28 R **32 Claims**

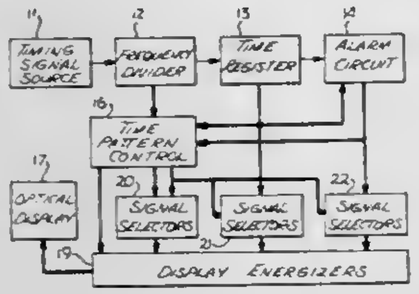


1. A method of indirect synchronization of a mechanical

oscillating system to the accuracy of a quartz standard, in particular the timing control of a clock, comprising the steps of: generating timing pulses from a quartz oscillator; deriving an existing-value signal from said oscillating system; comparing said existing-value signal with said timing pulses by a phase comparison and detecting frequency deviations of said existing-value signal; and adjusting the frequency of said mechanical oscillating system dependent on the deviations detected.

4,106,281
TIME DISPLAYS FOR ELECTRONIC TIME KEEPING DEVICES

Alfred B. Freeman, 20418 Seaboard Rd., Malibu, Calif. 90265
Filed Jun. 28, 1976, Ser. No. 700,127
Int. Cl.² G04B *19/24*
U.S. Cl. 58—50 R **13 Claims**



12. In an electronic time keeping device having a time signal source and a time register holding the time in electrical form, the combination of:

(a) a plurality of optical display elements located around a loop on the face of said time keeping device;

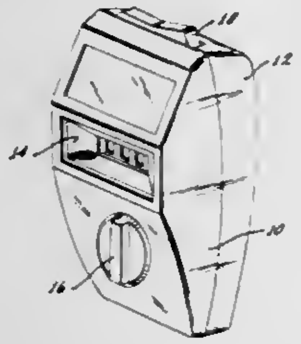
(b) means coupled to said elements for energizing said elements responsive to signals identifying those of said elements to be energized;

(c) first means coupled to said timing signal source and to said time register for applying to said energizing means signals identifying those of said elements at the hour and 5 minute positions held in said time register; and

(d) second means coupled to said timing signal source and to said time register for applying a sequence of signals repetitively a plurality of times per minute to said energizing means, said sequence of signals identifying a number of said elements corresponding to the number of minutes from the 5 minute position held in said time register.

4,106,282
ESCAPEMENT MECHANISM FOR WATCH

Ake Lennart Larsson, Palos Verdes Estates, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 26, 1976, Ser. No. 745,071
Int. Cl.² G04F *7/04;* G04C *3/00;* G04B *15/00*
U.S. Cl. 58—74 **4 Claims**



1. In a mechanical watch for measuring a period of elapsed time, the combination comprising:

a housing having a display window;

spring means within the housing;

windup means for winding said spring means;

an output display means for indicating the elapsed time measurement;

an escapement mechanism having a balance pivotable through a predetermined angle;

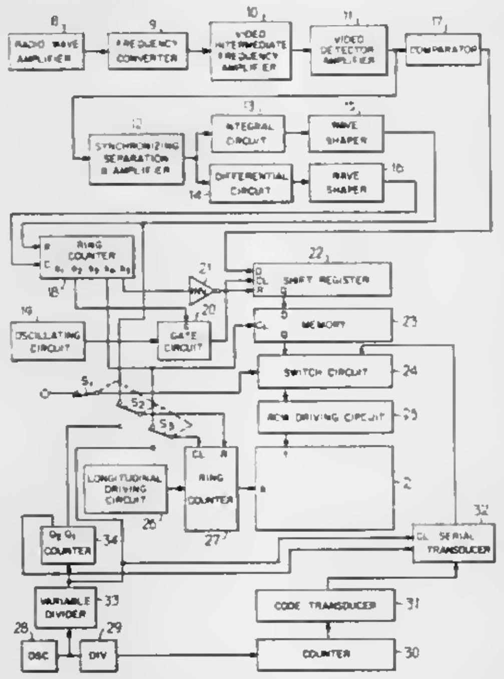
cam means coacting with said balance and adjustable to set said predetermined angle;

other means coupling said spring means, said display means and said escapement mechanism; and

switch means operable to enable said spring means to actuate said display means under control of said escapement means through said other means.

4,106,283
COMBINATION PORTABLE ELECTRONIC TIMEPIECE AND TELEVISION

Shiro Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Apr. 30, 1976, Ser. No. 681,905
Claims priority, application Japan, May 1, 1975, 50-52842
Int. Cl.² G04C *3/00, 17/00, 23/00*
U.S. Cl. 58—152 R **5 Claims**



1. A portable electronic timepiece comprising: electronic time-keeping means for developing electric time signals suitable for use as a time standard; receiving means for receiving a telecast video signal and developing therefrom electric video signals representative of the video information contained in the telecast video signal; indicating means receptive of the electric time signals and the electric video signals for selectively visually displaying an image of the time and of the video information; and switching means coacting with said time-keeping means and said receiving means for selectively switching the electric time and video signals to said indicating means to thereby select either the time image or the video information image to be displayed by said indicating means.

4,106,284
SPRING-BIASED SPLIT-SLEEVE COUPLING PIN RETAINER

Edward J. Crook, Jr., Tulsa, Okla., assignor to American Hoist & Derrick Company, Tulsa, Okla.
Filed Aug. 8, 1977, Ser. No. 822,734
Int. Cl.² F16G *15/04*
U.S. Cl. 59—85 **11 Claims**

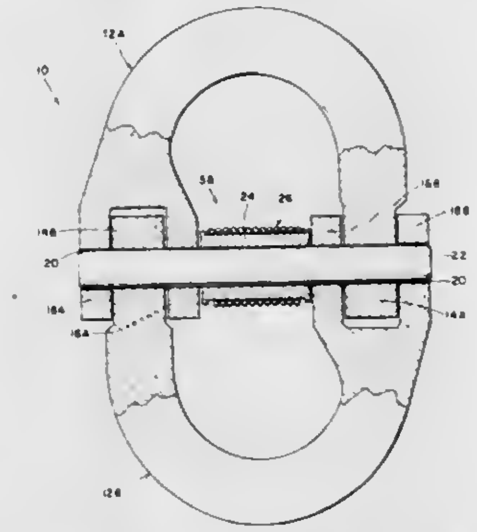
1. A coupling link comprising, in combination:

(a) a first and a second half link, each half link comprising a U-shaped member, each of the ends of each of said U-shaped members having at least one ear, each of the plurality of ears having an opening therethrough, the axes of the plurality of openings substantially perpendicular to the arms of said U-shaped members;

(b) said plurality of ears adapted to interact with each other so that the openings through said at least four ears will be the same diameter and coaxial;

(c) a hardened steel pin adapted to be received in said plurality of coaxial openings to lock said two half links together;

(d) a cylindrical spacer of length slightly less than the dimension between the parallel faces of the two inner ears of said plurality of ears, having an axially opening substantially equal in diameter to that of said pin; said spacer cut along a diametral plane into two similar halves each slightly thinner than a semi-cylinder; and

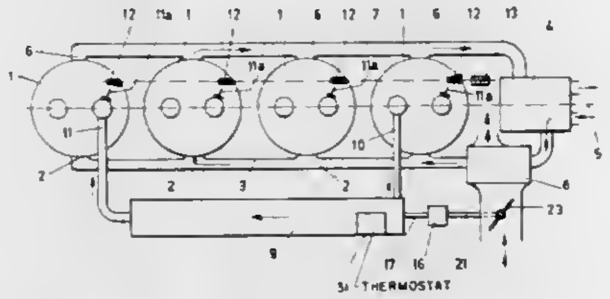


(e) spring means surrounding said cylindrical spacer, adapted to press said two halves together, forming a pin retaining means;

whereby when said pin retaining means is placed between the inner pair of ears, and said pin is inserted through the openings in said ears and through said retaining means, said spring means will press the two halves of said spacer to tightly grip said pin, and prevent its longitudinal movement.

4,106,285
METHOD FOR REGULATING THE DRIVING POWER OF AN EXPANSION ENGINE AND EXPANSION ENGINE FOR CARRYING OUT THIS PROCESS

Cornelis Hubers, 11, Slingerlaantje, Harderwijk, Netherlands
Filed Nov. 12, 1975, Ser. No. 631,404
Claims priority, application Netherlands, Nov. 20, 1974, 7415108
Int. Cl.² F02G *3/02*
U.S. Cl. 60—39.63 **7 Claims**



1. Expansion engine apparatus comprising

an expansion engine;

a separate combustion device having inlets for combustion air and for fuel, an ignition device for igniting said fuel, and an outlet for combustion gas connected to a combustion gas inlet on said expansion engine;

a supercharger for precompressing combustion air;

a cooling device connected to receive said combustion air from said supercharger and supply said combustion air to said combustion device through said inlet for combustion air in said combustion device, and also having an inlet and an outlet for a cooling medium;

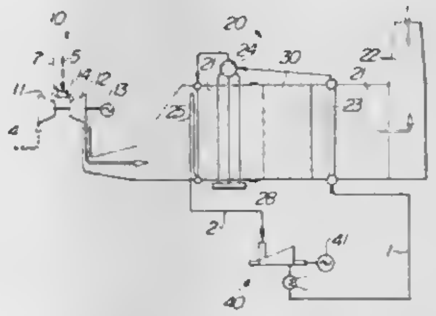
characterized by

a sensitive element influenced by changes in said combustion gas in said combustion device;

and a cooling air control means disposed in said inlet for said cooling medium of said cooling device and actuated by said sensitive element, for cooling said combustion air precompressed by said supercharger and supplied to said combustion device to maintain the pressure of the combustion gas substantially constant within the normal power region of the expansion engine apparatus.

4,106,286
WASTE HEAT RECOVERY BOILER APPARATUS

Akira Sakai; Taiji Inui, both of Hitachi, and Yasuaki Yokoi, Nagoya, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Sep. 24, 1976, Ser. No. 726,186
Claims priority, application Japan, Sep. 29, 1975, 50-116474
Int. Cl.² F01N *3/08*
U.S. Cl. 60—39.18 B **11 Claims**



1. A waste heat recovery boiler apparatus for generating steam by utilizing the heat of exhaust gases of a gas turbine machine, comprising:

passage means connected at one end thereof to the gas turbine machine, said exhaust gases passing through said passage means;

means, arranged in said passage means, for preheating feed water;

evaporator means, arranged in said passage means and disposed on the upstream side of said preheater means, for vaporizing the preheated feed water;

means, arranged in said passage means and disposed on the upstream side of said evaporator means, for super heating the vaporized saturated steam to generate super heated steam;

means, arranged in a zone in said passage means and adjacent to said evaporator means, for removing oxides of nitrogen from the exhaust gases, said exhaust gases in said zone having a temperature in the range between 300° and 400° C;

means, arranged in said nitrogen oxide-removing means, for injecting ammonia gas into the exhaust gases; and

catalytic reaction means, arranged in said nitrogen oxide-removing means and disposed on the downstream side of said injection means, for reaction with a mixture of said ammonia gas and said exhaust gases to thereby decompose by reduction the oxides of nitrogen in the exhaust gases into nitrogen and steam, wherein said catalytic reaction means further comprises a plurality of chambers, arranged in said catalytic reaction means, each of said chambers havng therin a catalyst layer and being divided into two compartments, one of said two compartments communicating with a portion of said passage means disposed on the upstream side of said nitrogen oxide-removing means and the other of said two compartments communicating with a portion of said passage means disposed on the downstream side of said nitrogen oxide-removing means.

4,106,287
REDUCING POLLUTION FROM INTERNAL COMBUSTION ENGINES

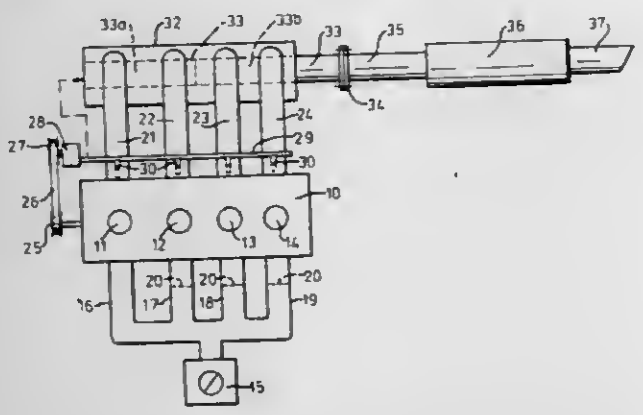
Michel Auclair, and Louis Le Parmentier, both of Mont-Saint-Aignan, France, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 2, 1976, Ser. No. 654,480

Claims priority, application France, Feb. 3, 1975, 75 03198

Int. Cl.² F02B *75/10;* **F01N** *3/10*

U.S. Cl. 60—274 **27 Claims**



1. A method for reducing pollution from an internal combustion engine having a plurality of cylinders each of which includes a reciprocating piston, in combination with a reactor for the combustion of exhaust which flows in a downstream direction from said engine, said reactor having an outlet zone communicating through flame trap means with an exhaust discharge aperture wherein said flame trap means retains the flame of burning gas upstream thereof, the method comprising: burning in one cylinder a fuel-air mixture for producing a rich exhaust gas containing sufficient combustible matter for combustion when mixed with oxygen-containing gas; burning in the other of said cylinders a fuel-air mixture for producing a lean exhaust gas containing insufficient combustible material for combustion when mixed with oxygen-containing gas; conducting said rich exhaust gas into a first communicating region within said reactor adjacent said flame trap means to form a stratum of burning rich exhaust gas; conducting said lean exhaust gas into a second communicating region within said reactor located in a direction downstream from said first communication region in the direction of flow of said exhaust from said flame trap to said exhaust discharge aperture; exhausting said lean exhaust gas through said discharge aperture including passing said lean exhaust gas through said first communicating region in contact with said stratum of burning rich exhaust gas; mixing oxygen-containing gas with said rich and lean exhaust gases for combusting said combustible material in said rich exhaust gas and enhancing combustion of said combustible material in said lean exhaust gas; and thereafter discharging exhaust gas substantially depleted of combustible material through said outlet zone and said exhaust discharge aperture.

4,106,288
EXHAUST GAS REACTOR FOR INTERNAL COMBUSTION ENGINE AND ITS MANUFACTURING METHOD

Hatuo Nagaishi, and Tooru Yoshimura, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 16, 1976, Ser. No. 723,949

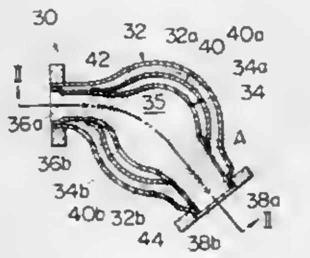
Claims priority, application Japan, Oct. 13, 1975, 50/123508

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **16 Claims**

1. A method of making a reactor including an outer shell, an inner core shell in said outer shell and spaced apart from the inner surface of said outer shell to form a space therebetween, said inner core shell defining therein a reaction chamber and having an inlet pipe portion and an outlet pipe portion, and an outer core shell disposed in said space to divide said space into two chambers, said outer core shell being secured to the outer surface of said inner core shell, comprising the steps of:

- forming separately first and second outer shell counterparts;
- forming separately first and second inner core shell counterparts, said first inner core shell counterpart having a first integral inlet pipe portion counterpart and a first integral outlet pipe portion counterpart and said second inner core shell counterpart having a second integral inlet pipe portion counterpart and a second integral outlet pipe portion counterpart;
- forming separately first and second outer core shell counterparts;



- combining said first and second inner core shell counterparts to form said inner core shell, in which said first and second integral inlet pipe portion counterparts are combined to form said inlet pipe portion and said first and second integral outlet pipe portion counterparts are combined to form said outlet pipe portion;
- securing said first and second outer core shell counterparts to the outer surface of at least one of said inlet pipe or outlet pipe portions of said combined inner core shell, combining said first and second outer core shell counterparts to form said outer core shell; and
- combining said first and second outer shell counterparts, securely disposing said formed inner core shell with said formed outer core shell.

4,106,289
EXHAUST SYSTEM IN A TWO-STROKE-CYCLE MULTICYLINDER INTERNAL COMBUSTION ENGINE

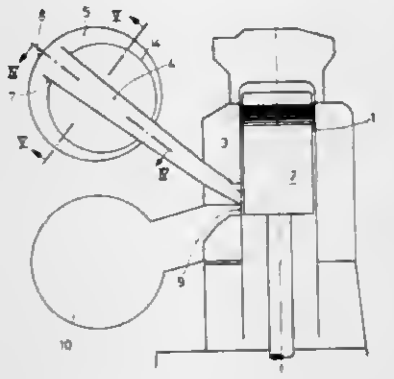
Eglof von Schnurbein, Augsburg; Jakob Bucher, Bobingen, and Thomas Mikota, Wulfertshausen, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Oct. 20, 1975, Ser. No. 624,232

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1974, 2449628

Int. Cl.² F02B *27/04;* **F01N** *7/10*

U.S. Cl. 60—314 **10 Claims**



1. In a two-stroke-cycle multicylinder internal combustion engine having an exhaust port provided for each cylinder and having connecting exhaust ducts, each individual to a single cylinder of the engine, running between the exhaust port of said cylinder and a substantially cylindrical common exhaust discharge manifold, the improvement wherein each connecting exhaust duct (**4, 24, 35**) is extended to as to project into the manifold (**5, 25, 36**) to such an extent that the portion of the duct that projects into the manifold has an end (**7**) therein, extends therein for a length not less than half the diameter of the manifold and, at least in the region of said portion, has a continuously broadening cross-section, and wherein said portion is directed substantially perpendicularly to the axis (A—A) of the manifold and has an opening transverse to the duct axis at said end (**7**) which opens into said manifold and wherein, further, said manifold has a wall facing said open end of each connecting exhaust duct, and at least said open end (**7**) of each connecting exhaust duct (**4, 24, 35**), by reason of the amount of free discharge area between the exhaust duct and said facing wall of said manifold, forms a pressure-gradient diffusor in cooperation with said facing wall acting as a baffle, the said continuously broadening cross-section in at least said projecting portion of each connecting exhaust duct also contributing to the formation of said diffusor.

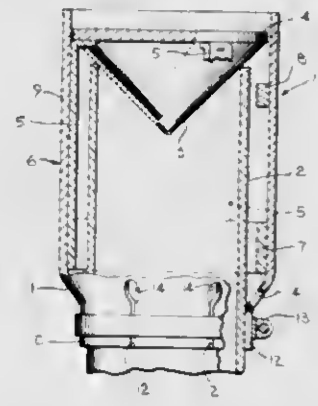
4,106,290
PROTECTIVE CAP ASSEMBLY FOR AN EXHAUST PIPE

Donald E. Johnson, 2208 Highway 51, Stoughton, Wis. 53589

Filed May 18, 1977, Ser. No. 798,250

Int. Cl.² F01N *7/00;* **F23L** *17/02*

U.S. Cl. 60—324 **10 Claims**



1. A protective cap assembly to be attached to a vertical exhaust pipe, comprising an inverted conical cap disposed to engage the upper end of the exhaust pipe to seal the exhaust pipe when gas is not flowing through the pipe, support means connected to the cap and extending downwardly along the outer surface of the exhaust pipe, flow of gas within the exhaust pipe lifting the cap from the end of said exhaust pipe, stop means to limit the upward movement of the cap, and a housing located radially outward of said exhaust pipe, said housing having an upper end extending upwardly above the level of the cap when the cap is in sealing relation to the exhaust pipe and said housing have a lower portion disposed to be attached to said exhaust pipe.

4,106,291
CORE MACHINE HAVING HYDROSTATIC DRIVE

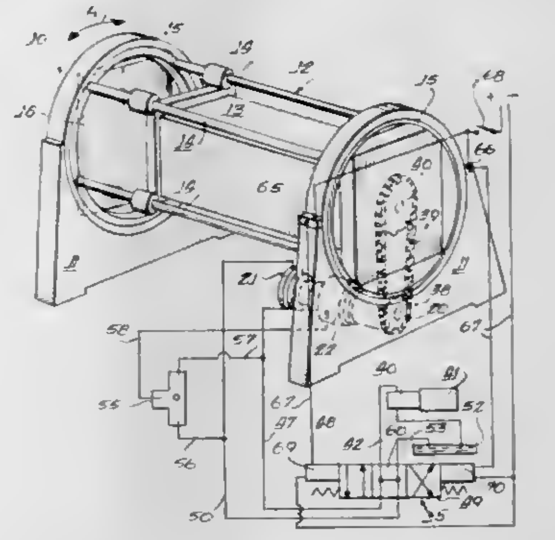
George H. Morgan, South Bend, Ind., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Mar. 31, 1977, Ser. No. 783,325

Int. Cl.² F15B *15/18*

U.S. Cl. 60—369 **10 Claims**

1. A hydrostatically powered machine drive in combination with a machine having a fixed carriage and an assembly movable on the carriage, the drive comprising a reversible fluid power motor having an output shaft and fluid power means for rotating the output shaft in either of two directions; a failsafe fluid power brake having a brake shaft directly coupled with the motor output shaft, brake means for selectively engaging the brake shaft and retarding brake shaft rotation, means normally urging the brake means into engagement with the brake shaft for normally retarding brake shaft rotation and selectively energizable fluid power brake override means for overriding the brake-urging means so as to disengage the brake means and permit free brake shaft rotation when the fluid power override means is energized; transmission means having a drive shaft directly coupled with the brake shaft and means operatively coupled with the movable assembly to transmit motion from the motor output shaft and brake shaft to the movable assembly; and fluid power circuit means for powering said machine drive and including a source of pressurized fluid and conduit means for selectively leading the pressurized fluid from the source to the brake override means to permit free brake shaft rotation and for leading pressurized fluid from the source to the fluid power motor to drive the fluid power motor output shaft, the brake shaft and the transmission means drive shaft so as to move the machine movable assembly upon the fixed carriage, withdrawal of fluid power pressure to the fluid power motor and brake override means operating to terminate motor driving action on the motor output shaft and to allow engagement of brake means with the brake shaft means so as to halt motion of the movable assembly and to precisely fix the movable assembly in a stationary position on the machine carriage.



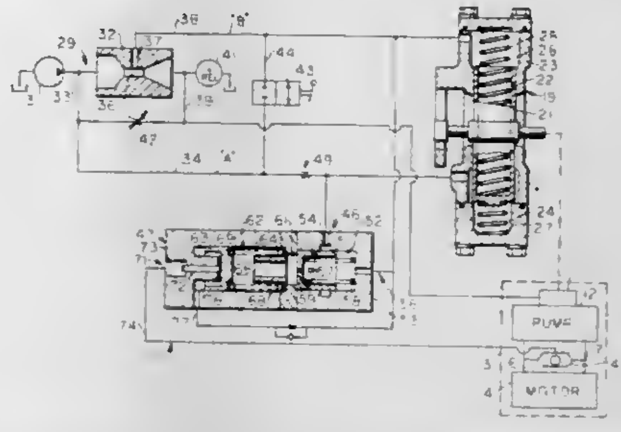
4,106,292
SPEED AND LOAD RESPONSIVE UNDERSPEED ACTUATOR FOR HYDROSTATIC TRANSMISSIONS

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 16, 1977, Ser. No. 807,278

Int. Cl.² F16H *39/46*

U.S. Cl. 60—447 **9 Claims**



1. A control system for controlling the displacement of a first pump driven by a prime mover, comprising:

- control means for controlling the displacement of said first pump;
- an underspeed actuator having a piston, first and second actuating chambers at opposite ends of said piston, and biasing means, said piston being connected to the control means and movable between a first position at which said first pump is at minimum displacement and a second posi-

tion at which said first pump is at maximum displacement, said biasing means urging the piston toward the first position, and said piston being movable between said first and second positions in response to pressure differential in said first and second chambers;

signal means for controllably developing first and second control signals in response to the operating speed of the prime mover and delivering said first and second signals to respective first and second chambers; and

first means for controllably reducing the magnitude of fluid pressure in the first chamber in response to the rate of pressure rise of the output fluid of said first pump exceeding a preselected rate of pressure rise.

4,106,293

STIRLING CYCLE MACHINE WITH A CONTROL DEVICE FOR SUPPLYING WORKING MEDIUM

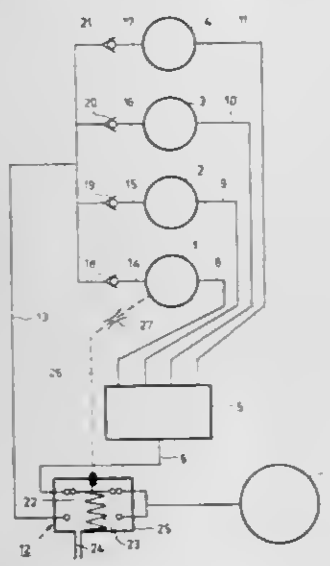
Jacobus Hubertus Abrahams, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,686

Claims priority, application Netherlands, Apr. 2, 1976, 7603430

Int. Cl.^{2} F02G *1/06*

U.S. Cl. 60—521 **3 Claims**



1. A hot-gas reciprocating machine with two or more working spaces whose volumes can be varied at a mutual phase difference by piston-like bodies coupled to a crank shaft, a working medium which performs a thermodynamic cycle in each of said working spaces during operation, and a control device comprising a housing having an inlet connected to a source of pressurized working medium and a plurality of outlets, each of which outlets is separately connected to an associated working space, the housing accommodating a control member which, during each revolution of the crank shaft, successively brings each of the outlets separately into open communication with the inlet, each time for a period during which the maximum cycle pressure occurs in the interconnected working space;

wherein the control member is formed by an annular body having a plurality of wall elements distributed over its circumference and arranged to be subject on one side, viewed radially, to the source pressure; and the other side of each wall element is arranged to engage in a sealing manner with an associated outlet where they are subject to the variable cycle pressure occurring in the connected working space, the body further being so arranged that said wall elements close or release the outlets by changes of the shape of this body due to the variable forces acting on this body as a result of the variable differential pressures prevailing across the wall elements.

4,106,294

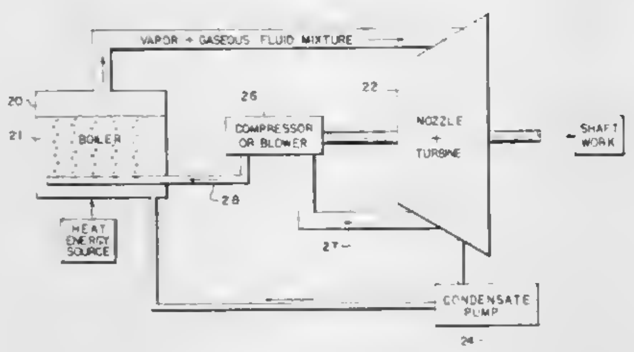
THERMODYNAMIC PROCESS AND LATENT HEAT ENGINE

Julius Czaja, 4 Crestview Dr., Pittsford, N.Y. 14534

Filed Feb. 2, 1977, Ser. No. 765,045

Int. Cl.^{2} F02C *1/04*

U.S. Cl. 60—649 **27 Claims**



1. A method of forming a jet of a gaseous fluid for driving a turbine in a heat engine, said method comprising moving a mixture of a vapor and said gaseous fluid through a nozzle so that the expansion of said mixture in said nozzle is sufficient to transform the latent heat of condensation of a substantial portion of said vapor into kinetic energy of said gaseous fluid and cause a substantial portion of said vapor to condense, separating said condensed vapor from said gaseous fluid, and compressing and returning the exhaust from said turbine for reentry to said nozzle.

4,106,295

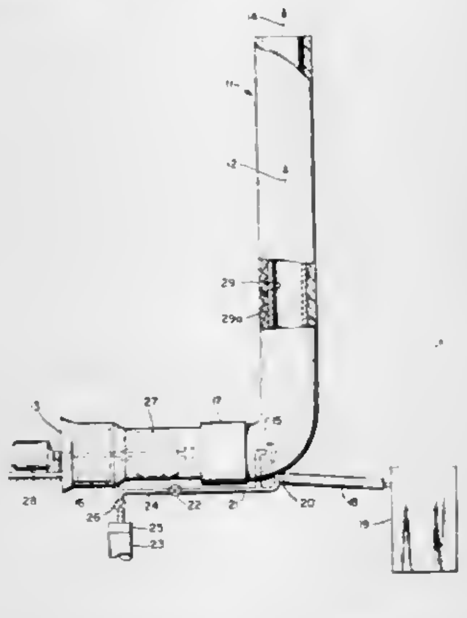
AIR PRESSURE DIFFERENTIAL ENERGY SYSTEM

P. John Wood, 3024 Broadmoor View, Oakland, Calif. 94605

Filed Mar. 14, 1977, Ser. No. 777,342

Int. Cl.^{2} F02C *1/04*

U.S. Cl. 60—649 **7 Claims**



1. An energy-generating system comprising:

a stack having open lower and upper ends for receipt and discharge respectively of air at relatively high and low atmospheric pressures;

means heating and humidifying the air within said stack adjacent said lower end inducing an upward flow of air in said stack; and

a turbine mounted in said stack and driven by said air flow.

4,106,296

METHOD OF SOIL STABILIZATION

John B. Leonard, Jr., 119 Bridge Rd., Hillsborough, Calif. 94010, and Laurence Latta, Jr., 1010 Westridge Dr., Portola Valley, Calif. 94025

Continuation-in-part of Ser. No. 599,383, Jul. 28, 1975. This application Jul. 23, 1976, Ser. No. 708,286

Int. Cl.^{2} E02D *3/14*

U.S. Cl. 61—36 C **29 Claims**

1. A method of stabilizing soil which comprises the steps of applying to the soil an aqueous emulsion comprising water and an epoxy resin ester which is a reaction product of bisphenol A-glycidyl ether type epoxy resin with an unsaturated fatty acid, and wherein the ratio of water to said reaction product is about 1:1 to about 1000:1, in an amount sufficient to wet the soil to a predetermined thickness;

compacting the wet soil to a predetermined density; and

curing the reaction product wetting the compacted soil at ambient conditions.

4,106,297

METHOD OF AND AN ARRANGEMENT FOR ESTABLISHING AN UNDERGROUND PASSAGE

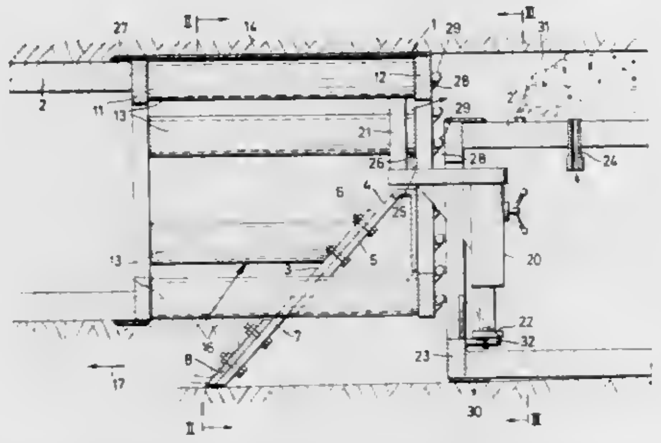
Richard Weiss, Endstrasse 7, 4130 Moers, Fed. Rep. of Germany

Filed Sep. 17, 1976, Ser. No. 725,137

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546491

Int. Cl.^{2} E21D *9/00*

U.S. Cl. 61—42 **7 Claims**



1. A method of correcting the course, particulaly the slope, of an elongated underground conduit that includes an original line of consecutive pipe sections of given transverse diemensions embedded in a surrounding material and follows a desired course except for at least one region where the conduit follows a deviating course, the method comprising the steps of aligning a leading end of an additional line of consecutive pipe sections of the given transverse dimensions with one end of the original line; advancing the lines until the leading end of the additional line reaches the one region; removing the surrounding material present between the boundaries of the deviating and desired courses at the one region; and so continuing the advancement of the lines that the additional line follows the desired course even through the one region.

4,106,298

DEVICE FOR THE PRODUCTION OF EARTH HOLES

Hans Mathieu, Bischmisheim, and Jürgen Hochstrasser, Stengelstrasse 6, 66 Saarbrucken 1, both of Fed. Rep. of Germany, assignors to Elizabeth Hochstrasser nee Wack and Jurgen Hochstrasser, both of, Germany

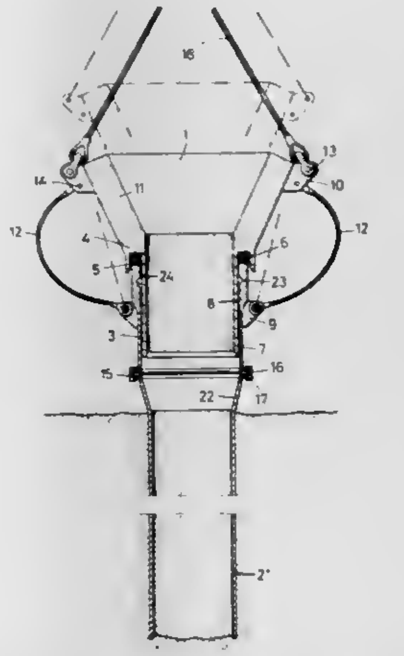
Filed Oct. 26, 1976, Ser. No. 735,589

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550595

Int. Cl.^{2} E02D *11/00*

U.S. Cl. 61—53.64 **17 Claims**

1. A device for the production of earth holes and poles, which are located in these holes, which poles are made of poured or compressed concrete, said device comprising a ram equipped with an axial, cylindrical opening, an earth remover insertable in said opening for the concurrent removal of the earth by means of said earth remover; a tube, said ram further comprising a cylindrical extension which is inserted into said tube and serves to guide the ram during its ramming movements, which ram can be lifted and lowered by a crane, and which ram is brought into contact with the frontal plane of the tube characterized by the fact that the tube is connected in a disconnectable fashion with the ram by means of yielding devices, which determine the lifting height of the ram, a ring-shaped shoulder formed on the ram and having a groove for the reception of a noise-muffling buffer and for the reception of the frontal plane of the tube; said tube having a groove formed on the inner surface thereof, a snap ring in said groove to define a stop; and an axially movable compression-and-impact-piston tightly contained in the tube below the snap ring.



4,106,299

METHOD FOR INSTALLATION OF GROUNDING POLE

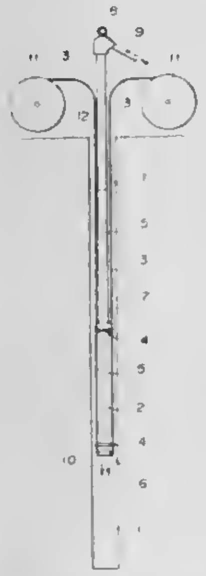
Masami Fujii, 3294-2 Oaza Ota, Hazaki-machi, Kashima-gun, Ibaragi-ken, Japan

Filed Dec. 3, 1976, Ser. No. 747,128

Claims priority, application Japan, Jun. 18, 1976, 51-071723

Int. Cl.^{2} E02B *1/00*

U.S. Cl. 61—63 **8 Claims**



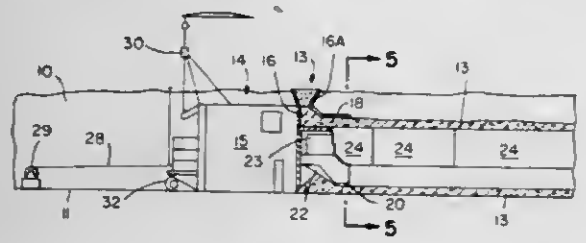
1. A method, for installation of a grounding pole in the earth, which comprises the steps of:

(a) boring a hole in the earth to a desired depth
(b) securing an end of at least one grounding pole, having a length substantially equal to the depth of said hole, to a guide member,
(c) inserting said grounding pole and said guide member fully into the hole with the guide member leading,
(d) measuring contact resistance between the earth and a boring machine during boring operation, and terminating said boring when the contact resistance is not greater than a desired target value.

4,106,300

METHOD OF MAKING REINFORCED CAST-IN-PLACE CONCRETE PIPE

Charles T. McNeill, Yuba City, Calif., assignor to No-Jnint Concrete Pipe Co., Yuba City, Calif.
Continuation of Ser. No. 469,517, May 13, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,891
Int. Cl.² B28B *21/88;* E03F *3/06*
U.S. Cl. 61—72.2 **1 Claim**



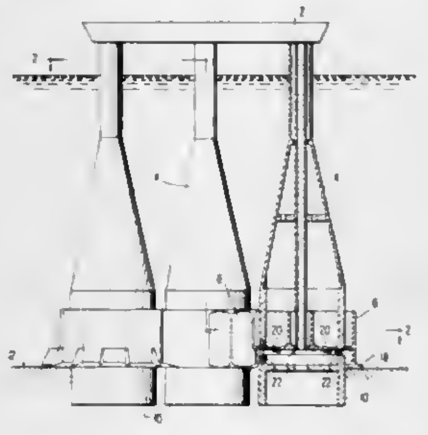
1. In the method of making cast-in-place concrete pipe, which method includes the steps of:
(a) digging a ditch in the ground having a bottom portion shaped to conform to the part of the pipe to be cast directly in the ground;
(b) moving a mechanism lengthwise in said ditch, which mechanism is adapted to receive and distribute concrete to form said pipe in a continuous manner within said ditch;
(c) loading a quantity of a concrete mix suitable for use in making cast-in-place concrete pipe into a ready-mix truck at a central supply point remote from said mechanism;
(d) transporting and mixing said quantity of concrete mix in transit from said central supply point to said mechanism; and
(e) introducing said quantity of concrete mix into said mechanism for formation of said pipe;
the improvement comprising the additional steps of:
(f) forming a plurality of fibers each having a diameter of about 10 mils and a length between about ½ and about 2 inches;
(g) transporting a quantity of said fibers to said mechanism for forming said pipe; and
(h) gradually adding said fibers to said quantity of concrete mix in said ready-mix truck at said mechanism in an amount by weight of about 2% of the weight of the quantity of concrete mix in said ready-mix truck immediately prior to introducing said quantity of concrete mix into said mechanism.

4,106,301

BUILDING SYSTEM FOR SEISMIC-ACTIVE AREAS

Ben C. Gerwick, Jr., Oakland, Calif., assignor to Kajima Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 644,017, Dec. 24, 1975, Pat. No. 4,045,968. This application Mar. 28, 1977, Ser. No. 782,258
Int. Cl.² E02B *17/00;* E02D *5/00*
U.S. Cl. 61—86 **14 Claims**

1. A building system for use in areas susceptible to seismic disturbances, comprising,
a base structure,
an upper structure connected to the base structure and being laterally movable with respect to the base structure when subjected to seismic disturbances,
connector means extending between and interconnecting the base structure and the upper structure, said connector means including a first set of members extending between said base structure and said upper structure and a second set of members extending between said base structure and said upper structure,
said first set of members being relatively rigid and capable of failure by buckling, when the system is subjected to seismic disturbances,

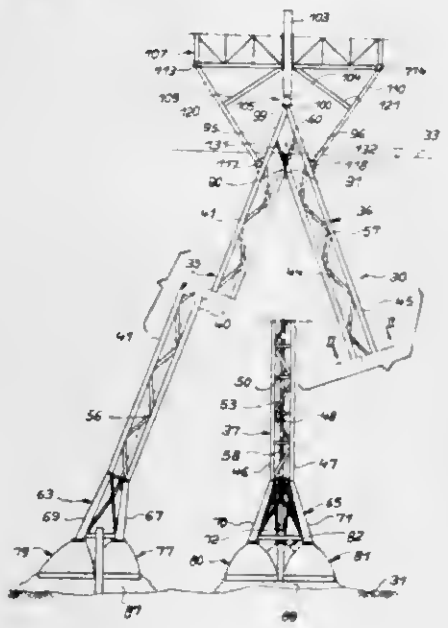


said second set of members being more flexible than said first set of members and capable of flexing without failing when the system is subjected to seismic disturbances whereby under normal conditions the first set of members will contribute to the strength of the connector means, and subjection of the system to seismic disturbances will cause the first set of members to buckle and the second set of members to flex without failure to preserve the connection and between the base structure and the upper structure.

4,106,302

OFF-SHORE DRILLING AND PRODUCTION PLATFORM AND METHOD OF BUILDING SAME

Rudolf Vogel, Salzgitter, Germany, assignor to Maschioenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Fed. Rep. of Germany
Filed May 17, 1976, Ser. No. 686,685
Int. Cl.² E02B *17/00*
U.S. Cl. 61—94 **41 Claims**

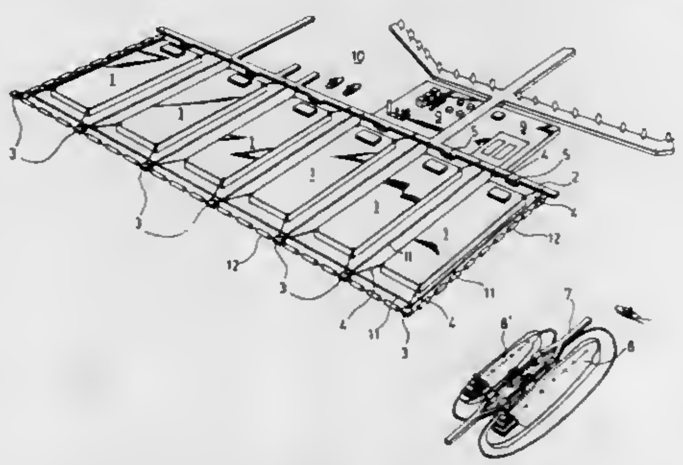


1. An off-shore drilling and production platform in combination which includes a working deck for location above the water level of the sea in which the platform is to be installed, legs supporting said deck and diverging from said deck in downward direction for resting on the bed of the sea in which the said platform is to be installed, said legs comprising hollow sections and being interconnected in the region of their upper ends only, each leg being formed as a three-post space framework with tubular posts, each post being formed with an axially continuous hollow space with the wall of the hollow space being gastight, the hollow space of each post is being connectible with a pressure gas pipe, each post having a pipe therewith for a ballast liquid extending from the top of the post down to the hollow space of its spud tank, each leg carrying at its top part of a universal joint which cooperates with the other joint parts, at least one grouping of the joint parts and the joint members being welded together.

4,106,303

MARINE OIL STORAGE INSTALLATION

Hiroyuki Shimada, Nagasaki, and Shozo Toyoda, Yokohama, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1977, Ser. No. 802,317
Claims priority, application Japan, Jun. 10, 1976, 51-68013
Int. Cl.² B63B *25/08;* E02B *3/04*
U.S. Cl. 61—101 **4 Claims**



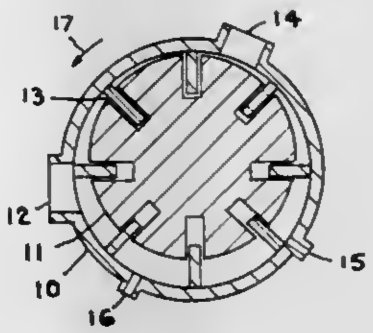
1. A marine oil storage installation comprising at least one floating type oil storage tank provided with shore connection means to effect transfer of oil to and from said tank, each said storage tank having double walled side walls and a double walled bottom, protector means composed of at least one line of floating members surrounding each oil storage tank respectively for protecting each oil storage tank from damage as the result of waves and contacting moving objects and for preventing oil from flowing out of said installation, mooring means for drawing each oil storage tank, loading arm means carried on said mooring means being adapted for connection and disconnection with said shore connection means of each said oil storage tank respectively, a shore based facility installed on the shore or on an artificial land and communicating with said loading arm means on said mooring means, and a platform installed on the sea for moorage of tankers and provided with means communicating with said shore based facility for feeding oil between said tankers and said shore based facility.

4,106,304

THERMODYNAMIC COMPRESSOR

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042
Continuation-in-part of Ser. No. 708,863, Jul. 26, 1976, Ser. No. 546,912, Feb. 4, 1976, abandoned, and Ser. No. 600,312, Jul. 30, 1975, Pat. No. 3,986,361. This application Sep. 17, 1976, Ser. No. 724,407
Int. Cl.² F25B *3/00*
U.S. Cl. 62—88 **4 Claims**

1. A method of compressing a compressible working fluid comprising:
a. confining said working fluid in an approximately constant volume and simultaneously adding heat into said working fluid increasing the temperature of said working fluid, and increasing the pressure of said working fluid;
b. elevating the pressure of said working fluid by adding work into subsequently said working fluid in a mechanical compressing means;

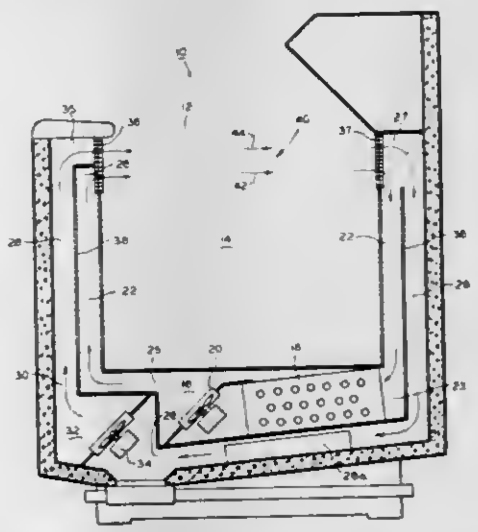


c. removing heat from said working fluid and transferring at least a portion of such heat into said working fluid upstream of said mechanical compressing means.

4,106,305

OPEN WELL TYPE REFRIGERATED DISPLAY CASE WITH REVERSE FLOW OF AIR BANDS

Fayez F. Ibrahim, 830 Skyline Dr., Niles, Mich. 49120
Continuation of Ser. No. 703,225, Jul. 7, 1976, abandoned, which is a continuation of Ser. No. 564,256, Apr. 2, 1975, abandoned. This application May 4, 1977, Ser. No. 793,592
Int. Cl.² F25D *17/06;* A47F *3/04*
U.S. Cl. 62—89 **12 Claims**



11. A method for cooling an open well refrigerated product display case having a bottom portion, upstanding front, rear, and side portions, and an open top which defines an access opening to a display space in the refrigerated case, the method comprising:
providing an inner air passage adjacent to and substantially surrounding the bottom and sides of said display space, and providing cooling means mounted in said inner air passage;
providing a separate outer air passage outwardly of and adjacent to said inner air passage, said outer air passage being in heat exchanging relation with said inner air passage whereby said cooling means also partially cools the air in said outer passage;
each of said inner and outer passages having front and rear end portions, with said front end portion terminating adjacent a front edge of said access opening and said rear end portion terminating at a rear edge of said access opening;
directing a cooled flow of air from said inner air passage through one end portion thereof, across the access opening and into the other end portion thereof to form a first curtain of cooled air;
directing a flow of partially cooled air from the outer air passage substantially horizontally, across the access open-

ing to form a second partially cooled curtain of air over said first curtain of air thereof, with the use of said cooled inner air curtain and said partially cooled outer air curtain permitting the use of high velocity air curtains without excessive aspiration with ambient air which in turn permits the removal of radiant heat by said air curtains at a rate greater than the input rate of said radiant heat to thus maintain the integrity of the refrigerated product.

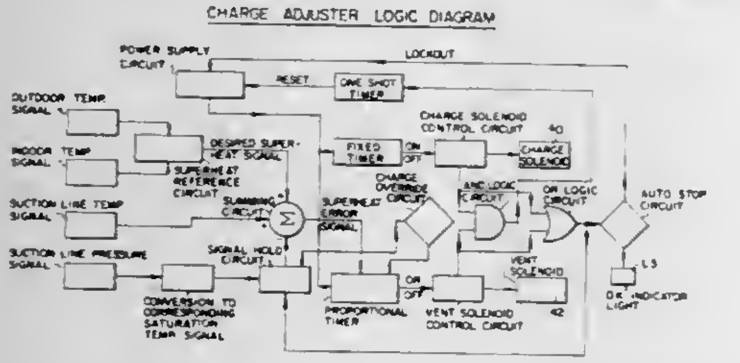
4,106,306
REFRIGERANT CHARGE ADJUSTER APPARATUS

James Fredrick Saunders, Onalaska, Wis., assignor to The Trane Company, La Crosse, Wis.

Continuation of Ser. No. 699,369, Jun. 24, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,592

Int. Cl.^{2} F25B *45/00*

U.S. Cl. 62—149 **8 Claims**



1. In a refrigerant charge adjuster apparatus for adjusting the charge in a refrigeration system, and having means for determining the actual superheat by at least sensing the refrigerant saturation pressure of said refrigeration system, the improvement including: means for sensing the refrigerant saturation pressure of said refrigeration system, means for producing a signal which varies directly with said sensed saturation pressure, and means for temporarily substantially fixing the value of said signal during charge adjustments in said refrigeration system.

4,106,307
REVERSE-FLOW AIR CONDITIONER

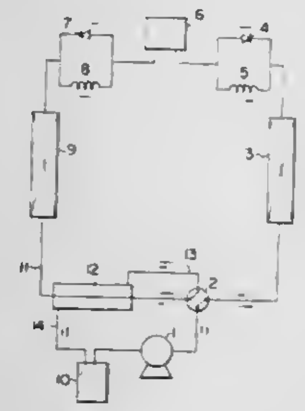
Toshiharu Matsuda, Kudamatsu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,487

Claims priority, application Japan, Mar. 5, 1976, 51-23270; May 12, 1976, 51-26136

Int. Cl.^{2} F25B *13/00, 43/00*

U.S. Cl. 62—324 **9 Claims**



1. A reverse-flow air conditioner for a selective operation on a heating cycle or a cooling cycle, comprising a compressor for delivering a hot compressed refrigerant gas, an indoor heat exchanger to act as the evaporator during the cooling cycle and as the condenser during the heating cycle, an outdoor heat exchanger to act as the evaporator during the heating cycle and the condenser during the cooling cycle, piping means interconnecting the compressor, outdoor heat exchanger, and indoor heat exchanger, a four-way valve for selectively connecting the compressor outlet to the indoor heat exchanger during the heating cycle and the outdoor heat exchanger during the cooling cycle, a receiver connected between the indoor heat exchanger and the outdoor heat exchanger in the piping means, decompression means in the piping means between the indoor heat exchanger and the outdoor heat exchanger for reducing the pressure of the liquid refrigerant condensed in and flowing from the indoor heat exchanger during the heating cycle and the outdoor heat exchanger during the cooling cycle to produce a mixture of gas
and liquid refrigerant at reduced pressure and temperature, and a suction accumulator in the piping means between the suction inlet of the compressor and the four-way valve for separating refrigerant into gas and liquid portions, with the four-way valve feeding the refrigerant from the outdoor heat exchanger to the suction accumulator during the heating cycle and from the indoor heating exchanger to the suction accumulator during the cooling cycle, wherein the improvement comprises in combination:
the suction accumulator and receiver being in heat exchange relationship with each other;
the decompression means being a single fluid flow restriction connected between the outdoor heating exchanger and the receiver and providing substantially the sole pressure drop for both the heating cycle and the cooling cycle; and
the piping means between the indoor heat exchanger and the receiver opening into the receiver at a position spaced a substantial vertical distance below the position where the piping means from the decompression means opens into the receiver, so that the receiver will store a quantity of liquid refrigerant during the heating cycle that is greater than that stored during the cooling cycle by an amount equal to the volume of the receiver between such vertically spaced openings.

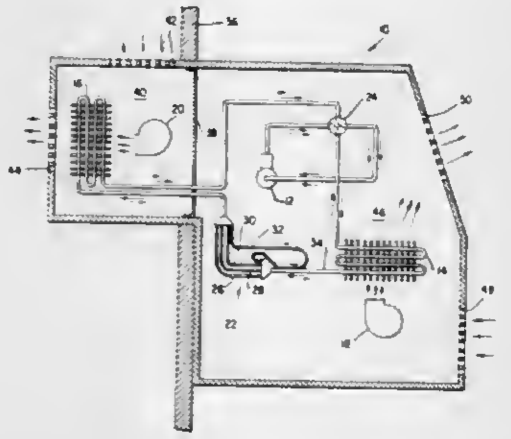
4,106,308
HEATING AND COOLING SYSTEM WITH CAPILLARY CONTROL MEANS

Jerome Freed Miller, Auburn, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,529

Int. Cl.^{2} F25B *13/00, 39/02, 41/06*

U.S. Cl. 62—324 **1 Claim**



1. In a reversible air conditioning system, means for compressing a refrigerant to be circulated through the system, a roomside heat exchanger, another heat exchanger exposed to outside air, a capillary system for metering the flow of refrigerant between the two heat exchangers, and a reversing valve for reversing the direction of flow of refrigerant through the two heat exchangers and capillary system, the capillary system including a plurality of branch lines all of which are out of heat exchanging relationship with both of said heat exchangers, and at least one of the said branch lines including a looped portion in a heat exchanging contacting relationship with a refrigerant carrying line between the capillary system and the roomside heat exchanger.

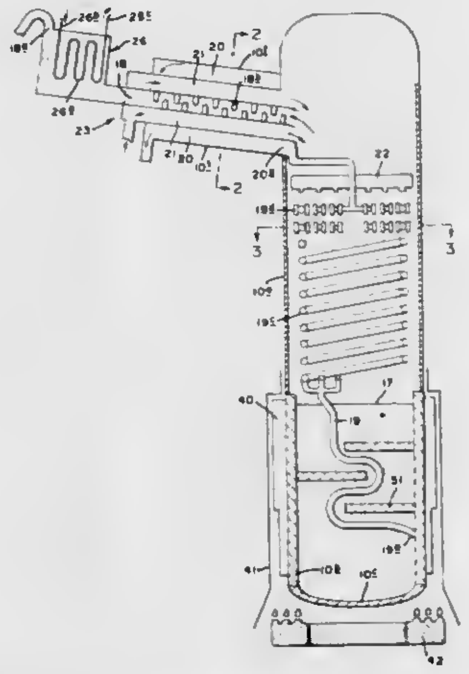
4,106,309
ANALYZER AND RECTIFIER METHOD AND APPARATUS FOR ABSORPTION HEAT PUMP

Benjamin A. Phillips, Benton Harbor, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 13, 1977, Ser. No. 796,631

Int. Cl.^{2} F25B *15/00, 33/00*

U.S. Cl. 62—476 **14 Claims**



1. A generator unit for an absorption heat pump system comprising:
- a. a housing defining an upstanding interior zone including a zone boiler being a reservoir zone for a rich liquor solution of absorbent and refrigerant and an analyzer zone above the boiler zone, and also defining a rectifier zone slanting upwardly and outwardly from adjacent said interior zone above said analyzer zone; said rectifier zone being divided into three conduits, a first conduit being a weak liquor outlet conduit, a second conduit being a rich liquor inlet conduit and a third conduit being a refrigerant outlet conduit with said second conduit being in heat exchange relation with said first and third conduits;
- b. a fourth conduit being a weak liquor conduit extending from said boiler zone to an end of said first conduit proximal said interior zone, the interior of said fourth conduit being out of communication with and in heat exchange relation with said analyzer zone, and said second and third conduits communicating with said interior zone whereby rich liquor and refrigerant vapor in said analyzer zone are in heat and mass exchange relation with each other and in heat exchange relation with weak liquor in said fourth conduit;
- c. boiler means in said boiler zone for evaporating refrigerant into said interior zone from rich liquor containing refrigerant in said boiler zone and for propelling weak liquor depleted of refrigerant into the lower end of said fourth conduit and through said fourth conduit and first conduit; and
- d. reflux means in said third conduit adjacent an end of said rectifier zone distal said interior zone for withdrawing heat from refrigerant vapor and condensing absorbent vapor, said third conduit being slanted to permit condensed absorbent to flow in a downward path into said interior zone.

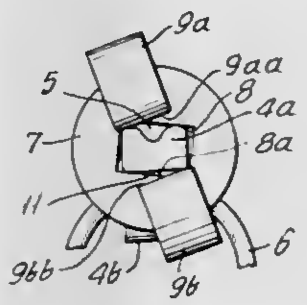
4,106,310
PIERCED EARRING DEVICE

Herbert Abramowitz, 143-19 25th Ave., Whitestone, N.Y. 11357

Filed Jun. 20, 1977, Ser. No. 808,154

Int. Cl.^{2} A44C *7/00*

U.S. Cl. 63—12 **4 Claims**



1. An earring device comprising in combination: an elongated post having at-least one side thereof extending as a planar surface along an axis transversely of a longitudinal axis of the elongated post, further having ornament-attaching means at one end thereof for the supporting of an ornament thereon, and an opposite remaining end of the elongated post being of a shape adapted to be fastened to an anchoring element, adapted such that when mounted in a pierced ear said one side's planar surface faces downwardly thereby providing optimally maximum surface area, and earring post-locking means for detachable securement to said opposite remaining end, comprising said anchoring element, adapted for preventing withdrawal of the elongated post from a pierced earlobe when the earring post-locking means is attached, said earring postlocking means including receptacle structure forming and providing a space receivable of said opposite remaining end therein and space-defining walls of said space being shaped such that a cross-section of the space is of a shape and size substantially the same as a cross-section transversely through said elongated post, and the earring post-locking means further including a clamping means attached to and mounted in fixed spacial relationship to said receptacle structure and the space thereof, and the clamping means including at-least one clamping surface extending in a manner and positioned such that, when in a clamping state, the clamping surface presses against said one side's planar surface in a non-parallel relationship thereto whereby a slight twist is imparted to said post relative to said earring post-locking means such that the anchoring thereof is improved against potential accidental unfastening.

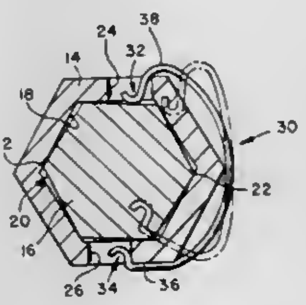
4,106,311
NO-LASH AXIALLY MOVABLE STEERING COLUMN

Richard W. Euler, La Porte, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 13, 1976, Ser. No. 750,295

Int. Cl.^{2} F16D *3/06;* **B62D** *1/18*

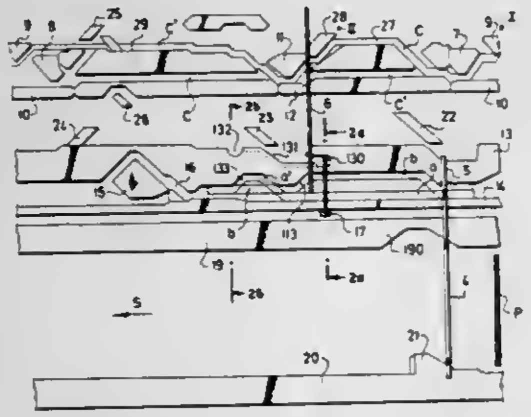
U.S. Cl. 64—23 **6 Claims**



1. A variable length column assembly comprising:
a tube having an outer circumferential surface and an internal polygonal bore therein;
a shaft having a polygonal surface and extending into said

tube polygonal bore, said shaft cooperating with said tube to provide for limited rotation therebetween; and
flexible means frictionally engaging said tube and said shaft to resiliently oppose the rotation therebetween and permitting axial movement between said tube and said shaft when the axial forces therebetween offset the frictional engagement therebetween, said flexible means extending over at least a portion of said tube outer circumferential surface and having one end frictionally engaged with said tube and the other end frictionally engaged with said shaft, said flexible means biasing said shaft to a rotated position relative to said tube.

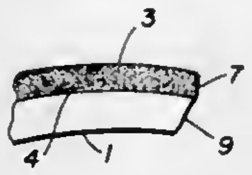
4,106,312
METHOD AND APPARATUS FOR SELECTING NEEDLES IN A CIRCULAR KNITTING MACHINE
Josef Maleř; Evžen Fischer; Miloslav Losert, and Miroslav Kopečný, all of Trebic, Czechoslovakia, assignors to Elitex, Koncern textilniho strojirenstvi, Liberec, Czechoslovakia
Filed Feb. 15, 1977, Ser. No. 768,863
Claims priority, application Czechoslovakia, Feb. 20, 1976, 1114/76
Int. Cl.^{2} D04B *15/68*
U.S. Cl. 66—50 R **2 Claims**



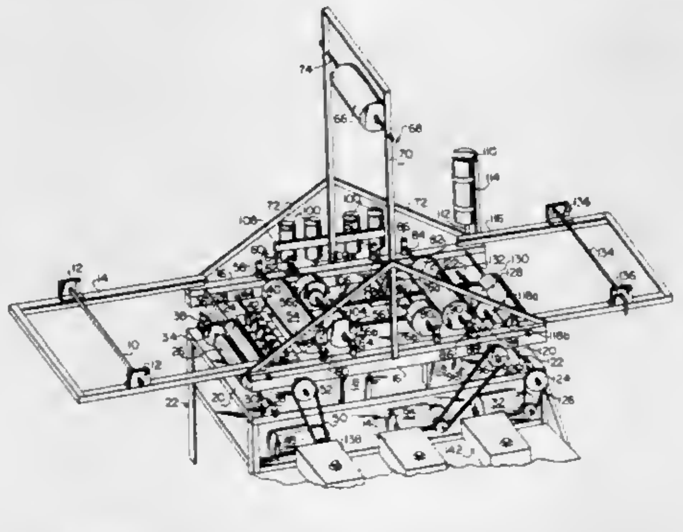
1. The method of controlling the operation of the needles in a circular knitting machine having two yarn feed systems, a cam system and a needle selection system for each needle including at least a needle jack, a selector jack and an intermediate jack located therebetween, cooperating with said cam system to reciprocate the associated needle, comprising the steps of arranging before the stitch knock-over point of one of said feed systems, pattern selection means for rocking certain ones of said selector jacks into engagement with said cam system and a lifting cam arranged after the knock-over point of said one feed system to raise said certain ones of said selector jacks into engagement with said intermediate jack, to engage the needle jack to actuate the associated needles in the other of the feed systems, and arranging prior to the stitch knock-over point of the other of the feed systems a tilting cam to rock the intermediate jacks associated with the selector jacks not rocked by the patterning means into engagement with the cam system and after the stitch knock-over point of the other feed system a lifting cam to raise said rocked intermediate jacks to activate the associated needles in said one feed system.

4,106,313
SHEER STRETCH HOSE HAVING HIGH COMPRESSIVE FORCE UNIFORMITY, AND YARN
Norman W. Boe, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 773,716, Nov. 6, 1968, abandoned. This application Apr. 1, 1971, Ser. No. 130,351
Int. Cl.^{2} D04B *7/18*
U.S. Cl. 66—202 **18 Claims**

1. A garment having a leg portion knitted from a helically crimped yarn, said yarn comprising two side-by-side substantially permanently conjugated components, one of said components being translucent and substantially undyed and the other of said components being dyed.



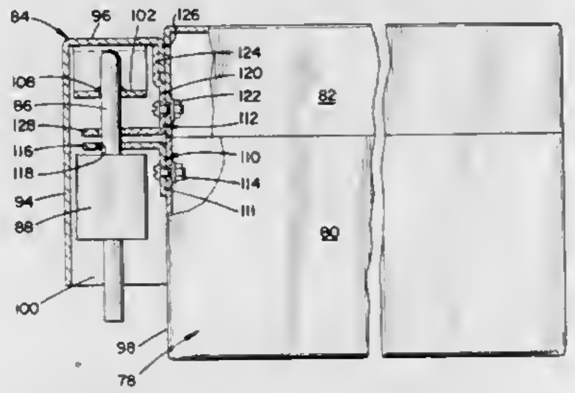
4,106,314
APPARATUS FOR DYEING, OPTIONALLY FIXING AND ELUTING A DYEABLE SUBSTRATE
Gabriel Rostanol Andrianjafy, Hatton, England, assignor to B.S.G. Designs, Inc., England
Filed Jun. 28, 1977, Ser. No. 810,742
Int. Cl.^{2} D06B *1/14, 11/00, 15/02*
U.S. Cl. 68—22 R **8 Claims**



1. An apparatus for dyeing, optionally fixing and eluting a dyeable substrate, said apparatus comprising:
a take-up roller for receiving the dyeable substrate;
roller means, including a driven roller, for receiving said substrate from said take-up roller and for orienting said substrate in a generally horizontal plane;
a dyeing assembly including a plurality of dye containers, a like plurality of discs mounted on a first rotatable shaft so that, for each disc, one edge thereof dips into the container so as to pick up dye therefrom, the opposite edge of each of said discs engaging the substrate;
an idler roller assembly for receiving the substrate after the substrate passes through the dyeing assembly;
a further roller, mounted a substantial distance above the working plane of said apparatus, over which said substrate is entrained;
a further idler roller assembly, for receiving said substrate after said substrate passes over said further roller;
an eluting assembly including a plurality of eluant containers, a like plurality of discs mounted on a second rotatable shaft so that, for each disc, one edge dips into the container so as to pick up eluant therefrom, the opposite edge of each of said discs engaging the substrate;
pinch roller means, including a driven roller, for receiving said substrate from said eluting assembly and pinching said substrate therebetween;
a take-off roller for receiving said substrate from said pinch roller means;
means including a plurality of dye storage tanks mounted on said apparatus for selectively gravity feeding dye to said dye containers;
means, including an eluant storage tank mounted on said apparatus, for feeding eluant to said eluant containers; and

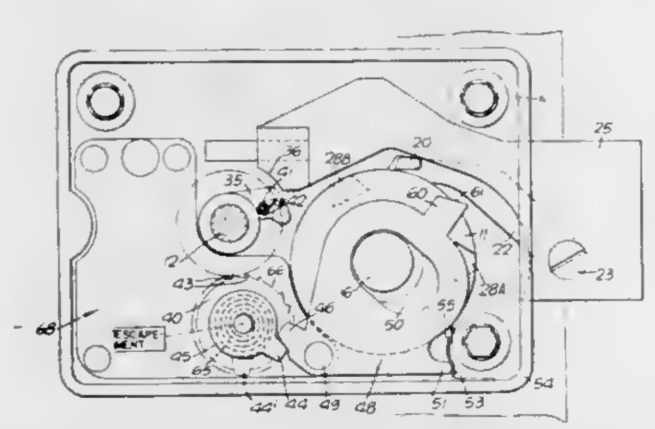
first and second separate drive motor means for selectively driving said first and second shafts at variable speeds.

4,106,315
SHIELDED LOCK ASSEMBLY
John A. Dohanyos, 2711 Vestry Ave., Cleveland, Ohio 44113
Filed Jan. 14, 1977, Ser. No. 759,576
Int. Cl.^{2} E05B *67/38*
U.S. Cl. 70—56 **6 Claims**



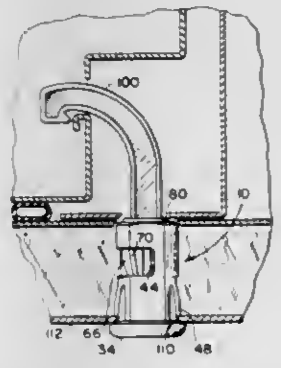
1. A shielded lock assembly comprising in combination:
a housing having at least a single side wall, an outer wall, and an upper wall, said housing being adapted to be positioned adjacent a member such that said side wall, said outer wall and said upper wall cooperate with said member to define a closed generally cup-shaped enclosure with an access opening near the bottom of said enclosure;
at least one locking staple extending from said member into said enclosure;
a shackle and lock body disposed within said enclosure;
a shackle hanger supported interiorly of said enclosure, said shackle being held and retained within said enclosure by said hanger;
said locking staple engaging said shackle in a locked position;
retention means to secure the upper portion of said housing in engagement with said member in a manner so as to render more difficult the removal of said housing away from said member.

4,106,316
KEYLESS COMBINATION LOCKS
Arthur D. Tippin, Tamworth, England, assignor to Chubb & Son's Lock and Safe Company Limited, London, England
Filed Feb. 25, 1977, Ser. No. 772,025
Claims priority, application United Kingdom, Mar. 11, 1976, 9844/76
Int. Cl.^{2} E05B *43/00, 37/08*
U.S. Cl. 70—268 **10 Claims**



1. In a combination lock comprising a bolt, a dial, a plurality of co-operating co-axial combination wheels, means for driving said combination wheels from said dial, and means co-operating with said combination wheels for connecting said dial to said bolt when the correct combination has been dialled for operating said lock, the improvement comprising a rotary member rotatable between a datum position and a second position, means turned by rotation of said dial for driving said rotary member from said datum position to said second position responsive to the excessive rotation of said dial characterizing unauthorized operation, a protective member movable between an inoperative position and an operative position for rendering operation of the lock impossible, said protective member being engaged by said rotary member for being placed in said inoperative position when said rotary member is in said datum position and being moved to said operative position when said rotary member is in said second position and means for returning said rotary member to said datum position thereof after a time delay to return said protective member to said inoperative position.

4,106,317
FREEZER LOCK ASSEMBLY WITH KEY EJECTING MECHANISM
Bruce W. Anderson, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jun. 6, 1977, Ser. No. 803,095
Int. Cl.^{2} E05B *17/00*
U.S. Cl. 70—388 **20 Claims**

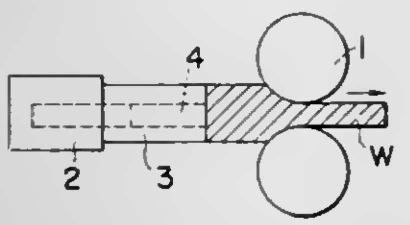


1. A lock having a low co-efficient of thermal conductivity adapted to be mounted in an apertured workpiece including a first body means having a bore therethrough and plug means rotatably mounted within said bore and having integral driver means adapted to directly and slidingly receive a key, resiliently urged key ejector means surrounding and coupled to said plug driver means and axially and rotationally moveable within said bore, and mutually engageable locking means carried by said ejector means and said body means for restraining rotation of said plug at predetermined angular locations.

4,106,318
METHOD AND APPARATUS FOR ROLLING METALLIC MATERIAL
Samon Yanagimoto; Minoru Kawaharada; Shuji Nagata, and Fujimasa Koyama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Kitakyushu, Japan
Continuation of Ser. No. 564,894, Apr. 30, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,868
Claims priority, application Japan, Dec. 17, 1974, 49-145316; May 15, 1974, 49-54027; May 15, 1974, 49-54028
Int. Cl.^{2} B21B *1/00, 1/08, 1/02, 39/06*
U.S. Cl. 72—199 **11 Claims**

1. A method of rolling a steel workpiece by using a rolling mill having opposed working rolls in a fixed position relative to the direction of travel of the workpiece and at a fixed spacing from each other, which method comprises rolling the workpiece between the working rolls while driving said rolls and continuously exerting on the workpiece a force in the direction of movement of the workpiece through the rolling mill in addition to the force exerted in the direction of rolling by the working rolls within the surface of contact of the working rolls and the workpiece and which additional force in the

direction of movement of the workpiece is less than that necessary to stress the workpiece beyond its yield point under the conditions of rolling and having a value $\sigma_p \times A$ where A is the



cross-sectional area of the workpiece and σ_p is the additional exerted force per unit area of the workpiece and is represented by:

$$1 > \frac{\sigma_p}{K} \geqq \frac{1}{a\mu}(\theta - C_1) - \frac{b}{a} > 0$$

where:

K: Yield stress (kg/mm^2) of the workpiece at the rolling temperature
θ: Contact angle of the working roll (rad)
a: Constant
b: Constant
C_1: Constant
μ: Coefficient of friction between the working roll and the workpiece
$\mu = [C_2(1.05 - 0.0005.T) - 0.056\cdot V_R]\,C_3$
C_2: Constant determined according to the material of the working roll; 1.0 in the case of a forged steel roll; 0.8 in the case of a cast steel roll
C_3: Constant determined according to the roll lubrication = 1 ~ 0.1
V_R: Rolling speed (m/sec)
T: Rolling temperature (°C)

whereby an elongation of the workpiece is produced which is much greater than the arithmetic sum of the elongation which would be produced by the driven working rolls alone and the elongation produced by the force in the direction of movement of the workpiece alone for moving the workpiece through non-driven rolls.

4,106,319

APPARATUS FOR HOT-ROLLING NON-FERROUS METALS

Robert Steven Linne, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Mar. 11, 1977, Ser. No. 776,796

Int. Cl.^{2} B21B *1/00*

U.S. Cl. 72—234 **8 Claims**

1. A hot-rolling mill for hot-working of non-ferrous metals including a plurality of successively arranged roll stages comprising a breakdown roll stage, an intermediate roll stage and a finishing roll stage, the work rolls of said finishing stage having a greater hardness than the work rolls of either of said intermediate roll stage and said breakdown roll stage and the work rolls of said intermediate stage having a greater hardness than the work rolls of said breakdown stage.

4,106,320

FORMING OF MATERIALS BY EXTRUSION

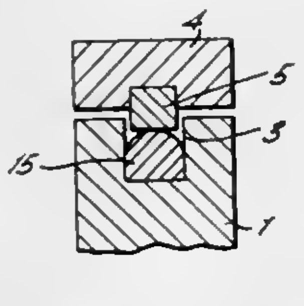
John Alan Pardoe, Lytham Saint Annes; Clifford Etherington, Blackpool, and Eric Hunter, Preston, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 570,782, Apr. 23, 1975, abandoned. This application May 11, 1976, Ser. No. 685,186

Claims priority, application United Kingdom, May 7, 1974, 20119/74; Dec. 11, 1974, 53645/74

Int. Cl.^{2} B21C *23/21, 23/32*

U.S. Cl. 72—256 **8 Claims**



1. In an extrusion process in which the force for extrusion of a material through a die means is derived by maintaining frictional engagement of the said material with passageway-defining surfaces of a member which is moved toward the die means, relative to a non-moving part of the passageway surface, such that frictional drag of the moving passageway-defining surfaces urges the said material through the die means, the improvement, for enhancing the force available for extrusion, wherein the cross-sectional configuration of said material in said passageway over an initial lengthwise portion thereof is such that over said initial lengthwise portion said material makes generally lengthwise line contact with said non-moving part and substantially greater than lengthwise line contact with one of the passageway-defining surfaces of said moving member.

4,106,321

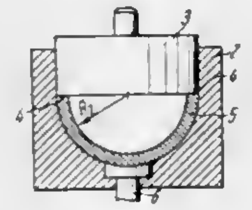
METHOD OF PRODUCING MOULDED PARTS

Mikhail Alexandrovich Platonov, Profsojuznaya ulitsa, 96, kv. 100, and Grigory Vasilievich Pokrovsky, 9 ulitsa Sokolinoi gory 1, kv. 15, both of Moscow, U.S.S.R.

Continuation of Ser. No. 584,170, Jun. 5, 1975, abandoned, which is a continuation of Ser. No. 497,735, Aug. 15, 1974, abandoned, which is a continuation of Ser. No. 396,221, Sep. 11, 1973, abandoned. This application Apr. 30, 1976, Ser. No. 682,104

Int. Cl.^{2} B21D *22/00*

U.S. Cl. 72—348 **1 Claim**



1. A method of producing a moulded part comprising the steps of: bending a blank to form bending sections having open upper end edges and a radius less than a given bending radius of a part to be produced; placing the bent blank completely in a die; and exerting pressure only on the open upper end edges of the blank along the generant of the bending sections with a resultant gradual increase of the bending radius to the given bending radius.

4,106,322

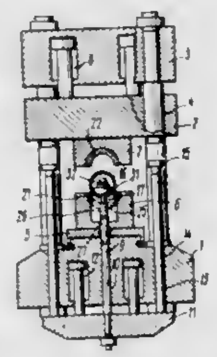
PRESS FOR PRESSING PIPE FITTINGS

Evgeny Nikolaevich Moshnin, ulitsa Akademika Pavlova, 50, kv. 5; Alexei Fedorovich Nistratov, ulitsa Khlobystova, 16, korpus 1, kv. 48; Viktor Alexeevich Odnodushny, Stremyanny pereulok, 2/12, kv. 8; Nikolai Ivanovich Romashko, Sumskoi proezd, 12, korpus 4, kv. 108, and Nikolai Pavlovich Schlyakhin, Stremyanny pereulok, 17/12, kv. 43, all of Moscow, U.S.S.R.

Filed Sep. 22, 1976, Ser. No. 725,506

Int. Cl.^{2} B21D *22/00*

U.S. Cl. 72—356 **7 Claims**



1. A press for pressing pipe fittings from tubular billets comprising: a stationary crosshead; a sliding table mounted on said stationary crosshead; a lower die mounted on said sliding table, a vertical passage along the press axis and extending through said stationary crosshead, said sliding table and said lower die; a movable crosshead located above said stationary crosshead and carrying an upper die; a third crosshead, connecting means for interconnecting said stationary crosshead, said movable crosshead, and said third crosshead comprising pillars; a drive means associated with said third crosshead for reciprocating said movable crosshead whereby said upper die is moved into engagement with said lower die; a pulling device means for pulling a punch along the press axis and through a tubular billet comprising a rod carried within said vertical axial passage of said stationary crosshead, an auxiliary crosshead positioned below said stationary crosshead, means for connecting said rod to said auxiliary crosshead, pulling device drive means associated with said stationary crosshead and connected to said auxiliary crosshead for driving said auxiliary crosshead with respect to said stationary crosshead thus moving said rod within said vertical axial passage, said auxiliary crosshead further comprising a pair of vertical spindles with stops mounted at the ends of the vertical spindles for contacting said movable crosshead at the beginning of radial compression of the tubular billet by said upper and lower die, wherein said rod is axially movable a first predetermined distance by means of said movable crosshead contacting said stops mounted at the ends of said vertical spindles and moving said vertical spindles until said upper die carried on said movable crosshead contacts said lower die mounted on said sliding table, and axially movable a second predetermined distance by said pulling device drive means.

4,106,323

BENDING TOOL

Eduard J. Haenni, Zofingen, and Vaclav Zbornik, Oftringen, both of Switzerland, assignors to Haennerle AG, Zofingen, Switzerland

Filed Jun. 21, 1976, Ser. No. 698,007

Claims priority, application Austria, Jun. 24, 1975, 4849/75; Oct. 13, 1975, 7808/75; Apr. 2, 1976, 2404/76

Int. Cl.^{2} B21D *7/06*

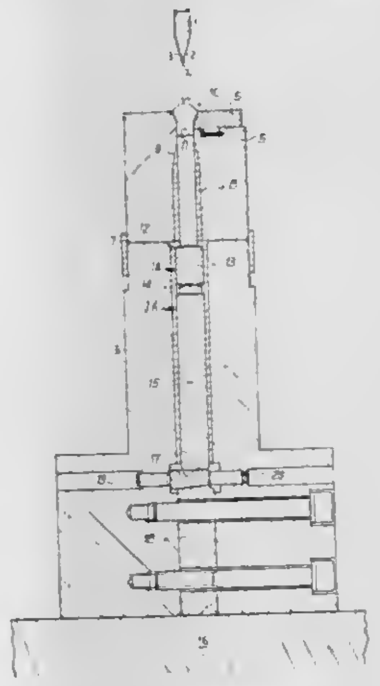
U.S. Cl. 72—389 **5 Claims**

1. A bending device adapted to be connected to a bending press for the bending of sheet metal in said press, comprising in combination:

a male bending die adapted to be connected to the ram of the bending press with a tapered end, and a female bending die resting on a die support, said female die having a longitudinal groove on its top side facing said male die and cooperating with said tapered end of said male die;

said longitudinal groove determining by its width and depth the bending angle to be achieved in the sheet metal workpiece fitted between said male die and female die whereby at least one of the limiting planes of the groove is displaceable in its position relative to the other limiting planes of the groove to change the shape of the groove and thereby the angle to be bent in the sheet metal;

a displaceable jaw on said female die to change the width of said groove, said jaw having a first guide means protruding from said displaceable jaw and engaging a first guide notch in the base part of said female die, said first guide means and said first guide notch extending in an angle to said groove, the width of said groove thereby changing by sliding said first guide means along said first guide notch, and



a displaceable support means to change the depth of said groove, said support means resting on a second guide means arranged in a second guide notch in said die support of said female die, a displacement of said second guide means varying the depth of said groove.

4,106,324

FEEDING MECHANISM

Martin Götz, Sersheim, Germany, assignor to Erich Grau Stanzwerk fur Elektrobleche, Sersheim, Germany

Filed Nov. 10, 1975, Ser. No. 630,417

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1974, 2454460

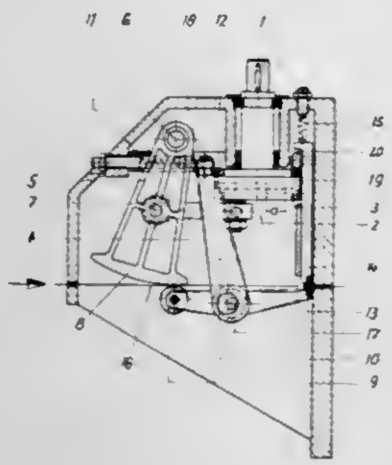
Int. Cl.^{2} B21D *43/02;* **B26D** *5/20;* **B65H** *17/36*

U.S. Cl. 72—421 **9 Claims**

1. The combination with a processing machine having an eccentric shaft, of

a feeding mechanism for intermittently feeding stock to said machine, which feeding mechanism comprises a rocker lever having at its outer end an arcuate surface shaped according to an arc of a circle, a crank drive driven by the processing machine comprising a crank which is operatively connected to said rocker lever to impart oscillation thereto, a camwheel operatively connected to said crank, a clamping roller adapted to cooperate with said arcuate surface and forming a feeding clamp therewith, a retaining clamp for holding stock in position,

a double bell-crank lever having a first, second and third arm, said first arm carrying said clamping roller, said third arm forming part of said retaining clamp, and said second arm connecting said first arm and said third arm and positioned for operative connection to said camwheel, a control means including said bell-crank lever, said camwheel and spring means for operatively urging said second arm of said bell-crank lever against said camwheel,



said control means adapted to oscillate said bell-crank lever between a first position in which said feeding clamp is open and said retaining clamp is closed, to a second position in which said feeding clamp is closed and said retaining claim is open.

4,106,325

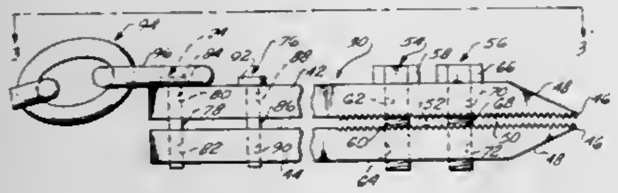
CHISEL CLAMP FOR USE IN STRAIGHTENING AUTOMOBILE BODIES

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed May 27, 1976, Ser. No. 690,404

Int. Cl.² B21D *1/12*

U.S. Cl. 72—457 **15 Claims**



1. A chisel clamp for use in the application of force when straightening an automobile body member, the clamp comprising a pair of elongated jaws each having a blade edge at one end, and an elongated serrated clamping surface extending inboard from the blade edge; fastening means for releasably extending through the serrated portions of the jaws and for being loosened or tightened so the serrated clamping surfaces of the jaws can apply a controllable amount of pressure to the opposite sides of a workpiece sandwiched between the jaws; alignment means for extending through a portion of the jaws on a side of the fastening means opposite the blade edges for holding the jaws in an overlying relation so the clamping surfaces thereof face one another and for aligning the jaws with one another to facilitate extending the fastening means through the jaws; and flexible chain means rigidly affixed to at least one of the jaws adjacent an end thereof opposite the blade edge for use in cooperating with the jaws to apply force to an automobile body member via the attachment to the workpiece.

4,106,326

INITIALIZATION AND PREPARATION OF ON-PRODUCTION-LINE ULTRASONIC TEST EQUIPMENT

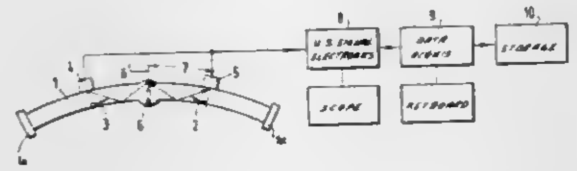
Dieter Lather, Rheurdt, and Karl Ries, Mulheim, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,451

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613799

Int. Cl.² G01N *29/04*

U.S. Cl. 73—1 DV **4 Claims**



1. Method of initializing and preparing an ultrasonic test stand in a production line for on-line testing of production objects in and passing through the line, comprising the steps of:

providing a dummy, representing a zone of a production object to be traversed by ultrasonic radiation dummy testing;

orienting and positioning an individual test head with reference to said dummy in particular relation to the zone;

conducting first ultrasonic tests by means of the test heads as oriented and positioned under utilization of test circuitry, the tests including (i) generating and launching a test pulse into the dummy, (ii) detecting a particular return echo, (iii) determining an amplitude of the return echo, and (iv) adjusting the timing of a particular gating period on the basis of the detected occurrence of the said return echo;

replacing the dummy by a standard for each test head;

conducting second ultrasonic tests by means of the test heads and the standard and under utilization of the same test circuitry as in the first tests, the second tests including (i) generating and launching a test pulse into the standard; (ii) detecting a particular return echo; (iii) determining an amplitude of the latter return echo; and (iv) determining the transit time of the latter return echo;

arithmetically relating and referencing (i) the amplitudes as acquired pursuant to said first and second tests as conducted and separately for each test head, to obtain amplitude calibration signals; and (ii) arithmetically relating the adjusted timing of the gating period as per the first tests and the transit times of the return echos as per the second tests to obtain timing calibration signals, also separately for each test head;

storing the amplitude and timing calibration signals;

placing the test heads in positions in said test stand being the same or corresponding positions the test heads had in relation to said dummy during the first mentioned conducting test;

repeating the second ultrasonic tests conducting step with the test head in test stand position but with said standard in position as in said second conducting step and under utilization of a different test circuit to obtain again an amplitude and a transit time for a return echo; and

using the amplitude and transit time data as acquired pursuant to the last mentioned, repeated conducting step and the stored amplitude and timing calibration signals, for adjusting the said test circuit to obtain therein a particular gating period and amplitude response for the subsequent on line testing.

4,106,327

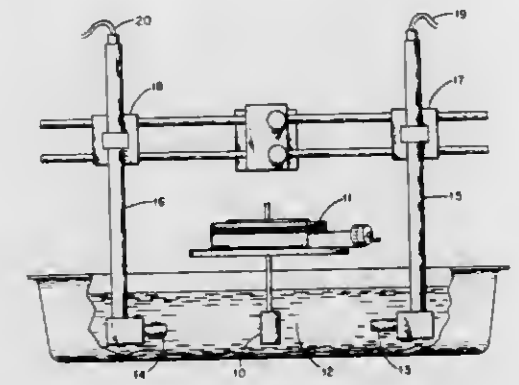
ANISOTROPIC DETERMINATION AND CORRECTION FOR ULTRASONIC FLAW DETECTION BY SPECTRAL ANALYSIS

Laszlo Adler, Knoxville; K. Von Cook, Clinton; William A. Simpson, Jr., and D. Kent Lewis, both of Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 22, 1977, Ser. No. 853,947

Int. Cl.² G01N *29/00*

U.S. Cl. 73—1 DV **10 Claims**



1. A method for determining the true velocity of sound in an anisotropic material as a function of orientation comprising the steps of obtaining a plurality of respective samples of said material along at least three mutually perpendicular axes therethrough, sequentially positioning each of said respective samples between an ultrasonic transmitter and an ultrasonic receiver in a sound coupling liquid, slowly rotating each of said samples during the time each sample is positioned between said transmitter and receiver, sequentially deriving a series of polar plots as a function of orientation from the output of said ultrasonic receiver for each of said samples during the time each of said rotating samples is in position between said transmitter and receiver, and determining said true velocity of sound in said anisotropic material for a desired orientation from said polar plots, whereby said true velocity can subsequentially be utilized in a spectral analysis method for quantitatively determining the size and location of flaws within another sample of said material.

4,106,328

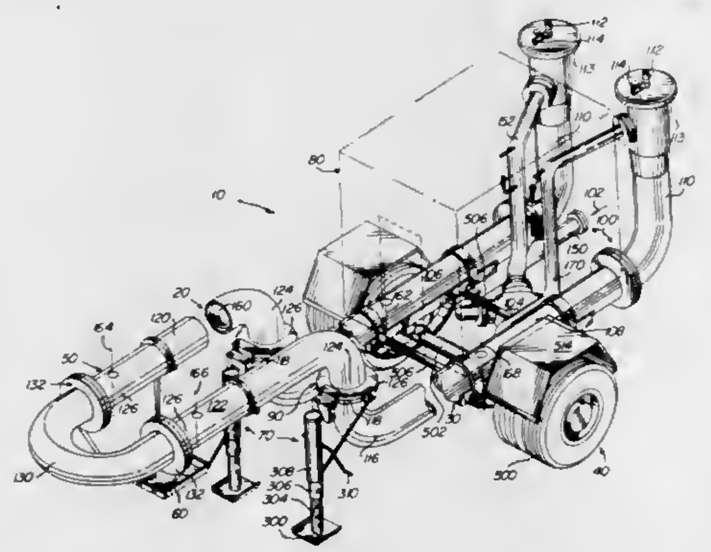
PORTABLE PROVER BARREL

Harry B. Neeff, 1530 E. "C" St., Casper, Wyo. 82602

Filed Oct. 6, 1977, Ser. No. 834,334

Int. Cl.² G01F *25/00*

U.S. Cl. 73—3 **10 Claims**



1. A portable prover barrel apparatus, said apparatus comprising:

a lower section with left and right tubes, each of the aforesaid tubes being horizontal and parallel to each other and terminating in a vertical upstanding tubular rear end and in a vertical upstanding tubular connector at the front end,

a wheel assembly connected to said lower section, said wheel assembly comprising:
  (a) an axle,
  (b) wheels operatively connected to opposing ends of said axle, and
  (c) means engaging the mid-section region of said left and right lower section tubes for mounting said lower section to said axle,

an upper section with left and right tubes, each of the aforesaid tubes being horizontal and parallel to each other and terminating, at the rearward end, in a downwardly extending vertical tubular connector,

a U-shaped tubular portion operatively interconnected with the forward ends of said upper section left and right tubes, said upper section and said U-shaped tubular portion being positioned above and parallel to said lower section left and right tubes,

a fifth wheel male assembly mounted to said upper section left and right tubes near said U-shaped portion, and

means for connecting said lower's upstanding connector to said upper section's downwardly extending connector.

4,106,329

SOLID OR WATER QUANTITY MEASUREMENT APPARATUS USING MICROWAVES

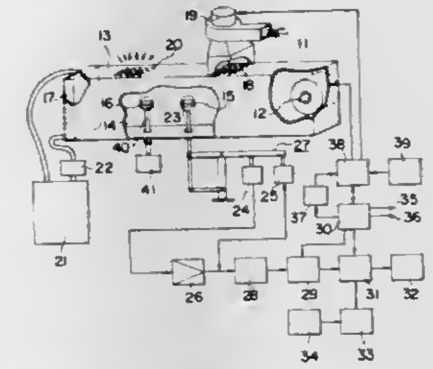
Yoshiyuki Takahasbi, Aikawamachi; Akibiko Nagai, Ebina; Sbigenobu Kawawa, Machida; Hidetaka Kubozono, and Mitsuo Tanaka, both of Atsugi, all of Japan, assignors to Anritsudenki Kabusbikigaisha, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 790,992

Claims priority, application Japan, Apr. 26, 1976, 51-46514

Int. Cl.² G01N *5/04*

U.S. Cl. 73—15 B **13 Claims**



1. A solid or water quantity measurement apparatus using microwaves, comprising:

a waveguide forming an oven with an inner space and two ends, at one end of which a microwave oscillator is assembled and at the other end of which a dummy is assembled;

a balance having a weight detection plate in said waveguide and assembled with said waveguide;

means for discharging evaporated water in said waveguide away from said waveguide; and

a sample plate attachable on and detachable from said weight detection plate in said waveguide.

4,106,330

TENSION SENSOR

Donald R. Hinrichs, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Apr. 12, 1977, Ser. No. 786,894

Int. Cl.² G01L *5/04*

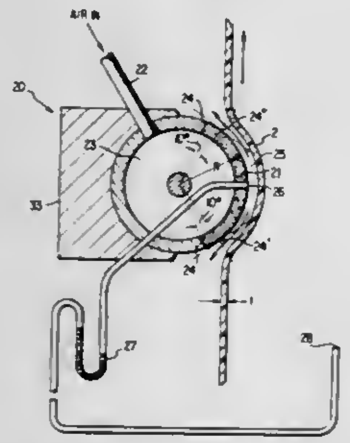
U.S. Cl. 73—37.7 **8 Claims**

3. A method for determining tension within a thin, flexible

member by utilizing a device which includes an enclosure, said enclosure having a porous and permeable wall section adapted for passing a gas flow therethrough with an axial dimension substantially smaller than its radial dimension, and a probe extending to the outer surface of said active surface of said enclosure, comprising the successive steps of:

providing a continuous flow of gas into said enclosure so that said gas flow exits from said enclosure through said porous wall section,

bringing said device into close proximity with said flexible member such that the axis of said device is perpendicular to the direction along which tension is to be measured and



such that the gas flowing from said porous wall section concentrically and elastically deflects said member away from said section,

measuring the static pressure in the passageway defined by the outer surface of said porous wall section and the concentrically deflected surface of said member, and

computing the tension within said member according to the relationship

$$T = R(\Delta P)$$

where T is tension, R is the radius of the active surface of the enclosure and ΔP is the pressure differential between the opposing surfaces of the flexible member.

4,106,331

METHOD AND APPARATUS FOR DETECTING CONTAMINATION OF LIQUIDS

John Darrah Bunton, and David John Marsh, both of Bromsgrove, England, assignors to G.K.N. Group Services Limited, Smethwick, England

Filed May 6, 1977, Ser. No. 794,658

Claims priority, application United Kingdom, May 6, 1976, 18548/76; Jul. 9, 1976, 36963/76

Int. Cl.² G01N *25/00, 33/28*

U.S. Cl. 73—61.1 R **4 Claims**

1. A method of detecting fluid contaminants in a liquid comprising the steps of

heating a temperature sensing element to a relatively high initial temperature;

immersing said sensing element in a sample of the liquid to be tested;

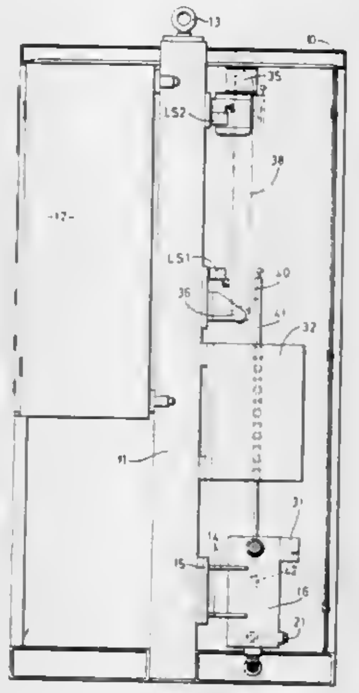
allowing said sensing element to cool naturally in said liquid until a first predetermined temperature below said initial temperature is reached;

initiating timing means in response to the element reaching said first predetermined temperature;

allowing said sensing element to continue cooling naturally in said liquid until a second predetermined temperature is reached;

measuring the time interval between the initiation of the timing means and the sensing element reaching said second predetermined temperature;

and comparing said time interval with a time interval representing the rate of cooling of the sensing element in a sample of the liquid having an acceptable level of contamination, between the same first and second predetermined temperatures, said first and second predetermined temperatures being selected, in accordance with the type of liquid to be tested, as delimiting a range of temperatures over which the presence of fluid contaminants in the liquid causes a substantial measurable deviation from the normal cooling power of the liquid.



4,106,332

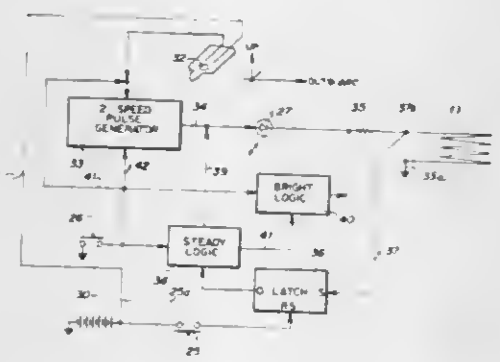
RECORDING MONITOR FOR STRUCTURE FAULTS

William L. McKeown, Euless, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Apr. 4, 1977, Ser. No. 784,146

Int. Cl.² G08B *21/00*

U.S. Cl. 73—104 **7 Claims**



1. A crack detection system for aircraft structure having a normally conductive test circuit affixed to said structure and subject to being temporarily rendered noncontinuous under stress and to regaining continuity when stresses are removed which comprises:

(a) an oscillator for periodically applying a search pulses to said test circuit and including a visual indicator energized by current flow due to each pulse,

(b) latch means connected to said test circuit and responsive to high voltage levels for setting a circuit condition therein, and

(c) test means for utilizing said condition for actuating said oscillator to energize said indicator in a first sense responsive to said condition and in a second sense when said condition is nonexistent.

4,106,333

METHOD OF AND APPARATUS FOR EXAMINING THE ROUGHNESS OF SURFACES

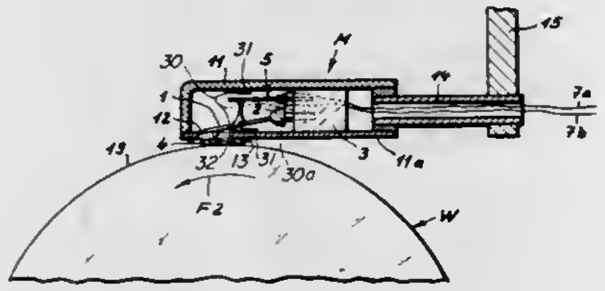
Ernst Saljé, Schulheide 4, D.2106 Bendestorf, Germany, and Heinrich Mushardt, Ahstedt, Germany, assignors to Ernst Saljé, Bendestorf, Germany

Filed Aug. 9, 1976, Ser. No. 712,829

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1975, 2535912

Int. Cl.² G01B *5/28*

U.S. Cl. 73—105 **17 Claims**



1. A method of examining roughness of a surface of a workpiece utilizing a sensing element means for providing mechanical movement in response to the roughness of said surface, and support element means for holding said sensing element means and having a natural frequency of oscillation, said method comprising the steps of:

effecting relative movement between said sensing element means and said workpiece surface;

engaging said workpiece surface by said sensing element means, causing said sensing element means to be stimulated by said relative movement such that said support element means oscillates at said natural frequency; and

producing a value corresponding to the magnitude of said oscillation, said value indicative of the roughness of said surface.

4,106,334

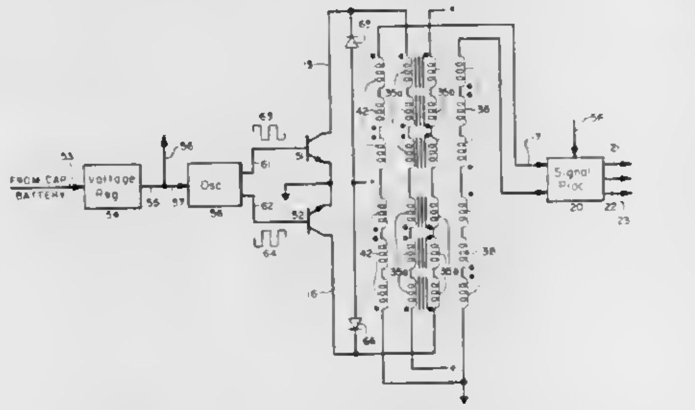
TORQUE TRANSDUCER WITH CLOSELY COUPLED PRIMARY WINDINGS

George Henry Studtmaon, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 16, 1977, Ser. No. 797,208

Int. Cl.² G01L *3/10*

U.S. Cl. 73—136 A **7 Claims**



1. An indicating system for providing an information signal regarding at least one characteristic of a rotatable shaft, comprising:

a transducer, including first, second, and third physically separated magnetic cores, a first primary winding wound on the first magnetic core, a second primary winding wound in a closely coupled manner adjacent the first winding on the first magnetic core, a first secondary winding disposed on the second magnetic core, and a second secondary winding disposed on the third magnetic core, with means for connecting both secondary windings to produce the information signal when the primary windings are energized;

first and second switches, each connected to complete a circuit for current flow through one of the primary windings when that switch is actuated; and

means for regulating operation of the switches to provide an energizing flux adjacent the first magnetic core, to develop the information signal in said secondary winding.

4,106,335

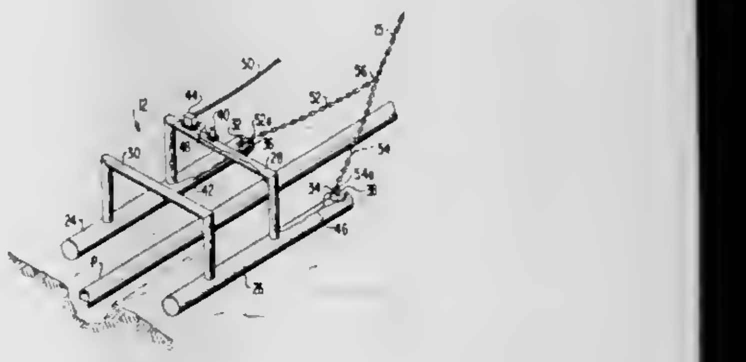
SEA SLED TOW LINE VECTOR SYSTEM

Harry H. Shatto, Laguna Beach, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Filed Dec. 27, 1976, Ser. No. 753,983

Int. Cl.² G01L *5/10*

U.S. Cl. 73—143 **66 Claims**



61. In a subsurface towing system, wherein a subsurface body is towed by a surface tow vessel, said towed body and surface vessel being connected by cable means, a method of remotely monitoring the attitude of said towed body, comprising:

measuring first and second non-colinear forces acting between said cable means and said towed body at the location where said cable means is coupled to said towed body; and

determining the deviation of said cable means relative to reference axis of said towed body from said measured first and second forces.

4,106,336

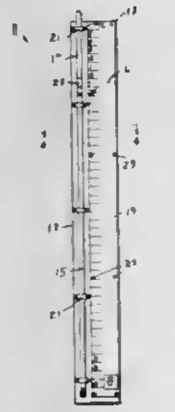
FULL-SEASON RAIN GAUGE HAVING REPLACEABLE CHARTS FOR MAKING PROFILE GRAPHS

Clement F. Marley, P.O. Box 93, Nokomis, Ill. 62075

Filed Nov. 10, 1976, Ser. No. 740,761

Int. Cl.² G01W *1/14*

U.S. Cl. 73—171 **6 Claims**

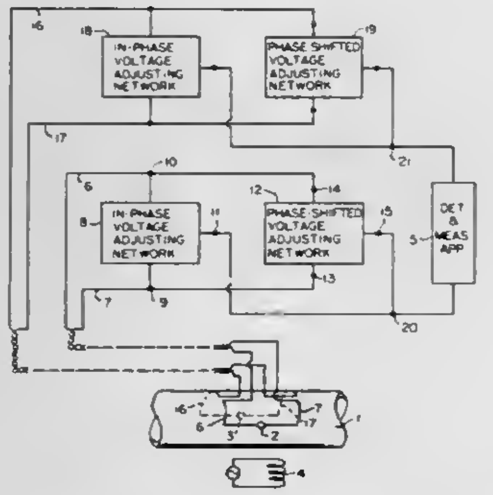


1. A rain gauge comprising: a support panel, a vertically disposed translucent season-height gauge tube mounted on said panel, a shorter translucent gauge tube attached co-axially above to said season-height tube, the interconnection between

said tubes being constructed and arranged to facilitate discharge of rain water from said shorter tube into said season-height tube, and a calibrated record chart removably and replaceably mounted laterally adjacent said tubes and adapted for subsequent juxtapositioning with similar charts for providing a seasonal rain-profile graph.

4,106,337
MAGNETIC FLOW METER NULLING SYSTEM

Harry Louis Trietley, Jr., Brighton, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed May 19, 1976, Ser. No. 687,674
Int. Cl.² G01F *1/60*
U.S. Cl. 73—194 EM **2 Claims**


IN-PHASE VOLTAGE ADJUSTING NETWORK
PHASE SHIFTED VOLTAGE ADJUSTING NETWORK
IN-PHASE VOLTAGE ADJUSTING NETWORK
PHASE SHIFTED VOLTAGE ADJUSTING NETWORK
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1. An electromagnetic flowmeter system, including in combination,

a. a primary element for producing an electrical potential difference proportional to the flow rate of flowing electrically-conductive material, and

b. a detecting and measuring circuit for measuring said electrical potential difference such as to produce a measure of the rate of flow of said material through said primary element;

c. said primary element having field means for producing an AC magnetic field in the path of said material and for directing said field transverse to the direction in which said material flows through said primary element;

d. said primary element having a first electrode, the electrical potential of which is due to voltage at a first location in said material, due to flow of said material through and transverse to the direction of said field;

e. said primary element having a second electrode, the electrical potential of which is due to voltage at a second location in said material, due to said flow of said material, said locations being spaced one from the other along a line transverse to said flow;

f. said primary element having a first lead circuit connected to said first electrode and a first output terminal for presenting a first output voltage corresponding to the potential of said first electrode;

g. said primary element having a second lead circuit connected to said second electrode and having a second output terminal for presenting a second output voltage corresponding to the potential of said second electrode;

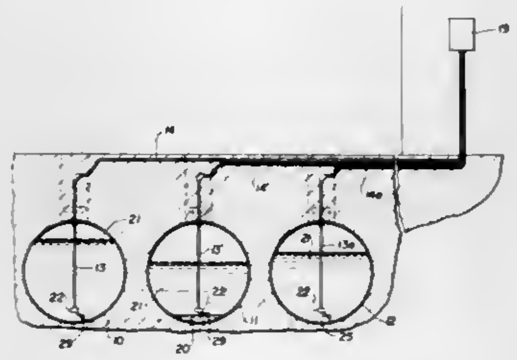
h. said first lead circuit having therein an adjusting element for adjusting the amplitude of said first output voltage with respect to the potential of said first electrode;

i. said second lead circuit having therein an adjusting element for adjusting the amplitude of said second output voltage, with respect to the potential of said second electrode;

j. said first lead circuit also having an adjusting element for adjusting the phase of said first output voltage with respect to the phase of said second output voltage; each said lead circuit comprising a pick-up loop, said loop incorporating the corresponding said electrode, and each said lead circuit including therein, remote from the corresponding said electrode, a potentiometer of which the slide wire is a series element of such loop, said slide wire being connected to an input terminal of said detecting and measuring circuit.

4,106,338
WATER DETECTOR MEANS FOR TANK LIQUID LEVEL MEASURING SYSTEM

John H. Castle, Tulsa, Okla., assignor to Control Marketing Associates, Tulsa, Okla.
Filed Oct. 21, 1977, Ser. No. 844,517
Int. Cl.² G01F *23/16*
U.S. Cl. 73—302 **7 Claims**



1. In a liquid level measuring system for liquid storage vessels, a liquid level measuring gage, a conduit connected with said gage and projecting into a liquid storage vessel near the bottom thereof, and pumping means common to a compression chamber of the gage and said conduit and operable to evacuate liquid from the conduit by pressure while simultaneously pressurizing the compression chamber of said gage, the improvement comprising a float valve means on the lower end of the conduit near the bottom of the liquid storage vessel and adapted in an open condition to uncover an orifice communicating with the conduit, and in a closed condition to cover said orifice whereby pressure in the conduit developed by said pumping means increases and causes said gage to provide a maximum reading indicating the presence in the bottom of the storage vessel of a contaminating liquid having a specific gravity greater than that of the stored liquid in the vessel above the contaminating liquid, said float valve means having a float element which is adapted to float in the contaminating liquid and which sinks in said stored liquid of lesser specific gravity.

4,106,339
WIND CHILL METER AND METHOD OF MEASURING WIND CHILL EFFECT

John Stephen Baer, Schooner Head, Bar Harbor, Me. 04609
Filed Sep. 28, 1977, Ser. No. 837,103
Int. Cl.² G01K *13/00*
U.S. Cl. 73—339 C **14 Claims**

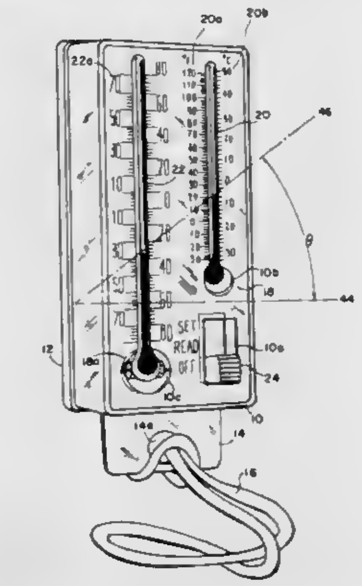
1. A wind chill meter comprising in combination

first and second temperature measuring means, the first being conventionally calibrated and the second being calibrated in the same temperature scale as the first but with that scale offset so that the normal reading is low by an amount representative of a preselected chill effect,

heater means associated with the second temperature measuring means, having appropriate energizing means,

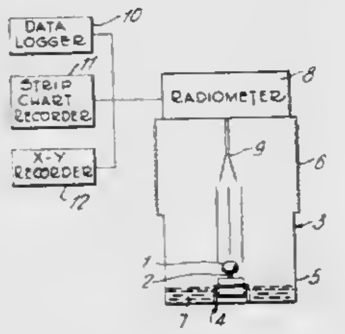
means for selectively energizing said heater means so that at one selection position, upon energizing the heater means, the indication of the second temperature measuring means can be made to rise to the level calibrated to correspond to the temperature shown on the first temperature measuring means and in a second selection position that level can be maintained in the absence of wind, and

wind shield means for selectively shielding at least heater means associated with the second temperature measuring means or permitting the wind to cool said heater means associated with said second temperature measuring means.



4,106,340
GRADING AGRICULTURAL PRODUCTS WITH A MICROWAVE ANTENNA

Michael A. Hamid, Winnipeg, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada
Filed Oct. 1, 1976, Ser. No. 728,651
Claims priority, application Canada, Apr. 7, 1976, 249712
Int. Cl.² G01J *5/46*; H04B *7/00*
U.S. Cl. 73—355 R **5 Claims**



1. A method for contactless grading a plurality of objects, comprising:

(a) scanning a selected said object with a microwave radiometric antenna means at a series of frequencies in the range 12–18 GHz and measuring radiometric output intensity from said object to thereby establish an optimum frequency corresponding to maximum radiometric output;

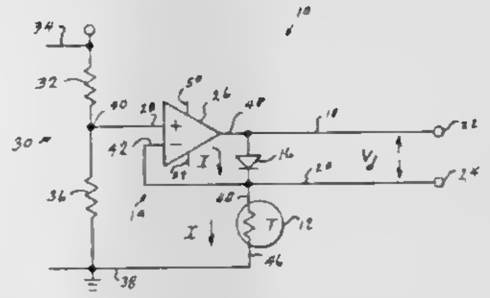
(b) sequentially bringing a plurality of said objects into close proximity with said antenna means and effecting relative movement therebetween so as to scan each of said objects;

(c) measuring the radiometric output intensity for each said object at said optimum frequency to thereby establish a signature for each said object; and

(d) relating said signatures to a preselected non-electric parameter of said object whereby said objects may be graded by comparing their respective signatures to a standard established for that parameter.

4,106,341
LINEARIZED THERMISTOR TEMPERATURE MEASURING CIRCUIT

Juan de J. Serrano, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Jan. 3, 1977, Ser. No. 756,233
Int. Cl.² G01K *7/24*
U.S. Cl. 73—362 AR **11 Claims**



11. A method of linearizing the output of a thermistor having an exponential resistance-temperature characteristic, which method comprises:

sensing voltage across the thermistor;

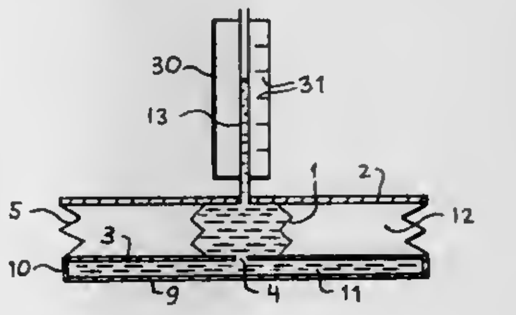
controlling current through the thermistor as required to maintain the sensed voltage substantially constant; and

supplying current to a forwardly biased decoder diode having an exponential current-voltage characteristic in response to the current through said thermistor;

whereby the resultant voltage across the decoder diode is a substantially linear function of the temperature sensed by the thermistor.

4,106,342
PRESSURE MEASURING APPARATUS

Onni Sőre Sörmuoen, Boovagen 53, 13200 Saltsjo-Boo, Sweden
Filed Apr. 14, 1977, Ser. No. 787,671
Int. Cl.² G01L *7/06*
U.S. Cl. 73—386 **5 Claims**



1. A pressure measuring apparatus, useful as a barometer, comprising

a first variable volume vessel containing a gas, said first vessel being extendable and retractable between a first end and a second end thereof, the pressure to be measured acting on said first vessel

a second variable volume vessel containing a substantially incompressible liquid, said second vessel being extendable and retractable between a first end and a second end thereof,

a riser tube communicating with the interior of said second vessel for indicating the pressure acting on said first vessel,

a first member joined to said first end of said first vessel and a second member joined to said second end of said first vessel,

said first end of said second vessel being joined to one of said members,

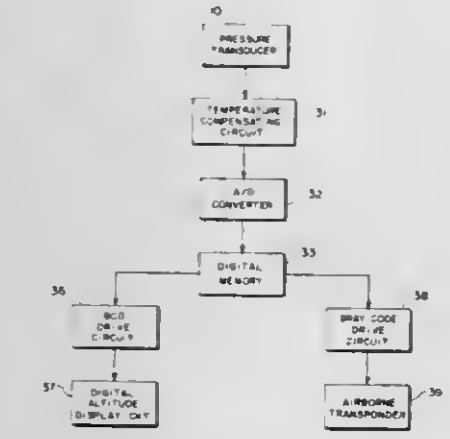
said second end of said second vessel being joined to the other of said members, said members being relatively movable toward and away from each other in parallel relationship

whereby a temperature induced pressure variation of said gas and a temperature induced volume variation of said liquid compensate each other.

4,106,343
SOLID STATE BAROMETRIC ALTIMETER-ENCODER

Harry Cook, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1977, Ser. No. 801,937
Int. Cl.² G01L *7/14*
U.S. Cl. 73—387 **4 Claims**



1. A barometric altimeter-encoder which comprises:

pressure sensing means to electronically sense pressure and to generate an analog voltage signal which is proportional to the applied atmospheric pressure:

analog-to-digital converter means to convert said analog voltage signal into a corresponding digital pressure signal;

memory means including look-up table means, having address inputs, a first set of data outputs, and a second set of data outputs, with connections from the analog-to-digital converter means to said address inputs, so that for each possible value of the digital pressure signal there are output signals at the first set of data outputs in a first digital code indicating altitude, and output signals at the second set of data outputs in a second digital code also indicating altitude;

baroset digital switch means for setting a value representing the current site atmospheric pressure, baroset converter means to convert the last said value to the first digital code, arithmetic combining means with input connections from the first set of data outputs and from the baroset converter means to correct the signals from the first set of data outputs to give the true altitude above sea level;

display means to visually display the output from said combining means;

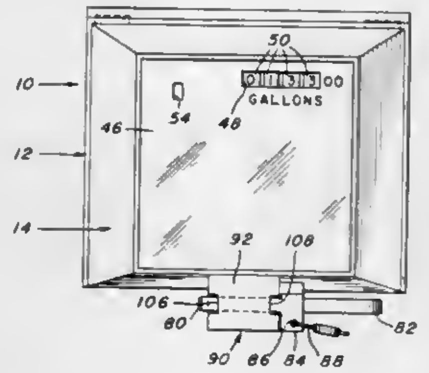
and a transponder having inputs from said second set of data outputs for transmitting signals representing the altitude in said second digital code to a remote receiver.

4,106,344
HOUSING FOR ELECTRO-MECHANICAL COUNTER

Eberbard Moll, Magstadt, Fed. Rep. of Germany, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 27, 1977, Ser. No. 810,335
Int. Cl.² G01D *11/24*
U.S. Cl. 73—431 **4 Claims**

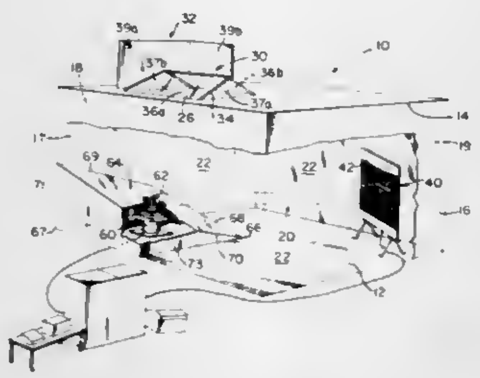
1. A tamperproof housing for a remote counter comprising, a base member molded of impact-resistant material having provision for mounting said counter, and a cover member of impact-resistant material having interengaging portions when assembled with said base, said interengaging portions being tongue and groove members on one mating surface of said base and said cover, and upstanding leg members projecting from an opposed surface of said base, said leg members cooperating with said cover to retain said tongue and groove members in assembled relation, and a locking pin integral with said base for retaining said base and said cover together when said members are assembled.



4,106,345
SIMULATION FACILITY FOR DYNAMICALLY TESTING GUIDANCE SYSTEMS WHICH USE RADIOMETRIC FREQUENCIES

Ronald A. Saunders, 27626-145 Pl. SE., Kent, Wash. 98031, and Donald A. Willard, 2766 Westlake N., Seattle, Wash. 98101

Filed Aug. 3, 1977, Ser. No. 821,607
Int. Cl.² G01S *11/00*
U.S. Cl. 73—432 SD **9 Claims**



1. A simulator for use in the dynamic testing of guidance systems which use radiometric frequency energy emitted by the components of a terrestial scene for guidance information, the simulator comprising:

a chamber, wherein said chamber (1) has interior surfaces which have a low emissity at radiometric frequencies, and (2) includes an opening to a heat sink capable of receiving radiometric frequency energy from said chamber, so that a low background level of radiometric frequency energy is maintained in said chamber;

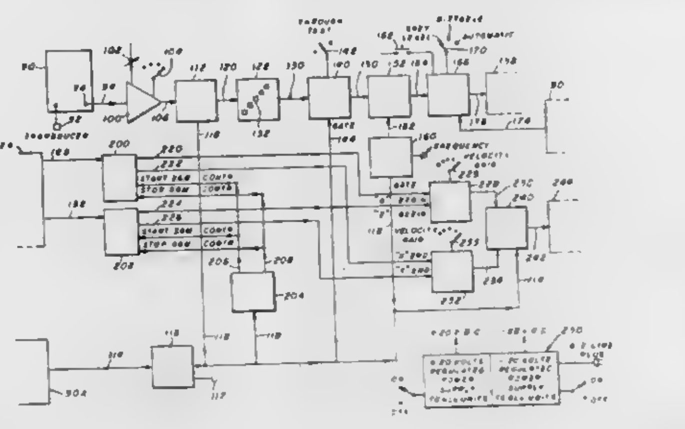
an array of radiometric energy means located in said chamber for producing in operation a variable-intensity pattern of radiometric frequency energy, said pattern simulating the pattern of radiometric frequency energy produced by the components of a particular terrestial scene, wherein in simulator operation, the radiometric frequency energy produced by said array is directed toward a sensor located in said chamber; and

a low-emissity reflecting surface means located in said chamber in such a manner that said surface means reflects a substantial portion of the radiometric frequency energy produced by said array not otherwise captured by the sensor out of said chamber through said opening.

4,106,346
GREY-LEVEL ULTRASONIC IMAGING

Terrance Matzuk, 154 Eileen Dr., Pittsburgh, Pa. 15214

Filed Mar. 23, 1977, Ser. No. 780,277
Int. Cl.² G01N *29/04*
U.S. Cl. 73—614 **47 Claims**



40. A method of ultrasonic grey-level imaging comprising:

amplifying electrical signals which are related to acoustical waves received by an ultrasonoscope from a test specimen,

converting said amplified electrical signals to positive voltage signals monotonically related to said amplified electrical signals,

converting said positive voltage signals to non-linear function signals,

producing modulated dot width output signals having dot widths generally proportional to the amplitude of said non-linear function signals,

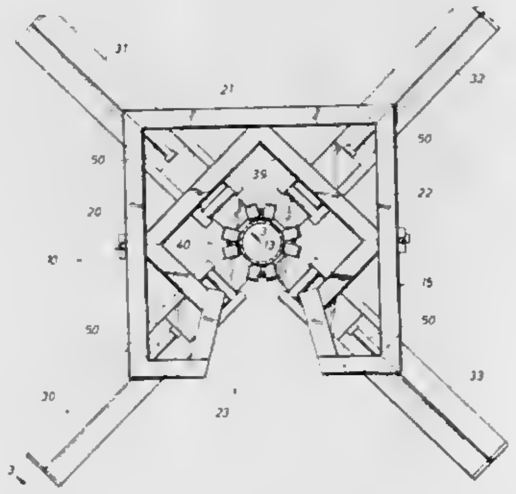
controlling the spacing between said dots by tone-burst generator signals, and

displaying said modulated dot width output signals.

4,106,347
ULTRASONIC INSPECTION APPARATUS FOR TUBULAR MEMBERS AND METHOD

Deke E. DeKerlegand, Lafayette, La., assignor to W. C. Lamb, Lafayette, La.

Filed Aug. 10, 1977, Ser. No. 823,509
Int. Cl.² G01N *29/04*
U.S. Cl. 73—622 **13 Claims**



1. In an ultrasonic inspection apparatus of the type having a frame with a central vertical passage for receiving a substantially vertically disposed pipe, a plurality of wheel search units each operatively associated with a respective search unit assembly and adapted to be ultrasonically coupled to the pipe by urging such units into contact with the pipe in the presence of a selected coupling fluid, an improved search unit assembly for each search unit comprising:

a substantially horizontally disposed fluid cylinder longitudinally directed toward the centerline axis of the central vertical passage and having an extendable and retractable member extending therefrom;

a wheel search unit secured to said member for horizontal movement therewith into and out of ultrasonic coupling engagement with the pipe; and

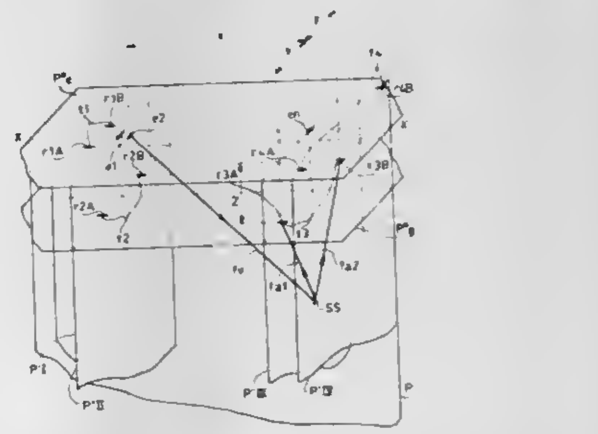
means for supplying a substantially constant pressure to said fluid cylinder.

4,106,348
DEVICE FOR EXAMINATION BY MEANS OF ULTRASONIC VIBRATIONS

Michel Joseph Auphan, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 550,957, Feb. 19, 1975. This application Feb. 1, 1977, Ser. No. 764,585

Claims priority, application France, Feb. 20, 1974, 74 05718
Int. Cl.² G01N *29/04*
U.S. Cl. 73—624 **3 Claims**



1. A device for ultrasonic examination of a body situated in an analysis plane, comprising:

a plurality of transmission transducers situated in a row lying in the analysis plane and having a direction of transmission in the analysis plane toward the body:

means for pulsing the transmission transducers one at a time in a predetermined spaced sequence for launching ultrasonic pulses therefrom toward the body;

a plurality of receive transducers situated in each of a plurality of parallel planes which are perpendicular to the row of transmission transducers, the receive transducers being oriented to detect echo pulses reflected from interfaces in the body;

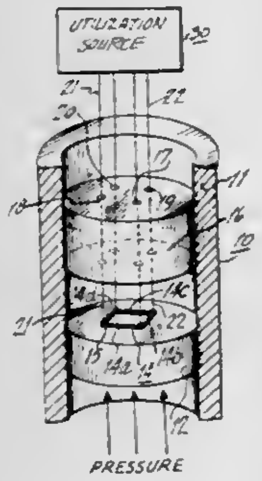
means for determining the depth of an interface, connected to receive signals from said receive transducers, which function to determine the depth of an interface reflecting an echo pulse with respect to the row of transducers from the time of detection of the echo pulse and the position of the detecting receive transducer with respect to the position of the transmission transducer that launched the detected pulse; and

means for displaying, connected to receive signals representing the depth of the interface from the means for determining the depth, which function to display detected echo pulses as image points on a screen, the positions of image points in one rectangular coordinate direction corresponding to the positions of the receive transducers detecting the corresponding echo pulses along the direction of the row of transmission transducers and in the other rectangular coordinate direction corresponding to the determined depths of the reflective interfaces, the image points together forming an image of the reflective interfaces of the body which intersect the analysis plane.

4,106,349

TRANSDUCER STRUCTURES FOR HIGH PRESSURE APPLICATION

Anthony D. Kurtz, Englewood, N.J., assignor to Kulite Semiconductor Products, Inc., Ridgefield, N.J.
Filed Nov. 3, 1977, Ser. No. 848,159
Int. Cl.^{2} G01L *9/06*
U.S. Cl. 73—746 **10 Claims**



1. A pressure transducer particularly adapted for high pressure measurements, comprising:

(a) a first disk of a predetermined thickness having located on a surface thereof, a piezoresistive sensor element having at least one terminal associated therewith,

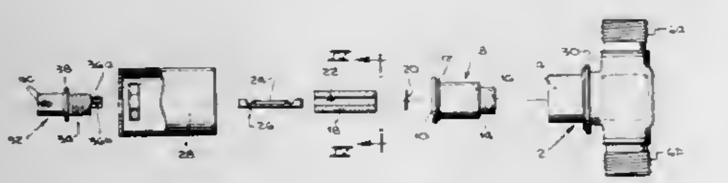
(b) a second disk of a substantially greater thickness than said first disk and of a relatively congruent surface configuration, said second disk having at least one aperture directed from a first to a second surface, and

(c) means positioning said first and second disks in contact with each other, with the surface of said first disk as containing said sensor, in contact with a surface of said second disk containing said aperture, with said aperture overlying said terminal and, a lead directed through said aperture and in contact with said terminal.

4,106,350

THIN WIRE PRESSURE SENSOR

Richard T. Morris, 4820 W. 118th St., Hawthorne, Calif. 90250, and Arthur H. Wildvank, 12516 Destino St., Cerritos, Calif. 90701
Filed Aug. 29, 1977, Ser. No. 828,317
Int. Cl.^{2} G01L *21/12*
U.S. Cl. 73—755 **22 Claims**



1. Apparatus for sensing gas pressure comprising:

a structure defining a gas passageway,

a pressure-sensitive, thin resistance wire having a measurable resistance response to pressure changes within a selected pressure regime,

means mounting said wire in a substantially stationary generally longitudinal position within said passageway,

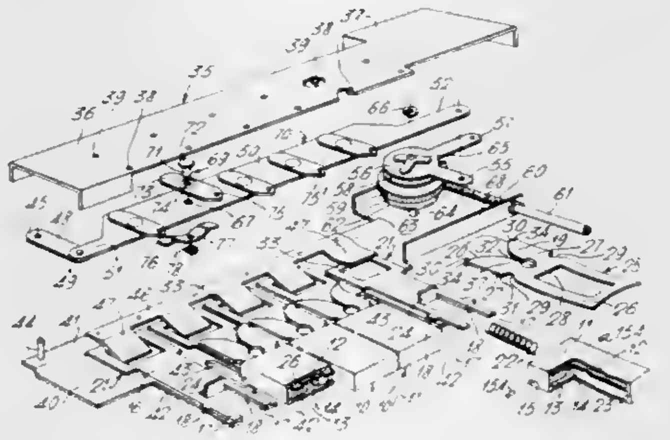
a pair of electrical contact means respectively making contact with spaced portions on said wire, for applying to said wire an electrical input signal and inducing therein an output response signal representing the then prevailing resistance value of said wire, and

baffle means supported within said passageway near an end of the wire for shielding said wire from direct impact by gas traversing said passageway in response to changes in the sensed pressure.

4,106,351

MECHANICAL PUSHBUTTON DEVICES SUITABLE FOR RECORDING POSITIONS OF A MOBILE ELEMENT IN RELATION TO A FIXED SUPPORT

Giovanni Santoro, Via Gradoli 105, Roma, Italy
Filed Aug. 10, 1976, Ser. No. 713,129
Claims priority, application Italy, Aug. 11, 1975, 50919 A/75
Int. Cl.^{2} F16H *35/18*
U.S. Cl. 74—10.33 **3 Claims**



1. Pushbutton control apparatus comprising:

pushbutton key assembly means actuable along a first direction, said pushbutton key assembly means including a housing having a first cavity and a second cavity, first control plate means associated with said first cavity for guiding said pushbutton key assembly means, said first control plate means having a first end and a second end, said first end being U-shaped and having at least one tooth toward the outside of each arm thereof, and said second end having a completely enclosed aperture, said pushbutton key assembly means further including second control plate means;

support means movable relative to said pushbutton key assembly means along a second direction at a substantial angle to said first direction;

recording element means affixed to said support means and cooperable with said second control plate means to move said support means to a preselected position relative to said pushbutton key assembly means when said pushbutton key assembly means is actuated; and

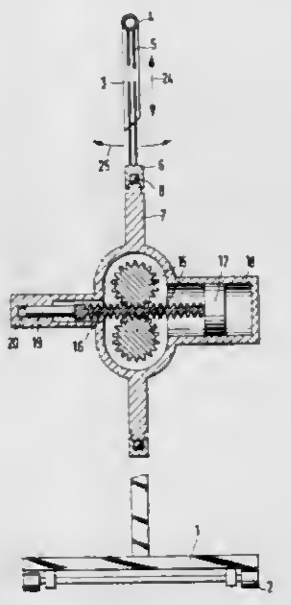
blocking pivot means and resilient spring means for affixing said recording means to said support means in close frictional contact therewith to normally prevent said recording means from rotating.

4,106,352

WIRE POINTING MACHINE

Walter Arndt, Meschede, Fed. Rep. of Germany, assignor to Firma Friedrich Krollmann, Altena, Fed. Rep. of Germany
Filed Apr. 1, 1977, Ser. No. 783,847
Int. Cl.^{2} F16H *19/04*
U.S. Cl. 74—29 **10 Claims**

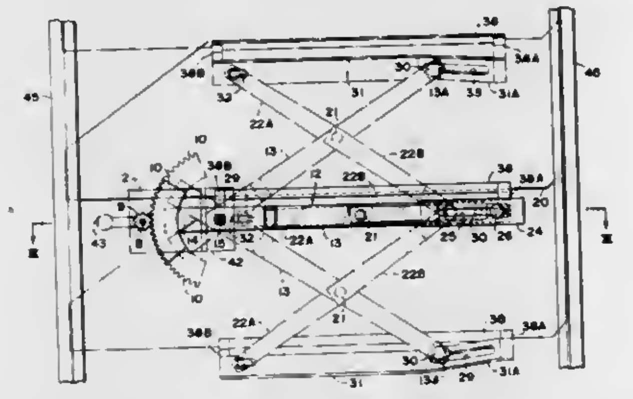
1. A wire pointing machine having two grooved rolls, characterised in that the two grooved rolls are supported in a gear ring which can be pivoted about a horizontal axis, teeth being provided on end trunnions of the grooved rolls which mesh with a common gear rack which is directly powerdriven.



4,106,353

DEVICE FOR MOVING CURVED PLATE BENT IN A SUBSTANTIALLY ARCUATE-SHAPE ALONG CURVED PATH

Osamu Kondo, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Apr. 14, 1976, Ser. No. 676,959
Claims priority, application Japan, Aug. 13, 1975, 50-98689
Int. Cl.^{2} F16H *21/18*
U.S. Cl. 74—45 **5 Claims**



1. A device for moving a curved plate bent in a substantially arcuate-shape along a curved path comprising:

(a) a base panel;

(b) a curved plate holding frame for holding said curved plate, said frame being disposed in substantially parallel relation and predetermined spaced relation with said base panel;

(c) a rotary shaft rotatably mounted on said base panel;

(d) a pivot mounted on said base panel with the axis thereof disposed parallel with that of said rotary shaft;

(e) arm means pivotably mounted at an intermediate portion thereof on said pivot;

(f) a guide pin protruding laterally from one end of said arm means;

(g) rotation transmission means for transmitting the rotation of said rotary shaft to the other end of said arm means opposite to said one end thereby causing swinging movement of said arm means around said pivot;

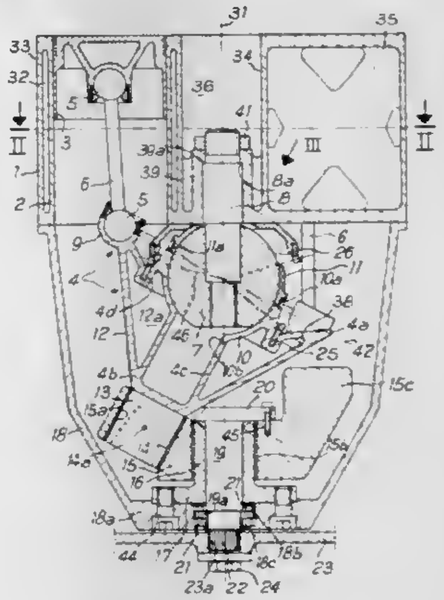
(h) arm bracket means secured to said curved plate holding frame and having a portion bent away at a predetermined angle from said curved plate holding frame toward said one end of said arm means, an extension line from said bent portion making an acute angle with the axis of said pivot, said arm bracket means having a guide slot formed at said bent portion and elongated in the direction of said extension line, said guide slot being adapted for guiding said guide pin on said arm means for movement along said slot; and

(i) curved plate guiding means for guiding the curved plate along a predetermined curved path defined thereby, so that as said arm means rotates, said curved plate holding frame is adapted to move substantially parallel to the curvature of the curved plate.

4,106,354

RECIPROCATING ENGINES, PUMPS OR COMPRESSORS

Marius G. Girodin, La Fontaine Peureuse, 78580 Bazemont, France
Filed Nov. 5, 1974, Ser. No. 521,201
Claims priority, application France, Nov. 9, 1973, 73 39814
Int. Cl.^{2} F16H *23/00*
U.S. Cl. 74—60 **10 Claims**

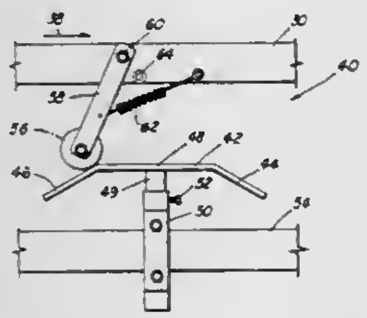


1. A machine comprising a cylinder block having a plurality of cylinders disposed around the axis of the block with the axes of the cylinders being at least substantially parallel with the axis of said block, a hollow casing secured to said block in generally axial alignment therewith, said cylinders being positioned equidistant from the said axis of said block and from each other, a straight rotating shaft rotatably mounted in said casing disposed co-axially with the axis of the block, a movement transformer mounted in said casing and having a widened end and an opposed reduced end, a swivel bearing swivelably connecting the widened end of the transformer to the block, pistons mounted in the cylinders, swivelled connecting rods individually and swivelably connecting each piston to the periphery of the transformer, a connection element located between said rotating shaft and the reduced end of the transformer, the widened end of the movement transformer constituting a portion of the swivel bearing, the other portion of which is rigid with the cylinder block, and said straight rotating shaft being disposed in said casing co-axially with the axis of the cylinder block adjacent to the reduced end of the movement transformer, said connecting element comprising crank means for connecting the shaft to the said reduced end, said crank means being secured to the shaft for rotationg therewith and having articulation means for rotatably receiving said reduced end of the transformer, with the axis of said articulation means passing through the center of the swivel bearing, strut means associated with each of said pistons for connecting the widened end of the movement transformer to the reduced end, one portion at least of said strut means being situated at least approximately in line with a respective connecting rod when its associated piston is in its innermost position in its

cylinder, toothed bevel gear concentric with the axis of the transformer and carried within the widened end thereof, and a toothed bevel gear coaxial with the axis of said block and located to engage with at least one tooth of the toothed gear of the transformer.

4,106,355
RAMP DEVICE TO REDUCE WEAR ON TROJAN BAR DOGS AND WHEEL LUGS IN AN IRRIGATION VALLEY CENTER PIVOT WATER DRIVE

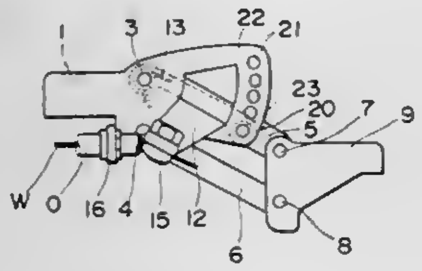
Jerry H. Cox, Rte. 1, Box 101, and Robert F. Thomas, Rte. 1, Box 66, both of Hugoton, Kans. 67951
Filed Sep. 23, 1976, Ser. No. 725,774
Int. Cl.² F16H *21/44*
U.S. Cl. 74—99 A **6 Claims**



1. A ramp device used to reduce wear on trojan bar dogs mounted on the ends of a trojan bar and reduce wear on wheel lugs driven by the dogs, the ramp device used in conjunction with a wheel mounted self-propelled irrigation sprinkler, the trojan bar dogs engaging the wheel lugs for driving the sprinkler wheels during the drive stroke of the trojan bar, the trojan bar dogs riding over the top of adjacent wheel lugs during the return stroke of the trojan bars, the ramp device comprising:
- ramp means for raising the trojan bar, said ramp means attached to a tower frame of the sprinkler, said ramp means disposed adjacent to the trojan bar; and
- a roller mounted on one end of a roller arm, the other end of said roller arm pivotly mounted on the trojan bar, said roller arm held in a vertical position by a stop secured to the trojan bar during the return stroke of the trojan bar so that said roller when contacting the surface of said ramp means raises the trojan bar; and
- a spring attached to said roller arm and the trojan bar for biasing said roller arm against said stop.

4,106,356
DERAILER FOR A BICYCLE

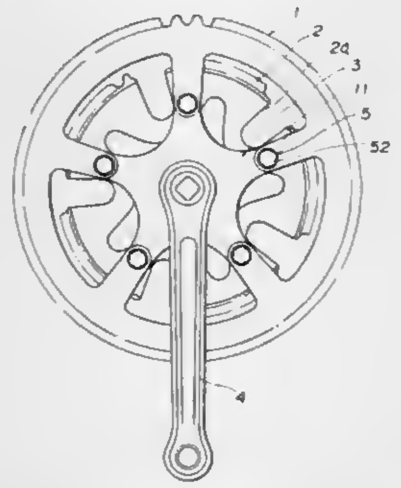
Masashi Nagano, and Hideaki Fujimoto, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan
Filed Nov. 1, 1976, Ser. No. 737,670
Claims priority, application Japan, Jan. 12, 1976, 51/3005
Int. Cl.² F16H *11/04*
U.S. Cl. 74—217 B **25 Claims**



1. A derailleur for a bicycle, which is adapted to shift a driving chain to one of two or more sprockets by operating a control wire to thereby change the bicycle speed, comprising:
(a) three members including a first fitting member, a second connecting member pivoted to said first fitting member, and a third movable member pivotably supported to said connecting member and provided with a chain guide means, said connecting member being swingable with respect to said fitting member, said movable member being swingable with respect to said connecting member and movable back and forth co-axially of said sprockets with respect to said fitting member,
(b) at least one control member, said control member being swingably independently from said third movable member and having secured thereto either said control wire or an outer cable guiding said control wire,
(c) a spring between said control member and said connecting member, said spring transmitting a force from said control member to said movable member when said control member is moved by said control wire or cable, said spring when energized energizing said movable member to shift axially in one direction when said control member swings independently of said movable member, the strength of said spring being greater than the force needed to shift the movable member under normal pedaling conditions of the bicycle, and
(d) a positioning means provided between said control member and one of said three members and serving to positionally set said chain guide means, said positioning means comprising a holder provided on one of said control member and one of said three members, said holder having a plurality of set positions; and a retainer provided on either of said control member or one of said three members not carrying said holder and being engageable with any one of said set positions, means biassing the retainer to the holder with a force greater than that of the spring so that when energy stored in the spring is later released by the connecting member swinging to abut the control member, the retainer will stay in engagement with the holder.

4,106,357
MULTISTAGE GEAR CRANK FOR A BICYCLE

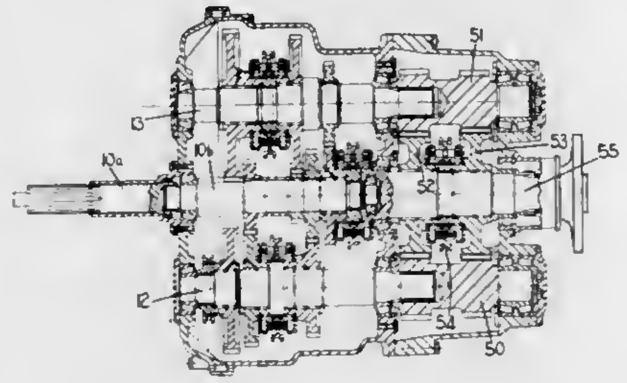
Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Dec. 16, 1976, Ser. No. 751,443
Claims priority, application Japan, Dec. 29, 1975, 50-180305[U]
Int. Cl.² F16H *55/30;* B21D *53/26*
U.S. Cl. 74—243 DR **2 Claims**



1. A multistage gear crank for a bicycle, comprising
at least two chain gears of different pitch diameters,
- a mounting plate for connecting said chain gears at a regularly spaced interval therebetween by means of a fixing means, and
- a crank body having a boss to which said mounting plate is fixed; said larger diameter chain gear being ring shaped, having an inner diameter larger than the diameter of the addendum circle of the smaller diameter chain gear, and having a plurality of mounting portions extending radially from the inner periphery of said larger diameter chain gear; each mounting portion being provided at its end with a mounting bore; said mounting plate having at its center a bore engageable with said boss of the crank body and at its periphery legs which are as many in number as said mounting portions, said legs having bores at the ends thereof; said smaller diameter chain gear having at its center a through hole contoured similarly to said mounting plate, peripheral cutouts contoured similarly to said mounting portions of the larger diameter chain gear, and at substantially radially intermediate portions mounting bores as many in number as said mounting portions, said bores in said larger diameter chain gear, said smaller diameter chain gear and said mounting plate being coincidental.

4,106,358
GEAR BOXES

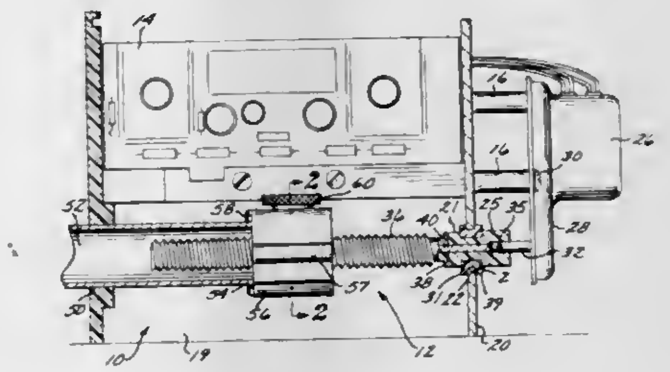
William McKenzie Meek Morrison, Wolverhampton, England, assignor to Turner Manufacturing Company, Ltd., England
Continuation of Ser. No. 340,282, Mar. 12, 1973, abandoned.
This application Jun. 7, 1976, Ser. No. 693,476
Claims priority, application United Kingdom, Mar. 17, 1972, 12533/72
Int. Cl.² F16H *3/08*
U.S. Cl. 74—331 **1 Claim**



1. A gear box comprising a relatively long input shaft, a relatively short output shaft in coaxial relation and operatively connected with said input shaft and relatively rotatable therewith,
- two spaced lay shafts disposed in parallel relationship with said input and output shafts,
- a plurality of fixedly mounted input shaft gears on said input shaft,
- at least one rotatably mounted lay shaft gear disposed on each of said respective lay shafts and permanently meshing with a corresponding one of said fixedly mounted input shaft gears,
- at least one rotatably mounted input shaft gear on said input shaft,
- at least one fixedly mounted lay shaft gear disposed on at least one of said lay shafts and permanently meshing with said rotatably mounted input shaft gear,
- two output shaft gears rotatably mounted on said output shaft,
- two further fixedly mounted lay shaft gears disposed on each of said respective lay shafts towards one end thereof and each permanently meshing with one of said two output shaft gears,
- means for alternatively engaging one of said output shaft gears for operative transmission of torque between the two lay shafts and the output shaft;
- a synchronizer on said input shaft for engaging said input shaft with said input shaft rotatably mounted gear,
- at least one further synchronizer on each of said lay shafts for selectively engaging said respective lay shaft with a respective rotatably mounted lay shaft gear, and
- all forward gears synchronized by synchronizers.

4,106,359
ANTIFRICTION ASSEMBLIES

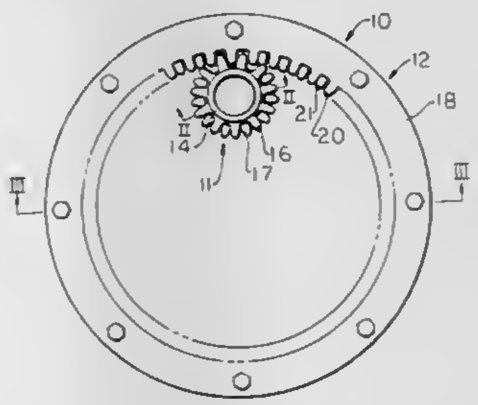
Denis G. Wolfe, Santa Ana, and Richard J. Berryhill, Fullerton, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Aug. 21, 1975, Ser. No. 606,484
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 R **18 Claims**



1. An antifriction assembly comprising:
(a) an elongated screw member having external helical threads;
(b) an annular nut member having internal helical threads of the same pitch and diameter as said external helical threads and threadably engaged on said screw member; and
(c) said external and internal helical threads having distinctively different flank angles to provide a minimal surface area of thread engagement and maximum surface loading;
said members being formed with engagement surfaces of plastics characterized by a coefficient of friction that is inversely dependent upon compressive loading.

4,106,360
INDEXED AND COWORKING GEARS

Albert Manna, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 30, 1977, Ser. No. 782,666
Int. Cl.² F16H *55/18;* B21D *53/28*
U.S. Cl. 74—440 **17 Claims**



1. In an assembly having a first gear assembly including a first gear having a first plurality of teeth, and a coworking second gear fixedly coaxially adjacent said first gear and having a second plurality of teeth indexed relative to said first plurality of teeth, the improvement comprising
- a second gear assembly including a third gear having a third plurality of teeth in meshed engagement with said first gear first plurality of teeth, and a fourth gear adjustably coaxially secured adjacent to said third gear and having a fourth plurality of teeth adjustably indexed relative to said third plurality of teeth to have accurate meshed engagement with said second gear second plurality of teeth.

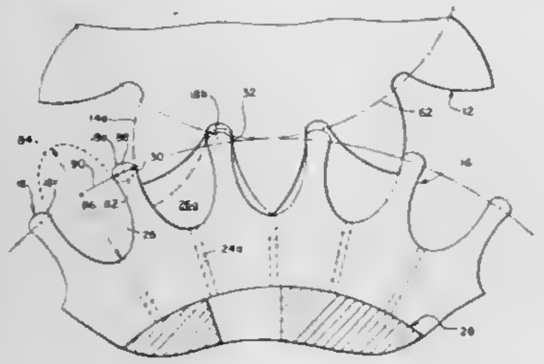
4,106,361
GEAR PUMP, GEAR AND METHOD

Wilson A. Burtis, Westminster, Calif., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Oct. 26, 1976, Ser. No. 735,324

Int. Cl.^{2} F16H *55/06, 1/28;* B23F *9/04*

U.S. Cl. 74—462 7 Claims



1. Gear apparatus comprising:
a gear having a plurality of teeth, each tooth having a shape identical to the shape of a cylinder-developed gear produced by first shaping a gear blank on a gear shaper, using as a cutter a first gear having teeth with the tips thereof forming at least 180° of a cylinder to form the cylinder-developed gear.

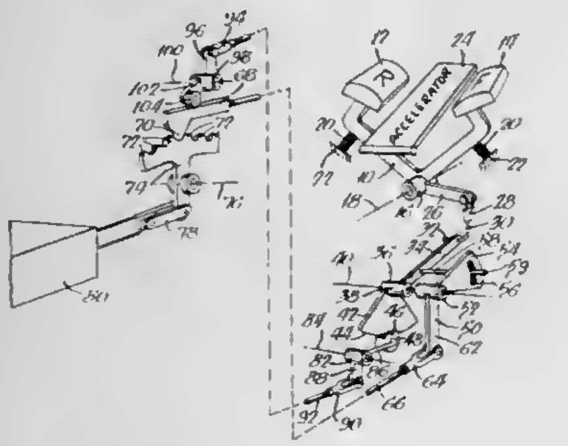
4,106,362
CONTROL LINKAGE FOR TORQUE CONVERTER TRANSMISSION OR THE LIKE

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Feb. 14, 1977, Ser. No. 768,119

Int. Cl.^{2} G05G *1/14, 7/06*

U.S. Cl. 74—474 10 Claims



1. A control linkage comprising:
an actuator mounted for movement between first and second extreme positions and an intermediate position between said extreme positions;
means for restoring said actuator to said intermediate position from either extreme position upon the release of said actuator by an operator thereof;
a multiple-toothed member adapted to be connected to a mechanism to be controlled by said linkage;
means mounting said toothed member for shifting movement between at least three positions;
an element having a rounded nose and mounted for selective engagement with the teeth on said toothed member to shift said member between said three positions;
said teeth and said nose being constructed and arranged so that said nose may be cammed out of effective engagement with said teeth upon relative movement between said element and said member; and
means, including a linkage, interconnecting said actuator and said element for (a) moving said nose in opposite directions when said actuator is moved to or from its intermediate positions from or to its extreme positions, and (b) positively engaging said nose and said teeth when said actuator is moved from its intermediate position to either of its extreme positions and allowing said nose to be cammed out of effective engagement with said teeth when said actuator is moved from either of its extreme positions to its intermediate position.

4,106,363
ANTI-ROLL RACK BAR

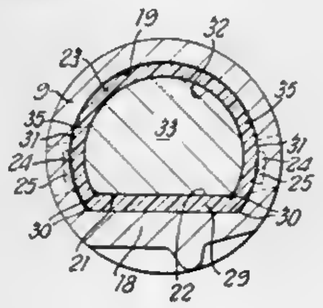
James Ernest Buckingham, Bristol, England, assignor to Cam Gears Limited, England

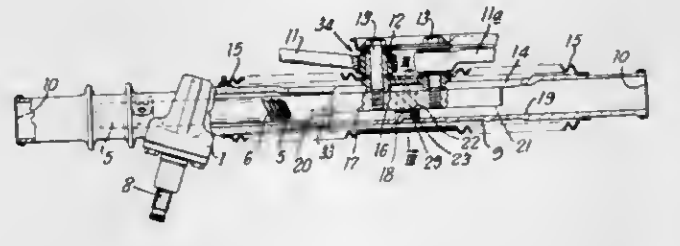
Filed Jun. 25, 1976, Ser. No. 699,720

Claims priority, application United Kingdom, Jul. 7, 1975, 28508/75

Int. Cl.^{2} B02D *1/20*

U.S. Cl. 74—498 14 Claims





1. A center take-off rack and pinion vehicle steering assembly including a housing part, a rack bar part and a transmission bar part coaxial with said rack bar part, said rack bar part and said transmission bar part being disposed and axially slidable in said housing, steering linkage connected to said transmission bar part operable to effect vehicle steering upon axial movement of said transmission bar part, laterally extending pin means for connecting said steering linkage to said transmission bar part, a pinion coacting with the rack on said rack bar part and first means coacting between the housing and the rack bar part for urging said rack into contact with said pinion, means for rotating said pinion to effect axial movement of the transmission bar part and second means coacting between the housing and the transmission bar part including a separate bearing bush having side portions which at least straddle the transmission bar part and an intermediate portion which is located between the transmission bar part and said housing part, the bearing bush being fixed relative to either of said housing or transmission bar parts and slidable relative to the other part, said intermediate portion of the bearing bush carrying a flat face which opposes and is substantially in face-to-face contact with a second flat face carried on the transmission bar part and relative to which the bearing bush is slidable, said flat faces co-operating to resist turning movement of the transmission bar part and rack bar in the housing part.

4,106,364
VARIABLE GEAR TRANSMISSION

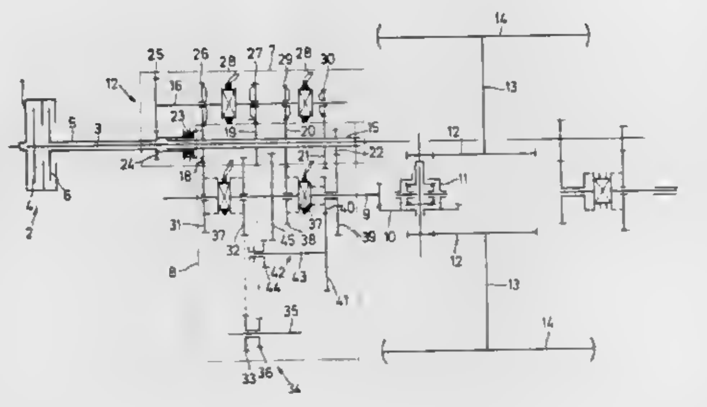
Walter Zenker, Bensberg-Refrath, and Karl-Heinz Hülsebusch, Cologne, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 5, 1976, Ser. No. 673,372

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514781

Int. Cl.^{2} F16H *37/02*

U.S. Cl. 74—740 5 Claims



1. A gear change transmission of the group type, especially for motor vehicles for agriculture and construction work, which includes in combination: an input shaft, a speed control transmission drivingly connected to said input shaft, a group transmission drivingly connected to and following said speed control transmission, a main shaft common to said group trnsmission and said speed control transmission, said group transmission having an output shaft journalled parallel to said main shaft, said main shaft being coaxially mounted with said input shaft, a first group of gears connected to said main shaft for rotation therewith, a counter shaft forming part of said speed control transmission and being arranged parallel to said main shaft for driving the gears of said first group of gears, inlet transmission means drivingly connecting said counter shaft to said input shaft, clutch means operable to drivingly connect said input shaft to said main shaft, a second group of gears freely rotatably mounted on said counter shaft and comprising a first and second pair of gears, a third group of gears freely rotatably mounted on said output shaft and comprising a third and fourth pair of gears, all gears of said first group of gears being drivingly connected to said second and third group of gears, first and second double shift means axially displaceable on and connected to said counter shaft for rotation in common therewith and respectively operatively associated with said first and second pair of gears of said second group of gears, third and fourth double shift means axially displaceable on and connected to said output shaft and respectively operatively associated with said third and fourth pairs of gears of said third group of gears, and a reversing transmission including a gear meshing with one of the gears of said third group of gears, said first and second double shift means being provided with synchronizing elements, and said third and fourth double shift means and said first and second double shift means having like annular grooves for shift forks of the same wrench width.

4,106,365
POWER TRAIN ARRANGEMENT FOR SURFACE-HANDLING VEHICLE

Koji Nozawa, and Motoichi Ohba, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

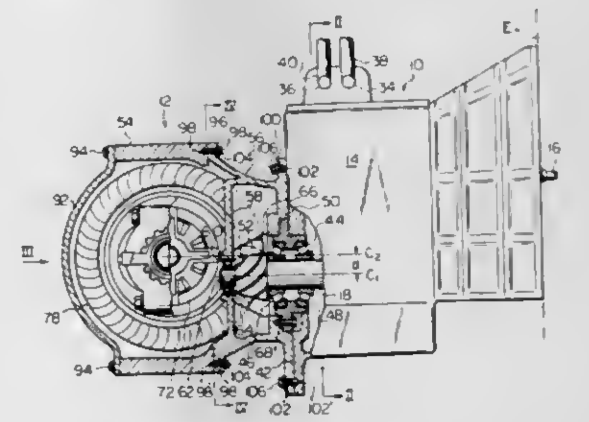
Filed Apr. 5, 1977, Ser. No. 784,721

Claims priority, application Japan, Apr. 6, 1976, 51-43097[U]

Int. Cl.^{2} F16H *37/00*

U.S. Cl. 74—740 5 Claims

1. A power train arrangement of a powered surface-handling vehicle, comprising
a power transmission mechanism including a transmission output shaft and a transmission casing having a vertical wall portion, and
a differential reduction gear unit including a drive gear connected to said transmission output shaft and rotatable about a fixed center axis substantially normal to said wall portion, an axle housing accommodating therewithin a differential gear assembly rotatable in its entirety about an axis of rotation non-intersecting said center axis, said gear assembly including a driven gear in mesh with said drive gear and rotatable about said axis of rotation, an axle carrier including a first wall portion fixedly but detachably attached to said axle housing and a second wall portion having an axis substantially in line with said center axis of said drive gear and an outer contour symmetrical with respect to said axis thereof, and a plurality of fastening elements fixedly but detachably connecting said second wall portion to said wall portion of said transmission casing and arranged substantially symmetrically with respect to said axis of said second wall portion, said axle carrier being reversible in vertical position relative to said transmission casing and said differential gear assembly being reversible in the axial direction thereof for having said axis of rotation located on a plane parallel with and higher or lower by a predetermined distance than said center axis of said drive gear.



4,106,366
PLANETARY GEAR

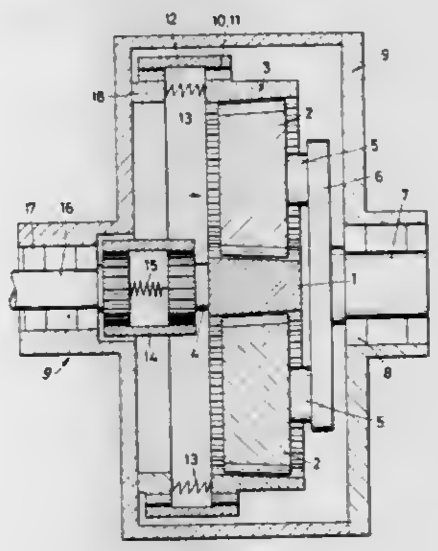
Karlheinz Altenbokum; Rolf Goldschmidt; Klaus Hansgen, all of Witten; Heinz M. Hiersig, Dusseldorf, and Peter Szynka, Witten, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 26, 1976, Ser. No. 745,431

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1975, 2558093

Int. Cl.^{2} F16H *1/28, 57/00*

U.S. Cl. 74—801 5 Claims



1. A planetary drive comprising:

a sun gear;
an internal gear;
at least two planet gears having teeth and being in engagement with said sun gear and said internal gear, said sun gear and said internal gears are axially movable with respect to the planet gears;
a planet link connecting said planet gears; at least one of said sun gear, said planet link, and said internal gear being radially movable for equalizing the load; said sun gear, said internal gear and said planet gears having beveled spur gear teeth, with the bevel of said sun gear and of said internal gears matching the bevel of said planet gears; and
means for axially urging said sun gear and internal gear into engagement with said planet gears.

4,106,367

PRESSURE CONTROL APPARATUS FOR THE AUTOMATIC TRANSMISSION OF AUTOMOTIVE VEHICLES

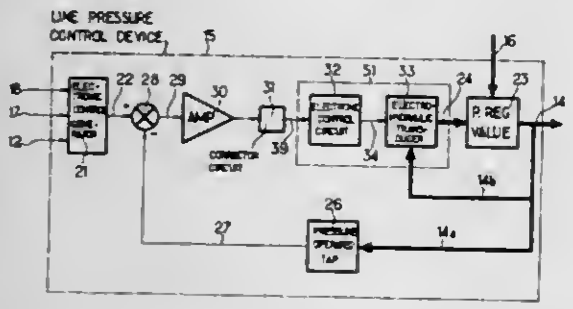
Jean-Marie Bouvet, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Oct. 3, 1975, Ser. No. 619,187

Claims priority, application France, Oct. 7, 1974, 74 33669

Int. Cl.^{2} B60K *41/18*

U.S. Cl. 74—866 **13 Claims**



1. Apparatus for controlling the supply pressure of the control members of an automatic transmission for vehicle power units, said apparatus comprising a control generator element supplying an electrical command voltage which is directly proportional to said supply pressure as a function of electrical signals representing information relative to the functioning of said transmission and of the vehicle power unit, said information comprising the state of the transmission, whether in engagement or between engagements due to inherent circuit delay, the ratio engaged or about to be engaged, the rotational speed of a transmission member, and the load of the vehicle power unit, said apparatus comprising in combination therewith:

first means for supplying a first voltage which is a decreasing linear function of the said rotational speed and whose gradient is a function of the state of the transmission ratio,
second means for supplying, starting from the said first voltage, a second voltage which is a decreasing linear function analogous to said first voltage but whose position is displaced as a function of the said load,
third means for supplying, starting from said second voltage and from the information relative to the state of the transmission ratio, a third voltage which is a decreasing function of the rotational speed and comprises two linear portions connected by a point of discontinuity, the respective gradients of each of said linear portions being a function of the state of the transmission ratio, and
fourth means supplying, starting from said third voltage and from the information relative to the said load, a fourth voltage which is a decreasing function of the rotational speed and comprises two linear portions connected by a point of discontinuity whose position is a function of the load,
said control generator element being responsive to said four voltages for supplying said command voltage.

4,106,368

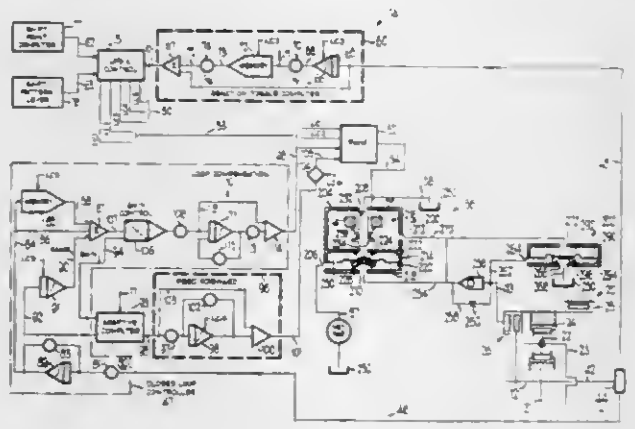
TRANSMISSION CONTROL SYSTEM

John Saxon Ivey, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1976, Ser. No. 753,329

Int. Cl.^{2} B60K *41/18*

U.S. Cl. 74—866 **8 Claims**



1. An electronic control system for regulating change of gear ratio in a gear set which has an input connection for receiving drive from an engine and an output mechanical drive connection for supplying drive torque to a load, comprising an electronic control unit having an output connection coupled to the gear set to effect a change of gear ratio when the control unit supplies a change-gear signal and including a diaphragm valve having a variable position diaphragm;

a sensor, positioned adjacent the mechanical output driving connection of the gear set, for providing an output torque signal which varies as a function of the output drive torque provided by the gear set;
means, coupled between the sensor and the control unit, for supplying the output torque signal to the control unit in order that the control unit can control the change of gear ratio in response to the output torque signal; said diaphragm valve including a reciprocating piston member responsive to an electrical signal from said control unit to open and close fluid ports in said valve to control the position of said diaphragm to control the change of ratio, said transmission including a fluid actuated friction device for changing gear ratio, said friction device being connected to said diaphragm valve, said diaphragm valve having two fluid chambers separated by said diaphragm, said valve having an inlet port connected to said source of pressure and one of said chambers, said valve having an outlet pressure port in said one chamber connected to said friction device, and said valve including a fluid exhaust port and said piston being adapted to open said exhaust port when positioned to close said outlet port, said exhaust port being connected to said friction device and adapted to reduce the pressure therein when open.

4,106,369

OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yutaka Taga, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1975, Ser. No. 620,269

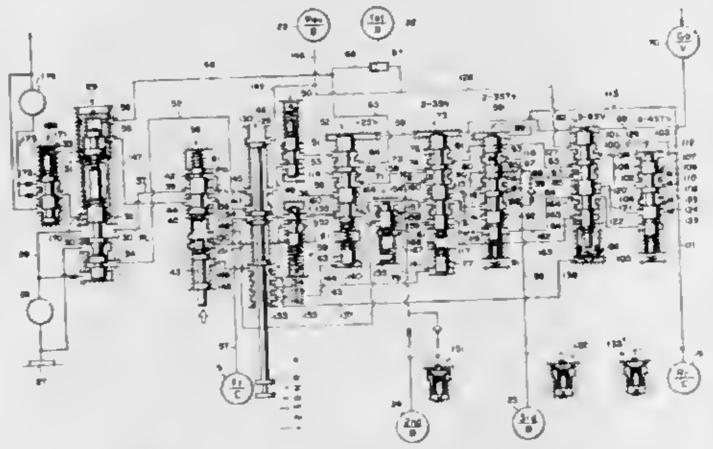
Claims priority, application Japan, Dec. 23, 1974, 49-147901

Int. Cl.^{2} B60K *21/00*

U.S. Cl. 74—869 **12 Claims**

2. An oil pressure control system for an automatic transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising:

a source of oil pressure;
a line pressure regulating valve which generates a line pressure from the oil pressure of said source, said line pressure being regulated to be suitable for operating said friction engaging means;
a throttle pressure regulating valve which generates a throttle pressure from said line pressure, said throttle pressure increasing as the engine torque increases;
a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;
a throttle pressure modulating valve which generates a throttle modulated pressure from said throttle pressure, said throttle modulated pressure being lower than said throttle pressure by a determined amount;
a manual shift valve for shifting speed ranges; and
a plurality of speed shift valves which are shifted between lower and higher speed shift positions for changing over supply of oil pressure to said friction engaging means for shifting transmission between lower and higher speed stages, said speed shift valve comprising a valve member, said valve member being shifted between first and second shift positions to control first, second, third, fourth, fifth and sixth ports, said first port connecting to a first one of said friction engaging means which is actuated for establishing a lower speed stage transmission and being supplied with the line pressure when said valve member is shifted to said first shift position while said first port being isolated from supply of the line pressure and connected to said second port when said valve member is shifted to said second shift position, said second port connecting to a drain passage, said third port connecting to a second one of said friction engaging means and being supplied with the line pressure when said valve member is shifted to said second shift position while said third port being isolated from supply of the line pressure and connected to said fourth port when said valve member is shifted to said first shift position, said fourth port connecting to a drain passage, said valve member comprising first and second land portions presenting first and second end faces oppositely arranged as exposed to a common chamber, said first end face being larger than said second end face, said first land portion controlling said fifth port in a manner to open said port toward said common chamber when said valve member is shifted to said first shift position while said first land portion isolating said fifth port from said chamber when said valve member is shifted to said second shift position, said second land portion controlling said sixth port in a manner to open said port toward said common chamber when said valve member is shifted to said second shift position while said second land portion isolating said sixth port from said chamber when said valve member is shifted to said first shift position, said first end face of said first land portion being applied with a force from pressure existing in said common chamber, said force acting in a first direction to urge said valve member toward said first shift position, said fifth port being supplied with said throttle pressure while said sixth port being supplied with said throttle modulated pressure, said valve member further being applied with said governor pressure at its one end, said governor pressure driving said valve member in a second direction opposite to said first direction.



4,106,370

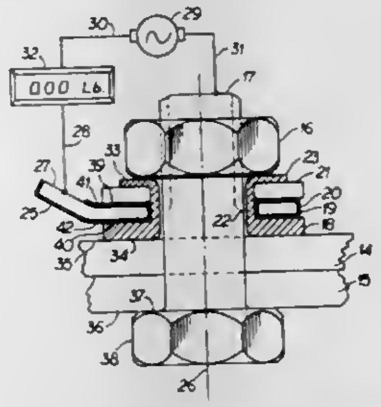
ELECTRIC INFINITE-RANGE LOAD-SENSING TRANSDUCER

Robert August Kraus, and Edmund Joseph Kraus, both of 14160 Redhill #39, Tustin, Calif. 92680

Filed Feb. 9, 1977, Ser. No. 767,138

Int. Cl.^{2} F16B *31/02*

U.S. Cl. 73—88 F **6 Claims**



1. An infinite-range compressive load-sensing and measuring device, comprising a first flat, metallic, electrically conductive member, having at least one electrically conductive side surface;

and further comprising a second, flat, metallic, electrically conductive aluminum member having an electrically insulating surface material on each of its opposing sides;
said first and said second electrically conductive members each having means for connecting the terminal of an electric current carrying wire thereto;
an electrically conductive side surface of said first member and at least one of said second member's electrically insulated surfaces being in a full solid abutting contact with each other; thus, said first and second member in combination form a compressive load-responsive assembly;
wherein the electrically insulating material of said second member is the oxide of aluminum, being ongrown thereto to a predetermined thickness, utilizing the process of electrolytic conversion;
and wherein, upon the supply of an electric current to said first and said second electrically conductive members the application of an opposing light to severe compressive load to the flat outer surfaces of said first and said second members causes a minute, but electronically detectable, change in the electric current-leakage across the electrically insulating material of the second member;
which minute change in the electric current-leakage may be electronically detected, measured and displayed.

4,106,371

CLAMPING TOOL

Toshio Akiyoshi; Tsutomu Ooishi, both of Fukuoka, and Shozo Haikawa, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Terauchi Seisakusho, Kyoto, both of, Japan

Division of Ser. No. 683,874, May 6, 1976, which is a continuation of Ser. No. 450,921, Mar. 13, 1974, abandoned. This application Feb. 17, 1977, Ser. No. 769,806

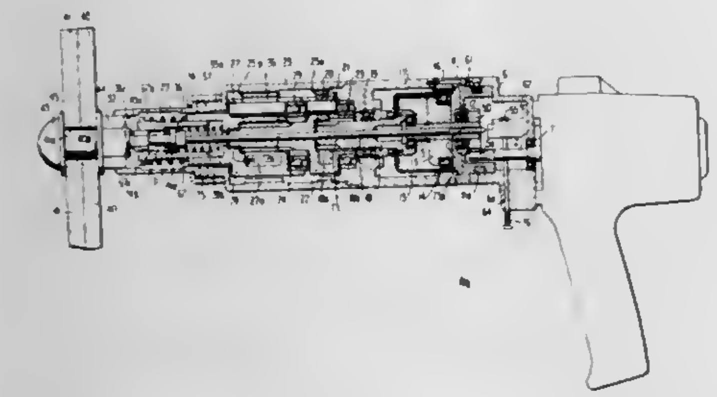
Int. Cl.^{2} B25B *29/00*

U.S. Cl. 81—57.14 **8 Claims**

1. A power wrench comprising:

a case,
a harmonic drive mechanism,
at least one planetary gear device incorporated in said case and connected to said harmonic drive mechanism for

reducing the output speed of said harmonic drive mechanism,
a first mechanism driven by said at least one planetary gear device and rotating a nut screwable on a torque set bolt,
a second mechanism driven by said at least one planetary gear device engaging a projection portion of said torque set bolt and rotating said projection portion,
said second mechanism including a fitting portion fitting to the projection portion of said torque set bolt,
said first mechanism having a cylindrical portion fitted to said nut,
said second mechanism fitting portion comprising a cylindrical bore,
a cylindrical inertia weight slidably mounted within said fitting portion bore, axially of said projection portion of said torque set bolt.



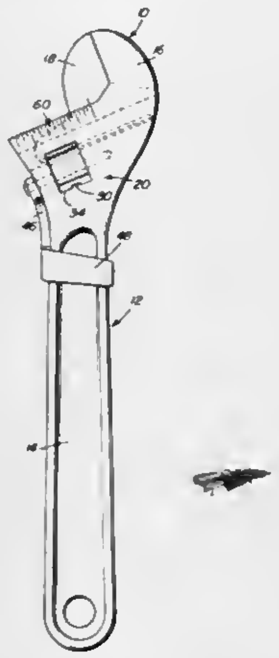
means for spring biasing said inertia weight into contact with said projection portion of said torque set bolt when received by said second mechanism fitting portion, with said projection portion axially shifting said inertia weight within said bore and compressing said biasing means,
a rod fixed to and extending axially from said inertia weight in a direction away from said torque set bolt, and
a displaceable engaging member engagable with the end of said rod remote from said inertia weight to releasably latch said rod with said inertia weight axially displaced under spring compression and in abutment with the projection portion of said torque set bolt prior to torquing of said set bolt and severance of the smaller diameter portion of said torque set bolt due to the rotation of said projection portion.

4,106,372

ADJUSTABLE END WRENCH

Jerold R. Miller, Porterville, Calif., assignor to Robert A. Dexter, Porterville, Calif., a part interest
Filed Apr. 12, 1977, Ser. No. 786,941
Int. Cl.² B25B *13/14*
U.S. Cl. 81—143 **1 Claim**

1. An adjustable wrench, comprising, in combination:
(a) a frame provided with a fixed jaw;
(b) a movable jaw mounted on the frame for movement toward and away from the fixed jaw; and
(c) lock means mounted on the frame for selectively restraining the movable jaw from movement relative to the frame and fixed jaw, the lock means including, in combination:
(1) a projection provided on the movable jaw;
(2) a latch provided with a protrusion arranged for selective engagement with the projection of the movable jaw; and
(3) actuator means mounted on the frame for moving the protrusion provided on the latch toward and away from the movable jaw and selectively engaging the protrusion with the projection in order to restrain the movable jaw from movement, the actuator means including, in combination:
(4) the latch being provided with a through opening, with the movable jaw being provided with a plurality of projections in the form of teeth, and the latch being provided with a plurality of protrusions also in the form of teeth mating with the teeth of the movable jaw so that the teeth of the latch can selectively engage with the teeth of the movable jaw, the frame forming a manipulating handle and being provided with a groove arranged extending away from the fixed jaw, the movable jaw being provided with a tongue slidably engaged in the groove, the frame also being provided with a through recess communicating with the groove provided in the frame, and the latch being slidably disposed in the recess;

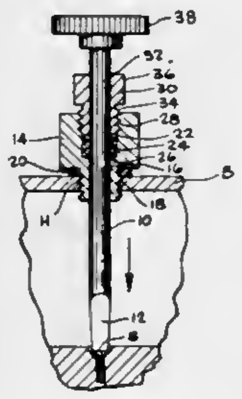


(5) a cylindrical eccentric having a depending shaft arranged substantially parallel to the groove and off center of the eccentric and journaled on the frame, with the eccentric conforming with and being arranged in the opening of the latch for moving the latch by cam action by rotation of the eccentric; and
(6) an actuation handle affixed to the shaft of the eccentric for facilitating rotation of same.

4,106,373

BIT DRIVING TOOL FOR USE IN BARRIERS SEPARATING DIFFERENT ENVIRONMENTS

George Trongo, 2974 Flannery Rd., San Pablo, Calif. 94806
Filed Jun. 15, 1977, Ser. No. 806,619
Int. Cl.² B25B *23/00*
U.S. Cl. 81—180 R **5 Claims**

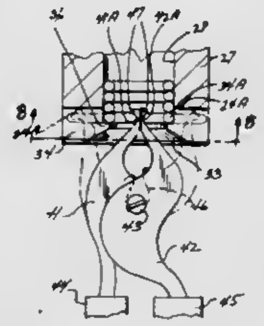


1. A self-supporting tool for removable use in broach holes of barriers separating different environments comprising,
an elongated sleeve having first and second spaced apart ends defining a shaft guide hole therethrough with an annular recess in said sleeve, said first sleeve end having a means of removable attachment to a barrier broach hole,
a shaft having a driving and a driven end, said shaft being positioned through the shaft guide hole in a slidable, rotatable relation therewith, said shaft having a length greater than the length of said sleeve for operating in said broach hole beyond said sleeve,
sealing material disposed in said annular recess of said sleeve for sealing said shaft guide hole between said shaft and said sleeve.

4,106,374

ORTHODONTIC O-RING DISPENSER AND LIGATOR THEREFOR

William B. Dragan, R.F.D. #1 Burr St., Fairfield, Conn. 06430
Continuation-in-part of Ser. No. 423,420, Dec. 10, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 631,920
Int. Cl.² B25B *7/12*
U.S. Cl. 81—302 **9 Claims**



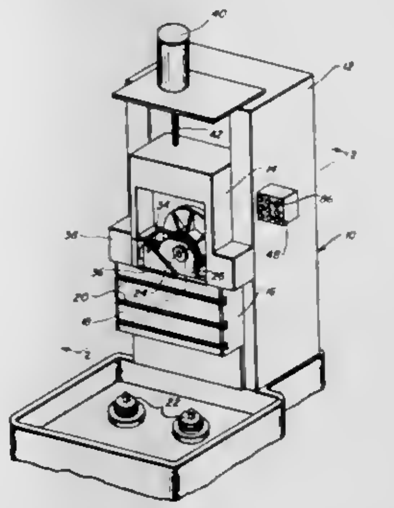
1. An orthodontic O-ring dispenser comprising:
a housing having a bore extending therethrough,
said bore adapted to contain a supply of stacked elastic O-rings,
said bore having a diameter for accommodating an O-ring adapted to be dispensed therefrom,
said housing having a rigid non-expandible end portion terminating in a dispensing opening formed at one end of said housing, said opening being in communication with said bore,
said dispensing opening being defined by a transversely extending slot formed in said end portion,
said slot having a width which is less than the diameter of an O-ring adapted to be dispensed therefrom,
means adjacent said slot for defining a stop for said O-ring,
and means for progressively advancing said stacked O-rings toward said stop means as the endmost O-ring is dispensed by causing said endmost O-ring to be stretched to and form a flat oval permitting it to be removed through said rigid slot.

4,106,375

VARIABLE FEED HIGH-PRODUCTION PRECISION MACHINE

Felix J. Gurdak, Winsted, and Francis W. Cook, Jr., Newington, both of Conn., assignors to Litton Industrial Products, Inc., New Britain, Conn.
Filed Apr. 18, 1975, Ser. No. 569,543
Int. Cl.² B23B *3/32*
U.S. Cl. 82—21 B **6 Claims**

1. In a machine tool having movable slides for moving a slide mounted tool holder through a tool path relative to a rotating workpiece to machine said workpiece to a desired form,
means to drive said slides comprising rotatable slide driving cams having profiles defining said tool path coordinates whereby in each revolution of said cams said workpiece will be machined to said desired form, said workpiece form having portions that cam be machined at faster rates than other portions,
a variable speed motor for rotating said driving cams at a plurality of speeds providing optimum feed rates for each portion of the workpiece form to be machined in each revolution of said cams,
means for establishing voltages corresponding to speeds providing optimum machining rates for each portion of said workpiece, and

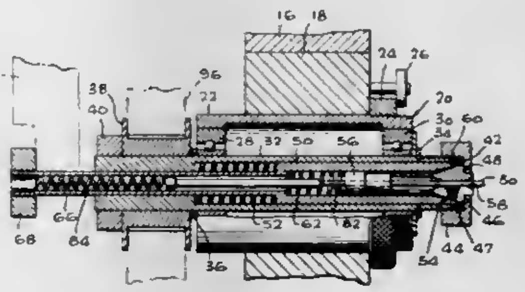


means for applying said voltages to vary the speed of said motor in each revolution of said driving cams thereby to vary the feed rate of said tool holder according to the portion of the workpiece form being machined.

4,106,376

REPLACEABLE ROTATING WORKPIECE SPINDLE WITH NORMALLY CLOSED COLLET

Edgar P, Freer, 7000 Scarborough Peak Dr., Canoga Park, Calif. 91307
Filed Apr. 19, 1976, Ser. No. 678,221
Int. Cl.² B23B *19/02. 19/00*
U.S. Cl. 82—30 **7 Claims**



1. A spindle assembly for mounting in a spindle carrier for adjustment with respect to the front wall of the spindle carrier, said spindle assembly comprising:
a spindle housing, said spindle housing having an external surface for mounting in an opening in the spindle carrier;
a spindle mounted for rotation on a spindle axis in said spindle housing, said mounting being such that said spindle is axially rigid with respect to said spindle housing;
an adjustment ring threaded on said spindle housing and extending outwardly from said external surface on said spindle housing so that said adjustment ring can lie against the front wall of the spindle carrier and be clamped with respect thereto and said spindle housing can be adjusted in a direction along said axis with respect to said wall by rotation of said adjustment ring on its threads on said housing.

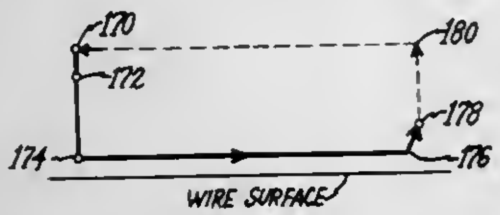
4,106,377
METHOD FOR STRIPPING INSULATION FROM WIRE

William S. Owen, Jr., Lenox, and George C. Lovejoy, Pittsfield, both of Mass., assignors to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 654,365, Feb. 2, 1976, Pat. No. 4,067,250. This application Dec. 27, 1976, Ser. No. 754,270

Int. Cl.² H02G *1/12*

U.S. Cl. 83—4 **6 Claims**



1. A method of stripping bonded insulation from an insulated metal wire of generally rectangular cross-section comprising the steps of:

(a) engaging the insulation of the wire with the edge of a knife,

(b) penetrating said insulation and said metal forming the wire with said knife edge by moving said knife edge in a substantially orthogonal direction through said insulation into said metal,

(c) then moving said knife edge through a predetermined stroke in a longitudinal direction along the length of said wire while maintaining said edge in the metal of the wire during substantially said entire stroke to thereby remove from the wire a composite chip including a length of said insulation substantially equal to said stroke and a sliver of said metal of substantially the same length.

4,106,378
APPARATUS FOR AVOIDING PLAY IN THE DRIVE OF A CIRCULAR SAW

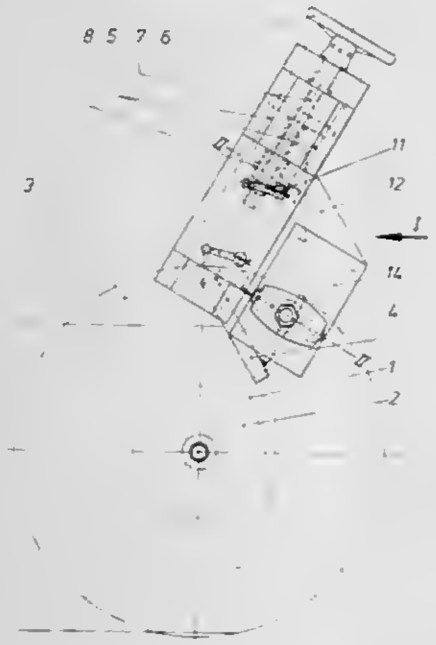
Gerhard Kaiser, Metzingen, Fed. Rep. of Germany, assignor to Gustav Wagner Maschinenfabrik, Reutlingen, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,747

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641465

Int. Cl.² B23D *45/00*

U.S. Cl. 83—74 **10 Claims**



1. An apparatus for avoiding play in the drive mechanism of a circular saw, including electric motor means for operating a circular saw blade, comprising brake means, support means supporting said brake means for cooperation with said circular saw blade, power operating means operatively connected to said brake means, sensing means connected to sense the operating status of said circular saw blade, and control means operatively associated with said power operating means and to said sensing means for operating said brake means in response to the instantaneous operating status of said saw blade.

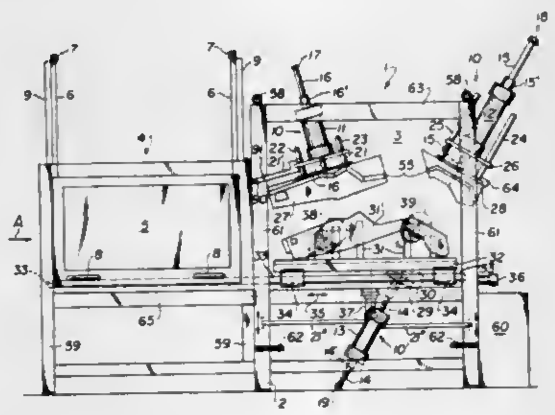
4,106,379
APPARATUS FOR TRIMMING THREE-DIMENSIONAL WORKPIECES

Ernst Maximilian Spengler, Heusenstamm, Germany, assignor to Stanztechnik GmbH R & S, Frankfurt, Germany

Filed Jun. 24, 1977, Ser. No. 809,921

Int. Cl.² B26D *5/12, 5/42, 7/02, 11/00*

U.S. Cl. 83—171 **22 Claims**



1. An apparatus for trimming randomly, three-dimensionally shaped workpieces having an inside and an outside, comprising frame means, workpiece support means mounted in said frame means for holding said workpiece on the outside of the workpiece, counter-holder means mounted in said frame means for contacting the workpiece on the inside and for holding a three-diimensional workpiece against said workpiece support means, tool carrier means mounted in said frame means, strip steel knife means operatively secured to said tool carrier means, power drive means operatively connected to said tool carrier means for moving said strip steel knife means toward and away from said workpiece, said strip steel knife means having a configuration corresponding to workpiece edges to be trimmed, said apparatus further comprising mounting means for securing said tool carrier means to said frame means in different angular positions, whereby said strip steel knife means which are secured to said tool carrier means, are movable in a direction determined by the angular position of the respective tool carrier means, said workpiece support means having openings therein for the strip steel knife means to pass through said openings whereby, the combination of all individual knife movements provides a three-dimensional cutting.

4,106,380
ANGLE IRON CUTTING

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed May 9, 1977, Ser. No. 795,088

Int. Cl.² B26D *9/00, 7/06*

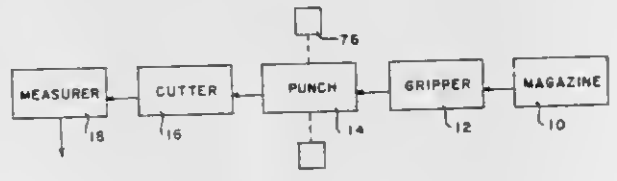
U.S. Cl. 83—212 **14 Claims**

1. Apparatus for automatic punching and cutting of angle irons or the like comprising:

means for providing a supply of angle irons to be cut comprising means for vertically stacking a plurality of angle irons and means for feeding the angle irons one at a time to the transporting means from the top of the stack, said stacking means comprising a magazine, and further comprising means for pivotally mounting said magazine so that it may be moved to a generally horizontal position in which said magazine may be loaded with angle irons, and

then moved to the position in which the angle irons are vertically stacked; means for upwardly biasing the angle irons in said stack so that upon removal of one angle iron from the top of the stack, the next angle iron assumes the position previously taken by the removed angle iron,

means for transporting said angle irons away from said supply supply means;



means for punching holes of predetermined size in an angle iron at a punching position;

means for automatically determining the length of angle iron to be cut at a cutting position; and

means for cutting an angle iron at the cutting position to provide an angle iron of predetermined length.

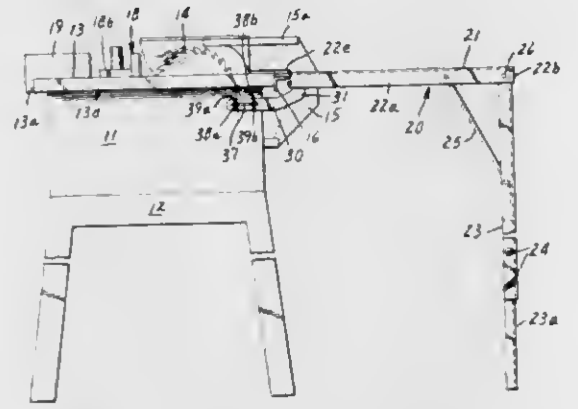
4,106,381
EXTENSION TABLE FOR TABLE SAWS

Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472

Filed Aug. 15, 1977, Ser. No. 824,913

Int. Cl.² B27B *5/22*

U.S. Cl. 83—477.2 **12 Claims**



1. In combination with a power saw assembly which comprises a saw housing supported a desired distance above the floor; mounted above said housing a generally rectangular horizontal worktable having a feed end, a discharge end, right and left sides, and peripherally depending lips; said worktable having a centrally located elongate opening to accommodate a rotary saw blade; at least one groove located in the top of said worktable extending parallel to both sides and shaped to accommodate a miter gauge rod; located at the ends of said worktable, means for positioning a rip fence parallel to said sides; a rotary saw blade positioned within said housing beneath said worktable and movable through said opening; means for rotating said blade; positioned beneath said worktable and extending beyond the discharge end, a support; and a saw guard hingedly connected to said support;

a generally rectangular, flat-topped extension table comprising an elongate flat panel having two sides, a distal end, and a proximal end, lips depending from said sides and ends to enhance rigidity;

support means connected to the distal portion of said extension table to position said distal end a predetermined distance above the floor, said distance corresponding to the height of the worktable above the floor:

first means attaching the proximal lip adjacent one side of said extension table to the lip at the discharge end of said worktable, thereby aligning the upper surfaces of said tables; and

second means attaching the proximal lip adjacent the other side of said extension table to said saw housing.

4,106,382
CIRCULAR SAW TOOL

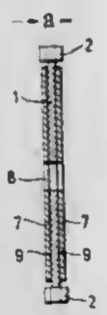
Ernst Saljé, Schulheide 4, D 2106 Bendestorf, Germany, and Ulrich Bartsch, Brunswick, Fed. Rep. of Germany, assignors to Ernst Saljé, Bendestorf, Germany

Filed May 24, 1977, Ser. No. 800,049

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623339

Int. Cl.² B27B *33/08*

U.S. Cl. 83—835 **6 Claims**



1. A circular saw tool, with a single-ply or multi-ply disc-shaped saw blade and teeth distributed over the circumference thereof, the saw blade being provided on each side with a covering having the shape of a thin round blank and an intermediate layer consisting of an adhesive having a high degree of elasticity which connects the covering to the blade, said coverings together with said layers of adhesive providing a noise suppression system as well as an encapsulation on both sides of the saw blade for reducing noise radiated by the saw blade.

4,106,383
REGISTER ARRANGEMENT FOR AN ELECTRONIC MUSICAL INSTRUMENT

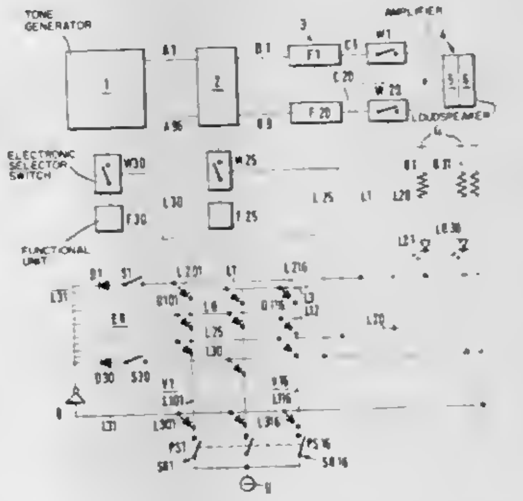
Wilfried Dittmar, Halsenbach, Fed. Rep. of Germany, assignor to WERSI-electronic GmbH & Co. Kommanditgesellschaft, Halsenbach, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,735

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555083

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.01 **17 Claims**



1. In an electronic musical instrument, the combination of

(a) a tone generator (**1**) adapted to produce tone signals;

(b) means (**2**) for selecting said tone signals;

(c) functional units (**F1–F30**) for influencing said tone signals;

(d) a discrete electronic selector switch (**W1–W30**) in controlling relationship with each of said functional units;

(e) a discrete control conductor (**L1–L30**) in controlling relationship with each of said selector switches;

(f) an individual register assembly (ER) having first actuating elements (S1-S30) each operatively connected to one of said control conductors to apply control voltage (from L31) thereto; and

(g) a plurality of collecting register assemblies (SR1-SR16) each having a second actuating element (PS1-PS16 or PSU1-PSU16) and an associated distributor circuit (V1-V16), each of said distributor circuits being connected to a different combination of control conductors and being energizable by the respective second actuating element to apply control voltage simultaneously to the corresponding combination of selector switches.

4,106,384

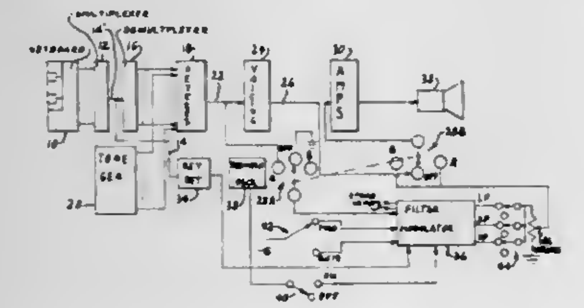
VARIABLE FILTER CIRCUIT, ESPECIALLY FOR SYNTHESIZING AND SHAPING TONE SIGNALS

Billy J. Whittington; John William Robinson, and Ralph N. Dietrich, all of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed May 21, 1976, Ser. No. 688,565

Int. Cl.^{2} G10H *1/04, 5/00*

U.S. Cl. 84—1.19 **20 Claims**



1. The method of producing special sound effects in an electronic organ having a tone generator, an output circuit including an acoustic transducer, and playing keys with each key when depressed controlling the supply of a respective tone signal from the generator to the output circuit, said method comprising:

interposing a filter circuit comprising a first amplifier, a second amplifier and a third amplifier connected in series in the order named and connected between the tone generator and output circuit,

interposing a variable impedance element in the inputs to each of the second and third amplifiers,

said filter circuit having a high pass filter characteristic output, a band pass filter characteristic output and a low pass filter characteristic output corresponding to respective ones of the first, second and third amplifiers,

detecting the depression of a key and generating a transient control signal,

controlling the rise and the decay of the transient control signal, and

varying the values of the variable impedance elements in accordance with the transient control signal to vary the characteristics of the filter circuit.

4,106,385

DIGITAL ARPEGGIO GENERATING DEVICE

Patrick S. Roberts, Glendale Heights, Ill., assignor to Thomas International Corporation, Chicago, Ill.

Filed Oct. 6, 1975, Ser. No. 619,810

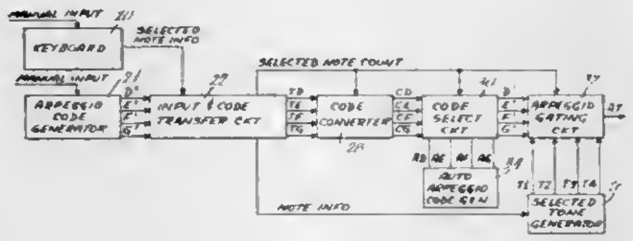
Int. Cl.^{2} G10H *3/06;* **G10F** *1/00;* **G10H** *1/02*

U.S. Cl. 84—1.24 **20 Claims**

1. In a musical instrument having tone signal generating means, a first set of controls for selecting tone signals and means for sequentially producing tone signals having predetermined frequency relationships with the selected tone signals, the improvement comprising:

a second set of serially arranged individually actuable switches smaller in number than said first set of controls and manually actuable for generating a series of individually identifiable control signals; means associated with said second set of switches for preventing generation of more than one control signal at a time;

means connected with said second set of switches and said tone signal generating means for associating a selected tone signal with each of said control signals; and



means responsive to generation of each control signal and its associated selected tone signal for generating output tone signals having predetermined frequency relationships with said selected tone signals.

4,106,386

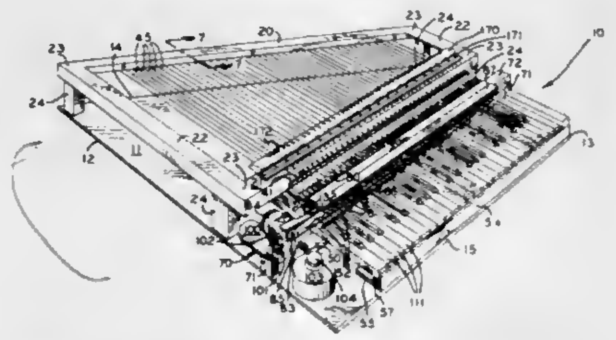
MUSICAL STRINGED INSTRUMENT

Richard A. Rotramel, 2525 E. Peralta Way, Fresno, Calif. 93703, and Charles Michael Fisher, Fresno, Calif., assignors to Richard A. Rotramel, Fresno, Calif.

Filed Dec. 6, 1976, Ser. No. 747,500

Int. Cl.^{2} G10C *1/00*

U.S. Cl. 84—256 **17 Claims**



1. A musical instrument comprising:

(A) a vibratory string;

(B) a resiliently flexible filament having a mounting end and an opposite tip adapted to engage the string for inducing vibrations thereof;

(C) means mounting the filament for movement in an orbital path in which the filament periodically engages the string and in which the tip passes substantially through the position occupied by the string when the string is at rest;

(D) powered means for rotating the filament in said orbital path; and

(E) manually controlled means for moving said path relative to the string for selective engagement with and disengagement from the string by the filament, in which the mounting means includes a shaft having a portion adjacent to the string on which the filament is mounted; and the means for moving said path is a key mechanism having a support portion provided with a bearing receiving said shaft for rotational movement about an axis substantially parallel to the string, a finger portion, and a pivot portion connected to the support portion for pivotal movement of the support portion towards and from the string in response, respectively, to depression and release of the finger portion.

4,106,387

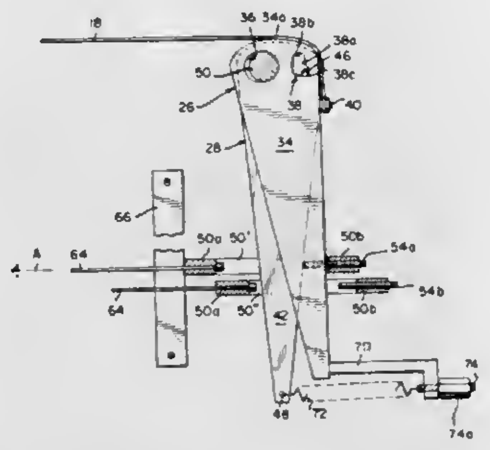
STRINGED MUSICAL INSTRUMENT

Arthur William Alifano, P.O. Box 467, West Sand Lake, N.Y. 12196

Filed Mar. 19, 1976, Ser. No. 668,553

Int. Cl.^{2} G10D *3/14*

U.S. Cl. 84—312 P **7 Claims**



1. A stringed musical instrument including:

a means supporting thereon a plurality of strings,

a plurality of tuning keys each having one end of a corresponding string attached thereto for controllably tensioning said strings to a basic normally tuned condition corresponding to a predetermined nominal tone,

tone changing means connected to the other end of each string including a shaft and a pair of operable members pivotally supported on said shaft and each capable of being rotated about said shaft from a normal first position to a second variable position, actuation of either of said members to its second variable position altering the pitch of the associated string by an amount dependent on the second variable position, the first of said operable members comprising an elongated flat member having an arcuate head, an oblong hole, and an eccentric cam slot means the other end of each of said strings being operatively connected to the upper end of a corresponding first member, the second of said operable members comprising substantially the same configuration as said first lever with a circular hole and an extending controlling pin, said oblong hole of said first lever being aligned with said circular hole of said second lever, said controlling pin registering within said eccentric cam slot means,

a plurality of pedals and means for coupling any one of said pedals to either of said operable members for any said string to selectively change the pitch of any string by an amount dependent on which pedal is actuated,

and means responsive to the concurrent actuation of a pair of pedals coupled respectively to both said operable members associated with any string to produce a third change of pitch of said string which is different from the amount of pitch change occuring in response to actuation of either of said pair of pedals alone.

4,106,388

KEYBOARD UNIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Reinhard Franz, Halsenbach, Fed. Rep. of Germany, assignor to WERSI-electronic GmbH & Co. Kommanditgesellschaft, Halsenbach, Fed. Rep. of Germany

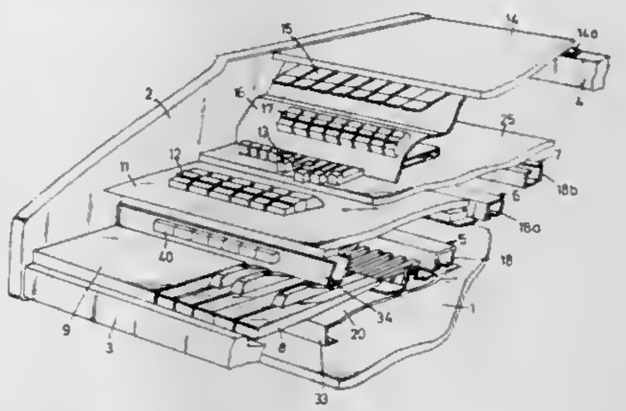
Filed Mar. 9, 1977, Ser. No. 775,932

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610318

Int. Cl.^{2} G10C *3/04, 3/12*

U.S. Cl. 84—434 **16 Claims**

1. In a musical instrument, a keyboard unit comprising a housing having a bed and spaced-apart first and second side walls extending upwardly from said bed; substantially plate-like first and second bearing members provided in said housing adjacent the respective side walls; means for adjustably securing said bearing members to said housing; a plurality of carriers disposed between said bearing members and each including an elongated hollow profiled member having first and second end portions adjacent the respective bearing members and an elongated slot, at least one substantially plate-like support for keys, switches, stops, drawbars or analogous components, and



means for adjustably fastening said support to said profiled member including at least one externally threaded member extending through said support and the slot of said profiled member and an internally threaded member non-rotatably received in and slidable lengthwise of said profiled member and mating with said externally threaded member, the profiled members of said carriers being substantially parallel to each other; and means for pivotally securing the end portions of said profiled members to the respective bearing members.

4,106,389

AIRCRAFT WEAPON MOUNTINGS

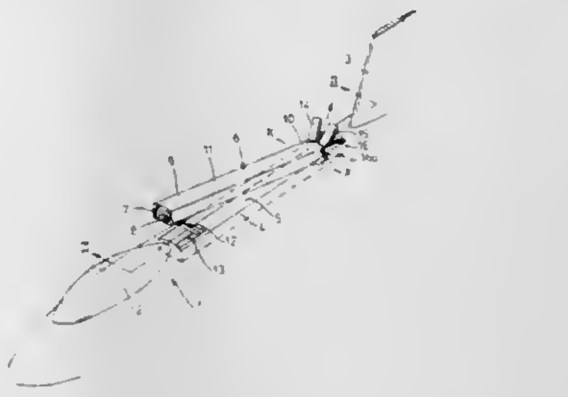
Gerald David Walley, Preston, England, assignor to British Aircraft Corporation, London, England

Filed May 10, 1977, Ser. No. 795,626

Claims priority, application United Kingdom, May 14, 1976, 20084/76

Int. Cl.^{2} F41F *3/06*

U.S. Cl. 89—1.815 **7 Claims**



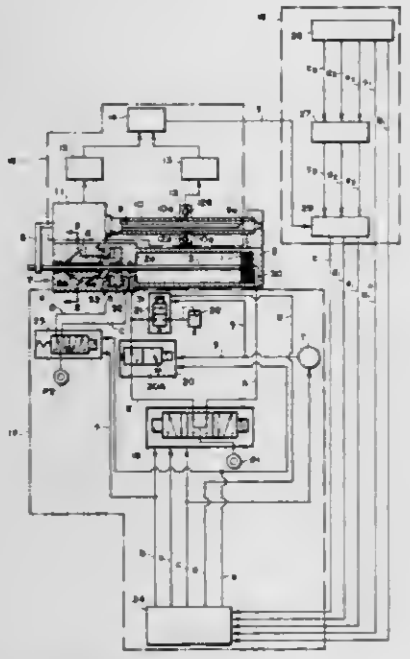
1. An aircraft having a fuselage with a forward cockpit region, an aft empennage region, an upper deck region extending between the two regions, a launcher assembly, for housing and launching at least one rocket propelled weapon, the launcher assembly being of elongated form with a forward end region through which the weapon is launched, a rearward end region through which rocket exhaust gases are dissipated, and an upper deck region extending between said end regions, a trough in the fuselage upper deck region formed to accommodate the launcher assembly in a stowed position such that its upper deck region lies smoothly continuously with the fuselage upper deck region, hinge means, and jack means, spaced from the hinge means, connecting the launcher assembly to the fuselage, the arrangement being such that the launcher assem-

bly can be moved from the stowed position to an extended position in which the weapon can be launched.

4,106,390

PNEUMATIC LINEAR ACTUATOR

Hiroshi Kodaira, and Mitsuo Masuda, both of Asahi, Japan, assignors to Kuroda Seiko Co., Ltd., Kawasaki, Japan
Filed Nov. 24, 1976, Ser. No. 744,592
Claims priority, application Japan, Dec. 1, 1975, 50-144101
Int. Cl.^{2} F15B *15/26*
U.S. Cl. 91—42 **2 Claims**



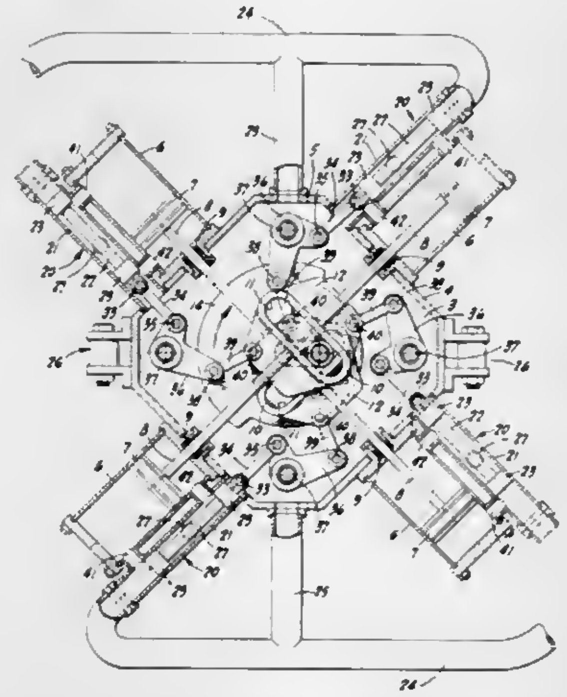
1. A pneumatic linear actuator comprising a cylinder, a piston axially movable in said cylinder, a piston rod connected to said piston, mechanical braking means for mechanically engaging with said piston rod to mechanically brake said piston rod, displacement control means for automatically controlling sequential operation including pneumatically braking to decelerate said piston in the course of movement toward a predetermined stop position and then actuating said mechanical braking means to stop said piston and said piston rod at the predetermined stop position, a source of air pressure incorporated in said displacement control means to be connected to said cylinder and said mechanical braking means for supplying air under pressure to said cylinder and said mechanical braking means, a main control means of digital control type connected to said displacement control means for generating a sequence of control signals used to operate said displacement control means according to a predetermined sequence and detecting means for digitally detecting the axial displacement of said piston rod to feed back the digital signal representative of the detected axial displacement of said piston rod to said main control means of digital control type, said detecting means comprises:

a rod coupled to said piston;
a sleeve covering said rod;
an analogue to digital converter coupled to said rod such that said analogue to digital converter generates a pulse train as said rod moves together with said piston;
a means for detecting when said rod has moved a predetermined distance inside of said sleeve;
a reference pulse generator for generating a train of pulses in response to said rod position detector when said rod reaches said predetermined position; and
a means for comparing said train of pulses from said analogue to digital converter with said train of pulses from said reference pulse generator.

4,106,391

MOTOR

Roland T. Wheeler, 744 Empire Ave., Modesto, Calif. 95351
Filed Jan. 31, 1977, Ser. No. 764,232
Int. Cl.^{2} F01B *3/10*
U.S. Cl. 91—481 **4 Claims**



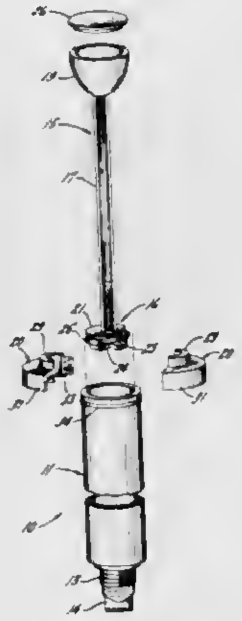
1. A radial type, fluid pressure actuated motor comprising a support, sets of opposed cylinders mounted on the support, the cylinders of each set being spaced in alinement, pistons reciprocable in such cylinders, a support-mounted crankshaft axially centered between the sets of opposed cylinders, a connecting rod extending in common between the pistons of each set of opposed cylinders, each connecting rod being formed centrally of its ends with a yoke having an elongated transverse slot therein, the yokes being disposed side by side with the slots in intersecting relation, the crankpin of the crankshaft extending in journaled but slidable relation through the slot of both yokes, a fluid pressure supply conduit, valves corresponding to each cylinder of each set thereof, and motion-transmitting means connected to and extending between the latter to effect feed of fluid pressure from said conduit to, and exhaust the same from, the cylinders in a predetermined cyclic order wherein the pistons of each set are simultaneously powered on each stroke, and produce, through the medium of said connecting rods and yokes, rotative motion of the crankshaft; said motion-transmitting means including, for each valve of each set of cylinders, one part connected to the valve, and another part connected to the yoke of the other set of cylinders.

4,106,392

HAND-OPERATED PUMP

Arthur L. Johnson, Jr., and Marlow W. Dodge, both of Rockford, Ill., assignors to Johnson Enterprises, Inc., Rockford, Ill.
Filed Feb. 3, 1977, Ser. No. 765,078
Int. Cl.^{2} F16J *1/10*; B67D *5/42*; F04B *21/04*
U.S. Cl. 92—128 **5 Claims**

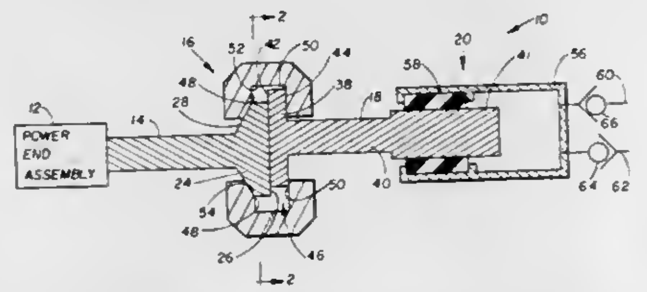
1. A pump comprising a cylinder having inner and outer ends, an outlet at the inner end of said cylinder, a plunger extending into said cylinder from the outer end thereof, said plunger being formed of plastic and comprising (a) a piston telescoped slidably into said cylinder, (b) an elongated stem molded integrally with said piston and extending outwardly from said cylinder, and (c) an enlarged hand grip molded integrally with the outer end of said stem, and means covering the outer end of said cylinder, said means comprising first and second substantially semi-circular caps telescoped with said cylinder and telescopically receiving said stem.



4,106,393

CLAMP - SELF ALIGNMENT

James C. Dodson, and Harold S. Labyer, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Division of Ser. No. 674,693, Apr. 8, 1976, Pat. No. 4,033,701. This application Nov. 26, 1976, Ser. No. 745,502
Int. Cl.^{2} F16J *15/18*
U.S. Cl. 92—168 **1 Claim**



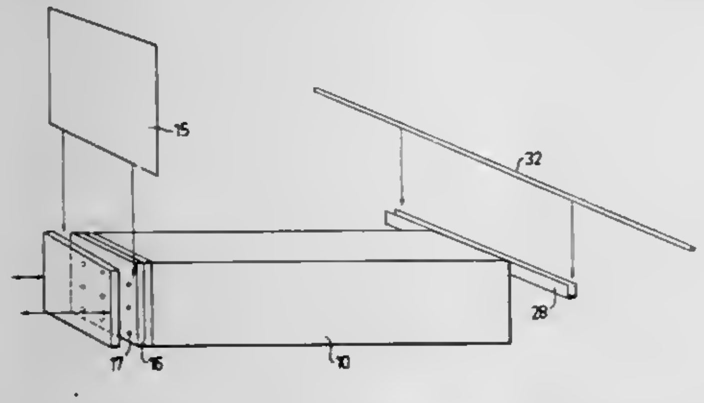
1. A self-centering clamp having a central axis for coupling a reciprocating push rod having a central axis and a reciprocating plunger having a central axis in a pump assembly having a power end assembly and a fluid end assembly such as to maintain said clamp centered relative to one of said reciprocating push rod and said reciprocating plunger and effect self-alignment of said reciprocating plunger within the fluid end assembly of said pump assembly, said clamp having the central axis thereof laterally displaced from the central axis of one of said reciprocating push rod and said reciprocating plunger, comprising:

(a) an outwardly tapered head on one of said reciprocating push rod and said reciprocating plunger;
(b) a flat radial head on the other of said reciprocating push rod and said reciprocating plunger;
(c) said self-centering clamp including a pair of semi-circular sections, each section of said pair of semi-circular sections having a radially inward facing cavity extending substantially uniformly along the arc of each said section and each cavity having a first and second wall and a bottom;
each said first wall having a flat radial surface slidably receiving said flat radial head;
each said second wall having a substantial portion thereof angled toward the bottom of said cavity and slidably receiving said outwardly tapered head; and
(d) means jointly positioning each said semi-circular section to encase said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger for permitting temporary transverse movement of said reciprocating push rod and said reciprocating plunger relative to each other to establish alignment of said reciprocating plunger within said fluid end assembly of said pump assembly;
said pair of semi-circular sections being operable when engaged with said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger and with the ends of said reciprocating push rod and said reciprocating plunger being laterally slidably engaged, to cooperate with said tapered head and said flat radial head to permit unitary reciprocative movement of said reciprocating push rod and said reciprocating plunger,
with the central axis of said reciprocating push rod and the central axis of said reciprocating plunger undergoing displacement in relative to each other response to said reciprocating movement while remaining in mutually, generally parallel relation, and with said tapered head and said flat radial head of said reciprocating push rod and said reciprocating plunger remaining in generally axially abutting relation;
said pair of semi-circular sections being operable to undergo joint reciprocating movement with said reciprocating push rod and said reciprocating plunger, while said central axis of said reciprocating push rod and said central axis of said reciprocating plunger are displaced relative to each other,
with the angled portion of said second wall of said pair of semicircular sections and said tapered head of one of said reciprocating push rod and said reciprocating plunger cooperating to wedgingly urge said tapered head and said flat radial head of said reciprocating push rod, and said reciprocating plunger into a relatively mutually immobilized condition with said axis of said reciprocating push rod and said axis of said reciprocating plunger being displaced relative to each other;
said tapered head and said flat radial head being alternately subjected to pushing and pulling forces during said reciprocating movement and being mutually displaceable, generally laterally of said reciprocating movement and in response thereto, to effect said mutual displacement of said central axis of said reciprocating push rod and said central axis of said reciprocating plunger during, and in response to, said reciprocating movement; and
said pair of semi-circular sections remaining substantially centered in relation to said one of said reciprocating push rod and said reciprocating plunger and said tapered head thereof by said tapered head cooperating with the angled portion of said second wall and said flat radial head cooperating with the flat radial surface of said first wall of said pair of semicircular sections during said mutual displacement of said central axis of said reciprocating push rod and said central axis of said reciprocating plunger, while said other of said reciprocating push rod and said reciprocating plunger and said radial head thereof are laterally displaced relative to said pair of semi-circular sections during and in response to said reciprocating movement as permitted by relatively reduced frictional engagement between said reciprocating push rod and said reciprocating plunger ends while said reciprocating push rod and said reciprocating plunger ends are slidably engaged prior to said relative immobilizing of said central axis of said reciprocating push rod and said central axis of said reciprocating plunger.

4,106,394

METHOD OF FORMING A WRAPPING FOR A SHIPMENT UNIT AND DEVICE FOR CARRYING OUT THE METHOD

Theodor Själander, Nipstadsgatan 11, 881 00 Solleftea, Sweden
Filed Feb. 11, 1977, Ser. No. 767,840
Claims priority, application Sweden, Feb. 12, 1976, 7601601
Int. Cl.^{2} B31D *5/00;* B31B *17/00*
U.S. Cl. 93—1 F **17 Claims**



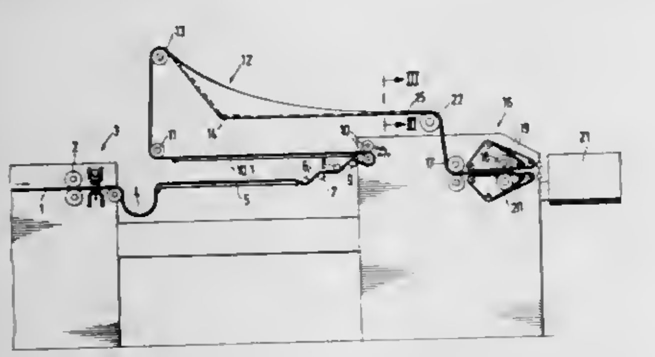
1. The method of forming a wrapping for a substantially rectangular block unit of material to be shipped in which said wrapping comprises a center piece which is the same length as the said unit and encloses the said unit on three sides thereof and having at least one fixed end-piece at one end comprising the steps of:

folding at least one end of said center piece into a U-shaped configuration;
placing a rectilinear end piece over said U-shaped one end and overlapping three edges with the respective closed sides of said configuration and with a fourth side of said end piece substantially in the plane of the open side of said configuration;
joining said three overlapped edges while holding said end piece in position adjacent said one end of said center piece; and
placing a drawing cord transversely of said other end of said center piece and joining same.

4,106,395

METHOD AND APPARATUS FOR PRODUCING STACKS OF FOLDED BAGS

Kurt Rochla, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany
Filed Nov. 17, 1976, Ser. No. 742,608
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1975, 2551569
Int. Cl.^{2} B31B *23/26*
U.S. Cl. 93—35 R **6 Claims**



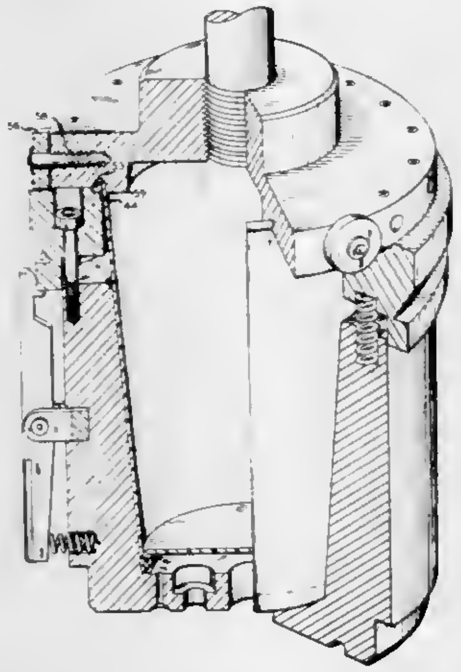
1. A method of producing stacks of folded bags from a chain of formed bags, the bags being formed from a tubular or semi-tubular web having transverse bag-forming weld seams and lines of perforations parallel and adjacent to the transverse weld seams, said method comprising:

folding the chain of formed bags thereby forming connected, individually folded bags;
severing individual folded bags, along the lines of perforations, from the folded chain of formed bags; and
stacking the individual folded bags.

4,106,396

APPARATUS FOR FORMING A CONTAINER HAVING A ROLLED RIM

Frank P. Richards, Prairie Village, Kans., and Jerry W. Young, Weston, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 18, 1977, Ser. No. 798,217
Int. Cl.^{2} B31B *17/02*
U.S. Cl. 93—36.5 R **13 Claims**



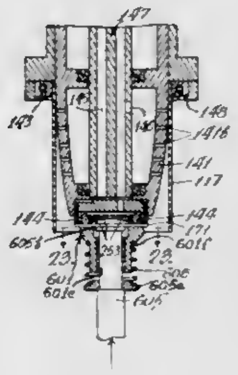
1. An apparatus for forming a bead on a free open end of a container, said apparatus comprising:

(a) a container receiving receptacle having an open free end with a first surface defining the free end, said receptacle having a container receiving pocket therein extending inwardly from the open free end;
(b) a ring having a through bore communicating with said pocket, said ring also having second and third surfaces with said second surface being adjacent said first surface;
(c) first means movably mounting said ring on said receptacle wherein said ring is movable between an extended position away from said receptacle and a retracted position adjacent said receptacle with said first means also biasing said ring to the extended position, said ring having an annular first groove recessed in said third surface;
(d) latch means cooperating with said ring and operable to releasably retain said ring in its retracted position;
(e) second means cooperating with said latch means for selectively releasing same from retaining said ring in its retracted position;
(f) a forming head positioned adjacent to said ring and having a fourth surface with an annular second groove therein selectively cooperating with said first groove to form a substantially enclosed bead forming groove; and
(g) third means with said forming head mounted on a portion thereof, said third means being operable for rotating said forming head and for selectively moving said forming head between an extended portion adjacent to and engaging said ring and a retracted position remote from said ring.

4,106,397

PICK-UP HEAD ASSEMBLY FOR USE IN APPARATUS FOR FABRICATING THERMOPLASTIC CONTAINERS

Stephen W. Amberg, 1004 Glann Rd., Toledo, Ohio 43607, and Thomas E. Doherty, 7 Carriage La., Setauket, N.Y. 11733, assignors to Owens-Illinois, Inc., Toledo, Ohio
Division of Ser. No. 479,421, Jun. 14, 1974, Pat. No. 3,970,492, which is a continuation-in-part of Ser. No. 354,305, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,259, Dec. 23, 1971, Pat. No. 3,995,740, and Ser. No. 473,998, May 28, 1974, Pat. No. 3,995,740, which is a continuation of said Ser. No. 211,259. This application May 6, 1976, Ser. No. 683,893
Int. Cl.^{2} B31B *17/02*
U.S. Cl. 93—55.1 R **3 Claims**



1. A pick-up head assembly for use in conveying a circular disc to the bottom of a container forming mandrel, comprising: a vertical carrier rod; means slidable along said carrier rod comprising, a dish-shaped member having an axial bore therein adapted to receive said carrier rod; said dish-shaped member has an annularly recessed center portion in the upper surface thereof, means resiliently positioning said dish-shaped member along the upper end of said carrier rod; a disc carrying member having an upwardly facing recessed portion for receiving a disc; said disc carrying member being positioned on said dish-shaped member; said disc carrying member is cylindrically shaped and positioned within said annularly recessed center portion and means biasing said disc carrying member upwardly relative to said dish-shaped member.

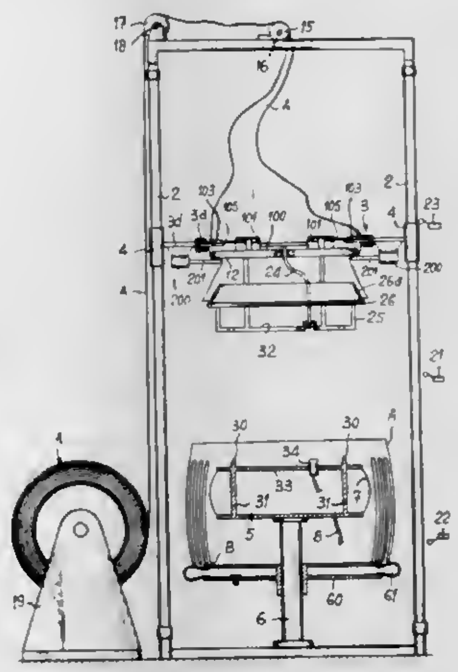
4,106,398

METHOD AND APPARATUS FOR THE TRANSVERSE FOLDING OF A CONTINUOUS TUBULAR SLEEVE

Marcel Buisson, 3 Place des Halles, Chartres, France (28000)
Filed Nov. 29, 1976, Ser. No. 745,563
Claims priority, application France, Mar. 23, 1976, 76 08307
Int. Cl.^{2} B31D *5/04*
U.S. Cl. 93—84 TW **41 Claims**

1. A method of folding a continuous length of tubular material to form a package comprising a plurality of concentric layers juxtaposed concentrically adjacent to each other, comprising the steps of:

holding open the tubular material in the vicinity of a free end thereof;
gripping the tubular material at a distance from the free end at least equal to twice the length of one of the juxtaposed concentric layers;
moving the gripped portion of the tubular material into juxtaposition adjacent to the free end of the tubular material and folding the tubular material over itself to form two concentric layers one overlying the other from the material between the free end and the gripped portion;
releasing the gripped portion; and,

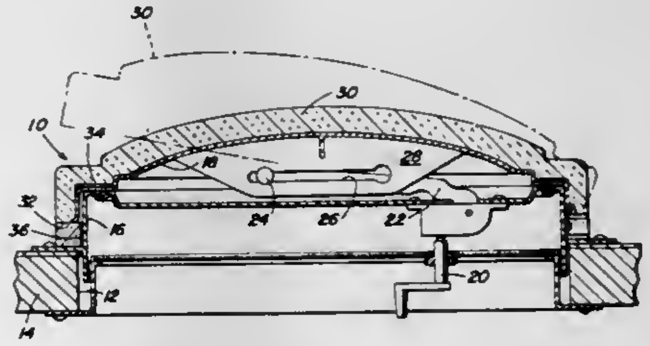


cutting the folded tubular material to form the package of concentric layers juxtaposed concentrically adjacent to each other.

4,106,399

VEHICLE ROOF VENTILATOR INSULATION COVERING

George C. Lawrence, Jr., 294 Hickory La., Lennon, Mich. 48449
Filed Mar. 8, 1977, Ser. No. 775,543
Int. Cl.^{2} B60H *1/26*
U.S. Cl. 98—2.14 **6 Claims**

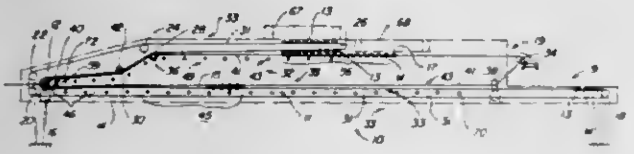


1. An insulative cover for a ventilator formed in a roof of a vehicle, the ventilator being comprised of a stationary frame member mounted about the periphery of an opening in the roof or the like of said vehicle and a movable dome member hingably mounted to the frame member, the insulative cover comprising:

an upper cover member formed of insulative material and having inner wall portions formed in the shape of exterior surface portions of the dome member, said inner wall portions fitting contiguously to said exterior surface portions of the dome member; and,
a lower cover member formed of insulative material and having inner wall portions formed in the shape of exterior surface portions of the frame member, said inner wall portions fitting contiguously to said exterior surface portions of the frame member.

4,106,400
CONTROLLED PROCESS MUFFIN GRIDDLE

Eugene M. Noel, Lowell St., Humarock, Mass. 02047
Filed Jul. 14, 1977, Ser. No. 815,496
Int. Cl.² A47J *37/00*
U.S. Cl. 99—373 9 Claims



1. A continuous muffin griddle comprising:

a. a frame;

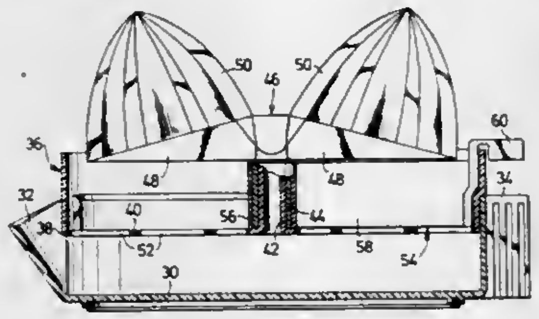
b. a prime mover mounted on said frame;

c. a cup conveying web including a doughball loading station at the input end thereof operationally mounted on said frame having a forward cup conveying portion operationally mounted on said frame in horizontal orientation thereon including an input end in coordinate conveying communication with the output of said doughball loading station and an output end therefrom, and a plurality of burners arranged in parallel distributed array thereunder; said cup conveying web having a driving connection with said prime mover at its output end; a cup turnover portion, having a cup turnover means, operationally mounted on said frame having an input in coordinated conveying communication with the output end of the forward conveying portion of said cup conveying web; a backward cup conveying portion of said cup conveying web operationally mounted on said frame in horizontal orientation thereon and vertically spaced above the forward cup conveying portion of said cup conveying web including an input end in coordinated conveying communication with the output of the cup turnover means and a terminating end therefrom; and a cup return conveying portion of said cup conveying web operationally mounted on said frame having its input end in coordinated conveying communication with the output end of said backward cup conveying portion and its output end in coordinated conveying communication with the input to said doughball loading station; and

d. a cover/hearth conveying web including a muffin offloading station at the output therefrom operationally mounted on said frame and functioning as a cover traveling over and in parallel and adjacent coordinated traveling relation with said forward cup conveying portion of said cup conveying web, and having a starting end thereover in extended forward travel relation with respect to said cup conveying doughball loading station and an output end in coterminus travel and concentric relation with the output end of the forward cup conveying portion of said cup conveying web; a cover/hearth turnover portion operationally mounted on said frame having an input in coordinated conveying communication with the output end of the forward conveying portion of said cover/hearth conveying web and in operational connection with said cup turnover means in said cup conveying web for coordinated cooperation therebetween; a backward cover/hearth conveying portion of said cover/hearth conveying web operationally mounted on said frame beneath the backward conveying portion of the cup conveying web and functioning as a hearth plate traveling in parallel and adjacent coordinated relation with the backward cup conveying portion of said cup conveying web, said backward cover/hearth conveyor portion having a plurality of burners arranged in parallel distributed array thereunder and having a muffin offloading station in extended backward travel relation with respect to the terminating end of said backward cup conveying portion of said cup conveying web, and a driving connection with said prime mover at said muffin offloading station; and a cover/hearth return conveying portion of said cover/hearth conveying web operationally mounted on said frame in coordinated conveying communication with the muffin offloading station at the output end of said backward cover/hearth conveying portion.

4,106,401
HAND-OPERATED SQUEEZER FOR EXTRACTING THE JUICE FROM CITRUS FRUITS

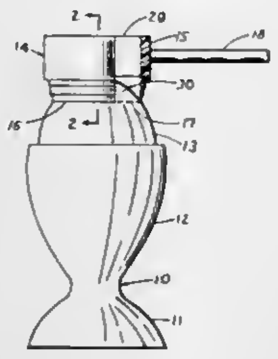
Peter Ackeret, Kusnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland
Filed Oct. 6, 1976, Ser. No. 730,198
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635503
Int. Cl.² A23N *1/00;* A47J *19/02*
U.S. Cl. 99—508 25 Claims



1. A hand-operated squeezer for the extraction of juice from citrus fruits, the squeezer comprising at least one pair of substantially upright, but oppositely inclined and generally conical squeezer members of the same size and shape and having inclined axes converging on each other in a downward direction, wherein the squeezer members are so arranged with respect to one another that they may be used for the simultaneous squeezing with both hands of fruit halves of approximately the same size with approximately the same expenditure of force and time, the forces occurring upon simultaneous squeezing of two fruit halves on the two squeezer members substantially cancelling each other out.

4,106,402
EGG SHELL BREAKER

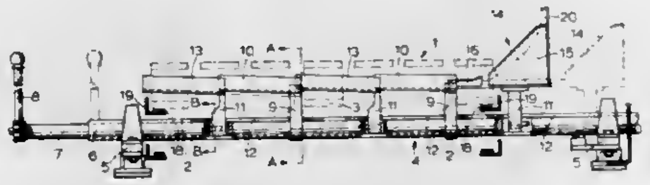
James Constantine Gevas, One Ford La., Roseland, N.J. 07068
Filed Nov. 26, 1976, Ser. No. 745,413
Int. Cl.² A47J *43/00*
U.S. Cl. 99—571 12 Claims



1. A tool for breaking the shell of an egg and severing an end segment therefrom comprising a hollow cylindrical body with a shell engaging edge at one end for disposition over and about an end of said shell with said edge engaging said shell along a circular line of contact lying intermediate the equator and a pole, said body having a circumferential section immediately adjacent said edge which section has a wall with substantially right circular cylindrical radially inner and outer surfaces and a thickness throughout its length of the same order of magnitude as the thickness of said shell, means strengthening said section to resist departure from circularity when advanced through said shell, and means for permitting the transfer of kinetic energy to said body generally in a direction parallel to the axis of said body for advancing said body axially through said shell severing said segment from the remainder of the shell for easy removal from said shell remainder.

4,106,403
BAND FEED GUIDES

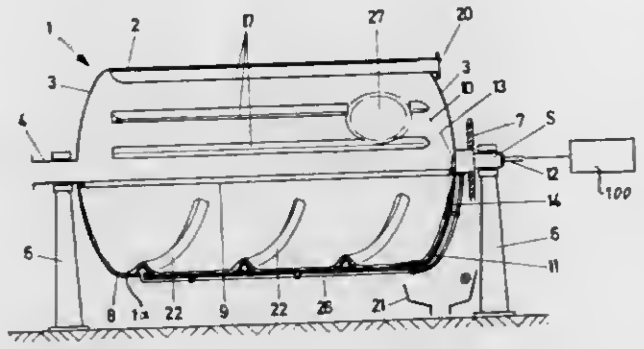
Donald Sutehall, Harlow, England, assignor to Gerrard Industries Limited, England
Filed Mar. 29, 1977, Ser. No. 782,318
Claims priority, application United Kingdom, Apr. 3, 1976, 13618/76
Int. Cl.² B65B *13/04*
U.S. Cl. 100—25 11 Claims



1. In banding apparatus for securing a load on a pallet and having a band feed guide means for threading banding through the voids between the deck and runners of a pallet and comprising spaced supports with conveyor means positioned thereon for moving said pallet, at least two primary chute sections and at least one secondary chute section, carrier means for mounting the chute sections, the primary chute sections being mounted on the carrier means for movement into the voids of a pallet at the apparatus to join the secondary chute section and form therewith a continuous guide below the deck of the pallet, the secondary chute section being so mounted in the apparatus as to lie between the runners of the pallet.

4,106,404
APPARATUS FOR SEPARATING LIQUIDS AND SOLIDS FROM ONE ANOTHER, ESPECIALLY FOR EXTRACTING JUICE FROM AGRICULTURAL PRODUCTS

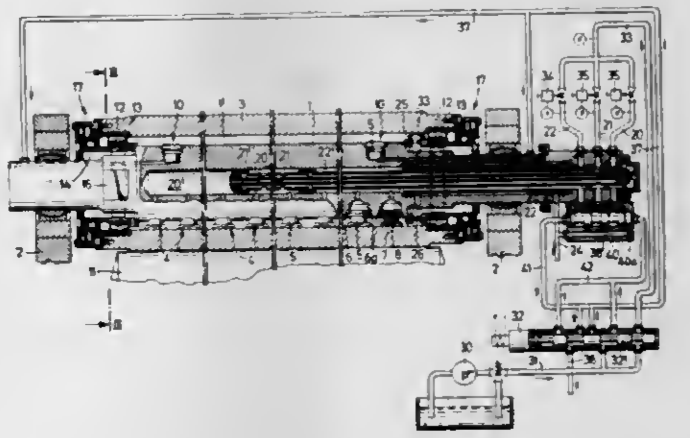
Alfred Schmid, Niederweningen, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland
Filed Mar. 31, 1977, Ser. No. 783,266
Claims priority, application Switzerland, Apr. 7, 1976, 4359/76
Int. Cl.² B30B *9/12, 5/02*
U.S. Cl. 100—117 11 Claims



1. An apparatus for separating liquid and solid materials from one another, especially for the extraction of juice from agricultural products, in particular from fruit, comprising:
- a press container;
- means for rotatably mounting said press container;
- a substantially hood-shaped squeezing diaphragm subdividing the press container into a pressure compartment and a squeezing compartment;
- means defining an inlet arrangement for a pressurized fluid medium delivered to said pressure compartment;
- means defining a juice outlet arrangement provided for said squeezing compartment;
- a plurality of product residue-ejection elements arranged at the region of said squeezing diaphragm;
- said ejection elements protruding into said squeezing compartment and extending along sections of a screw line.

4,106,405
CONTROLLED DEFLECTION ROLL

Mario Biondetti, and Ignazio Marchioro, both of Schio, Italy, assignors to Escher Wyss Limited, Zurich, Switzerland
Filed Jul. 1, 1977, Ser. No. 812,280
Claims priority, application Switzerland, Jul. 13, 1976, 8947/76
Int. Cl.² B30B *3/04;* B21B *13/02*
U.S. Cl. 100—162 B 8 Claims

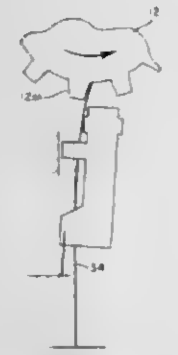


1. A controlled deflection roll arrangement comprising:
- a fixed support;
- a hollow shell;
- means mounting said hollow shell to be rotatable about the fixed support and displaceable relative to said fixed support in the direction of a pressure plane;
- at least one hydrostatic contact element disposed between the fixed support and the roll shell;
- a counter roll cooperating with said roll shell;
- said at least one hydrostatic contact element being operatively effective in the pressure plane and serving to press the roll shell against the counter roll and thus for producing a pressure force of the controlled deflection roll;
- at least one hydrostatic lift-off element which is effective in an opposite direction to the effective contact element and serving to lift-off the roll shell from the counter roll;
- means defining at least one source of hydraulic pressurized fluid medium;
- hydraulic lines for connecting the contact element and the lift-off element with said source of hydraulic pressurized fluid medium;
- an outflow conduit for the hydraulic pressurized fluid medium; and
- control means for selectively connecting a hydraulic line of the contact element or the lift-off element with said source of hydraulic pressurized fluid medium and for simultaneously connecting the hydraulic line of the element which has been disconnected from the source with an outflow conduit.

4,106,406
PRINT HAMMER APPARATUS

Gerald A. Angelichio, Ilion, N.Y., and Frank A. Digilio, Acton, Mass., assignors to Mohawk Data Sciences Corp., Herkimer, N.Y.

Filed Sep. 17, 1976, Ser. No. 724,427
Int. Cl.^{2} B41J *9/36*
U.S. Cl. 101—93.31 21 Claims

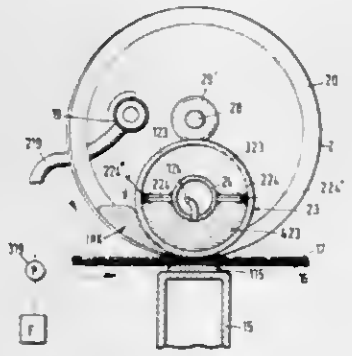


1. In an impact printer having a printer frame to which is mounted carrier means for periodically presenting a plurality of type die to a print line adjacent a document on which a printing operation is to be performed, and a print impacting mechanism, including at least one print hammer arranged to impact the document with selected ones of the type die at the print line, a source of mechanical energy including an impeller having at least one impeller tooth rotating in synchronism with the periodic presentation of the type die by the carrier means, an interposer having a mass smaller than the mass of the hammer and associated with the hammer and arranged for selective movement by a control element from a normal position into the path of motion of the impeller tooth such that the impeller tooth engages the interposer driving it and the associated print hammer from a rest position toward the print line to impact the document with a selected type die, said impeller tooth and hammer having the same plane of motion; said print impacting mechanism being characterized by said print hammer being elongated with a print hammer head at one of its ends and the other of its ends being secured to the impact printer frame by a flat flexure spring adapted to flex in the plane of motion of the print hammer; by said interposer being mechanically coupled to said print hammer in a linkage including an aperture in the print hammer through which the interposer extends and is moveable into and out of the path of said impeller tooth and captivates the smaller mass interposer to travel with the larger mass hammer after engagement of the interposer to travel with the larger mass hammer after engagement of the interposer by the impeller tooth; by said interposer being flexible in the plane of motion of said hammer and impeller tooth and flexing in such plane when engaged by the impeller tooth such that a relatively smooth accelerating force is imparted to the print hammer and such that the removal of the interposer from the path of the impeller tooth and return to the normal position after such engagement is enhanced by such flexing and by the captivation linkage to the print hammer; and by said linkage captivating the interposer to the hammer at a first point in proximity to the hammer head and at a second point in proximity to the other end of the hammer so as to control flexing and oscillation of the interposer between said two points.

4,106,407
DEFLECTABLE HOLLOW SOCKET SQUEEGEE FOR ROTARY SCREEN PRINTER

Mathias Mitter, Schloss Holte, Fed. Rep. of Germany, assignor to Mitter & Co., Schloss Holte, Fed. Rep. of Germany

Continuation of Ser. No. 657,081, Feb. 11, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,576
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1975, 2505903
Int. Cl.^{2} B41F *15/44*
U.S. Cl. 101—120 10 Claims



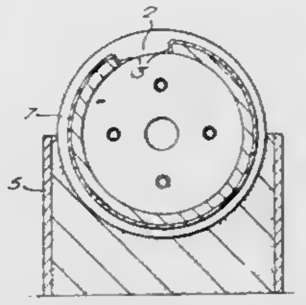
1. In a screen printing machine of the type having a roller squeegee and wherein the pressure exerted by the center region of such roller squeegee upon the printing machine to be forced through the printing screen of the machine tends to be less than the pressure exerted thereupon by the end regions of the roller squeegee, resulting in non-uniform printing by the machine, a combination comprising a printing screen having a surface for supporting a printing medium which is to be forced through said printing screen onto a travelling web to be imprinted; squeegee means for forcing said printing medium through said printing screen, said squeegee means comprising a non-rotatable shaft upwardly spaced from and extending substantially parallel to said surface, a driven tubular jacket rotatably surrounding said shaft; a drive shaft parallel to said non-rotatable shaft; drive gears on said drive shaft for driving said tubular jacket pairs of axially spaced shaft bearings at opposite end portions of said non-rotatable shaft, journalling said drive shaft and maintaining said shafts at a predetermined distance from each other; and means for shifting said squeegee means relative to said surface, including means for displacing said jacket relative to said shaft in direction towards said surface and for deforming said jacket into conformance with the contour of said surface when the surface is downwardly bowed in direction away from said shaft, so that the pressure exerted by said jacket is always uniform over the axial length of said tubular jacket.

4,106,408
DUPLICATOR CYLINDER CONSTRUCTION

Norman Holland, Liege, Belgium, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 604,503, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 420,218, Nov. 29, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,330
Int. Cl.^{2} B41C *1/18, 3/02;* **B22D** *19/02*
U.S. Cl. 101—401.1 3 Claims

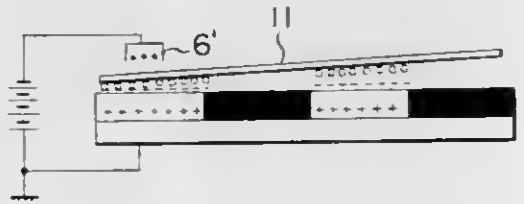
1. For a lithographic duplicator, a cylinder comprising a support body and a preformed outer layer of stainless steel sheet, the cylinder being so configured as to present a longitudinal surface gap and the stainless steel sheet having its ends bent so as to extend into and define the gap, wherein the support body is of cast iron which has been formed under normal ambient foundry temperature conditions by casting against the interior of the otherwise unheated preformed outer layer at a pouring temperature at least 150° C above its normal pouring temperature, and thereby bonded to the interior surface of the outer layer throughout its area including the bent ends.



4,106,409
ELECTROSTATIC PRINTING METHOD

Hajime Kobayashi, Mitaka; Yasuhiro Yano, Tokyo, and Ichiro Endo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,401
Claims priority, application Japan, Jan. 26, 1976, 51-7740
Int. Cl.^{2} G03G *13/14, 15/00, 5/04*
U.S. Cl. 101—426 9 Claims



1. In a process for electrostatic printing which includes (1) a step for forming an electrostatic latent image by subjecting a printing master to an electric charging treatment, (2) a step of developing the electrostatic latent image, and (3) a step of transferring the developed image onto an image-receiving material, the improvement which comprises: employing an electrostatic printing master formed by

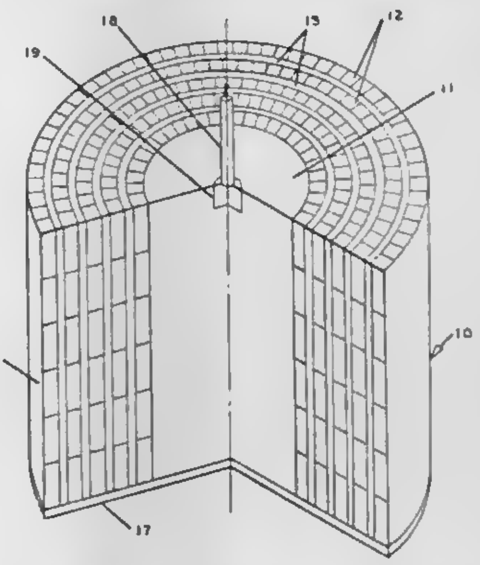
(A) subjecting an image-forming member to a pre-heat treatment to enhance image-forming capability, said member having a first layer, wherein an organic silver salt is dispersed in an electrically insulating medium and a reducing agent is associated with said first layer,
(B) irradiating said image-forming member with an active radiation ray, and
(C) heat-developing said image-forming member.

4,106,410
LAYERED FRAGMENTATION DEVICE

Charles A. Borcher, Maitland, and William R. Porter, Orlando, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation-in-part of Ser. No. 769,464, Aug. 26, 1968, abandoned, which is a continuation-in-part of Ser. No. 518,481, Jan. 3, 1966, abandoned. This application Apr. 28, 1972, Ser. No. 249,458
Int. Cl.^{2} F42B *13/48*
U.S. Cl. 102—67 7 Claims

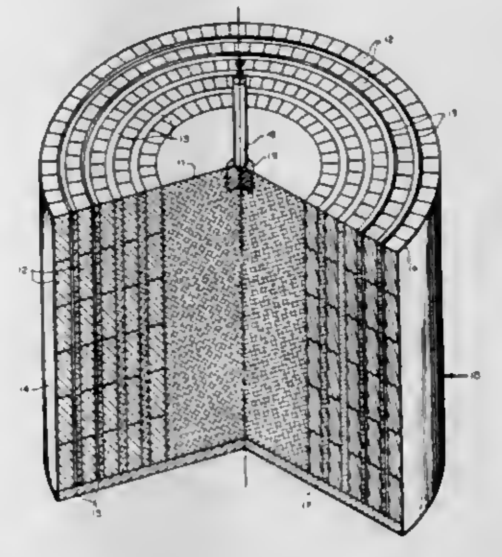
1. A layered warhead for projecting a multitude of fragments in a highly controlled pattern, comprising alternating substantially continuous layers of fragments and explosive, means for bringing about an explosive detonation that is propagated through the layers of fragments and explosive at essentially right angles to the intersections between such layers, the occurrence of detonation in the explosive layer nearest said detonation means serving to expand the adjacent fragment layer against its adjacent explosive layer, thus compressing such adjacent explosive layer to a higher energy density before it detonates, such adjacent explosive layer detonating a very small increment of time after the first layer, and at a higher energy density, with such compression taking place with regard to each succeeding explosive layer, thereby increasing the energy in such explosive layers as they eject their respective fragment layers within a few microseconds of each other, and causing the discrete fragment layers to form a spatially desirable explosion pattern.



4,106,411
INCENDIARY FRAGMENTATION WARHEAD

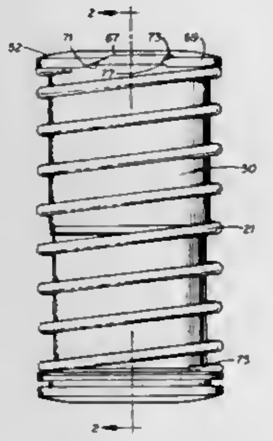
Charles A. Borcher, Maitland; William R. Porter, Orlando, and Martin H. Harris, Winter Park, all of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation of Ser. No. 103,903, Jan. 4, 1971, abandoned. This application Sep. 2, 1975, Ser. No. 609,777
Int. Cl.^{2} F42B *13/48*
U.S. Cl. 102—67 20 Claims



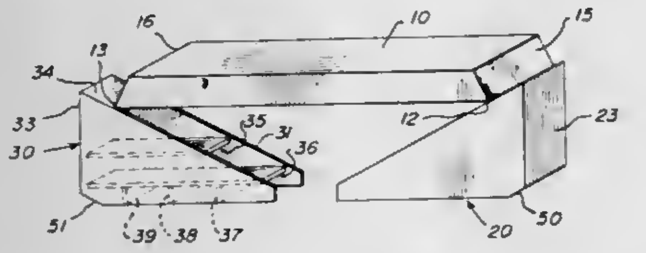
1. A layered incendiary fragmentation device designed to project fragments in a highly controlled pattern, comprising at least two layers of fragmentable material, and at least two layers of explosive material, with a layer of explosive material being utilized for each layer of fragmentable material, at least one layer of pyrophoric material disposed with said fragmentable and explosive layers, said layers being adjacently disposed, yet separate and substantially continuous, extending for a substantial portion of a major dimension of the device, and means for bringing about the detonation of said explosive layers substantially simultaneously so as to cause the outward projection of fragments and pyrophoric material.

4,106,412
FLUID TRUCK BOLSTER SNUBBER
Richard C. Farris, Joshua, and William S. Butler, Burleson, both of Tex., assignors to Halliburton Company, Duncan, Okla.
Filed Apr. 23, 1976, Ser. No. 679,620
Int. Cl.² B61F *5/12;* B61H *11/00;* F16F *9/24, 9/38*
U.S. Cl. 105—197 DH 40 Claims



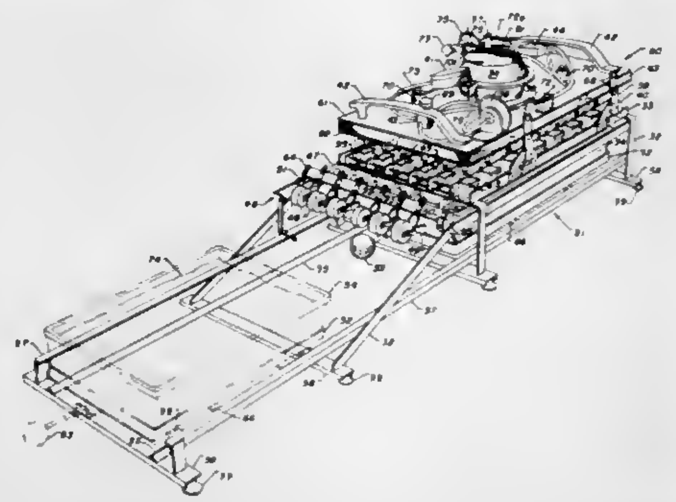
1. In a motion damping apparatus, the improvement comprising:
- a movable piston;
- cylinder means, for sealingly surrounding at least a portion of said piston; said cylinder means including end cap means for closing a first end, a second open end axially opposite to said first end, and an internal surface therebetween;
- a high pressure chamber between said closed end of said cylinder means and said piston;
- a reservoir on an opposite side of said piston from said high pressure chamber;
- two-way valve means, in said piston, for allowing relatively unrestricted flow from said reservoir into said high pressure chamber through said piston in response to a slightly lower pressure in said high pressure chamber than in said reservoir and for allowing relatively restricted flow from said high pressure chamber into said reservoir in response to a much higher pressure in said high pressure chamber than in said reservoir;
- spiral groove means, disposed between said piston and said cylinder means, for allowing regulated flow bypassing said piston within said cylinder means; and
- fixed diameter orifice means between said high pressure chamber and said reservoir for allowing regulated flow between said high pressure chamber and said reservoir.

4,106,413
MULTI-POSITION TABLE
Neal B. Hoaglund, R.F.D. Box 3646, Nelson Rd., Boyne City, Mich. 49712
Filed Dec. 5, 1977, Ser. No. 857,375
Int. Cl.² A47B *3/00*
U.S. Cl. 108—12 11 Claims



1. A table adapted for multiple positions, comprising a top surface having two opposite ends sloped downwardly and outwardly relative to said top surface; a hinge attached along the bottom of each of said sloped table ends; and a leg structure attached to each of said hinges, each of said leg structures constructed from generally triangular-shaped members with said hinge attachment along one triangular edge so as to permit said triangular edge to pivotally contact a sloped table end.

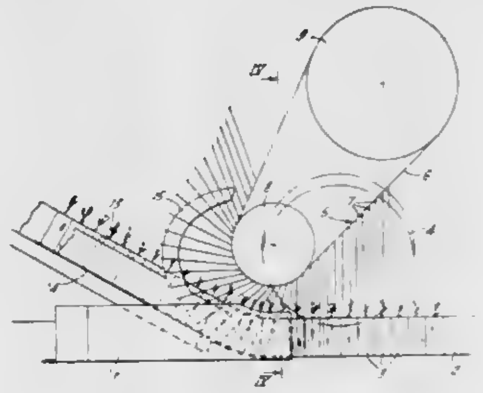
4,106,414
SEED PLANTER AND PLANTING VALVE THEREFOR
Carl Vastag, 34 Pope Blvd., Prairie View, Ill. 60090
Filed Sep. 20, 1976, Ser. No. 724,866
Int. Cl.² A01C *7/04, 5/06*
U.S. Cl. 111—1 10 Claims



1. A vacuum-operated seed planter which comprises, in cooperative combination with a vacuum source:
- (a) a sealed box-like vacuum chamber (i) having separated parallel upper and lower surfaces and, (ii) communicating with said vacuum source via first conduit means containing a first regulating valve for adjusting the vacuum within said chamber;
- (b) a center plate disposed between said upper and lower surfaces, and freely vertically movable within said vacuum chamber;
- (c) vacuum-operated diaphragm valve first motor means (i) communicating with said vacuum source via second conduit means containing a second regulating valve for adjusting the vacuum within said first motor means, (ii) connected by shaft means, through the upper surface of said vacuum chamber, to said center plate and, (iii) effecting vertical movement thereof within said vacuum chamber;
- (d) a plurality of spaced-apart, seed planting valves connected to the lower surface of said vacuum chamber, said valves (i) having a hollow core housing, a plurality of apertures in the upper end portion thereof, such that said hollow core is in open communication with said vacuum chamber, and a coaxially-disposed center shaft vertically-movable within said hollow core and extending through the upper end of said housing, and, (ii) contacting said center plate, within said vacuum chamber, at the upper extremity of said center shaft;
- (e) a seed planter frame containing a plurality of spaced-apart seed storage hoppers;
- (f) guide supporting means, in which said seed-planting frame is positioned, (i) disposed a finite distance below the lower surface of said vacuum chamber and, (ii) in turn removably supported by an elongated, substantially rigid frame member containing a movable nursery flat rack, guide means and a soil-containing nursery flat for positioning the rack and nursery flat beneath said seed-planting frame;
- (g) a pair of vacuum operated diaphragm valve second motor means (i) attached to opposite edges of said vacuum chamber and, (ii) communicating with said vacuum source via third conduit means containing a third regulating valve for adjusting the vacuum within said pair of second motor means;

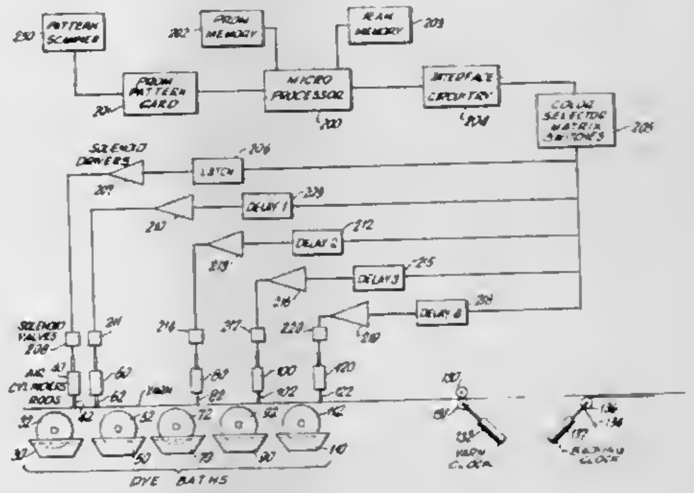
- (h) vertically-aligned biased hinge means (i) attached to said vacuum chamber and said supporting guide means and, (ii) in hinged connection to said pair of second motor means, said biased hinge means effecting simultaneous horizontal and downward movement of said vacuum chamber with respect to said supporting guide means;
- (i) a first plurality of rollers (i) supported by said rigid frame member, (ii) the axis of rotation of which is disposed at right angles to the direction of travel of said nursery flat and, (iii) forming seed-receiving furrows in said soil as the flat is being positioned beneath said seed planting frame; and,
- (j) a second plurality of rollers (i) supported by said rigid frame member, (ii) the axis of rotation of which is disposed at right angles to the direction of travel of said nursery flat and, (iii) closing said furrows after seeds have been planted and the flat is being removed from beneath said seed planting frame.

4,106,415
PLANT-SETTING MACHINE
Reijo Sakari Häkli, Iso-Vimma, Finland, assignor to Lanoeo Tehtaat OY, Iso-Vimma, Finland
Filed Oct. 7, 1976, Ser. No. 730,687
Claims priority, application Finland, Apr. 30, 1976, 761221
Int. Cl.² A01C *11/02*
U.S. Cl. 111—3 7 Claims



1. A plant setting machine comprising a plowshare for the formation of a furrow, a feeding apparatus mounted behind said plowshare for feeding and guiding plants into said furrow, means mounted behind said feeding apparatus for compressing the soil on both sides of the furrow after the plants have been set therein, and an operating device for holding said plants in an upright position in said furrow until the compressing is completed, said operating device comprising a first pair of laterally spaced pulleys mounted on said machine above and on opposite sides of said furrow and substantially above the point of deposit of said plants in said furrow, a second pair of spaced pulleys mounted on said machine spaced from and parallel to said first pair of pulleys and adapted to be driven in the direction of movement of said plowshare, a pair of endless means interconnecting the corresponding pulleys of said two pairs, and a plurality of flexible members attached to each of said endless means at relatively short intervals whereby said flexible members on each such endless means form a pair of walls on opposite sides of the deposited plants, moving in a direction opposite to that of the movement of said plowshare whereby said walls laterally support said plants and maintain their position until said compressing means compacts the sides of the furrow to fix the position of said plants.

4,106,416
CONTROL APPARATUS FOR TEXTILE DYEING AND TUFTING MACHINERY
James Otto Blackstone, Jr., Lanett, Ala., and Fred Pickett Strother, West Point, Ga., assignors to WestPoint Pepperell, Inc., West Point, Ga.
Filed Dec. 2, 1976, Ser. No. 746,948
Int. Cl.² D05C *15/34*
U.S. Cl. 112—79 A 20 Claims



1. Apparatus for dyeing, individually, yarn ends of a plurality of yarn ends at predetermined positions along their lengths and producing a tufted textile product with a multi-colored predetermined complex design incorporated therein, comprising: a tufting station; a plurality of spaced dyeing stations of different colors; a plurality of yarn control assemblies at each dyeing station, each yarn control assembly controlling one or more individual yarn ends and having a corresponding yarn control assembly at each other dyeing station controlling the same one or more individual yarn ends as the yarns are passed through the dyeing stations; each yarn control assembly being individually controllable by digital color pattern data to cause the dyeing of yarn at its associated dyeing station; a holding register for holding digital color pattern data for each yarn control assembly at a first dyeing station, and for the corresponding yarn control assembly at each other dyeing station; means to present a stitch of sequential digital color pattern data from a predetermined pattern to the holding registers for yarn control assemblies sequentially positioned from one side of a dyeing station to the other side, each holding register then containing digital color pattern data identifying one particular dyeing station having a particular color dye; means to output digital color pattern data from each holding register to the yarn control assemblies at the first dyeing station when predetermined portions of yarn ends are at the first dyeing station, and means to delay the output of digital color pattern data from each holding register to the yarn control assemblies at each other dyeing station until the same predetermined portions of yarn ends are at the other dyeing stations, whereby the stitch of digital color pattern data in the holding registers causes particular yarn control assemblies at particular dyeing stations receiving digital color pattern data to dye the yarn ends they control; and means for presenting each next sequential stitch of digital color pattern data from a predetermined pattern to the holding registers for a corresponding operation; whereby, individual yarn ends are dyed different colors at predetermined positions along their length and a multi-colored predetermined complex design is tufted according to the digital color pattern data presented to the holding registers.

4,106,417

APPARATUS FOR CONTROLLING THE MOVEMENT OF A FABRIC-SUPPORTING CARRIAGE IN A QUILTING MACHINE

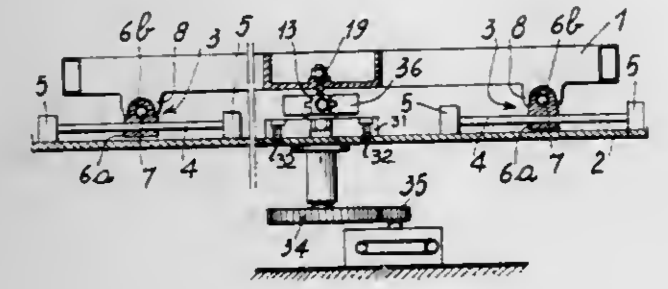
Giannino Landoni, Fagnano Olona, Italy, assignor to MECA S.n.c., Cassano Magnago, Italy

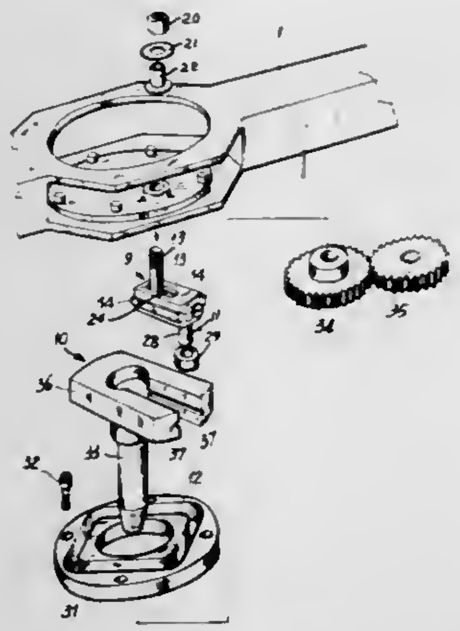
Filed Sep. 27, 1976, Ser. No. 726,757

Claims priority, application Italy, Oct. 3, 1975, 27933 A/75

Int. Cl.² D05B *21/00, 11/00*

U.S. Cl. 112—119 **7 Claims**





1. In a quilting machine having a fabric-supporting carriage and a needle-supporting bar and means for guiding the movement of the carriage relative to the bar, which means includes a cam and follower arrangement wherein the cam is a substantially flat member having a groove and the follower includes a pin which engages into the groove, the improvement wherein said cam and follower arrangement comprises a rotatable member comprising a shaft and a shaped guide coupled to said shaft; a slider slidably housed in said guide wherein said slider protrudes from said guide and being mounted for sliding movement with respect to the guide during rotation of the shaft with a first pin connected to said fabric-supporting carriage and with a second pin parallel to said first pin slidably housed within said groove; and means for adjusting distance between said first and second pins.

4,106,418

ONE-STEP BUTTONHOLE MECHANISM FOR SEWING MACHINE

Yasuhisa Hayashi, Osaka, Japan, assignor to White Sewing Machine Company, Cleveland, Ohio

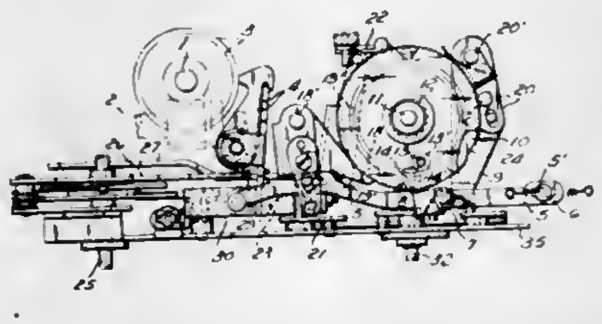
Filed Aug. 30, 1976, Ser. No. 718,810

Claims priority, application Japan, Sep. 11, 1975, 50-125221[U]

Iot. Cl.² D05B *3/02, 3/06*

U.S. Cl. 112—158 B **4 Claims**

1. In a sewing machine, a device for sewing buttonholes through a continuous sequence of four stages controlled by the machine, comprising a plurality of rotary cams fixed relative to one another for controlling the position of amplitude, base line, and feed modifying elements, means for rotating said cams in incremental steps proportional in number to stitches, control means including means to interrupt stepwise rotation of said cams at the completion of the first stage of sewing through a predetermined fixed number of stitches and the initiation of the second stage, said control means including a manually adjustable element settable prior to initiation of sewing to re-establish stepwise rotation of said cams at the completion of a second stage of sewing through a variable predetermined number of stitches, said control means including means to interrupt stepwise rotation of said cams at the completion of a third stage of sewing through a second predetermined fixed number of stitches, said cams being arranged to produce a high amplitude and minimal feed during the first stage of sewing, a reduced amplitude, a base line to one side and moderate feed in one direction during the second stage of sewing, a high amplitude and minimal feed during the third stage of sewing, and a reduced amplitude, a base line to the side opposite said one side and a moderate feed in a direction opposite said one direction during the sewing of the fourth stage, wherein said control means includes a ratchet wheel, said cam rotating means including a pawl for advancing said ratchet wheel in timed relation to the formation of stitches, said ratchet wheel being arranged to rotationally drive said cams, said first-mentioned interrupting means including means to prevent said pawl from advancing said ratchet wheel.



4,106,419

SEWING MACHINE

Marcel Fresard, Petit-Lancy, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

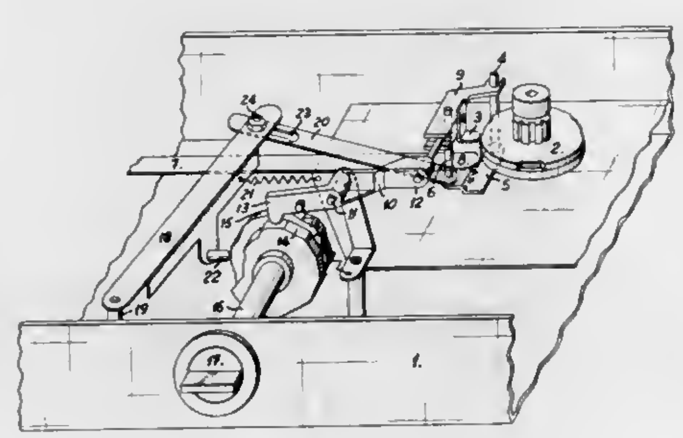
Filed Mar. 8, 1977, Ser. No. 775,652

Claims priority, application Switzerland, Mar. 16, 1976, 3234/76

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 A **1 Claim**

1. In a zig-zag sewing machine comprising a frame housing a series of cams juxtaposed on a drive-shaft for controlling oscillation of a needle-bar cradle by means of a set of transmission elements comprising a slide able to oscillate about an axis parallel to said drive-shaft and a feeler rotatably connected with the slide and able to move parallel to said drive shaft, and manual cam-selection means for controlling movement of said feeler, said cam-selection means including first and second cam profiles, said first cam profile enabling the feeler to be spaced apart from the series of juxtaposed cams, said second cam profile producing movement of the feeler parallel to said drive-shaft, the improvement comprising a lever having first and second ends, said first end articulated to the frame of the machine, a rod connected to the second end of said lever and connecting it to said slide, a cam follower fixed on said lever, said first cam profile cooperating with said cam follower, a second lever including first and second ends and pivotally mounted on the frame of the machine about an axis perpendicular to said drive-shaft, said second cam profile cooperating with the first end of said second lever, the second end of said second lever controlling movement of said feeler.



4,106,420

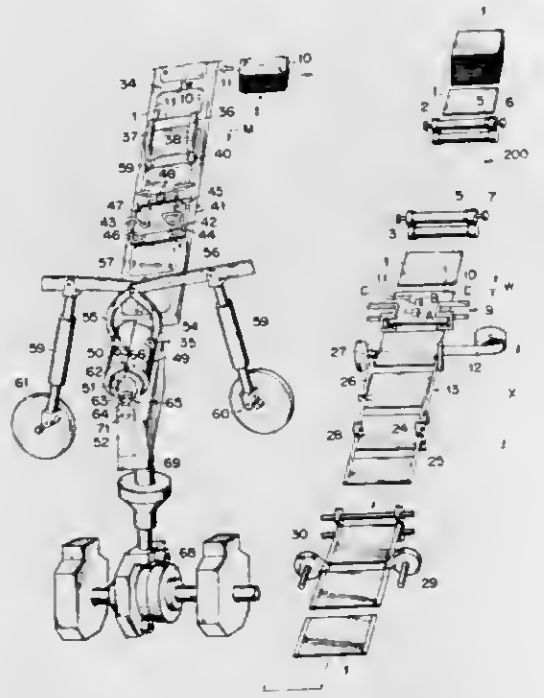
APPARATUS FOR FORMING CANS

Yuzo Takahashi; Yasuyuki Tanaka; Katsumi Nagai; Nobuo Takahashi; Hiroshi Matsuda; Koichi Ono; Kozi Tanaka, and Shiro Oyama, all of Iwatsuki, Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1977, Ser. No. 780,840

Int. Cl.² B21D *51/26*

U.S. Cl. 113—12 **6 Claims**



1. An apparatus for forming cans comprising:

a plurality of pairs of can blank end pressing devices, each provided with a pair of rolls having a parallel axis at a different elevation from each other, one roll of said pair of rolls having at least one end portion thereof tapered at an angle sequentially increasing in said plurality of pressing devices;

a high-frequency induction heating means for heating said can blank end portions;

an organic adhesive film sticking device provided with a U-shaped guide roll for folding an organic adhesive film into a U-shape or V-shape and feeding the folded adhesive film toward said can blank end portions and a pair of rolls for sticking said adhesive film under pressure onto said blank ends from the upper and lower sides;

a high-frequency induction heating means for melting said organic adhesive film stuck onto said blank end portions; and

a can forming device composed of a forming horn provided at the underside thereof with a cooling and pressure accepting member disposed in a spline-like manner through a heat insulating material, left and right wing-like members opposed to each other and moveable so as to form a substantially circular shape in section, and a liquid-cooled hammer which can move upward and downward so as to overlap, squeeze and join together said can blank end portions.

4,106,421

METHOD OF COATING UTILIZING RHEOLOGICALLY MODIFIED METAL DECORATING AND AQUEOUS COATING COMPOSITION COMPRISING LATEX AND AMINOPLAST

Thomas H. Haag, Feasterville; William H. Brendley, Jr., Hatboro, both of Pa., and Richard Martorano, Marlton, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 372,447, Jun. 21, 1973, Pat. No. 4,062,821, which is a continuation-in-part of Ser. No. 333,594, Feb. 20, 1973. This application Feb. 25, 1977, Ser. No. 771,876

Int. Cl.² B21D *51/26*

U.S. Cl. 113—120 A **11 Claims**

1. A method of decorating a substrate comprising the steps of coating said substrate with a pigmented or unpigmented thermosettable composition comprising an alkaline aqueous blend having a binder consisting essentially of:

A. a latex of a water-insoluble addition copolymer of (1) 28 to 70% of a monovinyl aromatic monomer, (2) 18 to 68% of at least one ester of acrylic or methacrylic acid, (3) at least one olefinically unsaturated monomer having at least one of an amide and a hydroxyl group, and (4) an olefinically unsaturated monomer having a carboxyl group, the amount of (3) being from 1.5 to 10% when said monomer contains an amide group and from 1.5 to 15% when said monomer contains a hydroxyl group, and the amount of (4) being from 0.5 to 5% based on the total weight of monomers, the T_g of the polymer being below 45° C., the total of (1), (2), (3), and (4) being 100, and

B. a water-soluble condensation product of urea or a triazine with formaldehyde or a water-soluble methanol or ethanol ether thereof.

the weight ratio of A to B on a solids basis being from 35:65 to 65:35, the minimum film-forming temperature of the composition being no higher than about 25° C., the solids content of the composition being between 40 and 80% by weight, said composition containing from 1 to 5% by weight based on the weight of the solids in the composition of a water-soluble rheology modifier in the form of a polyethylene glycol, the amount of the coating being such as to provide a final cured layer of 0.05 to 5 mils in thickness, and heating the coating until it is thermoset.

4,106,422

METHOD FOR MANUFACTURE OF CAN END CLOSURES

Fred W. Buhrke, Arlington Heights, Ill., assignor to Buhrke Industries, Inc., Arlington Heights, Ill.

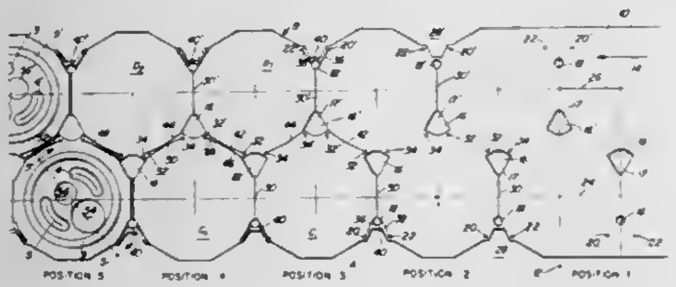
Filed Mar. 14, 1977, Ser. No. 776,949

Int. Cl.² B21D *51/44*

U.S. Cl. 113—121 C **12 Claims**

1. The method of making convenience opened can tops from a metallic web of coil stock which comprises the steps of piercing, marginally notching, and lancing the web according to a predetermined pattern at longitudinally spaced intervals to define a series of identical individual can top blanks which are

part of a web layout comprising a plurality of nested and integrally connected rows of said blanks and in which all of said blanks in said web are spaced apart on equal centers, lancing the web between the adjacent rows of blanks with substantially parallel pairs of cuts extending between the blanks of one row and the adjacent blanks of a contiguous row to separate the rows from each other except for simultaneously formed flexible links extending between the parallel cuts to connect the blanks of the one row with those of the other row, and then passing the thus prepared web over the necessary stations of a single progressive die to draw and countersink each web blank to form a complete can top panel therein while the web material acts as a carrier of the blanks.



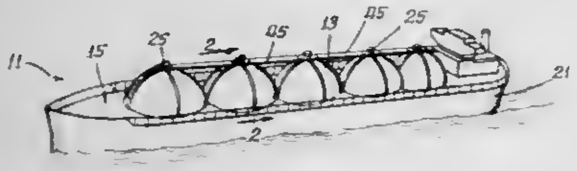
4,106,423
WEATHER COVERS FOR TANKERS

Rolf D. Glasfeld, Cohasset, and Jan G. Morrill, Leominster, both of Mass., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed Oct. 28, 1976, Ser. No. 736,478

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 A **14 Claims**



1. A liquid-transporting cargo ship comprising a hull, a main deck connected to said hull, at least one cargo tank for holding liquid disposed in said hull and extending above said main deck, and a cover surrounding the above-deck portion of said tank, said cover being generally a section of a spheroidal surface and including at least three self-supporting subsections formed of metal plating, each of which subsections is curved in two directions and is connected along its bottom edge to said main deck, and also including at least three expansion members, each expansion member being joined to the lateral edges of two adjacent subsections and being generally tubular in cross section and having a thickness less than the thickness of said cover subsections so as to resiliently deflect when subjected to stresses and thereby protect the shape of said cover subsections.'

4,106,424
INSULATED MARINE CONTAINER FOR LIQUEFIED GAS

Alan L. Schuler, Hingham, and David L. Post, South Weymouth, both of Mass., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed May 26, 1977, Ser. No. 800,702

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 A **9 Claims**

1. An insulated marine container for holding liquefied gas which container comprises

a metal tank having the general shape of a surface of revolution and designed to contain a liquefied gas by maintaining a low temperature therewithin,

means for supporting said tank aboard a marine carrier, and

a thermal insulation barrier surrounding the exterior surface of said tank for maintaining said low temperature by minimizing the flow of ambient heat thereinto,

which barrier includes

a first layer of panels formed of a foamed polymeric material, said panels of said first layer each having at least four holes arranged in a predetermined hole pattern,

studs affixed to said exterior surface of said tank having a size substantially smaller than the size of said holes, said panels being disposed with said studs extending into said holes,

fibrous insulation filling the region of said holes surrounding said studs,

posts of heat-insulating material joined to said studs and extending outward therefrom in axial alignment therewith to form stud-post units,

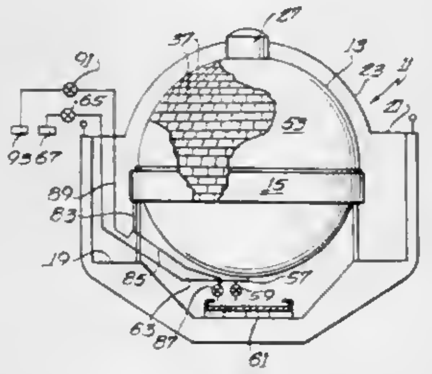
fibrous thermal-insulating material filling the joints between the peripheral edges of adjacent panels of said first layer,

a second layer of fibrous insulating material surrounding and in contact with the outer surface of said first layer of panels, said second layer being impaled upon said stud-post units,

a third layer of panels formed of a foamed polymeric material, the individual panels of said third layer having holes therethrough of a size larger than necessary to accommodate said posts, which holes are located in the same pattern but in different positions relative to the periphery of the panels than the holes in said first layer panels, so that the joints between panels in said third layer are staggered with respect to the joints between the first layer panels,

fasteners connected to the ends of said posts which contact the outer surface of said third layer of panels, said fasteners having apertures which lead to the space between said posts and the interior surface of said holes in said third layer panels, and

foamed in situ polymeric insulating material filling said space.



4,106,425
MARINE PROPULSION UNIT WITH PROTECTED SCREW

Ludwig Gruber, Freilassing, Fed. Rep. of Germany, assignor to John GmbH, Freilassing, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,305

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620770

Int. Cl.² B63H *5/14*

U.S. Cl. 115—42 **11 Claims**

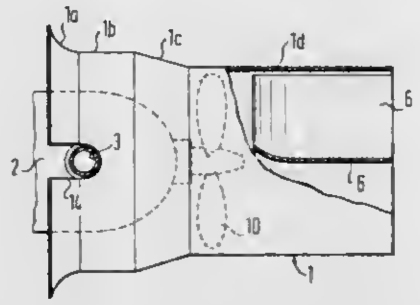
1. A marine propulsion unit comprising:

(a) an elongated casing having an axis and formed with an elongated, axial passage therethrough,
  (1) said passage including four consecutive, axially joined sections of substantially circular cross section,
  (2) a first one of said sections being substantially bell-shaped and tapering toward the second section,
  (3) a third section tapering substantially conically from the second toward the fourth section,

  (4) the second and fourth sections being substantially cylindrical, said fourth section being smaller in diameter and axially longer than said second section;

(b) an approximately torpedo-shaped housing mounted in said passage, said housing being of substantially circular cross-section about said axis,
  (1) one axial end portion of said housing projecting outward of said casing through said first section,
  (2) the other axial end portion of said housing being spacedly enveloped by said third section and tapering in a direction toward said fourth section;

(c) drive means including a shaft substantially coaxially projecting from said other end portion toward said fourth section;



(d) a screw mounted on said shaft in said fourth section adjacent said third section for rotation by said drive means about said axis,
  (1) said housing and said casing radially defining therebetween an annular portion of said passage, said portion being of a length and width to prevent accidental insertion of a human limb into said passage through said first section to a depth sufficient to reach said screw;

(e) a plurality of baffle plates radiating from said axis in said fourth section and defining orifices of said passage therebetween, the spacing of said orifices from said screw being sufficiently great and the size of each orifice being sufficiently small to prevent accidental insertion of a human limb into said passage through said fourth section to a depth sufficient to reach said screw.

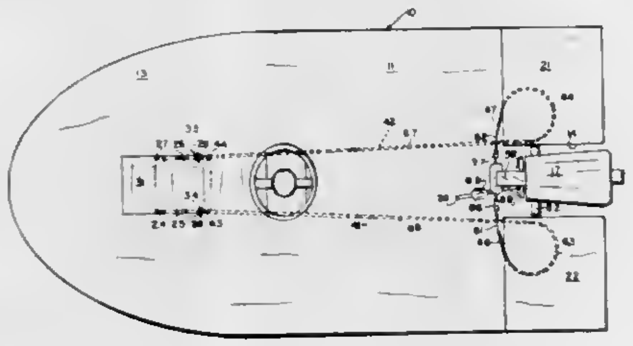
4,106,426
BOAT AND STEERING APPARATUS THEREFOR

Daniel Elanzo Wertz, 250 S. Ocean Blvd., Apt. 11D, Boca Raton, Fla. 33432

Filed Oct. 14, 1976, Ser. No. 732,510

Int. Cl.² A63H *5/08*

U.S. Cl. 115—70 **4 Claims**



1. An improved stand up boat suitable for two persons, said boat having a stern wall for attaching an outboard motor, and a steering mechanism for pivoting said motor comprising:

a shallow draft hull, said hull including a molded lower shell including a bow and a stern, and an upper deck including a stern deck portion affixed to said hull;

floatation foam filling said hull between said stern deck and said lower shell, said hull including a stern indentation sized to receive an outboard motor, said stern foam portion including a pair of spirally disposed channels, said channels sized to receive steering flexible line, said channels including looped portions proceeding outwardly from the center line of the boat hull, whereby the sizing of said channel and the looped portion thereof provides a frictional restraint on said steering flexible line to hold said outboard motor in a selected position.

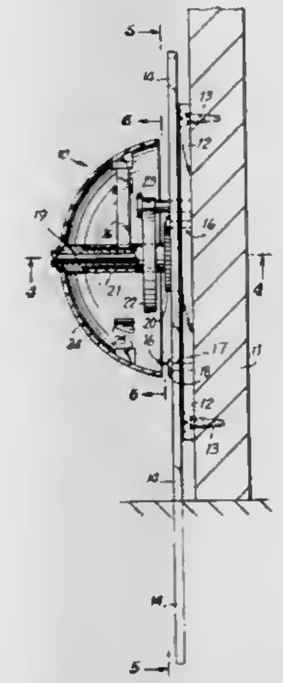
4,106,427
ALARM SYSTEM

Charles L. Sabatinl, P.O. Box 458, Spring Lake, N.J. 02762

Filed Mar. 9, 1977, Ser. No. 775,830

Int. Cl.² G08B *13/08*

U.S. Cl. 116—90 **3 Claims**



1. An alarm system for detecting and signaling the opening of a movable closure comprising:

a support plate having at least two spaced-apart guide pins and an upstanding arbour mounted thereon;

a toothed rack having a longitudinally extending slot formed therein slidably supported on said support plate for longitudinal reciprocable movement, said guide pins of said support plate being received within said slot of said rack;

a gear rotatably mounted on said support plate and in mesh with the teeth of said rack, said gear having a coaxially-disposed, hollow cylindrical sleeve, secured thereto, which is rotatably supported on said arbour;

a resilient lever arm having an inner end which is coupled to said sleeve for rotation therewith;

spring means coupled to said gear which biases said gear against rotation in a first direction, said spring means comprising a flat, spiral spring, having an inner end which is fixed to said sleeve and an outer end which is fixed to said support plate; and

a bell mounted on the outer end of said arbour, said bell having an interior surface from which inwardly project a plurality of spaced abutments, said abutments being disposed in the path of a portion of said level arm for striking engagement therewith.

4,106,428
SAFETY SHIELD FOR FLANGE TYPE COUPLING

Roy A. Matthiessen, 30 Sandy Hill Rd., Westfield, N.J. 07090

Filed Dec. 30, 1976, Ser. No. 755,859

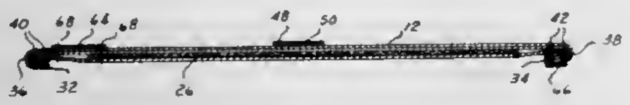
Int. Cl.² F16L *55/00;* **G01N** *31/22*

U.S. Cl. 116—114 P **12 Claims**

1. An improved shield having indicating means for a flanged pipe joint carrying a pressurized fluid, comprising:

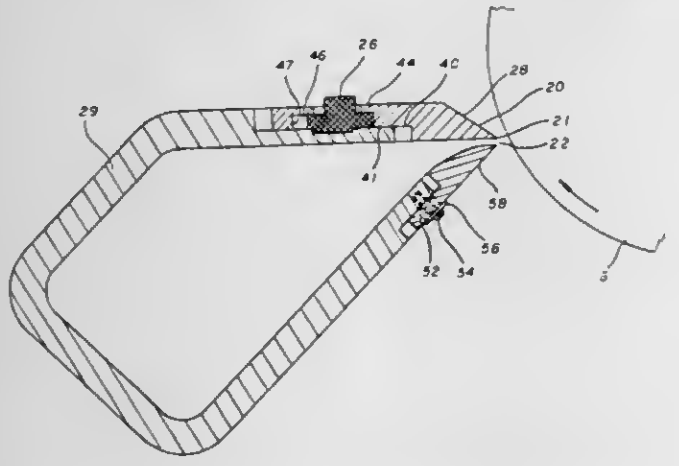
an elongated porous pliable fabric body having an underside and an overside of a length and a width to be wrapped

around a pipe coupling with its ends overlapped and with its underside adjacent the pipe coupling and its overside remote therefrom;
connection means for separably connecting said ends together;
a pliable porous liner reinforcing strip maintained at least at one end disposed between said underside and said overside confined wholly within the boundaries of said body and extending centrally longitudinally of said body;
retaining means for separably holding said liner strip in said body against displacement relative thereto;
at least one display means for monitoring pipe coupling integrity, said display means including chemically sensitive material having the indicating means thereon to change appearance in the presence of given substances; and
clear envelope means having peripheral edges secured on said overside of said shield to surround said display means to hold said display means and fabric body in assembled relation relative to the pipe flange, so that said display means will provide a visual indication of leakage from the pipe joint that has seeped through the underside, pliable porous liner and overside and be protected by said clear envelope means from outside atmospheric or environmental conditions.



4,106,429
AIR KNIFE WITH ADJUSTABLE LIP

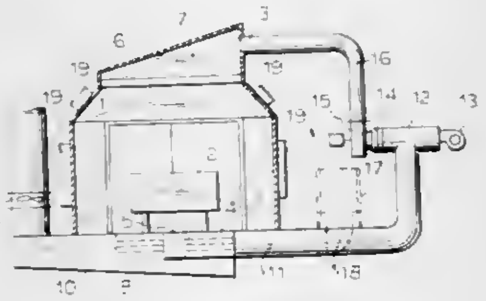
Irvin J. Phillips, South Beloit, Ill., assignor to Beloit Corporation, Beloit, Wis.
Filed May 23, 1977, Ser. No. 799,504
Int. Cl.² B05C *11/06*
U.S. Cl. 118—63 **2 Claims**



1. In an air knife having a body member and a pair of lips defining an orifice gap, the improvement comprising:
at least one of the lips being adjustable and having
a. a surface slidably movable on the body member,
b. a plurality of slots, each of the slots extending to permit lip movement toward the orifice gap,
c. a plurality of circular pressure surfaces,
d. a plurality of rims extending about the pressure surfaces;
a plurality of cam plugs, each having a circular cam surface of smaller diameter than the circular pressure surfaces and mounted in the body member with their cam surfaces engaging the pressure surfaces and held in position between the lip and body member by a corresponding rim whereby turning movement of the cam plugs urges the lip to move relative to the body member;
a plurality of screws extending through the slots in the movable lip and mounted in the body member whereby the movable lip is selectively secured relative to the body member upon being positioned by the cam plugs.

4,106,430
SINGLE CHAMBER TYPE COATING AND BAKING APPARATUS

Takashi Nakajima, Nishinomiya; Tomoyuki Irie, Neyagawa, and Kelichi Kusumoto, Sakai, all of Japan, assignors to Nippun Paint Co., Ltd., Osaka, Japan
Filed Mar. 18, 1977, Ser. No. 779,224
Claims priority, application Japan, Mar. 26, 1976, 51-033788
Int. Cl.² B05C *15/00*
U.S. Cl. 118—64 **5 Claims**

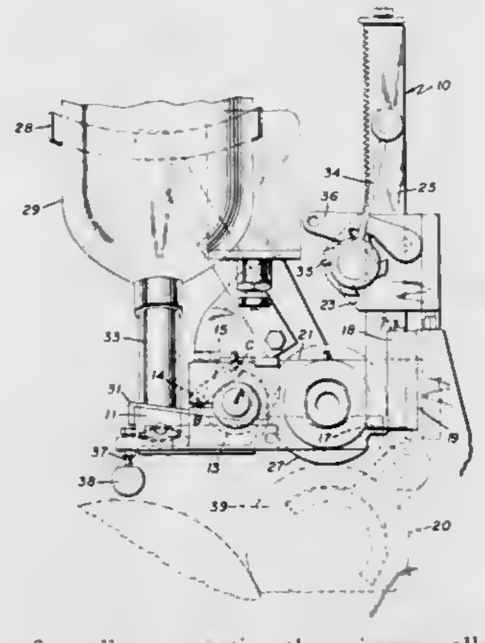


1. A apparatus for coating and baking an item positioned thereinside, said apparatus comprising:
enclosed chamber means having a ceiling and floor for containing said item a first opening in said ceiling and second and third openings in said floor, said third opening being smaller than and positioned within said second opening, which is smaller than said floor, both of said second and third openings being positioned directly beneath said item in said chamber means;
exhaust means connected to said second opening for exhausting air in said chamber to the outside of said chamber;
heat generating means connected to said first opening for supplying heated air into said chamber; and
recycling means connected to said third opening and to said heat generating means for returning the air in said chamber to said heat generating means.

4,106,431
GUM APPLICATOR

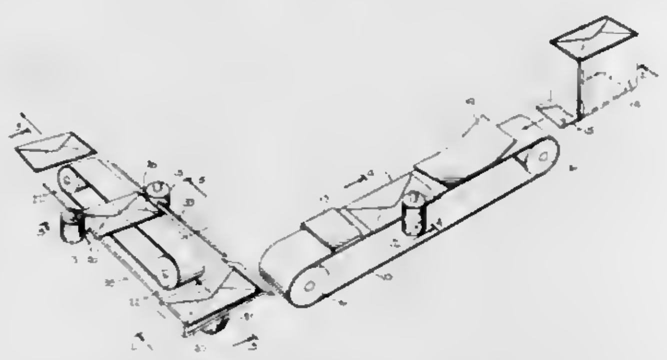
George Frederick Howatt, Holden, Mass., assignor to New England Envelope Manufacturing, Worcester, Mass.
Filed Jan. 28, 1977, Ser. No. 763,574
Int. Cl.² B05C *1/02*
U.S. Cl. 118—203 **8 Claims**

1. Gum applicator, comprising:
(a) an elongated box with an open top adapted to contain a body of gum,
(b) a primary roller mounted for rotation about a first axis extending longitudinally of the box with its lower periphery lying in the box and submerged in the body,
(c) a secondary roller mounted for rotation about a second axis parallel to and spaced from the first axis, the secondary roller being biased toward the primary roller for contact with its surface at a portion hereof as it emerges from the body of gum, and rotatably mounted in a carrier element which in turn is swingable about a third axis spaced from and parallel to the first and second axis, the third axis being located above the primary roller, so that the secondary roller is biased by gravity toward contact with the primary roller, said secondary roller being provided with a central portion of reduced diameter, the length of said central portion being substantially less than the total length of the portions of said secondary roller which contact said primary roller, and
(d) a transfer roller contacting the primary roller to form a small secondary reservoir in the nip between the rollers.



4,106,432
APPARATUS FOR APPLYING CHEMICALS TO ENVELOPES

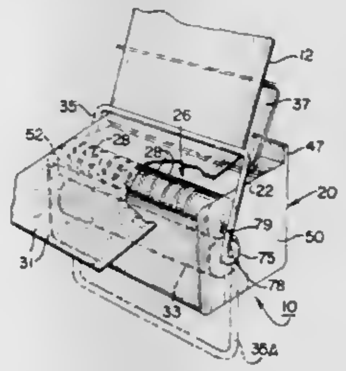
William H. Gunther, Jr., Guilford, Conn., assignor to Thor Dahl, Inc., New York, N.Y.
Filed Apr. 19, 1976, Ser. No. 677,890
Int. Cl.² B05C *1/02*
U.S. Cl. 118—211 **1 Claim**



1. A mechanism for applying a chemical solution to envelope edges which comprises a first conveyor for moving an envelope in a first direction, said first conveyor being narrower than said envelope so that an edge of the envelope extends beyond an edge of the first conveyor, a first applicator roller located adjacent said first conveyor and spaced transversely therefrom so that the extending evelope edge contacts said first roller to have a chemical solution applied thereto as the envelope moves past the first roller, a second conveyor mounted at right angles to the first conveyor for moving the envelope in a second direction at a right angle to said first direction, the second conveyor being narrower than the envelope so that opposed edges of the envelope extend beyond opposed edges of the second conveyor, a pair of second applicator rollers located adjacent opposite edges of the second conveyor and spaced transversely therefrom so that said extending envelope edges contact said second rollers to have a chemical applied thereto as the envelope moves past the second rollers, the portions of said first and second rollers which contact said envelope edges being on the same plane as the said conveyors, means for transferring the envelope from said first conveyor to said second conveyor, said transfer means comprising a dead plate interposed between said first and second conveyor, said dead plate being at least as large as the envelope so that the envelope is unaffected by said first and second conveyors while on said dead plate, a transfer roller on said dead plate to move the envelope from said dead plate to said second conveyor, a spring-pressed hold-down shoe being provided over the first conveyor to keep said envelope on said conveyor, said shoe provided with a downwardly extending lip opposite the first roller to contact the envelope and to move the edge of the envelope beyond the conveyor into contact with the first roller, said dead plate extending beneath the second conveyor for at least the greater portion of its length, said transfer roller mounted below said dead plate and extending through an opening in the dead plate between the first and second conveyors to move the envelope into contact with said second conveyor, said second conveyor having a spring-pressed hold-down shoe mounted therewithin, guide rails being provided to guide the envelopes along said dead plate and interruptions in the guide rails to accommodate the applicator rollers, and the applicator rollers being at right angles to the conveyors and being made a porous steel, said dead plate being flat and uninterrupted throughout its area, except for the opening to accommodate said transfer roller.

4,106,433
COATING APPARATUS

Chulani Kumarlal Fernando, 736 Oakwood, Westmont, Ill. 60559; Sangarappillai Asokan, 1047 S. Lewis Ave.; Sangarappillai Nagendran, 1360 S. Finley Rd., both of Lombard, Ill. 60148; Mohanlal Randith Wickramasinghg, 1858 W. 35 St., Chicago, Ill. 60609, and H. Paul Weirich, Box 164, Libertyville, Ill. 60048, assignors to Chulani Kumarlal Fernando, Westmont; Sangarappillai Asokan; Sangarappillai Nagendran, both of Lombard and Mohanlal Randith Wickramasinghg, Chicago, all of, Ill.
Filed Jul. 26, 1977, Ser. No. 819,075
Int. Cl.² B05C *1/12, 1/16*
U.S. Cl. 118—212 **8 Claims**



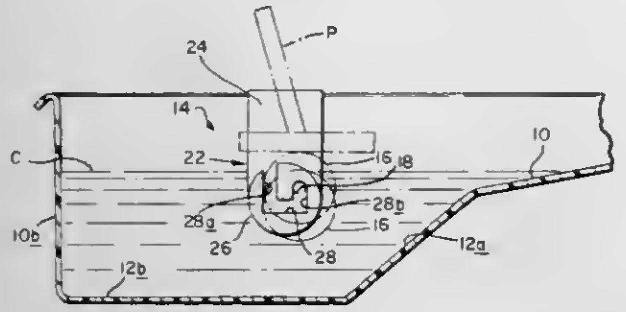
1. Apparatus for applying liquid to a movable web of moisture-absorbent material, comprising:
an open mouthed container supply means for said liquid;
rotatable , buoyant applicator roll means horizontally mounted and at least partially disposed within said container to float on said liquid whereby to apply liquid to said web when operatively associated therewith;
said roller being journalled in vertical guide-slot means whereby to adapt to change in level of said liquid;
movably mounted cover means adapted in a first position to close said container including the roll therein and in a second open position to permit utilization of said applicator roll;
a horizontally disposed guide bar element comprised of a U-shaped member, pivotally mounted on said container and adapted in a first raised position to hold a lead section of said associated web against a rearwardly disposed surface of said apparatus;
stop means disposed on a forward section of said container and operatively associated a feed motion of said associated web, which is threaded between said bar and said surface, said bar is carried forward against said stop and the web then being movable across the roll to receive the liquid; and
said member being adapted to be selectively moved for-

wardly past said stop means whereby the cover may be moved to the closed position when it be desirable to selectively utilize the web in a dry condition.

4,106,434

PAINTER PAD APPLICATOR

Ellsworth Vines, Wellesley, Mass., assignor to Baltimore Brushes, Inc., Brockton, Mass.
Filed Aug. 1, 1977, Ser. No. 820,578
Int. Cl.^{2} B05C *1/02*
U.S. Cl. 118—258 **5 Claims**

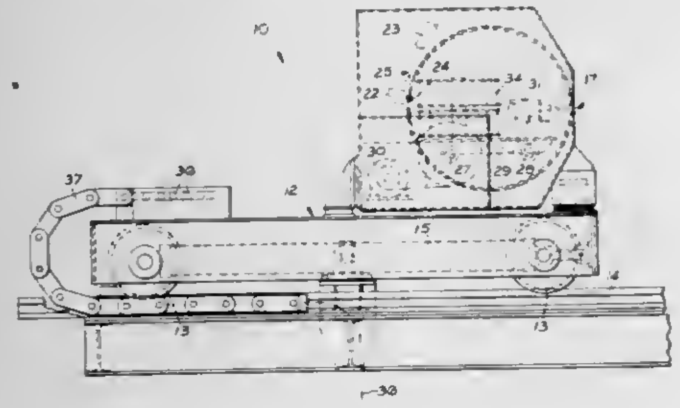


1. An applicator for applying coating liquid from a container to a painter pad, said applicator comprising
- A. an elongated roller, said roller being formed with a circumferential array of lengthwise planar facets or faces adapted for continuous wiping engagement with the pad, the ostensible outer diameter of said roller being appreciably less than the height of the container,
- B. a pair of brackets removably secured to the walls of the container,
- C. axle means supported by the brackets for rotatively mounting the roller,
- D. means on the brackets for permitting the roller to slide relative to the brackets, and
- E. said roller being buoyant in the liquid being applied to the pad so that when the brackets are secured to the container filled with the liquid, the roller floats in the liquid with an upper portion of the roller projecting out of the liquid and a lower portion of the roller being immersed in the liquid as the liquid level in the container varies.

4,106,435

APPARATUS FOR MARKING METAL

Eric Douglas Woodhouse, East Kilbride; Alexander Murray Lawrie, Paisley, and Thomas McNeil, East Kilbride, all of England, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein
Filed Mar. 18, 1975, Ser. No. 559,438
Claims priority, application United Kingdom, Mar. 19, 1974, 12055/74
Int. Cl.^{2} B05B *15/04;* B05C *5/00*
U.S. Cl. 118—301 **15 Claims**

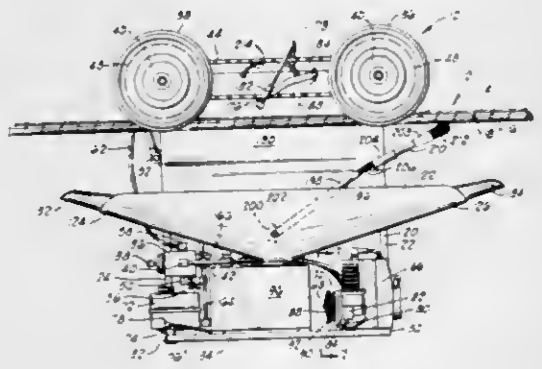


1. Apparatus for applying an identifying marking on the surface of a piece of metal, comprising a molten metal spray gun assembly and a stencil assembly, said stencil assembly including a plurality of side-by-side arranged stencilling members each having an inner surface and an oppositely disposed outer surface with a plurality of serially arranged cut-outs extending from said inner surface to said outer surface and each said cutout defining an indicium, and first means for moving each said stencilling member for locating at least certain selected ones of said cut-outs formed in said stencilling member in an operative position, second means for moving one of said spray gun assembly and stencil assembly transversely of the direction of movement of said stencilling members by said first means for marking the piece of metal by spraying metal from said spray gun assembly through the cut-outs located in the operative position with the sprayed metal passing first through the inner surface and then the outer surface onto the surface to be marked.

4,106,436

APPARATUS FOR DISPENSING A COATING OF LIQUID ON AN ELEVATED CABLE OR THE LIKE

Leslie L. Booker, 1504 Old Mill Rd., Moore, Okla. 73160
Filed Aug. 26, 1976, Ser. No. 717,982
Int. Cl.^{2} B05C *5/02*
U.S. Cl. 118—307 **18 Claims**

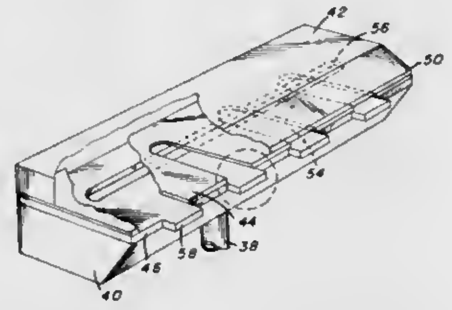


1. Apparatus for dispensing a coating of liquid on a telephone cable or the like supported above the ground, comprising:
- a frame;
- support means carried on said frame for supporting said apparatus on a cable for movement of said apparatus therealong;
- liquid supply means carried by said frame for providing a quantity of liquid under elevated pressure;
- nozzle means carried by said frame and communicating with said liquid supply means for receiving liquid therefrom and directing liquid onto a cable;
- hydraulic motor drive means carried by said frame and operatively connected to said support means for propelling said apparatus along the cable upon which it is supported;
- conduit means for connecting said hydraulic motor to said liquid supply means for conducting liquid between said hydraulic motor and said liquid supply means to drive said hydraulic motor; and
- means drivingly connecting said hydraulic motor to said support means for transmitting power from said hydraulic motor to said support means thereby to propel said apparatus.

4,106,437

APPARATUS FOR MULTIPLE STRIPE COATING

Lawrence C. Bartlett, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 22, 1977, Ser. No. 826,616
Int. Cl.^{2} B05C *5/02*
U.S. Cl. 118—412 **8 Claims**

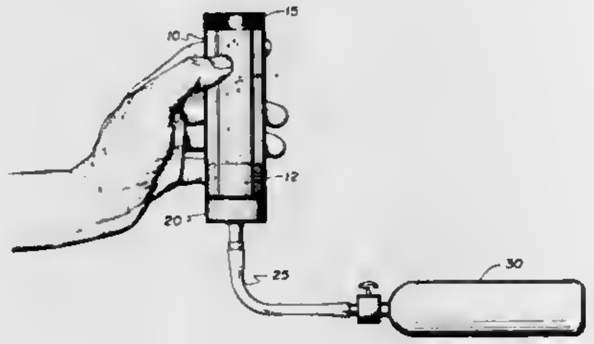


1. Apparatus for multiple stripe coating of a web with liquid coating composition, said apparatus comprising:
- (1) a hopper communicating with a supply of said liquid coating composition, said hopper including a pair of spaced lips;
- (2) a first shim mounted within said hopper and positioned between said spaced lips, said first shim having a plurality of open-ended channels therein;
- (3) a second shim mounted within said hopper and positioned between said spaced lips in face-to-face arrangement with said first shim, said second shim having a plurality of projecting portions corresponding in width and location to the desired stripes, said projecting portions aligning with said open-ended channels and extending beyond the open ends thereof; and
- (4) means for advancing the web to be coated across and closely adjacent to said projecting portions to receive coating composition flowing from said open-ended channels onto said projecting portions and form a plurality of stripes on said web corresponding in width and location with said projecting portions.

4,106,438

METHOD OF HANDLING DROSOPHILA

Roger K. Nelson, 415 Layman La., Bloomington, Minn. 55420
Filed Sep. 3, 1976, Ser. No. 720,119
Int. Cl.^{2} A01K *29/00*
U.S. Cl. 119—1 **10 Claims**

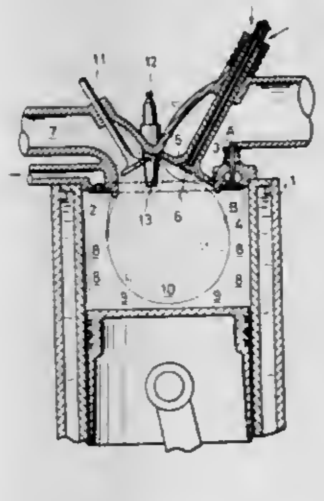


6. A method of handling Drosophila comprising:
- (a) placing a nozzle connected to a controlled source of carbon dioxide gas over a porous plug in a culture container of Drosophila and allowing a series of controlled pulses of carbon dioxide gas to enter into the culture container through the nozzle and porous plug until all flies therein are anesthetized;
- (b) removing the nozzle and plug from the container and transferring the flies therein into a sorting container;
- (c) sorting the flies in the sorting container into a desired selection;
- (d) withdrawing flies in a desired selection from the sorting container to a new culture container by placing a collecting tube near selected flies in the sorting container and applying a vacuum pulse from the culture container through the collecting tube to transport the flies to the new culture container;
- (e) placing a porous plug in a new culture container; and,
- (f) including an additional step of reanesthetizing flies in the sorting container should activity of the flies be noted during sorting by covering the sorting container with a cover having a porous plug therein and introducing carbon dioxide gas into the sorting container;
- (g) the porous plugs in the cover of the sorting container and the culture container being compressible foam plugs extending beyond the surface of the containers and in which the nozzle for introducing carbon dioxide gas has a conically shaped extremity to compress the edges of the porous plugs sealing the edges to the nozzle and allowing for passage of the carbon dioxide gas into the containers.

4,106,439

INTERNAL COMBUSTION ENGINE

Mitsuhiro Kanao, No. 2156-14, Yakeyamacho, Kure-shi, Hiroshima-ken, Japan
Filed May 25, 1976, Ser. No. 689,892
Claims priority, application Japan, May 27, 1975, 50-63636; Aug. 31, 1975, 50-105755
Int. Cl.^{2} F02B *75/02;* F01L *3/00*
U.S. Cl. 123—75 B **3 Claims**



1. In a 4-stroke internal combustion engine, in combination:
- (i) a cylinder structure having a cylindrical inner wall surface bounding a combustion chamber, said structure having a head at an end of said inner wall surface, said head including a fuel-air mixture inlet port and an exhaust gas outlet port both spaced radially inwards from the cylindrical inner wall, said head further including an annular air entry port opening into said combustion chamber between (a) the cylindrical inner wall and (b) the inlet and outlet ports
- (ii) a fuel-air mixture inlet valve member positioned in and movable to open and close said fuel-air mixture inlet portion
- (iii) an exhaust gas outlet valve member positioned in and movable to open and close said exhaust gas outlet port
- (iv) an annular air entry valve member positioned in and movable to open and close said air entry port.

4,106,440

ELECTRONIC SPARK TIMING ADJUSTMENT CIRCUIT

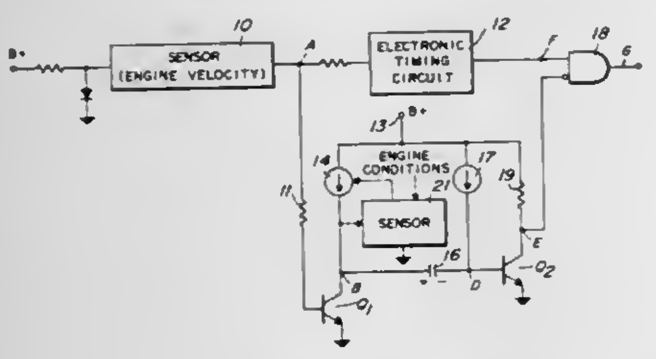
Chi Sun Lai, Lake Zurich, and Philip D. Gunderson, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 31, 1974, Ser. No. 537,726
Int. Cl.^{2} F02P *5/04*
U.S. Cl. 123—117 R **12 Claims**

1. An adjustable electronic spark timing circuit for use with

the ignition system of an internal combustion engine, comprising:

sensor means for providing an input signal, the frequency and period of which is proportional to the speed of an engine;

first means for receiving said input signal and developing a first spark timing digital output signal having a series of pulses synchronized with the input signal with pulse widths equal to an adjustable constant proportion of the period of the input signal;

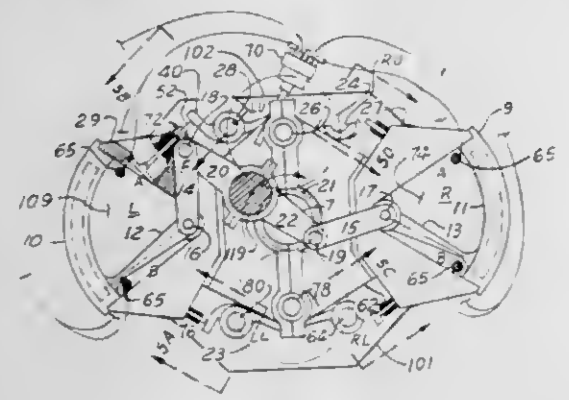


second means for receiving said input signal and developing a second digital signal having a series of pulses synchronized with the input signal with predetermined pulse widths for a given engine condition, and

circuit means for combining the first and second digital signals to provide an electronic spark timing signal having second signal pulses which are each adjusted in time by amounts equal to the pulse widths of the first digital signal.

4,106,441
POWER TRANSLATION MACHINE WITH OSCILLATING PISTON

Thomas W. Anderson, 1209 Boxwood La., Apex, N.C. 27502
Filed Jan. 19, 1977, Ser. No. 760,749
Int. Cl.^{2} F02B *53/00*
U.S. Cl. 123—18 R **3 Claims**



1. A machine for the translation of power between pressure within a confined space and rotation of a shaft comprising:

at least one enclosure defined by a sector of a cylinder with respect to a discrete first axis of a discrete length, and the sector dimension extending angularly 60° to 90°;

a first shaft concentric with said first axis, and a relatively flat piston journalled on said first shaft and positioned and configured to oscillate angularly within said enclosure over at least a portion of the angular displacement available in said enclosure, and forming on opposite sides of the piston the combination of progressively increasing and decreasing first and second cavities of confined spaced;

at least two valves, an intake valve and an exhaust valve, connected to at least one of said cavities, and including means for opening said intake valve during at least a portion of movement of said piston effecting an expansion of said one cavity, and opening said exhaust valve during at least a portion of movement of said piston, effecting a contraction in volume of said one cavity;

a first crank rigidly affixed about a first axis at one end to said first shaft and having a pivotal coupling about a second axis on said first crank at a point spaced on it from said first shaft;

a second shaft spaced from said first shaft and journalled for 360° rotation about a third axis parallel to said first shaft;

a second crank rigidly affixed at one end to said second shaft and having a pivotal coupling at a fourth axis on said second crank at a point spaced on it from said second shaft;

a linkage pivotally connecting between said pivotal couplings of said first and second cranks; and

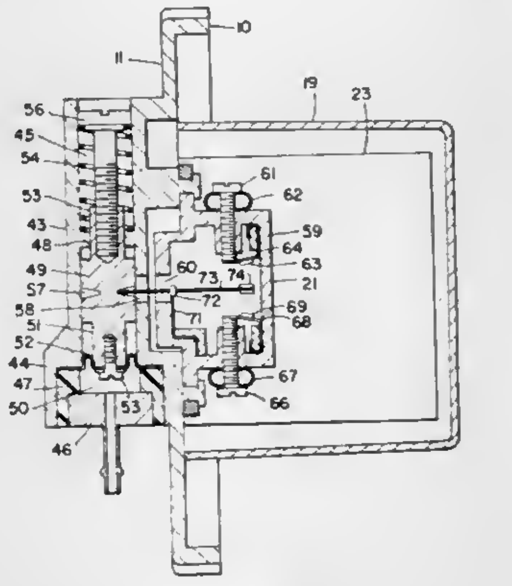
said cranks and said linkage being of relative lengths, whereby said piston will move from one extreme position in said enclosure to an opposite extreme position in said enclosure during a 180° rotation of said second shaft, and wherein the angle T formed between a plane approximately corresponding to said flat piston and a line through said first and second axes is equal to 90° + $(S/2) - [(S/2] - AA)$, where:

AA is the angle formed between a line passing through said first and third axes and a line extending through said third and fourth axes, and

S is an angle at least twice the magnitude of angle *AA*.

4,106,442
DEVICE FOR INCREASING FUEL ECONOMY OF AN INTERNAL COMBUSTION ENGINE

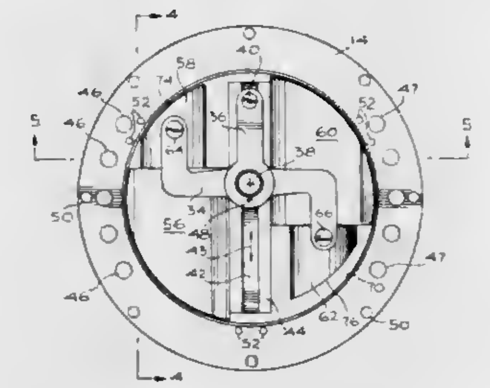
Albert J. Miller, Campbell, Calif., assignor to Engineering Systems Corporation, Santa Clara, Calif.
Filed Nov. 15, 1976, Ser. No. 742,004
Int. Cl.^{2} F02M *23/04, 7/10*
U.S. Cl. 123—26 **13 Claims**



1. A device for improving the fuel economy of an internal combustion engine which includes an intake manifold supplying a combustible air-fuel mixture and an ignition system, comprising air filter means for providing clean, uncarbureted air, and means for introducing said uncarbureted air into said intake manifold when said engine is operating above a predetermined speed and is undergoing deacceleration or substantially open throttle full acceleration, said uncarbureted air inreasing the air-fuel ratio in said intake manifold and decreasing the rate of consumption of fuel; said last mentioned means including a vacuum sensing electrical switch connected to said intake manifold, said switch including switch contacts closable by high and low vacuum conditions in said intake manifold corresponding to said deacceleration and said full acceleration, respectively, of said engine; solenoid actuated valve means connected between air filter means and said intake manifold for selectively admitting said uncarbureted air into said intake manifold; electronic circuit means connected to said ignition system for producing an actuating signal when said engine is operating above said predetermined speed, and electronic switching means connected to said solenoid actuated valve means and said switch contacts for operating said valve means when receiving said actuating signal and said switch contacts are closed.

4,106,443
ROTARY INTERNAL COMBUSTION ENGINE

Joseph P. Triulzi, 5931 Abernathy Dr., Los Angeles, Calif. 90045
Filed Oct. 12, 1976, Ser. No. 731,519
Int. Cl.^{2} F02B *57/00*
U.S. Cl. 123—43 R **24 Claims**



1. A rotary internal combustion engine comprising:

a housing including a right circular cylindrical interior surface;

rotor means for providing rotary shaft power including a partially cylindrical exterior and a rotor adapted to rotate concentrically within, and about the axis of, the cylindrical interior surface, the rotor including at least a first cylinder block and a second cylinder block rotatably disposed about an axis of rotation coincident with an axis for the cylindrical interior surface;

cylinder means within each of said cylinder blocks defining a combustion chamber for receiving therein a longitudinally movable piston, a first piston in the first cylinder block and a second piston in the second cylinder block, the cylinder block and both ends of the associated piston being shaped to conform to the housing interior surface;

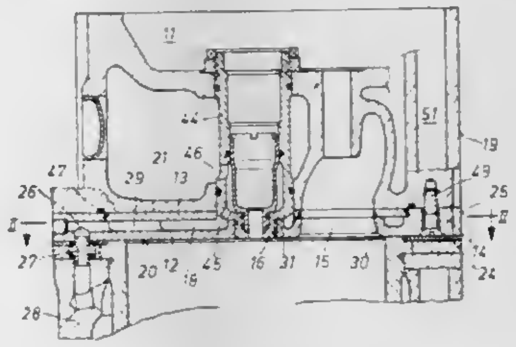
connecting means for rotatably connecting the first piston, the second piston and a first end of a crank; and

link means including the crank, for movably connecting the connecting means and the housing at a point offset from the axis for the cylindrical interior surface.

4,106,444
INDIVIDUAL CYLINDER HEAD

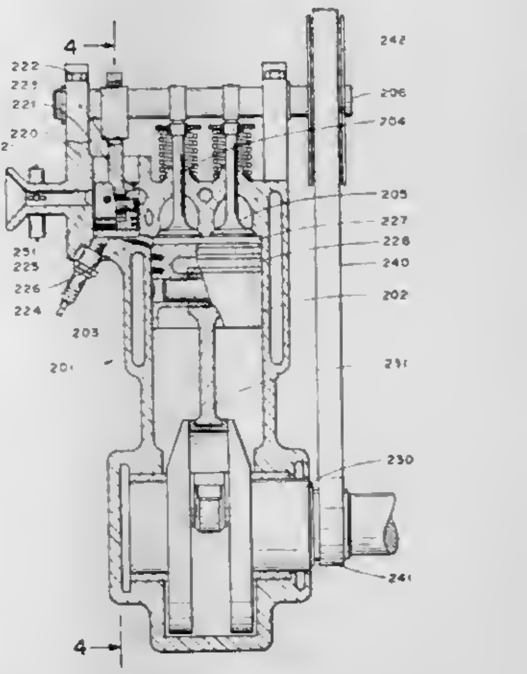
Herbert Deutschmann, and Karl Schier, both of Friedrichshafen, Germany, assignors to Motoren-und Turbinen-Union Friedrichshafen GmbH, Germany
Filed Mar. 31, 1976, Ser. No. 672,282
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1975, 2514592
Int. Cl.^{2} F02F *1/36*
U.S. Cl. 123—41.82 R **30 Claims**

1. A liquid-cooled cylinder head assembled of several parts for piston internal combustion engines having two inlet and outlet valves respectively arranged adjacent one another, the liquid-cooled cylinder head comprises a cast upper part and a double-walled bottom means between said upper part and a combustion space, said double-walled bottom means being provided with aperture means for valves and for one of an injection nozzle and a pre-chamber, and cooling liquid space means being formed in said double-walled bottom means, characterized in that the double-walled bottom means extends substantially over an entire lower surface of the cylinder head upper part essentially up to an outer boundary thereof, in that a lower surface of the upper part and upper and lower surfaces of the double-walled bottom means are constructed substantially planar, in that upper and lower wall portions of the double-walled bottom means are supported with respect to one another by support means within an annular zone in an area of the support of the double-walled bottom means on a cylinder head seal, and in that several cooling medium inlet openings are distributed in the lower wall portion of the double-walled bottom means between the annular zone and an outer boundary of the double-walled bottom means.



4,106,445
RECIPROCATING PISTON MACHINE WITH COMPLETE COMBUSTION SYSTEM

John H. Beveridge, 177 Cornelio, San Clemente, Calif. 92672
Continuation of Ser. No. 389,277, Aug. 17, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 621,999
Int. Cl.^{2} F02B *25/12, 17/00*
U.S. Cl. 123—53 A **6 Claims**



1. Apparatus of the class described comprising:

a block member;

at least one cylinder and a crankshaft rotatably mounted in said block member;

a piston reciprocable in said cylinder;

valving means for valving intake and exhaust from said one cylinder;

at least one auxiliary cylinder in said block member having a swept volume substantially smaller than said one cylinder;

a piston reciprocal in said auxiliary cylinder;

inlet ports in said auxiliary cylinder controlled by said auxiliary piston for charging the auxiliary cylinder;

ignition means in said auxiliary cylinder;

passage means communicating between said auxiliary cylinder and said one cylinder; and connecting means connecting said pistons to said crankshaft;

said crankshaft and connecting means providing a predetermined phase relationship between said auxiliary piston and said one piston whereby substantially all of the ignited charge is expelled into said one cylinder providing almost complete combustion in said one cylinder.

4,106,446

INTERNAL COMBUSTION ENGINE WITH AUXILIARY COMBUSTION CHAMBER

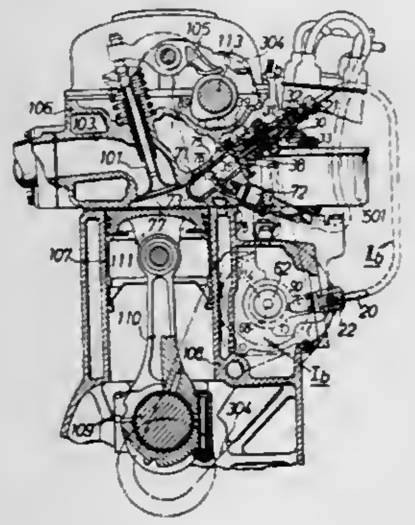
Masatoshi Yamada, Nagoya; Yujiro Oshima, Ichinomiya; Katsuhiko Hattori, and Hideyuki Suzuki, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

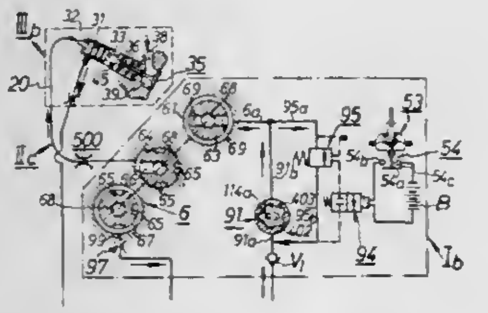
Filed Feb. 28, 1975, Ser. No. 554,229

Claims priority, application Japan, Feb. 28, 1974, 49-23830

Int. Cl.² F01L *9/02*

U.S. Cl. 123—90.13 **2 Claims**





1. An internal combustion engine which comprises:

a main combustion chamber for the combustion of an air fuel mixture;

means for operating the control of opening and closing of an intake valve and an exhaust valve of said main combustion chamber;

an auxiliary combustion chamber communicating with said main combustion chamber through a passage such that the ignition of an air-fuel mixture in said auxiliary combustion chamber induces ignition and combustion of the air-fuel mixture in said main combustion chamber;

an intake valve provided in said auxiliary combustion chamber for opening and closing a passage connected to a fuel supply means therefor;

an intake valve lifter having a piston member which is associated with said intake valve of said auxiliary combustion chamber and a cylinder member in which said piston member moves, said intake valve lifter further comprising an opening means provided in the side wall of said cylinder member thereof in communication with an oil reservoir and in a position corresponding to a predetermined piston stroke position, thereby to drain a predetermined amount of pressure fluid out of said cylinder member through said opening means on each compression stroke of said piston member;

a fluid pressure supply device driven by said internal combustion engine to supply a fluid pressure for operating the control of opening and closing of said intake valve of said auxiliary combustion chamber separately and independently of the operation of said valve operating means of said main combustion chamber, said fluid pressure supply device further comprising a hydraluic circuit having an unloading valve in communication with said fluid pressure supply passage and an oil reservoir and a detecting means operatively connected to said unloading valve for detecting particular driving conditions of said internal combustion engine, thereby to turn said unloading valve in a conductive condition upon detecting particular driving conditions of said internal combustion engine, to allow the fluid pressure supplied by said fluid pressure supply device to escape to said oil reservoir, and to halt temporarily the control of the opening and closing operation of said intake valve by said intake valve lifter;

a fluid pressure supply passage for feeding said fluid pressure being supplied by said fluid pressure supply device to said intake valve lifter whereby the fluid pressure generated by said fluid pressure supply device is fed through said fluid pressure supply passage to a cylinder chamber defined between said piston and cylinder members, said piston member is moved in synchronism with the rotation of said internal combustion engine and said intake valve of said auxiliary combustion chamber is controlled in the opening and closing operation thereof separately from and independently of the operation of said valve operating means of said main combustion chamber,

a rotary distributor valve means comprising a rotary member driven in synchronized relation with the rotation of said internal combustion engine and provided with a number of predetermined fluid passages therein; and a casing rotatably supporting said rotary member and having a number of fluid passages in predetermined position relative to said rotary member on a side wall thereof, whereby the fluid pressure supplied to said fluid pressure supply device is fed to each cylinder chamber defined between the piston and cylinder members of the respective intake valve lifters of a number of auxiliary combustion chambers, in accordance with a predetermined ignition order of the respective combustion chambers, through said fluid passages of said rotary member and casing of said rotary distribution valve means when said rotary member is rotated and said fluid passages of said rotary member are communicated with those of said casing, and said intake valves of the respective auxiliary combustion chambers are controlled to open and close in a predetermined order and wherein,

said fluid pressure supply device and said rotary distrihuting valve are integrally formed;

said fluid pressure supply device comprises a trochoidal pump comprising an inner rotor having a side wall of a trochoidal curve configuration driven by a drive shaft connected to a crankshaft of a four cylinder internal combustion engine by a timing chain mechanism and an outer rotor relatively rotatable to said inner rotor in a casing fixed integrally to a side wall of an engine block, a suction port of a valve plate of said trochoidal pump being connected to a gear pump of an engine lubricating pump through an oil filter and a check valve, a delivery port of a valve plate of said trochoidal pump being connected to a suction port of said pressure regulating valve, said pressure regulating valve comprising a cylinder, a valve seat formed in said cylinder, a hollow stepped piston having an orifice at the stepped part thereof and spring means reciprocatingly mounted in said cylinder, and a pressure regulator pilot means having a screw member provided in a casing, a valve member, spring means forcing said screw member and valve member, and a valve seat opposed to said valve member;

said rotary distributing valve means further comprises a cylinder fixed integrally to said side wall of said engine block on which an annular feeding groove is connected to said delivery port of said trochoidal pump, four distributing ports, having respectively a phase difference of 90° , each connected to four cylinders of said intake valve lifter and an annular discharging groove connected to said oil reservoir through a back pressure regulating restricted orifice, are respectively provided at a predetermined part of an inner wall thereof, and a distributing shaft, which is integrally connected to said drive shaft and has a bottom-closed axial inner cavity in an axial center thereof, a feeding passage extending radially therethrough, for distributing passages connecting said four distributing ports of said cylinder and said bottom-closed axial inner cavity in response to the rotation of said distributing shaft, and four discharging grooves having a phase difference of 90 degrees formed on an outer wall of said distributing shaft, said detecting means comprising a diaphragm type actuator having a first chamber with spring means connected to the intake manifold of said four cylinder engine and a second chamber connected to the atmosphere, divided by a diaphragm member, a switch element having a movable element connected to said diaphragm member, and a DC source connected to both terminals of said switch element;

said hydraulic circuit has an electromagnetic on-off valve as said unloading valve connected to said switch element of said detecting means which has one port communicated with a passage connecting said pressure regulating valve of said fluid pressure supply device and said check valve and the other part communicates with a vent pressure induction passage of said pressure regulating valve;

said intake valve lifter comprises four means corresponding to each of the cylinders of said four cylinder engine, each means comprising said cylinder member being integrally fixed to said cylinder head at a position according to each cylinder of said engine, said piston member interposed respectively in each of the bores of said cylinder member and connected through a rod member and spring means to said intake valve, the valve part of which is provided within a derby hat-shaped hollow member as said auxiliary combustion chamber having a spark plug, said intake valve reciprocably supported on the hollow cylindrical member having flange parts at both ends and a passage for cooling thereof, said flange parts integrally fixing said cylinder member and said derby hat-shaped member to said cylinder head, said hollow cylindrical member having a lower chamber connecting to a carburetor for said auxiliary combustion chamber through pipe means;

said fluid pressure supply passage comprises four steel pipes connected to said four distributing ports of said rotary distributing valve through a metal fitting and connecting to said four means of said intake valve lifter through metal fittings; and

said opening means comprises an opening provided on each hollow cylindrical intermediate member which is interposed between said piston member and said cylinder bore of said cylinder member, said opening being connected to an oil pan as the oil reservoir through a throttle member disposed on the side wall of said cylinder member, metal fitting and a steel pipe, the position of said opening being decided in such a manner that the opening is normally closed when said piston member is not stroked and is opened to introduce the fluid pressure out of said cylinder member only when the piston is stroked.

4,106,447

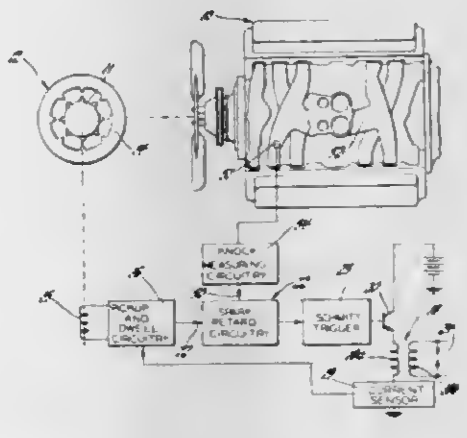
ENGINE SPARK TIMING SYSTEM WITH RETARD MEANS AND MINIMUM BURN TIMER

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1977, Ser. No. 789,801

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **3 Claims**



1. A spark timing system for an internal combustion engine having a crankshaft, a plurality of spark plugs, a spark coil adapted to provide spark pulses to the spark plugs in predetermined order as the crankshaft rotates, means for providing an electric current through the spark coil including switch means responsive to a coil-on signal to switch on the electric current and thus cause a buildup of electromagnetic energy in the spark coil and further responsive to a coil-off signal to switch off current in the coil and thus release the built up electromagnetic energy as a spark pulse, the system comprising, in combination:

signal generating means timed to crankshaft rotation, shiftable in phase with respect thereto in accordance with a program based on engine operating conditions and effective to generate a train of alternating coil-on and coil-off signals;

first means responsive to the signal generating means to normally pass the coil-on signals directly to the switch means to switch on current in the spark coil immediately with each coil-on signal;

second means responsive to the signal generating means to pass the coil-off signals to the switch means after a retard varying with at least one additional engine operating condition to turn off current in the coil and generate a spark pulse with each coil-off signal after said retard; and

third means responsive to the second means to prevent the first means from passing the following coil-on signal to the switch means for a constant predetermined time, whereby the spark pulse is ensured a predetermined minimum burn time for good engine combustion, even at high engine speed when the next coil-on signal might occur before the retarded previous spark pulse.

4,106,448

INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION

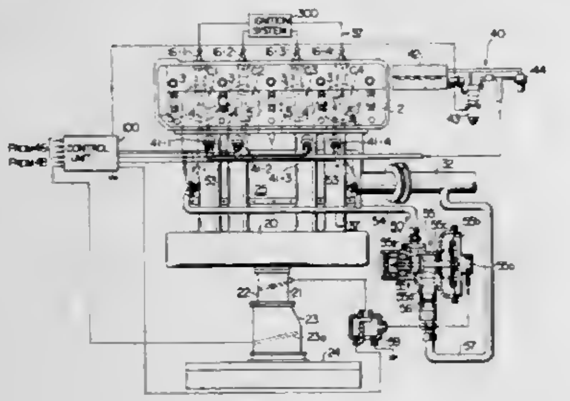
Masaaki Noguchi, Nagoya; Masabaru Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 11, 1976, Ser. No. 657,201

Claims priority, application Japan, Mar. 3, 1975, 50-26375; Mar. 10, 1975, 50-29232; Mar. 19, 1975, 50-33719; Apr. 2, 1975, 50-40709; Apr. 4, 1975, 50-41692; Apr. 14, 1975, 50-45685; Apr. 21, 1975, 50-47926; Apr. 25, 1975, 50-51047; May 9, 1975, 50-55781; May 15, 1975, 50-58234; May 21, 1975, 50-61223; Jun. 12, 1975, 50-71774; Jun. 12, 1975, 50-71778; Jun. 18, 1975, 50-74958; Jun. 28, 1975, 50-80419

Int. Cl.² F02M *7/00;* **F02P** *5/04;* **F02B** *19/10, 19/16*

U.S. Cl. 123—119 LR 254 Claims



1. A method of operating an internal combustion engine having a plurality of sequentially operative combustion chambers, comprising the steps of:

supplying to said combustion chambers a lean air-fuel charge having an air-fuel ratio larger than **16**;

supplying additional fuel to at least one of said combustion chambers relative to the quantity of air sucked-in said at least one of said combustion chambers as the engine power demand increases, said additional fuel rendering the air-fuel charge in said at least one combustion chamber richer than approximately stoichiometric, selecting in a sequential firing of all of said combustion chambers the number of combustion operations at which the combustion of said richer air-fuel charge is made to meet said engine power demand; and

converging exhaust gases of said combustion chambers.

4,106,449

EGR SYSTEM

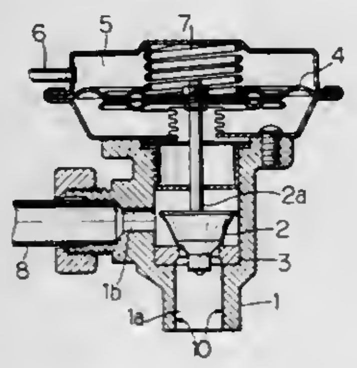
Noboru Matsumoto; Kunio Kurose, both of Toyota, and Kinya Ueno, Seto, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 15, 1976, Ser. No. 736,192

Claims priority, application Japan, Jan. 20, 1976, 51-5690

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A 10 Claims



1. In an EGR system for diminishing the harmful substances contained in the exhaust gas from an internal combustion engine by recycling a portion of the exhaust gas into the gas in-take side of the engine, said EGR system comprising a valve body and an EGR cooler, the improvement wherein each is made of a casting of an aluminum alloy, with at least the portions of the inside thereof exposed to the exhaust gas being coated with means for improving the corrosion-resistance and function of the EGR valve, for eliminating pitting, and for inhibiting the sticking of solid particles thereto, said means comprising a PTFE coating having a layer thickness of 10 – 15 μ.

4,106,450

AIR-TO-FUEL RATIO FEEDBACK CONTROL SYSTEM

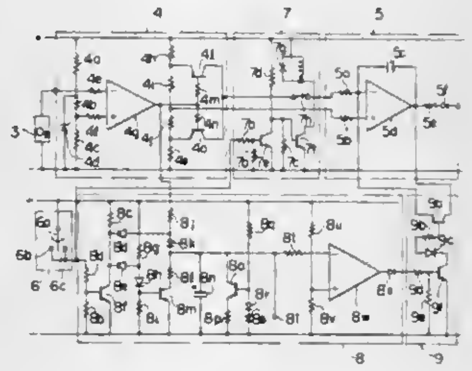
Hideaki Norimatsu; Mitsuo Nakamura, both of Kariya, and Nobuyuki Kobayashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 12, 1977, Ser. No. 786,898

Claims priority, application Japan, Jul. 2, 1976, 51-79096

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 EC 8 Claims



1. An air-to-fuel ratio feedback control system for internal combustion engines comprising:

an air-to-fuel ratio detector, positioned in an exhaust passage of an engine, for generating a detection signal indicative of the air-to-fuel ratio of air-fuel mixture supplied to said engine;

a discriminator, connected to said air-to-fuel ratio detector, for generating a discrimination signal which changes to high and low levels alternately in response to said detection signal;

an integrator, connected to said discriminator, for generating an integration signal the level of which increases or decreases in response to said discrimination signal;

a mixture controller, adapted to supply said engine with air-fuel mixture of air-to-fuel ratio which is preset to vary in accordance with engine operating conditions and connected to said integrator, for correcting said air-to-fuel ratio to a constant ratio which is substantially equal to the stoichiometric ratio in response to said integration signal;

a condition detector for generating a condition signal when the throttle valve of said engine is fully closed and when fully opened;

a monitor circuit, connected to said discriminator and said condition detector, for generating a monitor signal indicative of at least one of conditions in which an alternately changing interval of said discrimination signals exceeds a first predetermined interval and a generation interval of said condition signals exceeds a second predetermined interval longer than said first predetermined interval; and

a halt circuit, connected to said monitor circuit, for causing said integrator to maintain said integration signal to a constant level in response to said monitor signal, said constant level being predetermined to indicate that air-to-fuel ratio correction in said mixture controller is stopped.

4,106,451

AIR-FUEL RATIO ADJUSTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

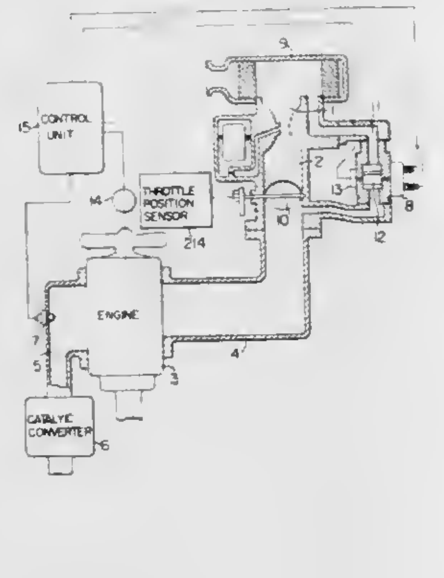
Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 30, 1977, Ser. No. 782,748

Claims priority, application Japan, Apr. 13, 1976, 51-42145; Apr. 13, 1976, 51-42147; Apr. 19, 1976, 51-44653

Int. Cl.² F02B *75/10;* **F02M** *7/00;* **F02B** *3/00*

U.S. Cl. 123—119 EC 6 Claims



1. In an air-fuel ratio adjusting system for an internal combustion engine including:

means communicated with an intake manifold of an internal combustion engine for producing and supplying to said engine air-fuel mixture;

a throttle valve disposed in said means for controlling the amount of said air-fuel mixture;

a bypass passage communicated with said intake manifold downstream of said throttle valve for supplying additional air therethrough;

a bypass valve operatively disposed in said bypass passage for controlling the opening area of said passage through which said additional air flows, whereby the amount of said additional air is controlled by said bypass valve;

an air-fuel ratio sensor disposed in an exhaust manifold of said engine for sensing the air-fuel ratio of the air-fuel mixture fed to said engine;

driving means operatively connected to said bypass valve for driving the same in a valve opening or closing direction; and

a control unit electrically connected to said air-fuel ratio sensor and driving means for actuating said driving means in accordance with the output from said air-fuel ratio sensor in order to adjust the air-fuel ratio of the mixture to be fed to said engine,

the improvement comprising:

a maximum opening detecting circuit electrically connected to said control unit for limiting a maximum opening of said bypass valve to a predetermined value depending on at least one of operating conditions of said engine, whereby effective operation for adjusting the air-fuel ratio can be obtained.

4,106,452

EXHAUST GAS RECIRCULATOR

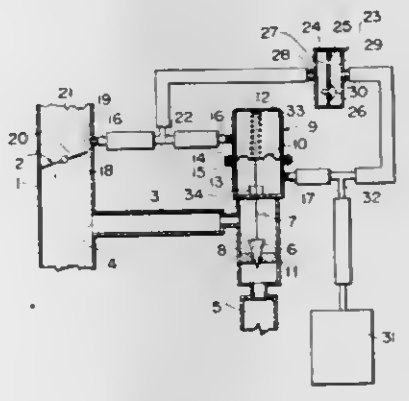
Kohichi Mizutani, Seto, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 704,506, Jul. 12, 1976, abandoned. This application May 16, 1977, Ser. No. 797,607

Claims priority, application Japan, Mar. 11, 1976, 51-29250

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A 3 Claims



1. An exhaust gas recirculation system for use in an engine provided with an intake manifold and throttle valve mounted therein comprising:

first conduit means for recirculating exhaust gas from said engine to said intake manifold at a position downstream from said throttle valve,

valve actuator means including a diaphram separating two pressure chambers,

valve means responsive to movement of said diaphram for opening and closing said first conduit means,

second conduit means coupling a first of said two pressure chambers with a port in said intake manifold located slightly upstream of an idle opening position of said throttle valve,

a negative pressure delaying valve, and

a third conduit means coupling the second of said two pressure chambers with said second conduit means through said negative pressure delaying valve.

4,106,453

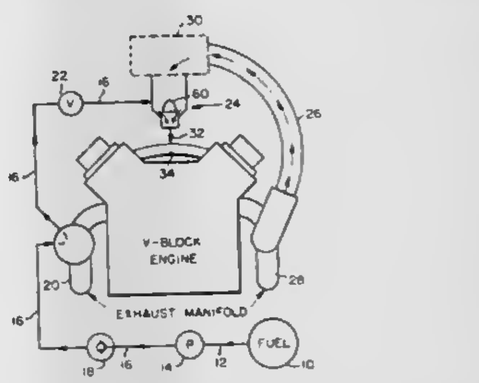
APPARATUS AND PROCESS FOR IMPROVING FUEL EFFICIENCY OF AN INTERNAL COMBUSTION ENGINE UTILIZING A VAPOR STATE OF FUEL

Ernest G. Burley, R.D. 1, Watkins Glen, N.Y. 14891

Filed Aug. 2, 1976, Ser. No. 710,374

Int. Cl.² F02M *31/00*

U.S. Cl. 123—120 16 Claims



1. In an internal combustion engine of the type which includes (a) heating means for converting liquid fuel into vapor fuel and (b) a mixing chamber for combining a regulated fuel of the vapor fuel with a flow of air, the improvement in said mixing chamber comprising

a housing defining a mixing zone through which a regulated flow of vapor fuel is mixed with a turbulent flow of air to produce a high efficiency fuel/air mixture, said housing having

a major inlet for admitting air to said mixing zone,

a plurality of ports for introducing fuel vapor into said mixing zone, and

a major outlet for discharging the fuel/air mixture to combustion zones of an associated internal combustion engine,

a regulating assembly contained within said housing for controlling the rate of flow of fuel vapor into the housing, said regulating assembly being fitted within said housing for relative movement thereto and for sequentially opening and closing said plurality of ports as said regulating assembly is moved between limit positions within the housing, and

linkage means operatively connected between said regulating assembly and a standard throttle control for said internal combustion engine so that operation of said throttle control will effect movement of said regulating assembly to thereby control the rate of flow of fuel vapor to the engine, wherein said plurality of ports are formed through portions of said cylindrical member intermediate its ends and at varying distances from its ends, and including a reservoir structure around said housing and in communication with said plurality of ports for containing a volume of fuel vapor for introduction into said housing, and

wherein said regulating assembly comprises a second cylindrical member fitted within the bore of said first cylindrical member for axial movement therein, said second cylindrical member having a number of openings formed therein which are equal in number to the number of said plurality of ports formed in the first cylindrical member, said openings being positioned and arranged to become sequentially aligned or misaligned with said ports in accordance with the axial positioning of said second cylindrical member within the first cylindrical member, said second cylindrical member being further provided with a longitudinal bore therethrough for admitting a flow of air through the regulating assembly.

4,106,454

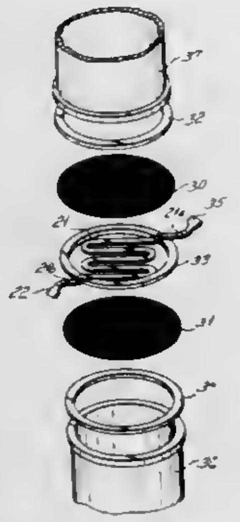
APPARATUS FOR INCREASING THE EFFICIENCY OF INTERNAL COMBUSTION ENGINES

Lawrence Philip Henlis, Hawley, Pa., assignor to Harvey Jasper, Woodmere; Ezekiel Jasper and Harry Ball, both of Brooklyn, all of, N.Y., part interest to each

Filed Nov. 5, 1976, Ser. No. 738,998

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 F **4 Claims**



1. Apparatus for increasing the efficiency of combustion in an internal combustion engine having fuel atomizing means, an intake to the combustion chambers and a battery powered electrical ignition system including a distributor, comprising at least one screen inserted between the fuel atomizing means and the intake for contacting fuel which has been atomized by the fuel atomizing means, electrical means powered by the battery for heating the at least one screen sufficiently to vaporize atomized fuel coming in contact therewith and means for adjusting the power supplied to the heating means by the battery in response to the operating conditions of the engine, the adjusting means comprising means for comparing the voltage of electrical pulses from the distributor with the voltage of the battery and means for conducting the pulses to the heating means when the voltage thereof exceeds the voltage of the battery thereby to power the heating means, the output of the heating means being proportional to the power supplied thereto.

4,106,455

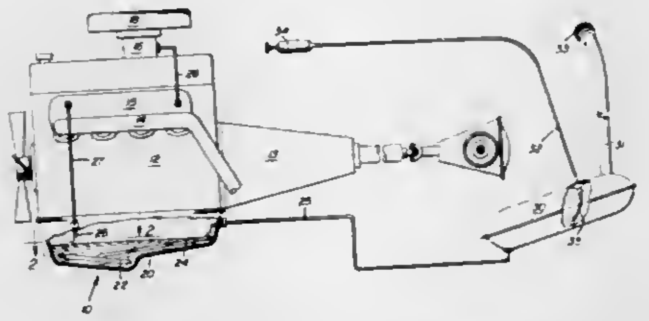
VAPORIZER SYSTEM FOR GASOLINE ENGINES

Robert Vance, Jr., 116 E. 25 St., Huntington Station, N.Y. 11746

Filed Jan. 6, 1977, Ser. No. 760,132

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 E **7 Claims**



1. In combination with an internal combustion engine system, the engine provided with means for burning fuel therewithin, an exhaust system associated therewith. a fuel induction system, an oil lubricating system with engine oil sump, and a liquid fuel storage tank, the improvement comprising means for applying pressure to said storage tank, and further means for converting the liquid fuel to vapor form prior to feeding to the engine fuel induction system, the means for converting the liquid fuel to the vapor form including a heat exchange unit mounted in the engine oil sump for the purpose of absorbing heat from the engine oil when hot in order to vaporize the liquid fuel to a gas.

4,106,456

FUEL SUPPLY INSTALLATION FOR INTERNAL COMBUSTION ENGINES

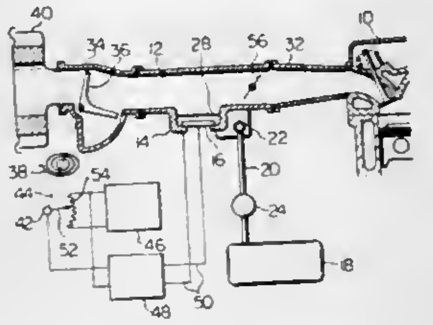
Kazuo Shinoda, and Masanori Torii, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 17, 1976, Ser. No. 715,145

Claims priority, application Japan, Mar. 16, 1976, 51-027681

Int. Cl.^{2} F02M *29/00*

U.S. Cl. 123—119 E **16 Claims**



1. A fuel supply installation for an internal combustion engine in which fluid fuel is atomized by ultrasonic vibrations, said engine including a throttle valve located in an intake air passage, comprising:

a fuel atomization pail containing said fluid fuel provided in said intake air passage of said engine, said atomization pail being open to said air passage;

an ultrasonic element provided in said fuel atomization pail, said ultrasonic element generating high frequency ultrasonic vibrations when supplied with electric power, at least a portion of said element being soaked in the fluid fuel in said atomization pail;

suction air measuring means located in said intake air passage and upstream of said throttle valve; and

means coupled to said suction air measuring means and to said ultrasonic element for controlling the electric power supplied to said ultrasonic element so as to be proportional to the quantity of suction air, whereby a quantity of fluid fuel which is proportional to the quantity of suction air is atomized from said atomization pail and introduced into said engine.

4,106,457

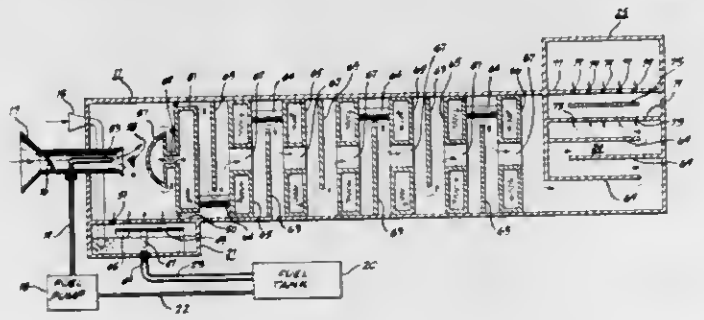
DRY GASEOUS FUEL GENERATOR

George F. Totten, 4400 Smoke Ranch Rd., Las Vegas, Nev. 89108, and Wayne L. Harman, 5958 Pence Way, Las Vegas, Nev. 89119

Filed Nov. 18, 1976, Ser. No. 743,044

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—133 **15 Claims**



1. Apparatus for converting liquid fuel into a highly combustible dry gaseous fuel for an internal combustion engine, comprising:

a heated baffle chamber having two ends, and having a multiplicity of heated baffles therein forming a long tortuous path therethrough;

injector means connected through one end of said heated baffle chamber for receiving and converting liquid fuel into a fine spray of droplets;

intake means mounted in said one end of said heated baffle chamber for receiving and mixing air with said fine spray of droplets;

means for heating said multiplicity of heated baffles in said heated baffle chamber to substantially the exhaust temperature of an internal combustion engine whereby said mixture of air and fine spray of droplets are converted into a substantially dry gaseous fuel;

an unheated baffle chamber connected to the other end of said heated baffle chamber and having a labyrinth of unheated baffles therein adapted to intercept and to slow the flow of said substantially dry gaseous fuel and to remove therefrom any remaining fuel in liquid form; and

distribution means adapted to receive the dry gaseous fuel from said unheated baffle chamber and to controllably disperse said dry gaseous fuel into the intake manifold of an internal combustion engine wherein said dry gaseous fuel is combusted.

4,106,458

FUEL INJECTOR

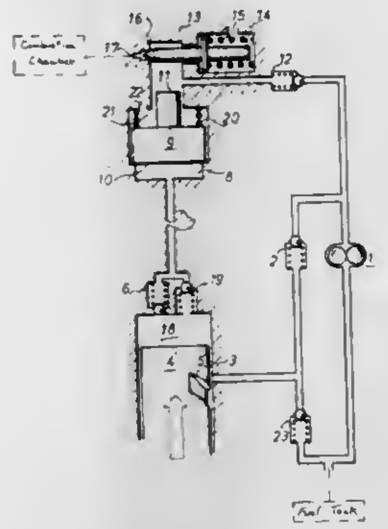
Wolfgang Köhler, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,620

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617841

Int. Cl.^{2} F02M *39/00*

U.S. Cl. 123—139 AT **2 Claims**



1. A fuel injector for internal combustion engines having a fuel tank, which comprises: fuel pumping means in communication with said fuel tank; fuel injection pumping means in communication with said fuel pumping means; volume governing means associated with said fuel injection pumping means; fuel injection valve means in communication with said fuel pumping means and said fuel injection pumping means; differential piston means interposed between and in communication with said fuel injection pumping means and said fuel injection valve means, said differential piston means having a first larger end face which is in communication with said fuel pumping means, and a second smaller end face which is in communication with said fuel pumping means; first check valve means interposed between said fuel injection valve means and said fuel pumping means; second check valve means interposed between said fuel pumping means and said fuel injection pumping means for limiting the feed pressure of said fuel pumping means; and pressure valve means interposed between said fuel injection pumping means and said fuel tank for determining the fuel pressure ahead of said fuel injection pumping means.

4,106,459

ULTRASONIC WAVE CARBURETOR

Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jun. 3, 1976, Ser. No. 692,349

Claims priority, application Japan, Jun. 3, 1975, 50-67298

Int. Cl.^{2} F02M *27/08*

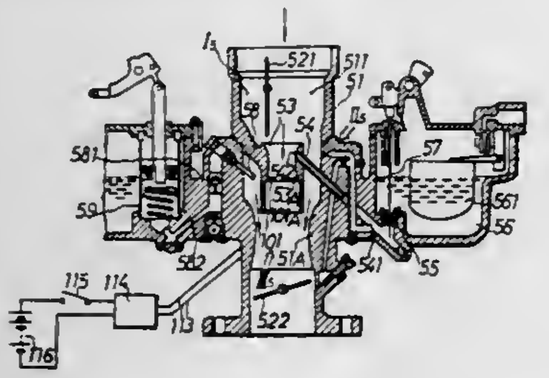
U.S. Cl. 123—141 **41 Claims**

1. An ultrasonic wave carburetor comprising:

an intake passage for admitting fresh air and supplying an air-fuel mixture therethrough;

a fuel supply device comprising a reservoir which reserves fuel therein, a venturi provided in said intake passage, and a nozzle, one end of which opens into said venturi and the other end of which is communicated with said reservoir; and

a fuel atomizing device comprising an ultrasonic transducer connected to an ultrasonic wave oscillator for transforming an electrical oscillation into a mechanical vibration, a mechanical vibration amplifying member secured to said ultrasonic transducer for amplifying said mechanical vibrations, and an ultrasonic vibratory member, having a hollow cylindrical body, which is positioned downstream of said venturi within said intake passage, with its outer peripheral surface integrally secured to said mechanical vibration amplifying member,



whereby fuel supplied through said nozzle in said fuel supplying device is atomized upon the peripheral surfaces of said hollow cylindrical body of said ultrasonic vibratory member which is being vibrated.

4,106,460

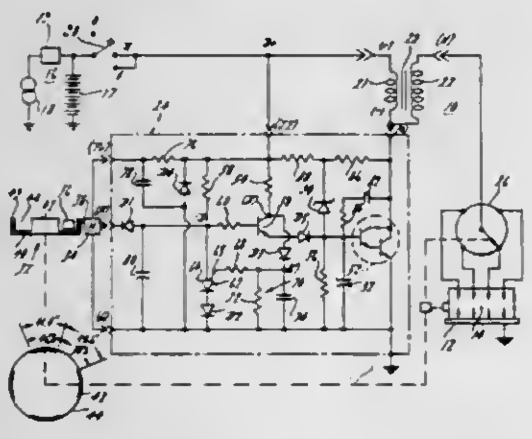
HALL EFFECT ELECTRONIC IGNITION CONTROL UNIT WITH AUTOMATIC SHUT-DOWN TIMER

Joseph J. Kopera, Trenton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 18, 1976, Ser. No. 743,021

Int. Cl.^{2} F02P *9/00*

U.S. Cl. 123—146.5 D **21 Claims**



1. A triggerable electronic control unit apparatus for controlling the energization of the ignition coil of an inductive-type ignition system from a source of low tension energy to apply high tension energy to a sparking device of an internal combustion engine upon triggering of said control unit from a trigger device driven in synchronism with the engine; said control unit comprising a controllable semiconductor power switching device adapted to be connected in series with the ignition coil directly across said source when the power switching device is conductive; a control transistor having collector, base and emitter electrodes coupled in conductivity controlling relation with said power switching device and triggerable between a conducting and a non-conducting state by said trigger device; and time delay control switch means connected to the control transistor and operative to change the state of conduction thereof and render said power switching device non-conductive when the control transistor remains in a state of conduction which renders the power switching device conductive for a period of time greater than the dwell period of the ignition cycle at engine cranking speeds, said time delay control switch means including a timing capacitor coupled to the collector electrode of said control transistor to be rapidly charged from said source when the control transistor is non-conductive, a discharge resistor connected in parallel with said timing capacitor to be slowly discharged when said control transistor is rendered conductive, and a third controllable semiconductor switching device having a pair of output electrodes connected in a circuit across the input circuit of said control transistor and a control electrode coupled to the timing capacitor, whereby said time delay switch means renders said control transistor non-conductive to shut off the power switching device and stop current flow through the ignition coil if the control transistor and power switching device remain on for a period of time greater than the dwell period of the ignition cycle at engine cranking speeds.

4,106,461

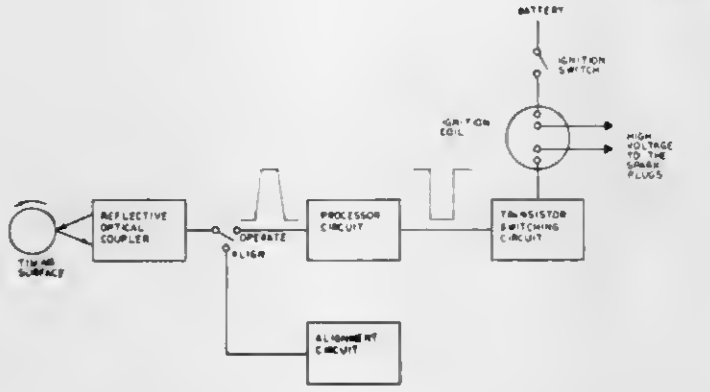
REFLECTIVE IGNITION TIMING PROCESS

Sebastian Louis Giannini, 1363 Teakwood Dr., San Jose, Calif. 95128

Filed Feb. 25, 1976, Ser. No. 661,288

Int. Cl.^{2} F02P *1/00*

U.S. Cl. 123—148 E **4 Claims**



1. An ignition system for internal combustion engines comprising a light source and photodetector, a shutter rotated at a speed proportional to engine speed to alternately interrupt and pass light from said light source to said photodetector, an indicator actuated by said photodetector to preoperationally align light from said light source to said photodetector, a pulse shaper actuated by said photodetector to provide rapid signal transition between voltage levels resulting from passage and interruption of light from said light source to said photodetector, a pulse amplifier actuated by said pulse shaper to provide switching of current through the ignition coil, said lightsource being a light emitting diode and said photodetector being a phototransistor each integrally mounted and geometrically related whereby light from said light source to said phototransistor has a predetermined focal distance from the said interrupter, said interrupter consisting of a cylindrical sleeve with alternate reflective and light absorbing areas corresponding to the timing requirements of the engine, said pulse shaper being a regenerative comparator with switchable inputs to produce outputs in phase or opposite in phase to input to drive an electronically switched inductive ignition output stage or capacitive discharge ignition output stage to the ignition coil.

4,106,462

IGNITION SYSTEM CONTROL CIRCUIT

Herbert J. Hildebrandt, Baldwinsville, and Donald W. Perkins, De Witt, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,052

Int. Cl.^{2} F02P *3/04*

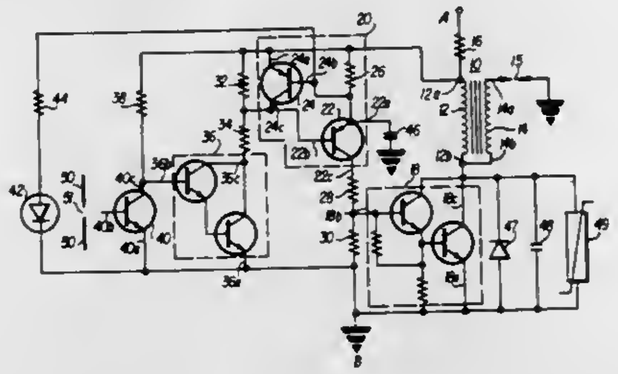
U.S. Cl. 123—148 E **5 Claims**

1. An ignition control circuit for providing the supply current switching function for the high voltage generating coil in an internal combustion engine ignition system including such coil and a power supply therefor, said ignition control circuit comprising:

(a) means for developing a control input signal representative of the crankshaft angle of the internal combustion engine with which said ignition control circuit is to function;

(b) an input transistor switching amplifier having said control input signal applied thereto and being responsive to such signal to switch its conductivity state;

(c) an output transistor switching amplifier connected to complete a circuit between said high voltage generating coil and said power supply when conducting and to break such circuit when not conducting, said output amplifier including a control electrode to which an applied bias current is effective to control the completion of said circuit and the magnitude of current flow therein in accordance with the bias current;



(d) a constant current source including a current regulating circuit providing current output at a constant level;

(e) means connecting said input transistor switching amplifier to said current source for turning the current source on and off in accordance with the conductivity state of the input amplifier; and

(f) means connecting said current source to the control electrode of said output transistor switching amplifier control to apply the constant current output of said source to said electrode as the operating bias for said output switching amplifier thereby to control current flow to said high voltage generating coil from said power supply.

4,106,463

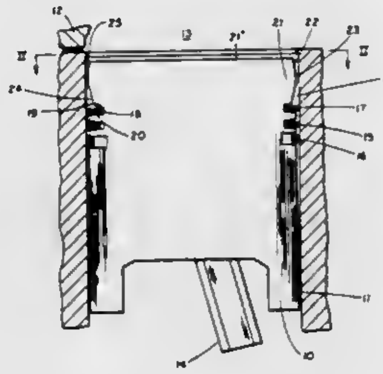
DOUBLE TAPER PISTON

John Markley Curtis, Jr., Baltimore, and Paul Roberts Shepler, Towson, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1977, Ser. No. 763,935

Int. Cl.^{2} F02F *3/00*

U.S. Cl. 123—193 P **7 Claims**



1. An improved piston for internal combustion engines of the type containing a skirt, upper, compression ring and a combustion head wherein the improvement comprises a top land above the compression ring having a zoned diameter wherein the largest diameter zone of the top land is disposed between lesser diameter zones of said land, said lesser diameter zones terminating adjacent the upper compression ring and combustion head respectively.

4,106,464

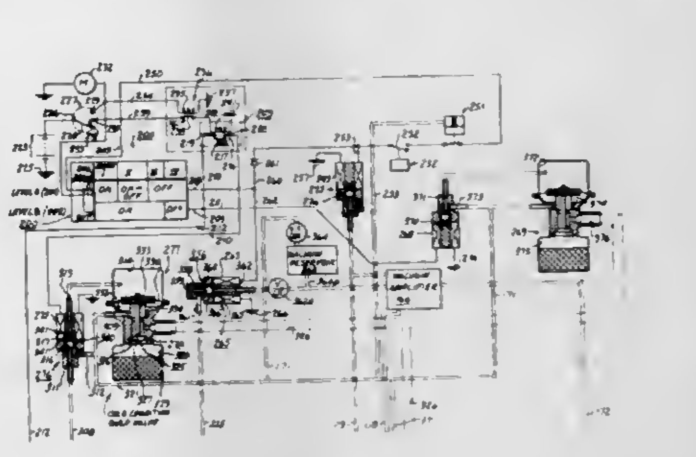
PROGRAMMED CONTROL SYSTEM FOR A LEAN-BURNING INTERNAL COMBUSTION ENGINE

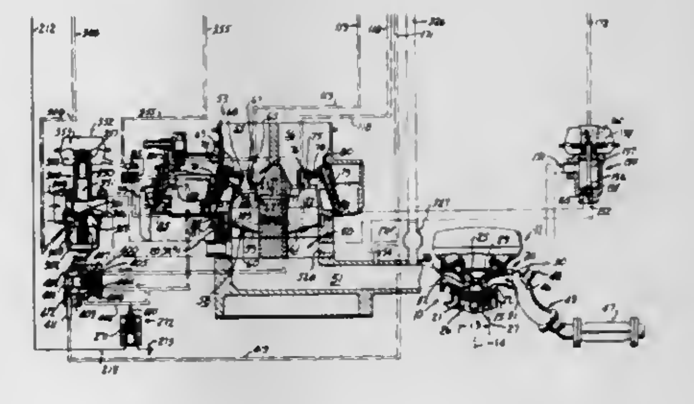
Ryuichi Yamashita; Hiromitsu Matsumoto, both of Hamamatsu, and Masato Eda, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 24, 1976, Ser. No. 717,365

Int. Cl.^{2} F02N *17/00;* F02M *23/04, 37/00*

U.S. Cl. 123—179 A **22 Claims**





1. In a carburetion system for an internal combustion engine which includes a principal carburetor, a starter carburetor, and an air gulp valve, which carburetors discharge a mixture of air and fuel into induction means, the induction means including a throttle valve whereby an induction pressure is established at a downstream location from the throttle valve that is respective to engine operating conditions, the starter carburetor including a fuel chamber containing fuel overlaid by a region having limited communication with the atmosphere, balance passage means interconnecting the said downstream location to the region, the gulp valve comprising gulp valve means operable to atmosphere, and gulp passage means connecting the said gulp valve means to the said downstream location, the improvement comprising:

- balance passage valve means in said balance passage means effective to permit or to prevent air flow through said balance passage means;
- balance passage valve actuator means operably connected to said balance passage valve means adapted to set the said balance passage valve means to permit or to prevent said air flow;
- gulp valve actuator means operably connected to said gulp valve to prevent or to enable flow of air from atmosphere through the gulp valve to said gulp passage means; and
- delay means operatively connected to both of said actuator means causing both of said actuator means to prevent said flows until after a predetermined period of time has elapsed following catching of the engine after cranking.

4,106,465

OFF-ON-START SWITCHING SYSTEM FOR DIESEL ENGINES, AND PARTICULARLY AUTOMOTIVE-TYPE DIESEL ENGINES

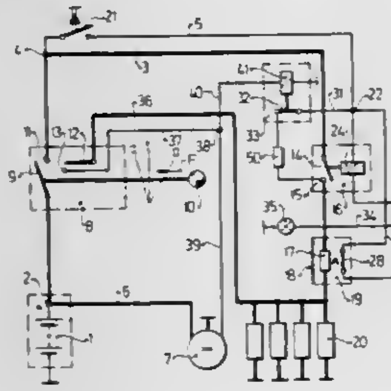
Walter Bernhardt, Fellbach, and Bodo Ziegler, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,994

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624685

Int. Cl.^{2} F02N *17/00*

U.S. Cl. 123—179 H **9 Claims**



1. Electrical ON-OFF-START operating control system for engines requiring a pre-heat time before starting, such as automotive-type Diesel engines having

a source of electrical power (1, 2);

a starter motor (7) and a starter switch means (8, 13) therefor, selectively connecting the motor to the source;

at least one glow plug (20);

a manually operable control switch (8, 9, 11, 12, 13) having the positions, in sequence: OFF (0); ON (I); START (II); and corresponding ON (11) and START (12, 13) terminals and a movable switch member (9) connected to said source (1);

the START position (II) of the control switch (8) being unstable and including means (F) biassing the switch to return to the ON position (I) upon release of manual operation to START position, and after having moved the switch through the ON position to the START position;

a glow plug energization relay (16);

a delayed operating timer circuit (26);

two energization circuits (3, 14, 15, 17; 36) for said at least one glow plug (20),

a first one (3, 14, 15, 17) of said energization circuits including

a heating element — temperature sensitive thermally responsive switch (19) having a heating resistance (17) and thermally responsive switch contacts (28) in heat transfer relation to said heating resistance (17), the heating resistance being serially connected with said at least one glow plug (20), the switch contacts (28) opening when the switch is heated due to current flow through said heating resistance (17),

and the contacts of the glow plug energization relay (16);

the second one (36) of said energization circuits being directly connected to the START position (II) of said control switch (8) to apply direct power from said source (I) through said switch (8) to the at least one glow plug (20) while bypassing said heating resistance (17);

a glow plug control circuit (5) for said first glow plug energization circuit (3, 14, 15, 17), connected to the ON terminal (11) of the switch (8) and including

a momentary-close plug pre-heat switch (21),

a first junction (22),

the control means (24) for said glow plug energization relay (16),

and the contacts (25) of said delayed-opening timer circuit (26);

a controllable self-holding circuit (50, 32) connected to said junction (22) and including a controlled circuit breaking device (33);

a control connection (37-38-40) from the START position (II) of said switch (8) to the controlled circuit breaking device (33) of the self-holding circuit (50, 32) to open the self-holding circuit when the switch (8) is moved to the START position (II);

a glow plug ready circuit (27, 28, 29, 26, 30) additionally connected to said first junction (22), said glow plug ready circuit including

the switch contacts (28) of said thermally responsive switch (19) and the time control element (30) of the delayed operating timer circuit providing, when the switch (8) is placed in the ON position (I) and the momentary-close plug pre-heat switch (21) is operated, power to said first junction (22), glow plug energization relay (16) control means (24) to effect closing of the energization contact thereof and, through the switch contacts (28) of the thermally responsive switch (19) power to said delayed operating timer circuit (26), power supply continuing after release of the momentary-close switch (21) due to the self-holding circuit (50, 32) and providing, upon closing of the glow plug energization relay (16) power through said first energization circuit (3, 14, 15, 17) including said heating resistance (17) to said at least one glow plug (20); and

indicator means (35) connected to be responsive to the state of the switch contacts (28) of the thermally responsive switch (19) and indicating when, after heating of the thermally responsive switch by current flowing through the heating resistance (17) thereof, a predetermined temperature has been reached to effect change-over of said thermally responsive contacts (28), change-over of said contacts interrupting energization of said timing circuit and initiating a timing delay interval to retain said first glow plug energization circuit in energized condition for the duration of the delay timing interval and permitting moving the switch (8) during said delay interval to the START position (II), but disconnecting the first glow plug energization circuit upon lapse of said delay timing interval.

4,106,466

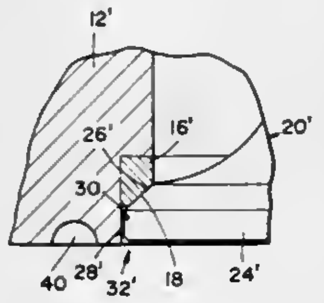
ENGINE VALVE WITH RECESSED SEAT AND ANNULAR GROOVE

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 16, 1976, Ser. No. 714,449

Int. Cl.^{2} F01L *3/00*

U.S. Cl. 123—188 S **7 Claims**



1. Valve apparatus comprising:

main body means;

a valve member movably mounted to said main body means so as to be reciprocable relative thereto, and comprising a valve stem and a valve head;

the main body means defining a seat portion against which said valve head may seat, the valve member being movable relative to the main body means to move the valve head away from the seat portion;

the main body means defining a bore adjacent the seat portion, the outer periphery of the valve head positioned in close proximity to the surface of the bore as the valve head is moved from the seat portion, so that the valve member and main body means maintain an effectively closed valve state as the valve head is removed from the seat portion, until the outer periphery of the valve head is moved from within the bore, wherein the bore is a cylindrical bore, and wherein the main body means define an annular groove located about the bore, the axis of the groove being substantially coincident with the cylinder axis of the cylindrical bore and wherein the annular groove is substantially semi-circular in cross-section.

4,106,467

INTERNAL COMBUSTION ENGINE WITH A SUBSIDIARY COMBUSTION CHAMBER

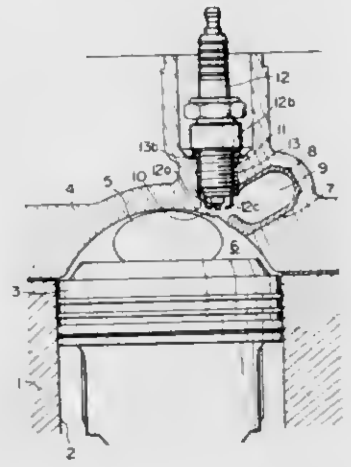
Toshio Tanahashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 19, 1976, Ser. No. 687,760

Claims priority, application Japan, Sep. 30, 1975, 50-117186

Int. Cl.^{2} F02B *19/16*

U.S. Cl. 123—191 SP **4 Claims**



1. An internal combustion engine with a subsidiary combustion chamber, said engine comprising:

a cylinder block;

a piston reciprocally disposed in said cylinder block;

a cylinder head on the cylinder block, said cylinder head having an inner surface;

a main combustion chamber defined between the inner surface of the cylinder head and the top surface of the piston;

said cylinder head having a recess therein opening into the main combustion chamber;

a subsidiary chamber component made of heat resistant material said recess having a mouth through which all of said subsidiary chamber will pass, said component being press-fitted into said recess through said mouth, said component having an inner chamber which comprises the subsidiary combustion chamber and a connecting passage which connects the main combustion chamber with the subsidiary combustion chamber;

a spark plug;

a first hole defined in the cylinder head;

a second hole defined in the subsidiary chamber component and aligned with the first hole; and

a flanged sleeve rigidly fixed into the first and second holes so as to prevent dislodging of the subsidiary chamber component from the recess, said sleeve having a threaded hole in which the spark plug is positioned.

4,106,468

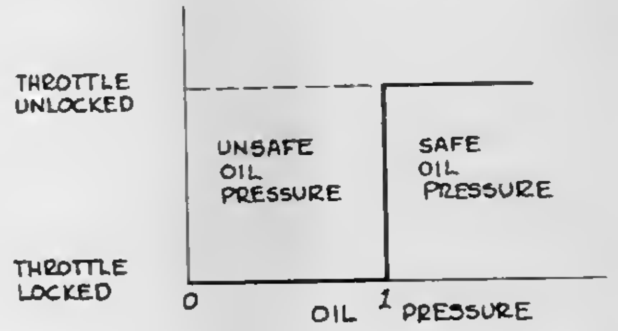
PRESSURE RATIO VALVE

Bill G. Davis, Phoenix, Ariz., assignor to Jetco, Inc., Phoenix, Ariz.

Filed Mar. 18, 1977, Ser. No. 778,852

Int. Cl.^{2} F01M *1/00*

U.S. Cl. 123—196 S **10 Claims**



1. In an internal combustion engine having a pressurized air supply and an air actuatable throttle control means for controlling the engine RPM in response to a pneumatic control signal, a pressure ratio valve for comparing the pressures of an engine fluid having a predetermined normal operating pressure and the air supply and for generating the pneumatic control signal in response thereto, said valve comprising in combination:

a. a body having a cylindrical bore including first and second bore sections;

b. a fluid pressure port communicating with said first bore section for connection to the engine fluid having a predetermined normal operating pressure;

c. an air pressure port communicating with said second bore section for connection to the pressurized air supply;

d. a control port communicating with said second bore section for transmitting the pneumatic control signal from said valve to the throttle control means;

e. an exhaust port communicating with said first bore section;

f. a piston slidably positioned in said bore between a first position and a second position, said piston including

  1. a first pressure receiving head on one end of said piston, positioned in said first bore section for receiving pressure from said engine fluid;

  2. a second pressure receiving head, on the opposite end of said piston, positioned in said second bore section for receiving pressure from said air supply, said second pressure receiving head opening a path between said air pressure port and said control port when said piston is in the second position and for closing the path between said air pressure port and said control port when said piston is in the first position; and

  3. a third pressure receiving head positioned intermediate said first and second pressure receiving heads for permitting air to flow from said control port to said exhaust port when said piston is in the first position and for preventing air flow between said control port and said exhaust port when said piston is in the second position;

whereby said piston is urged into the first position when the fluid pressure-air pressure ratio decreases below a predetermined magnitude for actuating the throttle control means to control the engine RPM.

4,106,469

AUTOMATIC MOTOR KILL SYSTEM

James Dey, 1101 Woodlark, Tyler, Tex. 75701

Division of Ser. No. 595,804, Jul. 14, 1975, Pat. No. 4,029,073. This application Jan. 14, 1977, Ser. No. 759,780

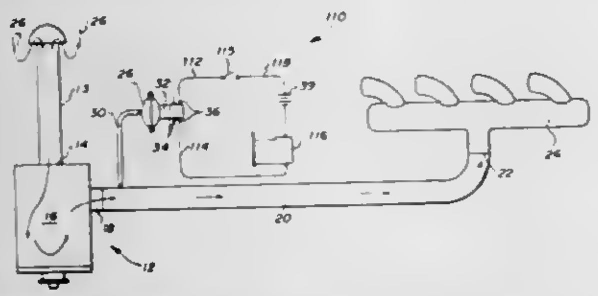
Int. Cl.^{2} F02B *77/00*

U.S. Cl. 123—198 DB **5 Claims**

1. An automatic engine shut off system for an internal combustion engine having an air cleaning system connected by a pipe to the intake manifold of the engine comprising:

means for sensing a pressure decrease to a predetermined level in the air cleaning connection pipe resulting from an obstruction of the air cleaning system,

means responsive to said sensing means for automatically shutting off the engine before damage occurs to the engine due to the obstruction of the air cleaning system, and



said sensing means including a normally closed vacuum switch responsive to the pressure level within the air cleaning connection pipe, whereby said vacuum switch opens in response to a decrease in the pressure level to a predetermined level.

4,106,470

SAFETY APPARATUS FOR STOPPING AN INTERNAL COMBUSTION ENGINE IN RESPONSE TO IRREGULARITIES OCCUR IN THE OIL PRESSURE OR IN THE WATER TEMPERATURE

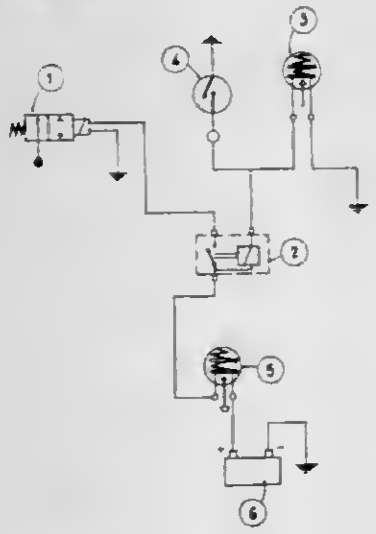
Jose Maria San Sebastian Saizar, c/Elcano, No. 15, Irun (Guipuzcoa), Spain

Filed May 25, 1976, Ser. No. 689,832

Claims priority, application Spain, May 28, 1975, 437.992

Int. Cl.² F02B ***77/08***

U.S. Cl. 123—198 DB **1 Claim**



1. A safety apparatus for causing an internal combustion engine to stop automatically when irregularities occur in the oil pressure or in the water temperature, said apparatus comprising

an oil-pressure-actuated switch having normally closed contacts which are held open when an oil pressure of the engine is above a minimum value,

a water-temperature-actuated switch having normally open contacts which are closed when the temperature of a cooling liquid for the engine reaches a high temperature,

an electrical relay having an armature winding and a pair of normally open contacts which are closed by energization of the armature winding,

said oil-pressure-actuated switch and said water-temperature-actuated switch being connected in parallel to one side of the armature winding for controlling energization of the relay,

a normally open electrically operated valve connected in series with a fuel line to the engine,

said valve being electrically connected in series with the relay contacts,

a manual switch which is normally closed connected in series with the relay contacts and the electrically operated valve for disabling the operation of the valve to allow the engine to be started, and

said manual switch being free of any starter circuit so that the engine can be started and operated in the event of an irregularity when the manual switch is opened.

4,106,471

INTERNAL COMBUSTION ENGINE SYSTEM WITH AN AIR-FUEL MIXTURE SHUT OFF MEANS

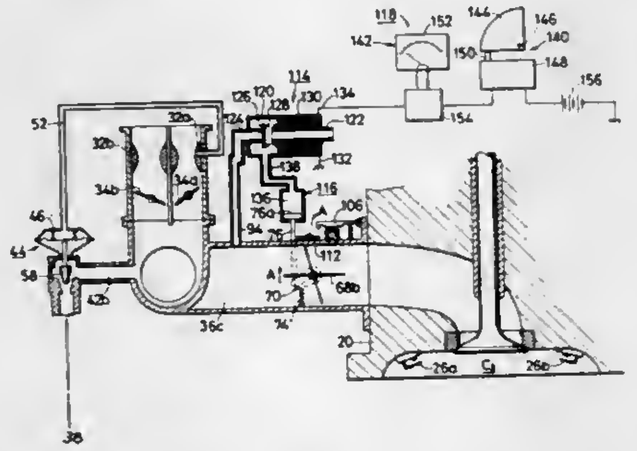
Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Jun. 23, 1976, Ser. No. 698,880

Claims priority, application Japan, Jun. 24, 1975, 50-78354

Int. Cl.² F02D ***13/06***

U.S. Cl. 123—198 F **12 Claims**



1. An internal combustion engine system, comprising:

an engine having therein at least two combustion chambers each of which is provided with at least two spark plugs, each combustion chamber being communicable with corresponding intake and exhaust ports also formed in said engine;

intake means including an intake manifold having branch tubes respectively connected to said intake ports, and air-fuel mixture supply means located upstream of said intake manifold for supplying the air-fuel mixture to said combustion chambers through said branch tubes and said intake ports;

exhaust means communicating with said exhaust ports for collecting the high temperature spent gases from said exhaust ports and carrying them to an exhaust tube from which said spent gases are discharged to the atmosphere;

exhaust gas recirculating means for feeding a portion of the exhaust gases in said exhaust means into said intake means; and

air-fuel mixture shut off means for blocking the air-fuel mixture supply into selected at least one of said combustion chambers when said engine is subjected to deceleration, said air-fuel mixture shut off means including:

at least one damper swingably disposed in the branch tube corresponding to said selected combustion chamber for selectively closing and opening the passage of said branch tube;

biasing means for biasing said damper in a direction to open said passage of the selected branch tube;

a vacuum motor means for moving said damper in a direction to close the passage of the selected branch tube against the counterforce of said biasing means when a predetermined degree of vacuum is applied thereto; and

a three-way solenoid valve means having first, second and third tubes which are respectively communicated with the atmosphere, the interior of the selected branch tube upstream of said damper, and said vacuum motor means and functioning such that when it is electrically energized, a fluid communication between said second and third tubes is accomplished and simultaneously a communication between said first and third tubes is blocked, and when it is de-energized, the communication between said second and third tubes is blocked and simultaneously the communication between said first and third tubes is accomplished.

4,106,472

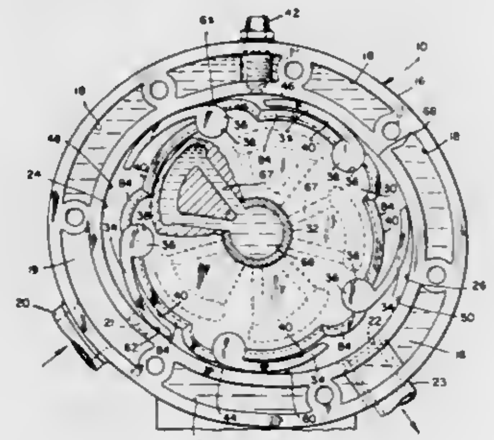
ROTARY ENERGY CONVERTER WITH RESPIRING CHAMBERS

Glenn Rusk, 396 Bleecker St., New York, N.Y. 10014

Filed Nov. 8, 1976, Ser. No. 740,028

Int. Cl.² F02B ***55/14, 53/10, 53/02;*** **F01C** ***19/00***

U.S. Cl. 123—205 **30 Claims**



1. An energy converter comprising a hollow housing having end walls enclosing a central section constituting a stator,

said central section having a chamber therein of generally circular shape defining an inner stator wall,

a cylindrical rotor mounted for rotation about an axis central within said chamber and having a generally circular outer surface,

a plurality of vanes pivotally mounted at equallyspaced points about the circumference of said rotor, with each of said vanes extending from its pivotal mount in the same direction along the periphery of said rotor,

said rotor being formed with spaced troughs underlying the respective vanes, each trough being sized to receive the overlying vane in a retracted position therein with the vane outer surface recessed within the outer surface of the rotor,

said inner stator wall being formed with at least one arcuate vaulted bay of greater radius from the center of said rotor than the basic circular extent of said stator wall, and at least one abutment station continuous with said bay,

said abutment station constituting a location on said stator inner wall of minimal radial distance from the rotor axis, and being positioned to depress said vanes into retracted position within said troughs as said vanes travel past said abutment station,

said vaulted arcuate bay enabling said vanes to pivot outwardly under the centrifugal force of the rotating vanes from their retracted positions to extended angular positions with the outer vane surfaces in engagement with the surfaces of said bay,

each pair of adjacent vanes forming therebetween a travelling chamber, the volume of which increases and decreases as said vanes move between their extended and retracted positions as said rotor turns within said stator, the outer surface of each vane being formed as a compound curve with each engaging area of the vane outer surface of lesser radius than the radius of the stator inner wall which it engages, whereby the vane outer surface is compatible with all surfaces of the stator inner wall,

each of said vanes engaging the surface of said bay at a sealing line which migrates from the journal end portion of said vane to the tip end portion thereof during the travel of said vane along said bay, whereby to provide a constant seal at the trailing end of one travelling chamber and the leading end of the succeeding travelling chamber, said vanes providing the only seals between adjacent chambers.

4,106,473

GRILLING DEVICE WITH WARMING CHAMBER

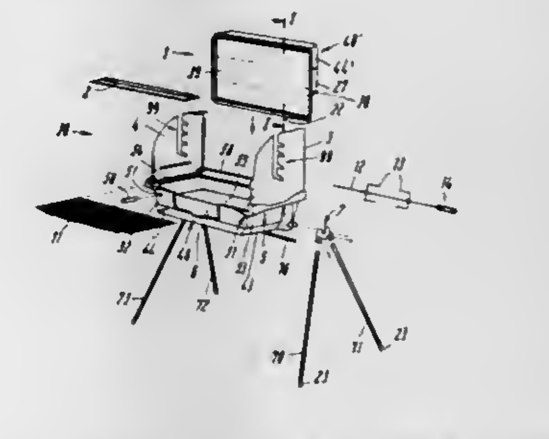
Stephan H. A. Wandel, Bremen, Fed. Rep. of Germany, assignor to EWG Import-und Export-Gesellschaft mit beschrankter Haftung, Bremen, Fed. Rep. of Germany

Filed Mar. 24, 1977, Ser. No. 780,696

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701552

Int. Cl.² A47J ***37/00***

U.S. Cl. 126—25 R **12 Claims**



1. A grill having a front and a rear, said grill comprising

a cast firebox having a bottom wall and upwardly extending side walls;

a grid extending in a horizontal plane between said upwardly extending side walls;

a grease-drip pan extending vertically upwardly between the rear edges of said side walls;

a shallow warming chamber disposed beneath said firebox, said warming chamber including side walls and a bottom wall in heat-conducting relationship with said firebox, the bottom wall of said firebox forming the top wall of said warming chamber;

said warming chamber including an opening at the front portion of said grill to allow the insertion of at least one heat-conducting flat plate for heating and warming;

legs for supporting said grill;

means interconnecting said legs and said grill for supporting said firebox in a horizontal plane and in a vertical plane;

said warming chamber opening being disposed upwardly when said firebox is in said vertical plane.

4,106,474

HEAT CONSERVING SPACE HEATER

Robert L. Hunter, and Everett L. Sartain, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

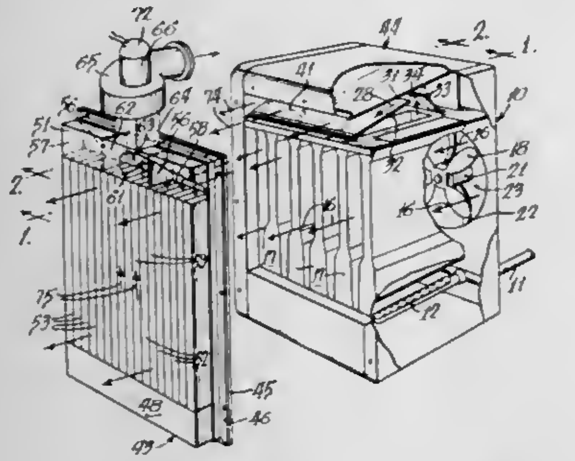
Filed Mar. 17, 1977, Ser. No. 778,367

Int. Cl.² F24H ***3/100***

U.S. Cl. 126—110 R **5 Claims**

1. A heat conserving space heater, comprising: (A) a gas fired unit heater having a heat source means for providing a supply of hot gas, main hot gas passages leading from said source, and main air passages leading from and exhausting into the space being heated and in heat exchange relationship with said main hot gas passages; and (B) an auxiliary add-on heat conserving heat exchanger unit attached to said unit heater and having in heat exchange relationship with each other a set of auxiliary hot gas passages receiving hot gas from said main hot gas passages and a set of auxiliary air passages receiving heated air from said main passages, and an exhaust blower on said

add-on unit for drawing said hot gas through said main hot gas passages on the unit heater, then through said auxiliary hot gas passages of said add-on unit and then for exhausting said hot gases from said auxiliary passages to a place of disposal, said unit heater including a cabinet, and seal means between the unit and add-on heaters for aid in defining and separating the combination of main hot gas passages and auxiliary hot gas passages from the main and auxiliary air passages.



4,106,475

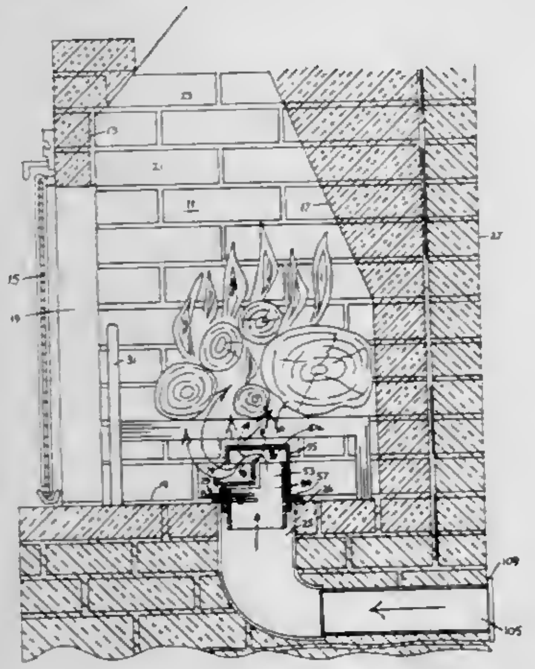
DRAFT AIR CONTROL SYSTEM

Clell C. Mayes, P.O. Box 8, Pigeon Forge, Tenn. 37863

Filed May 2, 1977, Ser. No. 792,536

Int. Cl.² F24B *7/02*

U.S. Cl. 126—121 5 Claims



1. In a fireplace comprising a floor, a rear wall, a pair of oppositely disposed side walls, and grate means including a bottom side disposed above said floor, the combination of a duct having an outside end in fluid communication with a source of outside air and terminating at its inside end at a location below said grate means, damper means adjustably controlling the cross-sectional area of said duct, hood means covering said inside terminal end of said duct, said hood means including a throat section defining a first passageway in fluid communication with said inside terminal end of said duct, a lateral section defining a cover for said throat section and further defining a second passageway in fluid communication with said first passageway and directing the flow of fluid from said first passageway to a substantially non-vertical flow direction, said lateral section further defining a downwardly opening outlet thereby permitting essentially unrestricted air flow from said duct into said fireplace and essentially preventing passage of particulate matter into said duct while simultaneously distributing said outside air laterally beneath said grate.

4,106,476

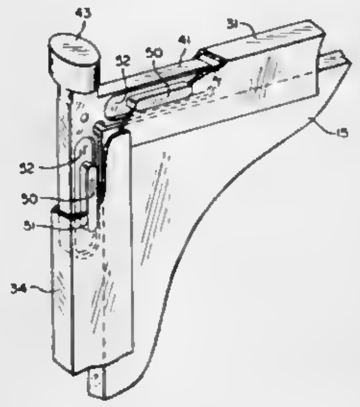
DOOR FOR FIREPLACE SCREEN

Robert W. Harsba, Oregon City, Oreg., assignor to Pacific Fireplace Furnishings, Inc., Portland, Oreg.

Filed Jun. 28, 1976, Ser. No. 700,524

Int. Cl.² F24C *15/04*

U.S. Cl. 126—140 4 Claims



4. In a fireplace screen, a vertical rectangular frame having a downwardly facing upper horizontal guide channel and an upwardly facing lower horizontal guide channel, a folding door in said frame having a first door panel hinged at one vertical edge thereof to said frame, a second door panel in said frame hinged at one vertical edge to the opposite vertical edge of said first panel, and vertical upper and lower guide posts on the opposite vertical edge of said second panel slidable and rotatable in said guide channels when the door is opened and closed, said guide posts being elliptical with the major axis of the ellipse perpendicular to said second panel, said major axis of the ellipse for each guide post being transverse to its guide channel when the door is closed, to position said opposite edge of said second panel, and said major axis rotating into alignment with the guide channel when the door is folded to open position to allow the lower guide post to pass by fine debris in said lower guide channel.

4,106,477

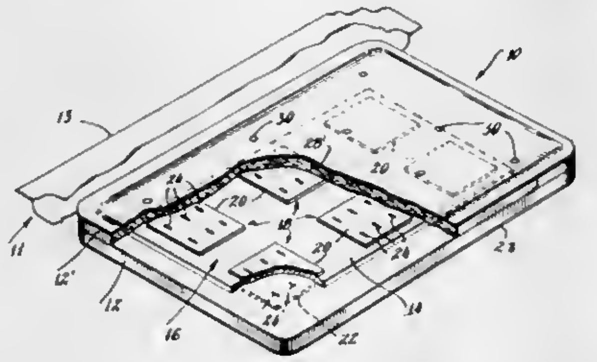
THERAPEUTIC SELF-GENERATING MOIST HEAT PAD

Sheldon L. Feld, Jamaica, N.Y., assignor to Chem-E-Watt Corporation, Racine, Wis.

Filed Apr. 12, 1974, Ser. No. 460,492

Int. Cl.² F24J *1/04, 3/04*

U.S. Cl. 126—263 26 Claims



22. In a self contained heating device formed with an electrochemical heat cell using an anode member, a cathode member and shorting elements connected thereto, the improvement comprising a cathode member formed with an electrochemically active reducible material intermixed with a dry electrolyte material.

4,106,478

PACKAGED HEAT GENERATOR

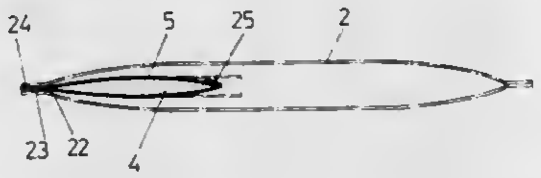
Sunao Higashijima, No. 17-12, Daita 6-chome, Setagaya-ku, Tokyo, Japan

Filed Apr. 9, 1976, Ser. No. 675,569

Claims priority, application Japan, Jun. 9, 1975, 50-78482[U]; Oct. 14, 1975, 50-139783[U]; Oct. 14, 1975, 50-139784[U]; Oct. 14, 1975, 50-148764[U]; Mar. 19, 1976, 51-30641

Int. Cl.² F24J *1/00*

U.S. Cl. 126—263 15 Claims



1. A packaged heat generator for warming objects, said heat generator comprising:

- heat generating material;
- first enclosing means of air-impermeable material surrounding said heat generating material for containing said heat generating material therein;
- second enclosing means of air impermeable material surrounding said first enclosing means for containing said first enclosing means therein, said second enclosing means having air passage means therethrough for allowing air to enter into said second enclosing means;
- oxidation promotion material within said second enclosing means and outside of said first enclosing means;
- third enclosing means of air impermeable material surrounding said second enclosing means for removably containing said second enclosing means therein, said third enclosing means being openable and recloseable at one end.

4,106,479

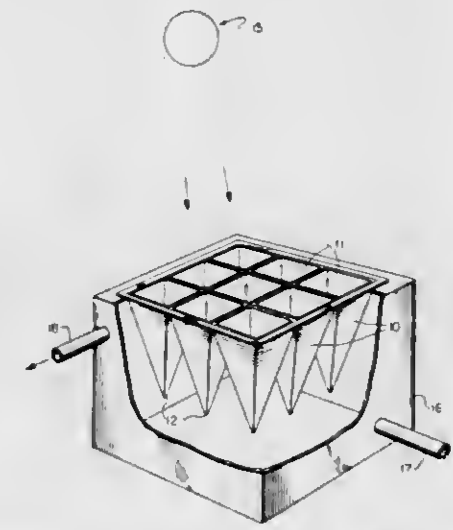
SOLAR HEAT COLLECTOR

Ramona Rogers, 4708 Meadow La., Sioux City, Iowa 51104

Filed Aug. 6, 1976, Ser. No. 712,224

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 9 Claims



1. A solar energy collector comprising a plurality of solar radiation absorbing receivers, each of said receivers being in the shape of a hollow pyramid having an open base and extending to a point at the interior of the apex, means for joining said pyramids together at their bases, and means including the inner walls of the pyramids are operative to absorb solar radiation when said bases are oriented generally toward the sun, whereby the energy absorbed by the receivers is available for transfer to a working fluid.

4,106,480

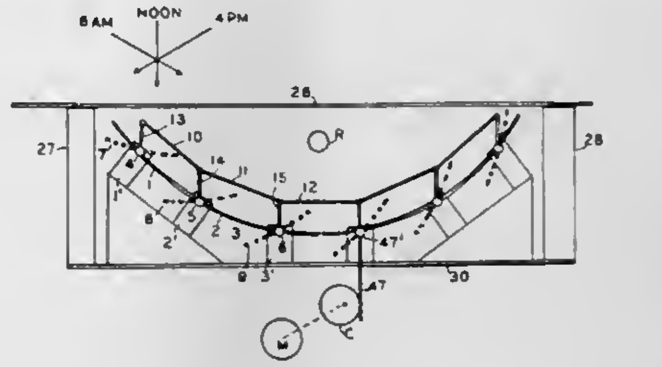
REFLECTIVE SOLAR HEAT COLLECTOR

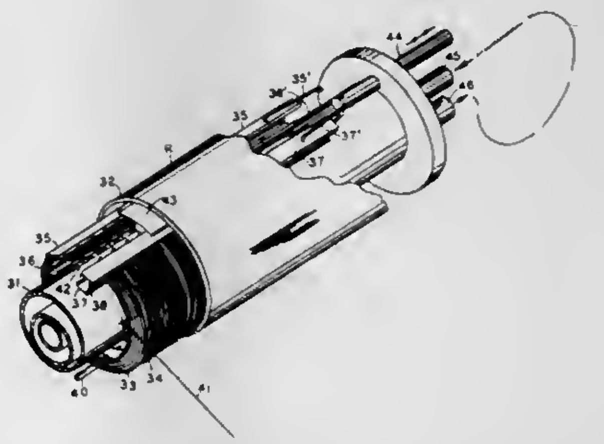
Floyd A. Lyon, Brookville, and Henry Harrison, Locust Valley, both of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Continuation of Ser. No. 640,694, Dec. 15, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,983

Int. Cl.² F24T *3/02*

U.S. Cl. 126—270 5 Claims





1. A reflecting solar heat collector having a stationary receiver adapted to absorb sunlight, an array of parallel curved reflecting mirror strips under tension rotatably mounted having said receiver substantially at the focus of said mirrors, means for pivotally rotating said mirror strips substantially in unison about spaced-apart axes parallel to said receiver to track the sun's motion,

- each of said mirror strips being a strip of flexible reflective film stretched between two end termination pivoting means, the said two end termination pivoting means being shaped to generate the curved cross-section contour of said reflecting mirror strip and adapted to rotate for tracking the sun about their common pivot axis which is parallel to the straight cylindrical shape of the mirror strip, said strip being detachably secured at each end to said end termination pivoting means.

4. A reflecting solar heat collector comprising a stationary cylindrical receiver surface adapted to absorb sunlight, an array of parallel curved reflecting mirror strips rotatably mounted having the said receiver surface substantially at the focus of said mirrors, means for pivotally rotating said mirror strips substantially in unison about spaced-apart axes parallel to said receiver surface to track the sun's motion and means for transferring heat from said cylindrical receiver surface for delivery to heat utilization apparatus, the mirrors being placed in a substantially parabolic arrangement with said receiver at its focus,

- means for reducing the heat loss from said cylindrical surface,
- said means for reducing heat loss including an evacuated transparent envelope surrounding said receiver surface in spaced apart substantially concentric relation,
- said receiver surface being surrounded by a plurality of axially spaced-apart radiation-suppressing groved reflect-

ing discs of equal diameter concentric with said receiver surface, substantially parallel to rays of sunlight incident on said receiver surface, said discs adapted to reflect back substantially all the radiation from the said receiver surface which strikes their grooved reflecting surfaces.

4,106,481

APPARATUS FOR RECOVERING SOLAR ENERGY

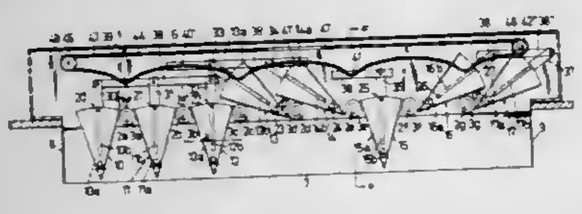
Josephus Petrus Maria van Kuijk, Chemin des Vignes 85, 1814 La Tour de Peilz, Switzerland

Filed Oct. 12, 1976, Ser. No. 731,671

Claims priority, application Netherlands, Oct. 20, 1975, 7512289

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **5 Claims**



1. Apparatus for recovering solar energy, the combination comprising
  a casing,
  a plurality of warming-up cylindrical tubes extending in parallel and side-by-side relationship in said casing,
  each tube having an associated pair of substantially flat reflection surfaces angularly diverging therefrom,
  means supporting said reflection surfaces tangent to their associated cylindrical tubes and including pivotal means whereby said reflecting surfaces reflect incident sun rays towards said tube while being pivoted to maintain their bisector face towards the sun, and
  coupling means for moving said reflecting surfaces relative to said pivotal means with a direction component transverse to a plane defined by said tubes.

4,106,482

AUTONOMIC SOLAR PANEL

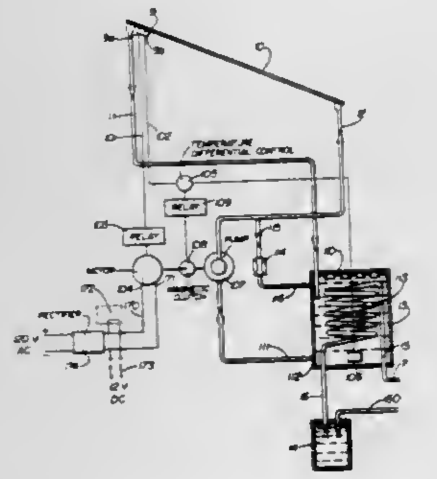
Fred L. Savage, #47 - 3987 Gordon Head Rd., Victoria, B.C., Canada (V8N 3X5), and Alfred D. Long, c/o 1100 Montreal Trust Bldg., 789 W. Pender St., Vancouver, B.C., Canada (V6C 2R8)

Filed Jul. 28, 1976, Ser. No. 709,386

Claims priority, application Canada, Apr. 27, 1976, 251184

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **29 Claims**



1. An autonomic solar heat collecting system comprising: a solar collecting panel exposed to the sun's radiation, said solar collecting panel comprising a flat outer surface adapted to the direction of the sun's radiation, a flat or formed inner sheet closely spaced from the flat outer surface to provide a thin plate-like passageway between the inner sheet and the outer sheet, whereby heat transfer medium flowing therebetween is in the form of a thin fluid membrane, a hollow fluid-tight cavity provided by joining the inner and outer surfaces to one another and forming a bottom cavity and a top cavity, means for allowing entrance of a fluid into said bottom cavity, and gravity return means for the removal of said fluid from the said top cavity; heat transfer medium means for adsorbing the energy of the sun's radiation within said plate-like passageway of said panel; means for removing said medium from the panel, sensing means for monitoring the temperature within the panel; a through-put heat transfer reservoir for accepting said medium for said solar panel; heat sensing means for monitoring the temperature within said reservoir; low pressure means for returning said medium to said solid panel from said reservoir, low pressure means for regulating the flow of said medium from said reservoir to said solar panel comprising pump means operable under low wattage and low power and activated by a small predetermined temperature differential derived from said heat sensing means within said solar panel and said heat sensing means within said reservoir; and means for providing such low wattage, low power for the operation of said system.

4,106,483

SOLAR ENERGY COLLECTOR

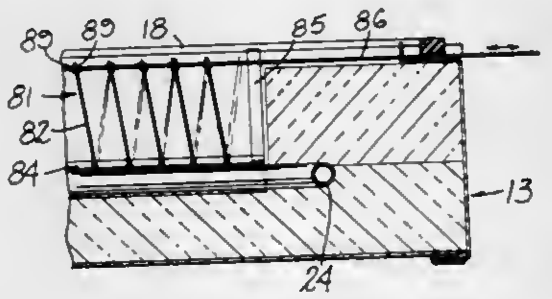
Everett M. Barber, Jr., Guilford, Conn., assignor to Sunworks, Inc., Guilford, Conn.

Continuation-in-part of Ser. No. 453,353, Mar. 21, 1974, Pat. No. 3,980,071. This application Aug. 30, 1976, Ser. No. 718,453

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **7 Claims**



1. A solar heat energy collector comprising a housing having a transparent cover member and an absorber having an inside surface spaced from said cover member, said housing adpated to be supported at an inclination to the vertical, a plurality of thin, vane-like members disposed over said absorbing surface below said cover to retard convection currents within said housing, said vane-like members having substantially parallel facing surfaces spaced apart from one another a distance substantially greater than their thicknesses to permit solar energy to pass therebetween and to impinge upon said absorber surface substantially undeviated, and means for varying the angular disposition of said vanes with respect to said absorber surface to maximize the solar energy incident upon said absorber surface throughout a day, the edges of said vane-like members proximate said absorber surface being just above but not in contact therewith, said vane-like members extending across said housing in a horizontal direction.

4,106,484

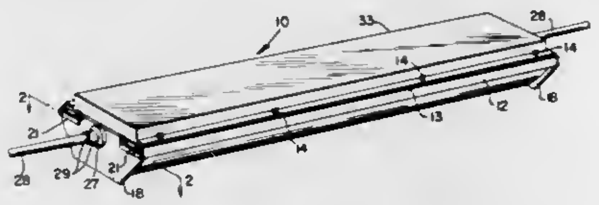
ADJUSTABLE SOLAR CONCENTRATOR

Richard E. Dame, Silver Spring, Md., assignor to Mega Analytical Research Services, Inc., Silver Spring, Md.

Filed Mar. 31, 1977, Ser. No. 783,345

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **7 Claims**



1. An adjustable solar concentrator comprising a receiver tube, means supporting said receiver tube including spaced walls, a reflector plate, support members connected to opposite edges of the reflector plate, trunnions projecting from the ends of said support members and rotatively mounted in said walls for supporting said members and the reflector plate between said walls, and means imparting moments to said support members for flexing the reflector plate to produce a geometrically correct cylindrical parabolic solar energy reflecting surface capable of producing a sharp solar image on said receiver tube.

4,106,485

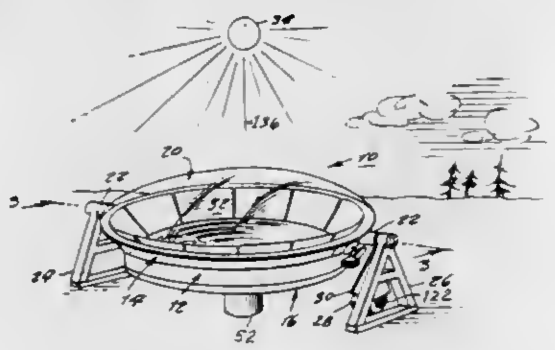
SOLAR ENERGY REFLECTING SYSTEM

Joseph A. Polley, P.O. Box 361, Massapequa, N.Y. 11758

Filed Aug. 9, 1977, Ser. No. 823,131

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **10 Claims**



1. A solar energy reflector system comprising:
  a. a circular dish-like housing with outwardly flared peripheral walls;
  b. upper and lower circular hoops supported within said housing in spaced relationship to each other, the upper hoop being largerthan the lower hoop;
  c. means for mounting said hoops within said housing for movement relative to each other;
  d. sensing means for detecting the position of the sun in the sky;
  e. control means coupled to said upper and lower hoops responsive to said sensing means for displacing the hoops relative to each other;
  f. a plurality of refelctor panels sequentially spaced around said peripheral wall; and
  g. means for pivotally connecting said panels to said upper and lower hoops to lie in an outwardly flared direction, each of said panels pivoting with the displacement of said hoops, whereby the reflector configuration of the system is modified in accordance with the movement of the sun across the sky.

4,106,486

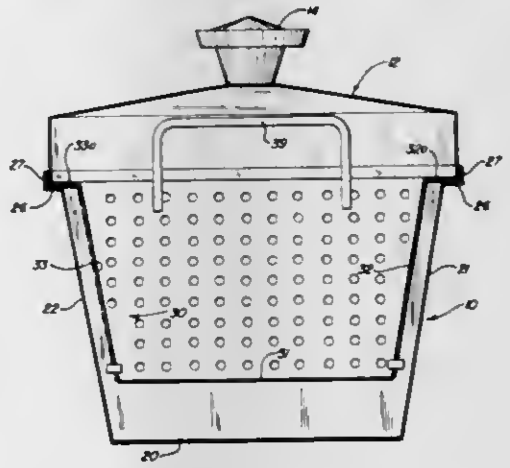
COOKING UTENSIL

B. Paul Lee, 15400 E. 14th Pl., Aurora, Colo. 80011

Filed Mar. 1, 1976, Ser. No. 662,509

Int. Cl.^{2} A47J *27/04*

U.S. Cl. 126—369 **6 Claims**



1. A cooking pan assembly comprising:
  (a) an outer generally rectangular, open top pan having an outwardly extending shoulder peripherally around the edge of the opening and an upstanding flange on the outer edge of said shoulder;
  (b) an inner, generally rectangular, open top pan having perforated sides, perforated ends and a unitary perforated bottom, wherein the sides are fixed to the bottom to form a fixed U-shaped channel, and the ends are pivotally hinged adjacent the bottom for movement from a closed position abutting the edges of the U-channel to an outwardly extending position for food removal, and an outwardly extending shoulder sized to seat on said shoulder on the outer pan and inside said upstanding flange, wherein said bottom is substantially spaced from said outer pan in its nesting position, and wherein said perforations in said inner pan are sufficiently large for free passage of liquids and steam and sufficiently small to support food in said inner pan;
  (c) handle means fixed to and extending upwardly from each of said ends, whereby when the inner pan is lifted by said handle means, the ends tend to remain closed against the edges of the U-shaped channel because the ends are pivotally hinged to the U-shaped channel at locations adjacent the bottom; and
  (d) cover means including sloped top portions from about the center to the sides thereof, said cover being sized and shaped to seat on said shoulder of the inner pan and in said upstanding flange, whereby said inner pan is completely enclosed and condensate from said cover flows into said outer pan.

4,106,487

CONTINUOUS STEEPING OF CORN FOR WET PROCESSING TO STARCHES, SYRUPS AND FEEDS

James R. Randall, Decatur, Ill.; Arling K. Langhurst, Fairfax; Herman H. Schopmeyer, Cedar Rapids, both of Iowa, and Robert L. Seaton, Decatur, Ill., assignors to Archer Daniels Midland Company, Decatur, Ill.

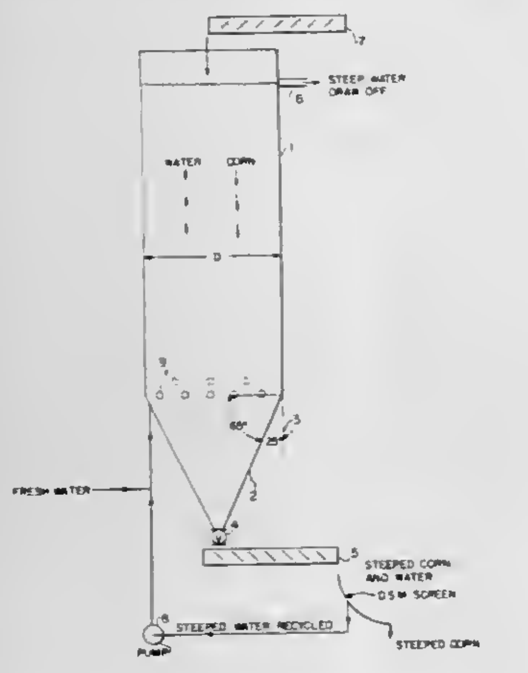
Filed Jul. 20, 1977, Ser. No. 817,488

Int. Cl.^{2} C13L *1/00*

U.S. Cl. 127—23 **5 Claims**

5. An apparatus for steeping corn comprising a cylindrical tank having a cone bottom, the cone having an angle of 22°–28° from the vertical and a controllable outlet at the bottom of the cone and said tank having a plurality of inlets approximately at the junction of the cone with the straight sides of the tank, means for removing corn and water at the bottom of the cone

and means for passing said removed water into said inlets and means for removing water from near the top of said vertical tank, the height of the cylindrical tank being about 1.5 to 2.5 times its diameter.



4,106,488

CANCER TREATMENT METHOD

Robert Thomas Gordon, 4936 W. Estes, Skokie, Ill. 60076

Continuation-in-part of Ser. No. 499,074, Aug. 20, 1974, abandoned. This application Jan. 22, 1976, Ser. No. 651,395

Int. Cl.² A61B *19/00*; A61F *7/00*; A61K *43/00*

U.S. Cl. 128—1 R **17 Claims**

1. The process for the treatment of cancer cells without substantially damaging living normal cells comprising:
  - providing one of a tumor specific material selected from an antibody and a radioisotope,
  - encapsulating said tumor specific material with material capable of being removed upon entering the cancer cell after a preselected time, to produce a total particle size of less than 1 micron,
  - intravenously injecting the encapsulated particles of tumor specific material,
  - removing said encapsulating material, and
  - releasing said tumor specific material within the cancer cells.

4,106,489

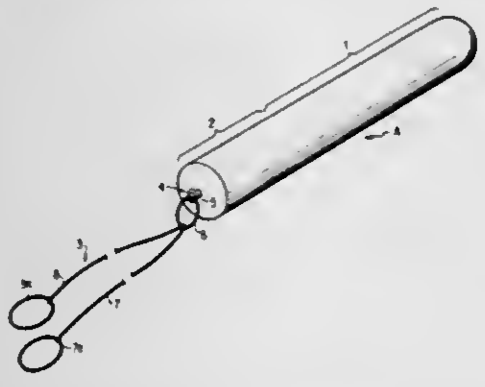
DEVICE TO STRENGTHEN MUSCLES

Kenneth W. Martin, 934 Fourth St. NE., Pulaski, Va. 24303

Filed Nov. 16, 1976, Ser. No. 742,093

Int. Cl.² A61B *19/00*

U.S. Cl. 128—1 R **4 Claims**



1. Means for strengthening muscles in a vaginal cavity comprising, in combination: a penile shaped element having a fore portion for insertion and against which said muscles are contracted as a radial force to grip said fore portion, and a base portion which remains outside said cavity; and elongated means attached to said base portion, at least a portion of said elongated means being resilient, said elongated means further having foot engaging elements on one end to tension said resilient portion to produce a controlled force of withdrawal of said fore portion, axial of said penile element, against the radial gripping force wherein said elongated means comprises a resilient member which is attached to said base portion, and a pair of non-resilient, elongated members attached to said resilient portion at one of their ends, each of said elongated members terminating in a foot engaging loop at their respevtice other ends.

4,106,490

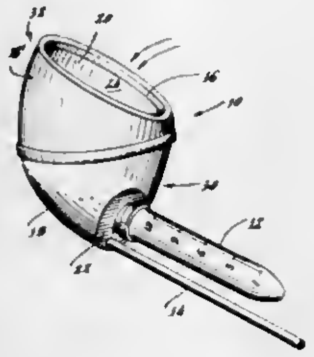
URINE COLLECTION AID

Raymond Spilman; Edward Emil Haase, Jr.; Kurt John Kruger; Donald Barry Budnick, and Vincent John Lasorso, Jr., all c/o Raymond Spilman Industrial Design 217 Bedford St., Stamford, Conn. 06901, assignors to Raymond Spilman; Edward Emil Haase, Jr.; Kurt John Kruger; Donald Barry Budnick; Vincent John Lasorso, Jr. and Louis H. Reens

Filed Sep. 27, 1976, Ser. No. 726,938

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 F **9 Claims**



1. An article for aiding in the direct collection of a urine sample in a specimen tube having an opening comprising
  - a hollow body formed of a pair of relatively movable parts, one upper part having a main opening at an upper end of the hollow body as determined by its normal operative orientation, said main opening being sized to conveniently receive a urine voiding stream from either a female or male person, the other part being a lower part which matingly engages the upper part along a plane of rotation to enable the upper part to be rotated from a male position to a female position to effectively reduce the vertical height of the collection aid when employed to receive a female voiding stream, said hollow body being formed with a wall which extends downwardly from the main opening to form a urine flow confining chamber with the mating engagement of said upper and lower parts, said hollow body being further sized sufficiently small for manual retention and manipulation in proximity to the exit point of the voiding stream from a person;
  - said wall further being provided at a bottom located lower segment of the lower part with specimen and excess outlets, said bottom located lower segment being selectively shaped to effectively guide the voiding stream to both of the outlets with normal operative orientation of the urine collection aid; and
  - said specimen and excess urine outlets being selectively spaced relative to each other to enable excess urine to be drained away while a specimen sample of urine is passed through the specimen outlet for sample collection in a specimen tube having its opening in communication with the specimen outlet.

4,106,491

DEVICE FOR PROLONGED INTRAVASCULAR INFUSION

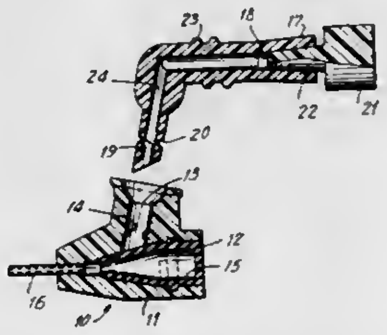
Luis A. Guerra, Apt. 3A, 239 Central Park West, New York, N.Y. 10024

Continuation-in-part of Ser. No. 598,902, Jul. 24, 1975, Pat. No. 3,996,923, and a continuation-in-part of Ser. No. 344,387, Mar. 23, 1973, Pat. No. 3,906,930. This application Dec. 13, 1976, Ser. No. 749,948

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 F **12 Claims**



1. An improvement in a device for introducing fluids into a blood vessel over extended periods of time, comprising a support portion removably and sealingly connectable with a source of intravenous fluid, of medication in solution or of alimentation in solution, said support portion comprising a body having a passage therethrough and an aperture connecting with said passage and forming a junction therewith, valve means at the proximal end of said passage and normally closing said aperture at said junction, and a cannula, the proximal end of said cannula being tightly sealed in the distal end of said passage, said valve means being operable by exertion of mechanical force through said aperture.

4,106,492

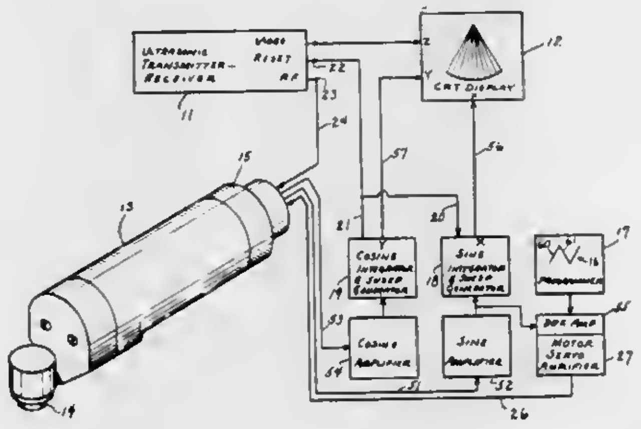
REAL TIME TWO-DIMENSIONAL MECHANICAL ULTRASONIC SECTOR SCANNER WITH ELECTRONIC CONTROL OF SECTOR WIDTH

William H. Schuette, McLean, Va., and George F. Norris, Kensington, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,851

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 V **10 Claims**



1. A real time ultrasonic scanning apparatus for medical examination of the body, the apparatus comprising hand-held housing means provided with a pivoted transducer and a reversible servo motor drivingly connected to said transducer, means for generating a positional electrical signal function varying in accordance with the angular position of said transducer over a scanning range of oscillation, programming means for generating periodic substantially triangular control wave signals including linear forward and reverse sections, position feedback control means for energizing said servo motor in accordance with the difference between the values of the position signal function and the triangular signals over the scanning range of oscillation of said transducer, pulse scan display means, means operatively connecting said transducer to said display means, and means for synchronizing said pulse scan display means with said positional electrical signal function.

4,106,493

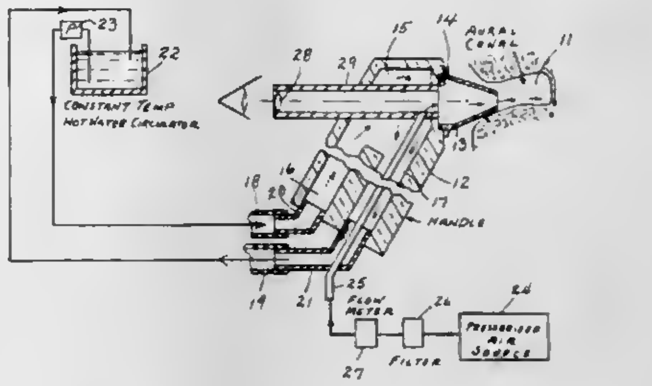
BIPHASIC OTOSCOPIC AIR STIMULATOR FOR PERFORMING CLINICAL CALORIC TESTS

Leonard R. Proctor, Chicago, and Raymond G. Byrnes, Oak Lawn, both of Ill., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 13, 1977, Ser. No. 759,172

Int. Cl.² A61B *19/00*

U.S. Cl. 128—2 R **10 Claims**



1. An apparatus for stimulating an aural canal of a patient comprising an insulating handle member, means to view the aural canal of an ear comprising a viewing tube having a forward discharge end and a rear end and mounted on said handle member and having frusto-conical nozzle means at its forward end adapted to be inserted in a patient's ear to continuously pass alternately heated and cooled gas to the aural canal and then out of the aural canal, a source of pressurized gas, conduit means connecting said source to said viewing tube and passing through said insulating handle, and means for precisely controlling the temperature of gas entering the aural canal comprising heat exchanger means surrounding at least a portion of said conduit means, the location of said heat exchanger means relative to said nozzle means being such that the temperature of said gas entering the aural canal is precisely controlled.

4,106,494

HEART DEFIBRILLATING AND MONITORING SYSTEM

Robert A. McEachern, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

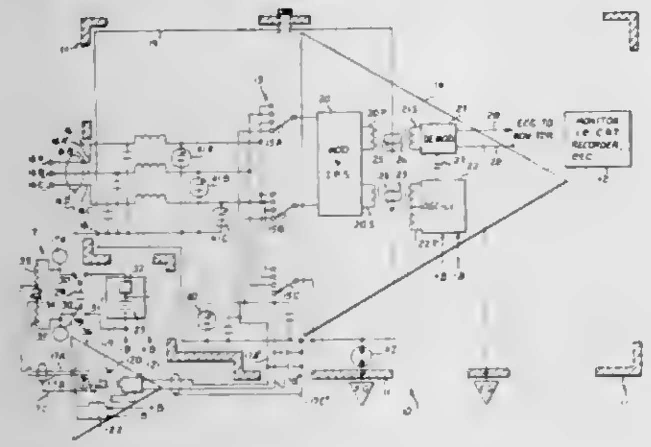
Filed Aug. 29, 1977, Ser. No. 828,395

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 B **7 Claims**

1. In a heart defibrillating and monitoring system having a source of high-voltage defibrillating signals and signal monitoring means for monitoring signals indicating heart activity, a first electrode system for selectively applying defibrillating signals to a patient and for selectively applying monitoring signals to the means for monitoring signals, and a second electrode system for selectively applying monitoring signals to the means for monitoring signals, said means for monitoring signals include a first isolation amplifier, switch means for selectively applying monitoring signals to said first isolation amplifier alternatively from said first electrode system or from said second electrode system, the improvement comprising a sec-

ond isolation amplifier coupled intermediate said first electrode system and said switch means, whereby to prevent current leakage between said first electrode system and said second electrode system during application of a defibrillating signal.



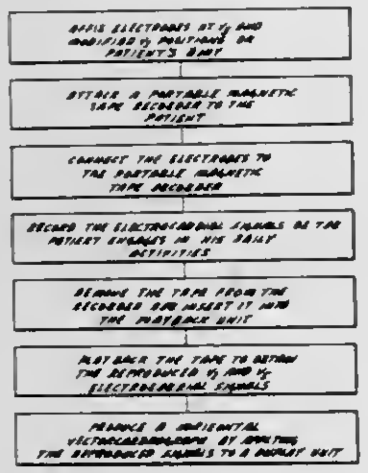
4,106,495
VECTORCARDIOGRAPHIC METHOD FOR AMBULATORY PATIENTS

Harold L. Kennedy, Baltimore, Md., assignor to Del Mar Avionics, Irvine, Calif.

Filed Apr. 11, 1977, Ser. No. 786,252

Int. Cl.^{2} A61B *5/04*

U.S. Cl. 128—2.06 V **7 Claims**


ATTACH A PORTABLE MAGNETIC TAPE RECORDER TO THE PATIENT
CONNECT THE ELECTRODES TO THE PORTABLE MAGNETIC TAPE RECORDER
RECORD THE ELECTROCARDIAC SIGNALS AS THE PATIENT ENGAGES IN HIS DAILY ACTIVITIES
REMOVE THE TAPE FROM THE RECORDER AND INSERT IT INTO THE PLAYBACK UNIT
PRODUCE A HORIZONTAL VECTORCARDIOGRAM BY APPLYING THE REPRODUCED SIGNALS TO A DISPLAY UNIT

1. A method of obtaining a horizontal vectorcardiogram from an ambulatory patient, comprising the steps of:

(a) affixing electrodes at predetermined positions on the patient's body to pick up electrocardiac signals of the ambulatory patient;
(b) attaching a portable magnetic tape recorder to the patient;
(c) connecting the electrodes to the portable magnetic tape recorder;
(d) recording on separate tracks in a magnetic recording tape inserted in the portable magnetic tape recorder the electrocardiac signals picked up by the electrodes as the patient engages in his daily activities;
(e) removing the magnetic recording tape from the portable magnetic tape recorder and inserting it into a playback apparatus;
(f) playing back the magnetic recording tape to produce two simultaneous reproduced electrocardiac electrical signals;
(g) producing a horizontal vectorcardiogram by applying the two simultaneous reproduced electrocardiac electrical signals to orthogonal inputs of a display unit.

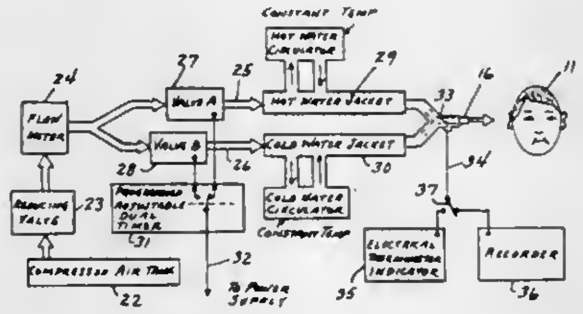
4,106,496
METHOD AND APPARATUS FOR AIR CALORIC TESTING FOR THE EVALUATION OR AURAL VESTIBULAR DISORDERS

Leonard R. Proctor, Baltimore, Md.; Rollin C. Dix, Chicago, Ill., and Werner A. Metz, Atlanta, Ga., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Dec. 23, 1976, Ser. No. 753,945

Int. Cl.^{2} A61B *19/00, 10/00*

U.S. Cl. 128—2 R **12 Claims**



1. A method of stimulating an aural lateral canal passage for evaluating vestibular responsiveness comprising the steps of irrigating the canal with air heated to a precise and controlled temperature above the body temperature for a brief period of time sufficient to develop a predetermined temperature difference across the canal passage, then promptly removing said heated air at the end of said brief period and irrigating the canal for a brief period unequal to the first brief period with relatively cold air precisely controlled at a temperature below body temperature, to first reduce said temperature difference to zero and then produce a second temperature difference across the canal passage, and then again irrigating the canal with said precisely heated hot air for a brief but different period of time than said initial period of time, to first reduce said second temperature difference to zero and then produce a third temperature difference across the canal passage.

4,106,497
MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH INDICATOR MEANS

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

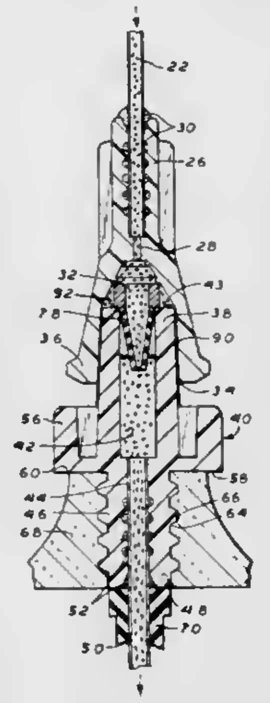
Filed Feb. 4, 1977, Ser. No. 765,868

Int. Cl.^{2} A61M *5/00*

U.S. Cl. 128—2 F **15 Claims**

1. Apparatus for collecting blood samples from a patient comprising:

a housing;
a first hollow, pointed needle extending forwardly from the housing and adapted for piercing the tissues of a patient and conducting blood therefrom;
blood flow indicating means coupled with said first needle and adapted to provide a visual signal when the sample has penetrated a blood vessel;
a chamber in the housing in fluid communication with a normally closed valve means adapted when closed to prevent any blood from flowing out of said chamber;
a second hollow pointed needle extending rearwardly from the housing;
said valve means adapted to be activated and shifted from the normally closed position to an open position to permit flow of blood from the patient to a blood sample container;
said blood flow indicating means including control means to provide for a limited amount of blood to be directed to a predetermined location for indication purposes and to isolate the limited amount of blood and to prevent leakage beyond the desired location including means facilitating the prevention of collection of the limited amount of blood with the blood sample accumulated in the container.



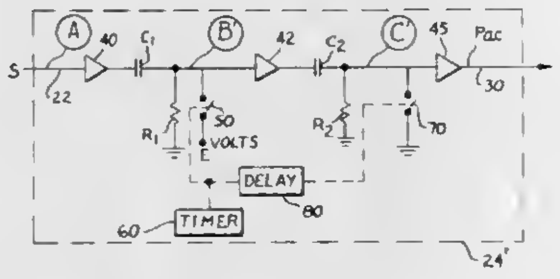
4,106,498
INITIALIZATION CIRCUIT

Jerry D. Haney, Sunnyvale, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 27, 1976, Ser. No. 754,486

Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 A **9 Claims**



1. In an apparatus for measuring blood pressure of a patient, including means for applying a selectively changeable pressure to the patient externally adjacent a blood vessel, means for measuring a fluctuating quantity proportional to a sum, said sum comprising a time-dependent fluctuating component representative of the pulsatile pressure within the blood vessel, plus the selectively changeable pressure applied externally adjacent the blood vessel, filter means having an AC time constant for separating said fluctuating component from said quantity, the DC output level of said filter means being a predeterminable value at steady-state following a start-up interval, and an analytical means responsive to said fluctuating component from said filter means for providing an indication of the patient's blood pressure, the improvement comprising:

Means for initializing said filter means during start-up of said apparatus, said initializing means comprising means for temporarily applying a predetermined potential to said filter means during at least the latter portion of a start-up interval and for removing said potential substantially at the end of said start-up interval, said predetermined potential corresponding substantially with said predeterminable steady-state DC output from said filter means.

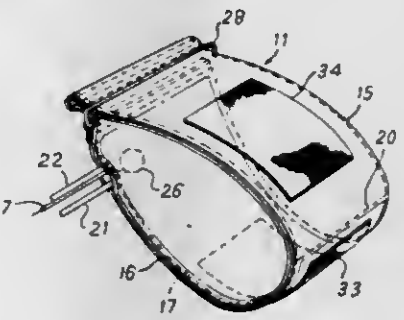
4,106,499
SPHYGMOMANOMETER CUFF

Kazuo Ueda, Tokyo, Japan, assignor to Ueda Works Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 630,466, Nov. 10, 1975, abandoned. This application Apr. 1, 1977, Ser. No. 783,524

Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 C **6 Claims**



1. A sphygmomanometer cuff comprising:

(i) an elongated flexible strap of a length sufficient to wrap by at least one and half turns about a limb of a patient, said strap being constituted by two layers of material which, over a portion of the length of the strap are spaced apart to define an internal pocket,
(ii) an inflatable pouch disposed in said pocket and having a first connector tube for connecting to a source of fluid under superatmospheric pressure and a second connector tube for connecting to a sphygmomanometer,
(iii) a rigid loop-shaped member secured at a first end of the strap and defining with the strap an elongated transverse opening,
(iv) a resiliently compressible rod-like member secured transversely at the second end of the strap, said rod-like member being adapted for forcing, with resilient deformation, through the opening defined by the loop-shaped member, said rod-like member in its unstressed condition being too thick to pass back through said opening,
(v) a first and second cooperable fastening members, said first fastening member being secured externally on a face of said strap adjacent to said first end thereof, said second fastening member being secured externally on said face of said strap adjacent to said second end thereof, the distance between the first and second fastening members, longitudinally of the strap, and the dimensions of the first and second fastening members longitudinally of the strap, being selected such that with the strap tightened about a patient's limb, the portion of the strap terminating at its second end may be doubled over externally to superimpose the second fastening member on the first fastening member.

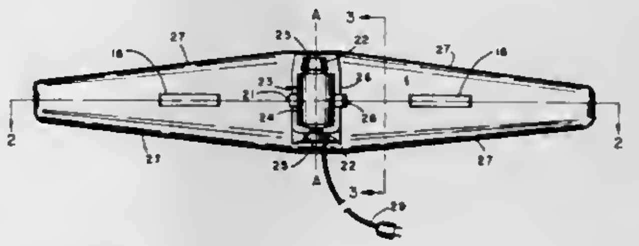
4,106,500
MASSAGING APPARATUS

Samuel C. Burchart, 822 W. 46th St., Richmond, Va. 23225

Filed Apr. 14, 1977, Ser. No. 787,689

Int. Cl.^{2} A61H *1/00*

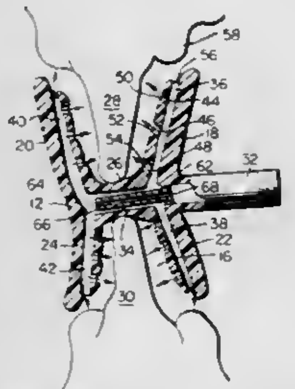
U.S. Cl. 128—36 **6 Claims**



1. An apparatus for use in combination with an orbital vibrator comprising a base assembly comprised of an elongated flat rigid platform symmetrically shaped with respect to its longi-

tudinal and lateral axes and tapering from a wide region at said lateral axis to a narrow region at each longitudinal extremity, and resilient cushioning material of uniform thickness evenly disposed on the upper and lower surfaces of said platform, a pair of holding members anchored in said platform and extending above said cushioning material above the upper surface of said platform and equidistantly spaced from said lateral axis, and harness means located above said cushioning material above the upper surface of said platform and substantially centered on said lateral axis, said harness means being anchored in said platform and adapted to secure an orbital vibrator tightly against said base assembly.

4,106,501
SWEEPING FLUID SPRAY ORAL HYGIENE DEVICE
Amber Lola Ozbey, and Ahmet M. Ozbey, both of 8221 Clay Dr., Oxon Hill, Md. 20022
Filed Mar. 11, 1977, Ser. No. 776,759
Int. Cl.² A61C *15/00*
U.S. Cl. 128—62 A **16 Claims**



1. A fluid jet spray oral hygiene device for cleaning the teeth and gums comprising a mouthpiece having at least one channel to receive the teeth of a user, said channel being defined by a front wall, a rear wall spaced from said front wall and web means extending between said front and rear walls at one end thereof, conduit means for supplying fluid to said mouthpiece, fluid jet forming means provided in said front and rear walls for directing a plurality of fluid jets into said channel against the teeth of a user, and fluid conducting means formed in said mouthpiece for connecting said fluid jet forming means to said conduit means, said web means operating in response to the application and release of pressure when a user chews upon the web means to move the free ends of said front and rear walls toward and away from the teeth to cause said fluid jets to sweep up and down the surface of the teeth of a user.

4,106,502
RESUSCITATOR
Porter C. Wilson, Tucson, Ariz., assignor to Margaret M. Laurence, Arlington, Va.
Filed Nov. 18, 1976, Ser. No. 742,884
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **23 Claims**

1. A mouth to mouth resuscitator for rendering artificial respiration by forcing tidal breaths of air into a victim comprising:

a resuscitator body unit having a top portion, a bottom portion and exterior side wall means;

top cover means adapted to sealingly engage said top portion of said body unit, said top cover means having an opening therethrough;

bottom cover means adapted to sealingly engage said bottom portion of said body unit;

said body unit further having first and second interior wall means, said interior wall means together with said top cover means, said bottom cover means and said exterior wall means defining within said body unit a fresh air inlet chamber, an air exchange chamber, and a victim inhalation chamber;

said fresh air inlet chamber being defined by said first interior wall means, said second interior wall means, said top cover means and a first portion of said exterior side wall means;

said air exchange chamber being defined by said first interior wall means, said second interior wall means, said top cover means and a second portion of said exterior side wall means;

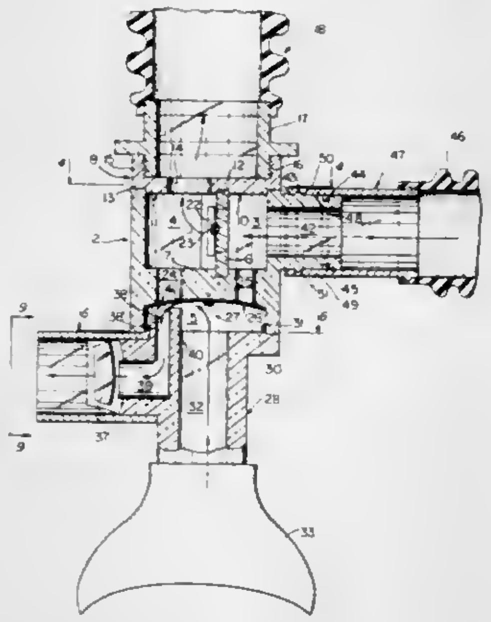
said victim inhalation chamber being defined by said second interior wall means, said bottom cover means and a third portion of said exterior side wall means;

said exterior side wall means having an air inlet means connected thereto, said air inlet means having an inlet port therethrough, said inlet port opening into said fresh air inlet chamber and externally of said body unit;

said first interior wall means having an operator inhalation passage therethrough, said operator inhalation passage interconnecting said fresh air inlet chamber and said air exchange chamber;

first flap valve means for preventing flow through said operator inhalation passage from said air exchange chamber to said fresh air inlet chamber;

said second interior wall means having an operator exhalation passage therethrough, said operator exhalation passage interconnecting said air exchange chamber and said victim inhalation chamber;



second flap valve means for preventing flow through said operator exhalation passage from said victim inhalation chamber to said air exchange chamber, said operator exhalation passage being opened by the exhalation of the operator;

air exchange hose means having a first end thereof attached to said top cover means, said air exchange hose means communicating with said air exchange chamber through said opening in said top cover means, the free end of said hose means having a mouthpiece into which the operator breathes;

face mask means attached to said bottom cover means;

said bottom cover means having an exterior wall means and an interior wall means, said interior wall means and a first portion of said exterior wall means defining a connecting passage which interconnects said victim inhalation chamber and said face mask means;

said interior wall means and a second portion of said exterior wall means of said bottom cover means defining an exhalation passage, said exhalation passage terminating at one end thereof at an exhalation port formed through said exterior wall means and at the other end thereof at an exhalation intake port disposed adjacent to said operator exhalation passage such that when said second flap valve means is opened by the exhalation of the operator said second flap valve means closes said exhalation intake port, said exhalation port opening externally of said body unit and being in fluid communication with said victim inhalation chamber except when said exhalation intake port is closed by said second flap valve means;

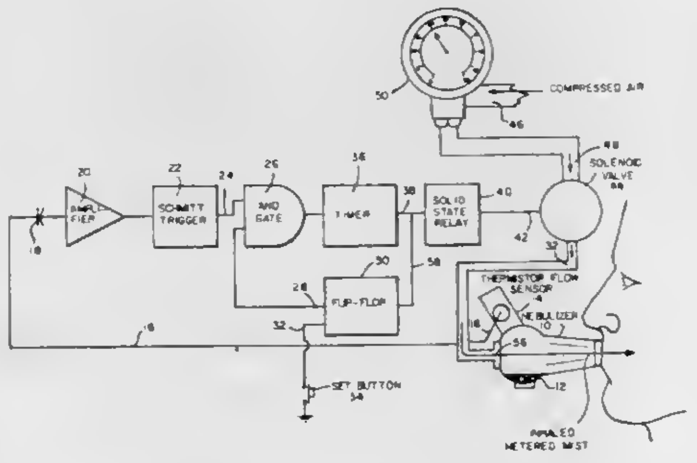
a by-pass passage interconnecting said fresh air inlet chamber and said victim inhalation chamber; and third valve means permitting flow through said by-pass chamber from said fresh air inlet chamber to said victim inhalation chamber upon inhalation of the victim at any desired time;

whereby inhalation of the operator on said mouthpiece causes said first flap valve to open thus allowing fresh air to be drawn into said body unit through said inlet port, said air passing through said fresh air inlet chamber, said operator inhalation passage, said air exchange chamber and then through said air exchange hose means;

whereby exhalation of the operator causes said first flap valve means to close so as to close said operator inhalation passage and further causes said second flap valve means to open so as to open said operator exhalation passage and so as to close said exhalation intake port, thereby allowing air to pass from said air exchange hose means and into said face mask means through said air exchange chamber, said operator exhalation passage, said victim inhalation chamber and said connecting passage; and

whereby exhalation of the victim causes said second flap valve means to close said operator exhalation passage and to open said exhalation intake port, thereby allowing the victim's exhalation to pass out of said body unit through said connecting passage, said victim inhalation chamber, said exhalation intake port, said exhalation passage and said exhalation port.

4,106,503
METERING SYSTEM FOR STIMULATING BRONCHIAL SPASM
Richard R. Rosenthal, 4301 Ann Fitz Hugh Dr., Annandale, Va., and Joseph French, Joppa, Md., assignors to Richard R. Rosenthal, Annandale, Va.
Filed Mar. 11, 1977, Ser. No. 776,662
Int. Cl.² A61M *16/00*
U.S. Cl. 128—194 **2 Claims**



1. A system for metering an aerosol provocative substance for patient inhalation comprising:

nebulizing means for normally containing the provocative substance in a liquid medium, the nebulizing means having an inlet and an outlet, the outlet delivering nebulized provocative substance to a patient;

means mounted to the nebulizing means for detecting the initiation of inhalation by the patient and generating a detection signal in response thereto;

timing means having its input connected in circuit with the detecting means and responsive thereto for generating a timing signal of preselected duration;

a source of compressed gas;

valving means responsive to said timing signal and driven open during the timing signal and connected between the gas source and said inlet of the nebulizer for nebulizing a metered dose of the nebulized provocative substance, depending upon the timing signal duration;

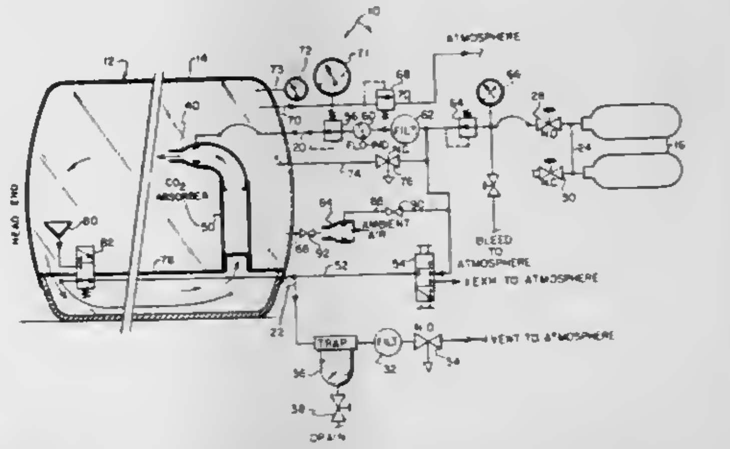
means connected in circuit between the detecting means and the timing means for triggering the timing means;

gating means connected in circuit between the output of the triggering means and the input of the timing means for permitting the passage of a triggering signal to the timing means;

means responsive to the end of the timing signal for blocking the gating means from passage of an erroneous trigger signal; and

means for selectively resetting the blocking means thereby enabling a subsequent passage of a triggering signal.

4,106,504
PORTABLE RECOMPRESSION CHAMBER WITH AIR SCRUBBER
Floyd L. York, Honolulu, Hi., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 6, 1976, Ser. No. 747,833
Int. Cl.² B63C *11/32*
U.S. Cl. 128—204 **12 Claims**



1. An air supply system for a recompression chamber comprising:

a chamber;

inlet and outlet conduits sealably extending through the chamber so that each conduit has an interior and an exterior portion with respect to the chamber;

the exterior portion of the inlet conduit being adapted for connection to a pressurized air source and the outlet conduit serving as a vent of chamber air;

fluid amplifier means located within the chamber for sucking in and discharging a secondary fluid flow upon receiving a primary fluid flow;

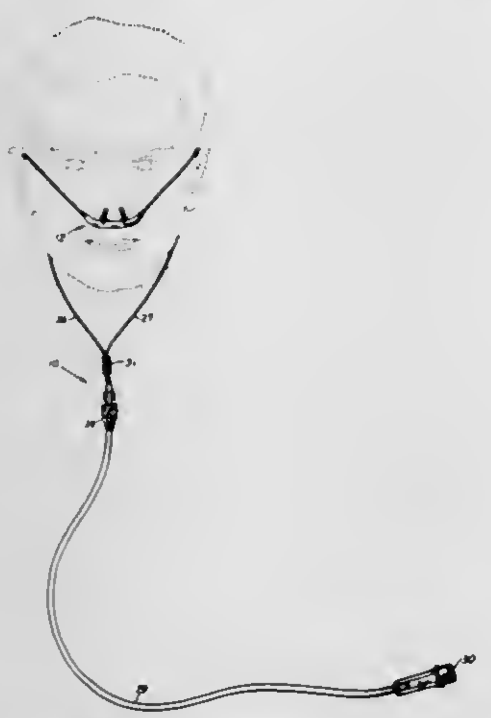
the interior portion of the inlet conduit being connected to the fluid amplifier means for supplying air from the pressurized air source as said primary fluid flow so that chamber air is sucked in and is discharged as the secondary fluid flow through the fluid amplifier means;

a secondary conduit connected in parallel with the outlet conduit and having an end located outside the chamber for connection to the pressurized air source;

valve means interconnected in the secondary conduit for selectively opening the secondary conduit to the pressurized air source so as to enable the chamber to be quickly compressed, or selectively opening the secondary conduit to space outside the chamber so as to exhaust the chamber, or selectively closing off the secondary conduit to both the pressurized air source and the space outside the chamber.

4,106,505
NASAL CANNULA ASSEMBLY

Peter W. Salter, and William W. Cook, both of Arvin, Calif., assignors to Salter Labs., Inc., Arvin, Calif.
Filed Jan. 17, 1977, Ser. No. 760,239
Int. Cl.² A61M *16/00*
U.S. Cl. 128—206 **8 Claims**



1. A nasal cannula assembly designed for contact with the nasalabidial area of a patient's nose and comprising:

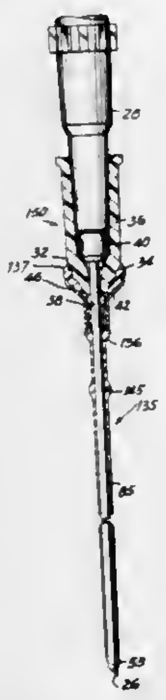
(a) a hollow tubular member having an oxygen supply opening at each end, said tubular member having a central portion of sufficient length to span the width of an average patient's nostrils and end portions extending acutely from each end of said central portion, said central portion having a pair of spaced, hollow tubular extensions integral with and projecting normally therefrom said tubular extensions terminating in gas directing orifices and which hollow portion of said extensions communicate with said hollow main body portion,

(b) said central portion having a longitudinal axis extending along its length, each said tubular extensions having a longitudinal axis, said longitudinal axis of said central portion and said longitudinal axis of said extensions lying in a first plane each said end portions of said tubular member having a longitudinal axis lying in a second plane, said longitudinal axis of said central portion also lying in a third plane perpendicular to said first plane, each said end portion longitudinal axis lying in said second plane and projecting from said first and third planes at an acute angle greater than zero, said orifices of said tubular extensions angled acutely from said first plane toward said second plane.

4,106,506
CATHETER

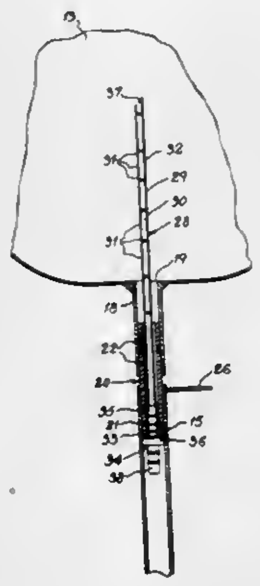
Wilbur R. Koehn, deceased, late of Sands Point, N.Y.; by Elizabeth M. Koehn, executrix, and by Theodore Ellenoff, executor, both of 2 Henhawk La., Huntington, N.Y. 11743
Division of Ser. No. 420,881, Dec. 3, 1973, Pat. No. 3,943,225, which is a continuation of Ser. No. 148,103, May 28, 1971, abandoned. This application Jan. 26, 1976, Ser. No. 652,614
Int. Cl.² A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **13 Claims**

1. In a surgical apparatus for delivering fluids to or withdrawing fluids from a human body, including a flexible catheter, which surrounds the shank and at least one part of the handle of a penetrating element, said catheter having a free end positioned adjacent the pointed end of the penetrating element and a fitting at its opposite end, said penetrating element and catheter being cooperable to cause the catheter to follow said pointed end through the skin to locate the free end of the catheter at a predetermined position in the body, the free end of the catheter and the pointed end of the penetrating element being relatively displacable to permit the penetrating element to be withdrawn through the aatheter tube, wherein the improvement comprises said fitting having a funnel-shaped neck; said opposite end of said catheter forming an overlying layer on said neck; a funnel-shaped relatively-rigid ring surroundly embedded in and substantially overlying the outer surface of said layer without any compressive force-fit thereon; said neck, said layer formed at said opposite end of said catheter, and said ring, all being bonded together in a substantially non-stressed relationship and being substantially concentric with respect to one another; and said layer being fixed to said neck and said ring.



4,106,507
BLOCKAGE PREVENTION DEVICE FOR BODY FLUID COLLECTION SYSTEMS

Janet R. Kellermeyer, 525 Prospect Ave., River Vale, N.J. 07675, and Jay M. Alexander, 114 DeGroff Pl., Park Ridge, N.J. 07656
Filed Aug. 30, 1976, Ser. No. 718,780
Int. Cl.² A61F *5/44*
U.S. Cl. 128—295 **1 Claim**



1. In a body fluid collection system, the combination comprising

a flexible collection bag having
- a bag inlet adjacent one end thereof adapted to be coupled to the stoma of a patient to receive body fluids therefrom,
- a neck portion at the other end thereof, and
- a bag outlet in said neck portion for draining fluids from the bag, said bag outlet comprising a hollow cylindrical adapter;

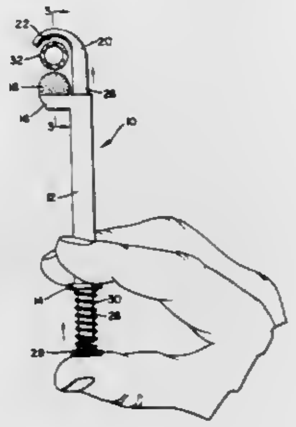
a connection tube having said adapter inserted into one end thereof, the other end of said tube being adapted to be coupled to a body fluid storage receptacle; and

an elongated blockage prevention member comprising
- a length of cylindrical tubing removably disposed in the interior of said bag having one end thereof extending through said bag outlet to the exterior of said bag and the other end thereof extending through said neck portion of the bag to that portion of the interior of the bag outside of the neck portion, said cylindrical tubing having walls defining a passageway extending through said tubing along the length thereof and a plurality of apertures extending through said walls at spaced points along the length of the tubing to connect said passageway to the exterior of said tubing, and
- a hollow cylindrical fitting having one end thereof inserted in said one end of said cylindrical tubing and the other end thereof having a collar formed thereon, said collar having a cross-sectional area greater than the cross-sectional area of said bag outlet, so that said collar abuts the bag outlet exteriorly of the bag to limit insertional movement of said member into the bag, said collar having a diameter substantially the same as the diameter of said adapter, so that said collar is held in place against the adapter by said connection tube to prevent withdrawal of said member from said bag,

whereby body fluids collecting in said bag because of a blockage in the neck portion thereof are drained through said apertures and said passageway of the blockage prevention member to said bag outlet.

4,106,508
CLAMP DEVICE

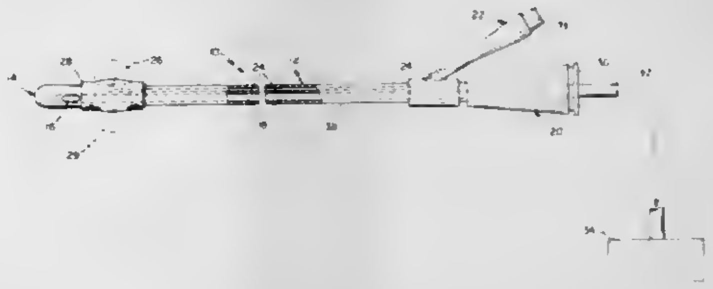
Richard Barnard Berlin, 309 Engle St., Englewood, N.J. 07631
Filed Aug. 31, 1976, Ser. No. 719,283
Int. Cl.² A61B *17/12*
U.S. Cl. 128—346 **7 Claims**



1. A clamp device adapted for occluding flexible tubular conduits comprising (1) a hook-shaped first jaw member with a concave inner surface, which jaw member is attached to an extended shaft, said first jaw member together with said shaft forming the shape of a J; (2) a second jaw member with a resiliently deformable convex inner surface, which jaw member is attached to an extended shaft, wherein said extended shafts are coextensively and slidably connected for moving and guiding said jaw members to maintain the concave and convex inner surfaces of said jaw members in an oppositely disposed and longitudinally engageable contacting relationship; and (3) biasing means for urging said jaw members into concave and convex inner surface contacting and conforming proximity.

4,106,509
CATHETERS

Daniel M. McWhorter, Arlington Heights, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Aug. 5, 1976, Ser. No. 711,774
Int. Cl.² A61M *25/00*
U.S. Cl. 128—349 B **8 Claims**

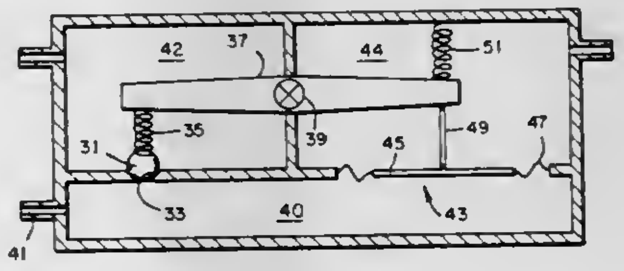


1. In a drainage system including a hollow catheter comprising a tubular shaft having proximal and distal ends, an inflatable sleeve surrounding the shaft adjacent the distal end thereof and upon inflation retaining the catheter in position by formation of an enlarged balloon surrounding the shaft, a first opening adjacent the distal end of the shaft through which body fluids may pass into a drainage channel defined by the drainage system and extending from the first opening through the length of the shaft, and a second opening spaced from the first opening through which the fluids may pass from the channel, that improvement comprising:

tubing connected to the proximal end of said catheter, defining a portion of said drainage channel, and having an outlet communicating with a receptacle; at least a longitudinally-extending circular in transverse cross-section portion of said tubing being of a porous material which is pervious to air but impervious to body fluids and which is not-wettable by body fluids, whereby air may pass through said material to said channel.

4,106,510
SERVO VALVE

Salomon Hakim, and Carlos A. Hakim, both of Bogota, Colombia, assignors to Hakim Company Limited, Saint Vincent, Saint Vincent
Filed Nov. 26, 1976, Ser. No. 745,072
Int. Cl.² A61M *27/00*
U.S. Cl. 128—350 V **9 Claims**



1. A servo valve comprising:

a valve element;

a valve seat against which said valve element operates to control flow through the valve, the inlet pressure tending to open the valve;

first spring means for biasing said valve element in a manner tending to close the valve;

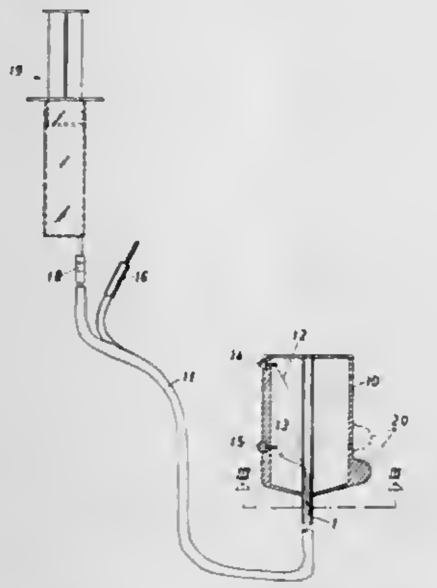
a diaphragm one side of which is exposed to the inlet pressure;

second spring means biasing said diaphragm against the inlet

pressure thereby defining the compliance of the diaphragm to changes in inlet pressure;
said diaphragm, said valve element and said seat being mechanically coupled in such a manner that the bias exerted by said first spring means is responsive to displacement of said diaphragm in such a manner that the force exerted by said first spring means on said valve element is increased in the same proportion as any increase in the inlet pressure so that the valve remains closed in the absence of any unbalancing additional force; and
means for applying to said valve element an additional, control force for controlling its opening whereby the opening of said valve is responsive to said control force but is essentially insensitive to changes in inlet pressure.

4,106,511
ELECTRICAL STIMULATOR IN REMEDY OF INCONTINENCE

Bjorn Erik Erlandsson, Goteborg, Sweden, assignor to Svenska Utvecklingsaktiebolaget, Stockholm, Sweden
Filed Apr. 12, 1977, Ser. No. 786,855
Claims priority, application Sweden, Apr. 21, 1976, 7604553
Int. Cl.^{2} A61N *1/04*
U.S. Cl. 128—407 **17 Claims**

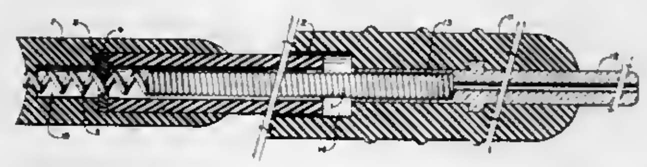


1. An electical stimulator comprising an obturator intended to be worn within the vagina or anus, said obturator being provided with electrodes energized by a pulse generator and thereby controlling the urethral-, the bladder and/or the rectal function, and said obturator being made of a flexible material, which is expandable and thus provides a safe fixation of the obturator within the body, wherein the obturator is provided with a substantially plane or somewhat curved end gable at its inner end as seen from its position of use, the electrodes being arranged in two groups arranged at a certain distance from each other, each group being electrically connected to the pulse generator and comprising a number of electrode plates connected in parallel and arranged in substantially the same plane, the electrode plates of both grops being directed towards the same direction and the electrode plates of each group extending over only a part of the circumference of the obturator for achieving a directional stimulating effect.

4,106,512
TRANSVENOUSLY IMPLANTABLE LEAD

Hans Jurgen Bisping, Aachen, Fed. Rep. of Germany, assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Dec. 16, 1976, Ser. No. 751,226
Int. Cl.^{2} A61N *1/04*
U.S. Cl. 128—418 **21 Claims**

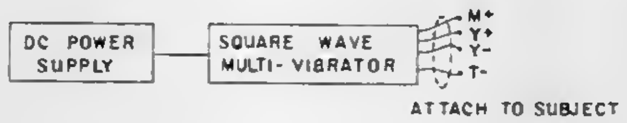
1. A body-implantable lead of materials substantially inert to body fluids and tissue comprising:
a length of electrical conductor having proximal and distal ends;
an electrode connected to the distal end of said conductor, said electrode having tissue engaging means for securely engaging said electrode in contact with body tissue;
sheath means having proximal and distal ends for loosely receiving and insulating said conductor from body tissue, said conductor being adapted to be axially advanced from its proximal end in and relative to said sheath means; and



electrode head means attached to the distal end of said sheath means for receiving and isolating said electrode from body fluids and tissue, said electrode head means further comprising means for loosely engaging at least a portion of said electrode and for allowing the axial advancement of said electrode a predetermined distance from said sheath means upon advancement of said conductor in and relative to said sheath means.

4,106,513
DEVICE AND METHOD FOR THREE POINT ELECTRO THERAPY

J. C. Tzeng, 2801 S. King Dr., Apt. 1007, Chicago, Ill. 60616
Filed Feb. 17, 1976, Ser. No. 658,849
Int. Cl.^{2} A61N *1/32*
U.S. Cl. 128—420 R **4 Claims**



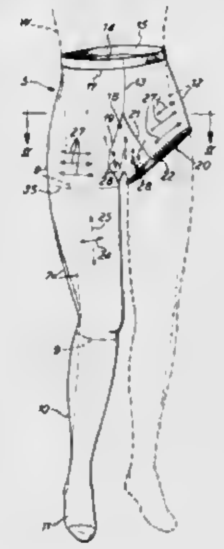
1. An apparatus for providing electric current at a low voltage to a body for healing purposes, the improvement comprising:
a power supply of positive and negative direct current voltage;
means for converting said voltage into pulsating form and including means for alternating pulses of positive and negative voltage to prevent simultaneous supply of both positive and negative voltage;
electrode means for contact with said body; and,
conductor means electrically connecting said electrode means with the means for alternating pulses;
said electrode means including first electrode means for contact with the surface of said body to create a first electrical flow path with said pulses of positive voltage, and, said electrode means including second electrode means for contact with said body in proximity with the first electrode means to create a second electrical flow path with said pulses of negative voltage whereby said first and second flow paths allow for electric current to pass through said body in an alternating, pulsating rate.

4,106,514
ARTICLE OF WEARING APPAREL PROVIDING AN UNDERGARMENT

Leonard Cecil Lowth, London, England, assignor to Scholl Inc., Chicago, Ill.
Filed Jan. 10, 1977, Ser. No. 757,940
Int. Cl.^{2} A41B *9/04*
U.S. Cl. 128—519 **16 Claims**

1. An article of wearing apparel providing an undergarment which will in and of itself provide for support in the abdominal, thigh, groin and leg areas of the wearer's body, comprising:

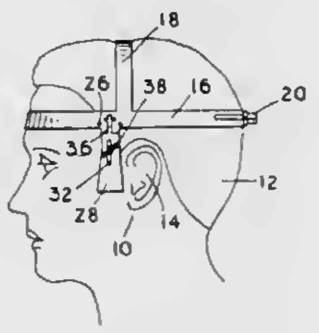
a leg portion shaped to cover at least the upper part of one of a wearer's legs from the knee up and attached at its upper end to a first upper thigh, hip and abdomen covering body section for said one leg side of the wearer's body;
a second upper thigh, abdomen and hip covering body section for the opposite side of the wearer's body;
a waistband to which upper ends of said sections are attached;
upper portions of said sections being connected together for a limited vertical distance adjacent to said waistband;
an elastic crotch gusset piece connected to and between the remaining lower portions of said sections and coacting with said sections to effect substantially uniformly tensioned engagement of said sections and said gusset piece entirely about each of the wearer's upper thighs, and in the hip, groin and abdomen areas;



said gusset piece and said second section defining between them a downward leg opening through which the remaining leg of a wearer extends;
said gusset piece and said second section each providing a substantial circumferential part of an edge for said leg opening and which edge engages in completely encircling relation about the upper thigh of said remaining leg of the wearer to restrain upward creeping of said second section;
and said gusset piece being dimensioned both vertically and horizontally to engage supportingly with the wearer's inner thigh and groin and being cooperative in mutually tensioning relation with said second section for efficient vericose vein support for the groin and the completely encircled upper thigh of the wearer's engaged leg, as well as the hip and abdomen areas.

4,106,515
SIDE BURN TRIMMING GUIDE

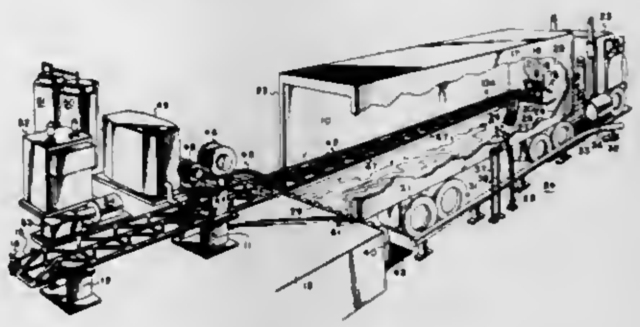
David Miller, 166 Bristol Ferry Rd., Portsmouth, R.I. 02871
Filed Feb. 7, 1977, Ser. No. 766,089
Int. Cl.^{2} A45D *24/36*
U.S. Cl. 132—45 R **7 Claims**



1. A side burn trimming guide appliance, comprising an annular first band circumscribing the head, a pitch controlling second band secured to said first band at diametrically opposed points, an arm depending from said first band, a threaded shaft extending substantially perpendicularly from said arm, a plurality of raised spaced apart protrusions disposed in an arc on said first band above said arm, at least one elongated template removably attachable to said arm, said template defining an aperture, a neck of reduced width being located on one distal end of said template, said shaft mating with said aperture, said neck being dimensioned to be selectively positioned between any adjacent two of said plurality of protrusions to permit angular positioning of said template about said shaft, means engaging said shaft for securing said template to said arm.

4,106,516
INTERNAL WASH CLEANER FOR TRUCK TRAILERS AND BODIES

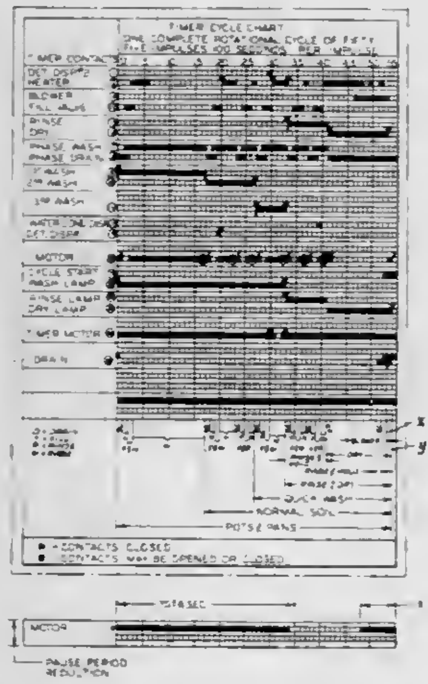
Paul C. Wiegand, 4008 Harlanwood Dr., Fort Worth, Tex. 76109
Continuation-in-part of Ser. No. 517,167, Oct. 23, 1974, abandoned. This application Feb. 24, 1976, Ser. No. 660,797
Int. Cl.^{2} B08B *3/04;* B60S *3/00;* B08B *9/00*
U.S. Cl. 134—45 **12 Claims**



1. In an internal washing system for truck cargo carrier enclosures open to the rear: multi-section extendable and retractable boom means; boom structure mounting means; fluid spray washing head means mounted on fore extendable end structure of said boom means; drive means of said boom means driving said boom fore extendable end and the washing head means in extension into the interior, and in retraction back out of said truck enclosure; fluid delivery system means interconnecting fluid source means and spray outlet means of said fluid spray washing head means; and washing cycle control means with selective fluid delivery control means operating said fluid source means and said fluid delivery system means in distinct cyclic operation sequential steps; said washing cycle control means comprising first switching means selectively operable to energize said drive means to effect boom extension into said cargo carrier enclosure and in circuit with said fluid delivery system control means to effect delivery of a mixture of detergent and water to said washing head means, second switching means responsive to a predetermined boom extension into said cargo carrier enclosure to effect de-energization of said drive means and in circuit with said fluid delivery system to effect a shut-off of detergent supply to said fluid mixture, time delayed switching means responsive to activation of said second switching means, and in circuit with said drive means, to energize said drive means in a reverse direction to effect retraction of said boom, and said further switching means responsive to full retraction of said boom and in circuit with said fluid delivery system, to de-energize said drive means and shut off said fluid delivery, thereby completing a washing cycle.

4,106,517
DISHWASHER CONTROL SYSTEM WITH CYCLE RESELECT

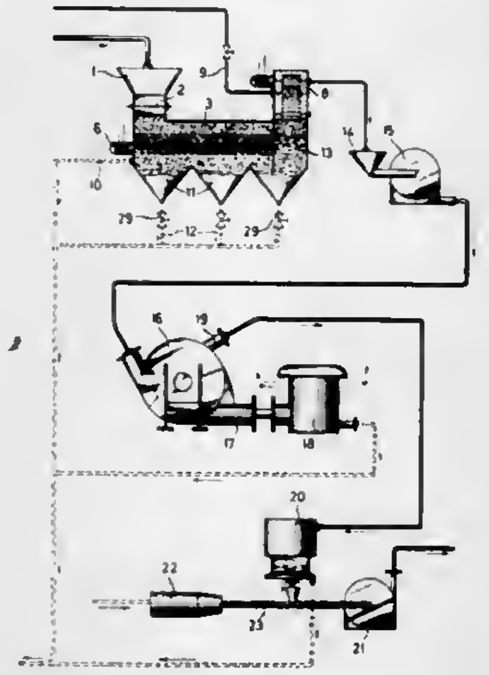
Carl J. Wright, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 21, 1977, Ser. No. 835,219
Int. Cl.^{2} B08B *3/02*
U.S. Cl. 134—58 D 1 Claim



1. In an automatic dishwasher including a wash chamber adapted to receive washing fluid therein and articles to be cleaned by said washing fluid, a control system for operating said dishwasher including a plurality of timer switches controlled in sequence by a timer, a plurality of electrically operated elements including drain means controlled by said timer switches to perform at least a first washing cycle with said washing fluid, a second washing cycle with said washing fluid and a drain operation at the start of said cycles to remove any residue of washing fluid remaining from a previous washing cycle; an electrical power source for said control system; said timer electrically connected to said power source, said timer including a normal advance motor operative to drive said timer switches in said sequence in a first predetermined period of time and a rapid advance motor operative to drive said timer switches in said sequence in a second predetermined period of time relatively shorter than said first predetermined period, manually operated washing cycle selector switch means in said control system, said cycle selector switch means including a separate actuating member for selecting each of the cycles, each actuating member having a latched position and a momentary position for initiating operation of the selected cycle upon being moved by the user through said latched position to said momentary position and upon release by said user being returned to said latched position, whereby a momentary switch is closed momentarily causing said rapid advance motor to be energized to rapid advance said timer switches in said sequence to the start of the selected cycle and to preset said selector switch means for cooperation with said timer switches in operating the dishwasher through the selected cycle, the improvement wherein said timer switches include an overriding drain timer switch operative at one interval in said sequence to bypass said cycle selector switch means and said rapid advance motor to energize said normal advance motor and said drain means at the end of said cycles, and said selector switch means includes a cancel-reset actuating member having a latched position and operative therein to cancel out the remaining portion of any previously selected cycle by energizing said rapid advance motor to rapid advance said timer switches through said sequence to said one point, whereupon said rapid advance motor is deenergized, said drain timer switch initiating a drain operation by energizing said drain means to remove said washing fluid from said selected cycle and energizing said normal advance motor to control said timer switches during said drain operation to drain the wash chamber of said washing fluid and then deenergizing said drain means and the normal advance timer motor to terminate said selected cycle, and whereby during said drain operation the user may without waiting manually move a substitute actucting member of the selector switch means through its first latched position to its momentary position to initially close said momentary switch such that said rapid advance motor will rapid advance said timer switches through said one interval in said sequence to the start of said substitute cycle so that timer switches other than said drain timer switch may continue the drain operation at the start of said substitute cycle which was initiated by said drain timer switch at the end of said selected cycle, thereby to preclude any residue of washing fluid in said wash chamber either at the end or the start of said washing cycles.

4,106,518
APPARATUS FOR WASHING GROSSLY SOILED PRODUCTS OF PLASTIC MATERIAL FOR SUBSEQUENT RE-USE

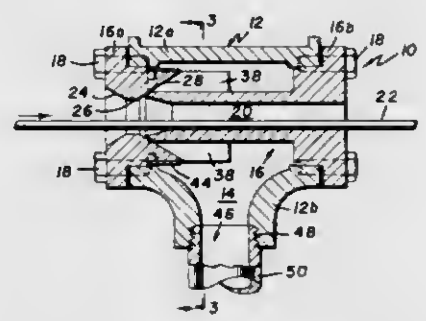
Heinrich Buzga, Grevenbroich; Werner Steprath, Dormagen, and Kurt Pause, Bosau Uber Eutin, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Buckau Aktiengesellschaft, Grevenbroich, Fed. Rep. of Germany
Division of Ser. No. 694,550, Jun. 10, 1976, Pat. No. 4,073,661. This application Jan. 6, 1977, Ser. No. 760,135
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2525750; Jun. 10, 1975, 2525749
Int. Cl.^{2} B08B *3/12*
U.S. Cl. 134—104 21 Claims



1. Washing apparatus for washing soiled comminuted products of plastic material, such as sheets, bands, sacks or the like, comprising an elongated container having at least one downwardly extending funnel-shaped bottom portion closed at a lower end thereof by a valve, said elongated container having a pair of opposite end walls; means for feeding soiled comminuted plastic material in the region of one of said end walls into said container; means for maintaining in said container a bath of washing solution of a specific weight greater than that of said comminuted plastic material fed thereinto; a partition adjacent the other end wall extending into the bath of washing solution and dividing the interior of said container in a washing zone and a discharge zone adapted to communicate with each other adjacent the container bottom; means for agitating the washing solution and the comminuted plastic material in said washing zone; and means for removing said comminuted plastic material from said discharge zone.

4,106,519
VANE-TYPE NOZZLE ASSEMBLY

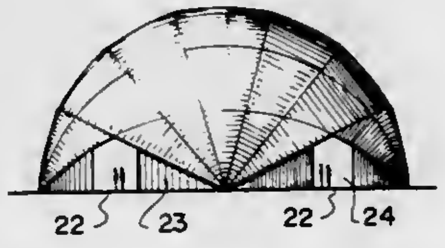
Asjed A. Jalil, Holden, and C. Allen Rich, Southboro, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.
Continuation of Ser. No. 497,030, Aug. 13, 1974, abandoned, which is a continuation of Ser. No. 353,496, Apr. 23, 1973, abandoned. This application Dec. 15, 1976, Ser. No. 750,760
Int. Cl.^{2} B08B *3/02*
U.S. Cl. 134—122 R 1 Claim



1. Apparatus for applying a liquid to the surface of an axially moving elongated element, said apparatus comprising: a housing including first and second communicating tubular sections arranged in a generally T-shaped configuration, said first tubular section defining an interior chamber; guide means for defining a passageway extending longitudinally through said chamber, said guide means including mating elements protruding into said chamber from opposite ends of said first tubular section, said passageway being suitably dimensioned and adapted to accommodate movement therethrough of an elongated element; inlet means in said second tubular section for admitting liquid into said chamber; the adjacent ends of said mating elements being spaced to define an orifice which surrounds said passageway and through which liquid flows from said chamber into said passageway for application to the surface of the elongated element moving axially therethrough, one of said mating element being provided at a location adjacent to said orifice with a plurality of slots arranged radially in relation to the longitudinal axis of said passageway; and vane means for directing the flow of liquid into said orifice, said vane means comprising flat plate members seated in said slots and protruding therefrom at said orifice into said chamber.

4,106,520
ENCLOSURE

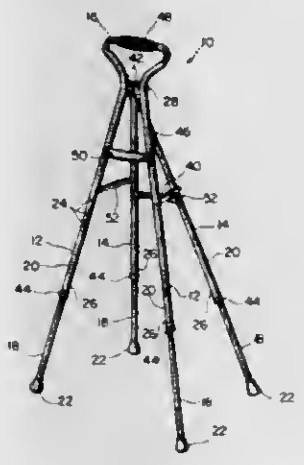
Gerhardt Allan Warner, and Kurt Ehrich Warner, both of 97 Canora Street, Winnipeg, Manitoba, Canada
Filed May 16, 1977, Ser. No. 797,520
Claims priority, application United Kingdom, Oct. 5, 1976, 41287/76
Int. Cl.^{2} A45F *1/16*
U.S. Cl. 135—4 R 9 Claims



1. An enclosure structure for erection upon a supporting surface and comprising in combination at least two sets of arched support ribs and a flexible cover for said support ribs, means for each set of support ribs pivoting the adjacent ends of each set of support ribs on common loci, each set of support ribs being situated in angular relationship to one another whereby said means pivoting the adjacent ends of each set of support ribs have different pivot axes, and means clamping some of said support ribs of one set of support ribs to some of said support ribs of the other set of support ribs at the intersections thereof.

4,106,521
COLLAPSIBLE CANE APPARATUS

Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.
Filed May 23, 1977, Ser. No. 799,397
Int. Cl.^{2} F16M *13/08*
U.S. Cl. 135—67 8 Claims



1. A single hand folding cane apparatus comprising:
a generally V-shaped frame including a handle section, a central pivot section connected to said handle section, and a first pair of telescoping legs connected to said central pivot section, said V-shaped frame having a relatively narrow waist at the central pivot section with respect to said handle section and to said first pair of telescoping legs;
a second pair of telescoping legs; and,
a common pivot means passing through said central pivot section of said V-shaped frame for connecting said V-shaped frame and said second pair of legs together in a divergent manner so as to form an expandable pyramid-like base for said cane apparatus in which said common pivot means forms the apex of said pyramid-like base,
whereby a downward force applied to the handle section is concentrated at the central pivot section through said common pivot means and into said first and second pair of telescoping legs and whereby the stability of the apparatus increases as the first and second pair of telescoping legs are extended due to the substantial divergent spreading of the legs in two dimensions during the extension process.

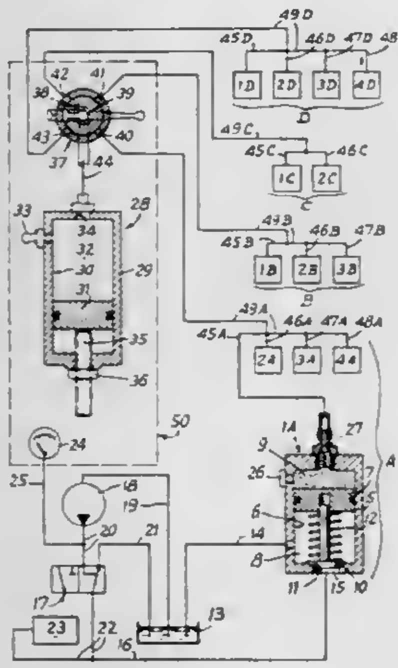
4,106,522
PRESSURE RELIEF VALVE

Jean-Pierre André Manesse, Senlis, France, assignor to Poclain, Societe Anonyme, Belleville, France
Filed Feb. 14, 1977, Ser. No. 768,185
Claims priority, application France, Mar. 5, 1976, 76 06381
Int. Cl.^{2} F16K *17/06*
U.S. Cl. 137—512 2 Claims

1. A pressure regulator mechanism for calibrating relief valves comprising at least two relief valves whose maximum operating pressures are selected to have different valves, each of said valves including a valve body having an internal bore, an opening and a valve seat about said opening formed therein; a piston movably positioned in said bore and separating the bore into an adjustment chamber and an exhaust chamber; said exhaust chamber being in communication with said opening; a movable closure member in said exhaust chamber positioned to selectively engage said seat to open and close said opening; and resilient means in said exhaust chamber operatively engaged between said piston and closure member for normally biasing

said closure member into engagement with said seat to close said opening;

means for adjusting the position of said pistons in said bores including, a source of incompressible fluid, separate conduits for separately connecting said source of incompressible fluid to said adjustment chambers; non-return valve means connected between said conduits and said adjustment chambers for permitting incompressible fluid to enter said adjustment chambers from their associated conduits and preventing incompressible fluid from passing from the adjustment chambers to the associated conduits; and means for selectively urging said incompressible fluid from said source thereof through said conduits and non-return valve means to said adjustment chamber; a use circuit containing pressurized fluid for operating a work member; said use circuit being operatively connected in fluid communication to the exhaust chambers of said valves through said openings whereby the pressure of the pressurized fluid in the use conduit connected to the valves is limited by the valve;



manometer means operatively connected to said use circuit for measuring the pressure of the pressurized fluid therein; said manometer means being located in proximity to said source of incompressible fluid; and

selector means for selectively connecting and supplying said incompressible fluid from said source thereof to the respective supply conduits associated with said valves to selectively supply said incompressible fluid to the valves and thereby adjust the position of the piston therein in order to adjust the limiting pressure applied by the valve on the pressurized fluid of the use circuit;

said valves each including an exhaust port communicating with said exhaust chamber whereby when the pressure in said user circuit rises above the limiting pressure applied by the valve the closure member is moved away from said valve seat against the bias of said resilient means to open said pressure circuit to exhaust through said exhaust port.

4,106,523

INTERCONNECT DEVICE FOR USE IN CLOSED FLUID CIRCULATING SYSTEMS

David Charles Thornton, Harrisburg; Linn Stephen Lightner, Camp Hill, and Patrick Edward Lanoan, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 501,541, Aug. 29, 1974, Pat. No. 3,917,370. This application Apr. 24, 1975, Ser. No. 571,129

Int. Cl.^{2} F16K *29/00*

U.S. Cl. 137—614.04 **2 Claims**

1. An interconnect device for conduits of closed fluid circulating systems comprising:

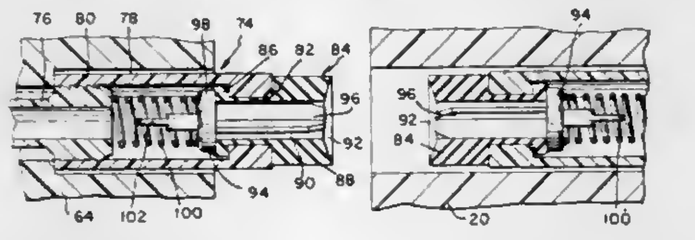
a pair of mating hermaphroditic members each comprising:

a body having a bore extending therethrough;

means on one end of said body for fixed connection of said bore to associate conduits;

a resilient sealing member fixedly mounted on said body extending from the opposite end thereof and having a bore coaxial with and forming an extension of the bore in said body;

a valve member movably mounted in said body, said valve member having a head portion adopted to engage said sealing member and an integral stem lying entirely within the bore of said sealing member in a normally closed condition, a stop integral with each valve head portion and extending in the opposite direction from said stem; and



spring means biasing said valve head portion against said seal;

whereby relative movement of said mating members towards one another causes a sealing engagement to be established between said sealing members prior to said valve stems engaging to move the associated valve head portions away from said sealing members to allow fluid flow through said coupled members, each said stop limiting opening movement of the respective valve member to less than the mating movement of said device thereby assuring opening of both valve members.

4,106,524

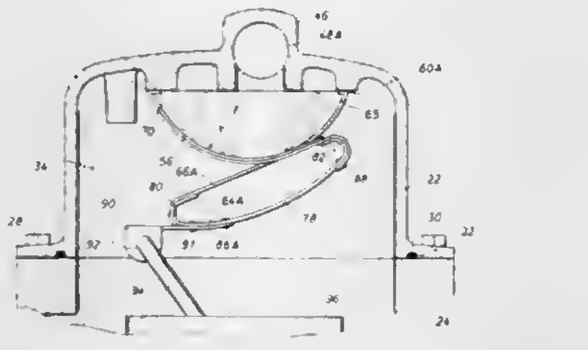
LOW ACTUATION FORCE FLUID VALVE APPARATUS

Walter G. Wunsch, Erie, Pa., assignor to Geosource Inc., Houston, Tex.

Filed Jul. 27, 1976, Ser. No. 709,172

Int. Cl.^{2} F16K *7/18*

U.S. Cl. 137—625.44 **4 Claims**



1. A low actuation force fluid valve apparatus comprising:

a valve housing;

a stationary member having an arcuate surface thereon mounted within said housing;

a fluid port extending through said stationary member;

a flexible valve band having a first and a second surface thereon flexibly movable from a first, closed, position to a second, open, position in response to an actuating force;

a substantially T-shaped actuating member having the edge of the crossbar and the edge of the leg being curved toward each other under the body of the T, said flexible valve band being connected to one of the edges of the T-shaped member, said actuating member being pivotally movable relative to said stationary member to transmit an actuating force to said flexible valve band to move said

flexible valve band from the first, closed, position to the second, open, position;

said valve band in the first, closed, position having said first surface adjacent to the surface of said stationary member to cover said fluid port, said valve band being subjected to a compressive load on said first surface thereof and a tensile load on said second surface thereof while in the first, closed position,

said valve band in the second, open, position extending tangentially from the surface of said stationary member to uncover said fluid port, said valve band being subjected only to a tangentially directed tensile force while in the second, open, position; and,

a flexible guide band having first and second surfaces thereon and being connected to the other edge of said T-shaped actuating member for movement in response to an actuating force from a first to a second position, connection of said T-shaped actuating member to said valve band and said guide band compressing said T-shaped member across its ends to generate a bend therein to impart a tensioning force to said valve band and said guide band;

said guide band in the first position extending tangentially from the surface of said stationary member and being subjected only to a tangentially directed tensile force;

said guide band in the second position having said first surface thereof disposed adjacent to the surface of said stationary member, said guide band being subjected to a compressive load on said first surface thereof and a tensile load on said second surface thereof while in the second position.

4,106,525

FLUID PRESSURE CONTROL

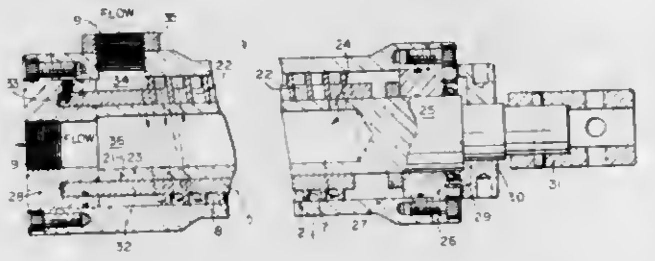
John Alexander Currie, Paisley; Maurice McKenna, and John Howard Upton, both of East Kilbride, all of Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 14, 1977, Ser. No. 768,628

Claims priority, application United Kingdom, Feb. 20, 1976, 6883/76

Int. Cl.^{2} F15D *1/02*

U.S. Cl. 138—43 **2 Claims**



1. A fluid flow restrictor comprising a housing adapted for attachment between a first and a second length of a pipeline, said housing having an internal helical duct arranged in fluid communication with the said first length of pipeline, a series of fluid transfer ports regularly disposed along the length of said helical duct so as to provide fluid communication between said helical duct and said axial duct, and a sleeve having an axial duct coaxially located within said helical duct and arranged in fluid communication with said second length of pipeline being adapted to rotate and which is in the form of a hollow cylinder fitted coaxially within said helical duct in fluid-tight proximity with the walls thereof so as to close said fluid transfer ports, said sleeve being provided with at least one radial aperture disposed along the length of the sleeve in the form of a single-turn helix, which aperture is successively alignable with every one of said fluid transfer ports by rotation of said sleeve through no more than one complete revolution thereby to permit selective opening of any one of said fluid transfer ports to said axial duct so as to vary the effective path length of said helical duct.

4,106,526

HIGH TEMPERATURE END FITTING

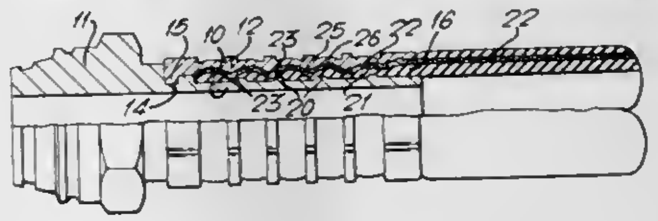
Charles Szentmihaly, Salisbury, England, assignor to BTR Industries Limited, London, England

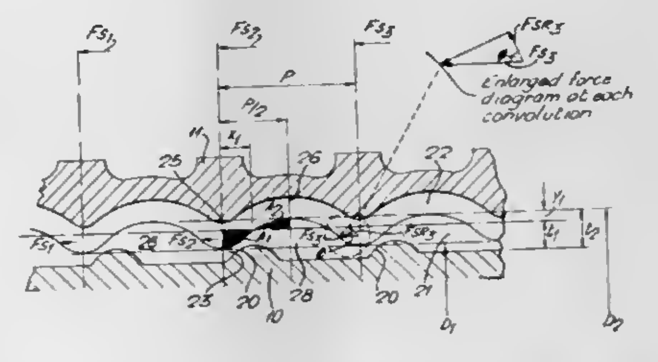
Filed Apr. 5, 1977, Ser. No. 784,910

Claims priority, application United Kingdom, Apr. 8, 1976, 14375/76

Int. Cl.^{2} F16L *11/08, 33/20*

U.S. Cl. 138—109 **8 Claims**





1. A hose end unit comprising a hose end portion consisting of an inner cylindrical elastomeric liner extending to the free end of the hose end portion and a reinforcement layer surrounding the liner, and an end fitting of the kind comprising an insert to enter into the hose end portion and a ferrule to surround the hose end portion, a plurality of radially inward projections being provided on the ferrule and a plurality of radially outward projections being provided on the insert, the ferrule being swaged around the insert so that the hose end portion is gripped between the insert and the ferrule, wherein the arrangement including the shape of the projections on the ferrule being such that the reinforcement layer lies against the ferrule and the dimensions of the projections on the insert and the ferrule are such that material of the liner is confined in cells delimited by annular gaps between the reinforcement and the projections on the insert, space between the reinforcement layer and the insert in between two said gaps being completely filled by liner material under compression and the gaps being sufficiently narrow to substantially prevent flow of the material of the elastomeric liner between adjacent cells in use.

4,106,527

REINFORCED FLEXIBLE CONDUIT AND METHOD OF MANUFACTURE

Erich Schmidt, Hoffeldstrasse 45a, 4 Dusseldorf, Germany

Filed Oct. 10, 1974, Ser. No. 513,823

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1973, 2350833

Int. Cl.^{2} F16L *11/00*

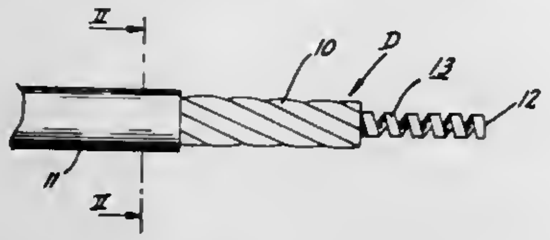
U.S. Cl. 138—131 **3 Claims**

1. A flexible conduit for conducting oxygen and for combustion therewith including

(a) a plurality of metallic strands twisted together to form

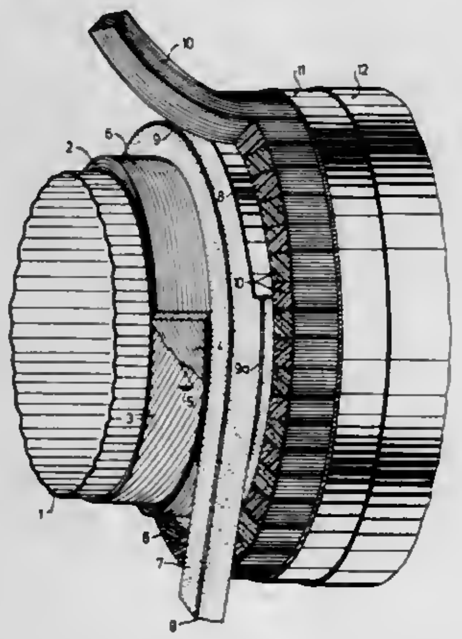
(b) a stranded duct having

(c) a central channel therein access means for providing access for oxygen within said central channel to penetrate the stranded duct, said access means including
(d) a helical metal insert in said central channel, said insert



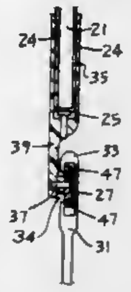
being sized to abut against the surface of the central channel and having adjacent windings thereof axially spaced from each other to form
(e) a discontinuous helical surface, and
(f) a gas impervious sheath enclosing said stranded duct.

4,106,528
TUBE FOR FLUID SUBSTANCES UNDER PRESSURE
Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen bei Stuttgart, Germany
Filed Dec. 16, 1974, Ser. No. 533,308
Claims priority, application Australia, Dec. 19, 1973, 210625/73
Int. Cl.^{2} F16L *9/14*
U.S. Cl. 138—149 **21 Claims**



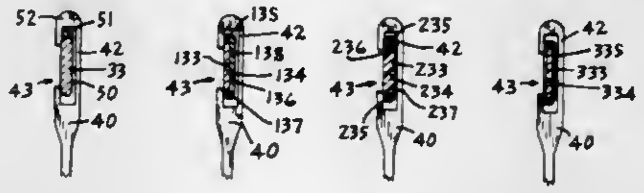
1. A pressure tube for the transport of fluid under pressure comprising a plurality of superimposed tubular layers including an inner thin-walled fluid impervious metal tubular layer, an outer tubular layer comprising windings of yarns formed from mineral fibers where said yarns carry the hoop stresses of the pressure tube resulting from the fluid under pressure, a porous insulating layer overlying said windings, axially extending yarns for carrying axial stresses positioned radially outwardly of said insulating layer, and a hermetically sealed tubular wall positioned between the layer of insulating material and the axially extending yarns and wherein the space between the hermetically sealed tubular wall and said metal tubular layer is evacuated.

4,106,529
HEDDLE FRAME
Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.
Filed Oct. 22, 1976, Ser. No. 734,823
Int. Cl.^{2} D03C *9/06*
U.S. Cl. 139—92 **5 Claims**



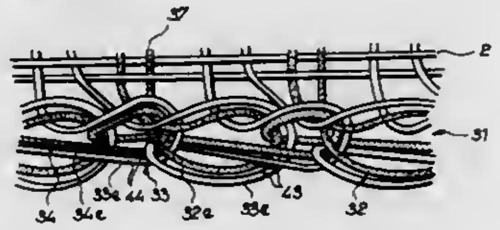
1. In a heddle frame having top and bottom rails, heddle supporting rods carried in said frame and heddles having end eyes carried on said rods, the improvement in said heddle supporting rods which comprises
- a central metallic rod portion having
  - longitudinally extending non-metallic portions of less impact noise response in covering relation to the upper and lower edges of said metallic rod portion for contact with the interiors of said end eyes for reducing impact noise.

4,106,530
HEDDLE FRAME
Frank H. Kaufmann, c/o Steel Heddle Manufacturing Co., P.O. Box 1867, Greenville, S.C. 29602
Continuation-in-part of Ser. No. 734,823, Oct. 22, 1976. This application Aug. 24, 1977, Ser. No. 827,441
Int. Cl.^{2} D03D *9/00*
U.S. Cl. 139—92 **7 Claims**



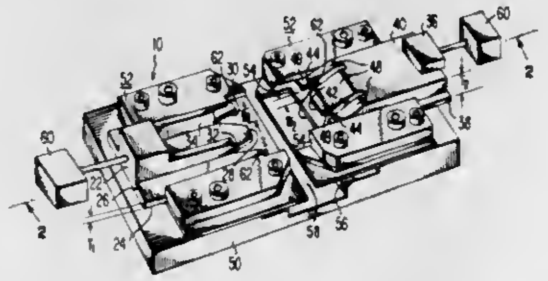
1. In a heddle frame having top and bottom frame rails, heddle supporting rods carried on said frame and heddles having end eyes carried on said rods, the improvement in said heddle supporting rods which comprises
- an upper rod with a central rod portion and having an upper edge portion for engagement with the upper end margin of the upper end eye and a lower rod with a central rod portion and having a lower edge portion for engagement with the lower margin of the lower end eye, and
- each of said edge portions comprises a longitudinally extending non-metallic non-ceramic portion of less impact noise response for reducing impact noise.

4,106,531
KNIT-WOVEN FABRIC SELVAGE STRUCTURE, AND APPARATUS FOR PRODUCING THE SAME
Oldrich Horáček, Liberec; Frantisek Šilar, Vratislavice n/Nisou, and Dalibor Rychlík, Liberec, all of Czechoslovakia, assignors to Statni vyzkumny ustav textilni Liberec, Liberec, Czechoslovakia
Filed Sep. 1, 1977, Ser. No. 829,887
Claims priority, application Czechoslovakia, Sep. 7, 1976, 5785-76
Int. Cl.^{2} D03D *23/00, 25/00*
U.S. Cl. 139—383 B **6 Claims**



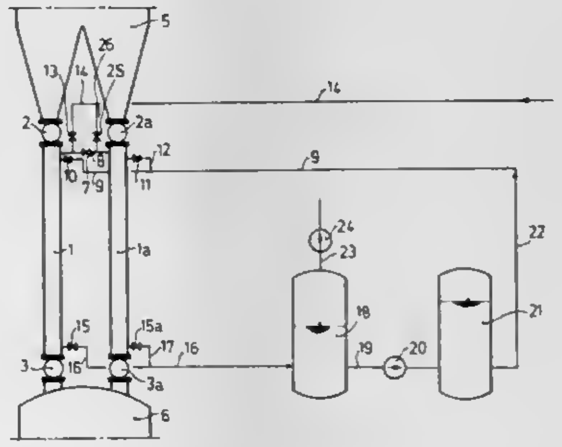
1. A selvage structure of a knit-woven fabric produced in a warp-knit structure from weft thread loops and comprising spaced apart stitch wales with warp thread groups disposed therebetween, said warp threads being interlaced with stitch connecting loops to form a weave while the fabric selvage consists of a weft thread and a marginal weft thread, comprising marginal wale built by mutually binding stitches from a weft thread, stitches from a marginal weft thread, and stitches from a lock thread.

4,106,532
MACHINE FOR STRAIGHTENING THE WIRE LEADS OF A DEVICE
Nicholas Francis Gubitose, Moosic, and Robert Artbur James, Hunlock Creek, both of Pa., assignors to RCA Corporation, New York, N.Y.
Filed Jun. 6, 1977, Ser. No. 804,006
Int. Cl.^{2} B21F *1/02*
U.S. Cl. 140—147 **10 Claims**



1. A machine for straightening at least one wire lead of a device wherein the leads extend in the same general direction when there is a plurality of leads comprising:
- a first jaw slidably affixed to a base, said first jaw having a leading edge which has at least one V-shaped groove therein, said first jaw being relatively thin with respect to the length of said lead;
- a second jaw slidably affixed to said base in an opposing relation to said first jaw, said first and second jaws being affixed to said base in such a fashion that the movement thereof is only in a single geometric plane, said second jaw having a leading edge which is proximate said leading edge of said first jaw, said leading edge of said second jaw having at least one V-shaped groove therein each substantially aligned with a corresponding one of said V-shaped grooves of said first jaw, said second jaw being affixed to said base such that said first jaw can slide thereunder, and
- means for moving said jaws toward each other such that said jaws mesh with each other to contact and straighten said lead or leads.

4,106,533
APPARATUS FOR AND A METHOD OF INTRODUCING COMBUSTIBLE PARTICULATE MATERIAL INTO A PRESSURIZED GASIFYING VESSEL
Alfred Herzig, Essen, Del.X, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany
Filed Dec. 8, 1976, Ser. No. 749,712
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556162
Int. Cl.^{2} B65B *1/16*
U.S. Cl. 141—1 **18 Claims**

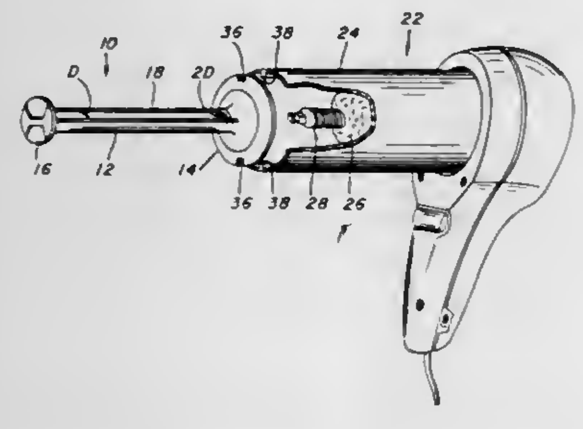


1. A method of operating an arrangement for introducing bulk material into a vessel, particularly combustible particulate material into a gasifying vessel, of the type having two conveying tubes arranged in parallel, a diaphragm member in each of the conveying tubes and subdividing the interior of the same into a first compartment communicating with a supply of the material and with the vessel, and a second compartment surrounding said first compartment and communicating with a source of control medium, first valves between the supply and the first compartments, second valves between the first compartments and the vessel, a source of pressurized fluid communicating with the first compartments, third valves between the source of presurized fluid and the first compartments, a conduit communicating the first compartments, and a fourth valve interposed in the conduit, the method comprising the steps of withdrawing the control medium to increase the volume of the first compartment of one of the conveying tubes; opening the associated first valve to admit the material from said supply into said first compartment; closing said associated first valve; equalizing the pressure in said first compartment with that in the vessel by opening said third and fourth valves thus admitting the pressurized fluid from said first compartment of the other conveying tube through said conduit and from said source of pressurized fluid; closing said fourth valve opening the associated second valve to discharge the pressurized contents of said first compartment into the vessel; continuing said admission of the pressurized fluid from said source into said first compartment to enhance the discharge of the material into the vessel; simultaneously forcing the control fluid at elevated pressure into the associated second compartment to reduce the volume of said first compartment; closing said second valve; opening said fourth valve during said forcing step to admit the pressurized fluid from said first compartment into the first compartment of the other conveying tube; closing said fourth valve prior to the opening of said first valve; and subsequently increasing the volume of said first compartment of the one conveying tube.

4,106,534

APPARATUS FOR PLACING COMESTIBLES IN DISPENSING MECHANISM

Marshall B. Johnson, Chillicothe, Ohio, assignor to Wear-Ever Aluminum, Inc., Chillicothe, Ohio
Filed Jun. 14, 1976, Ser. No. 695,464
Int. Cl.^{2} B65B *3/10*
U.S. Cl. 141—18 4 Claims



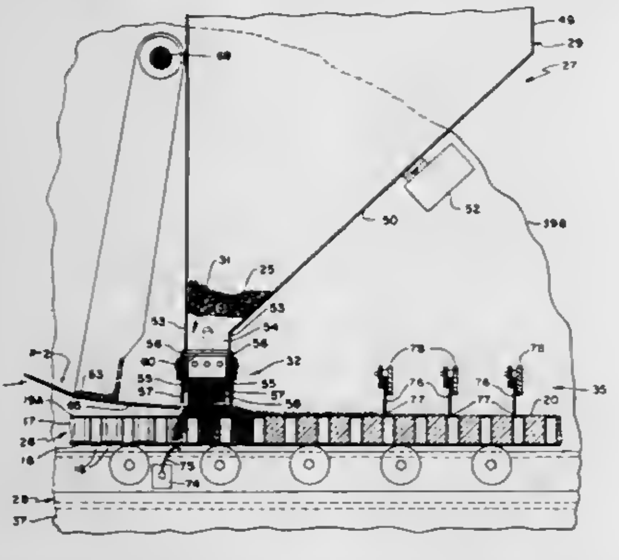
1. An apparatus in combination with a dispensing mechansim, the apparatus for placing comestibles in a barrel of a said dispensing mechanism, said dispensing mechanism, having a shaft located at the longitudinal axis of the barrel, the apparatus comprising:

(a) a substantially tubular body portion;
(b) an integral base portion at one end of said body portion, said base portion having a hole therethrough substantially aligned with the longitudinal axis of said body portion, the hole being larger than the shaft for receiving therethrough the end of the shaft of the dispensing mechanism into said tubular body and the outer configuration of said base portion being substantially identical to the noncircular cross section of the barrel of the dispensing mechanism;
(c) an integral head portion at the other end of said body portion, said head including a means for gripping; and
(d) means on said tubular body for permitting access to within said tubular body for cleaning includes a longitudinal opening extending along the length of said tubular body.

4,106,535

APPARATUS FOR FILLING THE CELLS OF AN EXPANDED CELLULAR CORE MEMBER WITH GRANULAR INSULATION

Bernard Harpley Davis, Stoney Creek, Canada, assignor to H. H. Robertson Company, Pittsburgh, Pa.
Filed Feb. 23, 1976, Ser. No. 660,014
Int. Cl.^{2} B65B *1/04*
U.S. Cl. 141—88 14 Claims



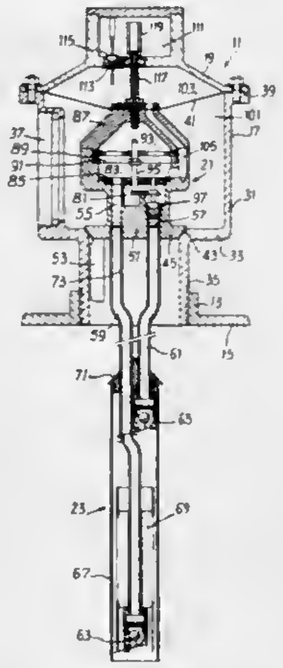
1. In apparatus for filling cells of an expanded cellular core member with granular insulation, said core member having a base sheet secured to and capping lower ends of said cells, said apparatus including horizontally disposed conveyor means arranged to transport said core member along a rectilinear path of travel, and hopper means positioned above said conveyor means, having a lower discharge opening therein proximate to said conveyor means, the improvement comprising:

adjustable barrier means for adjusting the cross-sectional area of said discharge opening;
valve means controlling the flow of said granular insulation through said discharge opening; and
horizontal path means disposed beneath said conveyor means, receiving excess granular insulation from said core member.

4,106,536

SELF-ACTING DEVICE FOR STOPPING FILLING OF TANKS WITH FLUID PRODUCTS

Michel Jacques Léon Coquerel, Villerville, France, assignor to Equipment Industriel Normand, Grentheville, France
Filed Sep. 20, 1976, Ser. No. 724,937
Int. Cl.^{2} B65B *57/14*
U.S. Cl. 141—220 14 Claims



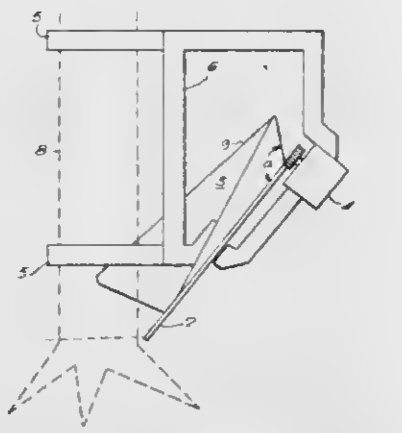
1. Mechanism for a self-acting stoppage of decanting operation of liquids from a filling tank to a vat to be filled, the tank comprising an outlet valve, the vat comprising an upper filling inlet, and the mechanism having an inlet port and an outlet port with a flexible pipe connecting the inlet port with the outlet valve of the tank and the outlet port being placed within the vat for flowing liquid therein, said mechanism comprising:

a body with an inlet and an outlet respectively communicating with said inlet port and outlet port,
a flexible membrane mounted in the body and delimiting therein an upper chamber and a lower chamber, the lower chamber communicating with the inlet of said body,
main valve means mechanically connected to the membrane and pendant therefrom to control opening of the inlet of said body whereby liquid coming from the filling tank through the outlet valve and the flexible pipe and the inlet port of the mechanism and the inlet of said body into the lower chamber raises the membrane and opens said main valve means, liquid then flowing through said outlet port in said vat,
second valve means connected both to the lower chamber and to the upper chamber of said body and controling communication therebetween,
a float placed in the vat for controling said second valve means at a first predetermined level in the vat, whereby when the liquid flowing in the vat through the main valve means reaches said first predetermined level, said second valve means is closed and causes liquid to flow from the lower chamber into the upper chamber so to balance the liquid on the flexible membrane which goes down with the main valve, said main valve being then closed and interrupting flowing of the liquid therethrough,
third valve means mounted between the lower chamber and said outlet, and controled by the second valve means to be opened when both said second valve means and outlet valve are closed and the flexible pipe is dismounted from the filing tank, whereby liquid contained in the flexible pipe and in the lower chamber can flow into the vat.

4,106,537

FELLING AND CUTTING DEVICE

Antti Tuomas Saikku, Ulvila, Finland, assignor to Rauma-Repola Oy, Finland
Continuation-in-part of Ser. No. 747,472, Dec. 3, 1976, abandoned, Continuation-in-part of Ser. No. 747,472, Dec. 3, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 762,192
Int. Cl.^{2} A01G *23/08*
U.S. Cl. 144—34 R 6 Claims



1. A device for cutting or felling a tree comprising:

(a) a rotatable base disk, and
(b) a curved cutting blade of increasing width in the shape of partial truncated cone mounted along a portion of the periphery of the base disk, said disk constituting a truncating plane, the increasing width of said blade causing the cutting edge thereof to be located progressively farther from the truncating plane, the widest portion of the blade having an edge constituting a rear edge extending abruptly downward to the surface of the base disk.

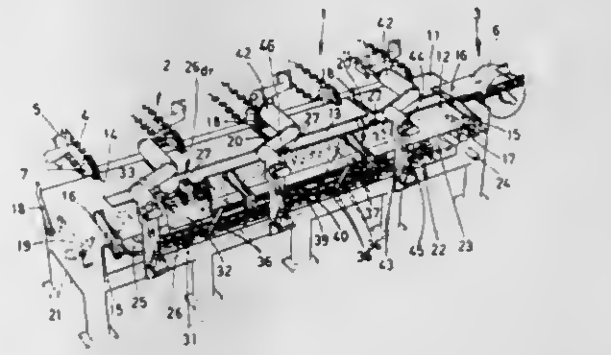
4,106,538

TRANSLATORY FEED OF LUMBER WORKPIECES FROM AN ORIENTING STATION THROUGH AN EDGE TRIMMING STATION

F.S. Meinrad Sigfridsson, Huskvarna, and K. Sigvard Jansson, Tyresö, both of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Apr. 4, 1977, Ser. No. 784,289
Claims priority, application Sweden, Apr. 7, 1976, 7604057
Int. Cl.^{2} B27M *1/08;* B27B *31/00;* B27C *1/12*
U.S. Cl. 144—309 R 8 Claims

1. The method of effecting translatory substantially lengthwise motion of an elongated workpiece such as a cant or a slab that has opposite top and bottom face surfaces, at least one of which is substantially flat, to feed the workpiece in a horizontal direction from an orienting station at which the workpiece is established in a predetermined orientation with its said one face surface substantially horizontal, into a cutting station at which straight and parallel cuts transverse to said one face surface are made along the length of the workpiece while its predetermined orientation is accurately maintained notwithstanding cutting forces which tend to disturb that orientation, said method being characterized by:

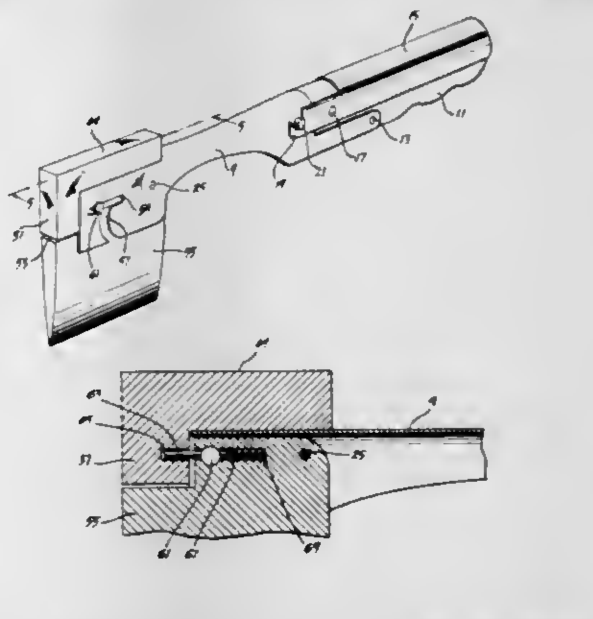
A. establishing the workpiece, in its said orientation, in vertical force transmitting relationship to force applying means by which said one face surface of the workpiece is engaged across the major portion of its width at each of a plurality of locations spaced along its length, and by which the workpiece can be confined against vertical motion in the direction of its said one face surface while being left free for movement in said horizontal direction;
B. while maintaining said force transmitting relationship, and by effecting translatory vertical relative motion between said force applying means and horizontally movable driving means, establishing forceful engagement between said driving means and a plurality of areas of the opposite face surface of the workpiece at locations thereon which are confined to a narrow lengthwise extending central zone of said other face surface, are spaced from one another along said zone, and are of such limited extent that the driving means is incapable of preventing tilting of the workpiece without cooperation of the force applying means but, owing to said forceful engagement, has sufficient friction with the workpiece that the workpiece is constrained to partake of all motion of the driving means; and
C. while maintaining the workpiece clampingly confined between the force applying means and the driving means, constraining the driving means to straight-line horizontal motion in said direction.



4,106,539

FOLDING HATCHET

Walter R. Petrich, 621 N. Yale, Fullerton, Calif. 92631
Continuation-in-part of Ser. No. 714,611, Aug. 16, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,316
Int. Cl.^{2} B26B *23/00*
U.S. Cl. 145—2 A 7 Claims



1. In a folding hand tool wherein a tool member is rotatably attached to a channel handle member, the improvement comprising:

a tool member having a working position and a folded position, said tool member having a receptacle therein adapted to receive a pin in sliding engagement therewith, said tool member having a slot therein which opens into said receptacle;

rigid block means attached to the channel member and having a hole thereon adapted to receive and engage a pin;

a pin slideably mounted in said receptacle of said tool member, said pin engaging said hole of said block means when said tool member is rotated into said working position thereby locking said tool member in a fixed position with respect to the channel handle member, said pin disengaging said hole of said block means thereby unlocking said tool member from said block means for rotating said tool member into said folded position; and

a manual extension arm attached to said pin and extending through said slot in said tool member, said manual extension arm being movably positioned in said slot to move said pin into engagement and disengagement with said hole in said block means.

4,106,540

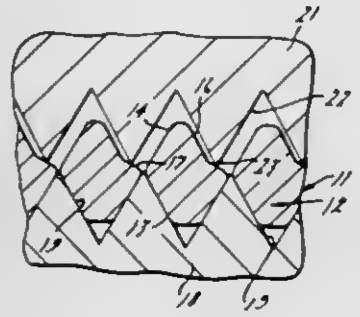
ANTI-VIBRATION THREAD INSERT

William D. Myers, Fullerton, Calif., assignor to Microdot, Inc., Greenwich, Conn.

Filed Jul. 7, 1977, Ser. No. 813,679

Int. Cl.² F16B *39/30*

U.S. Cl. 151—14 CS **3 Claims**



1. A coiled wire insert for insertion in a threaded female member comprising a preformed wire of generally diamond-shaped cross-section, said wire being formed into a coil having an outer thread form complimentary to the flank angles of and mateable with the thread of a female member and an inner thread, one face of the inner thread having a ramp at the thread root between the convolutions of said insert and angled at approximately 30° to the central axis of said insert, the crest of the thread on a male member thread being engageable with the ramp on said insert when said male member is axially loaded whereby a radially inward compressive force is exerted on said male member to minimize vibration and effect locking thereof and a radially outward compressive force is exerted on said insert generally parallel to the adjacent thread flank of said female member to lock the radially outer threads thereof in said female member and minimize twisting of said thread form relative to said female member.

4,106,541

QUICK ACTING COUPLING

William H. Gravert, Port Washington, N.Y., assignor to Marine Moisture Control Company, Inc., Inwood, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,739

Int. Cl.² F16L *23/02*

U.S. Cl. 151—48 **12 Claims**

1. A quick acting coupling for coupling together a pair of heavy pipes or hoses, comprising:

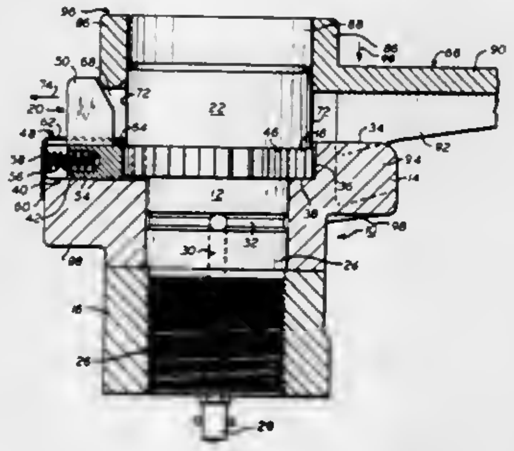
a clamp support;

a bolt threadedly received within and coupled to said clamp support, said bolt including a shank portion;

a rotatable cam element rotatable about said bolt and held to said clamp support as a unit; and,

releasable locking means to lock said cam element to said bolt to permit rotation in one direction and prevent rotation in an opposite direction;

said releasable locking means including a ratchet carried by said bolt, and a spring urged locking element supported in said cam element, a compression spring urging said locking element into engagement with said ratchet, said locking element including first and second dissimilar configurated teeth, one of said teeth having an included angle less than the other of said teeth, one of said first and second teeth being complementary with the teeth of said ratchet, whereby to enable said cam element to be rotated in one direction but prevented from rotation in a direction opposite to said one direction.



4,106,542

TIRE PROTECTIVE CHAINS

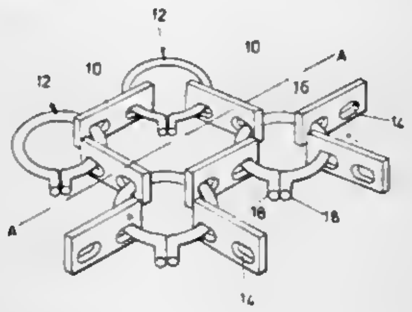
Hans Otto Dobmeier, Victoria, South Africa, assignor to Dome Inventions (Proprietary) Limited, Johannesburg, South Africa

Continuation-in-part of Ser. No. 603,807, Aug. 12, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,855

Claims priority, application South Africa, Aug. 21, 1974, 74/5368; Oct. 31, 1974, 74/7007; Feb. 6, 1976, 76/0913

Int. Cl.² B60C *27/20*

U.S. Cl. 152—239 **9 Claims**



1. In a tire protective chain comprising an open network of tread links of a carbon steel forming a pattern of closed figures and arranged to be perpendicular to the surface of a tire and connectors interconnecting the tread links at the corners of the closed figures and arranged to be parallel to the surface of a tire, the connectors being loops that are threaded through perforations in the tread links and that are welded closed after being engaged with the tread links, the improvement that the tread links and connectors are of carbon steels that are different and which have been heat treated to be hardened throughout their thicknesses; that each connector is a loop having ends which lap each other and which are welded together; and that the tread links have a surface hardness of **46** to **60** Rockwell C-scale and the connectors a core hardness of **15** to **35** Rockwell C-scale.

4,106,543

STRUCTURE OF SEALING AIR VALVES FOR SPLIT RIM TYPE WHEELS

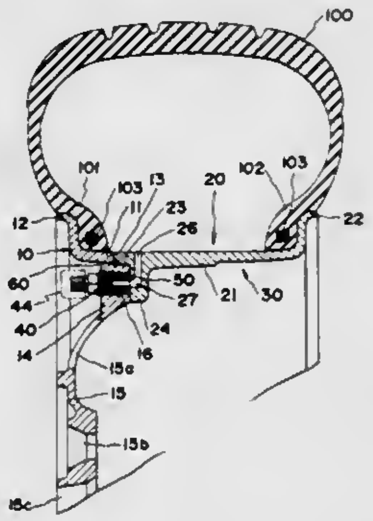
Shoichi Sano, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,953

Claims priority, application Japan, Oct. 4, 1975, 50-135261[U]

Int. Cl.² B60C *23/00. 29/00*

U.S. Cl. 152—405 **6 Claims**



1. A structure for sealing air valves for split rim type wheels, comprising:

an outer split rim member having a hole passing therethrough to and through a first end surface of said outer split rim member;

a screw thread being provided in at least a portion of the surface of said outer split rim member defining said hole;

an inner split rim member having a passage therethrough extending from the periphery of said inner split rim member to a second end surface of said inner split rim member which abuts against said first end surface of said outer split rim member;

an air valve theadedly engaged in said hole, the tip of said air valve butting against said second end surface of said inner split rim member around an opening of said passage on said second end surface of said inner split rim member; and

a sealing member pre-disposed on said tip of said air valve and being pressed in sealing contact against said second end surface around said opening on said second end surface within a space defined by said second surface, the inner periphery of said fitting hole and the tip of said air valve.

4,106,544

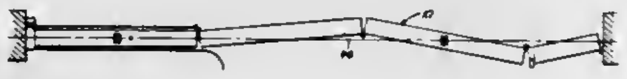
ELECTRICALLY OPERATED FOLDING PARTITION

Guy E. Dixon, Miami, and Thomas M. Dixon, Hollywood, both of Fla., assignors to Panelfold, Inc., Miami, Fla.

Filed Sep. 20, 1977, Ser. No. 835,024

Int. Cl.² E05D *15/26*

U.S. Cl. 160—199 **15 Claims**



1. In an electrically operated folding partition comprising a plurality of rigid panels having the vertical edges thereof pivotally connected with some or all of the panels being supported from a longitudinal trackway by carriages, said panels having substantial thickness and being disposed in a flat, straight line condition when the partition is in fully closed position and being stacked in accordion folded condition when the partition is in fully open position with the hinge axes of the pivotal connection between adjacent panels being disposed at or near opposite surfaces of the partition when the partition is fully closed, that improvement comprising control means for opening and closing the partition by applying a closing force to the partition for initially extending the partition to a length greater than the over-all length thereof when fully closed, thereby moving the hinge axes toward the longitudinal center line of the partition and reversing the direction of force to an opening force applied to the partition as the hinge axes cross over the center line due to inertia of the panels with continued opening force exerted on the partition moving the panels to their fully open or closed position.

4,106,545

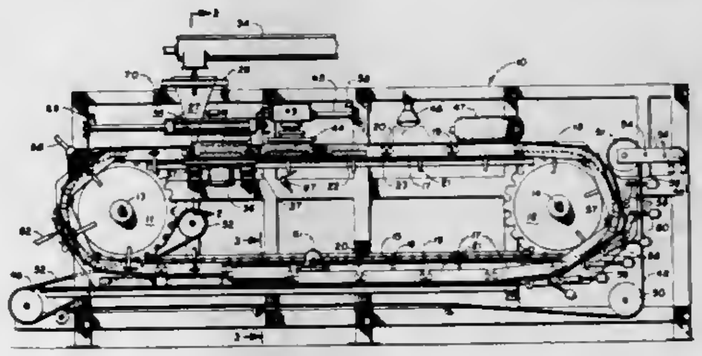
METHOD OF AUTOMATIC MOLD AND CORE FORMING

William R. Kloster, Muscatine, Iowa, and Patrick H. Stewart, Danville, Ill., assignors to C L Industries Inc., Danville, Ill.

Division of Ser. No. 688,698, May 21, 1976, Pat. No. 4,037,645, which is a continuation of Ser. No. 529,902, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 445,485, Feb. 25, 1974, abandoned. This application Apr. 20, 1977, Ser. No. 789,090

Int. Cl.² B22C *15/28*

U.S. Cl. 164—18 **10 Claims**



1. A method of making sand molds, cores or the like for use in casting foundry pieces, utilizing a first continuous conveyor having a plurality of pattern pieces and flasks attached thereto, each of the flasks being movable from an upright position through an inverted position and back to an upright position, and a second conveyor for transporting the sand molds, cores or the like from said flasks after deposition of said molds, cores or the like on said second conveyor while said flasks are in their inverted position, said method comprising the steps of substantially continuously

filling each of said flasks in turn with sand and binder mixture when each flask is in an upright position,

compacting said sand-binder mixture in each of said flasks,

allowing at least partial curing of the binder of said sand-binder mixture so that the sand-binder mixture in said flask will remain intact as a sand mold, core, or the like when inverted and separated from said flask,

inverting each of said flasks in turn, and bringing said sand mold, core or the like in each of said flasks in turn into abutting engagement with said second conveyor,

effecting release of said sand mold, core or the like from each of said flasks in turn while said flasks are in said inverted position, and

bringing said flasks back into an upright position for receipt of further sand-binder mixture therein for formation of additional sand molds, cores or the like.

4,106,546

METHOD FOR INDUCTIVELY STIRRING MOLTEN STEEL IN A CONTINUOUSLY CAST STEEL STRAND

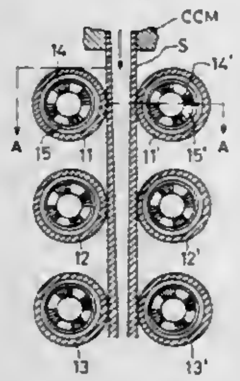
Yngve Sundberg, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Continuation-in-part of Ser. No. 705,164, Jul. 14, 1976, abandoned, which is a continuation of Ser. No. 552,937, Feb. 25, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,850

Claims priority, application Sweden, Feb. 27, 1974, 7402575

Int. Cl.^{2} B22D *27/02. 11/128*

U.S. Cl. 164—49 **1 Claim**



1. A method for inductively stirring molten steel contained in a solidifed steel skin of a travelling continuously cast steel strand by means of inductive stirrer coils supplied with multiphase a-c and which are positioned tranversely adjacent to the travelling strand, said method comprising powering said coils with multiphase a-c having a frequency between ρ/τ^2 and $2\rho/\tau^2$ where τ is the pole pitch of the travelling current field in said coils and ρ the electric resistivity of the strand in ohm mm^2/mm said pole pitch τ selected so as to obtain a frequency between approximately 2.4 and 4.8 Hz.

4,106,547

METHOD AND ARRANGEMENT FOR REMOVING A COOLED STRAND FROM A CONTINUOUS CASTING INSTALLATION

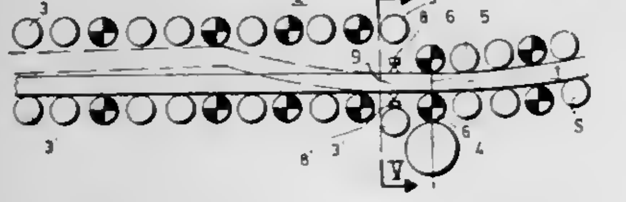
Friedrich Flückiger, Einsiedeln, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Apr. 25, 1977, Ser. No. 790,179

Claims priority, application Switzerland, Apr. 27, 1977, 5247/77

Int. Cl.^{2} B22D *11/00*

U.S. Cl. 164—82 **18 Claims**



1. A method of removing a cooled off stationary arcuate cast strand moving in a predetermined casting direction from a continuous casting installation, which installation includes a withdrawal and straightening zone having a pressure-exerting upper surface for bending said strand, comprising the steps of:
(a) raising said upper surface so as to permit advancement of said cooled off strand in the casting direction;
(b) advancing said cooled off strand in the casting direction;
(c) heating said cooled off strand to a temperature sufficient to enable said strand to be bent by said upper surface, said heating being carried out at a selected location such as to permit at least partial straightening of said strand via said upper surface; and
(d) bending said strand at said location while the latter is at said temperature by lowering said upper surface and thereby exerting pressure on said strand.

4,106,548

MASS FOR PRODUCTION OF CORES AND CASTING MOULDS

Pawel Murza-Mucba, Warsaw; Zbigniew Koszarewski, Raszyn; Wnjciech Ostaszewski, and Stanislaw Peksa, both of Warsaw, all of Poland, assignors to Politecbnika Warszawska, Warsaw, Poland

Filed Nov. 3, 1976, Ser. No. 739,533

Int. Cl.^{2} B22D *29/00*

U.S. Cl. 164—132 **13 Claims**

1. A composition for producing cores and casting molds consisting essentially of 100 parts by weight of sand, 0.5 to 30 parts by weight of at least one alkali metal hydroxide, 1 to 40 parts by weight of at least one alkali metal carbonate, 1 to 15 parts by weight of water and 0.2 to 10 parts by weight of a hydrophilic binder.

4,106,549

ARRANGEMENT FOR TRANSPORTING AWAY STRAND PIECES

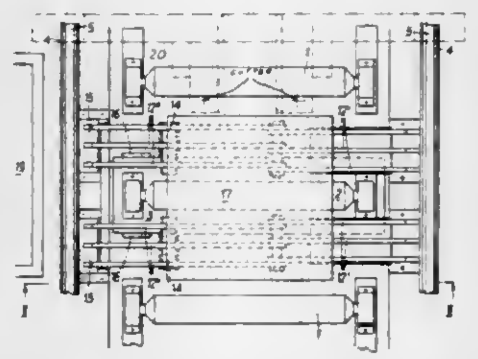
Werner Scheurecker, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,520

Claims priority, application Austria, Jan. 16, 1976, 267/76

Int. Cl.^{2} B22D *11/12*

U.S. Cl. 164—263 **6 Claims**



1. In an arrangement for transporting away strand pieces, in particular crop ends, cut off in a continuous casting plant of the type including a base, a cutting means, a conveying path comprising a plurality of conveying rollers located after the cutting means in the travel direction of the strand pieces, a cut strand discharge means, and an inclined sliding path extending transversely to the conveying path, the improvement comprising:
a plurality of arms for the cut strand discharge means, said arms being pivotable over at least part of their longitudinal extension from a horizontal position downward into a tilted position; and
a lifting table vertically displaceable perpendicular to the conveying path and located below the arms of the cut strand discharge means so as to partially support them, at least one of the conveying rollers being arranged on the lifting table, the cut strand discharge means and the lifting table being arranged relative to one another so that lowering of the lifting table causes the arms of the cut strand discharge means, over at least part of their longitudinal extension, to pivot downward into the tilted position due to the weight of a cut off strand piece so as to provide the inclined sliding path for the strand piece.

4,106,550

PINCH ROLL STAND FOR USE IN MULTI-STRAND CONTINUOUS CASTING MACHINE

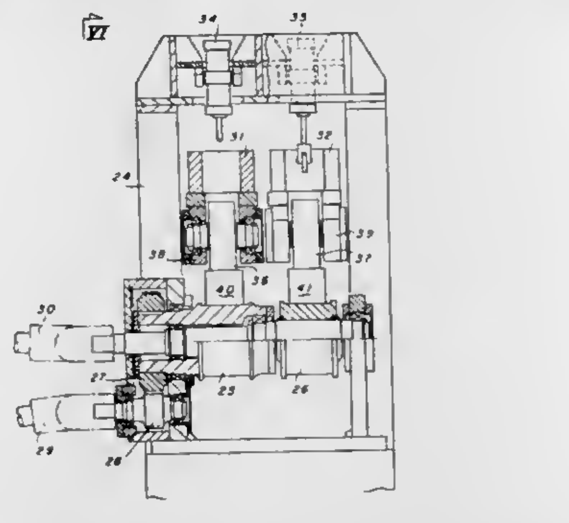
Yutaka Tsuchida, Yokosuka, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Jan. 24, 1977, Ser. No. 762,134

Claims priority, application Japan, Jan. 27, 1976, 51-7602

Int. Cl.^{2} B22D *11/12*

U.S. Cl. 164—448 **5 Claims**



1. A pinch roll stand for use in a multi-strand continuous casting machine, comprising a plurity of pinch-roll assemblies supported in said stand, each assembly comprising a first hollow pinch roll and a second pinch roll having a bearing neck rotatably extending through said hollow pinch roll coaxially thereof, and means for driving said first and second pinch rolls in each assembly individually and independently of each other.

4,106,551

ROLLER ASSEMBLY IN THE GUIDE PATH OF A CONTINUOUS CASTING MACHINE FOR BEAM BLANKS

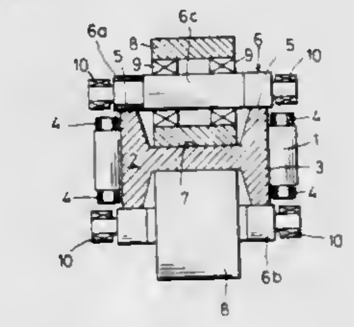
Yuuji Inoue, Amagasaki, Japan, assignor to Concast AG, Zurich, Switzerland

Filed May 13, 1977, Ser. No. 796,530

Claims priority, application Japan, May 18, 1976, 51-63587[U]

Int. Cl.^{2} B22D *11/12;* **B21B** *13/10*

U.S. Cl. 164—448 **7 Claims**



1. A roller assembly for use in the guide path of a continuous casting machine for casting sections, especially beam blanks having a web portion and to each side thereof an outer flange having an outer flange face and flange tips, comprising:
first roller means for rotationally abutting against the outer flange faces of the beam blank;
second roller means for rotationally abutting against each pair of flange tips at each side of the beam blank;
said first roller means and said second roller means having rotational axes which extend substantially perpendicular to one another;
third roller means for rotationally abutting against opposite sides of the web portion of the beam blank;
the rotational axes of said third roller means extending substantially coaxially with respect to the corresponding rotational axes of said second roller means; and
means for mounting the coaxial second roller means and third roller means on at least one side of the beam blank to rotate relative to one another.

4,106,552

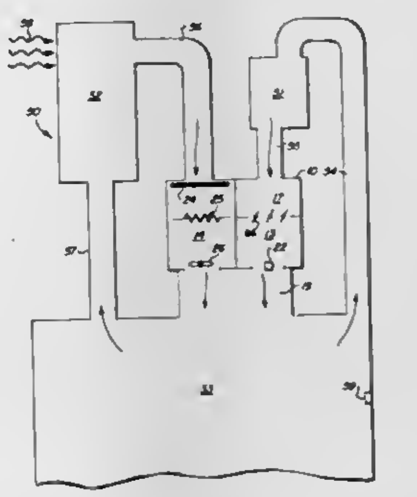
METHOD OF AIR-CONDITIONING EMPLOYING VARIABLE TERMINAL BOX

Jerrold L. Hufford, Phoenix, Ariz., assignor to Armer Construction Company, Phoenix, Ariz.

Division of Ser. No. 641,755, Dec. 17, 1975, Pat. No. 4,008,756. This application Jan. 17, 1977, Ser. No. 759,862

Int. Cl.^{2} F25B *29/00;* **F24J** *3/02;* **F28F** *27/02*

U.S. Cl. 165—2 **4 Claims**



1. A method of air conditioning an enclosure comprising the steps of:
circulating cool air from a source of cool air through a variable volume terminal, into an enclosure to be air conditioned and back to the source of cool air in a first passageway,
circulating heated air from a source of heated air through said terminal into the enclosure when a damping means in said terminal is actuated to reduce the flow of cool air through said first passageway a predetermined amount, and
periodically additionally heating said heated air from said source of heated air when the temperature of the air from said source of heated air fails to reach the temperature called for by a thermostat in the enclosure,
the circulating of heated air through said second passageway is controlled by the pneumatic pressure in said first passageway.

4,106,553

SEALING DEVICE FOR A ROTARY REGENERATIVE HEAT EXCHANGER

Kenya Nakamura, Okazaki, and Hiroshi Okano, Susono, both of Japan, assignors to Toynta Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 17, 1976, Ser. No. 715,249

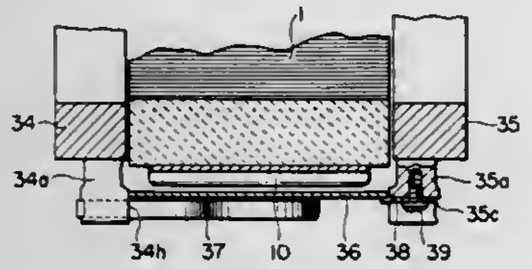
Claims priority, application Japan, Apr. 26, 1976, 51-46661

Int. Cl.^{2} F28D *19/00*

U.S. Cl. 165—9 **9 Claims**

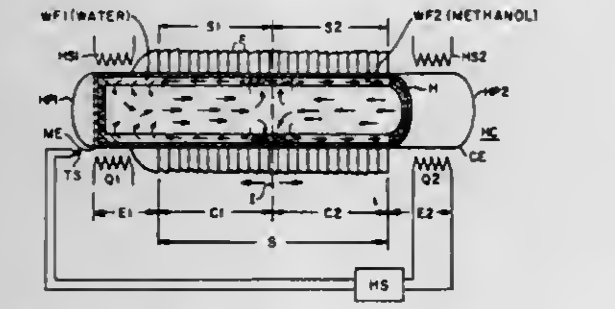
1. A sealing device for a rotary type regenerative heat exchanger comprising a rotary regenerative body having a pair of opposed generally planar parallel side surfaces, a pair of flat, rigid seal ring portions each positioned to extend through 360°, respectively, over said opposed surfaces on opposite sides of said rotary regenerative body, with a predetermined minute clearance spacing being maintained between each of said seal ring portions and the respective side surfaces of said regenerating body, at least a pair of cross bar portions provided one for each of said seal ring portions and extending crosswise over

said opposed side surfaces of said regenerative body from one position on a peripheral edge portion of each of said seal ring portions to another symmetrically opposite position on the same peripheral edge portion of said seal ring portion, with a predetermined minute clearance spacing being maintained between each cross bar portion and the respective side surface of said regenerative body, spacer means for maintaining clearances between said side surfaces of said rotary regenerative body and said respective seal ring portions to a predetermined value, said spacer means including spring means extending about said rotary regenerative body between respective peripheral edge portions of said seal ring portions to provide support for said seal ring portions relative to said regenerative body, cover means acting both as support means for said heat exchanger and to define fluid flow passages for said regenerative body, bellows means resiliently connected between said cover means and said rigid seal ring portions to cooperate with said cover means both to assist in supporting said seal ring portions and define said fluid flow passages, and resiliency means on said cross bar portions for imparting thereto flexibility in order to accommodate possible deformations in the central portions of said regenerative body due to thermal effects.



4,106,554
HEAT PIPE HEAT AMPLIFIER

Frank G. Arcella, Bethel Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 25, 1977, Ser. No. 818,779
Int. Cl.² F28D *15/00*
U.S. Cl. 165—32 **8 Claims**



1. A heat pipe amplifier apparatus, comprising,

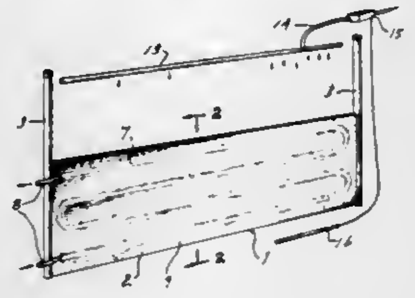
a heat pipe combination means including a first and second heat pipe means each having an evaporator section and a condenser section, said first and second heat pipe means being coupled such that said condenser sections combine to form a common condenser section,

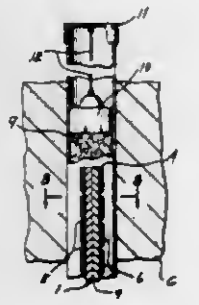
heat sink means operatively coupled to said common condenser section, and

a first working fluid operatively associated with said first heat pipe means and a second working fluid associated with said second heat pipe means, said first and second working fluids being in contact in said common condenser section, the vapor pressures of the respective working fluids being different at a common temperature.

4,106,555
GROUND HEAT EXCHANGER

Yvan Quintal, 12,663 Fortin St., Montreal North, Canada
Filed Oct. 21, 1976, Ser. No. 734,738
Int. Cl.² F28D *15/00*
U.S. Cl. 165—45 **7 Claims**



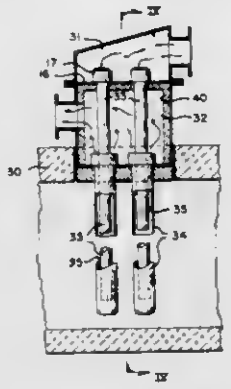


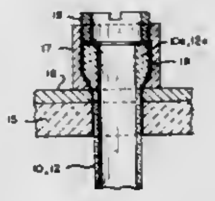
1. A ground heat exchanger operatively comprising a plate of heat-conducting material having a pair of opposite lateral edges and carrying a fluid circulating coil arranged in heat-conducting relation therewith, a pair of tubes each having a longitudinal slit extending through the wall thereof, and each having one of said opposite lateral edges of the plate slidably engaged therein, the walls of said tubes providing apertures communicating the interior of said tubes with the opposite outer surfaces of the plate, and a flowable heat-conducting material operatively contained in said tubes and outwardly flowable under pressure through said apertures against the opposite outer surfaces of said plate and filling spaces and gaps eventually occurring between said plate and the surrounding ground.

4,106,556
CERAMIC TUBE RECUPERATORS

Fred M. Heyn, Export; Ching-Feng Yin, Pittsburgh; Gordon L. Hanson, Bethel Park, and Robert C. Schreck, Monroeville, all of Pa., assignors to Thermal Transfer, Division of Kleinewefers, Monroeville, Pa.
Filed Nov. 26, 1976, Ser. No. 745,297
Int. Cl.² F28F *9/10*
U.S. Cl. 165—81 **5 Claims**

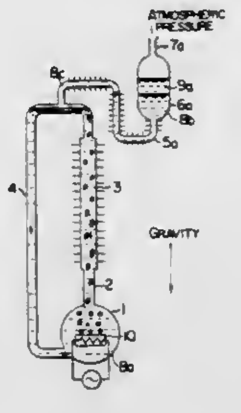
1. A recuperator having a chamber traversed by combustion gases, the improvement comprising a plurality of outer ceramic outer tubes in contact with said combustion gases, said tubes being closed at their bottom ends and open to a first manifold at their top, a like plurality of inner ceramic tubes extending coaxially within the outer tubes and forming an annulus therebetween and open at the bottom ends spaced from the end of the outer tube, the upper end of said inner tubes open to a second manifold, whereby gases to be heated pass through said second manifold, through the inner tube, through the annulus between the inner and outer tubes and out through the first manifold, suspension means in each manifold removably and sealingly receiving and supporting said inner and outer tubes respectively in each said manifold.





4,106,557
OPEN-TYPE BOILING COOLING APPARATUS

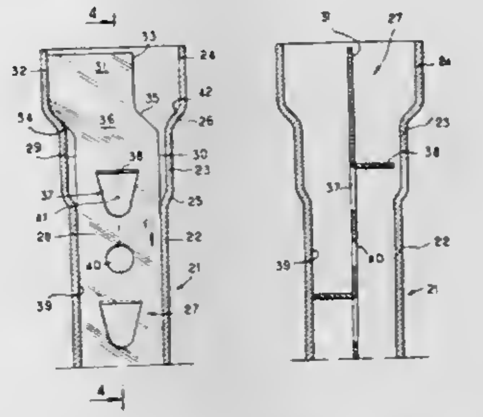
Hisao Sooobe, Ibaraki; Sadayuki Okada, Katsuta; Etsuo Oe, Hitachi; Hideo Tsukioka, Mito, and Moriichi Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Sep. 8, 1976, Ser. No. 721,409
Claims priority, application Japan, Sep. 20, 1975, 50-114002
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **32 Claims**



1. An open-type boiling cooling apparatus comprising: a boiling refrigerant, a cooling vessel including an evaporator section containing said boiling refrigerant and adapted to transfer the heat of a heat generating member to the refrigerant, and a condenser section completely filled with the refrigerant in a liquid state when one of no cooling or slight cooling of the heat generating member is effected, said condenser section during a cooling of the heat generating member accommodating the refrigerant in a gaseous state by displacing an amount of liquid refrigerant therefrom and liquefying the gaseous refrigerant contained therein; said condenser section becoming larger and accommodating a greater volume of gaseous refrigerant in proportion to a quantity of heat generated by the heat generating member, a liquid refrigerant reservoir means open at an upper end thereof and being adapted to store a volume of the liquid refrigerant which does not directly take part in a cooling operation of the heat generating member when a cooling operation is performed; and a communication means for communicating said condenser section with said liquid refrigerant reservoir means such that the amount of liquid refrigerant displaced by the gaseous refrigerant in the condenser section is accommodated in the liquid reservoir means during a cooling operation with the liquid refrigerant being returned to the condenser section when the cooling operation is terminated.

4,106,558
DEFLECTOR FOR HEAT EXCHANGER TUBE, ITS MANUFACTURING METHOD AND EXCHANGER COMPRISING SUCH DEFLECTORS

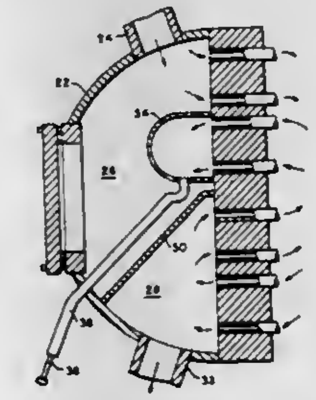
René Elie Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed Jun. 28, 1976, Ser. No. 700,485
Claims priority, application France, Aug. 6, 1975, 75 24538
Int. Cl.² F28F *1/40, 13/12, 9/24*
U.S. Cl. 165—109 **5 Claims**



5. A heat exchanger having manifolds, water headers, liquid circulation tubes extending between said manifolds, and deflectors within said tubes, said deflectors each comprising a band (strip) of constant width substantially equal to the inner diameter of the tube and one end of which has the same width and is coplanar to at least the part of the body of the band (strip) which is in the vicinity of said end, the lateral edges of said end being oblique relatively to the lateral edges of said body, in such a manner as to oppose escaping from the tube by abutment when the deflector is swept by the circulating liquid.

4,106,559
TUBE SIDE FLOW CONTROL DEVICE FOR MOISTURE SEPARATOR REHEATERS

Paul D. Ritland, Upper Darby Township, Delaware County, and Thomas J. Rabas, Broomall, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 29, 1976, Ser. No. 755,385
Int. Cl.² F28B *9/02, 9/08, 11/00;* **F28F** *9/02*
U.S. Cl. 165—111 **8 Claims**



1. A heat exchanger for transferring heat from a first fluid to a second fluid with the first fluid changing phase from a vapor to a liquid, said heat exchanger comprising:

a shell;

a tube sheet having a plurality of holes therethrough;

a plurality of tubes arranged in said shell so as to be exposable to said second fluid, said tubes having at least one end thereof disposed in said tube sheet holes;

a chamber cooperatively associated with said shell and tube sheet;

a dividing means for separating said chamber into an inlet and an outlet portion;

an inlet opening in said chamber for providing fluid communication for said first fluid to said inlet portion;

a manifold being disposed in said chamber so as to be in fluid communication with a plurality of said tubes causing a portion of said first fluid vapor to make four passes through said tubes;

an outlet opening in said chamber for providing fluid communication for said first fluid from said outlet portion, said outlet opening being disposed in said chamber between said second and third passes where a plenum is disposed which can separate the first fluid liquid condensed in said first and second passes from said first fluid vapor prior to said first fluid vapor entering said third pass;

a vent line providing fluid communication from the exit of said fourth pass tubes to a lower pressure source, said vent line exclusively transmitting all fluid exiting said fourth pass, said fluid constituting a two phase mixture of vapor and liquid; and said vent line being disposed to vent a two-phase mixture of vapor and liquid therethrough; and

a means for predictably controlling the flow rate of said two-phase mixture through said vent line whereby said first fluid vapor remaining after passing through said first and second passes is drawn through said third and fourth passes where a part of it is condensed into a liquid.

4,106,560

FALLING-FILM HEAT EXCHANGER

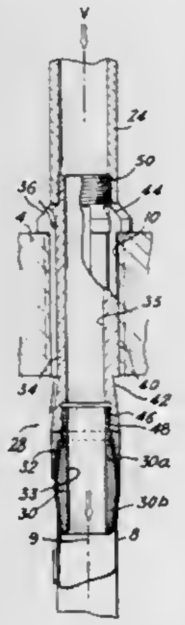
Fernand Lauro, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 17, 1977, Ser. No. 797,826

Claims priority, application France, May 26, 1976, 76 16047

Int. Cl.² F28B *9/00;* **F28D** *7/00;* **F28F** *9/02;* **F17C** *7/02*

U.S. Cl. 165—159 **7 Claims**



1. A thin falling-film heat exchanger of the type comprising within a fluid-tight shell a plurality of vertical flexible tubes for the circulation of primary fluid within said tubes and for the flow of secondary fluid over the external wall of said tubes, at least one horizontal tube plate pierced by holes and primary fluid distribution means, an admission chamber for said secondary fluid being defined in the upper portion of said shell by said tube plate and traversed by said primary fluid distribution means, wherein the upper end of each tube aforesaid is fixed on a unit which is of revolution with respect to the axis of the tube so as to be applied against said tube plate and connected to primary fluid distribution means, said unit being provided with an internal passage for said primary fluid and constituted by a sliding annular ring and by two so-called first and second members, said first member being provided externally with at least one frusto-conical surface so designed as to ensure attachment of said tube by cooperating with the internal wall of complementary surface of said ring, said second member being such as to have a cylindrical external surface provided with grooves extending to a height at least equal to the thickness of said tube plate in such a manner as to ensure that passages for the downflow of said secondary fluid are defined with the internal wall of a hole of said tube plate.

4,106,561

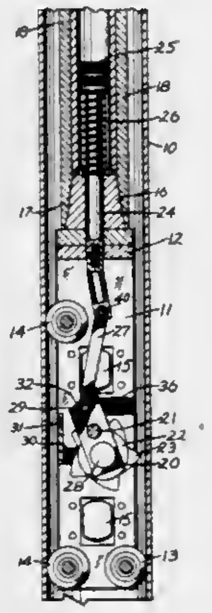
WELL CASING PERFORATOR

Robert J. Jerome, 3726 Mount Ave., Arlee, Mont. 59801, and Art Baum, P.O. Box 155, Arlee, Mont. 59821

Filed May 12, 1977, Ser. No. 796,226

Int. Cl.² E21B *43/112*

U.S. Cl. 166—55.2 **7 Claims**



5. An apparatus for perforating a well casing located within a bore hole, comprising:

an elongated body having a central longitudinal axis, said body being of a size to be received within the well casing;

guide means mounted on said body for engagement with the well casing;

carrier means pivotably mounted on said body about a first fixed axis perpendicular to said central longitudinal axis;

wheel means having a plurality of peripheral outwardly extending teeth;

means rotatably mounting said wheel means on said carrier means about a second axis parallel to said first axis and spaced to one side thereof;

movable piston means slidably mounted on said body, for motion parallel to said central longitudinal axis;

means for selectively moving said piston means in one direction;

link means pivotally interconnecting said movable piston means and said carrier means about axes respectively parallel to said first axis for imparting pivotal movement to said carrier means about said first axis in response to movement of said piston means relative to said body in said one direction, whereby the carrier is moved between a first position having said teeth spaced inwardly from the well casing to a second position having said teeth in friction engagement with the well casing;

and means for moving said body relative to the well casing in said one direction for moving said carrier means from said second position to a third position, causing the teeth to perforate the well casing.

4,106,562

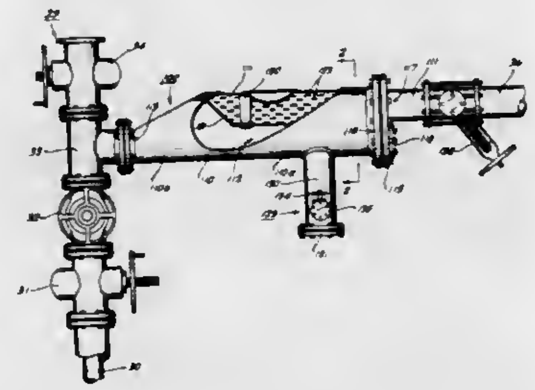
WELLHEAD APPARATUS

Michael L. Barnes, Sebastopol, and Ollo D. Whitescarver, Santa Rosa, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed May 16, 1977, Ser. No. 797,176

Int. Cl.² E21B *43/00*

U.S. Cl. 166—97 **12 Claims**



1. A debris separating device for separating and accumulating debris flowing with fluids produced from a well, which comprises:

a first conduit defining an accumulation chamber having a substantially horizontal axis;

adaptor means to provide fluid tight communication between said first conduit and said well and defining an inlet for receiving the fluids and debris from said well, said inlet having a smaller cross-sectional area than said first conduit;

closure means for sealing the outlet end of said first conduit and defining an outlet aperture of a smaller cross-sectional area than said first conduit;

a second conduit extending through said outlet aperture and into said chamber, said second conduit including a perforated section disposed within said chamber to provide fluid communication between said second conduit and said chamber and to prevent passage therebetween of said debris; and

access means communicating into said accumulation chamber to facilitate the periodic removal of accumulated debris from said chamber.

4,106,563

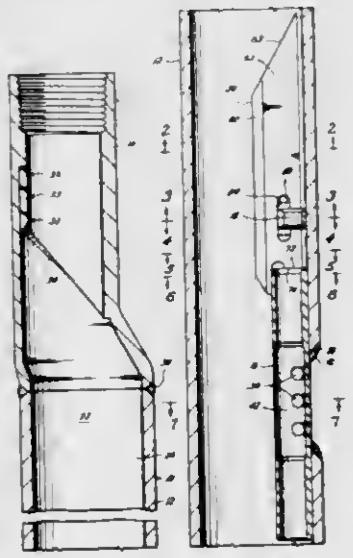
SIDEPOCKET MANDREL

Alvin O. Gatlin, Houston; Gilbert H. Tausch, Sugar Land, and Fred E. Watkins, Houston, all of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Nov. 3, 1977, Ser. No. 848,008

Int. Cl.² E21B *23/02*

U.S. Cl. 166—117.5 **8 Claims**



1. A mandrel for use in a well tubing comprising,

a body having an open bore extending therethrough for alignment with the well tubing and having an offset bore adjacent the open bore, said body having an opening in communication with the offset bore,

a valve pocket positioned inside the body in the offset bore and beside the body opening for receiving flow control devices,

a deflector guide positioned in the offset bore above the pocket and having a pair of rails forming a guide path between for allowing the entrance of flow control devices into said pocket but preventing the entrance of open bore tools into the guide path,

the top of the deflector guide extending upwardly and outwardly from the open bore for providing a deflecting surface which prevents open bore tools from catching on the guide or on any device in the pocket,

said deflector guide and said pocket being telescopically secured together for insuring alignment therebetween,

a locking lug secured to the deflector guide above said pocket, said lug being of a material having a greater resistance to corrosion than said deflector guide,

an intergrally forged sub welded to the top of the body, said forged sub including an actuating shoulder angularly spaced from the axis of the offset pocket a predetermined amount, and a guide surface positioned below said shoulder and directed upwardly towards said shoulder.

4,106,564

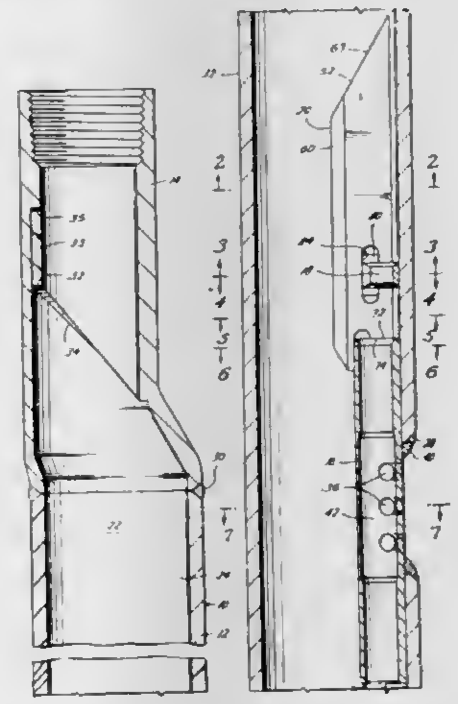
SIDEPOCKET MANDREL

Gilbert H. Tausch, Sugar Land, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Nov. 3, 1977, Ser. No. 848,053

Int. Cl.² E21B *23/00*

U.S. Cl. 166—117.5 **3 Claims**



1. A mandrel for use in a well tubing having a body having an open bore extending therethrough for alignment with the well tubing and having an offset bore adjacent the open bore, said body having an opening in communication with the offset bore, said body having a top and bottom adapted to be connected to well tubing, orientation means in the top in the open bore, a valve pocket positioned inside the body in the offset bore and besides the body opening for receiving flow control devices, a deflector guide positioned in the offset bore above the pocket and having a pair of rails forming a guide path therebetween for allowing the entrance of flow control devices into said pocket but preventing the entrance of open bore tools into the guide path, the top of the deflector guide extending upwardly and outwardly from the open bore for providing a deflecting surface which prevents open bore tools from

catching on the guide or on any device in the pocket, and a locking lug secured to the deflector guide above said pocket, the improvement comprising

said deflector guide and said pocket being telescopically secured together for insuring alignment therebetween.

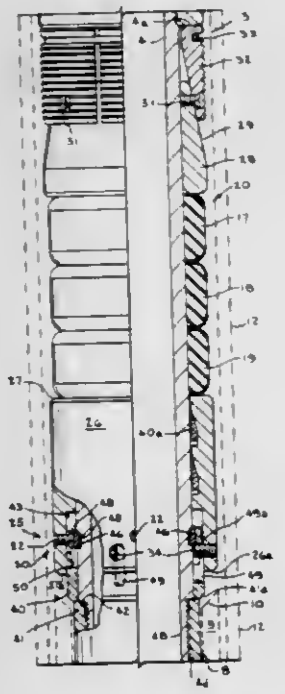
4,106,565
SEAL NIPPLE PACKER

Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Filed Apr. 15, 1977, Ser. No. 787,856

Int. Cl.^{2} E21B *23/00*

U.S. Cl. 166—118 **4 Claims**



1. In a seal nipple packer having a tubular member with seals thereon for sealing in a receptacle supported in a well string, the invention including:

a. expandable seal means on the tubular member for sealing with the well string above the receptacle;

b. actuating means including a setting sleeve movable on the tubular mandrel for expanding said expandable seal means into engagement with the well string;

c. releasable retaining means engaged with said actuating means and the tubular member to retain said actuating means in a non activated position until said releasable retaining means is actuated by engagement of said actuating means with the receptacle;

d. additional means to inhibit premature release of said releasable retaining means as the seal nipple packer is lowered through the well string, said additional means including:

1. an annular groove on the tubular member;
2. a split keeper ring in the groove;
3. a releasing sleeve which at one end thereof abuts a shoulder on the tubular member, said releasing sleeve being telescopically received within said setting sleeve and having a portion overlapping and abutting said keeper ring to retain it in the groove in the tubular member;
4. projection means secured with said setting sleeve and abutting said releasing sleeve and keeper ring; and
5. said releasable retaining means securing said setting sleeve and said releasing sleeve together to retain said projection means in abutting relationship with said releasing sleeve and keeper ring and to retain said releasing sleeve in abutting relationship over said keeper ring.

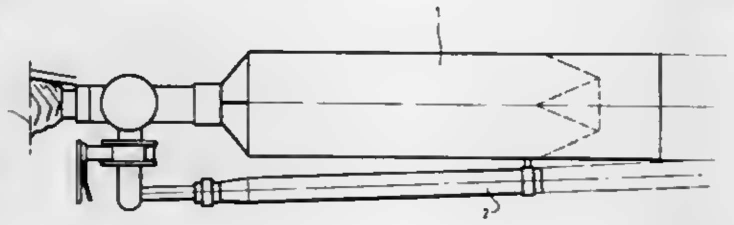
4,106,566
PROCESS FOR THE UTILIZATION OF LOW AND MEDIUM EXPANDED FOAM FOR THE EXTINCTION OF FIRES FROM LIQUEFIED PRODUCTS

Guy Dion-Biro, Vinceanes, France, assignor to Biro Fils, Paris, France

Filed Aug. 2, 1976, Ser. No. 711,085

Int. Cl.^{2} A62C *1/12, 31/12*

U.S. Cl. 169—44 **2 Claims**



1. A process for the simultaneous utilization of low expanded foam and medium expanded foam from respective generators thereof for the extinction of fires from liquefied gas and other burnable substances, said low expanded and medium expanded foams being relatively faster and slower traveling, said process comprising directing a plurality of jets of low expanded foam in a circular arrangement beneath a jet of medium expanded foam such that the jets of low expanded foam and the jet of medium expanded foam are inclined at angles between 8° and 12°, transporting the medium expanded foam by the faster traveling low expanded foam in order to provide a high velocity of flow and a greater range of the medium expanded foam, the jets of low expanded foam being set back from the jet of medium expanded foam for slicing off a lower portion of the jet of medium expanded foam.

4,106,567
SOIL CULTIVATING IMPLEMENTS

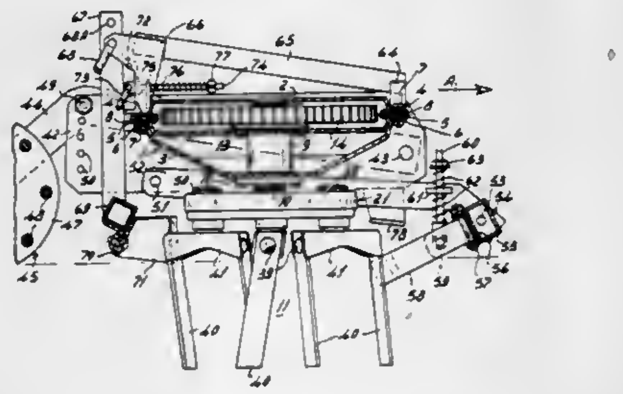
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 16, 1976, Ser. No. 723,726

Claims priority, application Netherlands, Sep. 19, 1975, 7511052

Int. Cl.^{2} A01B *33/06*

U.S. Cl. 172—59 **11 Claims**



1. A soil cultivating implement comprising a frame and a plurality of soil cultivating members mounted on a portion of said frame, each of said members being rotatable about a corresponding first axis defined by an upwardly extending shaft supported on said frame portion, driving means connected to rotate said cultivating member about said first axis, said member comprising a support and tine means depending from said support, said tine means being rotatable about a second upwardly extending axis that is rotated around said first axis, said tine means comprising two spaced apart tines having respective fastening portions connected to said support, said tines having respective elongated operative portions which extend substantially parallel to a plane that passes through said second axis and said plane being normal to a line passing between the fastening portions of the tines, said operative portions being inclined to a further plane that passes through said line and the second axis.

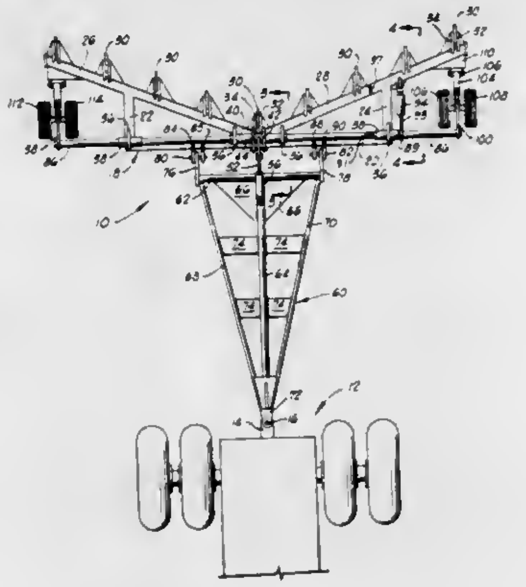
4,106,568
CHISEL PLOW WITH ADJUSTABLE TOWING TONGUE AND GAUGE WHEELS

Ted L. Cline, Box 37, Rush Springs, Okla. 73082

Filed Dec. 2, 1976, Ser. No. 746,697

Int. Cl.^{2} A01B *13/08, 63/22*

U.S. Cl. 172—327 **12 Claims**



12. In a chisel plow including a framework having a pair of blade-supporting frame bars angled to each other in a horizontal plane to define a V in configuration, and further having chisel blades mounted on said frame bars and projecting downwardly therefrom, the improvement which comprises:

a transversely extending frame bar at the forward side of said framework;

a towing tongue pivotally connected to the forward side of the framework for pivotation about a horizontal axis;

means for pivoting the tongue and framework relative to each other between a first position in which the framework is in coplanar alignment with the towing tongue, and other positions in which the framework is angulated with respect to the towing tongue;

gauge wheels pivotally mounted on opposite ends of said frame bar and movable with the framework in relation to the towing tongue;

an elongated, transversely extending control member mounted rotatably on said transversely extending frame bar for rotation about a horizontal axis extending transversely across the direction of travel of the plow when plowing;

crank means connected between said transversely extending control member and said gauge wheels for pivoting the gauge wheels on the framework when said transversely extending control member is rotated; and

means for rotating said transversely extending control member independently of the angulation adjustment of said framework with respect to said towing tongue, whereby said gauge wheels may be independently adjusted with respect to said towing tongue to facilitate independent control of blade depth and blade earth penetration angle.

4,106,569
APPARATUS FOR APPLYING AN IMPACT FORCE

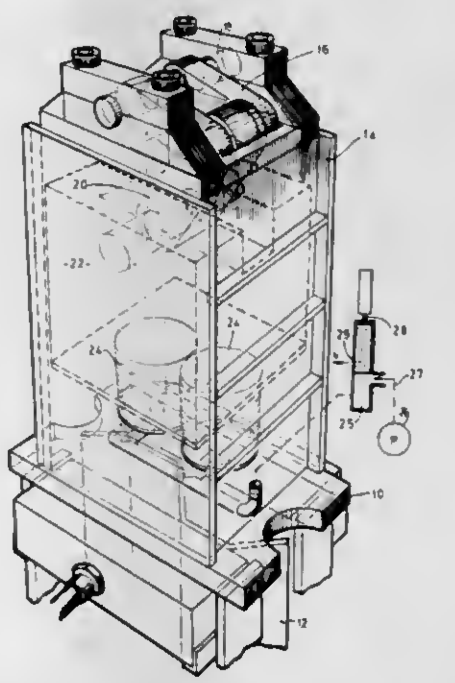
Harry Edgworth, 35a Broad Oaks Rd., Solihull, West Midlands, England, and Frederick Edgworth, Solihull, England, assignors to Harry Edgworth, England

Filed Feb. 6, 1976, Ser. No. 655,906

Claims priority, application United Kingdom, Feb. 14, 1975, 6248/75

Int. Cl.^{2} E02D *7/18*

U.S. Cl. 173—1 **14 Claims**



1. An apparatus for applying a high force to an object, such apparatus comprising:

a. a frame,

b. a driving member mounted on the frame and adapted to engage the object,

c. a weight mounted on the frame for reciprocating movement relative thereto, and

d. means for causing the weight to perform said reciprocating movement including means to cause sudden retardation of the weight at one stage during each complete reciprocation, the high force arising from the sudden retardation being transmitted from the weight to the object without impact, as herein defined.

4,106,570
ANGLE SENSING TOOL FOR APPLYING TORQUE

Siavash Eshghy, Pittsburgh; George D. Hall, Oakmont, and Dennis R. Hammerle, Pittsburgh, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,429

Int. Cl.^{2} B23Q *5/027*

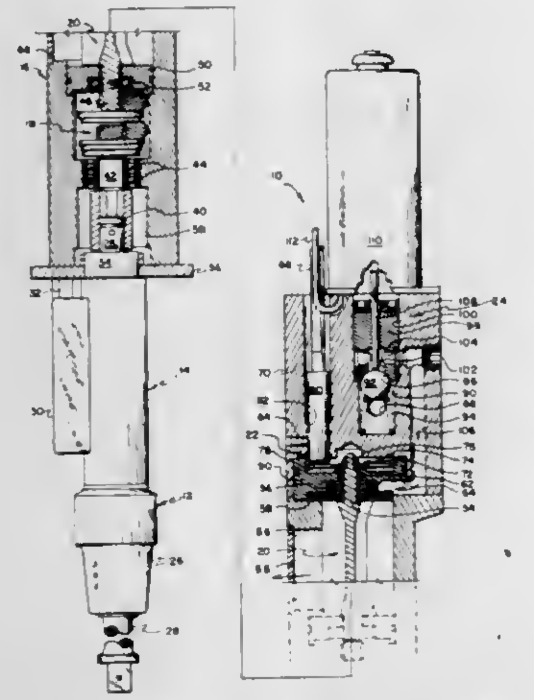
U.S. Cl. 173—12 **15 Claims**

1. A tool comprising

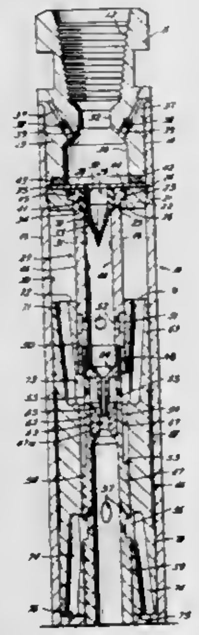
means for applying torque to a workpiece;

means for determining rotation of the torque applying means;

means for sensing torque applied to the workpiece; and means for compensating for torsional twist in the torque applying means including means correcting the rotational determinations as a function of applied torque and the torsional stiffness of the torque applying means.



4,106,571
PNEUMATIC IMPACT DRILLING TOOL
Charles W. Stone, Garden City, Mich., assignor to Reed Tool Co., Houston, Tex.
Filed Dec. 6, 1976, Ser. No. 747,769
Int. Cl.² B25D *17/14*
U.S. Cl. 173—64 **5 Claims**



1. An impact drilling tool for connection in a string of drilling pipe comprising

an upper sub for connection to said drilling pipe,

a casing with an upper end connected to said upper sub,

an anvil member slidably positioned in the lower end of said casing and having a bit member on its lower end extending outside said casing,

a hammer piston in said casing above said anvil member for reciprocal movement longitudinally of said casing to strike said anvil member repeatedly.

a feeder tube for feeding compressed pneumatic fluid from said drilling pipe extending longitudinally of said casing through said hammer,

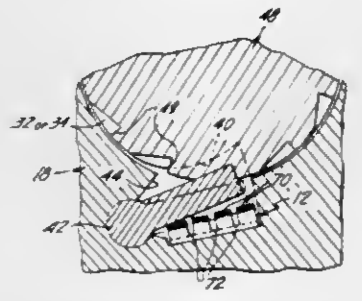
a plurality of passages and valve openings cooperable therewith in said feeder tube and said hammer piston to apply compressed pneumatic fluid to one end of said hammer piston when in one position and to the other end when said hammer piston is in another position, for effecting reciprocal movement thereof,

said casing and said sub defining an inlet chamber for receiving compressed pneumatic fluid in the inlet to said feeder tube,

at least one passageway in said tool opening from said inlet chamber diagonally through said sub to discharge pneumatic fluid upward and outward from said tool, and

a check valve positioned inside said passageway and opening to discharge fluid outside said tool and closing to prevent flow backward through said passageway into said tool.

4,106,572
PAWL SPRING ASSEMBLY FOR A ROTARY IMPACT MECHANISM
J. Edward C. Anderson, Moreland Hills, Ohio, assignor to Marquette Metal Products Co., Cleveland, Ohio
Filed Jul. 21, 1977, Ser. No. 817,830
Int. Cl.² B25D *15/00*
U.S. Cl. 173—93 **6 Claims**



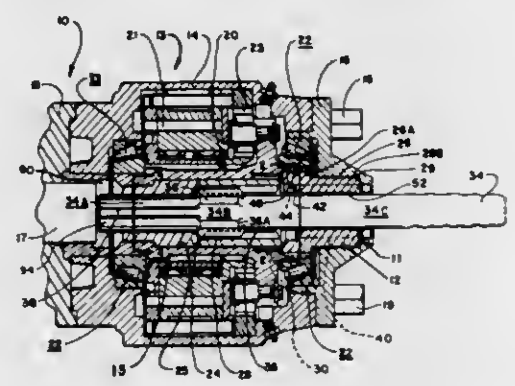
1. A pawl spring assembly for a rotary impact mechanism for tightening or loosening a fastener of the type comprising an input member, an output member and inertia member arranged in approximate symmetry about a common axis and journaled upon each other at mating, mutually telescoping, circular surfaces for independent angular movement about the common axis, a pawl and ratchet assembly for interconnecting the input and output members together for torque transmission, the pawl being carried by the inertia member and the ratchet connected for conjoined rotation with the output member, a power spring means interconnecting the input and inertia members for storing energy upon relative angular movement of the input and inertia members and for releasing the stored energy to accelerate angular movement of the inertia member, a cam coacting with the pawl upon relative angular movement of the input and inertia members to disengage the pawl from the ratchet and release the pawl for impact engagement with the ratchet to thereby rotatively drive the output member, the pawl spring assembly comprising:

a plurality of spring elements arranged to sequentially engage and load the pawl as the pawl is moved by the cam in a direction to disengage from the ratchet as the pawl is moved by said cam in a direction to disengage from a tooth of the teeth of the output member.

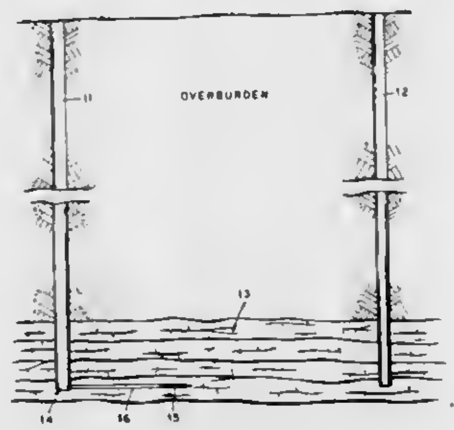
4,106,573
DRILL
Edward A. Bailey, Newport, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.
Filed Sep. 13, 1976, Ser. No. 722,811
Int. Cl.² B25D *9/00*
U.S. Cl. 173—106 **13 Claims**

1. In an actuator adapted to receive therein a drive portion of an elongated working member and including selectively energizable drive means engageable in rotary driving engagement with said drive portion for axial rotation of said working member, the improvement comprising:

said actuator including working member retention means rotatable with respect to said drive means to retain said drive portion in rotary driving engagement with said drive means during rotation of said working member in one rotary direction only.



4,106,574
METHOD FOR ESTABLISHING HIGH PERMEABILITY FLOW PATH BETWEEN BOREHOLES
Jerome P. Dow, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jul. 7, 1977, Ser. No. 813,551
Int. Cl.² E21B *7/00, 43/26*
U.S. Cl. 175—4.57 **6 Claims**



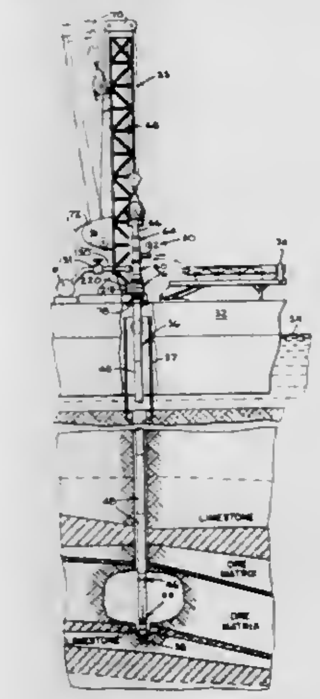
1. A method for establishing a high permeability flow path from a first borehole to a second borehole adjacent thereto in a subterranean formation which method comprises:

emplacing in the first borehole at a preselected depth a means for rapid penetration of terrestrial materials including an earth penetrating projectile and a means for delivering said projectile into the subterranean formation at an impact velocity sufficient for rapid penetration of subterranean materials;

orienting said means within the first borehole so as to enable rapid penetration of the subterranean formation by said earth penetrating projectile substantially along a preselected path from the first borehole to the second borehole; and

causing rapid penetration of the subterranean formation by said earth penetrating projectile, thereby establishing a high permeability flow path from the first borehole to the second borehole.

4,106,575
TOOL STRING AND MEANS FOR SUPPORTING AND ROTATING THE SAME
Phillip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.
Division of Ser. No. 704,277, Jul. 12, 1976, Pat. No. 4,077,481. This application Apr. 6, 1977, Ser. No. 785,142
Int. Cl.² E21C *45/00*
U.S. Cl. 175—170 **22 Claims**



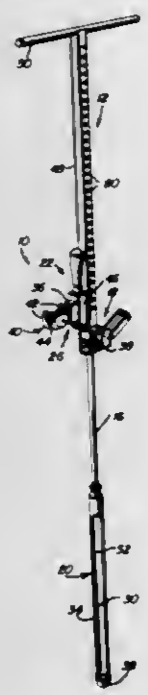
1. In a subterranean drilling and mining apparatus operable to both drill into subterranean deposits of ore and to mine the ore as a slurry; including a multi-section tool string having means defining an inner conduit and means defining an outer conduit, and a drill bit at the lower end of the tool string; the improvement which comprises a mining head connected to the upper end of said tool string during mining, a drilling head separate and independent from said mining head during drilling and adapted to be connected to each upper section of the tool string in turn during drilling and to the upper portion of the mining head during mining, first power means connected to said drilling head for supporting said tool string for vertical movement and for rotating said drilling head and tool string during drilling, and second power means for rotating only the outer conduit of each upper section in turn when adding sections to or removing sections from the portion of the tool string therebelow, said second power means rotating both said inner and outer conduit means of said tool string along with a portion of said mining head during mining.

4,106,576
SAMPLING TUBE CLEANING DEVICE
James M. Clements, R.R. #1, Box 162A, Newton, Iowa 50208
Division of Ser. No. 670,977, Mar. 26, 1976. This application Oct. 3, 1977, Ser. No. 838,576
Int. Cl.² G01N *1/00*
U.S. Cl. 175—313 **6 Claims**

1. A soil sample tube cleaning device, comprising a handle portion;

a cleaning head having a shaft which is connected to the handle portion;

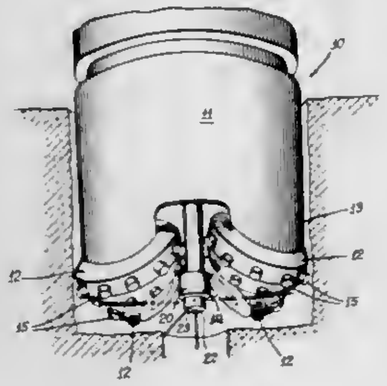
said cleaning head having a trough cleaner which is mounted to the shaft portion of said cleaning head so as to be at substantially a right angle to the longitudinal axis of said handle, adapted for being pulled along the length of a soil sample holding trough of a soil sample tube, and an end core removal member arranged for removal of the



end core of soil from the end of a sample tube by pulling on said handle portion.

4,106,577
HYDROMECHANICAL DRILLING DEVICE

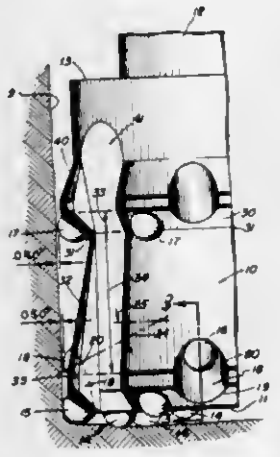
David A. Summers, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.
Filed Jun. 20, 1977, Ser. No. 808,161
Int. Cl.^{2} E21C *15/00*
U.S. Cl. 175—340 **1 Claim**



1. Rock drilling apparatus comprising:
a mechanical rock drilling tool in the form of an elongate cylindrical body having a longitudinal axis and a plurality of drilling teeth formed on rotatable cones and mounted on one end thereof;
a high pressure water jet nozzle mounted co-axially with said drilling tool body ahead of said drilling teeth and having orifices directed along said axis and at an angle with respect to said axis and adapted to drill a hole of relatively small diameter in rock in advance of a hole of relatively larger diameter formed by said drilling teeth;
said nozzle having a radial orifice for each of said rotatable cones and directed to cut rock immediately in advance of said drilling teeth; and
means for rotating said drilling tool about its longitudinal axis for performing its drilling function.

4,106,578
PERCUSSION DRILL BIT

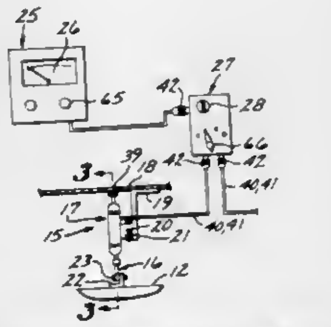
Leaman Rex Beyer, Box 207, Diamond, Mo. 64840
Filed May 4, 1976, Ser. No. 683,095
Int. Cl.^{2} E21B *9/22*
U.S. Cl. 175—407 **3 Claims**



1. In a rotary percussion drill bit having a cylindrical body portion having first and second ends with a flat bottom and a bevel face on one end and a shank axially aligned with said cylindrical portion on said other end, a first set of inserts of hard wear resistant material mounted in said body portion and projecting downwardly from said flat bottom and said bevel face, said body portion having a longitudinal groove means formed in said cylindrical body portion to provide a passage for dislodged chips and a peripheral groove means for passage of dislodged chips, said peripheral groove means formed around said cylindrical body portion intermediate said first and second ends, and at least a second set of inserts of wear resistant material spaced from said first set of inserts of wear resistant material mounted in said cylindrical body portion, an improvement comprising a peripheral chip storage groove means formed at the location of said peripheral groove means said peripheral chip storage groove means having a crossectional configuration of an obtuse angle when taken along the axis of said cylindrical body portion, said peripheral chip storage groove means having a maximum depth equal to or greater than 1/12 the diameter of said drill bit and having the side walls of said peripheral chip storage groove means tapered to form an obtuse angle from its deepest point toward said first and second set of inserts of wear resistant material, and therein said peripheral chip storage groove means give more storage for drill cuttings.

4,106,579
LOAD ANALYZER FOR AUTOMOTIVE VEHICLE

Marvin F. Hayes, Sr., and Marvin F. Hayes, Jr., both of 12424 Dawn La., Cerritos, Calif. 90701
Filed Mar. 25, 1977, Ser. No. 781,351
Int. Cl.^{2} G01G *19/08, 3/14*
U.S. Cl. 177—137 **3 Claims**

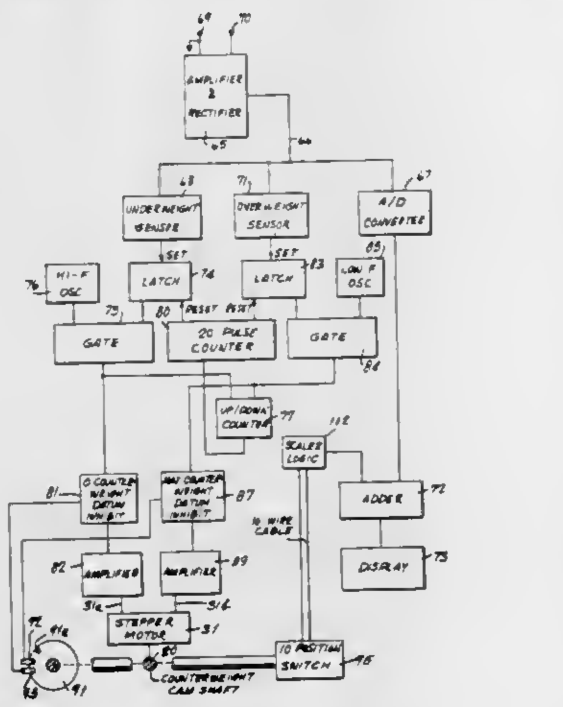


1. A load measuring system for use on an automotive vehicle in which a load bed is carried by vehicle axles in spring biased

arrangement to allow relative movement therebetween comprising:
a sensor having a pair of elements including primary and secondary induction coils with said primary connected to the vehicle electrical system to draw electrical power therefrom and wherein one of said sensor elements includes a ferromagnetic core mounted in reciprocal fashion relative to said secondary, whereby the position of said ferromagnetic core relative to said secondary varies the magnitude of said signal, and wherein said elements are longitudinally movable relative to each other, one of said elements being secured to said load bed and the other of said elements being secured to a vehicle axle for generating a signal indicative of relative position of said sensor elements;
indicator means connected to said sensor to receive said signal to provide an indication of weight in said load bed and connected to said secondary to receive an electrical signal provided therefrom;
adjustment means for altering the indication provided by said indicator means to allow recalibration of said sensor; and
a voltage regulation circuit coupled to said vehicle electrical system and means for transforming direct current to alternating current coupled to said voltage regulation circuit and to said primary.

4,106,580
FORCE MEASURING APPARATUS

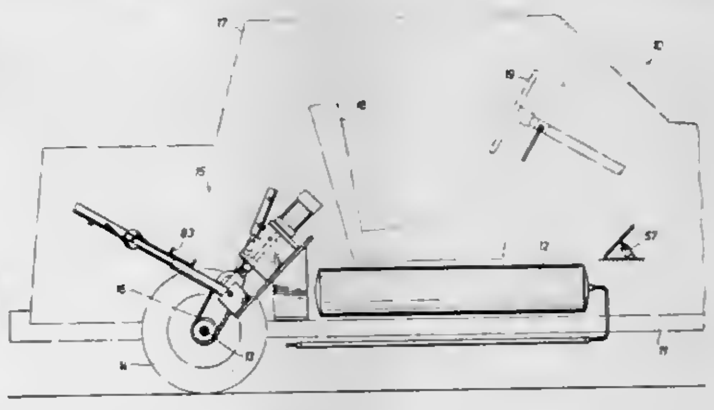
James J. DeMasters, Elmhurst, and Victor J. Musante, Garden City, both of N.Y., assignors to Brookline Instrument Company, Wallingford, Conn.
Filed Oct. 26, 1976, Ser. No. 735,146
Int. Cl.^{2} G01G *1/32*
U.S. Cl. 177—205 **11 Claims**



1. Force measuring apparatus, comprising:
a. a balance beam (I);
b. means (49,48,43,41) for applying a force to be measured to the balance beam;
c. counterweight means (38) operable to apply a balancing force to the balance beam in opposition to the force to be measured;
d. means (20, 21-29,33) for operating the counterweight means to vary the force thereof;
e. means (45 or 51,67,72) responsive to the position of the beam within a predetermined control range for producing a first digital signal representative of the load indicated by that position;
f. means (68,75,81,82; 71,84,87,89; and 31) responsive to movement of the beam to a limit of that range for driving the counterweight operating means in a sense tending to restore the beam to a position within that range;
g. means (95,102) actuated concurrently with the counterweight operating means for producing a second digital signal representative of the increment of force due to a change in the counterweight means;
h. means (72) for adding said first and second digital signals; and
i. display means (73) for indicating the output of the adding means.

4,106,581
VEHICLE UTILIZING CRYOGENIC FUEL

Curtis W. West, 7227 Drowsy Pine, Houston, Tex. 77092; Larry E. Lee, 9027 Eldora, Houston, Tex. 77080, and Aubrey O. Norris, P.O. Box 264, Pinehurst, Tex. 77362
Filed Mar. 5, 1976, Ser. No. 664,110
Int. Cl.^{2} B60K *3/02*
U.S. Cl. 180—54 B **15 Claims**



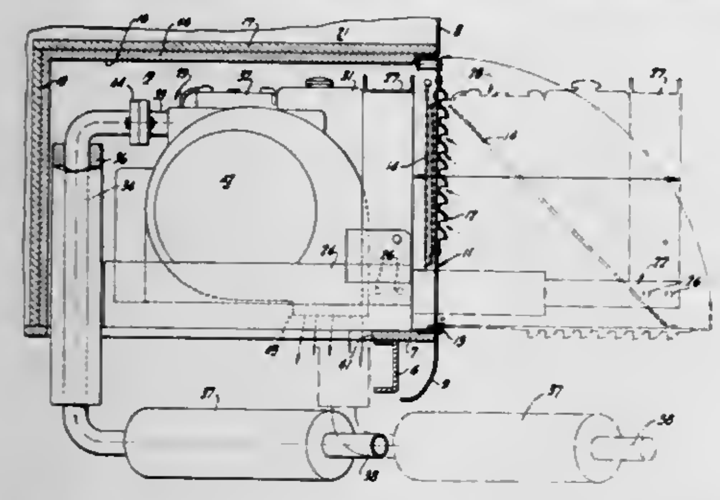
1. A vehicular power source, comprising;
an engine operable by expanding gases which imparts rotation to an output shaft;
a cryogenic liquid storage container means for receiving and storing a specified quantity of a cryogenic liquid therein;
a feed line extending from said storage means for removing cryogenic liquid therefrom, said line connecting to said engine;
means for adding heat to the cryogenic liquid removed from said container means by said line sufficient in amount to boil the cryogenic liquid and thereby create a flow of gas for pressurizing the engine to cause it to operate;
valve means for controlling the rate of flow of gas to said engine;
a vapor space above a liquid storage space in said storage means;
means for removing and vaporizing a portion of the liquid therein; and
means for returning at least a portion of the vaporized liquid to the vapor space to pressurize the liquid in said storage means to force liquid from said storage means into said feed line.

4,106,582
ENGINE-GENERATOR MOUNTING FOR A VEHICLE

Gasper V. De Bella, c/o Lothrop & West 1150 Alcoa Bldg., San Francisco, Calif. 94111
Filed Nov. 12, 1976, Ser. No. 741,293
Int. Cl.^{2} D60K *13/04*
U.S. Cl. 180—64 A **3 Claims**

1. An engine-generator mounting for a vehicle having a frame side rail and a floor above and overlying said frame side rail comprising means on said floor for supporting an engine-generator for movement in a predetermined linear path between a first position above said floor and a second position at least partially extending beyond said floor, an engine-generator on said supporting means and including a rigid exhaust pipe

extending from a point above said floor to a location below said floor, means defining an elongated slot in said floor surrounding said exhaust pipe and extending in a direction parallel to said linear path between an inner location around said exhaust pipe when said engine-generator is in said first position and an outer location stopping short of said frame side rail and around said exhaust pipe when said engine-generator is in said second position, and a muffler supported by and connected to said exhaust pipe and disposed lower than said floor and said frame side rail.



4,106,583

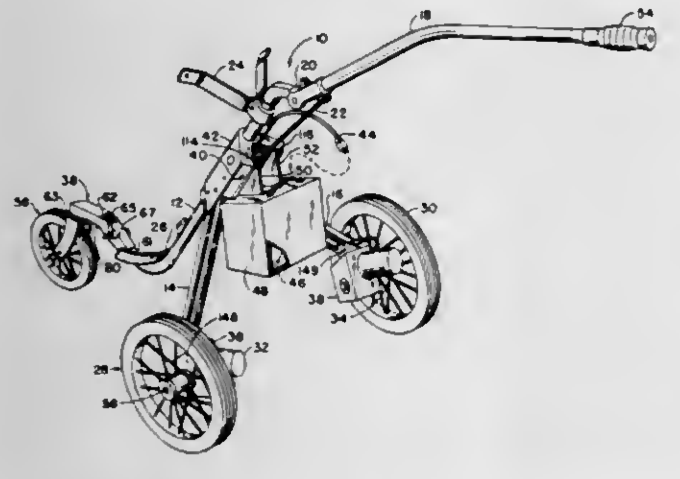
SELF-POWERED FOLDING GOLF CART

Edwin A. Nemeth, Martinez, Calif., assignor to P. N. Associates, Inc., Walnut Creek, Calif.

Filed Aug. 25, 1976, Ser. No. 717,780

Int. Cl.² B62D ***51/04***

U.S. Cl. 180—65 E **7 Claims**



1. In a foldable golf club carrying cart including a guide arm and a pair of laterally disposed drive wheels, the improvement comprising:

a pair of d.c. drive motors each directly coupled to one of said drive wheels;

a limited slip electric differential including a power control circuit operative to receive a control signal from an electric throttle and to communicate moderated power to both said independent drive motors in a controlled pulse train for providing independent power to said drive wheels, whereby said cart is easily turned without transfer of power between said drive wheels.

4,106,584

VEHICLE SPEED CONTROL SYSTEM

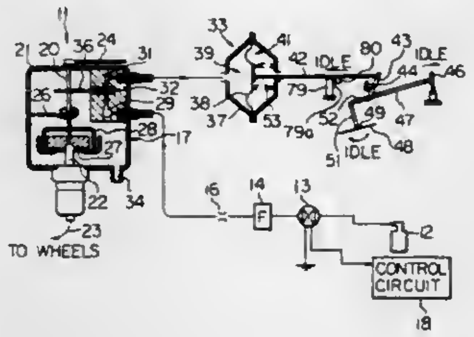
Hiroshi Matsobara, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,261

Claims priority, application Japan, Dec. 5, 1975, 50-164903[U]; Dec. 5, 1975, 50-164904[U]; Dec. 5, 1975, 50-164905[U]

Int. Cl.² B60K ***31/00***

U.S. Cl. 180—105 E **13 Claims**



1. A vehicle speed control system comprising:

a fuel control member;

a fluid pressure source;

a vehicle speed sensor arranged to modulate fluid pressure from the fluid pressure source to a value corresponding to sensed vehicle speed;

an electrically actuated control valve connected between the fluid pressure source and the speed sensor;

an actuator actuated by the speed sensor to control a position of the fuel control member in such a manner as to demand a predetermined vehicle speed, the actuator being actuated by the modulated fluid pressure from the speed sensor,

operable means connected to the control valve to open the control valve thereby energizing the speed sensor and to close the control valve thereby de-energizing the speed sensor,

an exhaust brake valve; and

switch means connected to close the exhaust brake valve when the speed sensor is energized by the operable means and the fuel control member is moved to a minimum fuel demand position by the actuator.

4,106,585

AIR GUN FIRING CONTROL

Willem Huizer, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 24, 1977, Ser. No. 762,216

Claims priority, application United Kingdom, Feb. 5, 1976, 4576/76

Int. Cl.² G01V ***1/08***

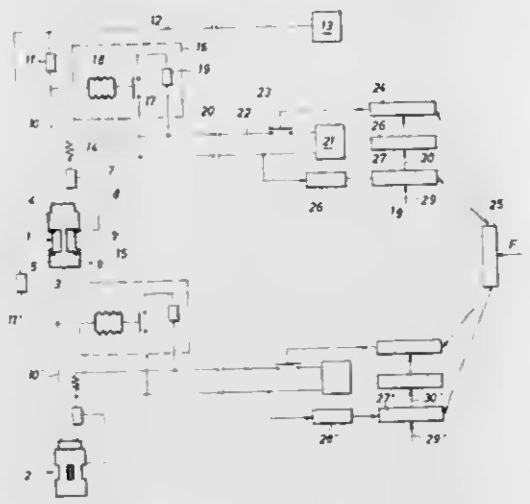
U.S. Cl. 181—107 **5 Claims**

1. Apparatus for controlling the moment of firing of an air gun, having a control chamber and a firing chamber, said air gun being fired by an electric system comprising an electric source, a two-conductor electric cable connecting the electric source with the actuating means of said air gun, electric switch means for controlling the electric connection between the electric source and the cable, and means for operating the switch means to a predetermined time period after a command signal has been supplied thereto, said apparatus comprising:

means adapted to be operatively coupled to the air gun and adapted to (influence an electrical property) change the electrical impedance across the two conductor cable of the electrical system upon detection of an increase in air pressure in the control chamber that accompanies the generation of a seismic pulse;

means for detecting a change in the value of said electrical impedance (electric property) of the electric system;

means for determining the length of the time period extending between the command signal and the said change of value of the electrical impedance (electric property); and,



means for adjusting the length of said predetermined time period in relation to the length of the time period between the command signal and the said change of value of the electrical impedance (electric property).

4,106,586

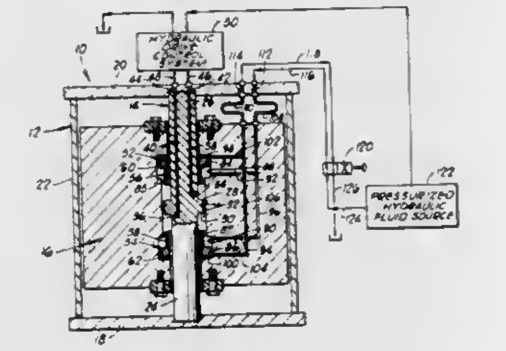
HYDRAULIC VIBRATOR

Jay H. Stafford, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jun. 6, 1977, Ser. No. 803,465

Int. Cl.² G01V ***1/14. 1/04***

U.S. Cl. 181—121 **8 Claims**



1. In a hydraulic vibrator having a piston member comprised of a pair of oppositely extending rods connected to a centrally disposed drive piston and a reaction mass reciprocally disposed around the piston member forming a hydraulic drive cylinder therein so that when hydraulic fluid is introduced to the drive cylinder relative to the drive piston the reaction mass is reciprocated, the improvement comprising:

a sleeve slidably disposed on each of the rods, each of said sleeves including a cylindrical portion of reduced diameter at the inner end thereof adjacent the drive piston and a cylindrical portion of enlarged diamter at the outer end thereof forming inner and outer oppositely facing annular surfaces on said sleeve;

the reaction mass including a pair of enlarged cylindrical recesses positioned at opposite ends of the drive cylinder for containing said enlarged cylindrical portions of said sleeves, each of said recesses terminating in inner and outer annular surfaces for coacting with said inner and outer annular surfaces of said enlarged portions of said sleeves and confining the longitudinal movement of said sleeves, the longitudinal lengths of said recesses being such that when said outer annular surfaces of said enlarged portions of said sleeves are in contact with said outer annular surfaces of said recesses, the reduced diameter portions of said sleeves lie substantially outside the drive cylinder and when said inner annular surfaces of said enlarged portions of said sleeves contact said inner annular surfaces of said recesses, said reduced diameter portions of said sleeves are extended within the drive cylinder thereby reducing the displacement of the drive cylinder;

slidable seal means attached to said enlarged portions of each of said sleeves for providing seals between said enlarged portions of said sleeves and the peripheral surfaces of said recesses; and

means including ports for introducing hydraulic fluid into said recesses on selected sides of said slidable seal means connected to said recesses and to a source of pressurized hydraulic fluid whereby said sleeves can be simultaneously selectively moved between positions whereby said portions of reduced diameter thereof lie substantially outside the drive cylinder and positions whereby said portions of reduced diameter extend within the drive cylinder thereby reducing the displacement thereof.

4,106,587

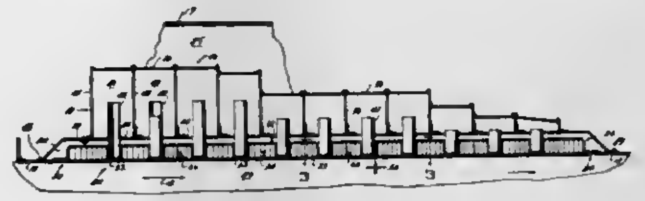
SOUND-SUPPRESSING STRUCTURE WITH THERMAL RELIEF

Dudley O. Nash, Forest Park, and Joseph Holowach, Cincinnati, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 2, 1976, Ser. No. 702,115

Int. Cl.² G10K ***11/00***

U.S. Cl. 181—213 **12 Claims**



1. Sound-suppressing structure comprising:

a duct wall partially defining a fluid flow path and having a hollow cavity therein;

a low frequency acoustic panel within said cavity and having a first cellular core sandwiched between a pair of first facing sheets, one of said first sheets penetrated by a plurality of hollow tubes rigidly attached thereto, one end of each tube extending into a core cell and providing the only access to the interior thereof; and

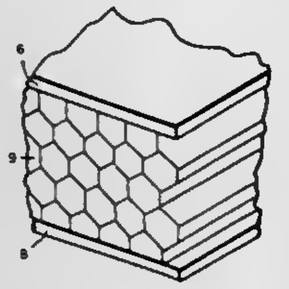
a high frequency acoustic panel within said cavity and covering said low frequency panel to further define the fluid flow path, said high frequency panel having a second cellular core sandwiched between a pair of second facing sheets, one of said second sheets perforated with a pluraity of small diameter holes communicating with the interiors of the second core cells, wherein

said high frequency panel includes a plurality of apertures extending completely therethrough in general alignment with the hollow tubes and freely receiving the ends thereof; and

wherein said high frequency panel is slidingly connected to said duct wall by at least one slip joint to permit relative thermal growth of one of said panels without inducing stresses in the other of said panels.

4,106,588
MODE CANCELING COMPOSITE PANEL FOR GREATER THAN MASS-LAW TRANSMISSION LOSS IN THE PRINCIPAL SPEECH BANDS

James A. Moore, Cambridge, and Richard H. Lyon, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Jul. 29, 1976, Ser. No. 709,822
Int. Cl.^{2} E04B *1/99;* G10K *11/04*
U.S. Cl. 181—284 **1 Claim**



1. An acoustic panel in a surrounding medium, said panel having greater than mass-law transmission loss in the principal speech band comprising
- a pair of homogeneous face sheets,
- a core completely filling the space between said face sheets and bonded thereto to form a unitary composite panel,
- a predetermined double wall symmetric mode resonance frequency of the panel delineates the low end of the band of frequencies having greater than mass-law transmission loss, the panel face sheets and core having the following parameters which are selected to provide this predetermined double wall symmetric mode resonance frequency as given by the equation

$$f_{dw} = \frac{1}{2\pi}\left(\frac{\frac{2E_{11}}{L}}{(\rho_{fs} + \frac{1}{6}\rho_c L)}\right)^{\frac{1}{2}}$$

where
- L is the thickness of the selected core material,
- ρ_{fs} is the surface mass density of a selected face sheet,
- ρ_c is the density of the core material,
- E_{11} is the elastic compressive stiffness of the core in the direction perpendicular to the face sheets,
- the phase speed of the antisymmetric mode at the transition between the low-frequency behavior of the panel and its high-frequency behavior is given by

$$c_{ph}^{s} = \left(\frac{GL}{2(\rho_{fs} + \frac{1}{2}\rho_c L)}\right)^{\frac{1}{2}}$$

- where G is the shear stiffness of the core in the plane of the panel in the direction of highest shear stiffness for said core, where the core is anisotropic,
- the value of c_{ph}^{s} being subsonic respect to the speed of sound, c_o, in the medium surrounding the panel,
- the predetermined upper frequency limit of the band of frequencies having greater than mass-law transmission loss being delineated by:

$$f_{fs} = \frac{c_o^2}{2\pi}\left\{\frac{(\rho_{fs} + \frac{1}{6}\rho_c L)}{D'}\right\}^{\frac{1}{2}}$$

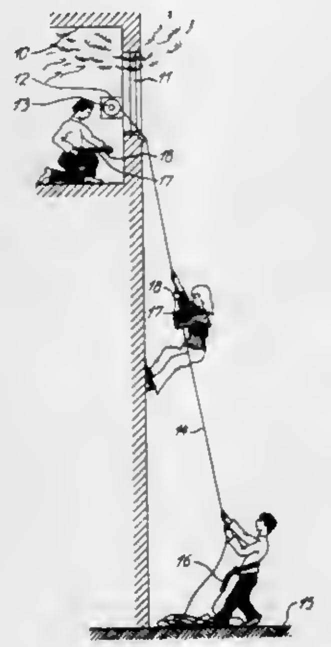
where

$$D' = \frac{E\,t_p^3}{12\,(1 - \nu^2)}$$

where E = Young's modulus,
ν = Poisson's ratio,
t_p = thickness, all of the selected face sheet.

4,106,589
DEVICE ADAPTED TO BE FASTENED TO A WIRE, A CABLE, A CORD, OR A SIMILAR FLEXIBLE ELONGATED ELEMENT

Knud William Petersen, and John Petersen, both of Rogle, Gronholt, 3480 Fredensborg, Denmark
Filed Jan. 21, 1977, Ser. No. 760,990
Claims priority, application Denmark, Jan. 23, 1976, 280/76
Int. Cl.^{2} A62B *1/14*
U.S. Cl. 182—5 **9 Claims**



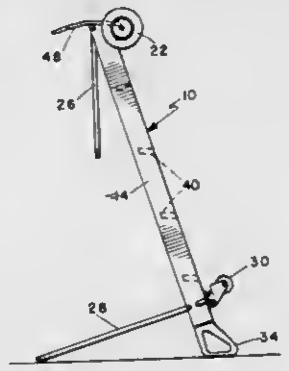
I. A device adapted to be fastened to a wire, a cable, or cord or a similar flexible elongated element, said device comprising a base member, an element engaging member mounted on said base member so as to be rotatable about an axis in at least one direction in relation to the base member, and means for preventing rotational return movement of the element engaging member, said element engaging member defining at one end an open channel or slot extending transversely to said axis and being adapted to receive part of said elongated element, whereby, when inserted in said channel, the elongated element may be wound around a portion of the element engaging member located between said one end and said base member by rotating the same in said one direction, said element engaging member comprising one or more radially outwardly extending parts positioned between said one end and said portion of the element engaging member.

4,106,590
COMBINED HAND TRUCK AND LADDER

Phil Keith Tarran, Carlsbad, Calif., assignor to Lords III Research & Development Co., Escondido, Calif.
Filed Mar. 21, 1977, Ser. No. 779,334
Int. Cl.^{2} B62B *1/20*
U.S. Cl. 182—20 **2 Claims**

I. A combined hand truck and ladder, comprising:
- a frame having a pair of elongated side rails with longitudinally spaced interconnecting cross braces fixed therebetween;
- said frame having an upper end and a lower end, with a load supporting foot projecting from the lower end;

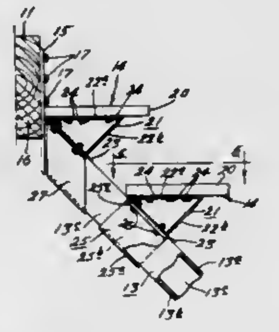
- wheels rotatably mounted on said lower end;
- a back frame member having one end pivotally attached to and between said side rails adjacent the upper end of said frame, said back frame being movable between a closed position within said frame, an extended position substantially perpendicular to the frame, and a further extended position projecting longitudinally beyond said upper end;



- locking means for locking said back frame in each of the positions;
- said frame having hand grips extending from the upper end beyond the pivotal attachment of said back frame;
- said back frame in the perpendicular extended position and said hand grips, in an inverted position of the frame, providing support members for holding the frame in a free standing ladder configuration.

4,106,591
KNOCK-DOWN OPEN RISER STAIRWAY

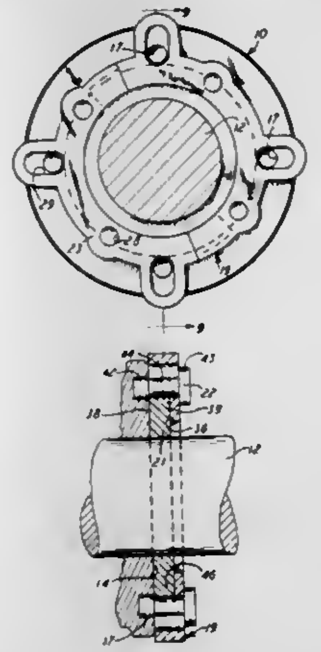
Allen Cohen, Havertown; Howard Cohen, and Ronald Cohen, both of Broomall, all of Pa., assignors to M. Cohen & Sons, Inc., Broomall, Pa.
Filed Apr. 13, 1977, Ser. No. 787,089
Int. Cl.^{2} E04F *11/12*
U.S. Cl. 182—93 **7 Claims**



1. A stairway, comprising:
- an elongated main support member having a non-circular transverse cross section with top, bottom and side walls;
- means carried at opposite ends of said support member for mounting said support member in inclined relation between different levels of a structure;
- a plurality of independent step assemblies extending laterally from both sides of said main support member carried in spaced relation on said support member;
- each step assembly including:
  - a tread support having a mounting flange engaging the top of said support member,
  - a locking sleeve having a bottom web and side webs engaging respectively the bottom and side walls of said support member, and
  - means fastening said locking sleeve to said tread support mounting flange to provide a clamping action on the support member,
- whereby the step assemblies are securely fastened to the support member.

4,106,592
ROD OILER ASSEMBLY

Gerald Eugene Siems, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed May 17, 1977, Ser. No. 797,614
Int. Cl.^{2} F16N *7/12*
U.S. Cl. 184—25 **5 Claims**



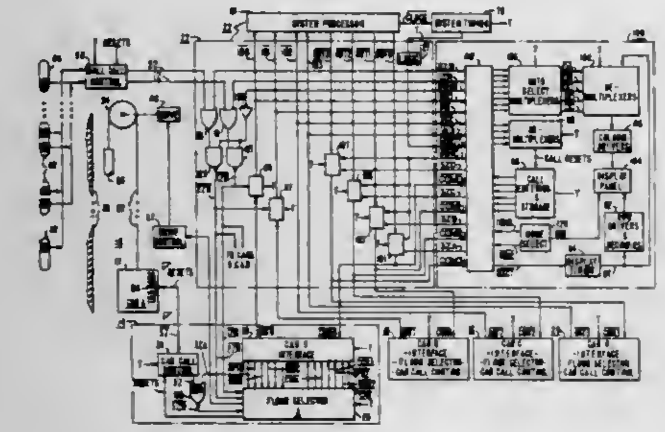
I. A rod oiler assembly for use with a support member having a planar end surface with a central opening extending therethrough and having holes spaced around said opening and having a rod axially movably mounted on said support member and extending through said central opening, comprising an annular oiler member for snugly endlessly surrounding said rod to be in abutment with said support member end surface, an open-center retainer member for co-axially surrounding said rod and being in abutment with said oiler member on the side of said oiler member away from said support member end surface for pressing said oiler member against said support member end surface, said retainer member having openings extending therethrough and located at different radial distances thereon with respect to the axis of said retainer member to present variable alignments with various said support member holes and thereby have only one of said retainer members accomodate a variety of said support members where said support member holes are located within a range of radial positions, and removable fastener means extending through said retainer member openings and extendable into said support member holes for removable attachment of said retainer member onto said support member end surface.

4,106,593
METHODS AND TOOLS FOR SERVICING AN ELEVATOR SYSTEM

Paul R. Otto, Marlboro, N.J., and Alan F. Mandel, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 17, 1977, Ser. No. 778,831
Int. Cl.^{2} B66B *3/00*
U.S. Cl. 187—29 R **20 Claims**

1. A method of servicing an elevator system which includes a plurality of elevator cars mounted in a building, and a supervisory system processor which makes assignments to the elevator cars responsive to system conditions and a predetermined strategy, comprising the steps of:
- providing a visual display which displays the assignments made to the cars by the system processor,

providing means for selectively entering calls for elevator service,
inhibiting the elevator cars from moving,

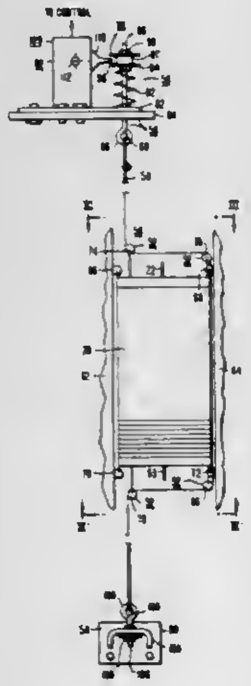


entering a call for elevator service,
and observing the assignments made to the cars by the system processor.

4,106,594
ELEVATOR SYSTEM

Andrew F. Kirsch, Edison, and Robert W. Koob, Hopatcong, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1977, Ser. No. 785,978
Int. Cl.² B66B ***13/24***
U.S. Cl. 187—29 R **7 Claims**

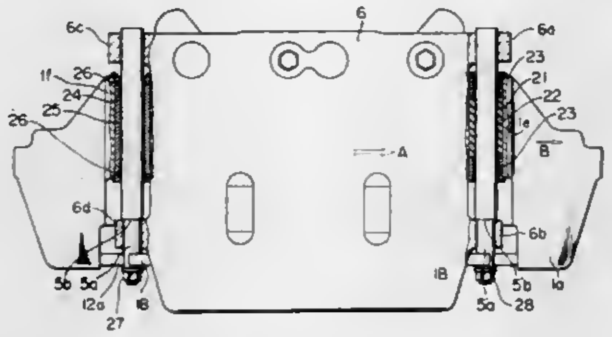


1. An elevator system, comprising:
a building having a plurality of floors and a hoistway,
an elevator car,
a counterweight,
means mounting said elevator car and said counterweight for guided vertical movement in the hoistway of said building, in adjacent vertical travel paths,
motive means for driving said elevator car and said counterweight in their respective travel paths,
cable guide means fixed to said counterweight,
a cable strung in said hoistway, with said cable being reeved about the cable guide means on said counterweight,
tension means providing a predetermined tension in said cable when the counterweight is mounted to operate in its normal vertical travel path, with said tension changing in response to an abnormal lateral deviation of said counterweight from its vertical travel path,
and detector means responsive to the tension in said cable, said detector means modifying the operation of said motive means in response to a predetermined change in the tension in said cable.

4,106,595
DISC BRAKE CALIPER AND SUPPORTING MEMBER

Toshihiko Kimura, and Tsuneo Nakayama, both of Iwatsuki, Japan, assignors to Akebono Brake Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 631,675, Nov. 13, 1975, abandoned. This application May 23, 1977, Ser. No. 799,786
Int. Cl.² F16D ***65/02***
U.S. Cl. 188—73.3 **3 Claims**

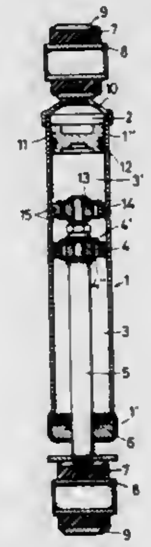


1. A disc brake for a vehicle comprising:
a rotatable disc rotor;
a caliper having an operating portion on one side of said disc rotor, a reacting portion on the other side of said disc rotor and a pair of ear portions respectively located on both sides of said caliper in peripheral directions of said rotor and on opposite sides of said disc rotor;
a support member fixed to a stationary portion of said vehicle on said one side of said disc rotor, said support member including a pair of arms extending in a radial direction with a space defining an opening between said arms, guide grooves provided on said arms facing each other in said opening, a boss portion being provided on each of said side arms and each boss portion being respectively provided with a supporting hole extending parallel with the axis of said disc rotor, and peripheral walls extending from the outer ends of said arms in the axial direction of said disc rotor beyond the outer periphery of said disc rotor, said peripheral walls having ends, said ends of said peripheral walls being provided with torque receiving faces;
a pair of pins engaged with said supporting holes of said support member and openings in said ear portions of said caliper for guiding said caliper in the axial direction of said disc rotor; and
a pair of friction pads positioned on opposite sides of said disc rotor, one of said friction pads having a back plate being provided with protrusions slidably engaging said guide grooves of said support member and the other of said friction pads having a back plate being supported by said pins positioned between said reacting portion of said caliper and respectively one of said pair of said ear portions located on said other side of said disc rotor so as to permit slidable engagement with said torque receiving faces.

4,106,596
HYDROPNEUMATIC SINGLE TUBE SHOCK ABSORBER, IN PARTICULAR STEERING SHOCK ABSORBER

Erwin Hausmann, Wuppertal, Fed. Rep. of Germany, assignor to Firma August Bilstein, Ennepetal-Altenvoerde, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,552
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1975, 2551516
Int. Cl.² F16F ***9/06, 9/40***
U.S. Cl. 188—314 **4 Claims**

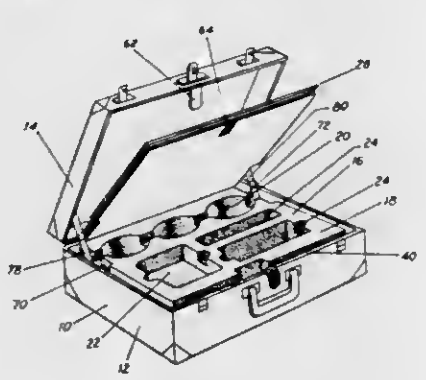


1. A hydropneumatic tube shock absorber, particularly adapted for use as a steering shock absorber comprising a damper cylinder partially filled with highly compressed gas and operating fluid; said pressure being such as to avoid foaming of said fluid in the normal course of shock absorber operation; a working piston movably mounted in said cylinder in said operating fluid; a piston rod sealingly passing through one end of said cylinder; a partition rigidly installed between the highly compressed gas and the working piston in said operating fluid; said partition being provided with valves that open during the working piston outward and inward movements respectively; the valve opening during the outward movement of the piston rod having a closing force which is substantially greater than the closing force of the valve which opens during the inward movement of the piston rod; the first-mentioned closing force being approximately equal to the product of the pressure of such highly compressed gas and effective cross-section of such outward movement partition valve.

4,106,597
EXECUTIVE FOOD CARRYING CASE

Robert L. Shook, and Howard D. Sirak, both of Columbus, Ohio, assignors to Executive Products Corporation, Columbus, Ohio

Filed Oct. 14, 1977, Ser. No. 842,064
Int. Cl.² A45C ***11/20***
U.S. Cl. 190—42 **3 Claims**

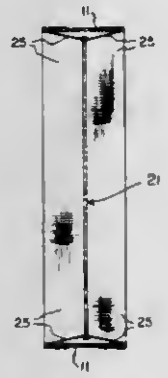


1. A food carrying attache' case comprising:
(a) an attache' case including a main base member and a top hingedly secured thereto at co-extensive edges;
(b) a block of insulative material removably positioned in said base member, said insulative material having a plurality of food receiving cavities formed into one of its major surfaces which faces said top; and
(c) a covering lid above said major surface of said block of insulative material and pivotally mounted thereto for, at times, protectively covering and retaining food in said cavities, said cover lid having an exterior top surface which is sufficiently smooth and flat to form a writing work surface and which is spaced from the interior of said top when said top is closed, first pressure responsive means for holding said lid in an open position when said lid is opened, and second pressure responsive means for holding said lid on said block and retaining food in said cavities when said lid in closed.

4,106,598
COMPARTMENTAL LUGGAGE CASE AND METHOD OF MAKING

Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed Sep. 7, 1977, Ser. No. 831,112
Int. Cl.² A45C ***13/02***
U.S. Cl. 190—52 **3 Claims**



1. In a luggage case of the compartmental type having a substantially rectangular frame of formed wood and two compartments therein respectively accessible from opposite sides of the frame, the improvement comprising a partition member of a semi-rigid sheet material smaller in area than the projected area of said frame and so disposed intermediate the opposite edges of said frame as to provide top and bottom sides, and a strip of elasticized fabric means in a closed loop completely surrounding and attached to the peripheral edge of the said partition member, said fabric means being stretched tautly in opposite directions from the partition member over the side edges of the said frame and attached to the outer surface of the said frame.

4,106,599
ELECTRIFICATION RAIL AND JOINT CONSTRUCTION

Alleyne C. Howell, Jr., 645 Mine Hill Rd., Fairfield, Conn. 06430

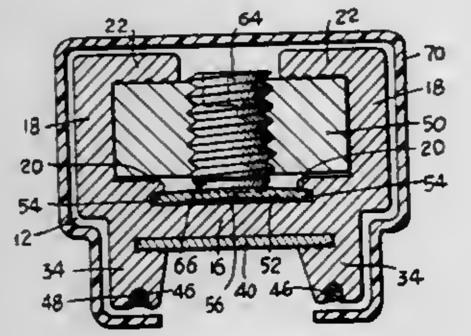
Filed Aug. 29, 1977, Ser. No. 828,837
Int. Cl.² B60M ***1/34***
U.S. Cl. 191—27 **25 Claims**

1. A conductor rail joint, comprising in combination:
(a) a pair of extruded metal rail members having juxtaposed and aligned end portions,
(b) said end portions being provided with aligned T-slots, and having bottom walls and side walls including longitudinally extending spaced-apart integral shoulder means in said slots adjacent the bottom walls thereof, and also flanges which are opposite the bottom walls and which define the openings of the T-slots.
(c) a connector block and a clincher strip extending into the

T-slots of said rail end portions, said clincher strip being disposed between said block and the bottom walls of said end portions and having opposite longitudinal edges engaged with said shoulder means, said strip being preformed to an arcuate transverse cross section so as to locate center portions thereof closer to said block than said longitudinal edges,

(d) operable pressure members carried by said block and engagable with said center portions of the clincher strip to flatten and spread the longitudinal edges of the latter such that they forcibly abut and wedge into said longitudinally-extending shoulder means, and

(e) hard metal contact liner strips carried by the rail members closely adjacent those sides of the bottom walls which are opposite to said shoulder means, said clincher strip thus maintaining close alignment of both the shoulder means of the adjacent rail members and of the contact liner strips thereof.



4,106,600
CURRENT COLLECTING SYSTEM FOR VEHICLE

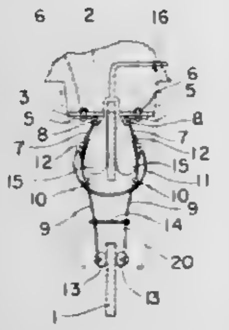
Kiyoshi Mihirogi, Odawara, Japan, assignor to Japan Air Lines, Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,541

Claims priority, application Japan, Feb. 28, 1977, 52-020193

Int. Cl.² B60L *5/08*

U.S. Cl. 191—59.1 6 Claims



1. A current collecting system for a vehicle, comprising a power supply member having two parallel surfaces, at least one expander unit which is inflatable with a pressurized medium, at least a pair of support members adapted to hold said inflatable expander unit therebetween and each having one end thereof pivotably connected to said vehicle, a pair of contact members each carried on the other ends of said support members to hold said power supply member therebetween, and control means which brings said contact members into and out of pressing engagement with said power supply member when said expander unit is inflated and deflated, respectively.

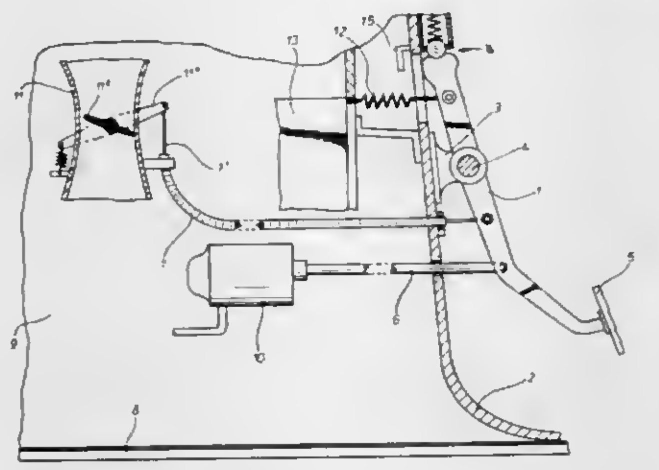
4,106,601
CONTROL DEVICE

Walter Fischer, Melle, Fed. Rep. of Germany, assignor to WF "Rational" Anbaükuchen Walter Fischerriemsloh, Melle, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 783,932

Int. Cl.² F16D *67/00*

U.S. Cl. 192—3 S 5 Claims



1. Mechanism, for the control of the fuel feed and for the application of the brakes of front or rear engine driven motor vehicles with manual or automatic gear boxes, comprising a single spring-loaded foot lever in form of a pedal in arrested idling position, said pedal being connected via transmission means both to a fuel feed and to a brake mechanism such that, when the pressure on the pedal is released from the idling position, the fuel feed is opened continuously, and such that when the pedal is depressed completely, the fuel feed is throttled to the idling position, and such that when the pedal is depressed beyond the idling position, the brake mechanism is put into continuous operation, and such that when the pressure on the pedal is released, the brake mechanism is put out of operation.

4,106,602
FREE-WHEEL CLUTCH

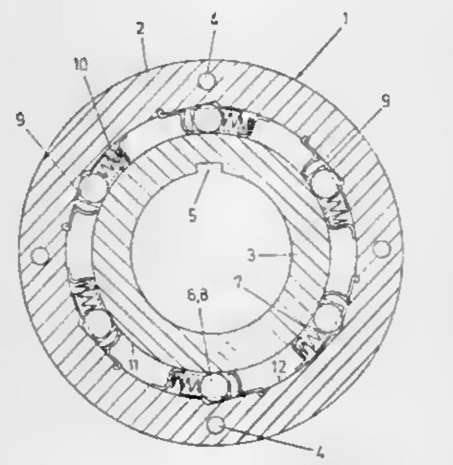
Friedhelm Dieckermann, Plankstadt, Fed. Rep. of Germany, assignor to Borg-Warner-Stieber GmbH, Heidelberg, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 763,193

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604567

Int. Cl.² F16D *15/00*

U.S. Cl. 192—45 15 Claims



1. A free-wheel clutch including an outer member and an inner member having gripper elements disposed between said outer and inner members and having springs engaging said gripper elements urging said gripper elements toward engagement with said outer and inner members characterized in that a gripper element (6) and its associated spring (10) are disposed within a segmental cage member (7, 29, 43, 56, 65, 80,), said segmental cage member being formed from a sheet metal blank, a group of said cage members being circumferentially disposed within said clutch (1).

4,106,603
ARRANGEMENT FOR DRIVING A WORKING SHAFT BY TWO COMBUSTION ENGINES

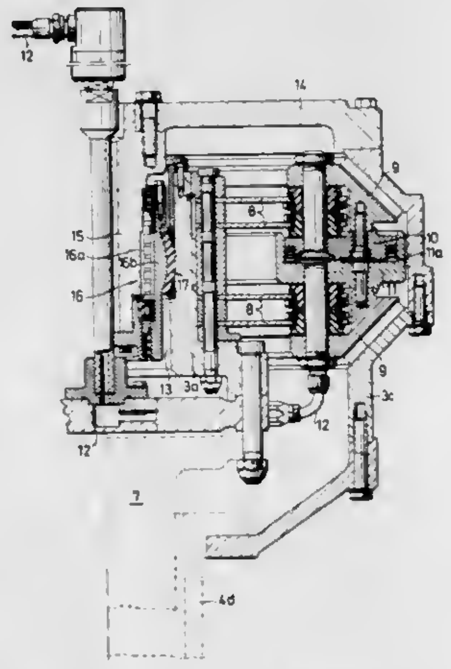
Jürgen Walter, Wanne-Eickel, Fed. Rep. of Germany, assignor to Vulkan Kupplungs -und Getriebebau Bernhard Hackforth, Wanne-Eickel, Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 669,879

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514029

Int. Cl.² B63H *23/30*

U.S. Cl. 192—85 AB 10 Claims



1. In a transmission system for transmitting drive from at least two internal combustion engines to a single driven shaft, a single clutch associated with each said engine, each said clutch having a hub part and a housing part, said housing part carring fixed friction elements, an intermediate shaft connected to said hub part of each clutch and, in use, connected to its associated engine through a flexible coupling, a hollow shaft connected to said housing part of each clutch, said intermediate shaft extending along and through its associated hollow shaft whereby each clutch is remote from its associated engine, a gear housing, each of said hollow shafts passing through said gear housing, a gear wheel fixed to each hollow shaft, a gear train in said gear housing connected to said single driven shaft, said gear wheels on said hollow shafts meshing with said gear train, the improvement wherein said movable friction elements of each clutch are yieldingly connected to said hub part so that they are movable in all directions with respect to said hub part, each of said hollow shafts being rigidly and co-axially connected on said respective housings, a rolling bearing in each of said clutches, each rolling bearing having inner rings fixed to one of said clutch parts, each rolling bearing having outer rings, an axially curved surface on said outer rings, thin resilient cushions covering said curved surface, and said curved outer surface engaging the other clutch parts through said thin resilient cushions, whereby said hub parts of each clutch are centered substantially non-yieldingly in a radial direction on their respective clutch axes to permit small angular movements of said intermediate shafts with respect to said hollow shafts.

4,106,604
CONTROL UNIT FOR THROTTLE AND CLUTCHES

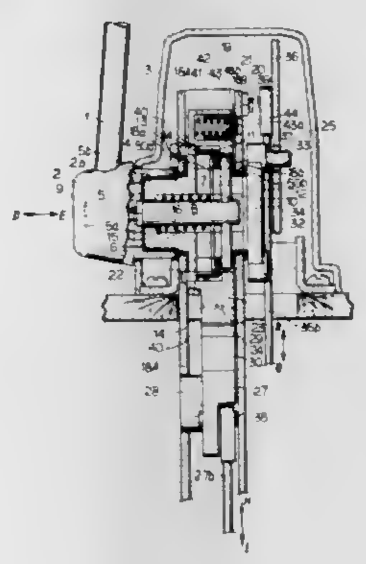
Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Japan

Filed Apr. 20, 1977, Ser. No. 789,255

Claims priority, applicatioo Japan, Dec. 20, 1976, 51-153751

Int. Cl.² B60K *21/00;* G05G *13/00*

U.S. Cl. 192—0.098 11 Claims



1. A single lever engine control unit comprising:

a. a frame member having first engaging means;

b. a drive shaft rotatably supported by the frame member and having relatively elongated second engaging means extending substantially across its axis and an axial bore extending therethrough;

c. a lever member having a boss portion engaging the drive shaft and slidable axially of the drive shaft;

d. a shift rod secured to the boss portion of the lever member concentrically therewith and inserted in the axial bore of the drive shaft, the shift rod having third engaging means and retaining means juxtaposed with the third engaging means, the third engaging means being in engagement with the second engaging means of the drive shaft at all times;

e. locking means retained by the retaining means on the shift rod and having fourth engaging means, the locking means loosely fitting around the drive shaft, the fourth engaging means being engageable with the first engaging means of the flame member by the movement of the lever member only when the drive shaft is in its neutral position;

f. a drive member turnably supported by the drive shaft and having a toothed portion and a circular outer peripheral edge continuous with the toothed portion, the drive member having fifth engaging means for selective engagement with the third engaging means on the shift rod and sixth engaging means in engagement with the fourth engaging means of the locking means at all times;

g. a clutch actuating member turnably supported by the frame member and having a toothed portion engageable with the toothed portion of the drive member and inwardly curved locking edges continuous with the toothed portion and slidingly engageable with the circular peripheral edge;

h. a clutch rod pivoted to the clutch actuating member;

i. a driven member secured to the drive shaft and having at least one bore;

j. a drive pin mounted in the bore of the driven member;

k. a throttle operating member turnably supported by the frame member and having a cam aperture for receiving the drive pin therein, and

l. a throttle rod pivoted to the throttle operating member.

4,106,605

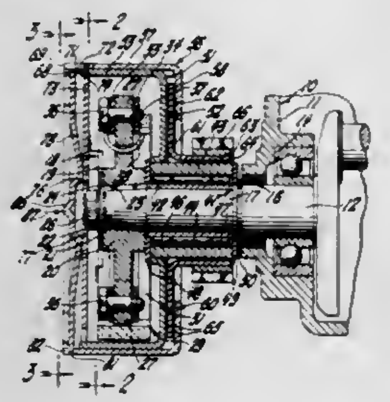
CENTRIFUGAL AND ONE WAY CLUTCHES IN SERIES WITH FRICTION CLUTCH

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1976, Ser. No. 749,917

Int. Cl.^{2} F16D *43/14, 21/08, 41/04*

U.S. Cl. 192—105 CD **4 Claims**



1. In a multiclutch drive: an input shaft; a one-way clutch having an inner race drive connected to said input shaft, an outer race, bearing and one-way drive means between said races to rotatably support said outer race concentrically on said inner race and to provide engagement for drive when said outer race overruns said inner race in the normal drive direction and disengagement when said inner race overruns said outer race in the normal drive direction, and thrust means to prevent axial movement of said races relative to said input shaft; a centrifugal clutch having a hub mounted on said input shaft for rotation with said input shaft, an inner drum having an inner cylindrical portion with an internal cylindrical friction surface concentric with said hub and with a free end, said inner drum also having a disk portion extending radially inward from the opposite end of said inner cylindrical portion and fixed to said outer race to provide a drive connection and to axially ground said inner drum, said disk portion having an external friction surface backing plate disk portion, clutch shoes pivoted on said hub, spring biasing means connected to said hub and clutch shoes to bias said clutch shoes to a disengaged position, and said clutch shoes rotating with said input shaft and hub and operative in response to input shaft speed above idle speed to provide a centrifugal bias force for starting torque drive to provide slipping drive and then at higher torque input speed provide lock-up drive as centrifugal clutch torque meets drive torque requirements; an outer drum having an outer cylindrical portion supported on said inner cylindrical portion of said inner drum for relative axial movement with a free end and with a clutch apply plate disk portion at the opposite end extending radially inwardly and facing said backing plate disk portion; a clutch driven disk plate positioned between said backing plate disk portion and apply plate disk portion providing a manual clutch; an output member drive connected to said clutch driven disk plate; a manual clutch actuator member secured to said free end of said outer drum and extending across the center of said drums and having a clearance relation with said inner drum, said centrifugal clutch and input shaft during movement between engaged and disengaged positions; said inner cylindrical portion having abutment recesses; said outer cylindrical portion end having spline recesses; a belleville spring having outer spring fingers engaging in said abutment recesses to axially locate and ground the outer perimeter of said belleville spring through said inner drum and one way clutch to said input shaft and extending through said abutment recesses and spline recesses with axial clearance relative to said outer drum for said axial movement of said outer drum to cause said inner and outer drums to rotate together and permit axial engaging and disengaging movement of said outer drum relative to said axially grounded inner drum for engaging and disengaging said manual clutch and said belleville spring having an inner portion engaging said manual clutch actuator member to bias said actuator member and outer drum to engage said manual clutch; and manual means engaging said actuator member to move said actuator member and outer drum against the belleville spring bias to disengage said manual clutch.

4,106,606

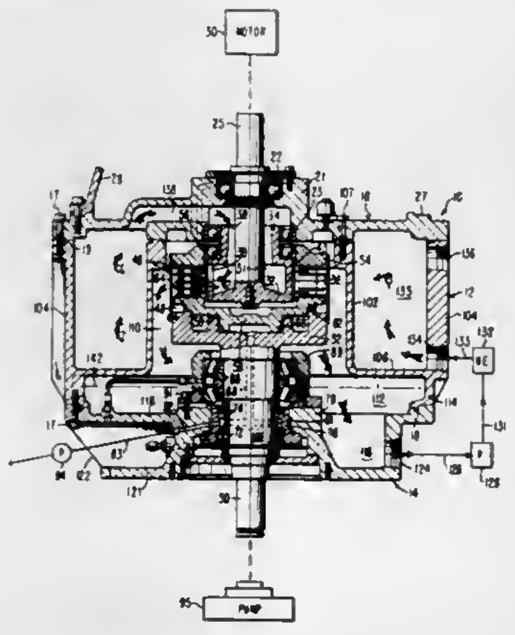
VARIABLE SPEED DRIVE

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio

Filed Dec. 15, 1976, Ser. No. 750,681

Int. Cl.^{2} F16D *13/60*

U.S. Cl. 192—113 B **15 Claims**



1. In a controllable variable speed drive including a housing, an input shaft supported within said housing for rotation, an output shaft supported within said housing for rotation generally coaxially with said input shaft, a series of annular clutch discs within said housing and mounted on said input shaft for rotation therewith, a series of annular clutch plates arranged in interfitting relation with said clutch discs, means for connecting said clutch plates to said output shaft for rotation therewith, means for applying an axial compressive force to said interfitting discs and plates for selectively coupling said input shaft to said output shaft, and said interfitting discs and plates defining spaces therebetween for receiving a flow of oil to maintain an oil film between adjacent discs and plates and to remove heat therefrom, the improvement wherein said housing comprises an inner wall surrounding said clutch discs and plates and defining a collecting chamber for receiving the oil flowing outwardly between said discs and plates, said housing further including an outer wall spaced radially outwardly from said inner wall and cooperating therewith to define a reservoir chamber therebetween, means for directing oil from said collecting chamber into said reservoir chamber, and means for directing a supply of oil from said reservoir chamber into said annular clutch discs carried by said input shaft.

4,106,607

PNEUMATIC SAFETY SYSTEM FOR MACHINE ENCLOSURES

Charles Arthur Badavas, Allendale, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 2, 1977, Ser. No. 773,497

Int. Cl.^{2} G08B *1/04*

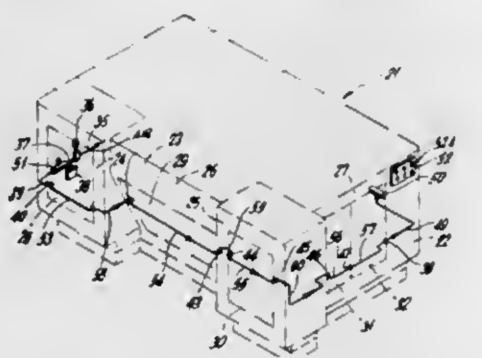
U.S. Cl. 192—129 B **11 Claims**

1. A pneumatic safety system comprising an enclosure having a first and second enclosure portions, which enclosure portions are movable into open and closed positions relative to each other, a source of compressed gas connected to said enclosure, a first gas line connected to said source of compressed gas, transducer means connected to said enclosure to convert a decrease in gas pressure into a control signal, a second air line connected to said transducer means,

a first gas connector member mounted on said first enclosure portion, said first gas connector member comprising a body portion, a bore through said body portion and connected to either one of said first or second gas lines, a flat face portion on said body portion and a round orifice in said flat face portion leading to said bore,

a second gas connector member mounted on said second enclosure portion, said second gas connector member comprising a body portion, a bore partly through said body portion and connected to said other of said first and second gas lines, a cavity within said body portion and connected to said bore, the cross-sectional area of said cavity perpendicular to the direction of gas flow therein being greater than the cross-sectional area of said orifice of said first gas connector member,

said second gas connector member having a normally flat face portion which is in gas sealing relationship relative to said flat face portion of said first connector member in the closed position of said enclosure portions, said flat face portion having a central opening and a plurality of slots extending from said central opening, said slots and central opening providing a gas passage to said cavity.



4,106,608

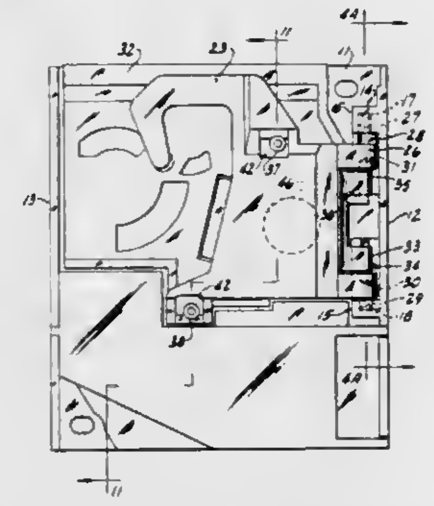
GATE ASSEMBLY FOR A COIN SELECTING AND SEPARATING DEVICE

Kristeo H. Dietz, Florissant, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Division of Ser. No. 774,252, Mar. 4, 1977. This application Nov. 4, 1977, Ser. No. 848,506

Int. Cl.^{2} G07F *1/00*

U.S. Cl. 194—1 R **8 Claims**



1. A gate assembly for a coin accepting and separating device, comprising:

(a) a main plate means,

(b) a first gate hingedly connected to the main plate means and movable selectively between an open position away from the main plate means and a closed position adjacent to the main plate means,

(c) a second gate hingedly connected to the main plate means, and located between the first gate and the main plate means, the second gate being movable selectively between an open position away from the main plate means and a closed position adjacent the main plate means,

(d) resilient means between the gates and tending to urge the gates apart, and

(e) latch means on the main plate means and selectively holding the first gate in its closed position, and the resilient means holding the second gate in its closed position.

4,106,609

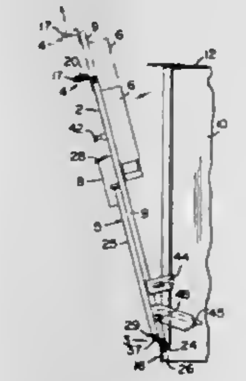
REMOVABLE FRONT PANEL

Don G. Kaspar, Shiner, Tex., assignor to Kaspar Wire Works, Inc., Shiner, Tex.

Filed Oct. 27, 1976, Ser. No. 736,166

Int. Cl.^{2} G07F *5/02*

U.S. Cl. 194—1 B **7 Claims**



1. A vending machine, comprising in combination:

a cabinet having a removable front panel;

a dispenser door hingedly connected to said panel;

a coin mechanism and a latch mounted to said panel for releasing said latch upon insertion of a predetermined amount of coins into said coin mechanism to enable the opening of said dispenser door;

pivot means including a peg secured in a fixed relation to one of said front panel and said cabinet and positioned to be removably inserted into a corresponding aperture located in the other of said front panel and said cabinet;

said peg being pivotable in said aperture enabling said front panel to be pivoted forward and removed from said cabinet;

panel lock means comprising a projecting portion having an aperture and extending from one of said front panel and said cabinet of the vending machine; and

an aperture in the other of said front panel and said cabinet and established to be coincident with said aperture in said projecting portion when said front panel is in the closed position enabling a padlock to be inserted through said apertures to lock said front panel the said cabinet.

4,106,610

COIN APPARATUS HAVING MULTIPLE COIN-DIVERTING GATES

Frederic P. Helman, Delran, N.J., assignor to Mars, Incorporated, Mc Lean, Va.

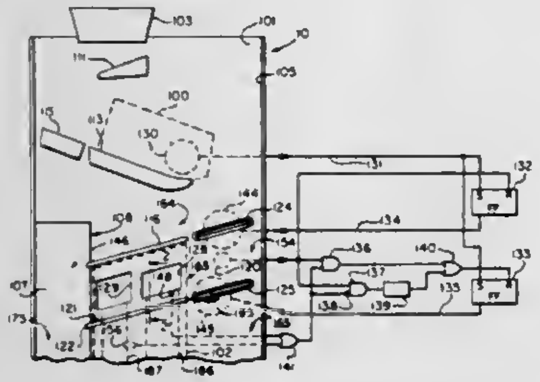
Filed Jun. 7, 1976, Ser. No. 694,050

Int. Cl.^{2} G07F *3/00*

U.S. Cl. 194—97 R **12 Claims**

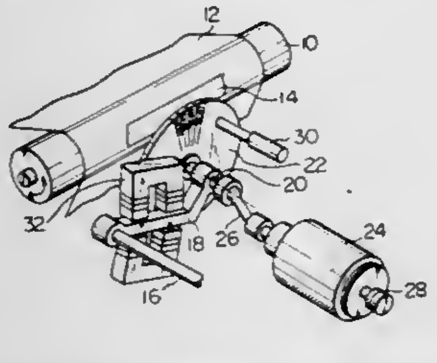
1. An improved coin apparatus comprising a structure defining a coin path, a coin tester for producing a first electrical signal indicative of coin acceptability, a cash box, a coin container for coins of a single denomination, a coin container filling apparatus, a first gate located downstream of the coin tester, the first gate being moveable between a first position

permitting coins on the coin path to enter only a rejected coin path and a second position permitting coins on the coin path to enter only an accepted coin path, first activator means responsive to the first electrical signal for causing the first gate to move between the first and second positions, a second gate located downstream of the first gate in the accepted coin path, the second gate being moveable between a first position permitting coins on the accepted coin path to enter only a passageway leading directly to the cash box and a second position permitting coins on the accepted coin path to enter only a coin container filling apparatus passageway, second activator means for causing the second gate to move from the first position in which it is normally biased to the second position, a coin presence sensor located adjacent the accepted coin path between the first gate and the second gate, and circuit means responsive to the coin presence sensor for producing a second electrical signal indicative of the presence of an acceptable coin on the path in the vicinity of the coin presence sensor, wherein the first electrical signal causes the second activator means to be energized thereby moving the second gate from its first position to its second position, and first time delay means initiated by the second electrical signal for deenergizing the second activator means a predetermined period of time after a coin is first detected by the coin presence sensor.



4,106,611
SERIAL PRINTING APPARATUS

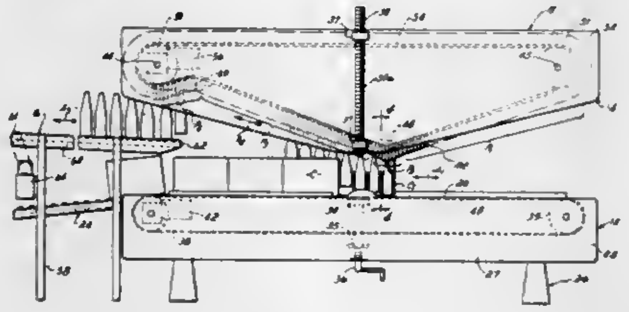
Takami Suzuki, and Nobuo Iwata, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 29, 1975, Ser. No. 644,987
Claims priority, application Japan, Dec. 28, 1974, 50/1291; Aug. 6, 1975, 50/94954; Aug. 18, 1975, 50/99933
Int. Cl.² B41J *1/30*
U.S. Cl. 400—144.2 **12 Claims**



1. Printing apparatus comprising, in combination:
at least two rotary hubs rotatable and shiftable to a printing position;
a plurality of resilient tongues extending generally radially from each of the rotary hubs;
type members provided on the tongues at predetermined distances from the rotary hubs;
first drive means for rotating the rotary hubs so that a selected one of the tongues is in a predetermined angular position;
a second drive means for moving the rotary hubs in a direction parallel to an axis of the selected tongue so that a selected type member on the selected tongue is in a predetermined linear position, and
a universal joint comprising a first member connected to the first drive means, a second member connected to the rotary hubs, and link means comprising a link formed with first and second slots to receive the first and second members respectively, a presser member, and biasing means urging the presser member to engage with the first and second members perpendicular to the axes thereof and press the first and second members against inner walls of the link defining the first and second slots, whereby to compensate for movement of the rotary hub by the second drive means.

4,106,612
GRIPPER FOR CASE UNLOADER

Heinz Albrecht Koerner, Macedonia, Ohio, assignor to MBI Corporation, Northfield, Ohio
Filed Sep. 24, 1976, Ser. No. 726,117
Int. Cl.² B65G *47/86*
U.S. Cl. 198—479 **7 Claims**

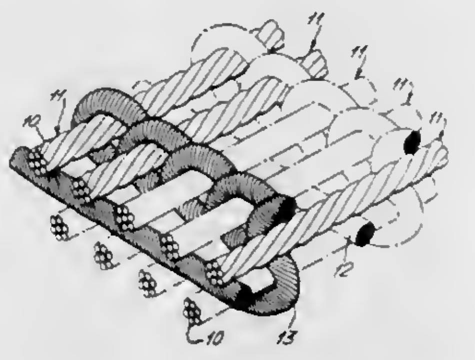


1. A gripper comprising,
two arms pivoted intermediate their ends to form tongs having opposed jaws at their lower ends,
a support,
links pivoted to said support and pivoted to respective upper ends of said arms to connect said tongs to said support,
said jaws having a closed position when said tongs and links are extended away from said support and an open position when said tongs are moved toward said support,
and a detent movably mounted in a hole in one of said arms and engageable with the other of said arms to hold said jaws in open position after said jaws are moved toward said support, said hole lying at an angle to horizontal when said gripper is in a normal position with said tongs depending from said support,
said detent having an inoperative position engaging one surface of said other arm when said jaws are closed, and an operative position engaging another surface of said other arm to hold said jaws in open position,
said detent being urged by gravity to move from said inoperative position to said operative position when said jaws are downwardly depending and spread apart.

4,106,613
CONVEYOR BELTS

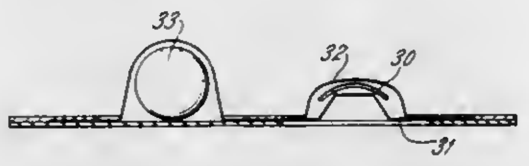
Ian Main Thomson, "Silverstock", Sandhurst Rd., Wokingham, Berkshire, England
Continuation-in-part of Ser. No. 575,782, May 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 381,567, Jul. 23, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,490
Claims priority, application United Kingdom, Aug. 11, 1972, 37679/72
Int. Cl.² B65G *15/34*
U.S. Cl. 198—847 **8 Claims**

1. A conveyor belt adapted to be supported and driven by ropes adjacent its edges, the belt comprising a body of rubber provided with formations adjacent its edges extending above and below the belt and adapted to be engaged by respective ropes to support and drive the belt, at least two sheets of open construction woven synthetic fabric embedded in said body, said sheets being coextensive longitudinally of the body and coextensive laterally of the body and coextensive with said formations adjacent the edges and being spaced apart from each other in the direction of the thickness of the body by a major portion of the thickness of the body of rubber, each of said sheets including two layers of a plurality of laterally extending flexible tensile and compressive force resisting yarns and plural longitudinally extending spacing strands positioned between and separating the two layers and spaced from each other a greater distance than said yarns, said yarns being disposed substantially parallel to each other along the body and extending for at least part of their length in a substantially straight line, said yarns each consisting of a plurality of synthetic filaments of polyethylene terephthalate spun or twisted together and being bonded directly to the rubber in proximity to the outer faces of the belt, said filaments having a modulus of elasticity exceeding 100,000 pounds per square inch and being ~~of large~~ diameter in the range of 0.001 to 0.100 inch, and said body of rubber penetrating into and through said two sheets of open construction fabric to mechanically interlock with said yarns, whereby both tensile and compressive forces produced by the transverse bending of the belt are resisted by the filaments while shear forces are absorbed by the rubber.



4,106,614
ARTIFICIAL FINGERNAIL DISPLAY PACKAGE

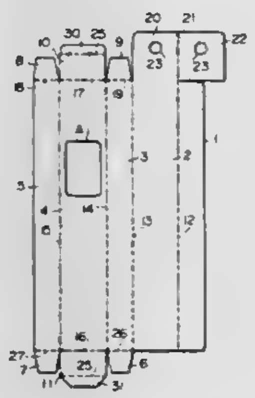
Eric Victor Aylott, Llanfrechfa Way,, Cwmbran, Gwent NP4 2XR, Wales
Continuation-in-part of Ser. No. 766,829, Feb. 8, 1977. This application Jun. 9, 1977, Ser. No. 805,218
Claims priority, application United Kingdom, Oct. 27, 1976, 44641/76
Int. Cl.² B65D *5/50*
U.S. Cl. 206—45.14 **7 Claims**



1. A package for the storage, handling and display of artificial fingernails comprising at least one artificial fingernail having a rear securing surface and a front surface, support means for fixedly positioning each said fingernail, packaging means for defining an enclosure surrounding each said fingernail, said packaging means including opposed transparent walls respectively disposed above and below the front and rear surfaces of each fingernail, said opposed transparent walls being dimensioned with respect to each said fingernail to permit the entire fingernail to be viewed and further permit a natural fingernail to be placed in substantially flush alignment against the wall below the rear surface of said artificial fingernail so that a size comparison and observance of the attractiveness of the artificial fingernail can be effected without removing the fingernail from said enclosure defined by said packaging means.

4,106,615
BOX BLANK AND ASSEMBLED PACKAGE BOX FOR DISPLAY

Suzuki Hiroshi, Sagamihara, Japan, assignor to Lion Hamigaki Kabushiki Kaisha, Japan
Filed Feb. 6, 1976, Ser. No. 655,935
Claims priority, application Japan, Feb. 6, 1975, 50-17304[U]
Int. Cl.² B65D *25/54*
U.S. Cl. 206—45.31 **18 Claims**

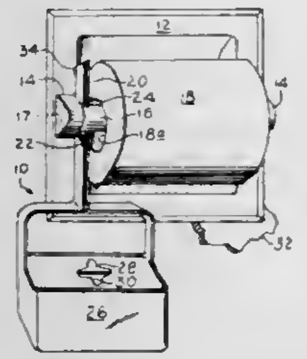


1. A box blank for assembly into a package box for display including:
a side flap to be bonded for forming a basic box structure;
a back, a front and two side sections integral with said side flap and defined by respective parallel sectioning scored lines for folding therearound in the assembly of said package box, said back, front and two side sections constituting the sides of said box;
top and bottom end sections each extending from said front section and individually defined by respective sectioning lines between said end sections and said front section, said end sections constituting the top and bottom of the box respectively, said top end section having a marginal flap defined by an end sectioning line between said top end section and said marginal flap;
a hanger portion for forming a hanger above said basic box structure, said hanger portion comprising a first hanger portion flap extending from said back section, said first hanger portion and back section being free of sectioning lines therebetween; and
a second hanger portion flap having a shape substantially conforming to the shape of said first flap and extending from a portion of said first hanger portion flap, and positioned adjacent to said side flap and defined by an extended substantially straight sectioning line defining said back section from said side flap and shaped so that it may be brought into registry with said first hanger portion flap;
at least said sectioning lines defining said back section and said end sectioning line defining said top end section marginal flap being formed with dash cuts;
said hanger portion being apertured for convenience in hanging said package box therefrom, said package box comprising a basic box structure for holding a packaged item and a hanger portion above said basic box structure, said hanger portion being reinforced by the presence of at least two layers of sheet therein, whereby said packaged box assembled from said box blank may be opened by holding said box and pulling away on said hanger portion to rip the section lines weakened by said dash cuts.

4,106,616

DEVICE FOR POSITIONING A CONTAINER OF SUPPLEMENTAL MATERIAL IN OPERATIONAL ALIGNMENT ADJACENT TO A TOILET-TISSUE HOLDER

Philip Boone, 15 Fenwick Rd., Winchester, Mass. 01890
Filed Mar. 18, 1977, Ser. No. 779,136
Int. Cl.^{2} B65D *69/00*
U.S. Cl. 206—233 **17 Claims**



1. A device for supplying and positioning auxiliary material adjacent to a standard toilet-tissue roll dispenser which dispenser comprises a principal body adapted to mounting on a bathroom wall and a plurality of roll holding means including a plurality of laterally spaced support portions integral with said body, each having a bore formed therein adapted to mount therebetween a retractable spindle for releasably carrying the roll of toilet-tissue as well as other means for supporting the device, the roll of toilet-tissue, in addition to being rotatable, being slidable in a direction longitudinally of the spindle by a given amount so that a given space may normally be provided in said direction longitudinally of the spindle between one end of the roll of toilet-tissue and core thereof and one of said spaced support portions, the device comprising:

a preferably substantially rigid arm member;
means forming an effective concavity in an upper portion of said arm member for connecting said upper portion thereof to a given one of said spindle and other supporting means to provide a generally vertical suspension of said arm member;
means providing a lateral space for positioning said upper arm portion between a support portion and said tissue coll means of a given thickness, at least partially encircling said spindle positioned adjacent to said arm member for fixing said arm member against lateral movement from said given position by occupying said lateral space; longitudinally of the spindle;
limit-stop means fixing said arm member against forward and rearward pivotal movement including upper and lower portions of the arm member adapted to contact given portions of said principal body;
a container having a predetermined located aperture releasably carrying a supply of said auxiliary material; and
means connecting a lower portion of said arm member to said container, the aforesaid means fixing the arm member against movement, serving to provide a firm fixed mounting of the container and a consistently given position of said aperture for facilitating removal of the auxiliary material.

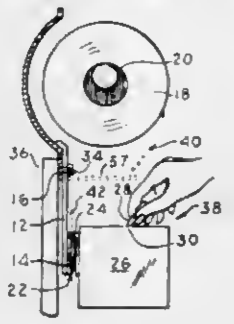
4,106,617

BATHROOM FIXTURE

Philip Boone, 15 Fenwick Rd., Winchester, Mass. 01890
Filed May 19, 1977, Ser. No. 798,465
Int. Cl.^{2} B65H *19/02*
U.S. Cl. 206—233 **20 Claims**

1. A multifunctional bathroom fixture for mounting on a vertical wall, said fixture comprising:

a vertically-disposed first support means adapted to be mounted on said wall, said first support means including means to receive a spindle and a supply of dry toilet-tissue;
a second support means including at least one downwardly extending substantially flat member, said member having its flattened portion parallel to the wall, the upper portion of said member being connected to a lower surface of said first support means;
first fastening means at the lower end of said member, said fastening means being disposed in a plane substantially perpendicular to the flat surface of the member;

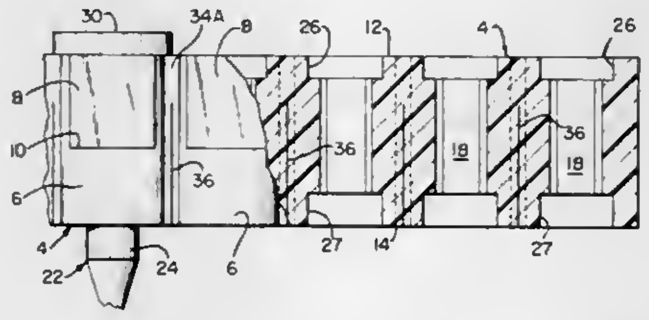


a container releasably holding a supply of moistening material, said container including means in a wall thereof forming an aperture through which said material can be withdrawn;
control means to determine the direction of withdrawal of said material; and
second fastening means integral with said container at a surface facing said second support means, said second fastening means including a portion complementary to said first fastening means to enable the container to be fastened thereto.

4,106,618

NAIL ASSEMBLIES

Harry M. Haytayan, Sunnyside La., Lincoln, Mass. 01773
Filed Dec. 15, 1975, Ser. No. 640,587
Int. Cl.^{2} B65D *83/02, 85/24, 85/62*
U.S. Cl. 206—343 **29 Claims**

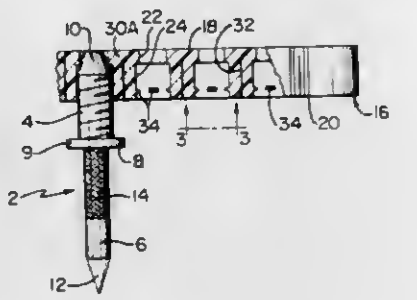


1. A nail support strip for supporting a plurality of nails in series with one another, said strip comprising a series of parallel sleeves each having a first end and a second opposite end, and a plurality of webs each connecting a pair of mutually adjacent sleeves and each having a corresponding first enc and a corresponding second end, said sleeves and said webs being integral with one another and made of the same material, and each web having a line fracture commencing at its first end thereof and extending toward but terminating short of said second end thereof, each web being divided by said fracture line into two parts having mutually confronting edge surfaces with substantially no gap between said edge surfaces, and the height of each web measured between said first and second ends thereof being substantially greater than the thickness of each web.

4,106,619

NAIL CLIPS

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Billerica, Mass.
Continuation of Ser. No. 715,856, Aug. 19, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,500
Int. Cl.^{2} B65D *85/24*
U.S. Cl. 206—346 **16 Claims**



1. A clip of fasteners comprising (1) a support strip for supporting a plurality of fasteners in parallel and in series with one another and (2) a plurality of like fasteners supported by said support strip;

said support strip being made of a plastic material and comprising a plurality of like parallel fastener-supporting elements and a plurality of webs each connecting a pair of mutually adjacent fastener-supporting elements, each of said fastener-supporting elements havig a circularly-curved outer surface;
said fasteners each comprising an elongate metal body having first and second opposite ends and a peripheral metal flange surrounding and carried by said body at a selected position intermediate its ends, each of said flanges having a circularly curved outer edge surface having substantially the same radius of curvature as said outer surfaces, each fastener body being pointed at its second end and also being threaded over at least a portion of its length between its first end and the flange which it carries;
each of said bodies being surrounded and gripped at its first end by one of said fastener-supporting elements with the center-to-center distance between each pair of fasteners at said first ends being substantially the same as the center-to-center distance between the same pair of fasteners at the flanges thereof when said flanges are in engagement with each other, each of said fasteners being formed separately from said support strip and also from one another and the flange of each fastener being unattached with respect the flange of each adjacent fastener, and each fastener-supporting element gripping at least a part of the threaded portion of the fastener which it supports.

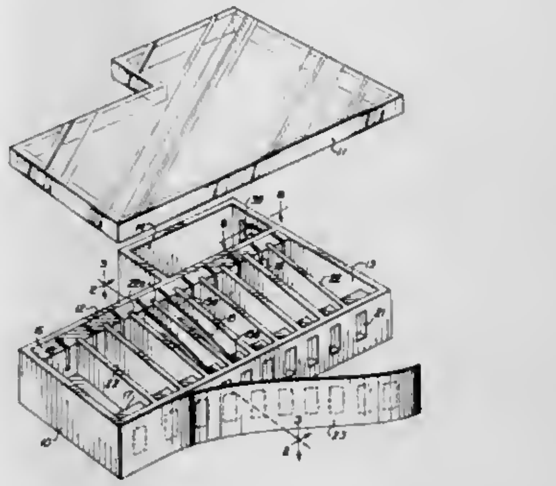
4,106,620

SURGICAL BLADE DISPENSER

Frances M. Brimmer, 3431 E. Monte Vista, Tucson, Ariz. 85717; Edward W. Ahrens, 4681 E. 32nd St., Tucson, Ariz. 85711, and Herbert C. Magney, 433 W. Linda La., Chandler, Ariz. 85224
Filed Oct. 3, 1977, Ser. No. 838,589
Int. Cl.^{2} B65D *83/10*
U.S. Cl. 206—363 **2 Claims**

1. A surgical blade dispenser for holding at least one surgical blade until ready for use, and for dispensing and attaching said blade to a scalpel handle,

said scalpel handle including an elongate handle portion terminating at its forward end in a narrowed extension forming a blade attaching tip, said tip having an elongate boss carried thereon,
said surgical blade having a sharpened tip and cutting edge portion and a shank portion extending rearwardly therefrom, the shank portion of said blade having an elongate aperture therein shaped and adapted to receive and lockingly engage with said mating elongate boss carried by the attaching tip of said scalpel handle,
said dispenser comprising:
(a) enclosure means defining a box for storing at least one of said surgical blades;
(b) blade positioning means within siad box for frictionally engaging
(i) the tip and at least a portion of the cutting edge of said blade, and

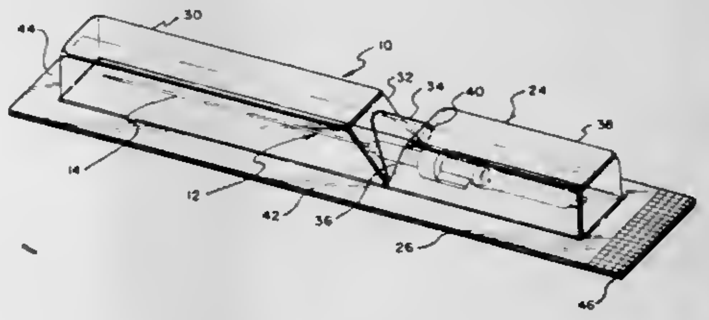


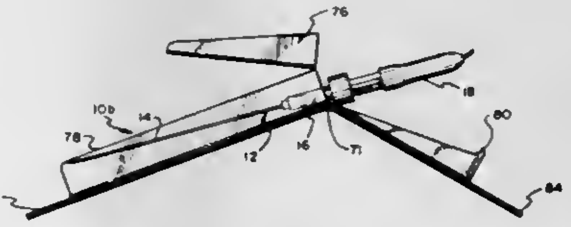
(ii) the shank portion of said blade to position said blade such that the shank portion of said blade curvingly extends toward a wall of said box proximate the shank portion of said blade, said wall having at least one aperture therein sized and shaped to receive the attaching tip of said scalpel handle therethrough, a distance sufficient that the boss of said attaching tip can be inserted and lockingly engaged with the aperture in the shank portion of said blade.

4,106,621

COMBINATION NEEDLE COVER AND VENIPUNCTURE DEVICE TRAY AND METHOD OF USING SAME

James L. Sorenson, Salt Lake City, Utah, assignor to Sorenson Research Co., Inc., Salt Lake City, Utah
Filed Jul. 26, 1976, Ser. No. 708,968
Int. Cl.^{2} B65D *73/00, 75/62, 83/02*
U.S. Cl. 206—365 **5 Claims**





1. A sterile package for venipuncture devices, said package being constructed in part of ductile material so that it can be angularly deformed when opened and comprising:

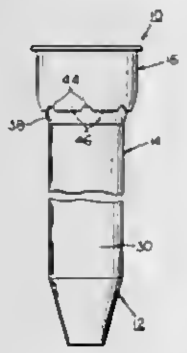
a top blister cover for the venipuncture device formed of ductile, transparent plastic, said blister cover being preformed to define a needle portion, a handle portion, and a handle restraining portion disposed between the needle portion and the handle portion, said handle restraining portion having a generally parabolic cross-sectional shape of smaller transverse and longitudinal dimensions than said needle and handle portions, said parabolically shaped handle restraining portion also defining a communicating passageway between said needle and handle portions, the needle portion and handle portion also each having a sloped surface that joins the parabolically cross-sectional shaped handle restraining portion so as to converge at the base of the handle restraining portion, thereby defining a bending location at said handle restraining portion which facilitates angular deformation of the top blister cover into an upright tray which fully exposes the handle of the device to finger access after bending the package, said handle restraining portion also defining an opening to the needle portion of the cover of sufficient diameter so as to allow withdrawal of the device without applying significant force to remove the blister cover when it is angularly deformed, said blister cover also having a peripheral flange circumscribing the base of the blister cover and defining front and rear surface-engaging edges for supporting the blister cover on a flat surface after it has been angularly deformed;

a flat strip of paper peelably joined to the blister cover so as to completely enclose the entire venipuncture device within the blister cover, said strip being peeled away from the handle portion of the blister cover and the handle restraining portion of the blister cover so as to partially expose the handle of the venipuncture device to finger access while at the same time maintaining the needle of the venipuncture device enclosed within the sterile needle portion of the blister cover, said handle of the venipuncture device being completely exposed to unobstructed finger access only after the blister cover has been angularly deformed; and

adhesive means disposed between the blister cover and strip of paper for peelably joining the blister cover to the paper, thereby forming a normally closed package for enclosing the entire venipuncture device until such time as the paper is peeled away from the handle portion and handle restraining portion of the blister cover so as to partially expose the handle of the venipuncture device in order to accommodate withdrawal of the device from the package.

4,106,622
TAMPER-RESISTANT RIGID SYRINGE PACKAGE AND METHOD OF MAKING THE SAME

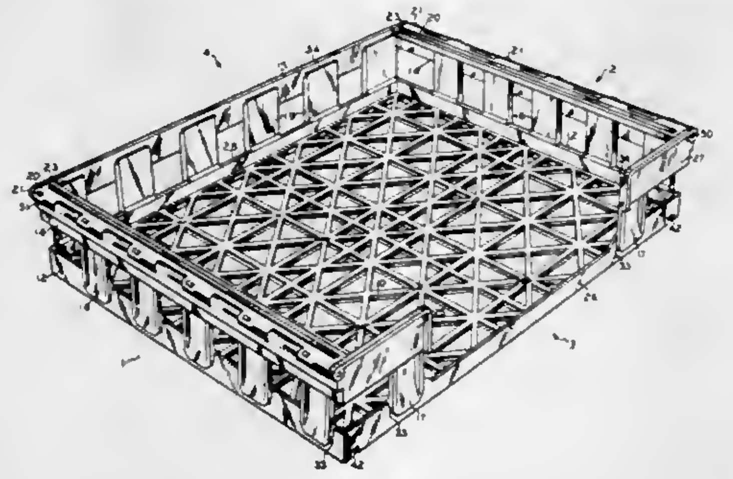
Edward F. Windischman, Daytona Beach, Fla., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Aug. 1, 1977, Ser. No. 820,674
Int. Cl.^{2} B65D *85/20;* **A61M** *5/00*
U.S. Cl. 206—365 **25 Claims**



1. A rigid syringe package comprising a rigid sleeve member closed at one end and open at the other end, a syringe in said sleeve member having a barrel with a radial flange at the proximal end thereof, and piston means in said barrel, said sleeve member having a main body portion, an enlarged end portion at said other end having a greater diameter than said body portion, and a radially inwardly tapering connection portion connecting said enlarged end portion with said body portion, and a substantially rigid plastic closure member for closing said other end of said sleeve member, said closure member being closed at one end and open at the opposite end and including a generally cylindrical portion surrounding said enlarged end portion of said sleeve member, and a radially inwardly tapering end portion connected to said cylindrical portion at said opposite end and surrounding and engaging said tapering connection portion, said end portion of said closure member being sufficiently resilient to permit manual removal of said closure member from said sleeve member and having a diameter smaller than that of said enlarged end portion of said sleeve member to thereby resist the replacement thereof on said sleeve member.

4,106,623
THREE-LEVEL STACKING CONTAINER

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 15, 1977, Ser. No. 824,578
Int. Cl.^{2} B65D *21/04, 21/06*
U.S. Cl. 206—506 **27 Claims**



1. A generally rectangular container adapted for stacking with another like container at three different levels comprising a generally horizontally disposed bottom, and first and second opposed sidewalls projecting upwardly from the opposing first and second sides of said bottom, respectively, with each of said first and second sidewalls comprising:

a border flange extending along the respective first or second opposite side of the bottom and being vertically disposed in a first vertical plane adjoining said respective side of said bottom,

an upper rim being vertically disposed above and in a second vertical plane outside and parallel to that of said first vertical plane,

a plurality of bar members extending vertically in a third vertical plane in an upwardly direction between the outer surface of said border flange and the inner surface of said upper rim, said bar members in one of said first and second opposed sidewalls being arranged with respect to the bar members and spacing thereof in the opposite of said first and second sidewalls so that another like container, when reversely oriented with respect to said container, will stack inside said container in a low stack position,

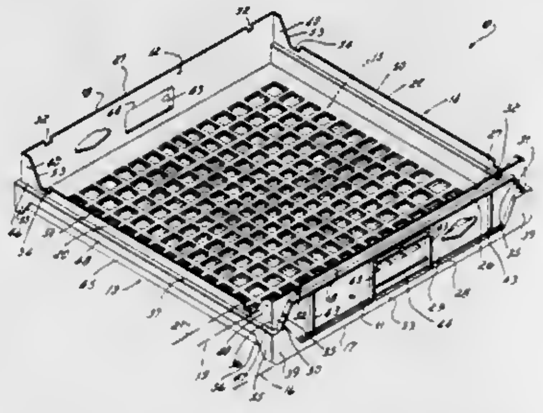
a plurality of spaced-apart stacking feet on the outer surface of the bottom flange,

a plurality of stacking saddles on the inner surface of said rim spaced above said stacking feet for registering in vertical alignment with said plurality of stacking feet of a like container placed upon said container in a like orientation so that the upper like oriented like container will stack inside said container in an intermediate stack position, said stacking feet and said stacking saddles being of such dimensions and so positioned as not to prohibit a like container from being placed in said container in said low stack position, and

a pivotable bar means extending along and mounted to said rim, said bar means being capable of resting upon at least some of said stacking saddles inside said rim and being of such dimensions that when said bar means so rests upon said stacking saddles, another like oriented or reversely oriented like container will stack upon said bar means of said container in a high stack position, said bar means further being capable of being pivoted to a point which will allow a like container to be stacked in said container in either low stack or intermediate stack position.

4,106,624
TRAY STRUCTURE

Paul G. Thurman, West Liberty, Ohio, assignor to Dare Pafco, Inc., Urbana, Ohio
Filed May 19, 1977, Ser. No. 798,339
Int. Cl.^{2} B65D *21/04*
U.S. Cl. 206—507 **18 Claims**



1. An improved square tray structure comprising

a pair of opposed end walls and a pair of opposed side walls, said end walls being of a height about one-half that of said side walls, and said end walls and side walls defining a tray structure of square configuration,

a floor, said end walls and said side walls all extending up from said tray's floor,

a top rail and a top rib extending along the top edge of each of said side walls, and a bottom rail extending along the bottom edge of each of said side walls, and

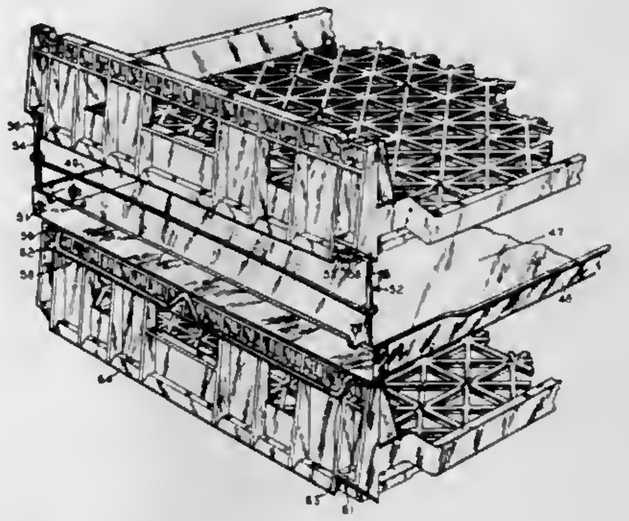
a middle rail and a middle rib extending along the top edge of each of said end walls,

the side walls of upper and lower trays being stackable one on another so that the upper tray's bottom rails seat on the lower tray's top ribs and rails on each side thereof for supporting said trays in stacked relation and for preventing side-to-side relative motion between said trays when in stacked relation, said stacked trays having a generally square cross section when in stacked relation with said square cross section being dimensionally the same as the square configuration for each tray in that stack, and

the upper and lower trays being nestable one on another in a position where the upper tray is rotated 90° relative to the lower tray from the stacked position so that the upper tray's bottom rails seat on the lower tray's middle ribs and rails, and so that the upper tray's middle rails seat on the lower tray's middle ribs and rails, and so that the upper tray's middle rails seat on the lower tray's upper ribs, for supporting said trays in nested relation and for preventing end-to-end motion between said trays when in nested relation, said nested trays having a generally square cross section when in nested relation with said square cross section being dimensionally the same as the square configuration for each tray in that nest.

4,106,625
MOLDED CONTAINER

James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 18, 1977, Ser. No. 825,739
Int. Cl.^{2} B65D *21/04*
U.S. Cl. 206—507 **4 Claims**



1. A unitary molded tray comprising:

a pair of vertical end walls, first and second side walls and a horizontal bottom connecting said end walls and said side walls;

a horizontal shoulder forming the upper edge of each of said end walls;

an elongated horizontal saddle formed on the lower portion of each of said end walls said elongated horizontal saddle terminating short of the ends of said end walls thereby providing recesses at each said end, said elongated horizontal shoulder and elongated horizontal saddle on each of said end walls being located in the same vertical plane whereby one said tray stacks on a second said tray when said one tray is placed above said second tray with said end walls of said one tray directly over said end walls of said second tray;

said side walls being horizontally longer and vertically shorter than said end walls and having horizontal support ledges on their upper surfaces whereby said one tray nests within said second tray and rests upon said ledges when oriented with its side walls parallel with the end walls of said second tray; and

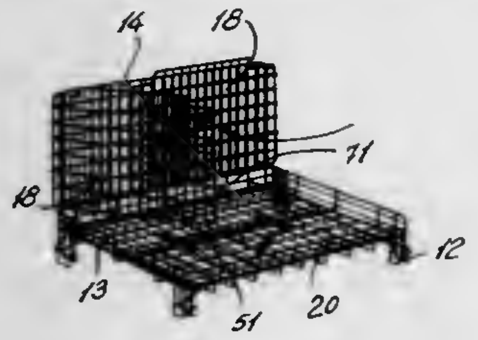
a pair of transverse saddles formed in each of said horizontal shoulders whereby said one tray stacks on a third tray having a horizontal upper rod member having vertically upraised portions on each end thereof, said elongated horizontal saddle resting on said rod member with the upraised portions thereof within said recesses and said transverse saddles accept a pair of rod members extending at right angles to the ends of said third tray permitting said third tray to be stacked on said second tray.

4,106,626
STACKABLE MATERIAL HANDLING CONTAINER

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All, Inc., Canada
Continuation of Ser. No. 735,510, Oct. 26, 1976, abandoned.
This application Aug. 22, 1977, Ser. No. 826,961
Int. Cl.^{2} B65D *21/02, 7/24, 7/20*
U.S. Cl. 206—513 **14 Claims**

1. A stackable material handling container comprising a bottom support wall, opposed pairs of leg members on opposite sides of said bottom support wall, each of said leg members having a support surface spaced downwardly of said bottom support wall and an intermediate bearing surface spaced between said bottom support wall and said support surface, a

rigid upstanding wall secured to a marginal edge of said bottom support wall and extending thereabove across said pairs of leg members, guide means on a top edge of said upstanding wall to position said bearing surface of each of said leg members of a further container in a respective support edge section of said top edge whereby containers may be stacked in alignment one on top of the other, a collapsible side wall extending upwardly from a respective peripheral edge of said bottom support wall, said leg members extending a predetermined distance below said bottom support wall to prevent obstruction between said side walls collapsed on said bottom support wall of a container on which said leg members are resting when containers are stacked one on top of the other, said bottom support wall and said collapsible side walls being made of structural wire members welded together, said leg members having two opposed spaced U-shaped members defining side arms and an interconnecting arm, said side arms being connected to said bottom support wall and said upstanding wall, a bottom portion of said side arms being angulated outward from each other, said interconnecting arm constituting said support surface, said side arms connected to said upstanding wall extending above a top edge of said upstanding wall and disposed angularly outwards in the plane of said upstanding wall to constitute a downwardly tapering groove having an open mouth substantially wider than the span of said support surface of said leg members to guide a respective one of said leg members so that said bearing surface will rest on said top edge between said side arms when folded containers are stacked one on top of the other.

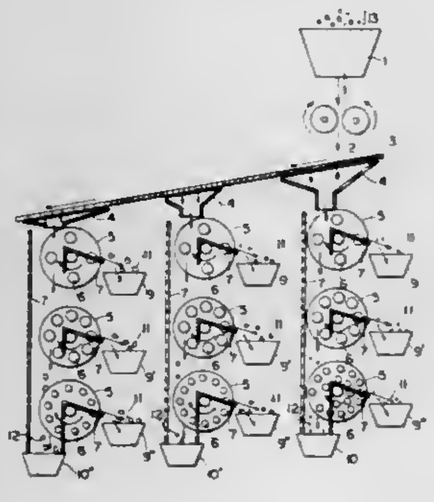


4,106,627

METHOD AND APPARATUS FOR USE IN SEPARATION AND RECOVERY OF NON-MAGNETIC METAL PIECES

Ryuji Watanabe; Syöichi Sato, both of Ibaraki, and Sadami Tomita, Katsuta, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 21, 1976, Ser. No. 650,852
Claims priority, application Japan, Jan. 30, 1975, 50-11916
Int. Cl.² B03B *1/00*
U.S. Cl. 209—7 20 Claims



14. A method for separation and recovery of crushed non-magnetic metal pieces from a mixture of crushed non-magnetic metal pieces and crushed non-metallic pieces, comprising:

deforming at least said non-magnetic metal pieces among said mixed crushed pieces to a flattened shape of relatively small thickness;

screening the mixture that includes the flattened crushed non-magnetic metal pieces into a given size range of screened mixture;

receiving the screened mixture and freely dropping the screened mixture of crushed pieces including flattened nonmagnetic metal pieces through a separation space to fall freely by gravity;

producing a plurality of separate rotating magnetic fields vertically spaced from each other in said separation space so as produce different magnetic field characteristics in the vertical direction to induce corresponding eddy currents in said flattened non-magnetic metal pieces contained in the screened mixture of freely falling crushed pieces, and thereby first laterally deflecting the freely falling nonmagnetic metal pieces most susceptible to the induction of eddy currents therein from their freely falling path so that successive magnetic fields separate the non-magnetic metal pieces in order according to their decreasing susceptibility to induction of eddy currents, by the electromagnetic forces acting between the rotating magnetic field and the eddy currents generated in the nonmagnetic metal pieces;

separating the path of the freely falling prices from the path of the laterially deflected non-magnetic metal pieces, to thereby separate non-metallic pieces from non-magnetic metal pieces according to susceptibility of induced eddy currents;

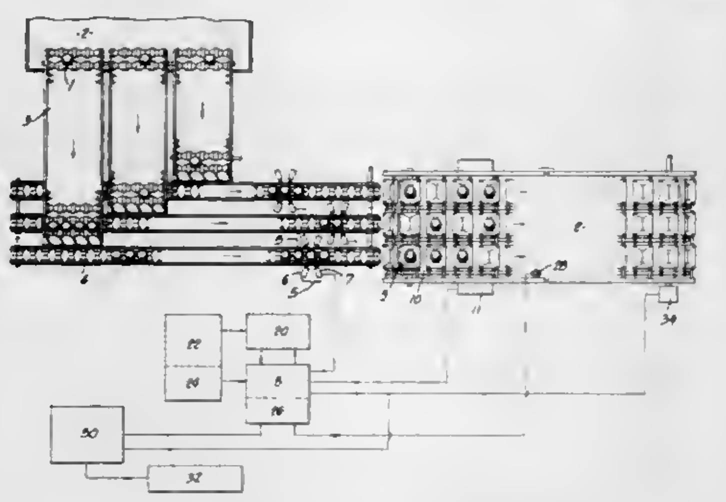
receiving and containing the separated non-metallic pieces separately and apart from each other according to their susceptibility to induction of eddy currents and from the separate non-magnetic metal pieces.

4,106,628

SORTER FOR FRUIT AND THE LIKE

Aaron J. Warkentin, 13551 View Dr., Orange Cove, Calif. 93646, and George A. Mills, 44 Kaweah River Dr., Three Rivers, Calif. 93271

Filed Feb. 20, 1976, Ser. No. 659,898
Int. Cl.² B07C *5/28, 5/342*
U.S. Cl. 209—74 M 18 Claims



1. An automatic sorting apparatus comprising conveyance means for transporting a plurality of items to be sorted along a track and having individual cups for transporting each said item, said individual cups being connected in a continuous belt,

electronic weighing means incorporated into a portion of said track for generating a signal proportional to the weight of said item to be sorted,

reference signal means for providing a predetermined number of reference signals, the value of each signal established according to a predetermined criteria,

comparison means for comparing the signal generated by said electronic weighing means to the reference signals provided by said reference signal means,

clock means for incrementally signalling changes in position of an item to be sorted,

first position indicating means responsive to the signal from said clock means and the signal from said comparison means for generating a signal indicative of the position of the item'to be sorted, and

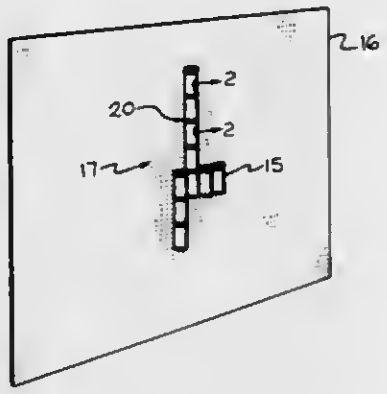
discharge means responsive to the signal generated by said position indicating means for discharging the item to be sorted at a predetermined position.

4,106,629

CAN DISPLAY HOLDER

Michael A. Doyle, 6917 Williams Dr., Perrysburg, Ohio 43551, and Paul E. Ekey, 115 Homestead Dr., Rossford, Ohio 43460

Filed Mar. 28, 1977, Ser. No. 781,534
Int. Cl.² A47F *5/00*
U.S. Cl. 211—71 13 Claims



I. A can display holder for use in displaying cans on a pegboard or the like having a plurality of vertically and horizontally spaced holes, each of such cans having an upper lip, said can display holder comprising a base for supporting a can, means extending upwardly from said base for retaining a can on said base, arms extending from said base for engaging respective holes on such pegboard, means extending downwardly from said base for resisting downward rotation of the base, said resisting means including at least one rotation resisting member integrally mounted on said base and extending downwardly from said base for abutting such pegboard, and means extending downwardly for holding the lip of a can positioned immediately below said can display holder whereby said cans are displayed in vertical juxtaposition on said pegboard, said holding means comprising at least one holding member extending downwardly from said base spaced from and adjacent said resisting member wherein said holding member engages the interior surface of the upper lip of a can positioned immediately below said can display holder to prevent rotation of such can.

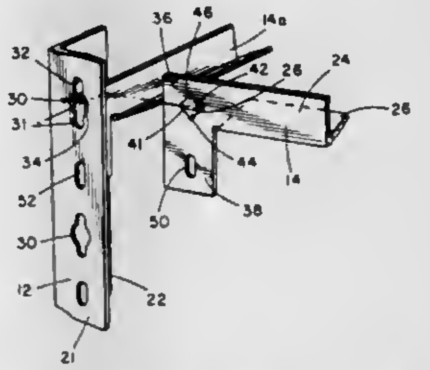
4,106,630

STORAGE RACK ASSEMBLY

Phillip Rosenband, Hammond, Ind., assignor to Parsteel Products Company, Inc., Chicago Heights, Ill.

Filed Apr. 28, 1977, Ser. No. 791,689
Int. Cl.² A47F *5/10*
U.S. Cl. 211—191 17 Claims

1. In a storage rack assembly comprising at least one part of sheet metal or the like having at least one supporting wall with a front face and a back face, at least one opening in said supporting wall, at least one, one-piece beam of sheet metal or the like having an elongate wall portion with a front face and a back face and at least one load carrying tab struck from the wall portion adjacent one end of said beam and projecting from one face thereof, said tab being received in said opening with said beam extending transversely of said post, the improvement residing in said opening being wider in the central area thereof between opposite ends of said opening, which ends lie on a line which is co-axial with the elongate axis of said post, said tab having a central portion spaced outwardly from said one face of said wall portion and a connecting portion defined by two short arms which are integral with and extend, respectively, from opposite sides of said central portion to said wall portion and are integral with said wall portion, said central portion having at least one edge extending outwardly therefrom and transversely of said connecting portion and, when said beam is connected to said post, said central portion is received through said central area of said opening and then moved in a line co-axial with the elongate axis of said post to place one of said arms in one of said ends of said opening with said edge positioned over one face of said wall of said post.

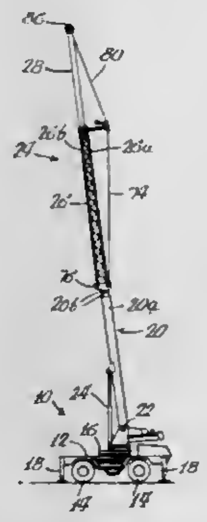


4,106,631

FLY AND JIB ASSEMBLY FOR CRANE

Richard W. Lundy, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 18, 1977, Ser. No. 769,933
Int. Cl.² B66C *23/06*
U.S. Cl. 212—144 12 Claims



1. A crane structure comprising a base, a main boom pivotally mounted on said base, a fly section secured to a free end of said main boom, said main boom having an opening adjacent the free end, and a jib section carried by an outer end of said fly section, means mounting said jib section for movement between a usable position in alignment with said fly section and a stored position below said fly section, said mounting means including link means having one end freely pivoted on said fly section and an opposite end pivotally supported on said jib section at a point spaced from a longitudinal center axis thereof, cable means for supporting said jib section, said cable means having one end connected to a free end of said jib section and a member on an opposite end receivable into said opening on said main boom so that the longitudinal axes for said fly section and said jib section are located on a common axis when said jib section is in an end-to-end usable position on said fly section, pivot means connecting said fly section to said

main boom to be fixed in a plurality of working positions one of which is in said end-to-end usable position and means preventing insertion of said member into said opening in said main boom when said fly section is in any position other than said end-to-end usable position.

4,106,632
DEVICE FOR AUTOMATICALLY LOADING A MACHINE TOOL, PARTICULARLY A SHAVING MACHINE

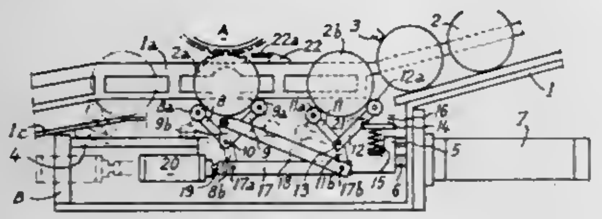
Oscar G. Bossi, Milan, Italy, assignor to Societe dite: Stabilimento Industriale Costruzione Macchinario Attrezzature, Pianezza, Italy

Filed Mar. 29, 1977, Ser. No. 782,457

Claims priority, application France, Mar. 31, 1976, 76 09348

Int. Cl.^{2} B23F *19/06*

U.S. Cl. 214—1 BB **4 Claims**



1. A device for automatically loading a machine tool, particularly a shaving machine, comprising on the one hand a chute conveying the workpieces, particularly gears, to a loading station, on the other hand an equipment whose support is mobile in translation along a rectilinear slide by means of a double-acting hydraulic or pneumatic ram, said slide extending at least between the loading station and the work station of the machine tool, whilst the mobile equipment comprises two units each comprising two arms, each unit of two arms being adapted to support a workpiece and the two arms of the front, unloading unit as well as the front arm of the rear, loading unit, being mounted to pivot on the sliding support, wherein the ends of the arms of the mobile equipment are provided with rotating rollers on which rest the workpieces, whilst a linkage connects the three pivotal arms and is coupled to a double-acting hydraulic or pneumatic ram mounted on said support and ensuring the passage of the pivotal arms from a high position to a low position and vice versa.

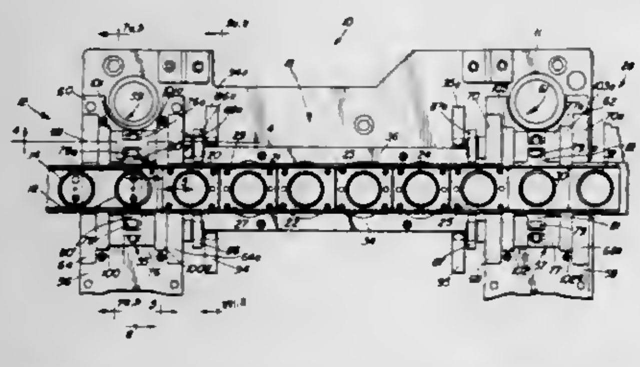
4,106,633
HIGH SPEED TRANSFER MECHANISM FOR TRANSFER DIE

Richard L. Lang, Mount Prospect, and Dietmar G. Quaas, Arlington Heights, both of Ill., assignors to Buhrke Industries, Inc., Arlington Heights, Ill.

Filed Feb. 24, 1977, Ser. No. 771,560

Int. Cl.^{2} B65G *47/90*

U.S. Cl. 214—1 BB **10 Claims**



1. In a progressive die for use on a single-acting press having a punch plate mounting on its ram and die shoe mounting on its bed with die tooling stations erected thereon in linear array, the improvement in transfer mechanisms for holding workpieces during transfer for die forming the same comprising:

(a) shaft means mounting on said shoe for reciprocal rotational movement and having its axis parallel with and adjacent the tooling stations;

(b) first drive means operationally coordinated with the punch plate and engaging said shaft means for reciprocally rotating the same;

(c) bar means mounting on the shaft means between and in parallel relation with the axis thereof and the tooling stations for reciprocal translational movement and progressively transferring the workpieces from station to station in a direction parallel therewith;

(d) second drive means operationally coordinated with the punch plate and engaging the bar means for reciprocally translating the same;

(e) workpiece retaining means operationally mounting on said shaft means and progressively engaging the workpiece with said bar means during translation of the same; and

(f) means for reciprocally rotating said transfer bar means by said reciprocally rotating shaft means operationally mounted between the same.

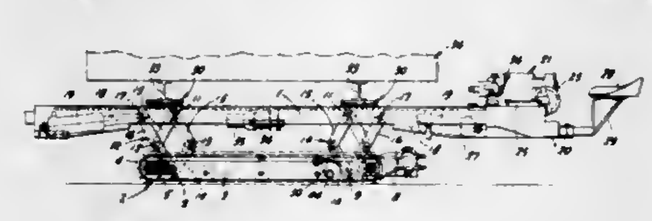
4,106,634
CRAWLER-TYPE SELF-PROPELLED HOIST

Clifford E. Becker, 1196-B Filbert Ave., Chico, Calif. 95926

Filed Jun. 3, 1977, Ser. No. 803,238

Int. Cl.^{2} B25J *3/00*

U.S. Cl. 214—1 D **6 Claims**



6. A hoist comprising a pair of elongated, power-driven, low-profile, endless track units disposed in adjacent but spaced parallel relation, said endless track units being interconnected in unitary relation, an elongated hoist beam disposed lengthwise between the endless track units, power-actuated supporting and lifting mechanism connected between the endless track units and the hoist beam, said power-actuated supporting and lifting mechanism including longitudinally spaced, foldable linkage assemblies of pantograph type and which when folded support the hoist beam in an initial lowered position substantially between the endless track units, the linkage assemblies when unfolded elevating said hoist beam from said initial lowered position to a raised position above the track units, and a corresponding longitudinal power cylinder mounted on the hoist beam and connected to each linkage assembly in unfolding and folding relation thereto.

4,106,635
ELEVATABLE DEPALLETIZING SYSTEM

Matsuo Nishimura, Tokyo, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Feb. 17, 1977, Ser. No. 769,776

Int. Cl.^{2} B65G *59/02*

U.S. Cl. 214—8.5 A **12 Claims**

1. A depalletizing system of the kind in which articles stacked up in layers on a pallet, each layer being composed of articles arranged in plural rows, are automatically depalletized, said system comprising;

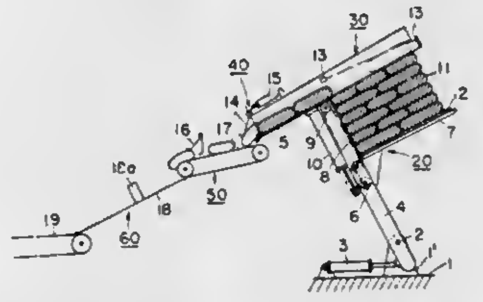
(a) hoisting means adapted to hoist up or down said palletized articles and tilt them at a required angle,

(b) a chute secured to the upper portion of said hoisting means substantially in parallel with the plane of each layer,

(c) control means adapted to stop the further upward movement of the palletized articles when the lower surface of the uppermost layer has been located in alignment with or slightly above the plane of said chute,

(d) selecting means adapted to permit only the articles included in one of the plural rows to pass while blocking the passage of the articles in other rows, and

(e) separating means adapted to separate the articles issuing from said selecting means in order to put a suitable interval between the two adjacent articles.



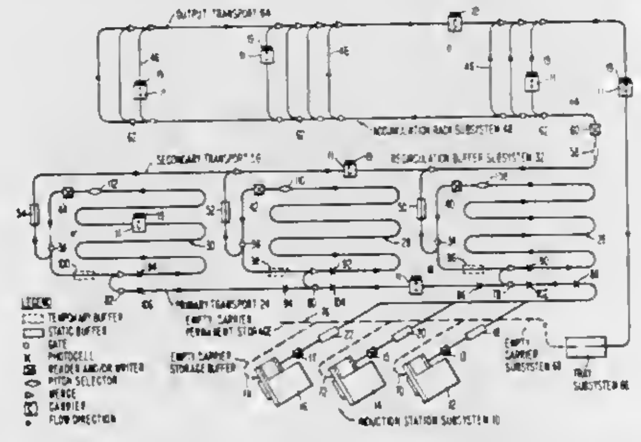
4,106,636
RECIRCULATION BUFFER SUBSYSTEM FOR USE IN SORTING AND PROCESSING ARTICLES INCLUDING MAIL FLATS

Raymond Joseph Ouimet, Downingtown; Edward Arthur Wojtowicz, Bryn Mawr; George Edward Lund, Berwyn, and Ermenegildo Fiorentino, Bridgeport, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 24, 1976, Ser. No. 744,613

Int. Cl.^{2} B65G *43/00*

U.S. Cl. 214—11 R **16 Claims**



1. A system for sorting and processing articles including flat mail pieces comprising in combination:

carriers coupled to said articles for providing support therefor and remaining therewith throughout the operation, escort memory means attached to each of said carriers and adapted to receive information regarding at least the destination of the article;

an induction station subsystem including write station means for storing a destination in the escort memory means of each of said carriers;

a recirculation buffer subsystem comprised of at least one recirculating buffer;

primary transport means for transporting said carriers from said induction station subsystem into said recirculating buffer, said last mentioned carriers having respective random destinations and being circulated continuously within said recirculating buffer;

control system means coupled to said induction station subsystem for establishing a destination queue encompassing all of the loaded carriers in the system, and in accordance with predetermined criteria, for selecting carriers associated with a particular destination to be outputted from the recirculating buffer;

read/write means situated within said recirculating buffer and so positioned with respect to the path of travel of said carriers as to read the destination of each carrier as contained in its escort memory;

an output accumulation rack subsystem having a plurality of individually identifiable output racks;

secondary transport means for transporting said carriers from said recirculation buffer subsystem to said output accumulation rack subsystem;

said read/write means within said recirculating buffer being coupled to said control system means and being directed thereby to store in the escort memory of the carriers selected to be outputted from the recirculating buffer, information identifying a particular output rack;

gate means within said recirculating buffer and operatively connected to said control system means for permitting said selected carriers to exit said recirculating buffer and to enter said secondary transport means;

read station means situated along said secondary transport means for reading said output rack information, and gating means situated within said accumulation rack subsystem and responsive to said read station means for causing said selected carriers to enter and be stored in said particular output rack identified in its escort memory.

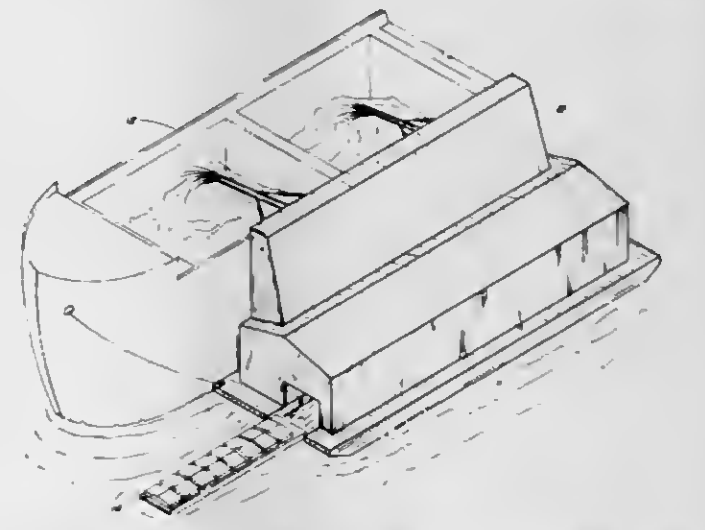
4,106,637
APPARATUS FOR AND METHOD OF LOADING LOOSE GRANULAR MATERIAL FROM BARGES INTO SHIPS

John Marsden, Kenner, La., assignor to Halter Marine Services, Inc., New Orleans, La.

Filed Mar. 30, 1977, Ser. No. 782,649

Int. Cl.^{2} B65G *67/58*

U.S. Cl. 214—13 **3 Claims**



1. A floating transfer vessel for loading loose granular material from barges into a ship comprising in combination:

a. a docking platform integral with said transfer vessel for mooring a ship thereto;

b. a floodable barge passageway defined longitudinally in said transfer vessel along a side opposite to said docking platform for floating a string of loaded barges therein;

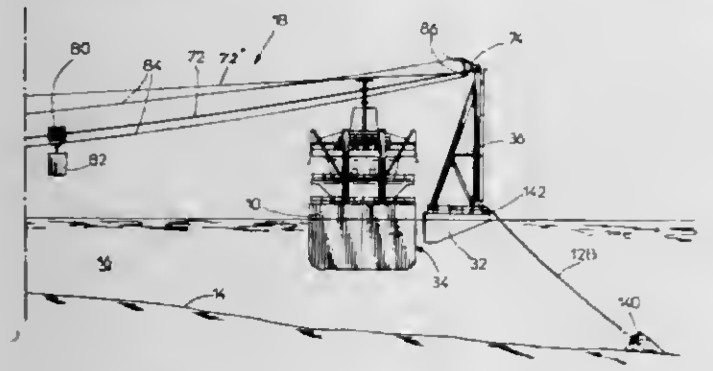
c. a closure mounted in an end of said passageway for the opening and closing thereof watertightly;

d. means for flooding and pumping out water, sufficient to float and to ground said barges in said barge passageway, mounted in said transfer vessel thereby making said transfer vessel and barges relatively movable and immovable in sequence; and

e. automated means, for digging and transferring granular materials from barge to ship, mounted in said transfer vessel and integral therewith and with said barges grounded in said barge passageway, said automated means being adjustable to closely follow the barge confines of said granular material without an allowance for relative movement between said transfer vessel and grounded barges.

4,106,638
SHIP AND SHORE LOAD HANDLING SYSTEM WITH AN ASYMMETRICAL SHAPED PONTOON FOR SUPPORTING CARRIAGE CABLES

Henri Negre, 8 & 10, rue Talma, 75016 Paris, and Jean-Pierre Cathiard, 38360 Noyarey, both of France
Filed Oct. 4, 1976, Ser. No. 728,958
Claims priority, application France, Oct. 13, 1975, 75 31333
Int. Cl.² B63B *27/00;* A01D *90/00;* B66C *21/00*
U.S. Cl. 214—14 **3 Claims**

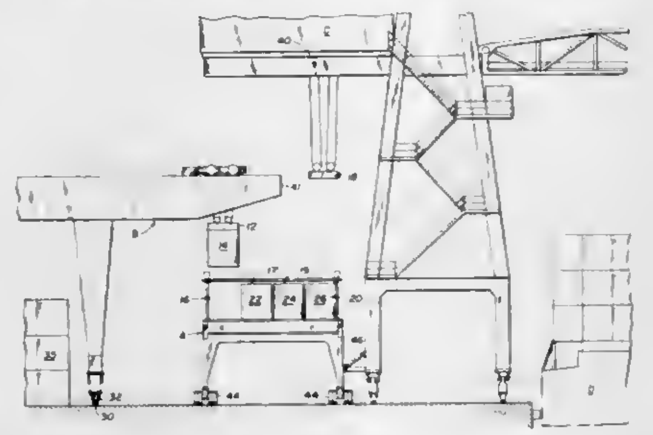


1. An installation for the loading and unloading of a ship anchored in a zone near a shore, comprising:
- a number of transporters each having an aerial cable and a first fixing point on the shore for the said cable,
- an elongated floating pontoon moored in the said zone, in a position parallel to a ship, and having a partially submerged hull with a longitudinal axis, a center of gravity and a center of thrust on which is exerted Archimedes' thrust,
- a number of piers carried and spaced along said pontoon, each pier having a second point of anchorage for respective cables thereon so that the cables stretch in parallel relationship between the pontoon and the shore while passing transversely over the ship, the said cables exerting a tipping moment on the pontoon, the shape of the said hull being asymmetrical about said longitudinal axis, the immersed part of said hull on the cable side being the larger in volume, so as to offset transversely the said center of thrust in relation to the said center of gravity in the direction of the said cables and engender a moment on the pontoon in opposition to the moment exerted by said cables,
- a ballast positioned on said pontoon so as to exert a moment in opposition to the moment exerted by said cables, and
- a means of mooring said pontoon which stretches in a direction opposite to that of the said aerial cables and is fixed to the pontoon so as to exert a moment in opposition to the moment exerted by said cables.

4,106,639
CONTAINER CONVEYOR APPARATUS AND METHOD FOR VESSEL LOADING CRANE-YARD INTERFACE

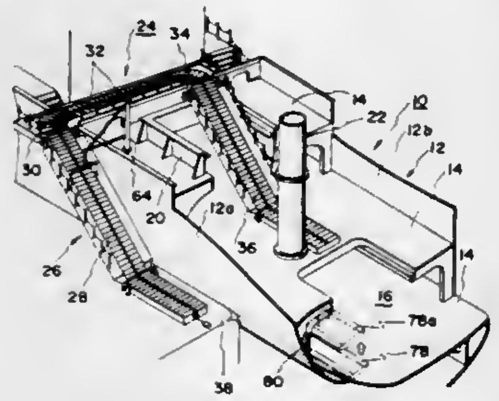
Murray Mathews Montgomery, Oakland; William Francis Gilger, Concord, and William Winfield Steiner, San Francisco, all of Calif., assignors to Matson Navigation Company, San Francisco, Calif.
Filed Dec. 13, 1976, Ser. No. 750,073
Int. Cl.² B65G *67/00*
U.S. Cl. 214—14 **20 Claims**

1. A process of conveying containers in the interface between a vessel loading crane and yard classification equipment comprising the steps of: providing a single file conveyance path having a first container work station underlying said vessel loading crane at one end of said path and a second container work station communicated to yard classification equipment at the other end of said path with at least one storage station between said first and second work stations for receiving at least one container; providing an underlying support along said single file conveyance path for the support of one or more containers on said work stations and said storage station; providing apparatus to convey containers deposited at one work station to the other said work station by lifting containers serially one at a time from below said support to a position above said support along said one-way conveyance path to convey containers between said work stations through said storage station whereby the spacing between said serially coveyed containers is variable; and, conveying said lifted containers serially between said work stations along and over said support to convey to said other work station any container on said path and conveying remaining containers on said path to a storage position juxtaposed to any container at said other work station to create a work bank of containers in conveyance between said work stations.



4,106,640
LOADING APPARATUS FOR CARGO VESSEL

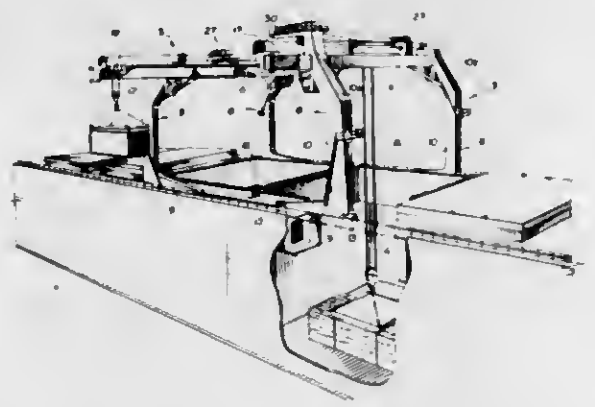
Sadao Omote, Tokyo, Japan, assignor to Nissei Shipping Co., Ltd., Tokyo, Japan
Filed Feb. 23, 1977, Ser. No. 771,373
Claims priority, application Japan, Mar. 9, 1976, 51-25288
Int. Cl.² B63B *27/22*
U.S. Cl. 214—14 **6 Claims**



1. A loading apparatus for a cargo vessel, comprising conveyor means including a loading-in conveyor to load cargoes in the vessel, a first turning conveyor connected to an inlet end of said loading-in conveyor to turn said cargoes in a direction traverse to sasid vessel, a traversing conveyor connected to said first turning conveyor to convey said cargoes transversely of said vessel, a second turning conveyor connected to said traversing conveyor to turn said cargoes in a direction longitudinal of the vessel, and lowering conveyor connected to said second turning conveyor to convey said cargoes through a hatch in an uppermost deck to the bottom of an uppermost hold in said vessel; and conveyor switching means to move said first and second turning conveyors and said traversing conveyor transversely of said vessel between a first position in which one of said first and second turning conveyors projects from one of the sides of the vessel over a quay and a second position in which the other turning conveyor projects from the other side of the vessel over the quay; said loading-in and lowering conveyors being detachably mounted so that in said first position, said loading-in conveyor is connected between the one turning conveyor and the quay in an inclined manner while the lowering conveyor is connectd between the other turning conveyor and the bottom of said uppermost hold in an inclined manner, and in said second position, said loading-in conveyor is connected between the other turning conveyor and the quay in an inclined manner while said lowering conveyor is connected between the one turning conveyor and the bottom of said uppermost hold in an inclined manner.

4,106,641
UNIVERSAL GANTRY CRANE

George Thomas Richardson Campbell; Tosbishige Kasuga, and Kosaku Ohno, all of Tokyo, Japan, assignors to Algoship International Limited, Nassau, The Bahamas
Filed Jan. 3, 1977, Ser. No. 755,996
Claims priority, application Japan, Mar. 17, 1976, 51-028921; Apr. 9, 1976, 51-043834; Jun. 24, 1976, 51-074742; Aug. 24, 1976, 51-100793
Int. Cl.² B63B *27/12*
U.S. Cl. 214—15 R **18 Claims**

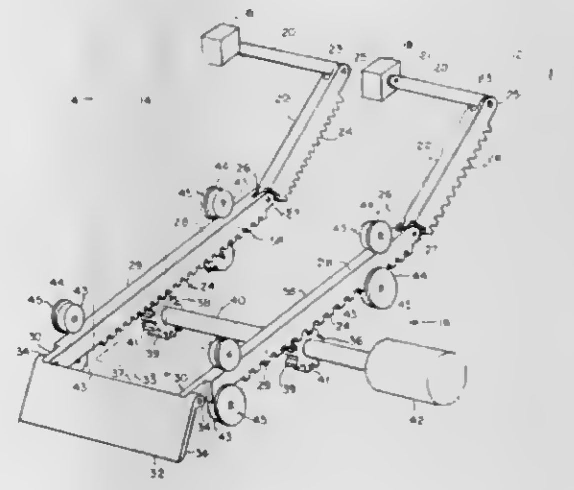


15. A gantry crane for travelling along rails on the deck of a ship, said crane having a pair of legs, the base portion of the said legs being horizontally disposed, a rail engaging drive wheel unit mounted on the end portions of the horizontally disposed base portion of the said legs, a bridge girder secured at its ends to the uppermost portion of the said pair of legs, a shuttle girder mounted for travel along one vertically outwardly facing surface of the said bridge girder for outreaching the ends of the bridge girder, a load hoisting trolley mounted for travel along a vertical outwardly facing surface of said shuttle girder remote from said bridge girder, said load hoisting trolley being located in a vertical plane intermediate the length of the base portion of the legs of the gantry crane, means to move said shuttle girder and said load hoisting trolley relative to each other and to said bridge girder, and means to operate said load hoisting trolley to raise and lower a load at any position of the load hoisting trolley with respect to the said shuttle girder and the said bridge girder, and means to locate and secure the gantry crane in a designated position on the rails on the deck of the ship on which the crane travels, said means to secure the gantry crane in a designated position including a pair of pedestals located immediately inwards on the deck surface on which the rails supporting the crane is laid, and a locking device on the inward facing surface of said legs of the crane engageable with securing means located on the top surface of said pedestals.

4,106,642
COKE PUSHING DEVICE

Harry Nicholas Hayduk, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Jul. 25, 1977, Ser. No. 818,392
Int. Cl.² C10B *39/14*
U.S. Cl. 214—18 R **6 Claims**

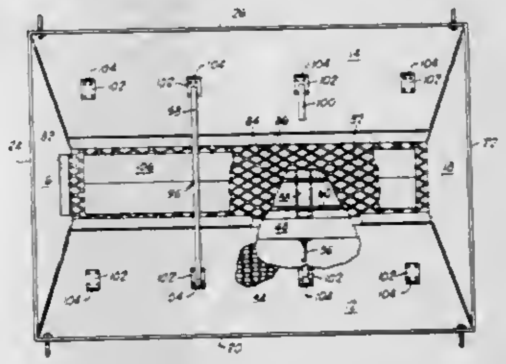
1. In a horizontal coke oven battery, in combination with a coke guide and a coke guide car, means for spreading and leveling coke pushed from a coke oven through said coke guide into a one-spot coke quench car comprising:
- (a) pusher means positioned adjacent the leading edge of the floor of said coke guide;
- (b) projecting means by which said pusher means can be extended outwardly from said leading edge of said floor of said coke guide across the width of said one-spot coke quench car which has been positioned to receive said coke;



- (c) pusher positioning means by which said pusher means can be diverted into said one-spot coke quench car to engage said coke therein; and
- (d) retraction means by which said pusher means can be withdrawn from within said one-spot quench car and retracted toward said leading edge of said floor of said coke guide.

4,106,643
FERTILIZER SPREADER BOX

Wendyl B. McGehee, 309 Pawnee, Burns Flat, Okla. 73624
Filed Mar. 22, 1977, Ser. No. 780,023
Int. Cl.² B60P *1/38*
U.S. Cl. 214—83.36 **25 Claims**

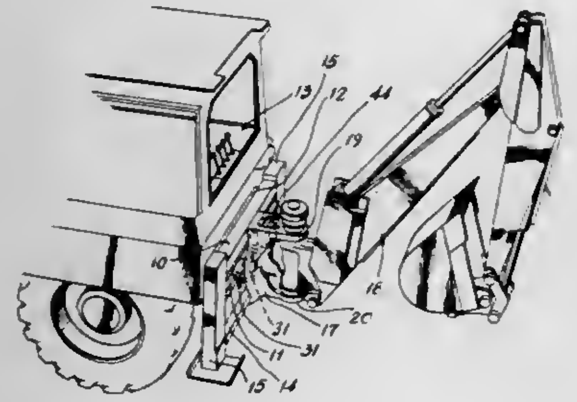


1. A box for containing and spreading fertilizer comprising:
- a hopper of inverted, frusto-conical configuration, said hopper including convergent, inwardly sloping side walls, and convergent, inwardly sloping end walls;
- a plurality of saddle plates connected to the outer sides of each of said side walls and projecting downwardly therefrom;
- a pair of tanks connected to lower end portions of said saddle plates and extending along the lower portion of said hopper along the outer sides thereof;
- a plurality of horizontally spaced members extending transversely across and beneath said hopper and each having its opposite ends connected to said tanks;
- a plurality of horizontally spaced, elongated rods extending longitudinally of, and beneath, said hopper and supported on said horizontally spaced members;

a bottom wall in said hopper and supported on said horizontally spaced, elongated rods; and
an endless belt conveyor including an upper run projecting over, and supported by, the bottom wall of said hopper, and including portions extending through openings at opposite ends of said hopper.

4,106,644
CLAMPING DEVICES

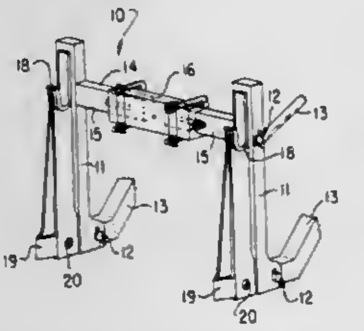
Derek Geoffrey Williams, Sale, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles
Filed Sep. 3, 1976, Ser. No. 720,489
Claims priority, application United Kingdom, Sep. 3, 1975, 36360/75
Int. Cl.² E02F *3/32*
U.S. Cl. 214—138 C **30 Claims**



1. A backhoe assembly comprising a support frame arranged to be attached to a support, for example a vehicle, and including generally horizontal frame members spaced apart from each other, an intermediate frame mounted so as to be movable along the frame members and arranged to support a digging boom, the backhoe assembly further including a vertically-acting clamp for clamping the intermediate frame to one of the horizontal frame members and a horizontally-acting clamp for clamping the intermediate frame to another of the horizontal frame members, a housing integral with said intermediate frame, a roof portion of said housing for containing said vertically acting clamp against said one frame member, said roof portion extending outwardly from said intermediate frame and located between said frame members.

4,106,645
MEANS FOR QUICK ATTACHMENT OF IMPLEMENT TO A TRACTOR

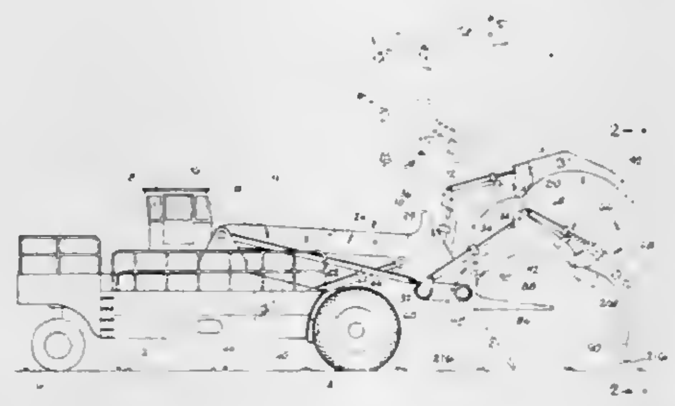
Rudolph G. Janish, Parkston, S. Dak. 57366
Filed Jul. 18, 1977, Ser. No. 816,722
Int. Cl.² E02F *3/81*
U.S. Cl. 214—145 A **3 Claims**



1. A device for providing quick attachment of implements to a tractor comprising a framework adapted to be attached to said tractor, said framework including hook means at its upper part and guide means at its lower part, implement attaching means including spaced apart walls on an implement adapted to embrace said hook means and guide means, upper pin means extending between said walls engageable with said hooks, lower movable pin means extendable into holes formed in said guide means, spring means engaging said movable pin means to bias said pins toward a position fully inserted into said holes in the guide means, said movable pin means including pins and means on said pins adapted to hold said pins partly withdrawn, said quide means being formed in a V-shape whereby insertion of said guide means between said walls will cause engagement of said guide means with said pin to press the pin outward against said spring means until said pins are aligned with said holes in said guide means.

4,106,646
LOAD HANDLING VEHICLE

Charles E. Weisgerber, Portland, Oreg., assignor to Raygo Wagner, Inc., Portland, Oreg.
Filed May 17, 1976, Ser. No. 686,926
Int. Cl.² B66F *9/00*
U.S. Cl. 214—147 R **18 Claims**

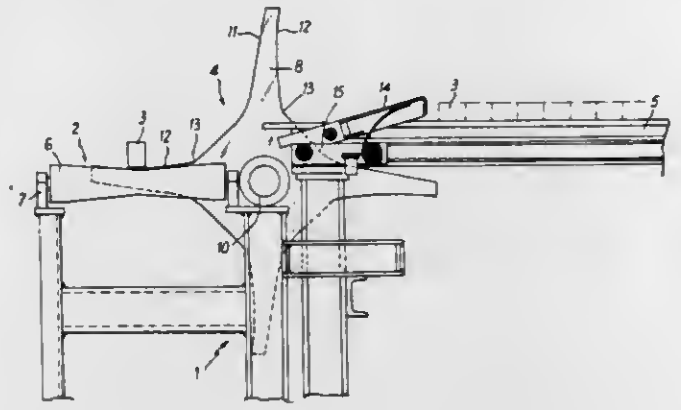


13. A load carriage apparatus for connection to a load lifting member of a load handling vehicle comprising:
a pair of generally vertically disposed claw means each adapted to be pivoted independently of the other to the load lifting member at laterally spaced apart positions, each of said claw means defining a load receiving opening and comprising a main carriage means pivotally connected to the load lifting member for movement relative to said load lifting member and relative to the main carriage means of the other claw means in a generally vertical plane, fork means extending forwardly of a lower portion of said main carriage means for supporting the load within said opening, and tusk means pivotally connected to an upper portion of said main carriage means for movement between an open position to admit a load within said opening and a closed position to grasp a load within said opening;
means operable for pivoting each of said main carriage means relative to the other; and
tusk operating means for pivoting each of said tusk means in a generally vertical plane between said open and closed positions.

4,106,647
METHOD OF HANDLING BARS

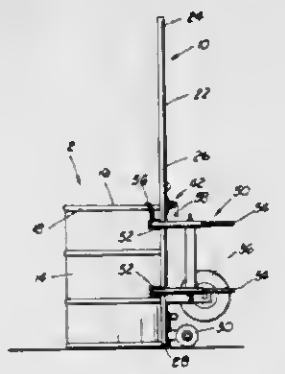
Daniel Robert, Ully St. Georges, France, assignor to Societe de Constructions Mecaniques de Creil-COMEC, Creil, France
Filed Feb. 15, 1977, Ser. No. 768,747
Claims priority, application France, Apr. 2, 1976, 76 09628
Int. Cl.² B65G *7/00*
U.S. Cl. 214—152 **9 Claims**

1. A method of disposing a bar having an outer envelope, as seen in cross-section, substantially rectangular shape, on one of its wider sides, the method comprising:
placing said bar on a first substantially cylindrical surface connected to a second substantially cylindrical surface along a common generatrix such that the two tangential planes along this generatrix form a dihedral angle;
tilting said first surface to cause said bar to slide in the direction of said common generatrix until it abuts against the apex of said dihedral angle;
increasing the tilt so that said bar tips onto said second surface if it is positioned on one of its narrower sides, or slides onto said second surface without tilting if it is positioned on one of its wider sides;
tilting said second surface to cause said bar to slide away from said common generatrix; and
collecting said bar with that one of its sides on which it has come to be positioned in a given orientation.



4,106,648
BARREL CART AND STAND

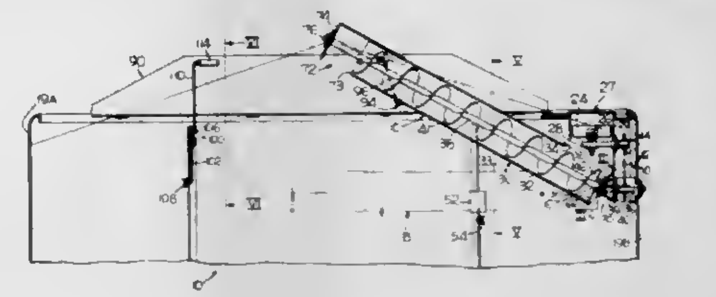
Richard E. Dickson, Box 517, Tribune, Kans. 67879
Filed May 27, 1977, Ser. No. 801,166
Int. Cl.² B62B *1/06*
U.S. Cl. 214—372 **5 Claims**



1. A barrel cart and a barrel stand for supporting a barrel thereon, the barrel having an annular rim around to top thereof, the cart and stand comprising:
a pair of elongated parallel barrel cart support members having an upper portion, a lower portion, and a center portion, the lower portion and the center portion receiving a side of the barrel thereon and therebetween, the upper portion used as cart handles;
a pair of first cart wheels mounted at the end of the lower portion of said support members and a pair of second cart wheels mounted on said support members and disposed adjacent the pair of said first cart wheels;
a barrel clamp attached to the center portion of said support members and disposed therebetween, said clamp engaging the annular rim of the barrel;
a concaved shaped barrel stand frame for receiving a portion of the side of the barrel thereon, said frame having outwardly extending legs in a spaced relationship for receiving said support members therebetween, and straps attached to said frame for suspending the barrel stand from the top of the barrel; and
the barrel stand suspended from the top of the barrel when the barrel is in an upright vertical position, the barrel cart received between said legs of the barrel stand and secured to the barrel by said barrel clamp with said barrel stand frame disposed therebetween.

4,106,649
FLOATING GRAIN BIN EXTENSION FOR USE WITH AGRICULTURAL COMBINE

John P. Nelson, Independence, and Roger D. Hanaway, Blue Springs, both of Mo., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Aug. 22, 1977, Ser. No. 826,751
Int. Cl.² B60P *1/42*
U.S. Cl. 214—522 **17 Claims**



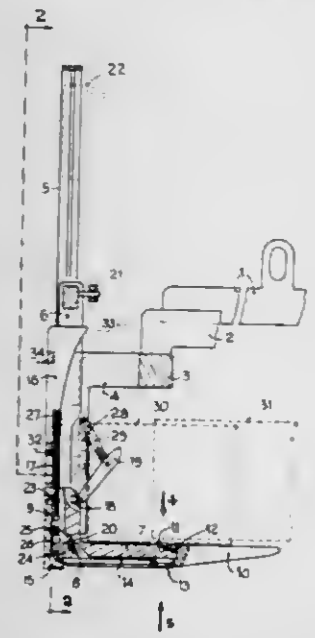
1. In combination, a grain bin adapted to be mounted on an agricultural combine, a bin loading conveyor positioned in the upper portion of said grain bin, means for delivering grain to said bin loading conveyor, said bin loading conveyor being adapted to receive grain and to convey grain which it receives to a discharge outlet of said bin loading conveyor in overlying relation to the interior of said grain bin, support means supporting said bin loading conveyor for pivotal movement about a horizontal axis whereby said bin loading conveyor swings vertically upwardly or downwardly about said horizontal axis in accordance with the level of grain in said bin after the grain in said bin reaches a predetermined level, at least one bin wall extension for increasing the height of said bin in the region of said bin wall extension, said bin wall extension being normally positioned in a lowered position, and means connecting said bin wall extension to said bin loading conveyor whereby said bin wall extension is selectively moved upwardly to a raised grain-retaining position or is moved downwardly to said lowered position in accordance with the vertical movement of said bin loading conveyor.

4,106,650
ARTICULATED MEMBER FOR HANDLING AND CONTROLLING LOADS

Christopher Edward James Blackstone, The Close, Minchinbampton Stroud, Gloucestershire, England (GL6 9JE), and Geoffrey Hugh Williams, Cogan, Talboys Walk, Tetbury, Gloucestershire, England (GL8 8YU)
Filed Jan. 10, 1977, Ser. No. 757,833
Claims priority, application United Kingdom, Jan. 20, 1976, 02061/76
Int. Cl.² B65G *67/00*
U.S. Cl. 214—750 **6 Claims**

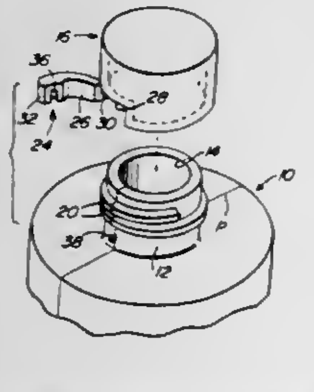
1. Improvements in load handling equipment of a kind comprising in combination: a lifting frame, a set of legs, means of fixing said legs to said frame, a set of guides, means of fixing said guides to said legs, a set of stirrup members, each said stirrup member being slideably connected to a pair of said guides, a set of root fork members, each said root fork member being pivotally connected to one said stirrup member, a set of tip fork members, each said tip fork member being pivotally connected to one associated root fork member, a set of back plates, means of fixing one said back plate to an adjacent pair of said legs, each said back plate is characterized by a shaped part of one edge, the said root fork member is characterized by a hook shaped extension, when the said root fork member is in an extended position the said hook shaped extension thereon abuts the said shaped part of the said back plate that is associ-

ated with that particular root fork member, said abutting contact being defined as the first root abutting contact, in addition a second root abutting contact is made between the said root member and the said associated back plate, said second root abutting contact is in an area removed from the area of the said first root abutting contact, each said root fork member is further characterized by the provision at an extremity, remote from the said back plate when in the extended position, of tooth shaped extensions and a joint abutting face removed from the area of said tooth shaped extensions, each said tip fork member is characterized by a set of tooth shaped extensions and a joint abutting face that match said tooth shaped extensions and joint abutting face of the said associated and said pivotally connected root fork member, when both said root fork member and said associated tip fork member are in the extended position both sets of said tooth shaped extensions are in contact and both said joint abutting faces are in contact, such conjunction of both said tooth shaped extensions and both said abutting faces provide a strong and stiff joint between said tip fork member and said associated root fork member, when said tip fork member and said associated root fork member are displaced from the extended position the accompanying relative rotation, between the said tip fork member and said associated root fork member, about the said pivotal connection causes both the said associated pair of tooth shaped extensions and said associated pair of joint abutting faces to move freely out of engagement.



4,106,651
LEFT AND RIGHT HANDED CHILD-RESISTANT SAFETY CAP

John B. Lemons, Box 55, R.R. #2,, Dunkirk, Ind. 47336
Filed Aug. 12, 1977, Ser. No. 824,327
Int. Cl.^{2} B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—221 **8 Claims**



1. A safety closure structure for containers, comprising, in combination:

a. a hollow container having a mouth forming an access opening into the container;

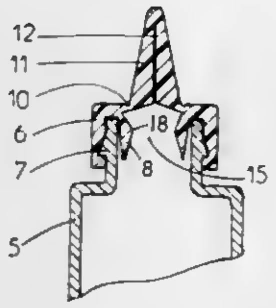
b. a cap removably mountable on the mouth of the container for blocking the access opening; and

c. lock means provided on the cap and the container for preventing removal of the cap from the mouth of the container, the cap being provided with a hollow cavity having a configuration arranged for receiving the mouth of the container, with the cap including an internal screw thread provided in the cavity and the mouth provided with an external screw thread provided on the container for engaging with the internal screw thread and holding the cap on the container, the clock means including, in combination:

1. flap means pivotally connected to the cap and arrangeable beneath the external thread provided on the container adjacent the mouth thereof; and
2. fastener means provided on the flap and on the container for securing the flap to the container and preventing the cap from rotation relative to the container, the cap having a side wall partially forming the cavity and an opening communicating with the cavity, and a cut out being provided in the side wall of the cap adjacent the opening therein and arranged for receiving the flap, the latter extending between a pair of spaced, substantially parallel edges, the flap being pivotally connected to the cap at one of the edges, and a portion of the fastener means being provided on the flap adjacent the other of the edges of the flap.

4,106,652
AMPOULE

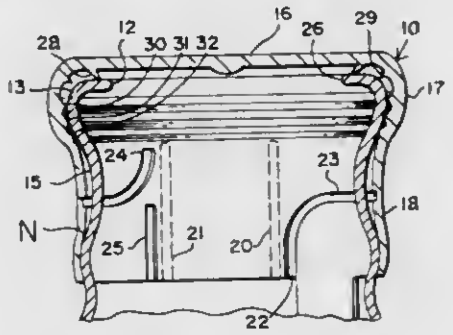
Jacques Leclabart, Vaucresson, France, assignor to Societe Anonyme Parfumerie et Chimieparchimy, Reims, France
Filed Sep. 7, 1976, Ser. No. 720,771
Claims priority, application France Sept. 11, 1975, 7527830
Int. Cl.^{2} B65D *41/46*
U.S. Cl. 215—253 **5 Claims**



1. An ampoule for containing a liquid product and able to be filled under vacuum, said ampoule comprising a container body having a neck with an opening and a stopper of plastic material force-fitted on said body to close said opening, said stopper having a weakened zone enabling a portion of said stopper to be easily torn away to open an orifice of sufficient area to allow the product contained in said ampoule to run out normally, said stopper defining a capillary vacuum-filling orifice to be closed after filling, said stopper including a projecting nose which constitutes said portion of said stopper which is torn away, said nose being of conical shape and having a tearable base, the portion of said ampoule which remains in place after tearing off said nose including an internal collar included in the neck of the container with a central opening of smaller diameter than said base of said nose so that said nose, after removal and reversal, is introducible into said opening to re-stopper said ampoule.

4,106,653
TEARABLE BOTTLE CAP

Luciano B. Martinelli, 418 Sevilla, Coral Gables, Fla. 33134
Filed Jun. 13, 1977, Ser. No. 806,079
Int. Cl.^{2} B65D *41/48*
U.S. Cl. 215—256 **1 Claim**

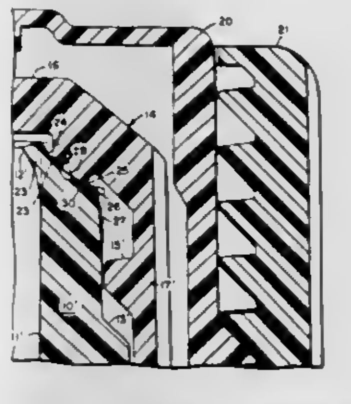


1. In the neck of a water bottle having a mouth portion, an upper and a lower bead and a neck portion of reduced diameter joining said upper and lower beads and a lip portion, a tearable plastic cap comprising a disk portion extending across the mouth of said neck portion having an inwardly extending peripheral finger portion engaging said lip portion, an external bead portion engaging said upper bead and a skirt portion extending downwardly from said external bead portion, across said neck portion of reduced diameter and engaging said lower bead, said external bead portion having a plurality of peripheral ridge portions on the inner surface thereof in water-tight relation with said upper bead, said peripheral ridge portions being of decreasing cross sectional areas engaging said upper bead from the upper to the lower portions thereof, a pair of spaced apart reinforcement members extending downwardly on the outer surface of said skirt portion from said external bead portion, a tab portion extending downwardly from said skirt portion, and a plurality of score lines formed along the inner surface of said skirt portion for the removal of said tab portion and said skirt portion, one of said score lines commencing at the lower portion of said skirt portion between said tab portion and one of said reinforcement members, extending upwardly to a position below said external bead, peripherally about said skirt and terminating at the upper portion of the other of said reinforcement members and a second score line extending alongside said other of said reinforcement members and terminatin proximity of the terminal end of said one of said score lines whereby upon grasping said tab portion and tearing said skirt along said score lines said tab and a portion of said skirt become separated from said cap and said cap becoming removable from said water bottle and that portion of said skirt portion between said reinforcement members becoming a second tab to permit reuse of said cap.

4,106,654
CONTAINER WITH SIDE SEALING CLOSURE AND METHOD OF FORMING THE SEAL THEREOF

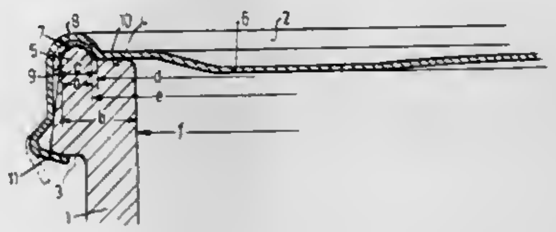
Eugene C. Jones, Laguna Niguel, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Mar. 10, 1977, Ser. No. 776,436
Int. Cl.^{2} B65D *41/04*
U.S. Cl. 215—329 **16 Claims**

1. In combination, a flexible plastic container having an upstanding neck portion terminating in an annular lip defining a discharge opening; said lip having an upwardly and inwardly tapering side surface; a closure for said opening having a top wall, an annular side wall, and an internal shoulder sealingly engagable with said tapered surface to flex said lip inwardly when said closure is forced downwardly into a lowered position about said neck; and means for releasably holding said closure in said lowered position.



4,106,655
CONTAINER HAVING A MOUTH, SUCH CONTAINER PROVIDED WITH A METAL CAP AND METAL CAP FOR CLOSING SUCH CONTAINER

Hendrik Gerrit Heijting, Deventer, Netherlands, assignor to Thomassen en Drijver-Verblifa N.V., Deventer, Netherlands
Filed Sep. 16, 1976, Ser. No. 724,078
Claims priority, application Netherlands, Sep. 17, 1975, 7503162
Int. Cl.^{2} B65D *53/00*
U.S. Cl. 214—341 **9 Claims**



1. A combination of a container and a closure cap; said container having a mouth internally defined by a substantially planar upwardly facing seating surface; an upstanding rim dispersed radially outwardly and axially upwardly of said seating surface, and cap retaining abutment means spaced axially downwardly from said rim; said closure cap having a central panel, downwardly opening a sealing channel surrounding said central panel, a skirt extending down from said sealing channel, said sealing channel having a deformable sealing material therein, and said skirt having retaining means; and said closure cap being seated on said container in mouth sealing relation with said retaining means engaging said abutment means and urging said sealing channel down over said rim with said sealing material being deformed around said rim and deformation of said sealing material being limited by the seating of said central panel on said seating surface.

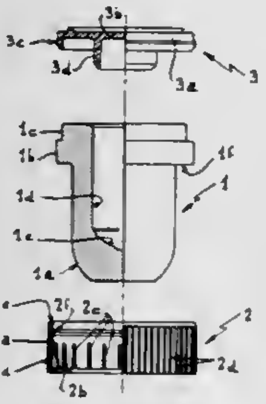
4,106,656
COMPOSITE STOPPER

Pierre Bablol, Villefranche-sur-Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques, S.N.B.P., Paris, France
Filed Oct. 14, 1976, Ser. No. 732,222
Claims priority, application France, Oct. 20, 1975, 75 32390
Int. Cl.^{2} B65D *39/00*
U.S. Cl. 215—364 **4 Claims**

1. A composite stopper comprising:

a body made of resilient deformable plastic material, the body having a cylindrical portion and having a central blind recess extending axially downwardly thereinto, and the body having an annular flange of diameter greater than the cylindrical portion extending around the cylindrical portion opposite said blind recess;

a cage member comprising a tubular skirt of diameter fitting over said flange, the skirt having an annular ring extending radially inwardly and terminating in an axial bore of diameter fitting said cylindrical portion of the body, the annular ring underlying the flange and the skirt extending up the flange; and

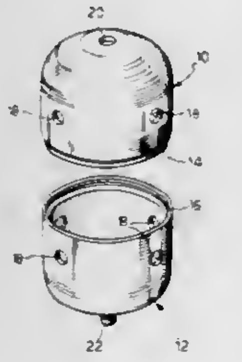


a disc-like member having a downwardly extending peripheral rim shaped to axially enter said skirt and overlie said resilient body, and the member having a downwardly extending axially disposed sleeve of diameter larger than said blind recess, the sleeve being force fitted within the body when the rim of the disc-like member is entered in the skirt and expanding the body into tight engagement with said skirt.

4,106,657

CONTAINER USABLE AS A TOY CONSTRUCTION ELEMENT

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy
Filed Jul. 19, 1976, Ser. No. 706,406
Claims priority, application Italy, Sep. 17, 1975, 53338/75[U]
Int. Cl.² B65D *21/02;* **A63H** *33/08*
U.S. Cl. 220—23.4 **1 Claim**



1. A container for gifts, suitable to be used as a toy construction element, said container comprising:

first and second substantially equal size cup-shaped parts,

means on said first and second parts permitting snap engagement of said parts together at their rims in such a manner as to form a container in the form of a generally ovoid barrel having a smooth hollow interior,

means defining a plurality of holes in the side wall of the first of said cup-shaped parts spaced from the rim of said first part and lying in a common plane parallel to said rim,

means defining a hole in the bottom of said first of said cup-shaped parts,

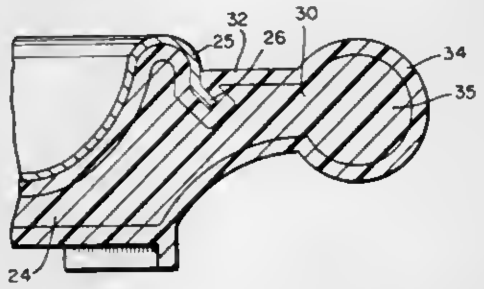
means defining a plurality of holes in the side wall of the second of said cup-shaped parts spaced from the rim of the second part and lying in a common place parallel to said rim, and

a mushroom headed projection extending outwardly from the bottom of the second of said cup-shaped parts, said mushroom headed projection being snap engageable with any of the holes in the side walls or the bottom of the first or second parts of another like container.

4,106,658

PLATTER

Richard N. Brandon, c/o Marco Tool & Die 6868 Homestretch Rd., Dayton, Ohio 45414
Filed Jun. 6, 1977, Ser. No. 803,560
Int. Cl.² B65D *25/14*
U.S. Cl. 220—453 **5 Claims**

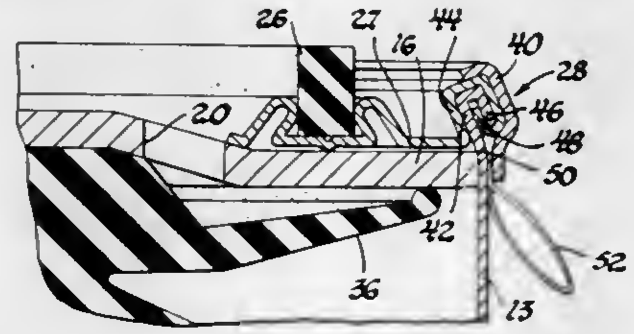


5. A heat retaining unitary serving platter comprising a sheet metal tray having a raised margin terminating in a peripherally downwardly turned edge, a rigid heat insulating plastic molded base in conforming underlying relation to the bottom surface of said tray with a peripheral rim extending outwardly of said raised portion, said edge being continuously embedded into said base inwardly of said rim encapsulating and locking said tray and said base together in a unitary construction.

4,106,659

PRESSURE VESSEL

Richard G. Dent, Davison, and Gary F. Stack, Holly, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 1, 1976, Ser. No. 701,527
Int. Cl.² B65D *7/42, 45/32*
U.S. Cl. 220—67 **2 Claims**

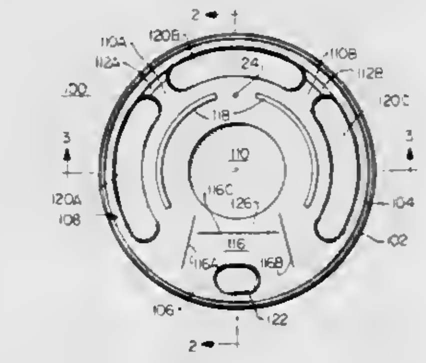


1. A pressure vessel comprising a sheet-metal canister having an open end, a rigid plate having an outer edge conforming to and fitting within said open end, a sheetmetal lid juxtaposed with an outer portion of said plate, said canister at said open end and an outer portion of said lid being folded together to form a lockseam having pleats extending longitudinally of said canister and overhanging said plate, and a continuous band fitting over said lockseam and also said plate and forcing said lockseam to be bent radially inward about said plate so that said pleats are oriented transversely of the canister whereby the forces acting to pull the lockseam apart must also bend said lockseam outward about said plate and against said band before the lockseam can unravel.

4,106,660

SPLASH PROOF DRINK-THROUGH BEVERAGE CONTAINER LID

Patrick T. Boyle, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.
Continuation-in-part of Ser. No. 722,402, Sep. 13, 1976, Pat. No. 4,056,210, which is a continuation-in-part of Ser. No. 678,751, Apr. 21, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,141
Int. Cl.² A47G *19/22;* **B65D** *7/24, 41/32*
U.S. Cl. 220—90.4 **28 Claims**



1. A friction fit sheet plastic lid for open mouthed containers having a peripheral lid receiving rim portion about the mouth thereof comprising:

a peripheral rim receiving cavity defined therein;

a central web bounded by said rim cavity;

a raised area formed in said central web;

an upper surface on said rim cavity at substantially the same height as said raised area and merging therewith over at least a predetermined peripheral portion; and

a wedge shaped tear-away section having a tear-tab at its innermost extremity defined by score lines which diverge to substantially subtend said predetermined peripheral portion and which terminate substantially inboard of said upper surface of said bead cavity;

said tear-away section and said predetermined peripheral portion being removable from the remainder of said lid by an upward and outward force on said tear-tab;

said rim cavity being interrupted internally of said lid over said predetermined peripheral portion; and

said tear-away segment including a substantially steepwalled cavity defined therein adjacent said rim cavity and having an outer wall cooperating with the outermost portion of the interrupter portion of said rim cavity to define a segmental rim gripping means for replaceably securing said tear-away section on the rim of an associated container.

4,106,661

INFLATABLY SEALED STERILIZER DOOR

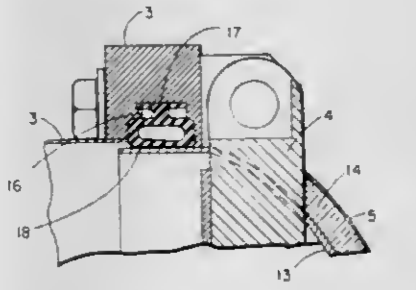
Robert E. Hunt, Andover, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 647,238, Jan. 7, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 774,166
Int. Cl.² B65D *53/00, 45/00*
U.S. Cl. 220—232 **1 Claim**

1. An apparatus for sealing a container comprising:

a. locking means having a track guide connected to the container, a bolt having tapered and untapered ends located in said track guide, a handle connected to the untapered end of said bolt, said track guide slotted for communication therethrough of said handle, and a receiving chamber connected to said container for receiving the tapered end of said bolt when said bolt is in the closed condition;

b. interlock means connected to said receiving chamber having a bar lever with first and second ends, said interlock means having a pin having one end located in and perpendicular to said receiving chamber and the other end connected to the first end of said bar lever, the second end of said bar lever hingedly affixed to said container and a circuit breaker button connected to the center of said bar lever;

c. a cover disposed over the mouth of the container, said cover having an inner rigid surface, a supportive member attached to said inner rigid surface having a hole therein positioned for communication with said bolt when said cover is in the closed condition, an outer rigid surface located parallel to said inner surface and removably affixed thereto, and insulating material located between said inner and outer materials;



d. a rigid flange affixed to the inside of said cover and positioned parallel and adjacent to the inner surface of the mouth of the container;

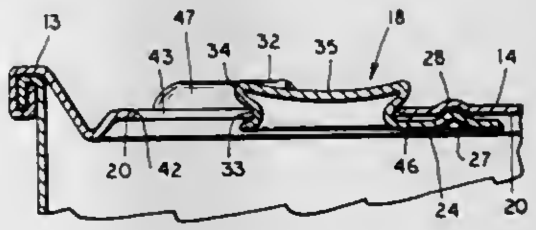
e. an inflatable seal carried in a recess in the inner surface of the mouth of the container, said inflatable seal when inflated making airtight contact with said flange and the inner surface of the mouth of the container causing a force in a direction perpendicular to said flange and the inside of the container; and

f. a hinge connecting said cover to said container whereby a frictional force is created which prevents the opening of said cover.

4,106,662

EASY-OPEN CONTAINER WITH FLANGE PUSH-IN MEMBER

Carl J. Strobe, 2831 Orchard Knob, and Robert A. Wells, 4450 Harris Trail, N.W., both of Atlanta, Ga. 30327
Division of Ser. No. 580,624, May 27, 1975, Pat. No. 4,023,703. This application May 13, 1977, Ser. No. 796,510
Int. Cl.² B65D *41/32*
U.S. Cl. 220—268 **14 Claims**



1. Easy opening container wall apparatus having unitary opening structure, comprising:

a wall having an outer side and an inner side;

an openable member defined in said wall by a selectably separable region of weakness;

an opening tab integrally formed with said openable member and extending a distance above said outer side, said opening tab having a portion which overhangs at least a portion of said separable region; and

said opening tab being formed in said openable member so that said opening tab is a unitary portion of said openable member.

4,106,663

MEANS FOR OPENING AND CLOSING A LID OF CASSETTE TAPE RECEIVER PORTION

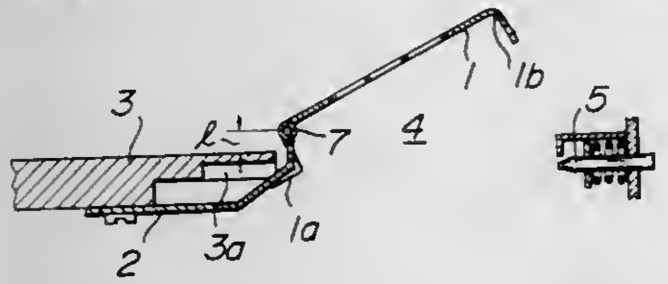
Toshihiro Nakao, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 805,171

Claims priority, application Japan, Jun. 11, 1976, 51-76136[U]

Int. Cl.² B65D *45/16*

U.S. Cl. 220—326 **5 Claims**



1. A means for opening and closing a lid on a cassette tape receiver portion comprising a casing having an opening portion, a lid body having a projection formed at a side end to be rotated for opening and closing the opening portion of the casing, a spring plate for rotatably supporting the lid body through a hinge connection and having a mandrel and being directed downwards and its free end portion being bent upwards against the side end fixed in the casing, and an abutment provided in the casing for engaging the projection of the lid body when closing the lid body, whereby the hinge connection is positioned above the surface of the casing by a predetermined amount when the lid body is opened.

4,106,664

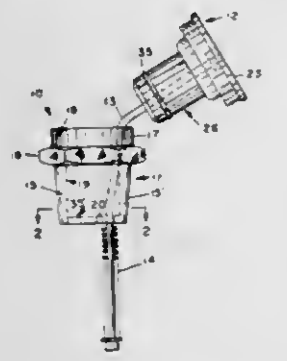
CLOSURE

Richard John Renk, and George Earl Boller, both of Winona, Minn., assignors to Gladys D. Miller, Winona, Minn.

Filed Jun. 4, 1976, Ser. No. 693,091

Int. Cl.² B65D *43/14*

U.S. Cl. 220—329 **13 Claims**



1. A closure for use with a base member having a bore therein defined by a wall area comprising,

a top member adapted to be moved into and out of engagement with said base member,

securing means having a relatively smooth area operatively connecting said top member to said base member, said securing means being pliant so as to be able to somewhat conform to said bore,

guide means carried by one of said members for slideably engaging said securing means along said smooth area and keeping at least a portion of the securing means in a predetermined alignment with respect to its associated member while allowing other portions of said securing means to be moved toward a different area of said base member to provide a relatively unobstructed bore, and

biasing means operatively connected to said securing means to urge said top member into restrictive engagement with said base member,

said top member being capable of being moved away from said base member to provide a generally unobstructed filling opening and being moveable into engagement with said base member under the action of said biasing means which causes said securing means to slide past said guide means and urge said top member into engagement with said base member.

4,106,665

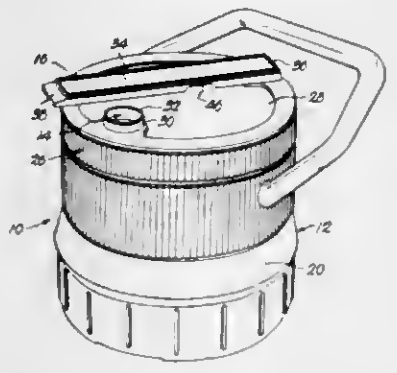
CONTAINER CLOSURE

John Porter Cannon, Overland Park, Kans., assignor to Plattner Industries, Inc., Ottawa, Kans.

Filed May 9, 1977, Ser. No. 794,746

Int. Cl.² B65D *43/14. 51/04*

U.S. Cl. 220—329 **6 Claims**



1. A container including:

a generally cylindrical hollow body provided with a circular substantially flat top wall presenting an arcuate periphery;

an outlet in said wall adjacent said periphery;

a closure for said outlet,

said closure including an elongate arm having a pair of opposed ends each presenting an arcuate terminal edge,

said terminal edges having a curvature substantially identical to the curvature of said periphery,

said arm being normally disposed in a first position overlying said outlet and fully traversing said wall diametrically,

said edges being aligned with opposed segments of said arcuate periphery when said arm is in said first position,

a mount at one end of said arm releasably, pivotally attaching the latter to the wall adjacent said periphery for swinging movement to and from said position within a plane generally parallel with the wall; and

releasable means at the opposite end of said arm holding the latter in closing relationship to the outlet when the arm is in said position,

said arm being resilient rendering the same capable of being flexed away from said outlet to a second position releasing the arm from the latter prior to swinging the arm about said mount away from the outlet,

at least a portion of each of said edges extending beyond said periphery when said arm is swung about said mount away from said outlet, whereby to provide convenient manual engagement of the arm for return of the latter to said first position or for releasing said arm from said mount.

4,106,666

FLUID RESERVOIR

Takayoshi Ono, Toyota, Japan, assignor to Toyota Tidoshakogyo Kabushiki Kaisha, Japan

Filed Mar. 3, 1976, Ser. No. 663,344

Claims priority, application Japan, Mar. 14, 1975, 50-35073[U]

Int. Cl.² B65D *51/16, 53/00*

U.S. Cl. 220—373 **6 Claims**

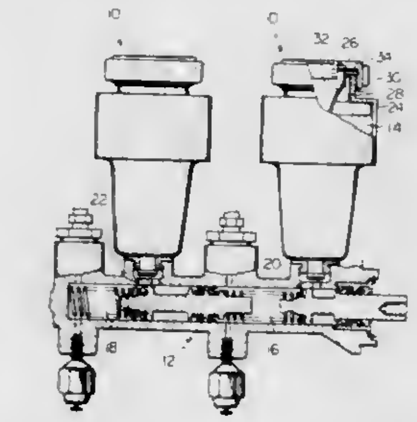
1. A fluid reservoir for brake or clutch master cylinders in motor vehicles, comprising:

a fluid reservoir body;

a cap attached to an inlet opening portion of said reservoir body by threaded engaging means;

a rubber sealing member interposed between an inside face of said cap and an end face of said inlet opening portion of the reservoir body; and

a spacer means composed of material other than rubber, such as metal or resins, disposed between said inside face of the cap and said sealing member so that the cap does not solidly adhere to the reservoir body, wherein said cap has an annular sleeve extending from the inside face of the cap and at least one air breathing port, which is formed in said cap between said sleeve and the abutting portion between said spacer means and said inside face of the cap.



4,106,667

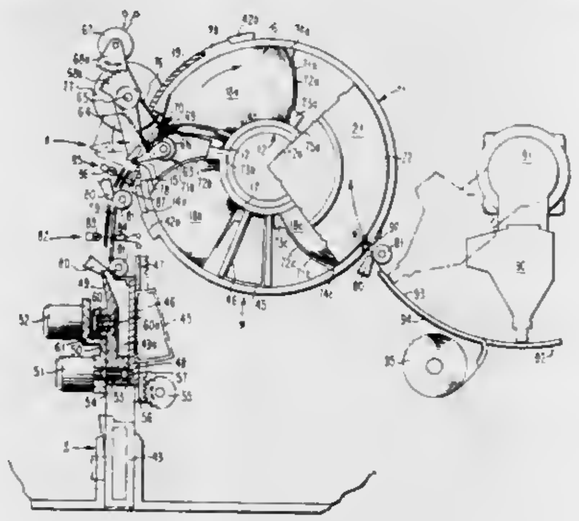
APPARATUS AND METHOD FOR CONDUCTING FINANCIAL TRANSACTIONS

John Joseph Lynott, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,503

Int. Cl.² G07F *11/00*

U.S. Cl. 221—1 **17 Claims**



1. For use in an apparatus for conducting financial transactions, a cartridge comprising:

two concentric members, the outer having an opening through which currency can be dispensed, and the inner providing a plurality of compartments for storing currency of differing denominations;

one of said members adapted to be rotatable relative to the other member to align a selected compartment with the opening preparatory to a currency dispensing operation;

a plurality of circumferentially spaced fixed stop elements projecting radially from a central core of said inner member; and

a plurality of compacting elements disposed between said stop elements and freely rotatable about said core, said elements being flexible and frictionally engaging the inner surface of said outer member to automatically compact the currency within the respective compartments upon rotation of said inner member relative to said outer member.

4,106,668

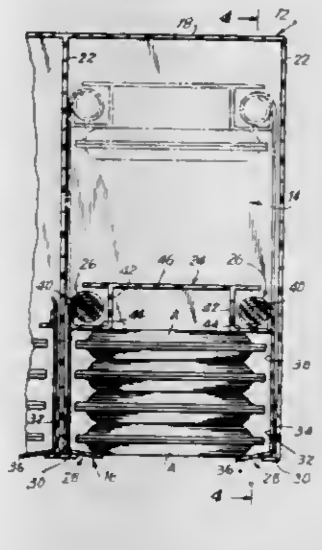
DEVICE FOR DISPLAYING AND STORING ARTICLES

Roland Gebhardt, and Robert P. Gersin, both of New York, N.Y., assignors to Kayser-Roth Corporation, New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,259

Int. Cl.² B65G *59/00*

U.S. Cl. 221—131 **9 Claims**

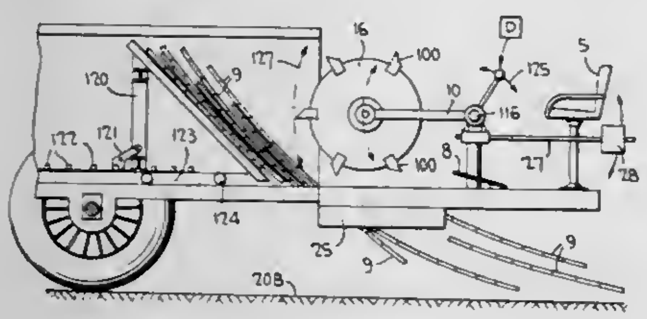


1. A device for storing and displaying articles, comprising wall means defining at least one chamber which has at least one open end and which is adapted to receive in its interior a plurality of articles arranged one behind the other with one of said articles nearer to said open end of said chamber than the other articles, pusher means situated in said chamber in alignment with said open end thereof for engaging that one of the articles which is most distant from said open end of said chamber and for pushing the articles toward said open end of said chamber, spring means engaging said pusher means for urging the latter toward said open end of said chamber so that said spring means and pusher means cooperate to urge the articles out of the chamber through said open end thereof, and retainer means carried by said wall means at the region of said open end of said chamber for retaining the articles in said chamber in opposition to the force of said pusher means with the article nearest to the open end of said chamber being held by said retainer means against movement out of said chamber until the latter article is withdrawn from the chamber, whereupon said pusher means is acted upon by said spring means to advance the articles toward said open end of said chamber until the next article initially situated behind the article withdrawn from the open end of the chamber becomes situated at the location previously occupied by the withdrawn article, said wall means which defines said chamber including a pair of opposed wall portions extending longitudinally along said chamber and terminating at said open end thereof, and said retainer means including at least as a part thereof a pair of flanges fixed to said pair of opposed wall portions where they terminate at said open end of said chamber, said flanges extending inwardly toward each other from said pair of opposed wall portions to provide for said open end of said chamber between said flanges a dimension smaller than the distance between said pair of opposed wall portions, said retainer means further including only one pair of yieldable springy members respectively fixed to said opposed wall portions at inner surfaces thereof which are directed toward each other and respectively having free end portions extending inwardly toward each other from said opposed wall portions and situated adjacent but behind said flanges, said free end portions of said springy members extending inwardly beyond said flanges for directly engaging an article which is nearest to said open end of said chamber as well for being urged into engagement with said flanges so that said free end portions of said springy members together with

said flanges form the retainer means which releasably retains in said chamber the row of articles with one of the latter articles situated at the region of said open end of said chamber, said flanges extending substantially along the entire length of end edges, respectively, of said opposed wall portions where they terminate at said open end of said chamber, and said flanges being relatively narrow and having a width sufficiently small to provide for a substantially full view of a front surface of an article which is nearest to said open end of said chamber, said free end portions of said springy members having a length which is only a small fraction of the length of said flanges and being situated between opposed ends of said flanges while extending inwardly beyond said flanges into overlapping relation with an article which is nearest to said open end of said chamber to an extent sufficient only for securely retaining the latter article at the open end of said chamber while still leaving substantially the entire front surface of the article nearest to the open end of said chamber uncovered and visible for displaying substantially the entire front surface of the article.

4,106,669
SUGAR CANE PLANTING MACHINES

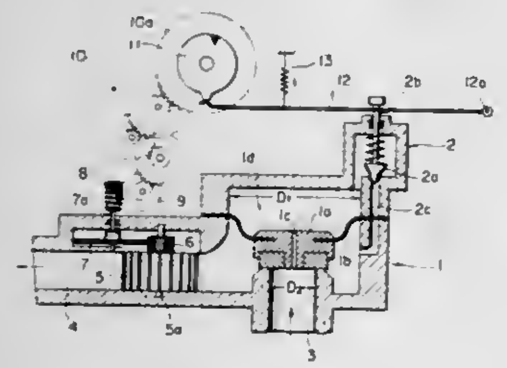
Sidney E. Longman, 510 Ibert St., Franklin, La. 70538
Filed Mar. 8, 1976, Ser. No. 665,108
Int. Cl.^{2} B65H *5/12*
U.S. Cl. 221—217 9 Claims



1. A sugar cane planter cart comprising a cart,
a boom pivotally mounted on said cart, and
a circular plate rotatably mounted in a vertical plane within said cart on said boom adjacent a load of sugar cane stalks and having a plurality of V-shaped elements about the periphery of said plate to engage a stalk within the V and drive the stalk downwardly and rearwardly from the load, said boom having pivotal movement both vertically and horizontally to permit the elements to engage the exposed layer of stalks.

4,106,670
PRESETTABLE METERING VALVE

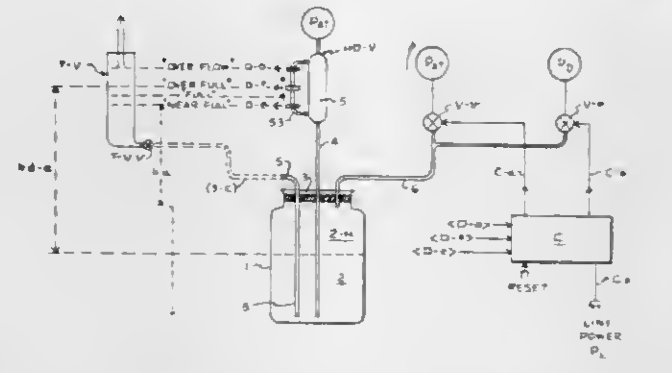
Yoshiaki Takeda, Yotsuya 3-64-27, Fuchu-shi, Tokyo-to, Japan
Filed Dec. 24, 1975, Ser. No. 644,051
Claims priority, application Japan, Dec. 24, 1974, 49-1704
Int. Cl.^{2} F16K *21/16*
U.S. Cl. 222—20 7 Claims



1. A valve which closes after a predetermined volume of fluid passes therethrough comprising:
means forming a flow path for the fluid;
a main valve controlling flow through said flow path
a trigger valve in communication with said main valve;
a conversion mechanism arranged in the flow path of said fluid with means to translate the amount of fluid flowing through said flow path into proportional amount of motion and
a cam mechanism comprising:
a cam shaft driven by said conversion mechanism;
a first cam having a high portion and low portion fixed to said cam shaft;
a second cam slidably mounted to said cam shaft and having a high portion and low portion;
said second cam being angularly adjustable on said cam shaft with respect to said first cam;
said trigger valve being equipped with a valve stem; and
an actuator fixed to the valve stem of said trigger valve and having one end biased against cam surfaces of both of said first and second cams;
setting means for moving said cam shaft and said cams to a first position prior to commencement of fluid flow and biasing means responsive to release of said setting means for moving said cam shaft and said cams from said first position to a second position at which flow commences.

4,106,671
LIQUID HEAD CONTROL SYSTEM

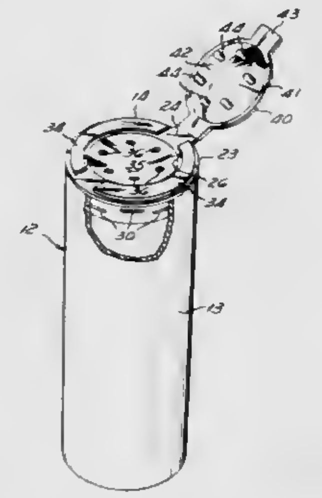
Thomas Davy Sharples, Atherton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Continuation of Ser. No. 627,804, Oct. 31, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,379
Int. Cl.^{2} B67D *5/54*
U.S. Cl. 222—61 6 Claims



1. In an improved automatic liquid dispensing system including a closed storage vessel for holding a prescribed volume of liquid to be dispensed to a use point in selectable dosages and upon demand, said closed storage vessel having a bottom, the combination therewith of:
an intermediate dispensing system including a closed transfer vessel hydraulically coupled between said storage vessel and said use point, said transfer vessel being designed to hold a fraction of the liquid capacity of said storage vessel;
an automatic replenishment control means adapted to automatically control the transfer of said liquid from the storage vessel to the transfer vessel; and
a pneumatic drive means comprising controlled gas pressurizing means and controlled gas venting means for placing a pressurized gas supply in pneumatic communication with said storage vessel sufficient to effect said replenishment in response to prescribed replenishment signals from said control means; and
wherein said automatic replenishment control means comprises a liquid level detecting sub-system comprising a riser tube having one end terminating adjacent the bottom of said storage vessel and the other end opening to the atmosphere, a plurality of detect units for detecting the presence of liquid at a minimal and other prescribed hydraulic reference levels in said riser tube, said detect units being mounted adjacent said riser tube; wherein each unit is coupled to apply signals to manipulate said control means; and wherein some of said signals are adapted to enable said gas pressurizing means and other of said signals are adapted to enable said gas venting means.

4,106,672
RESEALABLE END CLOSURE HAVING PLURAL OPENINGS

Charles Tecco, Northfield, and Lawrence E. Lasich, Twinsburg, both of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio
Continuation-in-part of Ser. No. 673,073, May 26, 1976, Pat. No. 4,029,202. This application Jun. 6, 1977, Ser. No. 803,721
Int. Cl.^{2} B65D *39/04, 41/18, 43/16*
U.S. Cl. 222—151 11 Claims

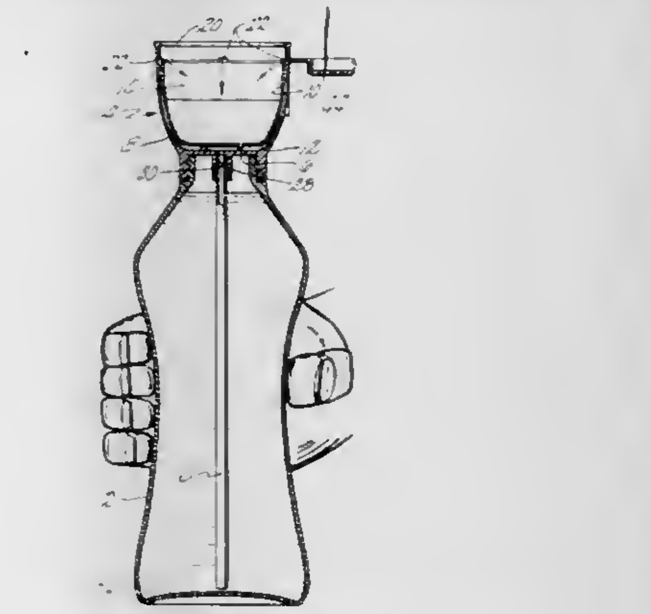


10. A one-piece plastic end closure comprising a generally flat annular ring like base, said base having a top wall and a bottom wall and a central opening, a dish-shaped dispensing wall in said central opening, a plurality of dispensing holes in said dispensing wall, a tab movable between an open position and a closed position, said tab being a disc shaped member hingedly connected to said base, said tab including a longitudinally recessed dish-shaped center portion extending longitudinally into said opening of said base and covering said dish-shaped dispensing wall when said tab is in said closed position, and said tab including a pin extending from said dish-shaped portion of said tab into each of said dispensing holes in said dispensing wall when said tab is in said closed position.

4,106,673
APPARATUS FOR MEASURING AND DISPENSING LIQUID

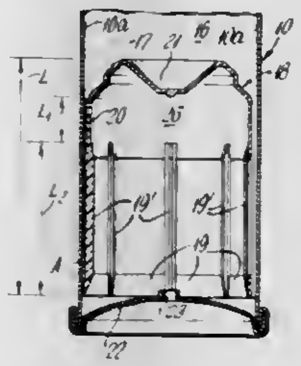
Robert J. Donoghue, 4 Burnwood Dr., Bloomfield, Conn. 06002
Filed Mar. 21, 1977, Ser. No. 779,630
Int. Cl.^{2} B65D *37/00*
U.S. Cl. 222—207 10 Claims

1. Apparatus for measuring and dispensing liquid comprising
a reservoir container having a flexible wall;
measuring and dispensing means disposed on said reservoir container, said measuring and dispensing means comprising an outer wall member and an inner wall member, said inner wall member being disposed within said outer wall member and spaced therefrom to define liquid passage means between said outer wall member and said inner wall member, said inner wall member defining a measuring chamber therewithin;
liquid communication means between said liquid passage means and said measuring chamber; and
liquid transfer means in communication with said reservoir container and said liquid passage means, whereby liquid may be transferred into said measuring chamber from said reservoir container, through said liquid transfer means, said liquid passage and said liquid communication means.



4,106,674
PRESSURE-OPERATED CONTAINER FOR VISCOUS PRODUCTS

Robert S. Schultz, 7 Heusted Dr., Old Greenwich, Conn. 06870
Continuation-in-part of Ser. No. 616,363, Sep. 24, 1975, Pat. No. 4,023,717, which is a continuation-in-part of Ser. No. 459,328, Apr. 9, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,681
Int. Cl.^{2} B67D *5/54*
U.S. Cl. 222—386.5 18 Claims



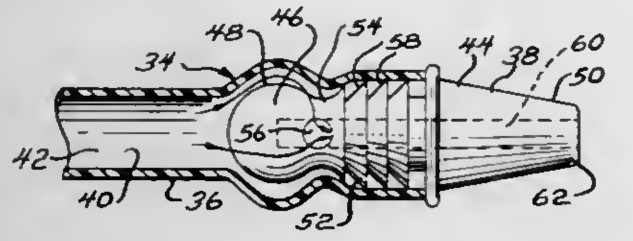
10. In combination, a pressure container comprising an elongate cylindrical body with a closed upper end, dispensing-valve means in said upper end, a one-piece molded piston of resiliently deformable material and integrally including a closed upper head end and a tubular body structure extending downwardly within the cylinder of the container wall and united to the closed end of said piston, said tubular body structure comprising a relatively thin resiliently expandable first circumferential tubular band of large continuously smooth surface area and predetermined axial length circumferentially continuously connected to and near said closed upper end, said first circumferential band having an upper end connected to the closed end of said piston, said first band also having a lower end, a second circumferential band near the open end of said piston, said second band being connected in axially spaced relation to said first band by plural angularly spaced longitudinal members integrally formed with the lower end of said first band and with the upper end of said second band, said tubular body structure being open in the spaces between longitudinal members; a viscous product in the space between said piston and valve means, pressure-sealing means closing the lower end of said container to define a pressure chamber beneath said piston, and a predetermined charge of gas under pressure in the

pressure chamber and for pressure-loading said first band into peripheral and axially continuous light sealing and stabilizing contact with the container wall during a product-dispensing operation, said stabilizing contact being aided by second-band contact with the container wall.

4,106,675
LIQUID SAMPLING DEVICE

Glenn N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 22, 1976, Ser. No. 753,113
Int. Cl.² B65D *47/26;* F16K *31/14*
U.S. Cl. 222—556 14 Claims

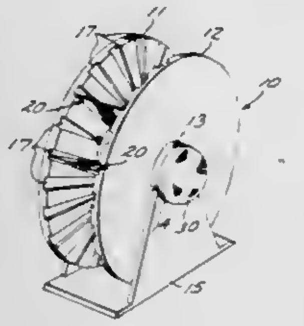


1. A drainage bag, comprising:
a receptacle having a liquid collection chamber;
a conduit connected to said receptacle and communicating with a lower portion of said chamber for draining liquid from the receptacle chamber, said conduit including a sampling section of flexible material having a wall defining a lumen and an outer surface adapted to be squeezed by a user's fingers; and
a flow control element comprising, a rigid valve member positioned in the lumen of said sampling section, said valve member having an outer sealing surface sealingly engaging against an inner surface of the sampling section, said sampling section deforming when said wall surface is squeezed from opposed directions against the valve member to permit passage of a liquid sample between the valve member and an inner surface of the sampling section, said valve member being secured in the lumen at an outer end of the sampling section and said valve member having an extension defining a nozzle for the conduit and a passageway communicating between an end of the nozzle and an outer surface of the valve member intermediate its ends.

4,106,676
SEWING ACCESSORY

Judy Freerking, 1406 59th St., Keoosha, Wis. 53140

Filed Jul. 14, 1977, Ser. No. 815,570
Int. Cl.² A41H *31/00*
U.S. Cl. 223—106 5 Claims

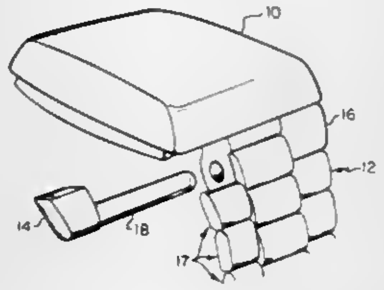


1. A thread storage device comprising:
a cylindrical central mount;
a first and second annular disk disposed in axial alignment about said cylindrical mount in spaced relationship proximate the ends thereof, each said annular disk including a plurality of radial slots arranged in opposingly adjacent alignment, said slots being tapered in planform towards the interior of said disks, and a corresponding plurality of circular recesses formed at the interior ends of said slots; and
a plurality of substantially rectangular planar bobbins received between the opposing ones of said slots each including a bead on one transverse edge thereof inserted in said recesses.

4,106,677
WRIST WEARABLE ELECTRONIC DEVICE WITH AN ENGAGEDLY STORED SELECTED TOOL

Bennie E. Helmso, Los Altos; Thomas E. Holden, Scotts Valley, both of Calif., and Edward T. Liljenwall, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 19, 1976, Ser. No. 715,805
Int. Cl.² A44C *5/02*
U.S. Cl. 224—5 A 2 Claims

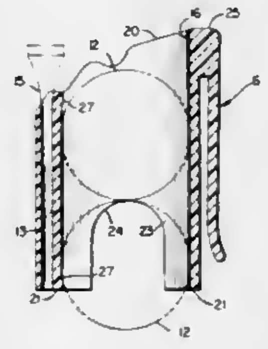


1. A wrist-wearable electronic device with provision for storing a special application tool therein, comprising:
a case portion; and
a wrist strap portion connected to said case portion to encircle the wrist of a wearer, said wrist strap portion including:
a selected number of complete links; and
at least one special link having:
a body portion connectable, independent of the special application tool, to at least one other link of either type adjacent thereto, said body portion defining a cavity and;
the special application tool being removable for performing selected operations upon one of said case and wrist strap portions, a portion of the special application tool being storable within the cavity of said body portion, and when the special application tool is so stored, another portion of the special application tool blends with the body portion to complete the external appearance of the special link so that it resembles a complete link.

4,106,678
GOLF BALL AND TEE CADDY

Thomas Thomas, Hollywood, Fla., assignor to Tatco Inc., Hollywood, Fla.

Filed Aug. 31, 1977, Ser. No. 829,535
Int. Cl.² B65D *71/00*
U.S. Cl. 224—5 D 2 Claims

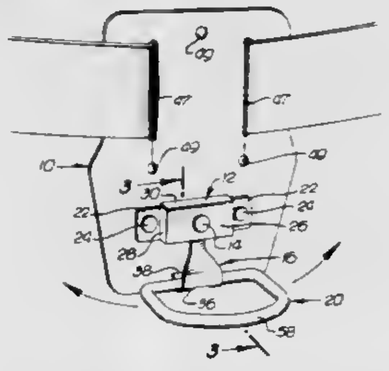


1. An integrally molded golf ball holder comprising a vertically disposed elongated hollow body member being open at both ends thereof and having an internal diameter such that a golf ball is slideably received therein, arcuate cut out portions defining a pair of transversely spaced arcuate side walls and a pair of diametrically opposed openings disposed at the lower end of said body, said side walls being leg-defining walls which engage and retain a golf ball; holding means comprising cylindrical tubes molded integrally with said holder adapted to receive the shank of a golf tee vertically arranged on the front and sides of said body, means integral within said body for removably retaining a golf ball disposed therein whereby a ball is removed from the holder by downward movement across said means by force applied with the fingers through said diametrically opposed openings, and retaining means provided at the rear of said holder whereby the holder can be attached to pants, shirt or wearing apparel of a golf player.

4,106,679
TOOL HOLDER

George Hillinger, Hollywood, Calif., assignor to Action Leathercraft, Inc., Commerce, Calif.

Filed Jan. 26, 1977, Ser. No. 762,566
Int. Cl.² A45F *5/00*
U.S. Cl. 224—26 B 14 Claims



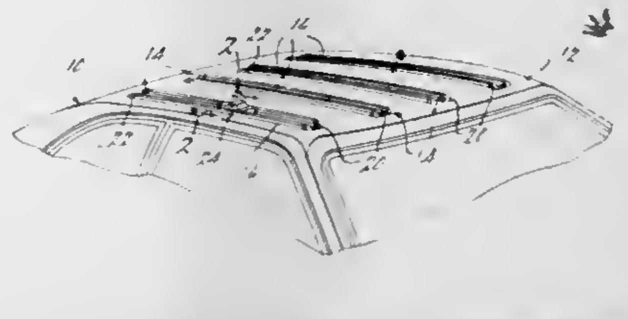
1. A tool holder for supporting from a waist belt an implement of the type having a shaft and a crosspiece transverse to the shaft, comprising:
pad means for supporting a tool suspension arrangement adjacent thereto;
a protruding support element including means spaced apart from the pad means for supporting pivot means generally normal to the pad means;
pivot means coupled to the pad means defining a swivel axis normal to the pad and the support element for swivelably supporting a tool suspension loop; and
means including a tool loop pivotally coupled to the pivot means and spaced apart from the swivel axis for suspending a tool of the aforementioned type in swivelable relationship from the tool crosspiece so that a shaft of a tool when inserted in the loop remains in a generally upright position and is prevented from falling out of the loop when the pad means is at an angle to a nominal wearing position and so that the tool and the tool loop may be readily rotated facilitating tool insertion and removal from the tool loop and enhancing the comfort of the wearer.

4,106,680
VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed May 5, 1976, Ser. No. 683,419
Int. Cl.² B60R *9/00*
U.S. Cl. 224—29 R 18 Claims

1. In combination in a vehicle article carrier for mounting on a planar surface of a motor vehicle comprising at least one generally horizontally arranged article supporting slat having an upwardly opening slot extending longitudinally thereof,
said slot being defined by a bottom wall and upwardly converging substantially flat side walls,
a load constraining member on said slat having a fastening element extending between said member and the interior of said groove, and
retaining element disposed within said groove and operatively connected to said fastening element, said retaining element having at least one upwardly inclined surface, said surface being inclined at substantially the same angle from the vertical axis extending through said slat as said upwardly converging side walls,

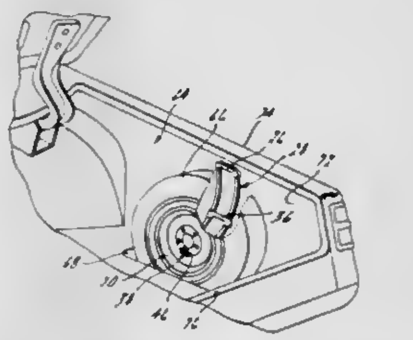


said retaining element being rotatable between a first orientation permitting removal and insertion thereof through the top of said groove, and a second orientation wherein said surface operatively engages at least one of said sidewalls of said groove so as to exert a clamping action between said sidewalls and said load constraining member for fixedly attaching said load constraining member to said slat at any longitudinal position along said slat.

4,106,681
SPARE TIRE EXTRACTION DEVICE

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Jun. 14, 1976, Ser. No. 696,029
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.² B62D *43/00*
U.S. Cl. 224—42.12 10 Claims



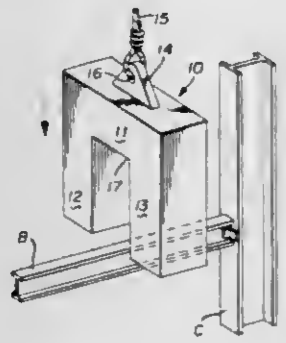
1. In combination,
an automotive vehicle having a longitudinal axis and a spare tire storage area,
a generally upstanding wall along an access side of said storage area,
a spare tire assembly including a tire and wheel,
said wheel having a plurality of holes formed therein and a flexible strap having a length equal to at least the radial distance between said holes and the outer periphery of said assembly and having a fastening element at one end thereof, a first handle at the opposite end thereof and a second handle at an intermediate position between said fastening means and said first handle,
said fastening element extending axially through and cooperative with one of the holes for securing said one end of said strap to said assembly,
said strap having a main body portion and extending radially of said assembly along one side thereof from said one hole to a position where said first handle may be conveniently grasped by a person reaching into said storage area,

whereupon said strap may be pulled in a direction causing said assembly to move toward a first position partially out of said storage area, whereby the person may grasp the second handle and continue to pull said strap until said assembly is removed from said storage area.

4,106,682

SHEARING TOOL FOR STRUCTURAL MEMBERS

Michael Ramun, 3180 Fifth Ave., Youngstown, Ohio 44505
Filed May 4, 1976, Ser. No. 682,983
The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.
Int. Cl.² B26F *3/00*
U.S. Cl. 225—103 **6 Claims**

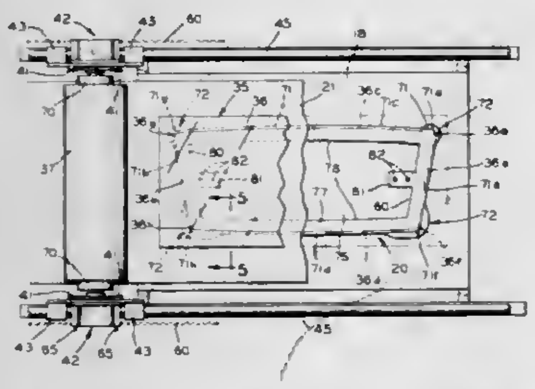


1. A shearing tool comprising an inverted U-shaped relatively large heavy steel body member as compared with structural members such as beams in a building being dismantled and including a horizontal upper section, right angular lower horizontal edges on said horizontal upper section and a pair of spaced depending vertical sections integral with said horizontal upper section and means on said horizontal upper section to which a supporting element can be attached whereby the shearing tool may be alternately lifted and dropped so as to move downwardly straddling said structural member to be sheared so as to shear the same upon impact of said horizontal upper section therewith.

4,106,683

GLASS BREAKING OUT APPARATUS

William P. Gulish, Jr., Curtice, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Aug. 11, 1977, Ser. No. 823,582
Int. Cl.² C03B *33/04*
U.S. Cl. 225—103 **6 Claims**

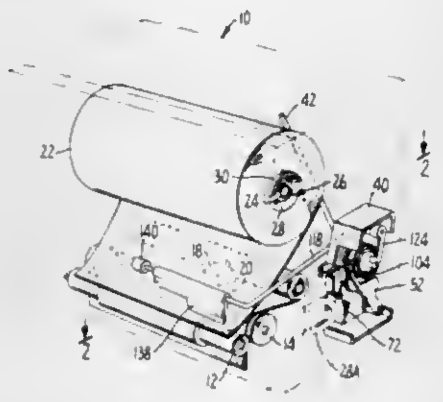


1. In apparatus for breaking out a scored glass pattern from a glass blank including a supporting surface, a template supported on said supporting surface, a resilient glass supporting means overlying the template, means positioning said glass blank on said resilient glass supporting means to vertically align the score line of said glass blank with said template, and pressure applying means engageable with said glass blank to snap the glass along said score line; the improvement in which said template comprises a body having a generally flat planar surface terminating in a major marginal edge complementary to but slightly larger than the outline of the score line formed on the overlying glass blank, said template having discrete lateral extensions along selective portions of said marginal edge and projecting outwardly therebeyond to limit downward movement of overlying marginal glass portions outwardly of said score line when snapped.

4,106,684

SHEET MATERIAL DISPENSING DEVICE

Ellsworth A. Hartbauer, Concord; Rudolf R. Weis, Antioch, and Horace N. Kemp, Walnut Creek, all of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Aug. 26, 1977, Ser. No. 828,000
Int. Cl.² B65H *17/42*
U.S. Cl. 226—91 **3 Claims**



1. A dispensing device for sequentially dispensing sheet material such as paper toweling from a primary roll and a reserve roll, said primary roll initially being rotatably mounted at a first location and adapted to be displaced therefrom to a second location, and including sheet material feed means for dispensing the sheet material from said device, the improvement comprising:

sensing means for sensing displacement of said primary roll from said first location, and

transfer means in operative association with said sensing means and responsive to the sensing of the displacement of said primary roll from said first location by said sensing means to place sheet material from said reserve roll into operative engagement with said sheet material feed means after said primary roll is located at said second location, said transfer means including metering means for metering sheet material removed from said primary roll by said feed means after displacement of said primary roll from said first location has been sensed by said sensing means and said primary roll is at said second location, said transfer means being responsive to the metering of a length of sheet material having been removed from said primary roll before placing the sheet material from said reserve roll into operative engagement with said sheet material feed means.

4,106,685

SEMI AUTOMATIC FILM CUTTER WITH MOVABLE CURSOR

Gerald R. Strunc, Maple Grove, and Warren J. Osby, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.
Filed Apr. 28, 1977, Ser. No. 791,704
Int. Cl.² B65H *17/22, 35/06*
U.S. Cl. 226—136 **18 Claims**

1. In a photographic system, web advancement means for advancing a web, the web advancement means comprising:

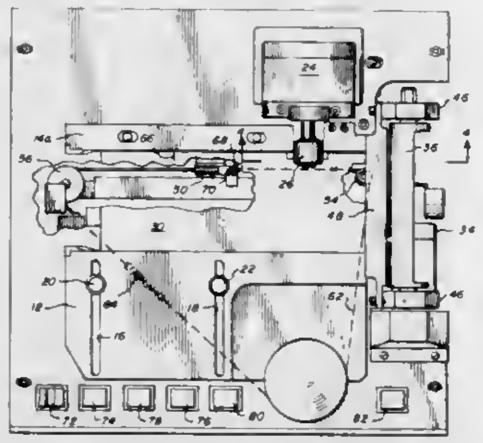
movable cursor means for indicating, by its position, a feed length desired;

bidirectional encoder means for providing encoder signals when the movable cursor means is moved;

up/down counter means for counting from a reference

count in response to the encoder signals to produce a feed length signal count;

calibration mark means for indicating a reference position for the movable cursor means;



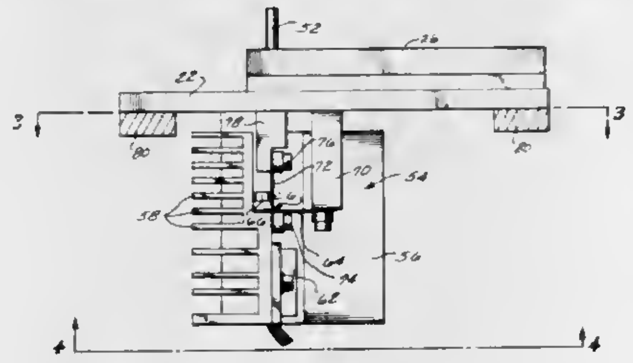
calibrate switch means for setting the up/down counter means to the reference count when the movable cursor means is positioned at the reference position; and

drive means for advancing the web by a distance determined by the feed length signal count.

4,106,686

TAPE TRANSPORT

William W. Valliant, La Canada, and Manfred G. Michelson, Van Nuys, both of Calif., assignors to Data Electronics, Inc., Pasadena, Calif.
Continuation of Ser. No. 631,230, Nov. 12, 1975, abandoned. This application May 19, 1977, Ser. No. 798,643
Int. Cl.² B65H *17/18*
U.S. Cl. 226—188 **26 Claims**



1. A tape transport assembly for driving a tape comprising:

tape drive means including a capstan for driving a tape, and a motor for driving the capstan, the tape drive means having a center of gravity and a pivotal axis extending through the center of gravity;

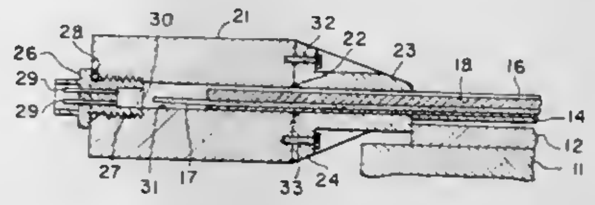
tape support means for positioning a tape supply means in an operative position relative to the capstan so that capstan-engaging means within the tape supply means enables a tape to be driven in response to rotation of the capstan; and

spring-biasing means mounting the tape drive means to pivot relative to the tape support means about said pivotal axis to provide spring-biased engagement of the capstan with said capstan-engaging means so that, when the tape supply means is mounted in said operative position, the capstan will continuously apply a substantially constant force to said capstan-engaging means, independently of external forces acting on the tape support means and the tape drive means, when the tape support means is mounted in a fixed position and the tape drive means is allowed to pivot freely relative to the tape support means through said spring-biasing means.

4,106,687

TOTALLY CONFINED EXPLOSIVE WELDING

Laurence J. Bement, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Division of Ser. No. 289,048, Sep. 14, 1972, Pat. No. 3,797,098. This application Sep. 10, 1973, Ser. No. 395,493
Int. Cl.² B23K *21/00*
U.S. Cl. 228—2.5 **3 Claims**



1. An apparatus for limiting the disturbing noise and hazardous debris of an explosive bonding procedure while transmitting the explosive pressure to the area to be bonded comprising:

infrangible enclosure means removably attached to one of the members to be bonded at the point directly opposite the bond area;

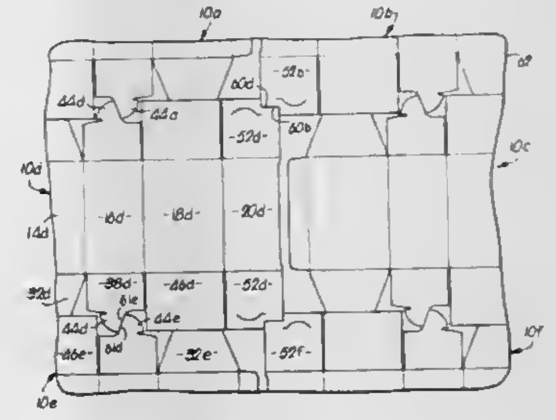
explosive means completely confined inside the infrangible enclosure means at a point of close proximity to the member to be bonded;

detonating means attached to said explosive means to initiate the explosive within the infrangible enclosure means; and the balance of the enclosure not occupied by explosive filled with a shaped material which directs the explosive pressure toward the bond area.

4,106,688

MATING BLANKS

Walter S. Berger, Overland Park; Andrew Paul Erhart, Lawrence, both of Kans.; William O. Fee, Raytown, Mo.; Darwin Lester Holtgren, Shawnee, Kans., and Burd & Fletcher Company, Kansas City, Mo.
Continuation of Ser. No. 693,365, Jun. 7, 1976, abandoned. This application Jul. 22, 1977, Ser. No. 818,146
Int. Cl.² B65D *5/11*
U.S. Cl. 229—39 R **7 Claims**



1. A carton blank, comprising:

a unitary sheet of material cut and configured to present substantially rectangular first, second, third and fourth panels connected in order along a first series of mutually parallel fold lines;

a pair of closure flaps respectively connected to the opposite ends of said first, second, third and fourth panels along mutually parallel marginal fold lines, with the flaps of each respective set thereof being substantially mirror images of one another,

each of said third panel closure flaps being substantially rectangular in shape and having an outermost edge which is spaced a first distance from and parallel to the adjacent fold line along which the third panel closure flap is connected to the third panel,

each of said second panel closure flaps being defined in part by an outermost cut line remote from said second panel which presents an outwardly projecting locking lobe and a recess between said locking lobe and the adjacent side edge of the proximal third panel closure flap,

said locking lobe and recess being cooperatively configured and arranged such that, when a first blank identical to said blank is placed in oppositely disposed, side-by-side abutting relationship with the said blank,

(1) the locking lobe of said blank is complementally received within the proximal recess of said first identical blank,

(2) the proximal locking lobe of said first identical blank is complementally received within the adjacent recess of said blank, and

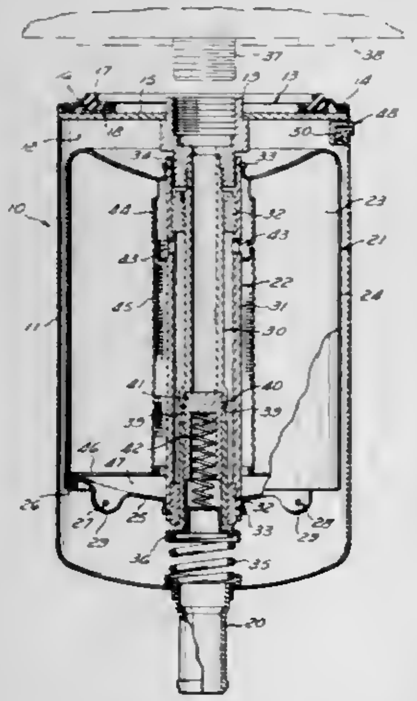
(3) the outermost edges of the locking lobes of said blank and first identical blank are each located a second distance from the second panel of the adjacent blank, said second distance being less than said first distance whereby the respective locking lobes each extend into the recess of the adjacent blank,

said fourth panel closure flaps each having locking means thereon for receiving the locking lobe of the adjacent second panel closure flap, and being defined in part by a cut line remote from said fourth panel and the adjacent third panel closure flap,

said last-mentioned cut line being configured and arranged to present an abutment edge for complementally abutting the abutment edge of a second identical blank placed in catercorner relationship with said blank, with the fourth panel of said blank being proximal to the fourth panel of said second identical blank.

4,106,689
DISPOSABLE CENTRIFUGAL SEPARATOR

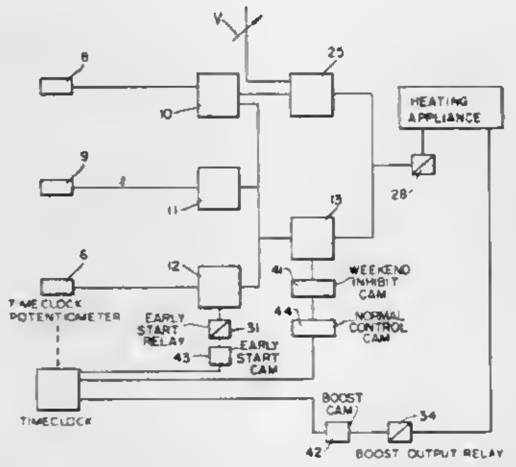
Robert E. Kozulla, Willowick, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio
Filed Apr. 4, 1977, Ser. No. 785,124
Int. Cl.² B04B *9/00*
U.S. Cl. 233—23 R **8 Claims**



1. In a centrifugal separator for separating contaminants from contaminated fluids and being disposable by virtue of its economical construction, comprising shroud means having ends and intermediate sides defining a first chamber, vertically extending spindle within said shroud means and having a hollow rotor rotatably mounted thereon, said hollow rotor defining a second chamber for receiving contaminated fluids to be separated, inlet port means at one end of said spindle and shroud means, passage means through said spindle to said second chamber, means to rotate said rotor and thereby cause contaminants in contaminated fluids within said second chamber to migrate toward a sidewall of said second chamber under the influence of centrifugal force and to be separated from such contaminated fluids, said means to rotate said rotor comprising tangentially mounted outlet port means on said rotor in fluid communication with said second chamber to cause said rotor to rotate upon discharge of fluid from said second chamber to said first chamber, outlet port means from said first chamber, in combination therewith the improvement wherein said shroud is a permanently closed assembly substantially fully defining said first chamber with its sides and ends, said inlet port means at said one end of said spindle being axially aligned with the axis of said spindle, said inlet port including attaching means adapted to releasably attach said inlet port to a fitting on a crankcase, said attaching means being permanently fixed to said shroud means, said attaching means of said inlet port being constructed and arranged to be capable of providing substantially the sole support of said separator on said crankcase whereby said separator is readily removed from said crankcase by release therefrom of said attaching means, and said outlet port means being at the other end of said shroud means.

4,106,690
OPTIMUM START CONTROLLER

Colin Henry Tomlinson, Gravesend, England, assignor to Rochester Instrument Systems Limited, Crayford, England
Filed Nov. 7, 1975, Ser. No. 629,697
Claims priority, application United Kingdom, Nov. 7, 1974, 48326/74
Int. Cl.² F23N *5/20*
U.S. Cl. 236—46 R **18 Claims**



1. A device for controlling the start of a heating appliance forming part of a heating system in a building comprising means for producing a time-variable signal comprising

a time clock having a 24-hour drive shaft and means for varying an electrically measurable parameter, said drive being coupled directly to said varying parameter means;

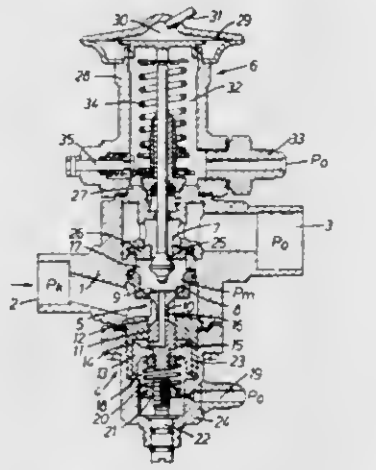
and including a variable biasing circuit for adjusting said time-variable signal to modify the control to suit the characteristics of a building in which the heating system is installed;

and including means coupled to said means for producing said time-variable signal for automatically adjusting said time-variable signal to cause said appliance to be started earlier, prior to a heating period following an interval more prolonged than the daily cooling cycle of the heating system;

a first temperature transducer located on the inside of said building; a second temperature transducer located on the outside of said building; proportional summing means for combining the outputs of said first and second transducers in respective predetermined proportions; and control means for combining said time variable signal with the output of said proportional summing means to produce an output to control said heating appliance.

4,106,691
VALVE ARRANGEMENT FOR REFRIGERATION PLANTS

Leif Nielsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed Jan. 11, 1977, Ser. No. 760,631
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603682
Int. Cl.² F25B *41/06*
U.S. Cl. 236—92 B **4 Claims**



1. A valve assembly for a refrigeration system having a condenser and an evaporator, comprising, a casing defining a condenser inlet passage and an evaporator outlet passage, first and second throttle valve means in series between said inlet and outlet passages and forming a mean pressure chamber between said first and second valve means, said second valve means being a thermostatic expansion valve unit operable in response to the temperature of the refrigerant leaving said evaporator, said first throttle valve means being biasable in a closing direction by pressurized fluid from said mean pressure chamber, said casing defining an evaporator feedback passage which is connectable to said evaporator outlet passage, said first throttle valve means being biasable in an opening direction by pressurized fluid from said evaporator feedback passage, and differential spring means also biasing said first throttle valve means in an opening direction.

4,106,692
HEATING SYSTEM WITH RESERVE THERMAL STORAGE CAPACITY

John F. Baier, 9 E. 40th St., New York, N.Y. 10016
Filed Jan. 28, 1977, Ser. No. 763,428
Int. Cl.² F24D *3/02, 3/08*
U.S. Cl. 237—8 R **4 Claims**

1. In a space heating system comprising:

a boiler for heating water

a source of heat for said boiler

a plurality of room heat exchangers in a group of zones

a connection from said boiler to said room heat exchangers,

means for controlling said connection from said boiler to said room heat exchangers to permit a supply of heated water to said room heat exchangers and to close said supply;

a return from said room heat exchangers;

the invention which comprises a heat bank;

said return being connected to said heat bank;

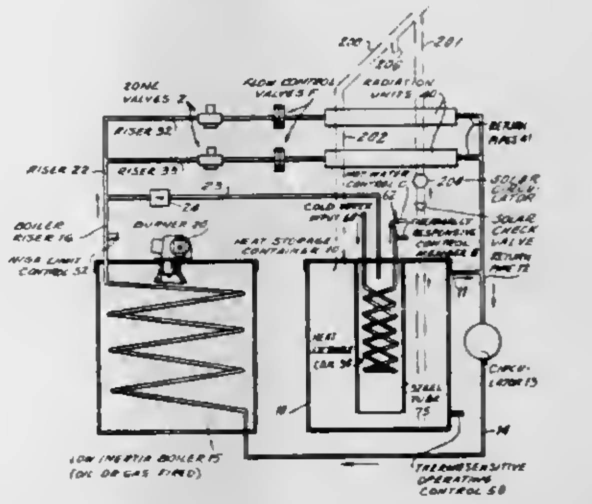
an output connection from said heat bank to said heating system;

and an input connection from said boiler to said bank, the volume of the heat bank being substantially greater than that of the boiler;

said system including a flow circulator; and a flow regulator in the circuit from the boiler to the room heat exchanger to the heat bank; the flow to the room heating system being less than the flow to the heat bank;

said heat bank providing a supply of heated water for said system while the source of heat for said boiler is turned off;

heat sensing means at each room heat exchanger connected to and controlling said circulator;



heat sensing means at said heat bank controlling the operation of said boiler heat source;

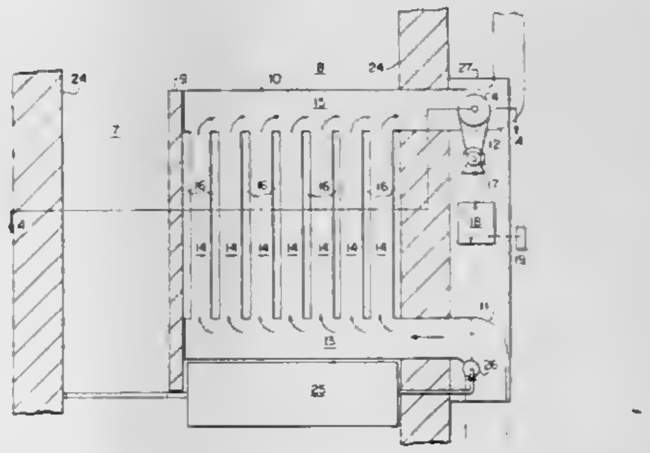
a heat exchange coil for domestic hot water carried in said heat bank;

the connection from said boiler to said heat bank being at the top of said heat bank and the input and output connections for the heat exchange coil being at the top of said heat bank;

a vertical shroud within said heat bank surrounding said heat exchange coil; the bottom of said shroud being open and the top of said shroud receiving the input of the connection from said boiler to said heat bank.

4,106,693
AUTOMATIC FIREPLACE HEATING SYSTEM

John F. Oliver, 112 W. 31st St., Wilmington, Del. 19802
Filed Apr. 22, 1977, Ser. No. 790,014
Int. Cl.² F24B *7/04*
U.S. Cl. 237—51 **2 Claims**



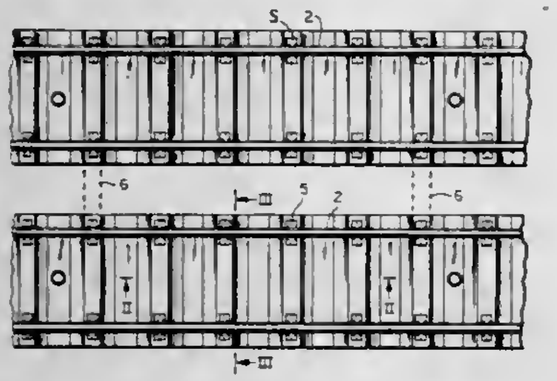
1. Automatically controlled residential heating system based on the heat from a fireplace comprising a fireplace, hearth, combustion zone, flue, and damper for opening and closing a passageway from the combustion zone to the flue, said flue being divided into two full-sized parallel independent flue passages by a flue divider, one of which is an unobstructed normal flue passage and the other of which is filled with a heat

exchanger adapted to absorb the heat from hot flue gases passing through the flue into air inside said heat exchanger, a movable diverter adapted to direct the hot flue gases into either parallel flue or into both in any desired proportion, a means for circulating air through said heat exchanger and releasing the absorbed heat through space heaters at other locations, temperature sensing means for sensing the heat in the space to be heated by space heaters, and means for automatically positioning said diverter to by-pass none, all, or any part of said hot flue gases from said heat exchanger in response to the temperature of the said sensing means.

4,106,694

PREFABRICATED RAIL BASE UNIT CONSISTING OF A PLURALITY OF PROJECTIONS AND A SINGLE CONTINUOUS SLAB

Santo Salvino, 117 Via dei Glicini, Rome, Italy
Filed Jul. 13, 1976, Ser. No. 704,808
Int. Cl.² E01B *3/38*
U.S. Cl. 238—10 C **9 Claims**

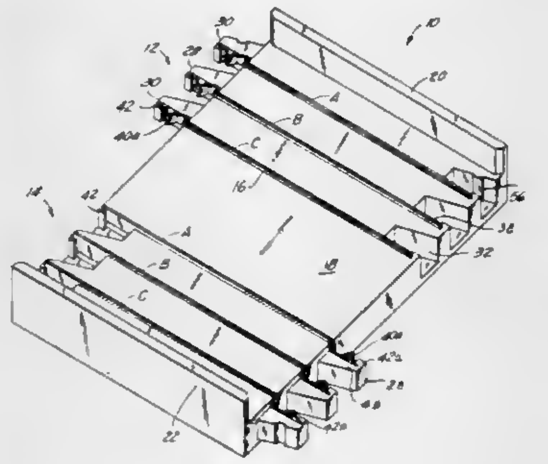


1. A railroad bed assembly for supporting thereon metallic railroad tracks comprising a base structure consisting essentially of reinforced concrete formed from a plurality of adjacently located prefabricated blocks, said prefabricated blocks including a slab section installed over a ground formation at a railroad bed site and at least two upwardly extending projections running transversely to said tracks each having a trapezoidal cross sectional configuration taken in a plane extending parallel to said tracks, said at least two projections and said slab being integrally formed of reinforced concrete with said at least two projections forming cross ties for supporting said tracks thereon, said slab being formed as an essentially solid continuous body between said projections, said projections having embedded therein attachment devices, said tracks being arranged to directly overlie said trapezoidal projections and being connected thereto by mechanical fastening means in gripping engagement with said tracks and connected with said attachment devices in order to hold said tracks directly on said trapezoidal projections.

4,106,695

TOY VEHICLE TRACK

Vincent Carella, Queens Village, and Edwin A. Nielsen, Oceanside, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Dec. 17, 1976, Ser. No. 751,636
Int. Cl.² A63H *19/30*
U.S. Cl. 238—10 F **27 Claims**

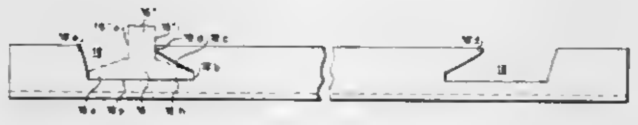


1. A toy vehicle track section for use with similar track sections to form an interconnected track; said track section comprising a base formed of an electrically non-conductive material having opposite ends and a track surface along which a vehicle can move; one of said ends having a plurality of generally wedge shaped projections extending longitudinally therefrom; said projections having upper surfaces lying in planes below the plane of said track surface; the other of said ends having a plurality of generally wedge shaped recesses formed in said track surface, said recesses each having an open side at the track surface and an open end at said other of the track ends for receiving the projections of an adjacent track section in contacting engagement, upon longitudinal insertion of said projections through said recess ends, said recesses and projections having cooperating means formed thereon for resisting longitudinal disengagement of the projections from the recesses of an adjacent track section whereby connected track sections may pivot about a horizontal axis with respect to one another about their adjacent ends without producing an obstruction above said track surface.

4,106,696

SLEEPER OF STEEL OR SIMILAR MATERIAL

Josef Carl-Olof Andersson, Koroettgården, Norberg, Sweden
Filed Oct. 19, 1976, Ser. No. 733,889
Int. Cl.² E01B *3/16, 9/22*
U.S. Cl. 238—62 **5 Claims**

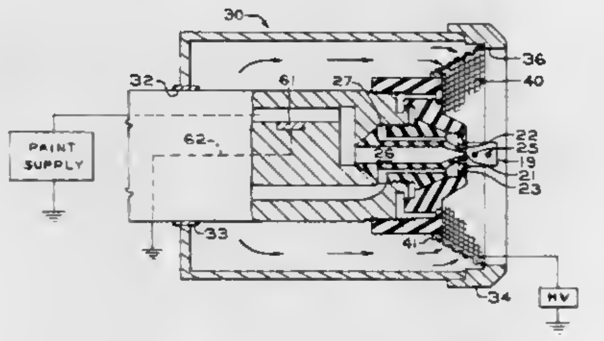


1. An intermediate sleeper for a pair of railway rails each of said rails comprising a web having a foot which includes first and second flanges extending in opposite directions relative to said web, wherein each said sleeper is one of a plurality of identical sleepers which support said rails at positions spaced inwardly from the ends thereof, each said sleeper comprising a web having at least one upwardly extending flange having a pair of upwardly open recesses therein for receiving one rail each of said pair of rails inserted vertically from above into said respective recess, each of said recesses being partially closed by at least one downwardly convex lug, the spacing between said lug and said first rail flange adjacent thereto increasing towards said rail web, the end of said lug furtherest spaced from said first rail flange contacting said rail web, the spacing between the side of each of said recesses opposing said lug and said rail web increasing away from said rail web, and the end of said second rail flange contacting said opposing side.

4,106,697

SPRAYING DEVICE WITH GAS SHROUD AND ELECTROSTATIC CHARGING MEANS HAVING A POROUS ELECTRODE

James E. Sickles, Glenshaw; Joseph V. Hornyak, Lower Burrell, and Helmut Franz, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 718,633, Aug. 30, 1976, abandoned. This application Nov. 16, 1976, Ser. No. 742,294
Int. Cl.² B05B *5/02, 12/12*
U.S. Cl. 239—15 **38 Claims**

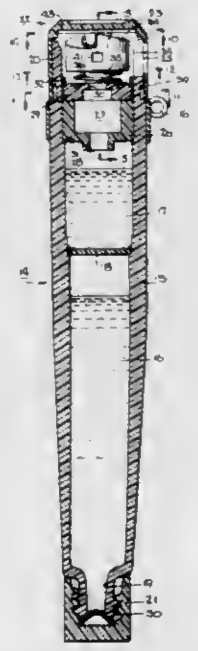


1. Spray apparatus for spraying dispersed electrically charged particulate coating material in a controlled atmosphere, comprising:
- a chamber having an opening,
- dispersing means mounted in said chamber for dispersing a stream of coating material into a spray of particles directed outwardly of the opening in the chamber,
- inlet means mounted in said chamber for delivering a flow of gas to said chamber, said inlet means and said dispersing means being in spaced relationship within said chamber whereby said gas exits through said opening and substantially envelops said spray, and
- electrode means adjacent said dispersing means, a portion of said electrode means being porous.

4,106,698

PERSONAL AUTOMATIC VAPORIZER

A. Oscar Lin, Woodside, N.Y., assignor to Yorker Research Corporation, Woodside, N.Y.
Filed Dec. 29, 1976, Ser. No. 755,203
Int. Cl.² A24F *25/00*
U.S. Cl. 239—34 **24 Claims**

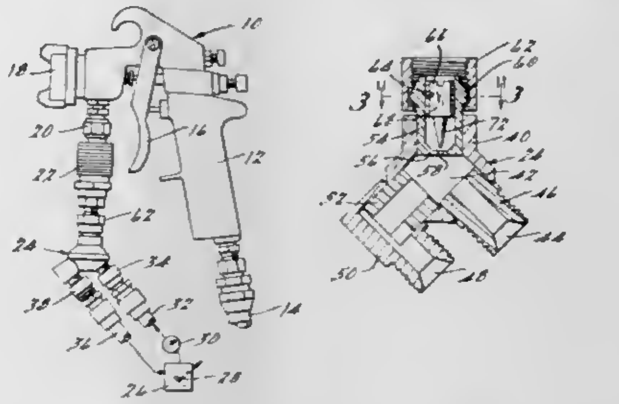


1. A personal automatic vaporizer comprising
- a housing having a pair of chambers for receiving respective vaporizing liquids therein, said housing having a first discharge opening communicating one of said chambers with the exterior of said housing, and a second discharge open communicating the other of said chambers with the exterior of said housing,
- at least said first opening being of a size sufficient to render the total force of surface tension and the attractive force between the liquid in said first chamber and said housing greater than the weight of the liquid in said first chamber,
- a cap removably secured to said housing over said first discharge opening to close said first discharge opening, and
- a movable cap secured to said housing over said second discharge opening to selectively open and close said second discharge opening.

4,106,699

RECIRCULATING PAINT FLOW CONTROL DEVICE

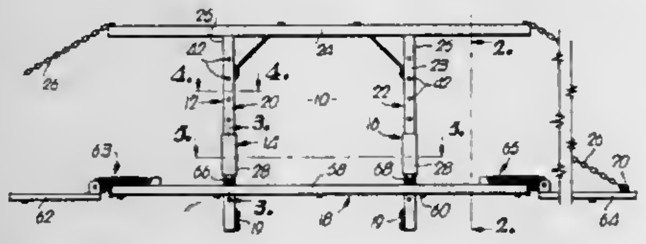
Earl R. Holt, Rochester, Mich., assignor to Hose Specialties Company, Detroit, Mich.
Filed Jan. 24, 1977, Ser. No. 762,050
Int. Cl.² B05B *9/04*
U.S. Cl. 239—124 **11 Claims**



1. In a paint spray apparatus including a spray nozzle and a recirculating paint supply system for supplying a liquid coating composition to the spray nozzle in an amount in excess of that required, the improvement comprising a flow control device in the recirculating suppy system for regulating the amount of paint supplied to the spray nozzle, said flow control device comprising a body formed with an internal chamber having an inlet port adapted to be connected to a supply conduit connected to a supply of pressurized paint, an outlet port connected to a return conduit for returning the excess of the recirculating paint to the paint supply and an elongated discharge port defining an axial chamber formed with a base at its inner end and having an orifice therethrough disposed in communication with said internal chamber and an outer end provided with coupling means for coupling said axial chamber in communication with a spray nozzle, said inlet port oriented with its axis aligned toward said base of said axial chamber and said orifice therethrough so that the paint entering said flow control device impinges on said base and said orifice providing for a self-cleaning action, said discharge port provided with a threaded section extending axially along the inner wall of said axial chamber, a flow control needle valve including a threaded body portion disposed in threaded engagement in said threaded section and a tapered end portion disposed in adjusted flow restricting relationship and axial alignment relative to said orifice, said axial chamber formed with a least one axially extending channel between said threaded section and said threaded body portion providing a communicating channel between said inner end and said outer end of said axial chamber.

4,106,700
SUPPORT FOR SPRAYER BOOMS

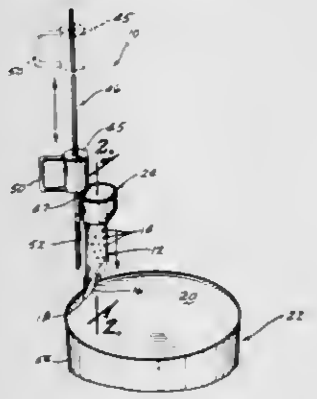
Otho A. Clark, Rte. 1, Independence, Mo. 64050
Filed Feb. 22, 1977, Ser. No. 770,787
Int. Cl.² B05B *1/20*
U.S. Cl. 239—168 9 Claims



1. A sprayer including:
a mobile frame;
a boom assembly having an elongated main section and an elongated outer section,
said sections being normally in end-to-end relationship and provided with a pivot interconnecting their proximal ends for limited up and down swinging movement of the outer section relative to the main section;
a pair of elongated, horizontally spaced members having normally vertical, longitudinal axes in parallel relationship, the members being vertically reciprocable along said axes thereof;
an attachment on each member respectively securing the same to the main section for maintaining the longitudinal axes of the members perpendicular to the longitudinal axis of the main section;
a yieldable device for each member respectively disposed to cushion downward movement thereof; and
a mounting for each member respectively securing the same to the frame and restraining movement of the main section relative to said frame to only rectilinear, normally vertical reciprocation transversely of the longitudinal axis of said main section, whereby to appreciably reduce the amount of up and down pitching of the outer section about said pivot as the frame traverses uneven terrain,
said frame including a spar disposed above said boom assembly, there being a flexible member extending between said spar and said outer section for limiting downward swinging movement of the latter relative to the frame.

4,106,701
DEVICE FOR PUNCTURING A HOLE IN A CAN AND WASHING THE INSIDE THEREOF

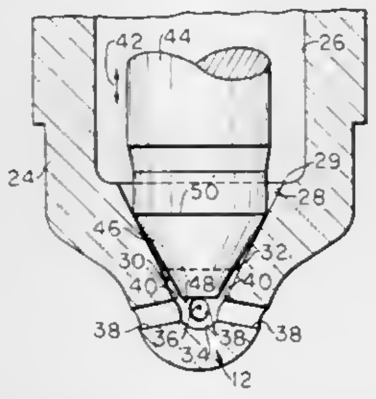
Larry O. Siefken, R.R. #1, Box 75, Palmer, Iowa 50571
Filed Oct. 26, 1976, Ser. No. 735,606
Int. Cl.² B05B *1/14*
U.S. Cl. 239—271 9 Claims



1. A device for puncturing a hole in a can and washing the inside of the can comprising,
an elongated nozzle having opposite ends, one of said ends having a pointed portion for puncturing a hole in a can and the other end having an opening for communication with a liquid source, said one end having spray openings for spraying the inside of a can and said pointed portion being offset from the axial center of said nozzle,
a striking surface on the other end of said nozzle offset from the axial center of said nozzle to expose said opening, and said pointed portion and said striking surface being substantially coplanar and being parallel to the axial center of said nozzle,
an elongated guide standard connected to said nozzle and extending parallel to said nozzle, and
a weight movably positioned on said guide standard for being driven against said striking surface to drive said pointed end of said nozzle through the wall of a can.

4,106,702
FUEL INJECTION NOZZLE TIP WITH LOW VOLUME TAPERED SAC

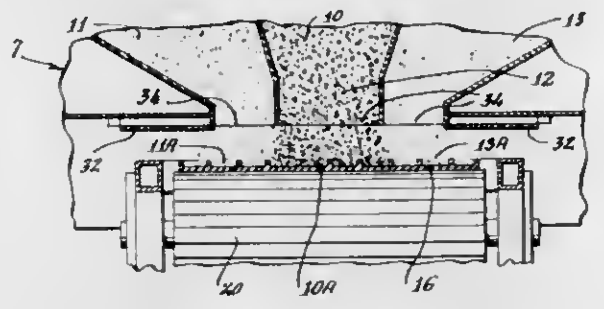
John W. Gardner, Chillicothe; William A. Grgurich, and Albert B. Niles, both of Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 19, 1977, Ser. No. 788,870
Int. Cl.² F02M *61/10;* B05B *1/30*
U.S. Cl. 239—533.3 9 Claims

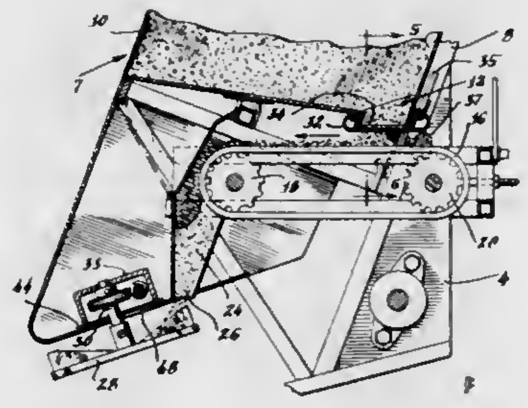


1. In a fuel injector, the combination of:
a hollow nozzle having a spray tip with a stepped, interior conical surface defined by first and second generally frusto-conical surfaces sharing a common base which defines a circular juncture with the second frusto-conical surface being steeper than the first frusto-conical surface, said spray tip further including an interior, partially rounded surface extending from the minor base of said second frusto-conical surface;
at least one injection opening in said nozzle at the spray tip thereof; and
a reciprocal valve within said nozzle and having a frusto-conical valve tip which in a closed position of the valve is seated against said first frusto-conical surface at the major base of said frusto-conical valve tip, said frusto-conical valve tip being less steep than said first frusto-conical surface and terminating in a blunt end which in said closed position is disaligned with said injection opening at the edge thereof remote from the spray tip, the area of said blunt end being a major portion of the cross-sectional area of said interior surface at said edge whereby said valve tip in said closed position occupies substantially the entire volume within said interior surface between said edge and said circular juncture, said reciprocal valve being movable to an open position in which the major base of said frusto-conical valve tip is at a level adjacent the major base of and radially within said first frusto-conical surface, the circular juncture of said first and second frusto-conical surfaces defining an annular control edge on the nozzle which, in cooperation with the frusto-conical surface of the valve tip, defines the minimum fuel flow area therebetween in the open position of the valve, said blunt end being disposed adjacent said circular juncture in said open position, said partially rounded surface comprising a spherical surface, each said injection opening being located on the radius of said spherical surface.

4,106,703
COMPACT LAWN SPREADER CAPABLE OF MIXING AND WIDELY SPREADING MULTIPLE LAWN TREATMENT MATERIALS

Robert J. Magda, Morganville, N.J., assignor to Lawn Doctor, Inc., Wickatunk, N.J.
Filed Mar. 7, 1977, Ser. No. 775,167
Int. Cl.² A01C *7/06*
U.S. Cl. 239—656 22 Claims

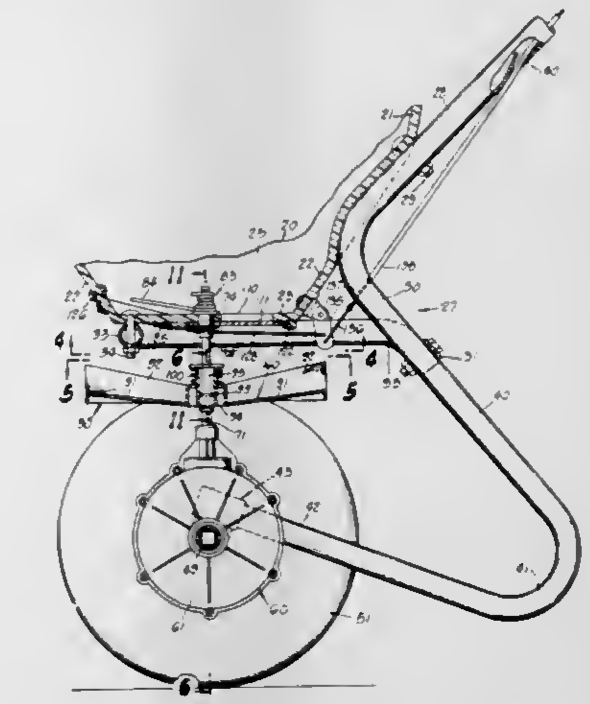




16. An improved spreader cart for mixing and distributing material, said cart being of the type including a frame with a base and sidewalls, a plurality of bins for storing said material, said bins being supported on said frame, a rotating belt positioned below said bins for receiving material from said bins thereon, means for rotating said belt, a hopper positioned below one end of said belt for receiving said material carried on said belt, a rotating spinner positioned to receive said material from said hopper, and means for rotating said spinner,
the improvement comprising:
a plate positioned adjacent to said base of said frame,
means for pivotably mounting said plate on said base for pivotal motion with respect thereto,
means for connecting said rotating spinner to said plate,
said means for connecting said rotating spinner to said plate including a connecting member positioned therebetween,
an arcuate slot carried on said base for receiving said connecting member,
said arcuate slot defining the path traversed by said member when said plate is pivoted on said base of said frame,
the extent of said pivotal motion of said plate being defined by the length of said arcuate slot,
means on said plate for receiving said connecting member such that said pivotal motion of said plate is transmitted to said spinner by said connecting member,
whereby the position of said plate and said spinner connected thereto is adjustable with respect to said base by pivoting said plate along said arcuate slot.

4,106,704
SPREADER (BROADCAST)

John W. McRoskey; Leonard H. McRoskey, both of Los Angeles, and Delbert D. Swartz, Sebastapol, all of Calif., assignors to Republic Tool & Manufacturing Corp., Los Angeles, Calif.
Filed Jan. 21, 1977, Ser. No. 760,967
Int. Cl.² A01C *17/00*
U.S. Cl. 239—685 10 Claims

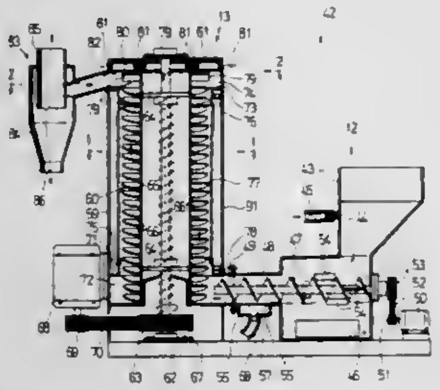


1. A spreader of the class described, comprising:
(a) a hopper adapted to contain a granular material to be applied to a surface;
(b) a feed opening through which said granules are discharged from said hopper;
(c) a metering gate for closing or opening said feed opening;
(d) operating means for said metering gate, including a spring connected to said hopper and said metering gate for exerting a pull on said metering gate to close same; and
(e) an operating member connected to said spring and said metering gate whereby a pull on said operating member will transfer the pulling force to said spring without said force being transmitted through said metering gate.

9. A spreader of the class described, comprising:
(a) a hopper adapted to contain a granular material to be applied to a surface;
(b) a feed opening through which said granules are discharged from said hopper;
(c) a metering gate for closing or opening said feed opening;
(d) operating means for moving said metering gate between closed and opened positions;
(e) wheel and axle means for rendering said spreader portable over the surface to be treated, said axle being rotated when said spreader is moved over said surface;
(f) a vertical shaft positioned below said hopper;
(g) an impeller mounted on said shaft and being rotatable to broadcast the granular material passing downward from said feed opening; and
(h) a preassembled drive unit adapted to be mounted, as a separate preassembled unit, in said spreader, said drive unit including:
  (1) a housing having a chamber into which the lower end of said shaft extends,
  (2) a driven gear in said housing, and attached to said shaft,
  (3) a drive gear in said housing, said drive gear meshing with said driven gear in order to rotate said shaft to rotate said impeller,
  (4) bearing means in said housing for supporting said drive gear to rotate on a substantially horizontal axis,
  (5) said unit being positioned below said hopper with the

upper end of said shaft positioned as previously stated whereafter said axle is extended through an axial opening in said drive gear for driving same, and
(6) said unit being centralized by said vertical shaft and said unit being supported on said axle so as to be axially movable thereon.

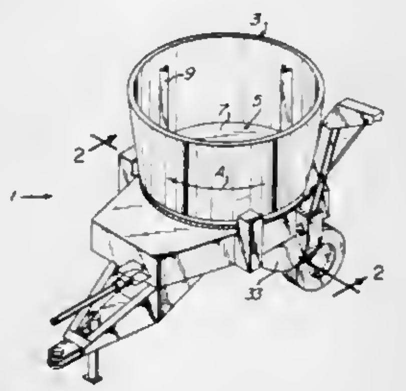
4,106,705
RESIN MATERIAL RECLAIMING MACHINE
Kensaku Nakamura, 272-1, Bessho-Cho, Matsubara, Osaka, Japan (580)
Filed Apr. 4, 1977, Ser. No. 784,511
Int. Cl.² B02C *23/14*
U.S. Cl. 241—49 **2 Claims**

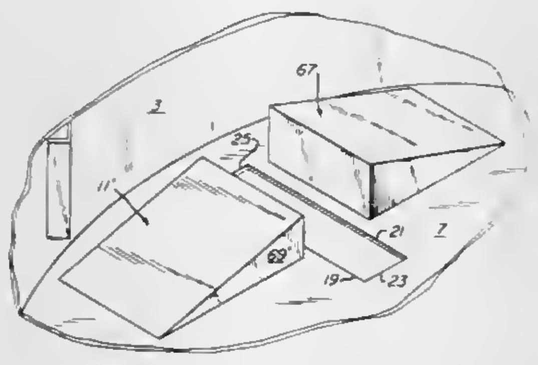


1. A resin material reclaiming machine comprising an upstanding cylindrical casing having a lower inlet and an upper outlet, a cylindrical filter means housed in said cylindrical casing spaced inwardly therein and extending from said inlet to said outlet, and an impeller means including a plurality of impelling blades rotatably mounted coaxially in said filter means along the axis thereof, being adapted to blow wet pieces of resin material from said inlet upwardly to said outlet thereby to dehydrate said pieces within said filter means during the upward blowing operation of said impeller means, a discharging impeller means mounted on the upper end of said impeller and adapted to discharge said pieces of material to the outside through the outlet of said cylindrical casing, and an air inlet formed in the portion of said cylindrical casing positioned over said discharging impeller, a cyclone separator mounted adjacent the upper portion of said cylindrical casing and in communication with the outlet of said casing, and a plurality of second cleaning means each consisting of a centrifugal blower and a second cyclone separator mounted in communicating relation with said cyclone separator, feed hopper means for said upstanding cylindrical casing mounted on the upper portion of a case having screw conveyor means therein, a feed pipe for supplying cleaning water to said hopper means, and an opening formed in the bottom of said case below said screw conveyor, and a dehydrating mesh netting stretched on said opening.

4,106,706
ROTARY TUB GRINDER
Harvey Paul Burrows, 1633 26th Ave. Ct., Greeley, Colo. 80631
Filed Aug. 1, 1977, Ser. No. 820,441
Int. Cl.² B02C *13/06, 13/286*
U.S. Cl. 241—186.2 **48 Claims**

1. In a tub grinder having a stationary floor member and a tub member mounted for rotation relative thereto about a first axis, said floor member having an upper surface with an opening therethrough and said tub member being mounted with at least a portion thereof extending above said upper surface of the floor member and with said first axis of rotation substantially perpendicular to said upper surface, said tub grinder further having a ramp member mounted on and extending above said upper surface of said floor member adjacent one side of the opening therethrough and a grinding means mounted for rotation about a second axis, said second axis being located below said upper surface of the floor member, said grinding means having a plurality of grinding elements, said grinding elements moving along a closed path as said grinding means is rotated about said second axis, a first portion of said closed path extending through said opening in said floor member and above said upper surface whereby material on said floor member within said rotating tub member is moved over the upper surface of said floor member and part of the material is moved up said ramp member into said first path portion of the closed path of said plurality of grinding elements, the improvement including:





means for stabilizing the moving material near said opening, said stabilizing means including at least one stabilizer member and means for mounting said at least one stabilizer member on said upper surface of said floor member adjacent a second side of said opening with said at least one stabilizer member extending above the upper surface of said floor member, said first and second sides of said opening being substantially opposite each other across said opening.

4,106,707
FEED DISTRIBUTOR FOR GYRATORY CRUSHER
Robert H. Kemnitz, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Jun. 17, 1977, Ser. No. 807,559
Int. Cl.² B02C *2/06*
U.S. Cl. 241—202 **7 Claims**

1. In a crusher having a frame which supports a crusher mantle head for gyratory movement and a stationary concave surrounding the crusher mantle, the mantle and concave defining an annular crushing chamber therebetween, a feed distributor comprising:

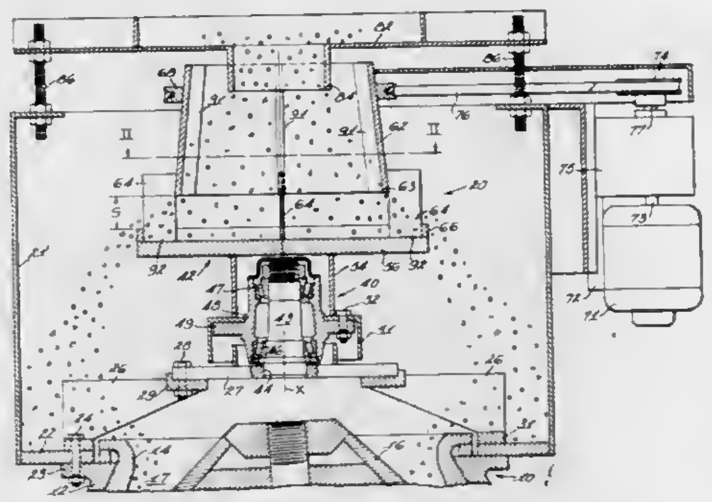
support means carried by the frame;

a circular material distributor plate carried by said support means for rotation independently of the movement of the crusher head;

a frusto conical material bin having an opening therethrough supported by said distributor plate in coaxial relationship above the surface thereof and positioned to define a circumferential opening between the bottom of the bin and the top surface of the distributor plate;

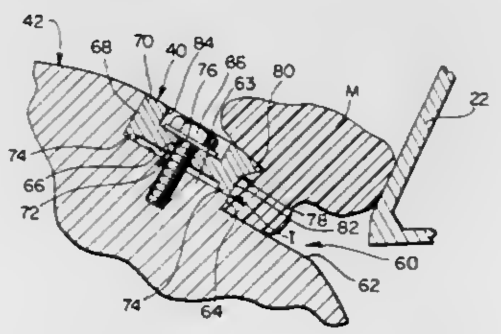
a material hopper means supported above said frusto conical material bin, said hopper having a discharge spout coaxial with said bin for supplying material to said bin; and,

power drive means operably connected to effect the simultaneous rotation of said material bin and said distributor plate;



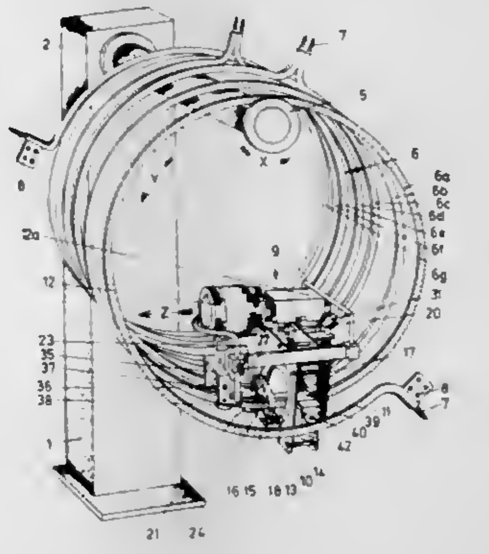
whereby the material fed to the distributor plate from said bin will flow radially outwardly from the circumferential opening and be distributed by centrifugal force evenly around the entire crushing chamber.

4,106,708
GRANULATOR AND KNIFE CONSTRUCTION THEREFOR
Gomer E. Kropa, North Reading, Mass., assignor to Leesona Corporation, Warwick, R.I.
Filed Apr. 11, 1977, Ser. No. 786,669
Int. Cl.² B02C *13/02, 18/18*
U.S. Cl. 241—222 **11 Claims**



1. A knife construction adapted for operative positioning with respect to a granular-to-rotor having a plurality of cut out portions laterally extending along spaced peripheral chords thereof to form continuous longitudinally extending seats each having a flat base portion along said chord and an upstanding shoulder at an inner terminus thereof for abutting receipt of said knife, said knife comprising an upstanding heel portion adapted to engage said seat shoulder, a base portion adapted to engage said seat base, a top surface opposite said base portion, and a generally hook-shaped blade face portion opposite said heel portion, said face portion having an outwardly extending cutting blade disposed above an undercut supporting segment thus forming a pocket for receipt of plastic material cut by said blade from a larger body of thermoplastic plastic material, said base portion including at least one relatively narrow downwardly directed, longitudinally extending foot portion adapted to engage the forward edge of said seat base, and means disposed through said top surface for receiving holding means to force said foot portion into high pressure sealing relationship engagement with said seat base, said base portion including an upwardly rearwardly extending cut out portion disposed adjacent said foot portion so as to concentrate such force at said foot portion.

4,106,709
METHOD OF AND APPARATUS FOR SERVING HELICAL COILS WITH A PROTECTIVE BAND
Theodor Ortmanns, Simmerath; Heinz Apelt, Roetgen, both of Germany, and Helmut Packes, Kettenis, Belgium, assignors to Otto Junker GmbH, Simmerath, Germany
Filed Jul. 13, 1976, Ser. No. 704,781
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534198
Int. Cl.² H01B *13/08;* **H01F** *41/04;* **B65H** *81/02*
U.S. Cl. 242—7.03 **43 Claims**

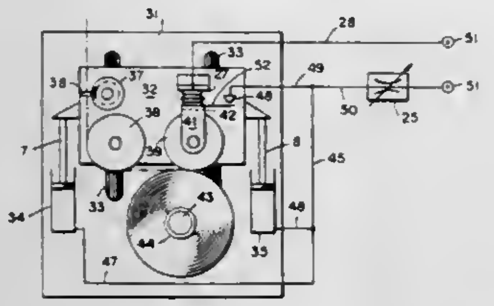


1. A method of serving helical induction coils of large diameters and including a multitude of axially adjacent convolutions with at least one protective band using a serving device of the type including a housing having an advancement axis, a serving ring mounted on the housing for rotation about the advancement axis, and at least one payout reel for the protective band mounted on the serving ring for shared rotation therewith about the advancement axis and also for individual rotation about a support axis radially offset from the advancement axis, the method comprising the steps of mounting the induction coil for rotation about a coil axis so that the latter extends substantially horizontally; supporting the housing on an inner surface of a respective convolution to be served and at a lowermost region of the induction coil so that the advancement axis coincides with the elongation of the respective convolution; setting the induction coil in rotation about the coil axis so that the respective convolution advances at a predetermined speed in a predetermined longitudinal direction; rotating the serving ring about the advancement axis so that the protective tape is paid out from the payout reel and served onto the respective convolution; and advancing the housing in the direction of the advancement axis at substantially the same speed as but in an opposite direction than those of the respective convolution.

4,106,710
WINDING MACHINES WITH CONTACT ROLLER CONTROL DEVICE
Heioz Schippers; Erich Lenk; Manfred Mayer; Hans-Jochen Busch, and Hermann Bremer, all of Remscheid, of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany
Filed Jun. 14, 1976, Ser. No. 695,784
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1975, 7518741[U]; Jun. 12, 1975, 7518742[U]; Jul. 18, 1975, 2532165; Jul. 18, 1975, 2532169; Oct. 7, 1975, 2544733
Int. Cl.² B65H *54/02, 54/52, 67/04*
U.S. Cl. 242—18 R **19 Claims**

1. A winding machine for winding synthetic threads on a winding tube to form a winding package comprising a rotatable chuck for holding said winding tube in winding position,

thread traversing means for traversing the thread being wound on said package, a contact roller maintained in frictional contact with said winding tube and the winding thereon, said contact roller being mounted by a roller support member in a carriage, means mounting said carriage on the winding machine for vertical linear movement of said carriage and the contact roller, and means for maintaining substantially constant pressure between said contact roller and said winding, said means embodying pneumatic cylinder-piston means in a pneumatic control system for supporting the vertically movable carriage, pneumatic control means in said pneumatic system for retracting said carriage and said contact roller upwardly away from said winding as its diameter increases, and force storage means mounting said roller support member in said carriage for relative vertical movement of said member and said contact roller relative to said carriage, said force storage means embodying a body mounted on said carriage above said roller support member, said body having fluid-tight chamber means pressurized with air and having a flexible, vertically movable, membrane wall, and connecting means rigidly joining said vertically movable membrane wall and said roller support member, the air pressure in said chamber being such that most of the weight of the support member and the contact roller is borne by the air-pressure-supported membrane wall and a desired contact pressure is provided between the contact roller and the winding formed on the winding tube, whereby, as the diameter of the winding progressively increases, said air-pressure-supported membrane wall is moved upwardly from its normal position until the carriage begins to move upwardly in response to activation of said pneumatic control means, whereupon said membrane wall begins to move downwardly under the weight of the roller support member and the contact roller mounted thereon toward the normal position of the membrane wall.



4,106,711

CHUCK FOR A TUBE ACTING AS A PACKAGE SUPPORT

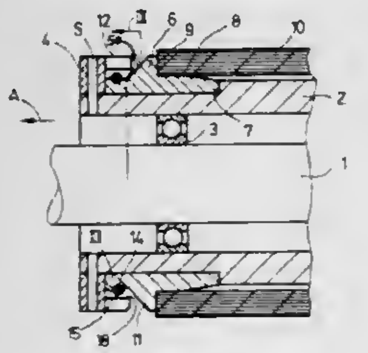
Heinz Oswald, Winterthur, and Olivier Wüst, Seuzach, both of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,226

Claims priority, application Switzerland, Dec. 31, 1976, 16503/76

Int. Cl.² B65H *75/32*

U.S. Cl. 242—19 **8 Claims**



1. A chuck device for a tube serving as a package support for textile threads, comprising:

chuck means;

a thread severing ring provided with protruding tooth-shaped cutting elements;

a thread guide ring;

said thread severing ring and thread guide ring being mounted on said chuck means so as to define therebetween a thread catch zone;

said thread guide ring having a thread guide surface extending beneath the cutting elements for guiding the thread in a direction towards the thread severing ring;

said thread guide ring including an extension located adjacent the thread guide surface;

said extension being provided with recess means;

radially movable clamping means arranged in said recess means; and

said radially movable clamping means in conjunction with the cutting elements forming clamping locations for the thread caught therebetween at the operating rotational speed of the chuck means.

4,106,712

DEVICE FOR CONTROLLING THE TENSION OF YARN UNWINDING FROM A YARN SUPPORTING BODY

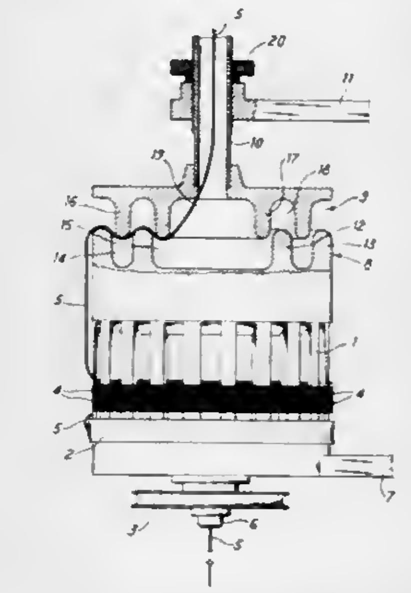
Ermanno Savio; Sergio Calamani, and Eugenio Turri, all of Milan, Italy, assignors to SAVIO e C. S.p.A., Milan, Italy

Filed Feb. 22, 1977, Ser. No. 770,744

Claims priority, application Italy, Mar. 4, 1976, 20865 A/76

Int. Cl.² B65H *51/20, 59/26*

U.S. Cl. 242—47.01 **4 Claims**



1. A device for controlling the tension of yarn unwinding from a yarn bearing body, particularly from a yarn storing and supplying apparatus, wherein: the device comprises two discs facing each other and coaxial with said yarn bearing body, to which one of said discs is integral, the other disc being provided with an axial hole passing therethrough for the passage of the yarn of which the tension has been controlled, said other disc being supported on a fixed bracket; the discs being defined by opposite faces so that at least one of the discs has at least one annular recess coaxial therewith and the other disc is provided with an annular projection coaxial therewith, the surface of said annular projection being substantially complemental with that of said recess for positioning said projection.

4,106,713

THREAD FEEDER FOR TEXTILE MACHINES

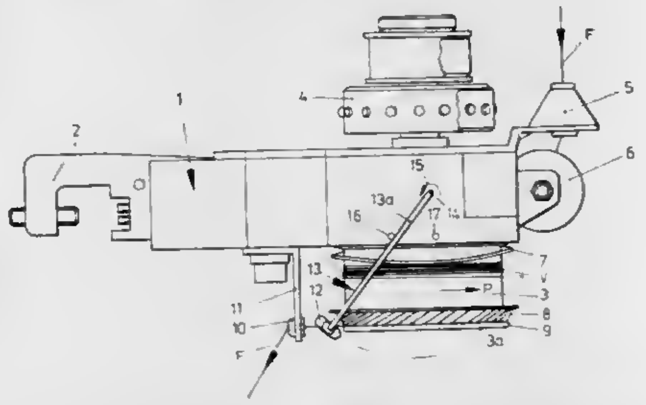
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed May 3, 1977, Ser. No. 793,254

Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2621014

Int. Cl.² B65H *51/20*

U.S. Cl. 242—47.01 **9 Claims**



1. In a thread delivery device for a textile machine having a drum which can be set in rotation and on which a thread issuing from a thread bobbin can be wound tangentially for forming an intermediate thread storage, said drum having a thread removal edge over which the thread can be withdrawn tangentially from the drum for permitting positive thread delivery, a thread guiding member stationarily positioned radially outside of the drum approximately at the level of the removal edge, said thread guiding member being engaged with the thread as withdrawn tangentially from the drum over the removal edge thereof, and a thread control element disposed for engagement with the withdrawn thread at a location disposed between its engagement with the drum and the thread guiding member, the thread control element being engaged with the withdrawn thread and positioned approximately at the level of the removal edge of the drum during withdrawal of the thread from the drum when the thread is subjected to a normal operating tension, comprising the improvement wherein the thread control element is disposed in the path of the withdrawn thread as it extends radially outwardly from the drum to the stationary thread guiding member, said thread control element being mounted for movement transversely of said path and transversely relative to the removal edge of said drum, and means for urging the thread control element and the withdrawn thread engaged therewith to move transversely of said path toward a position disposed below the plane of the removal edge when the tension in the withdrawn thread falls below said normal operating tension.

4,106,714

WIRE REELING APPARATUS

Harlo W. Janzen, Rte. 2, Box 74, Balko, Okla. 73931

Filed Jul. 18, 1977, Ser. No. 816,267

Int. Cl.² B65H *75/00, 79/00*

U.S. Cl. 242—54 R **27 Claims**

1. An apparatus for reeling up wire comprising:

at least one drive roller;

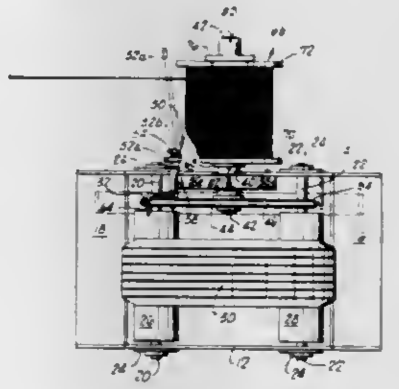
a reel shaft adapted to support a wire reel for rotation therewith;

a flexible driving member interconnecting the drive roller and reel shaft;

means for selectively preventing rotation of said reel shaft, and

control handle means including:

brake means selectively engageable with said flexible driving member upon pivotation of said control handle in one direction; and



tensioning means for tensioning said flexible member upon pivotation of said control handle means in a second direction.

4,106,715

ROLLING-UP MACHINE FOR LENGTHS OF CLOTH DESTINED FOR COLLAR-CUTTING MACHINES

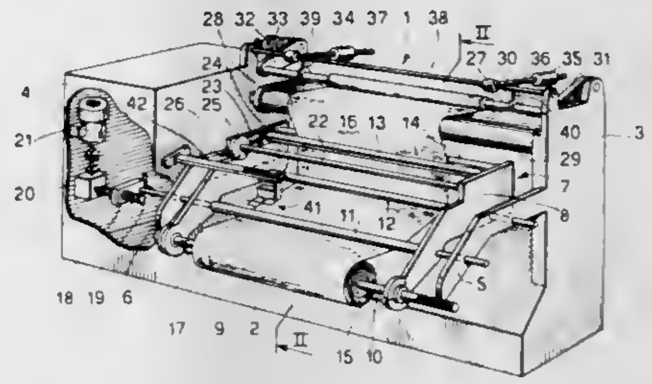
Luigi Pisani, Cilavegna (Pavia), Italy, assignor to Officina Meccanica Pisani Luigi, Pavia, Italy

Filed Mar. 8, 1977, Ser. No. 775,473

Claims priority, application Italy, Mar. 22, 1976, 21416 A/76

Int. Cl.² B65H *25/26*

U.S. Cl. 242—57.1 **4 Claims**



1. A rolling-up machine for lengths of cloth destined for collar-cutting machines, comprising a rolling-up bar, means to drive said bar, a cloth-drawing roll, means to drive said roll, a mobile frame carrying fixed stretching bars and a bar carrying the cloth to be rolled up, the said mobile frame being able to move transversally to the direction of unrolling of the cloth and continuously align the profile of one of the edges of the cloth roll corresponding to the head of the roll formed on the rolling-up bar, a cloth-stretching roll spaced from and parallel to the said cloth-drawing roll and rotating in the same direction; a pair of idler bars seated below the said stretching roll on the said mobile frame; these idler rolls being pressed one against the other so as to press the cloth passing therethrough and cause a relative transverse sliding motion between the stretching roll and the cloth as a result of the movement of the mobile frame in response to variations of the width of the cloth as detected by sensitive means, the interaction of the stretching roll with the pair of idler bars being capable of cancelling any undulation in the cloth and maintaining the edge of the cloth perfectly straight and well aligned with the feed path.

4,106,716

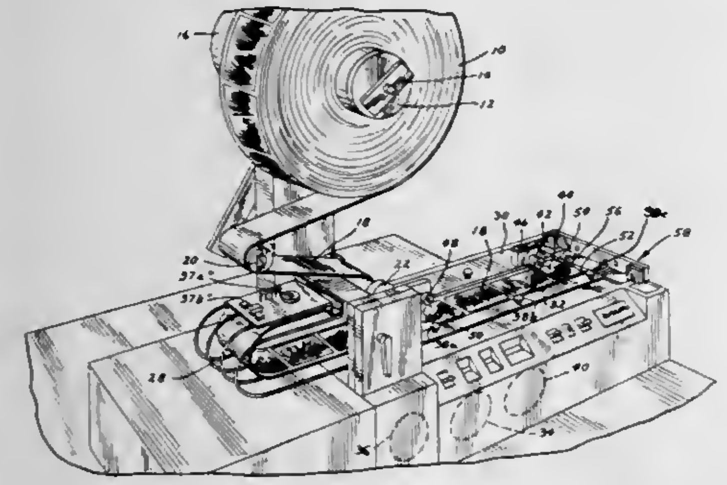
PAPER DRIVE MECHANISM FOR AUTOMATIC PHOTOGRAPHIC PAPER CUTTER

Robert E. Diesch, Rogers, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sep. 29, 1977, Ser. No. 837,987

Int. Cl.^{2} B65H *25/22*

U.S. Cl. 242—75.43 **14 Claims**



1. A paper drive system for a photographic paper cutter, the paper drive system comprising:
- paper supply means for supplying a strip of photographic print paper;
- guide means for guiding the strip along a path; and
- paper drive means proximate a first edge of the strip for driving the strip along the path by applying a driving force to the strip only at the first edge.

4,106,717

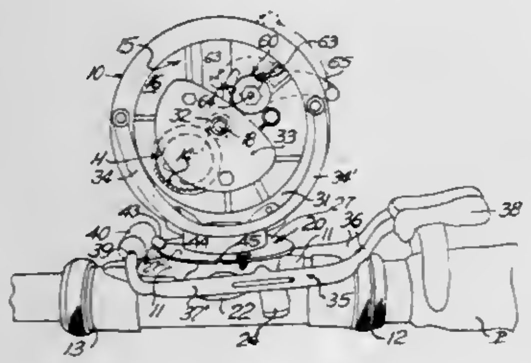
LATCHING MEANS FOR A FREE SPOOL RETRIEVAL AND SPIN TYPE CASTING REEL

Ralph Thiel, 1129 Wanda Ave., Seaside, Calif. 93955

Filed Aug. 4, 1976, Ser. No. 711,432

Int. Cl.^{2} A01K *89/015, 89/02*

U.S. Cl. 242—84.2 B **3 Claims**



1. A fishing reel for use of a fishing pole said reel being convertable from a fixed spool casting reel to a free spool retrieval reel comprising in combination:
- (1) a pole mount;
- (2) a turntable pivotally secured to said pole mount;
- (3) a gear housing secured to said turntable radially of the pivotal center thereof;
- (4) a gear arrangement within said housing;
- (5) means on said gear housing for turning said gear arrangement;
- (6) a sleeve shaft having one end secured to said gear housing and extending therefrom radially of and above said pivotally mounted turntable;
- (7) a spool journaled for free rotation on said sleeve shaft;
- (8) a drive shaft journaled as a free floating axle within said sleeve shaft and adapted to have drive connection with said gear arrangement within said gear housing;
- (9) means at the free end of said drive shaft for connecting the latter to said spool;
- (10) stop means on said turntable at right angles relative to each other, one below the free end of said drive shaft diametrically opposite said gear housing and the other at 90° therefrom;
- (11) a thumb actuated lever pivotally mounted on said pole mount on an axis transverse of the pole;
- (12) a thumb depressable pad on one end of said thumb actuated lever overlying the pole;
- (13) a tooth member on the opposite end of said thumb actuated lever adapted to engage said stop means on said turntable for limiting rotative movement of said turntable between a spin casting position with said sleeve shaft extending parallel to said pole and a reel retrieval position with said sleeve shaft transverse to said pole; and
- (14) a brake shoe on opposite end of said thumb actuated lever adapted to engage said spool when said sleeve shaft is disposed in spin casting position and the thumb pad depressed during spin casting of the fish line from the spool.

4,106,718

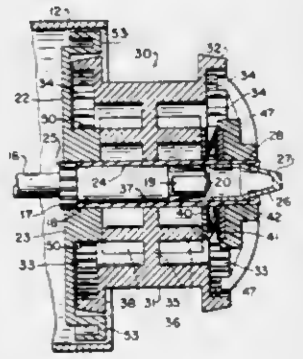
SPINNING REEL SPOOL AND ADAPTER THEREFOR

Robert T. Catignani, Fort Lee, N.J., assignor to The Garcia Corporation, Teaneck, N.J.

Continuation of Ser. No. 85,620, Oct. 30, 1970, abandoned, which is a continuation of Ser. No. 746,936, Jul. 23, 1968, abandoned. This application Jan. 6, 1977, Ser. No. 757,208

Int. Cl.^{2} A01K *89/01*

U.S. Cl. 242—84.2 R **6 Claims**



1. For use with a spinning reel having a spindle, a rotatable bail carrier disposed about said spindle, and a bail on said bail carrier to engage and wind line, a disengageable spindle adapter having a longitudinally symmetrical spool removably mounted thereon comprising, in combination, a spindle adapter having a tubular shaft sized to slide over the spindle of said reel, a base extending laterally outward from said tubular shaft, means fixing said tubular shaft against rotation about said spindle, and means disengageably securing said tubular shaft on said spindle, said tubular shaft having a forwardly disposed threaded end remote from said base; a longitudinally symmetrical spool having line pre-wound thereon, a cylindrical body and two larger diameter shoulders at the ends of said body, said body containing a central opening to receive the tubular shaft of said spindle adapter; a peripheral, forwardly extending flange on said base of said spindle adapter and surrounding the rearwardly disposed shoulder of said spool to substantially fill the annular space between the rearwardly disposed shoulder of said spool and said bail carrier; a nut turned about the threaded end of said tubular shaft to adjustably resist rotation, said longitudinally symmetrical spool being reversible on said adapter to accomodate right and left hand reels; and click means to indicate rotation of said spool about said spindle said clicking means comprises annular teeth on the ends of said spool and a spring member mounted on said adapter engaging the annular teeth on the rearwardly disposed end of said spool.

4,106,719

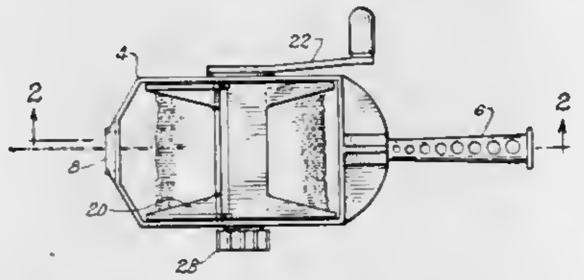
REEL ASSEMBLY FOR KITE LINES AND THE LIKE

Joseph G. Haverland, 516 Tallow Ct., Chula Vista, Calif. 92011

Filed Apr. 7, 1977, Ser. No. 785,387

Int. Cl.^{2} B65H *75/30, 75/40*

U.S. Cl. 242—96 **3 Claims**



1. In a reel assembly the combination of:
- a. dual oppositely disposed body members that are united to form a frame for the assembly;
- b. a spool rotatably mounted within the body members upon which spool string may be wound, each end of said spool within said body members having four flanges formed thereon for retaining said string therebetween, one of said ends having an axial, outwardly-directed extension which has a cylindrical outer surface and an outwardly tapered inner surface;
- c. a crank with handle for rotating the spool integrally formed on the end of the spool opposite the end having said extension; and
- d. frictional brake means and means on said frame for mounting said brake means for turning movement, said brake means having a tapered surface which cooperates with the tapered surface on said extension when said brake means is turned on its mounting on said frame to wedge said extension against said frame to control the resistance to force applied to the string on the spool.

4,106,720

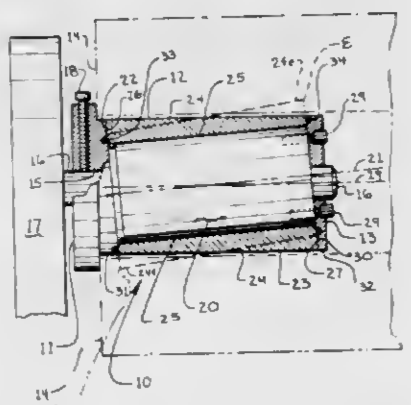
EXPANDABLE INTERNAL CHUCK

George Elwood Reeder, Jr., 10739 Mississippi Blvd., Coon Rapids, Minn. 55433

Filed Dec. 3, 1976, Ser. No. 747,464

Int. Cl.^{2} B65H *75/24*

U.S. Cl. 242—68.4 **28 Claims**



1. An expandable internal chuck for holding an item in a machine by expansion of the chuck within the item, comprising
- (a) an internal hub having
  - (1) a central axis,
  - (2) means for mounting of the hub to a machine, and
  - (3) an external radial bearing having an axis at an acute oblique angle to the central axis of the hub;
- (b) a sleeve mounted upon the radial bearing and rotatable with respect to the hub and having
  - (1) an outer cylindrical surface, and
  - (2) an inner journal positioned at an acute oblique angle to the outer cylindrical surface, said journal being closely fitted on said bearing; and
- (c) means for retaining the sleeve rotatably mounted upon the hub, with the hub and sleeve having
  - (1) a non-expanded first position with respect to one another wherein the sleeve outer cylindrical surface is substantially concentric with the hub central axis, and
  - (2) an expanded position in which the sleeve is rotated on and with respect to the hub from the first position to a second position in which the sleeve outer cylindrical surface is at an acute oblique angle to the hub central axis thereby expanding the effective diameter of the chuck for holding an item placed upon the chuck.

4,106,721

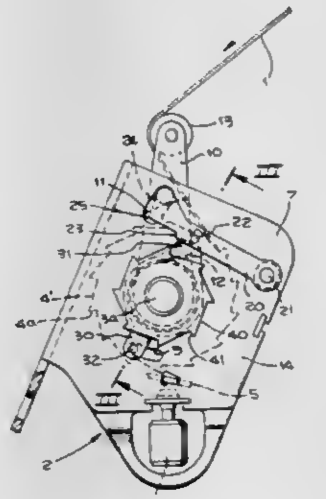
SAFETY BELT RETRACTOR WITH DUAL TENSION RETRACTION MEANS

Charles J. Ulrich, Montecito, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Continuation of Ser. No. 627,875, Oct. 31, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,682

Int. Cl.^{2} A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107 **14 Claims**

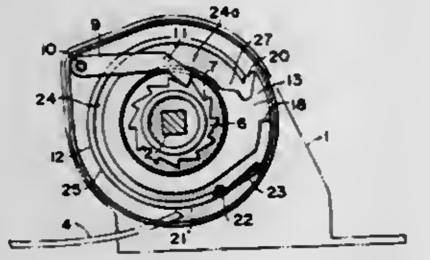


13. A safety belt retractor having a frame, a webbing storage means mounted on said frame and biased toward a webbing stored condition under a first tension applied by a first spring means and a safety belt webbing connected to said storage means and having webbing portions to be stored thereby, comprising:
- means for relieving the webbing of said first tension applied thereto by said first spring means through said storage means; and
- means mounted on said frame for applying a second lower tension upon said webbing through said webbing portions when the first tension of said first spring means is relieved, wherein
- means are provided for reapplying the first tension of said first spring means upon said webbing through said storage means in response to a movement of said webbing beyond a predetermined amount under the influence of said means for applying a second lower tension.

4,106,722
DEVICE FOR PREVENTING EXCESSIVE TIGHTNESS OF SEATBELTS

Mitsuo Inukai, Nagoya, and Yoshihiro Hayashi, Kasugai, both of Japan, assignors to K. K. Tokai Rika Denki Seisakusho, Japan

Continuation-in-part of Ser. No. 762,574, Jan. 26, 1977, abandoned. This application Mar. 24, 1977, Ser. No. 780,832
Claims priority, application Japan, Mar. 26, 1976, 51-37045
Int. Cl.² A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.7 4 Claims



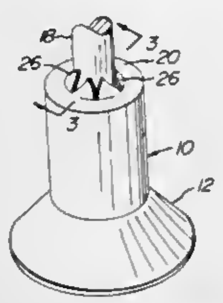
1. A seat belt retractor comprising:
a frame;
a seat belt takeup spool rotatably coupled to said frame;
a means for applying a rotational torque to said spool in a winding up direction;
a seat belt wound on said spool;
at least one ratchet gear coupled to said spool;
a pawl pivotally coupled to said frame and engageable with said ratchet gear such that the spool is prevented from winding up said seat belt when said pawl engages with said ratchet gear;
a cam plate frictionally coupled to said ratchet gear and rotatable therewith;
a first cam guide provided on said cam plate for guiding said pawl in such a direction that it disengages from said ratchet gear as said cam plate rotates in a direction of seat belt extension;
a second cam guide provided on said cam plate continuous with said first cam guide for holding said pawl in said disengaged position when said cam plate rotates in a winding up direction;
a third cam guide provided on said cam plate for engaging said pawl with said ratchet gear after said guide plate has rotated in a winding up direction and then rotates in an extending direction; and
a switching means provided on said cam plate which automatically switches said pawl from said first cam guide to said second cam guide when the direction of rotation of said cam plate switches from the extending direction to the winding up direction.

4,106,723
SPOOL FOR THREAD OR THE LIKE

Paul A. Couture, Stroudsburg, Pa., assignor to Holland Thread Co., Stroudsburg, Pa.

Filed Aug. 26, 1977, Ser. No. 828,134
Int. Cl.² B65H *75/12, 49/36*
U.S. Cl. 242—118.3 9 Claims

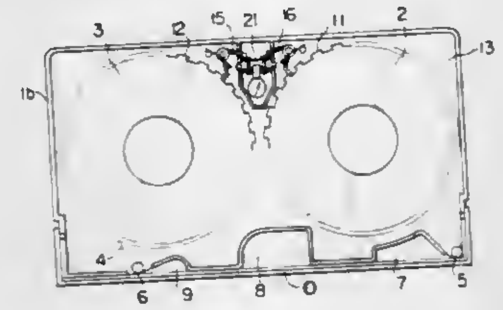
1. A spool for holding thread, said spool comprising:
a base and a substantially cylindrical portion with a bore passing therethrough, said spool being mountable over a spindle with said spindle passing through said spool bore; and
means for retaining said spool on said spindle, said means comprising a radially scored member mounted across said bore whereby said member breaks along said score lines when the spool is placed over the spindle causing radially inwardly projecting portions of said member to engage said spindle thereby holding said spool on said spindle.



4,106,724
TAPE CASSETTE

Yutaka Higashida, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 28, 1977, Ser. No. 791,776
Claims priority, application Japan, May 4, 1976, 51-56270[U]
Int. Cl.² G11B *23/10*
U.S. Cl. 242—198 3 Claims

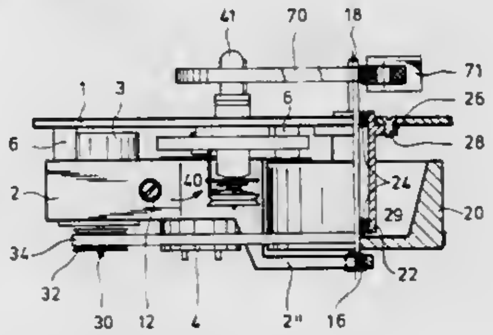


1. A tape cassette for use in a magnetic recording and reproducing apparatus provided with a brake release pin located parallel to and near a pair of reel engaging shafts comprising:
a housing including a bottom plate;
first and second tape reels rotatably mounted in said housing in substantially the same plane which is parallel to said bottom plate, said first and second reels being spaced a predetermined distance apart and each having a flange portion and teeth provided on the periphery of said flange portion;
first and second brake pieces pivotably mounted in said housing and having respective tooth engaging end portions for respective removable engagement with the teeth of said first and second reels to prevent rotation thereof;
biasing means for pivotably biasing said first and second brake pieces into respective engagement with said teeth of said first and second reels;
a single through-hole formed in said bottom plate; and,
a brake releasing means including an operating arm normally covering the entire area of said through-hole, said brake releasing means being pivotable by pushing pressure exerted on said operating arm by said brake release pin immediately prior to engagement of said shafts with said first and second reel, said brake releasing means further including a mechanism for engaging with said first and second brake pieces upon pivotal movement of said brake releasing means to pivot said brake pieces against the biasing force of said biasing means and away from respective engagement with said teeth on said first and second reels.

4,106,725
DRIVE UNIT FOR MAGNETIC TAPE-RECORDERS

Oskar Hubert Richt, Bucheneweg 14, Soecking, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,347
Int. Cl.² G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—201 14 Claims

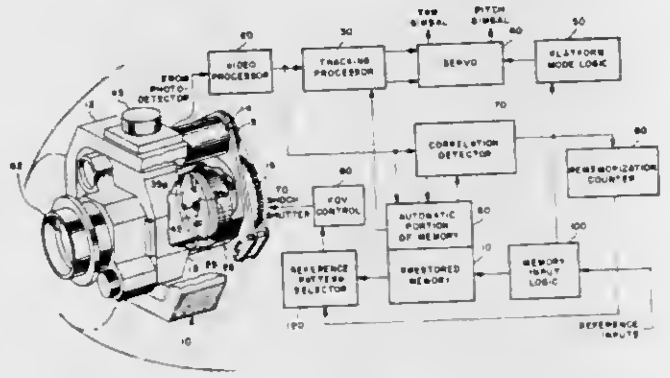


1. A drive unit for a magnetic tape-recorder comprising two driving spindles for moving the magnetic tape, a drive wheel associated with each driving spindle, a single drive motor rotatable in two opposite directions and in constant driving connection with the two drive wheels, and respective clutch means between each driving spindle and the associated drive wheel, each clutch means comprising a clutch lever pivotally mounted on the associated drive wheel and rotatable therewith, a cam disc cooperating with the clutch lever, the cam disc being rotatable relative to the drive wheel and defining two alternative pivotal positions for the lever, and a projection rotatable with the driving spindle and positioned so as to be engaged by the clutch lever when in only one of said pivotal positions, each clutch means being effective automatically to establish a torque connection between the associated drive wheel and driving spindle when the motor rotates in a respective one of said directions and to interrupt such torque connection when the motor rotates in the other said direction, and said cam disc being shaped so as to enable the clutch means to interrupt the existing torque connection to one spindle before establishing the torque connection to the other spindle.

4,106,726
PRESTORED AREA CORRELATION TRACKER

David L. Emmons, Orlando; Richard E. Roberts, Winter Park; Edward Pasko, Orlando, and George Lamar Harmon, Winter Park, all of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Nov. 4, 1969, Ser. No. 873,864
Int. Cl.² F41G *7/00;* **F42B** *15/02*
U.S. Cl. 244—3.17 25 Claims

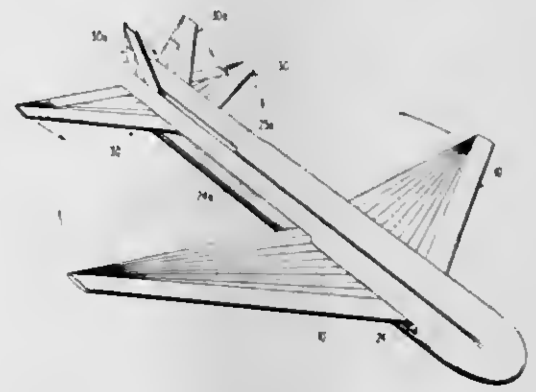


1. Apparatus for determining angular misalignment between a desired aim point and an actual aim point of a missile or other vehicle, comprising memory means for prestoring at least three related signals representing the appearance of the aim point area at an initial range and at successively closer ranges to such aim point, scanning means for generating a current signal indicative of the area about the actual aim point, and means for sequentially utilizing the prestored signals in determining angular misalignment between the current signal and the memory signals.

4,106,727
AIRCRAFT FOLDING AIRFOIL SYSTEM

Alexander Rudolph Ortell, Huntsville, Ala., assignor to Teledyne Brown Engineering, a Division of Teledyne Industries, Inc., Huntsville, Ala.

Filed May 9, 1977, Ser. No. 795,052
Int. Cl.² B64C *3/56*
U.S. Cl. 244—49 10 Claims



1. A foldable airfoil comprising
a plurality of elongated channels each having one end forming a portion of the root area of the airfoil and an outer end opposite said root end,
means for pivotally mounting said root end of each of said plurality of channels on a support base at spaced intervals along the root dimension of said airfoil for pivotal motion of each channel in the plane of the airfoil,
each said channel having a cross sectional shape nestably containable within the cross sectional envelope of the next adjacent of the pivotally mounted channels, and
means interconnecting the outer ends of each of said plurality of channels for rotational movement of said plurality of channels about their respective root end pivots between (1) an extended position in which the lengthwise dimension of each said channel extends spanwise of the airfoil with portions of adjacent channels overlying and (2) a retracted position in which said plurality of channels are colinear in alignment with the channel root end pivots and the cross sectional area of each of said channels is nestably contained within the envelope of the cross section of an adjaent channel, said interconnecting means including means nestingly containing said outer end of each of said plurality of channels within the envelope of the next adjacent channel in said extended position and during movement between said extended and retracted positions.

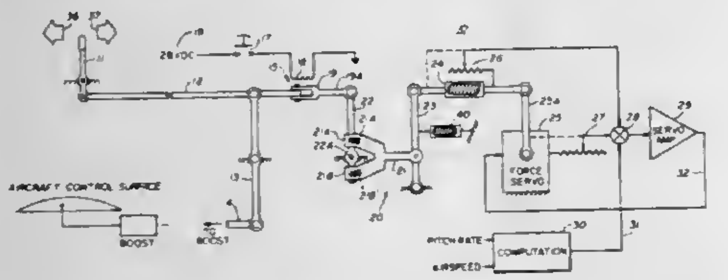
4,106,728
FAIL SAFE FORCE FEEL SYSTEM

Carl D. Griffith, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 760,045
Int. Cl.² B64C *13/04*
U.S. Cl. 244—83 D 10 Claims

1. A force feel apparatus for aircraft flight controls comprising
a manual control member for operating an aircraft attitude control surface through a boost actuator,
a variable artificial feel force gradient spring means,
a force servosystem connected to said spring means responsive to aircraft motion for varying the force gradient of said spring means, and
non-linear linkage means connected between said spring

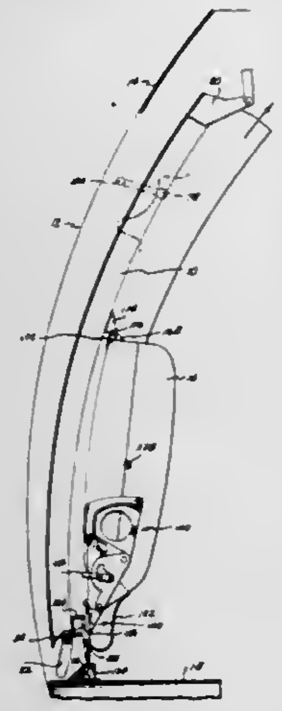
means and said manual control member for transmitting control member motions to said spring means and for



inhibiting motion of said spring means to said manual control member.

4,106,729
ESCAPE SLIDE DEPLOYING APPARATUS FOR USE IN AN AIRPLANE

Burton Bergman, Kent, and Stewart M. Herman, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Napoli, Italy
Filed Dec. 30, 1976, Ser. No. 755,838
Int. Cl.² B64D *25/14*
U.S. Cl. 244—137 P **17 Claims**



1. In combination with a door and means mounting said door for upward and downward movement relative to a substantially horizontally oriented floor and into and out of engagement with a door opening in a wall associated with said floor, said movement being between a closed position adjacent said floor and in engagement with said door opening and an open position spaced upwardly from said floor and said door opening, said door having inner and outer sides, an improved apparatus for deploying an escape slide container normally attached to said door, said container having a center of gravity, comprising:

a movable member and support means operatively associated with said floor adjacent the bottom of said door opening, said support means being constructed to allow upward movement of said movable member relative to said floor,

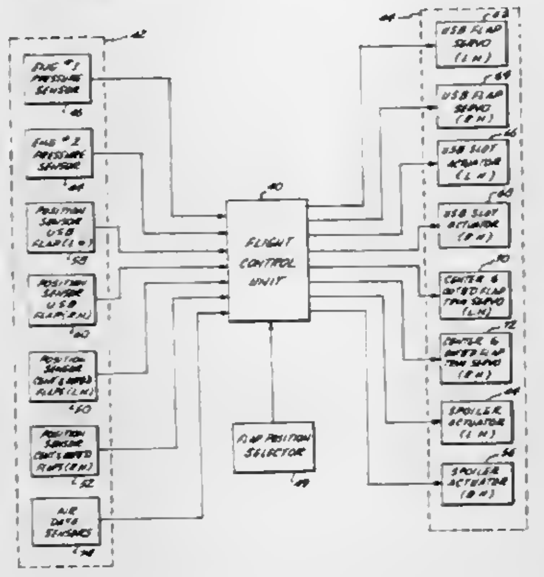
latch means operatively associated with said movable member, said latch means and said door having a first latching condition for securing said movable member to said door and releasing said movable member from said support means and a second latching condition for securing said movable member to said support means and for releasing said movable member from said door,

linkage means for coupling said container to said movable member, said linkage means and said movable member being so constructed and associated with each other to mount said container for outward swinging movement relative to said door opening, said linkage means being so constructed as to hold said container in a stable position wherein said container will remain in a position located above said movable member, said linkage means capable of moving said container to an unstable position wherein the center of gravity of said container is shifted to a location so as to cause said container initially to swing outwardly toward said door opening solely under the urging of gravity,

trip means associated with said linkage means for locking said linkage means to hold container in said stable position, and for causing said linkage means to move so as to shift said container to said unstable position in reaction to upward movement of said door when said latch means is in said second latching condition, thereby allowing said container to swing outwardly under the urging of gravity to position said container adjacent said door opening in readiness for deployment of an escape slide held by said container.

4,106,730
ENGINE OUT CONTROL SYSTEM FOR STOL AIRCRAFT

Robert E. Spitzer, Seattle, and Fred W. May, III, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Oct. 1, 1976, Ser. No. 728,742
Int. Cl.² G05D *1/12*
U.S. Cl. 244—183 **23 Claims**



1. In an STOL aircraft including first and second oppositely disposed wings projecting outwardly from a fuselage wherein at least one gas turbine engine is positioned on each of said first and second wings for supplying an exhaust stream to a lift augmentation flap extendable downwardly and rearwardly from the trailing edge of the wing upon which said engine is mounted, said lift augmentation flap including at least one spanwise slot and slot closure means for selectively opening or closing each of said spanwise slots, and wherein each of said first and second wings of said STOL aircraft further includes at least one slotted flap extendable downwardly and rearwardly from the trailing edge of said aircraft wing at a position in which said slotted flap is not supplied with an engine exhaust stream from said engine supplying said exhaust stream to said lift augmentation flap, an automatic control system for activating said lift augmentation flaps and said slotted flaps when said STOL aircraft effects a landing maneuver with one engine in an inoperative state wherein the thrust supplied by that engine is less than a predetermined thrust level, said automatic control system comprising:

engine failure detection means for detecting said inoperative state of one of said gas turbine engines;

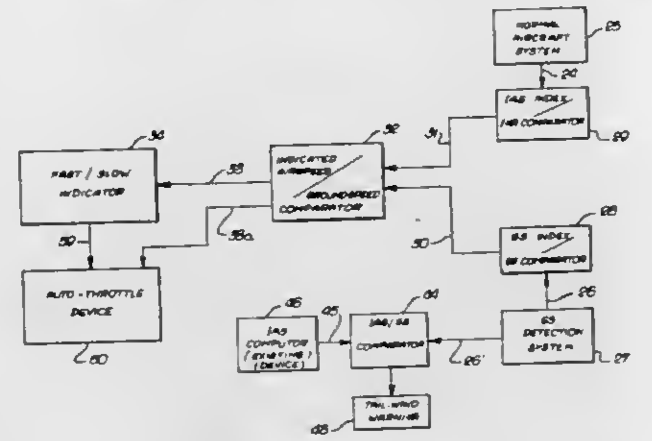
means responsive to said engine failure detection means for extending that lift augmentation flap normally supplied with an exhaust stream by said inoperative engine to a position wherein the rearward and downward extension of said lift augmentation flap corresponds to the rearward and downward extension of the slotted flap located on that wing of said aircraft including said inoperative engine;

means for activating said slot closure means to open said spanwise slot of said lift augmentation flap normally supplied with an exhaust stream by said inoperative engine; and

means for partially retracting the slotted flap of the wing not including said inoperative engine to reduce roll moment and associated drap caused by said inoperative engine.

4,106,731
METHOD AND APPARATUS TO OVERCOME AIRCRAFT CONTROL PROBLEMS DUE TO WIND SHEAR

John H. Bliss, 2740 Graysby Ave., San Pedro, Calif. 90732
Continuation-in-part of Ser. No. 608,408, Aug. 29, 1975, Pat. No. 4,021,010. This application Nov. 8, 1976, Ser. No. 740,112
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.
Int. Cl.² G05D *1/12*
U.S. Cl. 244—188 **8 Claims**



8. An apparatus in determining power to be applied to an aircraft engine during a landing approach, comprising

(a) first means for monitoring deviations of actual aircraft airspeed from desired approach airspeed, and deviations of actual aircraft groundspeed from desired approach groundspeed,

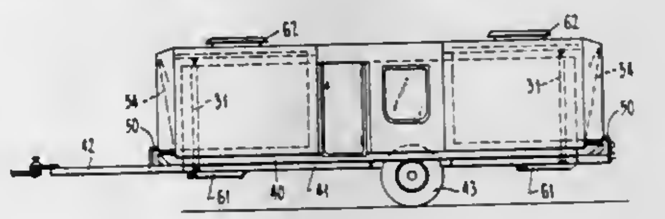
(b) second means coupled to said first means for providing an indication as to which of said deviations is the lower compared to the associated desired value, from which a pilot can maintain a stabilized speed condition above a safe value by adjusting engine power,

(c) and cooperating instrumentation on the aircraft and on the ground near the landing area to produce on the aircraft a Doppler frequency shifted signal indicative of actual groundspeed of the aircraft.

4,106,732
CAMPER TRAILER

Ernest Henry Whiting, 218-222 Balaclava Rd., Caulfield, Victoria, Australia (3162)
Filed Nov. 3, 1976, Ser. No. 738,295
Claims priority, application Australia, Nov. 5, 1975, PC3842; Aug. 16, 1976, PC7008
Int. Cl.² B60P *3/32*
U.S. Cl. 296—23 C **3 Claims**

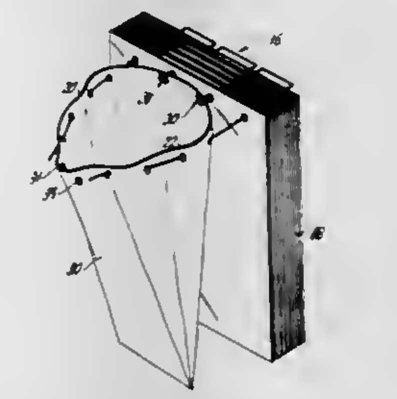
1. A camper trailer comprising a base having upstanding sides and a top having a roof and sides depending from the roof; wherein the top is raisable from a lowered position in which the sides of the base and top are telescoped one within the other to a raised position in which the sides of the base and the top are in at least substantially untelescoped condition; wherein the top includes a first member having depending sides and which is open at one end and an end member having a roof portion, depending sides and a depending end wall and wherein the end member is movable generally horizontally from a retracted position, in which the sides of the end member and said first member are telescoped one within the other, to an



extended position, in which the sides of the end member and said first member are in at least substantially untelescoped condition, and including a platform capable of closing the underside of the end member when in the extended position, the platform being pivotally attached to the camper trailer and being movable from a generally horizontal position, in which it closes the underside of the end member, to a generally vertical stored position.

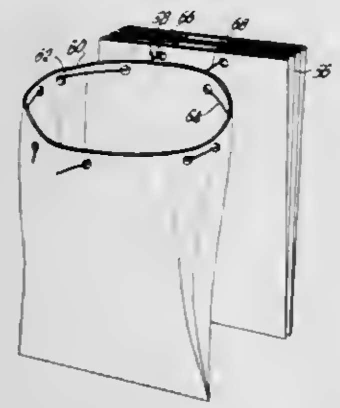
4,106,733
BAG DISPENSER AND HOLDER

Charles Richard Walitalo, Matteson, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 29, 1977, Ser. No. 782,390
Int. Cl.² B65B *67/04*
U.S. Cl. 248—100 **14 Claims**



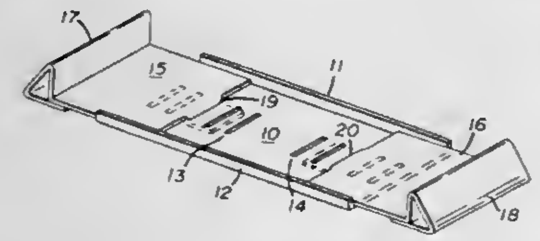
1. A bag dispenser and support holder comprising a brace member having a pair of deformable, resilient, outwardly extending spaced-apart support members, said support member comprising inner segments for supporting a plurality of bags proximal the brace member through a pair of spaced-apart holes in the mouth of the bags, and curved opposed outer segments which are aligned in a common plane to define a substantial, open hoop-type configuration; said brace member having at least one outwardly extending hook-wicket intermediate said extending pair of support members adapted for further supporting the plurality of bags through holes in said bags intermediate the pair of spaced-apart holes; and said support members being operable such that when a bag is advanced from the inner segments it will apply a sufficient force to slightly collapse the curved segments so as to accommodate the spacings of the support holes in the mouth of the bag and once the bag is fully advanced on the curved segments and supported on the at least one hook-wicket, said curved segments will exert an outwardly applied tensive force on the mouth of the bag sufficient to maintain the mouth of the bag in an open position.

4,106,734
BAG DISPENSER AND HOLDER
Charles Richard Walitalo, Matteson, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 29, 1977, Ser. No. 782,387
Int. Cl.^{2} B65B *67/04*
U.S. Cl. 248—100 **15 Claims**



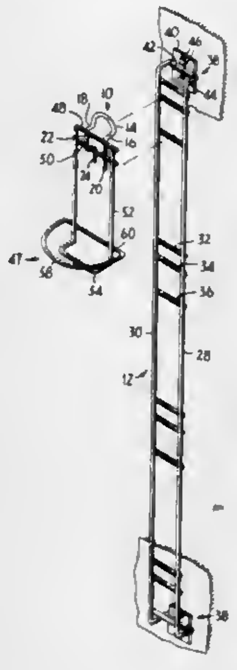
1. A bag dispenser and support holder comprising a brace member having a pair of outwardly extending, spaced-apart support members adapted for supporting a plurality of bags having holes in the mouth of said bags; a first deformable, resilient, substantially arcuate member extending from the end of one of said spaced-apart support members; a second deformable, resilient, substantially arcuate member extending from the end of the other of said spaced-apart support members; and said deformable, resilient substantially arcuate members being outwardly and oppositely aligned in a common plane to define a substantial, open hoop configuration, said arcuate members being operable such that as a bag is advanced from the support members, the bag will apply a sufficient inward force on the arcuate members to slightly collapse the arcuate members such that their extremities overlap so as to accommodate the spacing of the support wicket holes in the bag and once the bag is fully advanced on the arcuate members, the arcuate members will exert an outwardly applied tensive force on the mouth of the bag sufficient to maintain the mouth of the bag in an open position.

4,106,735
ADJUSTABLE COIL RACK
Wilbur A. Partain, 415 Illinois Ave., and Frank D. Sudol, 1124 Logan Ave., both of Mc Donald, Ohio 44437
Filed Jun. 13, 1977, Ser. No. 805,828
Int. Cl.^{2} B60P *7/00*
U.S. Cl. 248—119 R **4 Claims**



1. An adjustable coil rack for the anti-rolling support of steel coils comprising a flat rectangular body member having upstanding longitudinally extending flanges on its longitudinal edges, said body member having a plurality of spaced transversely extending slot-like apertures axially thereof and inwardly of the ends thereof and a pair of secondary flat body members having offset tongues on one of each of of their ends engaged in two of said slot-like apertures so that said offset tongues underlie portions of said flat rectangular body member to secure said secondary body members in spaced relation on said flat rectangular body member, upstanding abutments on the opposite ends of each of said secondary body members.

4,106,736
ARTICLE SUPPORTING APPARATUS
Frederick R. Becker, III, Dallas, and Charles W. Nicely, Wilkes-Barre, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.
Filed Jan. 3, 1977, Ser. No. 756,397
Int. Cl.^{2} A47F *5/01*
U.S. Cl. 248—222.2 **12 Claims**



1. An article supporting apparatus comprising the combination of:

(a) a bracket member including a U-shaped clip portion having a longitudinal axis lying in a first plane, a pair of parallel offset arms extending from respective ends of said U-shaped clip portion and lying in a second plane substantially perpendicular to said first plane, and a pair of legs extending longitudinally from a respective one of said arms and lying in a third plane substantially parallel to said first plane;

(b) a standard member having rod means for preventing lateral movement of said legs, said rod means including an elongated pair of laterally spaced apart rods, and at least two longitudinally spaced apart transverse bars connected to rear sides of said rods to accommodate and retain said bracket member;

(c) article support means coupled to said legs of said bracket member;

(d) the longitudinal spacing between said bars being less than longitudinal length of said clip portion to provide for a part of said clip portion being retained behind one of said bars when said arms sit on the other of said bars in a retained position; and

(e) the lateral spacing between said rods being slightly greater than width of said bracket member to receive said legs therein, said rods lying in said third plane in said retained position with said legs positioned inwardly of and adjacent to said rods to prevent said lateral movement of said legs.

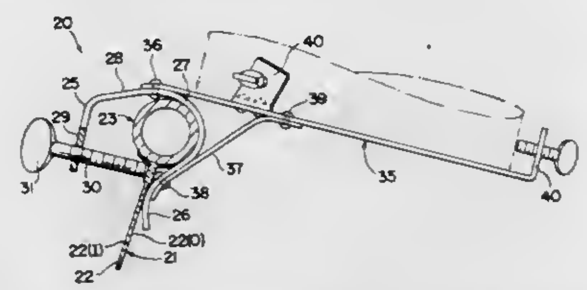
4,106,737
BOAT BRACKET
Roy L. Arnett, 278 Morningview Ave., Akron, Ohio 44305
Filed Mar. 28, 1977, Ser. No. 781,566
Int. Cl.^{2} A47F *5/00*
U.S. Cl. 248—226.4 **3 Claims**

1. A bracket for use on an open boat having a hull with a tubular gunwale,

said bracket comprising a deformable strap having inner and outer ends and a medial portion adapted for conforming engagement with the upper and outer surfaces of said tubular gunwale,

said strap being fabricated from a rectilinear elongated strip having a substantially uniform cross-section throughout the extent thereof from end to end,

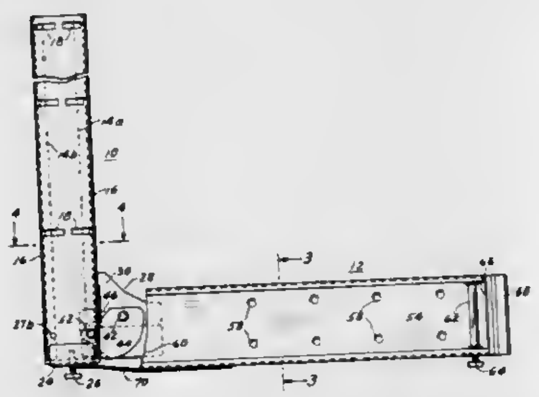
said strap inner end having an inverted L-shape providing a span portion extending laterally inward of said medial portion and downwardly projecting terminal portion, said terminal portion having a tapped bore therein for receiving the threads of a rotatable bolt projecting through said bore for adjustable engagement with the inner surface of said hull beneath said tubular gunwale,



said strap outer end being in engagement with the outer surface of said hull beneath said tubular gunwale,

there being an elongate load carrying base member integrally attached to and extending laterally outward of said strap medial portion.

4,106,738
BASE BRACKET FOR SHELVING
James F. Kostecky, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.
Filed Jul. 27, 1977, Ser. No. 819,315
Int. Cl.^{2} A47B *96/06*
U.S. Cl. 248—235 **1 Claim**



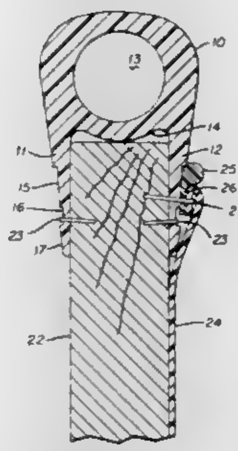
1. In combination with an upright, said upright having a vertical slot therein and mutually aligned holes passing through said upright whereby the mutual axis of said holes is perpendicular to said slot, a bracket comprising:

(a) a main body comprising a hook and heel member, said hook being characterized by a notch one wall of which is adapted to engage a first portion of a surface of said upright after said hook passes through said vertical slot, said hook being provided with a hole that is aligned with the holes in said upright when said hook is properly positioned with respect to said upright,

(b) a tab rotatably secured to said heel member, said tab being characterized by a notch one wall of which is adapted to engage a second portion of said surface of said upright after said tab passes through said vertical slot, said tab being provided with a hole that is aligned with the holes in said upright and the hole in said hook when the notch in said tab engages said upright, and

(c) a pin adapted to pass through the holes in said upright, said hook, and said tab whereby said bracket is secured to said upright.

4,106,739
BUMPER EDGE MEMBER FOR CHAIRS
George E. Gasser, 6455 Sodom-Hutchings Rd., Girard, Ohio 44420
Filed May 19, 1977, Ser. No. 798,646
Int. Cl.^{2} A47B *95/00*
U.S. Cl. 248—345.1 **6 Claims**



1. A bumper edge member for chairs and the like which have structural portions defining perimeter edges, the edge member comprising:

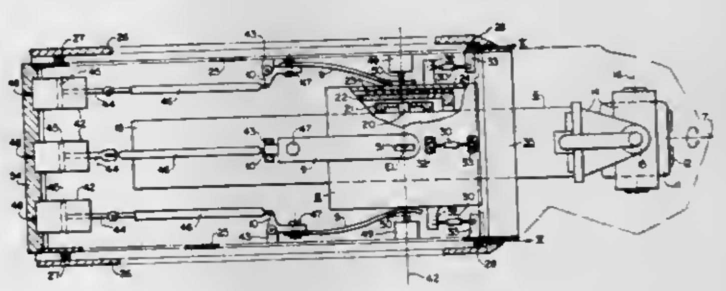
a continuous resilient member having an elongate body portion and a pair of spaced flanges extending outwardly from said body member, said flanges being located on said body member to receive therebetween a structural portion of a chair;

a first cushioning means defined in said body member, said first cushioning means including a hollow chamber defined in said body member to be located between said flanges in front of an edge of such structural portion;

a second cushioning means defined in said body member to be located between said flanges; and

said second cushioning means being positioned in said body member to be located between a chair structural portion edge and said first cushioning means.

4,106,740
AIRBORNE VIBRATION ISOLATED SENSOR APPARATUS
Wayne B. Lloyd, Baltimore, and Dale R. Logan, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 28, 1977, Ser. No. 782,278
Int. Cl.^{2} F16F *15/04*
U.S. Cl. 248—358 R **7 Claims**



1. Airborn vibration isolated sensor apparatus comprising:

an elongated hollow enclosure means for external mounting on an aircraft;

an elongated sensor assembly disposed substantially within said enclosure means with access to information arriving externally;

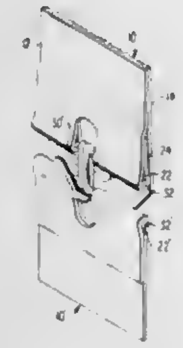
a plurality of elongated leaf springs extending longitudinally of said sensor assembly in distribution therearound;

said leaf springs being supported by said enclosure means

and supporting said sensor assembly by creation of yieldable flexural forces;
linkage means for introducing flexure to said leaf springs selectively; and
actuator means for operating said linkage means selectively.

4,106,741
TWO COMPONENT REMOVABLE ADHESIVE HANGER

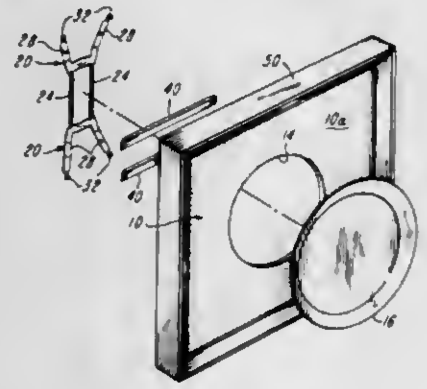
James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation of Tennessee, Goodletsville, Tenn.
Filed Nov. 8, 1976, Ser. No. 739,938
Int. Cl.² A47F *7/14*
U.S. Cl. 248—467 **16 Claims**



1. A two component removable adhesive hanger for hanging an object on a wall or like surface comprising:
(a) a hook member support component;
(b) a hook member supported by said hook member support component; and
(c) a backing sheet component of fibrous, water dissolvable material adhesively bonded to the hook member support component by a first adhesive, said backing sheet component having a water activated and water dissolvable second adhesive on the side which is affixed to the wall or like surface wherein the bonds created by said first and second adhesives are of greater strength than that of the fibrous material such that upon removal of said hook member support component from said backing sheet component, a portion of the backing sheet component remains attached to said hook member support component and a portion remains attached to said wall or like surface, which portion attached to said wall is dissolvable upon contact with water.

4,106,742
DECORATIVE PLATE MOUNTING ASSEMBLY

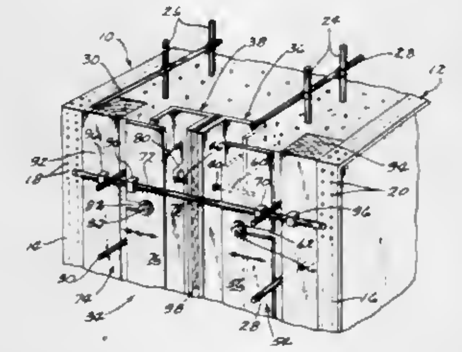
Emil E. Miller, and Stella Maye Miller, both of 1652 Brown St., Dayton, Ohio 45409
Filed Jan. 14, 1977, Ser. No. 759,391
Int. Cl.² A47G *1/24*
U.S. Cl. 248—488 **4 Claims**



1. A decorative plate and mounting assembly comprising a decorative plate having a front side and a rear side,
a panel having a front surface and a rear surface with an opening extending therethrough, the decorative plate being positioned adjacent the front surface of the panel and covering the opening with the front side of the plate facing away from the front surface of the panel,
a set of gripping members adjacent the rear side of the plate and having parts engaging the front side of the plate at spaced-apart edge portions thereof,
a resilient member connecting the gripping members and urging the gripping members one toward the other and into gripping relationship with the edge portions of the plate,
a rigid securing member extending across the opening adjacent the rear surface of the panel, and the rigid securing member also extending between the resilient member and the rear side of the plate and securing the resilient member and the gripping members and the plate to the panel.

4,106,743
ADJUSTABLE BULKHEAD FOR CONCRETE WALL FORMS

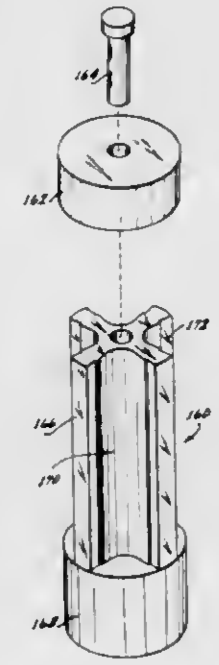
Dennis W. Deudinger, R.R. #1, Hartington, Nebr. 68739
Filed Oct. 27, 1977, Ser. No. 845,873
Int. Cl.² E04G *11/06*
U.S. Cl. 249—34 **6 Claims**



1. In combination,
first and second vertically disposed and horizontally spaced form members having end portions and inner and outer wall surfaces,
a plurality of reinforcing bars positioned between said form members including a plurality of first vertically spaced and horizontally disposed bars extending outwardly beyond the end portions of said form members, and a plurality of second vertically spaced and horizontally disposed bars extending outwardly beyond the end portions of said form members,
a plurality of vertically spaced tie bars secured to the end portions of said first and second form members and extending therebetween,
a first vertically disposed elongated member positioned at the inner wall surface of said first form member adjacent the end portion thereof,
a second vertically disposed elongated member positioned at the inner wall surface of said second form member adjacent the end portion thereof,
connection means securing said first and second elongated members to said tie bars,
first and second vertically disposed angle members mounted on said tie bars adjacent said first and second elongated members respectively,
first and second vertically disposed channel members secured to said first and second angle members,
second connection means horizontally adjustably securing together said first channel member and said first angle member,
third connection means horizontally adjustably securing together said second channel member and said second angle member,
said second and third connection means permitting relative horizontal movement between said first and second channel members and said first and second angle members respectively to provide an adjustable bulkhead for concrete placed between said form members,
said first reinforcing bars extending outwardly beyond said first form member between said first elongated member and said first angle member,
said second reinforcing bars extending outwardly beyond said second form member between said second elongated member and said second angle member.

4,106,744
MANDREL FOR FORMATION OF MASS SPECTROMETER FILTER

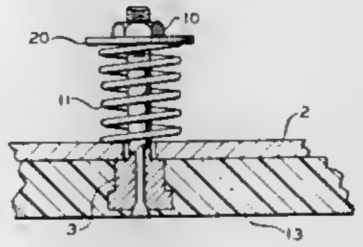
James L. Lawrence, Jr.; Robert A. Holzl, both of La Canada, and Frederick P. Pickett, Sierra Madre, all of Calif., assignors to Analog Technology Corporation, Irwindale, Calif.
Division of Ser. No. 612,551, Sep. 11, 1975, abandoned, which is a continuation of Ser. No. 768,174, Feb. 14, 1977. This application Feb. 14, 1977, Ser. No. 768,172
Int. Cl.² B29C *1/00*
U.S. Cl. 249—96 **13 Claims**



1. A male mandrel for use in forming a mass filter for use in a mass spectrometer, comprising:
(a) a cylindrical portion extended along a common axis, having constant cross section, and having axially-extending electrode-defining surfaces which comprise the surfaces of a plurality of axially extending valley regions in said cylindrical portion, each valley region, including both its bottom and its sides, being outwardly concave and arcuate over the greater portion of its surface; terminated at its first end by an integral end surface perpendicular to the common axis;
(b) a shank portion integral with said cylindrical portion having plane surfaces disposed perpendicular to the common axis for terminating said cylindrical portion at the end opposite its first end;
(c) an end piece, having a plane surface large enough to cover the entire end surface of said cylindrical portion, for mounting on said cylindrical portion with its plane surface held tightly against the end surface of said cylindrical portion.
(d) means for positioning the said end piece in contact with the first end of said cylindrical portion.

4,106,745
APPARATUS FOR ATTACHING AN INSERT IN A MOLD

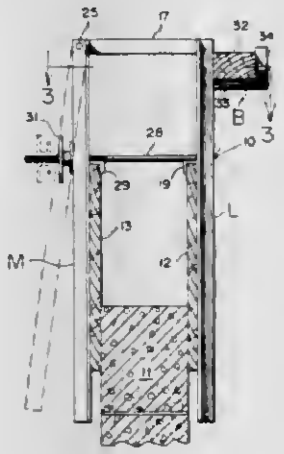
Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation-in-part of Ser. No. 357,662, May 7, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,090
Int. Cl.² B22D *19/00*
U.S. Cl. 249—97 **3 Claims**



1. An apparatus for molding an object that is to have an insert embedded therein comprising an insert, a mold having a hole in the mold wall where said insert is to be positioned, an extension of said insert extending through said hole to the exterior of the mold when said insert is in its proper position within the mold, a spring means attached to the part of said extension which extends outside the mold wall such that said insert is spring biasly held in its correct position within the mold, said hole in said mold wall being of sufficient size with respect to the portion of said extension extending through said hole in said mold wall to allow the insert to have sufficient freedom of movement to move laterally as well as axially in response to shifting or contracting of the molded object which will occur during cooling of the molded object, and wherein said insert is smaller than the hole in the mold wall and at least a portion of said insert is prevented from passing through the mold wall by a washer-like means located between the insert and the interior of the mold.

4,106,746
ADJUSTABLE FORM CLAMP

Umberto A. Baculo, 231 NW. 59th Ct., Miami, Fla. 33126
Filed May 19, 1977, Ser. No. 798,633
Int. Cl.² E04G *17/12*
U.S. Cl. 249—216 **1 Claim**



1. An adjustable beam clamp comprising a pair of elongated leg members in spaced and substantially parallel relation to each other, a cross member secured at one end to the upper end portion of one of said elongated leg members and extending in the direction of the other of said elongated leg members, pivot means mounting the other end of said cross member to the upper end portion of said other of said elongated leg members, an angle bar secured to an inner surface of said one of said elongated leg members, said angle bar having leg portions extending horizontally and downwardly for receiving the top

edge of a board forming one side of a concrete form, a threaded rod secured to said angle bar at one end and its threaded end extending beyond said other of said elongated leg members, nut means threadedly mounted on said threaded rod adapted to engage and cause said other of said elongated leg members to pivot about said pivot means, a second angle bar secured to the lower surface of said threaded rod, said second angle bar having leg portions extending horizontally and downwardly for receiving the top edge of a board forming the other side of said concrete form and bracket means mounted on said upper portion of said one of said elongated leg members and extending in a direction away from said other of said elongated leg members.

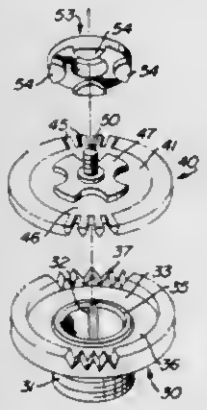
4,106,747
VALVE CONSTRUCTION

Joseph J. Malacheski, 28 E. Division St., and Edward A. Stelmack, 199 Willow St., both of Wilkes-Barre, Pa. 18702

Filed Dec. 16, 1976, Ser. No. 751,070

Int. Cl.² F16K *25/00*

U.S. Cl. 251—84 **8 Claims**



1. A valve construction comprising a seat, a stem having one end facing toward said seat, threaded stem mounting means mounting said stem for simultaneous axial spiral rotation and longitudinal shifting toward and away from said seat, a washer at said one end of said stem, washer mounting means mounting said washer for shifting movement with said stem toward and away from bearing engagement with said seat and rotation relative to said stem, and separable interfitting formations on said seat and washer movable into and out of engagement with each other upon washer movement toward and away from said seat for holding said washer against rotation upon washer movement into said bearing engagement, said interfitting formations comprising an annular array of teeth on each of said seat and washer, said teeth of said seat and washer respectively tapering in the directions toward said washer and seat to assure meshing engagement therebetween.

4,106,748
VALVE WITH TWO VALVE PLATES

Yasukazu Niino, Kitakyushu, and Takuya Nagai, Nogata, both of Japan, assignors to Nishinippon Engineering Co., Ltd., Fukuoka, Japan

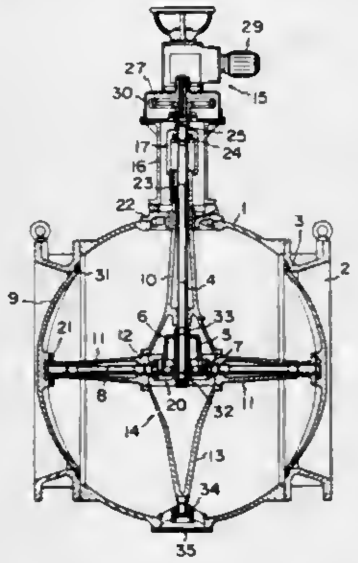
Filed Sep. 28, 1976, Ser. No. 727,499

Claims priority, application Japan, Aug. 25, 1976, 51-114218[U]; Aug. 25, 1976, 51-114219[U]

Int. Cl.² F16K *31/02*

U.S. Cl. 251—133 **12 Claims**

1. A valve with a pair of valve plates comprising a valve casing having two communicating ports, a pair of valve plates disposed in said valve casing for closing said communicating ports, a valve shaft mounted on said valve casing, a valve-shaft actuating mechanism mounted on said valve casing for operating said valve shaft, and a valve-plate acutating mechanism operably connected between said valve shaft and said valve plates for transforming the movement of said valve shaft to the movement of said valve plates such that the latter are pivotably movable about the axis of said valve shaft and displaceable along an axis perpendicular to the axis of said valve shaft, said valve-plate actuating mechanism comprising a shifter casing, said shifter casing having a first portion disposed generally coaxial with the axis of said valve shaft and a second portion disposed generally perpendicular to the axis of said valve shaft, and operable means disposed within said shifter casing operably connecting said valve shaft and said valve plates, said valve shaft actuating mechanism comprising a sleeve rotatably disposed about said valve shaft, said first portion of said shifter casing being disposed about said valve shaft, said sleeve engaging said upper portion of said shifter casing to preclude relative rotation therebetween while permitting relative axial displacement therebetween.



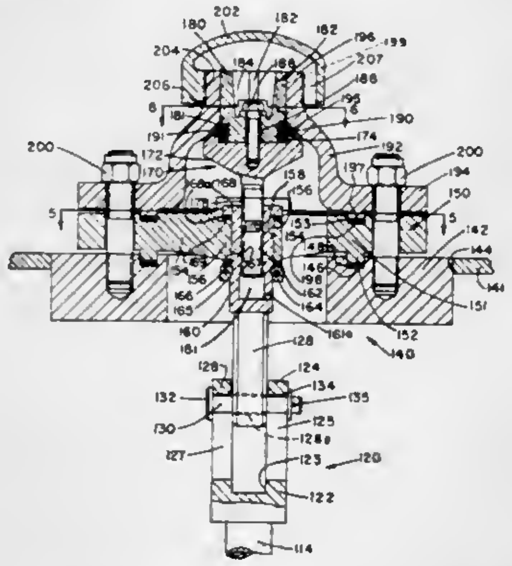
4,106,749
BOTTOM OPERABLE AIR INLET AND OUTLET VALVE ASSEMBLY

Gunter R. Behle, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 757,121

Int. Cl.² F16K *51/00*

U.S. Cl. 251—144 **17 Claims**



1. An air inlet and oulet valve assembly for a railway tank car comprising:

a valve member mounted within an opening in the top of a railway tank car; an operating shaft extending from the bottom of the car, through the tank to the top of the tank to operate the valve; said operating shaft including shaft rotating means located at the bottom of the tank to raise and lower said valve member; and shaft telescoping means comprising at least one fork; said fork including a pair of vertically extending arms each having a vertical slot therein such that the upper part of the operating shaft is movable vertically within said slots relative to the lower portion of the shaft, as the top of the tank moves relative to the bottom of the tank; whereby when the car is impacted and the top of the tank moves downwardly relative to the bottom of the tank the upper portion of the operating shaft will move downwardly within said slots, and the valve will remain closed during such impacts; and whereby said valve member may be opened and closed from the bottom of the car by means of said shaft rotating means and said operating shaft.

4,106,750
SAFETY VALVE FOR PNEUMATIC TOOLS

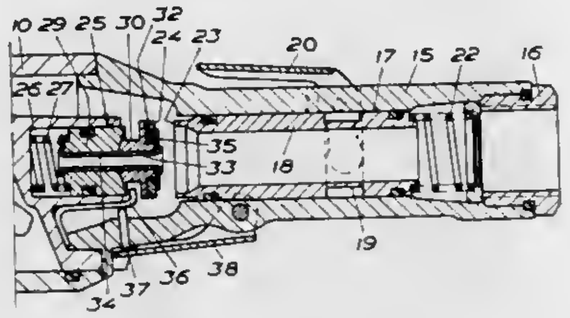
Karl Gösta Kårdēn, and Karl Gustav Berger, both of Nacka, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 2, 1976, Ser. No. 738,279

Claims priority, application Sweden, Nov. 6, 1975, 7512433

Int. Cl.² F16K *39/00*

U.S. Cl. 251—282 **18 Claims**



1. A safety valve for pneumatic tools, comprising:

a first movable valve member (18) manually shiftable between a closed position and an opened position;

a second movable valve member (25) movable relative to and selectively sealingly cooperating with said first valve member (18) to selectively open and close a pressure line;

a spring (27) loading said second valve member (25) in the opening direction of said first valve member (18), so as to maintain said sealing cooperation as said first valve member (18) is shifted toward its opened position; and

manually operable arresting means (36,37,38) coupled to said second valve member (25) to selectively lock said second valve member (25) against movement and thereby discontinue said sealing cooperation as said first valve member (18) is shifted toward its opened position, said second valve member (25) being freely movable with said first valve member (18) while maintaining said sealing cooperation when not engaged by said arresting means.

4,106,751
ROTATABLE VALVE ASSEMBLY

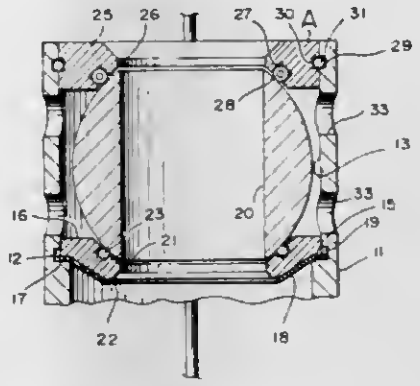
Shale J. Niskin, 2941 Lucaya, Miami, Fla. 33133

Continuation-in-part of Ser. No. 788,588, Apr. 18, 1977, Pat. No. 4,091,676, which is a continuation-in-part of Ser. No. 691,905, Jun. 1, 1976, Pat. No. 4,037,477. This application Aug. 15, 1977, Ser. No. 824,784

Int. Cl.² F16K *5/00*

U.S. Cl. 251—316 **4 Claims**

1. A rotatable valve assembly comprising a tubular member having a valve chamber, a ball valve having a axially disposed passageway mounted in said chamber for controlling the flow of fluid therethrough, a ledge portion mounted about said tubular member at said valve chamber, said tubular member having a peripheral groove at said ledge portion, a floating valve seat positioned in proximity of said ball valve, said valve seat being slidably mounted in said valve chamber and having a peripheral shoulder member adapted to rest on said ledge portion, a flexible diaphragm engaging said floating valve seat and having an outer edge portion interposed between said ledge portion and said peripheral shoulder, a seal mounted in said groove and securing said outer edge portion of said flexible diaphragm in said peripheral groove, a fixed valve seat mounted in said valve chamber and engaging said ball valve on a side opposite that of said floating valve seat, both of said valve seats having seals engaging said ball valve with said flexible diaphragm and said valve seats having openings in alignment with said passageway in said ball valve.



4,106,752
JACK FOR STRESSING CONCRETE RE-INFORCEMENT ELEMENTS

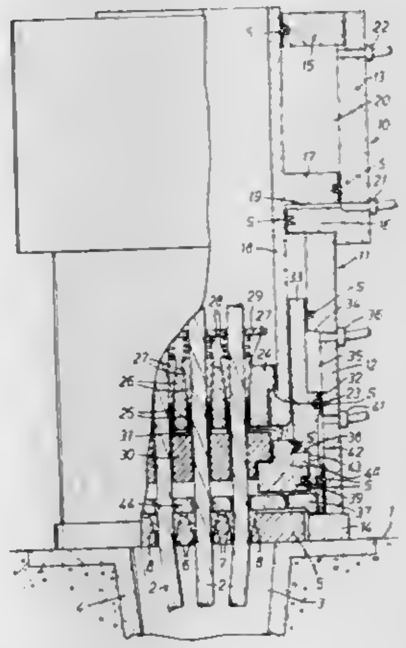
Eduardo Caro Roqueta, Barcelona, Spain, assignor to Buildinter AG, Vaduz, Liechtenstein

Filed Dec. 6, 1976, Ser. No. 748,069

Claims priority, application United Kingdom, May 4, 1976, 18269/76; Nov. 1, 1976, 45317/76

Int. Cl.² E21B *19/00*

U.S. Cl. 254—29 A **9 Claims**



1. A hydraulic jack for stressing simultaneously a plurality of concrete reinforcement elements and for anchoring the stressed elements in an anchoring member which has apertures for the elements and anchoring wedges seating in the apertures, the jack comprising

a. a body having a front end adapted to abut on a support member during a stressing operation,

b. gripping means for gripping the elements for stressing the elements, movable longitudinally of the body towards and away from the front end,

c. lock-off means actuable to cause the anchoring wedges to anchor the stressed elements in the anchoring member,

d. a first hydraulically driven member movable by means of hydraulic fluid longitudinally of the body and operatively connected to said gripping means to cause rearward movement thereof relative to the body thereby to stress the elements simultaneously,

e. a second hydraulically driven member movable by means of hydraulic fluid longitudinally of the body and relative to said first hydraulically driven member, and arranged to actuate said lock-off means,

f. a third hydraulically driven member movable by means of hydraulic fluid longitudinally of the body and relative to said first and second hydraulically driven members, and arranged to cause forward movement of the anchoring member relative to the body without actuation of the lock-off means, whereby the anchoring member can move rearwardly with the elements over at least part of the stressing distance as they elongate when being stressed, and the anchoring member can thereafter be moved forwardly along the elements by the third hydraulically driven member before the second hydraulically driven member is operated to actuate the lock-off means.

4,106,753

AUTOMATIC ANTI-FALL DEVICE FOR POWER-DRIVEN LIFTING MACHINERY

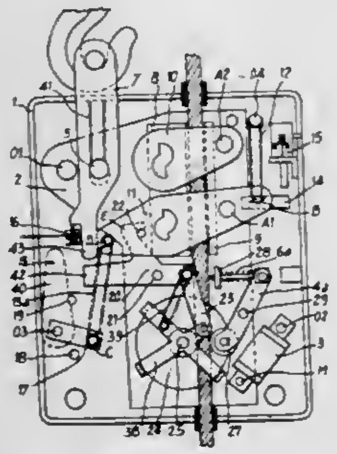
Michel Cavalieri, and Francois Batrêau, both of Neuilly sur Marne, France, assignors to Europe-Levage Manutention (Elma), Bagnolet, France

Filed Jul. 26, 1976, Ser. No. 708,820

Claims priority, application France, Jul. 30, 1975, 75 23722; Dec. 24, 1975, 75 39657

Int. Cl.^{2} B66D *5/04*

U.S. Cl. 254—157 **3 Claims**



1. An automatic anti-fall device, for use on a motor-driven lifting machine having a bearer cable for attachment of a load to be lifted, said device comprising
(i) a carrier structure having means for attachment of the load
(ii) a first pivot means on said carrier structure
(iii) a bearer member mounted on said first pivot means for movement in a vertical plane
(iv) connecting means for connecting said bearer member to the bearer cable
(v) a cable clamping assembly including (a) clamping means (b) control means for the clamping assembly pivotably mounted on said bearer member for movement in a vertical plane, and (c) means resiliently urging the clamping means into clamping condition,
(vi) an auxiliary safety cable positioned vertically between said clamping means
(vii) a lever pivotably mounted on said carrier structure for movement in a vertical plane,
(viii) coupling means coupling said lever to said connecting means,
(ix) resilient linking means connecting said lever to said clamping control means for holding said clamping means open when load is applied to the carrier structure,
(x) a first control for the motor of the lifting machine, said control being mounted on the carrier structure, said control being positioned in relation to said bearer member such that, upon occurrence of a predetermined extent of vertical pivoting movement of said bearer member under excessive load as well as when the load is transferred to the auxiliary safety cable, said bearer member actuates said first control to stop the motor,
(xi) resilient means connected to said carrier structure and to said bearer member and opposing vertical pivoting movement of said bearer member,
(xii) a second control for the motor of the lifting machine, said control being mounted on the carrier structure and being positioned in relation to an end portion of said connecting means such that, if the load decreases under a predetermined value, said connecting means actuates said second control to stop the motor, and
(xiii) a control lever pivoted to said carrier structure and adapted to engage said control means to urge them into a position closing said clamping means on the auxiliary cable against the action of said resilient linking means.

4,106,754

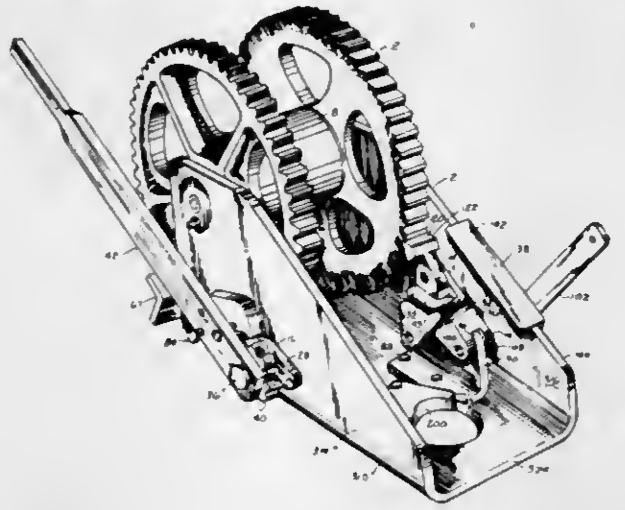
CABLE HAULING WINCH

Robert C. Kucber, 5200 Airport Way South, Seattle, Wash. 98108

Continuation-in-part of Ser. No. 349,540, Apr. 9, 1973, abandoned, and a continuation-in-part of Ser. No. 349,564, Apr. 9, 1973, abandoned. This application Nov. 15, 1976, Ser. No. 741,995

Int. Cl.^{2} B66D *1/00*

U.S. Cl. 254—186 HC **26 Claims**



3. A winch for receiving a line, said winch comprising:
a. a frame comprising a first support and a second support;
b. said first support and said second support being spaced apart;
c. a drum around which said line may be wound;
d. said drum being positioned between said first support and said second support;
e. a first means for rotating said drum for winding said line onto said drum;
f. a drum gear on said drum and connecting with said first means comprising said drum;
g. said first means comprising a drive pinion operatively connecting with said drum gear;
h. a second means for rotating said drive pinion for rotating said drum gear and said drum;
i. said drum gear being mounted on said drum and defining a barrier for said line to position said line on said drum;
j. said drum having a hub;
k. a means cooperating with said hub to firmly position said line;
l. said means comprising a rotating pawl having an end juxtapositioned to said hub;
m. the spacing between said hub and said rotating pawl being sufficient to receive said line;
n. said hub being recessed to receive said line;

o. said rotating pawl having a curved recessed end juxtapositioned to said hub; and,
p. laid line upon being positioned between said hub and said curved recessed end and under tension rotating said rotating pawl to clamp said line in position.

4. A winch for receiving a line, said winch comprising:
a. drum for receiving said line;
b. a frame having a base;
c. a passageway in said base;
d. a stand having a base for attaching to a support structure such as a deck;
e. said stand comprising a riser;
f. the interior dimensions of said passageway being greater than the exterior dimensions of said riser so that said frame may pass over said riser to be free to move along said riser and to rotate around said riser;
g. a cap on top of said riser;
h. said cap being of a, generally, elliptical configuration having a major axis of a greater dimenson than the dimension of said riser; and,
i. said passageway being of a, generally, elliptical configuration and having dimensions greater than the
dimensions of said cap so that said frame may pass over said cap.

4,106,755

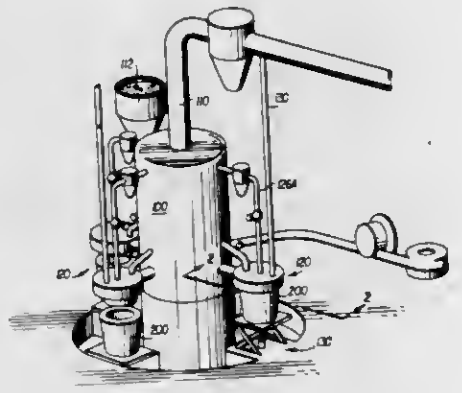
FLUIDIZED BED LADLE HEATING METHOD AND APPARATUS

William C. Dell, 1211 Conn. Ave., N.W., Washington, D.C. 20036

Continuation-in-part of Ser. No. 799,238, May 23, 1977. This application Jun. 23, 1977, Ser. No. 809,363

Int. Cl.^{2} C21D *1/00*

U.S. Cl. 266—44 **14 Claims**



1. The method of high temperature heat treatment of foundry ladles comprising the steps of:
A. forming a mother fluidized bed of refractory particles capable of containing and sustaining high temperatures;
B. periodically entraining and firing a solid fuel within the mother fluidized bed to raise and sustain the temperature thereof to 1500° - 2000° F.; and
C. sequentially conducting hot refractory particles and hot gasses from the mother fluidized bed to at least one ladle to form a secondary fluidized bed within said ladle raising the temperature of the ladle to the temperature range of the mother fluidized bed, while maintaining a steady state within both said beds.

4,106,756

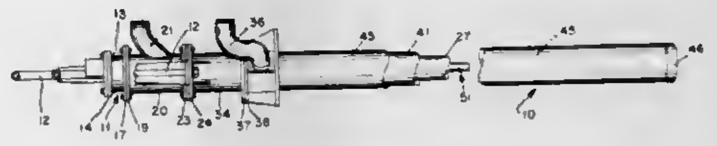
OXYGEN LANCE AND SENSING ADAPTER ARRANGEMENT

Nicholas M. Rymarchyk, Pittsburgh, and Leo L. Meinert, Baden, both of Pa., assignors to Pullman Berry Company, Harmony, Pa.

Filed Nov. 1, 1976, Ser. No. 737,637

Int. Cl.^{2} C21C *7/00, 5/32*

U.S. Cl. 266—99 **4 Claims**



1. A gas injection lance for insertion into a vessel for processing molten metal comprising:
a nozzle head at one end adapted to be positioned proximate to the molten metal,
a plurality of concentric gas and coolant-carrying tubes at least the innermost gas-carrying tube of which is connected to the nozzle head in communication with said nozzle head for discharging gas therethrough,
a sensor-mounting support positioned within said gas-carrying tube,
a sensor mounted at one end of the sensor-mounting support proximate to and out of contact with said nozzle head and in axially spaced relation thereto and defining a gas-fillable thermal buffer zone chamber therewith,
said nozzle head serving as a primary heat shield between the molten metal and said sensor,
said buffer zone chamber, adapted for gasses therein being the sole body between the sensor and head and providing a supplemental dynamic heat shield between said nozzle head and said sensor,
said nozzle providing a constricted unobstructed passage for draining a pressurized reservoir of gasses from said buffer zone chamber, and said chamber providing a gas-enveloping replenishable heat barrier about said sensor,
and means removably mounting said sensor on the support including a sleeve portion and a mounting block fixed within the sleeve portion mounted on the end of said support,
a housing having an annular flange seated against said block, and means securing said flange to said block.

4,106,757

HOVER FURNACES

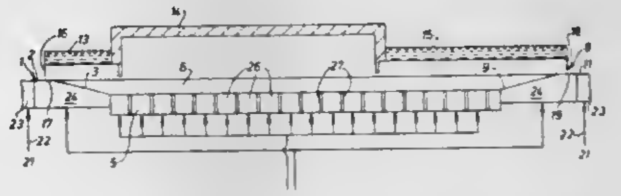
George Jackson, Sheffield, England, assignor to British Steel Corporation, London, England

Filed Feb. 4, 1977, Ser. No. 765,767

Claims priority, application United Kingdom, Feb. 17, 1976, 6188/76

Int. Cl.^{2} C21D *9/54*

U.S. Cl. 266—103 **9 Claims**



1. A furnace for continuously heat treating metallic strip comprising an entry table including a leading portion having a substantially plane upper surface and a trailing portion which inclines downwardly towards the base of a floatation trough, the trough extending along substantially the full length of the heating zone of the furnace and including upwardly and outwardly inclined side walls, the furnace also comprising flow restricting means located above the upper surface of the lead-

ing portion of the entry table to define with the table surface a shallow slot sufficient to enable strip to enter the furnace.

4,106,758
CONVERTERS FOR REFINING METALS

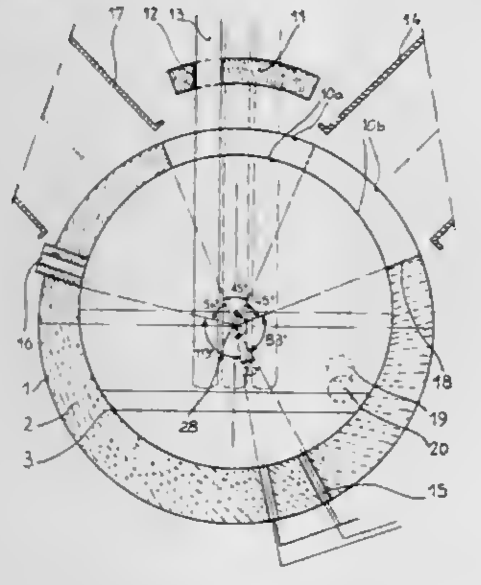
Pierre Leroy, Saint-Germain-en-Laye; André Maubon, and Jean Saleil, both of Saint-Etienne, all of France, assignors to Creusot-Loire Enterprises, Paris, France

Filed Jun. 10, 1977, Ser. No. 805,606

Claims priority, application France, Jun. 16, 1976, 76 18252

Int. Cl.^{2} C21C *5/38*

U.S. Cl. 266—158 **16 Claims**



1. A converter for the refinement of liquid metal comprising:

a generally cylindrical hollow body having a horizontal axis and opening means in the circumference thereof including first and second circumferentially spaced parts;

end members closing the ends of said body;

means for supporting and rotating said body about said axis;

a refractory arch including heating means;

means for removing said arch into said first part of said opening means when said opening means is in the upper part of said body, said heating means then extending into said body;

first means for collection of gases from said body, said first gas collection means being separate from said body and mounted to be aligned with said second part of said opening means to receive gases therethrough when said first part of said opening means is positioned to receive said arch and heating means;

blast pipe means extending through and into said body, said blast pipe means being arranged in a lower part of said body when said first part of said opening means is positioned to receive said arch and heating means; and second means for collection of gases from said body, said second gas collection means being separate from said body, said first and said second gas collection means being arranged symmetrically with respect to said arch such that on rotation of said body to position said arch in said second part of said opening means said second gas collection means is aligned with said first part of said opening means, said blast pipe means being then arranged in an emerged position above or at the surface of the bath of metal in the converter body.

4,106,759
DEVICE AND METHOD FOR THE INTRODUCTION OF GASES INTO REACTION VESSELS CONTAINING LIQUIDS

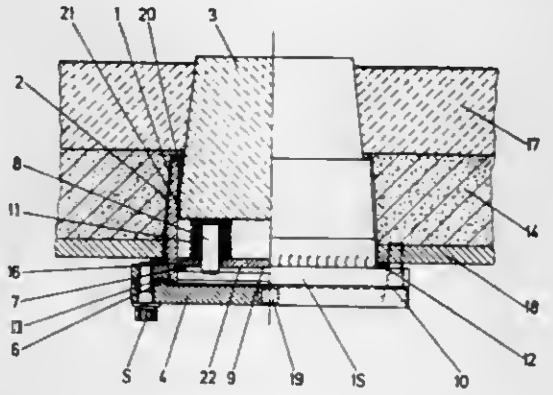
Alfred Steinegger, Venthône, and Ernst Huber, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 1, 1977, Ser. No. 802,527

Claims priority, application Switzerland, Jun. 1, 1976, 6835/76

Int. Cl.^{2} C21C *5/48*

U.S. Cl. 266—220 **19 Claims**



1. A device for the introduction of gas, in combination comprising:

a walled reaction vessel adapted to contain liquids, such as metal melts, the vessel being exposed to thermal stresses,

a sleeve secured to the wall of the reaction vessel,

a gas-permeable inlet body of heat-resistant material fitting into said sleeve, the wall of the reaction vessel including a rigid inner layer of heat-resistant material, a loose intermediate layer of bulk material, and a casing, said sleeve extending from the exterior of said vessel into said casing, said rigid inner layer and said gas-permeable inlet body being disposed directly adjacent to one another, and

a substantially air-tight shell of ceramic material secured to a side surface of said inlet body.

4,106,760
APPARATUS FOR REPAIRING THE FURNACE LINING WITH A SPRAY PIPE OF NON-CIRCULAR HOLLOW CROSS SECTION

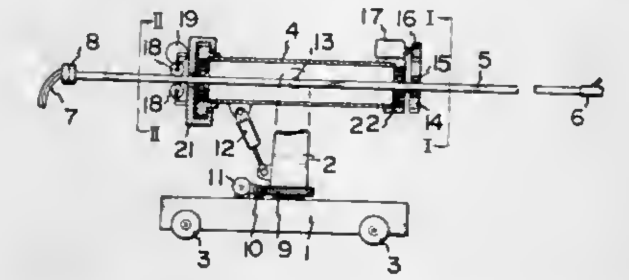
Hiroshi Kono; Sueki Kubo, and Tadahiko Matsuno, all of Kitayushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Filed Dec. 15, 1976, Ser. No. 750,778

Claims priority, application Japan, Dec. 25, 1975, 50-158436

Int. Cl.^{2} B05C *7/02*

U.S. Cl. 266—281 **19 Claims**



1. In a apparatus for repairing the lining of a furnace with a refractory material comprising a hollow spray pipe having a uniform thickness and being defined by integral inner and outer pipe walls, said inner wall defining an unobstructed internal passageway, said refractory material contacting said inner pipe wall in passing exclusively and directly through said passageway, a rocking sleeve in which said shooting pipe is slidably disposed, a support column pivotally mounting said rocking sleeve, a sliding mechanism directly engaging said outer wall of said spray pipe for sliding said spray pipe relative to said rocking sleeve, and a rotating mechanism for rotating said sliding means about the axis of said spray pipe, said outer wall and said inner wall of said spray pipe having non-circular cross sections such that engagement of said spray pipe by said sliding mechanism precludes rotation of said shooting pipe relative to said sliding mechanism so that rotation of said sliding mechanism also rotates said spray pipe, whereby said spray pipe is manipulated without weakening the rigidity or strength thereof.

4,106,761
ELEVATED SUPPORT ANGULARLY ADJUSTABLE ON A SPHERICAL JOINT HEAD AND SAME BEARING A VISE

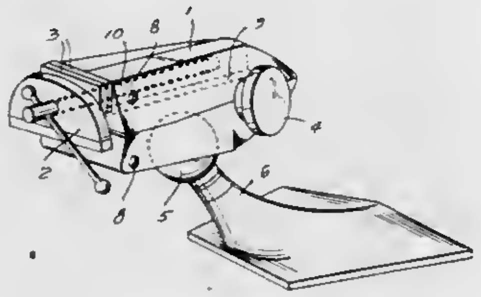
Carlos Morales Peregrina, Calle Floresta No. 131, Mexico 16 D.F., Mexico

Filed Feb. 18, 1976, Ser. No. 659,036

Claims priority, application Mexico, Feb. 20, 1975, 156694

Int. Cl.^{2} B23Q *3/04*

U.S. Cl. 269—75 **6 Claims**



1. A vise arranged on an elevated support adapted to be capable to be brought in different angular positions and fixed therein and movable into these positions on, and carried by, a universal linking joint head elevated over a substrate base, comprising an elongate parallelopipedic bulky body composed of a pair of mating mirror-like configured halves coupled to one another at one end thereof by at least one hinging bolt, each of said halves of said bulky body forming within its lower part one half of a unitary cavity for receipt of said linking joint head formed on top of a support leg-like rod projecting upwardly from said substrate plate, said cavity being configured to mate with, and surround, said joint head, wherein said bulky body, on the side distal from that of coupling of said halves by at least one hinging bolt, comprises a tightening bolt passing through said halves and being operable from outside to either loosen or tighten the engagement between said pair of halves and thereby also between the wall of said cavity and said linking joint head for enabling, respectively, angular motions of said bulky body and its securing in a desired angular position, said support being provided on its upper side with the assembly of a vise comprising one jaw fixed to said bulky body and the other jaw unitary with an elongate holder located on, and shiftable along, rail members extending longitudinally of said bulky body, said holder and both said jaws being provided with female threads, while a matingly threaded screw bolt operable from outside passes through said jaws and said holder to enable mutual distancing and approaching of said jaws.

4,106,762
HIGH SPEED INSERT HANDLING MECHANISM AND METHOD

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Filed May 21, 1976, Ser. No. 688,538

Int. Cl.^{2} B65H *39/02*

U.S. Cl. 270—54 **4 Claims**

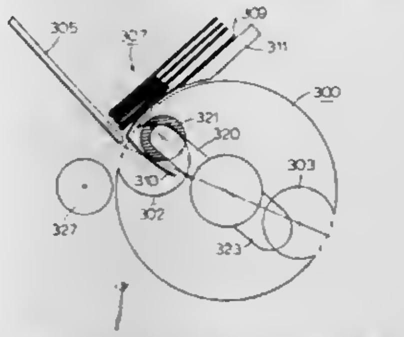
1. A high speed feeder for individually discharging products, having a long panel portion and a short panel portion folded thereover along a front edge with an extending end and the short panel portion being no longer than ⅓ of the long panel portion, from a source of supply comprising, in combination;

means for unfolding said products at said source;

means for individually accelerating the so unfolded products for feeding;

means forming a pathway for said products between the source and the means for accelerating;

said means for accelerating comprising at least one high speed roller and a high speed rotary drum; said means for unfolding including means located within the rotary drum for engaging the short panel portion;



said high speed roller being mounted adjacent said drum to form a nip therewith for engaging the end of said short portion for accelerating the product thereof away from said source along said pathway;

and, said nip being spaced a distance from the source of supply relative to the length of said short panel portion to permit the drum and roller to grip and pull said product out of the way of the next following product.

4,106,763
CASSETTE TYPE SHEET FEED APPARATUS FOR COPYING MACHINE OR THE LIKE

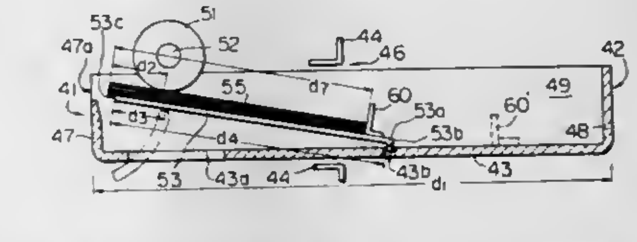
Tatsuo Tani, and Toshiaki Kameyama, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,284

Claims priority, application Japan, Nov. 11, 1975, 50-135298

Int. Cl.^{2} B65H *1/12, 1/23, 3/44*

U.S. Cl. 271—9 **14 Claims**



11. A cassette type sheet feed apparatus comprising:

a first sheet cassette including a bottom wall formed with a hole therethrough, a front wall and a rear wall spaced from the front wall of the first cassette by a first predetermined distance;

a feed roller rotatably supportable above the cassette and spaced from the front wall of the first cassette by a second predetermined distance which is shorter than the first predetermined distance;

an actuator intrudable into the first cassette through the hole thereof at a third predetermined distance from the front wall of the first cassette which is shorter than the first predetermined distance;

a first sheet supporting plate supported on the bottom wall of the first cassette, the first plate having a front edge substantially in alignment with the front wall of the first cassette and a rear edge spaced from the front edge of the first plate by a fourth predetermined distance which is longer than the third predetermined distance and shorter than the first predetermined distance, the rear edge of the first plate being tiltably connected to the bottom wall of the first cassette, the first plate having a first predetermined width and being adapted to support a stack of identical first sheets of substantially the first predetermined width and a length which is substantially at least equal to the fourth predetermined distance and less than the first predetermined distance, the actuator being engageable with the first plate to tilt the first plate toward the feed roller so that the first sheets feedably engage with the feed roller, the fourth predetermined distance being selected so that, with the first plate supporting the first sheets, a force exerted on the actuator by the first plate as the actuator engages the first plate is equal to a predetermined value;

a second sheet cassette including a bottom wall formed with a hole therethrough, a front wall and a rear wall spaced from the front wall of the second cassette by a fifth predetermined distance;

the first cassette being replaceable by the second cassette so that the feed roller is rotatably supportable above the second cassette and spaced from the front wall of the second cassette by the second predetermined distance and the actuator is intrudable into the second cassette through the hole thereof at the third predetermined distance from the front wall of the second cassette; and

a second sheet supporting plate supported on the bottom wall of the second cassette, the second plate having a front edge substantially in alignment with the front wall of the second cassette and a rear edge spaced from the front edge of the second plate by a sixth predetermined distance which is longer than the third predetermined distance and shorter than the fifth predetermined distance, the rear edge of the second plate being tiltably connected to the bottom wall of the second cassette, the second plate having a second predetermined width different from the first predetermined width and being adapted to support a stack of identical second sheets of substantially the second predetermined width and a length which is substantially at least equal to the sixth predetermined distance and less than the fifth predetermined distance, the actuator being engageable with the second plate to tilt the second plate toward the feed roller so that the second sheets feedably engage with the feed roller, the relative magnitude of the sixth and fourth predetermined distances being dependent on the relative magnitude of the second and first predetermined widths so that, with the second plate supporting the second sheets, a force exerted on the actuator by the second plate as the actuator engages the second plate is equal to said predetermined value.

4,106,764
CARDBOARD-FEEDING DEVICE

Takeo Tamura, Tokyo, Japan, assignor to Tanabe Shiko Kikai Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,971

Claims priority, application Japan, Jun. 17, 1976, 51-71817

Int. Cl.² B65H ***3/04***

U.S. Cl. 271—35 **8 Claims**

1. A device for feeding flat sheets of relatively stiff material which can have warps therein, comprising:

a. a frictional conveyor belt driven in a direction for feeding the sheets;

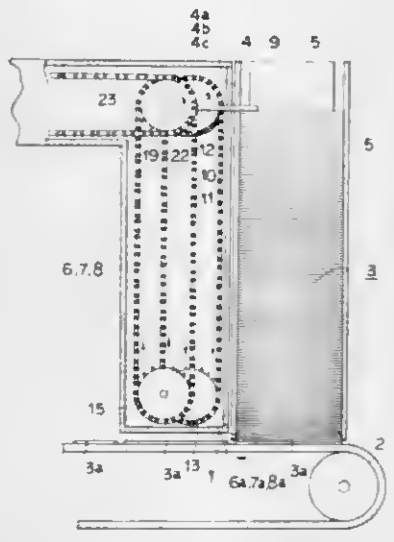
b. a control plate mounted above said frictional conveyor belt and spaced therefrom a distance sufficient to permit passage of only one sheet at a time beneath said control plate and against which a stack of sheets is held, said plate having at least one opening extending vertically therein;

c. a positioning means mounted above the level of said conveyor and spaced from said control plate in the direction opposite the direction of movement of said conveyor for engaging the side of said stack of sheets opposite to the side engaging said control plate;

d. at least one pair of endless movable loops located on the other side of said control plate from said positioning means and at different distances therefrom and each having a vertical run adjacent and parallel to said control plate;

e. a pair of sets of wheels around which said pair of endless loops extend and for moving said endless loops at a constant speed and in a direction for moving the vertical runs downwardly along said control plate;

f. a cardboard holding piece mounted in a horizontal position between said loops and having a tip projecting through said opening in said control plate and said holding piece being movable with said loops while remaining horizontal;



g. a drive shaft for supplying torque to said sets of wheels; and

h. slippable power transmission means between said sets of wheels and said drive shaft.

4,106,765
SHEET FEEDING APPARATUS

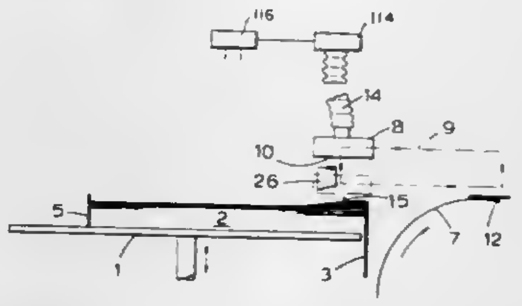
Ronald Howard Britt, Hassocks, England; Jan De Bruin, Bilthoven, Netherlands, and David Gordon Boulter, Wivelsfield Green, England, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 584,154, Jun. 5, 1975. This application Jun. 9, 1976, Ser. No. 694,150

Claims priority, application United Kingdom, Jun. 13, 1974, 26259/74

Int. Cl.² B65H ***3/40***

U.S. Cl. 271—93 **8 Claims**



1. An apparatus for feeding a sheet of material from the top of a stack of such sheets, comprising:

first suction means for pulling a corner portion of a top sheet of a stack upwards;

means for mounting said first suction means for movement between a lower position in which said suction means is disposed to suck against a portion of the top sheet at a location a given distance from the corner of the sheet, and an upper position;

means for determining when the top of the stack of sheets has fallen below a predetermined level, said determining means comprising a rigid member extending horizontally over said corner portion of the stack between said location and said corner; and actuator means for moving said member upwards to a predetermined raised position, and downwards to contact the top sheet;

means operable while said rigid member is in the raised position for moving said first suction means from said lower position to said upper position so as to pull a corner portion of the top sheet from beneath said rigid member and bringing said sheet to a position above said rigid member; and

second suction means for transferring the top sheet away from the stack.

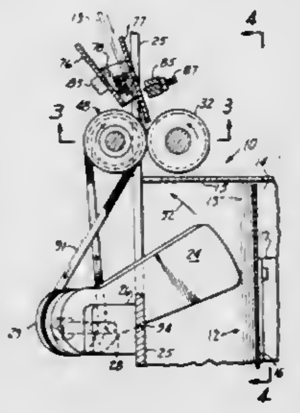
4,106,766
SHEET HANDLING AND STACKING METHODS AND APPARATUS

Rafn Stefansson, San Marino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 8, 1976, Ser. No. 748,624

Int. Cl.² B65H ***29/44, 31/06***

U.S. Cl. 271—181 **9 Claims**



1. Apparatus for handling sheets, comprising in combination:

means for driving said sheets seriatim from a first region to a second region, including drive roller means for engaging each sheet, and means connected to said drive roller means for rotating said drive roller means to propel each engaged sheet to said second region;

slidable means in said second region for receiving said propelled sheets;

means operatively associated with said slidable means for incrementally actuating said slidable means;

secondary roller means disengaged from said drive roller means;

means for positioning the secondary roller means for engagement and rotation by each sheet engaging said drive roller means; and

means connected to said secondary roller means and said actuating means for transmitting operating power from said rotating secondary roller means to said actuating means.

4,106,767
CONVEYOR SYSTEM FOR FLAT ARTICLES

Harry Schirrmeister, Munich; Gerd von Aschwege, Groebenzell; Harald Helmrich, Munich, and Herbert Bernardi, Arget, all of Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Germany

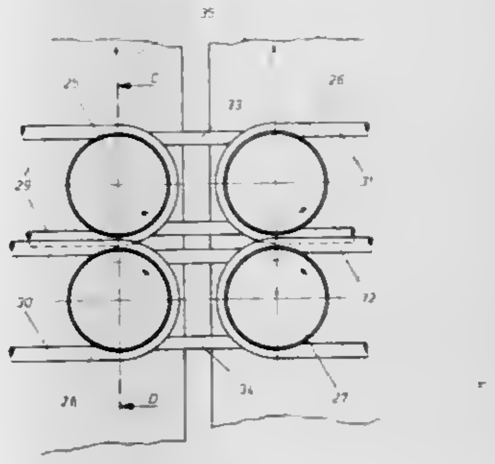
Filed Dec. 13, 1976, Ser. No. 749,665

Claims priority, application Austria, Dec. 12, 1975, 9436/75

Int. Cl.² B65H ***29/70, 29/12***

U.S. Cl. 271—188 **4 Claims**

1. A conveying system for conveying documents comprising a first conveyor section and a second conveyor section, each of said sections including a pair of endless conveyors, said conveyors respectively being disposed in side by side relationship and having corresponding flight portions contiguously disposed so that a document is conveyed by said contiguous flight portions as said conveyors are driven, said conveyors of said first section having end rollers defining a delivery end, and said conveyors of said second section having end rollers defining an entry end, said delivery end being spaced from said entry end, and said conveyors including a series of belts threaded about the end rollers defining said delivery end and entry end respectively, said belts being threaded about their respective end rollers to project beyond the circumference of its respective end rollers, whereby said belts extending in said contiguous flight portions of said pair of endless conveyors are staggered to impress upon a document conveyed therebetween an undulating cross-section shape, and including guide belts, said guide belts being threaded about the end rollers defining said delivery end and said entry end of said sections respectively whereby said guide belts extend across the space between said sections.



4,106,768
AMUSEMENT DEVICE

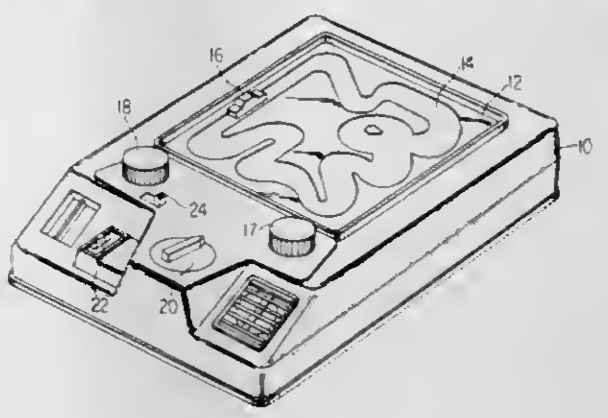
Hideyuki Kanno, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,416

Claims priority, application Japan, Jun. 23, 1976, 51-83079[U]; Jul. 7, 1976, 51-91044

Int. Cl.² A63F ***9/14;*** **A63H** ***30/00***

U.S. Cl. 273—1 M **9 Claims**



1. An amusement device, comprising:

a casing provided with a playing surface having a path;

a body for movement along said path and capable of being attracted by a magnet;

a magnet within said casing below said playing surface for attracting said body;

racks of teeth on said casing;

a housing within which said magnet is mounted and provided with passageway means;

first and second rods intersecting in the vicinity of said housing and passing through said passageway means such that said housing may move along each of said rods, and gears provided at the ends of said rods engaging said racks of teeth;

first and second control knobs corresponding to said first and second rods and provided with gears;

first and second flexible straps provided with racks of teeth and mounted to move within channels provided within said casing, said straps being attached to said first and second rods, and means operatively connecting said gears of said first and second control knobs and said racks of teeth of said flexible straps;

a third control knob mounted to said casing for rotation and provided with an abutment;

spring means associated with said third control knob for urging said knob to return to its original position after having been rotated to a different position; and

a plate mounted for sliding movement in said casing between first and second positions and provided with a surface positioned in the path of travel of said abutment, striking members provided on said plate and positioned to engage said means operably connecting said gears of said first and second control knobs and said racks of teeth of said flexible straps to prevent movement of said first and second control knobs when said abutment of said third control knob strikes said surface of said plate moving said plate to said first position, and spring means normally urging said plate to said second position.

4,106,769

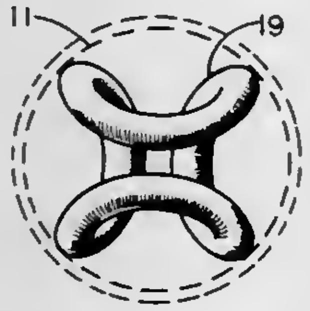
NON-REBOUNDING ARTICLE

Wayne E. Manska, Garden Grove, Calif., assignor to Ronald R. Moody and Wayne E. Manska, Yorba Linda, Calif.

Filed Nov. 3, 1976, Ser. No. 738,445

Int. Cl.^{2} A63B *39/00, 43/00*

U.S. Cl. 273—58 B **4 Claims**



1. A non-rebounding article comprising,

a substantially rigid thin-walled container having a region of substantially uniform thickness located adjacent the interior surface thereof adapted to receive a solid flexible material distributed therein, said container having an interior volume adjacent said region of uniform thickness and centrally located in said container, said interior volume being adapted to receive the solid flexible material from said region of substantially uniform thickness upon impact of said container with an exterior hard-surfaced object; and,

an elastic web composed of solid flexible material substantially located within said region of uniform thickness, said solid flexible material contacting said exterior surface of said container and container being free to move from said region of uniform thickness and initial position adjacent said interior surface into said interior volume upon impact of said container with an exterior hard-surfaced object whereby forces tending to cause the container to rebound from an exterior hard-surfaced object upon impact are absorbed, said solid flexible material having a structural memory to substantially return it to said initial position adjacent said interior surface after impact.

4,106,770

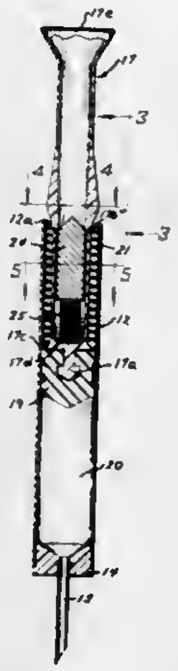
HYPODERMIC SYRINGE PROJECTILE

John M. Gray, 323 Wellesley Rd., Syracuse, N.Y. 13207

Filed Sep. 1, 1976, Ser. No. 719,658

Int. Cl.^{2} A63B *65/02;* A61M *5/20*

U.S. Cl. 273—106.5 D **6 Claims**



1. A hypodermic syringe projectile comprising a hollow housing, a body member movable within said housing along the longitudinal axis extending from one end of the projectile to the other, a needle extending from one end of said housing, means urging said body member in the direction of said needle, a flexible finger arranged in a side wall of said body member and movable from a non-retaining position to a retaining position, means normally biasing said finger to said non-retaining position, means on said housing engaging said finger at said retaining position to hold said body member rearwardly of said one end against the bias of said means urging said body member in the direction of said needle, a weight disposed for axial movement within a passageway in said body member, and means within said passageway in said body member urging said weight in the direction of said finger, said finger in said non-retaining position normally projecting into said passageway a sufficient distance to block axial movement of said weight, and said weight having a portion which flexes said finger to said retaining position.

4,106,771

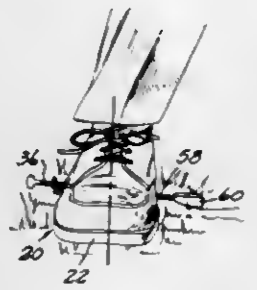
GOLFER'S TRAINING DEVICE

Thomas S. Fern, 50777 Lilac Rd., South Bend, Ind. 46628

Filed Jan. 21, 1977, Ser. No. 761,469

Int. Cl.^{2} A63B *69/36*

U.S. Cl. 273—183 B **7 Claims**



1. A golf training device comprising an elongated base, means for securing said base to the instep portion of a shoe to extend transversely of the shoe, an elongated spring plate projecting from said base longitudinally of said base, and laterally outwardly from the shoe, and an abutment part at the outer end of said spring plate spaced from the base and from the shoe for engagement with a surface on which a wearer of the shoe stands when the shoe tilts sidewise relative to said surface in the direction in which said spring plate extends, said spring plate including a deformed portion between said base and said abutment, said plate being adapted to produce a sound only incident to a predetermined extent of flexure of said spring plate during change of the lateral angular tilted position of the shoe incident of shifting of the wearer's weight during a golf stroke.

4,106,772

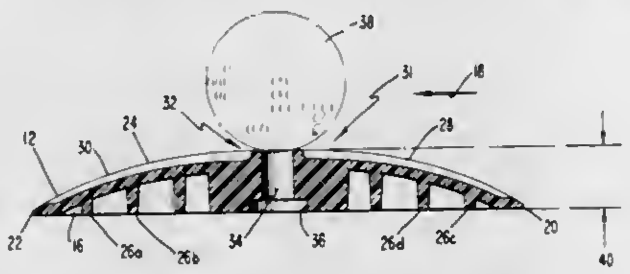
GOLF SWING PRACTICE BASE

Alois Krawagna, Toronto, Canada, assignor to Sports Technology Inc., Toronto, Canada

Filed Jan. 4, 1977, Ser. No. 756,800

Int. Cl.^{2} A63B *69/36*

U.S. Cl. 273—186 R **10 Claims**



1. A resiliently deformable base for supporting a golf ball above a support to be struck during the swinging movement of the head of a golf club, the base providing a turf-like feel during the deformation accompanying a practice swing with an iron-type golf club, the base comprising

(a) an upper surface having ribbing oriented substantially parallel to the direction of a preferred golf club head swing path, said top ribbing providing a visual guide to the direction of the preferred golf club head swing path, the upper surface of said top ribbing forming a convex profile along said golf club head swing path;

(b) a bottom surface having ribbing angularly oriented relative to said top ribbing to provide for engagement with the support to inhibit the movement of the base when struck with a club head, said bottom and top ribbing interacting to provide the desired deformation and resiliency, and

(c) means for supporting the golf ball, said means being positioned in said golf club head swing path substantially at the point of maximum elevation on said convex profile, the curvature of said convex profile beginning substantially at the point of maximum elevation and smoothly varying both forwardly and rearwardly of said point along said preferred swing path and terminating substantially in the plane of the support at the respective edges of said base.

4,106,773

CROSSWORD PUZZLE GAME

Nina Coefield, 2225 Beech Dr., Great Falls, Mont. 59404

Continuation of Ser. No. 777,877, Mar. 15, 1977, abandoned. This application Dec. 15, 1977, Ser. No. 860,512

Int. Cl.^{2} A63F *9/18*

U.S. Cl. 273—240 **14 Claims**

1. A method of playing a competitive game using apparatus comprising:

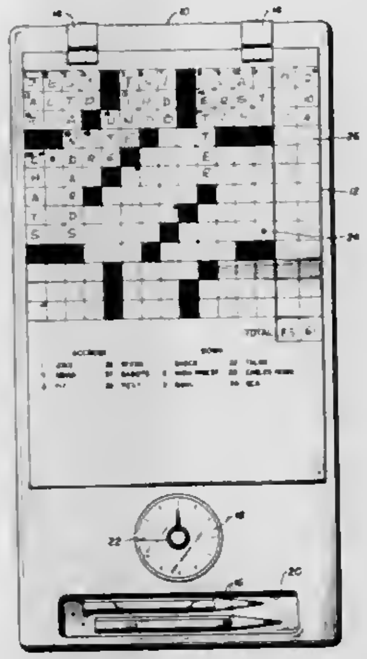
(a) at least one crossword puzzle having associated therewith definitions constituting clues for the solving of said puzzle;

(b) at least two marking apparatuses capable of filling in said crossword puzzle in distinguishable characters such that a character filled in by one of said marking apparatuses is distinguishable from a character filled in by another of said marking apparatuses; and

(c) a timer,

said method characterized as follows:

(i) the contestants take turns filling in said crossword puzzle, each contestant using a different one of said marking apparatuses and the lengths of their turns being measured by said timer;



(ii) values are assigned to portions of said crossword puzzle; and

(iii) points are awarded to each contestant based upon the number of said portions filled in correctly during their respective turns.

4,106,774

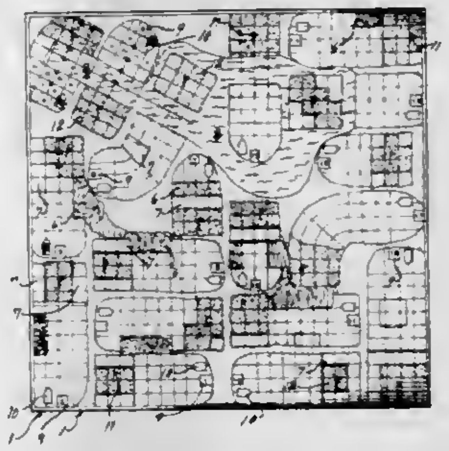
GOLF GAME BOARD ASSEMBLY

Gérard Newsy Seguin, 3318 Marechal St., Montreal, Canada

Filed Feb. 16, 1977, Ser. No. 769,041

Int. Cl.^{2} A63F *3/00*

U.S. Cl. 273—245 **5 Claims**



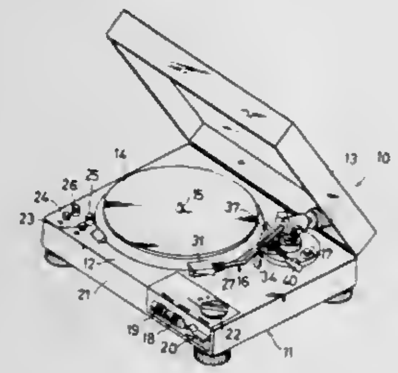
1. A golf game board assembly comprising a game board having a golf course layout marked thereon, polyhedrons having different playing directions marked on the flat faces thereof, golf ball position markers operatively displaced on said game board according to the playing directions pointed out by the polyhedrons upon throwing of the latter in die-like manner, said game board having tee areas, greens, and distances marked thereon and forming parts of said golf course layout, and said polyhedrons include a polyhedron for driving strokes, a polyhedron for fairway strokes, and a polyhedron for putting strokes successively used for the strokes at the tee, along the fairway, and on the green respectively, as the play progresses, the polyhedron for fairway strokes being of smaller size than the polyhedron for driving strokes and of larger size than the polyhedron for putting strokes, and wherein the driv-

ing polyhedron is a 50-face polyhedron including 18 octogonal flat faces marked each with a numeral and lettering representing a distance and direction, indicating the advance of a golf ball position marker, 8 hexagonal flat faces marked each with a P indicating that a par has been obtained, and 24 trapezoidal flat faces marked each with a dot indicating that a hole-in-one has been obtained, the hexagonal flat faces having a smaller size than the octogonal flat faces and a larger size than the trapezoidal flat faces.

4,106,775
PHONOGRAPH RECORD PLAYER

Kazuyuki Takizawa, Inzai, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,312
Claims priority, application Japan, Nov. 10, 1975, 50/135989
Int. Cl.² G11B *17/06*
U.S. Cl. 274—15 R **8 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism operative in an automatic lead-in mode for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and in an automatic return mode for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a rotatable control gear having first and second sets of peripheral teeth engageable by said drive gear for respectively effecting lead-in and return movements of said control gear and being separated from each other by diametrically opposed first and second toothless gaps which, when facing toward said drive gear in stop and play positions, respectively, of said control gear, permit the latter to remain at rest while said drive gear continues to rotate, said control gear further having a continuous cam groove therein;

lead-in and return clutch means mounted on said control gear at diametrically opposed locations, respectively, said lead-in and return clutch means having disengaged positions and engaged positions in which said lead-in and return clutch means are respectively operative for initiating movements of said control gear from said stop and play positions thereof;

a single actuating slide movable between an inoperative position to an operative position for selectively actuating said lead-in and return clutch means to the respective engaged positions when said control gear is in said stop and play positions, respectively;

electromagnetic means associated with said actuating slide and being energizable for moving the latter to said operative position of the slide;

lever means having a cam follower engaging said cam groove for effecting swinging movements of said lever means in first and second directions in response to said lead-in and return movements of said control gear in said automatic lead-in and return modes of operation, respectively;

tone arm drive means for effecting said lead-in and return movements of the tone arm in response to said swinging movements of said lever means in said first and second directions, respectively;

detecting means for providing an electrical output at the completion of a play operation;

circuit means operative for energizing said electromagnetic means and thereby initiating said automatic return mode of operation in response to said electrical output from said detecting means;

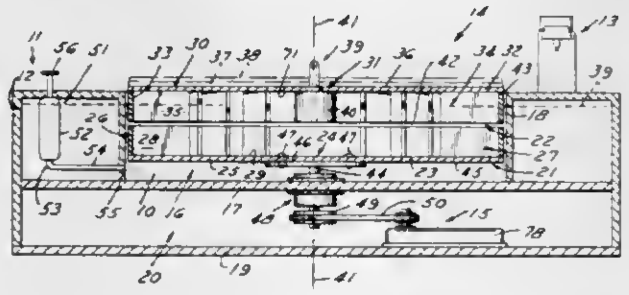
manual operation selecting means operative for blocking said lead-in movement of the tone arm by said tone arm drive means; and

switch means interposed in said circuit means and being actuated when said manual operation selecting means is made operative to block said lead-in movement for inhibiting the energizing of said electro-magnetic means.

4,106,776
FLUIDICALLY SUPPORTED AND FLUIDICALLY DRIVEN TURNTABLE

David M. Gillespie, 451 E. Fourteen Mile Rd., Birmingham, Mich. 48009

Filed Apr. 27, 1977, Ser. No. 791,275
Int. Cl.² G11B *3/60*
U.S. Cl. 274—39 R **30 Claims**



1. A turntable assembly for rotatively supporting phonograph records, memory disks and the like comprising:

tank means for receivably containing a quantity of liquid therein;

a first symmetrical member having an axis of rotation and a plurality of generally radially disposed vanes extending generally upwardly therefrom;

a second symmetrical member having an axis of rotation and plurality of generally radially disposed vanes extending generally downward therefrom, said first member and at least a portion of said second member being disposed within said tank means such that the vanes of said first member and at least a portion of the vanes of said second member are immersed in said quantity of liquid contained within said tank means, said second symmetrical member being supportively positioned above said first symmetrical member and spaced apart therefrom by the bouyant force of said liquid without any mechanical connections therebetween so as to establish a fluid coupling therebetween and a fluid bearing between the walls of said tank means and the radially outer portion of said second member such that the axes of rotation are coincident during rotational operation thereof, the plane of said second member being generally parallel to the plane of said first member and both of said planes being generally horizontal such that the vanes of said first member are disposed generally toward the vanes of said second member, and such that

either of said members is free to rotate with respect to the other about said coincident axes;

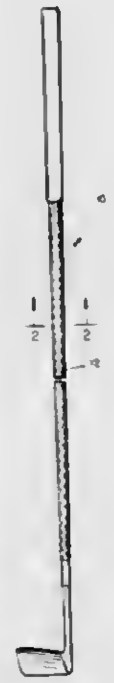
a turntable platter means carried by the upper surface of said second member for rotation therewith, said platter means being adapted for supportively carrying said phonograph records, memory disks and the like; and

means for rotatively driving said first member such that the rotation thereof causes said quantity of liquid to rotatively circulate within said tank means for drivably rotating said second member via said fluid coupling established therebetween while effectively isolating said turntable platter means from the effects of mechanical vibration and speed fluctuations.

4,106,777
RIGIDIZED SHAFT CONSTRUCTION FOR SPORTS APPARATUS

Sung Baik Kim, 32-32 82nd St., Jackson Heights, N.Y. 11372

Filed Feb. 7, 1977, Ser. No. 765,995
Int. Cl.² A63B *53/12*
U.S. Cl. 273—80 B **9 Claims**

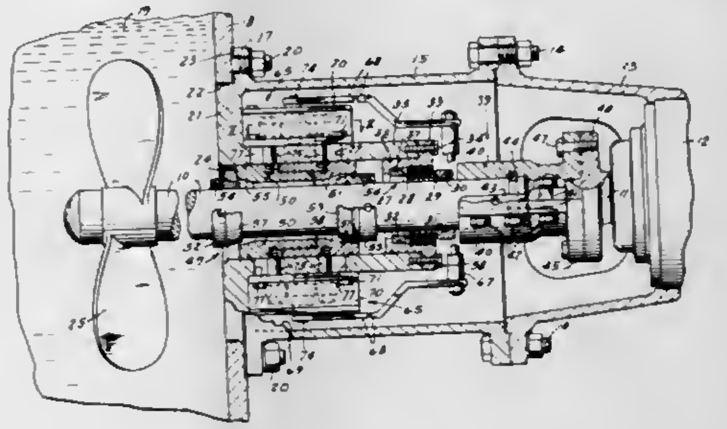


1. A tubular shaft suitable for use in a sports implement, said shaft comprising an elongate peripheral wall, the wall extending about a longitudinal axis, and integral shaft reinforcement means, the reinforcement means including means configuring the peripheral wall in a textured pattern comprising a plurality of equidistantly spaced first areas along a selected neutral planar axis, the plane of which intersect the longitudinal axis, the peripheral wall projecting outwardly beyond the selected neutral axis in the first areas, and a plurality of equidistantly spaced second areas along the selected neutral axis and occupying the spaces between the first areas, and wherein the peripheral wall projects inwardly from the selected neutral axis, the textured pattern further including a plurality of further first and second spaced areas along a second neutral axis adjacent and parallel to the selected neutral axis, wherein the first and second areas of the peripheral wall at the second neutral axis are staggered with respect to the first and second areas of the selected neutral axis.

4,106,778
DEVICE FOR TEMPORARILY SEALING AND SUPPORTING SHAFTS

Alexander D. Cormack, Portland, Oreg., and Boris Kool, Pittsfield, Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Feb. 23, 1976, Ser. No. 660,514
Int. Cl.² F16J *15/06*
U.S. Cl. 277—9.5 **22 Claims**



1. A device for temporarily sealing a normally operatively movable shaft which may extend at one end into fluid under pressure, while primary shaft sealing means adjacent the opposite end of the shaft are being worked on, comprising:

normally inactive secondary sealing means adapted to be located about a portion of the shaft between said one end and the primary sealing means and including collar means for attachment in encircling relation about a selected location on said portion of the shaft and means for securing the collar means fixedly on the shaft adjacent to axially shiftable secondary sealing ring means normally free from the collar means and not movable with the shaft so as to permit the shaft and the collar means to move freely relative to the sealing ring means during operative movements of the shaft;

and actuating means operable for activating said secondary sealing ring means when the shaft is stationary to engage said collar means whereby to effect a fluid retaining seal about the shaft without axial shifting of the shaft, so that the primary sealing means can be released from sealing relation to the shaft and freely worked on substantially without leakage of fluid past the shaft;

said actuating means being operable to release and inactivate said secondary sealing ring means relative to said collar means and the shaft after the primary sealing means have been caused to resume sealing relation to the shaft.

4,106,779
AUTOMATIC SEQUENTIAL DUAL ACTION SEALING SYSTEM

Clarence John Zabcik, Houston, Tex., assignor to NI Hycalog, Houston, Tex.

Filed Mar. 3, 1975, Ser. No. 554,453
Int. Cl.² F16J *15/54, 15/56*
U.S. Cl. 277—27 **5 Claims**

1. A dual action sealing system comprising

a female cylindrical member;

a male cylindrical member having one end thereof inserted into said female cylindrical member, thereby forming an annular fluid passageway in communication with the interior of said male cylindrical member;

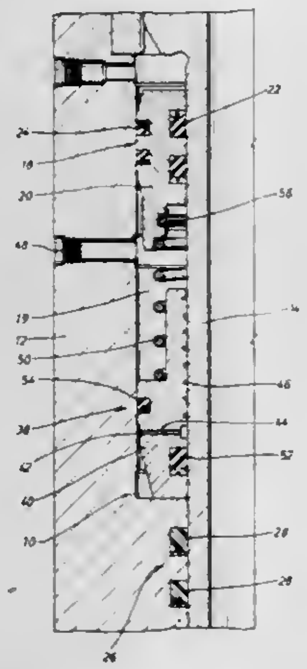
said female cylindrical member having an internal annular groove longitudinally surrounding a portion of said male cylindrical member, thereby forming an annular cylindrical chamber defined by said male and female cylindrical members, said annular cylindrical chamber being in fluid communication with the interior of said male cylindrical member by means of said annular fluid passageway;

said female cylindrical member also having a fluid outlet from said annular cylindrical chamber through said female cylindrical member, said fluid outlet being positioned remotely from the annular chamber end nearest the male cylindrical member end inserted into said female cylindrical member;

primary annular seal means positioned between said male and female members for sealing said annular fluid passageway; and

secondary annular seal means positioned in said annular cylindrical chamber, said secondary seal means comprising

an annular piston slidably positioned in said annular cylindrical chamber between first and second positions proximate and remote from the annular chamber end nearest the male cylindrical member and inserted into said female cylindrical member,



inner and outer annular seals positioned between said annular piston and said male and female cylindrical members, respectively,

said annular piston means being provided with an orifice to facilitate low fluid flow rates therethrough into said annular cylindrical chamber and through said fluid outlet without causing said piston to move from said first position to said second position, and

orifice seal means positioned in said annular cylindrical chamber for sealing said orifice when said piston is in said second position.

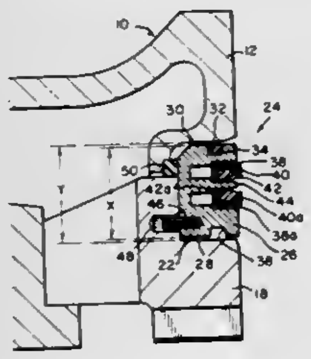
4,106,780
SEAL CARRIER FOR ROTARY PISTON ENGINE

Arthur L. Black, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 26, 1977, Ser. No. 845,475

Int. Cl.² F16J *15/34*; F01C *19/00*

U.S. Cl. 277—81 P **6 Claims**



1. In combination with a rotor which has a seal groove of given width formed by parallel groove surfaces in a surface of said rotor, which rotor is subject to radial and axial, mechanical or dynamic and thermal distortions; a seal carrier received by said groove for carrying a seal for sealing the rotor along said groove; said carrier having a width of less than said given width, to accommodate such groove reception of said carrier in a spaced-apart disposition from thereadjacent said parallel surfaces of said groove; wherein the improvement comprises:

means engaging said carrier, effecting an interpositioning thereof between at least one of said surfaces of said groove and said carrier, for resiliently isolating said carrier from at least radial distortions of the rotor.

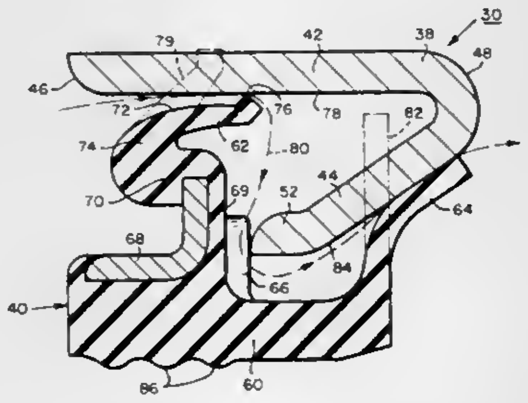
4,106,781
UNITIZED, GREASE-PURGEABLE SEAL

Martin E. Benjamin, Gastonia, N.C., and Dean R. Bainard, Bethel Township, York County, S.C., assignors to Garlock Inc., Rochester, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,866

Int. Cl.² F16J *15/32*

U.S. Cl. 277—82 **5 Claims**



1. An annular, unitized, grease-purgeable shaft seal comprising:

(a) an annular wear sleeve for installation on one of a bore and a shaft, said wear sleeve including a cylindrical wall and a flange extending toward the other of a bore and a shaft,

(b) an annular, one-piece, elastomeric member for use on the other of a bore and shaft, said elastomeric member having a cylindrical wall, an inner sealing lip extending toward and into contact with said wear sleeve and located axially inwardly of said flange, and an outer sealing lip extending toward and into contact with said wear sleeve and located axially outwardly of said flange,

(c) each of said sealing lips being outwardly facing sealing lips, whereby said seal provides a grease-purging path past each of said sealing lips, and

(d) said elastomeric member including a plurality of circumferentially spaced-apart bumper pads in-between said sealing lips, said bumper pads being on an axially outwardly facing surface of a root portion of said inner sealing lip and wherein said flange includes a distal end in contact with said bumper pads for properly locating said wear sleeve with respect to said sealing lips, and for providing a grease purging path past said distal end of said flange.

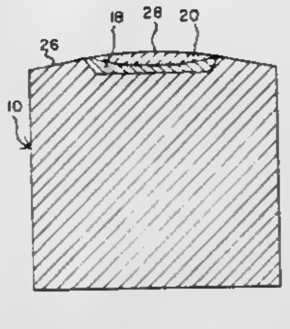
4,106,782
CERAMIC COATED PISTON RINGS

Glenn F. Hyde, Timonium, and Thomas W. Alban, Glen Burnie, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1977, Ser. No. 825,753

Int. Cl.² F16J *9/12*

U.S. Cl. 277—235 A **6 Claims**



1. A piston ring having a scuff and wear resistant ceramic coating comprised of 35 to 45 percent by weight titanium dioxide and 55 to 65 percent by weight aluminum oxide, said ceramic coating being plasma sprayed on said ring.

4,106,783
CLAMPING DEVICE FOR ACCURATELY CENTERING A WORK-PIECE OR A TOOL

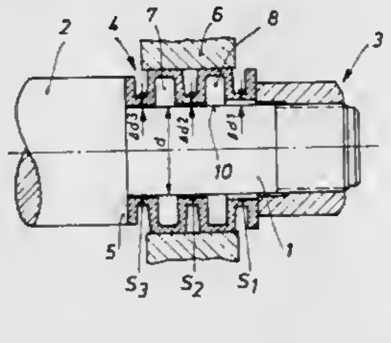
Helmut Glimpel, Lauf a.d. Pegnitz, Fed. Rep. of Germany, assignor to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge vormals Moschkau & Glimpel, Lauf a.d. Pegnitz, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,688

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613526

Int. Cl.² B23B *31/40*

U.S. Cl. 279—2 R **6 Claims**



1. A clamping device for accurately centering a workpiece or a tool, comprising:

a base body;

a clamping sleeve disposed co-axially with said base body;

a clamping device for exerting an axial clamping force on one end of said clamping sleeve;

said clamping sleeve comprising inner and outer radial recesses disposed mutually off-set, and further comprising inner and outer clamping base points disposed mutually off-set;

said clamping sleeve being substantially deformable in the manner of a plate spring;

said clamping sleeve being provided with at least two axially-spaced clamping base points, said base points being separated by one of said recesses disposed in a one-piece sleeve part;

said clamping base points being adapted to face an abutment face of said base body;

a fit clearance being provided between said clamping base points of said clamping sleeve and said abutment face of said base body when said clamping sleeve is in a substantially nontensioned condition;

said fit clearance between said clamping sleeve and said base body increasing in a step-like manner in the direction of said clamping device, from clamping base point to clamping base point, by means of diameter gradation; and

said clamping sleeve being adapted to be pressed against said abutment face of said base body with substantially the same clamping force in the region of each of said clamping base points when said clamping sleeve is in a substantially tensioned condition.

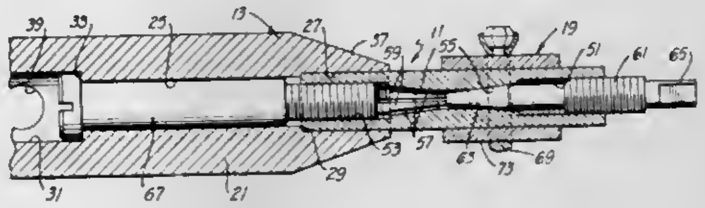
4,106,784
FINISHER'S MANDREL

Michael W. Davis, 2775 Mesa Verde E., Costa Mesa, Calif. 92726

Filed Aug. 12, 1976, Ser. No. 713,684

Int. Cl.² B23B *31/40*

U.S. Cl. 279—2 R **13 Claims**



1. A mandrel for holding a generally tubular workpiece comprising:

an elongated body section having a generally axial passage therein, said passage including a bore and a counterbore defining a shoulder therebetween;

a tubular collet having first and second end portions, said collet being resiliently deformable radially outwardly, said first end portion of said collet being received in said passage of said body section;

a screw in said body and received within said first end portion of said collet to retain said collet against said shoulder;

an expander member received within the tubular collet with at least a portion of the expander being exposed adjacent said second end portion of said collet and with the expander being rotatable relative to the collet, said expander member and said second end portion of said collet having cooperating screw threads thereon whereby the expander member is threadedly attached to said collet;

cooperating wedge surface means on said collet and said expander responsive to the rotation of the expander relative to the collet to radially expand the collet with such radial expansion being usable to firmly mount the workpiece;

said body section including first and second axially arranged portions, said first portion of said body section having opposed substantially flat external surfaces to facilitate gripping the body section in a vise and the second portion of the body section having a generally cylindrical outer surface;

means for radially expanding said second portion of said body section; and

an expandable mounting sleeve positioned on and at least substantially circumscribing said collet.

4,106,785

WORKPIECE HOLDER FOR A VERTICAL BROACHING MACHINE FOR BROACHING ANNULAR WORKPIECES

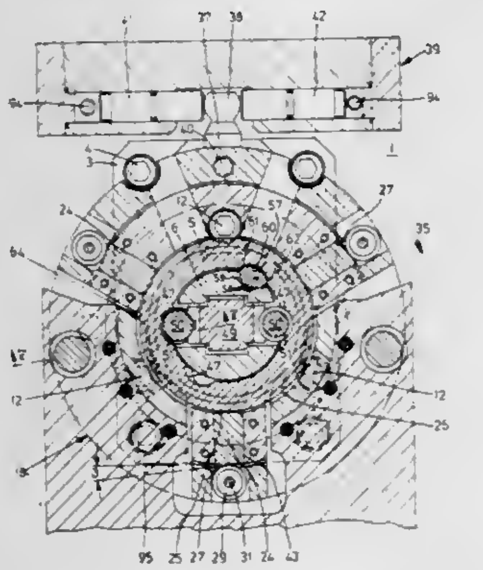
Wolfgang Marten; Herbert Holstein, and Gustav Esser, all of Solingen, Fed. Rep. of Germany, assignors to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH, Solingen, Fed. Rep. of Germany

Filed Jan. 7, 1977, Ser. No. 757,665

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1976, 2600272

Int. Cl.^{2} B23B *31/16*

U.S. Cl. 279—4 **10 Claims**



1. A workpiece holder for a vertical broaching machine for broaching an annular workpiece, comprising:

non-rotatable support means, on which the workpiece is received, for axially supporting the workpiece from below, said support means having a portion projecting into the center aperture of the workpiece;

tangential immobilization means, insertable between the portion of said support means projecting into the center aperture and the inner surface of the workpiece, for tangential immobilization of the workpiece; and

radial immobilization means for radial immobilization of the workpiece when in place on said support means, said radial immobilization means comprising:

at least two centering pieces disposed about the outer surface of the workpiece when in place on said support means, and

a common drive means for simultaneously driving all of said centering pieces into radially pressing engagement with the exterior of the workpiece.

4,106,786

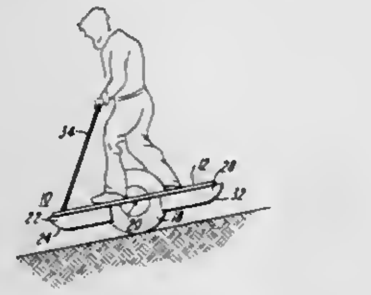
RECREATIONAL VEHICLE FOR USE ON SLOPING TERRAINS

Earl Raymond Talbott, 409 Jeff St., Newell, W. Va. 26050

Filed May 5, 1977, Ser. No. 793,835

Int. Cl.^{2} B62B *13/18*

U.S. Cl. 280—8 **9 Claims**



1. A recreational vehicle adapted to be ridden by a person down sloping terrain, said vehicle comprising:

(a) a riding platform having a periphery, and an aperture provided in said platform and elongated in the direction of movement intended for said vehicle;

(b) wheel means having an axle portion, said wheel means mounted in the aperture in said platform with said axle portion affixed to said platform and disposed perpendicular to the direction of movement intended for said vehicle, the diameter of said wheel means being sufficient that an appreciable portion thereof projects beneath said platform and an appreciable portion thereof projects above said platform;

(c) elongated, spaced forward skid means affixed to and projecting beneath said platform with the length dimensions thereof disposed in the direction of movement intended for said vehicle, said forward skid means positioned laterally on opposite sides of a vertical plane through said wheel means and perpendicular to said wheel means axle portion, the leading edge portions of said forward skid means having a gradually upwardly sloping configuration to provide a smooth skidding surface with the terrain to be traversed and extending a sufficient distance forwardly to prevent the leading edge portions of said platform from contacting the terrain to be traversed, and the distance said wheel means projects beneath said platform being greater than the distance said forward skid means project beneath said platform;

(d) elongated, spaced rearward skid means affixed to and projecting beneath said platform with the length dimensions thereof disposed in the direction of movement intended for said vehicle, said rearward skid means positioned laterally on opposite sides of a vertical plane through said wheel means and perpendicular to said wheel means axle portion, the trailing edges of said rearward skid means extending a sufficient distance rearwardly to prevent the trailing edge portions of said platform from contacting the terrain to be traversed, the distance said wheel means projects beneath said platform being greater than the distance said rearward skid means project beneath said platform, when said vehicle is appreciably tilted with respect to the terrain upon which it is supported, at least one of said forward skid means and said rearward skid means contacting the terrain before any peripheral portion of said platform, and when said vehicle is moving in its intended direction and is tipped backwardly, said rearward skid means contacts the terrain to provide a braking action therefor; and

(e) support means affixed to said platform to provide a rider on said vehicle with manual support to enable the rider to maintain a standing position on said vehicle, whereby vehicle speed on a sloping terrain can be controlled by the rider varying position on said vehicle to control the vehicle angle relative to the terrain, with braking accomplished by the rider shifting weight backward to cause said rearward skid means to contact the terrain in a skidding fashion and effect vehicle braking.

4,106,787

DEVICE FOR LOCKING A REMOVABLE SKI CROSSING DEFLECTOR

Dieter Thon, Munich, Fed. Rep. of Germany, assignor to Safety Jet, Munich, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,614

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 7539332[U]

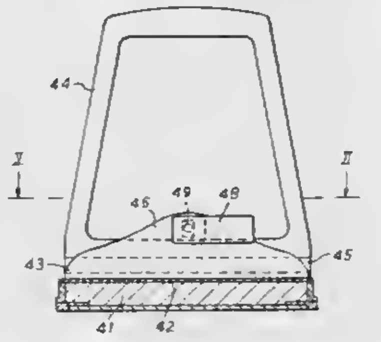
Int. Cl.^{2} A63C *11/00*

U.S. Cl. 280—11.37 E **12 Claims**

1. A device, for locking a ski-crossing deflector on a ski, which comprises:

(i) a base plate including a base to be secured to a ski, and a pair of side portions upstanding on said base and spaced transversely of the base, each of said side portions including a respective substantially rectangular opening and said openings being aligned transversely of the base, one of said side portions including a recess opening at its outer face, the base plate being resiliently deformable to permit movement of the side portions towards and away from each other,

(ii) a cotter pin for insertion through the side portions to serve for clamping a ski-crossing deflector onto the base, said cotter pin having at one end a T-shaped configuration in which the cross-piece of the "T" is shaped similarly to but is of smaller dimensions than the substantially rectangular openings of the side portions, such that the T-shaped configuration can pass through the openings when the cross-piece is aligned longitudinally with the openings but is prevented from passing through the openings when cotter pin is rotated so that the cross-piece is not aligned with the openings, said cotter pin having at its other end a handle portion having on a face thereof abutting said one side portion a projection which is positioned to engage into said recess, when the cotter pin is in a position of rotation in which the cross-piece is not aligned with the opening of the other side portion, thereby to retain the cotter pin in said position of rotation, said projection being releasable from said recess by forcible rotation of the cotter pin and resilient movement of the side portions towards each other.



4,106,788

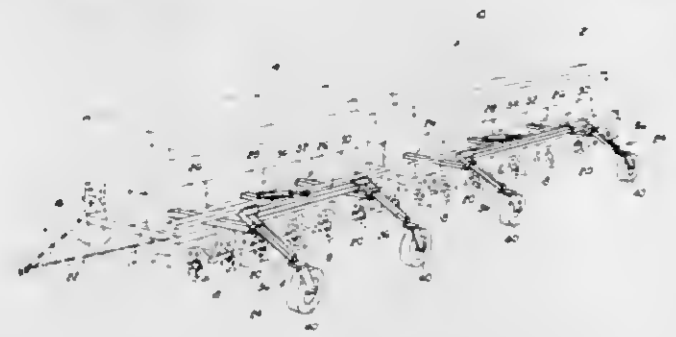
HOE DRILL CARRIER

Darrell F. Bohnert, Jewell, Kans. 66949

Filed Jun. 6, 1977, Ser. No. 803,528

Int. Cl.^{2} A01B *63/22*

U.S. Cl. 280—43.23 **4 Claims**



1. A hoe drill carrier for mounting on the rear of a hoe drill, the carrier co-acting with the front wheels of the hoe drill in transporting the hoe drill, the carrier comprising:

a pair of horizontal stationary mounting brackets for mounting on the rear of the hoe drill and disposed parallel to each other, said brackets adapted to be disposed perpendicular to the width of the hoe drill, said mounting brackets having forward and rearward ends, the rearward ends of said mounting brackets adapted to extend outwardly from the rear of the drill;

an elongated rock shaft pivotally mounted on the rearward ends of said mounting brackets, said shaft adapted to be disposed parallel to the width of the hoe drill, said shaft further being disposed intermediate the forward and rearward ends of said brackets;

a pair of parallel lift arms having forward and rearward ends, said lift arms mounted on the ends of said rock shaft and perpendicular thereto, said lift arms extending rearwardly and downwardly from the rearward ends of said mounting brackets and extending below the level of said brackets;

a pair of caster wheels mounted on the rearward ends of said lift arms; a horizontal stationary hydraulic cylinder mounting bracket disposed parallel to said mounting brackets and therebetween, said hydraulic cylinder mounting bracket mounted on the rear of the hoe drill; and

a hydraulic cylinder pivotally mounted on top of said hydraulic cylinder mounting bracket, the hydraulic ram of said hydraulic cylinder attached to said rock shaft for raising and lowering said rock shaft, such that when said shaft is raised, said caster wheels attached to the rearward ends of said lift arms are lowered downwardly contacting the ground surface and raising the rear of the hoe drill above the ground surface.

4,106,789

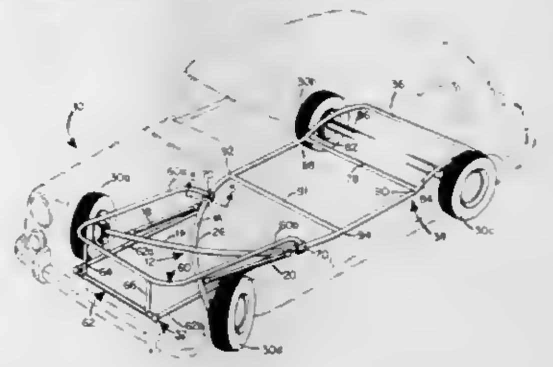
MOTOR VEHICLE SUSPENSION SYSTEM

Steve High, 3526 Wyoming NE. Apt. 101, Albuquerque, N. Mex. 87111

Filed May 9, 1977, Ser. No. 794,976

Int. Cl. B60g *11/04*

U.S. Cl. 280—793 **11 Claims**



1. A suspension system for a motor vehicle comprising

first and second crossover supporting members, said first crossover member extending from substantially a rearward section on a first side of the vehicle to a side front section of the vehicle, and said second crossover member extending from said rearward section on the second side of the vehicle to an opposing side front section of the vehicle, said first and second crossover members crossing each other at least once,

first and second means for connecting a front wheel to a front end portion of each of said first and second members respectively,

means for integrally connecting rear wheels to rearward portions of said first and second crossover members,

said first and second members being free to move relative to one another in a substantially vertical direction at each crossover point of said members,

said first member, at least at a rearward portion, being placed under torsion in response to vertical movement of the front end portion of the member,

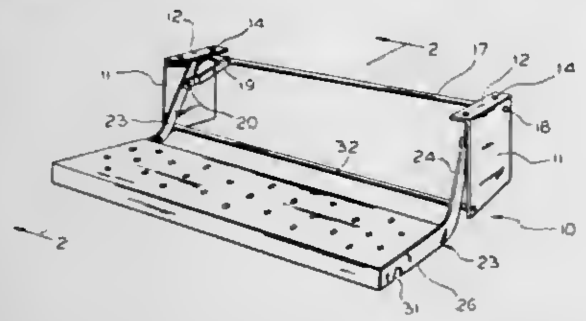
said second member, at least at a rearward portion, being placed under torsion in response to vertical movement of the front end portion of the member,

means for restraining longitudinal movement of the front end portions of said crossover members while allowing said respective front end portions to move substantially freely and independently, in the vertical direction, and

frame means integrally connecting said rearward portions.

4,106,790
VEHICLE STEP

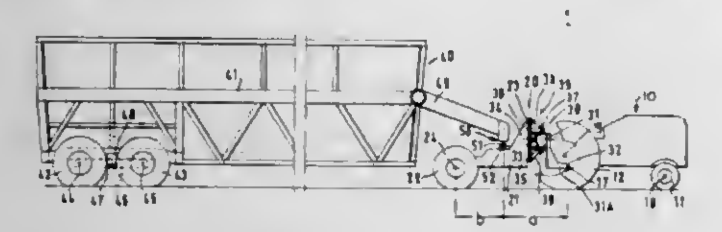
Raywood C. Weiler, Fontana, Calif., assignor to Blackstone Manufacturing Co., Inc., Chicago, Ill.
Filed Apr. 6, 1977, Ser. No. 785,058
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **5 Claims**



1. A retractable step for vehicles and the like comprising a pair of spaced vertical brackets, each having a flange along the top edge, with the flanges being directed towards each other, a transverse shaft journalled in said brackets for rocking movement, a pair of spaced levers fixed to said shaft each in close proximity to a respective bracket, a pair of tread supporting members each having forward and rearward arms angularly related, with each rearward arm being pivotally connected to a respective lever at a point spaced from the upper end of the rearward arm, a tread rigidly secured to the forward arms, a transverse bar extending between said brackets and disposed forwardly and below said shaft, each of said flanges overhanging a respective supporting member, the upper end of each rearward arm abutting a respective flange and an intermediate portion of each supporting arm engaging the bar when the tread is disposed in operative position.

4,106,791
COUPLING DOLLY

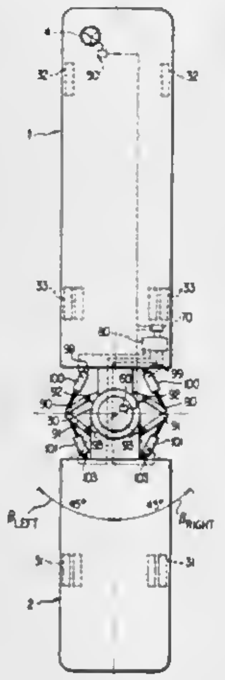
Robert Johnson Greatbatch, 2 Holmlea, Quadring Road, Gosberton, Spalding, Lincolnshire, England
Filed Sep. 13, 1976, Ser. No. 722,613
Claims priority, application United Kingdom, Sep. 13, 1975, 37709/75
Int. Cl.² B62D *53/06*
U.S. Cl. 280—423 A **6 Claims**



6. A vehicle assembly comprising an agricultural-type tractor, a coupling dolly connected to said tractor and a load-carrying semi-trailer connected to said coupling dolly, in which:
- said tractor has front and rear wheels and pitching bearing means defining a horizontal forwardly disposed pitching axis disposed between the axes of the front and rear wheels of the tractor and extending transversely of the tractor below the level of the axis of said rear wheels;
- said coupling dolly has a chassis having front and rear ends, support surface engaging rolling means supporting the rear end of the chassis, a weight transfer hitch connected to the front end of the chassis and first universal coupling means mounted on the chassis between the front and rear ends of the chassis; and
- said semi-trailer has a load bearing frame having front and rear ends, support surface engaging rolling means supporting the rear end of the frame, a draw bar projecting forwardly of the front end of the frame, and second universal coupling means which are mounted on the front end of the draw bar and cooperate with the first universal coupling means to form a ball-and-socket joint which connects the semi-trailer to the coupling dolly for pivotal articulation about mutually intersecting rearwardly disposed pitching rolling and yawing axes;
- the weight transfer hitch having first bearing means which cooperate with the pitching bearing means of the tractor to connect the coupling dolly to the tractor for pitching articulation about said forwardly disposed pitching axis, second bearing means for permitting rolling articulation between the tractor and the coupling dolly about an axis which is disposed above the rearwardly disposed rolling axis provided by the ball-and-socket joint connecting the semi-trailer to the coupling dolly, and third bearing means connected to the second bearing means for permitting yawing articulation between the tractor and the coupling dolly.

4,106,792
LOCKING MECHANISM ARRANGEMENT FOR A HINGED BUS

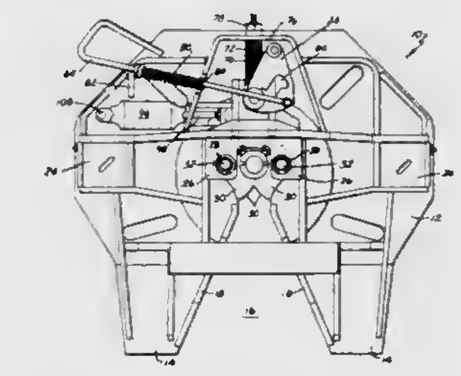
Otto Schultz, and Hilmar Feutlinske, both of Hamburg, Fed. Rep. of Germany, assignors to Hamburger Hochbahn Aktiengesellschaft, Hamburg, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 572,097, Apr. 28, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,402
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1974, 2420203
Int. Cl.² B62D *53/06*
U.S. Cl. 280—432 **9 Claims**



1. A locking system for a hinged vehicle wherein the vehicle has a front section and a rear section which are connected by a hinge between which determines the deflection angle, wherein the front section has a pair of passive axles for supporting a set of fixed rear wheels and a set of steerable front wheels between which determines the angle of lock upon steering the front wheels, and wherein the rear section has a single powered axle which powers a set of wheels for driving the vehicle, the locking system preventing the front and rear section from exceeding a maximum deflection angle predetermined for each angle of lock when cornering, the locking system comprising
- at least one sensing means for sensing the angle of lock and the deflection angle of said hinge, wherein said sensing means is connected with comparing means for sensing the maximum predetermined deflection angle of said hinge for each angle of lock, and hinge locking means having a hinge locking mechanism disposed around the hinge and between the front section and the rear section, said hinge locking means being operative by the comparing means in one direction against enlargement of the deflection angle greater than the maximum deflection angle of said hinge which is predetermined upon reaching the maximum steering deflection angle for the angle of lock, the hinge normally being unlocked under normal driving conditions.

4,106,793
FLUID WEDGED DOUBLE LOCK FIFTH WHEEL

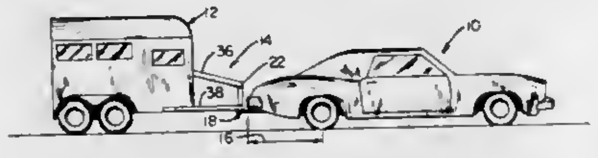
Charles G. Neff, Saratoga, Calif., assignor to William F. Beebe, Holland, Mich., a part interest
Filed Mar. 28, 1977, Ser. No. 781,859
Int. Cl.² B62D *53/10, 53/12*
U.S. Cl. 280—435 **8 Claims**



2. A fifth wheel hitch having a bifurcated slide plate with a convergent mouth terminating in a throat for receiving a kingpin, and kingpin locking mechanism at said throat having a pair of pivotally mounted jaws in opposing relation astraddle of said throat, each having a forward portion and a kingpin engagement portion, and each being pivotally shiftable between a kingpin engagement position wherein said forward portions are spaced from each other and a kingpin-receiving or releasing position wherein said forward portions approach each other; a plunger shiftable between a retracted position not between said pivotal jaw forward portions and an extended position between said pivotal jaw forward portions to retain said pivotal jaws from shifting out of kingpin engagement position; retractor means for retracting said plunger; transverse wedging means shiftable between a retracted condition and a plunger binding wedging condition; said plunger having a wedging surface aligned with said transverse wedging means when in said extended position between said pivotal jaw forward portions, for engaging said transverse wedging means; track means for guiding said plunger, and stop surface means transversely of said track means, said transverse wedging means being shiftable to a position between said stop means and said wedging surface to retain said pivotal jaws; and actuator means for shifting said transverse wedging means.

4,106,794
MULTIPLE BAR LINKAGE TOWING SYSTEM

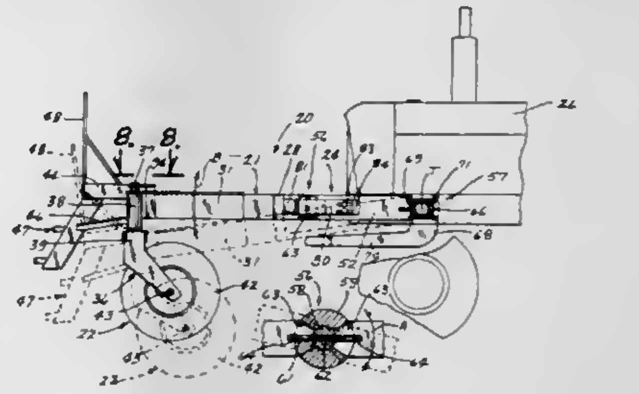
Daniel V. Sallis, 5720 Blue Sage Dr., Littleton, Colo. 80123
Filed Sep. 8, 1975, Ser. No. 611,318
Int. Cl.² B62D *53/00*
U.S. Cl. 280—456 R **6 Claims**



1. Towing apparatus for connecting the forward portion of a trailer mounted on road wheels to the aft portion of a towing vehicle having a laterally extending rear axle located well forward of the aft end of the vehicle and having road wheels connected to the ends of the axle, comprising:
- forward hitch means carried by the body of the towing vehicle aft of the rear axle including a plurality of longitudinally extending mounting members connected at their forward ends to the body of the vehicle for swinging laterally only about a generally vertical axis, and at least one first attachment member connected to the aft end of each mounting member rearward of the aft end of the vehicle;
- aft hitch means carried by the forward portion of the trailer including a plurality of second attachment members located substantially at the forward end of the trailer;
- the first attachment members being located substantially in a generally upright and laterally extending plane and being spaced vertically and laterally in a predetermined pattern;
- the second attachment members being located substantially in a generally upright and laterally extending plane in a pattern corresponding generally with the pattern arrangement of the first attachment members but with greater vertical and lateral spacing;
- and a multiple tow bar linkage extending between the trailer and the towing vehicle including upper and lower elongate bars extending longitudinally between corresponding first and second attachment members, mounted at their forward ends to the first attachment members for swinging vertically only about a lateral axis, and mounted at their aft ends to the second attachment members for swinging vertically and laterally;
- all of the attachment members being so located vertically and laterally that all of the tow bars connected thereto converge forwardly to define a virtual pivot point adjacent to the longitudinal axis for vertical and lateral swinging well forward of the aft end of the vehicle.

4,106,795
GROUND SUPPORTED FRONT MOUNTED TRACTOR ATTACHMENT

James Henning, R.F.D. 1, Hennepin, Ill. 61327
Filed Aug. 5, 1976, Ser. No. 712,099
Int. Cl.² B60D *3/00*
U.S. Cl. 280—481 **6 Claims**



1. A front mounted vehicle attachment steerable with and pushed by a vehicle, comprising:
- (a) a portable frame positionable forwardly of the vehicle,
- (b) a pair of caster wheels,
- (c) means for supporting the caster wheels on the frame at transversely spaced positions relative to the vehicle,
- (d) a drive linkage between the frame and vehicle,
- (e) means for connecting the frame to the drive linkage for pivotal movement of the frame about a generally longitudinal axis relative to the vehicle, including:
  - (1) a pivotal shaft connected at one end to the frame so as to extend rearwardly therefrom,
  - (2) a cylindrical sleeve connected to a front portion of the drive linkage for pivotally receiving the pivot shaft in axial alignment therewith, and
  - (3) means for releasably longitudinally securing the pivot

shaft within the sleeve, comprising an elongated pin insertable through a hole provided therefor in the pivot shaft with opposite ends of the pin slidably engageable within generally vertical slots in opposite sides of the cylindrical sleeve to provide limited pivotal movement of the pivot shaft about an axis extended through the sleeve generally longitudinally of the vehicle, and

(f) means for connecting the drive linkage to the vehicle for pivotal movement of the frame about a generally transverse axis relative to the vehicle.

4,106,796

CONNECTOR FOR DUCT SYSTEMS FOR LOW TEMPERATURE FLUIDS

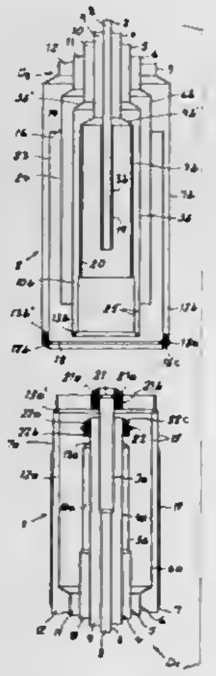
Stefan Asztalos; Alfred Stephan, both of Munich, and Reinhold Mayer, Geretsried, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 12, 1977, Ser. No. 758,789

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601117

Int. Cl.^{2} F16L *47/00*

U.S. Cl. 285—133 R **13 Claims**



1. A connector for a multipipe duct system having two duct parts each comprising a central flow passage, and at least one vacuum chamber coaxially surrounding said flow passage, said connector comprising a male member connected to one of said parts and a female member connected to the other of said parts and telescopingly receiving said male member, said members being provided with telescopingly engaging pipe portions forming said central flow passage and further pipe portions defining said vacuum chambers, the pipe portions of said members axially overlapping upon the fitting of said members together, a ring seal on one of the overlapping pipe portions of one member, and an axially extending sealing surface on a pipe portion of the other member overlapped thereby and slidably engageable by said ring seal for sealing said flow passage against the exterior, each of said members comprising a first pipe portion telescopingly engaging the first pipe portion of the other member to form said central flow passage through the connector, a second pipe portion coaxially surrounding said first pipe portion and telescopingly engaging the second pipe portion of the other member to define an intermediate flow passage through said connector, a third pipe portion coaxially surrounding said second pipe portion and sealed thereto at the end of the respective member to form an inner vacuum chamber, a fourth pipe portion coaxially surrounding said third pipe portion and telescopically engaging the fourth pipe portion of the other member to define an outer flow passage therewith, and a fifth pipe portion coaxially surrounding said fourth pipe portion and sealed thereto at the end of the respective member to define an outer vacuum chamber, the inner vacuum chambers of said members and the outer vacuum chambers of said members overlapping upon the fitting of said members together.

4,106,797

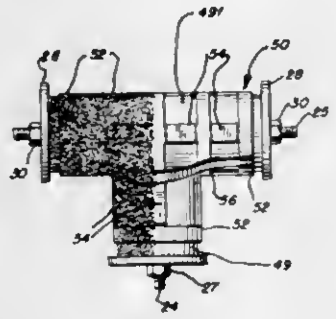
REINFORCED FITTING CONSTRUCTION

Vesta F. Michael, Big Spring, Tex., assignor to Fiber Glass Systems, Inc., Big Spring, Tex.

Filed May 7, 1976, Ser. No. 684,097

Int. Cl.^{2} F16L *41/00;* **B65H** *81/00*

U.S. Cl. 285—156 **10 Claims**



1. A method of forming corrosion-resistant fitting constructions having tubular conduit portions, comprising forming a first integral, seamless fitting body about a form from resin-saturated glass filaments arranged substantially transversely and parallel to the central axes of the fitting tubular portions; welding a plurality of spaced, annular metal reinforcement straps about each of said tubular conduit portions; welding the conduit reinforcement portions together with reinforcement connection means so as to form an integral, rigid, reinforcing metal case about said first fitting body; the elements of said metal cage being in snug engagement with the surface of said first fitting body; completing the formation of said fitting construction by application of additonal uncured resin and glass filament reinforcements until a fitting construction of desired dimensions is formed with said cage embedded within the thickness of said fitting construction and hidden from view whereby said fitting tubular portions are reinforced by said cage against axial and torsional forces said fitting construction being substantially free of interior voids, curing the additional uncured resin, and removing said form from the resulting fitting construction.

7. A fitting construction comprising a hardened, resinous, corrosion-resistant body of seamless, unitary construction having tubular portions formed along intersecting axes; said tubular portions being reinforced by reinforcing filaments of high tensile strength arranged substantially transversely and parallel to the axes of said tubular portions; said filaments being embedded in a cured resin matrix, a unitary reinforcing cage formed of spaced, reinforcing metal straps arranged within the thickness of said tubular portions; said straps of said cage being in the form of annuluses arranged substantially transversely to the axis of the tubular portion in which disposed, and annulus-connecting strap portions connecting said annuluses whereby interstices are defined by said cage straps; said annuluses and connecting straps being joined by welding and comprising reinforcement for said fitting tubular portions against axial and torsional forces; hardened resinous material disposed in said interstices defined by said cage straps; said transverse and parallel filament reinforcements embedded in a resin matrix comprising layer portions disposed inwardly and outwardly of said cage; said layer portions being connected by said hardened resinous material disposed in said strap interstices; the thickness of said fitting construction being substantially void free.

4,106,798

FLUID-TIGHT PIPE COUPLING ARRANGEMENT

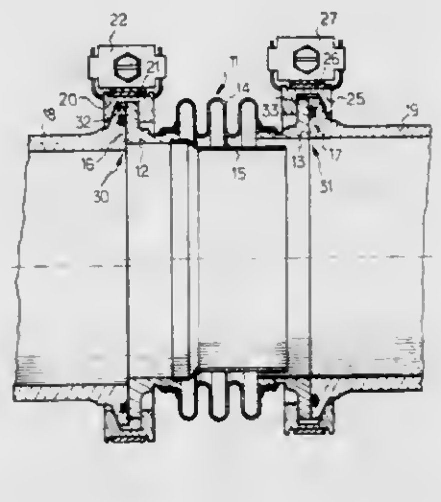
Albert Haug, Montmorency, France, assignor to Societe d'Etudes de Machines Thermiques-S.E.M.T., Saint Denis, France

Filed Dec. 13, 1976, Ser. No. 749,770

Claims priority, applicatinn France, Jan. 22, 1976, 76 01697

Int. Cl.^{2} F16L *51/02*

U.S. Cl. 285—226 **3 Claims**



1. A fluid tight coupling system for interconnecting in sealing relationship two longitudinally misaligned pipe sections, each said pipe section terminating in a first integral flange, each said first flange having a first contact face, an expansion compensator bellows having opposite ends interposed between the first flanges of the pipe sections, each opposite end of the bellows corresponding to a respective first contact face of said misaligned pipe sections and having at its respective ends a second flange, each said second flange having a second contact face in surface engagement with corresponding first contact faces, sealing means between the first and second flanges for furnishing a leak-tight seal at the engaged first and second contact faces, means rigidly sealingly joining the second flanges to the bellows, one of said first and second engaging flanges having a substantially frusto-conical shape on a side opposite to its contact face and a first peripheral substantially cylindrical surface extending between the frusto-conical shape and the contact face of said one engaging flange and the other said engaging flange having an annular flat surface on a side opposite its contact face and a second peripheral substantially cylindrical surface extending between the annular flat surface and the contact face of said other engaging flange, the engaged first and second contact faces of the first and second flanges being in a plane substantially perpendicular to the longitudinal axes of the pipe sections and, an annular clip member and means for tightening the clip member around said first and second flanges for clamping each of the first and second engaging flanges together to maintain the engagement of the first and second contact faces, the clip member being formed with a clamp portion having a clamping groove with lateral sides of complementary shape with the respective engaged first and second flanges, the bottom of said groove defining a cylindrical surface having a predetermined extent less than the total extent of the first and second peripheral substantially cylindrical surfaces to maintain the engaged first and second contact faces in bearing relationship.

4,106,799

AT LEAST TWO-PARTITE CLAMPING SLEEVE FOR CONNECTION OF TWO PIPE ENDS PROVIDED WITH FLANGES

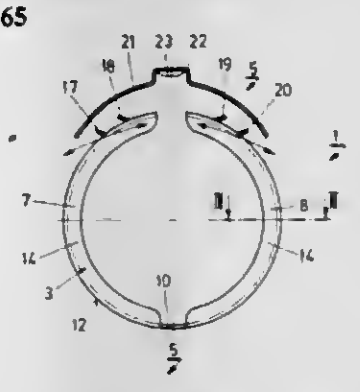
Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

Filed Mar. 18, 1976, Ser. No. 667,942

Claims priority, application Switzerland, Mar. 19, 1975, 3481/75

Int. Cl.^{2} F16L *17/00, 19/00, 21/02, 23/00*

U.S. Cl. 285—365 **1 Claim**



1. An at least two-partite clamping sleeve for connecting two pipe ends provided with flanges comprising: an open ring means including internal lateral side surfaces for abutting at the pipe ends and inclined relative to the ring axis, a substantially cylindrical outer surface means connecting the inclined surfaces, and a center area including a bendable place acting as a stiff hinge which is constructed as an annealed portion of the outer surface means, the lateral surface means being interrupted in the area of the annealed portion, and at least one connecting means formed completely separately of said ring means to be a disposable member and including an ear-like bulge means which is contractable under permanent deformation for the purpose of tightening the clamping sleeve, free ends of the open ring means being provided with one of outwardly directed hook and slot means and the ends of the connecting means being provided with one of slot and hook means for engagement, respectively, with the one of said hook and slot means of the free ring ends, and wherein the connecting means consists of a connecting member made of considerably thinner material than the ring means.

4,106,800

CHAIN LATCH FOR DOOR

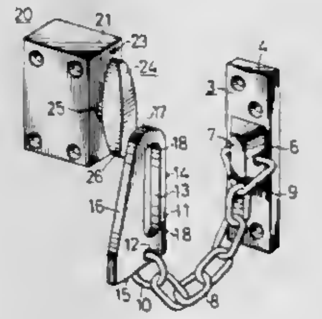
Yoshitaka Nakanishi, 12-9 Yawata 5-chome, Ichikawa-shi, Chiba-ken, Japan

Continuation of Ser. No. 618,956, Oct. 2, 1975, abandoned. This applicatinn Jan. 10, 1977, Ser. Nn. 758,186

Claims priority, application Japan, Dec. 6, 1974, 49-140958; Jan. 30, 1975, 50-11862

Int. Cl.^{2} E05C *17/36*

U.S. Cl. 292—264 **2 Claims**



1. A door latch, comprising;

a chain;

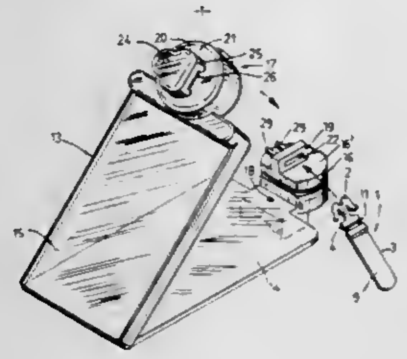
a base for fixing a first end of the chain to an inside surface of one of a door unit and a door-frame unit;

a locking plate shaped to approximately resemble a triangle modified by rounding a corner thereof, the locking plate having an elongate slot extending from adjacent the rounded corner along one side of the triangle, and having

a wide locking plate portion disposed adjacent an end of the slot remote from the rounded corner, said portion being fixed to a second end of the chain;
a retainer plate attachable to an inside surface of another of said units; and
a hook secured to the retainer plate for engagement with and disengagement from the locking member from inside the door and door-frame units when the door is closed and for preventing such disengagement from outside said units, the hook being T-shaped, having a horizontal shaft extending into and secured to the retainer plate, and extending from the retainer plate in a direction parallel to the surface of the unit to which the retainer plate is secured, and perpendicular to the head of the hook, the shaft having a vertical head which extends upwardly and downwardly from a free end of the shaft, said head being dimensioned to permit sliding of the locking plate onto and from the hook, for respectively effecting said engagement and disengagement, but to permit such sliding only when the slot is vertical and the shaft is centered therewith, whereby the wide locking plate portion tends to cause the locking plate, upon its engagement with the hook, to gravitationally slide down on the shaft of the hook with the wide locking plate portion disposed downwardly until the shaft engages an end of the slot adjacent the rounded corner, while permitting that, pursuant to such sliding and engaging, the locking plate is turned on the shaft by the chain, when the door is opened, to prevent said disengagement.

4,106,801
ONE PIECE SECURITY SEAL AND NEW SEALING SYSTEM

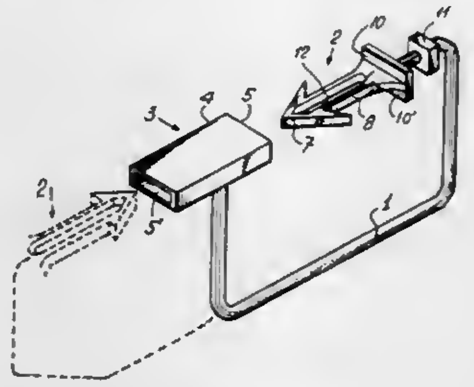
Eduardo De Lima Castro Neto, Rua Sao Luiz Gonzaga 912, 20,000, Rio de Janeiro - RJ, Brazil (20.000)
Filed Mar. 25, 1976, Ser. No. 670,318
Claims priority, application Brazil, Apr. 1, 1975, PI-7501943
Int. Cl.² B65D *33/34*
U.S. Cl. 292—307 R **11 Claims**



1. Single piece security seal comprising
(a) a first insert portion comprising a rectangular base, a central part extending perpendicularly from the middle of said base and, on the two opposite sides of the free end of said central part, two elastically deformable arms inclined outwardly and backwardly towards said base with a maximum separation between said arms in the undeformed condition which is greater than the corresponding width dimension of said rectangular base;
(b) a second removable portion comprising a blade alined with said central part and provided with a rectangular base having a width and thickness substantially equal to those of said insert portion base; and
(c) weakened breakable means connecting said bases.

4,106,802
SELF-LOCKING BAND

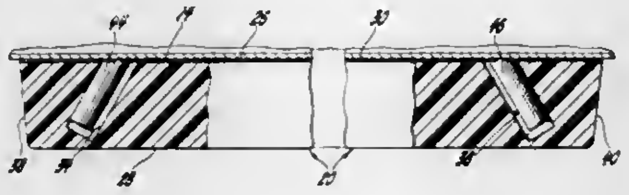
Battista Lozio, Milan, Italy, assignor to Lozio Battista e Figli S.p.A., Milan, Italy
Filed Mar. 2, 1977, Ser. No. 773,755
Claims priority, application Italy, Jun. 25, 1976, 24716 A/76
Int. Cl.² B65D *33/34*
U.S. Cl. 292—320 **9 Claims**



1. A self-locking band comprising:
a flexible link with a hook-shaped extremity having the shape of a flat tongue terminating in an arrowhead; and
a sleeve with two open ends secured to said link at a point remote from said extremity, said link being internally provided with oppositely facing resilient barbs positioned to coact with said extremity and prevent its withdrawal upon insertion thereof through either of said ends, said sleeve being of rectangular cross-section and provided with said barbs at both minor sides of the rectangle.

4,106,803
MOLDING ATTACHMENT FOR VEHICLE BODY

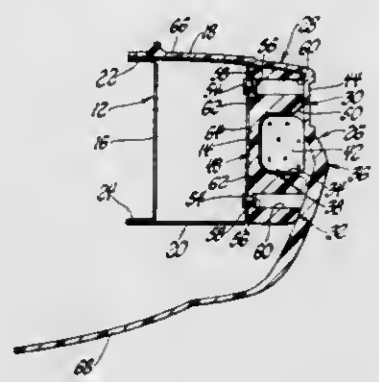
Alex C. Mair, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 20, 1977, Ser. No. 808,056
Int. Cl.² B60R *13/04*
U.S. Cl. 293—62 **2 Claims**



1. In a vehicle body, the combination comprising:
a vehicle body panel having an accessible outer face and an inaccessible inner face;
a molding strip of yieldable resilient material for attachment to the body panel to protect the body panel;
adhesive means acting between the molding strip and the body panel;
a pair of spaced apart circular cylindrical studs of uniform cross section projecting from the surface of the body panel and being inclined away from one another;
a pair of laterally spaced circular cylindrical bores of uniform cross section provided in the molding strip and having an angle of inclination equal to the angle of inclination of the studs projecting from the body panel, said molding strip being attached to the body panel by longitudinally stretching the molding strip to engage the molding strip over the projecting studs with the studs captured within the bores.

4,106,804
ENERGY ABSORBING BUMPER ASSEMBLY

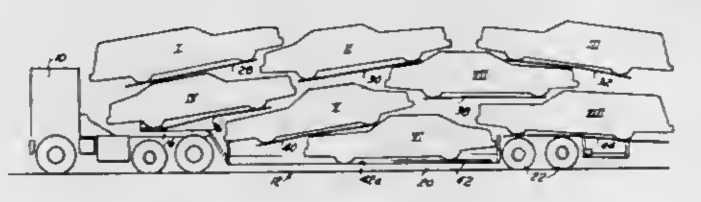
Jerry V. Scrivo, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.
Filed Feb. 26, 1976, Ser. No. 661,710
Int. Cl.² B60R *19/10*
U.S. Cl. 293—63 **25 Claims**



1. An energy absorbing bumper assembly comprising: a mounting means adapted for attachment to a vehicle, an elongated shell disposed adjacent said mounting means, a first bumper means of elastomeric material disposed between said mounting means and said shell for absorbing a first quantity of energy, said first bumper means including at least one pair of blocks, said shell having a front face with upper and lower portions, said pair comprising first and second members spaced vertically apart and defining a cavity interiorly of said front face of said shell, said first member presenting a continuous surface from said cavity through said upper portion of said shell, said second member presenting a continuous surface from said cavity through said lower portion of said shell, and a second bumper means disposed within said cavity for absorbing a second quantity of energy, said second bumper means having a different energy absorbing capacity than said first bumper means said continuous surface of said first member being the only medium between said cavity and said upper portion of said shell, said continuous surface of said second member being the only medium between said cavity and said lower portion of said shell.

4,106,805
VEHICLE TRANSPORT TRAILER

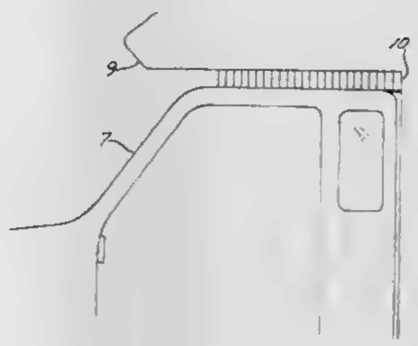
Billy Harold, 6869 Oldham St., Taylor, Mich. 48180
Continuation-in-part of Ser. No. 590,196, Jun. 25, 1975, Pat. No. 3,994,523, which is a continuation of Ser. No. 452,237, Mar. 18, 1974, abandoned. This application Jun. 2, 1976, Ser. No. 692,060
Int. Cl.² B62C *1/00*
U.S. Cl. 296—1 A **13 Claims**



1. A vehicle transport trailer for carrying a plurality of vehicles comprising:
three upper elevatable tracks operable to be height adjusted in a loaded condition, a first upper track having its front end proximate a forward end of said trailer;
a pair of intermediate tracks adjustable for height, a first of said intermediate tracks substantially aligned below the first of said upper tracks and a second of said intermediate tracks spanning a rear and front respective end of the two rearwardmost upper tracks;
three lower tracks mounted in a bed of said trailer; the rearwardmost two of said lower tracks substantially stationary in said bed and a forwardmost of said lower tracks being vertically movable; and
lifting means operably connected to the forwardmost of said lower tracks for lifting and expanding it forwardly between a loading and a loaded position.

4,106,806
WINDSPLITTER TRUCK STABILIZER

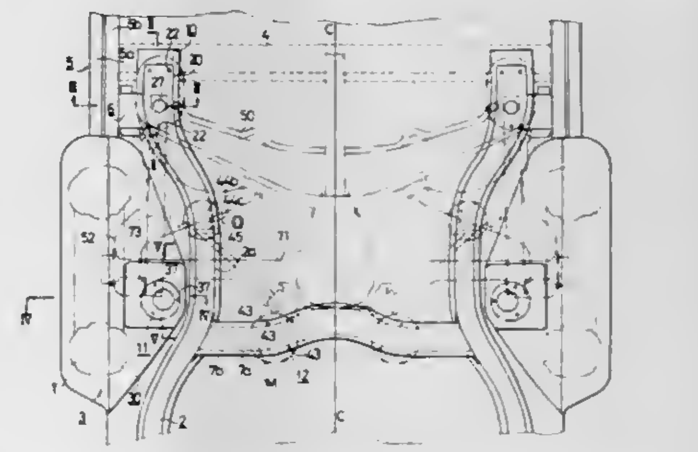
Frank M. Haddon, P.O. Box 2135, Downey, Calif. 90242
Filed Feb. 28, 1977, Ser. No. 726,237
Int. Cl.² B60P *3/32*
U.S. Cl. 296—23 MC **4 Claims**



1. A windsplitter truck stabilizer for use with a truck which includes a cab with a pick-up body and a camper carried in said pick-up body which has a forward portion which overhangs the roof of said cab but leaves a space between said camper overhanging portion and said cab roof: wherein said stabilizer is essentially triangular and fills the space between said overhanging camper portion and said cab roof and where said stabilizer is substantially positioned secured to said camper overhang so that an apex of its triangular shape is centered on said camper overhang and pointed forward with the two sides forming said apex sloping outwardly and back about equally toward the outer edges of said camper.

4,106,807
MOTOR VEHICLE BODY CONSTRUCTION

Shinichiro Sakurai, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan
Filed Apr. 15, 1977, Ser. No. 787,967
Claims priority, application Japan, Apr. 23, 1976, 51-47074
Int. Cl.² B60G *9/00*
U.S. Cl. 296—28 R **7 Claims**



1. A motor vehicle body construction for supporting the rear suspension of the vehicle comprising:
a floor panel so constructed and arranged to extend from the front of the passenger compartment to the rear end of the vehicle;
a pair of elongate rigid members connected to the floor panel throughout at least a portion of their length, each being

arranged to extend symmetrically with respect to the other from a first position, located near the side of the vehicle and forward of the common axis of rotation of the rear wheels, substantially parallel to the center line C of the vehicle to a second position between the rear end of the vehicle and the common axis or rotation of the rear wheels;

a pair of rear wheel housings each so constructed and arranged to cover the rear wheels of the vehicle, and be located outboard of an elongate rigid member and not extend further than said first and second positions;

a cross member connected symmetrically at its both ends to the pair of elongate rigid members and arranged to extend across the vehicle body rear of the common axis of rotation of the rear wheels;

a first pair of suspension mounting sites each formed at the forward end of each elongate rigid member so as to be located forward of the common axis of the rear wheels;

a second pair of suspension mounting sites each formed at the top of a wheel housing;

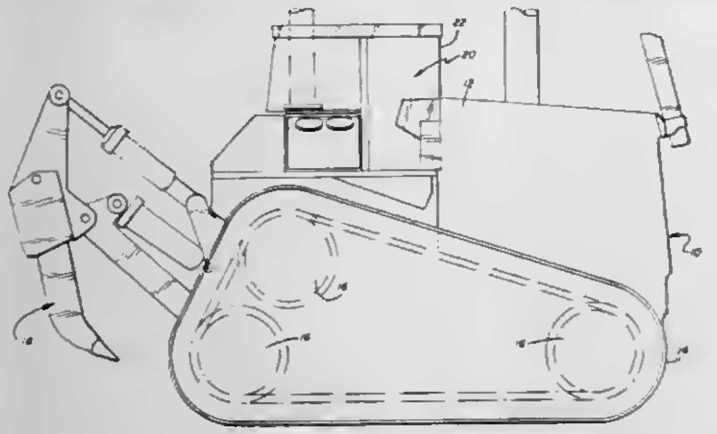
a third pair of suspension mounting sites formed on the cross member so as to be located rear of the common axis of rotation of the rear wheels and close to the centre line C of the vehicle;

a fourth pair of suspension mounting sites each formed on an elongate rigid member so as to be located between the first suspension mounting site and the common axis of rotation of the rear wheels; and

bracket means connectable to the suspension mounting sites so that a plurality of different types of vehicle rear suspension may be interchangeably fitted to the vehicle.

4,106,808
TAPPING STRIP RETAINER

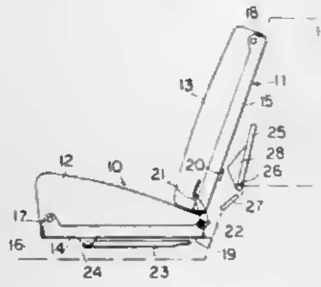
Michael B. Hyde, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 16, 1977, Ser. No. 778,201
Int. Cl.^{2} B62D *23/00*
U.S. Cl. 296—35 R **10 Claims**



1. In a retainer for fastening two parts together comprising an elongate bar, one of said parts having a wall with at least one elongate opening therethrough, mounting means passing through one of said elongate openings and engaging with said elongate bar, fastening means on said bar, mating fastening means on said other of said parts and aligning with said elongate bar, said mounting means being released to adjust the position of said fastening means on said bar into alignment with the fastening means on said other part whereby said fastening means are fastened together and said mounting means is locked to said one part.

4,106,809
CONVERTIBLE SEAT OF A VEHICLE

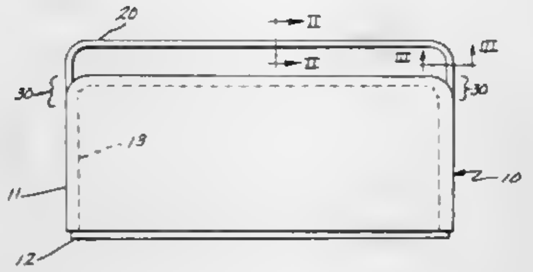
Karlis Minka, 204 E. Joppa Rd., Towson, Md. 21204
Filed Jul. 26, 1977, Ser. No. 819,157
Int. Cl.^{2} B60N *1/10*
U.S. Cl. 296—69 **23 Claims**



1. In a vehicle body, a convertible seat comprising a seat base unit having a seat-forming position and a load-carrying position, a seat back unit having a seat-forming position and a load-carrying position, first unit support means and second unit support means for supporting the seat base unit and the seat back unit, respectively, on the vehicle body, said units cooperating in the respective load-carrying positions to protectively close a load-carrying space and cooperating in the respective seat-forming positions to comfortably accomodate passengers, the first unit support means supporting the seat base unit for movement of the seat base unit between the seat-forming and the load-carrying positions thereof, the second unit support means supporting the seat back unit for movement of the seat back unit between the seat-forming and the load-carrying positions thereof, the seat base unit constituting in the load-carrying position thereof a forward wall protectively closing the front of the load-carrying space, the seat back unit constituting in the load-carrying position thereof a cover protectively closing the top of the load-carrying space, the upper edge of the seat back unit being at substantially the same level in either one of the seat-forming and the load-carrying positions of the seat back unit, and unit retaining means for positioning and maintaining said units in each of the respective seat-forming and load-carrying positions thereof.

4,106,810
GRAB RAIL FOR TRANSIT VEHICLE SEATS

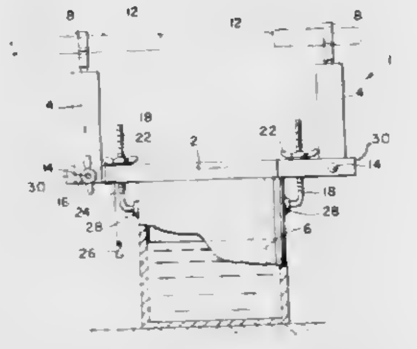
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Continuation of Ser. No. 569,970, Apr. 21, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,656
Int. Cl.^{2} A47C *11/00*
U.S. Cl. 297—183 **10 Claims**



1. A seat for mass transportation vehicles having a back portion terminating at an upper edge, a grab rail means having end portions at each end extending upwardly from said upper edge and a central portion connected to said end portions, said grab rail means extending along substantially said entire edge and spaced vertically therefrom a distance so as to provide an open space therebetween thereby providing the functions of a rail for passengers behind said seat to grab to assist them in entering and leaving said seat and providing a barrier means which will minimize the propelling of such passengers over said seat, the improvement comprising: said grab rail means being constructed of at least one elongated rectangular, tubular core member having a cross section in which the width is greater than the depth, said member being more easily deflected by a force from a vertical direction than from a horizontal direction; said core member being covered on at least the sides and top by a cushioned material covering of a thickness which does not destroy the rail's function of being capable of being grabbed by passengers to assist them in entering and leaving said seat and which when subjected to a force deflects before deflection of the core member; said combination of said deflectable core member and said cushioned material covering providing an energy absorbing grab rail for absorbing forces exerted thereon by a passenger striking the same in the event of sudden deceleration of the vehicle in which the seat is located; said energy absorption being provided by initial deflection of the cushioning material, then deflection of the core member, and if the force is sufficiently great, the subsequent deformation of the core member.

4,106,811
FISHING SEAT, ROD, AND PAIL HOLDER

Henry Hernandez, 1087 Admont Ave., Franklin Sq., N.Y. 11010
Filed Jan. 10, 1977, Ser. No. 757,906
Int. Cl.^{2} A01K *97/10*
U.S. Cl. 297—193 **1 Claim**

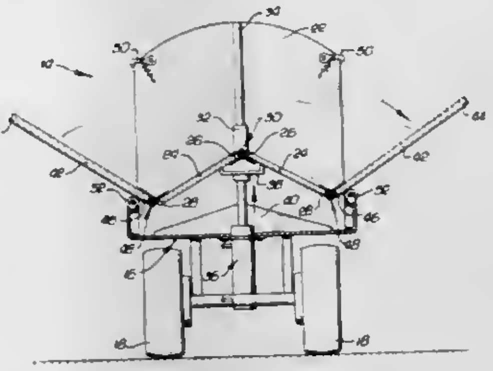


1. A combined fishing seat and rod and pail holder comprising:
a horizontal seat,
a plurality of vertically extending arms removably secured to said seat,
spring clamps attached to the upper ends of said arms for holding a rod and having their rod engaging surfaces coated with a resilient material,
a pair of slots extending through said seat,
a pail positioned under said seat and having a pair of holes in the side thereof,
an L-shaped member extending through each of said slots in said seat and into each of said holes in said pail,
means to secure each said L-shaped member to said seat and pail, and
a clip attachable to said rod and fastened to said seat by a cord.

4,106,812
SIDE DUMPING VEHICLE

Lee M. Clark, 4400 Philadelphia #61, Chino, Calif. 91710
Filed May 9, 1977, Ser. No. 794,799
Int. Cl.^{2} B60P *1/34*
U.S. Cl. 298—1 B **5 Claims**

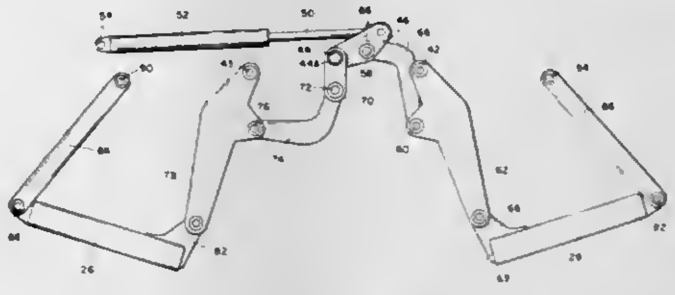
5. A side dumping vehicle comprising two bottom walls respectively having inner and outer edges and two side walls respectively having upper and lower edges, first hinge means pivotally interconnecting said inner edges of said bottom walls, two second hinge means respectively pivotally interconnecting said lower edges of said side walls and said outer edges of said bottom walls, two supporting means for respectively moveably supporting said side walls for movement between upright positions and laterally outwardly and downwardly sloping positions, and means for displacing said bottom and



side walls between a trough shaped configuration in cross section and an inverted "V" configuration in cross section.

4,106,813
BOTTOM DUMP DOOR LINKAGE APPARATUS AND DUMP BODY PARTITION MEANS

Edgar R. Goodbary, Cardin, Okla., assignor to Goodbary Engineering Co., Cardin, Okla.
Filed Nov. 23, 1976, Ser. No. 744,432
Int. Cl.^{2} B60P *1/56*
U.S. Cl. 298—35 M **4 Claims**



1. In combination with an off-highway vehicle having a dump body provided with a bottom opening for discharge of materials therethrough, a pair of substantially identical longitudinally extending doors mounted in said opening and adapted for alternate opening and closing of the bottom opening, single linkage assembly means operably connected with said doors for opening and closing said doors, said linkage assembly being of a double-acting scissor-type operation maintaining the overall movement of the linkage assembly through a minimum distance during the opening and closing of the doors and single actuator means operably connected at substantially the midpoint of said linkage assembly for actuation thereof during said opening and closing of the doors, said linkage assembly comprising first bell crank means pivotally secured between the actuator means and a fixed pivot point, second bell crank means pivotally secured between said first bell crank means and a first lever means, said first lever means pivotally secured between a fixed pivot point and one of said doors for movement of said door between said open and closed positions therefor, link means pivotally secured to said first fixed pivot point and movable simultaneously with said first bell crank means, third bell crank means pivotally secured between said link means and a second lever means, said second lever means pivotally secured between a third fixed pivot point and the other of said doors for movement of said other door between said open and closed positions simultaneously with the opening and closing of said first-mentioned door.

4,106,814

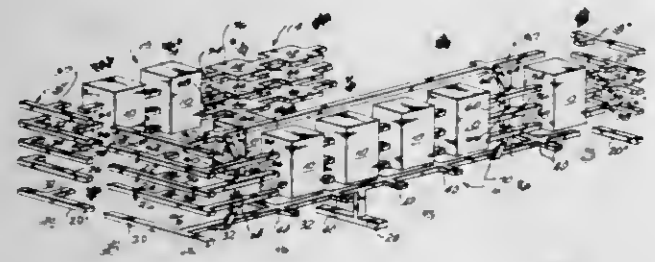
METHOD OF FORMING IN SITU OIL SHALE RETORTS

Gordoo B. Freach, Bakersfield, Calif., assignnr to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 15, 1977, Ser. No. 815,799

Int. Cl.² E21B *43/24, 43/26;* E21C *41/10*

U.S. Cl. 299—2 **22 Claims**



1. A method for recovering liquid and gaseous products from a plurality of in situ oil retorts in a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, each retort site having top, bottom and side boundaries, the method comprising the steps of:

excavating an upper level retort access drift through opposite side boundaries of a plurality of such retort sites;

excavating a lower level retort access drift at an elevation below the elevation of the upper level access drift, the lower level retort access drift also being excavated through opposite side boundaries of a plurality of such retort sites;

excavating a plurality of horizontally spaced apart upper horizontal voids along the length of the upper level access drift, each such upper horizontal void being excavated within the boundaries of a separate in situ retort site and having a horizontal cross section substantially larger than the horizontal cross section of the upper level retort access drift;

excavating a plurality of horizontally spaced apart lower horizontal voids along the length of the lower level access drift, each such lower horizontal void being excavated within the boundaries of a separate in situ retort site and at a location spaced vertically below a corresponding upper horizontal void, each such lower horizontal void having a horizontal cross section substantially larger than the horizontal cross section of the lower level retort access drift;

leaving a zone of unfragmented formation between adjacent vertically spaced apart upper and lower voids, such an unfragmented zone having a horizontal free face of formation adjoining each of the adjacent vertically spaced apart voids;

explosively expanding such a zone of unfragmented formation toward the horizontal free faces provided by such upper and lower horizontal voids to form a fragmented permeable mass of formation particles containing oil shale within said top, bottom and side boundaries of such a retort; and

retorting oil shale in the fragmented mass in each such in situ oil shale retort for producing liquid and gaseous products.

4,106,815

MINING MACHINES

Eric James Dunn, Retford, England, assignor to Dosco Overseas Engineering Limited, England

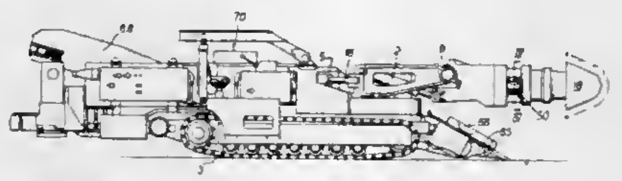
Filed Nov. 5, 1976, Ser. No. 739,095

Claims priority, application United Kingdom, Nov. 18, 1975, 47440/75

Int. Cl.² E21C *25/06*

U.S. Cl. 299—59 **4 Claims**

1. A mining machine comprising a body, means for driving the body forwardly towards a working face, a boom projecting forwardly from said body, a cutting tool mounted on the forward end of the boom, means for moving said boom relative to said body to effect transversing of a working face by said cutting tool, a drive mechanism for rotating the cutting tool relative to the boom, and said drive mechanism includes a multi-speed gearbox for selectively driving the cutting tool at two or more different cutting speeds, said gearbox including a gear selector lever movable between operating positions corresponding to respective ones of the cutting speeds of said gearbox, means for locking the gear selector lever in each of the operating positions, and a key for operating the locking means, and the drive mechanism for the cutting tool includes a motor and a lock, the motor being inoperable unless the said key is engaged in the lock.



4,106,816

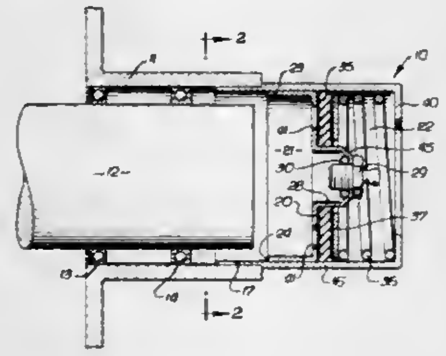
HUB CAP FOR TRAILER WHEELS AND THE LIKE

William S. August, Altadena, Calif., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jun. 28, 1977, Ser. No. 810,808

Int. Cl.² B60B *27/00*

U.S. Cl. 301—108 R **6 Claims**



1. In a hub cap for a vehicle wheel, the combination of:

a housing having a first open end for mounting on a vehicle and a second opposite end,

said housing including a fixed central member dividing said housing into an inner zone and an outer zone and having at least one opening for providing for grease flow between said zones,

said central member including a boss projecting into said outer zone;

a grease fitting mounted in said boss of said central member;

a seal slidable in said outer zone between a first sealing position in sealing engagement with said housing and said boss and a second non-sealing position out of engagement with said boss; and

a spring retained in said outer zone and urging said seal toward said first position.

4,106,817

APPARATUS FOR PNEUMATICALLY TRANSPORTING POWDERY OR GRANULAR MATERIALS

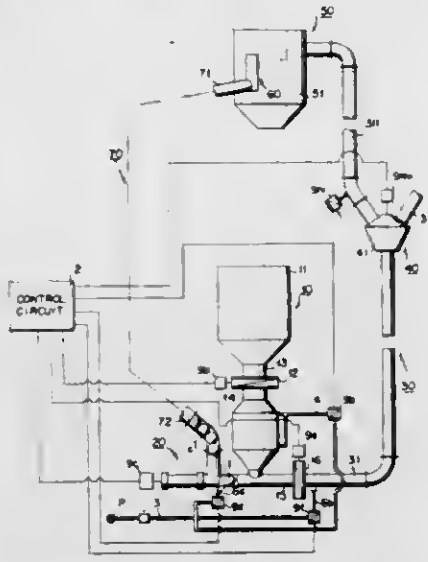
Akihiko Tsuzuku, Hiratsuka; Masao Tanazawa, Tokyo; Masashi Kaminishi, Hiratsuka, and Haruo Imamura, Fujisawa, all of Japan, assignors to Kabusbiki Kaisba Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 30, 1976, Ser. No. 701,025

Claims priority, application Japan, Jun. 30, 1975, 50-80694; Jun. 30, 1975, 50-91395[U]; Jun. 30, 1975, 50-91396[U]; Jul. 31, 1975, 50-105149[U]; Jul. 31, 1975, 50-105150[U]; Jul. 31, 1975, 50-105151[U]; Jul. 31, 1975, 50-105152[U]; Aug. 27, 1975, 50-117008[U]

Int. Cl.² B65G *51/02, 53/00*

U.S. Cl. 302—17 **16 Claims**



1. An apparatus for pneumatically transporting powdery or granular material from a material supply unit with a supply pipe to a material receiver unit through a transport pipeline connected between the supply pipe and the material receiver unit, comprising spherical secondary transport mediums each having a diameter slightly less than the inside diameter of said transport pipeline and adapted to be intermittently supplied by supply means into said supply pipe at a position just behind the material to be transported, separation means provided within said material receiver unit for separating the transported material from said transport mediums, and collection means provided between said supply means and said separation means so as to return said transport mediums into said supply means, characterized in that said material supply unit comprises the combination of:

a supply hopper arrangement with a material drop port formed in the lowermost part thereof, said supply hopper arrangement being mounted on the uppermost part of said material supply unit for accommodating therein the material to be transported;

a pressure chamber arrangement with upper and lower opening, said pressure chamber arrangement being provided under the material drop port of said supply hopper arrangement and being fixedly connected at the lower opening thereof to a substantially intermediate portion of said supply pipe for pressurizing the material supplied thereinto from said supply hopper arrangement by the action of airflow under pressure;

a hopper gate arrangement provided between said supply hopper arrangement and said pressure chamber arrangement for opening and shutting the material drop port of said supply hopper arrangement; and

a pipe gate arrangement provided in and mounted on said supply pipe on the side of the distal end of the latter for opening and airtightly shutting said supply pipe,

and in that said supply means for supplying said spherical secondary transport medium comprises:

a first casing fixedly connected to the proximal end of said supply pipe into which said transport medium is dropped one by one;

a second casing fixedly connected between said first casing and said collection means for returning said secondary transport mediums to said supply means;

an outer cylindrical hollow member having opening at upper and lower portions thereof, respectively, and fixedly secured to said second casing;

a cylindrical rotary member having formed in a part of the peripheral surface thereof a recess adapted to contain one by one said secondary transport mediums therein, said rotary member being rotatably, airtightly inserted into said outer cylindrical hollow member and being provided at both ends thereof with shafts journaled by means of bearings installed within both side ends of side outer cylindrical hollow member; and

a rotary driving power source connected to the end of one of shafts for rotating said rotary member.

4,106,818

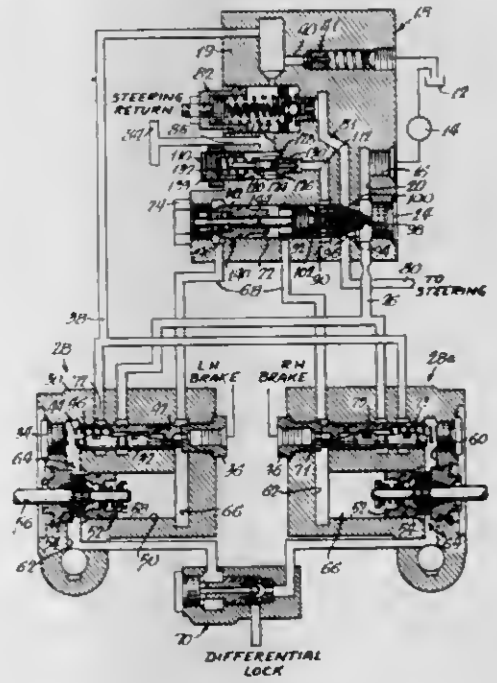
BRAKING SYSTEM FOR VEHICLE

George T. Fiala, Geneseo, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed May 27, 1977, Ser. No. 801,148

Int. Cl.² B60T *13/18;* 60 *547;548;555*

U.S. Cl. 303—11 **6 Claims**

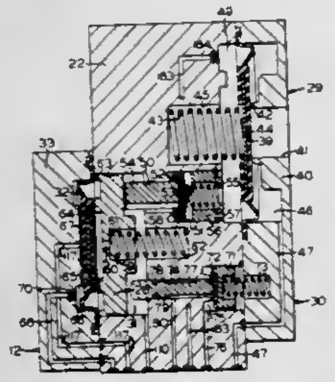


1. In a braking system for a vehicle including a reservoir; a pressurized fluid source; a fluid actuated brake; brake actuating means having a first conduit connected to said source and a second conduit connected to said reservoir; an auxiliary fluid actuated mechanism connected to said first conduit, and pressure regulating valve means in said first conduit for controlling flow of fluid to said auxiliary fluid actuating mechanism and the pressure of fluid flowing from said source to said brake actuating means with said brake actuating means having a third conduit connected to said pressure regulating valve means, said brake actuating means having movable valve elements defining first and second chambers, said first chamber being in communication with said third conduit and said fluid actuated brake, said movable valve elements having a first position placing said chambers in communication with each other and with said second conduit while blocking flow from said first conduit and a second position placing said first conduit in communication with said second chamber and blocking flow between said second conduit and both chambers, the improvement of said pressure regulating valve means having a valve bore with said first conduit in communication with one end of said bore and said auxiliary fluid actuated mechanism in communication with said bore adjacent said first conduit, a pres-

sure release assembly slidable in said bore and having one end in communication with source and an opposite end in communication with said third conduit, orifice means in said pressure release assembly and in communication with said source, and pilot valve means in communication with said bore and said orifice means so that said pressure release assembly and pilot valve means regulate the pressure of fluid to said brake actuating means and regulate flow of fluid to said auxiliary fluid actuated device at any pressure of said pressurized fluid source.

4,106,819
EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

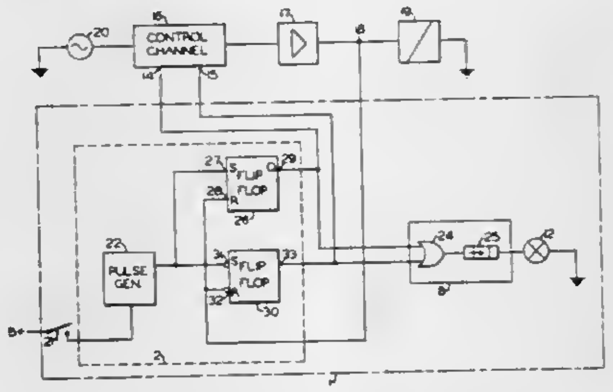
James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Aug. 18, 1977, Ser. No. 825,748
Int. Cl.^{2} B60T *15/32, 15/42*
U.S. Cl. 303—38 **36 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir, an emergency reservoir and a quick action chamber each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application, said emergency valve device comprising:
- (a) a quick service volume chamber,
- (b) a continual quick service valve device operable jointly by the pressure in the quick action chamber and in the brake pipe in response to a continuing reduction of the pressure in the brake pipe at a service rate to effect repeated successive release of fluid under pressure from said quick service volume chamber to atmosphere and thereafter recharge of said quick service volume chamber from the brake pipe to the reduced pressure present in the brake pipe,
- (c) restricted means enabling flow of fluid under pressure from the brake pipe to the quick action chamber to provide for charging the quick action chamber from the brake pipe to the pressure in the brake pipe, and
- (d) fluid-pressure-operated means operably responsive to the release of fluid under pressure from the brake pipe to atmosphere to so cooperate with said continual quick service valve device and said restricted means as to cause the release of fluid under pressure from the quick action chamber to atmosphere at a rate in excess of said service rate, whereby said continual quick service valve device is rendered sequentially operative to terminate the release of fluid under pressure from said quick service volume chamber to atmosphere and thereafter effect recharging of said quick service volume chamber from the brake pipe to the reduced pressure in the brake pipe, and said fluid-pressure-operated means is rendered sequentially operative in conjunction with said continual quick service valve device to terminate the release of fluid under pressure from the quick action chamber to atmosphere at said rate that is in excess of said service rate to enable the flow of fluid under pressure from the brake pipe to the quick action chamber until the pressure in the quick action chamber is the same as that in the brake pipe.

4,106,820
CIRCUIT ARRANGEMENT FOR PERIODICALLY TESTING THE OPERATING RELIABILITY OF AN ELECTRONIC ANTISKID CONTROL SYSTEM

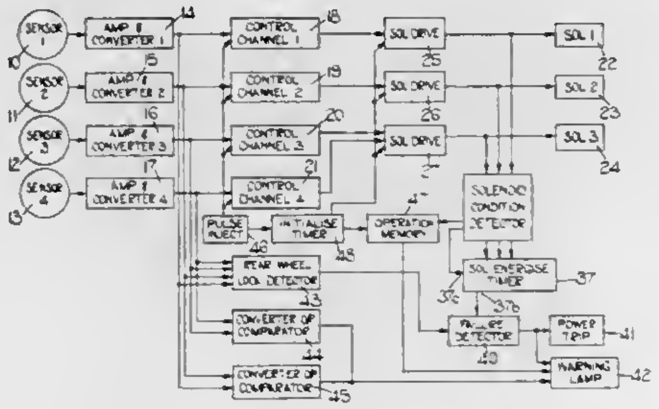
Gerhard Ruhnau, Hannover; Lutz Weise, Misburg a.d., and Karl-Heinz Hesse, Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Fed. Rep. of Germany
Filed Jul. 11, 1977, Ser. No. 814,077
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631569
Int. Cl.^{2} B60T *8/00*
U.S. Cl. 303—92 **19 Claims**



1. A test circuit for periodically monitoring the operational reliability of an electronic antiskid brake control system in which an electro-pneumatic modulator valve device influences the fluid brake pressure of a vehicle, such as a road vehicle, independently of the operator, in response to wheel behavior signals transmitted from a wheel sensor to an electronic control channel having an output amplifier via which a control signal is connected to the modulator valve device, said test circuit comprising:
- (a) pulse generator means for emitting a periodic pulse signal;
- (b) warning means operatively responsive to the presence of said periodic pulse signal for a predetermined time duration for issuing a warning signal indicative of an impending malfunction of said control channel or said output amplifier;
- (c) said control channel being normally operatively responsive to said periodic pulse signal for injecting in said control signal an impulse signal having a voltage level corresponding to the opposite digital logic state of said control signal indicative of said control channel and said output amplifier being capable of providing said control signal at a voltage level representative of said opposite digital logic state; and
- (d) evaluation means responsive to said injected impulse signal for nullifying said periodic pulse signal at said warning means to prevent operation thereof prior to expiration of said predetermined time duration.

4,106,821
FAILURE DETECTION CIRCUIT FOR A VEHICLE ANTI-SKID BRAKING SYSTEM

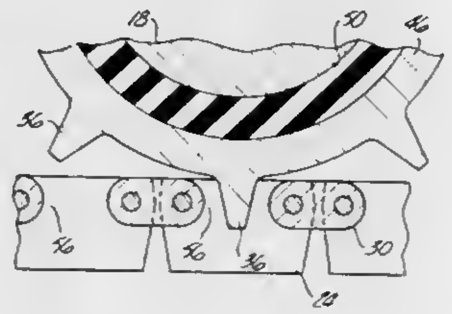
Malcolm Brearley, Solihull, England, assignor to Girling Limited, Birmingham, England
Filed Oct. 7, 1976, Ser. No. 730,423
Claims priority, application United Kingdom, Oct. 1, 1975, 40084/75
Int. Cl.^{2} B60T *8/00*
U.S. Cl. 303—92 **9 Claims**



9. An anti-skid braking system, comprising
- a wheel sensor providing an output in response to wheel speed,
- means operatively connected to said sensor output and providing a slippage output in response to sensed wheel slippage,
- coil means operatively connected to said slippage means and selectively energized in response to said slippage output to provide a brake control output,
- means operatively connected to said coil means and selectively providing a timing sequence in response to the energisation of said coil means and providing a warning output in response to a timing sequence of a predetermined duration,
- detecting means operatively connected to said coil means and providing a back e.m.f. responsive output in response to the deactivation of said coil means, and
- reset means operatively connected to said detecting means and resetting said timing sequence of said timing means in response to said back e.m.f. responsive output.

4,106,822
TRACK GUIDE MECHANISM

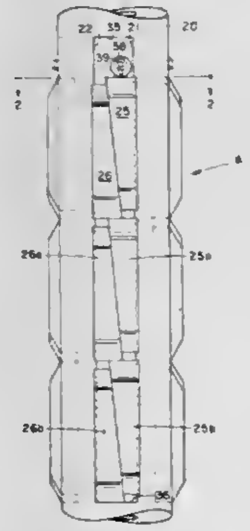
Richard A. Lee, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 14, 1977, Ser. No. 777,253
Int. Cl.^{2} B62D *55/14*
U.S. Cl. 305—28 **1 Claim**



1. In a tracked vehicle comprising a hull, ground-engaging tracks, and hull-mounted roadwheels riding on the track upper faces to absorb road shock forces, each track comprising two rows of ground-contacting blocks, end connectors pivotally joining the blocks along their outer side edges, and center connectors pivotally joining the blocks along their inner facing side edges: the improvement wherein the spaces between adjacent ones of the center connectors are utilized as guide openings to maintain track-roadwheel alignment; selected ones of the roadwheels having guide teeth thereon cooperable with the aforementioned guide openings; each selected roadwheel comprising two axially spaced cylindrical sections ridable on a row of ground-contact blocks, and a series of teeth arranged in the central transverse plane of the wheel for entry into successive ones of the guide openings as the wheel rolls along the block upper surfaces; the side faces of the teeth cooperating with edge surfaces of the blocks to maintain the track in alignment with the roadwheels; each tooth having a circumferential thickness substantially less than the length of each guide opening, whereby the teeth are precluded from striking the center connectors even though the associated roadwheel should slightly advance or retract along the track upper surface; means resiliently connecting the teeth to the associated roadwheel comprising an endless rigid ring (46) having said teeth extending therefrom, said ring being located within an annular groove formed in the peripheral surface of the associated roadwheel, and an endless elastomeric sleeve bonded to the ring inner surface and groove bottom surface, so that circumferential loads on the teeth produce torsional stress in the elastomeric sleeve without destruction of the above-mentioned bonds; said ring having sufficient radial thickness to maintain its initial configuration under load forces on the teeth; each elastomeric sleeve having a substantial radial thickness, whereby the sleeve can undergo torsional strain equivalent to the length of a center connector.

4,106,823
BOREHOLE CONTACTING APPARATUS FOR BOTTOM HOLE ASSEMBLY

Grey Bassinger, 2201 Country Club Dr., Midland, Tex. 79701
Filed Oct. 26, 1977, Ser. No. 845,777
Int. Cl.^{2} F16C *1/26*
U.S. Cl. 308—4 A **14 Claims**



1. A borehole wall contacting apparatus for a drill string comprising:
- an elongated body having a drilling fluid passage therethrough and having means for mounting in a drill string;
- a plurality of radially spaced retaining grooves formed in the outer surface of the elongated body with borehole wall contact means mounted therein;
- said borehole wall contact means including at least one pair of coacting elements, each element including a borehole wall contact surface, a retaining groove contacting portion and a camming portion, said camming portions of said pair of elements being slidably engageable upon relative movement of the elements toward each other to force the retaining groove contacting portions into locking engagement with the retaining groove.

4,106,824

HYDROSTATIC SUPPORTING DEVICE

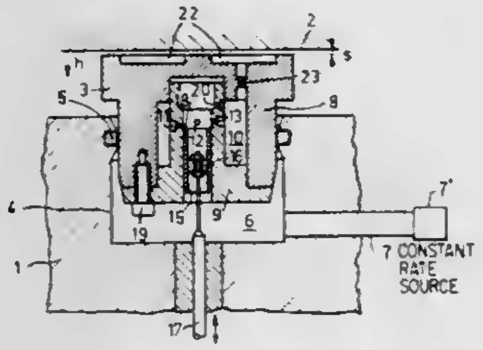
Noel Meystre, Meilen; Alfred Christ, Zurich, and Helmut Miller, Niederrhrodorf, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,252

Claims priority, application Switzerland, Dec. 2, 1975, 15607/75

Int. Cl.² F16C *32/06*

U.S. Cl. 308—9 **13 Claims**



1. Hydrostatic supporting apparatus for supporting without physical contact a mobile part which is subject to variable loading and moves relatively to a load-bearing part, the apparatus comprising

a. an hydraulic supporting motor including a pressure chamber formed in the load-bearing part and a supporting piston which is urged toward the mobile part by the pressure in that chamber,

b. the supporting piston having one end which is subject to pressure in said chamber and an opposite end which obtains at least one hydrostatic bearing pocket which opens in the direction of the mobile part and serves to provide a pressure cushion which supports that part;

c. a source of hydraulic fluid under pressure which delivers fluid at a constant rate and is connected with the pressure chamber by supply passage means;

d. a first flow passage which is throttled and which interconnects said pocket and chamber;

e. a second flow passage which is connected in parallel with the first flow passage; and

f. throttle valve means having cooperating members carried, respectively, by the supporting piston and the load-bearing part and which serves to increase and decrease restriction to flow through the second flow passage as the supporting piston moves toward and away from the load-bearing part, respectively.

4,106,825

HIGH PRESSURE MAGNETIC DRIVE INCLUDING MAGNETIC THRUST BEARINGS

Robert F. Ruyak, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Dec. 13, 1976, Ser. No. 749,789

Int. Cl.² F16C *17/10*

U.S. Cl. 308—139 **9 Claims**

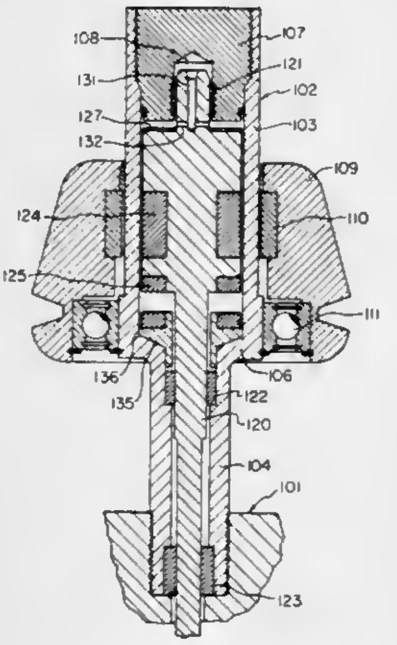
1. A magnetic drive assembly for transmitting torques to the interior of a pressurizable vessel or the like comprising:

a nonmagnetic tubular housing having two portions, one of larger diameter than the other, there being an annular step between the portions of the housing having different diameters, said housing having at the end of the portion of smaller diameter an opening securable to an opening in a pressurizable vessel whereby the housing may be subjected to the vessel pressure, said housing having an opening in the end of the portion of larger diameter and a plug for sealing said last mentioned end;

a sheave coaxial with and surrounding said larger diameter portion of the tubular housing, said sheave mounted rotatably thereto, said sheave carrying circumferentially magnetized rare earth cobalt magnets defining an even number of north and south magnetic poles having substantially equal angular spacing;

a driven shaft journaled in said housing by bushings that impose no axial restraint on said shaft and permit axial passage of the pressurized atmosphere to equalize pressure within said housing, said shaft being long enough to extend through an opening of said housing, said shaft having mounted thereto circumferentially magnetized cylindrical rare earth cobalt magnets defining an equal number of north and south magnetic poles having the same substantially equal angular spacing as the magnets mounted in said sheave, such that when the sheave is turned the driven shaft will follow, said shaft having at least one annular rare earth cobalt magnet being coaxial with and attached to said driven shaft, in the vicinity of the annular step, said annular magnet being axially polarized;

said nonmagnetic tubular housing having associated therewith at least one annular rare earth cobalt magnet coaxial with the driven shaft secured to the tubular housing near the annular step and said annular magnet being axially polarized and arranged to cooperate with the axially polarized annular magnet attached to said driven shaft so that magnetically opposite poles face to thus repulse the axial movement of the driven shaft toward the pressure vessel maintaining the axial position of said shaft.



4,106,826

BEARING WITH LUBRICATING SYSTEM

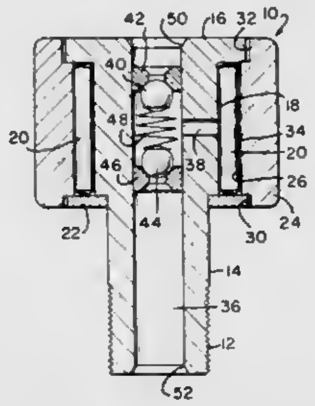
Americo Edward Marola, Torrington, and Leo Stella, Bristol, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Aug. 22, 1977, Ser. No. 826,453

Int. Cl.² F16C *33/66*

U.S. Cl. 308—187 **6 Claims**

1. A bearing comprising: an inner race member with a raceway and an outer race member with a raceway spaced from said inner race member raceway to provide an annular bearing space, the inner member having a longitudinal lubrication bore extending at least partially through the inner member; roller bearing members in said annular bearing space; a communicating passage from the longitudinal bore to the inner member raceway; and at least one one-way check valve mounted within said longitudinal lubrication bore as a permanent part of the inner race member, said valve including a valve seat in direct contact with the wall of the longitudinal lubrication bore and adapted to permit the flow of lubricant through the longitudinal lubrication bore, through the communicating passage, and into said annular bearing space, and to prevent the flow of lubricant back past the check valve and to exclude contaminants.



4,106,827

BEARING WITH TWO ROWS OF ROLLING ELEMENTS INCLUDING METHOD OF MOUNTING BEARING

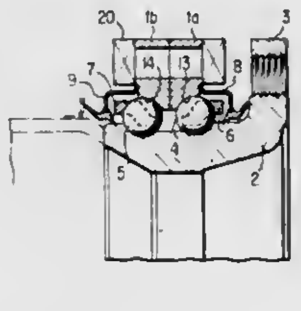
Alain Ducret, Annecy Levieux, and André Maurice Chalesle, Paris, both of France, assignors to Regie Nationale des Usines Renault, Billancourt, France

Filed Apr. 7, 1977, Ser. No. 785,694

Claims priority, application France, Apr. 7, 1976, 76 10061

Int. Cl.² F16C *33/76*

U.S. Cl. 308—187.1 **11 Claims**



1. A bearing comprising:

an outer race;

an inner race having a shoulder radially extending from one side thereof to form a mounting flange;

two bearing grooves in each of said outer and inner races;

two holding and guiding cages of the same continuous circular configuration disposed in parallel relation between said outer and inner races;

two sets of rolling elements arranged in parallel rows in corresponding bearing grooves of said outer and inner races and within respective ones of said two holding and guiding cages and wherein said outer race is made up of a pair of elementary races, each having one of said two bearing grooves therein, such that adjacent faces of said pair of elementary races are brought together.

4,106,828

DISPLAY FIXTURE

Paul Belokin, Jr., R.R. #4, Hayward, Wis. 54843

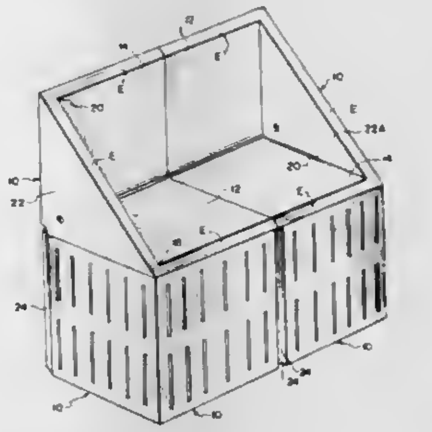
Filed Feb. 14, 1977, Ser. No. 768,148

Int. Cl.² A47B *87/00*

U.S. Cl. 312—107 **2 Claims**

1. A display fixture unit comprising six identical units, four of said identical units having flat square sides and forming a base of said display fixture unit; two of said identical units each having right angular disposed abutting surfaces, and each of said two units defining a pair of coplanar edge surfaces interconnecting and diverging at right angles from each of the opposite ends of the corner edge, and

a planar isosceles right triangular wall interconnecting only one of the pairs of parallel coplanar edges and having its hypotenuse edge coplanar with said coplanar edges, the remaining triangular space being open; wherein said four identical units having edge configurations defining face-to-face engaging surfaces disposed at a 45° angle to the plane of the square sides of said units.



4,106,829

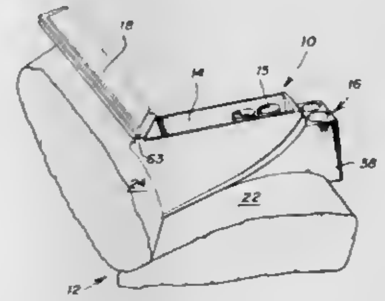
PORTABLE MOTOR VEHICLE DRINK COOLER, CADDY AND ARMREST

Alvin J. Dolle, 5303 Fredricksburg Rd., Apt. 2, San Antonio, Tex. 78229, and Joseph H. Butler, Jr., 3102 Clearfield, San Antonio, Tex. 78230

Filed Apr. 11, 1977, Ser. No. 786,388

Int. Cl.² A47B *67/02*

U.S. Cl. 312—235 A **9 Claims**



1. A portable motor vehicle cooler and armrest accessory dimensioned to rest on the benchseat in a motor vehicle, said accessory comprising:

outer side, front, rear and bottom walls defining a storage container, said rear wall contoured to fit and conform to the backrest of the benchseat, said bottom wall being contoured in a convex shape to fit and conform to the seat cushion of the benchseat to prevent said container from sliding therefrom while the vehicle is in motion;

a storage compartment defined by separate inner side, front, rear and bottom walls spaced from said outer walls, said inner walls substantially thermally insulated from said outer walls by an insulating medium;

a thermally insulated lid enclosing said storage compartment; and

material disposed substantially along the exposed upper side of said lid to provide an armrest for the occupant of the vehicle.

4,106,830

ROTATABLE SUPPORT STAND

Robert G. Sorgatz, Chicago, Ill. 60656

Filed Apr. 27, 1977, Ser. No. 791,436

Int. Cl.² H01R *39/00*

U.S. Cl. 339—8 R **10 Claims**

1. A support stand for electrically energizable apparatus, comprising:

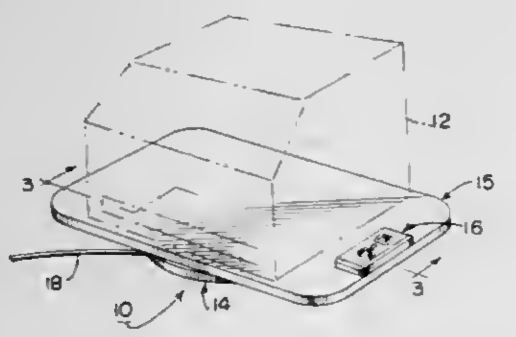
a base;

a platform disposed above said base and adapted to support the apparatus;

a grounded electrical outlet mounted on said platform for supplying electrical energy to the apparatus;

power line means connected to said base and adapted to be coupled to a source of electrical energy and to ground potential;

bearing means having a series of electrically conductive rollable bearing members being circular in cross section and being interposed between said platform and said base for supporting rollably said platform on said base to enable said platform to rotate freely about its vertical axis relative to said base in a continuous **360°** path of rotation and for coupling electrical energy to said electrical outlet, said bearing means including an upper bearing race fixed to the underside of said platform and composed of electrically conductive material for engaging said members, and a lower bearing race fixed to the top surface of said base opposite said upper race and composed of electrically conductive material for engaging said bearing members to guide said bearing race along a continuous first closed loop path of travel relative to the stationary lower bearing race;



upper and lower stationary contact means disposed within said closed loop path of travel and composed of electrically conductive material, said upper stationary contact means being attached to the underside of said platform and said lower stationary contact means being attached to the top surface of said base of said platform;

a first pair of electrical conductor leads connected electrically at one of their ends to said power line means, the other ends of said conductor leads being connected individually and electrically to said lower bearing race and to said lower stationary contact means;

a second pair of electrical conductor leads connected individually and electrically at one of their ends to said uper bearing race and to said upper stationary contact means, the other ends of said second pair of electrical conductor leads being connected electrically to said outlet; and

ground conductor means mounted between said base and said platform and extending through a second closed loop enclosing the first closed loop, said conductor means including a stationary closed loop conductor and moving electrical contact means for contacting continuously said closed loop conductor to couple said electrical outlet to said power line means.

4,106,831

REVOLVING CABLE-TO-HOUSING CONNECTION

Werner Albrecht, Nuremberg, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungsbutte AG., Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 651,189, Jan. 21, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,820

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501582

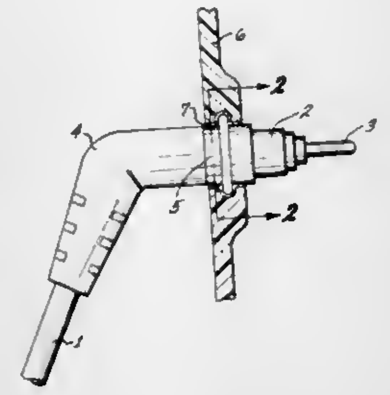
Int. Cl.² H01R *3/06*

U.S. Cl. 339—8 R **3 Claims**

1. Revolving connection of electrical cable conductors for passing through the relatively inflexible wall of a housing, comprising:

a socket member of a moldable plastic and being molded onto the cable thereby being mechanically connected to the conductors;

a pair of coaxial conductors in the socket member, mechanically and electrically connected to the said cable conductors, in addition to and independent from the mechanical connection for the cable to the socket member and being insulated from each other by a portion of the socket member being integral therewith;



a sleeve on said socket member being made of material having significant mechanical strength;

keying means integral with the socket member and inserted in the sleeve for firmly connecting the socket member to the sleeve and for impeding rotation of the sleeve relative to the socket member;

means in the housing defining a bearing for the sleeve and receiving said sleeve, the means permitting the turning of the socket with the sleeve about an axis coaxial to said conductors of the pairs; and

said sleeve and bearing means being constructed for axially retaining the sleeve in the bearing.

4,106,832

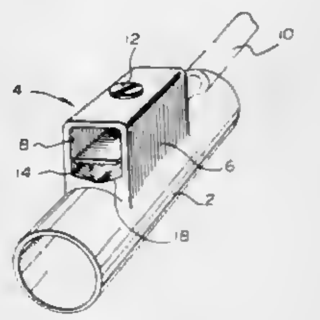
ELECTRICAL GROUNDING CLAMP

John Joseph Vincent Burns, P.O. Box 153, Tamworth, Ontario, Canada (K0K 3G0)

Filed Apr. 19, 1977, Ser. No. 788,819

Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 L **8 Claims**



1. An electrical ground fixture comprising:

a metal pipe section, the section to constitute an intermediate section of a grounded pipe system, and

a securing means for a ground wire associated therewith, said securing means comprising:

a metal casing adapted to receive the ground wire within, said casing being exterior to and an integral part of said pipe section, and

a clamp also part of the pipe section, operatively associated with and movable with respect to said casing, for securing the ground wire within said metal casing, whereby a ground path is provided between the secured ground wire and said casing and metal pipe section.

4,106,833

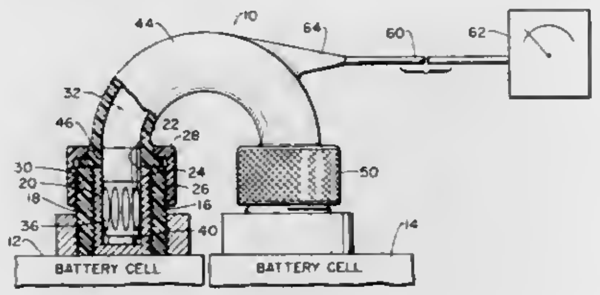
QUICK DISCONNECT INTERCELL BUSBAR FOR DEEP SUBMERGENCE BATTERIES

Jeffrey V. Wilson; Leroy W. Tucker; William D. Briggs, all of Camarillo, and Alan T. Inouye, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 2, 1977, Ser. No. 830,241

Int. Cl.² H01R *11/00, 11/18, 11/26*

U.S. Cl. 339—29 B **4 Claims**



1. A quick disconnect intercell busbar for use on deep water submergence battery cells having insulated terminal posts comprising:

a. a conductor having first and second terminations;

b. a first male member connected to said first termination, said first member being configured to electrically mate with a female terminal post;

c. a second male member connected to said second termination, said second member being configured to electrically mate with a female terminal post;

d. waterproof insulating means for electrically insulating said conductor;

e. a first flange seal molded integral with said waterproof means for establishing a waterproof connection between a terminal post and said waterproof insulating means upon the mating of said first member with a terminal post, said first flange seal being disposed adjacent said first member;

f. a second flange seal molded integral with said waterproof means for establishing a waterproof connection between a terminal post and said waterproof insulating means upon the mating of said second member with a terminal post, said second flange seal being disposed adjacent said first member;

g. a first lock nut disposed adjacent said first flange seal such that, upon mating, said first lock nut may be screwed down around threaded portion of said female terminal post thereby effecting a waterproof seal between said waterproof insulating means and said female terminal post;

h. a second lock nut disposed adjacent said second flange seal such that, upon mating, said second lock nut may be screwed down around threaded portions of said female terminal post thereby effecting a waterproof seal between said waterproof insulating means and said female terminal post;

i. an insulated wire connected to said conductor for monitoring intercell voltage; and

j. means for providing strain relief between said insulated wire and said conductor.

4,106,834

ELECTRICAL CONNECTOR

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

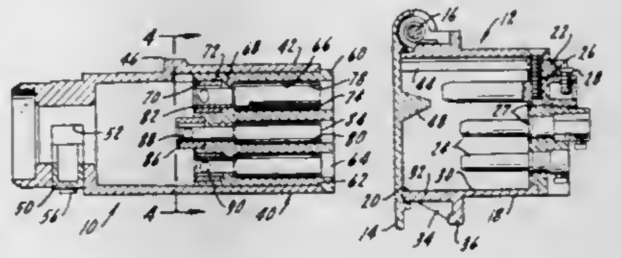
Continuation-in-part of Ser. No. 701,085, Jun. 30, 1976, abandoned. This application May 27, 1977, Ser. No. 801,098

Int. Cl.² H01R *13/44*

U.S. Cl. 339—44 M **7 Claims**

1. In an electrical connector for use with tractor-trailer vehicles, a receptacle and plug, said receptacle including a housing, a cover pivotally attached to said housing and a plurality of contact pins mounted in said housing and extending toward said cover,

said plug including a housing, a plurality of axially extending passages in one end of said housing adapted for alignment with and reception of said contact pins when said plug is inserted in said receptacle, a first bushing positioned in each passage, an axially extending slot in each first bushing, and a key extending into each passage through the bushing slot for preventing rotation of each first bushing within its passage,



each passage including an enlarged portion, a second bushing positioned within each enlarged passage portion and positioned exteriorly of said first bushing, said second bushing exterior and enlarged passage portion cooperating to provide a non-rotatable mounting for said second bushing, a portion of said first bushing being positioned within said second bushing and being mechanically interlocked therewith, said second bushing including means to fasten an electrical wire thereto.

4,106,835

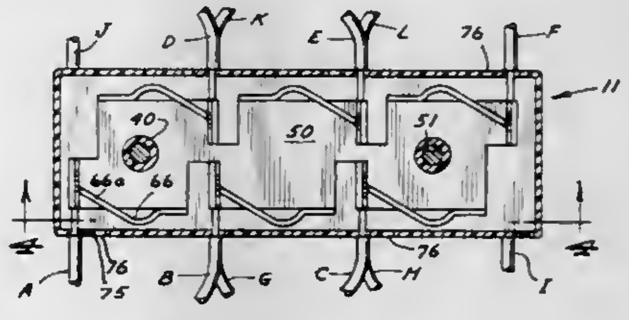
ELECTRICAL WIRE CONNECTING DEVICE FOR JUNCTION BOX

Herbert J. Kimm, 4950 France Ave. S., Edina, Minn. 55435

Filed Aug. 17, 1977, Ser. No. 825,264

Int. Cl.² H01R *9/12*

U.S. Cl. 339—95 D **2 Claims**



1. An electrical wire connecting device to be disposed into a junction box, having in combination,

a housing having a pair of superposed chambers therein,

an insulating barrier between said chambers,

a conductive member disposed within each of said chambers,

each of said conductive members comprising

a common base plate,

a plurality of right angled wall members struck from said base plate being disposed transversally of said housing and each having a medial angled channel thereacross,

a plurality of spring like tongue members struck from said base plate corresponding to each of said wall members and being disposed at right angles thereto and in a direction longitudinally of said housing,

said tongue members respectively having engagement with said wall members,

said tongue members having free end portions corresponding to the configuration of said channels of said wall members for mating engagement therewith to secure therebetween a conductive wire of no required minimum size, and said tongue members respectively engaging said wall members at an angle in a direction away from the direction of the insertion of a wire therebetween.

4,106,836

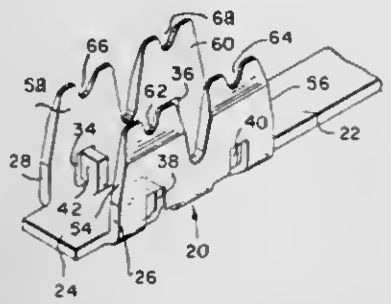
CRIMP BARREL FOR THICK, FLAT, FLEXIBLE CABLE

John Carl Asick, Harrisburg, and Clifton Wesley Huffnagle, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 14, 1977, Ser. No. 787,685

Int. Cl.^{2} H01R *11/20*

U.S. Cl. 339—97 C **6 Claims**



1. An electrical contact crimp barrel for use with thick flat flexible cable, said crimp barrel comprising:

a substantially U-shaped cross section defined by a base web and a pair of integral spaced sidewalls, each sidewall having at least one aperture formed therein adjacent the base web, a lance struck from said base web adjacent each said aperture, said lance extending normal to both said base and the sidewalls and including a projection at the free end thereof extending at least partially into said adjacent aperture, each said sidewall having a transverse slot in the free edge thereof substantially aligned with the respective lance, whereby after crimping of said barrel onto a conductor of a flat flexible cable with the sidewalls straddling the conductor and bent inwardly towards each other and curled upon themselves to form a spring, the conductor is pinched between the curled sidewalls and the lances to follow a tortuous path and each said slot straddles a respective lance.

4,106,837

ELECTRICAL CONNECTOR

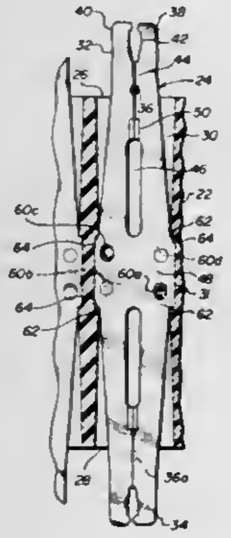
Edward S. Paluch, Elmwood Park, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Dec. 9, 1976, Ser. No. 749,062

Claims priority, application France, Jan. 12, 1976, 76 00558

Int. Cl.^{2} H01R *9/08*

U.S. Cl. 339—98 **10 Claims**



6. An electrical terminal comprising a flat generally planar conductive body having opposed ends with wire termination means thereat, each wire termination means comprising opposed cantilever arms that define a notch for receiving an insulated conductor and a slot for receiving a bare conductor part, the cantilever arms being on a common base constituting a part of the terminal that is intermediate the opposed ends, said common base having bosses projecting from the plane of the body, the bosses being four in number and defining substantially the corners of a rectangle, one pair of diagonally disposed bosses projecting in one direction and the other pair of diagonally opposed bosses projecting in the opposite direction.

4,106,838

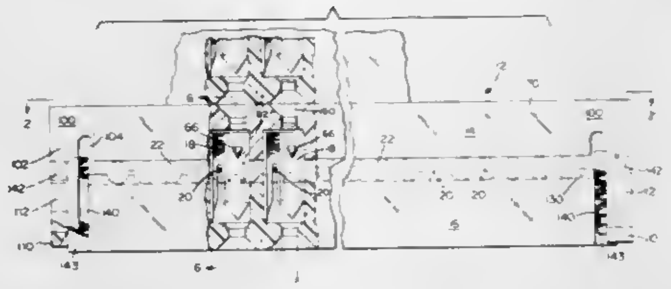
STACKABLE FLAT CABLE CONNECTOR AND CONTACT THEREFOR

Max Leroy Jayne, North Warren; Robert Stephen Orbanic, Warren, and Scott Jack Lapraik, Pleasantville, all of Pa., assignors to GTE Sylvania Inc., Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 783,070

Int. Cl.^{2} H01R *9/08*

U.S. Cl. 339—99 R **8 Claims**



1. A stackable connector assembly adapted to receive a flat cable having a plurality of parallel conductors, said connector assembly comprising:

a. a top body and a bottom body of insulative material, each having a confronting face portion, said top body mounting two rows of contacts, said bottom body adapted to position the flat cable whereby the top and bottom bodies are assembled together the contacts in each row will conductively engage in alternating succession the conductors in the flat cable,

b. the confronting face portions of the top and bottom bodies are provided with two rows of openings configured and sized to receive a portion of each contact with the offset portions of the contacts in one row facing one side and the offset portions of the contacts in the row facing in the opposite direction,

c. the contacts comprising a tubular body and an offset conductor receiving portion extending outwardly from said body, whereby contacts in one row have the offset portion facing towards one side and the contacts in the other row have their contacts facing the opposite direction,

d. the top and bottom bodies having openings to provide conductor pin access to the tubular body of each contact and further wherein these openings are in alignment from row to row and top to bottom, whereby the connector assembly may be plugged into an array of upstanding conductor pins, thereby interconnecting the cable conductors with the conductor pins.

4,106,839

ELECTRICAL CONNECTOR AND FREQUENCY SHIELDING MEANS THEREFOR AND METHOD OF MAKING SAME

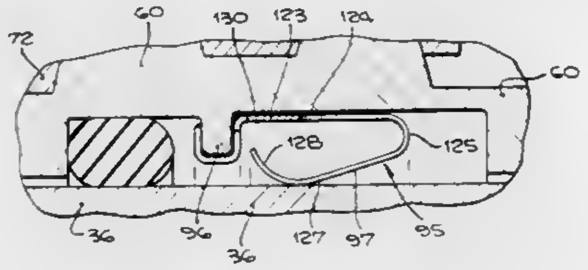
Earl A. Cooper, Los Angeles, Calif., assignor to Automation Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 708,476, Jul. 26, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,717

Int. Cl.^{2} H01R *13/54, 13/06*

U.S. Cl. 339—143 R **14 Claims**

1. Means for shielding an electrical connector against interfering frequencies, the connector including plug and receptacle means, each having shell members relatively movable along an axis into and out of mating engagement, comprising:
- an annular member including
  - a band having a cylindrical surface seated against the internal surface of one of said shells;
- means connected with one edge portion of said band for securing the annular member to said one shell;
- and a plurality of folded resilient fingers connected with the other edge portion of said band and in converging relation to said axis for biased pressure contact with said internal surface of said one shell and for biased pressure contact with other of said shells;
- said resilient folded fingers having adjacent edges spaced apart to provide minimal openings between said fingers.



4,106,840

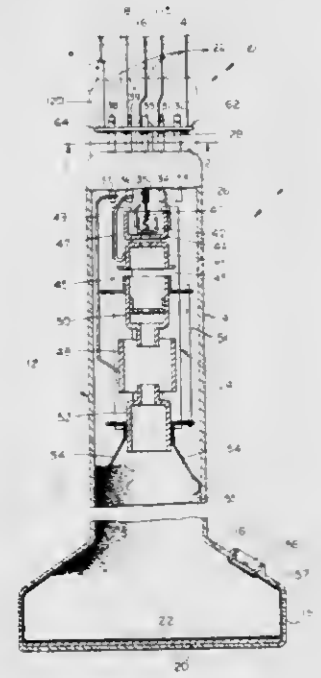
TUBE TERMINAL CONNECTOR ASSEMBLY

Charles H. Tyson, Lansdale, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 813,039

Int. Cl.^{2} H01J *5/50*

U.S. Cl. 339—145 R **11 Claims**



1. An electron tube terminal connector assembly comprised of:
- an electron tube including an evacuated envelope;
  - a plurality of spaced terminal members sealed into the envelope and having respective outer portions extended outwardly therefrom;
- printed circuit means mounted on respective outer portions of the terminal members for restricting forces applied to the terminal members, and including a dielectric substrate provided with electrical conduit means permanently connected mechanically and electrically to respective outer portions of the terminal members for making selective electrical connections to the terminal members in a spaced controlled manner; and
- wire conductor means permanently connected mechanically and electrically to the electrical conduit means for making external electrical connections to selected terminal members of the tube.

4,106,841

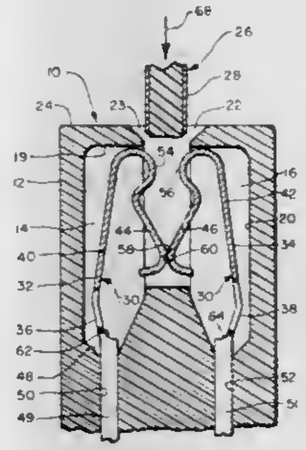
ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

Daniel P. Vladic, Berwyn, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 11, 1977, Ser. No. 776,932

Int. Cl.^{2} H01R *13/50*

U.S. Cl. 339—176 M **14 Claims**



1. A connector comprising:
- housing means adapted to receive a male connector therein, and
- electrical contact means including at least one pair of opposing, laterally movable contact members for receiving and electrically contacting said male connector therebetween and having electrically isolated terminal base portions, each said contact member including first and second contact portions spaced longitudinally from a fixed terminal base portion about which said member is laterally movable, said second contact portions of each said pair of members being biased against each other to maintain electrical continuity therebetween independent of said male connector until said male connector is electrically contacted by said first contact portions, said first and second contact portions being spaced from said fixed terminal base portions such that lateral movement of opposing first contact portions of each pair of members in response to insertion of said male connector therebetween decreases the bias force between said biased second contact portions to permit ready separation thereof in response to continued insertion of said male connector.

4,106,842

ELECTRICAL CONTACT AND CONNECTOR

John Eugene Benasutti, Oil City, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

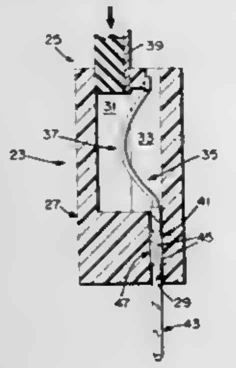
Filed Sep. 23, 1976, Ser. No. 725,728

Int. Cl.^{2} H01R *9/16*

U.S. Cl. 339—221 R **11 Claims**

1. An electrical connector comprising a housing having at least one opening therein, an electrical contact including a contact portion and a body portion adjoining said contacting portion, the aforesaid housing openig defined by a wall, a portion of said wall carrying a plurality of irregular-shaped

particles whereby when the contact body portion is inserted in said opening the irregular-shaped particles will engage the



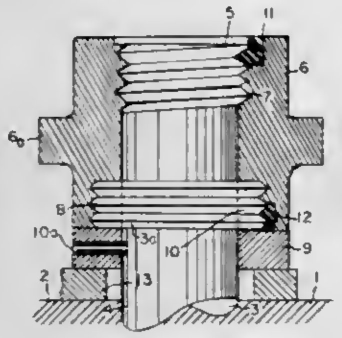
contact body and cut thereinto for retention of said contact in said housing.

4,106,843

DEVICE FOR ESTABLISHING ELECTRIC CONTACT PRESSURE

Erwin Salzer, Waban, Mass., assignor to Gould Inc., Newburyport, Mass.

Filed Sep. 7, 1976, Ser. No. 721,084
Int. Cl.^{2} H01R *9/18*
U.S. Cl. 339—232 **7 Claims**



1. A device for establishing electrical contact pressure between a pair of mutually engaging current-carrying contact members including

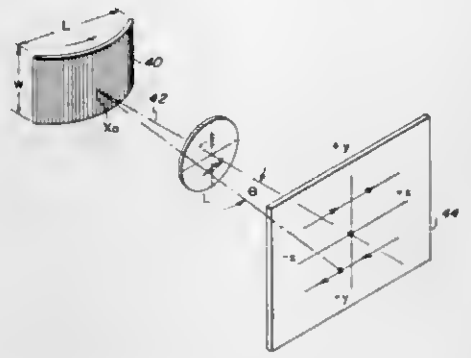
(a) a contact member having a contact surface;
(b) a stud projecting from and affixed to said contact member, said stud having an external screw-thread at the end thereof remote from said contact member;
(c) a drive-nut mounted on said stud and having a first screw-thread cooperatively engaging said screw-thread on said stud and further having a second screw-thread;
(d) a driven nut slidably mounted on said stud cooperatively engaging said second screw-thread;
(e) said screw-thread on said stud and said screw-threads on said drive nut and on said driven nut being oriented in such a way that the axial movements of said driven nut relative to said stud is the sum of the axial movements of said drive nut relative to said stud plus the axial movements of said driven nut relative to said drive nut; and
(f) means precluding rotation of said driven nut around said stud in response to rotation of said drive nut around said stud.

4,106,844

LASER SCANNING SYSTEM UTILIZING COMPUTER GENERATED HOLOGRAMS

Olof Bryngdahl, and Wai-Hon Lee, both of Cupertino, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 590,190, Jun. 25, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,603
Int. Cl.^{2} G02B *27/17*
U.S. Cl. 350—6.2 **4 Claims**



1. A laser scanning system for scanning a coherent light beam across a surface comprising:

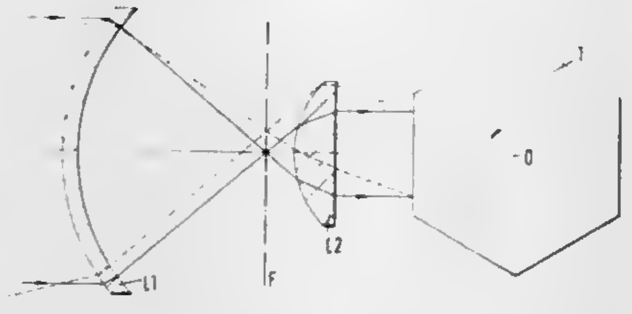
means for generating a coherent light beam,
an optical grating positioned such that an elemental portion of said optical grating is illuminated by said coherent light beam, and
means for rotating said optical grating about an axis of rotation such that said light beam successively illuminates different elemental portions of said optical grating,
said optical grating being computer generated and having a wavefront structure with fringes having a non-linear distance of separation in a direction radial to said axis of rotation and a non-linear distance separation in a direction tangential to the direction of rotation of said optical grating such that said light beam is scanned completely over a desired scan angle in a direction having at least a component tangential to said direction of rotation of said optical grating.

4,106,845

INFRA-RED SCANNER

William Thomas Moore, London, and George Heftman, Pinner, both of England, assignors to The Rank Organisation Limited, London, England

Filed Aug. 16, 1976, Ser. No. 714,492
Int. Cl.^{2} G02B *27/17*
U.S. Cl. 350—6.6 **12 Claims**



1. An optical scanning system for making successive line scans of a scene, comprising in combination:

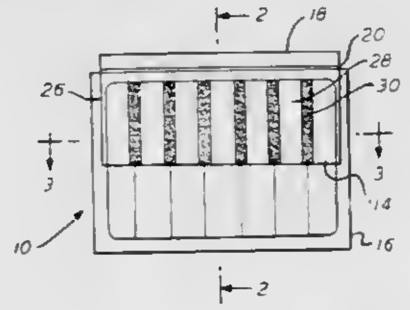
a radiation detector,
a regular rotary polygon having flat external reflective faces,
an afocal optical system substantially free of optical field curvature for directing radiation from a scene to be scanned in a substantially parallel beam onto each successive face of the rotary polygon,
a flat frame scanning mirror arranged for rotational oscillations about an axis perpendicular to the axis of rotation of the polygon to effect a frame scan of slower speed than the line scan effected by the rotary polygon, and
a relay optical system interposed between the rotary polygon and the frame scanning mirror, the relay optical system comprising:
a. a concave imaging mirror arranged with its centre of curvature substantially coincident with the centre of each polygon face when the latter is reflecting radiation into the mirror at the centre of a line scan, and
b. a beam deflecting mirror arranged substantially at the focal plane of said concave mirror, with an elongation parallel to the axis of rotation of the polygon, for directing the radiation beam reflected by the imaging mirror onto the frame scanning mirror, the latter being positioned at substantially the same optical path length from said imaging mirror as said polygon face.

4,106,846

TELEVISION COLOR BAR MATCHING DEVICE

Morton S. Russin, 32 Windmill La., New City, N.Y. 10956

Filed Nov. 15, 1976, Ser. No. 741,563
Int. Cl.^{2} H04N *9/62*
U.S. Cl. 358—10 **9 Claims**



1. A device for adjusting color television receivers wherein such receivers are used in cooperation with a system which provides, upon the screen of the receiver, a predetermined colored pattern of predetermined dimensions, the device comprising:

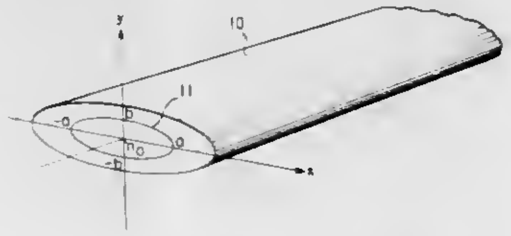
a housing; and
a mask, in combination with said housing, said mask comprises a plurality of translucent colored segments secured to said housing for being disposed over said screen, said segments being dimensioned so as to conform to at least a part of the predetermined pattern and to, simultaneously, leave a portion of the generated pattern uncovered by said mask, such that the color pattern can be compared with itself as viewed through said segments and upon the screen.

4,106,847

NONCIRCULAR SYMMETRIC OPTICAL FIBER WAVEGUIDE HAVING MINIMUM MODAL DISPERSION

Jacques Alexis Arnaud, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 7, 1976, Ser. No. 720,982
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.31 **2 Claims**



1. An optical fiber waveguide comprising a core surrounded by a layer of cladding material, the refractive index of said layer n_c being less than n_o the value of the index of refraction at the center of the core, and the index of refraction n in said core is graded in accordance with the following equation:

$$n^2 = n_o^2(1-N)$$

where N is the relative phase index equal to 0 at the center of said core and equal to 2Δ at the core-cladding interface, Δ being equal to $1/2(1-n_c^2/n_o^2)$, characterized in that the relative index N has values at the coordinates x and y with respect to the core center given by the following equation:

$$h(x,y) = \exp \int_{2\Delta}^{N} [(1+\sqrt{1-2\Delta}\,)n - N]^{-1} dN$$

where $h(x,y)$ is any arbitrary homogeneous function of degree 2 in x and y other than a multiple of (x^2+y^2), and N is a relative group index approximately given in terms of N by the following equation:

$$\bar{N} = [N + (S_o - S)/n_o^2]/(1+S_o/n_o^2).$$

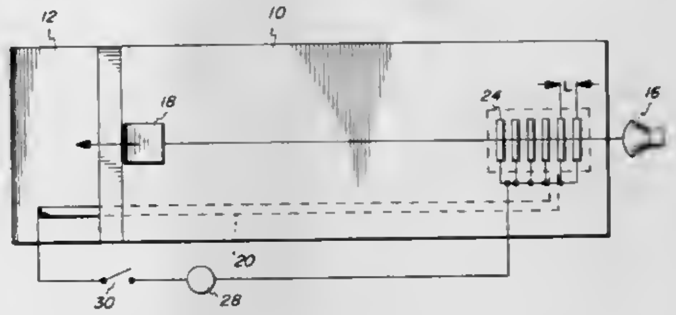
S being equal to $[-(\frac{1}{2})dn^2/d\lambda]$ which is determined by measurements on the materials to be used to obtain the various values of n within the core, and S_o is the value of S at the core center.

4,106,848

ELASTOMER WAVE GUIDE OPTICAL MODULATORS

Esther M. Conwell, Rochester; Dorian Kermisch, Penfield; James C. Maher, Sodus; Gustav R. Pfister, and Richard L. Schank, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 10, 1975, Ser. No. 621,312
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.14 **3 Claims**



1. An optical modulator comprising

(a) an elastomer waveguide which is comprised of materials selected from the group consisting of thin films of cross-linked dimethyl polysiloxane and cross-linked phenylmethyl polysiloxane, the film being supported by a rigid substrate, the waveguide having a given cross-sectional dimension and being adapted to propagate light; and
(b) an electric field means for impressing a field across the waveguide to change its cross-sectional dimension so that light propagating therethrough is modulated.

4,106,849

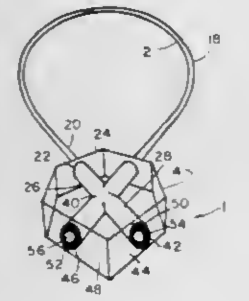
FIBER OPTIC SEAL

Lorin R. Stieff, P.O. Box 263, Kensington, Md. 20795

Filed Oct. 18, 1976, Ser. No. 733,177
Int. Cl.^{2} G02B *5/16*
U.S. Cl. 350—96.24 **20 Claims**

1. Fiber optic seal apparatus comprising a block, first and second pathways crossed within the block, the pathways having openings in spaced relationship on facial areas of the block, bundle holding means connected to the block for holding an

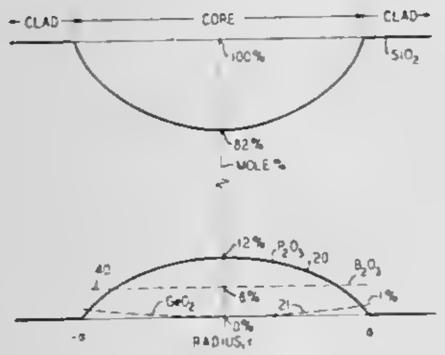
optic fiber bundle end inserted in each pathway with portions of the fibers near one end of the bundle threaded between



portions of the fibers near the opposite end of the bundle in random arrangement within the block with a medial portion of the bundle passing through an object to be sealed.

4,106,850
OPTICAL FIBER WITH GRADED INDEX CORE AND PURE SILICA CLADDING

Enrique Alfredo José Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 4, 1977, Ser. No. 784,290
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.31 **5 Claims**



1. An optical fiber waveguide comprising a core surrounded by a cladding material having a generally lower index of refraction than said core, said core being composed of silica and two or more dopants that are radially graded in order to improve the dispersive characteristics of said fiber, characterized in that said core includes a third dopant appearing with uniform concentration through said core, and said cladding is substantially pure silica.

4,106,851
FILM EXAMINING WITH DIFFUSE AND SPECULAR ILLUMINATION

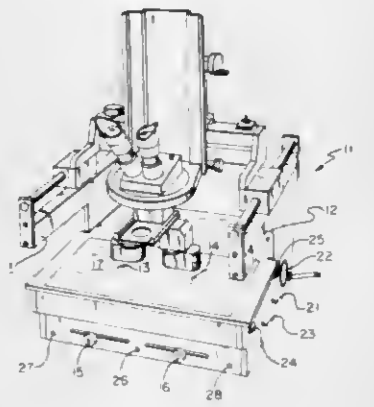
Philip S. Considine, Woburn, and Robert E. Whitney, Burlington, both of Mass., assignors to Eikonix Corporation, Burlington, Mass.
Filed Sep. 22, 1976, Ser. No. 725,396
Int. Cl.² G02B *21/06*
U.S. Cl. 350—87 **10 Claims**

1. Viewing apparatus comprising,

diffusion plate means for providing a diffuse background formed with at least one aperture for transmitting specular illumination,

a first source of light for illuminating said diffusion plate means,

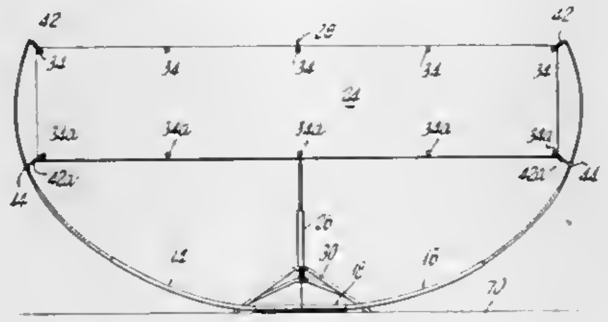
a second source of specular light,



and means for positioning said source of specular light for directing specular light energy through said aperture.

4,106,852
PROJECTION SCREEN SUPPORT STRUCTURE

Edward A. Chasins, Peekskill, N.Y., assignor to Producers Row Inc., New York, N.Y.
Filed Feb. 22, 1977, Ser. No. 771,046
Int. Cl.² G03B *21/56*
U.S. Cl. 350—117 **7 Claims**

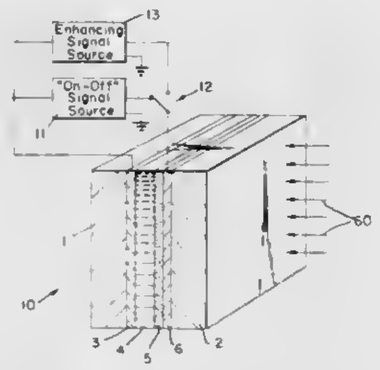


1. A projection screen support structure comprising a projection screen defining a plurality of upper and lower support openings, an extendable center support pole fastened to one of said upper support openings, a support socket located near the base of said center support pole, a pair of telescoping side support poles each fastened at its upper end to a pair of said end upper support openings, each fastened also to an associated pair of said end lower support openings and each further held by said support socket, said structure adapted and arranged to spread said screen between said side support poles.

4,106,853
METHOD AND APPARATUS FOR INCREASING CONTRAST RATIO OF THE STORED IMAGE IN A STORAGE MODE LIGHT VALVE

Donald D. Boswell, Granada Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Jul. 28, 1976, Ser. No. 709,490
Int. Cl.² G02F *1/13*
U.S. Cl. 350—333 **8 Claims**

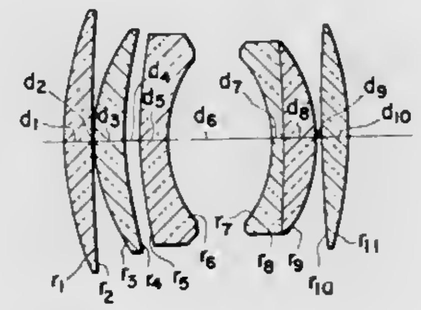
1. An improved storage-type liquid crystal cell comprising a storage-type liquid crystal layer and imaging means for causing emulsive scattering storage in selected regions of the liquid crystal cell, the improvement comprising means for applying a signal across selected regions of the liquid crystal layer said signal having an rms amplitude below the amplitude threshold



and a frequency above the maximum scattering frequency of the storage-type liquid crystal layer.

4,106,854
PHOTOGRAPHIC LENS SYSTEM HAVING A LARGE APERTURE RATIO

Toru Fujii, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Apr. 5, 1977, Ser. No. 784,795
Claims priority, application Japan, Apr. 6, 1976, 51-37850
Int. Cl.² G02B *11/30*
U.S. Cl. 350—176 **6 Claims**



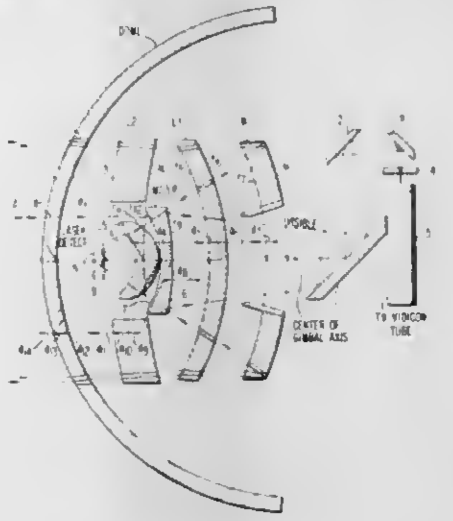
1. A photographic lens system having a large aperture ratio comprising a first positive meniscus lens component having a convex surface on the object side, a second positive meniscus lens component having a convex surface on the object side, a third negative meniscus lens components having a convex surface on the object side, a fourth negative meniscus cemented doublet component having a convex surface on the image side and a fifth positive lens component, and said lens system satisfying the following conditions:

(1) $0.22f \leqq d6 \leqq 0.27f$
(2) $1.74 \leqq n3, n4$
(3) $\nu3, \nu4 < 30$
(4) $-2.5f \geqq r8 \geqq -70f$
(5) At least, either $\nu1$ or $\nu2$ is 40 and below
(6) $n1, n2, n5, n6 > 1.7$
(7) $0.25/f \leqq |1/r4| - |1/r5| \leqq 0.4/f$

wherein the reference symbol $d6$ represents thickness of the airspace formed between the third and fourth lens components, the reference symbols $r4$, $r5$ and $r8$ designate radii of curvature on the image side surface of the second lens component, the object side surface of the third lens component and the cemented surface on the fourth lens component, the reference symbols $n1$ through $n6$ denote refractive indices of the respective lens elements, the reference symbols $\nu1$ through $\nu4$ represent Abbe's numbers of the first lens component, the second lens component, the third lens component and the object side element of the fourth lens component and the reference symbol f designates focal length of the lens system as a whole.

4,106,855
LENS ELEMENT INCORPORATING NARROW BANDPASS FILTER AND USABLE IN DUAL MODE

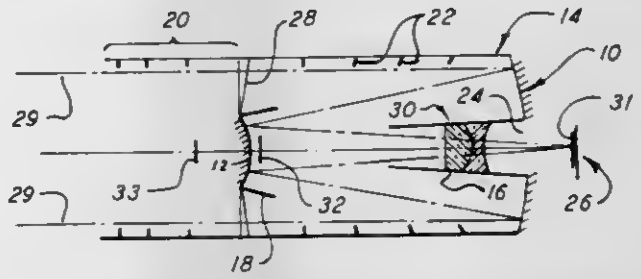
Bryan H. Coon, Seminole County, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.
Continuation-in-part of Ser. No. 604,365, Aug. 13, 1975, abandoned. This application May 12, 1977, Ser. No. 796,245
Int. Cl.² G02B *5/10, 5/28*
U.S. Cl. 350—196 **15 Claims**



1. A dual-mode catadioptric objective system comprising a positive meniscus lens convex to the object, a Mangin mirror concave to the object and spaced from said positive lens, a negative meniscus lens having a thin film dielectric filter on its one surface for separating visible light from laser light, and a thin film dielectric background blocking filter on its other surface, latter lens serving as a secondary mirror for visible light and serving to focus such visible light behind said Mangin mirror, latter lens also being transparent to laser light, and means for focusing laser light on a selected object.

4,106,856
STRAY LIGHT CONTROL IN AN OPTICAL SYSTEM

Richard Constantine Babish, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Continuation of Ser. No. 702,778, Jul. 6, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,100
Int. Cl.² G02B *17/08*
U.S. Cl. 350—199 **1 Claim**

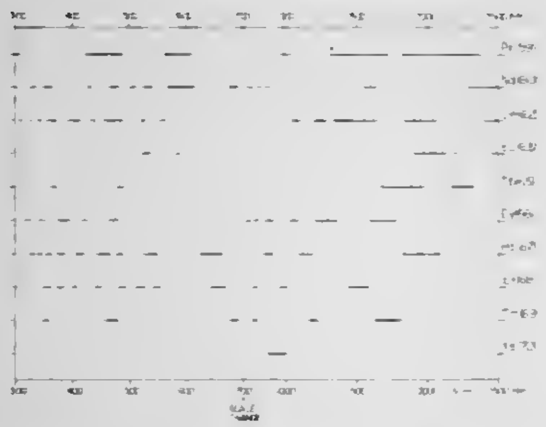


1. A solid catadioptric photographic system comprising, in combination, a primary mirror for receiving rays of light from a field of interest and reflecting them to a spaced secondary mirror that, in turn, reflects the rays through a central hole in the primary mirror to sensitive material disposed on a focal plane behind said primary mirror, said primary mirror and said secondary mirror being mounted in a tube, an inner primary baffle means mounted adjacent said central hole, a conical secondary baffle mounted adjacent the parameter of said secondary mirror, a series of baffles inwardly directed from the walls of said tube between said primary and said secondary mirrors, and a series of inwardly directed forebaffles mounted on the walls of said tube extending from said secondary mirror towards the field of interest, means for treating the surfaces surrounding the path of the rays of light through the system to

substantially reduce specularly the diffusely reflected stray light, a centrally located dark, obscuration disposed adjacent the front of said secondary mirror for intercepting light rays reflected from said sensitive materials towards said secondary mirror to prevent the reflection from said secondary mirror of said light reflected by the sensitive material from forming a secondary image on said sensitive material, the reflection from said sensitive material including a diffuse component and a specular component, the size of said dark obscuration being a function of the flare correction of the light reflected from said sensitive material and the vignetting of useful light, thereby improving the contrast in the desired image on said sensitive material.

4,106,857
OPTICAL FILTERS

Elias Snitzer, Wellesley, Mass., assignor to Better Environmental Development Corporation, Waltham, Mass.
Continuation of Ser. No. 515,426, Oct. 16, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 713,660
Int. Cl.^{2} G02B *5/22*
U.S. Cl. 350—311 12 Claims

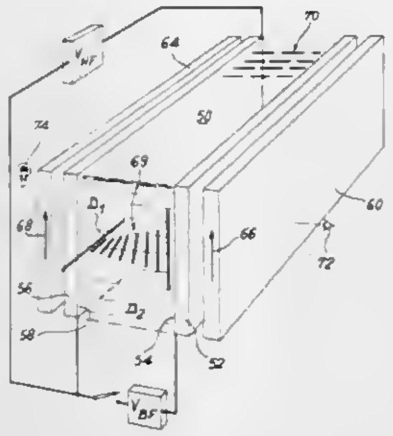


1. An optical filter comprising a rare earth-containing material positioned across an optical path through said filter, said material containing tripley charged ions of rare earth atoms with partially filled shells of 4*f* electrons, said rare earth atoms having first and second absorption resonances arising from absorption of light with rearrangement of electrons in the 4*f* shell, said rare earth atoms being disposed in said optical path in sufficient number to make said filter opaque near center wavelengths of each of said resonances, absorption in the short wavelength wing of said first resonance defining a long wavelength boundary of a spectral band and absorption in the long wavelength wing of said second resonance defining a short wavelength boundary of said pass band, said filter including a blocking component transmissive in said spectral pass band and immediately to the long and short wave sides thereof while blocking light transmission through said filter in spectral regions remote from said pass band where said rare earth material is transmissive, said filter transmitting light throughout said band while blocking it elsewhere in the spectrum.

4,106,858
LIQUID CRYSTAL DISPLAY APPARATUS

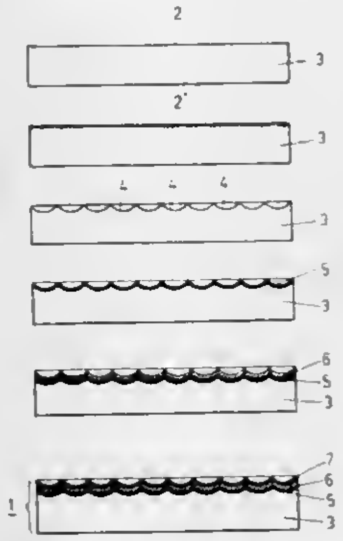
Bruno Dargent, Grenoble, and Jacques Robert, St. Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Apr. 18, 1977, Ser. No. 788,468
Claims priority, application France, Apr. 30, 1976, 76 12996
Int. Cl.^{2} G02F *1/13*
U.S. Cl. 350—332 5 Claims

1. An analog liquid crystal display apparatus comprising a liquid crystal film band inserted between a first conductive electrode and a second resistive electrode, a first voltage source connected between said first and second electrodes, a second power supply connected between the two ends of the resistive electrode, the liquid crystal then having a first optical state on a first part of the band and a second optical state on the remainder of the band, the length of said first part being a function of the value of the two voltages applied and thus constituting an analog representation of one of the voltages when the other is fixed, wherein the liquid crystal is of the type having a critical relaxation frequency which is either a load relaxation frequency or a dielectric relaxation frequency, the first power supply supplying a voltage at a first frequency and the second power supply supplying a voltage at a second frequency, said two frequencies being on either side of said critical frequency, whereby one of the voltages is then a display voltage and the other is a voltage which inhibits the display, the liquid crystal then having a first optical state over that part of the band where the display voltage prevails over the inhibition voltage and a second optical state over the remainder of the band, the length of said parts constituting the analog representation of the display voltage when the inhibition voltage is fixed.



4,106,859
REFLECTOR WITH LIGHT-SCATTERING SURFACE FOR LIQUID-CRYSTAL DISPLAYS AND METHOD FOR THEIR MANUFACTURE

Rino Doriguzzi, Dottingen; Markus Egloff, Wettingen; Meinolph Kaufmann, Fislisbach; Jurgen Nehring, Umiken, and Terry J. Scheffer, Wettingen, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed May 7, 1976, Ser. No. 684,251
Claims priority, application Switzerland, Jun. 27, 1975, 8375/75
Int. Cl.^{2} C09K *3/34;* G02F *1/01;* C03C *17/00;* B05D *3/12*
U.S. Cl. 350—338 18 Claims



1. A liquid crystal display device comprising a twisted nematic liquid electro-optical cell and a reflector, the reflector comprising a layer carrier provided with depressions of bubble-like structure and a thin, compared to the depth of the depressions, highly reflective layer applied upon the

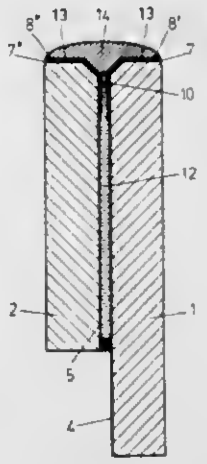
depression-comprising surface of the layer carrier, the layer carrier comprising a material selected from the group consisting of glass, plastic and metal and the reflective layer comprising a metal selected from the group consisting of silver, aluminum, gold and copper.

9. A method for the manufacture of a reflector with a light-scattering surface for liquid crystal displays operated in reflection having a layer carrier comprising a material selected from the group consisting of glass, plastic and metal provided with depressions and having a thin highly reflective layer comprising a metal selected from the group consisting of silver, aluminum, gold and copper evaporated upon the depression-provided surface of the layer carrier comprising the steps of: generating depressions by roughening and subsequently etching the surface of the layer carrier and evaporating said metal on said surface.

18. A method for manufacturing a reflector with a light-scattering surface for liquid crystal displays operated in reflection having a layer carrier comprising a material selected from the group consisting of glass, plastic and metal provided with depressions and having a thin highly reflective layer comprising a metal selected from the group consisting of silver, aluminum, gold and copper applied upon the depression-provided surface of the layer carrier comprising the steps of applying a highly reflective metal layer on the layer carrier and generating depressions in the highly reflective metal layer and in the layer carrier by impressing the highly reflective metal layer and the layer carrier with a stamping device.

4,106,860
LIQUID-CRYSTAL CELL

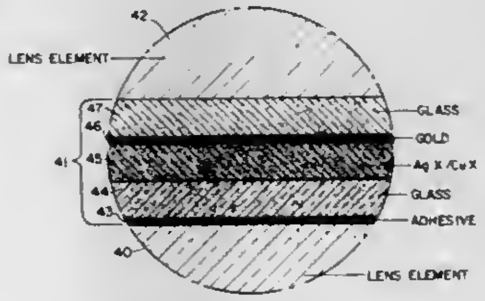
Meinolph Kaufmann, Niederwil, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerlaod
Continuation of Ser. No. 503,169, Sep. 3, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,779
Claims priority, applicatioo Switzerland, Sep. 7, 1973, 12865/73
Int. Cl.^{2} G02F *1/13*
U.S. Cl. 350—343 2 Claims



1. A liquid-crystal cell comprising:
two glass cell plates coated on the inner surfaces thereof with electrodes and containing a liquid crystal substance therebetween,
spacing elements separating said cell plates, and integrally bonded to said cell plates so as to hermetically seal said cell plates together,
electrically conducting material connecting said electrodes of said cell plates,
said spacing elements being so arranged with said cell plates that between said cell plates and said elements there is defined a hole for introducing said liquid-crystal substance,
contact films formed of aluminum provided by vapor deposition on the end surfaces of each of said cell plates in the region of said hole, said contact films extending over said end surfaces of said cell plates to the inner surfaces thereof and contacting said electrodes for forming enlarged electrical contact surfaces whereby said electrodes may be reliably interconnected.
a solderable metal coating of Cr-Cu-Au, or Cr-Ni-Au layers, disposed by vapor deposition over said contact films and said spacing elements extending from one of said cell plates across said spacing elements to the other of said cell plates so as to surround said hole, and
a conductive sealing substance applied to said contact films across said end surfaces for sealing said hole hermetically and for electrically connecting said electrodes.

4,106,861
REDUCED HAZE PHOTOCHROMIC SYSTEMS

William R. Brewer, Hingham; Kenneth S. Norland, Belmont, and Richard F. Wright, Acton, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Jul. 12, 1976, Ser. No. 704,699
Int. Cl.^{2} G02B *5/23*
U.S. Cl. 350—354 23 Claims



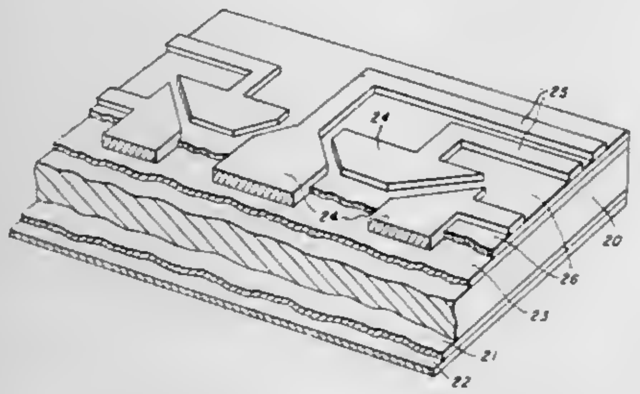
1. In a photochromic article comprising:
(a) a first continuous layer of material substantially impermeable to halogen selected from the group consisting of chlorine, bromine and iodine;
(b) a continuous layer comprising silver ions, copper ions and halide ions, said halide ions selected from the group consisting of chloride, bromide and iodide; and
(c) a second continuous layer of material substantially impermeable to the halogen comprising said halide ion; said layer of silver ions, copper ions and halide ions being between said layers of material substantially impermeable to the halogen; the improvement wherein said article comprises a continuous layer of a metal in a quantity effective to substantially reduce photochromic haze, said layer of metal being positioned between said first layer of halogen impermeable material and said layer of silver ions, copper ions and halide ions.

4,106,862
ELECTROCHROMIC DISPLAY CELL

Michel Lucien Bayard, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 12, 1976, Ser. No. 741,271
Int. Cl.^{2} G02F *1/00*
U.S. Cl. 350—357 7 Claims

1. An electrochromic display cell comprising:
a structural support substrate member having two major surfaces comprising a dry solid electrolyte material electrically insulative but conductive to sodium ions;
a thin display electrode layer of approximately 1 micron thickness of WO_3 applied to one major surface of said substrate;
a thin counter-electrode layer of approximately 1 micron

thickness of Na_yWo_3, y being about 0.3, applied to the other major surface of said substrate; and



electrical contacts to said display electrode layer and said counter-electrode layer.

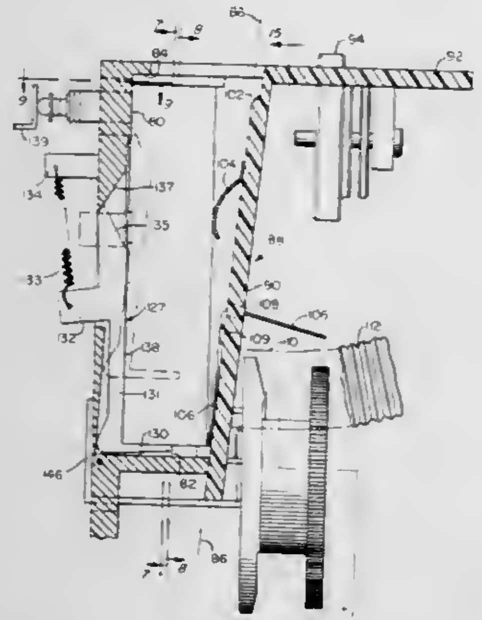
4,106,863
CASSETTE RECEIVING WELL STRUCTURE FOR PHOTOGRAPHIC VIEWING APPARATUS

Donald T. Scholz, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,430

Int. Cl.² G03B *23/02*

U.S. Cl. 352—72 5 Claims



1. In apparatus for viewing by projection a photographic film strip contained within a substantially thin film cassette which has a pair of opposed major wall surfaces connected and spaced apart by a peripheral wall substantially defining the thickness of the cassette and having an opening thereinf for projection of transparent image frames contained on the film strip, the improvement comprising:

means for receiving the cassete and operatively positioning the cassette within said apparatus including means defining an elongated opening slightly wider than the thickness of the cassette through which the cassette can be slidably inserted into said apparatus, a wall surface extending inwardly of said apparatus from said opening substantially perpendicular to the plane of said opening, the end of said appartus wall surface adjacent said opening terminating at a position spaced laterally from said opening, an inwardly facing abutment surface adjacent said opening and extending away therefrom in the direction of said end of said apparatus wall surface, means extending from said wall surface for actuating components within the cassette, means for guiding the portion of the cassette first entering said opening over and past said cassette component actuating means, means on the opposite side of the cassette as it enters said apparatus from said apparatus wall surface for engaging one major surface of the cassette and resiliently urging the cassette towards said apparatus wall surface so that the other major wall surface of the cassette will untimately rest against said apparatus wall surface with said cassette component actuating means operably engaging components of the cassette, and means for automatically engaging said cassette as it is inserted through said opening to resiliently urge said cassette in a direction outwardly of said apparatus through said opening, said last stated means and said means for resiliently urging the cassette against said apparatus wall surface in combination serving to seat a portion of the cassette's peripheral wall against said abutment surface when the cassette has been fully inserted into said apparatus through said opening; and

selectively operative means for exerting a force against the other major wall surface of the cassette to effect the displacement of the portion of the cassette seated against said abutment surface into alignment with said opening against the force exerted on the cassette by said means for resiliently urging the cassette against said apparatus wall surface, said means for urging the cassette outwardly of said apparatus through said opening being operative at such time to eject at least a portion of the cassette through said opening.

4,106,864
MOTION-PICTURE CAMERA WITH DIAPHRAGM CONTROL SYSTEM HAVING FADEOVER CAPABILITY

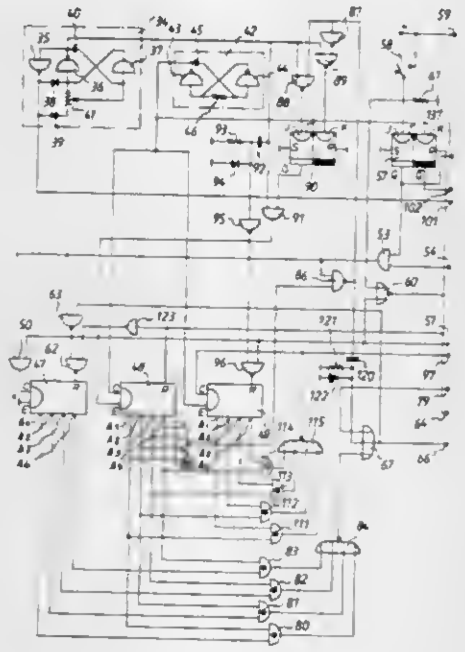
Norbert Burgermann, Munich, Fed. Rep. of Germaoy, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 827,776

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638403

Int. Cl.² G03B *21/36*

U.S. Cl. 352—91 C 18 Claims



1. In a motion-picure camera, in combination, an adjustable diaphragm; light-sensitive negative-feedback diaphragm control means operative for automatically adjusting the diaphragm setting in dependence upon scene light, including an adjusting motor coupled to the diaphragm, a film-transport motor operative for transporting film and means for generating frame pulses indicative of the number of transported frames; pulse-generating means operative for generating a pulse train; gating means having an input connected to receive pulses from the pulse-generating means and including selecting means for selecting the gating duration of the gating means to provide at the output of the gating means a reference pulse packet consisting of a selected number of pulses; first counting means connected to receive the frame pulses and operative for counting in dependence thereon; second counting means; comparator means connected to the first and second counting means for generating a program-step-change signal when the counts on the first and second counting means are the same; program-step counting means having an input connected to the comparator means and operative for counting program steps in dependence upon program-step-change signals furnished by the comparator means; means operative for initiating a sequence of program steps, including means for causing the second counting means to register the pulses of the reference pulse packet; means operative at the end of each program step in response to a program-step-change signal from said comparator means for resetting the first counting means for performance of another counting cycle for the next program step; logic circuit means connected to the program-step counting means, connected to the negative-feedback diaphragm control means and connected to the film-transport motor and operative for implementing fade-out and fade-in operations by altering the balance of the negative-feedback control means and controlling the energization of the film-transport motor in dependence upon the counts registered by the program-step counting means; and adjusting-speed control means connected to the second counting means and to the negative-feedback diaphragm control means, operative for causing the extent to which the adjusting motor alters the diaphragm setting during the course of each counting cycle of the first counting means to be constant irrespective of the number of pulses in the reference pulse packet registered by the second counting means, by automatically setting the adjusting speed of the adjusting motor to a value inversely related to the number of pulses in the reference pulse packet.

4,106,865
MOTION-PICTURE CAMERA PROGRAMMED FOR FADEOVER EFFECTS

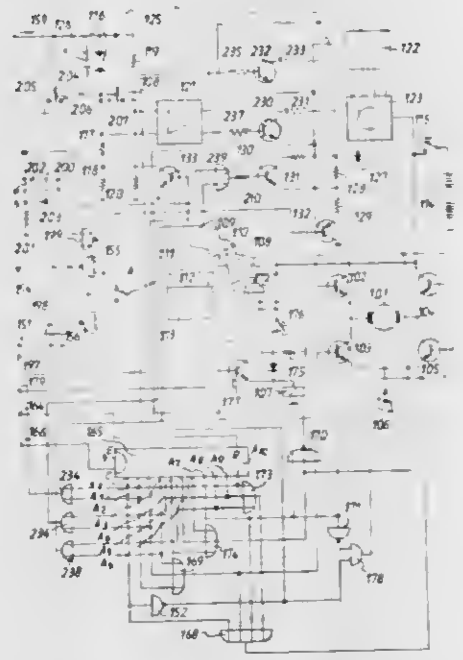
Norbert Burgermann, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,816

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640466

Int. Cl.² G03B *21/36*

U.S. Cl. 352—91 C 10 Claims



1. In a motion-picture camera of the type including a film transport motor, an adjustable diaphragm, and light-sensitive negative-feedback diaphragm control means operative for adjusting the diaphragm setting in dependence upon scene light, including a stepper motor coupled to the diaphragm, and a control circuit operative for operating the stepper motor by generating stepper-motor drive pulses and including components forming a time-constant circuit operative for establishing the repetition frequency of the stepper-motor drive pulses, a novel arrangement for producing fadeover effects, the arrangement comprising, in combination, means for establishing *m* different repetition frequencies for the stepper-motor drive pulses, the first through the *m*th frequencies being successively higher, including *m* semiconductor switches each connected to the time-constant circuit for changing the time-constant thereof; program-step counting means operative for receiving program-step-change signals and counting in dependence thereon, the program-step counting means being a 1-out-of-*n* binary counter having *n* outputs of which successive single ones carry a signal in response to successively received program-step-change signals, the *n* outputs including first, second and third output groups respectively constituting a fade-out output group, a rewind output group and a fade-in output group, the number of outputs in each group being equal to *m*; means for applying program-step-change signals to the input of the program-step counting means in dependence upon film transport effected by the film transport motor; logic circuit means connected to the outputs of the program-step counting means, connected to the negative-feedback diaphragm control means and connected to the film transport motor and operative in dependence upon the count registered on the program-step counting means for effecting a fade-out followed by a limited film rewind followed by a fade-in, by imbalancing the negative-feedback diaphragm control means and controlling the operation of the film transport motor; and connecting means connecting respective ones of the first through the *m*th semiconductor switches to respective ones of the first through the *m*th outputs of the fade-out output group, and connecting respective ones of the first through the *m*th semiconductor switches to respective ones of the *m*th through the first outputs of the fade-in output group, for controlling the conduction of the switches in dependence upon the signals carried on the outputs of the fade-out and fade-in output groups and causing the repetition frequency of the stepper motor drive pulses to increase during the course of a fade-out and decrease during the course of the subsequent fade-in.

4,106,866
IMAGE PROJECTION SYSTEM

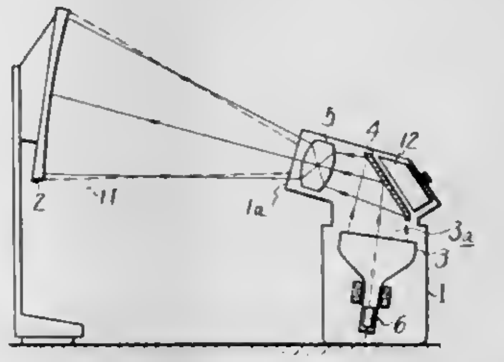
Satoshi Shimada, Yokohama, and Norio Ituh, Tokyo, both of Japan, assignors to Sony Corporation, Tokyu, Japan

Filed Jul. 18, 1975, Ser. No. 597,088

Claims priority, application Japan, Jul. 25, 1974, 49-88620

Int. Cl.² G03B *21/26*

U.S. Cl. 353—29 4 Claims



1. An apparatus for projecting images on a viewing screen comprising image reproducing means having an image display panel and being operative to produce on said display panel an image of at least one color, projection lens means for projecting said image from said display panel onto the viewing screen, and colored light source means for superimposing on the image projected onto said viewing screen colored light of a hue different from each said color of the image produced by said image reproducing means.

4,106,867
SLIDE PROJECTOR FOR BOTH MAGAZINE AND SINGLE SLIDE PROJECTION

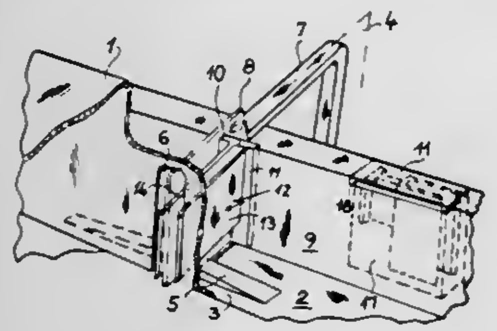
Reinhard Sobotta, Braunschweig, Mascherode, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,083

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 7627989[U]

Int. Cl.^{2} G03B *21/00*

U.S. Cl. 353—114 **5 Claims**



1. A photographic slide projector comprising means forming a magazine channel for guiding a slide magazine for movement to bring successive slides thereof to a slide changing plane, said guiding means including a magazine guide wall, a slide lifting ramp for lifting successive slides in the magazine as they approach the slide changing plane, a slide changing device for moving successive individual slides from the slide magazine to a projection position and back from projection position into the slide magazine, and an accessory for holding a single slide in position to be moved by the same slide changing device into projection position and back again to the accessory when it is preferred to project single slides rather than slides from a magazine, said accessory comprising a front plate and walls collectively forming a compartment for holding a single slide, said compartment being shaped to be placed crosswise in said magazine channel at said slide changing plane, said compartment having a top edge which is open for manual insertion and removal of single slides and having a side edge facing said projection position which is open for movement of a slide out of and into said compartment to and from projection position by action of said slide changing device, said magazine guide wall of said projector having a recess for releasably receiving and holding said front plate of said accessory to position said compartment on said slide changing plane, said accessory further including a resilient element for resiliently engaging a side of said lifting ramp when said front plate is seated in said recess.

4,106,868
ELECTROGRAPHIC COPYING APPARATUS WITH SURFACE-TO-SURFACE IMAGE TRANSFERS

Petrus J. M. Ophey, Grubbenvorst, Netherlands, assignor to OCE-van der Grinten N.V., Venlo, Netherlands

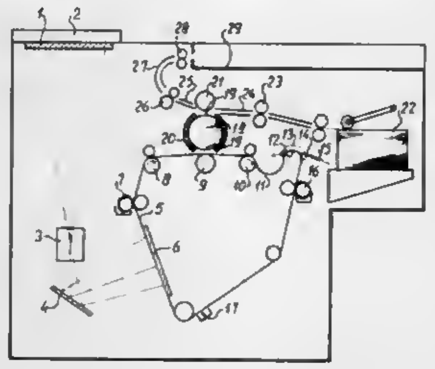
Filed Oct. 29, 1976, Ser. No. 737,049

Claims priority, application Netherlands, Nov. 5, 1975, 7512987

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 TR **6 Claims**

1. In an electrographic copying apparatus including a movable electrographic surface for carrying and transferring a powder image to an intermediate surface moving in pressing contact with it and means for moving a sheet of copy paper in contact with the intermediate surface for transferring the image from the latter surface to the sheet of copy paper, the improvement which comprises said intermediate surface having at least one receding portion each of which recedes away from the intermediate surface so that said portion cannot make contact with the electrographic surface, and means whereby a said receding surface portion is positioned opposite to said electrographic surface so that the electrographic surface and the intermediate surface make no contact with each other when no image transfer is to be effected.



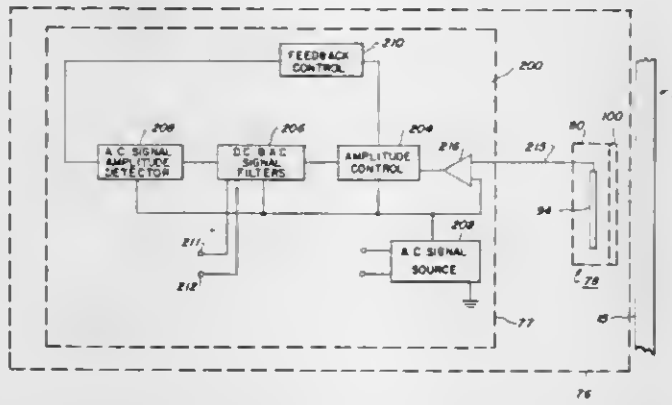
4,106,869
DISTANCE COMPENSATED ELECTROSTATIC VOLTMETER

Robert F. Buchheit, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 744,910

Int. Cl.^{2} G03G *21/00;* G01R *19/00*

U.S. Cl. 355—3 R **6 Claims**



1. In an electrostatic type voltmeter for measuring the potential on a surface, the voltmeter including a probe, a housing for said probe, and support means for supporting said probe together with said probe housing in spaced relationship with said surface, the probe producing a d.c. output signal reflecting the potential of said surface, the combination of:

means for generating an a.c. bias signal

means for applying said bias signal to said probe housing and for combining said bias signal with the output signal of said probe to produce a combined a.c./d.c. signal;

means for generating an a.c. reference signal; and

amplitude adjusting means for regulating the signal amplitude of said combined a.c./d.c. signal in response to a change in the amplitude of the a.c. component of said combined a.c./d.c. signal relative to said a.c. reference signal to maintain a preset relationship between the a.c. component of said combined a.c./d.c. signal and said a.c. signal whereby to compensate said probe output signal for a change in spacing between said probe and said surface.

4,106,870
COLOR ELECTROPHOTOGRAPHIC METHOD AND APPARATUS

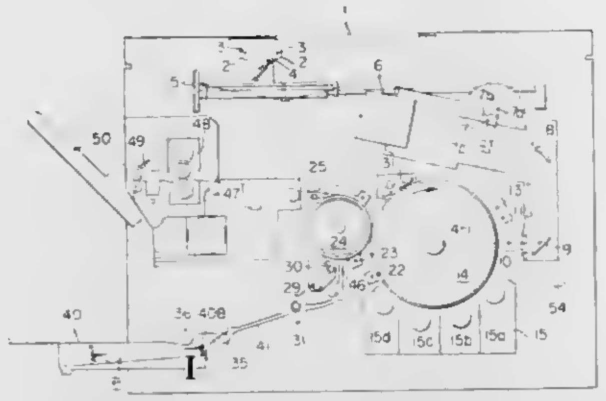
Eiichi Kondo, Kawasaki; Hajime Katayama; Toru Takahashi, and Yutaka Komiya, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1974, Ser. No. 535,083

Claims priority, application Japan, Dec. 28, 1973, 49-918

Int. Cl.^{2} G03G *15/01*

U.S. Cl. 355—4 **24 Claims**



1. A color electrophotographic apparatus wherein color resolved light images of an original are exposed onto a photosensitive medium to form a series of separate color resolved electrostatic latent images, comprising:

a movable photosensitive medium;

voltage charge applying means for applying a voltage charge to said photosensitive medium, and means for exposing the photosensitive medium with color resolved light images of an original to form successive color resolves latent images thereon; a plurality of adjustable voltage control means for varying the voltage of the charge applying means according to each color resolved light image;

means for simultaneously adjusting said plurality of voltage control means relative to each other for varying the relationship between the voltage charges applied to the photosensitive medium; and

programming means for selectively coupling individual ones of said voltage control means to said charge applying means during the formation of said successive color resolved latent images.

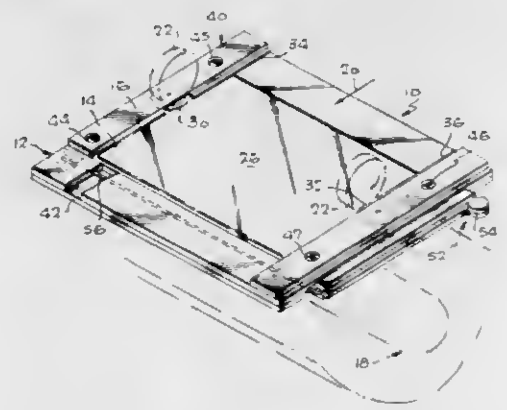
4,106,871
CONTACT PRINTER HOLDER

William E. Roberts, Palos Verdes Penn., Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 652,635, Jan. 26, 1976. This application Aug. 12, 1977, Ser. No. 823,912

Int. Cl.^{2} G03B *27/04*

U.S. Cl. 355—99 **14 Claims**



1. A microfiche contact copier holder for holding a microfiche master under a copy sheet, and where the copy sheet is moved by transport rollers that can bear against opposite sides of the copy sheet when it lies on the master, comprising:

a base which includes a light-transmitting plate; and

a pair of separator means mounted on opposite sides of said frame, for lying under the pheripheral edges of said transport rollers and between the copy sheet and master;

said separator means constructed to apply low drag to said copy sheet when it moves thereby, and being thin to enable substantially all of the area of said master and copy sheet lying between said separator means to be pressed into intimate contact.

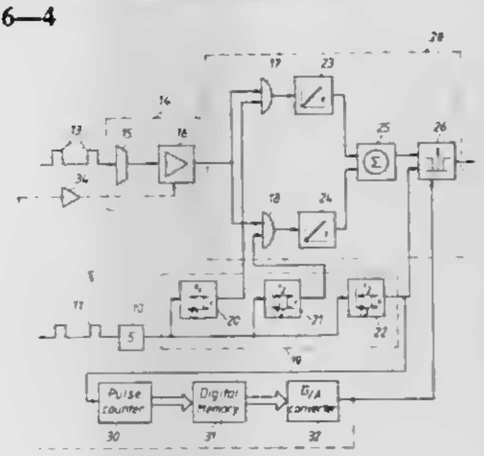
4,106,872
CLOUD ALTITUDE MEASURING APPARATUS AND METHOD

Sven-Erik Soderstrom, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Mar. 9, 1977, Ser. No. 776,063

Int. Cl.^{2} G01C *3/08*

U.S. Cl. 356—4 **2 Claims**



1. Means for measuring cloud altitude, comprising a transmitter for emitting light pulses towards a cloud, a receiver located adjacent the transmitter for detecting light reflected from the cloud, said receiver having a sensitivity, said sensitivity with increasing distance from the receiver, first decreases to a certain distance, and at greater distances from said certain distance said sensitivity increases, and said sensitivity is determined from the function:

$$K/K_{max} = C \cdot 1/A_h \cdot 1/T_h (h/h_{max})^2$$

where
K is the sensitivity of the receiver, K_{max} is the maximum sensitivity of the receiver, C is a constant, A_h is a complex function of height, T_h is an atmosphere transmission factor, h is the height above ground, h_{max} is the maximum measuring height.

4,106,873
DISK PRINTER INKING MECHANISM

John Edward Drejza, Endwell, and Joseph Vincent Riley, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,257

Int. Cl.^{2} B41J *27/06*

U.S. Cl. 400—470 **2 Claims**

1. In a printer having,

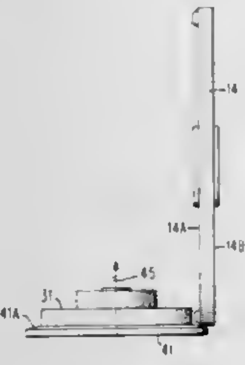
a platen,

a constantly rotating print disk,

a carrier for moving said print disk across said platen, said carrier having a home position at one end of said platen, said carrier being returned to said home position when a line of printing is complete and prior to the initiation of another line of printing,

an ink roll adapted to apply ink to said print disk, the improvement comprising,

a friction disk attached to one side of said ink roll, said friction disk having a diameter larger than said ink roll,
means for moving said ink roll away from said print disk when said carrier is returned to said home position, whereby there is no wear on said ink roll while said carrier is in home position,



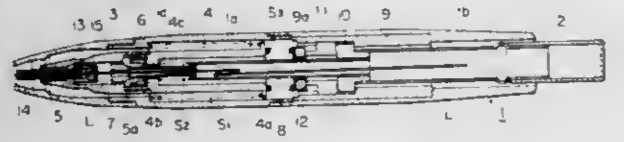
said friction disk remaining in contact with said print disk even when said ink roll is removed from contact with said ink roll whereby, there is no relative velocity between said ink roll and said print disk even when said ink roll is removed from contact with said print disk.

4,106,874

MECHANICAL PENCIL

Osamu Torii, Kyoto, Japan, assignor to Ancos Co., Ltd., Osaka, Japan

Filed Nov. 29, 1976, Ser. No. 745,751
Int. Cl.² B43K *21/22, 21/20*
U.S. Cl. 401—67 **8 Claims**



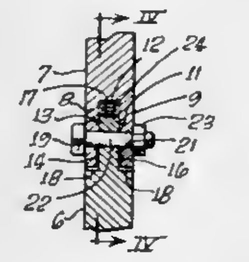
1. A mechanical pencil, comprising:
(a) an elongated hollow main body member defining a mouth opening at one end thereof,
(b) a mouth piece movable in and out of the mouth opening,
(c) a chuck receiver axially secured to one end of the mouth piece to define an annular recess therebetween and positioned within the body member,
(d) a chuck sleeve slidably positioned in the annular recess,
(e) a lead gripping chuck positioned within the chuck sleeve,
(f) an elongated lead case secured to one end of the chuck and slidably positioned within the body member and the chuck receiver,
(g) first spring means for urging the chuck into lead gripping engagement with the chuck sleeve and the chuck receiver inwardly with respect to the mouth opening,
(h) a push operated mechanism slidably positioned within the body member for locking the mouth piece, chuck receiver, chuck receiver, chuck sleeve, chuck and lead case in retracted and extended positions with respect to the mouth opening,
(i) second spring means positioned between the chuck receiver and the mechanism for urging the two apart, and,
(j) a secured to the lead case push cap for implementing the longitudinal movement of the lead case and mechanism.

4,106,875

EXPLOSIVELY-SEPARATED TONGUE AND GROOVE JOINT

Harvey R. Jewett, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1977, Ser. No. 836,167
Int. Cl.² F16B *1/00*
U.S. Cl. 403—2 **10 Claims**



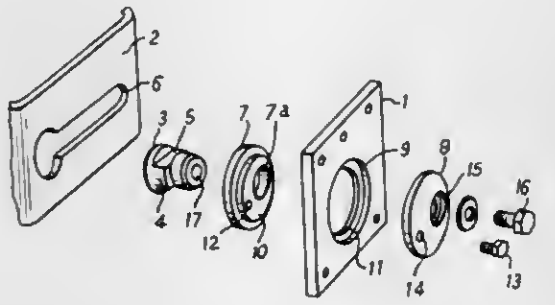
1. Explosively separated tongue and groove coupling apparatus comprising:
a groove member having laterally spaced leg portions forming a longitudinally-extending tongue-receiving groove,
a tongue member fitted into said groove,
at least one laterally-extending bolt means securing said members,
explosive means disposed between said members, and
means for detonating said explosive means,
both of said members being provided with aligned bolt-receiving holes and at least one of said members being formed with a plurality of slots disposed longitudinally of said member in close proximity to a bolt-receiving hole,
said explosive means operatively spanning the length of said plurality of slots and being spaced from said slots and bolt holes by a beam-like web portion of the tongue member,
detonation of said explosive means collapsing said web portion adjacent each of said slots for opening each bolt hole and said detonation further providing a force for driveably separating said members with each bolt freely passing through its opened bolt hole.

4,106,876

DOOR MOUNTINGS

Geoffrey Robinson Tregoning, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Nov. 29, 1976, Ser. No. 745,866
Claims priority, application United Kingdom, Dec. 20, 1975, 52278/75
Int. Cl.² F16B *1/00*
U.S. Cl. 403—4 **6 Claims**



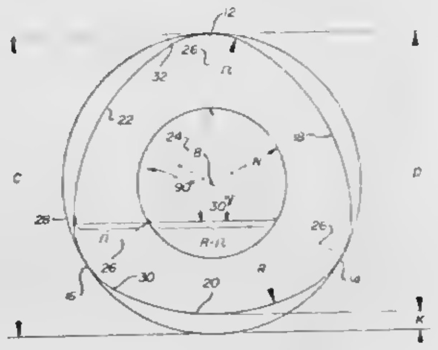
1. A door mounting device including when assembled, a first door part having an aperture, a mounting member rotatably mounted within said aperture, a second part having a slot, a further mounting member slideably mounted in said slot, said further mounting member extending from said slot to rotatably engage in an eccentric aperture in said mounting member, and means for locking said mounting member against rotation in said aperture.

4,106,877

LOBULAR PIN

Peter J. Ferguson, South Dartmouth, Mass., assignor to Research Engineeering & Manufacturing, Inc., New Bedford, Mass.

Filed Sep. 16, 1976, Ser. No. 723,765
Int. Cl.² F16B *19/00*
U.S. Cl. 403—14 **4 Claims**



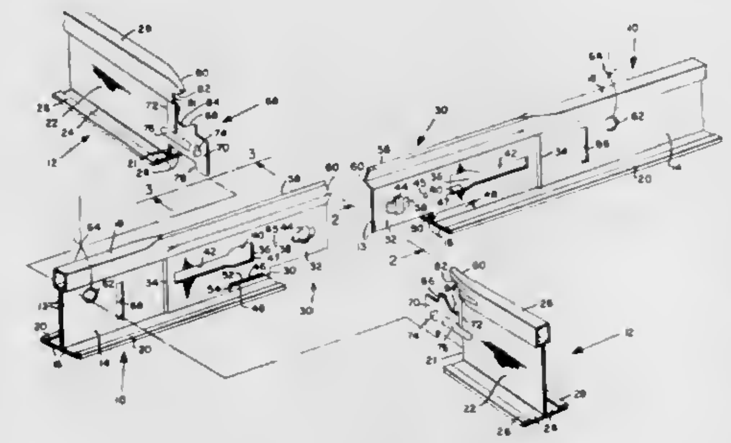
1. A pin having a pilot point with a uniform width throughout 360°, said pin having a longitudinal axis and a body containing a cross section of arcuate polygonal lobular configuration with an odd number of arcuate sides and intermediate circumferentially spaced arcuate lobes, the radii of the lobes each being substantially less than the radii of said sides, said cross section being of uniform width throughout 360°, the body width being greater than the width of said pilot point, the lobes having peaks which are equal distance from a said longitudinal axis and which peaks are adapted to engage the wall of a bore to enhance the grip between the pin and the wall of the bore at regions that are essentially localized at the lobes and with at least portions of said arcuate sides between the peaks being regions of stress relief between the pin and the bore, and wherein the imaginary circle that circumscribes said peaks is centered on said axis and wherein Z is defined as the diameter of the circle having an area equal to the area of said cross section, and wherein D is defined as said body width, the ratio Z/D being within the range of 0.9998 to 0.98863.

4,106,878

FIRE-RATED CEILING GRID CROSS JOINT

Paul H. Jones, Willow Grove, Pa., assignor to National Rolling Mills Company, Malvern, Pa.

Filed Feb. 4, 1977, Ser. No. 765,733
Int. Cl.² F16B *7/22*
U.S. Cl. 403—28 **14 Claims**



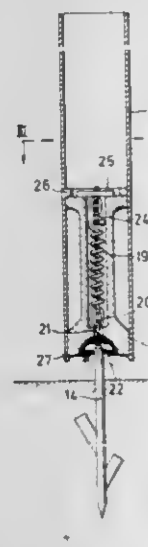
1. For use in a fire-rated suspended ceiling grid, a main beam comprising an elongated web with laterally offset flanges at one edge and a bulb at the other edge whereby said main beam has substantially an inverted T cross section, and coupling means integral with the main beam for connecting the end of said beam to the end of another similarly constructed main beam, said coupling means including a tongue at the end of said main beam, said tongue including portions of each of said web and of said bulb that are offset laterally relatively to the main portions of said web and bulb, with the said offset portion of said bulb being crushed to reduce its lateral dimension whereby said tongue may be brought into close parallel overlapping relation to the tongue of the coupling means of said another similarly constructed main beam with the main portions of said web and bulb and said flanges of said main beam and of such other similarly constructed main beam in longitudinal alignment, said coupling means further including retaining means to retain said tongue in such overlapping relationship with the tongue of the coupling means of such another main beam while allowing relative longitudinal movement of said beams.

4,106,879

KNOCKOVER ROADWAY MARKER POST

Bruno Diedersbagen, Wissen, Schonstein, and Hans Gubela, Cologne, both of Fed. Rep. of Germany, assignors to Gubela Strassenausrustungs-GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,087
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650940; Feb. 3, 1977, 2704496
Int. Cl.² E01F *9/00*
U.S. Cl. 404—10 **20 Claims**



1. A knockover roadway marker post comprising:
a base fixable to the ground and having an upper surface provided with an upwardly tapering formation;
an upright post element having a lower post end formed with a downwardly open recess fittable over said formation with same inside said recess and said lower post end engaging said upper surface; and
a spring braced between said post element and said base and biasing same together with said lower post end bearing on said upper surface and said formation inside said recess.

4,106,880

PORTABLE FIELD MACHINE FOR CUTTING, GRINDING AND LAPPING VALVE SEATS

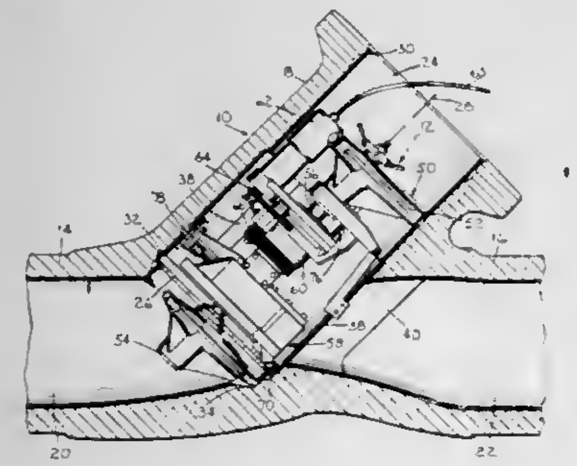
Ronald J. Anders, Raleigh, N.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 701,958, Jul. 1, 1976, Pat. No. 4,050,836. This application Feb. 14, 1977, Ser. No. 768,313
The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.
Int. Cl.² B23B *35/00, 1/00*
U.S. Cl. 408—1 R **1 Claim**

1. The method of finishing the valving seat of a valve attached to an associated fluid line without the removal of said valve therefrom using a portable valve seat finishing machine,

1

said valve having a valve body containing an internal valving chamber terminating in an annular valve seat having a profile adapted for sealing engagement by a valving member translatable along the control axis of said valve chamber, said valve seat finishing machine having a stationary housing having axially spaced sections interconnected by a shaft member, positioning means carried by said housing, comprising the steps of: positioning said portable valve seat finishing machine within said valving chamber, positioning said shaft member with respect to said control axis by contacting the interior surface of said valving chamber with said positioning means, tool holder means operatively attached to said shaft means, positioning said tool holder means within said valving chamber with respect to said annular valve seat, said tool holder means including a valve seat profile means and a carrier means rotatably supported thereby, supporting rotatably and reciprocally said tool holder means on said shaft member for axial movement along the control axis and rotation thereabout, preventing relative rotation between said housing and said carrier means, rotating with a drive means operatively connected between said tool holder means and said carrier means said tool holder means about said shaft member, feeding axially by a first feeding means operatively connected between said housing and said tool holder means, said tool holder means, said carrier means and said drive means as a unit along said shaft member, feeding radially with respect to said tool holder means and said shaft member said profile forming means by a second feed means, positioning said profile forming means axially and radially with respect to said control axis for performing finishing operations on said valve seat.



4,106,881
ENCAPSULATED MOTOR COMPRESSOR FOR REFRIGERATORS

Jorgen Christian Stannow, and Hans Jürgen Tankred, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

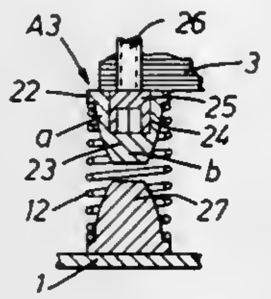
Filed Apr. 11, 1977, Ser. No. 786,421

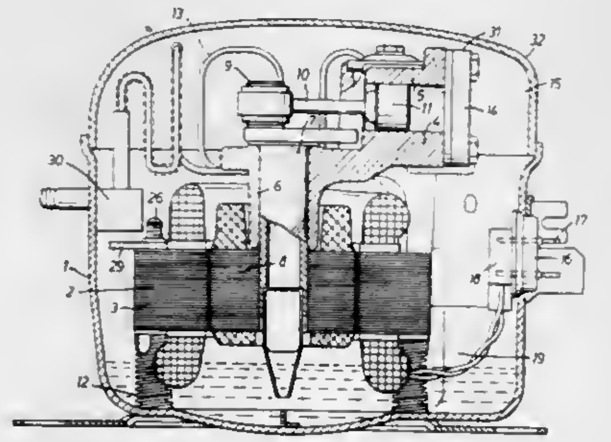
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617388

Int. Cl.² F04B *35/00*

U.S. Cl. 417—363 **1 Claim**

1. A motor compressor assembly for refrigerators comprising a casing, an integrated motor and compressor unit in said casing having a lower motor part and an upper compressor part, said motor part having a stator which includes a stack of laminations, said stack of laminations having a generally rectangularly shape periphery with four bevelled corners, stator bolts extending upwardly through said stack of laminations at the four corners thereof with the heads of said bolts projecting downwardly from the lower surface of said stack of laminations, resilient mounting means for supporting said unit, said mounting means including four generally cone shaped spring retaining abutment members attachable from below to the four corners of said stack of laminations, said abutment members having recesses for receiving said bolt heads and collars which extend outwardly beyond said bevelled corners of said stack of laminations, said collars being abuttingly engageable with the inner surface of said casing during lateral movement of said unit to provide bumper protection for said unit, and spring means including helical springs which respectively engage said collars.





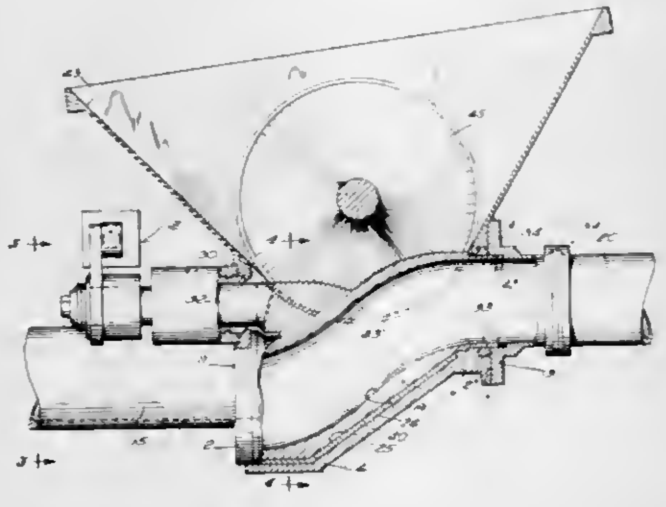
4,106,882
POSITIVE DISPLACEMENT PUMP FOR SEMI-FLUID MATERIALS

Eugene L. Sherrod, Via Massimo d'Azeglio 2, 20052 Monza, Italy

Filed Jul. 25, 1975, Ser. No. 598,991

Int. Cl.² F04B *7/00*

U.S. Cl. 417—517 **17 Claims**



1. In a positive displacement pump for forcing pumpable material into the receiving end of a delivery pipe, wherein a pump cylinder has a mouth opening to a feed chamber through one of a pair of opposite walls thereof, so that pumpable material in the feed chamber can be inducted into the cylinder during the retraction stroke of its piston, wherein a hole in the other one of said walls of the feed chamber opens to the receiving end of the delivery pipe, wherein a tubular swivel valve is mounted in the feed chamber between its said opposite walls for oscillation about a fixed axis that is coaxial with the receiving end of the delivery pipe and offset from the axis of the mouth of the pump cylinder, between pump charging and discharging positions wherein said swivel valve has a substantially S-curved material conveying passage extending lengthwise therethrough with its outlet end coaxial with the rotation axis of the valve and at all times in communication with the receiving end of the delivery pipe, and its inlet end offset from said rotation axis to register with and receive material expelled from the mouth of the pump cylinder upon oscillation of the swivel valve in timed relation with the reciprocation of the pump piston, the improvement which resides in:

A. all of that portion of said material conveying passage which is curved along the length thereof being between said opposite walls of the feed chamber;
B. the distance between said opposite walls of the feed chamber being such that a substantial area of the surface of said passage extends obliquely across the path of material being discharged from the pump cylinder at an angle to said path so steep as to cause such material to impose a substantially high axial thrust force upon the valve;
C. said swivel valve having an exterior surface for transmitting said axial thrust force upon the valve, which surface
    (1) lies directly radially outward of said area with respect to the rotation axis of the valve,
    (2) lies entirely within the feed chamber and substantially spans the distance between said opposite walls thereof,
    (3) has its axially opposite ends offset from one another substantially the same distance as are the axially opposite ends of the material conveying passage,
    (4) for its entire axial dimension is transversely arcuate, and
    (5) on every plane normal to the rotation axis of the valve and intersecting said exterior load transmitting surface is uniformly concentric to said rotation axis, but with decreasing radii towards the outlet end of the swivel valve so that for its entire axial dimension said load transmitting surface is substantially part of a cone; and
D. the feed chamber having another wall with an inner surface shaped to conform to the sweep of said arcuate exterior load transmitting surface of the swivel valve as the swivel valve oscillates about its rotation axis and in every position of the swivel valve has an area thereof uniformly contiguous to every part of said arcuate load transmitting surface of the swivel valve, so that said wall of the feed chamber receives and bears the axial thrust imposed upon the swivel valve by the material being discharged from the pump cylinder.

4,106,883
DISTRIBUTING VALVE ON A HYDRAULIC ROTARY PISTON ENGINE

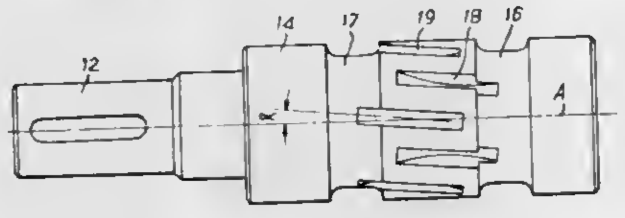
Gunnar Lyshoj Hansen, Nordborg, and Leif Viggo Sturlason, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 25, 1977, Ser. No. 771,979

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608887

Int. Cl.² F04C *15/02*

U.S. Cl. 418—61 B **2 Claims**



1. An expansible chamber rotary piston engine comprising meshing internal and external gears wherein one rotatable gear has rotatable and orbital movement relative to the other fixed gear to form expansible chamers, relatively rotatable and cooperable valve members connected respectively to said gears, said valve members having respective first and second sets of circumferentially arranged ports with each port in each set being sequentially aligned with each port in the other set upon relative rotation between said valve members, said valve members having cooperating cylindrically shaped surfaces in which said respective sets of ports are formed, the ports in each of said sets having at least one pair of generally parallel edges which are generally normal with respect to the direction of relative motion between said valve members, the ports in said first set having its said parallel edges orientated at the small angle relative to said parallel edges of the ports in the other of said sets, and said first set of ports having the circumferential spacing of the ports thereof alternately equal to and slightly larger than the width of the ports of said second set of ports so that each of said expansible chambers is completely closed off by said valve members upon reaching its largest volume.

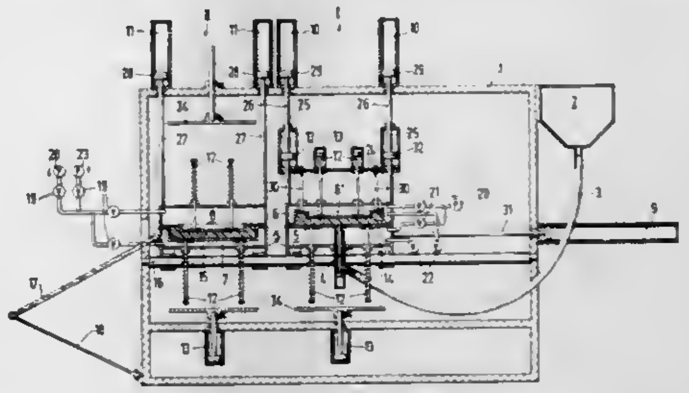
4,106,884
PRODUCTION OF ARTICLES OF FOAMED PLASTICS MATERIAL

Johann Friedrich Jegelka, Tannenstrasse 52, 6983 Kreuzwertheim, Germany

Filed Mar. 30, 1977, Ser. No. 782,615

Int. Cl.² B29C *3/02*

U.S. Cl. 425—345 **5 Claims**



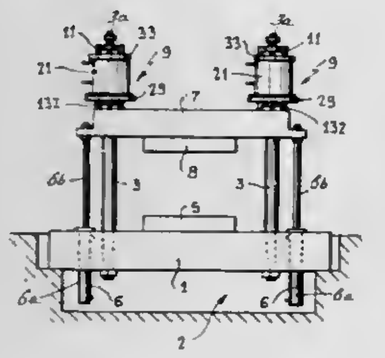
1. A machine for producing articles of foamed plastics material in a two-stage process with transfer of the workpiece from a hot-preforming station to a cold final-forming station, comprising:

a frame;
a hot-preforming station in said frame having a two-part hot mould consisting of a first hot mould part and a second hot mould part;
first fluid cylinder means for moving said second hot mould part towards and away from said first hot mould part only in the direction of pressing;
a cold final-forming station in said frame having a two-part cold mould consisting of a first cold mould part and a second cold mould part; and
second fluid cylinder means for moving said second cold mould part of said final-forming station towards and away from said first cold mould part of said final-forming station only in a direction parallel to the direction of motion of said first fluid cylinder means;
said two first mould parts being coupled together and mounted to be capable of shifting at right angles to the direction of movement of said first and second fluid cylinder means under the influence of third fluid cylinder means,
control means for the cylinders,
such that the workpiece is first formed in the hot-preforming station when the first and second hot mould parts of the hot mould are aligned, the workpiece is then carried with the second hot mould part as the two parts are separated, the first parts of the hot and cold moulds are shifted to align the second part of the hot mould and the first part of the cold mould and transfer of the workpiece is effected

from one to the other, the first parts of the hot and cold moulds are again shifted to align the first and second parts of the cold mould and cold forming is effected, the workpiece is then carried by the second part of the cold mould as the two parts of the cold mould are separated, the first part of the cold mould is shifted out of alignment and the finished article is ejected from the second part of the cold mould.

4,106,885
HYDRAULIC MOULDING PRESSES

Pierre Poncet, 12 bis, rue Trarieux, Lyons, France (69003)
Filed Mar. 17, 1977, Ser. No. 778,525
Claims priority, application France, Mar. 31, 1976, 76 10352
Int. Cl.² B29F *1/06*
U.S. Cl. 425—450.1 **4 Claims**



1. A press for supporting and closing mating mold portions, comprising:

a first platen for supporting a first mold portion;

multiple columns fixed to said first platen and extending therefrom in parallel relationship, each of said columns having a free end and having multiple annular grooves near the free end and spaced axially of the column;

a second platen for supporting a second mold portion, the second platen having multiple holes through it receiving said columns, and the second platen being reciprocable on said columns with respect to said first platen;

long stroke mold pre-closing rams connected between said first and second platens and operative when pressurized to displace the second platen on said columns with respect to the first platen;

a short stroke mold-clamping ram at each column, each short stroke ram comprising a cylinder containing a reciprocable piston, the piston being tubular and having the free end of an associated column extending through it, and the cylinder being connected to the second platen; and

a main locking means carried by the piston at each column and operable, when the long stroke rams have pre-closed the mold portions, to enter a groove and lock the piston to the column, whereby pressurizing of the cylinder will exert a mold closing stroke in a direction to displace the cylinder and connected platen to mate the mold portions.

4,106,886
PARISON PICKERS WITH VARIABLE SPACING

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.
Filed Jun. 21, 1977, Ser. No. 808,705
Int. Cl.² B29D *23/03*
U.S. Cl. 425—526 **10 Claims**

1. In a blow molding assembly including:

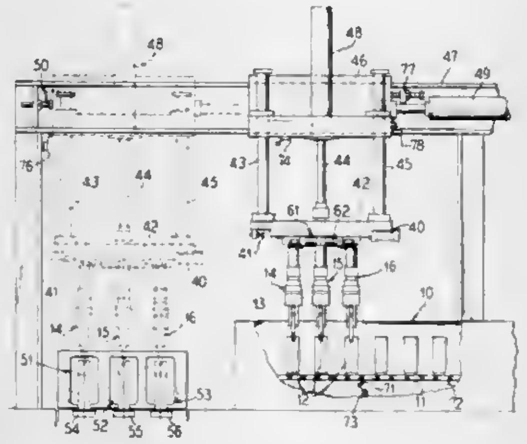
an oven,

a plurality of molds spaced from said oven,

a conveyor means arranged to carry parisons in equally spaced relation through said oven, and

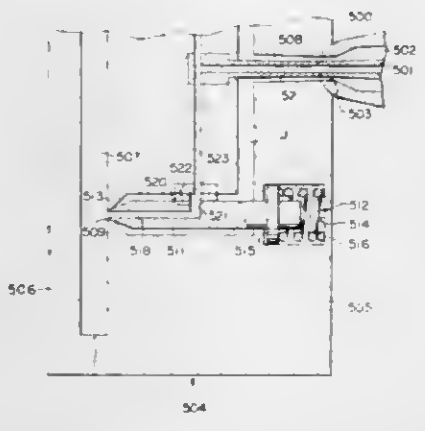
a carriage having picker means between arranged to grasp a plurality of parisons from said oven and deliver them to said molds, the improvement which comprises:

an adjustable displacement means operating on selected ones of said picker means to vary the spacing between said selected ones and an adjoining picker means in traveling from said oven to said molds.



4,106,887
APPARATUS FOR INJECTION MOLDING SYNTHETIC RESIN MATERIALS

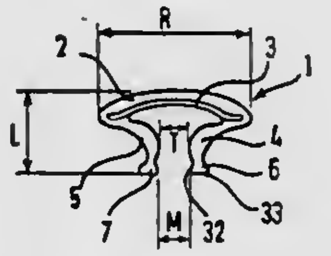
Akio Yasuike, Yokohama; Hirosbi Kataoka, Tokyo; Tutomu Fujikawa, Yamato, and Naoto Suzuki, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan
Filed Apr. 12, 1977, Ser. No. 786,939
Claims priority, application Japan, Feb. 21, 1977, 52-17137
Int. Cl.² B29F *1/08, 1/03*
U.S. Cl. 425—549 **6 Claims**



1. A mold assembly suitable for use in an injection molding machine having a nozzle for injection, comprising a body, at least one mold cavity in said body for receiving a synthetic resin from said injection molding machine; a sprue in said body for establishing a direct connection to the nozzle of said machine; at least one gate opened to the interior of said mold cavity; runner means connecting said sprue with said gate and being heated by heating means; valve seat means formed in said gate at that portion of said gate which faces said runner means; valve means including a needle valve slidably mounted within said runner means and being movable into engagement with said valve seat means, said needle valve having a tip portion and a fluid passage formed through said needle valve which is opened at its one end in said tip portion of said needle valve which faces the interior of said mold cavity when said needle valve is engaged by said valve seat means, the other end of said fluid passage being connected to a connecting passage formed in said body, said connecting passage being in turn connected to a source of pressurized fluid; and actuator means in said mold assembly for engaging said needle valve with said valve seat means to close said gate.

4,106,888
TIRE MOLDING APPARATUS

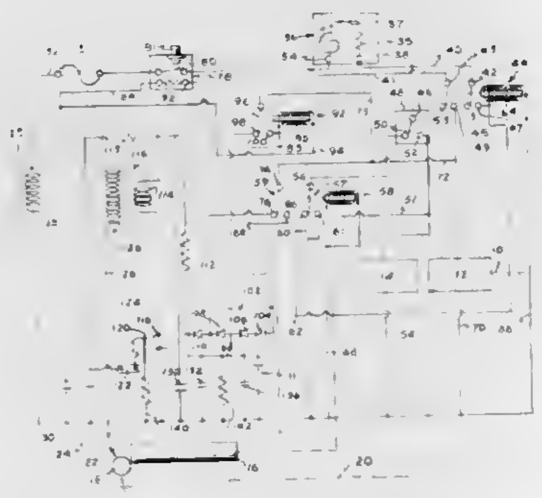
Giovanni Calori, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy
Filed May 25, 1976, Ser. No. 689,850
Claims priority, application Italy, Jun. 13, 1975, 24326 A/75
Int. Cl.² B29H *5/02;* **B29F** *1/00*
U.S. Cl. 425—577 **7 Claims**



1. A mold for manufacturing a tire with tread, sidewalls and beads, said beads being essentially made of a plastomeric or elastomeric material, said mold comprising an outer envelope and an inner body associated to form a mold cavity of the desired shape of the tire, said inner body comprising a core made of radially displaceable sectors, characterized in that the inner body comprises at least two annular elements, an upper one and a lower one, which are separable from one another and from the core along the direction of the core axis, said elements having at least two surfaces which correspond to the tire surfaces disposed between the inner zone connecting the sidewalls to the beads and a part of the axially outer zone of the beads, said two annular elements originating the spreading out of the sidewalls of the tire when the annular elements are moved away from each other, and said inner body comprising means for blocking said annular elements with the core and with the outer envelope during the tire molding.

4,106,889
BURNER IGNITION SYSTEM

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Nov. 19, 1976, Ser. No. 743,297
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—46 **19 Claims**



1. An ignition and control system for ignition of fuel discharged from a burner assembly including a main fuel burner having a fuel supply line connected thereto and a pilot burner to ignite fuel discharged from said main burner and having a pilot fuel supply line extending thereto, which comprises:

ignition means to ignite fuel discharged from said pilot burner;

first and second controlled valves for serial positioning in said main fuel supply line with means to connect said pilot fuel supply line to the fuel supply downstream of said first controlled valve;

condition sensing means to transmit a heating demand signal to said control system;

combustion detection means having cold and hot signal generation states to generate cold and hot signals, responsive to the absence or presence, respectively, of a flame at said pilot burner;

control means having an output signal to activate said first controlled valve into an open position and to activate said ignition means in response to receipt of said heating demand signal and said cold signal;

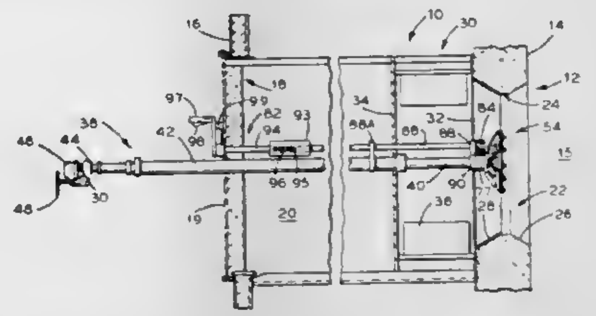
means to apply said hot signal to said second controlled valve to open said valve in response to receipt of said hot signal from said combustion detection means;

ignition control means having an output to inhibit operation of said ignition means in response to receipt of a hot signal from said combustion detection means; and

latching means, and means to apply said output signal of said igntion control means thereto, to maintain inhibition of said ignition means.

4,106,890
AIR DEFLECTOR

John Arthur Fulmer, Massillon, and David Judson Walker, Medina, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed Mar. 7, 1977, Ser. No. 774,822
Int. Cl.² F23M *9/02*
U.S. Cl. 431—184 **1 Claim**



1. In combination with a furnace wall having a circular port extending therethrough, the port being formed with inlet and outlet frusto-conical sections and a constricted section disposed therebetween, the inlet and outlet sections converging in the direction of the constricted section, a burner wall spaced from the furnace wall to form a windbox therebetween to which pressurized air is supplied, a fluid fuel burner including an air register of circular cross section disposed within the windbox and having a discharge end adjacent and opening to the inlet section of the port, the register being arranged to discharge a whirling stream of high velocity air through the port, a circular impeller disposed axially within and in radially spaced relation to the port, the impeller comprising a pair of axially adjacent plate members, each plate member having a hub, a plurality of laterally spaced segments extending outwardly from the hub, the segments being formed with openings defining a fixed free flow area therethrough, means including a shaft for rotating at least one of the plate members about its central axis to provide a first adjustable free flow area between said segments, means including a guide tube extending through each hub for moving the impeller longitudinally through the port to provide a second adjustable free flow area therebetween, means connecting each hub with the guide tube while accommodating rotation of at least one of the members with respect to the guide tube, the shaft including a pair of coaxial sections, a sleeve interconnecting the sections, one of the sections being fixedly connected to the sleeve, the other section being fitted with a guide pin, the sleeve being slotted to engage the pin and permit longitudinal movement between the pinned and fixed sections thereby allowing for adjustment of

the second free flow area independently of the first free flow area.

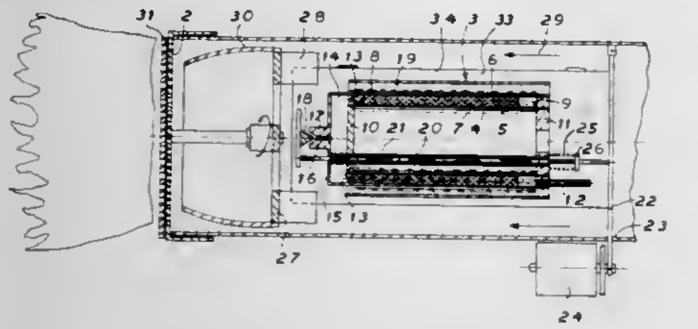
4,106,891
ELECTRICAL HEATING DEVICE

Hermann J. Schladitz, Plantschweg 74, Munich 60, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 534,432, Dec. 19, 1974, abandoned. This application Sep. 16, 1976, Ser. No. 723,982

Int. Cl.^{2} F23D *11/44*

U.S. Cl. 431—208 **19 Claims**



1. An electric heating device for the heating or vaporization of a liquid, comprising; at least one elongated porous body having a small dimension perpendicular to its longitudinal extension, said porous body consisting of a felted mass of polycrystalline metal whiskers or metal-coated non-metal whiskers metallically interconnected at their point of contact, said porous body being enclosed between walls of heat-conducting material along its longitudinal dimension, means for passing the liquid through the porous body in its longitudinal direction, an inlet connection for the liquid to be heated at one end face of the porous body and an outlet connection at the other end face, an electric heating element in direct contact with at least one of said walls, the small dimension of the porous body perpendicular to its longitudinal extension providing a thin cross section to facilitate an essentially uniform heating of the porous body by heat radiation from said heated wall and by heat conduction through the whiskers adjacent said wall to the whiskers more remote from said wall, said body is of hollow cylindrical form and is arranged to be traversed by the fluid to be heated in the direction of its axis and two said walls are provided in the form of an inner tube and an outer tube bounding said hollow cylinder.

4,106,892
APPARATUS FOR HEAT TREATMENT USING DOWNWARDLY SWIRLING HOT GAS FLOW

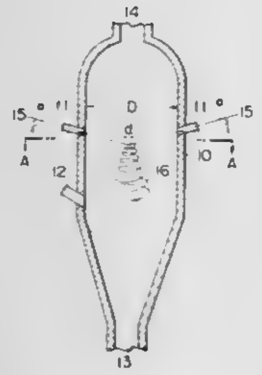
Toshikatsu Haga, and Saburo Hori, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Dec. 1, 1976, Ser. No. 746,574

Claims priority, application Japan, Dec. 23, 1975, 50-173227[U]; Dec. 4, 1975, 50-143312; Mar. 10, 1976, 51-25013

Int. Cl.^{2} F27B *15/00*

U.S. Cl. 432—58 **7 Claims**



1. An apparatus for the heat treatment of a bed of material including a vertically oriented, generally cylindrical furnace having an inlet for introducing the bed-forming material and an exhaust gas outlet at the top of the furnace, comprising:

a plurality of gas inlet nozzles in the furnace above the bed, said nozzles being oriented at a downward angle α between the axis of each nozzle and a horizontal sectional plane through the furnace defined by $0° < \alpha \leqq 30°$, and at a skew angle β between the axis of each nozzle and a horizontal line tangent to the furnace circumference at the point where the nozzle axis intersects the furnace wall defined by $45° \leqq \beta \leqq 85°$, whereby gas streams introduced through said nozzles collectively produce a downwardly swirling flow having a truncated conical configuration to thereby confine and contain particles of the material splashed or blown up out of the bed, the inside diameter of the upper portion of the furnace, above the nozzles, being greater than that of the lower portion of the furnace containing the nozzles, and said upper and lower portions being connected by an inclined arcuate section.

4,106,893
SINTERING FURNACE

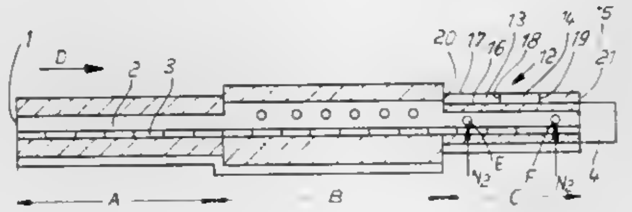
Helmut Baumann, and Fritz Petzi, Nüremberg, both of Fed. Rep. of Germany, assignors to Ludwig Riedbammer GmbH & Co. K.G., Nüremberg, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,444

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658489

Int. Cl.^{2} F27D *15/02;* **F27B** *9/26*

U.S. Cl. 432—77 **1 Claim**



1. A sintering furnace for sintering magnetic-ceramic articles comprising:

a rapid-firing carriage furnace structure having a gastight flooring;

an inlet at one end and an outlet at the other end of the structure;

means defining a plural-section cooling zone in the interior of the structure;

cooling means for effecting indirect cooling of the cooling zone with additional cooling in the section of highest temperature;

rails extending longitudinally of the structure along a lower part thereof;

carriages mounted for sliding movement along the rails;

means for selectively charging different ones of the sections of the plurality thereof in the cooling zone with different cooling media.

4,106,894
APPARATUS FOR HEAT TREATING FRAGMENTED MATERIALS

Andre Henri-Robert Bobleter, Villeneuve-St. Georges, and Jacques Louis-Paul Simonnet, Chevreuse, both of France, assignors to Bertin & Cie, Plaisir and Affimet, Paris, both of, FRX

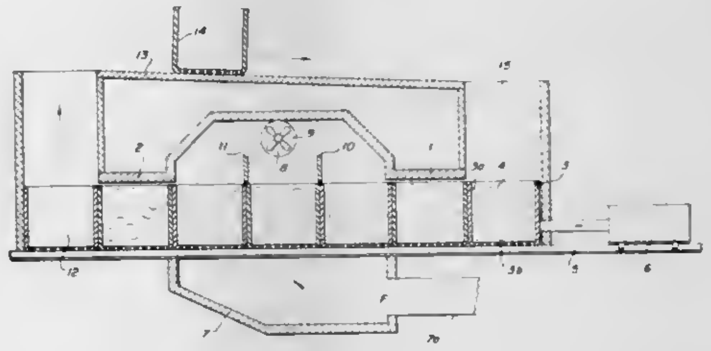
Filed Dec. 15, 1976, Ser. No. 750,807

Claims priority, application France, Dec. 19, 1975, 75 38970

Int. Cl.^{2} F27B *9/14*

U.S. Cl. 432—122 **6 Claims**

1. A furnace system for the heat treatment of fragmented materials, comprising, an elongated heating tunnel having smooth sides, a bottom flue in communication with said tunnel for the introduction of hot gases thereto and a top flue for collection and exhaustion of cooled gases, a basket inlet chamber having a solid ceiling at one end of said tunnel, a basket outlet chamber having a solid ceiling at the other end of said tunnel, rail means extending through the length of said tunnel, a plurality of baskets mounted on said rail means for carrying the materials to be treated through the tunnel, said baskets having solid vertical sides and a gas permeable base, an metallic slide block on the bottom of each basket in contact with the rail means and serving as a gas seal, and means for moving said baskets through said tunnel.



4,106,895

DYE TRANSFERRING METHOD

Geoffrey Allan Smith, Melrose, and Alan James Laidlaw, Galashiels, both of Scotland, assignors to Fastran AG, Zug, Switzerland

Filed Mar. 16, 1976, Ser. No. 667,319
Int. Cl.^{2} D06P *3/16, 3/06*

U.S. Cl. 8—2.5 A 3 Claims

1. A method of transferring dyes which comprises transferring coloured dyes from a paper roll onto a textile fabric or material of animal fibres which has been padded with a composition selected from the group consisting of potassium hydrogen sulfate and mixture of potassium hydrogen sulphate and citric acid in the ratio of 3:2 to 2:3 and a printing paste thickener which is stable under acid conditions, using a heated press at a temperature between 80° and 120° C at a pressure of up to 10 lbs. per square inch, and for a period not exceeding 10 minutes, the printed fabric or material being then removed from the press washed in water and dried.

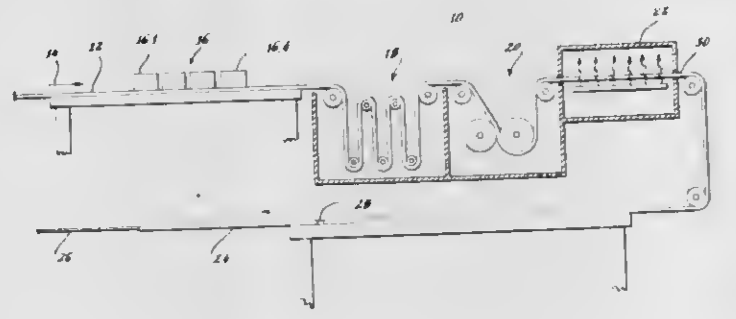
4,106,896

METHOD FOR PRODUCING MULTICOLOR PRINTED WEB MATERIAL

Alan Hedley Norris, and Phillip Wayne Chambley, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 7, 1977, Ser. No. 766,214
Int. Cl.^{2} D06P *5/12, 5/22*

U.S. Cl. 8—62 **10 Claims**



1. A method for producing a multicolor printed web material with dyes which are applied in separate patterns at dye printing stations on a common production web comprising the steps of

- attaching a lead web segment which is non-receptive to the dyes and of sufficient length to receive the respective printing patterns to the production web;
- advancing the lead web segment followed by the attached production web past the dye printing stations to print said dye patterns thereon;
- adjusting the printing operation at the dye printing stations to establish proper printing patterns on the lead web segment;
- processing the dye printed lead web segment and the attached printed production web to fix the dyes on the production web;
- said processing step including the step of washing of the lead web segment and the production web to remove non-fixed dyes therefrom and produce a reusable lead web segment from which the dye patterns have been effectively removed.

4,106,897

LEATHER TANNING WITH OLIGOURETHANES

Harro Träubel, Leverkusen, Fed. Rep. of Germany; Helmut Reiff, New Martinsville, W. Va., and Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,809, Mar. 25, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,489
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1974, 2416485; Jan. 31, 1975, 2504081
Int. Cl.^{2} C14C *0/00*

U.S. Cl. 8—94.33 **15 Claims**

1. Process for tanning or retanning hide, skin or leather, characterized in that hide, skin or leather are treated with an aqueous solution which contains:

- (a) optionally methylolated water-soluble oligourethanes containing ionic groups which have a molecular weight of from 300 to 20,000, characterized in that the water-soluble oligourethanes contain no phenolic groups, no free NCO groups and no aziridine groups; and, optionally,
- (b) formaldehyde or a substance from which formaldehyde may be split off.

4,106,898

LEATHER TANNING WITH OLIGOURETHANES

Harro Traubel, Leverkusen, Fed. Rep. of Germany; Helmut Reiff, New Martinsville, W. Va., and Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,809, Mar. 25, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,499
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1974, 2416485; Jan. 31, 1975, 2504081
Int. Cl.^{2} C14C *3/18*

U.S. Cl. 8—94.33 **16 Claims**

1. Process for tanning or retanning hide, skin or leather, characterized in that hide, skin or leather are treated with an aqueous liquor which contains:

- (a) optionally methylolated hydrophilic oligourethanes which have a molecular weight of from 300 to 20,000, characterized in that the oligourethanes have no free NCO groups, no aziridine groups, no phenolic groups, and no ionic groups; and, optionally,
- (b) formaldehyde or a substance from which formaldehyde may be split off.

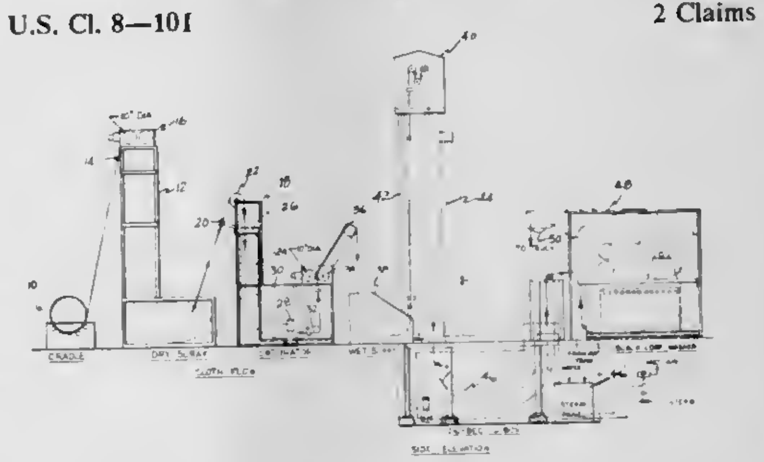
4,106,899

TEXTILE GOODS BLEACHING MEANS AND METHOD

Donald G. Bousquet, Gastonia; Jesse G. Camp, Jr.; Mortimer Gilbert Hopkins, both of Charlotte, and Leonard J. Jagt, Belmont, all of N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Jan. 19, 1977, Ser. No. 760,729
Int. Cl.^{2} D06L *3/14*

U.S. Cl. 8—101 **2 Claims**



2. The method of bleaching textile goods in which the goods are first saturated with a bleaching liquor and then fed to a

J-box for preliminary steaming and subsequent further treatment with bleaching liquor in the heel of the J-box, which comprises steaming the saturated goods within the J-box prior to piling of the goods therein, maintaining a flow of heated bleaching liquor through the goods in the heel of the J-box, and stopping the steaming and redirecting the flow of bleaching liquor to the steaming point for unheated flow throughout the J-box pile of goods whenever the feed of goods through the J-box is interrupted.

4,106,900

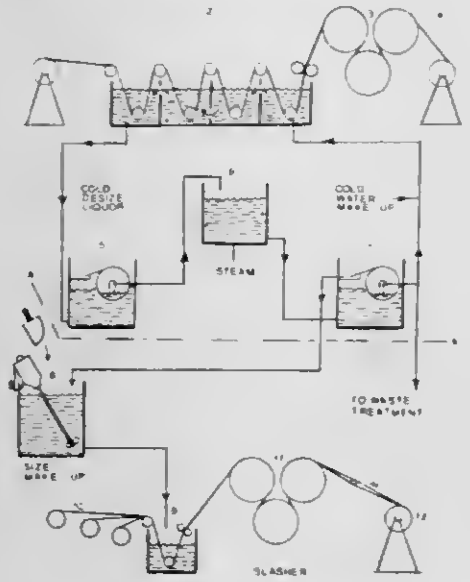
PROCESS FOR RECYCLING TEXTILE WARP YARN SIZE

Warren S. Perkins, Auburn, Ala., assignor to Auburn University Research Foundation, Auburn, Ala.

Filed Jan. 18, 1977, Ser. No. 760,278

Int. Cl.^{2} D06L *1/14;* D06M *9/00*

U.S. Cl. 8—115.6 **6 Claims**



1. A process for sizing and desizing textile yarns which comprise the steps of

  (a) dissolving a chemical which is soluble in water at one temperature and insoluble in water at a different temperature, the chemical being capable of forming a warp size in water to make an effective sizing solution;
  (b) sizing textile yarns with the solution;
  (c) weaving the sized yarns into a fabric;
  (d) desizing the fabric by contacting the fabric with water at a temperature which will dissolve out the chemical, thereby making a desize liquor;
  (e) changing the temperature of the desize liquor to precipitate a dispersion of the chemical;
  (f) separating the dispersion of precipitated chemical from supernatant water;
  (g) changing the temperature of the dispersion to make a solution of the chemical, and
  (h) adjusting solids content of the solution as required to make a sizing solution.

2. The process of claim **1** in which the chemical used is an hydroxypropylated polysaccharide characterized by

  a hydroxypropyl content of from 20% to 85% by weight of the hydroxypropylated polysaccharide, and
  an average molecular weight of from 20,000 to 1,500,000.

4,106,901

EMULSIFIER-SOLVENT SCOUR COMPOSITION AND METHOD OF TREATING TEXTILES THEREWITH

Bruce J. Bishop, and Allen J. Moon, both of Macon, Ga., assignors to Star Chemical, Inc., Macon, Ga.

Filed Aug. 31, 1976, Ser. No. 719,153

Int. Cl.^{2} D01C *1/00, 3/00*

U.S. Cl. 8—139 **4 Claims**

1. A method of desizing and scouring cellulosic fiber materials prior to dyeing which comprises treating said fibers with an aqueous caustic solution containing from 0.05 to 10.0% on weight fabric of a scour composition which is stable in aqueous solutions containing at least 3% caustic at ambient temperatures and up to about 212° F, comprising from about 50 to 90% by weight of a solvent medium of at least one inert organic solvent to provide a solvent medium having an average kauri-butanol value of at least 45 and containing by weight about:

  (a) 5 to 35% of at least one phosphate ester of a 30 to 75% ethoxylated and/or propoxylated C_8–C_{24} aliphatic or aromatic alcohol;
  (b) 1 to 10% of at least one C_8–C_{24} carboxylic acid or salt thereof; and
  (c) 4 to 20% of either
    (i) at least one member from the group consisting of a sulfonated C_8–C_{24} fatty acid or salt thereof, a 30–75% ethoxylated and/or propoxylated ester of a C_8–C_{24} carboxylic acid, a 30–75% ethoxylated and/or propoxylated glyceride of a C_8–C_{24} hydroxy containing carboxylic acid, and a sulfonated C_1–C_{18} alkyl diphenyl oxide or salt thereof; or
    (ii) at least one of a 30–75% ethoxylated and/or propoxylated C_8–C_{24} aliphatic or aromatic alcohol, primary or secondary amine or mercaptan; sulfonated C_1–C_{18} alkyl benzene or salt thereof; and a C_8–C_{24} fatty diethanol amide.

4,106,902

AMMONIA TREATMENT OF TEXTILE MATERIALS

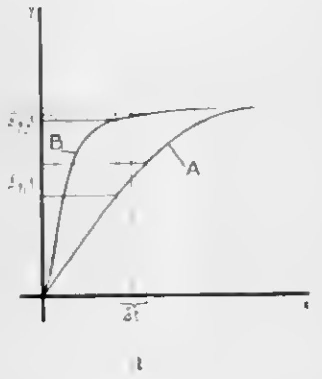
John Aitken, and William Eric Graham, both of Paisley, Scotland, assignors to J. & P. Coats Limited, Glasgow, Scotland

Filed Nov. 3, 1975, Ser. No. 628,319

Claims priority, application United Kingdom, Nov. 7, 1974, 48129/74

Int. Cl.^{2} D06M *1/08*

U.S. Cl. 8—181 **4 Claims**



1. A process of treating textile material of a cellulosic nature with liquid ammonia including the step of first applying water to the textile material which is to be subsequently impregnated with liquid ammonia so that the mositure content of the material before impregnation with liquid ammonia is greater than the mositure content normally present in the prevailing conditions of atmospheric humidity but with a maximum value of 30% by weight of the dry material and then impregnating the water-containing textile material with liquid ammonia.

4,106,903

PROCESS FOR THE TREATMENT OF CELLULOSE-FIBRES

Klaus Langheinrich, Schildgen; Otto Berenstecher, Bensberg-Refrath, and Horst Renziehausen, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

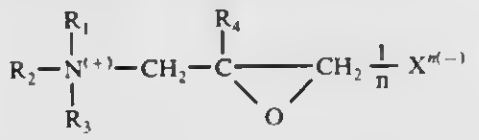
Filed Jun. 23, 1976, Ser. No. 698,958

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2527962

Int. Cl.^{2} D06M *13/46*

U.S. Cl. 8—196 **5 Claims**

1. Process for the treatment of cellulose fibres with fixing agents before the manufacture of yarn, characterised in that cellulose fibres or their mixtures with synthetic fibres, in the form of a doubled pre-drawn sliver, are impregnated with fixing agents of the general formula



$$\left[R_2-\overset{R_1}{\underset{R_3}{N^{(+)}}}-CH_2-\overset{R_4}{C}\overset{O}{\frown}CH_2 \right]_{\frac{1}{n}} X^{n(-)}$$

in which

  R_1, R_2, and R_3 represent a C_1-C_4-alkyl group, or a hydroxyl-substituted C_2-C_4-alkyl group or
  R_1 and R_2 can be joined to form a ring with N,
  R_4 represents hydrogen or a methyl group,
  $X^{n(-)}$ represents an anion and
  n represents 1, 2 or 3,

and with an adhesive selected from the group consisting of polyacrylates, copolymers thereof, polymethacrylates, copolymers thereof, polyvinylacetates, and alginates, and the impregnated fibres are subsequently fixed.

4,106,904

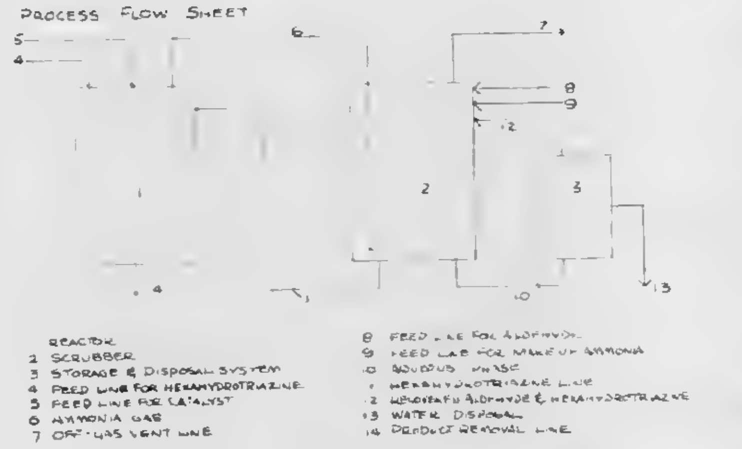
SUBSTITUTED PYRIDINES AND DIHYDROPYRIDINES AS CORROSION INHIBITORS

Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 647,342, Jan. 8, 1976, Pat. No. 4,022,785. This application Dec. 30, 1976, Ser. No. 755,534

Int. Cl.^{2} C23F *11/14, 11/12*

U.S. Cl. 21—2.7 R **6 Claims**



1. A process of inhibiting corrosion of metals in aqueous systems containing corrosive substances which comprises adding to said system 0.25 to 7500 p.p.m. of a mixture of an alkylpyridine and an N-substituted alkyl 1,2-dihydropyridine prepared by reacting a hexahydrotriazine in the presence of a Lewis acid at a temperature between 80° C. and 300° C. for a period of about 0.5 to 24 hours.

4,106,905

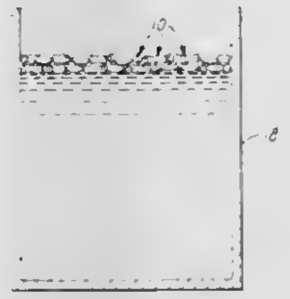
PROCESS FOR PROVIDING INSULATING COVERS

Joseph J. Schmitt; Richard R. Dahlen, both of White Bear Lake, and David A. Lindblad, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 9, 1976, Ser. No. 712,681

Int. Cl.^{2} B01J *1/18;* F28F *13/00*

U.S. Cl. 21—60.5 R **6 Claims**



1. A process for providing a thermal insulating cover of discrete, hollow, pillow shaped particles over a body of fluid comprising the steps of:

  (1) forming a plurality of discrete, hollow interior ceramic particles having a diameter at their substantially circular midpoint of about 5/16 inch and a length ranging from 1.5 to 2 inches;
  (2) firing said particles to a temperature of at least 350° C., the average particle density being in the range of 0.2 to 0.9 grams/cc.; and
  (3) placing said particles on said fluid to form a layer at least ⅛ in. thick on top of said fluid.

4,106,906

METHOD FOR SUPPRESSING WATER EVAPORATION USING A POLYBUTADIENE FILM

Kenneth L. Moore, China Lake, and Russell Reed, Jr., Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,135

Int. Cl.^{2} B01J *1/18;* E02B *1/00, 3/00*

U.S. Cl. 21—60.5 A **4 Claims**

1. A method for suppressing evaporation from a body of water which has a surface exposed to an ambient atmosphere consisting of the steps of:

  (a) applying a solution consisting essentially of polybutadiene prepolymer to said surface of said body of water; and
  (b) cross-linking, by air-activated cross-linking under ambient conditions, said prepolymer to form an evaporation suppressing continuous polymer film on said surface of said body of water.

4,106,907

CENTRIFUGE TUBE AND METHOD FOR PERFORMING ASSAY WITH SAME

John Cecil Charlton; John Stuart Glover, and Bryan Peter Shepherd, all of Amersham, England, assignors to The Radiochemical Centre Limited, Amersham, England

Filed Feb. 3, 1977, Ser. No. 765,403

Claims priority, application United Kingdom, Feb. 13, 1976, 5848/76

Int. Cl.^{2} G01N *33/16;* G01T *1/16*

U.S. Cl. 23—230.3 **15 Claims**

1. A container for radioactive counting, said container comprising:

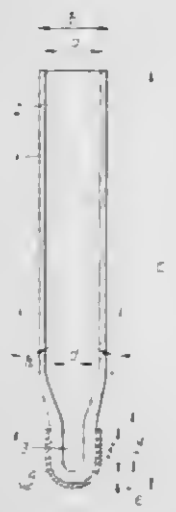
  a tube of organic plastics materials having a generally cylindrical cross-sectioned reaction zone at the top portion thereof, an open top end, and a closed tapered lower end portion tapered from said top portion;
  a radiation shield permanently positioned at the lower end of

said tube and extending up the side of said tube to a uniform height; and

said reaction zone having a volume of 1-10ml, and 1-10% of said reaction zone being surrounded by said shield.

14. A method of assaying a compound comprising the steps of:

introducing a sample containing said compound to be assayed together with a standard amount of a radioactivity labelled version of said compound and a standard amount, insufficient for complete reaction, of a specific reagent for said compound to be assayed into a tube-like container of plastics materials having a generally cylindrical cross-sectioned reaction zone at the top portion thereof, an open end, and a closed, tapered lower end portion tapered from said top portion, said container further having a radiation shield permanently positioned at the lower end thereof and extending up the side of said tube to a uniform height and said reaction zone having a volume of 1-10ml with 1-10% of said reaction zone being surrounded by said shield;



causing said two compounds to compete for reaction with said specific reagent;

removing from the liquid phase the fraction of the compound which is bound to the specific reagent so that the fraction removed from the liquid phase is contained within said shielded portion of said container, and

introducing said container into a counter and determining the radioactivity of that portion of the contents that is not shielded by said shield.

4,106,908

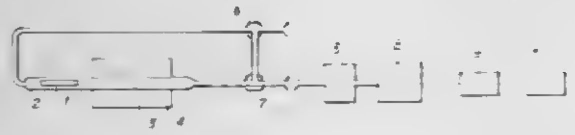
METHOD FOR THE DETERMINATION OF THE ORGANIC CARBON CONTENT IN MINERAL-CONTAINING MATERIALS

Paul A. Leplat-Gryspeerdt, Louvain, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Apr. 12, 1977, Ser. No. 786,851

Int. Cl.² G01N *31/08, 31/12, 33/24*

U.S. Cl. 23—230 PC **6 Claims**



1. A method for determining the organic carbon content of raw mineral materials, which essentially consists of the steps of:

(a) determining the relationship between the percent per weight amount of organic carbon content of raw mineral materials and the relative amount of benzene present in the pyrolysis gases which are formed upon pyrolysis of samples of raw mineral materials of known organic carbon content at a pyrolysis temperature of between about 400° and about 1,000° C under an inert gas atmosphere;

(b) pyrolyzing a weighed sample of a crushed raw mineral material of unknown organic carbon content under an inert gas atmosphere at the same temperature as that which is used in the determining step (a), whereby pyrolysis gases are formed;

(c) determining the relative amount of benzene which is present in the pyrolysis gases; and,

(d) determining the percent per weight amount of organic carbon content in the crushed raw mineral material which is equivalent to said amount of benzene determined in step (c) from the relationship which has been determined in step (a).

4,106,909

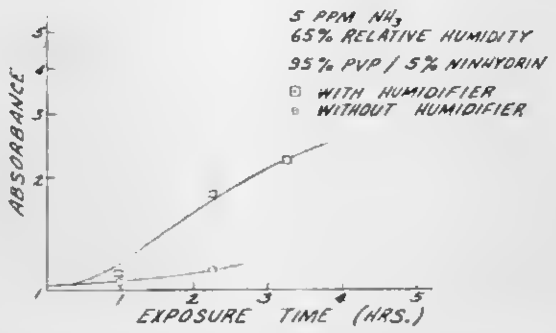
CHEMICAL ANALYSIS WITH COATED, LIGHT WAVEGUIDE UNDER HUMIDITY CONTROL

Donald J. David, Centerville, and Michael C. Willson, Waynesville, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 724,482, Sep. 20, 1976, Pat. No. 4,040,691, which is a continuation-in-part of Ser. No. 689,403, May 24, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,596

Int. Cl.² G01N *21/00. 21/46*

U.S. Cl. 23—232 R **2 Claims**



1. In a method for detecting a first material wherein there are the steps of

(a) exposing an elongated waveguide having on a longitudinal peripheral surface of said waveguide a second material providing for multiple internal reflections of light through said coating material, to an unknown material which may contain said first material, said second material upon being contacted with said first material selectively combines in in a water sensitive reaction with said first material to measurably change the light transmitting capabilities of said waveguide;

(b) transmitting light through said waveguide after exposure in step (a); and,

(c) detecting the light transmitted in step (b) as a measure of said first material, the improvement comprising increasing the sensitivity of detection in step (a) by maintaining said waveguide in an environment of substantially constant relative humidity at which said reaction is not appreciably affected by changes in ambient relative humidity.

4,106,910

RAS-GAS DILUTION DEVICE

Raymond A. Saunders, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1977, Ser. No. 825,351

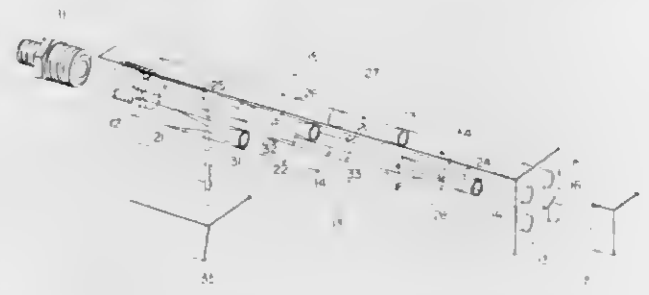
Int. Cl.² G01N *1/22, 1/26*

U.S. Cl. 23—232 R **9 Claims**

4. A method of diluting a gas flow to a desired concentration containing a dilutant gas which comprises:

directing a gas flow of the diluting gas into at least two equal size passages extending along the length of a housing with the gas flow evenly distributed into each of said passages and with the same gas flow rate,

directing the gas flow in each passage through a venturi in each of said passages wherein each venturi forms a gas diluting stage with each of said gas diluting stages placed in successive order along the length of said housing with the low pressure port of each successive stage communicating with the gas flow passage downstream of the venturi in the preceeding stage with the low pressure port of the first stage communicating with a chamber containing the gas to be diluted,



feeding a gas to be diluted at a controlled rate into the gas flowing through said first stage in said passage,

feeding the gaseous mixture in said first passage downstream of said first stage into the second stage to mix with said gas flowing through said venturi in said second passage to further dilute the gaseous flow from said first passage to said second passage, and

directing the diluted gas from the downstream passage of the second venturi into the next passage and likewise to as many passages as there are passages.

4,106,911

DEVICE FOR EXAMINING A PLURALITY OF MICRODOSES OF LIQUIDS

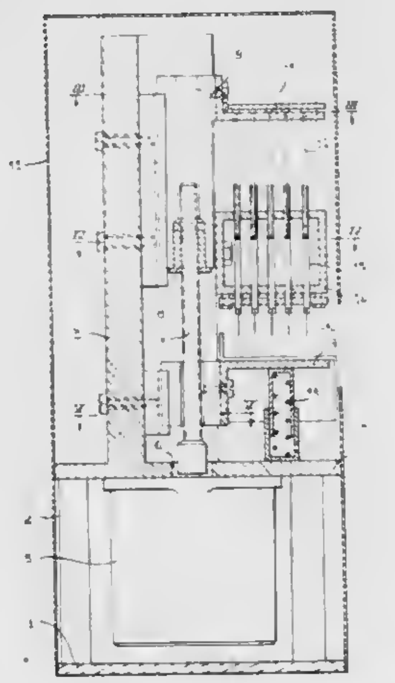
Aline Marcelli, Paris, France, assignor to Societe Francaise pour le Developpement de l'Automatisme en Biologie, Paris, France

Filed Jun. 29, 1977, Ser. No. 811,298

Claims priority, application France, Jul. 9, 1976, 76 21013; Feb. 2, 1977, 77 02846

Int. Cl.² G01N *1/14. 1/18*

U.S. Cl. 23—259 **7 Claims**



1. A device for examining a plurality of microdoses of liquids by means of a plurality of reagents, comprising in combination:

a frame;

a plurality of vertical syringes mounted on said frame and arranged in a fixed pattern, each of said syringes comprising a syringe body and a piston rod;

first means for imparting a relative vertical motion between the plurality of syringe bodies and the plurality of said piston rods, said first means being able to relatively move said syringe bodies and said piston rods between a near position and a remote position and vice versa as well as to a location between the near and remote positions, in order to draw up and dispense doses of liquids;

a support mounted on said frame and disposed below said plurality of vertical syringes;

second means for imparting a relative vertical motion between said plurality of syringe bodies and said support, said second means being able to relatively move said syringe bodies and said support between a near drawing up or dispensing position and a remote position;

first plate means, for filling said syringes with reagents, provided with a plurality of receptacles adapted to contain said reagents and arranged in a fixed pattern corresponding to the pattern of said syringes, said first plate means being adapted to be detachably supported by said support; and

second plate means provided with a plurality of reaction receptacles and arranged in a fixed pattern corresponding to the pattern of said syringes, said second plate means being adapted to be detachably supported by said support.

4,106,912

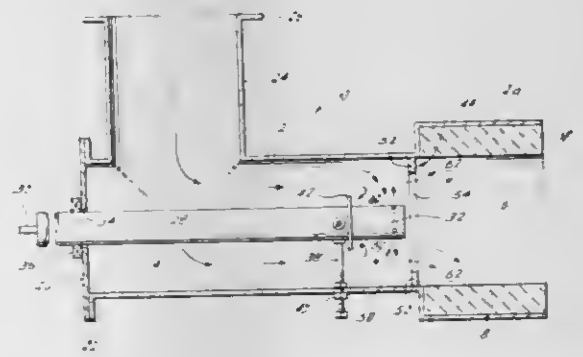
CARBON BLACK REACTOR WITH AXIAL FLOW BURNER

Robert E. Dollinger, Bedford; Clinton M. Wright, Odessa, both of Tex., and Theodore A. Ruble, deceased, late of Fort Worth, Tex. (by Eulalia Berry Ruble, executrix), assignors to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Division of Ser. No. 711,443, Aug. 4, 1976, Pat. No. 4,077,761. This application Oct. 31, 1977, Ser. No. 846,803

Int. Cl.² C01B *49/00*

U.S. Cl. 23—259.5 **4 Claims**



1. An apparatus comprising:

a carbon black reactor lined with refractory material of varying thickness defining a longitudinal tunnel of generally circular cross-sectional configuration and varying diameter,

said tunnel comprising combustion, reaction and quench zones;

a burner for supplying admixed oxidant gas and gaseous fuel to the combustion zone of said carbon black reactor for combustion therein to provide hot combustion product gases for flowing through said reactor to produce carbon black, said burner comprising,

a housing defining a generally cylindrical mixing zone having a central axis extending longitudinally therethrough,

said mixing zone being in open contiguous axial alignment with the combustion zone of said carbon black reactor,

means for introducing oxidant gas into said mixing zone to flow axially therethrough,

means for introducing gaseous fuel into said mixing zone at a point downstream of said oxidant gas introduction means, whereby said fuel is released into said flowing oxidant gas, mixer means in said mixing zone for admixing said oxidant gas and fuel, said mixer means comprising,

a central bluff body centered about the axis of said mixing zone and extending radially outwardly from said axis, and

a peripheral bluff body disposed at the periphery of said mixing zone and extending radially inwardly toward said axis,

said central and peripheral bluff bodies being spaced axially from each other;

means for introducing liquid hydrocarbon feedstock radially into said reactor zone of said carbon black reactor; and

means for introducing quench water into said quench zone of said carbon black reactor.

4,106,913
CATALYTIC CONVERTER HAVING VIBRATION-RESISTANT CATALYST CARRIER

Tsuchio Bunda, Okazaki; Itaru Niimi, Nagoya; Yasuhisa Kaneko, and Fumiyoshi Noda, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

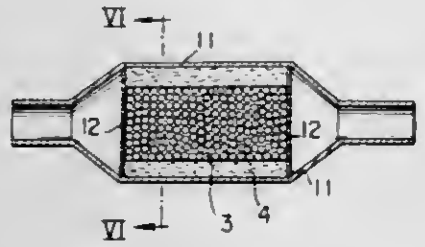
Division of Ser. No. 285,593, Sep. 1, 1972, abandoned. This application Jun. 27, 1975, Ser. No. 590,927

Claims priority, application Japan, Sep. 3, 1971, 46-67923

The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.

Int. Cl.² F01N *3/15, 7/14;* **B01J** *35/04, 37/08*

U.S. Cl. 23—288 FC **9 Claims**



1. A catalytic converter for the exhaust system of an internal combustion engine, comprising: a converter casing, and a vibration resistant sintered catalyst carrier disposed in said casing comprising a plurality of ceramic catalyst carrier pieces coated with a binding material, both of which are in their sintered condition said carrier having a catalyst dispersed therein.

4,106,914
SAFETY FUEL GAS AND APPARATUS FOR GENERATING THE SAME

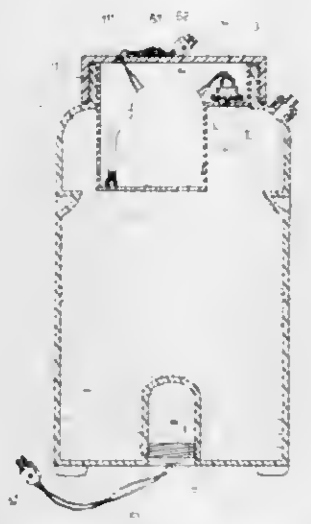
Liu Kun-Ming, No. 52, Lane 63, Lung Kang Rd., Section 1,, Chung Li, Taiwan

Filed May 9, 1977, Ser. No. 795,346

Int. Cl.² C10G *9/24*

U.S. Cl. 48—103 **1 Claim**

1. Apparatus for generating safety fuel gas comprising a container holding a fuel which is in a liquid state at normal temperature and pressure, said container is made of a light transmissible material and said container is of sufficient strength to withstand an internal pressure of at least 0.5 kg/cm², a sliding vane type rotary air compressor having a rotor and an electric motor coupled to drive the rotor, an inlet pipe connected to a compressed air outlet passageway of the air compressor for introducing the compressed air into the container to vaporize the liquid fuel, an outlet port provided on the container permitting the vaporized liquid fuel to leave the container and a pressure detector responsive to the pressure within the container to control the motor, the detector including a flexible disc member positioned to respond to the pressure, a switch controlling the energization of the motor and a projection provided on the flexible disc member for coupling movement of the flexible disc member to the switch whereby the pressure detector switches the motor to maintain the pressure in the container substantially constant wherein the bottom of the container defines a recess and an electric light bulb is housed in said recess to provide a visual indication of fuel level and to provide heat to facilitate vaporization of fuel in said container.



4,106,915
ABRADER FOR MIRROR POLISHING OF GLASS

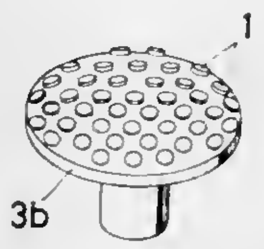
Fumio Kagawa, and Norimichi Aoki, both of Shiojiri, Japan, assignors to Showa Denko K. K., Tokyo, Japan

Filed Nov. 8, 1976, Ser. No. 739,950

Claims priority, application Japan, Nov. 11, 1975, 50-134733; Nov. 11, 1975, 50-134734; Nov. 11, 1975, 50-134735

Int. Cl.² B24D *3/32*

U.S. Cl. 51—296 **3 Claims**



1. An abrader for polishing the surface of a glass mirror, which comprises: from 40 to 90% by weight of a particulate abradant selected from the group consisting of zirconium oxide, cerium oxide and red iron oxide dispersed throughout a cured unsaturated polyester resin containing pores of a size ranging from 0.1 to 50 μm in diameter, said polyester resin having a porosity of 20 to 70%.

4,106,916
AUTOMATIC CONTROL OF AN ABSORPTION/STRIPPING PROCESS

William F. Tuckett; Gary L. Funk, and Dexter E. Smith, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 10, 1977, Ser. No. 823,368

Int. Cl.² B01D *53/14*

U.S. Cl. 55—21 **23 Claims**

1. Apparatus comprising:

an absorption column means for removing an impurity from a desired product material;

means for passing a feed stream containing said desired product material and said impurity into said absorption column means;

means for passing a stream of lean absorption medium, suitable for removing said impurity from said feed stream, into said absorption column means;

means for removing a purified desired product material from

an upper portion of said absorption column means as an absorber overhead product;

means for removing the rich absorption medium containing the absorbed impurity from a bottom portion of said absorption column means;

stripping column means and associated reboiler means for purifying said rich absorption medium by stripping at least a portion of said absorbed impurity from said rich absorption medium to produce lean absorption medium;

means for passing said rich absorption medium into said stripping column means and associated reboiler means;

means for passing a heat exchanging medium stream through said reboiler means;

means for establishing a first signal, representative of the flow rate of said heat exchanging medium stream flowing through said reboiler means;

means for establishing a second signal, representative of the flow rate of said rich absorption medium flowing into said stripping column means;

means for establishing a third signal, representative of the quantity of said heat exchanging medium required to strip a given quantity of said impurity from said rich absorption medium;

means for producing, in response to said second and third signals, a fourth signal, representative of the required flow rate of said heat exchanging medium necessary to assure that a sufficient quantity of said impurity is removed from said rich absorption medium by said stripping column means;

means for comparing said first signal and said fourth signal and for producing a fifth signal representative of this comparison;

means for manipulating the flow rate of said heat exchanging medium to said reboiler means in response to said fifth signal, thereby regulating the stripping process;

means for removing the thus stripped impurity from an upper portion of said stripping column means as a stripping column overhead stream;

means for removing the lean absorption medium from said stripping column means and passing the removed lean absorption medium to said means for passing a stream of lean absorption medium into said absorption column means to use the thus removed lean absorption medium in absorbing said impurity in said feed stream;

means for establishing a sixth signal representative of the actual flow rate of said lean absorption medium flowing into said absorption column means;

means for establishing a seventh signal representative of the flow rate of said feed stream into said absorption column means;

means for establishing an eighth signal representative of the concentration of said impurity in said feedstream;

means for establishing a ninth signal representative of the quantity of said lean absorption medium required to absorb a given quantity of said impurity;

means for producing, in response to said seventh, eighth and ninth signals, a 10th signal, representative of the required flow rate of said lean absorption medium into said absorption column means;

means for comparing said sixth signal and said tenth signal and for producing an 11th signal representative of this comparison; and

means for manipulating the flow rate of said lean absorption medium into said absorption column means in response to said 11th signal, thereby controlling the absorption process.

14. A method of operating an absorption process and a stripping process wherein an impurity constituent of a feed material is absorbed by an absorption medium, said method comprising:

passing a feed stream containing a desired product material and an impurity into an absorption zone to therein remove the impurity from said desired product material by utilizing a suitable lean absorption medium to absorb said impurity;

removing from an upper portion of said absorption zone an absorber overhead product comprising said desired product material and having a concentration of said impurity which is less than the concentration of said impurity in said feed stream;

removing the rich absorption medium containing the absorbed impurity from a bottom portion of said absorption zone and passing said rich absorption medium into a stripping zone to therein remove said ahsorbed impurity from the absorption medium;

passing a heat exchanging medium stream to said stripping zone to provide reboiling heat;

measuring the flow rate of said heat exchanging medium stream and producing a first signal representative thereof;

measuring the flow rate of said rich absorption medium into said stripping zone and producing a second signal representative thereof;

establishing a third signal, representative of the quantity of said heat exchanging medium required to strip a given quantity of said impurity from said rich absorption medium;

producing, in response to said second and third signals, a fourth signal, representative of the required flow rate of said heat exchanging medium necessary to assure that a sufficient quantity of said impurity is removed from said rich absorption medium in said stripping zone;

comparing said first signal and said fourth signal and producing a fifth signal responsive to the difference therebetween;

regulating the stripping process by manipulating the flow rate of said heat exchanging medium to said stripping zone in response to said fifth signal;

removing the thus stripped impurity from an upper portion of said stripping zone as a stripping zone overhead stream;

removing the resulting lean absorption medium from said stripping zone and passing the thus removed lean absorption medium into said absorption zone to be used in absorbing said impurity in said feed stream;

measuring the actual flow rate of said lean absorption medium flowing into said absorption zone and producing a sixth signal representative thereof;

measuring the flow rate of said feed stream into said absorption zone and producing a seventh signal representative thereof;

measuring the concentration of said impurity in said feed stream and producing an eighth signal representative thereof;

establishing a ninth signal representative of the quantity of said lean absorption medium required to absorb a given quantity of said impurity;

producing, in response to said seventh, eighth and ninth signals, a 10th signal, representative of the required flow rate of said lean absorption medium into said absorption zone;

comparing said sixth signal and said 10th signal and producing an 11th signal responsive to the difference therebetween;

controlling the absorption process by manipulating the flow rate of said lean absorption medium into said absorption zone in response to said 11th signal.

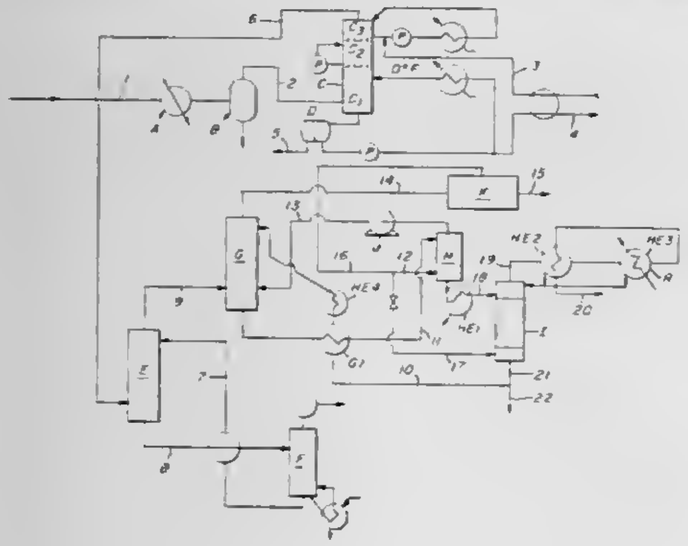
4,106,917
GAS PREPARATION

Marvin C. Fields, Wilkins Township, Allegheny County; David L. Oliver, North Huntingdon Township, Westmoreland County, and Arthur R. Snyder, Franklin Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1977, Ser. No. 767,916

Int. Cl.^{2} B01D *53/14*

U.S. Cl. 55—31 **13 Claims**



1. Method of preparing a gas mixture for selective removal of ethylene, acetylene or mixtures thereof comprising

(a) removing water therefrom by washing the gas mixture in a lower alcohol or glycol,

(b) removing H_2S, propylene, and one or more of CS_2 and C_4 to C_{10} hydrocarbons therefrom by absorption with solvent,

(c) removing ethylene and acetylene from the contaminated solvent of step (b) by stripping it, at a temperature less than that employed in step (d), with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent, and

(d) removing contaminants from the solvent for reuse of the solvent by stripping it, at a temperature between about − 50° and about 400° F, with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent.

8. Method of removing ethylene, acetylene, carbon monoxide, or mixtures thereof from a gas mixture comprising

(a) removing water from said gas mixture by washing it with a lower alcohol or glycol,

(b) removing H_2S, propylene, and one or more of C_2 and C_4-C_{10} hydrocarbons therefrom by absorption with solvent,

(c) removing ethylene and acetylene from the contaminated solvent of step (b) by stripping it, at a temperature less than that employed in step (d), with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent,

(d) removing contaminants from the solvent for reuse of the solvent by stripping it at a temperature between about − 50° F and about 400° F with a gas not containing ethylene or acetylene and which will not substantially dissolve in the solvent, and

(e) contacting the gas mixture from step (b) with a cuprous aluminum halide solution to remove ethylene, acetylene or carbon monoxide therefrom.

4,106,918
METHOD OF RECOVERING FLUORINE FROM VAPOR OF CRUDE PHOSPHORIC ACID SOLUTION

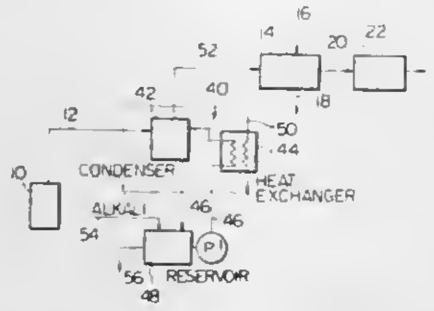
Tomio Fujikawa; Masayasu Funakoshi, and Tadanori Misumi, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Mar. 11, 1976, Ser. No. 665,706

Claims priority, application Japan, Mar. 14, 1975, 50-30236

Int. Cl.^{2} B01D *5/00*

U.S. Cl. 55—71 **6 Claims**



1. A method of recovering fluorine values from the vapor generated by evaporation under reduced pressure of an aqueous solution of crude phosphoric acid prepared by the wet process, said vapor consisting of a condensable portion comprising the fluorine values and a noncondensable portion, comprising:

(a) directly contacting the vapor with a first cooling water to condense into a liquid from about 50 to 90% of the condensable portion containing essentially all of the fluorine values;

(b) separating the resulting mixture of condensate and first cooling water from the noncondensed portion of the vapor;

(c) directly contacting the noncondensed portion of the vapor, which contains only trace amounts of the fluorine values, with a second cooling water to condense into a liquid the rest of the condensable portion containing the remainder of the fluorine values;

(d) separating the resulting mixture of condensate and second cooling water from the remaining noncondensed portion of the vapor which consists essentially of noncondensable gases;

(e) cooling the mixture of condensate and first cooling liquid from step (b) by heat exchange with a cooling fluid in fluidic isolation from said mixture;

(f) recycling a portion of the cooled mixture from step (e) to step (a) to serve as first cooling water, while maintaining said mixture isolated from said second cooling water, so that all of said first cooling water is provided by steps (a) and (f);

(g) recovering the fluorine values from the remainder of the cooled mixture of step (f); and

(h) adjusting the pH of the cooled mixture of condensate and first cooling liquid from step (e) to about from 7 to 9.

4,106,919
ARRANGEMENT IN EMITTING ELECTRODES FOR ELECTROSTATIC PRECIPITATORS

Sebastian Lagerdahl, Norrahammar, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

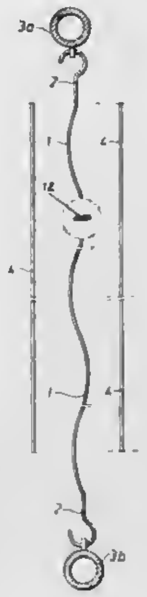
Filed Feb. 15, 1977, Ser. No. 768,855

Claims priority, application Sweden, Feb. 27, 1976, 7602779

Int. Cl.^{2} B03C *3/41*

U.S. Cl. 55—147 **5 Claims**

1. An electrostatic precipitator having collecting plates disposed in spaced parallel array, top and bottom beams with attachment means, and emitting electrodes between said plates tensionally attached by said attachment means on two sides located directly in front of each other on said beams at the top and bottom, respectively, of the electrostatic precipitator, said emitting electrodes being wound helically so that when extended and attached in the space between said collecting plates they assume a slightly wave-shaped form, said emitting electrodes comprising wire of an elastic material with high surface finish and with non-round cross-section having the length of the long axis approximately twice the length of its short axis, and the long axis of the cross-section being directed toward the adjacent collecting plates of the electrostatic precipitator at repeating intervals along the length of the emitting electrode.



4,106,920
METHOD OF MAKING A SEMI-PERMEABLE, ESSENTIALLY WATER-INSOLUBLE, HYDROPHILIC NYLON MEMBRANE AND RESULTANT PRODUCT

Robert D. Hughes, and Edward F. Steigelmann, both of Park Forest, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 339,975, Mar. 12, 1973, Pat. No. 3,864,418. This application Aug. 14, 1974, Ser. No. 497,510

Int. Cl.^{2} B01D *59/10;* B29D *27/04*

U.S. Cl. 55—158 **8 Claims**

1. A method of making a semi-permeable, essentially water-insoluble, hydrophilic, nylon film membrane which is essentially impermeable to liquids and wherein the membrane is suitable for separating aliphatically-unsaturated hydrocarbons of 2 to 4 carbon atoms from mixtures containing them, which comprises forming the film membrane from a solvent solution of film-forming viscosity having dissolved in a solvent hydrophilic, nylon film-forming material and citric acid pore-forming material, said pore-forming material being provided in a minor amount sufficient to increase the porosity of the nylon film when removed from the film, removing the solvent by evaporation thereby providing an essentially solid, nylon film containing citric acid pore-forming material, contacting the nylon film with an aqueous solvent for the pore-forming material, said nylon film being essentially insoluble in said solvent, to dissolve at least a portion of the pore-forming material from the nylon film sufficient to increase the porosity of the nylon film, and incorporating in the film metal containing ions which form a water-soluble complexes with said aliphatically-unsaturated hydrocarbons of 2 to 4 carbon atoms, to provide a porous, hydrophilic nylon film membrane which is essentially impermeable to liquids.

6. An essentially water-insoluble, hydrophilic semipermeable polymer film made by the process of claim 1.

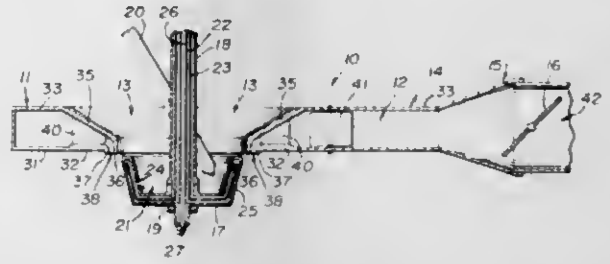
4,106,921
APPARATUS FOR LOW PRESSURE AIR FIBERIZATION OF MINERAL FIBER

William F. Porter, Medinah, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Sep. 13, 1976, Ser. No. 722,467

Int. Cl.^{2} C03B *37/04*

U.S. Cl. 65—14 **10 Claims**



1. In an apparatus for producing mineral fibers by forming molten slag and transforming the slag into fibers, the improvement comprising in combination:

(a) An air plenum defining a substantially toroidal air chamber and having a circular central opening, wherein said plenum is formed of a front wall, a rear wall, and a peripheral wall connecting said front wall and rear wall in spaced-apart relationship, and wherein said rear wall has a frustoconical portion surrounding said central opening converging toward said forward wall and defining a funnel for directing air toward said central opening, the radial dimension of said air chamber being greater than the axial dimension thereof, an annular opening provided in said plenum surrounding said circular opening and permitting air to be discharged from said torodial chamber through said opening in an axial direction with respect to said toroidal chamber, and a compressed air inlet,

(b) A cup mounted on a shaft adapted for rotation, the lip of said cup being positioned at said annular opening, and

(c) means for introducing molten slag into the interior of said cup when said cup rotates,

the arrangement being such that centrifugal force produced by rotation of said cup expels streams of molten slag into the air stream being discharged from said annular slot, and the air stream transforms said slag streams into mineral fibers.

4,106,922
ALKALINE DECOMPOSITION PROCESS FOR PRODUCING CALCINED PHOSPHATE FERTILIZER

Ulrich Hauschild, Hanover, and Heinrich Roetger, Gehrden, both of Fed. Rep. of Germany, assignors to Kali-Chemie, Hanover, Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,030

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606883

Int. Cl.^{2} C05B *11/16*

U.S. Cl. 71—42 **11 Claims**

1. In an alkaline high temperature decomposition process for producing a calcined citrate-soluble alkali-containing phosphate fertilizer, which comprises the step of calcining in a rotary kiln at a temperature of between about 900° and 1300° C, a mixture comprising a raw calcium phosphate, an alkali-metal-oxide supplying compound and silicic acid in such amounts that the molar ratio between the phosphate and the alkali metal oxidesupplying compound is equivalent to a per weight ratio P_2O_5:Na_2O of between about 1:0.45 and about 1:0.7 and the amount of silicic acid is sufficient to bind an excess of calcium, the improvement, which comprises said alkali metal oxide-supplying·compound, consisting essentially of the naturally occuring mineral trona.

4,106,923

PHOSPHONOMETHYL GLYCINE ESTER ANHYDRIDES, HERBICIDAL COMPOSITION CONTAINING SAME AND USE THEREOF

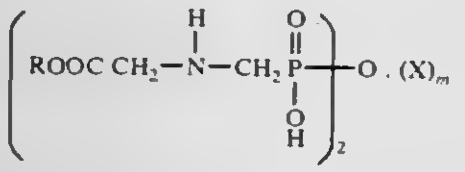
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 630,392, Nov. 10, 1975, which is a continuation of Ser. No. 362,712, May 22, 1973, abandoned, which is a division of Ser. No. 170,388, Aug. 9, 1971, Pat. No. 3,799,758, which is a continuation-in-part of Ser. No. 123,057, Mar. 3, 1971, abandoned. This application Jul. 2, 1976, Ser. No. 701,766

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 71—86 **30 Claims**

1. A compound of the formula



$$\left(\mathrm{ROOC\,CH_2-\overset{\overset{H}{|}}{N}-CH_2\,\underset{\underset{\underset{H}{O}}{|}}{\overset{\overset{O}{\|}}{P}}}\right)_2\!-O\cdot(X)_m$$

wherein R is a member of the group consisting of alkyl groups containing from 1 to 12 carbon atoms, phenyl or phenoxy substituted lower alkyl groups where the alkyl group contains from 2 to 4 carbon atoms and $R'—O—C_nH_{2n}—$ groups where *n* is an integer of from 2 to 4 and R′ is a lower alkyl carbonyl group, X is water of hydration and *m* is 0 or 1.

4,106,924

PESTICIDAL COMPOSITIONS

Asbjorn Baklien, Kingsbury; Alexandru Serban, and Jocelyn Margaret Gregory, both of Croydon, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Division of Ser. No. 551,520, May 20, 1966, abandoned. This application May 22, 1974, Ser. No. 472,308

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—106 **1 Claim**

1. The process of controlling the growth of undesired plant life which comprises treating said undesired plants with an effective amount of 2-chloro-4-nitrophenyl N-methyl carbamate.

4,106,925

NOVEL HERBICIDALLY ACTIVE, NUCLEAR-SUBSTITUTED PHENOXY-PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES AND USE THEREOF FOR CONTROLLING GRASS-LIKE WEEDS

Otto Rohr, Therwil, Switzerland; Georg Pissiotas, Lörrach, Germany, and Beat Bohner, Binningen, Switzerland, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

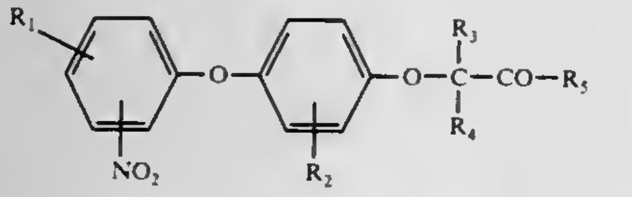
Filed Nov. 16, 1976, Ser. No. 742,311

Claims priority, application Switzerland, Nov. 20, 1975, 15033/75; Nov. 20, 1975, 15034/75

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—108 **18 Claims**

1. 4-phenoxy-α-phenoxy-alkanecarboxylic acid derivatives of the formula I



(I)

wherein

- R_1 represents halogen, CF_3, lower alkyl, lower alkoxy or lower alkylthio,
- R_2 represents hydrogen, halogen or lower alkyl, each of R_3 and R_4 independently repesents hydrogen or lower alkyl, and
- R_5 represents C_1–C_{10} alkyloxy, C_2–C_4 alkenyloxy, C_2–C_4 alkinyloxy, C_3–C_{12} cycloalkyloxy, benzyloxy or phenoxy optionally substituted by halogen, lower alkyl or nitro.

4,106,926

SINTERED HERBICIDE-FILLED CELLULOSE ESTER PARTICLES HAVING IMPROVED RESISTANCE TO WATER LEACHING

Norman W. Thomas, Warren, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,763

Int. Ct.^{2} A01N *9/24, 9/20*

U.S. Cl. 71—115 **14 Claims**

1. A controlled-release sintered herbicidal composition comprising discrete particles of a water-leachable benzoic acid herbicide selected from the group consisting of mono-, di- and tri-substituted benzoic acids in which the substituents are halo, amino, nitro and lower alkoxy occupying the voids, or channels, of a particulate, substantially water-impermeable, porous cellulose ester carrier wherein said herbicide has a sintering temperature below the softening temperature of the cellulose ester carrier and said voids, or channels, communicate with the exterior surface of the cellulose ester carrier particles, the herbicidal composition being heated at about the sintering temperature of the herbicide but below the softening temperature of the cellulose ester.

4,106,927

NON-EXPLOSIVE GLYOXIME COMPOSITIONS

Harris E. Petree, Kernersville; James B. Nabors, Jr., Greensboro, both of N.C., and Henry C. Grace, Baton Rouge, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1976, Ser. No. 709,134

Int. Cl.^{2} A01N *9/20, 9/02*

U.S. Cl. 71—121 **21 Claims**

1. A composition for facilitating the harvesting of fruit and having thermal and shock stability which comprises a blend of glyoxime and at least one water soluble ethylene glycol-based component selected from the group consisting of liquid polyethylene glycols having an average molecular weight of from about 200 to 600, and solid polyethylene glycols having an average molecular weight of from about 1000 to 7500.

4,106,928

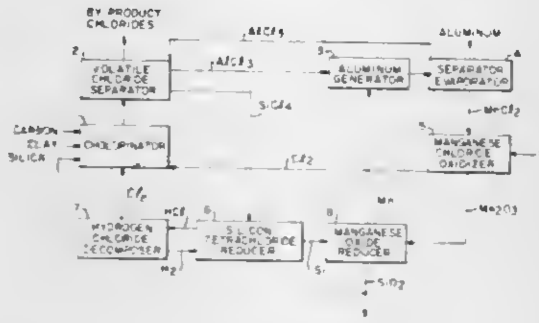
CHLORINATION PROCESS FOR PRODUCING ALUMINUM

Francis J. Harvey, II, Murrysville, and Maurice G. Fey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 666,812, Mar. 15, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,457

Int. Cl.^{2} C22B *21/02*

U.S. Cl. 75—68 B **7 Claims**



SCHEMATIC REPRESENTATION OF PROCESS FOR PRODUCING ALUMINUM

1. A process for the production of aluminum which is devoid

of aluminum-carbide products in a reactor comprising the steps of:

- (a) chlorinating a material containing chemically combined aluminum and silicon with chlorine in the presence of carbon to yield aluminum trichloride and silicon tetrachloride,
- (b) separating the aluminum trichloride from the silicon tetrachloride,
- (b) separating the aluminum trichloride from the silicon tetrachloride,
- (c) reacting the aluminum trichloride with manganese to yield aluminum and manganese chloride,
- (d) reducing the silicon tetrachloride with hydrogen to yield elemental silicon and hydrogen chloride,
- (e) oxidizing the manganese chloride to produce manganese oxide and chlorine which is recycled to step (a),
- (f) reducing the manganese oxide with elemental silicon to produce manganese which is recycled to step (c), and
- (g) decomposing hydrogen chloride from step (d) to produce hydrogen for recycle to step (d) and chlorine for recycle to step (a).

4,106,929

PROCESS FOR PREPARING A FERROCHROMIUM BY USING A BLAST FURNACE

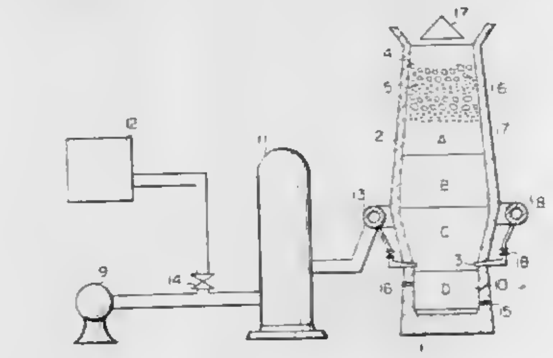
Tamekazu Saito; Mithunobu Tanaka; Yutaka Saito, and Kenicb Sakaue, all of Chichibu, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1977, Ser. No. 857,857

Claims priority, application Japan, Dec. 10, 1976, 51-148452

Int. Cl.^{2} C22C *39/14*

U.S. Cl. 75—130.5 **4 Claims**



1. Process for producing ferrochromium which comprises:

charging in a blast furnace (a) agglomerates containing a powder of chromium ore and a powder of carbonaceous reducing material and (b) lumpy coke, the ratio of said carbonaceous material in said agglomerates is set so that the minium value of said ratio is in agreement with the amount necessary for reducing an iron ore in the chromium ore according to the formula

$$7FeO + 10C \rightarrow Fe_7C_3 + 7CO$$

and the maximum value of said ratio is 1.2 times the amount necessary for reducing the iron oxide and chromium oxide in the chromium ore according to the formulae

$$7Cr_2O_3 + 27C \rightarrow 2Cr_7C_3 + 21CO$$

$$7FeO + 10C \rightarrow Fe_7C_3 + 7CO,$$

the slag-forming composition in the charged materials being such that the ratio of

$$\frac{CaO\text{ (by weight \%) in the slag}}{SiO_2\text{(by weight \%) in the slag}}$$

ranges from 0.4 to 1.3, and further, the ratio of

$$\frac{Al_2O_3\text{(\% by weight)} + MgO\text{(\% by weight)}}{CaO\text{(\% by weight)} + SiO_2\text{(\% by weight)} + MgO\text{(\% by weight)} + Al_2O_3\text{(\% by weight)}}$$

ranges from 0.4 to 0.8;

preheating a gas, selected from the group consisting of air and oxygen-enriched air having an oxygen content lower than 41% by volume, to a temperature from 200° to 1200° C, the airs of said gas containing a moisture content of from 3 to 50 grams per one m^3 of said air;

blowing said preheated gas through the tuyeres of said blast furnace at a rate of from 10 to 30 m^3/minute per one m^2 of the cross-sectional area of the blast furnace at the level of the tuyeres;

adjusting the gas pressure at the top of the blast furnace to a high absolute pressure of from 1 to 3 kg/cm^2;

thereby reducing said chromium ore to chromium carbide by said carbonaceous material, at a reduction degeee of more than 80% in a region of the blast furnace where the chromium ore is softened;

melting and dropping said reduced chromium carbide from said softening region to a hearth of said blast furnace; and

obtaining a ferrochromium containing more than 40% by weight of chromium and slag containing less than 5% of Cr_2O_3 from said hearth.

4,106,930

SOLDER ALLOYS FOR SOLDERING DIFFICULTLY SOLDERABLE MATERIAL

Koji Nomaki; Yoshibito Saoyama, and Ryo Tamamura, all of Yokohama, Japan, assignors to Asahl Glass Company, Ltd., Tokyo, Japan

Division of Ser. No. 527,652, Nov. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 331,200, Feb. 9, 1973, abandoned. This application May 26, 1976, Ser. No. 690,176

Claims priority, application Japan, Feb. 19, 1972, 47-17431

Int. Cl.^{2} B23K *35/12*

U.S. Cl. 75—134 B **2 Claims**

1. A solder alloy for soldering a difficultly solderable material having an oxide surface which consists essentially of 2-98 wt % Pb, 1-97.5 wt % Sn, 0.5-60 wt % Cd, 0.05-10 wt % Zn, 0.05-5 wt % Sb, 0-5 wt % Bi, and 0-15 wt % of at least one rare earth metal and which is characterized by a melting point of from 70° to 180° C.

4,106,931

METHODS FOR SINTERING POWDER METALLURGY PARTS

Harbhajan S. Nayar, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed May 18, 1977, Ser. No. 798,052

Int. Cl.^{2} B22F *3/00*

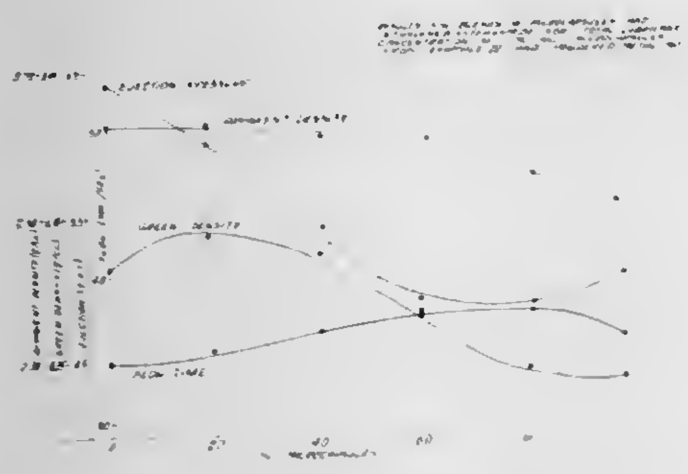
U.S. Cl. 75—201 **7 Claims**

1. A process for sintering carbon steel powder metallurgy parts having a density of less than 90% theoretical maximum density and 0.3 to 1.3% carbon in the form of graphite in the hot zone of a sintering furnace comprising the steps of heating said hot zone to a temperature of at least 2000° F, passing said parts through said hot zone while supplying to said hot zone an atmosphere comprised of the following constituents by volume: at least 90% nitrogen, up to 9.75% hydrogen and carbon monoxide with said carbon monoxide comprising 5% or less of said atmosphere, 0.25-2.0% gaseous hydrocarbon and having a dewpoint of −60° F or less.

4,106,932

LUBRICANTS FOR POWDERED METALS, AND POWDERED METAL COMPOSITIONS CONTAINING SAID LUBRICANTS

John Blachford, Westmount, Canada, assignor to H. L. Blachford Limited, Montreal, Canada
Continuation-in-part of Ser. No. 600,777, Jul. 31, 1975, Pat. No. 4,002,474. This application Dec. 10, 1976, Ser. No. 749,699
Claims priority, application Canada, Jul. 31, 1974, 206086
Int. Cl.^{2} B22F *1/00;* B01J *13/02;* C10M *5/14, 5/20*
U.S. Cl. 75—252 **31 Claims**



6. A novel composition of matter for the manufacture of sintered iron articles comprising a sinterable mixture comprising powdered iron and discrete pressure-rupturable microcapsules for lubrication in powder metallurgy, said microcapsules being present in an amount of 0.1% to 5%, by weight, said microcapsules comprising a core and a solid shell surrounding said core; said core comprising an organic liquid lubricant non-corrosive to ferrous metal, having a viscosity below 1500 cp and a surface tension below 50 dynes/cm and being able to wet powdered ferrous metal; said core comprising 50 to 85%, by weight, of the microcapsules; said shell being derived from the polymerization of a di- or poly-isocyanate with a di- or polyamine, non-degradable by moisture or oxygen, impermeable to said lubricant and having a smooth, non-tacky, outer surface such that the flow rate and apparent density of said mixture of powdered iron and microcapsules are at least 90% of the corresponding values for the free powdered ferrous metal, said outer surface being resistant to abrasion by powdered ferrous metal to the extent that the microcapsules can be thoroughly mixed with sinterable powdered metal without release of lubricant, said shell being rupturable when said micro-capsules are in admixture with powdered ferrous metal at a pressure of 20 to 100 t.s.i.; said lubricant and said shell being heat decomposable or volatilizable to gaseous products, which are non-corrosive to powdered ferrous metal, with a low residue of carbon at elevated temperatures below the sintering temperature of the ferrous metal; said microcapsules being spherical and having a diameter in the range of 1 to 200 microns with a shell thickness of 0.01 to 50 microns.

25. A novel composition of matter for the manufacture of a sintered metal article comprising a sinterable mixture comprising a powdered metal and microcapsules, said microcapsules being present in an amount of 0.1% to 5%, by weight, and comprising a core and a solid shell surrounding said core; said core comprising an organic liquid lubricant non-corrosive to ferrous metal, having a viscosity below 1500 cp and a surface tension below 50 dynes/cm and being able to wet powdered ferrous metal; said core comprising 50 to 85%, by weight, of the microcapsules; said shell being derived from the polymerization of a di- or poly-isocyanate with a di- or polyamine, non-degradable by moisture or oxygen, impermeable to said lubricant and having a smooth, non-tacky, outer surface such that the flow rate and apparent density of said mixture of powdered metal and microcapsules are at least 90% of the corresponding values for the free powdered ferrous metal, said outer surface being resistant to abrasion by powdered ferrous metal to the extent that the microcapsules can be thoroughly mixed with sinterable powdered metal without release of lubricant, said shell being rupturable when said micro-capsules are in admixture with powdered ferrous metal at a pressure of 20 to 100 t.s.i.; said lubricant and said shell being heat decomposable or volatilizable to gaseous products, which are non-corrosive to powdered ferrous metal, with a low residue of carbon at elevated temperatures below the sintering temperature of the ferrous metal; said microcapsules being spherical and having a diameter in the range of 1 to 200 microns with a shell thickness of 0.01 to 50 microns.

4,106,933

PIEZOELECTRIC METHOD AND MEDIUM FOR PRODUCING ELECTROSTATIC CHARGE PATTERNS

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Jun. 18, 1975, Ser. No. 587,904
Int. Cl.^{2} G03G *15/02, 13/02*
U.S. Cl. 96—1.5 R **49 Claims**

1. A process for producing a latent electrostatic charge pattern on a surface of a copy medium that includes a layer of poled piezoelectric material with upper and lower surfaces and a layer of photoconductive material with upper and lower surfaces, with the lower surface of said piezoelectric layer juxtaposed with and electrically connected to the upper surface of said photoconductive layer, which process comprises the steps of:

(1) forming an electrostatic charge of one polarity on the upper surface of said piezoelectric layer and an electrostatic charge of opposite polarity on the lower surface of said piezolectric layer by mechanically stressing said piezoelectric layer;
(2) transferring a portion of the charge on the upper surface of said piezoelectric layer to the lower surface of said photoconductive layer; and
(3) selectively exposing said photoconductive layer to radiation to develop an electrostatic charge pattern representative of the selective exposure on one of the surfaces of the copy medium.

25. A photoconductive piezoelectric copy medium for providing a latent electrostatic charge pattern on an electrically nonconductive exposed surface thereof, comprising:

(1) a first poled electrically nonconductive piezoelectric layer that provides an electrostatic charge of one polarity on its upper surface and an electrostatic charge of opposite polarity on its lower surface when mechanically stressed;
(2) a photoconductive layer that has its upper surface juxtaposed with and electrically connected to the lower surface of said first piezoelectric layer such that a portion of the charge on the upper surface of said piezoelectric layer can be transferred to the lower surface of said photoconductive layer so that a voltage potential is developed across the photoconductive layer; and
(3) not more than one of said piezoelectric and photoconductive layers has a conductive layer juxtaposed with and electrically connected thereto such that when the photoconductive layer is selectively exposed, an electrostatic charge pattern representative of the selective exposure develops on the electrically nonconductive exposed surface of the copy medium.

4,106,934

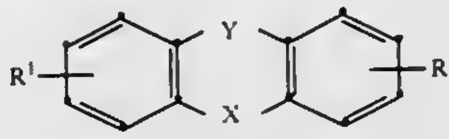
PHOTOCONDUCTIVE COMPOSITIONS AND ELEMENTS WITH CHARGE TRANSFER COMPLEXES

Ernest W. Turnblom, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 14, 1976, Ser. No. 695,350
Int. Cl.^{2} G03G *5/06, 5/09*
U.S. Cl. 96—1.5 R **18 Claims**

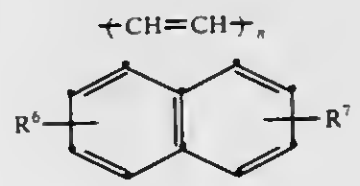
1. A photoconductive insulating composition comprising (a) one or more p-type organic photoconductor components and

(b) a charge-transfer complex of one or more electron acceptor components and one or more electron donor components; the amount of each of said photoconductor, electron acceptor, and electron donor components being within the range of from about 10 to about 65 mole percent based on the total amount of said components present in said photoconductive composition; and the electron donor components present in said composition being selected from materials having one of the following formulas:

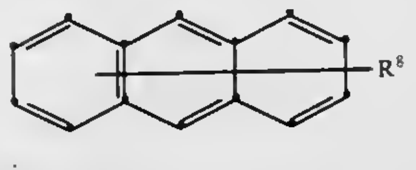
I.



II.



III.



wherein

n represents 0, 1, or 2; X represents oxygen, sulfur, selenium or the group $>CR^3R^4$ or $>C{=}CR^5R^6$; Y represents a single covalent chemical bond or the necessary carbon and hydrogen atoms to complete a 6 to 9 member saturated or unsaturated ring; and each of R^1 through R^8 represents a substituent group such that the resultant material forms a charge-transfer complex with 2,4,7-trinitro-9-fluorenone.

4,106,935

XEROGRAPHIC PLATE HAVING AN PHTHALOCYANINE PIGMENT INTERFACE BARRIER LAYER

Nicholas L. Petruzzella, Columbus, Ohio, assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 67,297, Aug. 26, 1970, abandoned, which is a continuation of Ser. No. 578,502, Sep. 12, 1966, abandoned. This application Apr. 24, 1975, Ser. No. 571,137
Int. Cl.^{2} G03G *5/08, 5/082*
U.S. Cl. 96—1.5 R **8 Claims**

1. In an electrophotographic imaging member consisting essentially of a conductive substrate, an interfacial barrier layer overlying said substrate and a photoconductive insulating layer comprising selenium overlying said barrier layer, said photoconductive insulating layer having a film thickness in the range of from about 5 to about 50 microns, the improvement comprising:

an interfacial barrier layer having a thickness from about 0.5 up to about 5 microns and containing phthalocyanine pigment dispersed in an insulating binder resin, the weight ratio of pigment to resin being in the range of from about 2:1 to about 1:15.

4,106,936

MICROIMAGING FILM CONTAINING AN ORGANIC DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN AZO ORGANIC PEROXIDE AND THE USE THEREOF

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 4, 1977, Ser. No. 784,109
Int. Cl.^{2} G03C *5/04, 5/24, 1/00*
U.S. Cl. 96—27 R **26 Claims**

1. A microimaging method which comprises:

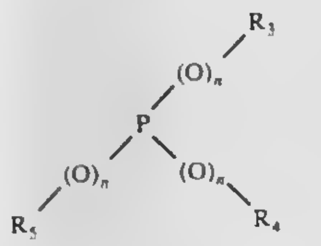
(a) providing a film of an organic polymer as matrix material having uniformly dispersed therein:

i. a photochemically reactive organo diselenide characterized by the formula:

$$R_1{-}Se{-}Se{-}R_2$$

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;

ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each n is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an azo organic peroxide characterized by the formula:

$$R_6-N=N-R_7$$

wherein R_7 is a peroxycarboxylic acid ester moiety and R_6 is either a straight or branched chain alkyl group containing from 4 to 10 carbon atoms or the same as R_7;

(b) exposing the film in an imagewise manner to ultraviolet radiation to form an image therein; and
(c) heating the exposed film to a temperature of at least 75° C for a time sufficient, depending on the magnitude of the irradiation of step (b), to either fix the image or erase it and prepare the film for reimaging.

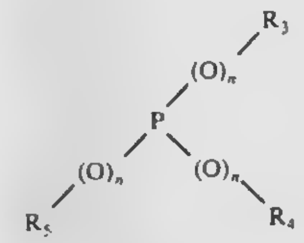
15. A microimaging film which comprises a film of an organic polymer as matrix material having uniformly dispersed therein:

i. a photochemically reactive organo diselenide characterized by the formula:

$$R_1{-}Se{-}Se{-}R_2$$

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;

ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each n is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an azo organic peroxide characterized by the formula:

$$R_6-N=N-R_7$$

wherein R_7 is a peroxycarboxylic acid ester moiety and R_6 is either a straight or branched chain alkyl group containing from 4 to 10 carbon atoms or is the same as R_7.

4,106,937

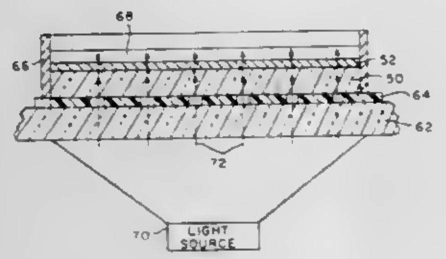
CATHODE RAY STORAGE TUBE HAVING A TARGET DIELECTRIC PROVIDED WITH PARTICULATE SEGMENTS OF COLLECTOR ELECTRODE EXTENDING THERETHROUGH

Gerald E. McTeague, Portland, and Kenneth R. Stinger, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 645,961, Jan. 2, 1976, abandoned, which is a division of Ser. No. 356,029, Apr. 30, 1973, Pat. No. 3,956,662. This application Aug. 13, 1976, Ser. No. 714,439

Int. Cl.² G03F *1/00;* **B05D** *5/12, 3/06*

U.S. Cl. 96—36.1 **3 Claims**



1. A method of fabricating a storage target for use in conjunction with a cathode ray tube comprising the steps of:
  applying a layer of photopolymerizable material having a dispersion of conductive particles therethroughout onto a conductive coating of a dielectric support member;
  transmitting light through a pattern of openings in a photomask which activates the photopolymerizable material to polymerize same in the areas the light engages;
  washing the photopolymerizable material which removes the material not polymerized and leaving in position on said conductive coating opaque segments of conductive particles;
  applying a layer of photopolymerizable material having phosphor particles dispersed therein onto said conductive coating and segments of conductive particles with said segments defining an in situ photomask;
  transmitting light into said photopolymerizable material through said support member with said light activating the photopolymerizable material in the areas to polymerize same except where said opaque segments are located; and
  washing the photopolymerizable material which removes the material not polymerized and leaving in position layer means of phosphor.

4,106,938

VESICULAR COMPOSITION, ELEMENT AND PROCESS UTILIZING A DIOL

George Leland Fletcher, Jr., and Jonas Dedinas, both of Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1977, Ser. No. 799,872

Int. Cl.² G03C *1/52, 1/00, 5/24*

U.S. Cl. 96—48 HD **14 Claims**

1. A vesicular imaging composition comprising, in admixture,
  a vesiculating agent capable of releasing a gas upon imagewise exposure to activating radiation,
  a water-insoluble, thermoplastic polymeric binder having a latent image stability period for said gas sufficient for vesicular imaging,
  and a diol capable of generating microscopic discontinuities in the binder when said element is formed as a coating and dried by heating at a first temperature less than about 100° C for a time sufficient to render the coating nontacky, and thereafter at a second, higher temperature between about 100° and about 200° C for less than about 30 seconds.

14. A dry process for forming a photographic image, comprising the steps of
(a) imagewise exposing an element containing in admixture,
  a vesiculating agent capable of releasing a gas upon imagewise exposure to activating radiation,
  a water-insoluble, thermoplastic polymeric binder having a latent image stability period for said gas sufficient for vesicular imaging,
  and a nucleating agent selected from the group consisting of benzopinacol; 1,2-diphenyl-1,2-dibenzylethanediol; 1,2-diphenyl-1,2-bis(2-fluorophenyl)ethanediol; 1,1,2,2-tetra-(4-chlorophenyl)ethanediol; 1,2-diphenyl-1,2-bis(4-methylphenyl)ethanediol; 1,2-diphenyl-1,2-bis-(2-naphthyl)ethanediol; 1,2-bis(2,4-dichlorophenyl)-1,2-bis(4-chlorophenyl)ethanediol; 1,2-bis(2,4-dichlorophenyl)-1,2-bis(3,4-dichlorophenyl) ethanediol; and 1,2-diphenyl-1,2-bis(4-chlorophenyl)ethanediol; and
(b) developing the exposed element by heating it at a temperature and for a time sufficient to force the gas formed by the photodecomposition of the agent to expand into vesicles which form a visible image.

4,106,939

IMAGING AND RECORDING OF INFORMATION UTILIZING A TELLURIUM TETRAHALIDE COMPLEX OF AN AROMATIC AMINE

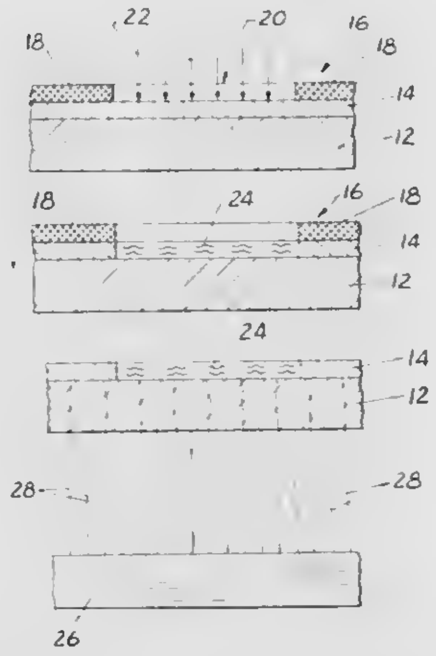
Yew C. Chang, Oakville, Canada; Stanford R. Ovshinsky, Bloomfield Hills, and David A. Strand, Novi, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 596,617, Jul. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 384,089, Jul. 30, 1973, abandoned. This application Oct. 3, 1977, Ser. No. 838,574

Claims priority, application United Kingdom, Jul. 17, 1974, 31676/74

Int. Cl.² G03C *5/24, 1/00*

U.S. Cl. 96—48 R **28 Claims**



1. A method for producing a record of retrievable information comprising:
  providing a layer including an imaging organo-tellurium material and a separate spectral sensitizer, said imaging material and said sensitizer being carried in a polymeric matrix material comprising said layer, said imaging material being in the form of a tellurium tetrahalide adduct of an aromatic amine in which nitrogen attached directly or indirectly to the aromatic radical is substituted by alkyls each containing from 1 to 4 carbon atoms and being free from diazo groups, said imaging organo-tellurium material being of one structure and having one detectable characteristic which is capable of undergoing a change in response to the application of imaging energy to produce a material of different structure having another detectable characteristic,
  the step of applying imaging energy in the form of particle or wave radiation to certain portions of said layer to bring about in said certain portions of said layer the formation of a latent image, at which said imaging organo-tellurium material can be changed to said different structure having said other detectable characteristic.

20. An article for producing a record of retrievable information in the form of a dry-to-the-touch layer comprising an imaging layer including a normally solid polymeric matrix containing an imaging material and a separate spectral sensitizer for the imaging material, said spectral sensitizer being capable of absorbing photons from particle or wave radiation whereby to form a latent image, said imaging material comprising an imaging organo-tellurium material in the form of a tellurium tetrahalide adduct of an aromatic amine in which nitrogen attached directly or indirectly to the aromatic radical is substituted by alkyls each containing from 1 to 4 carbon atoms and being free from diazo groups and being of one structure and having one detectable characteristic and which is capable of undergoing a change in response to the application of imaging energy in the form of particle or wave radiation to produce at the latent image a material of different structure having another detectable characteristic.

4,106,940

LIGHT-SENSITIVE MATERIAL CONTAINING EMULSIFIED SUBSTANCES

Hans Langen, Bonn; Erwin Ranz, Leverkusen; Johannes Eibl, Burscheid-Kaltenberg, and Walther Wolf, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

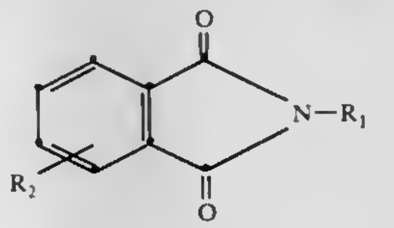
Filed Oct. 3, 1975, Ser. No. 619,229

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1974, 2447175

Int. Cl.² G03C *3/00, 1/52, 1/34, 1/40*

U.S. Cl. 96—74 **3 Claims**

1. Light-sensitive photographic material having at least one silver halide emulsion layer and at least one hydrophilic colloid layer containing at least one photographic additive selected from the group consisting of couplers, UV-absorbers, white toners and stabilizers emulsified in the hydrophilic layer as a mixture with at least one oil former which is substantially insoluble in water the improvement according to which the oil former is at least one compound of the formula



in which
  R_1 represents a group consisting of a cycloalkyl group, a secondary alkyl group containing 3 to 8 carbon atoms, an alkoxy carbonyl substituted alkyl group containing 2 to 8 carbon atoms and an alkyl group containing 2 to 18 carbon atoms interrupted by ether oxygen and
  R_2 represents hydrogen or a substituted selected halogen and hydroxyl, C_1 to C_4 alkoxy, carboxyl, C_1 to C_4 alkoxycarbonyl and phenyl groups.

4,106,941

PHOTOGRAPHIC SILVER HALIDE ELEMENTS CONTAINING OPTICAL BRIGHTENING WATER-SOLUBLE INTERPOLYMERS

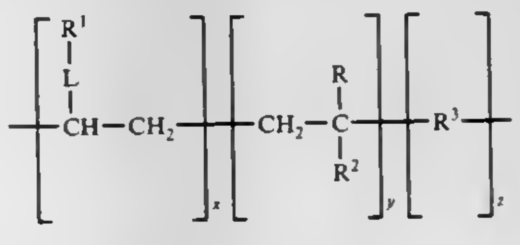
Peter W. Scullard, Webster; John Figueras, Rochester, and Carl F. Holtz, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1974, Ser. No. 489,192

Int. Cl.² G03C *1/92, 1/84*

U.S. Cl. 96—82 **13 Claims**

1. A photographic element containing at least one light sensitive silver halide layer and from about 0.05 grams to about 5.0 grams per square foot of support of an optical brightening interpolymer having the formula:



$$\left[\begin{array}{c}R^1\\|\\L\\|\\-CH-CH_2-\end{array}\right]_x\left[\begin{array}{c}R\\|\\-CH_2-C-\\|\\R^2\end{array}\right]_y\left[-R^3-\right]_z$$

wherein
  L is a linking group selected from the group consisting of CONH, O, COO,

$$\overset{O}{\overset{\|}{C}},$$

S, SO_2 and

$$\overset{O}{\overset{\|}{S}};$$

R^1 is an optical brightener moiety;
R is H or alkyl containing from 1 to 4 carbon atoms;
R^2 is an anionic solubilizing group selected from the groups consisting of COOM, SO_3M, OSO_3M, $COOR^4OSO_3M$, PO_3 and PO_4, wherein M is H or an alkali metal and R^4 is alkylene containing from 1 to 4 carbon atoms;
R^3 is a unit derived from a copolymerizable ethylenically unsaturated monomer;
x is from 0.25 to 50 mole percent, y is from 5 to 99 mole percent and z is from 0 to 90 mole percent of the interpolymer.

4,106,942
SILVER HALIDE EMULSION CONTAINING YELLOW COLOR COUPLERS

Mitsugu Tanaka; Kiyoshin Nakazyo, 01, Shiba; Keisuke, and Atsuaki Arai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

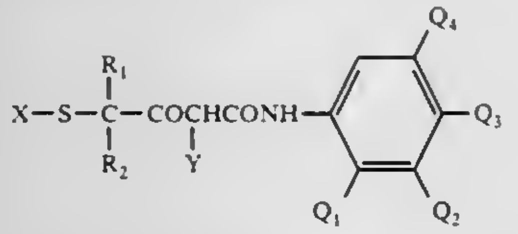
Continuation of Ser. No. 564,565, Apr. 2, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 791,084

Claims priority, applicatioo Japan, Apr. 2, 1974, 49-37239

Int. Cl.^{2} G03C *1/40*

U.S. Cl. 96—100 N **9 Claims**

1. A photographic silver halide emulsion containing a coupler represented by the following formula



wherein X represents an alkyl group having 1 to 20 carbon atoms; Y represents a hydrogen atom or a group capable of being released on coupling with the oxidation product of a primary aromatic amine developing agent; R_1 and R_2, which may be the same or different, each represents an alkyl group having 1 to 6 carbon atoms; Q_1 represents a halogen atom, an alkyl group, an alkoxy group, an aryloxy group or an N-substituted amino group; Q_2, Q_3 and Q_4, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group, an aryloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, an alkylamino group, an arylamino group, a sulfoamino group, an acylamino group, a carboxy group, a sulfo group, a cyano group or a hydroxy group.

4,106,943
PHOTOSENSITIVE CROSS-LINKABLE AZIDE CONTAINING POLYMERIC COMPOSITION

Hiroharu Ikeda; Seiji Aotani, and Yoshiyuki Harita, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

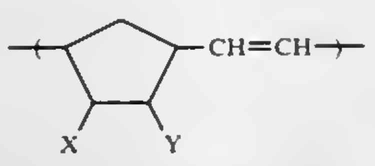
Continuation-in-part of Ser. No. 506,140, Sep. 16, 1974, abandoned. This application Oct. 13, 1976, Ser. No. 731,606

Claims priority, application Japan, Sep. 27, 1973, 48-108753

Int. Cl.^{2} G03C *1/70, 1/52*

U.S. Cl. 96—115 R **5 Claims**

1. A photosensitive composition consisting essentially of (1) a ring-opened polymer or copolymer of at least one norbornene derivative selected from the group consisting of methyl 5-norbornene-2-carboxylate, dimethyl 5-norbornene-2,3-dicarboxylate, N,N-dimethyl-5-norbornene-2-carboxylic acid amide, 5-norborne-2-nitrile and 5-norbornene-2,3-dicarboxylic anhydride, or a ring-opened copolymer of at least one said norbornene derivative and at least one cyclo-olefin selected from the group consisting of cyclopentene, cyclooctene and norbornene, wherein the molar ratio of the norbornene derivative to the cycloolefin in the ring-opened copolymer is from 100 : 0 to 10 : 90, wherein said ring-opened polymer of said norbornene derivative has a structure comprising units of the general formula:



in which X and Y represent the location of said 2- and 3-position substituents of said norbornene derivative,

and wherein said ring-opened polymer or copolymer is thermoplastic and is soluble in organic solvents or water; and (2) an azide type photosensitive crosslinking agent in an amount of 0.01 to 5% by weight based on the weight of said polymer or copolymer.

4,106,944
HARDENABLE COMPOSITIONS

David Epstein, London, England, assignor to National Research Development Corporation, England

Filed Apr. 9, 1976, Ser. No. 675,274

Claims priority, application United Kingdom, Apr. 10, 1975, 14822/75

Int. Cl.^{2} B28B *7/34*

U.S. Cl. 106—38.2 **4 Claims**

1. In a hardenable foundry composition that can be formed into the shape of a foundry core or mould and hardened, comprising an inert particulate refractory material selected from refractory oxides and silicates and binder ingredients that react to form a cured binder that hardens the composition, the improvement which consists of the use as binder ingredients of a particulate aluminosilicate glass and an aqueous solution of a polymer of acrylic acid that will leach cations from the glass to form the reacted binder, and in which the amount of the said binder ingredients is from 1 to 10% by weight of the composition.

4,106,945
INVESTMENT MATERIAL

Edmund E. Erndt, Timberlake, Ohio, assignor to Precision Metalsmiths, Inc., Cleveland, Ohio

Continuation of Ser. No. 689,153, May 24, 1976, abandoned. This application May 23, 1977, Ser. No. 799,523

Int. Cl.^{2} B28B *7/34*

U.S. Cl. 106—38.3 **8 Claims**

1. An investment material for use in making fired refractory molds consisting essentially of a gypsum binder and a refractory which is at least 15% by weight pyrophyllite.

5. A refractory mold comprising a fired body of investment material contained within a flask and consisting, before firing, essentially of a gypsum binder and a refractory which is at least 15% by weight pyrophyllite.

4,106,946
STEEP ABSORPTION EDGE FILTER GLASS

Willi Ritze, Mainz-Mombach, Fed. Rep. of Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,451

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621741

Int. Cl.^{2} C03C *3/04, 3/30*

U.S. Cl. 106—52 **13 Claims**

1. A glass suitable for filters with steep absorption edges in the wavelength range of 455 to 850 nm, consisting essentially of:

40 – 63 weight % SiO_2
8 – 30 weight % alkali metal oxides
14 – 30 weight % ZnO
0.9 – 9 weight % TiO_2
0 – 9 weight % B_2O_3
0 – 2.5 weight % P_2O_5
0 – 1.5 weight % Al_2O_3
0 – 2 weight % F
0 – 2 weight % CdO
0 – 2.5 weight % CdTe
0 – 1.65 weight % ZnS
0 – 2.0 weight % CdS
0 – 0.9 weight % S
0 – 0.9 weight % Se
0 – 0.8 weight % As_2S_3 or As_2S_4 or a mixture thereof
0 – 0.5 weight % Sb_2S_3 or Sb_2S_5 or a mixture thereof
0 – 6 weight % MgO
0 – 15 weight % CaO
0 – 8 weight % BaO
0 – 12 weight % SrO

with the provision that the total of MgO, CaO, BaO, SrO, ZnO and CdO is not higher than 36% by weight, and that the minimum content of the colloidal coloring components, CdTe, ZnS, CdS, S and Se or of any combination thereof is 0.5% by weight.

4,106,947
BEADS OF CERAMIC MATERIAL

Joseph Recasens, Sorgues, and André Penez, Courthezon, both of France, assignors to Societe Europeenne des Produits Refractaires, Neuilly-sur-Seine, France

Filed Jul. 30, 1976, Ser. No. 710,332

Claims priority, application France, Aug. 6, 1975, 75 24527

Int. Cl.^{2} C04B *35/48*

U.S. Cl. 106—57 **7 Claims**

1. Beads of ceramic material having a diameter of between about a few tenths of a mm and about 4 mm obtained by fusion, conversion into beads and solidification of a starting batch consisting, on the oxide basis, of up to 85% by weight of ZrO_2, a proportion of SiO_2 such that the weight ratio ZrO_2/SiO_2 is greater than or equal to 1.5, an optional proportion of Al_2O_3 such that the weight ratio Al_2O_3/SiO_2 is 0 to 1.5 and an optional proportion of Na_2O such that the weight ratio Na_2O/SiO_2 is from 0 to 0.04, the starting batch also containing at least one of the additional oxides MgO and CaO in proportions such that the weight ratio MgO/SiO_2 is from 0.03 to 1 and the weight ratio CaO/SiO_2 is from 0.03 to 1.45.

4,106,948
AQUEOUS COMPOSITIONS

Bryan Ewart Cooper, and Paul Lance Millard, both of South Glamorgan, Wales, assignors to Dow Corning Limited, Barry, Wales

Filed May 25, 1977, Ser. No. 800,241

Claims priority, application United Kingdom, Jun. 8, 1976, 23558/76

Int. Cl.^{2} C08L *1/28*

U.S. Cl. 106—197 R **6 Claims**

1. An aqueous composition consisting essentially of the product that has been obtained by mixing together (A) water, (B) hydroxyethyl cellulose and (C) an organosilicon compound of the general formula $RSi(OR')_3$, wherein R represents an organic group selected from methyl, ethyl and vinyl groups and R' represents an organic group selected from methyl, ethyl and methoxyethyl groups.

4,106,949
TREATMENT OF CLAY MINERAL PIGMENT

Peter James Malden, Lostwithiel, England, assignor to English Clays Lovering Pochin & Company, Limited, Austin, England

Filed Oct. 29, 1974, Ser. No. 518,970

Claims priority, application United Kingdom, Nov. 2, 1973, 51119/73

Int. Cl.^{2} C09C *1/42*

U.S. Cl. 106—288 B **13 Claims**

1. A process for reducing the viscosity at a given solids content of an aqueous suspension of a clay mineral for use as a pigment in a paper coating composition, which process consists essentially of the step of mixing an aqueous suspension of the clay mineral at a solids content in the range of from 5 to 30% by weight and at a pH of from 4.5 to 6.0 with from 0.05 to 0.25% by weight of a water-soluble compound having a plurality of basic groups and a number average molecular weight not greater than 1000 selected from the group consisting of polyethylene imine, ethylene diamine, 1:12 dodecane diamine, diethylene triamine, tetraethylene pentamine, and hexamethylene tetramine.

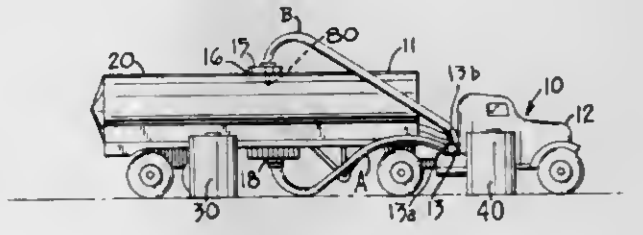
4,106,950
TANK WAGON CLEANING METHOD

Thomas A. Grismer, Dayton, Ohio, assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Oct. 28, 1977, Ser. No. 846,380

Int. Cl.^{2} B08B *3/02, 9/08*

U.S. Cl. 134—10 **6 Claims**



1. In a method for cleaning the interior of the tank of a transport tank truck with a reuseable organic solvent mixture stored in a stationary external storage means external to said tank truck, said reuseable organic solvent mixture being sprayable from a portable sprayhead means, wherein the tank truck comprises:

(a) a pump means located on said tank truck, said pump means comprising an inlet means and an outlet means;
(b) an inlet hose means having a first and a second end, at least one end adapted for being connected to said pump inlet means;
(c) an outlet hose means having a first and a second end, at least one end adapted for being connected to said pump outlet means;
(d) a tank means located on said tank truck, said tank means being capable of transporting chemicals and comprising:
  (1) a tank;
  (2) a manhole means including a manhole cover located near the top of said tank;
  (3) a drain means located near the bottom of said tank;

said cleaning method comprising:

(a) inserting a portable sprayhead means into the interior of said tank through said manhole means;
(b) connecting one end of said outlet hose means to said

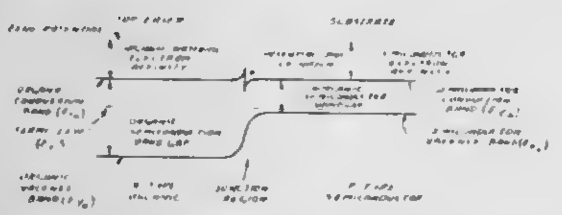
pump outlet means and connecting the second end of said outlet hose means to said sprayhead means;
(c) connecting one end of said inlet hose means to said pump inlet means and connecting the second end of said inlet hose means to said external storage means containing said reusable organic solvent mixture;
(d) pumping a residue-dissolving quantity of reusable organic solvent mixture from said external storage means into said tank;
(e) disconnecting said second inlet hose end from said external storage means and connecting said second inlet hose end to said drain means;
(f) starting said pump means and circulating said reusable organic solvent mixture through said tank, said drain means, said inlet hose means, said outlet hose means, and said sprayhead means;
(g) stopping said pump means;
(h) disconnecting said second outlet hose end from said sprayhead means and connecting said second outlet hose end to said external storage means; and
(i) pumping said reusable organic solvent mixture out of said tank and back into said external storage means so that said reusable organic solvent mixture can be reused.

4,106,951

PHOTOVOLTAIC SEMICONDUCTOR DEVICE USING AN ORGANIC MATERIAL AS AN ACTIVE LAYER

James V. Masi, Huntington, Conn., assignor to UCE, Inc., South Norwalk, Conn.

Filed Aug. 12, 1976, Ser. No. 713,880
Int. Cl.^{2} H01L *31/06*
U.S. Cl. 136—89 NB **5 Claims**



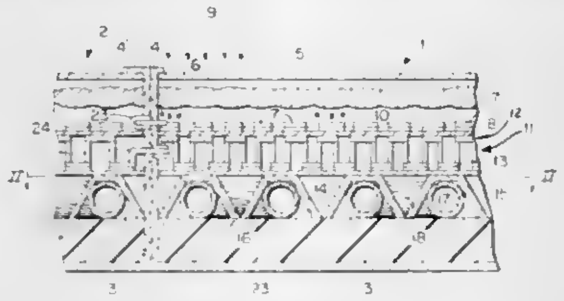
1. A semiconductor heterojunction device particularly useful as a solar cell, comprising
(a) first and second layers of different semiconductor materials, said first layer comprising the radiation receiving layer to which incident radiation is applied and consisting a solid, polymeric organic semiconductor material having a resistivity of less than 10^6 ohm-centimeters and said second layer consisting of an inorganic semiconductor material,
(b) said first and second layers each having a bandgap separating a conduction energy level band from a valence energy level band and by an electron affinity separating the conduction energy level band from a level of zero potential energy,
(c) said first and second layers being disposed in contact with each other forming a semiconductor heterojunction therebetween,
(d) said first layer of semiconductor material exhibiting one type of conductivity and said second layer of semiconductor material having the same or opposite type conductivity with respect to said first layer,
(e) said first layer having an energy bandgap wider than said second layer, and
(f) electrode means positioned on said first and second layers of semiconductor materials for providing electrical connections thereto, said electrode means positioned on said first layer being permeable to the radiation applied to said first layer.

4,106,952

SOLAR PANEL UNIT

Jerome H. Kravitz, 12403 Braxfield Ct., Rockville, Md. 20952

Filed Sep. 9, 1977, Ser. No. 831,962
Int. Cl.^{2} H01L *31/04;* **F24J** *3/02*
U.S. Cl. 136—89 HY **10 Claims**



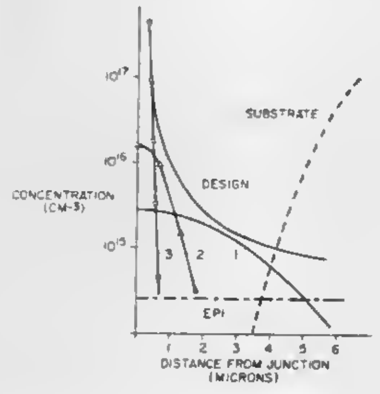
1. A solar energy conversion system, comprising:
a top fluid impervious sheet that freely passes solar radiant energy;
a plurality of photoelectric cell means arranged in a plane spaced below and parallel to said top sheet for receiving the solar radiant energy and directly converting a portion into electricity and converting substantially the remainder into heat;
means electrically connecting said photoelectric cell means in a power producing circuit;
a thermopile means below said photoelectric cell means for receiving the heat, converting a portion of the heat into electrical energy, and transmitting the remainder of the heat downwardly;
support means between said array of photoelectric cell means and said thermopile means for electrically insullating said thermopile means from said photoelectric cell means, for conducting heat downwardly, and converting any radiant energy directly received thereon into heat;
a planar heat sink means immediately below said thermopile means for receiving and transmitting downwardly the heat transmitted by said thermopile means; and
liquid conduit means beneath and in heat exchange relationship with said heat sink means.

4,106,953

METHOD OF PRODUCING AN ION IMPLANTED TUNING DIODE

George C. Onodera, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1976, Ser. No. 754,924
Int. Cl.^{2} H01L *21/265, 29/93*
U.S. Cl. 148—1.5 **7 Claims**



1. A method for producing a semiconductor device having a predetermined capacitance-voltage characteristic resulting from a particular doping distribution comprising the steps of:
a. providing a semiconductor body having a high resistivity epitaxial layer of a first conductivity type on a low resistivity wafer of the same conductivity type;

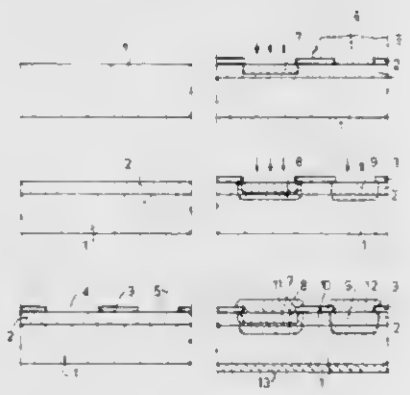
b. oxidizing the surfaces of said semiconductor body to provide an oxide layer thereon;
c. selectively removing said oxide layer from said semiconductor body to define an opening on said epitaxial layer;
d. implanting first ions through said opening and into said epitaxial layer;
e. thermally redistributing said first implanted ions;
f. implanting second ions through said opening and into said epitaxial layer;
g. thermally redistributing said first and said second implanted ions;
h. implanting third ions through said opening and into said epitaxial layer;
i. thermally redistributing said first, said second, and said third implanted ions; and
j. forming a PN junction in said semiconductor body by diffusing a conductivity determining impurity into said ion implanted epitaxial layer.

4,106,954

METHOD OF MANUFACTURING TRANSISTORS BY MEANS OF ION IMPLANTATION

Michel de Brebisson, Caen, and Maurice Bonis, Herouville, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,570
Claims priority, application France, Feb. 20, 1976, 76 04758
Int. Cl.^{2} H01L *21/265*
U.S. Cl. 148—1.5 **10 Claims**



1. A method of manufacturing a semiconductor device having a semiconductor body comprising at least one transistor in which an emitter zone of a first conductivity type, an underlying intrinsic base zone of a second conductivity type, and an extrinsic base zone of the second conductivity type connected to the intrinsic base zone are provided by ion implantation in a surface-adjoining region of the first conductivity type in said semiconductor body, the extrinsic base zone being provided with a connection conductor, comprising the steps of subjecting at least a part of the surface of the surface-adjoining region of the first conductivity type to a bombardment with ions of a dopant determining the second conductivity type so as to form the extrinsic base zone, covering the implanted surface with a layer masking against ion implantation, providing a first and a second window in said layer, implanting ions of a dopant determining the first conductivity type and ions of a dopant determining the second conductivity type through the first window so as to form the emitter zone and the intrinsic base zone, said ions forming the intrinsic base zone being implanted to a depth sufficient to convert a portion of said surface-adjoining region of the first conductivity type to the second conductivity type of said intrinsic base zone, contacting the emitter zone via the first window and contacting the extrinsic base zone via the second window.

4,106,955

COATING STEEL SURFACES

Carl Horowitz, Brooklyn; Duryodham Mangaraj, Staten Island, and Joseph A. Iorio, Ozone Park, all of N.Y., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Feb. 5, 1975, Ser. No. 547,427
Int. Cl.^{2} B05D *7/14, 3/02*
U.S. Cl. 148—6 **5 Claims**

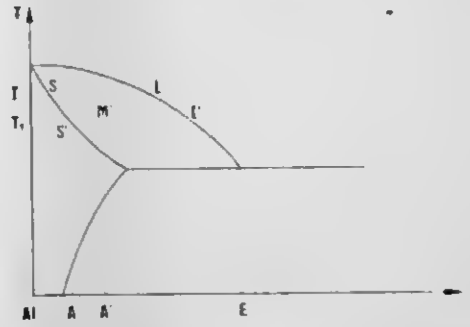
1. The process, for providing a steel workpiece with a coating of organic polymeric material, which includes the steps of:
(i) applying to an exposed face of the workpiece a composition including:
  (a) a polymerisable material having at least one constituent selected from the group consisting of
    glycidyl methacrylate
    glycidyl acrylate
    dimethyl amino ethyl acrylate
    hydroxy ethyl methacrylate
    hydroxy propyl methacrylate
  (b) monomer having at least one active group, adapted to form graft polymerisation linkages with the steel and with the polymerisable material, selected from the group consisting of
    hydroxyl
    carbonyl
    amine
    amide
    glycidyl
    aziridinyl
  (c) silver nitrate as a graft initiator
(ii) heating the composition until cured.

4,106,956

METHOD OF TREATING METAL ALLOYS TO WORK THEM IN THE STATE OF A LIQUID PHASE-SOLID PHASE MIXTURE WHICH RETAINS ITS SOLID FORM

Serge Bercovici, Grenoble, France, assignor to Societe de vente de l'Aluminium Pechiney, Paris, France

Continuation-in-part of Ser. No. 564,475, Apr. 2, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,017
Claims priority, application France, Feb. 19, 1976, 76 05159
Int. Cl.^{2} C22F *1/04*
U.S. Cl. 148—11.5 A **12 Claims**



1. A process for the treatment of a mass of solid aluminum alloy for making extruded products of aluminum alloy comprising the steps of:
(a) heat treating a billet of said alloy having a primary dendritic phase by subjecting it without agitation to an intermediate temperature between solidus and liquidus corresponding to a ponderable proportion of the liquid phase below about 25%;
(b) maintaining said billet at said intermediate temperature without agitation for a sufficient period of time to permit the solid dendritic phase to at least begin direct transformation into the globular form;
(c) subjecting said treated billet of aluminum alloy without agitation to extrusion while at said intermediate temperature state.

4,106,957

REINFORCEMENTS

Willy Tournoy, Lodewijk, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Aug. 29, 1972, Ser. No. 284,496

Claims priority, application United Kingdom, Sep. 2, 1971, 41043/71

Int. Cl.^{2} B60C *9/02;* **C21D** *9/34, 9/52*

U.S. Cl. 148—12 B **12 Claims**

1. A high carbon steel cord for reinforcement of vehicle tires, characterized in that it comprises a number of wires having a substantially martensitic crystal structure of an elongation ability ranging between 3 and 10%.

4,106,958

CHLORINATED WAX FLUX COMPOSITIONS

Robert A. Stayner, Lafayette; Richard C. Fox, San Rafael, and Thornton K. Jones, Greenbrae, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1977, Ser. No. 811,503

Int. Cl.^{2} B23K *35/34*

U.S. Cl. 148—23 **5 Claims**

1. A chlorinated wax-flux composition having a chlorine content below 50 weight percent and which is solid at 25° C comprising a mixture of (a) a wax having a melting point between 40° and 100° C; and (b) a solid chlorinated wax having a chlorine content greater than 60 weight percent.

4,106,959

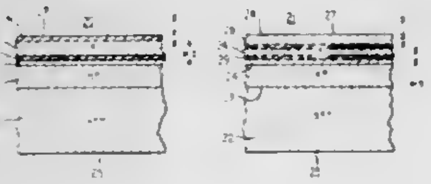
PRODUCING HIGH EFFICIENCY GALLIUM ARSENIDE IMPATT DIODES UTILIZING A GAS INJECTION SYSTEM

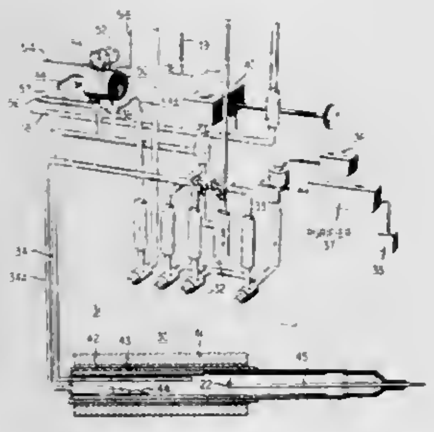
James Vincent DiLorenzo, Piscataway; William Charles Niehaus, Murray Hill, and Lawrence John Varnerin, Jr., Watchung, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 538,082, Jan. 2, 1975, Pat. No. 3,986,192. This application Jul. 6, 1976, Ser. No. 702,393

Int. Cl.^{2} H01L *21/205, 29/207, 29/48*

U.S. Cl. 148—175 **6 Claims**





1. A process for making a gallium arsenide diode comprising:

a. epitaxially depositing at least one layer of gallium arsenide on the surface of a gallium arsenide substrate from materials including a source of gallium, a source of arsenic, and a conductivity-type determining impurity;

b. varying the amount of conductivity-type determining impurity during the epitaxial deposition in the following sequence:

(1) raising the amount of impurity, (2) lowering the amount of impurity, and (3) raising the amount of impurity this sequence being timed such that a relatively thin region of the layer, ranging in thickness from 100 Angstroms to 0.5 μm, is deposited while the impurity level is raised, so as to form a layer having a first relatively thin region formed during step **1** and a second relatively thin region formed during step **3** both of which regions having an impurity concentration that is relatively high with respect to the bulk of the layer,

c. forming an electrical contact to the gallium arsenide substrate; and

d. forming a rectifying barrier contact on the deposited gallium arsenide layer.

4,106,960

TEMPERATURE-COMPENSATING PROPELLANT CHARGE

Heinrich Brachert, and Johannes Eich, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jan. 27, 1977, Ser. No. 763,161

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603927

Int. Cl.^{2} C06B *45/22*

U.S. Cl. 149—11 **16 Claims**

1. A propellant composition comprising individual powder particles of a nitrocellulose containing propellant coated with a material consisting essentially of an acrylic resin having a molecular weight between 100,000 and 200,000, the coating comprising 10 to 20% by weight of the propellant.

4,106,961

METHOD OF MANUFACTURING A LONGITUDINALLY WATERTIGHT TELECOMMUNICATION CABLE

Frederik Hendrik Kreuger, Delft, and Jacobus Petrus Ignatius Van Kesteren, Leidschendam, both of Netherlands, assignors to N.K.F. Kabel B.V., Netherlands

Continuation of Ser. No. 585,959, Jun. 11, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 719,925

Claims priority, application Netherlands, Jun. 28, 1974, 7408740

Int. Cl.^{2} H01B *13/00*

U.S. Cl. 156—48 **2 Claims**

1. A method of manufacturing a longitudinally watertight telecommunication cable, which comprises providing an initial multiplicity of longitudinally extending synthetic resin-insulated conductors, applying about said initial multiplicity of conductors in longitudinally separated regions first layers of a moisture-vulcanizable silicone rubber, positioning a second multiplicity of longitudinally extending synthetic resin-insulated conductors about said first conductor-silicone rubber combination, applying about said second multiplicity of conductors second layers of a moisture-vulcanizable silicone rubber at the same longitudinally separated regions as the first layers of moisture-vulcanizable silicone rubber, repeating said sequential steps of positioning a multiplicity of longitudinally extending synthetic resin-insulated conductors and applying layers of a moisture-vulcanizable silicone rubber until a cable core having the desired diameter is obtained, and thereafter applying a sheath about said cable core before the silicone rubber has been completely vulcanized.

4,106,962

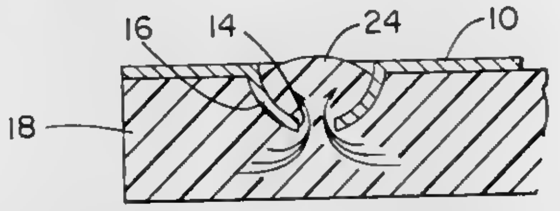
METHOD OF FASTENING METAL PART TO PLASTIC PART

Robert Clarence Adams, St. Clairsville, and James H. Sweigart, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 14, 1977, Ser. No. 815,759

Int. Cl.^{2} B29C *27/08;* **B32B** *31/00;* **B06B** *3/00*

U.S. Cl. 156—73.1 **10 Claims**



1. A method of bonding a metallic member to a non-metallic member comprising the steps of:

providing an aperture in said metallic member,

working the metallic member in the area adjacent said aperture to form a depression therearound,

placing the depression of said metallic member in contact with the surface of said non-metallic member, and

sonically heating a portion of said non-metallic member adjacent the depression to cause the material of said portion to soften and to flow through said aperture into said depression.

4,106,963

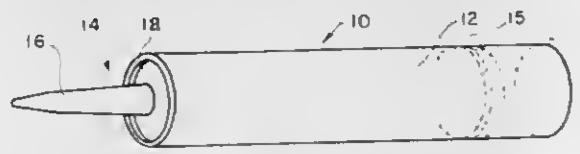
METHOD OF MAKING AN ALL PLASTIC CAULKING CARTRIDGE

Carl F. Yealy, New Oxford, Pa., and Joseph Abbott, Cincinnati, Ohio, assignors to Penland Container, Inc., Hanover, Pa.

Filed Mar. 18, 1974, Ser. No. 452,103

Int. Cl.^{2} B32B *31/16;* **B29C** *19/00*

U.S. Cl. 156—73.5 **13 Claims**



1. A method of making an all plastic caulking cartridge comprising the steps of providing a rigid thermoplastic first member comprising a generally disc shaped wall and an elongated spout extending therefrom, extruding a high density thermoplastic directly into a cylindrically shaped second member comprising a rigid cylindrical body for said cartridge, extruding a liner for said second member at the same time as said second member is being extruded, said second member having a constant inner diameter substantially throughout its length, said first member and said second member being provided with annular surface of substantially the same diameter, maintaining the cylindrical shape of said second member while rotating one of said members at a high speed relative to the other of said members and while urging said first and second members toward each other so that said annular surfaces are in contact to generate friction at the interface of said annular surfaces, maintaining the speed of said rotation sufficiently high so that the thermoplastic along said interface melts, stopping said rotation and permitting said thermoplastic to fuse along said interface.

4,106,964

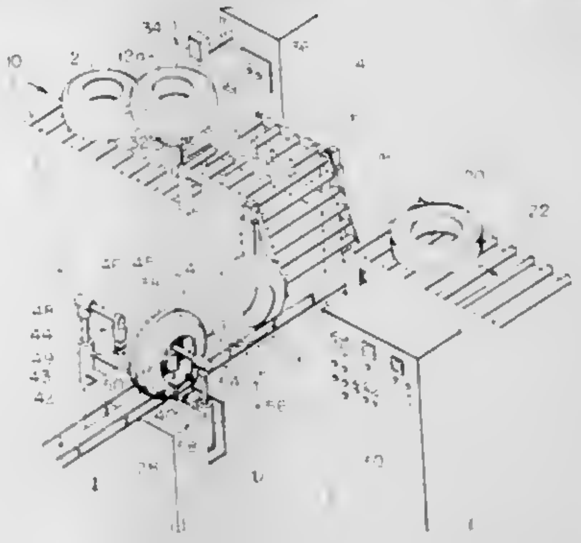
BALANCE CORRECTION METHOD AND APPARATUS

Joseph M. DeVittorio, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Jun. 11, 1976, Ser. No. 695,210

Int. Cl.^{2} G01M *1/00*

U.S. Cl. 156—75 **20 Claims**



5. The method of claim **1** in which the elastomer composition is deposited in an elongated pool on the tire.

4,106,965

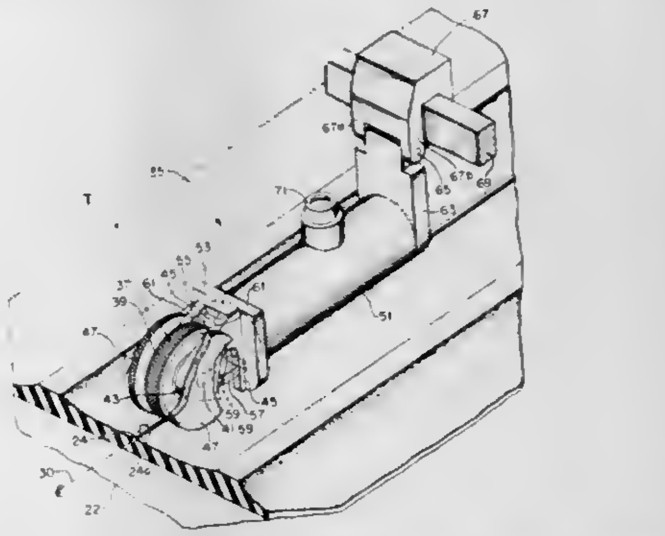
TIRE TREAD LINE STRIPPING

Michael Wayne Lee, Arlington, Ky., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 12, 1977, Ser. No. 832,509

Int. Cl.^{2} B29H *17/02, 17/36*

U.S. Cl. 156—123 R **9 Claims**



1. The method of making a tire to enable objective visual determination, after curing the tire, of the accuracy of building and molding such tire which method comprises:

while extruding uncured tread for such tire, providing thereon a visible raised and inked reference line coincident with the longitudinal centerline of said tread;

while building such tire, applying a length of said tread thereon and locating said line at the mid-circumferential plane of the tire;

inserting the tire including the tread thereon into a mold having mold parts which meet at a parting line in said plane and curing the tire, said parting line causing a line marking around the tire after curing;

then removing the tire;

whereby the relation of said parting line marking and the visible reference line provide objective indication of the accuracy of building and of molding the tire.

4,106,966

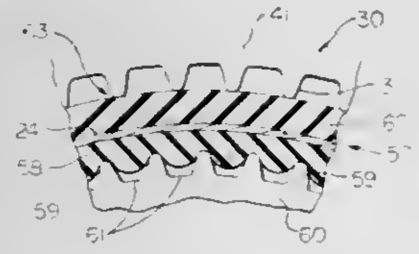
METHOD OF MAKING TOOTHED ENDLESS POWER TRANSMISSION BELTS

Alden W. Brooks, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 20, 1977, Ser. No. 799,012

Int. Cl.² B29H *7/22;* F16G *1/00*

U.S. Cl. 156—138 **13 Claims**



1. A method of making endless power transmission belts each having at least a toothed outside surface comprising the steps of, building a belt sleeve on a drum, extruding a polymeric material through an extrusion orifice to define a reusable cylindrical curing jacket having a toothed inside surface around said sleeve with the teeth thereof being disposed adjacent said sleeve, wherein the teeth comprising said toothed surface extend parallel to the longitudinal axis of said jacket, curing said sleeve with said jacket therearound while subjecting the jacket to pressure causing the inside teeth thereof to define corresponding outside teeth on said sleeve, removing said jacket from around said drum for reuse thereof, and cutting said sleeve to define said belts.

4,106,967

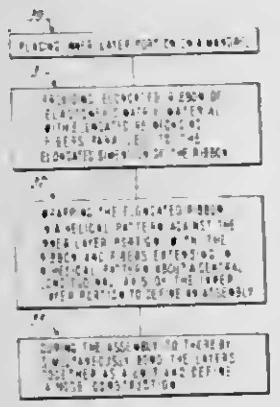
HOSE CONSTRUCTION AND METHOD OF MAKING SAME

Arthur D. Logan, and James B. Rush, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 633,060, Nov. 18, 1975, Pat. No. 4,013,101, which is a continuation-in-part of Ser. No. 452,471, Mar. 18, 1974, Pat. No. 3,921,674. This application Dec. 3, 1976, Ser. No. 747,268

Int. Cl.² B65H *81/08*

U.S. Cl. 156—184 **16 Claims**



6. A method of making a hose construction comprising the steps of forming a tubular construction having a reference axis and having at least one layer portion made primarily of uncured elastomeric matrix material having randomly distributed elongated fibers embedded therein in substantially parallel relation, said matrix material having a tensile modulus in the direction of fiber orientation higher than the tensile modulus in a direction transverse to said fiber orientation, by winding a layer of said matrix material about a mandrel having a right circular cylindrical outside surface with said fibers extending in a helical pattern about said axis at an angle relative thereto, and curing said tubular construction to define said hose construction having said fibers serving as reinforcement means for said hose construction.

4,106,968

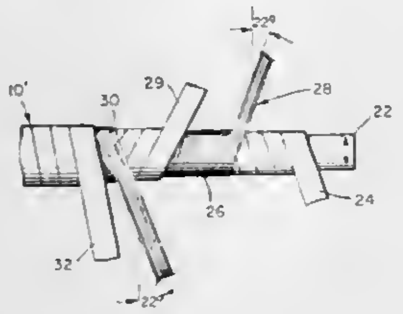
METHOD OF MAKING A FORMED HOSE

Thomas A. Kutnyak, Greenwood; George T. Dunn, and Chester L. Guiles, both of Abbeville, all of S.C., assignors to Automation Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 619,296, Oct. 3, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,695

Int. Cl.² B65H *81/00*

U.S. Cl. 156—189 **8 Claims**



1. A method of forming a contoured hose including the steps of:

providing a first cylindrical mandrel being substantially straight and having a relatively hard smooth outer surface;

helically wrapping a first strip of elastomeric material on said first mandrel, said strip being wrapped in an edge-to-edge relationship forming an inner layer having a substantially smooth inner cylindrical core;

helically wrapping a first layer of fiberous strands around said inner layer in a first direction to provide a first inner layer of reinforcement strands, said layer of reinforcement strands being wrapped at an angle in a range between 20° and 30° relative to a line perpendicular to a center axis of said inner cylindrical core;

helically wrapping a second strip of elastomeric material on said layer of fiberous strands of reinforcement material to form a tie-ply for holding said first layer of reinforcement material in position during construction of said hose;

helically wrapping a second layer of fiberous strands around said inner layer, in a second direction, to provide a second layer of reinforcement material, said second direction being opposite to said first direction, said second layer of reinforcement strands being wrapped at an angle in a range between 20° and 30° relative to a line perpendicular to the centerline axis of said cylindrical core;

helically wrapping a third strip of elastomeric material around said second layer of fiberous strands to form an outer cover;

providing a contoured mandrel having a relatively hard smooth surface and being contoured into predetermined shapes;

removing said hose from said straight mandrel before said hose is cured and placing on said contoured mandrel;

curing said hose on said contoured mandrel by subjecting said hose to an elevated temperature condition for a predetermined time to cause said layers to bond together into a monolithic structure; and

removing said hose from said contoured mandrel after said hose is cured.

4,106,969

METHOD FOR ASSEMBLING TOGETHER PARTS OF AUTOMOBILE LIGHTS

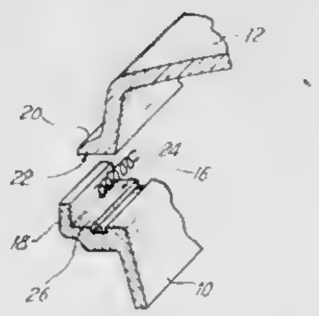
Olivier Puyplat, Paris, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Aug. 18, 1977, Ser. No. 825,633

Claims priority, application France, Sep. 8, 1976, 76 27012

Int. Cl.² B29C *19/06;* B29D *3/00;* C09J *5/00*

U.S. Cl. 156—275 **7 Claims**



1. In a method for assembling together two parts of headlights or lights for automobile vehicles, the first of said parts being made of an inorganic material and the second of a thermoplastic material not able to be directly fixed to the first by adhesion, a metallic connection element is partially introduced into the second thermoplastic part so that a part of said element projects and acts as free anchoring element, and the two first and second parts are then assembled by the depositing of a layer of glue which, on the one hand, adheres to the first part and, on the other hand, completely covers the said free anchoring element which, after the glue has set, acts as mechanical connection between the two parts, and wherein, in order partially to introduce said connection element in the second part, said connection element is heated for predetermined length of time and a pressure is applied thereto with a view to causing it to penetrate in the thermoplastic material.

4,106,970

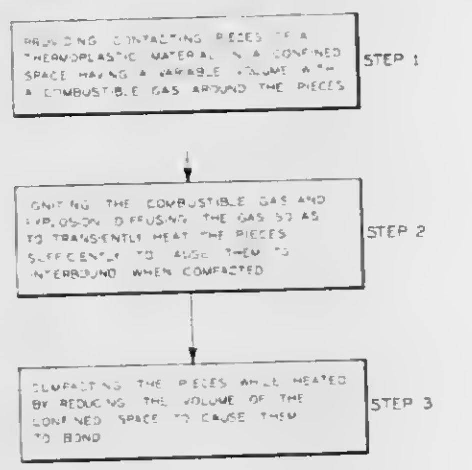
METHOD FOR THE THERMAL BONDING OF CONTACTING PIECES OF A THERMOPLASTIC MATERIAL

Christopher J. Torbet, Ann Arbor; Warren A. Rice, Dexter, and Clarence S. Vinton, Ann Arbor, all of Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Filed Aug. 29, 1977, Ser. No. 828,349

Int. Cl.² C09J *5/00*

U.S. Cl. 156—306 **16 Claims**



PROVIDING CONTACTING PIECES OF A THERMOPLASTIC MATERIAL IN A CONFINED SPACE HAVING A VARIABLE VOLUME WITH A COMBUSTIBLE GAS AROUND THE PIECES
STEP 1
IGNITING THE COMBUSTIBLE GAS AND EXPLOSION DIFFUSING THE GAS SO AS TO TRANSIENTLY HEAT THE PIECES SUFFICIENTLY TO CAUSE THEM TO INTERBOND WHEN COMPACTED
STEP 2
COMPACTING THE PIECES WHILE HEATED BY REDUCING THE VOLUME OF THE CONFINED SPACE TO CAUSE THEM TO BOND
STEP 3

1. The improved method for thermal bonding of contacting pieces of a thermoplastic material to form a bonded porous mass by the ignition of a combustible gas around the contacting pieces forming an unbonded porous mass so as to bond the pieces together which comprises:

(a) providing contacting pieces of a thermoplastic material in a confined space having a variable volume with an initiator means for igniting the combustible gas externally of the confined space, with an explosion diffuser providing a tortuous gas flow path adjacent the porous mass between the initiator means and the porous mass and with a combustible gas around the pieces which form an unbonded porous mass, said volume being reducible to compact the pieces in the unbonded porous mass;

(b) igniting the combustible gas within the unbonded porous mass by activating the initiator means which ignites the combustible gas externally of the confined space and diffuses the ignited gas through the tortuous flow path of the diffuser element so as to transiently heat the pieces sufficiently to cause them to interbond without damage from the ignited combustible gas when they are brought into contact with each other by compacting the unbonded porous mass; and

(c) compacting the pieces while they are heated by reducing the volume of the confined space so as to cause contact of the heated surfaces and to cause bonding and formation of the bonded porous mass.

4,106,971

METHOD OF ADHESIVE BONDING

Paul Clayton Briggs, Jr., Wilmington, and Lawrence Carl Muschiatti, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 551,964, Feb. 21, 1975, abandoned, which is a division of Ser. No. 357,387, May 4, 1974, Pat. No. 3,890,407, and a continuation-in-part of Ser. No. 273,353, Jul. 20, 1972, abandoned. This application Feb. 18, 1977, Ser. No. 770,059

Int. Cl.² B32B *7/00*

U.S. Cl. 156—310 **5 Claims**

1. A method of bonding two surfaces to each other, said method comprising applying to at least one of the surfaces to be joined an adhesive composition consisting essentially of a solution of a sulfur-bearing composition selected from chlorosulfonated polyethylene and a mixture of sulfonyl chloride with chlorinated polyethylene in a polymerizable vinyl monomer and at least one polymerization catalyst selected from the group consisting of an accelerator, an initiator, a promoter, and a free radical generator; the sulfur-bearing composition containing about 25–70 wt. percent chlorine and about 0.1–5 weight percent sulfur and being made from polyethylene having a melt index of about 4–500; said solution having a Brookfield viscosity of up to about 1 million; and then bringing the surfaces sufficiently close together that the adhesive composition fills the gap between the surfaces to create a bond that can be characterized by at least one of the following: the setting time is less than about 10 minutes, the T-peel strength is greater than about 5 pli, the lap shear strength on prepared surfaces is greater than about 2500 psi, and the bond strength on oily surfaces is not significantly adversely affected by the presence of the oil.

4,106,972

VELOCITY COMPENSATOR AND APPARATUS INCORPORATING THE SAME

Donald L. Caudill, Riverside, Calif., assignor to Label-Aire Inc., Fullerton, Calif.

Filed Sep. 26, 1977, Ser. No. 836,779

Int. Cl.² B65C *9/40*

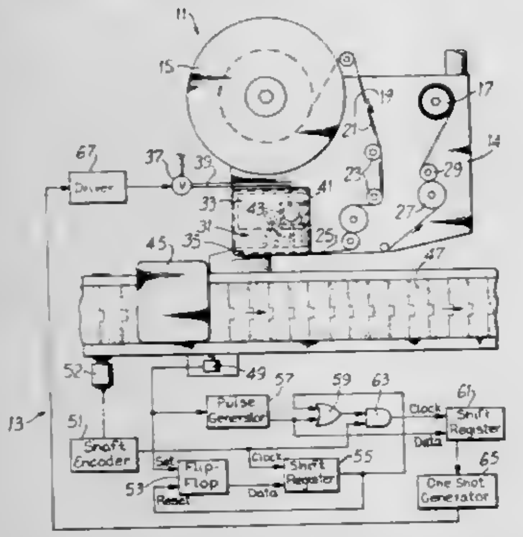
U.S. Cl. 156—363 **15 Claims**

1. A velocity compensator for controlling the initiation of an actuator wherein an article is moved along a path through a work station and actuator performs a work operation on the article at the work station with the actuator requiring an actuation period from the time it is initiated to perform the work operation, said compensator comprising:

first means responsive to movement of the article upstream of the work station for providing a distance signal having a characteristic related to a travel distance which is the distance the article travels in a period equal to the actuation period, said travel distance being no greater than a first predetermined distance;

measuring means for measuring distances having lengths up to a second predetermined distance, said second predetermined distance being at least as great as the travel distance;

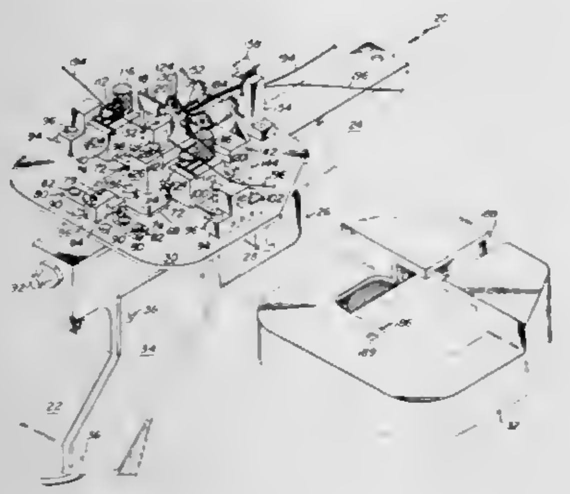
said measuring means including means responsive to said distance signal for reducing said second predetermined distance by said travel distance to define a remaining distance whereby the measuring means is then capable of measuring a distance equal to said remaining distance;



second means responsive to the article reaching a first location which is approximately said second predetermined distance from the work station for providing a first signal to the measuring means; and

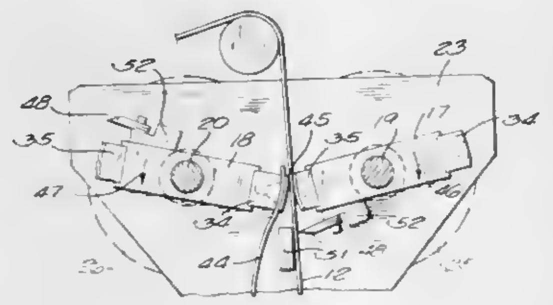
said measuring means including means responsive to the article traveling a distace equal to said remaining distance after the occurrence of said first signal to provide an actuation signal which can be used to initiate the actuator.

4,106,973
YARN WELDING DEVICE
Robert C. Wright, Huntingdon Valley, Pa., assignor to Narricot Industries, Inc., Philadelphia, Pa.
Filed Jan. 17, 1977, Ser. No. 759,616
Int. Cl.² B65H *69/08;* B29C *27/06*
U.S. Cl. 156—433 **10 Claims**



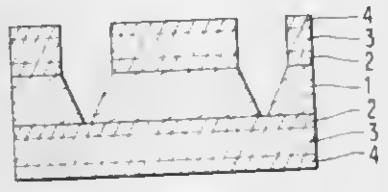
1. A yarn welding device comprising a heating element, means for holding the ends of two lengths of yarn against said heating element, means for energizing said heating element to weld the two ends of said yarn to form a continuous yarn and sever the free ends of said yarn, means for placing the welded yarn under tension and means for molding the weld joint to smooth the same and reduce its size, said molding means comprising a vertically movable molding head that is brought vertically downward against said weld joint and a laterally movable molding blade which is brought to bear against said weld joint, said head and blade cooperating to mold said joint.

4,106,974
FLYING SPLICE APPARATUS
John L. Hirsch, Sheboygan Falls, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.
Filed Sep. 13, 1976, Ser. No. 722,833
Int. Cl.² B65H *19/16*
U.S. Cl. 156—504 **7 Claims**



1. Flying splice apparatus for splicing the leading end of a new web to a running web, said apparatus comprising two coacting rotors between which the running web is trained, said rotors being respectively provided with coacting web press jaws, means for rotating said rotors concurrently through a cycle in which said jaws coact to engage the leading end of the new web with the running web, one said jaw comprising a vacuum pad for temporarily holding one side of the leading margin of the new web to said one jaw, an adhesive strip on the other side of the leading margin of the new web and adhered thereto and having an exposed face, the other said jaw comprising an anvil jaw whereby coaction of the jaws will splice the said leading end of the new web to the running web by adhering the exposed face of the adhesive strip to the running web, continued rotation of said rotors through said cycle pulling said leading margin of the new web off of said vacuum pad, each said rotor being provided with both a vacuum pad jaw and an anvil jaw and means mounting said jaws in angularly spaced relation about the axis of rotation of the rotor for successive coaction of a vacuum pad jaw on one rotor with an anvil jaw on the other rotor in each said cycle.

4,106,975
PROCESS FOR ETCHING HOLES
Melvin Berkenblit, Yorktown Heights; See Ark Chan, Croton-on-Hudson; Arnold Reisman, Yorktown Heights, and Stanley Zirinsky, Bronx, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 30, 1977, Ser. No. 811,750
Int. Cl.² C23F *1/00;* G01D *15/18*
U.S. Cl. 156—628 **17 Claims**



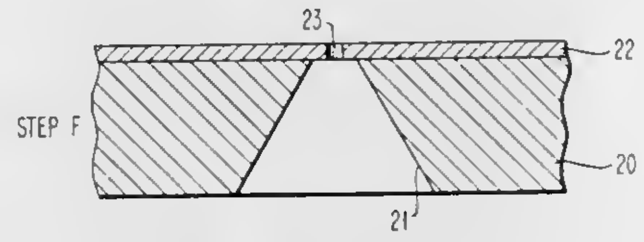
1. A method for etching at least one aperture having well defined crystallographic geometry in single crystal of a material selected from the group consisting of aluminum oxide, spinel, yttrium aluminum garnet and yttrium iron garnet which comprises:

(A) providing a substrate of said single crystal;

(B) providing a masking material on all sides of said substrate and providing at least one aperture in said masking material to thereby protect predetermined portions of the substrate from being etched, said masking material being resistant to etching at temperatures of up to about 325° C with mixtures of H_2SO_4 and H_3PO_4; and being adherent to the said substrate;

(C) contacting said substrate with a mixture of sulfuric acid and phosphoric acid in a range of mixtures of nine parts sulfuric acid to one part phosphoric acid to one part sulfuric acid to nine parts phosphoric acid by volume, for a time sufficient to anisotropically etch through said at least one aperture to provide said substrate with at least one aperture having well defined crystallographic geometry, said mixture being at a temperature of about 200° to about 325° C during said contacting.

4,106,976
INK JET NOZZLE METHOD OF MANUFACTURE
Charles Chiou, San Jose; Guido Galli, Saratoga; Karl H. Loeffler, San Jose, and Max R. Lorenz, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 665,143, Mar. 8, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,920
Int. Cl.² G01D *15/18;* H01L *21/306*
U.S. Cl. 156—644 **4 Claims**



1. A method of fabrication of a multi-orifice nozzle plate for pressurized fluid jets a monocrystalline substrate with an array of entrance openings overlayed by an inorganic membrane with an array of orifices corresponding with said openings, said method comprising the steps of:

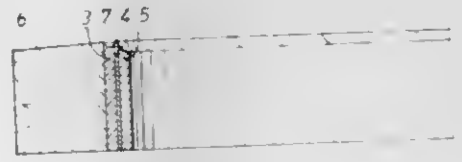
forming a layer of inorganic membrane material of uniform thickness less than one mil on the front surface of said monocrystalline substrate; said inorganic membrane material having physical characteristics sufficient to withstand said pressurized fluid;

controlled chemical preferential etching said monocrystalline substrate from the rear surface to form an array of uniform openings therethrough to said membrane; and

etching said membrane to form an array of uniform orifices therethrough, each of said orifices communicating with one of said substrate openings having approximately the same central axis therewith, and having smaller areal cross sections than said substrate openings.

4,106,977
PROCESS FOR PRODUCTION OF OIL CONTROL RINGS
Heck Klaus, Ingolstadt, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany
Filed Apr. 26, 1976, Ser. No. 679,890
Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2520698
Int. Cl.² C23F *1/02*
U.S. Cl. 156—645 **6 Claims**

1. A process for production of oil control rings for pistons of internal combustion engines having a smooth and continuous scraper edge formed by a layer of a wear-resistant material, a pair of spaced softer layers, interposing and embedding the wear-resistant layer between the softer layers, then finishing a surface to form a smooth and continuous exposed scraper edge, and then recessing the soft layers on said surface to either side of the wear resistant layer so that the scraper edge will cooperate with associated surfaces of the engine in preventing oil from escaping across the scraper edge.



4,106,978
METHOD OF PREVENTING EXPLOSIONS USING A SMELT WATER EXPLOSION INHIBITOR
Hugh Wharton Nelson, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Jan. 31, 1977, Ser. No. 764,116
Int. Cl.² D21C *11/12*
U.S. Cl. 162—1 **3 Claims**

1. A method of preventing explosions due to water contacting a smelt and forming a layer of water thereon comprising spreading over substantially the entire smelt-water bed a layer of a porous, high surface area powder which is coated with an anti-wetting agent and wherein said porous power contains trapped air and which is more dense than water such that said powder will sink through said water layer without releasing gas and forming a layer at the interface of said water and said smelt which is at least about 0.15 centimeters thick and said air after passing through the water layer is available for forming nucleating sites.

4,106,979

PREPARATION OF PAPER PULPS FROM DICOTYLEDONOUS PLANTS

Guglielmo Ruffini, Lovere, and Erio Pezzotti, Cassano Magnago, both of Italy, assignors to Consorzio Fabocart S.p.A., Milan, Italy

Filed Mar. 21, 1977, Ser. No. 779,293

Int. Cl.^{2} D21C *3/02, 3/20, 9/16*

U.S. Cl. 162—73 **7 Claims**

1. A process for the preparation of pulps for paper from dicotyledonous plants, comprising the steps of:

stirring in a pulper, the dicotyledonous plants in an alkaline solution in the presence of a surfactant and at least one stain inhibiting agent selected from the group consisting of peroxides and sodium hypochlorite, which agent prevents staining of the plant fibers in alkaline media by blocking the chromophoric groups of the dicotyledonous plants, in order to obtain a stock containing both a woody core fraction and a bark fraction containing bast fibers;

dividing said stock into a woody core fraction and a bark fiber fraction; and then

subsequently cooking and bleaching said bark fraction under atmospheric pressure in an alkaline solution containing an alkyl sulfate surfactant and an oxidizing agent selected from the group consisting of hydrogen peroxide and tertiary butyl hydroperoxide.

4,106,980

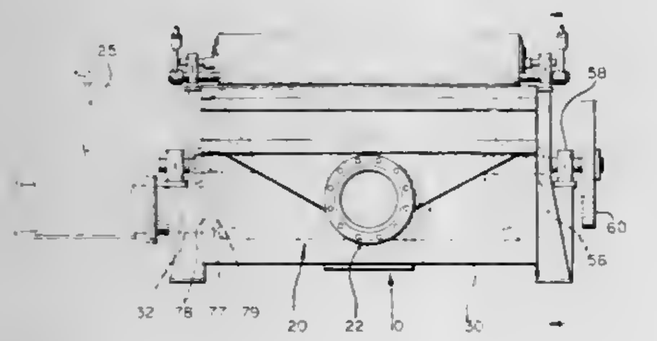
THICKENER APPARATUS INCLUDING A SHAFTLESS CYLINDER MOLD

Peter Seifert, and Walter R. Zimmerman, both of Middletown, Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed May 11, 1977, Ser. No. 795,703

Int. Cl.^{2} D21F *1/04, 1/60*

U.S. Cl. 162—330 **2 Claims**



1. In a thickening apparatus for thickening wood pulp, having a thickening vat, a slurry input, means for providing a controlled supply of supply slurry to said thickening vat, a cylinder mold rotatably supported within said vat, a white water outlet at one end of the cylinder mold for removing white water from the interior of the cylinder mold, a couch roll in driven engagement with the surface of the cylinder mold for removing the thickened slurry from the cylinder mold, and a thickened slurry discharge device for removing the thickened slurry from the couch roll, the improvement comprising:

said cylinder mold having opposed axially aligned end support members with outer cylindrical peripheral surfaces, one of said end members disposed opposite said white water outlet being closed to prevent mixing of the slurry in said vat and white water in said cylinder mold, and the second of said end members adjacent said white water outlet having an open portion extending around substantially said entire second end member so that the interior of said cylinder mold is in communication with said white water outlet to permit white water to flow from the cylinder mold into said white water outlet while said cylinder mold is rotating, each of said end members having separate axially aligned rotation shafts secured thereto by which said cylinder mold is rotatably supported in said vat;

a cylindrical perforated shell member circumferentially secured to said end support members, for rotation therewith, and screening means covering the outer surface of said shell member for controlling the water removal from the slurry into the interior of said cylinder mold;

a plurality of stiffening members disposed in axially spaced relation between said end members supportively engaging the inner surface of said shell member and having openings defined therein for flow of white water from said first end member to said second end member; and

said shell member being sufficiently rigid to be self-supporting in conjunction with said stiffening members.

4,106,981

PROCEDURE FOR OBTAINING ELEMENTS TO SUPPORT THE WIRE IN CONTINUOUS FORMING TABLES OF PAPER-MAKING MACHINES, AND THE ELEMENTS DERIVED THEREBY FOR SUPPORTING THE WIRE

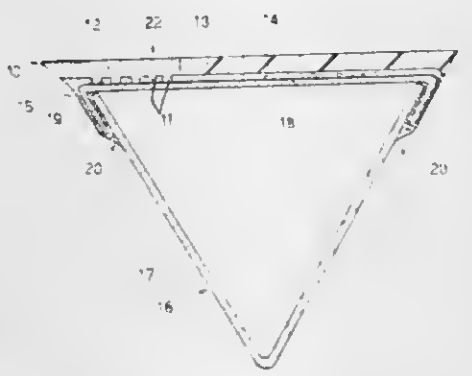
Glauco Corbellini, via Carducci, 33100 Udine, Italy

Continuation of Ser. No. 426,657, Dec. 20, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,694

Claims priority, application Italy, Dec. 20, 1972, 83450 A/72; Dec. 20, 1972, 83451 A/72

Int. Cl.^{2} D21F *1/54*

U.S. Cl. 162—352 **4 Claims**



1. In combination a paper-making machine and a water removing blade element, said blade element comprising a pre-formed blade having a leading edge made of a hard ceramic or metallic material; a resin support means united by a resin to said blade, and a support beam bonded to said blade and support means with an adhesive resin.

4,106,982

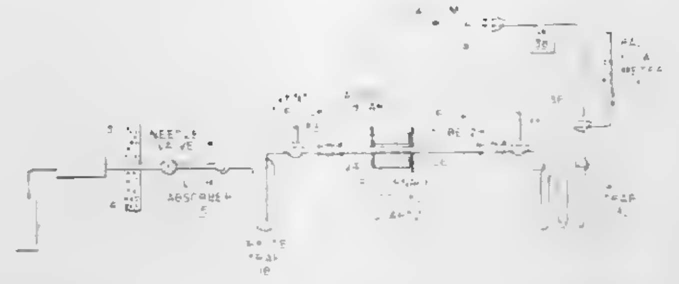
PRODUCTION OF CARRIER-FREE $H^{11}CN$

David R. Christman, Setauket; Ronald D. Finn, Westhampton Beach, and Alfred P. Wolf, Setauket, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1974, Ser. No. 456,996

Int. Cl.^{2} G21G *1/10*

U.S. Cl. 176—11 **6 Claims**



1. The method of synthesizing $H^{11}CN$ comprising the steps of:

a. subjecting a gaseous mixture of nitrogen and hydrogen to irradiation by a beam of protons having an energy in the range of about 4 to 18 MeV to induce the $^{14}N(p,\alpha)^{11}C$ reaction and produce an effluent containing NH_3 and $^{11}CH_4$;

b. reacting the $^{11}CH_4$ and NH_3 in said effluent to form $H^{11}CN + H_2$; and

c. removing the H_2, N_2 and remaining NH_3 to obtain $H^{11}CN$.

4,106,983

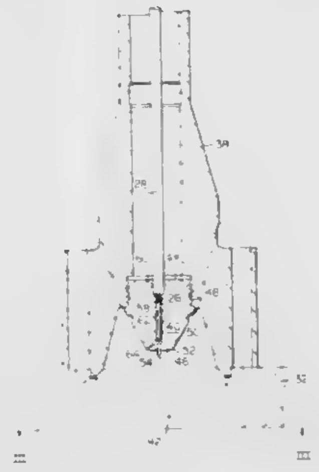
THERMOCOUPLE HOT JUNCTION RECEPTACLE FOR A NUCLEAR REACTOR

Robert E. Meuschke, Penn Hills Township, Allegheny County, Pa., and Jose M. Martinez, Miami, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,182

Int. Cl.^{2} G21C *17/02*

U.S. Cl. 176—19 R **3 Claims**



1. A receptacle to seat a thermocouple within the reactor vessel and above the core of a nuclear reactor, said thermocouple including a sheath and a hot junction of smaller cross section than said sheath protruding therefrom, said thermocouple disposed within a conduit that penetrates said reactor vessel and terminates within said receptacle, said receptacle comprising a generally inverted conical surface with a flattened apex and a base and an opening vertically through said receptacle intersecting said flattened apex and base, said opening having decreasing lateral areas along its length, said areas serially including a first area sized to receive said conduit through said base, a second smaller area within said receptacle sized to removably receive said sheath and interfere with said conduit, and a third yet smaller area sized to removably receive said hot junction and interfere with said sheath, said third cross section extending to said apex and having a shorter length than said hot junction, whereby said hot junction protrudes beyond said apex.

4,106,984

ROTATING SAFETY DRUM NUCLEAR REACTOR

Richard T. Schneider, 3550 NW. 33rd Pl., Gainesville, Fla. 32605

Filed Sep. 28, 1976, Ser. No. 727,485

Int. Cl.^{2} G21C *7/08*

U.S. Cl. 176—32 **9 Claims**

1. A nuclear reactor, comprising:

a rotatable drum;

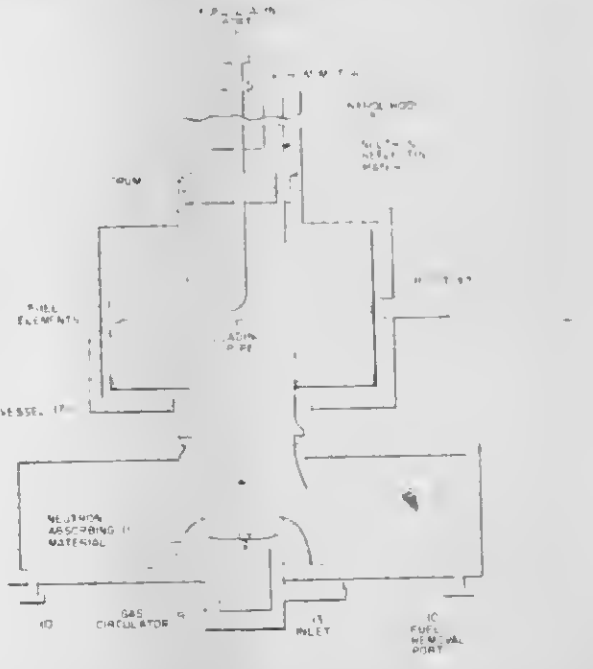
means for rotating said drum about its longitudinal axis when said reactor is operative thereby inducing centrifugal forces within said drum;

a plurality of solid fuel elements disposable within said drum, said fuel elements moving to a desired configuration about said longitudinal axis upon the application of said centrifugal forces thereby forming a central cavity within said drum;

means for loading said fuel elements within said drum;

a plurality of control rods insertable within said cavity and proximate said longitudinal axis, said control rods being spaced such that the distance between adjacent rods is less than the diameter of a fuel element;

means for partially inserting said control rods into said cavity when said reactor is operative and for fully inserting said control rods into said cavity when said reactor is not operative in order to retain said fuel elements between the walls of said drum and said control rods;



whereby when said reactor is operative and said control rods are not fully inserted, said fuel elements are held fixed along the walls of said drum by said centrifugal forces and form a critical mass within said desired configuration, and when said reactor is not operative and said control rods are fully inserted, said fuel elements are retained within said drum in a subcritical condition.

4,106,985

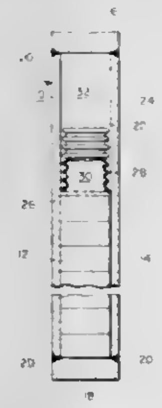
FUEL ELEMENT FOR A NUCLEAR REACTOR

Joseph Molloy, Deal, England, and William G. Clarke, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 24, 1976, Ser. No. 717,077

Int. Cl.^{2} G21C *3/16*

U.S. Cl. 176—68 **2 Claims**



1. A fuel element for a nuclear reactor comprising:

a sealed generally tubular sheath containing nuclear fuel;

a sealed hollow flexible bellows member disposed entirely within said sheath and capable of deforming in response to pressure changes;

a gas disposed in said sheath surrounding said flexible bellows member for exerting a uniform internal pressure on said sheath; and,

water disposed in said flexible bellows member responsive to the temperature and pressure of the environment in and around said sheath for causing said sealed flexible bellows member to deform thereby maintaining the internal sheath pressure substantially equal to the external sheath pressure.

4,106,986

MANUFACTURE OF EPOXIDE USING A MICROORGANISM

Shuzo Suzuki, Sayama; Keizo Furuhashi, Toda, and Akira Taoka, Urawa, all of Japan, assignors to Bio Research Center Company, Ltd., Tokyo, Japao

Filed Oct. 14, 1977, Ser. No. 842,029

Claims priority, application Japan, Jun. 24, 1977, 52-75127

Int. Cl.^{2} C12D *13/00*

U.S. Cl. 195—28 R **2 Claims**

1. A method for manufacture of an epoxide from an olefin of the group consisting of α-olefins and α,ω-dienes having 4 to 20 carbon atoms which comprises culturing aerobically in a nutrient medium containing such olefin the organism Nocardia corallina, A.T.C.C. 31338 and separating the resulting epoxide therefrom.

4,106,987

METHOD OF ISOMERIZING GLUCOSE TO FRUCTOSE

Tomoei Kanno, Okegawa; Hiroaki Watanabe, Yokohama, and Shohachiro Sano, Ageo, all of Japan, assignors to Showa Sangyo Co. Ltd., Tokyo, Japan

Filed Jan. 6, 1977, Ser. No. 757,211

Claims priority, application Japan, Jan. 8, 1976, 51-1789; Jan. 16, 1976, 51-4462

Int. Cl.^{2} C12D *13/00*

U.S. Cl. 195—31 F **3 Claims**

1. A method of isomerizing glucose to fructose which comprises contacting a stream of an aqueous glucose solution with a hydrogel of an edible substance and thereafter with an anion exchange resin, said hydrogel containing dispersed cells of a microorganism having glucose isomerase activity.

4,106,988

METHOD OF CULTIVATING *METHYLOMONAS PROBUS* ON METHANOL CONTAINING MEDIUM

Katsuhisa Ohsugi; Daizo Takeuchi; Masahiro Hamada, and Tamotsu Kano, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,655

Int. Cl.^{2} C12B *1/00*

U.S. Cl. 195—49 **5 Claims**

1. A method of producing microbial cells usable as protein source, which comprises cultivating the bacterium Methylomonas probus aerobically in a medium containing methanol as a carbon source, nitrogen and inorganic nutrient sources, and separating, then collecting the thus propagated microbial cells of said bacterium.

4,106,989

THERMOSTABLE CELLULASE AND A METHOD FOR PRODUCING THE SAME

Ichiro Komura, Kawasaki; Takeyoshi Awao, and Kazuhiko Yamada, both of Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,013

Claims priority, application Japan, Apr. 30, 1976, 51-49463

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—62 **5 Claims**

1. A cellulase produced by Sporotrichum cellulophilum and having the following properties:

(a) hydrolyzes microcrystalline cellulose, hydrocellulose, sulfite pulp, filter paper, and cotton mainly to glucose and to a small amount of cellobiose;
(b) optimum activity on Whatman No. 1 filter paper at pH 5.5 to 6.5 and at 60° C.;
(c) optimum activity at 60° to 65° C.;
(d) more than 50% of initial activity is retained at 50° C for 4 hours at any pH from 4.0 to 7.0;
(e) stable when heated without any substrate at 50° C.;
(f) retaining more than 40% of initial activity when heated at 80° C. for 1 hour without any substrate.

4,106,990

QUANTITATIVE DETERMINATION OF ANTITHROMBIN III

Hermann Erich Karges, and Norbert Heimburger, both of Marburg, Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Lahn, Fed. Rep. of Germany

Filed Jun. 10, 1976, Ser. No. 694,815

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1976, 2601372

Int. Cl.^{2} G01N *31/14;* C07G *7/02*

U.S. Cl. 195—63 3 Claims

1. A method for quantitatively determining antithrombin III in plasma or serum, which method comprises combining

(a) 1 ml of said plasma or serum, diluted by at least 1 to 50,
(b) 0.2 to 10 IU of a sulfated organic polymer selected from the group consisting of heparin and heparinoids, and
(c) 0.5 to 20 NIH units of thrombin, at a temperature of 4° C to 45° C, permitting the mixture to stand for 2 to 20 minutes, thereafter combining one part by volume of the mixture with one part by volume of a 0.05 to 1 percent solution of fibrinogen, and determining the coagulation time of the resultant mixture.

4,106,991

ENZYME GRANULATE COMPOSITION AND PROCESS FOR FORMING ENZYME GRANULATES

Erik Kjaer Markussen, Vaerloese, and Arne Wintherhalter Schmidt, Skovlunde, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jun. 28, 1977, Ser. No. 810,884

Claims priority, application United Kingdom, Jul. 7, 1976, 28343/76

Int. Cl.^{2} C07G *7/02*

U.S. Cl. 195—63 **11 Claims**

10. A granulate composition comprising enzyme, inorganic salts, a granulation binder, and finely divided cellulose fibers as 2–40% w/w of the granulate.

4,106,992

PURIFICATION OF UROKINASE

Edmond G. Vairel, Paris; Jean Goulay, Oissel, and Jean Choay, Paris, all of France, assignors to Choay S.A., Paris, France

Division of Ser. No. 292,139, Sep. 25, 1972, U.S. Pat. 3,926,727. Filed Nov. 5, 1975, Ser. No. 628,968

Claims priority, application France, Sep. 24, 1971, 71.34345; Jun. 30, 1972, 72.23867; Jun. 30, 1972, 72.23868

Int. Cl.^{2} C07G *7/02*

U.S. Cl. 195—66 B **17 Claims**

1. A method for obtaining a purified or purer solution of urokinase from a starting solution of crude urokinase containing proteins and pyrogens which comprises contacting a crude urokinase solution having a pH of about 4 to 6 and a conductivity of about 15,000 to 25,000 micromhos with a diethylaminoethylcellulose resin, adsorbing proteins and pyrogens on the resin, thereby forming a urokinase-enriched solution which is not retained by the resin, separating the urokinase-enriched solution and collecting the urokinase-enriched solution.

9. A method of obtaining a solution enriched in urokinase from an initial solution of crude urokinase containing proteins and pyrogens, which comprises contacting the crude urokinase solution which has a pH of about 6 to 7 and a conductivity of at least 15,000 micromhos with a diethylaminoethylcellulose resin, the weight of the resin relative to the activity in urokinase of the solution being sufficiently high for causing a noticeable retention of proteins on the resin under such conditions of conductivity and of pH, said weight not however exceeding that for which there would also be observed a non-negligible retention of urokinase on the resin; adsorbing proteins and pyrogens on the resin, thereby forming a urokinase-enriched solution and collecting the urokinase-enriched solution.

4,106,993

METHOD FOR PRESERVATION OF AQUEOUS GLUCOSE ISOMERASE SOLUTION

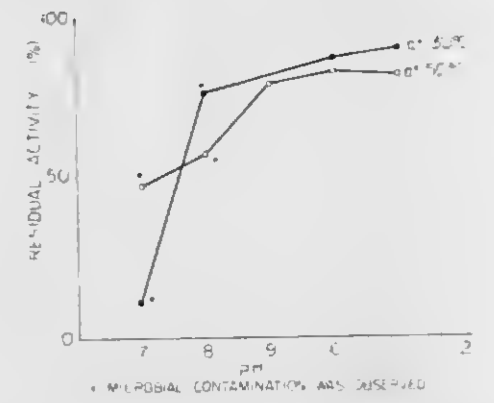
Tetsuya Hirota, Fujisawa; Tadashi Hishida, Tokyo; Akira Kamata, Yokohama; Isao Nakazawa, Kawasaki, and Hiroshi Takamisawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,685

Claims priority, application Japan, Mar. 17, 1976, 51-28963

Int. Cl.^{2} C07G *7/02;* **C12K** *1/00*

U.S. Cl. 195—65 **10 Claims**



1. A method for preservation of an aqueous glucose isomerase solution comprising adjusting the pH value of the aqueous solution to a range of from 9 to 12, wherein said aqueous solution is stored for a period of not less than three days.

4,106,994

PROCESS FOR PRODUCING STEFFIMYCINOL

Vincent P. Marshall, Portage; David W. Elrod, Kalamazoo; James M. Koert, Kalamazoo; Elizabeth A. Reisender, Kalamazoo, and Paul F. Wiley, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 782,621, Mar. 30, 1977, Pat. No. 4,077,844. This application Nov. 16, 1977, Ser. No. 851,866

Int. Cl.^{2} C12D *9/14*

U.S. Cl. 195—80 R **6 Claims**

1. A process for preparing the antibiotic steffimycinol which comprises cultivating *Streptomyces nogalater* var. nogalater, having the identifying characteristics of NRRL 3035, in an aqueous nutrient medium under aerobic conditions in the presence of the antibiotic steffimycinone until substantial conversion of steffimycinone to steffimycinol, and recovering steffimycinol.

4,106,995

MICROORGANISM GROWTH INHIBITOR DEVICE

Oscar Johan Petersen, Orange, and Timothy Frank Scott, Brea, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

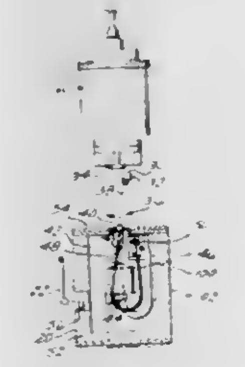
Filed Aug. 5, 1976, Ser. No. 711,489

Int. Cl.^{2} C12B *1/20*

U.S. Cl. 195—103.5 R **7 Claims**

1. The combination of an oxygen cell having an oxygen permeable membrane for immersion in an aqueous culture of a microorganism and a device for the inhibition of microorganism growth on the surface of said membrane, said device comprising:

(1) a source of an antiseptic having a limited water solubility sufficient to inhibit microorganism growth in the locality of said membrane but insufficient to inhibit said growth in the main body of said culture;
(2) carrier means bearing said source;



(3) transport means for said carrier means to sweep said source carried thereby within said aqueous culture and across said surface of said membrane; and
(4) drive means to actuate said transport means in a continuous repetitious manner.

4,106,996

METHOD OF IMPROVING THE MECHANICAL RESISTANCE OF COKE

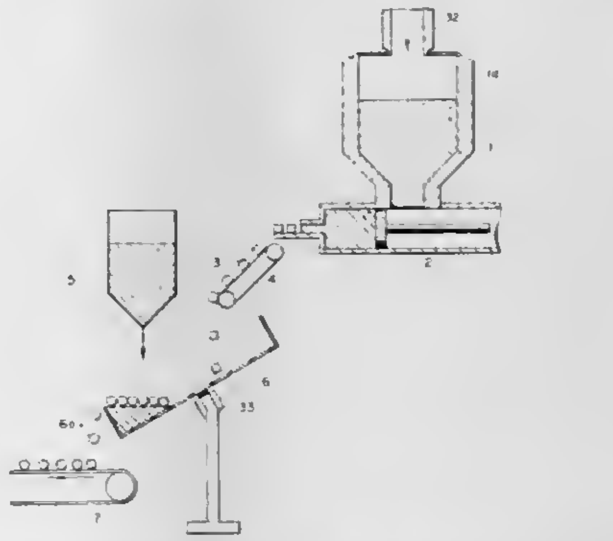
Werner Wenzel; Heinrich Gudenau, both of Intzestr., Aachen, Germany, and Joachim Bernt, Aachen, Fed. Rep. of Germany, assignors to Werner Wenzel and Heinrich Wilhelm Gudenau, both of Germany

Continuation-in-part of Ser. No. 613,461, Sep. 15, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 811,147

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1974, 2444066; Nov. 29, 1974, 2456437

Int. Cl.^{2} C10B *47/10, 53/08, 51/00*

U.S. Cl. 201—6 **4 Claims**



1. A method of improving the mechanical resistance of coke, comprising forming a liquor of fine grained coal and oil, with the oil being approximately 5% to 30% of the total weight, forming briquettes from the liquor at an elevated temperature in the range of approximately 80° C to 100° C, delivering said briquettes to a rotating cylinder having a parting ring therein between the ends thereof, rotating said cylinder to transform said briquettes into rounded pellets, discharging said pellets by passing said pellets through said parting ring and out of said rotating cylinder, passing said discharged pellets to a coke oven chamber and placing said pellets in said chamber to form spaces therebetween, heating said pellets in said coke oven chamber to form an improved coke by directing hot gas through said spaces between said pellets, from openings provided in the bottom of said chamber, until said spaces become clogged by the fusing coal, said hot gases comprising gases from a coke oven chamber which is already heated up to a correspondingly high temperature, and recycling oils pro-

duced during the coking process and separated from said heating gases to form part of said liquor.

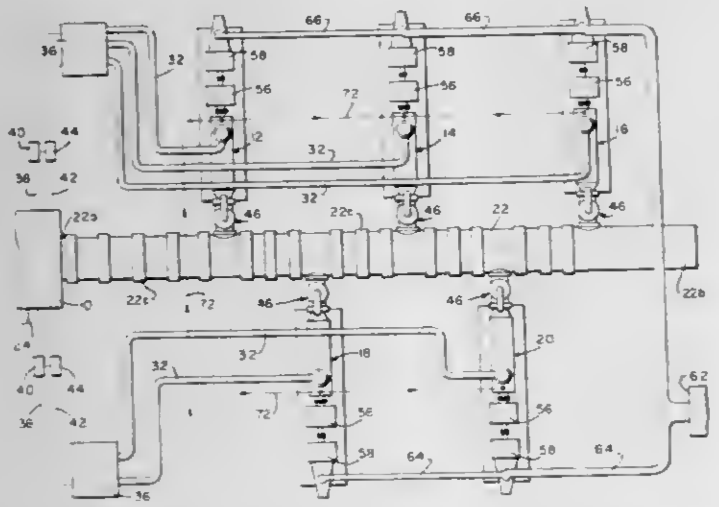
4,106,997
METHODS FOR CONVERTING COAL TO A PLASTIC-LIKE CONDITION AND FEEDING SAME TO A RECEIVER

Victor Kevorkian, Belle Mead, N.J., and Francis J. Cumings, Windham, N.H. assignors to Ingersoll-Rand Research, Inc., Princeton, N.J.

Continuation of Ser. No. 698,170, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 529,037, Dec. 3, 1974, Pat. No. 3,976,548. This application Apr. 13, 1977, Ser. No. 787,087

Int. Cl.^{2} C10B *47/20*

U.S. Cl. 201—32 **6 Claims**



1. A method for converting coal to a plastic-like condition and feeding such converted coal to a pressurized receiver, comprising the steps of:

- providing a supply of coal;
- providing a housing with a rotatively driven screw means therewithin, said housing having an inlet opening and a discharge opening;
- providing a pressurized receiver;
- communicating said discharge opening with said pressurized receiver;
- feeding the supplied coal to said inlet opening of said housing, to cause said screw means therewithin to move the coal through said housing to said discharge opening for discharge thereof to said pressurized receiver;
- heating the coal, during movement thereof through said housing by said screw means, to a given temperature, of at least about 750° to 800° F. which is sufficiently great to effect conversion of the coal to said plastic-like condition; wherein
- said step of heating the coal to a given temperature, during movement thereof through said housing by said screw means, comprises conducting a continuous flow of hot, energized, fluid through said screw means to heat said screw means, and to cause the latter to heat the coal; and
- further comprising the step of breaking up the converted coal, prior to discharge thereof from said housing to said receiver, by venting said continuous flow of energized fluid from openings in a terminal end of said screw means and addressing the venting fluid to the converted coal which has been moved through the housing to the discharge opening thereof.

4,106,998
METHOD OF RESTRAINING EMISSION FROM COKE QUENCHING EQUIPMENT

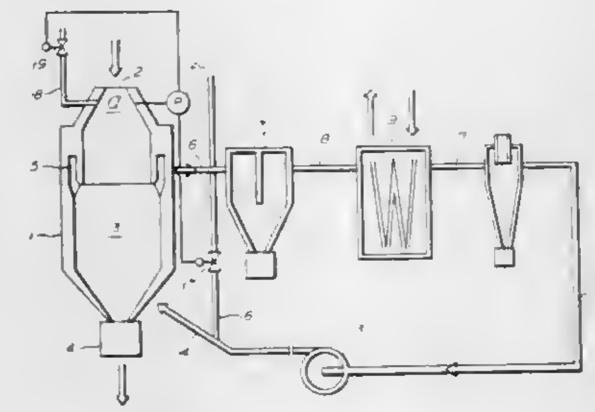
Yutaka Okada; Kyoji Sasaguri, and Kazuo Ishihara, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,826

Claims priority, application Japan, Oct. 25, 1973, 48/119433

Int. Cl.^{2} C10B *45/00, 27/04*

U.S. Cl. 201—39 **1 Claim**



1. A method of eliminating atmospheric emission of dust and smoke during the charging of hot coke into a quenching apparatus of the dry type, said apparatus having a quenching chamber with an upper portion and a lower protion, said upper portion having a charging port and means for covering said charging port located thereat, said lower portion having a discharge port located thereat, and means for supplying quenching gas to said lower portion of said quenching chamber and means for exhausting said gas from said chamber after quenching of said coke; said method comprising the steps of

- (A) Opening said covering means;
- (B) charging said coke into said chamber through said charging port while said covering is open;
- (C) bleeding said gas from said gas supplying means to outside of said chamber concurrently with the charging of said coke into said chamber through said charging port;
- (D) preventing gas from being bled from the upper portion of said chamber concurrently with the charging of said coke into said chamber, whereby the internal pressure of said upper portion of said chamber is selectively controlled to be within the range of 0 to −30 mmH$_2$O during the charging of said coke through said opening of said charging port with said covering means being open thereby to prevent emission of dust and smoke through said open charging port into the atmosphere during said charging of said coke;
- (E) and closing said covering means after completion of charging of said coke into said chamber.

4,106,999
CONTINUOUS THERMAL REACTOR

Edward Koppelman, 4424 Bergamo Dr., Encino, Calif. 91316, and Robert G. Murray, Palo Alto, Calif., assignors to Edward Koppelman, Encino, Calif.

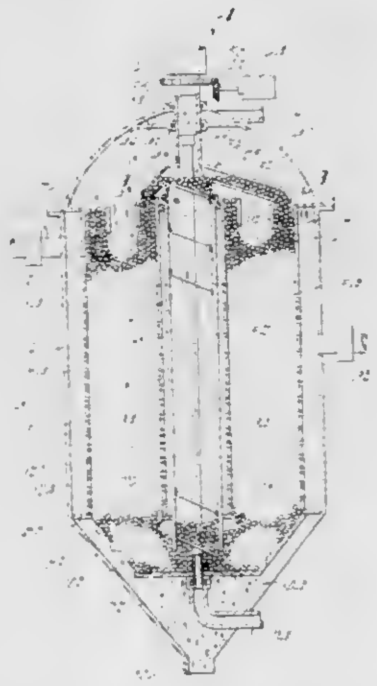
Continuation-in-part of Ser. No. 682,600, May 3, 1976, Pat. No. 4,069,107. This application Nov. 7, 1977, Ser. No. 849,176

Int. Cl.^{2} C10B *49/18*

U.S. Cl. 202—118 **17 Claims**

1. A thermal reactor comprising a reactor vessel defining an elongated upright reaction chamber including upper and lower end portions, a rotary distributor in the upper portion of said chamber for introducing a particulated carbonaceous feed material and preheated pebbles into said chamber and a residue outlet in the lower portion of said chamber for withdrawing the pyrolyzed residue therefrom, a separator in the lower portion of said chamber for separating the pyrolized residue from the pebbles, a pebble lift conduit having upper and lower end portions and extending longitudinally of said chamber

having a pebble inlet in the lower end thereof and a pebble outlet in the upper end portion thereof, conveying means in said lift conduit for conveying separated pebbles from said pebble inlet upwardly for discharge from said pebble outlet into said rotary distributor, gas supply means disposed in communication with said lift conduit for introducing an oxidizing gas for combustion of the carbonaceous residue on the pebbles and to provide a preheating of said pebbles during their ascending movement, vent means disposed in communication with the upper portion of said lift conduit for withdrawing said oxidizing gas and combustion products exteriorly of said chamber, supply means for supplying feed material to said rotary distributor, drive means for rotating said rotary distributor for mixing a portion of the preheated pebbles with the feed material in the form of a downwardly moving columnar reaction mass and for distributing the remaining portion of the pebbles substantially devoid of any feed material in the form of a downwardly moving upstream layer and a downwardly moving downstream layer overlying and surrounding said reaction mass, a gas inlet for introducing a gas into said reaction chamber along a region intermediate of said rotary distributor and said separator for passage substantially transversely through said upstream layer, said reaction mass and said downstream layer; and a gas outlet for withdrawing the gas and gaseous pyrolysis products from said reaction chamber along a region disposed adjacent the said downstream layer and transversely spaced from said gas inlet.



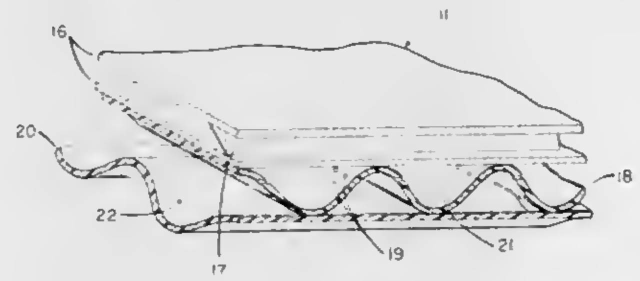
4,107,000
SOLAR STILL

Cedric G. Currin, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 29, 1975, Ser. No. 617,555

Int. Cl.^{2} B01D *1/00, 3/00*

U.S. Cl. 202—188 **6 Claims**



1. A solar still comprising

- a first corrugated sheet of solar energy absorbent material adapted to have the lower portions of one side thereof filled with water to be distilled, said lower portions thereby forming water channels,
- a plurality of vent holes through said corrugated sheet in the raised portions thereof whereby water evaporated from the channels can pass through the sheet to the spaces under the raised portions of the sheet between said channels,
- a first solar energy transmitting panel resting on uppermost part of said corrugated sheet to close the tops of said channels except for said vent holes, and
- condenser means underlying said corrugated sheet, in which evaporated water passing through said vent holes may condense and be drained from the system.

4,107,001
HIGH PRESSURE WATER CLEANER FOR ASCENSION PIPES

Raymond Carl Kinzler, Carnegie, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 12, 1977, Ser. No. 823,947

Int. Cl.^{2} C10B *43/08*

U.S. Cl. 202—241 **7 Claims**

1. In a coke oven battery comprising coke oven chambers having at least one ascension pipe for each such chamber, an improved apparatus for cleaning the inner surfaces of said ascension pipes, comprising:

- a. a carriage movable along the top of said coke oven battery in proximate relation to said ascension pipes;
- b. first pivotable support means mounted to said carriage;
- c. second pivotable support means mounted to said carriage in spaced apart relation to said first support means;
- d. flexible carriage means anchored at one end to said carriage and said flexible carriage means adapted to be carried by and guided by said first support means and said second support means;
- e. fluid conduit means operably connected to and supported by said flexible carriage means;
- f. at least one spray means connected to said fluid conduit means, said spray means adapted to receive fluid under pressure from said fluid conduit means and said fluid emerging from said spray means to impinge on the inner surface of said selected ascension pipe and wash away encrusted matter thereon;
- g. means connected to said first pivotable support means for pivoting it away from and toward said ascension pipes whereby at least one spray means is positionable above a selected one of said ascension pipes; and
- h. means acting upon said flexible carriage means for lower-

ing and raising said at least one spray means and said conduit means in and out of said selected ascension pipe.

4,107,002

PROCESS FOR THE PURIFICATION OF CRUDE ACETIC ANHYDRIDE

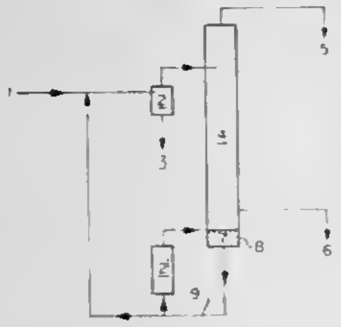
Herbert Eck; Elmar Bethe; Hans Schwarzbauer; Hellmuth Spes, and Klaus Kaiser, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 2, 1976, Ser. No. 654,309

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1975, 2505471

Int. Cl.^{2} B01D *1/00, 3/14;* C07C *53/12*

U.S. Cl. 203—75 **5 Claims**



1 A process for the purification of crude acetic anhydride, which contains at least 89.5% by weight of acetic anhydride, by continuous fractional distillation to obtain substantially pure acetic anhydride having a content of above 98% by weight of acetic anhydride and having a permanganate number of less than 10 and a color number of less than 5, the steps comprising:

introducing the crude acetic anhydride into a first evaporator and separating the crude acetic anhydride into vaporous distillable and non-vaporous non-distillable components;

thereafter removing the non-distillable components from the first evaporator and from the purification process and then introducing the vaporous distillable components into about the central section of a fractional distillation column and fractionally distilling it therein;

withdrawing from the top of the column components having a boiling point below that of acetic anhydride, withdrawing from near the bottom of the column substantially pure acetic anhydride having a content of above 98% by weight of acetic anhydride and having a permanganate number of less than 10 and a color number of less than 5, and removing from the sump of the column a liquid residue consisting substantially of crude acetic anhydride and accumulated impurities having a boiling point higher than that of acetic anhydride; said fractional distillation being the sole fractional distillation of said pure acetic anhydride and

returning up to about 8% by weight of the liquid residue to said first evaporator, based upon the initial amount of crude acetic anhydride introduced into the first evaporator.

4,107,003

METHOD OF MANUFACTURING A SEAMLESS CYLINDRICAL STENCIL AND A SMALL-MESH STENCIL OBTAINED BY APPLYING THIS METHOD

Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Jun. 27, 1977, Ser. No. 810,381

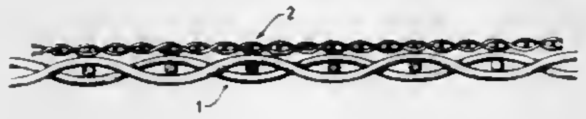
Claims priority, application Netherlands, Jun. 29, 1976, 7607139

Int. Cl.^{2} C25D *1/08, 7/04*

U.S. Cl. 204—16 **5 Claims**

1. A method of manufacturing a seamless cylindrical stencil comprising the steps of shrinking, a non-metal hose upon a formfix netting defining a supporting sleeve;

providing the threads of the non-metal hose and eventually of the netting with a conducting surface, and



securing the hose upon the netting by means of an electroplating deposit with a thickness which is smaller than half the diameter of the threads of the hose.

4,107,004

TRIVALENT CHROMIUM ELECTROPLATING BATHS AND METHOD

John Joseph Bernard Ward, and Clive Barnes, both of Wantage, England, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 668,443, Mar. 19, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,326

Claims priority, application United Kingdom, Mar. 26, 1975, 12776/75

Int. Cl.^{2} C25D *3/06*

U.S. Cl. 204—51 **9 Claims**

1. A trivalent aqueous chromium plating solution comprising trivalent chromium ions in a concentration of at least 0.2 M, sulphate ions in a concentration of at least 0.3 M, a weak complexing agent for said trivalent chromium ions in a concentration of at least 0.1 M and selected from the group consisting of hypophosphite ions and glycine, fluoride ions in a concentration of at least 0.025 M, and chloride ions in a concentration of at least 0.1 M.

4,107,005

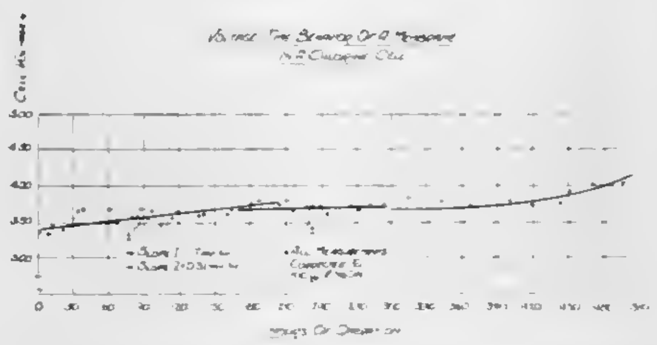
PROCESS FOR ELECTROLYSING SODIUM CHLORIDE OR HYDROCHLORIC ACID, AN AND ELECTROLYTIC CELL, EMPLOYINC TRIFLUOROSTYRENE SULFONIC ACID MEMBRANE

Vincent F. D'Agostino, Huntington Station; Joseph Y. Lee, Lake Grove, and Edward H. Cook, Jr., Lewiston, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls and RAI Research Corporation, Hauppauge, both of, N.Y., part interest to each

Division of Ser. No. 535,636, Dec. 23, 1974, Pat. No. 4,012,303. This application Nov. 11, 1976, Ser. No. 741,163

Int. Cl.^{2} C25B *1/16, 1/24, 13/08*

U.S. Cl. 204—98 **11 Claims**



7. In a chlor-alkali electrolytic cell comprising an anode, a cathode and an ion-exchange membrane therebetween, the improvement wherein the membrane comprises:

a. an inert polymeric film

b. a perfluoro vinyl monomer irradiation-grafted on said film, and

c. a pendant ion-exchange group on said vinyl monomer.

4,107,006

ELECTROLYSIS CELL

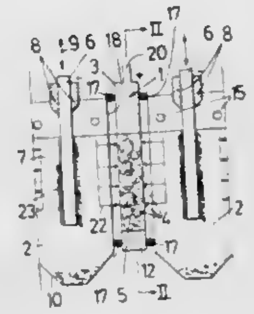
René Fernand Paul Winand, Rixensart, Belgium, assignor to Université Libre de Bruxelles, Brussels, Belgium

Filed Jul. 6, 1976, Ser. No. 703,007

Claims priority, application Belgium, Jul. 11, 1975, 831295

Int. Cl.^{2} C25C *1/10, 7/00, 7/04*

U.S. Cl. 204—105 M **12 Claims**



1. An electrolysis cell for treating inside the anode compartment a divided solid reactant, notably a powdered or fragmented material, which comprises, a cathode compartment being made from a solid electrical conducting material, a container forming an anode compartment and being made from an electrical conducting material and arranged to contain the solid reactant, at least one side wall of said anode compartment being permeable to allow the flow of an electrolyte from the cathode compartment to the anode compartment but which prevents the passage of the solid material from the anode compartment to the cathode compartment, and means for causing a substantially continuous flow of electrolyte from the cathode compartment to the anode compartment.

11. Method for using an electrolysis cell as defined in claim 1 for elaborating manganese metal from ferromanganese, in which to the anode compartment is fed the solid phase from the attack of ferromanganese by iron chloride in molten chlorides and to the cathode compartment is fed the electrolyte formed by the liquid phase from said attack in a molten chloride bath, said liquid phase having been subjected thereafter to purifying with an excess ferromanganese to remove the unreacted iron chloride, manganese-poor electrolyte loaded back with iron chloride being extracted from the anode compartment while manganese metal settling on the cathode is extracted from the cathode compartment.

4,107,007

PROCESS FOR THE RECOVERY OF LEAD FROM SCRAPPED LEAD BATTERIES

Andreas F. Gäumann, Feldmeilen, and Visnja Dancilovic-Matulas, Wettingen, both of Switzerland, assignors to Gesellschaft zur Förderung der Forschung an der Eidgenössischen Technischen Hochschule, Zürich, Switzerland

Filed May 9, 1977, Ser. No. 795,418

Claims priority, application Switzerland, May 14, 1976, 6059/76

Int. Cl.^{2} C25C *1/18, 1/00*

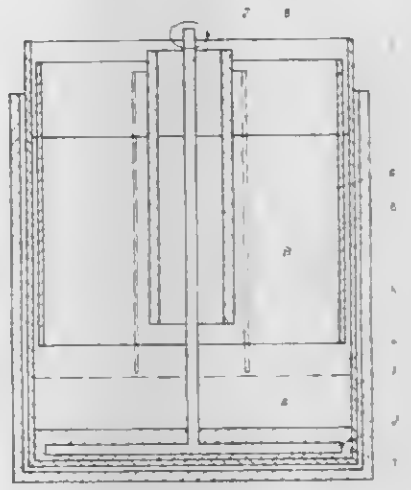
U.S. Cl. 204—116 **16 Claims**

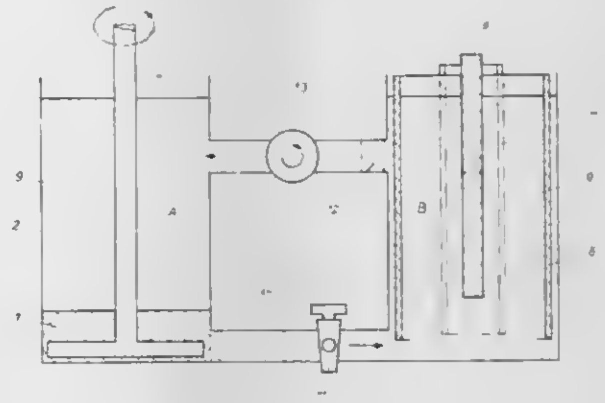
1. A process for recovering lead from scrap lead-acid storage batteries, which comprises the steps of:

placing in a dissolving vessel comminuted battery scrap comprising pieces of antimonial lead from grid plates and particles of lead metal, lead oxides and lead sulphate, said scrap being free of battery acid;

feeding into said dissolving vessel an aqueous solution of an alkaline material selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, ammonium hydroxide and ammonium carbonate, wherein the concentration of said alkaline material in said aqueous solution is at least 5 molar, and thereby dissolving said lead oxides and lead sulphate in said aqueous solution to provide lead ions in said aqueous solution;

feeding said aqueous solution containing dissolved lead oxides and lead sulphate from said dissolving vessel into an electrolysis cell while retaining undissolved antimonial lead and lead metal in said dissolving vessel;





subjecting said aqueous solution in said electrolysis cell to electrolysis to form particles of lead metal at the cathode thereof and removing said particles of lead metal from said electrolysis cell.

4,107,008

ELECTROLYSIS METHOD FOR PRODUCING HYDROGEN AND OXYGEN

Stephen Horvath, St. Ives, Australia, assignor to Beeston Company Limited, Hong Kong, Hong Kong

Continuation-in-part of Ser. No. 586,080, Jun. 16, 1975, abandoned, and Ser. No. 632,579, Nov. 17, 1975, said Ser. No. 586,080, is a continuation-in-part of Ser. No. 527,083, Nov. 25, 1974, Pat. No. 3,954,592, said Ser. No. 632,579, is a continuation-in-part of Ser. No. 527,085, Nov. 25, 1974, Pat. No. 3,980,053, said Ser. No. 527,083, and Ser. No. 527,085, each is a continuation-in-part of Ser. No. 485,498, Jul. 3, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,610

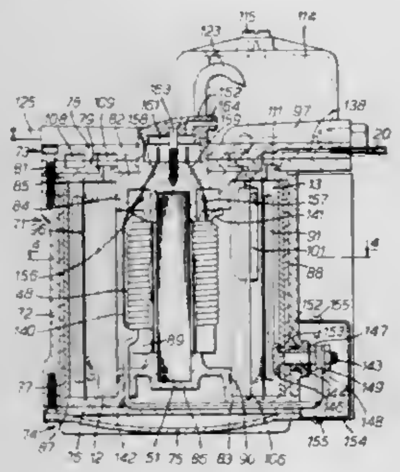
Int. Cl.^{2} C25B *1/04*

U.S. Cl. 204—129 **14 Claims**

1. A method of decomposition of water to produce hydrogen and oxygen comprising the steps of

placing an electrically conductive aqueous solution in a vessel in contact with a pair of separated electrodes,

causing electric current to flow between said electrodes while simultaneously irradiating the aqueous solution with electromagnetic radiation of wave length less than 10^{-10} meters and a stream of neutrons, and collecting hydrogen and oxygen which accumulates at the electrodes as highly ionised gases in which the hydrogen contains a higher proportion of deutrons than in naturally occurring hydrogen.



4,107,009
RECOVERY OF COPPER FROM ORES AND CONCENTRATES

Peter Kenneth Everett, Castlecrag, Australia, assignor to Dextec Metallurgical Proprietary Limited, Australia

Continuation-in-part of Ser. No. 654,391, Feb. 2, 1976, Pat. No. 4,061,552. This application Jul. 18, 1977, Ser. No. 816,450

Int. Cl.² C25C *1/12;* **C25B** *1/04*

U.S. Cl. 204—129 **12 Claims**

1. A process for extracting copper from a copper and iron-bearing ore or concentrate which comprises forming a slurry of the ore or concentrate with an electrolyte, intimately mixing finely dispersed oxygen-bearing gas with the slurry and maintaining the slurry and the mixture at substantially atmospheric pressure throughout the process and at a temperature of from 50° C to the boiling point of the electrolyte, said electrolyte being acidic and containing chloride ions in a concentration between that sufficient to maintain in solution a major portion of the dissolved copper as cuprous ions and saturation, and maintaining the pH of the mixture at above 1.5 and less than 7.0 throughout the process, whereby iron solubilized in the process is substantially simultaneously precipitated as ferric oxide and sulfide sulfur oxidized under the conditions is substantially converted to elemental form and the copper is taken into solution.

4,107,010
PHOTO-ELECTROLYTIC PRODUCTION OF HYDROGEN

Russell Gilbert Meyerand, Jr., Glastonbury; Nicholas Leo Krascella, Manchester, and David Gue McMahon, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 725,302, Sep. 21, 1976, Pat. No. 4,069,120. This application Oct. 20, 1977, Ser. No. 843,992

Int. Cl.² C25B *1/02*

U.S. Cl. 204—129 **2 Claims**

1. A process of producing electrical power which comprises:

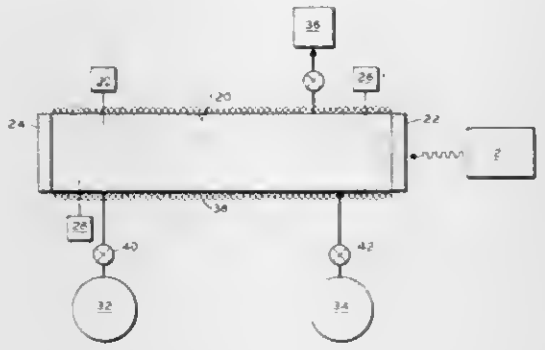
forming a water/halogen gas mixture;

irradiating the mixture with radiation energy in the visible spectrum to form the corresponding hydrogen halide and oxygen;

separating the hydrogen halide from the oxygen;

electrolytically decomposing the hydrogen halide to produce hydrogen; and

combining the hydrogen and oxygen to produce electrical power.



4,107,011
METHOD OF REGENERATION OF SPENT ETCHING SOLUTIONS

Vladimir Ilich Kucherenko, ulitsa Sverdlova, 93, kv. 77; Valery Nikolaevich Flerov, ulitsa Kovalikhinskaya, 30, kv. 80; Georgy Vladimirovich Korolev, ulitsa Vaneeva, 49, kv. 12, all of Gorky; Evgeny Pavlovich Kotov, ulitsa Nedelina, 34, korpus 3, kv. 7, Moscow; Anatoly Mikhailovich Praporov, ulitsa Belovezhskaya, 77, kv. 159, Moscow; Galina Alexandrovna Batova, ulitsa Pravdy, 11, kv. 129, Moscow; Gayane Leonovna Melikova, ulitsa Orshanskaya, 4, kv. 49, Moscow, and Alexandr Ivanovich Kolomeichuk, ulitsa Konenkova, 5, kv. 273, Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 666,156, Mar. 11, 1976, abandoned. This application Feb. 9, 1977, Ser. No. 767,228

Claims priority, application U.S.S.R., Mar. 17, 1975, 2110221; May 6, 1975, 2131975

Int. Cl.² C25C *1/12, 1/06*

U.S. Cl. 204—151 **5 Claims**

1. A method of regeneration of a spent etching solution containing cupric chloride and a metal chloride selected from the group consisting of cuprous chloride and ferrous chloride, comprising subjecting said solution to electrolysis with copper being reduced at the cathode, and the metal chloride being oxidized at the anode with simultaneous liberation of chlorine which is used for additional oxidation of said metal chloride.

4,107,012
MONOMER-FREE RESIN COMPOSITIONS, BASED ON UNSATURATED POLYESTERS, WHICH CAN BE CURED BY UV-LIGHT

Karl Fuhr, Krefeld; Hans-Joachim Traenckner, Krefeld-Fischeln; Hans Jürgen Rosenkranz, Krefeld; Hans Rufolph, Krefeld-Bockum; Manfred Patheiger, Krefeld-Uerdingen, and Artur Haus, Overath, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 24, 1973, Ser. No. 354,104

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1972, 2221335

Int. Cl.² C08G *18/00, 63/00*

U.S. Cl. 204—159.19 **9 Claims**

1. A resin composition which is curable by ultraviolet light, said composition comprising

(a) as the sole curable component, 10 to 99.7% by weight of a polyester having a molecular weight of 300 to 4,000 and containing α,β-ethylenically unsaturated dicarboxylic acid radicals and β,γ-ethylenically unsaturated ether groupings, the molar ratio of the β,γ-unsaturated ether groupings to the double bonds of the dicarboxylic acid radicals being from 0.2:1 to 8:1 and (b) 0.3 to 10% by weight of a photoinitiator.

4,107,013
ULTRAVIOLET CURABLE LATEXES

Vincent Daniel McGinniss, Valley City; Robert Joseph Seidewand, Olmsted Falls, and James Robert Erickson, Brunswick, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,883

Int. Cl.² C08F *8/00*

U.S. Cl. 204—159.16 **4 Claims**

1. An ultraviolet curable aqueous latex coating composition, comprising:

an aqueous latex mixture of a high molecular weight polymer and a low molecular weight cross-linking polymer wherein the mixture contains between 5% and 35% of said low molecular weight cross-linking polymer and between 1% and 5% of an ultraviolet sensitizer based on the combined weight of the cross-linking polymer and the high molecular weight polymer;

said high molecular weight polymer being a latex containing polymer particles having an average molecular weight greater than 100,000, said high molecular weight polymer particles comprising a core polymer of copolymerized ethylenically unsaturated monomers and a shell polymer portion of copolymerized difunctional monomers containing unreated allyl surface groups preferentially orientated on polymer particle surfaces;

said low molecular weight cross-linking polymer having a molecular weight between about 300 and 3,000 and containing ethylenically unsaturation for cross-linking with the allyl surface groups on said high molecular weight polymer particles upon exposure to ultraviolet energy.

4,107,014
ISOELECTRIC POINT MARKERS FOR GEL ISOELECTRIC SEPARATION

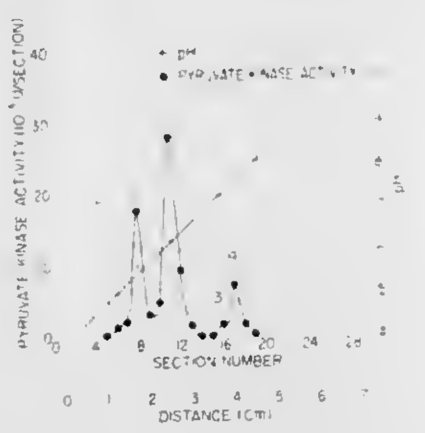
Yasuo Suzuki, Suita; Isamu Takagahara, Kawanishi; Tsuyoshi Fujita; Katsumi Fujii, both of Suita, and Takekazu Horio, Takatsuki, all of Japan, assignors to Oriental Yeast Co. Ltd., Japan

Filed Dec. 28, 1976, Ser. No. 754,976

Claims priority, application Japan, Jan. 30, 1976, 51/8388

Int. Cl.² G01N *27/26*

U.S. Cl. 204—180 R **6 Claims**



1. Isoelectric point markers for a gel isoelectric separation, which comprise at least two colored proteins of which the isoelectric point pHs are known, and wherein the difference between the highest value and the lowest value among said pHs is not less than 0.5.

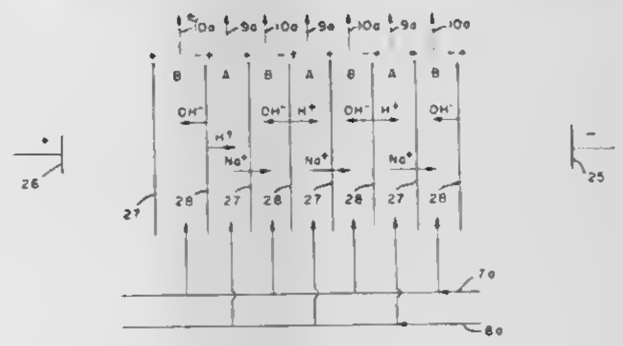
4,107,015
METHOD FOR REMOVAL OF SO_2 FROM GASES

Frederick P. Chlanda, Rockaway; Krishnamurthy Nagasubramanian, Parsippany, and Kang-Jen Liu, Somerville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jul. 18, 1977, Ser. No. 816,566

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 P **20 Claims**



1. Method for direct generation of SO_2 and a liquor which is capable of absorbing SO_2 from an aqueous SO_2-containing salt solution in which soluble sulfites and bisulfites are present which comprises:

(a) dividing said solution into two streams A and B;

(b) subjecting said streams to electrodialytic water splitting in a two-compartment water splitter comprised of alternating cation and a bipolar module consisting of a combination of anion and cation membranes functioning as a bipolar membrane, wherein one of said streams is introduced into the water splitter compartments between the cation membranes and the anion membranes of the bipolar membrane combination;

(c) introducing the other stream, A, into the compartments of said splitter between the cation sides of said bipolar module and the cation membranes;

(d) passing a direct current through the water splitter thereby effecting the acidification of the stream A and the basicification of the stream B and the transfer of cations from stream A to stream B and producing an aqueous solution comprised of SO_2 derived from stream A and a solution comprised of base capable of absorbing SO_2 derived from stream B.

4,107,016
METHOD AND APPARATUS FOR ELECTRO-PHORECTIC COATING

Loyd R. Brower, Jr., Olympia Fields; Leonard P. Madsen, St. Anne; Chesly L. Zutaut, Park Forest, and Walter M. Barden, Jr., Wheaton, all of Ill., assignors to Standard T. Chemical Company, Inc., Chicago, Ill.

Continuation of Ser. No. 686,110, Jun. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,314, Jul. 21, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 807,965

Int. Cl.² C25D *13/14*

U.S. Cl. 204—181 R **17 Claims**

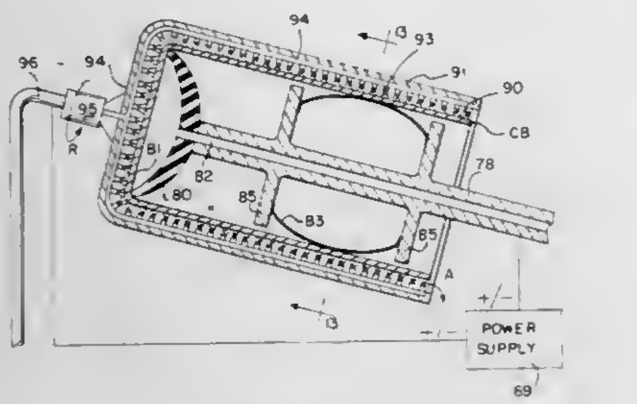
1. A method for electrophoretically coating a surface of an electrically conductive work piece having a selected linear dimension, comprising the steps of:

establishing said work piece at one electrical polarity,

flowing an electrophoretic coating material in a linear stream along the selected linear dimension of the work piece,

inducing an electrical charge of opposite polarity on the electrophoretic material and along the length of the linear stream thereof, whereby electrophoretic migration of the electrophoretic material to the work piece is effected, and

moving the work piece and the charged linear stream of electrophoretic material relative to one another about an axis fixed relative to the linear stream and in a direction lateral to the linear dimension, thereby to electrophoretically deposit a coating of the material over the entirety of the surface of the work piece.



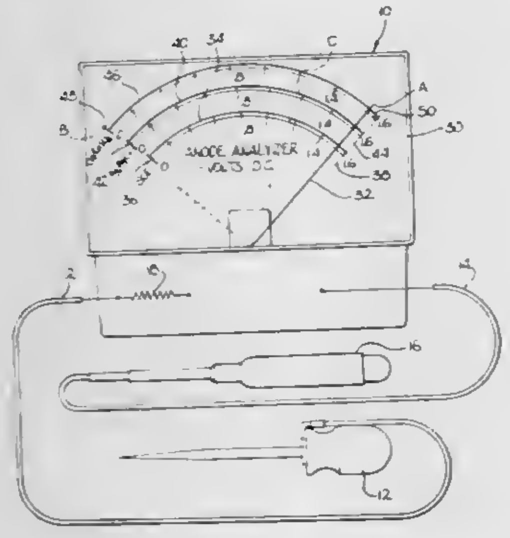
4,107,017
ANODE ANALYZER

Todd C. Sabins, El Cajon, Calif., assignor to Sabins Industries, Inc., Long Beach, Calif.

Filed Nov. 8, 1976, Ser. No. 740,116

Int. Cl.^{2} G01N *27/46;* **C23F** *13/00*

U.S. Cl. 204—195 R **10 Claims**



1. An apparatus for evaluating the effectiveness of anodes in a cathodic protection system protecting a structure in an electrolyte from electrochemical corrosion, said apparatus comprising:

a voltmeter having a positive terminal and a negative terminal, said negative terminal being conductively connected to a reference half cell member and said positive terminal being conductively connected to said structure;

said reference half cell which is a probe immersed in said electrolyte and which is made of an alloy of magnesium known as AZ **63** which has an electrochemical reaction potential more negative than the structure protected by said cathodic protection system when positioned in said electrolyte;

said voltmeter having a plurality of scales thereon, and an indicator needle moveable across the plurality of scales in response to a potential difference appearing between said positive and negative terminals;

each of said plurality of scales having a sequence of numbers placed therealong and each scale being so placed beneath the indicator needle that when the indicator needle comes to rest the number beneath the indicator needle indicates the negative of the electrochemical potential of the structure with respect to the voltage of a standard reference half cell for which that scale is calibrated.

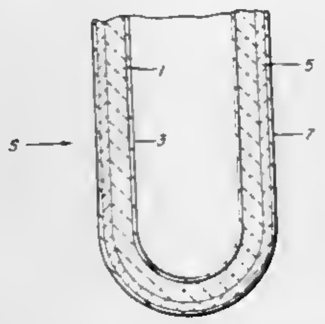
4,107,018
SOLID ELECTROLYTE GAS SENSOR HAVING A PROTECTIVE BONDING LAYER

James Daniel Bode, Royal Oak, and Seong Kwan Rhee, Livonia, both of Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Filed Sep. 1, 1977, Ser. No. 829,709

Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—195 S **10 Claims**



1. In a solid electrolyte sensor element for sensing oxygen wherein the element comprises a solid electrolyte body for transferring oxygen ions, the body having an inner surface with conductive means thereon, the improvement comprising a nonreactive but compatible bonding layer of an oxide of an alkaline earth metal selected from the group consisting of magnesium and calcium or a mixture thereof, on the outer surface of said solid electrolyte body and a conductive catalyst layer superimposed on said bonding layer.

5. In a method of forming a solid electrolyte sensor element for sensing oxygen having a solid electrolyte body with an inner surface having a conductive means thereon, the improvement comprising:

applying to the outer surface of said solid electrolyte body a nonreactive but compatible layer of an oxide of an alkaline earth metal selected from the group consisting of magnesium and calcium oxide or a mixture thereof; and

applying a conductive catalyst layer over said layer of oxide.

4,107,019
SOLID ELECTROLYTE THIN FILM OXYGEN SENSOR HAVING THIN FILM HEATER

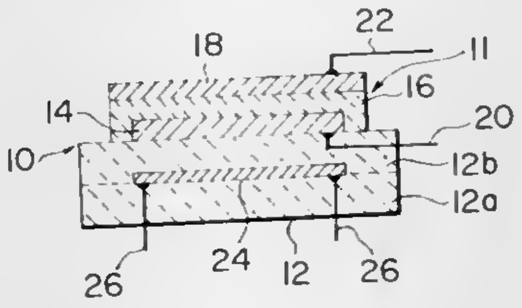
Hiroshi Takao, Kamakura, and Kazuo Matoba, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 13, 1977, Ser. No. 841,973

Claims priority, application Japan, Oct. 14, 1976, 51-122298

Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—195 S **10 Claims**



1. An oxygen sensor of an oxygen concentration cell type, comprising:

a base plate of an electrically nonconductive material;

a thin layer laid on one side of said base plate, said thin layer being of a material which is composed of a metal and an oxide of said metal and serves as the source of a reference oxygen partial pressure;

a thin layer of an oxygen ion conductive solid electrolyte laid on the metal-oxide layer so as to entirely shield the metal-oxide layer from the atmosphere;

an electron conductive and gas permeable thin layer coated on the solid electrolyte layer; and

a thin metal layer which has a resistance suitable as a resistance heating element and is embedded in said base plate to lie generally parallel to the solid electrolyte layer.

4,107,020
VERTICAL ELECROLYTIC CELLS

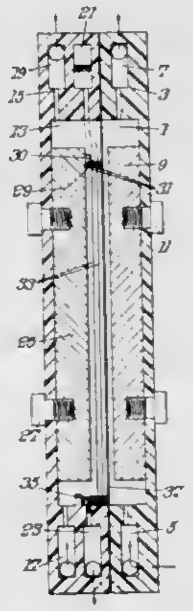
Michel Brochier, Grenoble, and Maurice Pichon, Decines, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 28, 1977, Ser. No. 763,633

Claims priority, application France, Jan. 30, 1976, 76 03017

Int. Cl.^{2} C25B *11/18, 9/00, 1/38*

U.S. Cl. 204—251 **18 Claims**



1. A vertical electrolytic cell having cathode means and anode means, wherein said cathode means comprises a substantially horizontal channel provided with a bottom wall having a plurality of apertures located above an unobstructed space, means for delivering mercury to said channel and means for collecting mercury flowing down by gravity from said apertures and directing said mercury out of said cell, the size of said apertures being such that mercury flows as continuous threads from said apertures throughout said space.

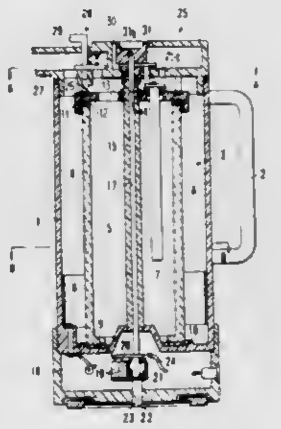
4,107,021
WATER POT WITH AN ELECTROLYZING DEVICE

Tatsuo Okazaki, Kamifukuoka, Japan, assignor to Okazaki Manufacturing Company Ltd., Kawagoe, Japan

Filed Nov. 24, 1976, Ser. No. 744,706

Int. Cl.^{2} C25B *11/00, 13/00, 15/00*

U.S. Cl. 204—263 **31 Claims**



1. A water pot with an electrolyzing device comprising a pot body having an opening at the top thereof to receive water to be electrolyzed, and a handle,

said pot body including:

an electrolyzing vessel, said vessel having support areas for supporting a partition therein;

a removable hollow, porous partition member which is mountable on said support areas of said vessel for dividing said vessel into two chambers, said hollow porous partition member being insertable into said vessel through said opening and being mountable in said vessel in water proof relationship to said vessel at said support areas;

a negative electrode in one of said chambers and a positive electrode in the other of said chambers;

means in communication with the positive electrode chamber for removing water from said positive electrode chamber after an electrolyzing operation;

a cover detachably mounted on said opening at the top of said pot body, said cover including two flow paths communicating respectively with said negative electrode chamber and said positive electrode chamber;

a nozzle in said pot body which is in communication with said negative electrode chamber; and

said means for removing water from said positive electrode chamber comprising a three way valve for selectively communicating said two flow paths with said nozzle.

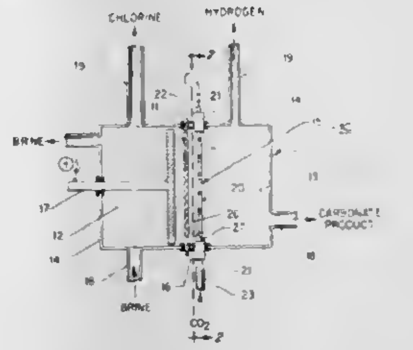
4,107,022
WAFER ELECTRODE FOR AN ELECTROLYTIC CELL

Thomas G. Strempel, Madison, and Charles J. Hora, Willoughby Hills, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 622,702, Oct. 15, 1975, Pat. No. 4,033,848. This application Apr. 29, 1977, Ser. No. 792,449

Int. Cl.^{2} C25B *11/02*

U.S. Cl. 204—265 **6 Claims**



1. An electrolytic cell comprising: two half-cell members; a hydraulically impermeable cation exchange membrane in contact with one of said half-cell members; at least one wafer electrode comprising two annular flanges having an inner circumferential edge and connected by a sealing engagement at an outer peripheral edge thereof, a foraminous electrode plate retained between said annular flanges by weldment at the outer peripheral edge of said annular flanges, and at least one access tube extending substantially in the same plane as said electrode plate from said outer peripheral edge to said inner circumferential edge through said annular flanges so as to define a passage way therebetween; and means for spacing said membrane from said at least one wafer electrode, said other half-cell member being in contact with said at least one wafer electrode so as to form a closed electrolytic cell having an anode compartment and a cathode compartment.

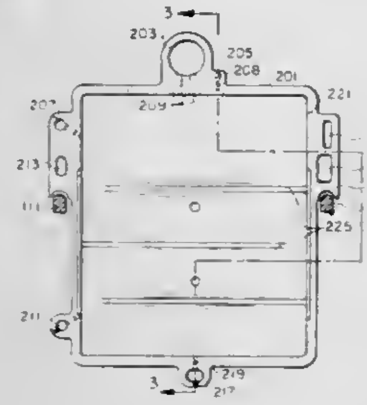
4,107,023
FILTER PRESS HALATE CELL

Bernardus J. Mentz, Pitt Meadows, Canada, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jul. 9, 1976, Ser. No. 703,721

Int. Cl.^{2} C25B *1/14, 1/26, 9/00, 9/02*

U.S. Cl. 204—269 **20 Claims**



1. A diaphragmless electrolysis cell for the manufacture of metal halates comprising in combination a plurality of electrode units, each electrode unit having a single frame member, an anode and cathode mounted to opposing sides of the frame member in spaced relationship with each other, means for maintaining each electrode unit uniformly spaced from adjacent electrode units, means for holding the electrode units together to effect a series cell arrangement, means for electrically connecting the electrode units, inlet means for feeding electrolyte to the cell, and outlet means for removing cell liquor and gaseous material from the cell.

4,107,024
ELECTROLYTIC CELL WITH ELECTRODES ARRANGED AS A HEXAGON

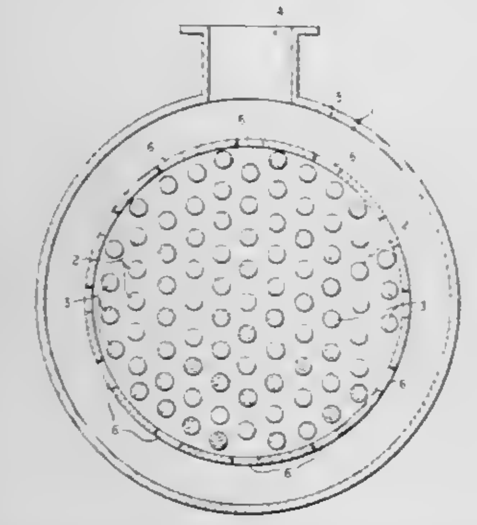
Toshio Fukuzuka; Kazutoshi Shimogori, both of Kobe, and Hiroshi Satoh, Suita, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 18, 1977, Ser. No. 797,880

Claims priority, application Japan, May 18, 1976, 51-57517

Int. Cl.^{2} C25B *9/00*

U.S. Cl. 204—275 **8 Claims**



1. An electrolytic cell for treatment of an electrolytic solution comprising a plurality of spaced apart and parallel monopolar bar type electrodes with clearances defined between said electrodes for receiving said electrolytic solution;
 a cathode terminal and an anode terminal disposed at opposite ends of said electrodes;
 at least one polar group of said electrodes arranged in said electrolytic cell so that one electrode is located at the center of an equilateral hexagon and other electrodes are located at apexes of said hexagon;
 said plurality of monopolar bar type electrodes including a plurality of cathodic bar type electrodes and a plurality of anodic bar type electrodes wherein the ratio of the total number of cathodic bar type electrodes most adjacent to respective anodic bar type electrodes to the total number of the anodic bar type electrodes is at least 2.

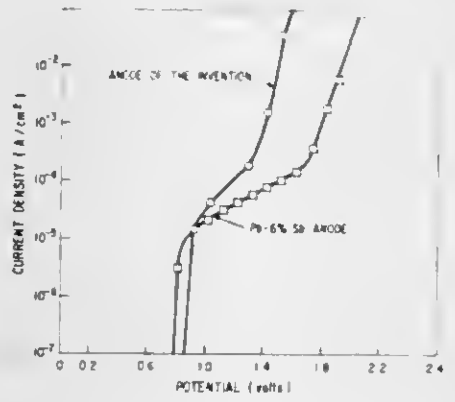
4,107,025
STABLE ELECTRODE FOR ELECTROCHEMICAL APPLICATIONS

Raouf O. Loutfy, Pierrefonds, and Paul P. K. Ho, Ile Bizard, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Nov. 9, 1977, Ser. No. 850,043

Int. Cl.^{2} C25B *11/08*

U.S. Cl. 204—290 F **9 Claims**



1. An electrode for use in an electrolytic process comprising an electrically conductive substrate made of a material resistant to the electrolyte and the electrolytic products thereof, coated on at least a portion of its surface with a basic coating of a material containing 30–70% by weight of an acid insoluble metal tungstate, 15–60% by weight Ta_2O_5 and 5–15% by weight of a noble metal oxide.

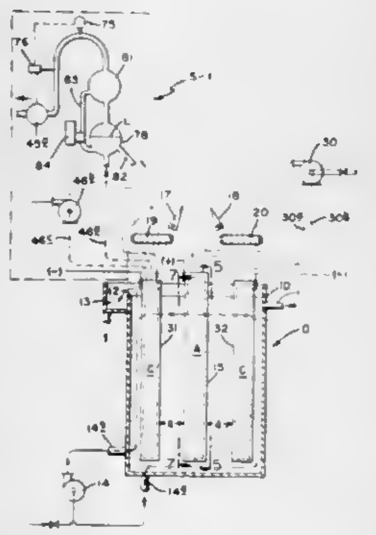
4,107,026
SYSTEM AND METHOD FOR ELECTRIC DEWATERING OF SOLIDS SUSPENSION

Mark P. Freeman, Darien, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jun. 17, 1976, Ser. No. 697,142

Int. Cl.^{2} B01D *13/02*

U.S. Cl. 204—300 R **43 Claims**



1. A treatment system for dewatering a suspension of solids in a carrier liquid, subject to the influence of an electric field, which comprises,
 a treatment tank,
 feed means for supplying a flow of said suspension to the tank, with means for containing therein a body of the suspension of a predetermined depth,
 a pair of self-contained mutually opposed electrode structures positioned in said tank as a cathodic electrode and as an anodic electrode having between them a controllable electric field, while submerged in said body suspension of said depth,
 one of said electrode structures being adapted for the formation thereon of a layer of suspension solids under the influence of said electric field, the second of said electrode structures comprising a hollow body having a liquid pervious wall representing a filtration area opposite to said electrode surface of the one electrode structure, and adapted for the passage therethrough of a flow of carrier liquid as filtrate separated from solids migrating in the opposite direction towards said one electrode structure under the influence of the electric field,
 a vacuum supply connected to the hollow body of said second electrode structure, adapted to provide a pressure differential for effecting passage of said carrier liquid through said filtration area,
 pumping means effective separate from the vacuum supply for drawing filtrate liquid from the said hollow electrode structure at a controlled rate against the vacuum,
 and actuating means operable for removing and recovering said layer of suspension solids from said electrode surface.

4,107,027
DEVICE FOR CONTINUOUS ELECTROPHORESIS IN A CARRIER FREE BUFFER CURRENT

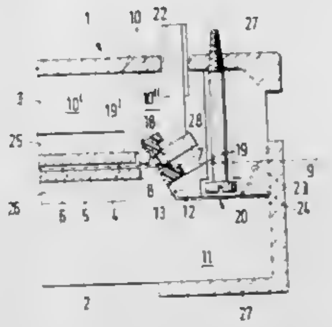
Helmüt Muckenmuller, Dossenbeim, and Hubert Muth, Mauer, both of Fed. Rep. of Germany, assignors to C. Desaga GmbH, Nachf. Ericb Fecht, Heidelberg, Fed. Rep. of Germany

Filed Mar. 15, 1977, Ser. No. 777,669

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2612005

Int. Cl.^{2} G01N *27/26, 27/28*

U.S. Cl. 204—301 **13 Claims**



1. Device for continuous electrophoresis in a carrier free buffer current, said device comprising a separating chamber including a two-part frame, two plane parallel glass plates positioned in said frame, said glass plates defining a separating space therebetween, electrode chambers disposed in said frame and coacting with said separating space, permeable membranes separating said electrode chambers from said separating space, said frame having a dividing plane parallel to said glass plates, first surfaces of one frame part facing second surfaces of the other frame part to define a dividing joint between the two frame parts, said dividing joint being at least partially disposed at an angle to said dividing plane, and means for maintaining said membranes in said dividing joint to press said membranes against at least one of said first and second surfaces when said two frame parts are joined together for providing a seal which is effected by said angle.

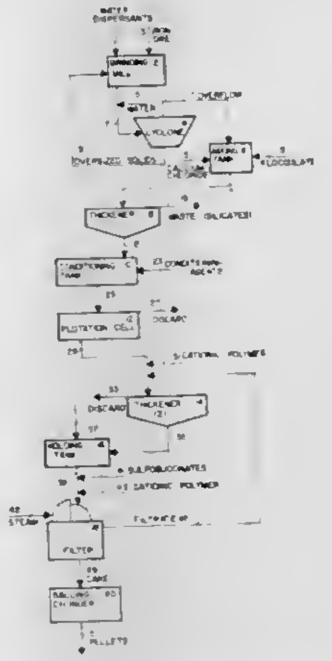
4,107,028
TREATMENT OF IRON CONCENTRATE SLURRY TO IMPROVE FILTRATION

Robert C. Emmett, Jr.; Stanley D. Heden, and Roger P. Summerhays, all of Salt Lake City, Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 27, 1977, Ser. No. 763,264

Int. Cl.^{2} B03B *9/00*

U.S. Cl. 209—5 **7 Claims**



1. In a process for concentration of iron ores comprising the following sequence of steps: (1) initially forming a relatively stable alkaline aqueous dispersion of the ore; (2) treating the dispersion of ore with a flocculating agent capable of causing selective flocculation of the iron oxides in the ore in preference to silica materials; (3) allowing the flocculated iron oxides to settle; (4) separating and removing the suspended silica materials from the flocculated iron oxides; (5) subsequently subjecting an aqueous pulp of the flocculated iron oxides to a froth flotation operation in the presence of a collector to further separate iron oxides from siliceous materials; and (6) thickening the underflow of the froth flotation operation to dewater the iron oxide slurry the improvement comprising:
 a. neutralizing the thickened iron oxide slurry to a pH of about 6 to 8.5 by addition of acid;
 b. adding to the neutralized iron oxide slurry a surface tension reducing agent consisting essentially of sulfosuccinates;
 c. filtering to form a cake from the neutralized and agent containing iron oxide slurry; and
 d. dewatering the cake in a steam environment.

4,107,029
DUAL CONTROL SYSTEM FOR TAILINGS OUTLET OF PRIMARY SEPARATION VESSEL IN THE HOT WATER PROCESS FOR BITUMINUOUS SANDS

Gordon Ronald Lorenz, Edmonton, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of, Canada

Filed Jan. 25, 1977, Ser. No. 762,776

Claims priority, application Canada, Apr. 27, 1976, 251142

Int. Cl.^{2} C10G *1/04*

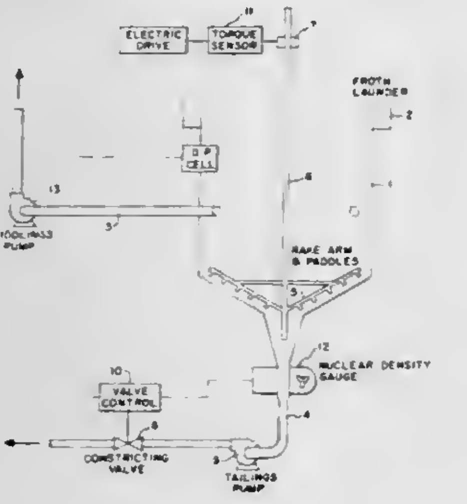
U.S. Cl. 208—11 LE **1 Claim**

1. In the hot water process for recovering bitumen from bituminous sands which vary in fine solids content, wherein an

aqueous slurry of the sands is fed to a primary separation vessel, said vessel having a sand rake rotated by a shaft and a tailings outlet controlled by throttling means, said vessel producing a bitumen froth stream, a tailings stream mainly comprising solids, and a middlings stream,

the improvement comprising:

when the slurry feed to the vessel is formed from bituminous sands containing less than 15 - 20% by weight of the total solids as fine solids, controlling the throttling means to increase the tailings withdrawal rate in response to measurements indicative of an increase in the rake shaft torque; and



when the slurry feed to the vessel is formed from bituminous sands containing more than 15 - 20% by weight of the total solids as fine solids, controlling the throttling means to increase the tailings withdrawal rate in response to measurements indicative of an increase in the density of the tailings stream,

so that the tailings level within the vessel can be accurately monitored and the information acquired used to control the rate of withdrawal of the tailings to thereby optimize the composition of the tailings stream and stabilize the operation of the vessel.

4,107,030

ANTIFOULANTS FOR CRUDE OIL

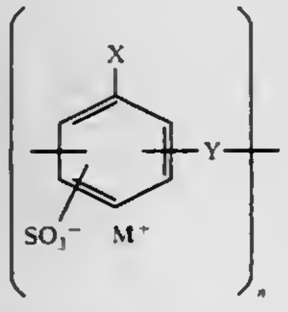
Manuel Sloviosky, and Dodd Wing Fong, both of Woodridge, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 692,554, Jun. 3, 1976, abandoned, which is a continuation of Ser. No. 550,874, Feb. 19, 1975, abandoned, which is a division of Ser. No. 491,011, Jul. 23, 1974, abandoned. This application Feb. 17, 1977, Ser. No. 769,747

Int. Cl.^{2} C10G *9/16*

U.S. Cl. 208—48 AA **7 Claims**

1. A method of preventing fouling on high temperature metal surfaces of oil heat exchangers by utilization at the metal surface an antifouling amount of a compound selected from the following formula:



X = NH$_2$, NHR, NHCH$_2$CHOHR (R = straight or branched chain alkyl containing 2 to 20, preferably 6 to 16, carbon atoms)

Y = H, CH$_2$

M = ammonia, amine containing 1–54 carbons where the total number of carbon atoms in X and M is $\geqq 8$ but $\leqq 54$

$n \geqq 1$.

4,107,031

HYDROCRACKING PROCESS WITH REACTIVATED CATALYST

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 16, 1976, Ser. No. 723,816

The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.

Int. Cl.^{2} C10G *13/02;* **B01J** *29/12*

U.S. Cl. 208—111 **14 Claims**

1. A hydrocracking process which comprises subjecting a hydrocarbon feedstock plus added hydrogen to contact at hydrocracking conditions of temperature, pressure and space velocity with a catalyst comprising a Group VIII noble metal supported on a stabilized Y zeolite cracking base, said catalyst having been previously utilized for hydrocracking to a point of substantial deactivation, and having thereafter been reactivated by a process which comprises:

(1) subjecting said deactivated catalyst to oxidative combustion to remove coke deposits therefrom;

(2) contacting the decoked catalyst from step (1) with aqueous ammonia containing at least 0.1 wt.% NH$_3$ for a sufficient time to effect a redispersal of said Group VIII noble metal; and

(3) drying and calcining the ammoniated catalyst from step (2) in an oxidizing gas at a maximum temperature of about 600°-850° F, to effect deammoniation of said catalyst and to reduce its water content to between about 4% and 12% by weight, the temperature and water vapor partial pressures during said drying and calcining being controlled for the purpose of preventing reagglomeration of said Group VIII noble metal.

4,107,032

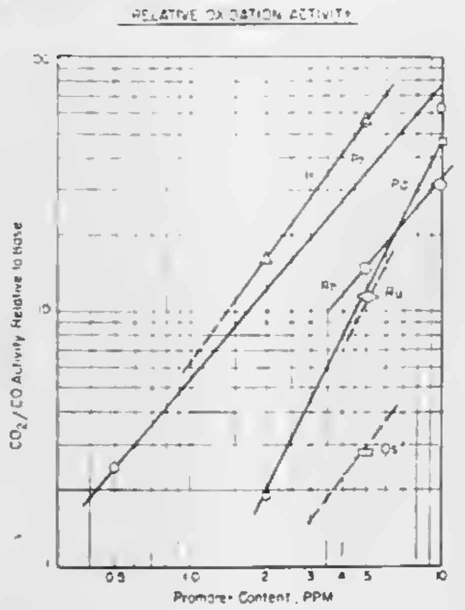
PROCESS FOR CRACKING HYDROCARBONS

Arthur Warren Chester, Cherry Hill Township, Camden County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,633

Int. Cl.^{2} B01J *8/24, 27/10;* **C10G** *23/04*

U.S. Cl. 208—120 **17 Claims**



1. In a fluid cracking process for cracking a hydrocarbon feed in the absence of added hydrogen, said process comprising continuously circulating an inventory of zeolitic cracking catalyst between a cracking zone wherein the temperature is higher than 800° F and a regeneration zone wherein the temperature is higher than about 1000° F, contacting said hydrocarbon feed with said zeolitic cracking catalyst in said cracking

zone thereby forming cracked products and coked catalyst, separating and passing said coked catalyst to said regeneration zone while feeding an oxygen containing regeneration gas to said regeneration zone thereby regenerating said coked catalyst and producing a flue gas with a CO$_2$/CO ratio of less than about 2.0, and returning said regenerated catalyst to said cracking zone, the improvement whereby the CO$_2$/CO ratio is increased to a predetermined value thereby forming a flue gas of reduced carbon monoxide content, which comprises:

including in said circulating inventory of zeolitic cracking catalyst combustion-promoter metal selected from the group consisting of platinum, palladium, rhodium, ruthenium, iridium, osmium and rhenium, in an amount that does not exceed 100 parts per million and that is insufficient to produce a CO$_2$/CO ratio of said predetermined value;

and, contacting said circulating inventory of metal-promoted catalyst with an amount of elemental chlorine, elemental bromine, a metal-free chlorine compound, or a metal-free bromine compound effective to increase said CO$_2$/CO ratio to said predetermined value.

4,107,033

APPARATUS FOR CLEANING FIBROUS SUSPENSIONS OF LOW STOCK CONSISTENCY

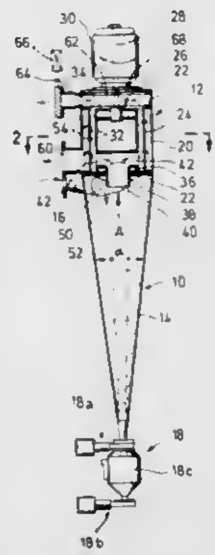
Emil Holz, Eningen/u.A., Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,065

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611885

Int. Cl.^{2} B04C *9/00*

U.S. Cl. 209—17 **10 Claims**



1. In an apparatus particularly suited for cleaning and sorting fibrous suspensions having a low stock consistency, the combination comprising:

a vortex cleaner having a downwardly tapering conical housing with an inlet for the suspension to be cleaned at the upper end and an outlet for the dirt particles removed at the lower end;

a pressure screen mounted to the upper end of the vortex cleaner housing, said pressure screen having a stationary and cylindric upright screen basket, a driven rotor within said screen basket, the axes of the screen basket and of the rotor being concentric with said vortex cleaner housing, said rotor having a lower surface with a central opening therein and means to promote the circulation of the suspension flowing into the vortex cleaner, said rotor forming an annular clearance with said screen basket and sealing means for closing the annular clearance between the rotor and the screen basket such that substantially none of said suspension entering said vortex cleaner passes upwardly between said screen basket and said rotor and substantially all of the cleaned suspension leaving said vortex cleaner passes upwardly through the central opening in said lower rotor surface, said central opening comprising means for delivering said cleaned suspension leaving said vortex cleaner to said annular clearance.

4,107,034

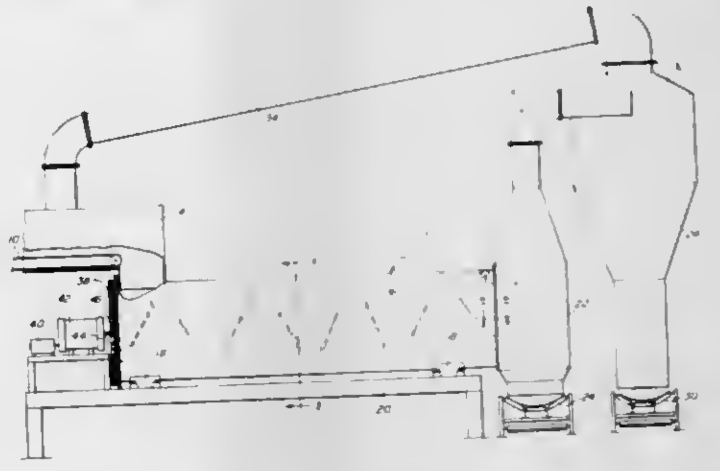
AIR SCREW CLASSIFIER

Malcolm M. Paterson, Lee, N.H.; Michael R. Grubbs, Houston, Tex.; Peter J. Cambourelis, Lexington, Mass., and Vernon L. Schrimper, Cedar Rapids, Iowa, assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 1, 1976, Ser. No. 728,686

Int. Cl.^{2} B07B *1/20, 1/22, 9/02*

U.S. Cl. 209—135 **5 Claims**



1. An air drum classifier for separating mixed solid materials into heavy and light materials, comprising an elongated drum having an inlet end and a discharge end spaced therefrom, a rotary feed screw extending axially within the drum, said screw being comprised of an arrangement of spiral ribbon flights providing an unobstructed opening extending throughout its axis, means for rotating said screw, the drum having an opening adjacent its inlet end whereby a mixture of solid materials may be deposited within the screw so as to be moved toward the discharge end by the screw, means for directing a stream of air longitudinally through the drum and axially through the screw for entraining light materials from said mixture and carrying them out of the drum through said discharge end while heavy materials move progressively along the drum and out said discharge end separately from the light materials, said feed screw being supported at one end by a ring gear which is rotatably mounted on the inlet end of the drum and rotatable with respect thereto, said one end of the feed screw being operatively connected to said gear.

4,107,035

THREE-PLANE BALANCE GYRO SIFTER

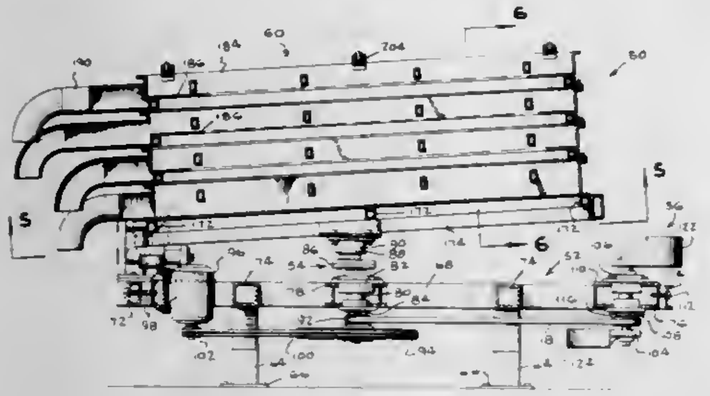
James Daniel Foresman, Hughesville, Pa., assignor to The Young Industries, Inc., Muncy, Pa.

Filed May 2, 1977, Ser. No. 793,196

Int. Cl.^{2} B07B *1/44*

U.S. Cl. 209—309 **17 Claims**

16. A method for balancing a gyratory screener having a base, a sieve box, a linear bearing mounted on the base for supporting the sieve box at an outlet end of the sieve box, an eccentric drive means with an axis of rotation relative to the screen assembly and spaced apart from the linear bearing for causing a portion of the sieve box to move on a circular path, and a balancing shaft rotatably mountable on said base with the axis of rotation of said balancing shaft being generally parallel to the axis of rotation of said circular path, said method comprising positioning the axis of rotation of the circular path to pass through the center of gravity of the screen assembly, providing a means for rotating the balancing shaft and the eccentric drive means at the same rate of rotation, and selecting the weight of a first eccentric balance weight to be mounted on said shaft, the vertical position and eccentric position of said first weight and the distance of the axis of rotation of the balancing shaft from the axis of rotation of the



circular path such that the gyratory screener is provided with dynamic balancing in all three planes.

4,107,036
SEPARATION OF CARBON BLACK BY LIQUID HYDROCARBONS

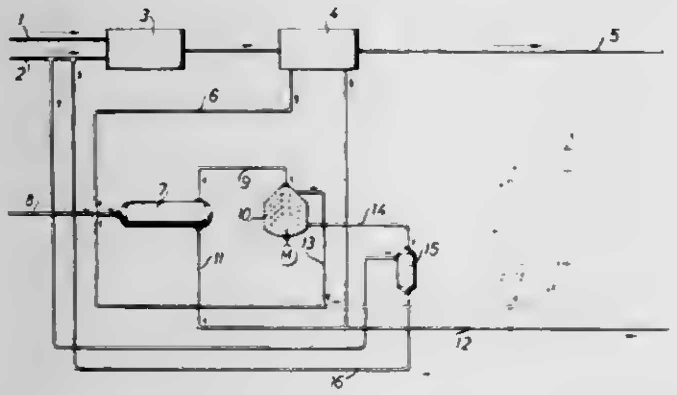
Heinz Giesen; Josef Hibbel; Willi Jansen, and Sebastian Speth, all of Oberhausen, Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Continuation of Ser. No. 602,237, Aug. 6, 1975, abandoned. This application Jul. 29, 1977, Ser. No. 820,349

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1974, 2440472

Int. Cl.² B01D *11/04*

U.S. Cl. 210—21 **5 Claims**



1. A process for separating carbon black from a liquid containing it comprising

a. adding 20 to 100 parts of a liquid hydrocarbon per part of carbon black to said liquid to form a first mixture and whereby said carbon black passes into the hydrocarbon phase,

b. passing said first mixture into a settling zone,

c. separating said hydrocarbon and carbon black from said liquid by the method comprising

  1. permitting said hydrocarbon and carbon black to form a layer upon the surface of said liquid,

d. passing said layer through a disk centrifuge having a plurality of conical disks.

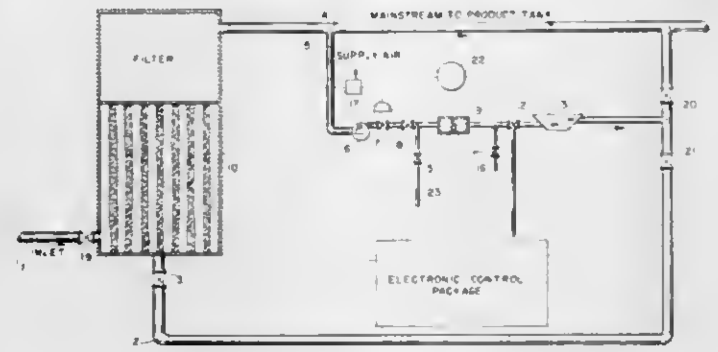
4,107,037
METHOD AND APPARATUS FOR AUTOMATIC CONTROL OF FILTRATE QUALITY

Robert J. Cavanaugh, Ponca City; Robert L. Coffee, Newkirk; Dell Conley, and Howard H. Ferrell, both of Ponca City, all of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sep. 28, 1977, Ser. No. 837,117

Int. Cl.² B01D *23/24*

U.S. Cl. 210—82 **14 Claims**



1. A method for determining filtered quality of a fluid stream which has passed through a primary filter the method comprising

(a) removing a sidestream of liquid which has passed through said filter,

(b) passing said sidestream through a means capable of maintaining constant flow,

(c) passing the stream from said constant flow means through a monitoring backwashable filter of appropriate pore size,

(d) determining the pressure drop (ΔP) over the monitoring filter, and thereby determining the quality of said filter stream,

(e) regenerating or replacing the primary filter when the ΔP for the monitoring filter reaches unacceptable levels

10. An apparatus for controlling quality of a primary filter filtrate comprising

(1) means for removing a sidestream from said filtrate, which has passed through a filter,

(2) passing said sidestream through means capable of maintaining constant flow, said means forcing said sidestream through,

(3) means for determining pressure drop (ΔP) from the upstream side to the downstream side of said monitoring filter, and determining the quality of said filtrate,

(4) means for backwashing said monitoring filter, said means being employed either

  (a) at predetermined time independent of P or

  (b) when ΔP reaches a predetermined value or

  (c) when the flow downstream of said monitoring filter falls below a predetermined value at controlled upstream pressure and

(5) means for stopping flow through said primary filter when ΔP of 4 begins the monitor filter backwash.

4,107,038
METHOD AND APPARATUS FOR REMOVING GRIT

Frank George Weis, Kansas City, Mo., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Aug. 12, 1977, Ser. No. 824,183

Int. Cl.² B03B *5/48*

U.S. Cl. 210—84 **11 Claims**

1. Apparatus for separating grit from liquid sewage while retaining organic solids therein, comprising:

(a) a circular settling chamber;

(b) a grit storage chamber disposed immediately below said settling chamber;

(c) a transition surface separating said settling chamber and said storage chamber, said transition surface having a

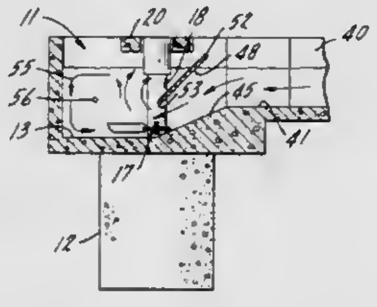
centrally disposed opening therethrough permitting communication between said settling chamber and said storage chamber;

(d) a multi-bladed propeller mounted for rotation in a predetermined direction about a vertical axis centered in said opening, said blades being adjustable as to height above said transition surface, pitch, and speed of rotation;

(e) an inlet trough having flume portion with one edge which intersects the upper portion of said settling chamber essentially tangentially thereto for flowing a tangential stream of liquid sewage into said settling chamber;

(f) a ramp extending downwardly from the intersecting edge of said flume portion to said transition surface at an acute angle with said transition surface for guiding grit to said transition surface;

(g) a baffle extending into said settling chamber adjacent to said flume potion at essentially a right angle to said edge of said flume portion which is tangential to said settling chamber, said baffle being at least as wide as said flume portion and having an upper portion extending above the surface of the liquid in said settling chamber, the lower edge of said baffle being spaced above said transition surface at an acute angle with said transition surface, said upper portion of said baffle being closer to said edge of said flume portion than said lower edge of said baffle, said baffle being positioned so that liquid moved by said propeller and all liquid entering said settling chamber through said flume portion impinges against said baffle and is deflected into a generally toroidal flow pattern moving in said predetermined direction of propeller rotation around said settling chamber with the centroid of such toroidal flow pattern being a circle lying in a horizontal plane and being concentric with said settling chamber; and



(h) outlet means for removing grit-free liquid and organic solids from an upper portion of said settling chamber along the outer periphery thereof.

4,107,039
DIALYSATE PREPARATION SYSTEM

Edward R. Lindsay, Jr., Clearwater, and Stephen Mason Meginniss, III, St. Petersburg, both of Fla., assignors to Extracorporeal Medical Systems, Inc., Pinellas Park, Fla.

Filed Apr. 7, 1976, Ser. No. 674,621

Int. Cl.² B01D *31/00*

U.S. Cl. 210—90 **12 Claims**

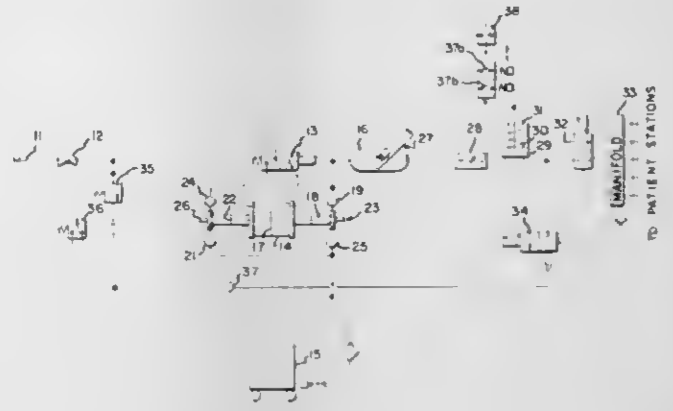
1. A central system for continuously preparing dialysate for a plurality of dialysis patient stations comprising:

a source of water under pressure,

a proportioning pump for mixing said water under pressure with concentrate to form dialysate under pressure,

a regulator valve connected between said source of water and said proportioning pump, and

volume sensing means connected between said proportioning pump and said patient station, said volume sensing means being connected to said regulator valve to control the pressure of the dialysate supplied to said patient station



at a constant pressure for different flow rates of dialysate to said patient station.

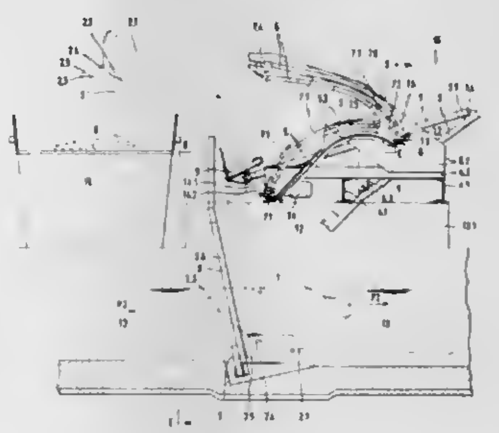
4,107,040
DRIVE DEVICE FOR RAKE ARM WITH ATTACHED SCREEN COMB IN CLEANING DEVICE FOR A WATER CONDUIT SCREEN

Siegfried Rudolph, Hanover; Josef Nöring, Burgwedel, and August Schreiber, Hanover-Vinnhorst, all of Germany, assignors to Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG, Langenhagen, Germany

Filed May 24, 1977, Ser. No. 799,920

Int. Cl.² B01D *33/00, 35/16*

U.S. Cl. 210—159 **22 Claims**



1. In a device for cleaning a screen located in a water conduit wherein the device includes a screen rake having an arm and a screen comb at one end thereof, the rake being mounted to be moved from an intermediate position above the water level in the conduit, to a position in engagement with the screen, to a position above a collecting bin where the screen comb is tilted about a horizontal axis to dump its carried screenings, and wherein the rake arm is mounted for pivoting about a horizontal pivot axis and wherein a drive device is connected to said rake arm for pivoting said arm and moving said arm in a vertical plane downstream of the screen;

the improvement wherein the drive device includes

a continuous chain,

stationarily mounted deflection chain wheels over which said continuous chain is mounted to run,

a stationary curved guide path means positioned entirely above and outside of said conduit and between said deflection chain wheels over which said continuous chain runs; and

the additional improvement wherein

the rake arm comprises a two-armed lever which has a pivot axle connected to said continuous chain for movement thereof, the rake arm being connected at the end thereof opposite the end attached to the screen comb adjacent one end of a hinged support means, said connection including a swing bearing having a horizontal pivot axle, and

said hinged support means being pivotably mounted on a stationary bearing having a horizontal pivot axle.

4,107,041

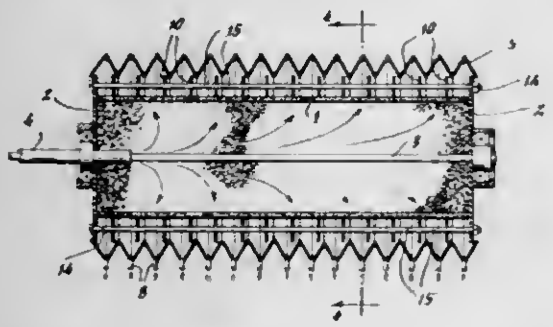
ELECTROMATOGRAPHIC SEPARATING APPARATUS AND SYSTEM

Eskil Karlson, P.O. Box 9000, Stamford, Conn. 06902

Filed Mar. 31, 1977, Ser. No. 783,208

Int. Cl.^{2} B01D ***15/08***

U.S. Cl. 210—198 C **10 Claims**



1. A continuous chromatographic column, the column having a length larger than its cross-sectional diameter, in which the column is packed with suitable chromatographic packing, means for introducing the materials to be separated under pressure at one end, means for spinning the column about an axis substantially central to the column at a rate such that the centrifugal force over the relatively short path at right angles to the column axis is very much greater than rate at which materials to be separated move along the column, whereby removal of materials at different points along the column is relatively very rapid, the column walls along its length being provided with means for permitting materials to be separated to pass through readily, and stationary collecting means for receiving the different fractions.

4,107,042

FILTER PRESS WITH SPRAY WASHING MEANS

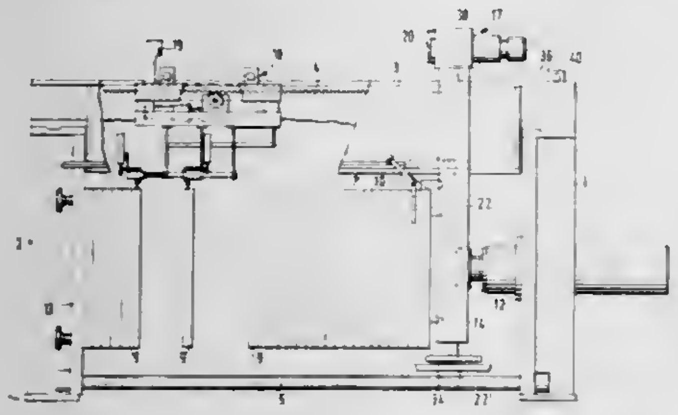
Hans Jüergen Heinrich, Wilhelmshoeher Str., 129, Ennepetal; Karl August Rademacher, Hatzfelder Str. 33; Helmut Strohn, Helmutstr. 12, both of Wuppertal, and Friedhelm Kramer, Unterm Hunnebrink 1, Attendorn-Neuenhof, all of Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,331

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627578

Int. Cl.^{2} B01D ***25/12;*** **B08B** ***3/02***

U.S. Cl. 210—225 **3 Claims**



1. A spray washing means for washing opposite sides of a filter plate having bores for filtering and for back washing when said plate is taken from a stack of filter plates mounted in a filter press, said means being adapted for washing the plate after filtering, comprising:

a spray pipe formed with a single inlet portion and a loop portion formed of two branched lines which are adapted to enclose a selected filter plate between said two branched lines;

nozzles in said loop portion in each of said two branched lines which face each other for simultaneous spraying opposite lateral surfaces of said filter plate under the same spraying pressure during spray washing by said pipe with water;

a carrier frame including generally vertical struts on which said spray pipe is mounted, said carrier frame being shiftable in a horizontal direction along the stack of plates in the filter press;

guides mounted on said vertical struts for guiding the vertical movement of said spray pipe;

said carrier frame further including a receiving tank at the underside of said carrier frame for collecting the spray water from said nozzles;

said receiving tank and carrier frame together being formed as a rectangular support;

a substantially vertical baffle suspended in a balanced relationship from each of said branched lines which is in alignment with the bores of the filter plate being washed, said baffle serving as a protective sheet to block washing liquid penetrating the bores of said plate and directing the blocked liquid into the receiving tank; and

said baffles having their lower edges curved toward each other and being swivelable toward a horizontal plane when in abuting relation to the receiving tank.

3. A filter press comprising:

vertical end posts;

horizontal I-guide carriers;

a stack of shiftable filter plates and a shiftable spray washing means carried by said horizontal I-guide carriers;

said spray means being adapted to simultaneously wash opposite sides of a filter plate which is taken from the stack by successively shifting the filter plates along said I-guide carriers;

said filter plates and said spray washing means being suspended from said horizontal I-guide carriers;

said spray washing means having a generally rectangular frame surrounding said I-guide carriers and said stack of filter plates for shiftable movement on the upper side of said I-guide carriers,

said spray washing means having a spray pipe;

said spray pipe being formed with an inlet portion and a generally horizontal loop portion formed of two branched lines which are adapted to enclose a selected filter plate between said two branched lines;

nozzles in said loop portion in each of said two branched lines which face each other for simultaneously spraying opposite lateral surfaces of said filter plate under the same spraying pressure during spray washing by said pipe with water;

said frame including generally vertical struts on which said spray pipe is mounted for guided vertical movement into a position beneath the underside of the stack; and

the base part of said rectangular frame forming a receiving tank collecting water dropping from the opposite sides of the filter plate during spray washing.

4,107,043

INLET CONDUIT FLUID FILTER

James C. McKinney, Atlanta, Ga., assignor to Creative Dispensing Systems, Inc., Atlanta, Ga.

Filed Mar. 3, 1977, Ser. No. 774,147

Int. Cl.^{2} B01D ***25/00, 25/18***

U.S. Cl. 210—232 **5 Claims**

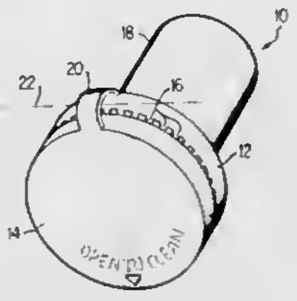
1. An article of manufacture for providing a fluid filter for an inlet conduit of a spray dispenser comprising a molded member having:

an annular plate portion;

a tubular portion in communication with a central opening in said annular plate portion, for engaging an end of the inlet conduit;

a generally circular plate portion, at least one of the surfaces of said plate portions having radially extending ribs for providing a plurality of fluid passages between said plates when the surfaces are located adjacent one another;

a flexible hinge portion connecting an area on the circumference of said circular plate portion to an area on the outer circumference of said annular plate portion; and,



means for maintaining a surface of said circular plate portion adjacent a surface of said annular plate portion, including a male member attached to said generally circular plate portion, comprising a plurality of radially extending, resilient members with channels therebetween, wherein said male member is adapted for insertion into said tubular portion to pressurely engage an inner wall of said tubular portion and wherein the channels in said male member are adapted to communicate between the inlet conduit and the plurality of fluid passages between said plate portions.

4,107,044

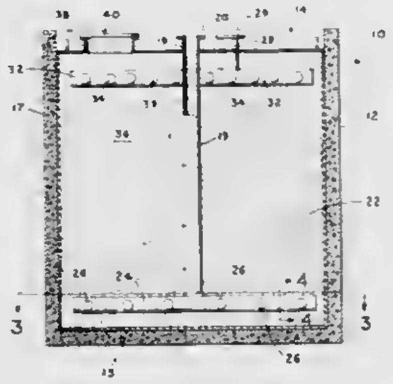
METHOD OF AND APPARATUS FOR PURIFYING FLUIDS WITH RADIOACTIVE IMPURITIES

Jospeh A. Levendusky, Bayonne, N.J., assignor to Epicor, Inc., Linden, N.J.

Filed Aug. 25, 1976, Ser. No. 717,583

Int. Cl.^{2} G21F ***9/04***

U.S. Cl. 210—266 **7 Claims**



1. A disposable filter apparatus for the removal of radioactive dissolved and undissolved solids from a fluid, the filter apparatus comprising:

(a) a fluid tight vessel, said fluid tight vessel including a wall having an upper wall portion and a lower wall portion, said fluid tight vessel defining a chamber containing a bed of demineralization materials for removing said dissolved solids from said fluid;

(b) an inlet pipe extending through a first opening formed in said upper wall portion, the joint defined by the external surface of said inlet pipe and said first opening being closed such as to rigidly secure said inlet pipe to said vessel and to establish a fluid type seal therebetween;

(c) an inlet manifold rigidly secured to said inlet pipe within said chamber, said inlet manifold being in fluid communication with said inlet pipe;

(d) dispersion means rigidly secured to said inlet manifold, said dispersion means for introducing fluid evenly into said bed of materials, said dispersion means being in fluid communication with said inlet manifold to cooperate therewith in accommodating the introduction of contaminated fluid through said inlet pipe and said inlet manifold for dispersion into said bed of material

(e) an effluent pipe extending through a second opening formed in said upper wall portion, the joint defined by the external surface of said effluent pipe and said second opening being closed such as to rigidly secure said effluent pipe to said vessel and to establish a fluid tight seal therebetween;

(f) an effluent manifold rigidly secured to said effluent pipe within said chamber, said effluent manifold being in fluid communication with said effluent pipe, and said effluent manifold being positioned within said chamber, adjacent said lower wall portion;

(g) at least one drain line rigidly secured to and in fluid communication with said effluent manifold, each said drain line comprising a pipe having a plurality of openings therethrough to place the interior of said pipe in fluid communication with said bed of demineralization materials;

(h) filter means disposed on at least one of said dispersion means and said drain line for removing said undissolved solids from said fluid; and

(i) a shielding means disposed around the outer surface of said vessel, said shielding means capable of precluding the emission of radiation from said vessel to the surrounding environs, and said shielding means defining a casing for said fluid tight vessel whereby, upon exhaustion of said demineralization materials and means for removing undissolved solids from said fluid, the entire structure may be removed to an authorized dumping site and buried thereby precluding the necessity for removing said exhausted, highly radioactive means and materials for removing said dissolved and undissolved solids from said filter apparatus.

4,107,045

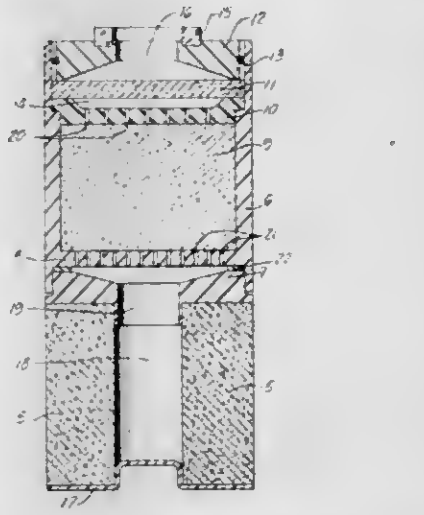
FILTER-PURIFIER CARTRIDGE

Isadore Turetsky, 23940 Welby Way, Los Angeles, Calif. 91307

Filed Apr. 25, 1977, Ser. No. 790,844

Int. Cl.^{2} B01D ***23/06, 27/02***

U.S. Cl. 210—266 **3 Claims**



1. A filter-purifier cartridge for fluids, having a separable self contained cylindrical vessel containing granular purifying media supported by a perforated bottom within said vessel, the cylindrical wall section of said vessel extending beyond said perforated bottom; a perforated disk having an offset rimmed section inserted in an internally recessed upper section of said

cylindrical vessel and enclosing the granular purifying media within said vessel; a permeable porous disk resting against the offset rimmed section of the previously inserted perforated disk, a sealing ring resting against said permeable porous disk; a frictional seal disposed between said sealing ring and the inside wall of said cylindrical vessel; a frictional seal contained at the exposed end of said sealing ring and encircling the port of said sealing ring, said port being the discharge passage of the purifier-filter element; the end section of said cylindrical vessel containing the perforated bottom being axially mounted above one end of a tubular filter by means of a hollow adapter-spacer which seals said end of tubular filter, said adapter-spacer disposed between said tubular filter and a ring gasket resting against the perforated bottom of said cylindrical vessel, the interior of said vessel communicating with the hollow core of said tubular filter by means of a passage through said adapter-spacer, and a closure disposed at the remaining exposed end of said tubular filter.

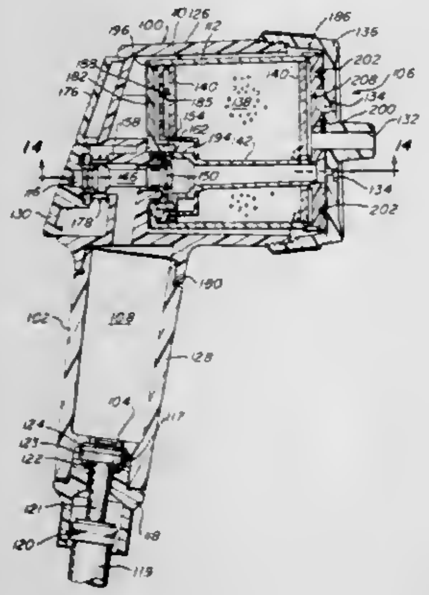
4,107,046
WATER PURIFIER

Thomas E. Corder, Fort Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Continuation of Ser. No. 617,449, Sep. 10, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,420

Int. Cl.^{2} B01D *27/02, 27/08*

U.S. Cl. 210—282 **37 Claims**



1. For use in a water purifier apparatus, a filter cartridge comprising:
- a tubular shell;
- an inlet wall substantially closing one end of said shell but having means defining first and third openings therein;
- an outlet wall substantially closing the other end of said shell but having means defining second and fourth openings therein;
- a conduit extending through the interior of said shell and between said third and fourth openings but exclusive of said first and second openings;
- a water-filtering material disposed within said shell in water-flow communication between said first and second openings but exclusive of said third and fourth openings and the interior of said conduit, said material substantially filling the entire space within said shell and surrounding said conduit;
- and said shell, said inlet wall, said outlet wall and said conduit being joined together to constitute a unitary cartridge assembly, with a portion of said conduit adjacent to said inlet wall being shaped to a conformation receptive of water-flow-control means cooperative therewith.

11. An internally by-passable water purifier comprising:
- a housing having an upstream portion and a downstream portion and defining through said portions a channel for the flow of water;
- inlet means in said upstream portion of said housing for admitting a flow of water into said channel;
- outlet means in said downstream portion of said housing for discharging a flow of water from said channel
- a unitary filter-material-containing water-purifying cartridge having a tubular shell closed by inlet and outlet walls to contain said material, a first opening in said inlet wall and a second opening in said outlet wall;
- means defining a chamber in said upstream portion of said housing for receiving said cartridge in said channel to establish a first path of flow through said first and second openings;
- means running lengthwise of said chamber and of said inlet and outlet walls of said cartridge received therein and exteriorly outward of said tubular shell to establish a second path of flow in exclusive by-pass of said filter material contained within said cartridge;
- means including a first valve disposed within said downstream portion of said housing in said channel for controlling the flow of water from said inlet means through said first and second openings of said cartridge to said outlet means;
- and means including a second valve disposed within said downstream portion of said housing in said channel for controlling the flow of water from said inlet means to said outlet means by way of said second path of flow in exclusive by-pass of said filter material.

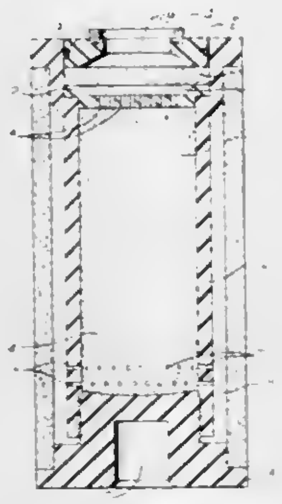
4,107,047
FILTER-PURIFIER CARTRIDGE

Isadore Turetsky, 23940 Welby Way, Los Angeles, Calif. 91307

Filed Feb. 24, 1977, Ser. No. 771,777

Int. Cl.^{2} B01D *27/00*

U.S. Cl. 210—337 **4 Claims**



1. A filter-purifier cartridge for liquids adapted to be inserted in a filter apparatus, comprising: a tubular purifier element containing a purifying medium within its hollow core, said tubular element being concentrically enlarged at one end section, an internal shoulder within, an outlet passage, and an external flange at said enlarged end section; a perforated disk inserted and contained against said internal shoulder by a similarly inserted permeable porous disk and a sealing ring within the hollow core of said enlarged tubular section, and circumferentially disposed perforations at the opposite unexpanded internally threaded end section of said tubular purifier element; said tubular purifier element inserted into the hollow core of a tubular filter, one end of said tubular filter being sealed and positioned by the flange and enlarged circumferential end section of the tubular purifier element; the unexpanded section of said tubular purifier element being spaced from the sidewall of the tubular filter by means of a flanged, threaded, hollow step-type plug, the threaded section of said step-type plug being inserted into the internally threaded end section of said tubular purifier element, the adjacent end of said tubular filter being sealed and positioned by the unthreaded section and flange of said hollow step-type plug; a purifying medium contained within the hollow core of said purifier element between the perforated disk resting against the internal shoulder of the expanded end section of said purifier element, and said hollow step-type plug; said hollow core of the purifier element communicating with the annular space between the positioned tubular filter and said purifier element by means of the circumferentially disposed perforations in said tubular purifier element.

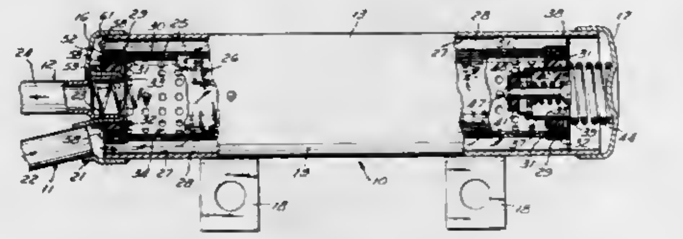
4,107,048
TURBULENCE AMPLIFIER BAFFLE

Raymond N. Darash, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 4, 1977, Ser. No. 765,757

Int. Cl.^{2} B01D *29/10*

U.S. Cl. 210—407 **7 Claims**



1. A filter assembly for treating a fluid comprising a circular, thin-walled housing having interior and exterior surfaces, an inlet and an outlet for admitting and discharging fluid to and from the interior of the housing, an elongated filter element extending lengthwise within the housing, the filter element having an outer surface spaced radially inwardly from the interior surface of the housing to provide therebetween an axially extending fluid flow path, means for directing fluid admitted at the inlet towards the flow path, said fluid directing means including a circular chamber at one end of said housing having a major diameter generally equal to the diameter of the housing interior, said fluid-directing means including swirl-inducing means for causing fluid to travel in a helical pattern through said flow path and about the outer surface of the filter, said swirl-inducing means being constructed and arranged to be substantially fully operative on substantially all of said fluid prior to its passage into said flow path, a wall extending between and separating said chamber and said flow path, a plurality of apertures circumferentially spaced on said wall for admitting fluid from said chamber into said flow path, said swirl-inducing means including a flow-deflecting fin associated with each aperture, all of said fins extending from said apertures in a direction away from said flow path, said swirl-inducing means being constructed and arranged to gradually accelerate flow into a helical path whereby internal heating of fluid is thereby substantially avoided.

4,107,049
PROCESS FOR PRODUCING SEMIPERMEABLE MEMBRANES

Takezo Sano, Takatsuki; Takatosbi Shimomura, Toyonaka; Masao Sasaki, Osaka, and Ichiki Murase, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

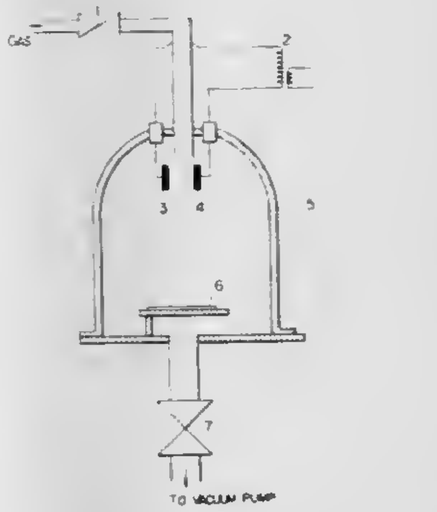
Filed Oct. 27, 1976, Ser. No. 736,071

Claims priority, application Japan, Oct. 30, 1975, 50-131253

Int. Cl.^{2} B29D *27/04;* **B01D** *31/00, 39/00*

U.S. Cl. 210—490 **18 Claims**

1. A method for the preparation of semipermeable membranes which comprises exposing porous shaped articles of polyacrylonitrile or copolymers containing acrylonitrile in an amount of more than 40% by mole to a plasma consisting essentially of a gaseous organic compound or mixture of said gaseous organic compound and an inert gas at room temperature under a pressure of 0.01 to 10 Torr, wherein said porous shaped articles of said polymeric material are prepared by a method comprising the steps of;
- (a) dissolving the polymeric material in a solvent,
- (b) casting the resulting solution,



- (c) dipping the cast solution in a non-solvent to prepare a porous membrane after partial evaporation of the solvent of the solution or without evaporation thereof, and
- (d) drying the wet porous membrane thus obtained.

15. A heterogeneous membrane obtained by the method of claim 1, which has a modified dense layer in the vicinity alone of the surface thereof and pores increasing in size gradually towards the back surface of the membrane.

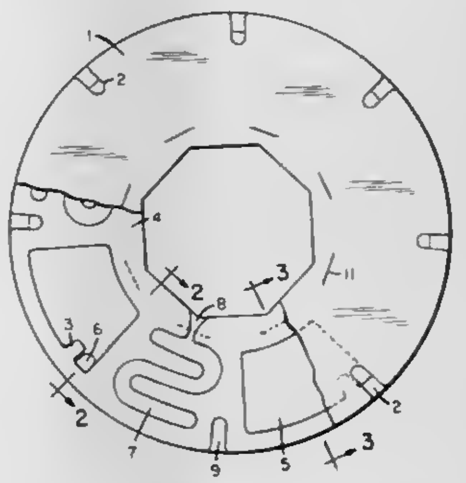
4,107,050
FILTER CARTRIDGE

Harold Wilansky, Big Flats, N.Y., assignor to The Hilliard Corporation, Elmira, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,220

Int. Cl.^{2} B01D *25/04, 25/16*

U.S. Cl. 210—492 **3 Claims**



1. A cartridge for filtering oily liquids which are contaminated with entrained immiscible material including water, comprising
- a plurality of filter discs,
- a plurality of spacer discs of foraminous material, each of said spacer discs being interposed between a pair of said filter discs, said spacer discs having circumferentially arranged cut-out portions forming, with the adjacent filter discs, alternately arranged inlet and outlet chambers, said inlet chambers having inlet passages,
- said filter discs having inlet ports registering with said inlet passages, and
- enlarged inlet means adjacent each of said inlet ports for

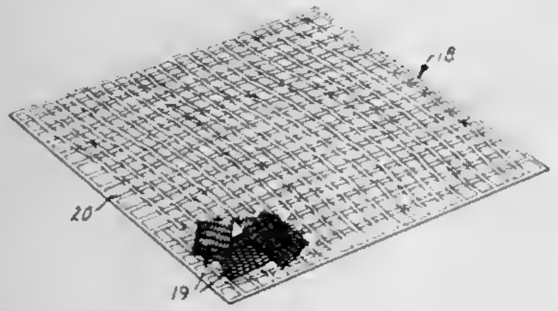
providing an enlarged inlet dimension in a direction parallel to the longitudinal axis of said cartridge, thereby reducing the tendency for the material of said spacer discs adjacent said inlet ports to expand into and clog said inlet ports, the total longitudinal dimension of each of said inlet ports and the respective inlet port means adjacent thereto being the thickness of one of said spacer discs plus the thickness of two of said filter discs.

4,107,051

OIL SORBING MAT

Alan P. Lorentzen, White Bear Township, Ramsey County, both of Minn., assignor to David J. Bucheck, North Saint Paul and Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 4, 1977, Ser. No. 774,669
Int. Cl.^{2} B01D *39/14;* **B32B** *5/12*
U.S. Cl. 210—500 R **10 Claims**



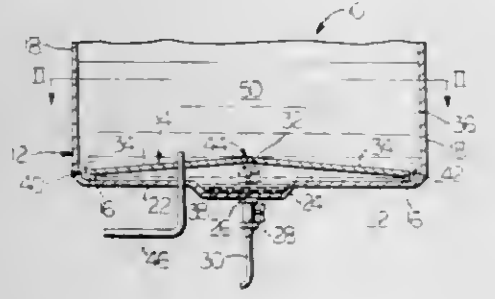
1. Oil sorbing mat comprising a plurality of sections of fibrillated film which are (a) expanded at least four times their transverse width prior to fibrillation to form a net-like structure and (b) assembled one over the other and attached in said expanded condition to form a fluffy bulky flexible resilient handleable integral structure having a bulk density of about 0.02 gram per cubic centimeter or less in which the openings in the sections are overlapped to establish a network of interstices into which oil can be received and stored, said mat having a sorbency number with No. 5 fuel oil at 24° C of at least 20.

4,107,052

FUEL TANK WATER SEPARATOR ASSEMBLY

Tsuneo Yoshino, and Junji Tatsuma, both of Yokohama, Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 804,957
Claims priority, application Japan, Aug. 10, 1976, 51-106144[U]
Int. Cl.^{2} B01D *12/00*
U.S. Cl. 210—534 **3 Claims**



1. A fuel tank water separator assembly comprising:
a tank including a concave sump portion having a normally closed drain member therein;
a water separating plate of a convex configuration defining a substantially centrally located apex and a plurality of sloping portions depending therefrom to a lower edge, said plate connected to said tank in juxtaposed position over said concave sump portion and defining communicating upper and lower chambers, said sloping portions serving to promote through gravity downward movement of water away from said apex toward said lower edge;
first opening means defined between said lower edge and said tank for communicating said chambers and providing a flow path for said water from said upper chamber into said lower chamber; and
second opening means defined at said apex of said plate for passing displaced fuel from said lower chamber to said upper chamber.

4,107,053

PREPARATION OF THE REACTION PRODUCT OF UREA AND ALKALI METAL HYDROXIDE OR CARBONATE

Rowland Kennington, and Robin Andrew Woolhouse, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 1, 1976, Ser. No. 737,272
Claims priority, application United Kingdom, Nov. 14, 1975, 47040/75
Int. Cl.^{2} A62D *1/00*
U.S. Cl. 252—2 **16 Claims**

1. A process for the preparation of a fire-extinguishing composition comprising a compound having an empirical formula $MC_2N_2H_3O_3$, where M is potassium or sodium, by reacting a mixture of urea and an alkali selected from hydroxides and carbonic salts of potassium or sodium, the process comprising adding solid particulate urea, or urea and alkali in solid particulate form, to an agitated bed of solid particulate material, the bed of particulate material being heated to a temperature in the range 95° C to 200° C and comprising at least alkali in the case where urea alone is added, and the rate of addition of the urea, or of the urea and alkali, being controlled to maintain the bed in a solid particulate form.

4,107,054

LUBRICATING OIL COMPOSITIONS

Warren W. Woods, San Diego, Calif., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jun. 27, 1977, Ser. No. 810,214
Int. Cl.^{2} C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33.4 **14 Claims**

1. A lubricating oil composition, having improved rust inhibiting properties, said composition comprising (a) a major amount of a base lubricating oil, (b) from about 0.5 to about 10 weight percent of an alkenyl succinimide dispersant and (c) a rust inhibiting amount, in the range of about 0.06 to about 1 weight percent of an acidic derivative of benzene selected from the group consisting of anthranilic acid, 2-amino-5-alkylbenzoic acid, wherein the alkyl group is methyl or ethyl, and 4-alkyl catechol, wherein the alkyl group is methyl or ethyl.

10. The lubricating oil composition of claim **1** wherein it contains from about 0.1 to about 5 weight percent of an overbased metal sulfonate.

4,107,055

FABRIC COATING COMPOSITIONS, METHOD AND COATED FABRIC HAVING DRY SOIL RESIST FINISHES

Bernard Sukornick, Williamsville, N.Y.; Pritam Singh Minhas, Mendham, N.J., and Richard Francis Sweeney, Elma, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 15, 1976, Ser. No. 751,003
Int. Cl.^{2} D06M *15/36*
U.S. Cl. 252—8.6 **37 Claims**

1. A composition consisting essentially of:
from about 0.25% to about 55% by weight of an essentially nonhalogenated polymer having a glass transition temperature above room temperature;
from about 0.05 to about 50% by weight of polymer of an ionic, non-polymeric fluoro surfactant with from 5 to 30 carbons per hydrophilic end; and

at least about 40 percent by weight of composition of a carrier in which said polymer is dissolved or suspended.

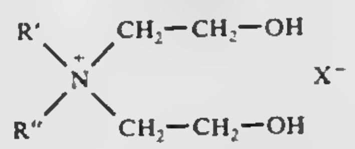
4,107,056

NOVEL POLYACETAL POLYMERS AND THEIR APPLICATION AS A SOIL-RELEASE AND ANTI-SOIL REDEPOSITION AGENTS FOR TEXTILE SUBSTRATES

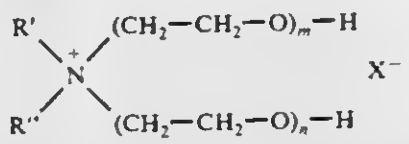
Robert Violland, Lyons, and Alain Lagasse, Villeurbanne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 9, 1976, Ser. No. 703,827
Claims priority, application France, Jul. 10, 1975, 75 22626
Int. Cl.^{2} D06M *13/12*
U.S. Cl. 252—8.8 **13 Claims**

1. An aqueous solution containing from about 2.10^{-3} to about 5% by weight of a hydrophilic polyacetal polymer prepared by reacting Reactant Composition I comprising:
(A) 20-60 weight percent of a component (A) which is a reaction product of a phthalic acid, phthalic anhydride or a phthalic diester and at least one saturated diol having a molecular weight less than 300, said reaction product having a hydroxyl number of between 150 and 500 and an acid number of less than 2,
(B) 40-80 percent of a component (B) comprising:
1. a mixture comprising:
(a) 50 to 100 weight percent of a hydroxylated compound represented by the general formula R $(OC_xH_{2x})_n$—OH wherein R represents a hydrogen or a hydrocarbyl radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl containing 1 to 20 carbon atoms, x is 2, 3, or 4 and n is an integer such that molecular weight ranges from between 300 and 10.000,
(b) 0-50 weight percent of a quaternary dialkyl diethanolamine having the formula:

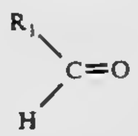


wherein R' and R" represent the same or different alkyl groups containing less than 5 carbon atoms or a benzyl radical and X^- is a halogen or methylsulfate ion, or
2. 100 weight percent of a quaternary ammonium compound containing both oxyalkylene units and a quaternized nitrogen atom represented by the formula:



wherein R' and R" represent the same or different members selected from alkyl radicals containing less than 5 carbon atoms or benzyl radicals, and m and n are numbers the sum of which is less than 15 and X^{31} is a halide or methylsulfate ion,

with
Rectant Composition II comprising an aldehyde having the formula:



wherein R_1 represents a hydrogen atom, and alkyl, an aryl or an alkenyl group containing 1 to 10 carbon atoms; wherein the number of mols of alkehyde is at least equal to half the total number of hydroxyl groups contained in Reactant Composition I.

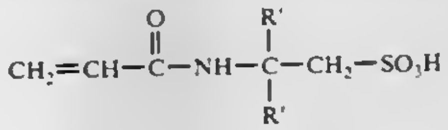
4,107,057

METHOD OF PREPARING AND USING ACIDIZING AND FRACTURING COMPOSITIONS, AND FLUID LOSS ADDITIVES FOR USE THEREIN

Walter R. Dill, and Eugene A. Elphingstone, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 19, 1977, Ser. No. 760,485
Int. Cl.^{2} E21B *43/27, 43/26*
U.S. Cl. 252—8.55 C **17 Claims**

1. An acidizing composition for use in acidizing a subterranean formation comprising
an acidic base fluid; and
from about 25 pounds to about 100 pounds per 1000 gallons of the base fluid of a crosslinked copolymer of a sulfonic acid-modified acrylamide monomer and a polyvinyl crosslinking agent;
wherein said sulfonic acid-modified acrylamide monomer is characterized in having the structural formula:



$$CH_2{=}CH{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}NH{-}\underset{\underset{\displaystyle R'}{|}}{\overset{\overset{\displaystyle R'}{|}}{C}}{-}CH_2{-}SO_3H$$

wherein R' and R" are selected from the group consisting of CH_3—, CH_2Cl—, CH_3—CH_2—, CH_3—CH_2—CH_2—, and H, and may be the same or different; and
wherein said polyvinyl crosslinking agent is an alkylidene bisacrylamide in which the alkylidene group contains from one to three carbon atoms; and still further
wherein said crosslinked copolymer contains from about 0.1 to about 20 weight percent of the polyvinyl crosslinking agent and the balance is the sulfonic acid-modified acrylamide monomer.

4,107,058

PRESSURE GREASE COMPOSITION

George A. Clarke, and Gary L. Harting, both of Westfield, N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 19, 1977, Ser. No. 826,175
Int. Cl.^{2} C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **11 Claims**

1. A lubricating grease composition comprising a major proportion of a base oil stock, a thickener and an additive package made up of an oil insoluble phosphorus compound selected from the group consisting of alkali metal and alkaline earth metal salts of a phosphorus acid and an oil soluble sulfur compound selected from the group consisting of sulfurized hydrocarbons and organometallic sulfur salts.

6. The composition of claim **5** wherein the thickener comprises a lithium soap or an aluminum soap.

7. The composition of claim **6** wherein said phosphorus compound is tricalcium phosphate.

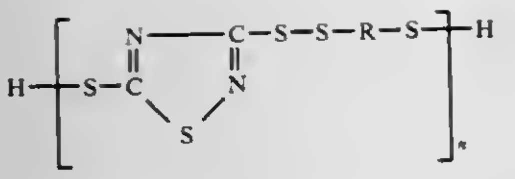
4,107,059

POLYMER OF 1,2,4-THIADIAZOLE AND LUBRICANTS CONTAINING IT AS AN ADDITIVE

James Ping King, Lansdale; Everett A. Mailey, Norristown, and Ivan Christoff Popoff, Ambler, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

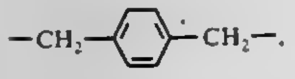
Filed Jun. 27, 1977, Ser. No. 810,137
Int. Cl.^{2} C10M *1/10, 3/02;* **C08F** *28/00;* **C08G** *75/00*
U.S. Cl. 252—28 **8 Claims**

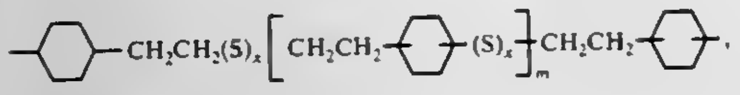
1. A composition having the formula

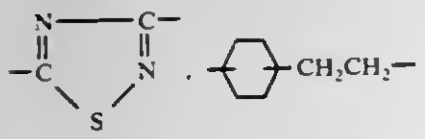


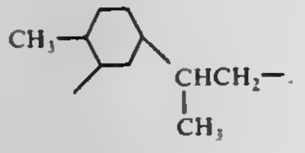
wherein

R is selected from the group consisting of









phenylene, an alkylene or substitute alkylene of 2-50 carbons. cyclic alkylene or substituted cyclic alkylene of 5-50 carbons wherein the alkylene or cyclic alkylene can contain oxygen and/or sulfur atoms, or $(S)_x$ groups;

m is an integer of 0-10;

n is an integer of 5-100;

x is an integer of 1-5.

4. A lubricating composition comprising a major amount of a lubricating grease or liquid and a minor amount of the composition of claim 1.

4,107,060

LUBRICANT COMPOSITIONS CONTAINING BIOCIDAL, ANTIRUST ADDITIVES

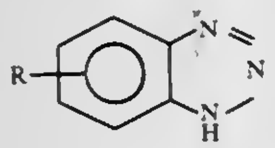
John W. Schick, Cherry Hill, and Robert H. Davis, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 587,761, Jun. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 353,178, Apr. 20, 1973, abandoned. This application Mar. 31, 1977, Ser. No. 783,239

Int. Cl.^{2} C10M *1/06*

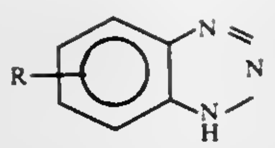
U.S. Cl. 252—49.3 **13 Claims**

1. A composition which comprises a lubricant base selected from the group consisting of oils of lubricating viscosity, water, and emulsions thereof; and in a biocidal and rust preventative amount, an additive consisting essentially of the reaction product of (a) a benzotriazole compound having the formula:



where R is hydrogen or an alkyl group containing from about 1 to about 6 carbon atoms and (b) a water soluble base, characterized by a basicity greater than that of said benzotriazole compound, which is selected from the group consisting of alkanol and hydrocarbylamines wherein said water soluble base is reacted with said benzotriazole in mole proportions from about 1:1 to about 5:1 and at a temperature of from about 10° to about 90° C.

8. The reaction product of (a) a benzotriazole compound having the formula:



where R is hydrogen or an alkyl group containing from about 1 to about 6 carbon atoms and (b) a water soluble base, characterized by a basicity greater than that of said benzotriazole compound, which is selected from the group consisting of alkanol and hydrocarbyl amines wherein said water soluble base is reacted with said benzotriazole in mole proportions of from 1:1 to about 5:1 and at a temperature of from about 10° to about 90° C.

4,107,061

AMINO-AMIDE LUBRICANTS DERIVED FROM POLYMERIC FATTY ACIDS AND POLY(OXYETHYLENE) DIAMINES

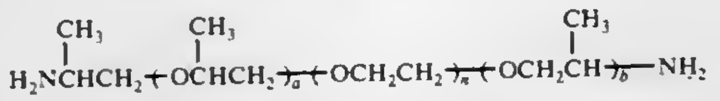
Robert J. Sturwold, and Mark A. Williams, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Nov. 7, 1977, Ser. No. 848,848

Int. Cl.^{2} C10M *1/06, 3/04;* **C09F** *5/00, 7/00*

U.S. Cl. 252—49.3 **11 Claims**

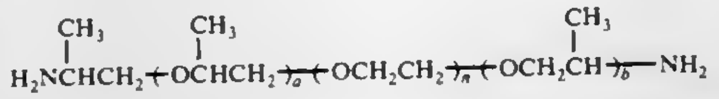
1. Amino-amide compositions comprising the reaction product of a poly (oxyethylene) diamine of the general formula



$$H_2N\overset{\overset{CH_3}{|}}{C}HCH_2(O\overset{\overset{CH_3}{|}}{C}HCH_2)_a(OCH_2CH_2)_n(OCH_2\overset{\overset{CH_3}{|}}{C}H)_b-NH_2$$

where the sum of $a+b$ is between 1 and 5 and n is a positive integer such that the average molecular weight is between about 500 and 1,000 and a polymeric fatty acid, said respective reactants employed at an equivalents ratio of 1.7-2.3:1.

9. An aqueous lubricant composition suitable for metal working containing about 0.1 to 40 weight percent of an amino-amide composition derived from a polymeric fatty acid and a poly(oxyethylene) diamine of the general formula:



$$H_2N\overset{\overset{CH_3}{|}}{C}HCH_2(O\overset{\overset{CH_3}{|}}{C}HCH_2)_a(OCH_2CH_2)_n(OCH_2\overset{\overset{CH_3}{|}}{C}H)_b-NH_2$$

where the sum of $a+b$ is between 1 and 5 and n is a positive integer such that the average molecular weight is between 500 and 1,000 and reacted at an equivalents ratio of 1:1.7-2.3.

4,107,062

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES COMPRISING AN AMINE-EPOXY RESIN MIXTURE

Makoto Tomono, Hino; Goichi Yamakawa, Hachioji, and Mitsunori Ohta, Kunitachi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,627

Claims priority, application Japan, Jan. 13, 1976, 51-3559

Int. Cl.^{2} G03G *9/08*

U.S. Cl. 252—62.1 P **8 Claims**

1. A toner for use in the dry development of electrostatic images comprising:

a colorant; and

a resin mixture of (A) at least 20% by weight of an amine-epoxy resin obtained by reacting an epoxy resin and an aliphatic primary or secondary monoamine having at least 8 carbon atoms and (B) a definite amount up to 80% by weight of an epoxy resin which is not reacted with an amine.

4,107,063

WATER BASED SELECTABLE CHARGE MAGNETIC INKS

Zlata Kovac, Somers, and Carlos Juan Sambucetti, Groton-on-Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,578

Int. Cl.^{2} H01F *1/28;* **C09D** *11/00*

U.S. Cl. 252—62.52 **37 Claims**

1. A water based magnetic ink comprising in combination magnetite particles having a coating of an adsorption site providing material taken from the group of organic sulfates, sulfonates and amino carboxylates and having chemically attached thereto a non-ionic surfactant taken from the group of polyoxyethylenes, alkylarylpolyether alcohols, and alkylphenolethers, said particles being dispersed in water containing at least one of glycerol and polyethylene glycol.

4,107,064

METAL SEQUESTERING METHOD

Gunner E. Nelson, and Tillmon H. Pearson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 682,320, May 3, 1976, Pat. No. 4,066,687, which is a division of Ser. No. 385,545, Aug. 3, 1973, Pat. No. 3,980,578, which is a continuation-in-part of Ser. No. 153,816, Jun. 16, 1971, Pat. No. 3,784,486. This application Aug. 15, 1977, Ser. No. 824,401

Int. Cl.^{2} C11D *1/86*

U.S. Cl. 252—89 R **9 Claims**

1. The method of sequestering sequesterable metal ions in an aqueous solution which comprises introducing into said solution a sequestrant composition selected from the group consisting of:

(a) α,α'-carboxyalkoxy succinic acid, wherein the carboxyalkoxy radicals contain from 2 to about 7 carbon atoms,

(b) water soluble salts of said acids; and

(c) mixtures of (a) and (b),

and a surfactant selected from the group consisting of anionic detergents, cationic detergents, nonionic detergents, ampholytic detergents, zwitterionic detergents and mixtures thereof, the ratio by weight of the surfactant to the sequestrant being from about 10:1 to about 1:10.

4,107,065

ACTIVATED PEROXY COMPOUND BLEACHING COMPOSITIONS AND BLEACHING DETERGENT COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,117

Int. Cl.^{2} C11D *7/18, 7/38, 7/56*

U.S. Cl. 252—99 **6 Claims**

1. An activated peroxy compound particulate solid bleaching composition consisting essentially of sodium perborate tetrahydrate and p-acetaminobenzenesulfonyl chloride wherein the weight ratio of active oxygen of the sodium perborate tetrahydrate to p-acetaminobenzenesulfonyl chloride is in the range of 1:10 to 1:3.

4,107,066

SUBSTITUTED ACETONAPHTHONES, PROCESSES FOR PREPARING SAME, USES OF SAME IN PERFUMERY, AND INTERMEDIATES USED IN SAID PROCESSES

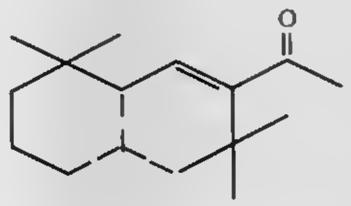
William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., Union Beach, N.J.

Division of Ser. No. 740,890, Nov. 11, 1976, Pat. No. 4,076,749. This application Jul. 28, 1977, Ser. No. 819,959

Int. Cl.^{2} C11D *3/50*

U.S. Cl. 252—132 **1 Claim**

1. A perfumed article having a vetiver aroma comprising a composition of matter containing a mixture of three compounds defined by the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond and a detergent or soap.

4,107,067

DETERGENT COMPOSITION

Alan Pearce Murphy, and John Rene Paris, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 25, 1976, Ser. No. 699,762

Int. Cl.^{2} C11D *3/075, 17/00*

U.S. Cl. 252—135 **12 Claims**

1. A gelatinous liquid or flowable gel detergent composition which comprises greater than about 40% by weight of a nonionic alkylene oxide detersive surfactant, from about 2% to about 10% by weight of a detergency builder salt, the balance comprising water, said detergent composition being in the form of an inversed emulsion, said inversed emulsion consisting of;

(a) a first, continuous phase comprising hydrated, nonionic alkylene oxide detersive surfactant in the form of neat liquid crystals; and

(b) a second, disperse phase comprising an aqueous solution of detergency builder salt, said disperse phase being substantially homogeneously distributed throughout said continuous phase.

4,107,068

ACRYLONITRILE-CAPPED POLYETHER-SILOXANES

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 627,251, Oct. 30, 1975, Pat. No. 4,043,951. This application May 19, 1977, Ser. No. 798,611

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 252—182 **7 Claims**

1. A solution composition comprising components (1), (2), (3) and (4) wherein component (1) comprises an acrylonitrile-capped polyoxyalkylene-polysiloxane polymer containing at least one silicon-bonded acrylonitrile-capped polyoxyalkylene radical having the average formula $-R''(X)_q(OC_3H_6)_n(OC_2H_4)_mOCH_2CH_2CN$ wherein R'' is an alkylene radical, free from unsaturation, and containing from 2 to 6 carbon atoms, wherein X is a bridging group selected from the class consisting of —CO— and —NHCO—, wherein q has a value of 0 or 1, wherein m has a value of from 4 to 30 and wherein n has a value of from 0 to 10; component (2) is a water soluble organic acidic component present in said solution in an amount from about 5 to about 90 parts by weight per 100 parts by weight of said polymer; component (3) is a water soluble, silicon-free organic surfactant; and component (4) is a water soluble glycol; the combined total weight of components (3) and (4) present in said solution ranging from about 5 to about 90 parts by weight per 100 parts by weight of said polymer.

4,107,069

STORAGE-STABLE PRECURSORS FOR RIGID POLYURETHANE FOAMS

Alfred A. Keller, Freehold, N.J.; Robert V. Russo, Brooklyn, N.Y., and Kenneth Treadwell, Rahway, N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Continuatioo-in-part of Ser. No. 592,473, Jul. 2, 1975, abandoned. This application Jun. 18, 1976, Ser. No. 697,525

Int. Cl.^{2} C08G *18/06. 18/28*

U.S. Cl. 252—182 **10 Claims**

1. A stable precursor for preparing rigid cellular polyurethanes, said precursor consisting essentially of

(a) a polyol containing at least 2 active hydrogen atoms, as determined by the Zerewitinoff method,
(b) a silicone-containing surfactant in an amount from about 1 to 5 parts by weight per 100 parts of said polyol,
(c) halogen-containing hydrocarbon, boiling from 30° to 90° C, blowing agents in an amount from about 10 to 50 parts by weight per 100 parts of said polyol, and
(d) a catalytically effective amount of a gel catalyst composition consisting of a tertiary amine and an alkali metal salt of a carboxylic acid containing from 2 to 20 carbon atoms.

4,107,070

PROCESS FOR IMPROVING THE PROPERTIES OF OXYSULFIDE PHOSPHOR MATERIALS

Clifford Leon Everts, Hilton; David Michael Taylor, and Paul John Delmore, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1976, Ser. No. 746,034

Int. Cl.^{2} C09K *11/46*

U.S. Cl. 252—301.4 S **16 Claims**

1. A process for improving the x-ray luminescent properties of a rare-earth activated yttrium, lanthanum, or gadolinium oxysulfide phosphor material that has been subjected to grinding,

comprising heating the phosphor material while exposed to an oxygen-containing atmosphere at a temperature of about 600° to about 1000° C for a time sufficient to improve the x-ray luminescent properties of the ground phosphor material.

4,107,071

METHOD OF PRODUCING MICROCAPSULES AND RESULTING PRODUCT

Robert G. Bayless, Yellow Springs, Ohio, assignor to Capsulated Systems, Inc., Yellow Springs, Ohio

Filed Feb. 16, 1977, Ser. No. 768,968

Int. Cl.^{2} B01J *13/02*

U.S. Cl. 252—316 **12 Claims**

1. A method of producing microcapsules having a capsule core material surrounded by a densified protective wall which comprises

(1) forming an agitated system which includes (a) a liquid vehicle as a major component of the system and constituting a continuous first phase, (b) a plurality of discrete capsule core material entities dispersed in said liquid vehicle and constituting a discontinuous second phase, and (c) partially-hydrolyzed poly(ethylene-vinyl acetate) containing about 60 to about 80 mol percent ethylene and having a melt index of about 18 to about 50, said capsule core material being wettable by said partially-hydrolyzed poly(ethylene-vinyl acetate);
(2) adding to said system a phase separation-inducing material in an amount sufficient to separate said partially-hydrolyzed poly(ethylene-vinyl acetate) from said continuous first phase and thereby forming a sheath of said partially-hydrolyzed poly(ethylene-vinyl acetate) and liquid vehicle entrapped therein about said capsule core material entities;
(3) extracting at least a major portion of the entrapped liquid vehicle from said sheath, thereby reducing the thickness of said sheath, by adding to said system said phase separation-inducing material in an amount sufficient to increase the concentration thereof in said liquid vehicle by at least about 30 weight percent in excess of the concentration required to effect formation of said sheath;
(4) cross-linking said partially-hydrolyzed poly(ethylene-vinyl acetate) in said sheath to form a protective wall about said capsule core material.

4,107,072

PROCESS OF ISOLATING CYCLOHEXANE-FREE ETHYLCELLULOSE MICROCAPSULES

Lewis D. Morse, Princeton, N.J.; Melvin J. Boroshok, Yonkers, N.Y., and Roy W. Grabner, North Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 25, 1973, Ser. No. 364,222

Int. Cl.^{2} B01J *13/02*

U.S. Cl. 252—316 **5 Claims**

1. In the process of isolating ethylcellulose-walled microcapsules from a cyclohexane medium, the improvement which comprises displacing the cyclohexane adhering to the said microcapsules by C_{5-8} alkanes.

4,107,073

PULP AND PAPERMAKING ADDITIVE

Joseph A. Maciaszek, Bridgeview, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

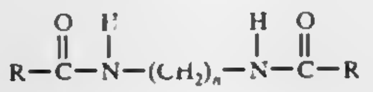
Continuation-in-part of Ser. No. 778,414, Mar. 17, 1977, abandoned. This application Aug. 22, 1977, Ser. No. 826,433

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—321 **10 Claims**

1. An antifoam and drainage aid composition useful in pulping and papermaking processes which consists of a water-based emulsion composition as follows:

(a) Hydrophobic silica
(b) Bisamide of the following formula:



$$R-\overset{\overset{O}{\|}}{C}-\overset{\overset{H}{|}}{N}-(CH_2)_n-\overset{\overset{H}{|}}{N}-\overset{\overset{O}{\|}}{C}-R$$

where

n is an integer from 1 to 6; and
R is a saturated or unsaturated, straight or branched chain hydrocarbyl group having from 5 to 22 carbon atoms
(c) Acid containing crosslinked copolymer of acrylic acid
(d) Dioctyl sulfosuccinate
(e) Paraffin oil
(f) Water

4,107,074

PROCESS FOR PREPARING AMINOALKYLPYRROLOBENZOXAZALKANES

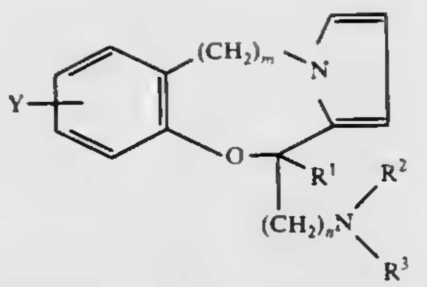
Richard C. Effland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Fed. Rep. of Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 661,505, Feb. 26, 1976, Pat. No. 4,029,672. This application Jan. 19, 1977, Ser. No. 760,507

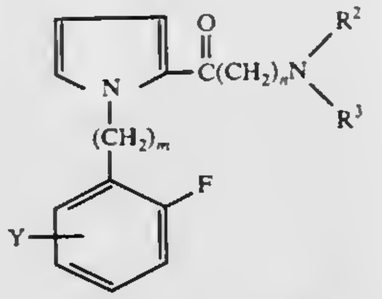
Int. Cl.^{2} C07D *491/04*

U.S. Cl. 260—326.5 B **4 Claims**

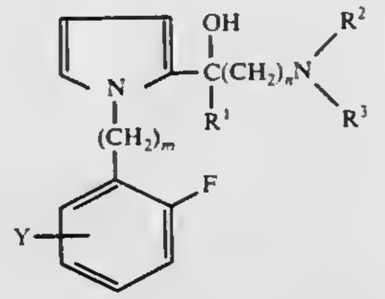
1. A process for the preparation of an aminoalkylpyrrolobenzoxazalkane of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino; R^1 is lower alkyl; R^2 is hydrogen, alkyl of from 1 to 5 carbon atoms, phenyl, phenylalkyl of the formula $C_6H_5(CH_2)_n$—, cycloalkyl of from 3 to 6 carbon atoms or cycloalkylalkyl of from 4 to 7 carbon atoms; R^3 is alkyl of from 1 to 5 carbon atoms, phenyl, phenylalkyl of the formula $C_6H_5(CH_2)_n$—, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of from 4 to 7 carbon atoms; *m* is 1 or 2 and *n* is 1, 2 or 3; which comprises reacting a pyrrylamino ketone of the formula



with a Grignard reagent of the formula R^1MgX wherein X is bromine or chlorine under Grignard conditions; hydrolizing the reaction mixture to form a pyrrylamino alkanol of the formula



and reacting said pyrrylamino alkanol with a mineral base to effect condensation to said aminoalkylpyrrolobenzoxazalkane.

4,107,075

APPARATUS FOR SPRAYING PLASTIC FOAM

Fritz Kramer, 911 Promontory Dr. West, Newport Beach, Calif. 92660

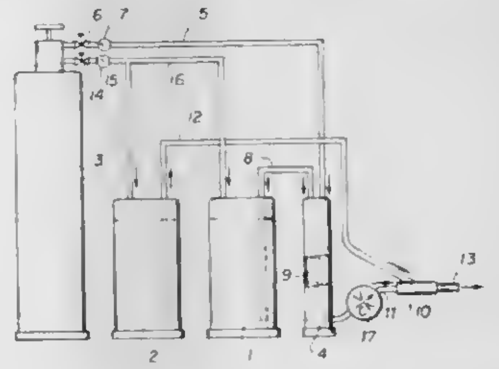
Filed Dec. 9, 1974, Ser. No. 530,982

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—359 E **1 Claim**

1. A plastic foam spraying apparatus comprising:

(a) a first container adapted to hold a solution of a urea-formaldehyde precondensate in a first aqueous medium free from catalyst;
(b) a second container adapted to hold a second aqueous medium including a catalyst capable of causing rapid hardening of said precondensate when said first medium is mixed with said second medium;
(c) supply means for supplying a gas under a pressure higher than atmospheric pressure;
(d) conduit means connecting said supply means to said first and second containers;
(e) foaming means including a foaming chamber communicating with said supply means and with said first container for dispersing said gas in said first medium and for thereby forming a foam in said foaming chamber;
(f) a mixing chamber;
(g) a first conduit connecting said foaming chamber to said mixing chamber;
(h) a second conduit connecting said second container to said mixing chamber;
(i) a third conduit leading outward of said mixing chamber and terminating in an orifice normally open to the atmosphere, whereby said gas under pressure
  (1) conveys said foam from said foaming chamber to said mixing chamber through said first conduit,



  (2) conveys said second medium from said second container to said mixing chamber through said second conduit,
  (3) mixes the conveyed foam and the conveyed second medium in said mixing chamber, and
  (4) conveys the mixture so produced outward of said mixing chamber through said third conduit when said orifice is open to the atmosphere; and
(j) check valve means in said first conduit for preventing flow of said mixture toward said foaming chamber when said orifice is blocked.

4,107,076

CATALYST SYSTEM FOR CATALYZING THE WATER GAS SHIFT REACTION

Richard Eisenberg, and Chien-Hong Cheng, both of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,133

Int. Cl.^{2} C01B *2/06*

U.S. Cl. 252—373 **33 Claims**

1. In a method for effecting the water gas shift reaction, the improvement which comprises contacting water and carbon monoxide reactants in the presence of a homogeneous catalyst system at a temperature from about 80° C to less than 95° C, said homogeneous catalyst system being formed essentially by combining $[Rh(CO)_2Cl]_2$, an iodide salt of a non-interacting cation, a strong acid selected from the group consisting of HCl and HBF_4, water and acetic acid, the ratio of iodide to rhodium being at least 50 to 1 and the ratio of water to hydrogen cations being about 5 to 100 to 1 in said catalyst system, thereby producing hydrogen and carbon dioxide.

4,107,077

LIMULUS LYSATE OF IMPROVED SENSITIVITY AND PREPARING THE SAME

James D. Sullivan, Jr., and Stanley W. Watson, both of Falmouth, Mass., assignors to Associates of Cape Cod, Inc., Woods Hole, Mass.

Continuatioo of Ser. No. 595,800, Jul. 14, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,226

Int. Cl.^{2} C09K *3/00;* **G01N** *31/00;* **C12K** *1/00*

U.S. Cl. 252—408 **10 Claims**

8. A lysate sensitive to endotoxins derived from horseshoe crabs (Limulus) by a process comprising:

withdrawing hemolymph from horseshoe crabs (Limulus);

preparing a lysate by lysing the amoebocytes obtained from said hemolymph;

treating said lysate with an amount of an organic solvent selected from the group consisting of chloroform, iodoform, bromoform, methylbromide, methylchloride, methyliodide, ethylchloride, ethylbromide, ethyliodide, propylchloride, propylbromide, propyliodide, ethylenechloride, methylenechloride, chlorobenzene, bromobenzene, iodobenzene, dimethylether, diethylether, carbontetrachloride, trichloroethylene, toluene and hexane sufficient to denature a clotting inhibitor present in said lysate; and

isolating said organic solvent treated lysate.

4,107,078

PREPARATION OF A SUPPORTED METAL PHTHALOCYANINE CATALYST

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 22, 1977, Ser. No. 826,620
Int. Cl.^{2} B01J *27/24*

U.S. Cl. 252—428 8 Claims

1. A method of preparing a supported metal phthalocyanine catalyst which comprises impregnating a solid adsorptive support with a common aqueous dispersion of a metal phthalocyanine and a water soluble carboxylic acid containing up to about 10 carbon atoms, and thereafter drying the resulting catalytic composite.

4,107,079

INSOLUBLE METALLIC COMPLEXES AND CATALYSTS THEREFROM

Yvonick Chevallier, Decines; Jacques-Pierre Martinaud, Lyon; Francois Meiller, Palaiseau, and Jean Berthoux, Decines, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 504,710, Sep. 10, 1974, abandoned. This application Jan. 26, 1977, Ser. No. 762,474
Claims priority, application France, Sep. 10, 1973, 73 33006
Int. Cl.^{2} B01J *23/42, 23/44, 23/46, 27/10*

U.S. Cl. 252—429 R 14 Claims

1. A solid, solvent insoluble catalyst comprising a coordination complex of an insoluble ligand, a Group VIII noble metal and ligands other than said insoluble ligand bonded to said transition metal and having the formula:

$$A - M\,(L')_n\,(L'')_q$$

wherein A is an insoluble ligand prepared by reacting an alkoxysilane or a chlorosilane which contains an amine radical or a carboxylic acid radical with silica or alumina or by reacting a vinylalkoxysilane or a vinylchlorosilane with silica or alumina and the copolymerizing the resultant product with vinylpyridine or acrylic acid; M is a Group VIII noble metal; L' and L'' are the same or different and comprise ligands selected from the group consisting of chlorine, carbon monoxide, olefins, hydrocarbyl substituted amines, phosphines, phosphites and arsines wherein any hydrocarbyl moiety has from 1 to 20 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkaryl; and *n* and *q* are integers between about 0 and 6.

4,107,080

PROCESS FOR PREPARING CATALYST FOR OLEFIN POLYMERIZATION

Ryozo Taniyasu, Yokohama; Hideo Kurokawa, Kawasaki, and Takeshi Saito, Chiba, all of Japan, assignors to The Lion Fat and Oil Company Limited, Tokyo, Japan

Filed May 4, 1977, Ser. No. 793,545
Claims priority, application Japan, May 10, 1976, 51-52161
Int. Cl.^{2} B01J *31/12, 31/02*

U.S. Cl. 252—431 C 7 Claims

1. A process for preparing a catalyst for polymerization of a mono olefin having 6 through 20 carbon atoms comprising condensing: (a) an aliphatic carboxylic acid having 3 to 12 carbon atoms and, (b) aluminum chloride, aluminum bromide or a mixture thereof, in an amount of 0.7 through 1.2 mol of the component (b) based upon 1 mol of the component (a) at a temperature within the range of from 30° to 150° C.

4,107,081

CATALYST SYSTEM AND PROCESS FOR POLYMERIZATION OF CONJUGATED DIENES THEREWITH

Adel Farhan Halasa, Bath, and James Edward Hall, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 24, 1977, Ser. No. 809,819
Int. Cl.^{2} C08F *4/08, 4/52*

U.S. Cl. 252—431 L 8 Claims

1. A catalyst composition capable of polymerizing butadiene to a high molecular weight polymer having 10–55% 1,2-microstructure consisting essentially of

(a) a trihydrocarbyl aluminum compound in which the hydrocarbyl radicals have 1–10 carbon atoms selected from the class consisting of alkyl, aryl and cycloalkyl radicals; and

(b) an alkali metal compound of the formula M—Y—R, wherein M represents Li, Na, or K; Y represents O, S or NR^1; R represents H or a hydrocarbyl radical of 1–10 carbon atoms; R^1 represents a hydrocarbyl or acyl radical of 1–10 carbon atoms, except that when Y is NR^1, the R and R^1 can each represent divalent groups so that together they form with the N a piperidyl, morpholino or diethylene diamino group;

the concentrations of the respective components giving an Al/alkali metal molar ratio of 0.1/1 to 10/1.

4,107,082

MALACHITE PREPARATION

Joseph Melvin Fremont, Glen Mills, Pa., assignor to E. I. Du Poot de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 687,179, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 445,476, Feb. 25, 1974, abandoned. This application May 6, 1977, Ser. No. 794,674
Int. Cl.^{2} B01J *27/20*

U.S. Cl. 252—431 R 18 Claims

11. A process for the production of a particulate cuprous acetylide complex having uniformly dispersed therein bismuth in the amount of 2 to 5 percent by weight based on the amount of copper present, said process consisting essentially of the following steps:

precipitating hydrated copper carbonate particles by the addition to water of solutions of cupric salts and alkali metal carbonate or bicarbonate to form a reaction mixture, said solutions being in such proportions as to maintain the pH about in the range of 5.0 to 8.0,

nucleating and converting the hydrated copper carbonate to basic copper carbonate in the reaction mixture at a temperature of at least about 60° C., and

growing agglomerates of the nucleated crystalline particles by precipitating basic copper carbonate containing bismuth by the addition to the reaction mixture of solutions of cupric salts, bismuth salts and alkali metal carbonate or bicarbonate in such proportions as to maintain the pH about in the range of 5.0 to 8.0 with the reaction mixture at a temperature of at least about 60° C. until the average cross-sectional dimension of the agglomerates of crystallites is at least about 10 microns, and then

subjecting the agglomerated basic copper carbonate as a slurry in aqueous medium at 50° to 120° C., to the simultaneous action of formaldehyde and acetylene at partial pressure of not more than 2 atmospheres, said aqueous medium having a pH of 3 to 10 at the initiation of said subjecting, and continuing the reaction until said complex is obtained.

4,107,083

HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Frank H. Adams, La Grange Park, and H. Peter G. Knapik, Brookfield, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 6, 1977, Ser. No. 804,136
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.^{2} B01J *27/04*

U.S. Cl. 252—439 12 Claims

1. A selectively sulfided acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.2 to about 5 wt. % nickel, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; and wherein substantially all of the catalytically available nickel is present in a sulfided state.

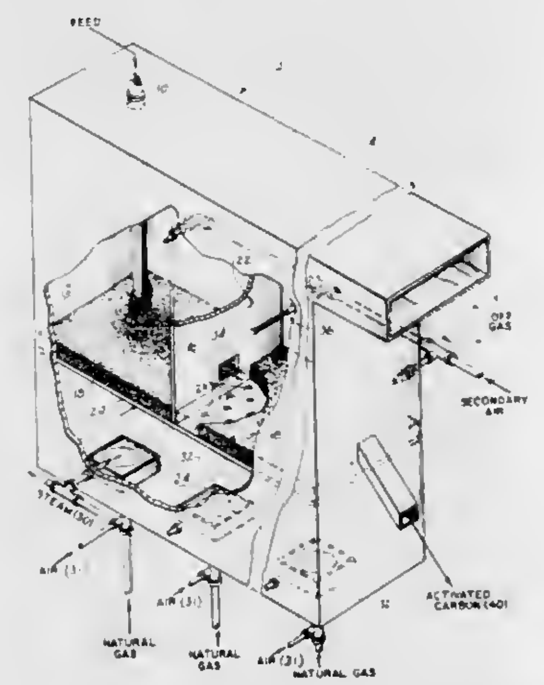
4,107,084

PROCESS FOR ACTIVATING CARBONACEOUS MATERIAL

Albert J. Repik, Charleston; Charles E. Miller, Mt. Pleasant, and Homer R. Johnson, Charleston, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 585,258, Jun. 9, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,098
Int. Cl.^{2} C01B *31/10;* **B01J** *21/18*

U.S. Cl. 252—445 6 Claims



1. In a process for continuously activating granular carbon in a fluidized bed system at a temperature between 1,000° F. and 2,200° F. within said system, said system being fluidized with a mixture of combustion gas and an oxidizing gas, the improvement in activation which consists essentially of,

supplying thermal energy to a plurality of fluidized bed compartments in side by side communication with one another whereby said carbon is continuously advanced from a preceding compartment to a succeeding compartment to maintain the temperature at a constant temperature in each bed by providing sufficient excess air to each bed whereby more than 10% of the thermal energy required for activation is supplied by reaction of the excess air in the fluidizing gases with the gaseous products of activation and devolatilization and maintaining a constant temperature within each bed by lowering the temperature of the fluidizing gases to thereby maximize the yield of the activated carbon.

4. The process of claim 1 further comprising injecting air into at least one of said beds at a point above the top of the bed in an amount sufficient to react with volatile products within the off gas from said bed to provide additional thermal energy for the activation process.

4,107,085

PROCESS FOR PRODUCTION OF ATTRITION RESISTANT ANTIMONY OXIDE CONTAINING FLUIDIZED BED CATALYST HAVING CONTROLLED PARTICLE SIZE DISTRIBUTION

Yutaka Sasaki, Yokohama, and Yoshimi Nakamura, Kawasaki, both of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,957
Claims priority, application Japan, May 19, 1976, 51-56686
Int. Cl.^{2} B01J *37/00, 29/16*

U.S. Cl. 252—448 18 Claims

1. A process for producing an attrition resistant antimony oxide containing fluidized bed catalyst having a controlled particle size distribution, the process comprising:

(a) preparing a slurry containing a pentavalent antimony compound, one or more polyvalent metal compounds and a silica sol as essential components;

(b) adjusting the pH of the above slurry to not more than about 7 and heating the slurry at a temperature of from about 40° C to about 150° C for at least 20 minutes while keeping the slurry in a slurry state to form a slurry containing pentavalent antimony;

(c) spray drying the thus obtained slurry to form substantially spherical particles;

(d) separating those extremely fine particles and/or coarse particles unsuitable for practical use from the above obtained spherical particles and returning these separated particles to the slurry prior to the spray drying in step (c) as they are or after a pulverization thereof; and

(e) calcining the particles not containing the extremely fine particles and/or coarse particles at a temperature of from about 400° C to about 1100° C.

3. The process according to claim 1, wherein the polyvalent metal compound is a compound of metal selected from the group consisting of iron, cobalt, nickel, tin, uranium, copper, manganese, titanium, vanadium, molybdenum, tungsten, tellurium, bismuth, thorium, cerium, magnesium, zinc, aluminum and zirconium.

4,107,086

CATALYTIC COMPOSITE AND METHOD OF MANUFACTURE

Edward Michalko, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 671,893, Mar. 29, 1976, abandoned, and a continuation-in-part of Ser. No. 671,895, Mar. 29, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,524
Int. Cl.^{2} B01J *29/06;* **C07C** *3/00, 3/58*

U.S. Cl. 252—455 Z 18 Claims

1. A catalytic composite comprising a calcined mixture of a refractory inorganic oxide and a zeolite of the mordenite crystal structure, said zeolite having been treated with an aqueous ammoniacal base solution at a pH of at least about 9.5 while containing less than about 5 wt. % sodium, calculated as Na_2O, and thereafter admixed with said refractory inorganic oxide in a weight ratio of from about 1:3 to about 3:1, and calcined to provide said catalytic composite.

10. A method of manufacture providing a catalytic composite of improved activity which comprises subjecting a zeolite of the mordenite crystal structure and containing less than about 5 wt. % sodium, calculated as Na_2O, to an aqueous

ammoniacal treatment at a pH of at least about 9.5, and thereafter admixing said zeolite with a refractory inorganic oxide in a weight ratio of from about 1:3 to about 3:1, and calcining the mixture to provide said catalytic composite.

4,107,087

USE OF CITRIC ACID TO MAKE CATALYST FROM CATALYST FINES

George N. Pessimisis, Berwyn, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 672,379, Mar. 31, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,479

Int. Cl.^{2} B01J *29/06, 27/00, 27/02*

U.S. Cl. 252—455 R **18 Claims**

1. A method of preparing hydrotreating catalysts from silica/alumina catalyst fines which comprises:

A. adding from 1.0 to 15.0% by weight of citric acid to an aqueous slurry of said silica/alumina catalyst fines, said fines being silica/alumina hydrotreating catalyst fines impregnated with:
   (1) a metal selected from the group consisting of iron, cobalt, nickel, palladium and platinum; and
   (2) a metal selected from the group consisting of chromium, molybdenum, tungsten, selenium and tellurium;
B. mixing, filtering, drying, extruding and calcining to form a hydrotreating catalyst.

8. A method of preparing hydrotreating catalysts which comprises:

A. adding from 1.0 to 15.0% by weight of citric acid to an aqueous slurry containing a mixture of silica/alumina catalyst fines and silica/alumina gel, said fines and gel having been impregnated with:
   (1) a metal selected from the group consisting of iron, cobalt, nickel, palladium and platinum; and
   (2) a metal selected from the group consisting of chromium, molybdenum, tungsten, selenium and tellurium;
B. mixing, filtering, drying, extruding and calcining said mixture to form a hydrotreating catalyst.

4,107,088

COPOLYMERIZED SILICA HYDROSOL BOUND CRACKING CATALYSTS

Curtis Homer Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 596,922, Jul. 17, 1975, Pat. No. 4,022,714. This application May 6, 1977, Ser. No. 796,644

Int. Cl.^{2} B01J *29/00, 29/06*

U.S. Cl. 252—455 Z **9 Claims**

1. A hydrocarbon cracking catalyst which comprises:
(a) clay;
(b) a crystalline aluminosilicate zeolite; and
(c) an inorganic oxide binder comprising silica and from about 0.1 to 10% by weight based on the weight of said silica of an inorganic oxide selected from the group consisting of titanium oxide, zirconium oxide, and mixtures thereof, said binder being prepared by drying an inorganic hydrosol of said binder components having a pH of about 2.0 to 3.2 before gellation occurs.

8. An inorganic oxide binder comprising:
(a) silica; and
(b) from about 0.1 to 10% by weight based on the weight of said silica of an inorganic oxide selected from the group consisting of titanium oxide, zirconium oxide and mixtures thereof, said binder being prepared by drying a hydrosol of said binder components having a pH of about 2.0 to 3.2 before gellation occurs.

4,107,089

CATALYST FOR THE SYNTHESIS OF METHANOL AND METHOD FOR PREPARING SAME

Petr Grigorievich Boodar, prospekt Kosmonavtov, 15, kv. 12; Oleg Nikolaevich Gorosbko, ulitsa Donetskaya, 54, kv. 24; Larisa Emmanuilovna Suschaya, prospekt Kosmonavtov, 15, kv. 52; Valentina Vasilievna Lavrova, ulitsa Avtomobilnaya, 7, kv. 49; Valentina Emmanuilovna Leleka, ulitsa Gagarina, 54-b, kv. 36, and Eduard Grigorievich Ilko, ulitsa Parizhskoi Kommuny, 8, kv. 31, all of Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

Filed Mar. 14, 1977, Ser. No. 777,333

Int. Cl.^{2} B01J *21/04, 21/10, 23/06, 23/26, 23/28, 23/30, 23/72*

U.S. Cl. 252—465 **15 Claims**

1. A catalyst composition for the synthesis of methanol consisting essentially of: copper oxide, zinc oxide and tungsten oxide; and at least one oxide of a difficultly reducible metal selected from the group consisting of aluminum and magnesium.

4,107,090

CATALYST FOR HYDROGENOLYSIS OF N,N-DIMETHYL-3,5-DITERT.BUTYL-4-HYDROXYBENZYLAMINE

Anatoly Borisovich Fasman, ulitsa Kazachya, 3"a"; Dmitry Vladimirovich Sokolsky, ulitsa Kalinina, 71, kv. 4, both of Alma-Ata; Grigory Iosifovich Rutman, ulitsa Revoljutsionnaya, 7, kv. 6; Jury Ivanovich Michurov, prospekt Lenina, 13, kv. 4, both of Sterlitamak, Bashkirskaya ASSR; Viktor Anatolievich Zavorin, 2 Vesnovskaya ulitsa, 45, kv. 88, Alma-Ata; Zoya Stepanovna Shallmova, ulitsa Druzhby, 19, kv. 56, Sterlitamak, Bashkirskaya ASSR; Venera Fatykhovna Timofeeva, ulitsa Zharokova, 184, kv. 5, Alma-Ata; Tulkibai Galikbarovich Dautov, ulitsa I.Nasyri, 13, kv. 96, Sterlitamak, Bashkirskaya ASSR; Daniel Kalimullovich Bazhakov, ulitsa Satpaeva, 37, kv. 41, Alma-Ata, and Jury Mikhailovich Sivakov, ulitsa Dybenko, 22, korpus 5, kv. 385, Moscow, all of U.S.S.R.

Filed Jun. 16, 1977, Ser. No. 807,254

Claims priority, application U.S.S.R., Jun. 21, 1976, 2374525

Int. Cl.^{2} B01J *21/04, 23/64, 23/86, 23/88*

U.S. Cl. 252—465 **1 Claim**

1. A catalyst for hydrogenolysis of N,N-dimethyl-3,5-ditert-.butyl-4-hydroxybenzylamine comprising an alloy of nickel, aluminum, chromium, molybdenum and palladium; the components being present in the alloy in the following proportions, percent by weight:

nickel — 39.0 to 47.7;
chromium — 0.3 to 2.0;
molybdenum — 0.5 to 4.0;
palladium — 0.01 to 0.20;
aluminum — the balance.

4,107,091

CATALYST FOR SYNTHESIZING A GASEOUS HYDROCARBON MIXTURE HAVING A HIGH METHANE CONTENT FROM CARBON MONOXIDE AND HYDROGEN

Surjit Singh Khera, Upper Arlington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 638,839, Dec. 8, 1975, Pat. No. 3,997,582. This application Dec. 2, 1976, Ser. No. 746,735

Int. Cl.^{2} B01J *21/04, 23/80*

U.S. Cl. 252—466 J **5 Claims**

1. A sulfur resistant catalyst for use in the synthesis of a gaseous hydrocarbon mixture having a high methane content from hydrogen and carbon monoxide which consisting essentially of an interspersed mixture of cobalt oxide, aluminum oxide and zinc oxide, which mixture by elemental analysis contains less than about 0.5 weight percent of alkali metal, with said catalyst comprising about 1 to about 15 percent of cobalt oxide, about 15 to about 60 weight percent of aluminum oxide and about 35 to about 70 weight percent of zinc oxide.

4,107,092

NOVEL COMPOSITIONS OF MATTER

Robert D. Carnahan, Barrington, Ill.; William C. Holt, Jr., Alexandria, Va., and Karl J. Youtsey, Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 335,972, Feb. 26, 1973, abandoned. This application Mar. 24, 1976, Ser. No. 670,014

The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.

Int. Cl.^{2} H01B *1/06*

U.S. Cl. 252—511 **5 Claims**

1. A composition of matter comprising a polymeric material containing, as a filler therefor, from about 10% to about 95% by weight of a refractory inorganic oxide having a carbonaceous pyropolymer composited on the surface thereof, said filler having a particle size in the range of from about 0.1 microns to about 100 microns and a resistivity in the range of from about 0.001 ohm-centimeters to about 10^{10} ohm-centimeters.

4,107,093

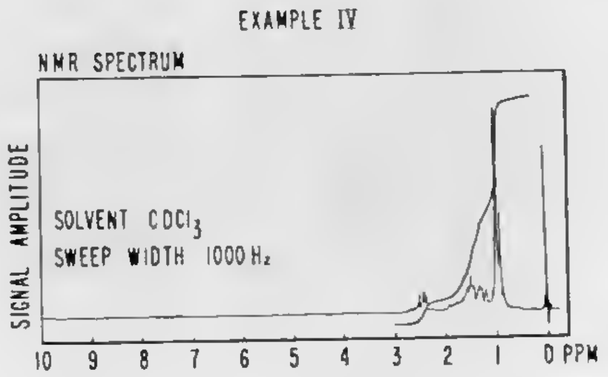
3,3-DIMETHYL-1-(4-METHYLVALERYL)-CYCLOHEXANE PERFUME COMPOSITIONS

Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust; Frederick Louis Schmitt, Holmdel; John B. Hall, Rumson, and James Milton Sanders, Eatontown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

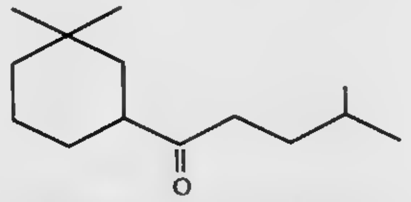
Division of Ser. No. 713,357, Aug. 11, 1976, Pat. No. 4,062,894. This application Jul. 28, 1977, Ser. No. 819,954

Int. Cl.^{2} C11B *9/00*

U.S. Cl. 252—522 **4 Claims**



1. The perfume composition comprising the compound with the structure:



and one or more auxiliary perfume ingredients.

4,107,094

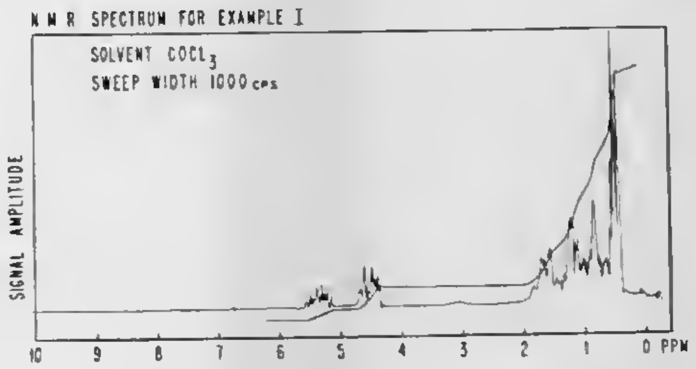
3,3-DIMETHYL 2(3-BUTENYL) NORBORNANOL-2 PERFUME COMPOSITIONS

Kenneth K. Light, Long Branch; Manfred Hugo Vock, Locust, both of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Frederick Louis Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

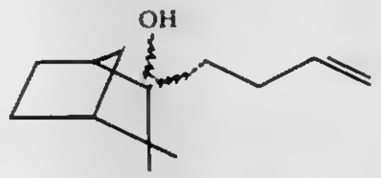
Division of Ser. No. 740,937, Nov. 11, 1976, Pat. No. 4,064,184. This application Sep. 19, 1977, Ser. No. 834,400

Int. Cl.^{2} C11B *9/00*

U.S. Cl. 252—522 **2 Claims**



1. A perfume composition comprising the compound having the structure:



wherein the wavy lines are representative of "exo" or "endo" configurations and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, nitriles, esters and lactones.

4,107,095

LIQUID OLEFIN SULFONATE DETERGENT COMPOSITIONS CONTAINING ANTI-GELLING AGENTS

Stephen Cajetan Klisch, Somerset, and Charles Andrew Martin, Morris Plains, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 350,268

Int. Cl.^{2} C11D *1/14, 3/34, 17/08*

U.S. Cl. 252—541 **4 Claims**

1. An aqueous, liquid detergent composition consisting essentially of from 25 to 35% by weight of a water-soluble salt of the reaction product of a sulfonated C_{12}–C_{18} alpha olefin or a mixture of said reaction product salt and a water-soluble salt of a C_{10}–C_{18} ethoxylated alcohol sulfate having 1 to 5 ethenoxy groups, said reaction product and sulfate salts being selected from the group consisting of sodium, potassium, ammonium and mono, di- and triethanolammonium salts, 0.5 to 8% by weight of a C_8–C_{16} alkanoic acid ethanolamide selected from the group consisting of monoethanolamide, diethanolamide and ethoxylated monoethanolamide having 1 to 4 ethenoxy groups and from 2 to 6% by weight of an anti-gelling agent selected from the group consisting of a water-soluble salt of a sulfosuccinate or an allyl sulfonate, the weight ratio of olefin sulfonate to anti-gelling agent being about 16:1 to 2:1, in an aqueous medium, said composition being characterized by resistance to gel formation and ready dissolution of any gel formed.

4,107,096

LOW FOAMING BETA-AMINO PROPIONIC ACID SURFACE ACTIVE AGENTS

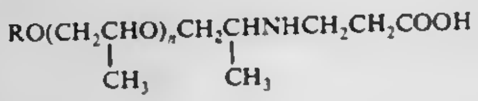
Edward E. McEntire, and Robert M. Gipson, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,940

Int. Cl.² C11D *1/88, 1/90;* **C07C** *101/04*

U.S. Cl. 252—546 **4 Claims**

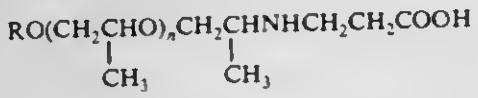
1. Low-foaming, surface active beta-amino propionic acids of the formula:



$$RO(CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HO)_nCH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HNHCH_2CH_2COOH$$

where R is a C_6 to C_{18} aliphatic hydrocarbon radical and *n* has an average value of from 0 to about 13.

4. An improved detergent composition containing from about 0.1 wt. % to about 10 wt. % of a beta-amino propionic acid of the formula:



$$RO(CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HO)_nCH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HNHCH_2CH_2COOH$$

where R is a C_6 to C_{18} aliphatic hydrocarbon radical and *n* has an average value of from 0 to about 13, the beta-amino propionic acid in the detergent composition maintaining water solubility in a pH range of 1 to 11.

4,107,097

PROCESS FOR PREPARING POLYCATION-POLYANION ELECTROLYTE COMPLEXES HAVING CARBOXYLIC ACID AND ALKENYL RADICAL SUBSTITUENTS AND FILMS THEREOF

Toru Seita; Shunichi Asami, and Akihiko Shimizu, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Nov. 12, 1976, Ser. No. 741,469

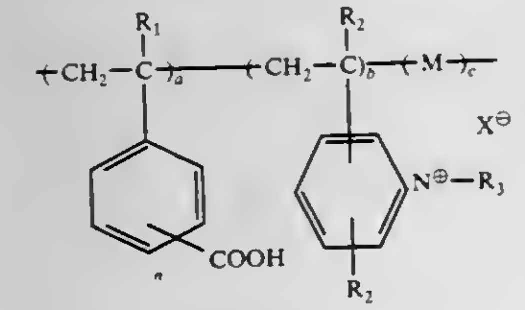
Claims priority, application Japan, Nov. 21, 1975, 50-139196

Int. Cl.² C08J *5/22;* **B01D** *13/04;* **A61F** *1/24*

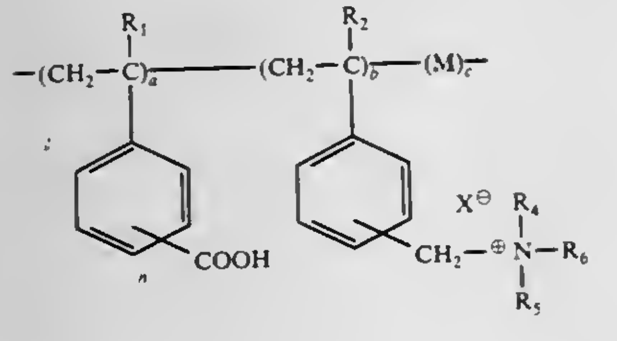
U.S. Cl. 521—32 **13 Claims**

1. A process for the preparation of polymeric electrolyte complexes, which comprises:

reacting at least one polymer represented by one of the following formulas:



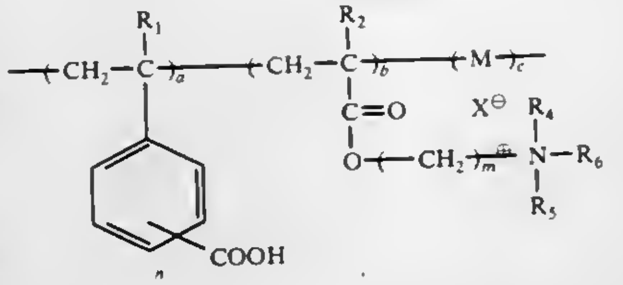
(1),



(2),

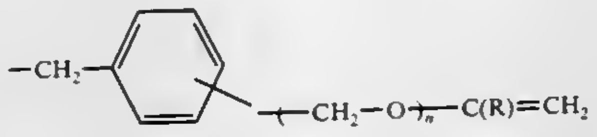
and,

-continued

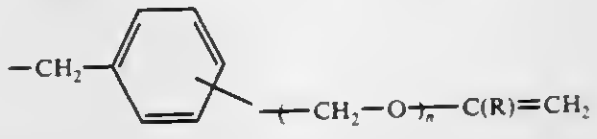


(3)

wherein R_1 and R_2 represent hydrogen or alkyl of 1 to 4 carbon atoms; R_3 is $-CH_2-C(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m COOC(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m COOCH_2-(R)=CH_2$, or $\leftarrow CH_2 \rightarrow_m O-C(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m O-CH_2-C(R)=CH_2$ or



wherein R is hydrogen or methyl, *m* is a number from 1 to 3 and *n* is 0 or 1; at least one of R_4, R_5 and R_6 is $-CH_2-C(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m COOC(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m COOCH_2OC(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m O-C(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m O-CH_2-C(R)=CH_2$, $\leftarrow CH_2 \rightarrow_m CONH-C(R)=CH_2$



wherein R is hydrogen or methyl, *m* is a number from 1 to 3 and *n* is 0 or 1; the remaining R_4, R_5 and R_6 groups represent alkyl or alkylol groups of 1 to 4 carbon atoms; *b* is an integer of 10 to 20,000, *a/b* is in a range of 0.01 to 2; *c/b* is in a range of 0 to 3;

X is halogen or hydroxyl, and M is a vinyl monomer and/or a monomer having an ethylenic double bond, with a highly electrolytic polyanion dissolved in water or a mixed solvent of water and at least one member selected from the group consisting of water-miscible acids and organic solvents.

4,107,098

ANION-EXCHANGE RESINS

Noriyoshi Tamura, and Kunio Kibara, both of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Jun. 10, 1977, Ser. No. 805,566

Claims priority, application Japan, Jun. 12, 1976, 51-68861

Int. Cl.² C08F *8/30;* **C08G** *59/00*

U.S. Cl. 521—25 **12 Claims**

1. A process for producing an anion-exchange resin which comprises reacting a compound (1) having a halomethyl group and an oxirane ring in the molecule thereof with an imidazole compound (2), and reacting the modified imidazole thus obtained with a polyfunctional epoxy compound (3) thereby to produce a resin which has an imidazole content of at least 0.9 mole per 1,000g of the resin.

4,107,099

BOROHYDRIDE EXCHANGE RESINS AND THEIR USES AS REDUCING AGENTS AND IN PREPARATION OF VOLATILE METAL HYDRIDES

Ramesh Subayya Hedge, Danvers, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed Feb. 10, 1977, Ser. No. 767,243

Int. Cl.² C07C *29/14;* **C22B** *43/00;* **C07C** *97/00*

U.S. Cl. 521—30 **4 Claims**

1. A method of making an anion exchange resin containing borohydride counter ions which comprises treating a halide form anion exchange resin with a solution containing a borohydride.

4. A composition comprising an anion exchange resin containing cyanoborohydride counter ions.

4,107,100

POROUS, SUBSTANTIALLY FOAM-FREE COMPOSITES

Josef Peterhans; Otto Volkert, both of Ludwigshafen, and Wilhelm Friedrich Beckerle, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 6, 1975, Ser. No. 584,665

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1974, 2427897

Int. Cl.² C08G *18/10, 18/14*

U.S. Cl. 521—137 **5 Claims**

1. Porous substantially foam-free composite material, characterized in that granular solid particles of shredded waste-rubber and/or rubber granulates with an averge grain size of 0.1 to 20 millimeters are mixed with

(a) 3 to 50 weight percent of an isocyanate-group-containing prepolymer, relative to the weight of the solid particles; and then with

(b) at least 20 weight percent water, relative to the weight of the isocyanate-group-containing prepolymer, and the reaction mixture thereby produced is permitted to harden.

4,107,101

PROCESS FOR THE PRODUCTION OF CROSSLINKED, URETHANE-CONTAINING PLASTICS

Rolf Kubens, Ordenthal-Hahnenberg, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 2, 1975, Ser. No. 582,970

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1974, 2427089

Int. Cl.² C08G *18/28*

U.S. Cl. 521—137 **9 Claims**

1. A process for the production of crosslinked, urethane-containing plastics which consists essentially of reacting

(a) at least one organic polyisocyanate,

(b) at least one organic polyhydroxyl polyester having an average hydroxyl number of from 200 to 1000, an average molecular weight of from 200 to 800, and an average double band content of from 0.1 to 0.5 gram equivalents of C=C double bonds per 100 grams of said polyester, and

(c) at least one olefinically unsaturated monomer having no more than one isocyanate-reactive group and having a boiling point of from 40° to 250° C, the amount of said monomer being such that for every olefinically unsaturated double bond in said polyester, there are from 0.3 to 5 olefinically unsaturated double bonds emanating from the monomer,

the quantities of the reactants being chosen such that there are from 0.3 to 5 isocyanate groups present in the reaction mixture per hydroxyl group present.

4,107,102

HIGHLY ELASTIC POLYURETHANE FOAMS AND PROCESS FOR MAKING THEM

Manfred Dahm, Bergisch Neukirchen, and Manfred Jautelat, Burscheid-Hilgen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 646,466, Jan. 5, 1976, abandoned, which is a continuation of Ser. No. 455,706, Mar. 28, 1974, abandoned. This application May 13, 1977, Ser. No. 796,797

Int. Cl.² C08G *18/14, 18/32*

U.S. Cl. 521—163 **6 Claims**

1. A process for making a highly elastic polyurethane foam which comprises reacting a poly(alkylene ether) polyol which contains at least two hydroxyl groups and has a molecular weight of at least about 1500, at least 10% by weight of the hydroxyl group being primary hydroxyl groups and, a hydrazine derivative and/or hydrazine adduct having the general formula:

$$R-NH-NH-R'.(H_2O)_n,$$

in which R and R'are identical or different and represent hydrogen or alkyl, cycloalkyl, aryl, aralkyl or acyl groups and *n* = 0 or 1, with an organic polyisocyanate containing distilled tolylene diisocyanate in the presence of a blowing agent, the reaction being carried out in the absence of polyether-polysiloxane blocked copolymer foam stabilizers and the resultant foam having a density of from about 18 to about 50 kg/m³.

4,107,103

POLYURETHANES PRODUCED FROM PHOSPHORUS CONTAINING FLAME RETARDING AGENTS WHICH ARE REACTIVE WITH ISOCYANATES

Hans Hübner, Leverkusen; Johannes Blahak, Cologne, and Hans-Joachim Meiners, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

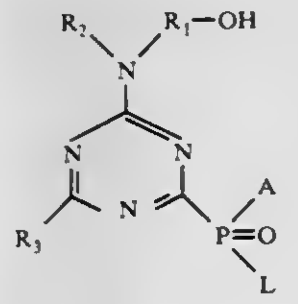
Division of Ser. No. 637,799, Dec. 4, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,189

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1974, 2459492

Int. Cl.² C08G *18/32, 18/38*

U.S. Cl. 528—72 **6 Claims**

1. In a process for the production of polyurethane resins comprising reacting polyisocyanate, high molecular and/or low molecular weight polyols, and optionally other compounds containing groups which are reactive with isocyanates, the improvement which comprises using as compounds which contain groups capable of reacting with isocyanates in such a quantity that the polyurethane contains at least 0.5% by weight of phosphorus, the compounds of the general formula:

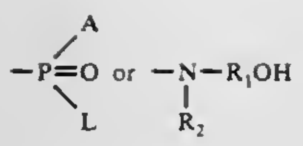


wherein

R_1 represents C_1–C_5 alkylene groups which may be branched,

R_2 represents C_1–C_3 alkyl groups which may be branched or R_1 OH and

R_3 represents C_1–C_8-alkyl, C_1–C_8-dialkylamino, C_1–C_4-oxyalkyl, C_1–C_4-thioalkyl, C_6–C_{14}-aryl or C_7–C_{15}-aralkyl groups or



$$-P(A)(L)=O \text{ or } -N(R_2)-R_1OH$$

and

A and L may be identical or different and represent C_1–C_{10}-alkyl groups, which may be branched, benzyl groups or OR groups, wherein R represents an alkyl group, with 1–8 C atoms which may be branched, or a benzyl group.

4,107,104
HALOGENATED XYLENES

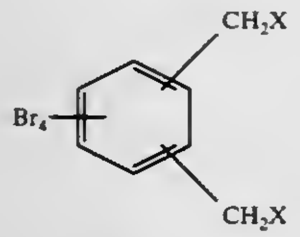
Michael Dubeck, Birmingham, and David R. Brackenridge, Royal Oak, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 70,922, Sep. 9, 1970, abandoned. This application May 25, 1973, Ser. No. 363,789

Int. Cl.² C08G *18/32, 18/14*

U.S. Cl. 521—171 **8 Claims**

1. A polyurethane foam composition produced by reaction of an organic polyisocyanate, a foaming agent and a polymer selected from the class consisting of hydroxylterminated polyethers and hydroxyl-terminated polyesters and said polyurethane foam having incorporated therein a flame retardant amount of a tetrabrominated xylene-α,α'-diol compound having the formula



wherein x is a hydroxyl radical.

4,107,105
CELLULAR UREA-FORMALDEHYDE RESIN AND METHOD OF PREPARING THE SAME

Heinz Ludwig Korf, Montreal, Canada, assignor to Rapperswill Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 841,997

Int. Cl.² C08J *9/30*

U.S. Cl. 521—80 **9 Claims**

1. A cellular plastic composition bounding a multiplicity of gas-filled cavities, said composition essentially consisting of urea-formaldehyde resin and at least one carbohydrate of the group consisting of glucose, fructose, maltose, and sucrose in an amount of 5 to 20% of the weight of said resin, said member being uniformly distributed in said resin.

4,107,106
PHENOL-ALDEHYDE-AMINE RESIN/GLYCOL CURATIVES FOR ENERGY ABSORBING POLYURETHANES

Raymond Augustine Dunleavy, Charleston, and Anthony Joseph Papa, St. Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,613

Int. Cl.² C08J *9/00*

U.S. Cl. 521—164 **9 Claims**

1. A process for producing a cellular polyurethane elastomer which comprises forming and curing a reaction mixture containing:

(a) a polyol,
(b) as a curative, the reaction product of:
  (I) a phenol which has at least one unsubstituted reactive position on the aromatic nucleus,
  (II) an aldehyde, and
  (III) an aromatic amine,
(c) as a curative, an organic diol,
(d) an organic polyisocyanate in an amount that provides from 0.8 to 1.3 isocyanato groups per active-hydrogen group in the reaction mixture,
(e) a catalytic amount of catalyst for the curing of the reaction mixture to produce the elastomer, and
(f) a blowing agent in an amount sufficient to produce a cellular structure in the elastomer,

said reaction mixture containing from 99 to 30 parts by weight of (a) and from 1 to 70 parts by weight of (b) per 100 parts by weight of (a) and (b) and said reaction mixture containing from 1 to 35 parts by weight of (c) per 100 parts by weight of (a) and (c), with the proviso that the reaction mixture contains no more than 35 parts by weight of (b) and (c) per 100 parts by weight of (a), (b) and (c).

4,107,107
PROCESS FOR THE MANUFACTURE OF A FLAME RESISTANT, INSULATING, ENERGY-ABSORBING, POROUS PHENOLIC FOAM

Morris A. Mendelsohn, Wilkins Township, Allegheny County, Pa.; Girard B. Rosenblatt, Jr., Los Altos, Calif., and Joseph F. Meier, Export, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 16, 1976, Ser. No. 696,609

Int. Cl.² C08J *9/14*

U.S. Cl. 521—106 **13 Claims**

1. A method of making a rigid, high compressive strength phenolic resin foam, comprising the steps of:

(A) forming a premix by mixing:
  (1) 200 parts by weight of at least one liquid phenolic resole resin comprising a mixture of a high viscosity phenolic resin having a viscosity at 25° C of between about 1,550 cps. to about 30,000 cps. and a low viscosity phenolic resin having a viscosity at 25° C of between about 100 cps. to about 1,500 cps., wherein the weight ratio of high viscosity phenolic resin:low viscosity phenolic resin is from about 1:0 to about 5:1,
  (2) about 0.5 parts to about 5 parts by weight of a dual surfactant mixture consisting of a lipophilic surfactant and a hydrophilic surfactant, and
  (3) about 8 parts to about 25 parts by weight of a fluorocarbon blowing agent to form a pre-mix, and then
(B) adding to the pre-mix about 20 parts to about 70 parts by weight of a dual acid catalyst solution comprising a sulfuric acid and phosphoric acid solution, and agitating the admixture, and then,
(C) placing the catalyzed admixture into a containing means and allowing it to solidify, to provide a rigid phenolic foam having a substantially uniform compressive strength of at least 40 psi. at between about 20% to about 50% compression, when compressed at a deflection rate of between about 2 in./min. to about 5 in./min.

4,107,108
POLYPHOSPHAZENE PLASTICIZED RESINS

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

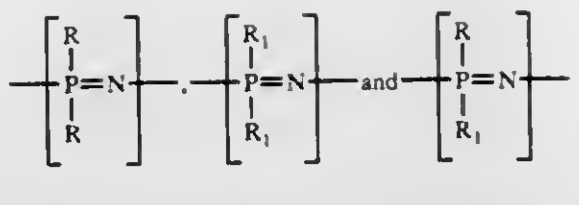
Filed Feb. 8, 1977, Ser. No. 766,780

Int. Cl.² C08J *9/10*

U.S. Cl. 521—85 **5 Claims**

1. A process for foaming a plasticized fire-retardant, low-smoking composition comprising

(a) a phosphazene homopolymer or copolymer comprising repeating units of the formula



$$-\!\left[P(R)(R)=N\right]\!-,\ -\!\left[P(R_1)(R_1)=N\right]\!- \text{ and } -\!\left[P(R)(R_1)=N\right]\!-$$

where R and R_1 are the same or different and are halogen, amino, C_1 to C_{10} dialkylamino, C_1 to C_{10} alkylamino, C_6 to C_{14} arylamino, C_6 to C_{14} diarylamino, C_1 to C_{18} linear or branched alkyl, C_2 to C_{18} linear or branched alkenyl, C_1 to C_{18} alkoxy, C_6 to C_{14} aryl, C_6 to C_{14} aryloxy, substituted C_1 to C_{18} linear or branched alkyl, substituted C_2 to C_{18} linear or branched alkenyl, substituted C_1 to C_{18} alkoxy, substituted C_6 to C_{14} aryl, or substituted C_6 to C_{14} aryloxy, the substituents selected from the group consisting of chlorine, bromine, nitro, cyano, alkoxy, aryloxy, alkenyl, amino, C_1 to C_{10} alkylamino, C_1 to C_{10} dialkylamino, C_6 to C_{14} arylamino, C_6 to C_{14} diarylamino, or mixtures thereof; and

(b) from about 0.1 to about 100 parts by weight per 100 parts of said phosphazene homopolymer or copolymer of a compatible cyclophosphazene of the formula

$$(NPR_{2x-y}{}^{R}{}_{1y})_x$$

where R and R_1 are the same as above, x is at least 3, and $y \leqq 2x$; ;

which process comprises mixing the composition with a chemical blowing agent and heating the mixture to a temperature sufficient to decompose said blowing agent.

4,107,109
REACTIVE COMPOSITIONS AND POLYMERS MADE THEREFROM

Robert James Kassal, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1977, Ser. No. 780,089

Int. Cl.² C08C *19/28;* **C08F** *253/00, 255/04, 255/06*

U.S. Cl. 260—4 R **20 Claims**

1. A stable reactive composition useful for making graft copolymers consisting essentially of a solution of about 25–65% by weight of an uncured elastomer selected from the group consisting of ethylene/higher α-olefin copolymers; natural rubber; ethylene/ethyl acrylate copolymers; stryene butadiene rubber; ethylene/vinyl acetate copolymers; polyisobutylenes; and polychloroprene solubilized in about 35–75% by weight of polymerizable vinyl monomer capable of dissolving said elastomer and a thermally activatable free radical peroxide polymerization initiator whereupon when said reactive composition is polymerized the elastomer forms a continuous phase and the resulting vinyl polymer forms a separate and discrete phase.

2. A free flowing, particulate stable reactive composition useful for making graft copolymers consisting essentially of a solid solution of about 25–65% by weight of an uncured ethylene/higher α-olefin copolymer elastomer containing 60–80% by weight ethylene units and about 35–75% by weight of polymerizable vinyl monomer capable of dissolving in said elastomer and a thermally activatable free radical peroxide initiator whereupon when said reactive composition is polymerized the elastomer forms a continuous phase and the resulting vinyl polymer forms a separate and discrete phase.

10. A process for manufacturing a graft copolymer which consists essentially of introducing a solution of about 25–65% by weight of an uncured elastomer selected from the group consisting essentially of ethylene/higher α-olefin copolymers; natural rubber, ethylene/ethyl acrylate copolymers; styrene butadiene rubber; ethylene/vinyl acetate copolymers; polyisobutylenes; and polychloroprene, solubilized in about 35–75% by weight of a polymerizable vinyl monomer capable of dissolving said elastomer and a free radical peroxide polymerization initiator into a mold cavity and heating the solution to about 120°–180° C for about 2–40 minutes under anaerobic conditions without solvent for the reactants to obtain a graft copolymer wherein the vinyl monomer graft polymerizes on the elastomer, said elastomer being a continuous phase and the resinous vinyl polymer is a separate phase that functions as a reinforcing filler, thus resulting in a grafted copolymer having a tensile modulus in the absence of inorganic fillers of at least about 1.0 MPa at 50% elongation.

4,107,110
GRAFT COPOLYMER COATED REINFORCING AGENTS

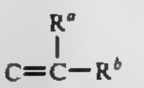
Donald R. Lachowicz, Fishkill, and Charles B. Holder, Wappinger Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 526,200, Nov. 22, 1974, Pat. No. 4,065,521, which is a continuation-in-part of Ser. No. 335,858, Feb. 26, 1973, abandoned, and Ser. No. 335,857, Feb. 26, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,282

Int. Cl.² C08L *9/00, 23/00*

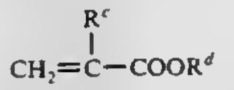
U.S. Cl. 260—17.4 CL **4 Claims**

1. A reinforcing agent coated with a graft copolymer comprising a backbone polymer having a hydrocarbon chain portion and a plurality of pendant hydrocarbon groups each containing a moiety of the formula:



$$-C=C(R^a)-R^b$$

wherein R^a and R^b are independently selected from the group consisting of hydrogen and alkyl of from 1 to 16 inclusive carbon atoms, having grafted thereon an acrylate of the formula:



$$CH_2=C(R^c)-COOR^d$$

wherein R^c is selected from the group consisting of hydrogen and alkyl of from 1 to 3 inclusive carbon atoms and R_d is alkyl of from 1 to 30 inclusive carbon atoms, to form a graft copolymer, wherein the said backbone polymer is 1,2-polybutadiene and wherein about 5 to about 80 percent by weight of the graft copolymer is 1,2-polybutadiene with the balance being the said acrylate, and wherein the said reinforcing agent is selected from the group consisting of glass fiber, asbestos fiber and alpha-cellulose.

4,107,111
POLYMER MADE OF LIGNIN, AND METHOD FOR MAKING IT

Jarl Johan Lindberg, Helsinki; Johannes Turunen, Rauma, and Bo Hortling, Helsinki, all of Finland, assignors to Rauma-Repola Oy, Rauma, Finland

Filed Feb. 21, 1975, Ser. No. 551,688

Claims priority, application Finland, Feb. 21, 1974, 518/74; Aug. 21, 1974, 750282/74

Int. Cl.² C07G *1/00;* **C08H** *5/02;* **C08L** *97/00*

U.S. Cl. 260—17.5 **23 Claims**

1. A method for producing a three-dimensional aromatic nuclei-containing, sulfur-containing polymer derived from lignin and exhibiting a weight loss of less than 10% when heated to 200° C for ½ hour in an inert gas, said method comprising:

heating, in a homogeneous reaction mixture, at least one lignin preparation which is a member of the group consisting of thioglycolic acid-lignin, sulfate-lignin, alkali-lignin, lignosulfonic acid, hydrolysis lignin, chlorinated lignin, ammonium-, alkali-, and alkaline-earth salts of said lignins and lignosulfonic acid, sulfite and sulfate pulp liquor from which carbohydrates have been removed, and lignin degradation products having a suitable activating substituent

with

at least one member of the group consisting of sulfur and a sulfur-containing compound from the group consisting of inorganic sulfides, mercaptans, thioepoxides, thioketones, organic sulfides, disulfides, and sulfur-containing lignin degradation products or mixtures thereof, the amount of elemental sulfur or the sulfur in said sulfur-containing compound comprising from 10–200% by weight of said lignin preparation, at a temperature of about 190°–350° C, for a time sufficient to form the polymer but not longer than 20 hours, wherein the hydrogen atoms of the aromatic rings of the phenyl propane units of lignin or of the conversion products of the phenyl propane units of lignin are partially or completely substituted by thioether bonds.

4,107,112

EPOXY RESIN SOIL STABILIZING COMPOSITIONS

Laurence Latta, Jr., and John B. Leonard, Jr, both of P.O. Box 3506, Beirut, Lebanon

Filed Jul. 28, 1975, Ser. No. 599,383

Int. Cl.^{2} C08L *91/00, 91/04;* **E01C** *7/30;* **E02D** *3/14*

U.S. Cl. 260—18 EP **15 Claims**

1. An epoxy resin ester-based soil stabilizing composition at a dilution sufficient to be applicable to said soil in an amount providing about 0.1 to about 1 weight percent of the epoxy resin ester in said soil, and capable of maintaining the individual particles of said soil in fixed relative positions for an extended period of time when exposed to natural environmental conditions and subjected to applied mechanical stresses, said soil stabilizing composition comprising an epoxy resin ester which is the reaction product of bisphenol A-glycidyl ether type epoxy resin with fatty acids of an oil which is a member of the group consisting of a drying oil and a semi-drying oil, water, a solvent for said reaction product and an emulsifying agent having the characteristics of providing a shelf stability of substantial duration to the soil stabilizing composition in a concentrated condition while permitting dilution with water, said soil stabilizing composition containing no more than about 10 percent free fatty acids.

4,107,113

AUTOXIDISABLE COMPOSITION

David Vincent Gibson, North Bayswater, and Bruce Leary, Frankston, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed May 4, 1976, Ser. No. 683,243

Claims priority, application Australia, May 15, 1975, 1615/75

Int. Cl.^{2} C08L *65/00*

U.S. Cl. 260—18 PF **3 Claims**

1. A liquid convertible coating composition capable of forming a solid film on a substrate, the film-forming constituent of which is a mixture consisting essentially of the following components;

(a) a component wich comprises epoxide groups and which has a maximum average molecular weight of 1200;
(b) a component which has a maximum average molecular weight of 1000 and which comprises on average at least two carboxyl groups; and
(c) a cross-linking agent which comprises at least two chemical groups per molecule which will react with hydroxyl groups,

the said components being present in the mixture in such proportions that

(1) the ratio of the total number of epoxide groups in component (a) to the total number of carboxyl groups in the mixture is from 1 : 05 to 1 : 3.0 and
(2) the total weight of components (a) plus (b) is 50–96% by weight of the mixture,

characterised in that

(i) component (a) is a compound which comprises on average one epoxide group and one autoxidisable fatty acid residue per molecule;
(ii) component (a) comprises at least one autoxidisable fatty acid residue per molecule; and
(iii) the mixture comprises from 10–70% by weight of autoxidisable fatty acid residue,

and further characterised in that the said components are selected from materials which do not boil or thermally decompose below 180° C.

4,107,114

AQUEOUS EMULSION COMPOSITIONS

Yasuharu Nakayama; Nobuhito Hirata, and Yoshio Yamashita, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Oct. 13, 1976, Ser. No. 731,947

Claims priority, application Japan, Oct. 23, 1975, 50/127944

Int. Cl.^{2} C09D *3/74, 5/02*

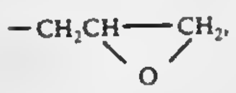
U.S. Cl. 260—22 CB **21 Claims**

1. An aqueous emulsion composition prepared by subjecting a mixture of monoethylenically unsaturated monomer and polyethylenically unsaturated monomer to emulsion polymerization with use of an emulsifier, the emulsifier being a water-soluble resin having a drying oil fatty acid residue or semi-drying oil fatty acid residue, or a water-soluble petroleum resin having non-vinyl double bonds, wherein said polyethylenically unsaturated monomer has 2 to 4 polymerizable double bonds and is at least one compound selected from the group consisting of: esters of (a) polyhydric alcohols having 2 to 4 functional groups and (b) acrylic acid or methacrylic acid; esters of (c) glycidyl acrylate or glycidyl methacrylate and (d) acrylic acid or methacrylic acid; esters of (e) polycarboxylic acids having 2 to 4 functional groups and (f) glycidyl acrylate glycidyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxy propyl methacrylate; adducts of (g) polyepoxy compounds or polyisocyanate compounds having 2 to 4 functional groups respectively and (h) acrylic acid, methacrylic acid, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxy propyl methacrylate; divinylbenzene; and adducts of (i) relatively low-molecular-weight epoxy polymers having a number average molecular weight of up to 2000, or polymers containing hydroxyl, epoxy or carboxyl having the similar molecular weight as above and (j) acrylic acid, methacrylic acid, glycidyl acrylate, glycidyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxypropyl methacrylate, said monoethylenically unsaturated monomer is at least one compound selected from the group consisting of: esters represented by the formula:

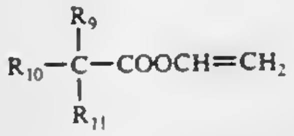
$CH_2{=}C(R_1)COOR_2$ wherein R_1 is hydrogen or CH_3, and R2 is alkyl having 1 to 26 carbon atoms:

esters represented by the formula:

$CH_2{=}C(R_1)COOR_3$ wherein R_1 is as defined above, R_3 is



$-CH_2CH(OH)CH_2OCOR_4$, $-(CH_2CH_2O)_{nR}5$, $[CH_2CH(CH_3)O]$ nR_5, $-CH_2CH(CH_3)$ OH or $CH_2CH_2CH_2OH$, R_4 is hydrogen or alkyl having 1 to 25 carbon atoms, R_5 is alkyl having 1 to 8 carbon atoms, and n is an integer of 1 to 8; and styrene, vinyltoluene, α-methylstyrene, methacrylonitrile, hydroxyethyl methacrylate and N-butoxymethyl acrylamide, vinyl acetate and vinyl monomers, having general formula:



$$R_{10}-\overset{\displaystyle R_9}{\underset{\displaystyle R_{11}}{C}}-COOCH{=}CH_2$$

(wherein R_9, R_{10} and R_{11} are alkyl and at least one of them is CH_3), and said polyethylenically unsaturated monomer is used in an amount of about 0.1 to about 20% by weight of all the monomers used.

4,107,115

SOAPS AND ESTER-SOAPS OF α-OLEFIN DERIVED HIGH MOLECULAR WEIGHT ACIDS AS LUBRICANTS FOR THERMOPLASTIC POLYMERS

Harold C. Foulks, Jr., Newport, Ky., assignor to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 535,603, Dec. 23, 1974, Pat. No. 4,029,682. This application Aug. 6, 1975, Ser. No. 602,328

Int. Cl.^{2} C08K *5/09, 5/11;* **C08L** *27/06*

U.S. Cl. 260—23 XA **7 Claims**

1. A thermoplastic resin composition comprising polyvinyl chloride homopolymer or copolymer and 0.1 to 5 parts per hundred parts resin of a soap or ester-soap derived from:

(a) a mixed, straight-chain aliphatic monocarboxylic acid obtained by the ozonization of a C_{22+} α-olefin and containing less than 30% by weight acids having fewer than 21 carbon atoms, less than 20% by weight acids having greater than 35 carbon atoms and 55% by weight or more $C_{21\text{-}35}$ acids wherein the weight ratio of odd to even carbon content acids in the $C_{21\text{-}35}$ range is between 1.5:1 and 10:1;
(b) a metal compound wherein the metal is selected from the group consisting of alkali metals, alkaline earth metals, amphoteric metals and heavy metals and;
(c) an aliphatic hydroxylic compound having 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups;

said soaps and ester-soaps containing from about 0.1 to 15% by weight of said metal.

4,107,116

EPOXY RESIN PLASTICS

Changkiu Keith Riew, Akron; Alan R. Siebert, Maple Heights, and Eugene H. Rowe, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 210,156, Dec. 20, 1971, Pat. No. 3,966,837. This application Jun. 24, 1976, Ser. No. 699,218

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.^{2} C08L *91/00, 63/02, 63/10*

U.S. Cl. 260—23 EP **7 Claims**

1. An epoxy resin composition yielding high strength, high modulus, high impact resistant, thermoset products, comprising a di-epoxy compound, a dicarboxylic acid functioning as a chain lengthening material, a curing agent for the epoxy compound, and a liquid elastomer with terminal functional groups reactive with epoxy groups and essentially free from other functional groups reactive with epoxy groups, the elastomer being not over about 10% of the weight of the di-epoxy compound, and the sum of the chemically equivalent quantities of the dicarboxylic acid, the functionally terminated liquid elastomer, and the curing agent, being less than the chemically equivalent quantity of the di-epoxy compound.

4,107,117

TIRE CORD IMPREGNANT

Kingso C. Lin, and Donald J. Hammond, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 3, 1976, Ser. No. 747,130

Int. Cl.^{2} C08L *91/00*

U.S. Cl. 260—28.5 B **10 Claims**

1. At least one glass fiber in contact with a residue produced by removing water from an aqueous composition comprising a butadiene ethoyxlated-alcohol, polycarboxylic acid anhydride half ester methacrylic acid terpolymer, a blend of emulsifiable mineral oils, silica derivatives and esters, a resorcinol-formaldehyde resin, a vinylpyridine terpolymer, a polybutadiene latex, and a wax emulsion.

4,107,118

SIZE COMPOSITION

Richard Alan McCoy, Gahanna, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 26, 1976, Ser. No. 680,312

Int. Cl.^{2} C08L *63/02*

U.S. Cl. 260—29.2 EP **4 Claims**

1. An aqueous composition consisting essentially of an epoxy resin emulsion, a polyvinylpyrrolidone and a polyethylene glycol ester mono oleate.

4,107,119

ADHESIVE COMPOSITION RAPIDLY HARDENABLE AT ROOM TEMPERATURE

Akinori Kameyama; Yoshiki Matsunaga, and Hiroyasu Saito, all of Iwaki, Japan, assignors to Nippon Kasei Chemical Co., Ltd., Iwaki, Japan

Filed Feb. 15, 1977, Ser. No. 768,761

Claims priority, application Japan, Jul. 26, 1976, 51-88934

Int. Cl.^{2} C08L *61/04, 61/20*

U.S. Cl. 260—29.4 UA **8 Claims**

1. An adhesive composition which comprises (a) a resinous composition produced by mixing an aromatic primary amine with an aqueous solution or emulsion containing a polymer of acrylamide or a copolymer of acrylamide and copolymerizable comonomers, and (b) formaldehyde or a formaldehyde derivative capable of liberating formaldehyde in situ, as main components.

4,107,120

HETEROPOLYMER ACRYLIC LATICES AND TEXTILES TREATED THEREWITH

Joseph E. Plamondon, Holland; William R. Wilber, Quakertown, and Stephen Goth, Southampton, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 17, 1976, Ser. No. 697,171

Int. Cl.^{2} C08F *263/02*

U.S. Cl. 260—29.6 RB **7 Claims**

1. A textile treating composition consisting essentially of an acrylic latex, the particles of which comprise about 30–60% by weight of a polymeric core and about 70–40% by weight of a polymeric shell, wherein said core is formed by emulsion polymerization of a first monomer composition consisting essentially of:

(a) a major amount of a principal monomer system, and
(b) a minor amount of a crosslinking monomer system comprising:
    (i) about 0.5% to 6% by weight on the total first monomer composition of a graftlinking monomer or an active crosslinking monomer, and
    (ii) about 4% to 10% by weight on the total first monomer composition of a latent crosslinking monomer;

and wherein said shell is formed on said core by emulsion polymerization of a second monomer composition in the presence of said core, said second monomer composition consisting essentially of:

(a) a major amount of a principal monomer system; and
(b) about 2% to 10% on the total second monomer composition of a latent crosslinking monomer;

the monomers of said first monomer composition being selected to provide a T_g in said core of $-20°$ C. or lower, and the monomers of said second monomer composition being selected to provide a T_g in said shell of about 60° C. to about $-10°$ C.

4,107,121
IONOGENIC HYDROPHILIC WATER-INSOLUBLE GELS FROM PARTIALLY HYDROLYZED ACRYLONITRILE POLYMERS AND COPOLYMERS, AND A METHOD OF MANUFACTURING SAME

Vladimir Stoy, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Czechoslovakia

Filed Nov. 20, 1975, Ser. No. 633,786

Claims priority, application Czechoslovakia, Nov. 25, 1974, 8051-74

Int. Cl.^{2} C08L *33/20*

U.S. Cl. 260—29.6 AB **5 Claims**

1. Method of manufacturing ionogenic, water-insoluble, water-swelled polymers of acrylonitrile comprising:
- (a) forming a homogeneous, aqueous rhodanide solution of 2–50 wt%, based on the total solution, of an acrylic polymer containing at least 80% (molar) of acrylonitrile units, together with comonomer units selected from the group consisting of arcylic acid, methacrylic acid, itaconic acid, citraconic acid, mesaconic acid, aconitic acid, fumaric acid, maleic anhydride, acrylamide, isobutyl acrylate and 2-hydroxyethyl methacrylate, said rhodanide being selected from the group consisting of lithium, sodium and calcium rhodanide and mixtures thereof and being present in an amount of 30 wt% to saturation;
- (b) hydrolyzing said homogeneous solution of said polymer, the homogeneity being maintained during the whole reaction, in the presence of 0.05–7.5 wt%, based on the total solution, of a base selected from the group consisting of alkali metal hydroxides and carbonates, ammonium hydroxide, dimethyl amine and trimethyl amine at a temperature of from −15° to +130° C.; and
- (c) recovering the product of hydrolysis, after having reached the desired degree of hydrolysis, by washing out said rhodanide and by washing out and/or neutralizing said base.

4,107,122
COPOLYMER PLASTICIZERS COMPRISING NOVEL ω-BROMOALKYL ESTERS OF ACYCLIC UNSATURATED DICARBOXYLIC ACIDS

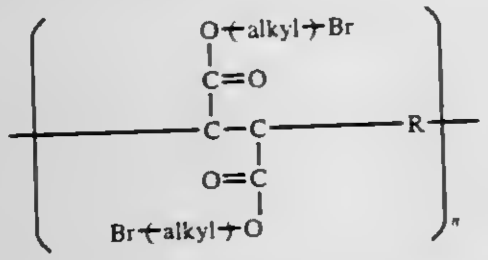
Albert W. Morgan, Collinsville, Ill.; Charles S. Shull, and William Vanderlinde, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 642,929, Dec. 22, 1975, Pat. No. 4,058,658. This application Jun. 3, 1976, Ser. No. 692,246

Int. Cl.^{2} C08F *210/00;* **C08G** *18/00;* **C08L** *23/00;* **C08F** *299/00*

U.S. Cl. 260—30.2 **22 Claims**

1. Composition containing a polymer and a flame retardant plasticizer comprising a copolymer of the formula



$$\left(-\overset{\substack{\text{O}(\text{alkyl})\text{Br}\\ |\\ \text{C=O}\\ |}}{\text{C}}-\underset{\substack{|\\ \text{O=C}\\ |\\ \text{Br}(\text{alkyl})\text{O}}}{\text{C}}-\text{R}- \right)_n$$

wherein R is the monomer unit derived from the polymerization of an ethylenically unsaturated comonomer having a reactivity value which, when multiplied by the reactivity value of diethyl fumarate, is less than one and n has a value of from about 10 to about 2,000 .

4,107,123
POLYVINYL CHLORIDE/SILICIC ACID/HEXANETRIOL MIXTURES AND PROCESS FOR THEIR PREPARATION

Willi Clas, Wesseling, and Wolfgang Büchel, Bornheim-Widdig, both of Germany, assignors to Duetsobe Goldund Silber-Scheideanstalt vormals Roessler, Frankfurt am Maio, Fed. Rep. of Germany

Contiouation-in-part of Ser. No. 608,794, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 451,313, Mar. 14, 1974, abandoned, which is a continuation of Ser. No. 226,529, Feb. 15, 1972, abandoned. This application May 6, 1977, Ser. No. 794,679

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1971, 2107243

Int. Cl.^{2} C08J *3/20;* **C08K** *5/05, 5/12;* **C08L** *27/06*

U.S. Cl. 260—31.8 G **7 Claims**

1. A process for improving the mechanical properties, heat stability and resistance to discoloration of mixtures of polyvinyl chloride and finely divided synthetic silicic acid, which comprises preparing a mixture consisting essentially of:
- (A) a plasticized polyvinyl chloride;
- (B) about 20 to about 100 parts by weight of a precipitated silicic acid per about 100 parts by weight of the polyvinyl chloride; and
- (C) hexanetriol in an amount up to about 20 parts by weight for each 100 parts by weight of the silicic acid; wherein the precipitated silicic acid has an average particle size of about 10–100 mμ and a BET specific surface of about 30 to about 800 m^2/g and the hexanetriol is present in an amount sufficient to substantially prevent discoloration of said mixture.

4,107,124
BLOCK COPOLYMER COMPOSITIONS

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 26, 1977, Ser. No. 762,598

Int. Cl.^{2} C08K *5/01*

U.S. Cl. 260—33.6 AQ **9 Claims**

1. A polymeric composition comprising:

	Parts by Weight
(a) a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 250,000, said blocks A comprising 8–65% by weight of the copolymer;	100
(b) a polyarene produced by the anionic polymerization of a monoalkenyl arene;	20–90
(c) a hydrocarbon rubber extending oil; and	50–125
(d) a finely divided filler	0–250

wherein the ratio of the number average molecular weight of the polyarene divided by the number average molecular weight of the A block of the block copolymer is between about 0.6 and about 2.0 and the Q value of the polyarene is between about 1.0 and about 3.0.

4,107,125
CROSSLINKED AROMATIC POLYIMIDES AND ARTICLES MADE THEREFROM

Elwyn Raymond Lovejoy, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 1, 1976, Ser. No. 702,356

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—37 N **12 Claims**

1. A polyimide polymeric material comprising a crosslinked chemical combination of
- (a) a higher molecular weight base resin of linear aromatic polyimide polymer having at least one ketonic carbonyl per repeat unit and a molecular weight of from 3,000 to 300,000 and
- (b) a lower molecular weight crosslinker resin of linear aromatic polyimide polymer having amine end-groups and a molecular weight of from 500 to 15,000; wherein the mole ratio of crosslinker resin to base resin is in a range of from greater than 2 to 40 and wherein the molecular weight ratio of higher molecular weight resin to lower molecular weight resin is from 2 to 50.

4,107,126
VINYLIC FILLER PIGMENTS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, both of Pompano Beach, Fla., co-trustees

Filed Aug. 6, 1976, Ser. No. 712,160

Int. Cl.^{2} C08L *61/10;* **C08F** *289/00*

U.S. Cl. 260—38 **26 Claims**

1. A process for producing an organic based pigment, which process consists essentially in
- (I) combining (a) an aqueous dispersion in the form of a latex of colloidal sized vinylic filler particles as hereinafter defined, (b) an aqueous dispersion of microground water insoluble pigment as hereinafter defined, (c) from 0 to an equal weight, based on the microground pigment present, of pigment bonding agent material as hereinafter defined and (d) from 0 to an equal weight based on the microground pigment present of nitrogenous material as hereinafter defined;
  - said vinylic filler (a) being made up essentially of polymer particles in the colloidal size range of about 5 millimicrons to about 4 microns average diameter and being three dimentionally cross-linked to insolubility in physical solvents, said particles having been prepared by cross-linking polymerization, in aqueous dispersion, of monomer material polymerizable therein and selected from the class consisting of the polymerizable monomers containing at least one carbon-to-carbon unsaturated group with the further limitation that the selected monomer material comprises cross-linking monomer material containing a plurality of such carbon-to-carbon unsaturated groups in at least a sufficient amount to effect, in said cross-linking polymerization, enough cross-linking within the particles to render them insoluble as aforesaid;
  - said microground pigment (b) being selected from the class consisting of the water insoluble organic and inorganic color and leuco pigments and having been microground to an average particle size which is less than 0.5 micron and which is less than the average particle size of the vinylic filler particles;
  - said dispersions (a) and (b) each containing and stabilized by surface active agent material and being combined in a weight ratio, dry basis, in the range of 200:1 to 1:2 based on the vinylic filler and microground pigment material;
  - said bonding agent material being selected from the class consisting of (i) water soluble and dispersible aminoplasts performed and formed in situ, (ii) water soluble and dispersible phenoplasts performed and formed in situ and (iii) water soluble and dispersible organic polymers having carboxyl, amine, sulfate or sulfonic acid groups and salts thereof; and
  - said nitrogenous material being selected from the class consisting of (i) oleophilic amines, (ii) oleophilic imines, (iii) oleophilic amine carboxylates, (iv) the oleophilic quaternary ammonium compounds, (v) water soluble polyamines, (vi) water soluble polyimines, and (vii) combinations of two or more members of the foregoing;
- (II) coagulating the combination formed in step (I) thereby affixing essentially all of said microground pigment to the surfaces of said vinylic filler particles; and
- (III) recovering the resulting organic based pigment.

4,107,127
FIRE-RESISTANT SYNTHETIC RESIN COMPOSITION AND METHOD

Lawrence E. Shea, 165 Lake Dr., San Bruno, Calif. 94066

Continuation-in-part of Ser. No. 721,069, Sep. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 691,290, Jun. 1, 1976, Pat. No. 4,053,447, which is a continuation-in-part of Ser. No. 492,881, Jul. 29, 1974, abandoned. This application Apr. 29, 1977, Ser. No. 792,402

Int. Cl.^{2} C08L *61/06*

U.S. Cl. 260—38 **22 Claims**

1. A tough, fire-resistive resin free from hydraulic cement, exhibiting low flame spread, good heat release and low smoke evolution when exposed to direct flame or to radiant heat and being resistant to embrittlement and cracking upon curing, comprising the reaction product reacted in the presence of water of
- (a) a hydroxyl-group-providing component chosen from the group consisting of resorcinol and a mixture of resorcinol and phenol containing not over 5 mols phenol per mol resorcinol, and
- (b) an aldehyde component consisting of both formaldehyde and paraformaldehyde providing a substantially equivalent amount of aldehyde with respect to the hydroxyl groups available in said component (a), said paraformaldehyde being present in said aldehyde component in an amount of from 5.5% to 15% by weight of the total of said components (a) and (b).

4,107,128
CARBON FIBER COMPOSITION

Keizo Hosoi; Tadayoshi Endo, and Hidetosi Kanzaki, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

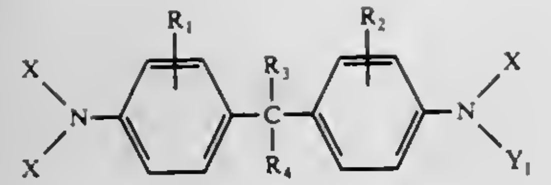
Filed Feb. 12, 1976, Ser. No. 657,598

Claims priority, application Japan, Feb. 20, 1975, 50-20379; Nov. 8, 1975, 50-134331; Dec. 19, 1975, 50-150651; Jan. 14, 1976, 51-2747

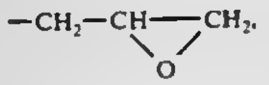
Int. Cl.^{2} C08K *7/06, 9/04*

U.S. Cl. 260—40 R **4 Claims**

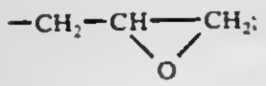
1. A carbon fiber composition comprising (i) about 90 to 99.9% by weight carbon fiber, (ii) a total of 0.1 to 10% by weight of at least one vinyl addition polymer having at least one oxirane ring, said vinyl addition polymer being prepared by polymerizing one or more ethylenic unsaturated compounds containing at least one oxirane ring or by copolymerizing said one or more ethylenic unsaturated compounds with one or more other polymerizable compounds and (iii) at least one polyfunctional epoxy compound having an epoxy equivalent of 80 through 175 and selected from the group consisting of polyfunctional epoxy compounds having the following formulae and the condensation products thereof in a compounding ratio (by weight) of said vinyl addition polymer to said polyfunctional epoxy compound of 2:98 – 98:2:


(I)

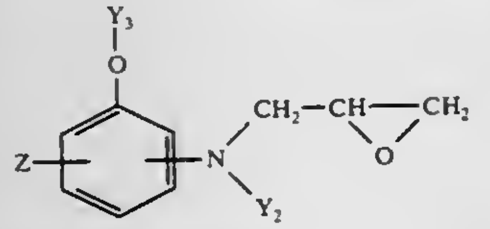
wherein X represents


$-CH_2-\underset{\diagdown O \diagup}{CH-CH_2},$

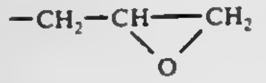
Y_1 represents —H or


$-CH_2-\underset{\diagdown O \diagup}{CH-CH_2};$

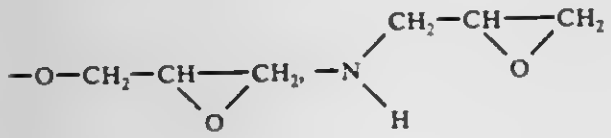
and R_1, R_2, R_3 and R_4 represent —H or —CH_3, and their condensation products, (b) compounds having the formula (II)

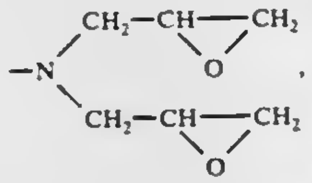

(II)

wherein Y_2 and Y_3 represent —H or

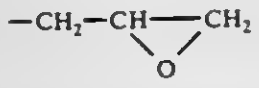

$-CH_2-\underset{\diagdown O \diagup}{CH-CH_2}$

and Z represents —H, —OH,

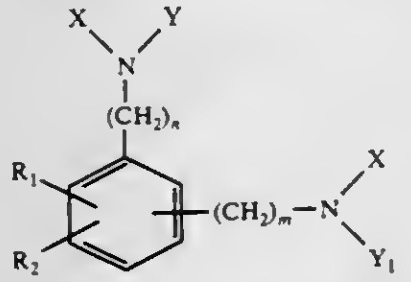

$-O-CH_2-\underset{\diagdown O \diagup}{CH-CH_2}, -N(H)-CH_2-\underset{\diagdown O \diagup}{CH-CH_2}$ or


$-N\left(CH_2-\underset{\diagdown O \diagup}{CH-CH_2}\right)_2,$

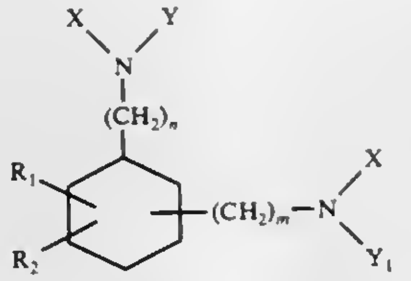
and at least three


$-CH_2-\underset{\diagdown O \diagup}{CH-CH_2}$

groups are contained in the compound, and their condensation products, (c) compounds having the formula (III)


(III)

(wherein X, R_1, R_1 and R_2 are the same as defined above, and *n* and *m* represent 0 or 1), and their condensation products, (d) cycloaliphatic compounds having the formula (IV)


(IV)

(wherein X, Y_1, R_1, R_2, *n* and *m* are the same as defined above and their condensation products, (e) novolak type epoxy resins and their condensation products and (f) polyglycidyl ethers of aliphatic polyols and their condensation products.

4,107,129
ANTISTATIC ACRYLIC FIBER

Hiroyoshi Tanaka; Teruo Koseki, and Shigeru Fujii, all of Ehime-ken, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,428

Claims priority, application Japan, Feb. 24, 1976, 51-18470

Int. Cl.^{2} C08K *3/04*

U.S. Cl. 260—40 P **14 Claims**

1. An acrylic fiber having an electrical resistivity of about $10^8 \Omega$.cm. or less, comprising (A) an acrylonitrile homopolymer or copolymer comprising at least about 80 mol% of acrylonitrile and up to about 20 mol% of at least one copolymerizable vinyl monomer and (B) an antistatic polymer which are miscible but incompatible with the acrylonitrile homopolymer or copolymer, and wherein the amount of acrylonitrile polymer (A) is about 55–98% by weight of said fiber and the amount of antistatic polymer (B) comprising polyether segments is about 2–45% by weight of said fiber, said antistatic polymer (B) having uniformly dispersed electrically conductive carbon black in an amount of about 10–200% by weight of antistatic polymer (B), and said antistatic polymer (B) extending in the form of long and slender stripes in polymer (A).

4,107,130
MULTICOMPONENT POLYOLEFIN-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,174, Feb. 7, 1977, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,384

Int. Cl.^{2} C08L *67/00;* **C08K** *7/14;* **C08L** *51/00*

U.S. Cl. 260—40 R **35 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a polyolefin in a weight ratio of polyolefin to dissimilar engineering thermoplastic of at least 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene/polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said polyolefin has a molecular weight in excess of about 10,000 and an apparent crystalline melting point of between about 100° C and about 250° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of saturated thermoplastic polyesters and fluorinated thermoplastics wherein said thermoplastic polyester has a molecular weight in excess of about 20,000, a melting point over about 120° C and is selected from the group consisting of the condensation product of a dicarboxylic acid and a glycol, polypivalolactone and polycaprolactone.

4,107,131
MULTICOMPONENT POLYURETHANE-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 794,200, May 5, 1977, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,497

Int. Cl.^{2} C08L *67/00;* **C08K** *7/14;* **C08L** *51/00*

U.S. Cl. 260—40 TN **15 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a thermoplastic polyurethane in a weight ratio of polyurethane to dissimilar engineering thermoplastic of greater than 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said thermoplastic polyurethane has a generally crystalline structure, and a melting point over about 120° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of polyamides, saturated thermoplastic polyesters, and fluorinated thermoplastics wherein said saturated polyester has a molecular weight in excess of about 20,000, a melting point over about 120° C and is selected from the group consisting of (i) the condensation product of a dicarboxylic acid and a glycol, (ii) polypivalolactone, and (iii) polycaprolactone.

4,107,132
VINYLIC FILLER PRODUCTS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, Pompano Beach, Fla., Co-Trustees

Filed Aug. 6, 1976, Ser. No. 712,213

Int. Cl.^{2} C08F *6/00, 6/14, 6/24*

U.S. Cl. 260—42.14 **8 Claims**

1. A process for producing a soft, readily dispersible dry vinylic filler product, which process consists essentially in

(a) providing an aqueous dispersion containing a dispersing agent and an aqueously wet, never previously dried vinylic filler material, said vinylic filler material consisting essentially of spheruloidal organic polymer material that is three dimensionally cross-linked to essential insolubility in any physical solvent and that has primary particles in the colloidal size range of about 5 millimicrons to not more than 4.0 microns average diameter, said spheruloidal particles having on the surfaces thereof from 0 to an equal weight based on the spheruloids, of an insoluble coloring component, said coloring component, when present, comprising organic and/or inorganic material at least in part precipitated in insoluble form onto said surfaces from water soluble precursor material thereof in aqueous solution,

(b) treating the dispersion provided in step (a) with a sufficient amount, in the range of from 0.5 to 35% by weight, based on the vinylic filler material present, of an agent selected from the class consisting of the aliphatic, cycloaliphatic and aromatic hydrocarbons and alcohols having boiling points between 90° C. and 200° C., and mixtures thereof, for a sufficient time in the range of 5 minutes to 5 hours, and at a sufficient nonboiling temperature in the range of 25° C. to 100° C. to effect conditioning of said vinylic filler material so that it will not form hard aggregates on drying, and

(c) thereafter drying the so treated material thereby forming the soft, readily dispersible vinylic filler product.

6. A soft, readily dispersible dry vinylic filler product, which product essentially comprises

(a) vinylic filler material consisting of spheruloidal organic polymer material three dimensionally cross-linked to essential insolubility in any physical solvent and having primary particles in the colloidal size range of about 5 millimicrons to not more than 4.0 microns average diameter, said spheruloidal particles having on the surfaces thereof from 0 to an equal weight based on the spheruloids, of an insoluble coloring component, said coloring component, when present, comprising organic and/or inorganic material at least in part precipitated in insoluble form onto said surfaces from water soluble precursor material thereof in aqueous solution,

(b) said vinylic filler material having been treated in aqueous medium without previously having been dried with from 0.5 to 35% by weight, based on the vinylic filler material present, of an agent selected from the class of aliphatic, cycloaliphatic and aromatic hydrocarbons and alcohols having boiling points between 90° C. and 200° C., and mixtures thereof and having thereafter been subjected to drying.

4,107,133
COLORED POLYETHYLENE MOLDING COMPOSITIONS

Hideo Sawai, Takatsuki; Satoshi Hirabayashi, Nagaokakyo, and Shigezi Sato, Nishinomiya, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Jan. 3, 1975, Ser. No. 538,388

Claims priority, application Japan, Jan. 14, 1974, 49-7228; Dec. 23, 1974, 49-146848

Int. Cl.^{2} C08K *5/04, 5/08, 9/00;* **C08L** *23/06*

U.S. Cl. 260—42.15 **6 Claims**

3. A moldable polyethylene capable of being molded into colored shaped articles with reduced deformation and shrinkage comprising (A) a medium or low pressure, high density polyethylene having a melt index of no more than 50 and a density of at least 0.94 g/cm^3 and (B) a coloring composition which comprises (I) 100 parts by weight of an organic pigment selected from the group consisting of Isoindolinone Yellow (Pigment Yellow 109), Cyanine Green (Pigment Green 7), Azo Yellow (Pigment Yellow 83), Perylene Red (Pigment Red 178), Perinone Orange (Pigment Orange 43), Anthraquinone Yellow (Pigment Yellow 108), Isoindolinone Yellow (Pigment Yellow 110), Isoindolinone Red (Pigment Red 180), Dioxazine Violet (Pigment Violet 23), Azo Red (Pigment Red 166), Quinacridone Red (Pigment Violet 19), Isoindolinone Orange (Pigment Orange 42), and Cyanine Blue (Pigment Blue 15) and (II) from about 10 to about 30 parts by weight of an organosilane compound selected from the group consisting of γ-aminopropyltriethyoxysilane, γ-aminopropyltrimethoxysilane, β-aminoethyltributoxysilane; N-γ-(aminopropyl)γ-aminopropyltriethoxysilane and N-β-(aminoethyl)-γ-aminopropyltrimethoxysilane.

5. A moldable polyethylene capable of being molded into colored shaped articles with reduced deformation and shrinkage comprising (A) a medium or low pressure, high density

polyethylene having a melt index of no more than 50 and a density of at least 0.94 g/cm^3 and (B) a coloring composition which comprises (I) 100 parts by weight of an organic pigment selected from the group consisting of Isoindolinone Yellow (Pigment Yellow 109), Cyanine Green (Pigment Green 7), Azo Yellow (Pigment Yellow 83), Perylene Red (Pigment Red 178), Perinone Orange (Pigment Orange 43), Anthraquinone Yellow (Pigment Yellow 108), Isoindolinone Yellow (Pigment Yellow 110), Isoindolinone Red (Pigment Red 180), Dioxazine Violet (Pigment Violet 23), Azo Red (Pigment Red 166), Quinacridone Red (Pigment Violet 19), Isoindolinone Orange (Pigment Orange 42), and Cyanine Blue (Pigment Blue 15) and (II) from about 10 to about 30 parts by weight of an organotitanium compound selected from the group consisting of tetra-iso-propyl titanate, hydroxy titanium oleate, diisopropoxy titanium bistriethanolamine, tetra-n-propyl titanate, tetrabutyl titanate, and diisopropoxy titanium bisacetylacetone.

4,107,134
POLYBUTADIENE COMPOSITIONS CONTAINING REINFORCING GLASS MICROSPHERES AND CARBON FIBERS

Francois Dawans, Bougival, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Oct. 27, 1976, Ser. No. 736,348
Claims priority, application France, Oct. 31, 1975, 75 33600
Int. Cl.^{2} C08K *7/06*
U.S. Cl. 260—42.17 **8 Claims**

1. A low density resin composition resulting from curing, in the presence of a sufficient cross-linking amount of at least one free-radical generator, a resin which comprises a polybutadiene containing from 50 to 80% of 1,2 units and having a number average molecular weight lower than 100,000, and at least one liquid vinyl monomer in a proportion of 0 – 150 parts by weight per 100 parts by weight of said polybutadiene, and incorporated in 100 parts by weight of said resin (a) 20–50 parts by weight glass hollow microspheres having a diameter of from 10 to 300 microns, and (b) 1–10 parts by weight of carbon fibers of a length of from 0.25 to 10 mm.

4,107,135
DECORATIVE POLYMERIC ARTICLE CONTAINING FLOCK FIBERS

Ray B. Duggins, Chadds Ford, Pa., and Richard V. Westerman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1976, Ser. No. 679,906
Int. Cl.^{2} C08K *7/02*
U.S. Cl. 260—42.37 **16 Claims**

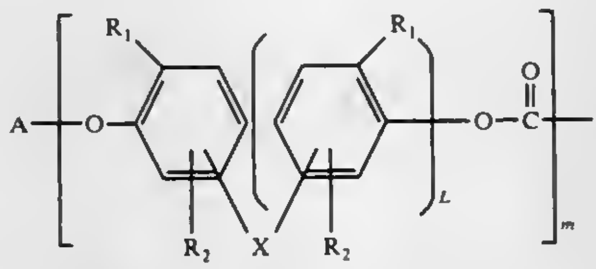
1. A dappled article consisting essentially of:
(A) 20–70 parts by weight of a crosslinked polymer having a glass transition temperature of at least 70° C;
(B) 80–30 parts by weight of an inert filler; and
(C) 0.01–2 percent by weight of the article, of short, colored fibers having a length of approximately 10–500 mils and a denier of about 1–300.

4,107,136
SYNTHETIC RESIN STABILIZER COMPRISING AN ORGANIC PHOSPHITE AND A CARBONATE

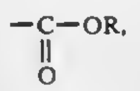
Motonobu Minagawa, Kosigaya; Yutaka Nakahara, Iwatsuki, and Tohru Haruna, Okegawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,975
Claims priority, application Japan, Oct. 6, 1975, 50-120393
Int. Cl.^{2} C08K *5/52*
U.S. Cl. 260—45.95 C **19 Claims**

1. A stabilizer composition useful in synergistically increasing the resistance of a synthetic resin to deterioration when heated at 150° C, comprising in combination (a) at least one organic phosphite having linked to phosphorus through oxygen at least two alkyl groups having from 6 to 20 carbon atoms and at least one organic group selected from polycyclic polyhydric phenol groups and pentaerythritol groups and (b) at least one carbonate ester of an orthosubstituted polyhydric phenol having an average molecular weight between 400 and 4000 and having the formula:

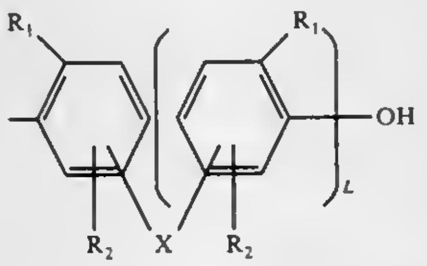


in which independently at each occurrence R_1 is selected from the group consisting of alkyl, cycloalkyl, and aralkyl radicals, R_2 is selected from the group consisting of hydrogen and R_1, A is selected from the group consisting of hydrogen and

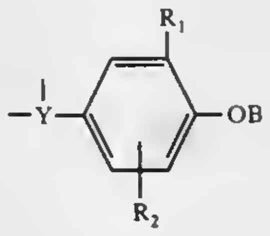


$$-\underset{\underset{O}{\|}}{C}-OR,$$

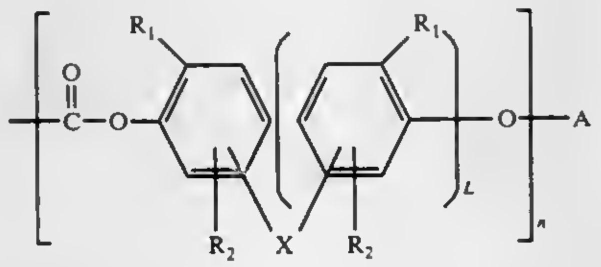
R is selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, cycloalkyl and



Groups, X is selected from the group consisting of —CH$_2$SCH$_2$—, and



where Y is a hydrocarbon radical, B is



L is 0 or 1, *m* is 1 to about 20, and *n* is an average of 0.1 to about 20.

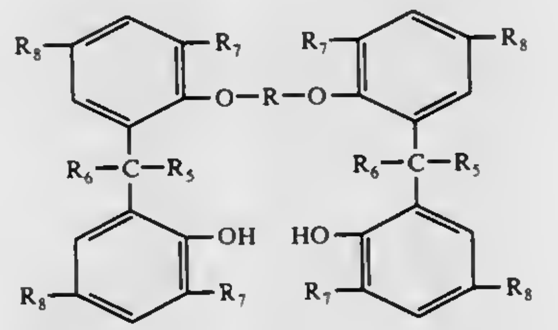
15. A stabilized synthetic resin composition comprising a synthetic resin and a stabilizing amount of a stabilizer composition according to claim 1.

4,107,137
PHENOLIC ANTIOXIDANTS FOR SYNTHETIC POLYMERS

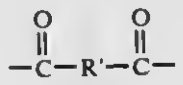
Yves Proux, and Christian Julien, both of Paris, France, assignors to Societe Francaise d'Organo Synthese, Gennevilliers, France

Continuation-in-part of Ser. No. 557,680, Mar. 12, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,019
Claims priority, application France, Mar. 12, 1974, 74 08403
Int. Cl.^{2} C08K *5/41, 5/13;* **C07C** *69/78, 141/00*
U.S. Cl. 260—45.85 T **10 Claims**

1. A compound of the formula:



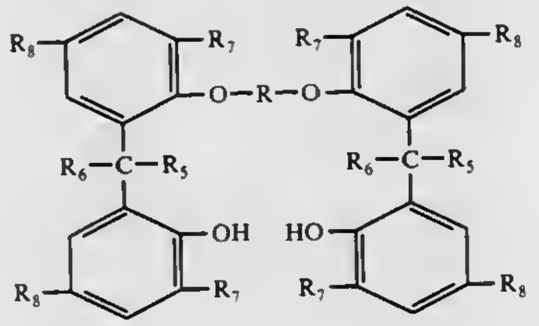
wherein:
R_5 and R_6 are hydrogen or alkyl groups
R_7 and R_8 are alkyl groups
R is an acid group derived from the group consisting of thionyl chloride, phthalic acid and



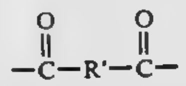
$$-\overset{\overset{O}{\|}}{C}-R'-\overset{\overset{O}{\|}}{C}-$$

wherein R' is an aliphatic group having from 1 to 7 carbon atoms.

5. A synthetic polymer containing a stabilizing amount of from 0.01 to 0.5% by weight of a compound having the formula:



wherein:
R_5 and R_6 are hydrogen or alkyl groups
R_7 and R_8 are alkyl groups
R is an acid group derived from the group consisting of thionyl chloride, phthalic acid and



$$-\overset{\overset{O}{\|}}{C}-R'-\overset{\overset{O}{\|}}{C}-$$

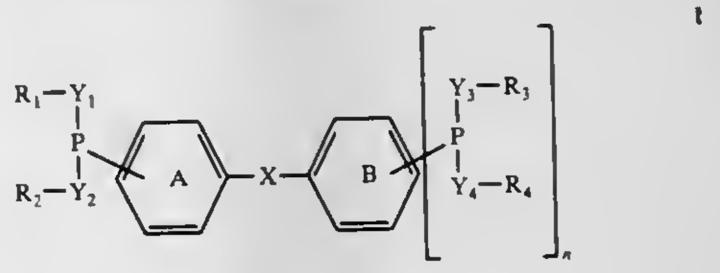
wherein R' is an aliphatic group having from 1 to 7 carbon atoms.

4,107,138
PHOSPHONOUS AND THIOPHOSPHONOUS ACID ETHERS AS STABILIZERS FOR ORGANIC MATERIALS

Kurt Hofer, Münchenstein, and Guenther Tscheulin, Rieben, both of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Division of Ser. No. 455,597, Mar. 28, 1974, Pat. No. 3,903,208, Continuation-in-part of Ser. No. 308,594, Nov. 21, 1972, Pat. No. 3,875,264. This application May 8, 1975, Ser. No. 575,524
Claims priority, application Switzerland, Nov. 24, 1971, 17129/71
Int. Cl.^{2} C08K *5/49, 5/53*
U.S. Cl. 260—45.7 P **12 Claims**

1. A composition comprising an organic material which is susceptible to degradation by light, oxygen and/or heat and an amount effective to stabilize said material against said degradation of a compound of formula I



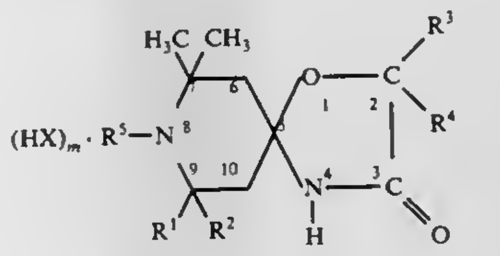
in which
n is 0 or 1,
X is —CH$_2$—, —O—, or —S—,
Y_1, Y_2, Y_3 and Y_4, which may be the same or different, each is —O—, or —S—,
R_1, R_2, R_3 and R_4, which may be the same or different, each is hydrogen or a hydrocarbon radical of up to 20 carbon atoms consisting of aromatic and/or saturated aliphatic and/or cycloalkyl units,
and rings A and B may be either further unsubstituted or each further substituted by 1 or 2 alkyl groups of 1 to 6 carbon atoms with the proviso that when Y_1 and Y_2 are oxygen and n is zero X is oxygen or sulfur.

4,107,139
1-OXA-4,8-DIAZASPIRO[4,5]DECANES AND POLYMERS STABILIZED AGAINST UV LIGHT WITH THESE COMPOUNDS

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,145
Int. Cl.^{2} C07D *498/10;* **C08K** *5/35*
U.S. Cl. 260—45.8 NZ **9 Claims**

1. Compounds of the general formula



in which
R^1 and R^2 are the same or different, straight-chained or branched alkyl radicals having 1 to 12 carbon atoms, or R^1 and R^2, together with the carbon atom to which they are bonded, form an optionally methyl-substituted cyclopentyl, cyclohexyl or 2,2,6,6-tetramethylpiperidyl ring, of which the carbon atom 4 is identical to the carbon atom 9 of the spiro system,
R^3 and R^4 are the same or different and represent hydrogen

atoms, alkyl radicals or isoalkyl radicals having 1 to 30 carbon atoms, or represent aryl radicals having 6 or 10 carbon atoms optionally substituted by a halogen atom or by an alkyl radical having 1 to 4 carbon atoms, or aralkyl radicals having 7 to 10 carbon atoms, or R^3 and R^4 together with the carbon atom to which they are bonded, form a cycloalkyl group having 4 to 20 carbon atoms, which may be substituted by C_1 to C_4 alkyl groups, or an optionally alkyl-substituted pyrrolidine or piperidine group the ring nitrogen atom of which cannot be in the α-position to the spiro atom,

R^5 represents a hydrogen atom, an oxygen atom, a hydroxyl group or an alkyl group having 1 to 4 carbon atoms, and

HX represents a non-oxidizing mineral acid, an aliphatic or aromatic sulfonic or phosphonic acid, an aliphatic mono-, di- or polycarboxylic acid or an aromatic mono- or dicarboxylic acid and $m = 0$ or 1 but when $> N—R^5$ does not have a basic reaction, is always 0.

9. Organic polymers stabilized against UV decomposition, containing 0.01 to 5% by weight, calculated on the polymers, of a stabilizer of claim 1.

4,107,140
PRODUCTION OF THE REACTION PRODUCTS OF OXIDATED SILICON COMPOUNDS REACTING WITH ORGANIC MONOHYDROXY COMPOUNDS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 765,050, Feb. 2, 1977, Pat. No. 4,089,883, which is a continuation-in-part of Ser. No. 703,925, Jul. 9, 1976, abandoned, and Ser. No. 589,626, Jun. 23, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 854,843

Int. Cl.^{2} C08G *77/04*

U.S. Cl. 521—154 **20 Claims**

1. The process for the production of the reaction products oxidated silicon compounds with an organic monohydroxy compound by the following steps:

(a) mixing about 1 part by weight of an oxidated silicon compound with 1 to 3 parts by weight of an organic monohydroxy compound;

(b) adding an alkali catalyst in the amount of 1% to 10% by weight, percentage based on the weight of the oxidated silicon compound;

(c) heating said mixture to just below the boiling temperature of the monohydroxy compound while agitating at ambient to 60 psig of pressure for 20 to 60 minutes, thereby

(d) producing an organic silicate compound.

4,107,141
METHOD OF PREPARING PHENOLAMINE RESINS

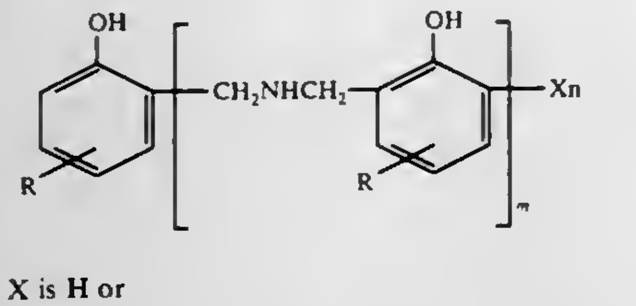
Vladimir Vasilievich Moiseev, Leninsky prospekt, 63, kv. 12; Vladimir Vasilievich Kosovtsev, Leninsky prospekt, 13, kv. 13; Galina Prokofievna Kolesnikova, ulitsa Karla Marxa, 92, kv. 23; Tamara Ivanovna Esina, prospekt Patriotov, 30, kv. 38; Alexandr Nikolaevich Polukhin, ulitsa Gomelskaya, 5, and Viktor Alexandrovich Zimnukhov, ploschad Lenina, 15, kv. 44, all of Voronezh, U.S.S.R.

Filed Oct. 10, 1975, Ser. No. 621,627

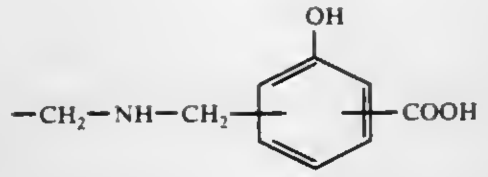
Int. Cl.^{2} C08F *2/00*

U.S. Cl. 528—129 **4 Claims**

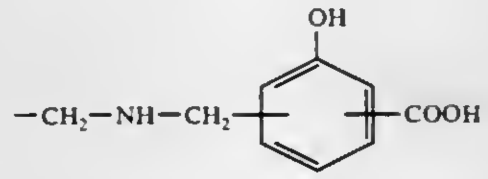
1. Phenolamine resins containing a fragment of a substituted phenol and methylene amine bridges of the formula:



where X is H or



m and *n* are of from 1 to 20; when X is H, R represents an alkyl radical with 5 to 12 carbon atoms, phenylethyl, cumyl, hydroxyarylalkyl, carboxy; when X is



R represents an alkyl radical with 1 to 12 carbon atoms, phenylethyl, cumyl, hydroxyarylalkyl, or carboxy comprising a product of condensation of hexamethylene tetramine with a phenol component selected from the group consisting of an alkylphenol with 5 to 12 carbon atoms in the alkyl radical having a molecular weight of from 160 to 350, styrene-alkylated phenol, cumylphenol, diphenylolpropane, hydroxybenzoic acid and mixtures thereof.

4,107,142
EPOXIDE MATERIALS

Anthony Vernon Cunliffe, Datchworth, England; Peter John Pearce, Innisfail, Australia, and David Hugh Richards, Bishops Stortford, England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 523,528, Nov. 13, 1974, abandoned. This application May 12, 1976, Ser. No. 685,674

Claims priority, application United Kingdom, Nov. 14, 1973, 52910/73

Int. Cl.^{2} C08G *67/00;* **C08K** *5/15;* **C08F** *24/00*

U.S. Cl. 528—93 **17 Claims**

1. A process for the production of an epoxide material comprising reacting, under substantially anhydrous conditions in a polar aprotic solvent, a conjugated diene with an electron donor in the presence of an epoxy compound containing at least two epoxide groups to form an anionic intermediate consisting essentially of a polydiene chain having terminal epoxy group derived from said epoxy compound, and subsequently hydrolysing said anionic intermediate to form an epoxy-terminated polydiene, wherein there is incorporated into said anionic intermediate, prior to its hydrolysis to form said epoxy-terminated polymer, a nitrile-substituted alkene in a molar ratio of diene to nitrile-substituted alkene up to 10:1.

4,107,143
AROMATIC POLYESTER CARBONATE AND METHOD FOR PRODUCING THE SAME

Hiroo Inata; Tsuto Morinaga, both of Hino; Takatoshi Kuratsuji, Matsuyama; Takanori Urasaki, and Shoji Kawase, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan and Teyin Limited, Osaka, Japan

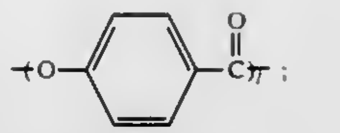
Filed Feb. 3, 1977, Ser. No. 765,333

Claims priority, application Japan, Feb. 12, 1976, 51-13257; Feb. 13, 1976, 51-13905; Mar. 1, 1976, 51-21078; Sep. 3, 1976, 51-104918

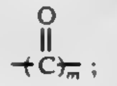
Int. Cl.^{2} C08G *63/62*

U.S. Cl. 528—176 **14 Claims**

1. Aromatic polyester carbonate in a substantially linear structure having an inherent viscosity of 0.5 and above, and consisting essentially of bonding units to be represented by the following general formulas:

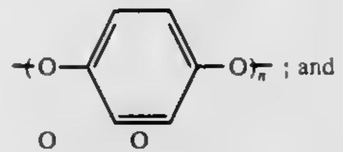


(a)

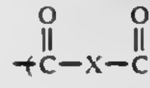


$$\left(\overset{O}{\overset{\|}{C}}\right)_m ;$$

(b)



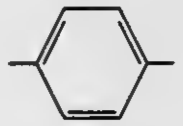
(c)



$$\left(\overset{O}{\overset{\|}{C}}-X-\overset{O}{\overset{\|}{C}}\right)_p$$

(d)

where: X is a divalent aromatic group; the group



and —X— in said general formulas (a), (c), and (d) are substantially bonded together by the ester bonding and the carbonate bonding; and said bonding units are mutually bonded under the following equational relationship:

$$0.75 \geqq l/(l + m + p) \geqq 0.6;$$

$$0.4 \geqq m/(l + m + p) \geqq 0.05;$$

$$0.35 \geqq p/(l + m + p) \geqq 0;$$

and

$$1.1 \geqq n/(m + p) \geqq 0.9.$$

4,107,144
PHENOLIC ANTIOXIDANTS WITH POLYMER TAILS

Kenneth E. Russell, and Linda G. M. C. Vail, both of Kingston, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Apr. 15, 1977, Ser. No. 787,935

Claims priority, application Canada, May 20, 1976, 252939

Int. Cl.^{2} C08F *232/00;* **C08L** *9/06;* **C08F** *8/02;* **C08L** *4/00*

U.S. Cl. 526—212 **22 Claims**

1. A dialkylphenol antioxidant having attached to the phenol in the 4 or 6 position on the ring a vinylic polymer tail of molecular weight from about 1000 to about 5000 as determined by vapor pressure osmometry or by gel permeation chromatography, said vinylic polymer being in the form of a pendant chain attached to said ring at one end of the chain derived from vinyl monomers which polymerize cationically with an acid catalyst of the Lewis Acid or Friedel-Crafts type.

4,107,145
SALTS OF BENZENEPHOSPHONIC ACID AND MELAMINE AS REACTIVE ADDITIVES TO FLAMMABLE EPOXY MONOMERS TO REDUCE FLAMMABILITY OF THE CURED REACTION PRODUCTS

Eli Simon, 7175 Little Harbor Dr., Huntington Beach, Calif. 92648

Division of Ser. No. 663,446, Mar. 3, 1976, Pat. No. 4,061,605. This application Aug. 23, 1977, Ser. No. 820,810

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 528—108 **3 Claims**

1. Cured reaction products having reduced flammability prepared by reacting polyfunctional epoxy monomers with benzenephosphonic acid-melamine salts, said salts being prepared by reacting benzenephosphonic acid with melamine in a mol ratio of benzenephosphonic acid to melamine of from 1-mol of benzenephosphonic acid : 2-mols of melamine to 2-mols of benzenephosphonic acid : 3-mols of melamine.

4,107,146
CURABLE ARYLOXYPHOSPHAZENE POLYMERS

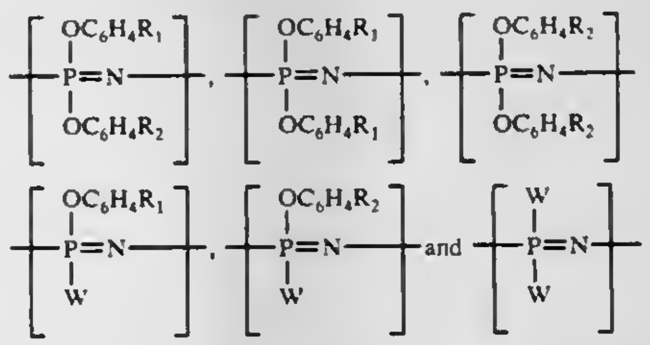
Ronald L. Dieck; Alan B. Magnusson, and Edwin J. Quinn, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 14, 1977, Ser. No. 768,603

Int. Cl.^{2} C08G *79/04;* **C08J** *9/10*

U.S. Cl. 528—168 **7 Claims**

1. A cured phosphazene copolymer prepared by heating in admixture with a sulfur-type curing agent a copolymer having randomly distributed repeating units represented by the formulas



$$\left[\begin{matrix}OC_6H_4R_1\\ |\\ P{=}N\\ |\\ OC_6H_4R_2\end{matrix}\right],\ \left[\begin{matrix}OC_6H_4R_1\\ |\\ P{=}N\\ |\\ OC_6H_4R_1\end{matrix}\right],\ \left[\begin{matrix}OC_6H_4R_2\\ |\\ P{=}N\\ |\\ OC_6H_4R_2\end{matrix}\right]$$

$$\left[\begin{matrix}OC_6H_4R_1\\ |\\ P{=}N\\ |\\ W\end{matrix}\right],\ \left[\begin{matrix}OC_6H_4R_2\\ |\\ P{=}N\\ |\\ W\end{matrix}\right]\text{ and }\left[\begin{matrix}W\\ |\\ P{=}N\\ |\\ W\end{matrix}\right]$$

wherein R_1 is C_1 to C_{10} linear or branched alkoxy, R_2 is hydrogen, C_1–C_{10} linear or branched alkyl or halogen, and W represents a monovalent radical containing a group capable of a crosslinking chemical reaction at moderate temperatures, said group being attached to a P atom by a —O— linkage.

4,107,147
POLYSULFONEIMIDES

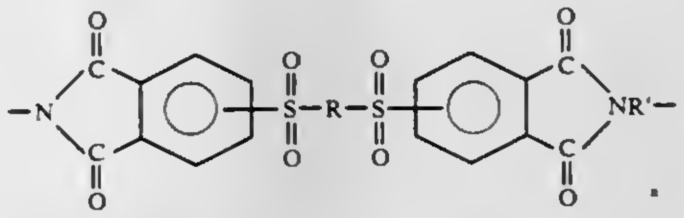
Frank J. Williams, III, Scotia, and Paul E. Donahue, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,114

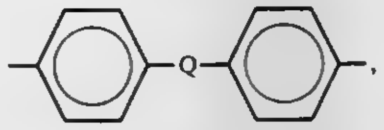
Int. Cl.^{2} C08G *73/10*

U.S. Cl. 528—172 **7 Claims**

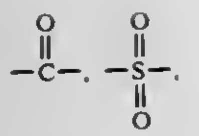
1. A polysulfoneimide consisting essentially of units of the formula



where R and R′ are divalent aromatic organic radicals having from 6–20 carbon atoms selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2\text{-}8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included in the formula,



where Q is a member selected from the class consisting of divalent radicals of the formulas $—C_yH_{2y}—$,



$-\overset{O}{\overset{\|}{C}}-$, $-\underset{O}{\underset{\|}{\overset{O}{\overset{\|}{S}}}}-$,

—O—, and —S—, and *y* is a whole number from 1 to 5, inclusive.

4,107,148
POWDER COATING COMPOSITION COMPRISING A MIXTURE OF A POLYESTER AND PLURAL SILICONE COMPOUNDS

Kanji Fujiyoshi; Minoru Fukuda; Yutaka Mizumura; Junji Sono, and Iori Naito, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 20, 1975, Ser. No. 606,022

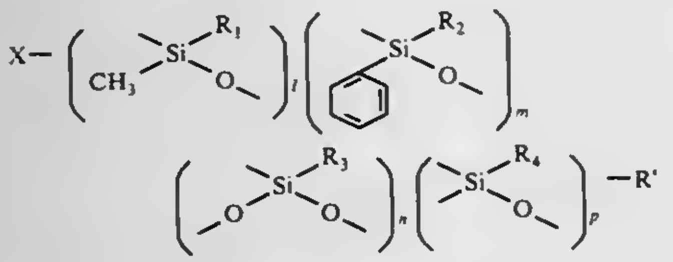
Claims priority, application Japan, Aug. 22, 1974, 49-96851; Jun. 20, 1975, 50-76049

Int. Cl.^{2} C08G *18/42, 18/61*

U.S. Cl. 528—273 **23 Claims**

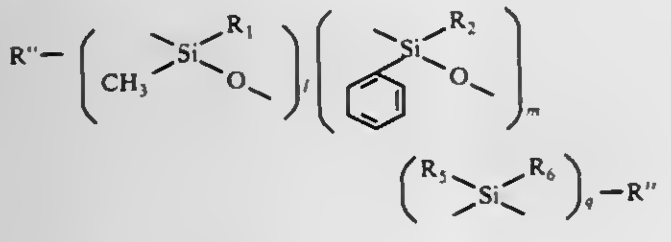
1. A heat durable powder coating composition comprising 100 parts by weight of an ethylene-terephthalic acid based copolyester [I] having hydroxy terminals, a coreactant selected from the group consisting of 2 to 10 parts by weight of an alkoxylated polyamine-aldehyde resin; 3 to 15 parts by weight of a polyanhydride; and 10 to 70 parts by weight of a blocked polyisocyanate and 0.1 to 5 parts by weight of silicone compounds [II] which consist of plural members selected from both the group [IIA] and the group [IIB]; the group [IIA] consisting of the silicone compounds conforming to the following formula,

[IIA]



and the group [IIB] consisting of the silicone compounds conforming to the following formula,

[IIB]



wherein,

R_1, R_2, R_3, R_4, R_5, R_6 are methyl or phenyl radicals;

R' is a hydrogen atom or methyl radical and links with the oxygen atom;

R'' is methyl or other alkyl radical and links with the Si atom or oxygen atom;

X is methoxy or a hydroxyl radical and links directly with the Si atom;

l, m, n, p, q are zero or positive integers, but are not zero all at once in each formula; the mark —O— attached to the Si atom in the formula [IIA] links with any Si atom in the four kinds of organosiloxane units in the formula [IIA], otherwise, terminates with a hydrogen atom or methyl radical;

the bond mark — attached to the Si atom in both formulas [IIA] and [IIB] links with an oxygen atom to form a siloxane bond; and

the mark —O— attached to the Si atom in the formula [IIB] links with any Si atom in the three kinds of organosiloxane units in the formula [IIB] or terminates with the R'' radical.

4,107,149
POLY(ETHYLENE/ALKYLENE) TEREPHTHALATES WHICH CRYSTALLIZE RAPIDLY

Peter Bier; Rudolph Binsack, and Hugo Vernaleken, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 17, 1976, Ser. No. 658,817

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507776

Int. Cl.^{2} C08G *63/16*

U.S. Cl. 528—309 **14 Claims**

1. A highly crystalline, thermoplastic terephthalic acid copolyester which crystallizes rapidly, said copolyester consisting of a dicarboxylic acid component, at least 90 mol %, based on the dicarboxylic acid component, of said dicarboxylic acid component being condensed terephthalic acid radicals, and 90 and 99.5 mol %, based on the diol component, of said diol component being condensed ethylene glycol radicals and 0.5 to 10 mol %, based on the diol component, thereof being condensed radicals of a member selected from the group consisting of hexane-2,5-diol, 2,2,4-trimethylpentane-1,3-diol, and 2-methylpentane-2,4-diol.

5. A process for the production of thermoplastic terephthalic acid copolyesters which crystallize more rapidly than polyethylene terephthalate homopolymer comprising

- (1) esterifying or transesterifying an acid component consisting of
  - (a) at least 90 mol % of terephthalic acid and dimethyl terephthalic acid ester, and
  - (b) up to 10 mol % of other aliphatic and aromatic dicarboxylic acids and acid esters with
- (2) 1.05 to 2.40 equivalents of a diol component consisting of
  - (a) 90 to 99.5 mol % of ethylene glycol, and
  - (b) 10 to 0.5 mol % of a codiol selected from the group consisting of hexane-2,5-diol; 2,2,4 trimethyl pentane-1,3-diol; and 2-methyl pentane-2,4-diol at
- (3) a temperature of between 150° and 250° C in the presence of esterification or transesterification catalysts, and
- (4) polycondensing the initial reaction products at a temperature between 200° and 300° C under reduced pressure in the presence of an esterification catalyst,

wherein the codiol is added to the reaction mixture after substantially all of the acid component has been reacted to di(2-hydroxyethyl)ester.

4,107,150
HIGH IMPACT TEREPHTHALATE COPOLYESTERS USING 1,4-BUTANEDIOL AND 1,4-CYCLOHEXANEDIMETHANOL

Robert W. Campbell, and James W. Cleary, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

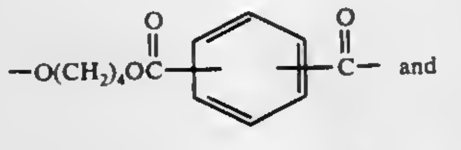
Filed May 27, 1976, Ser. No. 690,809

Int. Cl.^{2} C08G *63/12*

U.S. Cl. 528—307 **4 Claims**

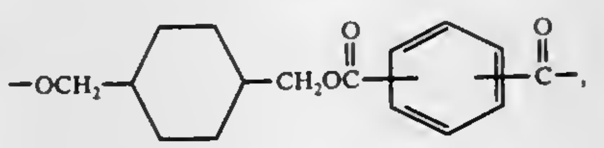
1. A copolyester consisting essentially of repeating units having the structures

(A)



and

(B)



wherein there is present about 3 to about 40 percent by number of repeating units (B) and wherein about 80 to 100 percent by number of the phenylene radicals in all of the repeating units are para-phenylene.

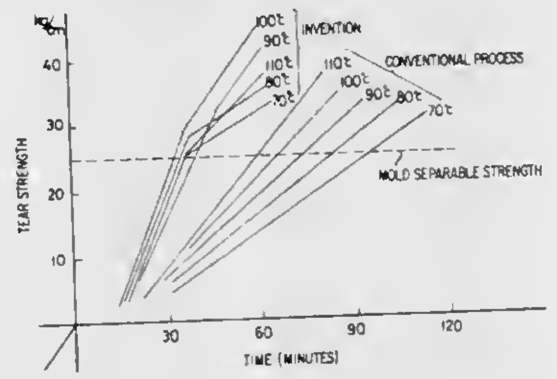
4,107,151
PROCESS FOR PRODUCING URETHANE ELASTOMER

Akio Takahashi, Yokohama; Hirokichi Saito, Shimizu, and Yosbijiro Oyaizu, Yaizu, all of Japan, assignors to Ihara Chemical Company Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,346

Int. Cl.^{2} C08G *18/65, 18/14, 18/16*

U.S. Cl. 528—54 **13 Claims**



1. A process for producing a urethane elastomer which comprises reacting

an organic polyisocyanate with a mixture of

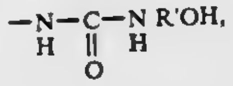
component (1) which is a long chain polyol having a molecular weight within the range of 400 to 5,000 and characterized as composed of terminal alcoholic hydroxyl groups attached to a moiety which is hydrocarbon or hydrocarbon interrupted by carboxylic ester or ether linkages,

a component (2) which is an aromatic diamine, and

a component (3) which is in an ungelled state and which is at least one of (a) a polyol having at least one urethane bond or at least one urethane bond and urea bond and (b) an amino alcohol having at least one urethane bond and a urea bond,

wherein at least one urethane bond of each of the components (a) and (b) is attached through the chain oxygen of said urethane bond to a group — GOH of a molecular weight such that HOGOH is of molecular weight not greater than 2000 wherein G is a divalent hydrocarbon moiety of a divalent hydrocarbon moiety interrupted by ester or ether linkages and wherein said G is otherwise unsubstituted or is substituted by alcoholic OH,

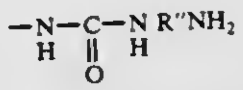
wherein the polyol (a) containing a urea bond contains it in a moiety



$-\underset{H}{N}-\underset{\underset{O}{\|}}{C}-\underset{H}{N}\,R'OH,$

R' being a low molecular weight divalent hydrocarbon radical

and wherein the amino alcohol (b) containing a urea bond contains it in a moiety



$-\underset{H}{N}-\underset{\underset{O}{\|}}{C}-\underset{H}{N}\,R''NH_2$

R'' being a divalent radical which is attached to the indicated nitrogen atoms at carbon, which is not reactive with —NCO, and which contains up to 9 carbon atoms and each carbon of R'' is attached to another carbon of R'',

all valences of the urethane and urea bonds in said (a) and (b) not above specified being attached to carbon atoms of organic radicals not reactive with —NCO, or said last mentioned radicals interrupted by at least one urethane linkage and constituting the balance of the molecule of each of (a) and (b),

there being a ratio of 5–40 mol % of the component (3) to the total of component (1) and component (3), and there being 0.90 - 1.30 equivalent of organic polyisocyanate per total of $-NH_2$ and —OH groups in components (1), (2) and (3).

4,107,152
POLYURETHANES PRODUCED FROM PHOSPHORUS CONTAINING FLAME RETARDING AGENTS WHICH ARE REACTIVE WITH ISOCYANATES

Hans Hübner, Leverkusen; Johannes Blahak, Cologne, and Hans-Joachim Meiners, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

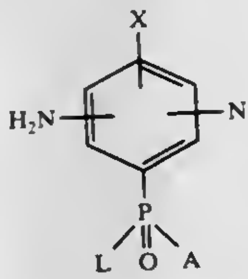
Division of Ser. No. 637,630, Dec. 4, 1975, Pat. No. 4,061,697. This application Sep. 1, 1977, Ser. No. 829,833

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1974, 2459491

Int. Cl.^{2} C08G *18/32*

U.S. Cl. 528—68 **6 Claims**

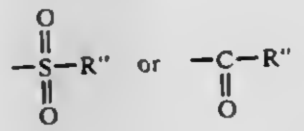
1. In a process for the preparation of polyurethanes comprising reacting polyisocyanates, high molecular weight and/or low molecular weight polyols and other organic compounds which contain groups capable of reacting with isocyanates, the improvement wherein the compounds which are reactive with isocyanate groups, include compounds of the following formula, used in an amount such that the polyurethane contains at least 0.5% by weight of phosphorous:



wherein

A and L, which are identical or different, represent optionally branched C_1–C_{17} alkyl group or -OR group wherein R represents an optionally branched C_1–C_8-alkyl group, and

X represents hydrogen, halogen, an optionally branched C_1-C_8 alkyl group, a C_6-C_{12} aryl or aralkyl groups, NH_2, CF_3, CN, COOR', SO_3R',



$-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}}-R''$ or $-\underset{O}{\underset{\|}{C}}-R''$

wherein:

R' represents hydrogen or an optionally branched alkyl or cycloalkyl group having 1–10 C atoms and

R'' represents an optionally branched alkyl or cycloalkyl group having 1–10 C atoms.

4,107,153

HEAT-RESISTANT THERMOSETTING POLYIMIDE RESIN

Keiichi Akiyama, Yokosuka; Junichi Kamiuchi, Yokohama; Itsuo Matsuda, Chofu, and Takara Fujii, Yokohama, all of Japan, assignors to Toshiba Chemical Products Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1975, Ser. No. 615,933

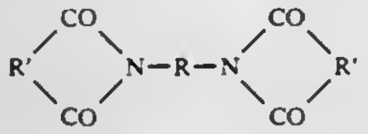
Claims priority, application Japan, Sep. 25, 1974, 49/109505; Mar. 6, 1975, 50/27292; Mar. 6, 1975, 50/27293

Int. Cl.^{2} C08G *69/26*

U.S. Cl. 528—322 **6 Claims**

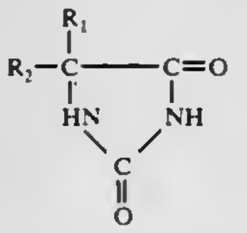
1. A heat-resistant thermosetting resin composition consisting essentially of the reaction product of at least one component (A), at least one component (B) and at least one component (C) under molar ratios satisfying the conditions $0 < B/B+C) \leqq 0.5$ and $1 \leqq A/(B+C) < 2$ wherein:

component (A) is bis-imide of the general formula:

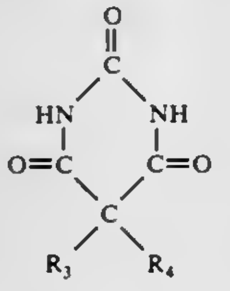


wherein R is a divalent radical selected from the group consisting of straight or branched alkylene radicals and having a ring of five to six carbon atoms, heterocyclic radical having at least any one of oxygen, nitrogen and sulfur, phenylene radical, polycyclic aromatic radical, and a plurality of phenylene or alicyclic radicals directly bonded with any one of — O —, $—CH_2—$, $—SO_2—$, —NHCO—, $—NR_5—$, $—NR_5R_6—$, each of R_5 and R_6 being an alkyl radical of one to four carbon atoms, a cycloalkyl radical having an alicyclic ring of five to six carbon atoms or a phenyl radical and R' is divalent radical of an acid selected from the group consisting of maleic, citraconic and tetrahydrophthalic acid; component (B) is selected from the group consisting of cyanuric acid, isocyanuric acid and tris (epoxypropyl) isocyanurate; and

component (C) is selected from the group consisting of pyromellitic diimide; benzophenone tetracarboxylic acid diimide; 2, 3, 6, 7-naphthalene-tetracarboxylic acid diimide; 3, 3', 4, 4'-diphenyltetra-carboxylic acid diimide; hydantoin or derivative of the formula:



wherein R_1 and R_2 may be the same or different and represent hydrogen or one to three carbon atom alkyl radicals, and barbituric acid or derivative of the formula:



wherein R_3 and R_4 may be the same or different and represent hydrogen or one to five carbon atom alkyl radicals.

4,107,154

ANIONIC COPOLYMERIZATION OF 2-PYRROLIDONE WITH C_7-C_{12} LACTAM

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 687,968, May 19, 1976, Ser. No. 724,801, Ser. No. 724,802. This application Mar. 2, 1977, Ser. No. 773,441 Int. Cl.^{2} C08G *69/24*

U.S. Cl. 528—312 **20 Claims**

2. The process according to claim 1 wherein said alkaline polymerization catalyst is potassium or sodium pyrrolidonate.

4,107,155

POLYSULFONAMIDES

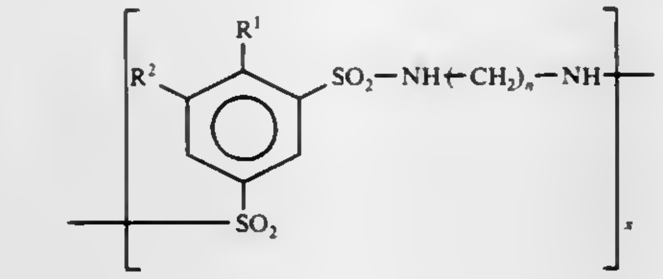
George Leland Fletcher, Pittsford, and Stewart H. Merrill, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,417

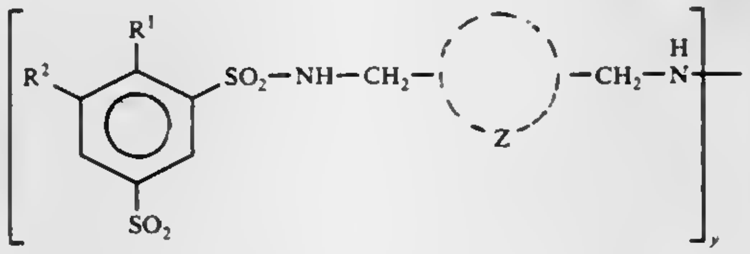
Int. Cl.^{2} C08G *75/30*

U.S. Cl. 528—373 **10 Claims**

1. A polymer comprising repeating units having the structures



and



wherein

- R^1 and R^2 are the same or different, and are each hydrogen, halogen or alkyl from 1 to 3 carbon atoms,
- *n* is 2 or 3,
- *x* and *y* are mole percentage amounts of the respective repeating units
- *x* ranging from 0 to about 90% and y being at least 10%, and
- Z represents the atoms necessary to form a saturated or unsaturated carbocyclic ring having from 5 to 7 carbon ring atoms.

4,107,156

PROCESS FOR PREPARING GEL POLYMER OF VINYL COMPOUND AND GEL POLYMER THEREOF

Takashi Sunamori, and Noboru Nishii, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1975, Ser. No. 591,860

Claims priority, application Japan, Jul. 5, 1974, 49/76271; Jul. 11, 1974, 49/78717

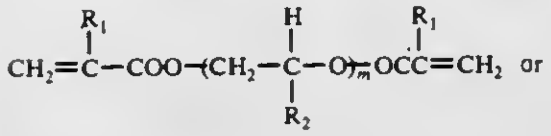
Int. Cl.^{2} C08F *4/28, 2/16, 20/18, 20/56*

U.S. Cl. 526—91 **11 Claims**

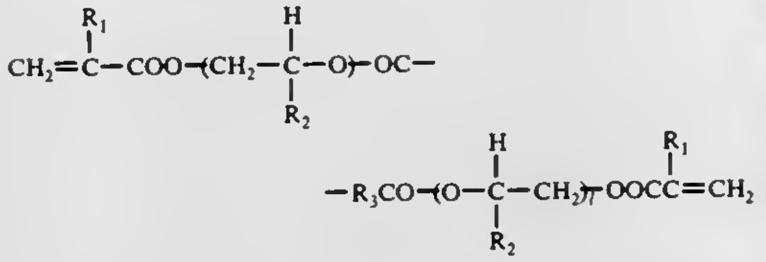
1. A process for preparing a gel polymer in the absence of peramides, hydroperoxides, persulfates and peroxides which consists essentially of: admixing a composition (B) which comprises at least one compound which, in an aqueous medium, has at least one hydroxyl group with at least one compound (C) capable of producing ferric ions or cerric ions in an aqueous medium, so as to form an intermolecular compound of (B) and (C),

reacting said intermolecular compound with a sulfur compound (D) which is capable of producing sulfur-containing ions selected from the group consisting of SO_2^{-2}, SO_3^{-2}, $S_2O_3^{-2}$, $S_2O_4^{-2}$, $S_2O_5^{-2}$, $S_2O_6^{-2}$, $S_2O_7^{-2}$, $S_3O_6^{-2}$, $S_4O_6^{-2}$, $S_5O_6^{-2}$, and $S_6O_6^{-2}$, in an aqueous medium, so as to form a polymerization initiator; and

reacting an aqueous composition (A) comprising an aqueous solvent and at least one water soluble vinyl compound selected from the group consisting of alkyl acrylates having 1 to 4 carbon atoms in the alkyl group, alkyl methacrylates having 1 to 4 carbon atoms in the alkyl group, acrylamide, methacrylamide, acrylic acid, methacrylic acid, itaconic acid, crotonic acid, α-methyleneglutaric acid, p-vinylbenzene sulfonic acid, 2-sulfoethyl acrylate, 2-sulfoethyl methacrylate, 2-acrylamide-2-methylpropane sulfonic acid and sodium, potassium and ammonium salts of said acids; diallyldimethyl ammonium bromide; methylene bisacrylamide, methylene bismethacrylamide; compounds having the general formula,



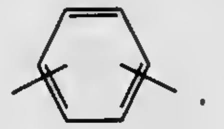
$$CH_2{=}\overset{R_1}{\overset{|}{C}}-COO\!\left(CH_2-\underset{\underset{R_2}{|}}{\overset{\overset{H}{|}}{C}}-O\right)_{\!m}OC\overset{R_1}{\overset{|}{C}}{=}CH_2 \quad \text{or}$$



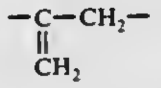
$$CH_2{=}\overset{R_1}{\overset{|}{C}}-COO\!\left(CH_2-\underset{\underset{R_2}{|}}{\overset{\overset{H}{|}}{C}}-O\right)-OC-$$

$$-R_3CO\!\left(O-\underset{\underset{R_2}{|}}{\overset{\overset{H}{|}}{C}}-CH_2\right)_{\!l}OOC\overset{R_1}{\overset{|}{C}}{=}CH_2$$

wherein R_1 and R_2 are —H or $—CH_3$, R_3 is an alkalene group, —CH═CH—,



or



$$-\underset{\underset{CH_2}{\|}}{C}-CH_2-$$

and *m* and *l* is an integer of 1 to 10; glycerin triacrylate, glycerin trimethacrylate, trimethylolpropane triacrylate, trimethylolpropane trimethylacrylate, pentaerythritol pentaacrylate, pentaerythritol pentamethacrylate; acryloyl or methacryloyl compounds of N-methylol- or N-alkylol-benzoguanamine, acryloyl or methacryloyl compounds of N-methylol- or N-alkylol-melamine in the presence of said polymerization initiator to form said gel polymer.

4,107,157

BARBITURIC ACID ANTIGENS AND ANTIBODIES SPECIFIC THEREFOR

Sidney Spector, Livingston, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 378,744, Jul. 12, 1973 abandoned, which is a division of Ser. No. 174,517, Aug. 24, 1971, Pat. No. 3,766,162. This application Mar. 23, 1976, Ser. No. 670,210

Int. Cl.^{2} A61K *37/06;* **C07G** *7/00*

U.S. Cl. 260—112 B **2 Claims**

1. A barbituric acid specific antibody consisting of a gamma globulin fraction protein having a multiplicity of sites which will selectively complex with a 5-substituted-1,3-unsubstituted-barbituric acid and an antigen consisting essentially of a 5-substituted-1,3-unsubstituted-barbituric acid derivative coupled through said 5-substituent by means of a peptide linkage to an immunogenic carrier material selected from the group consisting of proteins and polypeptides, said barbituric acid antibody being prepared by innoculating a host animal with the aforementioned antigen, collecting the serum from said host animal and precipitating the antibody therefrom.

4,107,158

PROCESS FOR MAKING AN OCTAPEPTIDE USEFUL FOR THE TREATMENT OF DIABETES

Pierre Lefrancier, Bures-sur-Yvette, France, assignor to Choay S.A., Paris, France

Filed Dec. 29, 1975, Ser. No. 644,844

Claims priority, application France, Dec. 31, 1974, 74 43513

Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **21 Claims**

1. The process for the preparation of the octapeptide leucyl—seryl—arginyl—leucyl—phenylalanyl—aspartyl—asparaginyl—alanine of the L-series free of racemized products, by stereospecific condensation, which comprises condensing: (1) (a) the pentapeptide leu—ser—arg—lue—phe— of the L-series with (b) the tripeptide asp—asn—ala of the L-series or (2) (a) the tripeptide leu—ser—arg of the L-series with (b) the pentapeptide leu—phe—asp—asn—ala of the L-series, these amino acids having the respective free amino, hydroxyl, N-guanidino and acid groups blocked to cause them to be inert during the condensation reaction, the condensation being carried out in a solvent for the defined peptides, completing the respective condensations, freeing without degradation the peptide formed of the groups which were blocked during the condensations and isolating the above-defined L-octapeptide.

4,107,159

ACETAL HYDRAZONES OF 2-HYDRAZINO-3H-1,4-BENZODIAZEPINE

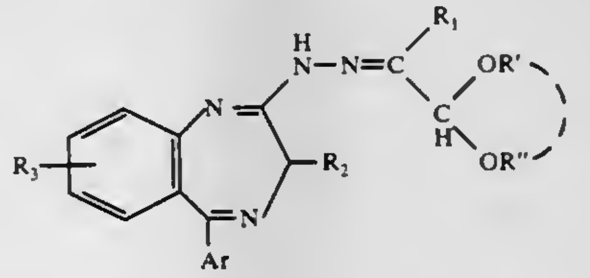
Gerald N. Evenson, Cooper, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 775,887, Mar. 9, 1977. This application Dec. 30, 1977, Ser. No. 865,976

Int. Cl.^{2} C07D *243/20, 401/04, 405/12, 405/14*

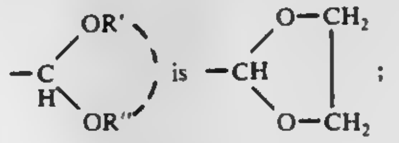
U.S. Cl. 260—239 BD **8 Claims**

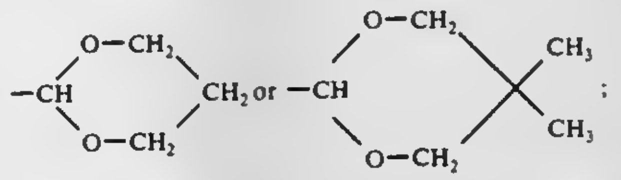
1. A compound of the formula III:



III

wherein R' and R'' are alkyl of 1 to 3 carbon atoms, inclusive, or the group





wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive; wherein

R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro and $—CF_3$; and wherein Ar is pheny, o-chlorophenyl, 2,6-difluorophenyl, and 2-pyridyl, and the pharmacologically acceptable acid addition salts thereof.

4,107,160
CONTINUOUS PROCESS FOR THE RECOVERY OF CAPROLACTAM

Ovidiu Dicoi, Offenbach, and Erwin Doerr, Markt Schwaben, both of Fed. Rep. of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,370

Int. Cl.² C07D *201/12*

U.S. Cl. 260—239.3 A **2 Claims**

1. A process for the continuous recovery of caprolactam from either solid polycaprolactam waste by a depolymerization reaction or from liquid polycaprolactam extraction water produced by a caprolactam extraction zone wherein, in either instance, a caprolactam water vapor mixture is produced and subsequently ungraded, in a distillation zone, to provide a concentrated caprolactam solution and a dilute, caprolactam water vapor overhead mixture which comprises

condensing a minor portion of the caprolactam water vapor mixture;

recycling the resultant condensed mixture to the distillation zone;

compressing the remaining, major portion of the water vapor;

admixing the compressed vapor with fresh steam;

superheating the resultant compressed vapor, fresh steam mixture; and

passing the superheated mixture to the caprolactam depolymerization reaction or caprolactam extraction zone.

4,107,161
BIS(TRIAMCINOLONE ACETONIDE)-4,4′-METHYLENEBIS-(3-METHOXY-2-NAPHTHOATE)

Agustin Agusti, Barcelona, Spain, assignor to J. Uriach & Cia. S.A., Barcelona, Spain

Filed Mar. 18, 1974, Ser. No. 452,322

Int. Cl.² C07J *71/00*

U.S. Cl. 260—239.55 D **5 Claims**

1. Bis(triamcinolone acetonide)4,4′-methylene-bis(3-methoxy-2-naphthoate).

4,107,162
PROCESS FOR PREPARING N_1-(2′-FURANIDYL)-5-FLUOROURACIL

Nobuyuki Suzuki, Hyuga; Yukinari Kobayashi, Nobeoka; Yumiko Hiyoshi, Nobeoka; Seiji Takagi, Nobeoka; Takanori Sone, Nobeoka; Mikio Wakahayasbi, Nobeoka, and Tuneo Sowa, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

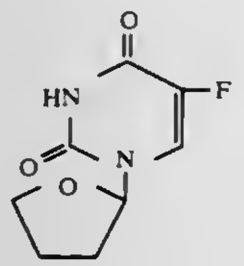
Filed Nov. 9, 1976, Ser. No. 740,324

Claims priority, application Japan, Nov. 10, 1975, 50-134805

Int. Cl.² C07D *239/54*

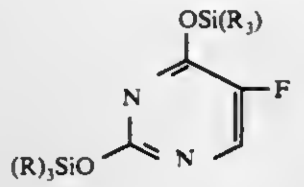
U.S. Cl. 544—313 **9 Claims**

1. A process for preparing N_1-(2′-furanidyl)-5-fluorouracil of the formula



(I)

which comprises reacting a 2,4-bis(trialkylsilyl)-5-fluorouracil of the formula



(II)

wherein R is a lower alkyl group, with 2,3-dihydrofuran in the presence of a catalyst selected from the group consisting of stannic chloride, aluminum chloride, titanium tetrachloride, silicon tetrachloride, antimony pentachloride, boron trifluoride, bromine, iodine, lithium iodide, sodium iodide, potassium iodide and mixtures thereof and a proton donor selected from the group consisting of water, an alcohol, an organic acid and mixtures thereof.

4,107,163
PEROVSKITE-TYPE COMPOSITIONS CONTAINING PENTAVALENT RU

Paul Christopher Donohue, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1976, Ser. No. 675,768

Int. Cl.² C01F *17/00;* **C01G** *55/00;* **C01F** *11/00*

U.S. Cl. 423—263 **5 Claims**

1. The metal oxides which contain pentavalent ruthenium, exhibit perovskite-type crystal structure, and are of the formula

Q_2MRuO_6

in which

Q is barium or strontium, and

M is yttrium, bismuth or rare earth metal of atomic number 57 to 70, provided that when Q is strontium, M is not bismuth.

4,107,164
CERTAIN PLEUROMULILIN ESTER DERIVATIVES

Helmut Egger, and Hellmuth Reinsbagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

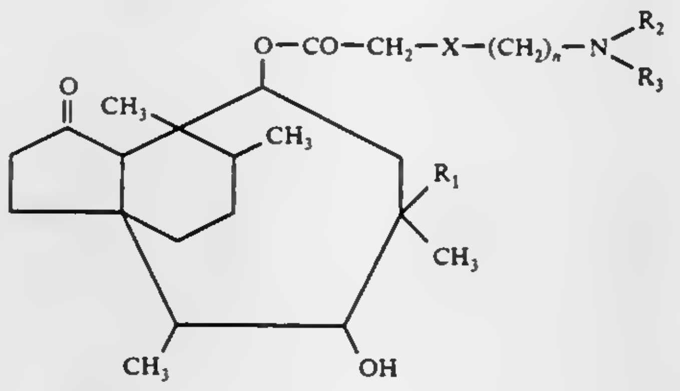
Division of Ser. No. 606,430, Aug. 21, 1975, Pat. No. 4,032,530, which is a division of Ser. No. 427,514, Dec. 26, 1973, Pat. No. 3,919,290, which is a continuation-in-part of Ser. No. 294,642, Oct. 3, 1972, abandoned. This application Jan. 10, 1977, Ser. No. 758,133

Claims priority, application Switzerland, Oct. 5, 1971, 14450/71; Oct. 5, 1971, 14451/71; May 25, 1972, 7738/72; May 25, 1972, 7739/72; May 25, 1972, 7740/72

Int. Cl.² C07D *295/08, 295/10, 295/12, 295/14*

U.S. Cl. 544—380 **31 Claims**

1. A compound of the formula:



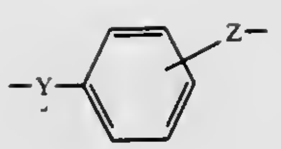
either

R_1 is ethyl or vinyl,

n is an integer from 2 to 5,

X is sulphur

a group



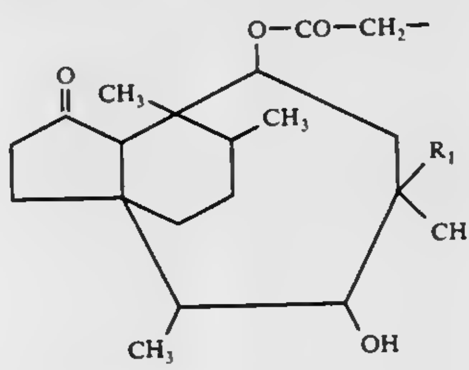
or a group $=N—R_4'$,

wherein

either Y and Z are both sulphur, or

one of Y and Z is oxygen and the other is sulphur, and

R_4' is hydrogen or a group of the formula:



wherein

R_1 is as defined above,

R_2 and R_3 together with the nitrogen atom form a piperazinyl radical, the second nitrogen atom of which is substituted by alkyl of 1 to 5 carbon atoms or hydroxyalkyl of 1 to 4 carbon atoms (alkancyloxy of 2 to 5 carbon atoms) alkyl of 1 to 4 carbon atoms or (benzoyloxy) alkyl of 1 to 4 carbon atoms,

or

wherein

R_1 is as defined above,

n is the number 2,

R_3 is alkyl of 1 to 10 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, (alkanoyloxy of 2 to 5 carbon atoms) alkyl of 1 to 4 carbon atoms or (benzoyloxy) alkyl of 1 to 4 carbon atoms,

X is the group $=N-R_4''$, and

R_2 together with R_4'' forms an ethylene bridge between both nitrogen atoms,

and pharmaceutically acceptable acid addition salts and quaternary salts thereof.

4,107,165
TRIS[TETRAHYDROISOQUINOLINE] COMPOUNDS

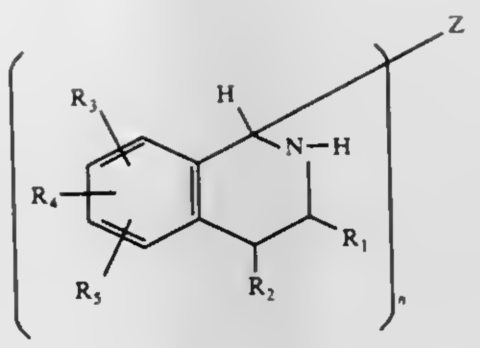
Parthasarathi Rajagopalan, Westbury, and Irwin J. Pachter, Woodbury, both of N.Y., assignors to Endo Laboratories, Garden City, N.Y.

Continuation of Ser. No. 561,435, Mar. 25, 1975, abandoned, which is a division of Ser. No. 336,973, Mar. 1, 1973, Pat. No. 3,928,611, which is a continuation of Ser. No. 165,346, Jul. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 1,029, Jan. 6, 1970, abandoned. This application Sep. 15, 1976, Ser. No. 723,336

Int. Cl.² C07D *401/06*

U.S. Cl. 260—288 CE **12 Claims**

1. A compound having formula:



wherein:

R_1 and R_2 individually represent hydrogen or lower alkyl;

R_3, R_4, R_5 represent hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy, lower alkenoxy, lower alkynoxy, acetoxy, butyryloxy, phenoxy, phenyl lower alkoxy, or R_3 and R_4 or R_4 and R_5 may be linked to form methylenedioxy;

n is 3; and

Z is a straight or branched alkanetriyl chain having 5 to 18 carbon atoms which is non-substituted or substituted by a nitro or amino group;

or a pharmaceutically acceptable acid addition salt thereof.

4,107,166
CERTAIN AMINO NAPHTHYRIDINES

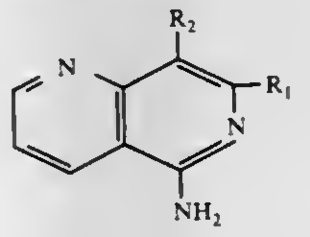
Joseph Mayer, New York, N.Y., and Margaret H. Sherlock, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

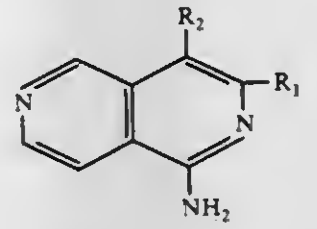
Division of Ser. No. 631,010, Nov. 12, 1975, Pat. No. 4,017,500, which is a division of Ser. No. 379,525, Jul. 16, 1973, Pat. No. 3,928,367, which is a continuation-in-part of Ser. No. 119,377, Feb. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 816,075, Apr. 14, 1969, abandoned. This application Apr. 11, 1977, Ser. No. 786,159

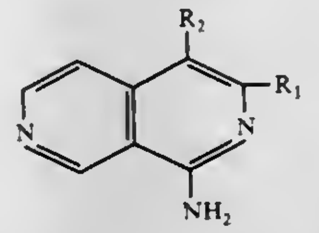
Int. Cl.² C07D *471/04*

U.S. Cl. 260—294.8 C **5 Claims**

1. A compound of the formula:

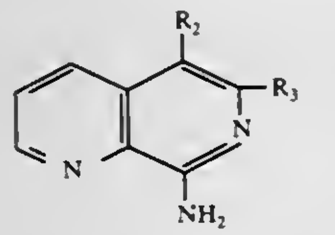






and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is selected from the group consisting of lower alkyl, phenyl, benzyl, phenethyl, thienyl, furyl and pyridyl, R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, benzyl, phenethyl and pyridyl and wherein the phenyl, benzyl, phenethyl, thienyl, furyl and pyridyl substituents and the pyrido moieties of the naphthyridine structures have lower alkyl, lower alkoxy, halo, nitro, lower alkyl mercapto, trifluoromethyl and di(lower alkyl) amino substituents.

5. A compound of the formula:



wherein R_3 is selected from the group consisting of lower alkyl, phenyl, benzyl and phenethyl, and R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, benzyl, phenethyl and pyridyl and wherein the phenyl, benzyl, phenethyl and pyridyl substituents and the pyrido moieties of the naphtyridine structures have lower alkyl, lower alkoxy, halo, nitro, lower alkyl mercapto, trifluoromethyl and di(lower alkyl) amino substituents.

4,107,167
ALKYL α-[3-(PYRIDYL)-ANILINOMETHYLENE]ACETOACETATES

Roman R. Lorenz, and William H. Thielking, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 635,758, Nov. 26, 1975, abandoned, which is a division of Ser. No. 479,627, Jun. 17, 1974, abandoned. This application Sep. 15, 1977, Ser. No. 833,484

Int. Cl.^{2} C07D *213/42*

U.S. Cl. 260—295 R **2 Claims**

1. Lower-alkyl α-(3-PY-anilinomethylene)acetoacetate where PY is 4(or 3)-pyridyl or 4(or 3)-pyridyl having one or two non-tertiary lower-alkyl substituents.

4,107,168
PHOSPHORUS SUBSTITUTED DIMERCAPTO THIADIAZOLES

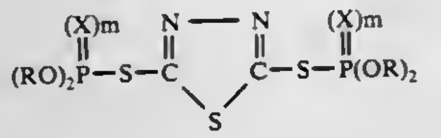
Abraham O. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 699,812, Jun. 24, 1976, abandoned, which is a division of Ser. No. 598,953, Jul. 24, 1975, Pat. No. 3,980,573. This application Apr. 15, 1977, Ser. No. 788,064

Int. Cl.^{2} C07D *285/12;* C07F *9/65*

U.S. Cl. 260—302 E **9 Claims**

1. The compound



wherein R is an alkyl having 1 to 25 carbon atoms, an aryl group or an alkyl substituted member thereof having 6 to 14 carbon atoms and *m* is zero or 1.

4,107,169
METHOD OF PREPARING 2-ARYL BENZOXAZOLES AND 2-ARYL BENZOTHIAZOLES

Klaus Schrage, Konigswinter, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,301

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619547

Int. Cl.^{2} C07D *277/66*

U.S. Cl. 260—304 P **9 Claims**

1. A method for preparing a 2-aryl benzoxazoles or 2-aryl benzthiazoles which comprises reacting a trichloromethyl aromatic compound with an aromatic compound carrying one amino group and one hydroxy or mercapto group in the ortho position with respect to the amino group or an acid addition salt thereof at about 130° to about 250° C.

4,107,170
METHOD OF PREPARING dl 6-PHENYL-2,3,5,6-TETRAHYDROIMIDAZO-[2,1-b]THIAZOLE AND ACID ADDITION SALTS THEREOF

Murray Garber, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

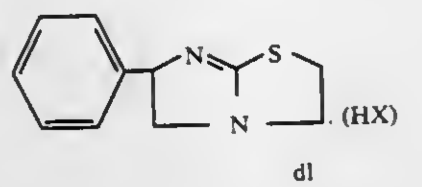
Continuation-in-part of Ser. No. 626,700, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,230, Jan. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 371,228, Jun. 18, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,133

Int. Cl.^{2} C07D *513/04*

U.S. Cl. 260—306.7 T **11 Claims**

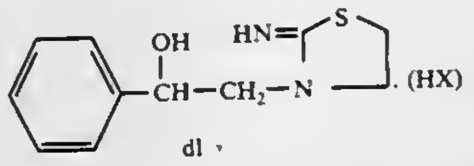
1. An improved process for the preparation of dl-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole and acid-addition salts thereof represented by formula (I):

(I)



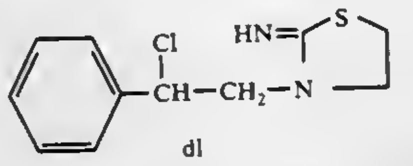
wherein the acid HX is selected from the group consisting of hydrochloric acid, hydrobromic acid and p-toleuenesulfonic acid; comprising the following reaction sequence: (a) replacing the hydroxy group of dl-3-(β-hydroxyphenethyl)-2-iminothiazolidine and acid-addition salts thereof represented by formula (II):

(II)



wherein HX is as hereinabove defined; with a chloro group by dissolving said formula (II) compound or an acid-addition salt thereof in a chlorination mixture prepared from at least 2 molar equivalent of concentrated aqueous hydrochloric acid of about 36% and at least 1 molar equivalent of sulfuric acid of about 94% to 98%, maintaining said solutions at a temperature range from 10° C. to 70° C. until the chlorination is essentially completed to obtain a solution of dl-3-(β-chlorophenethyl)-2-iminothiazolidine represented by formula (III):

(III)



in said acidic chlorination mixture; (b) diluting said acidic chlorination mixture with water, adding a water-immiscible organic solvent and ring-closing said formula (III) dl-3-(β-chlorophenethyl)-2-iminothiazoline to dl-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole by intramolecularly removing the elements of hydrochloric acid therefrom with a inorganic alkali metal base added to the above acidic solutions of said formula (III) compound in sufficient quantity to increase to, and maintain the pH of said mixture from about 7.5 to 9 at a temperature range from about 20° C. to 55° C., and recovering said formula (I) dl-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole base from the water-immiscible organic solvent phase, or converting said formula (I) compound to its HX salt, by adding a mixture of the appropriate HX acid as hereinabove defined and a lower C_1-C_4 alcohol to said organic solvent phase.

4,107,171
ALKANOLAMINE DERIVATIVES

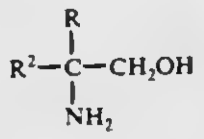
Louis A. Jurisch, Marengo, Ill., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Continuation-in-part of Ser. No. 652,432, Jan. 26, 1976, abandoned, which is a division of Ser. No. 601,699, Aug. 4, 1975, Pat. No. 3,994,919. This application Dec. 13, 1976, Ser. No. 750,080

Int. Cl.^{2} C07D *263/06*

U.S. Cl. 260—307 FA **7 Claims**

1. A product obtained by reacting an alkanolamine represented by the formula



$$R^2-\overset{R}{\underset{NH_2}{C}}-CH_2OH$$

where R is methyl, ethyl or hydroxymethyl and R^2 is hydrogen, methyl or hydroxymethyl, with oiticica oil in a ratio of 267 g per mole of alkanolamine at temperatures of 110° to 130° C in the presence of benzene, toluene, or xylene solvent.

4,107,172
URICOSURIC DIURETIC COMPOSITION

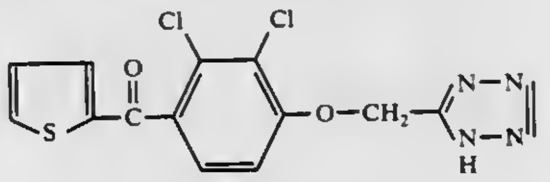
John Hans Biel, Lake Bluff, Ill.; Dilbagh S. Bariana, Cote St. Luc, and Anthony K. L. Fung, Pierrefonds, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 1, 1974, Ser. No. 447,182

Int. Cl.^{2} C07D *257/04;* A61K *31/41*

U.S. Cl. 260—308 D **1 Claim**

1. A tetrazole compound of the formula



4,107,173
3-SULFOMETHYL-1,2,4-TRIAZOLE-5-THIOL AND ITS ALKALI METAL SALTS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 726,377, Sep. 24, 1976. This application Dec. 1, 1977, Ser. No. 856,447

Int. Cl.^{2} C07D *249/12*

U.S. Cl. 260—308 R **3 Claims**

1. 3-Sulfomethyl-1,2,4-triazol-5-thiol and its alkali metal salts.

4,107,174
IMIDYL COMPOUNDS

Marcus Baumann, Basel; Vratislav Kvita, Muttenz; Martin Roth, Basel, all of Switzerland, and John Sidney Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

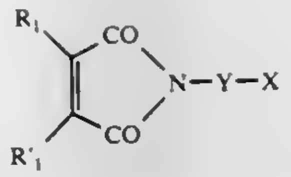
Filed Jun. 15, 1976, Ser. No. 696,346

Claims priority, application Switzerland, Jun. 18, 1975, 7951/75; Nov. 27, 1975, 15390/75

Int. Cl.^{2} C07D *207/46*

U.S. Cl. 260—326 NS **8 Claims**

1. A compound of the formula

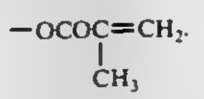


wherein

R_1 and R'_1 are each methyl or together are tetramethylene,

Y is a straight or branched alkylene of 2 to 6 carbon atoms or 1,4-cyclohexylene, and

X is $-OCOCH{=}CH_2$ or



$$-OCO\underset{CH_3}{C}{=}CH_2.$$

4,107,175
1,3-BENZODITHIOLANES

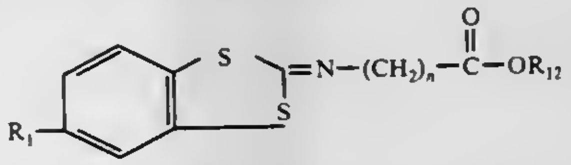
Peter W. Sprague, Titusville, and James E. Heikes, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 705,849, Jul. 16, 1976. This application Dec. 17, 1976, Ser. No. 751,552

Int. Cl.^{2} C07D *339/06*

U.S. Cl. 260—327 M **21 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, trifluoromethyl, alkyl, alkoxy, nitro, amino or hydroxy; R_{12} is hydrogen or alkyl; and n is 0, 1, 2, 3, 4 or 5; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 4 carbon atoms.

4,107,176
MONO-N-TOSYLSULFIMIDES, THEIR PREPARATION AND THEIR REACTION PRODUCTS

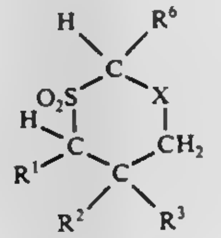
David H. Evans, and Richard B. Greenwald, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 679,487, Apr. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,463, Jun. 30, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,862

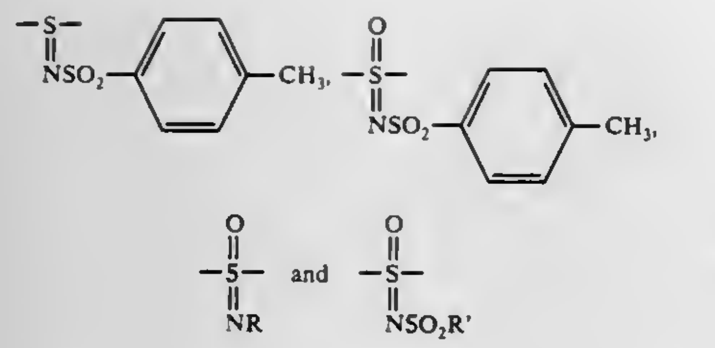
Int. Cl.^{2} C07D *339/08;* G03C *5/26*

U.S. Cl. 260—327 M **71 Claims**

1. A compound of the formula

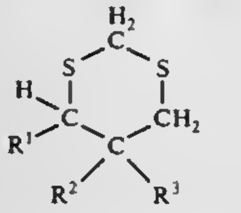


wherein R^1 is selected from hydrogen, alkyl containing 1 to 4 carbon atoms and $-CO_2R^4$ wherein R^4 is alkyl containing 1 to 4 carbon atoms; R^2 and R^3 when taken individually are selected from hydrogen and alkyl containing 1 to 4 carbon atoms and R^2 and R^3 when taken together are spiro; R^6 is selected from hydrogen and $-(CH_2)_nSR^0$ wherein *n* is 0, 2, 3, 4 or 5 and R^0 is alkyl containing 1 to 4 carbon atoms and X is selected from



wherein R is hydrogen or alkyl containing 1 to 4 carbon atoms and R′ is alkyl containing 1 to 4 carbon atoms.

56. A method which comprises reacting (a) a 1,3-dithiane unsubstituted in the 2-position having the formula



wherein R^1 is selected from hydrogen, alkyl containing 1 to 4 carbon atoms and $—CO_2R^4$ wherein R^4 is alkyl containing 1 to 4 carbon atoms; R^2 and R^3 when taken individually are selected from hydrogen and alkyl containing 1 to 4 carbon atoms and R^2 and R^3 when taken together are spiro and (b) N-chloro-p-toluenesulfonamide sodium salt in aqueous alkanol at a temperature between about 20° and 30° C to yield the corresponding 1-tosylimino-1,3-dithiane and isolating said 1-tosylimino-1,3-dithiane.

4,107,177

PROCESS FOR PREPARING HETEROARYLBENZOXEPIN-ACETIC ACIDS, PRECURSORS AND DERIVATIVES THEREOF

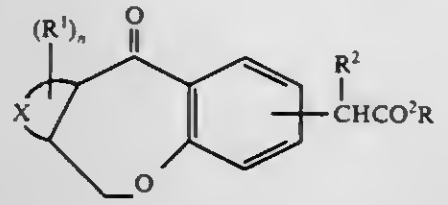
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,958

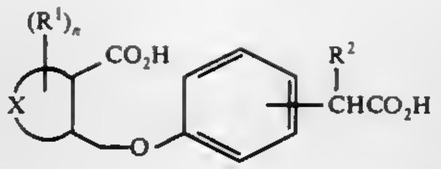
Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 C **5 Claims**

1. A process for the preparation of a compound of the formula



wherein X together with the carbon atoms to which it attaches is a thienyl radical R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; *n* is the integer 1, 2 or 3; and salts prepared from pharmaceutically acceptable bases which comprises cyclizing, with a dehydrating agent at a temperature of from 50° to 125° C. and for a time of 5 minutes to 12 hours, a dicarboxylic acid of the formula



wherein X and the carbon atoms to which it attaches, R^1, R^2 and *n* are as defined earlier.

4,107,178

THIOPRENE OR FURAN DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Genichi Tsuchibashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

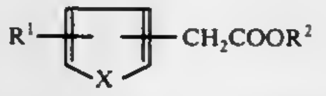
Division of Ser. No. 651,112, Jan. 21, 1976, Pat. No. 4,051,151. This application Apr. 22, 1977, Ser. No. 790,133

Claims priority, application Japan, Jan. 23, 1975, 50-9297; Jan. 27, 1975, 50-10520; Feb. 3, 1975, 50-13388; Nov. 25, 1975, 50-140249

Int. Cl.² C07D *333/24, 307/12, 307/16*

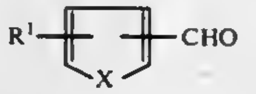
U.S. Cl. 260—332.2 A **1 Claim**

1. A process for preparing thienylacetic acid, furylacetic acid or an alkyl ester of each of said acids expressed by the following formula



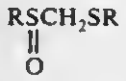
(I)

wherein X represents S or O, and R^1 and R^2, independently from each other, represent a hydrogen atom or an alkyl group, which comprises a first step of reacting at a temperature of from room temperature to 150° C an aldehyde compound of thiophene or furan expressed by the following formula



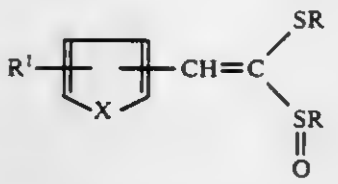
(V)

wherein X and R^1 are the same as defined above, with a mercaptal S-oxide of the following formula



$$\underset{\overset{\|}{O}}{RS}CH_2SR \qquad (II)$$

wherein R represents an alkyl or phenyl group in the presence of, as a strongly basic catalyst, a member selected from the group consisting of an alkali or alkaline earth metal hydride, an alkyl lithium, an alkali metal amide, an alkali or alkaline earth metal hydroxide, an alkali or alkaline earth metal alkoxide, an alkaline earth metal oxide, a quaternary ammonium hydroxide, and an alkali metal carbonate, to form a thiophene or furan derivative of the following formula



(II)

wherein X, R^1 and R are the same as defined above, and a second step of neutralizing the strong base contained in the resulting reaction mixture and then reacting the reaction mixture at a temperature of from −30° to 150° C with water or an alcohol of the following formula

$$R^2OH \qquad (III)$$

wherein R^2 is the same as defined above, in the presence of a mineral acid catalyst selected from the group consisting of hydrogen halides and hydrohalic acids.

4,107,179

METHOD FOR PREPARING TICRYNAFEN

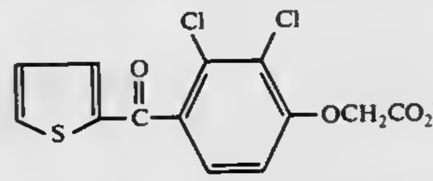
Harold Graboyes, Overbrook Hills, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 22, 1977, Ser. No. 826,604

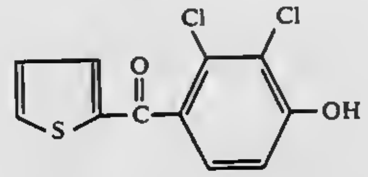
Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 A **5 Claims**

1. The method of preparing ticrynafen having the formula:



or its sodium or potassium salts comprising reacting a phenolic compound of the formula:



with sodium or potassium chloroacetate in an aqueous solvent at about 90°-95° C. at a pH of about 9-10 in the presence of sodium or potassium iodide in the amount of about 1-15% by weight of said phenolic compound to give the sodium or potassium salt of ticrynafen and optionally reacting said salt product with acid to obtain the acid form.

4,107,180

SALTS OF ALKALI METAL ANIONS AND PROCESS OF PREPARING SAME

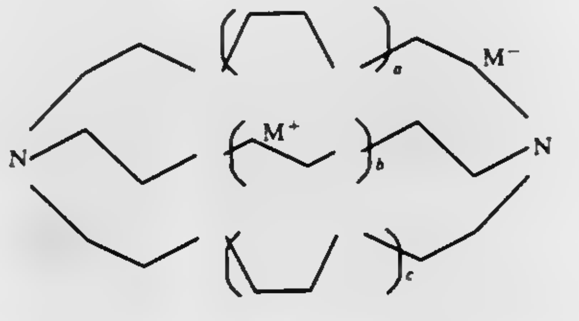
James L. Dye, East Lansing; Joseph M. Ceraso, Lansing, both of Mich.; Frederick J. Tehan, Utica, N.Y., and Mei Tak Lok, Urbana, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,381

Int. Cl.² C07F *1/04, 1/06*

U.S. Cl. 260—338 **9 Claims**

1. A compound of an alkali metal anion salt of an alkali metal cation in a bicyclic polyoxadiamine compound of the formula:



where M^+ is a cation of an alkali metal, M^- is an anion of an alkali metal, said M^+ and M^- are selected from the group consisting of Na, K, Rb, and Na and K, and *a*, *b* and *c* are integers from 0 to 2.

4,107,181

USEFUL PROSTAGLANDIN INTERMEDIATES

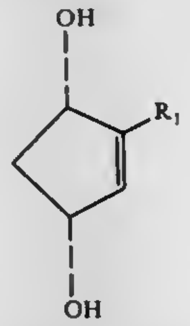
David A. Evans, Pasadena, Calif., assignor to Regent of the University of California, Berkeley, Calif.

Continuation of Ser. No. 687,419, May 17, 1976, abandoned, which is a division of Ser. No. 499,287, Aug. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 349,888, Apr. 10, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,314

Int. Cl.² C07D *317/12*

U.S. Cl. 260—340.9 R **1 Claim**

1. A compound of the formula:



wherein R_1 is a member of the group consisting of alkyl, (cis or trans) alkenyl and alkynyl groups of from 2 to 9 carbon atoms substituted by a terminal 1,3-dioxacyclopentyl group.

4,107,182

7-OXO-9-METHOXY-7H-FURO[3,2-G][1]BENZOPYRAN-6-CARBOXYLIC ACID

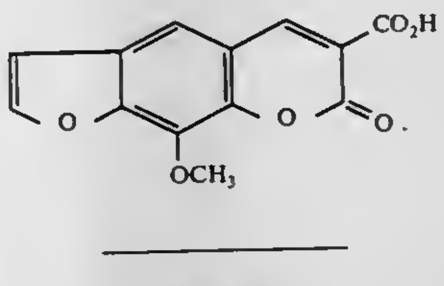
Arnold A. Liebman, Verona, and Yu-Ying Liu, Westwood, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 29, 1977, Ser. No. 820,265

Int. Cl.² C07D *493/04*

U.S. Cl. 260—343.21 **1 Claim**

1. A compound of the formula



4,107,183

SYNTHESIS OF OPTICALLY ACTIVE CARBOXYLIC ACID ESTERS

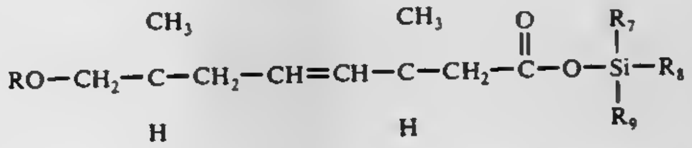
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 16, 1977, Ser. No. 796,929

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.8 R **1 Claim**

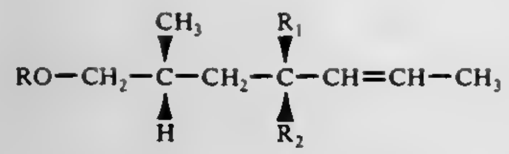
1. A process for producing a compound of the formula:



$$RO-CH_2-\underset{H}{\overset{CH_3}{C}}-CH_2-CH{=}CH-\underset{H}{\overset{CH_3}{C}}-CH_2-\overset{\overset{O}{\|}}{C}-O-\underset{R_9}{\overset{R_7}{\underset{|}{\overset{|}{Si}}}}-R_8$$

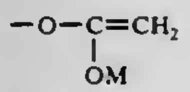
wherein R_7, R_8 and R_9 are lower alkyl, R taken together with the attached oxygen moiety forms an ether protecting group removable by acid catalyzed cleavage or hydrogenolysis;

comprising subjecting an optically active isomer of the formula:



$$RO-CH_2-\underset{H}{\overset{CH_3}{C}}-CH_2-\underset{R_2}{\overset{R_1}{C}}-CH=CH-CH_3$$

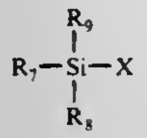
wherein one of R_1 and R_2 is hydrogen and the other is



$$-O-\underset{OM}{C}=CH_2$$

with the proviso that when R_1 is hydrogen, the 5-6 double bond has a trans configuration and when R_2 is hydrogen, the 5-6 double bond has a cis configuration; and M is an alkali metal;

to Claisen rearrangement by reaction with an agent of the formula:



$$R_7-\underset{R_8}{\overset{R_9}{Si}}-X$$

wherein R_7, R_8 and R_9 are as above; and X is halogen.

4,107,184

3-FURYL ALKYL DISULFIDES

William J. Evers, Middletown; Howard H. Heiosohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., Union Beach, N.J.

Continuation-in-part of Ser. No. 551,045, Feb. 19, 1975. This application Oct. 7, 1975, Ser. No. 620,353

Int. Cl.^{2} C07D *307/64*

U.S. Cl. 260—347.2 **5 Claims**

1. A 3-furan-alkyl disulfide selected from the group consisting of:

Ethyl(2-methyl-3-furyl) disulfide;
Isoamyl(2-methyl-3-furyl) disulfide;
Cyclohexyl(2-methyl-3-furyl) disulfide; and
Isoamyl(2,5-dimethyl-3-furyl) disulfide.

4,107,185

3-(3,4-EPOXY-4-METHYLCYCLOHEXYL)BUTYL ESTERS

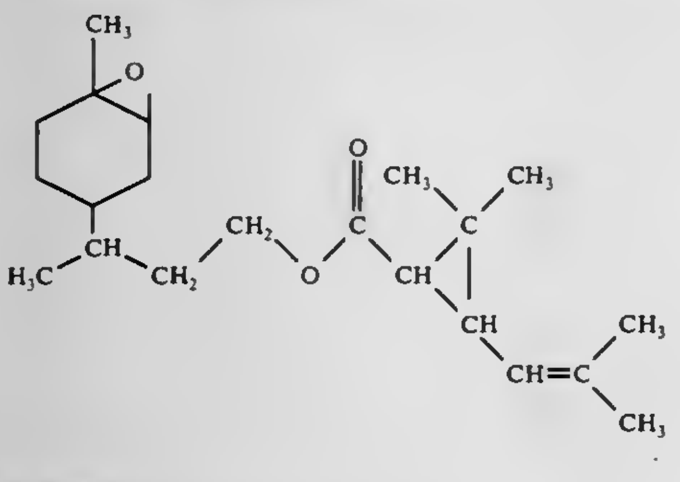
Jerry G. Strong, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 659,079, Feb. 18, 1976, Pat. No. 4,036,629, which is a continuation-in-part of Ser. No. 153,056, Jun. 14, 1971, abandoned. This application Apr. 1, 1977, Ser. No. 783,901

Int. Cl.^{2} C07D *303/44*

U.S. Cl. 260—348.55 **1 Claim**

1. A compound of the formula:



which is named:
3-(3,4-Epoxy-4-methylcyclohexyl)butyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate.

4,107,186

4-HYDROXYANTHRONES AND PROCESS OF PREPARATION

Gerd-Michael Petruck, Bergisch-Gladbach; Erich Klauke, Odenthal-Hahnenberg, and Horst Jäger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

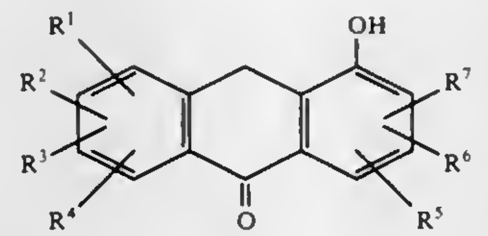
Filed Dec. 6, 1977, Ser. No. 858,035

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655824; May 24, 1977, 2723350

Int. Cl.^{2} C07C *49/82*

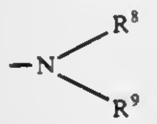
U.S. Cl. 260—351 **10 Claims**

1. A process for preparing a 4-hydroxyanthrone of the formula

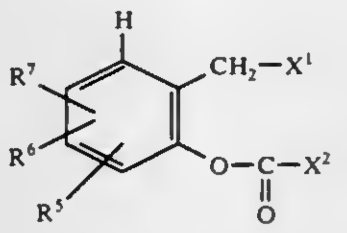


wherein

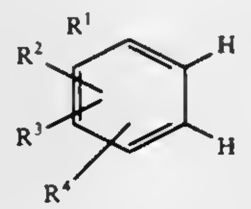
R^1 to R^7 are the same or different and denote hydrogen, hydroxyl, halogen, cyano, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 alkoxy, C_1-C_4 alkylmercapto, C_1-C_4 alkylsulphonyl, trifluoromethyl, trichloromethyl or an amino group of the formula



wherein R^8 and R^9 are identical or different and represent hydrogen, C_1-C_4 alkyl or C_1-C_4 alkylcarbonyl which comprises contacting a (2-halogeno-methyl)-phenyl haloformate of the formula

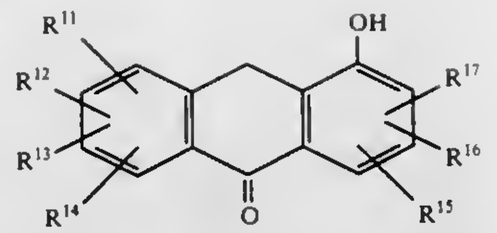


wherein R^5 to R^7 have the meanings indicated above and X^1 and X^2 are identical or different and represent a halogen with an aromatic carbocyclic compound of the formula

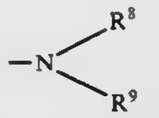


wherein R^1 to R^4 have the meanings indicated above, in the presence of a Friedel-Crafts catalyst at a temperature in the range of from 0° to 300° C.

8. A 4-hydroxyanthrone of the formula



wherein R^{11} to R^{17} are identical or different and denote hydrogen, hydroxyl, fluorine, chlorine, bromine, cyano, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 alkylmercapto, C_1-C_4 alkylsulphonyl, trifluoromethyl, trichloromethyl or an amino group of the formula



wherein R^8 and R^9 are identical or different and represent hydrogen, C_1-C_4 alkyl or C_1-C_4 alkylcarbonyl, at least one of the radicals R^{11} to R^{17} being different from hydrogen or methyl.

4,107,187

AMINOALKYLPYRROLOBENZOXAZALKANES

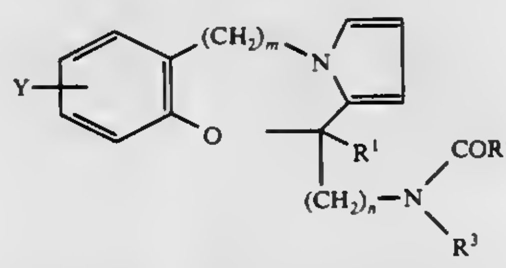
Richard C. Effland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Fed. Rep. of Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 661,505, Feb. 26, 1976, Pat. No. 4,029,672. This application Jan. 19, 1977, Ser. No. 760,509

Int. Cl.^{2} C07D *498/04*

U.S. Cl. 260—326.29 **3 Claims**

1. A compound of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino, R^1 is hydrogen or lower alkyl; R^3 is a straight or branched chain alkyl of from 1 to 5 carbon atoms, phenyl or cycloalkyl of from 3 to 6 carbon atoms; R^4 is straight or branched chain alkyl of from 1 to 4 carbon atoms, phenyl, benzyl, phenethyl, cycloalkyl of from 3 to 6 carbon atoms, cycloalkylalkyl of from 4 to 6 carbon atoms, phenoxy or lower alkoxy; m is the integer 1 or 2 and *n* is the integer 1, 2 or 3.

4,107,188

PREGNANES

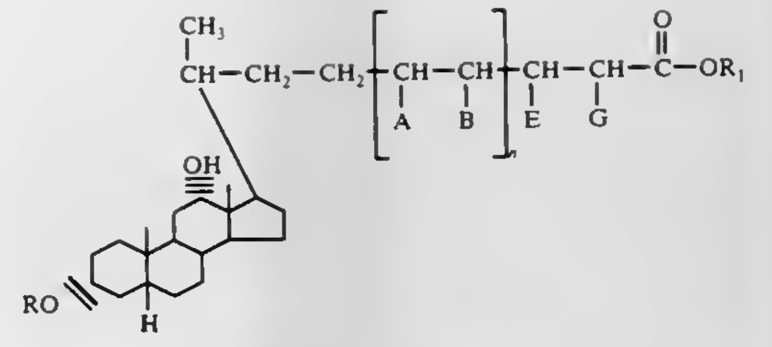
Hugo Gallo-Torres, Livingston; James Guthrie Hamilton, Nutley; Perry Rosen, North Caldwell, and Ann Clare Sulllvan, Cedar Grove, all of N.J., assignors to Hoffmann-La Rocbe Inc., Nutley, N.J.

Filed Apr. 22, 1977, Ser. No. 790,165

Int. Cl.^{2} C07J *9/00*

U.S. Cl. 260—397.1 **9 Claims**

1. A compound of the formula:



wherein R is hydrogen or lower alkanoyl; R_1 is lower alkyl or hydrogen, A and B are individually hydrogen or taken together form a carbon to carbon bond; *n* is an integer from 0 to 1; E and G are individually hydrogen or taken together form a carbon to carbon bond; with the proviso that when *n* is 1 and A and B are hydrogen, E and G are also hydrogen and pharmaceutically acceptable salts thereof.

4,107,189

LIQUID CRYSTALLINE COMPOUNDS

Jan van der Veen, and Theodorus Cornelis Jozef Maria Hegge, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

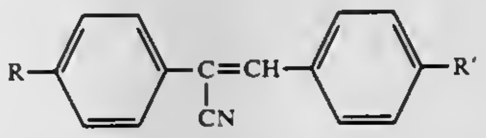
Continuation of Ser. No. 386,032, Aug. 6, 1973, abandoned. This application Oct. 7, 1975, Ser. No. 620,300

Claims priority, application Netherlands, Aug. 18, 1972, 7211383

Int. Cl.^{2} C07C *121/70*

U.S. Cl. 260—404 **14 Claims**

1. A compound of the formula I



wherein R and R′ are each independently moieties selected from the group consisting of alkyl of 3 to 8 carbon atoms, alkoxy of up to 8 carbon atoms and acyloxy wherein the acyl moiety is derived from an aliphatic carobxylic acid of up to 10 carbon atoms with the proviso that at least one of R and R′ is other than methoxy.

4,107,190

NOVEL COMPOUNDS OF 9-PHENYL-3,7-DIMETHYL-2,4,6,8-NONATETRAENAMIDE

Werner Bollag, Basel; Rudolf Rüegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

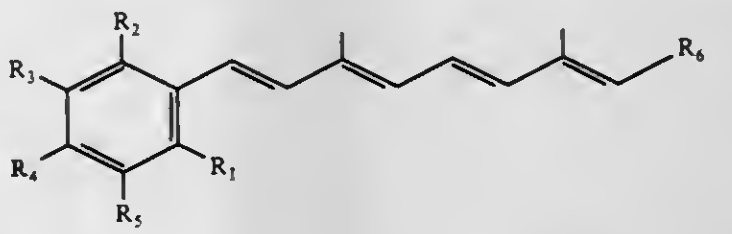
Division of Ser. No. 613,676, Sep. 15, 1975, Pat. No. 4,054,598. This application Jul. 18, 1977, Ser. No. 816,409

Claims priority, application Switzerland, Sep. 26, 1974, 13032/74; Jul. 9, 1975, 8962/75

Int. Cl.^{2} C09F *5/00;* **C11C** *3/00*

U.S. Cl. 260—404 **2 Claims**

1. A compound of the formula:



1

wherein one of R_1 and R_2 is halogen or lower alkyl, and the other is halogen or lower alkoxy; R_3 and R_5 are hydrogen or halogen or lower alkyl; with the proviso that one of R_3 and R_5 is other than halogen; R_4 is halogen or lower alkoxy, amino, mono(lower alkyl)amino or di(lower alkyl) amino; and R_6 is carbamoyl, mono(lower alkyl)carbamoyl or di(lower alkyl)-carbamoyl and salts thereof.

2. The compound of claim 1 wherein said compound is 9-(6-Chloro-4-methoxy-2,5-dimethyl-phenyl)-3,7-dimethyl-nona-2,4,6,8-tetraen-1-oic acid ethyl amide.

4,107,191

13,14-DIDEHYDRO-PGF, COMPOUNDS

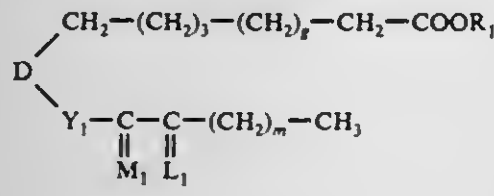
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 658,588, Feb. 17, 1976, abandoned. This application Dec. 29, 1976, Ser. No. 755,337

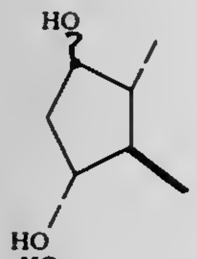
Int. Cl.² C07C *177/00*

U.S. Cl. 260—408 **106 Claims**

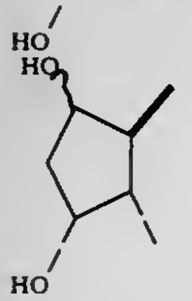
1. A prostaglandin analog of the formula



wherein D is



or



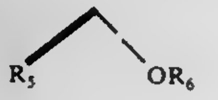
;

wherein

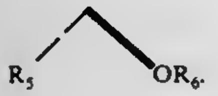
Y_1 is —C≡C—;

wherein g is one, 2, or 3, and m is one to 5;

wherein M_1 is

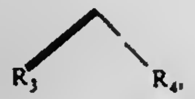


or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



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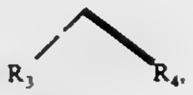
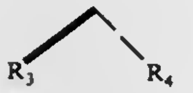
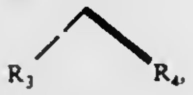


or a mixture of



and

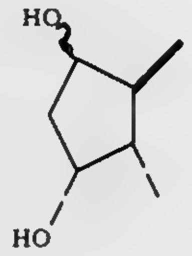


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation;

with the proviso that R_5 is methyl, R_3 and R_4 are both hydrogen, and g is one, only when

wherein D is



4,107,192

ANTIMICROBIAL ESTERS OF ALIPHATIC DIOLS

August V. Bailey; Gordon J. Boudreaux; Gene Sumrell, all of New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 667,055, Mar. 15, 1976, Pat. No. 4,024,164. This application Feb. 15, 1977, Ser. No. 768,806

Int. Cl.² C09F *5/08*

U.S. Cl. 260—410.5 **5 Claims**

1. 2-Benzoxyethyl laurate.

4,107,193

POLYPRENYL CARBOXYLIC ACID COMPOUND

Shizumasa Kijima, Tokyo; Toshiji Igarashi, Tokorozawa; Isao Yamatsu, Tokyo; Kimio Hamamura, Kashiwa; Yoshikage Nakajima, Tokyo; Norio Minami, Kawasaki; Youji Yamagishi, and Yuithi Inai, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

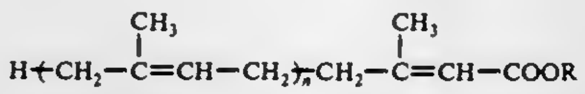
Filed May 13, 1977, Ser. No. 796,693

Claims priority, application Japan, May 27, 1976, 51/60583

Int. Cl.² C09F *5/08;* **C11C** *3/02*

U.S. Cl. 260—410 **18 Claims**

1. A polyprenyl carboxylic acid compound having the formula:



$$H\!\left(CH_2-\overset{\displaystyle CH_3}{\overset{|}{C}}=CH-CH_2\right)_{n}CH_2-\overset{\displaystyle CH_3}{\overset{|}{C}}=CH-COOR$$

wherein R is hydrogen, alkyl, alkenyl, cycloalkyl or aryl, and n is an integer of 6 to 11, and pharmacologically acceptable salts thereof.

10. A polyprenyl carboxylic acid compound as set forth in claim 1 wherein n is 9 and R is cyclohexyl.

4,107,194

PRODUCT AND PROCESS FOR REDUCING DISCOLORATION AND DARK SPOTTING IN TETRAFLUOROETHYLENE RESIN MOLDED PARTS

Satish Chandra Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 645,220, Dec. 29, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,395

Int. Cl.² C08K *3/08, 7/14*

U.S. Cl. 260—42.18 **7 Claims**

1. A mixture consisting essentially of comminuted granular tetrafluoroethylene resin that has been ground until it has a d_{50} of less than 200μ, particulate filler material, and an amount of a silicone effective to reduce discoloration and dark spotting upon sintering in an air-starved environment, said mixture being mixed in an apparatus for dry blending at a temperature between about 15° and 35° C.

4,107,195

PREPARATION OF ZEOLITE ZSM-35

Louis Deane Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 22, 1977, Ser. No. 789,900

Int. Cl.² C07F *5/06;* **C01B** *33/28*

U.S. Cl. 260—448 C **19 Claims**

1. A synthetic crystalline aluminosilicate zeolite having a composition in the anhydrous state, expressed in terms of mole ratios of oxides as follows:

$$(0.3\text{–}5)R:(0\text{–}0.8)M_2O:Al_2O_3:xSiO_2$$

wherein R is butanediamine or an organic nitrogen-containing cation derived therefrom, M is an alkali metal cation and x is greater than 8, and having an X-ray powder diffraction pattern substantially as that shown in Table 1 of the specification.

13. The method for preparing the crystalline aluminosilicate zeolite defined in claim 1 which comprises preparing a mixture containing sources of an alkali metal oxide, an organic nitrogen-containing oxide, an oxide of aluminum, an oxide of silicon and water and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3	=	8.8–200
H_2O/SiO_2	=	5–100
OH^-/SiO_2	=	10^{-10}–1.0
M/SiO_2	=	0.1–3.0
R/SiO_2	=	0.05–2.0

wherein R is butanediamine or an organic nitrogen-containing cation derived therefrom and M is an alkali metal ion, and maintaining the mixture at a temperature of at least 90° F until the crystals of said aluminosilicate are formed.

4,107,196

N-TERTIARYBUTYL ORGANOSILYLAMIDES

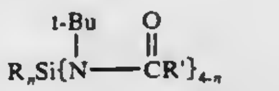
Cecil L. Frye, and Thomas H. Lane, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 7, 1977, Ser. No. 858,144

Int. Cl.² C07F *7/10*

U.S. Cl. 260—448.2 N **5 Claims**

1. A composition of the formula



$$R_nSi\{\overset{\displaystyle t\text{-Bu}}{\overset{|}{N}}-\!\!-\overset{\displaystyle O}{\overset{\|}{C}}R'\}_{4-n}$$

where n is 2 or 3, R is of the group methyl, ethyl, vinyl, phenyl or 3,3,3-trifluoropropyl, at least 2 R's being methyl when n is 3 and R' is methyl or ethyl.

4,107,197

PROCESS FOR PREPARING α-OXY(OXO)SULFIDES AND ETHERS

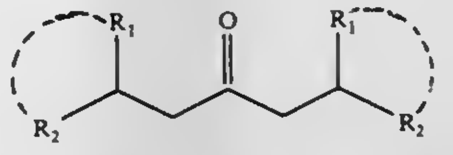
William J. Evers, Red Bank, and Howard H. Heinsohn, Jr., Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,538, Oct. 7, 1976, Pat. No. 4,045,491. This application Mar. 31, 1977, Ser. No. 783,495

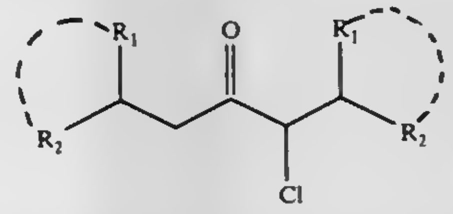
Int. Cl.² C07C *153/09*

U.S. Cl. 260—455 R **6 Claims**

1. The process comprising the steps of first reacting a ketone having the structure:



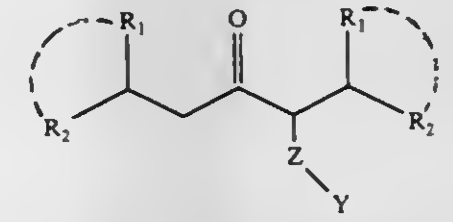
with SO_2Cl_2 at a temperature in the range of from 15° up to 40° C to form an alpha chloro ketone having the structure



distilling said alpha-chloro ketone from the reaction mass; then intimately admixing said alpha chloro ketone with a compound having the structure:

M—Z—Y

in the presence of an inert solvent at a temperature in the range of from 0° up to 30° C thereby forming an alpha oxo mercaptan, sulfide, hydroxide or ether having the structure:



and extracting said alpha oxo mercaptan, sulfide, hydroxide or ether from the reaction mass; wherein R_1 and R_2 can be taken together or separately; and when R_1 and R_2 are taken separately, R_1 is hydrogen or methyl and R_2 is methyl; and when R_1 and R_2 are taken together they form a phenyl moiety; M is alkali metal; Z is selected from the group consisting of oxygen and sulfur; and Y is one of hydrogen, C_1–C_4 alkyl, C_3 or C_4 alkenyl, acetyl, methoxy carbonyl methyl or 1,3-diethyl acetonyl.

4,107,198

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH ACRYLONITRILE

Harry K. Myers, Jr., Aston, and Abraham Schneider, Overbrook Hills, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jul. 1, 1977, Ser. No. 812,208

Int. Cl.^{2} C07C *120/00, 121/46*

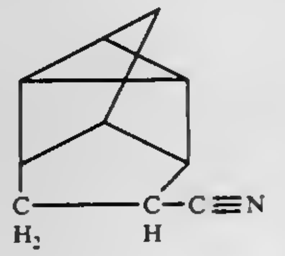
U.S. Cl. 260—464 **10 Claims**

1. Process for the catalytic codimerization of norbornadiene with acrylonitrile comprising:

(a) contacting norbornadiene and acrylonitrile in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of nickel acetylacetonate, triphenylphosphine and an alkyl aluminum chloride selected from the group consisting of diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range between from about −20° C to about 100° C; and

(c) continuing the contacting until a norbornadiene-acrylonitrile codimer having the following structure



is prepared.

4,107,199

BIS(ISOCYANATOPROPYL) ARYLACETONITRILES

Eberhard König, Leverkusen, and Josef Pedain, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

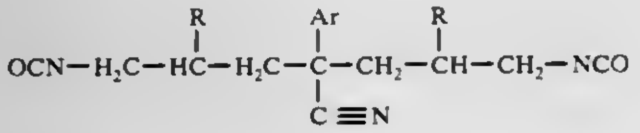
Filed Jan. 27, 1977, Ser. No. 763,219

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604831

Int. Cl.^{2} C07C *121/66*

U.S. Cl. 260—465 D **4 Claims**

1. Diisocyanates of the formula



$$OCN-H_2C-\overset{\overset{\displaystyle R}{|}}{HC}-H_2C-\underset{\underset{\displaystyle C\equiv N}{|}}{\overset{\overset{\displaystyle Ar}{|}}{C}}-CH_2-\overset{\overset{\displaystyle R}{|}}{CH}-CH_2-NCO$$

in which

Ar represents an aromatic hydrocarbon group having from 6 to 14 carbon atoms which may contain one or more substituents which are inert towards isocyanate groups and

R represents hydrogen or an aliphatic hydrocarbon group having from 1 to 4 carbon atoms.

4,107,200

BIS(AMINOPROPYL) ARYLACETONITRILES AND PREPARATION THEREOF

Eberhard König, Leverkusen, and Josef Pedain, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

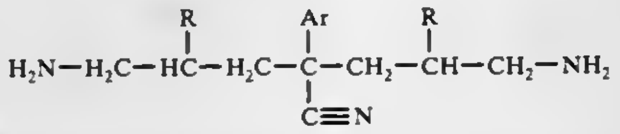
Filed Jan. 27, 1977, Ser. No. 763,218

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604794

Int. Cl.^{2} C07C *121/78*

U.S. Cl. 260—465 E **10 Claims**

1. Compounds of the formula



$$H_2N-H_2C-\overset{\overset{\displaystyle R}{|}}{HC}-H_2C-\underset{\underset{\displaystyle C\equiv N}{|}}{\overset{\overset{\displaystyle Ar}{|}}{C}}-CH_2-\overset{\overset{\displaystyle R}{|}}{CH}-CH_2-NH_2$$

in which

Ar represents an aromatic hydrocarbon group having from 6 to 14 carbon atoms, which may carry one or more substituents which are inert towards amino groups and

R represents hydrogen or an aliphatic hydrocarbon group having from 1 to 4 carbon atoms.

4,107,201

S-PHENENYLTRIS(THIOUREYLENE)TRINAPHTHALENETRISULFONIC ACID SALTS

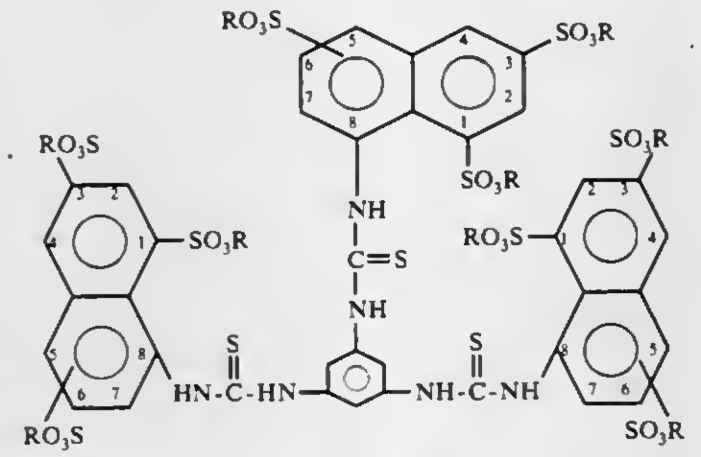
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,100

Int. Cl.^{2} C07C *143/60, 157/09;* **A61K** *31/185*

U.S. Cl. 260—506 **2 Claims**

1. A compound of the formula:



wherein R is a pharmaceutically acceptale salt cation.

4,107,202

SUBSTITUTED 4,4′-BIPHENYLYLENE BIS(2-THIOUREYLENE)DI-NAPHTHALENETRISULFONIC ACIDS AND SALTS THEREOF

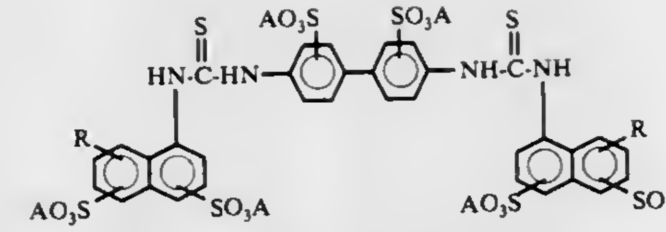
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 28, 1977, Ser. No. 782,211

Int. Cl.^{2} C07C *143/60;* **A61K** *31/185;* **C07C** *143/66*

U.S. Cl. 260—506 **4 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydroxy and —SO_3A, and A is a pharmaceutically acceptable salt cation.

4,107,203

OPTICAL RESOLUTION OF DL-α-PHENYLGLYCINE HYDROCHLORIDE

Yasuhisa Tashiro, Yokohama; Hideo Sugimura, Tokyo; Toshiaki Arai, Washinomiya; Masao Suzuki, Tokyo, and Tadashi Shirai, Musashino, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 657,532, Feb. 12, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,826

Claims priority, application Japan, Feb. 25, 1975, 50-23072

Int. Cl.^{2} C07C *101/04*

U.S. Cl. 260—518 R **6 Claims**

1. A process for separating optically active D- or L-α-phenylglycine hydrochloride from a supersaturated aqueous solution of DL-α-phenylglycine hydrochloride which comprises adding seed crystals of D- or L-α-phenylglycine hydrochloride to said supersaturated solution in the presence of at least one metal chloride selected from the group consisting of zinc chloride, stannous chloride, stannic chloride, cadmium chloride and ferric chloride, and cooling to selectively induce crystallization of the corresponding optically active D- or L-α-phenylglycine hydrochloride and separating the crystals from the solution.

4,107,204

CATALYTIC OXIDATION OF ACROLEIN TO ACRYLIC ACID

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 603,907, Aug. 11, 1975, Pat. No. 4,051,181. This application Jun. 9, 1977, Ser. No. 805,048

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.^{2} C07C *51/32*

U.S. Cl. 260—530 N **8 Claims**

1. A vapor phase process which comprises oxidizing acrolein by reacting the acrolein with an oxygen containing gas at a temperature of 125°-320° C in the presence of a supported two-metal catalyst wherein one metal is palladium and the second metal is copper or silver, and recovering acrylic acid.

4,107,205

α-ARYL-α,α-BIS[ω-(DISUBSTITUTED AMINO)ALKYL]ACETAMIDES AND RELATED COMPOUNDS

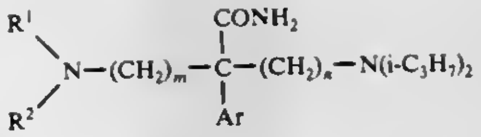
Jerry J. Renbarger, Arlington Heights, and Peter K. Yonan, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 11, 1977, Ser. No. 776,563

Int. Cl.^{2} A61K *31/165;* **C07C** *103/28*

U.S. Cl. 260—558 A **8 Claims**

1. A compound of the formula



$$\begin{matrix}R^1 \\ \quad\diagdown \\ \quad\quad N \\ \quad\diagup \\ R^2\end{matrix}-(CH_2)_m-\underset{\underset{\displaystyle Ar}{|}}{\overset{\overset{\displaystyle CONH_2}{|}}{C}}-(CH_2)_n-N(i\text{-}C_3H_7)_2$$

and the non-toxic pharmacologically acceptable acid addition salts thereof; wherein R^1 is lower alkyl having from 1 to 7 carbon atoms or cycloalkyl having 5 or 6 carbon atoms; R^2 is lower alkyl having from 1 to 7 carbon atoms; Ar is phenyl, trifluoromethylphenyl or phenyl substituted with 1 or 2 halogen or lower alkyl having from 1 to 4 carbon atoms; and *m* and *n* are each integers from 2 to 4 inclusive.

4,107,206

BENZO-BICYCLONONENE- DERIVATIVES

Colin Leslie Hewett, and David Samuel Savage, both of Glasgow, Scotland, assignors to Akzona Incorporated, Asheville, N.C.

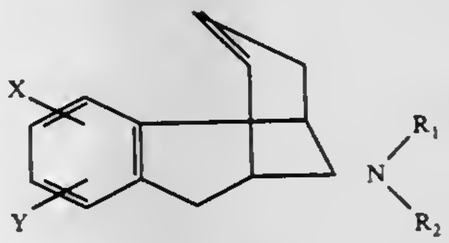
Continuation-in-part of Ser. No. 563,435, Mar. 31, 1975, Pat. No. 4,008,277. This application Oct. 26, 1976, Ser. No. 735,286

Claims priority, application United Kingdom, Apr. 8, 1974, 15.558/74

Int. Cl.^{2} C07C *103/10*

U.S. Cl. 260—562 R **12 Claims**

1. A compound of the formula



and pharmaceutically acceptable salts thereof, in which R_1 is selected from the group consisting of hydrogen or alkyl hydrocarbons of 1 to 6 carbon atoms and R_2 is an acyl group derived from an aliphatic carboxylic acid of from about 1 to 18 carbon atoms, or an araliphatic or aromatic carboxylic acid of from about 7 to 18 carbon atoms and X and Y are each selected from the group consisting of hydrogen, hydroxy, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro and trifluoromethyl.

4,107,207

MIXED METAL AMIDE CATALYSTS FOR H-D EXCHANGE IN AMINES

John M. Holmes, Sarnia, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Aug. 1, 1977, Ser. No. 820,876

Claims priority, application Canada, Aug. 3, 1976, 258321

Int. Cl.^{2} C07C *83/00*

U.S. Cl. 260—583 R **17 Claims**

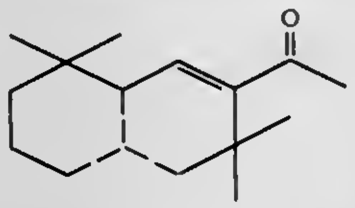
1. In a process for catalyzed H-D exchange between hydrogen and an amine in a deuterium enrichment process, the improvement comprising utilizing as catalyst in the amine phase a dissolved composite amide including both Group I metal and Group II metal amides, the composite catalyst being selected to provide at least one of an increased H-D exchange rate or prolonged activity over that of the single Group I metal amide.

4,107,208

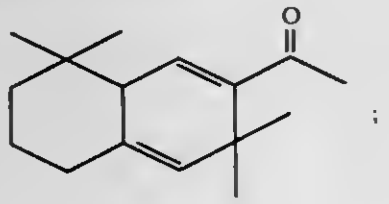
TETRAMETHYL-HEXAHYDROACETONAPHTHONES

William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., Union Beach, N.J.
Continuation-in-part of Ser. No. 740,890, Nov. 11, 1976, Pat. No. 4,076,749. This application Sep. 19, 1977, Ser. No. 834,500
Int. Cl.² C07C *49/61*
U.S. Cl. 260—586 F **2 Claims**

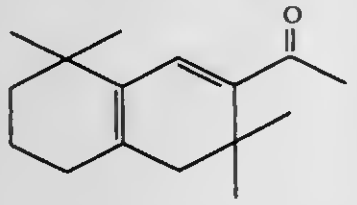
1. A mixture of compounds defined by the structure:



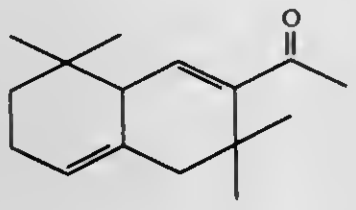
wherein one of the dashed lines is a carbon-carbon double bond, and each of the other of the dashed lines is a carbon-carbon single bond, said mixture consisting essentially of compounds having the structures:



;



; and

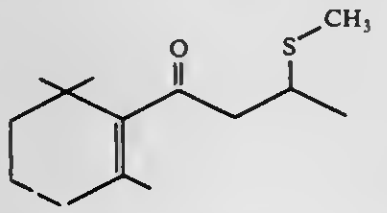


4,107,209

1-[3-(METHYLTHIO)BUTYRYL]-2,6,6-TRIMETHYL-CYCLOHEXENE AND THE 1,3-CYCLOHEXADIENE ANALOG

Richard A. Wilson, Westfield; Braja Dulal Mookherjee, Holmdel; Anne Sanderson Hruza, Brick Town; Manfred Hugo Vock, Locust; Louis Schmitt Frederick, Holmdel, and Joaquin Francisco Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Filed Mar. 3, 1977, Ser. No. 774,055
Int. Cl.² C07C *49/61*
U.S. Cl. 260—586 R **3 Claims**

1. A substantially pure, synthetically produced 1-[3-(methylthio)butyryl]-2,6,6-trimethyl-cyclohexene or the 1,3-cyclohexadiene analog defined by the structure:



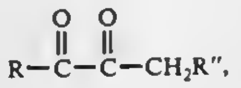
wherein the dashed line is a carbon-carbon single bond or a carbon-carbon double bond.

4,107,210

SYNTHESIS OF ALPHA-DIKETONES

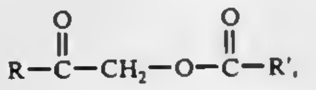
Edward R. Freiter, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sep. 7, 1976, Ser. No. 720,934
Int. Cl.² C07C *45/18*
U.S. Cl. 260—590 E **18 Claims**

1. A process for the preparation of an alpha-diketone of the formula,



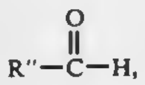
$$R-\overset{\overset{O}{\|}}{C}-\overset{\overset{O}{\|}}{C}-CH_2R'',$$

comprising contacting an acylmethyl ester of the formula,



$$R-\overset{\overset{O}{\|}}{C}-CH_2-O-\overset{\overset{O}{\|}}{C}-R',$$

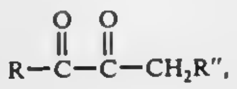
with an aldehyde of the formula,



$$R''-\overset{\overset{O}{\|}}{C}-H,$$

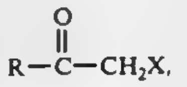
in the presence of an amount of acid catalyst and an amount of water and under reaction conditions, which amounts and conditions are sufficient to cause reaction of the ester with the aldehyde to form the diketone, wherein the aforementioned formulas R is an alkyl, cycloalkyl or aryl radical; an inertly substituted alkyl, cycloalkyl, or aryl radical; or a combination thereof; and R' and R'' are individually hydrogen or a radical as specified for R.

4. A process for the preparation of an alpha-diketone of the formula,



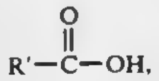
$$R-\overset{\overset{O}{\|}}{C}-\overset{\overset{O}{\|}}{C}-CH_2R'',$$

comprising (a) an initial process step which comprises reacting an alpha-haloketone of the formula,



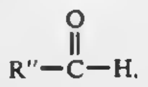
$$R-\overset{\overset{O}{\|}}{C}-CH_2X,$$

with a carboxylic acid of the formula,



$$R'-\overset{\overset{O}{\|}}{C}-OH,$$

or a salt thereof and (b) a second process step which comprises reacting the reaction mixture resulting from the initial process step with an aldehyde of the formula,



$$R''-\overset{\overset{O}{\|}}{C}-H.$$

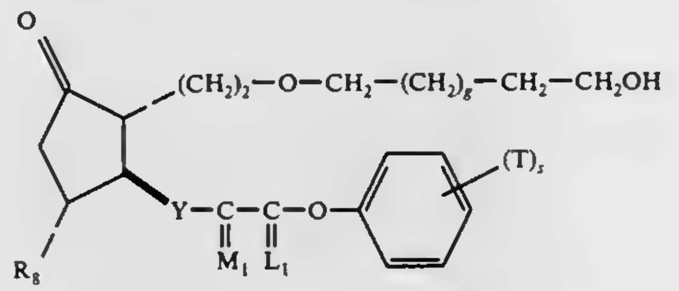
under conditions, and in the presence of amounts of an acid catalyst and water, which amounts and conditions are sufficient to cause formation of the alpha-diketone; wherein in the aforementioned formulas R is an alkyl, cycloalkyl, or aryl radical; an inertly substituted alkyl, cycloalkyl, or aryl radical; or a combination thereof; and R' and R'' are individually hydrogen or a radical as specified for R.

4,107,211

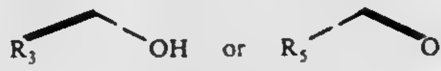
2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENOXY-PGE$_1$ COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,300
Int. Cl.² C07C *49/84*
U.S. Cl. 260—590 C **29 Claims**

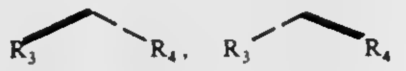
1. A prostaglandin analog of the formula



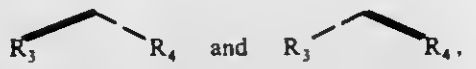
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH═CH—;
wherein M_1 is



wherein R_5 is hydrogen or hydroxy;
wherein L_1 is



or a mixture of



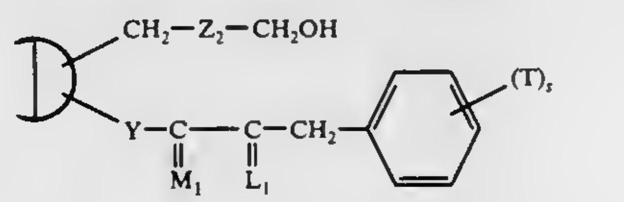
wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,212

2-DECAΓBOXY-2-HYDROXYMETHYL-ω-PHENYL-PGA OR 9-DEOXY-9,10-DIDEHYDRO-PGD ANALOGS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,033
Int. Cl.² C07C *49/82*
U.S. Cl. 260—590 C **119 Claims**

1. A prostaglandin analog of the formula



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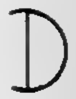
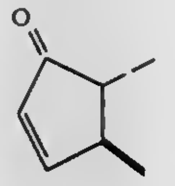
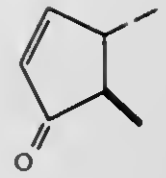
wherein  is

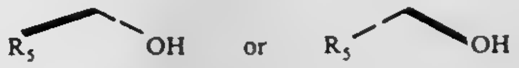


or

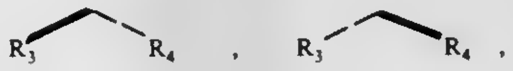


;

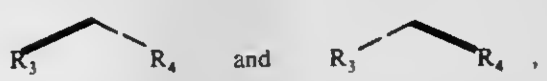
wherein Y is trans—CH═CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein Z_2 is

$cis\text{-}CH{=}CH-CH_2-(CH_2)_g-CF_2-$;

$cis\text{-}CH_2-CH{=}CH-(CH_2)_g-CH_2-$; or

$-(CH_2)_3-(CH_2)_g-CF_2-$;

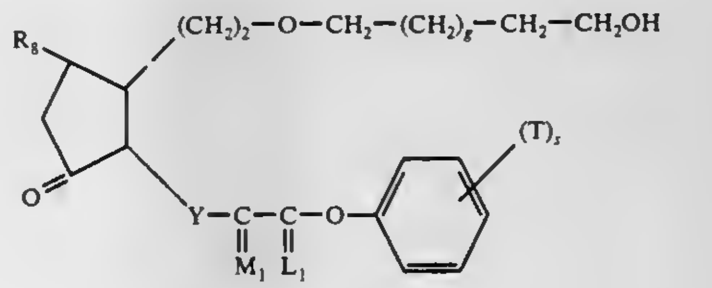
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,213

2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENOXY-PGD$_1$ COMPOUNDS

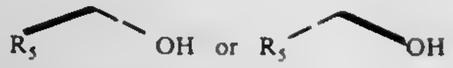
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,302
Int. Cl.² C07C *49/84*
U.S. Cl. 260—590 C **29 Claims**

1. A prostaglandin analog of the formula

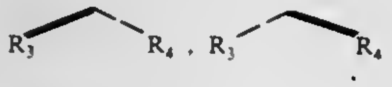


wherein R_8 is hydrogen or hydroxy;

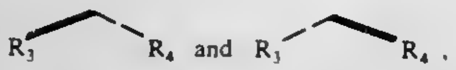
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or hydroxy;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein g is 1, 2, or 3; and
wherein s is 0, 1, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,214

2-DECARBOXY-2-HYDROXY-METHYL-3,7-INTER-M-PHENYLENE-ω-PHENOXY-PGD$_1$ COMPOUNDS

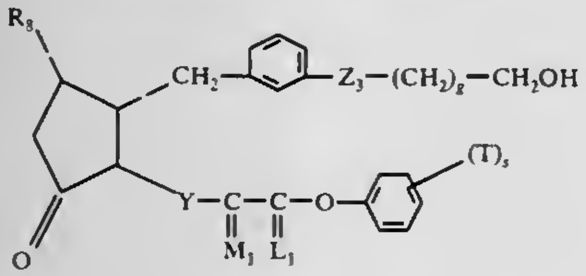
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,027

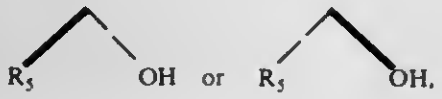
Int. Cl.^{2} C07C *49/82, 49/84*

U.S. Cl. 260—590 C **29 Claims**

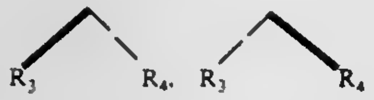
1. A prostaglandin analog of the formula



wherein
Z_3 is oxa or methylene;
wherein
R_8 is hydrogen or hydroxy;
wherein
Y is trans-CH=CH-;
wherein
M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



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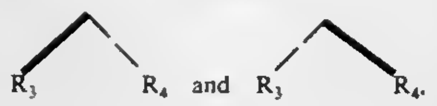


wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein g is one, 2, or 3; and
wherein s is zero, one, 2 or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,215

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-ω-PHENYL-PGE$_1$ COMPOUNDS

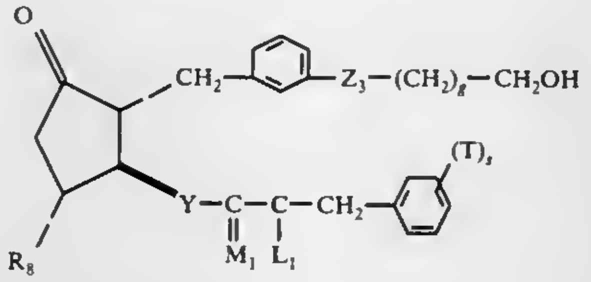
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,031

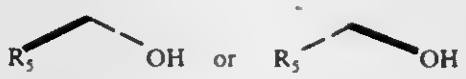
Int. Cl.^{2} C07C *49/82, 49/84*

U.S. Cl. 260—590 C **39 Claims**

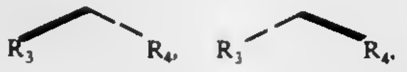
1. A prostaglandin analog of the formula



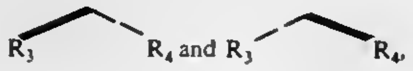
wherein
Z_3 is oxa or methylene;
wherein
R_8 is hydrogen or hydroxy;
wherein
Y is trans-CH=CH-;
wherein
M_1 is



wherein
R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,216

2-DECARBOXY-2-HYDROXY-METHYL-ω-PHENYL-PGD ANALOGS

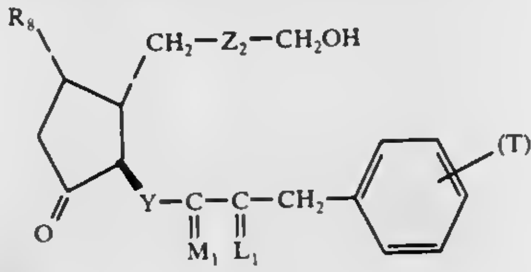
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,034

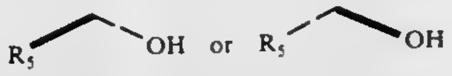
Int. Cl.^{2} C07C *49/84*

U.S. Cl. 260—590 C **119 Claims**

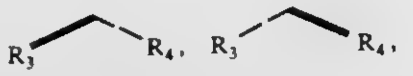
1. A prostaglandin analog of the formula



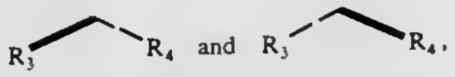
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein Z_2 is cis-$CH=CH-CH_2-(CH_2)_g-CF_2-$; cis-$CH_2-CH=CH-(CH_2)_g-CH_2-$; or $-(CH_2)_3-(CH_2)_g-CF_2-$;
wherein g is one, 2, or 3; and
wherein s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,107,217

ACETALS OF CONJUGATED ALKENALS

William L. Schreiber, Jackson, and Alan O. Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,471, Jul. 11, 1976, abandoned, which is a continuation of Ser. No. 597,189, Jul. 18, 1975, abandoned, which is a division of Ser. No. 383,579, Jul. 30, 1973, Pat. No. 3,922,309. This application May 26, 1977, Ser. No. 800,890

Int. Cl.^{2} C07C *43/30;* **A61K** *7/46*

U.S. Cl. 260—615 A **2 Claims**

1. A mixture of cis-2-ethylidene-trans-3-hexenal dimethyl acetal and trans-2-ethylidene-trans-3-hexenal dimethyl acetal produced by reacting ethyl triphenyl phosphonium bromide with n-butyl lithium and then reacting the resulting product with 1,1-dimethoxy-trans-3 -hexane-2-one at a temperature below 30° C.

4,107,218

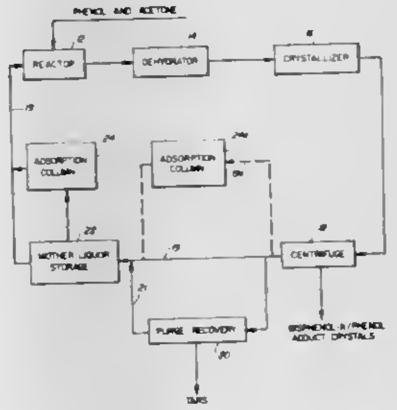
DECOLORATION OF BISPHENOL-A RECYCLE STREAM WITH CATION EXCHANGE RESIN

Frederick Miller Konrad, Basking Ridge, N.J., and Stephen Howard Mason, Ponce, P.R., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 696,726, Jun. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 616,026, Sep. 23, 1975, abandoned. This application May 6, 1977, Ser. No. 794,419

Int. Cl.^{2} C07C *37/22*

U.S. Cl. 560—724 **4 Claims**



1. A process for removing color bodies from 4,4'-bisphenol-A process recycle stream wherein a stoichiometric excess of phenol is reacted with acetone in a reaction mixture containing an acid catalyst to produce a product mixture containing phenol and 4,4'-bisphenol-A, wherein said product mixture is separated into a 4,4'-bisphenol-A/phenol adduct and a mother liquor recycle stream, wherein said mother liquor recycle stream is recycled to said reaction mixture, wherein at least a portion of said mother liquor recycle stream is contacted with an adsorbent comprising a substantially insoluble acidic cationic exchange resin for a period of time and at a temperature sufficient to reduce the content of color bodies contained in said mother liquor recycle stream, said temperature being within the range of from about 40° to about 150° C., **prior to recycling said mother liquor to said reaction mixture, wherein said absorbent is periodically washed with a phenol/water mixture to remove absorbed color bodies therefrom, and wherein the water content of said absorbent is substantially in equilibrium with the water content of said mother liquor recycle stream.**

4,107,219

PROCESS FOR PRODUCING CHAIN TERPENE ALCOHOL

Atsuo Murata; Shuji Tsuchiya; Hideo Suzuki, and Hisao Ikeda, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,789

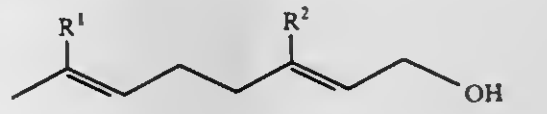
Claims priority, application Japan, May 14, 1976, 51-54941

Int. Cl.^{2} C07C *29/00*

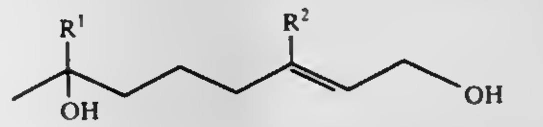
U.S. Cl. 568—875 **7 Claims**

1. A process for producing a chain terpene alcohol having the formula:

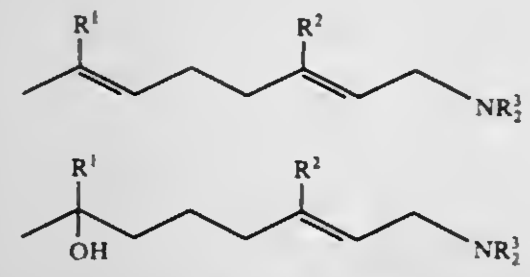
(I)



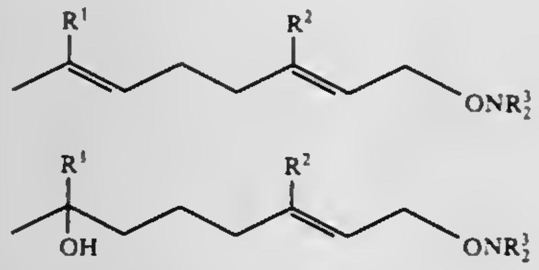
(II)



wherein R^1 and R^2 are the same or different and respectively represent hydrogen atom or a lower alkyl group which comprises oxidizing a chain unsaturated amine having the formula:



wherein R^3 represents an alkyl group to form the corresponding amine oxide, heating said amine oxide to effect a thermal rearrangement to form a chain unsaturated hydroxylamine having the formula:



and then, reducing the chain unsaturated hydroxylamine with hydrogen in the presence of a catalyst selected from the group consisting of metallic iron, cobalt, nickel, copper, oxides thereof, and copper chromite.

4,107,220
GAS PHASE NITRATION OF CHLOROBENZENE

Dennis C. Owsley, St. Louis, and Jordan J. Bloomfield, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 4, 1977, Ser. No. 848,547
Int. Cl.² C07C *79/12*
U.S. Cl. 260—646 **7 Claims**

1. A method for the production of a nitrochlorobenzene mixture in which the para:ortho isomer distribution can be readily controlled to predetermined relative proportions within a broad range comprising the vapor phase nitration of chlorobenzene with a nitrating agent in the presence of a molecular sieve catalyst having a relatively small pore size ranging from about 5 Å to about 10 Å.

4,107,221
REMOVAL OF OLEFIN OXIDE FROM CHLORINATED SOLVENTS

William D. Tasto, and Thomas E. Morris, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

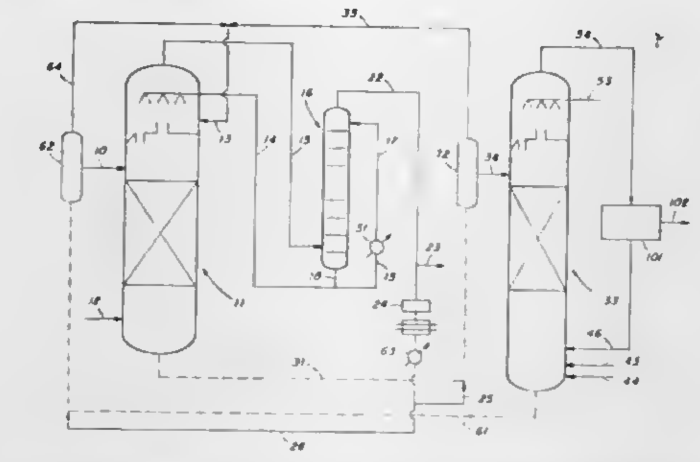
Filed Jul. 28, 1977, Ser. No. 819,749
Int. Cl.² C07C *19/02*
U.S. Cl. 260—652 P **6 Claims**

1. A method for removing an olefin oxide of 3-8 carbon atoms from a chlorinated lower aliphatic hydrocarbon containing a small amount of said oxide by contacting the liquid chlorinated hydrocarbon with the hydrogen form of a strong acid cation exchange resin in the presence of water, thereby converting said olefin oxide to the corresponding diol, and washing the resin periodically with water, thereby separating accumulated diol from the resin.

4,107,222
OXYCHLORINATION OF METHANE

Morgan C. Sze, Upper Montclair; Herbert Riegel, Maplewood, and Harvey D. Schindler, Paterson, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 299,848, Oct. 24, 1972, abandoned. This application Nov. 11, 1975, Ser. No. 631,157
Int. Cl.² C07C *17/00*
U.S. Cl. 260—659 A **7 Claims**



1. A process for producing as net chlorinated methane reaction product a mixture of methylene chloride and chloroform, without essential net production of carbon tetrachloride, comprising:
(a) contacting in an oxidation reaction zone a molten salt mixture of cuprous and cupric chloride with molecular oxygen to produce copper oxychloride;
(b) contacting molten salt mixture from step (a) in an oxychlorination reaction zone with fresh feed methane and chlorine to effect oxychlorination of the methane with oxygen requirements for the oxychlorination being provided by the oxychloride of the molten salt mixture, said contacting being effected at a temperature of from about 700° to about 860° F, at a methane conversion from about 25 to 50 mole percent and in the presence of carbon tetrachloride in an amount to provide tetrachloride to methane mole ratio of at least about 0.2:1 to essentially eliminate net production of carbon tetrachloride;
(c) withdrawing from the oxychlorination reaction zone an effluent containing unreacted methane, methyl chloride, methylene chloride, chloroform and carbon tetrachloride;
(d) recovering as net product, from the effluent, chloroform and at least a portion of the methylene chloride;
(e) recycling to the oxychlorination reaction zone unreacted methane, methyl chloride and any remaining methylene chloride recovered from the effluent; and
(f) passing the molten salt mixture from the oxychlorination reaction zone to the oxidation reaction zone.

4,107,223
PROCESS FOR IMPROVING THE LOW TEMPERATURE PROPERTIES OF TETRAHYDROALKYLDICYCLOPENTADIENES

Abraham Schneider, Overbrook Hills, and Richard E. Ware, Aston, both of Pa., assignors to Suntech, Inc., St. Davids, Pa.

Filed Sep. 3, 1976, Ser. No. 720,305
Int. Cl.² C07C *5/24*
U.S. Cl. 260—666 PY **9 Claims**

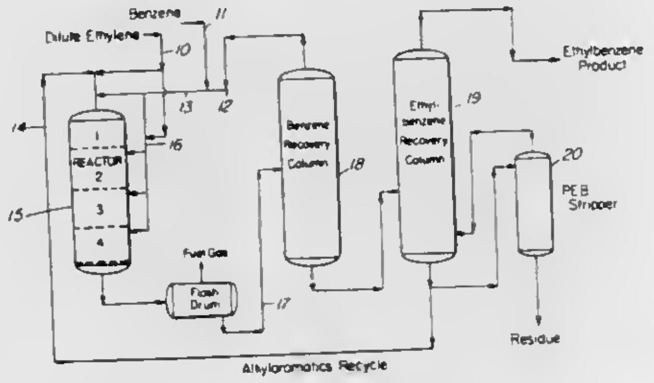
1. Process for isomerizing endo-tetrahydroalkyldicyclopentadienes comprising:
(a) contacting an endo-tetrahydroalkyldicyclopentadiene selected from the group consisting of endo-tetrahydromethyldicyclopentadiene, endo-tetrahydrodimethyldicyclopentadiene, and a mixture of the foregoing, with anhydrous aluminum trichloride wherein the mole ratio of the trichloride to the endo-tetrahydroalkyldicyclopentadiene is in the range between from about 0.001 to about 0.5 and

temperature of the contacting is in the range between from about 0° C to about 100° C;
(b) continuing contacting until resulting isomeric mixture of tetrahydroalkydiene has a kinematic viscosity and a pour point making it useful as diluent for high energy missile fuel; and
(c) recovering the isomeric tetrahydroalkydiene.

4,107,224
MANUFACTURE OF ETHYL BENZENE

Francis G. Dwyer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 11, 1977, Ser. No. 767,855
Int. Cl.² C07C *3/52*
U.S. Cl. 260—671 R **4 Claims**



1. In a process for effecting ethylation of an alkylatable aromatic hydrocarbon compound by contacting said compound with ethylene under conversion conditions of 250 to 600° C., a pressure between about 0.1 and about 100 atmospheres, a feed weight hourly space velocity between about 0.1 and about 100 and a molar feed ratio of said compound to ethylene between about 1 and about 30 in the presence of a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 in a series of beds of said zeolite wherein effluent of each such bed except the last is admixed with fresh reactant supplied at a temperature lower than that of said effluent and the so-quenched reaction mixture is passed to the next such bed; the improvement comprises supplying charge to the first said bed and fresh reactants to said effluents as a mixture consisting essentially of said alkylatable aromatic hydrocarbon compound and ethylene admixed with at least an equi-molar amount of inert hydrocarbon diluent consisting essentially of methane, ethane or a mixture of the same whereby to increase the partial pressure driving force to desorb coke precursors from the catalyst surface.

4,107,225
HYDROGENATION PROCESS OF OLEFIN POLYMERS FOR PRODUCING WHITE OILS

Guy F. S. Debande, Watermael; Raymond N. M. Cahen, Etterbeek, and Jacques F. J. Grootjans, Leefdael, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

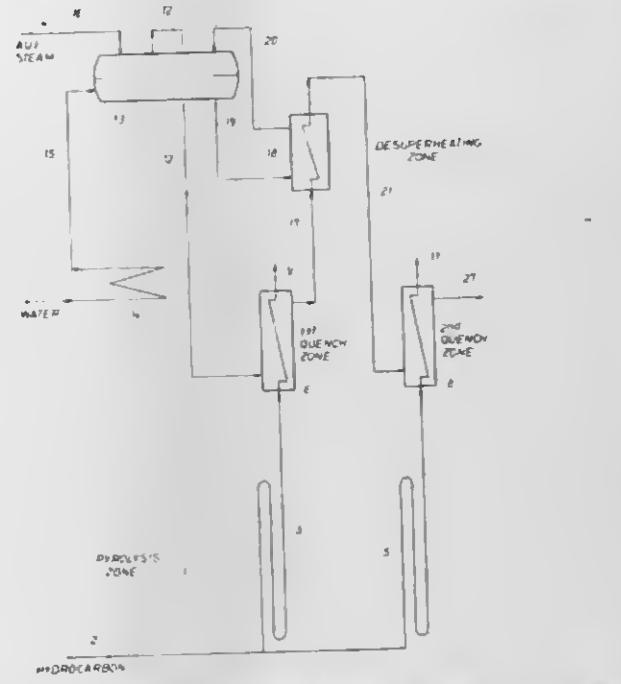
Filed Mar. 15, 1977, Ser. No. 777,908
Claims priority, application Luxembourg, Mar. 16, 1976, 74571
Int. Cl.² C07C *5/14*
U.S. Cl. 260—683.9 **13 Claims**

1. A process for hydrogenating a liquid polymer derived from olefin units containing 4 carbon atoms, which comprises the step of hydrogenating said polymer at a hydrogen pressure of between about 40 and about 120 kg/cm² and at a temperature of between about 200° and about 250° C in the presence of a catalyst comprising platinum on an alumina support exhibiting a total pore volume of at least about 0.25 ml/g, wherein about 90 to about 98% of said pore volume is provided by pores having a pore size distribution lower than 100A.

4,107,226
METHOD FOR QUENCHING CRACKED GASES

Bernard P. Ennis, Jr., and James R. Styslinger, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 19, 1977, Ser. No. 843,462
Int. Cl.² C07C *3/08*
U.S. Cl. 260—683 R **12 Claims**



1. A process for quenching cracked gases obtained by steam cracking a hydrocarbon fraction in a pyrolysis zone to produce olefins and the recovery of heat therefrom comprising:
quenching cracked gases in a quench zone by indirect heat exchange with steam to increase the superheat thereof and desuperheating steam having increased superheat in a desuperheating zone by indirect heat exchange with water to recover heat in the form of steam at an elevated pressure.

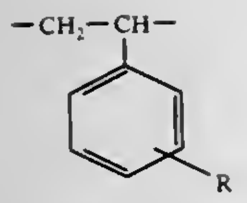
8. A process for quenching cracked gases obtained by steam cracking a hydrocarbon fraction in a pyrolysis zone to produce olefins and the recovery of heat therefrom comprising:
a. quenching cracking gases in at least two quench zones with steam to increase the superheat thereof wherein steam entering the first quench zone is saturated steam;
b. desuperheating steam having increased superheat in at least one desuperheating zone by indirect heat exchange with water to recover heat in the form of saturated steam at a pressure of from about 500 psia. to about 3100 psia.;
c. passing desuperheated steam to a second quench zone to quench cracked gases by indirect heat exchange thereby increasing the superheat of said desuperheated steam; and
d. recovering the superheated steam from the second quench zone.

4,107,227
METHOD FOR PREPARING IMPROVED POLYALPHAMETHYLSTYRENE-POLYDIORGANOSILOXANE BLOCK COPOLYMERS AND PRODUCTS THEREOF

John C. Saam, Midland, and Andrew H. Ward, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 9, 1976, Ser. No. 748,788
Int. Cl.² C08L *83/10*
U.S. Cl. 260—827 **11 Claims**

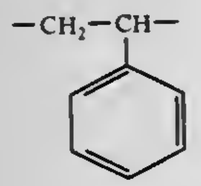
1. A method of increasing the upper glass transition temperature of a poly-α-methylstyrene-polydiorganosiloxane block copolymer, said method comprising coupling at least one poly-α-methylstyrene block with at least one polydiorganosiloxane block through at least one coupling unit of the formula



where R is an alkyl radical of from 1 to 4 carbon atoms, inclusive, any terminal poly-α-methylstyrene block being terminated by a monovalent hydrocarbon radical and any terminal polydiorganosiloxane block being terminated by a silicon-bonded hydroxy radical or a siloxane unit of the formula

$R'_3SiO_1/_2$

where each R' is selected from the group consisting of a monovalent hydrocarbon radical, a monovalent halogenated hydrocarbon radical and a hydrolyzable radical, and each organic radical of the polydiorganosiloxane is a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical of from 1 to 6, inclusive, carbon atoms and obtaining a block copolymer containing at least one poly-α-methylstyrene block and at least one polydiorganosiloxane block and having a higher glass transition temperature than an equivalent block copolymer wherein the coupling unit has the formula



4,107,228

UNIVERSAL PAINT COMPOSITION AND OBJECTS COATED THEREWITH

Carl Horowitz; Michael Dichter, both of Brooklyn; Mangara J. Duryodhan, Staten Island, and Joseph A. Ioria, Ozone Park, all of N.Y., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Continuation of Ser. No. 544,282, Jan. 27, 1975, abandoned. This applicatioo Dec. 29, 1976, Ser. No. 755,165

Int. Cl.^{2} C08L *63/10*

U.S. Cl. 260—836 **15 Claims**

1. A heat-curable paint composition comprising as ingredients:

(a) a polymerizable vinyl monomer, said vinyl monomer having at least one functional group in addition to the vinyl group;

(b) a polyurethane resin, said polyurethane resin including reactive-NCO-groups and being derived from the reaction of a polyester or polyether with an aliphatic diisocyanate and vulcanized through the isocyanate group by reaction with a material selected from the group consisting of glycols, diamines, diacids or amino alcohols;

(c) an epoxy resin prepolymer, said epoxy resin prepolymer having more than one epoxy group per molecule;

(d) an epoxy resin hardening agent;

(e) a peroxide polymerization initiator; and

(f) a source of silver ions;

said ingredients being dissolved in a solvent system, said paint composition being heat-curable by exposure to temperatures in the range of 150° to 300° F. for periods ranging from 15 minutes to 2 hours.

4,107,229

POLYURETHANE ACRYLATES OF HYDROXYALKYLATED NOVOLAC RESIN

Richard B. Tideswell, Buffalo, and Jeffrey E. Selley, East Amherst, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,815

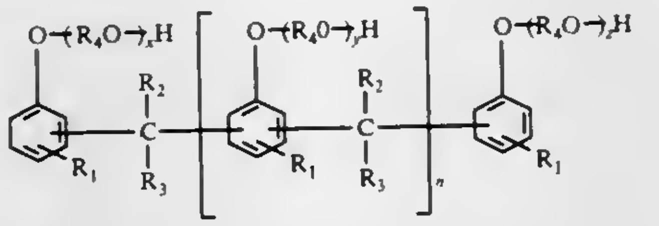
Int. Cl.^{2} C08G *18/00*

U.S. Cl. 260—841 **32 Claims**

1. A vinyl terminated, thermosetting polyurethane composition comprising the reaction product of:

(A) an organic polyisocyanate;

(B) an hydroxyalkylated novolac characterized by the formula:



wherein

n has an average value of about 0.2 to about 6;

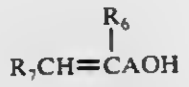
x, y and z are integers from 1 to 25;

R_1 is independently selected from the group consisting of hydrogen, fluorine chlorine, bromine, a hydrocarbon radical, a halogen substituted hydrocarbon radical; a hydrocarbon ketone radical, and a hydrocarbon carboxylic radical;

R_2 and R_3 are independently selected from the group consisting of hydrogen, a hydrocarbon radical, and a halogen substituted hydrocarbon radical; and

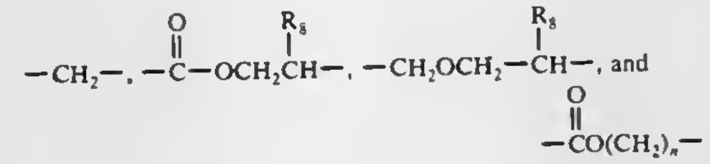
R_4 is a hydrocarbon radical; and

(C) a monohydric ethylenically unsaturated alcohol characterized by the formula:



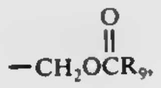
$$R_7CH{=}\overset{\overset{R_6}{|}}{C}AOH$$

wherein R_6 is —H, or —CH_3; R_7 is —H, —CH_3, or —C_6H_5; and A is a divalent organic radical selected from the group consisting of:

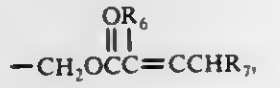


$$-CH_2-,\ -\overset{\overset{O}{\|}}{C}-OCH_2\overset{\overset{R_8}{|}}{C}H-,\ -CH_2OCH_2-\overset{\overset{R_8}{|}}{C}H-,\ \text{and}\ -\overset{\overset{O}{\|}}{C}O(CH_2)_n-$$

wherein n is 3 to about 12, and R_8 is —H, —$(CH_2)_m$—CH_3,



$$-CH_2O\overset{\overset{O}{\|}}{C}R_9,$$



$$-CH_2O\overset{\overset{O}{\|}}{C}\overset{\overset{R_6}{|}}{C}{=}CCHR_7,$$

CH_2OR_9, or —CH_2OCH_2CH—CHR_7 wherein m is an integer from zero to 10 and R_9 is a phenyl or halogenated phenyl radical, alkyl or halogenated alkyl radical having from 2 to 4 carbon atoms, benzoxy or halogenated benzoxy radicals, phenoxy or halogenated phenoxy radical.

4,107,230

FLAME-RETARDANT THERMOSETTING RESINOUS COMPOSITIONS

Roy G. Turnbo, Deer Park, Tex., and David C. Purpi, Woodcliff Lake, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 8, 1974, Ser. No. 467,884

Int. Cl.^{2} C08K *5/02*

U.S. Cl. 260—861 **17 Claims**

1. A flame-retardant resinous composition that comprises a thermoset organic polymer and a flame-retarding amount of 1,1,2,3,4,4-hexabromobutene-2.

4,107,231

FLAME-RETARDANT LINEAR POLYESTERS

Rolf Wurmb, Heidelburg; Wolfgang Seydl; Klaus Penzien, both of Frankenthal; Hermann Gausepohl, Mutterstadt, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

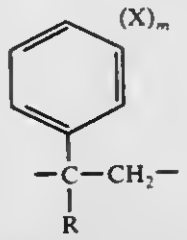
Filed Mar. 23, 1976, Ser. No. 669,740

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1975, 2515473

Int. Cl.^{2} C08L *67/06, 25/06*

U.S. Cl. 260—873 **8 Claims**

1. Linear polyesters flame-proofed with halogenous flame-proofing agents and synergists and optionally containing fillers and reinforcing fibers, the flame-proofing agents being halogenated oligomeric styrenes of the formula I



(I)

where x denotes halogen, R denotes hydrogen or an aliphatic radical, n is an integer of from 3 to 20 and m is an integer of from 1 to 5.

4,107,232

FLAME RETARDANT, NON-DRIPPING COMPOSITIONS OF POLYPHENYLENE ETHER AND ACRYLONITRILE-BUTADIENE-STYRENE

William Robert Haaf, Voorbesville, N.Y., and Donald Lewis Reinhard, Lenox, Mass., assignors to General Electric, Pittsfield, Mass.

Division of Ser. No. 530,373, Dec. 6, 1974. This application Dec. 22, 1975, Ser. No. 642,981

Int. Cl.^{2} C03L *51/00*

U.S. Cl. 260—876 R **5 Claims**

1. A flame retardant, non-dripping thermoplastic molding composition which comprises:

a. a normally flammable copolymer of acrylonitrile-butadiene-styrene;

b. a halogenated flame retardant additive in a minor proportion based on said thermoplastic molding composition but in an amount sufficient to render said thermoplastic composition non-burning or self-extinguishing; and

c. a polytetrafluoroethylene resin in a minor proportion based on said thermoplastic molding composition in an amount at least sufficient to render said thermoplastic molding composition non-dripping.

4,107,233

BLOCK COPOLYMER BLEND WITH CERTAIN ACRYLICS

David R. Hansen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1976, Ser. No. 718,996

The portion of the term of this patent subsequent to Feb. 13, 1994, has been disclaimed.

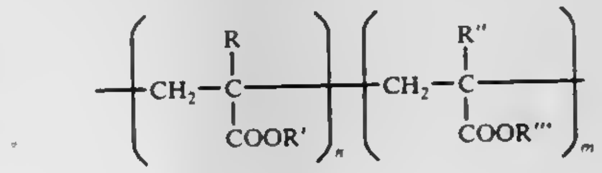
Int. Cl.^{2} C08L *51/00, 27/00, 75/00*

U.S. Cl. 260—876 B **10 Claims**

1. A polymer composition comprising 100 parts by weight of a block copolymer and about 1 to about 100 parts by weight of an acrylic resin wherein:

(a) said block copolymer has at least two monoalkenyl arene polymer end blocks A and at least one conjugated diene mid block B, said blocks A comprising 8-55% by weight of the block copolymer, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

(b) said acrylic resin is a random copolymer having an inherent viscosity of between about 0.1 and about 0.4, and having a structure



where R, R', R", and R''' are selected from the group consisting of hydrogen and C_1 to C_4 alkyls, R' differs from R''', and the ratio of n to m varies from about 1 to 8.

4,107,234

ABS COMPOSITION HAVING IMPROVED IMPACT STRENGTH AND WEATHER AGING RESISTANCE AND LATEX SUSPENSION PROCESS THEREFOR

Robert J. Cornell, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,783

Int. Cl.^{2} G08L *55/02*

U.S. Cl. 260—876 R **11 Claims**

1. A composition consisting essentially of a polyblend of

(a) a matrix of a copolymer of about 60–80% of a monovinylidenic aromatic hydrocarbon and about 20–40% of an alkenoic nitrile monomer; and

(b) a graft copolymer comprising a graftable rubber substrate, said substrate comprising a mixture of (1) about 50–95% of a cross-linked styrene-butadiene small particle size or large particle size rubber spine wherein the ratio of styrene to butadiene is from about 31/69 to 0/100, the degree of cross-linking thereof being about 50–98%; and said rubber spine being pregrafted with a monoethylenically unsaturated monovinylidenic aromatic or alkenoic nitrile monomer or mixtures thereof, and (2) about 5–50% of a low-gel elastomer selected from the group consisting of styrene/butadiene rubber wherein the ratio of styrene to butadiene is from 31/69 to 0/100 and acrylonitrile/-butadiene rubber wherein the ratio of acrylonitrile to butadiene is from about 15/85 to 50/50; and having grafted onto said substrate, a superstrate which is a copolymer of about 60–80% of a monovinylidenic aromatic hydrocarbon and about 20–40% of an alkenoic nitrile monomer, the ratio of the total copolymer, including the grafted copolymer and the copolymer constituting the matrix, to the spine being about 95/5 to 55/45, the degree of grafting which is defined as the ratio of the weight of the grafted copolymer to the weight of the substrate being between about 0.2 and 1.0.

4,107,235

HIGH IMPACT RESISTANT ACRYLIC COATING COMPOSITIONS AND COATED ARTICLES

Walter Groesbeck DeWitt, III, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 352,157, Apr. 18, 1973, abandoned. This application Oct. 20, 1977, Ser. No. 844,011

Int. Cl.² C08K *5/01, 5/05, 5/07, 5/10*

U.S. Cl. 260—876 R **4 Claims**

1. A composition for coating a substrate comprising an acrylic solution polymer polymerized from a monomer system comprising one or more lower alkyl methacrylates and acrylates and having a molecular weight of about 30,000 to 250,000 and a Tg above 65° F., a solvent therefor, and a compatible acrylic polymer having a Tg less than −20° F. comprising a poly(butyl acrylate), wherein the weight ratio of said acrylic solution polymer to said compatible acrylic polymer is about 10:1 to 1:10.

4,107,236

HYDROGENATED BLOCK COPOLYMERS CONTAINING A BLOCK DERIVED FROM LOW VINYL POLYBUTADIENE AND A BLOCK DERIVED FROM MEDIUM VINYL POLYBUTADIENE

Floyd E. Naylor, and Robert P. Zelinski, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1976, Ser. No. 656,770

Int. Cl.² C08F *293/00*

U.S. Cl. 260—879 **22 Claims**

1. A hydrogenated radial block polymer represented by the formula $(HLvB-HMvB)_{a}Z$ wherein each HLvB represents a block of hydrogenated low vinyl polybutadiene, each HMvB represents a block of hydrogenated medium vinyl polybutadiene, Z represents a residue from the coupling agent employed in the preparation of said radial block polymer, and *a* represents the degree of branching and is at least about 3, wherein prior to hydrogenation the vinyl content of said low vinyl block is in the range of about 6 to 20 weight percent, and the vinyl content of said medium vinyl block is in the range of about 20 to 90 weight percent and is substantially higher than the vinyl content of said low vinyl block.

4,107,237

RUBBER-MODIFIED ACRYLONITRILE-STYRENE-INDENE INTERPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

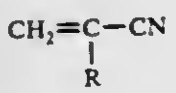
Filed Feb. 17, 1977, Ser. No. 769,509

Int. Cl.² C08F *279/02*

U.S. Cl. 260—880 R **8 Claims**

1. The polymeric composition resulting from the polymerization of a mixture consisting essentially of 100 parts by weight of

A from about 25 to 70% by weight of at least one nitrile having the structure



$$CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}{-}CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B from about 15 to 70% by weight of styrene, and

C from about 5 to 20% by weight of indene wherein the given percentages of (A), (B) and (C) are based on the combined weights of (A), (B) and (C) in the presence of from 1 to 40 parts by weight of

D. a rubbery polymer of at least 50% by weight of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and up to 50% by weight of at least one member selected from the group consisting of a styrene, acrylonitrile, and ethyl acrylate.

4,107,238

GRAFT COPOLYMERIZATION PROCESS

Robert Roper, Summit, and Arthur W. Langer, Jr., Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 22, 1976, Ser. No. 651,573

Int. Cl.² C08F *279/02*

U.S. Cl. 260—880 R **19 Claims**

1. A method for grafting styrene monomer in high grafting efficiency onto an elastomeric isobutylene-conjugated diene copolymer which comprises the steps of: (a) forming a solution of the elastomer in an inert hydrocarbon solvent; (b) treating said solution with an organolithium chelating polyamine composition whereby a polymer lithium polyamine complex is formed; (c) treating said complex with from 2 to 50 volume % of an organic monoether or polyfunctional ether whereby unreacted organolithium polyamine is decomposed; and (d) contacting the styrene monomer with the treated complex of step (c) whereby a graft copolymer is formed, at least a major proportion of the reacted styrene monomer being present in said graft copolymer, and said copolymer is a thermoelastomer.

4,107,239

PHENOLIC-ACRYLIC FAST-CURING SEALANT SYSTEM

Bruce Leffingwell, Hartford, Conn., assignor to MPB Corporation, New Britain, Conn.

Division of Ser. No. 517,736, Oct. 24, 1974, Pat. No. 3,957,907. This application Nov. 25, 1975, Ser. No. 635,166.

Int. Cl.² C08L *33/00*

U.S. Cl. 260—881 **6 Claims**

1. A storage-stable adhesive composition capable of curing rapidly in the presence of a free-radical catalyst, which composition contains from about 5% to 90% by weight of tris(dimethylaminomethyl)phenol tri(hydromethacrylate); from about 10% to 90% of at least one vinyl-polymerizable monomer and less than about 60% of at least one compatible acrylic polymer or copolymer.

4,107,240

METHOD AND DEVICE FOR LAKE RESTORATION BY OXYGEN-ENRICHING OF THE WATER

Bo Lennart Verner, Stockholm, and Lars Börje Staffan Fors, Ingarö, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 551,930, Feb. 21, 1975, Pat. No. 4,060,574, which is a continuation of Ser. No. 258,546, Jun. 1, 1972, abandoned. This application Feb. 11, 1977, Ser. No. 767,882

Claims priority, application Sweden, Jun. 1, 1971, 7002/71; Jan. 28, 1972, 972/72

Int. Cl.² B01F *3/04*

U.S. Cl. 261—77 **33 Claims**

1. A method of enriching the oxygen concentration in a subsurface stratum of a thermally stratified body of water comprising an upper warmer and relatively oxygen-rich epilimnion, an intermediate thermocline and a lower colder relatively oxygen-poor hypolimnion, while maintaining undisturbed the thermal stratification thereof, which method comprises:

(a) positioning a confined open-ended gas and water contact zone in the hypolimnion and extending said contact zone upwardly in the hypolimnion;

(b) passing a stream of pressurized oxygen-containing gas into the lower end of said confined open-ended gas and water contact zone to propel by gas lift pump action in the hypolimnion a column of hypolimnetic water upwardly within said contact zone while simultaneously enriching the oxygen concentration thereof by intense contact of said hypolimnetic water with said pressurized gas;

(c) positioning an upwardly confined collection zone in the hypolimnion above said contact zone and surrounding said contact zone to form an annular outlet zone terminating a predetermined distance below the top of and above said lower end of said contact zone;

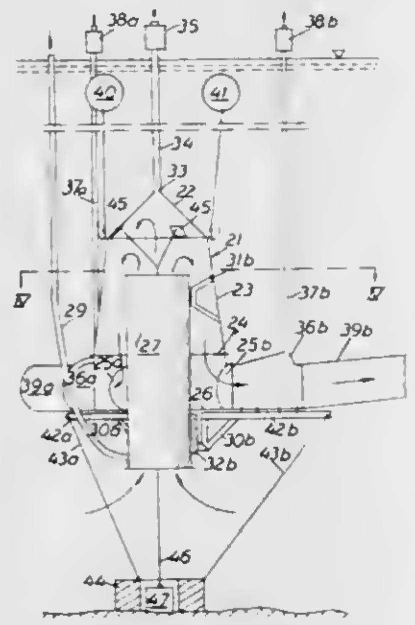
(d) entrapping excess propellant in said collection zone to form a gas cushion in said collection zone;

(e) maintaining said contact zone and collection zone buoyant in the hypolimnion by means of at least said gas cushion;

(f) utilizing said gas cushion to cause oxygenated hypolimnetic water from said column and said collection zone to flow downwardly within said annular outlet zone;

(g) introducing the thus oxygen-enriched hypolimnetic water into the hypolimnion of the body of water from the outlet zone;

(h) venting entrapped undissolved gas from said collection zone to the atmosphere at a controlled rate to maintain said gas cushion at a predetermined pressure and volume effective to produce undisturbed downward flow of the oxygen-enriched hypolimnetic water within said outlet zone and inhibit flow of entrapped gas bubbles therein, said predetermined volume being at least large enough that said contact and collection zones are maintained buoyant in the hypolimnion;



(i) subjecting the oxygen-enriched hypolimnetic water to a secondary gas collection step before introducing same into the hypolimnion from the outlet zone; and

(j) mooring said contact and collection zones to the bottom of the body of water to locate said contact and collection zones a predetermined distance from the bottom of the body of water.

12. Apparatus for enriching the oxygen concentration in a subsurface stratum of a thermally stratified body of water having an upper warmer and relatively oxygen-rich epilimnion, an intermediate thermocline and a lower colder relatively oxygen-poor hypolimnion, while maintaining undisturbed the thermal stratification thereof, which apparatus comprises:

(a) an upwardly extending open ended shell located in the hypolimnion, said shell having upper and lower ends;

(b) nozzle means for introducing pressurized oxygen-containing propellant gas into the lower end of said shell to propel by gas lift pump action in the hypolimnion a column of hypolimnetic water upwardly within said shell to thereby increase the oxygen concentration thereof;

(c) collection means located in the hypolimnion above said shell for entrapping excess propellant to form a gas cushion within said collection means;

(d) said collection means extending downwardly around said shell to form an outlet passage surrounding said shell, said collection means terminating a predetermined distance below said upper end and above said lower end of said shell for passing oxygen-enriched hypolimnetic water downwardly through said outlet passage from said gas cushion;

(e) outlet means coupled to said outlet passage and located at a level below said upper end and above said lower end of said shell for reintroducing the downwardly flowing oxygen-enriched hypolimnetic water into the hypolimnion;

(f) venting means coupled to said collection means and in communication with said gas cushion for venting excess undissolved gas produced by said gas lift pump action to the atmosphere to maintain said gas cushion at a predetermined pressure and volume to maintain said shell and collection means buoyant in the hypolimnion under the influence of at least said gas cushion, and to produce substantially undisturbed downward flow of the oxygen-enriched hypolimnetic water within said outlet passage and then through outlet means into the hypolimnion; and

(g) mooring means coupled to at least one of said shell and collection means for mooring said shell and collection means to the bottom of the body of water to maintain said shell and collection means buoyantly located a predetermined distance above the bottom of the body of the water.

4,107,241

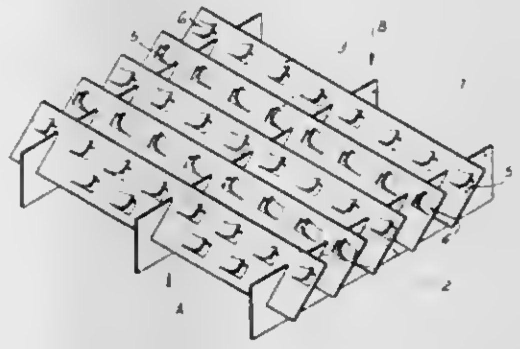
CONTACTING ARRANGEMENT FOR MASS TRANSFER OPERATIONS

Roland Braun, Ludwigshafen am Rhein, Fed. Rep. of Germany, assignor to Raschig G.m.b.H., Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,623

Int. Cl.² B01F *3/04*

U.S. Cl. 261—79 A **6 Claims**



1. A contacting arrangement for mass transfer operations, which comprises

a plurality of stacked contacting grates, each of which comprises a set of laterally spaced apart, parallel first strips which are transverse to vapor and liquid flow passage, the vapor being countercurrent to the liquid flow, and a set of laterally spaced apart second strips, each of which has a longitudinal direction which is transverse to the longitudinal direction of said first strips of the same grate,

each of said second strips having at right angles to its longitudinal direction a direction which includes an oblique angle with the longitudinal direction of said first strips of the same grate,

said oblique angle being in the same sense for all said second strips of a grate and being in opposite senses for the second strips of adjacent grates, whereby said second strips of all said grates define zig-zag flow passages,

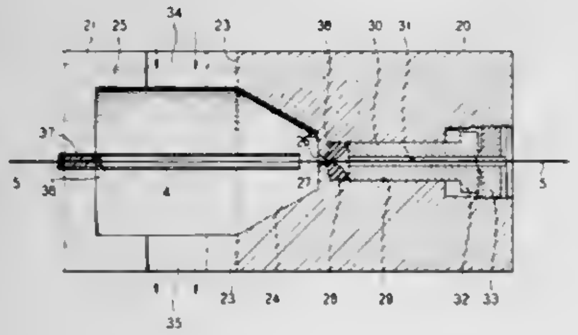
each strip of each of said sets intersecting all strips of the other set of the same grate,

the strips of at least one of said sets, having holes and struck-out lugs adjacent of said holes, for increasing the general turbulence available for mass transfer, as well as reducing the pressure drop therein, said lugs of adjacent grates being angled from said strips of at least one set in opposite senses, said second strips repeatedly deflecting the vapor rising between said second strips, and said second strips being wetted by the liquid flowing countercurrent to the vapor and in contact therewith,

each of said first strips is formed with slots which are spaced apart in the longitudinal direction of said strip, and include an oblique angle with its longitudinal direction and said second strips extending through said slots.

4,107,242
METHOD OF FABRICATING OPTICAL FIBER CONNECTORS

Peter Klaus Runge, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 630,930, Nov. 11, 1975. This application Apr. 21, 1977, Ser. No. 789,549
Int. Cl.^{2} B29D *11/00*
U.S. Cl. 264—1 **3 Claims**



1. A method of making an optical fiber connector having a flexible, dome-shaped contacting body; said method employing a mold comprising a precision die whose interior surface defines a frustum having a smaller diameter end surface in which there is a centrally located first aperture; a pair of detachable blocks having interior surfaces defining the body portion of said connector and including end surface portions wherein a second aperture is centrally located; said die and said blocks being mated to form one continuous mold cavity having the shape of the connector to be made; and an annulus disposed outside said mold cavity and coaxially aligned with, and adjacent to said first aperture;

said method characterized by the steps of:

securing an optical fiber within a protecting sleeve;

inserting said sleeve and secured fiber into said mold cavity through said second aperture with the fiber extending through said first aperture;

heating said mold to the transfer molding temperature;

injecting a transfer molding compound into said mold so as to fill the cavity defined by said mold;

the material of the annulus being such that it expands inward radially at the transfer mold temperature, simultaneously sealing the first aperture and gripping said fiber so as to accurately center said fiber in said first aperture;

and including the further steps of:

curing said injected mold compound;

cooling said mold;

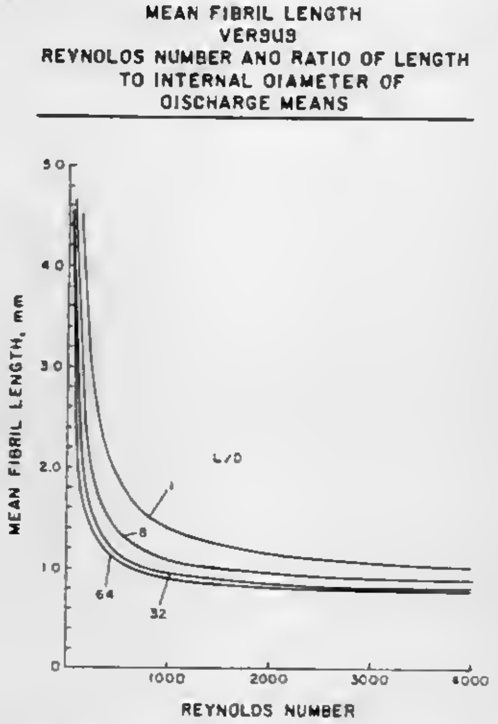
removing the resulting connector from the mold;

cutting the fiber off at the end of the connector to remove any excess;

and applying a flexible contacting dome body to the cut fiber end.

4,107,243
PREPARATION OF THERMOPLASTIC POLYMER FIBRILLA AND FIBRIL

Richard S. Stearns, Malvern; Neil A. Frankel, Media, both of Pa., and Elmer J. Hollstein, Wilmington, Del., assignors to Suntech, Inc., St. Davids, Pa.
Filed Jun. 10, 1976, Ser. No. 694,749
Int. Cl.^{2} D01D *5/04*
U.S. Cl. 264—13 **6 Claims**



1. A process for preparing solid thermoplastic polymer fibrilla or fibril comprising:

(a) discharging through a discharge means a two phase mixture of a thermoplastic polymer selected from the group consisting of low density polyethylene, medium density polyethylene, high density polyethylene, isotactic or syndiotactic polypropylene, isotactic polystyrene poly-4-methylpentene-1 and polybutene-1 or a blend of two or more such polymers and a solvent selected from the group consisting of pentane, hexane, cyclohexane, dichloromethane, methylchloride, trichlorotrifluoroethane, trichlorofluoromethane and mixtures thereof, where

(1) the discharging is from a zone of both an elevated temperature and pressure range to a zone of lower temperature and pressure,

(2) the elevated temperature range causes the formation of the two-phase mixture and maintains the two-phase mixture prior to discharge and after discharging permits vaporization of the solvent to cool the polymer to a temperature below the freezing point of the polymer,

(3) the differences between both the elevated temperature and pressure range and both the lower temperature and pressure are effective to cause rapid evaporation of the solvent after the discharging,

(4) one phase of the mixture is a polymer-rich phase and the other phase is a solvent-rich phase and concentrations between the two phases are in general equilibrium with each other,

(5) the polymer is soluble in the solvent at a temperature above the polymer's melting point but is essentially insoluble in the solvent at a temperature below about the freezing point of the polymer;

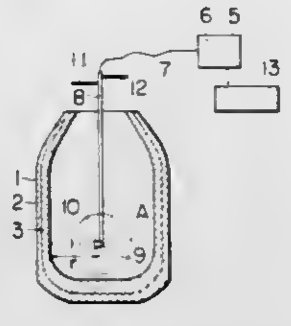
(b) and the mixture flowing has a Reynolds, Re, of less than 2×10^3, and the means has a ratio of length of internal diameter, L/D, in the range between from about 0.5 to about 100 and that the relationship between the Re, L/D, polymer and solvent is such that according to the following equation:

$$\text{mean fibril length} = 0.9122\,(L/D)^{-0.0498} + 489.5(Re)^{-1}\,(L/D)^{-0.2619}$$

the resulting mean fibril length is between from about 0.8 millimeters to about 2.9 millimeters.

4,107,244
METHOD AND APPARATUS FOR REPAIRING DAMAGED SURFACE OF REFRACTORY LINED VESSEL

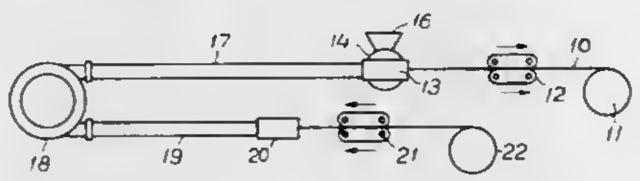
Tsunemi Ochiai, and Teruyuki Nishitani, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Jun. 14, 1976, Ser. No. 695,964
Claims priority, application Japan, Jun, 13, 1975, 50-71695
Int. Cl.^{2} F27D *1/16*
U.S. Cl. 264—30 **10 Claims**



1. In a method of repairing a damaged portion of the lining of a refractory lined vessel which comprises setting a reference position in the space of a vessel whose heated refractory lining is not substantially cooled, inserting an antenna and monolithic refractory nozzle into the vessel which are directed to the lining surface, causing microwaves transmitted from the antenna to reflect with the lining surface while shifting the antenna, receiving the microwaves, measuring the distance between each position on the lining surface and the reference position from the phase difference between the transmitted waves and received waves, comparatively operating the distance and a distance between the reference lining surface and the reference position, taking out deviations of each position as electric signals, controlling the transfer of the nozzle by employing the deviation signals, gunning the monolithic refractory to the deviated portion which needs repair and repairing the refractory lining.

4,107,245
METHOD OF AND COMPOSITION FOR MANUFACTURING AN OBJECT OF CROSS-LINKED POLYMER

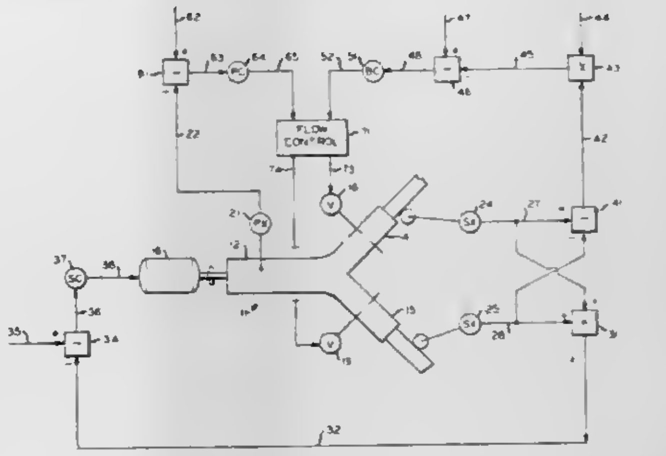
Gunnar Jansson, Älvsjö, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Sep. 4, 1975, Ser. No. 610,435
Claims priority, application Sweden, Sep. 9, 1974, 7411327; Sep. 9, 1974, 7411328; Jun. 9, 1975, 75065318; Jun. 9, 1975, 7506532
Int. Cl.^{2} C08K *5/00*
U.S. Cl. 264—40.1 **32 Claims**



1. Method of manufacturing an object of cross-linked polymer by using a peroxide, which comprises forming a starting material containing a peroxide and a polymer material with the ability to undergo a cross-linking reaction in the presence of the peroxide into an object and cross-linking the starting material during at least part of the manufacturing process in the presence of a substance with the ability to undergo a colour change during the cross-linking reaction of the polymer material, so that a colour change of the substance is achieved wherein said substance is an aromatic compound containing at least one halogen atom and/or at least one heterocyclic ring, in which ring there is at least one nitrogen atom to which no hydrogen atom is linked.

4,107,246
EXTRUSION CONTROL

Ronald J. LaSpisa, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 20, 1976, Ser. No. 751,860
Int. Cl.^{2} B29F *3/06*
U.S. Cl. 264—40.7 **23 Claims**



1. A method for controlling an extrusion process wherein a plurality of extrusion lines are supplied by a common source of molten extrudable material, said method comprising:

establishing an individual extrusion rate signal associated with each said extrusion line and representative of the rate of extrusion therethrough;

controlling the rate of delivery of said molten material by said common source thereof to maintain the sum of said individual extrusion rate signals at a preselected value;

establishing a pressure signal representative of the pressure of molten material provided to said plurality of extrusion lines;

generating a preliminary valve position set point signal associated with each said extrusion line, said preliminary valve position set point signals being representative of the positions of respective flow control valves associated with each said extrusion line required to maintain said pressure signal at a preselected value;

establishing, in response to a comparison of two or more of said individual extrusion rate signals, a valve position set point adjustment signal associated with each said extrusion line, each said valve position set point adjustment signal being representative of the change in the position of the flow control valve associated therewith necessary to provide a preselected relationship among the individual extrusion rate signals;

combining the preliminary valve position set point signal and the valve position set point adjustment signal associated with each said extrusion line to produce a plurality of adjusted valve postion set point signals; and

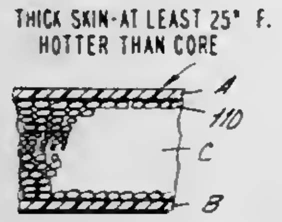
positioning the valve associated with each said extrusion line to provide a valve position represented by its respective adjusted valve position set point signal.

4,107,247
METHOD OF CO-EXTRUSION WITH FOAM CORE

Joseph Dukess, 517 Fayette Ave., Mamaroneck, N.Y. 10543
Continuation-in-part of Ser. No. 482,433, Jun. 24, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,623
Int. Cl.^{2} B29D *27/00*
U.S. Cl. 264—45.9 **5 Claims**

1. A method of manufacturing a coextruded article comprising the steps of mixing ingredients for a cellular plastic including a chemical blowing agent and a thermoplastic resin in a plastic state for forming a core and at a temperature ranging

between 300° and 400° F. and with no cross linking agent, mixing other ingredients for at least one solid thermoplastic resin in a plastic state at a temperature differing from and hotter than said temperature by at least 25° F., for forming a skin for said core and then simultaneously coextruding said cellular plastic and solid plastic through a die so that said solid plastic at a temperature greater then said cellular plastic will promote foaming of said cellular plastic and increase the size of cells of cellular plastic adjacent said solid plastic.



4,107,248

METHOD FOR THE CONTINUOUS MANUFACTURE OF FOAMED HOLLOW PROFILES

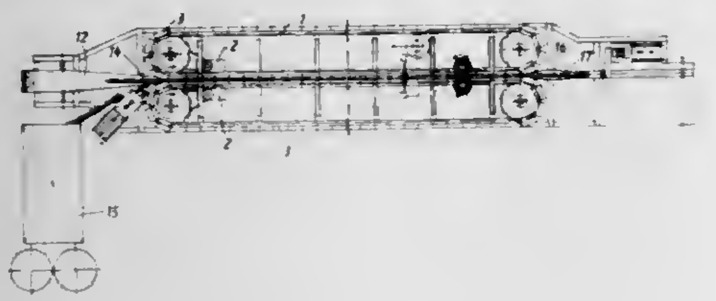
Alfred Schlieckmann, Vaterstetten, Germany, assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 615,248, Sep. 22, 1975, Pat. No. 4,021,173. This application Nov. 15, 1976, Ser. No. 741,858

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1974, 2449044

Int. Cl.^{2} B29C *5/10;* **B29D** *23/00, 27/04*

U.S. Cl. 264—51 **3 Claims**



1. The method of continuously manufacturing a foam pipe or annulus having a diametrically oriented slit extending longitudinally along its wall to give lateral access to an open center of substantially greater cross section than the width of the slit, which method comprises providing an articulated segmented internal core of suitable cross section to form said open center of said foam pipe, and a paired series of complementary outer mould portions externally and spacedly surrounding said core to define the annulus, said complementary mould portions having a parting plane along which they are separable and being formed in said plane to define a gap coincident with said diametrically oriented slit of said foam pipe, displacing said paired series in movement-conforming manner along a predetermined rectilinear path of travel while maintaining the respective outer mould portions in closed complementary relation whereby to form a moving moulding channel having said diametrically oriented gap extending lontigudinally in said parting planes coextensive with said predetermined path, providing a support externally of said mould portions, and supporting said core segments within said channel from said support by bridge elements which extend into said diametrically oriented gap and substantially close same and dispose said segmented core substantially axially of said moulding channel, advancing said core support means along said predetermined path in movement-conforming manner concomitantly with said outer mould portions to produce a continuous moving moulding channel of open-ended annular configuration and to avoid substantial relative motion between said internal core and outer mould portions, advancing a carrier sheet continuously into said moulding channel inlet and depositing a self-rising foam mix on said sheet ahead of said inlet, folding the lateral edges of said carrier sheet upwardly to conform it generally with the outer annular moulding surface with said edges extending outwardly through said diametrically oriented longitudinal gap on opposite sides of said core-supporting bridge elements to fully close said gap, and allowing said foam mix to rise and fill said moulding channel and encase said concomitantly advancing core means during advance along said predetermined path.

4,107,249

METHOD FOR FORMING AN ANNULAR GROOVE IN A THERMOPLASTIC PIPE

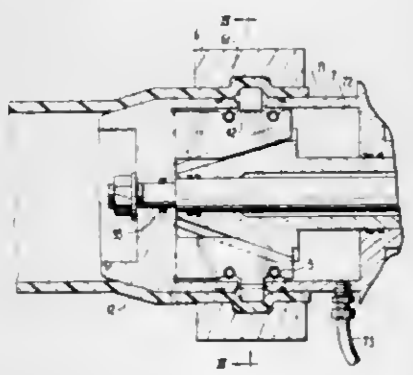
Sadao Murai; Nobuo Goto, both of Hirakata; Katsuhiko Tanioka, Asaka; Masaaki Matsunaga, Otsu, and Riyoiti Isayama, Asaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1976, Ser. No. 666,372

Claims priority, application Japan, Mar. 12, 1975, 50-30340; Mar. 12, 1975, 50-30341

Int. Cl.^{2} B29C *17/02*

U.S. Cl. 264—68 **3 Claims**



1. A method of forming an annular groove in a thermoplastic pipe comprising,

(a) fitting said pipe and a core mold having first and second segments with an aperture therebetween relative to one another so that an end of said pipe fits over said core mold with the part thereof to be expanded into said annular groove positioned in the path of multiple radially through said core mold extendable rigid members said members abutting a conical shaped internal core and being presently retracted within said core mold,

(b) positioning a split outer mold having an annular groove therein around said pipe so that the said annular groove of said outer mold confronts the outer periphery of the said part of said pipe to be expanded into said annular groove,

(c) applying an increased fluid pressure to the internal side of said part,

(d) sliding said conical shaped internal core, thereby extending said rigid members radially through said core mold to abut and expand said part, said applying step being continuous substantially for the duration of said extending step,

(e) hardening said pipe after expansion of said part,

(f) retracting said rigid members within said core mold, and

(g) removing said pipe and said core mold from one another.

4,107,250

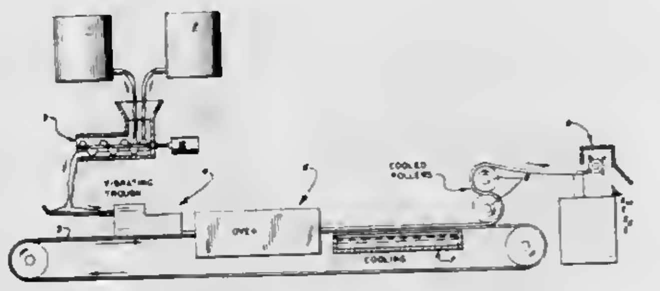
PROCESS FOR MAKING FIBER-REINFORCED THERMOPLASTIC PELLETS

James Zechinati, Woodridge, and Elra W. Pegg, Aurora, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 522,046, Nov. 8, 1974, abandoned, which is a continuation of Ser. No. 277,996, Aug. 4, 1972, abandoned. This application Feb. 24, 1977, Ser. No. 771,433

Int. Cl.^{2} B01J *2/26*

U.S. Cl. 264—118 **6 Claims**



1. A process comprising:

(a) forming a uniform mixture of fibers and powdered thermoplastic material of mesh size small enough to assure uniformity and continuously depositing said mixture on a moving conveyor belt in the form of a uniform-in-thickness-and-width layer, said mixing and depositing carried out so that said fibers are not degraded by breaking and are randomly oriented substantially in a plane;

(b) subjecting said layer to an elevated temperature whereby the thermoplastic material in said mixture flows freely, said temperature chosen to control the flow of said thermoplastic material in said mixture so that a desired geometry thereof is not disturbed and so as to avoid degrading of said thermoplastic material and said fibers;

(c) cooling the result of (b) to form a continuous, uniform, composite belt which can be cut without fouling cutter knives and which has a height of between about five-hundredths and about one-fifth inch containing said fibers randomized substantially in the plane of said belt; and

(d) cutting said belt into pellets, two dimensions being between one-eighths and three-eighths inch and the third dimension in the range of about 0.05 to about 0.2 inch being equal to the height of said belt.

4,107,251

PRODUCTION OF FILMS AND SHEETS OF POLYESTER-POLYCARBONATE BLENDS

Philip Stuart Bollen, Auburn, and Surendra A. Amin, both of Pottsville, Pa., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 552,496, Feb. 24, 1975, Pat. No. 3,975,355. This application Jun. 3, 1976, Ser. No. 692,696

Int. Cl.^{2} B29C *17/04*

U.S. Cl. 264—171 **11 Claims**

1. A process of forming a film or sheet capable of being thermoformed into a shaped article, said process comprising the steps of:

(a) blending about 60 to 85 parts by weight of a polyethylene terephthalate having an intrinsic viscosity of at least about 0.90 with about 15 to 40 parts by weight of a polycarbonate polymer and about 5 to 20 parts by weight of a nonacidic silica filler having a particle size of from about 1 micron to about 100 microns;

(b) extruding the resultant blend at a temperature above about 500° F. onto a moving support while maintaining the surface of said support at a temperature of about 225° to 380° F. whereby a film or sheet of the blend is formed; and

(c) collecting said film or sheet, said film or sheet being essentially nonoriented and the polyethylene terephthalate fraction of said film or sheet having a degree of crystallinity in the range of about 20 to 40 percent.

4,107,252

MELT SPINNING SYNTHETIC FILAMENTS

Michael Hugh Richmond, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 573,117, Apr. 30, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,232

Claims priority, application Canada, May 22, 1974, 200529

Int. Cl.^{2} D01D *1/04*

U.S. Cl. 264—176 F **5 Claims**

1. A process of forming a filament which comprises spinning by extruding molten polymer through a spinneret and cooling the so formed filament, characterized in that the molten polymer contains no solvent or plasticizer and that said polymer is a solid copolymer of 65–75 weight percent of acrylonitrile, 12–18 weight percent of styrene and 13–18 weight of isobutylene, the molten polymer and spinneret being at a temperature of about 350° to 500° F.

4,107,253

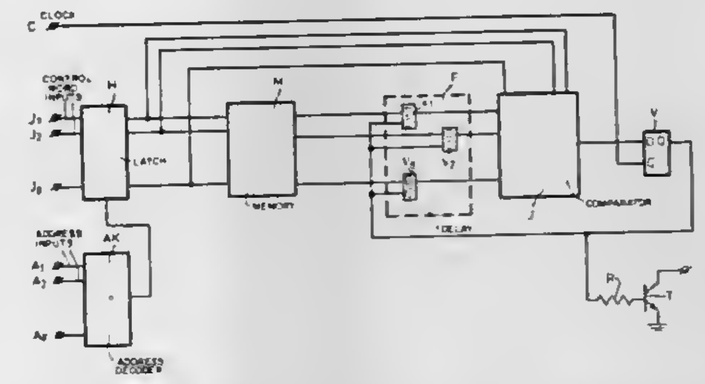
SAFETY AND TEST DEVICE IN A RAILWAY SIGNALLING SYSTEM

Lars Uno Borg; Lars Ragnar Kamp, both of Stockholm, and Kjell Olow Ingemar Olssoo, Järfälla, all of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,332

Int. Cl.^{2} B61L *3/24*

U.S. Cl. 246—182 B **6 Claims**



1. In a safety and test device in a railway signalling system comprising computer means having output means and input means for receiving information signals relating to prevailing and desired operating conditions such as prevailing speed, prevailing brake line pressure and desired speed, said computer means being adapted to treat said information signals in accordance with a predetermined program and to produce output signals for application to activation means comprising a brake for braking a train in order to effect speed reduction determined to be necessary by the treatment of said information signals, the improvement wherein the computer means is adapted in a cyclically repeated sequence to run through test program sections and at the end of each such program section to generate a control word, and comprising a control unit adapted to receive said control words successively generated by the computer means, said control unit being connected between the computer means and the activation means and including a memory for storing predetermined control words in a given sequence, a comparator for comparing the control words received from the computer means with said predetermined control words stored in said memory, means for producing an output pulse each time a received control word coincides with a control word stored in said memory and is received in said given sequence, and means for feeding said pulses from said control unit to a magnetic winding which keeps the brake in an unactivated condition, said computer means being further adapted to generate a further control word which is included in the given sequence of control

words, said further control word being generated at the end of said predetermined program if the treatment of said information signals indicated that braking is not to be effected, while if the treatment of the said information signals indicates that braking is to be effected said further control word is not generated or an erroneous control word is generated so that braking will be effected via said control unit due to disappearance of said output pulses.

4,107,254

METHOD OF LINING PIPES, MOLDS OR OTHER TUBULAR ARTICLES WITH THERMOSETTING PLASTIC MATERIAL

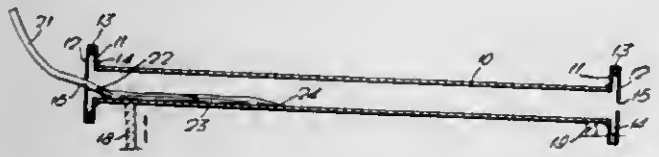
John David Webster, and Thomas John Jewell, both of St. Austell, England, assignors to English Clay Lovering Pochin & Co. Ltd., England

Continuation of Ser. No. 395,065 Sep. 7, 1973, abandoned. Filed Oct. 16, 1975, Ser. No. 623,060

Claims priority, application United Kingdom, Sep. 14, 1972, 42785/72

Int. Cl.² B29D *9/00;* **B29G** *7/00*

U.S. Cl. 264—270 **11 Claims**



1. A method of lining a pipe, mould or other tubular or hollow cylindrical article, herein referred to as a pipe, with a thermosetting synthetic plastics material which can be introduced into a pipe in the form of a liquid mixture of prepolymer and curing agent, which mixture is capable of setting to a resilient solid material, the method comprising arranging the pipe with its longitudinal axis inclined at a predetermined acute angle to the horizontal, introducing into an upper part of the pipe a selected amount of the liquid mixture from a mixing head which is operated for a predetermined period of time to mix the prepolymer and the curing agent passing therethrough and discharge the resulting mixture flowing therefrom at a substantially constant predetermined rate directly into the pipe, the pipe being held stationary while the liquid material is introduced, the angle of inclination of the pipe and the rate of introduction of the liquid mixture being so arranged that the liquid mixture which is first introduced into the pipe flows along the inside wall of the pipe to a predetermined lower part of the pipe in the same time as that for completing the introduction of the selected amount of liquid mixture, whereby the material is distributed along a length of the pipe, thereafter shifting the pipe to a position in which its longitudinal axis is horizontal and then spinning the pipe about its longitudinal axis to distribute the liquid mixture around the inside of the wall of the pipe, spinning being continued until the plastics material has set.

4,107,255

MANUFACTURE OF IMPROVED FUSED CAST REFRACTORY

Thomas A. Clisbem, Louisville, Ky.; Frederick D. Olympia, Elmira, N.Y., and Leonard W. Pokallus, Louisville, Ky., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 558,301, Mar. 14, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,534

Int. Cl.² C04B *35/60*

U.S. Cl. 264—299 **13 Claims**

1. The process of manufacturing basic fused cast refractory having principal crystal phases of periclase and magnesium-spinel and analytically consisting essentially of (by weight) of 45–78% MgO, 0–30% Cr_2O_3, 0–35% Al_2O_3, 0–17% FeO + Fe_2O_3, at least 82% MgO + Cr_2O_3 + Al_2O_3 + FeO + Fe_2O_3, 1–8% SiO_2, 0–2% CaO + BaO + SrO, 0–10% TiO_2 and 0–3% luorine,

which comprises forming a molten mass of the refractory, pouring a stream of the molten mass into a mold cavity and thereby filling the cavity with the molten mass cast there-into, adding particles of grog to the molten mass before, during and/or after pouring of it into the mold cavity, and at least partially solidifying the cast molten mass in the mold cavity to a state of self-sustaining cast shape substantially complementary to the interior surface configuration of the mold cavity,

wherein the improvement comprises substantially increasing the modulus of rupture at least within the temperature range of about 1340° to 1500° C. and inhibiting formation of shell in the refractory by providing at least half of the added grog as particles of nonfused oxidic inorganic material having a loss on ignition at 1000° C. of less than about 0.5% by weight and an aggregate SiO_2 content at least about equal to the SiO_2 content of the molten mass forming the cast refractory, the aggregate added grog particles being of a size and in an amount to about 70% by weight of the cast refractory sufficient to effect at least partial melting of and penetration into the particles by and resolidification with the cast molten mass so as to form a continuous coherent crystal structure throughout the solidified cast mass wherein discrete grog particles and remnants thereof are not optically identifiable, and at least that portion (if any) of the grog in excess of about 35% by weight of the cast refractory being SiO_2.

4,107,256

SUSPENSION POLYMERIZATION OF POLYURETHANES AND SPIN-MOLDING THE POWDER PRODUCT THEREOF

Wendell R. Conrad, Kent; Shingo Futamura, Seville, and Robert A. Hayes, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1977, Ser. No. 788,214

Int. Cl.² B29C *5/04;* **C08G** *18/82, 18/83, 18/86*

U.S. Cl. 264—310 **39 Claims**

1. A suspension polymerization process for producing polymerized suspended polyurethanes, comprising the steps of:

adding a silicone surfactant to a nonaqueous suspending medium,

said suspending medium being a nonsolvent with respect to polymerized urethanes,

adding urethane prepolymers to the resulting nonaqueous suspending medium,

agitating said nonaqueous suspending medium containing said silicone surfactant and said urethane prepolymers, and

polymerizing said urethane prepolymers by adding a chain extending agent to said suspending medium containing said urethane prepolymers to produce fine discrete particles of urethane polymers.

31. A process for curing suspension polyurethane powders during spin molding, comprising the steps of:

spinning and heating a mold having therein a fusible suspension powdered compound selected from the class consisting of a polyurethane, a urethane-urea polymer, and combinations thereof, having a plasticity of at least 2,000 square millimeters at 150° C, and a curing agent,

said heating temperature ranging from about 130° C to a temperature below the decomposition temperature of said suspension powder to produce a cured article.

4,107,257

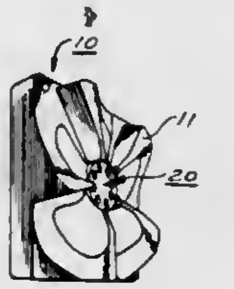
METHOD FOR MOLDING DYNAMICALLY BALANCED FANS

Richard E. Swin, Sr., 5302 Howard, Western Springs, Ill. 60558

Division of Ser. No. 616,387, Sep. 24, 1975, Pat. No. 4,047,692. This application Apr. 22, 1977, Ser. No. 789,872

Int. Cl.² B29C *5/00;* **B29F** *1/00*

U.S. Cl. 264—328 **2 Claims**



1. In the method of injection molding dynamically balanced plastic air movement devices wherein mold halves having complementary faces forming a mold cavity in the configuration of an air movement device are injected with plastic material to form an air movement device in the configuration of the mold cavity, the improvement comprising

inserting a plurality of selectively extendable plugs into one of the mold halves to form balancing pads of plastic material on the air movement device at predetermined positions to effect dynamic balancing thereof, and

adjusting said selectively extendable plugs from the face of said mold half to vary the quantity of plastic material forming said balancing pads.

4,107,258

INJECTION MOLDING REDUCED COMBUSTIBILITY HIGH IMPACT STRENGTH POLYETHYLENE ARTICLES

Richard Gordon Angell, Jr.; Laurence Herbert Gross, both of Bridgewater, N.J., and Sidney Ethan Berger, Rye, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,353

Int. Cl.² C08K *5/54*

U.S. Cl. 264—328 **8 Claims**

1. The process for the production of injection molded high density polyethylene articles having reduced combustibility and high impact strength comprising: maintaining a mold cavity at a preselected back pressure sufficiently high to substantially prevent foaming of a high density polyethylene material melt to be injected therein; injecting said melt into said mold cavity under pressure in excess of said back pressure to fill said mold cavity; said high density polyethylene material melt containing; (a) from about 50 to 70% by weight of alumina trihydrate, (b) from about 1 to 12% by weight of water as a processing aid, and (c) from about 0.5 to 3% by weight of a methoxy polyethylene glycol propyltrimethoxy silane having the formula:

$$CH_3O(C_2H_4O)_n C_3H_6 Si(OCH_3)_3,$$

wherein *n* represents the average number of ethoxy repeat units between about 3.0 and 11.0.

4,107,259

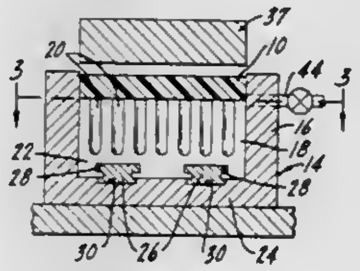
METHOD OF MAKING A CROSS LINKED PILE PRODUCT

William Chang Liu, Northbrook, Ill.; Francis H. Bratton, deceased, late of Wilmette, Ill. (by Jean C. Bratton, executrix), and Robert Ronald Nali, Mundelein, Ill., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 531,183, Dec. 9, 1974. This application Oct. 15, 1976, Ser. No. 732,935

Int. Cl.² B29C *5/00, 7/00;* **B29G** *7/00*

U.S. Cl. 264—331 **8 Claims**



1. A method of compression molding a pile product whose fibers have an aspect ratio greater than 10 comprising the steps of:

(a) subjecting a molding composition including a crosslinkable polymeric material to an elevated temperature and pressure to force the molding composition into a mold kept at the elevated temperature, the molding composition and crosslinkable material being selected so that the after crosslinking of the crosslinkable material the molding composition will have sufficient strength to remove the pile product from the mold at substantially said elevated temperature and the mold having a plurality of cavities corresponding to the fibers of the pile products; and

(b) with the formation of the fibers according to step (a), initiating crosslinking of the polymeric material to give the molding composition sufficient strength to remove it from the mold at substantially said elevated temperature; and

(c) removing the molded material from the mold at substantially said elevated temperature.

4,107,260

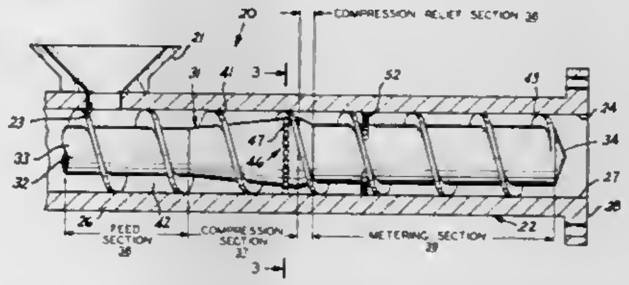
METHODS OF WORKING EXPANDABLE THERMOPLASTIC MATERIALS IN AN EXTRUDER

Timothy Stephen Dougherty, Roswell, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 557,728, Mar. 12, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,471

Int. Cl.² B29B *1/06*

U.S. Cl. 264—349 **9 Claims**



1. A method of extruding expandable thermoplastic materials, which comprises the steps of:

moving a core having a helical flight formed thereon rotatively about an axis of rotation to advance an expandable thermoplastic material along a path in a downstream direction from a supply end to an output end while compressing and heating portions of successive increments of the expandable thermoplastic material along a portion of the path which decreases continuously in cross-sectional area in the downstream direction to progressively melt the thermoplastic material and while causing unmelted portions of the expandable thermoplastic material to fragment at a predetermined location along said portion of the path; while

subjecting the thermoplastic material to forces exerted by force-producing components, which are attached to the core in the path of the thermoplastic material at the location at which the unmelted portions of the thermoplastic material fragment with at least some portion of each of the components lying in a plane which is perpendicular to the axis of rotation with the flight being continuous through the plane, to cause the fragmentation of the unmelted portions of successive increments of the thermoplastic material to be continuous and to be such as to provide a constant temperature melt at the output end with corresponding portions of successive increments of the melt having substantially identical thermal histories.

4,107,261

PROCESS FOR THE SEPARATION OF PLATINUM GROUP METALS

John Baltz, Lakewood, and Enzo Coltrinari, Arvada, both of Colo., assignors to PGP Industries Inc., Santa Fe Springs, Calif.

Continuation of Ser. No. 629,879, Nov. 7, 1975, Pat. No. 4,012,481. This application Dec. 15, 1976, Ser. No. 750,738

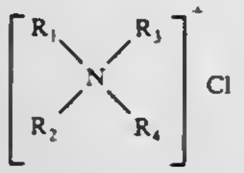
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.² C01G *55/00*

U.S. Cl. 423—22 **6 Claims**

1. A continuous process for the separation and recovery of Rhodium and Iridium dissolved in aqueous chloride solutions which comprises:

contacting said aqueous chloride solution with an organic solvent containing an organically substituted quaternary ammonium halide having the following structure:



wherein R_1, R_2, R_3 and R_4 are hydrocarbon groups for a predetermined time period to form an organic extract phase and an aqueous raffinate phase,

said quaternary ammonium compound being sufficiently soluble in said solvent to make a 1% solution,

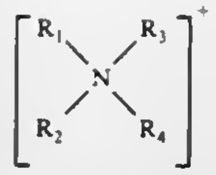
separating said extract phase from said aqueous phase,

contacting said separated extract phase with at least the stoichiometric amount of aqueous sodium hydroxide solution required to neutralize the chloride form of said amine and form a metallic hydroxide precipitate, contacting said alkaline treated solvent with at least a stoichiometric amount based on the stoichiometric value of said alkaline solution of an acidified aqueous reducing agent, said contact resulting in the formation of a loaded aqueous phase and a stripped organic phase,

separating said loaded aqueous phase and said stripped organic phase, and recovering Iridium from said loaded aqueous phase,

maintaining said Rhodium in the form of a cationic complex and maintaining said Iridium in an anionic state throughout said extraction procedure.

2. A process for the separation and selective recovery of Rhodium, Ruthenium and Iridium values from an aqueous acidic medium which comprises contacting the medium with an organic extraction reagent comprising a water immiscible solvent having dissolved therein an organically substituted quaternary ammonium compound having the structure



wherein R_1, R_2, R_3 and R_4 are hydrocarbon groups, said compound being sufficiently soluble in said solvent to make a 1% solution and capable of forming complexes with Iridium and Ruthenium that are preferentially soluble in said solvent and whereby said contacting results in the formation of an organic extract phase and an aqueous raffinate phase,

separating said extract phase from said aqueous raffinate phase,

contacting said organic extract phase with a sufficient quantity of an aqueous alkaline stripping agent to neutralize the organic extract phase, said contact resulting in the formation of an aqueous phase loaded with said Iridium and Ruthenium and a stripped organic phase, and thereafter

contacting said stripped organic phase and said loaded aqueous phase with a solution consisting of an acidified reducing agent which is at least the stoichiometric equivalent of said alkaline agent, and maintaining said Rhodium in the form of a cationic complex and said Iridium and Ruthenium in their anionic states during said extraction procedure.

4,107,262

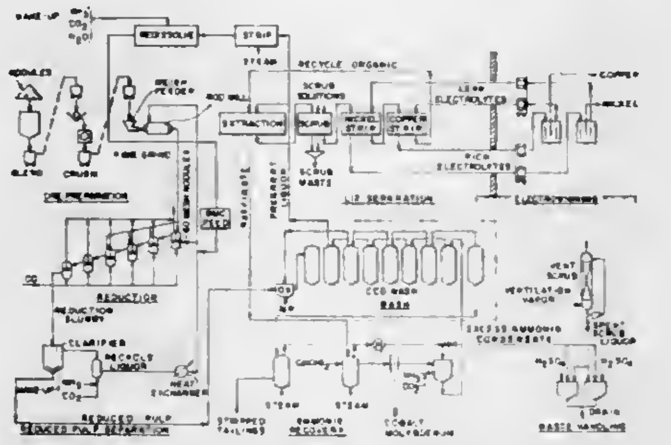
CUPRION PROCESS START-UP CONTROL

Robert E. Lueders, Needham; Roger N. Kust, Acton, and David S. Davies, Andover, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,494

Int. Cl.² C01G *3/14, 51/12, 53/12*

U.S. Cl. 423—32 **9 Claims**



1. In a process in which metal values selected from the group of copper, nickel, cobalt and molybdenum are recovered from manganese nodules by introducing the nodules into a reaction vessel containing an aqueous ammoniacal-ammonium carbonate solution and cuprous ions to allow the cuprous ions to reduce the manganese oxides in the nodules to enable the metal values to be solubilized and in which cuprous ions are continuously regenerated by a reducing gas wherein the improvement comprises providing a start-up solution of cuprous ions by oxidizing copper metal with the manganese nodules from which the metal values are to be recovered and recovering metal values selected from the group of copper, nickel, cobalt and molybdenum from the manganese nodules used to oxidize the copper metal to provide the start-up solution of cuprous ions.

4,107,263

PROCESS FOR THE PREPARATION OF BROMINE AND HYDROGEN BROMIDE FROM AMMONIUM BROMIDE

Lothar Schulz, Bad Soden am Taunus, and Hans-Jürgen Arpe, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 544,915, Jan. 28, 1975. This application Jun. 15, 1977, Ser. No. 806,938

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404335

Int. Cl.² C01B *7/12, 21/02, 7/10*

U.S. Cl. 423—481 **22 Claims**

1. A process for the selective production of hydrogen bromide directly from ammonium bromide which consists essentially of contacting ammonium bromide and an oxygen containing gas, at a molar ratio of oxygen to bromide of less than 1, with an inorganic oxidation catalyst containing at least one element selected from the group consisting of rhenium, a noble metal of the 8th Subgroup of the Periodic Table and carbon, and mixtures thereof, reacting said ammonium bromide and oxygen in the presence of said catalyst at about ambient pressure and a temperature of from 200 to 800° C. and a reaction time of more than 0.1 second to produce a reaction gas product consisting predominantly of hydrogen bromide, nitrogen and H_2O and recovering hydrogen bromide from said reaction gas product.

4,107,264

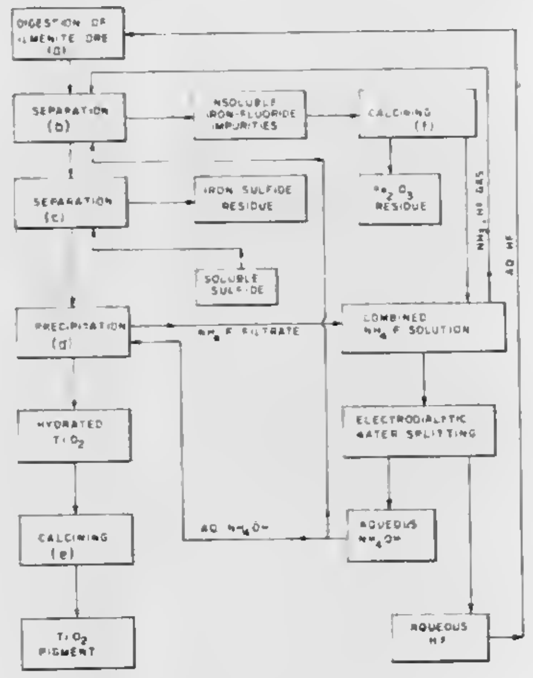
RECOVERY OF TiO_2 FROM ILMENITE-TYPE ORE BY A MEMBRANE BASED ELECTRODIALYSIS PROCESS

Krishnamurthy Nagasubramanian, Parsippany, and Kang-Jen Liu, Bridgewater, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1977, Ser. No. 851,221

Int. Cl.² C01G *23/04*

U.S. Cl. 423—81 **5 Claims**



1. In a process for producing titanium dioxide from ilmenite-type ore including the steps of

(a) digesting ilmenite ore with aqueous hydrogen fluoride to form a solution of titanium fluoride compounds and soluble iron fluoride impurities;

(b) adding aqueous ammonium fluoride and ammonium hydroxide to substantially precipitate iron-ammonium fluoride impurities from the solution;

(c) separating the remainder of the iron fluoride impurities by precipitating with ammonium sulfide and filtering off;

(d) adding ammonium hydroxide to precipitate hydrated titanium dioxide and to form aqueous ammonium fluoride;

(e) calcining the hydrated titanium dioxide to form pigmentary titanium dioxide; and

(f) converting the precipitated iron-ammonium fluoride impurities from step (b) to form iron oxide and aqueous ammonium fluoride, the improvement which comprises subjecting the combined ammonium fluoride solutions from steps (d) and (f) to electrodialytic water-splitting to form an aqueous solution of ammonium hydroxide and an aqueous solution of hydrogen fluoride and recycling said aqueous ammonium hydroxide to step (d), and said aqueous hydrogen fluoride to step (a).

5. The improvement in accordance with claim 1 wherein the aqueous hydrofluoric acid solution produced by electrodialytic water-splitting contains ammonium fluoride.

4,107,265

TREATING RESIDUES FROM THE LEACHING OF ROASTED ZINC BLENDE

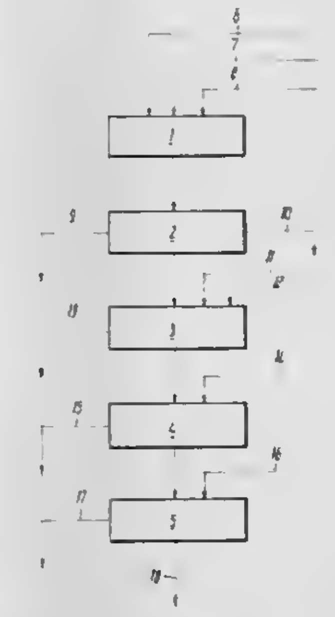
Adolf von Röpenack; Volker Wiegand, both of Datteln, and Gunter Smykalla, Gelsenkirchen-Buer, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,602

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624658

Int. Cl.² C01G *9/06*

U.S. Cl. 423—101 **6 Claims**



1. A process for treating a residue from the sulfuric acid leaching of roasted zinc blende, comprising

(a) leaching the residue in a single stage with a solution containing about 120 to 250 g/l of sulfuric acid and a metal sulfide supplied in a quantity sufficient for transforming the iron in the residue into divalent iron with concurrent formation of elemental sulfur, the temperature being maintained between about 60° C and the boiling point, the resulting suspension having a sulfuric acid concentration of about 15 to 60 g/l,

(b) heating the suspension to a temperature above the melting point of sulfur, separating a first fine-grained residue of low zinc and iron contents and high lead content, and separating a coarse-grained residue containing sulfur, compounds of iron and any excess metal sulfide from (a),

(c) adjusting the pH of the residual solution to at most about 2, and at a temperature between about 80° C and the boiling point adding zinc dust thereby to precipitate copper and separating the precipitate,

(d) adjusting the pH to about 4 to 5 and separating any precipitate which forms, and

(e) oxidizing the residual solution to precipitate iron as hematite, and separating the hematite from the purified zinc-containing solution.

4,107,266

PRODUCTION OF PURE ALUMINA FROM IRON CONTAMINATED SULFATE LIQUORS

Donald J. Bauer, Reno, and Judith A. Eisele, Verdi, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 818,045

Int. Cl.^{2} C01F *7/00, 7/30*

U.S. Cl. 423—112 **5 Claims**

1. A process for recovery of alumina from iron contaminated aluminum sulfate leach liquors comprising (1) treating the liquor with hydrogen chloride to the point of incipient crystallization of aluminum chloride hexahydrate whereby the iron contaminant is converted to an anionic complex, $FeCl_4^-$, (2) extracting the resulting solution with an extractant comprising a tertiary amine to yield a raffinate of low iron content, (3) treating the raffinate with hydrogen chloride to crystallize and precipitate aluminum chloride hexahydrate, and (4) roasting the aluminum chloride hexahydrate to alumina.

4,107,267

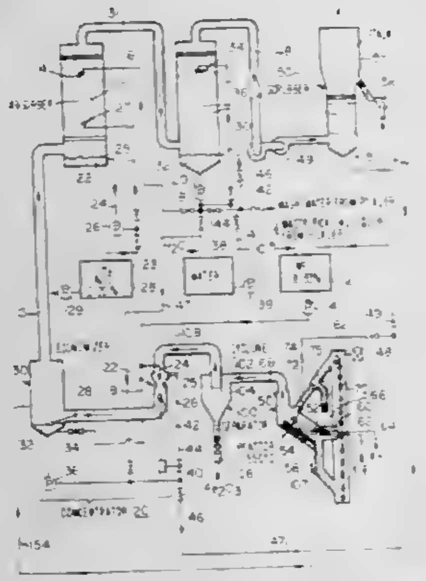
PROCESS FOR TREATING WASTE HYDROCHLORIC ACID

Lars J. Hansen, Petersburg, Mich., assignor to Toledo Pickling & Steel Service, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 702,082, Jul. 2, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,817

Int. Cl.^{2} C01G *49/02, 49/10;* **C01B** *7/01*

U.S. Cl. 423—138 **8 Claims**



1. A process for regenerating waste hydrochloric acid containing ferrous chloride and producing iron oxide comprising the steps of:

(A) concentrating said acid,

(B) reacting said concentrated acid with water and oxygen in the presence of solid particles and a hydrocarbon combustion fluid in a reactor having a bottom with opposite sides and a center portion at a resulting temperature between about 175° and 550° C. to produce hydrogen chloride and iron oxide particles without producing caking of said particles by increasing the rate of flow of said particles through said reactor more along the edges of the reactor bottom than in the center portion thereof,

(C) separating said iron oxide particles from both said hydrogen chloride and the resulting combustion gases from said hydrocarbon fluid,

(D) cooling the separated hydrogen chloride and combustion gases,

(E) absorbing in water said hydrogen chloride from said combustion gases to produce regenerated hydrochloric acid, and

(F) scrubbing the resulting combustion gases to remove harmful impurities therein before releasing said gases into the atmosphere.

8. A process for treating waste hydrochloric acid containing ferrous chloride to produce iron chloride comprising the steps of:

(A) concentrating said acid;

(B) reacting said concentrated acid in the presence of solid particles and a hydrocarbon combustion fluid in a reactor having a bottom with opposite sides and a center portion at a temperature between about 100° and 200° C. to produce iron chloride particles without producing caking of said particles by increasing the rate of flow of said particles through said reactor more along the edges in the reactor bottom than in the center portion thereof,

(C) separating said iron chloride particles from the resulting combustion gases from said hydrocarbon fluid,

(D) cooling the separated combustion gases,

(E) treating the resulting cooled gases with water to absorb soluble gases therein, and

(F) scrubbing the resulting combustion gases to remove harmful impurities therein before releasing said gases into the atmosphere.

4,107,268

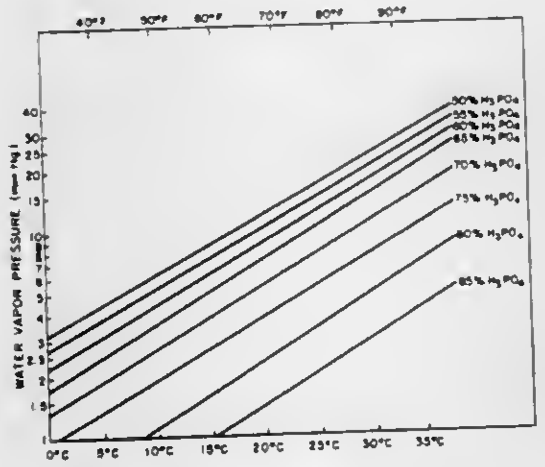
ANIMAL CONFINEMENT ENVIRONMENT CONTROL

Eugene T. O'Neill, Hightstown, N.J., and Donald O. Flach, Mamaroneck, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jul. 9, 1976, Ser. No. 703,915

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—210 **6 Claims**



1. A process for controlling the humidity of a closed animal confinement habitat and purifying the habitat air to prevent undesirable buildup of odorous and noxious gases, which comprises:

removing a portion of the air from the confinement habitat, said air containing odorous and noxious gases;

contacting the removed air with an aqueous solution containing 0.01% to 1.0% by weight hydrogen peroxide and 10% to 85% by weight of a mineral acid selected from the group consisting of phosphoric acid and sulfuric acid, said air and aqueous solution having essentially the same temperature;

absorbing and oxidizing the odorous and noxious gases in said aqueous solution;

adjusting the mineral acid concentration during the contacting step to maintain the humidity level of the contacted air to the desired level between 40% and 95% relative humidity; and

passing the air back into the confinement habitat.

4,107,269

METHOD OF PURIFYING A HYDROGENATED GAS CONTAINING ACID GASES

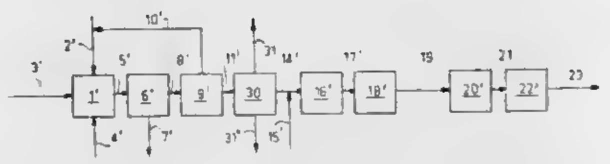
Jean Rossarie, 117, rue Louis Brindeau, 76600 Le Havre, and Jean Maurin, rue du Temple, 76 Montivilliers, both of France

Filed Jul. 7, 1977, Ser. No. 813,771

Claims priority, application France, Jul. 12, 1976, 76 21355

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—222 **12 Claims**



1. A method of purifying a hydrogenated gas containing carbon monoxide and hydrogen sulphide, the method comprising a hydrogen sulphide elimination step and at least one carbon monoxide elimination step, wherein the improvement comprises catalytic conversion of carbon monoxide at a temperature of from 280° C. to 350° C. followed by a hydrogen sulphide elimination step which comprises a reaction between sulphur dioxide and hydrogen sulphide to form sulphur, said reaction being performed in a solvent for sulphur dioxide and hydrogen sulphide at a temperature of from 0° to 200° C and at a pressure of from 1 to 150 atmospheres.

4,107,270

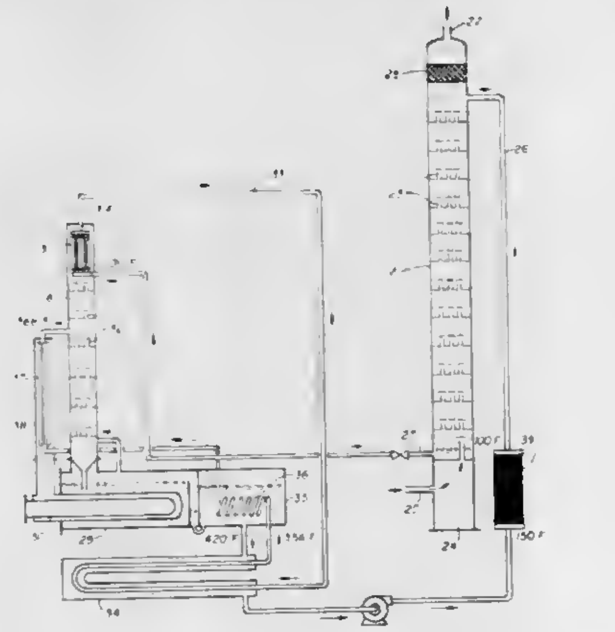
PROCESS FOR SIMULTANEOUS REMOVAL OF HYDROGEN SULFIDE AND WATER FROM A GAS MIXTURE WITHOUT SUBSTANTIAL REMOVAL OF CARBON DIOXIDE OR HYDROCARBONS

Charles Robert Ferrin, and William Patrick Manning, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 20, 1977, Ser. No. 807,936

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—226 **4 Claims**



1. The process for the separation of hydrogen sulfide and water from a mixture of natural gases which may also contain carbon dioxide, which comprises,

scrubbing the mixture of gases with a liquid, high boiling organic absorbent selected from the group consisting of 1-formyl piperidine and alkylated derivatives of 1-formyl piperidine in an absorption zone above atmospheric pressure to thereby absorb both the hydrogen sulfide and water but substantially less of the carbon dioxide and hydrocarbons,

conducting the absorbent containing the hydrogen sulfide and water to a desorption zone at atmospheric pressure

liberating the absorbed hydrogen sulfide and water from the absorbent to thereby regenerate the absorbent,

and recycling the regenerated absorbent to the absorption zone.

4,107,271

WET-TREATMENT OF EXHAUST GASES

Masumi Atsukawa; Naoharu Shinoda, and Takeji Tanaka, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,785

Claims priority, application Japan, Jun. 6, 1975, 50-67467

Int. Cl.^{2} C01B *21/00*

U.S. Cl. 423—235 **3 Claims**

1. In a process for the aqueous absorption treatment of an exhaust gas to remove simultaneously both oxides of nitrogen (NO_x) and oxides of sulphur (SO_x) from the exhaust gas, wherein the process comprises washing and contacting the exhaust gas with a slurry of lime or limestone, containing an aqueous solution of an alkali metal iodide, alkaline earth metal iodide or mixture of alkali metal iodide and alkaline earth metal iodide, (a) wherein said lime or limestone slurry reacts with (SO_x) thereby removing the sulphur oxides from the exhaust gas and (b) wherein said alkali metal iodide, alkaline earth metal iodide or mixture of alkali metal iodide and alkaline earth metal iodide remove (NO_x) from the exhaust gas;

the improvement comprising

(1) treating at least a portion of the aqueous solution of alkali metal iodide, alkaline earth metal iodide, or mixture of alkali metal iodide and alkaline metal iodide, after the aqueous solution contacts said exhaust gas in (a) and (b), with an amount of an oxidizing agent selected from the group consisting of chlorine, ozone, hydrogen peroxide, or nitrogen dioxide effective to convert substantially all iodide to iodine, said iodine being in the form of a gas or a solid,

(2) separating said iodine from the aqueous solution resulting from treatment with said oxidizing agent and recovering iodine;

(3) and further processing said iodine and the separated aqueous solution of (2)

(i) by reducing said recovered iodine with an agent selected from the group consisting of sulphurous acid, lime sulphite and mixtures thereof to regenerate iodide,

wherein said regenerated iodide is mixed with lime or limestone slurry and recycled for use in (a) and (b) to remove both oxides of nitrogen (NO_x) and oxides of sulphur (SO_x) from said exhaust gas, and

(ii) by neutralizing said separated aqueous solution, heating and concentrating said separated aqueous solution by a high temperature exhaust gas before said gas enters an exhaust gas cooling and dusting apparatus to remove impurities comprising NaCl, $CaCl_2$, $HON(SO_3)_2Ca$, $[N(SO_3)_3]_2Ca_3$ or mixures thereof which are contained in the liquid to convert them into solid waste materials.

4,107,272

PROCESS FOR REMOVING NITROGEN OXIDES USING AMMONIA AS A REDUCTANT AND SULFATED METALLIC CATALYSTS

Toshikatsu Mori, Hitachi; Masato Takeuchi, Katsuta; Otane Hitomi, Hitachi; Shigeo Uno, Hitachi; Jinichi Imahashi, Hitachi, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 471,151, May 17, 1974, abandoned. This application Jan. 25, 1977, Ser. No. 762,267

Claims priority, application Japan, May 21, 1973, 48-57080

Int. Cl.^{2} B01J *8/00;* **C01B** *21/00*

U.S. Cl. 423—239 **20 Claims**

1. In a process for removing nitrogen oxides from a flue gas

wherein the flue gas is contacted with ammonia in the presence of a catalyst at elevated temperatures to reduce the nitrogen oxides to nitrogen, the improvement wherein said flue gas contains 100 to 1000 ppm in volume of nitrogen oxides, 200 to 1500 ppm in volume of sulfur oxides and 1 to 7% by volume of oxygen, the flue gas is mixed with ammonia gas in an amount of more than equivalents of nitrogen oxides, and the flue gas and ammonia mixture is contacted with a catalyst initially containing at least one metallic atom M selected from the group consisting of Fe, Cu, V, Mn, Ni, and Cr, and a group SO_x, wherein x is 1.5 to 4.

4,107,273
FLUORESCENT MATERIAL

Atsushi Suzuki, Hachioji, Japan, and Jean-Pierre Jeser, Esslingen, Fed. Rep. of Germany, assignors to Hitachi, Ltd., Japan

Filed Oct. 28, 1977, Ser. No. 846,535

Claims priority, application Japan, Nov. 12, 1976, 51/135333

Int. Cl.² C09K *11/46*

U.S. Cl. 423—263 **4 Claims**

1. An infrared ray excited - infrared ray emitting fluorescent material represented by the following formula:

$$MM'_{1-x-y}Nd_xYb_yP_4O_{12}$$

where M denotes at least one element selected from the group consisting of Li, Na, K, Rb and Cs, and M' denotes at least one element selected from the group consisting of Sc, Y, La, Ce, Gd, Lu, Ga and In, and where $0.05 \leqq x \leqq 0.999$, $0.001 \leqq y \leqq 0.950$, and $x + y \leqq 1.0$; the maximum luminescence wavelength of said fluorescent material being approximately 980 nm.

4,107,274
PROCESS FOR PREVENTING CAKING AND OBTAINING FLOWABILITY OF ALKALI CHLORIDES AND SALT MIXTURES THEREOF

Helmut Knorre, Seligenstadt; Joachim Fischer, and Gerhard Pohl, both of Hanau, all of Germany, assignors to Duetsche Gold- und Silber-Scheldeanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 579,158, May 20, 1975, Pat. No. 4,051,228. This application Apr. 29, 1977, Ser. No. 792,471

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456434

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.² C01G *3/26*

U.S. Cl. 423—268 **14 Claims**

1. A flowable alkali metal chloride composition resistant to caking on storage including as an anticaking agent (A) a complex iron cyanide (B) a water insoluble, inorganic, inert, finely divided hydroxyl group containing precipitated or pyrogenically formed metal oxide or metalloid oxide carrier material, (C) a hydrophobizing material and (D) a polycarboxylate hydrophilizing material, said materials (A), (C) and (D) being present on B, said anticaking agent providing a permanent moisture content of at least 0.01 weight % of water on the salt.

9. A process of preparing the product of claim 7 comprising adding (A) to (C) and (D) on the hydroxyl group containing (B) carrier to the alkali metal chloride.

4,107,275
METHOD FOR PRODUCING NF_4BF_4

Karl O. Christe, Calabasas; Carl J. Shack, Chatsworth, and Richard D. Wilson, Canoga Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 12, 1976, Ser. No. 731,198

Int. Cl.² C01B *35/14*

U.S. Cl. 423—276 **5 Claims**

1. Improved metathetical process for the production of NF_4BF_4, comprising the steps of combining $CsBF_4$ with a 0–15 mol % excess of NF_4SbF_6 in anhydrous HF at room temperature, cooling the mixture to −78° C and removing the $CsSbF_6$ precipitate by filtration at −78° C.

4,107,276
MANUFACTURE OF HEXAGONAL BORON NITRIDE

Karl Alex Schwetz, Sulzberg; George Vogt, Kempten-Sankt Mang, and Alfred Lipp, Bad Worishofen, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Herzog-Wilhelm-Strasse 16, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,399, Dec. 29, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 808,212

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1974, 2461821

Int. Cl.² C01B *35/08*

U.S. Cl. 423—290 **15 Claims**

1. A process for the manufacture of hexagonal boron nitride which comprises, reacting a starting material selected from the group consisting of an alkali metal hexaboride, an alkali metal dodecaboride, an alkaline earth metal hexaboride and an alkaline earth metal dodecaboride with a grain size having a minimum BET surface of 1 m^2/g, with nitrogen at a temperature of at least about 900° C and a nitriding gas pressure of at least 1 bar, in the presence of at least one additive in the amount of at least 2% by weight, selected from the group consisting of B_2O_3, boric acid, boron carbide, an alkaline earth metal borate, carbon and iron.

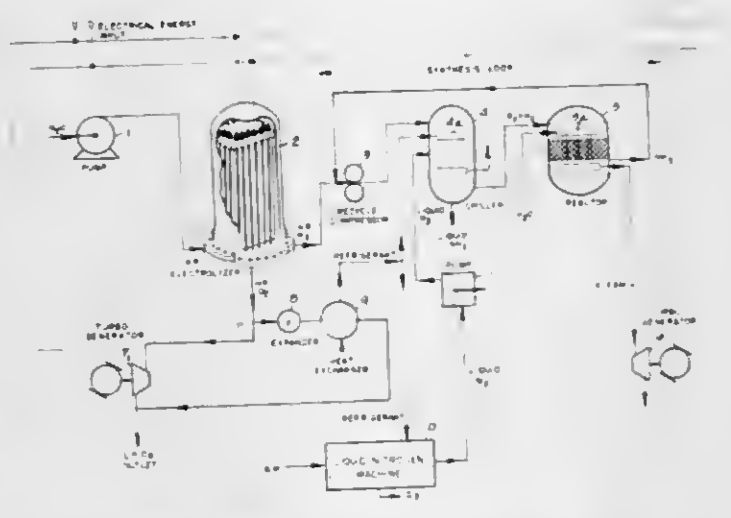
4,107,277
PROCESS FOR PRODUCTION OF AMMONIA

Aldo Vieira da Rosa, P. O. Box 443, Palo Alto, Calif. 94302

Filed Jul. 13, 1976, Ser. No. 704,772

Int. Cl.² C01C *1/04*

U.S. Cl. 423—359 **3 Claims**



1. A process for the production of ammonia comprising the steps:

subjecting water to electrolysis in a high pressure electrolyzer to produce hydrogen and oxygen at relatively high pressures;

introducing said high pressure hydrogen so produced into a synthesis loop comprising a recycle compressor, a chilling vessel, a reactor vessel, and interconnecting piping;

expanding said high pressure oxygen so produced in a first heat exchanger having a refrigerant circulating loop thereby effecting the cooling of said refrigerant;

circulating said refrigerant through said refrigerant circulating loop and through a second heat exchanger;

introducing nitrogen into said second heat exchanger thereby effecting liquefaction of said nitrogen;

introducing said liquid nitrogen into said chilling vessel thereby vaporizing said nitrogen and forming a mixture with said hydrogen from said synthesis loop and simultaneously cooling said mixture;

introducing said mixture of hydrogen and nitrogen into said reactor vessel thereby producing ammonia vapor;

circulating said ammonia vapor through said chilling vessel;

condensing said ammonia vapor in said chilling vessel;

removing said ammonia from said chilling vessel.

4,107,278
PROCESS FOR MAKING HCN

Victor Kai-Kuo Wang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 16, 1976, Ser. No. 714,353

Int. Cl.² C01C *3/02*

U.S. Cl. 423—376 **5 Claims**

1. A process for increasing the yield of HCN in an Andrussow-type process for the synthesis of HCN by the vapor-phase reaction of methane with ammonia and oxygen in the presence of a noble metal oxidation catalyst, which comprises: feeding a mixture of reactant gases over the entire catalyst surface, said reactant gas mixture having a volume ratio of methane to oxygen in the range of about 0.9–1.5 and containing about 0.5–20% by volume of CO_2, whereby the conversion of CH_4 to HCN is increased by at least about 6% by volume.

4,107,279
PROCESS FOR THE PREPARATION OF AMIDOSULFONIC ACID

Reinhold Gräser, Frankfurt am Main; Heinz Karl Hofmeister, Kelkheim, and Adolf Metzger, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,712

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637948

Int. Cl.² C01B *17/00*

U.S. Cl. 423—389 **6 Claims**

1. A process for the preparation of amidosulfonic acid consisting essentially of reacting sulfur trioxide and ammonia to produce a melt of reaction products; and reacting the melted reaction products directly with a mineral acid.

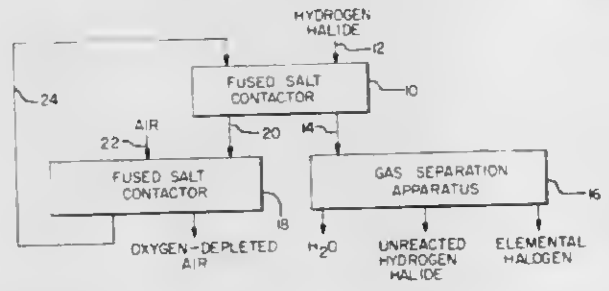
4,107,280
OXIDATION OF HYDROGEN HALIDES TO ELEMENTAL HALOGENS WITH CATALYTIC MOLTEN SALT MIXTURES

Charles A. Rohrmann, Kennewick, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 1, 1977, Ser. No. 820,733

Int. Cl.² C01B *7/00*

U.S. Cl. 423—502 **16 Claims**



1. A process for regenerating an elemental halogen, selected from chlorine, bromine and iodine, from a corresponding hydrogen halide comprising:

contacting a hydrogen halide in the substantial absence of an oxygen-bearing gas, with a molten salt mixture which includes a dissolved oxygen compound capable of reacting with said hydrogen halide to produce an elemental halogen and water; and

maintaining said salt mixture during said contacting at an elevated temperature sufficient to sustain a reaction between said oxygen compound and said hydrogen halide to produce a gaseous effluent, substantially free of gaseous oxygen and containing primarily steam and said elemental halogen along with a smaller amount of unreacted hydrogen halide.

13. A process for regenerating elemental chlorine from hydrogen chloride comprising:

in the substantial absence of an oxygen-bearing gas, contacting hydrogen chloride with a molten salt mixture comprising 5 to 25 wt. percent K_2SO_4, 50 to 90 wt. percent $K_2S_2O_7$ and 2 to 25 wt. percent V_2O_5;

during said contacting, maintaining said salt mixture at an elevated temperature sufficient to sustain a reaction between vanadium in its higher valence state (V^{+5}) and said hydrogen chloride whereby at least a portion of said vanadium, which is dissolved in said salt mixture, is reduced to a lower valence state and whereby a gaseous effluent, substantially free of gaseous oxygen and containing primarily steam and chlorine gas along with unreacted hydrogen chloride, is produced;

separating said effluent from the resulting salt mixture containing said reduced vanadium; and

contacting said salt mixture containing said reduced vanadium with an oxygen-bearing gas at an elevated temperature sufficient to sustain a reaction between oxygen in said oxygen-bearing gas and said dissolved, reduced vanadium to thus regenerate said vanadium to its higher valence state so that said salt mixture may be used for contacting additional amounts of said hydrogen chloride.

4,107,281
PROCESS FOR THE THERMAL DECOMPOSITION OF ALUMINUM CHLORIDE HEXAHYDRATE TO OBTAIN ALUMINA

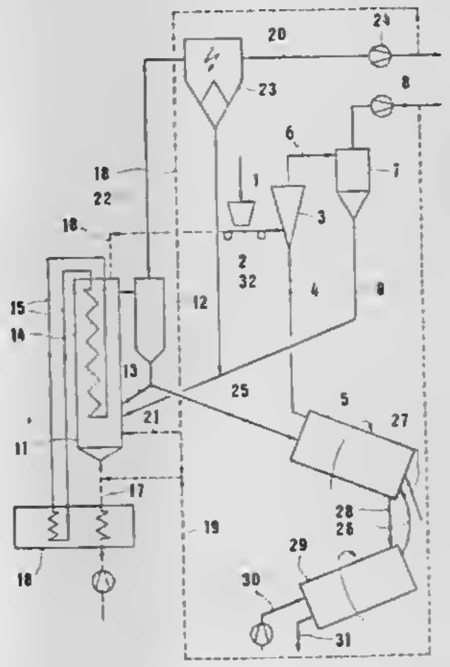
Lothar Reh, Bergen-Enkheim; Ludolf Plass, Kronberg, both of Fed. Rep. of Germany, and Philippe Marchessaux, Chemin des Trois Moulins, France, assignors to Aluminum Pechiney, Lyon, France

Filed Aug. 11, 1977, Ser. No. 823,643

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1976, 2636855

Int. Cl.² C01F *7/30*

U.S. Cl. 423—625 **9 Claims**



1. A continuous process for the thermal decomposition of aluminum chloride hydrate into solid aluminum oxide and gaseous hydrogen chloride comprising

(1) introducing the aluminum chloride hydrate into a thermal reaction zone,

(2) introducing a fluidizing gas into the reaction zone to maintain the aluminum chloride hydrate in a fluidized state within said reaction zone,

(3) indirectly heating the aluminum chloride hydrate while

in the fluidized state in said thermal reaction zone until a predominant portion of the thermal composition of the aluminum chloride hydrate has taken place in the reaction zone,

(4) separating the effluent from the thermal reaction zone into a gaseous phase containing hydrogen chloride and a solid phase of partially decomposed aluminum chloride hydrate,

(5) passing the separated solid phase of partially decomposed aluminum chloride hydrate to a rotary calcination zone,

(6) directly heating the partially decomposed aluminum chloride hydrate in the calcination zone to calcining temperature substantially to complete the thermal decomposition of the aluminum chloride hydrate to hydrogen chloride and solid aluminum oxide.

(7) cooling the solid aluminum oxide from the calcining zone, and

(8) processing the gaseous phase from step 4 for removal of entrained solids.

4,107,282

ACETYLIDE CATALYST AND PROCESS OF PRODUCING HYDROGEN

Van Michaels Christopher, 1817½ N. Las Palmas Ave., Hollywood, Calif. 90028

Continuation-in-part of Ser. No. 445,792, Feb. 25, 1974, abandoned, and Ser. No. 552,802, Feb. 24, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,110

Int. Cl.² B01J *37/28;* **C01B** *1/08*

U.S. Cl. 423—657 **4 Claims**

1. A species of hydrogenating fuel alloys evolving liquid and gaseous hydrocarbons when submitted to recycling hydrolysis and acidolysis which can be done both at room temperature and atmospheric pressure and at high pressure controlled in the range of 250 to 400 atmospheres to profit the fuel alloys' hydrogenating property said alloys being based on alloying hydrocarbonides with hydrides cobalt, nickel, chromium oxide and molybdenum oxide as catalysts and with powdered carbon comprising the following steps:

(a) incomplete burning of carbonaceous materials to produce carbon monoxide, reacting said carbon monoxide with hydrogen plasma from Nascent Hydrogen in the presence of to nickel catalyst at a temperature of 250° C to 400° C to form methane then mixing said methane with vapour of alkali or alkali-earth metal and heating said mixture at a temperature of 900° C to 1200° C in the presence of halogen catalyst salt to partially pyrolyse the methane thereby producing acetylene containing unreacted methane, hydrogen and CO, rapidly cooling said mixture to 550° C to 600° C to prevent partial thermal decomposion of said acetylene, then contacting the so cooled gaseous mixture with liquid alkali or fluidised alkali-earth metal at a temperature of 450° C to 600° C to produce an alkali or alkali-earth metal acetylide, naturally alloyed with small amounts of same metal's hydrides, then cooling said acetylide to about 350° C to 400° C, mixing them with additional liquid alkali metal, nascent hydrogen with the above defined hydrogenating catalyst and with powdered carbon to produce an acetylide-hydride-catalystcarbon fuel alloy evolving methane and other hydrcarbons but no acetylene when submitted to hydrolysis or acidolysis during which hydrolysis the liberated nascent hydrogen helped by the catalyst attacks the liberated acetylene and hydrogenate it immediatly to methane and other hydrocarbons, said nascent hydrogen hydrogenating predominantly the carbon constituent of the fuel alloy and producing predominantly liquid hydrocarbons when the acidolysis is conducted at the above stated high self-pressures high temperature where the catalyst is chromium oxide, molybdenum oxide or a mixture of both alloyed together with the other constituent of the recyclable alloy;

(b) incomplete burning of carbonaceous materials to produce carbon monoxide then passing said carbon monoxide through the bottom of a fluidising bed containing powdered mixture of carbon, iron, halides, oxides and hydroxides, manganese halides oxides and hydroxides to react with them under their melting points at 600° C to 1,000° C in the presence of CO_2 and hydrogen to lower the partial pressure of CO thus to evaporate the halides, self catalysts and thus to produce a powdered iron hydrocarbonide - manganese hydrocarbonide M_3C - carbon fuel alloy dopped with chromium and molybdenum oxides as hydrogenating catalysts which alloy is then passed into an oil quenching bed to rapidly quench the fuel alloy down to 55° C or lower which converts the different iron hydrocarbonide constituents to cementite hydrocarbonide Fe_3C permitting better yield of liquid hydrocarbons which hydrocarbons are liberated: during a recycling the feed stock cold hydrolysis when the manganese hydrocarbonide Mn_3C is more then 85%; during boiling hydrolysis when the Mn_3C is from 60 to 80%; during boiling acidolysis when the Mn_3C is below 60% said liquid hydrocarbons being evolved in significantly increasing yield when the fuel alloy is submitted to the above stated high self pressure and high temperature hydrogenating acid hydrolysis which yield is again increased when to the fuel alloy is added 5% to 10% uranium sesquicarbide U_2C_3 which must be produced separately from powdered mixture of uranium hydroxide, oxides, halides and excess carbon of up to 70% and more by atoms again with carbon monoxide in the presence of CO_2 and hydrogen heated at 1000° C to 1500° C where the excess carbon and the above specific temperature range serve to suppress the formation of other uranium carbides which differ from U_2C_3 are refractive and not evolving hydrocarbons; and

(c) a final mixing of alloys (a) with alloys (b) for further better yield and doping the mixture with neutral surfactant or other neutral substance to prevent the alloy from oxidation with moist air during storage.

2. The process of manufacturing nascent hydrogen H+ concurrently with oxygen of claim **1** from water without burden products or reducing substances not possible with any existing process said manufacturing employing my original process of manganese low temperature thermal splitting of the water possible only through the use of manganese oxides based specifically on the unique property of the manganese dioxide MnO_2 for pyrolytic self reduction to Mn_20_3 at over 530° C and to Mn_30_4 at over 940° C combined with the reverse property of the obtained Mn_20_3 for back self oxidation to MnO_2 below 530° C in the presence of air or steam comprising the steps:

(a) introducing into a reactor powdered MnO_2 feed stock then submitting it to thermal self reduction through pyrolysis only at over 530° C and pressure of 1 to 100 atmospheres liberating an abundance of O_2 avoiding all the while any burden products catalysts or reducing substances, a must for the classic process producing H_2, my process following the technique:

$$MnO_2 \xrightarrow[\text{1 to 100 atm}]{t^\circ > 530^\circ\text{ C}} Mn_2O_3 + \frac{1}{2}O_2,$$

(b) evacuation of the obtained oxygen and fluidizing the obtained Mn_20_3 with hot steam which reduces the steam to nascent hydrogen ions H+ conducted in the abscence of air at 1 to 100 atmospheres of pressure and temperature below 530° C but not below 100° C which splits the H_2O into 2H+ and O− oxidising the Mn_2O_3 back to MnO_2 ready to be used for a new pyrolysis cycle again without burden products or reducing substances as follows:

$$Mn_2O_3 + H_2O(\text{steam}) \xrightarrow[\text{1 to 100 atm}]{530^\circ\text{ C} > t^\circ > 100^\circ\text{ C}} 2MnO_2 + 2H+ \text{ , and}$$

(c) continuous alternation of step (a) with step (b) during which the obtained H+ and O, are used immediately for the purpose of claim **1** in order to prevent the recombination of the H+ into molecular H_2 combined with using the hydrogen in its molecular state for other purposes.

4,107,283

TRACER FOR CIRCULATION DETERMINATIONS

Frederick P. Pratt, East Somerville, and David L. Gagnon, North Billerica, both of Mass., assignors to New England Nuclear Corporation, Boston, Mass.

Filed Jul. 19, 1976, Ser. No. 706,434

Int. Cl.² A61K *29/00, 43/00*

U.S. Cl. 424—1 **40 Claims**

38. An injectable preparation for use in making circulatory system measurements comprising cores of ion exchange resin having a polymeric coating in a physiologically acceptable liquid carrier, said ion exchange resin being selected from the group consisting of a cationic exchange resin having both radioactive cations and H+ ions and an anionic exchange resin having both radioactive anions and OH^- anions, and said polymeric coating comprising a polymer selected from the group consisting of a polymer, the polymerization of which is catalyzed by H+ cations, and a polymer the polymerization of which is catalyzed by OH^- anions.

4,107,284

RADIOIMMUNOASSAY PROCEDURE USING A STABILIZED COMPLEX

Ishkhan V. Sultanian, 2729 Sandpiper Ave., Costa Mesa, Calif. 92626, and Joseph H. Irani, 3207 Broad St., Newport Beach, Calif. 92663

Filed Oct. 28, 1975, Ser. No. 626,228

Int. Cl.² A61K *43/00;* **G01N** *33/00*

U.S. Cl. 424—1 **10 Claims**

1. A stabilized radioactive isotope labelled antigen-antibody complex for use in radioimmunoassay procedures comprising:

a mixture of a labelled antigen and an antibody specific to said antigen,

said antigen being selected from the group consisting of triiodothyronine, thyroxine, thyroxine binding globulin, cortisol, estradiol, gentamicin and estrone, and

a plurality of stabilizers present in said mixture in an amount effective to inhibit the labelled antigen from associating with protein other than said specific antibody.

6. A radioimmunoassay procedure for quantitatively determining the concentration of an antigen comprising the steps of:

providing a stabilized radioactive isotope labelled antigen-antibody complex including a plurality of stabilizers present in an amount sufficient to provide a shelf life for said complex of between four to six weeks;

admixing the antigen to be determined with said complex whereby a portion of the antigen to be determined becomes bound to the antibody of said complex, separating the complex and the antigen bound thereto from the unbound antigen,

said antigen being selected from the group consisting of triiodothyronine, thyroxine, thyroxine binding globulin, cortisol, estradiol, gentamicin and estrone, and

measuring the radioactivity at least of one of the bound or unbound antigen whereby the value of said radioactivity is a function of the quantity of the antigen to be determined.

4,107,285

RADIOIMMUNOASSAY FOR METHAQUALONE

James Gordon Christenson, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 616,451, Sep. 24, 1975, Pat. No. 4,053,459. This application Jul. 5, 1977, Ser. No. 813,206

Int. Cl.² G01N *33/16;* **C07D** *239/00*

U.S. Cl. 424—1 **4 Claims**

1. A method for the assay of methaqualone and its metabolites in a sample, which method comprises mixing said sample with a known amount of a labeled methaqualone derivative and an antibody which will selectively complex with said methaqualone and its metabolites, and with said labeled methaqualone derivative, measuring the degree of binding of said labeled methaqualone derivative with said antibody, and determining the amount of methaqualone and its metabolites present in such sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of methaqualone and/or its metabolites with fixed amounts of said labeled methaqualone derivative.

4,107,286

POLYIODS BENZENE DERIVATIVES AND X-RAY CONTRAST MEDIA CONTAINING THE SAME

Guy Tilly; Michel Jean-Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Guerbet S.A., Aulnay-sous-Bois, France

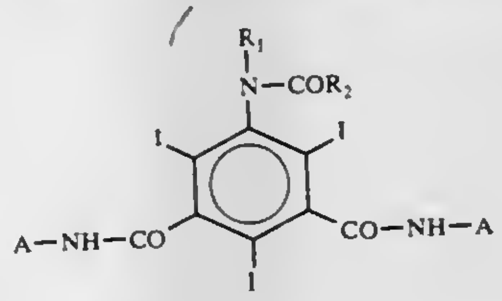
Filed Mar. 29, 1977, Ser. No. 782,413

Claims priority, application United Kingdom, Apr. 8, 1976, 14343/76

Int. Cl.² A61K *29/02;* **C07C** *101/42*

U.S. Cl. 424—5 **8 Claims**

1. A compound selected from a compound of the formula:



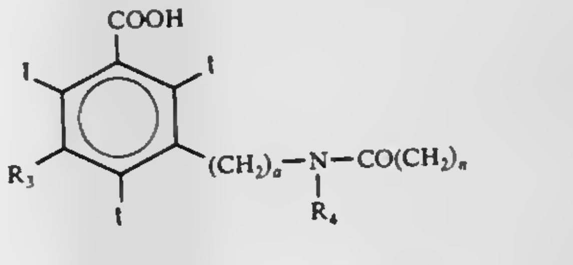
(I)

in which:

R_1 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

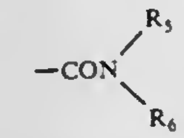
R_2 is selected from C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

A represents a group of the formula:

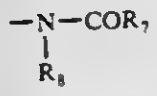


in which:

R_3 is selected from: hydrogen; a group of the formula



in which R_5 and R_6 are independently selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl; and a group of the formula



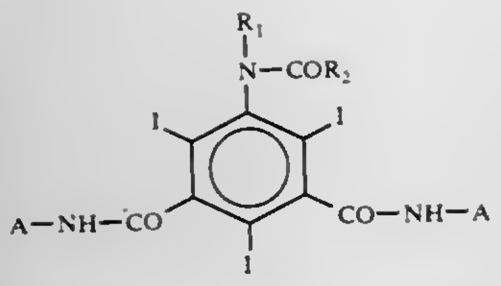
$$-\underset{\displaystyle R_8}{\underset{|}{N}}-COR_7$$

in which R_7 is selected from C_{1-4} alkyl and C_{1-4} hydroxyalkyl and R_8 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

a is an integer from 0 to 1 and *n* is an integer from 1 to 5,

R_4 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl, its methyl and ethyl esters and its salt with a pharmaceutically acceptable base.

4. X-ray contrast medium, comprising an effective amount of a compound selected from a compound of the formula:

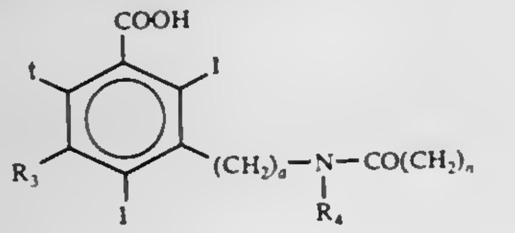


in which:

R_1 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

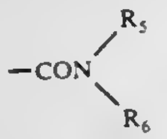
R_2 is selected from C_{1-4} alkyl and C_{1-4} hydroxyalkyl,

A represents a group of the formula:

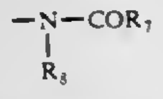


in which:

R_3 is selected from: hydrogen; a group of the formula



in which R_5 and R_6 are independently selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl; and a group of the formula



$$-\underset{\displaystyle R_8}{\underset{|}{N}}-COR_7$$

in which R_7 is selected from C_{1-4} alkyl, and C_{1-4} hydroxyalkyl and R_8 is selected from hydrogen, C_{1-4} and C_{1-4} hydroxyalkyl,

a is an integer from 0 to 1 and *n* is an integer from 1 to 5,

R_4 is selected from hydrogen, C_{1-4} alkyl and C_{1-4} hydroxyalkyl, its methyl and ethyl esters and its salt with a pharmaceutically acceptable base, in a pharmaceutically acceptable carrier.

4,107,287

GC ANTIGEN-SPECIFIC IMMUNOCHEMICAL INDICATOR REAGENT AND METHOD FOR PREPARING SAME

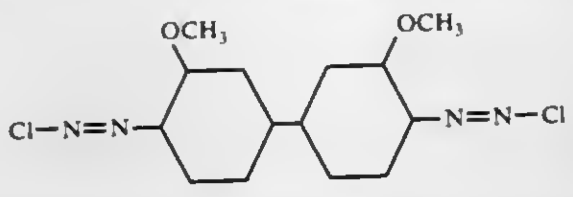
Harry E. Morton, Drexel Hill, and Gow T. Lam, Philadelphia, both of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Apr. 12, 1976, Ser. No. 675,879

Int. Cl.² G01N *31/00, 31/02, 31/22, 33/16*

U.S. Cl. 424—8 **9 Claims**

1. An immunochemical indicator reagent capable of indicating the presence of specific antigenic or haptenic material by hemagglutination reaction therewith, comprising a first moiety consisting of fixed enzyme-treated erythrocyte carrier particles whose surfaces are provided with exposed active hydrogen-containing groups including free amino groups, and a second moiety consisting of antibody globulin molecules having specific reactivity toward said specific antigenic or haptenic material and also having exposed active hydrogen-containing groups including free amino groups, said first and second moieties being chemically coupled together through a bifunctional chlorine-terminated coupling agent selected from the group consisting of diazo blue B having the formula (I)



and diazo blue B-terminated condensation products of diazo blue B with glycine, each of said first and second moieties being covalently bound to opposite ends of said coupling agent predominantly through chemical linkages formed by reaction between the respective chlorine-terminated ends of said coupling agent and the free amino groups of the respective moieties.

2. The immunochemical indicator reagent of claim **1**, wherein said first moiety consists of glutaraldehyde-fixed trypsinized erythrocyte carrier particles.

4,107,288

INJECTABLE COMPOSITIONS, NANOPARTICLES USEFUL THEREIN, AND PROCESS OF MANUFACTURING SAME

Richard Charles Oppenheim, Parkville; Jeonifer Joy Marty, East Kew, both of Australia, and Peter Speiser, Zurich, Switzerland, assignors to Pharmaceutical Society of Victoria, Parkville, Australia

Filed Sep. 9, 1975, Ser. No. 611,835

Claims priority, application Australia, Sep. 18, 1974, 8951/74

Int. Cl.² A61K *9/66, 9/64*

U.S. Cl. 424—22 **18 Claims**

1. A process of manufacturing particles in the size range from about 10 to about 1000 nanometres which particles comprise a crosslinked matrix of macromolecules of natural origin, which method consists essentially of:

(a) solvating the macromolecules to form a thermally equilibrated clear solution;

(b) treating said solution with a desolvating agent until the macromolecules have reached the desolvation region which is the region at which the intensity of scattered light is markedly increased, but before the point at which the solution becomes turbid; and,

(c) adding an aldehyde hardening agent to the mixture.

9. Particles in the size range from about 10 to about 1000 nanometres which particles comprise a crosslinked matrix of macromolecules of natural origin, said particles having been formed by the process of claim **1**.

4,107,289

USE OF SUBSTITUTED PYRANS AS DEODORANT CHEMICALS

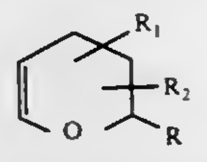
Jerome G. Kaufman, East Norwich, N.Y., assignor to Naarden International Holland, B.V., Naarden-Bussum, Netherlands

Continuation-in-part of Ser. No. 602,958, Aug. 7, 1975, abandoned. This application Jul. 29, 1976, Ser. No. 709,668

Int. Cl.² A61L *9/04*

U.S. Cl. 424—45 **17 Claims**

1. A process for the chemical destruction of malodors imparted by compounds, by the formation of addition products across the double bond in a substituted pyran compound having the general formula:



wherein R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl and cycloalkyl and R represents an organic radical, which comprises;

providing said pyran compound in admixture with a carrier substrate; and

forming said addition products.

4,107,290

ANTI-SOLAR POLYMERS, METHOD OF MAKING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME

Bernard Jacquet, Antony; Christos Papantoniou, Epinay-sur-Seine; Pierre Dufaure, and Claude Mahieu, both of Paris, all of France, assignors to L'Oreal, Paris, France

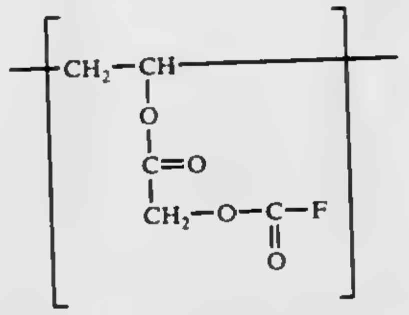
Continuation-in-part of Ser. No. 374,059, Jun. 27, 1973, Pat. No. 3,992,356. This application Aug. 18, 1976, Ser. No. 715,566

Claims priority, Application France Jul. 29, 1976 7623175, application Luxembourg, Jun. 29, 1972 65622

Int. Cl.² A61K *7/42, 7/44*

U.S. Cl. 424—47 **11 Claims**

1. An anti-solar cosmetic composition comprising an aqueous, hydroalcoholic or oily solution containing an amount to assure protection against wave lengths of light in the erythematous zone of at least one anti-solar polymer containing in the macromolecular chain thereof at least one unit having the formula



wherein F is a residue derived from an aromatic compound which imparts to the said polymer the ability to absorb wave lengths of light in the range of about 280–315 millimicrons and at least one unit derived from an ethylenically unsaturated monomer present in an amount of about 20–90 percent of the total weight of the polymer.

4,107,291

COMPOSITIONS FOR CLEANING TEETH AND ORAL CAVITY

Keijiro Ishibashi, Tokyo, Japan, assignor to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 43,224, Jun. 3, 1970, abandoned. This application Mar. 23, 1972, Ser. No. 237,577

Claims priority, application Japan, Jun. 5, 1969, 44-44210

Int. Cl.² A61K *7/28, 9/68*

U.S. Cl. 424—48 **24 Claims**

1. A method for cleaning teeth and oral cavity which comprises applying a sufficient amount of invertase to exert said cleaning effect to teeth and oral cavity.

4,107,292

STABLE WATER DISPERSIONS OF ENCAPSULATED PARATHION

Harold C. Nemeth, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 457,152, Apr. 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 230,935, Mar. 1, 1972, abandoned. This application Feb. 16, 1977, Ser. No. 769,362

Int. Cl.² A01N *9/36*

U.S. Cl. 424—78 **8 Claims**

1. An insecticidal composition consisting essentially of an aqueous dispersion of:

(a) from about 1% to about 40% by weight of said composition of capsules of a member of the group consisting of a phosphoromonothioate and a phosphorodithioate insecticide encapsulated in a skin selected from the group consisting of a polyamide, a polyurea, and a mixed polyamide-polyurea cross-linked with a cross-linking agent selected from the group consisting of a polyalkylene polyamine and a polyfunctional isocyanate;

(b) from about 0.1% to about 0.5% by weight of said composition of a xanthan gum dispersant for said capsules; and

(c) balance water.

4,107,293

ATTRACTANT FOR DARKSIDED CUTWORM MOTH

G. Edward Swailes, and Dean L. Struble, both of Lethbridge, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 25, 1977, Ser. No. 781,507

Int. Cl.² A01N *17/14*

U.S. Cl. 424—84 **7 Claims**

1. An attractant mixture for male moths of the darksided cutworm *Euxoa messoria* (Harris) comprising

(1) Z-11-hexadecen-1-yl acetate, and

(2) Z-7 compound selected from Z-7-hexadecen-1-yl acetate and Z-7, Z-11-hexadecadien-1-yl acetate and mixtures thereof,

in ratios of (1)/(2) within about 4:1 to about 40:1, and

(3) 0 to about 20% by wt. of the total mixture of at least one of the E-isomers E-11-hexadecen-1-yl acetate and E-7-hexadecen-1-yl acetate.

4,107,294

INSECTICIDAL COMPOSITION OF *BACILLUS THURINGIENSIS* ADMIXED WITH 1-(4-CHLOROPHENYL)-3-(2,6-DIFLUOROBENZOYL)-UREA

Abdul Rehman Chauthani, Riverside, Calif., assignor to Nutrilite Products, Inc., Buena Park, Calif.

Filed Jun. 27, 1977, Ser. No. 810,566

Int. Cl.² A01N *9/02, 9/20, 15/00*

U.S. Cl. 424—93 **7 Claims**

1. An insecticidal composition comprising an admixture of from about 70 to 30 weight percent by weight of total active materials of *Bacillus thuringiensis*, insecticidal material and concomitantly from about 70 to 30 weight percent of total active materials of 1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl)-urea.

4,107,295

ANTIBIOTIC RUBRADIRIN B AND PROCESS FOR PREPARING THE SAME

Herman Hoeksema, Kalamazoo; Fritz Reusser, Portage, and Donald R. Wait, Paw Paw, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 783,817, Apr. 1, 1977, abandoned. This application Apr. 15, 1977, Ser. No. 787,833

Int. Cl.² A61K *35/00;* **G07F** *11/00*

U.S. Cl. 424—120 **7 Claims**

1. Essentially pure rubradirin B, a compound which

(a) is effective in inhibiting the growth of various bacteria;

(b) is soluble in dimethylformamide, dimethylsulfoxide and aqueous base, and is insoluble in aqueous acid and hydrocarbon solvents;

(c) has the following elemental analysis: C, 59.25; H, 4.38; N, 5.17;

(d) has a molecular weight of 795 (determined by field desorption mass spectroscopy);

(e) has a characteristic infrared absorption spectrum as shown in FIG. **1** of the accompanying drawings;

(f) has a characteristic ultraviolet absorption spectrum as shown in FIG. 2 of the accompanying drawings;

(g) has a melting point > 265° Dec.; and,

(h) has a molecular formula $C_{40}H_{33}N_3O_{15}$.

4. A process for recovering rubradirin B from a fermentation using *Streptomyces ochromogenes* var. *rubradiris*, NRRL 3061, which comprises:

(a) filtering said fermentation beer to obtain a filtrate containing rubradirin B;
(b) adjusting the pH of the filtrate to about 4.0 to form a precipitate containing rubradirin B;
(c) removing said precipitate by filtration and eluting the filter cake which forms with a solvent for rubradirin B to give eluates containing rubradirin B;
(d) concentrating said eluates to a residue;
(e) leaching said residue with a solvent for rubradirin B and concentrating the solvent;
(f) diluting said solvent concentrate with a solvent in which rubradirin B is not soluble to form a precipitate containing rubradirin B;
(g) isolating and drying said precipitate containing rubradirin B to a solid; and,
(h) subjecting said solid containing rubradirin B to silica gel chromatography and isolating essentially pure rubradirin B.

4,107,296
ANTIBIOTIC RUBRADIRIN C

Herman Hoeksema, Kalamazoo, and Fritz Reusser, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 29, 1977, Ser. No. 810,955
Int. Cl.^{2} A61K ***35/00***
U.S. Cl. 424—121 **4 Claims**

1. Essentially pure rubradirin C, a compound which
(a) is effective in inhibiting the growth of *Streptococcus pyogenes* and *Bacillus cereus;*
(b) is soluble in dimethylformamide, dimethylsulfoxide and aqueous base, and is insoluble in aqueous acid and hydrocarbon solvents;
(c) has the following elemental analysis: C, 60.77; H, 4.45; N, 5.10;
(d) has a molecular weight of 779 (determined by field desorption mass spectroscopy);
(e) has a characteristic infrared absorption spectrum as shown in FIG. 1 of the accompanying drawings;
(f) has a characteristic ultraviolet absorption spectrum as shown in FIG. 2 of the accompanying drawings;
(g) has a melting point >300° Dec.; and,
(h) has a molecular formula $C_{40}H_{33}N_3O_{14}$.

4,107,297
ANTIBIOTIC COMPOUND

Satoshi Omura, Tokyo; Yuzuru Iwai, Narita, and Atsushi Hirano, Hasuda, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,379
Claims priority, application Japan, Dec. 11, 1976, 51-148299
Int. Cl.^{2} A61K ***35/00***
U.S. Cl. 424—122 **5 Claims**

1. An antibiotic having the following characteristics
(1) Elementary analysis:
Found: C, 70.03%; H, 6.03%; N, 11.21%;
(2) Molecular weight:
m/e determined by mass spectrum, 466;
(3) Molecular formula: $C_{28}H_{26}N_4O_3$;
(4) Specific rotation: $[\alpha]_D^{25} = +35.0$ (C = 1.0 in methanol);
(5) Melting point: No clear melting point is shown; The compound turns brown at 208° C and assumes a tarry state at 260° C;
(6) Ultraviolet absorption spectrum (FIG. 1):
$\lambda_{max}^{MeOH_{nm}}$ ($E_{1cm}^{1\%}$): 243 (537), 267 (sh. 552), 292 (1228), 322 (sh. 537), 335 (313), 356 (220) 372 (254);
These peaks are not shifted in alkaline and acidic conditions;
(7) Infrared absorption spectrum (FIG. 2): By KBr method, there are absorptions observed at 3450 cm^{-1} due to the presence of amine and hydroxy groups, at 2960 cm^{-1} due to the presence of methyl and methylene groups, at 1675 cm^{-1} due to the presence of carbonyl and double bond groups, at 1588 cm^{-1}, 1460 cm^{-1}, 1356 cm^{-1}, 1322 cm^{-1}, 1285 cm^{-1}, 1230 cm^{-1}, 1123 cm^{-1} and 752 cm^{-1};
(8) Color reaction: Positive in Dragendorff reaction, Molisch reaction, Rydon-Smith reaction and ninhydrin reagent. Negative in Beilstein reaction, ferric chloride reagent and aniline phthalate reagent;
(9) Solubility in various solvents: soluble in dimethyl sulfoxide and dimethyl formamide; sparingly soluble in chloroform, ethyl acetate, n-butyl acetate and methanol; insoluble in petroleum ether, n-hexane and water;
(10) R_f values by chromatography: Thin layer chromatography using silica gel (Kieselgel G, 0.3 mm, commercially available from Merck Inc., U.S.A.) carried out in conventional manner gave the following R_f values:

Chloroform - methanol (10:1 V/V)	0.55
Benzene - acetone (1:2 V/V)	0.43
n-Butanol - acetic acid - water (8:1:0.5 V/V)	0.24

4,107,298
ANTIGENICALLY ACTIVE POLYPEPTIDE AND A PROCESS FOR ITS PREPARATION

Björn Erik Gustav Bertilsson Lüning, Stockholm, Sweden, assignor to AB Bonnierforetagen, Stockholm, Sweden

Filed Apr. 21, 1977, Ser. No. 789,665
Claims priority, application Sweden, Apr. 29, 1976, 7604972
Int. Cl.^{2} A61K ***37/00;*** **C07C** ***103/52***
U.S. Cl. 424—177 **12 Claims**

1. Synthetic antigenically active polypeptide, characterized by containing an immunologically inert portion and as an active immunological determinant group the amino acid sequence: A_{-3}-A_{-2}-A_{-1}-A_0-A_1-A_2-A_3, wherein A_0 is an arginine residue, A_1, A_2, A_{-1} and A_{-2} are same or different and selected from residues of: glycine, alanine, valine, leucine, lysine, and isoleucine and A_3 and A_{-3} are same or different and selected from glutamic acid and aspartic acid.

10. Synthetic antigenically active polypeptide, characterized by containing an immunologically inert portion and as an active immunological determinant group the amino acid sequence: Ala Leu Leu Asn Asp Glu Leu Ala Gln Tyr Leu Asp Leu Val Arg Ala Leu Glu Ala Ala Asn Gly Glu Leu Glu Val.

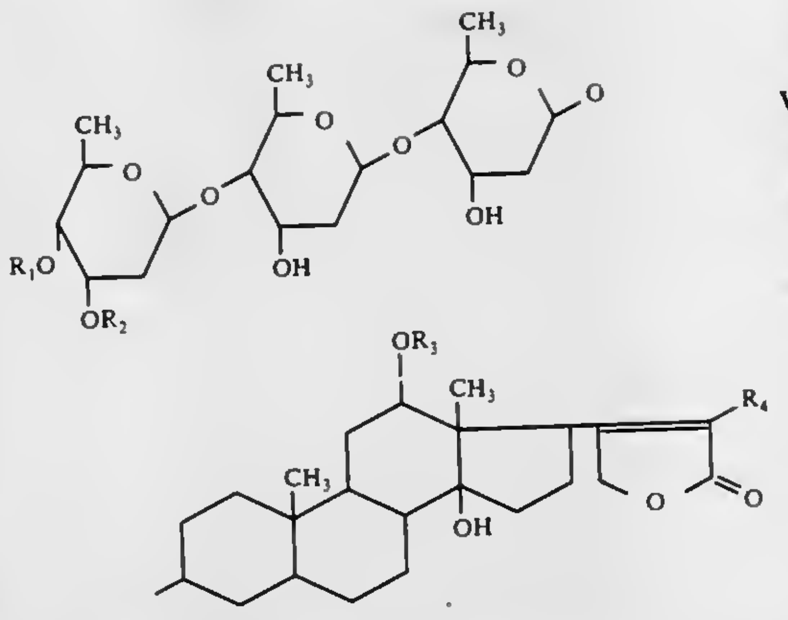
12. Synthetic antigenically active polypeptide, characterized by containing an immunologically inert portion and as an active immunological determinant group the amino acid sequence: Leu Asn Asp A_{-9} Leu Ala A_{-6} Tyr Leu Asp A_{-2} Val Arg Ala Leu Glu Ala Ala Asn Gly A_8 Leu Glu Val, wherein A_{-9} and A_8 are same or different and selected from residues of glutamic acid and arginine; A_{-6} is selected from residues of glutamine and lysine; and A_{-2} is selected from residues of leucine and lysine.

4,107,299
CARDIOACTIVE 12-EPI-DIGOXIN AND DERIVATIVES THEREOF

Fritz Kaiser, Lampertheim; Wolfgang Schaumann, Heidelberg, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; by Werner Plattner, administrator, Linz, Austria, and Wolfgang Voightlander, Viernheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Nov. 4, 1976, Ser. No. 738,808
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550354
Int. Cl.^{2} A61K ***31/705;*** **C07J** ***19/00***
U.S. Cl. 424—182 **9 Claims**

1. A 12-epi-digoxin of the formula



wherein
R_1 and R_2 each independently is hydrogen, an acyl radical or a lower alkyl radical,
R_3 is hydrogen or an acyl radical, and
R_4 is hydrogen or an aliphatic hydrocarbon radical containing up to 4 carbon atoms.

8. A method of treating cardiac insufficiency in a patient which comprises administering to said patient a cardioactive effective amount of a compound according to claim 1.

4,107,300
STABLE SOLID AGRICULTURAL CHEMICAL COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Toshiie Nakamura, Kusatsu; Hiromichi Shimizu; Kyuichi Tanaka, both of Shiga; Akihiko Kunitomo, and Kinji Tanizawa, both of Moriyama, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Sep. 23, 1974, Ser. No. 508,354
Claims priority, application Japan, Sep. 28, 1973, 48-109024
Int. Cl.^{2} A01N ***9/36***
U.S. Cl. 424—200 **4 Claims**

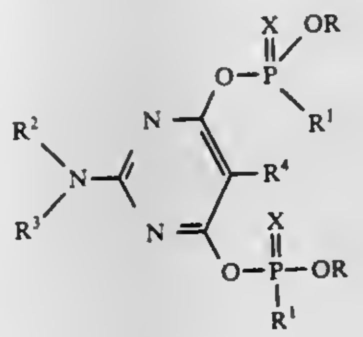
1. A stable solid agricultural chemical composition comprising an unstable agricultural chemical active ingredient is an agriculturally effective amount selected from the group consisting of 3,3'-ethylenebis (tetrahydro-4,6-dimethyl-2H-1,3,5-thiadiazine-2-thione), zinc ethylenebisdithiocarbamate, manganese ethylenebisdithiocarbamate, methyl 1-(butylcarbamoyl)-2-benzimidazole carbamate, O,O-dimethyl-S-(N-methyl-N-formyl-carbamoylmethyl) phosphorodithioate, O,O-dimethyl-S-2-(ethylthio)ethyl phosphorodithioate, O,O-dimethyl O-(5-phenyl-3-isoxazolyl)phosphorothioate, 2-(p-tert-butylphenoxy)-isopropyl-2'-chloroethyl sulfite, 2-(p-tert-butylphenoxy)-1-ethyl-O-tolyl sulfite and cycloheximide, and a stabilizer selected from the group consisting of anhydrous calcium chloride, calcium chloride monohydrate, calcium chloride dihydrate and mixtures thereof, said stabilizer being present in an amount effective to stabilize the composition against deterioration due to elevated temperature and high humidity conditions.

4,107,301
O,O'-DIALKYL-O,O'-[2-AMINOPYRIMIDIN(4,6)DIYL]-BIS-[(THIONO)(THIOL)PHOSPHORIC(PHOSPHONIC) ACID ESTERS]

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 25, 1977, Ser. No. 790,351
Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620089
Int. Cl.^{2} A61K ***31/665;*** **C07D** ***139/50***
U.S. Cl. 424—200 **10 Claims**

1. An O,O'-dialkyl-O,O'-2-aminopyrimidin(4,6)-diyl-bis-(thiono/(thiol) phosphoric (phosphonic acid) ester of the formula



in which
R is alkyl with 1 to 5 carbon atoms,
R_1 is alkyl, alkoxy, or alkyl thio with 1 to 4 carbon atoms,
R^2 and R^3 each independently is alkyl with 1 to 3 carbon atoms or conjointly are an alkylene group with 3 to 5 carbon atoms which can be interrupted by an oxygen atom, R^4 is hydrogen, alkyl with 1 to 3 carbon atoms or halogen, and X is oxygen or sulphur.

4,107,302
NOVEL AQUEOUS INSECTICIDAL CONCENTRATE COMPOSITION

Hiroshi Watanabe, Takasago, Japan, assignor to Osaka Kasei Company Limited, Osaka and Nippon Kayaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Nov. 16, 1976, Ser. No. 742,100
Int. Cl.^{2} A01N ***9/36***
U.S. Cl. 424—200 **6 Claims**

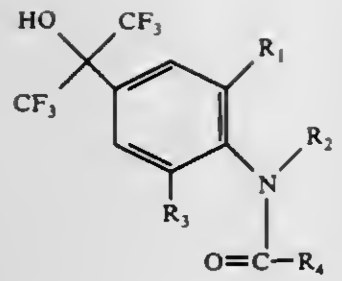
1. An aqueous insecticidal concentrate composition comprising:
2–50% by weight O,O-diethyl-O-(2-isopropyl-4-methyl-pyrimidyl (6)) thiophosphate;
2–30% by weight of a surface active agent in an amount sufficient to render said O,O-diethyl-O-(2-isopropyl-4-methylpyrimidyl (6)) thiophosphate soluble in water; and
an aqueous buffer solution providing said composition with a pH ranging from 6.5 to 8.5;
said concentrate containing at least 20% by weight water.

4,107,303
ANTIHYPERTENSIVE HEXAFLUOROHYDROXYISOPROPYL BENZAZEPINES AND BENZAZOCINES

Paul Edward Aldrich, Wilmington, Del., and Gilbert Harvey Berezin, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1976, Ser. No. 699,589
Int. Cl.^{2} A61K ***31/55;*** **C07D** ***223/16***
U.S. Cl. 424—244 **21 Claims**

1. A compound of the formula



where

R_1 and R_2 taken together = — $(CH_2)_4$ — or — $(CH_2)_5$ —

where

R = methyl or ethyl;

R_3 = H, methyl, or ethyl; and

R_4 = C_1-C_5 carbons which are saturated and straight-chained, branched-chained, or alicyclic.

15. A method of treating hypertension in a mammal which comprises administering to the mammal an effective antihypertensive amount of a compound of claim **1**.

4,107,304

OXO-IMIDAZOLIDINE SUBSTITUTED CEPHALOSPORINS AND ANTIBACTERIAL COMPOSITIONS AND METHODS OF COMBATTING BACTERIA EMPLOYING THEM

Wilfried Schröck; Hans-Bodo Konig; Michael Preiss; Karl Georg Metzger, all of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

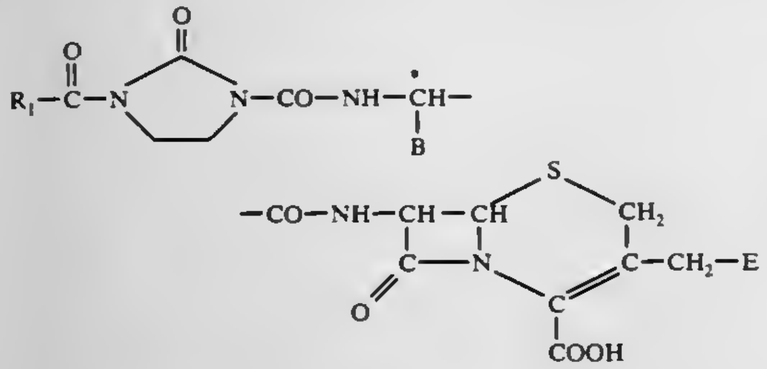
Continuation-in-part of Ser. No. 548,347, Feb. 10, 1975, abandoned. This application Jun. 27, 1975, Ser. No. 590,794

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1974, 2407715

Int. Cl.^{2} A61K *31/545;* **C07D** *501/34, 501/24*

U.S. Cl. 424—246 **20 Claims**

1. A compound selected from the group consisting of a cephalosporin derivative of the formula:



the nontoxic salts thereof and the hydrates thereof wherein the carbon atom designated * constitutes a center of chirality;

E is hydrogen; hydroxy or acetoxy;

B is phenyl; methylphenyl; chlorophenyl; hydroxyphenyl; or cyclohexa-1,4-dien-1-yl; and

R_1 is phenyl; naphthyl; phenyl or naphthyl substituted by one to five substituents selected from the group consisting of halo, cyano, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and alkylsulfamyl of 1 to 4 carbon atoms; thienyl; furyl; piperidyl; pyrrolidyl; NC—CH_2—; NC—CH_2-CH_2; or H_3CO—.

14. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially-effective amount of a compound of claim **1** in combination with a pharmaceutically acceptable nontoxic, inert diluent or carrier.

15. A method of treating bacterial infections in humans and animals which comprises administering to such human or animal an antibacterially-effective amount of a compound of claim **1**.

4,107,305

TREATMENT OF ENDOTOXAEMIA

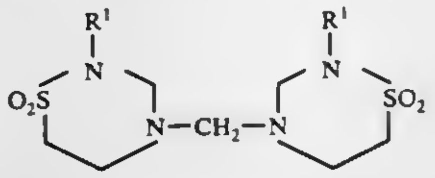
Rolf W. Pfirrmann, Lucerne, Switzerland, assignor to Ed. Geistlich Sohne A.G. fur Chemische Industrie, Lucerne, Switzerland

Filed Aug. 4, 1975, Ser. No. 601,716

Int. Cl.^{2} A61K *31/54*

U.S. Cl. 424—246 **10 Claims**

1. A method for treating a patient suffering from endotoxaemia wherein an effective amount to reduce or eliminate endotoxaemia of a compound of the formula:



I

where R^1 is hydrogen or alkyl having 1-6 carbon atoms is administered to said patient.

4,107,306

PROCESS FOR TREATING PROLIFERATIVE SKIN DISEASE

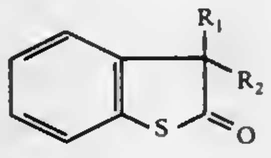
John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 643,633, Jan. 5, 1976, Pat. No. 4,034,087, which is a continuation-in-part of Ser. No. 425,065, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Jun. 21, 1977, Ser. No. 808,447

Int. Cl.^{2} A61K *31/535, 31/38*

U.S. Cl. 424—248.51 **2 Claims**

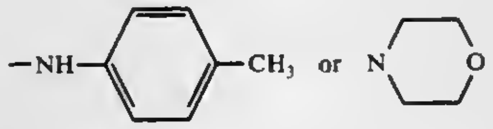
1. A process for treating proliferative skin diseases which comprises administering to the afflicted human or animal a composition containing as its active component at least one compound of the formula



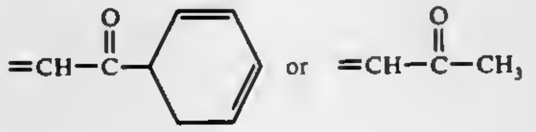
where

R_1 is hydroxy,

R_2 is



and R_1 and R_2 taken together can be



4,107,307

IMIDAZO [1,5-d]-AS-TRIAZINE-4(3H)-ONES AND THIONES

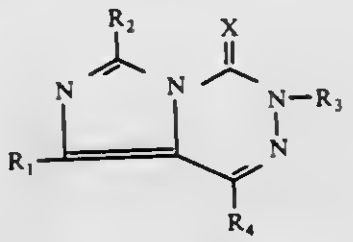
Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 765,318, Feb. 3, 1977, abandoned. This application Oct. 18, 1977, Ser. No. 843,174

Int. Cl.^{2} A61K *31/53;* **C07D** *253/08, 487/04*

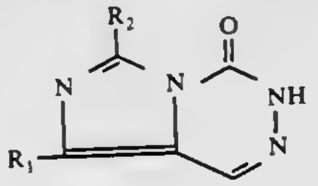
U.S. Cl. 424—249 **27 Claims**

1. A compound of the formula:

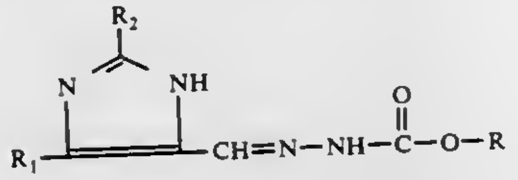


wherein X is divalent oxygen or divalent sulfur; R_1 is selected from the group consisting of hydrogen, alkyl (C_1–C_3), chloro, bromo, iodo and haloalkyl (C_1–C_3); R_2 is selected from the group consisting of hydrogen, alkyl (C_1–C_4), cycloalkyl (C_3–C_6), methoxymethyl, benzyl, naphthyl, phenyl and mono-substituted phenyl wherein said substituent is selected from the group consisting of halo, alkyl (C_1–C_4), haloalkyl (C_1–C_3) amino, dialkylamino and nitro; R_3 is selected from the group consisting of hydrogen, alkyl (C_1–C_3), alkenyl (C_3–C_4) and alkynyl (C_3–C_4); R_4 is selected from the group consisting of hydrogen and alkyl (C_1–C_3).

24. The process of preparing compounds of the formula:



wherein R_1 is hydrogen or alkyl having up to 3 carbon atoms and R_2 is hydrogen, alkyl having up to 4 carbon atoms, phenyl, benzyl, methoxymethyl or o-propoxyphenyl which comprises heating a compound of the formula:



wherein R is methyl or ethyl and R_1 and R_2 are as hereinabove defined in a non-polar high boiling organic solvent at a temperature of 175°–275° C. for a period of time sufficient for a substantial degree of ring closure to occur.

4,107,308

IMIDAZO[1,5-d]-AS-TRIAZINES

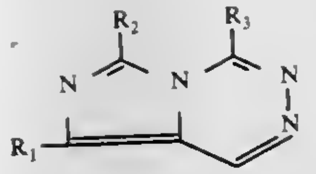
Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 18, 1977, Ser. No. 843,175

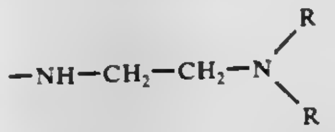
Int. Cl.^{2} C07D *253/08, 487/04;* **A61K** *31/53*

U.S. Cl. 424—249 **18 Claims**

1. A compound selected from the group consisting of those of the formula:



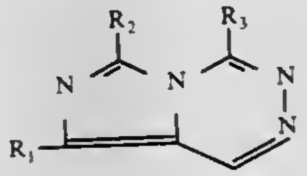
wherein R_1 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, chloro and bromo; R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, methoxymethyl and phenyl; and R_3 is selected from the group consisting of allylthio, pyrazolylamino, piperazinyl, 4-methylpiperazinyl and moieties of the formulae: —S—R, —NH—R and



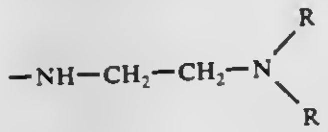
$$-NH-CH_2-CH_2-N\begin{matrix}\diagup R\\ \diagdown R\end{matrix}$$

wherein R is alkyl having up to 3 carbon atoms; and the pharmacologically acceptable acid-addition salts thereof when R_3 is a basic nitrogen containing moiety.

14. The method of lowering elevated blood pressure in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R_1 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, chloro and bromo; R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, methoxymethyl and phenyl; and R_3 is selected from the group consisting of allylthio, pyrazolylamino, piperazinyl, 4-methylpiperazinyl and moieties of the formulae: —S-R, —NH-R and



$$-NH-CH_2-CH_2-N\begin{matrix}\diagup R\\ \diagdown R\end{matrix}$$

wherein R is alkyl having up to 3 carbon atoms; and the pharmacologically acceptable acid-addition salts thereof when R_3 is a basic nitrogen containing moiety.

4,107,309

SUBSTITUTED IMIDAZO[1,2-D]-AS-TRIAZINES

Rolf Paul, River Vale, N.J., and Judith Menschik, Tappan, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 23, 1977, Ser. No. 799,821

Int. Cl.^{2} A61K *31/53;* **C07D** *471/04*

U.S. Cl. 424—249 **6 Claims**

1. 5-(Methylthio)-imidazo[1,2-d]-as-triazine.

4. The method of meliorating asthma in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of 5-(methylthio)-imidazo[1,2-d]-as-triazine, 5-(4-methyl-1-piperazinyl)-imidazo[1,2-d]-as-triazine and 5-(furfurylamino)-imidazo[1,2-d]-as-triazine.

4,107,310
QUINOLINE-3-CARBOXAMIDES

André Allais, Gagny; Francois Clémence, Rosny-sous-Bois; Roger Deraedt, Pavillons-soüs-Bois, and Odile Le Martret, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 7, 1977, Ser. No. 766,487

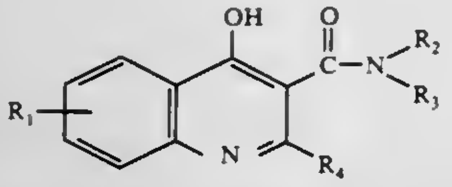
Claims priority, application France, Feb. 11, 1976, 76 03754

The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.^{2} A61K *31/47;* **C07D** *215/20*

U.S. Cl. 424—258 **25 Claims**

1. A compound selected from the group consisting of the formula



wherein R_1 is in the 5,6,7 or 8-position and is selected from the group consisting of hydrogen, halogen, $-CF_3$, $-OCF_3$, $-SCF_3$, straight chain alkyl of 1 to 4 carbon atoms, branched alkyl of 3 to 5 carbon atoms and alkoxy of 1 to 4 carbon atoms, R_2 is selected from the group consisting of hydrogen and methyl, R_3 is selected from the group consisting of 2-thiazolyl, 4,5-dihydrothiazolyl, pyridinyl, oxazolyl and 1H-imidazol-2-yl and R_4 is selected from the group consisting of hydrogen, hydroxyl, alkyl of 1 to 4 carbon atoms, phenyl and benzyl with the proviso that when R_1 is in the 7 or 8-position and is halogen, $-CF_3$, $-OCF_3$ or $-SCF_3$ and R_4 is hydrogen, R_3 is not thiazolyl, pyridinyl or oxazolyl and the non-toxic, pharmaceutically acceptable acid addition salts when R_3 is 1H-imidazol-2-yl or 4,5-dihydrothiazolyl.

22. A method of relieving pain in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound of claim 1.

4,107,311
SPIRO[ISOINDOLINE-1,3'(4'H)-ISOQUINOLINE]-1',3-DIONES

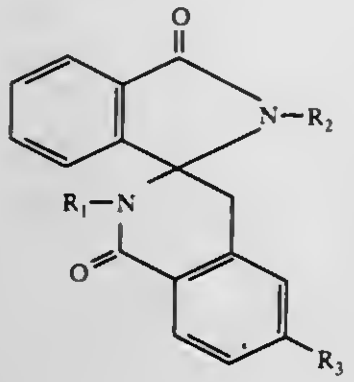
William J. Houlihan, Mt. Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Jul. 7, 1976, Ser. No. 703,253

Int. Cl.^{2} A61K *31/475;* **C07D** *471/00*

U.S. Cl. 424—258 **5 Claims**

1. A compound of the formula



wherein

R_1 and R_2 each independently represents straight chain lower alkyl having 1 to 4 carbon atoms and

R_3 represents hydrogen, fluoro or chloro, lower alkyl having 1 to 4 carbon atoms or lower alkoxy having 1 to 4 carbon atoms.

4. An abortifacient pharmaceutical composition comprising a compound according to claim 1 and a pharmaceutically acceptable carrier therefor.

4,107,312
DISINFECTANT FOR USE IN CLOSED-CIRCUIT TOILET FLUSHING FLUIDS

Jurgen Wegner, Düsseldorf; Klaus Bansemir, Langenfeld, and Othmar V. Ettingshausen, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 14, 1976, Ser. No. 695,456

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1975, 2526964

Int. Cl.^{2} A01N *9/02, 9/20, 9/22, 9/24*

U.S. Cl. 424—263 **5 Claims**

1. A solution suitable for disinfecting the circulating fluid in a closed-circuit toilet system consisting essentially of:

Component	Weight %
Formaldehyde	5-20
Glyoxal	0-1.5
Glutaraldehyde	2-13
Quaternary ammonium biocide, water-soluble, selected from the group consisting of benzyl trimethyl ammonium chloride, benzyl dimethyl dodecyl ammonium chloride, dichlorobenzyl dimethyl dodecyl ammonium chloride, dodecyl trimethyl ammonium chloride, dodecyl pyridinium chloride, and (p-dodecylbenzyl) trimethyl ammonium chloride	0.5-5
Inert scent	0-5
Non-ionic ethylene oxide adducts of higher fatty alcohols or alkyl phenols having 8 to 22 carbon atoms	0-5
Inert dye	0-5
Solvent selected from the group consisting of (i) water and (ii) a mixture of water and an alcohol selected from the group consisting of glycols having 2 to 4 carbon atoms and aliphatic alcohols having 1 to 4 carbon atoms	Remainder.

4,107,313
α,α-BIS-[4-(R-AMINO)-1-PYRIDINIUM]XYLENES AND ANTIBACTERIAL AND ANTIFUNGAL USES

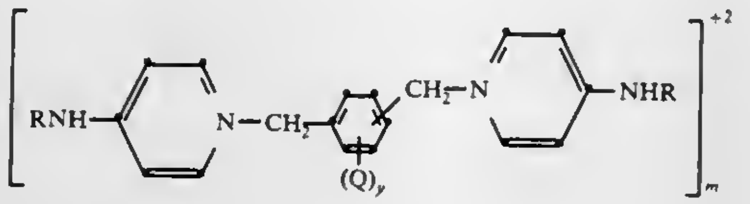
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 661,128, Feb. 25, 1976, abandoned. This application Oct. 22, 1976, Ser. No. 734,729

Int. Cl.^{2} A01N *9/22;* **C07D** *213/74*

U.S. Cl. 424—263 **18 Claims**

1. A compound having the formula



wherein:

R is hydrogen, a straight or branched-chain alkyl group containing from 1 to 18 carbon atoms, or benzyl;

Q is methyl or chlorine;

y is an integer 0 to 4;

A is an anion;

m is 1 or 3;

n is 1 or 2; and

x is 1, 2 or 3; and,

wherein $(m)\ (2)=(n)\ (x)$.

17. A method for controlling bacteria and fungi on human skin or other tissues or inanimate surfaces which comprises contacting said bacteria and fungi with an antibacterially and antifungally effective amount of a compound according to claim 1 wherein A is a pharaceutically acceptable anion when said compound is applied to human skin or other tissues.

4,107,314
ANTIFUNGAL THIO-ALKYL-IMIDAZOLE DERIVATIVES

David A. Cox, Canterbury; Geoffrey E. Gymer, Sandwich, both of England, and Braham Shroot, Cachan, France, assignors to Pfeizer Inc., New York, N.Y.

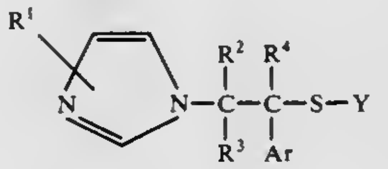
Filed Nov. 26, 1976, Ser. No. 745,305

Claims priority, application United Kingdom, Dec. 4, 1975, 49797/75

Int. Cl.^{2} A61K *31/44;* **C07D** *409/12*

U.S. Cl. 424—263 **13 Claims**

1. A compound of the formula:



and the pharmaceutically-acceptable acid addition salts thereof wherein

R^1, R^2, R^3 and R^4 are each hydrogen or alkyl of from 1 to 6 carbon atoms;

Ar is thienyl, halothienyl, phenyl, mono- or disubstituted phenyl, said substituents being selected from halogen, lower alkyl or lower alkoxy;

and Y is pyridyl, monosubstituted or disubstituted pyridyl, wherein said substituents are selected from amino, chloro and bromo.

13. A method of treating fungal infections in animals which comprises parenterally, orally or topically administering to an animal in need of such treatment an antifungal effective amount of a compound as claimed in claim 1.

4,107,315
5-(PYRIDINYL)-2(1H)-PYRIDINONES

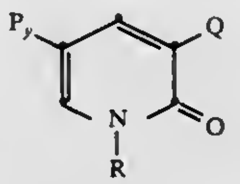
George Y. Lesher, and Chester J. Opalka, Jr., both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 707,235, Jul. 21, 1976, Pat. No. 4,072,746, and a continuation-in-part of Ser. No. 621,763, Oct. 14, 1975, Pat. No. 4,004,012. This application Jul. 25, 1977, Ser. No. 818,724

Int. Cl.^{2} A61K *31/44;* **C07D** *213/22*

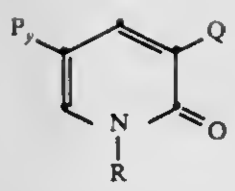
U.S. Cl. 424—263 **15 Claims**

1. A 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula:



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower hydroxy alkyl and Q is hydrogen or halo or a pharmaceutically-acceptable acid-addition salt thereof.

7. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically-acceptable inert carrier and, as the active component thereof, an effective amount of a cardiotonic 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl and Q is hydrogen, or pharmaceutically-acceptable acid-addition salt thereof.

4,107,316
FLUORURATED AMIDES OF NICOTINIC ACID AND THE PROCESS FOR THE PREPARATION THEREOF

Enrico Diamanti, Rome, Italy, assignor to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Italy

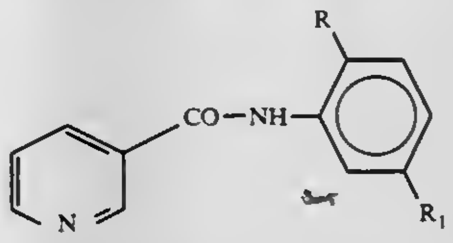
Continuation-in-part of Ser. No. 610,877, Sep. 5, 1975, abandoned. This application Mar. 8, 1977, Ser. No. 775,421

Claims priority, application Italy, Sep. 5, 1974, 52879 A/74

Int. Cl.^{2} C07D *213/55;* **A61K** *31/44*

U.S. Cl. 424—266 **7 Claims**

1. A compound of the structural formula:



when R is $-NO_2$ or NH_2, R_1 is $-CF_3$ and;

when R is $-CF_3$, R_1 is $-NO_2$ or NH_2; and their salts with pharmacologically acceptable acids.

6. A pharmaceutical composition comprising a compound according to claim 1 in an effective amount in unit dosage form in combination with a pharmaceutically acceptable vehicle.

4,107,317
CHROMAN DERIVATIVES

Eric Alfred Watts, Harlow, England, assignor to Beecham Group Limited, United Kingdom

Division of Ser. No. 577,614, May 14, 1975, Pat. No. 4,048,317. This application Apr. 11, 1977, Ser. No. 786,139

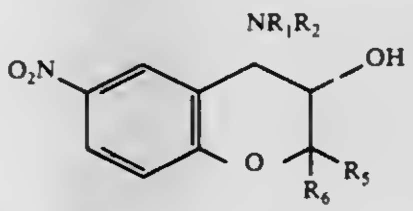
Claims priority, application United Kingdom, May 31, 1974, 24348/74

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.^{2} A61K *31/445;* **C07D** *405/04*

U.S. Cl. 424—267 **28 Claims**

1. A pharmaceutical composition useful for effecting vasodilation in humans and animals which comprises a vasodilatory amount of a compound of the formula



(VI)

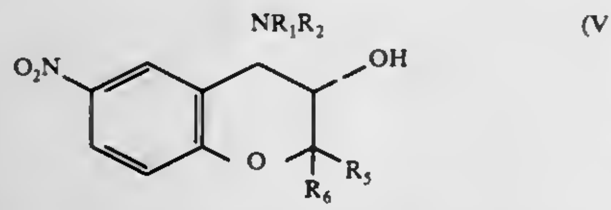
or a pharmaceutically acceptable acid addition salt thereof wherein

NR_1R_2 is a 3- to 8-membered heterocycle wherein the nitrogen atom is the only heteroatom, unsubstituted or substituted by 1 or 2 methyl groups;

R^5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R^6 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, in combination with a pharmaceutically acceptable carrier.

15. A method of effecting vasodilation in humans and animals which comprises administering to a human or animal in need thereof a vasodilatory amount of a compound of the formula


(VI)

or a pharmaceutically acceptable acid addition salt thereof wherein

NR_1R_2 is a 3- to 8-membered heterocycle wherein the nitrogen atom is the only heteroatom, unsubstituted or substituted by 1 or 2 methyl groups;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R_6 hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, in combination with a pharmaceutically acceptable carrier.

4,107,318
FUNGICIDAL DISPERSIONS OF A SYSTEMIC FUNGICIDE

Konrad Albrecht, Fischbach, Taunus; Heinz Frensch, Frankfurt am Main, and Kurt Hartel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 634,657, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 519,039, Oct. 29, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,495

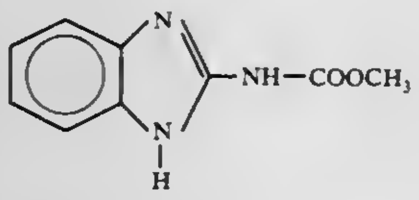
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1973, 2354467

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—273 R **3 Claims**

1. A fungicidal dispersion, comprising

a. about 5 to 30 percent by weight of the compound of the formula



b. about 60 to 85 percent by weight of an aliphatic mineral oil having a flash point of from 65° to 180° C and a viscosity of from 1.5 to 30 centipoise at 20° C

c. about 6 to 15 percent by weight of a combination of dispersible agents comprising from 5 to 10 percent by weight of a monoalkylphenol polyglycol ether of 8 to 12 glycol units the monoalkyl radical of which has from 8 to 12 carbon atoms and a triisobutylphenol polyglycol ether wherein the polyglycol portion has 8 to 15 glycol units and

d. about 0.1 to 3 percent by weight of calcium monoalkylbenzene sulfonate wherein the monoalkyl radical has from 8 to 15 carbon atoms in the same.

4,107,319
PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

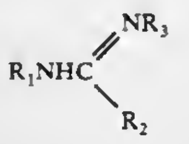
Division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application May 5, 1977, Ser. No. 794,178

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

Int. Cl.^{2} A61K *31/415;* **C07D** *233/64*

U.S. Cl. 424—273 R **7 Claims**

1. A compound of the formula:



$$R_1NHC(=NR_3)R_2$$

wherein R_1 represents a grouping of the structure

$$Het - CH_2 - S - (CH_2)_n -$$

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; *n* is 2 or 3; R_2 is NHR_5; R_3 is R_1; and R_5 is lower alkyl, or a pharmaceutically acceptable addition salt thereof.

7. A method of blocking histamine H_2-receptors, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim 1.

4,107,320
BIOLOGICALLY ACTIVE AMIDES

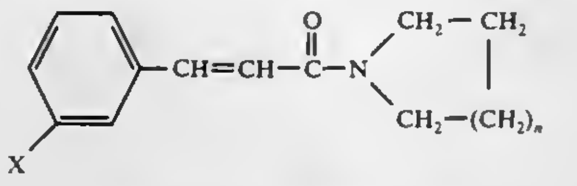
Eugene Michael Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 6, 1976, Ser. No. 712,133

Int. Cl.^{2} A61K *31/33, 31/40, 31/445*

U.S. Cl. 424—274 **10 Claims**

1. A method of treatment or prophylaxis of convulsions in a mammal susceptible to convulsions because of a previous occurrence of convulsions comprising the administration to said mammal of an anticonvulsant effective, non-toxic amount of a compound of formula (I)


(I)

wherein X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, iodo, trifluoromethyl, alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms in the alkyl moiety thereof; and n is an integer from 1 to 4.

4,107,321
OXOPYRROLOBENZOXEPIN-ACETIC ACIDS, PRECURSORS AND DERIVATIVES THEREOF

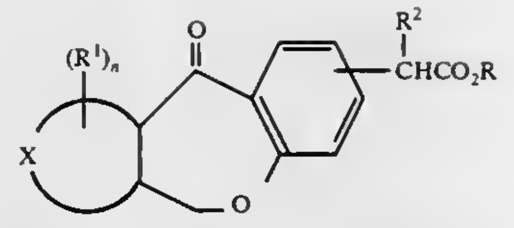
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,787

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—274 **12 Claims**

1. A compound of the formula



wherein X together with the carbon atoms to which it is attached is a pyrrolo ring structure; R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; *n* is the integer 1, 2 or 3; and salts thereof prepared from pharmaceutically acceptable bases.

4. A method of treating inflammation which comprises administering to a patient having inflammation an effective amount of a compound defined in claim 1.

4,107,322
BENZYL AND RELATED ESTERS OF 6,11-DIHYDRODIBENZ[B,E]OXEPIN-ACETIC ACIDS

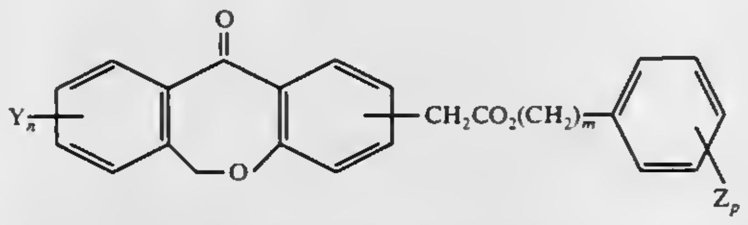
Arthur R. McFadden, East Brunswick, and Grover C. Helsley, Pottersville, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Jun. 3, 1976, Ser. No. 692,361

Int. Cl.^{2} C07D *313/12*

U.S. Cl. 424—278 **11 Claims**

1. A compound of the formula



wherein Y and Z each represent hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, halogen or trifluoromethyl and *m, n* and *p* each is an integer from 1 to 3.

4,107,323
FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO) LACTONES AND LACTAMS

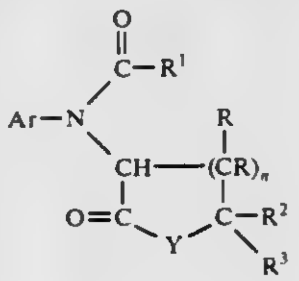
David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 631,351, Nov. 12, 1975, Pat. No. 4,012,519, which is a continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Oct. 12, 1976, Ser. No. 731,491

Int. Cl.^{2} C07D *307/32*

U.S. Cl. 424—279 **36 Claims**

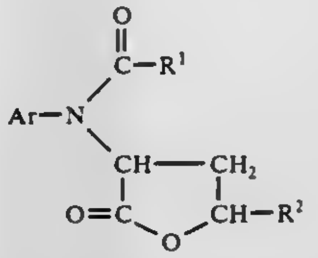
1. A method for the control of fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of a compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R is hydrogen or alkyl of 1 to 6 carbon atoms; R^1 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 3 carbon atoms and 1 to 5 of the same or different halogen selected from fluoro, chloro or bromo, halovinyl of from 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo, phenyl, or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R^2 is hydrogen or alkyl of 1 to 6 carbon atoms; R^3 is hydrogen or alkyl of 1 to 6 carbon atoms; *n* is 1 or 2; and Y is O.

9. A fungicidal composition comprising a biologically inert carrier and a fungicially effective amount of a compound of the formula defined in claim 1.

15. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R^1 is halovinyl of 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo; R^2 is hydrogen or alkyl of 1 to 6 carbon atoms; R^3 is hydrogen or alkyl of 1 to 6 carbon atoms; and *n* is 1 or 2.

4,107,324
INDAN-5-YL-N-METHYLCARBAMIC ACID ESTERS

Detlef Grotkopp, Duesseldorf; Karlfried Wedemeyer, Cologne; Wolfgang Behrenz, Overath, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

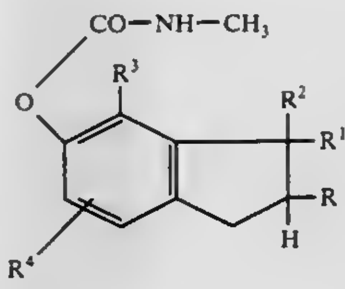
Filed Jan. 28, 1977, Ser. No. 763,742

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2603835

Int. Cl.^{2} C07C *125/06;* **A01N** *9/20*

U.S. Cl. 424—300 **8 Claims**

1. An indan-5-yl-N-methylcarbamic acid ester of the formula



in which

R and R^1 represent hydrogen or C_1–C_4-alkyl,

R^2 represents C_1–C_4-alkyl,

R^3 represents hydrogen or C_1–C_4-alkyl, and

R^4 represents hydrogen, chlorine, bromine, C_1–C_4 alkyl or C_1–C_4 alkoxy.

6. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

7. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,107,325

MITICIDAL AND APHICIDAL METHOD UTILIZING 2-HIGHER ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS

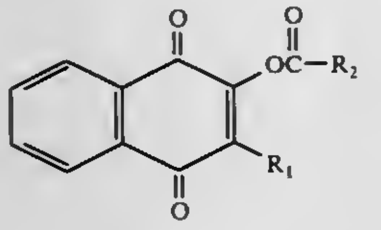
Russell Frank Bellina, and Dennis Lynn Fost, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 722,513, Sep. 13, 1976, Pat. No. 4,053,634, which is a continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,692, May 10, 1974, abandoned. This application Aug. 25, 1977, Ser. No. 827,598

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 424—301 **7 Claims**

1. A method for protecting plants from mites or aphids comprising applying to the plant locus to be protected a miticidally or aphicidally effective amount of a compound of the formula:



wherein

R_1 is alkyl of 8-14 carbon atoms which are branched, cyclic, or straight chain and

R_2 is alkoxy of 1-4 carbon atoms.

4,107,326

NOVEL BENZYLIDENEAMINOGUANIDINES

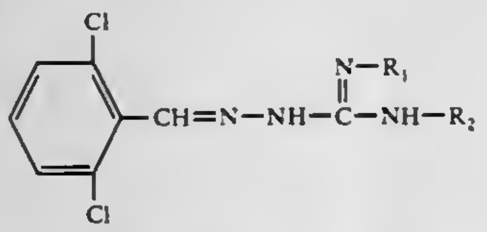
Leon Goldman; Yang-i Lin, both of Nanuet, and Joseph William Marsico, Jr., Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1977, Ser. No. 794,600

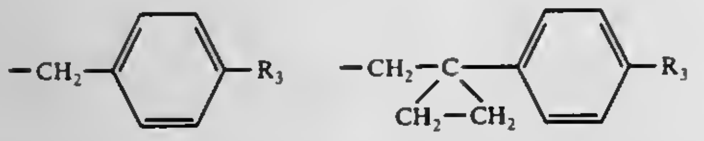
Int. Cl.^{2} A61K *31/155;* **C07C** *121/60, 133/10*

U.S. Cl. 424—304 **20 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, methyl, ethyl or benzyl and R_2 is a moiety of the formulae:



wherein R_3 is hydrogen, fluoro or chloro; the tautomers thereof and the pharmacologically acceptable acid-addition salts thereof.

4,107,327

TRANSFER MATERIALS

Edward Arthur Tilson, and Raymond Leonard Maybew, both of Waltham, England, assignors to Caribonum Limited, London, England

Continuation of Ser. No. 667,523, Mar. 16, 1976, abandoned. This application Jun. 30, 1977, Ser. No. 811,832

Claims priority, application United Kingdom, Mar. 26, 1975, 12609/75

Int. Cl.^{2} B32B *5/18*

U.S. Cl. 428—304 **4 Claims**

1. Transfer material comprising a base sheet including a precoat layer, a layer of porous material bonded to the precoat layer and colored ink contained within the pores of the porous material wherein the porous material comprises a mixture of cellulose acetate butyrate and medium molecular weight methyl methacrylate resins in a ratio of 6:1 to 1:1.

4,107,328

ANTIMICROBIAL COMPOSITIONS AND METHODS FOR UTILIZING THE SAME EMPLOYING MIXTURES OF AMINES

Edwin B. Michaels, Gregory Ct., East Norwalk, Conn. 06855

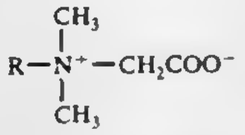
Continuation-in-part of Ser. No. 641,727, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 564,454, Apr. 2, 1975, abandoned. This application May 26, 1977, Ser. No. 800,898

Int. Cl.^{2} A01N *9/20*

U.S. Cl. 424—316 **16 Claims**

1. A broad spectrum, antimicrobial composition having low toxicity which consists of:

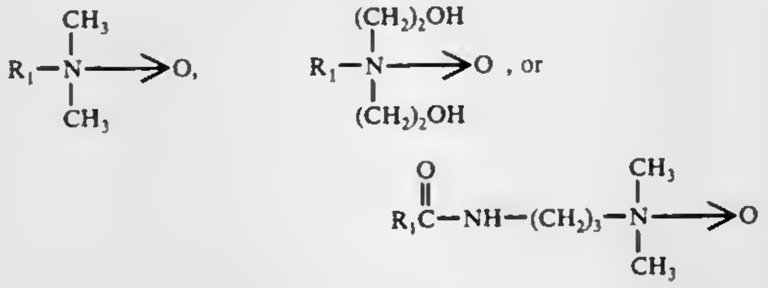
(a) from 0.1 to 40 parts, by weight, of a higher alkyl-N-betaine, said betaine having the structure:



$$R-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{N^+}}-CH_2COO^-$$

where R is a higher alkyl of from 10 to 18 carbon atoms, or mixed alkyl of the same,

(b) from 0.1 to 40 parts, by weight, of a higher alkyl-N,N-dimethylamine oxide, a higher alkyl-N,N-dihydroxyethylamine oxide, or an acylamido t-amine oxide having the respective structure:



$$R_1-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{N}}\longrightarrow O, \qquad R_1-\overset{\overset{(CH_2)_2OH}{|}}{\underset{\underset{(CH_2)_2OH}{|}}{N}}\longrightarrow O \text{ , or}$$

$$R_1\overset{\overset{O}{\|}}{C}-NH-(CH_2)_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{N}}\longrightarrow O$$

where R_1 is a higher alkyl of from 10 to 18 carbon atoms, or mixed alkyl of the same, and

(c) a protonating agent, sufficient to adjust the pH of said composition from 4.0 to 5.5.

4,107,329

FLUORINATED COMPOUNDS AS THERAPEUTICS

David Bryan Haydock; Thomas Patrick Cunningham Mulholland, and Jeffrey Meyrick Thorp, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

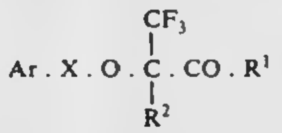
Continuation-in-part of Ser. No. 630,685, Nov. 10, 1975, Pat. No. 4,055,595. This application Jun. 6, 1977, Ser. No. 803,937

Claims priority, application United Kingdom, Dec. 6, 1974, 52829/74

Int. Cl.^{2} A61K *31/19, 31/22, 31/235*

U.S. Cl. 424—317 **11 Claims**

10. A method of producing an anti-arthritic effect in a warm blooded animal requiring such treatment which comprises orally administering to the said animal a therapeutically effective amount of a compound of the formula:



$$Ar\ .\ X\ .\ O\ .\ \overset{\overset{CF_3}{|}}{\underset{\underset{R^2}{|}}{C}}\ .\ CO\ .\ R^1 \qquad I$$

wherein Ar is a phenyl radical substituted in the 4-position by a halophenyl radical, or Ar is a naphthyl radical optionally substituted by a halogen atom; X is $—CH_2—$; R^1 is a hydroxy radical or an alkoxy radical of 1-6 carbon atoms; and R^2 is a methyl radical or a trifluoromethyl radical; or for a compound wherein R^1 is a hydroxy radical, a pharmaceutically acceptable base addition salt thereof.

4,107,330

TOPICAL APPLICATION OF THIOGLYCOLIC ACID IN THE TREATMENT OF ACNE

Aaron Leonard Sheffner, 18 Trombley Dr., Livingston, N.J. 07039

Filed Apr. 4, 1969, Ser. No. 813,750

Int. Cl.^{2} A61K *31/19*

U.S. Cl. 424—317 **8 Claims**

1. A process for treating acne comprising:

(1) applying to the acne affected skin of a person suffering therefrom, an acne alleviating amount of a topical composition containing 0.1% to 10% by weight of thioglycolic acid or a pharmaceutically acceptable salt thereof, and

(2) keeping said composition in contact with the affected skin for several hours.

4,107,331

ZINC CHELATING FUNGICIDAL COMPOSITION

Max Rosenberg, 1721 Nashville Ave., New Orleans, La. 70115

Filed Mar. 5, 1976, Ser. No. 664,361

Int. Cl.^{2} A01N *9/20, 9/22*

U.S. Cl. 424—319 **22 Claims**

1. A process of killing fungi requiring zinc ions to carry out the process of secondary metabolism necessary for their growth comprising administering to a mammal having an infection caused by such fungi a compound capable of chelating zinc ions in a concentration of at least 3.5% and a pH of about 4.5 to 10 in an amount effective to control said fungi, said compound being selected from the group consisting of nontoxic water soluble salts of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, 1,2-diaminocyclohexane-N,N'-tetraacetic acid, β-mercaptoethyliminodiacetic acid, tetrakis (2-aminoethyl)-ethylenediamine, B,B',B"-triaminotriethylamine, N-hydroxyethylethylenediaminetriacetic acid and ethylenediamine N,N-dipropionic acid N,N'-diacetic acid.

4,107,332

MITE AND MITE-OVICIDAL COMPOSITIONS

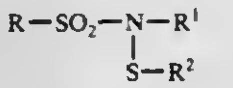
David C. K. Chan, Petaluma, and Arthur A. Whipp, Walnut Creek, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 17, 1977, Ser. No. 760,042

Int. Cl.^{2} A01N *9/16*

U.S. Cl. 424—321 **11 Claims**

1. A method for the killing of mite eggs which comprises applying thereto an ovicidally effective amount of a compound of the formula



$$R-SO_2-\underset{\underset{S-R^2}{|}}{N}-R^1$$

wherein R and R^1 individually are cycloaklyl of 5 to 8 carbon atoms substituted with up to 2 alkyl groups of 1 to 4 carbon atoms, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, and phenyl or benzyl substituted with up to 2 of the same or different substituents selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, trichloromethyl, tribromomethyl and alkyl of 1 to 2 carbon atoms and R^2 is tetrachloroethyl, with the proviso that R and R^1 are not both cycloalkyl or aryl.

4,107,333

SKIN CARE WITH A COSMETIC COMPOSITION CONTAINING OLEYL ACETATE

Bernard Hercelin, Clermont, and Jean-François Hamon, Saint-Quen l'Aumone, both of France, assignors to Laboratories Cassenne, Paris, France

Filed Mar. 22, 1976, Ser. No. 669,026

Claims priority, application France, Mar. 26, 1975, 75 09438

Int. Cl.^{2} A61K *7/48*

U.S. Cl. 424—365 **3 Claims**

1. A process for the care of the skin which comprises applying a cosmetic composition for skin care containing an effective amount of oleyl acetate and a carrier to the skin in an amount effective care of the skin.

4,107,334

MODIFIED PROTEIN

Ramesh C. Jolly, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 13, 1976, Ser. No. 732,018

Int. Cl.^{2} A23J *3/00*

U.S. Cl. 426—7 **11 Claims**

1. A process for the preparation of functional protein, which comprises:

(a) subjecting impure natural protein selected from the group consisting of whey, microbial protein and vegetable protein to a temperature of from about 40° to 150° C in aqueous medium until at least 50% of the ultimate protein capable of precipitation occurs;

(b) separating said precipitated protein from said medium;

(c) treating said separated protein in aqueous medium with a proteolytic enzyme at a temperature of from about 20° to 65° C for a period of up to 30 minutes until solution occurs; and

(d) deactivating said enzyme, said enzyme being employed at a level, per gram of said separated protein on a dry basis, of at least about

240 HUT where said enzyme is a microbial acid protease,
300 PC where said enzyme is a microbial neutral protease,
2300 Delf Units where said enzyme is a microbial alkaline protease,
130,000 N.F. PU where said enzyme is a plant protease, and
150 Pepsin Units where said enzyme is an animal protease, said impure protein being such that in in an aqueous medium a solution or suspension is formed and said suspen-

sion must be such that a hazy or clear solution results from said proteolytic hydrolysis.

4,107,335

FREEZE-DRIED MIX FOR SPOONABLE SALAD DRESSING AND METHOD THEREFOR

Myer Glickstein; Justin M. Tuomy, both of Framingham, and Marianne J. Shwert, Natick, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 8, 1977, Ser. No. 785,804
Int. Cl.^{2} A23L *1/24*

U.S. Cl. 426—96 **4 Claims**

1. A method of preparing a free-flowing, dry salad dressing mix which is characterized by being reconstituted into a spoonable salad dressing by the mixing of water therewith, which comprises preparing a mixture for subjection to freeze-drying, said mixture comprising the following composition prior to freeze drying thereof:

Ingredient	Percent of mixture
Salad oil (vegetable type)	20.0 – 40.6
Microcrystalline cellulose powder, (CMC-modified)	0.14 – 0.16
Pregelatinized starch	4.8 – 7.9
Unmodified food starch	1.0 – 3.1
Egg yolk solids	4.9 – 7.1
Dry synthetic vinegar	1.9 – 2.1
Hot water-soluble gum	0.3 – 0.6
Sugar	9.9 – 10.1
Salt	1.9 – 2.1
Dry powdery spice	0.9 – 1.1
Non-ionic surface-active agent	0.14 – 0.19
Water	33.5 – 45.5

by the steps of:

a. mixing said pregelatinized starch and said unmodified food starch to form a dry blend,
b. mixing about 80 to about 90 percent of said water with said dry blend to form a slurry,
c. cooking said slurry at about 85° C. to 88° C. for about 10 to about 15 minutes until said slurry is converted to a translucent mass,
d. restoring the quantity of water lost by evaporation during said cooking while thoroughly mixing said translucent mass,
e. dividing the remaining about 10 to about 20 percent of said water into two equal remaining water portions,
f. mixing said microcrystalline cellulose powder with one of said remaining water portions to form a paste,
g. mixing said hot water-soluble gum with the other of said remaining water portions to form a suspension of said gum,
h. heating said suspension of said gum for about 10 minutes at about 100° C. to form an aqueous solution of said gum,
i. mixing said sugar, said salt, said egg yolk solids, and said dry, powdery spice,
j. mixing said microcrystalline cellulose paste, said aqueous solution of said gum, said mixture of said sugar, said salt, said egg yolk solids, and said dry, powdery spice with said translucent mass at about 85° C. to about 88° C. in a vertical cutter mixer for about 2 minutes at low speed, then for an additional mixing period of 2 – 3 minutes at high speed while slowly adding a dispersion of said non-ionic surface-active agent in said vegetable salad oil to form a salad dressing,
k. spreading said salad dressing to a substantially uniform depth of about 1 to 1.5 cm on freeze drying trays,
l. blast freezing said salad dressing on said freeze drying trays for about 3 to about 4 hours,
m. freeze-drying said salad dressing for about 20 to about 24 hours until the moisture content of the salad dressing is reduced to not more than 2%,
n. grinding the freeze-dried salad dressing at slow speed to form a coarsely ground, freeze-dried salad dressing, and
o. thoroughly mixing said dry, synthetic vinegar with said coarsely ground, freeze-dried salad dressing to produce said free-flowing, dry salad dressing mix.

4,107,336

EDIBLES CONTAINING COLORANTS HAVING ETHYLSULFONATE-ALKYLAMINE BACKBONES

Kenneth Melvin Otteson, San Bruno, and Daniel Joseph Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 638,731, Dec. 8, 1975. This application Sep. 20, 1977, Ser. No. 835,086
Int. Cl.^{2} A23L *1/27, 1/275*

U.S. Cl. 426—250 **10 Claims**

1. A colored edible material comprising an edible material having admixed therewith an effective coloring amount in the range of from 10 ppm by weight to 1% by weight of a polymeric colorant itself comprising a copolymer consisting essentially of a plurality of ethylsulfonate and 2 to 6 carbon atom lower alkylamine groups, the sum of the number of ethylsulfonate groups and lower alkylamine groups being from 20 to 8000 and the number of lower alkylamine groups being from 0.4 to 2.5 times the number of ethylsulfonate groups, having a plurality of chromophoric group units covalently bonded thereto through said lower alkylamine groups.

4,107,337

SAUSAGE PRODUCT SIMULATING BACON AND METHOD OF MAKING

Frederick W. Deppner, Jr., Overland Park, Kans., assignor to Western Dairy Products Division of Chelsea Industries, Inc., San Francisco, Calif.

Filed May 28, 1976, Ser. No. 690,860
Int. Cl.^{2} A23L *1/31*

U.S. Cl. 426—266 **2 Claims**

1. A method for making a product simulating bacon which is sliceable without crumbling comprising curing pork belly robbins, lean pork and a member of the group consisting of bacon ends and slices and smoked pork jowls sliced, fine-grinding a portion of the cured mixture and forming an emulsion therewith of water and a binder selected from the group consisting of calcium reduced dried skim milk, sodium caseinate, calcium caseinate, high-fat caseinate, isolated soya protein and soya protein concentrate, mixing said emulsion with the remainder of said cured mixture transferring the resulting mixture to containers, and cooking the same.

4,107,338

BATTER MIX CONTAINING FLOURY STARCH OF FL_2FL_2 CONSTITUTION

Gerald L. Tutor, Sappington, Mo.; James C. Fruin, Green Valley, Ariz., and James L. Helm, Laurinburg, N.C., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 5, 1976, Ser. No. 739,209
Int. Cl.^{2} A23L *1/176;* **A21D** *10/00*

U.S. Cl. 426—293 **20 Claims**

1. Batter mix comprising floury starch derived from a plant of the genetic constitution fl_1fl_1, and translocations, inversions, mutants, and variants thereof, and water.

4,107,339

SOLUBLE COFFEE PROCESS AND PRODUCT

Brian Clifford Shrimpton, Chipping Warden, England, assignor to General Foods Limited, Banbury, England

Filed Jul. 26, 1977, Ser. No. 819,088

Claims priority, application United Kingdom, Jul. 29, 1976, 31711/76

Int. Cl.^{2} A23F *1/08*

U.S. Cl. 426—387 **6 Claims**

1. In a process for the preparation of soluble coffee powder obtained by dehydrating an aqueous roasted and ground coffee extract, the improvements which comprise;

a. evaporatively stripping the volatile flavourful components from the aqueous coffee extract in an evaporation zone at an absolute pressure ranging from 16 inches mercury to atmospheric pressure and vaporizing 5 to 15% of the water in the aqueous coffee extract, said water vapour containing the stripped flavourful coffee components;
b. partially condensing the stripped volatile flavourful components-containing water vapour mixture in a condensing zone at an absolute pressure ranging from 16 inches mercury to atmospheric pressure, the condensate as it exits from the condensing zone is within a temperature range from 33° F to 70° F to recover an aqueous solution of condensed flavourful and aroma component;
c. concentrating the stripped aqueous coffee extract from step (a) to form a concentrated coffee extract having a solids content ranging from 37% to 55% (w/w);
d. admixing the aqueous solution of flavourful components of step (b) with the concentrated coffee extract of step (c);
e. feeding the mixture of step (d) to a spray dryer within a temperature range from 27° F to 200° F;
f. spray drying the mixture of step (e) at a droplet size of between 100 and 300 microns using a spray drying nozzle pressure of from 700 to 2500 psig, an inlet air temperature of between 250° F and 550° F and an outlet air temperature of between 180° F and 230° F.

4,107,340

METHOD OF REMOVING CORN FROM THE COB

George H. Robertson; Melvin E. Lazar, both of Berkeley; John M. Krochta, El Cerrito; Daniel F. Farkas, Piedmont, and John L. Bomben, Mill Valley, all of Calif., assignors to The United States of America, as represented by the Secretary of Agriculture, Washingon, D.C.

Continuation of Ser. No. 680,643, Apr. 27, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,889
Int. Cl.^{2} A23L *1/212*

U.S. Cl. 426—481 **3 Claims**

1. A method of removing whole kernels of corn from the cob, which consists of

(a) longitudinally splitting the cob without damage to the whole kernels, and
(b) applying a force to the kernels sufficient to separate whole kernels intact from the split cob, said force being applied to individual rows of kernels of corn commencing with the row adjacent the split and advancing to adjacent rows as the kernels are separated from the cob.

4,107,341

METHOD WITH AN IMPROVED MIXING CYCLE FOR PREPARING DOUGH

Samuel O. Seiling, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 595,469, Jul. 14, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,450
Int. Cl.^{2} A21D *8/02*

U.S. Cl. 426—504 **5 Claims**

1. A method of preparing dough, comprising the discrete sequential steps of:

introducing raw dough ingredients into a mechanical mixer;
initiating the mixing cycle by mixing the ingredients for a first time interval at a mixing speed sufficient for preliminary blending of the ingredients;
increasing the mixing speed for a second time interval sufficient to develop the blended ingredients into a cohesive mass; and
terminating the mixing cycle by reducing the mixing speed for a third time interval for final development of the dough, the reduced mixing speed being greater than the mixing speed during the first time interval.

4,107,342

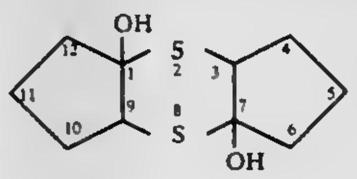
FLAVORING WITH 1,7-DIHYDROXY-2,5-DITHIA-TRICYCLO[7.3.0.0^{3,7}]DODECANE

Michael J. Greenberg, Chicago, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 769,520, Feb. 17, 1977. This application Sep. 26, 1977, Ser. No. 836,775
Int. Cl.^{2} A23L *1/231*

U.S. Cl. 426—535 **7 Claims**

1. A process for altering the flavor of a foodstuff comprising adding to the foodstuff an amount of a flavorant 1,7-dihydroxy-2,8-dithia-tricyclo[7.3.0.0^{3,7}]dodecane effective to impart a meat flavor and represented by the formula:



4,107,343

WHIPPABLE EMULSION STABLE AT ROOM TEMPERATURE

Anthony V. Petricca, Cleveland, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 739,511, Nov. 8, 1976, abandoned, which is a continuation of Ser. No. 589,497, Jun. 23, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,088
Int. Cl.^{2} A23G *3/00*

U.S. Cl. 426—564 **8 Claims**

1. A pourable, edible, homogenized emulsion consisting essentially of about 45 to 60% water, about 20 to 30% fat, about 7 to 20% sweetener, about 0.5 to 2.5% dispersible protein, about 0.1 to 0.75% thickener, about 0.1 to 1.0% buffer and about 0.75 to 2.5% emulsifier, said emulsifier consisting essentially of a major proportion of propylene glycol monostearate or hexaglycerol distearate in the range of about 0.5 to 1.5% and a minor proportion of a combination of ethoxylated sorbitan ester in the range of about 0.3 to 0.6%, sorbitan monostearate in the range of about 0.05 to 0.25% and lecithin in the range of about 0 to 0.15%, said emulsion being substantially stable against separation and/or gelation for at least about one year at room temperature under aseptic conditions and whippable in the temperature range from about 40° to 100° F. to at least about 200% overrun.

4,107,344

METHOD OF PRODUCING DEHYDRATED RICE FLAKES

George H. Beston, Cobourg, and Donald W. Kirk, Toronto, both of Canada, assignors to General Foods Limited, Toronto, Canada

Filed May 26, 1976, Ser. No. 690,138
Claims priority, application Canada, May 26, 1975, 227742
Int. Cl.^{2} A23L *1/18, 1/168*

U.S. Cl. 426—625 **7 Claims**

1. A method of preparing rice flakes which comprises drum drying an aqueous slurry of an admixture of about 70% to about 90% by weight of finely subdivided substantially completely gelatinized rice grains and about 10% to about 30% by weight of finely subdivided uncooked rice grains, and subdividing the drum dried sheet of dehydrated rice material into flakes.

4,107,345

PARTICULATE DEHYDRATED POTATOES WITH MONO- AND ETHOXYLATED GLYCERIDES

Ira A. MacDonald, Prior Lake, Minn., and Richard R. Egan, Worthington, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1971, Ser. No. 156,120
Int. Cl.² A23L *1/12*
U.S. Cl. 426—637 **12 Claims**

1. In the process of preparing particulate dehydrated potatoes wherein potatoes are cooked and dried, the improvement which comprises incorporating first and second intentional food additives into said potatoes before drying, said first additive consisting essentially of the condensation product of from 10 to 95 parts by weight ethylene oxide with correspondingly from 90 to 5 parts by weight of mixed C_{10}-C_{24} fatty acid ester of glycerine, said mixed ester having at least a 10 weight percent monoglyceride content with diglycerides, triglycerides and glycerine constituting the balance of said mixed ester and said second additive being an edible monoglyceride.

4,107,346

DIETARY SALT COMPOSITIONS

Hilard L. Kravitz, 402 Dobeny Rd., Beverly Hills, Calif. 90211

Filed Sep. 2, 1976, Ser. No. 719,913
Int. Cl.² A23L *1/237*
U.S. Cl. 426—648 **12 Claims**

1. A dietary salt composition for use as a replacement for salt in foods and as a dietary supplement which comprises a base formulation of the essential mineral element cations, sodium, potassium, calcium and magnesium in the form of physiologically acceptable compounds thereof in the proportions corresponding substantially to the proportions of these elements in the extra-cellular fluids of the human body, said proportions based on the cations comprising about 92-93.1% sodium, 2.4-3.4% potassium, 3.1-3.4% calcium and 1.2-1.4% magnesium, said base formulation acting as a carrier and having intimately associated therewith at least one of the trace elements known to be essential in the human diet, said trace elements being incorporated in proportions to supply at least about 20% of the recommended daily allowance of said trace elements as set by the National Academy of Sciences for each 10 gram portion of the salt composition.

4,107,347

METHOD OF MANUFACTURING A MILK CHOCOLATE

Victor George Burley, Tasmania, Australia, assignor to Cadbury Limited, Birmingham, England

Filed Aug. 16, 1974, Ser. No. 498,137
Claims priority, application United Kingdom, Aug. 17, 1973, 38960/73
Int. Cl.² A23G *1/00*
U.S. Cl. 426—660 **7 Claims**

1. A method of manufacturing a milk chocolate, comprising the steps of heating a solution consisting essentially of sugar and water to a temperature of between 250° F and 320° F, mixing the resultant heated sugar solution with a material selected from the group consisting of milk powder, milk powder and anhydrous butter fat, milk powder and cocoa mass and milk powder with cocoa powder and butter fat while the heated sugar solution is at a temperature of between 250° F and 320° F and by using a greater weight of sugar than milk powder, and processing the resultant mixture with other chocolate making ingredients to form a milk chocolate.

7. A method of manufacturing a milk chocolate, comprising the steps of heating a solution consisting essentially of sugar and water to a temperature of between 250° F and 320° F, substantially immediately mixing the resultant heated sugar solution with a material including milk powder while the heated sugar solution is at a temperature of between 250° F and 320° F and by using a greater weight of sugar than milk powder, and processing the resultant mixture with other chocolate making ingredients to form a milk chocolate.

4,107,348

METHOD OF CONSTRUCTING PORCELAIN-METAL DENTAL RESTORATIONS

Leo Hirschhorn, 4200 Hillcrest Dr., Hollywood, Fla. 33021

Filed Jan. 19, 1977, Ser. No. 760,634
Int. Cl.² A61C *5/10, 13/02*
U.S. Cl. 427—2 **4 Claims**

1. In the method of forming dental restorations including prosethetic teeth having a metallic base, there being at least one particulate opaque ceramic coating applied to said base, and at least one transluscent ceramic coating applied to said opaque coating, the improved step of applying said opaque coating in conjunction with a resinous binder in a volatile vehicle, which upon evaporation of said vehicle binds the particles of said opaque coating to said metallic base in the absence of a separate baking operation.

4,107,349

METHOD OF ADJUSTING THE FREQUENCY OF PIEZOELECTRIC RESONATORS

John R. Vig, Monmouth County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 12, 1977, Ser. No. 824,185
Int. Cl.² B05D *3/06;* **D05D** *5/12*
U.S. Cl. 427—36 **26 Claims**

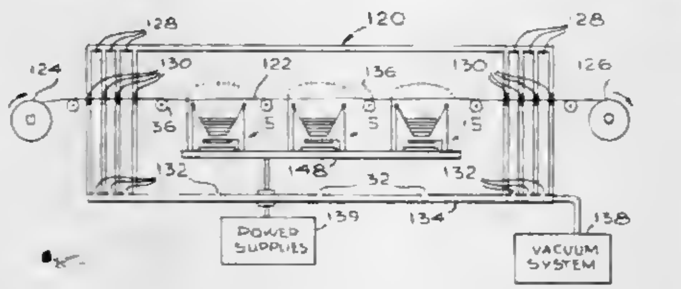
1. Method of adjusting the frequencies of a piezoelectric resonator prior to sealing the resonator into an enclosure, said method including the steps of
(A) placing the resonator into an enclosure;
(B) backfilling the enclosure with a polymerizable gas;
(C) polymerizing the polymerizable gas with radiation until an amount of polymer is formed on the resonator that causes the frequencies of the resonator to be adjusted to the desired frequencies; and
(D) sealing the enclosure.

4,107,350

METHOD FOR DEPOSITING FILM ON A SUBSTRATE

Joseph E. Berg, Box 3939 Terminal Annex, Los Angeles, Calif. 90051, and Randolph E. Brown, Jr., 14487 Edgeridge Dr., Hacienda Hts., Calif. 95431

Division of Ser. No. 280,489, Aug. 14, 1972, Pat. No. 3,913,520. This application Apr. 24, 1975, Ser. No. 571,480
Int. Cl.² B05D *3/06*
U.S. Cl. 427—38 **17 Claims**



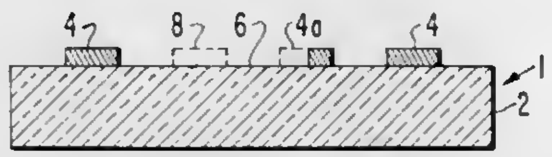
1. The method of depositing and implanting a film on a substrate within an airtight enclosure comprising the steps of:
exhausting the atmosphere from said enclosure to maintain a high vacuum:
emitting ionized molecular particles from a source of material to be deposited;
directing the molecular particles to a region adjacent a plurality of electrodes shaped to develop field emission of charged particles;
applying potentials to said shaped electrodes to establish electric fields sufficient to cause the electrodes to emit charged particles into said region for further ionizing said molecular particles after emission from said source of material; and
accelerating and directing the ionized molecular particles to a specimen remote from said source material with sufficient energy to implant a film of said molecular particles on said specimen to a selected depth of penetration and thickness.

4,107,351

METHOD OF DEPOSITING OR REPAIRING A PATTERNED METAL LAYER ON A SUBSTRATE

Edward Anthony James, Manville, and Philip Kuznetzoff, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1976, Ser. No. 732,782
Int. Cl.² C23F *1/02, 17/00*
U.S. Cl. 427—43 **9 Claims**



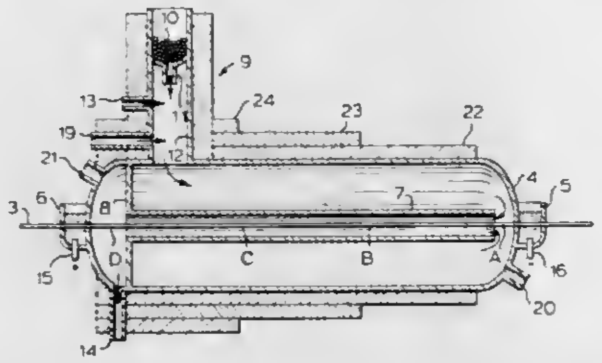
1. A method of electrolessly plating a patterned metal layer on an insulating substrate which comprises:
(a) sensitizing and activating said substrate,
(b) coating said substrate with a photoresist,
(c) exposing said photoresist through a mask,
(d) developing said exposed photoresist with a developer solution to form a pattern exposing portions of said substrate, said developer solution containing an effective amount of an activator, and
(e) immersing said substrate into an electroless plating solution whereby a pattern of metal is deposited onto said exposed portions of said substrate.

4,107,352

CHEMICAL VAPOR DEPOSITION

Mohammad Javid Hakim, Burlington, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

Filed Oct. 20, 1977, Ser. No. 843,869
Claims priority, application Canada, Jan. 13, 1977, 269628
Int. Cl.² B05D *3/14;* **C23C** *11/00, 13/00*
U.S. Cl. 427—50 **6 Claims**



1. A method of producing a coating of metallic composition on an elongated conductive substrate by means of chemical vapor deposition wherein the substrate is heated to a predetermined temperature by passing an electric current longitudinally therethrough and exposed to a gaseous mixture of reactant materials suitable to produce said metallic composition at said predetermined temperature characterized in that gaseous material is added to said gaseous mixture to maximize the Prandtl number and minimize the Schmidt number of said gaseous mixture in the vicinity of said substrate and at said predetermined temperature.

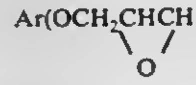
4,107,353

METHOD FOR PHOTOPOLYMERIZATION OF PIGMENTED EPOXIDE COMPOSITIONS

Gabriel Karoly, Springfield, N.J., and John L. Gardon, Birmingham, Mich., assignors to American Can Company, Greenwich, Conn.

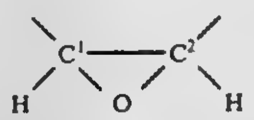
Continuation-in-part of Ser. No. 436,479, Jan. 25, 1974, abandoned, which is a division of Ser. No. 228,317, Feb. 22, 1972, abandoned. This application Mar. 4, 1976, Ser. No. 663,919
Int. Cl.² B05C *5/00, 17/04*
U.S. Cl. 427—54 **7 Claims**

1. In an improved method for preparing pigmented epoxide coatings exhibiting satisfactory adhesion and containing pigment in an amount ranging from that amount sufficient to impart an acceptable level of hiding of the substrate up to about 60% by weight by polymerization of a liquid epoxide-containing composition that incorporates a latent polymerization catalyst and which contains at most insignificant amounts of unreactive liquid components, wherein (a) said composition contains at least one epoxide selected from the group consisting of those exhibiting the general formula

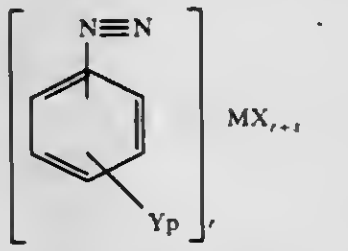


$$\mathrm{Ar(OCH_2\underset{\diagdown O \diagup}{CHCH_2})_n}$$

and low molecular weight telomers thereof and compounds containing at least two divalent radicals of the formula



wherein Ar represents an aryl or alkaryl hydrocarbon radical, *n* is the integer 2 or 3 and C^1 and C^2 form part of a five-or six-membered carboxylic ring structure, said epoxide comprising at least a major portion of the epoxides present in said liquid epoxide-containing composition; and (b) said composition contains between 0.25 and 5%, based on the total weight of said composition, of a latent catalyst selected from aryl diazonium compounds exhibiting the general formula



wherein X represents a halogen radical and M represents an element selected from the group consisting of arsenic, bismuth, boron, iron, phosphorus and tin; Y is selected from at least one of the groups consisting of nitro, hydroxyl, halogen, N-morpholino, alkyl, alkoxy, aryl, amino, arylamino, alkylamino and arylmercapto radicals, *r* is an integer equal to the absolute value of the charge on the complex anion MX_{R+S}, *s* is an integer equal to the valence state of M, and *p* is an integer between 1 and 5, inclusive; the improvements that comprise incorporating into said liquid epoxide-containing composition at least one carboxylic acid anhydride selected from the group consisting of liquid anhydrides of polycarboxylic acids and liquid mixtures containing two or more anhydrides of polycarboxylic acids, with the proviso that the composition contains at least 1.8 equivalent weights of epoxide per equivalent weight of said acid anhydride, applying the resultant liquid epoxide-containing composition to a substrate and exposing the resultant liquid coating to ultraviolet radiation for a period of time sufficient to decompose the latent catalyst and convert said coating to a dry solid material.

4,107,354

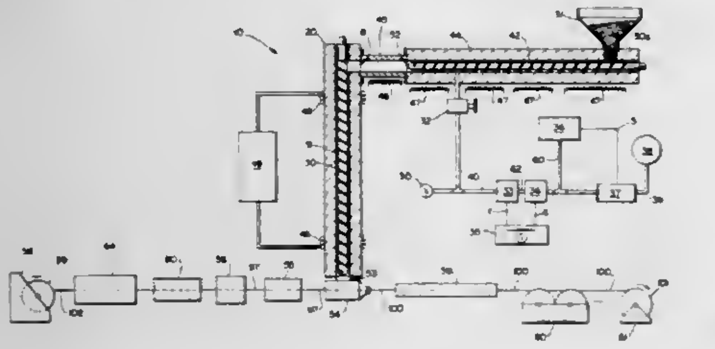
COATING ELECTRICALLY CONDUCTIVE WIRE WITH POLYOLEFIN

Frederic Nash Wilkenloh, Conover; Paul Alan Wilson, Hickory, and Steve Allen Fox, Taylorsville, all of N.C., assignors to Comm/Scope Company, Catawba, N.C.

Division of Ser. No. 584,164, Jun. 5, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,361

Int. Cl.^{2} B29D *27/00*

U.S. Cl. 427—118 **9 Claims**



1. A method of covering an electrically conductive wire with a polyolefin comprising:

(a) mixing a polyolefin with a nucleating agent to form a mixture;

(b) pressurizing above atmospheric pressure and heating said mixture to a temperature below that of the decomposition temperature of said nucleating agent sufficient to render said polyolefin molten;

(c) injecting into said pressurized molten polyolefin and nucleating agent mixture a physical blowing agent in a liquid state selected from the group comprising dichlorotetrafluoroethane, trichlorotrifluorethane and mixtures of trichlorofluoromethane and dichlorodifluoromethane and mixing under pressure the blowing agent in its liquid state with said pressurized and heated mixture of polyolefin and nucleating agent, said liquid blowing agent being convertible to a gas upon exposure to atmospheric pressure;

(d) cooling the mixture described in step (c) above to a predetermined temperature below that achieved in step (b) but above the solidification temperature of said mixture;

(e) coating the thus cooled mixture of step (d) onto a coating of unfoamed polyolefin on a wire and adhesively bonding it thereto;

(f) exposing the coated wire of step (e) to atmospheric pressure and temperatures below that achieved by step (d) for autogenously converting said blowing agent into a gas to expand said polyolefin by creating a multiplicity of cells wherein said gas is entrapped thereat, and solidifying the thusly expanded mixture.

4,107,355

PROCESS FOR THE PRODUCTION OF HIGHLY HEAT-RESISTANT INSULATING COATINGS ON ELECTRICAL CONDUCTORS

Suresh Merchant; Dietbard Winkler, both of Wuppertal, and Marita Bluhm, Schwelm, all of Fed. Rep. of Germany, assignors to Dr. Kurt Herberts & Co. Gesellschaft Mit Mit Beschrankter Haftung Vorm. Otto Louis Becker, Wuppertal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 779,001, Mar. 18, 1977, abandoned. This application Jun. 29, 1977, Ser. No. 811,383

Claims priority, application Austria, Mar. 25, 1976, 2202/76

Int. Cl.^{2} C08K *5/06;* **B05D** *5/12, 7/20*

U.S. Cl. 427—120 **14 Claims**

1. A process for the production of highly heat resistant insulating coatings on electrical conductor wires which comprises:

(a) coating the electrical conductor wire with a solution comprising a physiologically acceptable organic solvent and 30 to 90% by weight of an amide and/or imide-modified ester resin of polyhydric alcohols, polybasic carboxylic acids containing carboxyl groups attached to the aromatic rings, wherein said ester resins have an acid number of from 10 to 50 and the equivalent ratio of hydroxyl groups to carboxyl groups in the starting products for producing the ester resin is between 1.6 and 2.5, the solution contains aliphatic amines in such a quantity that there are from 0.5 to 1.5 amino groups for every free carboxyl group in the ester resin, and at least about 70% by weight of the total solvent consists of monoalkyl ethers and/or dialkyl ethers of mono- and/or dialkane diols containing from 2 to 4 carbon atoms per alkane moity, the alkyl moities of said dialkyl ethers each containing 1 to 6 carbon atoms; and

(b) heating said coated conductor wire to a temperature of 150°–400° C.

10. A stoving lacquer comprising a physiological acceptable organic solvent and 30 to 90% by weight of a thermosetting amide and/or imide-modified ester resins of polyhydric alcohols, polybasic carboxylic acids containing carboxylic groups attached to aromatic rings, wherein the ester resins have an acid number of from 10 to 50 and the equivalent ratio of hydroxyl groups to carboxyl groups in the starting products for producing the ester resins amounts to between 1.6 and 2.5, the solution contains aliphatic amines in such a quantity that there are from 0.5 to 1.5 amino groups for every free carboxyl group in the ester resin, and at least about 70% by weight of the total solvent consists of mono- and/or di-alkyl ethers of mono- and/or di-alkane diols containing from 2 to 4 carbon atoms per alkane moiety, the alkyl moieties of said ethers each containing 1-6 carbon atoms.

4,107,356

METHOD OF POWDER LINING

Hirosbi Ukihashi, Tokyo; Tetsuya Uchino, Yokohama; Takeshi Abe, Yokohama, and Nobuaki Kunil, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,456

Int. Cl.^{2} C08K *3/04, 7/06*

U.S. Cl. 427—195 **10 Claims**

1. In a powder lining process which comprises coating a synthetic resin powder onto a substrate and baking the adhered powder and substrate the improvement which comprises, coating onto said substrate a fluorine-containing melt processable synthetic resin powder having a bulk density of 0.1 to 1.2 gms/cm^3 and an average particle diameter of 2–400 microns which contains carbon fibers having a length of less than 1000 microns, a diameter of 5–30 microns and a length to diameter ratio of 2–100 wherein the content of carbon fiber in the total mixture of synthetic resin powder and carbon fiber is from 2 to 50 wt.%.

4,107,357

METHOD FOR EFFECTING ONE SIDE MOLTEN METAL PLATING

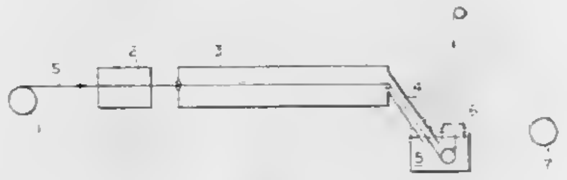
Kenichi Asakawa, Fukuoka, and Makoto Yoshida, Kitakyushu, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,626

Claims priority, application Japan, Sep. 16, 1975, 50-110947

Int. Cl.^{2} C23C *1/02, 1/03*

U.S. Cl. 427—300 **5 Claims**



1. A method for effecting application of a one side molten-metal coating to a steel strip in which the steel strip is subjected to activation treatment by heating it in a reducing atmosphere and then dipping it in a molten-metal bath for effecting continuous coating, characterized in that a gas containing oxygen in an amount of 0.001% or more by volume is blown against only one side surface of the steel strip subjected to said activation treatment in a snout part of a line whereby an oxide film is formed on said one side surface, and immediately thereafter the steel strip is dipped in said molten-metal bath to effect coating of the other side.

4,107,358

METHOD FOR PRODUCING A MICA BASED INSULATION

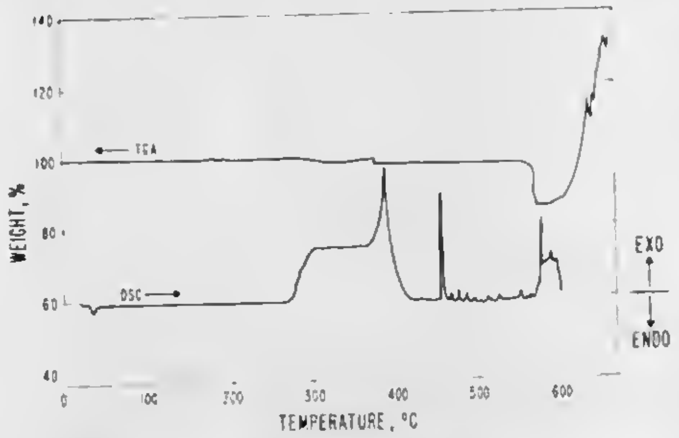
Francis Derrick Bayles, Dollard des Ormeaux, and Michael Alan Dudley, Toronto, both of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Continuation-in-part of Ser. No. 488,408, Jul. 15, 1974, Pat. No. 3,989,875. This application Oct. 29, 1976, Ser. No. 736,852

Claims priority, application Canada, Jun. 21, 1974, 203081

Int. Cl.^{2} B32B *15/00;* **D02G** *3/00*

U.S. Cl. 427—379 **8 Claims**



1. A method of producing a mica based composite comprising the steps of:

(a) solubilizing a poly (carborane siloxane) containing carborane moieties linked by siloxy groups in a suitable solvent at a loading between 20 and 50% weight by weight of total solution to form a solution consisting essentially of said poly (carborane siloxane) and said solvent;

(b) placing a mica sheet of a desired thickness on a support;

(c) impregnating the supported mica sheet with the solution so as to achieve complete wetting; and

(d) curing the impregnated mica sheet by oxidative crosslinking for a predetermined time interval and at a predetermined temperature above which oxidative crosslinking of the polymer becomes significant, but below which oxidative crosslinking becomes catastrophic, as determined by differential scanning calorimetry.

4,107,359

METHOD OF DRYING COATED CANS

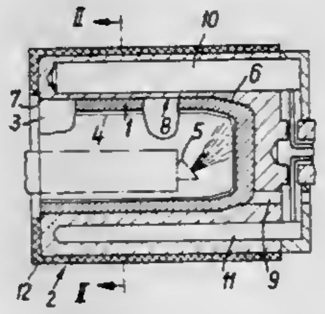
Karl-Heinz Witt, Recklinghausen, and Walter Sommer, Essen, both of Fed. Rep. of Germany, assignors to Fried. KRUPP Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 246,420, Apr. 21, 1972, abandoned. This application Nov. 13, 1973, Ser. No. 415,364

Claims priority, application Fed. Rep. of Germany, May 28, 1971, 2126598

Int. Cl.^{2} B05D *3/02, 7/22;* **F26B** *3/20*

U.S. Cl. 427—388 R **3 Claims**



1. The method of coating and drying one surface of a can having inside and outside surfaces, which includes the steps of:

placing the can with one of said surfaces in contact substantially throughout said one surface with a complementary surface of a heating element;

heating said element and can and controlling said heating not to exceed the optimum temperature of said can for drying the coating material;

coating the other surface of said can while in contact with said heating element, so that the heat from said heating element is transferred to said can to heat the coating material through the material of said can.

4,107,360

PROCESS FOR PACKING A PASTY STAIN REMOVER IN PORTION CAPSULES

Heinz Schmidgall, Teufen, Switzerland, assignor to Sagapha A. G., Zug, Switzerland

Continuation-in-part of Ser. No. 738,890, Nov. 4, 1976. This application Jun. 28, 1977, Ser. No. 810,773

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—389 **2 Claims**

1. In a method for packaging a basically anhydrous pasty stain remover which is substantially free of low molecular weight alcohols in portion capsules using gelatine as the supporting wall material of the portion capsules, said capsules being sufficiently large only to contain a sufficient amount of stain remover to treat a typical individual stain and being deformable under the influence of pressure, wherein the improvement comprises: coating the (finished, filled) exterior surface of the capsule material with a solution of a water-insoluble plastic material in a chlorinated hydrocarbon characterized in that said solution consists of from about five to twenty parts of post-chlorinated polyvinyl chloride per 100 parts of finished solution in a solvent selected from the group consisting of chloroform, methylene chloride, dichloroethane, trichloroethane and trichloroethylene and combinations thereof.

4,107,361
NEEDLE-PUNCHED GRASS-LIKE CARPETS

Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 30, 1975, Ser. No. 545,443

Int. Cl.^{2} B32B *3/02, 33/00*

U.S. Cl. 428—17 **10 Claims**

1. A carpet having a grass-like appearance comprising 1-20 plies of a fibrous web, consisting of ribs interconnected by fibrils, and made by fibrillating a film having a thickness of about 0.3 to 3 mils, needle-punched into a non-fibrillated substrate having a thickness of about from 0.05 to 1 inch and wherein said needle-punched fibrous web forms the pile of said carpet and has a grass-like appearance and wherein said substrate strengthens and stabilizes said carpet.

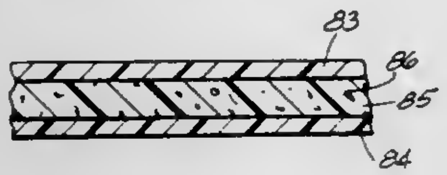
4,107,362
MULTILAYERED CONTAINER

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 743,644, Nov. 22, 1976, which is a continuation-in-part of Ser. No. 710,171, Jul. 30, 1976, Pat. No. 4,048,361, which is a continuation-in-part of Ser. No. 518,264, Oct. 29, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,080

Int. Cl.^{2} B65D *23/00, 23/02*

U.S. Cl. 428—35 **10 Claims**



1. A seamless multilayered hollow plastic container having improved resistance to gas permeation comprising: an inner first plastic carrier layer containing an effective amount of a uniformly distributed getter material capable of binding unwanted gas; a second intermediate barrier plastic layer adjacent said first layer, said barrier layer having substantial but incomplete resistance to gas permeation; and a third pressure molded outer plastic layer adjacent said second layer, said layers being adhered one to adjacent layers substantially over their entire contacting areas, wherein said container has a bottom and side walls integral therewith and extending therefrom terminating in an open mouth suitable for being closed by a cover having improved resistance to unwanted gas permeation.

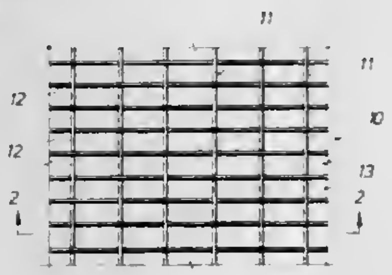
4,107,363
LIGHTWEIGHT ELECTRICALLY-POWERED FLEXIBLE THERMAL LAMINATE

Frederic S. Dawn, and Dale G. Sauers, both of Houston, Tex., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 14, 1975, Ser. No. 540,779

Int. Cl.^{2} B32B *5/00*

U.S. Cl. 428—109 **4 Claims**



1. A lightweight heater fabric for localized controlled heating in vacuum and non-vacuum environments where weight, bulk and stiffness are critical, comprising

a thin electrically non-conductive film forming a base member,

a matrix formed from cross-layers of yarns composed of electrically conductive metal yarns and electrically non-conductive yarns where said metal yarns are separated from one another,

said film and matrix being integrally attached to one another, and said film being metalized on the side obverse to said matrix.

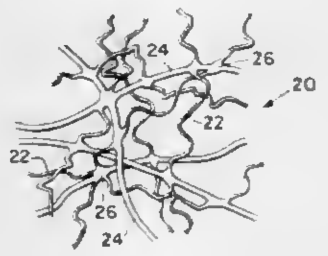
4,107,364
RANDOM LAID BONDED CONTINUOUS FILAMENT CLOTH

James Bryant Sisson, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 6, 1975, Ser. No. 584,312

Int. Cl.^{2} B32B *3/00*

U.S. Cl. 428—196 **41 Claims**



1. Cloth comprised of at least two types of organic polymer fibers, at least one of which is elastomeric, at least one of which is elongatable but non-elastic, at least one of which is dispersed to provide frequent random fiber crossings at least some of which are bonded at a bond strength which is sufficient to enable the non-elastic fibers to be stretched between said bonds without, in the majority of instances, breaking those bonds, said bonded crossings including at least some wherein said elongatable fibers are heat bonded to each other, at least some wherein said elongatable fibers are heat bonded to said elastic fibers, and at least some wherein said elastic fibers are heat bonded together.

4,107,365
IMPROVEMENTS IN TEXTILE TRANSFERS

Kenneth James Reed, and David Wellings Pointon, both of Wimbledon, England, assignors to E. T. Marler Limited, London, England

Continuation of Ser. No. 668,053, Mar. 18, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,836

Claims priority, application United Kingdom, Apr. 3, 1975, 13792/75

Int. Cl.^{2} B32B *3/16, 7/06*

U.S. Cl. 428—202 **5 Claims**

1. A method of applying a design to a substrate comprising the steps of:

(a) applying the design to a flexible carrier sheet;

(b) applying to the surface of said design a thermoplastic polymer containing layer of a heat sensitive adhesive polymer which contains a liquid component to reduce the adhesive bond between the design and the carrier sheet;

(c) placing the composite thus formed with the adhesive layer in contact with the substrate;

(d) applying heat and pressure to the carrier sheet to cause adhesion thereof and transference of the design to the substrate; and

(e) thereafter peeling off the carrier sheet to reveal the design.

5. A transfer sheet comprising a flexible carrier sheet provided with a dry ink design, and having a thermoplastic polymer containing layer of a heat sensitive adhesive polymer containing a liquid component applied over said design which polymer layer serves to reduce the adhesive bond of the design relative to the carrier sheet, the composite thus formed being arranged to be applied to a textile material by application of heat and pressure whereupon the carrier sheet is removed from the textile material.

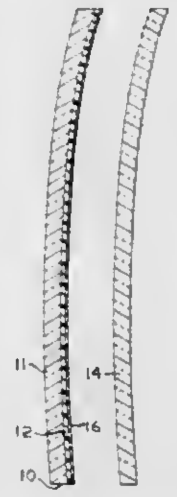
4,107,366
GLASS-PLASTIC LAMINATES

Raymond G. Rieser, Lower Burrell, and Joseph Chabal, Curtisville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 181,137, Sep. 16, 1971, Pat. No. 3,808,077. This application Jan. 30, 1974, Ser. No. 438,077

Int. Cl.^{2} B32B *7/02, 17/10, 27/00*

U.S. Cl. 428—215 **5 Claims**



1. A curved laminated window comprising an outer sheet of curved glass, an inner layer of polyvinyl butyral bonded on one side to said sheet of curved glass and a layer of polyvinyl fluoride bonded to said sheet of polyvinyl butyral on the side opposite to the side bonded to said outer sheet of curved glass.

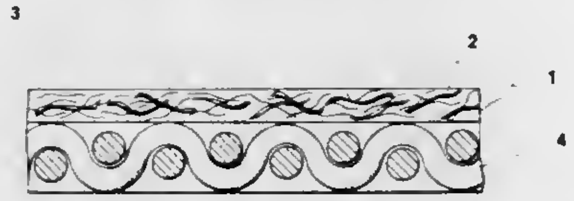
4,107,367
PAPERMAKERS FELTS

Eugene Zoltan Fekete, Vienna, Austria, assignor to Huyck Corporation, Wake Forest, N.C.

Continuation-in-part of Ser. No. 738,208, Nov. 3, 1976, abandoned. This application Jun. 16, 1977, Ser. No. 807,271

Int. Cl.^{2} B32B *5/06*

U.S. Cl. 428—234 **10 Claims**



1. In a felt for use in a papermaking machine, the improvement which comprises a nonwoven sheet-contacting layer for said felt, said sheet-contacting layer as initially formed being composed of at least a minor proportion of flat fibers having cross-sectional dimensions which are longer than they are wide, the remainder of the fibers in said sheet-contacting layer being of other than flat fibers, said sheet-contacting layer being joined to one surface of said felt.

4,107,368
WATER REPELLANT FABRICS

Walter James Ratcliffe, Montreal; Robert W. Kolb, Beaconsfield, and S. Esson Bruce, Mount Royal, all of Canada, assignors to Dominion Textile Limited, Montreal, Canada

Filed Sep. 23, 1976, Ser. No. 725,875

Claims priority, application United Kingdom, Oct. 7, 1975, 40982/75

Int. Cl.^{2} B32B *7/00*

U.S. Cl. 428—245 **24 Claims**

1. A method of making a water repellent fabric consisting of combining into the fabric structure at least one strand chosen from at least one of animal fibres, polyamide, cellulose acetate, cellulose triacetate, silk, polyester, acrylic and wool, the chosen strand having been rendered water repellent by applying thereto prior to the combination of said strand into said fabric structure at least one complex chosen from the long chain fatty acid complexes of chromium and aluminum.

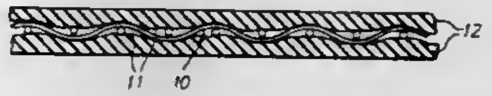
4,107,369
FABRIC HAVING AN ELASTOMER COAT ON FACE AND METHOD OF PRODUCING SAME

Eric Richard Gardner, Bath, England, assignor to Avon Rubber Company Limited, Melksham, England

Filed Sep. 22, 1976, Ser. No. 725,450

Int. Cl.^{2} B32B *7/00*

U.S. Cl. 428—246 **20 Claims**



1. The method of treating thermoplastic yarn having a plurality of thermoplastic filaments to at least reduce the capillary attraction of the interfilament spaces comprising distorting the filaments by: heating the yarn to a temperature sufficient to soften the thermoplastic material of the filaments, tensioning the yarn while the thermoplastic material is softened by said heating, maintaining such heating and tensioning for a time sufficient to insure distortion of the filaments and at least reduction of the interfilamentary space; cooling the yarn to set the filaments in their distorted state to permanently reduce the interfilament spaces whereby the capillary attraction of said yarn is reduced or eliminated; making up said yarn into thread; weaving said thread into a fabric; and finally securing an elastomer to at least one face of the fabric.

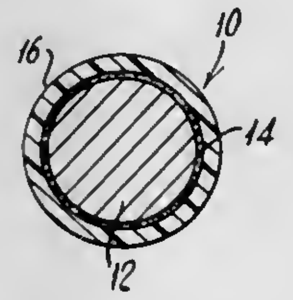
4,107,370
THERMOPLASTIC RESINOUS PROTECTIVE COATING ON A METALLIC SUBSTRATE

Glen E. Ingraham, R.D. 3, Sheridan Rd., Lebanon, N.J. 08833

Division of Ser. No. 384,374, Jul. 31, 1973, Pat. No. 3,941,866. This application Feb. 27, 1976, Ser. No. 661,866

Int. Cl.^{2} B29F *3/10;* **B29C** *25/00*

U.S. Cl. 428—247 **25 Claims**

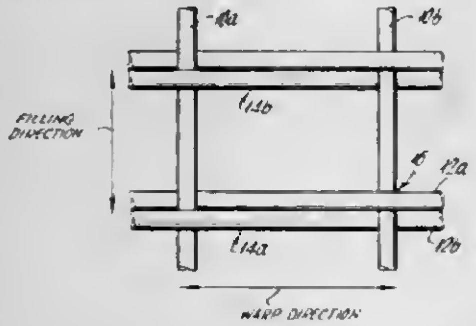


1. A protectively coated metallic substrate in the form of a fence material comprising as a first ply a resinous hot melt adhesive coating composed by weight of from 20 to 400 parts

of phenolic-modified terpene resin for each 100 parts of ethylene-vinyl acetate copolymer, bonded to said substrate; and a second coating of an extrudable thermoplastic resin composition selected from a plasticized vinyl resin, a polyolefin, and a polyamide adhering to said substrate by means of said adhesive.

4,107,371
WOVEN FABRIC THAT IS RELATIVELY STIFF IN ONE DIRECTION AND RELATIVELY FLEXIBLE IN THE OTHER

William Bruce Dean, Cornelia, Ga., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Oct. 25, 1977, Ser. No. 844,673
Int. Cl.^{2} B32B *7/00*
U.S. Cl. 428—255 7 Claims

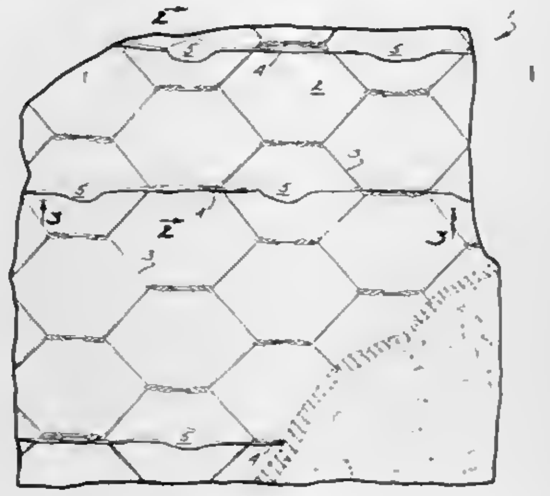


1. An open weave fabric that is relatively stiff in the filling direction and relatively flexible in the warp direction, said fabric comprising (a) a plurality of individual, spaced, stiff monofilaments in parallel relationship in the filling direction, and (b) a plurality of groups of at least two substantially parallel strands closely associated in side-by-side relationship in the warp direction, said groups being spaced to provide an open weave mesh pattern therebetween, the strands of each of said groups being arranged one strand over and the next strand under in alternating interlocking relationship at the point of crossing each of the respective individual monofilaments in the filling direction, wherein each of said strands comprises a multi-filament yarn core coated with a thermoplastic polymer sheath, and wherein said open weave fabric is stabilized by fusion of said thermoplastic polymer at the point where said strands cross the said individual monofilaments.

4,107,372
COMPOSITE

Victor H. Clausen, Vancouver, Wash., and Lester C. Brenno, Woodside, Calif., assignors to H. B. Fuller Company, St. Paul, Minn.
Filed Aug. 22, 1974, Ser. No. 499,651
Int. Cl.^{2} B32B *7/00*
U.S. Cl. 428—256 10 Claims

1. A composite comprising:
(a) A substrate;
(b) A mesh overlying said substrate, said mesh being retained upon but not substantially adhesively bonded to said substrate, thereby permitting some lateral movement of the substrate relative to the mesh;
(c) A plurality of retaining bands overlying said mesh and bonded to said substrate, the loci of bonding being located within the areas of said substrate underlying the holes in said mesh, whereby the mesh is not substantially bonded to the retaining bands; said retaining bands being adhesive coated, generally continuous filaments.



4,107,373
FLAME RETARDANT CELLULOSIC MATERIALS

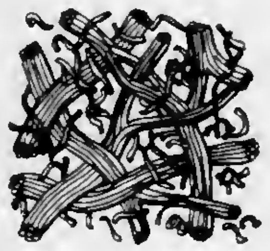
George T. Miller, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.
Filed Dec. 30, 1975, Ser. No. 645,156
Int. Cl.^{2} C09D *5/18;* B32B *33/00*
U.S. Cl. 428—264 16 Claims

1. Fire retardant cellulosic containing material, which material contains an effective fire retardant amount of a reaction product obtained by reacting an aqueous solution of sulfamic acid containing from about 1 to about 40% by weight of sulfamic acid with an amount of an alkylene oxide which is from about 0.5 to about 1.5 times the weight of 100% sulfamic acid intimately associated therewith.

12. The process of rendering cellulosic containing material fire retardant which comprises intimately associating with the material an effective fire retardant amount of the reaction product obtained by reacting an aqueous solution of sulfamic acid containing from about 1 to about 40% by weight of sulfamic acid with an amount of an alkylene oxide which is from about 0.5 to about 1.5 times the weight of 100% sulfamic acid intimately associated therewith.

4,107,374
NON-WOVEN FABRIC USABLE AS A SUBSTRATUM SHEET FOR ARTIFICIAL LEATHER

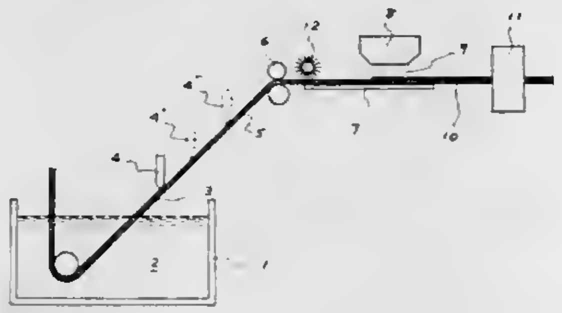
Tetsuhiro Kusunose; Tsukasa Shima; Hiroshi Henmi, and Sadahiko Yasui, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Sep. 11, 1975, Ser. No. 612,504
Int. Cl.^{2} D04H *1/58*
U.S. Cl. 428—288 8 Claims



1. A non-woven fabric usable as a substratum sheet of artificial leathers, comprising numerous fibrous bundles, each comprising a plurality of extremely fine filaments or fibers having a denier of 0.005 to 0.5 and spontaneously adhered to each other side-by-side without using an adhesive, a portion of said fibrous bundles being divided into thin fibrous bundles and individual filaments or fibers, said thin fibrous bundles, said individual filaments or fibers and the remaining fibrous bundles being entangled with each other to form a body of non-woven fabric.

4,107,375
BULKY ASPHALT-IMPREGNATED SHEET HAVING DIFFERENT PROPERTIES ON BOTH SURFACES

Hajime Iwasaki, and Yasuo Tomita, both of Tokyo, Japan, assignors to Mitsuboshi Sangyo Co., Ltd., Japan
Filed May 4, 1976, Ser. No. 683,214
Claims priority, application Japan, Dec. 30, 1975, 51-156331
Int. Cl.^{2} B32B *11/02*
U.S. Cl. 428—291 6 Claims



1. A method of manufacturing a bulky asphalt-impregnated sheet having asphalt on one side and a material different from the asphalt and which has different physical properties therefrom on the other side of the sheet which comprises continuously feeding a bulky sheet of a non-woven fabric into a bath of molten asphalt so as to completely saturate said bulky sheet with the molten asphalt, withdrawing said bulky sheet completely saturated with and coated on both sides thereof by the molten asphalt into the atmosphere from said bath, scraping off the asphalt, when it is in a fluidized or semi-solidified state, from one side of said sheet to expose the fibrous surface of one side of said sheet having very little asphalt remaining on the surface thereof so as to form a rough surface and then applying a material different from that of said asphalt onto the exposed fibrous surface so as to firmly adhere said material different from that of the asphalt onto the rough face of the exposed fibrous surface taking advantage of the adhesive property of the asphalt between the fibers of the exposed fibrous surface.

4,107,376
GRANULATED FIRE RETARDANT MATERIALS

Takashi Ishikawa, 1355, Ohaza Higashine-ko, Higashine-shi, Yamagata-ken, Japan
Filed May 27, 1976, Ser. No. 664,067
Claims priority, application Japan, Jun. 24, 1975, 50-79491
Int. Cl.^{2} B32B *3/26, 5/18*
U.S. Cl. 428—306 25 Claims

1. A heat-resistant composite in the form of a solid sphere comprising a noncombustible porous core material impregnated or coated with an inorganic material capable of foaming spontaneously when heated at an elevated temperature.

11. The heat-resistant composite of claim 1 wherein the porous core material is perlite and the inorganic material is sodium metaborate.

12. The heat-resistant composite of claim 11 wherein the surface of the porous core material is covered with a thin impermeable film.

13. A flame and heat-resistant panel comprising polyurethane foam molded in the form of a panel and having incorporated therein the composite of claim 2 as an aggregate.

14. A flame and heat-resistant structure comprising the panel of claim 13 sandwiched between a facing material and a backing material.

4,107,377
PROCESS FOR PRODUCING 3-TRICHLOROMETHYL-5-LOWERALKYLAMINO-1,2,4-THIADIAZOLE

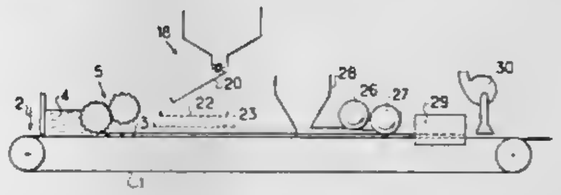
John H. Tobin, Winsted, Conn., assignor to Olin Corporation, New Haven, Conn.
Filed Aug. 1, 1977, Ser. No. 821,024
Int. Cl.^{2} C07D *285/08*
U.S. Cl. 260—306.8 D 22 Claims

1. A process for producing 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole compounds comprising
reacting an N-loweralkylisothiocyanate with an N-halotrichloroacetamidine in the presence of a base to form said 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole compound.

14. A process of producing an N-[3-trichloromethyl-1,2,4-thiadiazolyl (5)]-N,N'-di-loweralkylurea compound by reacting a loweralkylisocyanate with said 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole produced by the process of claim 1.

4,107,378
METHOD AND APPARATUS FOR MANUFACTURING LINING PLATES AND PRODUCTS THEREOF

Guy Clément Bourguignon, Saint Amand Les Eaux, and Joseph André Maquet, Lecelles, both of France, assignors to S.A. dite "Manufacture Francaise de Carrelages", Amand Les Eaux, France
Filed Aug. 9, 1976, Ser. No. 712,763
Claims priority, application France, Aug. 27, 1975, 75 26950
Int. Cl.^{2} B28B *1/16*
U.S. Cl. 428—323 8 Claims



1. A method of manufacturing covering plates having a base of hard materials, granulated and pulverulent matter, respectively, agglomerated with synthetic resins, comprising the following successive operations
coating a conveyor belt with a stripping agent,
uniformly depositing on the converyor belt a fine layer of binding agent of uniform thickness of accelerated catalyzed synthetic resin, containing hard pulverulent matter from 10 to 300 microns exclusively, and dyes, regularly and in graded manner by a binding agent distributor,
sprinkling dried and clean granules of a size from 1.5 mm to 10 mm exclusively, mixed in favorable proportions, on the layer of binding agent, the sprinkling being effected by a doser distributor spreader,
coating the granules prior to the sprinkling step with a wetting agent methyl methacrylate, the preceding operations being conducted by varying the speed of the belt, the thickness of the layer of binding agent, its fluidity, and the quantity of granules introduced into the binding agent so as to obtain an aggregate to binding agent weight ratio as high as possible,
vibrating the following section of the conveyor belt, effecting a sedimentation of the granules until the level of the binding agent has risen above said granules, thereby effecting a complete integration and homogeneous distribution of the granules in the binding agent,
covering the resulting strip with a base layer of granules which adhere on the upper surface of the strip,
vibro-compressing the resulting strip with rollers,
passing the resulting strip into a polymerization furnace,
recovering excess granules by suction from the base layer of the resulting layer,

removing the strip from the conveyor belt,
guillotining and cutting the removed strip into plates of large dimensions,
coarse polishing the faces of the plates on a grindstone,
fine finishing the faces of the plates,
sawing the plates to desired sizes, and
passing the plates into a final furnace.

6. Thin covering plates constituting a product obtained by carrying out the method as set forth in claim 1, comprising
a plate having a smooth, finished and polished surface, said plate comprising a fine layer of polymerized and solidified binding agent containing synthetic resin and at least hard pulverulent matter of approximately 200% of the weight of the resin, the pulverulent matter having the size of 10 to 300 microns,
said plate including granules wetted with methyl methacrylate of a size exclusively from 1.5 mm to 10 mm, excluding sizes of 300 microns to 1.5 mm inserted throughout the binding agent,
a base layer of coarse granules adhering to the other surface of the plate and embedded only a small amount into said binding agent, said other surface constituting a bottom surface of the plate adapted to be laid downwardly in use, said first mentioned surface being upward and visible in use,
said coarse granules on said bottom surface being ground so as to define a planar surface adapted to be laid planar in use.

4,107,379
BONDING OF SOLID LIGNOCELLULOSIC MATERIAL

John Stofko, 5079 Kearney, Oakland, Calif. 95602, assignor to John Stofko, St. Charles, Ill. and John Jansky, Paris, France
Continuation of Ser. No. 549,663, Feb. 13, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,261
Claims priority, application United Kingdom, Feb. 22, 1974, 8084/74; May 8, 1974, 20227/74
Int. Cl.² B32B *5/16*
U.S. Cl. 428—326 **21 Claims**

1. A method of providing a waterproof bond between solid lignocellulose materials, comprising:
applying to the surface of said solid lignocellulose material an amount sufficient to effect bonding comprising in the range of from 2 to 32 grams of carbohydrate per 1,000 cm^2 of area of material of a bonding composition comprising a non-cellulosic carbohydrate and an acid catalyst capable of catalyzing transformation of the carbohydrate, the amount of acid catalyst being from 1 to 20% by weight of the carbohydrate; and
pressing said solid lignocellulose materials together at about 140°-200° C at a pressure in the range of about 5-25 kg/cm^2 for about 0.32 to 2 minutes per mm of thickness of said solid lignocellulose materials to transform said carbohydrate into furan type compounds and form said waterproof bond.

2. A method of bonding solid lignocellulosic materials producing a waterproof bond, which comprises
applying to the surface of the material a bonding composition consisting essentially of a non-cellulosic carbohydrate and an acid catalyst capable of catalyzing transformation of the carbohydrate, said carbohydrate being present in an amount sufficient to coat the surface of said material, and said catalyst being present in an amount sufficient to catalyze transformation of said carbohydrate to produce a waterproof bond, and
pressing surfaces of the material together at an elevated temperature and for a time sufficient to effect bonding by transformation of the carbohydrate, and wherein the time, temperature and pressure are sufficient to produce a waterproof bond.

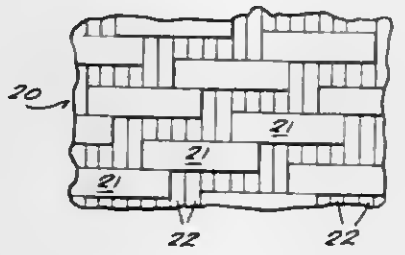
4,107,380
NON-BLOCKING COATING COMPOSITION

Dale Clifford Wiesman, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.
Filed Nov. 12, 1976, Ser. No. 741,232
Int. Cl.² B32B *5/16, 9/02;* B65D *85/72*
U.S. Cl. 428—327 **8 Claims**

1. A flexible packaging sheet material bearing on its surface a coating of a normally tacky heat-sealable wax composition selected from the group consisting of (1) microcrystalline petroleum wax and polyisobutylene and (2) ethylene-vinyl acetate copolymer, petroleum wax and a tackifying resin, (3) microcrystalline wax, petrolatum and polyisobutylene and (4) ethylene-vinyl acetate copolymer, paraffin wax, butyl rubber, rosin ester and microcrystalline wax, there being applied to the surface of said wax composition coating, as a non-blocking overcoating, between 0.75 and 4.0 pounds per ream of a composition comprising (a) between 65 and 90 weight percent of an ethylene-vinyl acetate copolymer having a melt index between about 20 and 40 and a vinyl acetate content of between 18 and 30% and (b) between 10 and 35 weight percent of a particulate polyethylene having a density between about 0.91 and 0.94 and an average particle size of between about 20 and 50 microns evenly dispersed throughout the overcoating.

4,107,381
COMPOSITE ARTICLE PROVIDING SEAMLESS FABRIC-LINED BEARINGS IN MULTIPLE

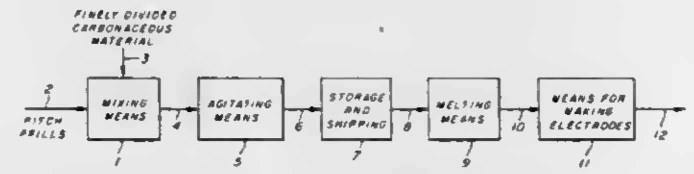
Neil W. Butzow, Greendale, and Bernbard Harris, Milwaukee, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.
Continuation of Ser. No. 398,367, Sep. 18, 1973, abandoned, which is a division of Ser. No. 730,399, May 20, 1968, Pat. No. 3,616,000, which is a continuation of Ser. No. 95,363, Dec. 4, 1970, abandoned. This application Mar. 9, 1976, Ser. No. 665,203
Int. Cl.² B32B *1/08, 17/06*
U.S. Cl. 428—365 **17 Claims**



1. An article of manufacture adapted with further processing to provide an improved bearing of the type which comprises a glass filament reinforced resin body and a fabric embedded therein and having yarns of a low friction material forming the bearing face, said article of manufacture comprising:
(a) a mandrel having substantially the outer dimensions of the element which is to operate in the bearing;
(b) a seamless woven sleeve comprising a circumferential fill of heat-shrinkable yarns and an axial warp of low-friction yarns, said sleeve having been drawn over said mandrel while the heat-shrinkable yarns were in an unshrunk condition and then having been heat shrunk so as to conform the low-friction yarns in said sleeve to the outer surface of said mandrel; and
(c) multiple layers of a continuous glass filament tape impregnated with a thermosetting liquid resin tightly and helically wound around said sleeve so as to further press the low-friction yarns in said sleeve against said mandrel, conforming the inner surface of the low-friction yarns to the outer surface of said mandrel.

4,107,382
COATED PITCH PRILL

Harry G. Augustine; Kenneth C. Krupinski, both of Pittsburgh, and Frank A. Smith, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Division of Ser. No. 637,262, Dec. 3, 1975, Pat. No. 4,082,823. This application Sep. 9, 1976, Ser. No. 721,745
Int. Cl.² B32B *11/02*
U.S. Cl. 428—368 **10 Claims**



1. A coated pitch prill having an average diameter of between about 1 and about 5 millimeters and comprising a pitch prill having adherently bonded to the exterior layer thereof finely divided carbonaceous material selected from at least one member of the group consisting of carbon black, graphite and coke and wherein the finely divided carbonaceous material is present in sufficient amount to prevent agglomeration of the prills at ordinary temperatures and pressures and in sufficient amount to reduce the dusting tendency of the prills during handling.

4,107,383
ELECTRIC CABLE INSULATING COMPOSITIONS CONTAINING COCONUT SHELL FLOUR FILLER

Brian C. Reid, 3 Pump Ct., London Temple, E.C. 4, England
Filed Feb. 14, 1977, Ser. No. 768,043
Int. Cl.² B44D *1/42;* C08L *1/00*
U.S. Cl. 428—379 **6 Claims**

1. An electric cable comprising a conductor and an insulating jacket of a composition containing a synthetic thermoplastic or rubbery organic polymeric insulating material and, as filler therefor, coconut shell flour, the proportion of coconut shell flour to insulating material being from 5 to 30 parts per 100 parts by weight.

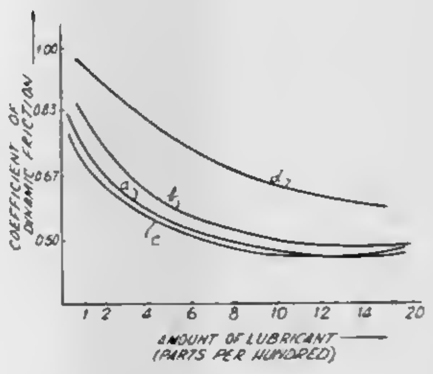
4,107,384
METHOD FOR PRODUCING POROUS FIBERS

Morito Musha, Seto, and Tokuhisa Miyamatsu, Nagoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Filed Aug. 10, 1976, Ser. No. 713,033
Int. Cl.² B29F *3/10*
U.S. Cl. 428—398 **13 Claims**

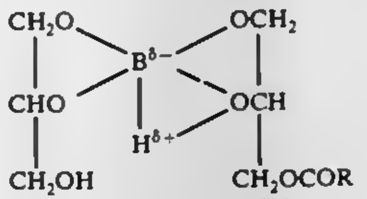
1. A method for producing porous cross-linked monovinyl polymer fibers, which comprises: impregnating substrate fibers capable of being swollen by 30–500 volume % with a mixed monomer liquid comprising at least one monovinyl monomer and at least one polyvinyl monomer which liquid monomer mixture contains a polymerization initiator such that said liquid monomer mixture is homogenously absorbed by the swollen substrate; polymerizing the monomer mixture absorbed in the fibers; and then removing the substrate fibers from the polymerized monomer mixture.

4,107,385
MAGNETIC RECORDING MEDIUM

Shigetaka Higuchi, Sendai; Masaatsu Iwasaki, Iwanuma, and Shigeo Kimura, Sendai, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 387,591, Aug. 13, 1973, abandoned. This application May 21, 1975, Ser. No. 579,471
Claims priority, application Japan, Aug. 14, 1972, 47-81265
Int. Cl.² H01F *10/02*
U.S. Cl. 428—412 **13 Claims**



1. A magnetic recording medium comprising a base, and a magnetic layer coated on the base and consisting essentially of a binder and a magnetic powder and, in admixture therewith, for each 100 parts by weight of said binder, from 1 to 15 parts by weight of a friction-reducing additive selected from the boron compounds having any one of the following structural formulas: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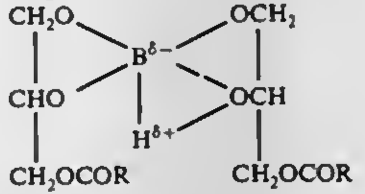
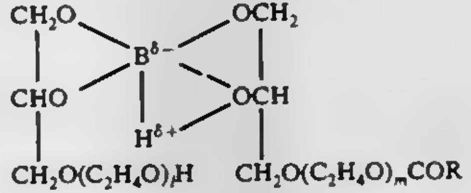
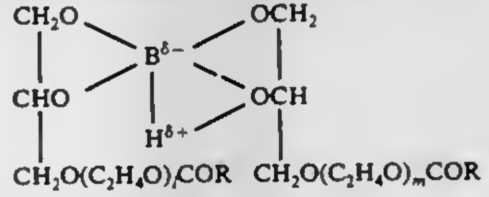

II


III


IV

in which $B^{\delta-}$ represents a boron atom with a negative electric charge which has a low bonding force, $H^{\delta+}$ represents a hydrogen atom with a positive electric charge which also has a low bonding force, R represents an alkyl group containing from 7 to 21 carbon atoms, each of *l* and m is a numerical value from 1 to 20 and the sum of the numerical values of *l* and m is no greater than 24.

4,107,386

ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS BASED ON (METH)ACRYLIC ESTERS CONTAINING POLYCARBONATES TERMINATED BY (METH)ACRYLIC ESTER GROUPS

Werner Gruber, Düsseldorf-Gerresheim; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,386

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607959

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 428—412 **21 Claims**

1. An anaerobically setting adhesive and sealing composition comprising

A. a polymerizable portion consisting of (i) 10 to 90% by weight of (meth) acrylic acid esters of terminal hydroxy polycarbonates having at least two terminal hydroxyl groups, (ii) 10 to 40% by weight of cycloaliphatic, heterocyclic, or aliphatic (meth) acrylic acid esters, which are optionally substituted by free hydroxy groups, and (iii) optionally 0.1 to 5% by weight of additional polymerizable, unsaturated compounds,

B. 0.1 to 20% by weight of organic hydroperoxides, and

C. optionally 0.05 to 5.0% by weight of stabilizers and 0.1 to 5% by weight of accelerators.

4,107,387

RESISTANCE MATERIAL

Alexander Hendrik Boonstra, and Cornelis Adrianus H. A. Mutsaers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1977, Ser. No. 775,457

Claims priority, application Netherlands, Mar. 15, 1976, 7602663

Int. Cl.^{2} H01B *1/08*

U.S. Cl. 428—426 **13 Claims**

13. A resistance body comprising a substrate to which a resistance material is adhered consisting of a mixture of a glass binder and metal oxides with a resistance-determining component comprising a metal rhodate of the composition $Pb_3Rh_7O_{15}$.

4,107,388

METHOD FOR THE SURFACE TREATMENT OF GLASS BY LEACHING

Gian Paolo Gambaretto, Padua, and Vittorio Gottardi, Venice, both of Italy, assignors to Industrie Zignago S. Margherita S.p.A, Fossalta Di Portogruaro (Venice), Italy

Filed Feb. 9, 1977, Ser. No. 766,968

Claims priority, application Italy, Feb. 16, 1976, 20198 A/76

Int. Cl.^{2} C03C *15/00*

U.S. Cl. 428—428 **7 Claims**

1. A method of preparing a glass surface resistant to chemical attack which comprises contacting the glass surface with an air stream containing an equilibrium mixture of silicon tetrafluoride, silicon dioxide, hydrogen fluoride and water vapor at a temperature of from 400° to 700° C for a time sufficient to reduce the alkali content of said glass.

6. Glass surfaces and articles resistant to the chemical attack, prepared by the method of claim 1. having

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4,107,389

FUSING SURFACE FOR FIXING XEROGRAPHIC TONER

Richard J. Murphy, Norwood, Mass., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 497,411, Aug. 14, 1974, Pat. No. 4,000,339. This application Oct. 18, 1976, Ser. No. 733,685

Int. Cl.^{2} B32B *25/20;* **G03G** *15/20*

U.S. Cl. 428—447 **2 Claims**

1. A fuser member for an electrostatic copier comprising a substrate having coated thereon a water-degradable silicone rubber having substantially no reinforcing filler and containing a catalytic agent which promotes the degradation of the silicone rubber in the presence of moisture, the surface of said coating comprising the fluid degradaton product of the silicone rubber which is a release material for tackified resin powder.

4,107,390

RADIATION-CURABLE ORGANOPOLYSILOXANE COATING COMPOSITION COMPRISING MERCAPTOALKYL AND SILACYCLOPENTENYL RADICALS, METHOD OF COATING AND ARTICLE THEREFROM

David J. Gordon, Essexville, and Maris J. Ziemelis, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1977, Ser. No. 856,693

Int. Cl.^{2} B32B *9/04;* **B05D** *3/06*

U.S. Cl. 428—447 **15 Claims**

1. A radiation-curable polydiorganosiloxane composition obtained by mixing components consisting essentially of

(A) a triorganosiloxane-endblocked polydiorganosiloxane fluid having a viscosity of at least 0.5 pascal-seconds at 25° C., wherein from 50 to 99 percent of all organic radicals are methyl, from 1 to 5 percent of all organic radicals are mercaptoalkyl having the formula $—(CH_2)_nSH$, wherein n has a value of from 1 to 4 inclusive, any remaining organic radicals in (A) being phenyl radicals or alkyl radicals having from 2 to 6, inclusive, carbon atoms,

(B) a polymethylvinylsiloxane, compatible with (A) and having an average of at least three vinyl groups per molecule, and

(C) 1,1′-oxy-bis(1-methyl-1-silacyclopentene), the amounts of (A), (B), and (C) being sufficient to provide

(i) a total of from 0.2 to 2.0 silicon-bonded aliphatically-unsaturated radicals for every silicon-bonded mercaptoalkyl radical in the composition, and

(ii) a molar ratio of silicon-bonded vinyl radicals to 1-methyl-1-silacyclopentenyl radicals of from 0 to 1.0.

4,107,391

METHOD FOR MAKING THERMOFORMABLE COMPOSITES AND COMPOSITES MADE THEREBY

James E. Moore, Clifton Park, and Siegfried H. Schroeter, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 423,007, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 320,302, Jan. 2, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,612

Int. Cl.^{2} B05D *3/06*

U.S. Cl. 428—483 **12 Claims**

1. A substantially pollution-free method for making thermoformable or vacuum formable biaxially stretchable composites exhibiting a biaxial elongation in excess of 200% without failure said method comprising

(1) providing as a substrate, a biaxially stretchable thermoplastic sheet exhibiting biaxially elongation in excess of 200%

(2) coating said biaxially stretchable thermoplastic sheet with a resinous composition to a thickness of up to 5 mils and

(3) effecting the cure of the resinous composition with a source of UV irradiation having a wave length of between 1849A to 4000A, where the resinous composition is a member selected from the class consisting of a

(A) solventless polyester resin containing as essential ingredients

(a) aliphatic unsaturated organic monomer,

(b) an aliphatically unsaturated polyester soluble in (a), and having a MW of from about 2000 to 10,000 which is the reaction product of a $C_{(2-20)}$ glycol free of aliphatic unsaturation and an aliphatically unsaturated dicarboxylic acid mixture consisting essentially of

(i) α,β-aliphatically unsaturated dicarboxylic acid and an organic dicarboxylic acid selected from the class consisting of

(ii) organic dicarboxylic acid having $C_{(5-30)}$ divalent organic radicals between carbonyl radicals selected from aromatic radicals and cyclic radicals free of aromatic saturation,

(iii) linear saturated aliphatic dicarboxylic acid having 1–3 carbon atoms between carbonyl radicals,

(iv) linear saturated aliphatic dicarboxylic acid having at least 4 carbon atoms between carbonyl radicals and

(c) from 0.5% to 5% by weight based on the weight of (a), (b) and (c) of a UV sensitizer,

where the weight ratio of (a)/(b) has a value of 0.15 to 4 and based on the total moles of (i), (ii), (iii) and (iv) in the aliphatically unsaturated polyester, (i) is present at from 0.01 to 10 mole percent, (ii) is present at from 0 to 99 mole percent, (iii) is present at from 0 to 70 mole percent and (iv) is present at from 0 to 30 mole percent, and

(B) a curable acrylic resin which contains as essential ingredients

(d) methylmethacrylate,

(e) polymethylmethacrylate and

(f) from 0.05 to 5% by weight of (d), (d) and (f) of a UV sensitizer,

where (e) has an average MW of from 1000 to 50,000 and the weight ratio of (d)/(e) is from 0.5 to 1.5.

2. A method in accordance with claim 1, where the solventless organic resin is a mixture of styrene and an unsaturated polyester.

4,107,392

HIGH TEMPERATURE ABRASION-RESISTANT MATERIAL AND METHOD OF PRODUCING SAME

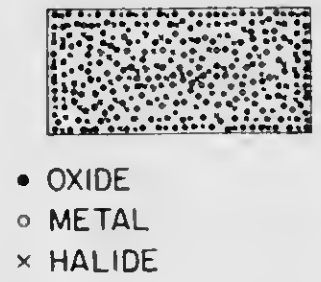
Hiroyuki Aoki, Yokohama; Hiroshi Takao, Kamakura, and Akira Oyamada, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 15, 1976, Ser. No. 750,622

Claims priority, application Japan, Dec. 25, 1975, 50-155485

Int. Cl.^{2} C22C *1/05*

U.S. Cl. 428—547 **19 Claims**



1. A high temperature abrasion-resistant material in the form of a sintered mass consisting essentially of at least one heavy metal oxide selected from the group consisting of NiO and CoO, at least one heavy metal selected from the group consisting of Ni and Co, said at least one heavy metal each being a constituent of at least one heavy metal oxide, and at least one halide of an alkaline earth metal selected from the group consisting of the fluorides, chlorides and bromides of Ca, Ba and Sr, the concentration of the total heavy metal oxide in the sintered mass being maximum at the surface of the mass and continuously decreasing as the depth from the surface increases, the concentration of the total heavy metal in the sintered mass being substantially zero at the surface of the mass and continuously increasing as the depth from the surface increases, the halide being uniformly distributed in the sintered mass.

4,107,393

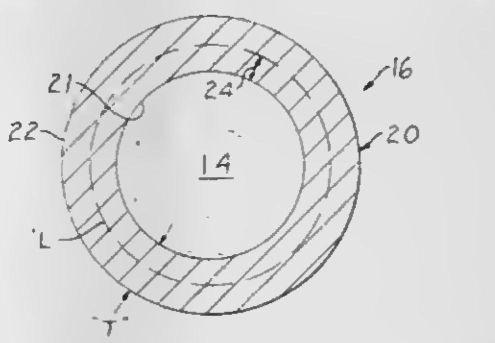
INOCULATION ARTICLE

John G. Frantzreb, Sr., and C. David Weiss, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 14, 1977, Ser. No. 777,387

Int. Cl.^{2} B22D *27/18;* **B32B** *15/00;* **C22C** *33/08*

U.S. Cl. 428—558 **4 Claims**



1. An inoculating article for treating a molten metal having a preselected temperature, comprising:

an elongated steel conduit having an internal surface, an external surface and a preselected thickness between said surfaces, said conduit having a melting temperature above said preselected temperature of the molten metal; and

an inoculating material positioned within said conduit, said material consisting essentially of ferrosilicon having a silicon content greater than about 75% by weight and being compacted within said conduit to at least 10% above the tapped density of said material, said ferro-silicon having a melting temperature below said preselected temperature of the molten metal, said silicon content being sufficient for diffusing silicon from said material into said internal surface of said conduit to a value sufficient for lowering the melting temperature of at least 30% of said preselected thickness of said conduit below said preselected temperature.

4,107,394

CORRUGATED SHEET METAL HEAT TRANSFER MEMBER

Rune Almen, Halmstad, Sweden, assignor to Sensotherm AB, Sandviken, Sweden

Filed Jan. 21, 1976, Ser. No. 650,952

Claims priority, application Sweden, Feb. 4, 1975, 7501204

Int. Cl.^{2} F28F *1/12*

U.S. Cl. 428—595 **3 Claims**

1. A sheet metal heat transfer member for providing air channels in a heating system or the like comprising a series of corrugations and one or more rows of recesses formed therein, each of said rows of recesses being for engagement with a tube, each of said corrugations having a first side, a crest, and a second side, each of said recesses having edges located in one of said first sides, one of said crests, and one of said second sides for establishing heat transmitting contact between said member and a tube to be assembled thereon.

4,107,395

OVERCHARGEABLE SEALED METAL OXIDE/LANTHANUM NICKEL HYDRIDE BATTERY

Gerrit van Ommering, Chevy Chase, and James D. Dunlop, Gaithersburg, both of Md., assignors to Communication Satellite Corporation, Washington, D.C.

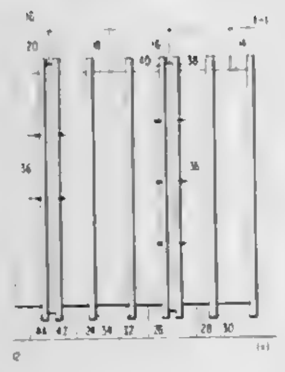
Filed Sep. 20, 1977, Ser. No. 834,946

Int. Cl.^{2} H01M *10/34*

U.S. Cl. 429—21 **17 Claims**

1. In a metal oxide-hydride electrode storage battery with an electrode stack having a metal oxide positive electrode and a lanthanum nickel hydride negative electrode, said positive and negative electrodes separated by separator means including separators of two widely different resistances to gas flow

disposed on opposite sides of said positive electrode, the improvement comprising an oxygen reduction catalytic electrode



disposed in said electrode stack adjacent said metal oxide electrode and held at the same potential as said negative hydride electrode.

4,107,396
METHOD AND APPARATUS FOR THE PRODUCTION OF HIGH OUTPUTS WITH HIGH CURRENT DENSITIES IN AN ELECTROCHEMICAL SYSTEM

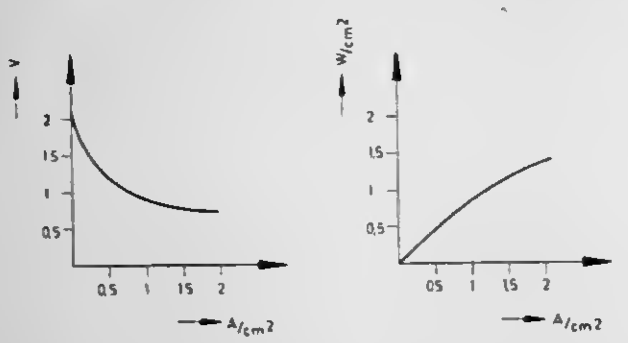
Jean Ruch, Brilon, Germany, assignor to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn, Cologne, Germany

Filed Aug. 1, 1977, Ser. No. 820,779

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635251

Int. Cl.² H01M *6/50*

U.S. Cl. 429—26 **18 Claims**



1. A method for the production of high outputs with high current densities in an electrochemical system of a metal-air-cell comprising a consumable electrode, an air electrode and electrolyte disposed between the electrodes, comprising the step of

controlling the heat occurring in the phase boundary interface of the electrode/electrolyte and the existing temperature, respectively, of the metal-air cell in the sense of a heating and/or cooling of the phase boundary interface such that the temperature thereat is substantially different from that of the entire cell.

4,107,397
ELECTRO-CHEMICAL CELLS

Jonathan Moubray Jenkins, Sevenoaks, and Kenneth Henson, Ramsbottom, both of England, assignors to Unigate Limited, London, England

Continuation of Ser. No. 500,763, Aug. 26, 1974. This application Jun. 1, 1976, Ser. No. 691,812

Claims priority, application United Kingdom, Aug. 24, 1973, 40299/73

Int. Cl.² H01M *4/96, 10/00*

U.S. Cl. 429—27 **3 Claims**

1. In a rechargeable zinc-halogen electric cell comprising:
(a) a casing;
(b) storage means external to said casing for storing molecular halogen;
(c) at least one halogen electrode structure located within said casing comprising an apertured substrate consisting essentially of an anodizable metal selected from the group consisting of Groups IV(A) and V(A) of the Periodic Table according to Mendeleef having an inherent oxide layer thereon, said substrate having permanently associated therewith at least one coherent permeable stratum of a mixture of substantially porous carbon and a polymeric binder, said electrode structure having been produced by pressing said mixture of porous carbon and binder at a pressure of at least 2 tons psi onto said substrate to provide said flexible halogen electrode structure, said halogen electrode structure being adapted to provide a space therein in communication with said external storage means for molecular halogen into and through which space molecular halogen can move;
(d) at least one metal bearing anode structure located within said casing including a zinc-containing material supported on an electrically conducting substrate; and
(e) positive and negative electric conductors leading from said electrode structures to terminals accessible to the outside of said casing; and casing being adapted to hold a body of liquid and flowable zinc halide electrolyte in contact with each of said electrode structures, the improvement comprising a separator between each halogen electrode structure and each anode structure, said separator permitting the passage of zinc and halogen ions therethrough but preventing the passage of halogen molecules, whereby diffusion of halogen molecules from said halogen electrode structures to said anodes is prevented and a pH differential between the anolyte and calholyte of 1–2 PH units is maintained.

4,107,398
GAS REMOVAL MEANS FOR STORAGE BATTERIES

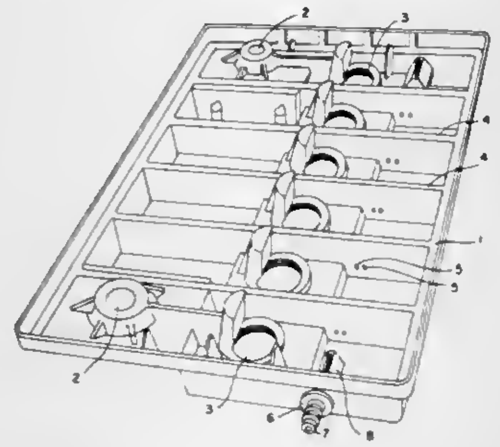
Hans-Georg Lindenberg, and Hans-Joachim Golz, both of Hanover, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 1, 1976, Ser. No. 737,619

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 7537737[U]

Int. Cl.² H01M *2/12*

U.S. Cl. 429—88 **6 Claims**



1. A housing for a block of cells which together constitute a storage battery, the housing providing for the block of cells a casing and a lid, at least one of which has internal partitions between the adjacent ones of the cells, the housing being characterized by

at least one aperture in each internal partition for the passage between cells of gas evolved in the storage battery, and

coupling means in the outer wall of an end cell for connecting hose means for evacuating the gas evolved in all the cells,

each aperture having a diameter of about 1.5 to 2.0 mm. that being such that evolved gas passage can readily take place without entraining excessive liquid fractions, whereas exchange of electrolyte in substantial quantities between cells is impeded,

the coupling means having a liquid separator means connected ahead of it, the liquid separator means including a chamber having a sloping bottom with a slot through which liquid entrained in the gases and separated from them in the chamber can flow back downward into the battery,

the slot being so dimensioned that during normal battery operation it retains a layer of the liquid which closes the slot, while permitting liquid to flow downwardly through the slot when additional liquid accumulates during greater-than-normal gas evolution.

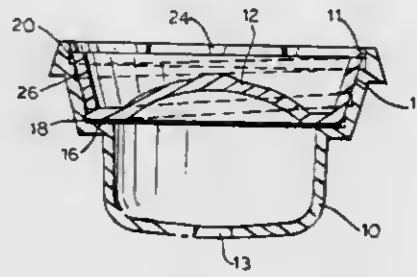
4,107,399
VENTED CAP FOR STORAGE BATTERY

Joseph Edmund Claxton, Aurora, Canada, assignor to Somerville Belkin Industries Limited, London, Canada

Filed Nov. 17, 1977, Ser. No. 852,461

Int. Cl.² H01M *2/12*

U.S. Cl. 429—89 **6 Claims**



1. A vented cap for a wet cell battery comprising:
a body adapted to form a closure for an opening of a wet cell battery and having an opening therethrough;
a cover for said body;
said cover nesting in said body over an interface;
said interface having a frustoconical portion that extends axially of said body;
a ventilation passage between said body and said cover through said cap, said ventilation passage having a devious flame arresting and gas ventilation section that extends across said interface, said devious flame arresting and gas ventilation section of said passage being defined by said body and said cover at said frustoconical portion of the interface and having a length to arrest passage of flame therethrough in use, and a cross-section large enough to provide ventilation for the battery cell;
said body and said cover having a clearance at said interface apart from said devious flame arresting and gas ventilation section small enough to retard the passage of flame.

4,107,400
BATTERY HATCH COVER

Raymond J. Grohoski, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 24, 1977, Ser. No. 809,575

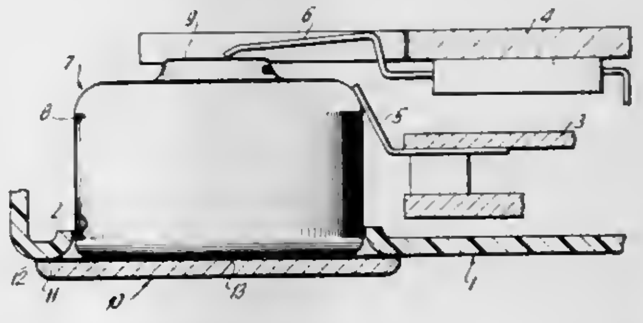
Int. Cl.² H01M *2/10*

U.S. Cl. 429—98 **5 Claims**

1. In a battery enclosure containing a battery and having a wall defining an opening therein for inserting at least one battery and having a pair of spring contacts therein connected to an electrically actuated device, the improvement comprising;

a hatch cover having a central portion for covering said opening and having peripheral edges overlapping portions of said enclosure wall,

a tacky adhesive disposed between the hatch cover peripheral edges and the overlapped enclosure wall portions, and



means on the hatch cover temporarily gripping said battery to facilitate removal of the battery from the enclosure when the hatch cover is removed.

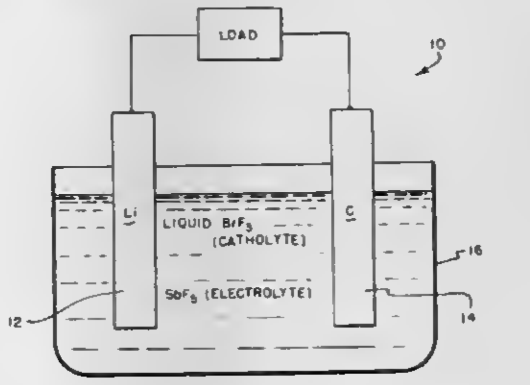
4,107,401
SUPER HIGH ENERGY DENSITY BATTERY

Forrest R. Goodson, Campbell; William H. Shipman, La Mesa, and Joseph F. McCartney, Solana Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1978, Ser. No. 871,877

Int. Cl.² H01M *6/14*

U.S. Cl. 429—101 **4 Claims**



1. In a battery the improvement comprising:
a lithium anode;
a catholyte solely of liquid bromine trifluoride; and
an electrolyte of antimony pentafluoride.

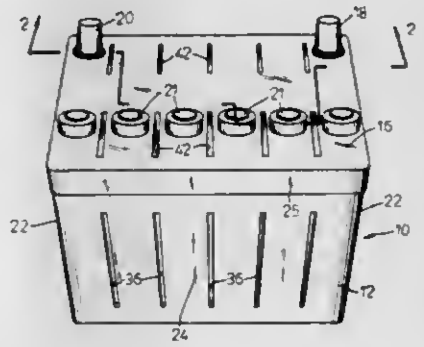
4,107,402
BATTERY AND BATTERY CONTAINER HAVING AIR-FLOW PASSAGES THERETHROUGH

Thomas John Dougherty, Waukesha; Roy Erving Hennen, Mequon, and John Ronald Pierson, Brookfield, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Sep. 22, 1977, Ser. No. 835,728

Int. Cl.² H01M *2/02*

U.S. Cl. 429—120 **8 Claims**



1. A one-piece molded thin-walled polymer battery con-

tainer comprising a plurality of unitary individual compartments therein integrally connected and for containing battery grids and electrolyte therein, and said container including opposed parallel spaced apart vertical end walls, vertical side walls joining said end walls, and pairs of mutually spaced apart partition walls extending between said side walls, transverse to said side walls and integrally joined with said side walls, each of said pairs of partition walls separating two adjacent compartments, and said pairs of partition walls each defining a narrow generally planar air-flow passage therebetween, and each of said partition walls having upper edges, and said partition walls forming each pair of partition walls being integrally joined adjacent a portion of their upper edges to form a single thickness partition wall portion, said air-flow passages including two spaced apart portions adjacent said upper edges and on opposite sides of said single partition wall portion.

4,107,403

ELECTROCHEMICAL CELL

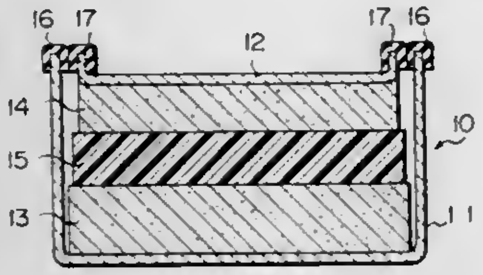
Tsutomu Takamura, Kawasaki, and Tamotsu Shirogami, Yamato, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 843,945

Claims priority, application Japan, Oct. 21, 1976, 51-125463

Int. Cl.^{2} H01M *2/08*

U.S. Cl. 429—174 **14 Claims**



1. An electrochemical cell comprising a sealed metallic container at least partially composed of an anode metal member and a cathode metal member with their respective edge portions; a power generating material contained in said metallic container; and insulating seal members formed over said respective edge portions, said insulating seal members including coating layers of thermoplastic resin containing a functional group with hydrogen bonding capability and formed on said respective edge portions of the metal members, sealing of said metallic container being achieved by heat-pressure bonding said seal members.

4,107,404

STABILIZATION OF LIASF$_6$/DIMETHYL SULFITE ELECTROLYTE SOLUTION

Robert J. Horning, Sellersville, and Walter B. Ebner, Hartsville, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 764,489, Jan. 31, 1977. This application Sep. 15, 1977, Ser. No. 833,401

Int. Cl.^{2} H01M *6/14*

U.S. Cl. 429—194 **3 Claims**

1. A process for stabilizing an electrolyte consisting essentially of a solution of lithium hexafluoroarsenate in dimethyl sulfite prior to contact with an anode and a cathode to produce an electrochemical cell, which comprises incorporating therein lithium metal in an effective amount to increase the storage stability of said solution.

4,107,405

ELECTRODE MATERIALS BASED ON LANTHANUM AND NICKEL, AND ELECTROCHEMICAL USES OF SUCH MATERIALS

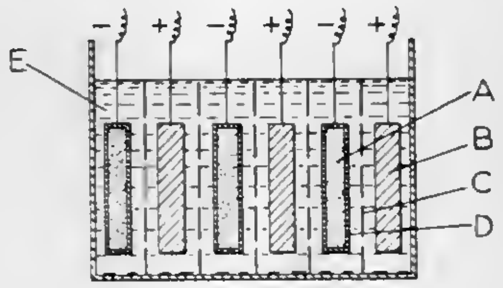
Annick Percheron born Guegen, Paris; Jean Claude Achard, Kremlin-Bicetre; Jean Loriers, Meudon; Maurice Bonnemay, Boulogne-Billancourt; Guy Bronoél, Versailles; Joél Sarradin, Elancourt, and Louis Schlapbach, Versailes, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed May 21, 1976, Ser. No. 688,537

Claims priority, application France, May 23, 1975, 75 16160

Int. Cl.^{2} H01M *10/24*

U.S. Cl. 429—218 **38 Claims**



1. An electrochemical energy accumulator of the alkaline electrolyte type including a negative electrode based on lanthanum and nickel, said negative electrode comprising an alloy corresponding substantially to the formula $LaNi_5$ in which one of the components La and Ni is partially substituted by a metal M selected from those in groups I*a*, II, III, IV and V*a* of the periodic table of elements and other than lanthanides, in an atomic proportion which is higher than 0.1% and lower than 25%.

4,107,406

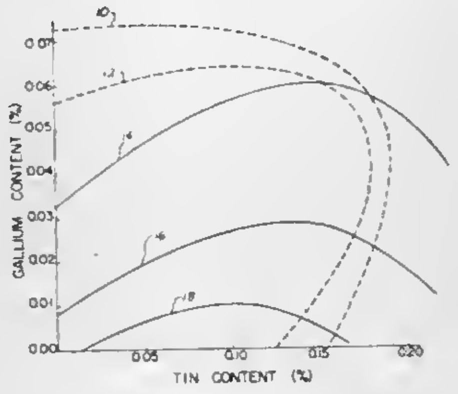
ALUMINUM ALLOY FOR PRIMARY ALKALINE FUEL CELLS AND BATTERIES

James R. Moden, Barrington, and George Perkons, Newport, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1977, Ser. No. 809,599

Int. Cl.^{2} H01M *4/58*

U.S. Cl. 429—218 **4 Claims**



1. An anode for a primary electrochemical energy source consisting essentially of 0.001 to 0.072 percent by weight of gallium, 0.5 to 1.2 percent by weight of magnesium and the balance of aluminum having an initial purity of at least 99.997 percent.

4,107,407

BATTERY AND GRID FOR POSITIVE ELECTRODE FOR LEAD STORAGE BATTERIES

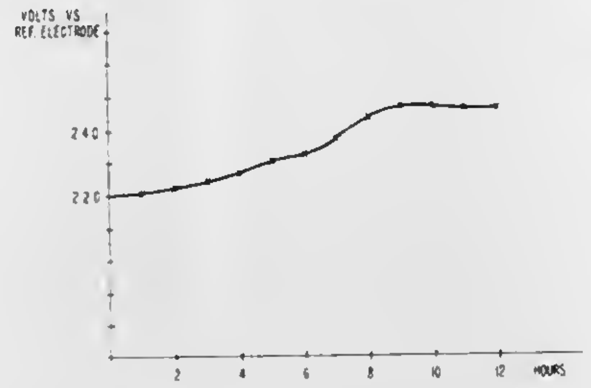
Kjell Koch, Kungälv, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Feb. 25, 1977, Ser. No. 771,975

Claims priority, application Sweden, Feb. 27, 1976, 76025956

Int. Cl.^{2} H01M *4/56*

U.S. Cl. 429—225 **10 Claims**



1. A grid for a positive electrode for electrical storage battery also including a negative electrode comprising a base of lead or a lead alloy which is essentially free from antimony coated on at least all surfaces which contact active material in the finished electrode with an alloy of lead and from 3 to 95 percent antimony, the amount of antimony being 2 percent or less by weight of the active material utilized in the finished electrode whereby the resulting grid achieves charging potentials of the same magnitude as those achieved with grids formed of lead alloys containing 6 to 12 weight percent antimony while minimizing the possibility of antimony poisoning of a negative electrode.

4,107,408

ACRYLONITRILE COPOLYMERS FOR CARBON FIBERS

Victor Conrad Richard McLoughlin, Farnborough; Roger Moreton, Aldershot, and William Watt, Farnborough, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 22, 1976, Ser. No. 735,122

Claims priority, application United Kingdom, Oct. 24, 1975, 43828/75

Int. Cl.^{2} C08F *220/44*

U.S. Cl. 526—8 **3 Claims**

1. An acrylonitrile copolymer suitable for use as a precurosr in the production of carbon fibers which copolymer contains at least one non-acrylonitrile moiety selected from a carbonyl group and two carbon moieties containing a carbonyl group in the polymer backbone, the non-acrylonitrile moiety being present to the extent of about 5 to about 16 molar parts per 100 molar parts of acrylonitrile moiety.

4,107,409

METHOD OF PRODUCING POLYMERS OF HIGH MOLECULAR WEIGHT BY THE TWO-PHASE INTERFACIAL METHOD

Otto Szabolcs, and Hans Schüller, both of Vienna, Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

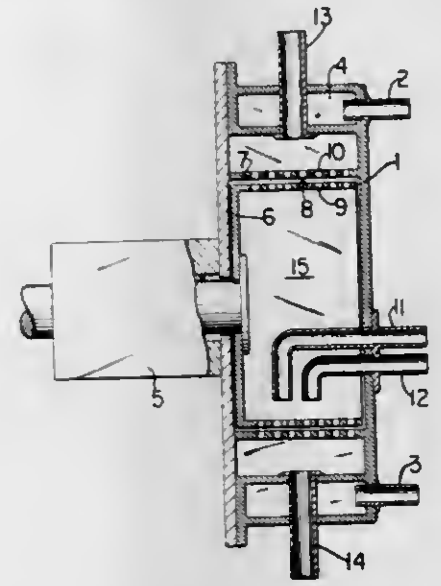
Filed Jun. 27, 1977, Ser. No. 810,083

Claims priority, application Austria, Jun. 29, 1976, 4764/76

Int. Cl.^{2} C08F *2/00*

U.S. Cl. 526—65 **5 Claims**

1. A process of producing polymers of high molecular weight by the two-phase interfacial method, wherein for the purpose of effecting the polymerization an intimate mixture of two liquid phases which are not miscible with one another is formed, each phase containing at least one reactant, comprising bringing the two liquid phases into contact with one another in a predetermined quantitative ratio to one another and passing the resulting mixture through one mixing stage or a plurality of serially connected mixing stages, said resulting mixture being thereby divided into a plurality of partial streams in each mixing stage, and causing said partial streams together with their flow boundaries to move transversely to their main directions of flow at mean speeds higher than 5 meters per second from a reactor antechamber and to pass into a mixing chamber which has inlet apertures for passage of said streams and their flow boundaries and one or more outlet ducts, in which mixing chamber the kinetic energy of the mixture is reduced to a value which is low in relation to its previously attained highest value and the portions of the mixture flowing in said mixing chamber are subjected to flow conditions which substantially vary at least periodically.



4,107,410

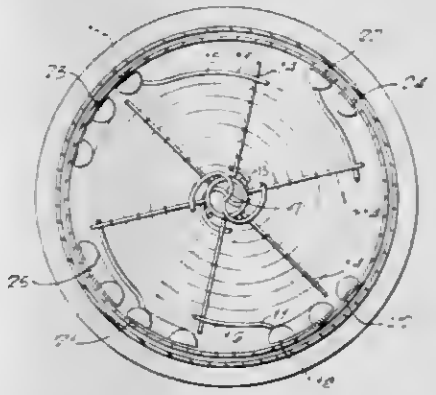
POLYMERIZATION COLUMN AND METHOD OF POLYMERIZING VINYLIDENE COMPOUNDS

Barna Toekes, Athol, Mass., assignor to Polysar Resins, Inc., Leominster, Mass.

Filed Apr. 22, 1977, Ser. No. 790,031

Int. Cl.^{2} C08F *2/02, 2/04, 2/12, 12/06*

U.S. Cl. 526—73 **12 Claims**



1. A polymerization column for polymerizing a monomeric vinylidene compound comprising a casing defining within it a polymerization chamber, a heat exchange means contained within the chamber, the heat exchange means comprising a series of heat exchange tubes which are spaced apart vertically of the chamber and each tube having a tube inlet and a tube outlet, a fluid ingoing tube length extending across the chamber in one directional sense from the tube inlet and a fluid return tube length which extends across the chamber in the opposite directional sense from the ingoing tube length to the tube outlet, and both tube lengths being in the form of wind-

ings to provide laterally spaced portions of each tube length with portions of one tube length being disposed laterally between spaced portions of the other tube length when considered in a radial plane of the chamber, and means to control the temperature of each tube.

4,107,411
METHOD OF PREPARING SALTS OF POLY-ALPHA-HYDROXYACRYLIC ACID

Julien Mulders, Dworp, and Jacques Gilain, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 489,718, Jul. 18, 1974, abandoned. This application Oct. 15, 1975, Ser. No. 622,503

Claims priority, application Luxembourg, Jul. 18, 1973, 68037

Int. Cl.^{2} C08F *2/10, 120/06*

U.S. Cl. 526—75 24 Claims

1. A process for preparing water-soluble salts of poly-α-hydroxyacrylic acid or its alkyl derivatives, comprising:
   (a) thermally dehydrochlorinating, in the gas phase in the presence of a catalyst, α,β-dichloro-propionic acid, or its alkyl derivatives, to the corresponding α-chloro-acrylic acid;
   (b) polymerizing the resulting α-chloro-acrylic acid in water in the presence of a free radical polymerization catalyst to obtain a solid product; and
   (c) neutralizing the solid product with an aqueous solution of an alkali metal hydroxide or ammonium hydroxide.

4,107,412
OLEFIN POLYMERIZATION PROCESS AND CATALYST THEREFOR

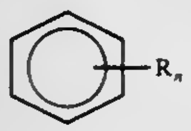
M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 24, 1976, Ser. No. 744,896

Int. Cl.^{2} C08F *4/02, 10/06*

U.S. Cl. 526—114 9 Claims

1. A process which comprises polymerizing at least one aliphatic monoolefin having from 2 to 8 carbon atoms and no chain branching, at a polymerization temperature, with a catalyst system active for such polymerization consisting of:
   A. a first component formed of a co-comminuted mixture of
      (1) a halogenated divalent, trivalent or tetravalent titanium compound selected from the group consisting of the chlorides, bromides and iodides thereof;
      (2) a Lewis base;
      (3) a dihalide of a divalent metal selected from the group consisting of magnesium and manganese, chlorides, bromides and iodides; and
      (4) an aromatic compound which is normally liquid at about 25° C selected from the group consisting of aromatic compounds having the formula



wherein R is an alkyl group having 1 to 4 carbon atoms and n is an integer having a value of 0 to 4, and halogenated derivatives thereof;
   B. a second component consisting of
      1. at least one trialkylaluminum compound of the formula AlR'''_3, wherein R''' is an alkyl group having from 1 to 12 carbon atoms; and
      2. a Lewis base; and
   C. an optional third component which is a dialkylaluminum halide of the formula AlR^{iv}_2X, wherein R^{iv} is an alkyl group having from 1 to 12 carbon atoms and X is a halide selected from the group consisting of chloride, bromide and iodide,

wherein the molar ratio of said halogenated titanium compound to said Lewis base is in the range of about 0.7:1 to about 1.6:1, said first component containing from 1 to 35 weight percent of said titanium compound, from 1 to 50 weight percent of said Lewis base, from 1 to 65 weight percent of said dihalide of magnesium or manganese and from 1 to 25 weight percent of said aromatic compound.

4,107,413
PROCESS FOR THE STEREOREGULAR POLYMERIZATION OF ALPHA OLEFINS

Umberto Giannini; Antonio Cassata; Paolo Longi, all of Milan, and Romano Mazzocchi, Pernate (Novara), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 503,765, Sep. 6, 1974, abandoned, and Ser. No. 503,963, Sep. 6, 1974, abandoned, which is a continuation of Ser. No. 265,438, Jun. 23, 1972, abandoned, said Ser. No. 503,765, is a continuation of Ser. No. 265,503, Jun. 23, 1972, abandoned. This application Mar. 21, 1977, Ser. No. 779,739

Claims priority, application Italy, Jun. 25, 1971, 26275 A/71

Int. Cl.^{2} C08F *4/02, 10/06*

U.S. Cl. 526—114 34 Claims

1. Process for the stereoregular polymerization of alpha-olefins of the formula $CH_2 = CHR$ wherein R is an alkyl radical having 1–6 carbon atoms and mixtures thereof with ethylene, which process comprises polymerizing the olefins in contact with a catalyst the starting catalyst-forming components of which comprise the following components (A) and (B):
   (A) the addition and/or substitution reaction product of an electron-donor compound (or Lewis base) free from ester groups of oxygenated organic and inorganic acids with an Al-trialkyl compound or the addition reaction product of said electron-donor compound with an Al-alkyl compound containing two or more Al atoms linked together through an oxygen or a nitrogen atom, component (A) being characterized in that the amount of Al-alkyl compound present as addition compound with the electron-donor compound ranges from 0.01 to 1 mole per mole of the starting Al compound and in that the Al-compound present as substitution compound ranges from 0.01 to 0.9 moles per mole of the starting Al-compound; and
   (B) the product obtained by contacting a Ti compound selected from the group consisting of the halogenated bi-, tri-, and tetravalent Ti compounds and complexes of said Ti compounds with an electron-donor compound, with a support comprising an anhydrous Mg or Mn bihalide in an active state such that the X-rays powder spectrum of component (B) does not show the most intense diffraction lines as they appear in the X-rays powder spectrum of normal non-activated Mg or Mn bihalides, the X-rays powder spectrum of component (B) showing a broadening of said most intense diffraction lines, component (B) being further characterized in that the Ti compound present therein, expressed as Ti metal, is less than 0.3 g atom per mole of the total amount of the electron-donor compound present in a combined form in the catalyst and the catalyst being additionally characterized in that the Al/Ti molar ratio is from 10 to 1,000.

4,107,414
PROCESS FOR THE STEREOREGULAR POLYMERIZATION OF ALPHA OLEFINS

Umberto Giannini; Antonio Cassata; Paolo Longi, and Romano Mazzocchi, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 503,766, Sep. 6, 1974, abandoned, which is a continuation of Ser. No. 265,455, Jun. 23, 1972, abandoned. This application May 18, 1977, Ser. No. 798,151

Claims priority, application Italy, Jun. 25, 1971, 26275 A/71

Int. Cl.^{2} C08F *4/02, 10/06*

U.S. Cl. 526—114 37 Claims

1. Process for the stereoregular polymerization of alpha-olefins of the formula $CH_2 = CHR$ wherein R is an alkyl radical having 1–6 carbon atoms and mixtures thereof with ethylene,

which process comprises polymerizing the olefins in contact with a catalyst the starting catalyst-forming components of which comprise:
   (a) an addition and/or substitution reaction product of an electron-donor compound (or Lewis base) selected from the group consisting of an ester of an oxygenated organic or inorganic acid with an Al-trialkyl compound or with an Al-alkyl compound containing two or more Al atoms linked together through an oxygen or a nitrogen atom, the amount of Al-alkyl compound contained in a combined form with the ester in catalyst-forming component (a) being from 0.05 to 1.0 mole per mole of the starting Al-compound; and
   (b) the product obtained by contacting a Ti compound selected from the group consisting of halogenated bi-, tri-, and tetravalent Ti compounds and complexes of said Ti compounds with an electron-donor compound, with a support which comprises, as the essential support material thereof, an anhydrous bihalide of Mg or Mn in an active state such that the X-rays powder spectrum of component (b) does not show the most intense diffraction lines as they appear in the X-rays powder spectrum of normal, nonactivated Mg or Mn bihalide, the X-rays powder spectrum of component (b) showing a broadening of said most intense diffraction lines, and component (b) being further characterized in that the amount of Ti compound present therein, expressed as Ti metal, is less than 0.3 g-atom per mole of the total amount of the electron-donor compound present in a combined form in the catalyst and the catalyst being additionally characterized in that the Al/Ti molar ratio is from 10 to 1,000.

4,107,415
PROCESS FOR THE STEREOSPECIFIC POLYMERIZATION OF ALPHA-OLEFINS

Umberto Giannini; Antonio Cassata; Paolo Longi, and Romano Mazzocchi, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 583,169, Jun. 3, 1975, abandoned, which is a continuation of Ser. No. 400,515, Sep. 25, 1973, abandoned. This application Mar. 18, 1977, Ser. No. 778,963

Claims priority, application Italy, Sep. 26, 1972, 29676 A/72

Int. Cl.^{2} C08F *4/02, 10/06*

U.S. Cl. 526—114 13 Claims

1. In the process for the stereoregular polymerization of alpha-olefins of the formula $CH_2 = CHR$, in which R is an alkyl radical containing from 1 to 6 carbon atoms, which process comprises polymerizing the alpha-olefins in contact with a catalyst prepared by mixing
   (a) a catalyst-forming component which is the addition and/or substitution product of an electron-donor compound (or a Lewis base) with an aluminum trialkyl, or the addition product of an electron-donor compound with an alkyl aluminum compound containing two or more aluminum atoms bound to one another through an oxygen or nitrogen atom, component (a) being characterized in that the organic aluminum compound combined with the electron-donor compound is comprised in the range from 0.01 to 1.0 mole per mole of the starting aluminum compound; with
   (b) a supported catalyst-forming component which is the product obtained by contacting a substance selected from the group consisting of bi-, tri- and tetravalent titanium compounds selected from the group consisting of
   $TiCl_4$;
   $TiCl_3$;
   TiI_4;
   $Ti(OC_3H_7)Cl_3$;
   $Ti(OC_4H_9)_2Cl_2$;
   3 $TiCL_3$. $AlCl_3$;
   $Ti[O—C(CH_3)=CH—CO—CH_3]_2Cl_2$;
   $Ti[N(C_2H_5)_2]Cl_3$;
   $Ti[N(C_6H_5)_2]Cl_3$;
   $Ti(C_6H_5COO)Cl_3$;
   $[N(C_4H_9)_4]_2TiCl_6$;
   $[N(CH_3)_4]Ti_2Cl_9$;
   $TiBr_4$;
   $TiCl_3OSO_2C_6H_5$; and
   $LiTi\ (OC_3H_7)_2Cl_3$,
   and addition compounds of such titanium compounds with an electron-donor, with a carrier consisting of an anhydrous active magnesium or manganese dihalide both the carrier and component (b) being characterized by having a surface area larger than 3 m^2/g, or component (b) being characterized in thsat its X-rays powder spectrum does not show the diffraction lines which are most intense in the X-rays powder spectrum of the normal, non-active Mg or Mn dihalide, component (b) being further characterized in that the amount of Ti-compound present, expressed as Ti-metal, is less than 0.3 g-atoms per mole of the total amount of electrondonor compound present in combined form in the catalyst,

the improvement consisting of adding, to the anhydrous Mg or Mn dihalide, a solid organic co-carrier selected from the group consisting of durene, anthracene, hexachlorobenzene, p-dichlorobenzene, acenaphthene, naphthalene and diphenyl, in an amount of from 10% to 90% by weight based on the combined weights of the Mg or Mn dihalide and said solid organic co-carrier.

4,107,416
COMPONENTS OF CATALYSTS FOR USE IN POLYMERIZING AND CATALYSTS PREPARED THEREFROM

Umberto Giannini, Milan; Enrico Albizzati, Arona (Novara), and Sandro Parodi, Oleggio (Novara), all of Italy, assignors to Montedison S.p.A., Milan, Italy

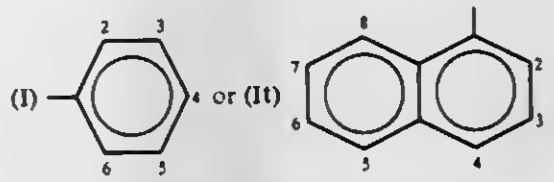
Filed Jul. 8, 1976, Ser. No. 703,546

Claims priority, application Italy, Jul. 9, 1975, 25217 A/75

Int. Cl.^{2} C08F *4/02, 10/00*

U.S. Cl. 526—114 7 Claims

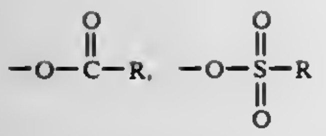
1. Catalysts for polymerizing olefins, prepared from the catalyst-forming components
   (A) at least one organometallic compound of Al selected from the group consisting of R_2AlOR'' and $RAl(OR'')_2$ in which R is an alkyl group containing from 1 to 12 carbon atoms inclusive, and R'' corresponds to one of the following structures



   wherein in positions 2 and 6 in structure (I) and position 2, optionally also in position 8, in structure (II) there are present radicals selected from the group consisting of alkyl, aryl and alkylaryl radicals at least one of which exerts a steric hindrance higher than that of the group $—C_2H_5$, and
   (B) a complex of a transition metal having the formula:

$$M_mM'X_{2m}Y.nE$$

wherein:
M is Mg, Mn and/or Ca;
m is a number from 0.5 to 2, inclusive;
M' is Ti, V and/or Zr;
X is Cl, Br or I;
Y is one or more atoms or groups, the same or different, and selected from the group consisting of halogen atoms, halogen atoms and, contemporaneously, oxygen atoms; $—NR_2$, $—OR$, $—SR$,



$$-O-\overset{\overset{\large O}{\|}}{C}-R,\quad -O-\overset{\overset{\large O}{\|}}{\underset{\underset{\large O}{\|}}{S}}-R$$

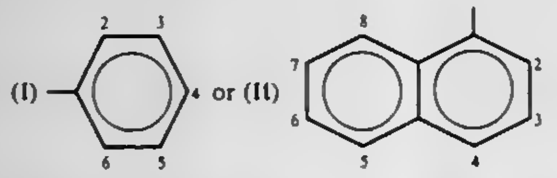
groups in which R is a hydrocarbon radical; acetylacetonate anion, acetylacetonate anion and, contemporaneously oxygen atoms; such groups or atoms being present in an amount to satisfy the valence of M';

n is a number from 0.5 *m* to 20 *m*, inclusive;

E is an electron-donor compound selected from the group consisting of
- (a) esters of organic carboxylic acids;
- (b) alcohols;
- (c) ethers;
- (d) amines;
- (e) esters of carbonic acid;
- (f) nitriles; and
- (g) phosphorous oxychloride and esters of phosphorous acid.

6. Catalysts for polymerizing olefins prepared from the catalyst-forming components:

(A) at least one organometallic compound of Al selected from the group consisting of R_2AlOR'' and $RAl(OR'')_2$ in which R is an alkyl group containing from 1 to 12 carbon atoms inclusive, and R'' corresponds to one of the following structures



wherein in positions 2 and 6 in structure (I) and position 2, optionally also in position 8, in structure (II) there are present radicals selected from the group consisting of alkyl, aryl and alkylaryl radicals at least one of which exerts a steric hindrance higher than that of the group $-C_2H_5$, and

(B) a solid component consisting of a transition metal, magnesium and a halogen selected from the group consisting of chlorine and bromine, said component being characterized in having a surface area higher than 3 m^2/g and/or in having an X-rays spectrum comprising a halo the intensity peak of which is at a lattice distance *d* comprised between 2.43 A and 3.20 A when the halogen is chlorine and present in said catalyst-forming component in a Cl/Mg ratio $\geqq 1$, and between 2.80 A and 3.25 A when the halogen is bromine and present in said catalyst-forming component in a Br/Mg ratio $\geqq 1$.

4,107,417
PROCESS FOR THE PRODUCTION OF POLYMERS AND COPOLYMERS OF ISOBUTYLENE

Aldo Priola; Sebastiano Cesca, and Giuseppe Ferraris, all of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Continuation of Ser. No. 307,498, Nov. 17, 1972, abandoned.
This application Sep. 6, 1974, Ser. No. 503,600
Claims priority, application Italy, Nov. 26, 1971, 31726 A/71
Int. Cl.² C08F *4/64, 4/60, 210/12, 236/04*

U.S. Cl. 526—117 **5 Claims**

1. Process for the production of butyl rubber through the copolymerization of isobutylene and isoprene wherein the improvement comprises conducting the copolymerization reaction in the presence of a catalyst system consisting essentially of:

(a) a compound selected from $AlEtCl_2$, $TiCl_4$, $Al_2Et_3Cl_3$, $SbCl_5$, $FeCl_3$, $ZrCl_4$, AlI_3, $GaCl_2$; and

(b) a compound able to react with the above mentioned ones chosen from SrR_4, $TiX_2(OR)_2$, $Ti(OR)_4$, PbR_4, $Ti(OR)X_3$, $Ti(OR)_3X$, $(C_5H_5)_2Ti(C_6H_5)_2$, $(C_5H_5)_2\ Ti(CH_3)_2$, $Ti(Acac)_4$, in which R is a hydrocarbon radical with from 1 to 10 carbon atoms; and X is an atom of halogen.

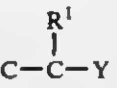
4,107,418
PROCESS FOR PREPARING COPOLYMERS

Tadao Yatsu, and Hiroshi Wakumoto, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Sep. 13, 1976, Ser. No. 722,499
Claims priority, application Japan, Sep. 18, 1975, 50-112170
Int. Cl.² C08F *4/28, 4/32, 4/34, 4/36*

U.S. Cl. 526—184 **4 Claims**

1. A process for preparing copolymers which comprises copolymerizing (a) at least one monomer selected from the group consisting of monoolefins, non-conjugated polyenes, conjugated polyenes, baloolefins, unsaturated esters of carboxylic acids and unsaturated ethers with (b) an acrylic monomer of the following formula



$$H_2C-\overset{\overset{\large R^1}{|}}{C}-Y$$

wherein R^1 is a member selected from the group consisting of a hydrogen atom, a halogen atom, a cyanide group, alkyl groups and aryl groups, and Y is a member selected from the group consisting of $-CN$, $-COR^2$, $-COOR^3$ and $-CONR^4R^5$ in which each of R^2, R^4 and R^5 is a hydrogen atom, or an alkyl, aryl or cycloalkyl group, and R^3 is an alkyl, aryl or cycloalkyl group or a monovalent metal, at a molar ratio of monomer (a) to monomer (b) of 1: to about 0.2 - 5, at a temperature ranging from about 0° C. to a point about 10° C, higher than the glass transition point of the resulting copolymer, with stirring, in the presence of a catalyst composed of (A) a component selected from the group consisting of (i) organoaluminum halides of the following formula

$$AlR_n^{\,6}X_{3-n}$$

wherein R^6 is an alkyl, alkenyl, aryl, aralkyl or cycloalkyl group, X is a halogen atom, and n is a number of more than 0 but less than 3, and (ii) complexes formed between said halides (i) and organic polar compounds, and (B) an organic peroxide, in a poor solvent of a saturated hydrocarbon for the resulting copolymer, the amount of the poor solvent being about 0.5 to about 100 times the total amount of the monomers (a) and (b), wherein the copolymerization reaction is preformed while,

(I) adding the monomers (a) and (b) to the reaction system so that the total amount of the monomers (a) and (b) remaining unreacted in the reaction system is sufficient to maintain the system in the slurried state under the reaction conditions wherein said monomers unreacted are not more than about 2.5 moles per liter of the poor solvent used, and

(II) adding small portions of either one or both of the catalyst components (A) and (B) continuously or intermittently to the reaction system with the proviso that when only one of the catalyst components is added in small portions to the reaction system, the other catalyst component is added in its entirety to the reaction system before feeding the small portions of the other catalyst component,

(III) the amount of the catalyst component (A) being about 1/1,000,000 to about 1 mole, calculated as the organoaluminum halide (i) per mole of the monomers (a) and (b) combined and the amount of the catalyst component (B) being about 1/100 to about 100 moles per mole of the organoaluminum halide (i) in the catalyst component (A).

4,107,419
ALPHA HALO SUBSTITUTED ASYMMETRICAL DIACYL PEROXIDES IN CO-INITIATOR SYSTEMS

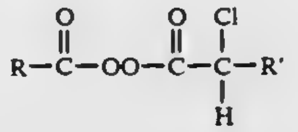
Ronald L. Friedman, deceased, late of San Rafael, Calif. (by Patty R. Friedman, executor), and Roger N. Lewis, Martinez, Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 739,416, Nov. 8, 1976. This application Mar. 4, 1977, Ser. No. 774,289
Int. Cl.² C08F *4/38, 14/06, 214/06*

U.S. Cl. 526—228 **18 Claims**

1. In the polymerization and copolymerization of vinyl chloride, polymerization of ethylene and polymerization of acrylates by subjecting said monomers and comonomers to polymerization conditions in the presence of an initiating amount of an organic peroxide, the improvement wherein said organic peroxide is a coinitiator composition comprising:

(a) an alpha halo substituted diacyl peroxide of the structure

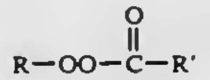


$$R-\overset{\overset{\large O}{\|}}{C}-OO-\overset{\overset{\large O}{\|}}{C}-\overset{\overset{\large Cl}{|}}{\underset{\underset{\large H}{|}}{C}}-R'$$

where R = alkyl group of 1-11 carbon atoms
and R' = alkyl group of 2-10 carbon atoms;
and

(b) a coperoxide selected from

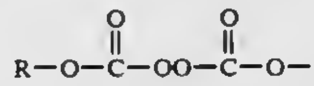
(1) t-alkyl peresters of t-hydroperoxides of the structure



$$R-OO-\overset{\overset{\large O}{\|}}{C}-R'$$

where R = t-alkyl of 4-20 carbon atoms
and R' = t-alkyl of 4-20 carbon atoms

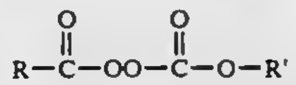
(2) peroxydicarbonates of the structure



$$R-O-\overset{\overset{\large O}{\|}}{C}-OO-\overset{\overset{\large O}{\|}}{C}-O-R$$

where each R — alkyl or cycloalkyl of 1-18 carbon atoms

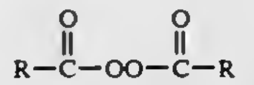
(3) acyl peroxycarbonic esters of the structure



$$R-\overset{\overset{\large O}{\|}}{C}-OO-\overset{\overset{\large O}{\|}}{C}-O-R'$$

where R = alkyl or aryl of 1-11 carbon atoms
and R' = alkyl or 1-18 carbon atoms

(4) aliphatic diacyl peroxides of the structure



$$R-\overset{\overset{\large O}{\|}}{C}-OO-\overset{\overset{\large O}{\|}}{C}-R$$

where each R = alkyl of 2-11 carbon atoms, wherein the weight ratio of alpha halo substituted diacyl peroxide to coperoxide is about 3:1 to 1:3.

4,107,420
PROCESS FOR THE PREPARATION OF TERPENE-MALEIC ANHYDRIDE ADDUCTS

Robert William Schluenz, and Curry Beach Davis, both of Panama City, Fla., assignors to Arizona Chemical Company, Wayne, N.J.

Division of Ser. No. 678,082, Apr. 19, 1976, Pat. No. 4,046,748. This application Apr. 18, 1977, Ser. No. 788,173
Int. Cl.² C08F *4/00, 222/04, 236/00*

U.S. Cl. 526—237 **7 Claims**

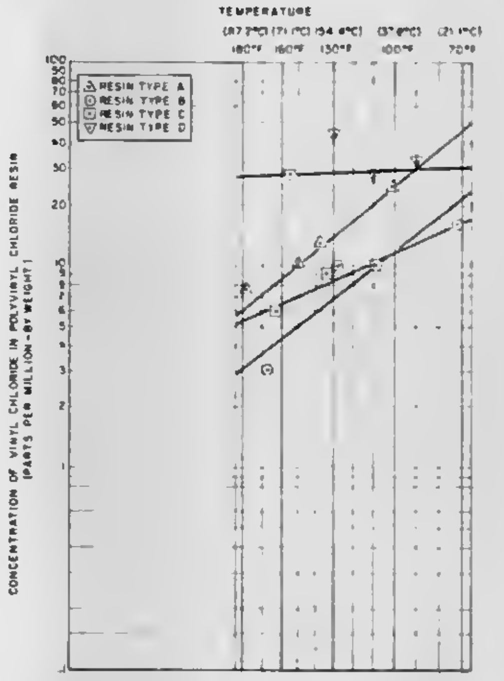
1. A process for preparing maleic anhydride adduct from non-conjugated terpenes which comprises: reacting at temperatures between 140° C. and 200° C. substantially equimolar amounts of (a) a non-conjugated terpene or mixed non-conjugated terpenes and (b) maleic acid anhydride in the presence of from 0.002% to 0.03% iodine, based on the weight of the terpene, and recovering a mixture of less than 85% mono-adduct and more than 15% di-adduct of terpene maleic adducts.

4,107,421
REMOVAL OF VINYL HALIDE FROM POLYVINYL HALIDE

John F. Scamehorn, and David V. Porchey, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 13, 1976, Ser. No. 714,058
Int. Cl.² C08F *6/24, 6/00*

U.S. Cl. 528—483 **6 Claims**



1. A method of reducing the vinyl halide content of polyvinyl halide, in particle form, containing, vinyl halide, to a preselected level, wherein the method comprises:

(a) determining the threshold temperature corresponding to said preselected level of vinyl halide, and

(b) purging the polyvinyl halide containing vinyl halide, with an inert gas heated to a temperature of at least the determined threshold temperature until the vinyl halide content of the polyvinyl halide reaches said preselected level.

4,107,422
SOLVENT REMOVAL FROM POLYMER SOLUTIONS

Emigdio J. Salmon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1977, Ser. No. 764,928
Int. Cl.² C08F *6/12, 6/10*

U.S. Cl. 528—502 **8 Claims**

1. In a process for removing solvent from a liquid mixture of polymer and solvent in which a liquid mixture is introduced into a devolatilizing extruder operated to volatilize at least a portion of the solvent in the liquid mixture in the extruder with cooling of the liquid mixture by circulating a cooling fluid in contact with the extruder barrel and removal of solvent vapor and at least partly devolatilized polymer from the extruder, the improvement of: controlling the surging of a motor driving the extruder by the amount of cooling of the liquid mixture.

4,107,423
PROCESS FOR PREPARING DAUNOMYCIN AND ANALOGUES THEREOF

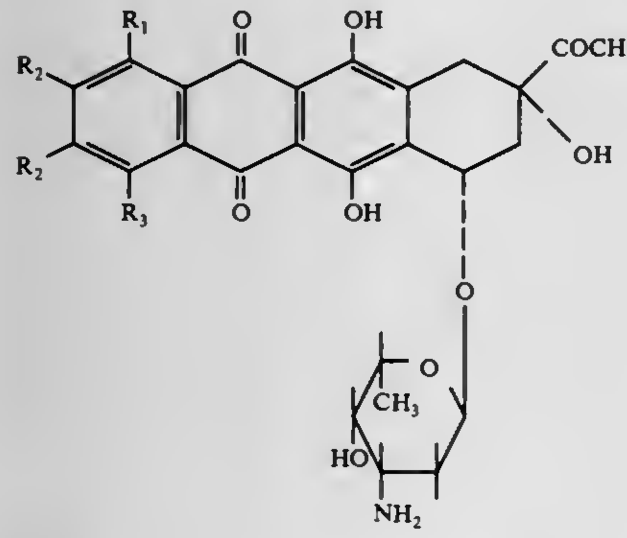
Federico Arcamone; Luigi Bernardi; Bianca Patelli, and Sergio Penco, all of Milan, Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

Filed Aug. 14, 1976, Ser. No. 695,434

Int. Cl.² C07H *15/24*

U.S. Cl. 536—4 **5 Claims**

1. A process for preparing a compound of formula I



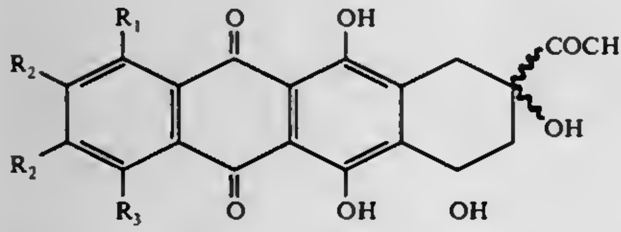
I

wherein

(a) R_2 is hydrogen and R_1 and R_3 are both methyl, methoxy, chlorine or bromine;

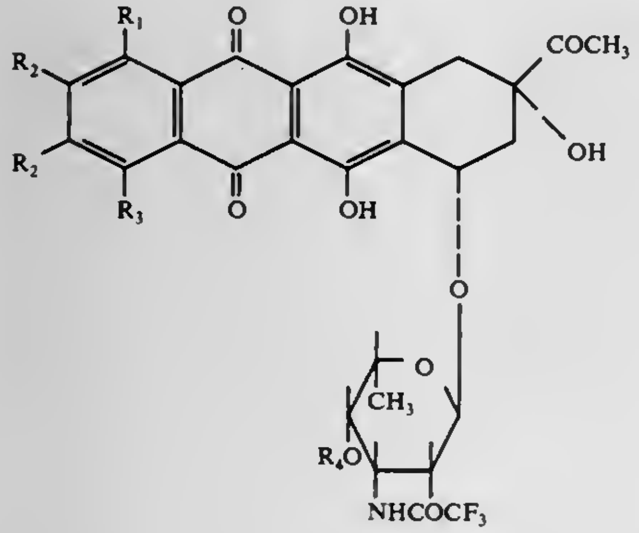
(b) R_1 and R_3 are both hydrogen and R_2 is hydrogen, methyl, methoxy, chlorine or bromine; and

(c) R_1 and R_2 are both hydrogen and R_3 is a lower alkoxy group having from 1 to 4 carbon atoms, said process comprising condensing a racemic aglycone of formula II:



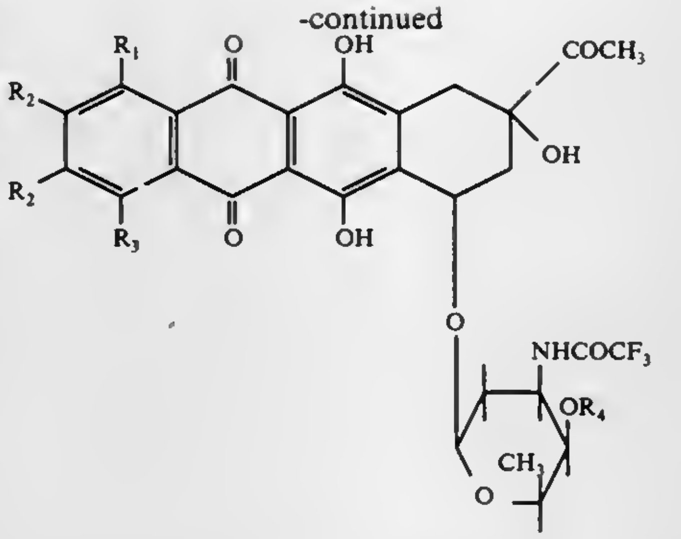
II

wherein R_1, R_2 and R_3 are as defined above, with 2,3,6-trideoxy-3-trifluoroacetamido-4-O-trifluoroacetyl-α-L-lyxo-pyranosyl chloride, in an aprotic solvent and in presence of an equimolecular amount of silver trifluoro-methane sulfonate in respect to the sugar compound, to give a mixture of the protected (7S : 9S)-α-glycosides (IVa) and (7R : 9R)-β-glycosides (Va):



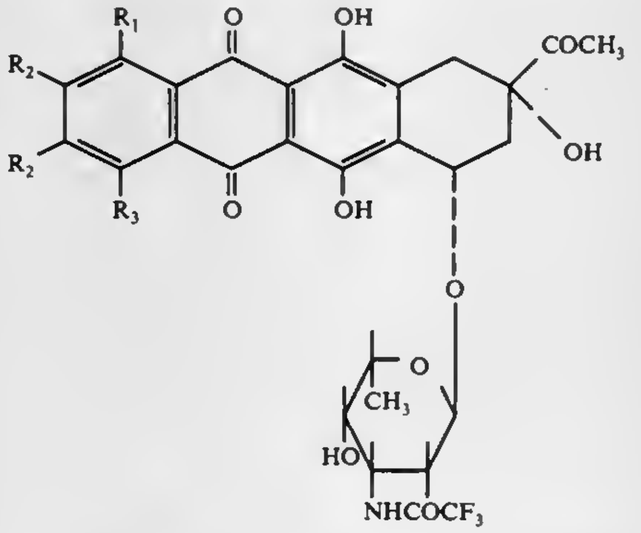
IVa

-continued

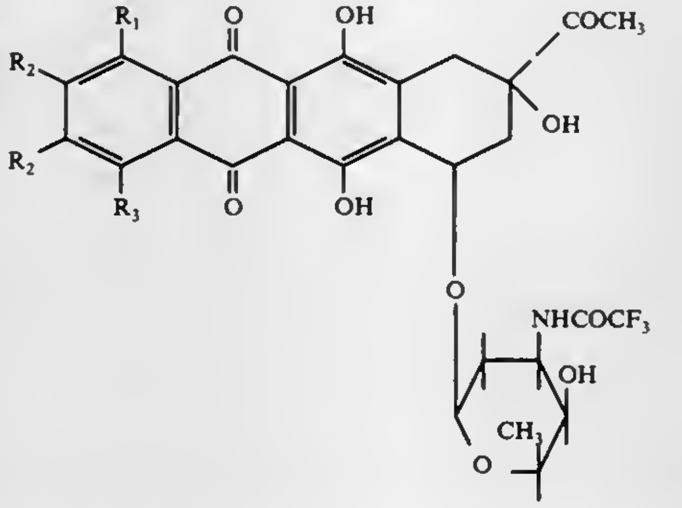


Va

wherein R_1, R_2 and R_3 are as defined above and R_4 is a $—COCF_3$ group, treating said mixture with methanol to remove the $—COCF_3$ group from the sugar moiety and thereby obtain a further mixture of the respective N-trifluoroacetyl derivatives of formulae IVb and Vb:



IVb



Vb

subjecting said further mixture to chromatography on a silica gel column using as the eluent therefor first chloroform and then a mixture of chloroform-acetone 95:5 (v/v), to obtain the (7S : 9S)-α-glycosides of formula IVb and then subjecting same to a mild alkaline hydrolysis at room temperature for about 30 minutes to thereby obtain a compound of formula I as the hydrochloride.

4,107,424
1-N-[(S)-α-HYDROXY-ω-AMINOACYL] DERIVATIVES OF 3′,4′-DIDEOXYKANAMYCIN B AND 3′-DEOXYKANAMYCIN B ANTIBIOTICS

Hamao Umezawa; Sumio Umezawa; Kenji Maeda, all of Tokyo; Osamu Tsuchiya; Shinichi Kondo, both of Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

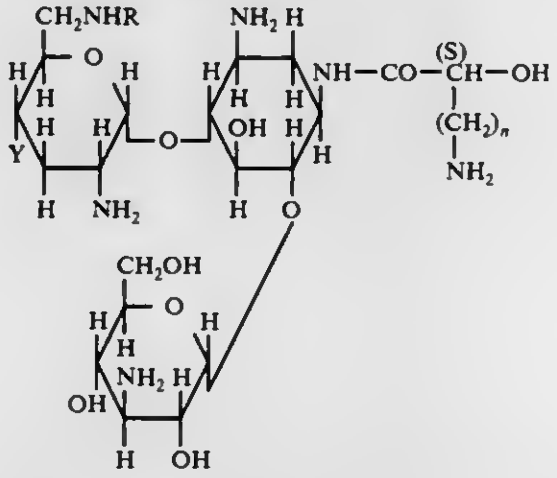
Continuation of Ser. No. 402,085, Oct. 1, 1973, Pat. No. 4,001,200. This application Jul. 23, 1976, Ser. No. 708,076

Claims priority, application Japan, Oct. 6, 1972, 47-99866; Oct. 19, 1972, 47-103988; Dec. 11, 1972, 47-123482; Jan. 23, 1973, 48-9146

Int. Cl.² C07H *15/22;* A61K *31/70*

U.S. Cl. 536—10 **5 Claims**

1. A compound of the formula:



wherein R is hydrogen or alkyl of 1–4 carbon atoms; Y is hydrogen or hydroxyl; *n* is 2 or 3; and the pharmaceutically acceptable acid addition salts thereof.

4,107,425
PREPARATION OF 1-α- AND 1-β-GLUCOSE ESTERS BY STEREOSELECTIVE ACYLATION OF METALATED 2,3,4,6,-TETRA-O-BENZYL-D-GLUCOPYRANOSE

Philip E. Pfeffer, Warrington, and Gordon G. Moore, Willow Grove, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,916

Int. Cl.² C07H *13/02*

U.S. Cl. 536—119 **5 Claims**

1. A process for the preparation of anomerically pure 1-α- and 1-β-D-glucosyl esters comprising metalating 2,3,4,6-tetra-O-benzyl-D-glucopyranose with n-butyllithium in a solvent selected from the group consisting of tetrahydrofuran and anhydrous benzene, acylating the metalated product with an appropriate acid chloride, and hydrogenating the resultant acyl glucopyranose.

4,107,426
PROCESS FOR TREATING CELLULOSE

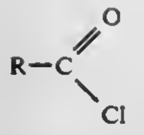
Roy Gerald Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed Jul. 6, 1976, Ser. No. 702,534

Int. Cl.² A61F *13/16;* B32B *27/42*

U.S. Cl. 536—56 **29 Claims**

1. An article of manufacture comprising a sheet, pad or cloth of cellulose characterized in that at least one side thereof is water-repellent wherein said water-repellent side consists essentially of the reaction product of the cellulose with an aliphatic acid chloride in the vapor phase, said acid chloride having the general formula



$$R-C(=O)-Cl$$

wherein R is selected from straight-chain, branched-chain, or cyclic aliphatic hydrocarbon radicals having from about 6 to about 20 carbon atoms.

4,107,427
PROCESS AND INTERMEDIATES FOR PREPARING THROMBOXANE B₁

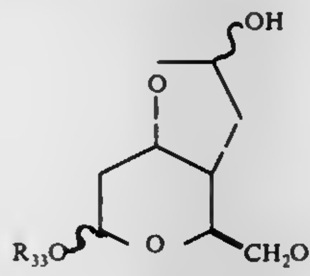
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 20, 1976, Ser. No. 716,447

Int. Cl.² C07D *309/36, 309/38*

U.S. Cl. 542—427 **14 Claims**

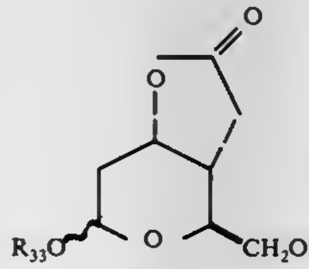
1. A process for preparing a thromboxane intermediate of the formula



wherein R_{33} is alkyl of one to 4 carbon atoms, inclusive; and wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group;

which comprises:

(1) reducing with diisobutylaluminum hydride at low temperature to a lactol a thromboxane intermediate of the formula



wherein R_{33} and R_{34} are as defined above.

4,107,428
DI-VINYL COLOR FORMERS

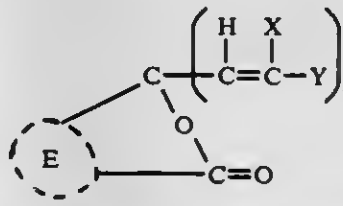
Sheldon Farber, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 566,851, Apr. 10, 1975, Pat. No. 4,020,056. This application Apr. 25, 1977, Ser. No. 790,628

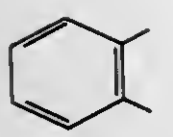
Int. Cl.² C07D *401/06, 401/14, 403/14*

U.S. Cl. 542—437 **7 Claims**

1. A compound represented by the formula:

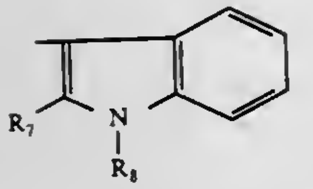


wherein E is tetrachloro- and tetrabromo-substituted



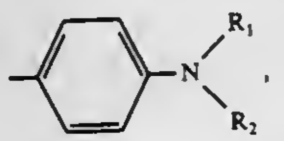
;

X is



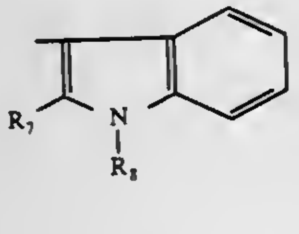
;

4-(N-piperidino)phenyl, and 4-(N-pyrrolidino)phenyl; Y is



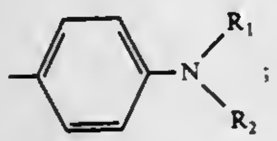
,

4-(N-piperidino)phenyl, and 4-(N-pyrrolidino)phenyl; provided when X is



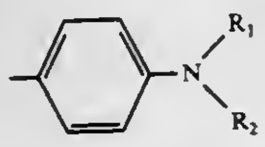
.

Y is



;

and when X is 4-(N-piperidino)phenyl or 4-(N-pyrrolidino)-phenyl; Y is the same as X, respectively, or



;

and R_1, R_2, R_7 and R_8 are methyl, ethyl, N, propyl or N-butyl groups.

4,107,429

1-NOR-2-AMINO CARBAMATES DERIVED FROM ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

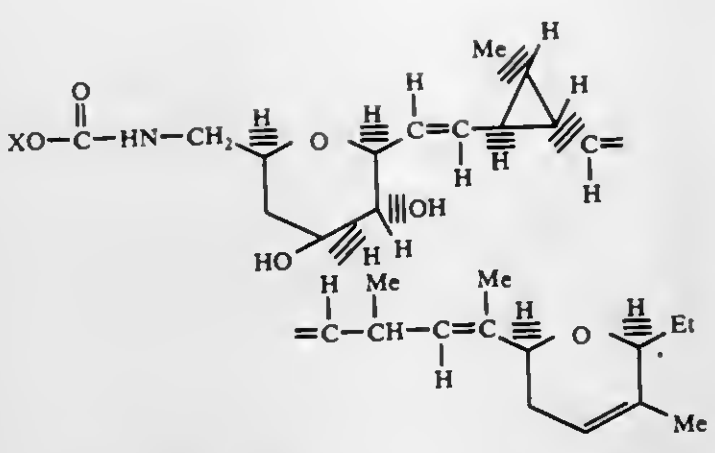
David T. Connor, Parsippany; Samuel M. Ringel, and Maximilian von Strandtmann, both of Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 696,096, Jun. 14, 1976, abandoned. This application Feb. 4, 1977, Ser. No. 765,569

Int. Cl.² C09B *23/00*

U.S. Cl. 542—447 **11 Claims**

1. A compound having the formula I:



wherein X is lower alkyl with the proviso that the 4-carbon alkyl group is n-butyl, isobutyl or secondary butyl.

4,107,430

CONVERSION OF TRANS- TO CIS-N,N-DIMETHYL-9-[3-(4-METHYL-1-PIPERAZINYL)-PROPYLIDENE]-THIOXANTHENE-2-SULFONAMIDE AND RECOVERY OF THE CIS-ISOMER

Donald E. Kuhla, Gales Ferry, and Harry A. Watson, Jr., New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,081

Int. Cl.² C07D *409/06*

U.S. Cl. 542—471 **8 Claims**

1. A process for the preparation of the cis-isomer of N,N-dimethyl-9-[3-(4-methyl-1-piperazinyl)propylidene]thioxanthene2-sulfonamide in isolated form which comprises the steps of contacting the trans-isomer with a base, selected from the group consisting of alkyl amines of from 3 to 12 total carbon atoms; cycloalkyl amines of from 4 to 18 total carbon atoms; lithium, sodium and potassium hydroxides, alkoxides of from 1 to 7 carbon atoms, and cycloalkoxides of from 4 to 10 carbon atoms; lithium, sodium and potassium salts of alkyl amines of from 3 to 12 total carbon atoms and cycloalkyl amines of from 4 to 18 total carbon atoms; and sodium amide, in solution in a reaction-inert polar organic solvent, in which solvent the solubility of the transisomer at a temperature of about −15° C. to 40° C. is at least about 1.25 times that of the cis-isomer, and separating precipitated cis-isomer from said solvent at said temperature.

4,107,431

Δ^3-3-VINYL OR SUBSTITUTED VINYL-4-CARBOXY CEPHALOSPORINS

John Colin Clark, Gerrards Cross, England; James Kennedy, Angus, Scotland; Alan Gibson Long, Greenford, and Niall Galbraith Weir, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

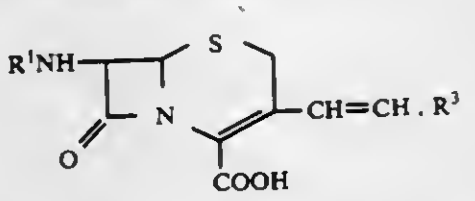
Continuation of Ser. No. 108,136, Jan. 20, 1971, abandoned. This application Jul. 8, 1974, Ser. No. 486,633

Claims priority, application United Kingdom, Jan. 23, 1970, 3436/70

Int. Cl.² A61K *31/545*

U.S. Cl. 544—16 **13 Claims**

1. A cephalosporin compound of the formula



wherein R^1 is an acyl group selected fromm the group consisting of

(a) R^2CH_2CO— where R^2 is thienyl; phenyl; phenyl substituted with fluoro, chloro, bromo, iodo, hydroxy, $(C_1–C_6)$ alkyl, nitro, amino, $(C_1–C_6)$ alkanoyl, $(C_1–C_6)$ alkoxy or $(C_1–C_6)$ alkylmercapto; phenoxy; benzylthio; phenylthio; or 5-methyl-1,3,4-thiadiazol-2-ylthio,

(b) R^4.CO.CO- where R^4 is thienyl; phenyl; phenyl substituted with fluoro, chloro, bromo, iodo, hydroxy, $(C_1–C_6)$ alkyl, nitro, amino, $(C_1–C_6)$ alkanoyl; $(C_1–C_6)$ alkoxy or $(C_1–C_6)$ alkylmercapto; or naphthyl and

(c) $CN.CH_2CO$—

and R^3 is hydrogen or lower alkyl or a physiologically acceptable salt thereof.

4,107,432

7-DIACYLIMIDO CEPHALOSPORINS

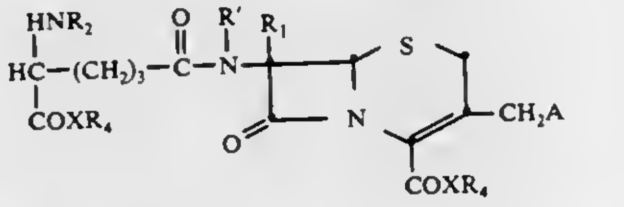
Burton G. Christensen; Lovji D. Cama, both of Metuchen; Sandor Karady, Mountainside, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 565,495, Apr. 7, 1975, Pat. No. 4,058,661, which is a division of Ser. No. 356,873, May 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,005, Feb. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 149,364, Jun. 2, 1971. This application Apr. 25, 1977, Ser. No. 790,793

Int. Cl.² C07D *501/32, 501/34*

U.S. Cl. 544—21 **7 Claims**

1. A cephalosporin compound of the formula:



wherein R_2 is hydrogen, trichloroethoxycarbonyl, t-butoxycarbonyl, trimethylsilyl, p-methoxybenzyloxy, 2-nitrophenylsulfenyl, 2,4-dinitrophenylsulfenyl, chloroacetyl, or o-nitrophenylthio;

X is oxygen or sulfur;

R_4 is hydrogen, methyl, ethyl, t-butyl, phthalimidomethyl, succinimidomethyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, 2-methylthioethyl, 2-(p-methylphenyl)ethyl, methoxymethyl, 2-(p-methylphenyl)sulfonylethyl, 2-methylaminoethyl, benzyloxymethyl, p-methoxybenzyl, 3,5-dinitrobenzyl, 2-chloroethyl, 2-bromoethyl, benzyl, p-nitrobenzyl, 2,4,6-trimethylbenzyl, 3,5-dichloro-4-hydroxybenzyl, benzhydryl, p-methoxybenzhydryl, acetoxymethyl, pivaloyloxymethyl, methoxymethyl, phenyl, p-nitrobenzyl, or 3,5-dinitrophenyl;

R_1 is hydrogen or methoxy;

R′ is phenylacetyl, thienylacetyl, furylacetyl, phenoxyacetyl, phenylthioacetyl, α-azidophenylacetyl or trifluoroacetyl; and

A is hydrogen or acetoxy.

4,107,433

PHTHALIDYL ESTER OF 3-CARBOMOYLOXY CEPHALOSPORIN DERIVATIVES

Peter Hubert Bentley, Rudgwick, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group Limited, England

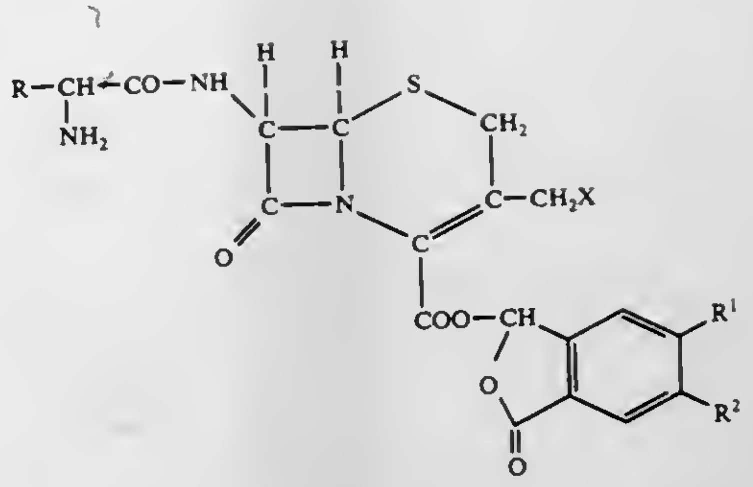
Division of Ser. No. 549,374, Feb. 12, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,159

Claims priority, application United Kingdom, Feb. 21, 1974, 7860/74

Int. Cl.² C07D *501/30, 501/34*

U.S. Cl. 544—30 **3 Claims**

1. A cephalosporin ester of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein R is phenyl, 4-hydroxyphenyl, 3-chloro-4-hydrophenyl,

2- or 3-thienyl or dihydrophenyl;

X is carbamoyloxy; and

R^1 and R^2 are hydrogen or methoxy.

4,107,434

PROCESS FOR MAKING PLEUROMUTILINS

Erwin Waldvogel, Convent Station, N.J., assignor to Sandoz Ltd., Basel, Switzerland

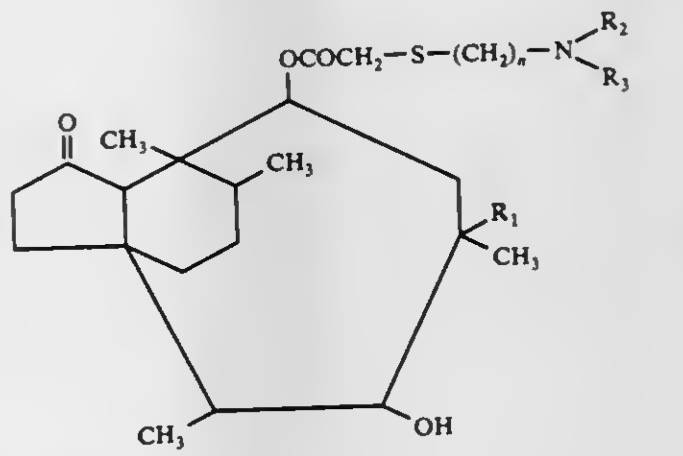
Filed Jan. 10, 1977, Ser. No. 757,858

Claims priority, application Switzerland, Jan. 15, 1976, 450/76

Int. Cl.² C07D *295/14*

U.S. Cl. 544—59 **7 Claims**

1. A process for the production of compounds of formula I,



I

in which *n* is 2, 3, 4 or 5,

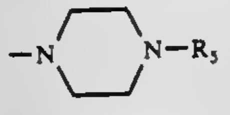
R_1 is ethyl or vinyl,

and either

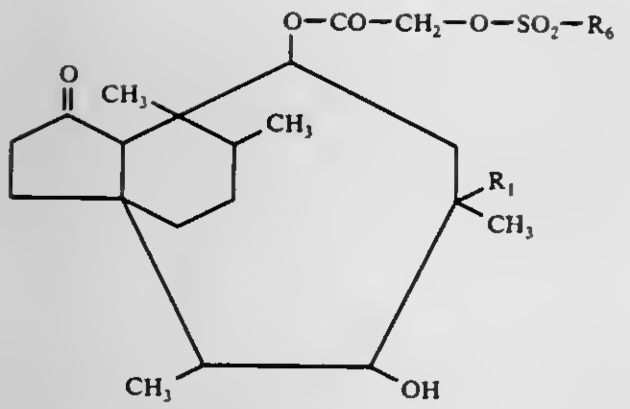
R_2 and R_3 are the same or different and each signifies alkyl of 1 to 4 carbon atoms,

or

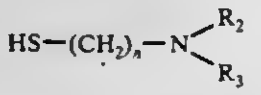
R_2 or R_3, together with the nitrogen atom to which they are attached, is morpholino, thiomorpholino

or 

where R_5 is methyl or ethyl, comprising reacting a compound of formula II,



in which
R$_1$ is as defined above,
and
R$_6$ is alkyl of 1 to 4 carbon atoms or phenyl, unsubstituted or substituted by alkyl of 1 to 4 carbon atoms,
with a compound of formula III,



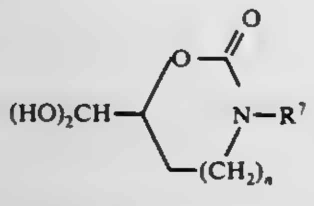
$$HS-(CH_2)_n-N\begin{matrix}R_2\\R_3\end{matrix}$$

III

in which n, R$_2$ and R$_3$ are as defined above, characterized in that the reaction is effected under alkaline conditions in the presence of a phase transfer catalyst.

4,107,435
PROCESS FOR ω-AMINO-2-HYDROXYALKYL DERIVATIVES OF AMINOGLYCOSIDE ANTIBIOTICS
Barry C. Ross, Birchington, England, assignor to Pfizer Inc., New York, N.Y.
Filed Feb. 10, 1977, Ser. No. 767,657
Claims priority, application United Kingdom, Feb. 25, 1976, 7529/76
Int. Cl.^{2} C07D *263/24, 265/06*
U.S. Cl. 544—97 **6 Claims**

1. A compound of the formula:

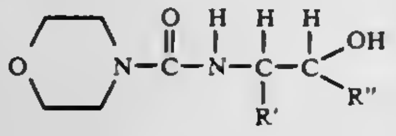


wherein R^7 is selected from the group consisting of hydrogen and benzyl, and n is 0 or 1.

2. A compound according to claim 1, wherein n is 1.

4,107,436
SUBSTITUTED N-(2-HYDROXYETHYL)MORPHOLINO CARBOXAMIDES
Shyam Sunder, and Norton P. Peet, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 624,365, Oct. 21, 1975, Pat. No. 4,052,385. This application May 27, 1977, Ser. No. 801,131
Int. Cl.^{2} C07D *295/18*
U.S. Cl. 544—169 **5 Clalms**

1. A N-(2-hydroxyethyl)cycloalkylaminocarboxamide having the formula

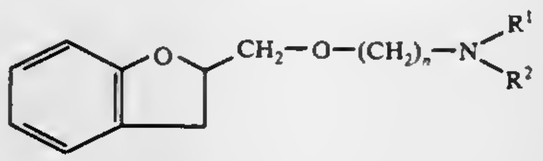


II

wherein R′ and R″ are hydrogen, an alkyl group of from 1 to 4 carbon atoms, or phenyl.

4,107,437
2,3-DIHYDROBENZOFURANS
Jean-Pierre Maffrand, and Jean-Marie Pereillo, both of Toulouse, France, assignors to PARCOR, Paris, France
Filed May 2, 1977, Ser. No. 792,504
Claims priority, application France, May 31, 1976, 76 16370
Int. Cl.^{2} C07D *405/12*
U.S. Cl. 544—376 **12 Claims**

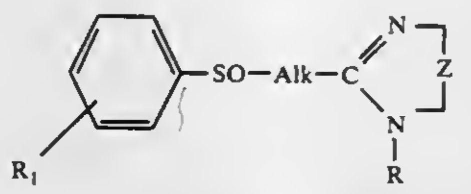
1. 2,3-dihydrobenzo(b)furan of the formula



wherein
R^1 and R^2 each independently represent alkyl having 1–12 carbon atoms, phenyl alkyl wherein the alkyl moiety has 1–12 carbon atoms or together with the nitrogen atom to which they are attached form morpholino, phenylpiperazino, halophenylpiperazino, pyrrolidino, piperidino, trifluoromethylphenylpiperazino, alkyl phenyl piperazino, having up to 12 carbon atoms in the alkyl moiety or alkoxyphenylpiperazino having up to 12 carbon atoms in the alkoxy moiety;
n is 2 or 3; and the pharmaceutically acceptable salts thereof.

4,107,438
CYCLIC PHENYLSULPHINYL-AMIDINE DERIVATIVES
Victor Lafon, 76, avenue de la Republique, Paris, France
Division of Ser. No. 617,665, Sep. 29, 1975, Pat. No. 4,013,776. This application Jan. 18, 1977, Ser. No. 760,407
Claims priority, application United Kingdom, Sep. 30, 1974, 42387/74
Int. Cl.^{2} C07D *233/22, 239/06*
U.S. Cl. 548—353 **8 Claims**

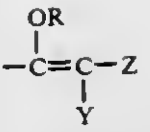
1. A phenylsulphinyl derivative of the formula:



in which R$_1$ is a substituent selected from the group consisting of H, F, Cl, Br, CF$_3$, C$_1$-C$_4$ alkyl, C$_1$-C$_4$ alkoxy and NO$_2$, Alk represents a C$_2$-C$_4$ hydrocarbon radical having a linear or branched chain, Z is selected from the group consisting of CH$_2$CH$_2$ and CH$_2$CH$_2$CH$_2$ and R is selected from the group consisting of H, CH$_2$COOH and C(CH$_3$)$_2$COOH and non-toxic acid addition salts thereof.

4,107,439
PROCESS FOR PREPARING ARYLALKANOIC ACID DERIVATIVES
Jerry A. Walker, Osthemo Township, Kalamazoo County; David R. White, and William G. Salmond, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Jun. 16, 1976, Ser. No. 696,720
Int. Cl.^{2} C07C *69/76, 65/00, 63/52*
U.S. Cl. 560—55 **18 Claims**

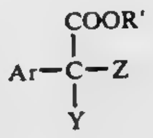
1. A process which comprises reacting an enol ether of the formula



$$Ar-\overset{\displaystyle OR}{\overset{|}{C}}=\underset{\displaystyle Y}{\underset{|}{C}}-Z$$

(III)

with trivalent thallium ions in an organic liquid containing at least one equivalent of an alcohol or water at a temperature of from about −25° C. to about reflux temperature of the mixture for a time sufficient to form a 2-aryl-C$_3$ to C$_6$-alkanoate ester of the formula



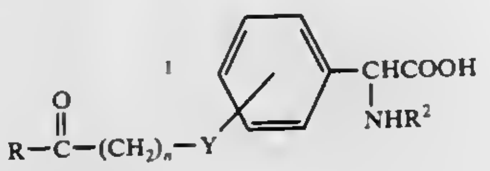
$$Ar-\overset{\displaystyle COOR'}{\overset{|}{\underset{\displaystyle Y}{\underset{|}{C}}}}-Z$$

(I)

wherein in each formula
Ar is the aromatic moiety of a useful acid product containing from 6 to about 13 carbon atoms, in which the aryl ring portion of the aromatic moiety is a phenyl, phenoxyphenyl, naphthyl or biphenylyl group bonded to the carbon atom adjacent to the carboxyl ester moiety at an aryl ring carbon;
R is C$_1$ to C$_4$-alkyl, benzyl, phenyl, tris-(C$_1$ to C$_3$-alkyl)silyl; and R′ is equal to R or is an alkyl, benzyl, or phenyl group derived from the solvent medium;
Y and Z denote the residue of a C$_3$ to C$_6$-alkanoic acid moiety with each of Y and Z being hydrogen or C$_1$ to C$_4$-alkyl, with Y and Z having a total of from one to about 4 carbon atoms.

4,107,440
INTERMEDIATES FOR PREPARING SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS
John Gerald Gleason, Cornwells Heights, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.
Division of Ser. No. 641,064, Dec. 15, 1975, Pat. No. 4,044,047, which is a division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439. This application Apr. 28, 1977, Ser. No. 791,770
Int. Cl.^{2} C07C *149/437*
U.S. Cl. 560—17 **4 Claims**

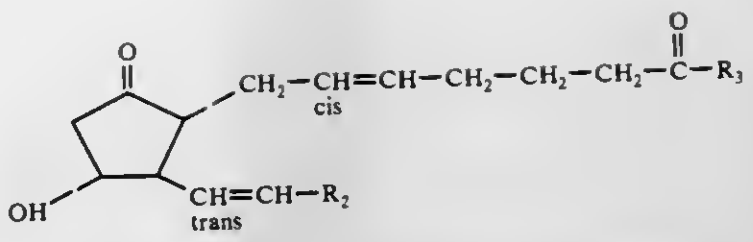
1. A compound of the formula:



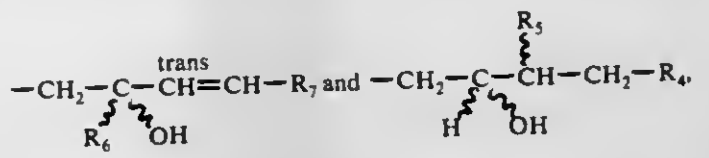
in which:
Y is S;
n is 1 to 5;
R is OR′, where R′ is lower alkyl of from one to four carbon atoms; and
R^2 is [hydrogen or]t-butoxycarbonyl.

4,107,441
NOVEL 16 HYDROXY 15-DEOXY-5-CIS-PROSTENOIC ACIDS AND ESTERS
Middleton Brawner Floyd, Jr., Suffern, N.Y.; Martin Joseph Weiss, Oradell, N.J.; William James McGahren, Demarest, N.J., and Robert Eugene Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 370,256, Jun. 15, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,867
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 560—121 **62 Claims**

1. An optically active compound of the formula:

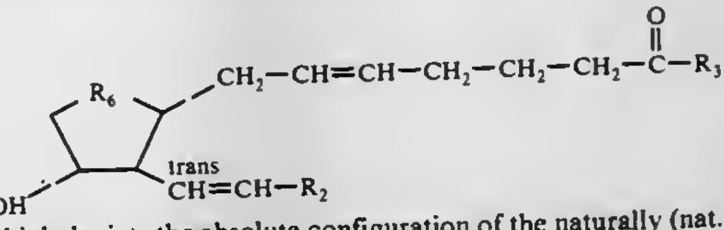


which depicts the absolute configuration of the naturally (nat.) occurring prostaglandins wherein R$_3$ is selected from the group consisting of hydroxy and C$_1$–C$_5$ alkoxy; and R$_2$ is selected from the group consisting of a moiety of the formula

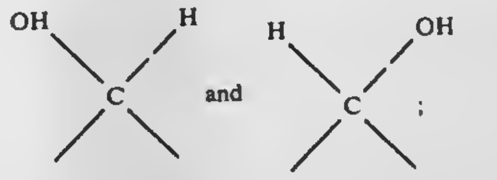


wherein R$_4$ is selected from the group consisting of C$_1$–C$_4$ alkyl and R$_5$ is selected from the group consisting of hydrogen and methyl and R$_6$ is selected from the group consisting of hydrogen and methyl and R$_7$ is selected from the group consisting of C$_2$–C$_3$ alkyl; with the proviso that when R$_5$ is methyl, then R$_4$ must be hydrogen; the racemic mixture thereof; the mirror image thereof; and the pharmacologically acceptable cationic salts thereof when R$_3$ is hydroxy.

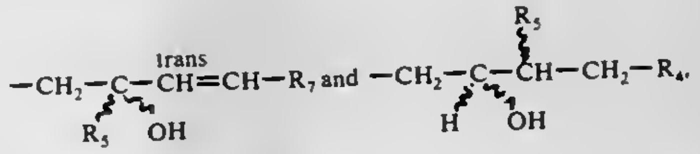
28. An optically acitve compound of the formula:



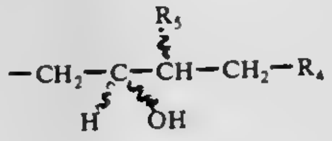
which depicts the absolute configuration of the naturally (nat.) occurring prostaglandins, wherein R$_3$ is selected from the group consisting of hydroxy and C$_1$–C$_5$ alkoxy; R$_6$ is selected from the group consisting of a moiety of the formula:



wherein R$_2$ is selected from the group consisting of a moiety of the formula



wherein R$_4$ is selected from the group consisting of C$_1$–C$_4$ alkyl and R$_5$ is selected from the group consisting of hydrogen and methyl and R$_7$ is selected from the group consisting of C$_2$–C$_3$ alkyl; with the proviso that when R$_2$ is



and R$_5$ is methyl, then R$_4$ must be hydrogen; the racemic mixture thereof; the mirror image thereof; and the pharmacologically acceptable cationic salts thereof when R$_3$ is hydroxy.

4,107,442

PROCESS FOR PREPARING DIHYDROXYDIPHENYL CHLOROETHYLENES

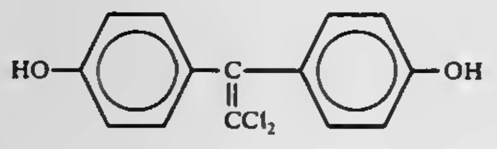
Clayton B. Quinn, Mt. Vernon, Ind., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 789,019, Apr. 20, 1977, abandoned. This application Aug. 18, 1977, Ser. No. 825,574

Int. Cl.^{2} C07C *37/00*

U.S. Cl. 568—726 **1 Claim**

1. The process for preparing the dihydroxydiphenyl compound, 1,1-dichloro-2,2-bis-(4-hydroxyphenyl)ethylene having the formula



which comprises effecting reaction between 1,1-dichloro-2,2-diphenoxy ethylene with phenol in the presence of BF_3 gas and methylene chloride, and thereafter isolating the aforementioned dihydroxydiphenyl compound.

4,107,443

PROCESS FOR PURIFYING IMPURE DIPHENOLS

Victor Mark, Evansville, and Charles Vernon Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 30, 1976, Ser. No. 755,983

Int. Cl.^{2} C07C *37/22, 37/24*

U.S. Cl. 568—750 **12 Claims**

1. A process for purifying impure p,p' diphenols which comprises dispersing the impure diphenol in water, heating the resulting slurry, adding a water soluble organic carboxylic acid co-solvent until the dissolution or near dissolution of the diphenol slurry results at or near the boiling point of water or the solvent system, cooling the solution to achieve the separation of the purified diphenol and recovering the purified p,p' diphenol.

4,107,444

THERMALLY STABLE, RIGID, ALIPHATIC DIOLS

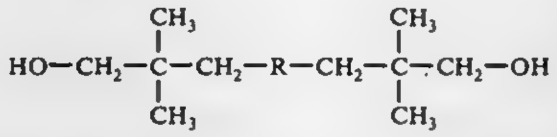
Elmore Louis Martin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1976, Ser. No. 751,085

Int. Cl.^{2} C07C *31/18*

U.S. Cl. 568—807 **8 Claims**

1. Thermally stable, rigid, aliphatic diols of the forumla



$$HO-CH_2-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-CH_2-R-CH_2-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-CH_2-OH$$

where R is an arylene selected from the group consisting of 1,4-phenylenes, 3,3'-biphenylenes, 4,4'-biphenylenes and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl.

ELECTRICAL

4,107,445

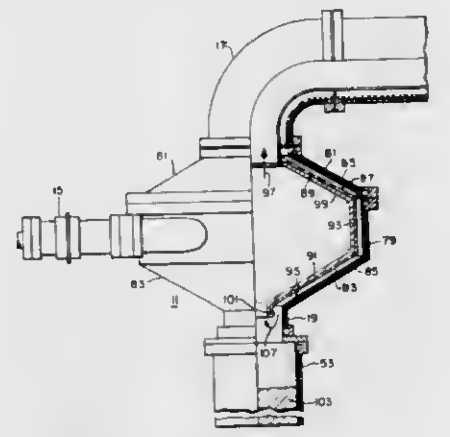
TITANIUM AND ZIRCONIUM PRODUCTION BY ARC HEATER

Charles B. Wolf, Irwin, and Maurice G. Fey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1976, Ser. No. 745,726

Int. Cl.^{2} H05H *1/00*

U.S. Cl. 13—2 P **10 Claims**



1. A high temperature reactor comprising a centrifugal chamber having a peripheral wall and opposite end walls, an inner wall substantially concentric with the peripheral wall and extending over and spaced from the opposite end walls, at least one arc heater extending from the chamber and through the inner and peripheral walls, the arc heater having a downstream outlet directed tangentially into the centrifugal chamber, the arc heater comprising a pair of axially spaced substantially cylindrical electrodes forming a narrow gap therebetween and adopted to be connected to a source of potential to produce an arc therebetween, the electrodes forming an arc chamber that communicates with the centrifugal chamber, gas inlet means communicating with the gap for introducing a non-conductive reducing gas into the arc chamber to form an arc heated gas stream, second inlet means communicating with the downstream outlet for introducing a quantity of a tetrahalide of a metal into the gas stream, third inlet means for introducing into the gas stream a quantity of one element selected from the group consisting of an alkali metal and an alkaline-earth metal, first vent means for lighter-weight products extending from the centrifugal chamber, and second vent means for heavier-weight products extending from the centrifugal chamber.

4,107,446

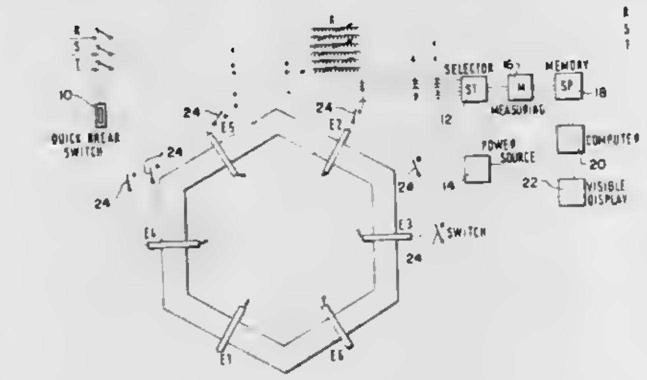
METHOD AND APPARATUS FOR MEASURING THE TEMPERATURE OF MOLTEN MASSES

Helmut Pieper, Lohr, Fed. Rep. of Germany, assignor to Sorg GmbH & Co. KG, Pflochsbach, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,871

Int. Cl.^{2} C03B *5/02*

U.S. Cl. 13—6 **9 Claims**



5. Apparatus for measuring the temperature or temperature distribution of an electrically conductive molten mass which is heated by electrodes receptive of heating current during use and immersed in the molten mass which comprises means to momentarily cut off the heating current supplied to the electrodes, means for passing measuring currents through the molten mass via said electrodes, means to measure the electrical resistance between paris of said electrodes and means to calculate the temperature of the basis of the measured resistance values.

4,107,447

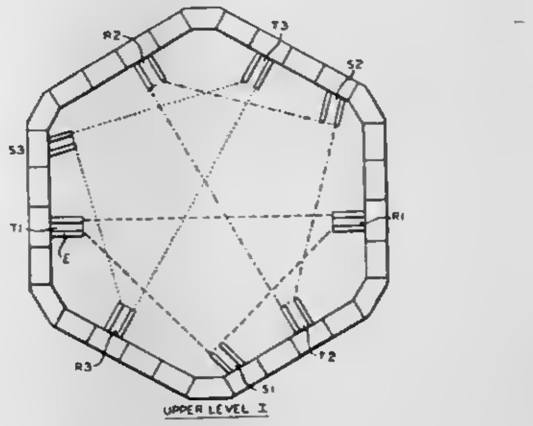
ELECTRICAL GLASS MELTING FURNACE

Helmut Pieper, Lohr, Fed. Rep. of Germany, assignor to Sorg GmbH & Co. KG, Plochsbach, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,405

Int. Cl.^{2} C03B *5/02*

U.S. Cl. 13—6 **8 Claims**



1. Electrical glass melting furnace having refractory tank means having a vertical center line wherein batch glass is fed to the surface of a bath of molten glass therein and refined glass is withdrawn from the lower portion thereof, comprising:

(i) at least two superposed levels of an integral multiple of nine electrode means extending into the molten glass and spaced around the periphery of the tank means; the uppermost level and the level therebelow each having sets of integral multiples of three electrodes with each set defining a current path not encompassing the center line;

(ii) a three-phase transformer means for each level, each having primary coil means and three secondary coil means, said primary coil means being connected to a source of three-phase AC;

(iii) said secondary coil means each being connected to one set of electrode means to provide both intraphase peripheral and cross firing current paths within each set of electrode means.

4,107,448

METHOD AND DEVICE FOR CRUCIBLE-FREE FLOATING ZONE MELTING

Hans Stut, Gröbenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 579,026, May 19, 1975, abandoned, which is a continuation of Ser. No. 186,618, Oct. 5, 1971, abandoned. This application Jul. 12, 1976, Ser. No. 704,639

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1970, 2050076

Int. Cl.^{2} B01J *17/08*

U.S. Cl. 13—26 **4 Claims**

2. Device for carrying out a method of automatically controlling crucible-free zone melting of a rod of semiconductor material supported by holders at opposite ends thereof, comprising a high frequency oscillating circuit including therein a high-frequency generator component, an inductive heater component for heating a molten zone formed in the rod, and a high-frequency cable fully matched during operation of the device and connecting said inductive heater component to said

4,107,448
METHOD AND DEVICE FOR CRUCIBLE-FREE FLOATING ZONE MELTING

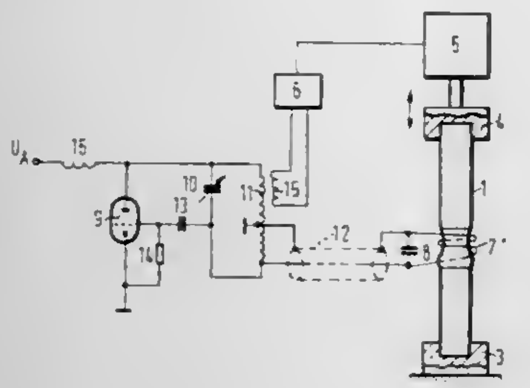
Hans Stut, Gröbenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 579,026, May 19, 1975, abandoned, which is a continuation of Ser. No. 186,618, Oct. 5, 1971, abandoned. This application Jul. 12, 1976, Ser. No. 704,639

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1970, 2050076

Int. Cl.^{2} B01J *17/08*

U.S. Cl. 13—26 4 Claims



2. Device for carrying out a method of automatically controlling crucible-free zone melting of a rod of semiconductor material supported by holders at opposite ends thereof, comprising a high frequency oscillating circuit including therein a high-frequency generator component, an inductive heater component for heating a molten zone formed in the rod, and a high-frequency cable fully matched during operation of the device and connecting said inductive heater component to said high-frequency generator component, said high-frequency oscillating circuit oscillating with a frequency determined by the combined inductivity of said high-frequency generator component and said inductive heater component, said inductive heater component being inductively coupled to the molten zone of the rod, the inductive coupling thereof and the inductivity of said inductive heater being variable with varying volume of the molten zone whereby the oscillating frequency of the high-frequency oscillating circuit is dependent upon the volume of the molten zone, and means responsive to the oscillating frequency of the high-frequency oscillating circuit for adjusting the distance between the rod end holders so as to adjust the volume of the molten zone to a given value at which the high-frequency oscillating circuit oscillates at a predetermined frequency serving as a control criterion.

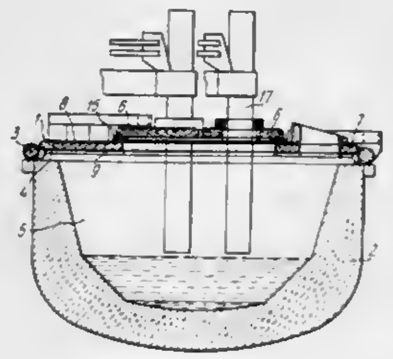
4,107,449
WATER-COOLED ROOF OF ELECTRIC-ARC FURNACE

Oleg Mikhailovich Sosonkin, ulitsa Chaikovskogo, 11, kv. 18; Leonid Savvich Katsevich, Sirenevy bulvar, 47, kv. 69, both of Moscow; Nikolai Alexeevich Pirogov, prospekt Lenina, 29, kv. 21, Elektrostal Moskovskoi oblasti; Zoya Mikhailovna Chistyakova, ulitsa Novocheremushkinskaya, 38, korpus 1, kv. 71; Viktor Alexandrovich Kudrin, ulitsa Krasnokazarmennaya, 12, korpus 1, kv. 32, both of Moscow; Jury Tikhonovich Borisov, Juzhny proezd, 3, kv. 30, Balashikha Moskovskoi oblasti; Oleg Evgenievich Molchanov, ploschad Metallurgov, 15, kv. 14, Cherepovets Volgogradskoi oblasti; Mikhail Vasilievich Savvin, ulitsa Kosmonavtov, 58, kv. 24, Lipetsk; Eduard Maximovich Grigoriev, poselok Remmash, 13, kv. 8, Zagorsk Moskovskoi oblasti; Alexei Ivanovich Fedchenko, ulitsa Michurina, 55, kv. 60; Anatoly Zakharovich Shevtsov, ulitsa Novaya, 149a, kv. 51, both of Krasnoyarsk; Valentin Semenovich Kudryavtsev, Teatralny proezd, 3, kv. 60, Belgorod; Ivan Kuzmich Silantiev, ulitsa Michurina, 63, kv. 20, Krasnoyarsk; Georgy Stepanovich Solomin, ulitsa Kutuzova, 162, kv. 53, Krasnoyarsk; Vasily Gerasimovich Mateshin, ulitsa Kutuzova, 122, kv. 6, Krasnoyarsk; Alexandr Mikhailovich Zinoviev, ulitsa Schorsa, 13, kv. 39, Krasnoyarsk; Viktor Iosifovich Shishiyannikov, ulitsa Michurina, 57, kv. 49, Krasnoyarsk; Gennady Mikhailovich Paly, ulitsa Parkovaya, 7, kv. 119, Odintsovo Moskovskoi oblasti; David Matveevich Koen, ulitsa Belomorskaya, 18, korpus 1, kv. 39, Moscow; Vladimir Vasilievich Seleverstov, ulitsa Ljusinovskaya, 53/12, kv. 21, Moscow; Jury Alexandrovich Smirnov, Teply Stan, 6 Mikroraion, korpus 113, kv. 163, Moscow, all of U.S.S.R.

Filed Sep. 20, 1976, Ser. No. 724,468

Int. Cl.^{2} F27D *9/00*

U.S. Cl. 13—35 11 Claims



1. A water-cooled roof for an electric-arc furnace comprising: a hollow roof ring of a circular cross-section disposed adjacent the top wall portion of said furnace; a roof structure having side walls and a central hollow, disc portion and a circular, hollow peripheral ring portion, said central portion bearing through a circular gasket of an electric-insulating material on said peripheral ring portion which in turn bears on said roof ring; at least said central portion being provided with at least one through hole for the electrode of said furnace and at least said peripheral ring portion being provided with holes for the delivery of gases into the furnace and discharging gaseous products; a refractory lining applied to the surfaces of said roof ring and said roof structure facing the interior side of the furnace space; and said roof ring, said central portion and said peripheral ring portion being in fluid flow connection with each other for circulating cooling water throughout said water-cooled roof.

4,107,450
REFRACTORIES AND METHODS OF MAKING SAME

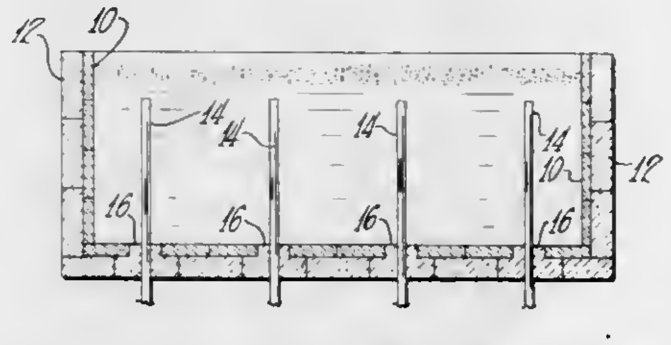
Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 477,705, Jun. 10, 1974, Pat. No. 4,052,339. This application Mar. 17, 1977, Ser. No. 778,411

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.^{2} C03B *5/02;* H01B *1/02;* H01C *1/02*

U.S. Cl. 13—35 18 Claims



2. An electric furnace having a heated chamber, said chamber having walls of a sintered refractory of low conductivity comprising: refractory particles having a crystalline lattice of metallic and non-metallic elements and which at elevated temperatures become an n-type or p-type semiconductor, and a purposeful addition of a dopant having an atomic radius sufficiently similar to that of the metallic lattice forming element that it diffuses into said lattice without forming deposits at the grain boundries between the particles and in an amount not appreciably exceeding the solubility of said dopant in said lattice to effectively alter the electrical conductivity of said crystalline lattice, said refractory being generally devoid of Group I and II fluxing elements at the grain boundries; and said particles being sintered together to form the refractory.

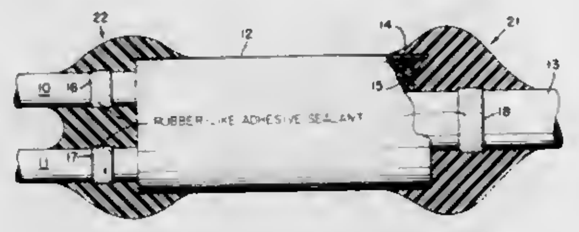
4,107,451
REINFORCED SPLICE JOINT AND METHOD OF MAKING SAME

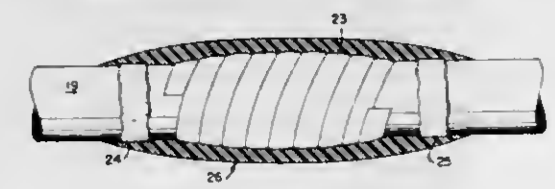
Robert W. Smith, Jr., Kennett Square, and George C. Waite, West Chester, both of Pa., assignors to Trech, Inc., Coatesville, Pa.

Filed Nov. 19, 1975, Ser. No. 633,243

Int. Cl.^{2} H02G *15/08, 1/14*

U.S. Cl. 174—84 R 10 Claims





1. The method of making a permanent air tight splice joint between the spaced ends of a cable sheath comprising the steps of:

- applying a sleeve over the area between the spaced ends of the cable sheath,
- winding discontinuous strips of rubber like adhesive sealant to form sealant bands of continuous homogeneous rubber-like adhesive material around the spaced ends of the cable sheath,
- preparing a filled resin containing a thixotropic agent, a bulk filler and fiber glass having a thick non-flowable putty-like consistency which becomes exothermic and shrinks upon curing and which is chemically compatible with the materials of the sleeve and sealant bands and will form a molecular bond therewith,
- manually wiping the filled resin over said sealant bands, the ends of the cable sheath and the sleeve to form a built-up reinforced splice joint therebetween encapsulating said sealant bands,
- permitting the filled resin joint to cure and shrink onto said adhesive sealant bands to form a rigid reinforced sealed splice joint partially molecularly bonded to said adhesive sealant bands and said sleeve and which is stronger than the parent cable in bending and compression.

10. A permanent pressure tight reinforced splice joint connecting spaced ends of an outer sheath of a telephone cable lying on opposite sides of repaired cable wires, comprising:

- a rigid plastic sleeve applied over the repaired cable wires and extending over the spaced ends of the cable sheath,
- sealant bands of adhesive rubber material, each being in the form of a string of adhesive sealant wound upon itself, wrapped around the spaced ends of the cable sheath adjacent the ends of said sleeve and forming tight adhesive bonds with said spaced ends of the cable sheath, and
- a cured filled resin extending over the ends and opening of said sleeve and also encapsulating and sealing said adhesive sealant bands on said cable sheath under pressure, said cured filled resin containing chopped glass fibers, a thixotropic agent, a filler and a catalyst, and said cured filled resin being chemically compatible with said rigid plastic sleeve and said adhesive sealant bands and forming partial molecular bonds therewith.

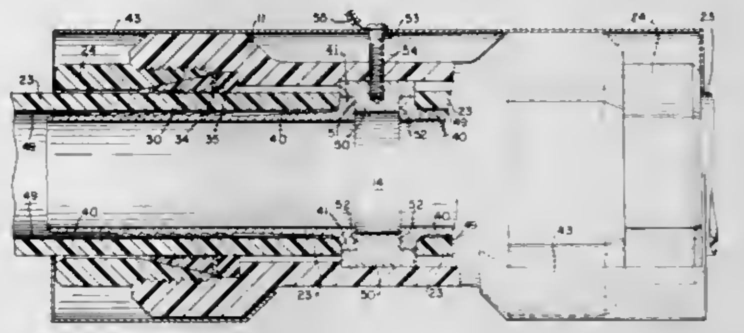
4,107,452
ELECTRICALLY CONDUCTIVE PIPE FITTING

Masood H. Razvi, 1889 Roberts St., Aurora, Ill. 60506

Filed Oct. 14, 1976, Ser. No. 732,378

Int. Cl.^{2} F16L *11/12*

U.S. Cl. 174—84 S 15 Claims



1. A coupling for joining two pipe segments each having an electrically conductive inner liner comprising, in combination:

- a body including an open-ended bore extending through at least an end portion of respective ones of said pipe segments, the sidewall of said bore including a first pair of annular shoulder portions forming regions of increased diameter between said shoulder portions and the adjoining open end of said bore;
- a pair of compression nuts each having an inside diameter substantially corresponding to the outside diameter of said pipe segments, an outside diameter substantially corresponding to said regions of increased diameter of said

bore, and a radially inwardly facing inclined inside surface, said compression nuts being threadedly engaged to said body at respective ends of said bore whereby said nuts are displaced inwardly along the axis of said bore when turned relative to said body;

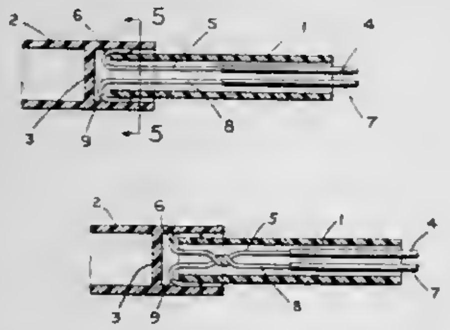
a pair of grip rings disposed over said pipe segment within respective ones of said regions of increased diameter of said bore, said grip rings each including a gap in the circumference thereof, and each having an outside surface complimentarily radially outwardly inclined to the inclined inside surface of respective ones of said compression nuts and arranged in close relationship therewith,

means including a pair of generally sleeve-shaped stiffeners having diameters substantially corresponding to the inside diameters of respective ones of said pipe segments and extending along the interior passageway of respective ones of said pipe segments in electrical contact with the liners thereof from the open ends thereof for preventing deformation of the walls of said segments, and means including a pair of gaskets disposed over said pipe segment within respective ones of said regions of increased diameter of said bore for forming a seal between the outer surfaces of said pipe segments and the wall of said bore, said grip rings and said gaskets being radially compressed into engagement with the outer walls of respective ones of said pipe segments when said compression nuts are tightened; and

means including an electrically conductive collar disposed within said bore between the open ends thereof for engaging respective ones of said collars to form an electrical connection therebetween.

4,107,453
WIRES AND TWO-PART ELECTRICAL COUPLING COVER

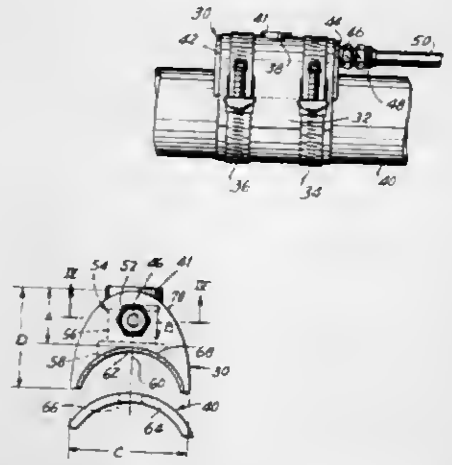
Berthold Erixon, Gyttorp, Sweden, assignor to Nitro Nobel, Gyttorp, Sweden
Filed Aug. 2, 1976, Ser. No. 710,594
Claims priority, application Sweden, Sep. 2, 1975, 7509718
Int. Cl.^{2} H01R ***5/08;*** **B21F** ***7/00, 15/04***
U.S. Cl. 174—87 **2 Claims**



1. In combination, two insulated electrical wires each having a bare end and a electrical coupling cover for the connection of said two insulated electrical wires, comprising: a first cover portion having a first open end and a second open end spaced from said first open end, said first cover portion having a hollow interior for the insertion therethrough of the bare ends of the two electrical wires, said first cover portion having an outer diameter; and a second cover portion of similar shape as said first cover portion and comprising an open end and a transverse wall spaced from said open end of said second cover portion, said second cover portion also having a hollow interior defined by an inner diameter thereof, said inner diameter being slightly larger than said outer diameter of said first cover portion, said second open end of said first cover portion being inserted into said open end of said second cover portion, said transverse wall preventing the insertion of said first cover portion into said second cover portion past a certain point, said first cover portion being of the same cross-sectional dimension throughout the length thereof, said second cover portion also being of the same cross-sectional dimension throughout the length thereof, the inner and outer surfaces of each of said first and second cover portions being smooth throughout, the bare ends of the two electrical wires being inserted through said first cover portion toward said second open end of said first cover portion and made to extend therebeyond, at least one of the ends of said bare ends being bent over said second open end of said first cover portion onto the outer smooth surface thereof, the difference in diameter between the first and second cover portions being related to the diameter of the bent bare end of the wires such that with said first cover portion with said bare wire end bent thereover inserted into said inner surface of said second cover portion said bent end is clamped in place by said first and second cover portions so that upon rotation of said cover portions together, said two electrical wires are twisted together for electrical contact.

4,107,454
APPARATUS FOR PNEUMATICALLY COMMUNICATING WITH A PRESSURIZED CABLE

William Jakobsen, Northport, N.Y., assignor to Lourdes Industries, Inc., Hauppauge, N.Y.
Filed Jan. 3, 1977, Ser. No. 758,922
Int. Cl.^{2} H02G ***15/20***
U.S. Cl. 174—135 **17 Claims**



1. Apparatus for pneumatically communicating with a pressurized cable provided with a peripheral opening, said apparatus comprising a saddle of resilient material adapted to sit astride said cable in surrounding relationship with said opening, said saddle having two end faces and defining a concavity having a longitudinal axis, and a pneumatic fitting extending out of one of the end faces of said saddle in cantilever relation thereto and in generally parallel relationship with said axis, said saddle having a profile shielding said fitting.

4,107,455
LINEAR INSULATOR WITH ALTERNATING NONCONDUCTIVE SHEDS AND CONDUCTIVE SHIELDS

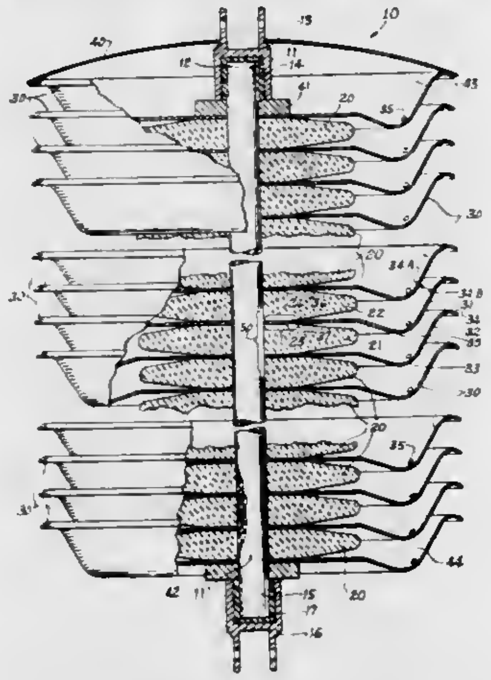
Clyde N. Richards, 4667 Ocean Blvd. Pacific Beach, San Diego, Calif. 92102
Filed Jun. 2, 1977, Ser. No. 802,661
Int. Cl.^{2} H01B ***17/42***
U.S. Cl. 174—140 R **10 Claims**

1. An improved linear insulator for electrically insulating a first electrical potential from a second electrical potential which comprises:

(a) a nonconductive core member having a first mounting means secured to one end of the core member for connecting to said first electrical potential and a second mounting means secured to the other end of the core member for connecting to said second electrical potential;

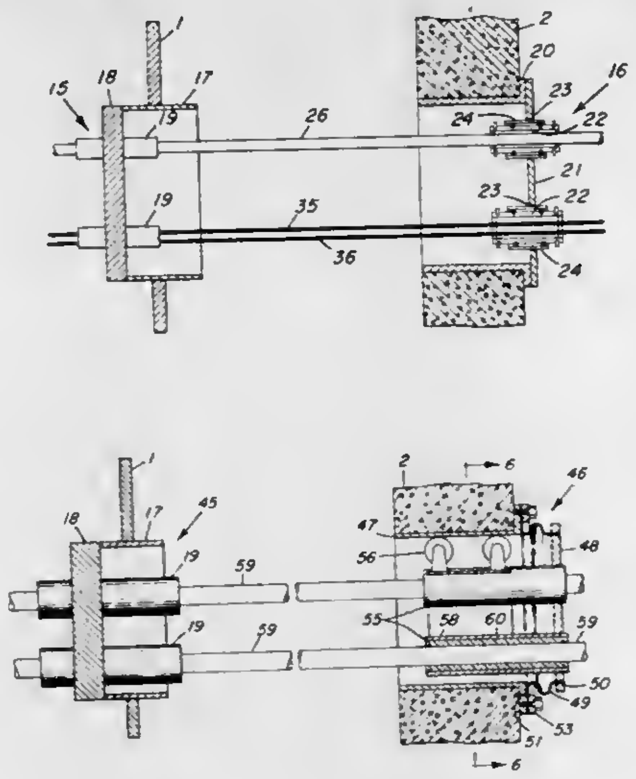
(b) a plurality of nonconducting sheds coaxially secured to the core member; and

(c) a plurality of conducting shields coaxially secured to the core member and alternatingly positioned with said sheds so that each of said sheds is located intermediate two of said shields, the central portion of the upper surface of each of said sheds being in contact with the central portion of the shield immediately above said shed, and the central portion of the lower surface of each of said sheds being in contact with the central portion of the shield immediately below said shed, each of said shields extending radially outwardly and downwardly then upwardly so that the outer perimeter of the shield is outside the shed immediately above said shields.



4,107,456
ELECTRICAL PENETRATION ASSEMBLY

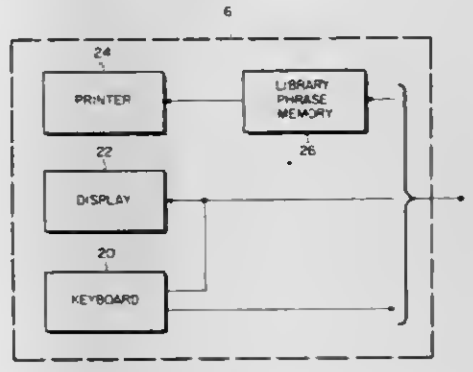
Robert M. Schuster, and Norman G. Luria, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.
Filed Sep. 27, 1976, Ser. No. 727,283
Int. Cl.^{2} G21C ***13/02, 13/04;*** **H01B** ***17/26***
U.S. Cl. 174—151 **11 Claims**



1. In a containment vessel having first and second spaced walls, said walls being subject to movement relative to one another, a penetration assembly to allow at least one electrical conductor to penetrate said containment vessel while maintaining the pressure and vapor integrity of the vessel, said penetration assembly including a first penetration subassembly fixed and sealed to said first wall comprising: a first tubular penetration nozzle sealed in said first wall, a first header sealed to one end of said first nozzle and having at least one first aperture, at least one first module sealed in said first aperture in said first header; and a second penetration subassembly in sliding engagement with and sealed to said second wall comprising: a second tubular penetration nozzle sealed in said second wall, a second header sealed to one end of said second nozzle and having at least one second aperture, at least one second module sealed in said second aperture, said first module and said second module each comprising a tubular body, at least one electrical conductor extending through said body and means for providing a vapor and pressure seal between said tubular body and said conductor, and said second penetration subassembly including means for accommodating relative movement between said conductor and said second wall to allow the unrestrained reaction of said conductor to relative movements between said first and second walls.

4,107,457
TRANSFER TERMINAL WITH LIBRARY PHRASE MEMORY

Thomas M. Hajduk, Torrance, Calif., assignor to TRW Inc., Los Angeles, Calif.
Filed May 23, 1977, Ser. No. 799,143
Int. Cl.^{2} G11C ***17/00;*** **H04L** ***13/08***
U.S. Cl. 178—17.5 **9 Claims**



1. A data transfer terminal of the type including a printer for printing out messages received from a remotely located data center, said data center providing different messages independently to a plurality of like data transfer terminals in a controlled data transfer system, said data transfer terminal being characterized by:

a library phrase memory containing a plurality of predetermined phrases at respective predetermined addresses in said library phrase memory, said addresses of said phrases corresponding respectively to a plurality of phrase address codes any of which may be included in a message sent by said data center to said transfer terminal, and

coupling control means, coupling said library phrase memory and said printer and responsive to messages received from said remotely located data center, for accessing from said memory the phrase stored at each address corresponding to a phrase address code included in said received message and for causing said printer to print out said accessed phrases, whereby the length of said message from said data center to be printed on said printer is greatly reduced in comparison with transmission from said data center of the full text to be printed.

4,107,458

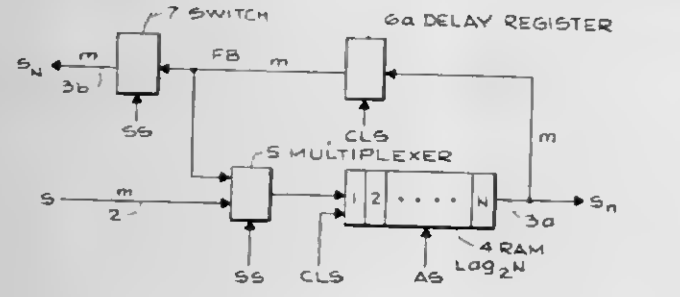
CIPHER COMPUTER AND CRYPTOGRAPHIC SYSTEM

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 90027

Filed Aug. 23, 1976, Ser. No. 716,679

Int. Cl.^{2} H04L *9/02*

U.S. Cl. 178—22 **32 Claims**



1. In a system for the implementation of a cipher computer and cryptographic system, the combination of:

a first memory means for storing a first signal S, said first memory means having storage locations for *n* words S_n;

a second memory means for storing a second signal K, said second memory means having storage locations for *n* words K_n;

crypto means having as input the stored outputs S_n, K_n of said first and second memory means and providing at its output the cipher product of said first and second signals,

with said stored outputs S_n, K_n representing at least one of delayed, encrypted, and decrypted signals S, K and with said cipher product representing the cipher function $f(S, K) = S_nK_n$ where the subscript *n* indicates that n delay operations by said first and second memory means and *n* encrypting operations including at least one of multiplying, permuting and substituting by said crypto means have been performed on said first signal S using said second signal K to obtain the output cipher function $f(S, K)$ as one of stream and block ciphers,

said crypto means including one of a multiplier and algorithm computer, where said multiplier encrypts a stream cipher function $f(S, K)$ and said algorithm computer encrypts a block cipher function $f(S, K)$; and

recirculation means providing a feedback path from one of the output of said first and second memory means and said crypto means to the input of one of said first and second memory means and including DELTIC feedback means in the form of a delay register.

4,107,459

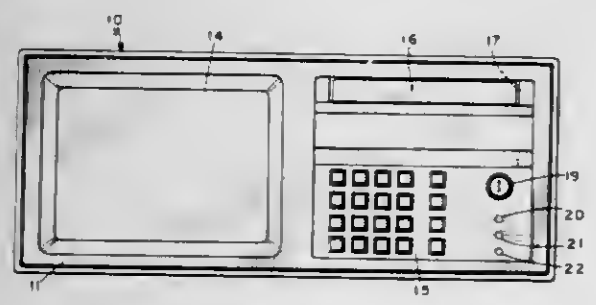
DATA PROCESSOR ANALYZER AND DISPLAY SYSTEM

Jerry Lee Stamper, San Diego, Calif., assignor to Conic Corporation, San Diegn, Calif.

Filed May 16, 1977, Ser. No. 797,188

Int. Cl.^{2} H04L *7/00*

U.S. Cl. 178—69.1 **23 Claims**



1. A system contained in a single console for distinguishing a digital signal in a received serial bit stream signal, wherein said bits represent data in an original digital signal having a predetermined bit rate, a predetermined number of bits per word, and a predetermined number of words per frame, with there being a predetermined synchronizing code word in each frame for defining said frame, comprising

processing means for processing said received signal to reconstruct said bits, to recognize said code word from said reconstructed bits, and to define said frames in response to recognition of said synchronizing code word, to thereby distinguish a digital signal having said predetermined number of bits per word, and said predetermined number of words per frame,

keyboard means coupled to the processing means for enabling an operator to indicate said predetermined bit rate, said predetermined number of bits per word, said predetermined number of words per frame and said predetermined code word to the processing means for programming the processing means to distinguish said digital signal; and

cathode ray tube means coupled to the processing means for providing an instant visual feedback from the processing means to said operator during operation of said keyboard, of said programming indications that are indicated to the processing means by operation of the keyboard means, and for providing a visual display of data represented by said distinguished digital signal.

4,107,460

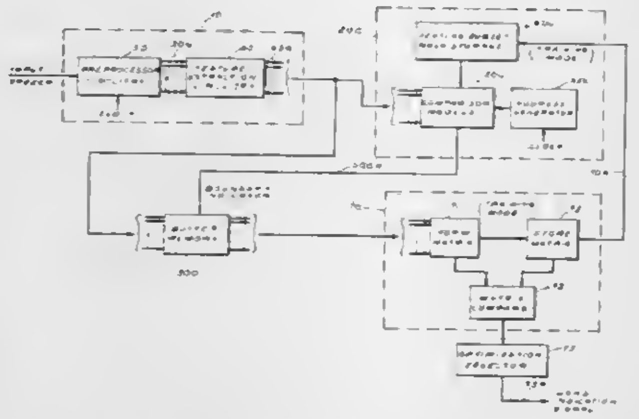
APPARATUS FOR RECOGNIZING WORDS FROM AMONG CONTINUOUS SPEECH

Gene Grunza, Blackwood, and Marvin B. Herscher, Cherry Hill, both of N.J., assignors to Threshold Technology, Inc., Delran, N.J.

Filed Dec. 6, 1976, Ser. No. 747,827

Int. Cl.^{2} G10L *1/00*

U.S. Cl. 179—1 SD **24 Claims**



1. Apparatus for recognizing the occurrence of a command word from among input speech that may be of continuous form, comprising:

means for generating successive subsets of feature signals which depend on the features present in the input speech during successive individual time slots;

means for sequentially processing the generated subsets of feature signals to determine the time interval of occurrence of a word candidate, said sequential processing means including means for comparing the generated subsets of feature signals with previously stored subsets of features and for determining a time interval during which the comparisons meet a predetermined standard; and

means for comparing a matrix formed from the feature subset signals which occurred during the determined interval with a previously stored matrix of features that are expected to occur characteristically during the command word, and for generating an occurrence indication when the comparison meets another predetermined standard.

4,107,461

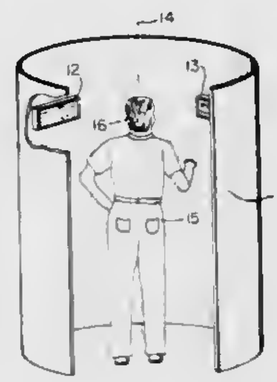
ENVIRONMENT FOR DEMONSTRATING A STEREO LOUDSPEAKER SYSTEM

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jun. 9, 1977, Ser. No. 804,896

Int. Cl.^{2} H04R *5/02*

U.S. Cl. 179—1 GA **5 Claims**



1. A loudspeaker system environment for demonstrating a stereo loudspeaker system to a single individual inside said environment without appreciably disturbing others outside said environment comprising,

first and second loudspeaker systems comprising said stereo loudspeaker system,

means defining an acoustic enclosure for supporting said first and second loudspeaker cabinets at a height corresponding substantially to the head of a listener and pointing toward the axis of said enclosure,

said enclosure having a span greater than the span of said first and second loudspeaker systems and sufficiently great to accommodate a person on said axis with its perimeter embracing at least substantially slightly less than a semicircle and embracing sufficiently less than a circle to provide an opening greater than the width of a person for providing easy entry to a person while providing good stereo sound reception along said axis at said head height while providing significantly less sound intensity outside said enclosure,

the separation between outermost portions of said first and second loudspeaker systems being greater than the radius of said semicircle and said first and second loudspeaker systems being substantially inside said semicircle.

4,107,462

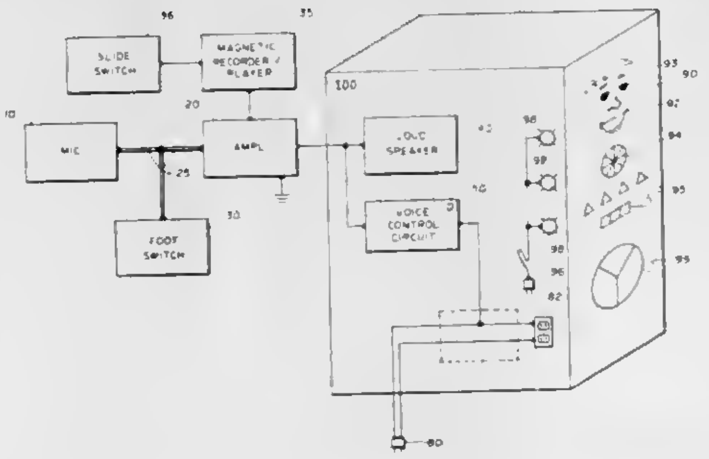
ELECTROVENTRILOQUIST

Satya Pal Asija, 2015 Butler Ave., S. St. Paul, Minn. 55075

Filed Jun. 9, 1977, Ser. No. 805,140

Int. Cl.^{2} A63H *3/33*

U.S. Cl. 179—1 VC **3 Claims**



1. An electroventriloquism apparatus comprising:

(a) a throat microphone;

(b) an amplifier connected to said throat microphone;

(c) a normally closed momentary foot switch connected to said throat microphone and said amplifier so as to normally short circuit the input to said amplifier;

(d) a loudspeaker connected to said amplifier;

(e) a voice modulated control circuit connected to the output of said amplifier; and

(f) plurality of lights and electromechanical devices powered via said voice actuated control circuit; and wherein said voice actuated control circuit comprises:

(g) an input plug;

(h) an output socket connected in series with said input plug;

(i) a diode bridge rectifier with its alternating current terminals connected across said series combination of said input plug and said output socket;

(j) a silicon controlled rectifier with its anode connected to positive direct current terminal of said diode bridge rectifier and its cathode connected to negative direct current terminal of said diode bridge rectifier;

(k) a coupling transformer with its primary terminals connected to said loudspeaker and one of secondary terminals connected to said cathode of said silicon controlled rectifier and the other secondary terminal connected to gate of said silicon controlled rectifier via a capacitor and a first resistor; and

(l) a second resistor connected to said cathode of said silicon controlled rectifier and the junction of said capacitor and said first resistor; and wherein:

(m) a magnetic tape recorder cum player pre-recorded with machine part of the dialogue is connected to another input of said amplifier; and

(n) a slide switch is connected in series with the power supply of said magnetic tape recorder cum player.

2. A process of debating with an electroventriloquism apparatus of this invention comprising the steps of:

(a) connecting a microphone in the vicinity of the human ventriloquist;

(b) sensing the audio from the microphone without lip movement of the human ventriloquist;

(c) amplifying the audio via an amplifier;

(d) short circuiting the output of said microphone during the human part of the dialogue;

(e) placing a loudspeaker connected to said amplifier within said electroventriloquism apparatus;

(f) modulating the lights and other electromechanical devices as a function of said amplifier output;

(g) pre-recording certain sounds on a tape recorder;

(h) open circuiting the power to said tape recorder during the machine part of the dialogue and during special sound effects; and

(i) controlling strobe rate of lights.

4,107,463

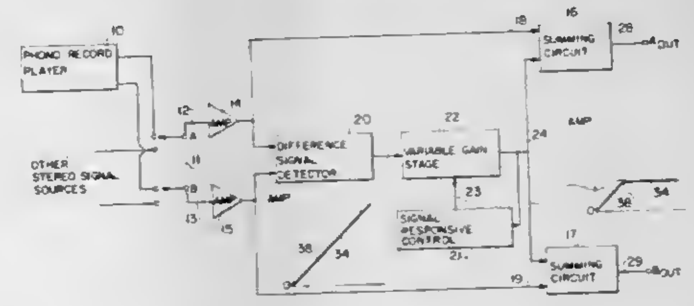
STEREOPHONIC NOISE SUPPRESSION SYSTEM

Edward E. Pearson, 220 Highland Dr., Lafayette, La. 70506

Filed Jul. 6, 1977, Ser. No. 813,179

Int. Cl.^{2} H04R *5/00*

U.S. Cl. 179—1 G **10 Claims**



1. In a stereophonic reproduction system, the combination comprising, two separate reproduction channels for providing

stereophonic output signals A and B from two separate input signal sources, third channel means for deriving the difference signal (A-B) between the two input channels,

variable gain means including control means for varying the magnitude of the difference signal to provide a linear transfer characteristic up to a predetermined input amplitude and essentially constant amplitude for input amplitudes higher than the predetermined input amplitude,

signal responsive control means operable with said variable gain means to control the gain by feedback path from the output of said variable gain means,

and means summing the output of said variable gain means into each of said two reproduction channels in proper phase that the signal in each channel respectively is reduced in the same proportion as the signal from the opposite channel is added,

thereby to provide two output signal channels in which oppositely phased signal content for amplitudes below said predetermined input amplitude is reduced as a function of the difference signal A-B, and wherein the averaged output from channels A and B remains constant for monaural input signal components regardless of the degree of control by the third channel.

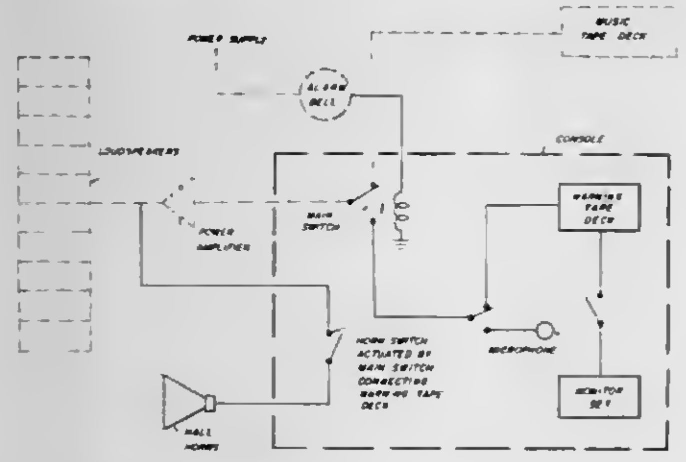
4,107,464
ALARM COMMUNICATIONS SYSTEM

John H. Lynch, 501 Ametbyst St., New Orleans, La. 70124, and George L. Gallegos, 513 Harang, Metairie, La. 70001

Cootinuation of Ser. No. 608,238, Aug. 27, 1975, abandooed. This application Jul. 26, 1977, Ser. No. 819,089

Int. Cl.^{2} H04R *27/00*

U.S. Cl. 179—1 B **1 Claim**



1. An alarm system for a high-rise building having a pre-installed non-verbal fire alarm system with at least one master alarm switch, and a pre-installed music transmitting system which includes a music source, amplifier and a plurality of loudspeakers, whereby the alarm system can be simply and conveniently installed to incorporate the pre-installed systems, the alarm system comprising:

(A) a console means comprising a tape unit with recorder-playback means with pre-recorded alarm verbal messages, a microphone, a monitor for the tape unit, a plurality of switching means comprising manual and relay means for operationally modifying modes of said alarm system, a plurality of terminals for convenient interconnection between console means and other components of said alarm system, and a plurality of lamps for indicating operating mode,

(B) emergency alarm speakers or horns located at strategic places throughout the building to which music is not normally coupled, and

(C) A remote alarm switch for manual alarm instigation, wherein said plurality of switching means comprise: a first relay which provides connection of the music source to the amplifier and loudspeakers in the non-alarm mode; a second relay which responds to the master alarm switch to cause a third relay to interconnect the tape unit to the amplifier and loudspeakers; a fourth relay which responds to the remote alarm switch to interconnect the tape unit to the amplifier and loudspeakers; a fifth relay which responds to a microphone switch to connect the microphone to the amplifier and loudspeakers; a sixth relay which energizes the tape unit, and a seventh relay which responds to a horn switch to connect the horn speakers and lamp indicators to their respective energy sources.

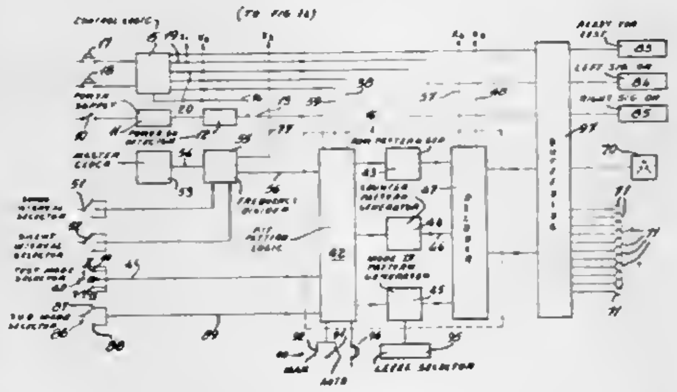
4,107,465
AUTOMATIC AUDIOMETER SYSTEM

Jacques Charlebois, and Guy Lescouflair, both of Sainte-Foy, Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Dec. 22, 1977, Ser. No. 863,238

Int. Cl.^{2} H04R *29/00*

U.S. Cl. 179—1 N **20 Claims**



1. An audiometer for testing the hearing of a person, said audiometer comprising a source of audible and selectable fixed frequency signals, frequency selector means for selecting a predetermined frequency signal from said source, a variable attenuator circuit having a plurality of attenuation levels for automatically attenuating said predetermined frequency signal through said attenuation levels and according to a preselected mode of operation for transmission of a plurality of attenuated frequency signals, means to transmit said attenuated frequency signals for audible reception by said person, visual display means to indicate the transmission of each of said attenuated frequency signals, and control circuit means for enabling said frequency selector means and said variable attenuator in accordance with said preselected mode of operation.

4,107,466
INDIVIDUAL ROOM ENERGY CONTROL SYSTEM

Steven T. Churchill, Wilton, Conn., assignor to Letot, Incorporated, Fairfield, Conn.

Filed Aug. 16, 1976, Ser. No. 714,848

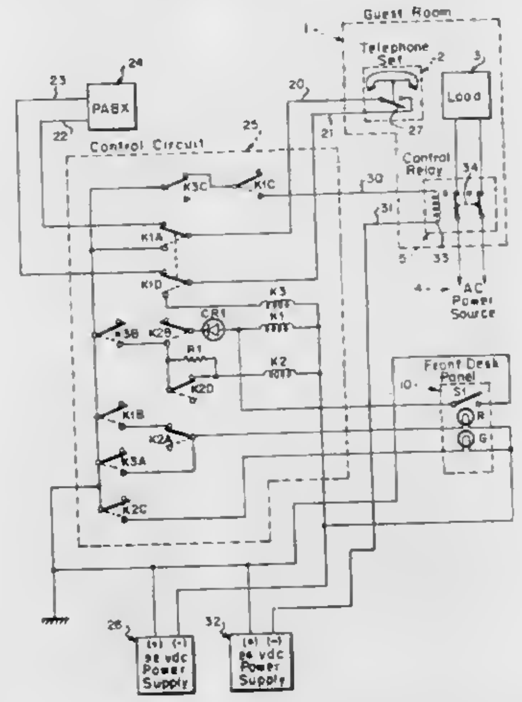
Int. Cl.^{2} H04M *11/00*

U.S. Cl. 179—2 A **4 Claims**

1. An individual room energy control system for selectively connecting an individual room electrical load means to a power source, said system including:

A. A status circuit having:
  1. An operator controlled room status switch located at a room status station by which the status circuit may be connected to a power supply, and
  2. A manually operated service switch located within an individual room for selectively connecting a portion of the status circuit to a power supply, and

B. A control ciruit having:
  1. A relay operated control switch for connecting said load means to said power source,
  2. A relay operated status switch responsive to movement of said operator controlled room status switch and energization of said status circuit for connecting said control circuit to a power supply and causing said relay operated control switch to disconnect said load means from said power source, and
  3. A relay operated service switch responsive to movement of said manually operated service switch for disconnecting said control circuit from said power supply and whereby said relay operated control switch will move to connect said load means to said power source.



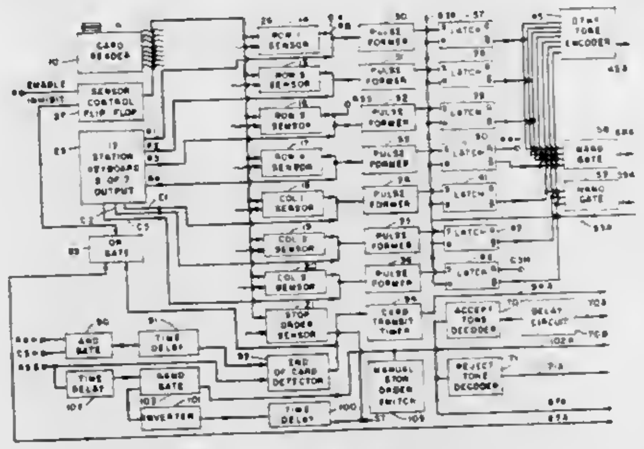
4,107,467
ELECTRONIC ORDER PLACEMENT SYSTEM USING SIGNALS OVER TELEPHONE LINE

Clifford Carl Johnson, Arlington Heights, Ill., and Vinceot Elliott Eitzen, Marco Island, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 9, 1977, Ser. No. 804,884

Int. Cl.^{2} H04M *11/00*

U.S. Cl. 179—2 DP **13 Claims**



1. Apparatus for communicating with a central processor capable of returning "accept" or "reject" signals responsive to the reception of subsets of transmitted data, comprising: a plurality of order cards forming a card order deck, each card bearing machine-interpretable data representaive of a known item and including an End-of-Card character for signaling the end of data thereon; card reader means holding a plurality of preselected ones of said cards and responsive to a feed signal for reading the next card in sequence and for generating first binary signals representative of the data on said card; manually-actuated keyboard means for generating second binary signals representative of data desired to be transmitted to said processor; tone generator circuit means responsive either to said first and second binary signals for generating tone signals representative thereof; acoustic coupler means receiving said tone signals for transmitting the same to a telephone line; first detector means responsive to an "accept" signal from said processor for generating a feed signal to said card reader means to read the next card; second detector means responsive to a "reject" signal from said processor for inhibiting said card reader means from reading said next card; first logic circuit means for controlling the generation of said feed signal to said card reader; detector circuit means for detecting an End-of-Card character being read by said card reader means; timer circuit means for delaying the output of said first detector means for a time sufficient to insure transit of said card being read from said card reading station; and said first logic circuit means being responsive to the output of said timer circuit and to an "accept" signal from said processor for generating said feed signal, whereby said feed signal will be inhibited if an End-of-Card signal is not detected or if an "accept" signal is not received from said processor.

4,107,468
DIGITAL TRAIN PROCESSING DEVICE

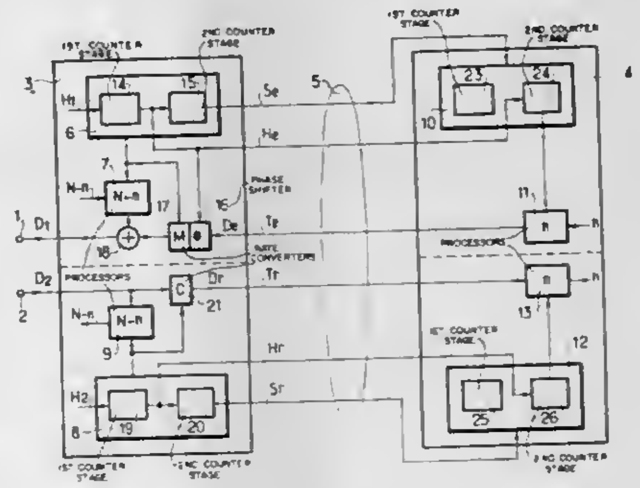
Gilles Gauriat, Paris; Jacques Vernezy, Viroflay, and Jean-Claude Barigot, Brie Comte Robert, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Oct. 14, 1976, Ser. No. 732,440

Claims priority, application France, Oct. 20, 1975, 75 32057

Int. Cl.^{2} H04J *3/12*

U.S. Cl. 179—15 BY **5 Claims**



1. A device for processing a digital pulse train composed of N-bit frames, said device comprising a main unit, an auxiliary unit and a cable connecting both units, said main unit comprising a main processor for processing N-*n* bits per frame and a modulo N counter, which counts at the bit rate of the train and which defines by its instantaneous state the position of a bit in the frame, said auxiliary unit comprising an auxiliary processor for processing at least some of the remaining bits of each frame and an auxiliary modulo N counter of the same type as the main counter, which receives via the cable a submultiple *n*/N of the bit rate of the train, said submultiple being applied to an intermediate stage of the auxiliary counter such that part of this counter counts at the same rate as the corresponding part of the main counter, said auxiliary counter including means for synchronizing the operation of the auxiliary processor and the information exchange with the main unit via the cable.

4,107,469
MULTIPLEX/DEMULTIPLEX APPARATUS

James R. Jenkins, Fort Worth, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 17, 1977, Ser. No. 769,494

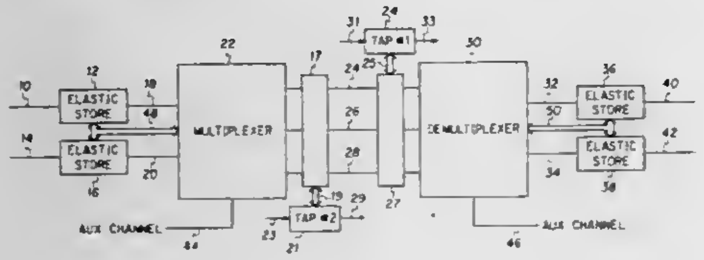
Int. Cl.^{2} H04T *3/18*

U.S. Cl. 179—15 BW **7 Claims**

1. A multiplexing communication system for transmitting two given data rate sources on three lower data rate communication channel means before demultiplexing to two channels at the data sink comprising, in combination:

first and second means for supplying first and second channels of data respectively at given substantially identical data rates;

multiplexing means, connected to said first and second means, for interleaving incoming data consecutively on X, Y, and Z data channel output means with overhead data bits used for demultiplexing wherein only said X output means includes said overhead data bits and each of said channels operate at lower data rates than said given data rate;



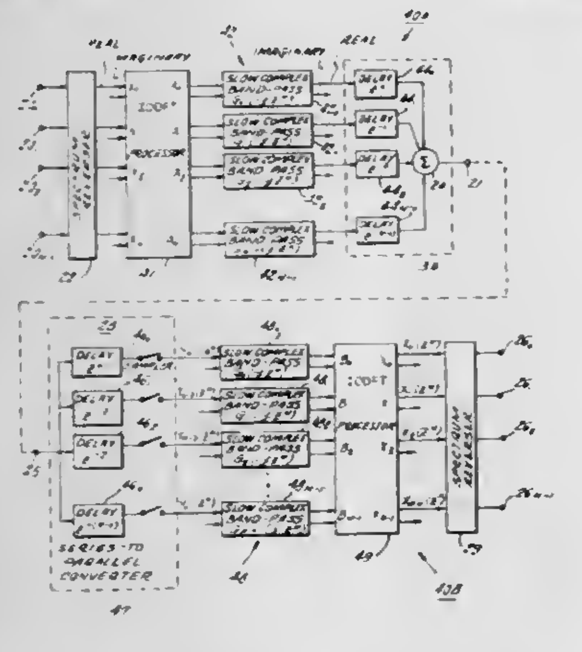
transmission means; and

demultiplexing means, interconnected by said transmission means for receiving signals from said X, Y, and Z output means of said multiplexing means, including frame bit synchronizer means operating at the rate of said incoming X channel for demultiplexing to two output data channels operating at said given data rates in accordance with overhead data received on said X channel.

4,107,470

DIGITAL SSB-FDM COMMUNICATION SYSTEM DERIVED FROM A COMPLEX BAND-PASS DIGITAL FILTER BANK AND BY A FILTER BREAKDOWN PROCESS

Rikio Maruta, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1977, Ser. No. 770,426
Claims priority, application Japan, Feb. 24, 1976, 51-19328; May 12, 1976, 51-54179
Int. Cl.^{2} H04J *1/18*
U.S. Cl. 179—15 FS 10 Claims



1. A single side-band frequency division multiplexed communication system for input sample sequences of real samples derived with a first sampling frequency f_s from baseband channel signals, respectively, of a plurality of baseband channels, N in number, said baseband channels including a predetermined number of dummy baseband channels, said predetermined number being less than N, each of said baseband signals having a bandwidth equal to or less than $f_s/2$, said communication system comprising:

first means for subjecting said sample sequences of real samples to offset discrete Fourier transformation to convert said sample sequences into a first set of complex sample sequences, N in number;

second means for digitally band-pass filtering said first set of complex sample sequences into a first set of real single side-band frequency division multiplexed sequence of samples corresponding to said real samples of said input same sequences and sampled at a second sampling frequency equal to Nf_s;

third means for converting said first set of real single side-band frequency division multiplexed sequence into a plurality of constituent sample sequences of real samples, N in number;

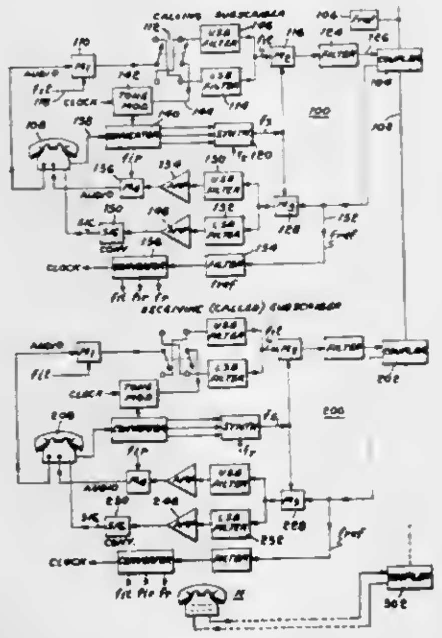
fourth means for converting said real samples of said plurality of constituent sample sequences into a second set of complex sample sequences, N in number, by digitally band-pass filtering said real samples of said constituent sample sequences, said second set of complex sample sequences corresponding to said samples of said single side-band frequency division multiplexed sequence and being sampled at said first sampling frequency; and

fifth means for subjecting the second set of complex sample sequences to offset discrete Fourier transformation to convert said second set of complex sample sequences into reproductions of said input sample sequences of real samples.

4,107,471

FREQUENCY DIVISION MULTIPLEX COMMUNICATIONS SYSTEM

Joseph Reed, Stamford, Conn., assignor to International Telephone & Telegraph Corp., Nutley, N.J.
Filed Mar. 22, 1977, Ser. No. 779,970
Int. Cl.^{2} H04J *1/06*
U.S. Cl. 179—15 FD 18 Claims



1. A frequency division multiplex communication system, comprising:

a plurality of subscriber stations coupled to a transmission line, each of said stations including at least one transmitter and at least one receiver having respectively an assigned transmitting frequency and an assigned receiving frequency; said assigned frequencies being related by a fixed frequency separation corresponding to the difference in transmitter and receiver intermediate frequencies;

mixer means for mixing a predetermined frequency with said intermediate frequencies to derive an independent side-band signal such that one sideband thereof contains communication information and the other of sideband thereof contains signalling data;

bandpass filter means at said transmitter and said receiver having a passband of approximately twice the difference in frequency between said transmitter intermediate frequency and said receiver intermediate frequency for rejecting undesired mixing products such that the desired sideband signal is selected;

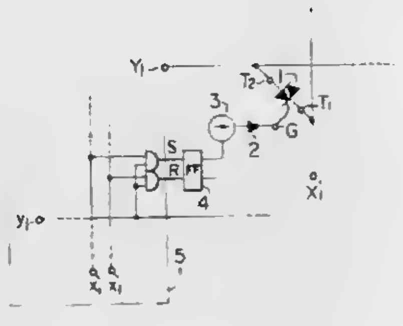
means for coupling said independent sideband signal onto said transmission line; and

means for coupling a common reference frequency onto said transmission line to obtain simultaneous communications and signalling in the same frequency band without interference therebetween.

4,107,472

SEMICONDUCTOR CHANNEL SWITCH

Mitsuru Kawanami, Yokohama; Shinzi Okuhara, Fujisawa, and Takuzi Mukaemachi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan
Continuation of Ser. No. 484,237, Jun. 28, 1974, abandoned. This application Jul. 21, 1976, Ser. No. 707,352
Claims priority, application Japan, Jun. 29, 1973, 48-72933
Int. Cl.^{2} H04Q *3/50;* H04K *17/60*
U.S. Cl. 179—18 GF 10 Claims



1. A semiconductor channel switch comprising:

a pair of PNPN switches having gate terminals and a self-holding action and connected to each other in anti-parallel configuration;

gate current circuit means including a gate current circuit for operatively providing a constant current to the gate terminals of said pair switches during its ON state and means for preventing reverse current flow in the circuit of said gate terminals, said gate current circuit means having high impedance and controlled to the ON or OFF state;

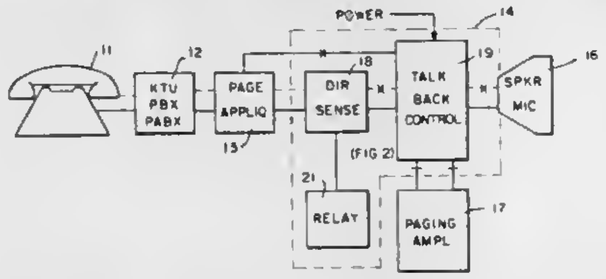
control means connected to the gate current circuit for operatively rendering the corresponding gate current circuit into the ON state; and

selecting means connected to the control means for selectively rendering said control means into its operative or inoperative state.

4,107,473

TWO-WAY PAGING SYSTEM TRANSMISSION DIRECTION SENSING AND CONTROL APPARATUS AND METHOD

Ben Arthur Pierce, Agua Dulce, Calif., assignor to Dracon Industries, Chatsworth, Calif.
Filed Apr. 29, 1977, Ser. No. 792,401
Int. Cl.^{2} H04M *3/42*
U.S. Cl. 179—18 BF 12 Claims



1. A voice paging and response system control adapted to be installed between a telephone at a master station and a speaker/microphone at a remote station, and operating in conjunction with a paging amplifier to drive the speaker, comprising

an amplifier connected to receive a remote signal initiated at the speaker/microphone and providing an amplified remote signal,

means for sensing the amplified remote signal and providing a remote signal timing indicative output,

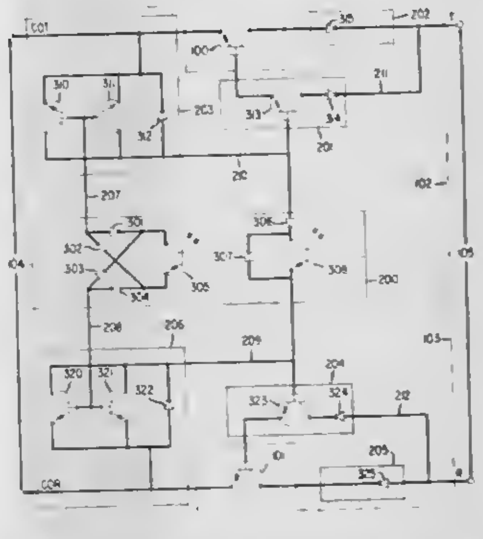
means for sensing the paging signal initiated at the telephone providing a paging signal timing indicative output,

means for comparing said paging and remote signal timing indicative output and providing a paging signal leading output when the former leads the latter, and means responsive to said paging signal leading output for coupling the paging amplifier to the speaker, whereby said paging signals are coupled thereto, said last named means operating to decouple the paging amplifier from the speaker and to couple said amplifier to the telephone in the absence of said paging signal leading output.

4,107,474

BIPOLAR TRANSISTOR SWITCHING NETWORK CROSSPOINT

Herbert Anton Schneider, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 31, 1977, Ser. No. 801,467
Int. Cl.^{2} H04Q *3/52*
U.S. Cl. 179—18 GF 15 Claims



1. A bipolar transistor crosspoint arrangement comprising:

a pair of input terminals;

a pair of output terminals;

a PNP bipolar transistor having an emitter, a base, and a collector terminal, said PNP transistor emitter being connected to one of said pair of input terminals;

an NPN bipolar transistor having an emitter, a base, and a collector terminal, said NPN transistor emitter being connected to the other one of said pair of input terminals;

control means responsive to a crosspoint control signal for enabling said transistors; and

protective shell means connected between said control means and the respective bases of said transistors, between said control means and the respective emitters of said transistors, and between each of said output terminals and the respective collectors of said transistors for protecting said transistors from any configuration of over voltages applied to said input and said output terminals of said transistor crosspoint when said transistors are in the off state and for providing a low forward impedance across said transistors when said transistors are in the on state.

4,107,475
RECEIVER APPARATUS FOR DETECTION OF TWO VOICE FREQUENCIES IN A MULTIFREQUENCY TONE SIGNAL

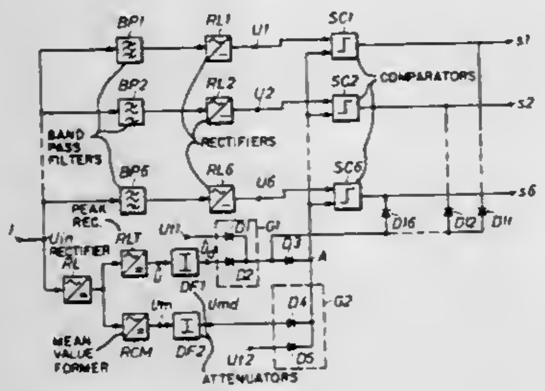
Bengt Roland Carlqvist, Stockholm, and Anders Gunnar Eriksson, Jobannesbov, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 3, 1977, Ser. No. 756,115

Claims priority, application Sweden, Mar. 9, 1976, 7603136

Int. Cl.^{2} H04M *1/50*

U.S. Cl. 179—84 VF **4 Claims**



1. Receiver apparatus for the detection of at least two voice frequencies in an incoming tone signal during MFC-signalling which is insensitive to disturbing signals comprising a reference rectifier and a number of parallel connected signal paths equal to the number of the possible voice frequencies in the incoming tone signal; each of said signal paths having a bandpass filter tuned to a certain voice frequency, a rectifier and an analog signal comparator for comparing the signal obtained from the rectifier with a reference signal produced by said reference rectifier; and said reference rectifier having a first signal path including a first circuit means for generating a first signal level in dependence on the incoming signal level for comparison with a signal obtained from one of the rectifiers in said parallel connected signal paths, a second signal path including a second circuit means for generating a second signal level in dependence on the incoming signal level but of lower value than said first signal level, and a number of paths each including means connected between the output of each signal comparator and said first signal path for blocking the output signal from the first signal path in dependence on said comparison, so that a new comparison is carried out between the output signal obtained from the second signal path and a signal obtained from another of the rectifiers in said parallel connected signal paths.

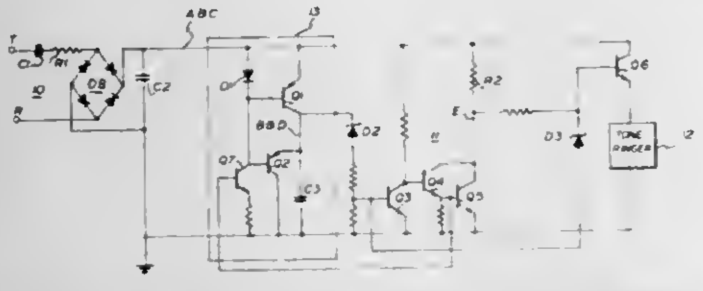
4,107,476
ELECTRONIC TONE RINGER CONTROL CIRCUIT FOR A TELEPHONE SET

Edward Llnyd Henderson, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 3, 1977, Ser. No. 838,493

Int. Cl.^{2} H04M *1/00*

U.S. Cl. 179—84 T **5 Claims**



5. In a control circuit for controlling the on-off ringing of a line-powered electronic tone ringer in a telephone set, powered by incoming a-c ringing signals on a telephone line;

the control circuit comprising:

a network for rectifying and filtering an incoming a-c voltage to provide a d-c supply voltage;

a gating circuit for connecting the tone ringer to the d-c supply voltage when said voltage exceeds a preselected minimum amplitude;

the improvement comprising:

a suppression circuit for suppressing transient voltages such as dial pulses, having a magnitude greater than, and a repetition frequency less than said a-c ringing signals, to substantially prevent false actuation of said gating circuit;

said suppression circuit comprising:

a capacitor connected across the input to the gating circuit for filtering an input control signal voltage thereto;

a source of constant current powered from said d-c supply voltage for charging said capacitor to develop said input control signal voltage;

means for rapidly discharging the capacitor when the amplitude of the input control signal voltage exceeds that of the d-c supply voltage.

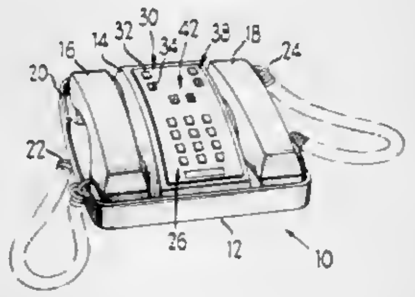
4,107,477
MULTI-SUBSCRIBER TELEPHONE APPARATUS

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 9, 1977, Ser. No. 775,786

Int. Cl.^{2} H04M *1/02*

U.S. Cl. 179—99 **23 Claims**



1. Telephone apparatus for connection to a plurality of telephone lines comprising:

a base portion including at least two arrangements defining structures for accepting a telephone handset, and a hook switch control device for each handset accepting structure;

at least two telephone handsets having transmitter and receiver elements and being positionable on said base portion handset accepting structures;

means for producing output signalling on said plurality of telephone line connections; and

selection means connected to said handsets and said output signalling means for controlling the operation of said handsets and said output signalling means on said plurality of telephone line connections, said selection control means comprising first handset selection means actuable in a plurality of selection conditions corresponding to the number of telephone connections for controlling the operation of a first of said handsets on each of said plurality of telephone line connections according to the selection condition actuated, second handset selection means actuable in a plurality of selection conditions corresponding to the number of telephone line connections for controlling the operation of a second of said handsets on each of said plurality of telephone line connections according to the selection condition actuated, and signalling selection means actuable in at least two selection conditions for controlling said output signalling means to operate on each of said plurality of telephone line connections according to the selection conditions actuated.

4,107,478
ANGLE MODULATED WAVE DEMODULATION SYSTEM

Nnbuaki Takahashi, Yamato; Kazunori Nishikawa, Fujisawa; Yoshiki Iwasaki; Masaaki Satoh, both of Yokohama; Katsuhiro Ohba, Yokobama; Shinji Nakamura, Tokyo; Tatsuo Sawada, Sagamibara; Nobuhide Ohsaki, Yokohama; Yasuo Itob, Tokyo; Nobuaki Suda, Yamato; Yasuhisa Okabe, Zama, and Hideaki Ozaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

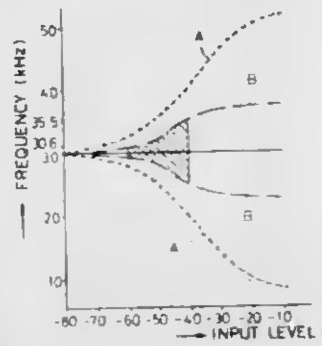
Continuation of Ser. No. 502,531, Sep. 3, 1974, which is a continuation of Ser. No. 294,371, Oct. 2, 1972, abandoned. This application Jun. 21, 1976, Ser. No. 698,191

Claims priority, application Japan, Oct. 5, 1971, 46-77531; Feb. 16, 1972, 47-16186; Feb. 23, 1972, 47-18109; Mar. 3, 1972, 47-22098; Apr. 6, 1972, 47-33842; Apr. 22, 1972, 47-40677; May 24, 1972, 47-51495

The portion of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.

Int. Cl.^{2} G11B *3/04, 3/74;* **H03D** *3/00*

U.S. Cl. 179—100.4 ST **4 Claims**



1. A system for demodulating an angle modulated wave which is picked up from a recording medium on which is recorded an audio signal which is angle modulated on a carrier wave, said system comprising:

a phase locked loop system including voltage controlled oscillator means; phase comparator means for comparing the phase of a carrier wave of the picked-up angle modulated wave with the phase of an oscillation signal generated by said voltage controlled oscillator means and for generating an output signal corresponding to the phase difference; time constant circuit means responsive to the phase comparator means output signal for attentuating audio frequency components more than it attenuates frequency components which are loweri frequency than audio frequency; the audio frequency components and the frequency components which are lower than the audio frequency components appearing in the output signal of said phase comparator means; the output signal of said time constant circuit means providing a demodulation signal of the picked-up angle modulated wave; and means responsive to the lower than audio frequency components from said time constant circuit means for causing the output of said voltage controlled oscillator means to follow deviations between the frequency of the picked-up carrier wave and the frequency which the carrier wave had when it was originally recorded, which deviations lie within a first lock frequency range, said last named means being further responsive to the audio frequency components from said time constant circuit means for causing the output of said voltage controlled oscillator means to follow the audio frequency deviations of the picked-up carrier wave, which deviations lie within a second lock frequency range, said second lock frequency range being more narrow than the first lock frequency range;

means responsive to the frequency of the carrier wave of the picked-up angle modulated wave which lies outside of said first lock frequency range for operating said voltage controlled oscillator mans to oscillate at a frequency which is substantially equal to the frequency which the carrier wave had when the carrier wave was recorded on the recording medium; and

means for adjusting the level of the picked-up carrier wave to be below a predetermined level at which the frequency width of said second lock frequency range begins to saturate, and means for applying the output of said level adjusting means to said phase comparator means.

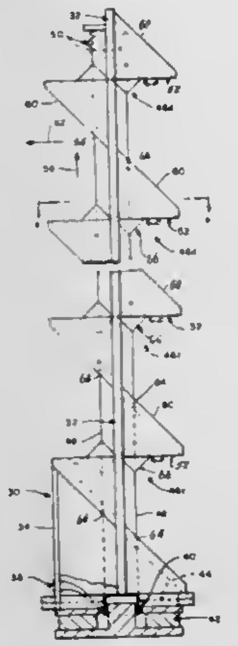
4,107,479
ELECTRO-ACOUSTIC TRANSDUCER

Oskar Heil, 1775 Parrott Dr., San Mateo, Calif. 94402

Filed Sep. 3, 1976, Ser. No. 720,357

Int. Cl.^{2} H04R *1/20, 1/34, 7/02, 9/02, 9/04, 9/06*

U.S. Cl. 179—116 **15 Claims**



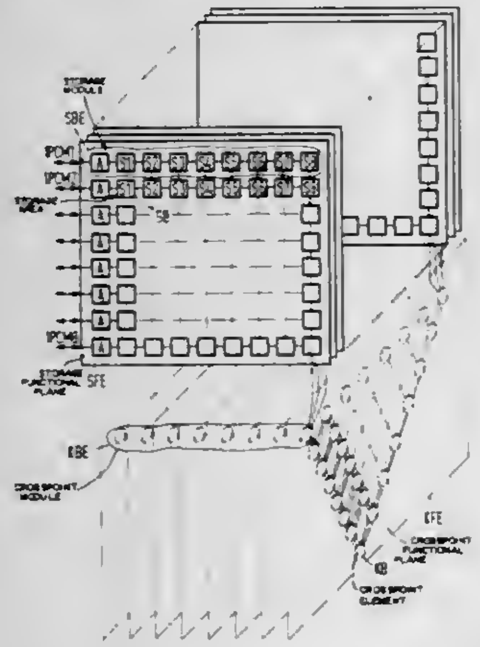
1. In a loudspeaker: a plurality of speaker stages aligned in a direction comprising a longitudinal axis for the loudspeaker; each speaker stage comprising a baffle plate extending perpendicular to said longitudinal axis of the loudspeaker, a diaphragm opening in said baffle plate, a sound emanating rigid non-resonant diaphragm disposed in said opening, hinge members on the periphery of said rigid diaphragm mounting said diaphragm in said opening, a deflecting plate extending at an acute angle from one side of the baffle plate to an opposite side of the baffle plate of the adjacent speaker stage thereby defining an opening between adjacent baffle plates through which sound is adapted to emanate at right angles to said longitudinal axis, the area of each said opening through which sound emanates being greater than the area of each said diaphragm; an acoustic generator for responding to an electrical signal for creating an acoustic motion; and a plurality of unitary drive means capable of longitudinal sound propagation interconnected between said acoustic generator and each of said diaphragms for moving the same in unison, said drive means being uniformly distributed with respect to the cross-sectional area of each diaphragm, whereby each said diaphragm moves bodily as a rigid unit.

12. In a loudspeaker: a speaker housing; a plurality of speaker stages aligned in a longitudinal direction and comprising one section of the loudspeaker; each speaker stage comprising a baffle plate extending perpendicular to the longitudinal direction of alignment of said stages, a diaphragm opening in said baffle plate, a sound emanating rigid diaphragm disposed in said opening, a deflecting plate extending at an acute angle from one side of the baffle plate and extending to an opposite side of the baffle plate of the adjacent speaker stage thereby defining an opening between adjacent baffle plates through which sound is adapted to emanate at right angles to said longitudinal axis, the area of each said opening through which sound emanates being greater than the area of each said diaphragm; an acoustic generator for responding to an electrical signal for creating an acoustic motion; and drive means com-

prising a plurality of separate elements each placed in tension and interconnected between said acoustic generator and each of said diaphragms for moving the same in unison; a second section mounted adjacent said one section; said drive means passing through said one section in one direction and through said second section in the opposite direction; and means interconnecting said sections for transferring the tension and motion of said separate elements between said sections in phase coherence.

4,107,480
PULSE CODE MODULATED, TIME DIVISION MULTIPLEX SWITCHING NETWORK

Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Continuation of Ser. No. 563,096, Mar. 28, 1975, abandoned.
This application Dec. 6, 1976, Ser. No. 747,933
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1974, 2415367
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AT **7 Claims**

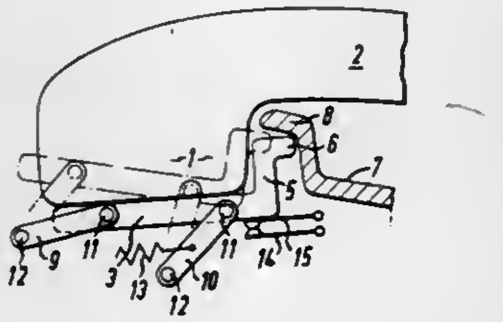


1. In a pulse code modulation/time division multiplex (PCM/TDM) switching network in a PCM tandem exchange for the connection of receive PCM/TDM trunks to transmit PCM/TDM trunks and for the time allocation of time slots to be used on the receive trunks to time slots to be used on the transmit trunks, the improvement comprising:

a plurality of storages each associated with a pair of receive and transmit PCM/TDM trunks, each of said plurality of storages having a storage capacity corresponding to the amount of data transferable over a PCM/TDM trunk within one sampling pulse frame, each of said plurality of storages comprising a plurality of storage areas selectively connectible to said associated pair of PCM/TDM trunks by a first pair of input/output connections, each of said storage areas comprising at least one storage location for storing a PCM word, wherein one of said storage locations is repeatedly seized during each sampling pulse frame assigned to a given call to sequentially store data incoming over said associated receive PCM/TDM trunk and data outgoing over said associated transmit PCM/TDM trunk, each of said storage areas having a second pair of input/output connections which are not connectible to said associated pair of PCM/TDM trunks, wherein said second pairs of input/output connections of said storage areas in one of said plurality of storages are connected to the second pairs of input/output connections of corresponding ones of said storage areas in a number of the other of said plurality of storages to thereby enable said switching network to selectively convey data over said PCM/TDM trunks.

4,107,481
TELEPHONE INSTRUMENTS

Digby Redshaw, Warwick, England, assignor to The Post Office, London, England
Filed Apr. 7, 1977, Ser. No. 785,559
Claims priority, application United Kingdom, Apr. 13, 1976, 15091/76
Int. Cl.² H04M *1/08*
U.S. Cl. 179—164 **1 Claim**



1. A switching device for energizing and de-energizing a telephone instrument in response to removal and replacement of the hand-set, comprising a platform for receiving one capsule of the hand-set, an abutment projecting from the plane of the platform providing a location for the capsule and including at least two linkages each having a part pivotally connected to the platform, a pivotal support for each linkage, the axis of all the pivots being parallel to one another and the platform and the linkages being movable against spring bias from a first position at which the instrument is energized, to a second position at which the instrument is de-energized, by the gravity bias of the hand-set with the capsule on the platform, the arrangement being that placing the hand-set on the instrument either in the horizontal or the vertical mode with the capsule on the platform provides secure cradled location of the hand-set and causes movement of the linkages to the second position.

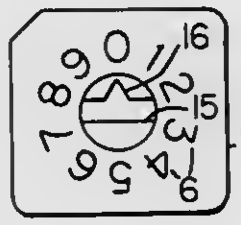
4,107,482
ROTARY ROCKING-BEAM SWITCH

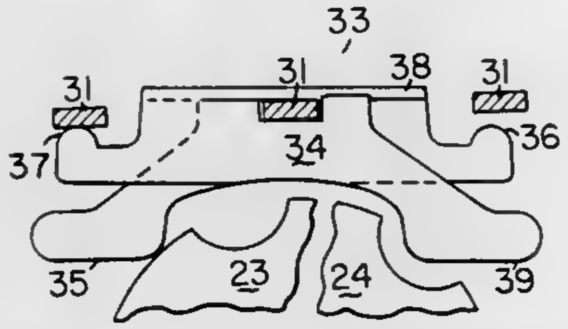
Harry Rudolph Marker, Costa Mesa, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.
Filed Jan. 31, 1977, Ser. No. 763,766
Int. Cl.² H01H *19/60, 21/80, 1/12*
U.S. Cl. 200—6 B **12 Claims**

6. A rotary plural-contact switch, comprising;
(a) an electrically insulative enclosure (7) having a cylindrical aperture (8),
(b) a revolvable rotor (12) having plural radial cams (19,13) with lobes, said rotor nested in said cylindrical aperture,
(c) plural spaced conductive contacts (31) stationarily aligned in pairs peripherally of said rotor within said enclosure,
(d) a stationary member (31) between each said pair of contacts, and
(e) a conductive beam (33) having a web stressed between said stationary member and the adjacent said pair of contacts;

a cam of said rotor in mechanical contact with said beam,

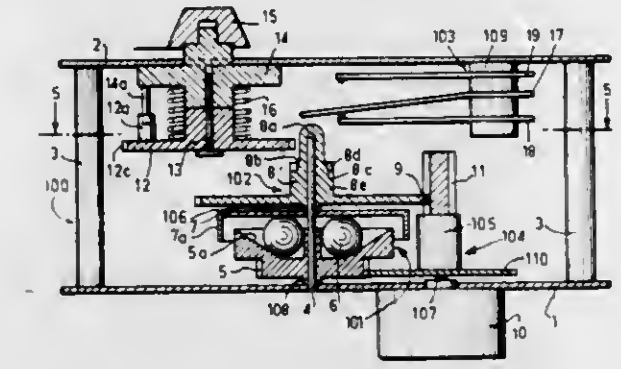
whereby engagement of a said lobe with a said beam stresses the web of said beam to open the electrical contact between said stationary member and at least one of said spaced contacts.





4,107,483
TIMER SWITCH ASSEMBLY HAVING CENTRIFUGAL DISPLACEMENT MECHANISM

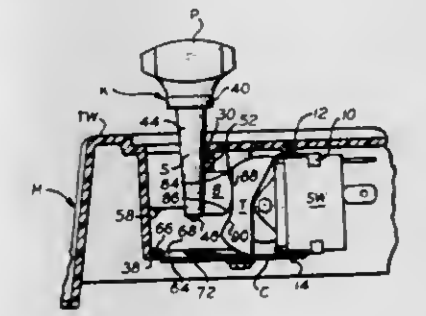
Edouard Léon Clément Jouret, Bresso-Milano, Italy, assignor to Crouzet, Paris, France
Filed Oct. 8, 1976, Ser. No. 730,978
Claims priority, application France, Oct. 24, 1975, 75-32730
Int. Cl.² H01H *43/90, 35/10*
U.S. Cl. 200—35 R **2 Claims**



1. A timing device including a support frame, comprising two support plates, a switch, a centrifugal mechanism and a timing wheel held between said two support plates, said switch and centrifugal mechanism being freely rotatable and co-axially mounted on a first axis secured to one of said support plates, and a synchronous motor secured to said support frame for rotating said switch at a low rate of speed and said centrifugal mechanism at a faster rate of speed through two driving gears mounted on the motor shaft and engaging two toothed driven portions formed on said switch and said centrifugal mechanism, respectively, said timing wheel being freely rotatable on a second axis fixedly secured to a disc frictionally engaged with said one support plate and having a manually rotatable knob keyed thereto, said timing wheel, for setting the duration of the timing, being rotated through a first predetermined angle by a biasing coil spring whose ends are attached to said disc and timing wheel, respectively, said timing wheel having a toothed driven portion and a teethless portion at the periphery thereof, said centrifugal mechanism being provided with a dished track receiving freely riding weighted balls to axially move an actuating member disposed between said centrifugal mechanism and said switch, and a toothed driving portion being formed on said switch for engaging said toothed driven portion of said timing wheel, whereby upon energization of said synchronous motor, said switch is moved axially in a direction parallel to the rotary axis of the timing wheel by said actuating member under the action of said centrifugal mechanism to a first position in which the toothed driving portion of the switch engages said toothed driven portion of the timing wheel, said switch being prevented from keeping on moving axially by the teeth of the toothed driven portion of the timing wheel against which abuts a teethless part of said switch adjacent the toothed driving portion thereof until said timing wheel has been rotated by said toothed driving portion of said switch through a second predetermined angle so that said teethless portion of the timing wheel registers with said switch and the toothed driving portion of the switch is disengaged from the timing wheel, whereupon said switch is moved axially to a second position and the timing wheel is maintained in position by said teethless part of the switch, the deenergization of the synchronous motor allowing the switch to move in the reverse direction to its normally inoperative state and thus, through the disengagement of the teethless portion of the timing wheel from the switch, allowing the timing wheel to move back to its initial position under the action of said coil spring.

4,107,484
SAFETY SWITCH

Carl Mogens Petersen, III, Pontiac, Mich., assignor to Irvin Industries Inc., Stamford, Conn.
Filed Jul. 18, 1977, Ser. No. 816,747
Int. Cl.² H01H *27/06*
U.S. Cl. 200—42 T **6 Claims**



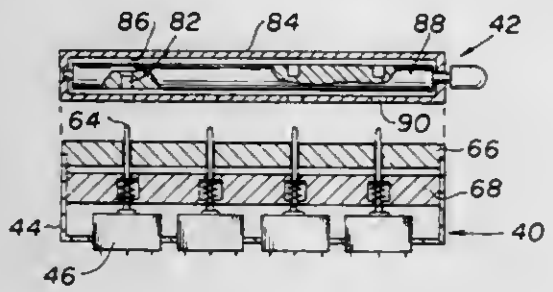
1. A safety switch comprising:
a key having a bit, a housing having a stationary keyway and an on-off electrical switch mounted in said housing,
said keyway being adapted to receive said key, said keyway having first and second opposed walls, said keyway providing an inserted position, intermediate rotational positions and an operative position, said second wall being substantially shorter than said first wall, said key when fully inserted in said inserted position being blocked from rotation in a first rotational direction by said first wall and free to rotate in a second rotational direction, said key when partially inserted into said inserted position being blocked from rotational movement by said first and said second walls,
said key when fully inserted in said inserted position being free to rotate in said second rotational direction through a predetermined arc to said operative position,
said key when in said operative position being free to move axially from said operative position to a partially retracted position,
said switch having an operative switching member, said key when in said operative position being aligned with said operative switching member,
axial retraction of said key to said partially retracted position when in said operative position, engaging said operative switching member to place said switch in an on state,

a wall of said housing, engagement between said wall and said bit determining said partially retracted position,
reinsertion of said key when in said partially retracted position causing said switch to switch into an off state,
said bit of said key engaging an edge of said second wall in substantially all said intermediate rotational positions of said key between the initial fully inserted position and said operative position, said edge of said second wall preventing axial retraction movement of said key in said intermediate rotational positions.

4,107,485

DEVICE FOR COMPLETING AN ELECTRIC CIRCUIT OR THE LIKE FOR A LOCK OR THE LIKE

Antoo L. Klug, 144 Garfield Pl., East Rockaway, N.Y. 11518
Filed Sep. 12, 1977, Ser. No. 832,572
Int. Cl.² H01H *27/10*
U.S. Cl. 200—43 **6 Claims**



1. A device for completing a circuit for operating a lock or the like, said device comprising first and second conductors of said circuit disposed in a normally open circuit relation to each other, a cooperating plurality of switch means operatively arranged so as to be effective in converting said open circuit relation of said cooductors into a closed circuit relation upon the selective actuation of some of said switch means and the non-actuation of the remainder thereof, each said switch means being of the type having at least a conductive and a non-conductive operating mode of which one such mode always is operational to the exclusion of the other, conductors for connecting said switch means in said conductive modes to said non-conductive modes of other of said switch means so as to form a partial series interconnection of said switch means, and a switch means-actuating member operatively effective to modify the non-conductive modes of select numbers of said switch means and not to disturb the conductive modes of the remainder thereof upon movement thereof into a position adjacent said switch means so as to cause the aforesaid modification therein, whereby said switch means-actuating member in said position adjacent to said switch means is effective in establishing a closed circuit relation between said first and second circuit conductors.

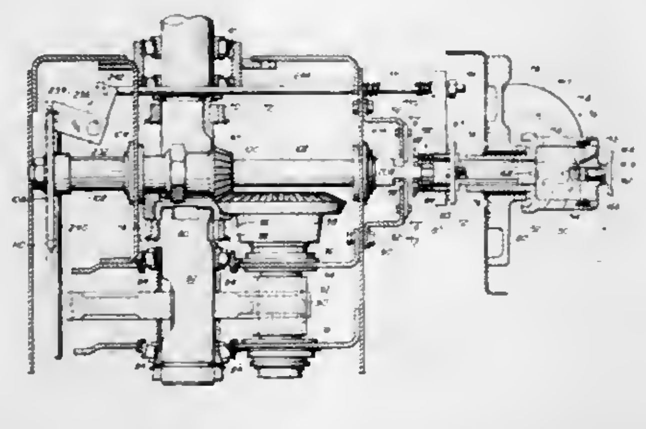
4,107,486

SWITCH OPERATING MECHANISMS FOR HIGH VOLTAGE SWITCHES

David M. Evans, Palatine, Ill., assignor to S & C Electric Company, Chicago, Ill.
Filed Juo. 30, 1976, Ser. No. 701,064
Int. Cl.² H01H *31/00*
U.S. Cl. 200—48 R **12 Claims**

1. In a mechanism for operating a high voltage switch including a rotatably mounted drive shaft connected to the switch for opening and closing the switch in response to rotation of the drive shaft, a motor, and a gear train operably connected to the motor, a clutch means disengageably connecting the gear train to the drive shaft, a selector handle mounted for pivotable movement between a first and a second position; a selector shaft connected to said selector handle for pivotable movement with the selector handle; means operably connected with the selector shaft for causing the clutch means to engage the gear train when the selector handle is in the first position, and for causing the clutch means to disengage the gear train when the selector handle is in the second position; an improvement comprising:
a locking plte positioned around the drive shaft adapted to move along the drive shaft but constrained from rotating with the drive shaft, said locking plate having a plurality of openings therein, the clutch means having a plurality of pins extending from the clutch means, said pins positioned to engage said openings in said locking plate when the clutch means disengages the gear train so that the drive shaft is prevented from rotating, and said pins disengaging said openings when the clutch means engages the gear train so that the drive shaft can be rotated by the gear train.

5. In a mechanism for operating a high voltage switch including a rotatably mounted drive shaft operably connected to the switch, a motor, a gear train operably connecting the motor with the drive shaft, a brake for locking the motor upon deenergization thereof, a manually operably crank handle foldable from a stored position to an operating position; means for releasing the brake upon folding of said crank handle to an operating position; a piston means operably connected with the crank handle for rotation therewith, and for translational motion in response to folding of the crank handle from a stored position to an operating position, the piston means including engaging means associated therewith for engaging the gear train so that rotation of the crank handle will rotate the drive shaft; an improvement comprising:
means for preventing the engaging means from engaging the gear train until the crank handle has both been folded to the operating position and rotated through a partial revolution thereof so that torsional energy stored in the drive shaft is released before the engaging means engages the gear train.



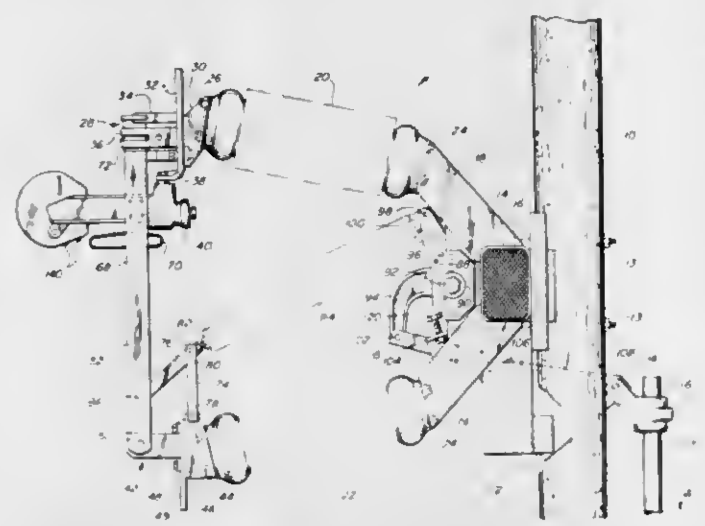
11. In an operating mechanism for operating devices through a resilient drive shaft including driven means operably connected to the drive shaft for rotation thereof; driving means; means for locking the driven means while the drive shaft is torsionally stressed; means for moving the driving means to engage the driven means; an improvement for preventing torsional snap back comprising:
means for releasing the means for locking in response to moving the driving means to engage the driven means; and
means for delaying said driving means from engaging the driven means until the torsional stress in the drive shaft has been relieved.

4,107,487

INTERRUPTER SWITCH ARRANGEMENT

David M. Evans, Palatine, Ill., assignor to S & C Electric Company, Chicago, Ill.
Filed Mar. 9, 1977, Ser. No. 775,905
Int. Cl.² H01H *33/44*
U.S. Cl. 200—48 KB **17 Claims**

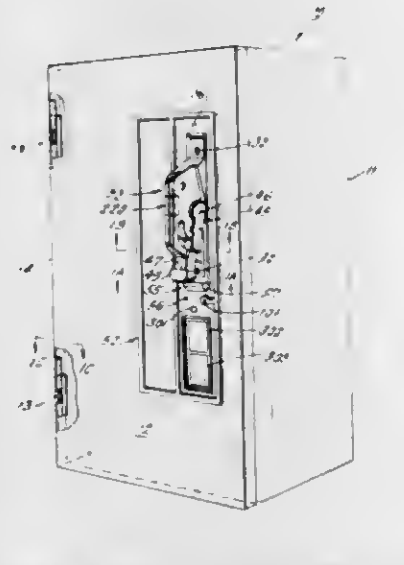
1. In an electrical switch of the type which includes a first insulator having a contact thereon; a switch blade pivotally mounted to a second insulator for movement into and out of engagement with the contact in a plane including the insulators; and a reciprocable push rod for pivoting the switch blade upon movement of a distal portion of the push rod, an axis of the push rod through the distal portion being included in the plane; an improved linkage means for connecting the push rod to the switch blade, comprising:
a first link having a first pivotal connection to the switch blade near the pivotal blade mount, and a second pivotal connection to a proximate portion of the push rod included by the axis; and
a second link having a first pivotal connection to a fixed point near the pivotal blade mount and a second pivotal connection to the proximate push rod portion, all force applied to and exerted by the push rod along the axis thereof due to movement of its distal portion being applied to, and along, a line defined by the pivotal connections of the first link during the movement of the switch blade.



4,107,488

PLATFORM MOUNTED SWITCH OPERATING MECHANISM

Frank R. Keller, Villanova, Pa.; Frank W. Kussy, Randallstown, Md.; Bernard DiMarco, Bellefontaine, Ohio, and Michel M. Fenneteau, Gaithersburg, Md., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Dec. 2, 1976, Ser. No. 746,833
Int. Cl.² H01H *9/22*
U.S. Cl. 200—50 A **10 Claims**

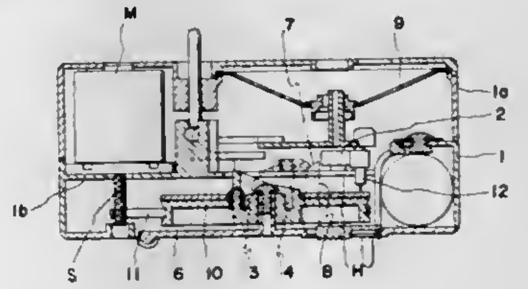


1. Enclosed switch apparatus including an enclosure having a front opening, a cover hingedly connected along a first of its edges to said enclosure for closing said opening, switch means inside said enclosure including a contact operating mechanism, switch operating means mounted to said enclosure forward of said contact operating mechanism, said operating means including platform means comprising a hollow narrow housing, a U-shaped manual operating handle having arms positioned adjacent opposite sides of said housing and having an end portion thereof keyed to pivot means extending transversely of said housing, linkage means keyed to said pivot means extending transversely of said housing, linkage means keyed to said pivot means and connected to said operating mechanism for operation of the latter by operation of said handle, said cover including means defining aperture means through which said housing extends when said cover is closed, said aperture means disposed adjacent a second edge of said cover opposite said first edge thereof, cover catch means on said platform means, defeatable cover interlock means on said platform means to prevent operation of said catch means to release said cover when said handle is in switch closed position, and defeatable switch interlock means on said platform means to prevent operation of said handle to switch closed position when said cover is open, said catch means having a cover holding portion extending through said aperture means forward of said cover when the latter is closed.

4,107,489

SWITCH MECHANISM FOR SIMPLE PHONOGRAPH

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Japan
Filed May 19, 1976, Ser. No. 687,692
Claims priority, application Japan, May 21, 1975, 50-68132[U]
Int. Cl.² H01H *35/00;* G11B *3/00;* H01H *3/00*
U.S. Cl. 200—52 R **5 Claims**



1. A switch mechanism for use in a simple phonograph, comprising:
(a) a casing having an opening and closing flap;
(b) a pivotally moveable pickup bracket which travels along a path coincident from the peripheral edge to the center of a turntable of the phonograph;
(c) a moveable contact piece extending into the path of the terminal end of the pivotal movement of the pickup bracket, said contact piece being biassed against the direction of movement of said pickup bracket toward the terminal end thereof;
(d) a fixed contact member against which said moveable contact piece is biassed and supported;
(e) a pivotally moveable switch actuator elastically biassed such that one end thereof thrusts out the free end of said moveable contact piece against its elastic forces so as to break the contact thereof with the fixed contact member, and
(f) a pawl element disposed on the opening and closing flap of the casing and projecting inwardly into the interior of the casing, the pawl element having a tapered end so that when the casing is closed said tapered end of said pawl element pushes the switch actuator such that the switch actuator is axially displaced away from the switch upon the engagement of the actuator with the pawl when the flap is closed.

4,107,490
HOSPITAL BEDS

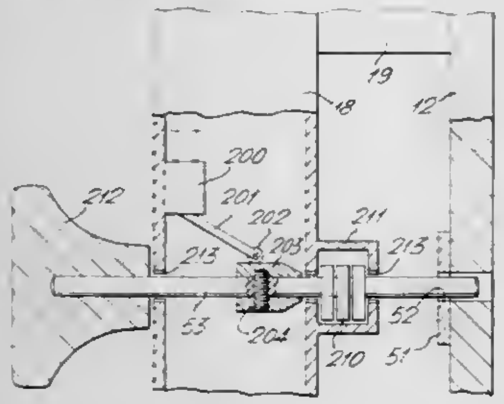
Francis Xavier Keane, 261 N. Circular Rd., Dublin, Northern Ireland (7)

Filed Feb. 25, 1977, Ser. No. 772,063

Claims priority, application United Kingdom, Mar. 4, 1976, 445/76

Int. Cl.² H01H *3/00, 3/42*

U.S. Cl. 200—52 R **5 Claims**



1. In a hospital bed comprising a bed frame, a supporting structure for a stretcher pivotally mounted in the bed frame for oscillation relative to the bed frame, an electric motor arranged to effect oscillation of the supporting structure relative to the bed frame upon energization of the motor, and means for locking the supporting structure at a desired angle relative to the bed frame, the locking means comprising cooperating elements on the bed frame and the supporting structure respectively, the cooperating elements including one of the elements arranged to assume two selected rest positions respectively in engagement with the other element to lock the supporting structure at the desired angle relative to the bed frame and out of engagement with the other element to release the supporting structure for pivotal movement relative to the bed frame:

(a) an electric switch adapted to control the supply of electrical energy to the motor for energization thereof, and

(b) means coupling the electric switch and the one element of the locking means, the coupling means being arranged to switch on the switch automatically to energize the motor when the one element is in the rest position out of engagement with the other element to release the supporting structure and to switch off the switch when the one element is in the rest position in engagement with the other element to lock the supporting structure.

4,107,491
WELDING MACHINE SPACER PLATE WITH SENSORS

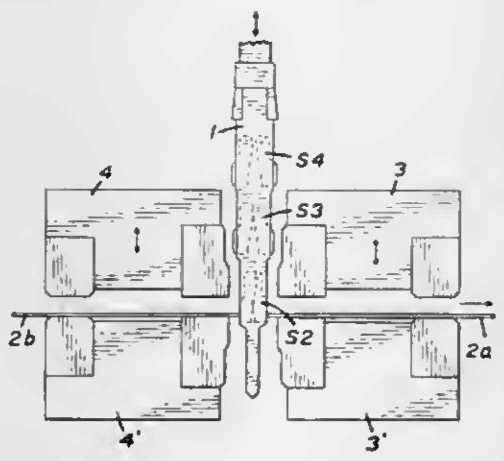
Charles A. Toma, Warren, and Walter F. Haessly, Salem, both of Ohio, assignors to The Taylor Winfield Corporation, Warren, Ohio

Filed Apr. 19, 1976, Ser. No. 678,154

Int. Cl.² H01H *3/60*

U.S. Cl. 200—61.42 **2 Claims**

1. For use in a welding machine, a spacer bar for selectively spacing the amount of projection of metal strip ends beyond two pairs of welding clamps on opposite sides of said bar, before welding the ends of the strip ends together to insure that the strip ends are flushly positioned before welding, said spacer bar comprising steps on opposite sides throughout its length to provide longitudinal portions of varying widths of the bar to vary the extent of projection of the strip ends beyond the ends of said two pairs of welding clamps, an opening inside each of the stepped sides of different width, a pair of pivotally mounted switch actuating elements on each side of said bar within each opening, spring means normally biasing the free end of said switch actuating elements beyond the sides of said bar, a proximity switch located in each cavity adjacent to and inward of said free end so as to be actuated upon retraction of said free end of said switch actuating element inwardly of the cavity in which it is located to complete an energizing circuit to clamp the associated pair of clamps together, thereby assuring that the strip ends projecting beyond the clamps are flush before they are welded together.



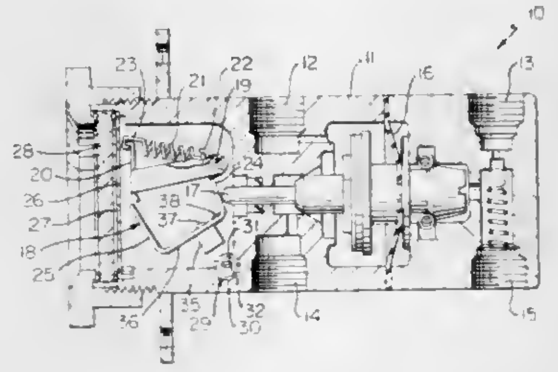
4,107,492
PNEUMATIC OPERATED SWITCH HAVING MOVABLE FLAG, SWITCH ACTUATOR MOUNTED THEREON, AND SWITCH IN CHAMBER DISPLACED FROM MEASURED FLOW PATH

William T. Moon, Jr.; Arden D. Rogers; Clifford E. Goff, and Harry B. Bannon, all of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 5, 1976, Ser. No. 683,623

Int. Cl.² H01H *35/40*

U.S. Cl. 200—81.9 M **5 Claims**



5. In a pneumatic indicator device having a housing means carrying therein a movable flag that in one position visually indicates through a window means of said housing means one pneumatic condition of said device and in another position visually indicates through said window means another pneumatic condition of said device, said housing means carrying therein a pneumatically operated plunger that engages and moves said flag between said positions thereof in relation to said pneumatic conditions of said device, the improvement comprising electrical switch means carried in said housing means, said movable flag having means thereon that operates said switch means so that said switch means electrically indicates said positions of said flag, said electrical switch means being magnetically operated, said means on said flag magnetically operating said switch means when said flag is in one of said positions thereof, said means on said flag comprising a magnet carried by said flag, said magnet being riveted to said flag by a single rivet, said flag carrying two other rivets adjacent said magnet to prevent rotation of said magnet about said single rivet thereof.

4,107,493
RADIATOR CAP

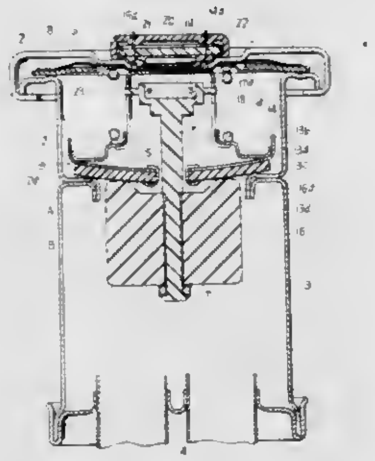
Toshio Nagara, Toyota; Kogoro Nakagawa, Kariya; Nobumasa Higo, Toyota; Masanori Kuno, Nagoya; Hiroshi Arai, and Jun Ota, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 11, 1975, Ser. No. 557,379

Claims priority, application Japan, Mar. 14, 1974, 48-29666

Int. Cl.² H01H *35/18*

U.S. Cl. 200—84 C **6 Claims**



1. A radiator cap for sealing a valve seat located within the filling neck of a radiator and for monitoring coolant levels within the radiator and signaling when the coolant level within the radiator falls below a predetermined level comprising:

a cap body,

a gasket assembly connected to said cap body,

means fixed to said cap body for generating a signal indicating that the coolant has fallen below the predetermined level, and

float means for sensing the level of coolant within said radiator and actuating said generating means, said float means being constructed to move up and down in accordance with changes in the level of the coolant,

wherein said gasket assembly comprises a support member having a gasket fixed thereto, said support member and said gasket having an opening extending therethrough, said float means comprising a movable shaft located within said opening, said shaft having a top end a bottom end, a float member attached to said bottom end, a magnet attached to said top end, said generating means comprising a reed switch located so as to be opposite said magnet

said cap further comprising a reversed-cup-shaped support member secured to said cap body and having guide slits, said magnet having projections adapted to slidably engage said slits so that twisting of said magnet is restricted during movement thereof.

4,107,494
MASTER CYLINDER RESERVOIR WITH VACUUM RELIEF DIAPHRAGM AND GUARDED FLUID LEVEL SENSOR

Robert O. Tuegel, St. Louis County, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Continuation of Ser. No. 637,643, Dec. 4, 1975, Pat. No. 4,058,694. This application Aug. 8, 1977, Ser. No. 822,940

Int. Cl.² H01H *35/18*

U.S. Cl. 200—84 C **4 Claims**

1. A brake fluid reservoir comprising:

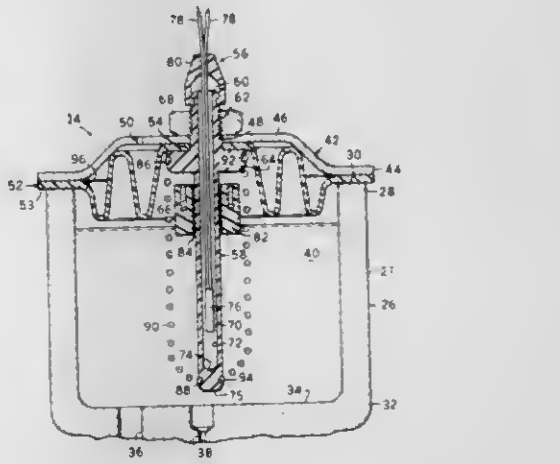
a main body portion;

a cap mounted on the main body;

brake fluid level sensor means mounted on the reservoir and protruding thereinto for indicating a predetermined minimum level of brake fluid in the reservoir;

said fluid level sensor including float means for floating on the surface of the brake fluid;

diaphragm means sealingly secured in the reservoir for corresponding movement into said reservoir in response to a decrease in the level of brake fluid in the reservoir and for sealingly separating a brake fluid containing portion of the reservoir from an air containing portion;



said corresponding movement being produced by differential air pressure on the two sides of said diaphragm; and

means surrounding the float means for maintaining the diaphragm means from interfering engagement with the float means.

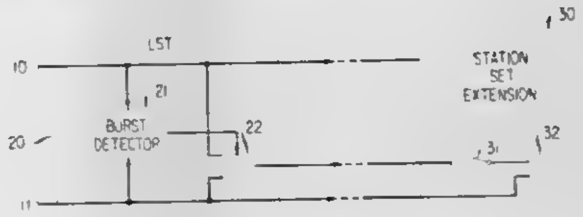
4,107,495
ELECTRONIC TONE RINGER

George Thomas Hawley, Murray Hill, and Lawrence Henry Young, Hanover Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1977, Ser. No. 795,946

Int. Cl.² H04M *1/26*

U.S. Cl. 179—84 T **11 Claims**



1. A telephone station set installation coupled to a central office line providing preconditioning signal bursts of predetermined characteristics preceding ringing signals comprising:

a normally quiescent amplifier for providing ringing signals appearing across said line to an alerting transducer operative in response to a control signal and

a burst detector responsive to said preconditioning signal bursts for developing said control signal and applying it to said amplifier for the duration of said ringing signals.

4,107,496
VACUUM SWITCHING APPARATUS WITH DOUBLE INTERRUPTION AND INCLUDING AN INTERPOSED BARRIER

Jan C. Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Dec. 17, 1974, Ser. No. 533,626

Claims priority, application Netherlands, Dec. 21, 1973, 7317611

Int. Cl.² H01H *33/00*

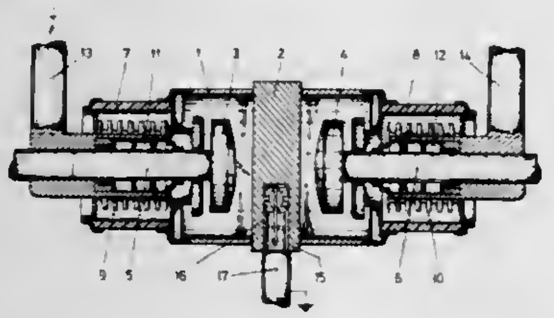
U.S. Cl. 200—144 B **5 Claims**

1. Vacuum switching apparatus for interconnecting a bus bar to a feeder cable and selectively connecting said bus bar and said feeder cable to ground, comprising:

a housing;

a first vacuum switch within said housing and connected to said bus bar;

a second vacuum switch within said housing and connected to said feeder cable;



a barrier mounted between said first and second vacuum switches for conducting switch-off current therefrom to ground; and

grounding means for interconnecting said barrier to ground.

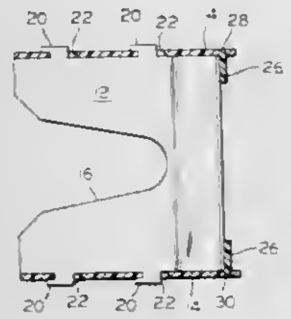
4,107,497
ARC CHUTE ASSEMBLY

Charles L. Jencks, Avon, and Roger N. Castonguay, Bristol, both of Conn., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 527,302, Nov. 26, 1974, abandoned. This application Jul. 15, 1976, Ser. No. 705,651

Int. Cl.^{2} H01H *33/10*

U.S. Cl. 200—144 R 2 Claims



1. An arc chute assembly for circuit interrupting devices, said assembly comprising, in combination:

A. a plurality of arc plates each having front, back and side edges;

B. a pair of spaced latching tangs extending laterally from each side edge of each arc plate, each said tang being undercut to provide a notch;

C. a pair of opposed, insulative sideplates mounting said arc plates, said sideplates including means forming elongated slots through which said arc plate tangs extend,

1. said arc plates being shifted to locked positions with the edge portions of said sideplates at one end of said slots engaged in said notches;

D. a separate backplate detachably mounted by said sideplates in engaging relation with the back edges of said arc plates to sustain the locked positions thereof.

4,107,498
DISCONNECT SWITCH AND DRIVE MECHANISM THEREFOR

John H. Golota, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,180

Int. Cl.^{2} H01H *33/80*

U.S. Cl. 200—148 B 3 Claims

1. A disconnect switch for use in gas insulated systems comprising:

an elongated sealed tank containing an insulating gas, and having opposing ends through which electrical conductors sealingly enter said tank;

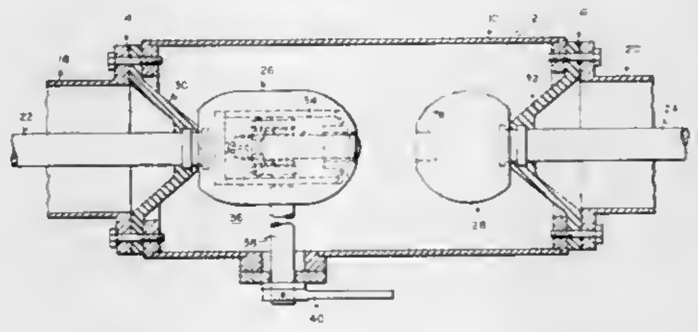
a pair of longitudinally spaced apart electrodes disposed within said tank, said electrical conductors electrically coupled to, and terminating at, said electrodes;

a longitudinally reciprocating switch blade disposed within said tank and coupled to one of said electrodes, said blade capable of being in electrical contact with both of said electrodes to permit the flow of electric current therebetween, thereby permitting the flow of electric current between said electric conductors, and said blade capable of being spaced apart from one of said electrodes to prohibit the flow of electric current between said electrodes, thereby prohibiting the flow of electric current between said electric conductors;

drive means for longitudinally positioning said switch blade disposed within said tank, said drive means including a rotatable drive shaft extending sealingly outwardly beyond said tank, said drive means translating the rotational movement of said drive shaft to a generally straight line movement of said switch blade; said drive means comprising:

a pair of parallel, spaced apart support members having an arcuate section at one end thereof, said arcuate section having a plurality of gear teeth therein;

a pair of crank elements pivotally coupled to said support members and having aligned openings therein;



a connecting rod disposed within said crank element aligned openings and coupling said crank elements together, said connecting rod being rotatable with respect to said crank elements;

a crank gear rotatably coupled to one of said crank elements and positioned adjacent to, and cooperating with, said support member gear teeth;

a rod gear fixedly secured to said connecting rod and positioned adjacent to, and cooperating with, said crank gear, said support member gear teeth having a pitch diameter twice the pitch diameter of said rod gear;

a drive arm fixedly secured to said connecting rod and movable therewith, and having an end section distal from said connecting rod, said distal end section being rotatably coupled to said switch blade, the distance from said connecting rod to said distal end section coupling to said switch blade being substantially the same as the distance from said connecting rod to the location of the pivotal coupling of said crank elements to said support members; and

said rotatable drive shaft being coupled to one of said crank elements and aligned with the pivotal coupling of said crank elements to said support members, the rotation of said drive shaft causing a pivotal movement of said crank elements and said connecting rod, the pivotal movement of said crank elements causing said support member gear teeth to rotate said crank gear, causing the rotation of said rod gear, and causing the rotation of said connecting rod within said aligned openings, the rotation and pivotal movement of said connecting rod causing a substantially straight line movement of said drive arm distal end section and said switch blade.

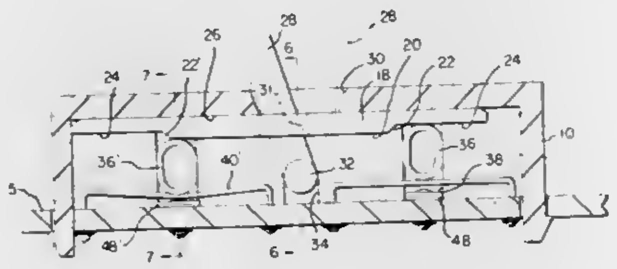
4,107,499
SWITCH ASSEMBLY FOR CIRCUIT BOARDS

Charles Harry Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1976, Ser. No. 753,405

Int. Cl.^{2} H01H *15/04*

U.S. Cl. 200—153 LA 6 Claims



1. A switch assembly on a circuit board for closing and opening a circuit between two conductors on said board, said switch assembly comprising:

a pair of fixed and movable keyboard switch contacts on said circuit board, said fixed contact comprising a fixed button type contact on said board which is electrically connected to one of said conductors, said movable contact comprising a generally rectangular spring member having mounting legs extending from each end thereof, and having side edges between said ends, said mounting legs extending into said circuit board and being electrically connected to the other one of said conductors on said circuit board, said spring member being upwardly concave and being resiliently deformable downwardly and into contact with said fixed contact,

a switch housing which is separate from said contacts, said housing being in enclosing relationship to said contacts and having a top wall and opposed sidewalls which are spaced from said side edges of said movable contact, said housing having integral latch arms extending through openings in said circuit board to latch said housing to said circuit board,

actuator camming means slidably contained in said housing against said top wall, said actuator camming means being movable parallel to said circuit board between first and second positions,

motion translating means extending between said sidewalls and transversely with respect to said side edges of said movable contact, groove means in said sidewalls, end portions of said motion translating means extending into said groove means for guiding said motion translating means towards and away from said movable contact,

said actuator camming means being effective upon movement from said first position to said second position to engage said motion translating means and move said motion translating means towards said movable contact whereby said translating means flexes said movable spring contact towards said fixed contact thereby to close said switch, said movable spring contact being effective to move away from said fixed contact upon movement of said actuator means from said second position to first position and to move said motion translating means towards said top wall.

4,107,500
TIME SWITCH DEVICE FOR X-RAY DIAGNOSTIC EQUIPMENT

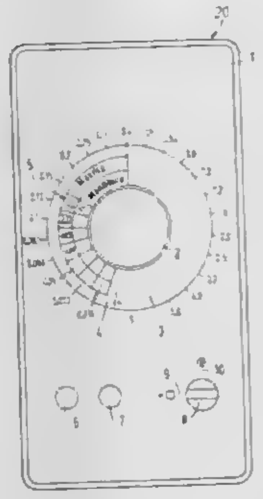
Georg Distler, Adlitz, and Horst Güetzl, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 3, 1976, Ser. No. 720,459

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1975, 2544697

Int. Cl.^{2} H01H *9/00;* **G01P** *13/00;* **G09F** *9/00*

U.S. Cl. 200—308 8 Claims



1. In a time switch device for X-ray diagnostic apparatus, particularly for preparation of dental exposures, said device including a housing, a knob mounted on the housing for rotation to set the exposure period, a time scale of exposure periods on a scale carrier concentrically arranged to the knob, a symbol carrier concentrically arranged to the knob and being mounted for rotation relative to the time scale, said symbol carrier having symbols of the objects being X-rayed arranged thereon one relative to the other at such a spacing relative to each other so that upon setting one of said symbols to the exposure period associated therewith, the other symbols will be located opposite their respective associated exposure periods on the time scale, and an indicia of at least one mark so that rotation of the knob to set the exposure period causes relative movement between the indicia and both the symbol carrier and time scale, the improvements comprising said knob being movable in an axial direction, and said symbol carrier and said knob having coupling means being engaged with each other as the knob assumes a predetermined axial position to couple the symbol carrier for rotational movement with said knob.

4,107,501
MICROWAVE OVEN CONTROL SYSTEM

Richard Ironfield, Williamsburg, Iowa, assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 13, 1976, Ser. No. 676,460

Int. Cl.^{2} H05B *5/00*

U.S. Cl. 219—10.55 B 5 Claims

1. A microwave oven comprising:

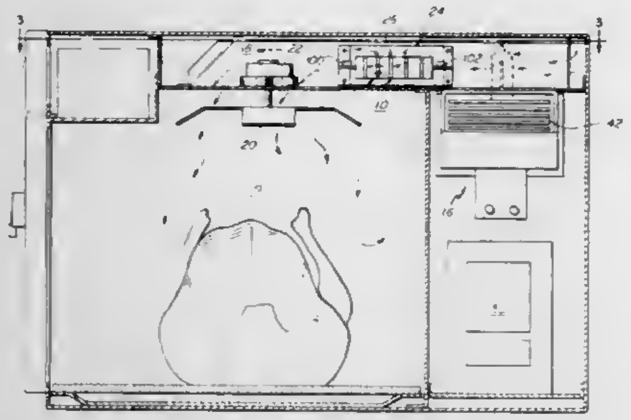
a microwave energy generator for supplying microwave energy to a heating cavity;

a source of power for said microwave generator;

means coupled between the output of said microwave generator and said cavity for substantially preventing the supply of microwave energy from said cavity to said microwave generator, comprising a microwave ferite circulator and a microwave energy absorber;

a first thermal sensor responsive to a first temperature of said microwave energy absorber for maintaining a flow of a cooling fluid past said microwave energy absorber when said microwave energy generator is de-energized;

a timing control for energizing said source of power and for maintaining said flow when said microwave energy generator source of power is energized; and



a second thermal sensor responsive to a second predetermined temperature of said absorber for preventing the energization of said source of power by said timing control.

4,107,502

MICROWAVE OVEN

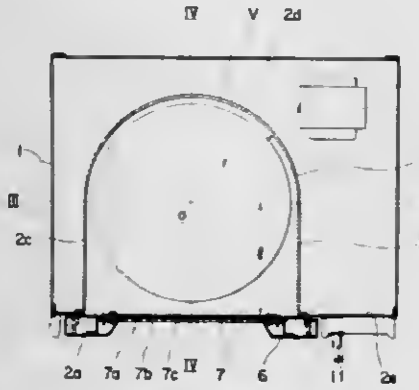
Junzo Tanaka, Fujiidera, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 5, 1977, Ser. No. 784,772

Claims priority, application Japan, Apr. 6, 1976, 51-38966

Int. Cl.^{2} H05B *9/06*

U.S. Cl. 219—10.55 F **5 Claims**



1. A microwave oven comprising:

an oven defining structure;

a heating cavity within said oven defining structure, said heating cavity being defined by a base plate, a top wall, a front wall having an access opening therein, a pair of spaced substantially planar side walls, and a concave rear wall having a semi-circular cross-sectional configuration, said concave rear wall smoothly joining said side walls so that said rear wall and side walls together form a continuous wall member of U-shaped configuration;

door means for selectively opening and closing said access opening in said front wall;

means for supplying microwave energy into said heating cavity; and

rotary table means of approximately circular shape, mounted within said heating cavity for rotation about a rotational axis, for receiving an object to be heated, said rotary table means being positioned within said heating cavity such that said semi-circular rear wall is concentric with said rotational axis.

4,107,503

METHOD FOR ELIMINATING RESIDUAL MAGNETISM IN PIPE-BLANK FOR WELDED STEEL PIPE LONGITUDINALLY SEAM-WELDED FROM INSIDE

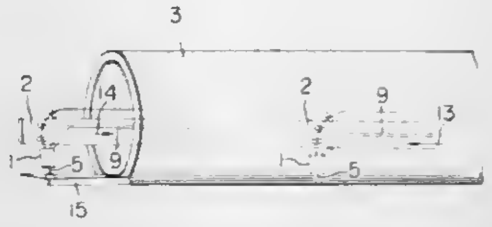
Fusao Koshiga, Kawasaki; Jinkichi Tanaka, Yokohama; Itaru Watanabe, Yokohama; Motoaki Suzuki, Yokohama; Toshifumi Kojima, Yokohama; Hiroyoshi Matsubara, Fukuyama; Tatsumi Osuka, Fukuyama; Kenji Takeshige, Fukuyama; Takashi Nagamine, Fukuyama, and Osamu Hirano, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1977, Ser. No. 776,235

Claims priority, application Japan, Apr. 6, 1976, 51-37825

Int. Cl.^{2} B23K *31/06*

U.S. Cl. 219—61 **7 Claims**



1. In longitudinally seam-welding a pipe-blank for welded steel pipe from the inside along a groove by the arc welding process comprising attaching a tab plate to at least a terminal end of said pipe-blank, supplying a direct electric current for welding to a consumable electrode through a cable, and moving said consumable electrode from a first end of the pipe-blank to the terminal end of the pipe-blank while effecting seam-welding,

a method for eliminating a residual magnetism in said pipe-blank produced by said direct electric current for welding flowing through said cable introduced into said pipe-blank, which method comprises:

reversing the polarity of said consumable electrode to a polarity opposite to that used for said longitudinal seam-welding, when said consumable electrode is adjacent said tab plate at the terminal end of the pipe-blank subjected to said longitudinal seam-welding, for causing a direct electric current for eliminating magnetism to flow through said cable in the opposite direction to that of said direct electric current for welding, thereby eliminating said residual magnetism in said pipe-blank.

4,107,504

METHOD AND APPARATUS FOR CONTROLLING AN ELECTRO-DISCHARGE MACHINE TOOL

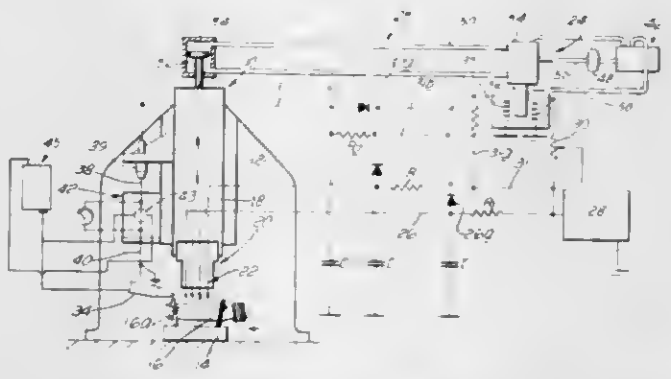
Raymond Dinsdale, Nelson, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 6, 1977, Ser. No. 785,250

Claims priority, application United Kingdom, Apr. 15, 1976, 15445/76

Int. Cl.^{2} B23P *1/08*

U.S. Cl. 219—69 E **7 Claims**



1. Electro-discharge machine tool apparatus comprising a pair of complementary rod electrodes mounted on an electro-discharge machine tool for relative reciprocating movement towards and away from each other, moving means for causing said relative reciprocating movement of said complementary electrodes and a similar, relative movement between at least one machining electrode and a workpiece electrode, first means electrically connectable to said complementary electrodes and at least one machining electrode and workpiece electrode and second means electrically connectable to a source providing an electrical reference potential, said first means in operation, being sensitive to differences in electrical potential across the complementary electrodes and across said at least one machining electrode and workpiece electrode relative to the electrical potential across said second means and on sensing said differences, to act upon said moving means to actuate it so as to cause relative movement of the complementary electrodes and said machining electrode and said workpiece electrode towards or away from each other at a rate determined by the difference between the potentials at said first and second means.

4,107,505

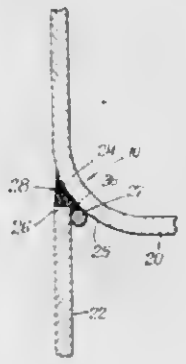
WELDMENT

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 566,500, Apr. 9, 1975, Pat. No. 3,986,784. This application Jun. 25, 1976, Ser. No. 700,062

Int. Cl.^{2} B23K *9/18*

U.S. Cl. 219—76.14 **5 Claims**



1. The method of welding to a first member having a surface portion a second member having an edge portion disposed adjacent said surface portion, comprising the steps of: welding a back-up element to said first member to define a substantially continuous elongated weld stop along an arcuate part of said surface portion; disposing said second member edge portion in engagement with said back-up element so as to cause said first member surface portion, said back-up element, and said second member edge portion to cooperatively define a weld space with the first and second members defining a rearwardly narrowing outer portion of said space terminating in a position of close proximity of said first member to said second member, and defining a rearwardly widening inner portion of said space between said portion and the back-up element; and providing an arc weld substantially filling said weld space and defining a continuous welded joint between said surface portion and said edge portion in both said outer and inner space portions bounded rearwardly by said weld stop, said first and second members at said position defining a flow restricting passage for throttling forces of the welding arc tending to urge the weld stop free of said first member during the arc welding step.

4,107,506

SOLDERING METHOD

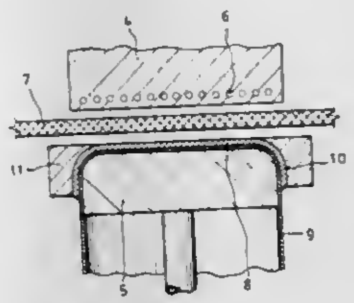
Ismael Martinez Pelegri, Pasaje Dos de Mayo 20, Barcelona, Spain

Filed Feb. 18, 1976, Ser. No. 659,039

Int. Cl.^{2} H05B *5/00*

U.S. Cl. 219—85 A **1 Claim**

1. In a method of soldering metallic parts, of the type based on the use of a filler metal having a lower melting point than said metallic parts, of two press plates, at least one of which is provided with an induction winding and at least one insulating means, partiuclarly applicable to the soldering of thin parts having a large surface area and at least one portion of the respective surfaces forming a non-planar surface, the improvement wherein a metallic ring having an inner surface complementary to said non-planar surface, favorable magnetic characteristics and a coefficient of expansion lower than that of the two metallic parts to be joined is positioned coaxially with said parts, externally thereto, and immediately adjacent the portion thereof forming a non-planar surface, so as to create pressure by reaction in a radial direction, in cooperation with a press acting in an axial direction, so that said ring embraces the portion of the surfaces to be joined forming a non-planar surface and also that said ring means receives heat energy by electromagnetic induction and transmits said heat by conduction to said parts, whereby the heat and pressure communicated by the ring to said parts produces the bonding of said parts at the non-planar surfaces thereof.



4,107,507

ARC WELDING PROCESS AND APPARATUS

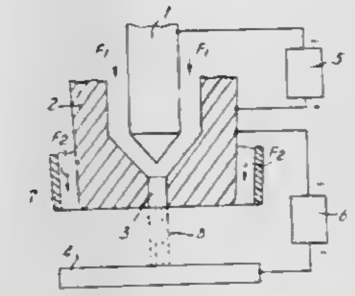
Jean-Pierre Schultz, Les Mureaux; Francis Cuny, Mantes-La-Jolie; Daniel Payraudeau, Aulnay-sous-Bois, and Jean-Marie Tritz, Les Mureaux, all of France, assignors to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 3, 1974, Ser. No. 475,879

Claims priority, application France, Jun. 6, 1973, 73.20490

Int. Cl.^{2} B23K *9/00*

U.S. Cl. 219—121 P **8 Claims**



1. A process for the electrical arc welding of workpieces, the process com in combination:

positioning a refractory electrode and an electrically conductive counter-electrode in spaced relationship with each other in juxtaposition with the workpiece to be welded;

supplying ionizable fluid to the space between the refractory electrode and the counter-electrode;

connecting a first d.c. voltage source between the refractory electrode and the counter-electrode to maintain the same at opposite polarities and thereby produce a first unidirectional electric current, the positive terminal of said first source being connected to said counter-electrode and the negative terminal of said first source being connected to said refractory electrode, the first current forming an arc which, in conjunction with the ionizable fluid, produces a plasma column between the refractory electrode and the counter-electrode on the one hand, and the workpieces on the other hand, the first unidirectional current comprising a continuous uninterrupted stream of electrons in the plasma column travelling toward said workpieces; and

connecting a second d.c. voltage source between the workpieces and the counter-electrode to produce a second unidirectional current simultaneously with the first unidirectional current, the positive terminal of said second source being connected to said counter-electrode and the negative terminal of said second source being connected to said workpieces, the electrons forming the second unidirectiona current flowing from the workpieces to the counter-electrode;

each of the unidirectional currents being a continuous constant current.

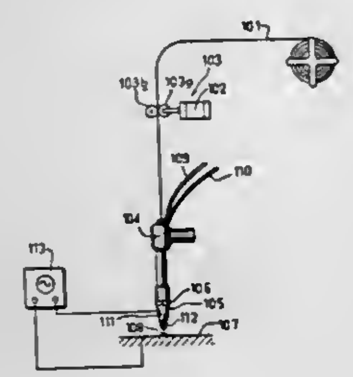
4,107,508
METHOD AND APPARATUS FOR WELDING USING FILLET-WIRE

Sachio Izumi, Kobe, and Tamotsu Kotani, Akashi, both of Japan, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 9, 1976, Ser. No. 694,353

Int. Cl.² B23K *9/12*

U.S. Cl. 219—137.7 **11 Claims**



1. A method of welding comprising the steps of continuously feeding a fillet-wire to a work piece at a welding location; heating both said fillet-wire and said work piece by a flame; passing an electrical heating current through at least a portion of said fillet-wire; and maintaining a predetermined relation between the rate at which said fillet-wire is fed to said work piece and the rate at which said fillet-wire melts, such that said fillet-wire contacts said work piece with a substantially constant pressure.

4,107,509
APPARATUS FOR TREATING BODY MEMBERS WITH HEAT AND MOISTURE

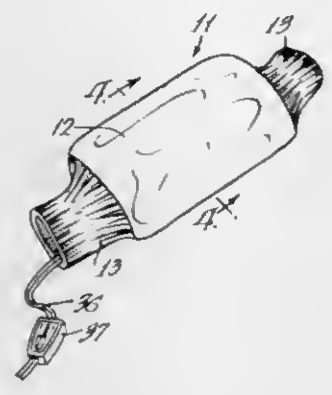
Victor H. Scher, Fort Lauderdale, Fla.; Theodore A. Fox, Winnetka, and Philip A. Sandford, Highland Park, both of Ill., assignors to Northern Electric Company, Chicago, Ill.

Filed Mar. 7, 1977, Ser. No. 775,086

Int. Cl.² H05B *1/00*

U.S. Cl. 219—211 **8 Claims**

1. Apparatus for treating the body with heat and moisture comprising a rectangularly-shaped electric heating pad having a waterproof covering over the entire pad with the power cord extending from one corner thereof, a double-walled fabric member forming a pocket within which said heating pad is removably received, said heating pad being coextensive with said pocket formed in said member, said member having a flap and retaining means on said flap and said pocket to hold said member in a tubular configuration with the ends of said pad being in closely spaced relation, cuffs of elastic material, each of which is attached along an edge to said member, said cuffs being positioned at opposite ends of said tubular configuration of said member, said cuffs extending the length of said pocket and each having retaining means to secure it in a closed tubular configuration to form with said member a chamber for treatment of body members.



4,107,510
STARTING AIDS FOR COMBUSTION ENGINES

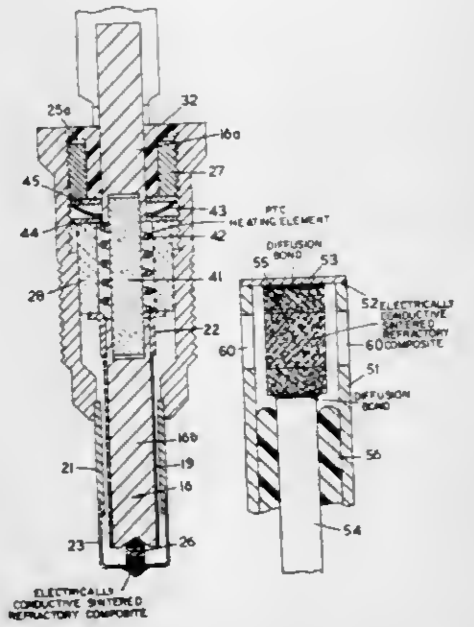
Terence Leslie Tombs; Brian Leslie Miles, and Dexter William Smith, all of Birmingham, England, assignors to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 422,149, Dec. 6, 1973, abandoned. This application May 30, 1975, Ser. No. 582,189

Claims priority, application United Kingdom, Dec. 7, 1972, 56505/72; Mar. 3, 1973, 10454/73; Mar. 15, 1973, 12546/73; Jul. 6, 1973, 32448/73; Jul. 28, 1973, 36052/73

Int. Cl.² F02P *19/02;* **F23Q** *7/22;* **H05B** *3/02*

U.S. Cl. 219—270 **7 Claims**



1. In an ignition aid for internal combustion engines comprising a first metallic electrode, a second metallic electrode and a resistive heating means in circuit with and responsive to electric current passing through the first and second electrodes, for igniting a combustive mixture in said engine, the improvement wherein:

said second electrode comprises an electrically conductive hollow body, removably insertable in an aperture in said engine, said body including a sleeve member and an electrically conductive bridge portion bridging one end of said sleeve member;

said heating means comprising a sintered, refractory, ceramic composite having a central portion interposed between a pair of terminal-defining end portions, said central portion having a higher electrical resistance than said end portions;

said first electrode extending into the sleeve member of said body but being spaced therefrom, said first electrode comprising two parts which are relatively movable, said heating means disposed between one part of said first electrode and said bridge portion with said terminal end portions in a non-point contact relationship with said first electrode and said bridge portion;

spring means associated with said relatively movable parts of said first electrode for establishing electrical contact between said one part of first electrode and the bridge portion of said second electrode and said end portions of said heating means;

means for electrically connecting said relatively movable parts of said first electrode while permitting relative movement between said parts; and

sealing means for blocking said space between the other part of said first electrode and said sleeve member of said body, preventing the passage of combustion gases therebetween, insulating and fixably positioning the other part of said first electrode with respect to said second electrode.

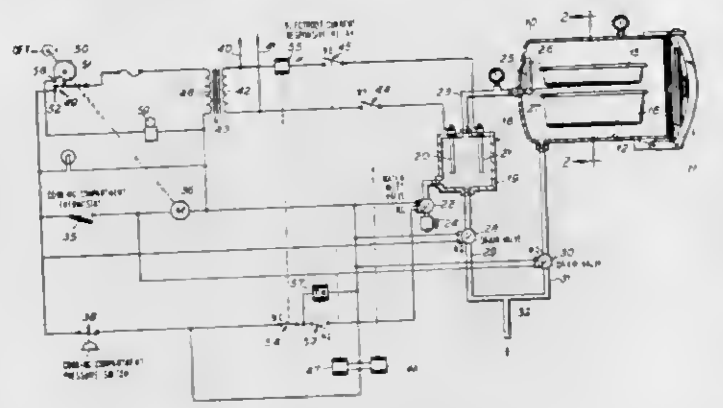
4,107,511
CONTROL SYSTEM FOR AN ELECTROLYTIC STEAM GENERATOR

Robert J. Shulz, Brookfield, and Orest A. Kozinczuk, Chicago, both of Ill., assignors to Innovative Patent Trust, Palatine, Ill.

Division of Ser. No. 434,506, Jan. 18, 1974, abandoned, which is a division of Ser. No. 253,409, May 15, 1972, Pat. No. 3,818,819. This application Nov. 6, 1975, Ser. No. 629,592

Int. Cl.² H05B *3/60;* **F22B** *1/30*

U.S. Cl. 219—286 **3 Claims**



1. In an electrolytic steam generator having a steam compartment provided with a water inlet and a steam outlet and a plurality of electrodes disposed in said compartment so as to be immersed in the water in said compartment when said compartment is filled with water to at least a predetermined level, the improvement comprising

a control system for controlling the supply of water to said chamber through said inlet and for controlling the supply of current to said electrodes, said control system including

normally closed valve means for controlling the supply of water to said inlet,

means for selectively operating said valve means,

relay means for connecting a source of current to said electrodes,

means for selectively energizing said relay means,

said valve operating means including means responsive to the magnitude of the current flow between said electrodes, said current flow responsive means allowing said valve means to be opened only when the current flow between the electrodes is below a predetermined value, and

said valve operating means further including a time delay means controlled by said current flow responsive means for delaying the opening of said valve means for a predetermined time after said relay means is energized to connect said source of current to said electrodes and the current supplied to said electrodes is less than said predetermined value.

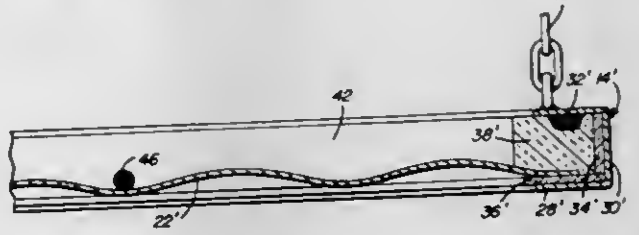
4,107,512
INSULATED RADIANT HEATER

Frank J. Brandenburg, Jr., Rte. 3, Box 28, Ashland, Va. 23005

Filed Aug. 10, 1976, Ser. No. 713,215

Int. Cl.² H05B *3/02;* **F24H** *9/08;* **F28F** *13/00*

U.S. Cl. 219—343 **5 Claims**



1. A radiant heater comprising a high temperature heat radiating panel, peripheral frame means for supporting said panel, said frame means including an inwardly opening channel-shaped frame having a bottom horizontal flange, an outer wall flange, and a top flange extending in overlying spaced relation to the bottom flange, said panel including a peripheral edge received between the bottom and top flanges, and insulating means interposed between said frame means and the panel for reducing heat transmission from the panel to the frame means to maintain the frame means at a substantially lower temperature than the panel, said insulating means including a layer of insulating material covering the upper surface of the bottom flange of the frame and supporting the edge of the panel therefrom, a layer of insulating material covering the inner surface of the wall flange of the frame, and insulating material between the edge of the panel and the top flange of the frame, the layer of insulating material covering the bottom flange further extending inwardly beyond the inner edge of the bottom flange a distance sufficient to prevent radiant heating of the frame from the panel, the insulating material between the edge of the panel and the top flange of the frame extending inwardly beyond the inner edge of the top flange at least a distance sufficient to prevent radiant heating of the frame from the panel.

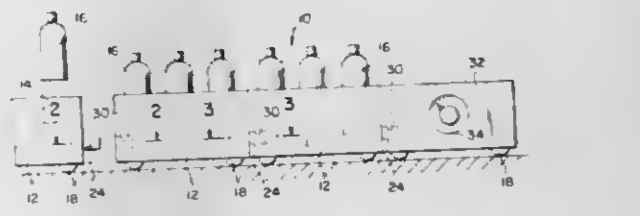
4,107,513
SHAMPOO AND CONDITIONER WARMER

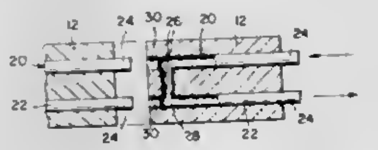
Bryan Ashford, 409 Ker Ave., Victoria, British Columbia, Canada (V9A 2B8)

Filed Jul. 5, 1977, Ser. No. 812,798

Int. Cl.² H05B *3/06*

U.S. Cl. 219—521 **4 Claims**





1. A bottle warming apparatus comprising:

a housing containing a pump adapted to be connected to a source of water and heating coil means for heating said water, said housing having a fluid inlet and a fluid outlet,

a receptacle for receiving a plurality of bottles containing liquid to be warmed, said receptacle including

a fluid conduit formed by a substantially U-shaped pipe having a fluid inlet end and a fluid outlet end extending beyond a side wall of said receptacle for receipt in the fluid outlet and fluid inlet in said housing, respectively, so as to be placed in communication with said pump.

4,107,514
SUBMERSIBLE THERMOSTATICALLY CONTROLLED HEATERS

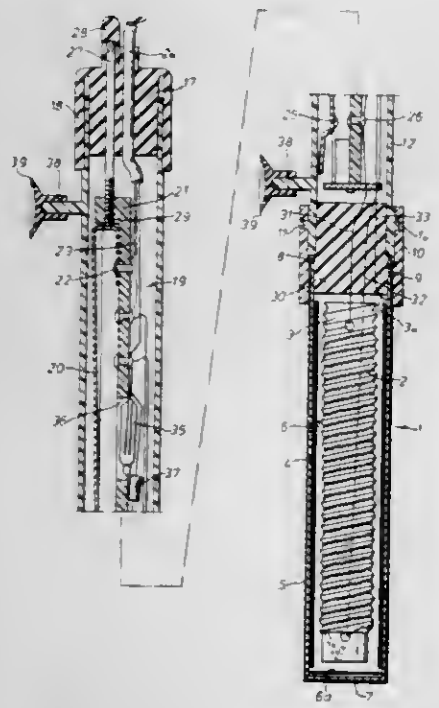
Walter Gill Ellson, Nantwich, England, assignor to C. Ellson & Co. Ltd., Nantwich, England

Filed Jan. 27, 1977, Ser. No. 763,103

Claims priority, application United Kingdom, Mar. 26, 1976, 12350/76

Int. Cl.^{2} H05B *3/06*

U.S. Cl. 219—523 **11 Claims**



1. A submersible thermostatically-controlled heater, comprising a metal tube which is permanently closed in liquid-tight manner at one end and contains an electrical heating element mounted on a ceramic former and separated from the side and end walls of the tube by a wall of electrically insulating material, a tube of synthetic plastics material closed in liquid-tight manner at one end by a bung of resilient electrically insulating material and containing a thermostat mounted on a terminal block of electrically insulating material, means securing the other ends of said tubes together in liquid-tight manner and an electrical circuit for connecting said heating element to an external source of operating current through said termostat and for connecting said metal tube to earth, including electrical supply leads which pass in liquid-tight manner through apertures in said bung.

4,107,515
COMPACT PTC RESISTOR

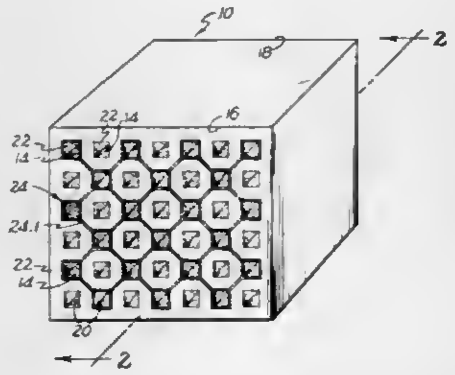
Bernard Michael Kulwicki, Foxboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1976, Ser. No. 721,727

Int. Cl.^{2} H05B *3/08*

U.S. Cl. 219—541 **9 Claims**

1. A resistor device comprising a body of resistor material of positive temperature coefficient of resistivity having a plurality of passages extending through the body between ends of the body in spaced, side-by-side relation to each other in a selected pattern defining a plurality of webs of said resistor material between said passages, electrically conductive coatings on the inner walls of said passages in ohmic contact relation to the body of resistor material, first electrically conductive interconnection coating means on an end of the body electrically connecting the coatings in selected alternate ones of said passages together, and second electrically conductive interconnection coating means on an end of the body electrically connecting the coatings in others of said passages together, whereby, when said interconnection means are electrically connected to respective terminals of an electrical power source, electrical current is directed through said webs of resistor material between the coatings in said alternate body passages and adjacent coatings in said other body passages.



4,107,516
PULSE COUNTING APPARATUS FOR MEASURING MECHANICAL MOVEMENT OF A MACHINE SUCH AS A MINING MACHINE

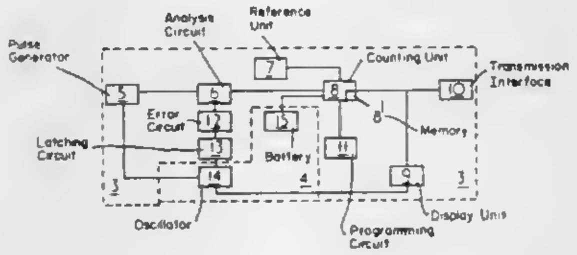
Jan Hagbert Hvidsten, Ashby-de-la-Zouch, England, assignor to Coal Industry (Patents) Limited, London, United Kingdom

Filed Mar. 7, 1977, Ser. No. 775,120

Claims priority, application United Kingdom, Mar. 23, 1976, 11622/76

Int. Cl.^{2} G06M *3/04*

U.S. Cl. 235—92 FP **11 Claims**



1. Pulse counting apparatus for use with a rotary mechanical member, said apparatus receiving electrical power from an external power supply, comrising:

an internal battery;

a plurality of light emitting diodes coupled across said external power supply and said internal battery;

a plurality of phototransistors, said light emitting diodes and said phototransistors being situated on opposite sides of said rotary mechanical member, each phototransistor being controlled by a respective one of said light emitting diodes to generate electrical pulse signals in response to movement of said rotary mechanical member between said diodes and phototransistors;

first means comprising

an analysis circuit for detecting the sequence of the electrical pulse signals generaed by said phototransistors, and

a counting unit for counting the number of electrical pulse signals generated by said phototransistors, said counting unit including a memory for storing the counted number of electrical pulse signals; and

second means including a delay circuit for disconnecting a portion of said pulse counting apparatus including said light emitting diodes from said internal battery after said external power supply has been removed from said pulse counting apparatus and only after a predetermined period of time has elapsed.

4,107,517
OPTO-ELECTRIC DEVICE

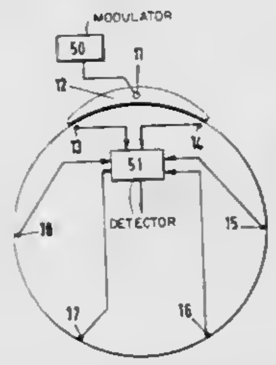
Peter Raymond Cooper, Enfield, England, assignor to The Rank Organisation Limited, London, Englaod

Filed Jan. 6, 1977, Ser. No. 757,195

Claims priority, application United Kingdom, Jan. 7, 1976, 476/76

Int. Cl.^{2} H04B *9/00;* G02B *5/14;* H01J *5/16, 39/12*

U.S. Cl. 250—199 **16 Claims**



1. Apparatus for transmitting information between two relatively rotatable members, so as to permit the relative rotation between the members to be continuous, said apparatus comprising:

a plurality of detectors sensitive to electromagnetic radiation, which, when fitted on one of the two relatively movable members are located in a circular array,

at least one source of electromagnetic radiation adapted to be carried on the other of said two relatively movable members, and

a radiation guide also adapted to be carried on said other of said two relatively movable members, said radiation guide having an arcuate output face so that, when positioned on said other of said relatively movable members to receive light from the or each said source of electromagnetic radiation, the radiation output from said radiation guide extends over an arc at least as great as that spanning the two adjacent detectors having the greatest circumferential separation.

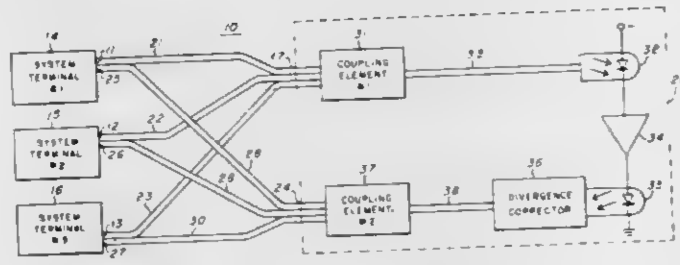
4,107,518
OPTICAL REPEATER

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,694

Int. Cl.^{2} H04B *9/00*

U.S. Cl. 250—199 **45 Claims**



1. An optical repeater having a first plurality of optical signal transmission lines, each including a core of transparent material and at least one of which possesses a numerical aperture $(NA)_1$ and a core with refractive index n_1, and a second plurality of optical signal transmission lines, each including a core of transparent material and at least one of which possesses a numerical aperture $(NA)_2$ and a core with refractive index n_2 comprising:

means for disposing said first plurality of optical signal transmission lines such that each optical signal transmission line in said plurality of optical signal transmission lines terminates with an end face thereof in a plane, thereby forming a planar array of said end faces;

photodetector means coupled to receive optical signals emitted from said planar array of end faces of said first plurality of optical signal transmission lines for generating an electrical signal representative of said received optical signals;

amplifier means coupled to said photodetector means for providing an electrical signal at an output terminal that is representative of said electrical signal generated by said photodetector means;

means coupled to said output terminal of said amplifier means for generating an optical signal in response to said electrical signal at said output terminal; and

means for disposing said second plurality of optical signal transmission lines such that each optical signal transmission line therein terminates with an end face thereof in a plane, thereby forming a planar array of end faces, said planar array coupled to receive said optical signal from said optical signal generating means such that said optical signal is coupled to each optical signal transmission line of said second plurality of optical signal transmission lines, whereby an optical signal propagating in one optical signal transmission line contained in said first plurality of optical signal transmission lines causes an optical signal representative thereof to propagate in each optical signal transmission line contained in said second plurality of optical signal transmission lines.

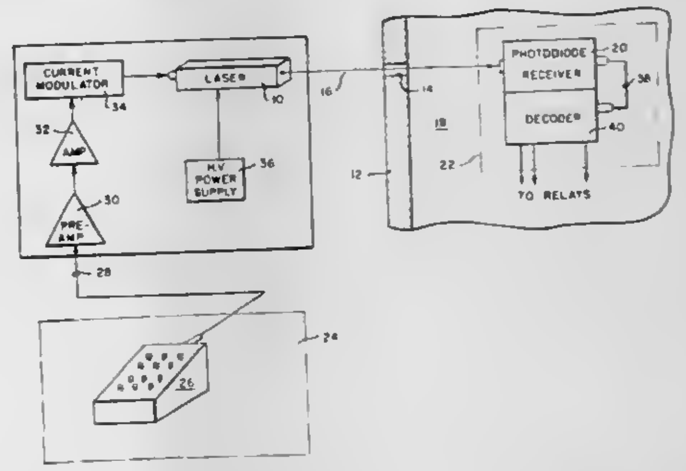
4,107,519
OPTICAL CONTROL SYSTEM FOR HIGH-VOLTAGE TERMINALS

John J. Bicek, Tinley Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1977, Ser. No. 787,129

Int. Cl.^{2} H04B *9/00;* H02N *1/00;* H04Q *9/12*

U.S. Cl. 250—199 **2 Claims**



1. An optical system for the control of devices at the terminal of an electrostatic accelerator comprising:

a laser disposed outside the tank of the electrostatic accelerator at an optical port and having a beam directed at the terminal;

an encoding system connected electrically to the laser to modulate the beam according to a predetermined scheme;

a receiver at the terminal coupled optically to the beam to generate a signal containing the modulation of the beam; and

a decoder connected to the receiver to decode the signal and generate control signals according to the predetermined scheme,

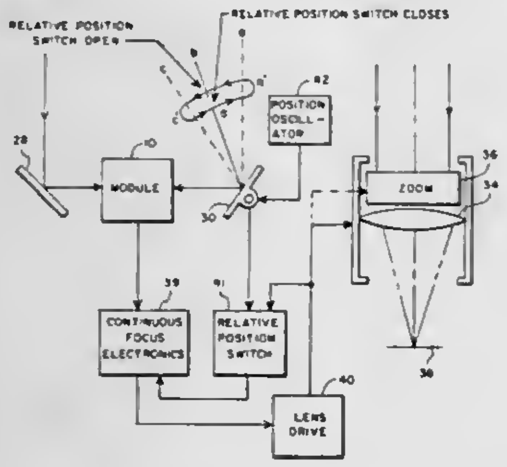
which control signals will control devices at the terminal.

4,107,520
CONTINUOUS FOCUS PROPORTIONAL CONTROLLER
Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 6, 1977, Ser. No. 804,111

Int. Cl.^{2} G01V *1/20*

U.S. Cl. 250—201 **6 Claims**


RELATIVE POSITION SWITCH OPEN
RELATIVE POSITION SWITCH CLOSES
POSITION OSCILL-ATOR
42
28
10
MODULE
30
ZOOM
36
34
39
41
CONTINUOUS FOCUS ELECTRONICS
RELATIVE POSITION SWITCH
40
LENS DRIVE
38

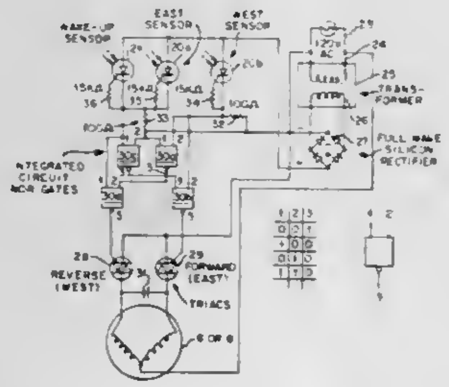
1. In an optical system including lens means and drive means for moving the lens means, an automatic focus system comprising:
- range sensing means for providing a time varying first signal having first and second states, the last transition of the first signal from the first to the second state being indicative of a position of proper focus;
- a signal source;
- signal storage means;
- first switch means connected to said range sensing means and operable in accordance with the first signal to connect said signal source to said signal storage means upon the occurrence of the last transition whereby said signal storage means thereafter stores a second signal derived from said signal source and of magnitude which varies with the time of occurrence of the last transition; and
- means connecting the signal storage means to the drive means to cause the drive means to move the lens mean toward the position of proper focus at a rate which depends upon the magnitude of the second signal.

4,107,521
SOLAR SENSOR AND TRACKER APPARATUS
Gordon Robert Winders, 204 Cbatterson Dr., Raleigh, N.C. 27609

Filed Oct. 14, 1976, Ser. No. 732,463

Int. Cl.^{2} G01J *1/20*

U.S. Cl. 250—203 R **1 Claim**



1. In a tracking apparatus for a solar energy collector in which there is provided, for each axis of tracking freedom, a reversible A.C. electric motor operatively connected to drive a pivotably mounted frame supporting the collector for tracking the same about the axis of said pivots, and wherein there is also provided for each said axis of tracking freedom a sensor and a motor control means and sources of electric power for operating said motor and control means, an improvement in the tracking sensor and motor control apparatus, comprising:
- a source of pulsating D.C. electric power connected to each said sensor;
- said sensors being light activated silicon control rectifiers;
- inhibitory logic means for blocking the simultaneous passage of outputs from any two said sensors for opposite directions of control motor rotation, said logic means being connected to the outputs of said sensors which are used for controlling a given motor rotation for tracking said collector in a given plane and about a given axis, and said logic means also being connected to said source of pulsating D.C. power at only one of two outputs of said logic means at any one time in response to the illumination of said sensors connected thereto, thereby supplying pulsating D.C. power to control the operation of said motor in only one direction at any one time;
- two triac A.C. power switching means connected to a source of A.C. electric power at the switched inputs thereof and, at the outputs thereof, to the inputs of said reversible A.C. motor for said given plane and axis of tracking, for said collector, the control inputs of said triacs being connected to the pulsating D.C. outputs of said inhibitory logic means so that both of said triacs may not be simultaneously switched on by the control outputs from said logic means, to provide a chopped A.C. power to said motor, and a phase reversing capacitance connected across the outputs of said triacs and the inputs of said motor, in parallel, to insure the proper direction of rotation of said motor in response to A.C. power supplied by one or the other of said triacs.

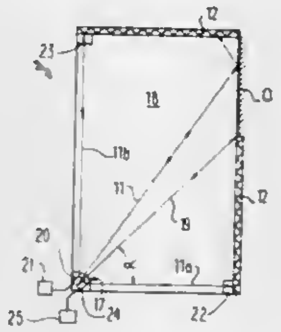
4,107,522
ROTARY BEAM LIGHT CURTAIN
Arthur Walter, Denzlingeo, Germany, assignor to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Electronik, Germany

Filed Oct. 15, 1976, Ser. No. 732,559

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550653

Int. Cl.^{2} G01D *21/04*

U.S. Cl. 250—221 **24 Claims**



1. Aparatus for detecting the presence of an object in an area defined by predetermined area bounds comprising: a light source disposed at a given location of the bounds and including means for generating a light beam and means for changing the direction of the light beam so as to scan therewith the full area, whereby the light beam will impinge on the area bounds; a photo-sensitive device at the location for generating an output signal as a function of light received by the device; a first retroreflector placed along a portion of the bounds opposite the light source for reflecting at least part of the beam impinging thereon back to the device; a second retroreflector placed along another portion of the bounds spaced apart from the first mentioned portion thereon for likewise reflecting the beam impinging thereon back to the device; and mirror means placed along a third portion of the bounds intermediate the first and

second portions and oriented relative to the second retroreflector for reflecting the light beam impinging thereon to the second retroreflector; whereby the retroreflectors reflect a directly impinging light beam from the source directly back to the device while a light beam from the source impinging on the mirror means is first directed to the second retroreflector which redirects such light beam via the mirror means to the device.

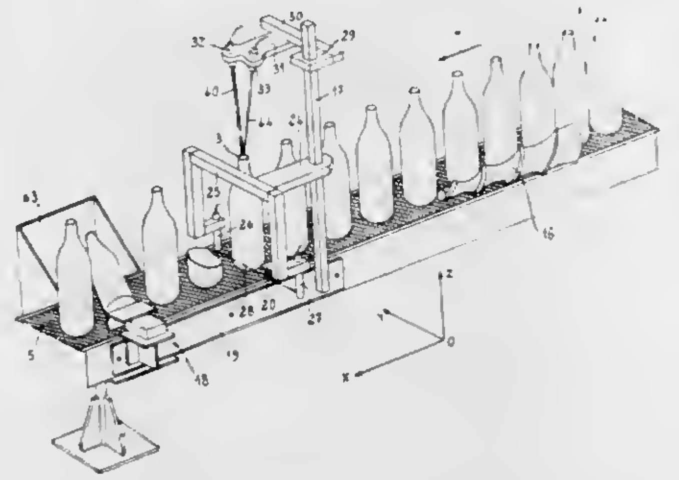
4,107,523
EQUIPMENT FOR AUTOMATICALLY MONITORING THE VERTICALITY OF BOTTLES
Guy Corman, Lyon, France, assignor to Boussois Souchon Neuvesel Gervais Danone (Societe Anonyme), Levallois-Perret, France

Filed Jan. 24, 1977, Ser. No. 762,172

Claims priority, application France, Jan. 26, 1976, 76 02486

Int. Cl.^{2} G01D *21/04*

U.S. Cl. 250—223 B **11 Claims**



1. An apparatus for automatically monitoring the verticality of bottles, and more particularly cylindrical bottles with a small mouth, of the type where the bottles, previously sorted, are monitored by means of optical processes as they pass along a flat conveyor, comprising in combination:
- an alignment device for the bottles effecting alignment thereof by the base of their body along a line parallel to the conveyor;
- a first photoelectric locating device for transmitting a first signal when the base of the body of a bottle positioned by the aforementioned alignment device reaches a first optical beam perpendicular to the conveyor;
- a second photoelectric detecting device for transmitting another optical beam oriented downwards and focused on a circular spot at the level of the top plane of a lip of the bottles and having a diameter less than the inside diameter of the said lip, the second device transmitting a second signal when a verticality defect of a bottle causes a reflection of said other optical beam on a flat annular part of its lip;
- means responsive to this second signal only at the moment when the bottle reaches the first optical beam; and
- an ejector designed to eliminate the defective bottles and controlled by the aforementioned means.

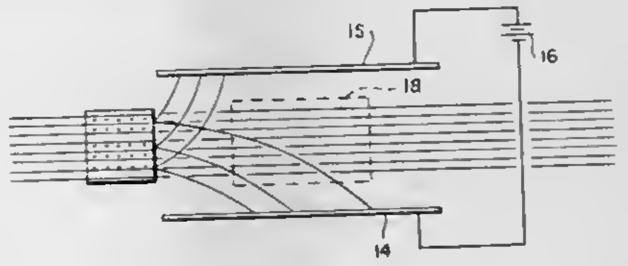
4,107,524
HIGH ATOMIC WEIGHT ISOTOPE SEPARATOR
David L. Book, 3001 Ordway St., Washington, D.C. 20008

Filed Dec. 4, 1975, Ser. No. 637,562

Int. Cl.^{2} H01J *39/00*

U.S. Cl. 250—282 **3 Claims**

3. A method of separating an isotopic species of a given element from a mixture which comprises:
- directing a first beam containing a mixture of isotopes toward an area bounded by spaced capacitor plates;
- directing a second beam containing a mixture of isotopes toward said first beam to intersect said first beam at an angle relative thereto in an area bounded by said capacitor plates;
- exciting and ionizing said first and second beams before intersection of said beams to form a plasma containing ions, electrons, and neutrals;
- applying a magnetic field across the area bounded by said capacitor plates; and



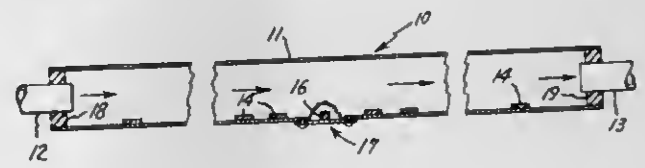
- applying a voltage source to said capacitor plates,
- whereby ion scattering is induced by plasma instabilities in the area bounded by said capacitor plates, and said ions are collected by one capacitor plate, said electrons are collected by the other capacitor plate and said neutrals are recovered outside of said capacitor plates.

4,107,525
FLOWMETER DEVICE AND METHOD FOR DETERMINING VELOCITY OF A FLUID
Howard R. Hart, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,076

Int. Cl.^{2} G01T *1/161*

U.S. Cl. 250—303 **6 Claims**



1. The method for determining the velocity of a fluid containing a known tracer substance having a known diffusion constant in said fluid, comprising the steps of:
- conducting at least some of said fluid through a conduit for a preselected period of time,
- detecting the pattern of movement of said tracer substance in terms of tracer density along said conduit under the combined influences of diffusion in, and transport by, the fluid, and
- deriving from said information of tracer density the velocity of said fluid by (a) plotting the logarithm of the tracer density along said conduit as a function of distance, (b) calculating the scope of at least a portion of any resulting curve, and (c) determining the velocity from a calibration curve for said device specific to said preselected period of time plotted for velocity as a function of slope.

4,107,526
ION SCATTERING SPECTROMETER WITH MODIFIED BIAS
James T. McKinney, Stillwater, and Thomas W. Ruscb, Falcon Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

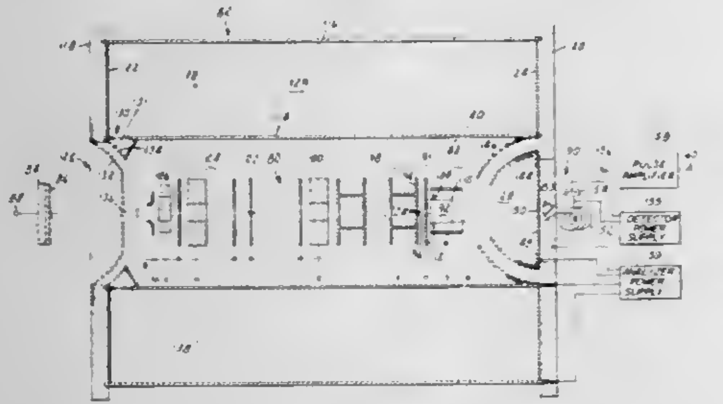
Continuation-in-part of Ser. No. 669,091, Mar. 22, 1976, abandoned. This application Jan. 12, 1977, Ser. No. 758,836

Int. Cl.^{2} H01J *35/00*

U.S. Cl. 250—305 **10 Claims**

1. In an ion scattering spectrometer comprising
- (a) means for supporting a specimen, a surface of which is to be analyzed,

(b) means for directing a beam of ions having a preselected atomic mass and a preselected energy toward the surface,
(c) analyzing means comprising an entrance section for receiving ions from the surfaces, analyzing section for selecting such ions passing through the entrance section at a given angle as have a predetermined energy, and an exit section for passing said selected ions, and
(d) detecting means comprising a material having an electron emissive surface for receiving and detecting passed ions from the analyzing means by converting an ion current associated with said passed ions into a corresponding electron signal,
the improvement wherein the spectrometer further comprises (e) biasing means to control the energy of ions impinging upon the electron emissive surface, to result in
(i) the preferential detection of low-mass scattered ions having relatively high velocities over high-mass sputtered ions having relatively low velocities,
and for maintaining a potential on said electron emissive surface within 30 volts of that maintained on said exit section of the analyzer means resulting in
(ii) the absence of a force tending to attract electrons emitted from the emissive surface toward the analyzing means, and
(iii) the absence of a force tending to attract such ions having an energy outside the pass-band of the analyzer through the exit section of the analyzing means to the emissive surface, such that there is produced an appreciably stronger electron signal corresponding to scattered ions, and a corresponding reduction in the background of the electron signal corresponding to the detection of heavier sputtered ions and spurious scattered ions not within the pass-band of the analyzer, said detecting means further comprising means for indirectly coupling said electron signal from the output portion to an amplifier means operating near ground potential, such that said output section may be maintained at a positive potential to cause electrons emitted from said emissive surface to drift into the detecting means.

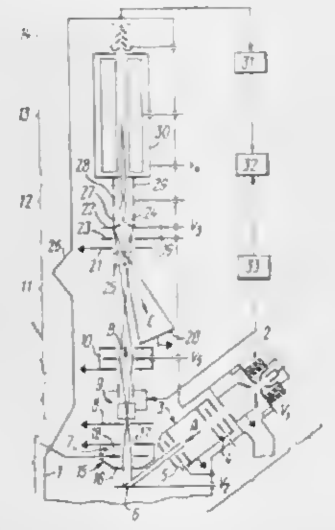


4,107,527
ION-EMISSION MICROANALYZER MICROSCOPE

Valentin Tikhonovich Cherepin, ulitsa Lenina, 42, kv. 30, and Valery Leonidovich Olkhovsky, prospekt Voroshilova, 17a, kv. 73, both of Kiev, U.S.S.R.

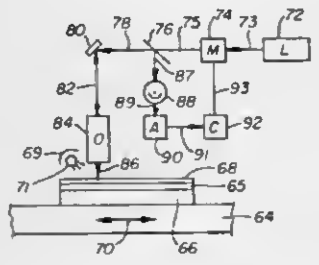
Filed Jul. 13, 1977, Ser. No. 815,443
Int. Cl.² H01J *37/26*
U.S. Cl. 250—309 **3 Claims**

1. An ion-emission microanalyzer microscope comprising: a vacuum chamber; an ion source for bombarding the surface of an object under investigation, and located in said vacuum chamber; a focusing system arranged in said vacuum chamber coaxially with a beam of primary ions emitted by said source; an immersion objective arranged in said vacuum chamber coaxially with said beam of secondary ions emitted by the bombarded surface of said object; an aperture diaphragm arranged in said vacuum chamber after said immersion objective along said beam of secondary ions; an ion-optical converter arranged in said vacuum chamber after said aperture diaphragm along said beam of secondary ions; a through opening in said ion-optical converter, coaxial with said beam of secondary ions; said opening performing the function of an aperture for separating an image element; a mass filter arranged in said vacuum chamber after said ion-optical converter along said beam of secondary ions; an ion detector arranged in said vacuum chamber after said mass filter along said beam of secondary ions; and recording means located outside said vacuum chamber and electrically associated with the output of said ion detector.



4,107,528
METHOD AND APPARATUS FOR TRANSFERRING A PATTERN ON AN OVERLYING WEB BY LASER BURNING ONTO AN UNDERLYING WEB

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105
Continuation-in-part of Ser. No. 498,954, Aug. 20, 1974, Pat. No. 3,979,591, which is a continuation-in-part of Ser. No. 262,290, Jun. 13, 1972, Pat. No. 3,832,547. This application Aug. 5, 1976, Ser. No. 712,009
The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.
Int. Cl.² G01D *15/10*
U.S. Cl. 250—317 **21 Claims**

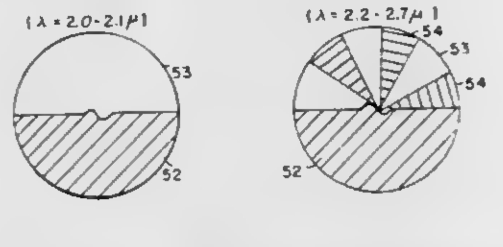


1. A system for directly transferring a preselected pattern of opaque and transparent areas in a first metal web to an underlying second web, comprising:
(a) a master web comprising a first metal layer carrying said preselected pattern of opaque and transparent areas, said first metal layer composed of a first metal, of a first thickness, of a first thermal characteristic;
(b) a facsimile web comprising a second layer, said second layer composed of a second material, of a second thickness of a second thermal characteristic;
(c) means to superimpose said master web in fixed relation on said facsimile web;
(d) optical means to focus a continuous beam of laser radiation of a selected constant level of intensity, and to direct said beam onto the surface of said master web, and means to relatively move said beam of laser radiation over substantially the entire area of said pattern on said master web at a selected velocity; and wherein
(e) said first metal has a higher melting point than the melting point of said second material;
whereby said focussed beam will penetrate said transparent areas in said master web and will irradiate said second layer below, and will burn areas in said second layer in a second pattern which is substantially similar to said first pattern.

4,107,529
DUAL MODE SEEKER RETICLE

Evan P. Chicklis, Nashua, N.H.; Charles S. Naiman, Brookline, Mass., and Kenneth D. Labaugh, Wilton, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 13, 1977, Ser. No. 805,669
Int. Cl.² G01J *1/00;* **G05D** *25/00*
U.S. Cl. 250—339 **9 Claims**

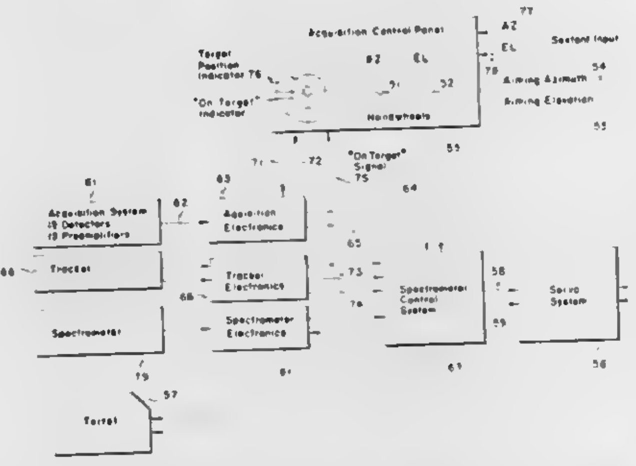


1. Apparatus for modulating radiation from active laser designated targets emitting at a wavelength of substantially λ_1 and passive targets emitting in the spectral region between λ_2 and λ_3, comprising:
a single reticle responsive to radiation from targets;
said reticle having first and second portions, each of said portions having a different transmissivity characteristics for radiation at λ_1 and radiation between λ_2 and λ_3; and
said reticle providing a similar output for radiations at λ_1 and radiations between λ_2 and λ_3.

4,107,530
INFRARED ACQUISITION DEVICE

Elvin S. Brumfield, Los Angeles; Edgar W. Kutzscher, Sherman Oaks, and James N. Lovelady, Saugus, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 26, 1966, Ser. No. 523,179
Int. Cl.² G01J *1/20, 1/00*
U.S. Cl. 250—342 **10 Claims**

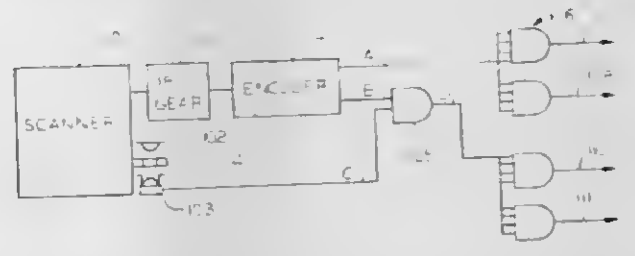


1. Acquisition apparatus responsive to an infrared emissive target within a given field of view, comprising:
a first array of infrared energy responsive detectors radially disposed in a common plane about a common center;
a second array of infrared energy responsive detectors annularly disposed with respect to said first array of detectors and coplanar therewith;
optical means for collecting and focusing infrared energy from said given field of view onto an image plane coplanar with said first and second arrays of detectors;
positioning means movably carrying said optical means and responsive to signals generated by infrared energy from said target impinging upon a detector of said second array to reposition said optical means to cause the energy from said target to be directed onto a detector of said first array and away from a detector of said second array.

4,107,531
X-RAY BODY SCANNER USING ENCODER FOR GENERATING SYSTEM CONTROLLING TIMING PULSE TRAIN

Philip Melvin Garratt, Amsterdam; Leroy Earl Foley, Schenectady, both of N.Y.; Robert Godbarsen, Elm Grove, and David M. Barrett, Brookfield, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,799
Int. Cl.² A61B *6/02;* **G01N** *23/08;* **H05G** *1/30*
U.S. Cl. 250—360 **21 Claims**

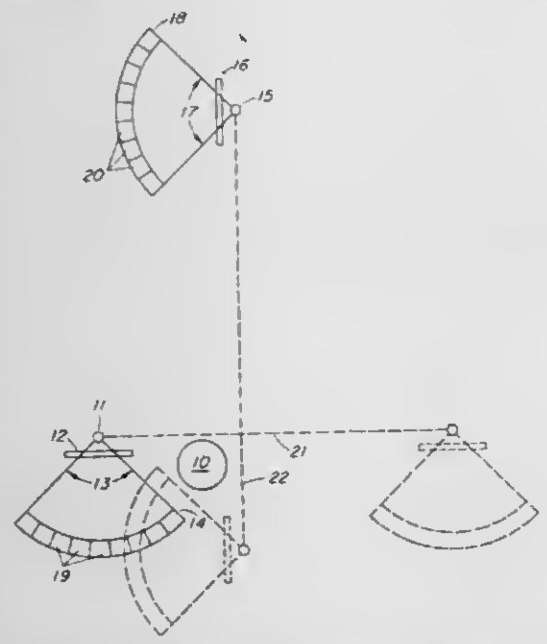


1. X-ray apparatus for examining at least a portion of a body by scanning successive layers of said body with a rotating x-ray beam and detecting the x-radiation along the beam that emerges from each body layer as it is scanned, comprising:
rotatable means that are rotatable through substantial angles about a longitudinal axis that is substantially normal to the layers of the body portion to be examined,
x-ray source means having a fixed focal spot from which an x-ray beam originates and x-ray detector means mounted on said rotatable means and spaced angularly relative to each other about said axis and being on opposite sides of said axis for orbiting jointly about a body portion when it is disposed between said source and detector means, the relationship between said focal spot, said axis and said detector means being unaltered during said orbiting,
means cooperating with said source means for defining the radiation emanating from said source means into a beam that is directed toward said detector means,
motor means operatively coupled with said rotatable means for driving said rotatable means to effect scanning of a body portion solely by said joint orbiting of said focal spot and detector means,
means for maintaining functions of said apparatus in predetermined relationships comprising encoder means having shaft means coupled to said rotatable means and including means responsive to rotation of said shaft means by producing a train of timing pulses in which each pulse corresponds with a fractional degree of rotation of said rotatable means, and
means responsive to occurrence of successive predetermined numbers of said timing pulses by controlling said x-ray source means to turn on for the duration of a predetermined number of timing pulses, to thereby provide x-radiation pulses at repeatable angular increments of said rotatable means.

4,107,532
ORTHOGONAL SCAN COMPUTERIZED TOMOGRAPHY

Albert MaCovski, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 11, 1976, Ser. No. 741,127
Int. Cl.² A61B *6/02;* G01N *23/08*
U.S. Cl. 250—360 **24 Claims**



1. In a method of computerized tomography the steps of:

directing divergent beams of radiation from two sources in orthogonal directions through an object;

translating each source in orthogonal paths such that each divergent beam is scanned across the lateral extent of the region of the object being examined;

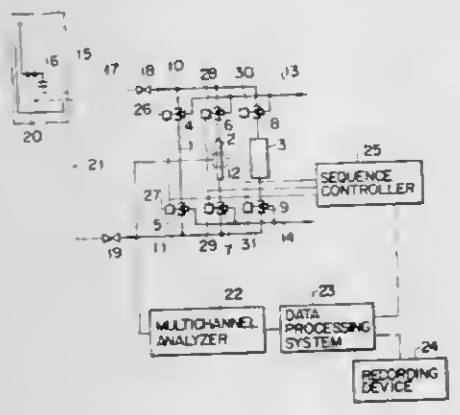
detecting the radiation that is transmitted through the object at each of a plurality of positions within the angle subtended by each of the divergent beams at each source position to derive projection data representing substantially all angles required to produce a reconstruction; and

reconstructing a 3-D tomographic image of the object from the projection data.

4,107,533
APPARATUS FOR MEASURING A CONCENTRATION OF RADIOACTIVITY

Hideho Tabuchi, Kashiwa, and Akira Ogushi, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 20, 1976, Ser. No. 734,318
Int. Cl.² G01T *1/24*
U.S. Cl. 250—364 **22 Claims**



1. An apparatus for automatically measuring concentration of radioactivity in a radioactive fluid comprising:

at least two sampling tubes of different cross sectional areas connected to a fluid system in which the radioactive fluid flows,

valve means provided at inlet and outlet sides of said at least two sampling tubes for selectively feeding to said at least two sampling tubes one of the radioactive fluid and a non-radioactive fluid,

control means for controlling said valves to permit the radioactive fluid to be fed to at least two sampling tubes,

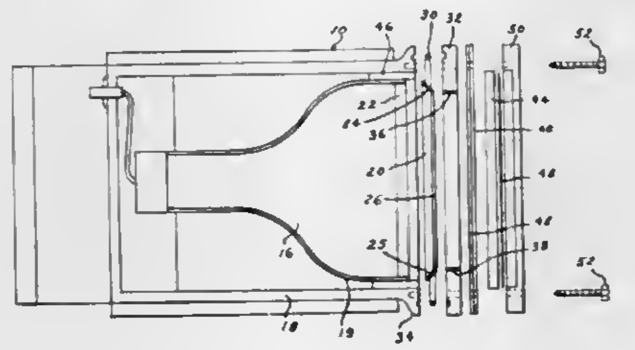
radiation detector means responsive to the radioactive fluid in said at least two sampling tubes for detecting the radiation from the fluid and providing a radiation output signal in accordance therewith, and

processing means responsive to the radiation signal of said radiation detector means for providing at least an indication of the concentration of radioactivity in the radioactive fluid.

4,107,534
PLUTONIUM-AMERICIUM DETECTION PROBE WITH FRONTAL LIGHT-GUIDE-DIFFUSER

Harley V. Piltingsrud, 3431 Whitfield Ave., Cincinnati, Ohio 45220

Filed Jun. 13, 1977, Ser. No. 805,664
Int. Cl.² G01T *1/20*
U.S. Cl. 250—368 **5 Claims**



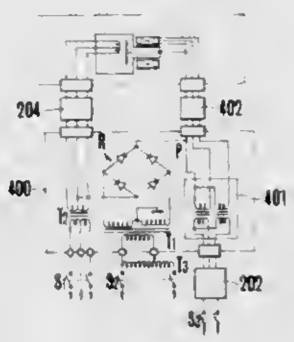
1. A detector probe for a scintillation detector instrument, comprising: metal housing; an end window type photomultiplier tube within said housing; an europium activated calcium fluoride scintillation crystal; means for coupling said crystal to the end window of the photomultiplier tube; a light impervous, reflective electrostatic shield on the side of said crystal remote from said photomultiplier tube; means for providing a light guide diffuser between the electrostatic shield and the photomultiplier on the side of the scintillation crystal remote from said photomultiplier and a radioactive contamination barrier on the side of said electrostatic shield, remote from said scintillation crystal.

4,107,535
X-RAY APPARATUS UTILIZING ROTARY ANODE TYPE X-RAY TUBES

Munenori Kotabe, Mobara, and Yasuji Nomura, Matsudo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1976, Ser. No. 696,753
Claims priority, application Japan, Jun. 20, 1975, 50-74474
Int. Cl.² H05G *1/70*
U.S. Cl. 250—406 **5 Claims**

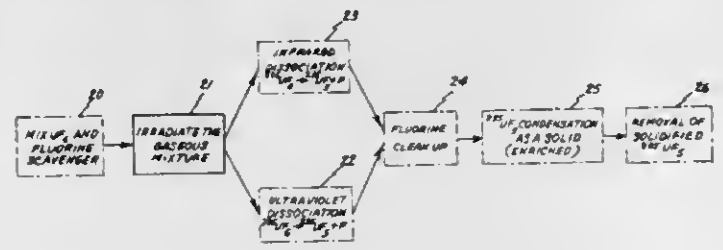
1. In an X-ray apparatus comprising an X-ray tube unit and driving source means therefor, wherein said X-ray tube unit includes a rotary anode type X-ray tube with an anode electrode having a target adapted to generate X-rays and a rotor for rotating said anode electrode, said anode electrode being rotatably supported in an envelope, and with a cathode electrode having at least one filament which is disposed in said envelope to oppose said target, and includes a stator positioned on the outside of said envelope and provided with stator windings for generating a magnetic field for rotating said rotor; and said driving source means includes means for impressing a voltage across said filament, means for impressing a predetermined negative high potential upon said cathode electrode, means for impressing a predetermined positive high potential upon said anode electrode, and means for impressing a low motive power potential difference at high potential across the terminals of said stator windings, the improvement wherein said means for impressing the low potential difference at high potential across the terminals of said stator windings includes a high voltage insulation transformer having a primary winding and a secondary winding which are insulated from each other, said primary winding is connected to a source of alternating current, said secondary winding is connected to energize said stator windings with motive power for driving said rotor, and one of the stator windings is connected to receive said positive high potential such that said anode and said stator windings are at the same high positive potential.



4,107,536
METHOD FOR ISOTOPE-SELECTIVE VIBRATIONAL EXCITATION OF A GASEOUS COMPOUND OF AN ISOTOPE USING MULTIPLE WAVELENGTHS

Richard L. St. Peters, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,170
Int. Cl.² H01J *39/34*
U.S. Cl. 250—423 P **16 Claims**


20
MIX UF6 AND FLUORINE SCAVENGER
21
IRRADIATE THE GASEOUS MIXTURE
23
INFRARED DISSOCIATION
22
ULTRAVIOLET DISSOCIATION
24
FLUORINE CLEAN UP
25
UF5 CONDENSATION AS A SOLID (ENRICHED)
26
REMOVAL OF SOLIDIFIED UF5

1. In a process for separating isotopes in a gaseous mixture of polyatomic molecules having a vibrational energy absorption spectrum of molecular absorption lines in the infrared complicated by multiple contributions from a plurality of thermally populated energy levels so that the isotope shifts are masked, the method of isotope-selective vibrational excitation of the desired isotopic molecules comprising

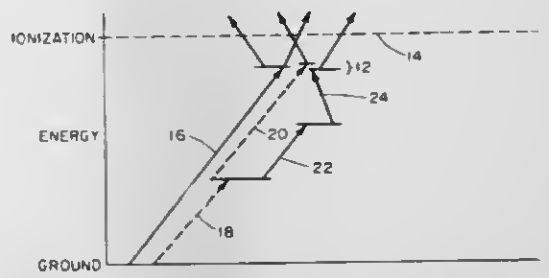
irradiating the gaseous mixture from a radiation source means emitting radiation of line width of the order of the Doppler width of said molecular absorption lines in the infrared spectrum at a first wavelength defining a first selected vibrational-rotational line of a first vibrational energy level transition of the desired isotopic molecules so that a fraction of the desired isotopic molecules are raised to a first higher vibrational energy level whereas a fraction of the undesired isotopic molecules may also be raised to a first higher vibrational energy level, and

irradiating the gaseous mixture from a radiation source means emitting radiation of line width of the order of the Doppler width of said molecular absorption lines in the infrared spectrum at a second wavelength different from the first wavelength and defining a second selected vibrational-rotational line of a second vibrational energy level transition of the desired isotopic molecules so that a substantial portion of the fraction of desired isotopic molecules raised to the first higher vibrational energy level are raised to a second vibrational energy level higher than the first whereas the undesired isotopic molecules that were raised to the first higher vibrational energy level are not raised to a second higher vibrational energy level higher than the first except those that may be so excited due to an accidental coincidence of an absorption line with the second wavelength so that the desired isotopic molecules are vibrationally excited to an energy level substantially unpopulated by the undesired isotopic molecules.

4,107,537
MULTIPLE PARTICLE TYPE INTERACTION ISOTOPICALLY SELECTIVE IONIZATION

Harold K. Forsen, Bellevue, Wash.; George Sargent Janes, Lincoln, and Richard H. Levy, Boston, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 469,407, May 13, 1974, abandoned. This application Oct. 12, 1976, Ser. No. 731,587
Int. Cl.² H01J *39/34*
U.S. Cl. 250—423 P **39 Claims**



1. A method for ionizing particles of one isotope type in an environment of plural isotope type particles comprising the steps of:

generating a vapor environment of particles of said plural isotope types, said vapor environment generating step including the step of generating energetic electron particles;

exciting the particles of said one isotope type to an excited state which is below the ionization level of the particles of said one isotope type by a small fraction of the ionization potential of said one isotope type;

the excitation of the particles of said one isotope type being isotopically selective with respect to that one isotope type so as not to correspondingly excite particles of other isotope types in said environment;

the excitation of the particles of said one isotope type being to an energy level from which ionization occurs in response to collision between the particles of said one isotope type and the energetic electron particles of said environment.

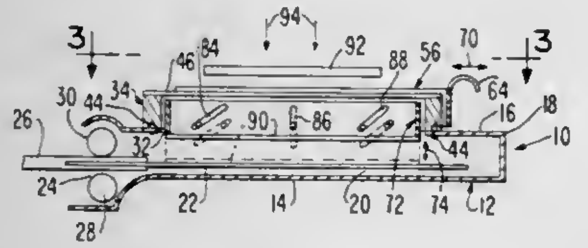
4,107,538
CASSETTE FOR PORTABLE X-RAY CAMERA

Toshio Zenitani, Nara, Japan, assignor to International Med-Electronics, Inc., San Mateo, Calif. and Helwa Electronic Industrial Co., Japan

Filed Dec. 8, 1976, Ser. No. 748,435
Int. Cl.² G03B *41/16*
U.S. Cl. 250—480 **12 Claims**

1. A cassette for use with a portable X-ray machine comprising a light-tight housing having a film-receiving space therewithin and an open end for permitting insertion of a photographic film in the space, said housing having a pair of opposed sidewalls, one of the sidewalls having an opening therethrough; an illumination screen; means coupled to said one sidewall and moveable at least partially through the opening

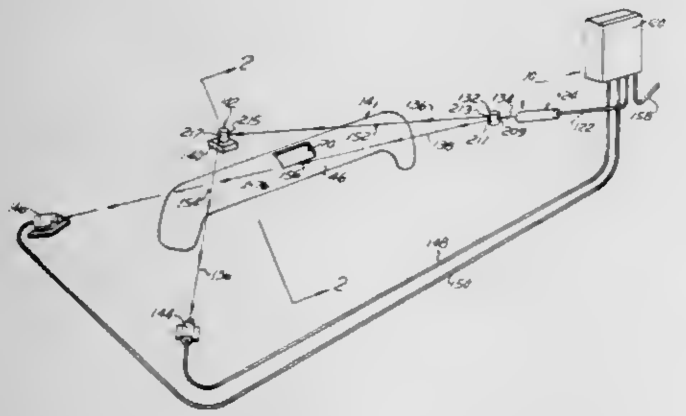
for mounting the screen for movement along a path into and out of a position contiguous to a film in the space; and means coupled with said mounting means for moving said screen along said path into and out of said position.



4,107,539
LASER WORKPIECE POSITION AND PRESENCE INSPECTOR AND MACHINE CONTROL GOVERNOR

Jerry Kirsch, 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

Filed Mar. 16, 1977, Ser. No. 777,901
Int. Cl.² G01N *21/30*
U.S. Cl. 250—561 **6 Claims**

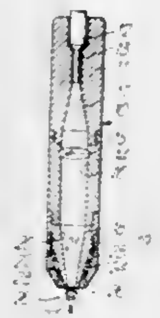


1. A laser-operated workpiece position and presence inspector for a workpiece shape-altering machine having a workpiece supporting member thereon and an electrical control circuit therefore, said inspector comprising
- a laser energization and control unit adapted to be electrically connected to the machine control circuit in operation-governing relationship therewith,
- a laser beam generator electrically connected to said laser energization and control unit and constructed and arranged to emit an outgoing laser beam;
- a laser beam splitter optically aligned with said outgoing laser beam and constructed and arranged to divide said outgoing laser beam into an emitted workpiece position-indicating laser beam and an emitted workpiece presence-indicating laser beam,
  - said beam splitter being positioned to project said workpiece position-indicating beam across a workpiece properly disposed upon said workpiece supporting and forming member in approximately grazing relationship with the workpiece,
  - said beam splitter being also positioned to project said emitted workpiece presence-indicating beam against a workpiece present on said workpiece supporting member in obstructed relationship with the workpiece but unobstructed in the absence of a workpiece on said member,
- a workpiece position-indicating laser beam detector optically aligned with said workpiece position-indicating laser beam and electrically connected to said laser energization and control unit in communicating relationship therewith,
- and a workpiece presence-indicating laser beam detector optically aligned with said emitted workpiece presence-indicating laser beam in the absence of a workpiece on said member,
- said laser energization and control unit being responsive to the interruption of signals from said workpiece position-indicating laser beam detector for transmitting an improper workpiece position signal to said laser energization and control unit, and also being responsive to the interruption of signals from said workpiece presence-indicating laser beam detector for transmitting a proper workpiece presence signal to said laser energization and control unit.

4,107,540
PRESSURE ACTUATED LIGHT PEN

Garth Decker Hillman, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 25, 1977, Ser. No. 790,264
Int. Cl.² G06K *7/10*
U.S. Cl. 250—566 **6 Claims**



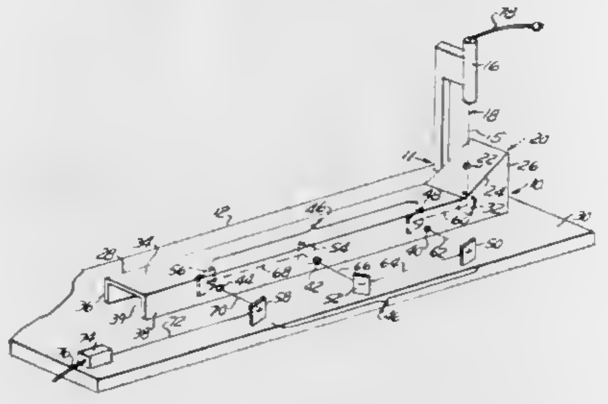
1. A pressure actuated light pen, comprising:
- a tubular body having front and rear end parts;
- means for connecting one end of an optical fibre bundle to said rear part, the end of said bundle at a predetermined position in said body;
- means supporting a plurality of wedge-shaped members side-by-side in said front part for sliding movement in a conical path;
- resilient means urging said wedge-shaped members to a forward position extending beyond said body, said members in contact with each other and closing off said body;
- said wedge-shaped members slidable rearwardly, on pressure on forward ends of said members, along said conical path, said wedge-shaped members moving apart and opening an aperture at said forward ends;
- a lens structure in said body and positioned to image said aperture on said end of said fibre bundle;
- a light image at said aperture focussed on said end of the fibre bundle when said wedge-shaped members are moved rearwardly and said aperture is at a predetermined position.

4,107,541
WORKPIECE HOLE PRESENCE AND ABSENCE INSPECTOR

Jerry Kirsch, 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

Filed Mar. 4, 1977, Ser. No. 774,601
Int. Cl.² G11B *1/00*
U.S. Cl. 250—571 **10 Claims**

1. A laser-operated hole presence and absence inspector for a workpiece containing multiple intendedly-formed spaced holes therethrough as produced by a hole-forming machine, said inspector comprising
- laser inspector supporting structure having a workpiece rest thereon,
- a laser beam source mounted on said supporting structure,
- a laser beam transmitting and reflecting system disposed adjacent and in alignment with the intended locations of the holes in the workpiece and including a multiplicity of laser beam reflectors and passageway means therebetween constructed and arranged to reflect a multiplicity of laser beam portions along an optical path having corresponding portions disposed angularly relatively to one another,
  - said reflectors being positioned to reflect said laser beam portions through the workpiece holes and from hole to hole thereof and to emerge from the final hole in said optical path,

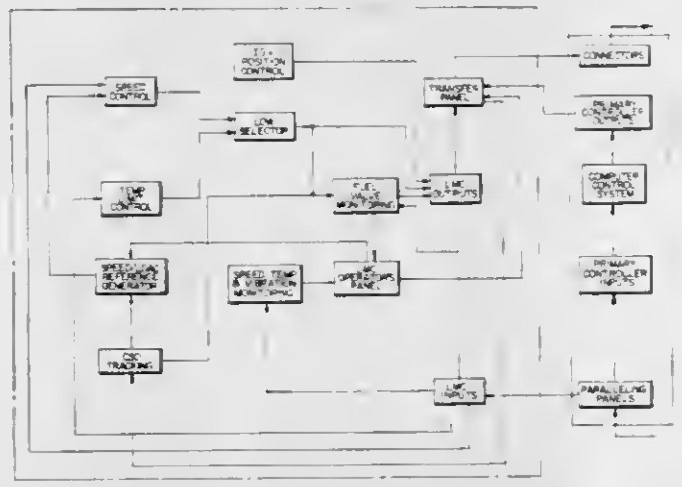


- a laser beam sensor disposed in alignment with the emergent portion of said laser beam from said final hole and responsive to its detection of said emergent portion of said laser beam for indicating an all hole formation in the workpiece and responsive to the non-detection of said emergent portion of said laser beam for indicating the blocking thereof by the non-formation of at least one of said holes.

4,107,542
TIME DELAYED RELAY SEQUENCER AND ALARM RESET FOR A GAS TURBINE LOCAL MAINTENANCE CONTROLLER

Richard S. Heiser, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1975, Ser. No. 551,204
Int. Cl.² H02P *9/04*
U.S. Cl. 290—40 R **9 Claims**

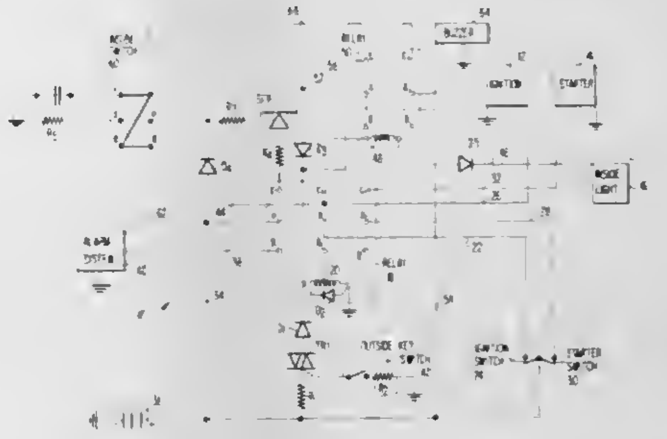


1. For a gas turbine power plant having a primary control system which develops a control signal output utilized to regulate fuel flow to the turbine, the plane including a generator drivably coupled to the turbine, a breaker for connecting the generator to an external power line and a plurality of plant sensors for generating signals indicating the status of predetermined plant parameters and operating status conditions, backup control apparatus for regulating fuel flow to the turbine when the primary control system is down comprising:
- (a) a first circuit portion and a second circuit portion;
- (b) input means coupled to receive the information signals from the plant sensors;
- (c) means for energizing said first portion of said backup control apparatus in a first condition of operation and for energizing said second portion of said backup control apparatus in a second condition of operation;
- (d) a plurality of alarm reset circuit means, cooperably coupled to said means for energizing and said input means; and
- (e) means for resetting said alarm circuit means when said means for energizing is switched from said first condition of operation to said second condition of operation and while said means for energizing is still in said first condition of operation.

4,107,543
VEHICLE ANTITHEFT SYSTEM

Neil B. Kaplan, 63 Mary St., Quincy, Mass. 02169

Filed Mar. 21, 1977, Ser. No. 779,478
Int. Cl.² B60R *25/10*
U.S. Cl. 307—10 AT **13 Claims**

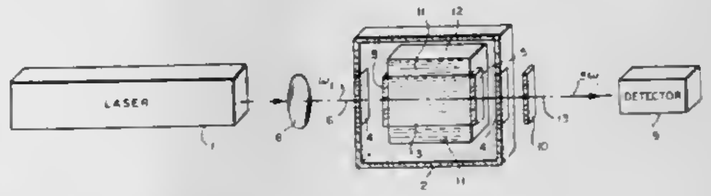


1. A passive anti-theft system for preventing the unauthorized use of a vehicle, the vehicle including at least one door for entering and exiting the vehicle, said system comprising:
- A. switchable control means for controlling use of the vehicle, said switchable control means including a first position in which use of the vehicle is prevented and a second position in which use of the vehicle is enabled, said switchable control means normally being in said first position thereby to prevent use of the vehicle;
- B. means actuatable by an authorized user prior to using the vehicle for switching said switchable control means to its second position thereby to enable use of the vehicle; and
- C. automatic arming means responsive to the closing of the vehicle door when the user exits the vehicle for switching said switchable control means back to its first position thereby to again prevent use of the vehicle, whereby said system is automatically armed and the vehicle is automatically protected upon the closing of the vehicle door without the need for any additional action on the part of the user.

4,107,544
TWO-PHOTON RESONANT LASER MIXING IN MOLECULAR LIQUIDS

Helge Kildal, and Steven R. J. Brueck, both of Acton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 5, 1977, Ser. No. 794,328
Int. Cl.² H03F *7/00*
U.S. Cl. 307—88.3 **24 Claims**



1. A coherent frequency source comprising:
a first molecular liquid,

means for minimizing optical inhomogeneities in said liquid.

a first input laser,

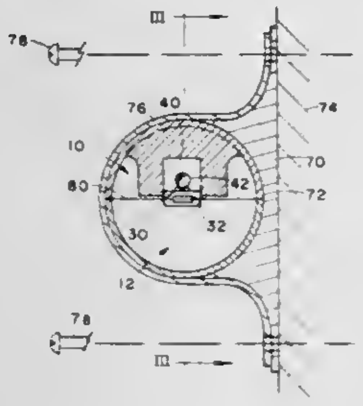
the frequency of said laser being substantially one-half a molecular vibrational two-photon resonance frequency of said liquid,

a means for passing the beam of said first laser through said liquid,

the output beam from said liquid containing a component at a frequency equal to the third harmonic of the frequency of said first laser.

4,107,545
MOUNTING CONSTRUCTION FOR MOTION SENSOR

Meir Gittelis, Moshav Bnei Atarot, Israel, assignor to Nahshol Electronics Ltd., Moshav Bnei Atarot, Israel
Filed Aug. 30, 1977, Ser. No. 829,184
Claims priority, application Israel, Aug. 31, 1976, 50389
Int. Cl.^{2} H01H *35/14*
U.S. Cl. 307—121 **4 Claims**



1. Mounting means for a sensor including

three conductive points respectively insulated from one another;

a movable conductive element normally resting in contact with said points and thus producing an electrical interconnection therebetween and being displaceable out of contact with at least one of said points in response to the application of a predetermined force; and

means for connecting said three points to logic circuitry for sensing interruption of said electrical interconnection and determining in response thereto whether an alarm condition exists; said mounting means comprising:

a housing containing said sensor and having an outer configuration which includes a spherical portion;

means fixedly mountable onto an article and defining a socket surface complementary to said spherical portion; and

clamp means for selectably attaching said housing to said mounting means and permitting ready adjustment of the orientation of said spherical portion with respect to said complementary socket portion with two degrees of freedom to enable precise angular orientation of said sensor with respect to said article.

4,107,546
FLUID CONTROL SYSTEM AND CONTROLLER AND MOISTURE SENSOR THEREFOR

Oded E. Sturman, and Benjamin Grill, both of Northbridge, Calif., assignors to Clifton J. Burwell, Northbridge, Calif., a part interest
Division of Ser. No. 662,682, Mar. 1, 1976. This application Oct. 13, 1976, Ser. No. 732,106
Int. Cl.^{2} H01H *43/00*
U.S. Cl. 307—141 **10 Claims**

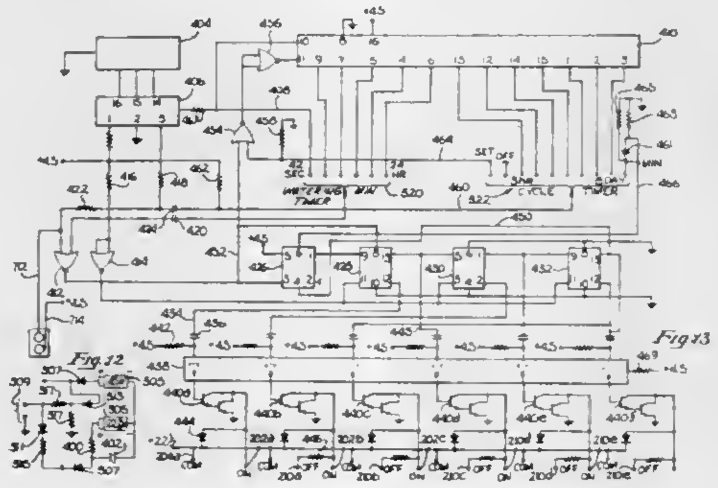
1. A sprinkler controller for controlling the frequency of a watering cycle and the desired watering time for each watering cycle for at least a first valve comprising:

a reference oscillator for providing a reference frequency;

means for counting down said reference frequency to provide a plurality of subfrequencies of said reference frequency;

first selection means for selecting one of a first predetermined group of said subfrequencies dependent upon the desired water time;

second selection means for selecting one of a second predetermined group of said subfrequencies dependent upon the desired frequency of the watering cycle;

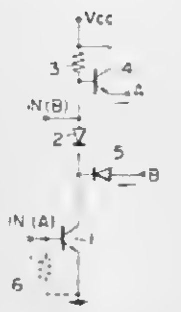


counter means coupled to said first and second selection means, said counter means being means enabled by a signal from said second selection means to count through a predetermined count at a rate responsive to the signal received by said first selection means; and

output means coupled to said counter means and responsive to said count to provide a plurality of successive drive signals for controlling at least one sprinkler valve.

4,107,547
LOGIC CIRCUIT FOR A SEMICONDUCTOR INTEGRATED CIRCUIT

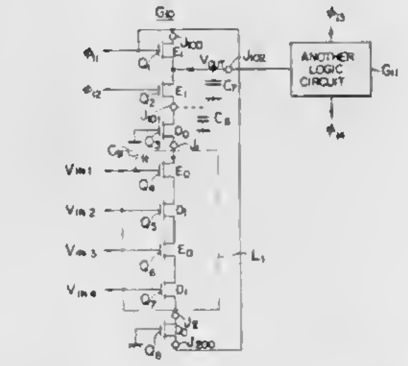
Hiroshi Ishino, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 11, 1976, Ser. No. 694,921
Claims priority, application Japan, Jun. 23, 1975, 50-75449; Oct. 7, 1975, 50-120289; Oct. 7, 1975, 50-120290
Int. Cl.^{2} H03K *19/12, 19/08*
U.S. Cl. 307—203 **9 Claims**



1. A basic logic circuit, wherein the collector of a first transistor which has an emitter which is connected to ground is connected to the base of a second transistor having at least one emitter and to the power source through a resistance component, the base of said first transistor is connected to an input terminal as well as to ground through a first resistor, the collector of said second transistor is connected to said power source, each of said emitters of said second transistor provides a first output signal, while to the collector of said first transistor is connected the cathode of at least one diode, and each of the anodes of said diodes provides a second output signal.

4,107,548
RATIOLESS TYPE MIS LOGIC CIRCUIT

Hiroo Sakaba, Kodaira, and Kenzo Masuda, Tokorozawa, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Mar. 4, 1977, Ser. No. 774,540
Claims priority, application Japan, Mar. 5, 1976, 51-23333; Mar. 5, 1976, 51-23334
Int. Cl.^{2} H03K *19/08, 19/20;* **G11C** *17/04*
U.S. Cl. 307—205 **5 Claims**



1. A ratioless type MIS logic circuit comprising:

at least one input terminal and an output terminal;

a logic block including at least one depletion mode FET having its gate connected with said input terminal and inherently having a gate-to-source parasitic capacitance and a gate-to-drain parasitic capacitance;

an output capacitance connected between said output terminal and a reference potential source;

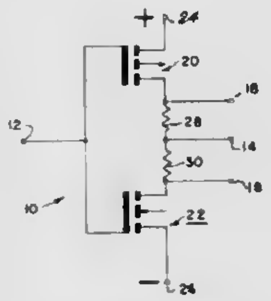
means arranged for precharging said output capacitance;

means for sensing the logical state of said logic block, said precharging means and said sensing means being operative in a timed relation with each other; and

first and second depletion mode FETs connected with one end and the other end of said logic block, repsectively, for suppressing electrical energy which tends to be fed back from said output terminal to said input terminal through said parasitic capacitances, the gates of said first and second suppressing depletion mode transistors being connected with said reference potential source, the threshold voltage value of said at least one depletion mode FET in said logic block being larger than those of said suppressing first and second depletion mode FETs.

4,107,549
TERNARY LOGIC CIRCUITS WITH CMOS INTEGRATED CIRCUITS

Hussein T. Moufah, 3480 Havenwood Dr., Apt. 203, Mississauga, Ontario, Canada
Filed May 10, 1977, Ser. No. 795,441
Int. Cl.^{2} H03K *19/08, 19/20;* **G11C** *11/40;* **H03K** *3/353*
U.S. Cl. 307—205 **12 Claims**



1. A three-valued logic operator having discrete positive, zero and negative output signal values for discrete negative, zero and positive input signal values, respectively, comprising:

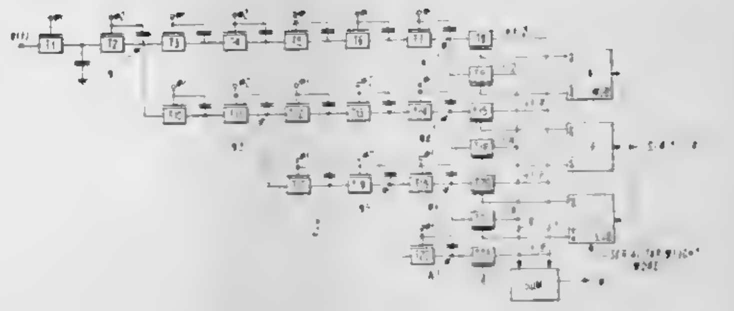
an input terminal connected to the gates of a pair o complementary p-type and n-type metal oxide semiconductor devices, at least the sources of which are each respectively connected to equal and opposite power supplies of positive and negative value, respectively, and the drains of which are each connected to one of a pair of equal-valued resistors;

said pair of equal-valued resistors having a common connection to each other at the ends of each opposite the drains of the respective p-type and n-type metal oxide semiconductor devices; and

a first output terminal connected to the common connection of said pair of equal-valued resistors; whereby for each of said positive and negative input signal values, only one of said semiconductor devices is conductive to produce the respective output signal value; and when the input signal value is at the zero level, both of said semiconductor devices are conductive.

4,107,550
BUCKET BRIGADE CIRCUITS

Christian A. Jacquart, Gattieres, France; Howard N. Leighton, Rockville, Md., and Raymond J. Wilfinger, Lagrangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 19, 1977, Ser. No. 760,612
Int. Cl.^{2} G08C *15/00;* **G11C** *19/00;* **G06G** *7/625;* **H03K** *13/02*
U.S. Cl. 307—241 **5 Claims**



1. A binary-weighted signal attenuator, comprising:

a first series array of charge transfer devices, having an input device connected to an input signal, and organized into sequentially connected stages of charge transfer devices with charge division output nodes at each stage, terminating with a first gated output device, for propagating one half the magnitude of said input signal;

a second series array of charge transfer devices, having an input device connected to a first one of said output nodes of said sequentially connected stages of said first series array, and organized into sequentially connected stages of charge transfer devices with charge division output nodes at each stage, terminating with a second gated output device, for propagating one fourth the magnitude of said input signal;

a third series array of charge transfer devices, having an input device connected to a first one of said output nodes of said sequentially connected stages of said second series array, and organized into sequentially connected stages of charge transfer devices with charge division output nodes at each stage, terminating with a third gated output device, for propagating one eighth the magnitude of said input signal;

a signal summer having a first input connected to the outputs of said first, second and third gated output devices, for selectively summing as a first sum, one half, one fourth and one eighth magnitudes of said input signal in response to the selectively gated states of said first, second and third gated output devices, respectively;

whereby selective binary weighted attenuation of said input signal is achieved.

4,107,551
THYRISTOR TURN-OFF SYSTEM

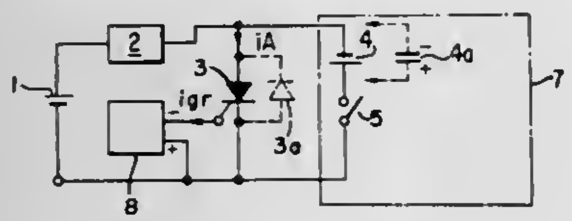
Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 545,906, Jan. 31, 1975, abandoned. This application Jun. 21, 1976, Ser. No. 698,112

Claims priority, application Japan, Apr. 17, 1973, 48-43392

Int. Cl.^{2} H03K *17/72*

U.S. Cl. 307—252 J **7 Claims**



1. A high speed method of turning off a thyristor in the conducting state, said thyristor having at least an anode, a cathode and a gate, comprising the steps of:

applying a reverse-bias between the anode and cathode of said thyristor;
applying a reverse-bias to the gate of said thyristor;
applying a forward-bias between the anode and cathode of said thyristor while continuing to apply the reverse-bias to the gate of said thyristor; and
subsequently removing the reverse-bias from the gate of said thyristor.

4,107,552
SEMICONDUCTOR SWITCH

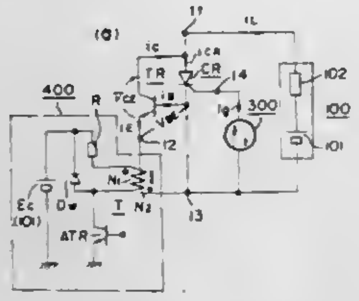
Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,671

Claims priority, application Japan, Jan. 12, 1976, 51-2574

Int. Cl.^{2} H03K *17/72*

U.S. Cl. 307—252 J **6 Claims**



1. A semiconductor switch comprising:

a thyristor having main electrodes and a gate electrode, said main electrodes connected in series to a power path connecting a power source and a load, the current in said power path flowing through said thyristor;
a transistor having a collector, an emitter and a base, said collector and emitter connected to said main electrodes of said thyristor in parallel with the forward direction thereof;
a pulsing means for generating a commutating pulse to reverse bias said main electrodes of said thyristor through said collector and emitter of said transistor; and
wherein said pulsing means is connected in series with said collector and emitter of said transistor.

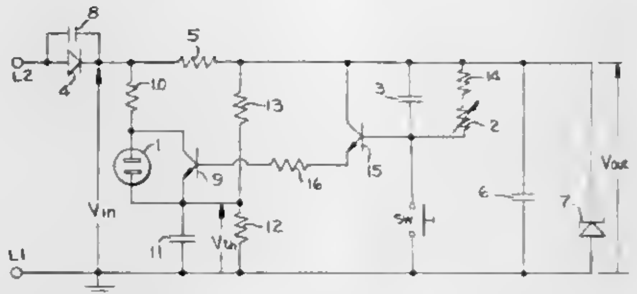
4,107,553
TIMER CONTROL CIRCUIT

Robert A. Carter, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Apr. 25, 1977, Ser. No. 790,294

Int. Cl.^{2} H03K *17/30*

U.S. Cl. 307—293 **10 Claims**



1. A timer control circuit for controlling the ON-OFF operation of a controllable current conducting device, comprising:

(a) capacitive timing means including variable resistance means that exhibits a timing cycle having an adjustable time interval,
(b) circuit means for initiating said timing cycle,
(c) transistor switching means having an input controlled by said capacitive timing means and having an output coupled to said controllable device for switching said device in and out of the circuit in accordance with said timing cycle, the switching means including first and second transistors connected in a current gain relationship with their base emitter circuits in series,
(d) means for developing a threshold voltage, including a voltage divider resistance means, the first transistor having its emitter connected to an intermediate point on the voltage divider resistance means, and
(e) means including said transistor switching means for feeding back said threshold voltage to said capacitive timing means, whereby said time interval is determined by said threshold voltage in combination with the setting of said variable resistance means.

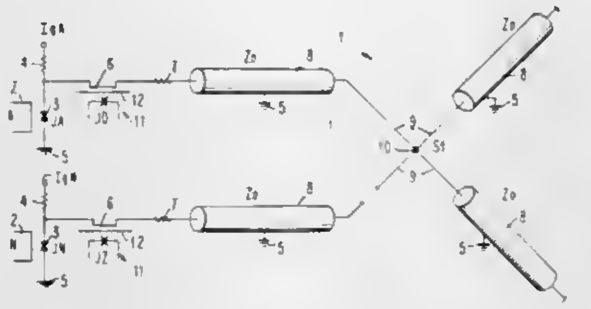
4,107,554
DATA BUS ARRANGEMENT FOR JOSEPHSON TUNNELING DEVICE LOGIC INTERCONNECTIONS

Ying Luh Yao, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,399

Int. Cl.^{2} H03K *3/38, 19/195*

U.S. Cl. 307—306 **22 Claims**



1. A data distribution network comprising:

a plurality of actuable devices having an actuated and unactuated state,
means connected to each of said plurality of actuable devices for powering said plurality of actuable devices,
transmission line means of given characteristic impedance having at least a pair of end portions for interconnecting said plurality of devices and having said an actuable device connected at each of said at least a pair of end portions said devices in their unactuated state forming a portion of said transmission line means, and,

separately actuable means coupled to each of said plurality of devices for selectively actuating said plurality of devices to provide a pulse of electromagnetic energy from one of said actuable devices in said actuated state to the remainder of said actuable devices in the unactuated state via said transmission line means.

4,107,555
PROXIMITY SWITCH AND CIRCUIT SYSTEM

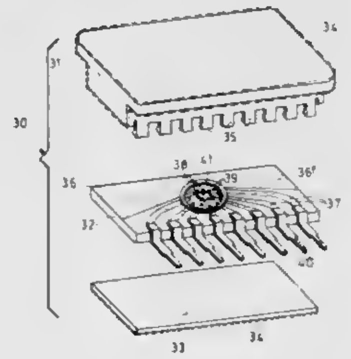
Lothar Haas; Rolf Bräutigam, both of Nuremberg, and Albert Weckenmann, Ahrensburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,806

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609077

Int. Cl.^{2} H03K *17/00;* **G01R** *27/26*

U.S. Cl. 307—308 **15 Claims**



1. Proximity switch and circuit system having

an insulating substrate (**11**, **32**);
two surface electrodes (**13**, **13'**; **36**, **36'**) on the substrate insulated from each other, one electrode forming a transmitting electrode and the other a receiving electrode to receive radiation transmitted from the transmitting electrode;
an electrically floating metallic shield (**15**, **34**) covering the electrodes and insulated therefrom and from ground,
whereby at least a portion of the field upon transmission of radiation by the transmitting electrode will pass through the shield to affect the receiving electrode and, upon approach in the proximity of the shield (**15**, **34**) or contact therewith of a grounded mass, the field passing through the shield will change, thus changing the received radiation and providing, in the receiving electrode, a proximity sensing signal
comprising, in accordance with the invention
an integrated circuit (IC) element (**17**, **38**) located beneath the metallic shield (**15**), the IC element being secured to the insulating substrate (**11**, **32**) to which the surface electrodes are also secured;
terminals (**19**, **40**) secured to the substrate (**11**, **32**);
and connection means (**18**, **37**) respectively connecting the IC element (**17**, **38**) to the surface electrodes (**13**, **13'**; **36**, **36'**) and to the terminals (**19**, **40**).

4,107,556
SENSE CIRCUIT EMPLOYING COMPLEMENTARY FIELD EFFECT TRANSISTORS

Roger Green Stewart, Neshanic Station, and Sargent Sheffield Eaton, Jr., Phillipsburg, both of N.J., assignors to RCA Corporation, New York, N.Y.

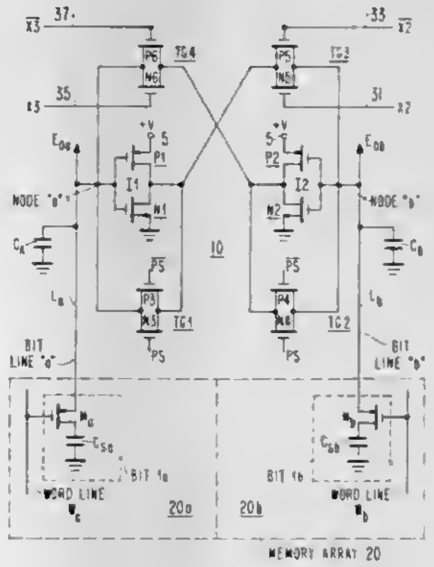
Filed May 12, 1977, Ser. No. 796,334

Int. Cl.^{2} H03K *5/18;* **G11C** *7/06;* **H03K** *3/353, 3/286*

U.S. Cl. 307—362 **8 Claims**

1. A sense amplifier comprising:

first and second nodes;
means for applying signals to said first and second nodes;
first and second inverters, each inverter having an input, an output, and first and second power terminals for the application thereto of first and second operating voltages, respectively; each inverter comprising respective first and second transistors of complementary conductivity type and being responsive to a first level at its input for clamping its output to the voltage at said first power terminal via its first transistor conducting in the common source mode, and being responsive to a second level at its input for clamping its output to the voltage at said second power terminal via its second transistor conducting in the common source mode;
means connecting the input of said first inverter to said first node, and means connecting the input of said second inverter to said second node;
a first biasing means connected between the input and the output of said first inverter, and a second biasing means



connected between the input and the output of said second inverter, said first and second biasing means for selectively providing a direct current connection between the input and output of each one of said first and second inverters and biasing them at first and second quiescent points, respectively; and
first and second selectively enabled cross coupling means; said first cross coupling means, when enabled, for coupling the output of said first inverter to said second node via a low impedance path which includes first transistor means conducting in the common source mode under all signal conditions, and said second cross coupling means, when enabled, for coupling the output of said second inverter to said first node via a low impedance path which includes second transistor means conducting in the common source mode under all signal conditions,.

4,107,557
SULFUR-FUELED MAGNETOHYDRODYNAMIC POWER GENERATION

Thomas L. Shepherd, Essex Fells, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 4, 1977, Ser. No. 784,001

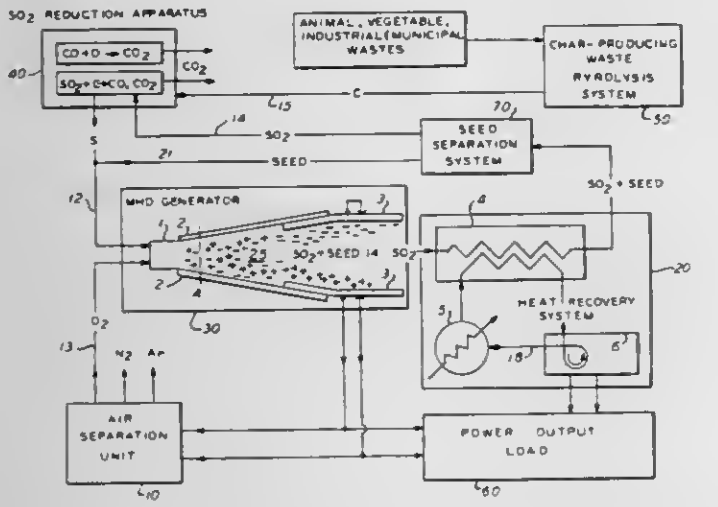
Int. Cl.^{2} H02N *4/02*

U.S. Cl. 310—11 **20 Claims**

1. A magnetohydrodynamic power generation system comprising:

a combustion chamber;
means for supplying elemental sulfur and oxygen to said combustion chamber wherein said sulfur is burned in said oxygen, forming sulfur dioxide, to generate a flame temperature of at least 8000° F and to produce a stream of positive ions and electrons;

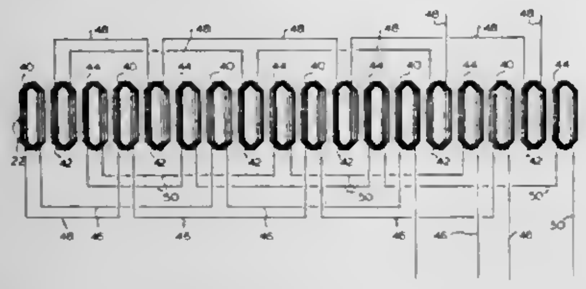
means for separating said positive ions from said electrons; and



electrode means for separately collecting said positive ions and said electrons, thereby developing an electromotive force across said electrode means.

4,107,558
LINEAR INDUCTION MOTOR ASSEMBLY

Geoffrey Edward Brown, Thornhill, Canada, assignor to Spar Aerospace Products Ltd., Toronto, Canada
Filed Apr. 28, 1977, Ser. No. 791,787
Claims priority, application Canada, Apr. 30, 1976, 251532
Int. Cl.² H02K *41/02*
U.S. Cl. 310—13 **6 Claims**

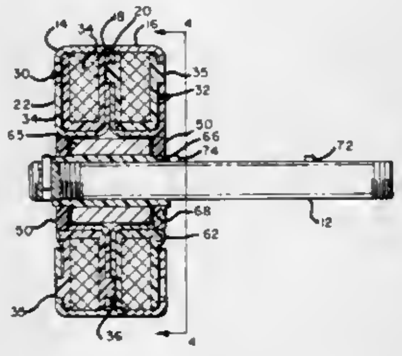


1. In a primary member for a single-sided linear induction motor having a core member and a plurality of multi-turn coils connected to one another in a plurality of phase groups, each phase group being arranged in a plurality of longitudinally spaced pole groups, each consisting of a plurality of coils, the coils of each pole group being connected to each other at a side of the core, the improvement wherein; the coils of each phase group are connected to one another at connection points arranged on the same side of the core, the connection points of one pole group being disposed at the opposite side of the core to that at which the connection points of at least one adjacent pole group are located.

4,107,559
MINIATURE MOTOR

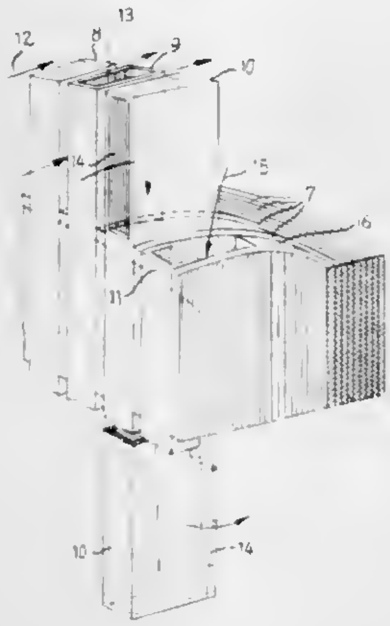
Jayant K. Patel, Englewood, Ohio, assignor to TRW Inc., Cleveland, Ohio
Filed Nov. 15, 1976, Ser. No. 741,545
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **3 Claims**

1. A miniature two-phase stepping motor comprising a pair of inner pole pieces having radial portions positioned in generally back-to-back relation and each having an annular array of axially extending outwardly turned poles, a first outer pole piece having a radial portion forming one end wall of the motor and having an annular array of inwardly turned axial poles spaced between the corresponding poles of one of said inner pole pieces, a second outer pole piece having a radial portion forming an opposite wall of said motor and having an annular array of inwardly turned axial poles spaced between the poles of the other of said inner pole pieces, a first plastic bobbin coil form received between said one inner pole piece and said first pole piece forming a first stepping motor phase, a second plastic bobbin coil form positioned between said second pole piece and said other inner pole piece defining a second stepping motor phase, integral axially extending protuberances on said coil forms, means in said pole pieces defining apertures receiving said protuberances therein for interlocking said pole pieces in fixed angular relation with respect to said coil forms, axially spaced bearing means directly supported on a different one of said bobbin coil forms adjacent said outer walls, a shaft rotatably received in said bearing means, and an armature mounted on said shaft in magnetic coupled relation to said poles.



4,107,560
ELECTRIC MACHINE

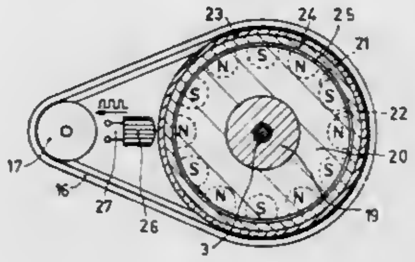
Stig Lennart Hallerbäck, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Lutphass, Netherlands
Filed Nov. 6, 1975, Ser. No. 629,380
Int. Cl.² H02K *9/16*
U.S. Cl. 310—60 R **9 Claims**



1. Electric machine comprising a stator and a rotor mounted in a rotor cavity in the stator, said stator including a plurality of axially extending laminations having a radially directed, circumferentially spaced end portions, the outer terminal edges of said end portions lying on the circumference of a common circle defining the rotor cavity, and means defining an axially directed cooling channel in at least one of the spaces between said lamination end portions in close proximity to the rotor cavity said means comprising longitudinal pipes having cavities for air streams said pipes protruding beyond the axial ends of the laminations, the pipe ends at one side of the stator having apertures facing inwards towards the rotor cavity and at the other side having apertures facing outwards from the rotor cavity.

4,107,561
CLUTCH APPARATUS FOR GENERATING A PULSE TRAIN

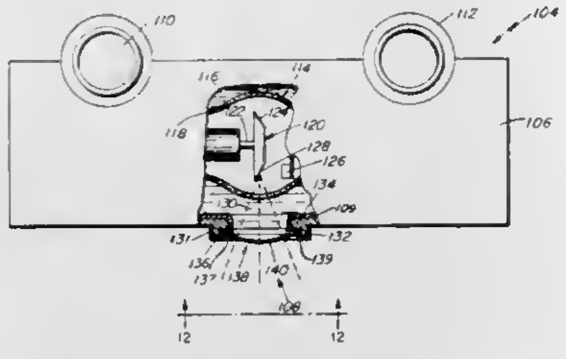
Peter Schmidt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 619,846, Oct. 6, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,611
Claims priority, application Austria, Oct. 9, 1974, 8124/74
Int. Cl.² H02K *49/04*
U.S. Cl. 310—95 **2 Claims**



1. Apparatus for generating a pulse train depending on the speed of rotation of a rotary system, a rotary part of said system comprising magnet poles which produce an external field, which field is sensed by a stationary sensing means responding to magnetic fields and supplying the pulse train, wherein said rotary system comprises a magnetic slipping clutch having a rotary magnet portion and a magnetically coupled portion, said portions being adapted to transmit a constant torque while undergoing relative slip, said magnet poles being formed by the rotary magnet portion of the clutch, whereby said pulse train measures varying speeds corresponding to varying degrees of slip.

4,107,562
X-RAY BEAM GENERATOR

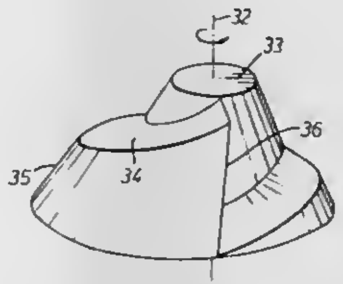
Thomas J. Koller, Huntington, and Jacob A. Randmer, Wilton, both of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.
Filed Aug. 30, 1976, Ser. No. 719,026
Int. Cl.² H01J *35/18*
U.S. Cl. 313—59 **6 Claims**



1. An X-ray beam generator comprising:
an X-ray tube including a tubular envelope having therein a focal spot area on a target surface disposed to direct a divergent X-ray beam out of the envelope; and
an X-ray shielded housing disposed to enclose the X-ray tube and including X-ray transmissive means disposed substantially concentric with respect to the center of the focal spot area for permitting egress of at least a portion of the beam having a desired configuration.

4,107,563
X-RAY GENERATING TUBES

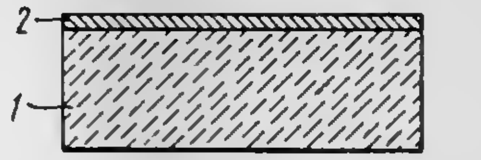
Leonard George Oddell, Bognor Regis, England, assignor to EMI Limited, Hayes, England
Filed Apr. 6, 1977, Ser. No. 785,205
Claims priority, application United Kingdom, Apr. 28, 1976, 17203/76
Int. Cl.² H01J *35/10*
U.S. Cl. 313—60 **6 Claims**



1. An x-ray generating tube having an envelope and including an anode rotatable about an axis, an electron beam source for projecting an electron beam towards said anode so as to impinge thereon at a location within the tube and produce x-radiation originating at said location, and means for reciprocating the location of the origin of the x-radiation, on the anode, relative to the envelope and in a direction substantially parallel to said axis.

4,107,564
PHOTOEMITTER

Alexandr Ivanovich Klimin, Gradhdansky prospekt, 110, korpus 1, kv. 71; Alexandr Alexeevich Mostovsky, Svetlanovsky prospekt, 35, kv. 19, and Rafail Lvovich Nemchenok, Bolshaya Pushkarskaya ulitsa 44, kv. 27, all of Leningrad, U.S.S.R.
Filed May 20, 1975, Ser. No. 579,227
Claims priority, application U.S.S.R., May 21, 1974, 2025744
Int. Cl.² H01J *39/00, 39/06*
U.S. Cl. 313—94 **4 Claims**



1. A photoemitter sensitive in the optical wavelength range of the light spectrum, comprising:
a. a substrate which emits electrons under the influence of said light radiation;
said substrate is made of p-type semiconductor materials belonging to a group of chemical compounds $A^{II}B^{IV}C_2^{V}$ in the periodic table, where A^{II} are chemical compounds selected from the second subgroup of group II and consisting of Zn and Cd, B^{IV} are elements selected from the second subgroup of group IV and comprising Ge, Si, Sn, and C^{V} are elements selected from the second subgroup of group V and comprising P and As;
b. one surface of said substrate;
c. a coating applied to said one surface of said base intended to reduce the electron work function and activating said surface of said substrate to the effective negative electron affinity state.

4,107,565
MERCURY EMITTING STRUCTURE

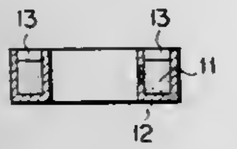
Tsuyoshi Isojima, Yokohama; Kenji Enokida, Yokosuka; Hideharu Nihei, Yokohama, and Wataru Ichise, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

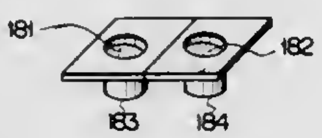
Filed Mar. 31, 1976, Ser. No. 672,324

Claims priority, application Japan, Apr. 2, 1975, 50-39246

Int. Cl.² H01J *7/10, 7/18, 7/20*

U.S. Cl. 313—174 11 Claims





1. A mercury emitting structure comprising an alloy of an intermetallic compound having a face centered cubic lattice type crystal structure of the Al type, said alloy being yttrium, nickel and mercury, and a holder for holding said alloy.

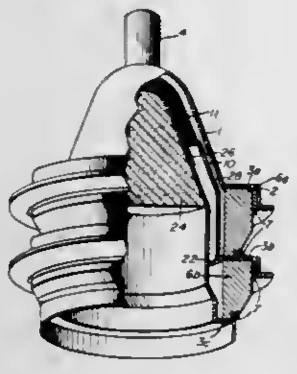
4,107,566
RUGGED QUICK-HEATING ELECTRON TUBES

Charles P. Marsden, Jr., Washington, D.C., assignor to The United States of America as represented by the Secretaru of the Army, Washington, D.C.

Filed Feb. 7, 1955, Ser. No. 486,743

Int. Cl.² H01J *1/46, 21/10*

U.S. Cl. 313—293 5 Claims



1. A rugged combustion-heated electron tube comprising: a metallic conically-shaped anode structure; a metallic conically-shaped cathode structure insulatedly and coaxially mounted in spaced relationship to said anode structure; a metallic conically-shaped grid structure insulatedly and coaxially mounted in spaced relationship between said anode structure and said cathode structure; first and second annular insulating spacer-seals separating said anode structure from said grid structure and said grid structure from said cathode structure, said spacer-seals in combination with said anode structure and said cathode structure providing a hermetically-sealed envelope containing said grid structure; and a combustible material mounted exteriorly of said envelope in proximity to said cathode structure, said combustible material being adapted to heat said cathode structure to an operating temperature.

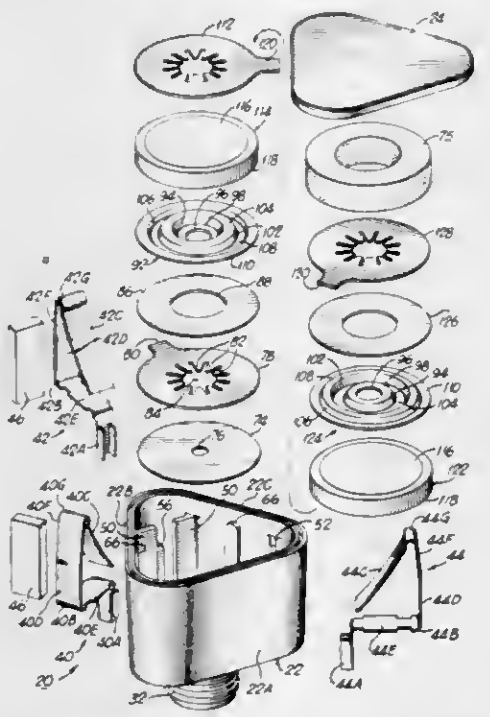
4,107,567
SURGE PROTECTOR

Francis V. Cunningham, Western Springs, and Michael A. Fanizza, Mount Prospect, both of Ill., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Division of Ser. No. 472,355, May 22, 1974, Pat. No. 3,987,343. This application Oct. 14, 1976, Ser. No. 732,487

Int. Cl.² H01J *17/00, 21/00*

U.S. Cl. 313—325 9 Claims



1. A spark gap assembly including spark gap electrodes spaced apart by a planar insulating washer defining a spark gap, one of said electrodes comprising a conductive plate having an upper portion and a lower portion and an outermost edge portion, each of said upper, lower and outermost portions having a common center, said outermost edge portion being substantially spaced from both said upper and lower portions and disposed between said upper and lower portions.

4,107,568
FACE PLATE FOR COLOR PICK-UP TUBE

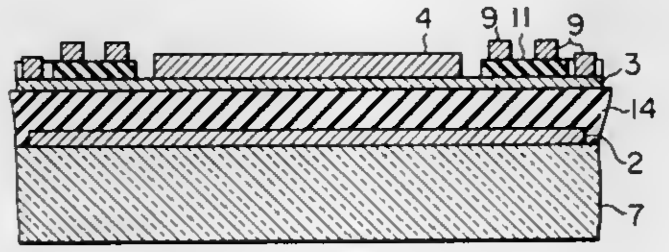
Toshio Nakano, Hachioji; Akira Sasano, Kodaira; Ken Tsutsui, Tachikawa, and Haruo Matumaru, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Ltd., both of, Japan

Filed Nov. 15, 1974, Ser. No. 524,274

Claims priority, application Japan, Dec. 3, 1973, 48-134306; Aug. 2, 1974, 49-88049

Int. Cl.² H01J *31/46*

U.S. Cl. 313—371 10 Claims



1. A face plate for a color pick-up tube, comprising,
- (a) a transparent substrate,
- (b) stripe-like color filters formed on said transparent substrate, said filters being disposed cyclically and in parallel to one another,
- (c) a transparent protection layer formed so as to cover said stripe-like color filters and exposed portions of said transparent substrate,
- (d) stripe-like transparent electrodes deposited over said stripe-like color filter through said protection layer interposed therebetween, and
- (e) bus bar electrodes electrically connected to said transparent electrodes in such a manner that each bus bar electrode is connected with corresponding transparent electrodes but insulated from the remaining transparent electrodes by an interposed insulation layer,

further comprising a flattening layer for correcting unevenness of surface, which layer is disposed between said protection layer and said stripe-like color filters and said transparent substrate.

4,107,569
COLOR SELECTION MEANS COMPRISING LENS ELECTRODES SPACED BY GRAINS OF INSULATING MATERIAL

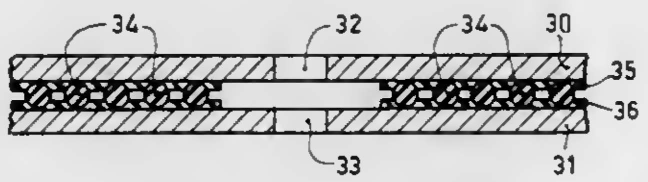
Hubertus Joseph Ronde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,089

Claims priority, application Netherlands, Jan. 16, 1976, 7600420

Int. Cl.² H01J *29/07, 19/30*

U.S. Cl. 313—402 3 Claims



1. A colour display tube comprising in an evacuated envelope means to generate a number of electron beams, a display screen comprising a large number of regions luminescing in different colours, and colour selection means having a large number of apertures which associate each electron beam with luminescent regions of one colour, which colour selection means comprise a first and a second system of lens electrodes, a lens electrode belonging to the first system being kept at a defined distance from a lens electrode belonging to the second system, characterized in that a lens electrode belonging to the first system is kept at a defined distance from a lens electrode belonging to the second system by means of grains of an electrically insulating material present between the facing surfaces of the electrodes, which grains are sunk on two sides in layers of an adhesive material present on the two said surfaces of the electrodes, the sum of the thicknesses of the said layers being smaller than the distance between the relevant electrodes.

4,107,570
CATHODE RAY TUBE INDEXING STRUCTURES

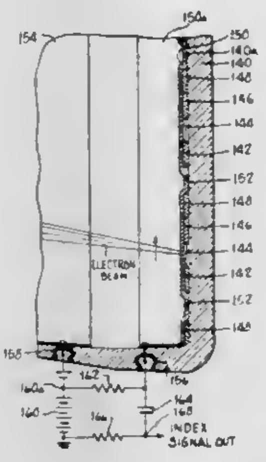
Clayton A. Washburn, 24 Andrea La., Thornwood, N.Y. 10594

Division of Ser. No. 340,167, Mar. 12, 1973, Pat. No. 3,914,651. This application Jun. 11, 1975, Ser. No. 585,922

Int. Cl.² H01J *29/10, 29/32*

U.S. Cl. 313—471 22 Claims

1. A screen for a cathode ray tube, comprising a supporting surface, a mosaic of elements positioned on said surface, selected ones of said elements being free of phosphoros and comprising indexing elements atoms of which have high atomic weight, said indexing elements being positioned in predetermined areas of said surface, and a backing film against said mosaic and of a material having an atomic weight less than the atomic weight of said indexing elements.



4,107,571
LIGHT EMITTING DEVICE HAVING LUMINESCENT SCREEN WITH SELF ACTIVATED BLUE LIGHT EMITTING PHOSPHOR

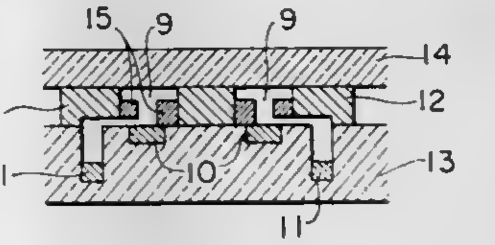
Shinkichi Tanimizu, Kokubunji; Teruki Suzuki, Funabashi, and Tadashi Fukuzawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 22, 1974, Ser. No. 516,953

Claims priority, application Japan, Oct. 22, 1973, 48-117966; Oct. 22, 1973, 48-117967

Int. Cl.² H01J *61/16, 61/44*

U.S. Cl. 313—486 17 Claims



1. A light emitting device comprising:
- a light-permeable envelope,
- an exciting source providing excitation energy ranging from 5 to 25 eV, said exciting source being a gas selected from the group consisting of xenon, krypton, argon, neon, helium, or a mixture thereof, and
- a luminescent screen which is provided inside said envelope at which it can convert said excitation energy from said exciting source into visible light, said luminescent screen containing a phosphor represented by the general formula:

$$M_{1-a}Eu_aP_bV_{1-b}O_4$$

where M stands for at least one member selected from the group consisting of yttrium, scandium, rare-earth elements having atomic numbers of 57 - 62 and 64 - 71, and group-IIIb elements of the periodic table, wherein said phosphor is a self-activated blue light emitting phosphor where $a = 0$ and $0<b<1.0$.

4,107,572

TRAVELING-WAVE TUBE HAVING PHASE VELOCITY TAPERING MEANS IN A SLOW-WAVE CIRCUIT

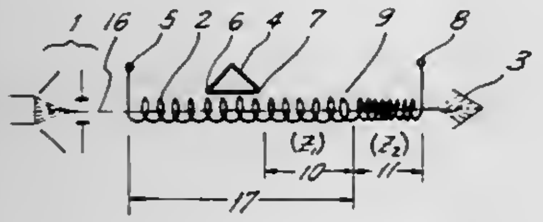
Yoshio Yuasa; Yoslbiro Morizuml, and Ryuzo Orui, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,359

Claims priority, application Japan, Apr. 16, 1976, 51-43195

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.6 **5 Claims**



1. A traveling-wave tune including an electron gun for providing a beam of electrons, a collector for collecting said electrons, a slow-wave circuit disposed midway between said electron gun and said collector for effecting interaction between the electron beam and an electromagnetic wave, and an attenuator provided along the slow-wave circuit; said slow-wave circuit having a constant phase velocity section disposed on the electron gun side of said slow-wave circuit for imparting a constant phase velocity to the electromagnetic wave propagating therethrough, and a phase velocity tapering section disposed on the collector side of said slow-wave circuit for imparting a smaller phase velocity than said constant phase velocity to said electromagnetic wave; the ratio of the length of said phase velocity tapering section to the length from the collector side end of said attenuator to the electron gun side end of said phase velocity tapering section being equal to or less than 0.4.

4,107,573

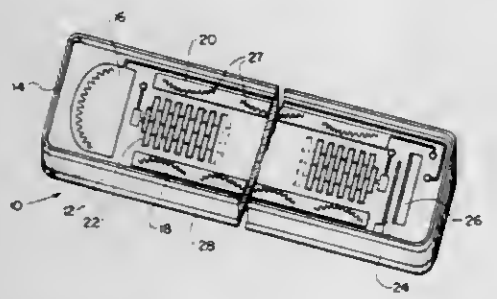
PRINTED CIRCUIT TRAVELING WAVE TUBE

Bobby R. Potter, Richardson, Tex., and Allan W. Scott, Los Altos, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1977, Ser. No. 773,563

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **6 Claims**



1. A microwave traveling wave tube comprising:

a pair of flat dielectric members defining a vacuum enclosure therebetween,

means at one end of said enclosure for emitting an electron beam,

means at the other end of said enclosure for collecting said electron beam,

means for focusing said electron beam into a flat sheet beam between said emitting and collecting means, and

microwave interaction circuit means disposed on at least one of said dielectric members and extending along said electron beam for applying microwave energy of a given frequency range to interact with said electron beam, said interaction circuit means including a planar multiple circuit strip meanderline disposed on the inner surface of said one dielectric member adjacent said electron beam and a ground plane conductor strip disposed on the opposite surface of said dielectric member, and oscillation suppression means disposed along said ground plane conductor strip for attenuating oscillations of selective microwave frequencies.

4,107,574

TRAVELLING-WAVE TUBE WITH COLLECTOR HOUSING HAVING ALL ELECTRICAL CONNECTIONS THROUGH ONE END WALL OF HOUSING

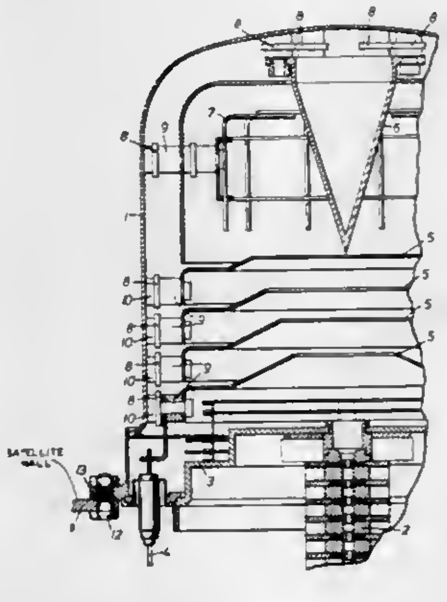
Herbert Ruf, Temmenhausen; Dieter Deml, Ay-Senden, and Werner Schwarz, Erbach, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jun. 9, 1976, Ser. No. 694,222

Claims primrity, application Fed. Rep. of Germany, Jun. 14, 1975, 2526681

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **16 Claims**



1. In a travelling-wave tube having a delay line section and an electron collector comprising several electrodes arranged inside a hollow cylindrical metal cooling chamber, one end wall of which is annular, is connected to the end of said delay line section so as to be vacuum-tight and has a diameter which is greater than the diameter of said delay line section; the improvement wherein: a plurality of electrical insulators which are good conductors of heat are fastened to the inner surface of the wall of said cooling chamber, said individual collector electrodes are mounted on said insulators so as to be good conductors of heat to, while being electrically insulated from, said cooling chamber, insulated bushings are provided on a portion of the annular surface of said one end wall which extends laterally beyond said delay line section, said bushings being connected to said individual collector electrodes in an electrically conductive manner, and means on said end wall connected to said delay line section for fastening said travelling-wave tube to a support wall so that said cooling chamber is located substantially on one side of said support wall and said delay line section and said insulated bushings extend through one or several openings in said support wall.

4,107,575

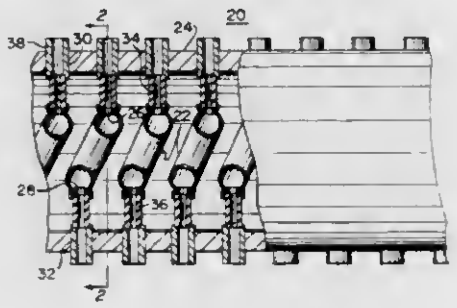
FREQUENCY-SELECTIVE LOSS TECHNIQUE FOR OSCILLATION PREVENTION IN TRAVELING-WAVE TUBES

Norman R. Vanderplaats, Alexandria, Va., and Henry D. Arnett, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,550

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **18 Claims**



1. In a traveling-wave tube of the type wherein a beam of electrons flows along the axis of a slow-wave interaction circuit through which an electromagnetic wave propagates, said slow-wave interaction circuit being axially disposed within a conductive metal shell, the improvement comprising means for preventing backward-wave oscillations, said preventing means comprising:

means for producing a cutoff frequency of the −1 space harmonic of the slow-wave interaction circuit at or near zero-phase-shift per period of the slow wave circuit and at or near the frequency of the potential backward-wave interaction between said beam of electrons and said −1 space harmonic; and

lossy material disposed between said slow-wave interaction circuit and said conductive shell, said lossy material being disposed so as to couple strongly with the electromagnetic field of said −1 space harmonic in the vicinity of said cutoff frequency.

4,107,576

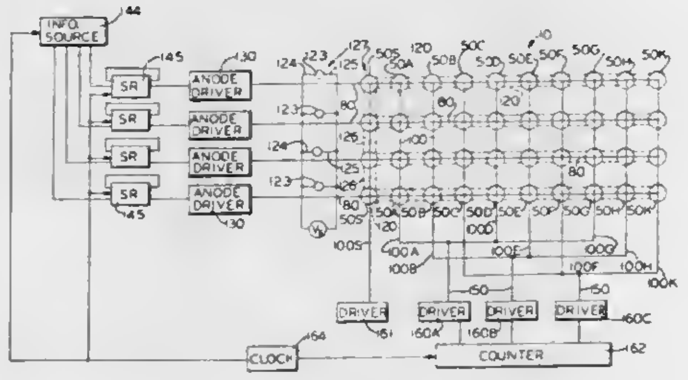
PANEL-TYPE DISPLAY DEVICE

James A. Ogle, Neshanic Station, and George E. Holz, North Plainfield, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 624,532, Oct. 22, 1975, Pat. No. 4,035,689, which is a division of Ser. No. 487,955, Jul. 12, 1974, Pat. No. 3,989,981, which is a continuation of Ser. No. 255,133, May 19, 1972, abandoned, which is a continuation of Ser. No. 850,984, Aug. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 828,792, May 28, 1969, abandoned. This application Dec. 2, 1976, Ser. No. 746,875

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **16 Claims**



1. A gas discharge display device including

a gas-filled envelope,

at least one series of display positions disposed along a line in said envelope,

auxiliary particle-supply cells at opposite ends of said line,

means for initiating a glow discharge substantially simultaneously in selected ones of said auxiliary cells, to facilitate the generation of glow discharges in the adjacent display cells along said line and in the adjacent auxiliary cells, and

means for scanning the display cells starting with the two display cells which are next adjacent the selected auxiliary cells and moving toward the center of the line.

4,107,577

TRANSFER WITHIN GASEOUS DISCHARGE DISPLAY/MEMORY DEVICE

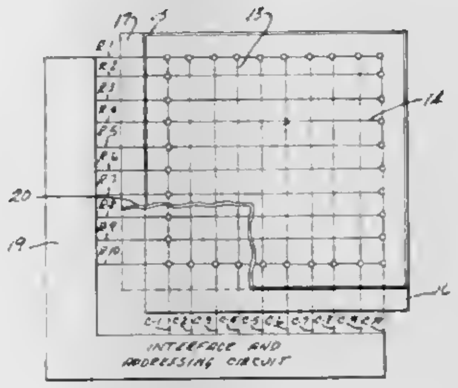
James F. Nolan, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 445,921, Feb. 26, 1974, abandoned, which is a continuation of Ser. No. 103,848, Jan. 4, 1971, Pat. No. 3,803,448. This application Oct. 4, 1976, Ser. No. 729,447

The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Int. Cl.² H05B *41/14*

U.S. Cl. 315—169 TV **1 Claim**



1. In a process for operating a multiple gaseous discharge display/memory panel device comprising a multiplicity of alternating current operated gaseous discharge units, including discharge units at one side of said panel,

the improvement wherein each discharge unit is in physically unconstrained open photonic communication with all of its adjacent discharge units and at least one discharge unit at the side of said panel has a discharge entered thereto and wherein said discharge at said at least one discharge unit at the side of the panel is electronically transferred and propagated laterally from one discharge unit to a first neighboring adjacent unit and from said first neighboring adjacent unit to one of its neighboring adjacent units remote from said at least one discharge unit at the side of said panel and so on across said panel to a selected discharge unit and terminating the transfer of said discharge at said selected unit.

4,107,578

GAS DISCHARGE PANEL DRIVE SYSTEM

Toyoshi Kawada; Shizuo Andoh, and Kazuo Yoshikawa, all of Kobe, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 22, 1977, Ser. No. 790,094

Claims priority, application Japan, May 10, 1976, 51/53589

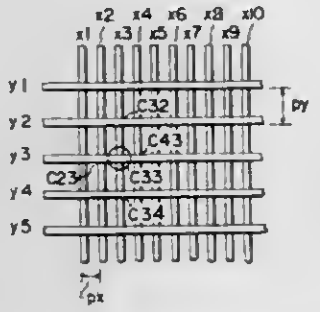
Int. Cl.² H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169 TV **10 Claims**

1. A drive system for driving a gas discharge panel, said panel comprising a plurality of X electrodes respectively covered with dielectric layers and forming an X-electrode group, and a plurality of Y electrodes respectively covered with dielectric layers and forming a Y-electrode group, which are disposed opposite to each other across a space having sealed therein a discharge gas, wherein a given one of the X electrode

group and the Y electrode group has a pitch which is smaller than the pitch of the other electrode group; said drive system comprising:

first means for applying a positive pulse voltage to a selected one of the electrodes of said given one of said X and Y electrode groups; and



second means for applying a negative pulse voltage to a selected one of the electrodes of the other one of the X and Y electrode groups;

whereby to impose a write pulse on a corresponding selected discharge point of said gas discharge panel.

4,107,579

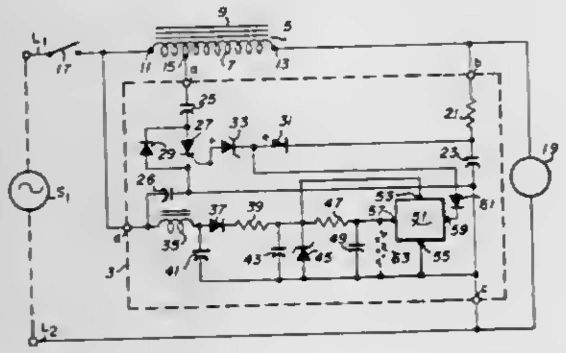
STARTING AND OPERATING BALLAST FOR HIGH PRESSURE SODIUM LAMP

Richard Hill Bodine, Jr., Germantown, Tenn., and Marion Rosiak, Athens, Ala., assignors to Litton Systems, Inc., Bellwood, Ill. and Bodine Co., Inc., Collierville, Tenn., part interest to each

Filed Jun. 27, 1977, Ser. No. 809,994

Int. Cl.² H05B *37/00*

U.S. Cl. 315—205 **17 Claims**



1. In a starting and operating apparatus for starting and operating a high intensity gaseous discharge lamp from a source of sinusoidal AC voltage having a predetermined cycle, which apparatus contains at least one inductive winding means of electrical insulated wire located on a core of magnetic material and circuit means operatively connecting said winding in circuit with said lamp for supplying AC operating voltage thereto; said lamp requiring a high starting voltage, higher than the voltage of said AC source, and at least ten times greater than its operating voltage; first capacitor means; first semiconductor controlled rectifier type electronic switching means, having alternate current conducting and nonconducting states and a gate input terminal, responsive to a predetermined voltage at said gate for switching into the conductive state; voltage breakdown switch device means connected in series with said gate input terminal, said breakdown device requiring a predetermined level of voltage thereacross to switch into an electrically conductive state to provide a predetermined voltage to said gate input; said first capacitor means and said first electronic switching means being coupled in circuit with at least a portion of said winding means to provide a discharge current path for any electrical charge in said first capacitor that extends through said winding portion responsive to said first electronic switching means being in the current conducting condition, whereby a high voltage pulse may be generated across said winding means through transformer action of a level exceeding the lamp starting voltage, and trigger circuit means for providing during a portion of an AC half cycle a voltage of a level sufficient to switch said voltage breakdown device at least once during each AC cycle only during the period when said AC voltage across said lamp is in excess of said lamp operating voltage; the improvement therein comprising in combination:

cut-out means for inhibiting said voltage breakdown device at a predetermined interval of time subsequent to the direct or indirect application of AC voltage from said source across said winding to prevent operation of said first electronic switching means, said last named means comprising:

AC to DC rectifier means for providing at an output a DC voltage responsive to the application of AC voltage to said winding means;

electronic switching device means having a first input, a second input, and an output;

means coupling the first input to said rectifier means output for supplying DC voltage to said first input;

said switching device means capable of providing a first or second output at the said output thereof, alternately, in the presence of DC voltage at said first input, responsive to a voltage at said second input being below or above, respectively, a predetermined voltage level;

timing network means having an input coupled to said rectifier means output and having an output coupled to said second input of said switching device means for providing at its output a voltage above said predetermined voltage level responsive to the continued presence of said DC voltage at said rectifier means output for at least a predetermined time interval, said time interval being greater than the normal starting time of a lamp, and further responsive to the absence of DC voltage at said rectifier means output for providing at its output a voltage of less than said predetermined voltage level;

means coupling said output of said switching device means in circuit with said voltage breakdown device means for inhibiting operation of said voltage breakdown device means responsive to said switching device means providing a second output.

4,107,580

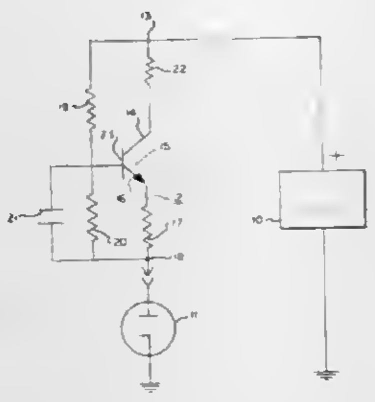
BALLAST CIRCUIT FOR GAS GLOW DISCHARGE DEVICES

Philip C. Thackray, 14 S. Drive, Valencia, Pa. 16059

Filed Feb. 24, 1977, Ser. No. 771,671

Int. Cl.² H05B *41/392;* G05F *1/52*

U.S. Cl. 315—311 **4 Claims**



1. A ballast circuit for a ripple-containing voltage supply to a negative resistance load comprising a transistor, a first resistor connected between its emitter and a load terminal, means connecting its collector to a voltage supply terminal, a second resistor connected between its collector and its base, a third resistor connected between its base and the said load terminal, and a decoupling capacitor connected in parallel with the third

resistor, the value of the second resistor being adjusted to exceed the negative resistance of the load and the voltage between transistor base and collector being adjusted to a value preventing the saturation of the transistor by the ripple voltage.

4,107,581

FLUORESCENT LAMP INSERT WITH CONDUCTIVE ROD SUPPORT

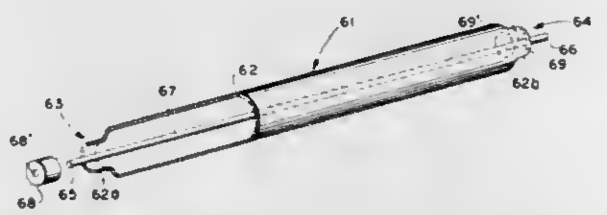
Robert R. Abernethy, 7295 Walton Rd., Walton Hills, Ohio 44116

Continuation-in-part of Ser. No. 575,628, May 8, 1975, Pat. No. 4,053,811. This application Apr. 15, 1976, Ser. No. 675,801

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.² H05B *41/16, 41/46;* H01G *1/02*

U.S. Cl. 315—324 **8 Claims**



4. For use in a lighting apparatus including a ballast circuit normally operable to effect energization of plural electric discharge lamps normally mounted in plural socket-type connectors of the lighting apparatus, the improvement comprising means for substantially completing said ballast circuit when one of said lamps has been removed from its respective socket-type connectors thereby to enable said ballast circuit effectively to energize at least one remaining lamp allowing normal lumen output in circuit connection therewith, said means for substantially completing said ballast circuit comprising a relatively rigid, electrically conductive rod-like means for connecting a contact in one of said respective socket-type connectors to a contact in another of said respective socket-type connectors in the lighting apparatus, a tubular body substantially coextensive with said rod-like means, and coupling means for coupling said tubular body and said rod-like means substantially as an integral structure, said coupling means comprising resilient plug-like members that fit relatively snugly in said tubular body and have respective openings through which respective ends of said rod-like means extend for connection with respective contacts of the socket-type connectors of the lighting apparatus.

4,107,582

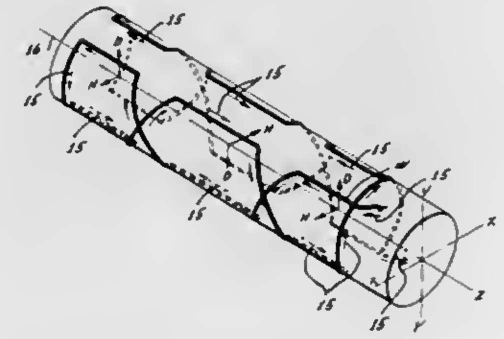
CHARACTER SELECTOR FOR A SHAPED BEAM CATHODE RAY TUBE

Charles Robert Corpew, El Cajon, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Jul. 21, 1976, Ser. No. 707,264

Int. Cl.² G06K *15/20;* H01J *31/16*

U.S. Cl. 315—365 **8 Claims**



1. A unitized selector for a shaped beam cathode ray tube including a neck with a central axis therethrough, positioned within said neck is an electron gun producing an electron beam directed along said central axis and a stencil having a plurality of apertures therethrough, said apertures arranged in a two dimensional pattern for shaping the cross-section of said electron beam passing through one of said plurality of apertures, comprising a pair of interacting shaped coils substantially longitudinally disposed on said neck, each of said coils comprises at least a single winding shaped to form three principal sections, and two cross-over sections for directing said electron beam on an off-axis trajectory through a selected one of said plurality of apertures, first on a path away from said central axis, then along a path convergent with said central axis, and then along a path coincident with said central axis, whereby said pair of interacting shaped coils have inherent alignment that provides a high degree of cancellation of undesirable effects.

4,107,583

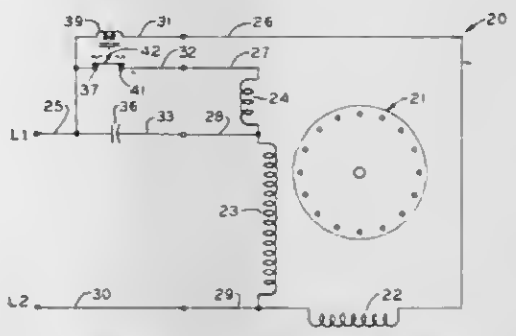
DYNAMOELECTRIC MACHINE WINDING ARRANGEMENTS, DYNAMOELECTRIC MACHINES INCORPORATING SAME AND METHODS OF OPERATING SUCH DYNAMOELECTRIC MACHINES

Jack A. Houtman, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 7, 1977, Ser. No. 785,512

Int. Cl.² H02P *1/44*

U.S. Cl. 318—221 D **17 Claims**



1. In a stator assembly for an induction motor including a magnetic core having regions for accommodating winding turns; a primary phase winding having a number of effective turns n_{le} thereof accommodated by the magnetic core; and an auxiliary phase winding having a first section having a number of effective turns n_{lesr} and particularly adapted for energization during both starting and running conditions, and having a second section particularly adapted for energization only during starting conditions, the improvement comprising: said second section having a preselected number of negative effective winding turns arranged and interconnected to be in bucking relation to said first section whereby the number of effective turns n_{lesr} reduced by said preselected number of negative effective winding turns is equal to a net number of effective turns n_{less}; the ratio of n_{less} to n_{le} is defined as a_s; the ratio of n_{lesr} to n_{le} is defined as a_r; and the number a_r is greater than the number a_s; whereby the stator assembly may be operated in a resistance start motor having satisfactory starting relay characteristics and also having satisfactory characteristics as a capacitor run motor.

4,107,584

CURRENT LIMITING DEVICE FOR AN A.C. MOTOR

Jean Roger, Conflans Ste Honorine, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed May 18, 1977, Ser. No. 797,960

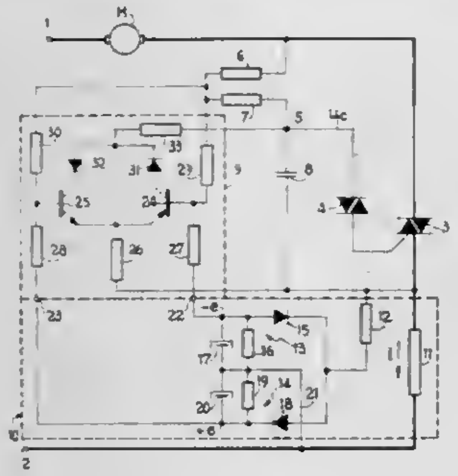
Claims priority, application France, May 18, 1976, 76 14943

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **5 Claims**

1. A device for limiting the current in an a.c. motor having a commutator and for connection to a single-phase a.c. current source, the device comprising an RC phase-shifting circuit, a triggerable silicon-controlled rectifier component connected in

series with said motor and in parallel with the RC phase-shifting circuit which is for furnishing the control voltage of said rectifier component, said RC circuit having a capacitive branch, a shunt circuit which is connected in parallel with said RC circuit and shunts a certain quantity of the charging current of said branch for modifying the trigger instants of said component, said shunt circuit comprising two transistors of opposed conductivity types and each comprising a base, an emitter and a collector and connected with a common emitter configuration, said transistors having collector-emitter circuits connected in parallel with said capacitive branch, said limiting device further comprising a control circuit furnishing two d.c. control signals whose magnitudes are a function of the intensities of the two half-cycles of the current flowing in said rectifier component, the bases of said transistors being connected to be respectively subjected to said control signals so that said shunt circuit can shunt, beyond a predetermined current threshold of the current in the motor, a notable part of the two half-cycles of each period of the current.



4,107,585

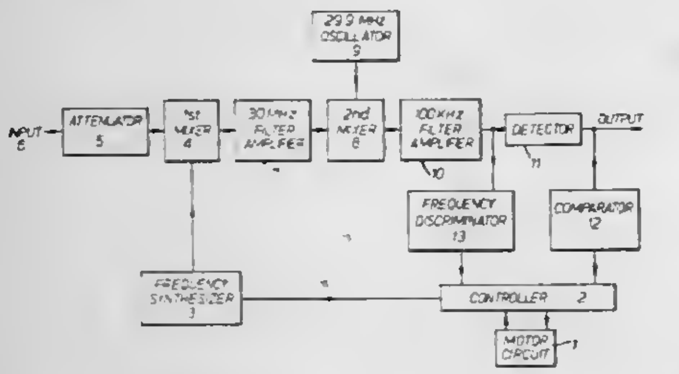
CONTROL DEVICES

Damer Evelyn O'Neill Waddington, St. Albans, England, assignor to Marconi Instruments Ltd., England

Filed Mar. 16, 1977, Ser. No. 778,312

Int. Cl.^{2} H02K *27/20*

U.S. Cl. 318—331 5 Claims



1. A control device suitable for an electronic apparatus and including means whereby rotation can be imparted to a rotational member of a d.c. ironless motor, means for driving from the back e.m.f. generated by the motor when it is turned a driving signal which is used to continue the rotation of the rotatable member to simulate an inertial effect and means coupled to the rotational member for scanning a range of signal or data values, and means for detecting a selected parameter of said range of values and which is arranged to stop rotation of said member upon detection of the selected parameter.

4,107,586

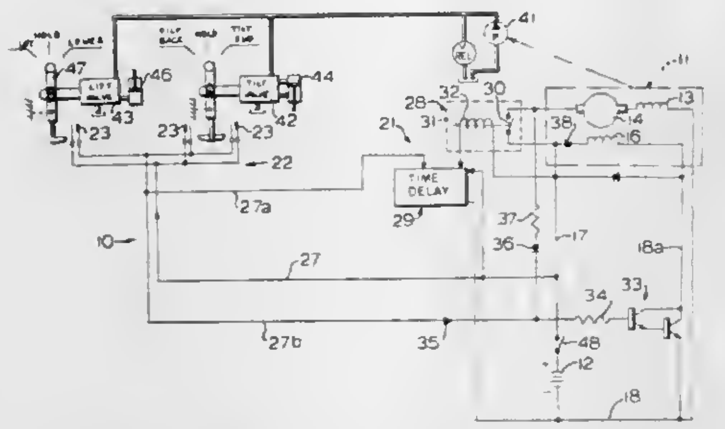
CONTROL SYSTEM FOR A COMPOUND DC ELECTRIC MOTOR

Frank S. Buchwald, Beachwood, and Grant C. Melocik, Chardon, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 24, 1977, Ser. No. 761,929

Int. Cl.^{2} H02P *1/16*

U.S. Cl. 318—426 5 Claims



1. A control system for connecting a power source to a compound DC electric motor which has a series field winding connected in parallel with a shunt field winding, comprising:

time delay means for energizing said series field winding only after said shunt field winding has been energized for a predetermined period of time, said time delay means including an electrical switching device and a time delay device, said electrical switching device being positioned between the series field winding and the power source, said time delay device being connected to the electrical switching device and being of a type activated by an electrical signal thereto for completing an electrical circuit to actuate the electrical switching device after being activated for said predetermined period of time;

an electronic switching device positioned between the power source and the shunt field winding, said electronic switching device being of the type rendered conductive by an electrical signal thereto; and

a switch positioned between the power source and both the time delay device and the electronic switching device for delivering said electrical signal simultaneously to the time delay device and the electronic switching device.

4,107,587

THREE-PHASE DC MOTOR HAVING NON-SUPERIMPOSED ARMATURE COILS

Itsuki Ban, 829, Higashioizumi-machi, Nerima-ky, Tokyo, and Manabu Shiraki, 171 Shimotsuruma, Yamato-shi, Kanagawa-ken, both of Japan

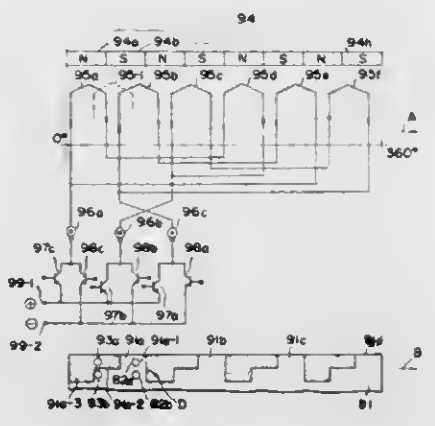
Filed Sep. 17, 1975, Ser. No. 614,318

Claims priority, application Japan, Sep. 24, 1974, 49-108866; Sep. 24, 1974, 49-108865; Jul. 31, 1975, 50-92553; May 12, 1975, 50-44725; Mar. 6, 1975, 50-26508

Int. Cl.^{2} H02K *13/14*

U.S. Cl. 318—439 10 Claims

1. In a coreless DC motor comprising a fixed field magnet (**27, 121**) having four magnetic poles of N and S magnetized in equal angular widths; a magnetic material (**2, 3, 12, 16, 70, 75-1**) for closing magnetic paths of said field magnet; a rotating shaft (**1, 15, 73**) supported by bearings provided to a central portion of said magnetic material; an armature (**5, 10, 57**) of one of disc- and cylindrical-shapes secured to said rotating shaft so as to be rotatable in said magnetic paths to face against said field magnet poles; three-phase armature coils of lap winding arranged on said armature; and electric circuit means interconnecting said three-phase armature coils in a manner selected from the class consisting of delta-connection and Y-connection for supplying current to said coils, the improvement wherein: said three-phase armature coils comprise three windings (**21, 22, 23, 122*a*–*c***) each arranged at equal angular interval so as to be non-superimposed with respect to one another on the armature



by shifting the coil (**23*a*, 122-1**) of one-phase by 180°; each of said coils having an angular width equal to that of said field magnet pole.

4,107,588

MULTIPLE TIMING INTERVAL INTEGRATED CIRCUIT STRUCTURE

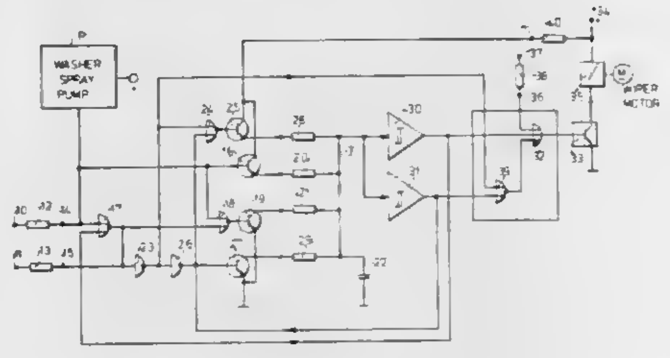
Hartmut Seiler, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 10, 1977, Ser. No. 776,422

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618028

Int. Cl.^{2} H02H *7/085*

U.S. Cl. 318—484 12 Claims



1. Multiple timing interval integrated timing circuit structure comprising

a plurality of input terminas (**10, 11**) of which, selectively, a signal applied to a first terminal (**10**) has priority over a signal applied to another terminal (**11**);

a main timing capacitor (**22**), the charge and discharge time of the timing capacitor determining the timing intervals;

at least two charge resistors (**20, 28**);

at least two discharge resistors (**21, 29**) each associated with a respective charge resistor;

at least two selectively controllable charge switches (**16, 25**), each, respectively, connected to a respective charge resistor (**20, 28**) and to said timing capacitor (**22**);

at least two selectively controllable discharge switches (**19, 27**) each connected to a respective associated discharge resistor (**21, 29**) and to the timing capacitor (**22**);

a charge resistor (**20, 28**), a controlled charge switch (**16, 25**), a discharge resistor (**21, 29**) and a controlled discharge switch (**19, 27**), together with the timing capacitor (**22**) forming a charge/discharge system;

at least two comparators (**30, 31**), said comparators having respectively different threshold levels, each associated with a charge/discharge system and connected to the timing capacitor (**22**), the comparators determining the charge voltage across the timing capacitor (**22**) and providing respective output signals when the voltage across the timing capacitor changes with respect to upper and lower threshold levels of said comparators;

the output of at least one comparator (**30**) being connected with the control input of that one discharge switch (**19**) which is associated with the discharge resistor (**21**) of the charge/discharge system connected to the terminal (**10**) having assigned the highest priority;

an interlock logic circuit (**17**) disabling that one of said charge/discharge systems connected to the terminal (**11**) having subordinate priority,

and wherein the charge/discharge system (**16, 20, 19, 21, 22**) connected to the higher priority terminal (**10**) has the output of the associated comparator (**30**) thereof connected to the interlock logic circuit (**17**) so that the system (**25, 28, 27, 29; 22**) having subordinate priority will be blocked during the charge and discharge phases of the system having dominance, or priority.

4,107,589

AUTOMATIC TOOL CHANGE APPARATUS

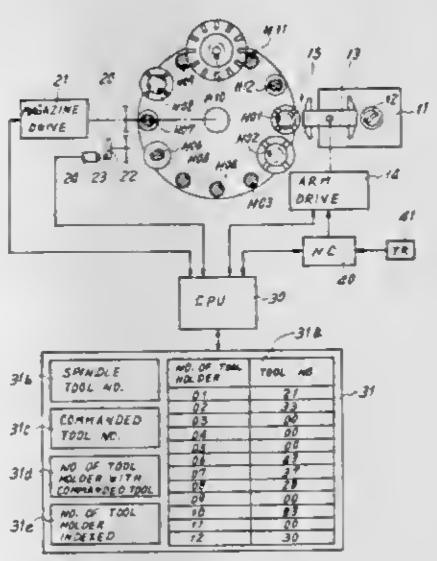
Kunihiko Eto, Toyota; Kuniyuki Niwa, Kariya, and Kaoru Owa, Nukata, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Jul. 19, 1977, Ser. No. 817,023

Claims priority, application Japan, Jul. 28, 1976, 51-90666

Int. Cl.^{2} G05B *19/28*

U.S. Cl. 318—602 5 Claims



1. In an automatic tool change apparatus for a machine tool including a rotatable magazine, a plurality of tool holding devices provided on said magazine and storing a variety of tools and addressed in a numerical order, a tool transfer device for performing a tool change operation between a tool indexed at a predetermined tool change position on said magazine and a tool held in a spindle of said machine tool, means for rotating said rotatable magazine, means for generating an index signal each time each tool holding device is indexed to the tool change position, means for commanding a tool to be indexed to the tool change position, first memory means for storing a number of a tool held in the spindle, second memory means for storing a relationship between numbers of the tool holding devices and numbers of the tools held in the respective tool holding devices, third memory means responsive to said command means for storing a number of the commanded tool, fourth memory means responsive to said index signal generating means for storing a number of a tool holding device indexed at the tool change position, means responsive to said command means for searching for a number of a tool holding device holding the commanded tool from said second memory means, fifth memory means responsive to said searching means for storing the searched number of the tool holding device, means for determining a rotational direction of said magazine in accordance with a difference in the contents stored in said fourth and fifth memory means to thereby cause said rotating

means to rotate said magazine and for checking coincidence of the contents in said fourth and fifth memory means, means for loading the content of said third memory means into said first memory means and for loading the content of said first memory means into said second memory means after the tool change operation has been completed by said tool transfer device, the improvement of which comprises:

the numbers of the tools being identifiable whether the tools are large or small ones;

first discrimination means for discriminating whether the tool held in said spindle and the commanded tool are large or small ones in accordance with the contents stored in said first and third memory means;

second discrimination means responsive to said first discrimination means for discriminating a combination of the tool held in said spindle and the commanded tool so as to determine whether the tool held in the spindle can be immediately returned to the tool holding device holding the commanded tool; and

cycle control means responsive to said second discriminating means for causing a normal cycle of a tool change operation to be performed if the spindle tool has been found to be immediately returnable, and for causing a special cycle of a tool change operation to be performed if the spindle tool has been found not to be immediately returnable.

4,107,590

POWER ASSIST DEVICE USING STRAIN RESPONSIVE MEANS

Thomas Pury, Brookfield; Menachem Assa, and Howard R. Wagner, both of Milwaukee, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,644

Int. Cl.² G05B ***11/01***

U.S. Cl. 318—628 **15 Claims**

1. For use with x-ray apparatus having a moveable component which is subject to being selctively positioned and having motor means operatively coupled to said component for driving it to desired positions; control means comprising:

manually engageable handle means coupled to said component and subject to having a manual force applied substantially in the direction in which movement of said component is desired,

strain responsive means having input and output means,

means for imparting a strain to said strain responsive means in correspondence with the force applied to said handle means,

said strain responsive means having the property of varying its electric resistance in response to varying the strain imparted thereto,

voltage source means for providing a voltage to said input means to produce a predetermined output signal at said output means in the absence of a force and to produce an error signal having a magnitude and polarity depending on the magnitude and direction, respectively, of the force applied to said handle,

non-integrating linear amplifier means having input means for receiving said error signal and having output means, said amplifier means being operative to produce an output signal that is directly proportional in magnitude and polarity to said error signal, and

means including a servo-amplifier having input means for receiving the amplified error signal and having output means for said component driving motor in a direction and at a rate independent, respectively, on the polarity and magnitude of said error signal.

4,107,591

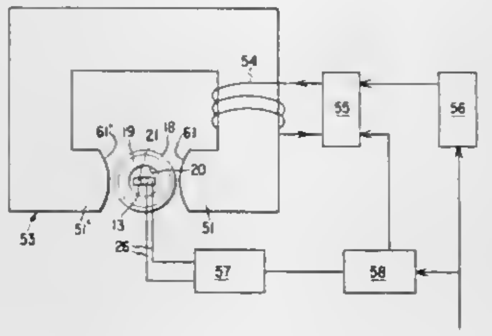
HALL GENERATOR POSITION SENSING DEVICE

John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,391

Int. Cl.² H01F ***13/00***

U.S. Cl. 318—663 **4 Claims**



1. A brushless position sensing device comprising an element formed of permanently magnetizable material, a Hall effect generator element, means supporting said Hall effect generator element and said permanently magnetizable element in contiguous relation and for relative shifting movement therebetween in a prescribed path, selected areas of said permanently magnetizable element being magnetized in varied magnetic intensity along said path so as to produce throughout said path of relative shifting movement between said elements Hall effect voltage outputs of predetermined values, said magnetization being induced in said permanently magnetizable element under control of Hall effect voltages generated by a specific Hall effect generator element carried by said supporting means contiguous to a specific permanently magnetizable element during inducement of said magnetization.

4,107,592

AUTOMATICALLY OPERATING SPEED-REGULATED POSITIONING ARRANGEMENT

Friedrich Bayer, Stockstadt, Fed. Rep. of Germany, assignor to Quick-Rotan Becker & Notz KG, Darmstadt, Fed. Rep. of Germany

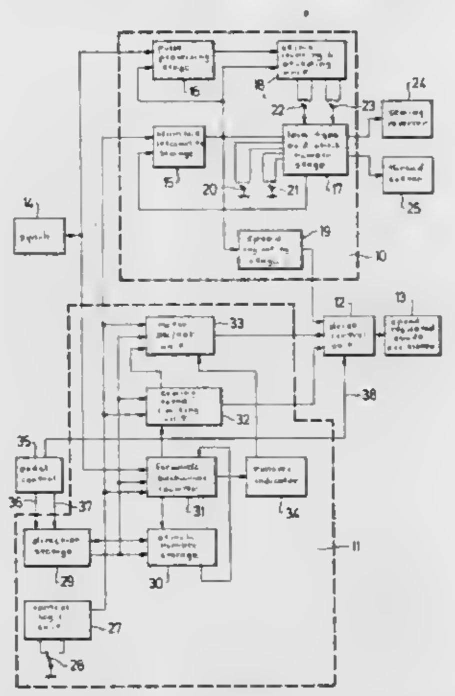
Filed May 17, 1974, Ser. No. 471,034

Claims priority, application Fed. Rep. of Germany, May 22, 1973, 2325969

Int. Cl.² G05B ***19/10***

U.S. Cl. 318—568 **4 Claims**

1. In combination with a sewing machine having a drive means, a control arrangement for the sewing machine, comprising, in combination, lock-type selector means having a plurality of manually selectable settings selectable by the user of the sewing machine for selecting different types of seam-end locks; stitch-number selector means having a plurality of manually selectable settings selectable by the user of the sewing machine for selecting numbers of stitches in seam-end locks; and drive control means connected to said drive means and to said selector means and activatable by the user of the sewing machine for causing the sewing machine to automatically sew a seam having a predetermined number of stitches including at least one of the two ends of the seam a seam-end lock of the type corresponding to the setting of said lock-type selector means and comprised of a number of stitches determined by the setting of said stitch-number selector means.



4,107,593

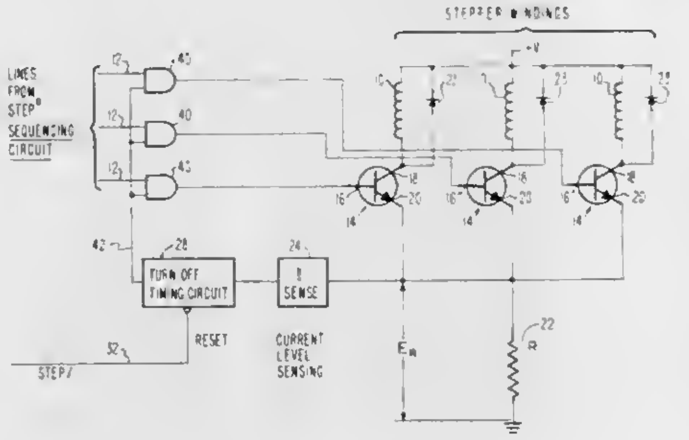
CURRENT CONTROL CIRCUIT

Eric G. Anderson, Rochester, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 7, 1977, Ser. No. 785,661

Int. Cl.² H02K ***37/00***

U.S. Cl. 318—685 **10 Claims**



1. An electronic circuit for controlling the energization of an external load having at least two conductors, a sequencing circuit selecting which one of the conductors to be energized, said circuit comprising:

switching means for sequentially allowing the conductors to be energized whereby an electric current flows therethrough a selected one of the conductors; and

control means responsive to a predetermined amount of current flowing through the selected conductor for interrupting said energization for a predetermined time period, said switching means being responsive to said control means to allow said energization to continue after said predetermined time period until said predetermined amount of current again flows through the selected conductor wherein said control means interrupts said energization again for said predetermined time period.

4,107,594

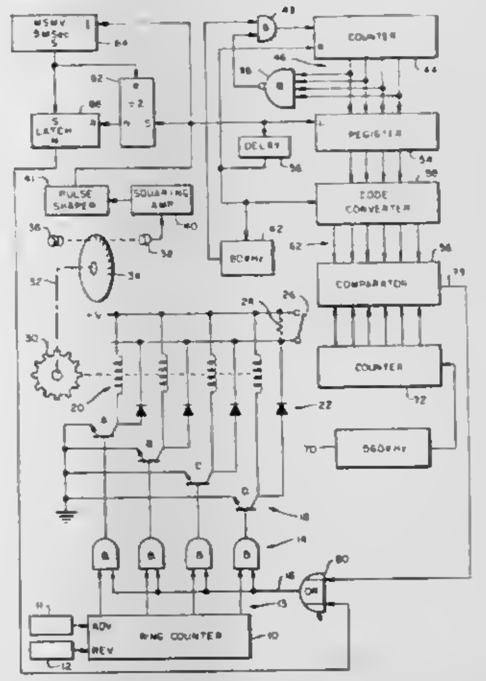
STEP MOTOR VELOCITY CONTROL

Norman A. Jacobs, Arlington Heights, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jan. 24, 1977, Ser. No. 762,069

Int. Cl.² G05B ***19/40***

U.S. Cl. 318—685 **10 Claims**



2. In a system for operating a stepping motor having a rotor and a stator with a plurality of individually-wound sets of phase coils for conducting electrical current, each set being individually energized by an associated driver-amplifier in a predetermined sequence in order to advance the rotor by one unit increment each time the energization of the driver-amplifiers is incremented in the predetermined sequence, improved apparatus for controlling the output torque of the motor comprising:

means for generating a plurality of shaft pulses evenly spaced with respect to the angular positions of the rotor and within less than one unit increment of rotor rotation, said shaft pulses occurring at a rate commensurate with the speed of rotation of the rotor;

means for generating clock pulses at a rate substantially greater than the maximum rate at which shaft pulses are expected to be generated;

means for counting the number of clock pulses generated between successive shaft pulses; and

means responsive to the count for controlling the amount of energy supplied by the driver-amplifiers to their associated coil sets.

4,107,595

CURRENT CONTROL SYSTEM FOR A STEPPING MOTOR

William T. Campe, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jan. 24, 1977, Ser. No. 762,065

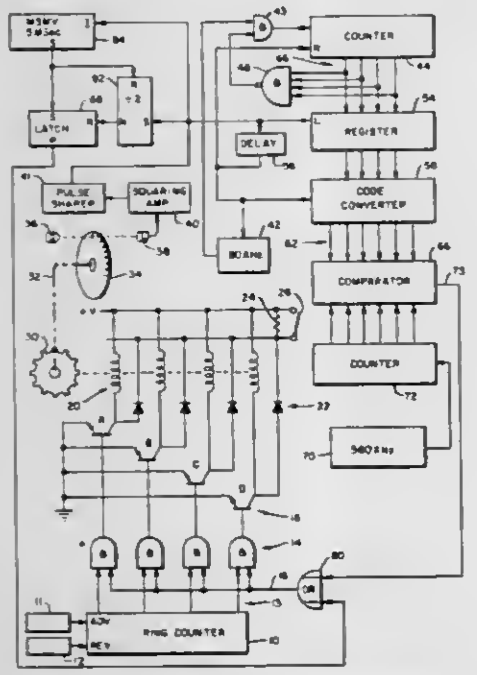
Int. Cl.² H02K ***29/04***

U.S. Cl. 318—696 **10 Claims**

9. An improved method of driving at a stepping rate a stepping motor having a plurality of windings each operated by an individually-associated switch each switch controlled by an associated switch-operating means to operate in a predetermined sequence, wherein the improved method includes the steps of:

generating a series of chopping pulses having a frequency substantially above the stepping rate and above the human-audible range and an ON-vs.-OFF duty cycle;

gating with the series of chopping pulses the control of each switch by its associated switch-operating means; and



varying the torque of the motor by varying the duty cycle of the pulses.

4,107,596

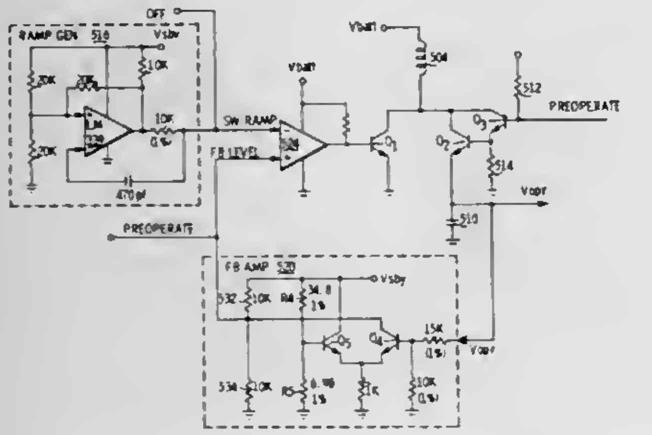
EFFICIENT BIDIRECTIONAL POWER CONVERTER FOR PORTABLE DATA GATHERING APPARATUS

Daniel J. Weaver, San Jose, Calif.; Robert Treiber, Centerport, and Avner Wolanow, Melville, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,693

Int. Cl.² G05F *1/56, 1/58*

U.S. Cl. 323—17 **14 Claims**



1. A bidirectional power converter responsive to an external standby-operate signal to provide an operate mode and a standby mode, and responsive to an internal periodic control signal for providing a step up-step down regulated dc output voltage to a load, the converter adapted to be powered by a battery having a voltage which varies as the battery discharges across a range transcending the value of the regulated dc output voltage, comprising:

- signal means for providing the periodic control signal which is adjusted to define an input duty cycle time period and an output duty cycle time period;
- input energy storage means which is charged by the battery during the input duty cycle and which is discharged during the output duty cycle;
- input switching means responsive to the periodic control signal for establishing a charging path for the input energy storage means during the input cycle;
- output energy storage means which is charged by transfer current generated by the discharge of the input energy storage means during the output cycle for providing the regulated output voltage to the load;
- controlled output switching means having an ON low impedance state and an OFF high impedance state, connected in series between the input energy storage means and the output energy storage means, which obtains the ON low impedance state for the duration of each output duty cycle in response to the termination of the input duty cycle for providing a discharge path allowing the transfer current to flow between the energy storage means during the output duty cycle, and which obtains the OFF high impedance state for the duration of each input duty cycle in response to the termination of the output duty cycle for disrupting the discharge path to prevent the flow of transfer current during the input duty cycle, and which further obtains the OFF high impedance state for the duration of the standby mode in response to the standby-operate signal for isolating the load from the battery;
- feedback means responsive to the regulated output voltage for adjusting the periodic control signal in response to variations in the regulated output voltage.

4,107,597

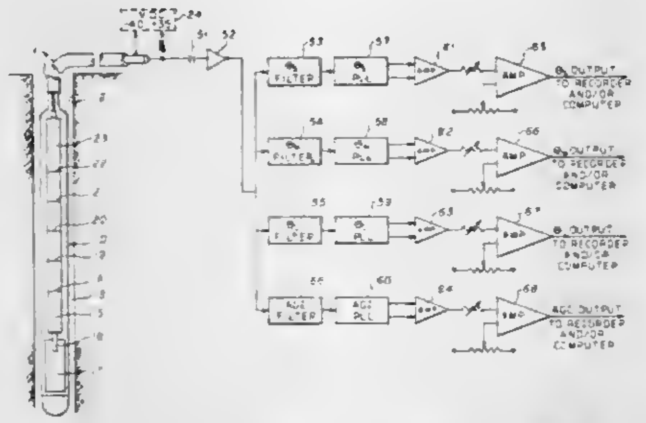
ELECTROMAGNETIC WAVE PROPAGATION WELL LOGGING UTILIZING MULTIPLE PHASE SHIFT MEASUREMENT

Richard A. Meador, Houston; Larry L. Adams, Stafford; Percy T. Cox; Larry W. Thompson, both of Houston, and James A. Fuchs, Missouri City, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,845

Int. Cl.² G01V *3/18, 3/12*

U.S. Cl. 324—6 **6 Claims**


FILTER
PLL
AMP
OUTPUT TO RECORDER AND/OR COMPUTER
AGC OUTPUT TO RECORDER AND/OR COMPUTER

1. A system for determining true formation resistivity (R_t), flushed zone resistivity (R_{xo}) and invasion diameter (d_i) of earth materials in the vicinity of a well borehole, comprising:

- means for generating, in said well borehole, an alternating electromagnetic field at a first radio frequency in the range of approximately 2 megahertz to 4 megahertz;
- means for detecting, in said well borehole, phase differences of the total electromagnetic field generated by said field generating means at relatively short, intermediate and long radial depths into the earth material surrounding said borehole and detecting means including pairs of receiver coils at longitudinally short, intermediate, and long spaced distances from said field generating means;
- means, connected to said detection means, and comprising receiver and amplifier means for receiving signals from each of said coils of said pairs of coils and converting said signals to signals of a second frequency having constant output amplitudes, for generating signals representative of said phase differences at said short, intermediate and long radial depths, respectively;
- means, connected to said signal generating means for transmitting said short, intermediate and long phase difference signals to the earth's surface; and
- means responsive to said short, intermediate and long phase difference signals for computing R_t, R_{xo} and d_i of said earth materials in the vicinity of said well borehole.

4,107,598

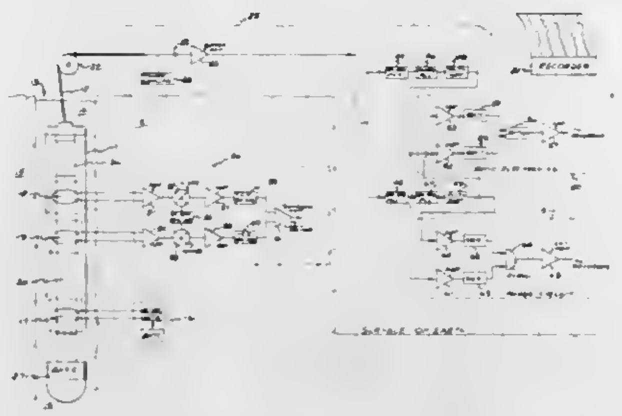
ELECTROMAGNETIC WAVE LOGGING SYSTEM FOR DETERMINING RESISTIVITY AND DIELECTRIC CONSTANT OF EARTH FORMATIONS

Richard A. Meador, Houston; Larry L. Adams, Stafford; James A. Fuchs, Missouri City; Percy T. Cox, and Larry W. Thompson, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 654,450, Feb. 2, 1976, abandoned. This application May 25, 1977, Ser. No. 800,500

Int. Cl.² G01V *3/18, 3/12*

U.S. Cl. 324—6 **4 Claims**



1. A method for determining the electromagnetic properties of earth formations in the vicinity of a well borehole, comprising the steps of:

- generating propagating electromagnetic waves at a frequency of approximately 30 megahertz in a well borehole;
- detecting said propagating electromagnetic waves at a first shorter longitudinally spaced location in the borehole and converting said detected waves to a first intermediate frequency signal at least two orders of magnitude less than said generated frequency while preserving absolute phase and amplitude information present on said detected waves in the conversion process;
- detecting said propagating electromagnetic waves at a second, longer longitudinally spaced location in the borehole and converting said detected waves to a second, different frequency, intermediate frequency signal at least two orders of magnitude less than said generated frequency while preserving absolute phase and amplitude information present on said detected waves in the conversion process;
- transmitting said first and second intermediate frequency signals to the surface of the earth;
- receiving, at the surface of the earth, said first and second intermediate frequency signals and extracting therefrom the unnormalized ratio of the amplitude components present at said first and second longitudinally spaced locations in the borehole and the relative phase shift of said propagating waves between said first and second longitudinally spaced locations in the borehole; and
- recording said unnormalized amplitude ratio and said relative phase shift as a function of borehole depth.

4,107,599

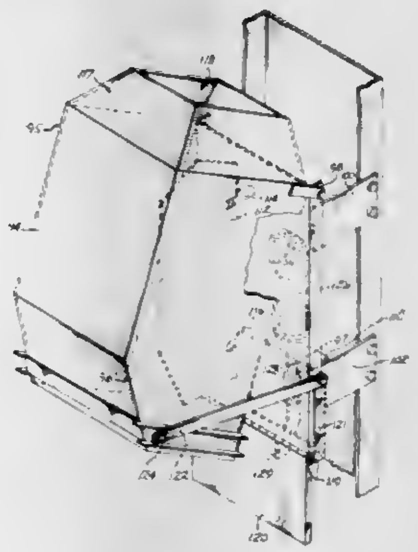
ELECTRODE FOR AN IMPEDANCE MEASURING APPARATUS

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008

Continuation-in-part of Ser. No. 483,094, Jun. 26, 1974, Pat. No. 3,992,665, which is a division of Ser. No. 395,736, Sep. 10, 1973, Pat. No. 3,824,461, which is a division of Ser. No. 299,133, Feb. 24, 1972, Pat. No. 3,781,671. This application Oct. 12, 1976, Ser. No. 731,756

Int. Cl.² G01R *27/26*

U.S. Cl. 324—61 R **17 Claims**



1. An electrode which is part of an apparatus for measuring the impedance of a sample of material, said electrode being formed as a sample box for receiving a sample of material through which an electrical field is radiated, comprising:

- front, rear and a pair of opposed, flat side walls of conductive material, together forming a rectangular container in which material to be tested is deposited;
- an inlet means situated at one end of said sample box, including an opening which is sized to receive a sample of material therethrough;
- an outlet means situated at the other end of said sample box, adapted to exhaust the sample of material after its electrical impedance has been measured; and,
- a flat electrode plate of conductive material mounted within said sample box and situated with its surfaces substantially parallel with and substantially equidistant from said opposed, flat side walls, said electrode plate being electrically insulated from the walls forming said sample box.

4,107,600

ADAPTIVE FREQUENCY TO DIGITAL CONVERTER SYSTEM

William Thomas McMannis, Springdale, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 13, 1976, Ser. No. 750,066

Int. Cl.² G01R *23/02*

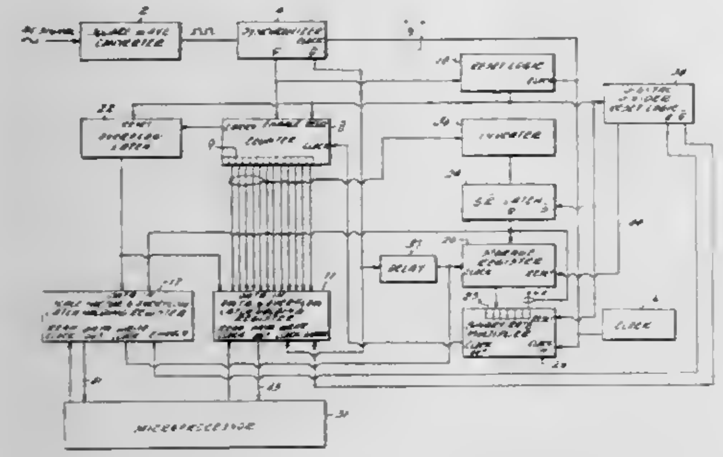
U.S. Cl. 324—78 R **20 Claims**

1. A method of converting a plurality of AC signals within a frequency range of interest to respective digital signals each having a binary value proportional to the frequency of a corresponding AC signal comprising:

(a) selecting a first AC signal
(b) generating a stream of pulses at a first clock frequency
(c) counting the number of pulses generated during a specified period of the selected AC signal and storing the count in a register of predetermined size
(d) generating a stream of pulses at a new clock frequency determined by using the generated count to compute a value for increasing the first clock frequency by an amount calculated to generate a cumulative total of clock

pulse during said specified period sufficient to use most hit positions of said register

(e) counting the number of pulses generated at the new clock frequency during a subsequent period of equal duration to said specified period, and

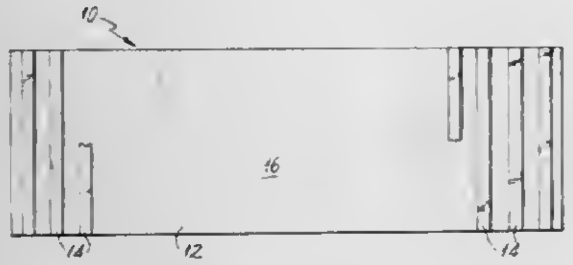


(f) selecting a new AC signal and repeating steps (a) through (e) each time a new frequency is selected whereby a high resolution of conversion is achieved throughout the frequency range of interest.

4,107,601
SELF-ADJUSTING EXCITER BAND FOR SHAFT SPEED MAGNETIC PICKUP

Harold J. Barmeier, Jr., Ballwin, and David A. Wright, Frontenac, both of Mo., assignors to National Marine Service, Inc., St. Louis, Mo.

Filed Jan. 21, 1977, Ser. No. 761,199
Int. Cl.² G01P *3/48*
U.S. Cl. 324—173 9 Claims



1. An exciter for use with a shaft speed magnetic pickup comprising:

(a) a flexible strip of material that is uniformly stretchable at least along its length, the strip having opposite ends and being adapted to be wrapped about and secured to a rotatable shaft;

(b) a plurality of separate, substantially uniformly spaced magnetic elements secured to the strip so as to face towards one side of the strip along its length;

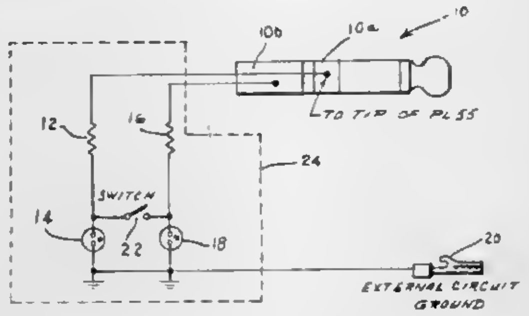
(c) fastening means for holding the ends of the strip in predetermined relationship with respect to each other when the strip has been wrapped about a shaft; and

(d) the magnetic elements most adjacent each end of the strip being spaced from the respective strip ends such that when the strip ends are held together in said predetermined relationship all the magnetic elements are substantially evenly spaced from one another.

4,107,602
PROBE MEANS UTILIZED WITH A PAIR OF INDICATORS FOR TESTING THE WIRING CONNECTIONS OF A FUSE RECEPTACLE

David M. Evans, PSC BOX 5095 APO, San Francisco, Calif. 96519

Filed Sep. 29, 1976, Ser. No. 727,817
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 5 Claims



1. A fuse safety tester apparatus comprising in combination:

a test probe means having a first and second member adjacent to each other, said first member being electrically connected to the tip of said test probe means, said first and second member being electrically insulated from said each other,

a first indicating means connected to said first member,

a second indicating means connected to said second member,

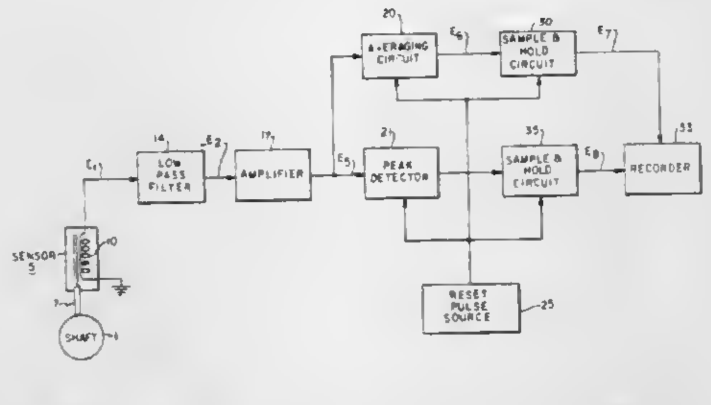
ground means connected to both said first and second indicating means for providing an external circuit ground, said ground means to be connected to the chassis ground of the unit under test, and

switch means connected between said first and second indicating means, said switch means being normally open, said test probe means being inserted into the fuse receptacle of the unit under test, said unit under test being connected to its power source, the power switch of said unit under test being in the power on position.

4,107,603
ELECTROMAGNETIC MEANS AND METHOD FOR DETECTING PROPELLER SHAFT BEARING WEAR

Carlton M. Slough, Spring, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,263
Int. Cl.² G01R *33/12*
U.S. Cl. 324—207 6 Claims

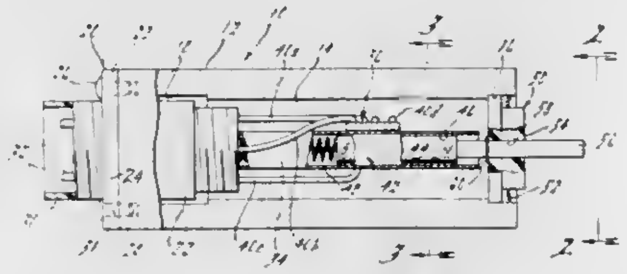


1. Apparatus for the monitoring of the wear of a shaft bearing while the shaft is rotating, comprising a magnetic noncontacting means for sensing displacement of the rotating shaft with respect to the shaft's longitudinal axis and providing a corresponding displacement signal reset pulse means for providing reset pulses; means connected to the sensing means and to the reset pulse means for averaging the displacement signal to provide an average displacement signal, said averaging means includes an averaging circuit means connected to the sensing means and to the reset pulse means for averaging the displacement signal in accordance with the reset pulses, and sample and hold means connected to the averaging circuit means and to the reset pulse means for sampling and holding the signal from the averaging circuit means in response to the reset pulses to provide the average displacement signal; and means for recording the average displacement signal to provide a record so that changes in the shaft displacement can be determined so as to monitor wear of the shaft bearing.

4,107,604
HALL EFFECT DISPLACEMENT TRANSDUCER USING A BAR MAGNET PARALLEL TO THE PLANE OF THE HALL DEVICE

Donald R. Bernier, Lake Orion, Mich., assignor to Compunetics, Incorporated, Troy, Mich.

Filed Dec. 1, 1976, Ser. No. 746,249
Int. Cl.² G01R *33/12*
U.S. Cl. 324—208 9 Claims

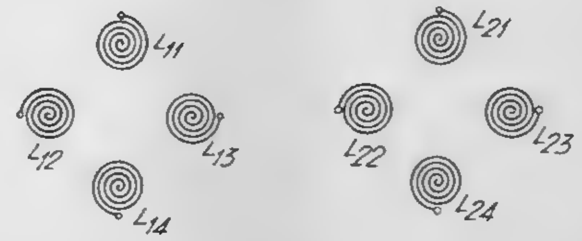


1. A position indicating device comprising: a housing having a central bore, an electrical connector connected to one end of said housing in registry with said bore for providing electrical connection into and out of said housing, a guide and support tube having one end connected to said electrical connector and extending into said central bore at one end, said guide and support tube being generally rectangular in cross section, sensing means responsive to changes in magnitude of magnetic flux for providing an output signal varying in magnitude in accordance with the changes in magnitude of magnetic flux, said sensing means secured to the outer surface of said guide and support tube and magnet means located within said support tube for movement relative to said sensing means whereby the variations in magnitude of said output signal will be provided as a function of the relative position between said magnet means and said sensing means, display means operatively connected with said sensing means and responsive to said output signal for providing a display of the magnitude of the relative position between said magnet means and said sensing means, said magnet means comprising a bar magnet extending longitudinally along an axis and having a circular cross section and a support tube structure fixedly holding said bar magnet, said support tube structure having a generally rectangular cross section and being located within said guide and support tube for relative sliding movement therein, said magnet means including a return, coil spring connected with one end of said bar magnet and engageable with said electrical connector, a cap located in the opposite end of said central bore, a pin slidably supported in said cap and engageable with the opposite end of said bar magnet whereby axial movement of said pin will result in movement of said bar magnet relative to said sensing means, said sensing means comprising a Hall effect device secured to said guide and support tube with its Hall plate parallel to the axis of said bar magnet, said bar magnet having only one north magnetic pole located at one end and only one south magnetic pole located at the opposite end, said output signal indicating a null when said Hall plate is located substantially centrally of said north and south poles.

4,107,605
EDDY CURRENT FLAW DETECTOR UTILIZING PLURAL SETS OF FOUR PLANAR COILS, WITH THE PLURAL SETS DISPOSED IN A COMMON BRIDGE

Robert John Hudgell, Warrington, England, assignor to British Gas Corporation, England

Filed Oct. 13, 1976, Ser. No. 731,892
Claims priority, application United Kingdom, Oct. 15, 1975, 42162/75
Int. Cl.² G01R *33/12*
U.S. Cl. 324—220 2 Claims

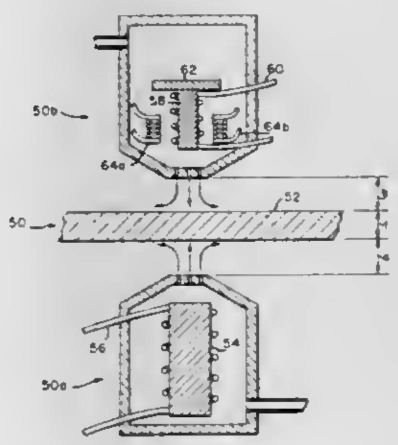


1. Apparatus for the non-destructive testing of metallic pipelines having a body adapted to tranverse a pipeline, a probe bearing a plurality of sets of four substantially planar spiral coils mounted on said body by probe mounting means for holding said coils each with its axis substantially normal to a surface of a pipeline while urging said probe towards said surface, coil energizing means for energizing said coils by the passage of an alternating current therethrough, magnetic biasing means, mounted on said body, for producing a magnetic field in the vicinity of said plurality of sets of coils, and detector means mounted on said body, the shape of the coils substantially conforming to the shape of the surface of the pipeline under test, each coil of each said set of four coils being arranged with its respective axis at a respective corner of a square and said plurality of sets of coils being connected in a single bridge circuit with each coil of each set being disposed in a different arm of the bridge with said detector means connected across said bridge circuit so that the sensitivity of said detector means to differences in spacing of said coils and the surface under test is reduced.

4,107,606
NON-CONTACTING ELECTROMAGNETIC THICKNESS GAUGE FOR SHEET MEASUREMENT HAVING IMPROVED SMALL DISTANCE SENSITIVITY

Pekka Matti Typpo, and Gunnar Wennerberg, both of Cupertino, Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 750,390, Dec. 14, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,469
Int. Cl.² G01R *33/12*
U.S. Cl. 324—229 5 Claims



1. An apparatus for non-contacting measurement of the thickness of a sheet of a non-magnetic material comprising:

a first body of a magnetically susceptible material, substantially cylindrical in shape, to one side of said sheet; said first body aligned such that the axis of the cylinder is substantially perpendicular to said sheet;

a first electrical wire wound a plurality of times about said first body, capable of being energized to produce a magnetic field;

means for holding said first body at a constant distance apart from said sheet;

a second body of a magnetically susceptible material, substantially cylindrical in shape, having a diameter less than the diameter of the first body, to other side of said sheet; said second body positioned such that the axis of the cylinder is substantially aligned with the axis of the first body;

a member of magnetically susceptible material, substantially disk shaped, attached to said second body with said second body between said member and said sheet and with the center of said member substantially aligned with the axis of said second body and having a diameter larger than that of the second body;

a second electrical wire wound a plurality of times about said second body, said second wire capable of detecting the amplitude of said magnetic field, said field detected determinative of the thickness of said sheet; and

means for maintaining said second body at a constant distance apart from said sheet.

4,107,607

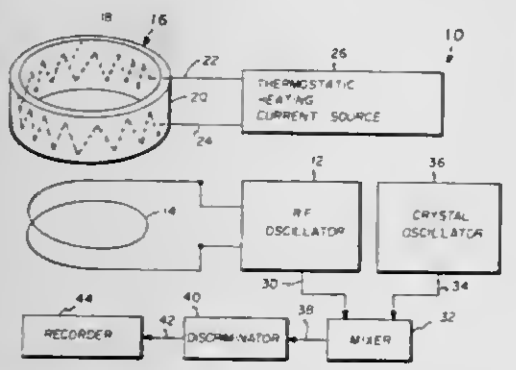
MAGNETOMETER USING A FIELD CONTROLLED OSCILLATOR, THE OSCILLATOR CORE BEING MAINTAINED NEAR ITS CURIE POINT

James L. Kirkland, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1977, Ser. No. 836,829

Int. Cl.^{2} G01R *33/02*

U.S. Cl. 324—253 **4 Claims**



1. A magnetometer of the type including oscillator means having an induction coil as part of an operating frequency determining resonant circuit, and magnetic field sensor means associated with said induction coil for changing inductance thereof and correspondingly changing said operating frequency in response to changes in a weak magnetic field, said magnetometer being characterized by the improvement comprising:

said oscillator means comprising a radio frequency oscillator and said induction coil having a predetermined radius;

said sensor means comprising a ferromagnetic sensor element having a permeability that, when in a weak magnetic field of strengths characteristic of the earth's magnetic field, increases with increases in temperature toward a Curie temperature that is elevated relative to normal room temperatures, said element having a magnetic induction B to magnetizing force H hysteresis curve at a predetermined temperature near said Curie temperature that is characterized by a steep slope in the region of said weak magnetic field;

means for heating said element so as to maintain the temperature of said element constant at said predetermined temperature, whereby small changes in said weak magnetic field produce large changes in said inductance and said operating frequency; and

said element being substantially free of any magnetic field biasing means or field concentrator means.

4,107,608

METHOD AND APPARATUS FOR BURST SYNCHRONIZATION IN A TIME DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM

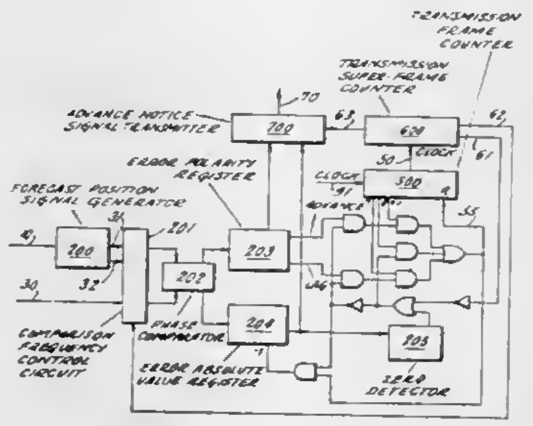
Akio Saburi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,822

Claims priority, application Japan, Dec. 10, 1975, 50-147569

Int. Cl.^{2} H04J *3/06*

U.S. Cl. 325—4 **4 Claims**


TRANSMISSION FRAME COUNTER
TRANSMISSION SUPER-FRAME COUNTER
ADVANCE NOTICE SIGNAL TRANSMITTER
70
200
ERROR POLARITY REGISTER
CLOCK
FORECAST POSITION SIGNAL GENERATOR
PHASE COMPARATOR
COMPARISON FREQUENCY CONTROL CIRCUIT
ERROR ABSOLUTE VALUE REGISTER
ZERO DETECTOR

1. A synchronizer associated with one of a plurality of member stations in a time division multiple access communication system of the type including said plurality of member stations and a repeater, said repeater sequentially receiving signal bursts from each of said member stations and retransmitting said signal bursts to all of said member stations whereby each of said member stations communicates with the remaining said member stations by transmitting signal bursts to and receiving signal bursts from said repeater, one of said member stations generating a reference signal for identifying a reference time slot in a super-frame comprising a plurality of time slots, each of said member stations being assigned a different one of said time slots, said one of a plurality of member stations also including means for transmitting a frame position synchronizing signal to said repeater, said synchronizer circuit comprising:

means responsive to reception of said reference signal from said repeater and for generating both a reference forecast gate signal and a reference forecast position pulse in response to said reference signal, said reference forecast position pulse being representative of a predicted position of the time slot to which said one of said member stations is assigned, said reference forecast position pulse occurring within the time period when said reference forecast gate signal is present;

means responsive to receipt of said frame position synchronizing signal from the repeater for generating a detection pulse representing the actual position occupied by the station's burst signals;

measurement initiation means responsive to the generation of said detection pulse during the interval of said reference forecast gate signal for comparing said position pulse and said detection pulse and for generating polarity and magnitude signals, respectively, representative of the magnitude and polarity of the position of said detection pulse relative to the position of said forecast position pulse;

means responsive to said polarity and magnitude signals for controlling the instant at which said one of said member stations generates a signal burst containing both said frame position synchronizing signal and data information;

means responsive to predetermined counts of said frame pulses for generating correction gate signals, measurement gate signals and advance notice signals each being of respectively different duration, and all occurring once within a super-frame interval whose duration is at least equal to twice the propagation time between a member station and the common repeater.

4,107,609

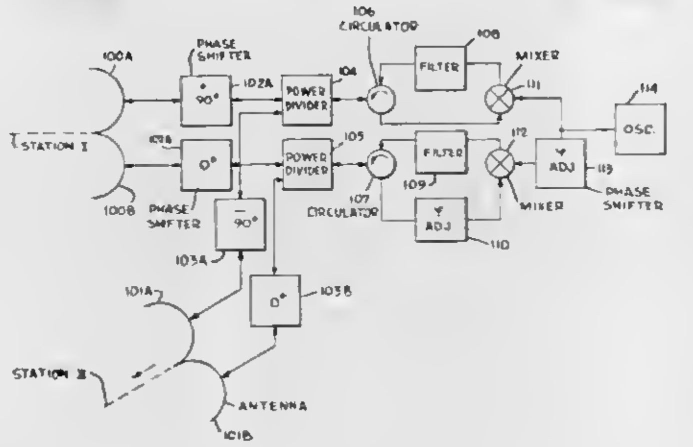
COMMUNICATIONS TRANSPONDER

Elliot L. Gruenberg, 6040 Boulevard East, New York, New York, N.J. 07093

Continuation-in-part of Ser. No. 545,623, Jan. 30, 1975, Pat. No. 4,001,691. This application Jan. 3, 1977, Ser. No. 756,375

Int. Cl.^{2} H04B *7/14*

U.S. Cl. 325—14 **10 Claims**



1. A transponder, for use in a communication system for receiving and transmitting electromagnetic signals,

comprising, in combination:

first antenna means operative for receiving an electromagnetic first signal from a first direction and transmitting an electromagnetic second signal;

second antenna means operative for transmitting said second signal in a second direction; and

signal processing means coupling said first and said second antenna means to each other and including means for receiving said first signal from said first antenna means, means for phase shifting said first signal to said second signal, means for coupling said second signal to said first antenna means to produce said second transmitting signal, said second transmitted signal possessing a relative null in the radiated spatial electromagnetic power density distribution in said first direction, and means for coupling said second signal to said second antenna means to produce said second transmitted signal, said second transmitted signal possessing a relative maximum in the radiated spatial electromagnetic power density distribution in said second direction.

4,107,610

DATA TRANSMISSION SYSTEM USING A SEQUENTIAL APPROXIMATION ENCODING AND DECODING TECHNIQUE

Donald R. Weber, Saratoga, Calif., assignor to Dacom, Inc., Santa Clara, Calif.

Continuation of Ser. No. 342,854, Mar. 19, 1973, which is a cnntinuation of Ser. No. 66,459, Aug. 24, 1970, abandoned. This application Dec. 31, 1975, Ser. No. 645,604

Int. Cl.^{2} H03K *13/22*

U.S. Cl. 325—38 R **10 Claims**

1. An encoding and decoding system, comprising:

an encoding means for generating an encoded signal in response to an analog input signal applied thereto, said encoding means including,

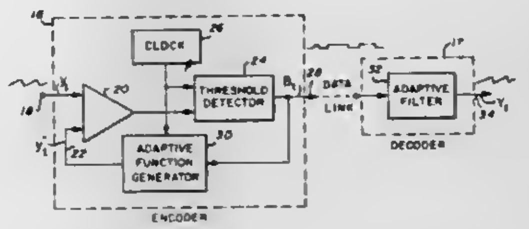
comparator means responsive to said input signal and a feedback signal for developing an error signal commensurate with the relationship between said input signal and said feedback signal.

detecting means responsive to said error signal for developing said encoded signal,

means for developing a cross-over signal in response to said error signal indicating a cross-over of said feedback signal and said input signal,

adaptive function generating means responsive to said encoded signal for developing said feedback signal, said feedback signal being comprised of the summation of a base signal component and a changeable reference signal component,

said adaptive function generating means including, voltage divider means for developing said base signal component by recirculating a sample of said feedback signal within



said function generating means, which sample occurs in response to derivation of said cross-over signal, and forming the next feedback signal by sequentially dividing down the feedback sampled signal and adding to said feedback sampled signal, serving as said base signal component, a positive or negative divided down reference signal to derive a summation signal, the polarity of said reference signal changing with each crossover signal;

decoding means responsive to said encoded signal and operative to develop an analog output signal which is commensurate with said analog input signal; and

data linking means for transferring said encoded signal from said encoding means to said decoding means.

4,107,611

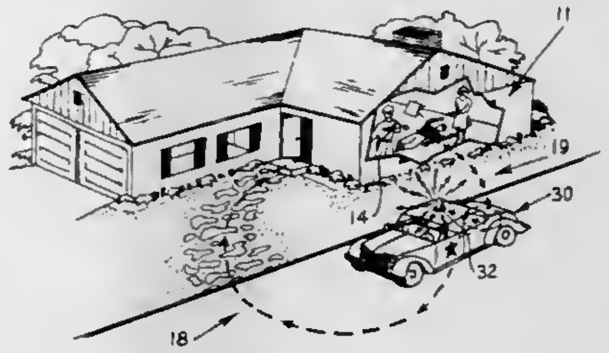
POLICE PROTECTION METHOD AND APPARATUS

Jack N. Holcomb, Galt Towers, Ocean Dr., Fort Lauderdale, Fla. 33308, and Hans D. Sylten, Fort Lauderdale, Fla., assignors to Jack N. Holcomb, Ft. Lauderdale, Fla.

Filed Dec. 6, 1973, Ser. No. 422,275

Int. Cl.^{2} H04B *1/00*

U.S. Cl. 325—55 **8 Claims**

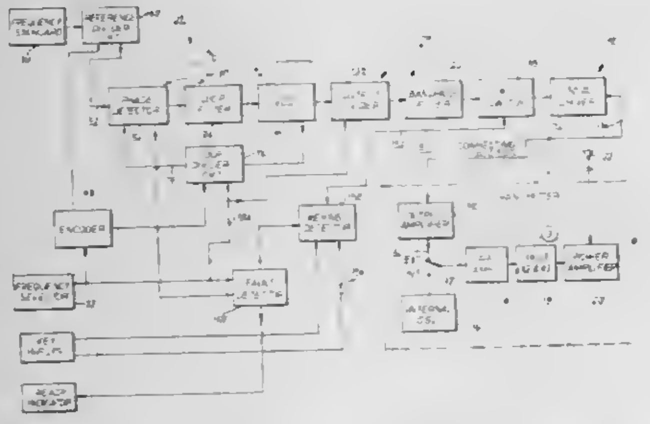


1. The method for providing the record of interrogation and activity by police officers, and protection to such officers, during investigations, including: a. replacement of an automatically activated transmitter in the officer's clothing; b. interrogation of an individual by an officer while carrying said transmitter; c. transmission by said transmitter to a receiver especially tuned to the wave length of the transmitter and located at a distance from said transmitter; d. recording the received transmission by means of a tape recorder operating in conjunc-

tion with, and receiving through, the receiver, the transmission from the transmitter; e. preserving the recording thus obtained for use in the future.

4,107,612
PHASE LOCKED LOOP EXCITER GENERATOR FOR HIGH FREQUENCY TRANSMITTER

J. Howard Leveque, Harper's Ferry, W. Va., assignor to Frederick Electronics Corporation, Frederick, Md.
Filed May 5, 1976, Ser. No. 683,383
Int. Cl.² H04B *1/04;* H03B *3/06*
U.S. Cl. 325—171 **12 Claims**



1. A phase locked loop signal generator for exciting a radio wave transmitter to transmit over selectable frequency ranges in response to an exciter signal of a variable frequency comprising:

signal input means for generating a frequency selector signal having a value indicative of the desired frequency at which the transmitter is to transmit;

a frequency standard signal generator for providing a frequency standard signal characterized by a highly stable, unvarying frequency; and

an enable signal generator responsive to the frequency standard signal and to the frequency selector signal for generating the exciter signal of a preselected frequency, the enable signal generator including

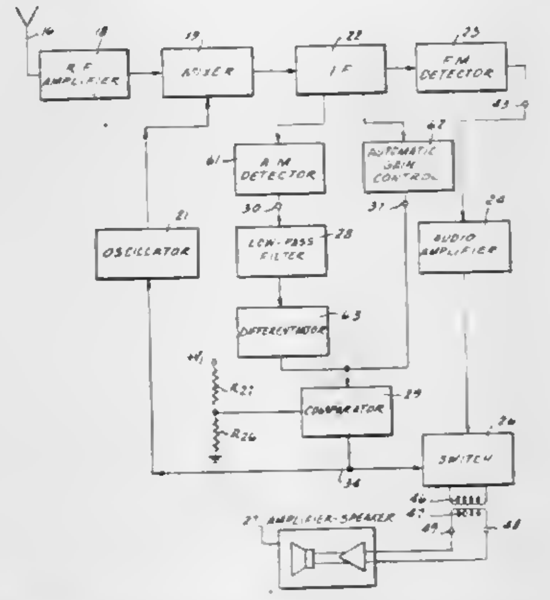
a. a reference dividing circuit coupled to the frequency standard signal generator and programmable in response to said frequency selector signal for providing a reference frequency signal having a frequency which is a fractional part of that of said frequency standard signal;

b. a phase locked loop circuit responsive to the reference frequency signal and to the selector signal for producing an intermediate signal having a frequency which is a multiple of that of said reference frequency signal, said phase locked loop circuit including a programmable loop divider circuit for producing a divided down intermediate signal of a frequency which is divided down from that of said intermediate signal to a value determined by said value of the frequency selector signal; and

c. output divider circuit means coupled to the phase locked loop circuit for generating the exciter signal, the frequency of the exciter signal being a fractional value of that of said intermediate signal and determined at least in part by said frequency selector signal.

4,107,613
WIRELESS MICROPHONE WITH FM RECEIVER MUTING SYSTEM RESPONSIVE TO EXCESSIVE UNDESIRED AM LEVEL OR LOW AGC CONTROL LEVEL

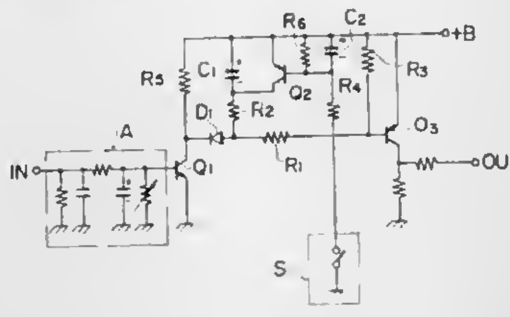
Daniel L. Queen, Chicago, and Kenneth W. Belt, Berwyn, both of Ill., assignors to Perma-Power Inc.
Filed Feb. 11, 1977, Ser. No. 767,972
Int. Cl.² H04B *1/10*
U.S. Cl. 325—348 **9 Claims**



8. An audio muting system for a remote microphone including an FM transmitter and a receiver having an I.F. section, an F.M. detector, an automatic gain control, an A.M. detector to detect undesired amplitude modulation, said F.M. detector, said automatic gain control and said A.M. detector receiving inputs from said I.F. section, and an audio output comprising a comparator receiving the outputs of said A.M. detector and said automatic gain control, and switch means connected between the output of said F.M. detector and said audio output and controlled by said comparator such that said audio output is disconnected when the output of said A.M. detector exceeds a predetermined level or when the output of said automatic gain control falls below a predetermined level, including a low-pass filter connected between said A.M. detector and said comparator.

4,107,614
MUTING CONTROL CIRCUIT FOR FM RECEIVER

Yoshiro Sugai, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Mar. 15, 1977, Ser. No. 777,802
Claims priority, application Japan, Mar. 17, 1976, 51/32107
Int. Cl.² H04B *1/16*
U.S. Cl. 325—348 **4 Claims**

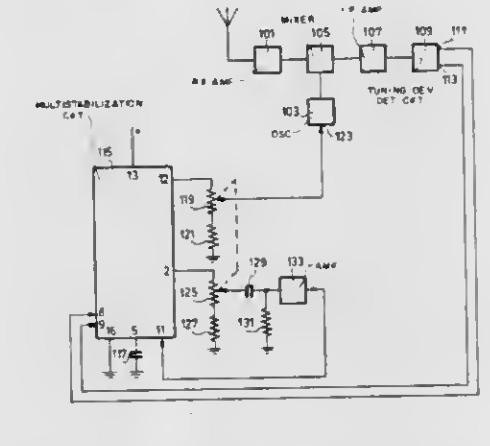


1. In a muting control circuit for an FM receiver including first switch means for detecting when the magnitude of a received FM signal falls below a predetermined threshold level, and second switch means for generating a muting control signal in rapid response to the first means, the improvement characterized by:

(a) means for delaying the turn-off response of the second switch means,
(b) means for detecting the performance of a station selection or tuning operation in the receiver, and
(c) means for disabling the delay means in response to the performance detecting means.

4,107,615
RECEIVER INCLUDING AN AUTOMATIC TUNING CORRECTION SUPPRESSION CIRCUIT COUPLED TO THE TUNING MEMBER

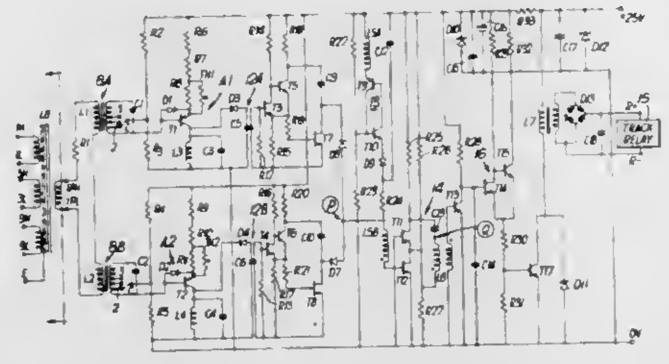
Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 16, 1976, Ser. No. 714,771
Claims priority, application Netherlands, Aug. 28, 1975, 7510149
Int. Cl.² H04B *1/16*
U.S. Cl. 325—420 **1 Claim**



1. A circuit for use with an automatic tuning correction means, said circuit comprising a tuning potentiometer; an automatic tuning correction suppression circuit means coupled to said potentiometer and said automatic tuning correction means for rendering the automatic tuning correction means inactive during operation of said potentiometer and having a control signal input; and a level variation detector circuit having a level adjusting potentiometer mechanically coupled to said tuning potentiometer and electrically coupled to said suppression circuit means, said detector circuit also having an output coupled to said control signal input.

4,107,616
SIGNAL MONITORING CIRCUIT

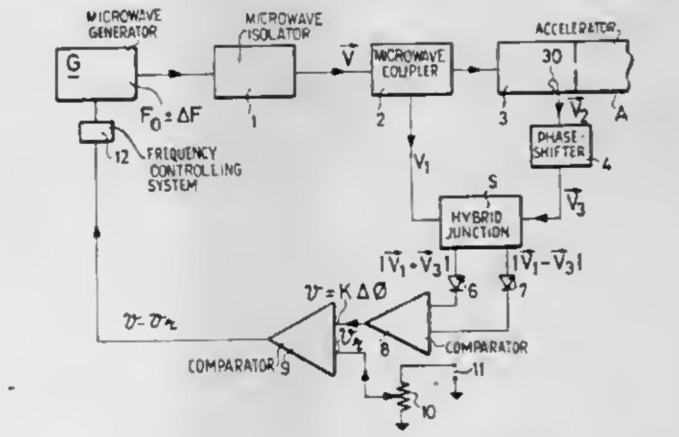
Ernest James Moorey, Ivybridge, England, assignor to M. L. Engineering (Plymouth) Limited, Plymouth, England
Filed Jan. 18, 1977, Ser. No. 760,391
Claims priority, application United Kingdom, Jan. 22, 1976, 2436/76
Int. Cl.² H03K *17/28*
U.S. Cl. 328—110 **4 Claims**



1. A signal monitoring circuit for monitoring the presence of at least two out-of phase input signals, comprising a timer device, a control circuit controlling the operation of the timer device, the control circuit having an enabling input, means combining two out-of-phase signals in a sequential manner derived from said input signals to be monitored, said combining means being connected to the said enabling input of the control circuit to enable the latter and initiate operation of the timer device upon receipt of one of said input signals for a predetermined time, said combining means continuing said enabling input longer than said predetermined time only when the rest of said input signals are thereafter sequentially received, said timer device providing an output signal from the monitoring circuit only when the control circuit is enabled for said predetermined time interval, timed by the timer device, corresponding to the application of all the input signals sequentially to the enabling input.

4,107,617
CONTROLLED-FREQUENCY FEEDING ARRANGEMENT FOR A LINEAR ACCELERATOR USING STATIONARY-WAVE ACCELERATING SECTIONS

Duc Tien Tran, Paris, France, assignor to CGR-MeV, Paris, France
Filed Dec. 3, 1976, Ser. No. 747,195
Claims priority, application France, Dec. 5, 1975, 75 37319
Int. Cl.² H05H *7/02. 9/04*
U.S. Cl. 328—233 **3 Claims**



1. A controlled-frequency feeding arrangement for feeding a charged-particle accelerator, said accelerator including a particle source providing a particle beam, n stationary-wave accelerating sections constituted with resonant cavities and means for injecting a microwave signal $\vec{V}_O$ issuing from a microwave generator G into one of said accelerating sections, said microwave arrangement comprising means for extracting a fraction $\vec{V}_1$ of said microwave signal $\vec{V}_0$ issuing from said microwave generator and intended to be injected into the first of said n accelerating sections, means for extracting a fraction $\vec{V}_2$ of the microwave signal stored in said first accelerating section loaded with said beam of particles and for phase-shifting said signal $\vec{V}_2$ by $\pi/2$ to obtain a signal $\vec{V}_3$, means for obtaining a continuous signal v of which the amplitude is proportional to the phase shift $\Delta\phi$ created between the microwave signals $\vec{V}_1$ and $\vec{V}_3$, means for comparing the signal v with a reference signal v_r and for determining an error signal $v - v_r$ and means for controlling the operating frequency of said microwave generator by means of said error signal $v - v_r$

4,107,618
AMPLIFIER SYSTEM HAVING SIGNAL GAIN INDEPENDENT OF A REFERENCE VOLTAGE

Alfred Newman Ormond, 11969 E. Rivera Rd., Santa Fe Springs, Calif. 90670
Filed Aug. 4, 1977, Ser. No. 821,632
Int. Cl.² H03F *3/45, 3/68*
U.S. Cl. 330—51 **3 Claims**

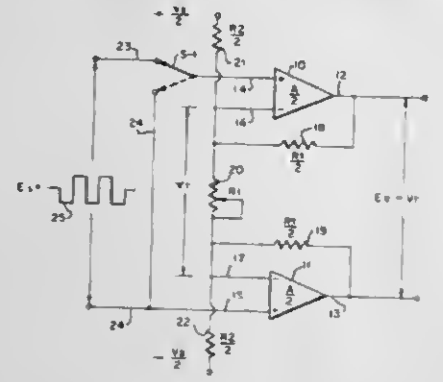
1. Am amplifier system to which a reference voltage and

differential input signal are applied and wherein the gain of said amplifier system can be varied to vary the amplification of said differential input signal without affecting said reference voltage, including, in combination:

(a) first and second operational amplifiers having outputs and positive input terminals and negative input terminals;

(b) first and second negative feedback fixed value resistances connected directly between the outputs and negative input terminals of said operational amplifiers respectively; and

(c) resistance means across which said reference voltage is applied, said resistance means including a center resistance with tap points on either side connecting to the negative input terminals to bias the negative input terminals of said operational amplifiers respectively between plus and minus values of said reference voltage and two outer fixed value resistances connected to opposite ends of said center resistance respectively, said differential input signal being supplied to the positive input terminals of said amplifiers, the gain of said amplifier system being adjusted by adjusting the value of said center resistance, the gain in each operational amplifier always being equal to the gain in the other and varying simultaneously therewith in the same direction.



4,107,619

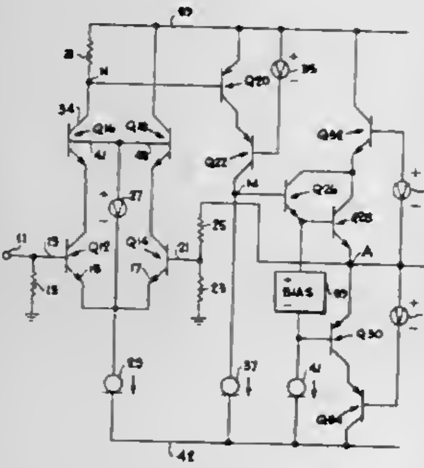
CONSTANT VOLTAGE - CONSTANT CURRENT HIGH FIDELITY AMPLIFIER

Nelson S. Pass, Sacramento, Calif., assignor to Threshold Corporation, Sacramento, Calif.

Filed Dec. 20, 1977, Ser. No. 862,406

Int. Cl.^{2} H03F *3/45*

U.S. Cl. 330—255 **11 Claims**



1. A high fidelity audio amplifier comprising,

a transistor input stage having a signal input terminal and a low level signal output node,

a transistor voltage gain stage having first and second transistors connected in cascode with a first constant voltage source means in parallel therewith for producing a constant V_{CE} drop in said first transistor, said transistor voltage gain stage connected to said low level signal output node and having an intermediate signal output node and

a transistor power amplifier stage having third and fourth transistors connected in cascode with a second constant voltage source means in parallel therewith for producing a constant V_{CE} drop in said third transistor, said transistor power amplifier stage connected to said intermediate signal output node and having a final signal output node wherein a nominal amount of output current is delivered.

4,107,620

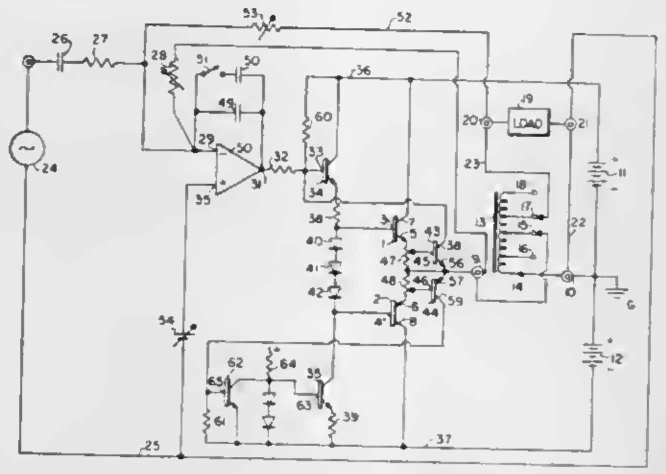
REGULATED POWER SUPPLY WITH AUTO-TRANSFORMER OUTPUT AND DIRECT CURRENT FEEDBACK

Paul Birman, and Sarkis Nercessian, both of Flushing, N.Y., assignors to Forbro Design Corp., New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,461

Int. Cl.^{2} H03F *1/34. 3/30*

U.S. Cl. 330—265 **3 Claims**



1. In a bipolar power amplifier, the combination of;

a pair of power transistors connected in series across a source of positive bias and a source of negative bias also connected in series;

an autotransformer at least a part of which is conductively connected between the common point between said two transistors and the common point between said positive and negative sources of bias;

bipolar direct coupled driving means coupled to the input means of said two transistors including amplifier means responsive to degenerative feedback;

a load means connected across at least a portion of said autotransformer;

and first feedback means directly connected between one side of said load means and a point in said amplifier means such that a degenerative circuit is created;

and wherein the connection between said load and said autotransformer is a line exhibiting a significant impedance in comparison with the impedance of said load.

4,107,621

MICROWAVE SIGNAL AMPLIFIER

Nagahisa Furutani, Kawasaki; Kazuo Takahara; Yoshikazu Doi, both of Yokohama, and Haruo Yokouchi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 9, 1977, Ser. No. 805,014

Claims priority, application Japan, Jun. 15, 1976, 51/70120

Int. Cl.^{2} H03F *3/19*

U.S. Cl. 330—296 **7 Claims**

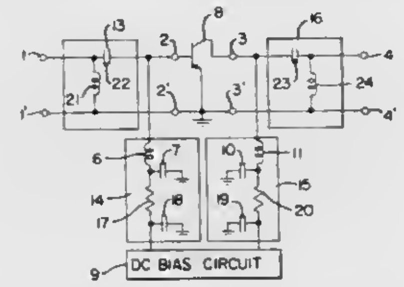
1. A microwave signal amplifier for amplifying a received line signal having predetermined band frequencies to produce an amplified signal output, comprising:

a transistor having an input terminal and an output terminal;

input matching means connected to said input terminal for applying said received line signal to said transistor, said transistor producing an amplified version thereof, said input matching means including a first high pass filter for filtering out low frequency components lower than the predetermined band frequencies and for making an open circuit to said low frequency components from the input terminal;

output matching means connected to said output terminal for converting said amplified version into said amplified signal output, said output matching means including a second high pass filter for filtering out said low frequency components and for making an open circuit thereto from the output terminal; and

bias supply means connected to said input and output terminals for supplying DC bias to said transistor, said bias supply means including a pair of low pass filters, each of said low pass filters being terminated by a termination resistor for blocking high frequency components higher than the predetermined band frequencies.



4,107,622

TONE CONTROLLER

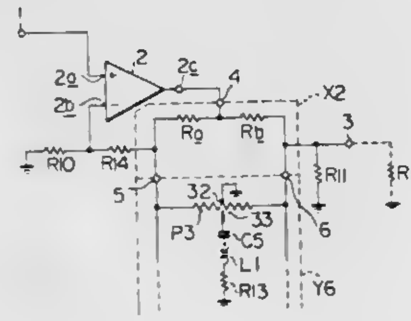
Kazuya Toyomaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Oct. 28, 1976, Ser. No. 736,393

Claims priority, application Japan, Oct. 29, 1975, 50-129355

Int. Cl.^{2} H03F *3/04*

U.S. Cl. 330—302 **15 Claims**



9. A tone controller for use in audio equipment comprising:

an input terminal adapted to be responsive to an audio frequency input signal,

an output terminal for deriving a tone controlled replica of the input signal,

a high gain amplifier having reversing and nonreversing input terminals and an output terminal for deriving an amplified signal, one of said amplifier input terminals being connected to said controller input terminal to be responsive to the audio frequency input signal, said amplifier output terminal being coupled to said controller output terminal so that the amplified audio frequency signal is supplied from the amplifier output terminal to the controller output terminal,

a frequency response control circuit having a first terminal connected to the amplifier output terminal and a second terminal, and means for connecting said second terminal to one of the amplifier input terminals so that said one amplifier input terminal is responsive to a replica of the audio signal at the second terminal, said control circuit including a reactance having a tendency to cause noise to be derived by the tone controller,

a negative feedback path between the amplifier output terminal and the reversing input terminal, said negative feedback path including a resistor having one terminal connected to one terminal of the tone control circuit, another terminal of the resistor being connected to supply a feedback voltage to said reversing terminal, said resistor suppressing the noise which tends to be derived by the control circuit.

4,107,623

PARALLEL ANALOG AND DIGITAL CONTROL LOOPS FOR PHASE LOCKING PRECISION OSCILLATOR TO REFERENCE OSCILLATOR

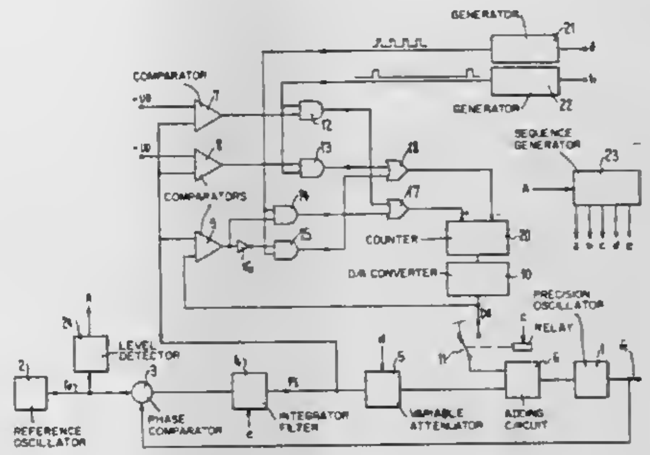
Erhard Graf, Bevaix, and Jean-Pierre Wiedmer, Neuchatel, both of Switzerland, assignors to Oscilloquartz Sa, Neuchatel, Switzerland

Filed Jun. 14, 1977, Ser. No. 806,495

Claims priority, application Switzerland, Jun. 24, 1976, 8081/76

Int. Cl.^{2} H03B *3/04*

U.S. Cl. 331—1 A **8 Claims**



1. A device for phase control of a precision oscillator by a reference oscillator, comprising a phase detector connected to said oscillators, two control loops connected in parallel to the output of said phase detector, a first of said loops being digital and comprising a control bi-directional memory counter capable of being set by a phase error signal from said phase detector, and a second of said loops being analog and including an adjustable variable-gain circuit, and an adding circuit for forming the sum of the output signals of the said loops for simultaneously controlling the phase of the said precision oscillator.

4,107,624

AUTOMATIC FREQUENCY-TRACKING CIRCUIT

Paul F. Turner, North Salt Lake, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,419

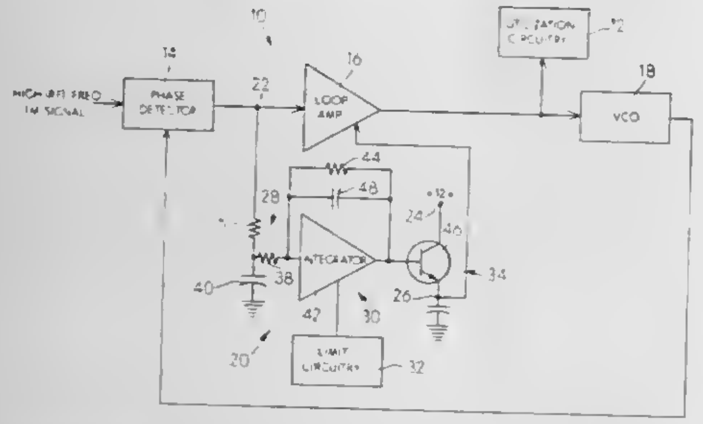
Int. Cl.^{2} H03B *3/04*

U.S. Cl. 331—8 **4 Claims**

4. A circuit for receiving an incoming signal incurring frequency drift and producing a local signal for tracking said incoming signal, comprising:

a phase-locked loop being defined by a phase detector, a DC amplifier and a voltage controlled oscillator connected in series, said detector receiving said incoming signal and a local signal generated by said oscillator and producing a DC voltage, said loop oscillator being controlled by said DC voltage produced by said detector and amplified by said amplifier such that said local signal generated by said oscillator locks on said incoming signal; and

correction means coupled to said loop in parallel with said loop amplifier and receiving said DC voltage from said detector such that a DC bias voltage produced by said correction means will be summed with that being fed into said amplifier from said detector so as to maintain the optimum amplifier balance for the full operational tuning range of said amplifier even as offsets in the DC voltage fed to said amplifier from said detector are produced by frequency drift of said incoming signal, said correction means including low frequency responsive means coupled to said detector and bias voltage supplying means coupled between said low frequency responsive means and said loop amplifier, said low frequency responsive means for receiving said DC voltage from said detector and, in response to low frequency components thereof, controlling within preset limits the level of said DC bias voltage supplied to said loop amplifier by said supplying means in correspondence with the magnitude of offsets in the DC voltage from said detector as produced by frequency drift of said incoming signal.



4,107,625
TRANSISTOR CRYSTAL OSCILLATOR WHICH MAY BE PAIRED FOR GENERATING A BEAT FREQUENCY

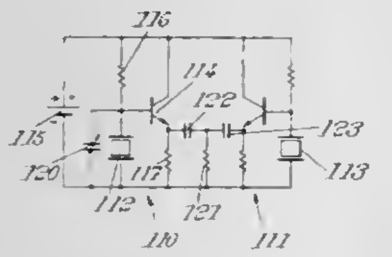
Henri Courier de Mere, Paris, France, assignor to Biscosa Societe de Recherche, France

Filed Feb. 23, 1977, Ser. No. 771,345

Claims priority, application France, Mar. 15, 1976, 76 07382; Mar. 15, 1976, 76 07383

Int. Cl.² H03B *5/36, 21/00*

U.S. Cl. 331—37 **8 Claims**



1. An oscillator circuit comprising a transistor, a piezoelectric element and a source of direct current, and wherein said transistor is connected in common collector configuration and said piezoelectric element is connected between the base of said transistor and a first terminal of said source, said oscillator circuit being characterized by a capacitive inpedance which sustains oscillation consisting exclusively of the capacitance of the base-emitter junction of said transistor, and the voltage of said source being no greater than 1.5 volts.

4,107,626
DIGITAL OUTPUT FORCE SENSOR USING SURFACE ACOUSTIC WAVES

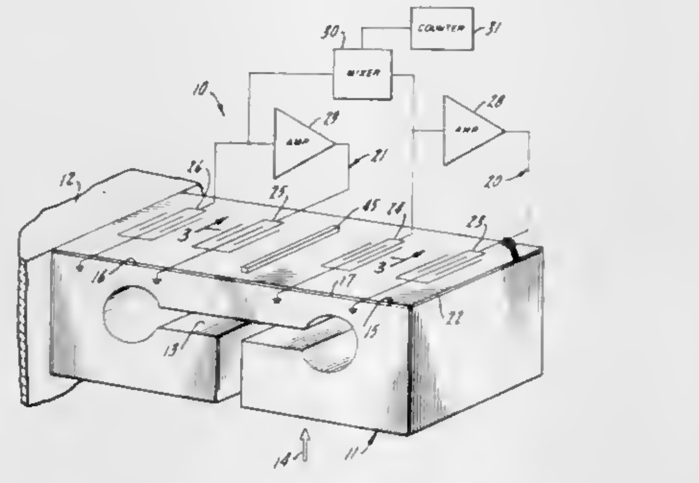
David A. Kiewit, Arlington Heights, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 20, 1976, Ser. No. 752,291

Int. Cl.² G01L *1/16;* **H03B** *5/32, 21/00*

U.S. Cl. 331—65 **7 Claims**

1. A sensor comprising, in combination, an elastic beam formed of metal anchored at one end and having a cross section such that a bending force near the other end causes a planar surface of the beam to undulate with a first portion of said surface being in tension and a second portion of said surface being in compression, transducers adhered to said beam surface and comprising interdigitated conductors formed at the surface of a piezoelectric layer, a pair of amplifiers respectively coupling said transducers to form a pair of oscillator circuits including surface acoustic waves in a pair of wave paths between the transducers with the acoustic wave paths including, respectively, said first and second beam surface portions, and means for comparing the oscillating frequencies of said circuits and generating an output signal based on the frequency variation that will reflect the value of said bending force.



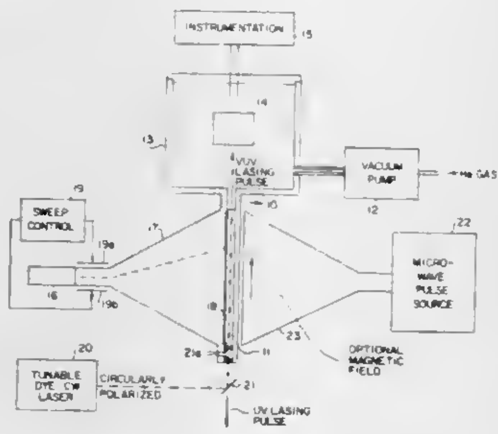
4,107,627
STABILIZATION OF HE$_2$(A$^3\Sigma_u{}^+$) MOLECULES IN LIQUID HELIUM BY OPTICAL PUMPING FOR VACUUM UV LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Jonas S. Zmuidzinas, Glendale, Calif.

Filed Mar. 29, 1977, Ser. No. 782,463

Int. Cl.² H01S *3/09*

U.S. Cl. 331—94.5 PE **14 Claims**



1. A method for achieving large populations of metastable spin-aligned He$_2$(a$^3\Sigma_u{}^+$) molecules in superfluid helium comprising the steps of electronically exciting said helium with an electron beam and optically pumping said helium with a circularly-polarized beam of coherent light from a continuous-wave laser.

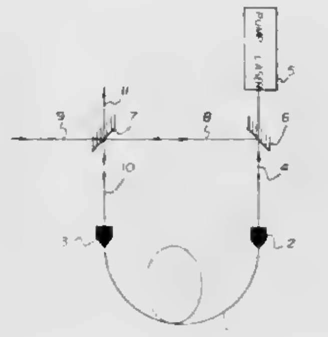
4,107,628
CW BRILLOUIN RING LASER

Kenneth O. Hill, Kanata; Brian S. Kawasaki, Carleton Place, and Derwyn C. Johnson, Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 2, 1977, Ser. No. 792,928

Int. Cl.² H01S *3/30*

U.S. Cl. 331—94.5 N **5 Claims**



1. A cw Brillouin ring laser comprising:

a length of low loss optical fiber, having a first end and a second end;

pump laser means for directing a pump beam of optical energy into the first end of the optical fiber for generating a Brillouin shifted Stokes beam therein; and

first partially reflective mirror means and second partially reflective mirror means, being positioned to form a ring beam path with the first and second ends of the fiber, the first mirror means reflecting a portion of the Brillouin shifted Stokes beam eminating from the first end of the fiber to the second mirror means, and the second mirror means reflecting a portion of the received Brillouin beam into the second end of the fiber.

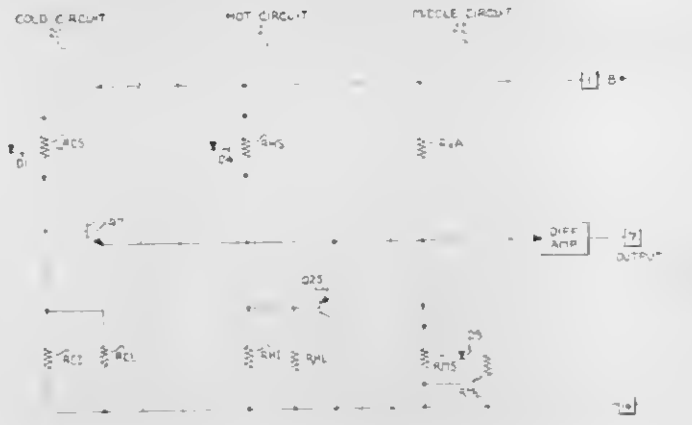
4,107,629
TEMPERATURE COMPENSATOR FOR A CRYSTAL OSCILLATOR

Russell L. Stone, Jr., Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed May 16, 1977, Ser. No. 796,888

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 R **12 Claims**



1. An improved temperature compensator for use with a crystal oscillator operating in a cold range, a middle range, and a hot range of temperature, said oscillator having at least one voltage sensitive capacitor associated therewith, said improved temperature compensator comprising:

a. voltage source terminals;

b. compensating voltage output terminals for connection to said voltage sensitive capacitor;

c. a middle temperature range compensating circuit comprising a current source circuit connected between said source voltage terminals, said current source circuit having a first path and a load path in series therewith, and temperature sensitive diode means connected to said first path for increasing the current through said load path in response to warmer temperatures and for decreasing the current through said load path in response to cooler temperatures;

d. a cold temperature range compensating circuit comprising a current source circuit connected between said voltage source terminals, said current source circuit having a first path and a load path in series therewith, and temperature sensitive diode means connected to said current source circuit for increasing the current through said load path in response to colder temperatures and for decreasing the current through said load path in response to warmer temperatures;

e. a hot temperature range compensating circuit comprising a current source circuit connected between said voltage source terminals, said current source circuit having a first path and a load path in series therewith, and temperature sensitive diode means connected to said current source circuit for decreasing the current through said load path in response to hotter temperatures and for increasing the current through said load path in response to cooler temperatures;

f. and means connected to each of said load paths for deriving middle, cold, and hot signals therefrom.

4,107,630
PULSE-MODULATED HIGH-FREQUENCY TRANSMITTER

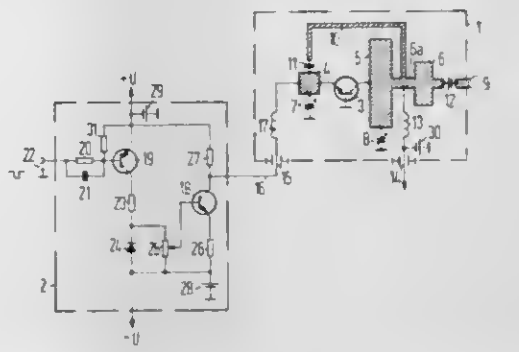
Peter Schubt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 15, 1977, Ser. No. 833,489

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648767

Int. Cl.² G01S *7/28;* **H03B** *5/18;* **H03K** *7/08*

U.S. Cl. 332—9 T **3 Claims**



1. A pulse-modulated, high-frequency transmitter, comprising:

a self-sustained oscillator including a transistor having a grounded base, an emitter and a collector, a feedback circuit connected between said collector and said emitter including a strip line and a capacitor in series with said strip line, said strip line having a length equal to half the wavelength of the frequency of oscillation; and

keying means including a pulse modulator constructed as a constant current source connected to said emitter, and a pulse generator for keying said pulse modulator.

4,107,631
PROTECTION OF HIGH-POWER COAXIAL CABLES

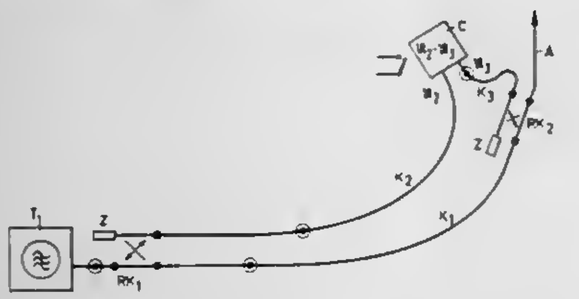
Georg Spinner, and Leo Treczka, both of Munich, Fed. Rep. of Germany, assignors to Spinner GmbH Elektrotechnische Fabrik, Munich, Fed. Rep. of Germany

Filed Jul. 7, 1975, Ser. No. 593,270

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1974, 2433404

Int. Cl.^{2} H03H *7/00*

U.S. Cl. 333—17 R **2 Claims**



1. In a high frequency transmission system comprising a high frequency and high power transmitter, an electrical output circuit, and a first coaxial cable for connecting said transmitter to said output circuit, a detection circuit for detecting flashover and arcing in said first coaxial cable, said detection circuit comprising:

first and second directional couplers, said first directional coupler connected to one end of said first coaxial cable adjacent said transmitter, said second directional coupler being connected to said first coaxial cable at a point along said first coaxial cable which is removed from said end of said first coaxial cable adjacent said transmitter;

comparator circuit means having first and second inputs;

a second coaxial cable connecting the signal output of said first directional coupler to said first input of said comparator circuit means;

a third coaxial cable connecting the signal output of said second directional coupler to said second input of said comparator circuit means;

said first and second coaxial cables having different delay times, the delay time of said third coaxial cable being chosen such that said signal outputs of said first and second directional couplers are in phase when they are applied to said first and second input of said comparator circuit means whereby a predetermined difference between the magnitude of said signals applied to said comparator circuit means is indicative of a fault in said first coaxial cable.

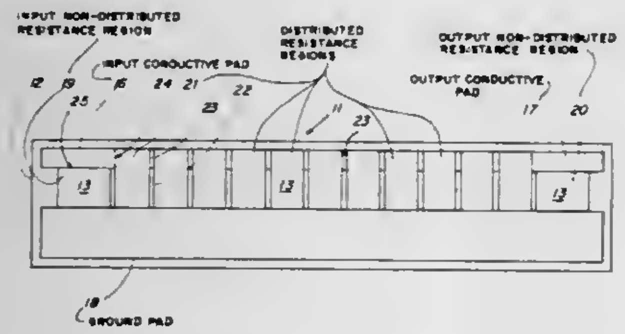
4,107,632
ATTENUATOR ELEMENT

William P. Dawson, Indianapolis, Ind., assignor to Texscan Corporation, Indianapolis, Ind.

Filed Aug. 9, 1976, Ser. No. 712,726

Int. Cl.^{2} H01P *1/22*

U.S. Cl. 333—81 A **2 Claims**


INPUT NON-DISTRIBUTED RESISTANCE REGION
INPUT CONDUCTIVE PAD
DISTRIBUTED RESISTANCE REGIONS
OUTPUT NON-DISTRIBUTED RESISTANCE REGION
OUTPUT CONDUCTIVE PAD
12
19
25
16
24
21
22
23
11
23
17
20
13
13
13
18
GROUND PAD

1. A flat attenuation element for high frequency electrical signals comprising a flat insulating base portion, an input conductive pad and an output conductive pad on the base portion, a common conductive pad on the base portion, a distributed resistance region coupled between said input and output conductive pads and also coupled directly to said common conductive pad, an input resistance region coupled in shunt between the input pad and the common pad, and an output resistance region coupled in shunt between the output pad and the common pad, said flat attenuation element further comprising at least one more distributed resistance region coupled between said input and output conductive pads and also coupled to said common conductive pad.

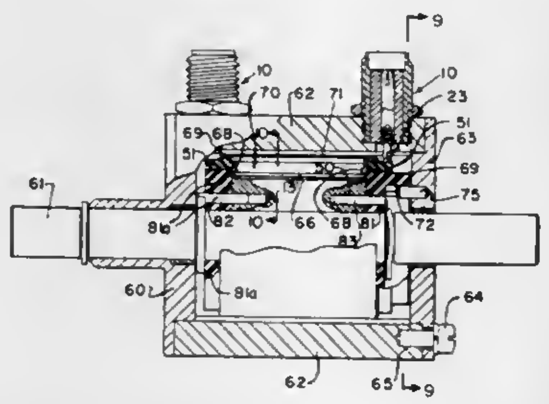
4,107,633
BROADBAND MICROWAVE CARD ATTENUATOR

Ronald C. Scaletta, Gaithersburg, Md., assignor to Weinschel Engineering Co., Gaithersburg, Md.

Filed Nov. 24, 1976, Ser. No. 744,897

Int. Cl.^{2} H01P *1/22*

U.S. Cl. 333—81 A **60 Claims**



1. An attenuator comprising:

an elongated insulating card having an inner conductor extending longitudinally along the card, said card having first and second faces,

an elongated tubular outer conductor surrounding said card and said inner conductor, said outer conductor having a conductive inner wall,

said outer conductor defining first and second cavities extending away from said first and second faces respectively with the first cavity being many times the size of the second cavity and with relatively small electric field intensity as compared with that in the second cavity,

said card having at least one side edge extending longitudinally along the card, in contact with the inner wall of the outer conductor and in spaced relation with said inner conductor, and

a resistive layer on one face of said card and extending from at least a portion of the inner conductor to the outer conductor,

said outer conductor and said card comprising means to accurately position the inner conductor with respect to that portion of the inner wall of the outer conductor which is contiguous with said second cavity and to provide the attenuator with a constant characteristic impedance over a band of frequencies extending from D.C. to at least 2 GHz.

4,107,634
DETENT MECHANISM ESPECIALLY FOR MICROWAVE DRUM ATTENUATOR

Ronald C. Scaletta, and George Capek, both of Frederick, Md., assignors to Weinschel Engineering Co., Gaithersburg, Md.

Filed Nov. 24, 1976, Ser. No. 745,037

Int. Cl.^{2} H01P *1/22;* **G05G** *5/06*

U.S. Cl. 333—81 A **23 Claims**

1. Apparatus for biasing a body, mounted for rotation about an axis, in any one of several predetermined angular positions comprising

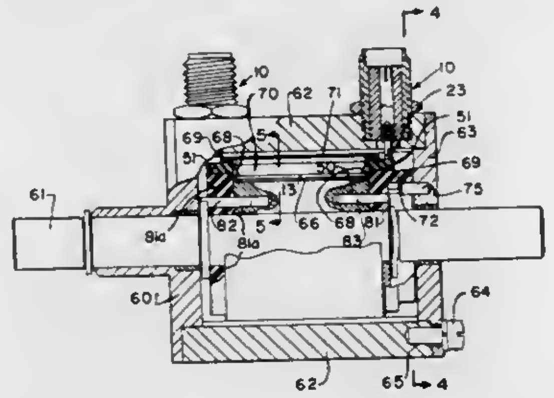
a shaft for said body, said shaft having an axis that corresponds to the axis of said body,

said body including an element projecting away from said body, said element having an inner wall surrounding said shaft and spaced therefrom to form a cavity,

said element having an outer wall farther from said axis than the inner wall,

said outer wall having the shape of a polygon with each side of the polygon being a tangent of a circle whose center is on said axis,

said element having a projection extending from said inner wall inwardly toward said axis,



a stationary stop member extending into said cavity and which engages said projection to limit the angle of rotation of said body,

each side of said polygon being of substantially equal length, and

biasing means, comprising a substantially flat surface having a fixed angular position in a plane perpendicular to said axis and which constitutes a tangent to said circle pressing against any one of said sides of said polygon presented to it, for biasing the polygon into any one of several particular angular positions, said last-named means including a resilient element which enables the flat surface to move away from said axis so that the polygon can move from one of its angular positions to the next.

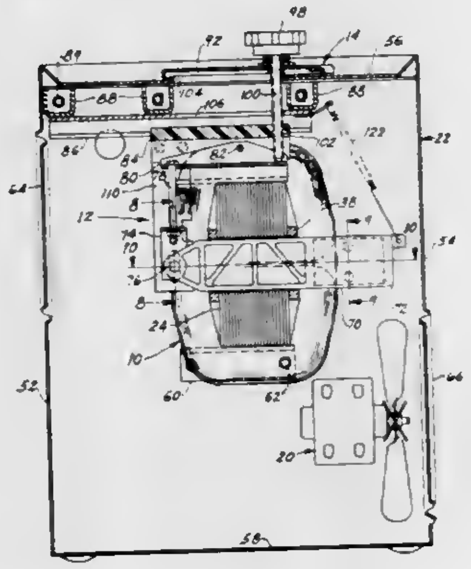
4,107,635
ARC WELDING MACHINE

Richard B. Brundage, Ladue; Walter P. Jost, Jr., Manchester, and Mortimer P. Burroughs, University City, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 6, 1976, Ser. No. 747,513

Int, Cl.^{2} H01F *21/06*

U.S. Cl. 336—45 **10 Claims**



1. In an a.c. arc welder, a transformer having an iron core comprising a flat frame defining a window, primary and secondary coil means wound on said frame, an elongated nonmetallic flux shunting member carrying an iron flux shunting core at one end thereof extending through said window perpendicular to said frame, said elongated member being freely slidable longitudinally between two opposed surface portions of said frame extending in parallel through said window when said member is substantially perpendicular to said frame, but being firmly locked against movement when forcibly tilted so as to bind between said surface portions, an elongated fixed guide spaced laterally from said window and extending perpendicular to said flat frame, a slidably mounted member constrained to slidable movement in said guide, means connecting said slidably mounted member to one end of said flux shunting member including force multiplying means operation to forcibly tilt said flux shunting member to a locked position when moved in one direction and operative to release it when moved oppositely, and a handle connected to said slidably mounted member for moving said flux shunting member longitudinally in said window.

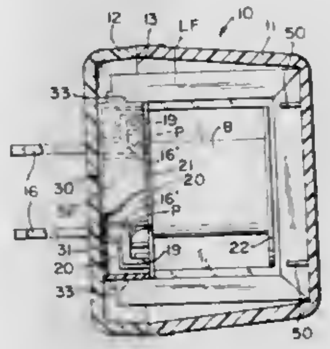
4,107,636
PLUG-IN ADAPTOR

John DiGirolamo, Orange, N.J., assignor to Jerome Industries Corporation, Orange, N.J.

Filed May 20, 1977, Ser. No. 798,971

Int. Cl.^{2} H01F *15/10, 27/04*

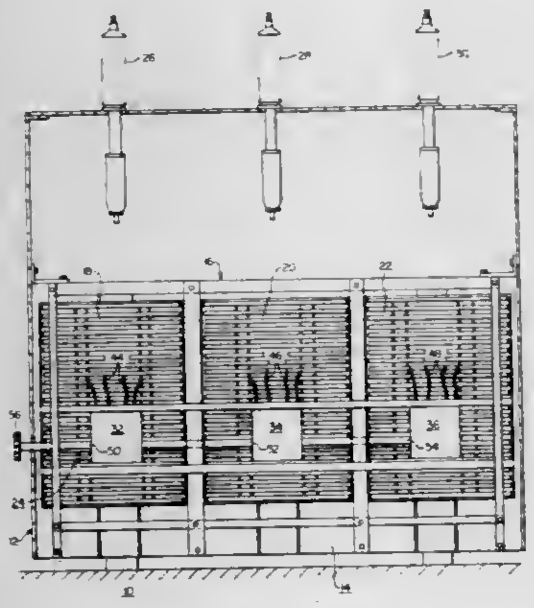
U.S. Cl. 336—92 **4 Claims**



1. A power pack including a bobbin having spaced apart parallel flanges extending from a spindle, magnetic transformer means extending about said bobbin and through said spindle in planes parallel to said spindle, primary wall blades extending from said bobbin in planes parallel to said transformer means, and perpendicular to said flanges, an outer casing for said bobbin and transformer means and having slots to accommodate said primary wall blades and boss means adjacent rearward portions of said transformer means for holding said transformer means and bobbin against relative upward and downward movement, a shelf fabricated integrally with one of said flanges and extending substantially perpendicularly thereto and outwardly above said transformer means, channel means integrally formed in said shelf, said primary wall blades having inner ends constituting with said channels cooperating means for retaining said ends within said channels, a separate cover fitted over and covering said inner ends of said blades and said shelf, said cover having a front wall formed with slots fitted around said blades, a top and sides fitted over and on either side of said shelf and an apron extending continuously from said front wall in front of said tranformer means and below said blades, said cover constituting means for insulating and for further retaining said blade inner ends, said cover and said transformer means being fitted within said casing with said apron press fit between said casing and said transformer means to constitute with said boss means and said casing slots the only means for retaining the relative positions of said casing, said bobbin and transformer means and said cover.

4,107,637
NO-LOAD TAP CHANGER FOR THREE-PHASE TRANSFORMERS

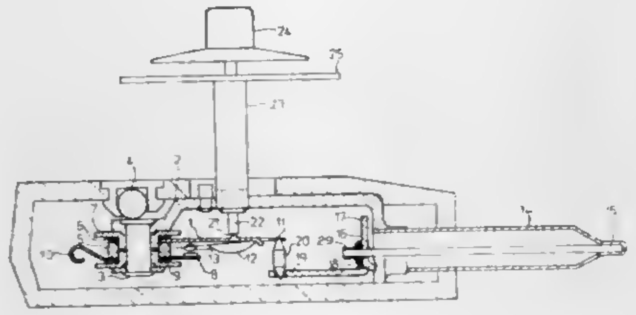
Edward F. Guidosh, Hubbard, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 27, 1977, Ser. No. 763,208
Int. Cl.^{2} H01F *21/12;* **H01H** *3/00*
U.S. Cl. 336—150 **7 Claims**



1. An electrical transformer comprising:
a sealed enclosure;
first, second and third electrical windings each formed of a plurality of turns disposed about a longitudinal axis, said first, second and third electrical windings disposed in said enclosure with their respective longitudinal axes aligned in a common plane;
said first, second and third electrical windings disposed in inductive relation with a three-phase magnetic core disposed within said enclosure;
each of said first, second and third windings having tapped winding sections with tap leads connected thereto;
insulating means having generally planar exterior surfaces; said insulating means disposed in said enclosure with said planar surfaces substantially parallel to said common plane and spaced laterally from and within the axial extent of said first, second and third windings;
first, second and third contact sets affixed to said insulating means, each of said contact sets containing a plurality of stationary contacts arranged in an arcuate pattern and equidistant from an axis of rotation; said stationary contacts connected to respective tap leads of said first, second and third windings;
first, second and third movable contacts pivotally mounted on said insulating means and adapted for making electrical connection with respective stationary contacts of said first, second and third contact sets;
first, second and third drive means; said first, second and third drive means having said first, second and third movable contacts, affixed thereto, respectively; said first, second and third drive means operative to rotate said first, second and third movable contacts, respectively, through sequential engagement with successive stationary contacts of said first, second and third contact sets;
operating means mounted outside of said enclosure; and
first, second and third connecting means, operative to couple said first, second and third drive means to said operating means such that movement of said operating means causes simultaneous movement of said first, second and third drive means.

4,107,638
THERMOSTAT

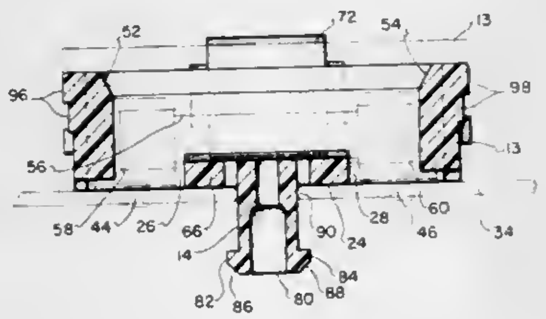
Walter Hollweck, Nuremberg, Germany, assignor to Inter Control Hermann Kobler Elektrik GmbH & Co. KG, Germany
Filed Mar. 4, 1976, Ser. No. 664,024
Claims priority, application Canada, Mar. 5, 1975, 221294
Int. Cl.^{2} H01H *5/04*
U.S. Cl. 337—131 **13 Claims**



1. A thermostat comprising:
(a) an electrical spring switch having first and second stressed stable operative states and carrying a first electrical contact;
(b) support means for retaining said switch at one end thereof;
(c) a second electrical contact mounted on said support means in opposition to said first electrical contact;
(d) a heat probe rod axially movable with change in temperature with respect to said support means; and
(e) a lever, the end of said heat probe rod being linked to one leg of the lever, the fulcrum of the lever being closer to the probe rod than to the end of the other leg of the lever, and the end of said other leg of the lever being linked to the other end of the switch opposite said one end thereof whereby movement of said lever by said heat probe rod are transmitted to said other end of said switch to motivate said switch between said first and second stressed stable operative states.

4,107,639
CARTRIDGE FUSE INJECTOR AND EJECTOR

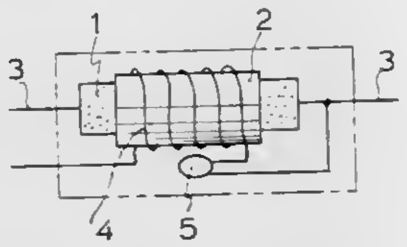
Ralph M. Levy, Abington, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 10, 1976, Ser. No. 656,886
Int. Cl.^{2} H01H *85/22*
U.S. Cl. 337—205 **13 Claims**



1. A fuse injector/ejector for use in association with a pair of spaced apart spring clip contacts for a cartridge type fuse, said clip contacts being mounted on a suitable support base to receive a fuse therebetween, said injector/ejector comprising:
a fuse shroud partially surrounding the clip contacts and having an open top and side and end walls of sufficient height to be at least coextensive with the spring clip contacts;
said fuse shroud further having a bottom wall with a pair of spaced apart openings adapted to receive said clip contacts and an interior bottom wall surface between said clip contacts arranged to be adjacent to a fuse mounted in said clip contacts;
a mounting pedestal attached to an exterior bottom wall surface and extending outwardly in a direction opposite from the direction of extension of said side walls and adapted to be inserted through a suitable opening in the support base for loose captive mounting therein to permit movement of said fuse shroud between a first position and a second position;
whereby to permit a cartridge fuse to be inserted between said clip contacts when said shroud is seated on said support base in said first position and whereby said interior surface ejects a mounted fuse from between both of said clip contacts when said shroud is lifted from said support base to said second position;
a shroud cover means arranged to cover at least a portion of said open top; and
a claw means mounted on an inside surface of said cover and arranged to grip a fuse to a lesser degree than the clip contacts, said claw means gripping the fuse when said shroud cover is closed and the fuse is mounted in said clip contacts and continuing to grip the fuse after the fuse has been ejected from said clip contacts by the movement of the shroud to said second position.

4,107,640
CURRENT LIMITING ELEMENT FOR PREVENTING ELECTRICAL OVERCURRENT

Chihiro Asano, Kakamigahara; Shigeyuki Hikita, and Kunio Kato, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho
Filed Nov. 19, 1976, Ser. No. 743,322
Claims priority, application Japan, Nov. 19, 1975, 50-139007
Int. Cl.^{2} H01C *7/13, 7/02*
U.S. Cl. 338—23 **7 Claims**

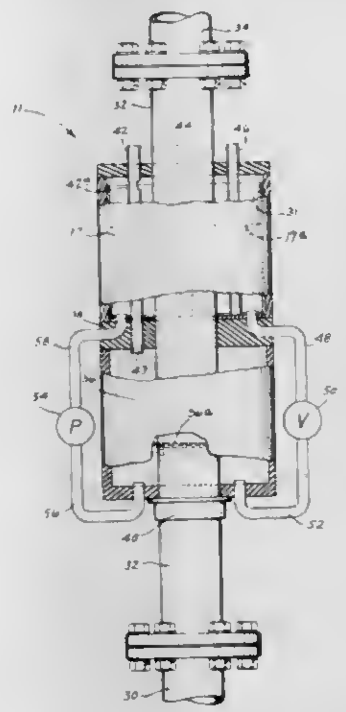


1. A current limiting element comprising:
a principal current conducting member made from a low resistance conductive elastomer having a high positive coefficient of thermal expansion, said principal conducting member having a flattened cross-sectional shape;
a heating/heat insulating member having a high resistance surrounding the circumference of said conducting member; and
an indirect heating element disposed adjacent said heating/heat insulating member.

4,107,641
LIQUID RHEOSTAT

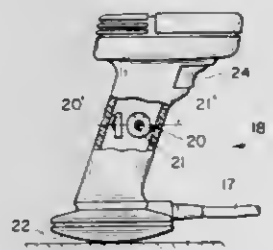
George M. Osgood, 4474 SW. Arthur Way, Portland, Oreg. 97201
Filed Jun. 24, 1976, Ser. No. 699,614
Int. Cl.^{2} H01C *1/082*
U.S. Cl. 338—55 **11 Claims**

1. A liquid rheostat comprising:
reservoir means for holding an electrolyte solution;
a plurality of spaced-apart, elongate electrodes disposed in said reservoir means, said electrodes having lengths adapted to be selectively submerged in the solution; and
electroconductive means disposed in said reservoir means spaced from and substantially surrounding said electrodes at least about the electrode lengths adapted to be selectively submerged, said electrodconductive means also adapted to be selectively submerged in the solution for providing a portion of path along which current may be conducted between submerged electrodes.



4,107,642
POTENTIOMETER JOYSTICK

James G. Crummett, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Feb. 14, 1977, Ser. No. 768,280
Int. Cl.^{2} H01C *10/16*
U.S. Cl. 338—128 **1 Claim**



1. An inclination sensitive type joystick, comprising:
(a) a handle controllable by an operator of the joystick, said handle having a convex tilting surface for engaging substantially horizontal surfaces during operation;
(b) a first inclination sensitive potentiometer mounted within said handle and having an electrically conductive fluid wiper, an elongate resistance element in wiping relation to the wiper, said fluid and resistance element being located within the potentiometer, and electrical leads operatively connected to the fluid and the resistance element to form a potentiometer circuit;
(c) a second inclination sensitive potentiometer mounted within said handle and having an electrically conductive fluid wiper, an elongate resistance element in wiping relation to the wiper, said fluid and resistance element being located within the potentiometer, and electrical leads operatively connected to the fluid and the resistance element to form a potentiometer circuit; and
(d) means for attaching said first and second potentiometers to said handle so that displacement of the handle is resolved into corresponding output resistance values.

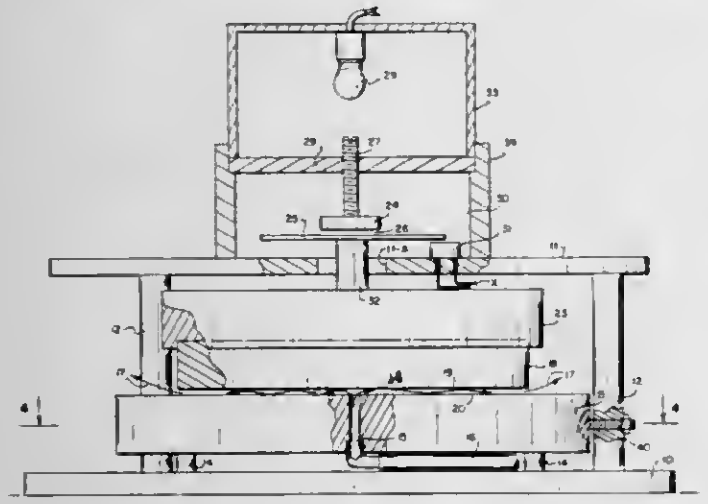
4,107,643
UNIDIRECTIONAL HORIZONTAL SEISMOMETER

William A. Rhodes, 4421 N. 13th Pl., Phoenix, Ariz. 85014

Filed May 31, 1977, Ser. No. 802,268

Int. Cl.^{2} G01V *1/16*

U.S. Cl. 340—17 R **3 Claims**



1. A unidirectional horizontal seismometer comprising: a horizontal stationary support with leveling means; first and second discs; said first disc having a concave surface; said second disc having a convex surface of equal and opposite curvature in relation to said first disc; said first disc being horizontally coupled with said stationary support; fluid admittance means communicating with the concave surface of said first disc; the convex surface of said second disc directed downwardly in contact with the concave surface of said first disc, whereby when a fluid is injected between said discs through said fluid admittance means, said second disc is levitated upon a film of fluid therebetween thus permitting the force of gravity to cause said second disc to seek a central concentric relationship with said first disc; the convex surface of said second disc as coupled by said fluid film to said first disc surface facing vertically upward causing the center of radius of curvature to exist in space above said curvature, whereupon fluid levitated said second disc when horizontally displaced relative to said first disc, assumes a natural period of oscillation similar to a pendulum of substantially the same radius of curvature; said oscillations being responsive to earth movements in opposition to said second disc movement through said stationary support, from any horizontally arriving earth tremor thereunder and from any horizontal direction; said response thereby causing horizontal positional changes of said first disc relative to said second disc; and means for transducing signals from such differential relative positions into an appropriate recording system; the radius of said curvature chosen for both said discs providing oscillations similar to those of a pendulum oscillating from the center of the curvature of said discs and thereabove within the spectral range of natural frequencies created by earthquakes; and further choice of special bands of frequency period response within the total range depending upon said radius of curvature periods being amendable to change toward longer periods as said fluid film is increased. thus causing wider separation between both said surfaces; and a means for damping out free oscillations of said second disc.

4,107,644
SYSTEM AND METHOD FOR DIGITALLY TRANSMITTING WELL LOGGING INFORMATION

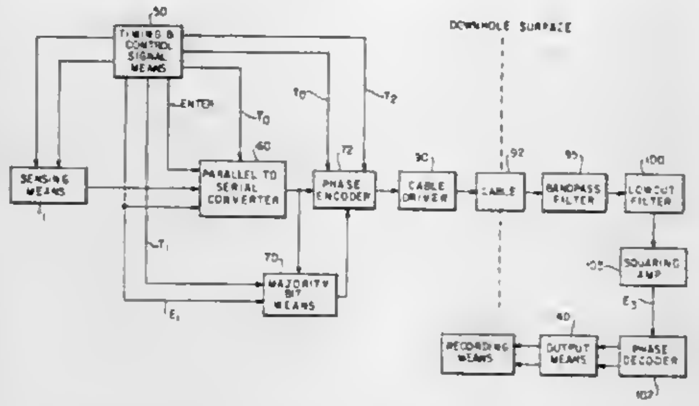
Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,746

Int. Cl.^{2} G01V *1/40*

U.S. Cl. 340—18 CM **4 Claims**

1. A well logging system comprising a logging tool adapted to be passed through a borehole traversing an earth formation including sensing means for sensing at least one condition of the earth formation and providing parallel digital signals corresponding to the sensed condition; converter means connected to sensing means for providing a serial digital signal wherein predetermined number of bits comprise digital words, some digital words are information words and correspond to the parallel digital signals while other digital words correspond to predetermined mined sync words; timing signal means connected to the converter means for providing timing pulses to the converter means so as to cause the converter means to provide the digital information words in a fixed predetermined relationship to the digital sync words, said timing signal means includes timing pulse means for repetitiously providing timing pulses T_0, T_1, T_2 and T_3 constituting a bit cycle, means connected to the timing pulse means for utilizing one of the timing pulses during each cycle to generate shift pulses and for providing the shift pulses to the converter means, first bit counter means connected to the timing pulse means for counting one of the timing pulses in each bit cycle of a bit pulse and providing a word pulse when the number of counter bit pulses equals a predetermined number which constitutes a digital word, first word counter means connected to the bit counter means for counting the word pulses and providing first and second pulses when the number of counted word pulses is equal to a predetermined number of digital words, and logic means connected to the timing pulse means, to the first bit counter and to the first word counter for providing an enter pulse and a reset pulse to the converter means in according with the timing pulses, other than the timing pulses used to generate the shift pulses, the word pulse and one of the pulses from the first word counter means; and phase encoding means connected to the converter means and to the timing signal means for phase encoding the serial digital signal in accordance with the timing pulses to provide a phase encoded signal, said phase encoder means includes a NOR gate connected to the converter and to the majority bit means for passing the digital data word or the majority bit, first and second NAND gates, said first NAND gate being connected to the NOR gate and receiving timing pulses T_2 and passed pulses from said NOR gate for passing timing pulse T_2 when enabled by a passed pulse from the NOR gate and for blocking the timing pulses T_2 when disabled by the absence of a passed pulse from the NOR gate, an inverter connected to the NOR gate for inverting the output of the NOR gate, said second NAND gate being connected to the inverter and receiving timing pulses T_2 for passing a T_2 time pulse when enabled by output from the inverter and for blocking the timing pulses T_2 when disabled by the output from the inverter, flip-flop means having a clear input, a preset input connected to the first and second NAND gates, respectively; and 'D' input connected to the NOR gate and a 'C' input receiving timing pulses T_0 for providing an output as the phase encoded signal in accordance with the presence or absence of passed pulses from the NOR gate, both NAND gates and timing pulses T_0; cable means for conducting electrical signals from the logging tool to surface equipment, and the logging tool also includes means connected to the phase encoder means for applying the phased encoded signal to the cable; and surface equipment includes filter means connected to the cable for filtering the phased encoded signal to compensate for distortion to the phase encoded signal caused by the cable to provide a filter signal, phase decoder means connected to the filtering means for phase decoding the filter signal to provide a second serial digital signal, corresponding to the first serial digital signal and to provide timing pulses, and output means connected to the phase decoder means for providing parallel digital signals representative of the information words and the sync words in accordance with the second serial digital signal.



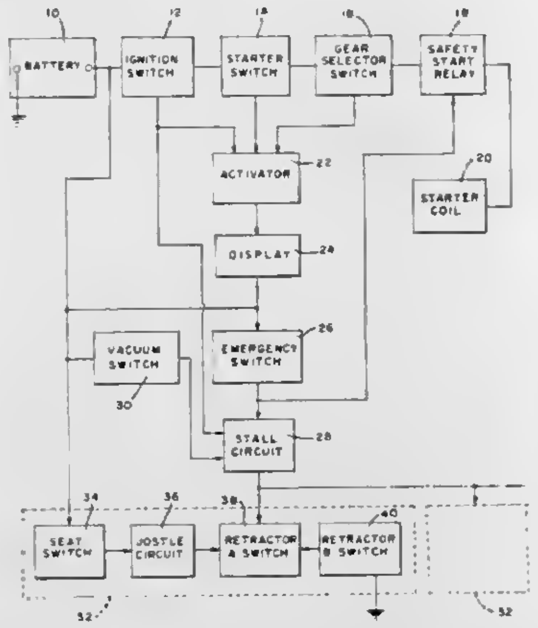
4,107,645
SEAT BELT SYSTEM WITH STARTER ENGINE LOCK AND ALARM

Donald J. Lewis, Troy, and Albert J. Jankowski, Royal Oak, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 208,173, Dec. 15, 1971, abandoned. This application May 22, 1972, Ser. No. 255,740

Int. Cl.^{2} B60R *21/10*

U.S. Cl. 340—52 E **12 Claims**



1. In a vehicle having a belt section for restraining an occupant in a seat, first sensor means for sensing whether the belt section has a protracted or retracted condition; second sensor means for sensing whether or not the seat is occupied; a starter motor; circuit means for receiving the outputs of both said first and second sensor means and for inhibiting the energization of said starter motor under conditions of said first and second sensor means other than conditions indicating that the seat has first been occupied and then said belt section has been placed in a protracted condition; and means for sensing a stall of the engine and for allowing the engine to be started one time independently of the condition of the sensing means following a stall;

said means for sensing the stall of the engine and for allowing the engine to be started one time independently of the condition of the sensing means including a switch having a first state wherein said circuit means for receiving the output of said first and second sensor means and for inhibiting the energization of said starter motor under conditions other than those indicating that the seat has first been occupied and then the belt section has been placed in a protracted condition is operative, and a second state wherein said circuit means is inoperative, said switch means being connected to the ignition switch of said vehicle and to a third sensor means operative to provide a signal when the engine stops running after the ignition switch has been closed and being normally in its first state and switched to its second state upon receipt of the signal from said third sensor means.

4,107,646
CENTRALIZED WARNING SYSTEM FOR VEHICLE

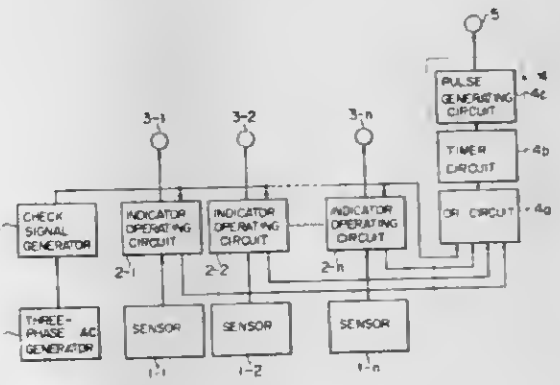
Hiroshi Arai, Toyota, and Koichi Taniguchi, Kariya, both of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 489,723, Jul. 18, 1974, abandoned. This application Mar. 28, 1977, Ser. No. 781,865

Claims priority, application Japan, Feb. 28, 1973, 48-85083

Int. Cl.^{2} G08B *19/00, 29/00*

U.S. Cl. 340—52 F **31 Claims**



1. A centralized warning system for a vehicle comprising:
- (1) a plurality of sensors each for detecting a vehicle operating fault at one of a plurality of check points of said vehicle and generating a corresponding electric output signal;
- (2) a plurality of indicators provided respectively corresponding to each of said plurality of sensors;
- (3) a plurality of indicator operating circuits connected to the respective indicators and sensors, each of said operating circuits generating, in accordance with the output signal of each sensor, an output signal for causing a corresponding one of said indicators to indicate the presence of a fault in the corresponding check point;
- (4) a logical circuit connected to each of said operating circuits for generating a logical output in response to the output signal from that indicator operating circuit;
- (5) a timer circuit connected to said logical circuit for generating a timing signal of a fixed time duration upon receipt of said logical output of said logical circuit; and
- (6) a master warning device operatively connected to said timer circuit for producing a warning signal in response to said timing signal and for automatically ceasing production of said warning signal at the end of said fixed time duration even when a sensor continues to produce said output signal after said fixed time duration.

4,107,647
DECELERATION INDICATING SYSTEM

Muneki Yoshino, Toyokawa, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 12, 1976, Ser. No. 675,751

Claims priority, application Japan, Apr. 14, 1975, 50-45686; Apr. 16, 1975, 50-51600[U]; May 13, 1975, 50-57139; May 16, 1975, 50-59101; May 28, 1975, 50-72444[U]; Jun. 4, 1975, 50-68049; Jun. 24, 1975, 50-87358[U]; Jun. 4, 1975, 50-68050; Jun. 18, 1975, 50-74957; Jun. 23, 1975, 50-77213; Jul. 31, 1975, 50-93865; Aug. 6, 1975, 50-96239; Jan. 8, 1976, 51-1890

Int. Cl.^{2} B60Q *1/26*

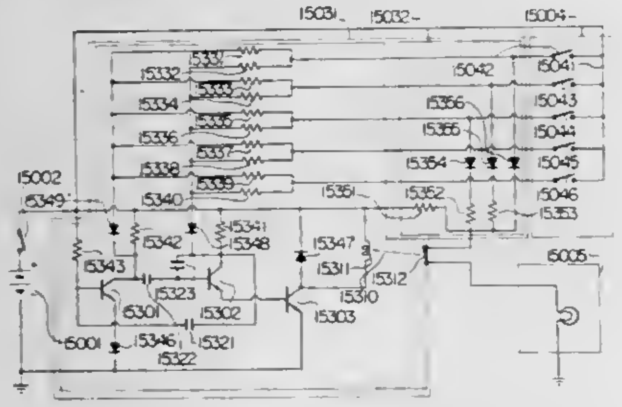
U.S. Cl. 340—71 **4 Claims**

1. A deceleration indicating system for a motor vehicle comprising:
- a power source mounted in a motor vehicle;
- a deceleration indicating lamp provided on the rear end of said motor vehicle;
- first means for producing a deceleration signal in response to the degree of deceleration of said vehicle, said first means including a plurality of contact switches respectively operative in response to respective predetermined degrees of the vehicle deceleration, each of said contact switches being connected at one end with said power source;

an oscillator for producing an ON-OFF signal, said oscillator including a first circuit for controlling the ON period of said ON-OFF signal in accordance with the time constant of said first circuit and a second circuit for controlling the OFF period of said ON-OFF signal in accordance with the time constant of said second circuit;

a first group of resistors, each connected at one terminal thereof to a respective one of said switches and connected at the other terminal to said first circuit such that when said respective switches are operated the resistors connected thereto change the time constant of said first circuit;

a second group of resistors, each connected at one terminal thereof to said switches and connected at the other terminal to said second circuit such that when said respective switches are operated the resistors connected thereto change the time constant of said second circuit;



second means connected to said oscillator, for selectively applying a current to said deceleration indicating lamp to switch said lamp ON and OFF in accordance with said ON-OFF signal;

a third group of resistors, each connected at one terminal thereof to a respective one of said switches and connected at the other terminal to said second means such that when said respective switches are operated the resistor connected thereto changes the current supplied to said lamp; and

whereby the brightness of said lamp and the frequency of the lighting of said lamp are simultaneously varied in accordance with the degree of the deceleration of said motor vehicle.

4,107,648
SCAN ENCODING OF TWO DIMENSIONAL PICTORIAL ENTITIES
Amalie Julianna Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 12, 1976, Ser. No. 675,926
Int. Cl.² G06K ***9/12***
U.S. Cl. 340—146.3 H **8 Claims**

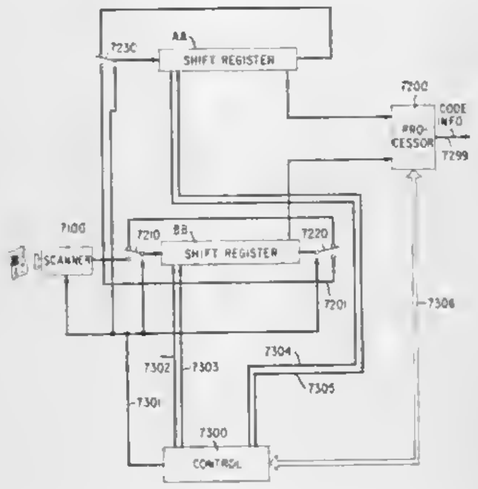
1. Apparatus for encoding two dimensional blobs defined by a plurality of runs from a sequence of consecutive scans, which runs meet the connectivity criteria that runs of consecutive scans have run-beginnings and run-endings that are no more than J pels apart and that only one run in a scan connect to the same run in a preceding scan, comprising:

means for placing each scan in a first register and its immediately preceding scan in a second register;

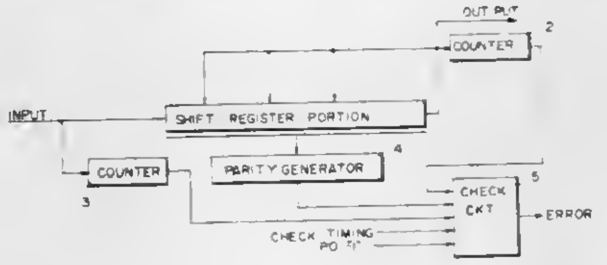
means for shifting the contents of both said registers and applying to their output signals said connectivity criteria;

means for assigning a connect code to runs in said first register for which such connectivity criteria are met; and

means for assigning a head code to runs in said first register and a tail code to runs in said second register for those runs that fail to meet said connectivity criteria.



4,107,649
CHECK SYSTEM FOR DETECTING MALFUNCTION OF AN ERROR DETECTION CIRCUIT
Yasuo Kurihara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 15, 1976, Ser. No. 750,649
Claims priority, application Japan, Dec. 30, 1975, 50-158119
Int. Cl.² G06F ***11/10***
U.S. Cl. 340—146.1 AG **14 Claims**



1. An error detection circuit checking system for checking error detection within a data processing circuit, said system receiving input data and having a data storing state for storing said input data and an output stage for providing said stored data as output data, comprising:

an error detection circuit of said data processing circuit, the error detection circuit having a parity generator for deriving a parity signal;

a predictive parity signal generator comprising means for counting the numbers of a predetermined logic value in the input data of the data processing circuit, and means for counting the numbers of said predetermined logic value in said output data of the data processing circuit; and

means for comparing the parity signal derived by the parity generator with the predictive parity signal from the predictive parity signal generator to detect malfunction of the error detection circuit.

4,107,650
ERROR CORRECTION ENCODER AND DECODER
Perry J. Luke, Silver Spring; James L. Machamer, Baltimore, and William A. Becraft, Silver Spring, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.
Filed Aug. 13, 1976, Ser. No. 714,330
Int. Cl.² G06F ***7/12***
U.S. Cl. 340—146.1 AL **33 Claims**

1. A method for correcting errors introduced during the recording of data bits onto and reproduction of data bits from

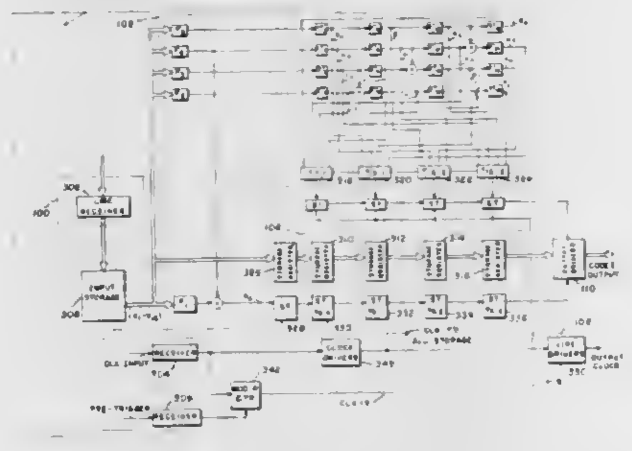
a plurality of parallel data tracks on a magnetic storage medium, comprising the steps of:

encoding data prior to recording, which comprises the steps of:

entering characters of data, comprising a data bit from each track, into an encoder,

formatting the entered data into a data block, said data block being defined as k *m*-bit bytes wherein the data block comprises a byte along each of *k* data tracks, where "*m*" and "*k*" are integers,

generating at least one *m*-bit output parity byte corresponding to each data block comprising the steps of:



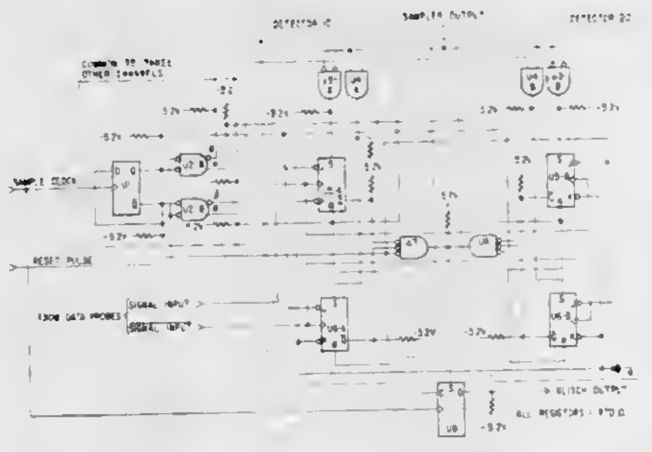
generating initial parity bits by selectively combining the data bits as each character is entered into the encoder,

combining the generated initial parity bits for every data block, in predetermined fashion, in order to produce intermediate parity bits, and

combining and reading the intermediate parity bits to produce *m*-bit output parity bytes onto separate parity tracks which are synchronous with the data tracks, and a

decoding the data following reproduction.

4,107,651
GLITCH DETECTOR
William Donald Martin, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 8, 1976, Ser. No. 740,266
Int. Cl.² H01J ***29/52;*** **G06F** ***11/00***
U.S. Cl. 340—146.1 R **3 Claims**

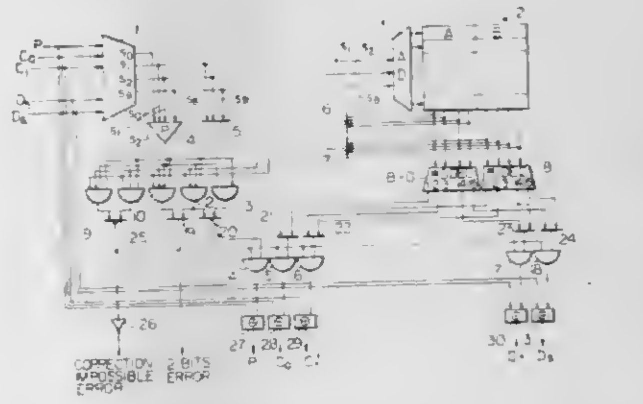


1. A circuit for detecting glitches on a digital signal comprising:

sampling means, coupled to receive the digital signal and having an output, for recurringly sampling the digital signal; and

detection means, coupled to receive the digital signal and coupled to the output of said sampling means and having an output, for detecting a positive transition upon the digital signal during the interval between sequential samples sequent to sampling of a high level signal on the digital signal. for detecting a negative transition upon the digital signal during the interval between sequential samples sequent to sampling a low level signal on the digital signal, and for providing a signal upon the output responsive to the detection of such transitions.

4,107,652
ERROR CORRECTING AND CONTROLLING SYSTEM
Jun'ichi Tanahashi, Yamato, and Takashi Kanie, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 23, 1976, Ser. No. 753,786
Claims priority, application Japan, Dec. 27, 1975, 50-157516; Dec. 29, 1975, 50-157727; Dec. 30, 1975, 50-156829
Int. Cl.² G08C ***25/00;*** **G06F** ***11/12***
U.S. Cl. 340—146.1 AL **12 Claims**



1. In an error correcting and controlling system in which an error check bit for correcting random t-bit errors ($t \geqq 2$) and detecting $(t+1)$-bit errors is added to data, and in utilizing said data, t-bit errors are automatically corrected based on said data and said added error check bit and $(t+1)$-bit errors are similarly detected, said error correcting and controlling system comprises:

syndrome generating means for generating syndrome outputs of said data,

a memory for storing encoded error bit position information at address positions corresponding one-to-one to a portion only of the outputs of said syndrome generating means,

addressing means responsive to said syndrome outputs of said syndrome generating means for addressing said memory to read out said bit position information corresponding to said syndrome outputs, and

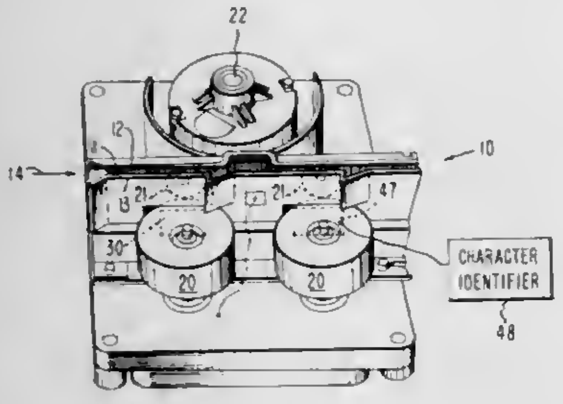
processing means for processing said syndrome outputs and said encoded error bit position information read out from said memory so as to decode the latter, to identify errors in said data, and to modify said data, whereby detection and correction of errors of said data are performed based on the stored contents of said memory.

4,107,653
DOCUMENT PROCESSING, MAGNETIC CHARACTER DETECTING APPARATUS
Karlis Kruklitis, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed May 23, 1977, Ser. No. 799,243
Int. Cl.² G06K ***9/00***
U.S. Cl. 340—146.3 C **10 Claims**

1. A method of detecting magnetic characters on documents where the dipoles of the magnetic characters may not be unidirectionally orientated, comprising:

moving documents serially along a document transport path;

orientating the magnetic dipoles of the characters on the documents in one direction by passing the documents between two magnets, one located on each side of the document transport path, with such magnets having like unidirectional magnetic poles facing toward each other; and



detecting the unidirectionally orientated magnetic characters on the documents as the documents pass along the transport path.

4,107,654

NUMERICAL CONTROL SYSTEM HAVING A POSITION PROCESSING UNIT OPERATED UPON A POWER FAILURE

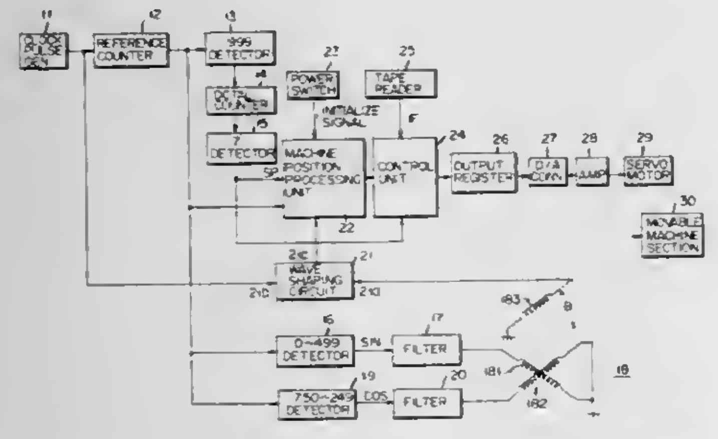
Tadashi Nishijima, Hamura, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 7, 1977, Ser. No. 766,346

Claims priority, application Japan, Feb. 6, 1976, 51-12006

Int. Cl.² G05B *13/02, 19/18*

U.S. Cl. 340—147 MT **9 Claims**



1. A numerical control system having a position processing unit operated upon a power failure, comprising a tape reader for inputting a numerical data for instructing an action of a machine tool; control means for receiving an instruction data from the tape reader and a data corresponding to the present position of the machine tool and calculating an amount of movement to be made by the machine tool for each predetermined time period; means for driving the machine tool based on an output from the control means which corresponds to the amount of movement of the machine tool; detection means for detecting the position of a movable section of the machine tool; and machine tool position processing means comprised of a position counter for counting based on a scale of 1000 notation a data corresponding to the absolute position of the machine tool which is detected at said detection means, a machine tool position calculating section for calculating based on a binary notation the present position of the machine tool for each said predetermined time period, a position register for storing a data from said machine tool position calculating section which corresponds to the present position of the machine tool and for supplying said data to said control means, a permanent storage type memory for storing and holding a data corresponding to absolute position of the machine tool counted at said position counter for each said predetermined time period even at the power interruption time, a position correction section for delivering at the power recovery time an output corresponding to the corrected actual position of the machine tool as obtained by correcting the over-travel effected by the machine tool at the power interruption time, and a gate circuit section for controlling a correction operation for presetting into said position register an output data corresponding to the corrected present position of the machine tool as obtained from said position correction section.

4,107,655

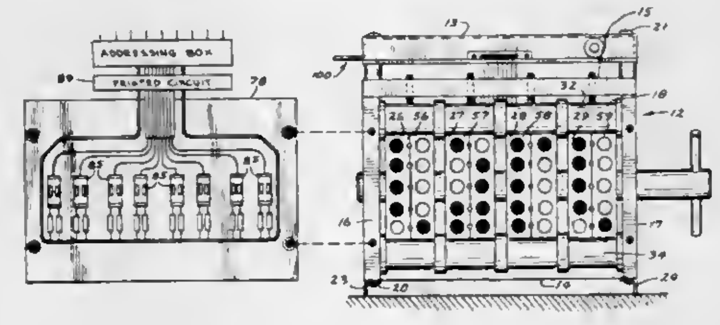
MECHANICAL CODE FOR OPERATED DEVICE FOR ACCESS TO CODED ELECTRICAL CIRCUITS

John H. Moorhouse, Clear Lake, Minn. 55319

Filed Jan. 10, 1977, Ser. No. 758,059

Int. Cl.² H04Q *3/00*

U.S. Cl. 340—149 R **6 Claims**



1. A mechanical code operated device and code sensing means, having in combination

a plurality of concentric cylindrical rotatable tumblers having relative rotation,

means supporting said tumblers,

said tumblers having aligned bores defining a keyway,

said tumblers each bearing code indicia on their respective edge portions,

code indicia sensing means carried by said first mentioned means sensing said code indicia aligned therewith,

said code indicia comprising reflective spots, some of said spots being more reflective than other of said spots,

means limiting relative rotation of said tumblers for alignment of said indicia, and

a code bearing operating means engaging said tumblers rotating the same relative to each other to indicate with said indicia a code corresponding to the code represented by said code bearing operating means, said code indicia being aligned with said code indicia sensing means.

4,107,656

DATA COMMUNICATION RECEIVER AND TRANSFER APPARATUS

Richard G. Farnsworth, York, Me., assignor to General Electric Company, Somersworth, N.H.

Filed May 23, 1977, Ser. No. 799,581

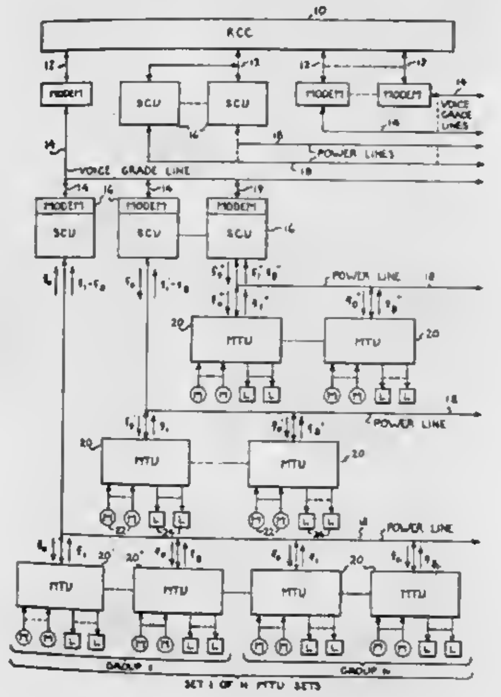
Int. Cl.² H04Q *3/00*

U.S. Cl. 340—151 **10 Claims**

1. In a communication system of the type including a plurality of message generating sources directable to simultaneously provide messages to a user device, apparatus for receiving messages from said sources and for preventing the loss of message data by compensating for the difference in time between the arrival of the earliest and the latest received messages due to inherent message delays in the system and for effecting the simultaneous transfer of the received messages to said user device, said apparatus comprising;

(a) a plurality of receivers, each in communication with at least one of said message generating sources, each of said receivers including,
  (1) means for generating a clock signal in response to a received message,
  (2) means for storing the received message in response to said clock signal;

(b) means common to said plurality of receivers including,
  (1) means responsive to the clock signal from each of said receivers for generating an output pulse corresponding to only the clock signal generated by the receiver to receive the earliest arrived message,
  (2) delay means responsive to said output pulse for generating a delay pulse at a prescribed interval of time after said output pulse, said interval of time being of sufficient duration to allow the latest arrived message to be received by the receiver receiving the latest message,
  (3) means enabled by said delay pulse to generate a transfer signal; and



(c) means coupled to the means for storing in each of said receivers and responsive to said transfer signal to effect the simultaneous transfer of the stored message from each receiver to said user device.

4,107,657

FLAME DETECTING APPARATUS

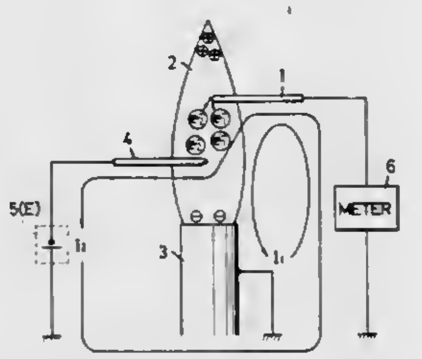
Susumu Nishigaki, and Akio Ohgoshi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 629,330, Nov. 6, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,747

Claims priority, application Japan, Nov. 14, 1974, 49-131375

Int. Cl.² G08B *17/12*

U.S. Cl. 340—579 **1 Claim**



1. A method of detecting the presence or absence of a flame at a flame position, said method comprising disposing a first electrode in said flame, said first electrode including a metal having a work function of less than 3 eV, disposing a second electrode in said flame at a level lower than said first electrode, biasing said second electrode with a negative direct current voltage, said first electrode having a direct current potential higher than said second electrode, and deriving a signal from said first electrode, which signal indicates whether a flame is present or not.

4,107,658

LIQUID LEVEL DETECTOR CIRCUITS

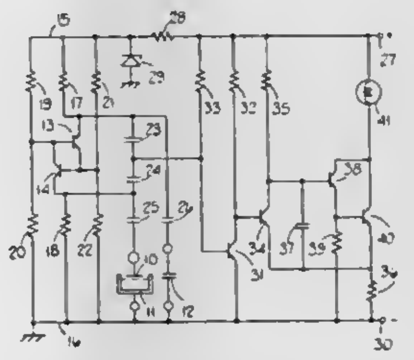
William Frank Hill, Stafford, and Thomas Nicol, Lichfield, both of England, assignors to Lucas Electrical Limited, Birmingham, United Kingdom

Filed Apr. 13, 1976, Ser. No. 676,608

Claims priority, application United Kingdom, Apr. 19, 1975, 16262/75

Int. Cl.² G08B *21/00*

U.S. Cl. 340—620 **6 Claims**



1. A liquid level detector circuit comprising:

first and second supply terminals for connection to opposite respective terminals of d.c. supply;

capacitive probe means having first and second terminals, said first terminal being connected to said first supply terminal;

reference capacitor means having first and second terminals, said first terminal being connected to said first supply terminal;

switch means having two terminals which are connected to the first and second supply terminals respectively and which are connected respectively to the second terminals of said capacitive probe means and said reference capacitor means, said switch means having a first condition in which a current path is established between the terminals of the switch means so that said second terminals of the capacitive probe means and the reference capacitor means are interconnected, and a second condition in which said current path is interrupted so that two different potentials are imposed on the second terminals of the capacitive probe means and the reference capacitor means respectively, whereby there is an excursion of the mean potential on said second terminals of said capacitive probe means and said reference capacitor means when the switch means change from their second condition to their first condition;

means connected to the second terminals of said capacitive probe means and said reference capacitor means to detect the mean potential on said second terminals; and

a warning circuit connected to the detecting means and sensitive to the sense of the excursion of the mean potential on said second terminals when said switch means change from their second condition to their first condition.

4,107,659

INTRUSION ALARM SYSTEM WITH IMPROVED AIR TURBULENCE COMPENSATION

Donald P. Massa, 280 Lincoln St., Hingham, Mass. 02043, assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., Trustees of The Stoneleigh Trust

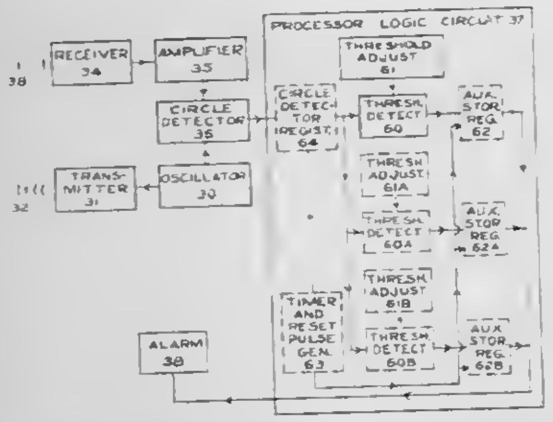
Filed May 5, 1976, Ser. No. 683,548

Int. Cl.² G08B *13/16*

U.S. Cl. 340—552 **18 Claims**

1. In an intrusion alarm system, means for radiating a signal

at a predetermined frequency into space, means for receiving the signal as it is reflected from a plurality of objects within the space, said received signal characterized in that it may be represented by a rotating phasor, said rotating phasor characterized in that it is the summation of a plurality of individual rotating component phasors, each representing a reflected signal from one of said plurality of objects, said rotating component phasors further characterized in that they represent two groups of reflected signals, a first group reflected from stationary objects, and a second group reflected from moving objects, said first group of reflected signals characterized in that they are represented by rotating component phasors whose average frequency of rotation is equal to the frequency of the transmitted signal, said second group of reflected signals characterized in that they are represented by rotating component phasors whose average frequency of rotation is different from the frequency of the transmitted signal by amounts corresponding to the rates of movements of said objects, said total rotating phasor further characterized in that the locus of the head of said total rotating phasor describes a quasi-circular path relative to the head of the summation of said first group of rotating component phasors, signal processing means for processing said received signal, said signal processing means including a circle detector for recognizing the presence of said quasi-circular paths in said total rotating phasor when they appear.



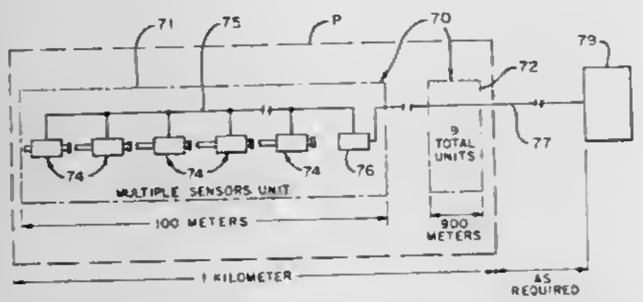
4,107,660
INTRUSION DETECTION SYSTEM

Thomas P. Chleboun, San Jose, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Nov. 3, 1970, Ser. No. 90,206

Int. Cl.² G08B ***21/00***

U.S. Cl. 340—566 **7 Claims**



1. A subterranean intrusion detection system comprising

an even numbered group of elongated sensors disposed in a single line in end-to-end relation at substantially the same depth below the earth's surface, each sensor being mechanically coupled to the earth for receiving pressure waves therefrom and comprising

a deformable hollow enclosure filled with an incompressible liquid,

a pressure responsive transducer in said liquid capable of converting pressure waves in said liquid into a unidirectional voltage, said transducer having two outputs of opposite polarity,

conductor means electrically connecting the outputs of said transducers in parallel with the polarities of the transducers of adjacent sensors reversed,

comparison means connected to said conductor means for comparing the transducer outputs of one polarity with the transducer outputs of opposite polarity and producing a signal when said outputs differ,

filter means connected to the output of said comparison means for receiving said signal from said comparison means, said filter means having passband characteristics whereby signals having frequencies within prescribed limits are transmitted and all others are blocked,

and means responsive to the output of said filter means for indicating an intrusion.

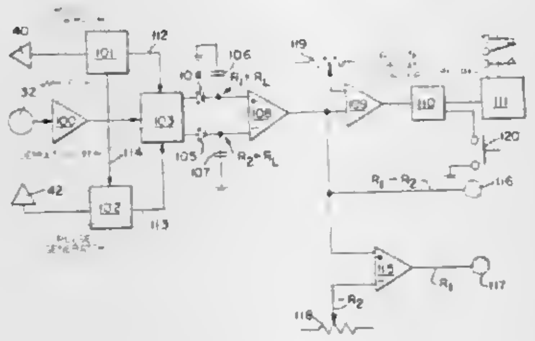
4,107,661
ELECTROOPTIC METER POINTER POSITION DETECTOR

Robert J. Crosby, Cleveland, Ohio, assignor to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

Continuation-in-part of Ser. No. 620,751, Oct. 8, 1975, abandoned. This application Aug. 17, 1976, Ser. No. 715,068

Int. Cl.² G08B ***21/00***

U.S. Cl. 340—688 **11 Claims**



1. A system adapted to be used in conjunction with a meter having a pointer and which detects the presence or absence of the pointer at some set point of the region normally traversed by the pointer during the operation of the meter, said system being operative independently of the operation of said meter and not affecting the same, said system comprising in combination: a meter including a meter face, a pointer mounted for movement across said meter face and detecting means including means to detect the presence or absence of said pointer at some set point along the path traversed by said pointer as it traverses said meter face, said detecting means comprising:

at least one and not more than two light emitting diodes positioned adjacent to said meter face and to one side of the set point position of said pointer and intermediate of the ends of said pointer;

a phototransistor positioned adjacent to said meter in a plane which includes a line which defines the set point position of said pointer;

means for pulsing said first light emitting diode so as to cause radiation from said light emitting diode to fall on said meter face and said pointer simultaneously and to be reflected from said meter face and said pointer onto said phototransistor whereby a signal is generated indicative of said reflected radiation and hence indicative of the position of said pointer;

wherein the means to pulse said light emitting diode is a buffer amplifier feeding said light emitting diode the information which said phototransistor sees, causing the system to regenerate and oscillate until the reflect light to said phototransistor is obscured by said pointer, at which time the oscillation ceases:

and containing in addition a bootstrap amplifier for the signal generated by said phototransistor whereby the sensing circuit is rendered insensitive to ambient light, but remains capable of seeing said reflected radiation of said light emitting diode.

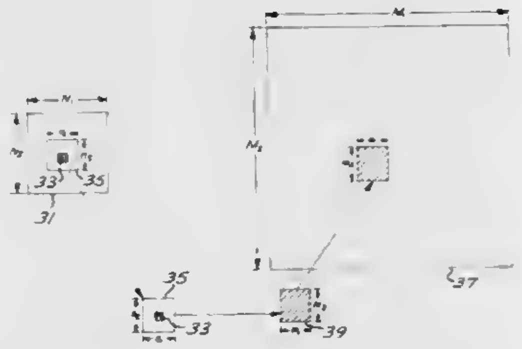
4,107,662
CHARACTER GENERATOR FOR VISUAL DISPLAY DEVICES

Hirohido Endo, Cupertino; Fumiyuki Inose, San Jose, and Akio Komatsu, Cupertino, all of Calif., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,390

Int. Cl.² G06K ***15/20***

U.S. Cl. 340—324 AD **17 Claims**



1. A character generator for display devices, comprising:

memory means for storing character patterns, each pattern being an $N_1 \times N_2$ matrix of binary data bits;

means for reading said $N_1 \times N_2$ matrix out of said memory means, line by line;

means for storing a plurality of the lines of the $N_1 \times N_2$ matrix read from memory in serial fashion, the length of said storing means being sufficient to store at least twice the number of bits required for generating the display bits required for one scan line on the display device;

means for extracting an $n_1 \times n_2$ matrix of binary data bits for each bit stored in said serial storing means; and

means for generating an $m_1 \times m_2$ matrix of binary data bits in response to said $n_1 \times n_2$ matrix, said $m_1 \times m_2$ matrix defining said bit expanded to its display size.

4,107,663
OPERATION STATE DISPLAY APPARATUS

Katsuhide Morimoto; Masaji Matsumura; Nobuharu Yamauchi, all of Amagasaki; Haruo Koyanagi, Musashi-Murayami; Iwao Sato, Komae; Buhei Yasuhara, and Jiro Sakai, both of Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Nissan Motor Company, Limited, both of, Japan

Filed Mar. 5, 1975, Ser. No. 555,597

Claims priority, application Japan, Mar. 26, 1974, 49-34096; Mar. 26, 1974, 49-24097

Int. Cl.² G06F ***3/14***

U.S. Cl. 340—324 AD **4 Claims**

1. An operation state display apparatus comprising:

a start input signal line for receiving a start signal,

a first input signal line for receiving a first input signal having on and off states representing the operation state of a first controlled object,

a second input signal line for receiving a second input signal having on and off states representing the operation state of a second controlled object,

a pulse generator for generating pulse trains at a predetermined cycle,

a first counter circuit,

a first gate circuit which assumes its on state when the first input signal is in the on state and its off state when the first input signal is in the off state,

a second gate circuit which assumes its on state when the first input signal is in the on state and its off state when the first input signal is in the off state,

a third gate circuit which assumes its on state when the second input signal is in the on state and its off state when the second input signal is in the off state,

a fourth gate circuit which assumes its on state when the second input signal is in the on state and its off state when the second input signal is in the off state,

a first register,

a second register,

a second counter circuit,

a third counter circuit,

a control circuit means,

a memory for storing signals representative of the period of time lapse from an operation initiation reference time when the first or second input signal changes from its off state to its on state or from its on state to its off state,

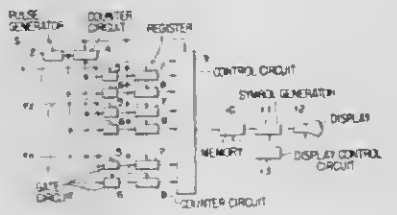
a symbol generator,

a display control circuit means,

a display for displaying in the form of a time chart the operation state of the first and the second controlled objects,

means connecting the start input signal line to a second input of the first counter circuit, to a second input of the first register, to a second input of the second counter circuit, to a second input of the second register, to a second input of the third counter circuit and to a first input of the control circuit,

means connecting the output of the pulse generator to a first input of the first counter circuit, to a first input of the second gate circuit and to a first input of the fourth gate circuit,



means connecting the output of the first counter circuit to a second input of the control circuit, to a first input of the first gate circuit and to a first input of the third gate circuit,

means connecting the first input signal line to a second input of the first gate circuit and to a second input of the second gate circuit,

means connecting the second input signal line to a second input of the third gate circuit and to a second input of the fourth gate circuit,

means connecting the output of the first gate circuit to a first input of the first register,

means connecting the output of the second gate circuit to a first input of the second counter circuit,

means connecting the output of the third gate circuit to a first input of the second register,

means connecting the output of the fourth gate circuit to a first input of the third counter circuit,

means connecting the output of the first register to a third input of the control circuit,

means connecting the output of the second counter circuit to a fourth input of the control circuit,

means connecting the output of the second register to a fifth input of the control circuit,

means connecting the output of the third counter circuit to a sixth input of the control circuit, means connecting the output of the control circuit to a first input of the memory,

means connecting the output of the memory to a first input of the symbol generator,

means connecting the output of the symbol generator to a first input of the display,

means connecting a first output of the display control circuit to a second input of the memory,

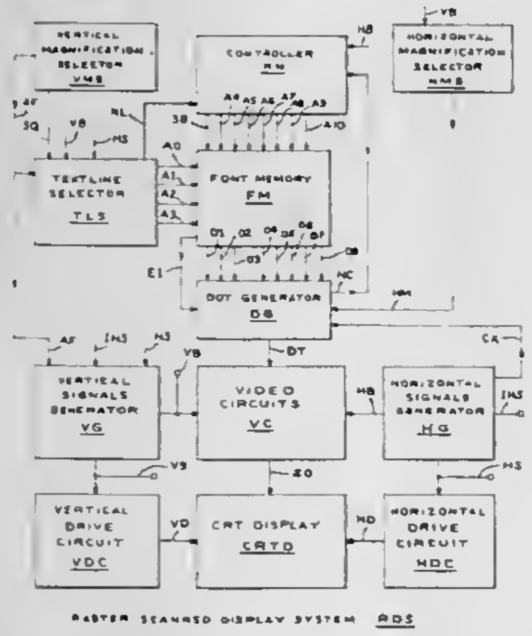
means connecting a second output of the display control circuit to a second input of the symbol generator,

means connecting a third output of the display control circuit to a second input of the display,

said control circuit means functioning to supply the memory with the data contained in the first and second registers and the second and third counters at addresses in the memory corresponding to either the first input signal or the second input signal,

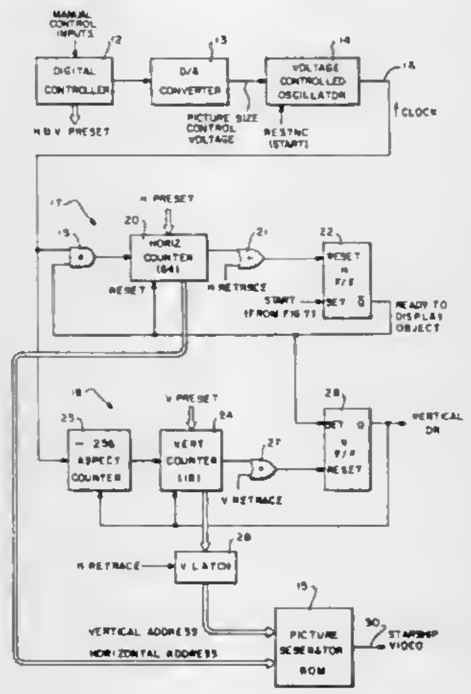
said display control circuit means functioning to cause the memory to deliver periodically data contained therein to the symbol generator, to cause the symbol generator to generate periodically symbols representative of the data supplied thereto by the memory and to cause the display to display the symbols supplied thereto on a continuous basis by the symbol generator to form a time chart showing the operation state of the first and the second controlled objects.

4,107,664
RASTER SCANNED DISPLAY SYSTEM
Francis C. Marino, Dix Hills, N.Y., assignor to Burroughs Corporation, Detroit, Mich.
Filed Jul. 6, 1976, Ser. No. 702,538
Int. Cl.^{2} G06K *15/20*
U.S. Cl. 340—324 AD **8 Claims**


VERTICAL MAGNIFICATION SELECTOR VMS
CONTROLLER RM
HORIZONTAL MAGNIFICATION SELECTOR HMS
TEXTLINE SELECTOR TLS
FONT MEMORY FM
DOT GENERATOR DG
VERTICAL SIGNALS GENERATOR VG
VIDEO CIRCUITS VC
HORIZONTAL SIGNALS GENERATOR HG
VERTICAL DRIVE CIRCUIT VDC
CRT DISPLAY CRTD
HORIZONTAL DRIVE CIRCUIT HDC
RASTER SCANNED DISPLAY SYSTEM RDS

1. In a display system wherein a beam is intensity modulated while scanning a record medium to display graphics and wherein the display system includes means for selectively perform sequential or interlaced scans of parallel display lines, apparatus for controlling the intensity modulation of the beam comprising: storing means for storing indicia associated with matrices of dots representing graphics wherein each row of dots of each matrix is stored in an addressed register of the storing means and the rows of dots of each matrix are stored in sequentially addressed registers; graphic selection means for generating a first portion of an address representing a desired graphic; row selection means for generating a second portion of said address representing a presently desired row of dots of the matrix of the desired graphic; and receiving means for receiving the indicia stored in the register indicated by said row selection means and said graphic selection means for controlling the intensity of the beam in accordance with the pattern of dots represented by said indicia; said row selection means including means for sequentially changing by one unit the second portion of said address for each subsequent display line when a sequential scan is being performed and for sequentially changing by two units the second portion of said address for each subsequent display line when an interlaced scan is being performed.

4,107,665
APPARATUS FOR CONTINUOUS VARIATION OF OBJECT SIZE ON A RASTER TYPE VIDEO SCREEN
Steven T. Mayer, Auburn, and Ronald E. Milner, Grass Valley, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.
Filed Jun. 23, 1977, Ser. No. 809,314
Int. Cl.^{2} G06K *15/20*
U.S. Cl. 340—324 AD **10 Claims**



1. Apparatus for continuous variation of object size on a raster type video screen comprising: control means for determining the movement of said objects on said video screen; variable oscillator means responsive to said control means for generating a signal having a period proportional to the object size as determined by said control means; picture memory means for storing an object having a predetermined number of addressable horizontal lines; counter means driven by said signal from said oscillator means for generating addresses for said picture memory means; vertical latch means for sensing during a horizontal retrace interval of said raster the address contained in said counter means and causing said corresponding addressable line to provide video data on the next horizontal line of said raster whereby if said period is less than the vertical scan rate of said raster said vertical latch means will asychronously cause some addressable lines of said object to be skipped to therefore display a smaller object.

4,107,666
VARIABLE PULSE DISTRIBUTION ELECTRO-OPTICAL SYSTEM
Ernest M. Ward, El Paso, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 10, 1977, Ser. No. 759,225
Int. Cl.^{2} G08B *5/00;* H05B *37/00*
U.S. Cl. 340—331 **6 Claims**

1. A variable pulse distribution system for testing radiant energy seekers comprising:

means for providing repetitive trigger pulses;

a first radiant energy source for radiating energy when in receipt of a first activation signal;

a second radiant energy source for radiating energy when in receipt of a second activation signal;

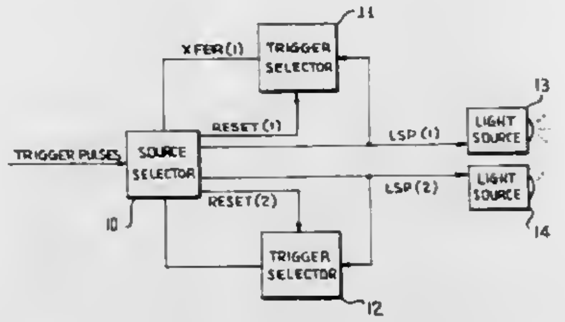
controllable source selector means for alternatively supplying said trigger pulses to said first and second radiant energy sources;

first trigger selector means including: a first pulse counter for counting trigger pulses supplied to said first radiant energy source; and first pre-set means for providing a first control pulse to said source selector means when said first counter attains a first pre-selected count; and

second trigger selector means including: a second pulse counter for counting trigger pulses applied to said second radiant energy source; and second pre-set means for providing a second control pulse to said source selector means when said second counter attains a second pre-selected count;

wherein said first and second pre-selected counts are independently adjustable; and

wherein said source selector means comprises means responsive to said first control pulse for supplying subsequent trigger pulses to said second radiant energy source and responsive to said second control pulse for supplying subsequent trigger pulses to said first radiant energy source.



4,107,667
DUAL SLOPE ANALOG-TO-DIGITAL CONVERTER WITH UNIQUE COUNTING ARRANGEMENT
John W. Kronlage, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 22, 1976, Ser. No. 743,900
Int. Cl.^{2} H03K *13/02, 13/20;* G01K *7/00*
U.S. Cl. 340—347 NT **33 Claims**

1. A dual slope analog-to-digital converter comprising:

(a) an integrator circuit having input and output means;

(b) controllable switch means coupled to the input means of said integrator circuit for selectively switching an analog voltage representing a measured parameter and a reference voltage representing the full scale of said measured parameter alternately to the input means of said integrator circuit, said integrator circuit for producing a ramp voltage in one direction when the analog voltage representing the measured parameter is applied to the input means thereof and produces a ramp voltage in the opposite direction when the reference voltage is applied to the input means thereof;

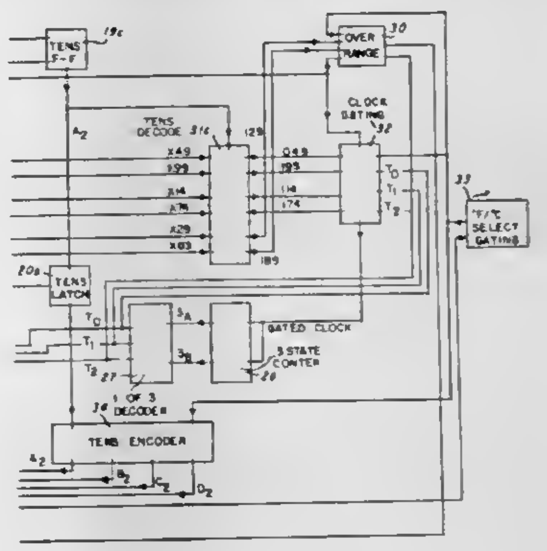
(c) comparator means coupled to the output means of said integrator circuit for producing a logic signal when the integrator ramp voltage crosses a predetermined threshold voltage;

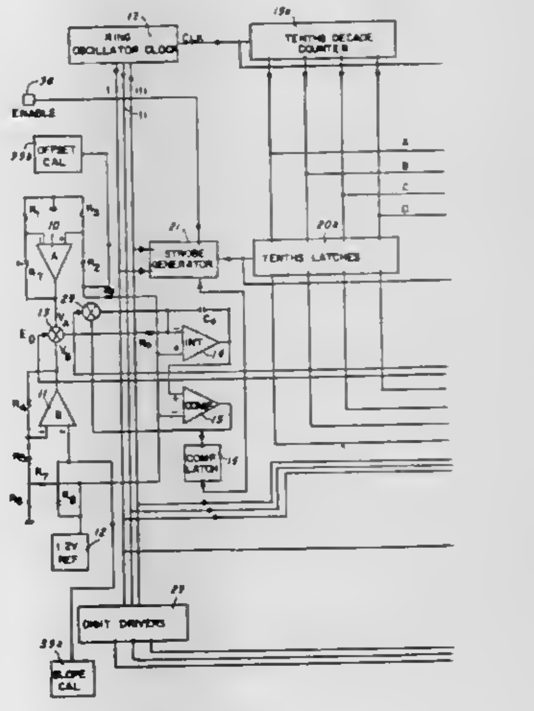
(d) oscillator means for generating a clock pulse signal;

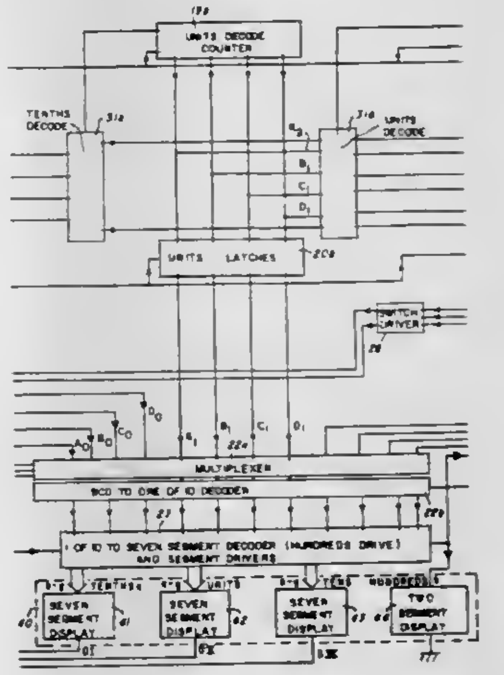
(e) decade counter means having a plurality of binary coded decimal stages coupled to said oscillator means for counting the pulses of said clock pulse signal and for generating a binary coded decimal output signal indicative of said count;

(f) transfer means coupled to said comparator means and to said counter means for transferring the counter value from said counter means each time said logical signal is generated, said transferred counter value being indicative of the binary boded decimal representation of said measured parameter; and

(g) control means coupled to said counter means and to said controllable switch means for controlling said controllable switch means to apply the analog voltage representing the measured parameter to said integrator means for a first predetermined time period represented by said counter means counting from a first counter value to a second counter value and for applying said reference voltage to







the input means of said integrator circuit for a second predetermined time period represented by said counter means counting from said second counter value to a third counter value, said second counter value being selected so that a plurality of the lowest order digits thereof are equivalent to the respective lowest order digits of the minimum value of the parameter being measured, wherein each count represents a unit of the parameter being measured whereby the binary decimal equivalent of the lowest order digits of the parameter being measured are directly readable from respective stages of said decade counter means.

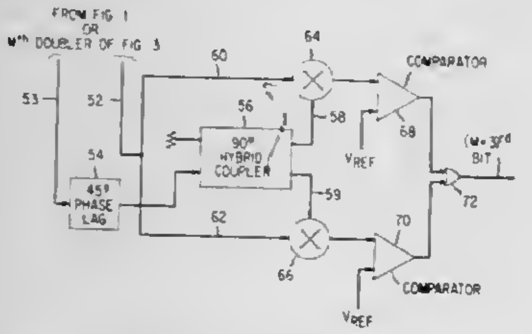
4,107,668
HIGH-SPEED ANALOG-TO-DIGITAL CONVERTER

Paul Shala Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 15, 1977, Ser. No. 815,820

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **4 Claims**



1. An additional bit generator for use in an analog-to-digital converter arrangement which converts an analog input signal to a multibit digital output signal, the arrangement comprising a phase modulator capable of generating a phase-modulated output signal derived from the modulation, by the analog input signal, of a carrier signal having a frequency which is higher than the highest frequency included in the analog input signal, and means for generating a first and a second bit of the converter multibit digital output signal from the phase relationship between the fundamental harmonic of the phase-modulated output signal and each of a quadrature and in-phase sample of the fundamental harmonic of the carrier signal; the additional bit generator comprising

means for both introducing a 45° phase lag in the carrier signal and generating an output signal representative of the phase lagged signal;

second means for generating a first and a second sample of said phase lag introduction means output signal which samples differ in phase by substantially 90° from each other;

a first and a second phase detector for determining the phase relationship between the output signal from said linear phase modulator and said first and second samples of said phase lag introduction means, respectively;

a first and a second comparator coupled to the output of said first and second phase detector, respectively, and to a predetermined reference potential for comparing the output signal from the associated phase detector with said reference potential, each comparator generating an output signal having a first binary value when the magnitude of the associated phase detector output signal is greater than said reference potential and a second binary value when the magnitude of the associated phase detector output signal is less than said reference potential; and

third means for generating an output signal representative of the Exclusive-OR function of the combined output signals from said first and second comparators, said output signal corresponding to the additional bit in the converter multibit digital output signal.

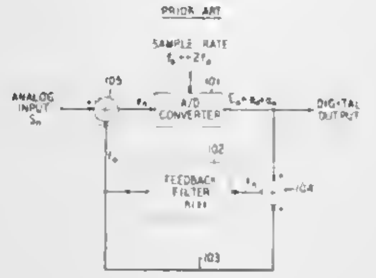
4,107,669
APPARATUS FOR ANALOG TO DIGITAL CONVERSION

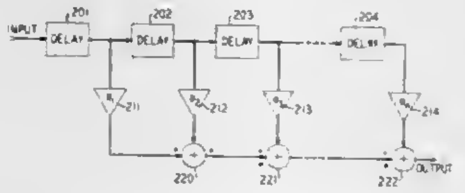
Stuart Keene Tewksbury, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 608,524, Aug. 28, 1975, Pat. No. 4,017,849. This application Jan. 3, 1977, Ser. No. 756,539

Int. Cl.² H03K *13/01*

U.S. Cl. 340—347 AD **5 Claims**





1. In a differential pulse code modulation encoder including means for converting an analog input signal into a digital output signal, a decoder for reconverting said output signal to a good prediction of said input signal, said decoder comprising

(1) first means including an N stage delay line having output taps 1 through N for receiving said output signal,

(2) N attenuators having attenuation coefficients a_1-a_n connected to respective ones of said output taps,

(3) second means for algebraically summing the outputs of said attenuators to form said good prediction, and

(4) third means for feeding back said good prediction to said first means, wherein said attenuation coefficients satisfy the relationship

$$a_i = \frac{(-1)^{i+1} N!}{(N-i)!\, i!},\ i = 1,2 \ldots N.$$

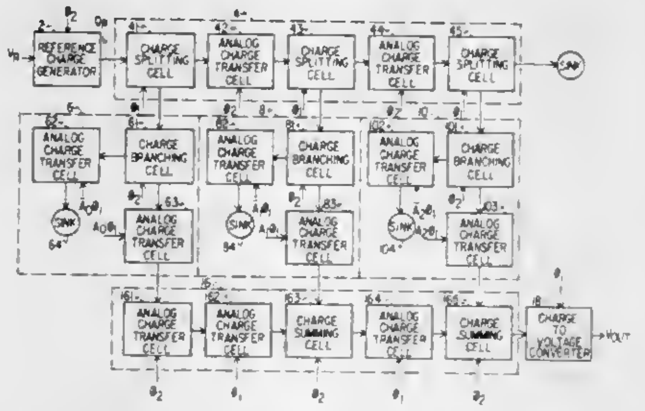
4,107,670
CHARGE COUPLED DIGITAL TO ANALOG CONVERTER

Thomas Hornak, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 19, 1976, Ser. No. 677,955

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **7 Claims**



1. A digital to analog converter comprising:

means for producing a reference charge;

charge dividing means coupled to receive the reference

charge for producing a plurality of binary weighted charge portions;

charge gating means coupled to receive the plurality of binary weighted charge portions and an applied digital signal having a plurality of bits for gating each of the plurality of binarily weighted charge portions in response to one value of the corresponding bit of the applied digital signal to thereby select it and for gating each of the plurality of binarily weighted charge portions in response to the other value of the corresponding bit of the applied digital signal to thereby sink it; and

charge summing means coupled to receive the selected binarily weighted charge portions and sum them to thereby generate a corresponding output analog quantity.

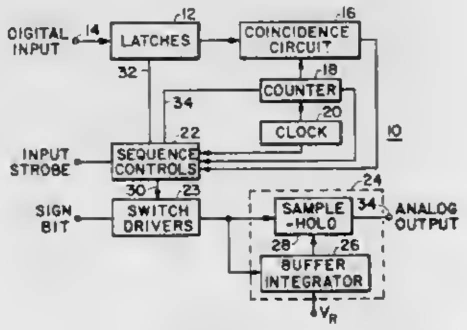
4,107,671
IMPROVED DIGITAL TO ANALOG CONVERTER PROVIDING SELF COMPENSATION TO OFFSET ERRORS

Robert Charles Huntington, Phoenix, Ariz., and James Everett Cooper, Jr., Woodland Hills, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1976, Ser. No. 719,550

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **7 Claims**



1. Apparatus for converting an input digital signal into an analog output signal, comprising:

means receiving the input digital signal for storing the same during a conversion cycle;

counter means for producing digital signals;

comparator means for comparing the stored input digital signal and said digital signals produced by said counter means to provide an output signal therefrom upon coincidence occurring therebetween;

integrator means receiving a single polarity reference voltage for integrating the same during said conversion cycle such that an analog signal is produced at the output of said integrator means which is representative of both the magnitude and polarity of the stored input digital signal, said integrator means including a buffer circuit, first charge storage means, and an integrator circuit;

sample and hold circuit means for sampling the analog signal appearing at said output of said integrator means during predetermined times during said conversion cycle and then holding the value of said sampled analog signal to provide the analog output signal at an output thereof;

control circuit means responsive to an applied input signal for initiating said conversion cycle and for selectively enabling and disabling said counter means, said integrator means and said sample and hold circuit means during distinct portions of said conversion cycle, said control circuit means causing said buffer circuit, said first charge storage means and said integrator circuit to be coupled in a first configuration during a first portion of said conversion cycle such that said reference voltage is applied thereto to charge said first charge storage means, the polarity of said charge across said first charge storage means being in accordance with the polarity of said stored input digital signal, said control circuit means causing said counter means to be activated during a second portion of said conversion cycle, said control circuit means causing said buffer circuit, said first charge storage means and said integrator circuit to be coupled in a second configuration during said second portion of said conversion cycle such that said charge across said first charge storage means is integrated by said integrator circuit to produce said analog signal, said control circuit means being responsive to said output signal from said comparator means to terminate said second portion and to initiate a third portion of said conversion cycle, said control circuit means causing said first charge storage means and said buffer circuit to be decoupled from said integrator circuit during said third portion such that the value of said analog signal appearing at said output of said integrator means is maintained during said third portion of said conversion cycle; and

said control circuit means selectively coupling and then decoupling said sample and hold circuit means to said integrator means during said third portion and said first and second portions respectively of said conversion cycle.

4,107,672
APPARATUS AND METHOD FOR DETECTING CRACKS IN THE HEAT-INSULATING LINING OF A CONTAINER FOR COLD LIQUIDS

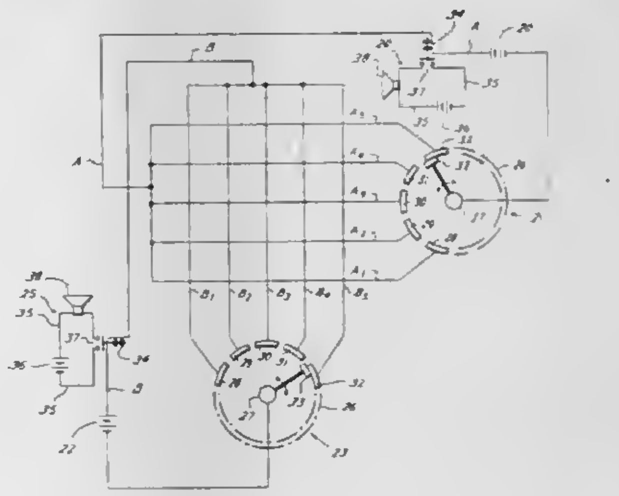
Arnoldus J. Van Riemsdijk, and Willem P. Hendal, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Jan. 15, 1976, Ser. No. 649,562

Claims priority, application Netherlands, Jan. 22, 1975, 00739/75

Int. Cl.² G08B *13/21*

U.S. Cl. 340—605 **32 Claims**



1. A heat-insulated container apparatus for storage or transport of cold liquids having a rigid wall structure with a lining of heat-insulating material on the interior surface wall structure, wherein the improvement comprises:

frangible electrical conductor means incorporated in the heat-insulating material; and

detector means linked with the conductor means to detect breakage in the electrical conductor means caused by cracks in the heat-insulating material attaining a critical length.

4,107,673

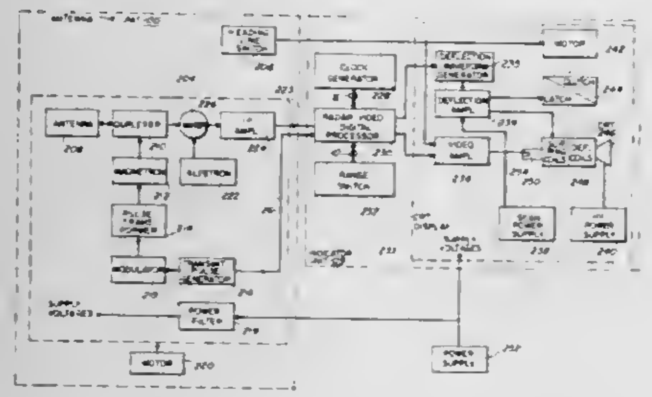
RADAR SYSTEM WITH IMPROVED BRIGHTNESS AND RESOLUTION

Fritz A. Gross; William M. Pease, both of Weston; John E. Meade, Lexington, and Harry Vickers, Oakham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 612,882, Sep. 12, 1975, abandoned, which is a continuation of Ser. No. 413,130, Nov. 5, 1973, abandoned. This application Dec. 29, 1976, Ser. No. 755,320

Int. Cl.² G01S *7/06*

U.S. Cl. 343—5 DP **25 Claims**



1. In combination:
means for storing digital representations corresponding to a plurality of ranges of a radar return signal;
means for writing said representations into said storing means in a first time period;
means for reading out said representations in a second time period, said second time period being greater than said first time period for the shorter ranges of a radar range setting and said second time period being constant for at least some ranges of said radar range setting; and
means for displaying said signal, said displaying means being coupled to said reading out means.

4,107,674

COLLISION AVOIDANCE SYSTEM FOR AIRCRAFTS

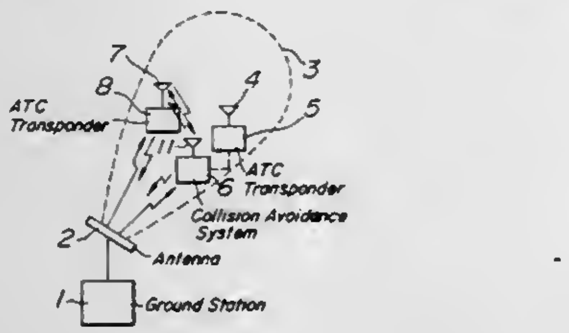
Chuhei Funatsu, Yokahama, and Toshikiyo Hirata, Samukawa, both of Japan, assignors to Toyo Tsushinki Kabushiki Jaka Toyo Communication Equipment Co. Ltd., Kawasaki, Japan

Filed Aug. 13, 1976, Ser. No. 714,335

Claims priority, application Japan, Aug. 15, 1975, 50-99674

Int. Cl.² G01S *9/56*

U.S. Cl. 343—6.5 R **11 Claims**



1. A collision avoidance system for aircraft each equipped with an ATC transponder comprising;
an interrogation station mounted on one aircraft, having secondary surveillance radar function emitting an interrogation signal to be responded to by the ATC transponder of a second aircraft,
coarse detection means on said one aircraft for detecting the existence of the second aircraft in proximity to said one aircraft, and
output control means for altering at least one of output power and transmission period of the interrogation signal so as to effect fine detection of said second aircraft when said coarse detection means delivers a signal representing information concerning said second aircraft which exceeds a certain value.

4,107,675

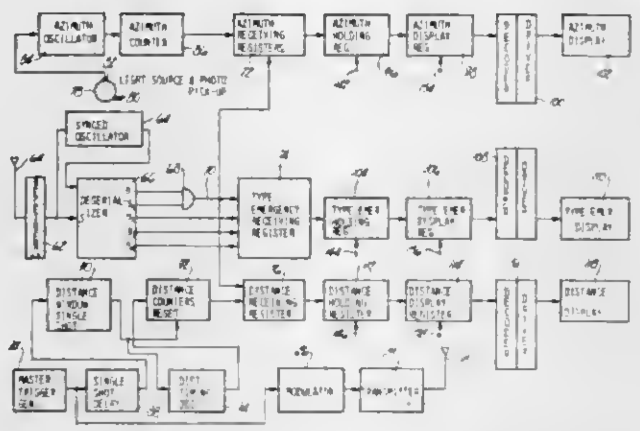
TRANSPONDER-RESPONDER SYSTEM

John C. Sellers, 8702 Morton Ave., Brooklyn, Ohio 44144, and James A. Romanauski, 8800 Farbar, Kirtland, Ohio 44094

Filed Mar. 4, 1977, Ser. No. 774,520

Int. Cl.² G01S *9/56*

U.S. Cl. 343—6.5 LC **7 Claims**



1. A transponder-responder system comprising a home station and at least one remote station, said home station having means for transmitting a periodic interrogation pulse via a directional antenna and means for varying the rotational position of said antenna,
said remote station comprising means for receiving said interrogation pulse, means for transmitting an encoded signal is response to the receipt of said interrogation pulse, and means for varying the encoding of said encoded signal, and
said home station further comprising means for receiving said encoded signal, means for decoding said encoded signal, means for determining the elapsed time between the transmission of the last interrogation pulse and the receipt of said encoded signal, means for determining the rotational position of the directional antenna and means for storing two encoded signals from two remote stations, said storing means further comprising a receiving register for storing the rotational position of said antenna, the decoded signal and said elapsed time upon the receipt of said encoded signal, the output of each receiving register being connected to the input of a holding register, the output from each holding register being connected to the input of a display register and means for displaying the contents of each display register, and upon receipt of two successive encoded signals by the home station, means for automatically loading the display registers with information pertinent to the first received encoded signal and for automatically loading the holding registers with information pertinent to the second received encoded signal.

4,107,676

TRANS-HORIZON NAVIGATION SYSTEM

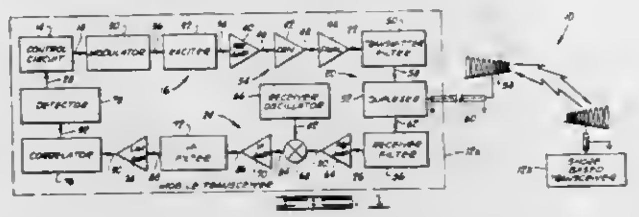
James W. Lassiter, P.O. Box 158, Ocala, Fla. 32617

Filed Nov. 2, 1977, Ser. No. 847,766

Int. Cl.² G01S *9/56, 9/04*

U.S. Cl. 343—6.5 R **10 Claims**

1. In a trans-horizon navigation system, the improvement comprising:
a first transceiver comprising:
a modulator providing a modulation code comprised of a predetermined sequence of control pulses, each of said control pulses having a predetermined one of mutually exclusive first and second states;
an exciter connected to the modulator, the exciter receiving the modulation code and providing a phase-modulated RF signal having a first phase in response to a received control pulse in the first state and a second phase in response to a received control pulse in the second state;
transmitting means connected to the exciter for receiving the phase-modulated RF signal and for transmitting the received phase-modulated RF signal; and
a second transceiver comprising:
receiving means for receiving the transmitted phase-modulated RF signal and for providing the received phase-modulated RF signal;
a receiver oscillator providing an RF signal having a predetermined frequency relative to the frequency of the phase-modulated RF signal;



a mixer connected to the receiving means and to the receiver oscillator, the mixer receiving the received phase-modulated RF signal and the RF signal, and providing an IF signal having a frequency proportional to the difference in frequency between the frequency of the received phase-modulated RF signal and the frequency of the RF signal; and
a correlator connected to the mixer and responsive to the predetermined sequence of control pulses comprising the modulation code, the correlator receiving the IF signal, detecting the correlation between the received IF signal and the predetermined sequence of control pulses, and providing a correlation signal proportional to the detected correlation, whereby a correlation signal of significant amplitude is indicative of a received phase-modulated RF signal.

4,107,677

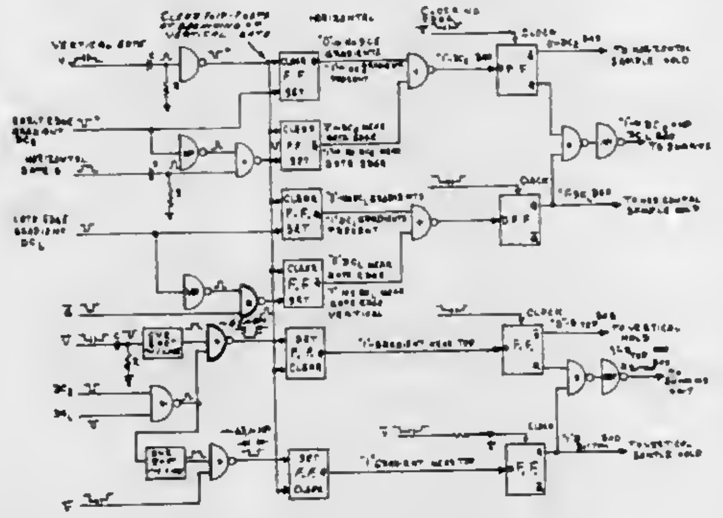
GATE TRACKING TECHNIQUE UTILIZING DIMENSION MEMORY

Robert Zwirn, Encino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1972, Ser. No. 274,540

Int. Cl.² G01S *9/02*

U.S. Cl. 343—7 A **4 Claims**



1. A target tracking apparatus to track and measure the dimensions of a target comprising in combination:
means for measuring the target extremities, said measuring means providing a gate to enclose said target, said measuring means generating a horizontal and a vertical voltage ramp, said horizontal and vertical voltage ramps defining the field of view of said target, said horizontal voltage ramp defining said target's left leading and right trailing edges, said vertical voltage ramp defining said target's upper leading and lower trailing edges, said horizontal and vertical voltage ramps provide four analog voltages, V_{T_L}, V_{T_R}, V_{T_T} and V_{T_B} which define the target extremities,
a dimension and center processor unit receives said four analog voltages, V_{T_L}, V_{T_R}, V_{T_T} and V_{T_B} and stores their values, said dimension and center processor unit processes said four analog voltages to determine the center of said target, said dimension and center processor unit processes said four analog voltages to determine the locations of said target's extremities, said dimension and center processor unit generates gate size and position command signals relative to said target, and,
a tracking logic unit for controlling said dimension and center processor unit, said tracking logic unit determining when a part of said target extends beyond said gate, said tracking logic unit adjusting said gate size to enclose said target, said tracking logic unit commanding said dimension and processor unit to enclose said target.

4,107,678

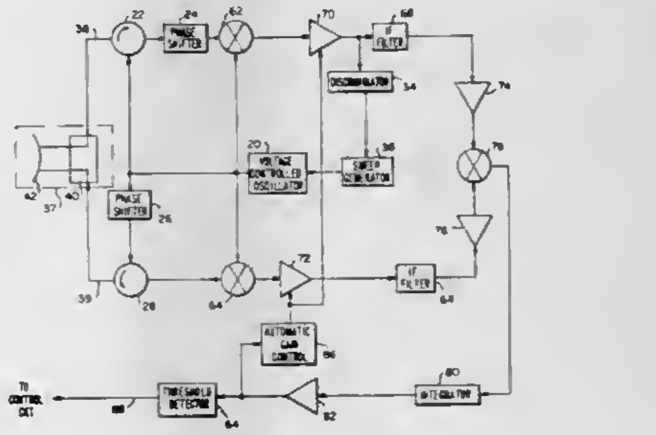
POLARIZATION CORRELATION TARGET SEEKER

Norman F. Powell, Ilchester, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1976, Ser. No. 727,506

Int. Cl.² G01S *9/02;* F41G *7/00;* H04B *7/10*

U.S. Cl. 343—7 ED **19 Claims**



1. A seeker circuit comprising:
means for generating an illumination signal;
means for mixing first and second polarized return signals with the illumination signal to provide first and second intermediate frequency signals bounded by a predetermined bandwidth;
means for cross-correlating the first and second intermediate frequency signals of said mixing means to provide a cross-correlation product signal; and
means for comparing a target threshold level in relation to the cross-correlation product signal of said cross-correlating means to provide a control signal.

4,107,679

FREQUENCY MODULATOR FOR HIGH-PRECISION RANGE MEASUREMENTS

Raymond Strauch, Viroflay, and Michel Riffiod, Paris, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Mar. 14, 1977, Ser. No. 777,110

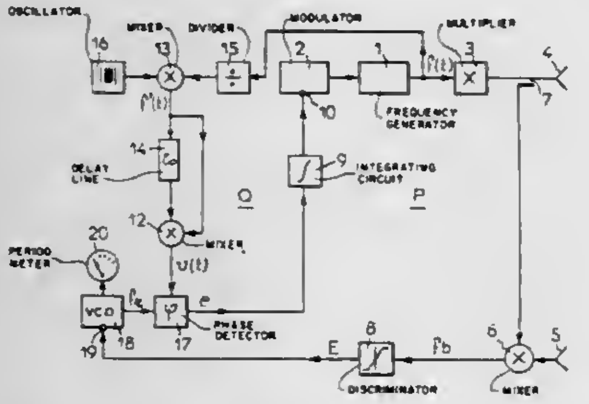
Claims priority, application France, Mar. 12, 1976, 76 07058

Int. Cl.² G01S *9/26*

U.S. Cl. 343—7.5 **4 Claims**

1. A range measuring apparatus, particularly for altitude measurements, comprising a generator controlled by a modulator for supplying a signal whose frequency is linearly modu-

lated, means for emitting towards a target a wave which corresponds to the signal of said generator, means for receiving the wave reflected by the target, means for forming a beat signal between the signals which correspond to the transmitted and received waves, means for forming an error signal which corresponds to the frequency variation between the frequency of the beat signal and a fixed frequency, means for forming a permanent second beat signal between two signals which are obtained from said generator and one of which is delayed by a delay line, a phase detector which receives said second beat signal and a signal from a controlled frequency oscillator, wherein the output signal of the phase detector controls the slope of the modulation signal supplied by the modulator while said error signal controls the frequency of the signal of said oscillator.



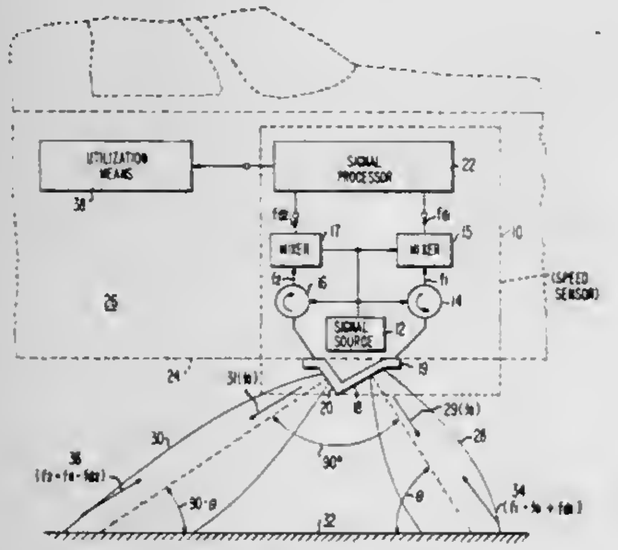
4,107,680
DIGITALLY PROCESSED RADAR SPEED SENSOR

Gerald Stanley Kapian, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,777

Iot. Cl.^{2} G01S *9/46;* H01Q *1/32, 21/00*

U.S. Cl. 343—8 **5 Claims**



1. In a Doppler speed sensor of the type for sensing motion of a vehicle parallel to a surface including a signal source for generating a signal of predetermined frequency, an antenna network for radiating said predetermined frequency signal as probe signals in predetermined directions to impinge on said surface, said antenna network further receiving portions of said probe signals reflected from said surface, said reflected signal portions being Doppler shifted in frequency from said predetermined frequency by an amount in accordance with the relative velocity of said signal source on said vehicle with respect to said surface, said speed sensor further including a signal processor responsive to said received signal portions and a signal indicative of said probe signals for producing a signal indicative of said relative velocity, the improvement wherein:

said antenna network comprises first and second antennas and means for maintaining the principle axes of the respective radiation patterns of said first and second antennas disposed 90° apart,

said antenna network means including means for mounting said antennas on said vehicle at a mounting angle relative to said vehicle such that said respective probe signals from said antennas impinge on said surface, and

said signal processor comprises means, responsive to said received reflected signals from said first and second antennas, for generating a signal indicative of a root mean square value of said Doppler frequency shifts,

whereby said signal is independent of any angle of mounting of said antennas to said vehicle and also independent of any angle of tilt of said vehicle.

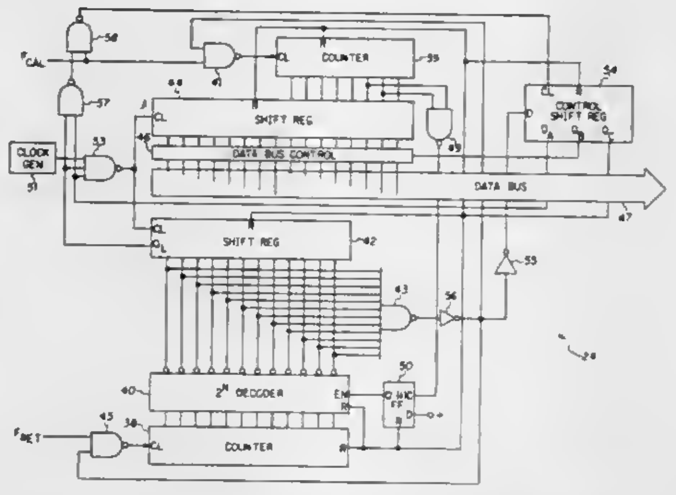
4,107,681
METHOD AND APPARATUS FOR AUTOMATICALLY ADJUSTING THE RESOLUTION OF A RADIO ALTIMETER OVER ITS OPERATING ALTITUDE RANGE

Roy E. Robertson, and Robert J. Weber, both of Marion, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 26, 1977, Ser. No. 800,685

Int. Cl.^{2} G01S *9/28*

U.S. Cl. 343—12 A **9 Claims**



3. A method for automatically adjusting the resolution of a CWFM radio altimeter over a range of altitudes comprising:

producing pulses having a period relatable to the altitude to be measured,

counting said altitude related pulses,

generating time referenced pulses,

counting said time reference pulses in a counter,

producing a signal when at least a predetermined minimum number of time reference pulses are counted,

continuing to count said reference pulses until the count of said related pulses reaches a power of the number base of said second counter,

determining a next occurring power of the number base of said counter of said altitude related pulses after said signal is produced,

and dividing by the base raised to said power the count of said time reference pulses existing in said counter when said power is reached.

4,107,682
SYSTEM FOR OVERCOMING THE EFFECT OF ELECTRONIC COUNTERMEASURES

Robert J. Boucher, Los Angeles, and Robert L. Brackney, Jr., Whittier, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 5, 1967, Ser. No. 629,864

Int. Cl.^{2} G01S *7/36, 9/22*

U.S. Cl. 343—16 M **7 Claims**

1. A radar system comprising

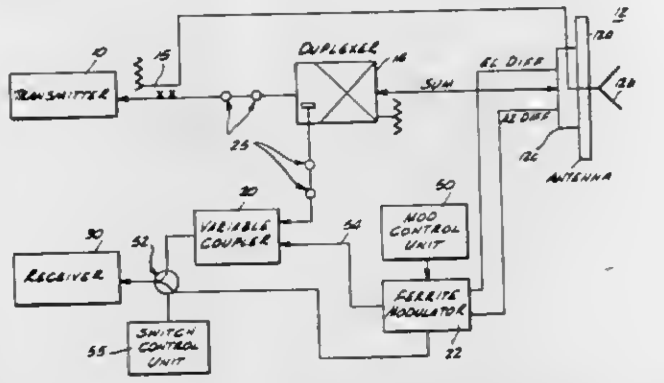
an antenna defining four quadrants;

a transmitter;

means for transmitting energy from said transmitter through said antenna, with the energy in said four quadrants in phase;

a receiver adapted to receive energy patterns received by said antenna; and

control means interposed between said receiver and said antenna and including microwave switching means, controllable by said control means to couple said receiver to said antenna to receive, in a conventional mode of reception, sum energy which is a function of the energy received in said four quadrants in phase, a first energy difference between the energy received in two quadrants defining the upper portion of said antenna and the energy received between two other quadrants defining the lower portion of said antenna, and a second energy difference between the energy received by two quadrants defining the right half of said antenna and the energy réceived by the other two quadrants defining the left half of said antenna, said control means further controlling said microwave switching means to couple said receiver to said antenna in a countering reception mode to receive energy which includes at least one of said energy differences.



4,107,683
DEVICE FOR CONTROLLING THE CONICAL SCANNING FREQUENCY FOR CONICAL SCANNING RADAR SYSTEMS

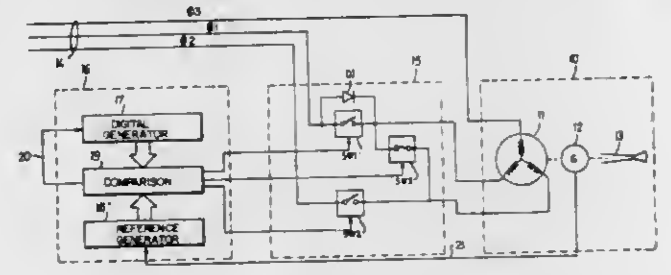
Filippo Neri, and Alfredo Albrande, both of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Italy

Filed Mar. 15, 1977, Ser. No. 777,813

Claims priority, application Italy, Sep. 16, 1976, 51310 A/76

Int. Cl.^{2} G01S *7/36*

U.S. Cl. 343—18 E **3 Claims**



1. In a device for controlling the conical scanning frequency of a conical scanning radar system, wherein an antenna illuminator is caused to revolve by means of a three-phase asynchronous rotary field motor and comprising control means to change in an incoherent manner the angular frequency of conical scanning, the improvement in which said control means comprise a reference generator coupled to said asynchronous motor, a random or pseudo-random signal generator, and a comparison circuit for comparing the signal of said reference generator and the signal of said signal generator, said comparison circuit having "greater", "less" and "equal" outputs, first switching means driven by said outputs for imposing a braking magnetic field or the entire three-phase voltage, respectively, to said motor, in correspondence with a "greater" or a "less" output, respectively, from said comparison circuit, said "equal" output controlling a change of state for said random or pseudo-random signal generator.

4,107,684
PHASE LOCKED DETECTOR

Charles A. Watson, Jr., Greenville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed May 2, 1977, Ser. No. 792,931

Iot. Cl.^{2} G01S *9/40;* G01D *21/04*

U.S. Cl. 343—7.5 **13 Claims**

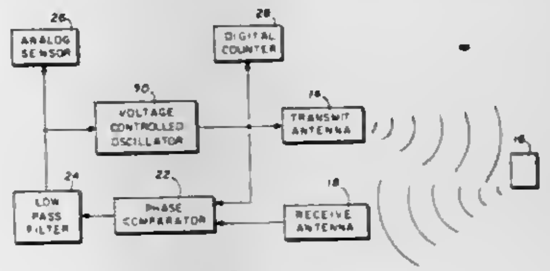


FIG. 3

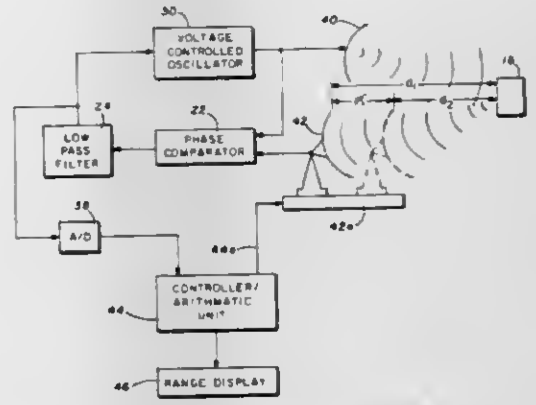


FIG. 4

1. Apparatus for detecting a change in position of an object in a field comprising:

a variable frequency transmitter for generating a transmit signal toward the object;

a receiver for receiving a reflection signal of said transmit signal from the object;

phase comparator means connected to receive said reflection signal and said transmit signal for generating an output signal applied to said variable frequency transmitter to control the frequency of said variable frequency transmitter to thereby maintain a predetermined phase relationship between said transmit signal and said reflection signal, such that the frequency of said transmit signal depends on the distance between the object and said variable frequency transmitter; and

means connected to said phase comparator means for continuously monitoring said output signal to provide an indication of a change in position of the object in the field.

8. A range finder for determining the range to an object comprising:

a variable frequency transmitter for generating a transmit signal toward the object;

a receiver for receiving a reflection signal at a first and second position of said transmit signal from the object, the distance between said first and second positions differing by a predetermined distance;

phase comparator means connected to receive said reflection signal and said transmit signal for generating an output applied to said variable frequency transmitter to control the frequency of said variable frequency transmitter to thereby maintain a predetermined phase relationship between said transmit signal and said reflection signal when said receiver is located at said first and second positions;

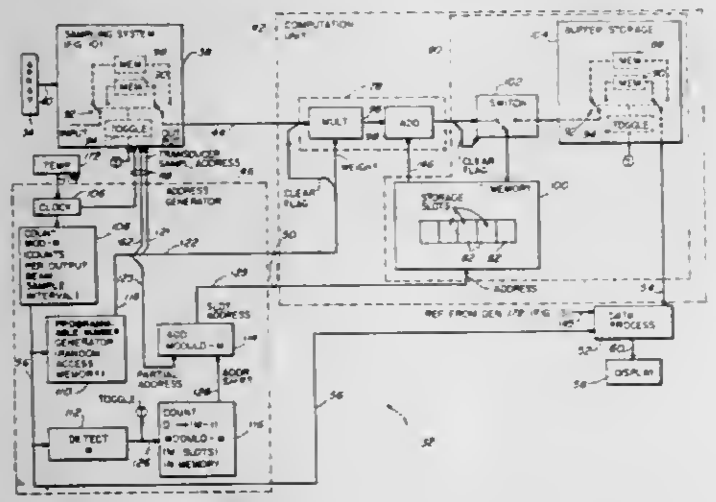
means for moving said receiver between said first and second positions;

means for calculating a difference frequency, being the difference between said transmit frequency generated by said variable frequency transmitter when said receiver is in said first position and when said receiver is in said second position;

means for determining the range to the object by calculating a ratio between said transmit frequency generated by said variable frequency transmitter when said receiver is in said first position increased by a factor of said predetermined distance between said first and second positions and said difference frequency; and

means for displaying the calculated range to the object.

4,107,685
BEAM FORMING SYSTEM
Walter J. Martin, Portsmouth, and John Furtado, Tiverton, both of R.I., assignors to Raytheon Company, Lexington, Mass.
Filed Dec. 1, 1976, Ser. No. 746,276
Int. Cl.^{2} G01S *3/80;* H04B *11/00*
U.S. Cl. 343—100 SA **12 Claims**



9. In combination:

a memory having locations for the storage of signals, each of said locations being identified by an address;

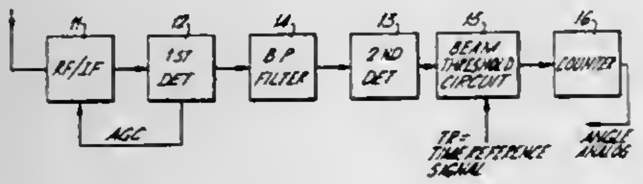
means connected to said memory for coupling said signals to the radiating elements of an array of radiating elements, said coupling means comprising an address generator, a counter, and a combiner;

said address generator producing repetitively sequences of partial addresses;

said counter counting said sequences modulo-M where M represents a number of said locations; and wherein

said combiner is connected to said generator and to said counter for combining said partial addresses with counts of said counter to produce addresses for said locations.

4,107,686
SCANNING BEAM RECEIVER SYSTEM WITH COHERENT POST-DETECTION SIGNAL PROCESSING
Paul Barton, Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Jan. 25, 1977, Ser. No. 762,259
Claims priority, application United Kingdom, Jan. 29, 1976, 3507/76
Int. Cl.^{2} G01S *1/44*
U.S. Cl. 343—106 R **8 Claims**



1. In a time-reference scanning beam receiving system, radio navigation apparatus for generating air-derived angular information, responsive to ground-based means for transmitting a radio frequency beam scanned through a sector of space and including means for providing a time-reference signal related to said beam scan, said ground-based means also including means for provision of an offset-frequency reference signal through one of a plurality of arrangements at least including continuous illumination of said scanned sector and generation of said reference within said receiving system, comprising:

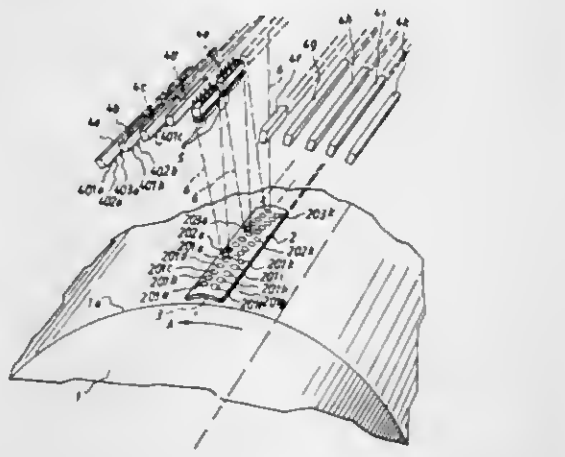
first detector means responsive to signals of said scanned beam and said offset-frequency reference to produce a first detector output centered about the frequency of said offset reference and having a spectral width which is a function of the aperture of the antenna transmitting said scanned beam;

first means responsive to said first detector output for effecting a predetermined amplitude taper on each side of said center frequency such that frequencies are increasingly attenuated as their spacing from said center frequency increases;

second detector means for demodulating the output of said tapering means;

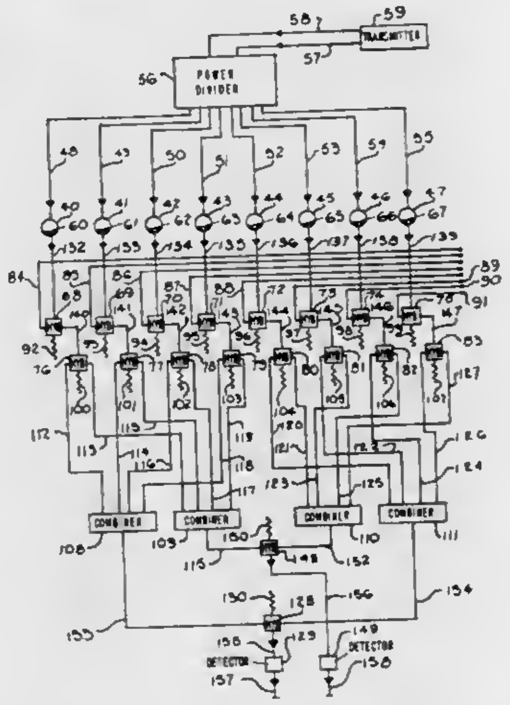
and second means responsive to said time-reference signal and to said second detector means to establish the relative position of said beam with respect to said time-reference signal to provide said angular information.

4,107,687
RECORDING DEVICE
Josef Pfeifer, Unterhaching; Rudolf Paulus, Munich; Walter Gutmann, Lochhofen, and Michael Resch, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Jul. 13, 1977, Ser. No. 815,414
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631848
Int. Cl.^{2} G01D *9/42;* B41B *13/10*
U.S. Cl. 346—107 R **6 Claims**



1. In a recorder of the type operative for forming an image on a recording-medium by illuminating a multitude of points on the surface of the recording-medium to form lines of image points, in combination, a plurality of light-emitting elements; transport means for effecting relative movement between the light-emitting elements and a recording-medium in a predetermined transport direction, the light-emitting elements being arranged distributed both in the transport direction and in a direction transverse to the transport direction; and a plurality of projector lenses operative for simultaneously projecting reduced-scale images of the light emitted by all of the light-emitting elements onto a portion of the recording-medium on which a single line of image points is to be formed, the plurality of light-emitting elements being constituted by groups of light-emitting elements, each group of light-emitting elements containing a plurality of light-emitting elements distributed in a direction transverse to the transport direction, each projector lens being dimensioned and oriented to project onto said portion of the recording-medium images of the light emitted by a respective one of the groups of light-emitting elements.

4,107,688
MONITOR FOR LOCALIZER ANTENNA ARRAYS
Andrew Alford, 71 Bacon St., Winchester, Mass. 01890
Filed Dec. 15, 1975, Ser. No. 640,749
Int. Cl.^{2} G01S *1/16*
U.S. Cl. 343—108 R **4 Claims**



1. A monitor for a localizer antenna array with a plurality of radiating elements comprising:

(1) Means for obtaining sample currents proportional to the currents in the radiating elements,

(2) Means for impedance matching each sampling means,

(3) Means for dividing sample currents into three sets of parts in accordance with fixed proportions,

(4) Means for combining the first set of sample currents using equal electrical paths and adding networks to obtain a resultant used to indicate course position,

(5) Means for combining a second set of currents using electrical paths in proportion to the distances from an end element to each of the other elements in the array,

(6) Means for comparing the magnitude of the current samples in the third set with present standards and

(7) Means for reducing interference by the first and second sets of samples with the magnitudes of the samples in the third set.

4,107,689
SYSTEM FOR AUTOMATIC VEHICLE LOCATION
Ernest Jellinek, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Jun. 7, 1976, Ser. No. 694,042
Int. Cl.^{2} G01S *3/02*
U.S. Cl. 343—112 TC **10 Claims**

1. A system for monitoring the position of a mobile unit within a predetermined area comprising:

dead reckoning means, within said mobile unit, for generating an output signal indicative of the instantaneous location coordinates of said mobile unit on a predetermined coordinate system;

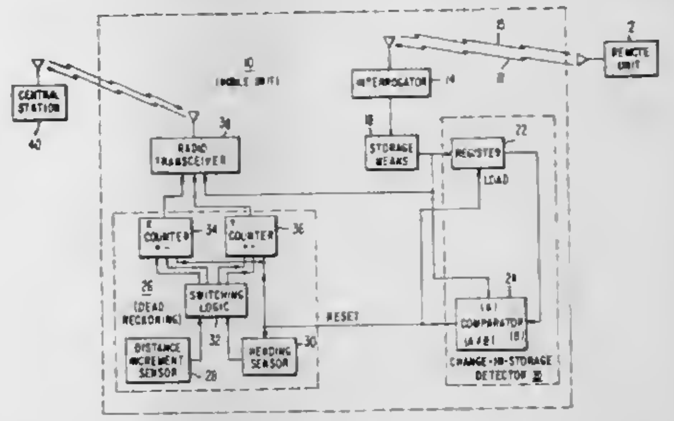
a plurality of remote unit means, each means comprising a unit positioned at a respective predetermined location within said area, for communicating to said mobile unit information signals indicative of said respective predetermined locations as said mobile unit passes each remote unit at the respective locations;

each of said units representing a separate coordinate system wherein the location of each of said units represents the reference coordinates for its associated coordinate system,

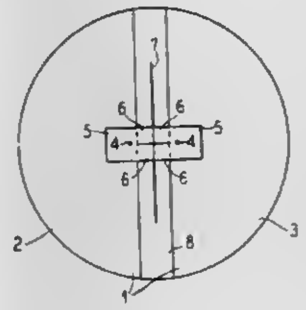
storage means, in said mobile unit, receptive of said remote unit location signals, for storing thereby the information signal indicative of the location of the last communicating unit;

resetting means, cooperating with said storage means, for generating a reset signal in response to changes in said stored information, said reset signal being applied to said dead reckoning means to reset said dead reckoning means output signal to zero, whereby said coordinate system is changed in accordance with the stored information corresponding to the last passed remote unit; and

utilization means, receptive of said stored information signals and said dead reckoning means output signal, for determining therefrom said position of said mobile unit relative to the coordinate system of the last communicating remote unit.



4,107,690
ANTENNA ARRANGEMENT FOR RADAR OR DIRECTION FINDING PURPOSES RESPECTIVELY, WITH SUM AND DIFFERENCE PATTERNS
Giswalt V. Trentini, Munich, and Werner Jatsch, Neubiberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Jul. 26, 1973, Ser. No. 385,589
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1972, 2245346
Int. Cl.^{2} G01S *3/46*
U.S. Cl. 343—113 R **9 Claims**



1. An antenna arrangement for radar or direction finding purposes having sum-difference patterns for monopulse operation, comprising: a reflector; two linearly polarized exciters located approximately centrally of and spaced from said reflector; a metallic conductive planar partition disposed between said two exciters and extending to said reflector, said partition disposed perpendicular to said reflector, said partition extending over only a portion of said reflector approximately in the area of said exciters; and a comparator connected to said exciters for a sum-difference operation so that the exciter located on one side of said partition can be compared with the exciter located on the other side of said partition with respect to voltage.

4,107,691

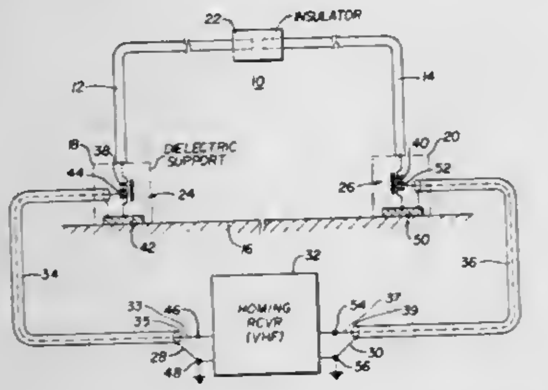
ANTENNA FOR PHASE FRONT HOMING

Donn V. Campbell, Eatontown, N.J., and Edward J. Paragi, New Haven, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 18, 1977, Ser. No. 760,320

Int. Cl.^{2} G01S *3/20;* **H01Q** *1/48*

U.S. Cl. 343—120 **10 Claims**



1. A homing radio receiving antenna system comprising in combination:

an electrically conductive ground plane;

first and second spaced apart dielectric support means secured to said ground plane;

first and second substantially like antenna elements each having a bend therein defining a pair of angulated antenna portions one respective end of which terminates in respective said first and second dielectric support means;

an electrically non-conductive joint commonly terminating the other respective end of said pair of angulated portions in a single plane including said support means, said non-conductive joint supporting said other end of said pair in a spaced apart relation;

homing radio receiving means having a pair of signal inputs; and

electrical circuit means including first and second symmetrical electrical impedance means respectively. coupled to said pair of inputs and to said angulated portions terminating in said support means for translating received signals from both said first and second antenna elements to said receiving means.

4,107,692

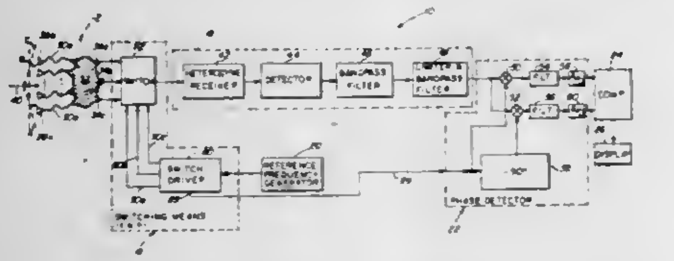
RADIO FREQUENCY SIGNAL DIRECTION FINDING SYSTEM

Robert Stewart Hutcheon, Goleta, and Bruce E. Gordon, Santa Barbara, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 9, 1977, Ser. No. 776,077

Int. Cl.^{2} G01S *3/20*

U.S. Cl. 343—120 **4 Claims**



1. Apparatus for determining the direction of a source of radio frequency signals comprising:

(a) an array antenna adapted to receive radio frequency signals from such source and direct such received signals to feed ports of such antenna, the level of the signals being related to the direction of the source relative to the array antenna;

(b) means, including a sampling reference signal source, for sampling the radio frequency signals directed to the feed ports in response to such sampling signal, such signals being sampled at a sampling frequency, f_s,

(c) bandpass filter means, tuned to the sampling frequency f_s and fed by the sampled signals, for producing a composite signal having a frequency component, f_s, and a phase angle, θ, relative to the phase angle of the reference signal, the relative levels of the received signals being related to the phase angle, θ;

(d) limiter means, coupled to the output of the bandpass filter means, for normalizing the level of the composite signal to a predetermined level invariant with variations in the level of the signals from the source producing a normalized composite signal having the phase angle θ and a frequency f_s; and

(e) means, responsive to the reference signal and the normalized composite signal for producing an output signal related to the phase angle θ to provide an indication of the direction of the radio frequency energy source relative to the array antenna.

4,107,693

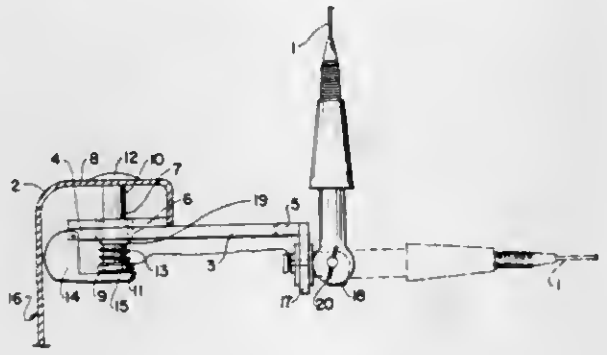
ANTENNA MOUNTING DEVICE

Cleatus W. Bennett, St. Ann, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 12, 1977, Ser. No. 796,229

Int. Cl.^{2} H01Q *1/32*

U.S. Cl. 343—715 **3 Claims**



1. An antenna mounting device for mounting a radio antenna on an automotive vehicle, said antenna mounting device comprising

a bracket member having spaced opposite first and second ends, said bracket member having a bore formed therethrough in the area of the first end thereof;

a stud extending through the bore of the bracket member and mounted on the vehicle, said stud having spaced opposite ends and a head at each end;

a spiral spring coaxially positioned on the stud and extending between one head of the stud and the bracket member;

a cam member pivotally affixed to the bracket member at the first end thereof and having a projecting portion abutting the one head of the stud in one position to raise the bracket member on the stud and is spaced from the stud in another position to lower the bracket member;

an arm extending substantially perpendicularly from the bracket member at the second end thereof; and

rotary mounting means rotatably mounting an antenna on the arm in a manner whereby in its releasably securable extended position the antenna extends substantially parallel to the arm and perpendicular to the bracket member and in its releasably securable storage position the antenna extends substantially parallel to and beyond the bracket member and perpendicular to said arm.

4,107,694

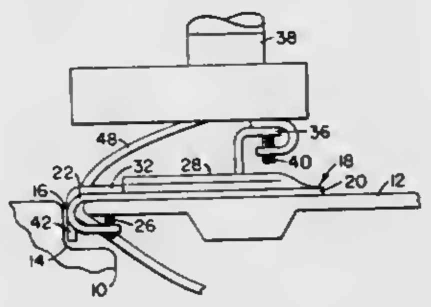
SEPARABLE BRACKET FOR SUPPORTING AN ANTENNA ON A VEHICLE TRUNK LID

Lewis Coleman Morgan, Sherwood, and Clarence Arthur Reed, N. Little Rock, both of Ark., assignors to Arthur W. Reed Machine Co., Little Rock, Ark.

Filed Jun. 6, 1977, Ser. No. 803,745

Int. Cl.^{2} H01Q *1/32*

U.S. Cl. 343—715 **8 Claims**



1. For use in a vehicle having a body portion defining an open-topped compartment bordered by a peripheral recess and a lid shaped to fit within the access in such manner as to leave a peripheral groove, said lid being hinged at one edge to the body portion for opening and closing the compartment: an accessory mount comprising a first part having a base adapted to overlie a portion of the lid and an integral hook portion for receiving and hooking over a peripheral edge portion of the lid, said hook portion having means for securing the first part to the adjacent under-portion of the lid, a second part overlying the base and having an integral depending ear proximate to the hook portion for depending into the proximate portion of the compartment groove and means on said second part for carrying an accessory, cooperative disengageable elements respectively on the two parts for selective engagement and disengagement only when the lid is open, said lip, being received in the groove when the lid is closed, preventing disengagement of the parts.

4,107,695

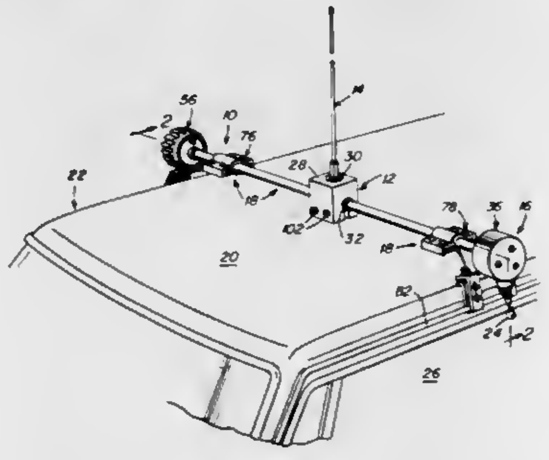
ANTENNA RAISING AND LOWERING DEVICE

Donald E. Urban, and Alan G. Urban, both of 7950 SW. 184th St., Miami, Fla. 33157

Filed Aug. 11, 1976, Ser. No. 713,609

Int. Cl.^{2} H01Q *15/20*

U.S. Cl. 343—882 **3 Claims**



1. An antenna raising and lowering device, comprising, in combination:

(a) antenna mount means for receiving an antenna;

(b) antenna rotating means for turning the antenna mount means between an upright raised position and a lowered position adjacent the roof of a motor vehicle on which the device is to be mounted; and

(c) clamp means for securing the antenna mount means and the antenna rotating means on the roof of the motor vehicle, the antenna rotating means including an actuating handle arrangeable adjacent a driver's side door window of the motor vehicle and connected to the antenna mount means, lock means associated with the handle for retaining the handle in the raised position and lowered position of the antenna rotating means, the antenna mount means being disposed centrally of the width of the motor vehicle and including a block provided with a recess arranged for receiving an antenna and with a through hole, and the antenna rotating means further including a longitudinally extending, rotatably mounted, hollow shaft having longitudinally spaced ends and journaled on the clamp means and fittingly received in the hole provided in the block of the antenna mount means for rotating the block, with the shaft being arrangeable traverse of the width of the vehicle and the block being disposed centrally of the shaft and the actuating handle being affixed to one of the ends of the shaft for rotating the shaft, the antenna rotating means further including torque adjusting means connected to the other of the ends of the shaft and spaced from the lock for providing sufficient torque to overcome variable weights and length of antenna mounted on the antenna mount means, the torque adjusting means including a knob rotatably mounted on the clamp means and a torsion spring disposed within the hollow shaft and connected to the knob and to the shaft for rotation with each, and a lock pin keyed to the clamp means and selectively engaging the knob for retaining the knob against rotation.

4,107,696

RECORDER

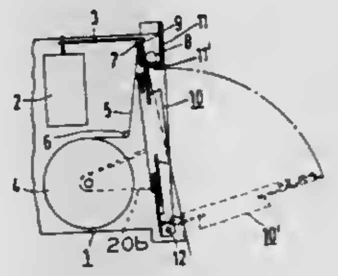
Arthur Wondra, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 18, 1977, Ser. No. 788,314

Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620302

Int. Cl.^{2} G01D *15/28*

U.S. Cl. 346—24 **13 Claims**



1. A recorder for recording electronic analogue signals on a moving strip of recording media comprising: a housing having a signal responsive meter device disposed therein actuating an indicator, a foldout recording table having a writing edge over which recording media is moved during operation of the apparatus, the indicator acting upon the media at the edge, a drive disposed in said housing having a drive roll positioned closely adjacent the writing edge of the writing table when the writing table is in a closed position, a tear-off edge positioned adjacent said drive, the recording table formed of two stacked rectangular plates, one of said plates pivotably attached to the housing, the plates interconnected by side guide members, the side guide members having longitudinal end recesses into which side margins of the plates project, at least one of the plates being longitudinally movable with respect to the side guides whereby the plates are longitudinally movable with respect to one another, the recording table having a closed position with an end of the table remote from the pivot connection projecting longitudinally into the recorder housing whereby the plates may be longitudinally moved to withdraw the end from the housing.

4,107,697

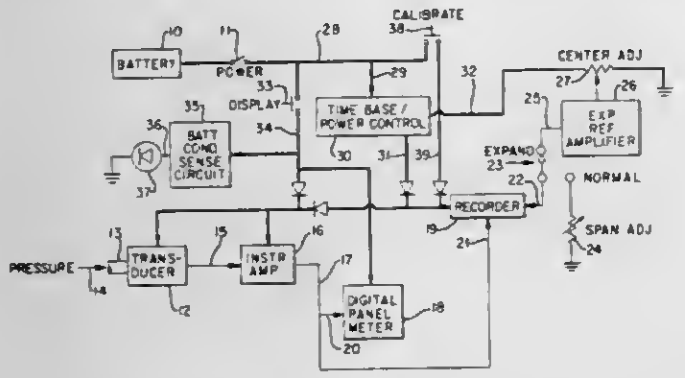
PRESSURE RECORDER WITH POWER CONSERVATION MEANS

Oliver W. McCracken, Richardson, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 3, 1977, Ser. No. 821,489

Int. Cl.^{2} G01D *9/00*

U.S. Cl. 346—33 R **13 Claims**



1. In a recording voltmeter apparatus comprising a driven chart recorder and chart imprinting stylus, with said chart being drivable at a predetermined rate and said stylus being deflectable in proportion to an input voltage from a pressure-voltage transducer; means responsive to a selectable first operating mode to power said transducer and chart recorder at predetermined periodic intervals to define a predetermined power application duty cycle, with deflection of said stylus with a predetermined sensitivity from a chart-edge extreme being proportional to an input voltage to be recorded, means responsive to a selectable second operating mode to effect a continuous readout from digital display means of said input voltage being measured, means enabled during said second operating mode to effect centering of said stylus on said chart, and means operable in a third operating mode to effect, with sensitivity substantially greater than such predetermined sensitivity, stylus deflection over a predetermined range either side of said centered stylus position with said transducer and chart recorder being powered at said predetermined power application duty cycle.

4,107,698

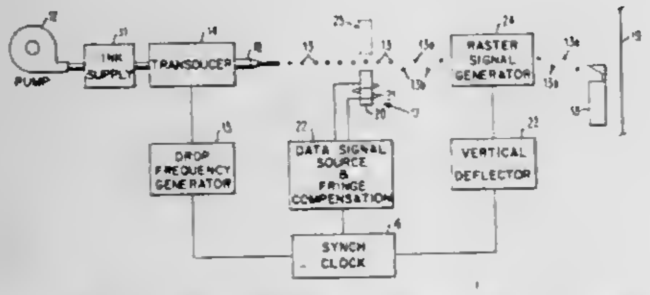
INK JET PRINTER APPARATUS AND METHOD OF OPERATION

Louis Valentine Galetto, Apalachin, and Donald Frederick Jenseo, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,403

Int. Cl.^{2} G01D *15/18*

U.S. Cl. 346—75 **6 Claims**



1. An ink jet printer apparatus comprising in combination,

means for projecting a continuous stream of individual ink drops toward a print medium;

means for selectively removing unwanted ink drops from said stream while allowing print drops to be deposited on said print medium including,

drop collector means positioned to prevent unwanted drops from depositing on said print medium,

selector means operable for deflecting ink drops of said stream for interruption by said drop collector; and

control means for operating said selector means for applying a first selection force capable of deflecting unwanted ink drops of said stream into a trajectory leading to said drop collector,

said control means including means for operating said selector means for applying to at least some of the print drops of said stream a second deflection force which compensates for fringe deflection forces produced by said first selection force on said print drops whereby said print drops are caused to move in a common trajectory which avoids said drop collector means.

4,107,699

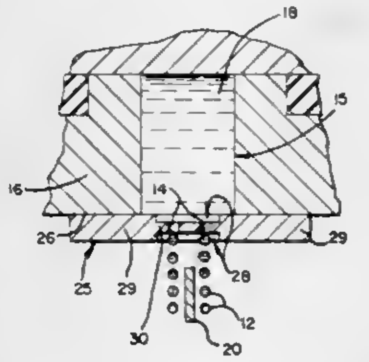
TRENCHED STIMULATING PLATE

E. J. Doyle Kenworthy, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 15, 1977, Ser. No. 824,425

Int. Cl.^{2} G01D *15/18*

U.S. Cl. 346—75 **9 Claims**



8. An orifice plate for a jet drop recording head comprising a marginal portion and a medial portion along which is arranged a row of regularly spaced orifices, characterized in that said marginal portion is rigid and in that said medial portion is a thin, flexible and acoustically conductive region defined by an elongated trench extending medially along the length of said plate.

4,107,700

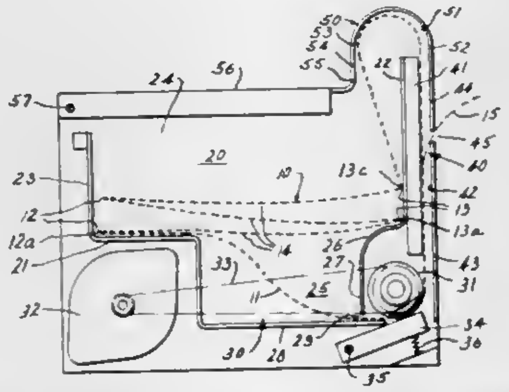
FANFOLD PAPER TRANSPORT

Eugene R. Jornod, Caledonia, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Oct. 1, 1976, Ser. No. 728,722

Int. Cl.^{2} G01D *15/30*

U.S. Cl. 346—76 R **9 Claims**



1. A fanfold strip transport comprising a substantially horizontal receptacle having a bottom, sides, and front and back ends for confining a flexible strip in a fanfolded pack configuration, a recess in the bottom of said receptacle intermediate the ends, a feed roll adjacent said recess for progressively withdrawing said strip through the recess, a channel adjacent said front end for directing upwardly the withdrawn strip, and a guide for deflecting said upwardly directed strip backwardly and downwardly into the receptacle at a location such that said strip automatically resumes the fanfolded pack configuration.

4,107,701

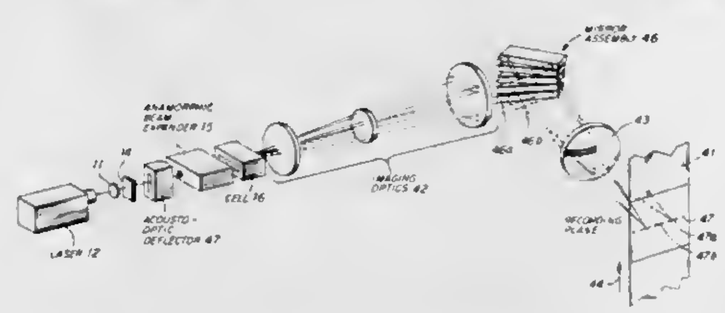
ACOUSTO-OPTIC SNAPSHOT RECORDER

Robert A. Sprague, Chelmsford, and Alan J. MacGovern, Acton, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Sep. 16, 1976, Ser. No. 723,878

Int. Cl.^{2} G01D *9/00*

U.S. Cl. 346—108 **5 Claims**



1. Acousto-optic recording apparatus for reading out a serial electrical signal as spatial optical data comprising:

- A. acousto-optic means;
- B. means for passing a continuous travelling acoustic wave through said acousto-optic means, said acoustic wave being proportional to said serial electrical signal;
- C. a recording medium;
- D. imaging means for imaging said acoustic wave on said recording medium, said imaging means including:
  - a. light source means for illuminating said acousto-optic means;
  - b. optical means for imaging the light from said acousto-optic means onto said recording medium; and,
  - c. means for "stopping" the motion of said travelling acoustic wave passing through said acousto-optic means for recording a stationary line of optical data on said recording medium proportional to the acoustic wave within said acousto-optic means; and,
- E. means for recording a plurality of said lines of optical data along one long line on said recording medium, including:
  - a. a plurality of optical deflector means in the path of the light from said acousto-optic means to direct images to different locations on said recording medium; and
  - b. an acousto-optic deflector for directing light from said acousto-optic means to consecutive ones of said plurality of optical deflector means for recording a plurality of said lines of optical data along one long line on said recording medium.

4,107,702

ARRANGEMENT FOR READING OUT AN OPTICAL MEMORY

Johann Plockl, Jagdstr. 4, 8025 Unterhaching, Fed. Rep. of Germany

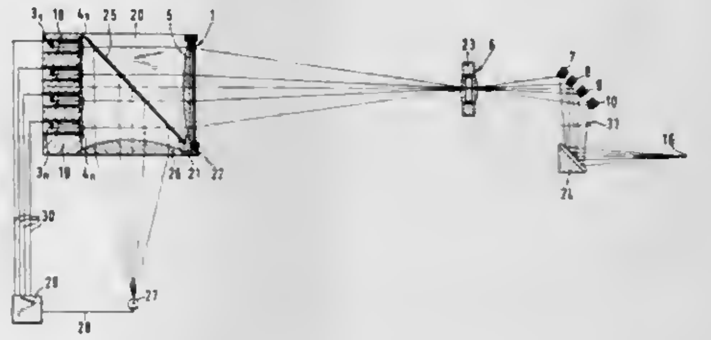
Filed Oct. 18, 1976, Ser. No. 733,718

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548649

Int. Cl.^{2} G03B *17/08*

U.S. Cl. 354—17 **6 Claims**

1. An arrangement for reading out selected characters from a font of characters stored on a stationary optical memory, comprising a number of light sources each associated with one of said characters for illuminating the same selectively, all of said characters being imaged onto a common location by an optical arrangement comprising one lens and first and second sets of optical elements performing together said imaging onto a common location, the lens imaging the characters into a common image plane, said first set of said optical elements deflecting the different rows of said characters onto said common location, said second set of said optical elements deflecting the different columns of said characters onto said common location each of said first and second sets of optical elements comprising a plurality of individual flat mirrors operating as optical deflecting members for combining the images of the characters at said common location, said arrangement further comprising mounting means for each plurality of deflecting members to maintain said sets of deflecting members in respective predetermined, fixed positions relative to each other on opposite sides of a common plane. and wherein each mirror deflecting member faces said common plane with its reflecting surface, wherein said deflecting optical elements of said first set comprise reflecting elements tilted relative to one another, each element being associated with one row of said characters, and wherein said second set of said deflecting optical elements comprises reflecting elements tilted relative to one another, each element being associated with one column of said characters, so that each mirror element reflects only light from its respectively associated row or column.



4,107,703

FILM SENSITIVITY DETECTING FILTER ACTUATING CAMERA

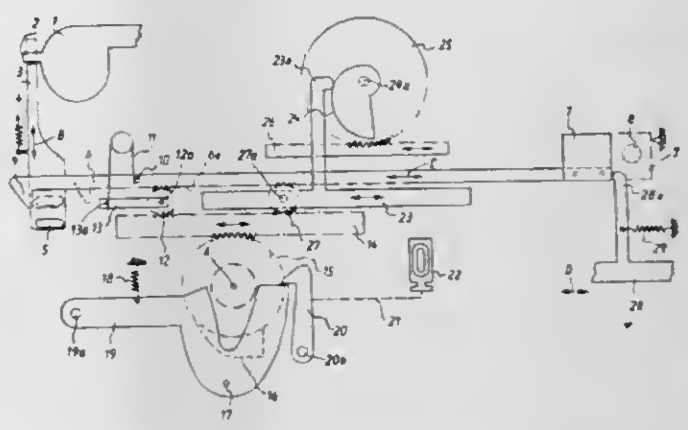
Dieter Engelsmann, Unterhaching; Hubert Hackenberg, and Andreas Schubert, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,942

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621612

Int. Cl.^{2} G03B *7/00, 17/26*

U.S. Cl. 354—21 **10 Claims**

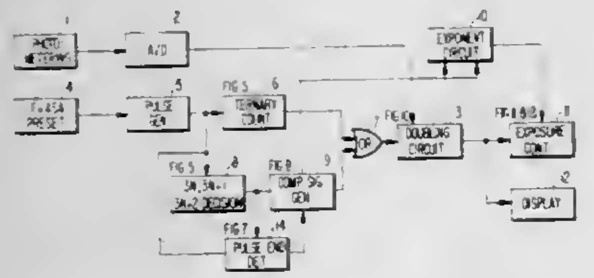


1. In a camera of the type using film cassettes which are with or without markers depending upon the sensitivity of film in the respective cassette, a combination comprising a light-sensitive element; a light-diminishing component; a member carrying said component and being movable in a path between a first and a second position in which said component is respectively interposed in and withdrawn from the path of light impinging said element; means permanently urging said member towards said first position; and means for detecting the sensitivity of a film in a cassette inserted into the camera, including an arm

movable in a direction transverse to said path between one position in which a portion of said arm extends into said path and blocks movement of said member to said first position, and another position in which said portion is withdrawn from said path so that said member is free to move to said first position thereof.

4,107,704
CIRCUIT FOR DIGITALLY COMPUTING EXPOSURE CONTROL INFORMATION

Shigehisa Iwata, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Jul. 29, 1976, Ser. No. 709,746
Claims priority, application Japan, Jul. 29, 1975, 50-92786
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 D **9 Claims**



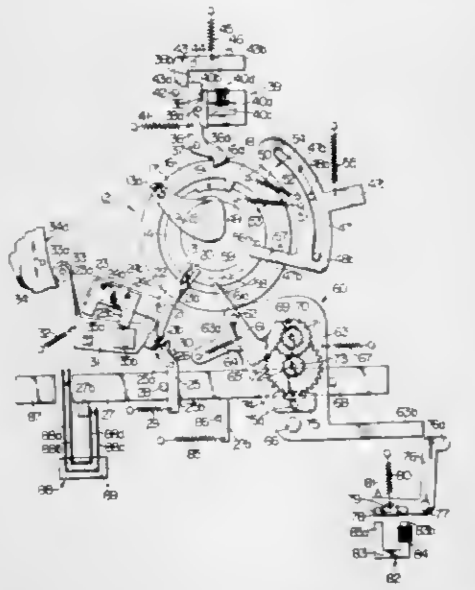
1. A circuit arrangement for digitally computing an exposure control information comprising:

means for generating a train of *n* pulses in number proportional to the quantity of a first information for exposure;
means for counting the pulses supplied from said pulse generating means;
means for generating a doubling operation pulse for each count of three pulses;
decision means for deciding to which of 3N+1, 3N+2 and 3N (where N stands for zero or a positive integer) the number *n* of said pulses corresponds;
means responsive to said decision means for generating, at the end of said pulse train, seven or four additional doubling operation pulses when said number of pulses corresponds to 3N+1 or 3N+2, respectively;
means for generating an exponential compensating signal according to the number of said pulses;
a register for storing a second information for exposure; and
doubling means for repeatedly doubling the information stored in said register as often as the sum of the number of doubling operation pulses generated by said doubling operation pulse generating means and the number of additional doubling operation pulses generated by said additional doubling operation pulse generating means.

4,107,705
BLADED SHUTTER

Akihiko Hashimoto, and Fuzio Enomoto, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Oct. 4, 1976, Ser. No. 729,275
Claims priority, application Japan, Oct. 28, 1975, 50-147137[U]; Oct. 28, 1975, 50-147138[U]
Int. Cl.² G03B *7/14*
U.S. Cl. 354—29 **6 Claims**

1. A bladed shutter for a camera including a plurality of shutter blades also serving as a diaphragm; a shutter opening ring and a shutter closing ring disposed in concentric manner with each other and being urged to rotate in the same direction, said rings cooperating with each other to pivotally support the plurality of shutter blades, the shutter blades being closed when said rings are in their starting position, being opened as the shutter opening ring precedes the shutter closing ring in movement and being closed again when both rings reach their terminal position; said shutter opening ring having a projection; first detent means movable between a first position wherein it locks said shutter opening ring in its initial position and a second position wherein it releases said shutter opening ring, said first detent means being urged into said first position prior to a shutter release operation, said first detent means being urged into said second position responsive to a shutter release operation; a governor movable between a first position lying out of the path of rotation of the projection on the shutter opening ring and a second position lying in the path of movement of the shutter opening ring, said governor being adapted to control the rate of rotation of the shutter opening ring; second detent means for selectively locking the shutter closing ring in its initial position; and shutter control means including a first photoelectric transducer element disposed within the camera to provide a photometry, the shutter control means also including an electromagnet which maintains the second detent means in its locking position until a photometric value obtained by the first transducer element reaches a level corresponding to a proper exposure, whereupon the electromagnet releases the second detent means; characterized by the provision of a second photoelectric transducer element located externally of the camera, a governor control circuit including said second photoelectric transducer element, and a second electromagnet associated with the governor control circuit for displacing the governor away from the path of movement of the shutter opening ring in accordance with a photometric value obtained by the second photoelectric transducer element, thereby varying the degree of engagement between the governor and the shutter opening ring.

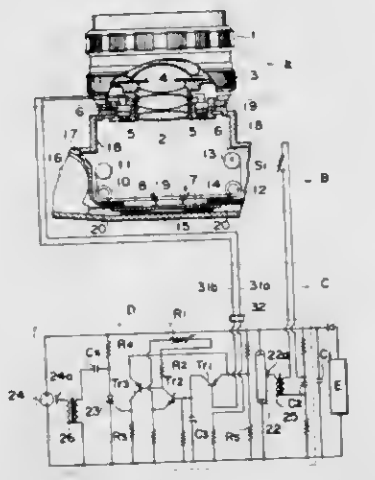


4,107,706
CAMERA APPARATUS

Hiroshi Ueda, Nara, and Kayoshi Tsujimoto, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation-in-part of Ser. No. 209,044, Dec. 17, 1971, Pat. No. 3,779,141. This application Dec. 17, 1973, Ser. No. 425,350
Claims priority, application Japan, Dec. 19, 1970, 45-113589; Feb. 6, 1971, 46-4917; Aug. 4, 1971, 46-58251
The portion of the term of this patent subsequent to Apr. 15, 1993, has been disclaimed.
Int. Cl.² G03B *7/08, 15/05, 11/00*
U.S. Cl. 354—31 **23 Claims**

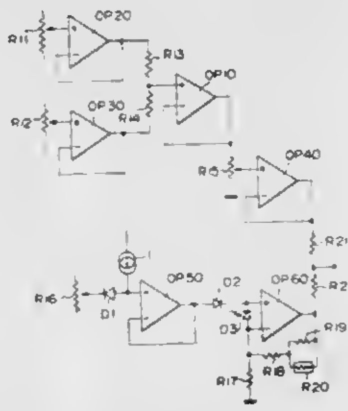
1. A barrel member adapted for exchangeable mounting to camera apparatus, comprising:

light receptive means mounted on said barrel member whereby said light receptive means is adapted to receive light reflected from the light sensitive surface of a film when said barrel member is mounted to said camera apparatus;
a terminal mounted on said barrel member; and
means for electrically connecting said light receptive means to said terminal.



4,107,707
ANALOGUE OPERATION ADJUSTING MEANS FOR PHOTOGRAPHIC CAMERA

Saburo Numata, and Shinichiro Okazaki, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed Mar. 7, 1977, Ser. No. 775,093
Claims priority, application Japan, Mar. 6, 1976, 51-24347
Int. Cl.² G03B *7/08*
U.S. Cl. 354—50 **8 Claims**

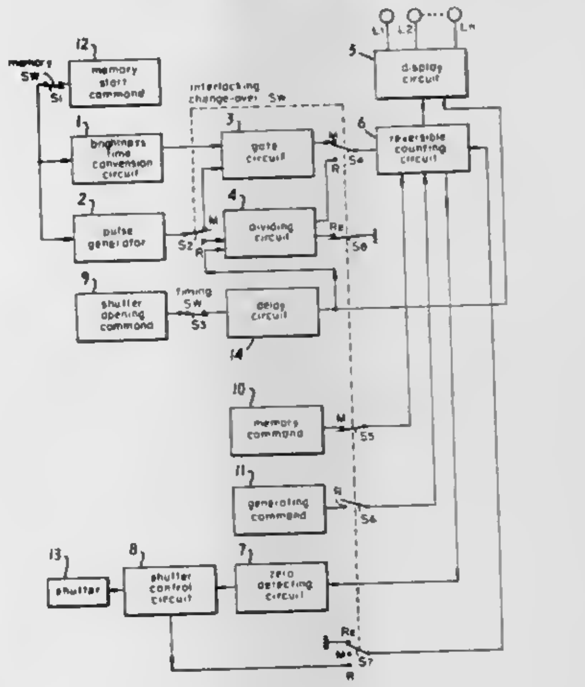


1. In an analogue type exposure control circuit built in a photographic camera including an analogue arithmetic unit in which a plurality of exposure information input means are connected with the input terminals of the arithmetic unit, an adjusting means for collectively compensating for all of errors due to the plurality of exposure information input means comprising a single additional adjustable information input means connected in parallel with at least one of said exposure information input means, said additional adjustable information input means being adjustable independently of the other exposure information input means.

4,107,708
SHUTTER CONTROL CIRCUIT HAVING EXPOSURE TIME DISPLAY

Takeo Saito, and Youichi Seki, both of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan
Continuation of Ser. No. 499,976, Aug. 23, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,062
Claims priority, application Japan, Aug. 24, 1973, 48-95004
Int. Cl.² G03B *7/00*
U.S. Cl. 354—60 L **2 Claims**

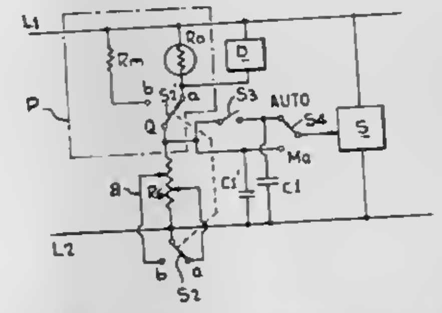
1. A shutter control circuit of the type having means for developing a plurality of pulses the number of which is representative of an exposure time; means for counting and storing said plurality of pulses and for reading-out the number of stored pulses in response to command signals, for controlling an exposure time; and means for applying a command signal to said means for counting and for reading-out to initiate reading-out of the stored pulses; wherein the improvement comprises:



a display circuit, cooperative with said means for counting and storing, for visually displaying the exposure time represented by the number of pulses counted and stored; said display circuit comprising means, responsive to the command signal for initiating reading-out of the stored pulses, for disabling said display circuit thereby to reduce power consumption by said display circuit during exposure.

4,107,709
EXPOSURE TIME CONTROL CIRCUITRY FOR CAMERAS

Kayoshi Tsujimoto, and Akira Yoshizaki, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 645,424, Dec. 30, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,721
Claims priority, application Japan, Dec. 31, 1974, 50-1378
Int. Cl.² G03B *7/08*
U.S. Cl. 354—51 **20 Claims**



1. An exposure time control circuit for a camera adapted for manual and automatic exposure control, comprising:

a photoelectric element responsive to scene brightness;
a fixed resistor;
means for controlling the exposure;
a variable resistance element including a first and a second independently movable member for varying the resistance between the end terminals of said variable resistance element, said first movable member being at least movable in accordance with the setting of the film sensitivity and said

second movable member being movable in accordance with the manually set exposure time;

first switching means having a first position for connecting said first movable member to one of said end terminals and a second position to connect said second movable member to said one end terminal;

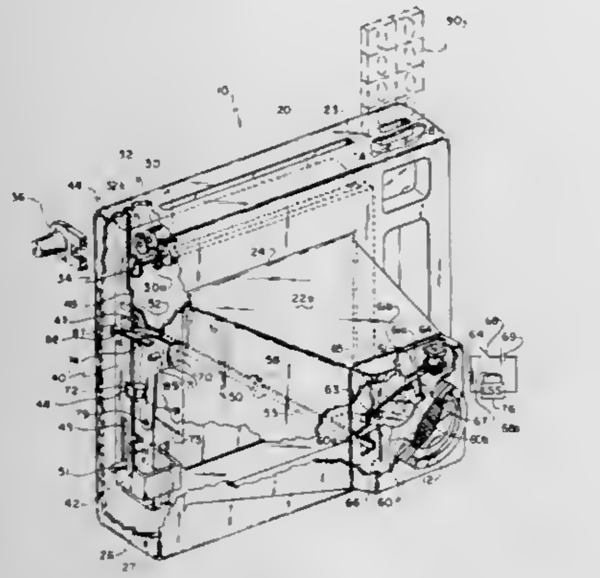
manually operable second switching means having a first position for connecting a first output signal formed between said photoelectric element and said variable resistance element to said means for controlling the exposure with said first switching means in said first position, and a second position for connecting a second output signal formed between said fixed resistor and said variable resistance element to said means for controlling the exposure with said first switching means in said second position;

a capacitor for selectively storing said first or second output; and

third switching means having an open position for selectively isolating said capacitor from said first and second outputs and a closed position for connecting said capacitor to said first or second outputs in accordance with the position of said second switching means, said means for controlling being responsive to the signal stored by said capacitor.

4,107,710
PHOTOGRAPHIC APPARATUS FOR USE WITH SELF-PROCESSING FILM UNITS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 22, 1977, Ser. No. 780,149
Int. Cl.² G03B *17/50*
U.S. Cl. 354—86 8 Claims



1. Photographic apparatus for effecting exposure and initiating processing of a self-processing film unit, the apparatus comprising:

means for locating a film unit in position for exposure;

exposure means for exposing the film unit;

rotatable pressure applying means for receiving a film unit and for initiating the processing of the film unit after the exposure;

a shuttle including film unit engaging means for advancing the film unit from an exposure position to a position in which it may be received by the pressure applying means;

means for supporting the shuttle for pivotal and translational movement;

spring means for biasing the shuttle for pivotal and translational movement of the film unit engaging means in a direction away from said pressure applying means and towards a retracted position wherein the film unit engaging means is disposed to engage a film unit in its exposure position and is adapted upon movement of the shuttle to an advanced position to engage the film unit and to initiate advancement of the film unit towards the pressure applying means;

drive means including gear means for rotating the pressure applying means prior to receipt of a film unit therein and for translating the shuttle from the retracted position towards the advanced position to introduce the film unit into the pressure applying means;

a rack on the shuttle cooperating with the gear means whereby rotation of the gear means drives the shuttle so that the film engaging portion thereof is driven towards the pressure applying means;

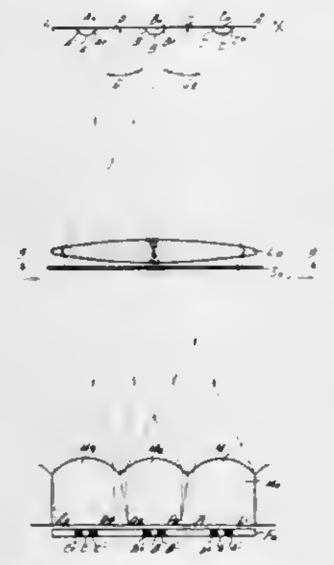
restraint means for supporting the shuttle in the advanced position and for preventing the return of the shuttle to its retracted position under the bias of the spring means;

body release means actuatable by the operator of the apparatus for initiating exposure of a film unit by removing the restraint upon the shuttle to permit the shuttle to move towards the retracted position under the bias of the spring means; and

lever means pivotably and slidably coupled to the shuttle and responsive to the movement of the shuttle from the advanced position towards the retracted position and operatively associated with the exposure means for effecting commencement of the exposure of the film unit by the exposing means.

4,107,711
PHOTOGRAPHIC CAMERA FOR TAKING THREE DIMENSIONAL PHOTOGRAPHS AND METHOD AND APPARATUS FOR FORMING TRIVISION IMAGES

Chi Yin Law, No. 35-5, Koishikawa, 5-chome, Bunkyo-ku, Tokyo-to, Japan
Filed Mar. 24, 1976, Ser. No. 669,864
Claims priority, application Japan, Mar. 28, 1975, 50-37644; May 28, 1975, 50-64698
Int. Cl.² G03B *35/00*
U.S. Cl. 354—112 30 Claims



1. A photographic camera for three dimensional photography comprising:

means for positioning photosensitive material at a position for exposure;

a lenticular screen positioned for close contact with such positioned photosensitive material, the screen comprising a plurality of lenticular elements, the boundaries of adjacent elements forming lines which define stripe portions;

an objective for projecting an object image to be photographed through said lenticular screen onto such photosensitive material; and

a shutter comprising plate shaped shutter blades relatively movable between open and closed conditions during exposure and so positioned and defining, when open, an aperture gap which is elongated transversely of the stripe portions to allow projection of the object image to the photosensitive material and, when closed, interrupts the projection,

the objective having an effective aperture defined by a pair of planes extending parallel to each other at opposite sides of a main optical axis and transversely to said stripe portions so that a single exposure by said shutter, when open, enables such object image to be projected on the photosensitive material as a reversed image;

the photosensitive material and the lenticular screen being maintained at a fixed position during the open condition of the shutter blades

23. A method for obtaining a three dimensional photographic image of an object comprising the steps of:

forming a photographic image comprising the steps of positioning a lenticular screen having predetermined optical characteristics adjacent to an exposure surface of a photosensitive material and in fixed relative position therewith during exposure;

projecting an object image through said screen and onto such surface to thereby expose and form a reversed three dimension image on said photosensitive material;

reversing the reversed image comprising the steps of positioning a lenticular screen, having substantially said predetermined characteristics, closely adjacent an original transparency carrying a developed form of the reversed three dimension image;

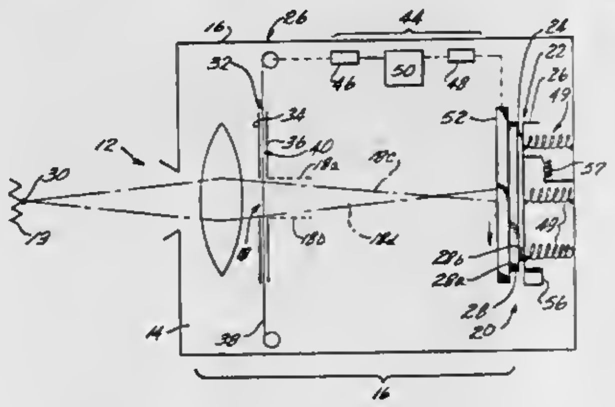
positioning a surface of fresh photosensitive material closely adjacent a surface of such original which is opposed from the lenticular screen;

projecting a beam of light through said lenticular screen and through said original to a surface of said fresh photosensitive material; and

while projecting, moving at least two of the following elements: said lenticular screen, said original, said fresh photosensitive material, and said beam of light, said movement being relative to said at least two elements and being relative to the others of said elements to thereby reverse the reversed three dimension image and create a non-reversed trivision image on said fresh photosensitive material.

4,107,712
CAMERA FOR TAKING THREE DIMENSIONAL PHOTOGRAPHS HAVING SCREEN MOVING MEANS

Chi Y. Law, 7845 Cambie St., Vancouver, British Columbia, Canada (V6P 3J1)
Continuation-in-part of Ser. No. 643,600, Dec. 22, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,229
Claims priority, application Japan, Dec. 25, 1974, 49/148202
Int. Cl.² G03B *35/08*
U.S. Cl. 354—115 14 Claims



1. A photographic camera for three dimension photography comprising:

a housing having an opening to the interior for light rays;

means for immovably locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;

optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong extending transversely to the direction of the path from a first side to a second side of the path, the optical means comprising

a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements of width P which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact with the surface of such located photosensitive material,

the optical means being characterized in that it changes, by a predetermined distance Y, on such surface of the photosensitive material, the position of light rays which come from a substantially common point on such scene and which extend along said first and second sides of said path;

means for blocking the received light rays at said first position;

an aperture movable transversely across said path at said first position, from said first side to said second side, for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements; and

means for so moving said aperture for a predetermined time for exposure while simultaneously and synchronously moving said screen, substantially throughout said predetermined time for exposure, in substantially the same direction as the light rays sequentially expose said photosensitive material and over a distance substantially equal to the sum of $P + Y$ to thereby expose a substantially continuous unreversed image of the scene on the photosensitive material, said means for moving comprising

means for moving said lenticular screen a predetermined distance along a path transverse to the path of the light simultaneously with the movement of said optical aperture and comprising

means for guiding said screen along said predetermined path,

a pivoted member,

means for connecting said pivoted member, at a position displaced from the pivot thereof, to said screen,

a rack connected to said pivoted member,

a pinion for engaging said rack,

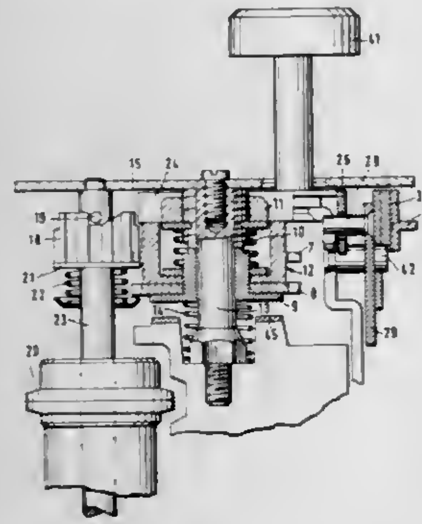
a motor connected for rotatably driving said pinion to thereby move said rack and thereby pivot the pivoted member and move said screen along said predetermined path a precise predetermined amount corresponding to the driving movement of said motor.

4,107,713
FILM FEED MECHANISM FOR CAMERAS

Paul Greger, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Feb. 11, 1977, Ser. No. 767,776
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606131
Int. Cl.² G03B *19/02*
U.S. Cl. 354—209 15 Claims

1. A photographic camera comprising an operating lever movable to tension a shutter, a first gear operatively connected to and moved by said lever, film feeding means including a second gear meshing with said first gear and driven thereby to cause feeding of film concomitantly with tensioning the shutter, means including a manually operable element for shifting said second gear axially to unmesh it from said first gear so that said lever may be moved to tension said shutter without causing feeding of film, a camera release member operable to re-

lease said shutter to make an exposure, and means responsive to operation of said release member for restoring said second gear to meshing relation to said first gear if said second gear has been unmeshed therefrom.



4,107,714

ADJUSTING MECHANISM FOR MOVABLE PICTURE-TAKING OBJECTIVE

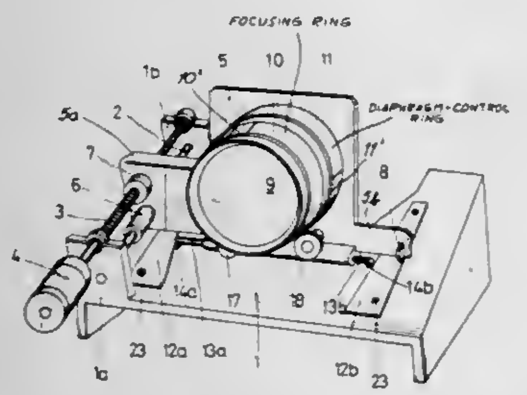
Karl-Heinz Raab, Bad Kreuznach, Fed. Rep. of Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Fed. Rep. of Germany

Filed Mar. 19, 1976, Ser. No. 668,793

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1975, 2512424

Int. Cl.² G03B *3/00, 13/02*

U.S. Cl. 354—196 **9 Claims**



1. In a picture-taking apparatus comprising an objective displaceable between a fixed first plane and a fixed second plane for projecting an image of an object in said first plane with a variable magnification ratio upon said second plane, said objective being provided with an adjustable diaphragm and with at least one movable component for varying the focal length of said objective, the combination thereof with:
   a base;
   mounting means supporting said objective on said base, said mounting means being movable in a direction generally parallel to the optical axis of said objective;
   a first setting member on said objective for adjusting said movable component;
   a second setting member on said objective for adjusting said diaphragm;
   first cam-follower means on said mounting means mechanically connected with said first setting member;
   first cam means on said base engaged by said first cam-follower means for imparting a predetermined adjusting motion to said first setting member upon displacement of said mounting means on said base;
   second cam-follower means mechanically connected with said second setting member; and
   second cam means on said base engaged by said second cam-follower means for imparting a predetermined adjusting motion to said second setting member upon displacement of said mounting means on said base.

4,107,715

FILMSTRIP METERING DEVICE FOR A CAMERA

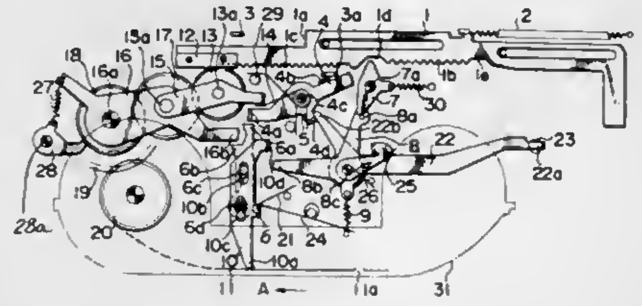
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 716,232, Aug. 20, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,814

Claims priority, application Japan, Aug. 21, 1975, 50-114328[U]

Int. Cl.² G03B *17/42*

U.S. Cl. 354—206 **11 Claims**



1. A camera in which a film cartridge may be inserted, the cartridge containing a filmstrip wound about a film wind-up gear and having a single filmstrip metering perforation on each frame thereof, the camera comprising:
   a wind-up member mounted on the camera for movement between a rest and a winding position and having drive means thereon;
   means resiliently urging the wind-up member toward its rest position;
   transmission members for rotating the film wind-up gear on which the filmstrip is to be wound, said members including a rotatable first gear engageable with said drive means, a first lever pivotally mounted on said first gear, a wind-up engaging gear rotatable about a shaft mounted on the camera, said engaging gear being engageable with the film wind-up gear, a second lever being mounted on the camera for pivotal movement about said shaft, an intermediate gear mounted on said shaft for rotation together with said engaging gear, a second gear rotatably mounted on both said first and second levers and being in meshing engagement with both said first and said intermediate gears, said second lever being movable between a first position wherein said first gear engages said drive means and a second position wherein said first gear is disengaged from said drive means;
   a sensing lever movable from a retracted position abutting said filmstrip through an extended position engaging one of said film metering perforations and to a metering position pivoted a predetermined angle while engaging one of said film metering perforations as said film is wound up;
   means on the camera for resiliently urging said sensing lever toward said extended position;
   a locking lever mounted on the camera for movement between a first position bearing against said second lever for locking it in its first position and a second position out of bearing engagement with said second lever for releasing it from its locked condition; and
   means on the camera for resiliently urging said locking lever toward its first position, said locking lever being operatively coupled with said sensing member so as to be moved to its second position when said sensing member reaches said metering position.

4,107,716

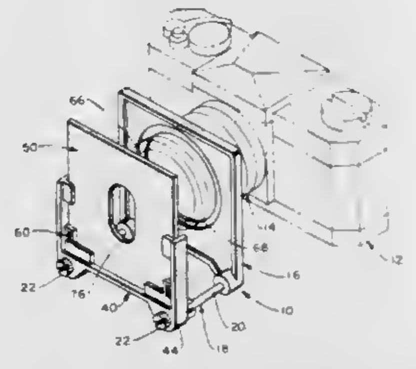
DEMOUNTABLE PHOTO VIGNETTING DEVICE

Irving Pfefer, 637 Anson St., Simi Valley, Calif. 93065

Filed Apr. 29, 1976, Ser. No. 681,532

Int. Cl.² G03B *11/00*

U.S. Cl. 354—296 **7 Claims**



1. In a photo vignetting device for use in conjunction with a camera lens and mounted therefor while a photograph is being made, the combination of: a mounting plate having a centrally located circular opening coincident with and disposable adjacent said lens and adapted to receive securement means through said opening to secure said mounting plate to said lens mount adjacent said lens; track means having one end thereof mounted in said mounting plate; and a vignetting screen standard mounted for sliding movement on said track means, said vignetting screen standard having receptacle means therein for receiving said screen and including resilient track means sufficient to maintain said standard in a predetermined location on said track means but permitting intended movement thereupon.

4,107,717

METHOD AND APPARATUS FOR ADDRESSING A DIGITAL MEMORY

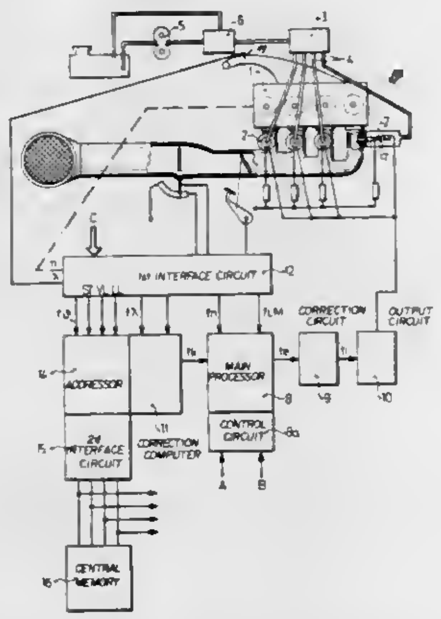
Winfried Klötzner, Schwieberdingen; Rolf Daumer, Merklingen; Wolfgang Busse, Hildesheim, and Hans-Christoph du Mont, Renningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,921

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551680

Int. Cl.² G06F *15/20;* **F02D** *5/00*

U.S. Cl. 364—431 **25 Claims**



1. A method for addressing a central memory for interrogation thereof and retrieval of data stored therein, said addressing taking place in dependence on the operational states of a system which is itself controlled by the data in said central memory, at least one of said operational states being dependent on another state, preferably the temperature of the system, and in particular adapted to controlling an electronic fuel injection system for generating a correction frequency by using the data retrieved from said central memory, for processing by a main processor and for generation of injection pulses to control the opening times of fuel injection valves of the engine, the improvement comprising:
   deriving switching signals from prevailing operational states of the system and feeding said switching signals to a decoder circuit, cyclically activating said decoder for generating a single pre-address selector signal corresponding to each combination of operational states, said pre-address selector signal being fed to an address memory for generating a digital address, a first part of which is fed directly to said main processor for selecting an address range and a second portion of which being fed to a counter which is thereby set to an initial value, gating said counter for a predetermined length of time, feeding to said counter a clock pulse train dependent on said operational state of the system, thereby causing said counter to count upwardly from its initial value, and delivering the final contents of said counter at the expiration of said gating time to said central memory for providing the complete address therein, and closing the gating input to said counter if a particular combination of operational states is independent of said other operational state.

4,107,718

BULK SEMICONDUCTOR LOGIC DEVICE

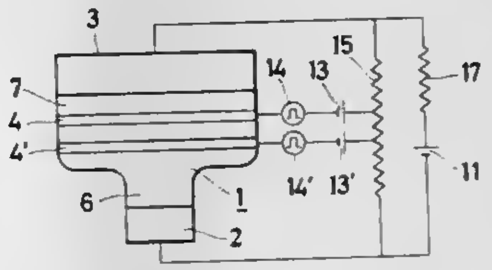
Shoei Kataoka, Tanashi; Nobuo Hashizume, Kawasaki, and Hiroshi Kodera, Kunitachi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 598,257, Jul. 23, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,697

Claims priority, application Japan, Jul. 24, 1974, 49-84247

Int. Cl.² H01L *27/26*

U.S. Cl. 357—3 **12 Claims**



1. A bulk semiconductor logic device comprising
   a bulk semiconductor body, said semiconductor body exhibiting negative conductivity under high electric field, said semiconductor body having bias electric field applying cathode and anode electrodes at opposite ends thereof, respectively, a portion of said semiconductor body having a lower electric field than that of other portions,
   at least two signal electrodes of field effect type in said low field portion thereof, said signal electrodes of field effect type being of a nature to form a depletion layer in said semiconductor body thereunder when a voltage negative with respect to said semiconductor body thereunder is applied thereto,
   means for applying bias voltage to said at least two signal electrodes, said bias voltage being of negative polarity with respect to the potential of the semiconductor body thereunder,
   means for applying a signal voltage to each said signal electrode, and
   means for detecting the presence of a high electric field domain in said semiconductor body.

4,107,719

INVERSE PLANAR TRANSISTOR

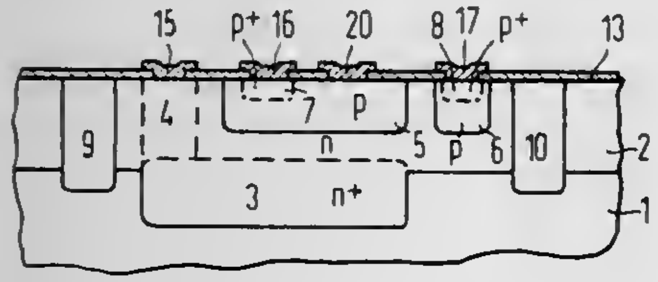
Juergen Graul, Gruenwald, and Helmut Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

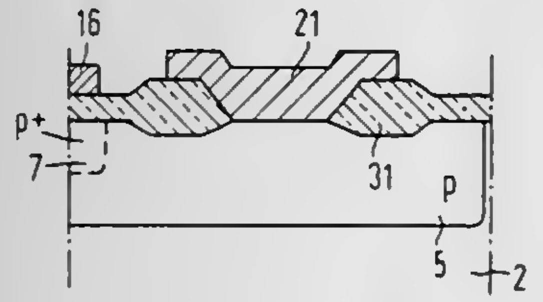
Continuation-in-part of Ser. No. 656,940, Feb. 10, 1976, abandoned. This application Dec. 10, 1976, Ser. No. 749,438

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2507148

Int. Cl.^{2} H01L *29/48*

U.S. Cl. 357—15 **3 Claims**





1. An inverse planar transistor adapted particularly for integrated circuits, comprising a semiconductor body having a first zone of a first conductivity type therein which extends to a planar surface of said semiconductor body and which provides a base zone for said transistor, a second zone in said body of the opposite conductivity type located on the opposite side of said base zone from that side which lies in said planar surface, said second zone being interfaced with said base zone and forming a PN junction, a relatively highly doped third zone of said second conductivity type in said body on the opposite side of said second zone from said base zone and interfaced with said second zone, a highly doped fourth zone of said second conductivity type extending from said planar surface to said third zone leading along side of and spaced from said base zone, said fourth zone providing a conductive path to said third zone, an insulating layer overlying the planar surface of said semiconductor body, and a Schottky contact forming a collector on the planar surface of said base zone, said Schottky contact having a guard ring underlying a marginal edge of said Schottky contact, said guard ring being formed as a relatively thick portion of said insulating layer surrounding the opening through which said Schottky contact extends into contact with said base zone as compared with the remaining portion of said insulating layer, the doping concentration of said base zone in the region of said Schottky contact being $\leqq 10^{17}$ /cm^3, the metal electrode of said Schottky contact being a metal from the group consisting of Pd, Pt and Al.

4,107,720

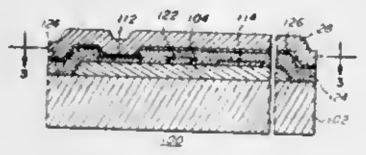
OVERLAY METALLIZATION MULTI-CHANNEL HIGH FREQUENCY FIELD EFFECT TRANSISTOR

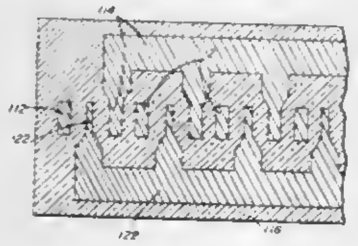
Robert A. Pucel, Needham, and James A. Benjamin, Boxford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 518,692, Oct. 29, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,509

Int. Cl.^{2} H01L *29/80, 29/48, 29/56*

U.S. Cl. 357—22 **30 Claims**





1. A field effect transistor device comprising in combination:

a transistor body;

an epitaxial layer upon one surface of said transistor body;

a plurality of contacts, each one of said contacts being disposed upon one surface of said epitaxial layer, a plurality of controlled conductive channels being formed between predetermined ones of said contacts;

first and second conductive layers coupled to and interconnecting contacts coupled to like ones of said contacts, said contacts being adjacent to said surface;

a layer of insulating material covering at least a portion of said first and second conductive layers, said insulating material having a plurality of apertures therein; and

a third conductive layer coupled to and interconnecting contacts coupled to a third type of said contacts, said third conductive layer extending through said aperture.

4,107,721

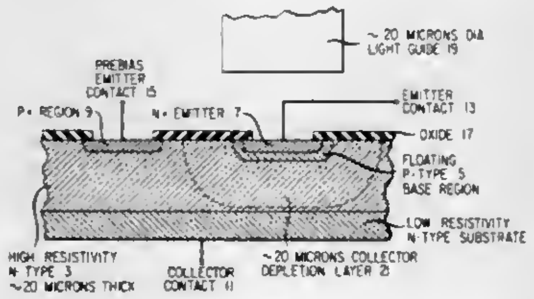
PHOTOTRANSISTOR

Gabriel Lorimer Miller, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 26, 1977, Ser. No. 762,675

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **4 Claims**


~20 MICRONS DIA
LIGHT GUIDE 19
PREBIAS EMITTER CONTACT 15
P+ REGION 9
N+ EMITTER 7
EMITTER CONTACT 13
OXIDE 17
FLOATING P-TYPE 5 BASE REGION
LOW RESISTIVITY N-TYPE SUBSTRATE 1
HIGH RESISTIVITY N-TYPE 3 ~20 MICRONS THICK
COLLECTOR CONTACT 11
~20 MICRONS COLLECTOR DEPLETION LAYER 21

1. An optical radiation detector comprising a substrate of a first conductivity type, first and second regions of a second conductivity type, said first and second regions being disposed within said substrate, a third region of said first conductivity type, said third region being disposed within said second region, said third, second and first regions being called the emitter, base and prebias emitter regions, respectively, said substrate being called the collector region, said collector region having a light sensitive depletion layer when reverse biased, said emitter having an exposed surface providing an optical radiation receiving surface, means for prebiasing said base region; characterized in that said means for prebiasing said base region comprises said prebias emitter in said collector region spaced from said light sensitive depletion layer, said prebias emitter being a current source for supplying a current to said base.

4,107,722

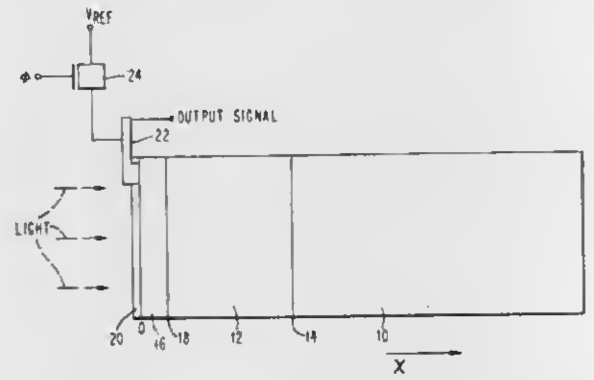
PHOTODIODE STRUCTURE HAVING AN ENHANCED BLUE COLOR RESPONSE

Savvas Georgiou Chamberlain, Waterloo, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 717,052, Aug. 23, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,877

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **6 Claims**



1. A photodiode device for radiation responsive image detectors comprising:

a semiconductor substrate of a *p* conductivity type,

a first layer of material having a first selected doping density of n-type conductivity, said first layer disposed on said substrate to form a first n-p junction at a first depth,

said first selected doping density of said first layer being a relatively low doping density,

and a second layer of material having a second selected doping density of n-type conductivity greater than the doping density of said first layer, said second layer disposed on said first layer to form a second junction at a second depth at least an order of magnitude less than said first depth of said first junction, said second selected doping density of said second layer being within one order of magnitude greater than said first selected doping density resulting in an n-n-p junction device,

wherein said first junction is relatively deep and has a relatively low doping density with respect to said relatively shallow, higher doping density second junction,

said second layer having an outer surface opposite to said second junction upon which radiation may be directed and said first and second n-conductivity type layers being responsive to radiation on said surface of second layer to produce minority carriers and wherein said doping densities of said first and second layers are selected for producing an electric field for directing said minority carriers away from said surface of said second layer and toward said first n-p junction,

said second junction functioning to screen said minority carriers from said surface of said second layer and to permit said relatively low doping density in said first layer to maintain the lifetime of said minority carriers.

4,107,723

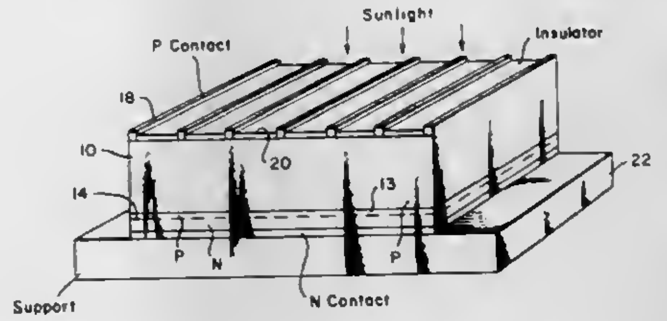
HIGH BANDGAP WINDOW LAYER FOR GaAs SOLAR CELLS AND FABRICATION PROCESS THEREFOR

G. Sanjiv Kamath, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1977, Ser. No. 792,840

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **6 Claims**



4. A PN junction semiconductor device including:

a. a gallium-free P-type substrate layer selected from the group of materials consisting of aluminum phosphide antimonide, aluminum arsenide, aluminum indium phosphide, aluminum nitride and boron nitride, and

b. a thin layer of N-type gallium arsenide disposed on said substrate layer and having a PN junction therein, whereby said device requires a minimum amount of gallium in its fabrication, and solar cells, light emitting diodes, laser diodes and other PN junction devices may be formed as PN junction structures utilizing a minimum of gallium.

4,107,724

SURFACE CONTROLLED FIELD EFFECT SOLID STATE DEVICE

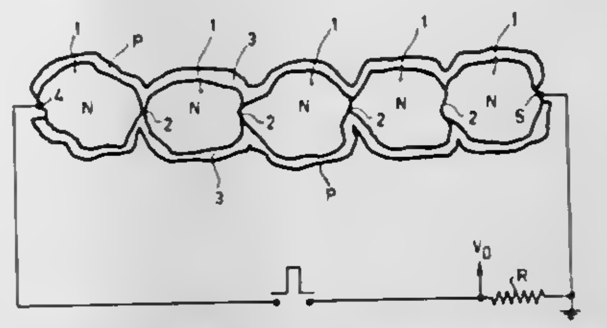
John Ernest Ralph, Crawley Down, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 639,280, Dec. 10, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,666

Claims priority, application United Kingdom, Dec. 17, 1974, 54484/74

Int. Cl.^{2} H01L *27/14, 31/00, 29/80*

U.S. Cl. 357—30 **20 Claims**



1. An electronic solid state device comprising an inhomogeneous body including a plurality of grains of semiconductor material, said grains positioned so as to adjoin each other to provide continuity of electrical conduction paths between the bulk material of adjoining grains, the dominant current conduction paths in said body passing through the interface regions between adjacent grains at grain to grain contacts, charge storage enabling means formed within said body at the surfaces of said grains at least locally adjoining but not interrupting said interface regions, and means contacting said charge storage enabling means for enabling the control of electrical conductivity of at least a portion of said body by surface field effect depletion of said conduction paths between adjoining grains in said interface region.

4,107,725

COMPOUND FIELD EFFECT TRANSISTOR

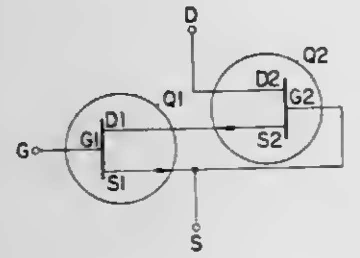
Takashi Yoshida, and Takeshi Matsuyama, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

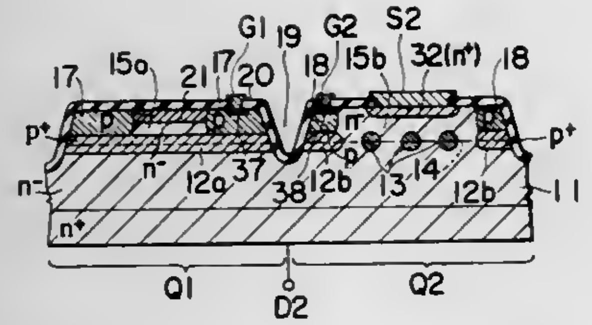
Filed Jul. 30, 1975, Ser. No. 600,476

Claims priority, application Japan, Aug. 2, 1974, 49/88688; Aug. 21, 1974, 49/95896

Int. Cl.² H01L *27/02*

U.S. Cl. 357—41 **16 Claims**





1. A compound field effect transistor having an output characteristic resembling that of a pentode vacuum tube comprising:

- a first junction-type field effect transistor having a saturated drain current to drain voltage characteristic and having a first gate electrode for receiving an input signal, a first source electrode and a first drain electrode,
- means comprising a second junction-type field effect transistor having an unsaturating drain current to drain voltage characteristic for extending the drain-current-saturated operating drain voltage range of said compound transistor and for improving the equality of the intervals between the characteristic curves of said compound transistor,
- said second transistor having a second source electrode and a second drain electrode,
- said first drain electrode being connected to said second source electrode, and said first source and second drain electrodes being the output electrodes for exhibiting the said extended saturated output characteristic resembling a pentode tube.

4,107,726

MULTILAYER INTERCONNECTED STRUCTURE FOR SEMICONDUCTOR INTEGRATED CIRCUIT

Hartmut Schilling, Boxboro, Mass., assignor to Raytheon Company, Lexington, Mass.

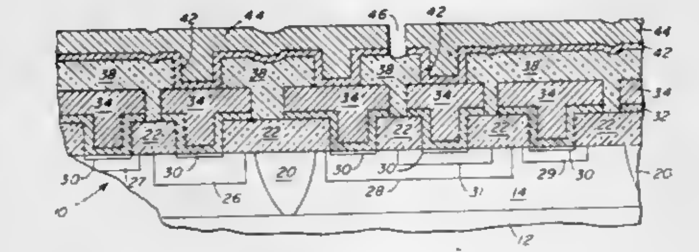
Filed Jan. 3, 1977, Ser. No. 756,508

Int. Cl.² H01L *23/48, 29/46, 29/54*

U.S. Cl. 357—71 **4 Claims**

1. A semiconductor integrated circuit structure comprising:

- (a) a first aluminum lead metal interconnecting system formed over a surface of a semiconductor body of such circuit;
- (b) an insulating layer on the first lead metal interconnecting layer, such insulating layer having apertures formed in selected regions thereof;
- (c) a refractory metal layer deposited on the insulating layer and through the apertures onto selected regions of the first lead metal interconnecting system; and



- (d) a second aluminum lead metal deposited directly on the refractory metal layer to form a second interconnecting layer.

4,107,727

RESIN SEALED SEMICONDUCTOR DEVICE

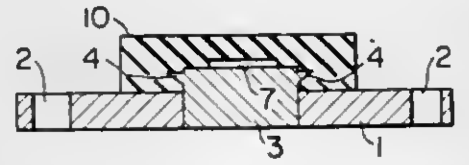
Ryuichi Ikezawa; Atsushi Sasayama, both of Takasaki, and Sakae Kikuchi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,053

Claims priority, application Japan, Jul. 28, 1976, 51-89112

Int. Cl.² H01L *23/28*

U.S. Cl. 357—72 **12 Claims**



1. A resin sealed semiconductor device comprising:

- a flange;
- a heat sink mounted at the center of said flange, said heat sink protruding from a top surface of said flange;
- a semiconductor pellet fixed on said heat sink;
- leads electrically connected to electrodes of said semiconductor pellet through wires;
- a resin mold on said flange for surrounding and sealing said semiconductor pellet fixed on said heat sink and inner ends of said leads; and
- a projection formed around an outer periphery at the protruding portion of said heat sink.

4,107,728

PACKAGE FOR PUSH-PULL SEMICONDUCTOR DEVICES

Lee B. Max, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

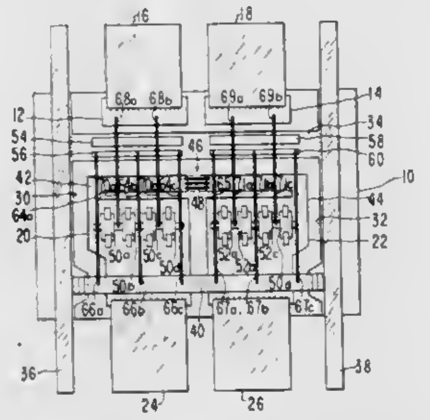
Filed Jan. 7, 1977, Ser. No. 757,716

Int. Cl.² H01L *39/02, 23/02, 23/12*

U.S. Cl. 357—80 **31 Claims**

1. A package for semiconductor devices comprising:

- a first dielectric member;
- a pair of mutually electrically isolated input areas on said first member comprised of a first conductive input area and a second conductive input area adjacent said first input area;
- a pair of mutually electrically isolated output areas on said first member comprised of a first conductive output area and a second conductive output area adjacent said first output area:
- a second dielectric member;
- a common ground plane on said second member substantially parallel to said pairs of input and output areas such that each of said first and second input areas and each of said first and second output areas cooperate with said ground plane to form a structure for packaging first and second active semiconductor devices to thereby provide first and second discrete paths for the transfer of energy at high frequency from input to output over each of said paths and further including first and second active semiconductor devices connected, respectively, between said first input area and said first output area, and between said second input area and said second output area.



4,107,729

METHOD AND APPARATUS FOR REPRODUCING SIGNALS FROM A ROTATING RECORD MEDIUM AND METHOD AND APPARATUS FOR MAKING SAME

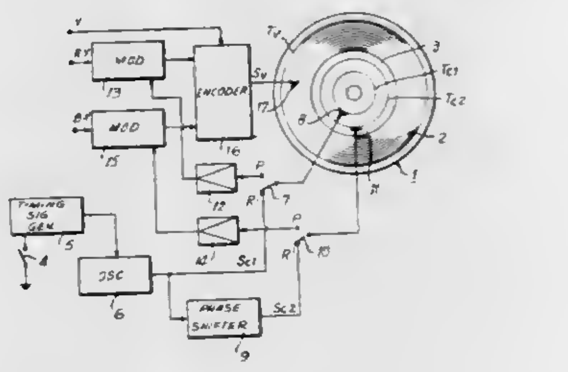
Takashi Otobe; Chiaki Kojima, both of Yokohama, and Hiroshi Ohki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,179

Claims priority, application Japan, Dec. 23, 1975, 50-154391

Int. Cl.² H04N *5/76*

U.S. Cl. 358—4 **16 Claims**



1. A method of recovering information from a record medium wherein said information is a color television signal and is modulated and recorded in an information track on one portion of said record medium and a reference carrier is recorded on another portion of said record medium, said reference carrier comprising first and second reference carriers recorded on first and second reference tracks, respectively, said method comprising the steps of rotating said record medium; reproducing said modulated information from said one portion of said record medium; simultaneously reproducing said reference carrier from said other portion of said record medium; and demodulating said reproduced modulated information with said reproduced reference carrier by separating the reproduced color television signal into luminance and chrominance components, and demodulating said chrominance components with the reproduced first and second reference carriers.

4,107,730

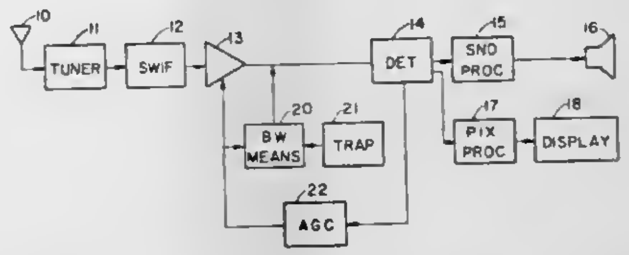
SIGNAL STRENGTH RESPONSIVE SOUND TRAP

Gary A. Jones, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 2, 1977, Ser. No. 773,722

Int. Cl.² H04N *9/535*

U.S. Cl. 358—37 **2 Claims**



1. In a color television reciever including; a tuner developing an intermediate frequency picture carrier and an intermediate frequency sound carrier from a received color television signal; an IF amplifier system including a variable gain amplifier and a surface wave integratable acoustic filter; AGC means; picture carrier enhancement means including a transistor; synchronous detector means, said synchronous detector means requiring sound carrier trapping in the presence of abnormally strong signals to preclude generation of a 920KHz sound-chrominance interference beat; said AGC means controlling said variable gain amplifier and conduction of said transistor in said picture carrier enhancement means to sharpen receiver response to the picture carrier under weak signal conditions, the improvement comprising:

- an absorption trap tuned to the frequency of the sound carrier in circuit with said transistor such that for said abnormally strong signals, said trap is fully effective and precludes generation of said 920KHz beat and for weak signals said trap is ineffective and sound carrier amplitude is maintained.

4,107,731

SILICON DOPED WITH CADMIUM TO REDUCE LIFETIME

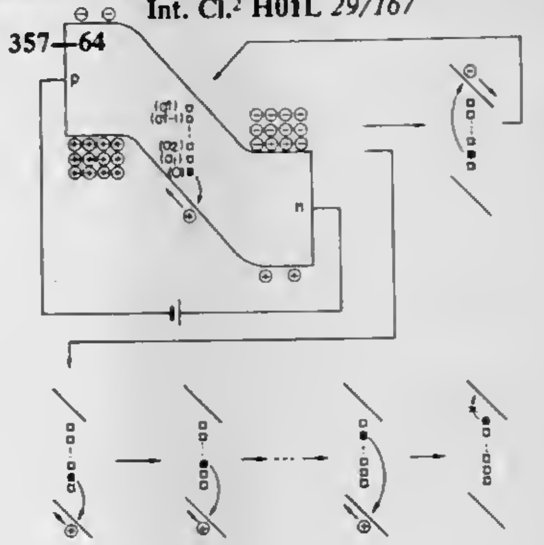
Masayoshi Naito, and Tatsuya Kamei, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 19, 1976, Ser. No. 668,400

Claims priority, application Japan, Mar. 24, 1975, 50-34370

Int. Cl.² H01L *29/167*

U.S. Cl. 357—64 **1 Claim**



1. A semiconductor device comprising a silicon semiconductor body having a first layer of N type conductivity and a second layer of P type conductivity adjacent to said first layer so as to form a PN junction between said first and second layers, said second layer having a higher resistivity than that of the first layer, and said second layer being doped with cadmium for imparting a short reverse recovery time of the PN junction to the device.

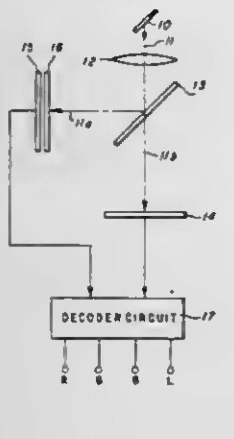
4,107,732
TWO SENSOR TIME ENCODED COLOR IMAGING SYSTEM

Willis A. Adcock, and Frank L. Skaggs, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1976, Ser. No. 700,359

Int. Cl.² H04N *9/07*

U.S. Cl. 358—43 **28 Claims**



1. A method producing three color-information signals representative of the shape and color of light received from an object, said method comprising:

(a) splitting the light from the object into first and second portions, the first portion comprising light of a first primary color and the second portion comprising light of second and third primary colors;

(b) encoding the first portion into a first color-information signal using a first charge coupled device image sensor, said first color signal corresponding to the light of said first primary color from said object;

(c) spatially filtering out light of said third primary color from said second portion using a striped optical filter;

(d) encoding the spatially filtered second portion into an electrical signal using a second charge-coupled device image sensor, said electrical signal comprising alternating first and second lines of video information, said first lines corresponding to the light of said second and third primary colors received from said object and said second lines corresponding to light of said second primary color received from said object;

(e) storing a selected one of said first and second lines of video information;

(f) substracting the selected lines of video information and the non-selected lines of video information to produce a second color-information signal corresponding to the light and said third primary color light received from said object; and

(g) removing said first lines from said electrical signal to form a third color-information signal, corresponding to the light of said second primary color received from said object.

4,107,733
FACSIMILE COLOR BLEACHING COPYING METHOD

Willi Schickedanz, Langener Strasse 70, 605 Offenbach am Main, Germany

Filed Jan. 5, 1976, Ser. No. 646,498

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1975, 2500520

Int. Cl.² H04N *1/46;* G01D *15/10*

U.S. Cl. 358—75 **7 Claims**

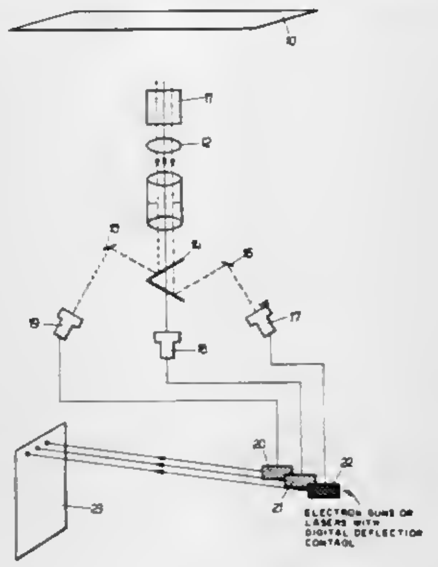
1. A method of making copies, comprising the following steps:

(a) dividing the pattern, which is to be copied, simultaneously into its components of colour;

(b) scanning the components of colour simultaneously point by point and converting the intensities of the coloured points into control signals;

(c) leading the control signals to electromagnetic sources, the beams of which are deflectable and the intensities of the beams being correspondent to the intensity of the control signals;

(d) bleaching the intensity of the components of colour in a special copy paper, wherein the colour components are arranged by points which lie side-by-side, the bleaching of a certain area of the copy paper corresponding to the inverse intensity of colours in the corresponding area of the pattern.



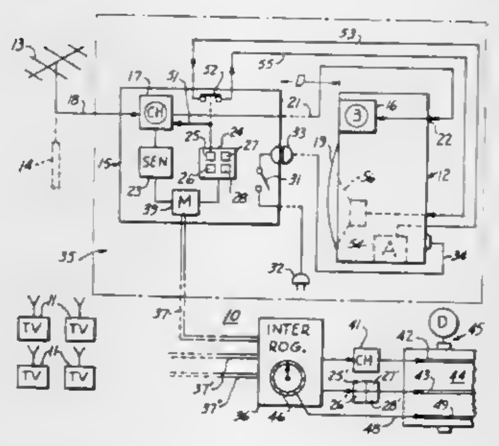
4,107,734
TELEVISION VIEWER REACTION DETERMINING SYSTEM

Roger D. Percy; David C. M. Wilding, both of Seattle, Wash., and Sholly Kagan, Boston, Mass., assignors to R. D. Percy & Company, Seattle, Wash.

Filed Jan. 31, 1977, Ser. No. 763,966

Int. Cl.² H04H *1/44*

U.S. Cl. 358—84 **20 Claims**



1. In a system for determining viewing habits of television viewers in a multi-channel television broadcast reception area including a television broadcast display set, the improvement comprising in combination:

a remote control for said television set including first manually actuable means located at a distance from said television set for causing said television set to display a television broadcast received on any one of a predetermined number of channels, and further manually actuable means adjacent said first manually actuable means for receiving a television viewer reaction to displayed television broadcasts;

means coupled to said further manually actuable means and to at least one of said first manually actuable means and television broadcast display set for altering the display of a television broadcast in response to a received television viewer reaction;

means coupled to said first manually actuable means for determining for each broadcast displayed by said television set the channel on which that broadcast is being received; and

means connected to said determining means and coupled to said further manually actuable means for polling said determining means as to the channel on which a broadcast displayed by said television set is received and said further manually actuable means as to received viewer reactions to a displayed broadcast received over the latter channel.

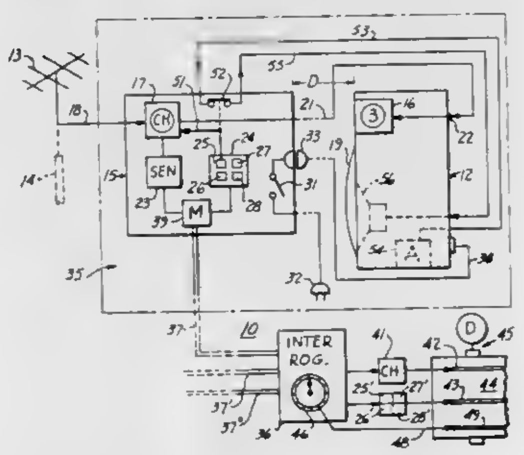
4,107,735
TELEVISION AUDIENCE SURVEY SYSTEM PROVIDING FEEDBACK OF CUMULATIVE SURVEY RESULTS TO INDIVIDUAL TELEVISION VIEWERS

Hugh F. Frohbach, Sunnyvale, Calif., assignor to R. D. Percy & Company, Seattle, Wash.

Filed Apr. 19, 1977, Ser. No. 788,719

Int. Cl.² H04M *7/02*

U.S. Cl. 358—84 **49 Claims**



1. In a method of determining the reaction of television viewers to a video program displayed by different video display sets in a broadcast reception area, the improvements comprising in combination the steps of:

broadcasting said video program to said sets for display at the discretion of television viewers in said area;

providing a display of said broadcast video program;

determining a relative number of said sets responding to said broadcast video program; and

providing in said display a pictorial representation of said relative number of responding sets.

4,107,736
NOISE REDUCTION SYSTEM FOR VIDEO SIGNALS

John D. Lowry, Willowdale, Canada, and Kenneth F. Holland, Granada Hills, Calif., assignors to Image Transform, Inc., Los Angeles, Calif.

Filed Dec. 20, 1971, Ser. No. 209,910

Int. Cl.² H04N *5/14*

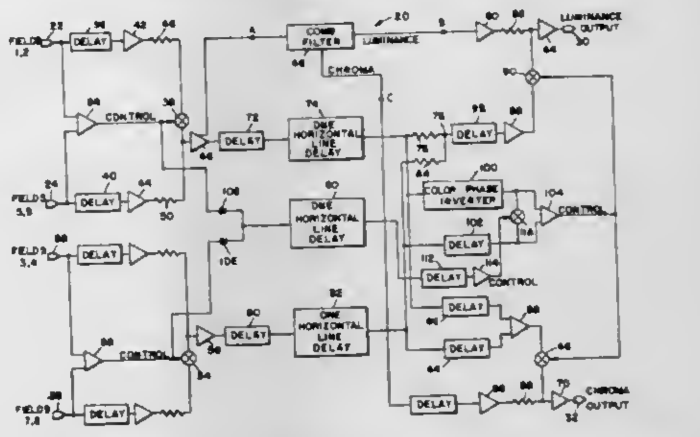
U.S. Cl. 358—36 **17 Claims**

15. A method of improving the quality of a video picture, comprising the steps of:

(a) electronically comparing corresponding portions of at least two separate frames of the video picture having the same phase, the first of said frames being the n^{th} frame of said video picture;

(b) using the result of said comparison to combine said corresponding portions;

(c) transmitting said combination of said portions; and



(d) repeating said comparison, combination, and transmission with said first frame being, successively, the $(n+1)^{th}$, $(n+2)^{th}$, etc. frame of said video picture.

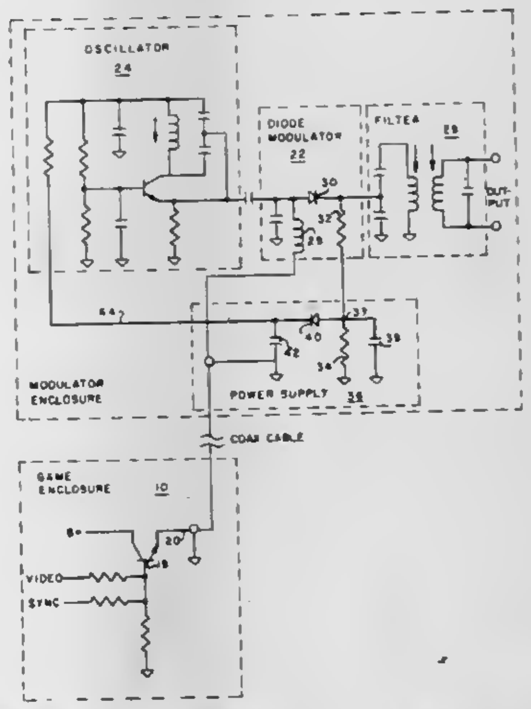
4,107,737
SYNCHRONIZATION SIGNAL POWERED TELEVISION TRANSMITTER

James W. Maben, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 24, 1977, Ser. No. 761,735

Int. Cl.² H04N *7/18;* A63B *71/04*

U.S. Cl. 358—93 **11 Claims**



1. Apparatus for generating d.c. power at an electrical circuit requiring said d.c. power and remotely located from a source of synchronization signals, comprising:

means coupled to the source of synchronization signals for generating substantially d.c. power from said synchronization signals; and

means coupling said means for generating substantially d.c. power to the electrical circuit.

4,107,738

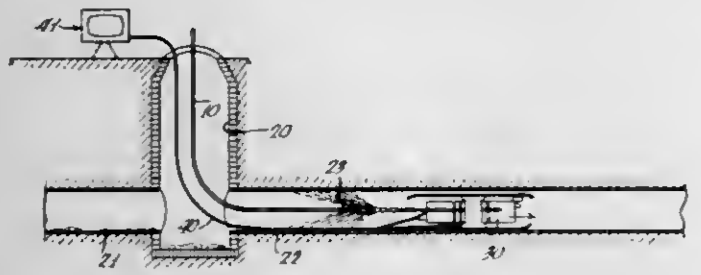
SEWER INSPECTION DEVICE AND METHOD OF SCANNING SEWERS FOR LEAKS

John W. Van Norman, Kansas City, Kans., assignor to Conco Inc., Mendota, Ill.

Filed Aug. 25, 1976, Ser. No. 717,544

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 358—100 **3 Claims**



1. A TV sewer inspection device including an aboveground receiver and a skid-mounted camera for movement along a sewer, and hydraulic jet propulsion means including a jet unit associated with said camera for advancing the camera along the sewer and further comprising a power-operated drum having a pressure hose mounted thereon which is connected to said jet unit for supplying fluid to the jet unit and for retraction thereof by windup of the pressure hose.

4,107,739

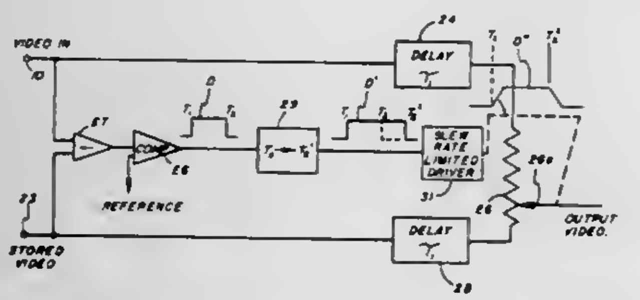
SYSTEM UTILIZING INTEGRATION AND MOTION EVALUATION FOR REDUCING NOISE IN VIDEO SIGNAL

John P. Rossi, New York, N.Y., and Marvin A. Stern, Stamford, Conn., assignors to CBS Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,292

Int. Cl.^{2} H04N *9/535, 5/21*

U.S. Cl. 358—167 **2 Claims**



1. In a system utilizing integration for reducing noise contained in arriving television video signals including means for storing a television video signal, controllable summing means having first and second input terminals and an output terminal for adding a first fractional amplitude portion of the signal stored in the storage means to a second fractional amplitude portion of the arriving video signal and producing at said output terminal a constant valued sum signal, and motion evaluation means for automatically and simultaneously changing said first and second fractional amplitude portions as a function of motion between the arriving video signal and the stored signal, and including means operative in response to a difference between the arriving video signal and the stored signal which exceeds a predetermined threshold value to generate a gating waveform having a duration corresponding to the time period that said difference exceeds said predetermined threshold value, and means for causing said controllable summing means to increase, during the existence of the gating waveform, the fractional amplitude portion of the arriving video signal and to decrease the fractional amplitude portion of the stored signal contained in the sum signal produced at said output terminal, the improvement in said motion evaluation means which comprises:

first and second signal coupling means for coupling said arriving video signal and said stored signal to the first and second input terminals, respectively, of said controllable summing means, said first and second coupling means each including means for delaying its coupled signal by a predetermined amount sufficient to cause the start of said gating waveform to be anticipatory of the delayed arriving video signal and delayed stored signal, and

means for delaying by a predetermined amount the termination of said gating waveform thereby to produce an extended gating waveform and applying said extended gating waveform to said causing means, said extended gating waveform delaying a change to a decreased value of the fractional amplitude portion of the arriving video signal from that which existed during the gating waveform.

4,107,740

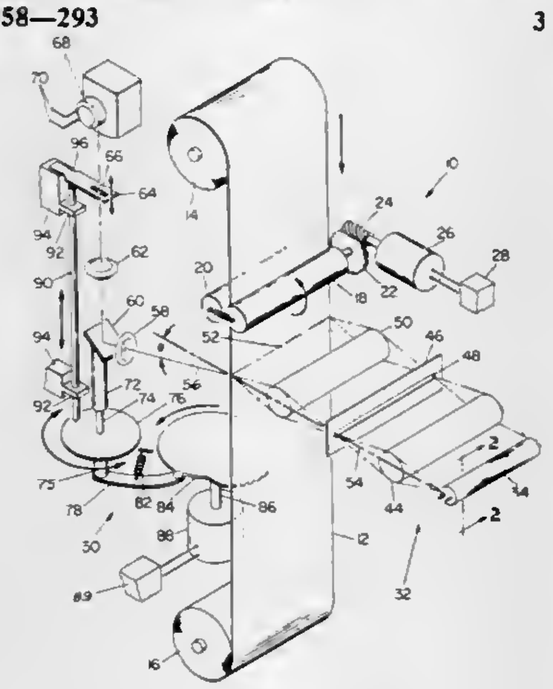
OPTICAL SCANNING SYSTEM UTILIZING AN OSCILLATING LENS AND MIRROR

Austin G. Cooley, 690 W. Second St., Reno, Nev. 89503

Continuation-in-part of Ser. No. 479,205, Jun. 14, 1974, Pat. No. 3,988,537. This application Feb. 2, 1976, Ser. No. 654,192

Int. Cl.^{2} H04N *3/08*

U.S. Cl. 358—293 **3 Claims**



1. An optical scanning system for the high-speed scanning of a sheet which system is at all times symmetrical to its optical axis, comprising:

a lens and mirror mounted upon a common frame;

a second lens;

said mirror arranged to reflect light from said sheet focused by said first-mentioned lens upon said second lens to establish said optical axis;

means for oscillating said lens and mirror mounting frame for sweeping the focus of said first-mentioned lens across said sheet onto said mirror;

electro-optical means mounted in said optical axis for receiving light reflected from said oscillating mirror focused thereon by said second lens;

an aperture plate having an aperture therein mounted between said second lens and said electro-optical means;

means for oscillating said aperture plate back and forth in a direction parallel to said optical axis; and

said second lens focused upon said oscillating aperture for retaining said light reflected by said mirror in focus on said aperture as said first-mentioned lens focus sweeps across said sheet.

4,107,741

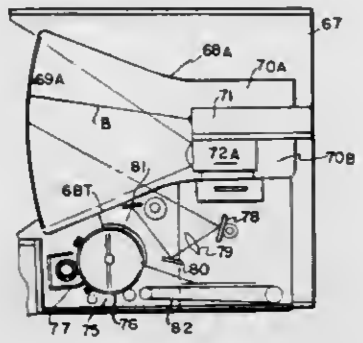
DATA GENERATING AND RECORDING SYSTEM FOR SCANNING A DISPLAY TUBE SCREEN

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 333,119, Feb. 16, 1973, Pat. No. 3,872,462. This application Mar. 17, 1975, Ser. No. 559,087

Int. Cl.^{2} H04N *5/80*

U.S. Cl. 358—300 **6 Claims**



1. An apparatus for recording images generated on the display screen of an electronic display tube comprising in combination:

an electronic display tube having a display screen for image information, said tube defining an enclosed envelope, said display screen being sealed within said envelope and disposed along one wall thereof,

means located within said enclosure for generating an image on said display screen which image varies in accordance with information signals received by said display tube,

said display screen being constructed and operable to permit the optical scanning of said screen from the rear thereof,

said tube having a wall portion which is made of light transmitting material,

scanning means supported operable to receive light of the images generated on said screen after said light has passed through said wall portion of said tube made of light transmitting material,

means for operating said scanning means to cause it to predeterminately scan the image presented on the rear of said screen of said display tube, and

recording means operable to receive the light received by said scanning means in scanning said rear of said display screen and to effect a hard copy recording thereof.

4,107,742

METHOD AND APPARATUS FOR RECORDING GRAPHIC INFORMATION MAGNETICALLY

Sidney Levy, 145 W. Cuthbert Blvd., Oaklyn, N.J. 08107

Filed May 30, 1975, Ser. No. 582,124

Int. Cl.^{2} H04N *1/28*

U.S. Cl. 358—301 **27 Claims**

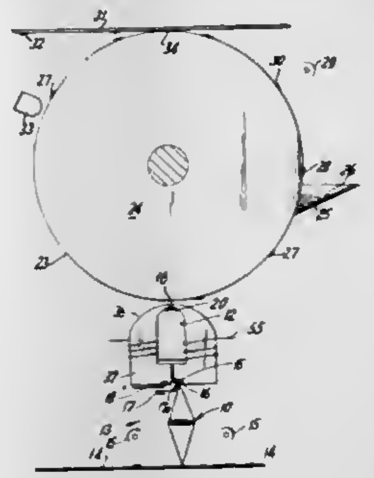
1. An imaging apparatus for recording graphic information from an original onto a receiving surface, comprising:

(a) means for providing a magnetic field;

(b) means for shaping the magnetic field to a substantially linear configuration to provide a line with a uniform magnetic intensity throughout its length for any instant of time; said shaping means including a copying head having a plurality of electrically conductive and magnetically permeable laminae electrically insulated from each other to define a stack of said laminae having a first terminal and a second terminal, each of said laminae having a gap therein between said terminals bridged by an electrically conductive and non-magnetic material, said line being disposed along said gap;

(c) electrical means connected to said first and second terminals for varying the intensity of portions of the magnetic field along said line to provide magnetic information in accordance with information contained on a corresponding portion of the original graphic information; and

(d) surface means positioned adjacent to said gap in magnetic coupling relation to said linear configuration of said magnetic field for recording thereon the magnetic information contained along said line and for producing thereon a magnetic image corresponding to the original graphic information, said surface means further attracting thereto a toner material and transferring the toner material to a receiving surface in quantity corresponding to variations of light and shade in the original as provided by magnetic field intensity variations along said line.



4,107,743

CASSETTE RECORDER WITH ANTI-ERASE INTERLOCK

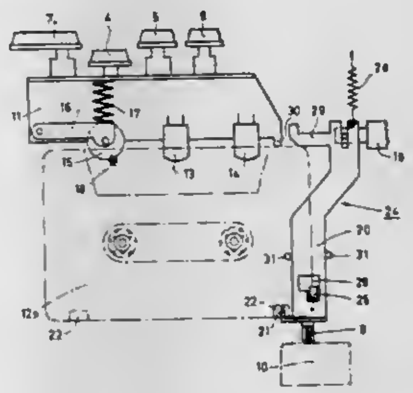
Gilbert Edouard Mestdagh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,028

Claims priority, application Netherlands, May 6, 1976, 7604825

Int. Cl.^{2} G11B *15/04, 21/04*

U.S. Cl. 360—60 **6 Claims**



1. A tape cassette recorder for use with a cassette of a type in which anti-erase openings are provided to prevent inadvertent erasure of pre-recorded tape, comprising:

a housing,

means mounted to the housing for holding a cassette in the recorder,

means for controlling tape driving functions of said recorder,

means for manually selecting a recording or reproducing mode of operation,

means for recording and playing back information on tape in a cassette held in the recorder, in response to selection of the recording or playback mode of operation,

means for sensing presence of an anti-erase opening in a cassette held in the recorder, and

means for blocking manual selection of the recording mode responsive to sensing presence of an anti-erase opening;

wherein said means for manually selecting and said means for sensing consist of a single rigid combined recording member, means for mounting said member for movement relative to the housing and a cassette in the recorder between a recording position and at least one inactive reproducing position, and means for switching the recorder to a recording condition responsive to said member being in the recording position and to a reproducing condition responsive to said members being in one of the inactive reproducing positions; and said member has a first portion arranged for sensing movement into an anti-erase opening where such opening is provided in a cassette held in the recorder, and a second portion accessible, at least in the absence of sensing of an anti-erase opening, for manual movement between said only one inactive reproducing and said recording positions.

4,107,744

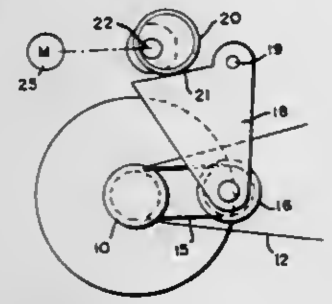
VARIABLE RATIO MAGNETIC TAPE DRIVE USING A VARIABLE BELT THICKNESS

Alexander R. Maxey, Santa Clara, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Oct. 5, 1976, Ser. No. 729,672

Int. Cl.² G11B *15/28, 15/46, 19/28*

U.S. Cl. 360—73 **9 Claims**



1. In a recorder having
means defining a path for the recording media,
drive means for advancing the media along said path including a drive motor,
pulleys and a drive belt providing a power transmitting connection from said motor to said drive means;
the improvement comprising
a drive ratio control belt running over one of said pulleys underneath said drive belt,
said control belt being variable in thickness to change the effective radius of said drive belt around said one pulley, and
tensioning means acting on said control belt to stretch it and thereby to vary its thickness between said one pulley and said drive belt to control the driving speed ratio between said motor and drive means.

4,107,745

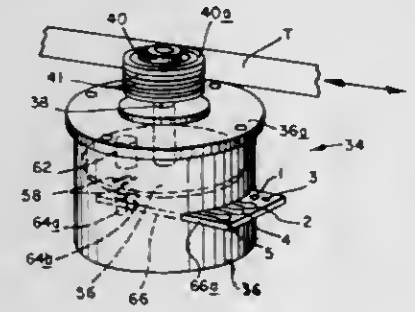
TAPE SPEED CONTROL APPARATUS

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Filed Apr. 6, 1977, Ser. No. 785,021

Int. Cl.² G11B *5/00*

U.S. Cl. 360—73 **4 Claims**



1. Apparatus for controlling tape speed in a high speed capstanless tape transport having a tape cassette-supporting surface, means for locating a cassette on that surface, a pair of motor driven let-off and take-up spindles projecting up from that surface for engagement in the cassette and a read/write head projecting up from the surface adjacent the spindles, said apparatus comprising:
A. a timing signal generator, said generator including
  (1) a housing,
  (2) a shaft rotatively mounted in the housing, and
  (3) means for producing an electrical output in response to rotation of the shaft.
B. means for mounting the housing in the transport so that said shaft projects up from the supporting surface thereof at a point substantially aligned with the read/write head therein,
C. a wheel mounted on said shaft, said wheel being dimensioned to project into the cassette supported on the tape transport with the periphery of the wheel providing the sole means for engaging the tape therein with sufficient interference so that when the tape is moving past the head it turns the wheel correspondingly whereby the generator produces an electrical output indicative of the speed of the tape past the head,
D. means defining one or more grooves in the peripheral surface of the wheel, said grooves extending around the circumference of the wheel so as to prevent entrainment of air between the wheel and the tape,
E. a control circuit for controlling the spindle motors, and
F. means for applying the output of the generator to the control circuit so that the spindles are driven so as to maintain the speed of the tape past the read/write head substantially constant.

4,107,746

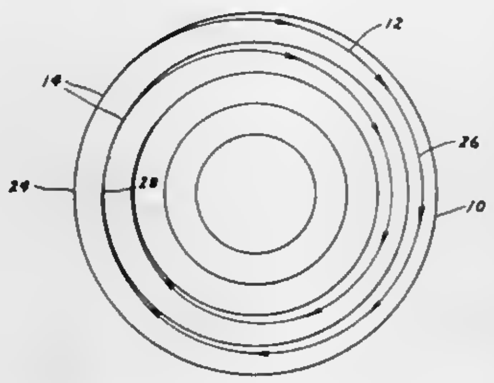
CONTINUOUS SPIRAL MODE TRACKING IN A CONVENTIONAL DISK DRIVE USING CONCENTRIC SERVO TRACKS

David Laurence Conway, Bloomington, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 25, 1977, Ser. No. 844,674

Int. Cl.² H04N *5/76*

U.S. Cl. 360—78 **2 Claims**



1. A system for operating a disk drive of the type used with a disk pack having a servo disk and at least one data disk and in which the disk pack rotates continuously at a constant speed and a transducer arm moves radially with respect to the disk pack, said system being a system to write and read data in a spiral tracking mode on a data disk while position is referenced with respect to a plurality of concentric servo tracks, said system comprising:
track address register means for referencing the number of the servo track being accessed,
means for incrementing said track address register means in response to a data signal,
means for receiving position error signal of a servo track transducer head with respect to a servo track and inverting said signal in response to a data signal and leaving it unchanged in the absence of a data signal,

means for receiving a once per revolution servo track index signal and generating a data signal after a predetermined time delay said data signal being transmitted to said means for receiving a position error signal and said means for incrementing said track address register,
integrator means for generating a continuous time varying signal,
means for initiating said integrator in response to a data signal from said means for receiving, and
means for summing said position error signal and the output of said integrator to form a signal for controlling said head arm transducer.

4,107,747

FLUIDIC CONTROLLED CARTRIDGE EJECTOR

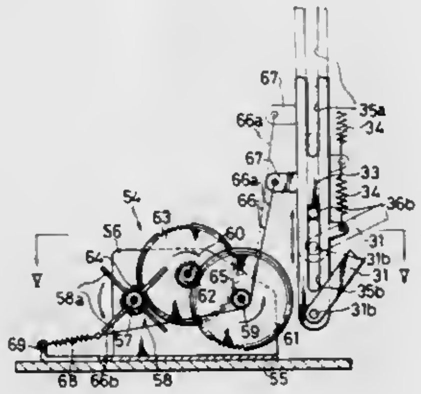
Noboru Kumaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,136

Claims priority, application Japan, Oct. 15, 1975, 50-140287[U]

Int. Cl.² G11B *15/00, 5/00*

U.S. Cl. 360—93 **13 Claims**



1. A magnetic tape recording and/or reproducing apparatus including a housing, a cassette support frame movably mounted on said housing for movement between a first loading position and a second recording and/or reproducing position with respect to said housing; spring bias means for norally urging said support frame from said second position to said first position; releasable latch means for holding said frame in said second position against the bias of said spring bias means; a linkage coupled to said support frame; and unidirectional fluidic resistance means coupled to said linkage for exerting a fluid resistance against the movement of said frame substantially only from said second position to said first position, thereby reducing the speed of movement of said frame from said second to said first position against the bias of said spring bias means without effecting movement of said frame from the first to the second position thereof.

4,107,748

RECORDING HEAD SUPPORT ASSEMBLY

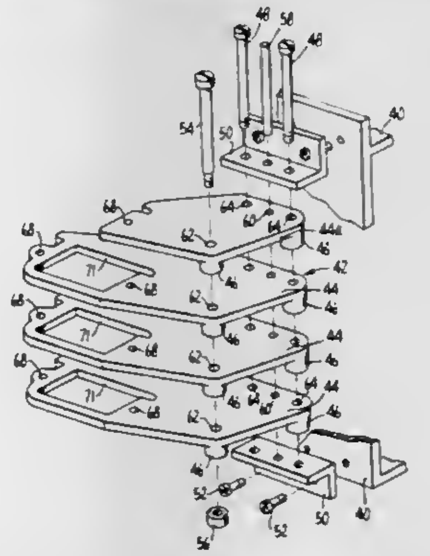
Bin-Lun Ho, Los Gatos, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed May 31, 1977, Ser. No. 801,648

Int. Cl.² G11B *21/16, 5/48*

U.S. Cl. 360—104 **3 Claims**

1. A recording head support assembly supporting and loading recording head slider elements for use on magnetic storage discs on a high density, direct access data storage device having an actuator with a movable armature, the support assembly comprising:
a plurality of flat, rigid arm members each having a configuration with a distal end projecting in part over the surface of a magnetic storage disc;
means for rigidly interconnecting said plural arm members in stacked, spaced relationship to define a unitary extension arm component, whereby the relative spacings and positioning of the rigid arm members are maintained within that extension arm component;
means for remvovably attaching said unitary extension arm component to said actuator armature; and
at least one first flat leaf spring means attached to each said rigid arm member for supporting and loading a slider element over a disc, said spring means having its base end fixedly attached to the distal end of said rigid arm member, said leaf spring means including a bifurcated support element having distal ends extending from the base of said leaf spring means, a flexure element connected to the distal ends of the support element and having means for connecting said flexure element to the slider element, and a loading element having means for engaging the head slider element and loading the head slider element with the predetermined loading force when the slider element is flying over a disc.



4,107,749

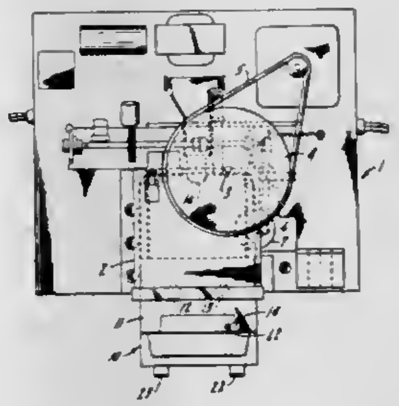
CASSETTE RECORD PLAYER-RECORDER

Kenneth B. Harper, Winnetka, Ill., assignor to Motorola, Inc., Schaumberg, Ill.

Filed May 21, 1970, Ser. No. 39,500

Int. Cl.² G11B *5/54, 21/22*

U.S. Cl. 360—105 **12 Claims**

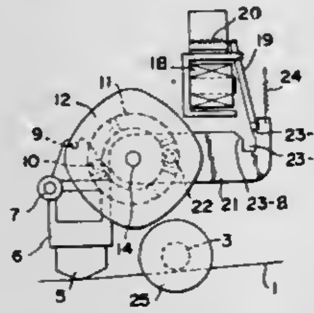


1. A tape drive unit for a tape recorder comprising a takeup reel shaft, a friction disc operatively connected with a drive source normally for driving the shaft, a transmission roller operable to operatively connect the shaft with the drive source, thereby causing the shaft to be driven at a different number of revolutions from that provided by said friction disc, control means to disengage the friction disc from operative connection with the shaft and at the same time to engage the transmission roller respectively with the shaft, and reset means for resetting said control means.

4,107,750
TRACK CHANGE-OVER MECHANISM FOR A MULTI-CHANNEL TAPE RECORDER

Itsuki Ban, 829 Higashioizumi-machi, Nerima-ku, Tokyo; Sumio Nozaki, Takashimadaira 2-chome, Tokyo; Takanori Kasuya, 1105 Kodanhagi-Yamadanchi, 2620-3, Kodaira-shi, Tokyo; Yukio Shinkado, 2-5-3, Kamabura 1-chrome, Katsushika-ku, Tokyo, and Kanji Yano, 31-17, Akitsu-cho-4-chome, Tokyo, all of Japan

Division of Ser. No. 605,406, Aug. 18, 1975, Pat. No. 4,024,582.
This application Jan. 18, 1977, Ser. No. 760,409
Claims priority, application Japan, Dec. 27, 1974, 50-148788
Int. Cl.^{2} G11B *21/08*
U.S. Cl. 360—106 **4 Claims**



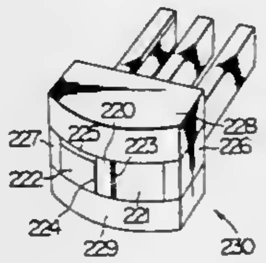
1. In a multi-channel tape recorder having a rotary capstan (3, 25) for driving a tape (1) at least with one magnetic head (5) with a cam follower (10) attached thereto, said magnetic head being adapted to act on the tape and a rotating stepped cam means (11) with a plurality of cam steps angularly arranged and corresponding in number to the number of channels of track on the tape for steppingly shifting the magnetic tape by acting on the cam follower (10), said cam follower (10) abutting against the steps of said rotating stepped cam member (11), a track change-over mechanism for shifting said cam follower (10), comprising in combination:

a. a pivotally supporting lever member (21), with a supporting end portion for supporting said cam means (11) at said end portion and a contacting portion at the end opposite said supporting end portion;
b. an idler (12) rotatably supported on said end portion, said idler (12) being coupled to said cam means (11), said idler (12) having on its periphery a plurality of second cam portions corresponding in number to the channels of track and with shorter and longer radius portions and arranged symetrically with respect to the axis of said idler;
c. an actuator member (19) with one end and a free end, said one end being pivotally supported and said free end contacting said lever member contacting portion for controlling the pivotal movement of said lever member, bias means (20) at said actuator member one end;
d. spring means (24) on said lever member for biasing said lever member and said idler (12) in a direction such that said idler is pushed into contact with the capstan;
e. a solenoid-operated electromagnet (18) disposed alongside said actuator member (19) for moving the actuator when the electromagnet is energized against the force of said bias means (20); and,
f. guide means at said lever member contacting portion cooperating with said actuator member including a first guide portion (23-B) for a temporary engagement with said free end to prevent the displacement of the lever under the action of the spring means (24) when said electromagnet is energized, a second guide portion (23-C) for cooperation with said bias means (20), said bias means releasing said free end from said temporary engagement with the first guide portion (23-B) when said electromagnet is de-energized so that said free end is moved by the bias exerted by the bias means and moves into said second guide portion (23-C) and, one of the cam portions of said idler (12) comes into contact with said capstan, and a third guide portion (23-A) for re-engagement with the free end of the actuator by a see-saw pivotal movement of said lever member and the bias of said bias means (20) to thereby displace the steped cam one step and thus shifting the magnetic head by one channel of track.

4,107,751
MAGNETIC HEAD

Misao Shimoda, Hamura, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 10, 1976, Ser. No. 685,060
Claims priority, application Japan, May 26, 1975, 50/62616
Int. Cl.^{2} G11B *5/12*
U.S. Cl. 360—122 **1 Claim**



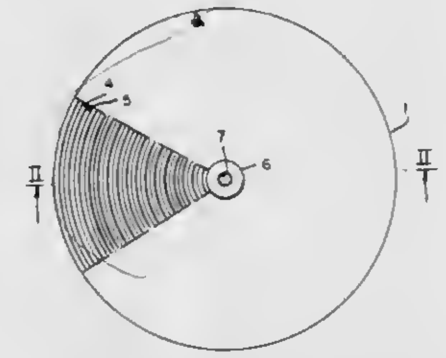
1. A composite magnetic transducer head for a magnetic tape; said transducer head comprising a central core piece, a second core piece disposed on one side of the central core piece and having the same elevation as the central core piece, and a third core piece disposed on the opposite side of the central core piece and having a reduced elevation as compared with the central core piece; each of the said core pieces having a plane upper surface and a parallel plane lower surface, a record/playback gap being defined between the central core piece, and the third core piece (and the third core piece,) and an erase gap being defined between the central core piece and the second core piece; the lower plane surface of the respective core pieces extending in the same plane with each other, and a positioning block having a thickness which is equal to the difference in elevation between the central core piece and the third core piece, the positioning block being disposed on the upper surface of the third core piece, said positioning block has a plane upper surface and a parallel plane lower surface engaging the upper surface of said third core piece; the upper surfaces of the first and second core pieces and of the positioning block extending in the same plane, all of the core pieces and the positioning block being integrally secured together; the interfitting surfaces of said members being polished to a mirror finish to present a smooth surface to said tape, said core pieces and block being enclosed by non-magnetic blocks so as to form a unitary composite transducer head.

4,107,752
HIGH DENSITY MAGNETIC STORAGE DISC COMPRISING A SPIRAL OF MAGNETIC TAPE

Clark E. Johnson, Jr., Weston, Mass., assignor to Micro Communications Corporation, Waltham, Mass.

Filed Oct. 13, 1976, Ser. No. 732,142
Int. Cl.^{2} G11B *5/012, 5/82*
U.S. Cl. 360—135 **7 Claims**

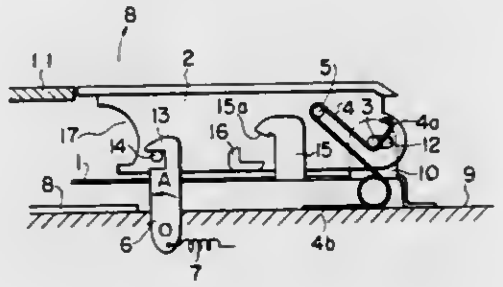
1. A magnetic data storage disc, comprising a cylindrical base member having a substantially flat bottom surface and a flexible plastic wall means joined to and projecting from the top surface thereof and arranged in a spiral coaxial with the cylindrical base member, adjacent convolutions of the spiral wall means having a normal position in which they are spaced from and out of contact with one another, at least one side of the wall means carrying an exposed coating of magnetic recording material for magnetically recording therein at least one track of information, said wall means being sufficiently flexible and resilient to be deflected from said normal position upon application of a deflecting force thereto and to return to said normal position upon removal of said force.



4,107,753
CASSETTE HOLDER CAPABLE OF ROTATION THROUGH A LARGER ANGLE OF INCLINATION

Akira Izumikawa, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Sep. 3, 1976, Ser. No. 720,208
Claims priority, application Japan, Sep. 12, 1975, 50-125725
Int. Cl.^{2} G11B *15/00*
U.S. Cl. 360—137 **6 Claims**



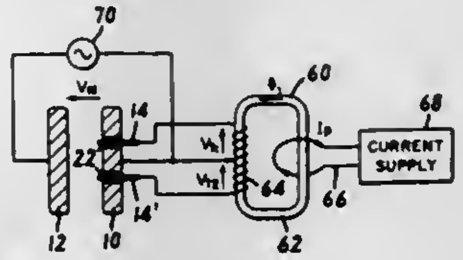
1. In a cassette tape recorder having a chassis and a cassette holder supporting plate, the improvement comprising:

a bracket mounted on said cassette holder supporting plate and carrying thereon a pivot shaft;
a cassette holder having an elongated slot formed at a rear end of said cassette holder longitudinally thereof and pivotally supported by said pivot shaft engaging said elongated slot;
biasing means for urging said cassette holder in a direction to bring said cassette holder into its open condition;
locking means for holding said cassette holder in its closed condition against the action of said biasing means;
releasing means for releasing said locking means from said cassette holder to cause said cassette holder to rotate into its open condition by the action of said biasing means; and
stopper means for maintaining said cassette holder in its open condition;
said cassette holder being movable forward along said elongated slot to disengage from said stopper means whereby said cassette holder is rotatable through a larger angle of inclination so that a cassette can be directly placed within said tape recorder.

4,107,754
DISCHARGE GAP DEVICE

Yotsuo Ishida, Chofu, and Hiroshi Kuwahara, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and The Tokyo Electric Power Co., Inc., Japan

Filed Jun. 30, 1975, Ser. No. 591,396
Claims priority, application Japan, Jul. 10, 1974, 49-79373
Int. Cl.^{2} H02H *9/00*
U.S. Cl. 361—120 **2 Claims**

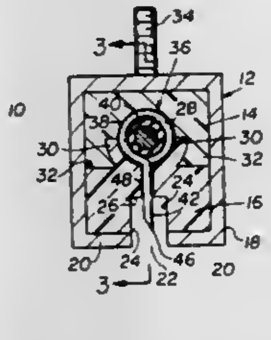


1. An electric discharge gap device comprising a pair of main electrodes disposed in spaced opposite relationship to define a gap therebetween, a plurality of trigger electrodes insulated from said main electrodes and extending through one of said main electrodes into said gap, and means for simultaneously applying electric potentials of opposite polarity to respective ones of said plurality of trigger electrodes for initiating in use a stable electric discharge across said gap between the other of said main electrodes and one of said trigger electrodes.

4,107,755
STATIC ELIMINATOR AND ION DISCHARGE MEANS THEREFOR

Richard J. Klefer, 72 Fulton Ave., Garden City, N.Y. 11530

Filed Jan. 17, 1977, Ser. No. 760,083
Int. Cl.^{2} H01T *19/04;* H05F *3/00*
U.S. Cl. 361—220 **17 Claims**



1. In a static eliminator, an insulator housing having a plurality of interengaging dielectric parts one of which has an interior cavity and longitudinally spaced apart apertures extending from said cavity to the exterior of said housing,

a plurality of electron discharge means in said housing cavity,
each said discharge means having a capacitor body and emitter pin inseparably formed as a unit with each said emitter pin being positioned snugly within a respective one of said apertures against movement relative to each other and their respective apertures and extending to the exterior of said one housing part such that each of said discharge means is longitudinally spaced from the other in said housing cavity,
the other of said housing parts closing said cavity and enclosing said discharge means therein,
and an insulated conductor extending longitudinally into said housing through each of said capacitor bodies.

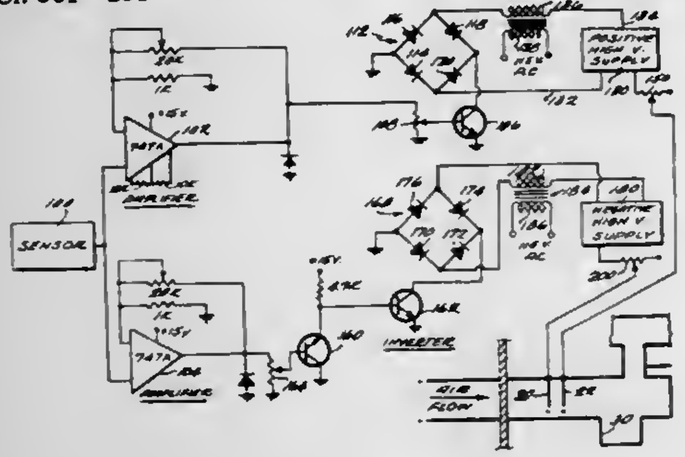
4,107,756

METHOD AND SYSTEM FOR MAINTAINING AN ELECTRICALLY NEUTRAL ATMOSPHERE

Robert H. Best, and William D. Harris, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 516,199, Oct. 18, 1974, Pat. No. 3,942,072.
This application Nov. 14, 1975, Ser. No. 632,007
Int. Cl.² H05F *1/00*

U.S. Cl. 361—231 **5 Claims**



1. An electrical circuit comprising:

a first bi-lateral switch having four branches,

a first power supply for receiving a first variable controlled A.C. input signal at input terminals and providing a D.C. high voltage output,

a first transformer having a first winding connected to a source of alternating voltage and a second winding connected between one of said input terminals of said first power supply and the connection between first and second of said branches of said first bi-lateral switch, the other input terminal of said first power supply being connected to the connection between third and fourth of said branches of said first bi-lateral switch,

first electronic switch means having a conductive and a non-conductive condition and responsive to an input signal for shifting between said conditions, said switch means being connected to the connection between said first and third branches of said first bi-lateral switch for coupling that connection to ground when said switch means is in said conductive condition, the connection between said second and fourth branches of said first bi-lateral switch being connected to ground so that when said first switch means is in its non-conductive condition no current flows through said first bi-laterial switch and accordingly through said first power supply, and when said first switch means in its conductive condition current flows through said first bi-lateral switch and accordingly through said first power supply,

a second bi-lateral switch having four branches,

a second power supply for receiving a second variable controlled A.C. input signal at input terminals and providing a D.C. high voltage output of opposite polarity to the output voltage of said first power supply,

a second transformer having a first winding connected to a source of alternating voltage and a second winding connected between one of said input terminals of said second supply and the connection between first and second of said branches of said second bi-lateral switch, the other input terminal of said second power supply being connected to the connection between third and fourth of said branches of said second bi-lateral switch,

second electronic switch means having a conductive and a non-conductive condition and responsive to an input signal for shifting between said conditions, said second switch means being connected to the connection between said first and third branches of said second bi-lateral switch for coupling that connection to ground when said second switch means is in said conductive condition, the connection between said second and fourth branches of said second bi-lateral switch being connected to ground so that when said second switch means is in its non-conductive condition no current flows through said second bi-lateral switch and accordingly through said second power supply, and when said second switch means in its conductive condition current flows through said second bi-lateral switch and accordingly through said second power supply, and

means for producing said first and second input signals including sensor means for producing a control signal, first and second means for each amplifying said control signal, first and second variable resistor means, respectively connected to the outputs of said first and second amplifying means, first means connecting said first variable resistor means to said first bi-lateral switch and second means connecting said second variable resistor means to said second bi-lateral switch including means for inverting the output of said second variable resistor means.

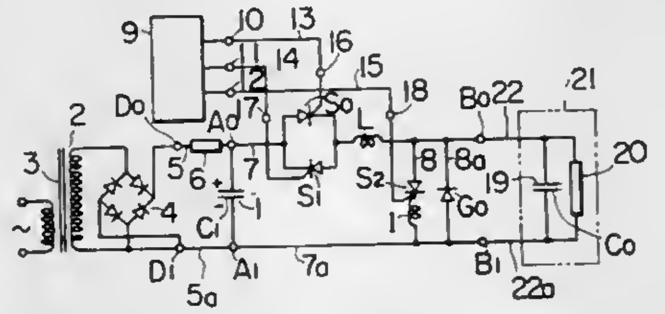
4,107,757

PULSE POWER SOURCE

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita-ku, Tokyo-to, Japan, and Junji Hirai, Nagoya, Japan, assignors to Senichi Masuda, Japan

Filed Jun. 30, 1977, Ser. No. 811,786
Int. Cl.² B05B *5/00*

U.S. Cl. 361—235 **12 Claims**



1. A pulse power source for applying a pulse voltage to a capacitive load, comprising a D.C. power source, a power source capacitor having a sufficiently large electrostatic capacity with respect to an electrostatic capacity of said capacitive load and connected across said D.C. power source via a current limiting impedance, a parallel connection of a load charging switch element and a load charge recovering switch element which can be individually opened or closed, said parallel connection of switch elements and an inductance for generating transient oscillation being serially connected between one end of said power source capacitor and one end of said capacitive load, the other end of said power source capacitor being connected to the other end of said capacitive load, a parallel connection of a rectifier element for preventing inverse charging of said capacitive load and a switch element for discharging residual charge on said capacitive load, which are connected in parallel to said capacitive load, and control means for successively making said load charging switch element, charge recovering switch element and residual charge discharging switch element conduct in the above-described sequence for a period substantially equal to a pulse width of said pulse voltage, a period substantially equal to one-half period of said transient oscillation and a pulse pause interval, respectively.

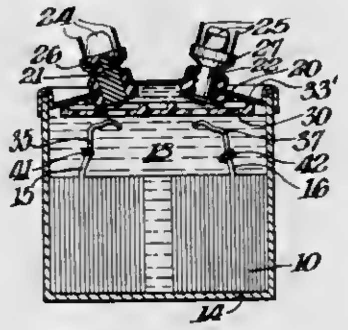
4,107,758

FUSED OIL FILLED CAPACITOR

George A. Shirn, Williamstown; Raynor Linzey, Adams, and Carol A. Cushenette, Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,202
Int. Cl.² H01G *1/01*

U.S. Cl. 361—275 **15 Claims**



9. A fused oil filled capacitor comprising a closed housing; a capacitor section within said housing; said section having a pair of sheet electrodes, and a dielectric spacer between said electrodes; a dielectric oil impregnating said section and essentially filling said housing; at least one terminal passing through a wall of said housing; an electrical conductor being connected between one of said electrodes and said terminal forming a circuit path therebetween; a strand of an exothermically alloyable fuse consisting of two metal elements in intimate contact with each other, said strand being a part of said conductor, a joint by which said strand is connected within said circuit path consisting of solder having a melting temperature lower than the elevated temperature of said oil which would cause the bursting of said housing.

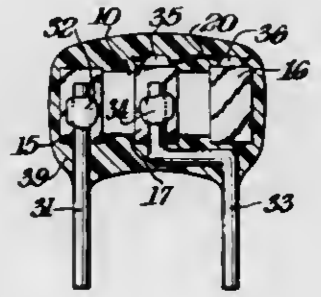
4,107,759

FUSED MONOLITHIC CERAMIC CAPACITOR PACKAGE

George A. Shirn, Williamstown, and John P. Maher, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,203
Int. Cl.² H01G *1/11*

U.S. Cl. 361—275 **14 Claims**



1. A fused monolithic ceramic capacitor package comprising a monolithic ceramic capacitor body having two sets of buried electrodes, three terminations on said body, a resin housing enclosing said capacitor body and said terminations, a first of said terminations connected to one of said sets of electrodes, a second of said terminations connected to the other of said sets of electrodes, a fuse of two exothermically alloyable metal elements in intimate contact with each other, said fuse being embedded in said resin housing, said fuse having a thermal connection to said capacitor body and an electrical connection between said second termination and a third of said terminations to provide a series electrical connection with said capacitor body, and external electrical terminals to said first termination and to said third termination, respectively, to provide electrical access to said capacitor body.

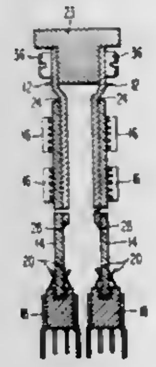
4,107,760

DUAL PRINTED CIRCUIT CARD MOUNT ASSEMBLY

Karl Joseph Zimmer, Berwyn, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 31, 1977, Ser. No. 801,455
Int. Cl.² H05K *7/20*

U.S. Cl. 361—383 **6 Claims**



1. An assembly for mounting dual printed circuit cards, each of which has a plurality of edge tabs, each of said cards having electronic components mounted on one side thereof, said assembly comprising:

a pair of metallic back-up plates, each of said plates being generally planar but having a substantially rectangular recessed area defined by an offset frame on three sides thereof, the other side of each of said circuit cards being affixed to one of said plates within said recessed area, a portion of each of said plates adjacent the fourth side of said recessed area being cut away leaving only the respective extensions of said frame on opposite sides thereof, the edge tabs of each of said circuit cards being situated in said cut away portion of one of said plates;

a pair of connectors each having a plurality of electrical contacts, said contacts engaging said edge tabs of one of said circuit cards, means for rigidly fastening each of said connectors to the frame extensions of one of said plates;

a header member, means fastening the frame portions of both said plates situated opposite to said cut away areas to said header, and

a pair of spacer elements affixed to the respective frames at opposite sides of said recessed areas and in proximity to said connector means, a pair of shoulder screws, said spacer elements being tapped to receive said screws, said frames having respective apertures in substantial alignment with said spacer elements whereby said screws engage said elements via said apertures for coupling said plates to each other in a parallel spaced-apart relationship, thereby completing said assembly, said assembly having a substantially unobstructed opening between said plates for air flow in a direction parallel to the longitudinal axes of said connectors, said spacer elements and shoulder screws permitting slight lateral movements of said pair of connectors with respect to each other to compensate for mounting tolerances.

4,107,761

ELECTROLYTIC CAPACITOR AND ELECTROLYTE

Makoto Oyama, Hitachi, Japan, assignor to United Chemi-Con, Inc., Rosemont, Ill.

Filed Mar. 28, 1977, Ser. No. 781,847
Int. Cl.² H01G *9/02*

U.S. Cl. 361—433 **12 Claims**

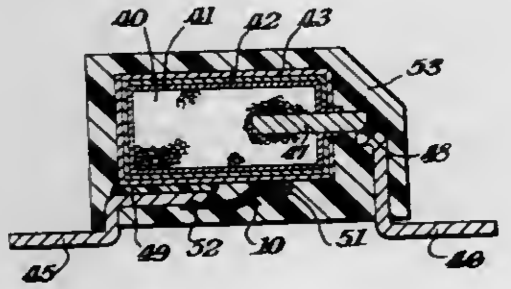
1. An electrolyte adapted to be incorporated into an electrolytic capacitor for use at elevated temperatures of from about 85° to 110° C. and voltages up to 500 V in the presence of a metal foil electrode, said electrolyte consisting essentially of per 100 parts by weight:

Ingredient	Parts
Ammonium pentaborate	10 to 30
Boric acid	0 to 20
Ethylene glycol	30 to 70
Water	0 to 10
Ketone selected from 2,4-pentanedione, 2,4-hexanedione, cyclohexanone, and mixtures thereof	2.8 to 30
Polar organic solvent selected from at least one of butyrolactone, monomethyl ether of ethylene glycol, monoether ether of ethylene glycol, monobutyl ether of ethylene glycol	0 to 10

4,107,762
SOLID ELECTROLYTE CAPACITOR PACKAGE WITH AN EXOTHERMICALLY-ALLOYABLE FUSE

George A. Shirn, Willlamstown, and John P. Maher, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 16, 1977, Ser. No. 797,206
Int. Cl.^{2} H01G *9/00;* B01J *17/00*
U.S. Cl. 361—433 **15 Claims**



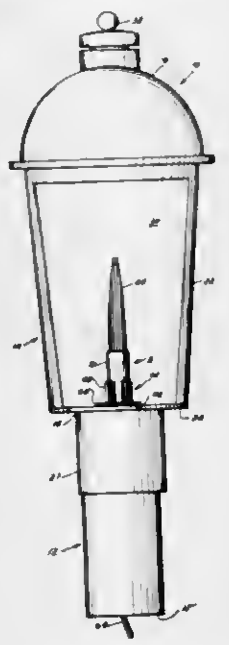
1. A fused capacitor package including a solid electrolyte capacitor body having two terminals, a housing enclosing said body and two leads extending to the outside of said housing, wherein the improvement comprises a fuse made of two exothermically alloyable elements in intimate contact with each other; said fuse being enclosed by said housing, and being connected between one of said terminals and one of said leads, and thus having a series electrical connection with said body, the other of said leads being connected to the other of said terminals, said fuse having a thermal connection to said capacitor body.

4,107,763
LAMP ADAPTING KIT

William A. Thiel, Chicago, and Harry Dziedzic, Glenview, both of Ill., assignors to Rank Precision Industries, Inc., Des Plaines, Ill.

Filed Nov. 26, 1976, Ser. No. 745,382
Int. Cl.^{2} F21V *7/04*
U.S. Cl. 362—32 **28 Claims**

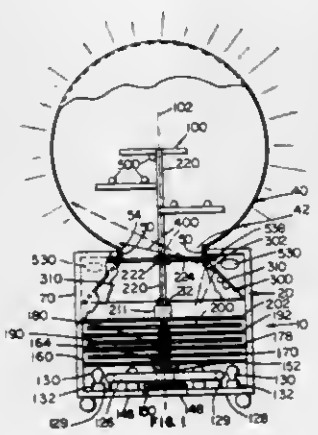
28. A flame-simulating optical element comprising a longitudinally extending bundle of parallel-oriented optical fibers, one end of said bundle being adapted to be exposed to a light source, the other end of said bundle being shaped to simulate a flame, the ends of said fibers being exposed at said shaped end of said bundle and the exposed ends of at least some of said fibers having a greater surface area than the other ends.



4,107,764
LIGHT DISPLAY

Bruce G. Riley, 8026 Maple St., Omaha, Nebr. 68134

Filed Oct. 1, 1975, Ser. No. 618,490
Int. Cl.^{2} A47G *33/16*
U.S. Cl. 362—35 **9 Claims**

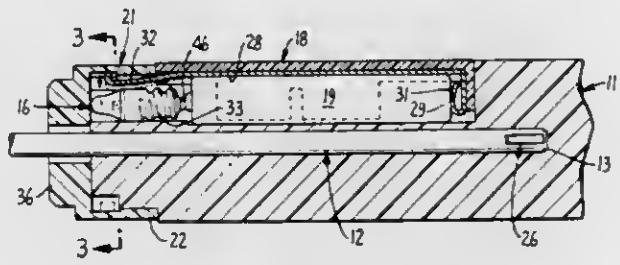


1. A varying pattern light display comprising: a frame, a hollow display housing mounted on said frame, a substantial portion of said display housing being translucent so as to provide a display surface means, said display housing having an opening therethrough on one side through which opening light can enter said display housing, a light source attached to said frame and delivering light into said housing, a light blocking means mounted on said frame between said source and said display surface means, said light blocking means having a light passage therethrough permitting light from said source to reach said housing opening, said blocking means blocking substantially all light from said source from reaching said translucent display housing except that light which passes through said display housing opening, a light dispersing means, said light dispersing means having portions moving in closed pathways transversely across the paths of light rays moving from said source to the inner surface of said display housing, means for driving said light dispersing means comprising an upwardly extending elongated post, means for mounting said post on said frame and for causing said post to rotate about an upwardly extending axis, said light dispersing means portions being disposed in spaced positions with respect to each other and being disposed in positions spaced outwardly from said post in directions transversely of said axis, means attaching each said light dispersing means portion to said post so that said light dispersing means portions each rotate around said axis.

4,107,765
SELF-ILLUMINATING HAND TOOL

Max C. Singleton, Novato, Calif., and Lea Frances Elgart, 100 Village Cir., Novato, Calif. 94947, assignors to Lea Frances Elgart, Novato, Calif.

Filed Sep. 2, 1976, Ser. No. 719,989
Int. Cl.^{2} F21L *7/00*
U.S. Cl. 362—120 **12 Claims**



1. A self-illuminating hand tool, comprising an elongated handle;

a shank extending from said handle with a work engaging tool structure at its distal end;

a prefocussed light bulb mounted in said handle in fixed position to direct a beam of light emitted therefrom onto work engaged by said tool structure;

power supply means in said handle for supporting an electric power source and effecting electrical connection of same with said bulb end;

switch means formed for making and breaking said electrical connection and including a metal strip having an end portion thereof extending alongside and normally spaced from the base of said light bulb, and an annular member rotatably mounted on the end of said handle encircling said shank for manual engagement and rotary displacement between a power on position making said electrical connection and a power off position breaking said electrical connection;

said annular member being formed for engaging and urging said end portion against said light bulb base upon rotation to said power on position;

said handle being formed with a recess in a side thereof accommodating said power supply means and said light bulb, and said power supply means including a cover for said recess to provide a smooth continuation of the configuration of said handle.

4,107,766
EMERGENCY POWER FAILURE LIGHT

Fred E. Baker, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Oct. 4, 1976, Ser. No. 728,979
Int. Cl.^{2} F21V *21/08, 25/00*
U.S. Cl. 362—226 **5 Claims**

1. An emergency power failure light having a multi-piece assembled housing with a safety interlock system comprising:

a bottom cup-shaped member enclosing and supporting the electrical components therein and having protruding male prongs on the back for plugging into an AC outlet;

a mid cover sized to fit completely over said bottom member and open at the top with a bottom wall to completely close over the electrical components;

said bottom wall having an apertured bulb socket therein with an electrical contact at the bottom thereof;

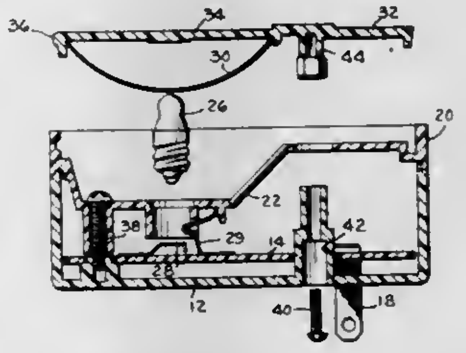
a curved reflector mounted over said bulb;

a lens-containing coverplate completely covering said mid cover;

said coverplate having a threaded socket therein extending through said mid cover, and

single bolt means through the back of said bottom member securing the coverplate and mid cover thereto;

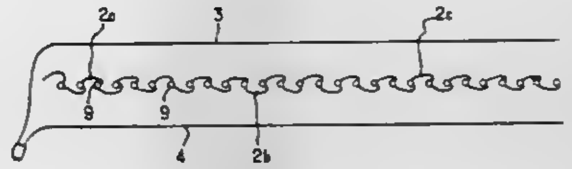
whereby the entire assembly must be removed from the AC outlet before the bolt means can be detached for coverplate removal for bulb changing.



4,107,767
FLEXIBLE LIGHTING STRIP

Jacques Anquetin, 7, rue de la Gouttiere, 78640 Neauphle le Chateau, France

Filed Apr. 29, 1977, Ser. No. 792,373
Claims priority, application France, May 10, 1976, 76 13941
Int. Cl.^{2} F21V *1/00*
U.S. Cl. 362—236 **10 Claims**



1. A flexible electric lighting strip, comprising an elongate section of plastics material including a longitudinal cylindrical cavity containing a chain of electric lamps; a rear portion containing longitudinal supply conductors for feeding the lamps from an electricity supply, the rear portion being filled with a translucent compound which adheres to the plastics material of the section; and a middle portion between the cavity and the rear portion and having a longitudinal triangular slit with its apex in communication with the cylindrical cavity; the strip further including a plurality of conductors interconnecting the supply conductors and the lamps and extending through and gripped at said apex; and a metallic sheet at the rear of the translucent compound and adhered to the compound.

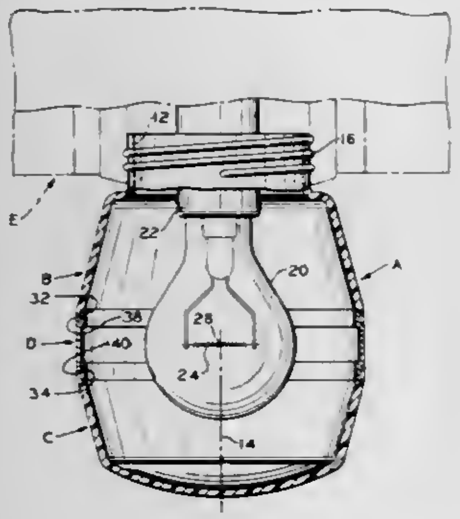
4,107,768
GLOBE FOR LIGHTBULBS

Jack L. Lemkin, Cincinnati, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 760,126
Int. Cl.^{2} F21V *3/00*
U.S. Cl. 362—363 **14 Claims**

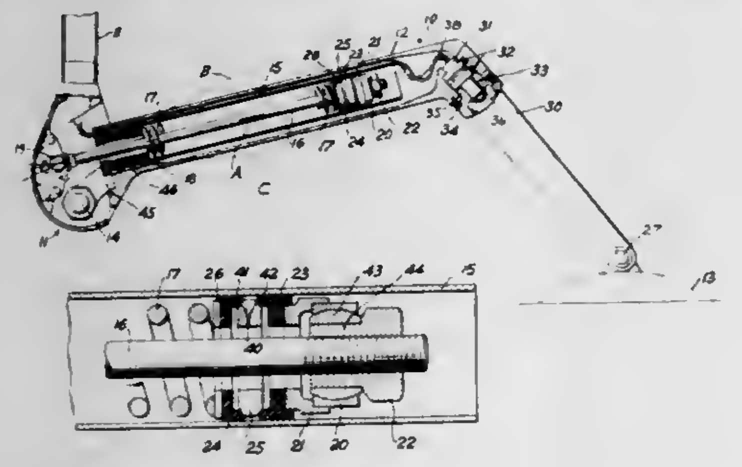
1. A globe for a bulbous-type incandescent lightbulb having a longitudinal bulb axis, said globe having an opening at one end sized for freely receiving the lightbulb therethrough while the lightbulb is mounted in an electrical socket by moving said globe axially with said opening therein aligned with the lightbulb so the lightbulb passes through said opening for positioning said globe in surrounding relationship to the lightbulb, said globe including a closed end opposite from said opening and having a central longitudinal globe axis extending between said opening and closed end, said globe axis being substantially coincidental with said bulb axis, said globe including opposite

parts of light transmitting synthetic plastic material inseparably bonded in spaced relationship to opposite edges of a heat dissipating metal ring surrounding said globe axis in radially-spaced relationship thereto and having a ring axis substantially coincidental with said globe axis and with said bulb axis, said globe being sized and positioned relative to the lightbulb such that said parts of plastic material would normally melt from heat produced by the lightbulb but being maintained at a temperature below melting by dissipation of heat from the lightbulb and globe through said ring, and said parts being inseparably bonded to said ring in the sense of being bonded thereto by such procedures as heat fusion, ultrasonic welding, or adhesive or the like as opposed to being joined by mechanical fasteners or a joint which is readily disassembled or separated.



4,107,769
BALANCED SINGLE HORIZONTAL SUSPENSION ARM

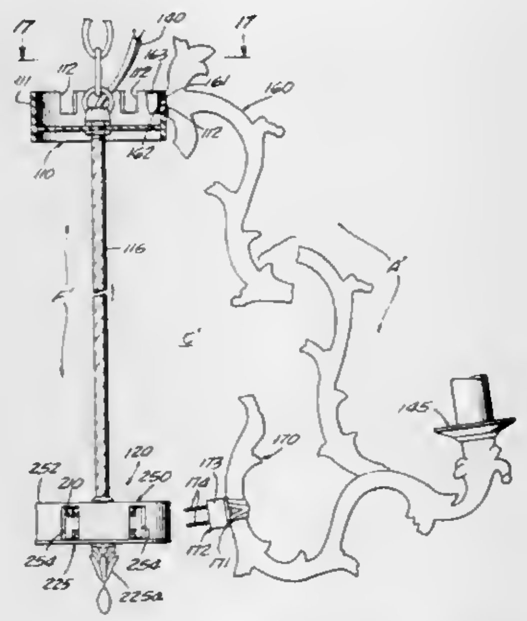
Satinder K. Saluja, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.
Filed Mar. 21, 1977, Ser. No. 779,498
Int. Cl.^{2} F21V *21/18*
U.S. Cl. 362—402 10 Claims



1. A lamp support comprising,
a base,
a hollow arm,
first pivot means swingably supported on said base,
a lamp head supported on the distal end of said hollow arm,
a tubular surface means in said hollow arm generally concentric thereto,
a rod in said tubular surface generally concentric thereto,
a helical compression spring in said tubular surface and bracket means on said arm engaging the said end of helical spring adjacent said base,
second pivot means on said base pivotally connecting said rod to said base at a position spaced from said first pivot means and bearing means pivoted to the distal end of said rod,
said bearing means engaging a second end of said spring and being slidably received on said tubular surface and engaging said helical spring and forming a stop therefor,
said bearing having means allowing said rod to swing relative to a tube whereby the counter-balancing moment of said pivot by said spring is substantially equal to the acting moment of said lamp on said arm about said first-mentioned first pivot point.

4,107,770
MODULAR CHANDELIER WITH PLUG-IN ARMS

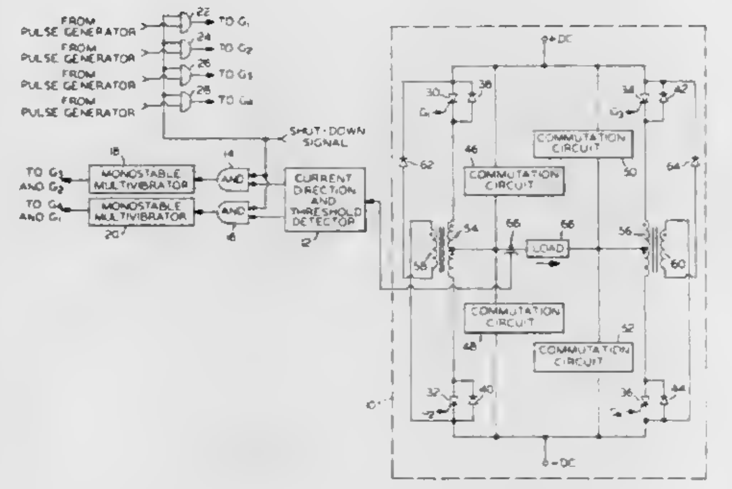
Frank K. Weber, Encino, Calif., assignor to Gene W. Arant, Los Angeles, Calif., a part interest
Continuation-in-part of Ser. No. 459,906, Apr. 11, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,337
Int. Cl.^{2} H02G *3/20*
U.S. Cl. 362—405 47 Claims



1. A modular chandelier with plug-in arms, comprising:
a chandelier central body having a generally circular peripheral wall and having a plurality of circumferentially spaced windows formed in said wall;
a distributor disposed within said central body, including a flat insulating spacer aligned with said windows, a pair of flat circular metallic plates engaging the upper and lower surfaces, respectively, of said spacer, and the circumferential edges of said plates being radially curved away from said spacer and from each other;
means restraining the movement of each of said plates in a vertical direction away from said spacer;
a plurality of detachable chandelier arms, each having on its inner end a rigidity extending male plug which includes an insulating base and a parallel pair of flat metallic prongs projecting therefrom; and
the distance between said plug prongs being substantially equal to the thickness of said spacer, and each said plug base being of such size and configuration as to be insertable within a corresponding one of said windows, whereupon the associated flat metallic prongs come into firm contact througout a substantial portion of their length with the respective metallic plates;
each said window being of non-circular configuration and the corresponding insulating base being of non-circular configuration and interfitting therewith.

4,107,771
CIRCUIT FOR SHUTTING DOWN AN INVERTER

Thomas E. Anderson, Normal; Ole N. Ibsen, Bloomington, both of Ill., and Loren H. Walker, Salem, Va., assignors to General Electric Company, New York, N.Y.
Filed Feb. 22, 1977, Ser. No. 770,736
Int. Cl.^{2} H02M *1/18*
U.S. Cl. 363—58 6 Claims

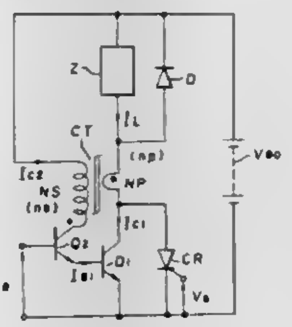


1. In combination, a self-commutating inverter and means for shutting down said inverter, said inverter including a load and at least first and second legs connected across a direct current source of potential, each leg including a series combination of at least first and second gate controlled rectifiers, at least first and second diodes connected in parallel and reverse polarity relationship across said first and second gate controlled rectifiers respectively, a commutating interval current limiting center tapped reactor connected in series and interposed between said rectifiers, and commutating means connected to the center tap of said reactor, said load being connected between the center tapped reactors of the respective first and second legs, said means for shutting down said inverter comprising:

- (a) means for sensing the instantaneous direction and magnitude of the instantaneous current flowing through said load;
- (b) means responsive to the direction and magnitude of the current sensed for generating a first output signal when the magnitude of the current exceeds a predetermined threshold level and is flowing in a first direction, and for generating a second output signal when the current exceeds the predetermined magnitude and is flowing in a direction opposite the first direction;
- (c) means responsive to the simultaneous receiving of a shutdown signal and the generated first output signal for generating a first gating pulse to be applied to said second gate controlled rectifier in said first leg and to said first gate controlled rectifier in said second leg to cause the current flowing through said load to quickly extinguish;
- (d) means responsive to the simultaneous receiving of the shutdown signal and the generated second output signal for generating a second gating pulse to be applied to said first gate controlled rectifier in said first leg and to said second gate controlled rectifier in said second leg to cause the current flowing through said load to quickly extinguish; and
- (e) means responsive to the shutdown signal for inhibiting further regular gating of said first and second gate controlled rectifiers in either of said first and second legs to ensure quick turn off of said inverter.

4,107,772
CHOPPER CONTROL DEVICE

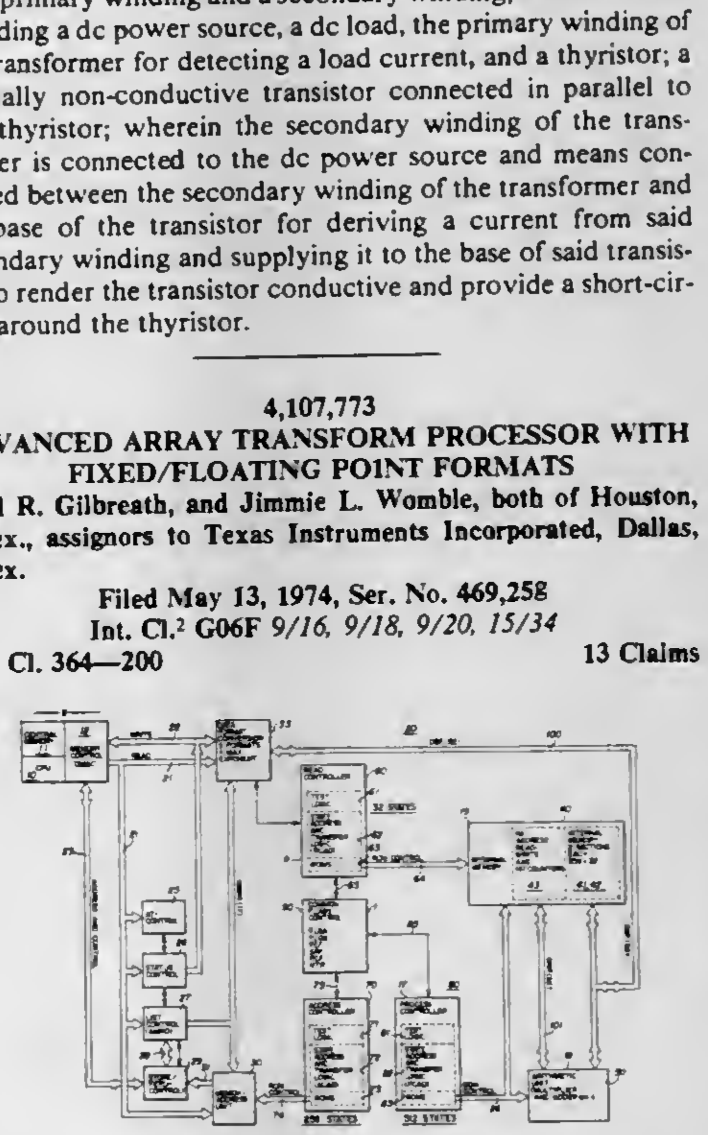
Ryohei Uchida; Satoshi Utsumi, both of Himeji, and Masahiko Akamatsu, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 15, 1976, Ser. No. 741,673
Claims priority, application Japan, Nov. 14, 1975, 50-137497; Nov. 26, 1975, 50-141404; Dec. 3, 1975, 50-144173; Aug. 25, 1976, 51-102004; Aug. 25, 1976, 51-102005
Int. Cl.^{2} H02M *7/515*
U.S. Cl. 363—124 20 Claims



1. A chopper control device comprising: a transformer having a primary winding and a secondary winding; a series circuit including a dc power source, a dc load, the primary winding of the transformer for detecting a load current, and a thyristor; a normally non-conductive transistor connected in parallel to said thyristor; wherein the secondary winding of the transformer is connected to the dc power source and means connected between the secondary winding of the transformer and the base of the transistor for deriving a current from said secondary winding and supplying it to the base of said transistor to render the transistor conductive and provide a short-circuit around the thyristor.

4,107,773
ADVANCED ARRAY TRANSFORM PROCESSOR WITH FIXED/FLOATING POINT FORMATS

Cecil R. Gilbreath, and Jimmie L. Womble, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed May 13, 1974, Ser. No. 469,258
Int. Cl.^{2} G06F *9/16, 9/18, 9/20, 15/34*
U.S. Cl. 364—200 13 Claims



1. A special purpose auxiliary array processor for use in conjunction with the central computer memory of a general purpose computer which comprises:

- (a) an address controller, having a ROM, operably connected to the central computer memory,
- (b) a read controller, having a ROM, operably connected to the central computer memory,
- (c) a process controller, having an ROM, operably connected to the central computer memory,
- (d) a dual memory and an arithmetic unit each operably connected to each of the controllers, and
- (e) a flag unit operable responsive to words from said ROMs

and including logic circuit means for producing two mutually exclusive output signals operable to change output signals in respose to selected words from said ROMs, said address controller, data handler, and process controller being operably responsive to said output signals and synchronized thereby.

4,107,774

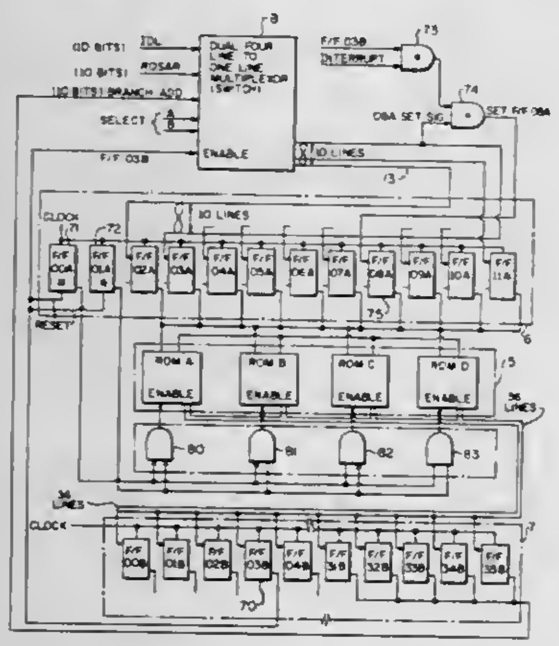
MICROPROGRAM SPLATTER RETURN APPARATUS

Thomas F. Joyce, Burlington, and Michel M. Raguin, Medford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 4, 1976, Ser. No. 729,065

Int. Cl.^{2} G06F *9/16*

U.S. Cl. 364—200 **8 Claims**



1. In a data processing system having at least one read only memory (ROM) for storing a plurality of microprograms each microprogram comprised of a plurality of microwords with each microword comprised of a plurality of bits, any of said microwords stored in said ROM being addressed by a predetermined number of bits stored in a ROM address register coupled to said ROM, said data processing apparatus further comprised of a ROM-local register (RSLR) also coupled to said ROM for storing any of said microwords addressed by said predetermined number of bits stored in said ROM-address register, an apparatus for initializing said ROM-address register to a zero address prior to the execution of each microprogram comprising:

(a) first means, coupled to said RSLR and to said ROM-address register and responsive to a predetermined bit position in said RSLR for setting the first two bits stored in bit positions zero and one of said ROM-address register, to zero; and,

(b) second means, coupled to said RSLR and to said ROM-address register and responsive to the predetermined bit position in said RSLR for setting to zero all bits stored in all bit positions after bit position one in said ROM-address register.

4,107,775

HUMAN BODY COMPARISON USING DRIVING POINT PARAMETERS

James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Filed Mar. 16, 1976, Ser. No. 667,287

Int. Cl.^{2} G06F *1/00*

U.S. Cl. 364—413 **25 Claims**

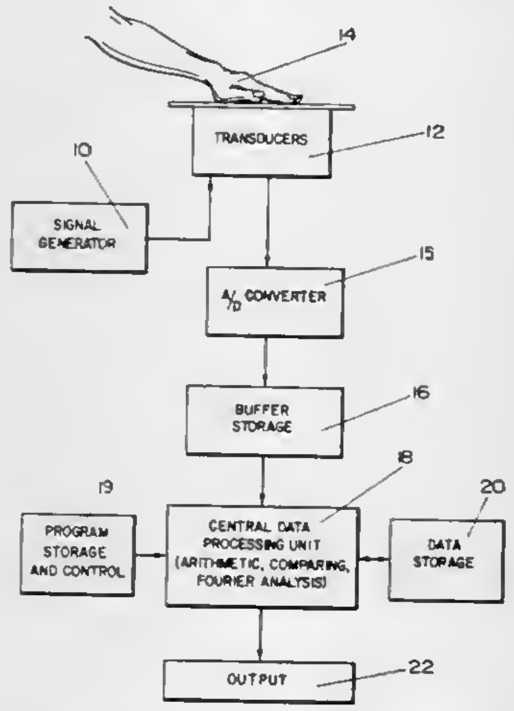
1. A method for comparing a subsequently interrogated person with a previously interrogated person, the method comprising:

(a) applying non-impulsive, physical vibration wave energy to a selected driving point on a human body at a plurality of frequencies to generate force and motion variations at said driving point;

(b) detecting a first set of data, while said wave energy is being applied, which data represents at least one of said variations as a function of time at said driving point;

(c) storing said first set of data;

(d) subsequently applying non-impulsive, physical vibration wave energy to a subsequent, corresponding driving point on a human body at a plurality of frequencies to generate subsequent force and motion variations at said subsequent driving point;


14
10
SIGNAL GENERATOR
TRANSDUCERS
12
A/D CONVERTER
15
BUFFER STORAGE
16
18
19
PROGRAM STORAGE AND CONTROL
CENTRAL DATA PROCESSING UNIT (ARITHMETIC, COMPARING, FOURIER ANALYSIS)
20
DATA STORAGE
OUTPUT
22

(e) detecting a second set of data, while said wave energy is being applied, said second set of data representing at least one of said subsequent variations as a function of time at said subsequent driving point; and

(f) comparing said first set of data with said second set of data to determine whether they are within selected tolerances of each other.

4,107,776

VEHICLE POWER TRANSMISSION ARRANGEMENTS AND ELECTRONIC POWER CONTROLS

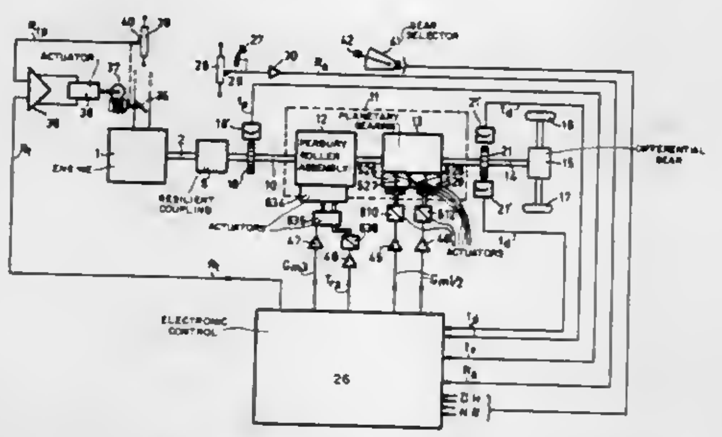
Julian R. A. Beale, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,699

Claims priority, application United Kingdom, Dec. 22, 1976, 28896/76; Dec. 22, 1976, 43598/76; Dec. 22, 1976, 51430/76

Int. Cl.^{2} B60K *41/18;* G06F *15/20*

U.S. Cl. 364—431 **19 Claims**



1. A power arrangement for a wheeled vehicle having a drive shaft, said arrangement comprising an engine, continuously variable gearing between the engine and the drive shaft, power-command means operable by a vehicle driver to command a variation in engine power, and electronic control means for varying the torque transmitted by the continuously variable gearing,

said control means being responsive to the engine speed w_e, the drive shaft speed w_d and the extent of actuation R_a of the power command means such that the torque transmitted to the drive shaft is a different function of engine speed w_e for different values of R_a, said different functions corresponding to different power-load lines on an engine-power engine-speed graph, and

said control means including means, responsive to increased actuation R_a of the power-command means, for causing transition between a previous power-load line and a higher-engine-speed power-load line while maintaining transmitted power at least as high as the previous level of power, and responsive to reduced actuation R_a of the power-command means, for causing transition between a previous power-load line and a lower-engine-speed power-load line while maintaining transmitted power at least as low as the previous level.

4,107,777

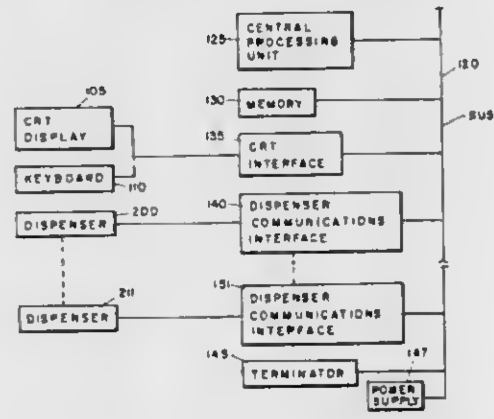
DISPENSING SYSTEM

Allen F. Pearson, Muskegon; Paul A. Mayo, and Ronald N. Lorenz, both of Grand Blanc, all of Mich., assignors to Anthes Imperial Limited, Rexdale, Canada

Continuation of Ser. No. 619,318, Oct. 3, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,874

Int. Cl.^{2} G06F *15/56;* B67D *5/08*

U.S. Cl. 364—465 **22 Claims**



1. A fuel dispensing system comprising an operator console including display means for displaying at a single location status information for dispensers of the system and a data entry keyboard for entry of data and command signals into the system, at least one fuel dispenser having an electronic display for displaying price per gallon, volume of fuel delivered and total cost of fuel delivered information to an operator and a dispenser control circuit coupled to said electronic display including a single flow pulser for generating signals representative of the volume of fuel dispensed therefrom, said dispenser control circuit including output circuit means coupled to said generating means for periodically providing an electrical signal comprising at least one binary word including dispenser status information and volume of fuel dispensed information; said dispenser control circuit further including input circuit means responsive to an input electrical signal comprising at least one binary word for controlling the status of said dispenser; means for coupling said dispenser control circuit to said operator console; said operator console including a central processing unit (CPU), a memory, and interface circuit means for coupling said CPU to said display means, to said data entry keyboard and to said dispenser control circuit, said memory comprising a control means for controlling the operation of said CPU to transfer and process data related to the dispensing of fuel by said at least one dispenser including volume data from said volume representative signals between said display means, said data entry keyboard and said dispenser control circuit of said at least one dispenser, and to generate binary input words applied to said input circuit means of said dispenser control circuit for controlling the operation of said dispenser.

4,107,778

DIGITAL FAULT-LOCATION CALCULATION SYSTEM

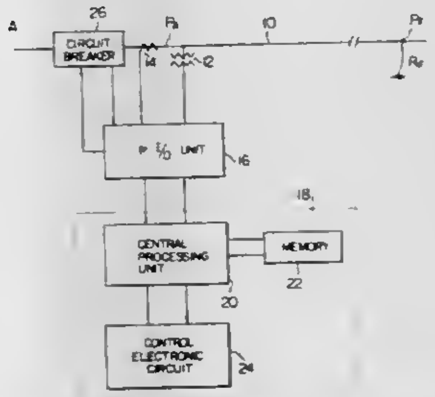
Yoshiji Nii, Kawaguchi; Takayuki Matsuda, Tokyo; Yoichi Yamazaki, and Haruo Nobara, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., Inc., both of, Japan

Filed Feb. 15, 1977, Ser. No. 768,841

Claims priority, application Japan, Feb. 18, 1976, 51-15979

Int. Cl.^{2} G01R *31/08;* G06F *15/20*

U.S. Cl. 364—492 **30 Claims**



1. A digital fault-location calculating system for a power transmission system comprising:

first means coupled to said power transmission system for obtaining information indicating conditions of said power transmission system including voltage and current information;

a computer; and

second means coupled between said first means and said computer for transferring the information obtained by said first means from said first means to said computer, said second means transferring a signal indicating on-off conditions of a circuit breaker provided in said power transmission system from said circuit breaker to said computer;

said computer having at least two functions which are performed on the basis of the information transferred thereto through said second means and in accordance with predetermined processes, a first one of said at least two functions being the detection of occurrence of a fault in said power transmission system, a second one of said at least two functions being the calculation of distance to the fault point from the installation point of said digital fault-location calculating system on said power transmission system, said second function being performed only upon the detection of occurrence of a fault in said power transmission system by said first function and after said computer receives a circuit breaker open signal indicating said circuit breaker has been opened from its closed state.

4,107,779

PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

Bernard C. Fisk, Dallas, Tex., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,662

Int. Cl.^{2} G06F *15/20;* G03G *15/00*

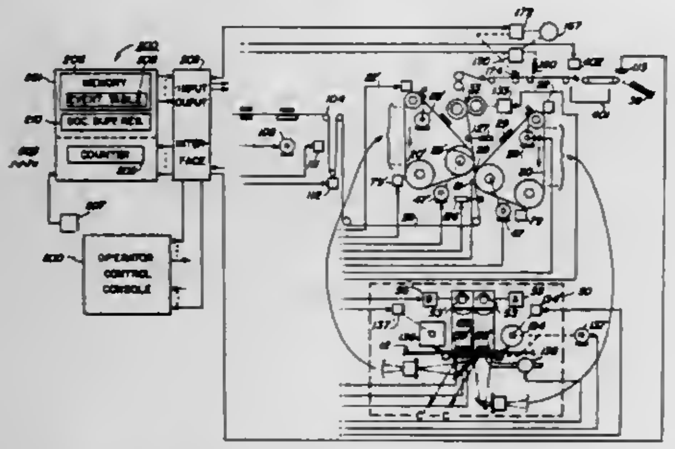
U.S. Cl. 364—518 **5 Claims**

1. A method of operating a reproduction system including a reproduction machine having a plurality of process step implementing means and a programmable controller operatively

connected to enable said plurality of process step implementing means, comprising the steps of:

inputting a reproduction run instruction of a predetermined characteristic to said controller;

storing an operating program having instruction routines for



determining timing intervals between successive process steps; and

commanding said controller to operate and generate timed process control signals at said timing intervals in accordance with said operating program to make reproductions in succession for said reproduction run instruction.

4,107,780
DISPLAY APPARATUS

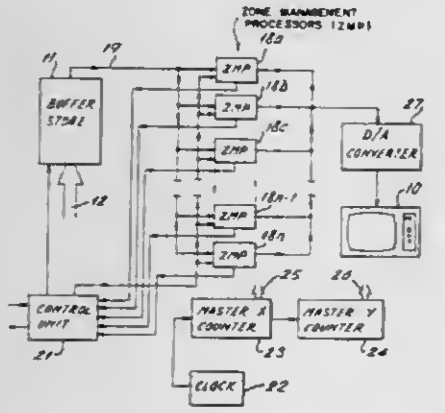
Richard Lawrence Grimsdale, Brighton; Philip John Willis, Shoreham-by-Sea, and Aris Hadjiaslanis, Brighton, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 25, 1977, Ser. No. 762,799

Claims priority, application United Kingdom, Jan. 28, 1976, 03301/76

Int. Cl.^{2} G06F *15/20; G09B 9/08*

U.S. Cl. 364—521 13 Claims



1. Apparatus for controlling intensity in a raster display, including a plurality of data processors each capable, when supplied with signals defining a zone of a display, of managing the display of that zone by providing intensity control signals when that zone is to be displayed, allocation control means for allocating the data processors to zones, and means for transferring signals defining zone boundaries to the data processors under the control of the allocation control means, each data processor including a local store for storing signals defining the boundaries of a zone allocated to that data processor, means for deriving signals representing the co-ordinates of points in the boundaries of the zone allocated from the signals stored, comparison means for comparing signals representing the co-ordinates of the current display point in the display raster with the signals representing the co-ordinates of the said points, and local control means, coupled to the comparison means, for passing control signals for determining the intensity of the display within the zone allocated to the output of the processor when the said co-ordinates of the current display point are within the zone allocated to that processor.

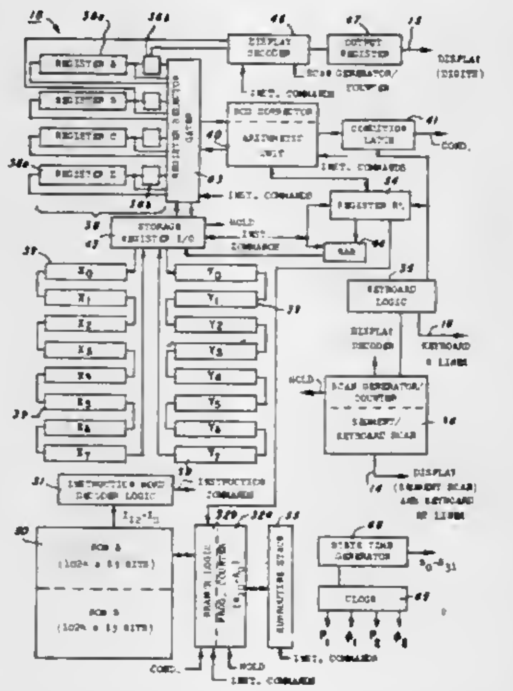
4,107,781
ELECTRONIC CALCULATOR OR MICROPROCESSOR WITH INDIRECT ADDRESSING

Johnny M. Barrett, Richardson, and Stephen P. Hamilton, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,001

Int. Cl.^{2} G06F *9/20*

U.S. Cl. 364—700 22 Claims



1. An electronic microprocessor system having input means for receiving numeric data and function commands, an arithmetic unit for performing arithmetic operations on numeric data, an address register responsive to said input means, an instruction word memory for storing a number of instruction words and addressable in response to an address stored in said address register, instruction decoder means for decoding instruction words outputted from said instruction word memory and for controlling said system in response thereto, a plurality of operational registers for storing numeric data, means responsive to said decoder means for coupling said operational registers to said arithmetic unit, an auxiliary register coupled to the output of said arithmetic unit for temporarily storing at least a portion of all the numeric data outputted by said arithmetic unit and branch logic means coupled to said instruction word decoder means, said address register and said auxiliary register, said branch logic means being selectively operable in a first mode in response to the decoding of a particular instruction word for modifying at least a portion of the contents of said address register in response to contents of said auxiliary register for performing an indirect address branch and selectively operable in a second mode in response to the decoding of another instruction word for modifying at a least a portion of the contents of said address register in response to said another instruction word for performing a direct address branch.

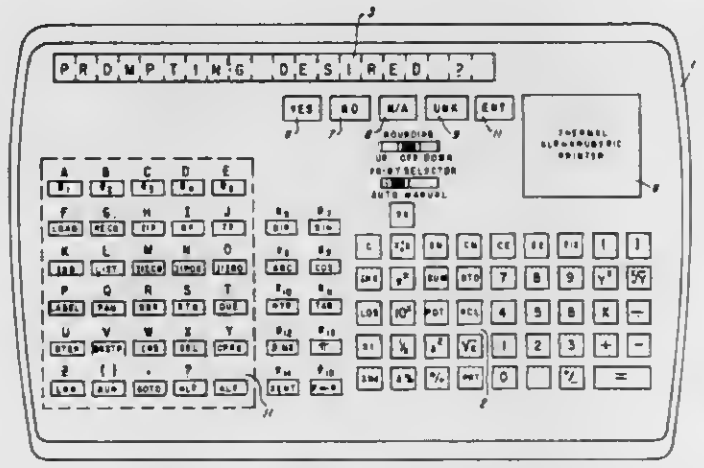
4,107,782
PROMPTING PROGRAMMABLE CALCULATOR

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 622,280, Oct. 10, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,660

Int. Cl.^{2} G06F *15/06*

U.S. Cl. 364—706 11 Claims



1. A programmable calculator having program storage and program execution modes comprising:

a. a keyboard having function keys and alphanumeric data entry means and a plurality of response keys;

b. storage means for storing data and user program instructions including prompting messages which indicate specific information required by a user program in order to proceed executing a user program with said calculator in said program execution mode;

c. means selectively coupling said keyboard to said storage means for transferring data and user program instructions including prompting messages in a selected sequence from the function keys and alphanumeric data entry means to said storage means with said calculator in said program storage mode;

d. control means for controlling the operation of said calculator in response to the user program instructions stored in said storage means;

e. an arithmetic means for performing arithmetic operations on data stored in said storage means in response to the user program instructions under control of said control means;

f. output display means for displaying data stored in said storage means and for displaying said prompting messages; and

g. means selectively coupling said response keys to said control means for controlling said calculator to selectively proceed in the execution of the user program in one of a plurality of different preselected manners whenever said response keys are actuated in response to the display of said prompting messages.

4,107,783
SYSTEM FOR PROCESSING ARITHMETIC INFORMATION USING RESIDUE ARITHMETIC

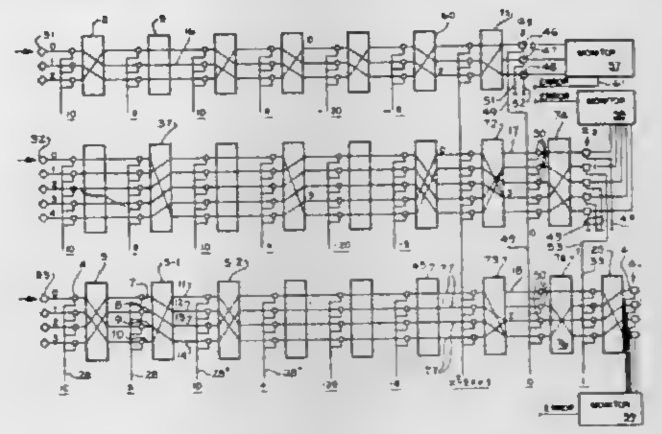
Alan Huang, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Feb. 2, 1977, Ser. No. 764,994

Int. Cl.^{2} G06F *7/38*

U.S. Cl. 364—746 72 Claims

1. In a system for processing arithmetic information employing a residue number system employing a modulus including a processing segment associated with said modulus, a plurality of processing stages within said segment; each processing stage including at least one map means having input states and output states representing the same residue digits, one state for each residue digit; said output states being related to the input states by MOD (P (input state), m_i) where P is an integer polynomial, and m_i is the modulus of the segments; and means



routing the output of one map to the related input of the next map.

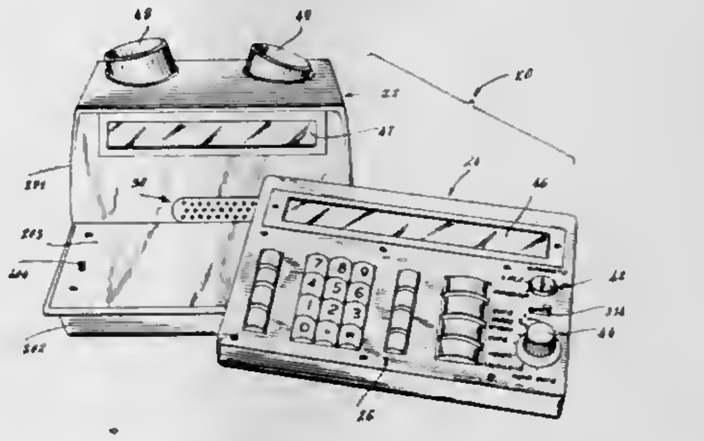
4,107,784
MANAGEMENT CONTROL TERMINAL METHOD AND APPARATUS

Henri M. Van Bemmelen, 21 W. Bank Rd., Rye, N.Y. 10580

Filed Dec. 22, 1975, Ser. No. 643,173

Int. Cl.^{2} G06F *3/02*

U.S. Cl. 364—900 18 Claims



1. Management control terminal apparatus specifically adaptable to a particular management application comprising:

first and second sections which are detachable and separatable one from the other, said sections being matable together in operative relationship for forming said management control terminal apparatus;

said first and second sections having respective first and second mating detachable electrical connector means for electrically interconnecting said first and second sections to complete said management control terminal apparatus when said sections are mated together in operative relationship;

said first section of the terminal apparatus including:

a. an upstanding back and a low front portion projecting forward from the lower portion of said upstanding back;

b. said low front portion having a support deck thereon;

c. input/output means for connection to other equipment;

d. data memory means for storing data and microprocessor means for sequencing the operation of the terminal apparatus;

e. read out display means with a display screen positioned in said upstanding back portion for displaying data;

f. first circuit means for carrying data connected to said data memory means and microprocessor means, said input/output means, said read out display means and said first detachable connector means;

said second section of the terminal apparatus being adapted to be removably mounted upon said support deck in a predetermined position thereon with said second electrical connector means mating with said first electrical connector means when said second section is mounted in said predetermined position on said deck, said second section including:

g. a keyboard arranged for convenient use in performing a particular management application for entering data into said memory means relating to that particular management application;

h. prompting means for prompting a human operator in the correct use of the keyboard for entering particular data as instructed by said prompting means to be in proper order for that particular management application;

i. application program memory means pre-programmed for that particular management application for controlling the operation of said terminal apparatus to perform that particular management application;

j. second circuit means for carrying data connected to said second detachable connector means, said keyboard, said prompting means, and said application program memory means;

whereby when said second section is mounted upon said support deck of said first section with said first and second electrical connector means mated together, said management control terminal apparatus has a keyboard which is conveniently arranged for use in performing a particular management application, and the terminal apparatus is operationally and functionally completed and specifically adapted for conveniently carrying out that particular management application.

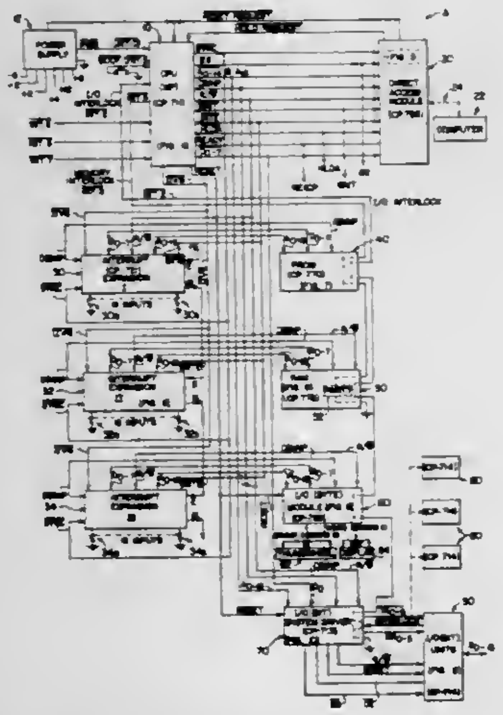
4,107,785
PROGRAMMABLE CONTROLLER USING MICROPROCESSOR

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Jul. 1, 1976, Ser. No. 701,858

Int. Cl.² G06K *7/01*

U.S. Cl. 364—900 **7 Claims**



1. A programmable controller of the type using a microprocessor having a plurality of bi-directional data terminals and a plurality of address terminals upon which a binary code address of bits appears, said controller including: a set of data lines, data input means for applying a byte of binary data on said set of data lines, said byte having a given bit on one of said data lines to be applied to a selected one of said data terminals for processing by said microprocessor; a first logic decoder means connected to said set of data lines for selecting said given bit of said byte on said one of said data lines in response to logic on said address terminals; said first logic decoding means having an output for receiving said selected bit; and, second logic network means for applying said bit selected by logic on said address terminals and received by said decoder output to said selected one of said data terminals of said microprocessor for bit processing by said microprocessor of binary logic on said selected terminal.

4,107,786
CHARACTER SIZE CHANGING DEVICE

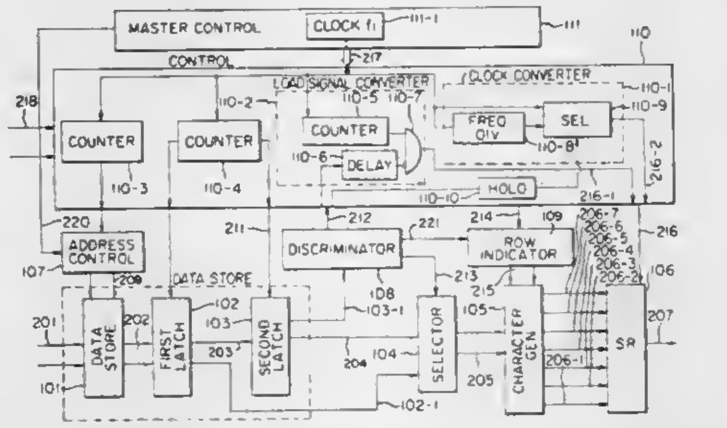
Katsumi Masaki, Kodaira, and Yukio Ioagi, Isaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,468

Claims priority, application Japan, Mar. 1, 1976, 51-21911

Int. Cl.² G06F *3/12, 3/14*

U.S. Cl. 364—900 **23 Claims**



1. A character size changing device comprising:

(a) pattern signal output means responsive to an input information signal for developing pattern signals;

(b) pattern output means responsive to the pattern signals developed from said pattern signal output means for producing visible character patterns;

(c) storage means for storing therein information signals to be applied to said pattern signal output means and instruction signals for designating a part of the visible patterns to be produced by said pattern output means and specifying the size of the visible patterns;

(d) read-out means for reading out information and instruction signals stored in said storage means;

(e) transmission means for transmitting the information signals read out from said storage means to said pattern signal output means;

(f) discrimination means for discriminating the presence of an instruction signal in the signals read out from said storage means; and

(g) control means for controlling said pattern signal output means to cause, when no instruction signal is discriminated by said discrimination means, said pattern signal output means to develop all the pattern signals corresponding to a read-out information signal and to cause, upon detection of a read-out instruction signal, the pattern signal output means to develop a part of the pattern signals corresponding to the part of the visible pattern designated by the discriminated instruction signal.

4,107,787
SCREW EXTRUDER FOR CONTINUOUSLY PROCESSING AND DEGASING OF ELASTOMERS AND POLYMERS HAVING A VISCOSITY OF MORE THAN 1,000 POISE

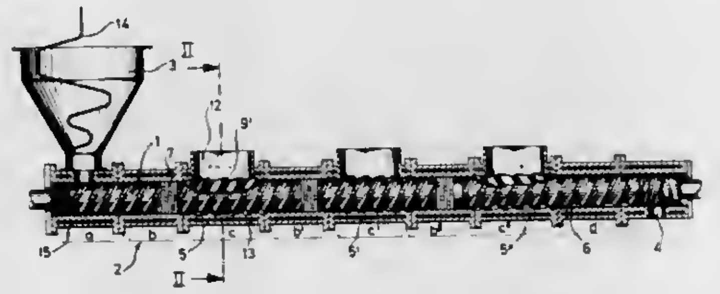
Herbert Ocker, Leonberg, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1977, Ser. No. 778,943

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612827

Int. Cl.² B29B *1/10*

U.S. Cl. 366—75 **10 Claims**



1. A screw extruder for continuously processing and degasing elastomers and polymers having a viscosity of more than thousand poise, said screw extruder comprising:

an elongate casing defining a lengthwise inner space and having at one end an input zone and at the other end a discharge zone;

at least one extruder screw having flights along its length rotatably mounted in said casing along the length thereof,

degasing zones lengthwise spaced within said casing space between said input and discharge zones;

pressure means in the space within the casing and disposed upstream of each of said degasing zones;

kneading and shear means disposed upstream of each of said degasing zones;

said casing having in its inside wall juxtaposed to the degasing zones and limited in length by the kneading and shear means a plurality of spirally grooved portions, one portion for each degasing zone, each portion having a plurality of spiral grooves, the pitch and the depth of said spiral grooves being at most equal to the depth of the flights on the extruder screw, the spiral grooves of each portion extending along the entire length of the respective degasing zone.

4,107,788
EXTRUDER SCREW

Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover-Kleefeld, Fed. Rep. of Germany

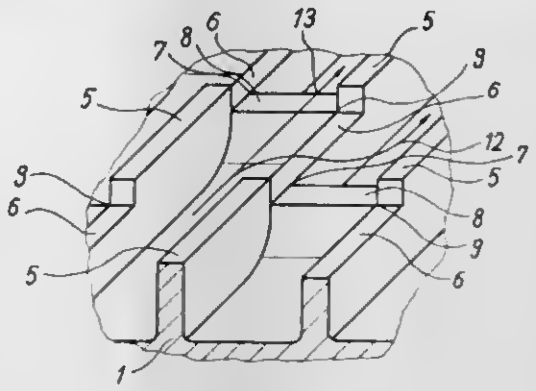
Filed Feb. 24, 1977, Ser. No. 771,642

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2608307

Int. Cl.² B29B *1/06*

U.S. Cl. 366—81 **3 Claims**

1. An extruder screw for the processing of the thermoplastics, natural rubber and other elastomeric materials, comprising a screw core and a plurality of webs spiralling around said core and forming a thread therein, wherein, for at least the blender section of the length of the extruder screw, each web has alternating lengths of lower height and lengths of greater height; transverse webs extending between adjacent webs, said transverse webs being positioned approximately at the end of a web length of greater height in one web and the beginning of a web length of greater height in the adjacent web, said transverse webs being of approximately the same height as said web lengths of lower height.



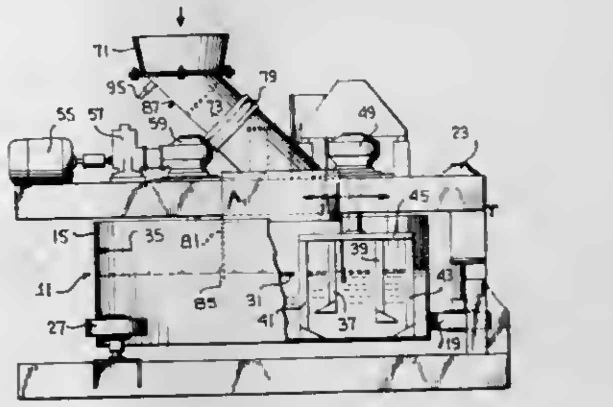
4,107,789
METHOD AND APPARATUS FOR UNIFORMLY PNEUMATICALLY DISPERSING MATERIAL

Robert McDowell, Aiken County, S.C., assignor to Bevil J. Kilgore, Sheffield, Ala. and James H. Backus, Alexandria, Va.

Filed Jan. 28, 1976, Ser. No. 653,024

Int. Cl.² B01F *15/02, 9/12;* B28C *5/06*

U.S. Cl. 366—3 **11 Claims**



1. The method of uniformly dispersing dry additive material into aggregate receiving material comprising the steps of:

entraining the additive material in air;

conducting the entrained material to a predetermined size surface area of the receiving material while,

confining the entrained material to a closed space between a source of said additive material and said receiving material to form a cloud of additive material particles impinging on said predetermined size surface of the aggregate receiving material; and

agitating the receiving material at said surface area to present new surface areas of receiving material to said entrained material.

4,107,790
ULTRASONIC CLEANING APPARATUS

James W. McCord, 9101 Nottingham, Louisville, Ky. 40222

Filed Sep. 30, 1977, Ser. No. 838,146

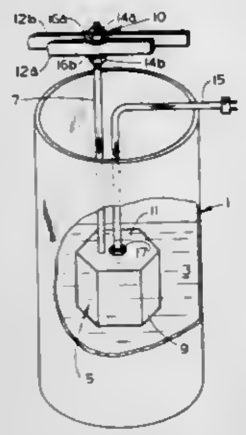
Int. Cl.² B08B *3/12*

U.S. Cl. 366—127 **4 Claims**

1. An ultrasonic cleaning apparatus comprising:

(a) a container for a liquid having an open top;

(b) an enclosed vibrating housing disposed within said container, said housing having at least three sides;

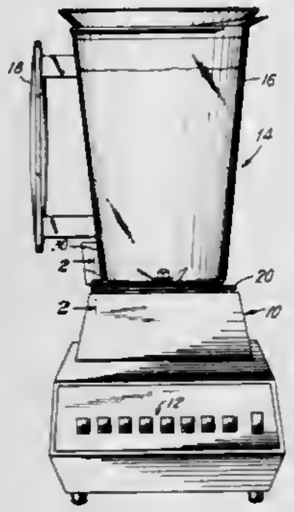


(c) at least one ultrasonic transducer attached to the inner surface of each side; and,
(d) means for providing electrical energy to said transducer.

4,107,791

LOCKING SYSTEM FOR BLENDER JAR OR THE LIKE

Murray M. Mikituk, Welland, Canada, assignor to General Signal Corporation, Rochester, N.Y.
Filed Oct. 3, 1977, Ser. No. 838,596
Int. Cl.^{2} B01F *13/04, 7/16*
U.S. Cl. 366—205 **5 Claims**



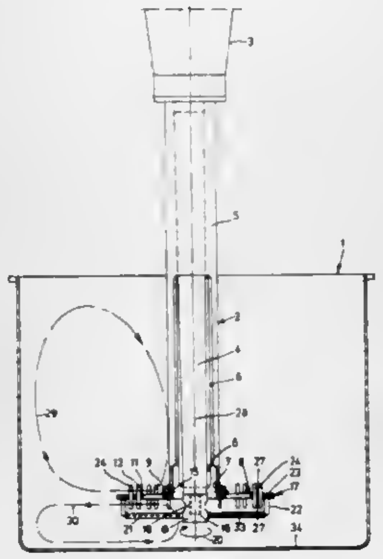
1. In a blender device having a blender jar assembly, which includes a blender jar engaged in a holder, adapted to be mounted on a base or console, the improvement of a locking system for preventing the jar from disengaging from its holder during blender operation, comprising

a flange member near the bottom of said jar, and an elongated locking pin held loosely in a opening in said holder such that, in the normal upright orientation for the jar assembly, the pin drops down so that the jar is free to rotate in either direction in its holder, but when the assembly is placed on the base or console, said pin is forced upwardly by the base and thereby acts as a barrier to the flange member so as to prevent rotation of said jar.

4,107,792

APPARATUS FOR DISCONTINUOUS MIXING OF AT LEAST TWO MATERIALS

Herbert Durr, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim-Waldhof, Germany
Filed Jun. 16, 1977, Ser. No. 807,391
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627600
Int. Cl.^{2} B01F *7/16*
U.S. Cl. 366—302 **8 Claims**



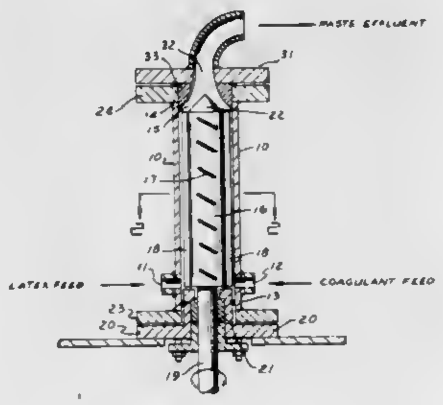
1. In an apparatus for discontinuous mixing of at least two substances, of which at least one is a liquid, the apparatus including a container, a mixer disposed in the container, the mixer having a rotor drivable at high speed through a shaft and having a stator, and respective teeth disposed on the rotor and on the stator in mutually concentric circular planes for movement past one another to form shearing slots, the improvement wherein at least those teeth located most outward radially on said rotor are disposed in a circular plane outside that plane in which those of said teeth on said stator which are most radially outwardly positioned are located and wherein said teeth on said stator and said rotor are mounted respectively on mutually concentric annular disks of said stator and of said rotor with a small radial distance between said teeth on said rotor and said teeth on said stator, in adjacent circumferential planes and wherein said teeth extend to both sides of said corresponding annular disks.

4,107,793

MIXER APPARATUS FOR CONTINUOUSLY COAGULATING AN AQUEOUS LATEX AND CONSOLIDATING AS A PASTE COAGULUM

James L. Wallace, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.
Filed May 26, 1977, Ser. No. 800,836
Int. Cl.^{2} B01F *7/16*
U.S. Cl. 366—312 **13 Claims**

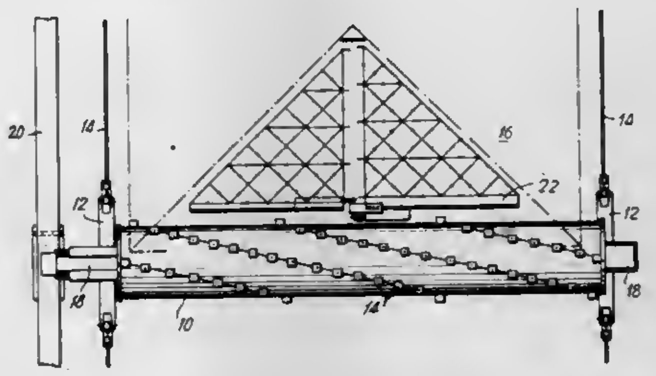
1. A mixer apparatus for continuously coagulating an aqueous polymeric latex and consolidating as a paste coagulum comprising:
(A) a generally cylinderical barrel having first and second feed port means in a first end portion thereof and a discharge port defined in the opposed second end portion thereof, the interior length of said barrel being greater than the interior diameter thereof,
(B) a rotor means generally extending through and coaxial with said barrel,
(C) at least two diametrically opposed longitudinally extending rows of tab blades affixed to said rotor means each tab blade having a radial projection from said rotor means and being angled relative to the axis of said rotor means so as to convey the coagulum toward said discharge port, said opposed rows of tab blades are so arranged that the individual blades of one row are positioned opposite to the openings between blades on the opposed row so that substantially the entire interior surface of said barrel along its length are wiped by the opposed rows of blades during operation of said apparatus,
(D) at least two diametrically opposed wiper densifier blades affixed to said rotor means each wiper blade having a radial projection from said rotor means and extending along the length thereof wherein said wiper blades have a leading surface tangential to said rotor rising to a predetermined clearance with the interior wall of said barrel, said wiper blade having a rounded following surface taking a curvature parallel to said rotor,
(E) a journal means, being an axial extension of said rotor permitting rotational movement of said rotor means relative to said barrel,
(F) a feed end closure means, and
(G) the relationship between said barrel, said rotor, said blades, said ports, said journal and said feed end closure means being such that during operation of said apparatus, said paste coagulum can output from said discharge port means when said latex is input to said first port means and a coagulant is input to said second port means.



4,107,794

MIXING BED PICK UP APPARATUS FOR A STAPLE SUPPLY PILE

Joachim Ruder, Duisburg, Germany, assignor to DeMag Aktiengesellschaft, Duisburg, Germany
Filed May 16, 1977, Ser. No. 797,131
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622115
Int. Cl.^{2} B01F *15/02*
U.S. Cl. 366—346 **1 Claim**



1. Apparatus for picking up and delivering incrementally and continuously representative portions of a pile of staple supply materials, comprising
(a) a rotary pipe pickup device positioned adjacent the base of a supply pile;
(b) a plurality of pickup blades positioned on said pipe, said blades positioned in spiral patterns around the circumference of said pipe;
(c) a reversible supply belt positioned adjacent said pipe, and mounted to move in the same direction as the spiral pattern on said pipe, or opposite thereto; the improvement characterized by
(d) said plurality of blades spaced evenly from each other on said pipe in said spiral pattern;
(e) said plurality of blades arranged in four longitudinally extending spirals of 24 blades each;
(f) each said blade positioned on said pipe with respect to the front of a supply pile being delivered at an embracing angle of 270°; and
(g) the ratio of velocity between said supply belt movement and the rate of advance of the delivery points of said plurality of blades is 0.6.

DESIGN PATENTS

GRANTED AUG. 15, 1978

ERRATA

For CLASS	See PATENT NO.
D23–020	248,897

DESIGNS

AUGUST 15, 1978

248,896

JACKET

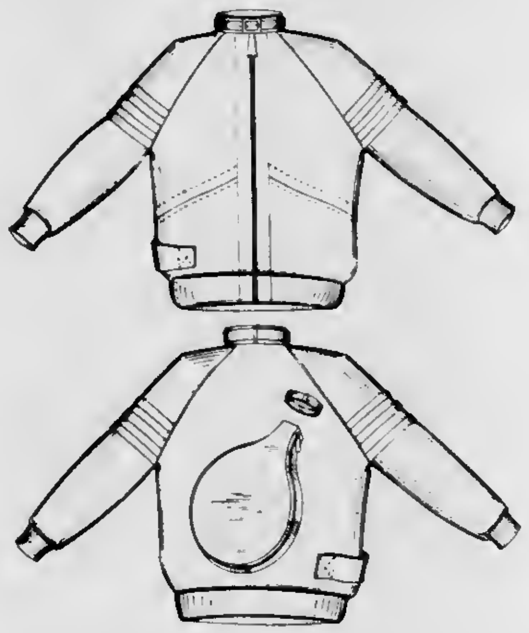
Robert Steven Hasday, 440 W. 34th St., New York, N.Y. 10001; Carmen Lodico, 32 Gramercy Park South, Apt. 16G, and Lloyd Greenleaf, 32 Gramercy Park South, both of New York, N.Y. 10013

Filed Oct. 8, 1976, Ser. No. 730,816

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—184



248,897

SOLE FOR FOOTWEAR

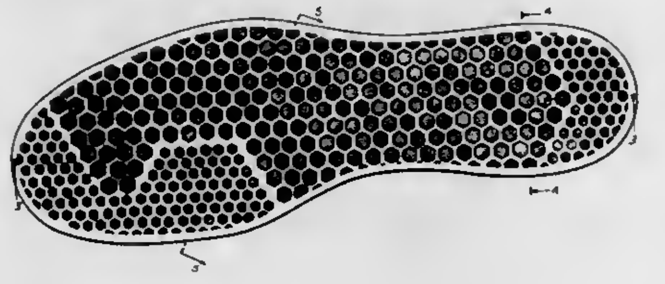
Carl Russell Toothaker, Woodbridge, Conn., assignor to Uniroyal, Inc.

Filed Oct. 8, 1976, Ser. No. 730,893

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—320



248,898

GLOVE

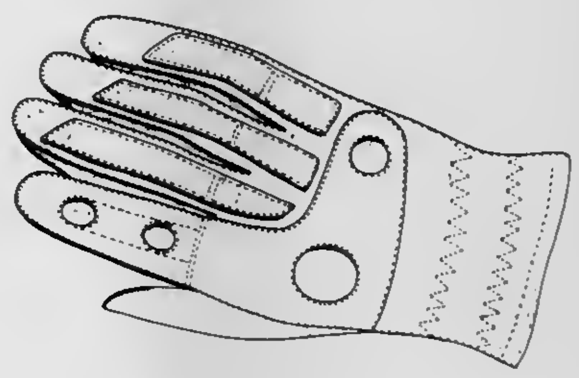
Carmen D. DeLeone, Cornwells Heights, Pa.; Ruth West, Evergreen, Colo., and Anthony DiStefano, Morrisville, Pa., assignors to Engine Specialties, Inc., Columbus, Ohio

Filed Nov. 24, 1976, Ser. No. 744,589

Term of patent 14 years

Int. Cl. D2—*06*

U.S. Cl. D2—361



248,899

DOCUMENT BELT

Axel de Neufville, 34 Boulevard Edouard Herriot, 13008 Marseille, France

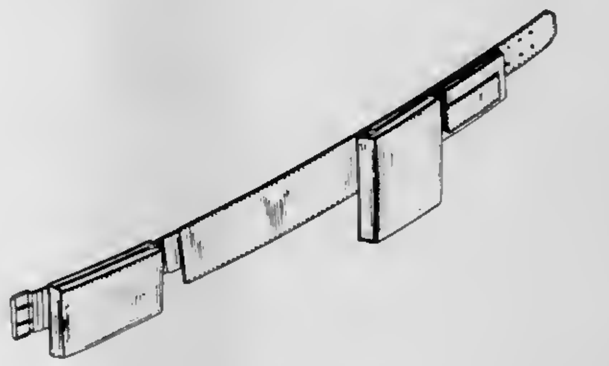
Filed Sep. 10, 1976, Ser. No. 721,931

Claims priority, application France, Apr. 26, 1976, 76 4253

Term of patent 14 years

Int. Cl. D2—*07*

U.S. Cl. D2—383

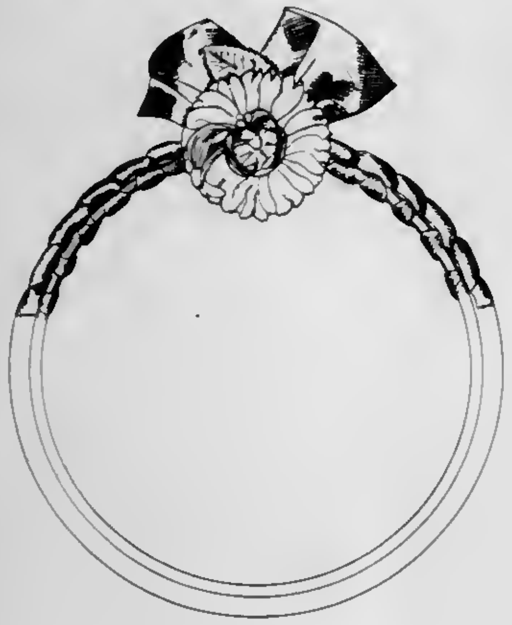


248,900

TRAIN RING

Diane Weitzbuch, 7533 Spring Lake Dr., Bethesda, Md. 20034
Filed Jul. 13, 1976, Ser. No. 704,941
Term of patent 14 years
Int. Cl. D2—*07*

U.S. Cl. D2—401

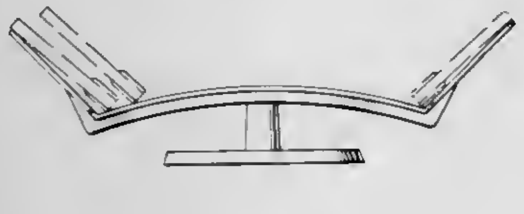


248,901

CASSETTE STORAGE STAND

Happy Hugh Unfried, Long Beach, Calif., assignor to Intermagnetics Corporation, Santa Monica, Calif.
Filed Oct. 28, 1976, Ser. No. 736,442
Term of patent 14 years
Int. Cl. D6—*04*

U.S. Cl. D6—25

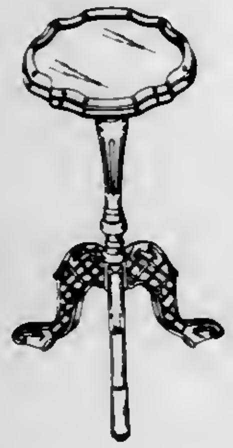


248,902

PEDESTAL TABLE

Michael Neels, 3046 Marna, Long Beach, Calif. 90808
Filed Sep. 30, 1976, Ser. No. 728,393
Term of patent 14 years
Int. Cl. D6—*03*

U.S. Cl. D6—29

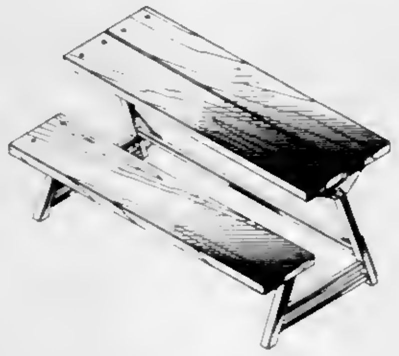


248,903

CONVERTIBLE PICNIC TABLE

Robert L. O'Connor, 11133 Harrison Rd., Osceola, Ind. 46561
Filed Sep. 2, 1976, Ser. No. 719,923
Term of patent 14 years
Int. Cl. D6—*05*

U.S. Cl. D6—45

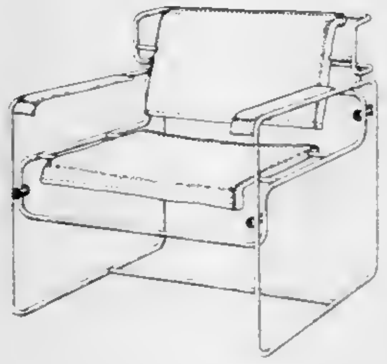


248,904

CHAIR

Emile E. Julian, Laguna Beach, Calif., assignor to Ipolar, Inc., Irvine, Calif.
Filed Jan. 12, 1976, Ser. No. 648,279
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—69

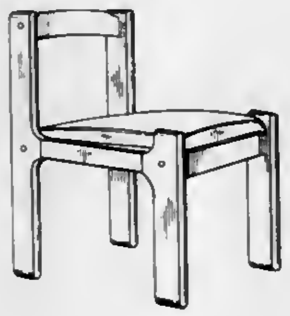


248,905

CHAIR

Armin E. Schoeller, 4271 SE. Marine Dr., Burnaby, B. C., Canada
Filed Aug. 20, 1976, Ser. No. 716,214
Claims priority, application Canada, Feb. 24, 1976, 2402761
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—78

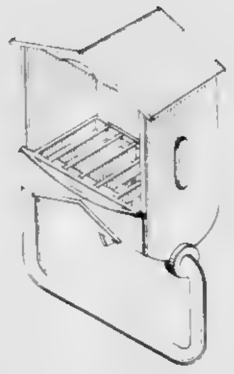


248,906

COMBINED SOAP HOLDER AND TOWEL RING

Rodney A. Johnson, 2140 Monroe St., Apt. 110, Hollywood, Fla. 33020, and Francis W. Selby, Box 170, R.D. #1, Middletown, Del. 19709
Filed Oct. 18, 1976, Ser. No. 733,462
Term of patent 14 years
Int. Cl. D23—*02*

U.S. Cl. D6—90

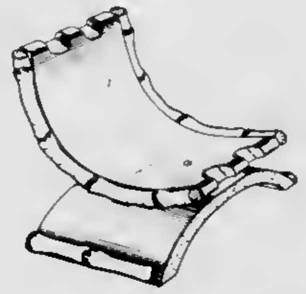


248,907

TOOTHBRUSH HOLDER

Nelson Yang, 1240 Dore St., West Covina, Calif. 91792
Filed Sep. 30, 1976, Ser. No. 728,422
Term of patent 7 years
Int. Cl. D23—*02*

U.S. Cl. D6—94

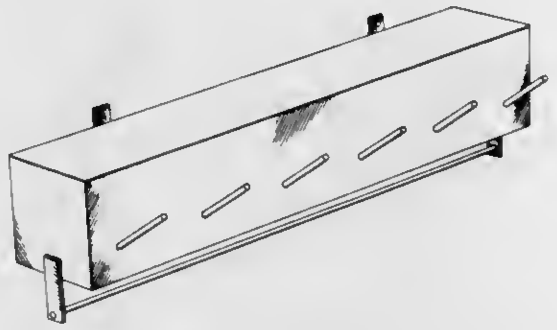


248,908

COAT RACK

Douglas A. Robinson, 806 Ariege Dr., Creve Coeur, Mo. 63141
Filed Dec. 7, 1976, Ser. No. 748,390
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—116

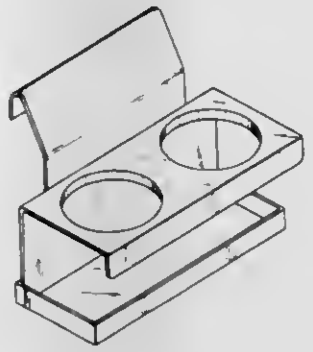


248,909

HOLDER FOR POTTED PLANTS TO BE USED IN AUTOMOBILES

Nicholas Frazian, Hebron, N.H. 03241
Filed Feb. 17, 1977, Ser. No. 762,033
Term of patent 7 years
Int. Cl. D6—*06*; D7—*99*

U.S. Cl. D6—137

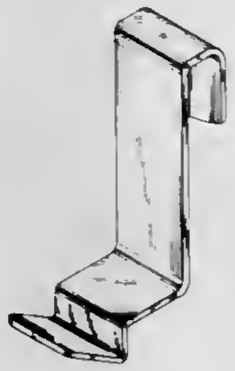


248,910

HANGER FOR POTTED PLANTS

Francis DeFilippo, 2525 Creighton Dr., Golden, Colo. 80401
Filed Jul. 28, 1977, Ser. No. 819,670
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—137



248,911
COMBINATION DRESSER AND MIRRORED HUTCH

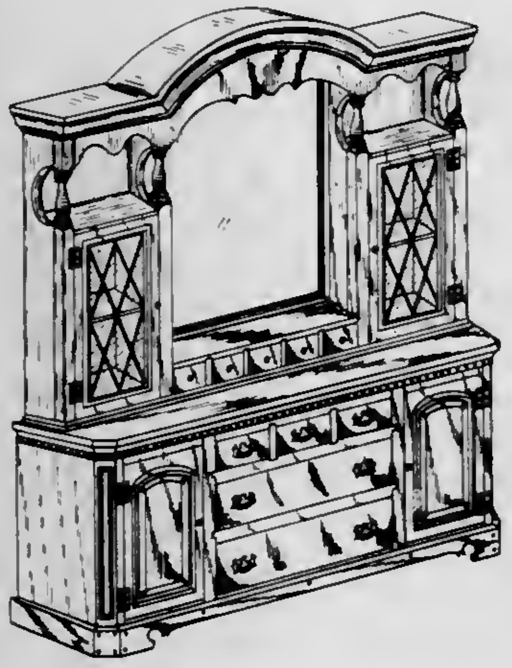
David M. Handel, Union, N.J., assignor to The Bennington Company, Union, N.J.

Filed Mar. 15, 1976, Ser. No. 666,632

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—154



248,912
MULTIPLE POSITION SERVICE COUNTER UNIT

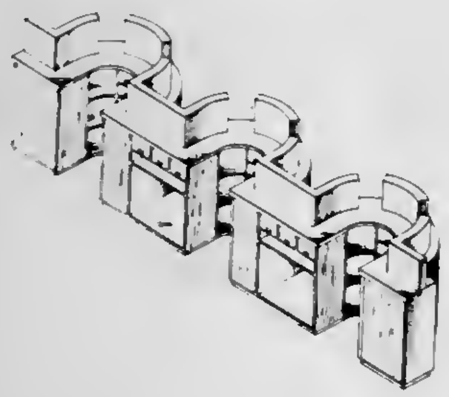
Vernon C. Canfield, Bainbridge Island, Wash., and Charles F. Anderson, San Marino, Calif., assignors to Pacific National Bank of Washington, Seattle, Wash.

Filed Sep. 30, 1976, Ser. No. 728,389

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—157



248,913
CABINET OR SIMILAR ARTICLE

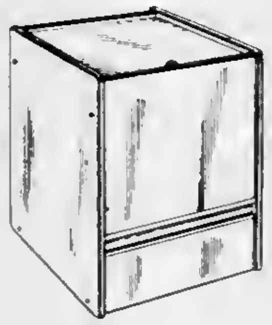
Anthony John Robinson, Woollahra, Australia, assignor to Framac Industries Pty. Limited, Gransville, Australia

Filed Sep. 21, 1976, Ser. No. 725,077

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—158



248,914
COMBINED SUPPORT FOR LIGHT SOURCE AND TABLE FOR POTTED PLANTS OR THE LIKE

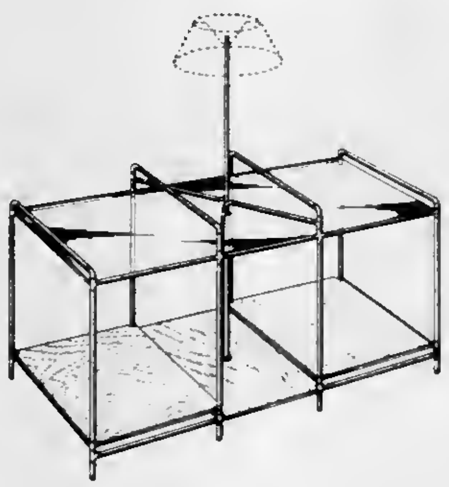
Ollie H. Ettress, 5238 Garfield, Kansas City, Mo. 64130

Filed Jun. 21, 1976, Ser. No. 698,477

Term of patent 14 years

Int. Cl. D26—*04, 05*

U.S. Cl. D6—175



248,915
BAKER'S TABLE OR SIMILAR ARTICLE

Carl Brandenfels, Scappoose, Oreg., assignor to H. T. Products, Inc., Scappoose, Oreg.

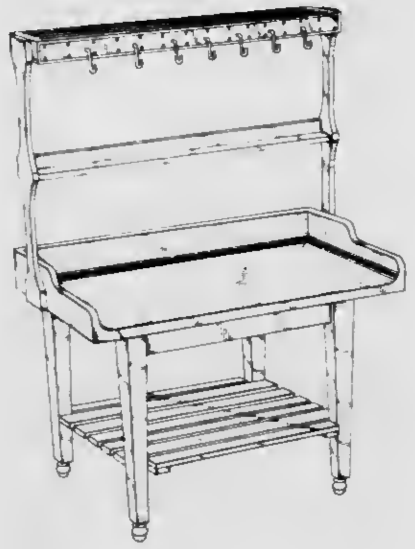
Filed Sep. 29, 1976, Ser. No. 727,968

The portion of the term of this patent subsequent to Dec. 9, 1989, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*03*

U.S. Cl. D6—179



248,916
BEVERAGE CAN OR SIMILAR ARTICLE

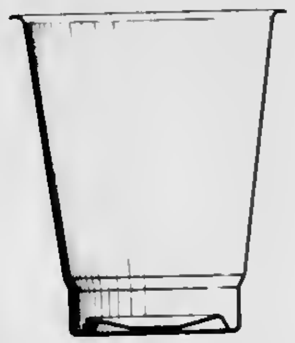
William G. Reynolds, 5115 Cary Street Rd., Richmond, Va. 23226, and Hurst F. W. Arfert, 1527 Westshire La., Richmond, Va. 23233

Filed Jun. 16, 1976, Ser. No. 696,857

Term of patent 14 years

Int. Cl.^{2} D7—*01*

U.S. Cl. D7—15



248,917
INSULATED PITCHER

Yoshito Kikuchi, 1033 Hayamicho, Kadoma, Osaka Prefecture, Japan 571

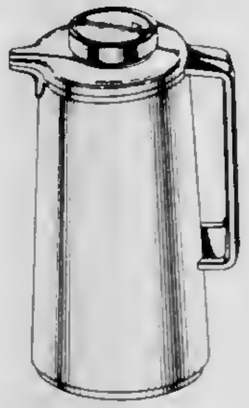
Filed Aug. 16, 1976, Ser. No. 714,683

Claims priority, application Japan, May 14, 1976, 51-118143

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—65



248,918
FRUIT KNIFE

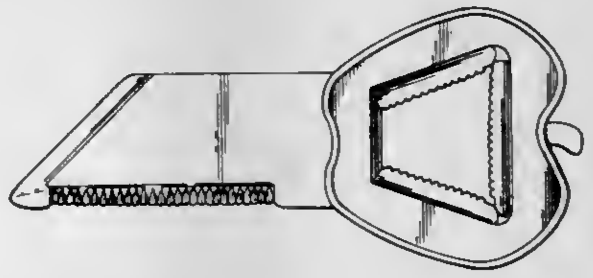
Nihachi Kudo, No. 13-10, Konakano kito 5 chome, Hachinohe-shi, Aomori-ken, Japan

Continuation-in-part of Ser. No. 545,455, Jan. 30, 1975, Pat. No. Des. 242,422. This application May 26, 1976, Ser. No. 690,333

Term of patent 14 years

Int. Cl. D7—*03*

U.S. Cl. D7—143

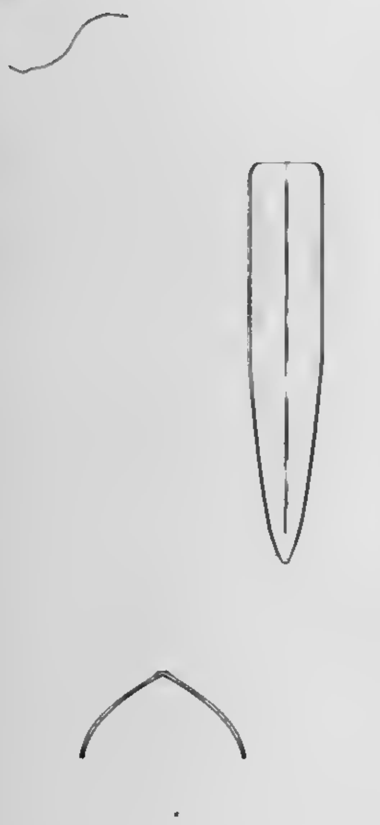


248,919
PLANT GROWTH CONTROL STAKE

J. Frank Schmidt, Jr., 19343 NE. Halsey St., Portland, Oreg. 97230

Filed Oct. 1, 1975, Ser. No. 618,483
Term of patent 14 years
Int. Cl. D31—*00*

U.S. Cl. D8—1

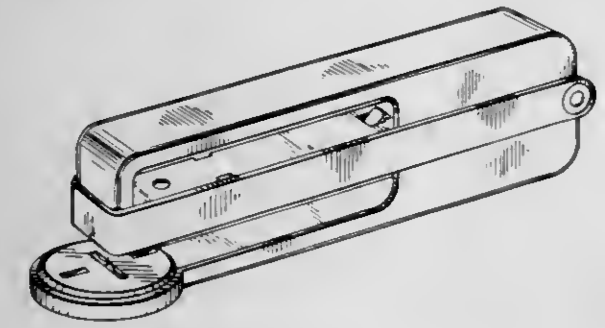


248,920
STAPLER

Grete Jalk, Skodsborg, and Jørgen Gammelgård, Alberts Lund, both of Denmark, assignors to Swingline, Inc., Long Island City, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,287
Term of patent 14 years
Int. Cl. D19—*02*

U.S. Cl. D8—50

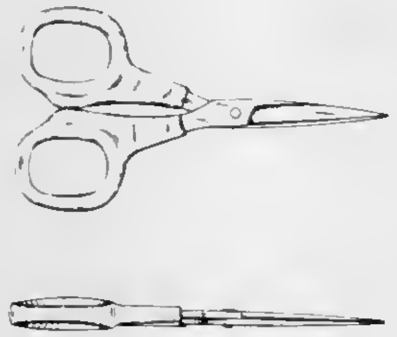


248,921
SCISSORS

William C. Ferguson, Denville, N.J., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 22, 1976, Ser. No. 743,905
Term of patent 14 years
Int. Cl. D8—*03*

U.S. Cl. D8—57

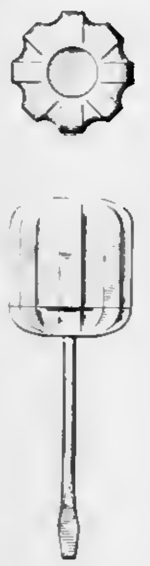


248,922
TOOL HANDLE WITH SCREWDRIVER

Frank M. Osak, Jr., Shelton, Conn., assignor to Shelton Products, Inc., Shelton, Conn.

Filed Mar. 7, 1977, Ser. No. 774,750
Term of patent 14 years
Int. Cl. D8—*04*

U.S. Cl. D8—82



248,923
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE

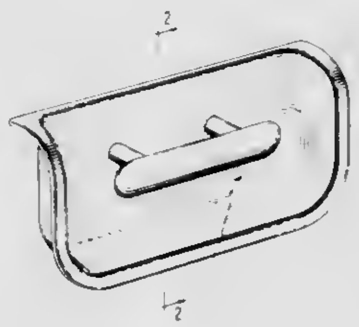
Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 30, 1976, Ser. No. 653,855

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 6 AR 138/75

Term of patent 14 years
Int. Cl. D8—*06*

U.S. Cl. D8—313



248,924
CLIP FOR ROOFING SHEETS

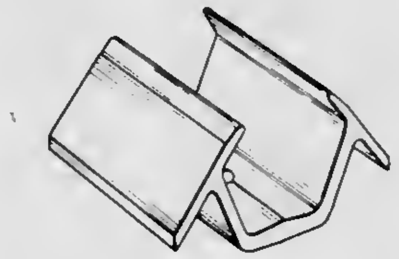
Christopher John Curtis, Melbourne, Australia, assignor to Comalco Products Pty. Limited, Melbourne, Australia

Filed Jan. 22, 1976, Ser. No. 651,582

Claims priority, application Australia, Aug. 29, 1975, 67675

Term of patent 14 years
Int. Cl. D8—*08*

U.S. Cl. D8—394

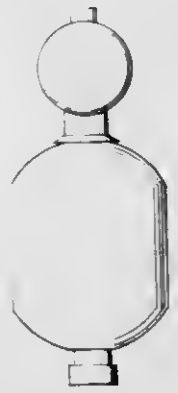


248,925
BOTTLE

Allen H. Howland, 60 Creston Way, Warwick, R.I. 02886

Filed Mar. 19, 1976, Ser. No. 668,777
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—117

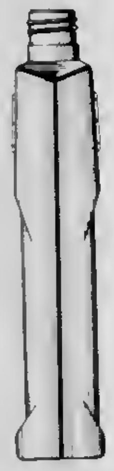


248,926
BOTTLE OR SIMILAR ARTICLE

Thomas A. Furlong, Wayne, N.J., and Charles D. Goldstein, Monsey, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 3, 1976, Ser. No. 692,253
Term of patent 14 years
Int. Cl. D9—*01*

U.S. Cl. D9—143

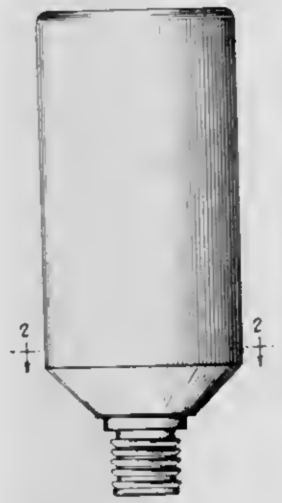


248,927
BOTTLE

Antonio Macchi Cassia, Milan, Italy, assignor to Steiner American Corporation

Filed Jun. 1, 1976, Ser. No. 691,847
Term of patent 14 years
Int. Cl. D9—*01*

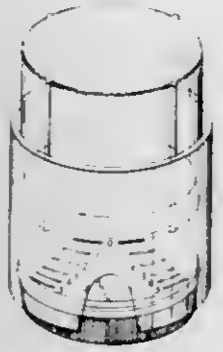
U.S. Cl. D9—158



248,928
MAGNETIC WEIGHING SCALE

Jerome A. Grunstad, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 4, 1976, Ser. No. 729,478
Term of patent 14 years
Int. Cl. D10—*04*

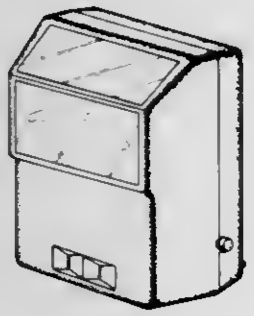
U.S. Cl. D10—91



248,929
WATT METER HOUSING

Jackson Connolly, Fremont, Calif., assignor to Watt Watchers, Inc., Lafayette, Calif.
Filed Jun. 24, 1976, Ser. No. 699,517
Term of patent 3 years
Int. Cl. D10—*04*

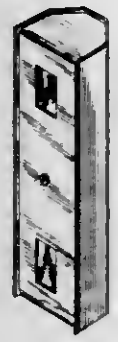
U.S. Cl. D10—102



248,930
ULTRASONIC INTRUSION DETECTOR

William G. Kahl, Jr., Brookfield, Conn., assignor to Arrowhead Enterprises, Inc., New Milford, Conn.
Filed Feb. 16, 1977, Ser. No. 769,209
Term of patent 14 years
Int. Cl. D10—*06*

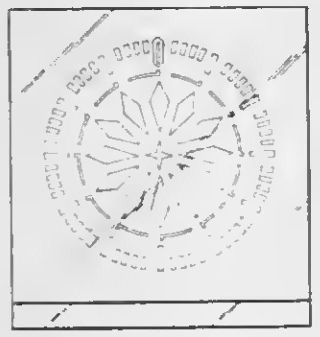
U.S. Cl. D10—106



248,931
DIAL FOR CLOCK

Kenji Nakamura, Kamakura, Japan, assignor to L C Chemical Company Limited, Tokyo, Japan
Filed Aug. 25, 1975, Ser. No. 607,459
Claims priority, application Japan, Mar. 28, 1975, 50-12225
The portion of the term of this patent subsequent to Aug. 15, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*07*

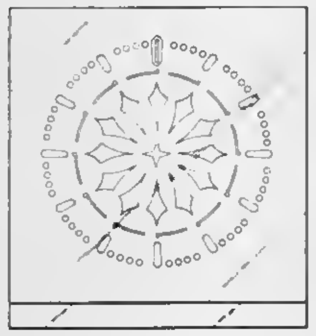
U.S. Cl. D10—125



248,932
DIAL FOR CLOCK

Kenji Nakamura, Kamakura, Japan, assignor to L C Chemical Company Limited, Tokyo, Japan
Filed Aug. 25, 1975, Ser. No. 607,460
Claims priority, application Japan, Mar. 7, 1975, 50-8953
The portion of the term of this patent subsequent to Aug. 15, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*07*

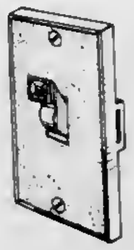
U.S. Cl. D10—125



248,933
PENDANT

Albert Lipten, New City, N.Y., assignor to Cyrano Creations, Inc., New York, N.Y.
Filed Mar. 3, 1976, Ser. No. 663,473
Term of patent 14 years
Int. Cl. D11—*01*

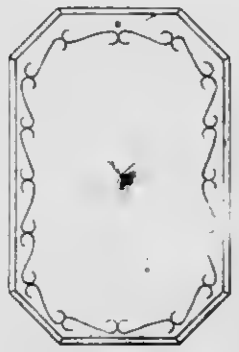
U.S. Cl. D11—81



248,934
CHRISTMAS ORNAMENT

William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,758
Term of patent 14 years
Int. Cl. D11—*02*

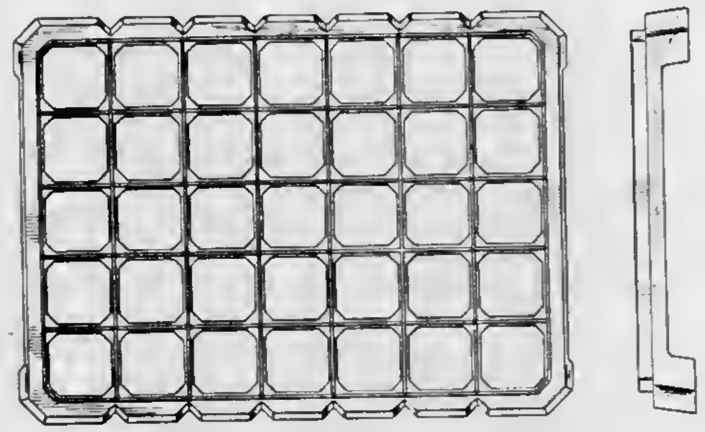
U.S. Cl. D11—121



248,935
HORTICULTURAL TRAY

Kenneth R. Stutelberg, Bloomington, and Dennis C. Anderson, Northfield, both of Minn., assignors to National Polymers, Inc., Lakeville, Minn.
Filed Mar. 26, 1976, Ser. No. 670,659
Term of patent 14 years
Int. Cl. D11—*02*

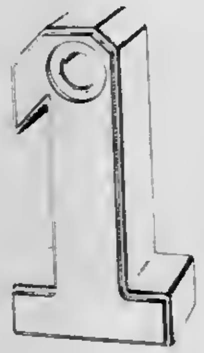
U.S. Cl. D11—155



248,936
TROPHY

William D. Lohan, 850 Ellis Ave., Orangeburg, S.C. 29115
Filed Jan. 19, 1977, Ser. No. 760,756
Term of patent 14 years
Int. Cl. D11—*02*

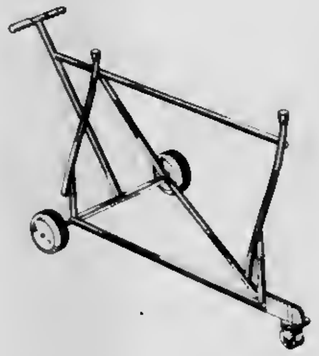
U.S. Cl. D11—157



248,937
CART FOR TRANSPORTING COLLAPSIBLE TABLES

Henry D. Figueroa, 1011 Magnolia Ave., Yuma, Ariz. 85364
Filed Apr. 22, 1977, Ser. No. 789,951
Term of patent 14 years
Int. Cl. D12—*02*

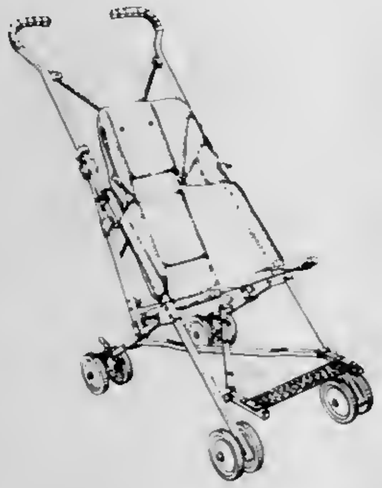
U.S. Cl. D12—26



248,938
COLLAPSIBLE BABY CARRIAGE

Angus Christopher Firth; Frederick John Sheldon, both of Shipley; John Atherton, and William John Block, both of Leeds, all of England, assignors to Lawrence Wilson & Son Limited, Leeds, England
Filed Mar. 18, 1977, Ser. No. 779,410
Term of patent 14 years
Int. Cl. D12—*12*

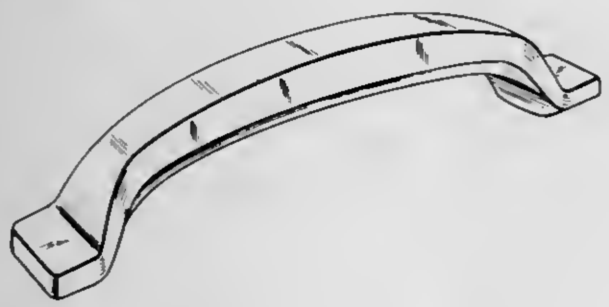
U.S. Cl. D12—129



248,939
ANTI-SKID BAR FOR POWER DRIVEN VEHICLES

Göran Eriksson, Rundviksverken, Sweden, assignor to Masonite AB, Rundviksverken, Sweden
Filed Jun. 18, 1976, Ser. No. 697,432
Claims priority, application Sweden, Feb. 3, 1976, 76216
Term of patent 14 years
Int. Cl.^{2} D12—*16*

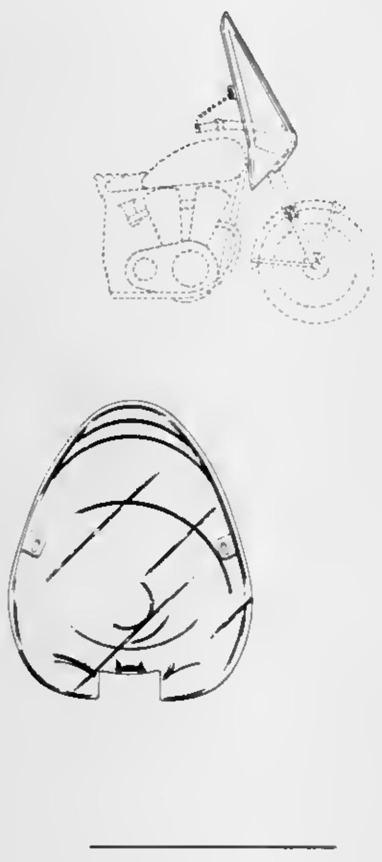
U.S. Cl. D12—154



248,940
MOTORCYCLE FAIRING

Charles A. Saunders, IV, Columbus, Nebr. 68601
Filed Jul. 22, 1977, Ser. No. 818,115
Term of patent 14 years
Int. Cl. D12—*11*

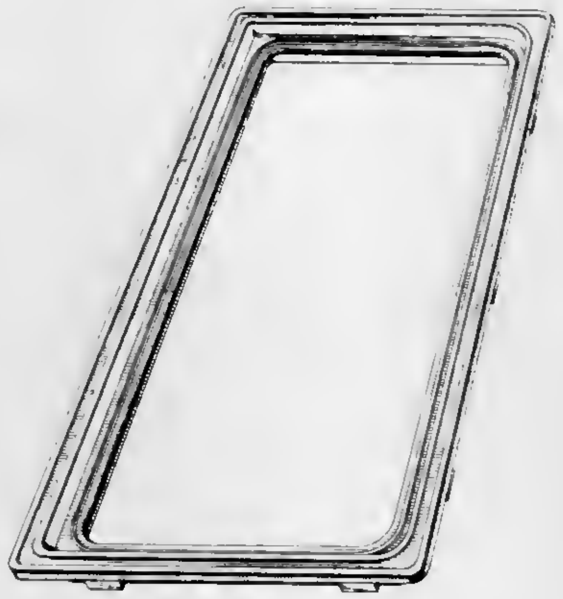
U.S. Cl. D12—182



248,941
VEHICLE WINDOW FRAME

Karl Ingvar Carlsson, and Sven Torsten Åkesson, both of Tidaholm, Sweden, assignors to AB Bofors, Bofors, Sweden
Filed Oct. 4, 1976, Ser. No. 729,313
Claims priority, application Sweden, Apr. 5, 1976, 760768
Term of patent 14 years
Int. Cl. D12—*16*; D25—*02*

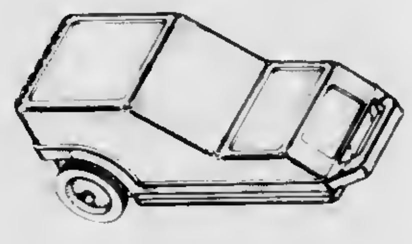
U.S. Cl. D12—183



248,942
COMBINED MOBILE BATTERY CHARGER AND CARRYING UNIT THEREFOR

Terry W. Kniss, 14430 18th S.W., Seattle, Wash. 98166
Filed Nov. 8, 1976, Ser. No. 739,421
Term of patent 14 years
Int. Cl. D13—*02*

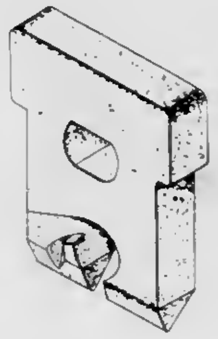
U.S. Cl. D13—7



248,943
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT

Reynold C. King, 865 N. 18th St., Wytheville, Va. 24382
Filed Dec. 13, 1976, Ser. No. 752,423
Term of patent 14 years
Int. Cl. D13—*03*

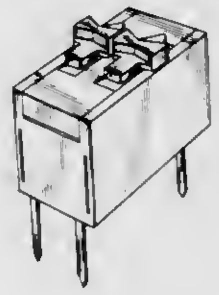
U.S. Cl. D13—18



248,944
ELECTRICAL SWITCH

Nelson Frederick Godfrey, 36 Holywell Rd., Studham, Bedfordshire, England
Filed Dec. 1, 1975, Ser. No. 636,466
Claims priority, application United Kingdom, Oct. 2, 1975, 972743/75; Oct. 2, 1975, 972747/75; Oct. 2, 1975, 972744/75; Oct. 2, 1975, 972745/75; Oct. 2, 1975, 972746/75
Term of patent 14 years
Int. Cl. D13—*03*

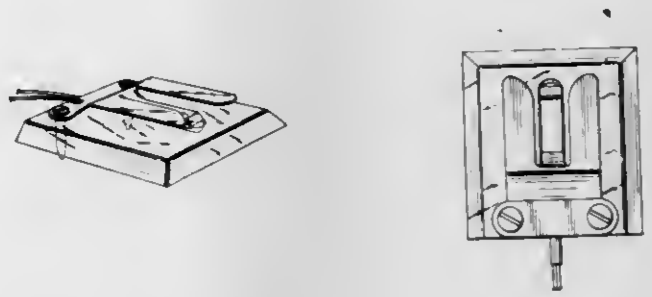
U.S. Cl. D13—32



248,945
ILLUMINATED MICROPHONE HOLDER

Thomas R. Astleford, 6203B 153rd St., Grandview, Mo. 64030, and James E. Stout, 500 Webb Rd., Raymore, Mo. 64083
Filed Jul. 21, 1976, Ser. No. 707,696
Term of patent 14 years
Int. Cl. D14—*01, 99*

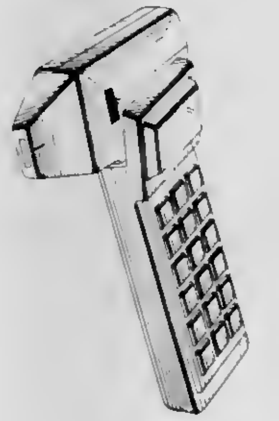
U.S. Cl. D14—13



248,946
HAND SCAN UNIT

Robert B. Koenig, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.
Filed Dec. 27, 1976, Ser. No. 754,851
Term of patent 14 years
Int. Cl. D14—*02*

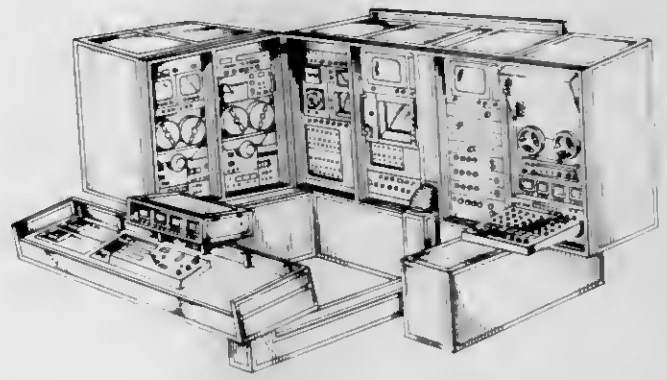
U.S. Cl. D14—40



248,947
VIDEO PRODUCTION MODULE

William G. Graham, Las Vegas, Nev., assignor to Las Vegas Convention Service Co.
Filed Jul. 21, 1975, Ser. No. 597,951
Term of patent 14 years
Int. Cl. D14—*02*

U.S. Cl. D14—42



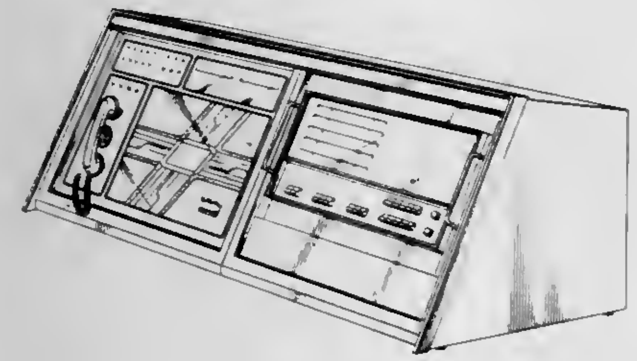
248,948
CONSOLE CABINET
Thomas W. Seabury, 3300 Crow Canyon Rd., San Ramon, Calif. 94583

Filed Nov. 22, 1976, Ser. No. 743,676

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—42



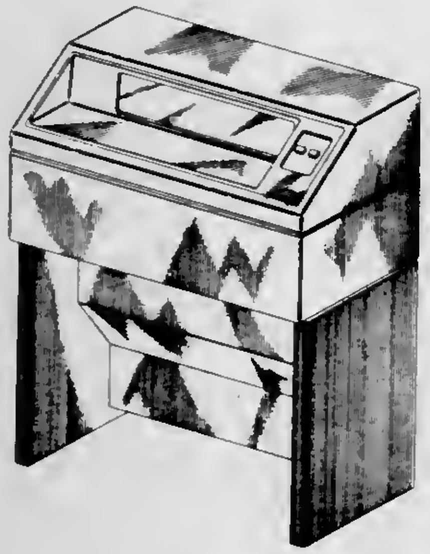
248,949
PRINTER HOUSING OR SIMILAR ARTICLE
Andrew L. Alger, Wilmette, Ill., assignor to Computer Peripherals, Inc.

Filed Oct. 12, 1976, Ser. No. 731,403

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—50



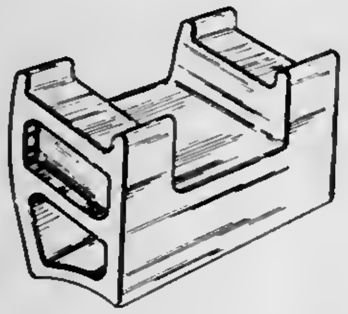
248,950
AUXILIARY TELEPHONE-RECEIVER SADDLE
Richard L. Vitacco, 1653 Thurston Ave., Racine, Wis. 53405

Filed Apr. 9, 1976, Ser. No. 675,588

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—59



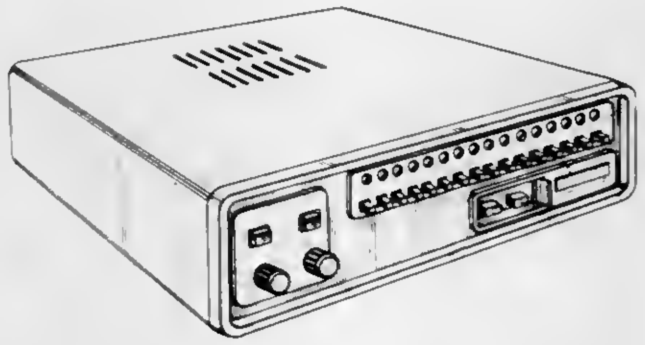
248,951
PROGRAMMABLE SCANNING RADIO RECEIVER OR THE LIKE
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,455

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—71



248,952
COMBINED RADIO RECEIVER AND TAPE PLAYER
Susumu Yamamotn, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

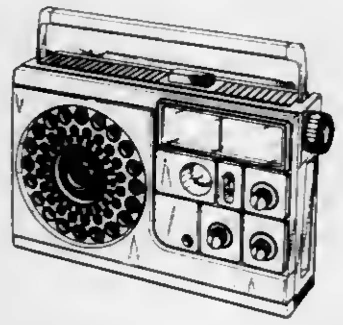
Filed Feb. 11, 1976, Ser. No. 657,336

Claims priority, application Japan, Nov. 20, 1975, 50/46225

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—72



248,953
TREE HARVESTER
Olli Aho, Tampere; Timo Hartman, Pirkkala; Jouko Hyytianien, Tampere; Matti Kaarnametsa, Tampere; Jukko Moisander, Tampere; Markku Makela, Tampere, and Kari Rikkonen, Tampere, all of Finland, assignors to Rauma-Repola Oy, Lokomoo Tehtaat, Finland

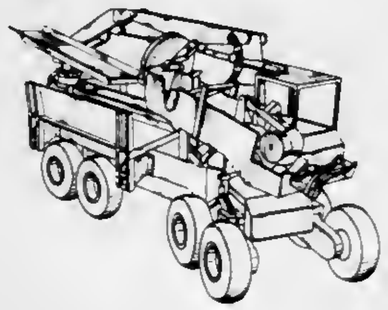
Filed Aug. 19, 1976, Ser. No. 715,880

Claims priority, application Finland, Feb. 27, 1976, 76101

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—26



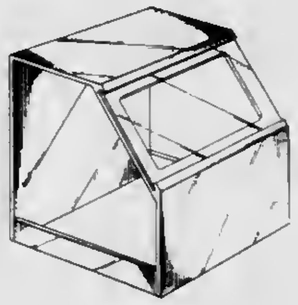
248,954
DUST CATCHER FOR GRINDING OPERATIONS OR THE LIKE
Mesrop Der-Avanessian, 2020 Sunset Blvd., Los Angeles, Calif. 90036

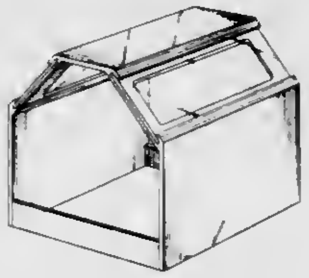
Division of Ser. No. 673,281, Apr. 2, 1976, Pat. No. Des. 244,277, which is a continuation-in-part of Ser. No. 644,536, Dec. 29, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,131

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—126





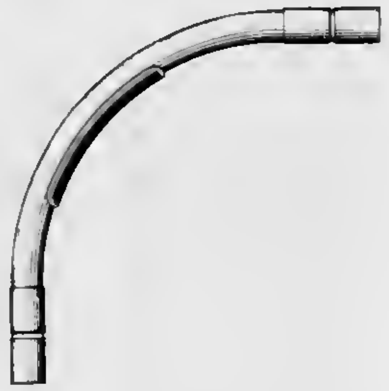
248,955
FEED PIPE TURN
Gerald L. Kitson, 9709 Belding Rd. NE., Rockford, Mich. 49341

Continuation-in-part of Ser. No. 629,866, Nov. 7, 1975, abandoned, which is a continuation of Ser. No. 480,761, Jun. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 270,316, Jul. 10, 1972, abandoned. This application Jul. 2, 1976, Ser. No. 702,295

Term of patent 14 years

Int. Cl. D12—*05*

U.S. Cl. D15—148



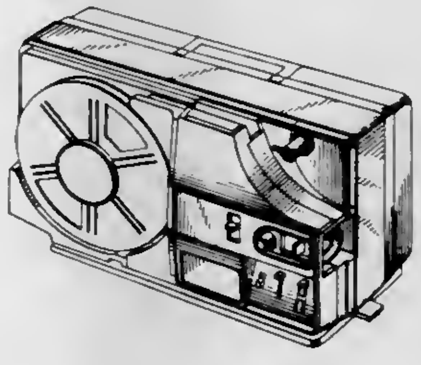
248,956
MOTION PICTURE PROJECTOR
Norman R. Kubnlck, Skokie, and Albert L. Nagele, Wilmette, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jul. 8, 1976, Ser. No. 703,396

Term of patent 14 years

Int. Cl. D16—*02*

U.S. Cl. D16—23



248,957
ELECTROPHOTOGRAPHICAL DUPLICATOR
Isao Kitai; Matafumi Ikeda, and Tsutomu Yamazaki, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

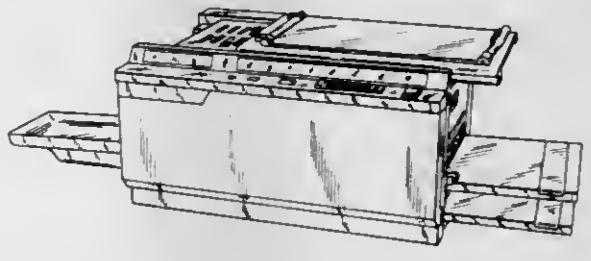
Filed Mar. 3, 1977, Ser. No. 774,032

Claims priority, application Japan, Sep. 6, 1976, 51/353445

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—31



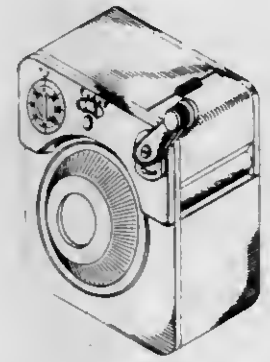
248,958
BULK FILM LOADER OR SIMILAR ARTICLE
Thomas R. Joiner, 149 Osage Ave., Los Altos, Calif. 94022

Filed Jul. 29, 1976, Ser. No. 709,689

Term of patent 14 years

Int. Cl. D16—*05*

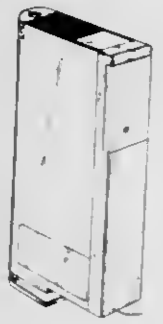
U.S. Cl. D16—38



248,959
ELECTRONIC FLASH UNIT

Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 2, 1977, Ser. No. 773,710
Claims priority, application Japan, Sep. 7, 1976, 51/35271
Term of patent 14 years
Int. Cl. D16—*05*

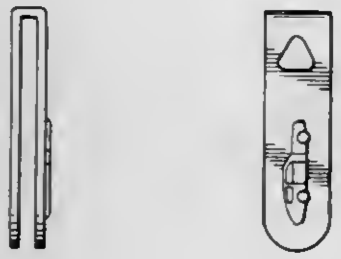
U.S. Cl. D16—42



248,960
KEY LABEL

Yvonne J. Iverson, 8801 Chowen Ave. South, Minneapolis, Minn. 55431
Division of Ser. No. 562,825, Mar. 28, 1975, Pat. No. Des. 241,539. This application Sep. 23, 1976, Ser. No. 726,639
Term of patent 14 years
Int. Cl. D19—*08*

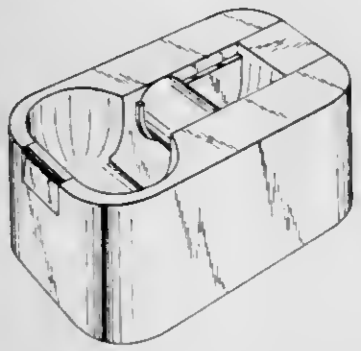
U.S. Cl. D19—18



248,961
PRESSURE SENSITIVE ADHESIVE TAPE DISPENSER

Robert J. De brey, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Aug. 19, 1976, Ser. No. 715,972
Term of patent 14 years
Int. Cl. D19—*02*

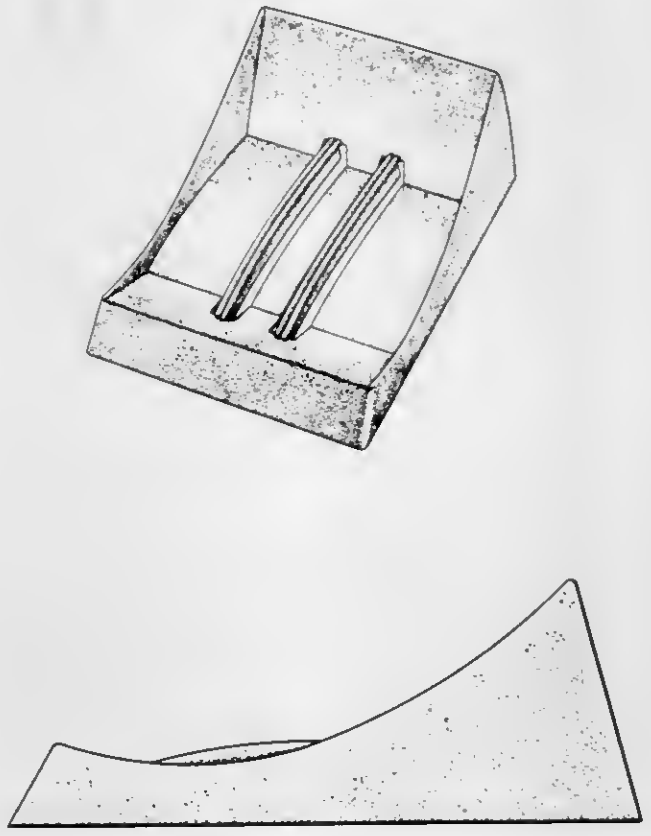
U.S. Cl. D19—69



248,962
FILE CARD HOLDER

Martin Glauhinger, Teaneck, and William L. Effinger, Roseland, both of N.J., assignors to Rolodex Corporation
Filed Sep. 10, 1975, Ser. No. 611,878
Term of patent 14 years
Int. Cl. D19—*02*

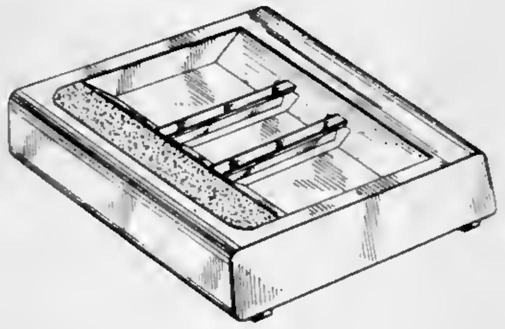
U.S. Cl. D19—76



248,963
CARD FILE

William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Apr. 16, 1976, Ser. No. 677,814
Term of patent 14 years
Int. Cl. D19—*02*

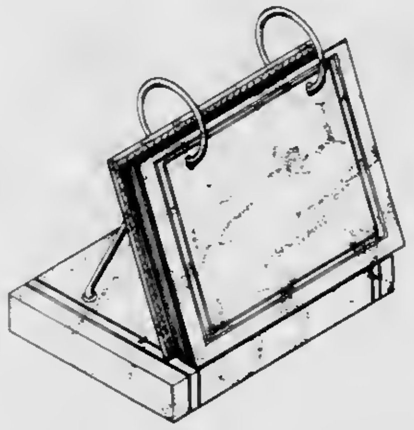
U.S. Cl. D19—76



248,964
PHOTOGRAPH DISPLAY

George Kizlauskas, Jamaica, N.Y., assignor to Mele Manufacturing Co., Inc.
Filed Jun. 16, 1976, Ser. No. 696,528
Term of patent 14 years
Int. Cl. D19—*02*

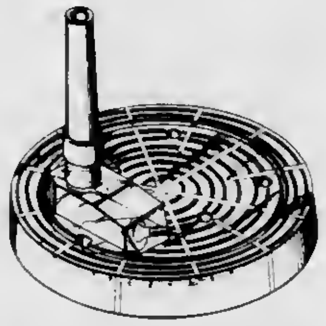
U.S. Cl. D19—76



248,965
AQUARIUM FILTER

Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.
Filed Apr. 26, 1977, Ser. No. 791,165
Term of patent 14 years
Int. Cl. D23—*01*

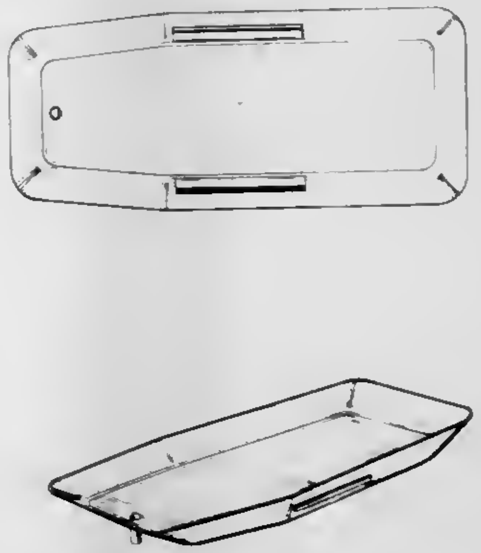
U.S. Cl. D23—4



248,966
MATTRESS FOR A TABLE PLATE OF A PATIENT SUPPORTING TABLE

Hans Arne Valentin Johansson, Treháradsvägen 36, Eslöv, Sweden (241-00)
Filed Jan. 15, 1976, Ser. No. 649,533
Claims priority, application Sweden, Nov. 3, 1975, 2172/75
Term of patent 14 years
Int. Cl. D24—*01*

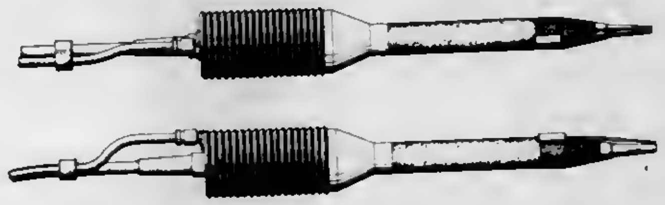
U.S. Cl. D24—3



248,967
HIGH SPEED BONE DRILL

John J. Shea, and Harry Phillips, both of Memphis, Tenn., assignors to XOMED Inc., Cincinnati, Ohio
Filed Aug. 18, 1976, Ser. No. 715,235
The portion of the term of this patent subsequent to Sep. 13, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D24—*02*

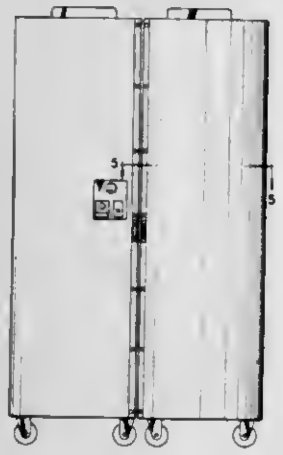
U.S. Cl. D24—28

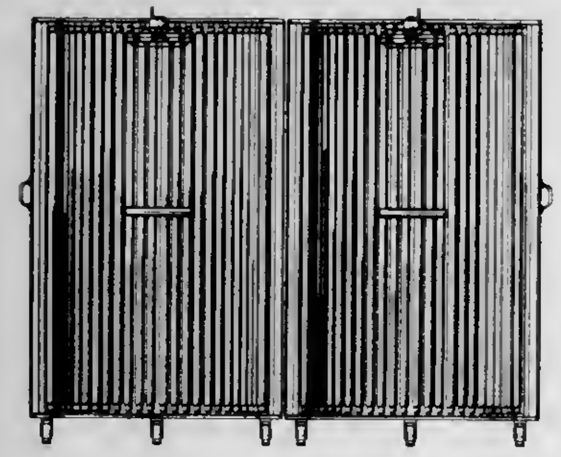


248,968

PHOTOTHERAPY CABINET FOR LONGWAVE ULTRAVIOLET LIGHT TREATMENT

William C. McMillan, Rte. 1, Ozora Rd., Loganville, Ga. 30249
Filed Mar. 12, 1976, Ser. No. 666,482
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—39

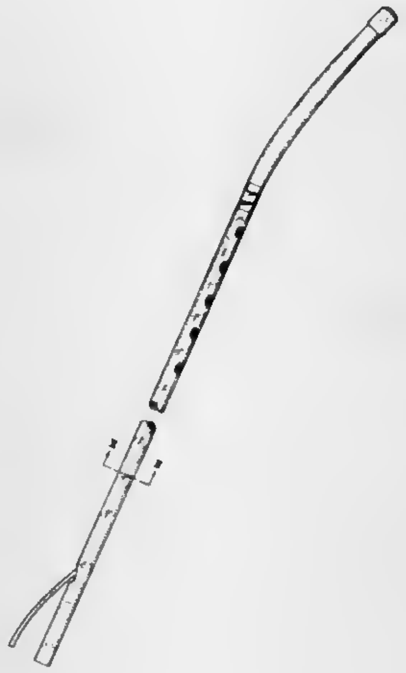




248,969

ASPIRATOR TUBE

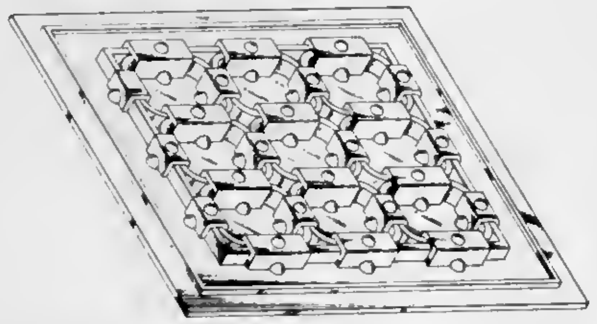
Joseph Hodge, 1008 Wendover Way, Spartanburg, S.C. 29303
Filed Feb. 27, 1976, Ser. No. 661,963
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54



248,970

SPEAKING PORT

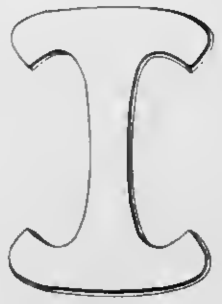
William B. Hunt, Redmond, and William H. Heiderich, Seattle, both of Wash., assignors to Simpson Timber Company, Seattle, Wash.
Filed Dec. 20, 1976, Ser. No. 752,563
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—52



248,971

INTERLOCKING MODULE

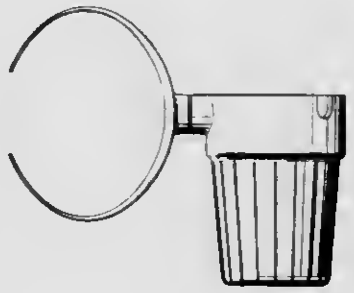
James Wood, 137 North St., Williamsport, Pa. 17701
Filed May 11, 1976, Ser. No. 685,338
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—94



248,972

WRIST ASH TRAY

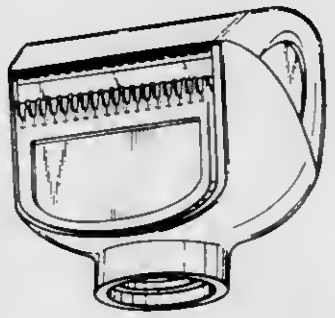
Earl C. Carter, P.O. Box 93, Charleston, W. Va. 25321
Filed Aug. 2, 1976, Ser. No. 710,932
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—14



248,973

DETACHABLE ELECTRIC SHAVER HEAD

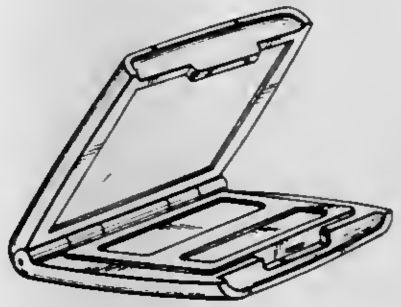
Shima Ito, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan
Filed Mar. 3, 1976, Ser. No. 663,606
Claims priority, application Japan, Dec. 16, 1975, 50-49859
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



248,974

COMPACT

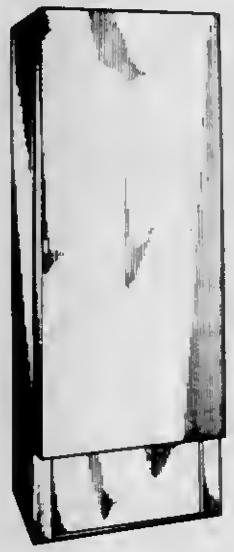
Pierre Ballereaud, Dammarie, France, assignor to Société Anonyme, "GERMAINE MONTEIL", Paris, France
Filed Jul. 14, 1976, Ser. No. 705,112
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83



248,975

VERTICAL SECURITY CHEST

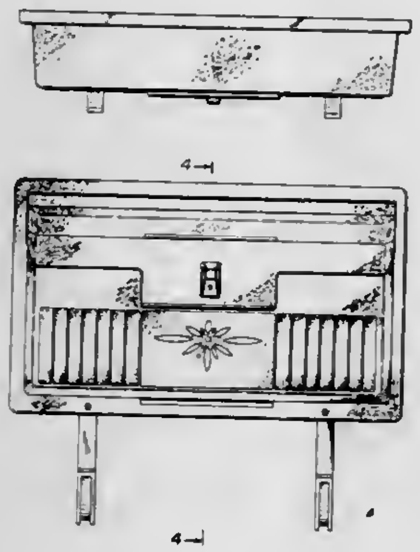
David M. Cole, Roanoke, Va., assignor to Tread Corporation, Roanoke, Va.
Filed Jan. 19, 1976, Ser. No. 650,441
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D31—22



248,976

MAILBOX

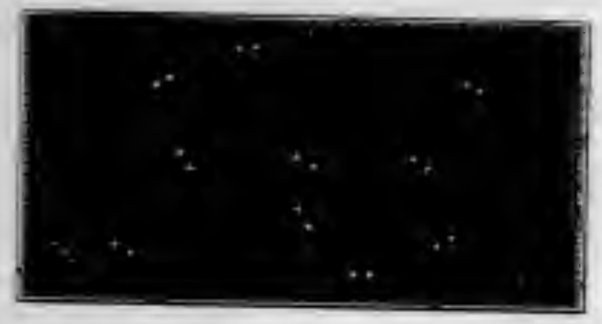
Jay Raab, 351 W. Broadway, New York, N.Y. 10013
Filed Sep. 10, 1976, Ser. No. 721,974
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24



248,977

ELECTRONIC GAME PANEL OF SOCCER OR THE LIKE

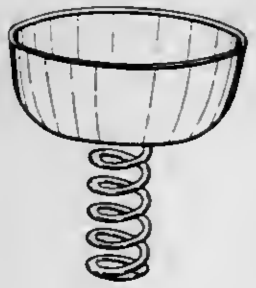
H. Frank Fogleman, San Diego, Calif., assignor to Gremlin Industries, Inc.
Filed Jun. 25, 1976, Ser. No. 699,620
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,978

SPRING-SUPPORTED BOWL PLAYGROUND APPARATUS

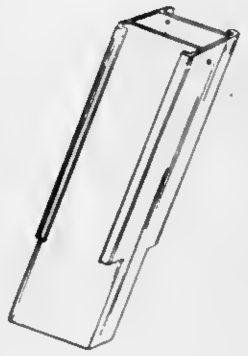
Dwight C. Shaneour, Hillsdale, Mich., assignor to Quality Industries, Inc.
Filed Aug. 24, 1976, Ser. No. 717,466
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



248,979

GOLF CLUB CARRIER

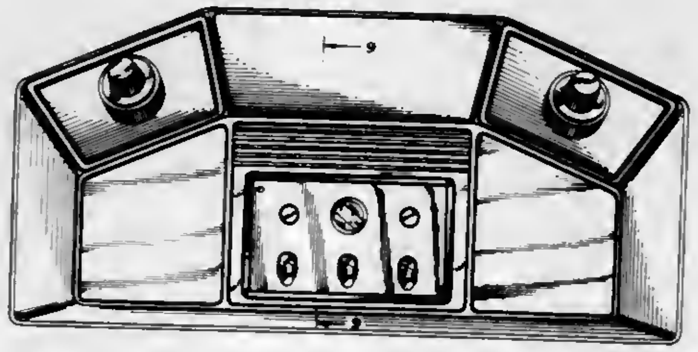
John L. Findeisen, 11026 S. Avenue L, Chicago, Ill. 60617
Filed Mar. 17, 1976, Ser. No. 667,902
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GB



248,980

ELECTRONIC CABINET FOR A VIDEO GAME

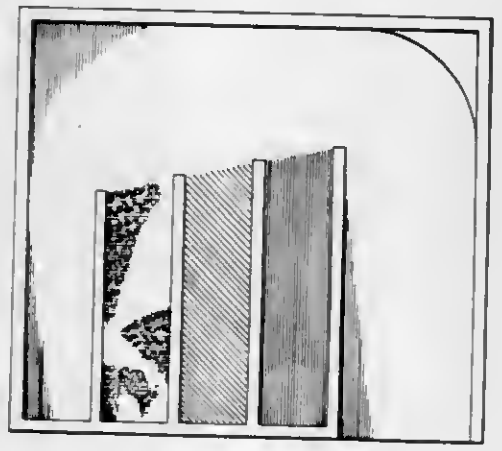
Alan H. Friedman, Milburn, N.J., assignor to APF Electronics, Inc., New York, N.Y.
Filed Sep. 27, 1976, Ser. No. 726,722
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 R



248,981

BALL GAME BOARD

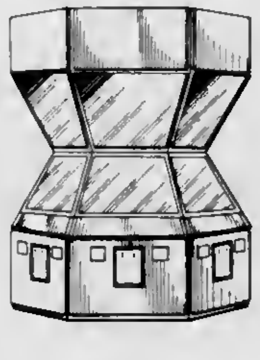
Peter Lombardo, 738 Allen Ave., Vineland, N.J. 08360
Filed Sep. 20, 1976, Ser. No. 724,527
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,982

GAME CABINET

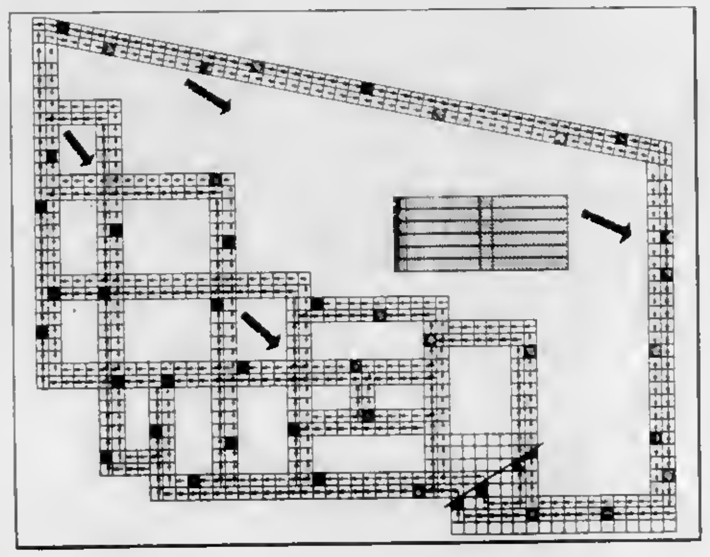
David M. Cook, San Jose, Calif., assignor to Atari, Inc. (Delaware Corporation), Sunnyvale, Calif.
Filed Oct. 22, 1976, Ser. No. 734,982
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



248,983

SAILING GAME BOARD

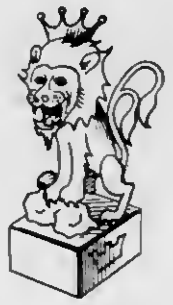
Eugene Alfred Cavicchi, 186 Wordsworth St., and George Scigliano, 149 Coleridge St., both of East Boston, Mass. 02128
Filed Dec. 27, 1976, Ser. No. 754,105
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,984

SET OF CHESSMEN OR SIMILAR ARTICLE

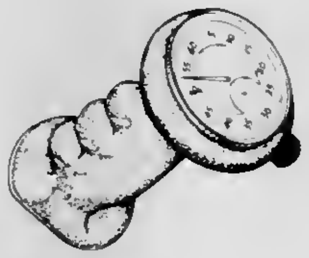
Jeanette Lamonica, and Diana Lamonica, both of 426 Neckar Ave., Staten Island, N.Y. 10304
Filed Mar. 29, 1976, Ser. No. 671,365
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH



248,985

COMBINED GRIP AND STOP-WATCH FOR SKI-POLE

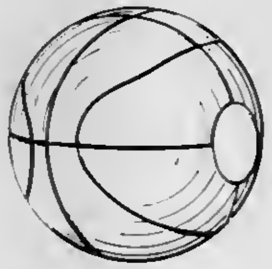
Hansruedi Spiri, Biel, Switzerland, assignor to BFG Baumgartner Freres SA, Grencben, Switzerland
Filed Oct. 1, 1976, Ser. No. 728,533
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D



248,986

VOLLEY-BALL OR THE LIKE

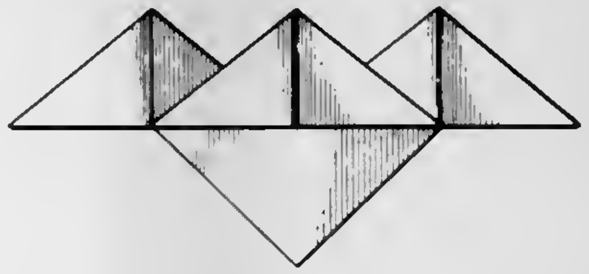
Kuniichi Nakata, Hiroshima, Japan, assignor to Myojyo Rubber Industry Co., Inc., Japan
Filed Jul. 22, 1975, Ser. No. 598,019
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 EE



248,987

FOLDING PUZZLE

Mary Ann Paschal, P.O. Box 443, Milligan College, Tenn. 37682
Filed Apr. 10, 1975, Ser. No. 566,666
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

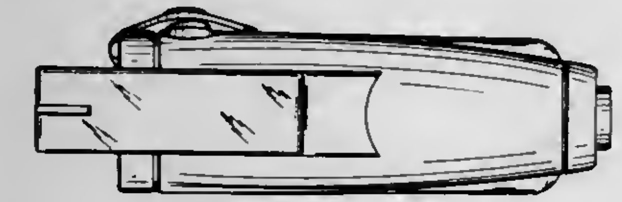


248,988
LAUNCHER FOR TOY AIRCRAFT

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91345; Erwin Benkoe, deceased, late of Encino, Calif.; Elisabeth Benkoe, executrix, 17965 Medley Dr., Encino, Calif. 91316; Delmar K. Everitt, Woodland Hills, Calif.; Ronald F. Chesley, La Crescenta, Calif., and Richard D. Frierdich, Canoga Park, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif. and Elisabeth Benkoe, Encino, Calif., executrix for the estate of Erwin Benkoe

Filed Jan. 5, 1976, Ser. No. 646,520
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 PP

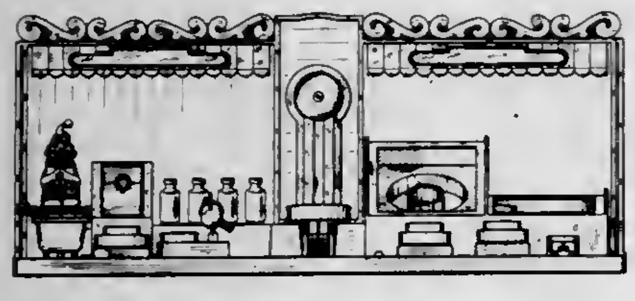


248,989
TOY AMUSEMENT CENTER

Michael C. Cartabiano, Mamaroneck, N.Y., assignor to Child Guidance Playthings, Inc., New York, N.Y.

Filed Sep. 2, 1976, Ser. No. 719,983
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 R

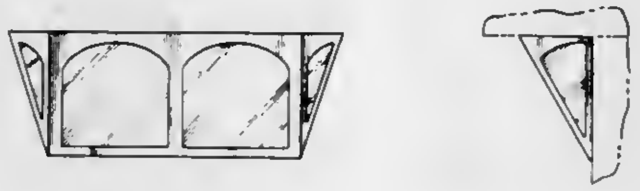


248,990
CABINET FOR A LIGHT SOURCE

Michael D. Iacobelli, 410 Baldwin, Rochester, Mich. 48063

Filed Jun. 12, 1975, Ser. No. 586,371
Term of patent 14 years
Int. Cl. D26—*05*

U.S. Cl. D48—4 B

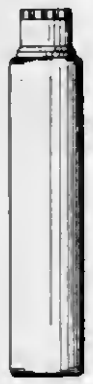


248,991
FLASHLIGHT

David E. Stauh, 461 Palm Island N.E., Clearwater, Fla. 33151

Filed Sep. 1, 1976, Ser. No. 719,980
Term of patent 14 years
Int. Cl. D26—*02*

U.S. Cl. D48—24 A

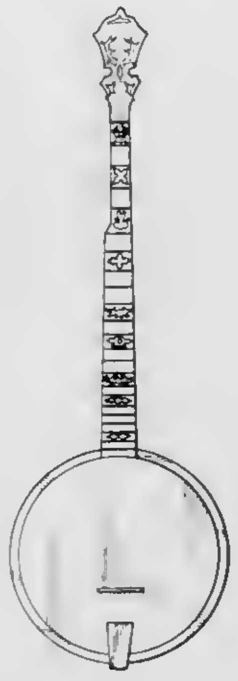


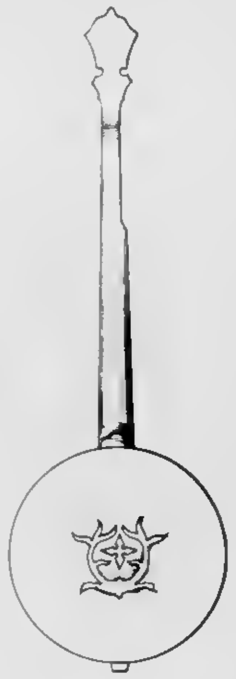
248,992
BANJO

Geoffrey H. Stelling, 8815 Kenwood Dr., Spring Valley, Calif. 92077

Filed Feb. 24, 1976, Ser. No. 661,037
Term of patent 14 years
Int. Cl. D17—*03*

U.S. Cl. D56—1 A



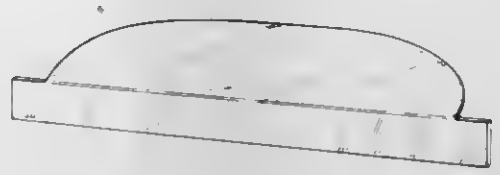


248,993
COVER FOR ORGAN KEYBOARD

Ray J. Oliver, 451 S. 1st St., San Jose, Calif. 95113, and Stanford M. Sammarcelli, 1357 Loyola Dr., Santa Clara, Calif. 95051

Filed Feb. 17, 1976, Ser. No. 658,171
Term of patent 14 years
Int. Cl. D17—*01, 99*

U.S. Cl. D56—2

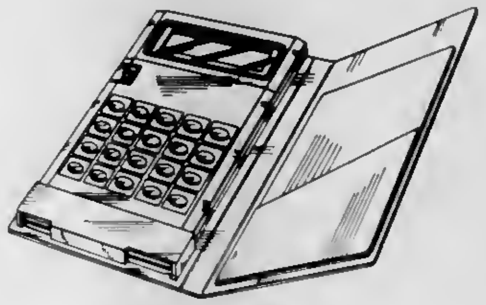


248,994
ELECTRONIC CALCULATING MACHINE

Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1977, Ser. No. 791,869
Claims priority, application Japan, Nov. 10, 1976, 51-44413
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 B

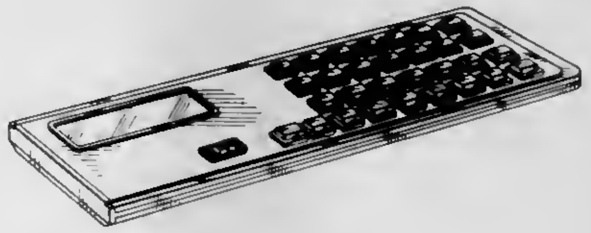


248,995
ELECTRONIC CALCULATING MACHINE

Shigetoshi Hazama; Seiichiro Nishiguchi, and Yoshiaki Kobayashi, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1977, Ser. No. 809,095
Claims priority, application Japan, Dec. 29, 1976, 51-51448
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See*—
August, William S., 4,106,816, Cl. 301-108.00R.

Aarons, Raymond Joseph, to Monier Colourtile Pty. Ltd. Tiling system for roofs. 4,106,253, Cl. 52-547.000.

AB Bonnierforetagen: *See*—
Luning, Bjorn Erik Gustav Bertilsson, 4,107,298, Cl. 424-177.000.

Abbott, Joseph: *See*—
Yealy, Carl F.; and Abbott, Joseph, 4,106,963, Cl. 156-73.500.

Abbott Laboratories: *See*—
Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., 4,107,172, Cl. 260-308.00D.

Abe, Takeshi: *See*—
Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.

Abernethy, Robert R. Fluorescent lamp insert with conductive rod support. 4,107,581, Cl. 315-324.000.

Abrahams, Jacobus Hubertus, to U.S. Philips Corporation. Stirling cycle machine with a control device for supplying working medium. 4,106,293, Cl. 60-521.000.

Abramowitz, Herbert. Pierced earring device. 4,106,310, Cl. 63-12.000.

Accumulatorenwerk Hoppecke Carl Zoellner & Sohn: *See*—
Ruch, Jean, 4,107,396, Cl. 429-26.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,106,749, Cl. 251-144.000.

Achard, Jean Claude: *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarredin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.

Aciers et Outillage Peugeot: *See*—
Roger, Jean, 4,107,584, Cl. 318-227.000.

Ackeret, Peter, to Zyliss Zysset AG. Hand-operated squeezer for extracting the juice from citrus fruits. 4,106,401, Cl. 99-508.000.

Acme General Corporation: *See*—
Kellems, Kenneth K.; and Brydolf, Robert, 4,106,158, Cl. 16-129.000.

Action Leathercraft, Inc.: *See*—
Hillinger, George, 4,106,679, Cl. 224-26.00B.

Adams, Frank H.; and Knapik, H. Peter G., to UOP Inc. Hydrocarbon conversion with a selectively sulfided acidic multimetallic catalytic composite. 4,107,083, Cl. 252-439.000.

Adams, Larry L.: *See*—
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.

Adams, Robert Clarence; and Sweigart, James H., to NCR Corporation. Method of fastening metal part to plastic part. 4,106,962, Cl. 156-73.100.

Adcock, Willis A.; and Skaggs, Frank L., to Texas Instruments Incorporated. Two sensor time encoded color imaging system. 4,107,732, Cl. 358-43.000.

Addressograph Multigraph Corporation: *See*—
Holland, Norman, 4,106,408, Cl. 101-401.100.
Roberts, William E., 4,106,871, Cl. 355-99.000.

Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, to United States of America, Energy. Anisotropic determination and correction for ultrasonic flaw detection by spectral analysis. 4,106,327, Cl. 73-1.0DV.

Aeritalia S.p.A.: *See*—
Bergman, Burton; and Herman, Stewart M., 4,106,729, Cl. 244-137.00P.

Affimet: *See*—
Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, 4,106,894, Cl. 432-122.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.

Agency of Industrial Science & Technology: *See*—
Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, 4,107,718, Cl. 357-3.000.
Watanabe, Ryuji; Sato, Syoichi; and Tomita, Sadami, 4,106,627, Cl. 209-7.000.

AGFA-Gevaert, A.G.: *See*—
Burgermann, Norbert, 4,106,864, Cl. 352-91.00C.
Burgermann, Norbert, 4,106,865, Cl. 352-91.00C.
Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, 4,107,703, Cl. 354-21.000.
Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, 4,106,940, Cl. 96-74.000.
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.

Agusti, Agustin, to J. Uriach & Cia. S.A. Bis(triamcinolone acetonide)-4,4'-methylenebis-(3-methoxy-2-naphthoate). 4,107,161, Cl. 260-239.55D.

Ahrens, Edward W.: *See*—
Brimmer, Frances M.; Ahrens, Edward W.; and Magney, Herbert C., 4,106,620, Cl. 206-363.000.

Airco, Inc.: *See*—
Nayar, Harbhajan S., 4,106,931, Cl. 75-201.000.
Shepherd, Thomas L., 4,107,557, Cl. 310-11.000.

Airway Industries, Inc.: *See*—
Davis, Michael, 4,106,598, Cl. 190-52.000.

Aitken, John; and Graham, William Eric, to J. & P. Coats Limited. Ammonia treatment of textile materials. 4,106,902, Cl. 8-181.000.

Ajinomoto Co., Inc.: *See*—
Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, 4,106,989, Cl. 195-62.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Thyristor turn-off system. 4,107,551, Cl. 307-252.00J.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switch. 4,107,552, Cl. 307-252.00J.

Akamatsu, Masahiko: *See*—
Uchida, Ryohei; Utsumi, Satoshi; and Akamatsu, Masahiko, 4,107,772, Cl. 363-124.000.

Akebono Brake Company, Ltd.: *See*—
Kimura, Toshihiko; and Nakayama, Tsuneo, 4,106,595, Cl. 188-73.300.

Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, to Toshiba Chemical Products Co., Ltd. Heat-resistant thermosetting polyimide resin. 4,107,153, Cl. 528-322.000.

Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, to Mitsubishi Denki Kabushiki Kaisha; and Kabushiki Kaisha Terauchi Seisakusho. Clamping tool. 4,106,371, Cl. 81-57.140.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt Arne Gunnar, 4,106,713, Cl. 242-47.010.

Aktiebolaget Svenska Flaktfabriken: *See*—
Lagerdahl, Sebastian, 4,106,919, Cl. 55-147.000.

Aktiebolaget Tudor: *See*—
Koch, Kjell, 4,107,407, Cl. 429-225.000.

Akzona Incorporated: *See*—
Fitzner, Josef; and Low, Lothar, 4,106,275, Cl. 57-77.330.
Hewett, Colin Leslie; and Savage, David Samuel, 4,107,206, Cl. 260-562.00R.
Nemeth, Harold C., 4,107,292, Cl. 424-78.000.

Alban, Thomas W.: *See*—
Hyde, Glenn F.; and Alban, Thomas W., 4,106,782, Cl. 277-235.00A.

Albizzati, Enrico: *See*—
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,107,416, Cl. 526-114.000.

Albrande, Alfredo: *See*—
Neri, Filippo; and Albrande, Alfredo, 4,107,683, Cl. 343-18.00E.

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Fungicidal dispersions of a systemic fungicide. 4,107,318, Cl. 424-273.00R.

Albrecht, Werner, to Kabel-und Metallwerke Gutehoffnungshutte AG. Revolving cable-to-housing connection. 4,106,831, Cl. 339-8.00R.

Aldrich, Paul Edward; and Berezin, Gilbert Harvey, to Du Pont de Nemours, E. I., and Company. Antihypertensive hexafluorohydroxyisopropyl benzazepines and benzazocines. 4,107,303, Cl. 424-244.000.

Alexander, Jay M.: *See*—
Kellermeyer, Janet R.; and Alexander, Jay M., 4,106,507, Cl. 128-295.000.

Alford, Andrew. Monitor for localizer antenna arrays. 4,107,688, Cl. 343-108.00R.

Algoship International Limited: *See*—
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, 4,106,641, Cl. 214-15.00R.

Alifano, Arthur William. Stringed musical instrument. 4,106,387, Cl. 84-312.00P.

Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, to Roussel Uclaf. Quinoline-3-carboxamides. 4,107,310, Cl. 424-258.000.

Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymond T., to Jensen Corporation. Spreading apparatus for sheet feeder. 4,106,227, Cl. 38-143.000.

Allied Chemical Corporation: *See*—
Bollen, Philip Stuart; and Amin, Surendra A., 4,107,251, Cl. 264-171.000.
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,015, Cl. 204-180.00P.
Lewis, Donald J.; and Jankowski, Albert J., 4,107,645, Cl. 340-52.00E.

  - Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,264, Cl. 423-81.000.
  - Phillips, Benjamin A., 4,106,309, Cl. 62-476.000.
  - Sukornick, Bernard; Minhas, Pritam Singh; and Sweeney, Richard Francis, 4,107,055, Cl. 252-8.600.
- Allis-Chalmers Corporation: *See—*
  - Kemnitz, Robert H., 4,106,707, Cl. 241-202.000.
  - Knudson, Henry T., 4,106,269, Cl. 56-15.800.
  - Nelson, John P.; and Hanaway, Roger D., 4,106,649, Cl. 214-522.000.
  - Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., 4,106,272, Cl. 56-202.000.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Jansson, Gunnar, 4,107,245, Cl. 264-40.100.
- Almen, Rune, to Sensotherm AB. Corrugated sheet metal heat transfer member. 4,107,394, Cl. 428-595.000.
- Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, to Mannesmann Aktiengesellschaft. Planetary gear. 4,106,366, Cl. 74-801.000.
- Aluminum Pechiney: *See—*
  - Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, 4,107,281, Cl. 423-625.000.
- Amberg, Stephen W.; and Doherty, Thomas E., to Owens-Illinois, Inc. Pick-up head assembly for use in apparatus for fabricating thermoplastic containers. 4,106,397, Cl. 93-55.10R.
- American Can Company: *See—*
  - Badavas, Charles Arthur, 4,106,607, Cl. 192-129.00B.
  - Karoly, Gabriel; and Gardoo, John L., 4,107,353, Cl. 427-54.000.
  - Wiesman, Dale Clifford, 4,107,380, Cl. 428-327.000.
- American Cyanamid Company: *See—*
  - Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,201, Cl. 260-506.000.
  - Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,202, Cl. 260-506.000.
  - Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, 4,107,441, Cl. 560-121.000.
  - Garber, Murray, 4,107,170, Cl. 260-306.70T.
  - Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., 4,107,326, Cl. 424-304.000.
  - Paul, Rolf; and Menschik, Judith, 4,107,307, Cl. 424-249.000.
  - Paul, Rolf; and Menschik, Judith, 4,107,308, Cl. 424-249.000.
  - Paul, Rolf; and Menschik, Judith, 4,107,309, Cl. 424-249.000.
- American Hoechst Corporation: *See—*
  - Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,074, Cl. 260-326.50B.
  - Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,187, Cl. 260-326.290.
  - McFadden, Arthur R.; and Helsley, Grover C., 4,107,322, Cl. 424-278.000.
  - McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,177, Cl. 260-332.20C.
  - McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,321, Cl. 424-274.000.
- American Hoist & Derrick Company: *See—*
  - Crook, Edward J., Jr., 4,106,284, Cl. 59-85.000.
- American Hospital Supply Corporation: *See—*
  - Carpentier, Alain F.; and Lane, Ernest, 4,106,129, Cl. 3-1.500.
  - Johnson, Clifford Carl; and Eitzen, Vincent Elliott, 4,107,467, Cl. 179-2.0DP.
  - Jones, Eugene C., 4,106,654, Cl. 215-329.000.
- American Optical Corporation: *See—*
  - Haney, Jerry D., 4,106,498, Cl. 128-2.05A.
  - McEachern, Robert A., 4,106,494, Cl. 128-2.06B.
- American Safety Equipment Corporation: *See—*
  - Mattchen, Terry M., 4,106,181, Cl. 29-450.00R.
  - Ulrich, Charles J., 4,106,721, Cl. 242-107.000.
- American Seating Company: *See—*
  - Barecki, Chester J., 4,106,810, Cl. 297-183.000.
- American Standard Inc.: *See—*
  - Delker, Wilfried, 4,106,131, Cl. 4-1.000.
- American Sterilizer Company: *See—*
  - Saluja, Satinder K., 4,107,769, Cl. 362-402.000.
- AMF Incorporated: *See—*
  - Seiling, Samuel O., 4,107,341, Cl. 426-504.000.
- Amin, Surendra A.: *See—*
  - Bollen, Philip Stuart; and Amin, Surendra A., 4,107,251, Cl. 264-171.000.
- AMP Incorporated: *See—*
  - Asick, John Carl; and Huffnagle, Clifton Wesley, 4,106,836, Cl. 339-97.00C.
  - Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 4,106,523, Cl. 137-614.040.
  - Weidler, Charles Harry, 4,107,499, Cl. 200-153.0LA.
- Analog Technology Corporation: *See—*
  - Lawrence, James L., Jr.; Holzl, Robert A.; and Pickett, Frederick P., 4,106,744, Cl. 249-96.000.
- Anchor Wire Corporation of Tennessee: *See—*
  - Hogg, James W., 4,106,741, Cl. 248-467.000.
- Ancos Co., Ltd.: *See—*
  - Torii, Osamu, 4,106,874, Cl. 401-67.000.
- Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Extruder screw. 4,107,788, Cl. 366-81.000.
- Anders, Ronald J., to Rockwell International Corporation. Portable field machine for cutting, grinding and lapping valve seats. 4,106,880, Cl. 408-1.00R.
- Anderson, Bruce W., to Illinois Tool Works Inc. Freezer lock assembly with key ejecting mechanism. 4,106,317, Cl. 70-388.000.
- Anderson, Eric G., to Burroughs Corporation. Current control circuit. 4,107,593, Cl. 318-685.000.
- Anderson, J. Edward C., to Marquette Metal Products Co. Pawl spring assembly for a rotary impact mechanism. 4,106,572, Cl. 173-93.000.
- Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., to General Electric Company. Circuit for shutting down an inverter. 4,107,771, Cl. 363-58.000.
- Anderson, Thomas W. Power translation machine with oscillating piston. 4,106,441, Cl. 123-18.00R.
- Andersson, Josef Carl-Olof. Sleeper of steel or similar material. 4,106,696, Cl. 238-62.000.
- Andoh, Shizuo: *See—*
  - Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, 4,107,578, Cl. 315-169.0TV.
- Andrianjafy, Gabriel Rostanol, to B.S.G. Designs, Inc. Apparatus for dyeing, optionally fixing and eluting a dyeable substrate. 4,106,314, Cl. 68-22.00R.
- Angelichio, Gerald A.; and Digilio, Frank A., to Mohawk Data Sciences Corp. Print hammer apparatus. 4,106,406, Cl. 101-93.310.
- Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, to Union Carbide Corporation. Injection molding reduced combustibility high impact strength polyethylene articles. 4,107,258, Cl. 264-328.000.
- Anheuser-Busch, Incorporated: *See—*
  - Tutor, Gerald L.; Fruin, James C.; and Helm, James L., 4,107,338, Cl. 426-293.000.
- Ankenman, Thomas W.: *See—*
  - White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,106,268, Cl. 56-1.000.
- Anquetin, Jacques. Flexible lighting strip. 4,107,767, Cl. 362-236.000.
- Anritsudenki Kabushikigaisha: *See—*
  - Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.
- Anselrode, Lodewijk, to Stork Brabant B.V. Method of manufacturing a seamless cylindrical stencil and a small-mesh stencil obtained by applying this method. 4,107,003, Cl. 204-16.000.
- Anthes Imperial Limited: *See—*
  - Pearson, Allen F.; Mayo, Paul A.; and Lorenz, Ronald N., 4,107,777, Cl. 364-465.000.
- Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, to Nissan Motor Company, Limited. High temperature abrasion-resistant material and method of producing same. 4,107,392, Cl. 428-547.000.
- Aoki, Norimichi: *See—*
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- Aotani, Seiji: *See—*
  - Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, 4,106,943, Cl. 96-115.00R.
- Apelt, Heinz: *See—*
  - Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, 4,106,709, Cl. 242-7.030.
- Arai, Atsuaki: *See—*
  - Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, 4,106,942, Cl. 96-100.00N.
- Arai, Hiroshi; and Taniguchi, Koichi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Centralized warning system for vehicle. 4,107,646, Cl. 340-52.00F.
- Arai, Hiroshi: *See—*
  - Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.
- Arai, Toshiaki: *See—*
  - Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.
- Arant, Gene W.: *See—*
  - Weber, Frank K., 4,107,770, Cl. 362-405.000.
- Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, to Societa Farmaceutici Italia S.p.A. Process for preparing daunomycin and analogues thereof. 4,107,423, Cl. 536-4.000.
- Arcella, Frank G., to Westinghouse Electric Corp. Heat pipe heat amplifier. 4,106,554, Cl. 165-32.000.
- Archer Daniels Midland Company: *See—*
  - Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.
- Argus Chemical Corporation: *See—*
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  - Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,107,136, Cl. 260-45.95C.
- Arizona Chemical Company: *See—*
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- Armer Construction Company: *See—*
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  - Dieck, Ronald L.; and Quinn, Edwin J., 4,107,108, Cl. 521-85.000.
  - Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,107,146, Cl. 528-168.000.
- Arnaud, Jacques Alexis, to Bell Telephone Laboratories, Incorporated. Noncircular symmetric optical fiber waveguide having minimum modal dispersion. 4,106,847, Cl. 350-96.310.
- Arndt, Walter, to Friedrich Krollmann, Firma. Wire pointing machine. 4,106,352, Cl. 74-29.000.

- Arnett, Henry D.: *See—*
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- Arnett, Roy L. Boat bracket. 4,106,737, Cl. 248-226.400.
- Arpe, Hans-Jurgen: *See—*
  - Schulz, Lothar; and Arpe, Hans-Jurgen, 4,107,263, Cl. 423-481.000.
- Arthur W. Reed Machine Co.: *See—*
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- Arvin Industries, Inc.: *See—*
  - Maxey, Alexander R., 4,107,744, Cl. 360-73.000.
- Asahi-Dow Limited: *See—*
  - Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, 4,106,887, Cl. 425-549.000.
- Asahi Glass Company, Ltd.: *See—*
  - Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, 4,106,930, Cl. 75-134.00B.
  - Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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  - Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, 4,107,374, Cl. 428-288.000.
  - Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.
- Asai, Kiyokazu; and Takeuchi, Akihiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Ultrasonic wave carburetor. 4,106,459, Cl. 123-141.000.
- Asakawa, Kenichi; and Yoshida, Makoto, to Nippon Steel Corporation. Method for effecting one side molten metal plating. 4,107,357, Cl. 427-300.000.
- Asami, Shunichi: *See—*
  - Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,107,097, Cl. 521-32.000.
- Asano, Chihiro; Hikita, Shigeyuki; and Kato, Kunio, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Current limiting element for preventing electrical overcurrent. 4,107,640, Cl. 338-23.000.
- ASEA Aktiebolag: *See—*
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- Ashford, Bryan. Shampoo and conditioner warmer. 4,107,513, Cl. 219-521.000.
- Ashland Oil, Inc.: *See—*
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- Asick, John Carl; and Huffnagle, Clifton Wesley, to AMP Incorporated. Crimp barrel for thick, flat, flexible cable. 4,106,836, Cl. 339-97.00C.
- Asija, Satya Pal. Electroventriloquist. 4,107,462, Cl. 179-1.0VC.
- Asokan, Sangarappillai: *See—*
  - Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Nagendran, Sangarappillai; Wickramasinghg, Mohanlal Randith; and Weirich, H. Paul, 4,106,433, Cl. 118-212.000.
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- Associates of Cape Cod, Inc.: *See—*
  - Sullivan, James D., Jr.; and Watson, Stanley W., 4,107,077, Cl. 252-408.000.
- Asztalos, Stefan; Stephan, Alfred; and Mayer, Reinhold, to Linde Aktiengesellschaft. Connector for duct systems for low temperature fluids. 4,106,796, Cl. 285-133.00R.
- Atari, Inc.: *See—*
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  - Mayer, Steven T.; and Milner, Ronald E., 4,107,665, Cl. 340-324.0AD.
- Aterianus, John S., to FMC Corporation. Wrapping machine and method with four side rotary tucker. 4,106,262, Cl. 53-28.000.
- Aterianus, John S., to FMC Corporation. Wrapping machine and method with four side rotary tucker. 4,106,265, Cl. 53-180.00R.
- Atlas Copco Aktiebolag: *See—*
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  - Verner, Bo Lennart; and Fors, Lars Borje Staffan, 4,107,240, Cl. 261-77.000.
- Atomic Energy of Canada Limited: *See—*
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- Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, to Mitsubishi Jukogyo Kabushiki Kaisha. Wet-treatment of exhaust gases. 4,107,271, Cl. 423-235.000.
- Auburn University Research Foundation: *See—*
  - Perkins, Warren S., 4,106,900, Cl. 8-115.600.
- Auclair, Michel; and Le Parmentier, Louis, to Exxon Research & Engineering Co. Reducing pollution from internal combustion engines. 4,106,287, Cl. 60-274.000.
- Audi Nsu Auto Union Aktiengesellschaft: *See—*
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- August Bilstein, Firma: *See—*
  - Hausmann, Erwin, 4,106,596, Cl. 188-314.000.
- August, William S., to A-T-O Inc. Hub cap for trailer wheels and the like. 4,106,816, Cl. 301-108.00R.
- Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., to United States Steel Corporation. Coated pitch prill. 4,107,382, Cl. 428-368.000.
- Aultz, Daniel Eugene: *See—*
  - McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,177, Cl. 260-332.20C.
  - McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,107,321, Cl. 424-274.000.
- Auphan, Michel Joseph, to U.S. Philips Corporation. Device for examination by means of ultrasonic vibrations. 4,106,348, Cl. 73-624.000.
- Austin, Harry W.: *See—*
  - Marangoni, Roy D.; and Austin, Harry W., 4,106,127, Cl. 2-416.000.
- Autoclave Engineers, Inc.: *See—*
  - Ruyak, Robert F., 4,106,825, Cl. 308-139.000.
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  - Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,106,968, Cl. 156-189.000.
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- Awao, Takeyoshi: *See—*
  - Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, 4,106,989, Cl. 195-62.000.
- Axelrod, Herbert R. Method of binding papers. 4,106,148, Cl. 11-1.0AD.
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- B. F. Goodrich Company, The: *See—*
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- B.S.G. Designs, Inc.: *See—*
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- Baba, Masanao, to Nippon Cable System Inc. Control unit for throttle and clutches. 4,106,604, Cl. 192-0.098.
- Babcock & Wilcox Company, The: *See—*
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- Babiol, Pierre, to Societe Nouvelle de Bouchons Plastiques, S.N.B.P. Composite stopper. 4,106,656, Cl. 215-364.000.
- Babish, Richard Constantine, to Perkin-Elmer Corporation, The. Stray light control in an optical system. 4,106,856, Cl. 350-199.000.
- Bache, William Harry, to Steel Stampings Limited. Vehicle wheels. 4,106,172, Cl. 29-159.010.
- Backus, James H.: *See—*
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- Bacskai, Robert, to Chevron Research Company. Anionic copolymerization of 2-pyrrolidone with C_7-C_{12} lactam. 4,107,154, Cl. 528-312.000.
- Baculo, Umberto A. Adjustable form clamp. 4,106,746, Cl. 249-216.000.
- Badavas, Charles Arthur, to American Can Company. Pneumatic safety system for machine enclosures. 4,106,607, Cl. 192-129.00B.
- Baer, John Stephen. Wind chill meter and method of measuring wind chill effect. 4,106,339, Cl. 73-339.00C.
- Baier, John F. Heating system with reserve thermal storage capacity. 4,106,692, Cl. 237-8.00R.
- Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. New antimicrobial esters of aliphatic diols. 4,107,192, Cl. 260-410.500.
- Bailey, Denis M., to Sterling Drug Inc. α,α-Bis-[4-(R-amino)-1-pyridinium]xylenes and antibacterial and antifungal uses. 4,107,313, Cl. 424-263.000.
- Bailey, Edward A., to Joy Manufacturing Company. Drill. 4,106,573, Cl. 173-106.000.
- Bainard, Dean R.: *See—*
  - Benjamin, Martin E.; and Bainard, Dean R., 4,106,781, Cl. 277-82.000.
- Baker, Fred E., to General Electric Company. Emergency power failure light. 4,107,766, Cl. 362-226.000.
- Baker, Thomas E. Swimming pool skimmer and the like. 4,106,157, Cl. 16-112.000.
- Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, to ICI Australia Limited. Pesticidal compositions. 4,106,924, Cl. 71-106.000.
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- Baltz, John; and Coltrinari, Enzo, to PGP Industries Inc. Process for the separation of platinum group metals. 4,107,261, Cl. 423-22.000.
- Ban, Itsuki; and Shiraki, Manabu. Three-phase DC motor having non-superimposed armature coils. 4,107,587, Cl. 318-439.000.
- Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji. Track change-over mechanism for a multi-channel tape recorder. 4,107,750, Cl. 360-106.000.
- Bancroft, Joseph C.; and Hallin, Peter R., to Croft Metals, Inc. Lockable window construction. 4,106,239, Cl. 49-449.000.
- Bannon, Harry B.: *See—*
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- Bansemir, Klaus: *See—*
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- Barber-Colman Company: *See—*
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- Barber, Everett M., Jr., to Sunworks, Inc. Solar energy collector. 4,106,483, Cl. 126-271.000.

- Barden, Walter M., Jr.: *See—*
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- Barigot, Jean-Claude: *See—*
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- Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
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- Barmeier, Harold J., Jr.; and Wright, David A., to National Marine Service, Inc. Self-adjusting exciter band for shaft speed magnetic pickup. 4,107,601, Cl. 324-173.000.
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- Barnes, Michael L.; and Whitescarver, Olin D., to Union Oil Company of California. Wellhead apparatus. 4,106,562, Cl. 166-97.000.
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- Barrett, Johnny M.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Electronic calculator or microprocessor with indirect addressing. 4,107,781, Cl. 364-700.000.
- Bartlett, Lawrence C., to Eastman Kodak Company. Apparatus for multiple stripe coating. 4,106,437, Cl. 118-412.000.
- Barton, Paul, to International Standard Electric Corporation. Scanning beam receiver system with coherent post-detection signal processing. 4,107,686, Cl. 343-106.00R.
- Bartsch, Ulrich: *See—*
  - Salje, Ernst; and Bartsch, Ulrich, 4,106,382, Cl. 83-835.000.
- BASF Aktiengesellschaft: *See—*
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- Basiulis, Algerd, to Hughes Aircraft Company. Method for closure of heat pipes and device fabricated thereby. 4,106,171, Cl. 29-157.30R.
- Bassinger, Grey. Borehole contacting apparatus for bottom hole assembly. 4,106,823, Cl. 308-4.00A.
- Batova, Galina Alexandrovna: *See—*
  - Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.
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- Batterton, Elmo L.; and Lonsdale, Melvin J., to Meyer Morton Co. Grain dryer sidewall construction and method of drying grain. 4,106,212, Cl. 34-65.000.
- Bauer, Donald J.; and Eisele, Judith A., to United States of America, Interior. Production of pure alumina from iron contaminated sulfate liquors. 4,107,266, Cl. 423-112.000.
- Baum, Art: *See—*
  - Jerome, Robert J.; and Baum, Art, 4,106,561, Cl. 166-55.200.
- Baumann, Helmut; and Petzi, Fritz, to Ludwig Riedhammer GmbH & Co. K.G. Sintering furnace. 4,106,893, Cl. 432-77.000.
- Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, to Ciba-Geigy Corporation. Imidyl compounds. 4,107,174, Cl. 260-326.0NS.
- Bayard, Michel Lucien, to Texas Instruments Incorporated. Electrochromic display cell. 4,106,862, Cl. 350-357.000.
- Bayer Aktiengesellschaft: *See—*
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  - Dahm, Manfred; and Jautelat, Manfred, 4,107,102, Cl. 521-163.000.
  - Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
  - Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.
  - Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
  - Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,103, Cl. 528-72.000.
  - Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,152, Cl. 528-68.000.
  - Konig, Eberhard; and Pedain, Josef, 4,107,199, Cl. 260-465.00D.
  - Konig, Eberhard; and Pedain, Josef, 4,107,200, Cl. 260-465.00E.
  - Kubens, Rolf, 4,107,101, Cl. 521-137.000.
  - Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, 4,106,903, Cl. 8-196.000.
  - Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, 4,107,186, Cl. 260-351.000.
  - Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.
  - Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,897, Cl. 8-94.330.
  - Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,898, Cl. 8-94.330.
- Bayer, Friedrich, to Quick-Rotan Becker & Notz KG. Automatically operating speed-regulated positioning arrangement. 4,107,592, Cl. 318-568.000.
- Bayles, Francis Derrick; and Dudley, Michael Alan, to Canada Wire and Cable Limited. Method for producing a mica based insulation. 4,107,358, Cl. 427-379.000.
- Bayless, Robert G., to Capsulated Systems, Inc. Method of producing microcapsules and resulting product. 4,107,071, Cl. 252-316.000.
- Bazhakov, Daniel Kalimullovich: *See—*
  - Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.
- BBC Brown Boveri & Company Limited: *See—*
  - Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.
  - Kaufmann, Meinolph, 4,106,860, Cl. 350-343.000.
- Beale, Julian R. A., to U.S. Philips Corporation. Vehicle power transmission arrangements and electronic power controls. 4,107,776, Cl. 364-431.000.
- Beard, James Henry; Lea, Cyril; and Ludwig, Bernard William. Method of withdrawing elongate tubular members. 4,106,177, Cl. 29-427.000.
- Becker, Clifford E. Crawler-type self-propelled hoist. 4,106,634, Cl. 214-1.00D.
- Becker, Frederick R., III; and Nicely, Charles W., to Metropolitan Wire Corporation. Article supporting apparatus. 4,106,736, Cl. 248-222.200.
- Beckerle, Wilhelm Friedrich: *See—*
  - Peterhans, Josef; Volkert, Otto; and Beckerle, Wilhelm Friedrich, 4,107,100, Cl. 521-137.000.
- Beckman Instruments, Inc.: *See—*
  - Sharples, Thomas Davy, 4,106,671, Cl. 222-61.000.
- Becraft, William A.: *See—*
  - Luke, Perry J.; Machamer, James L.; and Becraft, William A., 4,107,650, Cl. 340-146.1AL.
- Becton, Dickinson and Company: *See—*
  - Percarpio, Edward P., 4,106,497, Cl. 128-2.00F.
- Beebe, William F.: *See—*
  - Neff, Charles G., 4,106,793, Cl. 280-435.000.
- Beecham Group Limited: *See—*
  - Bentley, Peter Hubert; and Clayton, John Peter, 4,107,433, Cl. 544-30.000.
  - Watts, Eric Alfred, 4,107,317, Cl. 424-267.000.
- Beeston Company Limited: *See—*
  - Horvath, Stephen, 4,107,008, Cl. 204-129.000.
- Behle, Gunter R., to ACF Industries, Incorporated. Bottom operable air inlet and outlet valve assembly. 4,106,749, Cl. 251-144.000.
- Behrenz, Wolfgang: *See—*
  - Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.
  - Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
- Behringwerke Aktiengesellschaft: *See—*
  - Karges, Hermann Erich; and Heimburger, Norbert, 4,106,990, Cl. 195-63.000.
- Bell & Howell Company: *See—*
  - Stefansson, Rafn, 4,106,766, Cl. 271-181.000.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Arnaud, Jacques Alexis, 4,106,847, Cl. 350-96.310.
  - DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 4,106,959, Cl. 148-175.000.
  - Frank, Amalie Julianna, 4,107,648, Cl. 340-146.30H.
  - Hawley, George Thomas; and Young, Lawrence Henry, 4,107,495, Cl. 179-84.00T.
  - Henry, Paul Shala, 4,107,668, Cl. 340-347.0AD.
  - Marcatili, Enrique Alfredo Jose, 4,106,850, Cl. 350-96.310.
  - Miller, Gabriel Lorimer, 4,107,721, Cl. 357-30.000.
  - Runge, Peter Klaus, 4,107,242, Cl. 264-1.000.
  - Schneider, Herbert Anton, 4,107,474, Cl. 179-18.0GF.
  - Tewksbury, Stuart Keene, 4,107,669, Cl. 340-347.0AD.
- Bellina, Russell Frank; and Fost, Dennis Lynn, to Du Pont de Nemours, E. I., and Company. Miticidal and aphicidal method utilizing 2-higher alkyl-3-hydroxy-1,4-naphthoquinone carboxylic acid esters. 4,107,325, Cl. 424-301.000.
- Beloit Corporation: *See—*
  - Cormack, Alexander D.; and Kool, Boris, 4,106,778, Cl. 277-9.500.
  - Phillips, Irvin J., 4,106,429, Cl. 118-63.000.
  - Sokolow, Nickolas N., 4,106,886, Cl. 425-526.000.
- Belokin, Paul, Jr. Display fixture. 4,106,828, Cl. 312-107.000.
- Belson, Gary W. Tactical load bearing vest. 4,106,121, Cl. 2-102.000.
- Belt, Kenneth W.: *See—*
  - Queen, Daniel L.; and Belt, Kenneth W., 4,107,613, Cl. 325-348.000.
- Bement, Laurence J., to United States of America, National Aeronautics and Space Administration. Totally confined explosive welding. 4,106,687, Cl. 228-2.500.

- Benasutti, John Eugene, to GTE Sylvania Incorporated. Electrical contact and connector. 4,106,842, Cl. 339-221.00R.
- Bendix Autolite Corporation: *See—*
  - Bode, James Daniel; and Rhee, Seong Kwan, 4,107,018, Cl. 204-195.00S.
- Bendix Corporation, The: *See—*
  - Euler, Richard W., 4,106,311, Cl. 64-23.000.
- Benjamin, James A.: *See—*
  - Pucel, Robert A.; and Benjamin, James A., 4,107,720, Cl. 357-22.000.
- Benjamin, Martin E.; and Bainard, Dean R., to Garlock Inc. Unitized, grease-purgeable seal. 4,106,781, Cl. 277-82.000.
- Bennett, Cleatus W., to Raymond Lee Organization, Inc., The, a part interest. Antenna mounting device. 4,107,693, Cl. 343-715.000.
- Benseler, Hans, to PUMA-Sportschunfabriken Rudolf Dassler KG. Ski boot. 4,106,223, Cl. 36-117.000.
- Bentley, Peter Hubert; and Clayton, John Peter, to Beecham Group Limited. Phthalidyl ester of 3-carbomoyloxy cephalosporin derivatives. 4,107,433, Cl. 544-30.000.
- Bercovici, Serge, to Societe de vente de l'Aluminium Pechiney. Method of treating metal alloys to work them in the state of a liquid phase-solid phase mixture which retains its solid form. 4,106,956, Cl. 148-11.50A.
- Berenstecher, Otto: *See—*
  - Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, 4,106,903, Cl. 8-196.000.
- Berezin, Gilbert Harvey: *See—*
  - Aldrich, Paul Edward; and Berezin, Gilbert Harvey, 4,107,303, Cl. 424-244.000.
- Berg, Jack V., to Minnesota Mining and Manufacturing Company. Hand tool for cutting and forming aesthetic ends on decorative molding. 4,106,195, Cl. 30-293.000.
- Berg, Joseph E.; and Brown, Randolph E., Jr. Method for depositing film on a substrate. 4,107,350, Cl. 427-38.000.
- Berger, Karl Gustav: *See—*
  - Karden, Karl Gosta; and Berger, Karl Gustav, 4,106,750, Cl. 251-282.000.
- Berger, Sidney Ethan: *See—*
  - Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, 4,107,258, Cl. 264-328.000.
- Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgren, Darwin Lester; and Burd & Fletcher Company. Mating blanks. 4,106,688, Cl. 229-39.00R.
- Berges, David A., to SmithKline Corporation. 3-Sulfomethyl-1,2,4-triazole-5-thiol and its alkali metal salts. 4,107,173, Cl. 260-308.00R.
- Bergman, Burton; and Herman, Stewart M., to Boeing Company, The; and Aeritalia S.p.A. Escape slide deploying apparatus for use in an airplane. 4,106,729, Cl. 244-137.00P.
- Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, to International Business Machines Corporation. Process for etching holes. 4,106,975, Cl. 156-628.000.
- Berlin, Richard Barnard. Clamp device. 4,106,508, Cl. 128-346.000.
- Bernardi, Herbert: *See—*
  - Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, 4,106,767, Cl. 271-188.000.
- Bernardi, Luigi: *See—*
  - Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.
- Bernhardt, Walter; and Ziegler, Bodo, to Robert Bosch GmbH. OFF-ON-START switching system for diesel engines, and particularly automotive-type diesel engines. 4,106,465, Cl. 123-179.00H.
- Bernier, Donald R., to Compunetics, Incorporated. Hall effect displacement transducer using a bar magnet parallel to the plane of the Hall device. 4,107,604, Cl. 324-208.000.
- Bernstein, Seymour: *See—*
  - Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,201, Cl. 260-506.000.
  - Conrow, Ransom Brown; and Bernstein, Seymour, 4,107,202, Cl. 260-506.000.
- Bernt, Joachim: *See—*
  - Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, 4,106,996, Cl. 201-6.000.
- Berryhill, Richard J.: *See—*
  - Wolfe, Denis G.; and Berryhill, Richard J., 4,106,359, Cl. 74-424.80R.
- Berthoux, Jean: *See—*
  - Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
- Bertin & Cie: *See—*
  - Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, 4,106,894, Cl. 432-122.000.
- Best, Robert H.; and Harris, William D., to Burlington Industries, Inc. Method and system for maintaining an electrically neutral atmosphere. 4,107,756, Cl. 361-231.000.
- Beston, George H.; and Kirk, Donald W., to General Foods Limited. Method of producing dehydrated rice flakes. 4,107,344, Cl. 426-625.000.
- Bethe, Elmar: *See—*
  - Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.
- Bethlehem Steel Corporation: *See—*
  - Kostecky, James F., 4,106,738, Cl. 248-235.000.
- Better Environmental Development Corporation: *See—*
  - Snitzer, Elias, 4,106,857, Cl. 350-311.000.
- Beveridge, John H. Reciprocating piston machine with complete combustion system. 4,106,445, Cl. 123-53.00A.
- Beyer, Leaman Rex. Percussion drill bit. 4,106,578, Cl. 175-407.000.
- Bicek, John J., to United States of America, Energy. Optical control system for high-voltage terminals. 4,107,519, Cl. 250-199.000.
- Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., to Abbott Laboratories. Uricosuric diuretic composition. 4,107,172, Cl. 260-308.00D.
- Bier, Peter; Binsack, Rudolph; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Poly(ethylene/alkylene) terephthalates which crystallize rapidly. 4,107,149, Cl. 528-309.000.
- Bierlich, Johannes Harald. Window assemblies. 4,106,237, Cl. 49-249.000.
- Binsack, Rudolph: *See—*
  - Bier, Peter; Binsack, Rudolph; and Vernaleken, Hugo, 4,107,149, Cl. 528-309.000.
- Bio Research Center Company, Ltd.: *See—*
  - Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, 4,106,986, Cl. 195-28.00R.
- Biondetti, Mario; and Marchioro, Ignazio, to Escher Wyss Limited. Controlled deflection roll. 4,106,405, Cl. 100-162.00B.
- Birman, Paul; and Nercessian, Sarkis, to Forbro Design Corp. Regulated power supply with auto-transformer output and direct current feedback. 4,107,620, Cl. 330-265.000.
- Biro Fils: *See—*
  - Dion-Biro, Guy, 4,106,566, Cl. 169-44.000.
- Biscosa Societe de Recherche: *See—*
  - Courier de Mere, Henri, 4,107,625, Cl. 331-37.000.
- Bishop, Bruce J.; and Moon, Allen J., to Star Chemical, Inc. Emulsifier-solvent scour composition and method of treating textiles therewith. 4,106,901, Cl. 8-139.000.
- Bisping, Hans Jurgen, to Medtronic, Inc. Transvenously implantable lead. 4,106,512, Cl. 128-418.000.
- Blachford, John, to H. L. Blachford Limited. Lubricants for powdered metals, and powdered metal compositions containing said lubricants. 4,106,932, Cl. 75-252.000.
- Black, Arthur L., to Ingersoll-Rand Company. Seal carrier for rotary piston engine. 4,106,780, Cl. 277-81.00P.
- Black Clawson Company, The: *See—*
  - Seifert, Peter; and Zimmerman, Walter R., 4,106,980, Cl. 162-330.000.
- Blackstone, Christopher Edward James; and Williams, Geoffrey Hugh. Articulated member for handling and controlling loads. 4,106,650, Cl. 214-750.000.
- Blackstone, James Otto, Jr.; and Strother, Fred Pickett, to WestPoint Pepperell, Inc. Control apparatus for textile dyeing and tufting machinery. 4,106,416, Cl. 112-79.00A.
- Blackstone Manufacturing Co., Inc.: *See—*
  - Weiler, Raywood C., 4,106,790, Cl. 280-166.000.
- Blackwell, Henry Wayne, to Dresser Industries, Inc. Method of manufacturing an oilwell swab cup. 4,106,182, Cl. 29-460.000.
- Blahak, Johannes: *See—*
  - Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,103, Cl. 528-72.000.
  - Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,152, Cl. 528-68.000.
- Bleckmann, Richard. Method of cold-joining metal parts. 4,106,179, Cl. 29-432.000.
- Bliss, John H. Method and apparatus to overcome aircraft control problems due to wind shear. 4,106,731, Cl. 244-188.000.
- Bloomfield, Jordan J.: *See—*
  - Owsley, Dennis C.; and Bloomfield, Jordan J., 4,107,220, Cl. 260-646.000.
- Blount, David H. Production of the reaction products of oxidated silicon compounds reacting with organic monohydroxy compounds. 4,107,140, Cl. 521-154.000.
- Bluhm, Marita: *See—*
  - Merchant, Suresh; Winkler, Diethard; and Bluhm, Marita, 4,107,355, Cl. 427-120.000.
- Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, to Bertin & Cie; and Affimet, FRX. Apparatus for heat treating fragmented materials. 4,106,894, Cl. 432-122.000.
- Bode, James Daniel; and Rhee, Seong Kwan, to Bendix Autolite Corporation. Solid electrolyte gas sensor having a protective bonding layer. 4,107,018, Cl. 204-195.00S.
- Bodine Co., Inc.: *See—*
  - Bodine, Richard Hill, Jr.; and Rosiak, Marion, 4,107,579, Cl. 315-205.000.
- Bodine, Richard Hill, Jr.; and Rosiak, Marion, to Litton Systems, Inc.; and Bodine Co., Inc., part interest to each. Starting and operating ballast for high pressure sodium lamp. 4,107,579, Cl. 315-205.000.
- Boe, Norman W., to Monsanto Company. Sheer stretch hose having high compressive force uniformity, and yarn. 4,106,313, Cl. 66-202.000.
- Boehm, Edward A. Positioning system utilizing binary code. 4,106,216, Cl. 35-9.00R.
- Boehringer Mannheim GmbH: *See—*
  - Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.
- Boeing Company, The: *See—*
  - Bergman, Burton; and Herman, Stewart M., 4,106,729, Cl. 244-137.00P.
  - Spitzer, Robert E.; and May, Fred W., III, 4,106,730, Cl. 244-183.000.

- Bohner, Beat: *See—*
    - Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,106,925, Cl. 71-108.000.
- Bohnert, Darrell F. Hoe drill carrier. 4,106,788, Cl. 280-43.230.
- Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. Novel compounds of 9-phenyl-3,7-dimethyl-2,4,6,8-nonatetraenamide. 4,107,190, Cl. 260-404.000.
- Bollen, Philip Stuart; and Amin, Surendra A., to Allied Chemical Corporation. Production of films and sheets of polyester-polycarbonate blends. 4,107,251, Cl. 264-171.000.
- Boller, George Earl: *See—*
    - Renk, Richard John; and Boller, George Earl, 4,106,664, Cl. 220-329.000.
- Bomben, John L.: *See—*
    - Rnbertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.
- Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich. Catalyst for the synthesis of methanol and method for preparing same. 4,107,089, Cl. 252-465.000.
- Bonello, Alfred, to Indal Product Limited. Interchangeable storm doors. 4,106,238, Cl. 49-382.000.
- Bonis, Maurice: *See—*
    - de Brebisson, Michel; and Bonis, Maurice, 4,106,954, Cl. 148-1.500.
- Bonnemay, Maurice: *See—*
    - Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
- Book, David L. High atomic weight isotope separator. 4,107,524, Cl. 250-282.000.
- Booker, Leslie L. Apparatus for dispensing a coating of liquid on an elevated cable or the like. 4,106,436, Cl. 118-307.000.
- Boone, Philip. Device for positioning a container of supplemental material in operational alignment adjacent to a toilet-tissue holder. 4,106,616, Cl. 206-233.000.
- Boone, Philip. Bathroom fixture. 4,106,617, Cl. 206-233.000.
- Boonstra, Alexander Hendrik; and Mutsaers, Cornelis Adrianus H. A., to U.S. Philips Corporation. Resistance material. 4,107,387, Cl. 428-426.000.
- Borcher, Charles A.; and Porter, William R., to Martin Marietta Corporation. Layered fragmentatinn device. 4,106,410, Cl. 102-67.000.
- Borcher, Charles A.; Porter, William R.; and Harris, Martin H., to Martin Marietta Corporation. Incendiary fragmentation warhead. 4,106,411, Cl. 102-67.000.
- Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, to U.S. Philips Corporation. Safety and test device in a railway signalling system. 4,107,253, Cl. 246-182.00B.
- Borg-Warner Corporation: *See—*
    - Ivey, Jnhn Saxon, 4,106,368, Cl. 74-866.000.
    - Studtmann, George Henry, 4,106,334, Cl. 73-136.00A.
- Borg-Warner-Stieber GmbH: *See—*
    - Dieckermann, Friedhelm, 4,106,602, Cl. 192-45.000.
- Borisov, Jury Tikhonovich: *See—*
    - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrnvich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
- Boroshok, Melvin J.: *See—*
    - Morse, Lewis D.; Boroshok, Melvin J.; and Grabner, Roy W., 4,107,072, Cl. 252-316.000.
- Bose, Amar G., to Bose Corporation. Environment for demonstrating a stereo loudspeaker system. 4,107,461, Cl. 179-1.0GA.
- Bose Corporation: *See—*
    - Bose, Amar G., 4,107,461, Cl. 179-1.0GA.
- Bossi, Oscar G., to Societe dite: Stabilimento Industriale Costruzione Macchinario Attrezzature. Device for automatically loading a machine tool, particularly a shaving machine. 4,106,632, Cl. 214-1.0BB.
- Boswell, Donald D., to Hughes Aircraft Company. Method and apparatus for increasing contrast ratio of the stored image in a storage mode light valve. 4,106,853, Cl. 350-333.000.
- Bott, John A. Vehicle article carrier. 4,106,680, Cl. 224-29.00R.
- Bott, John A. Spare tire extraction device. 4,106,681, Cl. 224-42.120.
- Boucher, Robert J.; and Brackney, Robert L., Jr., to Hughes Aircraft Company. System for overcoming the effect of electronic countermeasures. 4,107,682, Cl. 343-16.00M.
- Boudreaux, Gordon J.: *See—*
    - Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.
- Boulter, David Gordon: *See—*
    - Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, 4,106,765, Cl. 271-93.000.
- Bourguignon, Guy Clement; and Maquet, Joseph Andre, to S.A. dite "Manufacture Francaise de Carrelages". Method and apparatus for manufacturing lining plates and products thereof. 4,107,378, Cl. 428-323.000.
- Bousquet, Donald G.; Camp, Jesse G., Jr.; Hopkins, Mortimer Gilbert; and Jagt, Leonard J., to Gaston County Dyeing Machine Company. Textile goods bleaching means and method. 4,106,899, Cl. 8-101.000.
- Boussois Souchon Neuvesel Gervais Danone (Societe Anonyme): *See—*
    - Corman, Guy, 4,107,523, Cl. 250-223.00B.
- Bouvet, Jean-Marie, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Pressure control apparatus for the automatic transmission of automotive vehicles. 4,106,367, Cl. 74-866.000.
- Boyett, Vernon Hugo; and Devine, Robert W. Point to point self-leveling plumbing device. 4,106,207, Cl. 33-286.000.
- Boyle, Patrick T., to Maryland Cup Corporation. Splash proof drink-through beverage container lid. 4,106,660, Cl. 220-90.400.
- Bozisov, Jury Tikhonovich: *See—*
    - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktnr Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Jvanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailnvich; Katsevich, Leonid Savvich; Pizognv, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
- Brachert, Heinrich; and Eich, Johannes, to Dynamit Nobel Aktiengesellschaft. Temperature-compensating propellant charge. 4,106,960, Cl. 149-11.000.
- Brackenridge, David R.: *See—*
    - Dubeck, Michael; and Brackenridge, David R., 4,107,104, Cl. 521-171.000.
- Brackney, Robert L., Jr.: *See—*
    - Boucber, Robert J.; and Brackney, Robert L., Jr., 4,107,682, Cl. 343-16.00M.
- Braddick, Britt O., to Texas Iron Works, Inc. Seal nipple packer. 4,106,565, Cl. 166-118.000.
- Brandenburg, Frank J., Jr. Insulated radiant heater. 4,107,512, Cl. 219-343.000.
- Brandon, Richard N. Platter. 4,106,658, Cl. 220-453.000.
- Bratton, Francis H., deceased: *See—*
    - Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.
- Bratton, Jean C., executrix: *See—*
    - Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.
- Braun, Roland, to Raschig G.m.b.H. Contacting arrangement for mass transfer operations. 4,107,241, Cl. 261-79.00A.
- Brautigam, Rolf: *See—*
    - Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, 4,107,555, Cl. 307-308.000.
- Brearley, Malcolm, to Girling Limited. Failure detection circuit for a vehicle anti-skid braking system. 4,106,821, Cl. 303-92.000.
- Bremer, Hermann: *See—*
    - Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.
- Brendley, William H., Jr.: *See—*
    - Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, 4,106,421, Cl. 113-120.00A.
- Brenno, Lester C.: *See—*
    - Clausen, Victor H.; and Brenno, Lester C., 4,107,372, Cl. 428-256.000.
- Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., to Polaroid Corporation. Reduced haze photochromic systems. 4,106,861, Cl. 350-354.000.
- Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, to Du Pont de Nemours, E. I., and Company. Method of adhesive bonding. 4,106,971, Cl. 156-310.000.
- Briggs, William D.: *See—*
    - Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., 4,106,833, Cl. 339-29.00B.
- Brimmer, Frances M.; Ahrens, Edward W.; and Magney, Herbert C. Surgical blade dispenser. 4,106,620, Cl. 206-363.000.
- British Aircraft Corporation: *See—*
    - Walley, Gerald David, 4,106,389, Cl. 89-1.815.
- British Gas Corporation: *See—*
    - Hudgell, Robert John, 4,107,605, Cl. 324-220.000.
- British Steel Corporation: *See—*
    - Jackson, George, 4,106,757, Cl. 266-103.000.
- Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, to U.S. Philips Corporation. Sheet feeding apparatus. 4,106,765, Cl. 271-93.000.
- Brochier, Michel; and Pichon, Maurice, to Commissariat a l'Energie Atomique. Vertical elecrnlytic cells. 4,107,020, Cl. 204-251.000.
- Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., to W. A. Whitney Corp. Combined punch press and cutting torch with workpiece supporting means. 4,106,183, Cl. 29-564.000.

- Bronoel, Guy: *See—*
    - Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
- Brookline Instrument Company: *See—*
    - DeMasters, James J.; and Musante, Victor J., 4,106,580, Cl. 177-205.000.
- Brooks, Alden W., to Dayco Corporation. Method of making toothed endless power transmission belts. 4,106,966, Cl. 156-138.000.
- Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., to Standard T. Chemical Company, Inc. Method and apparatus for electro-phorectic coating. 4,107,016, Cl. 204-181.00R.
- Brown, Frederick L., to Dow Chemical Company, The. Drying veneer with jets of superheated solvent vapor. 4,106,209, Cl. 34-9.500.
- Brown, Geoffrey Edward, to Spar Aerospace Products Ltd. Linear induction motor assembly. 4,107,558, Cl. 310-13.000.
- Brown, Randolph E., Jr.: *See—*
    - Berg, Joseph E.; and Brown, Randolph E., Jr., 4,107,350, Cl. 427-38.000.
- Bruce, S. Esson: *See—*
    - Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, 4,107,368, Cl. 428-245.000.
- Brueck, Steven R. J.: *See—*
    - Kildal, Helge; and Brueck, Steven R. J., 4,107,544, Cl. 307-88.300.
- Brumfield, Elvin S.; Kutzscber, Edgar W.; and Lovelady, James N., to Lockheed Aircraft Corporation. Infrared acquisition device. 4,107,530, Cl. 250-342.000.
- Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., to Emerson Electric Co. Arc welding machine. 4,107,635, Cl. 336-45.000.
- Brunswick Corporation: *See—*
    - Green, Charles Emmons, 4,106,124, Cl. 2-187.000.
    - Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.
- Brydolf, Robert: *See—*
    - Kellems, Kenneth K.; and Brydolf, Robert, 4,106,158, Cl. 16-129.000.
- Bryngdahl, Olnf; and Lee, Wai-Hon, to Xerox Corporation. Laser scanning system utilizing computer generated holograms. 4,106,844, Cl. 350-6.200.
- BTR Industries Limited: *See—*
    - Szentmihaly, Charles, 4,106,526, Cl. 138-109.000.
- Bucheck, David J.: *See—*
    - Lorentzen, Alan P., 4,107,051, Cl. 210-500.00R.
- Buchel, Wolfgang: *See—*
    - Clas, Willi; and Buchel, Wolfgang, 4,107,123, Cl. 260-31.80G.
- Bucher-Guyer AG Maschinenfabrik: *See—*
    - Schmid, Alfred, 4,106,404, Cl. 100-117.000.
- Bucher, Jakob: *See—*
    - von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, 4,106,289, Cl. 60-314.000.
- Buchheit, Robert F., to Xerox Corporation. Distance compensated electrostatic vnltmeter. 4,106,869, Cl. 355-3.00R.
- Buchwald, Frank S.; and Melocik, Grant C., to Towmotor Corporation. Control system for a compound DC electric motor. 4,107,586, Cl. 318-426.000.
- Buckingham, James Ernest, to Cam Gears Limited. Anti-roll rack bar. 4,106,363, Cl. 74-498.000.
- Budnick, Donald Barry: *See—*
    - Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.
- Buhrke, Fred W., to Buhrke Industries, Inc. Method for manufacture of can end closures. 4,106,422, Cl. 113-121.00C.
- Buhrke Industries, Inc.: *See—*
    - Buhrke, Fred W., 4,106,422, Cl. 113-121.00C.
    - Lang, Richard L.; and Quaas, Dietmar G., 4,106,633, Cl. 214-1.0BB.
- Buildinter AG: *See—*
    - Roqueta, Eduardo Caro, 4,106,752, Cl. 254-29.00A.
- Buisson, Marcel. Method and apparatus for the transverse folding of a continuous tubular sleeve. 4,106,398, Cl. 93-84.0TW.
- Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalytic converter having vibration-resistant catalyst carrier. 4,106,913, Cl. 23-288.0FC.
- Bunker Ramo Corporation: *See—*
    - Vladic, Daniel P., 4,106,841, Cl. 339-176.00M.
- Bunnelle, Philip R., to FMC Corporation. Tool string and means for supporting and rotating the same. 4,106,575, Cl. 175-170.000.
- Bunton, John Darrah; and Marsh, David John, to G.K.N. Group Services Limited. Method and apparatus for detecting contamination of liquids. 4,106,331, Cl. 73-61.10R.
- Buras, Edmund Maurice, Jr.; and Harper, Allan Carl, to Gillette Company, The. Hair clipper. 4,106,190, Cl. 30-43.700.
- Burchart, Samuel C. Massaging apparatus. 4,106,500, Cl. 128-36.000.
- Burd & Fletcher Company: *See—*
    - Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgreo, Darwin Lester; and Burd & Fletcher Company, 4,106,688, Cl. 229-39.00R.
- Burgermann, Norbert, to AGFA-Gevaert, A.G. Motion-picture camera with diaphragm control system having fadeover capability. 4,106,864, Cl. 352-91.00C.
- Burgermann, Norbert, to AGFA-Gevaert, A.G. Motion-picture camera programmed for fadeover effects. 4,106,865, Cl. 352-91.00C.
- Burke, Edward F., Jr., to MFE Corporation. Tape speed control apparatus. 4,107,745, Cl. 360-73.000.
- Burke, Oliver W., Jr., deceased (by Scala, Norma, administratix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y., co-trustees. Vinylic filler pigments and processes for producing same. 4,107,126, Cl. 260-38.000.
- Burke, Oliver W., Jr., deceased (by Scala, Norma, administrstrix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y., Co-Trustees. Vinylic filler products and processes for producing same. 4,107,132, Cl. 260-42.140.
- Burley, Ernest G. Apparatus and process for improving fuel efficiency of an internal combustion engine utilizing a vapor state of fuel. 4,106,453, Cl. 123-120.000.
- Burley, Victor George, to Cadbury Limited. Method of manufacturing a milk chocolate. 4,107,347, Cl. 426-660.000.
- Burlington Industries, Inc.: *See—*
    - Best, Robert H.; and Harris, William D., 4,107,756, Cl. 361-231.000.
- Burmesch, Gerald C.: *See—*
    - Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., 4,106,272, Cl. 56-202.000.
- Burns, John Joseph Vincent. Electrical grounding clamp. 4,106,832, Cl. 339-14.00L.
- Burroughs Corporation: *See—*
    - Anderson, Eric G., 4,107,593, Cl. 318-685.000.
    - Kruklitis, Karlis, 4,107,653, Cl. 340-146.30C.
    - Marino, Francis C., 4,107,664, Cl. 340-324.0AD.
    - Ogle, James A.; and Holz, George E., 4,107,576, Cl. 315-169.0TV.
    - Ouimet, Raymond Joseph; Wojtowicz, Edward Arthur; Lund, George Edward; and Fiorentino, Ermenegildo, 4,106,636, Cl. 214-11.00R.
    - Zimmer, Karl Joseph, 4,107,760, Cl. 361-383.000.
- Burroughs, Mortimer P.: *See—*
    - Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., 4,107,635, Cl. 336-45.000.
- Burroughs Wellcome Co.: *See—*
    - Grivsky, Eugene Michael, 4,107,320, Cl. 424-274.000.
- Burrows, Harvey Paul. Rotary tub grinder. 4,106,706, Cl. 241-186.200.
- Burtis, Wilson A., to Wyle Laboratories. Gear pump, gear and method. 4,106,361, Cl. 74-462.000.
- Burwell, Clifton J.: *See—*
    - Sturman, Oded E.; and Grill, Benjamin, 4,107,546, Cl. 307-141.000.
- Buscb, Hans-Jocben: *See—*
    - Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.
- Busse, Wolfgang: *See—*
    - Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
- Butler, Joseph H., Jr.: *See—*
    - Dolle, Alvin J.; and Butler, Joseph H., Jr., 4,106,829, Cl. 312-235.00A.
- Butler, William S.: *See—*
    - Farris, Richard C.; and Butler, William S., 4,106,412, Cl. 105-197.0DH.
- Butzow, Neil W.; and Harris, Bernhard, to Rexnord Inc. Composite article providing seamless fabric-lined bearings in multiple. 4,107,381, Cl. 428-365.000.
- Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, to Maschinenfabrik Buckau Aktiengesellschaft. Apparatus for washing grossly soiled products of plastic material for subsequent re-use. 4,106,518, Cl. 134-104.000.
- Byrnes, Raymond G.: *See—*
    - Proctor, Leonard R.; and Byrnes, Raymond G., 4,106,493, Cl. 128-2.00R.
- C.A. Pemberton & Co. Limited: *See—*
    - Ilines, Laurence James, 4,106,174, Cl. 29-239.000.
- C.A.V. Limited: *See—*
    - Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, 4,107,510, Cl. 219-270.000.
- C. Desaga GmbH, Nachf. Erich Fecht: *See—*
    - Muckenmuller, Helmut; and Muth, Hubert, 4,107,027, Cl. 204-301.000.
- C. Ellson & Co. Ltd.: *See—*
    - Ellson, Walter Gill, 4,107,514, Cl. 219-523.000.
- C I. Industries Inc.: *See—*
    - Kloster, William R.; and Stewart, Patrick H., 4,106,545, Cl. 164-18.000.
- Cadbury Limited: *See—*
    - Burley, Victor George, 4,107,347, Cl. 426-660.000.
- Cahen, Raymond N. M.: *See—*
    - Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,107,225, Cl. 260-683.900.
- Calamani, Sergio: *See—*
    - Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,106,712, Cl. 242-47.010.
- Calori, Giovanni, to Industrie Pirelli S.p.A. Tire molding apparatus. 4,106,888, Cl. 425-577.000.
- Cam Gears Limited: *See—*
    - Buckingham, James Ernest, 4,106,363, Cl. 74-498.000.
- Cama, Lovji D.: *See—*
    - Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.
- Cambourelis, Peter J.: *See—*
    - Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.

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Tausch, Gilbert H., 4,106,564, Cl. 166-117.500.
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Campbell, Donn V.; and Paragi, Edward J., to United States of America, Army. Antenna for phase front homing. 4,107,691, Cl. 343-120.000.
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, to Algoship International Limited. Universal gantry crane. 4,106,641, Cl. 214-15.00R.
Campbell, Robert W.; and Cleary, James W., to Phillips Petroleum Company. High impact terephthalate copolyesters using 1,4-butanediol and 1,4-cyclohexanedimethanol. 4,107,150, Cl. 528-307,000.
Campe, William T., to Teletype Corporation. Current control system for a stepping motor. 4,107,595, Cl. 318-696.000.
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Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Hamid, Michael A., 4,106,340, Cl. 73-355.00R.
Canada Wire and Cable Limited: *See—*
Bayles, Francis Derrick; and Dudley, Michael Alan, 4,107,358, Cl. 427-379.000.
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Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., 4,107,628, Cl. 331-94.50N.
Russell, Kenneth E.; and Vail, Linda G. M. C., 4,107,144, Cl. 526-212.000.
Swailes, G. Edward; and Struble, Dean L., 4,107,293, Cl. 424-84.000.
Cannon, John Porter, to Plattner Industries, Inc. Container closure. 4,106,665, Cl. 220-329.000.
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Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,106,409, Cl. 101-426.000.
Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.
Masaki, Katsumi; and Isaka, Yukio Inagi,, 4,107,786, Cl. 364-900.000.
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Carey, Thomas A.; and Ridge, George W., to International Harvester Company. Rotary knife stripper. 4,106,271, Cl. 56-119.000.
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Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, to Telefonaktiebolaget L M Ericsson. Receiver apparatus for detection of two voice frequencies in a multifrequency tone signal. 4,107,475, Cl. 179-84.0VF.
Carlson, David H. J., to UOP Inc. Preparation of a supported metal phthalocyanine catalyst. 4,107,078, Cl. 252-428.000.
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., to UOP Inc. Novel compositions of matter. 4,107,092, Cl. 252-511.000.
Carpentier, Alain F.; and Lane, Ernest, to American Hospital Supply Corporation. Supported bioprosthetic heart valve with compliant orifice ring. 4,106,129, Cl. 3-1.500.
Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Three-level stacking container. 4,106,623, Cl. 206-506.000.
Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Molded container. 4,106,625, Cl. 206-507.000.
Carrow, Guy E., to Phillips Petroleum Company. Apparatus for attaching an insert in a mold. 4,106,745, Cl. 249-97.000.
Carter, Robert A., to General Electric Company. Timer control circuit. 4,107,553, Cl. 307-293.000.
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Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,415, Cl. 526-114.000.
Castle, John H., to Control Marketing Associates. Water detector means for tank liquid level measuring system. 4,106,338, Cl. 73-302.000.
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Gardner, John W.; Grgurich, William A.; and Niles, Albert B., 4,106,702, Cl. 239-533.300.
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Goloff, Alexander, 4,106,466, Cl. 123-188.00S.
Habiger, Cyril W., 4,106,292, Cl. 60-447.000.
Hyde, Michael B., 4,106,808, Cl. 296-35.00R.
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Catignani, Robert T., to Garcia Corporation, The. Spinning reel spool and adapter therefor. 4,106,718, Cl. 242-84.20R.
Caudill, Donald L., to Label-Aire Inc. Velocity compensator and apparatus incorporating the same. 4,106,972, Cl. 156-363.000.
Cavalieri, Michel; and Batreau, Francois, to Europe-Levage Manutention (Elma). Automatic anti-fall device for power-driven lifting machinery. 4,106,753, Cl. 254-157.000.
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., to Continental Oil Company. Method and apparatus for automatic control of filtrate quality. 4,107,037, Cl. 210-82.000.
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Chan, David C. K.; and Whipp, Arthur A., to Chevron Research Company. Mite and mite-ovicidal compositions. 4,107,332, Cl. 424-321.000.
Chan, David Cheong King, to Chevron Research Company. Fungicidal 3-(N-acyl-N-arylamino) lactones and lactams. 4,107,323, Cl. 424-279.000.
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Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., to Energy Conversion Devices, Inc. Imaging and recording of information utilizing a tellurium tetrahalide complex of an aromatic amine. 4,106,939, Cl. 96-48.00R.
Charlebois, Jacques; and Lescouflair, Guy, to Centre de Recherche Industrielle du Quebec. Automatic audiometer system. 4,107,465, Cl. 179-1.00N.
Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, to Radiochemical Centre Limited, The. Centrifuge tube and method for performing assay with same. 4,106,907, Cl. 23-230.300.
Chasins, Edward A., to Producers Row Inc. Projection screen support structure. 4,106,852, Cl. 350-117.000.
Chauthani, Abdul Rehman, to Nutrilite Products, Inc. Insecticidal composition of *Bacillus thuringiensis* admixed with 1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl)-urea. 4,107,294, Cl. 424-93.000.

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Cherepin, Valentin Tikhonovich; and Olkhovsky, Valery Leonidovich. Ion-emission microanalyzer microscope. 4,107,527, Cl. 250-309.000.
Chester, Arthur Warren, to Mobil Oil Corporation. Process for cracking hydrocarbons. 4,107,032, Cl. 208-120.000.
Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, to Rhone-Poulenc Industries. Insoluble metallic complexes and catalysts therefrom. 4,107,079, Cl. 252-429.00R.
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Chicklis, Evan P.; Naiman, Charles S.; and Labaugh, Kenneth D., to Sanders Associates, Inc. Dual mode seeker reticle. 4,107,529, Cl. 250-339.000.
Childress, Bobby Belton, to Pelton & Crane Company. Control arrangement for handpiece instrument. 4,106,198, Cl. 32-22.000.
Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., to International Business Machines Corporation. Ink jet nozzle method of manufacture. 4,106,976, Cl. 156-644.000.
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Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Piro-
gov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Ku-
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chanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigo-
riev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevt-
sov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich;
Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mate-
shin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich;
Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich;
Koen, David Matveevich; Seleverstov, Vladimir Vasilievich;
Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich;
Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chis-
tyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich;
Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich;
Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich;
Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zak-
harovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Piro-
gov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Ku-
drin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Mol-
chanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigo-
riev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevt-
sov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich;
Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mate-
shin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich;
Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich;
Koen, David Matveevich; Seleverstov, Vladimir Vasilievich;
Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich;
Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chis-
tyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich;
Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich;
Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich;
Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zak-
harovich, 4,107,449, Cl. 13-35.000.
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, to Allied Chemical Corporation. Method for removal of SO_2 from gases. 4,107,015, Cl. 204-180.00P.
Chleboun, Thomas P., to GTE Sylvania Incorporated. Intrusion detection system. 4,107,660, Cl. 340-566.000.
Choay, Jean: *See—*
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 4,106,992, Cl. 195-66.00B.
Choay S.A.: *See—*
Lefrancier, Pierre, 4,107,158, Cl. 260-112.50R.
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, 4,106,992, Cl. 195-66.00B.
Christ, Alfred: *See—*
Meystre, Noel; Christ, Alfred; and Miller, Helmut, 4,106,824, Cl. 308-9.000.
Christe, Karl O.; Shack, Carl J.; and Wilson, Richard D., to Rockwell International Corporation. Method for producing NF_4BF_4. 4,107,275, Cl. 423-276.000.
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, to Merck & Co., Inc. 7-Diacylimido cephalosporins. 4,107,432, Cl. 544-21.000.
Christenson, James Gordon, to Hoffmann-La Roche Inc. Radioimmunoassay for methaqualone. 4,107,285, Cl. 424-1.000.
Christman, David R.; Finn, Ronald D.; and Wolf, Alfred P., to United States of America, Energy. Production of carrier-free $H^{11}CN$. 4,106,982, Cl. 176-11.000.
Christopher, Van Michaels. Acetylide catalyst and process of producing hydrogen. 4,107,282, Cl. 423-657.000.
Chrysler Corporation: *See—*
Kopera, Joseph J., 4,106,460, Cl. 123-146.50D.
Chubb & Son's Lock and Safe Company Limited: *See—*
Tippin, Arthur D., 4,106,316, Cl. 70-268.000.
Churchill, Steven T., to Letot, Incorporated. Individual room energy control system. 4,107,466, Cl. 179-2.00A.
Ciba-Geigy Corporation: *See—*
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, 4,107,174, Cl. 260-326.0NS.
Petree, Harris E.; Nabors, James B., Jr.; and Grace, Henry C., 4,106,927, Cl. 71-121.000.
Cibie Projecteurs: *See—*
Puyplat, Olivier, 4,106,969, Cl. 156-275.000.
Clark, David L.: *See—*
Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., 4,106,186, Cl. 29-616.000.
Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, to Glaxo Laboratories Limited. Δ^3-3-Vinyl or substituted vinyl-4-carboxy cephalosporins. 4,107,431, Cl. 544-16.000.
Clark, Lee M. Side dumping vehicle. 4,106,812, Cl. 298-1.00B.
Clark, Otho A. Support for sprayer booms. 4,106,700, Cl. 239-168.000.
Clarke, George A.; and Harting, Gary L., to Exxon Research & Engineering Co. Pressure grease composition. 4,107,058, Cl. 252-18.000.
Clarke, William G.: *See—*
Molloy, Joseph; and Clarke, William G., 4,106,985, Cl. 176-68.000.
Clas, Willi; and Buchel, Wolfgang, to Duetsohe Gold- und Silber-Scheideanstalt vormals Roessler. Polyvinyl chloride/silicic acid/hexanetriol mixtures and process for their preparation. 4,107,123, Cl. 260-31.80G.
Clason, Jan C., to Hazemeijer B.V. Vacuum switching apparatus with double interruption and including an interposed barrier. 4,107,496, Cl. 200-144.00B.
Clausen, Victor H.; and Brenno, Lester C., to H. B. Fuller Company. Composite. 4,107,372, Cl. 428-256.000.
Claxton, Joseph Edmund, to Somerville Belkin Industries Limited. Vented cap for storage battery. 4,107,399, Cl. 429-89.000.
Clayton, John Peter: *See—*
Bentley, Peter Hubert; and Clayton, John Peter, 4,107,433, Cl. 544-30.000.
Cleary, James W.: *See—*
Campbell, Robert W.; and Cleary, James W., 4,107,150, Cl. 528-307.000.
Clemence, Francois: *See—*
Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.
Clements, James M. Sampling tube cleaning device. 4,106,576, Cl. 175-313.000.
Cline, Ted L. Chisel plow with adjustable towing tongue and gauge wheels. 4,106,568, Cl. 172-327.000.
Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., to Corning Glass Works. Manufacture of improved fused cast refractory. 4,107,255, Cl. 264-299.000.
Clowers, Earl R.; and Davis, John C., to Singer Company, The. Retractable cord guiding and locking devices. 4,106,165, Cl. 24-134.00R.
Coal Industry (Patents) Limited: *See—*
Hvidsten, Jan Hagbert, 4,107,516, Cl. 235-92.0FP.
Cochran, Michael J., to Texas Instruments Incorporated. Prompting programmable calculator. 4,107,782, Cl. 364-706.000.
Cody, David L., to Symons Corporation. Adjustable shoring apparatus. 4,106,256, Cl. 52-646.000.
Coefield, Nina. Crossword puzzle game. 4,106,773, Cl. 273-240.000.
Coffee, Robert L.: *See—*
Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.
Cohen, Allen; Cohen, Howard; and Cohen, Ronald, to M. Cohen & Sons, Inc. Knock-down open riser stairway. 4,106,591, Cl. 182-93.000.
Cohen, Howard: *See—*
Cohen, Allen; Cohen, Howard; and Cohen, Ronald, 4,106,591, Cl. 182-93.000.
Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of optically active carboxylic acid esters. 4,107,183, Cl. 260-345.80R.
Cohen, Ronald: *See—*
Cohen, Allen; Cohen, Howard; and Cohen, Ronald, 4,106,591, Cl. 182-93.000.
Coin Acceptors, Inc.: *See—*
Dietz, Kristen H., 4,106,608, Cl. 194-1.00R.
Colgate-Palmolive Company: *See—*
Gray, Frederick W., 4,107,065, Cl. 252-99.000.
Klisch, Stephen Cajetan; and Martin, Charles Andrew, 4,107,095, Cl. 252-541.000.
Coltrinari, Enzo: *See—*
Baltz, John; and Coltrinari, Enzo, 4,107,261, Cl. 423-22.000.
Combustion Engineering, Inc.: *See—*
Ferrin, Charles Robert; and Manning, William Patrick, 4,107,270, Cl. 423-226.000.
Nelson, Hugh Wharton, 4,106,978, Cl. 162-1.000.
Comm/Scope Company: *See—*
Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,107,354, Cl. 427-118.000.
Commissariat a l'Energie Atomique: *See—*
Brochier, Michel; and Pichon, Maurice, 4,107,020, Cl. 204-251.000.
Dargent, Bruno; and Robert, Jacques, 4,106,858, Cl. 350-332.000.
Lauro, Fernand, 4,106,560, Cl. 165-159.000.
Communication Satellite Corporation: *See—*
van Ommering, Gerrit; and Dunlop, James D., 4,107,395, Cl. 429-21.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See*—
  Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,107,468, Cl. 179-15.0BY.
Compunetics, Incorporated: *See*—
  Bernier, Donald R., 4,107,604, Cl. 324-208.000.
Concast AG: *See*—
  Fluckiger, Friedrich, 4,106,547, Cl. 164-82.000.
  Inoue, Yuuji, 4,106,551, Cl. 164-448.000.
Conco Inc.: *See*—
  Van Norman, John W., 4,107,738, Cl. 358-100.000.
Conic Corporation: *See*—
  Stamper, Jerry Lee, 4,107,459, Cl. 178-69.100.
Conley, Dell: *See*—
  Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.
Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 1-Nor-2-amino carbamates derived from acid S, an antibiotic produced hy *Polyangium cellulosum* var. *fulvum*. 4,107,429, Cl. 542-447.000.
Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., to Firestone Tire & Rubber Company, The. Suspension polymerization of polyurethanes and spin-molding the powder product thereof. 4,107,256, Cl. 264-310.000.
Conrad, William A., to Rheem Manufacturing Company. Apparatus for pressure testing of containers. 4,106,263, Cl. 53-97.000.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. s-Phenenyltris(thioureylene)trinaphthalenetrisulfonic acid salts. 4,107,201, Cl. 260-506.000.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Substituted 4,4'-hiphenylylene bis(2-thioureylene)dinaphthalenetrisulfonic acids and salts thereof. 4,107,202, Cl. 260-506.000.
Considine, Philip S.; and Whitney, Robert E., to Eikonix Corporation. Film examining with diffuse and specular illumination. 4,106,851, Cl. 350-87.000.
Consorzio Fabocart S.p.A.: *See*—
  Ruffini, Guglielmo; and Pezzotti, Erio, 4,106,979, Cl. 162-73.000.
Constant, James N. Cipher computer and cryptographic system. 4,107,458, Cl. 178-22.000.
Continental Oil Company: *See*—
  Cavanaugh, Robert J.; Coffee, Robert L.; Conley, Dell; and Ferrell, Howard H., 4,107,037, Cl. 210-82.000.
  Scamehorn, John F.; and Porchey, David V., 4,107,421, Cl. 528-483.000.
  Stafford, Jay H., 4,106,586, Cl. 181-121.000.
  Woods, Warren W., 4,107,054, Cl. 252-33.400.
Contraves AG: *See*—
  Schneider, Urs; and Heller, Rudolf, 4,106,219, Cl. 35-17.000.
Control Data Corporation: *See*—
  Conway, David Laurence, 4,107,746, Cl. 360-78.000.
Control Marketing Associates: *See*—
  Castle, John H., 4,106,338, Cl. 73-302.000.
Conway, David Laurence, to Control Data Corporation. Continuous spiral mode tracking in a conventional disk drive using concentric servo tracks. 4,107,746, Cl. 360-78.000.
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., to Xerox Corporation. Elastomer wave guide optical modulators. 4,106,848, Cl. 350-96.140.
Cook, Edward H., Jr.: *See*—
  D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,107,005, Cl. 204-98.000.
Cook, Francis W., Jr.: *See*—
  Gurdak, Felix J.; and Cook, Francis W., Jr., 4,106,375, Cl. 82-21.00B.
Cook, Harry, to United States of America, Army. Solid state barometric altimeter-encoder. 4,106,343, Cl. 73-387.000.
Cook, Ronald Janney, to Syhron Corporation. Latching hinge for kilns. 4,106,159, Cl. 16-146.000.
Cook, William W.: *See*—
  Salter, Peter W.; and Cook, William W., 4,106,505, Cl. 128-206.000.
Cooley, Austin G. Optical scanning system utilizing an oscillating lens and mirror. 4,107,740, Cl. 358-293.000.
Coon, Bryan H., to Martin Marietta Corporation. Lens element incorporating narrow bandpass filter and usahle in dual mode. 4,106,855, Cl. 350-196.000.
Cooper, Bryan Ewart; and Millard, Paul Lance, to Dow Corning Limited. Aqueous compositions. 4,106,948, Cl. 106-197.00R.
Cooper, Earl A., to Automation Industries, Inc. Electrical connector and frequency shielding means therefor and method of making same. 4,106,839, Cl. 339-143.00R.
Cooper, James Everett, Jr.: *See*—
  Huntington, Robert Charles; and Cooper, James Everett, Jr., 4,107,671, Cl. 340-347.0DA.
Cooper, Peter Raymond, to Rank Organisation Limited, The. Optoelectric device. 4,107,517, Cl. 250-199.000.
Coquerel, Michel Jacques Leon, to Equipment Industriel Normand. Self-acting device for stopping filling of tanks with fluid products. 4,106,536, Cl. 141-220.000.
Corbellini, Glauco. Procedure for obtaining elements to support the wire in continuous forming tables of paper-making machines, and the elements derived thereby for supporting the wire. 4,106,981, Cl. 162-352.000.
Corder, Thomas E., to Teledyne Industries, Inc. Water purifier. 4,107,046, Cl. 210-282.000.
Cormack, Alexander D.; and Kool, Boris, to Beloit Corporation. Device for temporarily sealing and supporting shafts. 4,106,778, Cl. 277-9.500.
Corman, Guy, to Boussois Souchon Neuvesel Gervais Danone (Societe Anonyme). Equipment for automatically monitoring the verticality of bottles. 4,107,523, Cl. 250-223.00B.
Cornell, Robert J., to Uniroyal, Inc. ABS Composition having improved impact strength and weather aging resistance and latex suspension process therefor. 4,107,234, Cl. 260-876.00R.
Corning Glass Works: *See*—
  Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., 4,107,255, Cl. 264-299.000.
Corpew, Charles Robert, to Stromberg Datagraphix, Inc. Character selector for a shaped beam cathode ray tube. 4,107,582, Cl. 315-365.000.
Cortex Research Corporation: *See*—
  Fosslien, Egil, 4,106,155, Cl. 15-321.000.
Cory, Halsey W., to Force Control Industries, Inc. Variable speed drive. 4,106,606, Cl. 192-113.00B.
Costin, Darryl J., to Owens-Corning Fiberglas Corporation. Refractories and methods of making same. 4,107,450, Cl. 13-35.000.
Courier de Mere, Henri, to Biscosa Societe de Recherche. Transistor crystal oscillator which may be paired for generating a beat frequency. 4,107,625, Cl. 331-37.000.
Couture, Paul A., to Holland Thread Co. Spool for thread or the like. 4,106,723, Cl. 242-118.300.
Cowdery, Ray; and Larsen, Johan M., to Hukuba Kogyo Kabushiki Kaisha. Carpet sweeper. 4,106,151, Cl. 15-42.000.
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, to Pfeizer Inc. Antifungal thio-alkyl-imidazole derivatives. 4,107,314, Cl. 424-263.000.
Cox, Jerry H.; and Thomas, Robert F. Ramp device to reduce wear on trojan bar dogs and wheel lugs in an irrigation valley center pivot water drive. 4,106,355, Cl. 74-99.00A.
Cox, Percy T.: *See*—
  Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
  Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.
Creative Dispensing Systems, Inc.: *See*—
  McKinney, James C., 4,107,043, Cl. 210-232.000.
Creusot-Loire Enterprises: *See*—
  Leroy, Pierre; Maubon, Andre; and Saleil, Jean, 4,106,758, Cl. 266-158.000.
Croft Metals, Inc.: *See*—
  Bancroft, Joseph C.; and Hallin, Peter R., 4,106,239, Cl. 49-449.000.
Crook, Edward J., Jr., to American Hoist & Derrick Company. Spring-biased split-sleeve coupling pin retainer. 4,106,284, Cl. 59-85.000.
Crosby, Robert J., to Horizons Incorporated a division of Horizons Research Incorporated. Electrooptic meter pointer position detector. 4,107,661, Cl. 340-688.000.
Crouzet: *See*—
  Jouret, Edouard Leon Clement, 4,107,483, Cl. 200-35.00R.
Crown Zellerbach Corporation: *See*—
  Hartbauer, Ellsworth A.; Weis, Rudolf R.; and Kemp, Horace N., 4,106,684, Cl. 226-91.000.
Crummett, James G., to Atari, Inc. Potentiometer joystick. 4,107,642, Cl. 338-128.000.
Cumings, Francis J.: *See*—
  Kevorkian, Victor; and Cumings, Francis J., 4,106,997, Cl. 201-32.000.
Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, to Dean Steel Buildings, Inc. Self-interlocking standing seam for a building panel. 4,106,250, Cl. 52-394.000.
Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, to National Research Development Corporation. Epoxide materials. 4,107,142, Cl. 528-93.000.
Cunningham, Francis V.; and Fanizza, Michael A., to Joslyn Mfg. and Supply Co. Surge protector. 4,107,567, Cl. 313-325.000.
Cuny, Francis: *See*—
  Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.
Currie, John Alexander; McKenna, Maurice; and Upton, John Howard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Fluid pressure control. 4,106,525, Cl. 138-43.000.
Currin, Cedric G., to Dow Corning Corporation. Solar still. 4,107,000, Cl. 202-188.000.
Curt G. Joa, Inc.: *See*—
  Hirsch, John L., 4,106,974, Cl. 156-504.000.
Curtis, John Markley, Jr.; and Shepler, Paul Roberts, to Koppers Company, Inc. Double taper piston. 4,106,463, Cl. 123-193.00P.
Cushenette, Carol A.: *See*—
  Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., 4,107,758, Cl. 361-275.000.
Czaja, Julius. Thermodynamic process and latent heat engine. 4,106,294, Cl. 60-649.000.
Dacom, Inc.: *See*—
  Weber, Donald R., 4,107,610, Cl. 325-38.00R.
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation; and RAI Research Corporation, part interest to each. Process for electrolysing sodium chloride or hydrochloric acid, an and electrolytic cell, employing trifluorostyrene sulfonic acid membrane. 4,107,005, Cl. 204-98.000.
Dahlen, Richard R.: *See*—
  Schmitt, Joseph J.; Dahlen, Richard R.; and Lindhlad, David A., 4,106,905, Cl. 21-60.50R.

Dahm, Manfred; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Highly elastic polyurethane foams and process for making them. 4,107,102, Cl. 521-163.000.
Dainippon Ink & Chemicals, Inc.: *See*—
  Sawai, Hideo; Hirabayashi, Satoshi; and Sato, Shigezi, 4,107,133, Cl. 260-42.150.
Dame, Richard E., to Mega Analytical Research Services, Inc. Adjustable solar concentrator. 4,106,484, Cl. 126-271.000.
Dancilovic-Matulas, Visnja: *See*—
  Gaumann, Andreas F.; and Dancilovic-Matulas, Visnja, 4,107,007, Cl. 204-116.000.
Danfoss A/S: *See*—
  Hansen, Gunnar Lysboj; and Sturlason, Leif Viggo, 4,106,883, Cl. 418-61.00B.
  Nielsen, Leif, 4,106,691, Cl. 236-92.00B.
  Stannow, Jorgen Christian; and Tankred, Hans Jurgen, 4,106,881, Cl. 417-363.000.
Darash, Raymond N., to Weatherhead Company, The. Turbulence amplifier baffle. 4,107,048, Cl. 210-407.000.
Dare Pafco, Inc.: *See*—
  Thurman, Paul G., 4,106,624, Cl. 206-507.000.
Dargan, Evander E.: *See*—
  Jack, Clyde A.; and Dargan, Evander E., 4,106,254, Cl. 52-574.000.
Dargent, Bruno; and Robert, Jacques, to Commissariat a l'Energie Atomique. Liquid crystal display apparatus. 4,106,858, Cl. 350-332.000.
da Rosa, Aldo Vieira. Process for production of ammonia. 4,107,277, Cl. 423-359.000.
Darrah, Marion: *See*—
  Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,126, Cl. 260-38.000.
  Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,132, Cl. 260-42.140.
Data Elecuronics, Inc.: *See*—
  Valliant, William W.; and Michelson, Manfred G., 4,106,686, Cl. 226-188.000.
Daumer, Rolf: *See*—
  Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
Dautov, Tulkibai Galikbarovich: *See*—
  Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.
David, Donald J.; and Willson, Michael C., to Monsanto Research Corporation. Chemical analysis with coated, light waveguide under humidity control. 4,106,909, Cl. 23-232.00R.
Davies, David S.: *See*—
  Lueders, Robert E.; Kust, Roger N.; and Davies, David S., 4,107,262, Cl. 423-32.000.
Davis, Bernard Harpley, to H. H. Robertson Company. Apparatus for filling the cells of an expanded cellular core member with granular insulation. 4,106,535, Cl. 141-88.000.
Davis, Bill G., to Jetco, Inc. Pressure ratio valve. 4,106,468, Cl. 123-196.00S.
Davis, Curry Beach: *See*—
  Schluenz, Robert William; and Davis, Curry Beach, 4,107,420, Cl. 526-237.000.
Davis, John C.: *See*—
  Clowers, Earl R.; and Davis, John C., 4,106,165, Cl. 24-134.00R.
Davis, Larry: *See*—
  Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,074, Cl. 260-326.50B.
  Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,187, Cl. 260-326.290.
Davis, Michael, to Airway Industries, Inc. Compartmental luggage case and method of making. 4,106,598, Cl. 190-52.000.
Davis, Michael W. Finisher's mandrel. 4,106,784, Cl. 279-2.00R.
Davis, Robert H.: *See*—
  Schick, John W.; and Davis, Robert H., 4,107,060, Cl. 252-49.300.
Davison, Sol: *See*—
  Gergen, William P.; and Davison, Sol, 4,107,130, Cl. 260-40.00R.
  Gergen, William P.; and Davison, Sol, 4,107,131, Cl. 260-40.0TN.
Dawans, Francois, to Institut Francais Du Petrole. Polyhutadiene compositions containing reinforcing glass microspheres and carbon fibers. 4,107,134, Cl. 260-42.170.
Dawn, Frederic S.; and Sauers, Dale G., to United States of America, Administrator, National Aeronautics and Space Administration. Lightweight electrically-powered flexible thermal laminate. 4,107,363, Cl. 428-109.000.
Dawson, Daniel Joseph: *See*—
  Otteson, Kenneth Melvin; and Dawson, Daniel Joseph, 4,107,336, Cl. 426-250.000.
Dawson, William P., to Texscan Corporation. Attenuator element. 4,107,632, Cl. 333-81.00A.
Dayco Corporation: *See*—
  Brooks, Alden W., 4,106,966, Cl. 156-138.000.
  Logan, Arthur D.; and Rush, James B., 4,106,967, Cl. 156-184.000.
De La Cruz Cuevas, Francisco, to Caterpillar Tractor Co. Cutting assembly. 4,106,224, Cl. 37-80.00A.
Dean, Charles Wallace: *See*—
  Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, 4,106,250, Cl. 52-394.000.
Dean Steel Buildings, Inc.: *See*—
  Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, 4,106,250, Cl. 52-394.000.
Dean, William Bruce, to Johnson & Johnson. Woven fabric that is relatively stiff in one direction and relatively flexible in the other. 4,107,371, Cl. 428-255.000.
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., to Labofina S.A. Hydrogenation process of olefin polymers for producing white oils. 4,107,225, Cl. 260-683.900.
De Bartolo, Paul I. Apparatus for precisely indexing the orientation of a portion of a device with respect to a support structure of the device. 4,106,240, Cl. 51-125.000.
De Bella, Gasper V. Engine-generator mounting for a vehicle. 4,106,582, Cl. 180-64.00A.
de Brebisson, Michel; and Bonis, Maurice, to U.S. Philips Corporation. Method of manufacturing transistors hy means of ion implantation. 4,106,954, Cl. 148-1.500.
De Bruin, Jan: *See*—
  Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, 4,106,765, Cl. 271-93.000.
Dedinas, Jonas: *See*—
  Fletcher, George Leland, Jr.; and Dedinas, Jonas, 4,106,938, Cl. 96-48.0HD.
DeKerlegand, Deke E., to Lamb, W. C. Ultrasonic inspection apparatus for tuhular members and method. 4,106,347, Cl. 73-622.000.
Del Mar Avionics: *See*—
  Kennedy, Harold L., 4,106,495, Cl. 128-2.06V.
De Lima Castro Neto, Eduardo. One piece security seal and new sealing system. 4,106,801, Cl. 292-307.00R.
Delker, Wilfried, to American Standard Inc. Water distributor for siphon closet. 4,106,131, Cl. 4-1.000.
Dell, William C. Fluidized bed ladle heating method and apparatus. 4,106,755, Cl. 266-44.000.
Dellorfano, Fred M., Jr.: *See*—
  Massa, Donald P., 4,107,659, Cl. 340-552.000.
Delmore, Paul John: *See*—
  Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, 4,107,070, Cl. 252-301.40S.
DeMag Aktiengesellschaft: *See*—
  Ruder, Joachim, 4,107,794, Cl. 366-346.000.
DeMasters, James J.; and Musante, Victor J., to Brookline Instrument Company. Force measuring apparatus. 4,106,580, Cl. 177-205.000.
Deml, Dieter: *See*—
  Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, 4,107,574, Cl. 315-3.500.
Dendinger, Dennis W. Adjustable hulkhead for concrete wall forms. 4,106,743, Cl. 249-34.000.
Dent, Richard G.; and Stack, Gary F., to General Motors Corporation. Pressure vessel. 4,106,659, Cl. 220-67.000.
Dentsply Research & Development Corp.: *See*—
  McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.
Deppner, Frederick W., Jr., to Western Dairy Products Division of Chelsea Industries, Inc. Sausage product simulating bacon and method of making. 4,107,337, Cl. 426-266.000.
Deraedt, Roger: *See*—
  Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.
Desverchere, Jean, to Cefilac. Apparatus for the dry production of non-woven webs. 4,106,163, Cl. 19-296.000.
Deutschmann, Herbert; and Schier, Karl, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Individual cylinder head. 4,106,444, Cl. 123-41.82R.
Devine, Robert W.: *See*—
  Boyett, Vernon Hugo; and Devine, Robert W., 4,106,207, Cl. 33-286.000.
DeVittorio, Joseph M., to Ransburg Corporation. Balance correction method and apparatus. 4,106,964, Cl. 156-75.000.
DeWitt, Walter Groesbeck, III, to Rohm and Haas Company. High impact resistant acrylic coating compositions and coated articles. 4,107,235, Cl. 260-876.00R.
Dextec Metallurgical Proprietary Limited: *See*—
  Everett, Peter Kenneth, 4,107,009, Cl. 204-129.000.
Dexter, Robert A.: *See*—
  Miller, Jerold R., 4,106,372, Cl. 81-143.000.
Dey, James. Automatic motor kill system. 4,106,469, Cl. 123-198.0DB.
Diamanti, Enrico, to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A. Fluorurated amides of nicotinic acid and the process for the preparation thereof. 4,107,316, Cl. 424-266.000.
Diamond Shamrock Corporation: *See*—
  Strempel, Thomas G.; and Hora, Charles J., 4,107,022, Cl. 204-265.000.
Dichter, Michael: *See*—
  Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.
Dickson, Richard E. Barrel cart and stand. 4,106,648, Cl. 214-372.000.
Dicoi, Ovidiu; and Doerr, Erwin, to Zimmer Aktiengesellschaft. Continuous process for the recovery of caprolactam. 4,107,160, Cl. 260-239.30A.
Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene plasticized resins. 4,107,108, Cl. 521-85.000.
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., to Armstrong Cork Company. Curable aryloxyphosphazene polymers. 4,107,146, Cl. 528-168.000.
Dieckermann, Friedhelm, to Borg-Warner-Stieber GmbH. Free-wheel clutch. 4,106,602, Cl. 192-45.000.

- Diedershagen, Bruno; and Gubela, Hans, to Gubela Strassenausrustungs-GmbH. Knockover roadway marker post. 4,106,879, Cl. 404-10.000.
- Diesch, Robert E., to Pako Corporation. Paper drive mechanism for automatic photographic paper cutter. 4,106,716, Cl. 242-75.430.
- Diesel Kiki Co., Ltd.: *See—*
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  - Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,897, Cl. 8-94.330.
  - Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,898, Cl. 8-94.330.
- Dietrich, Ralph N.: *See—*
  - Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., 4,106,384, Cl. 84-1.190.
- Dietz, Kristen H., to Coin Acceptors, Inc. Gate assembly for a coin selecting and separating device. 4,106,608, Cl. 194-1.00R.
- Digilio, Frank A.: *See—*
  - Angelichio, Gerald A.; and Digilio, Frank A., 4,106,406, Cl. 101-93.310.
- DiGirolamo, John, to Jerome Industries Corporation. Plug-in adaptor. 4,107,636, Cl. 336-92.000.
- Dill, Walter R.; and Elphingstone, Eugene A., to Halliburton Company. Method of preparing and using acidizing and fracturing compositions, and fluid loss additives for use therein. 4,107,057, Cl. 252-8.55C.
- DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., to Bell Telephone Laboratories, Incorporated. Producing high efficiency gallium arsenide IMPATT diodes utilizing a gas injection system. 4,106,959, Cl. 148-175.000.
- DiMarco, Bernard: *See—*
  - Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., 4,107,488, Cl. 200-50.00A.
- Dinsdale, Raymond, to Rolls-Royce Limited. Method and apparatus for controlling an electro-discharge machine tool. 4,107,504, Cl. 219-69.00E.
- Dion-Biro, Guy, to Biro Fils. Process for the utilization of low and medium expanded foam for the extinction of fires from liquefied products. 4,106,566, Cl. 169-44.000.
- Distler, Georg; and Guetzl, Horst, to Siemens Aktiengesellschaft. Time switch device for X-ray diagnostic equipment. 4,107,500, Cl. 200-308.000.
- Dittmar, Wilfried, to WERSI-electronic GmbH & Co. Kommanditgesellschaft. Register arrangement for an electronic musical instrument. 4,106,383, Cl. 84-1.010.
- Dix, Rollin C.: *See—*
  - Proctor, Leonard R.; Dix, Rollin C.; and Metz, Werner A., 4,106,496, Cl. 128-2.00R.
- Dixon, Guy E.; and Dixon, Thomas M., to Panelfold, Inc. Electrically operated folding partition. 4,106,544, Cl. 160-199.000.
- Dixon, Thomas M.: *See—*
  - Dixon, Guy E.; and Dixon, Thomas M., 4,106,544, Cl. 160-199.000.
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- Dodd, Laura M. Haltered cover garment for nursing mothers. 4,106,122, Cl. 2-104.000.
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- Dodson, James C.; and Labyer, Harold S., to Halliburton Company. Clamp - self alignment. 4,106,393, Cl. 92-168.000.
- Doerr, Erwin: *See—*
  - Dicoi, Ovidiu; and Doerr, Erwin, 4,107,160, Cl. 260-239.30A.
- Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Container usable as a toy construction element. 4,106,657, Cl. 220-23.400.
- Dohanyos, John A. Shielded lock assembly. 4,106,315, Cl. 70-56.000.
- Doherty, Thomas E.: *See—*
  - Amberg, Stephen W.; and Doherty, Thomas E., 4,106,397, Cl. 93-55.10R.
- Dohmeier, Hans Otto, to Dome Inventions (Proprietary) Limited. Tire protective chains. 4,106,542, Cl. 152-239.000.
- Doi, Yoshikazu: *See—*
  - Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, 4,107,621, Cl. 330-296.000.
- Dolle, Alvin J.; and Butler, Joseph H., Jr. Portable motor vehicle drink cooler, caddy and armrest. 4,106,829, Cl. 312-235.00A.
- Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased (by Ruble, Eulalia Berry, executrix), to Sid Richardson Carbon & Gasoline Co. Carbon black reactor with axial flow burner. 4,106,912, Cl. 23-259.500.
- Dome Inventions (Proprietary) Limited: *See—*
  - Dohmeier, Hans Otto, 4,106,542, Cl. 152-239.000.
- Dominion Textile Limited: *See—*
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- Donahue, Paul E.: *See—*
  - Williams, Frank J., III; and Donahue, Paul E., 4,107,147, Cl. 528-172.000.
- Donoghue, Robert J. Apparatus for measuring and dispensing liquid. 4,106,673, Cl. 222-207.000.
- Donohue, James M.: *See—*
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- Donohue, Paul Christopher, to Du Pont de Nemours, E. I., and Company. Perovskite-type compositions containing pentavalent Ru. 4,107,163, Cl. 423-263.000.
- Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., to BBC Brown Boveri & Company Limited. Reflector with light-scattering surface for liquid-crystal displays and method for their manufacture. 4,106,859, Cl. 350-338.000.
- Dorr-Oliver Incorporated: *See—*
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  - Jukkola, Walfred Wilhelm, 4,106,210, Cl. 34-10.000.
- Dosco Overseas Engineering Limited: *See—*
  - Dunn, Eric James, 4,106,815, Cl. 299-59.000.
- Dougherty, Thomas John; Hennen, Roy Erving; and Pierson, John Ronald, to Globe-Union Inc. Battery and battery container having air-flow passages therethrough. 4,107,402, Cl. 429-120.000.
- Dougherty, Timothy Stephen, to Western Electric Company, Inc. Methods of working expandable thermoplastic materials in an extruder. 4,107,260, Cl. 264-349.000.
- Dow Chemical Company, The: *See—*
  - Brown, Frederick L., 4,106,209, Cl. 34-9.500.
  - Freiter, Edward R., 4,107,210, Cl. 260-590.00E.
  - Greenawalt, Eddie Lee, 4,106,261, Cl. 53-27.000.
  - Southard, Robert W., 4,106,139, Cl. 5-186.00R.
  - Sunder, Shyam; and Peet, Norton P., 4,107,436, Cl. 544-169.000.
  - Tasto, William D.; and Morris, Thomas E., 4,107,221, Cl. 260-652.00P.
- Dow Corning Corporation: *See—*
  - Currin, Cedric G., 4,107,000, Cl. 202-188.000.
  - Frye, Cecil L.; and Lane, Thomas H., 4,107,196, Cl. 260-448.20N.
  - Gordon, David J.; and Ziemelis, Maris J., 4,107,390, Cl. 428-447.000.
  - Saam, John C.; and Ward, Andrew H., 4,107,227, Cl. 260-827.000.
- Dow Corning Limited: *See—*
  - Cooper, Bryan Ewart; and Millard, Paul Lance, 4,106,948, Cl. 106-197.00R.
- Dow, Jerome P., to United States of America, Energy. Method for establishing high permeability flow path between boreholes. 4,106,574, Cl. 175-4.570.
- Doyle, Michael A.; and Ekey, Paul E. Can display holder. 4,106,629, Cl. 211-71.000.
- Dracon Industries: *See—*
  - Pierce, Ben Arthur, 4,107,473, Cl. 179-18.0BF.
- Dragan, William B. Orthodontic O-ring dispenser and ligator therefor. 4,106,374, Cl. 81-302.000.
- Draiswerke GmbH: *See—*
  - Durr, Herbert, 4,107,792, Cl. 366-302.000.
- Drejza, John Edward; and Riley, Joseph Vincent, to International Business Machines Corporation. Disk printer inking mechanism. 4,106,873, Cl. 400-470.000.
- Dresser Industries, Inc.: *See—*
  - Blackwell, Henry Wayne, 4,106,182, Cl. 29-460.000.
- Dubeck, Michael; and Brackenridge, David R., to Ethyl Corporation. Halogenated xylenes. 4,107,104, Cl. 521-171.000.
- Ducret, Alain; and Chalesle, Andre Maurice, to Regie Nationale des Usines Renault. Bearing with two rows of rolling elements including method of mounting bearing. 4,106,827, Cl. 308-187.100.
- Dudley, Michael Alan: *See—*
  - Bayles, Francis Derrick; and Dudley, Michael Alan, 4,107,358, Cl. 427-379.000.
- Duetsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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- Duetsobe Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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- Dufaure, Pierre: *See—*
  - Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,107,290, Cl. 424-47.000.
- Duggins, Ray B.; and Westerman, Richard V., to Du Pont de Nemours, E. I., and Company. Decorative polymeric article containing flock fibers. 4,107,135, Cl. 260-42.370.
- Dukess, Joseph. Method of co-extrusion with foam core. 4,107,247, Cl. 264-45.900.
- Dulux Australia Ltd.: *See—*
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- du Mont, Hans-Christoph: *See—*
  - Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
- Dunleavy, Raymond Augustine; and Papa, Anthony Joseph, to Union Carbide Corporation. Phenol-aldehyde-amine resin/glycol curatives for energy absorbing polyurethanes. 4,107,106, Cl. 521-164.000.
- Dunlop, James D.: *See—*
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- Dunn, Eric James, to Dosco Overseas Engineering Limited. Mining machines. 4,106,815, Cl. 299-59.000.
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- Du Pont de Nemours, E. I., and Company: *See—*
  - Aldrich, Paul Edward; and Berezin, Gilbert Harvey, 4,107,303, Cl. 424-244.000.
  - Bellina, Russell Frank; and Fost, Dennis Lynn, 4,107,325, Cl. 424-301.000.
  - Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, 4,106,971, Cl. 156-310.000.

  - Donohue, Paul Christopher, 4,107,163, Cl. 423-263.000.
  - Duggins, Ray B.; and Westerman, Richard V., 4,107,135, Cl. 260-42.370.
  - Fremont, Joseph Melvin, 4,107,082, Cl. 252-431.00R.
  - Kassal, Robert James, 4,107,109, Cl. 260-4.00R.
  - Lovejoy, Elwyn Raymond, 4,107,125, Cl. 260-37.00N.
  - Malhotra, Satish Chandra, 4,107,194, Cl. 260-42.180.
  - Martin, Elmore Louis, 4,107,444, Cl. 568-807.000.
  - Wang, Victor Kai-Kuo, 4,107,278, Cl. 423-376.000.
- Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,107,319, Cl. 424-273.00R.
- Durr, Herbert, to Draiswerke GmbH. Apparatus for discontinuous mixing of at least two materials. 4,107,792, Cl. 366-302.000.
- Duryodhan, Mangara J.: *See—*
  - Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.
- Dwyer, Francis G., to Mobil Oil Corporation. Manufacture of ethyl benzene. 4,107,224, Cl. 260-671.00R.
- Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, to United States of America, Energy. Salts of alkali metal anions and process of preparing same. 4,107,180, Cl. 260-338.000.
- Dynamit Nobel Aktiengesellschaft: *See—*
  - Brachert, Heinrich; and Eich, Johannes, 4,106,960, Cl. 149-11.000.
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- Dynapol: *See—*
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- E. R. Squibb & Sons, Inc.: *See—*
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- E-Systems, Inc.: *See—*
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- E. T. Marler Limited: *See—*
  - Reed, Kenneth James; and Pointon, David Wellings, 4,107,365, Cl. 428-202.000.
- Eastman Kodak Company: *See—*
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  - Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, 4,107,070, Cl. 252-301.40S.
  - Fletcher, George Leland; and Merrill, Stewart H., 4,107,155, Cl. 528-373.000.
  - Fletcher, George Leland, Jr.; and Dedinas, Jonas, 4,106,938, Cl. 96-48.0HD.
  - Harvey, Donald M., 4,107,710, Cl. 354-86.000.
  - Scullard, Peter W.; Figueras, John; and Holtz, Carl F., 4,106,941, Cl. 96-82.000.
  - Turnblom, Ernest W., 4,106,934, Cl. 96-1.50R.
- Eaton, Sargent Sheffield, Jr.: *See—*
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- Eaves, Ronald Spencer, to Ernest Scragg & Sons Limited. Yarn texturing machine. 4,106,274, Cl. 57-34.0HS.
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  - Horning, Robert J.; and Ebner, Walter B., 4,107,404, Cl. 429-194.000.
- Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, to Wacker-Chemie GmbH. Process for the purification of crude acetic anhydride. 4,107,002, Cl. 203-75.000.
- Eckel, Alan, to Eckel Industries, Inc. Wall panel assemblies. 4,106,255, Cl. 52-582.000.
- Eckel Industries, Inc.: *See—*
  - Eckel, Alan, 4,106,255, Cl. 52-582.000.
- Ecodyne Corporation: *See—*
  - Weis, Frank George, 4,107,038, Cl. 210-84.000.
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- Eda, Masato: *See—*
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- Edgworth, Frederick: *See—*
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- Edgworth, Harry; and Edgworth, Frederick, to Edgworth, Harry. Apparatus for applying an impact force. 4,106,569, Cl. 173-1.000.
- Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, to American Hoechst Corporation. Process for preparing aminoalkylpyrrolobenzoxazalkanes. 4,107,074, Cl. 260-326.50B.
- Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, to American Hoechst Corporation. Aminoalkylpyrrolobenzoxazalkanes. 4,107,187, Cl. 260-326.290.
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- Egger, Helmut; and Reinshagen, Hellmuth, to Sandoz Ltd. Certain pleuromulilin ester derivatives. 4,107,164, Cl. 544-380.000.
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- Eibl, Johannes: *See—*
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- Eich, Johannes: *See—*
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- Eikonix Corporation: *See—*
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- Eisai Co., Ltd.: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Eisele, Judith A.: *See—*
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- Eisenberg, Richard; and Cheng, Chien-Hong, to University of Rochester. Catalyst system for catalyzing the water gas shift reaction. 4,107,076, Cl. 252-373.000.
- Eitzen, Vincent Elliott: *See—*
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- Ekey, Paul E.: *See—*
  - Doyle, Michael A.; and Ekey, Paul E., 4,106,629, Cl. 211-71.000.
- Electronic Engineering Co. of California: *See—*
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- Elektroschmelzwerk Kempten GmbH: *See—*
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- Elgart, Lea Frances: *See—*
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- Elitex, Koncern textilniho strojirenstvi: *See—*
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- Ellenoff, Theodore, executor: *See—*
  - Koehn, Wilbur R., deceased; Koehn, Elizabeth M., executrix; and Ellenoff, Theodore, executor, 4,106,506, Cl. 128-214.400.
- Elliott, Curtis Homer, Jr., to W. R. Grace & Co. Copolymerized silica hydrosol bound cracking catalysts. 4,107,088, Cl. 252-455.00Z.
- Ellson, Walter Gill, to C. Ellson & Co. Ltd. Submersible thermostatically controlled heaters. 4,107,514, Cl. 219-523.000.
- Elphingstone, Eugene A.: *See—*
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- Elrod, David W.: *See—*
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- Emerson Electric Co.: *See—*
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- Emery Industries, Inc.: *See—*
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  - Sturwold, Robert J.; and Williams, Mark A., 4,107,061, Cl. 252-49.300.
- EMI Limited: *See—*
  - Oddell, Leonard George, 4,107,563, Cl. 313-60.000.
- Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., to Envirotech Corporation. Treatment of iron concentrate slurry to improve filtration. 4,107,028, Cl. 209-5.000.
- Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, to Martin Marietta Corporation. Prestored area correlation tracker. 4,106,726, Cl. 244-3.170.
- Empire Foods, Inc.: *See—*
  - Niccolls, Paul L., 4,106,161, Cl. 17-11.000.
- Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge vormals Moschkau & Glimpel: *See—*
  - Glimpel, Helmut, 4,106,783, Cl. 279-2.00R.
- Endo, Hirohido; Inose, Fumiyuki; and Komatsu, Akio, to Hitachi, Ltd. Character generator for visual display devices. 4,107,662, Cl. 340-324.0AD.
- Endo, Ichiro: *See—*
  - Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,106,409, Cl. 101-426.000.
- Endo Laboratories: *See—*
  - Rajagopalan, Parthasarathi; and Pachter, Irwin J., 4,107,165, Cl. 260-288.0CE.
- Endo, Tadayoshi: *See—*
  - Hosoi, Keizo; Endo, Tadayoshi; and Kanzaki, Hidetosi, 4,107,128, Cl. 260-40.00R.
- Energy Conversion Devices, Inc.: *See—*
  - Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., 4,106,939, Cl. 96-48.00R.
- Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, to AGFA-Gevaert, A.G. Film sensitivity detecting filter actuating camera. 4,107,703, Cl. 354-21.000.
- Engineering Systems Corporation: *See—*
  - Miller, Albert J., 4,106,442, Cl. 123-26.000.
- English Clay Lovering Pochin & Co. Ltd.: *See—*
  - Webster, John David; and Jewell, Thomas John, 4,107,254, Cl. 264-270.000.
- English Clays Lovering Pochin & Company, Limited: *See—*
  - Malden, Peter James, 4,106,949, Cl. 106-288.00B.
- Ennis, Bernard P., Jr.; and Styslinger, James R., to Pullman Incorporated. Method for quenching cracked gases. 4,107,226, Cl. 260-683.00R.

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Envirotech Corporation: *See—*
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Epicor, Inc.: *See—*
Levendusky, Jospeh A., 4,107,044, Cl. 210-266.000.
Epstein, David, to National Research Development Corporation. Hardenable compositions. 4,106,944, Cl. 106-38.200.
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Coquerel, Michel Jacques Leon, 4,106,536, Cl. 141-220.000.
Erhart, Andrew Paul: *See—*
Berger, Walter S.; Erhart, Andrew Paul; Fee, William O.; Holtgren, Darwin Lester; and Burd & Fletcher Company, 4,106,688, Cl. 229-39.00R.
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Erickson, James Robert: *See—*
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Eriksson, Anders Gunnar: *See—*
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, 4,107,475, Cl. 179-84.0VF.
Erixon, Berthold, to Nitro Nobel. Wires and two-part electrical coupling cover. 4,107,453, Cl. 174-87.000.
Erlandsson, Bjorn Erik, to Svenska Utvecklingsaktiebolaget. Electrical stimulator in remedy of incontinence. 4,106,511, Cl. 128-407.000.
Erndt, Edmund E., to Precision Metalsmiths, Inc. Investment material. 4,106,945, Cl. 106-38.300.
Ernest Scragg & Sons Limited: *See—*
Eaves, Ronald Spencer, 4,106,274, Cl. 57-34.0HS.
Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
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Escher Wyss Limited: *See—*
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Meystre, Noel; Christ, Alfred; and Miller, Helmut, 4,106,824, Cl. 308-9.000.
Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., to Rockwell International Corporation. Angle sensing tool for applying torque. 4,106,570, Cl. 173-12.000.
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Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.
Eskeli, Michael. Thermodynamic compressor. 4,106,304, Cl. 62-88.000.
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Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, to Toyoda-Koki Kabushiki-Kaisha. Automatic tool change apparatus. 4,107,589, Cl. 318-602.000.
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Europe-Levage Manutention (Elma): *See—*
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Evans, David A., to Regent of the University of California. Useful prostaglandin intermediates. 4,107,181, Cl. 260-340.90R.
Evans, David H.; and Greenwald, Richard B., to Polaroid Corporation. Mono-N-tosylsulfimides, their preparation and their reaction products. 4,107,176, Cl. 260-327.00M.
Evans, David M., to S & C Electric Company. Switch operating mechanisms for high voltage switches. 4,107,486, Cl. 200-48.00R.
Evans, David M., to S & C Electric Company. Interrupter switch arrangement. 4,107,487, Cl. 200-48.0KB.
Evans, David M. Probe means utilized with a pair of indicators for testing the wiring connections of a fuse receptacle. 4,107,602, Cl. 324-51.000.
Evenson, Gerald N., to Upjohn Company, The. Acetal hydrazones of 2-hydrazino-3H-1,4-benzodiazepine. 4,107,159, Cl. 260-239.0BD.
Everett, Peter Kenneth, to Dextec Metallurgical Proprietary Limited. Recovery of copper from ores and concentrates. 4,107,009, Cl. 204-129.000.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 3-Furyl alkyl disulfides. 4,107,184, Cl. 260-347.200.
Evers, William J.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. Process for preparing α-oxy(oxo)sulfides and ethers. 4,107,197, Cl. 260-455.00R.
Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, to Eastman Kodak Company. Process for improving the properties of oxysulfide phosphor materials. 4,107,070, Cl. 252-301.40S.
EWG Import-und Export-Gesellschaft mit beschrankter Haftung: *See—*
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Faltin, Hans G. High speed insert handling mechanism and method. 4,106,762, Cl. 270-54.000.
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Farnsworth, Richard G., to General Electric Company. Data communication receiver and transfer apparatus. 4,107,656, Cl. 340-151.000.
Farris, Richard C.; and Butler, William S., to Halliburton Company. Fluid truck bolster snubber. 4,106,412, Cl. 105-197.0DH.
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich. Catalyst for hydrogenolysis of N,N-dimethyl-3,5-ditert.butyl-4-hydroxybenzylamine. 4,107,090, Cl. 252-465.000.
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Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Nagendran, Sangarappillai; Wickramasinghg, Mohanlal Randith; and Weirich, H. Paul, to Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Nagendran, Sangarappillai; and Wickramasinghg, Mohanlal Randith. Coating apparatus. 4,106,433, Cl. 118-212.000.

Ferraris, Giuseppe: *See—*
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Ferrin, Charles Robert; and Manning, William Patrick, to Combustion Engineering, Inc. Process for simultaneous removal of hydrogen sulfide and water from a gas mixture without substantial removal of carbon dioxide or hydrocarbons. 4,107,270, Cl. 423-226.000.
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Fiber Glass Systems, Inc.: *See—*
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Fisher, Leonard; and Richardson, James E. Rotary scraper with non-gouging finger array. 4,106,193, Cl. 30-172.000.
Fisher, Sidney L.; and Fisher, Harry S. Segmented guide eye. 4,106,156, Cl. 16-2.000.
Fisk, Bernard C.; and Donohue, James M., to Xerox Corporation. Programmahle controller for controlling reproduction machines. 4,107,779, Cl. 364-518.000.
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Fitzner, Josef; and Low, Lothar, to Akzona Incorporated. Process and device for high speed threading of yarn into a false-twisting spindle. 4,106,275, Cl. 57-77.330.
Flach, Donald O.: *See—*
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Fletcher, George Leland; and Merrill, Stewart H., to Eastman Kodak Company. Polysulfonamides. 4,107,155, Cl. 528-373.000.
Fletcher, George Leland, Jr.; and Dedinas, Jonas, to Eastman Kodak Company. Vesicular composition, element and process utilizing a diol. 4,106,938, Cl. 96-48.0HD.
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, to American Cyanamid Company. Novel 16 hydroxy 15-deoxy-5-cis-prostenoic acids and esters. 4,107,441, Cl. 560-121.000.
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Foresman, James Daniel, to Young Industries, Inc., The. Three-plane balance gyro sifter. 4,107,035, Cl. 209-309.000.
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Fox, Richard C.: *See—*
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Frantzreb, John G., Sr.; and Weiss, C. David, to Caterpillar Tractor Co. Inoculation article. 4,107,393, Cl. 428-558.000.
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Freedman, Melvin H. Article of jewelry. 4,106,123, Cl. 2-152.00R.
Freeman, Alfred B. Time displays for electronic time keeping devices. 4,106,281, Cl. 58-50.00R.
Freeman, Mark P., to Dorr-Oliver Incorporated. System and method for electric dewatering of solids suspension. 4,107,026, Cl. 204-300.00R.
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Fremont, Joseph Melvin, to Du Pont de Nemours, E. I., and Company. Malachite preparation. 4,107,082, Cl. 252-431.00R.
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Friedman, Ronald L., deceased (by Friedman, Patty R., executor); and Lewis, Roger N., to Argus Chemical Corporation. Alpha halo substi-

tuted asymmetrical diacyl peroxides in co-initiator systems. 4,107,419, Cl. 526-228.000.

- Friedrich Krollmann, Firma: *See—*
  - Arndt, Walter, 4,106,352, Cl. 74-29.000.
- Fritz, John E., Jr.: *See—*
  - Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., 4,106,188, Cl. 29-631.000.
- Frohbach, Hugh F., to R. D. Percy & Company. Television audience survey system providing feedback of cumulative survey results to individual television viewers. 4,107,735, Cl. 358-84.000.
- Fruin, James C.: *See—*
  - Tutor, Gerald L.; Fruin, James C.; and Helm, James L., 4,107,338, Cl. 426-293.000.
- Frye, Cecil L.; and Lane, Thomas H., to Dow Corning Corporation. N-tertiarybutyl organosilylamides. 4,107,196, Cl. 260-448.20N.
- Fuchs, James A.: *See—*
  - Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
  - Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.
- Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, to Bayer Aktiengesellschaft. Monomer-free resin compositions, based on unsaturated polyesters, which can be cured hy UV-light. 4,107,012, Cl. 204-159.190.
- Fuhrmeister, Ralph, to Furma Manufacturing Co. Pty. Ltd. Method and apparatus for riveting. 4,106,180, Cl. 29-432.100.
- Fuji Photo Film Co., Ltd.: *See—*
  - Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, 4,106,942, Cl. 96-100.00N.
- Fuji Photo Optical Co., Ltd.: *See—*
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- Fujü, Katsumi: *See—*
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- Fujii, Masami. Method for installation of grounding pole. 4,106,299, Cl. 61-63.000.
- Fujü, Shigeru: *See—*
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- Fujü, Takara: *See—*
  - Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujü, Takara, 4,107,153, Cl. 528-322.000.
- Fujü, Toru, to Olympus Optical Co., Ltd. Photographic lens system having a large aperture ratio. 4,106,854, Cl. 350-176.000.
- Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, to Central Glass Company, Limited. Method of recovering fluorine from vapor of crude phosphoric acid solution. 4,106,918, Cl. 55-71.000.
- Fujikawa, Tutomu: *See—*
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- Fujimoto, Hideaki: *See—*
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- Fujita, Tsuyoshi: *See—*
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- Fujitsu Limited: *See—*
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  - Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, 4,107,578, Cl. 315-169.0TV.
  - Kurihara, Yasuo, 4,107,649, Cl. 340-146.1AG.
  - Tanahashi, Jun'ichi; and Kanie, Takashi, 4,107,652, Cl. 340-146.1AL.
- Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, to Toyo Boseki Kabushiki Kaisha. Powder coating composition comprising a mixture of a polyester and plural silicone compounds. 4,107,148, Cl. 528-273.000.
- Fukatsu, Shunzo: *See—*
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- Fukuzawa, Tadashi: *See—*
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- Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, to Kobe Steel, Ltd. Electrolytic cell with electrodes arranged as a hexagon. 4,107,024, Cl. 204-275.000.
- Fulk, Ronald Dean: *See—*
  - Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.
- Fulmer, John Arthur; and Walker, David Judson, to Babcock & Wilcox Company, The. Air deflector. 4,106,890, Cl. 431-184.000.
- Funakoshi, Masayasu: *See—*
  - Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, 4,106,918, Cl. 55-71.000.
- Funatsu, Chubei; and Hirata, Toshikiyo, to Toyo Tsushinki Kabushiki Jaka Toyo Communication Equipment Co. Ltd. Collision avoidance system for aircrafts. 4,107,674, Cl. 343-6.50R.
- Fung, Anthony K. L.: *See—*
  - Biel, John Hans; Bariana, Dilbagh S.; and Fung, Anthony K. L., 4,107,172, Cl. 260-308.00D.
- Funk, Gary L.: *See—*
  - Tuckett, William F.; Funk, Gary L.; and Smith, Dexter E., 4,106,916, Cl. 55-21.000.
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- Furuto, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Stop mechanism for shearing apparatus. 4,106,147, Cl. 10-25.000.
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  - Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., 4,107,256, Cl. 264-310.000.
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- Gaccione, Carmine. Amalgamator. 4,106,199, Cl. 32-40.00A.
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- Galetto, Louis Valentine; and Jensen, Donald Frederick, to International Business Machines Corporation. Ink jet printer apparatus and method of operation. 4,107,698, Cl. 346-75.000.
- Galinke, Joachim: *See—*
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- Galli, Guido: *See—*
  - Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.
- Gallo, Joseph Sebato. Artificial stem assembly for a short stem cut flower. 4,106,234, Cl. 47-55.000.
- Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, to Hoffmann-La Roche Inc. Pregnanes. 4,107,188, Cl. 260-397.100.
- Gambaretto, Gian Paolo; and Gottardi, Vittorio, to Industrie Zignago S. Margherita S.p.A. Method for the surface treatment of glass by leaching. 4,107,388, Cl. 428-428.000.
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- Garber, Murray, to American Cyanamid Company. Method of preparing dl 6-phenyl-2,3,5,6-tetrahydroimidazo-[2,1-b]thiazole and acid addition salts thereof. 4,107,170, Cl. 260-306.70T.
- Garcia Corporation, The: *See—*
  - Catignani, Robert T., 4,106,718, Cl. 242-84.20R.
- Gardner, Eric Richard, to Avon Rubber Company Limited. Fabric having an elastomer coat on face and method of producing same. 4,107,369, Cl. 428-246.000.
- Gardner, John W.; Grgurich, William A.; and Niles, Albert B., to Caterpillar Tractor Co. Fuel injection nozzle tip with low volume tapered sac. 4,106,702, Cl. 239-533.300.
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- Garlock Inc.: *See—*
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- Garratt, Philip Melvin; Foley, Leroy Earl; Godbarsen, Robert; and Barrett, David M., to General Electric Company. X-ray body scanner using encoder for generating system controlling timing pulse train. 4,107,531, Cl. 250-360.000.
- Garrison, Donald W.; and Hartman, James T., to Time Computer, Inc. Wristwatch setting system. 4,106,277, Cl. 58-4.00A.
- Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver including an automatic tuning correction suppression circuit coupled to the tuning member. 4,107,615, Cl. 325-420.000.
- Gasser, George E. Bumper edge member for chairs. 4,106,739, Cl. 248-345.100.
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  - Bousquet, Donald G.; Camp, Jesse G., Jr.; Hopkins, Mortimer Gilbert; and Jagt, Leonard J., 4,106,899, Cl. 8-101.000.
- Gatlin, Alvin O.; Tausch, Gilbert H.; and Watkins, Fred E., to Camco, Incorporated. Sidepocket mandrel. 4,106,563, Cl. 166-117.500.
- Gaumann, Andreas F.; and Dancilovic-Matulas, Visnja, to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule. Process for the recovery of lead from scrapped lead batteries. 4,107,007, Cl. 204-116.000.
- Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A. Digital train processing device. 4,107,468, Cl. 179-15.0BY.

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- Gebhardt, Roland; and Gersin, Robert P., to Kayser-Roth Corporation. Device for displaying and storing articles. 4,106,668, Cl. 221-131.000.
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  - Oliphant, Howard G., 4,106,236, Cl. 49-141.000.
- General Dynamics Corporation: *See—*
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  - Schuler, Alan L.; and Post, David L., 4,106,424, Cl. 114-74.00A.
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  - Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., 4,107,771, Cl. 363-58.000.
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  - Carter, Robert A., 4,107,553, Cl. 307-293.000.
  - Farnsworth, Richard G., 4,107,656, Cl. 340-151.000.
  - Garratt, Philip Melvin; Foley, Leroy Earl; Godbarsen, Robert; and Barrett, David M., 4,107,531, Cl. 250-360.000.
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  - Hildebrandt, Herbert J.; and Perkins, Donald W., 4,106,462, Cl. 123-148.00E.
  - Houtman, Jack A., 4,107,583, Cl. 318-221.00D.
  - Jencks, Charles L.; and Castonguay, Roger N., 4,107,497, Cl. 200-144.00R.
  - Lauer, Richard E., 4,106,185, Cl. 29-596.000.
  - Mark, Victor; and Hedges, Charles Vernon, 4,107,443, Cl. 568-750.000.
  - McMannis, William Thomas, 4,107,600, Cl. 324-78.00R.
  - Moore, James E.; and Schroeter, Siegfried H., 4,107,391, Cl. 428-483.000.
  - Owen, William S., Jr.; and Lovejoy, George C., 4,106,377, Cl. 83-4.000.
  - Pury, Thomas; Assa, Menachem; and Wagner, Howard R., 4,107,590, Cl. 318-628.000.
  - Quinn, Clayton B., 4,107,442, Cl. 568-726.000.
  - St. Peters, Richard L., 4,107,536, Cl. 250-423.00P.
  - Schuster, Robert M.; and Luria, Norman G., 4,107,456, Cl. 174-151.000.
  - Serrano, Juan de J., 4,106,341, Cl. 73-362.0AR.
  - Stone, Russell L., Jr., 4,107,629, Cl. 331-116.00R.
  - Williams, Frank J., III; and Donahue, Paul E., 4,107,147, Cl. 528-172.000.
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  - Shrimpton, Brian Clifford, 4,107,339, Cl. 426-387.000.
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  - Dent, Richard G.; and Stack, Gary F., 4,106,659, Cl. 220-67.000.
  - Mair, Alex C., 4,106,803, Cl. 293-62.000.
  - West, Gene A., 4,106,447, Cl. 123-117.00R.
  - Winchell, Frank J., 4,106,605, Cl. 192-105.0CD.
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- Geosource Inc.: *See—*
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- Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyolefin-block copolymer-polymer blends. 4,107,130, Cl. 260-40.00R.
- Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyurethane-block copolymer-polymer blends. 4,107,131, Cl. 260-40.0TN.
- Gerrard Industries Limited: *See—*
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- Gersin, Robert P.: *See—*
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- Gerwick, Ben C., Jr., to Kajima Corporation. Building system for seismic-active areas. 4,106,301, Cl. 61-86.000.
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- Gevas, James Constantine. Egg shell breaker. 4,106,402, Cl. 99-571.000.
- Giannini, Sebastian Louis. Reflective ignition timing process. 4,106,461, Cl. 123-148.00E.
- Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montedison S.p.A. Process for the stereoregular polymerization of alpha olefins. 4,107,413, Cl. 526-114.000.
- Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montecatini Edison S.p.A. Process for the stereoregular polymerization of alpha olefins. 4,107,414, Cl. 526-114.000.
- Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, to Montecatini Edison S.p.A. Process for the stereospecific polymerization of alpha-olefins. 4,107,415, Cl. 526-114.000.
- Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, to Montedison S.p.A. Components of catalysts for use in polymerizing and catalysts prepared therefrom. 4,107,416, Cl. 526-114.000.
- Gibrich, Jack. Suspensible ornamental display. 4,106,228, Cl. 40-605.000.
- Gibson, David Vincent; and Leary, Bruce, to Dulux Australia Ltd. Autoxidisable composition. 4,107,113, Cl. 260-18.0PF.
- Gibson, Myron R., to Caterpillar Tractor Co. Seal lubrication in a rotary engine. 4,106,169, Cl. 29-156.40R.
- Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, to Ruhrchemie Aktiengesellschaft. Separation of carbon black by liquid hydrocarbons. 4,107,036, Cl. 210-21.000.
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- Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Composite truss bearing clip. 4,106,257, Cl. 52-693.000.
- Gilbreath, Cecil R.; and Womble, Jimmie L., to Texas Instruments Incorporated. Advanced array transform processor with fixed/floating point formats. 4,107,773, Cl. 364-200.000.
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- Gillen, John E.; and Odom, Gary C. Boat mounted game blind. 4,106,145, Cl. 9-5.000.
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- Girodin, Marius G. Reciprocating engines, pumps or compressors. 4,106,354, Cl. 74-60.000.
- Gittelis, Meir, to Nahshol Electronics Ltd. Mounting construction for motion sensor. 4,107,545, Cl. 307-121.000.
- Glasfeld, Rolf D.; and Morrill, Jan G., to General Dynamics Corporation. Weather covers for tankers. 4,106,423, Cl. 114-74.00A.
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- Gleason, John Gerald, to SmithKline Corporation. Intermediates for preparing substituted phenylglycylcephalosporins. 4,107,440, Cl. 560-17.000.
- Glickstein, Myer; Tuomy, Justin M.; and Shwert, Marianne J., to United States of America, Army. Freeze-dried mix for spoonable salad dressing and method therefor. 4,107,335, Cl. 426-96.000.
- Glimpel, Helmut, to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge vormals Moschkau & Glimpel. Clamping device for accurately centering a work-piece or a tool. 4,106,783, Cl. 279-2.00R.
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- Goloff, Alexander, to Caterpillar Tractor Co. Engine valve with recessed seat and annular groove. 4,106,466, Cl. 123-188.00S.
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- Gordon, Robert Thomas. Cancer treatment method. 4,106,488, Cl. 128-1.00R.
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Gray, John M. Hypodermic syringe projectile. 4,106,770, Cl. 273-106.50D.
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Griffith, Carl D., to Sperry Rand Corporation. Fail safe force feel system. 4,106,728, Cl. 244-83.00D.
Grigoriev, Eduard Maximovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Grill, Benjamin: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,107,546, Cl. 307-141.000.
Grimsdale, Richard Lawrence; Willis, Philip John; and Hadjiaslanis, Aris, to National Research Development Corporation. Display apparatus. 4,107,780, Cl. 364-521.000.
Grismer, Thomas A., to Economics Laboratory, Inc. Tank wagon cleaning method. 4,106,950, Cl. 134-10.000.
Grivsky, Eugene Michael, to Burroughs Wellcome Co. Biologically active amides. 4,107,320, Cl. 424-274.000.
Groboski, Raymond J., to Timex Corporation. Battery hatch cover. 4,107,400, Cl. 429-98.000.
Grootjans, Jacques F. J.: *See—*
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,107,225, Cl. 260-683.900.
Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, to Raytheon Company. Radar system with improved brightness and resolution. 4,107,673, Cl. 343-5.0DP.
Gross, Laurence Herbert: *See—*
Angell, Richard Gordon, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, 4,107,258, Cl. 264-328.000.
Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Indan-5-yl-N-methylcarbamic acid esters. 4,107,324, Cl. 424-300.000.
Grubbs, Michael R.: *See—*
Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.
Gruber, Ludwig, to John GmbH. Marine propulsion unit with protected screw. 4,106,425, Cl. 115-42.000.
Gruber, Werner; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Anaerobically hardening adhesives and sealants based on (meth)acrylic esters containing polycarbonates terminated by (meth)acrylic ester groups. 4,107,386, Cl. 428-412.000.
Gruenberg, Elliot L. Communications transponder. 4,107,609, Cl. 325-14.000.
Grunza, Gene; and Herscher, Marvin B., to Threshold Technology, Inc. Apparatus for recognizing words from among continuous speech. 4,107,460, Cl. 179-1.0SD.
GTE Sylvania Incorporated: *See—*
Benasutti, John Eugene, 4,106,842, Cl. 339-221.00R.
Chleboun, Thomas P., 4,107,660, Cl. 340-566.000.
Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, 4,106,838, Cl. 339-99.00R.
Gubela, Hans: *See—*
Diedershagen, Bruno; and Gubela, Hans, 4,106,879, Cl. 404-10.000.
Gubela Strassenausrustungs-GmbH: *See—*
Diedershagen, Bruno; and Gubela, Hans, 4,106,879, Cl. 404-10.000.
Gubitose, Nicholas Francis; and James, Robert Arthur, to RCA Corporation. Machine for straightening the wire leads of a device. 4,106,532, Cl. 140-147.000.
Gudenau, Heinrich: *See—*
Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, 4,106,996, Cl. 201-6.000.
Gudenau, Heinrich Wilhelm: *See—*
Wenzel, Werner; Gudenau, Heinrich; and Bernt, Joachim, 4,106,996, Cl. 201-6.000.
Guerbet S.A.: *See—*
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, 4,107,286, Cl. 424-5.000.
Guerra, Luis A. Device for prolonged intravascular infusion. 4,106,491, Cl. 128-2.00F.
Guetzl, Horst: *See—*
Distler, Georg; and Guetzl, Horst, 4,107,500, Cl. 200-308.000.
Guidosh, Edward F., to Westinghouse Electric Corp. No-load tap changer for three-phase transformers. 4,107,637, Cl. 336-150.000.
Guiles, Chester L.: *See—*
Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., 4,106,968, Cl. 156-189.000.
Gulf Oil Canada Limited: *See—*
Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
Gulf & Western Industries, Inc.: *See—*
Seipp, William H., 4,107,785, Cl. 364-900.000.
Gulf & Western Manufacturing Company: *See—*
Horowitz, Carl; Mangaraj, Duryodham; and Iorio, Joseph A., 4,106,955, Cl. 148-6.000.
Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.
Gulish, William P., Jr., to Libbey-Owens-Ford Company. Glass breaking out apparatus. 4,106,683, Cl. 225-103.000.
Gunderson, Philip D.: *See—*
Lai, Chi Sun; and Gunderson, Philip D., 4,106,440, Cl. 123-117.00R.
Gunther, William H., Jr., to Thor Dahl, Inc. Apparatus for applying chemicals to envelopes. 4,106,432, Cl. 118-211.000.
Gurdak, Felix J.; and Cook, Francis W., Jr., to Litton Industrial Products, Inc. Variable feed high-production precision machine. 4,106,375, Cl. 82-21.00B.

Gustav Wagner Maschinenfabrik: *See—*
Kaiser, Gerhard, 4,106,378, Cl. 83-74.000.
Gutmann, Walter: *See—*
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.
Gymer, Geoffrey E.: *See—*
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, 4,107,314, Cl. 424-263.000.
H. B. Fuller Company: *See—*
Clausen, Victor H.; and Brenno, Lester C., 4,107,372, Cl. 428-256.000.
H. F. Hanscom & Company, Inc.: *See—*
Hanscom, Harris F., 4,106,264, Cl. 53-124.00D.
H. H. Robertson Company: *See—*
Davis, Bernard Harpley, 4,106,535, Cl. 141-88.000.
H. L. Blachford Limited: *See—*
Blachford, John, 4,106,932, Cl. 75-252.000.
Haaf, William Robert; and Reinhard, Donald Lewis, to General Electric. Flame retardant, non-dripping compositions of polyphenylene ether and acrylonitrile-butadiene-styrene. 4,107,232, Cl. 260-876.00R.
Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, to Rohm and Haas Company. Method of coating utilizing rheologically modified metal decorating and aqueous coating composition comprising latex and aminoplast. 4,106,421, Cl. 113-120.00A.
Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, to Robert Bosch GmbH. Proximity switch and circuit system. 4,107,555, Cl. 307-308.000.
Haase, Edward Emil, Jr.: *See—*
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.
Habiger, Cyril W., to Caterpillar Tractor Co. Speed and load responsive underspeed actuator for hydrostatic transmissions. 4,106,292, Cl. 60-447.000.
Hackenberg, Hubert: *See—*
Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, 4,107,703, Cl. 354-21.000.
Hadary, Joseph. Toothbrush. 4,106,152, Cl. 15-172.000.
Haddon, Frank M. Windsplitter truck stabilizer. 4,106,806, Cl. 296-23.0MC.
Hadjiaslanis, Aris: *See—*
Grimsdale, Richard Lawrence; Willis, Philip John; and Hadjiaslanis, Aris, 4,107,780, Cl. 364-521.000.
Haennerle AG: *See—*
Haenni, Eduard J.; and Zbornik, Vaclav, 4,106,323, Cl. 72-389.000.
Haenni, Eduard J.; and Zbornik, Vaclav, to Haennerle AG. Bending tool. 4,106,323, Cl. 72-389.000.
Haessly, Walter F.: *See—*
Toma, Charles A.; and Haessly, Walter F., 4,107,491, Cl. 200-61.420.
Haga, Toshikatsu; and Hori, Saburo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for heat treatment using downwardly swirling hot gas flow. 4,106,892, Cl. 432-58.000.
Haikawa, Shozo: *See—*
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.
Hajduk, Thomas M., to TRW Inc. Transfer terminal with library phrase memory. 4,107,457, Cl. 178-17.500.
Hakim, Carlos A.: *See—*
Hakim, Salomon; and Hakim, Carlos A., 4,106,510, Cl. 128-350.00V.
Hakim Company Limited: *See—*
Hakim, Salomon; and Hakim, Carlos A., 4,106,510, Cl. 128-350.00V.
Hakim, Mohammad Javid, to Westinghouse Canada Limited. Chemical vapor deposition. 4,107,352, Cl. 427-50.000.
Hakim, Salomon; and Hakim, Carlos A., to Hakim Company Limited. Servo valve. 4,106,510, Cl. 128-350.00V.
Hakli, Reijo Sakari, to Lannen Tehtaat OY. Plant-setting machine. 4,106,415, Cl. 111-3.000.
Halasa, Adel Farhan; and Hall, James Edward, to Firestone Tire & Rubber Company, The. Catalyst system and process for polymerization of conjugated dienes therewith. 4,107,081, Cl. 252-431.00L.
Hall, George D.: *See—*
Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., 4,106,570, Cl. 173-12.000.
Hall, James Edward: *See—*
Halasa, Adel Farhan; and Hall, James Edward, 4,107,081, Cl. 252-431.00L.
Hall, John B.: *See—*
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
Hallerback, Stig Lennart, to SKF Industrial Trading and Development Company B.V. Electric machine. 4,107,560, Cl. 310-60.00R.
Halliburton Company: *See—*
Dill, Walter R.; and Elphingstone, Eugene A., 4,107,057, Cl. 252-8.55C.
Dodson, James C.; and Lahyer, Harold S., 4,106,393, Cl. 92-168.000.
Farris, Richard C.; and Butler, William S., 4,106,412, Cl. 105-197.0DH.
Hallin, Peter R.: *See—*
Bancroft, Joseph C.; and Hallin, Peter R., 4,106,239, Cl. 49-449.000.
Halm Instrument Co., Inc.: *See—*
Lyon, Floyd A.; and Harrison, Henry, 4,106,480, Cl. 126-270.000.
Halter Marine Services, Inc.: *See—*
Marsden, John, 4,106,637, Cl. 214-13.000.
Hamada, Masahiro: *See—*
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.
Hamamura, Kimio: *See—*
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
Hamburger Hochbahn Aktiengesellschaft: *See—*
Schultz, Otto; and Feutlinske, Hilmar, 4,106,792, Cl. 280-432.000.
Hamid, Michael A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Grading agricultural products with a microwave antenna. 4,106,340, Cl. 73-355.00R.
Hamilton, James Guthrie: *See—*
Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, 4,107,188, Cl. 260-397.100.
Hamilton, Stephen P.: *See—*
Barrett, Johnny M.; and Hamilton, Stephen P., 4,107,781, Cl. 364-700.000.
Hammann, Ingeborg: *See—*
Grotkopp, Detlef; Wedemeyer, Karlfried; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,107,324, Cl. 424-300.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
Hammerle, Dennis R.: *See—*
Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., 4,106,570, Cl. 173-12.000.
Hammond, Donald J.: *See—*
Lin, Kingso C.; and Hammond, Donald J., 4,107,117, Cl. 260-28.50B.
Hamon, Jean-Francois: *See—*
Hercelin, Bernard; and Hamon, Jean-Francois, 4,107,333, Cl. 424-365.000.
Hanaway, Roger D.: *See—*
Nelson, John P.; and Hanaway, Roger D., 4,106,649, Cl. 214-522.000.
Hanes Corporation: *See—*
King, J. Frank, 4,106,260, Cl. 53-21.0FW.
Haney, Jerry D., to American Optical Corporation. Initialization circuit. 4,106,498, Cl. 128-2.05A.
Hanscom, Harris F., to H. F. Hanscom & Company, Inc. Apparatus for compressing and holding a hanked package of flexible material during fastening. 4,106,264, Cl. 53-124.00D.
Hansen, David R., to Shell Oil Company. Block copolymer blend with certain acrylics. 4,107,233, Cl. 260-876.00B.
Hansen, Gunnar Lyshoj; and Sturlason, Leif Viggo, to Danfoss A/S. Distributing valve on a hydraulic rotary piston engine. 4,106,883, Cl. 418-61.00B.
Hansen, Lars J., to Toledo Pickling & Steel Service, Inc. Process for treating waste hydrochloric acid. 4,107,267, Cl. 423-138.000.
Hansen, Owen P. Tape measure. 4,106,201, Cl. 33-75.00R.
Hansgen, Klaus: *See—*
Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, 4,106,366, Cl. 74-801.000.
Hanson, Gordon L.: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.
Hanson, Raymond A. Bidirectional rotary excavator. 4,106,226, Cl. 37-190.000.
Haralambou, Larry A. Combination hedge trimmer and clippings collector. 4,106,191, Cl. 30-132.000.
Hardouin, Michel Jean-Charles: *See—*
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, 4,107,286, Cl. 424-5.000.
Harita, Yoshiyuki: *See—*
Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, 4,106,943, Cl. 96-115.00R.
Harman, Wayne L.: *See—*
Totten, George F.; and Harman, Wayne L., 4,106,457, Cl. 123-133.000.
Harmon, George Lamar: *See—*
Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.
Harold, Billy. Vehicle transport trailer. 4,106,805, Cl. 296-1.00A.
Harper, Allan Carl: *See—*
Buras, Edmund Maurice, Jr.; and Harper, Allan Carl, 4,106,190, Cl. 30-43.700.
Harper, Kenneth B., to Motorola, Inc. Cassette record player-recorder. 4,107,749, Cl. 360-105.000.
Harris, Bernhard: *See—*
Butzow, Neil W.; and Harris, Bernhard, 4,107,381, Cl. 428-365.000.
Harris, Martin H.: *See—*
Borcher, Charles A.; Porter, William R.; and Harris, Martin H., 4,106,411, Cl. 102-67.000.
Harris, William D.: *See—*
Best, Robert H.; and Harris, William D., 4,107,756, Cl. 361-231.000.
Harrison, Henry: *See—*
Lyon, Floyd A.; and Harrison, Henry, 4,106,480, Cl. 126-270.000.
Harry M. Miller Attractions Pty. Limited: *See—*
Steed, Trevor Ashton, 4,106,194, Cl. 30-228.000.
Harsha, Robert W., to Pacific Fireplace Furnishings, Inc. Door for fireplace screen. 4,106,476, Cl. 126-140.000.
Hart, Howard R., Jr., to General Electric Company. Flowmeter device and method for determining velocity of a fluid. 4,107,525, Cl. 250-303.000.

Hart, James E., to Westinghouse Air Brake Company. Emergeocy portion for a brake control valve. 4,106,819, Cl. 303-38.000.

Hartbauer, Ellsworth A.; Weis, Rudolf R.; and Kemp, Horace N., to Crown Zellerbach Corporation. Sheet material dispensing device. 4,106,684, Cl. 226-91.000.

Hartel, Kurt: *See—*

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,107,318, Cl. 424-273.00R.

Harting, Gary L.: *See—*

Clarke, George A.; and Harting, Gary L., 4,107,058, Cl. 252-18.000.

Hartman, James T.: *See—*

Garrison, Donald W.; and Hartman, James T., 4,106,277, Cl. 58-4.00A.

Haruna, Tohru: *See—*

Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,107,136, Cl. 260-45.95C.

Harvey, Donald M., to Eastman Kodak Company. Photographic apparatus for use with self-processing film units. 4,107,710, Cl. 354-86.000.

Harvey, Francis J., II; and Fey, Maurice G., to Westinghouse Electric Corp. Chlorination process for producing aluminum. 4,106,928, Cl. 75-68.00B.

Harvey, Gary Lee: *See—*

Cummings, Gary Eugene; Harvey, Gary Lee; and Dean, Charles Wallace, 4,106,250, Cl. 52-394.000.

Hashimoto, Akihiko; and Enomoto, Fuzio, to Olympus Optical Co., Ltd. Bladed shutter. 4,107,705, Cl. 354-29.000.

Hashizume, Nobuo: *See—*

Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, 4,107,718, Cl. 357-3.000.

Hassemer, Georg: *See—*

Kessler, Erich; Hassemer, Georg; and Weber, Paul, 4,106,244, Cl. 52-63.000.

Hattori, Katsuhiko: *See—*

Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.

Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio adjusting system for internal combustion engines. 4,106,451, Cl. 123-119.0EC.

Haug, Albert, to Societe d'Etudes de Machines Thermiques-S.E.M.T. Fluid-tight pipe coupling arrangement. 4,106,798, Cl. 285-226.000.

Haus, Artur: *See—*

Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.

Hauschild, Ulrich; and Roetger, Heinrich, to Kali-Chemie. Alkaline decomposition process for producing calcined phosphate fertilizer. 4,106,922, Cl. 71-42.000.

Hausmann, Erwin, to August Bilstein, Firma. Hydropneumatic single tube shock absorber, in particular steering shock absorber. 4,106,596, Cl. 188-314.000.

Haverland, Joseph G. Reel assembly for kite lines and the like. 4,106,719, Cl. 242-96.000.

Hawley, George Thomas; and Young, Lawrence Henry, to Bell Telephone Laboratories, Incorporated. Electronic tone ringer. 4,107,495, Cl. 179-84.00T.

Hayashi, Yasuhisa, to White Sewing Machine Company. One-step buttonhole mechanism for sewing machine. 4,106,418, Cl. 112-158.00B.

Hayashi, Yoshihiro: *See—*

Inukai, Mitsuo; and Hayashi, Yoshihiro, 4,106,722, Cl. 242-107.700.

Hayashi, Yoshimasa: *See—*

Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,106,471, Cl. 123-198.00F.

Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, to Imperial Chemical Industries Limited. Fluorinated compounds as therapeutics. 4,107,329, Cl. 424-317.000.

Hayduk, Harry Nicholas, to Koppers Company, Inc. Coke pushing device. 4,106,642, Cl. 214-18.00R.

Hayes, Marvin F., Jr.: *See—*

Hayes, Marvin F., Sr.; and Hayes, Marvin F., Jr., 4,106,579, Cl. 177-137.000.

Hayes, Marvin F., Sr.; and Hayes, Marvin F., Jr. Load analyzer for automotive vehicle. 4,106,579, Cl. 177-137.000.

Hayes, Robert A.: *See—*

Conrad, Wendell R.; Futamura, Shingo; and Hayes, Robert A., 4,107,256, Cl. 264-310.000.

Haytayan, Harry M. Nail assemblies. 4,106,618, Cl. 206-343.000.

Haytayan, Harry M., to Pneutek, Inc. Nail clips. 4,106,619, Cl. 206-346.000.

Hazemeijer B.V.: *See—*

Clason, Jan C., 4,107,496, Cl. 200-144.00B.

Heden, Stanley D.: *See—*

Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., 4,107,028, Cl. 209-5.000.

Hedge, Ramesh Subayya, to Ventron Corporation. Borohydride exchange resins and their uses as reducing agents and in preparation of volatile metal hydrides. 4,107,099, Cl. 521-30.000.

Hedges, Charles Vernon: *See—*

Mark, Victor; and Hedges, Charles Vernon, 4,107,443, Cl. 568-750.000.

Heftman, George: *See—*

Moore, William Thomas; and Heftman, George, 4,106,845, Cl. 350-6.600.

Hegge, Theodorus Cornelis Jozef Maria: *See—*

van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 4,107,189, Cl. 260-404.000.

Heijting, Hendrik Gerrit, to Thomassen en Drijver-Verblifa N.V. Container having a mouth, such container provided with a metal cap and metal cap for closing such container. 4,106,655, Cl. 214-341.000.

Heikes, James E.: *See—*

Sprague, Peter W.; and Heikes, James E., 4,107,175, Cl. 260-327.00M.

Heil, Oskar. Electro-acoustic transducer. 4,107,479, Cl. 179-116.000.

Heiman, Frederic P., to Mars, Incorporated. Coin apparatus having multiple coin-diverting gates. 4,106,610, Cl. 194-97.00R.

Heimburger, Norbert: *See—*

Karges, Hermann Erich; and Heimburger, Norbert, 4,106,990, Cl. 195-63.000.

Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm. Filter press with spray washing means. 4,107,042, Cl. 210-225.000.

Heinsohn, Howard H., Jr.: *See—*

Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,107,184, Cl. 260-347.200.

Evers, William J.; and Heinsohn, Howard H., Jr., 4,107,197, Cl. 260-455.00R.

Heiser, Richard S., to Westinghouse Electric Corp. Time delayed relay sequencer and alarm reset for a gas turbine local maintenance controller. 4,107,542, Cl. 290-40.00R.

Heiwa Electronic Industrial Co.: *See—*

Zenitani, Toshio, 4,107,538, Cl. 250-480.000.

Heller, Rudolf: *See—*

Schneider, Urs; and Heller, Rudolf, 4,106,219, Cl. 35-17.000.

Helm, James L.: *See—*

Tutor, Gerald L.; Fruin, James C.; and Helm, James L., 4,107,338, Cl. 426-293.000.

Helmrich, Harald: *See—*

Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, 4,106,767, Cl. 271-188.000.

Helmso, Bennie E.; Holden, Thomas E.; and Liljenwall, Edward T., to Hewlett-Packard Company. Wrist wearable electronic device with an engagedly stored selected tool. 4,106,677, Cl. 224-5.00A.

Helsley, Grover C.: *See—*

McFadden, Arthur R.; and Helsley, Grover C., 4,107,322, Cl. 424-278.000.

Hendal, Willem P.: *See—*

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Henlis, Lawrence Philip, to Jasper, Harvey; Jasper, Ezekiel; and Ball, Harry, part interest to each. Apparatus for increasing the efficiency of internal combustion engines. 4,106,454, Cl. 123-122.00F.

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Henning, John C., to Stearns & Foster Company, The. Method for expanding the width of preformed fibrous webs. 4,106,166, Cl. 28-103.000.

Henry, Paul Shala, to Bell Telephone Laboratories, Incorporated. High-speed analog-to-digital converter. 4,107,668, Cl. 340-347.0AD.

Henson, Kenneth: *See—*

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Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See—*

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Hewett, Colin Leslie; and Savage, David Samuel, to Akzona Incorporated. Benzo-bicyclononene- derivatives. 4,107,206, Cl. 260-562.00R.

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Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., to Thermal Transfer, Division of Kleinewefers. Ceramic tube recuperators. 4,106,556, Cl. 165-81.000.

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Higashijima, Sunao. Packaged heat generator. 4,106,478, Cl. 126-263.000.

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Hildebrecht, Harold V., to Towmotor Corporation. Control linkage for torque converter transmission or the like. 4,106,362, Cl. 74-474.000.

Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., to Canadian Patents and Development Limited. CW Brillouin ring laser. 4,107,628, Cl. 331-94.50N.

Hill, William Frank; and Nicol, Thomas, to Lucas Electrical Limited. Liquid level detector circuits. 4,107,658, Cl. 340-620.000.

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Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, to Mitsubishi Chemical Industries Limited. Method for preservation of aqueous glucose isomerase solution. 4,106,993, Cl. 195-65.000.

Hirsch, John L., to Curt G. Joa, Inc. Flying splice apparatus. 4,106,974, Cl. 156-504.000.

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Schulz, Lothar; and Arpe, Hans-Jurgen, 4,107,263, Cl. 423-481.000.

Hoeksema, Herman; Reusser, Fritz; and Wait, Donald R., to Upjohn Company, The. Antibiotic rubradirin B and process for preparing the same. 4,107,295, Cl. 424-120.000.

Hoeksema, Herman; and Reusser, Fritz, to Upjohn Company, The. Antibiotic rubradirin C. 4,107,296, Cl. 424-121.000.

Hofer, Kurt; and Tscheulin, Guenther, to Sandoz Ltd. Phosphonous and thiophosphonous acid ethers as stabilizers for organic materials. 4,107,138, Cl. 260-45.70P.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. O,O'-Dialkyl-O,O'-[2-aminopyrimidin(4,6)diyl]-bis-[(thiono)(thiol)-phosphoric(phosphonic) acid esters]. 4,107,301, Cl. 424-200.000.

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- Holik, Herbert, to Escher Wyss GmbH. Apparatus for operating a drying cylinder of a paper making machine. 4,106,211, Cl. 34-48.000.
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- Holland, Norman, to Addressograph Multigraph Corporation. Duplicator cylinder construction. 4,106,408, Cl. 101-401.100.
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- Hollweck, Walter, to Inter Control Hermann Kohler Elektrik GmbH & Co. KG. Thermostat. 4,107,638, Cl. 337-131.000.
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- Holz, Emil, to Hermann Finckh Maschinenfabrik. Apparatus for cleaning fibrous suspensions of low stock consistency. 4,107,033, Cl. 209-17.000.
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- Holzl, Robert A.: *See—*
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  - Tideswell, Richard B.; and Selley, Jeffrey E., 4,107,229, Cl. 260-841.000.
- Hooker, Joe Bryan, to Leggett & Platt, Incorporated. Bed frame. 4,106,141, Cl. 5-201.000.
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- Horacek, Oldrich; Silar, Frantisek; and Rychlik, Dalibor, to Statni vyzkumny ustav textilni Liberec. Knit-woven fabric selvage structure, and apparatus for producing the same. 4,106,531, Cl. 139-383.00B.
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- Horn, John J., to PepsiCo Inc. Sloped roof construction for modular building structures. 4,106,243, Cl. 52-16.000.
- Hornak, Thomas, to Hewlett-Packard Company. Charge coupled digital to analog converter. 4,107,670, Cl. 340-347.0DA.
- Horning, Robert J.; and Ebner, Walter B., to United States of America, Army. Stabilization of $LiAsF_6$/dimethyl sulfite electrolyte solution. 4,107,404, Cl. 429-194.000.
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- Horowitz, Alvin E. Imitation bark board for the support of climbing plants. 4,106,233, Cl. 47-44.000.
- Horowitz, Carl; Mangaraj, Duryodham; and Iorio, Joseph A., to Gulf & Western Manufacturing Company. Coating steel surfaces. 4,106,955, Cl. 148-6.000.
- Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., to Gulf & Western Manufacturing Company. Universal paint composition and objects coated therewith. 4,107,228, Cl. 260-836.000.
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- Hosoya, Kiyoshi, to Tokyo Rope Mfg. Co. Ltd. Non-rotating rope. 4,106,276, Cl. 57-147.000.
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- Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Spiro[isoindoline-1,3'(4'H)-isoquinoline]-1',3-diones. 4,107,311, Cl. 424-258.000.
- Houtman, Jack A., to General Electric Company. Dynamoelectric machine winding arrangements, dynamoelectric machines incorporating same and methods of operating such dynamoelectric machines. 4,107,583, Cl. 318-221.00D.
- Howatt, George Frederick, to New England Envelope Manufacturing. Gum applicator. 4,106,431, Cl. 118-203.000.
- Howell, Alleyne C., Jr. Electrification rail and joint construction. 4,106,599, Cl. 191-27.000.
- Howlett, Donald L., to Texaco Inc. System and method for digitally transmitting well logging information. 4,107,644, Cl. 340-18.0CM.
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- Hubers, Cornelis. Method for regulating the driving power of an expansion engine and expansion engine for carrying out this process. 4,106,285, Cl. 60-39.630.
- Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, to Bayer Aktiengesellschaft. Polyurethanes produced from phosphorus containing flame retarding agents which are reactive with isocyanates. 4,107,103, Cl. 528-72.000.
- Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, to Bayer Aktiengesellschaft. Polyurethanes produced from phosphorus containing flame retarding agents which are reactive with isocyanates. 4,107,152, Cl. 528-68.000.
- Hudgell, Robert John, to British Gas Corporation. Eddy current flaw detector utilizing plural sets of four planar coils, with the plural sets disposed in a common bridge. 4,107,605, Cl. 324-220.000.
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- Hughes, Robert D.; and Steigelmann, Edward F., to Standard Oil Company (Indiana). Method of making a semi-permeable, essentially water-insoluble, hydrophilic nylon membrane and resultant product. 4,106,920, Cl. 55-158.000.
- Huizer, Willem, to Shell Oil Company. Air gun firing control. 4,106,585, Cl. 181-107.000.
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- Hulsebusch, Karl-Heinz: *See—*
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  - Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,132, Cl. 260-42.140.
- Hunt, Robert E., to United States of America, Army. Inflatably sealed sterilizer door. 4,106,661, Cl. 220-232.000.
- Hunter, Eric: *See—*
  - Pardoe, John Alan; Etherington, Clifford; and Hunter, Eric, 4,106,320, Cl. 72-256.000.

- Hunter, Lee. Method of and apparatus for determining vehicle wheel alignment. 4,106,208, Cl. 33-288.000.
- Hunter, Robert L.; and Sartain, Everett L., to Modine Manufacturing Company. Heat conserving space heater. 4,106,474, Cl. 126-110.00R.
- Huntington, Robert Charles; and Cooper, James Everett, Jr., to Motorola, Inc. Improved digital to analog converter providing self compensation to offset errors. 4,107,671, Cl. 340-347.0DA.
- Hurd, Deane E. Mathematical teaching aid. 4,106,220, Cl. 35-31.00R.
- Hutcheon, Robert Stewart; and Gordon, Bruce E., to Raytheon Company. Radio frequency signal direction finding system. 4,107,692, Cl. 343-120.000.
- Huyck Corporation: *See—*
  - Fekete, Eugene Zoltan, 4,107,367, Cl. 428-234.000.
- Hvidsten, Jan Hagbert, to Coal Industry (Patents) Limited. Pulse counting apparatus for measuring mechanical movement of a machine such as a mining machine. 4,107,516, Cl. 235-92.0FP.
- Hyde, Glenn F.; and Alban, Thomas W., to Koppers Company, Inc. Ceramic coated piston rings. 4,106,782, Cl. 277-235.00A.
- Hyde, Michael B., to Caterpillar Tractor Co. Tapping strip retainer. 4,106,808, Cl. 296-35.00R.
- Ibrahim, Fayez F. Open well type refrigerated display case with reverse flow of air bands. 4,106,305, Cl. 62-89.000.
- Ibsen, Ole N.: *See—*
  - Anderson, Thomas E.; Ibsen, Ole N.; and Walker, Loren H., 4,107,771, Cl. 363-58.000.
- Ichise, Wataru: *See—*
  - Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, 4,107,565, Cl. 313-174.000.
- ICI Australia Limited: *See—*
  - Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, 4,106,924, Cl. 71-106.000.
- Ideal Toy Corporation: *See—*
  - Carella, Vincent; and Nielsen, Edwin A., 4,106,695, Cl. 238-10.00F.
- Igarashi, Toshiji: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Ihara Chemical Company Co., Ltd.: *See—*
  - Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, 4,107,151, Cl. 528-54.000.
- Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, to Japan Synthetic Rubber Co., Ltd. Photosensitive cross-linkable azide containing polymeric composition. 4,106,943, Cl. 96-115.00R.
- Ikeda, Hisao: *See—*
  - Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.
- Ikezawa, Ryuichi; Sasayama, Atsushi; and Kikuchi, Sakae, to Hitachi, Ltd. Resin sealed semiconductor device. 4,107,727, Cl. 357-72.000.
- Ilines, Laurence James, to C.A. Pemberton & Co. Limited. Device for removing meat hangers from meat. 4,106,174, Cl. 29-239.000.
- Ilko, Eduard Grigorievich: *See—*
  - Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.
- Illinois Tool Works Inc.: *See—*
  - Anderson, Bruce W., 4,106,317, Cl. 70-388.000.
- Image Transform, Inc.: *See—*
  - Lowry, John D.; and Holland, Kenneth F., 4,107,736, Cl. 358-36.000.
- Imahashi, Jinichi: *See—*
  - Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,107,272, Cl. 423-239.000.
- Imamura, Haruo: *See—*
  - Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.
- IMC Chemical Group, Inc.: *See—*
  - Jurisch, Louis A., 4,107,171, Cl. 260-307.0FA.
- Imperial Chemical Industries Limited: *See—*
  - Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,107,329, Cl. 424-317.000.
  - Kennington, Rowland; and Woolhouse, Robin Andrew, 4,107,053, Cl. 252-2.000.
- Imperial Oil Limited: *See—*
  - Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.
- Inai, Yuithi: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, to Teijin Limited; and Teyin Limited. Aromatic polyester carbonate and method for producing the same. 4,107,143, Cl. 528-176.000.
- Indal Product Limited: *See—*
  - Bonello, Alfred, 4,106,238, Cl. 49-382.000.
- Indian Head Inc.: *See—*
  - Forsberg, Charles W., 4,106,154, Cl. 15-244.00R.
- Industrie Pirelli S.p.A.: *See—*
  - Calori, Giovanni, 4,106,888, Cl. 425-577.000.
- Industrie Zignago S. Margherita S.p.A: *See—*
  - Gambaretto, Gian Paolo; and Gottardi, Vittorio, 4,107,388, Cl. 428-428.000.
- Ingersoll-Rand Company: *See—*
  - Black, Arthur L., 4,106,780, Cl. 277-81.00P.
  - Rice, Edwin Eugene; and Vliet, Walter Carl, 4,106,176, Cl. 29-407.000.
- Ingersoll-Rand Research, Inc.: *See—*
  - Kevorkian, Victor; and Cumings, Francis J., 4,106,997, Cl. 201-32.000.
- Ingraham, Glen E. Thermoplastic resinous protective coating on a metallic substrate. 4,107,370, Cl. 428-247.000.
- Innovative Patent Trust: *See—*
  - Shulz, Robert J.; and Kozinczuk, Orest A., 4,107,511, Cl. 219-286.000.
- Inose, Fumiyuki: *See—*
  - Endo, Hirohido; Inose, Fumiyuki; and Komatsu, Akio, 4,107,662, Cl. 340-324.0AD.
- Inoue, Yuuji, to Concast AG. Roller assembly in the guide path of a continuous casting machine for beam blanks. 4,106,551, Cl. 164-448.000.
- Inouye, Alan T.: *See—*
  - Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., 4,106,833, Cl. 339-29.00B.
- Institut Francais Du Petrole: *See—*
  - Dawans, Francois, 4,107,134, Cl. 260-42.170.
- Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
  - Hollweck, Walter, 4,107,638, Cl. 337-131.000.
- International Business Machines Corporation: *See—*
  - Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, 4,106,975, Cl. 156-628.000.
  - Chamberlain, Savvas Georgiou, 4,107,722, Cl. 357-30.000.
  - Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.
  - Drejza, John Edward; and Riley, Joseph Vincent, 4,106,873, Cl. 400-470.000.
  - Galetto, Louis Valentine; and Jensen, Donald Frederick, 4,107,698, Cl. 346-75.000.
  - Jacquart, Christian A.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,107,550, Cl. 307-241.000.
  - Kovac, Zlata; and Sambucetti, Carlos Juan, 4,107,063, Cl. 252-62.520.
  - Lynott, John Joseph, 4,106,667, Cl. 221-1.000.
  - Yao, Ying Luh, 4,107,554, Cl. 307-306.000.
- International Flavors & Fragrances Inc.: *See—*
  - Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,107,184, Cl. 260-347.200.
  - Evers, William J.; and Heinsohn, Howard H., Jr., 4,107,197, Cl. 260-455.00R.
  - Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,107,094, Cl. 252-522.000.
  - Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,066, Cl. 252-132.000.
  - Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,208, Cl. 260-586.00F.
  - Schreiber, William L.; and Pittet, Alan O., 4,107,217, Cl. 260-615.00A.
  - Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
  - Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, 4,107,209, Cl. 260-586.00R.
- International Harvester Company: *See—*
  - Carey, Thomas A.; and Ridge, George W., 4,106,271, Cl. 56-119.000.
- International Lead Zinc Research Organization, Inc.: *See—*
  - Ward, John Joseph Bernard; and Barnes, Clive, 4,107,004, Cl. 204-51.000.
- International Med-Electronics, Inc.: *See—*
  - Zenitani, Toshio, 4,107,538, Cl. 250-480.000.
- International Standard Electric Corporation: *See—*
  - Barton, Paul, 4,107,686, Cl. 343-106.00R.
- International Telephone & Telegraph Corp.: *See—*
  - Reed, Joseph, 4,107,471, Cl. 179-15.0FD.
- Inui, Taiji: *See—*
  - Sakai, Akira; Inui, Taiji; and Yokoi, Yasuaki, 4,106,286, Cl. 60-39.18B.
- Inukai, Mitsuo; and Hayashi, Yoshihiro, to K. K. Tokai Rika Denki Seisakusho. Device for preventing excessive tightness of seatbelts. 4,106,722, Cl. 242-107.700.
- Ioria, Joseph A.: *See—*
  - Horowitz, Carl; Dichter, Michael; Duryodhan, Mangara J.; and Ioria, Joseph A., 4,107,228, Cl. 260-836.000.
- Iorio, Joseph A.: *See—*
  - Horowitz, Carl; Mangaraj, Duryodham; and Iorio, Joseph A., 4,106,955, Cl. 148-6.000.
- Irani, Joseph H.: *See—*
  - Sultanian, Ishkhan V.; and Irani, Joseph H., 4,107,284, Cl. 424-1.000.
- Irie, Tomoyuki: *See—*
  - Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, 4,106,430, Cl. 118-64.000.
- Ironfield, Richard, to Raytheon Company. Microwave oven control system. 4,107,501, Cl. 219-10.55B.
- Irvin Industries Inc.: *See—*
  - Petersen, Carl Mogens, III, 4,107,484, Cl. 200-42.00T.
- Irwin, Robert M. Elevated loading platform. 4,106,150, Cl. 14-71.300.
- Isaka, Yukio Inagi,: *See—*
  - Masaki, Katsumi; and Isaka, Yukio Inagi,, 4,107,786, Cl. 364-900.000.

Isayama, Riyoiti: *See*—
Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, 4,107,249, Cl. 264-68.000.

Ishibashi, Keijiro, to Sankyo Company Limited. Compositions for cleaning teeth and oral cavity. 4,107,291, Cl. 424-48.000.

Ishida, Yotsuo; and Kuwahara, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha; and Tokyo Electric Power Co., Inc., The. Discharge gap device. 4,107,754, Cl. 361-120.000.

Ishihara, Kazuo: *See*—
Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, 4,106,998, Cl. 201-39.000.

Ishihara Sangyo Kaisha Ltd.: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,106,925, Cl. 71-108.000.

Ishikawa, Takashi. Granulated fire retardant materials. 4,107,376, Cl. 428-306.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Tsuchida, Yutaka, 4,106,550, Cl. 164-448.000.

Ishino, Hiroshi, to Oki Electric Industry Co., Ltd. Logic circuit for a semiconductor integrated circuit. 4,107,547, Cl. 307-203.000.

Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, to Tokyo Shibaura Electric Co., Ltd. Mercury emitting structure. 4,107,565, Cl. 313-174.000.

Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See*—
Szabolcs, Otto; and Schuller, Hans, 4,107,409, Cl. 526-65.000.

Itek Corporation: *See*—
Sprague, Robert A.; and MacGovern, Alan J., 4,107,701, Cl. 346-108.000.

Itoh, Norio: *See*—
Shimada, Satoshi; and Itoh, Norio, 4,106,866, Cl. 353-29.000.

Itoh, Yasuo: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Ivey, John Saxon, to Borg-Warner Corporation. Transmission control system. 4,106,368, Cl. 74-866.000.

Iwai, Yuzuru: *See*—
Omura, Satoshi; Iwai, Yuzuru; and Hirano, Atsushi, 4,107,297, Cl. 424-122.000.

Iwasaki, Hajime; and Tomita, Yasuo, to Mitsuboshi Sangyo Co., Ltd. Bulky asphalt-impregnated sheet having different properties on both surfaces. 4,107,375, Cl. 428-291.000.

Iwasaki, Masaatsu: *See*—
Higuchi, Shigetaka; Iwasaki, Masaatsu; and Kimura, Shigeo, 4,107,385, Cl. 428-412.000.

Iwasaki, Yoshiki: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Iwata, Nobuo: *See*—
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Iwata, Shigehisa, to Nippon Electric Co., Ltd. Circuit for digitally computing exposure control information. 4,107,704, Cl. 354-23.00D.

Izumi, Sachio; and Kotani, Tamotsu, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method and apparatus for welding using fillet-wire. 4,107,508, Cl. 219-137.700.

Izumikawa, Akira, to Victor Company of Japan, Limited. Cassette holder capable of rotation through a larger angle of inclination. 4,107,753, Cl. 360-137.000.

J. I. Case Company: *See*—
Fiala, George T., 4,106,818, Cl. 303-11.000.
Lundy, Richard W., 4,106,631, Cl. 212-144.000.
Siems, Gerald Eugene, 4,106,592, Cl. 184-25.000.

J. & P. Coats Limited: *See*—
Aitken, John; and Graham, William Eric, 4,106,902, Cl. 8-181.000.

J. Uriach & Cia. S.A.: *See*—
Agusti, Agustin, 4,107,161, Cl. 260-239.55D.

Jack, Clyde A.; and Dargan, Evander E. Assembly miter joint. 4,106,254, Cl. 52-574.000.

Jackson, George, to British Steel Corporatiop. Hover furnaces. 4,106,757, Cl. 266-103.000.

Jacobs, Norman A., to Teletype Corporation. Step motor velocity control. 4,107,594, Cl. 318-685.000.

Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread feeder for textile machines. 4,106,713, Cl. 242-47.010.

Jacquart, Christian A.; Leighton, Howard N.; and Wilfinger, Raymond J., to International Business Machines Corporation. Bucket brigade circuits. 4,107,550, Cl. 307-241.000.

Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, to L'Oreal. Anti-solar polymers, method of making the same and cosmetic compositions containing the same. 4,107,290, Cl. 424-47.000.

Jaffe, Wolfgang: *See*—
Herr, John A.; and Jaffe, Wolfgang, 4,107,591, Cl. 318-663.000.

Jager, Horst: *See*—
Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, 4,107,186, Cl. 260-351.000.

Jagt, Leonard J.: *See*—
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Jakobsen, William, to Lourdes Industries, Inc. Apparatus for pneumatically communicating with a pressurized cable. 4,107,454, Cl. 174-135.000.

Jalil, Asjed A.; and Rich, C. Allen, to Morgan Construction Company. Vane-type nozzle assembly. 4,106,519, Cl. 134-122.00R.

James, Edward Anthony; and Kuznetzoff, Philip, to RCA Corporation. Method of depositing or repairing a patterned metal layer on a substrate. 4,107,351, Cl. 427-43.000.

James, Joseph W. Apparatus for indicating the angle of a drafting parallel. 4,106,202, Cl. 33-80.000.

James, Robert Arthur: *See*—
Gubitose, Nicholas Francis; and James, Robert Arthur, 4,106,532, Cl. 140-147.000.

Janes, George Sargent: *See*—
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Janish, Rudolph G. Means for quick attachment of implement to a tractor. 4,106,645, Cl. 214-145.00A.

Jankowski, Albert J.: *See*—
Lewis, Donald J.; and Jankowski, Albert J., 4,107,645, Cl. 340-52.00E.

Jansen, Willi: *See*—
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,107,036, Cl. 210-21.000.

Jansky, John: *See*—
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Jansson, Gunnar, to Allmanna Svenska Elektriska Aktiebolaget. Method of and composition for manufacturing an object of cross-linked polymer. 4,107,245, Cl. 264-40.100.

Jansson, K. Sigvard: *See*—
Sigfridsson, F.S. Meinrad; and Jansson, K. Sigvard, 4,106,538, Cl. 144-309.00R.

Janzen, Harlo W. Wire reeling apparatus. 4,106,714, Cl. 242-54.00R.

Japan Air Lines, Co., Ltd.: *See*—
Mihirngi, Kiyoshi, 4,106,600, Cl. 191-59.100.

Japan Synthetic Rubber Co., Ltd.: *See*—
Ikeda, Hiroharu; Aotani, Seiji; and Harita, Yoshiyuki, 4,106,943, Cl. 96-115.00R.

Jarvis, Charles Richard: *See*—
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.

Jasiewicz, Theodore M.: *See*—
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Jasper, Ezekiel: *See*—
Henlis, Lawrence Philip, 4,106,454, Cl. 123-122.00F.

Jasper, Harvey: *See*—
Henlis, Lawrence Philip, 4,106,454, Cl. 123-122.00F.

Jatsch, Werner: *See*—
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Jautelat, Manfred: *See*—
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Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, to GTE Sylvania Inc. Stackable flat cable connector and contact therefor. 4,106,838, Cl. 339-99.00R.

Jegelka, Johann Friedrich. Production of articles of foamed plastics material. 4,106,884, Cl. 425-345.000.

Jellinek, Ernest, to RCA Corporation. System for automatic vehicle location. 4,107,689, Cl. 343-112.0TC.

Jenaer Glaswerk Schott & Gen.: *See*—
Ritze, Willi, 4,106,946, Cl. 106-52.000.

Jencks, Charles L.; and Castonguay, Roger N., to General Electric Company. Arc chute assembly. 4,107,497, Cl. 200-144.00R.

Jenkins, James R., to Rockwell International Corporation. Multiplex/-demultiplex apparatus. 4,107,469, Cl. 179-15.0BW.

Jenkins, Jonathan Moubray; and Henson, Kenneth, to Unigate Limited. Electro-chemical cells. 4,107,397, Cl. 429-27.000.

Jensen Corporation: *See*—
Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymood T., 4,106,227, Cl. 38-143.000.

Jensen, Donald Frederick: *See*—
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Jentsch, Hans G. Apparatus for volume dosing compressible, lumpy material. 4,106,160, Cl. 17-32.000.

Jerome Industries Corporation: *See*—
DiGirolamo, John, 4,107,636, Cl. 336-92.000.

Jerome, Robert J.; and Baum, Art. Well casing perforator. 4,106,561, Cl. 166-55.200.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Forsen, Harold K.; Janes, George Sargent; and Levy, Richard H., 4,107,537, Cl. 250-423.00P.

Jeser, Jean-Pierre: *See*—
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Jetco, Inc.: *See*—
Davis, Bill G., 4,106,468, Cl. 123-196.00S.

Jewell, Thomas John: *See*—
Webster, John David; and Jewell, Thomas John, 4,107,254, Cl. 264-270.000.

Jewett, Harvey R., to United States of America, Navy. Explosively-separated tongue and groove joint. 4,106,875, Cl. 403-2.000.

John GmbH: *See*—
Gruber, Ludwig, 4,106,425, Cl. 115-42.000.

Johns Hopkins University, The: *See*—
Luke, Perry J.; Machamer, James L.; and Becraft, William A., 4,107,650, Cl. 340-146.1AL.

Johnson, Arthur L., Jr.; and Dodge, Marlow W., to Johnson Enterprises, Inc. Hand-operated pump. 4,106,392, Cl. 92-128.000.

Johnson, Clark E., Jr., to Micro Communications Corporation. High density magnetic storage disc comprising a spiral of magnetic tape. 4,107,752, Cl. 360-135.000.

Johnson, Clifford Carl; and Eitzen, Vincent Elliott, to American Hospital Supply Corporation. Electronic order placement system using signals over telephone line. 4,107,467, Cl. 179-2.0DP.

Johnson, Derwyn C.: *See*—
Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., 4,107,628, Cl. 331-94.50N.

Johnson, Donald E. Protective cap assembly for an exhaust pipe. 4,106,290, Cl. 60-324.000.

Johnson Enterprises, Inc.: *See*—
Johnson, Arthur L., Jr.; and Dodge, Marlow W., 4,106,392, Cl. 92-128.000.

Johnson, Homer R.: *See*—
Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., 4,107,084, Cl. 252-445.000.

Johnson & Johnson: *See*—
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Johnson, Lewis T.: *See*—
Carroll, James C.; and Johnson, Lewis T., 4,106,623, Cl. 206-506.000.
Carroll, James C.; and Johnson, Lewis T., 4,106,625, Cl. 206-507.000.

Johnson, Marshall B., to Wear-Ever Aluminum, Inc. Apparatus for placing comestibles in dispensing mechanism. 4,106,534, Cl. 141-18.000.

Jolly, Ramesh C., to Pfizer Inc. Modified protein. 4,107,334, Cl. 426-7.000.

Jones, Eugene C., to American Hospital Supply Corporation. Container with side sealing closure and method of forming the seal thereof. 4,106,654, Cl. 215-329.000.

Jones, Gary A., to Zenith Radio Corporation. Signal strength responsive sound trap. 4,107,730, Cl. 358-37.000.

Jones, Paul H., to National Rolling Mills Company. Fire-rated ceiling grid cross joint. 4,106,878, Cl. 403-28.000.

Jones, Thornton K.: *See*—
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,106,958, Cl. 148-23.000.

Jornod, Eugene R., to Barber-Colman Company. Fanfold paper transport. 4,107,700, Cl. 346-76.00R.

Jos. Schneider & Co. Optische Werke: *See*—
Raab, Karl-Heinz, 4,107,714, Cl. 354-196.000.

Joslyn Mfg. and Supply Co.: *See*—
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Jost, Walter P., Jr.: *See*—
Brundage, Richard B.; Jost, Walter P., Jr.; and Burroughs, Mortimer P., 4,107,635, Cl. 336-45.000.

Jouret, Edouard Leon Clement, to Crouzet. Timer switch assembly having centrifugal displacement mechanism. 4,107,483, Cl. 200-35.00R.

Joy Manufacturing Company: *See*—
Bailey, Edward A., 4,106,573, Cl. 173-106.000.

Joyce, Thomas F.; and Raguin, Michel M., to Honeywell Information Systems Inc. Microprogram splatter return apparatus. 4,107,774, Cl. 364-200.000.

Jukkola, Walfred Wilhelm, to Dorr-Oliver Incorporated. Solids discharge system with cooling means for pressurized fluid bed reactors. 4,106,210, Cl. 34-10.000.

Julien, Christian: *See*—
Proux, Yves; and Julien, Christian, 4,107,137, Cl. 260-45.85T.

Jurisch, Louis A., to IMC Chemical Group, Inc. Alkanolamine derivatives. 4,107,171, Cl. 260-307.0FA.

K. K. Tokai Rika Denki Seisakusho: *See*—
Inukai, Mitsuo; and Hayashi, Yoshihiro, 4,106,722, Cl. 242-107.700.

Kabel-und Metallwerke Gutehoffnungshutte AG.: *See*—
Albrecht, Werner, 4,106,831, Cl. 339-8.00R.

Kabushiki Kaisha Daini Seikosha: *See*—
Yamashita, Shiro, 4,106,283, Cl. 58-152.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Furuto, Takashi, 4,106,147, Cl. 10-25.000.
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Yasuda, Hirofumi, 4,106,278, Cl. 58-23.00A.

Kabushiki Kaisha Terauchi Seisakusho: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Asano, Chihiro; Hikita, Shigeyuki; and Kato, Kunio, 4,107,640, Cl. 338-23.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,106,459, Cl. 123-141.000.
Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.

Kagan, Sholly: *See*—
Percy, Roger D.; Wilding, David C. M.; and Kagan, Sholly, 4,107,734, Cl. 358-84.000.

Kagawa, Fumio; and Aoki, Norimichi, to Showa Denko K. K. Abrader for mirror polishing of glass. 4,106,915, Cl. 51-296.000.

Kai, Toshio: *See*—
Tanaka, Junzo; and Kai, Toshio, 4,107,502, Cl. 219-10.55F.

Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; by Plattner, Werner, administrator; and Voightlander, Wolfgang, to Boehringer Mannheim GmbH. Cardioactive 12-epi-digoxin and derivatives thereof. 4,107,299, Cl. 424-182.000.

Kaiser, Gerhard, to Gustav Wagner Maschinenfabrik. Apparatus for avoiding play in the drive of a circular saw. 4,106,378, Cl. 83-74.000.

Kaiser, Klaus: *See*—
Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.

Kajima Corporation: *See*—
Gerwick, Ben C., Jr., 4,106,301, Cl. 61-86.000.

Kali-Chemie: *See*—
Hauschild, Ulrich; and Roetger, Heinrich, 4,106,922, Cl. 71-42.000.

Kamata, Akira: *See*—
Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.

Kamath, G. Sanjiv, to Hughes Aircraft Company. High bandgap window layer for GaAs solar cells and fabrication process therefor. 4,107,723, Cl. 357-30.000.

Kamei, Tatsuya: *See*—
Naito, Masayoshi; and Kamei, Tatsuya, 4,107,731, Cl. 357-64.000.

Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, to Nippon Kasei Chemical Co., Ltd. Adhesive composition rapidly hardenable at room temperature. 4,107,119, Cl. 260-29.4UA.

Kameyama, Toshiaki: *See*—
Tani, Tatsuo; and Kameyama, Toshiaki, 4,106,763, Cl. 271-9.000.

Kaminishi, Masashi: *See*—
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.

Kamiuchi, Junichi: *See*—
Akiyama, Keüchi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,107,153, Cl. 528-322.000.

Kamp, Lars Ragnar: *See*—
Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, 4,107,253, Cl. 246-182.00B.

Kanao, Mitsuhiro. Internal combustion engine. 4,106,439, Cl. 123-75.00B.

Kaneko, Yasuhisa: *See*—
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.

Kanie, Takashi: *See*—
Tanahashi, Jun'ichi; and Kanie, Takashi, 4,107,652, Cl. 340-146.1AL.

Kanner, Bernard: *See*—
Prokai, Bela; and Kanner, Bernard, 4,107,068, Cl. 252-182.000.

Kanno, Hideyuki, to Tomy Kogyo Co., Inc. Amusement device. 4,106,768, Cl. 273-1.00M.

Kanno, Tomoei; Watanabe, Hiroaki; and Sano, Shohachiro, to Showa Sangyo Co. Ltd. Method of isomerizing glucose to fructose. 4,106,987, Cl. 195-31.00F.

Kano, Tamotsu: *See*—
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.

Kansai Paint Company, Limited: *See*—
Nakayama, Yasuharu; Hirata, Nobuhito; and Yamashita, Yoshio, 4,107,114, Cl. 260-22.0CB.

Kanzaki, Hidetosi: *See*—
Hosoi, Keizo; Endo, Tadayoshi; and Kanzaki, Hidetosi, 4,107,128, Cl. 260-40.00R.

Kaplan, Gerald Stanley, to RCA Corporation. Digitally processed radar speed sensor. 4,107,680, Cl. 343-8.000.

Kaplan, Neil B. Vehicle antitheft system. 4,107,543, Cl. 307-10.0AT.

Karady, Sandor: *See*—
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.

Karden, Karl Gosta; and Berger, Karl Gustav, to Atlas Copco Aktiebolag. Safety valve for pneumatic tools. 4,106,750, Cl. 251-282.000.

Karges, Hermann Erich; and Heimburger, Norbert, to Behringwerke Aktiengesellschaft. Quantitative determination of antithrombin III. 4,106,990, Cl. 195-63.000.

Karlson, Eskil. Electromatographic separating apparatus and system. 4,107,041, Cl. 210-198.00C.

Karoly, Gabriel; and Gardon, John L., to American Can Company. Method for photopolymerization of pigmented epoxide compositions. 4,107,353, Cl. 427-54.000.

Kaspar, Don G., to Kaspar Wire Works, Inc. Removable front panel. 4,106,609, Cl. 194-1.00B.

Kaspar Wire Works, Inc.: *See*—
Kaspar, Don G., 4,106,609, Cl. 194-1.00B.

Kassal, Robert James, to Du Pont de Nemours, E. I., and Company. Reactive compositions and polymers made therefrom. 4,107,109, Cl. 260-4.00R.

Kasuga, Toshishige: *See*—
Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, 4,106,641, Cl. 214-15.00R.

Kasuya, Takanori: *See*—
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.

Kataoka, Hiroshi: *See*—
Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Nanto, 4,106,887, Cl. 425-549.000.

Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, to Agency of Industrial Science & Technology. Bulk semiconductor logic device. 4,107,718, Cl. 357-3.000.

Katayama, Hajime: *See*—
Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.

- Katchka, Jay R., to Robertshaw Controls Company. Burner ignition system. 4,106,889, Cl. 431-46.000.
- Kato, Kunio: *See—*
  - Asano, Chihiro; Hikita, Shigeyuki; and Kato, Kunio, 4,107,640, Cl. 338-23.000.
- Katsevich, Leonid Savvich: *See—*
  - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
  - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
- Kaufman, Jerome G., to Naarden International Holland, B.V. Use of substituted pyrans as deodorant chemicals. 4,107,289, Cl. 424-45.000.
- Kaufmann, Frank H., to Steel Heddle Manufacturing Company. Heddle frame. 4,106,529, Cl. 139-92.000.
- Kaufmann, Frank H. Heddle frame. 4,106,530, Cl. 139-92.000.
- Kaufmann, Meinolph, to BBC Brown Boveri & Company Limited. Liquid-crystal cell. 4,106,860, Cl. 350-343.000.
- Kaufmann, Meinolph: *See—*
  - Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.
- Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, to Fujitsu Limited. Gas discharge panel drive system. 4,107,578, Cl. 315-169.0TV.
- Kawaharada, Minoru: *See—*
  - Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.
- Kawanami, Mitsuru; Okuhara, Shinzi; and Mukaemachi, Takuzi, to Hitachi, Ltd. Semiconductor channel switch. 4,107,472, Cl. 179-18.0GF.
- Kawasaki, Brian S.: *See—*
  - Hill, Kenneth O.; Kawasaki, Brian S.; and Johnson, Derwyn C., 4,107,628, Cl. 331-94.50N.
- Kawase, Shoji: *See—*
  - Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.
- Kawawa, Shigenobn: *See—*
  - Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.
- Kayser-Roth Corporation: *See—*
  - Gebhardt, Roland; and Gersin, Robert P., 4,106,668, Cl. 221-131.000.
- Keane, Francis Xavier. Hospital beds. 4,107,490, Cl. 200-52.00R.
- Keenan, William Douglas Sulman: *See—*
  - Zurbrigg, Charles Edward; and Keenan, William Douglas Sulman, 4,106,120, Cl. 2-51.000.
- Kellems, Kenneth K.; and Brydolf, Robert, to Acme General Corporation. Adjustable height door pivot. 4,106,158, Cl. 16-129.000.
- Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, to M&T Chemicals Inc. Storage-stable precursors for rigid polyurethane foams. 4,107,069, Cl. 252-182.000.
- Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., to Gould Inc. Platform mounted switch operating mechanism. 4,107,488, Cl. 200-50.00A.
- Kellermeyer, Janet R.; and Alexander, Jay M. Blockage prevention device for body fluid collection systems. 4,106,507, Cl. 128-295.000.
- Kelly, Robert C., to Upjohn Company, The. Process and intermediates for preparing Thromboxane B_1. 4,107,427, Cl. 542-427.000.
- Kemnitz, Robert H., to Allis-Chalmers Corporation. Feed distributor for gyratory crusher. 4,106,707, Cl. 241-202.000.
- Kemp, Horace N.: *See—*
  - Hartbauer, Ellsworth A.; Weis, Rudolf R.; and Kemp, Horace N., 4,106,684, Cl. 226-91.000.
- Kendall Company, The: *See—*
  - McWhorter, Daniel M., 4,106,509, Cl. 128-349.00B.
  - Taylor, Glenn N., 4,106,675, Cl. 222-556.000.
- Kennecott Copper Corporation: *See—*
  - Lueders, Robert E.; Kust, Roger N.; and Davies, David S., 4,107,262, Cl. 423-32.000.
- Kennedy, Harold L., to Del Mar Avionics. Vectorcardiographic method for ambulatory patients. 4,106,495, Cl. 128-2.06V.
- Kennedy, James: *See—*
  - Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,107,431, Cl. 544-16.000.
- Kennington, Rowland; and Woolhouse, Robin Andrew, to Imperial Chemical Industries Limited. Preparation of the reaction product of urea and alkali metal hydroxide or carbonate. 4,107,053, Cl. 252-2.000.
- Kenworthy, E. J. Doyle, to Mead Corporation, The. Trenched stimulating plate. 4,107,699, Cl. 346-75.000.
- Kermisch, Dorian: *See—*
  - Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.
- Kessler, Erich; Hassemer, Georg; and Weber, Paul, to Fried. KRUPP Gesellschaft mit beschrankter Haftung. Cooling tower. 4,106,244, Cl. 52-63.000.
- Kevorkian, Victor; and Cumings, Francis J., to Ingersoll-Rand Research, Inc. Methods for converting coal to a plastic-like condition and feeding same to a receiver. 4,106,997, Cl. 201-32.000.
- Khera, Surjit Singh, to Battelle Development Corporation. Catalyst for synthesizing a gaseous hydrocarbon mixture having a high methane content from carbon monoxide and hydrogen. 4,107,091, Cl. 252-466.00J.
- Kiefer, Richard J. Static eliminator and ion discharge means therefor. 4,107,755, Cl. 361-220.000.
- Kievits, Anton, to N. V. Bekaert S.A. Body supporting furniture frame. 4,106,140, Cl. 5-191.000.
- Kiewit, David A., to Gould Inc. Digital output force sensor using surface acoustic waves. 4,107,626, Cl. 331-65.000.
- Kihara, Kunio: *See—*
  - Tamura, Noriyoshi; and Kihara, Kunio, 4,107,098, Cl. 521-25.000.
- Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, to Eisai Co., Ltd. Polyprenyl carboxylic acid compound. 4,107,193, Cl. 260-410.000.
- Kikuchi, Sakae: *See—*
  - Ikezawa, Ryuichi; Sasayama, Atsushi; and Kikuchi, Sakae, 4,107,727, Cl. 357-72.000.
- Kildal, Helge; and Brueck, Steven R. J., to Massachusetts Institute of Technology. Two-photon resonant laser mixing in molecular liquids. 4,107,544, Cl. 307-88.300.
- Kilgore, Bevil J.: *See—*
  - McDowell, Robert, 4,107,789, Cl. 366-3.000.
- Kim, Sung Baik. Rigidized shaft construction for sports apparatus. 4,106,777, Cl. 273-80.00B.
- Kimball International, Inc.: *See—*
  - Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., 4,106,384, Cl. 84-1.190.
- Kimm, Herbert J. Electrical wire connecting device for junction box. 4,106,835, Cl. 339-95.00D.
- Kimura, Shigeo: *See—*
  - Higuchi, Shigetaka; Iwasaki, Masaatsu; and Kimura, Shigeo, 4,107,385, Cl. 428-412.000.
- Kimura, Toshihiko; and Nakayama, Tsuneo, to Akebono Brake Company, Ltd. Disc brake caliper and supporting member. 4,106,595, Cl. 188-73.300.
- King, J. Frank, to Hanes Corporation. Article folding and packaging system. 4,106,260, Cl. 53-21.0FW.
- King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, to Pennwalt Corporation. Polymer of 1,2,4-thiadiazole and lubricants containing it as an additive. 4,107,059, Cl. 252-28.000.
- Kinzler, Raymond Carl, to Koppers Company, Inc. High pressure water cleaner for ascension pipes. 4,107,001, Cl. 202-241.000.
- Kirk, Donald W.: *See—*
  - Beston, George H.; and Kirk, Donald W., 4,107,344, Cl. 426-625.000.
- Kirkland, James L., to United States of America, Navy. Magnetometer using a field controlled oscillator, the oscillator core being maintained near its Curie point. 4,107,607, Cl. 324-253.000.
- Kirsch, Andrew F.; and Koob, Robert W., to Westinghouse Electric Corp. Elevator system. 4,106,594, Cl. 187-29.00R.
- Kirsch, Jerry. Laser workpiece position and presence inspector and machine control governor. 4,107,539, Cl. 250-561.000.
- Kirsch, Jerry. Workpiece hole presence and absence inspector. 4,107,541, Cl. 250-571.000.
- Kitasato Institute, The: *See—*
  - Omura, Satoshi; Iwai, Yuzuru; and Hirano, Atsushi, 4,107,297, Cl. 424-122.000.
- Klauke, Erich: *See—*
  - Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, 4,107,186, Cl. 260-351.000.
- Klaus, Heck, to Audi Nsu Auto Union Aktiengesellschaft. Process for production of oil control rings. 4,106,977, Cl. 156-645.000.
- Klimin, Alexandr Ivanovich; Mostovsky, Alexandr Alexeevich; and Nemchenok, Rafail Lvovich. Photoemitter. 4,107,564, Cl. 313-94.000.
- Klisch, Stephen Cajetan; and Martin, Charles Andrew, to Colgate-Palmolive Company. Liquid olefin sulfonate detergent compositions containing anti-gelling agents. 4,107,095, Cl. 252-541.000.
- Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
  - Kohler, Wolfgang, 4,106,458, Cl. 123-139.0AT.
  - Zenker, Walter; and Hulsebusch, Karl-Heinz, 4,106,364, Cl. 74-740.000.

- Kloster, William R.; and Stewart, Patrick H., to C L Industries Inc. Method of automatic mold and core forming. 4,106,545, Cl. 164-18.000.
- Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, to Robert Bosch GmbH. Method and apparatus for addressing a digital memory. 4,107,717, Cl. 364-431.000.
- Klug, Anton L. Device for completing an electric circuit or the like for a lock or the like. 4,107,485, Cl. 200-43.000.
- Knapik, H. Peter G.: *See—*
  - Adams, Frank H.; and Knapik, H. Peter G., 4,107,083, Cl. 252-439.000.
- Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, to Duetsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for preventing caking and obtaining flowability of alkali chlorides and salt mixtures thereof. 4,107,274, Cl. 423-268.000.
- Knudson, Henry T., to Allis-Chalmers Corporation. Adjustable ground roller for mower. 4,106,269, Cl. 56-15.800.
- Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, to Canon Kabushiki Kaisha. Electrostatic printing method. 4,106,409, Cl. 101-426.000.
- Kobayashi, Nobuyuki: *See—*
  - Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.
- Kobayashi, Yukinari: *See—*
  - Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.
- Kobe Steel, Ltd.: *See—*
  - Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, 4,107,024, Cl. 204-275.000.
- Koch, Kjell, to Aktiebolaget Tudor. Battery and grid for positive electrode for lead storage batteries. 4,107,407, Cl. 429-225.000.
- Kochs, H. W., Jr.: *See—*
  - Oliphant, Howard G., 4,106,236, Cl. 49-141.000.
- Kodaira, Hiroshi; and Masuda, Mitsuo, to Kuroda Seiko Co., Ltd. Pneumatic linear actuator. 4,106,390, Cl. 91-42.000.
- Kodera, Hiroshi: *See—*
  - Kataoka, Shoei; Hashizume, Nobuo; and Kodera, Hiroshi, 4,107,718, Cl. 357-3.000.
- Koehn, Elizabeth M., executrix: *See—*
  - Koehn, Wilbur R., deceased; Koehn, Elizabeth M., executrix; and Ellenoff, Theodore, executor, 4,106,506, Cl. 128-214.400.
- Koehn, Wilbur R., deceased; Koehn, Elizabeth M., executrix; and Ellenoff, Theodore, executor. Catheter. 4,106,506, Cl. 128-214.400.
- Koen, David Matveevich: *See—*
  - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich: Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
- Koerner, Heinz Albrecht, to MBI Corporation. Gripper for case unloader. 4,106,612, Cl. 198-479.000.
- Koert, James M.: *See—*
  - Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., 4,106,994, Cl. 195-80.00R.
- Kohler, Wolfgang, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injector. 4,106,458, Cl. 123-139.0AT.
- Kojima, Chiaki: *See—*
  - Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,107,729, Cl. 358-4.000.
- Kojima, Toshifumi: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
- Kolb, Robert W.: *See—*
  - Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, 4,107,368, Cl. 428-245.000.
- Kolesnikova, Galina Prokofievna: *See—*
  - Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.
- Koller, Thomas J.; and Randmer, Jacob A., to Machlett Laboratories, Inc., The. X-ray beam generator. 4,107,562, Cl. 313-59.000.
- Kolomeichuk, Alexandr Ivanovich: *See—*
  - Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Oalina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.
- Komatsu, Akio: *See—*
  - Endo, Hirohido; Inose, Fumiyuki; and Komatsu, Akio, 4,107,662, Cl. 340-324.0AD.
- Komiya, Yutaka: *See—*
  - Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.
- Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, to Ajinomoto Co., Inc. Thermostable cellulase and a method for producing the same. 4,106,989, Cl. 195-62.000.
- Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Color electrophotographic method and apparatus. 4,106,870, Cl. 355-4.000.
- Kondo, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for moving curved plate bent in a substantially arcuate-shape along curved path. 4,106,353, Cl. 74-45.000.
- Kondo, Shinichi: *See—*
  - Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,107,424, Cl. 536-10.000.
- Konig, Eberhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Bis-(isocyanatopropyl) arylacetonitriles. 4,107,199, Cl. 260-465.00D.
- Konig, Eberhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Bis-(aminopropyl) arylacetonitriles and preparation thereof. 4,107,200, Cl. 260-465.00E.
- Konig, Hans-Bodo: *See—*
  - Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.
- Konishiroku Photo Industry Co., Ltd.: *See—*
  - Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, 4,107,062, Cl. 252-62.10P.
- Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, to Kurosaki Refractories Co., Ltd. Apparatus for repairing the furnace lining with a spray pipe of non-circular hollow cross section. 4,106,760, Cl. 266-281.000.
- Konrad, Frederick Miller; and Mason, Stephen Howard, to Union Carbide Corporation. Decoloration of bisphenol-A recycle stream with cation exchange resin. 4,107,218, Cl. 560-724.000.
- Koob, Robert W.: *See—*
  - Kirsch, Andrew F.; and Koob, Robert W., 4,106,594, Cl. 187-29.00R.
- Kool, Boris: *See—*
  - Cormack, Alexander D.; and Kool, Boris, 4,106,778, Cl. 277-9.500.
- Kopecny, Miroslav: *See—*
  - Maler, Josef; Fischer, Evzen; Losert, Miloslav; and Kopecny, Miroslav, 4,106,312, Cl. 66-50.00R.
- Kopera, Joseph J., to Chrysler Corporation. Hall effect electronic ignition control unit with automatic shut-down timer. 4,106,460, Cl. 123-146.50D.
- Koppelman, Edward; and Murray, Robert G., to Koppelman, Edward. Continuous thermal reactor. 4,106,999, Cl. 202-118.000.
- Koppers Company, Inc.: *See—*
  - Curtis, John Markley, Jr.; and Shepler, Paul Roberts, 4,106,463, Cl. 123-193.00P.
  - Hayduk, Harry Nicholas, 4,106,642, Cl. 214-18.00R.
  - Hyde, Glenn F.; and Alban, Thomas W., 4,106,782, Cl. 277-235.00A.
  - Kinzler, Raymond Carl, 4,107,001, Cl. 202-241.000.
- Korf, Heinz Ludwig, to Rapperswill Corporation. Cellular urea-formaldehyde resin and method of preparing the same. 4,107,105, Cl. 521-80.000.
- Korolev, Georgy Vladimirovich: *See—*
  - Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.
- Koseki, Teruo: *See—*
  - Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, 4,107,129, Cl. 260-40.00P.
- Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, to Nippon Kokan Kabushiki Kaisha. Method for eliminating residual magnetism in pipe-blank for welded steel pipe longitudinally seam-welded from inside. 4,107,503, Cl. 219-61.000.
- Kosovtsev, Vladimir Vasilievich: *See—*
  - Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.
- Kostecky, James F., to Bethlehem Steel Corporation. Base bracket for shelving. 4,106,738, Cl. 248-235.000.
- Koszarewski, Zbigniew: *See—*
  - Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.
- Kotabe, Munenori; and Nomura, Yasuji, to Hitachi, Ltd. X-ray apparatus utilizing rotary anode type X-ray tubes. 4,107,535, Cl. 250-406.000.
- Kotani, Tamotsu: *See—*
  - Izumi, Sachio; and Kotani, Tamotsu, 4,107,508, Cl. 219-137.700.
- Kotov, Evgeny Pavlovich: *See—*
  - Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova,

Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.

Kountz, Jack Merriel: *See—*
Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.

Kovac, Zlata; and Sambucetti, Carlos Juan, to International Business Machines Corporation. Water based selectable charge magnetic inks. 4,107,063, Cl. 252-62.520.

Koyama, Fujimasa: *See—*
Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.

Koyanagi, Haruo: *See—*
Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

Kozinczuk, Orest A.: *See—*
Shulz, Robert J.; and Kozinczuk, Orest A., 4,107,511, Cl. 219-286.000.

Kozulla, Robert E., to Weatherhead Company, The. Disposable centrifugal separator. 4,106,689, Cl. 233-23.00R.

Kramer, Friedhelm: *See—*
Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm, 4,107,042, Cl. 210-225.000.

Kramer, Fritz. Apparatus for spraying plastic foam. 4,107,075, Cl. 252-359.00E.

Krascella, Nicholas Leo: *See—*
Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, 4,107,010, Cl. 204-129.000.

Kraus, Edmund Joseph: *See—*
Kraus, Robert August; and Kraus, Edmund Joseph, 4,106,370, Cl. 73-88.00F.

Kraus, Robert August; and Kraus, Edmund Joseph. Electric infinite-range load-sensing transducer. 4,106,370, Cl. 73-88.00F.

Kravitz, Hilard L. Dietary salt compositions. 4,107,346, Cl. 426-648.000.

Kravitz, Jerome H. Solar panel unit. 4,106,952, Cl. 136-89.0HY.

Krawagna, Alois, to Sports Technology Inc. Golf swing practice base. 4,106,772, Cl. 273-186.00R.

Kreitz, Lloyd D. Extension table for table saws. 4,106,381, Cl. 83-477.200.

Kreuger, Frederik Hendrik; and Van Kesteren, Jacobus Petrus Ignatius, to N.K.F. Kabel B.V. Method of manufacturing a longitudinally watertight telecommunication cable. 4,106,961, Cl. 156-48.000.

Krochta, John M.: *See—*
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.

Kroder, Ernest A.: *See—*
McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.

Kronlage, John W., to Texas Instruments Incorporated. Dual slope analog-to-digital converter with unique counting arrangement. 4,107,667, Cl. 340-347.0NT.

Kropa, Gomer E., to Leesona Corporation. Granulator and knife construction therefor. 4,106,708, Cl. 241-222.000.

Kruger, Kurt John: *See—*
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.

Kruklitis, Karlis, to Burroughs Corporation. Document processing, magnetic character detecting apparatus. 4,107,653, Cl. 340-146.30C.

Krupinski, Kenneth C.: *See—*
Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., 4,107,382, Cl. 428-368.000.

Krupp-Koppers GmbH: *See—*
Herzig, Alfred, 4,106,533, Cl. 141-1.000.

Kubens, Rolf, to Bayer Aktiengesellschaft. Process for the production of crosslinked, urethane-containing plastics. 4,107,101, Cl. 521-137.000.

Kubo, Sueki: *See—*
Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, 4,106,760, Cl. 266-281.000.

Kubozono, Hidetaka: *See—*
Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.

Kucher, Robert C. Cable hauling winch. 4,106,754, Cl. 254-186.0HC.

Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich. Method of regeneration of spent etching solutions. 4,107,011, Cl. 204-151.000.

Kudrin, Viktor Alexandrovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Kudryavtsev, Valentin Semenovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Boxisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Kuhla, Donald E.; and Watson, Harry A., Jr., to Pfizer Inc. Conversion of trans- to cis-N,N-dimethyl-9-[3-(4-methyl-1-piperazinyl)-propylidene]-thioxanthene-2-sulfonamide and recovery of the cis-isomer. 4,107,430, Cl. 542-471.000.

Kuhn, Charles J. Chisel clamp for use in straightening automobile bodies. 4,106,325, Cl. 72-457.000.

Kulite Semiconductor Products, Inc.: *See—*
Kurtz, Anthony D., 4,106,349, Cl. 73-746.000.

Kulwicki, Bernard Michael, to Texas Instruments Incorporated. Compact PTC resistor. 4,107,515, Cl. 219-541.000.

Kumaki, Noboru, to Sony Corporation. Fluidic controlled cartridge ejector. 4,107,747, Cl. 360-93.000.

Kun-Ming, Liu. Safety fuel gas and apparatus for generating the same. 4,106,914, Cl. 48-103.000.

Kunii, Nobuaki: *See—*
Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.

Kunitomo, Akihiko: *See—*
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.

Kuno, Masanori: *See—*
Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.

Kuratsuji, Takatoshi: *See—*
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Haga, Toshikatsu; and Hori, Saburo, 4,106,892, Cl. 432-58.000.
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.

Kurihara, Yasuo, to Fujitsu Limited. Check system for detecting malfunction of an error detection circuit. 4,107,649, Cl. 340-146.1AG.

Kuroda Seiko Co., Ltd.: *See—*
Kodaira, Hiroshi; and Masuda, Mitsuo, 4,106,390, Cl. 91-42.000.

Kurokawa, Hideo: *See—*
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, 4,107,080, Cl. 252-431.00C.

Kurosaki Refractories Co., Ltd.: *See—*
Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, 4,106,760, Cl. 266-281.000.

Kurose, Kunio: *See—*
Matsumoto, Noboru; Kurose, Kunio; and Ueno, Kinya, 4,106,449, Cl. 123-119.00A.

Kurtz, Anthony D., to Kulite Semiconductor Products, Inc. Transducer structures for high pressure application. 4,106,349, Cl. 73-746.000.

Kussy, Frank W.: *See—*
Keller, Frank R.; Kussy, Frank W.; DiMarco, Bernard; and Fenneteau, Michel M., 4,107,488, Cl. 200-50.00A.

Kust, Roger N.: *See—*
Lueders, Robert E.; Kust, Roger N.; and Davies, David S., 4,107,262, Cl. 423-32.000.

Kusumoto, Keiichi: *See—*
Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, 4,106,430, Cl. 118-64.000.

Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Non-woven fabric usable as a substratum sheet for artificial leather. 4,107,374, Cl. 428-288.000.

Kutnyak, Thomas A.; Dunn, George T.; and Guiles, Chester L., to Automation Industries, Inc. Method of making a formed hose. 4,106,968, Cl. 156-189.000.

Kutzscher, Edgar W.: *See—*
Brumfield, Elvin S.; Kutzscher, Edgar W.; and Lovelady, James N., 4,107,530, Cl. 250-342.000.

Kuwahara, Hiroshi: *See—*
Ishida, Yotsuo; and Kuwahara, Hiroshi, 4,107,754, Cl. 361-120.000.

Kuznetzoff, Philip: *See—*
James, Edward Anthony; and Kuznetzoff, Philip, 4,107,351, Cl. 427-43.000.

Kvita, Vratislav: *See—*
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, 4,107,174, Cl. 260-326.0NS.

Labaugh, Kenneth D.: *See—*
Chicklis, Evan P.; Naiman, Charles S.; and Labaugh, Kenneth D., 4,107,529, Cl. 250-339.000.

Label-Aire Inc.: *See—*
Caudill, Donald L., 4,106,972, Cl. 156-363.000.

Labofina S.A.: *See—*
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,107,225, Cl. 260-683.900.
Leplat-Gryspeerdt, Paul A., 4,106,908, Cl. 23-230.0PC.

Laboratories Cassenne: *See—*
Hercelin, Bernard; and Hamon, Jean-Francois, 4,107,333, Cl. 424-365.000.

Labyer, Harold S.: *See—*
Dodson, James C.; and Labyer, Harold S., 4,106,393, Cl. 92-168.000.

Lac-Mac Limited: *See—*
Zurbrigg, Charles Edward; and Keenan, William Douglas Sulman, 4,106,120, Cl. 2-51.000.

Lachowicz, Donald R.; and Holder, Charles B., to Texaco Inc. Graft copolymer coated reinforcing agents. 4,107,110, Cl. 260-17.4CL.

Lafon, Victor. Cyclic phenylsulphinyl-amidine derivatives. 4,107,438, Cl. 548-353.000.

LaFountaine, Leonard Howard. Swimming pool construction. 4,106,246, Cl. 52-169.700.

Lagasse, Alain: *See—*
Violland, Robert; and Lagasse, Alain, 4,107,056, Cl. 252-8.800.

Lagerdahl, Sebastian, to Aktiebolaget Svenska Flaktfabriken. Arrangement in emitting electrodes for electrostatic precipitators. 4,106,919, Cl. 55-147.000.

Lai, Chi Sun; and Gunderson, Philip D., to Motorola, Inc. Electronic spark timing adjustment circuit. 4,106,440, Cl. 123-117.00R.

Laidlaw, Alan James: *See—*
Smith, Geoffrey Allan; and Laidlaw, Alan James, 4,106,895, Cl. 8-2.50A.

Laing, Nikolaus. Tube for fluid substances under pressure. 4,106,528, Cl. 138-149.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Izumi, Sachio; and Kotani, Tamotsu, 4,107,508, Cl. 219-137.700.
Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.

Lam, Gow T.: *See—*
Morton, Harry E.; and Lam, Gow T., 4,107,287, Cl. 424-8.000.

Lamb, W. C.: *See—*
DeKerlegand, Deke E., 4,106,347, Cl. 73-622.000.

Lambert Brake Corporation: *See—*
Morgan, George H., 4,106,291, Cl. 60-369.000.

Landoni, Giannino, to MECA S.n.c. Apparatus for controlling the movement of a fabric-supporting carriage in a quilting machine. 4,106,417, Cl. 112-119.000.

Lane, Ernest: *See—*
Carpentier, Alain F.; and Lane, Ernest, 4,106,129, Cl. 3-1.500.

Lane, Thomas H.: *See—*
Frye, Cecil L.; and Lane, Thomas H., 4,107,196, Cl. 260-448.20N.

Lang, Richard L.; and Quaas, Dietmar G., to Buhrke Industries, Inc. High speed transfer mechanism for transfer die. 4,106,633, Cl. 214-1.0BB.

Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, to AGFA-Gevaert, A.G. Light-sensitive material containing emulsified substances. 4,106,940, Cl. 96-74.000.

Langer, Arthur W., Jr.: *See—*
Roper, Robert; and Langer, Arthur W., Jr., 4,107,238, Cl. 260-880.00R.

Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, to Bayer Aktiengesellschaft. Process for the treatment of cellulose-fibres. 4,106,903, Cl. 8-196.000.

Langhurst, Arling K.: *See—*
Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.

Lannan, Patrick Edward: *See—*
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 4,106,523, Cl. 137-614.040.

Lannen Tehtaat OY: *See—*
Hakli, Reijo Sakari, 4,106,415, Cl. 111-3.000.

Lapp, Ellsworth W. Device for absorbing shock in a cable. 4,106,164, Cl. 24-16.00R.

Lapraik, Scott Jack: *See—*
Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, 4,106,838, Cl. 339-99.00R.

Larsen, Johan M.: *See—*
Cowdery, Ray; and Larsen, Johan M., 4,106,151, Cl. 15-42.000.

Larsson, Ake Lennart, to Mattel, Inc. Escapement mechanism for watch. 4,106,282, Cl. 58-74.000.

Larsson, Erik Johan, to Barracudaverken AB. Inflatable floating bridge, laid out by inflating longitudinal hoses in the bridge. 4,106,149, Cl. 14-27.000.

Lasich, Lawrenoe E.: *See—*
Tecco, Charles; and Lasich, Lawrence E., 4,106,672, Cl. 222-151.000.

Lasorso, Vincent John, Jr.: *See—*
Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.

LaSpisa, Ronald J., to Phillips Petroleum Company. Extrusion control. 4,107,246, Cl. 264-40.700.

Lassiter, James W. Trans-horizon navigation system. 4,107,676, Cl. 343-6.50R.

Lather, Dieter; and Ries, Karl, to Mannesmann Aktiengesellschaft. Initialization and preparation of on-production-line ultrasonic test equipment. 4,106,326, Cl. 73-1.0DV.

Latta, Laurence, Jr.; and Leonard, John B., Jr. Epoxy resin soil stabilizing compositions. 4,107,112, Cl. 260-18.0EP.

Latta, Laurence, Jr.: *See—*
Leonard, John B., Jr.; and Latta, Laurence, Jr., 4,106,296, Cl. 61-36.00C.

Lauer, Richard E., to General Electric Company. Motor manufacturing method, system and method, system and components. 4,106,185, Cl. 29-596.000.

Laurence, Margaret M.: *See—*
Wilson, Porter C., 4,106,502, Cl. 128-145.800.

Lauro, Fernand, to Commissariat a l'Energie Atomique. Falling-film heat exchanger. 4,106,560, Cl. 165-159.000.

Lautrou, Jean: *See—*
Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, 4,107,286, Cl. 424-5.000.

Lavrova, Valentina Vasilievna: *See—*
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.

Law, Chi Y. Camera for taking three dimensional photographs having screen moving means. 4,107,712, Cl. 354-115.000.

Law, Chi Yin. Photographic camera for taking three dimensional photographs and method and apparatus for forming trivision images. 4,107,711, Cl. 354-112.000.

Lawn Doctor, Inc.: *See—*
Magda, Robert J., 4,106,703, Cl. 239-656.000.

Lawrence, George C., Jr. Vehicle roof ventilator insulation covering. 4,106,399, Cl. 98-2.140.

Lawrence, James L., Jr.; Holzl, Robert A.; and Pickett, Frederick P., to Analog Technology Corporation. Mandrel for formation of mass spectrometer filter. 4,106,744, Cl. 249-96.000.

Lawrence Peska Associates, Inc.: *See—*
Mannheim, Daniel I., 4,106,135, Cl. 4-247.000.

Lawrie, Alexander Murray: *See—*
Woodhouse, Eric Douglas; Lawrie, Alexander Murray; and McNeil, Thomas, 4,106,435, Cl. 118-301.000.

Lazar, Melvin E.: *See—*
Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.

Lea, Cyril: *See—*
Beard, James Henry; Lea, Cyril; and Ludwig, Bernard William, 4,106,177, Cl. 29-427.000.

Leary, Bruce: *See—*
Gibson, David Vincent; and Leary, Bruce, 4,107,113, Cl. 260-18.0PF.

Leclabart, Jacques, to Societe Anonyme Parfumerie et Chimieparchimy. Ampoule. 4,106,652, Cl. 215-253.000.

Leclerc, Real. Sofa bed. 4,106,137, Cl. 5-24.000.

Lee, B. Paul. Cooking utensil. 4,106,486, Cl. 126-369.000.

Lee, Joseph Y.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,107,005, Cl. 204-98.000.

Lee, Larry E.: *See—*
West, Curtis W.; Lee, Larry E.; and Norris, Aubrey O., 4,106,581, Cl. 180-54.00B.

Lee, Michael Wayne, to Goodyear Tire & Rubber Company, The. Tire tread line stripping. 4,106,965, Cl. 156-123.00R.

Lee, Richard A., to United States of America, Army. Track guide mechanism. 4,106,822, Cl. 305-28.000.

Lee, Wai-Hon: *See—*
Bryngdahl, Olof; and Lee, Wai-Hon, 4,106,844, Cl. 350-6.200.

Leesona Corporation: *See—*
Kropa, Gomer E., 4,106,708, Cl. 241-222.000.

Leffingwell, Bruce, to MPB Corporation. Phenolic-acrylic fast-curing sealant system. 4,107,239, Cl. 260-881.000.

Lefrancier, Pierre, to Choay S.A. Process for making an octapeptide useful for the treatment of diabetes. 4,107,158, Cl. 260-112.50R.

Leggett & Platt, Incorporated: *See—*
Hooker, Joe Bryan, 4,106,141, Cl. 5-201.000.

Leighton, Howard N.: *See—*
Jacquart, Christian A.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,107,550, Cl. 307-241.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Huang, Alan, 4,107,783, Cl. 364-746.000.

MaCovski, Albert, 4,107,532, Cl. 250-360.000.
Leleka, Valentina Emmanuilovna: *See—*
Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.
Le Martret, Odile: *See—*
Allais, Andre; Clemence, Francois; Deraedt, Roger; and Le Martret, Odile, 4,107,310, Cl. 424-258.000.
Lemelson, Jerome H. Cleaning appliance. 4,106,153, Cl. 15-231.000.
Lemelson, Jerome H. Data generating and recording system for scanning a display tube screen. 4,107,741, Cl. 358-300.000.
Lemkin, Jack L., to Midland-Ross Corporation. Globe for lightbulbs. 4,107,768, Cl. 362-363.000.
Lemons, John B. Left and right handed child-resistant safety cap. 4,106,651, Cl. 215-221.000.
Lenk, Erich: *See—*
Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.
Leonard, John B., Jr.; and Latta, Laurence, Jr. Method of soil stabilization. 4,106,296, Cl. 61-36.00C.
Leonard, John B., Jr: *See—*
Latta, Laurence, Jr.; and Leonard, John B., Jr, 4,107,112, Cl. 260-18.0EP.
Le Parmentier, Louis: *See—*
Auclair, Michel; and Le Parmentier, Louis, 4,106,287, Cl. 60-274.000.
Leplat-Gryspeerdt, Paul A., to Labofina S.A. Method for the determination of the organic carbon content in mineral-containing materials. 4,106,908, Cl. 23-230.0PC.
Leroy, Pierre; Maubon, Andre; and Saleil, Jean, to Creusot-Loire Enterprises. Converters for refining metals. 4,106,758, Cl. 266-158.000.
Lescouflair, Guy: *See—*
Charlebois, Jacques; and Lescouflair, Guy, 4,107,465, Cl. 179-1.00N.
Lesher, George Y.; and Opalka, Chester J., Jr., to Sterling Drug Inc. 5-(Pyridinyl)-2(1H)-pyridinones. 4,107,315, Cl. 424-263.000.
Letot, Incorporated: *See—*
Churchill, Steven T., 4,107,466, Cl. 179-2.00A.
Leu, Robert F.: *See—*
McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.
Levendusky, Jospeh A., to Epicor, Inc. Method of and apparatus for purifying fluids with radioactive impurities. 4,107,044, Cl. 210-266.000.
Leveque, J. Howard, to Frederick Electronics Corporation. Phase locked loop exciter generator for high frequency transmitter. 4,107,612, Cl. 325-171.000.
Levy, Ralph M., to Honeywell Inc. Cartridge fuse injector and ejector. 4,107,639, Cl. 337-205.000.
Levy, Richard H.: *See—*
Forsen, Harold K.; Janes, George Sargent; and Levy, Richard H., 4,107,537, Cl. 250-423.00P.
Levy, Sidney. Method and apparatus for recording graphic information magnetically. 4,107,742, Cl. 358-301.000.
Lewis, D. Kent: *See—*
Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, 4,106,327, Cl. 73-1.0DV.
Lewis, Donald J.; and Jankowski, Albert J., to Allied Chemical Corporation. Seat belt system with starter engine lock and alarm. 4,107,645, Cl. 340-52.00E.
Lewis, Roger N.: *See—*
Friedman, Ronald L., deceased; and Lewis, Roger N., 4,107,419, Cl. 526-228.000.
Li, George S., to Standard Oil Company, The. Rubber-modified acrylonitrile-styrene-indene interpolymers. 4,107,237, Cl. 260-880.00R.
Libbey-Owens-Ford Company: *See—*
Gulish, William P., Jr., 4,106,683, Cl. 225-103.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, 4,107,574, Cl. 315-3.500.
Liebman, Arnold A.; and Liu, Yu-Ying, to Hoffmann-La Roche Inc. 7-Oxo-9-methoxy-7H-furo[3,2-g][1]benzopyran-6-carboxylic acid. 4,107,182, Cl. 260-343.210.
Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, to International Flavors & Fragrances Inc. 3,3-Dimethyl 2(3-butenyl) norbornanol-2 perfume compositions. 4,107,094, Cl. 252-522.000.
Lightner, Linn Stephen: *See—*
Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, 4,106,523, Cl. 137-614.040.
Liljenwall, Edward T.: *See—*
Helmso, Bennie E.; Holden, Thomas E.; and Liljenwall, Edward T., 4,106,677, Cl. 224-5.00A.
Lin, A. Oscar, to Yorker Research Corporation. Personal automatic vaporizer. 4,106,698, Cl. 239-34.000.
Lin, Kingso C.; and Hammond, Donald J., to Owens-Corning Fiberglas Corporation. Tire cord impregnant. 4,107,117, Cl. 260-28.50B.
Lin, Yang-i: *See—*
Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., 4,107,326, Cl. 424-304.000.
Lindberg, Jarl Johan; Turunen, Johannes; and Hortling, Bo, to Rauma-Repola Oy. Polymer made of lignin, and method for making it. 4,107,111, Cl. 260-17.500.
Lindblad, David A.: *See—*
Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., 4,106,905, Cl. 21-60.50R.
Linde Aktiengesellschaft: *See—*
Asztalos, Stefan; Stephan, Alfred; and Mayer, Reinhold, 4,106,796, Cl. 285-133.00R.
Lindenberg, Hans-Georg; and Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Gas removal means for storage batteries. 4,107,398, Cl. 429-88.000.
Lindsay, Edward R., Jr.; and Meginniss, Stephen Mason, III, to Extracorporeal Medical Systems, Inc. Dialysate preparation system. 4,107,039, Cl. 210-90.000.
Lindsay, Fredrick H. Mobile building floor joist assembly. 4,106,258, Cl. 52-693.000.
Linne, Robert Steven, to Southwire Company. Apparatus for hot-rolling non-ferrous metals. 4,106,319, Cl. 72-234.000.
Linzey, Raynor: *See—*
Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., 4,107,758, Cl. 361-275.000.
Lion Fat and Oil Company Limited, The: *See—*
Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, 4,107,080, Cl. 252-431.00C.
Lion Hamigaki Kabushiki Kaisha: *See—*
Hiroshi, Suzuki, 4,106,615, Cl. 206-45.310.
Lipp, Alfred: *See—*
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Lippincott, Richard L., Sr. Toilet flush flow accelerator. 4,106,136, Cl. 4-368.000.
Litton Industrial Products, Inc.: *See—*
Gurdak, Felix J.; and Cook, Francis W., Jr., 4,106,375, Cl. 82-21.00B.
Litton Systems, Inc.: *See—*
Bodine, Richard Hill, Jr.; and Rosiak, Marion, 4,107,579, Cl. 315-205.000.
Liu, Kang-Jen: *See—*
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,015, Cl. 204-180.00P.
Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,264, Cl. 423-81.000.
Liu, William Chang; Bratton, Francis H., deceased (by Bratton, Jean C., executrix); and Nali, Robert Ronald, to Brunswick Corporation. Method of making a cross linked pile product. 4,107,259, Cl. 264-331.000.
Liu, Yu-Ying: *See—*
Liebman, Arnold A.; and Liu, Yu-Ying, 4,107,182, Cl. 260-343.210.
Lloyd, Wayne B.; and Logan, Dale R., to Westinghouse Electric Corp. Airborne vibration isolated sensor apparatus. 4,106,740, Cl. 248-358.00R.
Lockheed Aircraft Corporation: *See—*
Brumfield, Elvin S.; Kutzscher, Edgar W.; and Lovelady, James N., 4,107,530, Cl. 250-342.000.
Loeffler, Karl H.: *See—*
Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.
Logan, Arthur D.; and Rush, James B., to Dayco Corporation. Hose construction and method of making same. 4,106,967, Cl. 156-184.000.
Logan, Dale R.: *See—*
Lloyd, Wayne B.; and Logan, Dale R., 4,106,740, Cl. 248-358.00R.
Lok, Mei Tak: *See—*
Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, 4,107,180, Cl. 260-338.000.
Long, Alan Gibson: *See—*
Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,107,431, Cl. 544-16.000.
Long, Alfred D.: *See—*
Savage, Fred L.; and Long, Alfred D., 4,106,482, Cl. 126-271.000.
Longi, Paolo: *See—*
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,413, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,415, Cl. 526-114.000.
Longman, Sidney E. Sugar cane planting machines. 4,106,669, Cl. 221-217.000.
Lonsdale, Melvin J.: *See—*
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,106,212, Cl. 34-65.000.
Lords III Research & Development Co.: *See—*
Tarran, Phil Keith, 4,106,590, Cl. 182-20.000.
L'Oreal: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,107,290, Cl. 424-47.000.
Lorentzen, Alan P., to Bucheck, David J.; and Minnesota Mining and Manufacturing Company. Oil sorbing mat. 4,107,051, Cl. 210-500.00R.
Lorenz, Gordon Ronald, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Dual control system for tailings outlet of primary separation vessel in the hot water process for bituminous sands. 4,107,029, Cl. 208-11.0LE.

Lorenz, Max R.: *See—*
Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., 4,106,976, Cl. 156-644.000.
Lorenz, Roman R.; and Thielking, William H., to Sterling Drug Inc. Alkyl α-[3-(pyridyl)-anilinomethylene]acetoacetates. 4,107,167, Cl. 260-295.00R.
Lorenz, Ronald N.: *See—*
Pearson, Allen F.; Mayo, Paul A.; and Lorenz, Ronald N., 4,107,777, Cl. 364-465.000.
Loriers, Jean: *See—*
Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
Losert, Miloslav: *See—*
Maler, Josef; Fischer, Evzen; Losert, Miloslav; and Kopecny, Miroslav, 4,106,312, Cl. 66-50.00R.
Lourdes Industries, Inc.: *See—*
Jakobsen, William, 4,107,454, Cl. 174-135.000.
Loutfy, Raouf O.; and Ho, Paul P. K., to Noranda Mines Limited. Stable electrode for electrochemical applications. 4,107,025, Cl. 204-290.00F.
Lovejoy, Elwyn Raymond, to Du Pont de Nemours, E. I., and Company. Crosslinked aromatic polyimides and articles made therefrom. 4,107,125, Cl. 260-37.00N.
Lovejoy, George C.: *See—*
Owen, William S., Jr.; and Lovejoy, George C., 4,106,377, Cl. 83-4.000.
Lovelady, James N.: *See—*
Brumfield, Elvin S.; Kutzscher, Edgar W.; and Lovelady, James N., 4,107,530, Cl. 250-342.000.
Low, Lothar: *See—*
Fitzner, Josef; and Low, Lothar, 4,106,275, Cl. 57-77.330.
Lowe, Colin F. Frameless metal building. 4,106,245, Cl. 52-90.000.
Lowry, John D.; and Holland, Kenneth F., to Image Transform, Inc. Noise reduction system for video signals. 4,107,736, Cl. 358-36.000.
Lowth, Leonard Cecil, to Scholl Inc. Article of wearing apparel providing an undergarment. 4,106,514, Cl. 128-519.000.
Lozio, Battista, to Lozio Battista e Figli S.p.A. Self-locking band. 4,106,802, Cl. 292-320.000.
Lozio Battista e Figli S.p.A.: *See—*
Lozio, Battista, 4,106,802, Cl. 292-320.000.
Luc, Penelope Jane Vesey. Frictional method and machine for seaming tubular sections. 4,106,167, Cl. 29-33.00D.
Lucas Electrical Limited: *See—*
Hill, William Frank; and Nicol, Thomas, 4,107,658, Cl. 340-620.000.
Lucas, Gareth Douglas. Knee brace. 4,106,143, Cl. 9-1.700.
Ludwig, Bernard William: *See—*
Beard, James Henry; Lea, Cyril; and Ludwig, Bernard William, 4,106,177, Cl. 29-427.000.
Ludwig Riedhammer GmbH & Co. K.G.: *See—*
Baumann, Helmut; and Petzi, Fritz, 4,106,893, Cl. 432-77.000.
Lueders, Robert E.; Kust, Roger N.; and Davies, David S., to Kennecott Copper Corporation. Cuprion process start-up control. 4,107,262, Cl. 423-32.000.
Luke, Perry J.; Machamer, James L.; and Becraft, William A., to Johns Hopkins University, The. Error correction encoder and decoder. 4,107,650, Cl. 340-146.1AL.
Lummus Company, The: *See—*
Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., 4,107,222, Cl. 260-659.00A.
Lund, George Edward: *See—*
Ouimet, Raymond Joseph; Wojtowicz, Edward Arthur; Lund, Genrge Edward; and Fiorentino, Ermenegildo, 4,106,636, Cl. 214-11.00R.
Lundquist, Alvin G., Jr.: *See—*
Allen, William W.; Sweeney, Charles E.; Lundquist, Alvin G., Jr.; and Hersh, Raymond T., 4,106,227, Cl. 38-143.000.
Lundy, Richard W., to J. I. Case Company. Fly and jib assembly for crane. 4,106,631, Cl. 212-144.000.
Luning, Bjorn Erik Gustav Bertilsson, to AB Bonnierforetagen. Antigenically active polypeptide and a process for its preparation. 4,107,298, Cl. 424-177.000.
Luria, Norman G.: *See—*
Schuster, Robert M.; and Luria, Norman G., 4,107,456, Cl. 174-151.000.
Lynch, John H.; and Gallegos, George L. Alarm communications system. 4,107,464, Cl. 179-1.00B.
Lynott, John Joseph, to International Business Machines Corporation. Apparatus and method for conducting financial transactions. 4,106,667, Cl. 221-1.000.
Lyon, Floyd A.; and Harrison, Henry, to Halm Instrument Co., Inc. Reflective solar heat collector. 4,106,480, Cl. 126-270.000.
Lyon, Richard H.: *See—*
Moore, James A.; and Lyon, Richard H., 4,106,588, Cl. 181-284.000.
M. Cohen & Sons, Inc.: *See—*
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M. L. Engineering (Plymouth) Limited: *See—*
Moorey, Ernest James, 4,107,616, Cl. 328-110.000.
M&T Chemicals Inc.: *See—*
Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, 4,107,069, Cl. 252-182.000.
Maari, Roger, to Single Buoy Moorings Inc. Connecting arrangement between a floating structure and an anchor. 4,106,146, Cl. 9-8.00P.
Maben, James W., to Sanders Associates, Inc. Synchronization signal powered television transmitter. 4,107,737, Cl. 358-93.000.
MacDonald, Ira A.; and Egan, Richard R., to Ashland Oil, Inc. Particulate dehydrated potatoes with mono- and ethoxylated glycerides. 4,107,345, Cl. 426-637.000.
MacGovern, Alan J.: *See—*
Sprague, Robert A.; and MacGovern, Alan J., 4,107,701, Cl. 346-108.000.
Machamer, James L.: *See—*
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Machlett Laboratories, Inc., The: *See—*
Koller, Thomas J.; and Randmer, Jacob A., 4,107,562, Cl. 313-59.000.
Maciaszek, Joseph A., to Nalco Chemical Company. Pulp and papermaking additive. 4,107,073, Cl. 252-321.000.
MacNiel, Douglas K., to Master Specialties Company. Low level light indicator. 4,106,231, Cl. 40-547.000.
MaCovski, Albert, to Leland Stanford Junior University, The Board of Trustees of the. Orthogonal scan computerized tomography. 4,107,532, Cl. 250-360.000.
Madsen, Leonard P.: *See—*
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.
Maeda, Kenji: *See—*
Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,107,424, Cl. 536-10.000.
Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, to PARCOR. 2,3-Dihydrobenzofurans. 4,107,437, Cl. 544-376.000.
Magda, Robert J., to Lawn Doctor, Inc. Compact lawn spreader capable of mixing and widely spreading multiple lawn treatment materials. 4,106,703, Cl. 239-656.000.
Magney, Herbert C.: *See—*
Brimmer, Frances M.; Ahrens, Edward W.; and Magney, Herbert C., 4,106,620, Cl. 206-363.000.
Magnusson, Alan B.: *See—*
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Maher, James C.: *See—*
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.
Maher, John P.: *See—*
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Shirn, George A.; and Maher, John P., 4,107,762, Cl. 361-433.000.
Mahieu, Claude: *See—*
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Mailey, Everett A.: *See—*
King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, 4,107,059, Cl. 252-28.000.
Mair, Alex C., to General Motors Corporation. Molding attachment for vehicle body. 4,106,803, Cl. 293-62.000.
Malacheski, Joseph J.; and Stelmack, Edward A. Valve construction. 4,106,747, Cl. 251-84.000.
Malden, Peter James, to English Clays Lovering Pochin & Company, Limited. Treatment of clay mineral pigment. 4,106,949, Cl. 106-288.00B.
Maler, Josef; Fischer, Evzen; Losert, Miloslav; and Kopecny, Miroslav, to Elitex, Koncern textilniho strojirenstvi. Method and apparatus for selecting needles in a circular knitting machine. 4,106,312, Cl. 66-50.00R.
Malhotra, Satish Chandra, to Du Pont de Nemours, E. I., and Company. Product and process for reducing discoloration and dark spotting in tetrafluoroethylene resin molded parts. 4,107,194, Cl. 260-42.180.
Mandel, Alan F.: *See—*
Otto, Paul R.; and Mandel, Alan F., 4,106,593, Cl. 187-29.00R.
Manesse, Jean-Pierre Andre, to Poclain, Societe Anonyme. Pressure relief valve. 4,106,522, Cl. 137-512.000.
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Horowitz, Carl; Mangaraj, Duryodham; and Iorio, Joseph A., 4,106,955, Cl. 148-6.000.
Manna, Albert, to Caterpillar Tractor Co. Indexed and coworking gears. 4,106,360, Cl. 74-440.000.
Mannesmann Aktiengesellschaft: *See—*
Altenbokum, Karlheinz; Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Szynka, Peter, 4,106,366, Cl. 74-801.000.
Lather, Dieter; and Ries, Karl, 4,106,326, Cl. 73-1.0DV.
Mannheim, Daniel I., to Lawrence Peska Associates, Inc. Water closet basin assembly. 4,106,135, Cl. 4-247.000.
Manning, William Patrick: *See—*
Ferrin, Charles Robert; and Manning, William Patrick, 4,107,270, Cl. 423-226.000.
Manska, Wayne E., to Moody, Ronald R.; and Manska, Wayne E. Non-rebounding article. 4,106,769, Cl. 273-58.00B.
Maquet, Joseph Andre: *See—*
Bourguignon, Guy Clement; and Maquet, Joseph Andre, 4,107,378, Cl. 428-323.000.
Mar-Kal Products Corporation: *See—*
Schmid, Hans F., 4,106,229, Cl. 40-611.000.
Marangoni, Roy D.; and Austin, Harry W., to Mine Safety Appliances Company. Energy absorbing suspension element. 4,106,127, Cl. 2-416.000.
Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incor-

porated. Optical fiber with graded index core and pure silica cladding. 4,106,850, Cl. 350-96.310.
Marcelli, Aline, to Societe Francaise pour le Developpement de l'Automatisme en Biologie. Device for examining a plurality of microdoses of liquids. 4,106,911, Cl. 23-259.000.
Marchessaux, Philippe: *See—*
  Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, 4,107,281, Cl. 423-625.000.
Marchioro, Ignazio: *See—*
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Marconi Company Limited, The: *See—*
  Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.
Marconi Instruments Ltd.: *See—*
  Waddington, Damer Evelyn O'Neill, 4,107,585, Cl. 318-331.000.
Marine Moisture Control Company, Inc.: *See—*
  Gravert, William H., 4,106,541, Cl. 151-48.000.
Marino, Francis C., to Burroughs Corporation. Raster scanned display system. 4,107,664, Cl. 340-324.0AD.
Mark, Victor; and Hedges, Charles Vernon, to General Electric Company. Process for purifying impure diphenols. 4,107,443, Cl. 568-750.000.
Marker, Harry Rudolph, to Electronic Engineering Co. of California. Rotary rocking-beam switch. 4,107,482, Cl. 200-6.00B.
Markussen, Erik Kjaer; and Schmidt, Arne Wintherhalter, to Novo Industri A/S. Enzyme granulate composition and process for forming enzyme granulates. 4,106,991, Cl. 195-63.000.
Marley, Clement F. Full-season rain gauge having replaceable charts for making profile graphs. 4,106,336, Cl. 73-171.000.
Marola, Americo Edward; and Stella, Leo, to Torrington Company, The. Bearing with lubricating system. 4,106,826, Cl. 308-187.000.
Marquette Metal Products Co.: *See—*
  Anderson, J. Edward C., 4,106,572, Cl. 173-93.000.
Mars, Incorporated: *See—*
  Heiman, Frederic P., 4,106,610, Cl. 194-97.00R.
Marsden, Charles P., Jr., to United States of America, Army. Rugged quick-heating electron tubes. 4,107,566, Cl. 313-293.000.
Marsden, John, to Halter Marine Services, Inc. Apparatus for and method of loading loose granular material from barges into ships. 4,106,637, Cl. 214-13.000.
Marsh, Dana G., to Xerox Corporation. Microimaging film containing an organic diselenide, a tertiary phosphine or phosphite and an azo organic peroxide and the use thereof. 4,106,936, Cl. 96-27.00R.
Marsh, David John: *See—*
  Bunton, John Darrah; and Marsh, David John, 4,106,331, Cl. 73-61.10R.
Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., to Upjohn Company, The. Process for producing steffimycinol. 4,106,994, Cl. 195-80.00R.
Marsico, Joseph William, Jr.: *See—*
  Goldman, Leon; Lin, Yang-i; and Marsico, Joseph William, Jr., 4,107,326, Cl. 424-304.000.
Marten, Wolfgang; Holstein, Herbert; and Esser, Gustav, to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH. Workpiece holder for a vertical broaching machine for broaching annular workpieces. 4,106,785, Cl. 279-4.000.
Martin, Charles Andrew: *See—*
  Klisch, Stephen Cajetan; and Martin, Charles Andrew, 4,107,095, Cl. 252-541.000.
Martin, Elmore Louis, to Du Pont de Nemours, E. I., and Company. Thermally stable, rigid, aliphatic diols. 4,107,444, Cl. 568-807.000.
Martin, Jean-Claude; and Piguet, Christian, to Centre Electronique Horloger S.A. Wrist watch incorporating a thermoelectric generator. 4,106,279, Cl. 58-23.0BA.
Martin, Kenneth W. Device to strengthen muscles. 4,106,489, Cl. 128-1.00R.
Martin Marietta Corporation: *See—*
  Borcher, Charles A.; and Porter, William R., 4,106,410, Cl. 102-67.000.
  Borcher, Charles A.; Porter, William R.; and Harris, Martin H., 4,106,411, Cl. 102-67.000.
  Coon, Bryan H., 4,106,855, Cl. 350-196.000.
  Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.
Martin, Walter J.; and Furtado, John, to Raytheon Company. Beam forming system. 4,107,685, Cl. 343-100.0SA.
Martin, William Donald, to Hewlett-Packard Company. Glitch detector. 4,107,651, Cl. 340-146.10R.
Martinaud, Jacques-Pierre: *See—*
  Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
Martinelli, Luciano B. Tearable bottle cap. 4,106,653, Cl. 215-256.000.
Martinez, Eugene E., to Reikel, Robert H. Photo album. 4,106,230, Cl. 40-158.00R.
Martinez, Jose M.: *See—*
  Meuschke, Robert E.; and Martinez, Jose M., 4,106,983, Cl. 176-19.00R.
Martorano, Richard: *See—*
  Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, 4,106,421, Cl. 113-120.00A.
Marty, Jennifer Joy: *See—*
  Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, 4,107,288, Cl. 424-22.000.
Maruta, Rikio, to Nippon Electric Co., Ltd. Digital SSB-FDM communication system derived from a complex band-pass digital filter bank and by a filter breakdown process. 4,107,470, Cl. 179-15.0FS.
Marvin Glass & Associates: *See—*
  Morrison, Howard J., 4,107,477, Cl. 179-99.000.
Maryland Cup Corporation: *See—*
  Boyle, Patrick T., 4,106,660, Cl. 220-90.400.
Masaki, Katsumi; and Isaka, Yukio Inagi,, to Canon Kabushiki Kaisha. Character size changing device. 4,107,786, Cl. 364-900.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
  Vogel, Rudolf, 4,106,302, Cl. 61-94.000.
  von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, 4,106,289, Cl. 60-314.000.
Maschinenfabrik Buckau Aktiengesellschaft: *See—*
  Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,106,518, Cl. 134-104.000.
Masi, James V., to UCE, Inc. Photovoltaic semiconductor device using an organic material as an active layer. 4,106,951, Cl. 136-89.0NB.
Mason, Stephen Howard: *See—*
  Konrad, Frederick Miller; and Mason, Stephen Howard, 4,107,218, Cl. 560-724.000.
Massa, Donald P., to Dellorfano, Fred M., Jr.; and Massa, Donald P., Trustees of The Stoneleigh Trust. Intrusion alarm system with improved air turbulence compensation. 4,107,659, Cl. 340-552.000.
Massachusetts Institute of Technology: *See—*
  Kildal, Helge; and Brueck, Steven R. J., 4,107,544, Cl. 307-88.300.
  Moore, James A.; and Lyon, Richard H., 4,106,588, Cl. 181-284.000.
Massey-Ferguson Services N.V.: *See—*
  Williams, Derek Geoffrey, 4,106,644, Cl. 214-138.00C.
Master Specialties Company: *See—*
  MacNiel, Douglas K., 4,106,231, Cl. 40-547.000.
Masuda, Kenzo: *See—*
  Sakaba, Hiroo; and Masuda, Kenzo, 4,107,548, Cl. 307-205.000.
Masuda, Mitsuo: *See—*
  Kodaira, Hiroshi; and Masuda, Mitsuo, 4,106,390, Cl. 91-42.000.
Masuda, Senichi; and Hirai, Junji, to Masuda, Senichi. Pulse power source. 4,107,757, Cl. 361-235.000.
Matejczyk, Mary-Blair: *See—*
  Greenwald, A. Seth; Porritt, Derek S.; and Matejczyk, Mary-Blair, 4,106,128, Cl. 3-1.910.
Mateshin, Vasily Gerasimovich: *See—*
  Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Mathieu, Hans; and Hochstrasser, Jurgen, to Hochstrasser nee Wack, Elizabeth; and Hochstrasser, Jurgen. Device for the production of earth holes. 4,106,298, Cl. 61-53.640.
Matoba, Kazuo: *See—*
  Takao, Hiroshi; and Matoba, Kazuo, 4,107,019, Cl. 204-195.00S.
Matson Navigation Company: *See—*
  Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, 4,106,639, Cl. 214-14.000.
Matsubara, Hiroshi, to Diesel Kiki Co., Ltd. Vehicle speed control system. 4,106,584, Cl. 180-105.00E.
Matsubara, Hiroyoshi: *See—*
  Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
Matsuda, Hiroshi: *See—*
  Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
Matsuda, Itsuo: *See—*
  Akiyama, Keüchi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujü, Takara, 4,107,153, Cl. 528-322.000.
Matsuda, Takayuki: *See—*
  Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Ynichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.
Matsuda, Toshiharu, to Hitachi, Ltd. Reverse-flow air conditioner. 4,106,307, Cl. 62-324.000.
Matsumoto, Hiromitsu: *See—*
  Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,106,464, Cl. 123-179.00A.
Matsumoto, Noboru; Kurose, Kunio; and Ueno, Kinya, to Toyota Jidosha Kogyo Kabushiki Kaisha. EGR system. 4,106,449, Cl. 123-119.00A.
Matsumura, Masaji: *See—*
  Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

Matsunaga, Masaaki: *See—*
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Matsunaga, Yoshiki: *See—*
  Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, 4,107,119, Cl. 260-29.4UA.
Matsuno, Tadahiko: *See—*
  Kono, Hiroshi; Kubo, Sueki; and Matsuno, Tadahiko, 4,106,760, Cl. 266-281.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
  Higashida, Yutaka, 4,106,724, Cl. 242-198.000.
  Tanaka, Junzo; and Kai, Toshio, 4,107,502, Cl. 219-10.55F.
Matsuyama, Takeshi: *See—*
  Yoshida, Takashi; and Matsuyama, Takeshi, 4,107,725, Cl. 357-41.000.
Mattchen, Terry M., to American Safety Equipment Corporation. Quick release mechanism for oscillating saw blade. 4,106,181, Cl. 29-450.00R.
Mattel, Inc.: *See—*
  Larsson, Ake Lennart, 4,106,282, Cl. 58-74.000.
Matthiessen, Roy A. Safety shield for flange type coupling. 4,106,428, Cl. 116-114.00P.
Matumaru, Haruo: *See—*
  Nakano, Toshio; Sasano, Akira; Tsutsui, Keo; and Matumaru, Haruo, 4,107,568, Cl. 313-371.000.
Matzuk, Terrance. Grey-level ultrasonic imaging. 4,106,346, Cl. 73-614.000.
Maubon, Andre: *See—*
  Leroy, Pierre; Maubon, Andre; and Saleil, Jean, 4,106,758, Cl. 266-158.000.
Maurer, Fritz: *See—*
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  Rossarie, Jean; and Maurin, Jean, 4,107,269, Cl. 423-222.000.
Max, Lee B., to Varian Associates, Inc. Package for push-pull semiconductor devices. 4,107,728, Cl. 357-80.000.
Maxey, Alexander R., to Arvin Industries, Inc. Variable ratio magnetic tape drive using a variable belt thickness. 4,107,744, Cl. 360-73.000.
Maxwell, David. Marker compass. 4,106,200, Cl. 33-27.00B.
May, Fred W., III: *See—*
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Mayer, Joseph; and Sherlock, Margaret H., to Schering Corporation. Certain amino naphthyridines. 4,107,166, Cl. 260-294.80C.
Mayer, Manfred: *See—*
  Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, 4,106,710, Cl. 242-18.00R.
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. 1-Oxa-4,8-diazaspiro[4,5]decanes and polymers stabilized against UV light with these compounds. 4,107,139, Cl. 260-45.8NZ.
Mayer, Reinhold: *See—*
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Mayer, Steven T.; and Milner, Ronald E., to Atari, Inc. Apparatus for continuous variation of object size on a raster type video screen. 4,107,665, Cl. 340-324.0AD.
Mayes, Clell C. Draft air control system. 4,106,475, Cl. 126-121.000.
Mayhew, Raymond Leonard: *See—*
  Tilson, Edward Arthur; and Mayhew, Raymond Leonard, 4,107,327, Cl. 428-304.000.
Mayo, Paul A.: *See—*
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Mazzocchi, Romano: *See—*
  Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,413, Cl. 526-114.000.
  Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
  Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,415, Cl. 526-114.000.
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McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., to Dentsply Research & Development Corp. Workhead for an automatic bur grinding machine. 4,106,242, Cl. 51-225.000.
McCartney, Joseph F.: *See—*
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McCord Corporation: *See—*
  Scrivo, Jerry V., 4,106,804, Cl. 293-63.000.
McCord, James W. Ultrasonic cleaning apparatus. 4,107,790, Cl. 366-127.000.
McCoy, Richard Alan, to Owens-Corning Fiberglas Corporation. Size composition. 4,107,118, Cl. 260-29.2EP.
McCracken, Oliver W., to Otis Engineering Corporation. Pressure recorder with power conservation means. 4,107,697, Cl. 346-33.00R.
McCulloch, Reginald W.: *See—*
  Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., 4,106,186, Cl. 29-616.000.
McDowell, Robert, to Kilgore, Bevil J.; and Backus, James H. Method and apparatus for uniformly pneumatically dispersing material. 4,107,789, Cl. 366-3.000.
McEachern, Robert A., to American Optical Corporation. Heart defibrillating and monitoring system. 4,106,494, Cl. 128-2.06B.
McEntire, Edward E.; and Gipson, Robert M., to Texaco Development Corp. Low foaming beta-amino propionic acid surface active agents. 4,107,096, Cl. 252-546.000.
McFadden, Arthur R.; and Helsley, Grover C., to American Hoechst Corporation. Benzyl and related esters of 6,11-dihydrodibenz[b,e]oxepin-acetic acids. 4,107,322, Cl. 424-278.000.
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, to American Hoechst Corporation. Process for preparing heteroarylbenzoxepin-acetic acids, precursors and derivatives thereof. 4,107,177, Cl. 260-332.20C.
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, to American Hoechst Corporation. Oxopyrrolobenzoxepin-acetic acids, precursors and derivatives thereof. 4,107,321, Cl. 424-274.000.
McGahren, William James: *See—*
  Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, 4,107,441, Cl. 560-121.000.
McGehee, Wendyl B. Fertilizer spreader box. 4,106,643, Cl. 214-83.360.
McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, to SCM Corporation. Ultraviolet curable latexes. 4,107,013, Cl. 204-159.160.
McKenna, Maurice: *See—*
  Currie, John Alexander; McKenna, Maurice; and Upton, John Howard, 4,106,525, Cl. 138-43.000.
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McKinney, James C., to Creative Dispensing Systems, Inc. Inlet conduit fluid filter. 4,107,043, Cl. 210-232.000.
McKinney, James T.; and Rusch, Thomas W., to Minnesota Mining and Manufacturing Company. Ion scattering spectrometer with modified bias. 4,107,526, Cl. 250-305.000.
McLoughlin, Victor Conrad Richard; Moreton, Roger; and Watt, William, to National Research Development Corporation. Acrylonitrile copolymers for carbon fibers. 4,107,408, Cl. 526-8.000.
McMahon, David Gue: *See—*
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McMahon, Donald H., to Sperry Rand Corporation. Optical repeater. 4,107,518, Cl. 250-199.000.
McMannis, William Thomas, to General Electric Company. Adaptive frequency to digital converter system. 4,107,600, Cl. 324-78.00R.
McMillen, Kenneth Ray: *See—*
  Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.
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  Woodhouse, Eric Douglas; Lawrie, Alexander Murray; and McNeil, Thomas, 4,106,435, Cl. 118-301.000.
McNeill, Charles T., to No-Joint Concrete Pipe Co. Method of making reinforced cast-in-place concrete pipe. 4,106,300, Cl. 61-72.200.
McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., to Republic Tool & Manufacturing Corp. Spreader (broadcast). 4,106,704, Cl. 239-685.000.
McRoskey, Leonard H.: *See—*
  McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,106,704, Cl. 239-685.000.
McTeague, Gerald E.; and Stinger, Kenneth R., to Tektronix, Inc.; and Tektronix, Inc. Cathode ray storage tube having a target dielectric provided with particulate segments of collector electrode extending therethrough. 4,106,937, Cl. 96-36.100.
McWhorter, Daniel M., to Kendall Company, The. Catheters. 4,106,509, Cl. 128-349.00B.
Mead Corporation, The: *See—*
  Kenworthy, E. J. Doyle, 4,107,699, Cl. 346-75.000.
Meade, John E.: *See—*
  Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, 4,107,673, Cl. 343-5.0DP.
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., to Texaco Inc. Electromagnetic wave propagation well logging utilizing multiple phase shift measurement. 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., to Texaco Inc. Electromagnetic wave logging system for determining resistivity and dielectric constant of earth formations. 4,107,598, Cl. 324-6.000.
Measurex Corporation: *See—*
  Typpo, Pekka Matti; and Wennerberg, Gunnar, 4,107,606, Cl. 324-229.000.
MECA S.o.c.: *See—*
  Landoni, Giannino, 4,106,417, Cl. 112-119.000.
Medtronic, Inc.: *See—*
  Bisping, Hans Jurgen, 4,106,512, Cl. 128-418.000.
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Meginniss, Stephen Mason, III: *See—*
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Meier, Joseph F.: *See—*
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- Meiller, Francois: *See—*
  - Chevallier, Yvonick; Martinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
- Meiners, Hans-Joachim: *See—*
  - Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,103, Cl. 528-72.000.
  - Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,107,152, Cl. 528-68.000.
- Meinert, Leo L.: *See—*
  - Rymarchyk, Nicholas M.; and Meinert, Leo L., 4,106,756, Cl. 266-99.000.
- Melikova, Gayane Leonovna: *See—*
  - Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.
- Melocik, Grant C.: *See—*
  - Buchwald, Frank S.; and Melocik, Grant C., 4,107,586, Cl. 318-426.000.
- Memorex Corporation: *See—*
  - Ho, Bin-Lun, 4,107,748, Cl. 360-104.000.
- Mendelsohn, Morris A.; Rosenblatt, Girard B., Jr.; and Meier, Joseph F., to Westinghouse Electric Corp. Process for the manufacture of a flame resistant, insulating, energy-absorbing, porous phenolic foam. 4,107,107, Cl. 521-106.000.
- Menschik, Judith: *See—*
  - Paul, Rolf; and Menschik, Judith, 4,107,307, Cl. 424-249.000.
  - Paul, Rolf; and Menschik, Judith, 4,107,308, Cl. 424-249.000.
  - Paul, Rolf; and Menschik, Judith, 4,107,309, Cl. 424-249.000.
- Mentz, Bernardus J., to Hooker Chemicals & Plastics Corporation. Filter press halate cell. 4,107,023, Cl. 204-269.000.
- Merchant, Suresh; Winkler, Diethard; and Bluhm, Marita, to Dr. Kurt Herberts & Co. Gesellschaft Mit Mit Beschrankter Haftung Vorm. Otto Louis Becker. Process for the production of highly heat-resistant insulating coatings on electrical conductors. 4,107,355, Cl. 427-120.000.
- Merck & Co., Inc.: *See—*
  - Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,107,432, Cl. 544-21.000.
  - Morse, Lewis D.; Boroshok, Melvin J.; and Graboer, Roy W., 4,107,072, Cl. 252-316.000.
- Merrill, Stewart H.: *See—*
  - Fletcher, George Leland; and Merrill, Stewart H., 4,107,155, Cl. 528-373.000.
- Mestdagh, Gilbert Edouard, to U.S. Philips Corporation. Cassette recorder with anti-erase interlock. 4,107,743, Cl. 360-60.000.
- Metallgesellschaft Aktiengesellschaft: *See—*
  - von Ropenack, Adolf; Wiegand, Volker; and Smykalla, Gunter, 4,107,265, Cl. 423-101.000.
- Metropolitan Wire Corporation: *See—*
  - Becker, Frederick R., III; and Nicely, Charles W., 4,106,736, Cl. 248-222.200.
- Metz, Werner A.: *See—*
  - Proctor, Leonard R.; Dix, Rollin C.; and Metz, Werner A., 4,106,496, Cl. 128-2.00R.
- Metzger, Adolf: *See—*
  - Graser, Reinhold; Hofmeister, Heinz Karl; and Metzger, Adolf, 4,107,279, Cl. 423-389.000.
- Metzger, Karl Georg: *See—*
  - Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.
- Meuschke, Robert E.; and Martinez, Jose M., to Westinghouse Electric Corp. Thermocouple hot junction receptacle for a nuclear reactor. 4,106,983, Cl. 176-19.00R.
- Meyer Morton Co.: *See—*
  - Batterton, Elmo L.; and Lonsdale, Melvin J., 4,106,212, Cl. 34-65.000.
- Meyer, Robert R., to Monroe Auto Equipment Company. Method and apparatus for manufacturing combination shock absorbers and leveling struts. 4,106,175, Cl. 29-243.520.
- Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, to United Technologies Corporation. Photo-electrolytic production of hydrogen. 4,107,010, Cl. 204-129.000.
- Meystre, Noel; Christ, Alfred; and Miller, Helmut, to Escher Wyss Limited. Hydrostatic supporting device. 4,106,824, Cl. 308-9.000.
- MFE Corporation: *See—*
  - Burke, Edward F., Jr., 4,107,745, Cl. 360-73.000.
- Michael, Vesta F., to Fiber Glass Systems, Inc. Reinforced fitting construction. 4,106,797, Cl. 285-156.000.
- Michaels, Edwin B. Antimicrobial compositions and methods for utilizing the same employing mixtures of amines. 4,107,328, Cl. 424-316.000.
- Michalko, Edward, to UOP Inc. Catalytic composite and method of manufacture. 4,107,086, Cl. 252-455.00Z.
- Michelson, Manfred G.: *See—*
  - Valliant, William W.; and Michelson, Manfred G., 4,106,686, Cl. 226-188.000.
- Michurov, Jury Ivanovich: *See—*
  - Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.
- Micro Communications Corporation: *See—*
  - Johnson, Clark E., Jr., 4,107,752, Cl. 360-135.000.
- Microdot, Inc.: *See—*
  - Myers, William D., 4,106,540, Cl. 151-14.0CS.
- Midland-Ross Corporation: *See—*
  - Lemkin, Jack L., 4,107,768, Cl. 362-363.000.
- Mihirogi, Kiyoshi, to Japan Air Lines, Co., Ltd. Current collecting system for vehicle. 4,106,600, Cl. 191-59.100.
- Mikituk, Murray M., to General Signal Corporation. Locking system for blender jar or the like. 4,107,791, Cl. 366-205.000.
- Mikota, Thomas: *See—*
  - von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, 4,106,289, Cl. 60-314.000.
- Miles, Brian Leslie: *See—*
  - Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, 4,107,510, Cl. 219-270.000.
- Millard, Paul Lance: *See—*
  - Cooper, Bryan Ewart; and Millard, Paul Lance, 4,106,948, Cl. 106-197.00R.
- Miller, Albert J., to Engineering Systems Corporation. Device for increasing fuel economy of an internal combustion engine. 4,106,442, Cl. 123-26.000.
- Miller, Charles E.: *See—*
  - Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., 4,107,084, Cl. 252-445.000.
- Miller, David. Side burn trimming guide. 4,106,515, Cl. 132-45.00R.
- Miller, Emil E.; and Miller, Stella Maye. Decorative plate mounting assembly. 4,106,742, Cl. 248-488.000.
- Miller, Gabriel Lorimer, to Bell Telephone Laboratories, Incorporated. Phototransistor. 4,107,721, Cl. 357-30.000.
- Miller, George T., to Hooker Chemicals & Plastics Corporation. Flame retardant cellulosic materials. 4,107,373, Cl. 428-264.000.
- Miller, Gladys D.: *See—*
  - Renk, Richard John; and Boller, George Earl, 4,106,664, Cl. 220-329.000.
- Miller, Helmut: *See—*
  - Meystre, Noel; Christ, Alfred; and Miller, Helmut, 4,106,824, Cl. 308-9.000.
- Miller, Jerold R., to Dexter, Robert A., a part interest. Adjustable end wrench. 4,106,372, Cl. 81-143.000.
- Miller, Jerome Freed, to Singer Company, The. Heating and cooling system with capillary control means. 4,106,308, Cl. 62-324.000.
- Miller, Stella Maye: *See—*
  - Miller, Emil E.; and Miller, Stella Maye, 4,106,742, Cl. 248-488.000.
- Mills, George A.: *See—*
  - Warkentin, Aaron J.; and Mills, George A., 4,106,628, Cl. 209-74.00M.
- Milner, Ronald E.: *See—*
  - Mayer, Steven T.; and Milner, Ronald E., 4,107,665, Cl. 340-324.0AD.
- Milton, William M.: *See—*
  - Fournier, Lawrence E.; Jasiewicz, Theodore M.; and Milton, William M., 4,106,184, Cl. 29-570.000.
- Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Synthetic resin stabilizer comprising an organic phosphite and a carbonate. 4,107,136, Cl. 260-45.95C.
- Minami, Norio: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Mine Safety Appliances Company: *See—*
  - Marangoni, Roy D.; and Austin, Harry W., 4,106,127, Cl. 2-416.000.
- Minhas, Pritam Singh: *See—*
  - Sukornick, Bernard; Minhas, Pritam Singh; and Sweeney, Richard Francis, 4,107,055, Cl. 252-8.600.
- Minka, Karlis. Convertible seat of a vehicle. 4,106,809, Cl. 296-69.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Berg, Jack V., 4,106,195, Cl. 30-293.000.
  - Lorentzen, Alan P., 4,107,051, Cl. 210-500.00R.
  - McKinney, James T.; and Rusch, Thomas W., 4,107,526, Cl. 250-305.000.
  - Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., 4,106,905, Cl. 21-60.50R.
  - Taylor, Allen L., 4,106,933, Cl. 96-1.50R.
- Minolta Camera Kabushiki Kaisha: *See—*
  - Tanaka, Harumi, 4,107,715, Cl. 354-206.000.
  - Tsujimoto, Kayoshi; and Yoshizaki, Akira, 4,107,709, Cl. 354-51.000.
  - Ueda, Hiroshi; and Tsujimoto, Kayoshi, 4,107,706, Cl. 354-31.000.
- Misumi, Tadanori: *See—*
  - Fujikawa, Tomio; Funakoshi, Masayasu; and Misumi, Tadanori, 4,106,918, Cl. 55-71.000.
- Mitsubishi Chemical Industries Limited: *See—*
  - Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Akamatsu, Masahiko, 4,107,551, Cl. 307-252.00J.
  - Akamatsu, Masahiko, 4,107,552, Cl. 307-252.00J.
  - Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.
  - Ishida, Yotsuo; and Kuwahara, Hiroshi, 4,107,754, Cl. 361-120.000.
  - Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

  - Uchida, Ryohei; Utsumi, Satoshi; and Akamatsu, Masahiko, 4,107,772, Cl. 363-124.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, 4,107,271, Cl. 423-235.000.
  - Shimada, Hiroyuki; and Toyoda, Shozo, 4,106,303, Cl. 61-101.000.
- Mitsubishi Petrochemical Company Limited: *See—*
  - Tamura, Noriyoshi; and Kihara, Kunio, 4,107,098, Cl. 521-25.000.
- Mitsubishi Rayon Co., Ltd.: *See—*
  - Musha, Morito; and Miyamatsu, Tokuhisa, 4,107,384, Cl. 428-398.000.
  - Sunamori, Takashi; and Nishii, Noboru, 4,107,156, Cl. 526-91.000.
- Mitsuboshi Sangyo Co., Ltd.: *See—*
  - Iwasaki, Hajime; and Tomita, Yasuo, 4,107,375, Cl. 428-291.000.
- Mitsui Petrochemical Industries Ltd.: *See—*
  - Yatsu, Tadao; and Wakumoto, Hiroshi, 4,107,418, Cl. 526-184.000.
- Mitter & Co.: *See—*
  - Mitter, Mathias, 4,106,407, Cl. 101-120.000.
- Mitter, Mathias, to Mitter & Co. Deflectable hollow socket squeegee for rotary screen printer. 4,106,407, Cl. 101-120.000.
- Miyamatsu, Tokuhisa: *See—*
  - Musha, Morito; and Miyamatsu, Tokuhisa, 4,107,384, Cl. 428-398.000.
- Mizumura, Yutaka: *See—*
  - Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.
- Mizutani, Kohichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculator. 4,106,452, Cl. 123-119.00A.
- Mobil Oil Corporation: *See—*
  - Chester, Arthur Warren, 4,107,032, Cl. 208-120.000.
  - Dwyer, Francis G., 4,107,224, Cl. 260-671.00R.
  - Okorodudu, Abraham O., 4,107,168, Cl. 260-302.00E.
  - Rollmann, Louis Deane, 4,107,195, Cl. 260-448.00C.
  - Schick, John W.; and Davis, Robert H., 4,107,060, Cl. 252-49.300.
  - Strong, Jerry G., 4,107,185, Cl. 260-348.550.
- Moden, James R.; and Perkons, George, to United States of America, Navy. Aluminum alloy for primary alkaline fuel cells and batteries. 4,107,406, Cl. 429-218.000.
- Modine Manufacturing Company: *See—*
  - Hunter, Robert L.; and Sartain, Everett L., 4,106,474, Cl. 126-110.00R.
- Mohawk Data Sciences Corp.: *See—*
  - Angelichio, Gerald A.; and Digilio, Frank A., 4,106,406, Cl. 101-93.310.
- Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich. Method of preparing phenolamine resins. 4,107,141, Cl. 528-129.000.
- Molchanov, Oleg Evgenievich: *See—*
  - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
  - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
- Moll, Eberhard, to Rockwell International Corporation. Housing for electro-mechanical counter. 4,106,344, Cl. 73-431.000.
- Molloy, Joseph; and Clarke, William G., to Westinghouse Electric Corp. Fuel element for a nuclear reactor. 4,106,985, Cl. 176-68.000.
- Monier Colourtile Pty. Ltd.: *See—*
  - Aarons, Raymond Joseph, 4,106,253, Cl. 52-547.000.
- Monroe Auto Equipment Company: *See—*
  - Meyer, Robert R., 4,106,175, Cl. 29-243.520.
- Monsanto Company: *See—*
  - Boe, Norman W., 4,106,313, Cl. 66-202.000.
  - Franz, John E., 4,106,923, Cl. 71-86.000.
  - Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, 4,107,122, Cl. 260-30.200.
  - Owsley, Dennis C.; and Bloomfield, Jordan J., 4,107,220, Cl. 260-646.000.
  - Wallace, James L., 4,107,793, Cl. 366-312.000.
- Monsanto Research Corporation: *See—*
  - David, Donald J.; and Willson, Michael C., 4,106,909, Cl. 23-232.00R.
- Montecatini Edison S.p.A.: *See—*
  - Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,414, Cl. 526-114.000.
  - Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,415, Cl. 526-114.000.
- Montedison S.p.A.: *See—*
  - Giannini, Umberto; Cassata, Antonio; Longi, Paolo; and Mazzocchi, Romano, 4,107,413, Cl. 526-114.000.
  - Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,107,416, Cl. 526-114.000.
- Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, to Matson Navigation Company. Container conveyor apparatus and method for vessel loading crane-yard interface. 4,106,639, Cl. 214-14.000.
- Moody, Ronald R.: *See—*
  - Manska, Wayne E., 4,106,769, Cl. 273-58.00B.
- Mookherjee, Braja Dulal: *See—*
  - Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, 4,107,209, Cl. 260-586.00R.
- Moon, Allen J.: *See—*
  - Bishop, Bruce J.; and Moon, Allen J., 4,106,901, Cl. 8-139.000.
- Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., to Robertshaw Controls Company. Pneumatic operated switch having movable flag, switch actuator mounted thereon, and switch in chamber displaced from measured flow path. 4,107,492, Cl. 200-81.90M.
- Moore, Gordon G.: *See—*
  - Pfeffer, Philip E.; and Moore, Gordon G., 4,107,425, Cl. 536-119.000.
- Moore, James A.; and Lyon, Richard H., to Massachusetts Institute of Technology. Mode canceling composite panel for greater than mass-law transmission loss in the principal speech bands. 4,106,588, Cl. 181-284.000.
- Moore, James E.; and Schroeter, Siegfried H., to General Electric Company. Method for making thermoformable composites and composites made thereby. 4,107,391, Cl. 428-483.000.
- Moore, Kenneth L.; and Reed, Russell, Jr., to United States of America, Navy. Method for suppressing water evaporation using a polybutadiene film. 4,106,906, Cl. 21-60.50A.
- Moore, William Thomas; and Heftman, George, to Rank Organisation Limited, The. Infra-red scanner. 4,106,845, Cl. 350-6.600.
- Moorey, Ernest James, to M. L. Engineering (Plymouth) Limited. Signal monitoring circuit. 4,107,616, Cl. 328-110.000.
- Moorhouse, John H. Mechanical code for operated device for access to coded electrical circuits. 4,107,655, Cl. 340-149.00R.
- Moreton, Roger: *See—*
  - McLoughlin, Victor Conrad Richard; Moreton, Roger; and Watt, William, 4,107,408, Cl. 526-8.000.
- Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, to Monsanto Company. Copolymer plasticizers comprising novel ω-bromoalkyl esters of acyclic unsaturated dicarboxylic acids. 4,107,122, Cl. 260-30.200.
- Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., to United States of America, Energy. Boron nitride insulating material. 4,106,186, Cl. 29-616.000.
- Morgan Construction Company: *See—*
  - Jalil, Asjed A.; and Rich, C. Allen, 4,106,519, Cl. 134-122.00R.
- Morgan, George H., to Lambert Brake Corporation. Core machine having hydrostatic drive. 4,106,291, Cl. 60-369.000.
- Morgan, Lewis Coleman; and Reed, Clarence Arthur, to Arthur W. Reed Machine Co. Separable bracket for supporting an antenna on a vehicle trunk lid. 4,107,694, Cl. 343-715.000.
- Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, to Hitachi, Ltd. Process for removing nitrogen oxides using ammonia as a reductant and sulfated metallic catalysts. 4,107,272, Cl. 423-239.000.
- Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, to Mitsubishi Denki Kabushiki Kaisha; and Nissan Motor Company, Limited. Operation state display apparatus. 4,107,663, Cl. 340-324.0AD.
- Morinaga, Tsuto: *See—*
  - Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.
- Morizumi, Yosihiro: *See—*
  - Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, 4,107,572, Cl. 315-3.600.
- Morokuma, Tadashi; and Tsuda, Naotsune, to Olympus Optical Co., Ltd. Method of manufacturing magnetic heads. 4,106,173, Cl. 29-603.000.
- Morrill, Jan G.: *See—*
  - Glasfeld, Rolf D.; and Morrill, Jan G., 4,106,423, Cl. 114-74.00A.
- Morris, Richard T.; and Wildvank, Arthur H. Thin wire pressure sensor. 4,106,350, Cl. 73-755.000.
- Morris, Thomas E.: *See—*
  - Tasto, William D.; and Morris, Thomas E., 4,107,221, Cl. 260-652.00P.
- Morrison, Howard J., to Marvin Glass & Associates. Multi-subscriber telephone apparatus. 4,107,477, Cl. 179-99.000.

- Morrison, William McKenzie Meek, to Turner Manufacturing Company, Ltd. Gear boxes. 4,106,358, Cl. 74-331.000.
- Morse, Lewis D.; Boroshok, Melvin J.; and Grabner, Roy W., to Merck & Co., Inc. Process of isolating cyclohexane-free ethylcellulose microcapsules. 4,107,072, Cl. 252-316.000.
- Morton, Harry E.; and Lam, Gow T., to University of Pennsylvania. GC Antigen-specific immunochemical indicator reagent and method for preparing same. 4,107,287, Cl. 424-8.000.
- Morton, Virgil R., to Verco Manufacturing, Inc. Method and apparatus for interlocking and venting a structural diaphragm. 4,106,249, Cl. 52-336.000.
- Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fednrovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich. Press for pressing pipe fittings. 4,106,322, Cl. 72-356.000.
- Mostovsky, Alexandr Alexeevich: *See—*
  - Klimin, Alexandr Ivanovich; Mostovsky, Alexandr Alexeevich; and Nemchenok, Rafail Lvovich, 4,107,564, Cl. 313-94.000.
- Motoren-und Turbinen-Union Friedrichshafen GmbH: *See—*
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- Motorola, Inc.: *See—*
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  - Huntington, Robert Charles; and Cooper, James Everett, Jr., 4,107,671, Cl. 340-347.0DA.
  - Lai, Chi Sun; and Gunderson, Philip D., 4,106,440, Cl. 123-117.00R.
  - Onodera, George C., 4,106,953, Cl. 148-1.500.
- Moufah, Hussein T. Ternary logic circuits with CMOS integrated circuits. 4,107,549, Cl. 307-205.000.
- MPB Corporation: *See—*
  - Leffingwell, Bruce, 4,107,239, Cl. 260-881.000.
- Muckenmuller, Helmut; and Muth, Hubert, to C. Desaga GmbH, Nachf. Erich Fecht. Device for continuous electrophoresis in a carrier free buffer current. 4,107,027, Cl. 204-301.000.
- Mukaemachi, Takuzi: *See—*
  - Kawanami, Mitsuru; Okuhara, Shinzi; and Mukaemachi, Takuzi, 4,107,472, Cl. 179-18.0GF.
- Mulders, Julien; and Gilain, Jacques, to Solvay & Cie. Method of preparing salts of poly-alpha-hydroxyacrylic acid. 4,107,411, Cl. 526-75.000.
- Mulholland, Thomas Patrick Cunningham: *See—*
  - Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,107,329, Cl. 424-317.000.
- Multinorm, B.V.: *See—*
  - Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,106,273, Cl. 56-295.000.
- Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for forming an annular groove in a thermoplastic pipe. 4,107,249, Cl. 264-68.000.
- Murase, Ichiki: *See—*
  - Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.
- Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, to Nissan Chemical Industries Ltd. Process for producing chain terpene alcohol. 4,107,219, Cl. 568-875.000.
- Murib, Jawad H., to National Distillers and Chemical Corporation. Catalytic oxidation of acrolein to acrylic acid. 4,107,204, Cl. 260-530.00N.
- Murphy, Alan Pearce; and Paris, John Rene, to Procter & Gamble Company, The. Detergent composition. 4,107,067, Cl. 252-135.000.
- Murphy, Richard J., to Xerox Corporation. Fusing surface for fixing xerographic toner. 4,107,389, Cl. 428-447.000.
- Murphy, Timothy P., to Simmons Company. Platform bed. 4,106,138, Cl. 5-181.000.
- Murray, Robert G.: *See—*
  - Koppelman, Edward; and Murray, Robert G., 4,106,999, Cl. 202-118.000.
- Murrmann, Helmut: *See—*
  - Graul, Juergen; and Murrmann, Helmut, 4,107,719, Cl. 357-15.000.
- Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, to Politechnika Warszawska. Mass for production of cores and casting moulds. 4,106,548, Cl. 164-132.000.
- Musante, Victor J.: *See—*
  - DeMasters, James J.; and Musante, Victor J., 4,106,580, Cl. 177-205.000.
- Muschiatti, Lawrence Carl: *See—*
  - Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, 4,106,971, Cl. 156-310.000.
- Musha, Morito; and Miyamatsu, Tokuhisa, to Mitsubishi Rayon Co., Ltd. Method for producing porous fibers. 4,107,384, Cl. 428-398.000.
- Mushardt, Heinrich: *See—*
  - Salje, Ernst; and Mushardt, Heinrich, 4,106,333, Cl. 73-105.000.
- Muth, Hubert: *See—*
  - Muckenmuller, Helmut; and Muth, Hubert, 4,107,027, Cl. 204-301.000.
- Mutsaers, Cornelis Adrianus H. A.: *See—*
  - Boonstra, Alexander Hendrik; and Mutsaers, Cornelis Adrianus H. A., 4,107,387, Cl. 428-426.000.
- Myers, Harry K., Jr.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with acrylonitrile. 4,107,198, Cl. 260-464.000.
- Myers, William D., to Microdot, Inc. Anti-vibration thread insert. 4,106,540, Cl. 151-14.0CS.
- N.K.F. Kabel B.V.: *See—*
  - Kreuger, Frederik Hendrik; and Van Kesteren, Jacobus Petrus Ignatius, 4,106,961, Cl. 156-48.000.
- N. V. Bekaert S.A.: *See—*
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  - Tournoy, Willy, 4,106,957, Cl. 148-12.00B.
- Naarden International Holland, B.V.: *See—*
  - Kaufman, Jerome G., 4,107,289, Cl. 424-45.000.
- Nabors, James B., Jr.: *See—*
  - Petree, Harris E.; Nabors, James B., Jr.; and Grace, Henry C., 4,106,927, Cl. 71-121.000.
- Nadelson, Jeffrey: *See—*
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- Nagai, Akihiko: *See—*
  - Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.
- Nagai, Katsumi: *See—*
  - Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.
- Nagai, Takuya: *See—*
  - Niino, Yasukazu; and Nagai, Takuya, 4,106,748, Cl. 251-133.000.
- Nagaishi, Hatuo; and Yoshimura, Tooru, to Nissan Motor Company, Limited. Exhaust gas reactor for internal combustion engine and its manufacturing method. 4,106,288, Cl. 60-282.000.
- Nagamine, Takashi: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
- Nagano, Masashi; and Fujimoto, Hideaki, to Shimano Industrial Company Limited. Derailer for a bicycle. 4,106,356, Cl. 74-217.00B.
- Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, to Nippondenso Co., Ltd. Radiator cap. 4,107,493, Cl. 200-84.00C.
- Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, to Allied Chemical Corporation. Recovery of TiO_2 from ilmenite-type ore by a membrane based electrodialysis process. 4,107,264, Cl. 423-81.000.
- Nagasubramanian, Krishnamurthy: *See—*
  - Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,107,015, Cl. 204-180.00P.
- Nagata, Shuji: *See—*
  - Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.
- Nagendran, Sangarappillai: *See—*
  - Fernando, Chulani Kumarlal; Asokan, Sangarappillai; Nagendran, Sangarappillai; Wickramasinghg, Mohanlal Randith; and Weirich, H. Paul, 4,106,433, Cl. 118-212.000.
- Nahshol Electronics Ltd.: *See—*
  - Gittelis, Meir, 4,107,545, Cl. 307-121.000.
- Naiman, Charles S.: *See—*
  - Chicklis, Evan P.; Naiman, Charles S.; and Labaugh, Kenneth D., 4,107,529, Cl. 250-339.000.
- Naito, Iori: *See—*
  - Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.
- Naito, Masayoshi; and Kamei, Tatsuya, to Hitachi, Ltd. Silicon doped with cadmium to reduce lifetime. 4,107,731, Cl. 357-64.000.
- Nakagawa, Kogoro: *See—*
  - Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.
- Nakahara, Yutaka: *See—*
  - Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,107,136, Cl. 260-45.95C.
- Nakajima, Fumito: *See—*
  - Mnri, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,107,272, Cl. 423-239.000.
- Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, to Nippon Paint Co., Ltd. Single chamber type coating and baking apparatus. 4,106,430, Cl. 118-64.000.
- Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Company, Ltd. Internal combustion engine system with an air-fuel mixture shut off means. 4,106,471, Cl. 123-198.00F.
- Nakajima, Yoshikage: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Nakamura, Kensaku. Resin material reclaiming machine. 4,106,705, Cl. 241-49.000.
- Nakamura, Kenya; and Okano, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Sealing device for a rotary regenerative heat exchanger. 4,106,553, Cl. 165-9.000.
- Nakamura, Mitsuo: *See—*
  - Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.
- Nakamura, Shinji: *See—*
  - Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
- Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, to Sankyo Company Limited. Stable solid agricultural chemical composition and process for preparation thereof. 4,107,300, Cl. 424-200.000.

- Nakamura, Yoshimi: *See—*
  - Sasaki, Yutaka; and Nakamura, Yoshimi, 4,107,085, Cl. 252-448.000.
- Nakanishi, Yoshitaka. Chain latch for door. 4,106,800, Cl. 292-264.000.
- Nakano, Toshio; Sasano, Akira; Tsutsui, Ken; and Matumaru, Haruo, to Hitachi, Ltd.; and Hitachi Electronics Ltd. Face plate for color pick-up tube. 4,107,568, Cl. 313-371.000.
- Nakao, Toshihiro, to Olympus Optical Co., Ltd. Means for opening and closing a lid of cassette tape receiver portion. 4,106,663, Cl. 220-326.000.
- Nakase, Takamichi: *See—*
  - Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
- Nakayama, Tsuneo: *See—*
  - Kimura, Toshihiko; and Nakayama, Tsuneo, 4,106,595, Cl. 188-73.300.
- Nakayama, Yasuharu; Hirata, Nobuhito; and Yamashita, Yoshio, to Kansai Paint Company, Limited. Aqueous emulsion compositions. 4,107,114, Cl. 260-22.0CB.
- Nakazawa, Isao: *See—*
  - Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.
- Nakazyo, Kiyoshin: *See—*
  - Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, 4,106,942, Cl. 96-100.00N.
- Nalco Chemical Company: *See—*
  - Maciaszek, Joseph A., 4,107,073, Cl. 252-321.000.
  - Pessimisis, George N., 4,107,087, Cl. 252-455.00R.
  - Slovinsky, Manuel; and Fong, Dodd Wing, 4,107,030, Cl. 208-48.0AA.
- Nali, Robert Ronald: *See—*
  - Liu, William Chang; Bratton, Francis H., deceased; and Nali, Robert Ronald, 4,107,259, Cl. 264-331.000.
- Narricot Industries, Inc.: *See—*
  - Wright, Robert C., 4,106,973, Cl. 156-433.000.
- Nash, Dudley O.; and Holowach, Joseph, to United States of America, National Aeronautics and Space Administration. Sound-suppressing structure with thermal relief. 4,106,587, Cl. 181-213.000.
- National Distillers and Chemical Corporation: *See—*
  - Murib, Jawad H., 4,107,204, Cl. 260-530.00N.
- National Marine Service, Inc.: *See—*
  - Barmeier, Harold J., Jr.; and Wright, David A., 4,107,601, Cl. 324-173.000.
- National Research Development Corporation: *See—*
  - Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, 4,107,142, Cl. 528-93.000.
  - Epstein, David, 4,106,944, Cl. 106-38.200.
  - Grimsdale, Richard Lawrence; Willis, Philip John; and Hedjiaslanis, Aris, 4,107,780, Cl. 364-521.000.
  - McLoughlin, Victor Conrad Richard; Moreton, Roger; and Watt, William, 4,107,408, Cl. 526-8.000.
  - Scales, John Tracy, 4,106,130, Cl. 3-1.910.
- National Rolling Mills Company: *See—*
  - Jones, Paul H., 4,106,878, Cl. 403-28.000.
- National Storage Systems, Inc.: *See—*
  - Zapara, Gerald A., 4,106,248, Cl. 52-234.000.
- Nayar, Harbhajan S., to Airco, Inc. Methods for sintering powder metallurgy parts. 4,106,931, Cl. 75-201.000.
- Naylor, Floyd E.; and Zelinski, Robert P., to Phillips Petroleum Company. Hydrogenated block copolymers containing a block derived from low vinyl polybutadiene and a block derived from medium vinyl polybutadiene. 4,107,236, Cl. 260-879.000.
- NCR Corporation: *See—*
  - Adams, Robert Clarence; and Sweigart, James H., 4,106,962, Cl. 156-73.100.
  - Farber, Sheldon, 4,107,428, Cl. 542-437.000.
- Neeff, Harry B. Portable prover barrel. 4,106,328, Cl. 73-3.000.
- Neff, Charles G., to Beebe, William F., a part interest. Fluid wedged double lock fifth wheel. 4,106,793, Cl. 280-435.000.
- Negre, Henri; and Cathiard, Jean-Pierre. Ship and shore load handling system with an asymmetrical shaped pontoon for supporting carriage cables. 4,106,638, Cl. 214-14.000.
- Nehring, Jurgen: *See—*
  - Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.
- Nelson, Gunner E.; and Pearson, Tillmon H., to Ethyl Corporation. Metal sequestering method. 4,107,064, Cl. 252-89.00R.
- Nelson, Hugh Wharton, to Combustion Engineering, Inc. Method of preventing explosions using a smelt water explosion inhibitor. 4,106,978, Cl. 162-1.000.
- Nelson, John P.; and Hanaway, Roger D., to Allis-Chalmers Corporation. Floating grain bin extension for use with agricultural combine. 4,106,649, Cl. 214-522.000.
- Nelson, Lloyd A.: *See—*
  - Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., 4,106,188, Cl. 29-631.000.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-5-oxa-ω-phenoxy-PGE$_1$ compounds. 4,107,211, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-ω-phenyl-PGA or 9-deoxy-9,10-didehydro-PGD analogs. 4,107,212, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-5-oxa-ω-phenoxy-PGD$_1$ compounds. 4,107,213, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-3,7-inter-m-phenylene-ω-phenoxy-PGD$_1$ compounds. 4,107,214, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-ω-phenyl-PGE$_1$ compounds. 4,107,215, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-ω-phenyl-PGD analogs. 4,107,216, Cl. 260-590.00C.
- Nelson, Roger K. Method of handling Drosophila. 4,106,438, Cl. 119-1.000.
- Nelsson, Nels, to United States Gypsum Company. Relocatable wall mounting system. 4,106,251, Cl. 52-765.000.
- Nemchenok, Rafail Lvovich: *See—*
  - Klimin, Alexandr Ivanovich; Mostovsky, Alexandr Alexeevich; and Nemchenok, Rafail Lvovich, 4,107,564, Cl. 313-94.000.
- Nemeth, Edwin A., to P. N. Associates, Inc. Self-powered folding golf cart. 4,106,583, Cl. 180-65.00E.
- Nemeth, Harold C., to Akzona Incorporated. Stable water dispersions of encapsulated parathion. 4,107,292, Cl. 424-78.000.
- Nercessian, Sarkis: *See—*
  - Birman, Paul; and Nercessian, Sarkis, 4,107,620, Cl. 330-265.000.
- Neri, Filippo; and Albrande, Alfredo, to Selenia-Industrie Elettroniche Associate S.p.A. Device for controlling the conical scanning frequency for conical scanning radar systems. 4,107,683, Cl. 343-18.00E.
- Neveux, Rene Elie, to Societe Anonyme Francaise du Ferodo. Deflector for heat exchanger tube, its manufacturing method and exchanger comprising such deflectors. 4,106,558, Cl. 165-109.000.
- New England Envelope Manufacturing: *See—*
  - Howatt, George Frederick, 4,106,431, Cl. 118-203.000.
- New England Nuclear Corporation: *See—*
  - Pratt, Frederick P.; and Gagnon, David L., 4,107,283, Cl. 424-1.000.
- Niccolls, Paul L., to Empire Foods, Inc. Poultry cleaning apparatus and method. 4,106,161, Cl. 17-11.000.
- Nicely, Charles W.: *See—*
  - Becker, Frederick R., III; and Nicely, Charles W., 4,106,736, Cl. 248-222.200.
- Nicol, Thomas: *See—*
  - Hill, William Frank; and Nicol, Thomas, 4,107,658, Cl. 340-620.000.
- Niehaus, William Charles: *See—*
  - DiLorenzo, James Vincent; Niehaus, William Charles; and Varnerin, Lawrence John, Jr., 4,106,959, Cl. 148-175.000.
- Nielsen, Edwin A.: *See—*
  - Carella, Vincent; and Nielsen, Edwin A., 4,106,695, Cl. 238-10.00F.
- Nielsen, Leif, to Danfoss A/S. Valve arrangement for refrigeration plants. 4,106,691, Cl. 236-92.00B.
- Nihei, Hideharu: *See—*
  - Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wataru, 4,107,565, Cl. 313-174.000.
- Nii, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, to Hitachi, Ltd.; and Tokyo Electric Power Co., Inc., The. Digital fault-location calculation system. 4,107,778, Cl. 364-492.000.
- Niimi, Itaru: *See—*
  - Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.
- Niino, Yasukazu; and Nagai, Takuya, to Nishinippon Engineering Co., Ltd. Valve with two valve plates. 4,106,748, Cl. 251-133.000.
- Niles, Albert B.: *See—*
  - Gardner, John W.; Grgurich, William A.; and Niles, Albert B., 4,106,702, Cl. 239-533.300.
- Nippon Cable System Inc.: *See—*
  - Baba, Masanao, 4,106,604, Cl. 192-0.098.
- Nippon Electric Co., Ltd.: *See—*
  - Iwata, Shigehisa, 4,107,704, Cl. 354-23.00D.
  - Maruta, Rikio, 4,107,470, Cl. 179-15.0FS.
  - Saburi, Akio, 4,107,608, Cl. 325-4.000.
  - Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, 4,107,572, Cl. 315-3.600.
- Nippon Gakki Seizo Kabushiki Kaisha: *See—*
  - Yoshida, Takashi; and Matsuyama, Takeshi, 4,107,725, Cl. 357-41.000.
- Nippon Kasei Chemical Co., Ltd.: *See—*
  - Kameyama, Akinori; Matsunaga, Yoshiki; and Saito, Hiroyasu, 4,107,119, Cl. 260-29.4UA.
- Nippon Kayaku Kabushiki Kaisha: *See—*
  - Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.
  - Watanabe, Hiroshi, 4,107,302, Cl. 424-200.000.
- Nippon Kokan Kabushiki Kaisha: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.
  - Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, 4,106,998, Cl. 201-39.000.
- Nippon Paint Co., Ltd.: *See—*
  - Nakajima, Takashi; Irie, Tomoyuki; and Kusumoto, Keiichi, 4,106,430, Cl. 118-64.000.
- Nippon Soken, Inc.: *See—*
  - Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
  - Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.
- Nippon Steel Corporation: *See—*
  - Asakawa, Kenichi; and Yoshida, Makoto, 4,107,357, Cl. 427-300.000.

Ochiai, Tsunemi; and Nishitani, Teruyuki, 4,107,244, Cl. 264-30.000.

Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, 4,106,318, Cl. 72-199.000.

Nippondenso Co., Ltd.: *See—*

Arai, Hiroshi; and Taniguchi, Koichi, 4,107,646, Cl. 340-52.00F.

Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.

Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,450, Cl. 123-119.0EC.

Yoshino, Muneki, 4,107,647, Cl. 340-71.000.

Nishigaki, Susumu; and Ohgoshi, Akio, to Sony Corporation. Flame detecting apparatus. 4,107,657, Cl. 340-579.000.

Nishii, Noboru: *See—*

Sunamori, Takashi; and Nishii, Noboru, 4,107,156, Cl. 526-91.000.

Nishijima, Tadashi, to Tokyo Shibaura Electric Co., Ltd. Numerical control system having a position processing unit operated upoo a power failure. 4,107,654, Cl. 340-147.0MT.

Nishikawa, Kazunori: *See—*

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Nishimura, Matsuo, to Yasui Sangyo Co., Ltd. Elevatable depalletizing system. 4,106,635, Cl. 214-8.50A.

Nishinippon Engineering Co., Ltd.: *See—*

Nüno, Yasukazu; and Nagai, Takuya, 4,106,748, Cl. 251-133.000.

Nishitani, Teruyuki: *See—*

Ochiai, Tsunemi; and Nishitani, Teruyuki, 4,107,244, Cl. 264-30.000.

Niskin, Shale J. Rotatable valve assembly. 4,106,751, Cl. 251-316.000.

Nissan Chemical Industries Ltd.: *See—*

Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.

Nissan Motor Company, Limited: *See—*

Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, 4,107,392, Cl. 428-547.000.

Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.

Nagaishi, Hatuo; and Yoshimura, Tooru, 4,106,288, Cl. 60-282.000.

Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,106,471, Cl. 123-198.00F.

Nozawa, Koji; and Ohba, Motoichi, 4,106,365, Cl. 74-740.000.

Sakurai, Shinichiro, 4,106,807, Cl. 296-28.00R.

Takao, Hiroshi; and Matoba, Kazuo, 4,107,019, Cl. 204-195.00S.

Nissei Shipping Co., Ltd.: *See—*

Omote, Sadao, 4,106,640, Cl. 214-14.000.

Nistratov, Alexei Fedorovich: *See—*

Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.

Nitro Nobel: *See—*

Erixon, Berthold, 4,107,453, Cl. 174-87.000.

Nitto Chemical Industry Co., Ltd.: *See—*

Sasaki, Yutaka; and Nakamura, Yoshimi, 4,107,085, Cl. 252-448.000.

Niwa, Kuniyuki: *See—*

Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, 4,107,589, Cl. 318-602.000.

Nl Hycalog: *See—*

Zabcik, Clarence John, 4,106,779, Cl. 277-27.000.

No-Joint Concrete Pipe Co.: *See—*

McNeill, Charles T., 4,106,300, Cl. 61-72.200.

Noda, Fumiyoshi: *See—*

Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.

Noel, Eugene M. Controlled process muffin griddle. 4,106,400, Cl. 99-373.000.

Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine and method of operation. 4,106,448, Cl. 123-119.0LR.

Nohara, Haruo: *See—*

Nü, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.

Nolan, James F., to Owens-Illinois, Inc. Transfer within gaseous discharge display/memory device. 4,107,577, Cl. 315-169.0TV.

Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, to Asahi Glass Company, Ltd. Solder alloys for soldering difficultly solderable material. 4,106,930, Cl. 75-134.00B.

Nomura, Yasuji: *See—*

Kotabe, Munenori; and Nomura, Yasuji, 4,107,535, Cl. 250-406.000.

Noranda Mines Limited: *See—*

Loutfy, Raouf O.; and Ho, Paul P. K., 4,107,025, Cl. 204-290.00F.

Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-to-fuel ratio feedback control system. 4,106,450, Cl. 123-119.0EC.

Noring, Josef: *See—*

Rudolph, Siegfried; Noring, Josef; and Schreiber, August, 4,107,040, Cl. 210-159.000.

Norland, Kenneth S.: *See—*

Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., 4,106,861, Cl. 350-354.000.

Norris, Alan Hedley; and Chambley, Phillip Wayne, to Champion International Corporation. Method for producing multicolor printed web material. 4,106,896, Cl. 8-62.000.

Norris, Aubrey O.: *See—*

West, Curtis W.; Lee, Larry E.; and Norris, Aubrey O., 4,106,581, Cl. 180-54.00B.

Norris, George F.: *See—*

Schuette, William H.; and Norris, George F., 4,106,492, Cl. 128-2.00V.

Northern Electric Company: *See—*

Scher, Victor H.; Fox, Theodore A.; and Sandford, Philip A., 4,107,509, Cl. 219-211.000.

Northern Telecom Limited: *See—*

Henderson, Edward Lloyd, 4,107,476, Cl. 179-84.00T.

Hillman, Garth Decker, 4,107,540, Cl. 250-566.000.

Novak, Arthur F.: *See—*

Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Oene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.

Novar Electronics Corporation: *See—*

Ott, James H., 4,107,775, Cl. 364-413.000.

Novo Industri A/S: *See—*

Markussen, Erik Kjaer; and Schmidt, Arne Wintherhalter, 4,106,991, Cl. 195-63.000.

Nozaki, Sumio: *See—*

Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.

Nozawa, Koji; and Ohba, Motoichi, to Nissan Motor Company, Limited. Power train arrangement for surface-handling vehicle. 4,106,365, Cl. 74-740.000.

Numata, Saburo; and Okazaki, Shinichiro, to Fuji Photo Optical Co., Ltd. Analogue operation adjusting means for photographic camera. 4,107,707, Cl. 354-50.000.

Nutrilite Products, Inc.: *See—*

Chauthani, Abdul Rehman, 4,107,294, Cl. 424-93.000.

Occidental Oil Shale, Inc.: *See—*

French, Gordon B., 4,106,814, Cl. 299-2.000.

OCE-van der Grinten N.V.: *See—*

Ophey, Petrus J. M., 4,106,868, Cl. 355-3.0TR.

Ochiai, Tsunemi; and Nishitani, Teruyuki, to Nippoo Steel Corporation. Method and apparatus for repairing damaged surface of refractory lined vessel. 4,107,244, Cl. 264-30.000.

Ocker, Herbert, to Werner & Pfleiderer. Screw extruder for continuously processing and degasing of elastomers and polymers having a viscosity of more than 1,000 poise. 4,107,787, Cl. 366-75.000.

Oddell, Leonard George, to EMI Limited. X-ray generating tubes. 4,107,563, Cl. 313-60.000.

Odnodushny, Viktor Alexeevich: *See—*

Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.

Odom, Gary C.: *See—*

Gillen, John E.; and Odom, Gary C., 4,106,145, Cl. 9-5.000.

Oe, Etsuo: *See—*

Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, 4,106,557, Cl. 165-105.000.

Oetiker, Hans. At least two-partite clamping sleeve for connection of two pipe ends provided with flanges. 4,106,799, Cl. 285-365.000.

Officina Meccanica Pisani Luigi: *See—*

Pisani, Luigi, 4,106,715, Cl. 242-57.100.

Ogle, James A.; and Holz, George E., to Burroughs Corporation. Panel-type display device. 4,107,576, Cl. 315-169.0TV.

Ogura, Katsuyuki: *See—*

Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,107,178, Cl. 260-332.20A.

Ogushi, Akira: *See—*

Tabuchi, Hideho; and Ogushi, Akira, 4,107,533, Cl. 250-364.000.

Ohba, Katsuhiro: *See—*

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Ohba, Motoichi: *See—*

Nozawa, Koji; and Ohba, Motoichi, 4,106,365, Cl. 74-740.000.

Ohgoshi, Akio: *See—*

Nishigaki, Susumu; and Ohgoshi, Akio, 4,107,657, Cl. 340-579.000.

Ohki, Hiroshi: *See—*

Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,107,729, Cl. 358-4.000.

Ohno, Kosaku: *See—*

Campbell, George Thomas Richardson; Kasuga, Toshishige; and Ohno, Kosaku, 4,106,641, Cl. 214-15.00R.

Ohsaki, Nobuhide: *See—*

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of cultivating *Methylomonas probus* oo methanol containing medium. 4,106,988, Cl. 195-49.000.

Ohta, Mitsunori: *See—*

Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, 4,107,062, Cl. 252-62.10P.

Okabe, Yasuhisa: *See—*

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Okada, Sadayuki: *See—*

Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, 4,106,557, Cl. 165-105.000.

Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, to Nippon Kokan Kabushiki Kaisha. Method of restraining emission from coke quenching equipment. 4,106,998, Cl. 201-39.000.

Okano, Hiroshi: *See—*

Nakamura, Kenya; and Okano, Hiroshi, 4,106,553, Cl. 165-9.000.

Okazaki Manufacturing Company Ltd.: *See—*

Okazaki, Tatsuo, 4,107,021, Cl. 204-263.000.

Okazaki, Shinichiro: *See—*

Numata, Saburo; and Okazaki, Shinichiro, 4,107,707, Cl. 354-50.000.

Okazaki, Tatsuo, to Okazaki Manufacturing Company Ltd. Water pot with an electrolyzing device. 4,107,021, Cl. 204-263.000.

Oki Electric Industry Co., Ltd.: *See—*

Ishino, Hiroshi, 4,107,547, Cl. 307-203.000.

Okorodudu, Abraham O., to Mobil Oil Corporatioo. Phosphorus substituted dimercapto thiadiazoles. 4,107,168, Cl. 260-302.00E.

Okuhara, Shinzi: *See—*

Kawanami, Mitsuru; Okuhara, Shinzi; and Mukaemachi, Takuzi, 4,107,472, Cl. 179-18.0GF.

Olin Corporation: *See—*

Tobin, John H., 4,107,377, Cl. 260-306.80D.

Oliphant, Howard G., to Kochs, H. W., Jr.; Geer, R. M.; and Cason, Lois Jean. Fire door for trailers. 4,106,236, Cl. 49-141.000.

Oliver, David L.: *See—*

Fields, Marvin C.; Oliver, David L.; and Snyder, Arthur R., 4,106,917, Cl. 55-31.000.

Oliver, John F. Automatic fireplace heating system. 4,106,693, Cl. 237-51.000.

Olkhovsky, Valery Leonidovich: *See—*

Cherepin, Valentin Tikhonovich; and Olkhovsky, Valery Leonidovich, 4,107,527, Cl. 250-309.000.

Olsson, Kjell Olow Ingemar: *See—*

Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, 4,107,253, Cl. 246-182.00B.

Olympia, Frederick D.: *See—*

Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., 4,107,255, Cl. 264-299.000.

Olympus Optical Co., Ltd.: *See—*

Fujü, Toru, 4,106,854, Cl. 350-176.000.

Hashimoto, Akihiko; and Enomoto, Fuzio, 4,107,705, Cl. 354-29.000.

Morokuma, Tadashi; and Tsuda, Naotsune, 4,106,173, Cl. 29-603.000.

Nakao, Toshihiro, 4,106,663, Cl. 220-326.000.

Shimoda, Misao, 4,107,751, Cl. 360-122.000.

Omote, Sadao, to Nissei Shipping Co., Ltd. Loading apparatus for cargo vessel. 4,106,640, Cl. 214-14.000.

Omura, Satoshi; Iwai, Yuzuru; and Hirano, Atsushi, to Kitasato Institute, The. Antibiotic compound. 4,107,297, Cl. 424-122.000.

O'Neill, Eugene T.; and Flach, Donald O., to FMC Corporation. Animal confinement environment control. 4,107,268, Cl. 423-210.000.

Onishi, Tsutomu: *See—*

Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,106,371, Cl. 81-57.140.

Ono, Koichi: *See—*

Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.

Ono, Takayoshi, to Toyota Tidoshakogyo Kabushiki Kaisha. Fluid reservoir. 4,106,666, Cl. 220-373.000.

Onodera, George C., to Motorola, Inc. Method of producing an ioo implanted tuning diode. 4,106,953, Cl. 148-1.500.

Ontario Energy Corporation: *See—*

Lorenz, Gordon Ronald, 4,107,029, Cl. 208-11.0LE.

Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm, B.V. Mower. 4,106,273, Cl. 56-295.000.

Opalka, Chester J., Jr.: *See—*

Lesher, George Y.; and Opalka, Chester J., Jr., 4,107,315, Cl. 424-263.000.

Ophey, Petrus J. M., to OCE-van der Grinten N.V. Electrographic copying apparatus with surface-to-surface image transfers. 4,106,868, Cl. 355-3.0TR.

Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, to Pharmaceutical Society of Victoria. Injectable compositions, nanoparticles useful therein, and process of manufacturing same. 4,107,288, Cl. 424-22.000.

Orbanic, Robert Stephen: *See—*

Jayne, Max Leroy; Orbanic, Robert Stephen; and Lapraik, Scott Jack, 4,106,838, Cl. 339-99.00R.

Oriental Yeast Co. Ltd.: *See—*

Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujü, Katsumi; and Horio, Takekazu, 4,107,014, Cl. 204-180.00R.

Ormood, Alfred Newman. Amplifier system having signal gain independent of a reference voltage. 4,107,618, Cl. 330-51.000.

Ortell, Alexander Rudolph, to Teledyne Brown Engineering, a Division of Teledyne Industries, Inc. Aircraft folding airfoil system. 4,106,727, Cl. 244-49.000.

Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, to Otto Junker GmbH. Method of and apparatus for serving helical coils with a protective band. 4,106,709, Cl. 242-7.030.

Orui, Ryuzo: *See—*

Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, 4,107,572, Cl. 315-3.600.

Osaka Kasei Company Limited: *See—*

Watanabe, Hiroshi, 4,107,302, Cl. 424-200.000.

Osby, Warren J.: *See—*

Strunc, Gerald R.; and Osby, Warren J., 4,106,685, Cl. 226-136.000.

Oscilloquartz Sa: *See—*

Graf, Erhard; and Wiedmer, Jean-Pierre, 4,107,623, Cl. 331-1.00A.

Osgood, George M. Liquid rheostat. 4,107,641, Cl. 338-55.000.

Oshima, Yujiro: *See—*

Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.

Ostaszewski, Wojciech: *See—*

Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.

Osuka, Tatsumi: *See—*

Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH: *See—*

Marten, Wolfgang; Holstein, Herbert; and Esser, Gustav, 4,106,785, Cl. 279-4.000.

Oswald, Heinz; and Wust, Olivier, to Rieter Machine Works Ltd. Chuck for a tube acting as a package support. 4,106,711, Cl. 242-19.000.

Ota, Jun: *See—*

Nagara, Toshio; Nakagawa, Kogoro; Higo, Nobumasa; Kuno, Masanori; Arai, Hiroshi; and Ota, Jun, 4,107,493, Cl. 200-84.00C.

Otis Engineering Corporation: *See—*

McCracken, Oliver W., 4,107,697, Cl. 346-33.00R.

Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, to Sony Corporation. Method and apparatus for reproducing signals from a rotating record medium and method and apparatus for making same. 4,107,729, Cl. 358-4.000.

Ott, James H., to Novar Electronics Corporation. Human body comparisoo using driving point parameters. 4,107,775, Cl. 364-413.000.

Otteson, Kenneth Melvin; and Dawson, Daniel Joseph, to Dynapol. Edibles containing colorants having ethylsulfonate-alkylamine backbones. 4,107,336, Cl. 426-250.000.

Otto Junker GmbH: *See—*

Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, 4,106,709, Cl. 242-7.030.

Otto, Paul R.; and Mandel, Alan F., to Westinghouse Electric Corp. Methods and tools for servicing an elevator system. 4,106,593, Cl. 187-29.00R.

Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Substituted pyridines and dihydropyridines as corrosion inhibitors. 4,106,904, Cl. 21-2.70R.

Ouimet, Raymond Joseph; Wojtowicz, Edward Arthur; Lund, George Edward; and Fiorentino, Ermenegildo, to Burroughs Corporation. Recirculation buffer subsystem for use in sorting and processing articles including mail flats. 4,106,636, Cl. 214-11.00R.

Ovshinsky, Stanford R.: *See—*

Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., 4,106,939, Cl. 96-48.00R.

Owa, Kaoru: *See—*

Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, 4,107,589, Cl. 318-602.000.

Owen, William S., Jr.; and Lovejoy, George C., to General Electric Company. Method for stripping insulation from wire. 4,106,377, Cl. 83-4.000.

Owens-Corning Fiberglas Corporation: *See—*

Costin, Darryl J., 4,107,450, Cl. 13-35.000.

Lin, Kingso C.; and Hammond, Donald J., 4,107,117, Cl. 260-28.50B.

McCoy, Richard Alan, 4,107,118, Cl. 260-29.2EP.

Owens-Illinois, Inc.: *See—*

Amberg, Stephen W.; and Doherty, Thomas E., 4,106,397, Cl. 93-55.10R.

Nolan, James F., 4,107,577, Cl. 315-169.0TV.

Owsley, Dennis C.; and Bloomfield, Jordan J., to Monsanto Company. Gas phase nitration of chiorobenzene. 4,107,220, Cl. 260-646.000.

Oyaizu, Yoshijiro: *See—*

Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, 4,107,151, Cl. 528-54.000.

Oyama, Makoto, to United Chemi-Con, Inc. Electrolytic capacitor and electrolyte. 4,107,761, Cl. 361-433.000.

Oyama, Shiro: *See—*

Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.

Oyamada, Akira: *See—*

Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, 4,107,392, Cl. 428-547.000.

Ozaki, Hideaki: *See—*

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Ozbey, Ahmet M.: *See—*

Ozbey, Amber Lola; and Ozbey, Ahmet M., 4,106,501, Cl. 128-62.00A.

Ozbey, Amber Lola; and Ozbey, Ahmet M. Sweeping fluid spray oral hygiene device. 4,106,501, Cl. 128-62.00A.

P. Ferrero & C. S.p.A.: *See—*

Dogliotti, Amilcare, 4,106,657, Cl. 220-23.400.

P. N. Associates, Inc.: *See—*
Nemeth, Edwin A., 4,106,583, Cl. 180-65.00E.

Pachter, Irwin J.: *See—*
Rajagopalan, Parthasarathi; and Pachter, Irwin J., 4,107,165, Cl. 260-288.0CE.

Pacific Fireplace Furnishings, Inc.: *See—*
Haraha, Robert W., 4,106,476, Cl. 126-140.000.

Pacific Handy Cutter, Inc.: *See—*
Smithline, John P., 4,106,196, Cl. 30-294.000.

Packes, Helmut: *See—*
Ortmanns, Theodor; Apelt, Heinz; and Packes, Helmut, 4,106,709, Cl. 242-7.030.

Pako Corporation: *See—*
Diesch, Robert E., 4,106,716, Cl. 242-75.430.
Strunc, Gerald R.; and Osby, Warren J., 4,106,685, Cl. 226-136.000.

Paluch, Edward S., to Reliable Electric Company. Electrical connector. 4,106,837, Cl. 339-98.000.

Palumbo, Angeline. Convertible garment. 4,106,125, Cl. 2-213.000.

Paly, Gennady Mikhailovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Panelfold, Inc.: *See—*
Dixon, Guy E.; and Dixon, Thomas M., 4,106,544, Cl. 160-199.000.

Papa, Anthony Joseph: *See—*
Dunleavy, Raymond Augustine; and Papa, Anthony Joseph, 4,107,106, Cl. 521-164.000.

Papantoniou, Christos: *See—*
Jacquet, Bernard; Papantoniou, Christos; Dufaure, Pierre; and Mahieu, Claude, 4,107,290, Cl. 424-47.000.

Paragi, Edward J.: *See—*
Campbell, Donn V.; and Paragi, Edward J., 4,107,691, Cl. 343-120.000.

PARCOR: *See—*
Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, 4,107,437, Cl. 544-376.000.

Pardoe, John Alan; Etherington, Clifford; and Hunter, Eric, to United Kingdom Atomic Energy Authority. Forming of materials by extrusion. 4,106,320, Cl. 72-256.000.

Paris, John Rene: *See—*
Murphy, Alan Pearce; and Paris, John Rene, 4,107,067, Cl. 252-135.000.

Parker, Phillip H., to Chevron Research Company. Needle-punched grass-like carpets. 4,107,361, Cl. 428-17.000.

Parodi, Sandro: *See—*
Giannini, Umberto; Albizzati, Enrico; and Parodi, Sandro, 4,107,416, Cl. 526-114.000.

Parsons, William H., to Teleflex Incorporated. Method and apparatus for assembling a ball cage of the type utilized in a motion transmitting remote control assembly. 4,106,168, Cl. 29-148.40C.

Parsteel Products Company, Inc.: *See—*
Rosenband, Phillip, 4,106,630, Cl. 211-191.000.

Partain, Wilbur A.; and Sudol, Frank D. Adjustable coil rack. 4,106,735, Cl. 248-119.00R.

Pasko, Edward: *See—*
Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.

Pass, Nelson S., to Threshold Corporation. Constant voltage - constant current high fidelity amplifier. 4,107,619, Cl. 330-255.000.

Patel, Jayant K., to TRW Inc. Miniature motor. 4,107,559, Cl. 310-49.00R.

Patelli, Bianca: *See—*
Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.

Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., to Raytheon Company. Air screw classifier. 4,107,034, Cl. 209-135.000.

Patheiger, Manfred: *See—*
Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rudolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.

Paul, Rolf; and Menschik, Judith, to American Cyanamid Company. Imidazo [1,5-d]-as-triazine-4(3H)-ones and thiones. 4,107,307, Cl. 424-249.000.

Paul, Rolf; and Menschik, Judith, to American Cyanamid Company. Imidazo[1,5-d]-as-triazines. 4,107,308, Cl. 424-249.000.

Paul, Rolf; and Menschik, Judith, to American Cyanamid Company. Substituted imidazo[1,2-d]-as-triazines. 4,107,309, Cl. 424-249.000.

Pauley, Merle R.: *See—*
Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,106,183, Cl. 29-564.000.

Paulus, Rudolf: *See—*
Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.

Pause, Kurt: *See—*
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,106,518, Cl. 134-104.000.

Payne, Stephen Martin: *See—*
Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.

Payraudeau, Daniel: *See—*
Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.

Pearce, Peter John: *See—*
Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, 4,107,142, Cl. 528-93.000.

Pearson, Allen F.; Mayo, Paul A.; and Lorenz, Ronald N., to Anthes Imperial Limited. Dispensing system. 4,107,777, Cl. 364-465.000.

Pearson, Edward E. Stereophonic noise suppression system. 4,107,463, Cl. 179-1.00G.

Pearson, Tillmon H.: *See—*
Nelson, Gunner E.; and Pearson, Tillmon H., 4,107,064, Cl. 252-89.00R.

Pease, Ronald J.: *See—*
Sikma, William J.; and Pease, Ronald J., 4,106,203, Cl. 33-86.000.

Pease, William M.: *See—*
Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, 4,107,673, Cl. 343-5.0DP.

Pedain, Josef: *See—*
Konig, Eberhard; and Pedain, Josef, 4,107,199, Cl. 260-465.00D.
Konig, Eberhard; and Pedain, Josef, 4,107,200, Cl. 260-465.00E.

Peet, Norton P.: *See—*
Sunder, Shyam; and Peet, Norton P., 4,107,436, Cl. 544-169.000.

Pegg, Elra W.: *See—*
Zechinati, James; and Pegg, Elra W., 4,107,250, Cl. 264-118.000.

Peksa, Stanislaw: *See—*
Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.

Pelegri, Ismael Martinez. Soldering method. 4,107,506, Cl. 219-85.00A.

Pelton & Crane Company: *See—*
Childress, Bobby Belton, 4,106,198, Cl. 32-22.000.

Penco, Sergio: *See—*
Arcamone, Federico; Bernardi, Luigi; Patelli, Bianca; and Penco, Sergio, 4,107,423, Cl. 536-4.000.

Penez, Andre: *See—*
Recasens, Joseph; and Penez, Andre, 4,106,947, Cl. 106-57.000.

Penland Container, Inc.: *See—*
Yealy, Carl F.; and Abbott, Joseph, 4,106,963, Cl. 156-73.500.

Pennwalt Corporation: *See—*
King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, 4,107,059, Cl. 252-28.000.

Penzien, Klaus: *See—*
Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.

PepsiCo Inc.: *See—*
Horn, John J., 4,106,243, Cl. 52-16.000.

Percarpio, Edward P., to Becton, Dickinson and Company. Multiple sample needle assembly with indicator means. 4,106,497, Cl. 128-2.00F.

Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electrode materials based on lanthanum and nickel, and electrochemical uses of such materials. 4,107,405, Cl. 429-218.000.

Percy, Roger D.; Wilding, David C. M.; and Kagan, Sholly, to R. D. Percy & Company. Television viewer reaction determining system. 4,107,734, Cl. 358-84.000.

Peregrina, Carlos Morales. Elevated support angularly adjustable on a spherical joint head and same bearing a vise. 4,106,761, Cl. 269-75.000.

Pereillo, Jean-Marie: *See—*
Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, 4,107,437, Cl. 544-376.000.

Perkin-Elmer Corporation, The: *See—*
Babish, Richard Constantine, 4,106,856, Cl. 350-199.000.

Perkins, Donald W.: *See—*
Hildebrandt, Herbert J.; and Perkins, Donald W., 4,106,462, Cl. 123-148.00E.

Perkins, Warren S., to Auburn University Research Foundation. Process for recycling textile warp yarn size. 4,106,900, Cl. 8-115.600.

Perkons, George: *See—*
Moden, James R.; and Perkons, George, 4,107,406, Cl. 429-218.000.

Perma-Power Inc.: *See—*
Queen, Daniel L.; and Belt, Kenneth W., 4,107,613, Cl. 325-348.000.

Pessimisis, George N., to Nalco Chemical Company. Use of citric acid to make catalyst from catalyst fines. 4,107,087, Cl. 252-455.00R.

Peterhans, Josef; Volkert, Otto; and Beckerle, Wilhelm Friedrich, to BASF Wyandotte Corporation. Porous, substantially foam-free composites. 4,107,100, Cl. 521-137.000.

Peters, Robert W. Stator coil press. 4,106,189, Cl. 29-736.000.

Petersen, Carl Mogens, III, to Irvin Industries Inc. Safety switch. 4,107,484, Cl. 200-42.00T.

Petersen, John: *See—*
Petersen, Knud William; and Petersen, John, 4,106,589, Cl. 182-5.000.

Petersen, Knud William; and Petersen, John. Device adapted to be fastened to a wire, a cable, a cord, or a similar flexible elongated element. 4,106,589, Cl. 182-5.000.

Petersen, Oscar Johan; and Scott, Timothy Frank, to Robertshaw Controls Company. Microorganism growth inhibitor device. 4,106,995, Cl. 195-103.50R.

Peterson, James F.; Freier, Edward, Jr.; and Burmesch, Gerald C., to Allis-Chalmers Corporation. Grass collecting multiple blade mower without auxiliary blower means. 4,106,272, Cl. 56-202.000.

Petree, Harris E.; Nabors, James B., Jr.; and Grace, Henry C., to Ciba-Geigy Corporation. Non-explosive glyoxime compositions. 4,106,927, Cl. 71-121.000.

Petricca, Anthony V., to SCM Corporation. Whippable emulsion stable at room temperature. 4,107,343, Cl. 426-564.000.

Petrich, Walter R. Folding hatchet. 4,106,539, Cl. 145-2.00A.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,106,904, Cl. 21-2.70R.

Petruck, Gerd-Michael; Klauke, Erich; and Jager, Horst, to Bayer Aktiengesellschaft. 4-Hydroxyanthrones and process of preparation. 4,107,186, Cl. 260-351.000.

Petruzzella, Nicholas L., to Xerox Corporation. Xerographic plate having an phthalocyanine pigment interface barrier layer. 4,106,935, Cl. 96-1.50R.

Petzi, Fritz: *See—*
Beumann, Helmut; and Petzi, Fritz, 4,106,893, Cl. 432-77.000.

Pezzotti, Erio: *See—*
Ruffini, Guglielmo; and Pezzotti, Erio, 4,106,979, Cl. 162-73.000.

Pfahler, Gerhard: *See—*
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,107,139, Cl. 260-45.8NZ.

Pfefer, Irving. Demountable photo vignetting device. 4,107,716, Cl. 354-296.000.

Pfeffer, Philip E.; and Moore, Gordon G., to United States of America, Agriculture. Preparation of 1-α- and 1-β-glucose esters by stereoselective acylation of metalated 2,3,4,6,-tetra-O-benzyl-D-glucopyranose. 4,107,425, Cl. 536-119.000.

Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, to AGFA-Gevaert, A.G. Recording device. 4,107,687, Cl. 346-107.00R.

Pfeizer Inc.: *See—*
Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, 4,107,314, Cl. 424-263.000.

Pfirrmann, Rolf W., to Ed. Geistlich Sohne A.G. fur Chemische Industrie. Treatment of endotoxaemia. 4,107,305, Cl. 424-246.000.

Pfister, Gustav R.: *See—*
Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.

Pfizer Inc.: *See—*
Jolly, Ramesh C., 4,107,334, Cl. 426-7.000.
Kuhla, Donald E.; and Watson, Harry A., Jr., 4,107,430, Cl. 542-471.000.
Ross, Barry C., 4,107,435, Cl. 544-97.000.

PGP Industries Inc.: *See—*
Baltz, John; and Coltrinari, Enzo, 4,107,261, Cl. 423-22.000.

Pharmaceutical Society of Victoria: *See—*
Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, 4,107,288, Cl. 424-22.000.

Phillips, Benjamin A., to Allied Chemical Corporation. Analyzer and rectifier method and apparatus for absorption heat pump. 4,106,309, Cl. 62-476.000.

Phillips, Irvin J., to Beloit Corporation. Air knife with adjustable lip. 4,106,429, Cl. 118-63.000.

Phillips Petroleum Company: *See—*
Campbell, Robert W.; and Cleary, James W., 4,107,150, Cl. 528-307.000.
Carroll, James C.; and Johnson, Lewis T., 4,106,623, Cl. 206-506.000.
Carroll, James C.; and Johnson, Lewis T., 4,106,625, Cl. 206-507.000.
Carrow, Guy E., 4,106,745, Cl. 249-97.000.
LaSpisa, Ronald J., 4,107,246, Cl. 264-40.700.
Naylor, Floyd E.; and Zelinski, Robert P., 4,107,236, Cl. 260-879.000.
Richards, Frank P.; and Young, Jerry W., 4,106,396, Cl. 93-36.50R.
Salmon, Emigdio J., 4,107,422, Cl. 528-502.000.
Tuckett, William F.; Funk, Gary L.; and Smith, Dexter E., 4,106,916, Cl. 55-21.000.
Welch, M. Bruce, 4,107,412, Cl. 526-114.000.

Pichon, Maurice: *See—*
Brochier, Michel; and Pichon, Maurice, 4,107,020, Cl. 204-251.000.

Pickett, Frederick P.: *See—*
Lawrence, James L., Jr.; Holzl, Robert A.; and Pickett, Frederick P., 4,106,744, Cl. 249-96.000.

Piehl, Julia A., legal representative: *See—*
Piehl, Otto W., deceased, 4,106,206, Cl. 33-199.00R.

Piehl, Otto W., deceased (by Piehl, Julia A., legal representative), to United States of America, Navy. Positively expandable and retractable thread measuring gage. 4,106,206, Cl. 33-199.00R.

Pieper, Helmut, to Sorg GmbH & Co. KG. Method and apparatus for measuring the temperature of molten masses. 4,107,446, Cl. 13-6.000.

Pieper, Helmut, to Sorg GmbH & Co. KG. Electrical glass melting furnace. 4,107,447, Cl. 13-6.000.

Pierce, Ben Arthur, to Dracon Industries. Two-way paging system transmission direction sensing and control apparatus and method. 4,107,473, Cl. 179-18.0BF.

Pierson, John Ronald: *See—*
Dougherty, Thomas John; Hennen, Roy Erving; and Pierson, John Ronald, 4,107,402, Cl. 429-120.000.

Piguet, Christian: *See—*
Martin, Jean-Claude; and Piguet, Christian, 4,106,279, Cl. 58-23.0BA.

Piltingsrud, Harley V. Plutonium-americium detection probe with frontal light-guide-diffuser. 4,107,534, Cl. 250-368.000.

Pioneer Electronic Corporation: *See—*
Sugai, Yoshiro, 4,107,614, Cl. 325-348.000.

Pirogov, Nikolai Alexeevich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Pisani, Luigi, to Officina Meccanica Pisani Luigi. Rolling-up machine for lengths of cloth destined for collar-cutting machines. 4,106,715, Cl. 242-57.100.

Pissiotas, Georg: *See—*
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,106,925, Cl. 71-108.000.

Pittet, Alan O.: *See—*
Schreiber, William L.; and Pittet, Alan O., 4,107,217, Cl. 260-615.00A.

Pizogov, Nikolai Alexeevich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, to Rohm and Haas Company. Heteropolymer acrylic latices and textiles treated therewith. 4,107,120, Cl. 260-29.6RB.

Plass, Ludolf: *See—*
Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, 4,107,281, Cl. 423-625.000.

Platonov, Mikhail Alexandrovich; and Pokrovsky, Grigory Vasilievich. Method of producing moulded parts. 4,106,321, Cl. 72-348.000.

Plattner Industries, Inc.: *See—*
Cannon, John Porter, 4,106,665, Cl. 220-329.000.

Plattner, Werner, administrator: *See—*
Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.

Plockl, Johann. Arrangement for reading out an optical memory. 4,107,702, Cl. 354-17.000.

Pnentek, Inc.: *See—*
Haytayan, Harry M., 4,106,619, Cl. 206-346.000.

Poclain, Societe Anonyme: *See—*
Manesse, Jean-Pierre Andre, 4,106,522, Cl. 137-512.000.

Pohl, Gerhard: *See—*
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,107,274, Cl. 423-268.000.

Pointon, David Wellings: *See—*
Reed, Kenneth James; and Pointon, David Wellings, 4,107,365, Cl. 428-202.000.

Pokallus, Leonard W.: *See—*
Clishem, Thomas A.; Olympia, Frederick D.; and Pokallus, Leonard W., 4,107,255, Cl. 264-299.000.

Pokrovsky, Grigory Vasilievich: *See—*
Platonov, Mikhail Alexandrovich; and Pokrovsky, Grigory Vasilievich, 4,106,321, Cl. 72-348.000.

Polaroid Corporation: *See—*
Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., 4,106,861, Cl. 350-354.000.
Evans, David H.; and Greenwald, Richard B., 4,107,176, Cl. 260-327.00M.
Scholz, Donald T., 4,106,863, Cl. 352-72.000.

Politechnika Warszawska: *See—*
Murza-Mucha, Pawel; Koszarewski, Zbigniew; Ostaszewski, Wojciech; and Peksa, Stanislaw, 4,106,548, Cl. 164-132.000.

- Polley, Joseph A. Solar eoergy reflecting system. 4,106,485, Cl. 126-271.000.
- Polstorff, Walter K., to United States of America, National Aeronautics and Space Administration. Simulator method and apparatus for practicing the mating of an observer-controlled object with a target. 4,106,218, Cl. 35-12.00C.
- Polukhin, Alexandr Nikolaevich: *See*—
  - Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.
- Polysar Limited: *See*—
  - Richmood, Michael Hugh, 4,107,252, Cl. 264-176.00F.
- Polysar Resins, Inc.: *See*—
  - Toekes, Barna, 4,107,410, Cl. 526-73.000.
- Poncet, Pierre. Hydraulic moulding presses. 4,106,885, Cl. 425-450.100.
- Popoff, Ivan Christoff: *See*—
  - King, James Ping; Mailey, Everett A.; and Popoff, Ivan Christoff, 4,107,059, Cl. 252-28.000.
- Porchey, David V.: *See*—
  - Scamehorn, John F.; and Porchey, David V., 4,107,421, Cl. 528-483.000.
- Porritt, Derek S.: *See*—
  - Greenwald, A. Seth; Porritt, Derek S.; and Matejczyk, Mary-Blair, 4,106,128, Cl. 3-1.910.
- Porter, William F., to United States Gypsum Company. Apparatus for low pressure air fiberization of mineral fiber. 4,106,921, Cl. 65-14.000.
- Porter, William R.: *See*—
  - Borcher, Charles A.; and Porter, William R., 4,106,410, Cl. 102-67.000.
  - Borcher, Charles A.; Porter, William R.; and Harris, Martin H., 4,106,411, Cl. 102-67.000.
- Post, David L.: *See*—
  - Schuler, Alan L.; and Post, David L., 4,106,424, Cl. 114-74.00A.
- Post Office, The: *See*—
  - Redshaw, Digby, 4,107,481, Cl. 179-164.000.
- Potomac Applied Mechanics, Inc.: *See*—
  - Stubbings, James Henry, 4,106,380, Cl. 83-212.000.
- Potter, Bobby R.; and Scott, Allan W., to United States of America, Army. Printed circuit traveling wave tube. 4,107,573, Cl. 315-3.500.
- Potts, Robert John: *See*—
  - Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, 4,106,187, Cl. 29-625.000.
- Powell, Norman F., to Westinghouse Electric Corp. Polarization correlation target seeker. 4,107,678, Cl. 343-7.0ED.
- PPG Industries, Inc.: *See*—
  - Rieser, Raymond G.; and Chabal, Joseph, 4,107,366, Cl. 428-215.000.
  - Sickles, James E.; Horoyak, Joseph V.; and Franz, Helmut, 4,106,697, Cl. 239-15.000.
- Praporov, Anatoly Mikhailovich: *See*—
  - Kucherenko, Vladimir Ilich; Flerov, Valery Nikolaevich; Korolev, Georgy Vladimirovich; Kotov, Evgeny Pavlovich; Praporov, Anatoly Mikhailovich; Batova, Galina Alexandrovna; Melikova, Gayane Leonovna; and Kolomeichuk, Alexandr Ivanovich, 4,107,011, Cl. 204-151.000.
- Pratt, Frederick P.; and Gagnon, David L., to New England Nuclear Corporation. Tracer for circulation determinations. 4,107,283, Cl. 424-1.000.
- Precision Metalsmiths, Inc.: *See*—
  - Erndt, Edmund E., 4,106,945, Cl. 106-38.300.
- Preikschat, Fritz K. Electrode for an impedance measuring apparatus. 4,107,599, Cl. 324-61.00R.
- Preiss, Michael: *See*—
  - Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,107,304, Cl. 424-246.000.
- Prichard, Daniel Ray: *See*—
  - Weigand, Rex Olen; McMillen, Kenneth Ray; Fulk, Ronald Dean; Prichard, Daniel Ray; and Kountz, Jack Merriel, 4,106,270, Cl. 56-98.000.
- Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, to Snamprogetti, S.p.A. Process for the productioo of polymers and copolymers of isobutylene. 4,107,417, Cl. 526-117.000.
- Procter & Gamble Company, The: *See*—
  - Murphy, Alan Pearce; and Paris, John Rene, 4,107,067, Cl. 252-135.000.
  - Sisson, James Bryant, 4,107,364, Cl. 428-196.000.
- Proctor, Leonard R.; and Byrnes, Raymond G., to United States of America, Health, Education and Welfare. Biphasic otoscopic air stimulator for performing clinical caloric tests. 4,106,493, Cl. 128-2.00R.
- Proctor, Leonard R.; Dix, Rollin C.; and Metz, Werner A., to United States of America, Health, Education and Welfare. Method and apparatus for air caloric testing for the evaluation or aural vestibular disorders. 4,106,496, Cl. 128-2.00R.
- Producers Row Inc.: *See*—
  - Chasins, Edward A., 4,106,852, Cl. 350-117.000.
- Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Acrylonitrile-capped polyether-siloxanes. 4,107,068, Cl. 252-182.000.
- Proux, Yves; and Julien, Christian, to Societe Francaise d'Organo Synthese. Phenolic antioxidants for synthetic polymers. 4,107,137, Cl. 260-45.85T.
- Pucel, Robert A.; and Benjamin, James A., to Raytheon Company. Overlay metallization multi-channel high frequency field effect transistor. 4,107,720, Cl. 357-22.000.
- Pullman Berry Company: *See*—
  - Rymarchyk, Nicholas M.; and Meinert, Leo L., 4,106,756, Cl. 266-99.0C.
- Pullman Incorporated: *See*—
  - Ennis, Bernard P., Jr.; and Styslinger, James R., 4,107,226, Cl. 260-683.00R.
- PUMA-Sportschunfabriken Rudolf Dassler KG.: *See*—
  - Benseler, Hans, 4,106,223, Cl. 36-117.000.
- Purpi, David C.: *See*—
  - Turnbo, Roy G.; and Purpi, David C., 4,107,230, Cl. 260-861.000.
- Pury, Thomas; Assa, Menachem; and Wagner, Howard R., to General Electric Company. Power assist device using strain responsive means. 4,107,590, Cl. 318-628.000.
- Puyplat, Olivier, to Cibie Projecteurs. Method for assembling together parts of automobile lights. 4,106,969, Cl. 156-275.000.
- Quaas, Dietmar G.: *See*—
  - Lang, Richard L.; and Quaas, Dietmar G., 4,106,633, Cl. 214-1.0BB.
- Quaker Oats Company, The: *See*—
  - Greenberg, Michael J., 4,107,342, Cl. 426-535.000.
- Queen, Daniel L.; and Belt, Kenneth W., to Perma-Power Inc. Wireless microphone with FM receiver muting system responsive to excessive undesired AM level or low AGC control level. 4,107,613, Cl. 325-348.000.
- Quick-Rotan Becker & Notz KG: *See*—
  - Bayer, Friedrich, 4,107,592, Cl. 318-568.000.
- Quinn, Clayton B., to General Electric Company. Process for preparing dihydroxydiphenyl chloroethylenes. 4,107,442, Cl. 568-726.000.
- Quinn, Edwin J.: *See*—
  - Dieck, Ronald L.; and Quinn, Edwin J., 4,107,108, Cl. 521-85.000.
  - Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,107,146, Cl. 528-168.000.
- Quintal, Yvan. Ground heat exchanger. 4,106,555, Cl. 165-45.000.
- R. D. Percy & Company: *See*—
  - Frohbach, Hugh F., 4,107,735, Cl. 358-84.000.
  - Percy, Roger D.; Wilding, David C. M.; and Kagan, Sholly, 4,107,734, Cl. 358-84.000.
- Raab, Karl-Heinz, to Jos. Schneider & Co. Optische Werke. Adjusting mechanism for movable picture-taking objective. 4,107,714, Cl. 354-196.000.
- Rabas, Thomas J.: *See*—
  - Ritland, Paul D.; and Rabas, Thomas J., 4,106,559, Cl. 165-111.000.
- Rademacher, Karl August: *See*—
  - Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm, 4,107,042, Cl. 210-225.000.
- Radiochemical Centre Limited, The: *See*—
  - Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, 4,106,907, Cl. 23-230.300.
- Raguin, Michel M.: *See*—
  - Joyce, Thomas F.; and Raguin, Michel M., 4,107,774, Cl. 364-200.000.
- RAI Research Corporation: *See*—
  - D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,107,005, Cl. 204-98.000.
- Railoc Company, Inc.: *See*—
  - Rutten, Peter T., 4,106,252, Cl. 52-762.000.
- Rajagopalan, Parthasarathi; and Pachter, Irwin J., to Endo Laboratories. Tris[tetrahydroisoquinoline] compounds. 4,107,165, Cl. 260-288.0CE.
- Ralph, John Ernest, to U.S. Philips Corporation. Surface controlled field effect solid state device. 4,107,724, Cl. 357-30.000.
- Ramun, Michael. Shearing tool for structural members. 4,106,682, Cl. 225-103.000.
- Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., to Archer Daniels Midland Company. Continuous steeping of coro for wet processing to starches, syrups and feeds. 4,106,487, Cl. 127-23.000.
- Randmer, Jacob A.: *See*—
  - Koller, Thomas J.; and Randmer, Jacob A., 4,107,562, Cl. 313-59.000.
- Rank Organisation Limited, The: *See*—
  - Cooper, Peter Raymond, 4,107,517, Cl. 250-199.000.
  - Moore, William Thomas; and Heftman, George, 4,106,845, Cl. 350-6.600.
- Rank Precision Industries, Inc.: *See*—
  - Thiel, William A.; and Dziedzic, Harry, 4,107,763, Cl. 362-32.000.
- Ransburg Corporation: *See*—
  - DeVittorio, Joseph M., 4,106,964, Cl. 156-75.000.
- Ranz, Erwin: *See*—
  - Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, 4,106,940, Cl. 96-74.000.
- Rapperswill Corporation: *See*—
  - Korf, Heinz Ludwig, 4,107,105, Cl. 521-80.000.
- Raschig G.m.b.H.: *See*—
  - Braun, Roland, 4,107,241, Cl. 261-79.00A.
- Ratcliffe, Walter James; Kolb, Robert W.; and Bruce, S. Esson, to Dominion Textile Limited. Water repellant fabrics. 4,107,368, Cl. 428-245.000.
- Rauma-Repola Oy: *See*—
  - Lindberg, Jarl Johan; Turunen, Johannes; and Hortling, Bo, 4,107,111, Cl. 260-17.500.
  - Saikku, Antti Tuomas, 4,106,537, Cl. 144-34.00R.
- Raygo Wagner, Inc.: *See*—
  - Weisgerber, Charles E., 4,106,646, Cl. 214-147.00R.

- Raymond Lee Organization, Inc., The: *See*—
  - Bennett, Cleatus W., 4,107,693, Cl. 343-715.000.
- Raytheon Company: *See*—
  - Gross, Fritz A.; Pease, William M.; Meade, John E.; and Vickers, Harry, 4,107,673, Cl. 343-5.0DP.
  - Hutcheon, Robert Stewart; and Gordon, Bruce E., 4,107,692, Cl. 343-120.000.
  - Ironfield, Richard, 4,107,501, Cl. 219-10.55B.
  - Martin, Walter J.; and Furtado, John, 4,107,685, Cl. 343-100.0SA.
  - Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.
  - Pucel, Robert A.; and Benjamin, James A., 4,107,720, Cl. 357-22.000.
  - Schilling, Hartmut, 4,107,726, Cl. 357-71.000.
  - Tyson, Charles H., 4,106,840, Cl. 339-145.00R.
- Razvi, Masood H. Electrically conductive pipe fitting. 4,107,452, Cl. 174-84.00S.
- RCA Corporation: *See*—
  - Gubitose, Nicholas Francis; and James, Robert Arthur, 4,106,532, Cl. 140-147.000.
  - James, Edward Anthony; and Kuznetzoff, Philip, 4,107,351, Cl. 427-43.000.
  - Jellinek, Ernest, 4,107,689, Cl. 343-112.0TC.
  - Kaplan, Gerald Stanley, 4,107,680, Cl. 343-8.000.
  - Stewart, Roger Green; and Eaton, Sargent Sheffield, Jr., 4,107,556, Cl. 307-362.000.
- Recasens, Joseph; and Penez, Andre, to Societe Europeenne des Produits Refractaires. Beads of ceramic material. 4,106,947, Cl. 106-57.000.
- Redshaw, Digby, to Post Office, The. Telephone instruments. 4,107,481, Cl. 179-164.000.
- Reed, Clarence Arthur: *See*—
  - Morgan, Lewis Coleman; and Reed, Clarence Arthur, 4,107,694, Cl. 343-715.000.
- Reed, Joseph, to International Telephone & Telegraph Corp. Frequency division multiplex communications system. 4,107,471, Cl. 179-15.0FD.
- Reed, Kenneth James; and Pointon, David Wellings, to E. T. Marler Limited. Improvements in textile transfers. 4,107,365, Cl. 428-202.000.
- Reed, Russell, Jr.: *See*—
  - Moore, Kenneth L.; and Reed, Russell, Jr., 4,106,906, Cl. 21-60.50A.
- Reed Tool Co.: *See*—
  - Stone, Charles W., 4,106,571, Cl. 173-64.000.
- Reeder, George Elwood, Jr. Expandable internal chuck. 4,106,720, Cl. 242-68.400.
- Reens, Louis H.: *See*—
  - Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., 4,106,490, Cl. 128-2.00F.
- Regent of the University of California: *See*—
  - Evans, David A., 4,107,181, Cl. 260-340.90R.
- Regie Nationale des Usines Renault: *See*—
  - Bouvet, Jean-Marie, 4,106,367, Cl. 74-866.000.
  - Ducret, Alain; and Chalesle, Andre Maurice, 4,106,827, Cl. 308-187.100.
- Reh, Lothar; Plass, Ludolf; and Marchessaux, Philippe, to Aluminum Pechiney. Process for the thermal decomposition of aluminum chloride hexahydrate to obtain alumina. 4,107,281, Cl. 423-625.000.
- Reid, Brian C. Electric cable insulating compositions containing coconut shell flour filler. 4,107,383, Cl. 428-379.000.
- Reiff, Helmut: *See*—
  - Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,897, Cl. 8-94.330.
  - Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, 4,106,898, Cl. 8-94.330.
- Reikel, Robert H: *See*—
  - Martinez, Eugene E., 4,106,230, Cl. 40-158.00R.
- Reinhard, Donald Lewis: *See*—
  - Haaf, William Robert; and Reinhard, Donald Lewis, 4,107,232, Cl. 260-876.00R.
- Reinshagen, Hellmuth: *See*—
  - Egger, Helmut; and Reinshagen, Hellmuth, 4,107,164, Cl. 544-380.000.
- Reisender, Elizabeth A.: *See*—
  - Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., 4,106,994, Cl. 195-80.00R.
- Reisman, Arnold: *See*—
  - Berkenblit, Melvin; Chan, See Ark; Reisman, Arnold; and Zirinsky, Stanley, 4,106,975, Cl. 156-628.000.
- Reliable Electric Company: *See*—
  - Paluch, Edward S., 4,106,837, Cl. 339-98.000.
- Renbarger, Jerry J.; and Yonan, Peter K., to G. D. Searle & Co. α-Aryl-α,ω-bis[ω-(disubstituted amino)alkyl]acetamides and related compounds. 4,107,205, Cl. 260-558.00A.
- Renk, Richard John; and Boller, George Earl, to Miller, Gladys D. Closure. 4,106,664, Cl. 220-329.000.
- Renziehausen, Horst: *See*—
  - Langheinrich, Klaus; Berenstecher, Otto; and Renziehausen, Horst, 4,106,903, Cl. 8-196.000.
- Repik, Albert J.; Miller, Charles E.; and Johnson, Homer R., to Westvaco Corporation. Process for activating carbonaceous material. 4,107,084, Cl. 252-445.000.
- Republic Tool & Manufacturing Corp.: *See*—
  - McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,106,704, Cl. 239-685.000.
- Resch, Michael: *See*—
  - Pfeifer, Josef; Paulus, Rudolf; Gutmann, Walter; and Resch, Michael, 4,107,687, Cl. 346-107.00R.
- Research Engineeering & Manufacturing, Inc.: *See*—
  - Ferguson, Peter J., 4,106,877, Cl. 403-14.000.
- Reusser, Fritz: *See*—
  - Hoeksema, Herman; Reusser, Fritz; and Wait, Donald R., 4,107,295, Cl. 424-120.000.
  - Hoeksema, Herman; and Reusser, Fritz, 4,107,296, Cl. 424-121.000.
- Rexnord Inc.: *See*—
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- Reynolds Metals Company: *See*—
  - Hinrichs, Donald R., 4,106,330, Cl. 73-37.700.
- Rhee, Seong Kwan: *See*—
  - Bode, James Daniel; and Rhee, Seong Kwan, 4,107,018, Cl. 204-195.00S.
- Rheem Manufacturing Company: *See*—
  - Conrad, William A., 4,106,263, Cl. 53-97.000.
- Rhodes, William A. Unidirectional horizontal seismometer. 4,107,643, Cl. 340-17.00R.
- Rhone-Poulenc Industries: *See*—
  - Chevallier, Yvonick; Marinaud, Jacques-Pierre; Meiller, Francois; and Berthoux, Jean, 4,107,079, Cl. 252-429.00R.
  - Violland, Robert; and Lagasse, Alain, 4,107,056, Cl. 252-8.800.
- Rice, Edwin Eugene; and Vliet, Walter Carl, to Ingersoll-Rand Company. Method and apparatus for fastener tensioning. 4,106,176, Cl. 29-407.000.
- Rice, Warren A.: *See*—
  - Torbet, Christopher J.; Rice, Warren A.; and Vinton, Clarence S., 4,106,970, Cl. 156-306.000.
- Rich, C. Allen: *See*—
  - Jalil, Asjed A.; and Rich, C. Allen, 4,106,519, Cl. 134-122.00R.
- Richards, Clyde N. Linear insulator with alternating nonconductive sheds and conductive shields. 4,107,455, Cl. 174-140.00R.
- Richards, David Hugh: *See*—
  - Cunliffe, Anthony Vernon; Pearce, Peter John; and Richards, David Hugh, 4,107,142, Cl. 528-93.000.
- Richards, Frank P.; and Young, Jerry W., to Phillips Petroleum Company. Apparatus for forming a container having a rolled rim. 4,106,396, Cl. 93-36.50R.
- Richardson, James E.: *See*—
  - Fisher, Leonard; and Richardson, James E., 4,106,193, Cl. 30-172.000.
- Richmond, Michael Hugh, to Polysar Limited. Melt spinning synthetic filaments. 4,107,252, Cl. 264-176.00F.
- Richt, Oskar Hubert. Drive unit for magnetic tape-recorders. 4,106,725, Cl. 242-201.000.
- Ricoh Company, Ltd.: *See*—
  - Suzuki, Takami; and Iwata, Nobuo, 4,106,611, Cl. 400-144.200.
  - Tani, Tatsuo; and Kameyama, Toshiaki, 4,106,763, Cl. 271-9.000.
- Ridge, George W.: *See*—
  - Carey, Thomas A.; and Ridge, George W., 4,106,271, Cl. 56-119.000.
- Riebel, Hans-Jochem: *See*—
  - Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,107,301, Cl. 424-200.000.
- Riegel, Herbert: *See*—
  - Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., 4,107,222, Cl. 260-659.00A.
- Ries, Karl: *See*—
  - Lather, Dieter; and Ries, Karl, 4,106,326, Cl. 73-1.0DV.
- Rieser, Raymond G.; and Chabal, Joseph, to PPG Industries, Inc. Glass-plastic laminates. 4,107,366, Cl. 428-215.000.
- Rieter Machine Works Ltd.: *See*—
  - Oswald, Heinz; and Wust, Olivier, 4,106,711, Cl. 242-19.000.
- Riew, Changkiu Keith; Siebert, Alan R.; and Rowe, Eugene H., to B. F. Goodrich Company, The. Epoxy resin plastics. 4,107,116, Cl. 260-23.0EP.
- Riffiod, Michel: *See*—
  - Strauch, Raymond; and Riffiod, Michel, 4,107,679, Cl. 343-7.500.
- Riley, Bruce G. Light display. 4,107,764, Cl. 362-35.000.
- Riley, Joseph Vincent: *See*—
  - Drejza, John Edward; and Riley, Joseph Vincent, 4,106,873, Cl. 400-470.000.
- Ringel, Samuel M.: *See*—
  - Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, 4,107,429, Cl. 542-447.000.
- Ritland, Paul D.; and Rabas, Thomas J., to Westinghouse Electric Corp. Tube side flow control device for moisture separator reheaters. 4,106,559, Cl. 165-111.000.
- Ritze, Willi, to Jenaer Glaswerk Schott & Gen. Steep absorption edge filter glass. 4,106,946, Cl. 106-52.000.
- Robert Bosch GmbH: *See*—
  - Bernhardt, Walter; and Ziegler, Bodo, 4,106,465, Cl. 123-179.00H.
  - Haas, Lothar; Brautigam, Rolf; and Weckenmann, Albert, 4,107,555, Cl. 307-308.000.
  - Klotzner, Winfried; Daumer, Rolf; Busse, Wolfgang; and du Mont, Hans-Christoph, 4,107,717, Cl. 364-431.000.
  - Seiler, Hartmut, 4,107,588, Cl. 318-484.000.
- Robert, Daniel, to Societe de Constructions Mecaniques de Creil-COMEC. Method of handling bars. 4,106,647, Cl. 214-152.000.
- Robert, Jacques: *See*—
  - Dargent, Bruno; and Robert, Jacques, 4,106,858, Cl. 350-332.000.

- Roberts, Patrick S., to Thomas International Corporation. Digital arpeggio generating device. 4,106,385, Cl. 84-1.240.
- Roberts, Richard E.: *See—*
  - Emmons, David L.; Roberts, Richard E.; Pasko, Edward; and Harmon, George Lamar, 4,106,726, Cl. 244-3.170.
- Roberts, Thomas J. Contamination prevention device for sitz bath. 4,106,133, Cl. 4-6.000.
- Roberts, William E., to Addressograph Multigraph Corporation. Contact printer holder. 4,106,871, Cl. 355-99.000.
- Robertshaw Controls Company: *See—*
  - Katchka, Jay R., 4,106,889, Cl. 431-46.000.
  - Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,107,492, Cl. 200-81.90M.
  - Petersen, Oscar Johan; and Scott, Timothy Frank, 4,106,995, Cl. 195-103.50R.
  - Wolfe, Denis G.; and Berryhill, Richard J., 4,106,359, Cl. 74-424.80R.
- Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., to United States of America, Agriculture. Method of removing corn from the cob. 4,107,340, Cl. 426-481.000.
- Robertson, Roy E.; and Weber, Robert J., to Rockwell International Corporation. Method and apparatus for automatically adjusting the resolution of a radio altimeter over its operating altitude range. 4,107,681, Cl. 343-12.00A.
- Robinson, John William: *See—*
  - Whittington, Billy J.; Robinson, John William; and Dietrich, Ralph N., 4,106,384, Cl. 84-1.190.
- Rochester Instrument Systems Limited: *See—*
  - Tomlinson, Colin Henry, 4,106,690, Cl. 236-46.00R.
- Rochla, Kurt, to Windmoller & Holscher. Method and apparatus for producing stacks of folded bags. 4,106,395, Cl. 93-35.00R.
- Rockwell International Corporation: *See—*
  - Anders, Ronald J., 4,106,880, Cl. 408-1.00R.
  - Christe, Karl O.; Shack, Carl J.; and Wilson, Richard D., 4,107,275, Cl. 423-276.000.
  - Eshghy, Siavash; Hall, George D.; and Hammerle, Dennis R., 4,106,570, Cl. 173-12.000.
  - Jenkins, James R., 4,107,469, Cl. 179-15.0BW.
  - Moll, Eberhard, 4,106,344, Cl. 73-431.000.
  - Robertson, Roy E.; and Weber, Robert J., 4,107,681, Cl. 343-12.00A.
  - Schoeneweis, E. Frederick, 4,106,170, Cl. 29-157.10R.
- Roetger, Heinrich: *See—*
  - Hauschild, Ulrich; and Roetger, Heinrich, 4,106,922, Cl. 71-42.000.
- Roger, Jean, to Aciers et Outillage Peugeot. Current limiting device for an a.c. motor. 4,107,584, Cl. 318-227.000.
- Rogers, Arden D.: *See—*
  - Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,107,492, Cl. 200-81.90M.
- Rogers, Ramona. Solar heat collector. 4,106,479, Cl. 126-270.000.
- Rohm and Haas Company: *See—*
  - DeWitt, Walter Groesbeck, III, 4,107,235, Cl. 260-876.00R.
  - Haag, Thomas H.; Brendley, William H., Jr.; and Martorano, Richard, 4,106,421, Cl. 113-120.00A.
  - Plamondon, Joseph E.; Wilber, William R.; and Goth, Stephen, 4,107,120, Cl. 260-29.6RB.
- Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, to Ishihara Sangyo Kaisha Ltd. Novel herbicidally active, nuclear-substituted phenoxy-phenoxy-alkanecarboxylic acid derivatives and use thereof for controlling grass-like weeds. 4,106,925, Cl. 71-108.000.
- Rohrmann, Charles A., to Battelle Memorial Institute. Oxidation of hydrogen halides to elemental halogens with catalytic molten salt mixtures. 4,107,280, Cl. 423-502.000.
- Rollei-Werke Franke & Heidecke: *See—*
  - Greger, Paul, 4,107,713, Cl. 354-209.000.
  - Sobotta, Reinhard, 4,106,867, Cl. 353-114.000.
- Rollmann, Louis Deane, to Mobil Oil Corporation. Preparation of zeolite ZSM-35. 4,107,195, Cl. 260-448.00C.
- Rolls-Royce Limited: *See—*
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- Romanauski, James A.: *See—*
  - Sellers, John C.; and Romanauski, James A., 4,107,675, Cl. 343-6.5LC.
- Romashko, Nikolai Ivanovich: *See—*
  - Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.
- Roode, Hubertus Joseph, to U.S. Philips Corporation. Color selection means comprising lens electrodes spaced by grains of insulating material. 4,107,569, Cl. 313-402.000.
- Roper, Robert; and Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Graft copolymerization process. 4,107,238, Cl. 260-880.00R.
- Roqueta, Eduardo Caro, to Buildinter AG. Jack for stressing concrete re-inforcement elements. 4,106,752, Cl. 254-29.00A.
- Rosen, Howard N., to United States of America, Agriculture. Wood impingement dryer. 4,106,215, Cl. 34-217.000.
- Rosen, Perry: *See—*
  - Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, 4,107,188, Cl. 260-397.100.
- Rosenband, Phillip, to Parsteel Products Company, Inc. Storage rack assembly. 4,106,630, Cl. 211-191.000.
- Rosenberg, Max. Zinc chelating fungicidal composition. 4,107,331, Cl. 424-319.000.
- Rosenblatt, Girard B., Jr.: *See—*
  - Mendelsohn, Morris A.; Rosenblatt, Girard B., Jr.; and Meier, Joseph F., 4,107,107, Cl. 521-106.000.
- Rosenkranz, Hans Jurgen: *See—*
  - Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
- Rosenthal, Richard R.; and French, Joseph, to Rosenthal, Richard R. Metering system for stimulating bronchial spasm. 4,106,503, Cl. 128-194.000.
- Rosiak, Marion: *See—*
  - Bodine, Richard Hill, Jr.; and Rosiak, Marion, 4,107,579, Cl. 315-205.000.
- Ross, Barry C., to Pfizer Inc. Process for ω-amino-2-hydroxyalkyl derivatives of aminoglycoside antibiotics. 4,107,435, Cl. 544-97.000.
- Rossarie, Jean; and Maurin, Jean. Method of purifying a hydrogenated gas containing acid gases. 4,107,269, Cl. 423-222.000.
- Rossi, John P.; and Stern, Marvin A., to CBS Inc. System utilizing integration and motion evaluation for reducing noise in video signal. 4,107,739, Cl. 358-167.000.
- Roth, Martin: *See—*
  - Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John Sidney, 4,107,174, Cl. 260-326.0NS.
- Rotramel, Richard A.; and Fisher, Charles Michael, to Rotramel, Richard A. Musical stringed instrument. 4,106,386, Cl. 84-256.000.
- Roussel Uclaf: *See—*
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- Rowe, Eugene H.: *See—*
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- Ruble, Eulalia Berry, executrix: *See—*
  - Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,106,912, Cl. 23-259.500.
- Ruble, Theodore A., deceased: *See—*
  - Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,106,912, Cl. 23-259.500.
- Ruch, Jean, to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn. Method and apparatus for the production of high outputs with high current densities in an electrochemical system. 4,107,396, Cl. 429-26.000.
- Ruder, Joachim, to DeMag Aktiengesellschaft. Mixing bed pick up apparatus for a staple supply pile. 4,107,794, Cl. 366-346.000.
- Rudolph, Siegfried; Noring, Josef; and Schreiber, August, to Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG. Drive device for rake arm with attached screen comb in cleaning device for a water conduit screen. 4,107,040, Cl. 210-159.000.
- Ruegg, Rudolf: *See—*
  - Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,107,190, Cl. 260-404.000.
- Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Travelling-wave tube with collector housing having all electrical connections through one end wall of housing. 4,107,574, Cl. 315-3.500.
- Ruffini, Guglielmo; and Pezzotti, Erio, to Consorzio Fabocart S.p.A. Preparation of paper pulps from dicotyledonous plants. 4,106,979, Cl. 162-73.000.
- Rufolph, Hans: *See—*
  - Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
- Ruhnau, Gerhard; Weise, Lutz; and Hesse, Karl-Heinz, to WABCO Westinghouse GmbH. Circuit arrangement for periodically testing the operating reliability of an electronic antiskid control system. 4,106,820, Cl. 303-92.000.
- Ruhrchemie Aktiengesellschaft: *See—*
  - Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,107,036, Cl. 210-21.000.
- Runge, Peter Klaus, to Bell Telephone Laboratories, Incorporated. Method of fabricating optical fiber connectors. 4,107,242, Cl. 264-1.000.
- Rupprath, Hans Friedrich: *See—*
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- Rusch, Thomas W.: *See—*
  - McKinney, James T.; and Rusch, Thomas W., 4,107,526, Cl. 250-305.000.
- Rush, James B.: *See—*
  - Logan, Arthur D.; and Rush, James B., 4,106,967, Cl. 156-184.000.
- Rusk, Glenn. Rotary energy converter with respiring chambers. 4,106,472, Cl. 123-205.000.
- Russell, Charles E. Ice cream spoon. 4,106,197, Cl. 30-324.000.
- Russell, Kenneth E.; and Vail, Linda G. M. C., to Canadian Patents and Development Limited. Phenolic antioxidants with polymer tails. 4,107,144, Cl. 526-212.000.
- Russin, Morton S. Television color bar matching device. 4,106,846, Cl. 358-10.000.
- Russo, Robert V.: *See—*
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- Rutman, Grigory Iosifovich: *See—*
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- Rutten, Peter T., to Railoc Company, Inc. Building structure. 4,106,252, Cl. 52-762.000.
- Ruyak, Robert F., to Autoclave Engineers, Inc. High pressure magnetic drive including magnetic thrust bearings. 4,106,825, Cl. 308-139.000.
- Rychlik, Dalibor: *See—*
  - Horacek, Oldrich; Silar, Frantisek; and Rychlik, Dalibor, 4,106,531, Cl. 139-383.00B.
- Rymarchyk, Nicholas M.; and Meinert, Leo L., to Pullman Berry Company. Oxygen lance and sensing adapter arrangement. 4,106,756, Cl. 266-99.000.
- Ryser, Gottlieb: *See—*
  - Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,107,190, Cl. 260-404.000.
- S & C Electric Company: *See—*
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  - Evans, David M., 4,107,487, Cl. 200-48.0KB.
- Saab-Scania Aktiebolag: *See—*
  - Sigfridsson, F.S. Meinrad; and Jansson, K. Sigvard, 4,106,538, Cl. 144-309.00R.
- Saam, John C.; and Ward, Andrew H., to Dow Corning Corporation. Method for preparing improved polyalphamethyls tyrene-polydiorganosiloxane block copolymers and products thereof. 4,107,227, Cl. 260-827.000.
- Sabatini, Charles L. Alarm system. 4,106,427, Cl. 116-90.000.
- Sabins Industries, Inc.: *See—*
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- Sabins, Todd C., to Sabins Industries, Inc. Anode analyzer. 4,107,017, Cl. 204-195.00R.
- Saburi, Akio, to Nippon Electric Co., Ltd. Method and apparatus for burst synchronization in a time division multiple access communication system. 4,107,608, Cl. 325-4.000.
- Safety Jet: *See—*
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- Sagami Chemical Research Center: *See—*
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- Sagapha A. G.: *See—*
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- Saikku, Antti Tuomas, to Rauma-Repola Oy. Felling and cutting device. 4,106,537, Cl. 144-34.00R.
- St. Peters, Richard L., to General Electric Company. Method for isotope-selective vibrational excitation of a gaseous compound of an isotope using multiple wavelengths. 4,107,536, Cl. 250-423.00P.
- Saito, Hirokichi: *See—*
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- Saito, Hiroyasu: *See—*
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- Saito, Takeo; and Seki, Youichi, to Seiko Koki Kabushiki Kaisha. Shutter control circuit having exposure time display. 4,107,708, Cl. 354-60.00L.
- Saito, Takeshi: *See—*
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- Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, to Showa Denko Kabushiki Kaisha. Process for preparing a ferrochromium by using a blast furnace. 4,106,929, Cl. 75-130.500.
- Saito, Yutaka: *See—*
  - Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.
- Sakaba, Hiroo; and Masuda, Kenzo, to Hitachi, Ltd. Ratioless type MIS logic circuit. 4,107,548, Cl. 307-205.000.
- Sakai, Akira; Inui, Taiji; and Yokoi, Yasuaki, to Hitachi, Ltd. Waste heat recovery boiler apparatus. 4,106,286, Cl. 60-39.18B.
- Sakai, Jiro: *See—*
  - Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwan; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.
- Sakaue, Kenich: *See—*
  - Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.
- Sakurai, Shinichiro, to Nissan Motor Company, Limited. Motor vehicle body construction. 4,106,807, Cl. 296-28.00R.
- Saleil, Jean: *See—*
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- Salje, Ernst; and Mushardt, Heinrich, to Salje, Ernst. Method of and apparatus for examining the roughness of surfaces. 4,106,333, Cl. 73-105.000.
- Salje, Ernst; and Bartsch, Ulrich, to Salje, Ernst. Circular saw tool. 4,106,382, Cl. 83-835.000.
- Sallis, Daniel V. Multiple bar linkage towing system. 4,106,794, Cl. 280-456.00R.
- Salmon, Emigdio J., to Phillips Petroleum Company. Solvent removal from polymer solutions. 4,107,422, Cl. 528-502.000.
- Salmond, William G.: *See—*
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- Salter Labs., Inc.: *See—*
  - Salter, Peter W.; and Cook, William W., 4,106,505, Cl. 128-206.000.
- Salter, Peter W.; and Cook, William W., to Salter Labs., Inc. Nasal cannula assembly. 4,106,505, Cl. 128-206.000.
- Saluja, Satinder K., to American Sterilizer Company. Balanced single horizontal suspension arm. 4,107,769, Cl. 362-402.000.
- Salvino, Santo. Prefabricated rail base unit consisting of a plurality of projections and a single continuous slab. 4,106,694, Cl. 238-10.00C.
- Salzer, Erwin, to Gould Inc. Device for establishing electric contact pressure. 4,106,843, Cl. 339-232.000.
- Sambucetti, Carlos Juan: *See—*
  - Kovac, Zlata; and Sambucetti, Carlos Juan, 4,107,063, Cl. 252-62.520.
- Sanders Associates, Inc.: *See—*
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- Sanders, James Milton: *See—*
  - Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
- Sandford, Philip A.: *See—*
  - Scher, Victor H.; Fox, Theodore A.; and Sandford, Philip A., 4,107,509, Cl. 219-211.000.
- Sandoz, Inc.: *See—*
  - Houlihan, William J.; and Nadelson, Jeffrey, 4,107,311, Cl. 424-258.000.
- Sandoz Ltd.: *See—*
  - Egger, Helmut; and Reinshagen, Hellmuth, 4,107,164, Cl. 544-380.000.
  - Hofer, Kurt; and Tscheulin, Guenther, 4,107,138, Cl. 260-45.70P..
  - Waldvogel, Erwin, 4,107,434, Cl. 544-59.000.
- Sankyo Company Limited: *See—*
  - Ishibashi, Keijiro, 4,107,291, Cl. 424-48.000.
  - Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.
- Sano, Shohachiro: *See—*
  - Kanno, Tomoei; Watanabe, Hiroaki; and Sano, Shohachiro, 4,106,987, Cl. 195-31.00F.
- Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Structure of sealing air valves for split rim type wheels. 4,106,543, Cl. 152-405.000.
- Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, to Sumitomo Chemical Company, Limited. Process for producing semipermeable membranes. 4,107,049, Cl. 210-490.000.
- San Sebastian Saizar, Jose Maria. Safety apparatus for stopping an internal combustion engine in response to irregularities occur in the oil pressure or in the water temperature. 4,106,470, Cl. 123-198.0DB.
- Santa Fe International Corporation: *See—*
  - Shatto, Harry H., 4,106,335, Cl. 73-143.000.
- Santoro, Giovanni. Mechanical pushbutton devices suitable for recording positions of a mobile element in relation to a fixed support. 4,106,351, Cl. 74-10.330.
- Saoyama, Yoshihito: *See—*
  - Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, 4,106,930, Cl. 75-134.00B.
- Sarradin, Joel: *See—*
  - Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.
- Sartain, Everett L.: *See—*
  - Hunter, Robert L.; and Sartain, Everett L., 4,106,474, Cl. 126-110.00R.
- Sasaguri, Kyoji: *See—*
  - Okada, Yutaka; Sasaguri, Kyoji; and Ishihara, Kazuo, 4,106,998, Cl. 201-39.000.
- Sasaki, Masao: *See—*
  - Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.
- Sasaki, Yutaka; and Nakamura, Yoshimi, to Nitto Chemical Industry Co., Ltd. Process for production of attrition resistant antimony oxide containing fluidized bed catalyst having controlled particle size distribution. 4,107,085, Cl. 252-448.000.
- Sasano, Akira: *See—*
  - Nakano, Toshio; Sasano, Akira; Tsutsui, Ken; and Matumaru, Haruo, 4,107,568, Cl. 313-371.000.
- Sasayama, Atsushi: *See—*
  - Ikezawa, Ryuichi; Sasayama, Atsushi; and Kikuchi, Sakae, 4,107,727, Cl. 357-72.000.
- Sato, Iwao: *See—*
  - Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwan; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.
- Sato, Moriichi: *See—*
  - Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, 4,106,557, Cl. 165-105.000.
- Sato, Shigezi: *See—*
  - Sawai, Hideo; Hirabayashi, Satoshi; and Sato, Shigezi, 4,107,133, Cl. 260-42.150.
- Sato, Syoichi: *See—*
  - Watanabe, Ryuji; Sato, Syoichi; and Tomita, Sadami, 4,106,627, Cl. 209-7.000.
- Satoh, Hiroshi: *See—*
  - Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, 4,107,024, Cl. 204-275.000.
- Satoh, Masaaki: *See—*
  - Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Saucy, Gabriel: *See—*

Cohen, Noal; and Saucy, Gabriel, 4,107,183, Cl. 260-345.80R.

Sauers, Dale G.: *See—*

Dawn, Frederic S.; and Sauers, Dale G., 4,107,363, Cl. 428-109.000.

Saunders, James Fredrick, to Trane Company, The. Refrigerant charge adjuster apparatus. 4,106,306, Cl. 62-149.000.

Saunders, Raymond A., to United States of America, Navy. Ras-Gas dilution device. 4,106,910, Cl. 23-232.00R.

Saunders, Ronald A.; and Willard, Donald A. Simulation facility for dynamically testing guidance systems which use radiometric frequencies. 4,106,345, Cl. 73-432.0SD.

Savage, David Samuel: *See—*

Hewett, Colin Leslie; and Savage, David Samuel, 4,107,206, Cl. 260-562.00R.

Savage, Fred L.; and Long, Alfred D. Autonomic solar panel. 4,106,482, Cl. 126-271.000.

SAVIO e C. S.p.A.: *See—*

Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,106,712, Cl. 242-47.010.

Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, to SAVIO e C. S.p.A. Device for controlling the tension of yarn unwinding from a yarn supporting body. 4,106,712, Cl. 242-47.010.

Savvin, Mikhail Vasilievich: *See—*

Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Aleseevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alesandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Aleseevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Aleseevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Sawada, Tatsuo: *See—*

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.

Sawai, Hideo; Hirabayashi, Satoshi; and Sato, Shigezi, to Dainippon Ink & Chemicals, Inc. Colored polyethylene molding compositions. 4,107,133, Cl. 260-42.150.

Scala, Norma, administratix: *See—*

Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,126, Cl. 260-38.000.

Scala, Norma, administratrix: *See—*

Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,107,132, Cl. 260-42.140.

Scales, John Tracy, to National Research Development Corporation. Endoprosthetic bone joint devices. 4,106,130, Cl. 3-1.910.

Scaletta, Ronald C., to Weinschel Engineering Co. Broadband microwave card attenuator. 4,107,633, Cl. 333-81.00A.

Scaletta, Ronald C.; and Capek, George, to Weinschel Engineering Co. Detent mechanism especially for microwave drum attenuator. 4,107,634, Cl. 333-81.00A.

Scamehorn, John F.; and Porchey, David V., to Continental Oil Company. Removal of vinyl halide from polyvinyl halide. 4,107,421, Cl. 528-483.000.

Schader, Karl, to Schneider & Kern. Dual readout dial-type caliper. 4,106,204, Cl. 33-147.00T.

Schank, Richard L.: *See—*

Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.

Schaub, Robert Eugene: *See—*

Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; McGahren, William James; and Schaub, Robert Eugene, 4,107,441, Cl. 560-121.000.

Schaub, Wolfgang: *See—*

Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,074, Cl. 260-326.50B.

Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,107,187, Cl. 260-326.290.

Schaumann, Wolfgang: *See—*

Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.

Scheffer, Terry J.: *See—*

Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,106,859, Cl. 350-338.000.

Scher, Victor H.; Fox, Theodore A.; and Sandford, Philip A., to Northern Electric Company. Apparatus for treating body members with heat and moisture. 4,107,509, Cl. 219-211.000.

Schering Corporation: *See—*

Mayer, Joseph; and Sherlock, Margaret H., 4,107,166, Cl. 260-294.80C.

Scheurecker, Werner, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Arrangement for transporting away strand pieces. 4,106,549, Cl. 164-263.000.

Schick, John W.; and Davis, Robert H., to Mobil Oil Corporation. Lubricant compositions containing biocidal, antirust additives. 4,107,060, Cl. 252-49.300.

Schickedanz, Willi. Facsimile color bleaching copying method. 4,107,733, Cl. 358-75.000.

Schier, Karl: *See—*

Deutschmann, Herbert; and Schier, Karl, 4,106,444, Cl. 123-41.82R.

Schilling, Hartmut, to Raytheon Company. Multilayer interconnected structure for semiconductor integrated circuit. 4,107,726, Cl. 357-71.000.

Schindler, Harvey D.: *See—*

Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., 4,107,222, Cl. 260-659.00A.

Schippers, Heinz; Lenk, Erich; Mayer, Manfred; Busch, Hans-Jochen; and Bremer, Hermann, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Winding machines with contact roller control device. 4,106,710, Cl. 242-18.00R.

Schiron, Klaus; and Rupprath, Hans Friedrich. Lifting floors for swimming pools. 4,106,134, Cl. 4-172.130.

Schirrmeister, Harry; von Aschwege, Gerd; Helmrich, Harald; and Bernardi, Herbert, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Conveyor system for flat articles. 4,106,767, Cl. 271-188.000.

Schladitz, Hermann J. Electrical heating device. 4,106,891, Cl. 431-208.000.

Schlapbach, Louis: *See—*

Percheron born Guegen, Annick; Achard, Jean Claude; Loriers, Jean; Bonnemay, Maurice; Bronoel, Guy; Sarradin, Joel; and Schlapbach, Louis, 4,107,405, Cl. 429-218.000.

Schlichte, Max, to Siemens Aktiengesellschaft. Pulse code modulated, time division multiplex switching network. 4,107,480, Cl. 179-15.0AT.

Schlieckmann, Alfred, to Upjohn Company, The. Method for the continuous manufacture of foamed hollow profiles. 4,107,248, Cl. 264-51.000.

Schluenz, Robert William; and Davis, Curry Beach, to Arizona Chemical Company. Process for the preparation of terpene-maleic anhydride adducts. 4,107,420, Cl. 526-237.000.

Schlyakhin, Nikolai Pavlovich: *See—*

Moshnin, Evgeny Nikolaevich; Nistratov, Alexei Fedorovich; Odnodushny, Viktor Alexeevich; Romashko, Nikolai Ivanovich; and Schlyakhin, Nikolai Pavlovich, 4,106,322, Cl. 72-356.000.

Schmid, Alfred, to Bucher-Guyer AG Maschinenfabrik. Apparatus for separating liquids and solids from one another, especially for extracting juice from agricultural products. 4,106,404, Cl. 100-117.000.

Schmid, Hans F., to Mar-Kal Products Corporation. Vehicle sign holder. 4,106,229, Cl. 40-611.000.

Schmidgall, Heinz, to Sagapha A. G. Process for packing a pasty stain remover in portion capsules. 4,107,360, Cl. 427-389.000.

Schmidt, Arne Wintherhalter: *See—*

Markussen, Erik Kjaer; and Schmidt, Arne Wintherhalter, 4,106,991, Cl. 195-63.000.

Schmidt, Erich. Reinforced flexible conduit and method of manufacture. 4,106,527, Cl. 138-131.000.

Schmidt, Peter, to U.S. Philips Corporation. Clutch apparatus for generating a pulse train. 4,107,561, Cl. 310-95.000.

Schmidt, Robert H. Dryer attachment. 4,106,214, Cl. 34-86.000.

Schmitt, Frederick Louis: *See—*

Light, Kenneth K.; Vock, Manfred Hugo; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,107,094, Cl. 252-522.000.

Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.

Schmitt, Joseph J.; Dahlen, Richard R.; and Lindblad, David A., to Minnesota Mining and Manufacturing Company. Process for providing insulating covers. 4,106,905, Cl. 21-60.50R.

Schnabel Foundation Company: *See—*

Schnabel, Harry, Jr., 4,106,225, Cl. 37-184.000.

Schnabel, Harry, Jr., to Schnabel Foundation Company. Method and apparatus for excavating underpinning holes. 4,106,225, Cl. 37-184.000.

Schneider, Abraham; and Ware, Richard E., to Suntech, Inc. Process for improving the low temperature properties of tetrahydroalkyldicyclopentadienes. 4,107,223, Cl. 260-666.0PY.

Schneider, Abraham: *See—*

Myers, Harry K., Jr.; and Schneider, Abraham, 4,107,198, Cl. 260-464.000.

Schneider, Herbert Anton, to Bell Telephone Laboratories, Incorporated. Bipolar transistor switching network crosspoint. 4,107,474, Cl. 179-18.0GF.

Schneider & Kern: *See—*

Schader, Karl, 4,106,204, Cl. 33-147.00T.

Schneider, Richard T. Rotating safety drum nuclear reactor. 4,106,984, Cl. 176-32.000.

Schneider, Urs; and Heller, Rudolf, to Synthes AG Chur; and Contraves AG. Plastic bone used for training purposes by surgeons. 4,106,219, Cl. 35-17.000.

Schoeneweis, E. Frederick, to Rockwell International Corporation. Method of assembling a coupling. 4,106,170, Cl. 29-157.10R.

Scholl Inc.: *See—*

Lowth, Leonard Cecil, 4,106,514, Cl. 128-519.000.

Scholz, Donald T., to Polaroid Corporation. Cassette receiving well structure for photographic viewing apparatus. 4,106,863, Cl. 352-72.000.

Schopmeyer, Herman H.: *See—*

Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.

Schrage, Klaus, to Dynamit Nobel Aktiengesellschaft. Method of preparing 2-aryl benzoxazoles and 2-aryl benzothiazoles. 4,107,169, Cl. 260-304.00P.

Schreck, Robert C.: *See—*

Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.

Schreiber, August: *See—*

Rudolph, Siegfried; Noring, Josef; and Schreiber, August, 4,107,040, Cl. 210-159.000.

Schreiber-Klaranlagen Dr.-Ing. Aug. Schreiber GmbH & Co. KG: *See—*

Rudolph, Siegfried; Noring, Josef; and Schreiber, August, 4,107,040, Cl. 210-159.000.

Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Substituted acetonaphthones, processes for preparing same, uses of same in perfumery, and intermediates used in said processes. 4,107,066, Cl. 252-132.000.

Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Tetramethyl-hexahydroacetonaphthones. 4,107,208, Cl. 260-586.00F.

Schreiber, William L.; and Pittet, Alan O., to International Flavors & Fragrances Inc. Acetals of conjugated alkenals. 4,107,217, Cl. 260-615.00A.

Schrimper, Vernon L.: *See—*

Paterson, Malcolm M.; Grubbs, Michael R.; Cambourelis, Peter J.; and Schrimper, Vernon L., 4,107,034, Cl. 209-135.000.

Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Oxoimidazolidine substituted cephalosporins and antibacterial compositions and methods of combatting bacteria employing them. 4,107,304, Cl. 424-246.000.

Schroeter, Siegfried H.: *See—*

Moore, James E.; and Schroeter, Siegfried H., 4,107,391, Cl. 428-483.000.

Schubert, Andreas: *See—*

Engelsmann, Dieter; Hackenberg, Hubert; and Schubert, Andreas, 4,107,703, Cl. 354-21.000.

Schucht, Peter, to Siemens Aktiengesellschaft. Pulse-modulated high-frequency transmitter. 4,107,630, Cl. 332-9.00T.

Schuder, Paul S. Mattress construction. 4,106,142, Cl. 5-345.00R.

Schuette, William H.; and Norris, George F., to United States of America, Health, Education and Welfare. Real time two-dimensional mechanical ultrasonic sector scanner with electronic control of sector width. 4,106,492, Cl. 128-2.00V.

Schuler, Alan L.; and Post, David L., to General Dynamics Corporation. Insulated marine container for liquefied gas. 4,106,424, Cl. 114-74.00A.

Schuller, Hans: *See—*

Szabolcs, Otto; and Schuller, Hans, 4,107,409, Cl. 526-65.000.

Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Arc welding process and apparatus. 4,107,507, Cl. 219-121.00P.

Schultz, Otto; and Feutlinske, Hilmar, to Hamburger Hochbahn Aktiengesellschaft. Locking mechanism arrangement for a hinged bus. 4,106,792, Cl. 280-432.000.

Schultz, Robert S. Pressure-operated container for viscous products. 4,106,674, Cl. 222-386.500.

Schulz, Hansrichard; and Hummel, Herbert. Method and apparatus for synchronizing a mechanical oscillating system to the accuracy of a quartz standard. 4,106,280, Cl. 58-28.00R.

Schulz, Lothar; and Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the preparation of bromine and hydrogen bromide from ammonium bromide. 4,107,263, Cl. 423-481.000.

Schuster, Robert M.; and Luria, Norman G., to General Electric Company. Electrical penetration assembly. 4,107,456, Cl. 174-151.000.

Schwarz, Werner: *See—*

Ruf, Herbert; Deml, Dieter; and Schwarz, Werner, 4,107,574, Cl. 315-3.500.

Schwarzbauer, Hans: *See—*

Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.

Schwetz, Karl Alex; Vogt, George; and Lipp, Alfred, to Elektroschmelzwerk Kempten GmbH. Manufacture of hexagonal boron nitride. 4,107,276, Cl. 423-290.000.

SCM Corporation: *See—*

McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, 4,107,013, Cl. 204-159.160.

Petricca, Anthony V., 4,107,343, Cl. 426-564.000.

Scott, Allan W.: *See—*

Potter, Bobby R.; and Scott, Allan W., 4,107,573, Cl. 315-3.500.

Scott, Timothy Frank: *See—*

Petersen, Oscar Johan; and Scott, Timothy Frank, 4,106,995, Cl. 195-103.50R.

Scott, William B.: *See—*

Brolund, Theodore F.; Scott, William B.; and Pauley, Merle R., 4,106,183, Cl. 29-564.000.

Scrivo, Jerry V., to McCord Corporation. Energy absorbing bumper assembly. 4,106,804, Cl. 293-63.000.

Scullard, Peter W.; Figueras, John; and Holtz, Carl F., to Eastman Kodak Company. Photographic silver halide elements containing optical brightening water-soluble interpolymers. 4,106,941, Cl. 96-82.000.

Seaton, Robert L.: *See—*

Randall, James R.; Langhurst, Arling K.; Schopmeyer, Herman H.; and Seaton, Robert L., 4,106,487, Cl. 127-23.000.

Segawa, Takashi, to Shimano Industrial Company Limited. Multistage gear crank for a bicycle. 4,106,357, Cl. 74-243.0DR.

Seguin, Gerard Newsy. Golf game board assembly. 4,106,774, Cl. 273-245.000.

Seidewand, Robert Joseph: *See—*

McGinniss, Vincent Daniel; Seidewand, Robert Joseph; and Erickson, James Robert, 4,107,013, Cl. 204-159.160.

Seifert, Peter; and Zimmerman, Walter R., to Black Clawson Company, The. Thickener apparatus including a shaftless cylinder mold. 4,106,980, Cl. 162-330.000.

Seiko Koki Kabushiki Kaisha: *See—*

Saito, Takeo; and Seki, Youichi, 4,107,708, Cl. 354-60.00L.

Seiler, Hartmut, to Robert Bosch GmbH. Multiple timing interval integrated circuit structure. 4,107,588, Cl. 318-484.000.

Seiling, Samuel O., to AMF Incorporated. Method with an improved mixing cycle for preparing dough. 4,107,341, Cl. 426-504.000.

Seipp, William H., to Gulf & Western Industries, Inc. Programmable controller using microprocessor. 4,107,785, Cl. 364-900.000.

Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Process for preparing polycation-polyanion electrolyte complexes having carboxylic acid and alkenyl radical substituents and films thereof. 4,107,097, Cl. 521-32.000.

Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., to Hughes Aircraft Company. Transistor cooling by heat pipes. 4,106,188, Cl. 29-631.000.

Seki, Youichi: *See—*

Saito, Takeo; and Seki, Youichi, 4,107,708, Cl. 354-60.00L.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*

Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, 4,107,249, Cl. 264-68.000.

Selenia-Industrie Elettroniche Associate S.p.A.: *See—*

Neri, Filippo; and Albrande, Alfredo, 4,107,683, Cl. 343-18.00E.

Seletyn, James P. Threaded stud driving tool. 4,106,178, Cl. 29-428.000.

Seleverstov, Vladimir Vasilievich: *See—*

Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alesandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alesei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Sellers, John C.; and Romanauski, James A. Transponder-responder system. 4,107,675, Cl. 343-6.5LC.

Selley, Jeffrey E.: *See—*

Tideswell, Richard B.; and Selley, Jeffrey E., 4,107,229, Cl. 260-841.000.

Selon, Michael David. Two-dimensional visualization aid for the retail jewelry trade. 4,106,221, Cl. 35-53.000.

Sensotherm AB: *See—*

Almen, Rune, 4,107,394, Cl. 428-595.000.

Serban, Alexandru: *See—*

Baklien, Asbjorn; Serban, Alexandru; and Gregory, Jocelyn Margaret, 4,106,924, Cl. 71-106.000.

Serrano, Juan de J., to General Electric Company. Linearized thermistor temperature measuring circuit. 4,106,341, Cl. 73-362.0AR.

Seydl, Wolfgang: *See—*

Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.

Shack, Carl J.: *See—*

Christe, Karl O.; Shack, Carl J.; and Wilson, Richard D., 4,107,275, Cl. 423-276.000.

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Sharples, Thomas Davy, to Beckman Instruments, Inc. Liquid head control system. 4,106,671, Cl. 222-61.000.

Shatto, Harry H., to Santa Fe International Corporation. Sea sled tow line vector system. 4,106,335, Cl. 73-143.000.

Shea, Lawrence E. Fire-resistant synthetic resin composition and method. 4,107,127, Cl. 260-38.000.

Sheffner, Aaron Leonard. Topical application of thioglycolic acid in the treatment of acne. 4,107,330, Cl. 424-317.000.

Shell Internationale Research Maatschappij B.V.: *See—*
Van Riemsdijk, Arnoldus J.; and Hendal, Willem P., 4,107,672, Cl. 340-605.000.

Shell Oil Company: *See—*
Gergen, William P.; and Davison, Sol, 4,107,130, Cl. 260-40.00R.
Gergen, William P.; and Davison, Sol, 4,107,131, Cl. 260-40.0TN.
Hansen, David R., 4,107,233, Cl. 260-876.00B.
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Huizer, Willem, 4,106,585, Cl. 181-107.000.

Shepherd, Bryan Peter: *See—*
Charlton, John Cecil; Glover, John Stuart; and Shepherd, Bryan Peter, 4,106,907, Cl. 23-230.300.

Shepherd, Thomas L., to Airco, Inc. Sulfur-fueled magnetohydrodynamic power generation. 4,107,557, Cl. 310-11.000.

Shepler, Paul Roberts: *See—*
Curtis, John Markley, Jr.; and Shepler, Paul Roberts, 4,106,463, Cl. 123-193.00P.

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Mayer, Joseph; and Sherlock, Margaret H., 4,107,166, Cl. 260-294.80C.

Sherrod, Eugene L. Positive displacement pump for semi-fluid materials. 4,106,882, Cl. 417-517.000.

Sherwood Medical Industries Inc.: *See—*
Windischman, Edward F., 4,106,622, Cl. 206-365.000.

Shevtsov, Anatoly Zakharovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Shima, Tsukasa: *See—*
Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, 4,107,374, Cl. 428-288.000.

Shimada, Hiroyuki; and Toyoda, Shozo, to Mitsubishi Jukogyo Kabushiki Kaisha. Marine oil storage installation. 4,106,303, Cl. 61-101.000.

Shimada, Satoshi; and Itoh, Norio, to Sony Corporation. Image projection system. 4,106,866, Cl. 353-29.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi; and Fujimoto, Hideaki, 4,106,356, Cl. 74-217.00B.
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Shimizu, Akihiko: *See—*
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Shimizu, Hiromichi: *See—*
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Shimoda, Misao, to Olympus Optical Co., Ltd. Magnetic head. 4,107,751, Cl. 360-122.000.

Shimogori, Kazutoshi: *See—*
Fukuzuka, Toshio; Shimogori, Kazutoshi; and Satoh, Hiroshi, 4,107,024, Cl. 204-275.000.

Shimomura, Takatoshi: *See—*
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Shinkado, Yukio: *See—*
Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.

Shinoda, Kazuo; and Torii, Masanori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply installation for internal combustion engines. 4,106,456, Cl. 123-119.00E.

Shinoda, Naoharu: *See—*
Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, 4,107,271, Cl. 423-235.000.

Shipman, William H.: *See—*
Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,107,401, Cl. 429-101.000.

Shirai, Tadashi: *See—*
Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.

Shiraki, Manabu: *See—*
Ban, Itsuki; and Shiraki, Manabu, 4,107,587, Cl. 318-439.000.

Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., to Sprague Electric Company. Fused oil filled capacitor. 4,107,758, Cl. 361-275.000.

Shirn, George A.; and Maher, John P., to Sprague Electric Company. Fused monolithic ceramic capacitor package. 4,107,759, Cl. 361-275.000.

Shirn, George A.; and Maher, John P., to Sprague Electric Company. Solid electrolyte capacitor package with an exothermically-alloyable fuse. 4,107,762, Cl. 361-433.000.

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Shishiyannikov, Viktor Iosifovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Shook, Robert L.; and Sirak, Howard D., to Executive Products Corporation. Executive food carrying case. 4,106,597, Cl. 190-42.000.

Showa Denko K. K.: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Showa Sangyo Co. Ltd.: *See—*
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Shrimpton, Brian Clifford, to General Foods Limited. Soluble coffee process and product. 4,107,339, Cl. 426-387.000.

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Cox, David A.; Gymer, Geoffrey E.; and Shroot, Braham, 4,107,314, Cl. 424-263.000.

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Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, 4,107,122, Cl. 260-30.200.

Shulz, Robert J.; and Kozinczuk, Orest A., to Innovative Patent Trust. Control system for an electrolytic steam generator. 4,107,511, Cl. 219-286.000.

Shuster, Edward J.: *See—*
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Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,066, Cl. 252-132.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,208, Cl. 260-586.00F.

Shwert, Marianne J.: *See—*
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Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,066, Cl. 252-132.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,107,208, Cl. 260-586.00F.

Sickles, James E.; Hornyak, Joseph V.; and Franz, Helmut, to PPG Industries, Inc. Spraying device with gas shroud and electrostatic charging means having a porous electrode. 4,106,697, Cl. 239-15.000.

Sid Richardson Carbon & Gasoline Co.: *See—*
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Siebert, Alan R.: *See—*
Riew, Changkiu Keith; Siebert, Alan R.; and Rowe, Eugene H., 4,107,116, Cl. 260-23.0EP.

Siefken, Larry O. Device for puncturing a hole in a can and washing the inside thereof. 4,106,701, Cl. 239-271.000.

Siemens Aktiengesellschaft: *See—*
Distler, Georg; and Guetzl, Horst, 4,107,500, Cl. 200-308.000.

Graul, Juergen; and Murrmann, Helmut, 4,107,719, Cl. 357-15.000.
Schlichte, Max, 4,107,480, Cl. 179-15.0AT.
Schucht, Peter, 4,107,630, Cl. 332-9.00T.
Stut, Hans, 4,107,448, Cl. 13-26.000.
Trentini, Giswalt V.; and Jatsch, Werner, 4,107,690, Cl. 343-113.00R.
Wondra, Arthur, 4,107,696, Cl. 346-24.000.

Siems, Gerald Eugene, to J. I. Case Company. Rod oiler assembly. 4,106,592, Cl. 184-25.000.

Sigfridsson, F.S. Meinrad; and Jansson, K. Sigvard, to Saab-Scania Aktiebolag. Translatory feed of lumber workpieces from an orienting station through an edge trimming station. 4,106,538, Cl. 144-309.00R.

SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A.: *See—*
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Sikma, William J.; and Pease, Ronald J. Garden row marker. 4,106,203, Cl. 33-86.000.

Silantiev, Ivan Kuzmich: *See—*
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Silar, Frantisek: *See—*
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Silverman, Daniel. Method and apparatus for transferring a pattern on an overlying web by laser burning onto an underlying web. 4,107,528, Cl. 250-317.000.

Simmons Company: *See—*
Murphy, Timothy P., 4,106,138, Cl. 5-181.000.

Simon, Eli. Salts of benzenephosphonic acid and melamine as reactive additives to flammable epoxy monomers to reduce flammability of the cured reaction products. 4,107,145, Cl. 528-108.000.

Simonnet, Jacques Louis-Paul: *See—*
Bobleter, Andre Henri-Robert; and Simonnet, Jacques Louis-Paul, 4,106,894, Cl. 432-122.000.

Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 4,106,257, Cl. 52-693.000.

Simpson, William A., Jr.: *See—*
Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, 4,106,327, Cl. 73-1.0DV.

Singer Company, The: *See—*
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Herr, John A.; and Jaffe, Wolfgang, 4,107,591, Cl. 318-663.000.
Miller, Jerome Freed, 4,106,308, Cl. 62-324.000.
Weaver, Daniel J.; Treiber, Robert; and Wolanow, Avner, 4,107,596, Cl. 323-17.000.

Single Buoy Moorings Inc.: *See—*
Maari, Roger, 4,106,146, Cl. 9-8.00P.

Singleton, Max C.; and Elgart, Lea Frances, to Elgart, Lea Frances. Self-illuminating hand tool. 4,107,765, Cl. 362-120.000.

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Sjalander, Theodor. Method of forming a wrapping for a shipment unit and device for carrying out the method. 4,106,394, Cl. 93-1.00F.

Skaggs, Frank L.: *See—*
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SKF Industrial Trading and Development Company B.V.: *See—*
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Sletzinger, Meyer: *See—*
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Sloan Valve Company: *See—*
Horowitz, Charles, 4,106,834, Cl. 339-44.00M.

Slough, Carlton M., to Texaco Inc. Electromagnetic means and method for detecting propeller shaft bearing wear. 4,107,603, Cl. 324-207.000.

Slovinsky, Manuel; and Fong, Dodd Wing, to Nalco Chemical Company. Antifoulants for crude oil. 4,107,030, Cl. 208-48.0AA.

Smirnov, Jury Alexandrovich: *See—*
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Smith, Brian Roger; Jarvis, Charles Richard; Payne, Stephen Martin; Potts, Robert John; and Wallis, Frank, to Marconi Company Limited, The. Curved rigid printed circuit boards. 4,106,187, Cl. 29-625.000.

Smith, Dexter E.: *See—*
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Smith, Dexter William: *See—*
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Smith, Frank A.: *See—*
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Smith, Geoffrey Allan; and Laidlaw, Alan James, to Fastran AG. Dye transferring method. 4,106,895, Cl. 8-2.50A.

Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-PGF, compounds. 4,107,191, Cl. 260-408.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,107,319, Cl. 424-273.00R.

Smith, Robert W., Jr.; and Waite, George C., to Trech, Inc. Reinforced splice joint and method of making same. 4,107,451, Cl. 174-84.00R.

Smith, Walton J. Horticultural improvements. 4,106,235, Cl. 47-59.000.

SmithKline Corporation: *See—*
Berges, David A., 4,107,173, Cl. 260-308.00R.
Gleason, John Gerald, 4,107,440, Cl. 560-17.000.
Graboyes, Harold, 4,107,179, Cl. 260-332.20A.

Smithline, John P., to Pacific Handy Cutter, Inc. Coin wrapper cutting device. 4,106,196, Cl. 30-294.000.

Smykalla, Gunter: *See—*
von Ropenack, Adolf; Wiegand, Volker; and Smykalla, Gunter, 4,107,265, Cl. 423-101.000.

Snamprogetti, S.p.A.: *See—*
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Snitzer, Elias, to Better Environmental Development Corporation. Optical filters. 4,106,857, Cl. 350-311.000.

Snyder, Arthur R.: *See—*
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Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Slide projector for both magazine and single slide projection. 4,106,867, Cl. 353-114.000.

Societa Farmaceutici Italia S.p.A.: *See—*
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S.A. dite "Manufacture Francaise de Carrelages": *See—*
Bourguignon, Guy Clement; and Maquet, Joseph Andre, 4,107,378, Cl. 428-323.000.

Societe Anonyme Francaise du Ferodo: *See—*
Neveux, Rene Elie, 4,106,558, Cl. 165-109.000.

Societe Anonyme Parfumerie et Chimieparchimy: *See—*
Leclabart, Jacques, 4,106,652, Cl. 215-253.000.

Societe de Constructions Mecaniques de Creil-COMEC: *See—*
Robert, Daniel, 4,106,647, Cl. 214-152.000.

Societe de vente de l'Aluminium Pechiney: *See—*
Bercovici, Serge, 4,106,956, Cl. 148-11.50A.

Societe d'Etudes de Machines Thermiques-S.E.M.T.: *See—*
Haug, Albert, 4,106,798, Cl. 285-226.000.

Societe dite: Stabilimento Industriale Costruzione Macchinario Attrezzature: *See—*
Bossi, Oscar G., 4,106,632, Cl. 214-1.0BB.

Societe Europeenne des Produits Refractaires: *See—*
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Societe Francaise d'Organo Synthese: *See—*
Proux, Yves; and Julien, Christian, 4,107,137, Cl. 260-45.85T.

Societe Francaise pour le Developpement de l'Automatisme en Biologie: *See—*
Marcelli, Aline, 4,106,911, Cl. 23-259.000.

Societe Nouvelle de Bouchons Plastiques, S.N.B.P.: *See—*
Bahiol, Pierre, 4,106,656, Cl. 215-364.000.

Soderstrom, Sven-Erik, to ASEA Aktiebolag. Cloud altitude measuring apparatus and method. 4,106,872, Cl. 356-4.000.

Sokolow, Nickolas N., to Beloit Corporation. Parison pickers with variable spacing. 4,106,886, Cl. 425-526.000.

Sokolsky, Dmitry Vladimirovich: *See—*
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

Solomin, Georgy Stepanovich: *See—*
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riev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

- Solvay & Cie.: *See—*
  - Mulders, Julien; and Gilain, Jacques, 4,107,411, Cl. 526-75.000.
- Somerville Belkin Industries Limited: *See—*
  - Claxton, Joseph Edmund, 4,107,399, Cl. 429-89.000.
- Sommer, Walter: *See—*
  - Witt, Karl-Heinz; and Sommer, Walter, 4,107,359, Cl. 427-388.00R.
- Sone, Takanori: *See—*
  - Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.
- Sono, Junji: *See—*
  - Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.
- Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hiden; and Sato, Moriichi, to Hitachi, Ltd. Open-type boiling cooling apparatus. 4,106,557, Cl. 165-105.000.
- Sony Corporation: *See—*
  - Higuchi, Shigetaka; Iwasaki, Masaatsu; and Kimura, Shigeo, 4,107,385, Cl. 428-412.000.
  - Kumaki, Noboru, 4,107,747, Cl. 360-93.000.
  - Nishigaki, Susomu; and Ohgoshi, Akio, 4,107,657, Cl. 340-579.000.
  - Otobe, Takashi; Kojima, Chiaki; and Ohki, Hiroshi, 4,107,729, Cl. 358-4.000.
  - Shimada, Satoshi; and Itoh, Norio, 4,106,866, Cl. 353-29.000.
  - Takizawa, Kazuyuki, 4,106,775, Cl. 274-15.00R.
- Sorenson, James L., to Sorenson Research Co., Inc. Combination needle cover and venipuncture device tray and method of using same. 4,106,621, Cl. 206-365.000.
- Sorenson Research Co., Inc.: *See—*
  - Sorenson, James L., 4,106,621, Cl. 206-365.000.
- Sorg GmbH & Co. KG: *See—*
  - Pieper, Helmut, 4,107,446, Cl. 13-6.000.
  - Pieper, Helmut, 4,107,447, Cl. 13-6.000.
- Sorgatz, Robert G. Rotatable support stand. 4,106,830, Cl. 339-8.00R.
- Sormunen, Onni Sore. Pressure measuring apparatus. 4,106,342, Cl. 73-386.000.
- Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich. Water-cooled roof of electric-arc furnace. 4,107,449, Cl. 13-35.000.
- Sosonkin, Oleg Mikhailovich: *See—*
  - Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.
- Southard, Robert W., to Dow Chemical Company, The. Mattress foundation. 4,106,139, Cl. 5-186.00R.
- Southwire Company: *See—*
  - Linne, Robert Steven, 4,106,319, Cl. 72-234.000.
- Sowa, Tuneo: *See—*
  - Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.
- Spar Aerospace Products Ltd.: *See—*
  - Brown, Geoffrey Edward, 4,107,558, Cl. 310-13.000.
- Spector, Sidney, to Hoffmann-La Roche Inc. Barbituric acid antigens and antibodies specific therefor. 4,107,157, Cl. 260-112.00B.
- Speiser, Peter: *See—*
  - Oppenheim, Richard Charles; Marty, Jennifer Joy; and Speiser, Peter, 4,107,288, Cl. 424-22.000.
- Spengler, Ernst Maximilian, to Stanztechnik GmbH R & S. Apparatus for trimming three-dimensional workpieces. 4,106,379, Cl. 83-171.000.
- Sperry Rand Corporation: *See—*
  - Griffith, Carl D., 4,106,728, Cl. 244-83.00D.
  - McMahon, Donald H., 4,107,518, Cl. 250-199.000.
  - Turner, Paul F., 4,107,624, Cl. 331-8.000.
- Spes, Hellmuth: *See—*
  - Eck, Herbert; Bethe, Elmar; Schwarzbauer, Hans; Spes, Hellmuth; and Kaiser, Klaus, 4,107,002, Cl. 203-75.000.
- Speth, Sebastian: *See—*
  - Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,107,036, Cl. 210-21.000.
- Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; and Lasorso, Vincent John, Jr., to Spilman, Raymond; Haase, Edward Emil, Jr.; Kruger, Kurt John; Budnick, Donald Barry; Lasorso, Vincent John, Jr.; and Reens, Louis H. Urine collection aid. 4,106,490, Cl. 128-2.00F.
- Spinner, Georg; and Treczka, Leo, to Spinner GmbH Elektrotechnische Fabrik. Protection of high-power coaxial cables. 4,107,631, Cl. 333-17.00R.
- Spinner GmbH Elektrotechnische Fabrik: *See—*
  - Spinner, Georg; and Treczka, Leo, 4,107,631, Cl. 333-17.00R.
- Spitzer, Robert E.; and May, Fred W., III, to Boeing Company, The. Engine out control system for STOL aircraft. 4,106,730, Cl. 244-183.000.
- Sports Technology Inc.: *See—*
  - Krawagna, Alois, 4,106,772, Cl. 273-186.00R.
- Sprague Electric Company: *See—*
  - Fournier, Lawrence E.; Jasiewicz, Theodore M.; and Milton, William M., 4,106,184, Cl. 29-570.000.
  - Shirn, George A.; Linzey, Raynor; and Cushenette, Carol A., 4,107,758, Cl. 361-275.000.
  - Shirn, George A.; and Maher, John P., 4,107,759, Cl. 361-275.000.
  - Shirn, George A.; and Maher, John P., 4,107,762, Cl. 361-433.000.
- Sprague, Peter W.; and Heikes, James E., to E. R. Squibb & Sons, Inc. 1,3-Benzodithiolanes. 4,107,175, Cl. 260-327.00M.
- Sprague, Robert A.; and MacGovern, Alan J., to Itek Corporation. Acousto-optic snapshot recorder. 4,107,701, Cl. 346-108.000.
- Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances Inc. 3,3-Dimethyl-1-(4-methylvaleryl)-cyclohexane perfume compositions. 4,107,093, Cl. 252-522.000.
- Stach, Kurt, deceased: *See—*
  - Kaiser, Fritz; Schaumann, Wolfgang; Stach, Kurt, deceased; Plattner, Werner, administrator; and Voightlander, Wolfgang, 4,107,299, Cl. 424-182.000.
- Stack, Gary F.: *See—*
  - Dent, Richard G.; and Stack, Gary F., 4,106,659, Cl. 220-67.000.
- Stafford, Jay H., to Continental Oil Company. Hydraulic vibrator. 4,106,586, Cl. 181-121.000.
- Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Shaft bearing arrangement. 4,106,192, Cl. 308-172.000.
- Stahlecker, Hans: *See—*
  - Stahlecker, Fritz, 4,106,192, Cl. 308-172.000.
- Stamper, Jerry Lee, to Conic Corporation. Data processor analyzer and display system. 4,107,459, Cl. 178-69.100.
- Standard Oil Company, The: *See—*
  - Li, George S., 4,107,237, Cl. 260-880.00R.
- Standard Oil Company (Indiana): *See—*
  - Hughes, Robert D.; and Steigelmann, Edward F., 4,106,920, Cl. 55-158.000.
  - Zechinati, James; and Pegg, Elra W., 4,107,250, Cl. 264-118.000.
- Standard T. Chemical Company, Inc.: *See—*
  - Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.
- Stannow, Jorgen Christian; and Tankred, Hans Jurgen, to Danfoss A/S. Encapsulated motor compressor for refrigerators. 4,106,881, Cl. 417-363.000.
- Stanztechnik GmbH R & S: *See—*
  - Spengler, Ernst Maximilian, 4,106,379, Cl. 83-171.000.
- Star Chemical, Inc.: *See—*
  - Bishop, Bruce J.; and Moon, Allen J., 4,106,901, Cl. 8-139.000.
- Statni vyzkumny ustav textilni Liberec: *See—*
  - Horacek, Oldrich; Silar, Frantisek; and Rychlik, Dalibor, 4,106,531, Cl. 139-383.00B.
- Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Chlorinated wax flux compositions. 4,106,958, Cl. 148-23.000.
- Stearns & Foster Company, The: *See—*
  - Henning, John C., 4,106,166, Cl. 28-103.000.
- Stearns, Richard S.; Frankel, Neil A.; and Hollstein, Elmer J., to Suntech, Inc. Preparation of thermoplastic polymer fibrilla and fibril. 4,107,243, Cl. 264-13.000.
- Steed, Trevor Ashton, to Harry M. Miller Attractions Pty. Limited. Cutting means. 4,106,194, Cl. 30-228.000.
- Steel Heddle Manufacturing Company: *See—*
  - Kaufmann, Frank H., 4,106,529, Cl. 139-92.000.
- Steel Stampings Limited: *See—*
  - Bache, William Harry, 4,106,172, Cl. 29-159.010.
- Stefansson, Rafn, to Bell & Howell Company. Sheet handling and stacking methods and apparatus. 4,106,766, Cl. 271-181.000.

- Steigelmann, Edward F.: *See—*
  - Hughes, Robert D.; and Steigelmann, Edward F., 4,106,920, Cl. 55-158.000.
- Steinegger, Alfred; and Huber, Ernst, to Swiss Aluminium Ltd. Device and method for the introduction of gases into reaction vessels containing liquids. 4,106,759, Cl. 266-220.000.
- Steiner, William Winfield: *See—*
  - Montgomery, Murray Mathews; Gilger, William Francis; and Steiner, William Winfield, 4,106,639, Cl. 214-14.000.
- Stella, Leo: *See—*
  - Marola, Americo Edward; and Stella, Leo, 4,106,826, Cl. 308-187.000.
- Stelmack, Edward A.: *See—*
  - Malacheski, Joseph J.; and Stelmack, Edward A., 4,106,747, Cl. 251-84.000.
- Stephan, Alfred: *See—*
  - Asztalos, Stefan; Stephan, Alfred; and Mayer, Reinhold, 4,106,796, Cl. 285-133.00R.
- Steprath, Werner: *See—*
  - Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,106,518, Cl. 134-104.000.
- Sterling Drug Inc.: *See—*
  - Bailey, Denis M., 4,107,313, Cl. 424-263.000.
  - Lesher, George Y.; and Opalka, Chester J., Jr., 4,107,315, Cl. 424-263.000.
  - Lorenz, Roman R.; and Thielking, William H., 4,107,167, Cl. 260-295.00R.
- Stern, Marvin A.: *See—*
  - Rossi, John P.; and Stern, Marvin A., 4,107,739, Cl. 358-167.000.
- Sterzel, Hans-Josef: *See—*
  - Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, 4,107,231, Cl. 260-873.000.
- Stewart, Patrick H.: *See—*
  - Kloster, William R.; and Stewart, Patrick H., 4,106,545, Cl. 164-18.000.
- Stewart, Roger Green; and Eaton, Sargent Sheffield, Jr., to RCA Corporation. Sense circuit employing complementary field effect transistors. 4,107,556, Cl. 307-362.000.
- Stieff, Lorin R. Fiber optic seal. 4,106,849, Cl. 350-96.240.
- Stinger, Kenneth R.: *See—*
  - McTeague, Gerald E.; and Stinger, Kenneth R., 4,106,937, Cl. 96-36.100.
- Stofko, John, to Stofko, John; and Jansky, John. Bonding of solid lignocellulosic material. 4,107,379, Cl. 428-326.000.
- Stone, Charles W., to Reed Tool Co. Pneumatic impact drilling tool. 4,106,571, Cl. 173-64.000.
- Stone, Russell L., Jr., to General Electric Company. Temperature compensator for a crystal oscillator. 4,107,629, Cl. 331-116.00R.
- Stork Brabant B.V.: *See—*
  - Anselrode, Lodewijk, 4,107,003, Cl. 204-16.000.
- Stoy, Vladimir, to Ceskoslovenska akademie ved. Ionogenic hydrophilic water-insoluble gels from partially hydrolyzed acrylonitrile polymers and copolymers, and a method of manufacturing same. 4,107,121, Cl. 260-29.6AB.
- Strand, David A.: *See—*
  - Chang, Yew C.; Ovshinsky, Stanford R.; and Strand, David A., 4,106,939, Cl. 96-48.00R.
- Strauch, Raymond; and Riffiod, Michel, to Telecommunications Radioelectriques et Telephoniques T.R.T. Frequency modulator for high-precision range measurements. 4,107,679, Cl. 343-7.500.
- Strempel, Thomas G.; and Hora, Charles J., to Diamond Shamrock Corporation. Wafer electrode for an electrolytic cell. 4,107,022, Cl. 204-265.000.
- Strobe, Carl J.; and Wells, Robert A. Easy-open container with flange push-in member. 4,106,662, Cl. 220-268.000.
- Strohn, Helmut: *See—*
  - Heinrich, Hans Juergen; Rademacher, Karl August; Strohn, Helmut; and Kramer, Friedhelm, 4,107,042, Cl. 210-225.000.
- Stromberg Datagraphix, Inc.: *See—*
  - Corpew, Charles Robert, 4,107,582, Cl. 315-365.000.
- Strong, Jerry G., to Mobil Oil Corporation. 3-(3,4-Epoxy-4-methylcyclohexyl)butyl esters. 4,107,185, Cl. 260-348.550.
- Strother, Fred Pickett: *See—*
  - Blackstone, James Otto, Jr.; and Strother, Fred Pickett, 4,106,416, Cl. 112-79.00A.
- Struble, Dean L.: *See—*
  - Swailes, G. Edward; and Struble, Dean L., 4,107,293, Cl. 424-84.000.
- Strunc, Gerald R.; and Osby, Warren J., to Pako Corporation. Semi automatic film cutter with movable cursor. 4,106,685, Cl. 226-136.000.
- Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Angle iron cutting. 4,106,380, Cl. 83-212.000.
- Studtmann, George Henry, to Borg-Warner Corporation. Torque transducer with closely coupled primary windings. 4,106,334, Cl. 73-136.00A.
- Sturlason, Leif Viggo: *See—*
  - Hansen, Gunnar Lyshoj; and Sturlason, Leif Viggo, 4,106,883, Cl. 418-61.00B.
- Sturman, Oded E.; and Grill, Benjamin, to Burwell, Clifton J., a part interest. Fluid control system and controller and moisture sensor therefor. 4,107,546, Cl. 307-141.000.
- Sturwold, Robert J.; and Williams, Mark A., to Emery Industries, Inc. Amino-amide lubricants derived from polymeric fatty acids and poly(oxyethylene) diamines. 4,107,061, Cl. 252-49.300.
- Stut, Hans, to Siemens Aktiengesellschaft. Method and device for crucible-free floating zone melting. 4,107,448, Cl. 13-26.000.
- Styslinger, James R.: *See—*
  - Ennis, Bernard P., Jr.; and Styslinger, James R., 4,107,226, Cl. 260-683.00R.
- Suda, Nobuaki: *See—*
  - Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
- Sudol, Frank D.: *See—*
  - Partain, Wilbur A.; and Sudol, Frank D., 4,106,735, Cl. 248-119.00R.
- Sugai, Yoshiro, to Pioneer Electronic Corporation. Muting control circuit for FM receiver. 4,107,614, Cl. 325-348.000.
- Sugimura, Hideo: *See—*
  - Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.
- Sukornick, Bernard; Minhas, Pritam Singh; and Sweeney, Richard Francis, to Allied Chemical Corporation. Fabric coating compositions, method and coated fabric having dry soil resist finishes. 4,107,055, Cl. 252-8.600.
- Sullivan, Ann Clare: *See—*
  - Gallo-Torres, Hugo; Hamilton, James Guthrie; Rosen, Perry; and Sullivan, Ann Clare, 4,107,188, Cl. 260-397.100.
- Sullivan, James D., Jr.; and Watson, Stanley W., to Associates of Cape Cod, Inc. Limulus lysate of improved sensitivity and preparing the same. 4,107,077, Cl. 252-408.000.
- Sultanian, Ishkhan V.; and Irani, Joseph H. Radioimmunoassay procedure using a stabilized complex. 4,107,284, Cl. 424-1.000.
- Sumitomo Chemical Company, Limited: *See—*
  - Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; and Murase, Ichiki, 4,107,049, Cl. 210-490.000.
- Sumiyoshi, Masaharu: *See—*
  - Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.
- Summerhays, Roger P.: *See—*
  - Emmett, Robert C., Jr.; Heden, Stanley D.; and Summerhays, Roger P., 4,107,028, Cl. 209-5.000.
- Summers, David A., to University of Missouri, The Curators of the. Hydromechanical drilling device. 4,106,577, Cl. 175-340.000.
- Sumrell, Gene: *See—*
  - Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.
- Sun Oil Company of Pennsylvania: *See—*
  - Myers, Harry K., Jr.; and Schneider, Abraham, 4,107,198, Cl. 260-464.000.
- Sunamori, Takashi; and Nishii, Noboru, to Mitsubishi Rayon Co., Ltd. Process for preparing gel polymer of vinyl compound and gel polymer thereof. 4,107,156, Cl. 526-91.000.
- Sundberg, Yngve, to ASEA Aktiebolag. Method for inductively stirring molten steel in a continuously cast steel strand. 4,106,546, Cl. 164-49.000.
- Sunder, Shyam; and Peet, Norton P., to Dow Chemical Company, The. Substituted N-(2-hydroxyethyl)morpholino carboxamides. 4,107,436, Cl. 544-169.000.
- Suntech, Inc.: *See—*
  - Schneider, Abraham; and Ware, Richard E., 4,107,223, Cl. 260-666.0PY.
  - Stearns, Richard S.; Frankel, Neil A.; and Hollstein, Elmer J., 4,107,243, Cl. 264-13.000.
- Sunworks, Inc.: *See—*
  - Barber, Everett M., Jr., 4,106,483, Cl. 126-271.000.
- Suschaya, Larisa Emmanuilovna: *See—*
  - Bondar, Petr Grigorievich; Goroshko, Oleg Nikolaevich; Suschaya, Larisa Emmanuilovna; Lavrova, Valentina Vasilievna; Leleka, Valentina Emmanuilovna; and Ilko, Eduard Grigorievich, 4,107,089, Cl. 252-465.000.
- Sutehall, Donald, to Gerrard Industries Limited. Band feed guides. 4,106,403, Cl. 100-25.000.
- Suzuki, Atsushi; and Jeser, Jean-Pierre, to Hitachi, Ltd. Fluorescent material. 4,107,273, Cl. 423-263.000.
- Suzuki, Hideo: *See—*
  - Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.
- Suzuki, Hideyuki: *See—*
  - Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, 4,106,446, Cl. 123-90.130.
- Suzuki, Masao: *See—*
  - Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, 4,107,203, Cl. 260-518.00R.
- Suzuki, Motoaki: *See—*
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- Suzuki, Naoto: *See—*
  - Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, 4,106,887, Cl. 425-549.000.
- Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing N_1-(2′-furanidyl)-5-fluorouracil. 4,107,162, Cl. 544-313.000.
- Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, to Bio Research Center Company, Ltd. Manufacture of epoxide using a microorganism. 4,106,986, Cl. 195-28.00R.

Suzuki, Takami; and Iwata, Nobuo, to Ricoh Company, Ltd. Serial printing apparatus. 4,106,611, Cl. 400-144.200.

Suzuki, Teruki: *See*—
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Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujii, Katsumi; and Horio, Takekazu, to Oriental Yeast Co. Ltd. Isoelectric point markers for gel isoelectric separation. 4,107,014, Cl. 204-180.00R.

Svenska Utvecklingsaktiebolaget: *See*—
Erlandsson, Bjorn Erik, 4,106,511, Cl. 128-407.000.

Svensson, Lennart. Lintel for supporting e.g. arches over wall openings, facade coverings and similar. 4,106,247, Cl. 52-204.000.

Swailes, O. Edward; and Struble, Dean L., to Canadian Patents and Development Limited. Attractant for darksided cutworm moth. 4,107,293, Cl. 424-84.000.

Swartz, Delbert D.: *See*—
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Sweeney, Charles E.: *See*—
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Sweeney, Richard Francis: *See*—
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Swin, Richard E., Sr. Method for molding dynamically balanced fans. 4,107,257, Cl. 264-328.000.

Swiss Aluminium Ltd.: *See*—
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Sybron Corporation: *See*—
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Symons Corporation: *See*—
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Szabolcs, Otto; and Schuller, Hans, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Method of producing polymers of high molecular weight by the two-phase interfacial method. 4,107,409, Cl. 526-65.000.

Sze, Morgan C.; Riegel, Herbert; and Schindler, Harvey D., to Lummus Company, The. Oxychlorination of methane. 4,107,222, Cl. 260-659.00A.

Szentmihaly, Charles, to BTR Industries Limited. High temperature end fitting. 4,106,526, Cl. 138-109.000.

Szynka, Peter: *See*—
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Tabuchi, Hidebo; and Ogushi, Akira, to Hitachi, Ltd. Apparatus for measuring a concentration of radioactivity. 4,107,533, Cl. 250-364.000.

Taga, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control system for an automatic transmission system. 4,106,369, Cl. 74-869.000.

Takagahara, Isamu: *See*—
Suzuki, Yasuo; Takagahara, Isamu; Fujita, Tsuyoshi; Fujii, Katsumi; and Horio, Takekazu, 4,107,014, Cl. 204-180.00R.

Takagi, Seiji: *See*—
Suzuki, Nobuyuki; Kobayashi, Yukinari; Hiyoshi, Yumiko; Takagi, Seiji; Sone, Takanori; Wakabayashi, Mikio; and Sowa, Tuneo, 4,107,162, Cl. 544-313.000.

Takahara, Kazuo: *See*—
Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, 4,107,621, Cl. 330-296.000.

Takahashi, Akio; Saito, Hirokichi; and Oyaizu, Yoshijiro, to Ihara Chemical Company Co., Ltd. Process for producing urethane elastomer. 4,107,151, Cl. 528-54.000.

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, to Victor Company of Japan, Limited. Angle modulated wave demodulation system. 4,107,478, Cl. 179-100.4ST.

Takahashi, Nobuo: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.

Takahashi, Toru: *See*—
Kondo, Eiichi; Katayama, Hajime; Takahashi, Toru; and Komiya, Yutaka, 4,106,870, Cl. 355-4.000.

Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, to Anritsudenki Kabushikigaisha. Solid or water quantity measurement apparatus using microwaves. 4,106,329, Cl. 73-15.00B.

Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, to Hokkai Can Co., Ltd. Apparatus for forming cans. 4,106,420, Cl. 113-12.000.

Takamisawa, Hiroshi: *See*—
Hirota, Tetsuya; Hishida, Tadashi; Kamata, Akira; Nakazawa, Isao; and Takamisawa, Hiroshi, 4,106,993, Cl. 195-65.000.

Takamura, Tsutomu; and Shirogami, Tamotsu, to Tokyo Shibaura Electric Co., Ltd. Electrochemical cell. 4,107,403, Cl. 429-174.000.

Takao, Hiroshi; and Matoba, Kazuo, to Nissan Motor Company, Limited. Solid electrolyte thin film oxygen sensor having thin film heater. 4,107,019, Cl. 204-195.00S.

Takao, Hiroshi: *See*—
Aoki, Hiroyuki; Takao, Hiroshi; and Oyamada, Akira, 4,107,392, Cl. 428-547.000.

Takata, Akira: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.

Takeda, Yoshiaki. Presettable metering valve. 4,106,670, Cl. 222-20.000.

Takeshige, Kenji: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Takeuchi, Akihiro: *See*—
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,106,459, Cl. 123-141.000.

Takeuchi, Daizo: *See*—
Ohsugi, Katsuhisa; Takeuchi, Daizo; Hamada, Masahiro; and Kano, Tamotsu, 4,106,988, Cl. 195-49.000.

Takeuchi, Masato: *See*—
Mori, Toshikatsu; Takeuchi, Masato; Hitomi, Otane; Uno, Shigeo; Imahashi, Jinichi; and Nakajima, Fumito, 4,107,272, Cl. 423-239.000.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,106,775, Cl. 274-15.00R.

Talbott, Earl Raymond. Recreational vehicle for use on sloping terrains. 4,106,786, Cl. 280-8.000.

Tamamura, Ryo: *See*—
Nomaki, Koji; Saoyama, Yoshihito; and Tamamura, Ryo, 4,106,930, Cl. 75-134.00B.

Tamura, Noriyoshi; and Kihara, Kunio, to Mitsubishi Petrochemical Company Limited. Anion-exchange resins. 4,107,098, Cl. 521-25.000.

Tamura, Takeo, to Tanabe Shiko Kikai Seizo Kabushiki Kaisha. Cardboard-feeding device. 4,106,764, Cl. 271-35.000.

Tanabe Shiko Kikai Seizo Kabushiki Kaisha: *See*—
Tamura, Takeo, 4,106,764, Cl. 271-35.000.

Tanahashi, Jun'ichi; and Kanie, Takashi, to Fujitsu Limited. Error correcting and controlling system. 4,107,652, Cl. 340-146.1AL.

Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a subsidiary combustion chamber. 4,106,467, Cl. 123-191.0SP.

Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Filmstrip metering device for a camera. 4,107,715, Cl. 354-206.000.

Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, to Toray Industries, Inc. Antistatic acrylic fiber. 4,107,129, Cl. 260-40.00P.

Tanaka, Jinkichi: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,107,503, Cl. 219-61.000.

Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,107,502, Cl. 219-10.55F.

Tanaka, Kozi: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.

Tanaka, Kyuichi: *See*—
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.

Tanaka, Mithunobu: *See*—
Saito, Tamekazu; Tanaka, Mithunobu; Saito, Yutaka; and Sakaue, Kenich, 4,106,929, Cl. 75-130.500.

Tanaka, Mitsugu; Nakazyo, Kiyoshin; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Silver halide emulsion containing yellow color couplers. 4,106,942, Cl. 96-100.00N.

Tanaka, Mitsuo: *See*—
Takahashi, Yoshiyuki; Nagai, Akihiko; Kawawa, Shigenobu; Kubozono, Hidetaka; and Tanaka, Mitsuo, 4,106,329, Cl. 73-15.00B.

Tanaka, Takeji: *See*—
Atsukawa, Masumi; Shinoda, Naoharu; and Tanaka, Takeji, 4,107,271, Cl. 423-235.000.

Tanaka, Taro: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.

Tanaka, Yasuyuki: *See*—
Takahashi, Yuzo; Tanaka, Yasuyuki; Nagai, Katsumi; Takahashi, Nobuo; Matsuda, Hiroshi; Ono, Koichi; Tanaka, Kozi; and Oyama, Shiro, 4,106,420, Cl. 113-12.000.

Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,106,448, Cl. 123-119.0LR.

Tanazawa, Masao: *See*—
Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, 4,106,817, Cl. 302-17.000.

Tani, Tatsuo; and Kameyama, Toshiaki, to Ricoh Company, Ltd. Cassette type sheet feed apparatus for copying machine or the like. 4,106,763, Cl. 271-9.000.

Taniguchi, Koichi: *See*—
Arai, Hiroshi; and Taniguchi, Koichi, 4,107,646, Cl. 340-52.00F.

Tanimizu, Shinkichi; Suzuki, Teruki; and Fukuzawa, Tadashi, to Hitachi, Ltd. Light emitting device having luminescent screen with self activated blue light emitting phosphor. 4,107,571, Cl. 313-486.000.

Tanioka, Katsuhiko: *See*—
Murai, Sadao; Goto, Nobuo; Tanioka, Katsuhiko; Matsunaga, Masaaki; and Isayama, Riyoiti, 4,107,249, Cl. 264-68.000.

Taniyasu, Ryozo; Kurokawa, Hideo; and Saito, Takeshi, to Lion Fat and Oil Company Limited, The. Process for preparing catalyst for olefin polymerization. 4,107,080, Cl. 252-431.00C.

Tanizawa, Kinji: *See*—
Nakamura, Toshiie; Shimizu, Hiromichi; Tanaka, Kyuichi; Kunitomo, Akihiko; and Tanizawa, Kinji, 4,107,300, Cl. 424-200.000.

Tankred, Hans Jurgen: *See*—
Stannow, Jorgen Christian; and Tankred, Hans Jurgen, 4,106,881, Cl. 417-363.000.

Taoka, Akira: *See*—
Suzuki, Shuzo; Furuhashi, Keizo; and Taoka, Akira, 4,106,986, Cl. 195-28.00R.

Tarran, Phil Keith, to Lords III Research & Development Co. Combined hand truck and ladder. 4,106,590, Cl. 182-20.000.

Tashiro, Yasuhisa; Sugimura, Hideo; Arai, Toshiaki; Suzuki, Masao; and Shirai, Tadashi, to Nippon Kayaku Kabushiki Kaisha. Optical resolution of DL-α-phenylglycine hydrochloride. 4,107,203, Cl. 260-518.00R.

Tasto, William D.; and Morris, Thomas E., to Dow Chemical Company, The. Removal of olefin oxide from chlorinated solvents. 4,107,221, Cl. 260-652.00P.

Tatco Inc.: *See*—
Thomas, Thomas, 4,106,678, Cl. 224-5.00D.

Tatsuma, Junji: *See*—
Yoshino, Tsuneo; and Tatsuma, Junji, 4,107,052, Cl. 210-534.000.

Taupin, Jean-Paul. Eye-shades. 4,106,119, Cl. 2-12.000.

Tausch, Gilbert H., to Camco, Incorporated. Sidepocket mandrel. 4,106,564, Cl. 166-117.500.

Tausch, Gilbert H.: *See*—
Gatlin, Alvin O.; Tausch, Gilbert H.; and Watkins, Fred E., 4,106,563, Cl. 166-117.500.

Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Piezoelectric method and medium for producing electrostatic charge patterns. 4,106,933, Cl. 96-1.50R.

Taylor, David Michael: *See*—
Everts, Clifford Leon; Taylor, David Michael; and Delmore, Paul John, 4,107,070, Cl. 252-301.40S.

Taylor, Glenn N., to Kendall Company, The. Liquid sampling device. 4,106,675, Cl. 222-556.000.

Taylor-Smith, Ernest J. Automatic apparatus for laying block units. 4,106,259, Cl. 52-749.000.

Taylor Winfield Corporation, The: *See*—
Toma, Charles A.; and Haessly, Walter F., 4,107,491, Cl. 200-61.420.

Tecco, Charles; and Lasich, Lawrence E., to Weatherchem Corporation. Resealable end closure having plural openings. 4,106,672, Cl. 222-151.000.

Tehan, Frederick J.: *See*—
Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, 4,107,180, Cl. 260-338.000.

Teijin Limited: *See*—
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.

Tektronix, Inc.: *See*—
McTeague, Gerald E.; and Stinger, Kenneth R., 4,106,937, Cl. 96-36.100.
McTeague, Gerald E.; and Stinger, Kenneth R., 4,106,937, Cl. 96-36.100.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Strauch, Raymond; and Riffiod, Michel, 4,107,679, Cl. 343-7.500.

Teledyne Brown Engineering, a Division of Teledyne Industries, Inc.: *See*—
Ortell, Alexander Rudolph, 4,106,727, Cl. 244-49.000.

Teledyne Industries, Inc.: *See*—
Corder, Thomas E., 4,107,046, Cl. 210-282.000.

Teleflex Incorporated: *See*—
Parsons, William H., 4,106,168, Cl. 29-148.40C.

Telefonaktiebolaget L M Ericsson: *See*—
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, 4,107,475, Cl. 179-84.0VF.

Teletype Corporation: *See*—
Campe, William T., 4,107,595, Cl. 318-696.000.
Jacobs, Norman A., 4,107,594, Cl. 318-685.000.

Temco Products, Inc.: *See*—
Thomas, Morton I., 4,106,521, Cl. 135-67.000.

Tenneco Chemicals, Inc.: *See*—
Turnbo, Roy G.; and Purpi, David C., 4,107,230, Cl. 260-861.000.

Tewksbury, Stuart Keene, to Bell Telephone Laboratories, Incorporated. Apparatus for analog to digital conversion. 4,107,669, Cl. 340-347.0AD.

Texaco Development Corp.: *See*—
McEntire, Edward E.; and Gipson, Robert M., 4,107,096, Cl. 252-546.000.

Texaco Inc.: *See*—
Howlett, Donald L., 4,107,644, Cl. 340-18.0CM.
Lachowicz, Donald R.; and Holder, Charles B., 4,107,110, Cl. 260-17.4CL.
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.
Slough, Carlton M., 4,107,603, Cl. 324-207.000.

Texas Instruments Incorporated: *See*—
Adcock, Willis A.; and Skaggs, Frank L., 4,107,732, Cl. 358-43.000.
Barrett, Johnny M.; and Hamilton, Stephen P., 4,107,781, Cl. 364-700.000.
Bayard, Michel Lucien, 4,106,862, Cl. 330-357.000.
Cochran, Michael J., 4,107,782, Cl. 364-706.000.
Gilbreath, Cecil R.; and Womble, Jimmie L., 4,107,773, Cl. 364-200.000.
Kronlage, John W., 4,107,667, Cl. 340-347.0NT.
Kulwicki, Bernard Michael, 4,107,515, Cl. 219-541.000.

Texas Iron Works, Inc.: *See*—
Braddick, Britt O., 4,106,565, Cl. 166-118.000.

Texacan Corporation: *See*—
Dawson, William P., 4,107,632, Cl. 333-81.00A.

Textron, Inc.: *See*—
McKeown, William L., 4,106,332, Cl. 73-104.000.

Teyin Limited: *See*—
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.

Thackray, Philip C. Ballast circuit for gas glow discharge devices. 4,107,580, Cl. 315-311.000.

Thermal Transfer, Division of Kleinewefers: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.

Thiel, Ralph. Latching means for a free spool retrieval and spin type casting reel. 4,106,717, Cl. 242-84.20B.

Thiel, William A.; and Dziedzic, Harry, to Rank Precision Industries, Inc. Lamp adapting kit. 4,107,763, Cl. 362-32.000.

Thielking, William H.: *See*—
Lorenz, Roman R.; and Thielking, William H., 4,107,167, Cl. 260-295.00R.

Thomas International Corporation: *See*—
Roberts, Patrick S., 4,106,385, Cl. 84-1.240.

Thomas, Morton I., to Temco Products, Inc. Collapsible cane apparatus. 4,106,521, Cl. 135-67.000.

Thomas, Norman W., to Celanese Corporation. Sintered herbicide-filled cellulose ester particles having improved resistance to water leaching. 4,106,926, Cl. 71-115.000.

Thomas, Robert F.: *See*—
Cox, Jerry H.; and Thomas, Robert F., 4,106,333, Cl. 74-99.00A.

Thomas, Thomas, to Tatco Inc. Golf ball and tee caddy. 4,106,678, Cl. 224-5.00D.

Thomassen en Drijver-Verblifa N.V.: *See*—
Heijting, Hendrik Gerrit, 4,106,655, Cl. 214-341.000.

Thompson, Larry W.: *See*—
Meador, Richard A.; Adams, Larry L.; Cox, Percy T.; Thompson, Larry W.; and Fuchs, James A., 4,107,597, Cl. 324-6.000.
Meador, Richard A.; Adams, Larry L.; Fuchs, James A.; Cox, Percy T.; and Thompson, Larry W., 4,107,598, Cl. 324-6.000.

Thompson, Neil E. S.: *See*—
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,106,904, Cl. 21-2.70R.

Thomson, Ian Main. Conveyor belts. 4,106,613, Cl. 198-847.000.

Thon, Dieter, to Safety Jet. Device for locking a removable ski crossing deflector. 4,106,787, Cl. 280-11.37E.

Thor Dahl, Inc.: *See*—
Gunther, William H., Jr., 4,106,432, Cl. 118-211.000.

Thornton, David Charles; Lightner, Linn Stephen; and Lannan, Patrick Edward, to AMP Incorporated. Interconnect device for use in closed fluid circulating systems. 4,106,523, Cl. 137-614.040.

Thorp, Jeffrey Meyrick: *See*—
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,107,329, Cl. 424-317.000.

Threshold Corporation: *See*—
Pass, Nelson S., 4,107,619, Cl. 330-255.000.

Threshold Technology, Inc.: *See*—
Grunza, Gene; and Herscher, Marvin B., 4,107,460, Cl. 179-1.0SD.

Thurman, Paul G., to Dare Pafco, Inc. Tray structure. 4,106,624, Cl. 206-507.000.

Tideswell, Richard B.; and Selley, Jeffrey E., to Hooker Chemicals & Plastics Corporation. Polyurethane acrylates of hydroxyalkylated novolac resin. 4,107,229, Cl. 260-841.000.

Tilly, Guy; Hardouin, Michel Jean-Charles; and Lautrou, Jean, to Guerbet S.A. Polyiods benzene derivatives and X-ray contrast media containing the same. 4,107,286, Cl. 424-5.000.

Tilson, Edward Arthur; and Mayhew, Raymond Leonard, to Caribonum Limited. Transfer materials. 4,107,327, Cl. 428-304.000.

Time Computer, Inc.: *See*—
Garrison, Donald W.; and Hartman, James T., 4,106,277, Cl. 58-4.00A.

Timex Corporation: *See*—
Grohoski, Raymond J., 4,107,400, Cl. 429-98.000.

Timofeeva, Venera Fatykhovna: *See*—
Fasman, Anatoly Borisovich; Sokolsky, Dmitry Vladimirovich; Rutman, Grigory Iosifovich; Michurov, Jury Ivanovich; Zavorin, Viktor Anatolievich; Shalimova, Zoya Stepanovna; Timofeeva, Venera Fatykhovna; Dautov, Tulkibai Galikbarovich; Bazhakov, Daniel Kalimullovich; and Sivakov, Jury Mikhailovich, 4,107,090, Cl. 252-465.000.

Tippin, Arthur D., to Chubb & Son's Lock and Safe Company Limited. Keyless combination locks. 4,106,316, Cl. 70-268.000.

Tobin, John H., to Olin Corporation. Process for producing 3-trichloromethyl-5-loweralkylamino-1,2,4-thiadiazole. 4,107,377, Cl. 260-306.80D.

Toekes, Barna, to Polysar Resins, Inc. Polymerization column and method of polymerizing vinylidene compounds. 4,107,410, Cl. 526-73.000.

- Tokyo Electric Power Co., Inc., The: *See—*
  - Ishida, Yotsuo; and Kuwahara, Hiroshi, 4,107,754, Cl. 361-120.000.
  - Nü, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.
- Tokyo Rope Mfg. Co. Ltd.: *See—*
  - Hosoya, Kiyoshi, 4,106,276, Cl. 57-147.000.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Isojima, Tsuyoshi; Enokida, Kenji; Nihei, Hideharu; and Ichise, Wstaru, 4,107,565, Cl. 313-174.000.
  - Nishijima, Tadashi, 4,107,654, Cl. 340-147.0MT.
  - Takamura, Tsutomu; and Shirogami, Tamotsu, 4,107,403, Cl. 429-174.000.
- Toledo Pickling & Steel Service, Inc.: *See—*
  - Hansen, Lars J., 4,107,267, Cl. 423-138.000.
- Toma, Charles A.; and Haessly, Walter F., to Taylor Winfield Corporation, The. Welding machine spacer plate with sensors. 4,107,491, Cl. 200-61.420.
- Tombs, Terence Leslie; Miles, Brian Leslie; and Smith, Dexter William, to C.A.V. Limited. Starting aids for combustion engines. 4,107,510, Cl. 219-270.000.
- Tomecek, Charles J.: *See—*
  - McCandless, William; Leu, Robert F.; Kroder, Ernest A.; and Tomecek, Charles J., 4,106,242, Cl. 51-225.000.
- Tomita, Sadami: *See—*
  - Watanabe, Ryuji; Sato, Syoichi; and Tomita, Sadami, 4,106,627, Cl. 209-7.000.
- Tomita, Yasuo: *See—*
  - Iwasaki, Hajime; and Tomita, Yasuo, 4,107,375, Cl. 428-291.000.
- Tomlinson, Colin Henry, to Rochester Instrument Systems Limited. Optimum start controller. 4,106,690, Cl. 236-46.00R.
- Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, to Konishiroku Photo Industry Co., Ltd. Toner for developing electrostatic latent images comprising an amine-epoxy resin mixture. 4,107,062, Cl. 252-62.10P.
- Tomy Kogyo Co., Inc.: *See—*
  - Kanno, Hideyuki, 4,106,768, Cl. 273-1.00M.
- Toray Industries, Inc.: *See—*
  - Tanaka, Hiroyoshi; Koseki, Teruo; and Fujii, Shigeru, 4,107,129, Cl. 260-40.00P.
- Torbet, Christopher J.; Rice, Warren A.; and Vinton, Clarence S., to Chemotronics International, Inc. Method for the thermal bonding of contacting pieces of a thermoplastic material. 4,106,970, Cl. 156-306.000.
- Torii, Masanori: *See—*
  - Shinoda, Kazuo; and Torii, Masanori, 4,106,456, Cl. 123-119.00E.
- Torii, Osamu, to Ancos Co., Ltd. Mechanical pencil. 4,106,874, Cl. 401-67.000.
- Torrington Company, The: *See—*
  - Marola, Americo Edward; and Stella, Leo, 4,106,826, Cl. 308-187.000.
- Toshiba Chemical Products Co., Ltd.: *See—*
  - Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,107,153, Cl. 528-322.000.
- Totten, George F.; and Harman, Wayne L. Dry gaseous fuel generator. 4,106,457, Cl. 123-133.000.
- Tournoy, Willy, to N. V. Bekaert S.A. Reinforcements. 4,106,957, Cl. 148-12.00B.
- Towmotor Corporation: *See—*
  - Buchwald, Frank S.; and Melocik, Grant C., 4,107,586, Cl. 318-426.000.
  - Hildebrecht, Harold V., 4,106,362, Cl. 74-474.000.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Fujiyoshi, Kanji; Fukuda, Minoru; Mizumura, Yutaka; Sono, Junji; and Naito, Iori, 4,107,148, Cl. 528-273.000.
- Toyo Soda Manufacturing Co., Ltd.: *See—*
  - Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,107,097, Cl. 521-32.000.
- Toyo Tsushinki Kabushiki Jaka Toyn Communication Equipment Co. Ltd.: *See—*
  - Funatsu, Chuhei; and Hirata, Toshikiyo, 4,107,674, Cl. 343-6.50R.
- Toyoda-Koki Kabushiki-Kaisha: *See—*
  - Eto, Kunihiko; Niwa, Kuniyuki; and Owa, Kaoru, 4,107,589, Cl. 318-602.000.
- Toyoda, Shozo: *See—*
  - Shimada, Hiroyuki; and Toyoda, Shozo, 4,106,303, Cl. 61-101.000.
- Toyomaki, Kazuya, to Victor Company of Japan, Limited. Tone controller. 4,107,622, Cl. 330-302.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Arai, Hiroshi; and Taniguchi, Koichi, 4,107,646, Cl. 340-52.00F.
  - Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 4,106,913, Cl. 23-288.0FC.
  - Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,106,451, Cl. 123-119.0EC.
  - Kondo, Osamu, 4,106,353, Cl. 74-45.000.
  - Matsumoto, Noboru; Kurose, Kunio; and Uenn, Kinya, 4,106,449, Cl. 123-119.00A.
  - Mizutani, Kohichi, 4,106,452, Cl. 123-119.00A.
  - Nakamura, Kenya; and Okano, Hiroshi, 4,106,553, Cl. 165-9.000.
  - Norimatsu, Hideaki; Nakamura, Mitsuo; and Kobayashi, Nobuyuki, 4,106,430, Cl. 123-119.0EC.
  - Shinoda, Kazuo; and Torii, Masanori, 4,106,456, Cl. 123-119.00E.
  - Taga, Yutaka, 4,106,369, Cl. 74-869.000.
  - Tanahashi, Toshio, 4,106,467, Cl. 123-191.0SP.
- Toyota Tidoshakogyo Kabushiki Kaisha: *See—*
  - Ono, Takayoshi, 4,106,666, Cl. 220-373.000.
- Traenckner, Hans-Joachim: *See—*
  - Fuhr, Karl; Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgeo; Rufolph, Hans; Patheiger, Manfred; and Haus, Artur, 4,107,012, Cl. 204-159.190.
- Traenkle, William J. Within-the-shoe sock having removable retaining device. 4,106,126, Cl. 2-240.000.
- Tran, Duc Tien, to CGR-MeV. Controlled-frequency feeding arrangement for a linear accelerator using stationary-wave accelerating sections. 4,107,617, Cl. 328-233.000.
- Trane Company, The: *See—*
  - Saunders, James Fredrick, 4,106,306, Cl. 62-149.000.
- Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Leather tanning with oligourethanes. 4,106,897, Cl. 8-94.330.
- Traubel, Harro; Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Leather tanning with oligourethanes. 4,106,898, Cl. 8-94.330.
- Treadwell, Kenneth: *See—*
  - Keller, Alfred A.; Russo, Robert V.; and Treadwell, Kenneth, 4,107,069, Cl. 252-182.000.
- Trecb, Inc.: *See—*
  - Smith, Robert W., Jr.; and Waite, George C., 4,107,451, Cl. 174-84.00R.
- Treczka, Leo: *See—*
  - Spinner, Georg; and Treczka, Leo, 4,107,631, Cl. 333-17.00R.
- Tregoning, Geoffrey Robinson, to Westinghouse Brake and Signal Company Limited. Door mountings. 4,106,876, Cl. 403-4.000.
- Treiber, Robert: *See—*
  - Weaver, Daniel J.; Treiber, Robert; and Wolanow, Avner, 4,107,596, Cl. 323-17.000.
- Trentini, Giswalt V.; and Jatsch, Werner, to Siemens Aktiengesellschaft. Antenna arrangement for radar or direction finding purposes respectively, with sum and difference patterns. 4,107,690, Cl. 343-113.00R.
- Trietley, Harry Louis, Jr., to Sybron Corporation. Magnetic flow meter nulling system. 4,106,337, Cl. 73-194.0EM.
- Tritz, Jean-Marie: *See—*
  - Schultz, Jean-Pierre; Cuny, Francis; Payraudeau, Daniel; and Tritz, Jean-Marie, 4,107,507, Cl. 219-121.00P.
- Triulzi, Joseph P. Rotary internal combustion engine. 4,106,443, Cl. 123-43.00R.
- Trongo, George. Bit driving tool for use in barriers separating different environments. 4,106,373, Cl. 81-180.00R.
- Trubiano, Antoine, to Cari-All, Inc. Stackable material handling container. 4,106,626, Cl. 206-513.000.
- TRW Inc.: *See—*
  - Hajduk, Thomas M., 4,107,457, Cl. 178-17.500.
  - Patel, Jayant K., 4,107,559, Cl. 310-49.00R.
- Tscheulin, Guenther: *See—*
  - Hofer, Kurt; and Tscbeulin, Guenther, 4,107,138, Cl. 260-45.70P.
- Tsuchida, Yutaka, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Pinch roll stand for use in multi-strand continuous casting machine. 4,106,550, Cl. 164-448.000.
- Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Sagami Cbemical Research Center. Thioprene or furan derivatives and process for preparation thereof. 4,107,178, Cl. 260-332.20A.
- Tsuchiya, Osamu: *See—*
  - Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,107,424, Cl. 536-10.000.
- Tsuchiya, Shuji: *See—*
  - Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,107,219, Cl. 568-875.000.
- Tsuda, Naotsune: *See—*
  - Morokuma, Tadashi; and Tsuda, Naotsune, 4,106,173, Cl. 29-603.000.
- Tsujimoto, Kayoshi; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Exposure time control circuitry for cameras. 4,107,709, Cl. 354-51.000.
- Tsujimoto, Kayoshi: *See—*
  - Ueda, Hiroshi; and Tsujimoto, Kayoshi, 4,107,706, Cl. 354-31.000.
- Tsukioka, Hideo: *See—*
  - Sonobe, Hisao; Okada, Sadayuki; Oe, Etsuo; Tsukioka, Hideo; and Sato, Moriichi, 4,106,557, Cl. 165-105.000.
- Tsutsui, Ken: *See—*
  - Nakano, Toshio; Sasano, Akira; Tsutsui, Ken; and Matumaru, Haruo, 4,107,568, Cl. 313-371.000.
- Tsuzuku, Akihiko; Tanazawa, Masao; Kaminishi, Masashi; and Imamura, Haruo, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for pneumatically transporting powdery or granular materials. 4,106,817, Cl. 302-17.000.
- Tucker, Leroy W.: *See—*
  - Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., 4,106,833, Cl. 339-29.00B.
- Tuckett, William F.; Funk, Gary L.; and Smith, Dexter E., to Phillips Petroleum Company. Automatic control of an absorption/stripping process. 4,106,916, Cl. 55-21.000.
- Tuegel, Robert O., to Wagner Electric Corporation. Master cylinder reservoir with vacuum relief diaphragm and guarded fluid level sensor. 4,107,494, Cl. 200-84.00C.
- Tuomy, Justin M.: *See—*
  - Glickstein, Myer; Tuomy, Justin M.; and Shwert, Marianne J., 4,107,335, Cl. 426-96.000.
- Turetsky, Isadore. Filter-purifier cartridge. 4,107,045, Cl. 210-266.000.

- Turetsky, Isadore. Filter-purifier cartridge. 4,107,047, Cl. 210-337.000.
- Turnblom, Ernest W., to Eastman Kodak Company. Photoconductive compositions and elements with charge transfer complexes. 4,106,934, Cl. 96-1.50R.
- Turnbo, Roy G.; and Purpi, David C., to Tenneco Chemicals, Inc. Flame-retardant thermosetting resinous compositions. 4,107,230, Cl. 260-861.000.
- Turner Manufacturing Company, Ltd.: *See—*
  - Morrison, William McKenzie Meek, 4,106,358, Cl. 74-331.000.
- Turner, Paul F., to Sperry Rand Corporation. Automatic frequency-tracking circuit. 4,107,624, Cl. 331-8.000.
- Turri, Eugenio: *See—*
  - Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,106,712, Cl. 242-47.010.
- Turunen, Johannes: *See—*
  - Lindberg, Jarl Johan; Turunen, Johannes; and Hortling, Bo, 4,107,111, Cl. 260-17.500.
- Tutor, Gerald L.; Fruin, James C.; and Helm, James L., to Anheuser-Busch, Incorporated. Batter mix containing floury starch of Fl_2Fl_2 constitution. 4,107,338, Cl. 426-293.000.
- Typpo, Pekka Matti; and Wennerberg, Gunnar, to Measurex Corporation. Non-contacting electromagnetic thickness gauge for sheet measurement having improved small distance sensitivity. 4,107,606, Cl. 324-229.000.
- Tyson, Charles H., to Raytheon Company. Tube terminal connector assembly. 4,106,840, Cl. 339-145.00R.
- Tzeng, J. C. Device and method for three point electro therapy. 4,106,513, Cl. 128-420.00R.
- UCE, Inc.: *See—*
  - Masi, James V., 4,106,951, Cl. 136-89.0NB.
- Uchida, Ryohei; Utsumi, Satoshi; and Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Chopper control device. 4,107,772, Cl. 363-124.000.
- Uchino, Tetsuya: *See—*
  - Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, 4,107,356, Cl. 427-195.000.
- Ueda, Hiroshi; and Tsujimnto, Kayoshi, to Minolta Camera Kabushiki Kaisha. Camera apparatus. 4,107,706, Cl. 354-31.000.
- Ueda, Kazuo, to Ueda Works Co., Ltd. Sphygmomanometer cuff. 4,106,499, Cl. 128-2.05C.
- Ueda Works Co., Ltd.: *See—*
  - Ueda, Kazuo, 4,106,499, Cl. 128-2.05C.
- Ueno, Kinya: *See—*
  - Matsumoto, Noboru; Kurose, Kunio; and Ueno, Kinya, 4,106,449, Cl. 123-119.00A.
- Ukihashi, Hiroshi; Uchino, Tetsuya; Abe, Takeshi; and Kunii, Nobuaki, to Asahi Glass Company, Ltd. Method of powder lining. 4,107,356, Cl. 427-195.000.
- Ulrich, Charles J., to American Safety Equipment Corporation. Safety belt retractor with dual tension retraction means. 4,106,721, Cl. 242-107.000.
- Umezawa, Hamao; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 1-N-[(S)-α-hydroxy-ω-aminoacyl] derivatives of 3',4'-dideoxykanamycin B and 3'-deoxykanamycin B antibioties. 4,107,424, Cl. 536-10.000.
- Umezawa, Sumio: *See—*
  - Umezawa, Haman; Umezawa, Sumio; Maeda, Kenji; Tsuchiya, Osamu; Kondo, Shinichi; and Fukatsu, Shunzo, 4,107,424, Cl. 536-10.000.
- Unigate Limited: *See—*
  - Jenkins, Jonathan Moubray; and Henson, Kenneth, 4,107,397, Cl. 429-27.000.
- Union Carbide Corporation: *See—*
  - Angell, Richard Gordnn, Jr.; Gross, Laurence Herbert; and Berger, Sidney Ethan, 4,107,258, Cl. 264-328.000.
  - Dunleavy, Raymond Augustine; and Papa, Anthnny Joseph, 4,107,106, Cl. 521-164.000.
  - Konrad, Frederick Miller; and Mason, Stephen Howard, 4,107,218, Cl. 560-724.000.
  - Prokai, Bela; and Kanner, Bernard, 4,107,068, Cl. 252-182.000.
  - Walitalo, Charles Richard, 4,106,733, Cl. 248-100.000.
  - Walitaln, Charles Richard, 4,106,734, Cl. 248-100.000.
- Union Oil Company of California: *See—*
  - Barnes, Michael L.; and Whitescarver, Olin D., 4,106,562, Cl. 166-97.000.
  - Ward, John W., 4,107,031, Cl. 208-111.000.
- Uniroyal, Inc.: *See—*
  - Cornell, Rnbert J., 4,107,234, Cl. 260-876.00R.
- United Chemi-Con, Inc.: *See—*
  - Oyama, Makoto, 4,107,761, Cl. 361-433.000.
- United Kingdom Atomic Energy Authority: *See—*
  - Pardoe, John Alan; Etherington, Clifford; and Hunter, Eric, 4,106,32J, Cl. 72-256.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
  - Currie, John Alexander; McKenna, Maurice; and Upton, John Howard, 4,106,525, Cl. 138-43.000.
- United States Gypsum Company: *See—*
  - Nelsson, Nels, 4,106,251, Cl. 52-765.000.
  - Porter, William F., 4,106,921, Cl. 65-14.000.
- United States of America
  - Administrator, National Aeronautics and Space Administration: *See—*
    - Dawn, Frederic S.; and Sauers, Dale G., 4,107,363, Cl. 428-109.000.
  - Agriculture: *See—*
    - Bailey, August V.; Boudreaux, Gordnn J.; Sumrell, Gene; and Novak, Arthur F., 4,107,192, Cl. 260-410.500.
    - Pfeffer, Philip E.; and Moore, Gordon G., 4,107,425, Cl. 536-119.000.
    - Robertson, George H.; Lazar, Melvin E.; Krochta, John M.; Farkas, Daniel F.; and Bomben, John L., 4,107,340, Cl. 426-481.000.
    - Rosen, Howard N., 4,106,215, Cl. 34-217.000.
  - Air Fnrce: *See—*
    - Zwirn, Robert, 4,107,677, Cl. 343-7.00A.
  - Army: *See—*
    - Campbell, Donn V.; and Paragi, Edward J., 4,107,691, Cl. 343-120.000.
    - Cook, Harry, 4,106,343, Cl. 73-387.000.
    - Glickstein, Myer; Tuomy, Justin M.; and Shwert, Marianne J., 4,107,335, Cl. 426-96.000.
    - Horning, Robert J.; and Ebner, Walter B., 4,107,404, Cl. 429-194.000.
    - Hunt, Robert E., 4,106,661, Cl. 220-232.000.
    - Lee, Richard A., 4,106,822, Cl. 305-28.000.
    - Marsden, Charles P., Jr., 4,107,566, Cl. 313-293.000.
    - Potter, Bobby R.; and Scott, Allan W., 4,107,573, Cl. 315-3.500.
    - Vig, John R., 4,107,349, Cl. 427-36.000.
    - Ward, Ernest M., 4,107,666, Cl. 340-331.000.
  - Energy: *See—*
    - Adler, Laszlo; Von Cook, K.; Simpson, William A., Jr.; and Lewis, D. Kent, 4,106,327, Cl. 73-1.0DV.
    - Bicek, John J., 4,107,519, Cl. 250-199.000.
    - Christman, David R.; Finn, Ronald D.; and Wolf, Alfred P., 4,106,982, Cl. 176-11.000.
    - Dow, Jerome P., 4,106,574, Cl. 175-4.570.
    - Dye, James L.; Ceraso, Joseph M.; Tehan, Frederick J.; and Lok, Mei Tak, 4,107,180, Cl. 260-338.000.
    - Morgan, Chester S., Jr.; Cavin, O. Burl; McCulloch, Reginald W.; and Clark, David L., 4,106,186, Cl. 29-616.000.
  - Health, Education and Welfare: *See—*
    - Proctor, Leonard R.; and Byrnes, Raymnnd G., 4,106,493, Cl. 128-2.00R.
    - Proctor, Leonard R.; Dix, Rollin C.; and Metz, Werner A., 4,106,496, Cl. 128-2.00R.
    - Schuette, William H.; and Norris, George F., 4,106,492, Cl. 128-2.00V.
  - Interior: *See—*
    - Bauer, Donald J.; and Eisele, Judith A., 4,107,266, Cl. 423-112.000.
  - National Aeronautics and Space Administration; administrator; with respect to an invention of:
    - Zmuidzinas, Jonas S. Stabilization of $He_2(a^3\Sigma_u^+)$ molecules in liquid helium by optical pumping for vacuum UV laser. 4,107,627, Cl. 331-94.5PE.
  - National Aeronautics and Space Administration: *See—*
    - Bement, Laurence J., 4,106,687, Cl. 228-2.500.
    - Nash, Dudley O.; and Holowach, Joseph, 4,106,587, Cl. 181-213.000.
    - Polstorff, Walter K., 4,106,218, Cl. 35-12.00C.
  - Navy: *See—*
    - Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,107,401, Cl. 429-101.000.
    - Jewett, Harvey R., 4,106,875, Cl. 403-2.000.
    - Kirkland, James L., 4,107,607, Cl. 324-253.000.
    - Moden, James R.; and Perkons, George, 4,107,406, Cl. 429-218.000.
    - Moore, Kenneth L.; and Reed, Russell, Jr., 4,106,906, Cl. 21-60.50A.
    - Piehl, Otto W., deceased, 4,106,206, Cl. 33-199.00R.
    - Saunders, Raymond A., 4,106,910, Cl. 23-232.00R.
    - Vanderplaats, Norman R.; and Arnett, Henry D., 4,107,575, Cl. 315-3.500.
    - Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., 4,106,833, Cl. 339-29.00B.
    - York, Floyd L., 4,106,504, Cl. 128-204.000.
- U.S. Philips Corporation: *See—*
  - Abrahams, Jacobus Hubertus, 4,106,293, Cl. 60-521.000.
  - Auphan, Michel Joseph, 4,106,348, Cl. 73-624.000.
  - Beale, Julian R. A., 4,107,776, Cl. 364-431.000.
  - Boonstra, Alexander Hendrik; and Mutsaers, Cornelis Adrianus H. A., 4,107,387, Cl. 428-426.000.
  - Borg, Lars Uno; Kamp, Lars Ragnar; and Olsson, Kjell Olow Ingemar, 4,107,253, Cl. 246-182.00B.
  - Britt, Ronald Howard; De Bruin, Jan; and Boulter, David Gordon, 4,106,765, Cl. 271-93.000.
  - de Brebisson, Michel; and Bonis, Maurice, 4,106,954, Cl. 148-1.500.
  - Garskamp, Arnoldus, 4,107,615, Cl. 325-420.000.
  - Mestdagh, Gilbert Edouard, 4,107,743, Cl. 360-60.000.
  - Ralph, John Ernest, 4,107,724, Cl. 357-30.000.
  - Ronde, Hubertus Joseph, 4,107,569, Cl. 313-402.000.
  - Schmidt, Peter, 4,107,561, Cl. 310-95.000.
  - van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 4,107,189, Cl. 260-404.000.
- United States Steel Corporation: *See—*
  - Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., 4,107,382, Cl. 428-368.000.

Fields, Marvin C.; Oliver, David L.; and Snyder, Arthur R., 4,106,917, Cl. 55-31.000.
United Technologies Corporation: *See*—
Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, 4,107,010, Cl. 204-129.000.
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University of Michigan, The Regents of the: *See*—
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Uno, Shigeo: *See*—
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UOP Inc.: *See*—
Adams, Frank H.; and Knapik, H. Peter G., 4,107,083, Cl. 252-439.000.
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Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,107,092, Cl. 252-511.000.
Michalko, Edward, 4,107,086, Cl. 252-455.00Z.
Upjohn Company, The: *See*—
Evenson, Gerald N., 4,107,159, Cl. 260-239.0BD.
Hoeksema, Herman; Reusser, Fritz; and Wait, Donald R., 4,107,295, Cl. 424-120.000.
Hoeksema, Herman; and Reusser, Fritz, 4,107,296, Cl. 424-121.000.
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Marshall, Vincent P.; Elrod, David W.; Koert, James M.; Reisender, Elizabeth A.; and Wiley, Paul F., 4,106,994, Cl. 195-80.00R.
Nelson, Norman A., 4,107,211, Cl. 260-590.00C.
Nelson, Norman A., 4,107,212, Cl. 260-590.00C.
Nelson, Norman A., 4,107,213, Cl. 260-590.00C.
Nelson, Norman A., 4,107,214, Cl. 260-590.00C.
Nelson, Norman A., 4,107,215, Cl. 260-590.00C.
Nelson, Norman A., 4,107,216, Cl. 260-590.00C.
Schlieckmann, Alfred, 4,107,248, Cl. 264-51.000.
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Urasaki, Takanori: *See*—
Inata, Hiroo; Morinaga, Tsuto; Kuratsuji, Takatoshi; Urasaki, Takanori; and Kawase, Shoji, 4,107,143, Cl. 528-176.000.
Urban, Alan O.: *See*—
Urban, Donald E.; and Urban, Alan G., 4,107,695, Cl. 343-882.000.
Urban, Donald E.; and Urban, Alan G. Antenna raising and lowering device. 4,107,695, Cl. 343-882.000.
Utsumi, Satoshi: *See*—
Uchida, Ryohei; Utsumi, Satoshi; and Akamatsu, Masahiko, 4,107,772, Cl. 363-124.000.
Vail, Linda G. M. C.: *See*—
Russell, Kenneth E.; and Vail, Linda G. M. C., 4,107,144, Cl. 526-212.000.
Vairel, Edmond G.; Goulay, Jean; and Choay, Jean, to Choay S.A. Purification of urokinase. 4,106,992, Cl. 195-66.00B.
Valliant, William W.; and Michelson, Manfred G., to Data Electronics, Inc. Tape transport. 4,106,686, Cl. 226-188.000.
Valyi, Emery I. Multilayered container. 4,107,362, Cl. 428-35.000.
Van Bemmelen, Henri M. Management control terminal method and apparatus. 4,107,784, Cl. 364-900.000.
Vance, Robert, Jr. Vaporizer system for gasoline engines. 4,106,455, Cl. 123-122.00E.
van der Lely, Cornelis. Soil cultivating implements. 4,106,567, Cl. 172-59.000.
Vanderlinde, William: *See*—
Morgan, Albert W.; Shull, Charles S.; and Vanderlinde, William, 4,107,122, Cl. 260-30.200.
Vanderplaats, Norman R.; and Arnett, Henry D., to United States of America, Navy. Frequency-selective loss technique for oscillation prevention in traveling-wave tubes. 4,107,575, Cl. 315-3.500.
van der Veen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, to U.S. Philips Corporation. Liquid crystalline compounds. 4,107,189, Cl. 260-404.000.
Van Kesteren, Jacobus Petrus Ignatius: *See*—
Kreuger, Frederik Hendrik; and Van Kesteren, Jacobus Petrus Ignatius, 4,106,961, Cl. 156-48.000.
van Kuijk, Josephus Petrus Maria. Apparatus for recovering solar energy. 4,106,481, Cl. 126-271.000.
Van Norman, John W., to Conco Inc. Sewer inspection device and method of scanning sewers for leaks. 4,107,738, Cl. 358-100.000.
van Ommering, Gerrit; and Dunlop, James D., to Communication Satellite Corporation. Overchargeable sealed metal oxide/lanthanum nickel hydride battery. 4,107,395, Cl. 429-21.000.
Van Riemsdijk, Arnoldus J.; and Hendal, Willem P., to Shell Internationale Research Maatschappij B.V. Apparatus and method for detecting cracks in the heat-insulating lining of a container for cold liquids. 4,107,672, Cl. 340-605.000.
van Staveren, Hendricus Cornelis: *See*—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,106,273, Cl. 56-295.000.
Varian Associates, Inc.: *See*—
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Varnerin, Lawrence John, Jr.: *See*—
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Varta Batterie Aktiengesellschaft: *See*—
Lindenberg, Hans-Georg; and Golz, Hans-Joachim, 4,107,398, Cl. 429-88.000.
Vastag, Carl. Seed planter and planting valve therefor. 4,106,414, Cl. 111-1.000.
Ventron Corporation: *See*—
Hedge, Ramesh Subayya, 4,107,099, Cl. 521-30.000.
Verco Manufacturing, Inc.: *See*—
Morton, Virgil R., 4,106,249, Cl. 52-336.000.
Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See*—
Scheurecker, Werner, 4,106,549, Cl. 164-263.000.
Vernaleken, Hugo: *See*—
Bier, Peter; Binsack, Rudolph; and Vernaleken, Hugo, 4,107,149, Cl. 528-309.000.
Verner, Bo Lennart; and Fors, Lars Borje Staffan, to Atlas Copco Aktiebolag. Method and device for lake restoration by oxygen-enriching of the water. 4,107,240, Cl. 261-77.000.
Vernezy, Jacques: *See*—
Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,107,468, Cl. 179-15.0BY.
Vickers, Harry: *See*—
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Victor Company of Japan, Limited: *See*—
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Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 4,107,478, Cl. 179-100.4ST.
Toyomaki, Kazuya, 4,107,622, Cl. 330-302.000.
Vig, John R., to United States of America, Army. Method of adjusting the frequency of piezoelectric resonators. 4,107,349, Cl. 427-36.000.
Vinals, Joaquin Francisco: *See*—
Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, 4,107,209, Cl. 260-586.00R.
Vines, Ellsworth, to Baltimore Brushes, Inc. Painter pad applicator. 4,106,434, Cl. 118-258.000.
Vinton, Clarence S.: *See*—
Torbet, Christopher J.; Rice, Warren A.; and Vinton, Clarence S., 4,106,970, Cl. 156-306.000.
Violland, Robert; and Lagasse, Alain, to Rhone-Poulenc Industries. Novel polyacetal polymers and their application as a soil-release and anti-soil redeposition agents for textile substrates. 4,107,056, Cl. 252-8.800.
Vladic, Daniel P., to Bunker Ramo Corporation. Electrical connector for printed circuit boards. 4,106,841, Cl. 339-176.00M.
Vliet, Walter Carl: *See*—
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Vock, Manfred Hugo: *See*—
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Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,107,093, Cl. 252-522.000.
Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, 4,107,209, Cl. 260-586.00R.
Vogel, Rudolf, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Off-shore drilling and production platform and method of building same. 4,106,302, Cl. 61-94.000.
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von Ropenack, Adolf; Wiegand, Volker; and Smykalla, Gunter, to Metallgesellschaft Aktiengesellschaft. Treating residues from the leaching of roasted zinc blende. 4,107,265, Cl. 423-101.000.
von Schnurbein, Eglof; Bucher, Jakob; and Mikota, Thomas, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Exhaust system in a two-stroke-cycle multicylinder internal combustion engine. 4,106,289, Cl. 60-314.000.

von Strandtmann, Maximilian: *See*—
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Voorhees, John J., to University of Michigan, The Regents of the. Process for treating proliferative skin disease. 4,107,306, Cl. 424-248.510.
Vulkan Kupplungs -und Getriebebau Bernhard Hackforth: *See*—
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W. A. Whitney Corp.: *See*—
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Walitalo, Charles Richard, to Union Carbide Corporation. Bag dispenser and holder. 4,106,734, Cl. 248-100.000.
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Walley, Gerald David, to British Aircraft Corporation. Aircraft weapon mountings. 4,106,389, Cl. 89-1.815.
Wallis, Frank: *See*—
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Walter, Arthur, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Rotary beam light curtain. 4,107,522, Cl. 250-221.000.
Walter, Jurgen, to Vulkan Kupplungs -und Getriebebau Bernhard Hackforth. Arrangement for driving a working shaft by two combustion engines. 4,106,603, Cl. 192-85.0AB.
Wandel, Stephan H. A., to EWG Import-und Export-Gesellschaft mit beschrankter Haftung. Grilling device with warming chamber. 4,106,473, Cl. 126-25.00R.
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Warren, Albert D. Sitz bath. 4,106,132, Cl. 4-6.000.
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Weber, Donald R., to Dacom, Inc. Data transmission system using a sequential approximation encoding and decoding technique. 4,107,610, Cl. 325-38.00R.
Weber, Frank K., to Arant, Gene W., a part interest. Modular chandelier with plug-in arms. 4,107,770, Cl. 362-405.000.
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- Weiss, Richard. Method of and an arrangement for establishing an underground passage. 4,106,297, Cl. 61-42.000.
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- West, Curtis W.; Lee, Larry E.; and Norris, Aubrey O. Vehicle utilizing cryogenic fuel. 4,106,581, Cl. 180-54.00B.
- West, Gene A., to General Motors Corporation. Engine spark timing system with retard means and minimum burn timer. 4,106,447, Cl. 123-117.00R.
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  - Guidosh, Edward F., 4,107,637, Cl. 336-150.000.
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  - Lloyd, Wayne B.; and Logan, Dale R., 4,106,740, Cl. 248-358.00R.
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  - Meuschke, Robert E.; and Martinez, Jose M., 4,106,983, Cl. 176-19.00R.
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- Wildvank, Arthur H.: *See—*
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- Williams, Derek Geoffrey, to Massey-Ferguson Services N.V. Clamping devices. 4,106,644, Cl. 214-138.00C.
- Williams, Frank J., III; and Donahue, Paul E., to General Electric Company. Polysulfoneimides. 4,107,147, Cl. 528-172.000.
- Williams, Geoffrey Hugh: *See—*
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- Wilson, Jeffrey V.; Tucker, Leroy W.; Briggs, William D.; and Inouye, Alan T., to United States of America, Navy. Quick disconnect intercell busbar for deep submergence batteries. 4,106,833, Cl. 339-29.00B.
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- Wilson, Porter C., to Laurence, Margaret M. Resuscitator. 4,106,502, Cl. 128-145.800.
- Wilson, Richard A.; Mookherjee, Braja Dulal; Hruza, Anne Sanderson; Vock, Manfred Hugo; Frederick, Louis Schmitt; and Vinals, Joaquin Francisco, to International Flavors & Fragrances Inc. 1-[3-(Methylthio)butyryl]-2,6,6-trimethyl-cyclohexene and the 1,3-cyclohexadiene analog. 4,107,209, Cl. 260-586.00R.
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- Wilwerding, Dennis J., to Honeywell Inc. Continuous focus proportional controller. 4,107,520, Cl. 250-201.000.
- Winand, Rene Fernand Paul, to Universite Libre de Bruxelles. Electrolysis cell. 4,107,006, Cl. 204-105.00M.
- Winchell, Frank J., to General Motors Corporation. Centrifugal and one way clutches in series with friction clutch. 4,106,605, Cl. 192-105.0CD.

- Winders, Gordon Robert. Solar sensor and tracker apparatus. 4,107,521, Cl. 250-203.00R.
- Windischman, Edward F., to Sherwood Medical Industries Inc. Tamper-resistant rigid syringe package and method of making the same. 4,106,622, Cl. 206-365.000.
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- Witt, Frank A. Head mounted flight training apparatus. 4,106,217, Cl. 35-12.00B.
- Witt, Karl-Heinz; and Sommer, Walter, to Fried. KRUPP Gesellschaft mit beschrankter Haftung. Method of drying coated cans. 4,107,359, Cl. 427-388.00R.
- Witte, Earl L. Exhaust recirculation system for clothes dryer. 4,106,213, Cl. 34-79.000.
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- Wolf, Alfred P.: *See—*
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- Wolf, Charles B.; and Fey, Maurice G., to Westinghouse Electric Corp. Titanium and zirconium production by arc heater. 4,107,445, Cl. 13-2.00P.
- Wolf, Walther: *See—*
  - Langen, Hans; Ranz, Erwin; Eibl, Johannes; and Wolf, Walther, 4,106,940, Cl. 96-74.000.
- Wolfe, Denis G.; and Berryhill, Richard J., to Robertshaw Controls Company. Antifriction assemblies. 4,106,359, Cl. 74-424.80R.
- Womble, Jimmie L.: *See—*
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- Wondra, Arthur, to Siemens Aktiengesellschaft. Recorder. 4,107,696, Cl. 346-24.000.
- Wood, P. John. Air pressure differential energy system. 4,106,295, Cl. 60-649.000.
- Woodhouse, Eric Douglas; Lawrie, Alexander Murray; and McNeil, Thomas, to Hilti Aktiengesellschaft. Apparatus for marking metal. 4,106,435, Cl. 118-301.000.
- Woods, Warreo W., to Continental Oil Company. Lubricating oil compositions. 4,107,054, Cl. 252-33.400.
- Woolhouse, Robin Andrew: *See—*
  - Kennington, Rowland; and Woolhouse, Robin Andrew, 4,107,053, Cl. 252-2.000.
- Wright, Carl J., to General Motors Corporation. Dishwasher control system with cycle reselect. 4,106,517, Cl. 134-58.00D.
- Wright, Clinton M.: *See—*
  - Dollinger, Robert E.; Wright, Clinton M.; and Ruble, Theodore A., deceased, 4,106,912, Cl. 23-259.500.
- Wright, David A.: *See—*
  - Barmeier, Harold J., Jr.; and Wright, David A., 4,107,601, Cl. 324-173.000.
- Wright, Richard F.: *See—*
  - Brewer, William R.; Norland, Kenneth S.; and Wright, Richard F., 4,106,861, Cl. 350-354.000.
- Wright, Robert C., to Narricot Industries, Inc. Yarn welding device. 4,106,973, Cl. 156-433.000.
- Wunsch, Walter G., to Geosource Inc. Low actuation force fluid valve apparatus. 4,106,524, Cl. 137-625.440.
- Wurmb, Rolf; Seydl, Wolfgang; Penzien, Klaus; Gausepohl, Hermann; and Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Flame-retardant linear polyesters. 4,107,231, Cl. 260-873.000.
- Wust, Olivier: *See—*
  - Oswald, Heinz; and Wust, Olivier, 4,106,711, Cl. 242-19.000.
- Wyle Laboratories: *See—*
  - Burtis, Wilson A., 4,106,361, Cl. 74-462.000.
- Xerox Corporation: *See—*
  - Bryngdahl, Olof; and Lee, Wai-Hon, 4,106,844, Cl. 350-6.200.
  - Buchheit, Robert F., 4,106,869, Cl. 355-3.00R.
  - Conwell, Esther M.; Kermisch, Dorian; Maher, James C.; Pfister, Gustav R.; and Schank, Richard L., 4,106,848, Cl. 350-96.140.
  - Fisk, Bernard C.; and Donohue, James M., 4,107,779, Cl. 364-518.000.
  - Marsh, Dana G., 4,106,936, Cl. 96-27.00R.
  - Murphy, Richard J., 4,107,389, Cl. 428-447.000.
  - Petruzzella, Nicholas L., 4,106,935, Cl. 96-1.50R.
- Yamada, Kazuhiko: *See—*
  - Komura, Ichiro; Awao, Takeyoshi; and Yamada, Kazuhiko, 4,106,989, Cl. 195-62.000.
- Yamada, Masatoshi; Oshima, Yujiro; Hattori, Katsuhiko; and Suzuki, Hideyuki, to Kabushiki Kaisha Toyota Chuo Kenkyusbo. Internal combustion engine with auxiliary combustion chamber. 4,106,446, Cl. 123-90.130.
- Yamagishi, Youji: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Yamaha Hatsudoki Kabushiki Kaisha: *See—*
  - Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,106,464, Cl. 123-179.00A.
- Yamakawa, Goichi: *See—*
  - Tomono, Makoto; Yamakawa, Goichi; and Ohta, Mitsunori, 4,107,062, Cl. 252-62.10P.
- Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, to Yamaha Hatsudoki Kabushiki Kaisha. Programmed control system for a lean-burning internal combustion engine. 4,106,464, Cl. 123-179.00A.
- Yamashita, Shiro, to Kabushiki Kaisha Daini Seikosha. Combination portable electronic timepiece and television. 4,106,283, Cl. 58-152.00R.
- Yamashita, Yoshio: *See—*
  - Nakayama, Yasuharu; Hirata, Nobuhito; and Yamashita, Yoshio, 4,107,114, Cl. 260-22.0CB.
- Yamatsu, Isao: *See—*
  - Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,107,193, Cl. 260-410.000.
- Yamauchi, Nobuharu: *See—*
  - Morimoto, Katsuhide; Matsumura, Masaji; Yamauchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.
- Yamazaki, Yoichi: *See—*
  - Nü, Yoshiji; Matsuda, Takayuki; Yamazaki, Yoichi; and Nohara, Haruo, 4,107,778, Cl. 364-492.000.
- Yanagimoto, Samon; Kawaharada, Minoru; Nagata, Shuji; and Koyama, Fujimasa, to Nippon Steel Corporation. Method and apparatus for rolling metallic material. 4,106,318, Cl. 72-199.000.
- Yano, Kanji: *See—*
  - Ban, Itsuki; Nozaki, Sumio; Kasuya, Takanori; Shinkado, Yukio; and Yano, Kanji, 4,107,750, Cl. 360-106.000.
- Yano, Yasuhiro: *See—*
  - Kobayashi, Hajime; Yano, Yasuhiro; and Endo, Ichiro, 4,106,409, Cl. 101-426.000.
- Yao, Ying Luh, to International Business Machines Corporation. Data bus arrangement for Josephson tunneling device logic interconnections. 4,107,554, Cl. 307-306.000.
- Yasuda, Hirofumi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece utilizing semiconductor-insulating substrate integrated circuitry. 4,106,278, Cl. 58-23.00A.
- Yasuhara, Buhei: *See—*
  - Morimoto, Katsuhide; Matsumura, Masaji; Yamanchi, Nobuharu; Koyanagi, Haruo; Sato, Iwao; Yasubara, Buhei; and Sakai, Jiro, 4,107,663, Cl. 340-324.0AD.
- Yasui, Sadahiko: *See—*
  - Kusunose, Tetsuhiro; Shima, Tsukasa; Henmi, Hiroshi; and Yasui, Sadahiko, 4,107,374, Cl. 428-288.000.
- Yasui Sangyo Co., Ltd.: *See—*
  - Nishimura, Matsuo, 4,106,635, Cl. 214-8.50A.
- Yasuike, Akio; Kataoka, Hiroshi; Fujikawa, Tutomu; and Suzuki, Naoto, to Asahi-Dow Limited. Apparatus for injection molding synthetic resin materials. 4,106,887, Cl. 425-549.000.
- Yatcilla, George: *See—*
  - White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,106,268, Cl. 56-1.000.
- Yatsu, Tadao; and Wakumoto, Hiroshi, to Mitsui Petrochemical Industries Ltd. Process for preparing copolymers. 4,107,418, Cl. 526-184.000.
- Yealy, Carl F.; and Abbott, Joseph, to Penland Container, Inc. Method of making an all plastic caulking cartridge. 4,106,963, Cl. 156-73.500.
- Yin, Ching-Feng: *See—*
  - Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,106,556, Cl. 165-81.000.
- Yokoi, Yasuaki: *See—*
  - Sakai, Akira; Inui, Taiji; and Yokoi, Yasuaki, 4,106,286, Cl. 60-39.18B.
- Yokouchi, Haruo: *See—*
  - Furutani, Nagahisa; Takahara, Kazuo; Doi, Yoshikazu; and Yokouchi, Haruo, 4,107,621, Cl. 330-296.000.
- Yonan, Peter K.: *See—*
  - Renbarger, Jerry J.; and Yonan, Peter K., 4,107,205, Cl. 260-558.00A.
- York, Floyd L., to United States of America, Navy. Portable recompression chamber with air scrubber. 4,106,504, Cl. 128-204.000.
- Yorker Research Corporation: *See—*
  - Lin, A. Oscar, 4,106,698, Cl. 239-34.000.
- Yoshida, Makoto: *See—*
  - Asakawa, Kenichi; and Yoshida, Makoto, 4,107,357, Cl. 427-300.000.
- Yoshida, Takashi; and Matsuyama, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Compound field effect transistor. 4,107,725, Cl. 357-41.000.
- Yoshikawa, Kazuo: *See—*
  - Kawada, Toyoshi; Andoh, Shizuo; and Yoshikawa, Kazuo, 4,107,578, Cl. 315-169.0TV.
- Yoshimura, Tooru: *See—*
  - Nagaishi, Hatuo; and Yoshimura, Tooru, 4,106,288, Cl. 60-282.000.
- Yoshino, Muneki, to Nippondenso Co., Ltd. Deceleration indicating system. 4,107,647, Cl. 340-71.000.
- Yoshino, Tsuneo; and Tatsuma, Junji, to Caterpillar Mitsubishi Ltd. Fuel tank water separator assembly. 4,107,052, Cl. 210-534.000.
- Yoshizaki, Akira: *See—*
  - Tsujimoto, Kayoshi; and Yoshizaki, Akira, 4,107,709, Cl. 354-51.000.
- Young Industries, Inc., The: *See—*
  - Foresman, James Daniel, 4,107,035, Cl. 209-309.000.

Young, Jerry W.: *See—*
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Young, Lawrence Henry: *See—*
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Young, Rodney Christopher: *See—*
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Youtsey, Karl J.: *See—*
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,107,092, Cl. 252-511.000.

Yuasa, Yoshio; Morizumi, Yosihiro; and Orui, Ryuzo, to Nippon Electric Co., Ltd. Traveling-wave tube having phase velocity tapering means in a slow-wave circuit. 4,107,572, Cl. 315-3.600.

Yugen Kaisha Watanabe Kenkyusho: *See—*
Watanabe, Katsumi, 4,107,489, Cl. 200-52.00R.

Zabcik, Clarence John, to NI Hycalog. Automatic sequential dual action sealing system. 4,106,779, Cl. 277-27.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
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Zapara, Gerald A., to National Storage Systems, Inc. Demountable modular display system for furniture and the like. 4,106,248, Cl. 52-234.000.

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Zbornik, Vaclav: *See—*
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Zechinati, James; and Pegg, Elra W., to Standard Oil Company (Indiana). Process for making fiber-reinforced thermoplastic pellets. 4,107,250, Cl. 264-118.000.

Zelinski, Robert P.: *See—*
Naylor, Floyd E.; and Zelinski, Robert P., 4,107,236, Cl. 260-879.000.

Zenitani, Toshio, to International Med-Electronics, Inc.; and Heiwa Electronic Industrial Co. Cassette for portable X-ray camera. 4,107,538, Cl. 250-480.000.

Zenith Radio Corporation: *See—*
Jones, Gary A., 4,107,730, Cl. 358-37.000.

Zenker, Walter; and Hulsebusch, Karl-Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Variable gear transmission. 4,106,364, Cl. 74-740.000.

Ziegler, Bodo: *See—*
Bernhardt, Walter; and Ziegler, Bodo, 4,106,465, Cl. 123-179.00H.

Ziemelis, Maris J.: *See—*
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Zimmer Aktiengesellschaft: *See—*
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Zimmer, Karl Joseph, to Burroughs Corporation. Dual printed circuit card mount assembly. 4,107,760, Cl. 361-383.000.

Zimmerman, Walter R.: *See—*
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Zimnukhov, Viktor Alexandrovich: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Esina, Tamara Ivanovna; Polukhin, Alexandr Nikolaevich; and Zimnukhov, Viktor Alexandrovich, 4,107,141, Cl. 528-129.000.

Zinoviev, Alexandr Mikhailovich: *See—*
Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pirogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Borisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; Shevtsov, Anatoly Zakharovich; Kudryavtsev, Valentin Semenovich; Silantiev, Ivan Kuzmich; Solomin, Georgy Stepanovich; Mateshin, Vasily Gerasimovich; Zinoviev, Alexandr Mikhailovich; Shishiyannikov, Viktor Iosifovich; Paly, Gennady Mikhailovich; Koen, David Matveevich; Seleverstov, Vladimir Vasilievich; Smirnov, Jury Alexandrovich; Sosonkin, Oleg Mikhailovich; Katsevich, Leonid Savvich; Pizogov, Nikolai Alexeevich; Chistyakova, Zoya Mikhailovna; Kudrin, Viktor Alexandrovich; Bozisov, Jury Tikhonovich; Molchanov, Oleg Evgenievich; Savvin, Mikhail Vasilievich; Grigoriev, Eduard Maximovich; Fedchenko, Alexei Ivanovich; and Shevtsov, Anatoly Zakharovich, 4,107,449, Cl. 13-35.000.

Zirinsky, Stanley: *See—*
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Zmuidzinas, Jonas S.: *See—*
United States of America, National Aeronautics and Space Administration; and Zmuidzinas, Jonas S., 4,107,627, Cl. 331-94.5PE.

Zurbrigg, Charles Edward; and Keenan, William Douglas Sulman, to Lac-Mac Limited. Reversible surgical gown. 4,106,120, Cl. 2-51.000.

Zutaut, Chesly L.: *See—*
Brower, Loyd R., Jr.; Madsen, Leonard P.; Zutaut, Chesly L.; and Barden, Walter M., Jr., 4,107,016, Cl. 204-181.00R.

Zwirn, Robert, to United States of America, Air Force. Gate tracking technique utilizing dimension memory. 4,107,677, Cl. 343-7.00A.

Zyliss Zysset AG: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbott Laboratories: *See—*
Flouret, George Rogelio, Re. 29,732, Cl. 260-112.50R.

Benmax, Peter David. Buttoning means. Re. 29,729, Cl. 24-90.00B.

Darwood, James R., to T.A.D. Avanti, Inc. Telephone answering apparatus. Re. 29,733, Cl. 179-6.00R.

Fishman, Herbert; and Kresge, James S., to General Electric Company. Metal oxide voltage-variable resistor composition. Re. 29,731, Cl. 252-521.000.

Flouret, George Rogelio, to Abbott Laboratories. Tripeptide. Re. 29,732, Cl. 260-112.50R.

Franklin, Robert S. Lifesaving device. Re. 29,728, Cl. 9-14.000.

General Electric Company: *See—*
Fishman, Herbert; and Kresge, James S., Re. 29,731, Cl. 252-521.000.

Kresge, James S.: *See—*
Fishman, Herbert; and Kresge, James S., Re. 29,731, Cl. 252-521.000.

Manning, Kenneth G., to Schlumberger Technology Corporation. Well bore data-transmission apparatus with debris clearing apparatus. Re. 29,734, Cl. 340-18.0NC.

Matsushita Electric Industrial Co., Ltd.: *See—*
Miyoshi, Seizo, Re. 29,730, Cl. 274-10.00R.

Miyoshi, Seizo, to Matsushita Electric Industrial Co., Ltd. Automatic record player. Re. 29,730, Cl. 274-10.00R.

Murray Tovi Designs, Inc.: *See—*
Tovi, Murray, Re. 29,735, Cl. 362-401.000.

Schlumberger Technology Corporation: *See—*
Manning, Kenneth G., Re. 29,734, Cl. 340-18.0NC.

T.A.D. Avanti, Inc.: *See—*
Darwood, James R., Re. 29,733, Cl. 179-6.00R.

Tovi, Murray, to Murray Tovi Designs, Inc. Rotational lighting system. Re. 29,735, Cl. 362-401.000.

LIST OF PLANT PATENTEES

F. Harmon Saville Nor'East Miniature Roses: *See—*
Schwartz, Ernest, deceased, 4,291, Cl. 7.000.
Schwartz, Ernest, deceased, 4,292, Cl. 7.000.
Schwartz, Ernest, deceased, 4,293, Cl. 10.000.
Schwartz, Ernest, deceased, 4,294, Cl. 9.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,291, 8-15-78, Cl. 7.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,292, 8-15-78, Cl. 7.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,293, 8-15-78, Cl. 10.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,294, 8-15-78, Cl. 9.000.

Schwartz, Hazel E., executrix: *See—*
Schwartz, Ernest, deceased, 4,291, Cl. 7.000.
Schwartz, Ernest, deceased, 4,292, Cl. 7.000.
Schwartz, Ernest, deceased, 4,293, Cl. 10.000.
Schwartz, Ernest, deceased, 4,294, Cl. 9.000.

LIST OF DESIGN PATENTEES

AB Bofors: *See—*
Carlsson, Karl Ingvar; and Akesson, Sven Torsten, 248,941, Cl. D12-183.000.

Aho, Olli; Hartman, Timo; Hyytianien, Jouko; Kaarnametsa, Matti; Moisander, Jukko; Makela, Markku; and Rikkonen, Kari, to Rauma-Repola Oy. Tree harvester. 248,953, 8-15-78, Cl. D15-26.000.

Akesson, Sven Torsten: *See—*
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Alger, Andrew L., to Computer Peripherals, Inc. Printer housing or similar article. 248,949, 8-15-78, Cl. D14-50.000.

American Cyanamid Company: *See—*
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Anderson, Charles F.: *See—*
Canfield, Vernon C.; and Anderson, Charles F., 248,912, Cl. D6-157.000.

Anderson, Dennis C.: *See—*
Stutelberg, Kenneth R.; and Anderson, Dennis C., 248,935, Cl. D11-155.000.

APF Electronics, Inc.: *See—*
Friedman, Alan H., 248,980, Cl. D34-5.00R.

Arfert, Horst F. W.: *See—*
Reynolds, William G.; and Arfert, Horst F. W., 248,916, Cl. D7-15.000.

Arrowhead Enterprises, Inc.: *See—*
Kahl, William G., Jr., 248,930, Cl. D10-106.000.

Astleford, Thomas R.; and Stout, James E. Illuminated microphone holder. 248,945, 8-15-78, Cl. D14-13.000.

Atari, Inc. (Delaware Corporation): *See—*
Cook, David M., 248,982, Cl. D34-5.00L.

Atherton, John: *See—*
Firth, Angus Christopher; Sheldon, Frederick John; Atherton, John; and Block, William John, 248,938, Cl. D12-129.000.

Ball Corporation: *See—*
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Bell & Howell Company: *See—*
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Benkoe, Elisabeth, executrix: *See—*
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Benkoe, Erwin, deceased: *See—*
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Block, William John: *See—*
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Brandenfels, Carl, to H. T. Products, Inc. Baker's table or similar article. 248,915, 8-15-78, Cl. D6-179.000.

- Campbell, William B., to Ball Corporation. Christmas ornament. 248,934, 8-15-78, Cl. D11-121.000.
- Canfield, Vernon C.; and Anderson, Charles F., to Pacific National Bank of Washington. Multiple position service counter unit. 248,912, 8-15-78, Cl. D6-157.000.
- Canon Kabushiki Kaisha: *See—*
  - Kando, Masahiro, 248,959, Cl. D16-42.000.
- Carlsson, Karl Ingvar; and Akesson, Sven Torsten, to AB Bofors. Vehicle window frame. 248,941, 8-15-78, Cl. D12-183.000.
- Cartabiano, Michael C., to Child Guidance Playthings, Inc. Toy amusement center. 248,989, 8-15-78, Cl. D34-15.00R.
- Carter, Earl C. Wrist ash tray. 248,972, 8-15-78, Cl. D27-14.000.
- Cassia, Antonio Macchi, to Steiner American Corporation. Bottle. 248,927, 8-15-78, Cl. D9-158.000.
- Cavicchi, Eugene Alfred; and Scigliano, George. Sailing game board. 248,983, 8-15-78, Cl. D34-5.0SS.
- Chesley, Ronald F.: *See—*
  - Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 248,988, Cl. D34-15.0PP.
- Child Guidance Playthings, Inc.: *See—*
  - Cartabiano, Michael C., 248,989, Cl. D34-15.00R.
- Cole, David M., to Tread Corporation. Vertical security chest. 248,975, 8-15-78, Cl. D31-22.000.
- Comalco Products Pty. Limited: *See—*
  - Curtis, Christnpher John, 248,924, Cl. D8-394.000.
- Computer Peripherals, Inc.: *See—*
  - Alger, Andrew L., 248,949, Cl. D14-50.000.
- Connolly, Jackson, to Watt Watchers, Inc. Watt meter housing. 248,929, 8-15-78, Cl. D10-102.000.
- Cook, David M., to Atari, Inc. (Delaware Corporatinn). Game cabinet. 248,982, 8-15-78, Cl. D34-5.00L.
- Cooper Industries, Inc.: *See—*
  - Ferguson, William C., 248,921, Cl. D8-57.000.
- Curtis, Christopher John, to Comalco Products Pty. Limited. Clip for roofing sheets. 248,924, 8-15-78, Cl. D8-394.000.
- Cyrano Creations, Inc.: *See—*
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- De brey, Robert J., to Minnesota Mining and Manufacturing Company. Pressure sensitive adhesive tape dispenser. 248,961, 8-15-78, Cl. D19-69.000.
- DeFilippo, Francis. Hanger for potted plants. 248,910, 8-15-78, Cl. D6-137.000.
- DeLeone, Carmen D.; West, Ruth; and DiStefano, Anthony, to Engine Specialties, Inc. Glove. 248,898, 8-15-78, Cl. D2-361.000.
- de Neufville, Axel. Document belt. 248,899, 8-15-78, Cl. D2-383.000.
- Der-Avanessian, Mesrop. Dust catcher for grinding operations or the like. 248,954, 8-15-78, Cl. D15-126.000.
- DiStefano, Anthony: *See—*
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- Findeisen, John L. Golf club carrier. 248,979, 8-15-78, Cl. D34-5.0GB.
- Firth, Angus Christopher; Sheldon, Frederick John; Atherton, John; and Block, William John, to Lawrence Wilson & Son Limited. Collapsible baby carriage. 248,938, 8-15-78, Cl. D12-129.000.
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- Godfrey, Nelson Frederick. Electrical switch. 248,944, 8-15-78, Cl. D13-32.000.
- Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, executrix; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Gnldfarb, Adolph E.; and Benkoe, Elisabeth, executrix for the estate nf Erwin Benkoe. Launcher for toy aircraft. 248,988, 8-15-78, Cl. D34-15.0PP.
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382	4,106,238
449	4,106,239
CLASS 51	
125	4,106,240
165.74	4,106,241
225	4,106,242
296	4,106,915
CLASS 52	
16	4,106,243
63	4,106,244
90	4,106,245
169.7	4,106,246
204	4,106,247
234	4,106,248
336	4,106,249
394	4,106,250
347	4,106,253
574	4,106,254
582	4,106,255
646	4,106,256
693	4,106,257
	4,106,258
749	4,106,259
762	4,106,252
765	4,106,251
CLASS 53	
21 FW	4,106,260
27	4,106,261
28	4,106,262
97	4,106,263
124 D	4,106,264
180 R	4,106,265
CLASS 54	
24	4,106,266
CLASS 55	
21	4,106,916
31	4,106,917
71	4,106,918
147	4,106,919
158	4,106,920
CLASS 56	
1	4,106,267
	4,106,268
15.8	4,106,269
98	4,106,270
119	4,106,271
202	4,106,272
295	4,106,273
CLASS 57	
34 HS	4,106,274
77.33	4,106,275
147	4,106,276
CLASS 58	
4 A	4,106,277
23 A	4,106,278
23 BA	4,106,279
28 R	4,106,280
50 R	4,106,281
74	4,106,282
152 R	4,106,283
CLASS 59	
85	4,106,284
CLASS 60	
39.18 B	4,106,286
39.63	4,106,285
274	4,106,287
282	4,106,288
314	4,106,289
324	4,106,290
369	4,106,291
447	4,106,292
521	4,106,293
649	4,106,294
	4,106,295
CLASS 61	
36 C	4,106,296
42	4,106,297
53.64	4,106,298
63	4,106,299
72.2	4,106,300
86	4,106,301
94	4,106,302
101	4,106,303
CLASS 62	
88	4,106,304
89	4,106,305
149	4,106,306
324	4,106,307
	4,106,308
476	4,106,309
CLASS 63	
12	4,106,310
CLASS 64	
23	4,106,311
CLASS 65	
14	4,106,921
CLASS 66	
50 R	4,106,312
202	4,106,313
CLASS 68	
22 R	4,106,314
CLASS 70	
56	4,106,315
268	4,106,316
388	4,106,317
CLASS 71	
42	4,106,922
86	4,106,923
106	4,106,924
108	4,106,925
115	4,106,926
121	4,106,927
CLASS 72	
199	4,106,318
234	4,106,319
256	4,106,320
348	4,106,321
356	4,106,322
389	4,106,323
421	4,106,324
457	4,106,325
CLASS 73	
1 DV	4,106,326
	4,106,327
3	4,106,328
15 B	4,106,329
37.7	4,106,330
61.1 R	4,106,331
88 F	4,106,370
104	4,106,332
105	4,106,333
136 A	4,106,334
143	4,106,335
171	4,106,336
194 EM	4,106,337
302	4,106,338
339 C	4,106,339
355 R	4,106,340
362 AR	4,106,341
386	4,106,342
387	4,106,343
431	4,106,344
432 SD	4,106,345
614	4,106,346
622	4,106,347
624	4,106,348
746	4,106,349
755	4,106,350
CLASS 74	
10.33	4,106,351
29	4,106,352
45	4,106,353
60	4,106,354
99 A	4,106,355
217 B	4,106,356
243 DR	4,106,357
331	4,106,358
424.8 R	4,106,359
440	4,106,360
462	4,106,361
474	4,106,362
498	4,106,363
740	4,106,364
	4,106,365
801	4,106,366
866	4,106,367
	4,106,368
869	4,106,369
CLASS 75	
68 B	4,106,928
130.5	4,106,929
134 B	4,106,930
201	4,106,931
252	4,106,932
CLASS 81	
57.14	4,106,371
143	4,106,372
180 R	4,106,373
302	4,106,374
CLASS 82	
21 B	4,106,375
30	4,106,376
CLASS 83	
4	4,106,377
74	4,106,378
171	4,106,379
212	4,106,380
477.2	4,106,381
835	4,106,382
CLASS 84	
1.01	4,106,383
1.19	4,106,384
1.24	4,106,385
256	4,106,386
312 P	4,106,387
434	4,106,388
CLASS 89	
1.815	4,106,389
CLASS 91	
42	4,106,390
481	4,106,391
CLASS 92	
128	4,106,392
168	4,106,393
CLASS 93	
1 F	4,106,394
35 R	4,106,395
36.5 R	4,106,396
55.1 R	4,106,397
84 TW	4,106,398
CLASS 96	
1.5 R	4,106,933
	4,106,934
	4,106,935
27 R	4,106,936
36.1	4,106,937
48 HD	4,106,938
48 R	4,106,939
74	4,106,940
82	4,106,941
100 N	4,106,942
115 R	4,106,943
CLASS 98	
2.14	4,106,399
CLASS 99	
373	4,106,400
508	4,106,401
571	4,106,402
CLASS 100	
25	4,106,403
117	4,106,404
162 B	4,106,405
CLASS 101	
93.31	4,106,406
120	4,106,407
401.1	4,106,408
426	4,106,409
CLASS 102	
67	4,106,410
	4,106,411
CLASS 105	
197 DH	4,106,412
CLASS 106	
38.2	4,106,944
38.3	4,106,945
52	4,106,946
57	4,106,947
197 R	4,106,948
288 B	4,106,949
CLASS 108	
12	4,106,413
CLASS 111	
1	4,106,414
3	4,106,415
CLASS 112	
79 A	4,106,416
119	4,106,417
158 A	4,106,419
158 B	4,106,418
CLASS 113	
12	4,106,420
120 A	4,106,421
121 C	4,106,422
CLASS 114	
74 A	4,106,423
	4,106,424
CLASS 115	
42	4,106,425
70	4,106,426
CLASS 116	
90	4,106,427
114 P	4,106,428
CLASS 118	
63	4,106,429
64	4,106,430
203	4,106,431
211	4,106,432
212	4,106,433
258	4,106,434
301	4,106,435
307	4,106,436
412	4,106,437
CLASS 119	
1	4,106,438
CLASS 123	
18 R	4,106,441
26	4,106,442
41.82 R	4,106,444
43 R	4,106,443
53 A	4,106,445
75 B	4,106,439
90.13	4,106,446
117 R	4,106,440
	4,106,447
119 A	4,106,449
	4,106,452
119 E	4,106,456
119 EC	4,106,450
	4,106,451
119 LR	4,106,448
120	4,106,453
122 E	4,106,455
122 F	4,106,454
133	4,106,457
139 AT	4,106,458
141	4,106,459

CLASSIFICATION OF PATENTS

146.5 D	4,106,460
148 E	4,106,461
	4,106,462
179 A	4,106,464
179 H	4,106,465
188 S	4,106,466
191 SP	4,106,467
193 P	4,106,463
196 S	4,106,468
198 DB	4,106,469
	4,106,470
198 F	4,106,471
205	4,106,472
CLASS 126	
25 R	4,106,473
110 R	4,106,474
121	4,106,475
140	4,106,476
263	4,106,477
	4,106,478
270	4,106,479
	4,106,480
271	4,106,481
	4,106,482
	4,106,483
	4,106,484
	4,106,485
369	4,106,486
CLASS 127	
23	4,106,487
CLASS 128	
1 R	4,106,488
	4,106,489
2 F	4,106,490
	4,106,491
	4,106,497
2 R	4,106,493
	4,106,496
2 V	4,106,492
2.05 A	4,106,498
2.05 C	4,106,499
2.06 B	4,106,494
2.06 V	4,106,495
36	4,106,500
62 A	4,106,501
145.8	4,106,502
194	4,106,503
204	4,106,504
206	4,106,505
214.4	4,106,506
295	4,106,507
346	4,106,508
349 B	4,106,509
350 V	4,106,510
407	4,106,511
418	4,106,512
420 R	4,106,513
519	4,106,514
CLASS 132	
45 R	4,106,515
CLASS 134	
10	4,106,950
45	4,106,516
58 D	4,106,517
104	4,106,518
122 R	4,106,519
CLASS 135	
4 R	4,106,520
67	4,106,521
CLASS 136	
89 HY	4,106,952
89 NB	4,106,951
CLASS 137	
512	4,106,522
614.04	4,106,523
625.44	4,106,524
CLASS 138	
43	4,106,525
109	4,106,526
131	4,106,527
149	4,106,528
CLASS 139	
92	4,106,529
	4,106,530
383 B	4,106,531
CLASS 140	
147	4,106,532
CLASS 141	
1	4,106,533
18	4,106,534
88	4,106,535
220	4,106,536
CLASS 144	
34 R	4,106,537
309 R	4,106,538
CLASS 145	
2 A	4,106,539
CLASS 148	
1.5	4,106,953
	4,106,954
6	4,106,955
11.5 A	4,106,956
12 B	4,106,957
23	4,106,958
175	4,106,959
CLASS 149	
11	4,106,960
CLASS 151	
14 CS	4,106,540
48	4,106,541
CLASS 152	
239	4,106,542
405	4,106,543
CLASS 156	
48	4,106,961
73.1	4,106,962
73.5	4,106,963
75	4,106,964
123 R	4,106,965
138	4,106,966
184	4,106,967
189	4,106,968
275	4,106,969
306	4,106,970
310	4,106,971
363	4,106,972
433	4,106,973
504	4,106,974
628	4,106,975
644	4,106,976
645	4,106,977
CLASS 160	
199	4,106,544
CLASS 162	
1	4,106,978
73	4,106,979
330	4,106,980
352	4,106,981
CLASS 164	
18	4,106,545
49	4,106,546
82	4,106,547
132	4,106,548
263	4,106,549
448	4,106,550
	4,106,551
CLASS 165	
2	4,106,552
9	4,106,553
32	4,106,554
45	4,106,555
81	4,106,556
105	4,106,557
109	4,106,558
111	4,106,559
159	4,106,560
CLASS 166	
55.2	4,106,561
97	4,106,562
117.5	4,106,563
	4,106,564
118	4,106,565
CLASS 169	
44	4,106,566
CLASS 172	
59	4,106,567
327	4,106,568
CLASS 173	
1	4,106,569
12	4,106,570
64	4,106,571
93	4,106,572
106	4,106,573
CLASS 174	
84 R	4,107,451
84 S	4,107,452
87	4,107,453
135	4,107,454
140 R	4,107,455
151	4,107,456
CLASS 175	
4.57	4,106,574
170	4,106,575
313	4,106,576
340	4,106,577
407	4,106,578
CLASS 176	
11	4,106,982
19 R	4,106,983
32	4,106,984
68	4,106,985
CLASS 177	
137	4,106,579
205	4,106,580
CLASS 178	
17.5	4,107,457
22	4,107,458
69.1	4,107,459
CLASS 179	
1 B	4,107,464
1 G	4,107,463
1 GA	4,107,461
1 N	4,107,465
1 SD	4,107,460
1 VC	4,107,462
2 A	4,107,466
2 DP	4,107,467
6 R	Re.29,733
15 AT	4,107,480
15 BW	4,107,469
15 BY	4,107,468
15 FD	4,107,471
15 FS	4,107,470
18 BF	4,107,473
18 GF	4,107,472
	4,107,474
84 T	4,107,476
	4,107,495
84 VF	4,107,475
99	4,107,477
100.4 ST	4,107,478
116	4,107,479
164	4,107,481
CLASS 180	
54 B	4,106,581
64 A	4,106,582
65 E	4,106,583
105 E	4,106,584
CLASS 181	
107	4,106,585
121	4,106,586
213	4,106,587
284	4,106,588
CLASS 182	
5	4,106,589
20	4,106,590
93	4,106,591
CLASS 184	
25	4,106,592
CLASS 187	
29 R	4,106,593
	4,106,594
CLASS 188	
73.3	4,106,595
314	4,106,596
CLASS 190	
42	4,106,597
52	4,106,598
CLASS 191	
27	4,106,599
59.1	4,106,600
CLASS 192	
0.098	4,106,604
3 S	4,106,601
45	4,106,602
85 AB	4,106,603
105 CD	4,106,605
113 B	4,106,606
129 B	4,106,607
CLASS 194	
1 B	4,106,609
1 R	4,106,608
97 R	4,106,610
CLASS 195	
28 R	4,106,986
31 F	4,106,987
49	4,106,988
62	4,106,989
63	4,106,990
	4,106,991
65	4,106,993
66 B	4,106,992
80 R	4,106,994
103.5 R	4,106,995
CLASS 198	
479	4,106,612
847	4,106,613
CLASS 200	
6 B	4,107,482
35 R	4,107,483
42 T	4,107,484
43	4,107,485
48 KB	4,107,487
48 R	4,107,486
50 A	4,107,488
52 R	4,107,489
	4,107,490
61.42	4,107,491
81.9 M	4,107,492
84 C	4,107,493
	4,107,494
144 B	4,107,496
144 R	4,107,497
148 B	4,107,498
153 LA	4,107,499
308	4,107,500
CLASS 201	
6	4,106,996
32	4,106,997
39	4,106,998
CLASS 202	
118	4,106,999
188	4,107,000
241	4,107,001
CLASS 203	
75	4,107,002
CLASS 204	
16	4,107,003
51	4,107,004
98	4,107,005
105 M	4,107,006
116	4,107,007
129	4,107,008
	4,107,009
	4,107,010
151	4,107,011
159.16	4,107,013
159.19	4,107,012
180 P	4,107,015
180 R	4,107,014
181 R	4,107,016
195 R	4,107,017
195 S	4,107,018
	4,107,019
251	4,107,020
263	4,107,021
265	4,107,022
269	4,107,023
275	4,107,024
290 F	4,107,025
300 R	4,107,026
301	4,107,027
CLASS 206	
45.14	4,106,614
45.31	4,106,615
233	4,106,616
	4,106,617
343	4,106,618
346	4,106,619
363	4,106,620
365	4,106,621
	4,106,622
506	4,106,623
507	4,106,624
	4,106,625
513	4,106,626
CLASS 208	
11 LE	4,107,029
48 AA	4,107,030
111	4,107,031
120	4,107,032
CLASS 209	
5	4,107,028
7	4,106,627
17	4,107,033
74 M	4,106,628
135	4,107,034
309	4,107,035
CLASS 210	
21	4,107,036
82	4,107,037
84	4,107,038
90	4,107,039
159	4,107,040
198 C	4,107,041
225	4,107,042
232	4,107,043
266	4,107,044
	4,107,045
282	4,107,046
337	4,107,047
407	4,107,048
490	4,107,049
492	4,107,050
500 R	4,107,051
534	4,107,052
CLASS 211	
71	4,106,629
191	4,106,630
CLASS 212	
144	4,106,631
CLASS 214	
1 BB	4,106,632
	4,106,633
1 D	4,106,634
8.5 A	4,106,635
11 R	4,106,636
13	4,106,637
14	4,106,638
	4,106,639
	4,106,640
15 R	4,106,641
18 R	4,106,642
83.36	4,106,643
138 C	4,106,644
145 A	4,106,645
147 R	4,106,646
152	4,106,647
341	4,106,655
372	4,106,648
522	4,106,649
750	4,106,650
CLASS 215	
221	4,106,651
253	4,106,652
256	4,106,653
329	4,106,654
364	4,106,656
CLASS 219	
10.55 B	4,107,501
10.55 F	4,107,502
61	4,107,503
69 E	4,107,504
76.14	4,107,505
85 A	4,107,506
121 P	4,107,507
137.7	4,107,508
211	4,107,509
270	4,107,510
286	4,107,511
343	4,107,512
521	4,107,513
523	4,107,514
541	4,107,515
CLASS 220	
23.4	4,106,657
67	4,106,659
90.4	4,106,660
232	4,106,661
268	4,106,662
326	4,106,663
329	4,106,664
	4,106,665
373	4,106,666
453	4,106,658
CLASS 221	
1	4,106,667
131	4,106,668
217	4,106,669
CLASS 222	
20	4,106,670
61	4,106,671
151	4,106,672
207	4,106,673
386.5	4,106,674
556	4,106,675
CLASS 223	
106	4,106,676
CLASS 224	
5 A	4,106,677
5 D	4,106,678
26 B	4,106,679
29 R	4,106,680
42.12	4,106,681
CLASS 225	
103	4,106,682
	4,106,683
CLASS 226	
91	4,106,684
136	4,106,685
188	4,106,686
CLASS 228	
2.5	4,106,687
CLASS 229	
39 R	4,106,688
CLASS 233	
23 R	4,106,689
CLASS 235	
92 FP	4,107,516
CLASS 236	
46 R	4,106,690
92 B	4,106,691
CLASS 237	
8 R	4,106,692
51	4,106,693
CLASS 238	
10 C	4,106,694
10 F	4,106,695
62	4,106,696
CLASS 239	
15	4,106,697
34	4,106,698
124	4,106,699
168	4,106,700
271	4,106,701
533.3	4,106,702
656	4,106,703
685	4,106,704
CLASS 241	
49	4,106,705
186.2	4,106,706
202	4,106,707
222	4,106,708
CLASS 242	
7.03	4,106,709
18 R	4,106,710
19	4,106,711
47.01	4,106,712
	4,106,713
54 R	4,106,714
57.1	4,106,715
68.4	4,106,720
75.43	4,106,716
84.2 B	4,106,717
84.2 R	4,106,718
96	4,106,719
107	4,106,721
107.7	4,106,722
118.3	4,106,723
198	4,106,724
201	4,106,725
CLASS 244	
3.17	4,106,726
49	4,106,727
83 D	4,106,728
137 P	4,106,729
183	4,106,730
188	4,106,731
CLASS 246	
182 B	4,107,253
CLASS 248	
100	4,106,733
	4,106,734
119 R	4,106,735
222.2	4,106,736
226.4	4,106,737
235	4,106,738
345.1	4,106,739
358 R	4,106,740
467	4,106,741
488	4,106,742
CLASS 249	
34	4,106,743
96	4,106,744
97	4,106,745
216	4,106,746
CLASS 250	
199	4,107,517
	4,107,518
	4,107,519
201	4,107,520
203 R	4,107,521
221	4,107,522
223 B	4,107,523
282	4,107,524
303	4,107,525
305	4,107,526
309	4,107,527
317	4,107,528
339	4,107,529
342	4,107,530
360	4,107,531
	4,107,532
364	4,107,533
368	4,107,534
406	4,107,535
423 P	4,107,536
	4,107,537
480	4,107,538
561	4,107,539
566	4,107,340
571	4,107,541
CLASS 251	
84	4,106,747
133	4,106,748
144	4,106,749
282	4,106,750

316	4,106,751
CLASS 252	
2	4,107,053
8.55 C	4,107,057
8.6	4,107,055
8.8	4,107,056
18	4,107,058
28	4,107,059
33.4	4,107,054
49.3	4,107,060
	4,107,061
62.1 P	4,107,062
62.52	4,107,063
89 R	4,107,064
99	4,107,065
132	4,107,066
135	4,107,067
182	4,107,068
	4,107,069
301.4 S	4,107,070
316	4,107,071
	4,107,072
321	4,107,073
359 E	4,107,075
373	4,107,076
408	4,107,077
428	4,107,078
429 R	4,107,079
431 C	4,107,080
431 L	4,107,081
431 R	4,107,082
439	4,107,083
445	4,107,084
448	4,107,085
455 R	4,107,087
455 Z	4,107,086
	4,107,088
465	4,107,089
	4,107,090
466 3	4,107,091
511	4,107,092
521	Re.29,731
522	4,107,093
	4,107,094
541	4,107,095
546	4,107,096
CLASS 254	
29 A	4,106,752
157	4,106,753
186 HC	4,106,754
CLASS 260	
4 R	4,107,109
17.4 CL	4,107,110
17.5	4,107,111
18 EP	4,107,112
18 PF	4,107,113
22 CB	4,107,114
23 EP	4,107,116
23 XA	4,107,115
28.5 B	4,107,117
29.2 EP	4,107,118
29.4 UA	4,107,119
29.6 AB	4,107,121
29.6 RB	4,107,120
30.2	4,107,122
31.8 G	4,107,123
33.6 AQ	4,107,124
37 N	4,107,125
38	4,107,126
	4,107,127
40 P	4,107,129
40 R	4,107,128
	4,107,130
40 TN	4,107,131
42.14	4,107,132
42.15	4,107,133
42.17	4,107,134
42.18	4,107,194
42.37	4,107,135
45.7 P	4,107,138
45.8 NZ	4,107,139
45.85 T	4,107,137
45.95 C	4,107,136
112 B	4,107,157
112.5 R	Re.29,732
	4,107,158
239 BD	4,107,159
239.3 A	4,107,160
239.55 D	4,107,161
288 CE	4,107,165
294.8 C	4,107,166
295 R	4,107,167
302 E	4,107,168
304 P	4,107,169
306.7 T	4,107,170
306.8 D	4,107,377
307 FA	4,107,171
308 D	4,107,172
308 R	4,107,173
326 NS	4,107,174
326.29	4,107,187
326.5 B	4,107,074
327 M	4,107,175
	4,107,176
332.2 A	4,107,178
	4,107,179
	4,107,177
332.2 C	4,107,180
338	4,107,181
340.9 R	4,107,182
343.21	4,107,183
345.8 R	4,107,184
347.2	4,107,185
348.55	4,107,186
351	4,107,188
397.1	4,107,189
404	4,107,190
	4,107,191
408	4,107,193
410	4,107,192
410.5	4,107,195
448 C	4,107,196
448.2 N	4,107,197
455 R	4,107,198
464	4,107,199
465 D	4,107,200
465 E	4,107,201
506	4,107,202
	4,107,203
518 R	4,107,204
530 N	4,107,205
558 A	4,107,206
562 R	4,107,207
583 R	4,107,208
586 F	4,107,209
586 R	4,107,211
590 C	4,107,212
	4,107,213
	4,107,214
	4,107,215
	4,107,216
590 E	4,107,210
615 A	4,107,217
646	4,107,220
652 P	4,107,221
659 A	4,107,222
666 PY	4,107,223
671 R	4,107,224
683 R	4,107,226
683.9	4,107,225
827	4,107,227
836	4,107,228
841	4,107,229
861	4,107,230
873	4,107,231
876 B	4,107,233
876 R	4,107,232
	4,107,234
	4,107,235
879	4,107,236
880 R	4,107,237
	4,107,238
881	4,107,239
CLASS 261	
77	4,107,240
79 A	4,107,241
CLASS 264	
1	4,107,242
13	4,107,243
30	4,107,244
40.1	4,107,245
40.7	4,107,246
45.9	4,107,247
51	4,107,248
68	4,107,249
118	4,107,250
171	4,107,251
176 F	4,107,252
270	4,107,254
299	4,107,255
310	4,107,256
328	4,107,257
	4,107,258
331	4,107,259
349	4,107,260
CLASS 266	
44	4,106,755
99	4,106,756
103	4,106,757
158	4,106,758
220	4,106,759
281	4,106,760
CLASS 269	
75	4,106,761
CLASS 270	
54	4,106,762
CLASS 271	
9	4,106,763
35	4,106,764
93	4,106,765
181	4,106,766
188	4,106,767
CLASS 273	
1 M	4,106,768
58 B	4,106,769
80 B	4,106,777
106.5 D	4,106,770
183 B	4,106,771
186 R	4,106,772
240	4,106,773
245	4,106,774
CLASS 274	
10 R	Re.29,730
15 R	4,106,775
39 R	4,106,776
CLASS 277	
9.5	4,106,778
27	4,106,779
81 P	4,106,780
82	4,106,781
235 A	4,106,782
CLASS 279	
2 R	4,106,783
	4,106,784
4	4,106,785
CLASS 280	
8	4,106,786
11.37 E	4,106,787
43.23	4,106,788
166	4,106,790
423 A	4,106,791
432	4,106,792
435	4,106,793
456 R	4,106,794
481	4,106,795
793	4,106,789
CLASS 285	
133 R	4,106,796
156	4,106,797
226	4,106,798
365	4,106,799
CLASS 290	
40 R	4,107,542
CLASS 292	
264	4,106,800
307 R	4,106,801
320	4,106,802
CLASS 293	
62	4,106,803
63	4,106,804
CLASS 296	
1 A	4,106,805
23 C	4,106,732
23 MC	4,106,806
28 R	4,106,807
35 R	4,106,808
69	4,106,809
CLASS 297	
183	4,106,810
193	4,106,811
CLASS 298	
1 B	4,106,812
35 M	4,106,813
CLASS 299	
2	4,106,814
59	4,106,815
CLASS 301	
108 R	4,106,816
CLASS 302	
17	4,106,817
CLASS 303	
11	4,106,818
38	4,106,819
92	4,106,820
	4,106,821
CLASS 305	
28	4,106,822
CLASS 307	
10 AT	4,107,543
88.3	4,107,544
121	4,107,545
141	4,107,546
203	4,107,547
205	4,107,548
	4,107,549
241	4,107,550
252 3	4,107,551
	4,107,552
293	4,107,553
306	4,107,554
308	4,107,555
362	4,107,556
CLASS 308	
4 A	4,106,823
9	4,106,824
139	4,106,825
172	4,106,192
187	4,106,826
187.1	4,106,827
CLASS 310	
11	4,107,557
13	4,107,558
49 R	4,107,559
60 R	4,107,560
95	4,107,561
CLASS 312	
107	4,106,828
235 A	4,106,829
CLASS 313	
59	4,107,562
60	4,107,563
94	4,107,564
174	4,107,565
293	4,107,566
325	4,107,567
371	4,107,568
402	4,107,569
471	4,107,570
486	4,107,571
CLASS 315	
3.5	4,107,573
	4,107,574
	4,107,575
3.6	4,107,572
169 TV	4,107,576
	4,107,577
	4,107,578
205	4,107,579
311	4,107,580
324	4,107,581
365	4,107,582
CLASS 318	
221 D	4,107,583
227	4,107,584
331	4,107,585
426	4,107,586
439	4,107,587
484	4,107,588
568	4,107,592
602	4,107,589
628	4,107,590
663	4,107,591
685	4,107,593
	4,107,594
696	4,107,595
CLASS 323	
17	4,107,596
CLASS 324	
6	4,107,597
	4,107,598
51	4,107,602
61 R	4,107,599
78 R	4,107,600
173	4,107,601
207	4,107,603
208	4,107,604
220	4,107,605
229	4,107,606
253	4,107,607
CLASS 325	
4	4,107,608
14	4,107,609
38 R	4,107,610
55	4,107,611
171	4,107,612
348	4,107,613
	4,107,614
420	4,107,615
CLASS 328	
110	4,107,616
233	4,107,617
CLASS 330	
51	4,107,618
255	4,107,619
265	4,107,620
296	4,107,621
302	4,107,622
CLASS 331	
1 A	4,107,623
8	4,107,624
37	4,107,625
65	4,107,626
94.5 N	4,107,628
94.5 PE	4,107,627
116 R	4,107,629
CLASS 332	
9 T	4,107,630
CLASS 333	
17 R	4,107,631
81 A	4,107,632
	4,107,633
	4,107,634
CLASS 336	
45	4,107,635
92	4,107,636
150	4,107,637
CLASS 337	
131	4,107,638
205	4,107,639
CLASS 338	
23	4,107,640
55	4,107,641
128	4,107,642
CLASS 339	
8 R	4,106,830
	4,106,831
14 L	4,106,832
29 B	4,106,833
44 M	4,106,834
95 D	4,106,835
97 C	4,106,836
98	4,106,837
99 R	4,106,838
143 R	4,106,839
145 R	4,106,840
176 M	4,106,841
221 R	4,106,842
232	4,106,843
CLASS 340	
17 R	4,107,643
18 CM	4,107,644
18 NC	Re.29,734
52 E	4,107,645
52 F	4,107,646
71	4,107,647
146.1 AG	4,107,649
146.1 AL	4,107,650
	4,107,652
146.1 R	4,107,651
146.3 C	4,107,653
146.3 H	4,107,648
147 MT	4,107,654
149 R	4,107,655
151	4,107,656
324 AD	4,107,662
	4,107,663
	4,107,664
	4,107,665
331	4,107,666
347 AD	4,107,668
	4,107,669
347 DA	4,107,670
	4,107,671
347 NT	4,107,667
552	4,107,659
566	4,107,660
579	4,107,657
605	4,107,672
620	4,107,658
688	4,107,661
CLASS 343	
5 DP	4,107,673
6.5 LC	4,107,675
6.5 R	4,107,674
	4,107,676
7 A	4,107,677
7 ED	4,107,678
7.5	4,107,679
	4,107,684
8	4,107,680
12 A	4,107,681
16 M	4,107,682
18 E	4,107,683
100 SA	4,107,685
106 R	4,107,686
108 R	4,107,688
112 TC	4,107,689
113 R	4,107,690
120	4,107,691
	4,107,692
715	4,107,693
	4,107,694
882	4,107,695
CLASS 346	
24	4,107,696
33 R	4,107,697
75	4,107,698
	4,107,699
76 R	4,107,700
107 R	4,107,687
108	4,107,701
CLASS 350	
6.2	4,106,844
6.6	4,106,845
87	4,106,851
96.14	4,106,848
96.24	4,106,849
96.31	4,106,847
	4,106,850
117	4,106,852
176	4,106,834
196	4,106,855
199	4,106,856
311	4,106,857
332	4,106,858
333	4,106,853
338	4,106,859
343	4,106,860
354	4,106,861
357	4,106,862
CLASS 352	
72	4,106,863
91 C	4,106,864
	4,106,865
CLASS 353	
29	4,106,866
114	4,106,867
CLASS 354	
17	4,107,702
21	4,107,703
23 D	4,107,704
29	4,107,705
31	4,107,706
50	4,107,707
51	4,107,709
60 L	4,107,708
86	4,107,710
112	4,107,711
115	4,107,712
196	4,107,714
206	4,107,715
209	4,107,713
296	4,107,716
CLASS 355	
3 R	4,106,869
3 TR	4,106,868
4	4,106,870
99	4,106,871
CLASS 356	
4	4,106,872
CLASS 357	
3	4,107,718
15	4,107,719
22	4,107,720
30	4,107,721
	4,107,722
	4,107,723
	4,107,724
41	4,107,725
64	4,107,731
71	4,107,726
72	4,107,727
80	4,107,728
CLASS 358	
4	4,107,729
10	4,106,846
36	4,107,736
37	4,107,730
43	4,107,732
75	4,107,733
84	4,107,734
	4,107,735
93	4,107,737
100	4,107,738
167	4,107,739
293	4,107,740
300	4,107,741
301	4,107,742
CLASS 360	
60	4,107,743
73	4,107,744
	4,107,745
78	4,107,746
93	4,107,747
104	4,107,748
105	4,107,749
106	4,107,750
122	4,107,751
135	4,107,752
137	4,107,753
CLASS 361	
120	4,107,754
220	4,107,755
231	4,107,756
235	4,107,757
275	4,107,758
	4,107,759
383	4,107,760
433	4,107,761
	4,107,762
CLASS 362	
32	4,107,763
35	4,107,764
120	4,107,765
226	4,107,766
236	4,107,767

CLASSIFICATION OF PATENTS

363	4,107,768
401	Re.29,735
402	4,107,769
405	4,107,770
CLASS 363	
58	4,107,771
124	4,107,772
CLASS 364	
200	4,107,773
	4,107,774
413	4,107,775
431	4,107,717
	4,107,776
465	4,107,777
492	4,107,778
518	4,107,779
521	4,107,780
700	4,107,781
706	4,107,782
746	4,107,783
900	4,107,784
	4,107,785
	4,107,786
CLASS 366	
3	4,107,789
75	4,107,787
81	4,107,788
127	4,107,790
205	4,107,791
302	4,107,792
312	4,107,793
346	4,107,794
CLASS 400	
144.2	4,106,611
470	4,106,873
CLASS 401	
67	4,106,874
CLASS 403	
2	4,106,875
4	4,106,876
14	4,106,877
28	4,106,878
CLASS 404	
10	4,106,879
CLASS 408	
1 R	4,106,880
CLASS 417	
363	4,106,881
517	4,106,882
CLASS 418	
61 B	4,106,883
CLASS 423	
22	4,107,261
32	4,107,262
81	4,107,264
101	4,107,265
112	4,107,266
138	4,107,267
210	4,107,268
222	4,107,269
226	4,107,270
235	4,107,271
239	4,107,272
263	4,107,163
	4,107,273
268	4,107,274
276	4,107,275
290	4,107,276
359	4,107,277
376	4,107,278
389	4,107,279
481	4,107,263
502	4,107,280
625	4,107,281
657	4,107,282
CLASS 424	
1	4,107,283
	4,107,284
	4,107,285
5	4,107,286
8	4,107,287
22	4,107,288
45	4,107,289
47	4,107,290
48	4,107,291
78	4,107,292
84	4,107,293
93	4,107,294
120	4,107,295
121	4,107,296
122	4,107,297
177	4,107,298
182	4,107,299
200	4,107,300
	4,107,301
	4,107,302
244	4,107,303
246	4,107,304
	4,107,305
248.51	4,107,306
249	4,107,307
	4,107,308
	4,107,309
258	4,107,310
	4,107,311
263	4,107,312
	4,107,313
	4,107,314
	4,107,315
266	4,107,316
267	4,107,317
273 R	4,107,318
	4,107,319
274	4,107,320
	4,107,321
278	4,107,322
279	4,107,323
300	4,107,324
301	4,107,325
304	4,107,326
316	4,107,328
317	4,107,329
	4,107,330
319	4,107,331
321	4,107,332
365	4,107,333
CLASS 425	
345	4,106,884
450.1	4,106,885
526	4,106,886
549	4,106,887
577	4,106,888
CLASS 426	
7	4,107,334
96	4,107,335
250	4,107,336
266	4,107,337
293	4,107,338
387	4,107,339
481	4,107,340
504	4,107,341
535	4,107,342
564	4,107,343
625	4,107,344
637	4,107,345
648	4,107,346
660	4,107,347
CLASS 427	
2	4,107,348
36	4,107,349
38	4,107,350
43	4,107,351
50	4,107,352
54	4,107,353
118	4,107,334
120	4,107,355
195	4,107,356
300	4,107,357
379	4,107,358
388 R	4,107,359
389	4,107,360
CLASS 428	
17	4,107,361
35	4,107,362
109	4,107,363
196	4,107,364
202	4,107,365
215	4,107,366
234	4,107,367
245	4,107,368
246	4,107,369
247	4,107,370
255	4,107,371
256	4,107,372
264	4,107,373
288	4,107,374
291	4,107,375
304	4,107,327
306	4,107,376
323	4,107,378
326	4,107,379
327	4,107,380
365	4,107,381
368	4,107,382
379	4,107,383
398	4,107,384
412	4,107,385
	4,107,386
426	4,107,387
428	4,107,388
447	4,107,389
	4,107,390
483	4,107,391
547	4,107,392
558	4,107,393
595	4,107,394
CLASS 429	
21	4,107,395
26	4,107,396
27	4,107,397
88	4,107,398
89	4,107,399
98	4,107,400
101	4,107,401
120	4,107,402
174	4,107,403
194	4,107,404
218	4,107,405
	4,107,406
225	4,107,407
CLASS 431	
46	4,106,889
184	4,106,890
208	4,106,891
CLASS 432	
58	4,106,892
77	4,106,893
122	4,106,894
CLASS 521	
25	4,107,098
30	4,107,099
32	4,107,097
80	4,107,105
85	4,107,108
106	4,107,107
137	4,107,100
	4,107,101
154	4,107,140
163	4,107,102
164	4,107,106
171	4,107,104
CLASS 526	
8	4,107,408
65	4,107,409
73	4,107,410
75	4,107,411
91	4,107,156
114	4,107,412
	4,107,413
	4,107,414
	4,107,415
	4,107,416
117	4,107,417
184	4,107,418
212	4,107,144
228	4,107,419
237	4,107,420
CLASS 528	
54	4,107,151
68	4,107,152
72	4,107,103
93	4,107,142
108	4,107,145
129	4,107,141
168	4,107,146
172	4,107,147
176	4,107,143
273	4,107,148
307	4,107,150
309	4,107,149
312	4,107,154
322	4,107,153
373	4,107,155
483	4,107,421
502	4,107,422
CLASS 536	
4	4,107,423
10	4,107,424
56	4,107,426
119	4,107,425
CLASS 542	
427	4,107,427
437	4,107,428
447	4,107,429
471	4,107,430
CLASS 544	
16	4,107,431
21	4,107,432
30	4,107,433
59	4,107,434
97	4,107,435
169	4,107,436
313	4,107,162
376	4,107,437
380	4,107,164
CLASS 548	
353	4,107,438
CLASS 560	
17	4,107,440
55	4,107,439
121	4,107,441
724	4,107,218
CLASS 568	
726	4,107,442
750	4,107,443
807	4,107,444
875	4,107,219

CLASSIFICATION OF DESIGNS

D2—	184	248,896
	320	248,897
	361	248,898
	383	248,899
	401	248,900
D6—	25	248,901
	29	248,902
	45	248,903
	69	248,904
	78	248,905
	90	248,906
	94	248,907
	116	248,908
	137	248,909
		248,910
	154	248,911
	157	248,912
	158	248,913
	175	248,914
	179	248,915
D7—	15	248,916
	65	248,917
	143	248,918
D8—	1	248,919
	50	248,920
	57	248,921
	82	248,922
	313	248,923
	394	248,924
D9—	117	248,925
	143	248,926
	158	248,927
D10—	91	248,928
	102	248,929
	106	248,930
	125	248,931
		248,932
D11—	81	248,933
	121	248,934
	155	248,935
	157	248,936
D12—	26	248,937
	129	248,938
	134	248,939
	182	248,940
	183	248,941
D13—	7	248,942
	18	248,943
	32	248,944
D14—	13	248,945
	40	248,946
	42	248,947
		248,948
	50	248,949
	59	248,950
	71	248,951
	72	248,952
D15—	26	248,953
	126	248,954
	148	248,955
D16—	23	248,956
	31	248,957
	38	248,958
	42	248,959
D19—	18	248,960
	69	248,961
	76	248,962
		248,963
		248,964
D23—	4	248,965
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4,107,624

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4,106,707
4,106,828
4,106,974
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4,107,381
4,107,402
4,107,428
4,107,590
56 : 4,106,328

DESIGN PATENTS

6 : 248,977
8 : 248,910
04 : 248,937
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55 : 248,950

PLANT PATENTS

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August 22, 1978 Volume 973 Number 4

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Patents Granted

General and Mechanical (4,107,795)	1505
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

IN RE STEPHEN WYDEN, RESPONDENT.

PROCEEDINGS FOR SUSPENSION OR DISBARMENT

Final Order

Upon consideration of a Joint Motion for Entry of Final Order filed by the Solicitor and respondent, it is hereby

ORDERED that Stephen Wyden of Brooklyn, N.Y., whose registration number is 26,060, is suspended, beginning on August 30, 1978, from practicing as a patent agent before the United States Patent and Trademark Office for a period of two (2) years; and it is

FURTHER ORDERED that Stephen Wyden may be reinstated as a patent agent upon showing satisfactory to the Committee on Enrollment that respondent is competent in all respects to practice patent law before the United States Patent and Trademark Office.

Entry of this order terminates these proceedings.

This order is being entered pursuant to 35 U.S.C. 32 and 37 CFR 1.348.

DONALD W. BANNER,
Commissioner.

Dated: July 27, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 208,148, Re. S.N. 905,387, Filed May 12, 1978, Cl. D10/8, PULL, John R. Morgan, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, Ex. Gp.: 290

D. 209,813, Re. S.N. 905,388, Filed May 12, 1978, Cl. 10/8, PULL, Laverne E. Clayton, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, Ex. Gp.: 290

3,624,632, Re. S.N. 913,143, Filed Jun. 6, 1978, Cl. 340/324 A, MIXED ALPHAMERIC-GRAPHIC DISPLAY, David Ophir, Owner of Record: *Applied Digital Data Systems, Inc., Hauppauge, N.Y.,* Attorney or Agent: Joseph A. DeGrandi, Ex. Gp.: 234

3,630,781, Re. S.N. 913,890, Filed Jun. 8, 1978, Cl. 429/126, PROCESS OF FORMING RECHARGEABLE ELECTRODES UTILIZING UNSINTERED FLUOROCARBON BINDER, Guy Rampel, Owner of Record: *General Electric Company, Columbus, Ohio,* Attorney or Agent: Edward A. Hedman, et al., Ex. Gp.: 114

3,705,608, Re. S.N. 919,405, Filed Jun. 26, 1978, Cl. 139/127 D, METHOD FOR TRANSPORTING A WEFT THREAD THROUGH A WEAVING SHED AND A LOOM FOR PERFORMING SAID METHOD, Geert Jan Vermeulen, Owner of Record: *Inventor,* Attorney or Agent: Charles O. Marshall, Jr., Ex. Gp.: 353

3,724,285, Re. S.N. 918,329, Filed Jun. 22, 1978, Cl. 74/243 FC, CONVEYOR DRIVE, James M. Lapeyre, Owner of Record: *Inventor,* Attorney or Agent: Robert J. Schiller, et al., Ex. Gp.: 345

3,795,557, Re. S.N. 914,540, Filed Jun. 12, 1978, Cl. 156/646, PROCESS AND MATERIAL FOR MANUFACTURING SEMICONDUCTOR DEVICES, Adir Jacob, Owner of Record: *LFE Corporation, Waltham, Mass.,* Attorney or Agent: Melvin R. Jenney, Ex. Gp.: 161

3,867,216, Re. S.N. 914,539, Filed Jun. 12, 1978, Cl. 156/643, PROCESS AND MATERIAL FOR MANUFACTURING SEMICONDUCTOR DEVICES, Adir Jacob, Owner of Record: *LFE Corporation, Waltham, Mass.,* Attorney or Agent: Melvin R. Jenney, Ex. Gp.: 161

3,875,163, Re. S.N. 907,817, Filed May 19, 1978, Cl. 260/268 BC, NITROGEN CONTAINING ACYCLIC ISOPRENOID COMPOUNDS, Silvia Tricerri Zumin, et al., Owner of Record: *Pierrel S.P.A., Milan, Italy,* Attorney or Agent: Leo A. Rossetta, et al., Ex. Gp.: 122

3,923,986, Re. S.N. 907,816, Filed May 19, 1978, Cl. 424/250, NITROGEN CONTAINING ACYCLIC ISOPRENOID COMPOUNDS IN PHARMACEUTICAL COMPOSITIONS, Silvia Tricerri Zumin, et al., Owner of Record: *Pierrel S.P.A., Milan, Italy,* Attorney or Agent: Leo A. Rossetta, et al., Ex. Gp.: 125

3,933,501, Re. S.N. 916,172, Filed Jun. 16, 1978, Cl. 96/74, PHOTOGRAPHIC ELEMENTS CONTAINING COLOR-FORMING COUPLERS HAVING AND INHIBITING EFFECT UPON THE REACTIVITY OF COMPETING COUPLERS, Robert G. Cameron, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: J. G. Levitt, et al., Ex. Gp.: 166

3,957,723, Re. S.N. 919,382, Filed Jun. 26, 1978, Cl. 260/45.75 W, FLAME AND SMOKE RETARDANTS FOR POLYVINYL CHLORIDE, David Francis Lawson, et al., Owner of Record: *The Firestone Tire and Rubber Company, Akron, Ohio,* Attorney or Agent: S. M. Clark, et al., Ex. Gp.: 141

3,964,185, Re. S.N. 918,330, Filed Jun. 22, 1978, Cl. 38/14, SEAMBUSTING APPARATUS AND METHOD, Norman J. Bullock, et al., Owner of Record: *W. M. Cissel Manufacturing Company, Louisville, Ky.,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 353

3,966,267, Re. S.N. 918,670, Filed Jun. 23, 1978, Cl. 303/21 BE, SKID CONTROL SYSTEM, Joseph H. McNinch, Jr., et al., Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Raywood H. Blanchard, et al., Ex. Gp.: 315

3,983,919, Re. S.N. 916,699, Filed Jun. 19, 1978, Cl. 152/357 R, HIGH-MODULUS RUBBER COMPOSITION FOR PNEUMATIC TIRES, James W. Messerly, Owner of Record: *The B. F. Goodrich Company, Akron, Ohio,* Attorney or Agent: Michael J. Colitz, Jr., et al., Ex. Gp.: 314

4,002,053, Re. S.N. 899,005, Filed Jul. 13, 1978, Cl. 73/32 R, METHOD AND APPARATUS FOR MEASURING DENSITY SUSPENSION, Noboru Hayakawa, Owner of Record: *Nishihara Environmental Sanitation Research Corp. Ltd., Tokyo, Japan,* Attorney or Agent: Ralph E. Bucknam, et al., Ex. Gp.: 244

4,011,897, Re. S.N. 918,620, Filed Jun. 23, 1978, Cl. 141/207, INTERLOCK SYSTEM FOR A GASOLINE DISPENSING NOZZLE, William B. Hansel, Owner of Record: *Suntech, Inc., St. David, Pa.,* Attorney or Agent: J. Edward Hess, Ex. Gp.: 243

4,032,278, Re. S.N. 918,447, Filed Jun. 23, 1978, Cl. 425/525, SEALING AND SHEARING MEMBER IN A PLASTIC RESIN BLOW MOLDING MACHINE, Ernest O. Kuenzig, et al., Owner of Record: *Forest Mechanical Products Corp., Kew Gardens, N.Y.,* Attorney or Agent: Eliot S. Gerber, Ex. Gp.: 322

4,036,205, Re. S.N. 912,930, Filed Jun. 5, 1978, Cl. 126/126, FIREPLACE STOVE, Robert William Hayes, Owner of Record: *Hayes-Te Equipment Corporation, Unionville, Conn.,* Attorney or Agent: Anthony P. Delio, et al., Ex. Gp.: 344

4,047,444, Re. S.N. 911,019, Filed May 30, 1978, Cl. 74/229, SYNCHRONOUS BELT AND PULLEY DRIVE, Joseph O. Jeffrey, Owner of Record: *Borg-Warner Corporation, Chicago, Ill.,* Attorney or Agent: William S. McCurry, et al., Ex. Gp.: 345

4,083,592, Re. S.N. 918,669, Filed Jun. 23, 1978, Cl. 293/71 R, PROTECTIVE STRIP ASSEMBLY, Richard J. Rubin, et al., Owner of Record: *Boston Metal Products Sales Corporation, Cambridge, Mass.,* Attorney or Agent: Charles C. Winchester, Ex. Gp.: 315

PATENT NOTICES

Certificates of Correction for the Week of Aug. 22, 1978

3,500,373
3,934,124
3,947,941
3,978,977
3,990,009
3,993,977
3,996,244
3,997,879
4,008,388
4,016,036
4,016,479
4,017,345
4,025,926
4,026,906
4,027,121
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4,059,630
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4,062,231
4,062,663
4,062,743
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4,064,747
4,066,999
4,067,061
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4,067,920
4,068,252
4,069,017
4,069,151
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4,072,428
4,072,576
4,072,963
4,073,229
4,073,320
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4,074,032
4,074,117
4,074,371
4,074,392
4,074,562
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4,075,732
4,076,543
4,076,992
4,077,067
4,077,150
4,077,169
4,077,362
4,077,416
4,077,437
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4,078,874
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4,079,087
4,079,141
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4,080,267
4,080,358
4,080,556
4,080,730
4,080,949
4,080,966
4,081,256
4,081,353
4,081,384
4,081,461
4,081,551
4,081,595
4,081,624
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4,081,910
4,082,130
4,082,226
4,082,431
4,082,576
4,082,652
4,082,748
4,082,824
4,082,892
4,082,901
4,083,173
4,083,189
4,083,220
4,083,221
4,083,353
4,083,885
4,083,940
4,084,225
4,084,911
4,084,992
4,085,020
4,085,036
4,085,147
4,085,155
4,085,682
4,085,766
4,086,137
4,086,145
4,086,678
4,087,607
4,088,931

Dedications

3,686,899.—*Howard Rosenfeld,* New York, N.Y., and *Justin J. Wetzler,* Evanston, Ill. LAUNDERING SYSTEM. Patent dated Aug. 29, 1972. Dedication filed July 21, 1978, by the assignees, *Ludell Mfg. Co., Inc.* and *American Linen Supply Co.*

Hereby dedicate to the Public the remaining term of said patent.

3,780,543.—*Howard Rosenfeld,* New York, N.Y., and *Justin J. Wetzler,* Evanston, Ill. LAUNDERING SYSTEM WITH SOAK OF GARMENTS ON HANGERS. Patent dated Dec. 25,1973. Dedication filed July 21, 1978, by the assignees, *Ludell Mfg., Co., Inc.* and *American Linen Supply Co.*

Hereby dedicate to the Public the remaining term of said patent.

Disclaimers

Reissue No. 29,483.—*Frank Manuel Ré,* Holyoke, Mass. RECLINING CHAIR. Patent dated Nov. 29, 1977. Disclaimer filed July 19, 1978, by the assignee, *Dual Manufacturing and Engineering, Incorporated.*

The term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

3,169,295.—*Stanley F. Paspy,* Zanesville, Ohio. PRECISION TILE SETTER. Patent dated Feb. 16, 1965. Disclaimer filed June 15, 1978, by the assignee, *Ferro Corporation.*

Hereby enters this disclaimer to claims 1, 4, 6, 7 and 8 of said patent.

3,907,415.—*Yoshioki Sone,* Tokyo, and *Fumio Ueno,* Kawasaki, Japan. FILM SEARCHING APPARATUS. Patent dated Sept. 23, 1975. Disclaimer filed May 30, 1978, by the assignee, *Canon Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1, 2, 4, 5, 6, and 7 of said patent.

3,941,417.—*Frank M. Ré,* Holyoke, Mass. RECLINING CHAIR. Patent dated Mar. 2, 1976. Disclaimer filed July 19, 1978, by the assignee, *Dual Manufacturing and Engineering, Incorporated.*

The term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

4,023,185.—*Allen Bloom,* East Windsor, *Robert Alfred Bartolini,* Trenton, and *Alan Edward Bell,* East Windsor, N.J. ABLATIVE OPTICAL RECORDING MEDIUM. Patent dated May 10, 1977. Disclaimer filed June 22, 1978, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 7, 10, 11 and 13 of said patent.

4,026,494.—*Akira Tanaka,* Northridge, Calif. SAFETY BELT TENSION REDUCING MEANS. Patent dated May 31, 1977. Disclaimer filed June 21, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

4,045,271.—*Robert Alfred Clarke,* White Plains, *Peter J. Kuhl,* Jackson Heights, and *Richard H. Poschke,* Medford, N.Y. ULTRASONIC METHOD AND APPARATUS FOR MANUFACTURING BRASSIERE TAPES. Patent dated Aug. 30, 1977. Disclaimer filed June 28, 1978, by the assignee, *Cavitron Corporation.*

Hereby enters this disclaimer to claims 1 to 4 and 10 of said patent.

4,064,654.—*Harold G. Olson,* Westport, Conn. SEALED CLOSURES WITH WEATHER STRIPPING. Patent dated Dec. 27, 1977. Disclaimer filed June 21, 1978, by the assignee, *H. G. Olson & Co., Inc.*

The term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

4,081,153.—*Akira Tanaka,* Northridge, and *Charles Ulrich,* Montecito, Calif. SAFETY BELT TENSIONING AND REWINDING RETRACTOR. Patent dated Mar. 28, 1978. Disclaimer filed May 30, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

Patents Available for Licensing or Sale

3,355,139. SOLENOID CONTROLLED VALVE MECHANISM. Stephen Kittredge, 78 Smith St., South Portland, Maine 04106.

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 DeGrand Ave., Teaneck, N.J. 07666.

3,701,395. RESCUE AND SAFETY VEST. Stuart J. Theobald, 3206 Paul Drive, Wheaton, Md. 20902.

3,770,297. TRAVEL HOME WITH CAR TOP HITCH. Robert G. Quick, Hy-Rider Associates, 7419 Allstate Drive, Petersburg, Va. 23803.

3,880,623. DUST AND MIST COLLECTOR. Mitsugu. Aoyama, Japan. Correspondence to: Frank J. Jordan, 875 Avenue of the Americas, New York, N.Y. 10001.

3,991,922. ABRASIVE SHEET MEASURING AND CUTTING BOARD. Mervin B. Martin, Box 408, R.D. #4, Coatesville, Pa. 19320.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 North Lake Shore Drive, 14–M, Chicago, Ill. 60610.

4,056,897. PLANTER DESIGN AND CONSTRUCTION. Mary Ellen and John Scott Pearce. Correspondence to: E. Barron Batchelder, Sixbey, Friedman & Leedom, P. C., Suite 206, 2001 Jefferson Davis Hyw., Arlington, Va. 22202.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,074,538. WALL STRUCTURES. Jurgen Peter Janus. Neuer Markt 17, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,080,923. ANCHOR WITH PIVOTAL SECONDARY FLUKES. Margrete Stinnes. Jackson Heights, N.Y. Correspondence to: Michael J. Striker. 360 Lexington Ave., New York, N.Y. 10017.

4,084,341. DETACHABLE GUN LOCK. Ramon H. Cervantes, 4600 78th St., Sacramento, Calif. 95820.

The following two patents are offered by John O. Richards. 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to the Patent Counsel, Turbine Patent Operation, General Electric Company, 1 River Road, Building 18a, 5th Floor, Schenectady, N.Y. 12345.

3,999,766. DYNAMOELECTRIC MACHINE SHAFT SEAL.

4,055,067. AXIAL MOVEMENT LIMITING COUPLING ASSEMBLY.

4,058,804. SIGNAL MONITORING SYSTEM.

4,082,948. GENERATOR MONITORING APPARATUS.

Application for license may be addressed to: Division Patent Counsel. Switchgear & Distribution Transformer Division. General Electric Company, 6901 Elmwood Ave., Philadelphia. Pa. 19102.

3,947,726. REVERSE VOLTAGE SURGE PROTECTION FOR HIGH-VOLTAGE THYRISTORS.

4,021,764. SHEET-WOUND TRANSFORMER COILS WITH REDUCED EDGE HEATING.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of the patent applications can be purchased from the National Techincal Information Service (NTIS), Springfield. Va. 22161 for $4.00 ($8.00 outside North American Continent). Request for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP 1900 Half St., SW.,
Washington, D.C. 20324

Patent application 865,268. Interconnection for Planar Electronic Circuits. Filed Dec. 28, 1977.

Patent application 876,444. Low Gamma Photographic Developer. Filed Feb. 9, 1978.

Patent application 876,445. Self-Sealing Fuel Line Assembly. Filed Feb. 9, 1978.

Patent application 878,142. Recoil Motion Distributor for Flexible Ammunition Chuting. Filed Feb. 15, 1978.

Patent application 882,524. Apparatus for Centering a Tubular Fluid Flow Conduit Within a Large Tubular Conduit. Filed Mar. 1, 1978.

Patent 4,076,454. Vortex Generators in Axial Flow Compressor. Filed June 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements & Patent Branch General Services
Division, Federal Bldg., Agricultural Research Service,
Hyattsville, Md. 20782.

Patent application 878,040. Process for Imparting Water Repellancy to Fibrous Cellulosic Textile Materials. Filed Feb. 15, 1978.

Patent application 878,041. Sized Paper and Method for Producing Same. Filed Feb. 15, 1978.

Patent application 891,953. Extraction of Rubber or Rubberlike Substances from Fibrous Plant Materials. Filed Mar. 31, 1978.

Patent application 891,956. Physiochemically Designed Fat Compositions from Tallow and Process for Making. Filed Mar. 31, 1978.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent application 880,831. Method and Composition for Removing Calcium Sulfate Scale Deposits from Surfaces. Filed Feb. 24, 1978.

Patent 4,071,473. Preparation and Use of High Surface Area Transition Metal Catalysts. Filed Nov. 3, 1976. Patented Jan. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 678,094. Fire Control Correction System for Wind and Target Motion. Filed Apr. 19, 1976.

Patent application 836,324. Apparatus for Launching Stores from a Submerged Vehicle. Filed Sept. 26, 1977.

Patent application 871,861. Alinement Aid. Filed Jan. 24, 1978.

Patent application 874,453. Propagation Sampled Acoustic Line Array. Filed Feb. 2, 1978.

Patent application 875,036. Low Frequency Hydrophone. Filed Feb. 6, 1978.

Patent application 879,555. Liquid Propellant Gun, Positive Displacement Single Valve. Filed Feb. 21, 1978.

Patent application 880,406. Piezoelectric Polymer Membrane Stress Gage. Filed Feb. 23, 1978.

Patent application 885,706. Bi-Metallic Thermal Compensator. Filed Mar. 31, 1978.

Patent application 891,652. Rigid Mount for an Internally Pressurized Tube. Filed Mar. 30 1978.

Patent 4,021,813. Geometrically Derived Beam Circular Antenna Array. Filed Mar. 5, 1976. Patented May 3, 1977. Not available NTIS.

Patent 4,022,705. Gas Generating Compositions. Filed Mar. 27, 1975. Patented May 10, 1977. Not available NTIS.

Patent 4,024,818. Stab-Initiated Explosive Device Containing a Single Explosive Charge. Filed May 16, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,025,370. Double Base Propellant Containing Azobisformamide. Filed Apr. 4, 1974. Patented May 24, 1977. Not available NTIS.

Patent 4,030,427. Armor Plate. Filed Oct. 30, 1974. Patented June 21, 1977. Not available NTIS.

FORM 1

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents	Numbers 2,067 to 2,075, inclusive

REISSUES

AUGUST 22, 1978

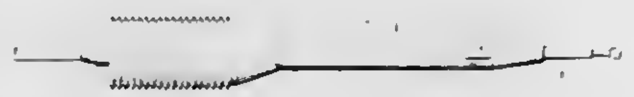
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,736
HIGH SPEED BONE DRILL

John J. Shea, and Harry Phillips, both of Memphis, Tenn., assignors to Xomed Inc., Jacksonville, Fla.
Original No. 4,007,528, dated Feb. 15, 1977, Ser. No. 624,661, Oct. 22, 1975. Application for reissue Apr. 27, 1977, Ser. No. 791,587

Int. Cl.² A61L *1/08*

U.S. Cl. 32—26 **5 Claims**



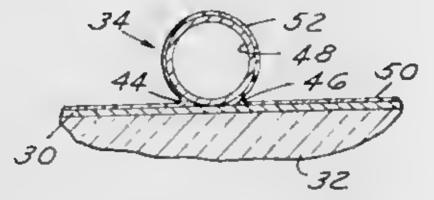
1. A high speed drill comprising
[a burr having an elongate slank,]
a hollow casing,
a drive motor in said casing,
a drive member rotatably supported in said casing and drivingly connected at one end to said motor, said drive memver having an elongate hollow tubular portion at the other end thereof [for receiving said burr shank which slidably fits therein] *for slidably receiving a tool having an elongate shank,* means at the inner end of said hollow tubular portion for drivingly connecting [said burr] *the* shank thereto,
a sleeve surrounding the drive member and slidable lengthwise thereon between first and second positions,
detent means engaging between said sleeve and [said burr] *the* shank, said detent means being movable between one position in which the [burr] shank is held against endwise movement relative to said sleeve and another position in which the [burr] shank is released for endwise movement in said sleeve,
said sleeve in the first position thereof retaining said detent means in said one position and in the second position thereof releasing said detent means so that they are free to move to the other position thereof,
resilient means for urging said sleeve towards said first position, and a finger piece movably supported on said casing engageable with said sleeve for moving the same to said second position,
a rotary bearing member between the casing and the hollow tubular portion of the drive member, the elongate hollow tubular portion of said drive member projecting outwardly beyond said casing, and providing support for [said burr] *the* shank along a substantial portion of its length.

Re. 29,737
SOLAR COLLECTOR

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116
Original No. 4,026,277, dated May 31, 1977, Ser. No. 586,612, Jun. 13, 1975. Application for reissue Aug. 1, 1977, Ser. No. 820,583

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **5 Claims**



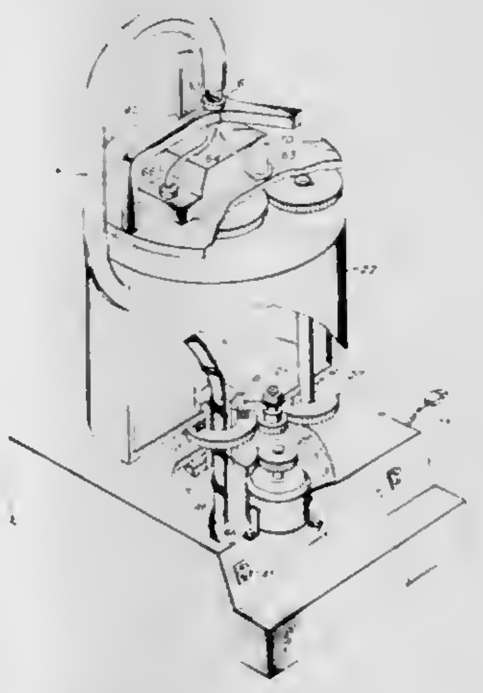
1. A solar collector comprising a housing, a steel plate within the housing to absorb sun rays and convert such rays to heat energy, steel tubing secured to the plate for conduction of heat energy from the plate to the tubing, said tubing being adapted for the flow of fluid therethrough to transfer heat energy from the solar collector to a point of use, a copper bond brazed in [an inert] *a reducing* atmosphere between said tubing and the plate forming both a mechanical bond and a heat conducting medium, and transparent plate means on the housing to permit sun rays to impinge upon the steel plate.

Re. 29,738
APPARATUS FOR PROVIDING ENERGY COMMUNICATION BETWEEN A MOVING AND A STATIONARY TERMINAL

Dale A. Adams, Rte. 8, Box 316-0, Tucson, Ariz. 85730
Original No. 3,586,413, dated Jun. 22, 1971, Ser. No. 810,310, Mar. 25, 1969. Application for reissue Aug. 23, 1977, Ser. No. 827,117

Int. Cl.² G02B *17/00;* **H01R** *39/00*

U.S. Cl. 350—6.5 **7 Claims**



4. Apparatus for providing fluid communication between a moving terminal and a stationary terminal comprising: a rotating platform having an axis of rotation; a rotating support extending from a stationary surface supporting said platform in spaced-apart relation to said stationary surface, said axis of rotation passing through said stationary surface, said rotating support having a second axis of rotation; said rotating platform having a far side facing away from said stationary surface and a near side facing said stationary surface; first means fixedly secured to said far side of said rotating platform for receiving or transmitting fluid; second means fixedly secured to said stationary surface for receiving or transmitting fluid transmitted or received by said first means; a rotating, flexible, fluid-carrying channel connected between said first and second means; said fluid-carrying channel extending from a point substantially at the axis of rotation of said far side of said rotating platform, out around the platform, to a point on said stationary surface which is substantially at the intersection of said axis of rotation of said rotating platform and said stationary surface, the axis of rotation of said fluid-carrying channel being coaxial with said axis of rotation of the rotating platform; means for rotating said platform and said fluid-carrying channel in the same direction coaxially about the axis of rotation of said rotating *platform and relative to each other in the ratio of 2:1, respectively.*

Re. 29,739

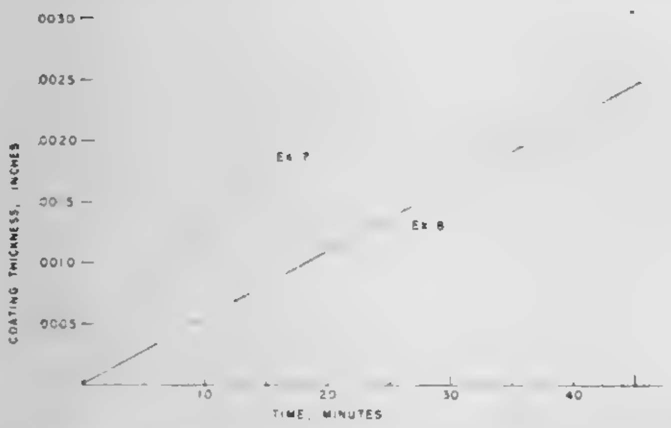
PROCESS FOR FORMING AN ANODIC OXIDE COATING ON METALS

Saul Kessler, Canoga Park, Calif., assignor to Josepb W. Aidlin, Los Angeles, Calif.

Original No. 3,996,115, dated Dec. 7, 1976, Ser. No. 607,127, Aug. 25, 1975. Application for reissue Feb. 3, 1977, Ser. No. 765,451

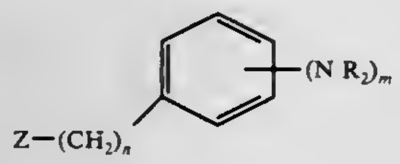
Int. Cl.² C25D *11/34, 11/26, 11/30*

U.S. Cl. 204—56 R **11 Claims**



1. A method of depositing an electrolytic anodic oxide layer on the surface of a metal article capable of being converted to a passivated metal salt layer comprising the steps of:

applying to the surface of the article an aqueous anodizing electrolyte containing an effective amount of oxidant capable of forming an anodic oxide on the metal surface and 0.1 to 50 g/l of an additive comprising the reaction product of (a) a halogenated compound of fluorine, chlorine, iodine or bromine and an inorganic cation selected from Groups 1b, 2, 3a, 4b, 5b, 6b or 8 and (b) an alkarylamine of the formula:



where n is an integer from [1] *0* to 4, m is an integer from 1–2 and R is selected from hydrogen, lower alkyl of 1–9 carbon atoms, lower alkanol of 1–8 carbon atoms, aryl or aralkyl and Z is [hydrogen or] CX_3 where X is fluoro, chloro, bromo, *or* iodo [or R]:

making the article the anode in the electrolyte;

applying a current density between 5 to 200 amps/dm^2; and depositing an anodic oxide layer on said surface.

Re. 29,740

COLOR CATHODE RAY TUBE OF THE PLURAL BEAM, SINGLE ELECTRON GUN TYPE

Susumu Yoshida; Akio Ohgoshi, both of Tokyo; Senri Miyaoka, Zushi, and Minoru Morio, Tokyo, all of Japan, assignors to Sony Corporstion, Tokyo, Japan

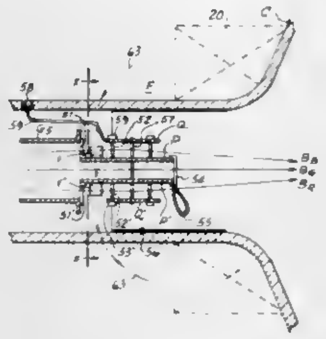
Original No. 3,548,249, dated Dec. 15, 1970, Ser. No. 796,838, Feb. 5, 1969. Application for reissue Nov. 1, 1976, Ser. No. 737,660

Claims priority, application Japan, Feb. 5, 1968, 43-6857

Int. Cl.² H01J *29/70, 29/76*

U.S. Cl. 315—368 **9 Claims**

1. In a color cathode ray tube having means generating plural beams including a central beam and opposite side beams which originate in a common plane and which are directed, at predetermined incident angles to each other for convergence on a screen, through horizontal and vertical deflection fields produced by electromagnetic deflection means and by which said beams are made to scan said screen, the improvement comprising magnetic yoke means disposed *in advance of said electromagnetic deflection means to be in advance of all but the leakage flux of at least one field from the same and* wholly within said tube adjacent the paths of said beams through said deflection fields and being operative to collect *said* leakage flux from one of said fields and to concentrate the collected leakage flux in a correction field through which only said central beam passes for correcting deviations between the rasters of said plural beams on said screen.



Re. 29,741

AIR-FUEL RATIO FEED BACK TYPE FUEL INJECTION CONTROL SYSTEM

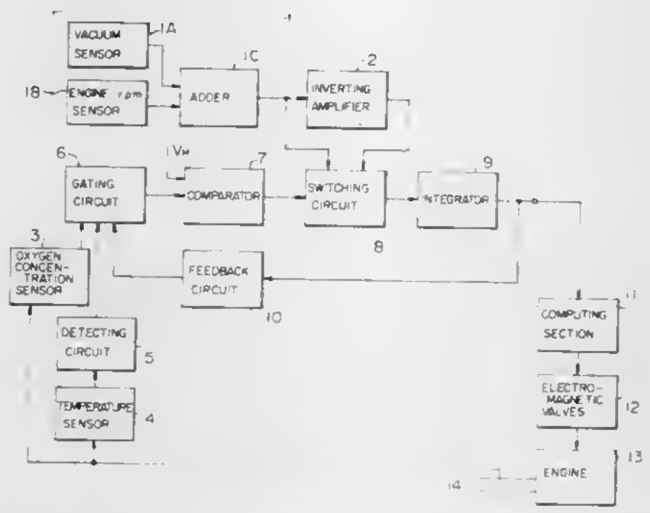
Hideaki Norimatsu, Kariya, and Susumu Harada, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Original No. 3,916,170, dated Oct. 28, 1975, Ser. No. 463,369, Apr. 23, 1974. Application for reissue Mar. 23, 1977, Ser. No. 780,644

Claims priority, application Japan, Apr. 25, 1973, 48-47486; Jun. 28, 1973, 48-73454

Int. Cl.² G06G *7/70;* **F02M** *7/00*

U.S. Cl. 364—431 **22 Claims**



1. An air-fuel ratio feedback type fuel injection control system comprising a main feedback circuit and a holding means; said main feedback circuit including:

an oxygen concentration sensor for detecting the concentration of oxygen contained in the exhaust gases of a vehicle internal combustion engine;

a comparator for comparing the output of said oxygen concentration sensor with a first predetermined value to generate an output;

an adder circuit for adding at least a first detected value representing an intake state in said engine and a second detected value of the number of revolutions of said engine and generating a sum output thereof;

an inverter connected to said adding circuit to generate an inverted output of said sum output;

a switching circuit connected to said comparator, said adder circuit and said inverter and responsive to the output of said comparator for selecting and generating either of said sum output and said inverted output as an output thereof;

an integrating circuit connected to said switching circuit for integrating the output of said switching circuit to generate an integrated output;

an electronically controlled fuel injection means connected to said integrating circuit and said engine and adapted for injecting a fuel amount corresponding to at least one of operating parameters of said engine, whereby fuel amount to be injected is corrected in accordance with the output of said integrating circuit; and

said holding means being connected to said integrating circuit and said fuel injection means, and maintaining said integrated output at a second predetermined value except upper and lower saturation values of said integrated output when the correction of the injection fuel amount by said main feedback circuit is terminated.

PATENTS

GRANTED AUG. 22, 1978

ERRATA

For CLASS	See PATENT NO.
005–118	4,107,797
010–027 R	4,107,805
040–601	4,107,864
165–169	4,107,919
248–165	4,107,960
128–400	4,108,146
128–404	4,108,147
128–419	4,108,148
128–579	4,108,149
130–027 H	4,108,150
131–009	4,108,151
131–173	4,108,152
131–235 R	4,108,153
401–088	4,108,185
400–354	4,108,297
028–119	4,108,299
542–417	4,108,399
526–017	4,108,802
521–121	4,108,804
521–180	4,108,805
521–054	4,108,806
521–118	4,108,807
521–181	4,108,808
521–136	4,108,809
521–129	4,108,810
528–032	4,108,832
528–031	4,108,833
528–289	4,108,834
528–183	4,108,835
528–128	4,108,836
528–126	4,108,837
528–249	4,108,838
528–270	4,108,839
528–046	4,108,840
528–289	4,108,841
528–061	4,108,842
528–074	4,108,843
526–217	4,108,844
526–240	4,108,845
544–245	4,108,853
544–277	4,108,854
568–730	4,108,908
568–766	4,108,909
260–875	4,108,942
260–878 R	4,108,943

ERRATA – Continued

260–879	4,108,944
260–880 B	4,108,945
260–881	4,108,946
260–889	4,108,947
260–897 B	4,108,948
260–932	4,108,949
260–986	4,108,950
261–034 B	4,108,951
261–044 R	4,108,952
261–142	4,108,953
425–566	4,109,060
235–462	4,109,143
362–247	4,109,144
356–086	4,109,259

PATENTS

GRANTED AUGUST 22, 1978

GENERAL AND MECHANICAL

4,107,795

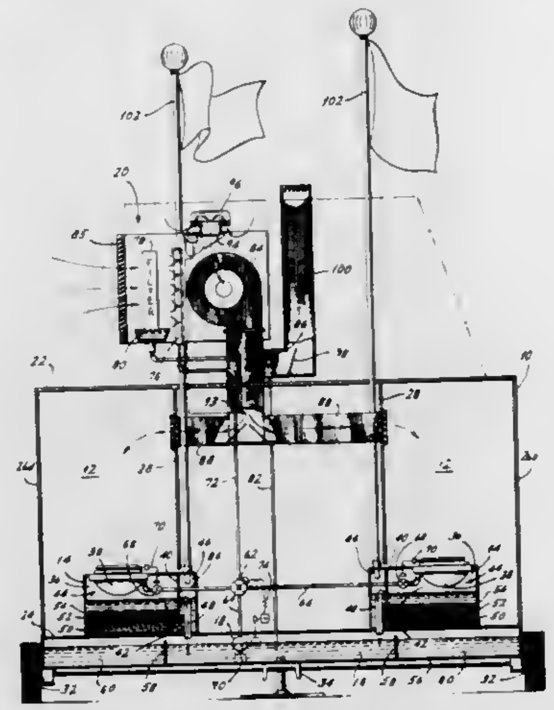
SELF-CONTAINED COMFORT STATION

William Edward Carter, Piedmont, S.C., and Italo Americo Cosentino, Huntingdon Valley, Pa., assignors to Modular Conceptual Systems, Inc., Ivyland, Pa., by said William E. Carter

Filed Aug. 18, 1975, Ser. No. 605,285

Int. Cl.^{2} E03D *5/016;* **B01D** *1/16;* **B60R** *15/04*

U.S. Cl. 4—313 **16 Claims**



1. A self-contained comfort station including a building module having at least one toilet compartment therein, said toilet compartment including at least one toilet therein, means associated with said toilet for breaking down waste and paper to provide a relatively clean liquid effluent, a flush tank into which said effluent is discharged, evaporator means for removing excess effluent said evaporator means including means for filtering and aerating the effluent during evaporation, pump means operative to displace the effluent from said flush tank to said evaporator means when it is desired to remove excess effluent from said flush tank, control means for determining when excess effluent is present in said flush tank, and valve means responsive to said control means for directing the flow of effluent to said evaporator means when excess effluent is determined to be present in said flush tank by said control means.

4,107,796

FLUSH TANK SYSTEM

Joel L. Nafziger, R.R. 1, Hopedale, Ill. 61747

Filed Mar. 18, 1977, Ser. No. 779,049

Int. Cl.^{2} E03D *1/20*

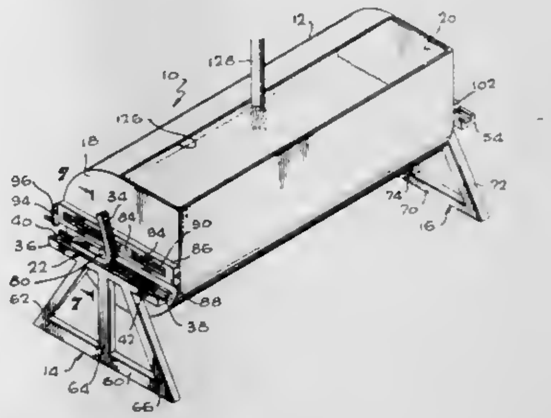
U.S. Cl. 4—353 **16 Claims**

1. A flush tank system comprising the combination of:

a tank having a pair of opposite ends and an opening therein between the opposite ends, the tank being configured to laterally shift the center of gravity thereof as the tank is filled with fluid while in an upright position;

a pair of rockers, each having an outer surface having a relatively greatly curved portion thereof between opposite relatively slightly curved portions, the pair of rockers being coupled to the tank at the opposite ends thereof; and

a pair of support means disposed to receive the outer surfaces and to support different ones of the pair of rockers thereon and the tank extending therebetween, each of the rockers being operative to rock on its support means from one of the opposite slightly curved portions of the outer surface over the greatly curved portion to the other one of the opposite slightly curved portions to rotate the tank from the upright position into a discharge position when fluid in the tank laterally shifts the center of gravity thereof a given amount and to rock from the other one of the opposite slightly curved portions over the greatly curved portion to said one of the opposite slightly curved portions to rotate the tank from the discharge position back into the upright position after fluid is discharged from the tank.



4,107,797

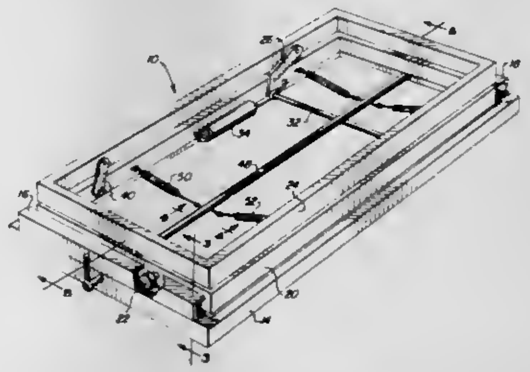
MATTRESS SUSPENSION SYSTEM

George E. Maxwell, Sr., 825 E. Sheridan, Phoenix, Ariz. 85006

Filed Jun. 10, 1977, Ser. No. 805,278

Int. Cl.^{2} B62D *25/00*

U.S. Cl. 5—118 **10 Claims**



1. A mattress suspension system attachable to a horizontally oriented deck of a vehicle for substantially reducing the amplitude of fore-and-aft excursions and of up and down excursions which are transmitted by the vehicle to an individual reclining on a mattress positioned above said suspension system, said suspension system comprising in combination:

(a) a lower rectangular frame positionable above the deck and having first and second ends;

(b) an intermediate rectangular frame having first and second ends and including roller means on the first and second ends thereof, said roller means being coupled to said lower frame for permitting a limited amount of fore-and-aft travel but not tilting of said intermediate frame with respect to said lower frame in response to fore-and-aft excursions of the vehicle;

(c) an upper rectangular frame positionable above said lower and said intermediate frames and below the mattress; and

(d) damper means coupled to said upper and said intermediate frames for maintaining said upper frame above and in a fixed fore-and-aft position with respect to said intermediate frame and for permitting damped up and down excursions but not tilting of said upper frame with respect to said intermediate frame in response to up and down excursions of said vehicle.

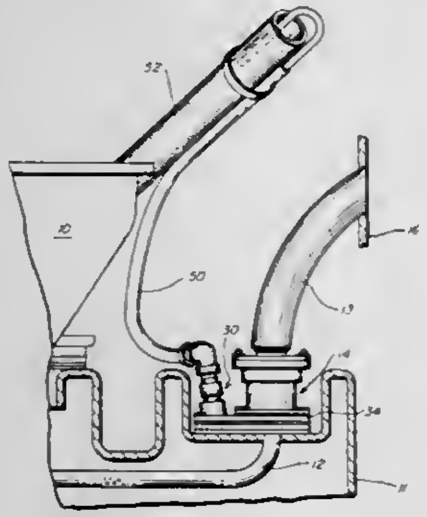
4,107,798
SELF-CONTAINED TOILET

Richard C. Lamb, Plantsville, and Robert C. Iwans, Farmington, both of Conn., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Filed Jul. 18, 1977, Ser. No. 816,586

Int. Cl.² E03D *1/00*

U.S. Cl. 4—321 **2 Claims**



1. A self-contained toilet comprising
a collecting tank,
means for rinsing the interior of said collecting tank including
- a rinsing manifold,
- a rinsing conduit, and
- a check valve operatively connecting said rinsing manifold and rinsing conduit, and

means for preventing liquid contained within said rinsing manifold from being forced through said check valve by a pressure differential threracross including
- a normally open second check valve, and
- check valve conduit means communicating at one end with one end of said second check valve and communicating at the other end with said rinsing means at a location proximate the connection of said rinsing manifold and said first check valve,

means for maintaining the second end of said second check valve and said collecting tank at the same pressure.

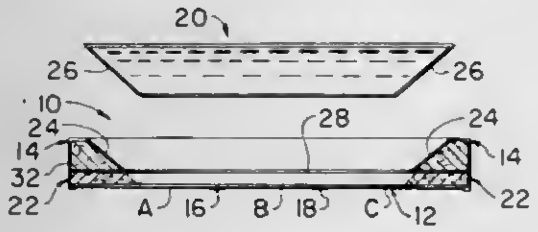
4,107,799
WATERBED AND FRAME WITH PLIANT SUPPORTING SIDES

Everette M. Lambert, Santa Clara, Calif., assignor to Liberty Vinyl Corporation, Santa Clara, Calif.

Filed May 2, 1977, Ser. No. 792,827

Int. Cl.² A47C *27/08*

U.S. Cl. 5—370 **11 Claims**



1. In a frame for a fluid filled mattress, said frame having a horizontally flexible bulkhead about a frame periphery, the improvement comprising longitudinally resilient retaining means secured under tension to opposing peripheral portions of said bulkhead and adapted to support from below said mattress for minimizing horizontal flexture of said bulkhead.

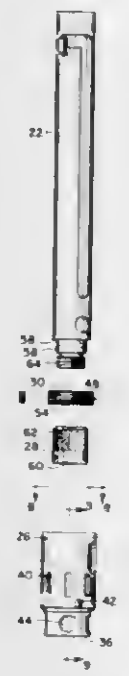
4,107,800
COMBINATION DRILLING AND WRENCHING TOOL

Arne Roy Jorgensen, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 13, 1977, Ser. No. 806,030

Int. Cl.² B26B *11/00*

U.S. Cl. 7—158 **6 Claims**



1. In a tool for securing a screw fastener including, in combination, a body with a driving member located at one extremity for receiving the head of an associated screw fastener, the driving member comprising surfaces adapted to transmit torque to said head, a sleeve member surrounding the torque transmitting surface comprising inner wall portions spaced radially from the torque transmitting surfaces so as to prevent torque transmitting contact between the associated fastener head and the sleeve, means for securely, but axially, adjustably mounting the sleeve member on the body so that the relative axial locations of the torque transmitting surfaces and workpiece engageable end surfaces of the sleeve may be readily varied, the mounting means comprising a ring member surrounding the body and including a helical thread configured on the outer surface thereof and a substantially cylindrical surface comprising the inner periphery adapted to rotate freely on a mating cylindrical surface of the body, the sleeve member including an internal thread configuration cooperating with the thread on the ring thereby adapted to selectively axially move the sleeve relative to the body, the body including abutment surfaces on either side of the mating cylindrical surface retaining the ring member from axial movement relative to body, means cooperating with the body, sleeve and ring to selectively clamp the ring into nonrotative position relative to the mating cylindrical surface during adjustment modes of the sleeve and relative to the sleeve during operative modes of the tool.

4,107,801
LOOP LENGTH CORRECTION OF SPIRALLY SET TEXTILE FABRIC IN PROCESSING APPARATUS

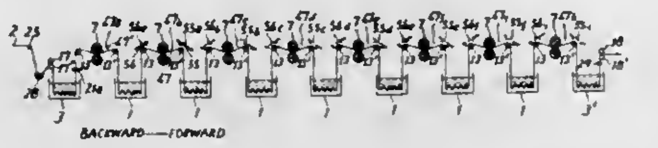
Yoshishige Tachibana, Akashi, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1977, Ser. No. 768,643

Claims priority, application Japan, Dec. 17, 1976, 51-152736

Int. Cl.² D06B *3/10, 17/00, 23/00*

U.S. Cl. 8—152 **28 Claims**



1. A method for unifying the individual loop lengths of a continuous textile fabric fed along a path in a feeding direction through a textile fabric processing apparatus, said method comprising the step of:
- providing a textile fabric processing apparatus having a squeeze roller assembly elongated in an axial direction,
- passing said textile fabric successively and spirally around said squeeze roller assembly from one end to the other end thereof so as to cause squeezing and nipping of said fabric at a plurality of nip points, to form a plurality of loop-like portions of said fabric formed between adjacent ones of said plurality of nip points,
- providing said fabric with at least one detectable portion thereof,
- providing a plurality of detectors disposed along said path at respective ones of said plurality of nip points for detecting said at least one detectable portion,
- stopping the feed of said fabric at each respective nip point when said detector disposed at said each respective nip point detects one of said at least one detectable portion of said fabric,
- determining a point on that portion of said fabric backward adjacent with respect to said feeding direction, which point is spaced from said each respective nip point by a predetermined reference loop length,
- correct feeding that portion of said fabric backward adjacent with respect to said feeding direction until said point determined by said determining step reaches a nip point backward adjacent to said each respective nip point, whereby the loop length of one of said loop-like portion is corrected to said reference loop length,
- releasing said stoppage of that portion of said fabric backward adjacent with respect to said feeding direction, and
- repeating said steps above with respect to other loop-like portions.

4,107,802
APPARATUS FOR RELEASING SUBMERGED FLOATS

Jean-François Patinet, Paris, and Claude Guiomard, Les Lilas, both of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

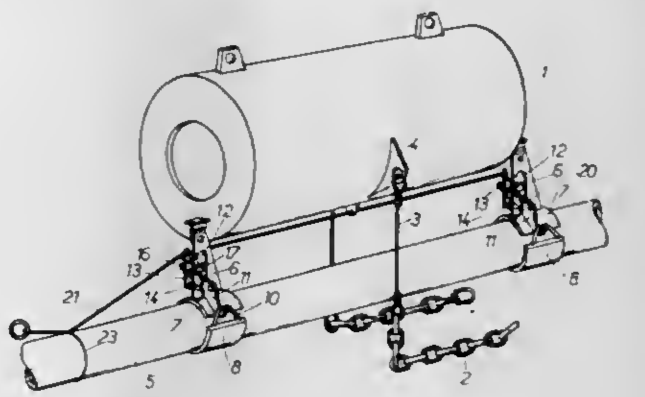
Filed May 19, 1977, Ser. No. 798,428

Claims priority, application France, May 25, 1976, 76 15782

Int. Cl.² B63C *11/00*

U.S. Cl. 9—400 **3 Claims**

1. Apparatus for the controlled release of a submerged float which is releasably fastened to undersea structure, comprising in combination,
- a support member connected to said float and provided with a slot formed therethrough,
- a double-piece collar designed for fastening said float and said structure to one another, said collar comprising a first collar piece fast with said support member, a second collar piece, means at one end of said second collar piece for hinging the same to said first collar piece, and a hooking lug at the other end of said second collar piece,
- a hook member having a hooking head designed for engaging said hooking lug and an opposite tail threaded through said slot,
- a locking lever fulcrumed onto said support member and provided with a notch for engagement by said tail to lock said hook member in hooking position with said hooking lug, and
- a control member attached to said locking lever to actuate the same out of engagement with said tail of said hook member, whereby said hooking head and hooking lug are disengaged from one another and said second collar piece is allowed to swing about said hinging means for release of said collar from said structure.



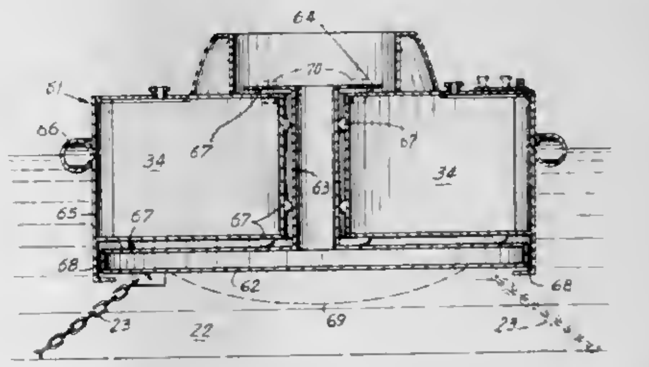
4,107,803
SEA TERMINAL

Leroy M. Sylverst, 910 Riverside Dr., New York, N.Y. 10032

Division of Ser. No. 730,109, Oct. 6, 1976, Pat. No. 4,067,080, which is a continuation of Ser. No. 529,651, Dec. 4, 1974, abandoned. This application Aug. 25, 1977, Ser. No. 828,008

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 P **7 Claims**



1. A self-contained terminal for the storage of products at sea and for the transference of products between a cargo vessel and said terminal comprising a first structure, positioning means carried by said first structure for maintaining said terminal at a preselected location, a second structure having a generally cylindrical configuration formed with an outer side wall, a top wall, a bottom wall and a cylindrical inner wall about a central vertical axis, said first structure including a base member and a central member extending from the center of said base member within said second structure along said vertical axis, said second structure being rotatable about said central member, means mounting said second structure in rotatable relationship about said central member with respect to said first structure for maintaining said second structure in said preselected location while permitting relative rotational movement between said second and said first structures, and limiting means for limiting the vertical movement between said first and second structure, said second structure including at least one product storage container, mooring means carried by said

second structure and positioned eccentrically with respect to said central member for mooring a vessel to said terminal, and at least one product transfer means carried by said second structure independently of said mooring means and positioned eccentrically with respect to said central member for the transfer therethrough of product between said product storage container and the vessel.

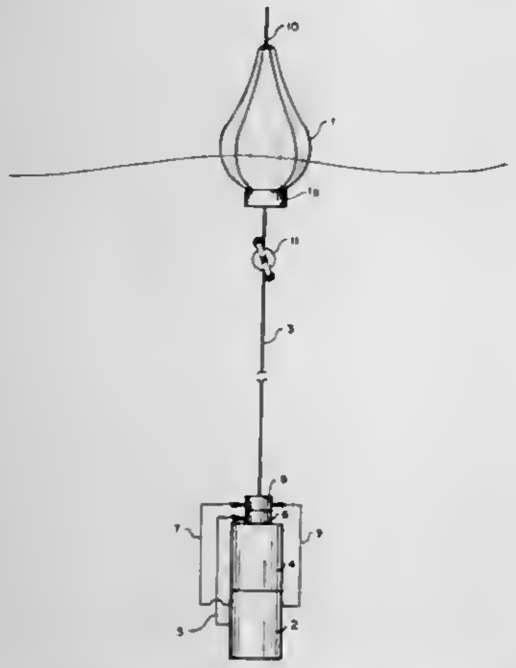
4,107,804
WAVE MOTION ISOLATOR BETWEEN BUOY AND CABLE-SUSPENDED INSTRUMENTATION PACKAGE

Derek J. Bennett, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 721,054, Sep. 7, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,907

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **8 Claims**



1. A wave motion isolator for dynamically compliant suspension of a submersible instrument package from a buoy in a body of water having significant waves by a cable comprising: two parallel bars; an axle fixed between said bars; a spool mounted on said axle to turn between said bars; said spool being comprised of a hollow cylinder spaced about said axle; a high-tensile, flat metal strip formed into a spiral, one end of said strip being attached to said axle and the other end being attached to said hollow cylinder to provide fairly uniform restoring torque for any revolutions of said cylinder about said axle; means for attaching the center of a loop in said cable to said spool with both sides of said loop wound around said spool in the same direction; whereby as said loop is unwound under increasing tension of cable at both ends of said loop in opposite directions, said metal strip functions as an energy storing means being connected to said spool and said bars to rewind said loop on said spool under decreasing tension of said cable at both ends of said loop; and at least two guide sheaves mounted between said bars, one on each side of said spool for guiding said cable at opposite ends of said loop past ends of said bars and preventing said bars from rotating as said loop of cable is wound and unwound under varying tension by operation of the rewinding energy restoring means on said spool.

4,107,805
RIVET MAKING METHOD AND RIVET

Leo E. Gatzek, 5825 Alcove, North Hollywood, Calif. 91607

Filed May 9, 1977, Ser. No. 794,935

Int. Cl.² B21K *1/58*

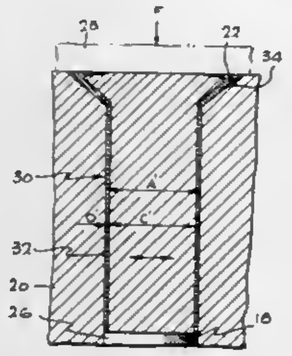
U.S. Cl. 10—27 R **3 Claims**

1. The method of making a high-strength corrosion resistant rivet comprising the steps of:

forming a rivet blank having a high-strength core and having a metallurgically bonded uniformly thick exterior cladding layer of higher corrosion resistance than the core;

placing the rivet blank in a heading die which has a shank bore larger than the rivet blank by about 0.0005 inch; and

forming the rivet blank into a rivet by striking the rivet blank with a header punch while the rivet blank is in the heading die to simultaneously expand the rivet blank into the bore of the die, from the head on the rivet and cause hydrodynamic flow of cladding material, part of such cladding material flowing out of the shank bore and around and onto the top of the head of the finished rivet so that there is more clad volume on the head after the strike than there was on the corresponding length of the rivet blank before the strike.



4,107,806
ANCHORING DEVICE

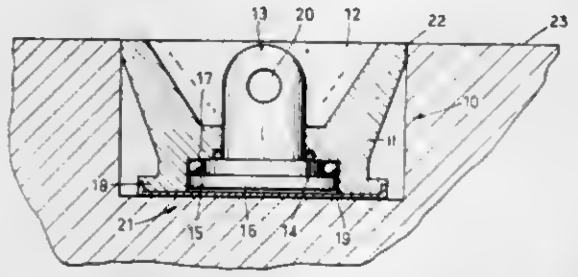
Robert Andrew Newland, and Wallace Richard Leeke, both of Watsons Ln., Newrybar, New South Wales, 2479, Australia

Filed Apr. 27, 1977, Ser. No. 791,248

Claims priority, application Australia, Oct. 28, 1976, 7921/76

Int. Cl.² A63C *15/06*

U.S. Cl. 9—310 E **4 Claims**



1. An anchoring device adapted to be contained within and cemented into a cavity formed in the topside of a surfboard and including, a hollow body part arranged substantially symmetrically about a central normally vertical axis; a post having its upper end apertured for connecting a cord or the like thereto and supported co-axially and rotatable within and by said body part for rotation about said axis and said part being substantially symmetrical thereabout; an outwardly radially extending base flange on said post to prevent retraction of said post through said body part in an upwards direction, and an outwardly radially extending annular locating flange about the lower end of said body part, said locating flange having an outer diameter not greater than the outer diameter of the upper end of said body part, the upper interior face of which is dished inwards from the surface of the surfboard in the direction of the lower end of said post, forming a hollow surrounding said upper apertured end of said post.

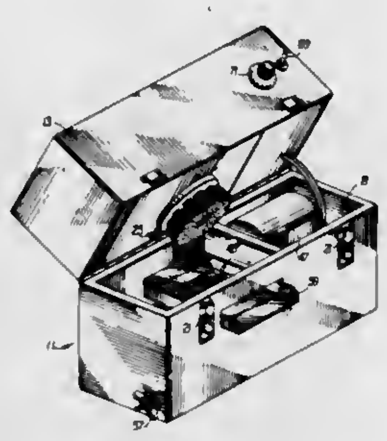
4,107,807
PORTABLE TACK CLEANING MACHINE

Bernard J. Nash, Jr., P.O. Box 358A, Rte. 1, Glen Allen, Va. 23060

Filed Aug. 3, 1977, Ser. No. 821,378

Int. Cl.² A46B *13/04*

U.S. Cl. 15—21 C **10 Claims**



1. A tack cleaning machine comprising:

a housing;

a rotary, cleaning and scrubbing brush mounted in said housing and having bristles extending substantially parallel to the axis of rotation;

a rotary, cylindrical feeder-brush mounted in said housing for rotation on a horizontal axis and having outwardly extending radial brushes substantially perpendicular to the axis of rotation;

a cleaning fluid tank mounted in said housing, said feeder-brush being disposed above said tank so that said bristles thereof are adapted to extend into said cleaning fluid;

said cleaning and scrubbing brush being mounted contiguous to said feeder-brush so that the respective axes of rotation of said brushes are perpendicular to one another;

means to drive said brushes;

said housing having entrance and exit means to provide for ingress and egress of said tank, and disposed adjacent to the interface between said brushes.

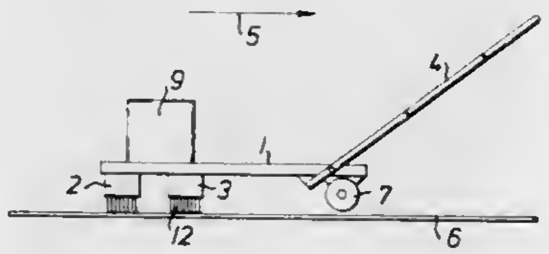
4,107,808
DEVICE FOR PREPARING THE CLEANING OF CARPET FLOORS

Herbert Schröder, 65b Kadettenweg, 1000 Berlin (West) 45, Germany

Filed Dec. 29, 1975, Ser. No. 644,458

Int. Cl.² A47L *11/32*

U.S. Cl. 15—41 R **7 Claims**



1. An apparatus for treating a carpet having a nap, said apparatus comprising a carrier displaceable over said carpet; means for displacing said carrier over said carpet in a predetermined transport direction; two brushes mounted on said carrier and having an elastic bedding and a multiplicity of individual wire bristles secured in said bedding and extending downwardly therefrom, whereby said bristles are engageable in said nap to loosen up the same, said bristles being elastically deflectable by said nap in said bedding, and said two brushes being spaced apart in said direction, the brush trailing in said direction having bristles which project downwardly further than the bristles of the leading brush, thereby effecting a raising of the nap of said carpet to an increasing extent in subsequent individual steps, by first loosening up said nap by the bristles of said leading brush and by completely raising said nap by the bristles of said trailing brush; and means for supporting said carrier on said carpet during displacement thereover with said bristles engaging through said nap.

4,107,809
CORNER SWEEPING BRUSH DISPOSED ON A FLOOR SWEEPER

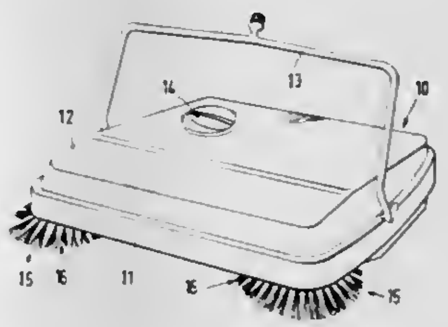
Rolf G. Schuelein, Singhofen, and Rainer Friedrich, Nassau, Lahn, both of Germany, assignors to Leifheit International Guenter Leifheit GmbH, Nassau, Lahn, Germany

Filed Apr. 28, 1977, Ser. No. 791,985

Claims priority, application Fed. Rep. of Germany, May 17, 1976, 2621871

Int. Cl.² A47L *11/33*

U.S. Cl. 15—42 **10 Claims**



1. A floor sweeper, comprising a frame having a corner portion; a hub member mounted at said corner portion for rotation about an upright axis which is inclined to the horizontal, said hub member having a circumferential sideface and an underside facing toward a surface to be swept; an annulus of bristles on said sideface of said hub member and having free end portions which project downwardly beyond said underside so that, due to the inclination of said axis, only the bristles of consecutive increments of said annulus are in contact with the surface to be swept; and an annulus of radially extending teeth on said underside of said hub member and extending downwardly therefrom for engaging the surface to be swept so as to rotate said hub member.

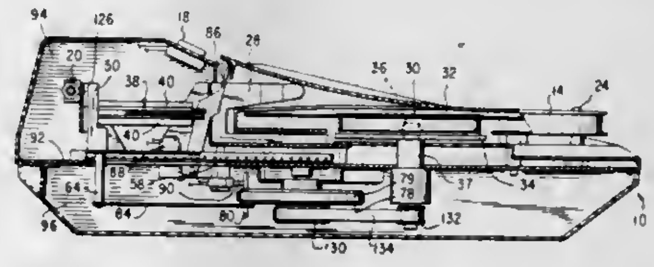
4,107,810
MAGNETIC DISC CLEANING MACHINE

Anselm Francis Varni, Woodland Hills, and Joseph Sandor, Reseda, both of Calif., assignors to Innovative Computer Products, Tarzana, Calif.

Filed Oct. 4, 1977, Ser. No. 839,280

Int. Cl.² G11B *1/04*

U.S. Cl. 15—97 R **20 Claims**



1. A magnetic disc cleaning machine for removing dirt, dust and other undesirable material from a magnetic disc surface comprising:

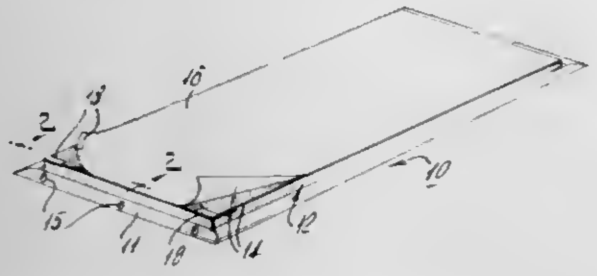
(a) a housing having outwardly extending flexible members configured to selectively engage a magnetic disc cartridge containing said magnetic disc; and

(b) a cleaning pad assembly disposed on said housing and including (i) at least one arm member having an associated cleaning surface and (ii) means for selectively moving said arm member and associated cleaning surface across said disc such that as said surface is moved across said disc, said cleaning surface engages a surface of said disc and removes dirt, dust and other undesirable material therefrom.

4,107,811
TACKY FLOOR MAT WITH IMPROVED PEELING PROVISION

Grant A. Imsande, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Filed Apr. 19, 1977, Ser. No. 788,942
Int. Cl.² A47L *23/22;* B32B *7/06*
U.S. Cl. 15—215 **3 Claims**

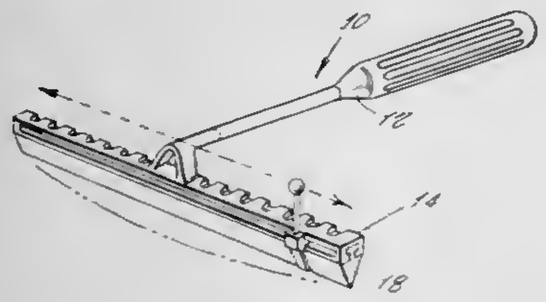


1. In a tacky floor mat for removing loose particles of dirt, dust and the like coming in pressure contact therewith of the type having a stack containing a plurality of superimposed adjacently adhered sheets, each sheet being substantially identical in size and having a pressure-sensitive adhesive layer on substantially the entire upper surface thereof, with the lower surface of each sheet being less adhesively treated than said upper surface of each sheet so that said adjacently adhered sheets are peelable from each other in descending order, wherein the improvement to initiate the peeling of each sheet comprises: a thin coating of non-adhesive material being print deposited on top of said adhesive layer in at least one corner of said upper surface of each sheet to render said upper corner non-adhesive to facilitate peeling of said sheet, said non-adhesive coating being a different color than the color of each of said sheets to readily indicate the section whereupon said peeling is to originate, said coating comprising an ink for color, an adhesive coating ingredient and silicone for adhesive release properties.

4,107,812
SQUEEGEE WITH MOISTURE REMOVING MEANS

Joseph R. Lantto, 702 Fourth Ave. NW., Buffalo, Minn. 55313

Filed Jul. 8, 1976, Ser. No. 703,692
Int. Cl.² A47L *1/08*
U.S. Cl. 15—245 **2 Claims**



1. A squeegee comprising:

an elongated handle having an elongated blade holder disposed transverse thereto, said blade holder being formed with a first elongated recess having a T-shaped cross-section,

an elongated squeegee blade formed with an elongated projection on a side opposite the working edge thereof, said projection having a T-shaped cross-section matching the cross-section of said elongated recess for slidingly fitting into the latter, whereby said blade is interchangeable with another blade,

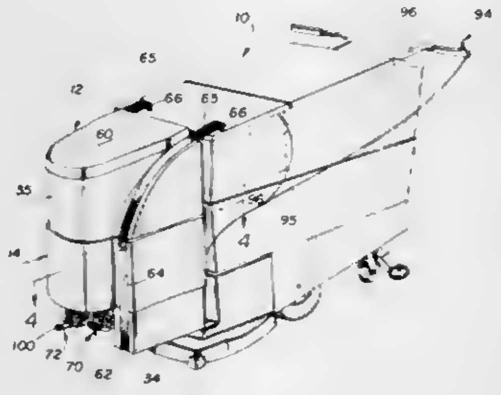
a second elongated recess having a T-shaped cross-section formed in said holder and, disposed at right angles to said first elongated recess,

a second handle formed with a T-shaped projection slidingly fitting into said second elongated recess, said second handle having a blade-gripper fitting over said blade, whereby upon said second handle being slid along said second recess said blade is wiped free of moisture.

4,107,813
WAX-STRIPPER AND APPLICATOR DEVICE

Richard J. Torres, 1025 Grevelia St., South Pasadena, Calif. 91030

Filed Aug. 19, 1977, Ser. No. 826,153
Int. Cl.² A47L *11/03*
U.S. Cl. 15—246 **10 Claims**



1. A wax-stripper and applicator device for use with an automatic scrubbing machine, wherein the device comprises:

attaching means to removably mount said device to said machine;

a first tank defining a storage chamber to receive a solution therein, and having at least one outlet port disposed therein;

a second tank defining a second storage chamber to receive a solution therein, and having at least one outlet port disposed therein, said second tank being supported by said first tank and being removable therefrom;

a pump means operably mounted to said device and connected to each of said chambers of said tanks to receive solution stored therein;

a first valve means operably disposed between said first chamber and said pump means;

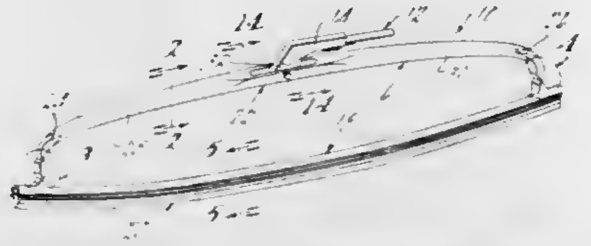
a second valve means operably disposed between said second chamber and said pump means; and

an adjustable spray means mounted to said pump means, whereby said solutions in said tanks can be selectively sprayed therefrom.

4,107,814
WINDSHIELD WIPER CONSTRUCTION

Johan H. vanden Berg; Alex H. van Eekelen, both of Hasselt, and Albert G. Hoebrechts, Mechelen-Bovelingen, all of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 438,038, Jan. 30, 1974, Pat. No. 3,978,544. This application Aug. 19, 1976, Ser. No. 715,993
Int. Cl.² A471 *1/00;* B60S *1/02*
U.S. Cl. 15—250.42 **1 Claim**



1. A one-piece monolythic windshield wiper blade construction comprising,

an elongated flexor section adapted to operatively support a wiper element,

a bridge section formed integrally of said flexor section and including opposed end portions secured to longitudinally spaced portions of said flexor section and an intermediate portion adapted to be operatively secured to an associated wiper arm or the like,

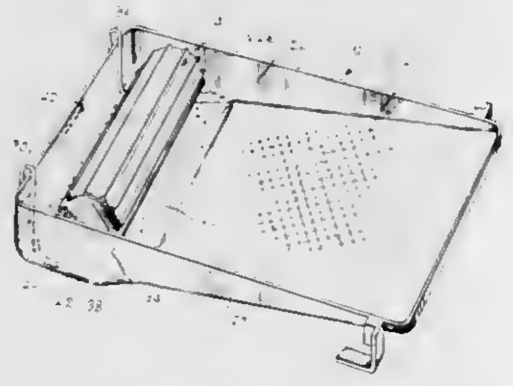
said opposed end portions of said bridge section comprising a first hinge means at one end of said blade construction and second and third hinge means at the opposite end of said blade construction,

each of said hinge means comprising first and second pairs of converging surfaces defining a reduced thickness portion arranged at right angles to the length of said blade construction, with one of said surfaces of each of said pair thereof lying substantially within a first imaginary plane and the other of said surfaces of each of said pair thereof lying substantially within a second imaginary plane, said first and second imaginary planes intesecting along a line colinear of the hinge axis of the associated of said hinge means.

4,107,815
TRAY HAVING PAINT TRANSFER ROLLER FOR PAD PAINTERS

Eugene F. Dumesnil, Jr., Glen Rrock, N.J., assignor to Tip Top Industries, Inc., Jersey City, N.J.

Filed Oct. 6, 1977, Ser. No. 840,257
Int. Cl.² B44D *3/12*
U.S. Cl. 15—257.05 **5 Claims**



1. A paint applicator for applying paint to a pad painter, said paint applicator comprising:

a. a paint tray having end, side and bottom walls defining a paint trough,

b. a paint transfer roller, and

c. mounting means for rotatably supporting the paint transfer roller on the paint tray for partial immersion in paint contained therein,

d. whereby moving the pad painter across the paint transfer roller causes said roller to rotate in contact with the paint and to transfer the paint from the paint tray to the pad painter,

e. said mounting means comprising a pair of interconnected hook-shaped clip elements which are adapted to be hooked onto the end wall of the paint tray, a pair of bearing elements which are adapted to support the transfer roller, and a pair of support arms extending from the clip elements and supporting the bearing elements,

f. said paint transfer roller being journaled to said bearing elements, portions of the support arms extending below the roller,

g. the hook-shaped clip elements being vertically elongated to adjustably support said paint transfer roller on end walls of different heights formed on paint trays having paint wells of different depths,

h. the vertical dimensions of said hook-shaped clip elements being sufficient to enable the said portions of the support arms to engage the bottom wall of the paint tray,

i. thereby preventing said paint transfer roller from rubbing against said bottom wall when rotated by the pad painter,

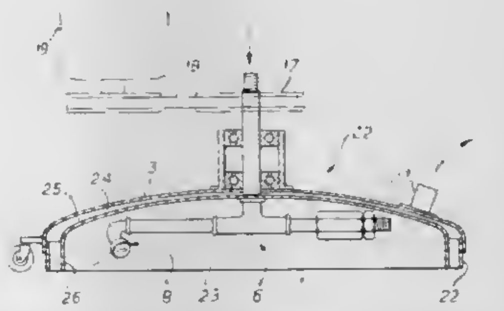
j. said hook-shaped clip elements being vertically slidable on the end walls to raise or lower the paint transfer roller relative to the surface level of the paint in the paint well,

k. thereby controlling the depth of immersion of the paint transfer roller in the paint.

4,107,816
CLEANING HEADS

Paul William Matthews, Hadleigh, England, assignor to Babcock Kina Limited, Hadleigh, England

Filed Dec. 22, 1976, Ser. No. 753,470
Int. Cl.² A47L *7/00*
U.S. Cl. 15—320 **1 Claim**

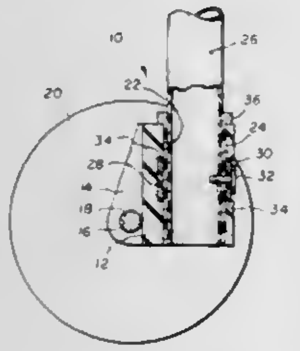


1. A cleaning head including a dished casing open at a base portion thereof, bearing means co-axially mounted on the dishes casing, a cleaning liquid supply tube axially rotatably extending though the bearing means and dished casing and connected to a source of cleaning liquid, a cleaning liquid supply arm extending radially from the cleaning liquid supply tube adjacent the base portion of the dished casing, a cleaning liquid discharge nozzle extending perpendicularly from the cleaning liquid supply arm adjacent the dished casing, means for rotating the cleaning liquid supply arm, means for dynamically balancing the cleaning liquid supply arm and means for movably supporting the dished casing with the base adjacent a surface to be cleaned, a first flexible skirt and a second flexible skirt mounted on the dished casing and extending toward the surface to be cleaned, with a region bounded by said first and second flexible skirts connected to exhaust means to produce a suction effect within the region relative to spaces external of the region both within the casing and outside the casing.

4,107,817

SWIVEL ASSEMBLY

James L. Sloan, Avon, and Greg W. Meeker, Rochester, both of N.Y., assignors to Cross River Products, Inc., Rochester, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,556
Int. Cl.^{2} B60B *33/00*
U.S. Cl. 16—20 **4 Claims**



1. An improved swivel assembly rotatably mounted on a stationary leg of a cart or the like comprising:

a yoke having at least one load bearing shoulder, a vertically extending first opening for receiving a leg journaled therein about which said yoke rotates, and a horizontally extending second opening laterally spaced from said first opening for rotatably supporting the shaft of a wheel;

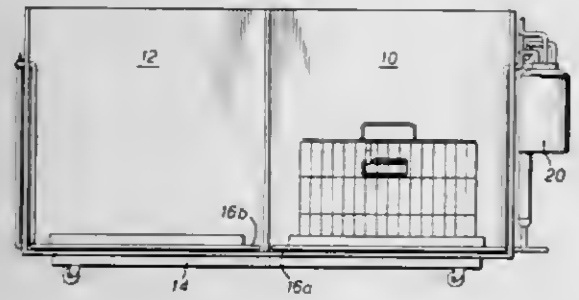
abutment means encircling the leg with a portion of said abutment means positioned adjacent said load bearing shoulder; and

means for rigidly securing said abutment means to the leg whereby said portion of said abutment means cooperates with said shoulder for preventing disengagement of the leg from said yoke and for transmitting the load of the cart to said yoke.

4,107,818

ANIMAL EUTHANASIA

Walter Norris Scott, Letchworth, and Judy Anne MacArthur, Salisbury, both of England, assignors to Universities Federation for Animal Welfare, England
Filed Dec. 7, 1976, Ser. No. 748,335
Claims priority, application United Kingdom, Dec. 11, 1975, 50765/75
Int. Cl.^{2} A61M *16/00*
U.S. Cl. 17—51 **10 Claims**

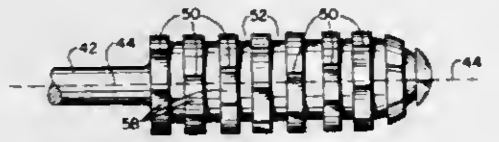


1. A method for the euthanasia of small animals which comprises filling a first chamber with a regulated mixture of gases in predetermined proportions containing not less than 40% carbon dioxide and sufficient oxygen to prevent the animal from having convulsions but not more than 50% oxygen, filling a second chamber in a regulated manner substantially wholly with carbon dioxide, after establishment of the correct gas mixture placing the animal in the first chamber and leaving it in said chamber until fully anaesthetised, and then transferring the animal to the second chamber until life is extinct.

4,107,819

HAND-HELD, ELECTRICALLY OPERATED FISH SCALER

Floyd S. Saizon, 8880 Darby Dr., Baton Rouge, La. 70896
Filed Jan. 3, 1977, Ser. No. 755,960
Int. Cl.^{2} A22C *25/02*
U.S. Cl. 17—64 **1 Claim**



1. A hand-held, electrically operated fish scaler comprising:

(a) An electric motor for providing rotary motion, the motor being configured for hand-held operations;

(b) a housing for said motor;

(c) a switch for actuating said motor, said switch being configured in association with said housing for preventing inadvertent actuation thereof;

(d) a descaling tool rotated by the motor for engaging the scales of a fish, the descaling tool including a shank and a teeth defining member secured to the shank, the shank extending through an opening in the housing and removeably secured to the motor for rotation about the axis of the shank, and the member providing rows of teeth circumferential of said axis to thereby provide rows of cutting edges;

(e) one of said rows disposed substantially at the end of the teeth defining member opposite the shank, adjacent rows of edges at different radii from said axis to provide an oval periphery of cutting edges, adjacent teeth in the rows separated by longitudinal slots and adjacent rows separated by transverse grooves having groove bottoms shaped substantially in said oval configuration, the adjacent grooves having their respective bottoms at different radii from said axis;

(f) each said tooth being defined by a front wall, a rear wall, an upper surface, and a pair of side walls, said front walls of the teeth lying in non-radial planes with respect to said axis, thereby providing either negative or positive rake;

(g) annular structure secured to the housing and disposed within said opening for providing bearing support to said shank and for maintaining a seal between the housing and the shank; and

(h) a substantially transparent shield fixedly disposed with respect to the source of power and adjacent said descaling tool for deflecting scales during operation of the fish scaler.

4,107,820

DEVICE FOR OPENING AND MIXING FIBER BALES

Gunter Mahrt, Oberstimm, and Georg Goldammer, Gaimersheim, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany
Filed Jun. 2, 1977, Ser. No. 802,818
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626648
Int. Cl.^{2} D01G *13/00*
U.S. Cl. 19—81 **9 Claims**

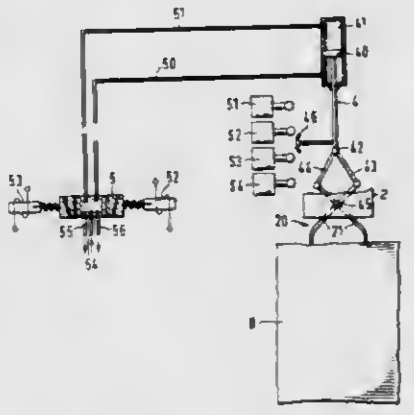
1. A device for removing fibers according to predetermined mixture ratios with a pincer-like gripper device which picks off fibers from bales of different fibers and deposits said fibers at another location, said device comprising:

drive means for effecting the opening and closing of said pincer-like gripper device for removing fibers from said bales of different fibers;

means operably connected to said drive means for limiting the opening of said pincer-like gripper device to a first predetermined width for removing fibers constituting the smallest ratio of said desired mixture ratio when picking off fibers from one of said bales;

means operably connected to said drive means for limiting the opening of said pincer-like gripper device to a second predetermined width for removing fibers from another bale of different fibers constituting a larger ratio of said mixture ratio; and

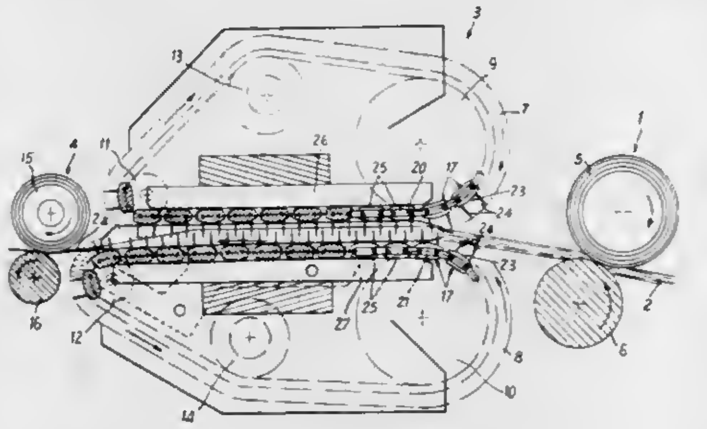
said second width of opening of said pincer-like gripper device being greater than said first width so that the individual pickoffs from the bale calling for a larger ratio is greater than the individual pickoff from said bale of said one type of fibers.



4,107,821

DRAWING DEVICE FOR SLIVER

Jean Frédéric Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France
Filed Oct. 22, 1976, Ser. No. 734,969
Claims priority, application France, Oct. 28, 1975, 75 32864; Jul. 15, 1976, 76 21611
Int. Cl.^{2} D01G *19/10*
U.S. Cl. 19—127 **11 Claims**

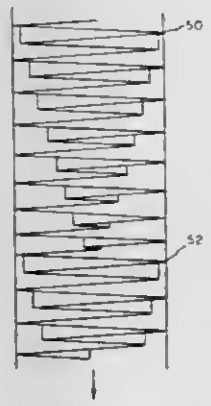


1. A device for drawing sliver comprising two endless elements moving in unison and one located above the other and forming therebetween a working zone through which the sliver passes for the control and retention of the sliver, at least one of said two endless elements comprising an assembly, said assembly comprising a pair of laterally spaced endless chains mounted for movement on a closed circuit with a portion of the circuit traversing the working zone, a plurality of transverse bars extending between said pair of endless chains and being hinged relative to one another by said endless chains, each of said transverse bars having a convex cylindrical active surface facing inwardly toward the other said endless element as said transverse bars traverse the working zone, the convex cylindrical active surface of said transverse bars forming a materially continuous apron in the working zone, the convex cylindrical active surface of said transverse bars each having a crown portion located closest to the other said endless element as said transverse bars traverse said working zone with the crown portion forming a contact surface for the sliver, a plurality of penetration members formed on and projecting outwardly from said convex cylindrical active surface toward the other said endless element as said transverse bars traverse the working zone, said penetration members being offset in the direction of movement of said endless elements through the working zone from the crown portion of said convex cylindrical active surface on which they are located, only one of said two endless moving elements comprising said transverse bars, and the other of said two endless moving elements is constituted by a succession of transverse bars hinged to one another and having grooves for the passage of said penetration members of said one endless moving element and smoothed raised portions for controlling the sliver.

4,107,822

PROCESS FOR MAKING A BATT OF MODIFIED BASIS WEIGHT PROFILE AND LENGTHWISE UNIFORMITY

Roger Alan Brown, 2131 Elm Hill Pk. C-54, Nashville, Tenn. 37210
Filed Jun. 8, 1977, Ser. No. 804,854
Int. Cl.^{2} D04H *1/00*
U.S. Cl. 19—163 **1 Claim**



1. In the process of cross lapping a fibrous web onto a horizontal conveyor surface moving laterally to the direction of web laydown to form a batt, the improvement which comprises cross lapping the web onto the batt conveyor surface from a horizontal laydown surface moving back and forth across the batt conveying surface, varying the length of the cross-lapping movement in a programed cycle of operation to obtain a modified basis weight profile in cross sections of the batt produced by varying the length of the cross-lapping movement to form full laps alternating with different sizes of smaller laps in a repeating cycle along the length of the batt, wherein the sizes of the smaller laps are varied to provide a gradual increase in basis weight from side portions of the batt to central portions of the batt, and maintaining the batt conveyor speed at a value equal to the width of the web divided by the time required to complete one cycle of operation.

4,107,823

BELT HOLDING CLIPS, PARTICULARLY FOR KEYS, TOOLS AND THE LIKE

Joseph T. Siesto, 8200 Bay Pkwy., Brooklyn, N.Y. 11214
Filed Oct. 3, 1977, Ser. No. 838,637
Int. Cl.^{2} A44B *15/00*
U.S. Cl. 24—3 K **6 Claims**

1. Belt holding clip to hold attachment such as keys, tools, or the like comprising

a single elongated unitary loop element of resilient material having

an essentially flat back strip portion (10);

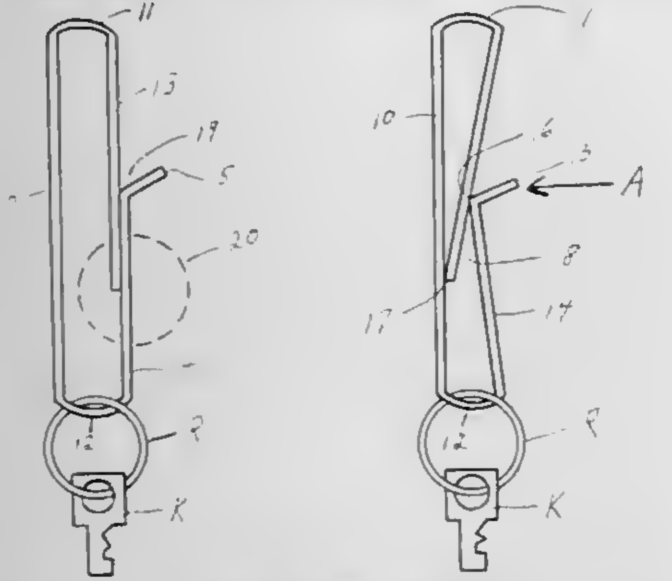
a pair of bent-over connecting portions (11, 12) extending away from the face of a back strip portion (10);

and two end portions (13, 14) bent to be essentially parallel to said back strip portion (10) to form an essentially closed loop therewith wherein, in accordance with the invention

the end portions overlap each other by a distance of at least in the order of about the spacing of said end portions (**13**, **14**) from the back strip portion (**10**) and at substantially the center of said back strip portion;

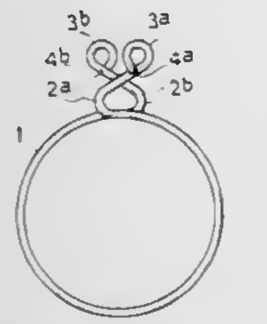
the outer and upwardly extending one of said overlapping end portions being formed with an angled tip (**15**) extending away from the back strip portion and forming therewith a first access space (**19**),

bent-over connecting portions (**11**, **12**) resiliently biasing the end portions (**13**, **14**) against each other and pressing the tip end (**17**) of the inner end portion in engagement with the inner surface of the outer end portion (**14**) to prevent removal of attachments threaded on the clip, the junction between the angled tip (**15**) and the outer end portion (**14**) forming a fulcrum to permit resilient deflection of the inner one (**13**) of the end portions against the back strip portion (**10**) and generate a second access opening for removal of attachments threaded on the clip, upon application of pressure against the outer end portion (**14**) in a direction towards said back strip portion (**10**) and wherein (FIGS. 7–11) the terminal part of the tip end (**77**, **87**, **97**, **107**, **117**) of the inner end portion (**13**) and the outer one of the overlapping end portion (**14**) are formed with respective interengaging projection and recess means, at least the inner tip end having a finished edge.



4,107,824
CLAMPING COLLAR

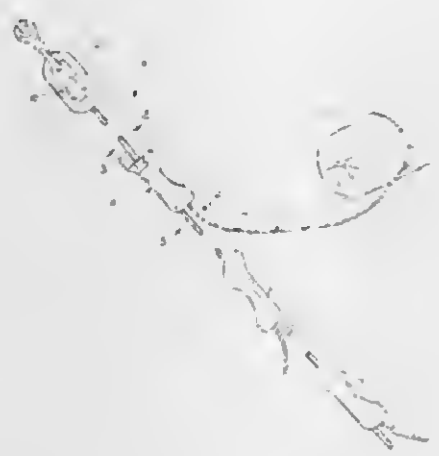
Michel Lussier, Vichy, France, assignor to Automobiles Peugeot and Hautrifil, Paris, France
Filed May 3, 1977, Ser. No. 793,297
Claims priority, application France, May 3, 1976, 76 13151
Int. Cl.² B65D *63/10*
U.S. Cl. 24—27 **2 Claims**



1. A clamping collar comprising a wire of elastically yieldable material forming a coil which has neighbouring end portions each of which end portions comprises hooking means and, beyond said coil, an intermediate bent portion between the coil and the hooking means, the curvature of each bent portion being opposed to the curvature of the corresponding end portion of the coil, and said hooking means are constituted by an end closed loop portion extending each one of the intermediate bent portions, each loop portion having an end portion which is bent, in the free position of the collar, to a side of its corresponding end portion of the coil opposite to the neighbouring end portion of the coil.

4,107,825
TAG LINE AND BUTT HOOK CONSTRUCTIONS

Franklin M. Brawand, 7706 SW. Florence La., Portland, Oreg. 97223
Continuation of Ser. No. 494,501, Aug. 5, 1974, which is a continuation of Ser. No. 354,696, Apr. 26, 1973, abandoned, which is a continuation of Ser. No. 192,087, Oct. 26, 1971, abandoned. This application Mar. 1, 1976, Ser. No. 662,358
Int. Cl.² F16G *11/14;* **B66C** *1/12*
U.S. Cl. 24—115 R **4 Claims**



1. In combination,

a tag line having a ferrule thereon,

a choker line having a nubbin of a predetermined diameter,

an elongated eye-like member having an enlarged transverse passage therethrough of a predetermined width sufficient to permit the nubbin to pass endwise therethrough and located generally at the central portion lengthwise of the member,

said member also having a first slot of a width less than that of said nubbin and adapted to receive both the choker line and said tag line,

the first slot extending along one side of the member from the passage to one end of the eye-like member,

said member having a second slot extending along said one side of the member from the passage toward the other end of the member for receiving the ferrule on the tag line in a position blocking the passage to prevent accidental withdrawal of the nubbin through the passage,

the member having a socket at the end portion of the first slot for receiving the nubbin on the choker line,

the member also having an eye-like opening from the second slot to said other end for the tag line and adapted to prevent passage of the ferrule therethrough,

the ferrule being of such a length and diameter as to block the passage when in the second slot,

a bridge on the other side of said member, spaced from said other end of said member and closing one side of the second slot and forming one side of a socket for receiving the ferrule,

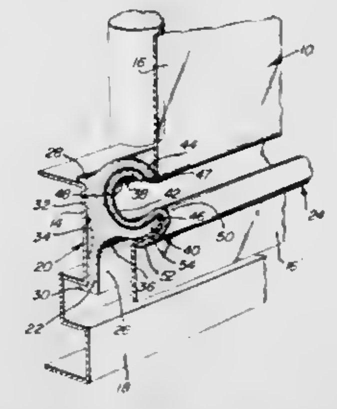
the bridge forming one side of the passage,

the ferrule being positioned on the tag line intermediate the ends of the tag line and a pulling portion of the tag line at one end of the ferrule extending through the eye-like opening to hold the ferrule in the second slot in a position blocking the passage,

the member having opposed projections spaced apart a distance less than the diameter of the nubbin and positioned between the passage and the socket to form the side of the passage opposite to the bridge.

4,107,826
FLEXIBLE COVERING ANCHOR

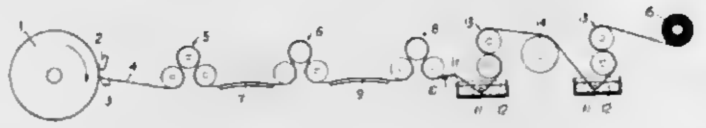
Daryl D. Tysdal, P. O. Box 5286, Texarkana, Tex. 75501
Filed Jan. 23, 1978, Ser. No. 871,693
Int. Cl.² A44B *21/00;* **A47H** *13/01*
U.S. Cl. 24—243 K **9 Claims**



1. A sheet material attaching assembly including a rigid, shape-retaining base member adapted to be attached to a support and having a substantially non-deformable, transverse configuration, said base having a channel defined therein for receiving a portion of sheet material therein, a rigid, shape-retaining material holding element including a first portion insertable into said channel and having a substantially non-deformable, transverse configuration similar to that of said channel whereby said element is nested in said channel when inserted therein, said channel being generally C-shaped in transverse configuration and said element portion being C-shaped in exterior transverse configuration and snugly receivable within said channel through the open side thereof with clearance between the opposing surfaces of said element portion and said channel to tightly receive a sheet of material therebetween, said element including, at the open side of said element portion, a reversely directed outer tongue portion overlying, extending lengthwise along and generally paralleling the corresponding side of said element portion and defining a pocket extending along and opening outwardly away from said open side, at least one side of said channel being defined by an arcuate arm portion of said base, said arm portion being snugly receivable in said pocket with clearance between said arm portion and the opposing surfaces of said pocket to tightly receive a sheet of material therebetween.

4,107,827
APPARATUS FOR PRODUCING SYNTHETIC FIBERS

Franz Sasshofer, Ried i.I.; Friedrich Gotschy, Vöcklabruck; Johannes Krässig, Seewalchen, and Adalbert Wimmer, Vöcklabruck, all of Austria, assignors to Chemiefaser Lenzing Aktiengesellschaft, Lenzing, Austria
Division of Ser. No. 642,016, Dec. 18, 1975, Pat. No. 4,025,598. This application Mar. 9, 1977, Ser. No. 775,773
Claims priority, application Austria, Jan. 3, 1975, 20/75
Int. Cl.² B29C *17/10*
U.S. Cl. 28—246 **6 Claims**



1. An apparatus for producing threads and fibers of synthetic materials, in particular of materials including high-melting, non-melting, difficult-to-dissolve and insoluble polymers, comprising:

a turning mechanism with a carriage and a spindle adapted to receive a cylindrically shaped body of synthetic material for rotation thereof;

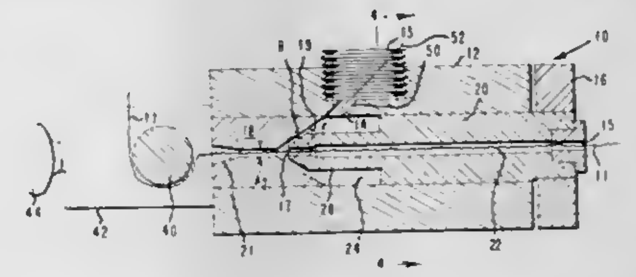
a foil peeling knife secured to the carriage of the turning mechanism so as to peel off a layer of the synthetic material;

a scratching tool arranged to precede said foil-peeling knife in the rotation direction of said cylindrically shaped body of synthetic material and carrying a plurality of parallel scratching edges which are adapted to scratch the periphery of the cylindrical body of synthetic material so as to form a plurality of parallel grooves in that body; and

a guiding and transporting section arranged to follow said foil peeling knife and adapted to draw off a curtain of parallel threads peeled off by the foil peeling knife from the parallel grooves in the synthetic material, which guiding and transporting section includes stretching means for stretching the threads in at least one step.

4,107,828
YARN TREATING JET

Francis Joseph Clendening, Jr., and Elva Lincoln Rose, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 4, 1977, Ser. No. 793,850
Int. Cl.² D02G *1/16*
U.S. Cl. 28—254 **6 Claims**



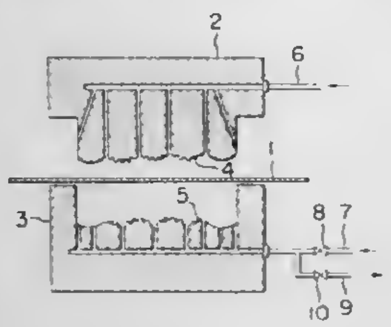
1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a nozzle block having a conical surface entrance located in said bore at said outlet end, and a yarn guiding element extending into said bore from the yarn inlet end of the body, said element having a passage therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through the exit end of said element to the conical entrance of the nozzle block, said nozzle block, said guiding element and the bore in said body forming an annular chamber in said body, the improvement for creating turbulence in said annular chamber comprising: a restriction joining said gas inlet and said chamber, said restriction having a central axis directed across the central axis of the yarn guiding element to intersect the conical surface entrance of the nozzle block at a location shielded from the restriction by the yarn guiding element whereby pressurized gas issuing from said restriction impinges on the surface of the yarn guiding element to create turbulence in said annular chamber.

4,107,829
METHOD OF MANUFACTURING SEAT CUSHIONS

Muneharu Urai; Shuichi Goto, and Yutaka Fukui, all of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan
Filed Mar. 23, 1977, Ser. No. 780,522
Claims priority, application Japan, Apr. 5, 1976, 51-37284
Int. Cl.² B68G *7/052, 7/06, 7/12, 15/00*
U.S. Cl. 29—91.1 **3 Claims**

1. A method of manufacturing a seat cushion comprising the steps of placing a seat covering providing fabric material on a lower die disposed opposite to an upper die of shape complementary to that of said lower die, supplying steam by way of at least one conduit connected with said upper and lower dies thereby heating and wetting said fabric material, urging said upper and lower dies relative to each other to press said fabric material therebetween thereby forming a seat covering of bag-like structure, inserting a first filler pad of cushion provid-

ing material into the internal space of said seat covering of bag-like structure and bonding said first filler pad to said seat covering, bonding a second filler pad of cushion providing material having a density greater than that of said first filler pad to said first filler pad, mounting a frame together with



elements including springs on the assembly thus obtained, anchoring said seat covering to said frame at its peripheral edges, and including applying vacuum suction to said lower die so as to assist in the formation of said seat covering of bag-like structure by the steam supply.

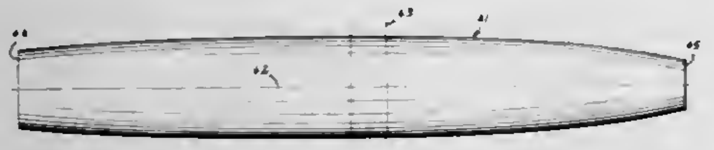
4,107,830
ROLLING PIN CONSTRUCTION

George V. Thomson, 4400 Golden Valley Rd., Minneapolis, Minn. 55422

Continuation-in-part of Ser. No. 792,544, May 2, 1977, abandoned. This application Jun. 17, 1977, Ser. No. 807,356

Int. Cl.² A47J *43/04*

U.S. Cl. 29—110.5 **4 Claims**



1. A pastry roller consisting a rigid, elongated, terete body having a longitudinal axis, the diameter of said body being less at its ends than therebetween so that in a plane passing through said axis the edges of said body form smooth curves having greater curvature at one end of the body than at the other end of the body.

4,107,831
PRESSURE ROLLER

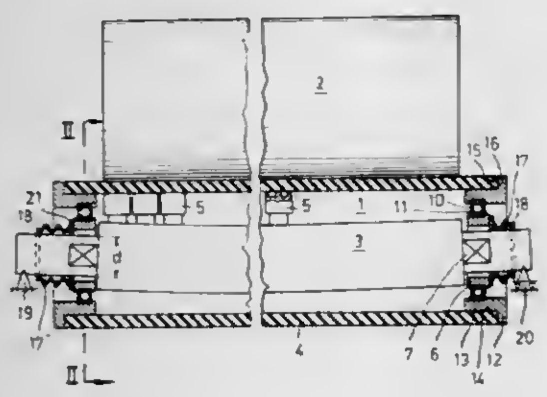
Armin Siegfried, Köniz, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Aug. 2, 1977, Ser. No. 821,093

Claims priority, application Switzerland, Aug. 10, 1976, 10160/76

Int. Cl.² B21B *13/02*

U.S. Cl. 29—116 AD **8 Claims**



1. Pressure roller with a non-rotatably mounted axial support about which a roller shell can rotate which is supported in a supporting plane on the support by hydrostatic supporting elements and is mounted to be rotatable and is guided axially and also radially at both ends by means of a guide ring arranged at each roller shell edge, the said guide ring being non-rotatable relatively to the support but capable of displacement axially and along the supporting plane, in which pressure roller, for holding the guide rings in a desired axial position relatively to the support, there is situated at each end of the roller shell a device, at the side of the guide ring, the said device elastically pressing the guide ring in the axial direction towards the respective adjacent edge of the roller shell.

4,107,832
METHOD FOR WINDING SPIRAL FINS ONTO OVAL TUBING

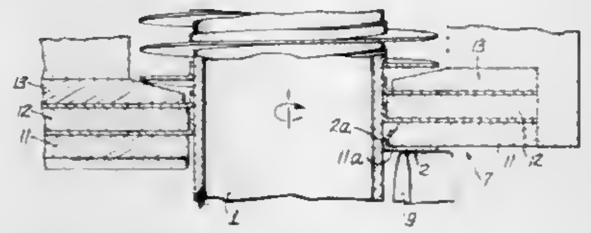
Alfred Joekel, Essen-Werden; Hans Langen, and Peter Denner, both of Ratingen, all of Fed. Rep. of Germany, assignors to Balke-Durr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 451,589, Mar. 15, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 569,887

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1974, 2436768

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 AH **6 Claims**



1. A method of producing finned heat transfer tubing of oval cross section, by winding a continuous metal strip around a length of oval tubing having a maximum diameter is at least fifty percent larger than its minimum diameter, in order to form a continuous spiral fin thereon, the method comprising the steps of:

rotating said length of oval tubing about its longitudinal axis;

feeding to at least one winding point on the circumference of said tubing, in a transverse tangential direction, a continuous strip of ductile sheet metal of an on-edge height equal to at least ten times its gauge, the strip or strips, respectively, being advanced through the rotation of said tubing by virtue of a starting attachment between the strip and tubing;

shaping the metal strip, or strips, prior to arrival at the winding point, into a hook-like cross-sectional profile, so as to give the metal strip a contact edge with a laterally extending flange portion which is bent substantially more than 90° into an acute angle with the remainder of the strip;

bending the metal strip, or strips, on edge against the circumference of the tubing under high tensile stress applied to said strip, while advancing the winding point or points, respectively, axially relative to the rotating tubing, so as to bend the strip into a spiral fin enveloping the tubing; and

guiding and ironing the laterally extending flange portion of the metal strip, or strips, during the bending step, so that said flange portion is flattened against the surface of the tubing.

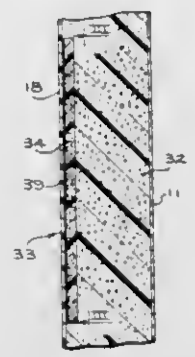
4,107,833
STRUCTURAL SUPPORT FOR A REFRIGERATOR

J. Nelson Knight, Louisville, Ky., and Roger C. Turner, Arlington, Va., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 9, 1976, Ser. No. 749,087

Int. Cl.² B65D *25/00*

U.S. Cl. 29—460 **13 Claims**



1. A method for forming a structural support in a refrigerator cabinet of the type employing in situ foamed polyurethane thermal insulation within the cabinet wall space, which method comprises:

attaching a body of fibrous material to the wall space side of a panel of the refrigerator cabinet;

injecting foam reactant material into the wall space; and

allowing expanding foam reactant material to penetrate and impregnate the body of fibrous material and to contact the wall sapce side of the panel to serve as an adhesive;

whereby, as the foam reactant material expands into insitu foamed insulation, the portion of the foam reactant material which penetrates and impregnates the body of fibrous material solidifies to form a strong, rigid support adhered to the panel by polyurethane material.

4,107,834
CAPACITORS WITH MINIMUM ESR AND METHOD OF MAKING THE SAME

James J. Kolkowski, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 20, 1976, Ser. No. 752,585

Int. Cl.² B01J *17/00*

U.S. Cl. 29—570 **2 Claims**

1. A method of providing a plurality of electrolytic capacitors of a voltage rating and capacitance and having a minimum ESR at a standard frequency and for the rating and the capacitance,

wherein each capacitor has an anode foil and a cathode foil separated by a spacer and an electrolyte,

electrical connections to the foils,

said foils being disposed with respect to each other along a common length,

on the variables involved in a method of calculating the common foil length having said minimum ESR,

and wherein the foil length has an ESR of the square root of said electrolyte-spacer oxide and interface resistivity values divided by twice the resistivity of the capacitor foil, which method comprises

determining the tab and contact-to-foil resistance of the electrical connection to the capacitors,

the electrolyte-oxide interface value of the capacitors

and the cathode and anode resistivity of foil of each capacitor

measuring the characteristics of the capacitor components of each of the capacitors;

determining the minimum ESR at a standard frequency and for the rating and the capacitance and determining the constant foil length which is defined as the length of foil having an ESR of the square root of said electrolyte-spacer oxide and interface resistivity values divided by twice the resistivity of the capacitor foil,

and thereafter cutting a length of foil for each capacitor and for the rating to said constant foil length to provide the minimum ESR at the standard frequency with a minimum ESR foil length, oxide and resistivity taking into consideration the foil width to provide the respective capacitance of respective capacitors so as to provide foils of different widths but constant length for said plurality of capacitors each having capacitance in accordance with the foil width,

assembling the foils, electrolyte, spacers and tabs into capacitor bodies and encasing said bodies,

to provide a correlated plurality of capacitors having at least two different capacitances and of uniform voltage rating in said capacitors comprising the plurality of capacitors, all of which are related to each other in having a constant foil length and a minimum ESR at a standard frequency so that each capacitor is capable of operation at the standard frequency at an ESR which is not appreciably in excess of its lowest ESR at the standard frequency.

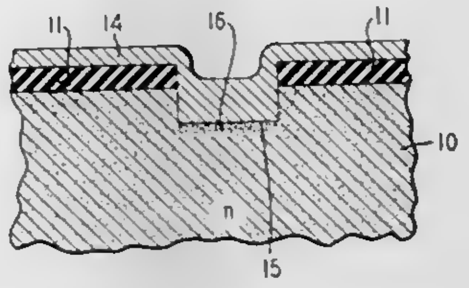
4,107,835
FABRICATION OF SEMICONDUCTIVE DEVICES

Jeffrey Bruce Bindell; Edward Franklin Labuda, and William Michael Moller, all of Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 11, 1977, Ser. No. 767,681

Int. Cl.² B01J *17/00*

U.S. Cl. 29—590 **9 Claims**



1. In the process of making a semiconductive device, the method of making a surface barrier connection to a silicon wafer which comprises the steps of implanting the region underlying where the connection is to be made with dopant ions of the conductivity type already predominant in the region, the implanted ions having a concentration profile with a peak lying below the silicon surface, depositing over said region a layer of the contact metal which is to make the connection to a thickness greater than the depth of the peak of the profile of the implanted dopant ions, and heating the wafer for causing the metal to react with the silicon, the resultant interface advancing into the wafer beyond the location of the original peak whereby the peak is moved deeper into the wafer and there is formed a layer of dopant ions of higher peak concentration than originally implanted and the connection is made beyond the original peak of the implanted profile.

4,107,836
CIRCUIT BOARD WITH SELF-LOCKING TERMINALS

Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Merrimack, N.H.

Filed Jun. 22, 1977, Ser. No. 808,808

Int. Cl.² H05K *3/06*

U.S. Cl. 29—625 **7 Claims**

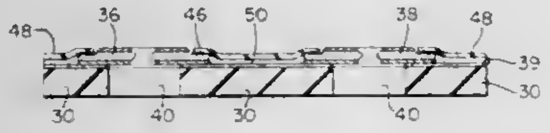
1. A method of making a circuit board having at least one electrically conductive circuit pattern formed on a surface of said board, and at least one shaped aperture formed between said surface and the surface opposite thereto, said method comprising the steps of:

(A) providing a resiliently flexible metallic sheet material;

(B) removing material from selected areas on one surface of said metallic sheet while leaving (i) a substantially continuous metallic sheet having (ii) at least one raised area and (iii) at least one area of reduced cross-section bounded by said at least one raised area;

(C) providing a flexible dielectric sheet material having at least one aperture of approximate shape and location as said at least one raised area, and aligning and bonding said dielectric sheet material to said metallic sheet so as to cover said one surface of said metallic sheet at least in part while leaving substantially uncovered said at least one raised area;

(D) masking selected areas on the other surface of said metallic sheet so as to leave uncovered (i) one or more metallic patterns corresponding to said conductive circuits and (ii) areas opposite said raised areas;



(E) plating the uncovered areas on both surfaces of said metallic sheet and removing said mask;

(F) chemically milling said metallic sheet employing the resulting plated areas as resist whereby metallic material is removed from said metallic sheet leaving behind one or more conductive circuit patterns and at least one shaped aperture;

(G) providing a relatively rigid dielectric panel having at least one aperture of approximate shape and location as said at least one aperture in said metallic sheet;

(H) positioning said metallic sheet and said dielectric panel so that said dielectric panel is adjacent said other surface of said metallic sheet and said apertures are substantially aligned with one another; and

(I) fixedly attaching said dielectric panel and said metallic sheet to one another.

4,107,837

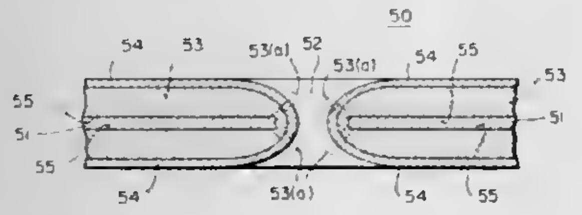
METHOD OF FABRICATING A PRINTED CIRCUIT BOARD

Joseph Jawshio Chang, Ewing Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 7, 1977, Ser. No. 785,480

Int. Cl.^{2} H05K *3/00*

U.S. Cl. 29—625 **7 Claims**



1. A method of preparing a printed wiring board, which comprises:

(a) forming a metal substrate having a thickness of from about 1 to about 7 mils and a through hole; and

(b) coating said substrate with a dielectric powder having a suitable flow length value within the range defined by the area extending between lines A and B in the graph of FIG. 2.

4,107,838

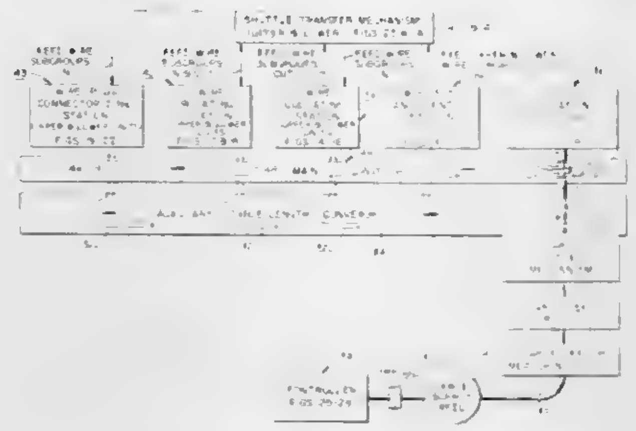
ARRANGING RANDOMLY POSITIONED ARTICLES INTO PRESELECTED POSITIONS

Ralph H. Keen; Raymond D. Kimsey, both of Arvada, and Gary G. Seaman, Broomfield, all of Colo., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,248

Int. Cl.^{2} H01R *43/04*

U.S. Cl. 29—628 **45 Claims**



1. A method of arranging portions of electrical conductor wires which are initially in random positions into preselected positions on a wire-receiving member, which comprises:

connecting trailing portions of the wires to electrical reference points, representative of respective ones of the positions on the wire-receiving member, in a preselected numerical order which corresponds to a preselected numerical order of the positions on the wire-receiving member;

sequentially completing electrical circuits through the wires to the reference points from adjacent the randomly positioned wire portions, to identify the wire portions;

sequentially arranging each wire portion in an identified reference position within at least one randomly disposed, linear array, of wire portions on the wire-receiving member;

causing relative movement between the wire-receiving member and each identified wire portion of the linear array thereof in the reference position to locate the preselected position for the wire portion on the wire-receiving member adjacent the reference position, said relative movement, with the exception of the first-identified wire portion, being an amount representative of the difference between the numerical position of each wire portion while in the reference position and the preselected numerical position of the wire portion previously identified with an electrical reference point, and

feeding each identifed wire portion in an automated manner out of the reference position into its preselected position on the wire-receiving member after the preselected position has been located adjacent the reference position.

12. Apparatus for arranging portions of electrical conductor wires which are in random positions, into preselected positions, which comprises:

means for identifying the randomly positioned portions of the wires, and their relative positions;

means for connecting trailing portions of the wires to said identifying means;

means for energizing said identifying means by electrically contacting the wires in sequence adjacent the randomly positioned wire portions to complete electrical circuits through the trailing portions of the wires to said identifying means in sequence;

means connected to and responsive to said identifying means for arranging the randomly positioned wire portions into their preselected positions;

means for connecting the arranged wire portions to respective electrical terminals, and

means for automatically transferring the wire portions between said wire portion electrical contacting means, said wire portion arranging means, and said wire portion connecting means.

4,107,839

MANUALLY GUIDED CUTTING MACHINE FOR SHEET MATERIAL

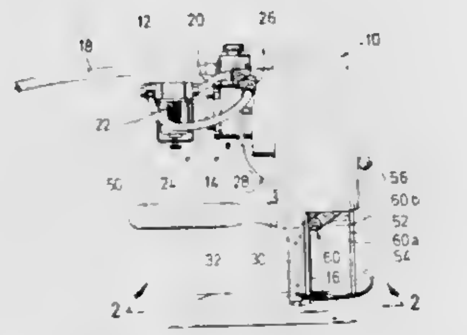
Rolf Jung, Waiblingen, Fed. Rep. of Germany, assignor to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,613

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 7614335[U]

Int. Cl.^{2} B26D *1/10*

U.S. Cl. 30—123.3 **9 Claims**



1. A manually guided cutting machine for sheet material comprising, in combination, a frame including a downwardly extending column, a foot plate secured to the lower end of the column, the foot plate being of flat extensive construction for supporting the machine on a cutting table, the frame having a grip for manual guidance of the machine over the surface of the table, a driven knife blade at the front edge of the column for cutting sheet material overlying the foot plate, an air motor on the frame mechanically coupled to the knife blade, the air motor having an inlet connectable to a source of compressed air and having an outlet for exhaust air, and means defining a conduit for conducting exhaust air from the outlet of the motor to a centrally located confined recess under the foot plate free of any communication with the top of the plate so that the foot plate floats on a cushion of air and with the noise of the exhaust air being muffled by the foot plate and the overlying sheet material.

4,107,840

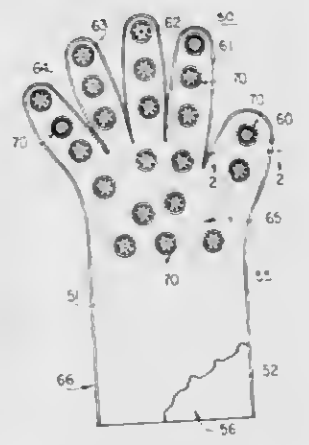
ABRASIVE HAND COVERING

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to Rub-A-Venture, Skokie, Ill.

Filed Jun. 6, 1977, Ser. No. 803,785

Int. Cl.^{2} A47J *17/02*

U.S. Cl. 30—172 **23 Claims**



1. A hand covering comprising a synthetic organic resin front piece and back piece sealed at the peripheries thereof forming a hand holding envelope and an open ended gauntlet with a seam extending around the entire closed periphery thereof, at least one of said front and back pieces having a predetermined three dimensional formed shape, and a plurality of discrete one-piece synthetic organic resin abrading units each having a generally flat rear surface secured to said front piece and an abrasive front surface having a plurality of discrete substantially rigid scraping means extending therefrom.

4,107,841

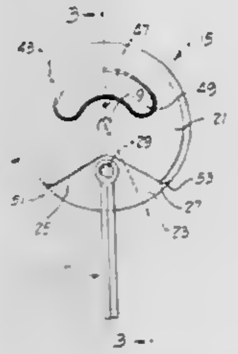
WEED CUTTER CONSTRUCTION

Charles F. Rebhun, Austinburg, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Apr. 22, 1977, Ser. No. 789,950

Int. Cl.^{2} A01D *55/18*

U.S. Cl. 30—276 **2 Claims**



1. Apparatus for cutting vegetation, said apparatus comprising:

a support disc including mounting means for mounting the disc for rotation in a generally horizontal plane about an axis, support means offset from said axis for receiving a single cutting blade, and counterbalance means for stabilizing said disc and any attachments thereon;

said support disc comprises a first portion having a relatively large thickness in the direction of said axis and a second portion having a relatively small thickness in the direction of said axis, the juncture of said first and second portions being defined by abutment surfaces, and said support means being disposed in said second portion; and

said blade being an elongated, substantially rigid plastic cutting blade including attachment means disposed at one end of said cutting blade for attaching said cutting blade to said support means for pivotal movement, said cutting blade extending radially outwardly from said axis and rotating about said axis in response to the rotation of said support disc to cut vegetation disposed in the path of said blade; and

said cutting blade being restricted to a predetermined range of movement within said second portion by said abutment surface.

4,107,842

EYELET REMOVING PUNCH

Thomas H. MacKeigan, Winchester, Va., assignor to Abex Corporation, New York, N.Y.

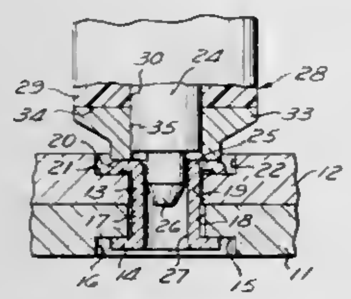
Filed May 27, 1977, Ser. No. 801,281

Int. Cl.^{2} B26F *1/32*

U.S. Cl. 30—358 **1 Claim**

1. An eyelet punching device for removing eyelets which pass through aligned bores in a friction material and a metallic backing plate to securely fasten the friction material to the backing plate, comprising an axially movable cutting element, said cutting element sized smaller than the bore in the backing plate, a reduced diameter pilot on the cutting element which can fit within the center bore of the eyelet, the metallic backing plate having a cutting edge adjacent its bore, means for moving said cutting element axially to engage the end of said eyelet which engages the backing plate, said cutting element cooperative with the cutting edge to shear off said end of the eyelet as the cutting element is moved into the backing plate bore, said

cutting element sequentially passing through the sheared ends of the eyelet to prevent it from passing into the bores and pushing the eyelet body out of the aligned bores, and a stripper on the cutting element for removing the eyelet end from the cutting element after it is withdrawn from the backing plate bore.



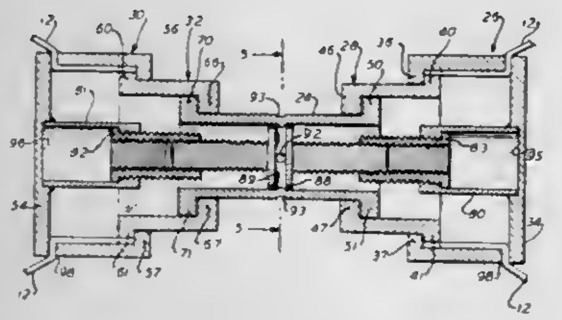
4,107,843
ORTHODONTIC APPLIANCE

Raymond N. Spino, 264 W. Valley Brook Rd., and Casimir G. Warren, P.O. Box 94, both of Califon, N.J. 07830

Filed Sep. 24, 1976, Ser. No. 726,124

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 E **14 Claims**



1. Biasing apparatus for use as a component of an orthodontic appliance, comprising:

(a) a first telescoping element;

(b) a second telescoping element;

(c) a central section having a first end and a second end, the first end of said central section being slidably received within said first telescoping element and the second end of said central section being slidably received within said second telescoping element;

(d) said first and second telescoping elements and said central section cooperating to define a cavity;

(e) operating means disposed within said cavity for causing displacement of said first and second telescoping elements between an extended position and a retracted position, said operating means being in threaded engagement with said first and second telescoping elements and in rotating sliding engagement with said central section; and

(f) access means formed in said first and second telescoping elements and said central section to provide access for an operator to said operating means.

4,107,844
ORTHODONTIC APPLIANCE

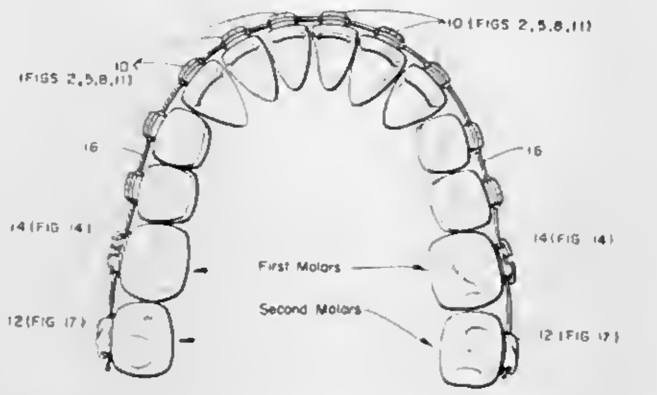
Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Filed Nov. 15, 1976, Ser. No. 741,851

Int. Cl.² A61C *7/00*

U.S. Cl. 32—14 A **14 Claims**

1. A fixed hybrid orthodontic arch wire appliance system comprising: a plurality of plastic brackets to be adhesively bonded to the labial surfaces of the anterior teeth of the maxillary or mandibular arch, a first pair of tubes to be adhesively bonded to the buccal surfaces of the first molars of said arch, and a second pair of tubes to be adhesively bonded to the buccal surfaces of the second molars of said arch; and an arch wire intercoupling said brackets and said tubes; each of said brackets including a transverse slot which receives said arch wire, the angulation of said slot being predetermined and measured so that the tooth to which the bracket is attached will assume the proper mesio-distal, labial-lingual and buccal-lingual angulation when the appliance is in place, each of said brackets having a peripheral groove and an elastic positioned in said peripheral groove to provide a stay for said arch wire, each of said brackets being shaped to have smooth corners and rounded edges, each of said brackets having a base contoured to match the anatomy of the surface of the tooth to which the bracket is attached, and each of said brackets including metal reinforcing means embedded therein and positioned above and below said transverse slots; and each of said tubes of the first and second pairs being formed of metal, each of said tubes having a passage extending transversely therethrough for receiving the arch wire, and each of said tubes having a plastic base contoured to provide an intimate fit between each tube and its corresponding tooth.



4,107,845
DENTAL ADHESIVE COMPOSITES

Henry L. Lee, Jr., Pasadena, and Jan Alexander Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 424,223, Dec. 13, 1973, abandoned, which is a continuation of Ser. No. 215,112, Jan. 3, 1972, abandoned. This application Dec. 16, 1976, Ser. No. 751,517

Int. Cl.² C08K *7/02*

U.S. Cl. 32—15 **26 Claims**

1. An adhesive dental restorative composite coating material to be coated over a dry tooth surface by flowing it onto the surface and that is easily rearranged on the tooth surface without pressure after application and prior to curing, comprising a suspension consisting essentially of from 40% to 70% inorganic filler fibers having a hardness on the Mohs scale of 3.5 to 6 by weight of said composite in a liquid acrylate or substituted acrylate resin composition, said resin having a viscosity of less than 5,000 centipoises, said fibers being from 1 to 100 microns in length and having (a) diameters of from 1/20 to 1/5 their said lengths, respectively, and a peroxide catalyst and an accelerator for said resin, said composite coating material being selfcuring in place to form a cured hardened coating.

4,107,846
DEVICE FOR SUPPLYING COOLING AGENTS TO A DENTAL INSTRUMENT OF A HANDPIECE

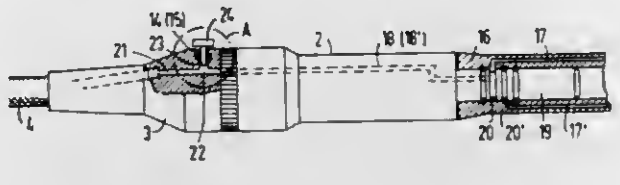
Ernst-Otto Fleer, Bensheim-Auerbach, and Erich Heubeck, Bensheim, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 2, 1976, Ser. No. 720,051

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542826

Int. Cl.² A61C *1/10*

U.S. Cl. 32—27 **4 Claims**



1. In a hand-held dental device including

a handpiece having a center section,

a drive means in said center section,

said handpiece being adapted to engage one of two different handle sections, each said handle section being demountably connectable at a rear end thereof to a forward end of said center section, each said handle section further having

tool connection means at a forward working end thereof

a drivable shaft means rotatably supported therein and extending therethrough between said drive means and said tool connection means,

discharge nozzle means directed externally towards a dental tool positioned in said tool connection means, and

pathway means for conducting cooling agent to said nozzle means, one of said handle sections having external such passageway means, the other having internal such passageway means, and

flexible supply hose means terminably functionally associated with said handpiece opposite said center section and containing longitudinally extending therein both energy supply line means for said drive means, and also tube supply means for said cooling agent,

the improvement which comprises in combination:

(A) conduit means functionally connected to said cooling agent tube means and longitudinally defined internally through said handpiece to internal port means defined in a forward end portion of said center section and adapted for making functional engagement with said pathway means when said pathway means is internally contained in said handle section,

(B) a bypass passageway means extending from said conduit means to external port means defined in said handpiece, said port means being adapted for making functional engagement with said pathway means when said pathway means is external of said handle section,

(C) selective connection means arranged to open said external port means and concurrently close said internal port means, and reversably and alternatively to close said external port means and concurrently open said internal port means,

whereby cooling fluid is alternatively deliverable to said discharge nozzle means by one of said conduit means and said bypass passageway.

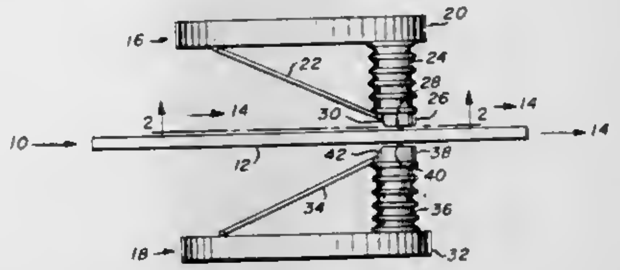
4,107,847
CONTACTING CALIPER GAUGE

Pekka Matti Typpo; Gunnar Wennerberg, both of Cupertino, and Tor Grotnes Larsen, Saratoga, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Mar. 3, 1977, Ser. No. 774,158

Int. Cl.² G01B *7/06*

U.S. Cl. 33—147 L **5 Claims**



1. A contacting caliper gauge for measuring the thickness of a moving sheet material, said sheet material moving from the anterior to the posterior of the gauge, said gauge comprises:

a first base to one side of said sheet;

a first skid between said first base and said sheet material, said skid having one end hinged to said first base near the anterior portion thereof;

a first means for elastically connecting the other end of said first skid to the posterior portion of said first base, said means defining an axis which is substantially perpendicular to the surface of said sheet;

a first cap attached to said first means adjacent said other end of the associated skid, said cap has a flat surface substantially parallel to said sheet on the posterior end thereof and a beveled surface near the anterior portion thereof;

a second base to the other side of said sheet;

a second skid between said second base and said sheet material, said skid having one end hinged to said second base near the anterior portion thereof;

a second means for elastically connecting the other end of said second skid to the posterior portion of said second base, said means defining an axis which is substantially perpendicular to the surface of said sheet and is substantially in linear alignment with said first means; and

a second cap attached to said second means adjacent said other end of the associated skid, said cap has a flat surface substantially parallel to said sheet on the posterior end thereof and a beveled surface near the anterior portion thereof.

4,107,848
PROFILER

James E. Boehnlein, Mentor, Ohio, assignor to PMC Industries, Inc., Wickliffe, Ohio

Filed Feb. 7, 1977, Ser. No. 766,009

Int. Cl.² G01B *7/28*

U.S. Cl. 33—174 P **8 Claims**

1. In a profiler, a profile tracing device comprising:

a support;

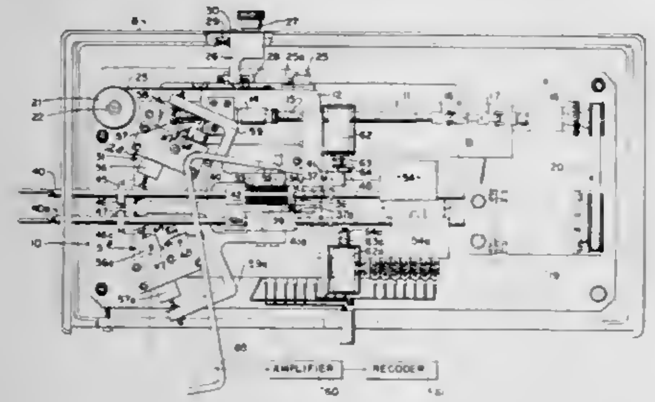
pivot means on the support;

a rocker carried by the pivot means for rocking about the axis thereof;

a stylus holding arm having a stylus holding portion adapted to hold a stylus which has a tracing edge for tracing the profile of the surfaces of an article;

means connecting the arm to the rocker, at a location spaced from said portion, for rocking of the arm with the rocker about said axis to and from a predetermined normal arm position, and for concurrent movement of at least the stylus holding portion of said arm, endwise of the arm, relative to the rocker, away from and toward said axis, to extended and retracted positions, respectively, during rocking of the rocker;

driving means, including a cam member and complementary follower member which are connected one member to the stylus holding portion and the other member to the support, drivingly interconnecting the support and the stylus holding portion of the arm and rendered operative, by rocking the arm away from said normal arm position, to extend the stylus holding portion of the arm progressively as the arm rocks progressively farther from normal arm position, and rendered operative by rocking the arm toward said normal arm position to retract the stylus holding portion of the arm progressively as the arm rocks



progressively nearer to said normal arm positions, said cam member having a profile surface engaged by the follower member, and shaped so that the tracing edge of a stylus carried by said arm portion is constrained by the members to follow, in each of said directions of rocking of the arm, a substantially lineal path tangent to the arcuate path which would be described by said edge were said edge swung about said axis at a constant radius equal to the distance from said edge to said axis in the normal starting position of the arm, and with the point of tangency of said path substantially at the location of said edge in said normal starting position of the arm.

4,107,849

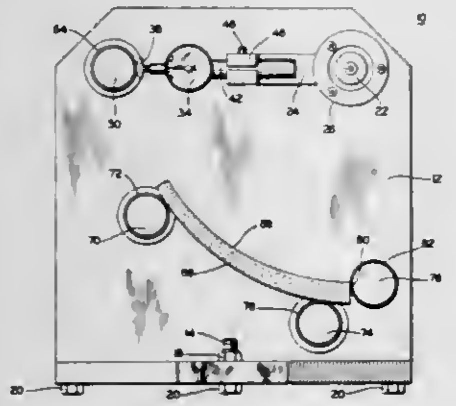
TAPERED BLOCK THICKNESS GAUGE

W. Fred Lettau, Winchester, Va., assignor to Abex Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,256

Int. Cl.² G01B *5/24*

U.S. Cl. 33—174 E **5 Claims**



1. A gauging device for measuring the accuracy of the rate of taper of a tapered, arcuate brake block at a first measuring point and a second measuring point comprising:

a base plate;

a swing arm;

means for pivotally mounting the swing arm on the base plate;

an indicator means rigidly affixed to the swing arm for visually indicating the variation of the thickness of a brake block from a specified thickness;

a first rest bar mounted on the base plate and projecting perpendicular from it to provide a support surface for the brake block at the first measuring point, the first said support surface located from the axis of the swing arm mounting means a distance equal to the specified radius plus the specified thickness of the brake block at the first measuring point;

a second rest bar mounted on the base plate and projecting perpendicular from it to provide a second support surface for the brake block at the second measuring point, the second support surface located from the axis of the swing arm mounting means a distance equal to the specified radius plus the specified thickness of the brake block at the second measuring point and;

means for positioning the brake block so that the first measuring point on the brake block is aligned with the first support surface and the second measuring point on the block is aligned with the second support surface.

4,107,850

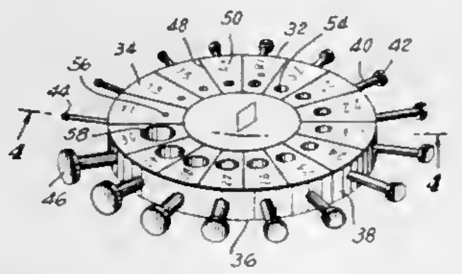
STONE AND MOUNTING GAUGE

Raphael Adler, 73-44 Vleigh Pl., Kew Garden Hills, Queens, N.Y. 11367

Filed Mar. 18, 1977, Ser. No. 778,889

Int. Cl.² G01B *3/46, 5/08*

U.S. Cl. 33—178 B **15 Claims**



1. A jeweler's mounting gauge for measuring the internal size of a stone mounting comprising:

a support assembly including a circular member having upper and lower surfaces and a circumferential wall surface therebetween;

a series of individual extended arms of uniform length angularly spaced apart about the periphery of the circular member and radially embedded in and extending from said circumferential wall of said support assembly; and

a disc-like foot permanently mounted on the outer end of each said arms concentrically therewith to lie in a plane perpendicular to the longitudinal axis of each arm and perpendicular to said upper and lower surfaces of said support assembly, the feet being successively larger in diameter.

13. A jeweler's mounting gauge for measuring the internal size of a stone mounting comprising: a support assembly; a series of individual arms extending in sequence from said support assembly, and a disc-like foot permanently mounted on the outer end of each said arm in a plane perpendicular to a longitudinal axis of each arm, the feet being successively larger in diameter, and further comprising selection means for selectively moving one of said arms between a retracted position and an operational extended position.

4,107,851

METHOD OF AND APPARATUS FOR FLUIDIZATION

István Tákacs; György Fábry; László Pap, and György Kiszely, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Dec. 2, 1976, Ser. No. 746,671

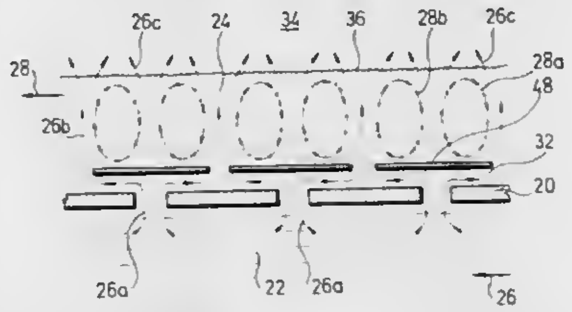
Claims priority, application Hungary, Dec. 9, 1975, RI 582

Int. Cl.² F26B *3/08;* F27B *15/00*

U.S. Cl. 34—10 **10 Claims**

1. A method of fluidizing particulate material, comprising the steps of introducing particulate material to be fluidized into

a fluidized bed at one end thereof, passing a fluidizing gas upwardly through the bottom of the bed at a flow velocity by at least one order of magnitude greater than the velocity of fluidization, and causing said fluidizing medium to pass upwardly through the bottom of the bed through orifices that open and close at a frequency that varies inversely as the flow resistance above each individual orifice, and continuously removing the fluidized particulate material at the opposite end of the fluidized bed.



4,107,852

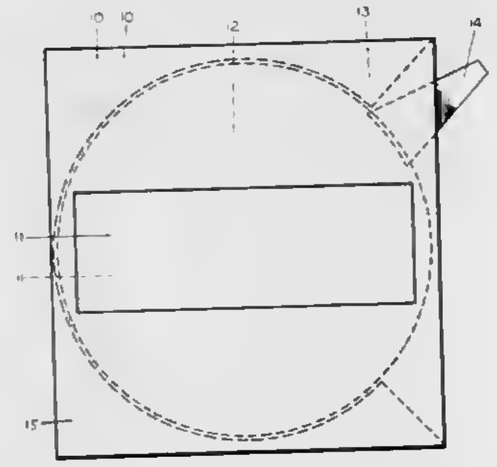
MEMORIZATION AIDS

Robert D. Epstein, 7 Tanglewood Rd., West Hartford, Conn. 06117

Filed Jan. 4, 1977, Ser. No. 756,621

Int. Cl.² G09B *19/00*

U.S. Cl. 35—8 R **3 Claims**



1. A memorization device that is manually operable, comprising: a top plate member with an opening cut therein; two linear polarizers comprising a first linear polarizer fixed beneath said plate member such that it obstructs said opening and a second linear polarizer which is circular in form; and a frame for said second polarizer such that the frame is fixed beneath the first plate member and such that said second polarizer is free to rotate within that frame and such that said polarizer obstructs the opening cut in the top plate member; a bottom plate member fixed beneath the frame of the second linear polarizer, said plate member having an opening cut therein that coincides with the opening in the top plate member; a means for rotating the second linear polarizer through at least a ninety degree angle with respect to the first linear polarizer comprising a lever attached to the second linear polarizer and protruding from a cutaway section of the frame of the second linear polarizer.

4,107,853

EDUCATIONAL TOYS

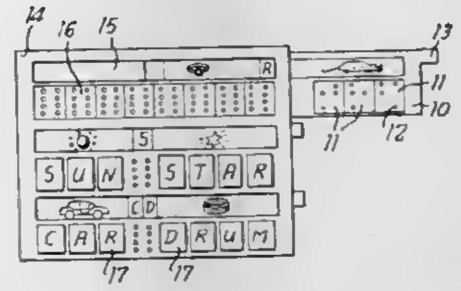
Peter Henry Cook, 39 Romer Ave., Lewisham, London, S.E. 13, England , and Joseph Arthur Henry Holmes, London, England, assignors to B & H Commercial Inventors & Designers Limited and Peter Henry Cook, both of London, England

Filed Feb. 25, 1977, Ser. No. 772,093

Claims priority, application United Kingdom, Mar. 9, 1976, 9390/76; Jul. 12, 1976, 28962/76

Int. Cl.² G09B *1/10*

U.S. Cl. 35—35 H **16 Claims**



1. An educational toy comprising support means arranged or arrangeable to define a plurality of adjacent stations, a supply of elements each bearing at least one character, from which elements the solution of a problem represented by the stations can be built up by placement of the element on respective stations, and co-operating means on the stations and elements for verifying that a correct element is mounted on any station, said supply of elements divided into a plurality of groups each having a distinctive visible coding which is not associated with any said problem or its solution and said stations each bear the appropriate group coding, whereby an appropriate element can be chosen from a predetermined number of possibilities corresponding to the number of different elements in its group.

4,107,854

TRAINING SYSTEM FOR SIMULATING AN ANIMATED SCENE

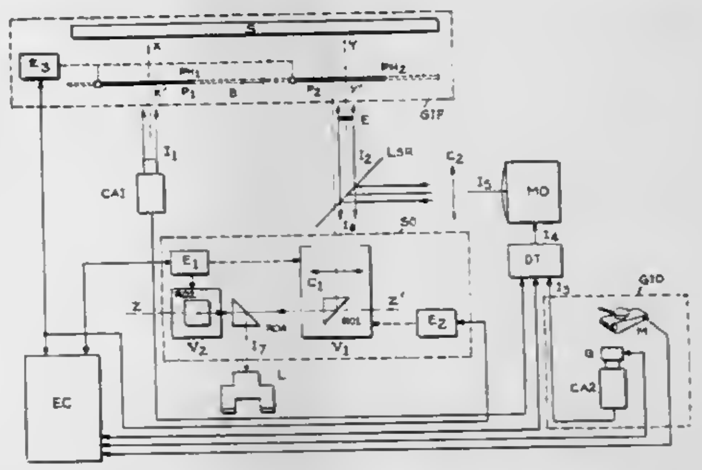
Pierre Paul André Bougon, Elancourt, France, assignor to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Apr. 19, 1977, Ser. No. 788,783

Claims priority, application France, Apr. 23, 1976, 7612043

Int. Cl.² G09B *9/00*

U.S. Cl. 35—25 **4 Claims**



1. An animated scene simulation system of the type wherein the image of an object is inserted electronically into an animation zone image which, in turn, is added optically into a landscape image, which comprises:

means for generating first and second substantially similar landscape images;

means for inducing displacements of said images in their respective planes, each of these displacements being defined with respect to a given fixed mean axis perpendicular to the translation plane of the corresponding image;

an image converter, the optical axis of which is coincident with the means axis of the first landscape image and which produces an image of the animation zone;

an opaque screen the outline of which is similar to that of said animation zone and which is positioned opposite the second landscape image in registration with the mean axis of said second landscape image thereby to form an environmental image similar to the second landscape image but possessing a zero-brightness zone similar in outline and position in said environmental image to the animation zone in the first landscape image;

means for producing an animated object image in electronic form;

a processing device for electronically inserting the object image into the animation zone image thereby to produce in electronic form an animated image of the animation zone;

an image converter for producing in optical form an animated image of the animation zone;

means for producing, by the optical addition of the animated image of the animation zone and the environmental image, in correspondence with the zero-brightness zone, a moving image of the animated landscape, the displacement of said moving image being substantially similar to that of the second landscape image;

an optical compensation device for producing from the moving animated landscape image an animated landscape image observable in a viewfinder fixed with respect to an observer; and

control means for coordinating the operation of the object producing means, displacement inducing means and moving image producing means.

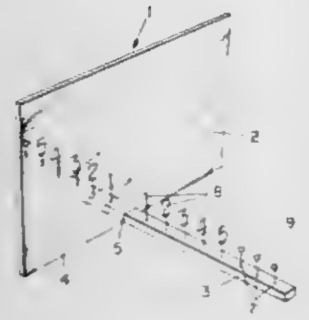
4,107,855
TEACHING AID FOR MATHEMATICS

George Ropchan, 95 Willowridge, Weston, Ontario, Canada (M9R 3Z5)

Filed May 2, 1977, Ser. No. 792,769

Int. Cl.^{2} G09B *19/02*

U.S. Cl. 35—31 R **5 Claims**



1. A teaching aid for mathematics comprising a mirror surface, arm means extending at right angles from said surface, spaced peg means vertically arranged on said arm means, integer means sequentially disposed on said peg means whereby said integer means will be viewable from the front and represent positive integers and their images will be reflected in said mirror surface and will represent negative integers.

4,107,856
FAST CLOSING ATHLETIC BOOT

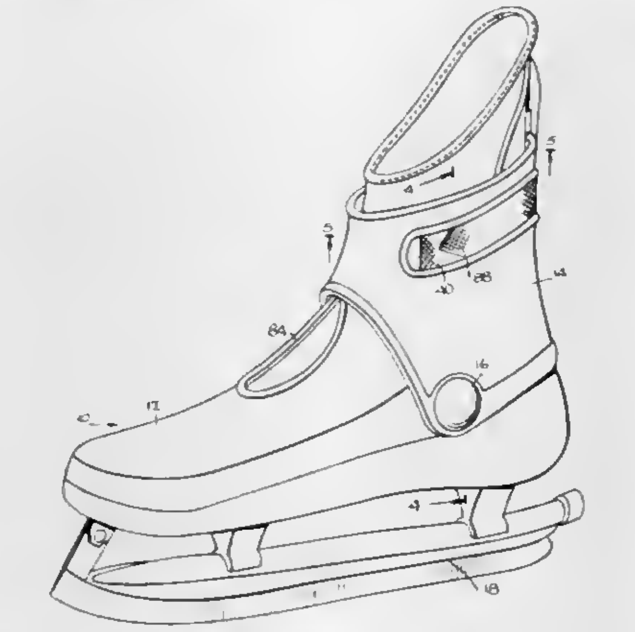
Rene Bourque, Laval, Canada, assignor to The Garcia Corporation, Teaneck, N.J.

Continuation of Ser. No. 735,520, Oct. 26, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,809

Claims priority, application Canada, Sep. 13, 1976, 261092

Int. Cl.^{2} A43B *5/04, 11/00;* **A63C** *3/02*

U.S. Cl. 36—115 **14 Claims**



1. A molded athletic boot comprising:

a lower shaped to substantially encase the toe, sides and heel of the wearer's foot, said lower including an upward extension on each side thereof, and an upward extension from the heel area;

a generally U-shaped upper;

means connecting said upper and lower for limited relative rotation, said upper being arranged with its open sides adjacent said heel extension and the closed portion of said U-shaped upper disposed opposite to said heel extension;

a flexible strap connected to the end of each of said upward side extensions of said lower, said upper provided with an aperture on each side thereof dimensioned to receive one of said straps; and

connecting means associated with said straps, each of said straps being constructed and arranged to pass from its associated extension through the aperture on the opposite side of said upper and around the back of said heel extension of said lower whereby said upward extensions are disposed in overlapping relationship at the instep area of the wearer's foot when said lower and upper are closed about said wearer's foot and secured thereon by drawing said straps and fastening same together.

4,107,857
ATHLETIC SHOE CONSTRUCTION

Gerard P. Devlin, 1028 Adams Ave., Franklin Square, N.Y. 11010

Filed Apr. 11, 1977, Ser. No. 786,176

Int. Cl.^{2} A43B *5/00, 3/12, 23/26;* **A43C** *15/00*

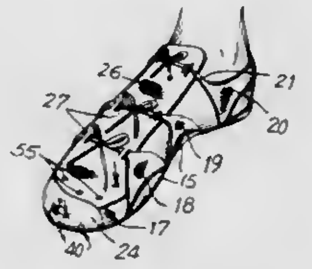
U.S. Cl. 36—129 **13 Claims**

11. An athletic shoe comprising:

a sole having toe, ball, arch, and heel sections, corresponding to the toe, ball, arch, and heel of a foot;

an upper including a toe cup secured generally to the periphery of said sole adjacent to said toe section thereof, a tongue secured to said top cup and extending generally rearwardly therefrom toward said heel section of said sole, and a heel cup secured generally to the periphery of the sole adjacent to said heel section of said sole, said upper also having three holes formed therethrough adjacent to said toe section of said sole;

a removable spike assembly, said spike assembly including at least one spike mount means embedded in said sole, adjacent to said toe section thereof, said spike mount means having at least one hole formed therethrough, which facilitates embedding and positive securement of said spike mount means in said sole, said spike mount means having at least three vertically-extending bores formed therethrough, at least three removable spikes, each of which has an upper portion which is insertable within one of said bores of said spike mount means, and which has formed therein an upwardly-opening, axially-extending, internally-threaded bore, and at least three removble screws, each of which has an expanded head portion, and which is insertable in one of the bores of said spike mount means with said head thereof abutting said spike mount means, and which is threadably receivable within said bore of one of said spikes to effect locking engagement of said spikes



to said sole in a rigid and fixed, non-displaceable position, said holes in said upper each being vertically-aligned with one of the bores of said spike mount means to permit access to said screws received therein, and said spikes each having a radially, outwardly-extending annular collar which abuts the bottom of said sole, when said spikes are fully inserted in said spike mount means, said spikes, each having an arcuately-curved, forward portion, and a flat, rearward portion below said collar thereof.

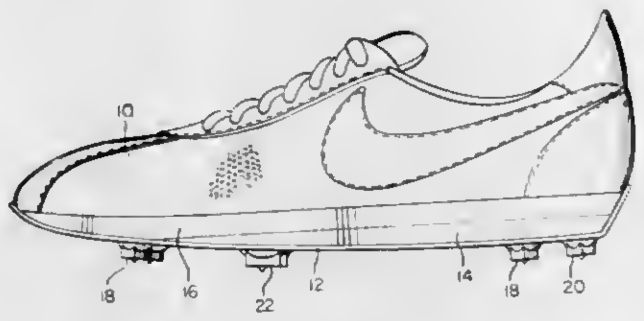
4,107,858
ATHLETIC SHOE HAVING LATERALLY ELONGATED METATARSAL CLEAT

William J. Bowerman; Stanley L. James, and Dennis E. Vixie, all of Eugene, Oreg., assignors to BRS, Inc., Beaverton, Oreg.

Filed Apr. 15, 1977, Ser. No. 787,888

Int. Cl.^{2} A43B *5/00, 13/04;* **A43C** *15/00*

U.S. Cl. 36—134 **17 Claims**



1. An athletic shoe in which the improvement comprises:

an outer sole having a plurality of spaced cleats of resilient material molded integral with said outer sole under the toe and heel portions of the shoe;

said cleats including an elongated lateral cleat extending laterally across substantially the entire width of the toe portion of said sole;

said cleats each having a substantially flat ground engaging bottom surface and including a plurality of other toe cleats of smaller ground engaging surface area than said lateral cleat, said other toe cleats being positioned in front of said lateral cleat, substantially the same height as said lateral cleat, and spaced from each other laterally across the width of said sole.

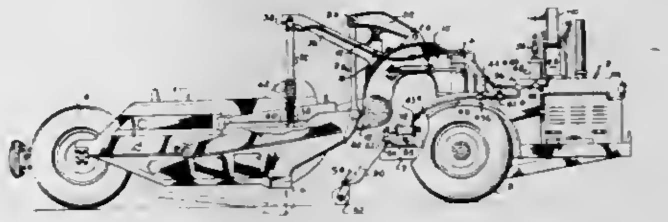
4,107,859
DEPTH INDICATING AND DEPTH CONTROLLING DEVICES FOR EARTH MOVING MACHINES

Wayland D. Keith, P.O. Box 2446, Wichita Falls, Tex. 76307

Continuation of Ser. No. 560,260, Mar. 20, 1975, abandoned, which is a continuation of Ser. No. 457,658, Apr. 4, 1974, abandoned, which is a continuation of Ser. No. 364,331, May 29, 1973, abandoned, which is a continuation of Ser. No. 256,618, May 24, 1972, abandoned, which is a continuation of Ser. No. 59,371, Jul. 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 813,778, Jun. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 504,380, Oct. 24, 1965, abandoned. This application Dec. 24, 1975, Ser. No. 644,165

Int. Cl.^{2} E02F *3/62*

U.S. Cl. 37—126 A **1 Claim**



1. An attachment for an earth moving machine having a ground engaging blade and a hydraulic system for raising and lowering the ground engaging blade, which attachment comprises:

(a) a first electrical circuit,

(b) a first selsyn motor mounted on the earth moving machine and being connected within said first electrical circuit, which selsyn motor is capable of receiving electro-magnetic impulses,

(c) a selsyn generator connected with said first electrical circuit, which selsyn generator is capable of generating electro-magnetic impulses to be transmitted to a receiving motor for synchronous rotation therewith,

(d) an indicator means connected with the shaft of said first selsyn motor,

  (1) a dial surrounding said shaft and being readable with respect to said indicator means,

  (2) circumferentially spaced indicia on said dial of said indicator means to indicate the relative position of said first selsyn motor with respect to said selsyn generator to indicate the position of the ground engaging blade with respect to the surface of the terrain,

(e) an electrical circuit associated with said indicator means,

(f) a bulb mounted on said indicator means and being connected within said electrical circuit,

(g) said dial having circumferentially spaced holes formed therein adjacent said indicia,

(h) said bulb on said indicator means being adapted to swing arcuately in register with the holes formed in said dial,

(i) an electrical circuit associated with said indicator means,

(j) said indicator means having an electrical brush mounted thereon and connected with said electrical circuit,

(k) circumferentially spaced contact points on said dial, which points are adapted to register with said brush on said indicator means when moved arcuately,

(l) circuits leading from each said contact points,

(m) a double throw limit switch associated with each of said circuits leading from said contact points,

(n) an electrically controlled valve associated with the hydraulic system to control the flow of hydraulic fluid therein to move the ground engaging blade with respect to the surface of the terrain,

(o) said electrically controlled valve having two circuits leading thereto for movement of the valve to different positions,

(p) a switch contact on opposite sides of each said double throw limit switch,

(q) a circuit leading from each contact on one side of each said limit switch to said electrically controlled valve,

(r) a second set of electrical contacts leading from the other of said contacts of said double throw limit switches, which contacts lead to another circuit associated with said electrically controlled valve so as to move the valve in the opposite direction from the movement accorded by the first mentioned circuit,

(1) a source of electricity,

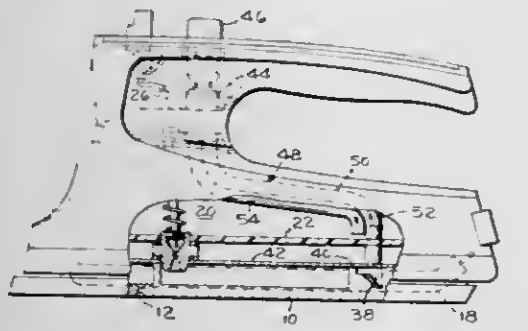
(2) the other side of each circuit leading from said electrically controlled valve being connected with said source of electricity, and

(s) said limit switches actuating said electrically controlled valve to admit fluid therethrough in one direction or to direct fluid therethrough in the opposite direction, in accordance with the setting of said limit switches, to maintain the ground engaging blade within certain limits with respect to the terrain.

4,107,860
STEAM IRON

James P. Coggiola, Pomona, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 1, 1977, Ser. No. 856,265
Int. Cl.² D06F *75/06*
U.S. Cl. 38—77.83 5 Claims



1. In a steam iron with a handle and fill opening to a water tank above an electrically heated soleplate and having steam generator means positioned in the lower rear portion of the iron and steam ports in the soleplate, a handle mounted pump connected to the generator to rapidly force a volume of water to the generator for a surge of steam to the ports, the improvement comprising,

said pump being disposed in the upper forward portion of the handle and completely external of said tank,

a double conduit tubular means connected to said pump at one end,

one conduit extending through said tank and terminating at the generator and

the other conduit terminating adjacent said generator in said tank rear portion, at the other end of said double conduit,

said double conduit extending from said upper forward handle portion substantially slanted down to said generator and tank rear for surge generation in horizontal and vertical positions.

4,107,861
LABEL STRUCTURE

Kenneth M. Johnson, Chicago, Ill., assignor to Packaging Laminators, Inc., Bensenville, Ill.

Filed Apr. 26, 1976, Ser. No. 680,381
Int. Cl.² A44C *3/00*
U.S. Cl. 40—2 R 23 Claims

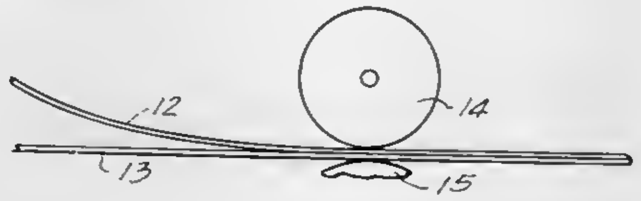
1. A label structure comprising

a sheet member having generally spaced parallel faces said sheet member having, a thickness ranging from about 0.1 to 100 mils and comprised of an oriented thermoplastic polymer which is translucent as respects transmitted daylight,

a substrate member in a sheet-like form having a generally smooth surface, said surface being adjacent one face of said sheet member,

bonding means joining said sheet member and said substrate member together in fixed adjacent relationship relative to one another,

at least one of said substrate member, and said bonding means having a contrasting color relative to said sheet member, and



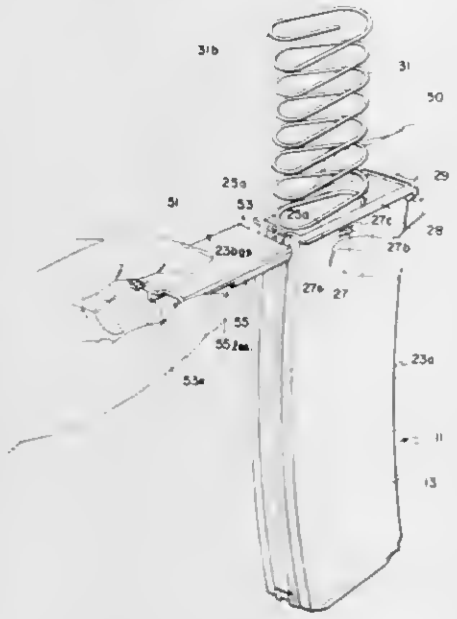
fastening means engaging said label structure for securing said label structure to a body spatially proximate to said label structure;

said label structure being capable of having information recorded therein by impressing indicia onto a face of said sheet member without mechanical distortion of said label structure so as to record said indicia into said label structure permanently during a normal life cycle of said label structure by causing localized indicia-impressed areas of said sheet member to become more light-transmissive than unimpressed adjacent sheet member areas.

4,107,862
CARTRIDGE MAGAZINE

Jacob Sofinowski, III, Baldwin, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Nov. 16, 1976, Ser. No. 742,304
Int. Cl.² F41C *25/02*
U.S. Cl. 42—50 5 Claims



1. A cartridge magazine comprising

a main body having a cartridge receiving and holding chamber formed therein and open at two opposite ends, one of said open ends forming a cartridge entry and exit feed opening, and the other of said open ends forming a feed spring and feed plate assembly opening,

a cartridge feed member slidable in feeding relation within said chamber,

a cover removably secured to said main body in a position over said spring and feed plate assembly opening,

and a compression feed spring disposed within said chamber and extending in compression biasing relation between said cover and said feed plate,

said cover being laterally slidably removable from said main body,

said main body having outwardly oppositely extending slide/retention rails formed at opposite sides of said feed spring and feed plate assembly opening,

said cover having inturned slide/retention lips with associated slide/retention grooves slidably engagable with said rails for slidably removable retention of said cover over said feed spring and feed plate assembly opening,

lock stop means formed on at least one outer side wall of said main body adjacent at least one of said rails,

and lock lip means formed on at least one of said slide/retention lips and engagable with said lock stop means to lock said cover in place,

said one outer side wall being manually elastically flexible to an extent to enable depression of said lock stop means to a laterally inward position out of locking relation with said lock lip means,

said lock stop means being cam lock stop means having a cam entry portion engagable by said lock lip means to enable ease of slide locking of said cover into place on said rails, and a shoulder lock stop retention portion to lock said lock lip means in place after sliding over said cam entry portion,

said lock stop means and said lock lip means comprising respective lock stop means and lock lip means on opposite respective sides of said main body and said cover, and both associated outer side walls of said main cover being manually elastically flexible to an extent to enable depression of the respective said lock stop means to a laterally inward position out of locking relation with the respective said lock stop means,

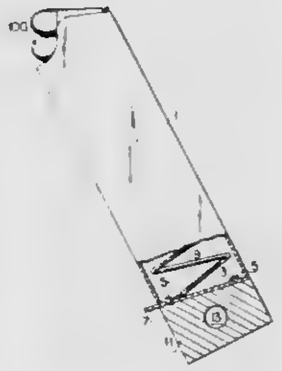
a central lateral spring biasing and constraining key tab formed on said cover and engagable in lateral biasing and displacing relation with said spring as a function of slide-on assembly and locking of said cover into place on said rails,

and a key tab slot formed in an associated end wall of said main body for passage therethrough of said key tab during assembly and disassembly movement of said cover along said rails.

4,107,863
MAGAZINE ENGAGEMENT MEANS

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed May 5, 1977, Ser. No. 794,102
Int. Cl.² F41C *25/02*
U.S. Cl. 42—50 15 Claims

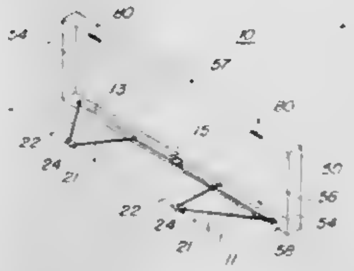


1. In a cartridge magazine including a casing and a floor: a member affixed to said magazine and extending a substantial distance below said floor, said member comprising an extension of said casing; and at least one hole in said member adapted for releaseable engagement with a supporting structure whereby said magazine can be supported in an extended manner.

4,107,864
SIGN OPENING, CLOSING AND LOCKING DEVICE

Donald W. Brown, 218 E. Curling Dr., Boise, Id. 83702

Filed Feb. 22, 1977, Ser. No. 770,857
Int. Cl.² G09F *7/00*
U.S. Cl. 40—601 2 Claims



1. In a sign having a substantially rectangular, boxlike, frame including two oppositely disposed side panels, oppositely disposed top and bottom panels, a back panel, and a hinged front panel containing advertising indicia, a sign opening, closing, and locking device comprising:

a first and second raceway longitudinally secured to the top surface of the bottom panel, said raceways parallel to one another;

a first and second rack, each slidably engaging one of said raceways;

a pinion rotatably engaging each of said racks for moving said racks in opposite directions to one another upon rotation of said pinion;

a first pin securedly attached to the front panel;

a second pin securedly attached to the bottom panel;

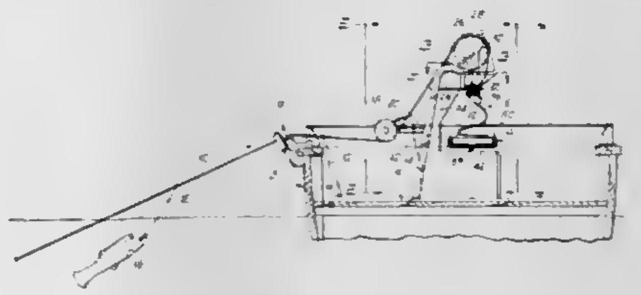
a first and second lever pivotally connecting said first and second rack, respectively to a lower portion of the front panel at a common pivoting juncture, and each lever defining and its end a slot and an adjacent hook, said slots slidably engaging said first pin and said hooks operable to lockingly engage said second pin when the sign opening and closing device is in the closed position; and

a pair of springs, each of said springs connecting one of said levers to said first pin for moving the slot relative to said first pin.

4,107,865
LONG LINE COILING APPARATUS

Wayne E. Alex, Box 95, Juneau, Ak. 99802

Filed Jan. 28, 1977, Ser. No. 763,620
Int. Cl.² A01K *91/00*
U.S. Cl. 43—27.4 4 Claims



1. A long line hauling and coiling apparatus for long lines having spaced gangions and hooks thereon, comprising:

a power driven line hauling wheel;

a rotatable line coiler device adjacent said wheel and guide means for directing a line from said wheel to said coiler device;

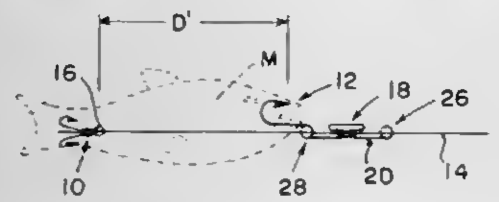
chute means adjacent said wheel for directing gangions and hooks secured to said line to said guide means;

a conveyor belt arranged to receive coils of line from said coiler device; and

drive means for moving said conveyor belt at a selected speed whereby said line is deposited on said belt in successively displaced loops with said hooks lying within said loops.

4,107,866
KNOTLESS MINNOW RIG

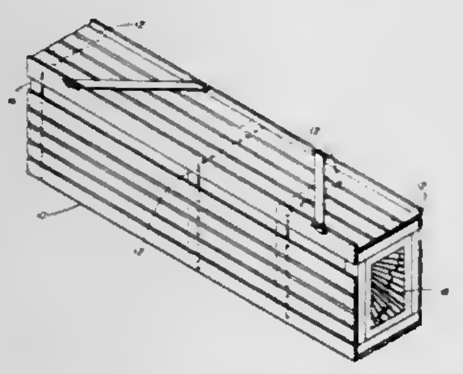
Joseph T. Manno, Star Rte., Kane, Pa. 16735
Filed Mar. 21, 1977, Ser. No. 779,547
Int. Cl.^{2} A01K *91/04*
U.S. Cl. 43—44.83 **8 Claims**



1. A minnow rig comprising
a first hook adapted to be disposed in a tail portion of a live minnow,
a second hook adapted to be disposed in a head portion of a live minnow,
a single line,
a portion of said first hook for connection to a free end of said line, and
means integrally connected to said second hook for effecting connection of said single line to said second hook by friction wrapping for holding said second hook in a predetermined fixed relative position with respect to said first hook along said line, said means consisting of at least a first surface manifestation for receiving said line, formed on one side of a generally T-shaped projection; said at least one surface manifestation and said projection disposed in-line, substantially parallel to the direction said line takes when connected up to said hooks; and said surface manifestation and said projection being spaced a fixed predetermined distance apart.

4,107,867
CATFISH TRAP

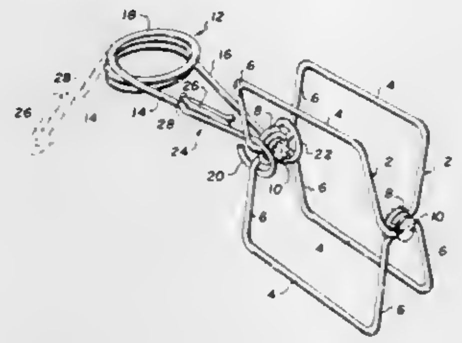
Benton B. Kennedy, Gen Delivery, Allemand, La. 70030
Continuation-in-part of Ser. No. 622,928, Oct. 16, 1975, abandoned. This application May 31, 1977, Ser. No. 802,220
Int. Cl.^{2} A01K *69/06*
U.S. Cl. 43—65 **1 Claim**



1. A catfish trap for catching catfish only of a desired size and comprising:
a. an elongated box defined by spaced apart slats, and having an open end for the entrance of fish therein;
b. an outer passageway converging inwardly from said open end to a round exit sized to lightly engage the desired size catfish at their respective largest transverse dimensions, said outer passageway being defined by short tapered plastic splines mounted around said open end and opposed in length to define closed sides; and
c. an inner passageway converging to relatively smaller round second exit having a diameter of the same size as the spacing between slats, and defined by longer tapered and thus more flexible plastic splines than those of said outer passageway mounted in said elongated box and spaced inwardly from said exit of said outer passageway a distance less than the average length of the desired size of catfish, said inner passageway being easily expandable by said catfish by its passage therethrough into a fish retaining part of said slatted box, but not out, whereby only catfish sized to lightly touch the exit of said outer passageway are finally trapped and all the other fish of the same size and all larger fish do not enter the box, and smaller fish swim out.

4,107,868
ACTUATOR

Frank Conibear, and Peter Verstraaten, both of Victoria, Canada, assignors to Woodstream Corporation, Lititz, Pa.
Filed Jan. 31, 1977, Ser. No. 764,352
Claims priority, application Canada, Jnl. 12, 1976, 267353
Int. Cl.^{2} A01M *23/26*
U.S. Cl. 43—88 **4 Claims**

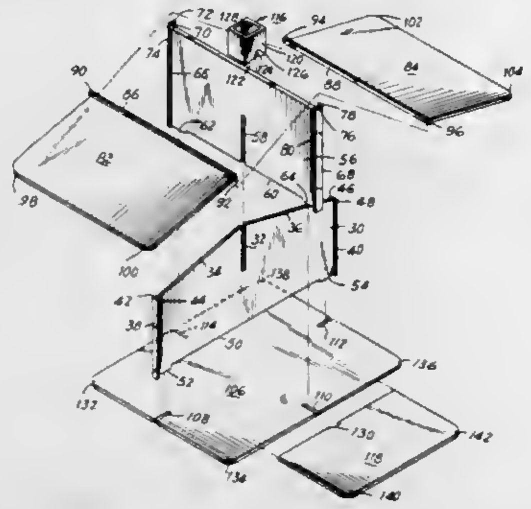


1. In an actuator for a rotating frame animal trap having two similar frames pivotaly connected to each other, the actuator comprising two arms spring biased at one end and each terminating in a ring at the other, the rings having the dimensions so that the actuator can be mounted on the trap to encircle adjacent ends of both frames of the trap, whereby on release of the trap, the actuator can rapidly and forcefully effect a rotation of the trap to its closed position, the improvement comprising a rigid joint formed in one arm of the actuator, said joint being breakable to separate the one arm by application of a force to the spring biased end of the actuator.

4,107,869
DEMOUNTABLE TOY HOUSE

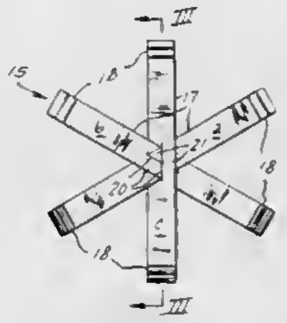
D. David Abrams, Kowloon, Hong Kong, assignor to Mego Corp., New York, N.Y.
Filed Mar. 15, 1977, Ser. No. 777,850
Int. Cl.^{2} A63H *33/08*
U.S. Cl. 46—21 **8 Claims**

1. A toy house assembled from a plurality of panels and comprising a plurality of flat planar panels, said panels including
(a) a first panel, said first panel being a vertically oriented interior panel having an upper vertical slot, two upper edges which slope downwardly away from the open upper end of said upper slot, two vertical side edges, each of said side edges being defined by a vertical strip, each vertical strip having two lips which extend transversely to a side edge of said first panel, and a lower horizontal edge having a terminal vertical extension at each end thereof;
(b) a second panel, said second panel being a generally rectangular vertically oriented interior panel having a lower vertical slot, said lower slot extending upwards from the lower horizontal edge of said second panel, so that when the toy house is assembled, said first and second panels are substantially perpendicular to each other with each of said first and second panels fitting into the respective slot of the other panel, the lower horizontal edge of said second panel having a terminal vertical extension at each end thereof, and two vertical side edges, each of said side edges being defined by a vertical strip, each vertical strip having an upper recess and two lips which extend transversely to a side edge of said second panel;
(c) a third and fourth panels, said third and fourth panels being generally rectangular roof panels, each of said third and fourth panels having a horizontal lip which extends transversely to the top edge of the respective associated panel, each lip projecting outwards from a corner of said associated panel so that each lip extends into one of said upper recesses in a vertical strip of a said second panel when the toy house is assembled; and
(d) a fifth panel, said fifth panel being a generally rectangular horizontal floor panel, each edge of said fifth panel having a slot which extends inwards from the periphery of said fifth panel, so that each terminal vertical extension of said first and second panels extends into a slot when the toy house is assembled.



4,107,870
SEPARABLE CONNECTIVE FLEXIBLE TOY ASSEMBLY

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021
Filed Sep. 13, 1976, Ser. No. 722,722
Int. Cl.^{2} A63H *33/08*
U.S. Cl. 46—28 **17 Claims**

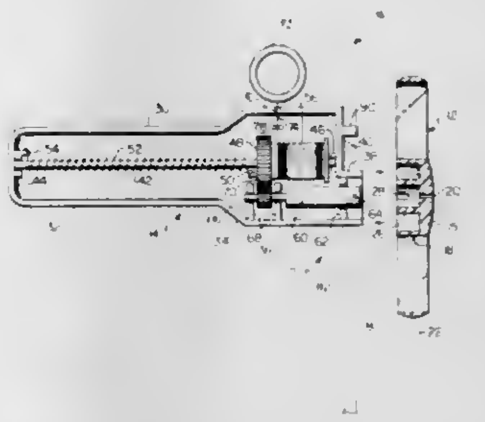


1. A separably connective flexible toy, comprising:
a plurality of generally flat elongated flexible strips, each of which has complementary rib and groove fastener means at each opposite end;
each of said strips being bendable and twistable along its length, and said fastener ribs and grooves being interlockable with fastener ribs and grooves at the opposite end of the same strip or of another such strip; and
at least one of said strips having a slit therein through which a second of said strips projects for retained generally crossing assembled relation with the slit strip.

13. A method of making a separably connective flexible toy, comprising:
manipulating a plurality of generally flat elongated flexible toy strips which are bendable and twistable along their length and each having at opposite ends thereof complementary rib and groove fastener means; and
projecting at least one of the strips through a slit in at least a second of the strips and thereby assembling the strips into a generally crossing multi-arm relationship;
whereby the strip arms may be bent for interlocking the fastener ribs and grooves at the ends of the same strip with one another or with the fastener means of another strip.

4,107,871
PROPULSION TOY

James R. Hornsby, Jr., 6239 Edgewater Dr., Orlando, Fla. 32810
Filed Jan. 12, 1977, Ser. No. 758,782
Int. Cl.^{2} A63H *27/00*
U.S. Cl. 46—83 **4 Claims**

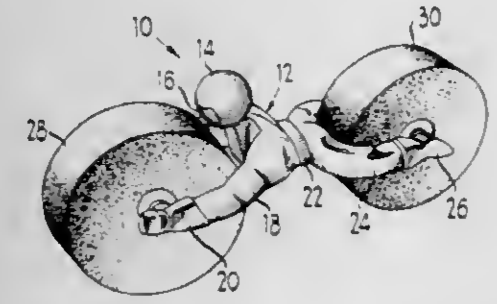


1. A propulsion toy amusement device comprising the combination of:
a launchable rotor member;
a launching device; and
an enlarged disc removably disposed between said rotor member and said launching device;
said rotor member including a central portion, a rim concentrically surrounding said central portion and blade members interconnecting said central portion and said rim;
said launching device including a housing having a forward end portion, a rotatable body within said housing extending at least partially within said forward end, and a digitally operable launching element for rapidly rotating said rotatable body;
said enlarged disc having a central aperture therein configured for reception of said housing forward end portion and into which said housing forward end portion extend thereby mounting said disc upon said launching device;
said rotor member being initially positioned in substantially abutting engagement with the forward surface of said enlarged disc and being retained in such initial position by engagement of said rotor central portion with that portion of said rotatable body which extends into the forward end of said housing;
said blades on said rotor member having their rear edges disposed in substantial abutment with said disc forward surface when said rotor member is in its initial position;
said rotor member being launched by digitial operation of said launch element which sets said rotatable body and engaged rotor member into rapid rotation whereby air pressure exerted by said rotating blade members is directed against said disc to cause said rotor member to disengage from said rotatable body and to be propelled forwardly in space while spinning rapidly;
said disc having a diameter substantially greater than the diameter of said rotor member to thereby shield and secret the launching device from the view of an observer in front of said amusement device in order to prevent such observer from seeing the launching operation;

said central aperture and said housing forward end portion being non-circular;
said disc including a guide hole formed therein adjacent to said central aperture and said housing having a forwardly projecting pin which extends through said guide hole, said disc thereby being removably secured to said housing in a manner which prevents said disc from rotating relative to said housing.

4,107,872
ACTION TOY FOR LAND AND WATER

James E. Tucker, Oak Park; Joseph M. Burck, Chicago, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Aug. 4, 1977, Ser. No. 821,702
Int. Cl.² A63H *11/10*
U.S. Cl. 46—103 **10 Claims**

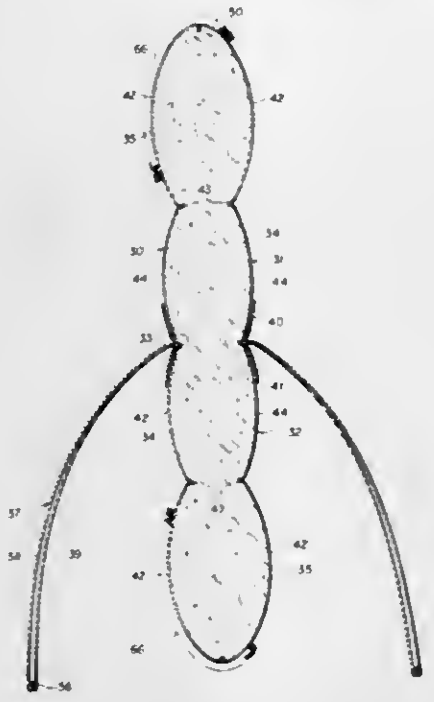


1. An action toy for children comprising:
a body having an outer surface shaped to resemble the human form in a generally horizontal position as in riding the surf;
said body including a pair of forwardly extending spaced apart arms and a pair of rearwardly extending spaced apart legs forming spaced apart recesses at opposite ends of said body;
a pair of relatively large cylindrical wheels mounted in said recesses formed of deformable, lightweight flotation material and mounted for rotation on a pair of spaced apart axes extending transversely between opposite outer end portions of said arms and legs, respectively; and
means for rotatively driving at least one of said wheels to propel said toy across a supporting surface.

4,107,873
STUFFED REVERSIBLE DOLL

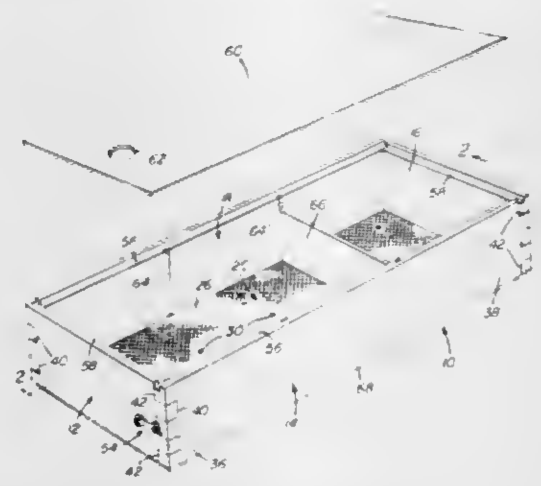
Adeline L. Bauer, Rte. 1, Trempealeau, Wis. 54661
Filed Dec. 3, 1976, Ser. No. 747,062
Int. Cl.² A63H *3/12*
U.S. Cl. 46—153 **2 Claims**

1. A stuffed reversible doll comprising a stuffed body which is unitary and includes oppositely longitudinally extending body sections having the stuffing contained within fabric covering to form individual doll figures joined at a common waist, said fabric coverings for said individual doll figures being of different fabric patterns and forming the stuffing envelope of said unitary stuffed body, a reversible skirt attached to the stuffed body at said common waist and adapted to conceal one doll figure while exposing the other doll figure to view in each of two positions of use, said skirt formed in two fabric plies and each ply having a different fabric pattern, the fabric pattern of one skirt ply matching the permanently attached fabric covering on one doll figure and the fabric pattern of the other skirt ply matching the permanently attached fabric covering on the other doll figure, said reversible skirt in either of its two positions of use coacting with one of said permanently attached fabric coverings on said doll figures to present the appearance of a full length dress on such figure having one fabric pattern, each ply of the two ply reversible skirt having a waist extension thereon overlapping and surrounding a comparatively narrow surface area of one doll figure immediately adjacent to and on one side of the common waist, and a pair of independent decorative waistbands overlying and surrounding said waist extensions of the skirt plies and substantially concealing the waist extensions and being attached therewith to said stuffed body, said waist extensions and their associated waistbands conforming to the shape of the doll at the waist areas of the individual doll figures.



4,107,874
SPROUTER

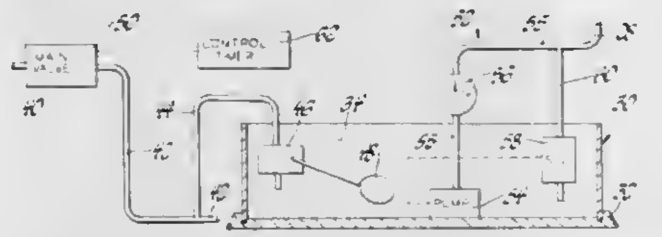
David A. Richardson, 2506 Southland Dr., Austin, Tex. 78704
Filed Jan. 28, 1977, Ser. No. 763,596
Int. Cl.² A01C *1/02*
U.S. Cl. 47—14 **6 Claims**



1. A sprouter, comprising, in combination:
(a) wall means for defining the lateral extent of a growing chamber of the sprouter; and
(b) a base connected to the wall means for forming a bottom of the growing chamber, the base including means for retaining a quantity of water and supplying sprouts in the growing chamber for a predetermined length of time, the base having a periphery, and the wall means including at least one wall forming a continuous surface around the periphery of the base, the wall means including a plurality of substantially planar walls pivotally connected together, each of the walls having edges defining a finite thickness and two spaced ends perpendicular to the edges, the ends of each of the walls being notched in alternate sequence to one another for interengaging with an end of an adjacent one of the walls, at least some of the walls being provided with holes extending perpendicularly to the edges and disposed at the notched ends of the walls, each of the holes being offset from a center of the finite thickness of the associated one of the walls, and pins inserted in the holes for pivotally joining the associated walls to one another, the offset of the holes locating the pins eccentrically with respect to the resulting joint for spacing the ends of the walls from one another when an included angle between the adjoining walls is increased and facilitating cleaning of the ends of the walls without removing the pins from the associated holes.

4,107,875
GREENHOUSE EQUIPMENT

Darrell E. Bordine, 1835 S. Rochester Rd., Rochester, Mich. 48063
Filed Jan. 27, 1977, Ser. No. 763,057
Int. Cl.² A01G *31/00*
U.S. Cl. 47—62 **9 Claims**

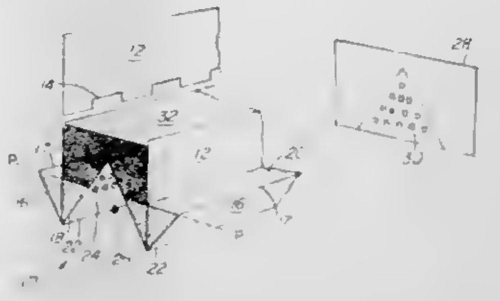


1. An assembly for supplying a nutrient solution to plants comprising: a greenhouse bench for supporting plants and retaining the solution; reservoir means for storing the solution for said bench; source means for providing a source of solution for said reservoir means; control means for automatically controlling the flow of solution from said source means to said reservoir means and for periodically effecting the flow of solution from said reservoir means to said bench to flood said bench; said control means including supply line means establishing communication for said solution between said source means and said reservoir means, supply valve means in said supply line means for controlling the flow of solution therethrough in response to the amount of solution in said reservoir means to maintain a predetermined amount of solution in said reservoir means, main valve means having open and closed positions for controlling the flow of solution from said source means to said supply line means, flood-drain means for flooding said bench with solution from said reservoir and draining solution from said bench into said reservoir, and timing means for actuating said flood-drain means to flood said bench and for closing said main valve means while said flood-drain means is actuated.

4,107,876
INVERTED V CHANNEL CULTURE

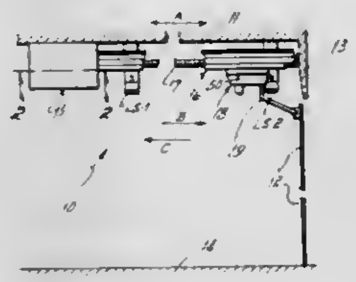
George Greenbaum, 790 Boylston St., Boston, Mass. 02199
Continuation-in-part of Ser. No. 842,292, Oct. 14, 1977, which is a continuation-in-part of Ser. No. 763,821, Jan. 31, 1977, which is a continuation-in-part of Ser. No. 684,465, May 7, 1976, Pat. No. 4,014,135. This application Feb. 27, 1978, Ser. No. 881,586
Int. Cl.² A01G *9/02*
U.S. Cl. 47—79 **33 Claims**

1. A planter for growing plants which comprises:
an inverted V-shaped floor having lower edges and an upper surface and a lower surface;
outer walls on either side of the floor combined to the lower edges and defining a reservoir therebetween at least a portion thereof adapted to hold a hydrophilic fill material;
inner walls having lower portions and upper portions, said lower portions received in the reservoir between the outer walls and floor and being fluid permeable, the upper portions defining with the floor a cavity to hold soil, the cavity and reservoir in fluid flow communication whereby when liquid is added to the soil, the configuration of the V-shaped floor will enhance the drainage through the lower portion of the inner wall, said liquid being absorbed by the hydrophilic fill, which fill will tend to transmit the liquid back to the soil as the soil loses its moisture.



4,107,877
GARAGE DOOR OPERATOR AND DOOR OBSTRUCTION SENSING APPARATUS

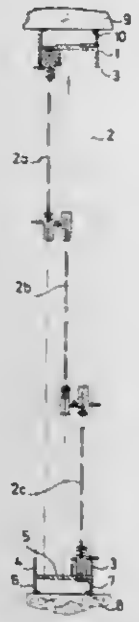
Maw Huei Lee, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio
Filed Sep. 19, 1977, Ser. No. 834,410
Int. Cl.² E05F *15/10*
U.S. Cl. 49—28 **35 Claims**



1. In a screw-driven garage door operator having a motor for rotating a screw and an operator control means for controlling said operator to selectively raise and lower a door, improved means for sensing a door obstruction and for controlling said operator in response to sensing said obstruction including:
a screw in said operator, said screw connected to said door for raising and lowering said door upon rotation of said screw, and said screw being movable in a longitudinal direction parallel to a longitudinal axis of said screw, whereby when said door strikes an obstacle, said screw, upon continued rotation, is moved in said longitudinal direction at least a predetermined distance,
at least one control switch operatively connected to said operator control means, and
control switch actuating means comprising a lever arm pivoted at one end to said operator on one side of said longitudinal axis, said lever arm connected intermediate its ends to said screw, and said lever arm having another end disposed in cooperative relationship with said control switch for actuating said control switch when said screw moves in said longitudinal direction over said predetermined distance.

4,107,878
LATERAL CONNECTION MEMBER OF A PARTITION FOR A BATHING- OR SHOWER-CABIN

Heinz Georg Baus, Ulmenweg 46, Thun, Switzerland (CH-3601)
Continuation of Ser. No. 549,025, Feb. 11, 1975, abandoned.
This application Jul. 6, 1976, Ser. No. 702,665
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407230
Int. Cl.² E05D *15/08;* E06B *3/46*
U.S. Cl. 49—125 **3 Claims**



1. Partition apparatus of a bathing or shower cabin, comprising at least one slideable partition; horizontal rail means for guiding sliding of said at least one partition; vertical U-shaped frame members comprising a crosspiece having first and second sides thereof opposite each other, said crosspiece comprising a first and a second projecting limb projecting from said first side and spaced apart so as to define between said first and second projecting limbs a first recess for receiving a terminal portion of said rail means, said crosspiece comprising a third projecting limb, which limb projects from said second side so as to define between said third limb and said crosspiece a second recess, said second recess being capable of receiving a further partition, said third limb being able to be attached to a barrier surface; and the projecting means engageable with or disengageable from a portion of said second side of said crosspiece and having a first surface aligned with the second limb, a second surface attached to said portion of said crosspiece and a third surface being able to be attached to said barrier surface, said portion being located so that projecting means will be spaced apart from said third limb.

4,107,879
DOOR OF THE SELF-LOCKING TYPE

Franz Steimann, Gelsenkirchen-Horst, Germany, assignor to Didier Engineering GmbH., Essen, Germany Germany
Filed Jul. 21, 1977, Ser. No. 818,100
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 7623290[U]
Int. Cl.² E05C *21/02*
U.S. Cl. 49—465 **7 Claims**

1. A door of the type wherein the weight of the door causes locking thereof against a door frame of the type having extending outwardly therefrom vertically spaced pairs of support hooks for supporting the door, said door comprising:

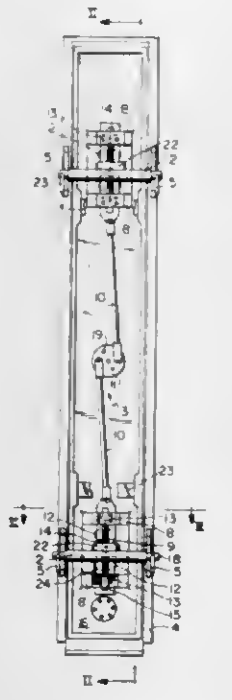
a door element adapted to be sealed against a door frame and close a door opening therein;

a pair of vertically spaced, horizontally extending locking bars carried by said door element, each said locking bar having opposite round ends adapted to rest on and be held by a respective pair of support hooks of the door frame;

a pair of locking support members, one each associated with a respective one of said locking bars, said locking support members being mounted for vertical sliding movement along said door element, each said locking support member having therein an elongated vertically extending slot;

means for pivotally connecting each said locking bar to the respective said locking support member about a respective horizontal axis, such that upon positioning said locking bars on the respective support hooks, the weight of the door will cause said locking bars to pivot about the respective said pivot axes in directions away from said door element, thereby pressing said door in a direction away from the hooks and toward the door frame;

equalizer linkage means, rotatably mounted on said door element and connected to both of said locking support members, for equalizing the relative positions of said locking bars with respect to the hooks upon initial positioning thereon of said locking bars, by allowing relative movement of said locking support members along said door element in vertical directions toward or away from each other;



a pair of vertically extending rails attached to said door element, one each of said rails extending into a respective one of said slots; and

means for guiding the vertical movement of said locking support members, said guiding means comprising first rollers mounted on said locking support members for rotation about axes extending parallel to said door element and second rollers mounted on said locking support members for rotation about axes perpendicular to said door element, said second rollers contacting and rolling on said rails.

4,107,880
FLOATING BUFFING WHEEL ASSEMBLY

John P. Randall, W153 N5264 Plaza Dr., Menomonee Falls, Wis. 53051
Filed Feb. 2, 1976, Ser. No. 654,064
Int. Cl.² B24B *5/18*
U.S. Cl. 51—103 TF **10 Claims**

1. A buffing wheel assembly comprising:

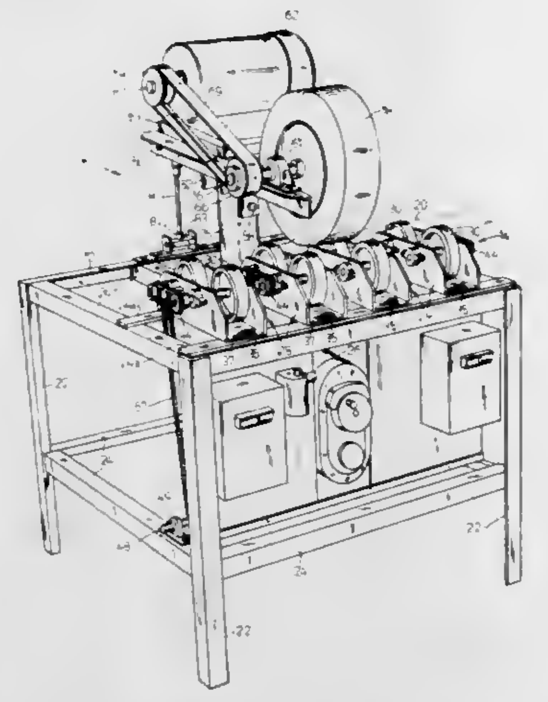
a main frame,

means on said frame for transporting a workpiece across the frame,

a buffing wheel having a flat cylindrical buffing surface,

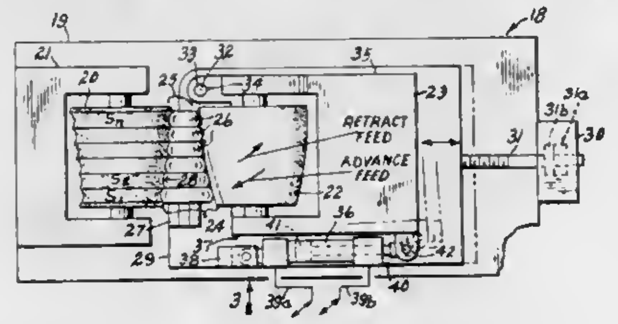
means on said frame for supporting the buffing surface on said buffing wheel in a position to engage the surface of the workpiece as it passes the wheel, said support means including a post and a pivot plate pivotally mounted on said post for adjusting the position of the buffing surface with respect to the surface of the workpiece and a support frame pivotally mounted on said pivot plate,

means on said support frame for driving said buffing wheel, and means for balancing the weight of the buffing wheel, said balancing means includes a threaded rod connected to the supporting means and the main frame, a pair of compression springs mounted on the rod on opposite sides of the support means and a nut on the rod on each side of the compression springs for adjusting the force of the springs acting on the support means, whereby the buffing wheel will follow the surface of the workpiece.



4,107,881
CENTERLESS GRINDING MACHINE

Wilbur F. Jessup, The Hague, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jun. 6, 1977, Ser. No. 803,569
Int. Cl.² B24B *5/32*
U.S. Cl. 51—103 R **8 Claims**



1. A centerless grinder, comprising in combination:

a. a base;

b. a grinding wheel, rotatably journaled in a grinding wheelhead on said base;

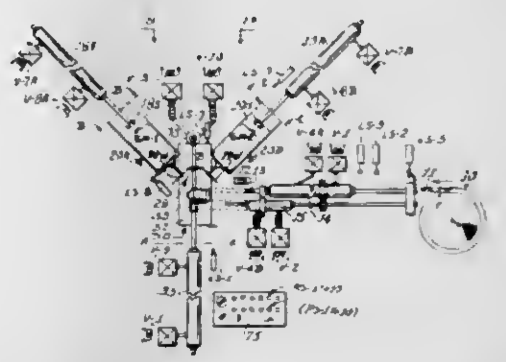
c. a regulating wheel rotatably journaled in a regulating wheelhead on said base and disposed relative to said grinding wheel so as to form an inlet end and an outlet end between said wheels;

d. a work support located between said wheels, and adapted to support a workpiece of revolution; and

e. means for effectuating relative pivotal feed movement between said regulating wheel and said grinding wheel during the grinding process and varying the feed distances along the face of said regulating wheel relative to said grinding wheel.

4,107,882
DRILL PRE-POINTING MACHINE

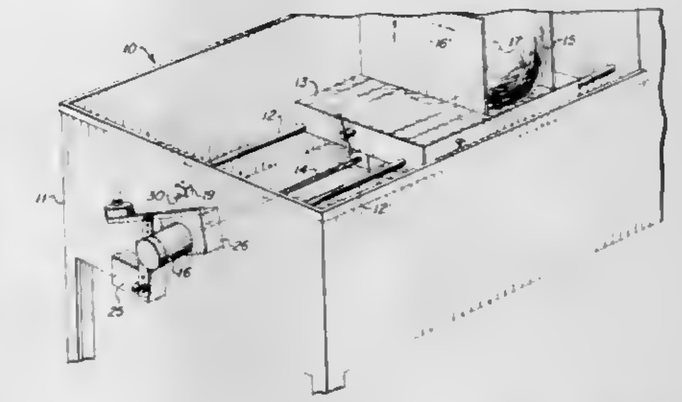
Charles Thomas Breitenstein, Elk Grove Village, Ill., assignor to Spiral Step Tool Company, Elk Grove Village, Ill.
Filed May 6, 1977, Ser. No. 794,671
Int. Cl.² B24B *3/26*
U.S. Cl. 51—118 **16 Claims**



1. In a grinding machine operative to grind substantially simultaneously both ends of workpieces such as drill bodies, first and second individually shiftable grinding heads each including a corresponding grinding wheel movable to and from respective starting positions and a working position; presettable means operative to limit the forward grinding movement of said grinding heads in the direction of said working position; a workhead carried on a transfer table shiftable from a starting position to said working position and including a rotary through-bore chuck operative to seize a workpiece with opposite ends thereof exposed in space for engagement respective with one of said wheels at said working position responsive to advance of the wheels in forward movement of the grinding heads relative thereto; drive means operative in timed action to move the heads from their starting positions to the working position in timed relation with advance of the wheels against corresponding ends of the workpiece to respectively preset limits under control of said presettable means and thereafter effect reverse movement of the heads in return to starting position and opening of the chuck as an incident to return of the workhead to such starting position; together with loading means operative in timed relation to movement of the workhead back to starting position to transfer a workpiece from a source of supply into said chuck.

4,107,883
APPARATUS FOR CONTROLLING FEED MECHANISMS OF GRINDING AND CUTTING APPARATUS

Kenneth E. Bein, 2518 Last Ave., Kingman, Ariz. 86401
Filed Jul. 13, 1977, Ser. No. 815,222
Int. Cl.² B24B *49/16*
U.S. Cl. 51—165.8 **5 Claims**



1. An apparatus for cutting or abrading materials having hardness variations comprising:

a frame,

a table for supporting a work piece movably mounted on said frame,

a feed screw mounted on said frame and threadedly connected to said table for controlled movement of said work piece relative to said frame,

an electric motor having a rotor journaled in its housing,

said rotor being coupled to said feed screw for actuation thereof,

said housing of said motor being free to rotate responsive to the reaction of the torque experienced by said feed screw and said rotor when the work piece engages a tool,

a potentiometer control means for varying a source of power coupled to said electric motor,

means connecting said housing to said control means for varying the electric power supplied to said electric motor in response to the position of said housing relative to said rotor of said electric motor reacting to the torque experienced by said rotor,

said means connecting said housing to said control means comprises a pair of pivotally connected links with the free end of one link connected to said housing and the free end of the other link connected to said control means,

switching means mounted on said frame for controlling the energization of said electric motor,

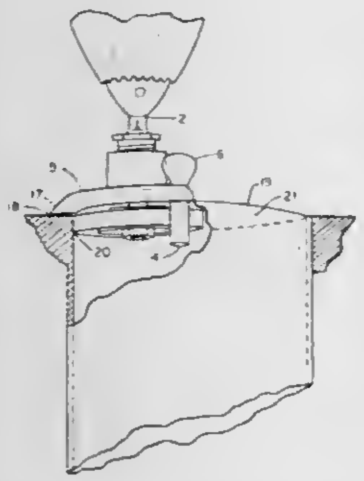
said switching means being actuated to open circuit condition by a predetermined movement of said means connected to said housing, and

means for mounting a tool on said frame against which the work piece carried by said table is moved adjacent to.

4,107,884

CYLINDER RIDGE GRINDER

Charles F. Morris, 305 Stage St., Tenino, Wash. 98589
Filed Nov. 3, 1976, Ser. No. 738,371
Int. Cl.^{2} B24B *15/02, 19/00*
U.S. Cl. 51—245 **2 Claims**

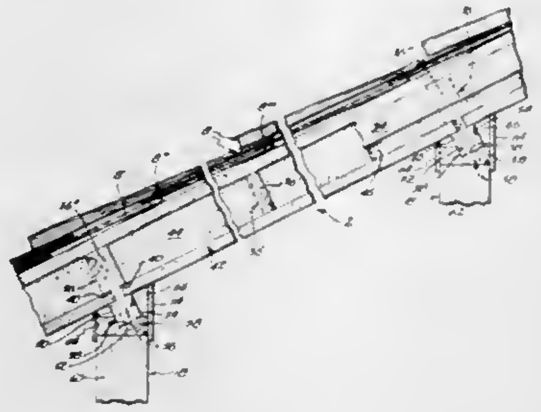


1. An electric drill powered cylinder ridge grinder having a body portion composed of a sheet metal plate; said plate including a semicircular plane section having a straight edge and a downwardly extending round edge; an internally threaded hub extending perpendicularly from one surface of said plate, in a direction opposite that of said round edge; and being disposed adjacent the center of said straight edge; an externally threaded sleeve bearing adjustably disposed internally of said hub and including a nut-type head above said hub; the sleeve bearing being of greater length than said hub and including locking means for adjustably securing said bearing in adjusted position; a shaft journaled in said bearing having means above said plate for connection to a power drill and means below said plate for mounting a grindstone; a flat grindstone carried by said shaft with a peripheral surface thereof disposed adjacent said downwardly extending round edge; a guide pin disposed along said straight edge and extending from said plate in the same direction as said grindstone; and a stabilizing knob disposed on said plate at said guide pin and extending from said plate in the direction of said drill whereby the grinder may be guided around the cylinder opening with the guide pin and the rotating grindstone in contact with the cylinder wall ridge.

4,107,885

PREFABRICATED ROOF SECTION

Sir Walter Lindal, 1120 8th Ave., #1201, Seattle, Wash. 98101
Filed Jul. 8, 1976, Ser. No. 703,644
Int. Cl.^{2} E04B *7/02;* E04D *1/00*
U.S. Cl. 52—90 **34 Claims**



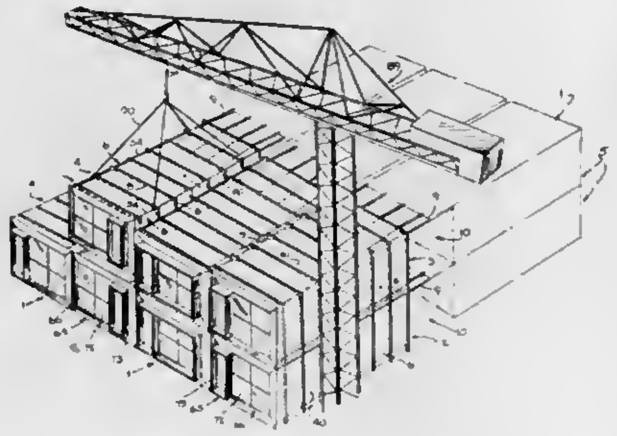
30. A building structure having a roof section obliquely mounted thereon, comprising a substrate of stiff sheathing-like material having a quadrilateral outline and a roof covering on the rooftop thereof which comprises a series of relatively offset but overlapping shingle-like roof plates that are arranged in two parallel relatively transversely offset but overlapping courses of the same that are superposed over one another and the substrate, respectively, so as to form a projecting lip along one side edge of the roof section and a complementary shoulder along the opposing side edge thereof, there being a pair of relatively vertically and horizontally spaced stops on the structure, and means on the bottom of the substrate which define a pair of spaced parallel depending surfaces thereon that are disposed crosswise of the side edges of the substrate and oriented in one serial direction of the roof covering, in abutment against the pair of stops, said depending surfaces of the roof section being defined by a pair of cleat-like projections on the bottom of the substrate which have faces thereon that are oriented in the opposite serial direction of the roof covering, and there being fasteners driven through the projections into the stops securing the roof section to the building structure, said substrate comprising a quadrilateral frame having a pair of rafter-like members along the side edges thereof and three spaced parallel cross members therebetween, the intermediate of which is flush with the top and bottom planes of the frame, and the endmost of which are flush with the top plane of the frame but depend below the bottom plane of the same to form the cleat-like projections on the bottom of the substrate, there being grooves in the endmost cross members which coincide with the bottom plane of the frame, and a sheet-like covering on the bottom of the frame, the ends of which are interengaged in the grooves of the endmost cross members.

4,107,886

PREFABRICATED BUILDING MODULE

Orlando F. Ray, Rio Biedras, and Enrique H. Gutierrez, Condado San Juan, both of P.R., assignors to Systems Concept, Inc., Miami, Fla.
Division of Ser. No. 454,702, Mar. 25, 1974, abandoned, which is a division of Ser. No. 245,090, Apr. 19, 1972, abandoned. This application Feb. 9, 1976, Ser. No. 656,208
Int. Cl.^{2} E04B *1/348*
U.S. Cl. 52—79.11 **8 Claims**

1. A building comprising at least one horizontal row of at least two side-by-side lightweight, prefabricated building modules, the one row of building modules forming at least a portion of one story of the building, each of the prefabricated building modules having at least two opposing side-wall portions, a ceiling portion and a floor portion, each of the two side-wall and ceiling portions including a thin panel of concrete-like material and a plurality of vertical open-web elongated reinforcing members, each of which includes longitudinal edge members spaced-apart and extending substantially parallel to one another and a web extending between the edge members substantially throughout the length thereof, the reinforcing members extending across the outer surface of the thin panel in the manner of studs, with an edge member of each reinforcing member being embedded in the thin panel and extending substantially to the outer surface thereof, and the other edge member and at least a portion of the web of each reinforcing member extending outwardly from said outer surface; plate means rigidly attached to the upper ends of the longitudinal edge members of each of the reinforcing members of each of the side-wall portions and to the adjacent ends of the longitudinal edge members of reinforcing members of the ceiling portion; and a plate rigidly attached to the lower ends of the longitudinal edge members of each of the reinforcing members of each of the side-wall portions and the floor portion, respectively, for forming a rigid, box-like structure, each building module in the one row of building modules having at least one side-wall portion thereof adjacent to and spaced-apart from a side-wall portion of an adjacent building module for forming a space therebetween, the thin panels of the adjacent side-wall portions providing a form structure, the reinforcing members of the side-wall portions of adjacent modules extending in staggered nesting relation into the form structure, and a wall disposed between each of the adjacent side-wall portions, the wall being formed by pouring a concrete-like material into at least a portion of the space between each of the adjacent side-walls, the reinforcing members of the adjacent side-wall portions reinforcing the wall formed therebetween and integrally incorporating the building modules on each of the sides of the wall into the wall, the thin panels and the reinforcing members of the adjacent side-wall portions merging with and into the poured concrete wall to form a monolithic reinforced concrete support wall for the floor and ceiling portions of the modules.



4,107,887

SOUND ABSORBING SYSTEM

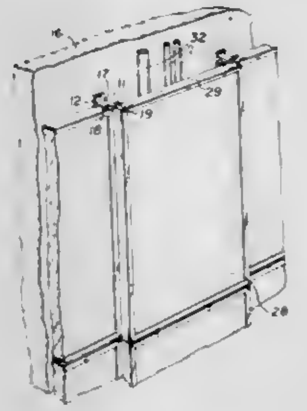
Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Filed Jan. 20, 1976, Ser. No. 650,634
Int. Cl.^{2} E04B *1/00*
U.S. Cl. 52—105 **10 Claims**

1. A sound absorbing structure comprising the combination of a supporting structure, clips attached to the supporting structure, and sound absorbing panels attached to the clips,

wherein said sound absorbing panels comprise a sound absorbing material with a frame extending around the exterior perimeter of the material, said frame having a plurality of openings for accepting a securing member, and

wherein said clips each comprise a wall plate, a projection extending outwardly from the wall plate, and at least two securing members integrally attached between their ends to the end of the projection opposite the wall plate, said securing members each extending further in one direction from the projection than their extension from the projection in the opposing direction, with a surface of the longer side having a depressed indentation therein spanning the width of the longer side, and located thereon at a distance from its attachment at the end of the projection equal to the extension on the other side of the projection; and

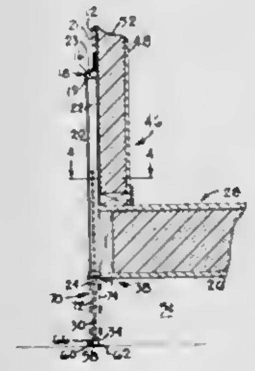
said wall plates clips being attached to said supporting structure and said openings of the frames of the sound absorbing panels engaging the securing members to affix the sound absorbing panels to the supporting structure.



4,107,888

MOBILE HOME SKIRTING

Lynn A. Krueger, 102 Pitcher Park, Devils Lake, N. Dak. 58301
Filed Jul. 5, 1977, Ser. No. 812,501
Int. Cl.^{2} E04D *2/38;* E04B *1/34*
U.S. Cl. 52—169.12 **15 Claims**



1. In a mobile home having exterior side walls and a floor, apparatus for enclosing the space between the floor and the ground when the mobile home is in a non-travel mode comprising:

exterior siding secured to each side wall and spaced apart therefrom to define a storage space between said siding and said wall, said siding extending downward and terminating at floor level to define an opening to said storage space proximate said floor;

a plurality of rigid skirting panels mounted for vertical reciprocating movement between a first position in which said panels are stored within said storage space for travel and a second position wherein said panels are lowered through said opening into contact with the ground, each panel having top, bottom and lateral edges, an exterior surface and an interior surface, said exterior siding having a vertical dimension at least as large as the distance between said top and said bottom edges of said panels whereby said panels are completely concealed from view in said first position; and

releasable latch means for securing said panels in said first position.

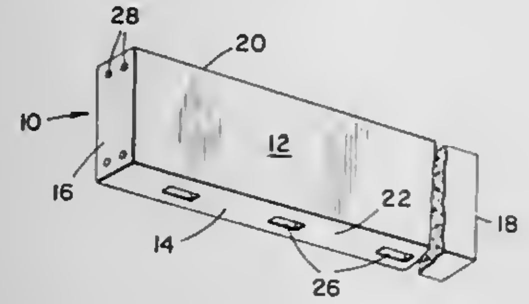
4,107,889
FOUNDATION SYSTEM

Mathew W. Gonsalves, Concord, and Carlos P. Murillo, Walnut Creek, both of Calif., assignors to Gonsalves, Santucci, Inc., Concord, Calif.

Continuation-in-part of Ser. No. 662,491, Mar. 1, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 748,842

Int. Cl.² E04B *1/16*

U.S. Cl. 52—259 **5 Claims**



1. A foundation for supporting a building upon a ground surface, the foundation having a number of sections, each section comprising:

at least two vertically elongate concrete pier elements poured in place in holes of predetermined dimensions formed in the ground, each of the pier elements having an uppermost end and at least one axially aligned reinforcing element extending upwardly out of the uppermost end;

at least two pedestals each of the pedestals having an internal surface defining a hollow interior with opposed open ends, one said open end affixed to the uppermost end of a corresponding one of the pier elements, the reinforcing rod extending into the pedestal and terminating at a location intermediate the opposed ends of the pedestal, said other open end disposed above the pier element;

an elongate precast concrete beam placed on at least two of the pedestals and having a parallel transverse aperture vertically disposed in generally overlying relation to a corresponding one of the respective pedestals therebeneath, the minimum distance between opposing portions of the internal surface of each pedestal being substantially greater than the cross-sectional area of each aperture; and

connecting means disposed interior of and extending between each of the apertures and extending into the pedestal therebeneath to connect each pier element to the beam and hold the beam in a predetermined relation with respect to the ground surface, the connecting means including a reinforcing element situated interior of and extending between each aperture and pedestal therebeneath and a bonding agent occupying the interior of each aperture and underlying pedestal.

4,107,890
FASTENING ASSEMBLY FOR REFRACTORY LININGS

Hans Dieter Seghezzi, Vaduz; Bernhard Klimesch, Mauren, both of Liechtenstein, and Reinhold Zaalatz, Rankweil, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

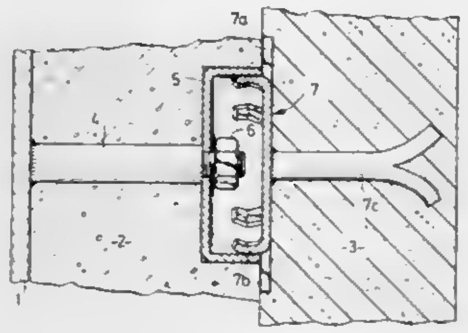
Filed Dec. 20, 1976, Ser. No. 752,097

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557846

Int. Cl.² E04B *1/16*

U.S. Cl. 52—379 **5 Claims**

1. A fastening assembly for use in securing a refractory lining onto a foundation wall in a furnace or the like, wherein the improvement comprises that said fastening assembly includes a receiving part to be anchored in the foundation wall so that the receiving part is wholly included within the foundation wall, an attaching part detachably connected to said receiving part and extending outwardly from said receiving part, said receiving part including a box-shaped member for securement within the foundation wall, said attaching part comprising a base plate and an anchoring element secured to and extending outwardly from said base plate away from said receiving part, projections being disposed in said base plate and extending therefrom into said box-shaped member for securing said attaching part to said receiving part, and said projections comprising fingers formed from said base plate and extending outwardly therefrom.



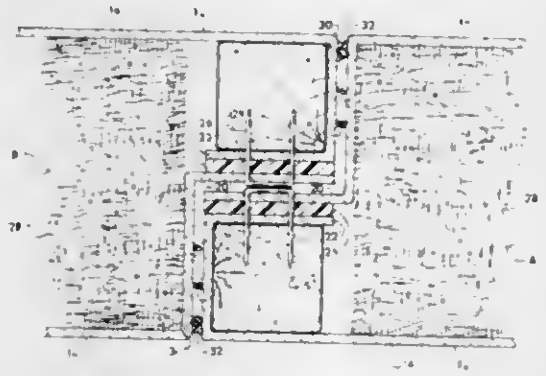
4,107,891
MODULAR BUILDING PANEL WITH HEAT NONCONDUCTING MEANS

Worth Cotton, Jr., and A. Reese Hunter, both of Greensboro, N.C., assignors to Industrial Air, Inc., Greensboro, N.C.

Filed Jul. 8, 1977, Ser. No. 813,872

Int. Cl.² E04B *2/28, 2/88;* E04C *2/08*

U.S. Cl. 52—394 **6 Claims**



1. A prefabricated building panel comprising:

(a) a pair of identically formed facing sheets joined along opposite side edges thereof and including a fiberglass core between the central planar surfaces of said two facing sheets;

(b) each of said facing sheets including:
  - (i) a central web section;
  - (ii) a side wall extending inwardly from each side edge of said web section;
  - (iii) a first flange extending laterally from the free edge of one of said side walls in a direction toward said core, and a second flange extending laterally from the free edge of the other of said side walls in a direction away from said core, said first and second flanges being substantially parallel to said central web section;

(c) said pair of facing sheets joined together with the first flange of each sheet being joined to the second flange of the other sheet;

(d) a structural support member of a size substantially equal to the space formed by said first flange, adjoining side wall, and opposite portion of said web, and positioned within said space to provide structural support along the edges of said panel;

(e) a flat strip of heat non-conducting material positioned between the adjoining flanges of said pair of facing sheets to minimize transfer of heat from one facing sheet to the other; and

(f) a plurality of fasteners extending through adjacent flanges of said facing sheets, through said strip of non-conducting material, and into said structural support member.

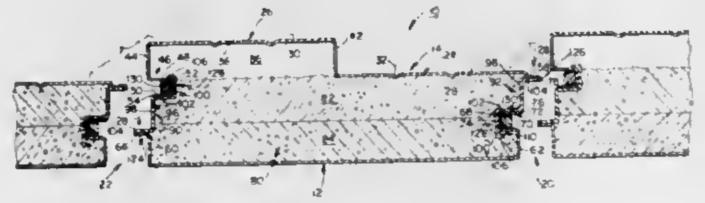
4,107,892
WALL PANEL UNIT

Norman A. Bellem, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jul. 27, 1977, Ser. No. 819,690

Int. Cl.² E04B *1/62, 1/74*

U.S. Cl. 52—403 **14 Claims**



1. A prefabricated wall panel unit capable of being matingly joined with like units in edge-abutting relationship, comprising:

an elongate interior wall panel having a first wing defining flange on one edge thereof and a first channel defining means on another edge thereof;

an elongate exterior wall panel having a second wing defining flange on one edge thereof and a second channel defining means on another edge thereof;

joining means connecting said wing elements to said channel means, said joining means being formed of a material having a thermal conductivity which is low relative to the material of said panels, said wing and channel elements being positioned on said wall panels so that said first channel means is located at the transverse centerline of the wall panel unit and said second channel means is spaced from the wall panel unit transverse centerline, and said first wing defining flange is located adjacent the wall panel unit transverse centerline and said second wing defining flange is spaced apart from the wall panel unit transverse centerline, said second channel defining means having an outer free edge which is located to be essentially co-planar with said interior wall panel one edge, said exterior wall panel one edge being located outwardly of said interior wall panel channel defining means; and

thermal spacer means in each channel defining means for maintaining wing elements of one wall panel unit out of direct thermal contact with channel defining means of an adjoined wall panel unit, said thermal spacer means including deformable strips of low thermal conductivity material mounted in said channels embeddingly receiving said wing-defining flanges and being interposed between adjoined wall panel units, said deformable strips forming a thermal break in a heat path through the wall panel unit whereby direct thermal contact between adjoined wall panel units is prevented so that formation of any continuous heat path between wall panel unit connecting elements is prevented.

4,107,893
PREFABRICATED BUILDING STRUCTURE

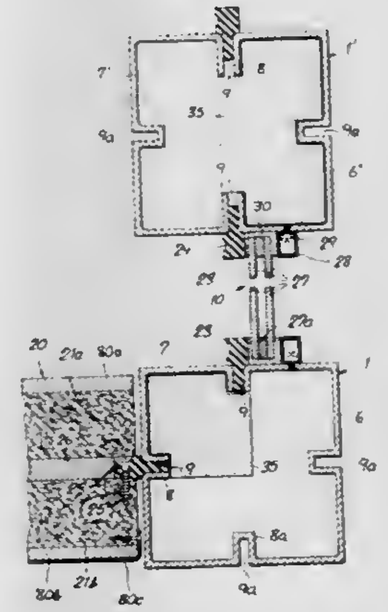
Eberhard G. Rensch, Lerchesbergring 24, Frankfurt, Main, Fed. Rep. of Germany (6000)

Continuation-in-part of Ser. No. 562,802, Mar. 27, 1975, abandoned, which is a continuation of Ser. No. 357,838, May 7, 1973, abandoned. This application Apr. 2, 1976, Ser. No. 673,134

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 7528031[U]; Jan. 8, 1976, 2600547; May 13, 1972, 2223457; Jun. 19, 1972, 2229737

Int. Cl.² E06B *3/04*

U.S. Cl. 52—775 **14 Claims**



1. A building structure assembled from prefabricated components, comprising:

a framework formed from rigidly interconnected horizontal and vertical elongate modular units defining a four-sided wall opening between them, said wall opening being bounded by confronting horizontal and vertical faces of said units, each of said faces being provided with a slot extending over the full length thereof, the slots of said faces lying in a common plane;

strips seated in said slots and projecting into said wall opening;

a four-sided wall element occupying said wall opening and resting against said strips; and

retaining means on at least one of said faces for holding said wall element in position adjacent said strips;

said vertical modular units being prismatic metallic columns of substantially uniform wall thickness having inbent wall portions defining the slots thereof, said columns being split along said slots to minimize heat transfer past said strips, said inbent wall portions including a substantially straight first flange and a generally J-shaped second flange enveloping said first flange, said second flange terminating in a lip closely paralleling said first flange.

4,107,894
INTERLOCKING CEMENTITIOUS BUILDING BLOCKS

Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Continuation-in-part of Ser. No. 736,724, Oct. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 582,378, Apr. 30, 1975, abandoned. This application May 23, 1977, Ser. No. 799,725

Int. Cl.² E04C *1/10*

U.S. Cl. 52—593 **21 Claims**

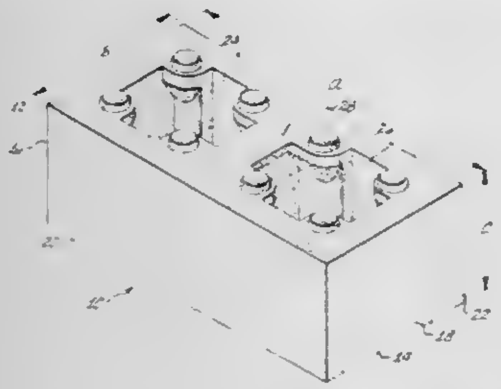
1. An interlocking building block comprising:

(a) a cementitious body of rectangular solid configuration having an upper horizontal surface and a lower horizontal surface;

(b) eight (8) projections integrally formed to extend normally from the upper horizontal surface of said body, said projections arranged on the upper surface in a predetermined geometric array;

(c) eight (8) recesses formed in the lower surface of said body and configured to be complemental to said projections, said recesses arranged on the lower surface in the same geometric array as said projections are arranged on the upper surface of said body; and

(d) a spaced pair of passages formed through said body so as to extend between the upper and lower horizontal surfaces thereof, said passages formed in cross-like shapes in horizontal cross section to provide said body with eight (8) vertically disposed cementitious columnar formations for supporting said projections and in which said recesses are formed, each of said vertical columnar formations comprises,



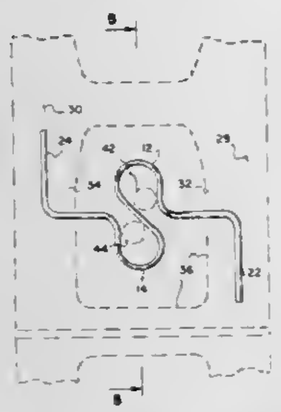
I. a shelf-like portion on the upwardly disposed end for supporting one of said projections,

II. a reduced mass portion on the downwardly disposed end in which one of said recesses is formed, and

III. a transition portion depending angularly from said shelf-like portion and merging with said reduced mass portion.

4,107,895
REINFORCING BAR LOCATING MEANS

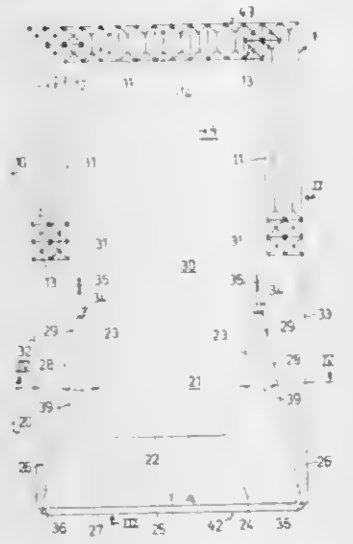
Carl F. LeGrady, 1024 N. 21st Ave., Phoenix, Ariz. 85009
Continuation-in-part of Ser. No. 633,645, Nov. 20, 1975, abandoned. This application May 9, 1977, Ser. No. 794,833
Int. Cl.² E04C ***5/18***
U.S. Cl. 52—687 **3 Claims**



1. In a reinforcing bar locating means; a single piece of wire having an S-shaped portion; said S-shaped portion having a pair of generally loop shaped bar receiving portions; said S-shaped portion having a pair of opposite end portions; arm portions integral with said opposite end portions of said loop shaped portions of said S-shaped portion; said arm portions extending in generally opposite directions relative to each other; said arm portions each having an anchor portion integral therewith; said anchor portions being spaced apart a distance substantially equal to a spacing between median areas of opposite side walls of a concrete block; said locating means being sized for disposition in a mortar layer between courses of concrete blocks; said S-shaped portion being disposed to overly a vertical opening between said side walls of a respective concrete block.

4,107,896
SHINGLE-TYPE WALL PANEL

Alfred Wetzel, Weissdornweg 114, 5300 Bonn Bad Godesberg, Fed. Rep. of Germany
Filed Sep. 23, 1977, Ser. No. 836,070
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642999
Int. Cl.² E04D ***1/00***
U.S. Cl. 52—537 **10 Claims**



1. A panel made of at least limitedly elastically deformable sheet material and adapted to be mounted shingle-fashion with a plurality of other such panels to an upright wall, said panel having a pair of generally parallel side edges and a pair of generally parallel end edges and when mounted having between said end edges a bend subdividing said panel generally into an upper half having one of said end edges and a lower half having the other of said end edges, said panel further having:

an upper central substantially planar region in said upper half,

an upper downwardly U-shaped and non-planar attachment portion in said upper half at said edges thereof and surrounding said upper central planar region,

a lower central substantially planar region in said lower half contiguous at said bend with said upper planar region and generally coplanar therewith in a relaxed unmounted condition of said panel,

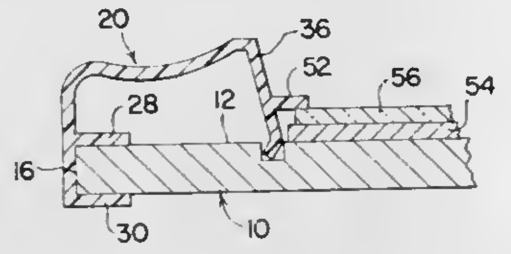
a lower outwardly directed flange in said lower half at said edges thereof and spacedly surrounding said lower planar region, and

a lower upwardly U-shaped contoured and non-planar portion having an inner periphery connected directly to said lower planar region and an outer periphery connected directly to said flange.

4,107,897
SNAP-IN PLASTIC FRAME FOR PANELS

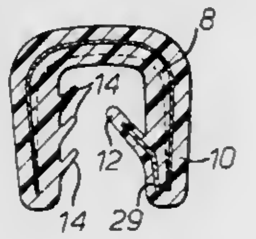
Myron E. Ullman, Jr., Canfield, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio
Continuation-in-part of Ser. No. 547,648, Feb. 6, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,800
Int. Cl.² E04C ***2/38***
U.S. Cl. 52—823 **11 Claims**

1. A contoured decorative trim strip for a panel core having flat parallel front and back surfaces, straight sides, and detents on the front surface parallel to said side surfaces comprising: an elongated extrusion having one straight flat portion adapted to abut against a straight side of said panel; said flat portion having a first rib extending from said flat portion to engage the back surface of said panel; a second rib parallel to and spaced apart from said first rib extending from said flat portion to engage the front surface of said panel; a flexible decorative generally convex contoured portion extending from the front edge of said flat portion to project over the front surface of said core to define an enclosed space thereunder; finger means projecting downwardly from said decorative contoured portion remote from said front edge adapted to engage a panel detent when said contoured portion is flexed and thereby extended against said panel; said strip being mitred at opposite ends to align with like adjacent mitred strips when also flexed into detent engagement with said panel.



4,107,898
CHANNEL-SHAPED SEALING, GUIDING OR FINISHING STRIPS AND THE LIKE

Heinz Andrzejewski; Werner Kruschwitz, and Robert G. Bright, all of Viersen, Germany, assignors to Draftex Development AG, Switzerland
Filed Apr. 26, 1977, Ser. No. 791,108
Claims priority, application United Kingdom, Apr. 26, 1976, 16912/76
Int. Cl.² E04C ***2/38***
U.S. Cl. 52—716 **10 Claims**



1. A channel-shaped strip structure, comprising

channel-shaped metal carrier means,

a covering of flexible material over and on the metal carrier means,

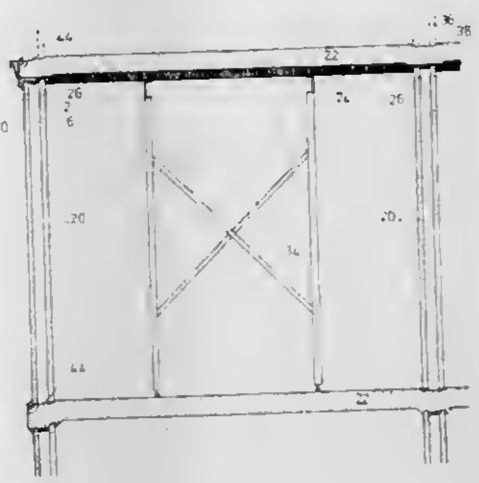
a gripping rib running along and protruding from one inside wall of the channel and defined by the flexible covering material, and

metal reinforcement which at least partly extends into the gripping rib and is separate from the carrier means and spaced therefrom by the flexible material.

4,107,899
LOAD-BEARING WALLS AND SIMILAR STRUCTURES

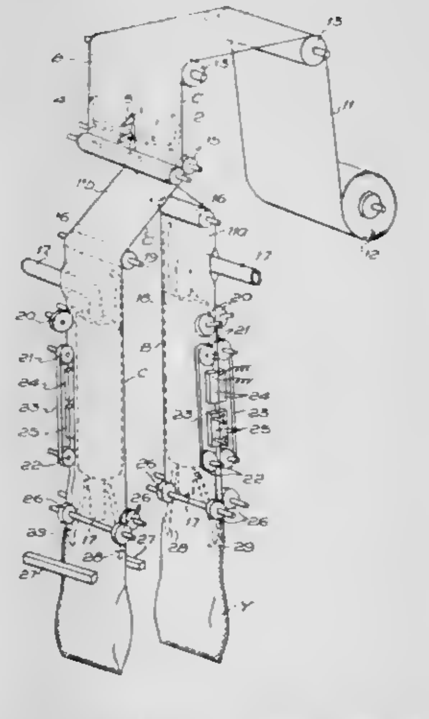
Frederick Crooks, 24 Philamere Ave., Glenmore, Durban, Natal, South Africa
Continuation-in-part of Ser. No. 574,753, May 5, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,903
Int. Cl.² E04G ***21/02;*** **E04B** ***1/16***
U.S. Cl. 52—747 **1 Claim**

1. A method of erecting a building, comprising erecting a jig, placing concrete formwork on said jig, inserting in said formwork the upper ends of storey-high relatively thin-walled precast cured concrete panels having a substantial L-shape in cross-section, placing the panels in opposed and staggered relation to each other, placing the lower ends of the panels in a channel in a base which is below said formwork, the panels extending vertically between the base and the formwork, the formwork extending down below the upper ends of the panels to form pockets on opposite sides of the upper ends of the panels, casting concrete into said formwork to a depth to fill said pockets and to overlie the upper ends of the panels, whereby the concrete, upon setting, locks the panels together to form load-bearing walls in the completed structure.



4,107,900
FORMING AND FILLING BAGS OF SYNTHETIC PLASTICS MATERIALS

Shinjiro Izumi, 1-17-5 Ryoke, Urawa-shi, Japan
Filed Jun. 3, 1977, Ser. No. 803,318
Int. Cl.² B65B ***9/12***
U.S. Cl. 53—180 R **7 Claims**



1. Apparatus for forming and for filling bags of a synthetic plastics material, comprising:

feed means for feeding a flattened tube of synthetic plastics material along a predetermined path through said apparatus;

cutting means for cutting said tube substantially along the mid-line thereof to produce two strips of material, each of which strips has two open edges along one side;

a tube constructed to pass between said open edges of each strip of material and to debouch into the interior of each strip;

sealing means for sealing together said open edges of each strip of material to form two further tubes; and

cutting and sealing means for sealing said further tubes transversely to form simultaneously the top and bottom of adjoining bags and for separating said bags from one another.

4,107,901

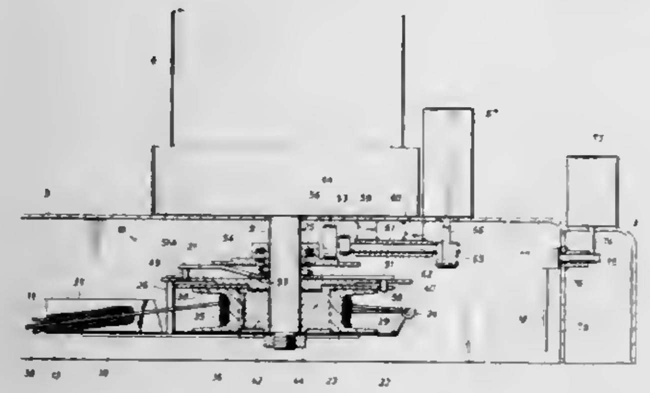
LAWN MOWER WITH MECHANICAL LINE FEED

Robert J. Moore, Fontana, Calif., assignor to Weed Eater, Inc., Houston, Tex.

Filed Jan. 3, 1977, Ser. No. 756,506

Int. Cl.² A01D *53/02*

U.S. Cl. 56—17.5 **40 Claims**



1. A lawn mower for mowing the vegetation growing on turf comprising:

(a) head means rotatable about an axis substantially perpendicular to a cutting plane and having a spool means movably mounted therein;

(b) drive means for rotating said head means about said axis in said cutting plane;

(c) flexible non-metallic line member having a portion carried on said spool means and further having a free end portion extending outwardly of said head means into the cutting plane;

(d) first means for securing said spool means against movement within said head means;

(e) second means for releasing said spool means for movement through an incremental distance within said head means to extend only a discrete incremental length of said line member from said head means and then securing said spool means against movement within said head means; and

(f) third means for actuating said releasing means during rotation of said head means.

4,107,902

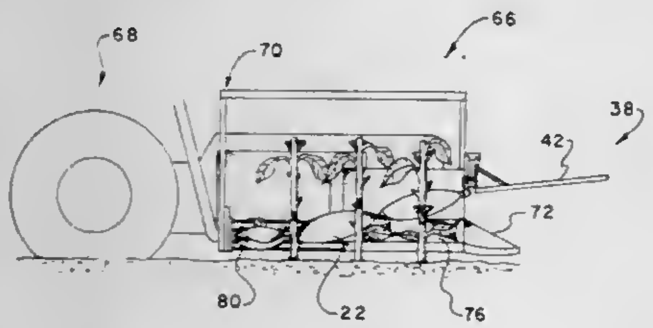
LEAF DEFOLIATOR ASSEMBLY FOR AN AUTOMATIC TABACCO HARVESTER

Charles W. Suggs, 1507 Trailwood Dr., Raleigh, N.C. 27606

Filed Nov. 4, 1976, Ser. No. 738,834

Int. Cl.² A01D *45/16*

U.S. Cl. 56—27.5 **1 Claim**



1. A tobacco harvester unit adapted to be mounted and supported adjacent one side of a tractor, said tobacco harvester unit comprising: a frame structure; rotatively driven leaf defoliation means extending generally longitudinally within said harvester unit and including rear and front ends; lateral conveyor means disposed on each side of said harvester unit generally adjacent the rear areas of said defoliating means, said lateral conveyor means extending on each side of said harvester unit from the rear area of said defoliating means forwardly where the lateral conveyor means terminates generally intermediately between the front and rear ends of said defoliator means; longitudinal conveyor means disposed outwardly adjacent said lateral conveyor means for receiving tobacco leaf material therefrom; and a front stationary leaf receiving panel adjoining said lateral conveyor means on each side of said harvester unit just generally below and adjacent the front portion of said defoliating means, said front stationary leaf receiving panel serving to catch and receive leaves initially defoliated from the upper portion of the target swath during the harvesting operation and wherein tobacco leaves remaining about the lower portion of the target swath act to engage and sweep these received leaves disposed on each of said stationary leaf receiving rearwardly onto said adjacent lateral conveyor means where the leaves are conveyed laterally onto said outwardly adjacent longitudinal conveying means.

4,107,903

FULLY AUTOMATIC DEVICE FOR PACKING PIECE GOODS, IN PARTICULAR FRUITS

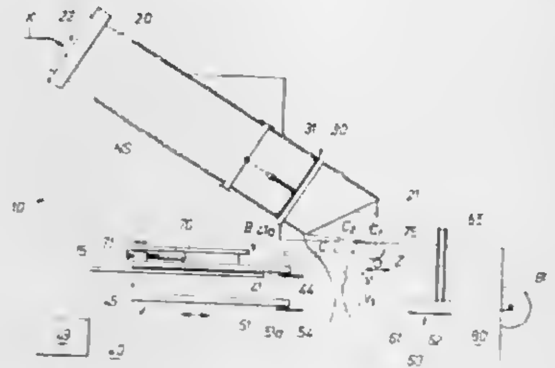
August Wickersheim, Rellingen, Germany, assignor to Wickersbem & Johne Maschinen-und Verpackungsanlagen GmbH, Rellingen, Germany

Filed Feb. 3, 1977, Ser. No. 765,193

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 7602840[U]

Int. Cl.² B65B *61/26, 1/06*

U.S. Cl. 53—138 A **5 Claims**



1. A fully automatic apparatus for packing discrete goods such as fruits, including a machine frame with a filling tube adapted to receive a relatively large supply of a telescopically pushed together mesh type hose material, an assembly associated with said filling tube for restraining said hose material supply during withdrawal of the material from said filling tube, said restraining assembly having a brake ring, an assembly for closing a hose section gathered into the shape of a strand by means of ribbon clips encircling said hose strand to define a bottom closure for a subsequent hose section overlying a filling tube discharge outlet, in combination with means for severing a completed package intermediate the closure points, said closing and severing assembly being arranged downstream from said filling tube relative to the direction of movement of the goods from said filling tube into the hose material, and means controlled by said closing and severing assembly for introducing ribbon shaped portions into the space between said hose strand and the ribbon clips encircling the same during the closing operation and for printing price and/or advertising indicia onto said ribbon shaped portions, wherein the improvement comprises a drive mechanism, a carriage **(40)** movably mounted in said machine frame **(19)** underneath said filling tube **(20)** and coupled to said drive mechanism **(49)** for movement in the horizontal direction, said carriage including a pair of vertically spaced supporting plates **(41, 51)** one positioned above the other, an end portion of each of said supporting plates facing said closing and severing assembly **(60)** with said end portions facing said closing and severing assembly **(41*a*, 51*a*)** each having a hose web take-up recess **(42, 52)** and in the vicinity thereof each having a pair of finger shaped gathering arms **(43, 44; 53, 54)** rotatably mounted about an associated vertical pivot axis **(46, 47; 56 57)** for movement transversely across the associated recess, said closing and severing assembly **(60)** including a closing head **(62)** defining an entry slot **(61)** for said hose web facing toward said take-up recesses in the path of movement **(V1)** of the lower one of said supporting plates **(51)**, the feed track of said lower supporting plate disposed below the feed track **(V)** of the upper one of said supporting plates **(41)**, and the movement of said pair of supporting plates being positively controlled by said carriage drive mechanism during advance movements of said carriage.

4,107,904

MACHINE FOR LOADING FISH IN BOXES

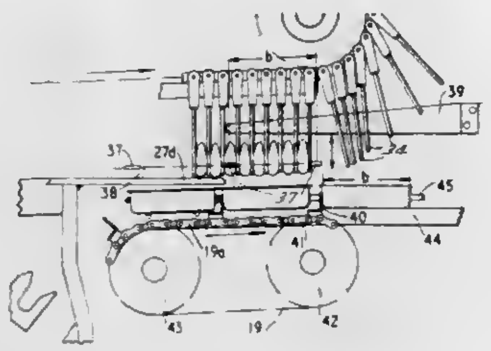
Willy Helgesen, Madla, Norway, assignor to Trio Engineering Ltd., Forus, Norway

Filed Jun. 23, 1977, Ser. No. 809,400

Claims priority, application Norway, Jun. 24, 1976, 762182

Int. Cl.² B65B *5/08, 25/00*

U.S. Cl. 53—142 **18 Claims**



1. A machine for loading fish in boxes which comprises:

(a) a first conveyor supporting a series of transport containers thereon, said first conveyor serving to transfer fish sideways while each is disposed in its respective transport container in a preselected position with the heads of fish in adjacent containers facing in opposite directions and the bellies directed upwards;

(b) cooperating feed means for supplying fish to said transport containers of said first conveyor and a second conveyor for receiving said fish from said first conveyor, said second conveyor having a series of catch devices each adapted to engage its respective fish and effect transfer thereof to an associated box for deposition therein;

(c) means for driving said first and second conveyors at a uniform speed in a continuous circulatory movement, the relative disposition of said conveyors being such that a local region of the path of movement of said catch devices of said second conveyor coincides with a local region of the path of movement of said transport containers of said first conveyor enabling said catch devices to engage their respective fish in their respective transport containers one after each other; and

(d) cooperating, co-travelling check elements adapted to cause said fish to be retained on said second conveyor in groups between corresponding groups of catch devices within a preselected region of the path of movement of said second conveyor between a first position in which the fish are lightly clamped together between the catch devices and a second position in which a group of fish can be transferred to an associated box.

4,107,905

PROCESS AND ARRANGEMENT FOR THE REMOVAL OF THE PACKING FROM PACKED OBJECTS

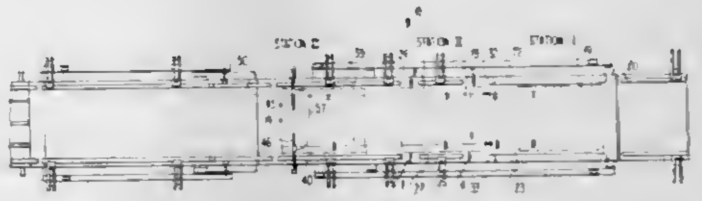
Diethelm W. K. Grocke, and Wilfried Jäger, both of Nuremberg, Fed. Rep. of Germany, assignors to NUTRO Patentverwertungs- und Maschinenhandels GmbH, Nuremberg, Fed. Rep. of Germany

Filed Nov. 22, 1976, Ser. No. 743,838

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1975, 2552163

Int. Cl.² B65B *43/26*

U.S. Cl. 53—3 **9 Claims**



1. A process for the removal of a rectangular foil packing including top, bottom, front, rear and side walls of a package of bottles comprising the steps of:

conveying the package of bottles through several stations on a first horizontal conveyor, step by step,

slitting said foil packing along predetermined cutting lines by automatically controlled cutting apparatus to develop along said cutting lines a foil flap at the top and front of the packing,

turning back said foil flap under the bottom of said foil packing in the direction of transport of said horizontal conveyor, below the conveying plane of said conveyor,

clamping down said turned back foil flap beneath the conveying plane of said horizontal conveyor, and

removing bottles horizontally from the remaining foil packing in the direction of conveyance movement of said horizontal conveyor.

4,107,906

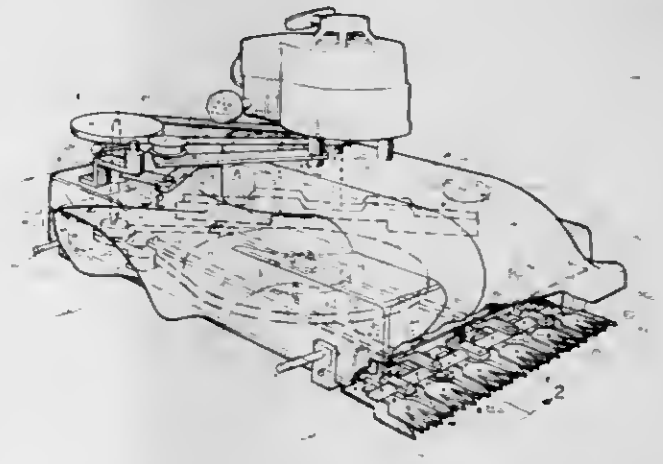
IMPACT ACTUATED LAWN MOWER

Walter F. Cousino, 4830 W. Bancroft, St. Toledo, Ohio 43615

Filed Feb. 16, 1977, Ser. No. 769,206

Int. Cl.² A01D *55/00*

U.S. Cl. 56—246 **4 Claims**



1. An impact actuated lawn mower having a wheel mounted base plate, comprising a plurality of individual pairs of pre-sharpened, permanently assembled scissor-like forked blades secured in overlying pivoted relationship by a rivet, said pairs being arranged in side-by-side aligned relationship across the forward edge of said base plate, one blade of each pair being detachably secured to the forward edge of said base plate, the other blade of each pair of blades being pivotally, reciprocatingly movable across the one blade to produce a cutting action, an actuating bar disposed generally parallel to the alignment of said pairs of scissor-like blades, overlying said blades, and

having a pin and slot connection with each of said movable blades, whereby longitudinal reciprocation of said bar effects concurrent reciprocation of all of said movable blades, a first force transmitting lever disposed generally perpendicular to said actuating bar and having one end thereof pivotally connected to said bar and the other end thereof pivotally connected to a rear portion of said base plate, a second impact lever disposed in laterally spaced, parallel relationship to said first force transmitting lever, said second lever having one end thereof pivotally connected to said actuating bar and the other end thereof pivotally connected to the rear portion of the base plate, an impact wheel lying between and in the same plane as said levers, and mounted on said base plate for rotation about an axis perpendicular to said plane, said impact wheel carrying at least one impact roller on its periphery, each of said levers having a medial portion thereof constructed and arranged to be momentarily impacted by said impact roller carried by said impact wheel during each rotation of said impact wheel, whereby said actuating levers are respectively repeatedly successively impacted by said roller in opposite directions, and means for rotating said impact wheel at relatively high speeds to cause rapidly repeated impacts with said levers to in turn impart rapid intermittent reciprocating movements to said actuating bar, thereby producing rapid intermittent reciprocating movement of said movable blades, with a dwell period of substantial duration interposed between each successive movement of the movable blades.

4,107,907

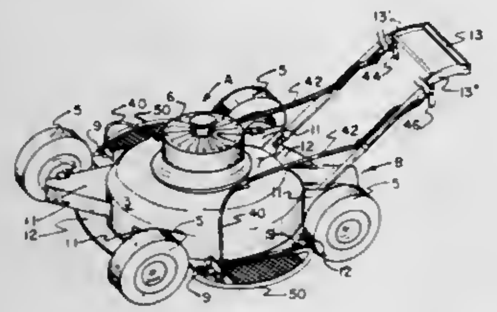
CUTTER BLADE GUARD FOR MOWERS

Harry T. Rutherford, 609 N. Second St., Martinsburg, W. Va. 25401

Filed Aug. 23, 1976, Ser. No. 716,871

Int. Cl.² A01D *75/20*

U.S. Cl. 56—320.2 **2 Claims**



2. In combination, a wheel-supported rotary type mower having a closed top and an open bottom housing, and wheel-supporting means supporting the mower housing being on front and rear axes for allowing a back and forth movement of the mower, and a handle secured to said mower for manipulating said mower in said back and forth movement, a propeller type cutter blade rotatably supported within said housing in a horizontal plane adjacent the bottom of the housing, and means for rotating said cutter blade, a cutter blade guard fixed to the housing in a substantially horizontal plane, the cutter blade guard being in a plane adjacent the bottom of the housing and below the plane of the rotatable cutter blade, the improvement comprising; said cutter blade guard being fixed to at least one side of said housing and having a hinged portion wherein the edge of said hinged portion adjacent the housing extends in a line from front to rear of the side of the mower and in a plane perpendicular to the axes of the wheel-supporting means, hinged means for connecting the said hinged portions to said housing, means for moving the hinged portion of the cutter blade guard between the substantially horizontal and a substantially vertical position and means for remotely operating the moving means.

4,107,908

METHOD AND APPARATUS FOR MANUFACTURING A SPUN YARN FROM ONE OR SEVERAL FILAMENTS

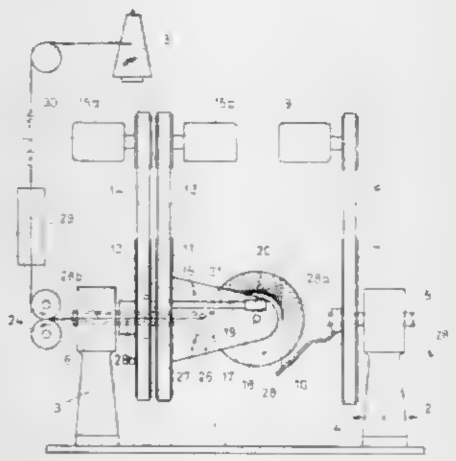
Heinrich Spübler, Oberägeri, Switzerland, assignor to Aktieogesellschaft Fr.Mettler's Söhne, Maschinenfabrik, Switzerland

Filed Jun. 7, 1977, Ser. No. 804,245

Claims priority, application Switzerland, Jun. 15, 1976, 7633/76

Iot. Cl.² D02J *1/00;* D01H *7/00, 7/46;* D02G *3/34*

U.S. Cl. 57—1 R **10 Claims**



1. A device for manufacturing spun yarn, comprising a rotatable disc rotatable about its own central axis, and a spinning head on which said disc is mounted for rotation being rotatable itself about a longitudinal axis at right angles to the axis of said disc, a filament guide member mointed for rotation about the axis of said spinning head and guiding filament onto said disc during rotation of said disc and said spinning head so as to form segmental partly overlapped flat loops on said disc, drive means connected to said spinning head and said disc and said filament guide member to rotate said spinning head and said disc and said guide member at selected speeds, and pickup and conveying means adjacent said disc opposite to said filament guide member for picking up the twisted yarn from said disc and conveying it away from said spinning head as it is twisted by rotation of said spinning head.

4,107,909

APPARATUS FOR SPINNING TEXTILE FIBERS

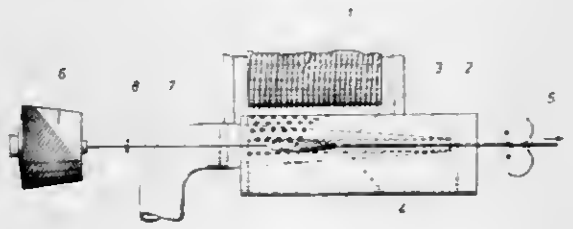
Ernst Febrer; Helmut Fuchs, and Franz Konig, all of Linz, Austria, assignors to Dr. Ernst Febrer Gesellschaft m.b.H. & Co., K.G., Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,587

Claims priority, application Austria, Apr. 8, 1976, 2568/76

Iot. Cl.² D01H *1/12;* D02G *3/36*

U.S. Cl. 57—5 **1 Claim**



1. Apparatus for spinning textile fibers into a spun yarn, which comprises:

(a) two air-permeable suction drums having axes parallel to each other and disposed closely beside each other to define therebetween a tapering gap extending parallel to the axes of the drums, the drums being arranged to rotate in the same sense,

(b) suction means defining on the peripheries of the suction drums respective air-permeable suction zones adjoining the gap and facing each other,

(c) a source of a yarn core positioned adjacent one end of the gap and arranged to supply the yarn core to the gap between the facing suction zones and in a path parallel to the axes, the yarn core being twisted by the rotating drums about its axis in said gap,

(d) means for supplying flying fibers into the gap between the facing suction zones, and

(e) yarn withdrawing means positioned adjacent another end of the gap opposite the one end and arranged to draw off the spun yarn in said path while holding the spun yarn against rotation

(1) whereby the flying fibers and the yarn core are spun into a yarn in the gap between the facing suction zones when the drums are rotated in the same sense.

4,107,910

DOUBLE TWISTING MACHINE

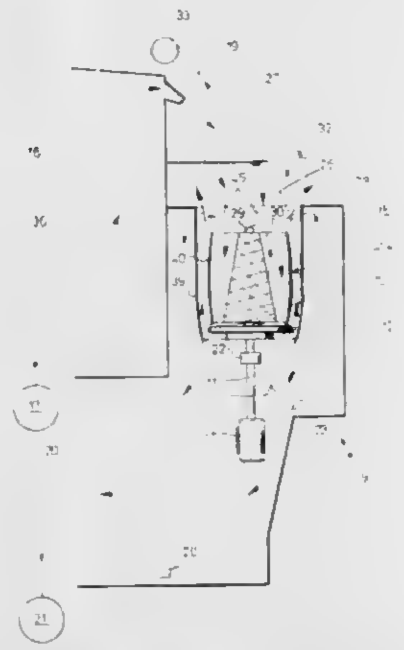
Joachim Fürstenberg, Aichelberg, and Dietmar Heocke, Butzbach, both of Germany, assignors to LTG Lufttechnische GmbH, Stuttgart, Germany

Filed Oct. 4, 1976, Ser. No. 728,968

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2544141

Int. Cl.² D01H *11/00, 13/30*

U.S. Cl. 57—34 R **14 Claims**



1. In a double twisting machine which includes at least one twisting station, said twisting station having a protective container surrounding a payoff bobbin and a turntable for providing thread rotation, the improvement comprising:

nozzle means for supplying air to the vicinity of the top of said protective container, said nozzle means being mounted on said twisting station and supplied with air which is pre-conditioned with respect to at least one of the parameters of temperature and humidity; and

said protective container being provided with an opening in its respective end near said turntable for permitting the flow of at least portions of said pre-conditioned air therethrough.

4,107,911

PNEUMATIC SPINNING APPARATUS

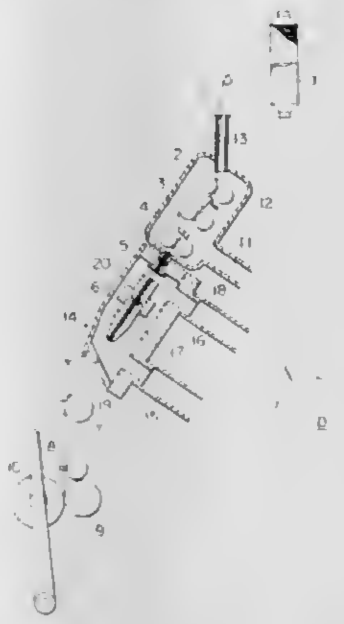
Makoto Yamana, Joyosbi, and Nobunori Kubota, Nagaokakyoshi, both of Japan, assignors to Murata Kikai Kabushiki Kaisba, Kyotoshi, Japan

Filed Jun. 14, 1977, Ser. No. 806,486

Claims priority, application Japan, Jun. 18, 1976, 51-80859[U]; Jun. 23, 1976, 51-83069[U]; Jan. 8, 1977, 52-1142[U]

Int. Cl.² D01H *11/00;* D02G *1/16*

U.S. Cl. 57—56 **7 Claims**



1. A cover means for a pneumatic spinning apparatus comprising a cover having four sides closed and being disposed between a draft zone and nip rollers to cover an entire spinning nozzle zone, and at least one air suction tube connected to the interior of the cover, whereby the air suction tube sucks and removes fly wastes generated from the spinning nozzle zone and is utilized for enhancing the effect of discharging air from the spinning nozzle, said cover comprising a body member and a lid which is connected to the body member by means of a hinge to be freely opened or closed, spinning nozzles are fixed to the body member and said air suction tubes are also connected to the body member.

4,107,912

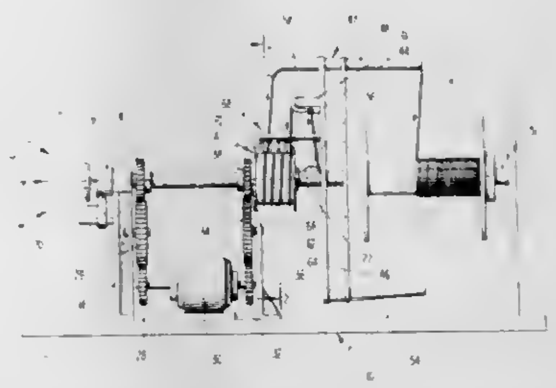
METERING CAPSTAN

William W. Pockman, and Thomas W. Pockman, both of 2872 Quail Hollow Rd., Clearwater, Fla. 33519

Filed May 3, 1977, Ser. No. 793,410

Int. Cl.² D01H *13/04*

U.S. Cl. 57—68 **9 Claims**



1. In combination with a rope making machine in which separate strands of rope are twisted together and drawn through a forming die by a capstan assembly mounted on a frame and then directed by a flyer assembly onto a take-up

spool, the improvement wherein said capstan assembly comprises:

a rotatably disposed single capstan having a smooth cylindrical peripheral wall and a hollow central shaft, said capstan including a radially outwardly extending flange on each end of said peripheral wall to preclude an advancing rope strand from slipping off the ends of said single capstan;

means on said frame cooperating with said single capstan to guide the twisted rope strand from said forming die through said hollow capstan shaft and around the peripheral wall of said capstan;

means on said frame for applying a driving force to rotate said single capstan; and

a separating comb fixedly carried on said flyer assembly with the teeth thereof arranged in a row, said row aligned substantially parallel to the capstan axis with the distal ends of said teeth disposed adjacent the peripheral wall of said capstan such that adjacent windings of the advancing rope strand on said single capstan are engaged at no more than a single point on a side of said strand for each winding and kept separate by the comb teeth and thereby are prevented from overlapping and binding.

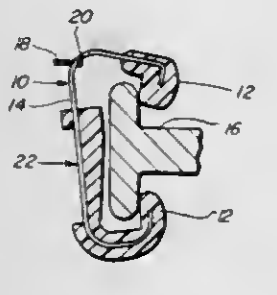
4,107,913
AIR-COOLED TRAVELER

Andrew J. Wayson, Needham, Mass., assignor to Litton Industrial Products, Inc., Hingham, Mass.

Continuation of Ser. No. 547,723, Feb. 6, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,665

Int. Cl.^{2} D01H *7/60*

U.S. Cl. 57—125 **7 Claims**



1. A traveler for use with a spinning ring having a vertical flange,

said traveler having a ring contacting part and a heat conductive yarn contacting part anchored to said ring contacting part,

said ring contacting part comprising a single J-shape whose curved portion is adapted to embrace the lower edge of said vertical flange and guide the traveler about the center of said spinning ring,

said yarn contacting part having a curved yarn guiding portion extending about the upper edge of said vertical flange and a J-shaped anchor portion,

said J-shaped anchor portion being in juxtaposition to said J-shaped ring contacting part on the side facing the center of said ring,

said ring contacting part having means extending toward the center of the spinning ring surrounding only a fractional length of the juxtaposed anchor portion of said yarn contacting part leaving directly exposed to air movement the major portion of the length of said anchor portion adjacent to the area of heat generation in the yarn guiding portion of said yarn contacting part said exposed portion of said anchor portion presenting surfaces exposed to air movement at least in the direction which faces the center of the ring and in oppositely facing directions which are mutually perpendicular to the ring center line and a ring diameter to provide maximum dissipation of frictional heat.

4,107,914
METHOD OF MANUFACTURING TWISTLESS YARN AND YARN OBTAINED BY THIS METHOD

Jacobus Maurits Van Dort, Almelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Continuation of Ser. No. 673,405, Apr. 5, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,932

Claims priority, application Netherlands, Apr. 22, 1975, 7504728

Int. Cl.^{2} D02G *3/40, 3/04*

U.S. Cl. 57—164 **7 Claims**

1. A method of manufacturing twistless or substantially twistless yarn from a stable fibre material, including the sequential steps of:

(a) wetting a sliver or roving of said stable fibre material with a liquid mixture comprising a first portion and a second portion which is a latent solvent for at least a portion of the stable fibre material and which evaporates at a higher temperature than said first portion;

(b) drafting the sliver or roving in a wet condition to form a thinner fibre strand;

(c) false twisting the fibre strand;

(d) heating the strand to an increased temperature so as to remove at least the first portion of said liquid mixture, while leaving at least the second portion;

(e) heating the strand to a further increased temperature so as to activate the latent solvent; and

(f) drying the fibre strand by evaporation of the solvent.

4,107,915
ELECTRONIC TIMEPIECE

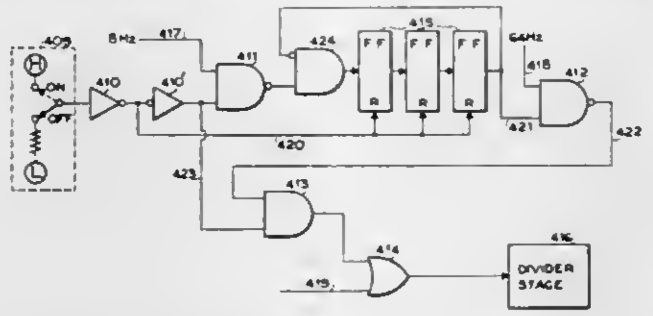
Fukuo Sekiya; Shigeru Morokawa, and Yasushi Nomura, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd, Tokorozawa, Japan

Division of Ser. No. 668,839, Mar. 22, 1976, and a continuation-in-part of Ser. No. 584,821, Jun. 6, 1975, abandoned, which is a continuation of Ser. No. 422,553, Dec. 6, 1973, abandoned. This application Dec. 17, 1976, Ser. No. 751,889

Claims priority, application Japan, Dec. 28, 1972, 47-1802

Int. Cl.^{2} G04C *3/00*

U.S. Cl. 58—23 R **5 Claims**



1. In an electronic timepiece, in combination:

display means for giving a reading of time;

switch means for setting said display means, said switch means being manually operable in a short-duration first mode and a long-duration second mode;

timing means connected to said switch means for distinguishing between said modes;

a source of stepping pulses for changing the reading of said display means; and

circuitry extending from said switch means to said display means for changing said reading at a relatively slow rate by pulses manually generated by operating said switch means in said first mode, said circuitry being controlled by said timing means for connecting said source to said display means in response to operation of said switch means in said long-duration mode for changing said reading at a relatively fast rate by said stepping pulses.

4,107,916
ELECTRONIC WATCH HAVING AN ALARM MEANS

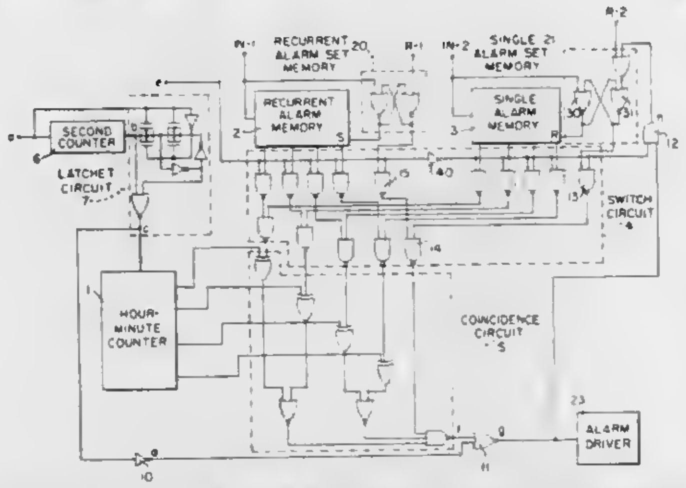
Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisba Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,431

Claims priority, application Japan, Oct. 28, 1975, 50-129578; Oct. 28, 1975, 50-129579

Int. Cl.^{2} G04C *21/00;* **G04B** *23/06, 23/12*

U.S. Cl. 58—38 R **5 Claims**



1. In an electronic alarm watch: a counter for counting a repetitive time signal and for developing a count representative of present time; a first alarm memory for storing a signal representing a first alarm time; a second alarm memory for storing a signal representing a second alarm time; a coincidence detecting circuit connected to receive the contents of said counter for comparing the contents of said counter with another signal applied to said coincidence detecting circuit and for developing an output signal when the compared signals coincide; means for alternately applying the signal stored in said first memory and the signal stored in said second memory to said coincidence detecting circuit to effectuate alternate comparison of the respective signals stored in the memories and the count representative of present time; alarm means responsive to the output of said coincidence detecting circuit for emitting an alarm signal when an alarm time and the present time coincide; and means responsive to the output of said coincidence detecting circuit for clearing said first memory after coincidence between the present time and said first alarm time is detected and for rendering said coincidence detecting circuit ineffective to develop an output signal when the present time passes through zero hours and zero minutes corresponding to the contents of said cleared first memory.

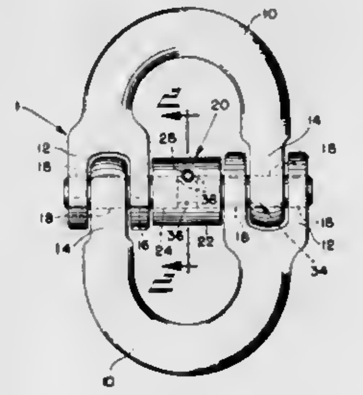
4,107,917
COUPLING LINK LOCKING ASSEMBLY

Richard H. Fink, York, Pa., assignor to Campbell Chain Company, York, Pa.

Filed Sep. 8, 1976, Ser. No. 721,293

Int. Cl.^{2} F16G *15/04*

U.S. Cl. 59—85 **5 Claims**



1. A locking assembly for interconnecting two members having aligned apertures therein comprising a hinge pin having a groove therein inserted through said aligned apertures, retention means to hold the hinge pin in a preselected axial position in which the members are coupled to said hinge pin for interconnection, said retention means including a blind end bore intersecting and aligned with the hinge pin groove when the hinge pin is inserted and a locking pin driven into said blind end bore for partial receipt in said hinge pin groove to effect the couple, with the inserted end of the pin being enclosed by the bind end bore to preclude removal of such locking pin by a reverse driving force.

4,107,918
COMBUSTION ASSEMBLY

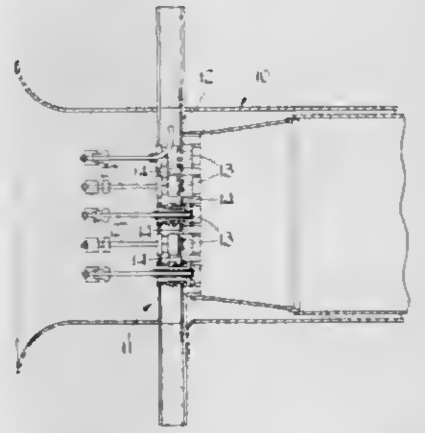
Gordon Edward Andrew, Burnley, and George Edward Bunn, Clitheroe, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 8, 1976, Ser. No. 739,743

Claims priority, application United Kingdom, Nov. 7, 1975, 46152/75

Int. Cl.^{2} F02G *1/00*

U.S. Cl. 60—39.71 **6 Claims**



1. A combustion assembly comprising a plurality of fuel spraying devices, each of which includes a body having air and fuel passages therein and also having at least one outlet communicating with said air and fuel passages so that a mixture of fuel from said fuel passage and air from said air passage is ejected therefrom in use; a baffle plate on which said plurality of fuel spraying devices are mounted with the outlets thereof disposed on a downstream side of the baffle plate with respect to the intended direction of air flow through the assembly in use; and a plurality of air admission apertures through said baffle plate, said apertures being disposed between said fuel spraying devices to ensure substantially uniform mixing of said fuel and air mixture and air passing through said apertures in use, and wherein the body of each fuel spraying device comprises two parts, of which a first, nozzle part contains said at least one outlet and has an abutment which engages the baffle plate on the downstream side thereof and a spigot which extends through an opening in the baffle plate, and a second, collar part is engaged with said spigot, the baffle plate being clamped between the collar part and the abutment on said nozzle part.

4,107,919
HEAT EXCHANGER

Daniel E. Sokolowski, Hinckley, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

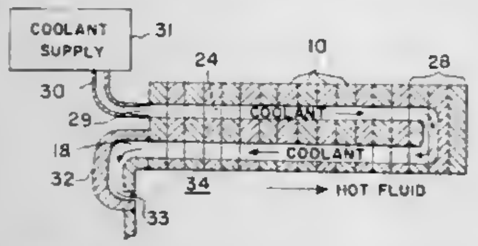
Filed Mar. 19, 1975, Ser. No. 559,847

Int. Cl.^{2} F02K *11/02*

U.S. Cl. 165—169 **21 Claims**

11. A rocket combustion chamber having a closed injector end and an open exhaust end with injector element openings in said closed end and comprising of:

a plurality of thin metal rings stacked and maintained under tension, each ring comprising an inner wall, an outer wall, and fins extending radially between the inner and outer walls, said walls and fins being established by a plurality of cooling channel openings which are no greater than 0.040 inchs in circumferential width; each ring being rotated slightly with respect to the preceding one to establish a plurality of spiral cooling channels;



a first manifold at said open end of the chamber in communication with said plurality of cooling channel openings;

a second manifold at said closed end of the chamber in communication with said plurality of cooling channel openings;

a coolant supply;

means for connecting said first manifold to said coolant supply; and

means for connecting said second manifold to said injector openings.

4,107,920
METHOD OF AND APPARATUS FOR CONTROLLING AIR/FUEL RATIO IN INTERNAL COMBUSTION ENGINE

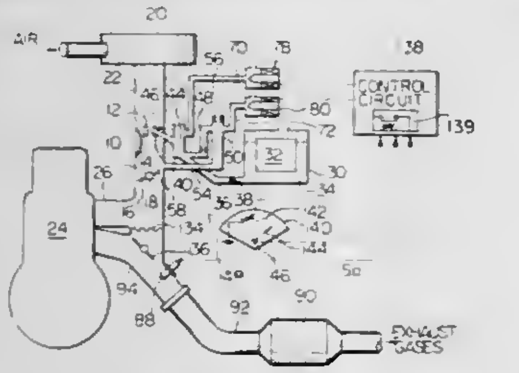
Hidehiro Minami, Yokohama; Kenji Ikeura, and Giichi Shioyama, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 12, 1975, Ser. No. 631,313

Claims priority, application Japan, Nov. 13, 1974, 49-136575[U]; Apr. 10, 1975, 50-48815[U]; Apr. 8, 1975, 50-47519[U]

Int. Cl.^{2} F02B *75/10*

U.S. Cl. 60—276 **1 Claim**



1. In an automotive internal combustion engine having a carburetor including main and low-speed fuel supply circuits connected in use to fuel storage means, an exhaust system, a sensor mounted in said exhaust system for detecting the air-to-fuel ratio of the exhaust gases and for producing a signal representative of the detected air-to-fuel ratio and control means including a control circuit which is electrically connected to said sensor and is operative in response to the signal from said sensor to produce a control signal and solenoid-operated main and low-speed air delivery control valves which are disposed respectively in said main and low-speed fuel supply circuits and are electrically connected to said control circuit, said solenoid-operated control valves being operative in response to the control signal from said control circuit to control the supply of additional air to the fuel in said main and low-speed fuel supply circuits to thereby maintain within a predetermined relatively high range the air-to-fuel ratio of the air-fuel mixture produced in said carburetor, an apparatus for improving the power output characteristics of the engine comprising detecting means for detecting variations of load conditions of the engine, said detecting means including a potentiometer which is operatively connected to a throttle valve of the engine for producing an electric signal in response to high load operating condition of the engine, and additional control means including a normally closed relay which is opened in response to the electric signal from said potentiometer to thereby cut the electrical connection between said solenoid-operated control valves and said control circuit thus causing said solenoid-operated control valves to be closed whereby the air-fuel ratio of the air-fuel mixture produced in said carburetor is altered into a range lower than said relatively high range.

4,107,921
FUEL-INJECTION INTERNAL COMBUSTION ENGINE

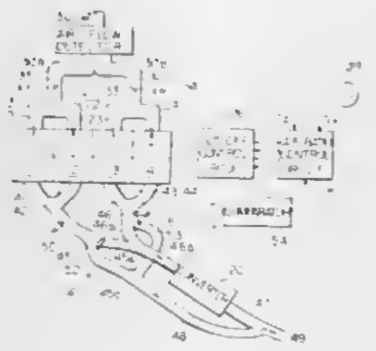
Haruhiko Iizuka, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Mar. 7, 1977, Ser. No. 775,056

Claims priority, application Japan, Mar. 8, 1976, 51-24108

Int. Cl.^{2} F01N *3/15;* F02D *13/06*

U.S. Cl. 60—288 **4 Claims**



1. An automotive multiple-cylinder fuel-injection internal combustion engine comprising:

(1) a plurality of groups of power cylinders each having intake and exhaust ports,

(2) an air intake system including intake passageways each communicating within the intake ports of the power cylinders of each of said groups,

(3) a fuel-injection system including fuel injection nozzles respectively communicating with the intake ports of the power cylinders of said groups,

(4) an exhaust system including (a) exhaust passageways each communicating with the exhaust ports of the power cylinders of each of said groups and (b) first and second branch passageways leading downstream from each of said exhaust passagways,

(5) flow shut-off valve means provided between each of said exhaust passageways and the branch passagways leading from the particular exhaust passageway,

(6) exhaust-gas processing means provided in said exhaust system for cleaning the exhaust gases to be passed therethrough,

the respective first branch passageways leading from said exhaust passageways being communicable downstream with said exhaust-gas processing means and the respective second branch passageways leading from said exhaust passageways by-passing the exhaust-gas processing means,

said flow shut-off valve means having a first condition providing communication between each of said exhaust passageways and said exhaust-gas processing means through the associated first branch passageway and a second condition closing said associated first branch passageway and providing communication between each of the exhaust passageways and the second branch passageway leading from the particular exhaust passageway,

(7) exhaust sensors respectively provided in said exhaust passageways for detecting the concentrations of oxygen in the exhaust gases to be passed through the respective exhaust passageways and thereby producing output signals representative of the respective detected concentrations of oxygen,

(8) comparator means operative to compare the respective output signals from said exhaust sensors with each other for passing therethrough the signal which is representative of the lowest one of said detected concentrations of oxygen;

(9) detecting means for detecting prescribed operational variables of the engine for producing output signals representative of the detected variables,

(10) air-fuel ratio control means responsive to the signals from said comparator means and said detecting means for controlling the air-to-fuel ratio of the air-fuel mixture to be produced in the power cylinders toward a predetermined value;

(11) cylinder cut-off control means operatively connected between said fuel-injection system and said air-fuel ratio control means for controlling the fuel-injection system in such a manner as to interrupt the delivery of fuel from the fuel injection nozzles for the power cylinders of at least one of said groups and thereby having the particular power cylinders held in inoperative conditions when the operational variables represented by said output signals from said detecting means are within said predetermined ranges,

said cylinder cut-off control means being further operatively connected to said flow shut-off valve means for controlling the valve means between the first and second conditions thereof depending upon the signals from said detecting means so that the valve means is in the first condition and in the second condition thereof when the power cylinders of the group communicating with the exhaust passageway which is associated with the particular valve means are in the operative and inoperative conditions, respectively.

4,107,922
EQUIPMENT FOR EXHAUST GAS DETOXIFICATION IN INTERNAL COMBUSTION ENGINES

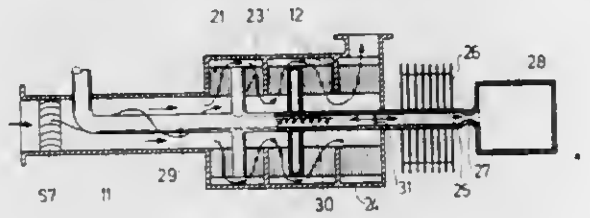
Günter Wössner, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 392,311, Aug. 28, 1973, Pat. No. 3,962,869. This application Feb. 11, 1976, Ser. No. 657,048

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1972, 2243428

Int. Cl.^{2} F01N *3/15*

U.S. Cl. 60—298 **2 Claims**



1. In equipment for exhaust gas detoxification of internal combustion engines of the type that includes an exhaust system with an exhaust manifold and an exhaust pipe and at least one thermal or catalytic reactor within the exhaust system, the improvement comprising: a heat pipe within which a working fluid flows; said heat pipe containing three zones, a first zone serving as an evaporation zone and accepting heat from the exhaust gas, a second zone serving as the transport zone for the transport of the working medium between the first and third zones and a third zone serving as a condensation zone and giving off heat to its surroundings, said condensation zone including at least one secondary, independently operating, heat pipe connected to the condensation zone in the reactor; a radially permeable capillary tube lying within the first mentioned heat pipe such that through and along its interior the working medium flows in a vapor phase towards the condensation zone and along its outside the working medium flows in a liquid phase toward the evaporation zone; and flow-scoops disposed within the exhaust system upstream of the reactor and serving to create a swirl of the exhaust gases for the purpose of improved heat transfer in the reactor.

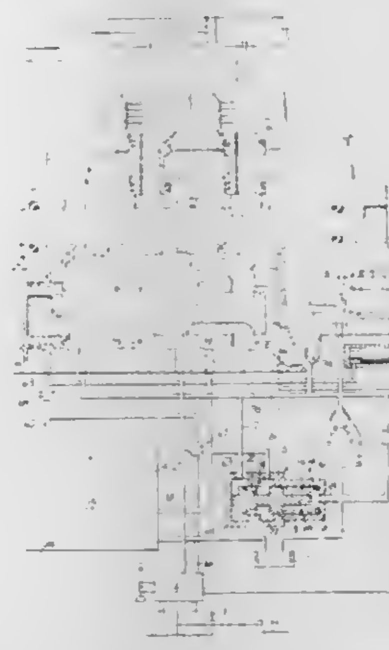
4,107,923
LOAD RESPONSIVE VALVE ASSEMBLIES

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and Ser. No. 655,561, Feb. 5, 1976. This application Aug. 20, 1976, Ser. No. 716,360

Int. Cl.^{2} F15B *13/08*

U.S. Cl. 60—427 **14 Claims**



14. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, outlet fluid conducting means, exhaust means connected to reservoir means and load pressure sensing means operable to transmit a control signal to control means operable to vary flow delivered from said pump to said inlet chamber, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber, said fluid exhaust means and said load pressure sensing means, said first valve means having variable metering orifice means operable to throttle fluid flow between said load chambers and said fluid exhaust means, second valve means interconnecting said fluid inlet chamber and said fluid supply chamber, said second valve means having means responsive to pressure upstream of said variable orifice means and means responsive to pressure in said fluid supply chamber and operable to maintain said pressure upstream of said variable orifice means at a relatively constant predetermined level when said fluid supply chamber is connected to one of said load chambers by said first valve means and said load chamber is pressurized, said second valve means having isolating means to isolate said fluid supply chamber from said fluid inlet chamber when said fluid supply chamber is connected to one of said load chambers by said first valve means and said load chamber is not pressurized and fluid replenishing means to connect said supply chamber with said exhaust means when said isolating means isolates said fluid supply chamber from said inlet chamber.

4,107,924
PUMP UPGRADING SYSTEM

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,901

Int. Cl.^{2} F16H *39/46;* F15B *13/06*

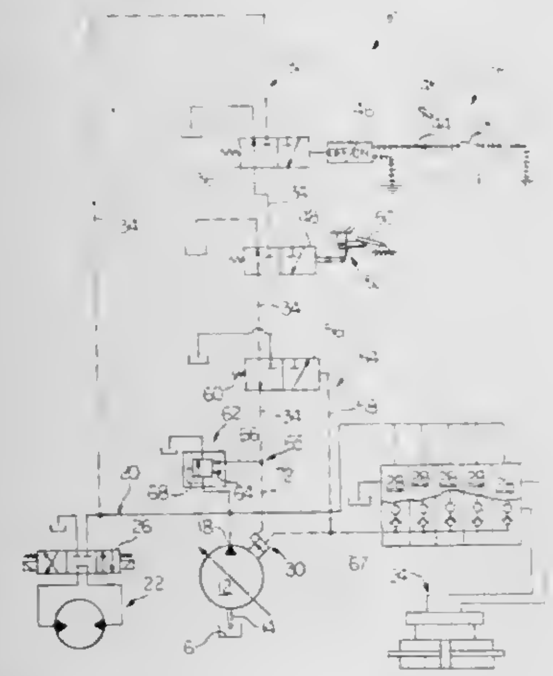
U.S. Cl. 60—445 **27 Claims**

1. A multi-range pressure compensated fluid delivery system

giving pressure compensated output flow over at least two independent pressure ranges, comprising:

a variable displacement pump driven by a prime mover and having an inlet connected to a source of hydraulic fluid and an outlet delivering pressurized fluid;

a fluid delivery circuit connected to said outlet having at least two work circuits selectively connected thereto, a first of said circuits being safely operable up to a first pressure and a second of said circuits being safely operable only up to a second pressure, said first pressure exceeding said second pressure;



an actuator system connected to said pump to control its displacement responsive to a pressure applied thereto;

means for selectively applying a first signal determined by said first pressure to said actuator system to adjust the displacement of said pump; and

means for reducing said first signal to a second signal determined by said second pressure responsive to connection of said second circuit to said fluid delivery circuit and thereby decreasing the operating pressure of said pump.

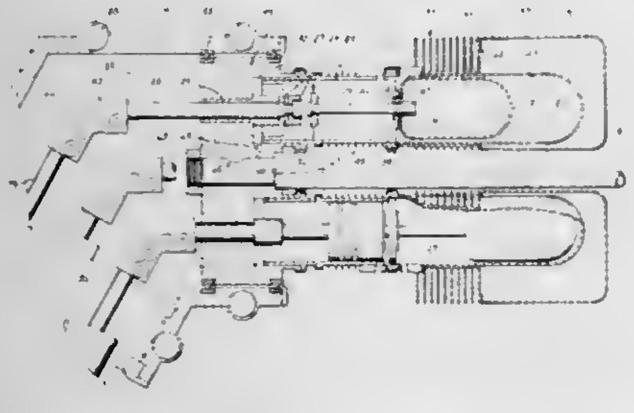
4,107,925
STIRLING ENGINE

Sanders Chapman Watson, 1358 Roller Coaster Rd., Tucson, Ariz. 85704

Filed Mar. 14, 1977, Ser. No. 777,101

Int. Cl.^{2} F02G *1/04*

U.S. Cl. 60—521 **16 Claims**



1. An external combustion engine operating in accordance with the Stirling cycle, said engine comprising in combination:

(a) a first cylinder bank comprising four cylinders symmetrically disposed about a first centrally located longitudinal axis of said first bank and a first cylinder lock disposed at the lower end of said first cylinder bank for rigidly securing the lower end of each of said cylinders;

(b) a second cylinder bank comprising four cylinders symmetrically disposed about a second centrally locaed longitudinal axis of said second bank and a second cylinder block disposed at the lower end of said second cylinder bank for rigidly securing the lower end of each of said cylinders;

(c) means for dividing each of said cylinders into a displacer cylinder in axial alignment with a power cylinder to prevent gas flow between said displacer cylinder and said power cylinder, each of said displacer cylinders and said power cylinders having an upper portion and a lower portion;

(d) a power piston disposed in each said power cylinder of said cylinders in said first and said second cylinder banks;

(e) a displacer piston disposed in each said displacer cylinder of said cylinders in said first and said second cylinder banks;

(f) first means for rigidly connecting in spaced relationship each axially aligned displacer piston and power piston within each respective one of said cylinders in said first cylinder bank;

(g) second means for rigidly connecting in spaced relationship each axially aligned displacer piston and power piston within each respective one of said cylinders in said second cylinder bank;

(h) first crossover means for permitting gas flow between each of said power cylinders in said first cylinder bank and an adjacent one of said displacer cylinders;

(i) second crossover means for permitting gas flow between each of said power cylinders in said second cylinder bank and an adjacent one of said displacer cylinders;

(j) means for heating the upper portion of each of said displacer cylinders;

(k) means for dissipating heat from the lower portion of each of said displacer cylinders and for reducing the heat transfer from the upper portion of said displacer cylinders to said power cylinders;

(l) vee transmission means for converting the reciprocating movement of said displacer pistons and said power pistons into rotational motion of said first and said second cylinder banks, said vee transmission means comprising:

i. a transmission housing for rotatably mounting said first and said second cylinder blocks and for maintaining a fixed angle between the first and the second longitudinal axes of said first and said second cylinder banks;

ii. a first group of four shafts each said shaft being slidably mounted within said first cylinder block and axially aligned with one of said first connecting means, each said shaft having a first end extending from said first cylinder block and a second end rotatably coupled to one of said power pistons within said first cylinder bank;

iii. a second group of four shafts each said shaft being slidably mounted within said second cylinder block and axially aligned with one of said second connecting means, each said shaft having a first end extending from said second cylinder block and a second end rotatably coupled to one of said power pistons within said second cylinder bank;

iv. means positioned within said transmission housing for rigidly coupling the first end of each said shaft in said first group to an aligned one of the first end of said shafts in said second group; and

(m) power coupling means for transmitting the rotational motion imparted by at least one of said first second cylinder blocks to a point remotely located from said engine.

4,107,926
BRAKE BOOSTER

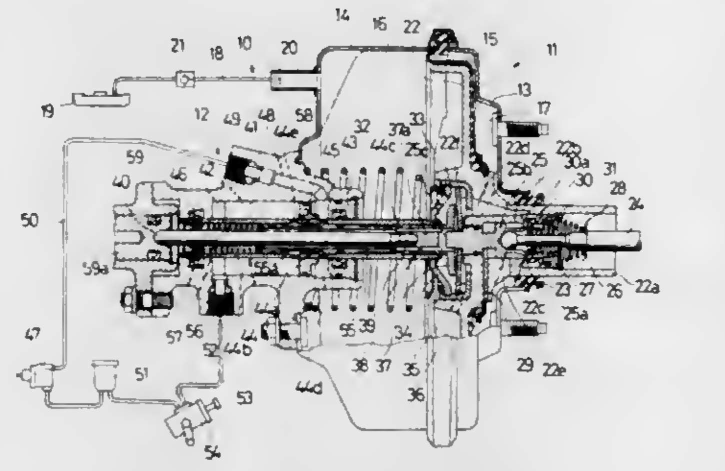
Yoshiharu Adachi, Gamogouri, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 20, 1976, Ser. No. 688,246

Claims priority, application Japan, Jun. 17, 1975, 50-73504

Int. Cl.^{2} B60T *13/12*

U.S. Cl. 60—548 **7 Claims**



1. A brake booster assembly with a master piston reciprocable in a master cylinder, the booster assembly comprising:

a differential air-vacuum pressure operated booster section including a first power piston, an input member operatively connected with a brake pedal, a first valve means actuated by said input member so as to thereby create a differential fluid pressure which actuates said first power piston, and an output means operatively connected to said first power piston so as to generate a master cylinder output pressure;

a hydraulic pressure operated booster section including a second power piston, means for mechanically and rigidly connecting said first and second power pistons so as to effect the movement of both of said power pistons as one body at all times, and a second valve means actuated by said input member so as to thereby create a differential hydraulic pressure which actuates said second power piston;

a delay means for delaying the actuation of said second valve means so as to commence the hydraulic booster operation after said air-vacuum booster section reaches its run-out condition; and

a common reaction mechanism for both of said booster sections interposed between said first power piston and said input member for causing reaction movement and operation of said output means by said first and second power pistons through said reaction mechanism, said output means including an output rod abutting said master piston and movable relative to both, the first and second power pistons.

4,107,927
EBULLIENT COOLED TURBOCHARGER BEARING HOUSING

Phillip B. Gordon, Jr., Washington, and Keats E. Hunt, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1976, Ser. No. 745,743

Int. Cl.^{2} F02B *37/00*

U.S. Cl. 60—605 **6 Claims**

1. In a turbocharged, internal combustion engine system, the combination of:

a liquid cooled, internal combustion engine;

a heat exchanger for cooling the liquid from the engine;

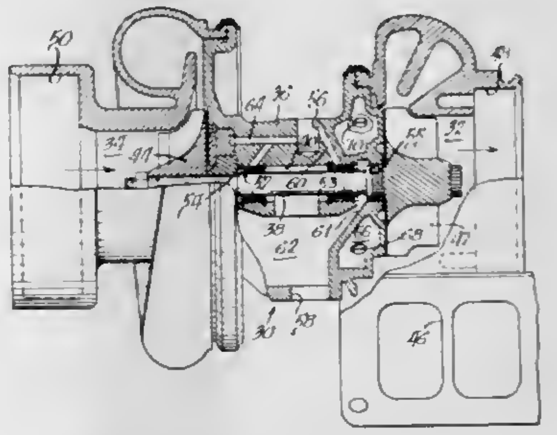
a turbocharger including a rotary turbine and a rotary compressor, housings containing the turbine and the compressor, a shaft interconnecting the turbine and the compressor and bearings journalling the shaft within the housing adjacent the turbine;

means for directing exhaust gases from said engine to said turbine to drive the same;

means for directing air from said compressor to the engine;

a liquid passage in said housing operatively interposed between said turbine and said bearings and having a lower inlet and an upper outlet;

means for directing liquid coolant from said engine to said inlet; and



means for directing coolant from said outlet to said heat exchanger whereby thermosiphoning of said coolant through said passage will occur when said engine is not operative and ebullient cooling of said housing immediately adjacent said bearings will occur to the presence of liquid in said passage to thereby prevent excessive heat buildup in said housing even when said engine is not operative and thereby prevent thermal damage to said bearings.

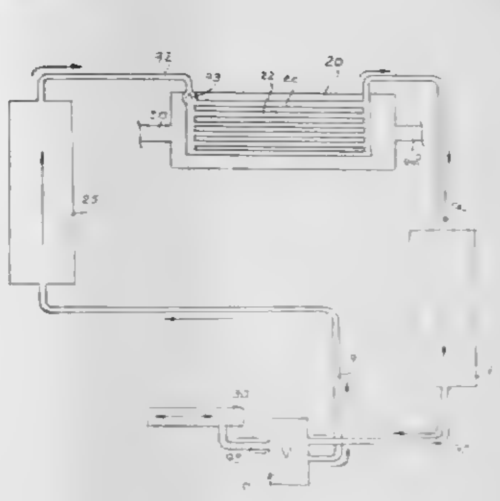
4,107,928
THERMAL ENERGY METHOD AND MACHINE

John C. Kelly, and Brian D. Pardo, both of Reno, Nev., assignors to American Solar King Corporation, Waco, Tex.

Continuation-in-part of Ser. No. 604,017, Aug. 12, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,457

Int. Cl.^{2} F03C *1/00*

U.S. Cl. 60—650 **15 Claims**



1. The method for utilization of thermal energy from a fluid comprising:

pumping fluid containing thermal energy into a container having a heat exchanger therein with a working fluid which flows into and out of said heat exchanger and in an isolated part of the heat exchanger;

discontinuing the flow of fluid containing thermal energy to said container and pumping a second fluid having a different amount of thermal energy to the same container;

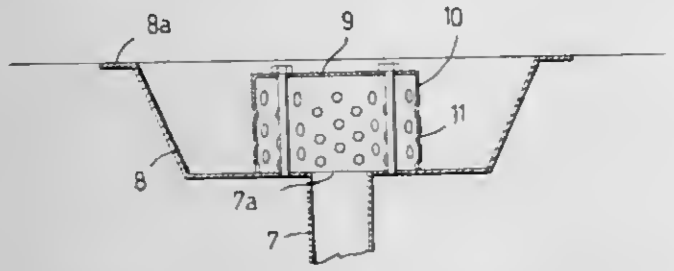
causing the working fluid to be introduced into at least one hydraulic cylinder;

causing the piston within said hydraulic cylinder to move by reason of the introduction of the working fluid therein; and utilizing the movement of the piston to provide mechanical energy.

4,107,929
RAIN WATER ROOF OUTLET OR SIMILAR FOR A BUILDING

Martii Olavi Aladar Ebeling, and Risto Waldemar Lundén, both of Helsinki, Finland, assignors to Kontekla Oy, Helsinki, Finland

Filed Jun. 20, 1977, Ser. No. 808,349
Int. Cl.^{2} E02B *5/08, 9/04*
U.S. Cl. 61—14 **1 Claim**

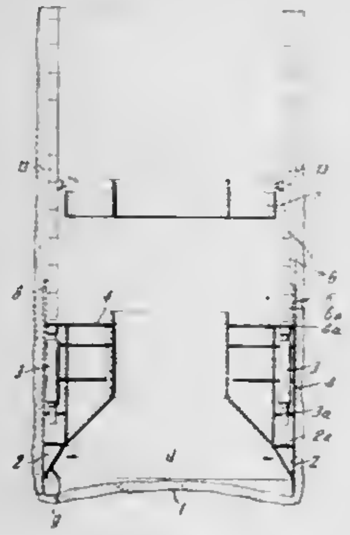


1. A rain water roof outlet for a building, comprising an outlet pipe leading from a roof or some other collecting area to a discharge point, said pipe having a mouth at its upper end, a trough connected to the upper end of said pipe, said trough being wider than the mouth of the pipe, the free upper edge of said trough being located at a higher level than the mouth of said outlet pipe, a lid provided with a closed top surface and fastened above said mouth, said lid being wider than the mouth but smaller than the trough, the lower edge of said lid being located below the upper edge of the trough to prevent the formation of an air whirl in the outlet pipe while the trough is filled with water, and a sieve extending from and about the periphery of said lid and extending between said lid and the bottom of said trough, said sieve surrounding the mouth of the outlet pipe and being provided with perforations, characterized in that the relation between the total area of the perforations of the sieve and the cross-sectional area of the outlet pipe is between 2.5 and 3.5.

4,107,930
METHOD AND APPARATUS FOR SINKING SHAFTS

Theodor Thiehofe, Essen, Fed. Rep. of Germany, assignor to Gewerkschaft Walter, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 720,096
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544834
Int. Cl.^{2} E21D *1/06*
U.S. Cl. 61—41 R **9 Claims**

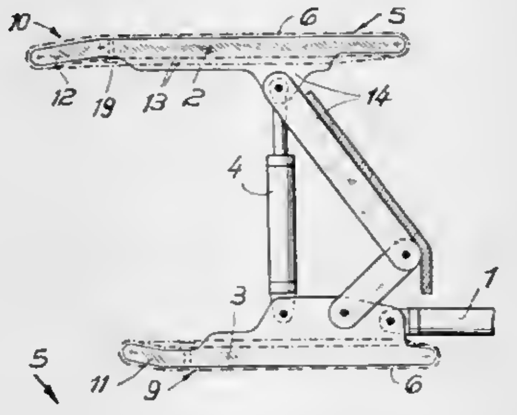


1. A method of sinking shafts particularly in unstable ground, comprising placing an open ended annular shield in a vertical position with its open end positioned into the ground and advancing the shield into the ground, controlling the advancing speed of the driving shield by varying the size of the opening within of the shield to reduce the speed with reduction in the opening area and as a function of the nature of the ground, and lining the excavated shaft behind the shield as it is advanced.

4,107,931
PROGRESSIVE TIMBERING DEVICE

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Germany, assignors to Halbach & Braun, Germany Germany

Filed Jul. 11, 1977, Ser. No. 814,839
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633799
Int. Cl.^{2} E21D *15/44*
U.S. Cl. 61—45 D **10 Claims**



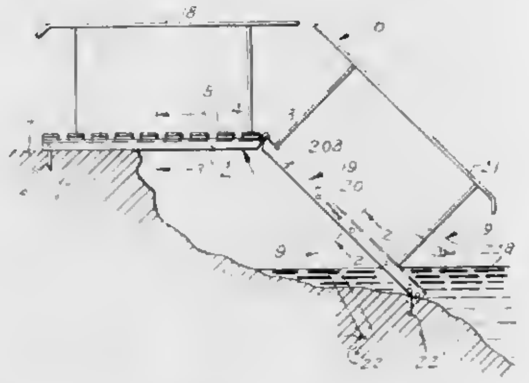
1. A progressive timbering device, comprising a ridge plate, a sill disposed beneath said ridge plate, a fluid pressure operated pressing cylinder and piston combination disposed between said sill and said ridge plate, at least one of said sills and said ridge plates having an endless track guideway extending around the top and bottom and ends thereof, and an endless track engaged in said guideway and projecting outwardly of the associated one of said sills and said ridge plates, said endless track comprises an endless chain having vertical and horizontal links and including vertically extending engaging humps on said horizontal links between which the vertical links are supported and which project upwardly on the top reach of said chain and downwardly on the bottom reach of said chain, said associated ridge plate and sill having accommodating recesses for the vertical links on both the bottom and top surfaces thereof, the top surface of the associated ridge plate and sill having a hard slide surface over which the horizontal links move.

4,107,932
PORTABLE DOCK

Seals R. Cantrell, P.O. Box 679, Cedartown, Ga. 30125

Filed Aug. 24, 1977, Ser. No. 827,162
Int. Cl.^{2} E02B *17/00*
U.S. Cl. 61—48 **1 Claim**

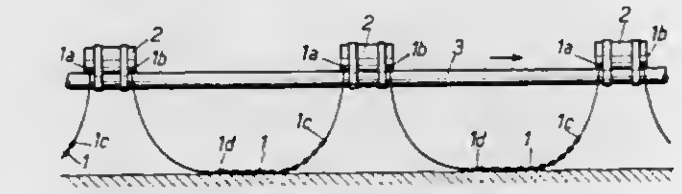
1. A portable dock, comprising, in combination, a platform body and a ladder, hinge means between one end of said platform body and one end of said ladder, an opposite end of said platform body and an opposite end of said ladder, each having a plurality of anchor pins, said platform body being comprised of a pair of parallel spaced-apart channels, a plurality of parallel, spaced-apart slats supported on said channels, and an upwardly extending hand rail along each side of said platform body; said ladder being comprised of a pair of parallel spaced-apart channels, supporting a plurality of transverse extending rungs therebetween, a removable hand rail along each side of said ladder, and said hinge means comprising a transverse extending extension bar across the first said end of said ladder, said extension being receivable in a slot in an end of each said channel of said platform body, said extension being removable from said slots, and said ladder channels being slidable within said channels of said platform body.



4,107,933
APPARATUS AND METHOD FOR TOWING A PIPELINE IN A BODY OF WATER

Jacques Ednuard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

Filed May 17, 1977, Ser. No. 797,697
Claims priority, application France, Jun. 4, 1976, 76 17023
Int. Cl.^{2} F16L *1/00*
U.S. Cl. 61—107 **17 Claims**

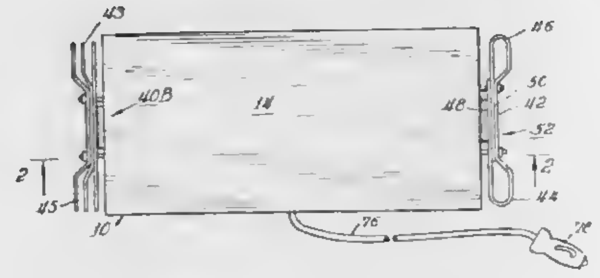


10. In a method of towing a submarine pipeline in a body of water to a point at which it is to be laid on the bed of a body of water, said pipeline having a positive buoyancy and being equipped with trail-ropes distributed along its length so that the pipeline is maintained a certain distance above the bed with the trail-ropes dragging on the bed, the improvement which comprises attaching at least some of said trail-ropes to the pipeline at two points spaced apart therein so that the part of the trail-ropes that drags on the bed is maintained substantially parallel to the longitudinal axis of the pipeline and thereby resisting drift by a transverse current.

4,107,934
PORTABLE REFRIGERATOR UNIT

Shlomo Beitner, Tel-Aviv, Israel, assignor to Bipol Ltd., Tel-Aviv, Israel

Filed Jul. 26, 1976, Ser. No. 708,569
Int. Cl.^{2} F25B *21/02;* **F25D** *3/08;* **F28F** *7/00*
U.S. Cl. 62—3 **15 Claims**

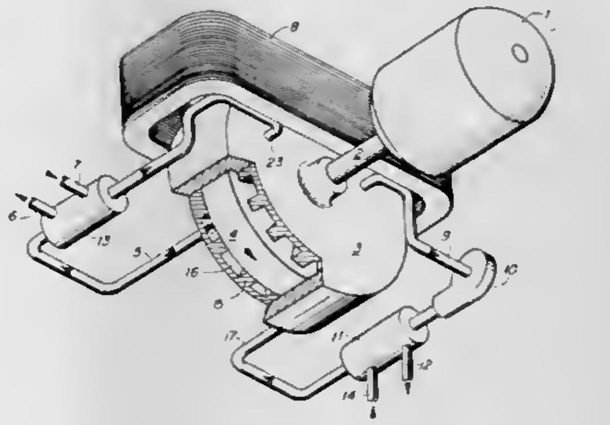


1. A portable refrigerator unit cooled by a thermoelectric element of the Peltier type having hot and cold faces, which comprises an insulated wall, an internal thermal sink imbedded in said insulated wall, having a relatively large portion and a relatively small portion having a face free of said insulating material, a thermoelectric element having its cold face in heat-transfer contact with the free face of said internal thermal sink and the cold portion thereof imbedded in said insulated wall, a heat-dissipating means having an external thermal sink in heat-transfer contact with the hot face of said thermoelectric element, said heat-dissipating means and said hot face being spaced from said insulated wall, and fastening means extending from the relatively large portion of said internal thermal sink through said insulating material to said external thermal sink, for fastening the two thermal sinks together and placing the thermoelectric element in compression between them.

4,107,935
HIGH TEMPERATURE REFRIGERATOR

William A. Steyert, Jr., Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,381
Int. Cl.^{2} F25B *21/02*
U.S. Cl. 62—3 **18 Claims**



1. A high temperature magnetic refrigerator capable of a temperature range of refrigeration load from 2 K to 400 K and operating at a Carnot efficiency of greater than 70% comprising in combination:

(a) motor and shaft means for rotating a wheel, said wheel contained in a housing,
(b) surrounding a portion of the housing is situate a superconducting magnet with a field strength of about 7 Telsa, and wherein the wheel rotates in and out of this magnetic field,
(c) said wheel having a rim composed of a permeable rare earth with inlet and outlet means positioned on the said rim's outer periphery, and
(d) by means of a pump a fluid is circulated within the said housing and is in thermal contact with the rim by passing back and forth by means of multiple separators through the said rim, and then flowing through a refrigeration load and heat exchanger by means of the said inlet and outlet.

4,107,936
CENTRIFUGAL AIR CONDITIONER

Donald Wayne Felder, 837 Hillside Dr., Sherman, Tex. 75090

Filed Jan. 6, 1977, Ser. No. 757,458
Int. Cl.^{2} F25B *9/02*
U.S. Cl. 62—5 **6 Claims**

1. A centrifugal air conditioner comprising:

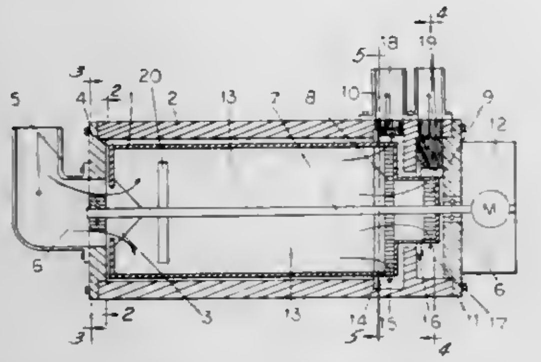
(a) an elongated, hollow cylinder including a cylindrical air chamber having at one end an air inlet port, and having an opposite outlet end portion,
(b) a shaft fixed to and extending coaxially through said cylinder,
(c) journal means mounting said shaft for rotary movement,
(d) a plurality of vanes fixed to, and circumferentially spaced

about, said shaft, said vanes extending substantially the length of said cylindrical chamber and projecting radially from said shaft to the cylindrical wall of said chamber,

(e) a disc-shaped baffle fixed to said shaft closer to said inlet port than said outlet end portion, said baffle intersecting said vanes and having a radius less than the radius of said cylindrical chamber to separate said air chamber into a pumping chamber adjacent said inlet port and a vortex chamber adjacent said outlet end portion,

(f) discharge means at the outlet end portion of said cylinder for separately discharging air of different temperatures from said air chamber, and

(g) means for rotatably driving said shaft.



4,107,937

METHOD OF AND APPARATUS FOR THE DEEP FREEZING OF BIOLOGICAL SUBSTANCES

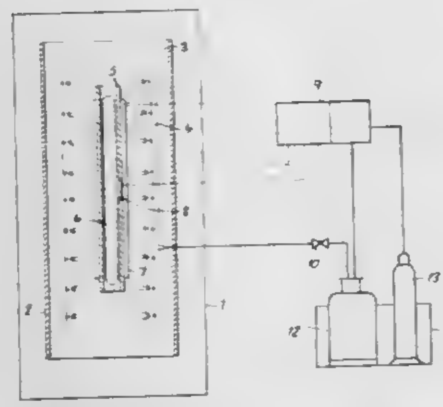
Horst Chmiel, Leonberg, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 21, 1976, Ser. No. 752,930

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557870

Int. Cl.² F25D *17/02*

U.S. Cl. 62—64 **11 Claims**



1. A process for the deep freezing of biological substances which comprises the steps of:

enclosing the biological substance to be deep frozen in a bioreceptacle; determining the temperature-time curve for the outer wall of said bioreceptacle which corresponds to the temperature gradient necessary to freeze all of said biological substance within the receptacle with an effective cell survival rate and

subjecting the bioreceptacle to heat exchange with a fluid coolant at a temperature sufficient to deep freeze said biological substance while controlling the temperature applied to the outer surface of said bioreceptacle as a function of time to conform to said temperature-time curve whereby the biological substance within the receptacle is subjected substantially exactly to said temperature gradient.

4,107,938

METHOD OF AND APPARATUS FOR COOLING A COOKED CONFECTIONERY

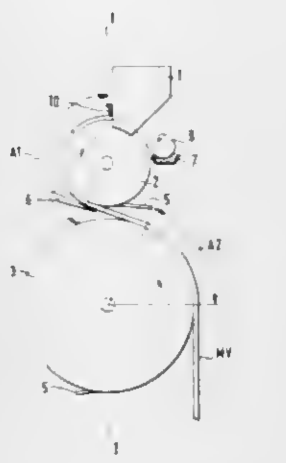
Helmut Sollich, Kalletal, Germany, assignor to Sollich KG, Bad Salzuflen, Germany

Filed Jul. 14, 1976, Ser. No. 705,131

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534131

Int. Cl.² A23G *3/12;* **F25C** *1/14*

U.S. Cl. 62—71 **4 Claims**



1. A method for cooling a cooked confectionery mass, comprising:

continually depositing a thin sheet of hot confectionery mass onto the upper side of a cooling cylinder rotating about a horizontal axis, the cooling temperature of the cylinder, the speed of revolution of the cylinder and the rate of deposition by weight of the mass being so chosen as to provide sufficient cooling of the side of the mass in contact with the cylinder for the sheet of confectionery mass to detach itself and drop off the bottom part of the cylinder by force of gravity, the other side of the mass remaining substantially uncooled; and

providing a second cooling cylinder positioned below the first cylinder and rotating in a direction opposite therefrom, in such a position as to receive the sheet of mass which has dropped off of the first cylinder, with the uncooled side of the sheet of mass in contact with the surface of the second cooling cylinder, and to carry the sheet of mass along the circumference thereof, the cooling temperature and the speed of rotation of the second cooling cylinder and the size and position thereof relative to the first cooling cylinder being chosen as to provide sufficient cooling of the mass to completely cool the confectionery mass to the temperature required for further processing.

4,107,939

APPARATUS FOR REDUCING EXTERIOR CONDENSATION IN AN AIR CONDITIONER

Theodore S. Bolton, Liverpool, and Charles N. High, Cazenovia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,873

Int. Cl.² F25B *47/00;* **F25D** *17/06*

U.S. Cl. 62—89 **5 Claims**

1. An air conditioning unit which prevents exterior condensation from forming on the unit being divided by a partition into an evaporator section containing an evaporator on which condensation is formed and a condenser section containing a condenser and a rotatable condenser fan and the unit having a motor to rotate the fan, comprising:

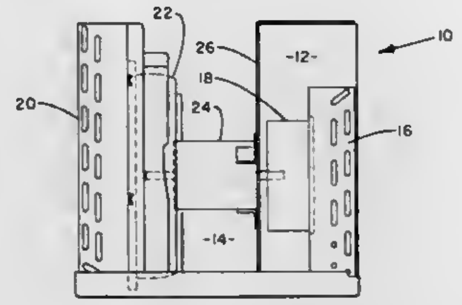
a base pan which defines a reservoir in the condenser section of the unit;

fluid transfer means from the evaporator section to the reservoir; and

a condenser fan shroud which divides the reservoir into two parts and which has sluiceways communicating with the reservoir located in the condenser fan shroud, whereby air pressure differentials resulting from fan rotation cause the condensation in the reservoir to circulate through the sluiceways eliminating pockets of cold condensation.

4. The method of preventing exterior condensation in an air conditioning unit, said unit being divided by a partition into an evaporator section containing an evaporator on which condensation is formed and a condenser containing a condenser and a rotatable condenser fan, and the unit having a motor to rotate the fan, which comprises:

locating a reservoir in the condenser section of the unit;



transferring condensate from the evaporator to the reservoir;

dividing the reservoir into two parts with a condenser fan shroud containing an opening for the condenser fan; and

providing sluiceways in the condenser fan shroud communicating with the reservoir whereby air pressure differentials resulting from rotation of the fan cause the condensation in the reservoir to circulate within the reservoir and through the sluiceways eliminating pockets of cold condensation.

4,107,940

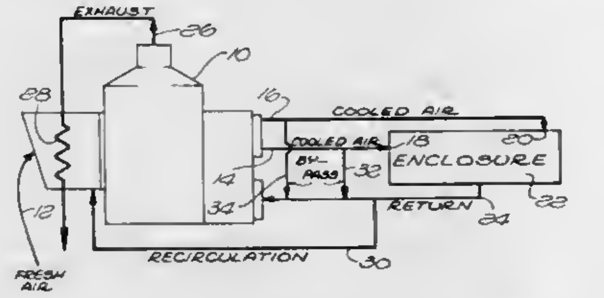
EVAPORATIVE REFRIGERATION SYSTEM

Leslie A. Schlom, 5524 Saloma Ave., 91411; Michael B. Dubey, 5518 Saloma Ave., both of Van Nuys, 91411, and Andrew J. Becwar, 818 Old Landmark La., La Canada, all of Calif. 91011

Division of Ser. No. 601,873, Aug. 4, 1975, Pat. No. 4,023,949. This application Feb. 7, 1977, Ser. No. 766,304

Int. Cl.² F28C *1/00;* **F28D** *5/00;* **F02M** *15/00;* **F24F** *3/12*

U.S. Cl. 62—121 **12 Claims**



1. A method of applying cooled fresh air to an enclosure utilizing air returned therefrom as a working fluid, comprising:

applying vaporizable liquid to first exposed surfaces of heat exchange walls having opposite first and second exposed surfaces to moisten said first exposed surfaces;

flowing return air from said enclosure over said moistened first exposed surfaces, as at least the majority of air flowing over said first surfaces, to evaporate said liquid by abstracting heat from said members to thereby cool said second surface and moisten said return air;

discharging said moistened return air to a position outside said enclosure;

flowing fresh air from outside said enclosure into thermal conductive contact with said cooled second exposed surfaces, as the majority of air flowing into said contact, to cool said fresh air; and

conducting at least a portion of said cooled air to said enclosure.

4,107,941

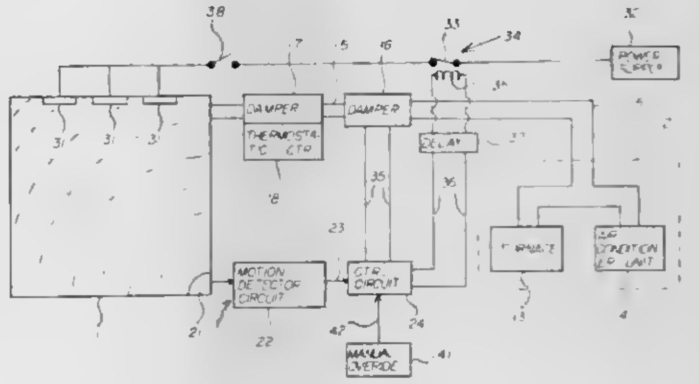
ENVIRONMENTAL CONTROL SYSTEM

Stuart R. Hamilton, 3 Bent Hill Dr., Framlogham, Mass. 01701

Filed Nov. 28, 1975, Ser. No. 636,075

Int. Cl.² F25D *17/04*

U.S. Cl. 62—186 **7 Claims**



1. An environmental control system comprising:

an enclosure for accommodating human activities;

an environmental conditioner means for inducing change in the natural environmental temperature conditions within said enclosure;

human presence detector means for distinguishing between the presence or absence of humans within said enclosure; and

thermostatic control means for causing said conditioner means to establish a given temperature in said enclosure in response to detection of any human presence by said detector means and an override control means to establish a substantially different temperature in said enclosure in response to a total evacuation of the enclosure as detected by said detector means.

4,107,942

COOLING SYSTEM

Stanley W. Fairman, 8780 E. McKellips Rd., #111, Scottsdale, Ariz. 85257

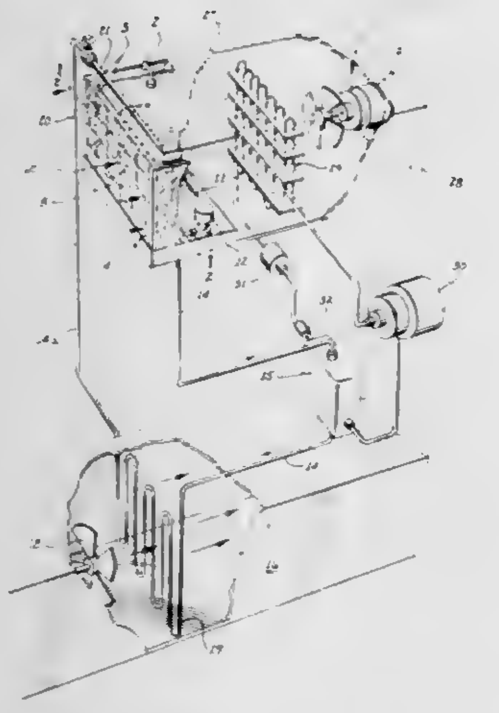
Filed Mar. 31, 1977, Ser. No. 783,107

Int. Cl.² F28D *5/00*

U.S. Cl. 62—305 **9 Claims**

1. A habitation cooling system comprising the combination of a compression refrigeration system; an evaporative cooler, having means for evaporating water by contact with moving air whereby said air and water are cooled; means for moving

air cooled by said evaporative cooler over the condenser of said refrigeration system; means for transferring heat from the air in the habitation to the cooled water without bringing the air and the water into direct contact.



4,107,943

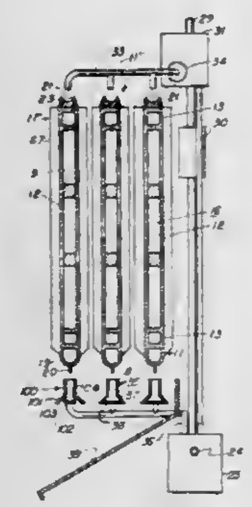
FREEZING APPARATUS AND METHOD

Robert S. Ohling, San Jose, Calif., assignor to Acoolco Corporation, Watsonville, Calif.

Filed Jun. 2, 1975, Ser. No. 583,196

Int. Cl.^{2} F25C *5/02*

U.S. Cl. 62—320 **26 Claims**



1. A freezing unit comprising

(a) at least one evaporator assembly with two freezing faces positioned to be substantially vertical, said freezing faces being planiform surfaces having connected at the periphery thereof an annulus defining a contained volume that runs along a substantial portion of the periphery of said freezing faces and with said freezing faces forms an enclosed central chamber, said chamber being interruptably connected to the contained volume of said annulus,

(b) guide means being connected to said assembly for guiding liquid from said freezing faces,

(c) trough means being mounted on said assembly to deliver liquid across said freezing faces,

(d) liquid delivery means for delivering liquid to said trough means, and

(e) recipient trough means positioned to receive liquid draining from said guide means and to discharge said liquid to said liquid delivery means, the recipient trough means having breaker portions comprised of substantially planer surfaces positioned at an angle to the path of the sheets of frozen liquid released from said freezing faces so that said sheets fall into contact with said planar surfaces and are broken into fragments.

17. A freezing unit comprising

(a) at least one evaporator assembly with two freezing faces, said freezing faces being planiform surfaces, and said freezing faces having connected therebetween an outer annulus having a contained volume that runs along a substantial portion of the periphery of the freezing faces and with said freezing faces forms a central chamber, said chamber being interruptably connected to the contained volume of said annulus,

(b) guide means being connected to said assembly for guiding liquid from said freezing faces,

(c) trough means being mounted on said assembly to deliver liquid across said freezing faces,

(d) liquid delivery means for delivering liquid to said trough means, and

(e) recipient trough means positioned adjacent to said evaporator assembly to receive liquid draining from said guide means and discharging the liquid to said liquid delivery means, the recipient trough having breaker portions comprised of substantially planar surfaces positioned at an angle to the path of the sheets of frozen liquid released from said freezing faces so that said sheets fall into contact with said planar surfaces and are broken into fragments.

4,107,944

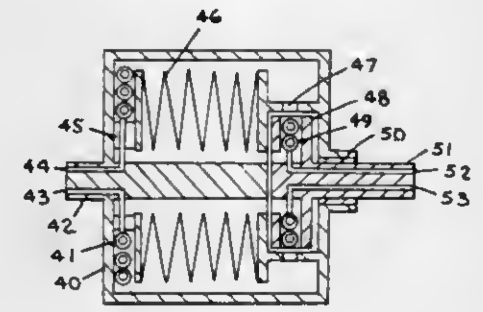
HEAT PUMP WITH TWO ROTORS

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 407,665, Nov. 18, 1973, Pat. No. 4,047,392, Ser. No. 591,881, Jun. 30, 1975, abandoned, and Ser. No. 618,456, Oct. 1, 1975, Pat. No. 4,005,587. This application Jan. 13, 1977, Ser. No. 759,075

Int. Cl.^{2} F25B *3/00*

U.S. Cl. 62—401 **8 Claims**



1. In a heat pump wherein a compressible working fluid is circulated radially outwardly in a

a. first fluid passage, said first passage contained in a first member, and radially inwardly toward center of rotation in a second fluid passage, said second passage contained in at least one of said first and second members, said first and second members coaxially arranged, at least one of said members being supported by a shaft for rotation;

said first and said second radial working fluid passages communicatingly connected at their respective outward ends by an outer passage and at their respective inward ends by an inner passage, said radial and outer and inner passages forming a closed loop extending at least partially through both of said members, a working fluid adapted to be circulating through said loop, means for compressing said working fluid by centrifugal force within said loop with accompanying temperature increase, first heat exchange means for cooling said working fluid after compression, said first heat exchange means being carried by one of said members, a second heat exchange means, carried by one of said members, for regeneratively exchanging heat between said working fluid within said inner and outer passages, and a third heat exchange means carried by one of said members for heating said working fluid after said heat exchange between said working fluid within said inner and outer passages.

4,107,945

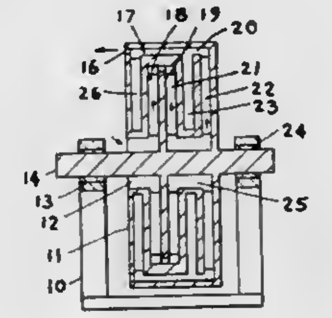
THERMODYNAMIC COMPRESSOR

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 675,304, Apr. 9, 1976, Pat. No. 4,060,989, and Ser. No. 600,312, Jul. 30, 1975, Pat. No. 3,986,361. This application Jul. 26, 1976, Ser. No. 708,863

Int. Cl.^{2} F25B *3/00*

U.S. Cl. 62—499 **8 Claims**



1. A compressor comprising:

a. a rotor mounted for rotation;

b. a continuous fluid passage within said rotor providing:

i. alternately outwardly and inwardly extending fluid passage portions for alternately compressing and expanding a working fluid flowing therein;

ii. an outwardly extending fluid passage means communicating downstream of the downward end of the alternately outwardly and inwardly extending fluid passage portion;

iii. a peripheral portion of the fluid passage communicating downstream of the outward end of the outwardly extending fluid passage means;

c. a heat exchange means carried by said rotor and providing for heat exchange between fluid entering and leaving said outwardly extending fluid passage means.

4,107,946

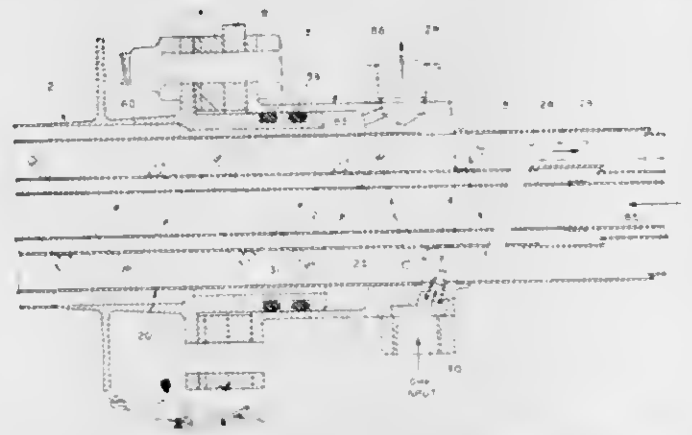
LOW HEAT LOSS LIQUID HELIUM DISCONNECT ATTACHMENT AND SYSTEM

Vernon L. Potter, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1977, Ser. No. 793,335

Int. Cl.^{2} F17C *13/04. 13/10*

U.S. Cl. 62—514 R **20 Claims**



1. A low heat leakage disconnect fitting adapted to interface with magnet dewars and which retains the vacuum integrity of both the dewar and a transfer line connected thereto comprising:

a bayonet-type insert for said dewars having an axial flow passage;

an enclosed inner annular chamber in said insert formed about said axial passage for insulating the passage;

an enclosed outer annular chamber in said insert and means in said outer chamber for conducting gases in both gaseous and liquid form adjacent to the periphery of said inner annular chamber to control the temperature of said dewar and said insert;

means in said insert for selectively diverting the fluid in said axial passage to the periphery of said insert; and

means common to said dewar and said insert for admitting and exiting said gases,

said means for diverting fluid including means for selectively preventing axial flow of fluid from entering said outer chamber,

whereby said insert when in the purge position directs fluid from said axial passage into said means for conducting gases and to the periphery of said insert to selectively alter the temperatures thereof, and when in the through-flow position prevents lateral dispersion of gases from said axial passage.

4,107,947

FINGER TIP ORNAMENT

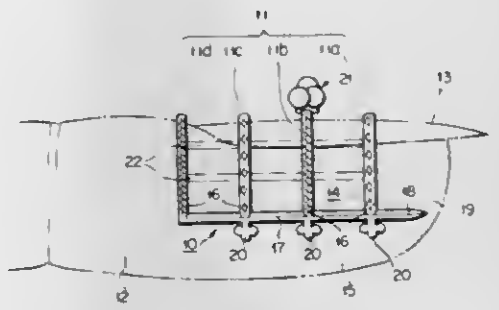
Takashi Saito, 123 Innai-cho, Funabashi-shi, Chiba-ken, Japan, assignor to Takashi Saito, Funabashi and Takashi Ishiyama, Tokyo, both of, Japan

Filed Dec. 30, 1976, Ser. No. 755,839

Claims priority, application Japan, Jan. 8, 1976, 51-452[U]

Int. Cl.^{2} A44C *25/00*

U.S. Cl. 63—2 **13 Claims**



1. A finger tip ornament comprising:

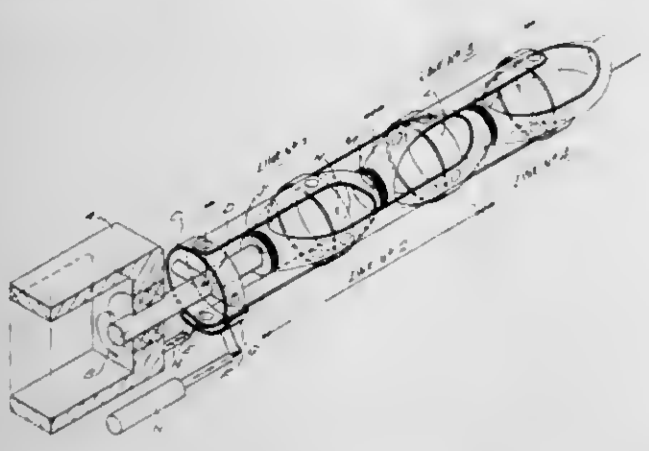
at least one generally C-shaped bridge member open at a bottom thereof and having a non-circular inner surface shape which is substantially complementary to a non-circular surface of a finger tip, said at least one bridge member being adapted to extend around a portion of a fingertip in the transverse direction of the finger with both end portions thereof extending around the lateral sides of the finger tip, said end portions extending to and contacting points near the fingerprint portion whereby said at least one bridge member may be non-rotatably mounted on a finger;

a pair of elongated supporting members connected to respective ends of said at least one bridge member, said supporting members extending lengthwise of the finger tip and substantially perpendicular to said at least one bridge member and adapted to abut against both lateral sides of the finger in the vicinity of the finger tip, said supporting members having retaining portions at the extreme ends thereof which are adapted to be adjacent the tip of a finger, said retaining portions being curved inward towards each other so as to be drawn to each other along the extreme end portion of the finger tip to contact the end portion of the finger tip; and

at least one gem mounted on said at least one bridge member.

4,107,948
FLEXIBLE ROBOT ARM

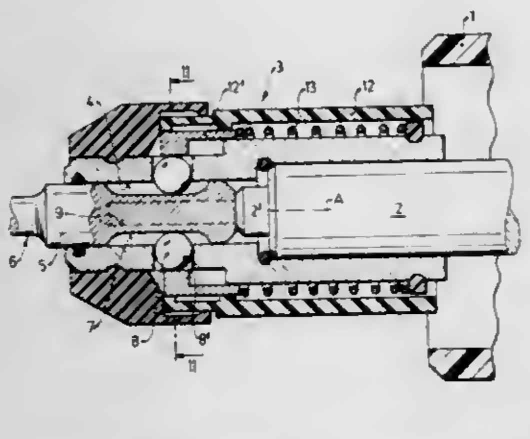
Ole Molaug, Bryne, Norway, assignor to Trallfa Nils Underhaug A/S, Bryne, Norway
Filed Jan. 31, 1977, Ser. No. 764,237
Claims priority, application Norway, Jan. 30, 1976, 760304
Int. Cl.^{2} F16C *1/02;* **G05G** *1/00*
U.S. Cl. 64—2 P **11 Claims**



1. Flexible robot arm including of a number of mutually connected rigid links and operatively adapted to perform controlled bending movements driven by robot drive means, wherein successive links of the arm are both interlinked as chain links and hinged to each other between interlinked link ends, in such manner that pair of arm links interlinked with the same intermediate link, are pivotably adjoined at their adjacent extreme ends, one of the terminal links of the arm being pivotably hinged in relation to said drive means and disposed to be operatively driven by the same into controlled angular tilts about said hinge, and the free extreme end of the subsequent link, which is interlinked with said terminal link, being pivotably adjoined with a connection point on the drive means in order to enable operative transfer of corresponding angular tilts to the successive arm links.

4,107,949
TOOL SHANK AND CHUCK COMBINATION FOR HAMMER DRILL

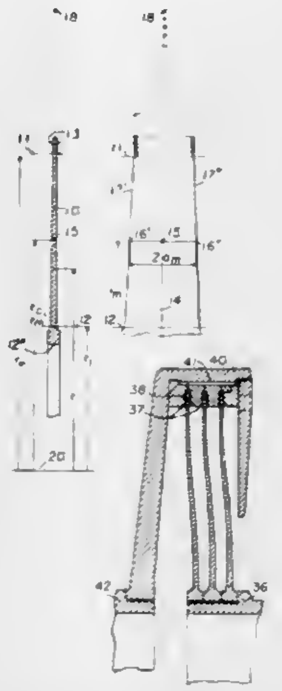
Karl Wanner, Echterdingen, and Klaus Voss, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Sep. 21, 1976, Ser. No. 725,193
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551125
Int. Cl.^{2} F16D *3/06;* **B23B** *31/06, 31/16*
U.S. Cl. 64—9 A **14 Claims**



1. In a combination with a chuck having a tool receptacle defining a chuck axis, a rotary and impact tool having a shank defining a tool axis and receivable in said receptacle; cooperating means on said shank and said receptacle for retaining said tool in said receptacle against extraction therefrom while permitting axial displacement of the tool relative to the receptacle so that the tool can transmit axial impact to a workpiece; and means separate from said cooperating means and operative for transmitting torque between said chuck and said tool, including an axially extending groove separate and circumferentially spaced from said cooperating means, said groove being axially open at the end of said shank and having at least one flank extending substantially radially of said tool axis, said torque transmitting means further including a rotary-entrainment formation in said receptacle formed with at least one side flatly engageable with said flank.

4,107,950
FLEXIBLE-DISK COUPLING

Ernest Wildhaber, 124 Summit Dr., Rochester, N.Y. 14620
Filed May 26, 1977, Ser. No. 801,009
Int. Cl.^{2} F16D *3/78, 3/52*
U.S. Cl. 64—13 **8 Claims**



1. A flexible-disk coupling containing at least one disk decreasing in thickness towards the outside and connected at the outside to a rotary part and at the inside to a mating rotary part of the coupling, whereby in axial sections the straight lines that pass through the mean points of opposite disk profiles in the directions of said profiles, intersect at distances from the disk axis between 2½ and six times the radial distance of said points from the disk axis, thereby including an uncommon small angle with each other, said mean points being midway between the outer and inner ends of the disk-working surface.

4,107,951
COUPLING

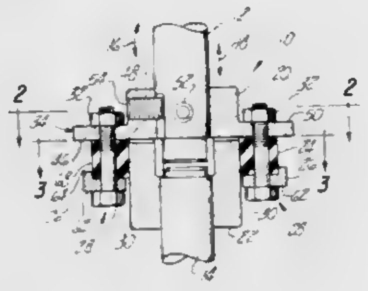
Lee E. Elfes, Bloomfield Hills, and Joseph W. Beckerman, Livonia, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.
Filed Aug. 9, 1976, Ser. No. 712,978
Int. Cl.^{2} F16D *3/12, 3/64*
U.S. Cl. 64—14 **10 Claims**

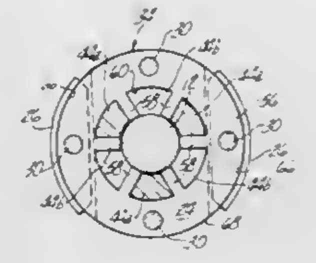
1. A coupling comprising:

first and second opposed coupling means each of which includes an elongated portion supporting a plurality of spaced apart projections;

an elastomeric member disposed between the first and second coupling means, the elastomeric member having a plurality of equally spaced apart radially extending fingers which define a plurality of adjacent first and second cavities, the first cavities receiving the projections of the first coupling means and the second cavities receiving the projections of the second coupling means; and

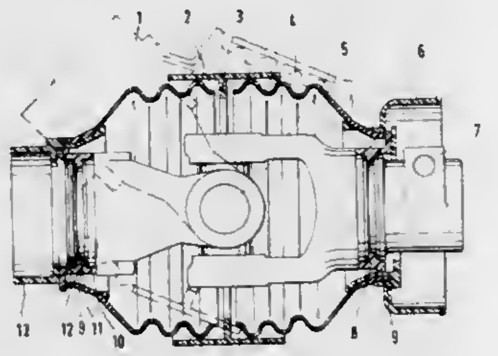
a plurality of securing means securing the first and second coupling means to the elastomeric member with the elongated portion of the first coupling means being angularly offset with respect to the elongated portion of the second coupling means, each of the securing means including a retainer in contact with one surface of the elastomeric member and spaced away from an adjacent side of the elongated portion of one of the coupling means, the elongated portion of the other coupling means contacting the other surface of the elastomeric member and cooperating with said retainer to confine a portion of the elastomeric member between said retainer and the elongated portion of the other coupling means, the parts being so arranged and constructed that the first and second coupling means do not come into contact with each other.





4,107,952
PROTECTIVE GUARD ASSEMBLY FOR A UNIVERSAL JOINT

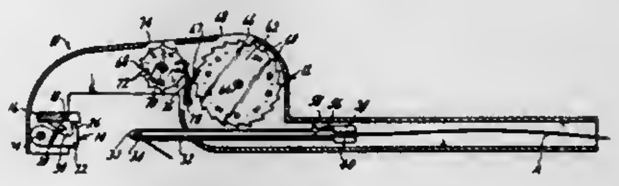
Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany
Filed Mar. 4, 1977, Ser. No. 774,468
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609069
Int. Cl.^{2} F16D *3/84*
U.S. Cl. 64—32 F **3 Claims**



1. In a protective guard assembly for a universal joint between the ends of two shafts, rotatably mounted boots of a resilient elastic material extending over said joint from the shaft ends, an annular guard member disposed around the outer surfaces of said boots and overlapping a portion of each of said boots, said annular guard member having a supporting ring radially positioned around the center of the universal joint and extending radially inwardly between said boots to support the ends thereof.

4,107,953
CROCHETING TOOL

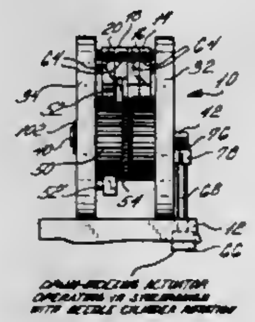
Santo Casillo, 9604 156th Ave., Howard Beach, N.Y. 11414
Filed Sep. 19, 1977, Ser. No. 834,333
Int. Cl.^{2} D04B *35/00, 37/00*
U.S. Cl. 66—1 R **9 Claims**



1. A crocheting tool comprising a chassis including yarn-collecting means for receiving and retaining a segment of yarn, a needle slidably mounted in said chassis, positioning means adapted to reciprocate said needle relative to said chassis between a first position in engagement with said yarn-collecting means and a second position remote from said yarn-collecting means, and counting means mounted in said chassis for recording the number of reciprocations of said needle, said counting means comprising a rachet gear rotatably mounted to said chassis and having numerals sequentially printed at its periphery, a resilient actuator mounted to said needle and located to advance said rachet gear as said needle moves from said second position to said first position, and a pawl engaging said rachet gear, said pawl being constructed and arranged to prevent said rachet gear from counter-rotating as said needle moves from said first position to said second position.

4,107,954
CIRCULAR KNITTING MACHINE PROVIDED WITH A NOVEL STRIPING BOX

Charles Seligson, 160 E. 38th St., New York, N.Y. 10018
Filed Jul. 6, 1976, Ser. No. 702,858
Int. Cl.^{2} D04B *15/58*
U.S. Cl. 66—133 **4 Claims**



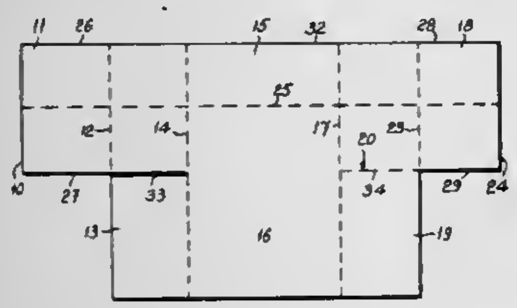
1. In a striping box for circular knitting machines comprised of a rotating needle cylinder having cylinder needles, a plurality of yarn-carrying fingers, each finger being individually movable between an inoperative position and an operative position in which it feeds the yarn it carries to cylinder needles receiving yarn from the striping box; and means operative in synchronism with needle cylinder rotation for causing more than one of the yarn-carrying fingers to move into and stay in the operative position throughout at least one complete rotation of the needle cylinder to feed yarn from more than one finger at a time to cylinder needles receiving yarn from the striping box during the at least one complete rotation, said means comprising a control drum provided with a circumferential succession of axial holding slots for holding finger-activating jacks, an indexing arrangement operative for indexing the control drum slot-by-slot at preselected intervals each corresponding to at least one complete rotation of the needle cylinder; and finger-activating jacks removably held in said holding slots including at least one two-legged double jack, the double jack having a first leg portion lying in the associated axial holding slot and a second leg portion projecting radially

outward of the control drum for finger activation, the breadth of the second leg portion measured in the axial direction of the control drum being such as to simultaneously activate more than one of the yarn-carrying fingers, the plurality of yarn-carrying fingers consisting of a first, second, third and fourth finger arranged successively in the stated order, the breadth of the second leg portion of the double jack and the location of the second leg portion relative to the yarn-carrying fingers being such that the second leg portion simultaneously activates only the second and third fingers.

4,107,955
METHOD OF KNITTING BLANK FOR A SLEEVED GARMENT AND PRODUCT THEREOF

Frank Robinson, and Nigel Stephen Whatmough, both of Breaston, England, assignors to Courtaulds Limited, London, England

Filed Apr. 13, 1977, Ser. No. 787,226
Int. Cl.^{2} A41B *9/06*
U.S. Cl. 66—176 **13 Claims**

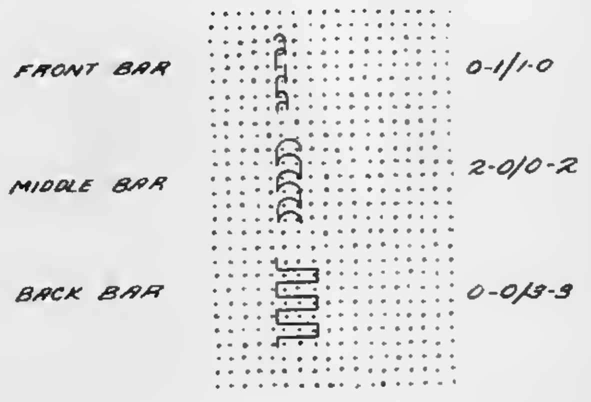


1. A method of knitting a blank for a sleeved garment, the method comprising the steps of
(a) knitting a sleeve for the garment starting at one end so that the wales extend longitudinally of the sleeve,
(b) knitting a shoulder region for the garment as a continuation of said sleeve so that wales extend along the sleeve and into the shoulder region,
(c) lengthening the knitted courses when knitting said shoulder region so that the courses extend to one side of the shoulder region into a body part of said blank whereby knitting of said body part is carried out contemporaneously with the knitting of said shoulder region,
(d) knitting a second sleeve for the garment as a continuation of said shoulder region, so that wales extend in a continuous line through the sleeves and said shoulder region, and
(e) knitting at least one further part of said body integral with said first mentioned body part so that wales of said at least one further body part extend into said first mentioned body part.

4,107,956
NARROW FABRICS

John T. Parsons, Harrogate, England, assignor to Lightning Fasteners Limited, Wolverhampton, United Kingdom
Continuation of Ser. No. 433,563, Jan. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 191,777, Oct. 22, 1971, abandoned, which is a continuation of Ser. No. 9,960, Feb. 9, 1970, abandoned. This application Nov. 13, 1975, Ser. No. 631,605
Claims priority, application United Kingdom, Feb. 11, 1969, 7385/69
Int. Cl.^{2} D04B *21/00*
U.S. Cl. 66—195 **2 Claims**

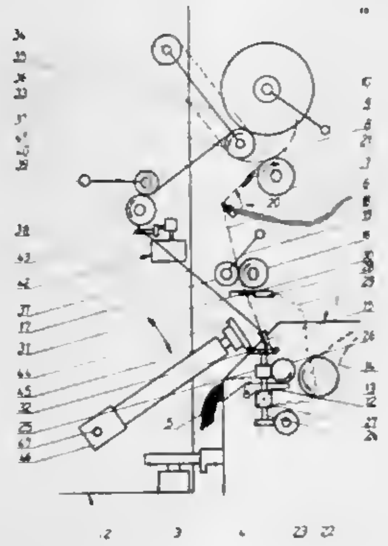
1. A method for warp knitting a stable sliding clasp fastener carrier tape with a strong selvage resistant to longitudinal and lateral stretch not exceeding 4 inches in full and finished width employing three guide bars in which the front guide bar knits a pillar stitch, the middle guide bar performs a two needle



overlap in successive courses and the back guide bar "lays-in" over three or more needles.

4,107,957
MOBILE PIECING DEVICE AND METHOD FOR AN OPEN END SPINNING MACHINE

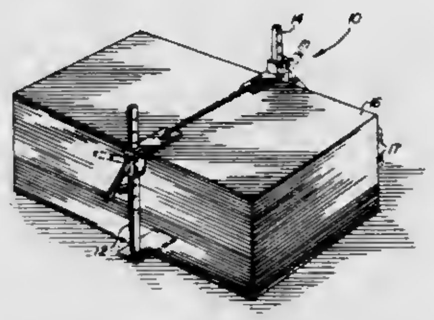
Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany
Filed May 2, 1977, Ser. No. 792,581
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620806
Int. Cl.^{2} D01H *15/00*
U.S. Cl. 57—34 R **18 Claims**



1. Apparatus comprising:
spinning assembly yarn take-off means for controlling the taking off of yarn produced at an open-end spinning assembly and supplied to a spool of the spinning assembly,
piecing device yarn take-off means for controlling the taking off of yarn from said open-end spinning assembly during yarn piecing operations,
said spinning assembly yarn take-off means exhibiting a yarn path during normal spinning operations having a different length than the yarn path through said piecing device yarn take-off means during yarn piecing operations,
and yarn tranfer means for transferring said yarn from said piecing device yarn take-off means to said spinning assembly yarn take-off means, said yarn transfer means including control means for controlling the respective yarn take-off means and spinning assembly during transfer of said yarn so that a uniform denier is maintained during said transfer which corresponds to the denier produced at the spinning assembly under normal spinning operations, said control means including means for accommodating said length differences of said yarn path during normal spinning and piecing operations.

4,107,958
LOCK FOR STACKED MATERIALS

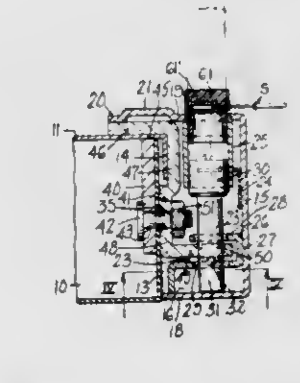
Paul P. Manley, Jr., 4560 E. Calle Barril, Tucson, Ariz. 85718
Filed Jul. 30, 1976, Ser. No. 710,197
Int. Cl.^{2} E05B *73/00;* **B65G** *1/14*
U.S. Cl. 70—58 **7 Claims**



1. A security device for deterring theft of stacked articles in sheet form by compressing the articles in a tight stack, said device including:
(a) a relatively flat base plate having a lower surface adapted to rest on a supporting surface, said plate having an upper surface adapted to engage the underside of the lowermost sheet whereby the base can be forced beneath the stacked articles;
(b) an elongate unstanding shaft secured to said base and adpted to extend along a side of the said stack;
(c) a member movable along said shaft including a clamping plate disposed generally opposite said base plate;
(d) engagement means associated with said member and cooperable with said shaft to selectively secure said member and clamping plate in a predetermined position on said shaft whereby said materials are compressed between said base and clamping plate so that individual articles cannot be removed without moving said member; and
(e) locking means for locking said engagement means in said predetermined position.

4,107,959
METER BOX GUARD LOCK

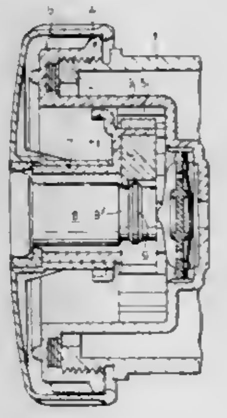
Thaddeus S. Skarzynski, New Haven, and James A. Swisher, Shelton, both of Conn., assignors to C. Cowles & Company, New Haven, Conn.
Filed Apr. 15, 1977, Ser. No. 787,918
Int. Cl.^{2} E05B *65/52*
U.S. Cl. 70—159 **10 Claims**



1. A locking assembly for a box having walls and being closed by a flanged cover comprising, an angle piece having a first portion adapted to overlie the cover and a second portion adapted to rest against a wall of the box adjacent the flange of the cover, a bolt passing through and projecting from the box wall and provided with a nut for securing said second portion to said wall with the first portion overlying the cover, a housing covering and enclosing on at least four sides the angle piece and said securing means, and a lock within the housing and holding the housing releasably in covering position, the angle piece having a third portion projecting from the second portion and the housing lock being engageable with said third portion.

4,107,960
ANTI-THEFT PLUG FOR SCREW-THREADED BASE WITH A TIGHTENING TORQUE LIMITING DEVICE

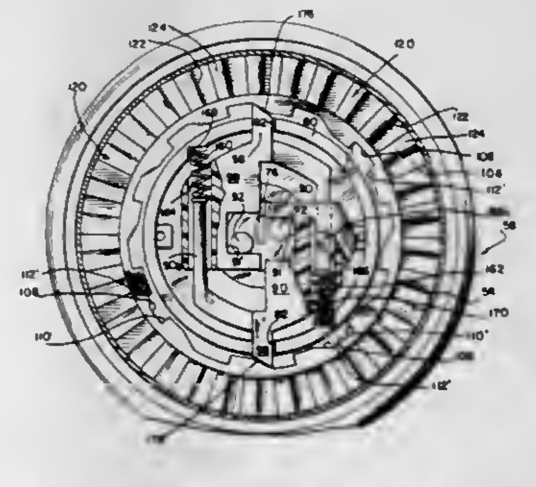
Michel Neiman, Paris, France, assignor to Societe de Diffusion Neiman, Courbevoie, France
Filed Jul. 8, 1977, Ser. No. 813,852
Claims priority, application France, Jul. 26, 1976, 76 22682
Int. Cl.^{2} E05B *65/52*
U.S. Cl. 248—165 **5 Claims**



1. An anti-theft plug for a screw-threaded base comprising:
(a) a plate with a thread corresponding to the threading of the base,
(b) a body rotatable in respect of the said plate,
(c) a cylindrical lock mounted in the said body,
(d) a toothed rim on said plate and
(e) a securing element being rotatable with the rotatable body and serving to render the said body integral with the said plate, having
(f) an elastically deformable arm resiliently removable from the axis of the plug under the action of the said lock, while its free end, when the arm has undergone no deformation, it disengaged from said teeth, although it engages them when the arm has undergone deformation.

4,107,961
LOCKING GAS CAP WITH TORQUE OVERRIDE FEATURE

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.
Continuation-in-part of Ser. No. 611,219, Sep. 8, 1975, Pat. No. 4,000,633. This application Oct. 29, 1976, Ser. No. 735,252
Int. Cl.^{2} B65D *51/16, 55/14*
U.S. Cl. 70—165 **11 Claims**



1. A locking cap for a fuel tank having a threaded filler neck, said cap comprising an outer shell, a lock assembly, a lock

assembly housing disposed within said outer shell and fixed against rotation relative thereto, said lock assembly including a lock having a cap removal position and a locking position and at least one locking bolt, a closure member providing a threaded axially inner portion for engaging the threads on said filler neck, said outer shell and closure member being connected together for relative rotation, said shell and lock assembly defining a concentric annular space therebetween, an annular race disposed within said space for rotation relative to said shell, said race having first and second sets of peripherally spaced apart engaging means, said lock being operatively connected to said bolt for drivingly engaging said bolt with said first set of engaging means for rotating said race with said outer shell when said lock is in said cap removal position, said closure member having means for drivingly engaging said second set of engaging means to provide a torque limited driving connection in the direction which advances said closure member onto said neck and a positive driving connection in the opposite direction, and means for yieldably urging said bolt into a position for drivingly engaging said race to advance said closure member onto said neck when said lock is in its locking position.

4,107,962

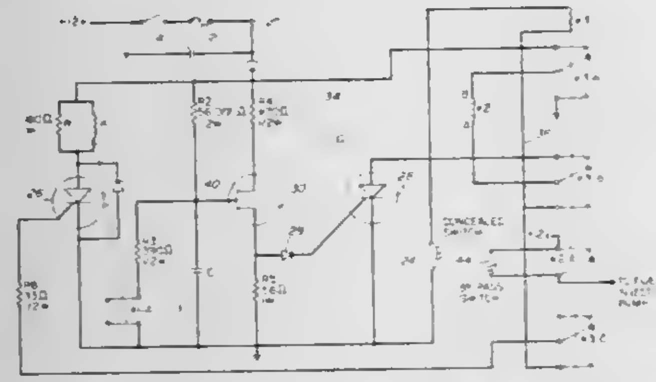
AUTO ANTI-THEFT DEVICE

Richard B. MacKinnon, 4613 Stearns Hill Rd., Waltham, Mass. 02154

Filed Apr. 28, 1977, Ser. No. 791,856

Int. Cl.^{2} B60R *25/04*

U.S. Cl. 70—243 **8 Claims**



1. An anti-theft circuit for a vehicle having an electrically-operated fuel system, and an ignition switch receiving energy from a battery in the vehicle, said circuit comprising;

electrical bistable means having an enabling position and a disabling position for controlling the operation of the fuel system,

a switch means disposed in the vehicle in a position known by an authorized operator but not known by an unauthorized operator,

means intercoupling the bistable means and switch means to operate the bistable means to an enabling position upon operation of the switch means by the authorized operator,

a timing network,

circuit path means intercoupling the switch means and an input to the timing network for operating said timing network when the switch means is unoperated,

said timing network providing a signal at the end of its timing period to change the state of the electrical bistable means to its disabling position interrupting further operation of the fuel system,

said switch means comprising a momentary switch,

said circuit path means including a semi-conductor latch means for storing an indication of closure of said switch means.

4,107,963

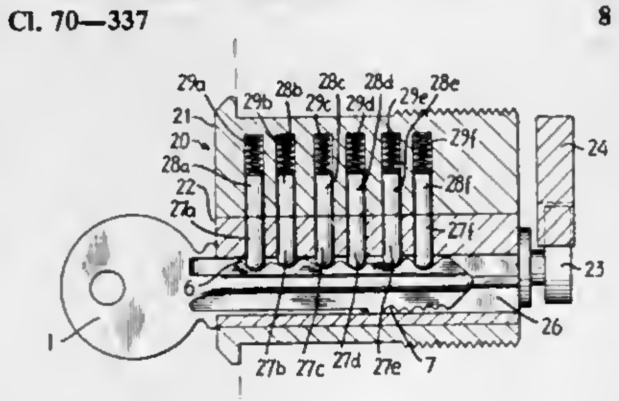
KEY AND LOCK SYSTEM

Noelle Yorio, and Albert E. Yorio, both of 70 West St., Harrison, N.Y. 10528

Filed Mar. 23, 1977, Ser. No. 780,662

Int. Cl.^{2} E05B *19/06, 35/08*

U.S. Cl. 70—337 **8 Claims**



1. A lock system comprising a combination of

(1) a first pin-tumbler lock having an outer cylinder and a rotating inner cylinder, the inner cylinder having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the inner and outer cylinders, wherein the lock pins project into the barrel;

(2) a second pin-tumbler lock, substantially shorter in size than the first lock, having an outer cylinder and a rotating inner cylinder, having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the inner and outer cylinders, wherein the lock pins project into the barrel; and

(3) a key having a conventional handle portion and shank portion with a first series of notches and projections extending along one longitudinal edge of the shank portion which engage the tumbler pins of the first pin-tumbler lock upon insertion of the key so as to render the lock operable, and having a second series of notches and projections extending partially along the opposite longitudinal edge of the shank at its outer extremity which engage the tumbler pins of the second pin lock upon insertion of the key to render the second lock operable.

4,107,964

DEVICE FOR CRIMPING TUBULAR ELEMENTS

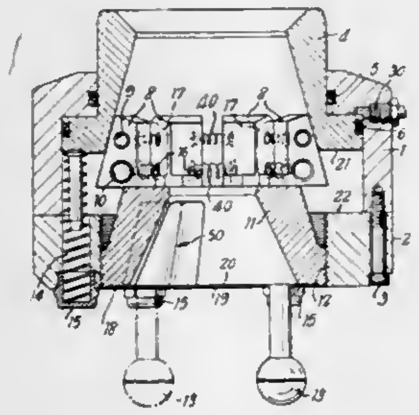
John Lionel Smith, Goldington Green, England, assignor to Andrew Hydraulics International Limited, Bedford, England

Filed Feb. 22, 1977, Ser. No. 770,910

Claims priority, application United Kingdom, Feb. 24, 1976, 7322/76

Int. Cl.^{2} B21D *7/00*

U.S. Cl. 72—36 **10 Claims**



1. A crimping device comprising a plurality of die means disposed around an axis, camming means disposed radially outside said die means relative to said axis, said camming means being formed such that axial relative movement between said camming means and said die means causes the camming means to drive the die means towards said axis, and a hydraulic actuator operatively associated with said die means and with said camming means for imposing said axial relative movement, said hydraulic actuator having therein an annular hydraulic chanber co-axial with said axis and expandible in said axial direction by hydraulic pressure to cause said axial relative movement, and wherein said camming means is an annular camming member having a radially inner surface portion formed as a camming surface, and having a radially outer surface portion which defines a radially inner surface of said hydraulic chamber of said actuator, said radially inner and radially outer surface portions of the camming member being directly opposite each other in the radial direction, whereby radially outward force of the die means on said radially inner surface is opposed by radially inward hydraulic pressure on said radially outer surface.

4,107,965

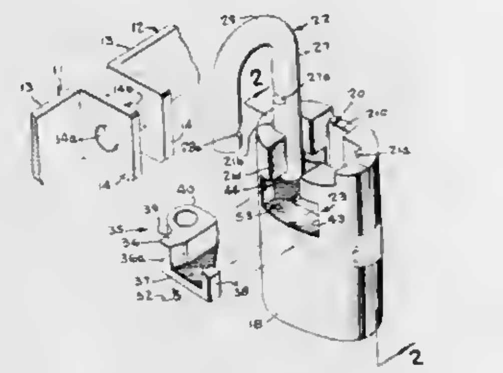
PADLOCK HAVING KNUCKLE TYPE ANTI-WEDGE-ATTACK STRUCTURE

James Clayton Miller, Nicholasville; Paul R. Proefrock, Lexington, and James P. K. Peppard, Nicholasville, all of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Oct. 18, 1977, Ser. No. 843,698

Int. Cl.^{2} E05B *67/02*

U.S. Cl. 70—52 **11 Claims**



1. A high security padlock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in parallel, laterally alined abutment, the padlock comprising a strong penetration and distortion resistant padlock body having a rearwardly opening cavity bounded by a pair of laterally spaced vertical bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded by the padlock body against access by attacking tools directed from the front, sides, or bottom of the lock body, the padlock including a shackle having a portion movable from a locking position extending transversely through the cavity and through the apertures of the abutting hasp portions therein and a retracted position enabling withdrawal of the hasp portion from the cavity, a lock mechanism within the padlock body for locking the shackle in said locking position and releasing the same for movement to the retracted position; the improvement comprising a wedge-attack resisting collar member in said cavity adapted to surround three sides of the pair of laterally alined abutting hasp portions at the rear of the lock body for resisting destructive attack by wedge-type attack tools in the zone driven against the rear of the padlock by persons seeking destructive tearing of the padlock shackle forwardly through the hasp portions, the attack resisting collar member comprising side walls defining a hasp-receiving passage therebetween to receive therethrough the laterally alined abutting hasp portions and one of said side walls having a generally cylindrical knuckle formation at the forward end thereof, said padlock body including means defining a pivot socket for said knuckle formation communicating with said cavity adjacent a side thereof, said knuckle formation being pivotally located in said socket for lateral swinging movement of the collar member about a vertical pivot axis therethrough, the one side wall of said collar formation having a contact surface confronting the adjacent lateral face of the adjacent hasp portion and normally located at a predetermined rearwardly diverging angle relative thereto, the collar member having a rear end portion projecting through the rearward opening of said cavity for a predetermined distance beyond the rear of the lock body flanking the opposite sides of the alined abutting hasp portions into said zone to be engaged by the attacking tool when driven against the rear of the lock body, the pivotal mounting of said knuckle formation in said socket imparting a predetermined component of lateral hasp gripping movement to the one side wall of the collar member toward the opposite bounding wall surface when the collar member is driven forwardly by the attacking tool and thereby bring surfaces of the collar member and cavity into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity.

4,107,966

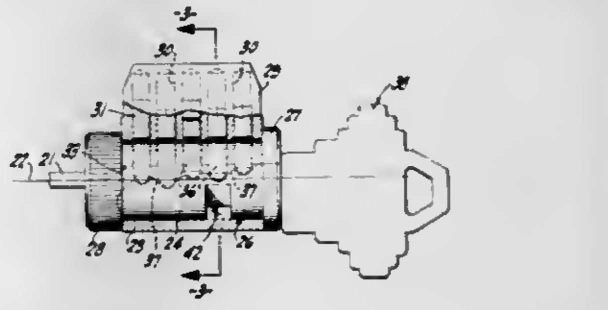
SELECTIVELY ROTATABLE CYLINDER FOR A LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Apr. 8, 1977, Ser. No. 786,010

Int. Cl.^{2} E05B *9/04, 27/04*

U.S. Cl. 70—364 A **2 Claims**



1. A selectively rotatable cylinder for a lock comprising a cylinder body having a bore therein extending along an axis, means defining an axially aligned series of upper tumbler bores spaced axially apart in said body and opening into said body bore, a series of upper tumbler pins having flat lower ends in said upper tumbler bores, springs urging said upper tumbler pins toward said body bore, a plug having a coaxial circular-cylindrical outer surface and disposed in said body bore and rotatable about said axis, means defining a keyway extending axially in said plug, means defining a series of lower tumbler bores in said plug opening into said keyway and in one rotary position of said plug disposed in radial alignment with respective ones of said upper tumbler bores, a series of lower tumbler pins in respective ones of said lower tumbler bores adapted to be engaged by a key in said keyway, and means defining a flat ramp on said plug extending chordally of said plug from an abrupt junction with said circular-cylindrical outer surface thereof toward a location in said keyway radially inward of said outer surface and in the normal plane of an intermediate one of said series of upper tumbler pins.

4,107,967

ACCESS-LIMITING APPARATUS

William C. Grabb, 325 Barton Shore Dr., Ann Arbor, Mich. 48105

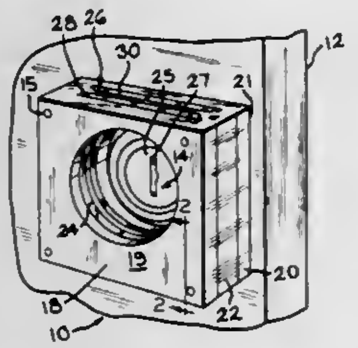
Filed Dec. 12, 1977, Ser. No. 859,220

Int. Cl.^{2} E05B *17/18*

U.S. Cl. 70—427 **11 Claims**

1. Access-limiting apparatus comprising a body having front and rear walls, means forming a longitudinal passageway through said body extending through said front and rear walls, means forming a second passageway through said body ex-

tending transversely of and intersecting said first passageway between said front and rear walls, a lock plate movable in said second passageway to a locked position closing said first passageway, coacting lock means on said body and said lock plate for securing said lock plate in said locked position, and a key plate having lock release means thereon engageable with said lock means to release said lock plate from said locked position.



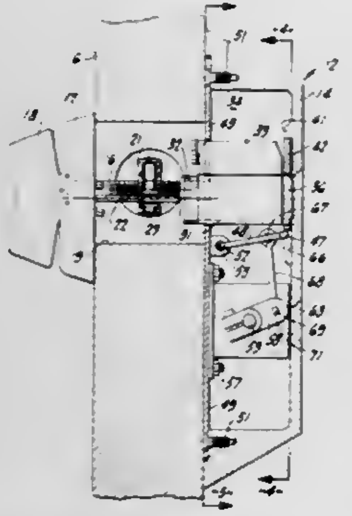
4,107,968
TALLY LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed May 26, 1977, Ser. No. 800,580

Int. Cl.² E05B *39/04*

U.S. Cl. 70—436 **7 Claims**



1. A tally lock comprising a frame, a lock cylinder, a lock plug having a key opening in one end thereof and rotatable in said cylinder away from and toward a central position, a plug flange on said plug at the key opening end thereof, means for mounting said lock cylinder on said frame, a counter, means for mounting said counter on said frame, a rotary driver disc having a flat thereon symmetrical in said central position and disposed on and rotatable with said plug flange, a follower mounted on said frame symmetrically with said central position and in the path of rotation of said flat on said disc, and means operated by said follower for actuating said counter.

4,107,969
HOT STRIP COILING MANDREL

Hiroshi Okabe; Noboru Hase, both of Sawara; Hitoshi Asai, Itako, and Teruo Hiramatu, Kashima, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

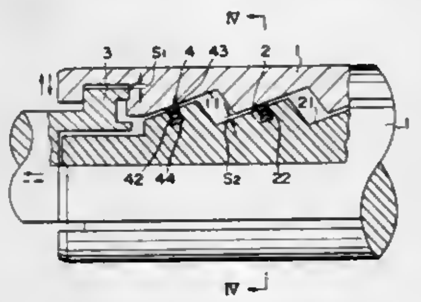
Filed May 3, 1977, Ser. No. 793,355

Claims priority, application Japan, May 15, 1976, 51-55757; May 15, 1976, 51-55758; Sep. 28, 1976, 51-130094[U]

Int. Cl.² B21C *47/30;* B65H *75/24*

U.S. Cl. 72—148 **9 Claims**

1. A hot strip coiling mandrel having a mechanism for radially expanding and collapsing a drum comprised of a plurality of circumferentially equally divided segments engaged around a core shaft by moving the core shaft or the drum segments axially relative to each other, said mandrel being characterized by buffer means comprising contact blocks and resilient members supporting said blocks resiliently and provided between said core shaft and each of said segments and urging said segments radially outwardly of said mandrel.



4,107,970
MACHINE FOR FLATTENING STRIP METAL

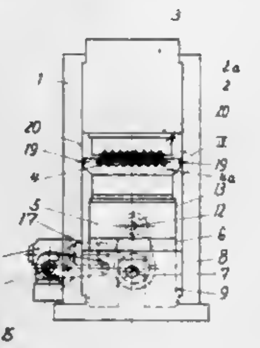
Josef Ihle, Pforzheim, Fed. Rep. of Germany, assignor to Irma Ungerer geb. Dollinger, Pforzheim, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 793,941

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646201

Int. Cl.² B21D *1/02*

U.S. Cl. 72—165 **11 Claims**



10. A machine for flattening sheet metal, comprising
a stationary frame,
a stationary set of upper rolls carried by said frame,
a yoke mounted in said frame for adjustment in height,
a set of lower rolls mounted in said yoke adjacent to said upper rolls and adjustable in height relative thereto in unison with said yoke,
adjusting shaft means mounted in said frame for rotation on a horizontal axis,
first motion-transmitting means which are eccentric to said adjusting shaft means and non-rotatably connected thereto, and
second motion-transmitting means connected to said yoke for rotation relative thereto about an axis which is offset from said horizontal axis and engaging said first motion-transmitting means and arranged to adjust said yoke in height in response to a rotation of said first motion-transmitting means.

4,107,971
CLUSTER TYPE ROLLING MILL

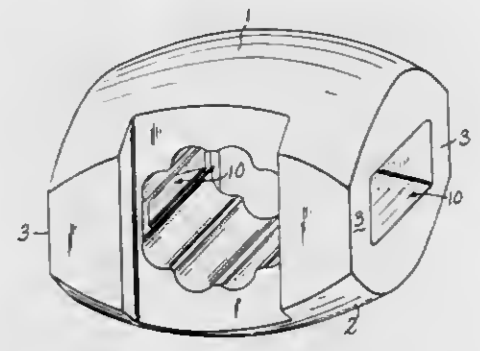
Siegfried H. Hunke, Thomaston, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Jun. 14, 1977, Ser. No. 806,522

Int. Cl.² B21B *31/02*

U.S. Cl. 72—237 **6 Claims**

1. A cluster type rolling mill having a housing comprising an upper part and a lower part, each generally rectangular in plan, four corner posts connecting said upper and lower parts, a roll cluster including a plurality of upper and lower backing elements, the shape of said upper and lower parts being defined by exterior curves, one in a plane of a backing element axis and perpendicular to the sides of the housing and another in a plane which is perpendicular to said axis, wherein each part acts as a curved beam, and the highest point of each part occurs at the vertical center axis of the housing.



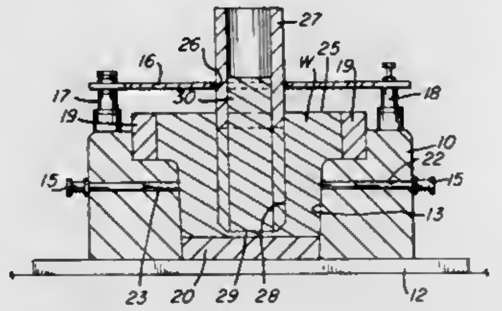
4,107,972
DIES FOR FORGING AND TREPANNING LARGE DIAMETER COUPLINGS AND METHOD OF FORGING AND TREPANNING COUPLINGS

Wayne A. Martin, Wilkens Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 7, 1977, Ser. No. 849,153

Int. Cl.² B21D *28/00*

U.S. Cl. 72—334 **12 Claims**



1. For forging a large diameter coupling, a die including a body having a bore and a counterbore, an annular flange insert received in said counterbore and having an inside diameter larger than the diameter of said bore, and a flat circular spacer received in said bore, said bore and said flange insert being adapted to receive a heated cylindrical workpiece which rests on said spacer, said bore, flange insert and spacer defining a space for contour-forging the workpiece to the outside configuration of a coupling having a flange at one end, said insert and spacer being removable and replaceable with inserts of different size.

4,107,973
PRESS DRIVE MECHANISM

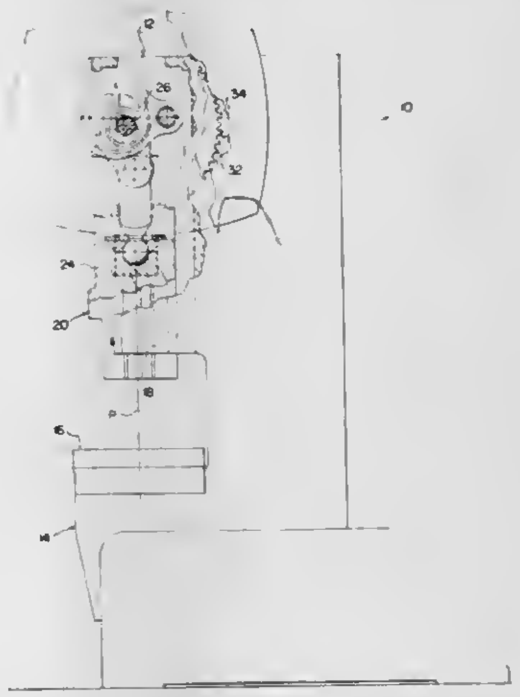
Paul V. Smejkal, Berwyn, and Robert B. Baranski, Chicago, both of Ill., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 4, 1977, Ser. No. 821,331

Int. Cl.² B21J *9/18*

U.S. Cl. 72—450 **33 Claims**

1. A press comprising, frame means, a slide member supported by said frame means for reciprocation along a linear slide path between upper and lower positions, and means to drive said slide member, said drive means including shaft means supported by said frame means for rotation about a shaft axis transverse to said path, said shaft means including first eccentric means rotatable therewith and having a first axis parallel to and offset with respect to said shaft axis, power link means pivotally received on said first eccentric means and having an end spaced from said shaft axis and said first axis, connecting link means pivotally interconnecting said slide member and said end of said power link means, said power link means including second eccentric means having an outer periphery surrounding said shaft axis and having a second axis parallel and offset with respect to said shaft axis and said first axis, and rocker link means pivotally received on said outer periphery of said second eccentric means and having an end spaced from said second axis and connected to said frame means for pivotal movement about a third axis parallel to said second axis.



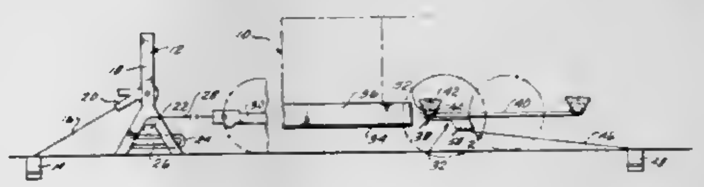
4,107,974
METHOD FOR STRAIGHTENING AUTOMOBILE BODIES

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed Mar. 1, 1976, Ser. No. 662,830

Int. Cl.² B21D *1/12*

U.S. Cl. 72—457 **4 Claims**



1. A method for straightening an automobile body wherein a pulling force required to straighten the automobile is applied to the automobile and an anchoring device anchors the automobile body against the pulling force, the automobile body being of unitized construction and having a longitudinal axis and a suspension spring assembly which includes a longitudinally extending, elongated rear leaf spring having a front end and a rear end, a bracket extending downward from the automobile body, and means attaching the front end of the leaf spring to the bracket, the spring attaching means being rounded about an axis transverse to said longitudinal axis of the body, the method including the steps of releasably attaching an anchoring device around the rounded portion of the leaf spring attaching means wherein the anchor device includes a hook made from an elongated steel bar of generally rectangular cross-sectional configuration being between about ⅜ inch to about ½ inch in thickness and being between about 1 inch and about 2½ inches in width, one end portion of said rectangular bar being curved to form a generally C-shaped hook having a generally circularly curved inside bearing surface for being

releasably attached to the rounded portion of said leaf spring attaching means, the bar having a portion thereof extending away from the hook to form an elongated, relatively straightened end portion remote from the hook; extending said straightened portion of the bar toward the rear end of the leaf spring when the hook portion of the bar is releasably engaged with said rounded portion of the leaf spring attaching means; attaching one end of a tension line means to a point of attachment on the straightened portion of the bar and securing an opposite end of the tension line means to the ground; and applying a pulling force to the automobile via a force means to straighten the automobile body.

4,107,975

METHOD AND APPARATUS FOR TESTING SHOCK ABSORBERS AND THE LIKE

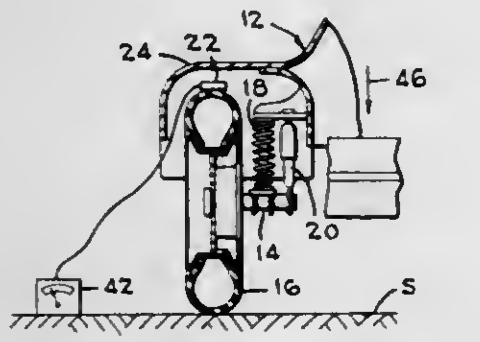
William P. Cargile, 206 El Granada Blvd., Half Moon Bay, Calif. 94019

Continuation-in-part of Ser. No. 716,632, Aug. 23, 1976, Pat. No. 4,034,596. This application Jun. 13, 1977, Ser. No. 805,988

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.^{2} G01M *17/04*

U.S. Cl. 73—11 **11 Claims**



1. Apparatus for in situ testing of a vehicular shock absorber wherein the shock absorber extends between an axle part of the vehicle and a body part of the vehicle to damp relative movement therebetween comprising transducer means having a reactive element cooperable with one of the parts to form a reactance with the one part that has a magnitude proportional to the distance between said transducer and the one part of the vehicle, means for supporting said transducer immovably with respect to only the other vehicle part and in spaced apart relation to the one vehicle part such that the magnitude of the reactance is proportional to the distance between the parts, and means for measuring and analyzing the output signal of said transducer in response to relative motion between the parts.

4,107,976

METHOD AND APPARATUS FOR DETECTING AND CONTROLLING A VOLATILE SUBSTANCE

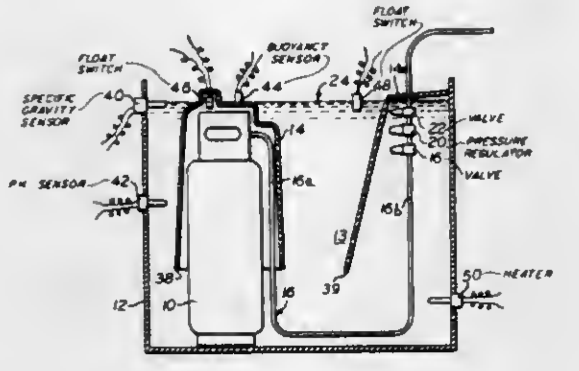
Harold Willids Andersen, and Charles H. Harrison, both of Oyster Bay, N.Y., assignors to H. W. Andersen Products Inc., Oyster Bay, N.Y.

Division of Ser. No. 387,461, Aug. 10, 1973, Pat. No. 3,981,701. This application Apr. 2, 1976, Ser. No. 672,937

Int. Cl.^{2} F17C *13/02;* **G01M** *3/04*

U.S. Cl. 73—52 **10 Claims**

1. The method of managing and detecting leaks in a flammable volatile substance which is used in a sterilization device to which the volative substance is delivered at a controlled delivery pressure, said volatile substance being contained under pressure within a closed storage tank and having delivery means for delivering the volatile substance from the closed storage tank to a pressure control device, comprising the steps of containing said volatile substance under pressure within said storage tank and within at least parts of said delivery means, immersing said storage tank and said parts of said delivery means within a liquid such that any accidental leakage of said volative substance from said storage tank or from said parts of said delivery means passes into said liquid, said liquid being capable of absorbing said leakage of volatile substance and in so doing effecting physicochemical changes in the liquid, utilizing said physicochemical changes in the liquid to actuate sensor means to trigger a warning signal indicating that such accidental leakage has occurred, said liquid being capable of absorbing said volatile substance to effect said physicochemical changes and trigger said warning signal so that corrective action may be taken before said flammable volatile substance escapes to the surrounding atmosphere, controlling the release of said volatile substance from said delivery means by said pressure control device, maintaining said pressure control device at the temperature of said immersion liquid by immersing the control device in the liquid, and maintaining the temperature of said liquid at a temperature greater than the condensation temperature of said volatile substance such that the volatile substance is prevented from condensing in said delivery means and in said pressure control device, whereby delivery of a condensed volatile substance to said sterilization device is precluded.



4,107,977

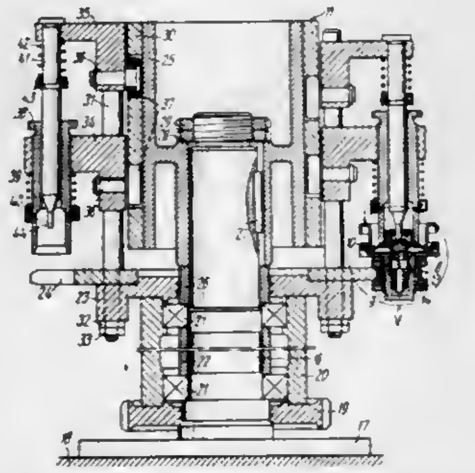
METHOD OF CHECKING THE VALVES OF AEROSOL CONTAINERS FOR TIGHTNESS AND AN APPARATUS FOR EFFECTING THE SAME

Ijun Iosifovich Grinberg, ulitsa Zavodskaya, 4a, kv. 44; Evgeny Kuzmich Zhukov, ulitsa Fevralskaya, 1, kv. 14, both of Klimovsk, and Lev Nikolaevich Koshkin, Samotechny pereulok, 23, kv. 54, Moscow, all of U.S.S.R.

Continuation of Ser. No. 511,463, Oct. 2, 1974, abandoned. This application Aug. 18, 1976, Ser. No. 715,570

Int. Cl.^{2} G01M *3/28*

U.S. Cl. 73—45.3 **9 Claims**



1. A leak tester for aerosol valves comprising an endless chain conveyor travelling along a pre-set closed path in a horizontal plane, said conveyor having blind seats for accommodating aerosol valves to be tested, means for introducing said aerosol valves onto said seats, resilient elements on said seats on which said valves are seated, a turnable drum movable along a circular path which coincides in part with the path of the chain conveyor, means mounted on said turnable drum for travelling therewith and cooperating with said valves for pressing said valves individually against respective resilient elements to form a sealed condition of said valves against said seats so that said resilient elements are deformed, means for opening said valves, cam means operatively coupled to the valve opening means and the valve pressing means first for opening the valves when they are sealed against said seats so that atmospheric pressure is established in said seats beneath said valves whereby the air pressure on the resilient elements is equalized and second for releasing the valve pressure means after the valves closing so that the pressure of the valves on the resilient elements is reduced and the latter elastically tend to return to their initial undeformed positions and carry the valves therewith to establish a suction in the seats below the valves and thereby a pressure differential on the valves tending to hold the valves on the seats, means downstream of said turnable drum for directing a jet of compressed fluid against said valves, said pressure differential being sufficient to cause the intact valves to withstand the jet of compressed fluid applied against the valves, said valves, if defective, permitting leakage of air beneath the seats to diminish the pressure differential and permit dislodging of the valves under the jet of compressed fluid, hopper means for receiving dislodged faulty valves, means downstream of said hopper means for re-opening said intact valves to permit atmospheric air to flow into said seats and cancel the pressure differential, means for removing the valves whose pressure differential has been cancelled, a second turnable drum movable along a circular path coinciding in part with a portion of the path of the chain conveyor downstream of the said hopper means; said means for re-opening the intact valves being mounted on the second drum.

4,107,978

DUROMETER ACCORDING TO ROCKWELL SYSTEM

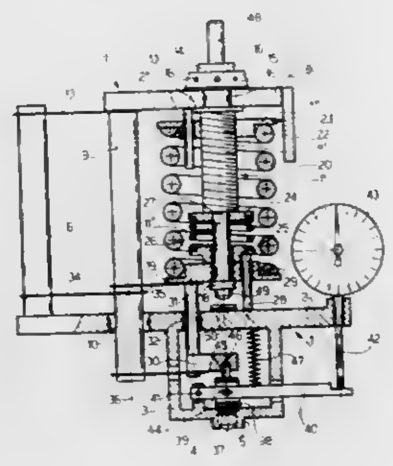
Alfred Ernst, Casa Carolina, Curio Ticino, Switzerland

Filed Feb. 28, 1977, Ser. No. 772,483

Claims priority, application Switzerland, Mar. 1, 1976, 2526/76; Mar. 1, 1976, 2527/76

Int. Cl.^{2} G01N *3/44*

U.S. Cl. 73—83 **12 Claims**



8. An apparatus for testing the hardness of a workpiece, said apparatus comprising:

lower structure having a substantially planar surface defining a reference plane;

a penetrator displaceable along a penetrator axis relative to said lower structure between an outer position projecting relatively far from said plane and an inner position generally flush with said plane;

a preload spring between said penetrator and said lower structure urging said penetrator into said outer position with a relatively small preload force;

upper structure adapted to receive an applied load force directed axially toward said lower structure;

means between said upper and lower structures for axial displacement of said upper structure relative to said lower structure through a relatively long axial distance between an upper rest position relatively far from said lower structure and a lower position abutting said lower structure;

an abutment carried on and axially displaceable with said upper structure;

intermediate structure axially displaceable toward said upper structure from a lower position resting on said abutment, said intermediate structure being spaced axially a relatively short distance from said penetrator in said lower position of said intermediate structure and said upper position of said upper structure, whereby displacement of said upper structure from said upper position engages said intermediate structure with said penetrator and thereafter engages said upper structure directly with said lower structure;

a load spring between said intermediate structure and said upper structure urging said intermediate structure against said abutment with a predetermined relatively large load force; and

a plurality of generally parallel resilient strips each having one end secured to one of said structures and another end secured to another of said structures.

4,107,979

METHOD AND DEVICE FOR MEASUREMENT OF ENVIRONMENTAL STRESS CRACKING

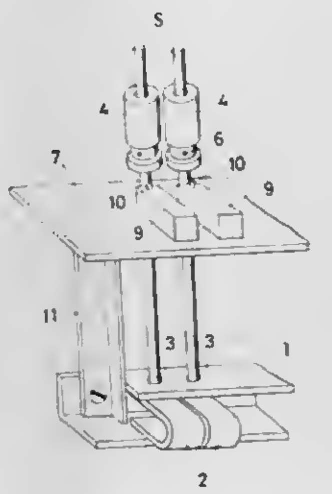
Shigeru Saeda, and Yukinori Suzaka, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,560

Claims priority, application Japan, Mar. 11, 1976, 51-25586

Int. Cl.^{2} G01N *3/00, 3/20*

U.S. Cl. 73—88 R **3 Claims**



3. A device for the measurement of environmental stress cracking, which comprises means for holding a test piece in a prestressed deformed position, where said holding means is shaped such that a known prestress is placed on said test piece resulting from a deformation of said test piece required in order for said test piece to be inserted in said holding means, said means incorporating an opening for communication between an inner space thereof and the exterior, loading means consisting of a supporting shaft penetrated through said opening in said test piece holding means and a weight fastened to said shaft, and means for sensing a displacement of said loading means.

4,107,980

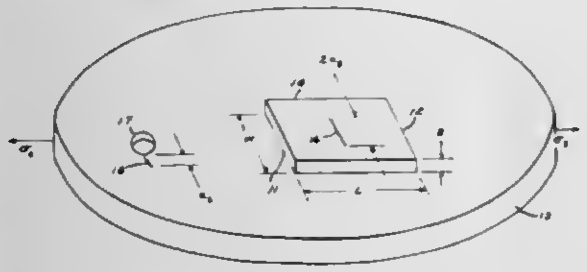
ASSESSMENT OF FLAW GROWTH POTENTIAL IN STRUCTURAL COMPONENTS

Robert L. Crane, Kettering; Alten F. Grandt, Jr., Dayton, and Joseph P. Gallagher, Bellbrook, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 7, 1977, Ser. No. 804,483

Int. Cl.² G01B *5/30*

U.S. Cl. 73—88 R **12 Claims**



7. The combination of a crack growth gage attached to a structural component for assessing damage accumulation in the structural component comprising a fatigued metal strip having a flaw therein of a predetermined initial length greater than an assumed or measured length of a flaw in the structural component; and means for attaching ends of the metal strip to the structural component with its underside between the attaching means in unobstructed contact with the structural component.

4,107,981

METHOD OF ESTIMATING GROUND PRESSURE

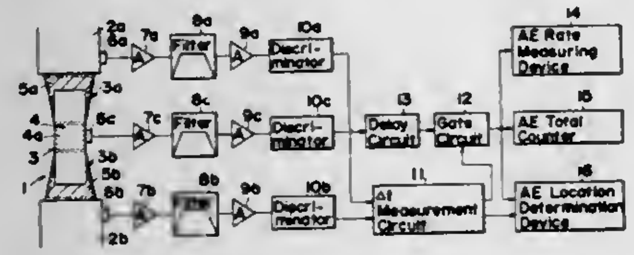
Tadashi Kanagawa, Kashiwa, and Hiroyasu Nakasa, Tokyo, both of Japan, assignors to Central Research Institute of Electric Power Industry, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,598

Claims priority, application Japan, Sep. 22, 1976, 51-113938

Int. Cl.² G01N *3/06*

U.S. Cl. 73—88 E **5 Claims**



1. A method of estimating ground pressure comprising the steps of:

removing at least one sample rock specimen from the ground location where the ground pressure is to be determined;

applying a load externally to said rock specimen, and continuously increasing said applied load over a given period of time;

counting the number of acoustic emissions produced from the interior of said rock specimen to which the load is applied during said given period of time;

determining the relationship between the number of acoustic emissions and the time period of measurement and determining the point of inflection of said acoustic emissions during said time period; and

comparing the time of said point of inflection with the time of the load applied and determining the load applied at the time of inflection, whereby the hysteretic maximum stress of said rock specimen is determined.

4,107,982

VESSEL FOR ATMOSPHERE FOR USE WITH MATERIAL TESTING DEVICE

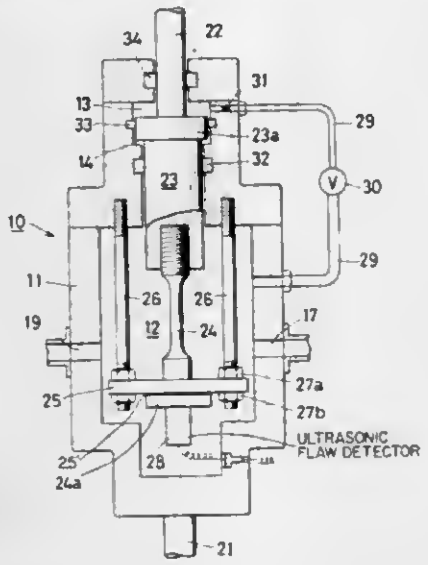
Murao Mitsui; Kiyoshi Yokogawa, and Seiji Fukuyama, all of Kure, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,361

Claims priority, application Japan, Mar. 29, 1976, 51-34779

Int. Cl.² G01N *3/08*

U.S. Cl. 73—95 **6 Claims**



1. A vessel for retaining an atmosphere in which a test piece is tested, comprising in combination:

(a) a casing defining an auxiliary chamber in an upper portion and a test atmosphere chamber in a lower portion, the auxiliary chamber and the test atmosphere chamber being separated by an airtight chamber,

(b) means for providing intercommunication between said test atmosphere chamber and said auxiliary chamber,

(c) a sliding member having a head portion thereof inside the auxiliary chamber and a bottom portion protruding airtightly into said test atmosphere chamber,

(d) means for equalizing the pressure to which the sliding member is exposed inside the auxiliary chamber and the pressure to which said sliding member is exposed inside the test atmosphere chamber,

(e) means disposed in the portion of said sliding member protruding into the test atmosphere chamber and adapted to support one end of the test piece,

(f) a stay fastened inside the test atmosphere chamber and adapted to support the other end of said test piece, and

(g) a shaft for applying a test load to the test piece, one end of the shaft being connected to the bottom of said casing and the other end of said shaft passing airtightly through the auxiliary chamber and connected to the head portion of said sliding member.

4,107,983

METHOD AND MACHINE FOR DETECTING AND CORRECTING TENSION OF SAW BLADES

Chester H. Dawson, Danbury, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Aug. 8, 1977, Ser. No. 822,418

Int. Cl.² G01N *3/20*

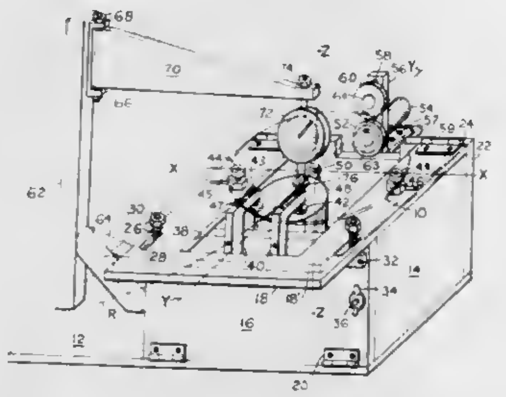
U.S. Cl. 73—100 **7 Claims**

7. A machine for detecting the tension in a saw blade, comprising:

means for supporting the blade horizontally at least at two points on opposite sides of the center of the blade, said points defining a first diametral axis of the blade;

means for resisting upward movement of the blade at at least two further points on opposite sides of the center of the blade, said further points defining a second diametral axis of the blade circumferentially spaced from said first diametral axis;

means for elastically deflecting the blade by pressing said supporting means and said resisting means in opposite directions along a major rotational axis of the blade normal to said first and second diametral axes, thereby to deflect the blade into a saddle form with an upper surface of the blade being concave along said first diametral axis and tending toward upward convexity along said second diametral axis, said tendency toward upward convexity being offset by and to the extent of any tendency of the central portion of the horizontally-supported blade to drop through in the presence of a decreasing level of tension from the periphery of the blade toward its center; and means for detecting any convexity of a portion of said upper surface of the blade lying along said second diametral axis, as an indication of the relative levels of tension existing diametrally across the blade.



4,107,984

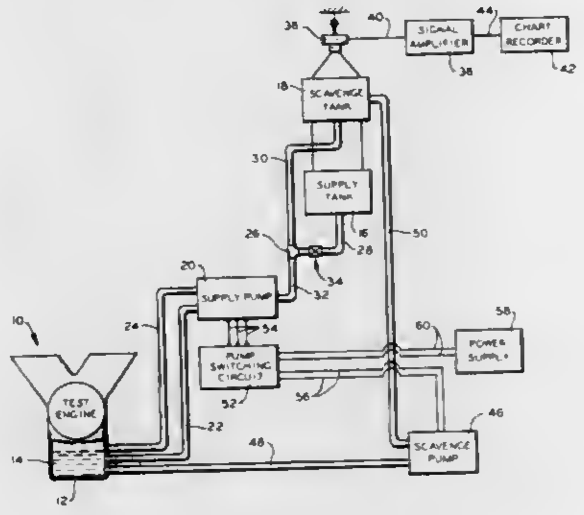
SYSTEM FOR MAINTAINING LEVEL OF OIL IN ENGINE

Ronald James Unger, Richmond, and John Gilbert Spoonamore, Hagerstown, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Apr. 11, 1977, Ser. No. 786,632

Int. Cl.² G01M *15/00*

U.S. Cl. 73—113 **9 Claims**



8. A system for delivering a lubricating fluid to an internal combustion engine under test comprising:

a first fluid supply tank;

a second fluid supply tank;

a load cell, said first and second tank suspended from said load cell with said second tank positioned above said first tank, said load cell generating a signal representing the weight of the fluid in said tanks;

a first pump having a first inlet in fluid communication with said first and second tanks, a second inlet in fluid communication with the engine above a predetermined fluid level and an outlet in fluid communication with the engine at the predetermined fluid level, said first pump for supplying fluid to the engine from said tanks when the fluid in the engine is below the predetermined level;

valve means blocking the flow of fluid from the first tank upon the presence of fluid in said second tank;

a second pump for delivering fluid from the engine to said second tank when the fluid in the engine is above the predetermined level; and

means responsive to said load cell signal for determining the rate of consumption of the fluid.

4,107,985

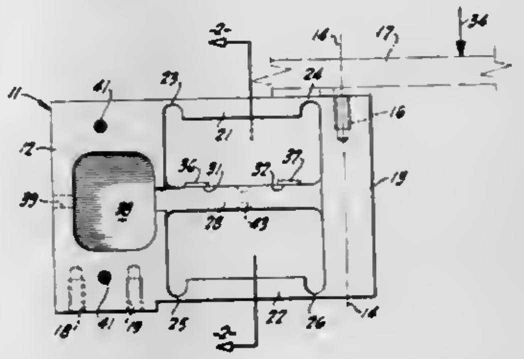
LOAD CELL

Thomas R. Sommer, Sebastopol, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Filed Sep. 10, 1976, Ser. No. 721,981

Int. Cl.² G01L *1/22;* G01G *3/14, 3/08*

U.S. Cl. 73—141 A **2 Claims**



1. In a load cell: a base, a load arm spaced from the base for receiving a load applied in an axial direction, a pair of generally parallel arms with flexures interconnecting the base and load arm and constraining the load arm for movement in the axial direction, a substantially rigid beam affixed to the load arm and base and having a region of reduced thickness toward the center thereof, and stress responsive means mounted on the beam and spaced longitudinally apart between the region of reduced thickness and the ends of the beam for providing an output signal corresponding to the load.

4,107,986

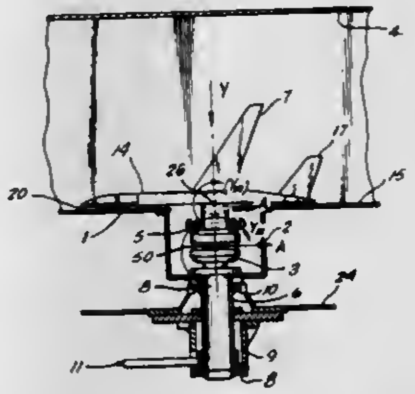
FIVE COMPONENT STRAIN GAUGE BALANCE

Roy L. Jones, Anaheim, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 4, 1977, Ser. No. 784,353

Int. Cl.² G01M *9/00;* G01L *5/16*

U.S. Cl. 73—147 **8 Claims**



3. A balance for measuring forces and moments exerted on an aircraft model in a wind tunnel wherein half of a model is mounted with the wing in the vertical plane, and with the fuselage half in close proximity to the wind tunnel floor and attached to the top of said balance, comprising,

an upper member rigidly attached to said model,

- a lower member attached to the wind tunnel structure,
- a forward beam, an aft beam and two side beams arranged in a diamond pattern in relation to the direction of air flow in said wind tunnel rigidly connecting said upper and lower members,
- at least one strain gauge attached to each beam for measuring the strain of each beam, and
- at least one flexure forward of, and at least one flexure aft of, each side beam, each flexure rigidly attached to said upper and lower members.

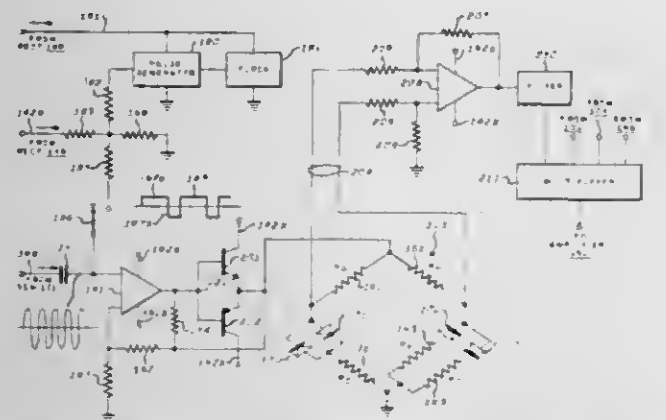
4,107,987
GEOTHERMAL WELL PUMP PERFORMANCE SENSING SYSTEM AND MONITOR THEREFOR

Kenneth W. Robbins, Wilmington, and Gerald F. Ross, Lexington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,220

Int. Cl.² E21B *47/06*

U.S. Cl. 73—151 **19 Claims**



1. In apparatus including moving means at a location within a borehole remote from the earth's surface for performing useful work with respect to a medium at said location:
- first transducer means having first and second relatively movable parts at least one of said parts being mechanically coupled to said moving means for generating a first electrical signal characteristic of motion of said moving means,
- multiple-arm bridge means having input means excited by said first electrical signal and first and second discrete output means,
  - said multiple-arm bridge means having one arm including first and second circuits in parallel,
    - said first circuit including first resistor means responsive to a characteristic of said medium and first diode means,
    - said second circuit including second resistor means stable with respect to said characteristic and second diode means poled oppositely with respect to said first diode means,
- transmitter means utilizing said first electrical signal as enabling electrical operating power and responsive to said discrete output means for transmitting signals representative of said characteristic, and
- receiver means responsive to said transmitter means and adapted for exciting utilization means exterior of said borehole.

4,107,988
NAVIGATION AID FOR SAILING VESSELS

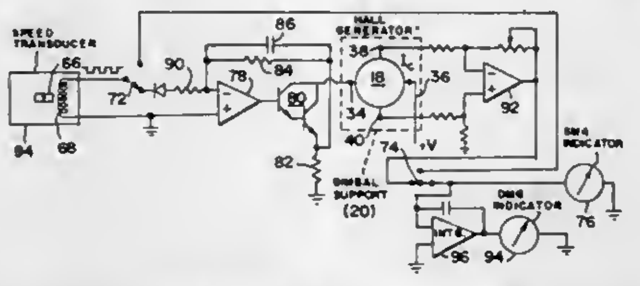
Lawrence M. Polsky, 529 French Rd., Rochester, N.Y. 14618

Filed Oct. 3, 1977, Ser. No. 839,061

Int. Cl.² G01C *21/10*

U.S. Cl. 73—178 R **13 Claims**

1. Navigation apparatus for indicating the actual progress of a sailing vessel towards a selected position, said apparatus comprising
- (a) means for detecting the speed of the vessel and providing a first output signal proportional thereto,
- (b) means responsive to the earth's magnetic field and to said first output signal and rotatable in azimuth for generating a second output signal which is proportional to the actual speed of said vessel along a direct course to said selected position, said generating means comprising a Hall effect generator having a sensitive axis, which when aligned in the direction of the earth's magnetic field maximizes said second output signal, and
- (c) indicating means responsive to said second output signal.



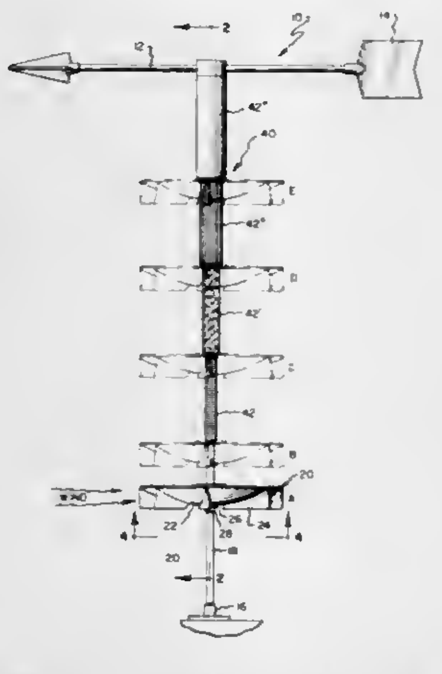
4,107,989
DECORATIVE WIND VELOCITY AND DIRECTIONAL INDICATOR

George Peters, 313 Lydia La., Cheektowaga, N.Y. 14225

Filed Jul. 20, 1977, Ser. No. 817,137

Int. Cl.² G01W *1/02*

U.S. Cl. 73—189 **18 Claims**



1. An apparatus for indicating wind speed, said apparatus comprising in combination:
- a. a base member for mounting said apparatus;
- b. a generally vertically disposed shaft held by said base;
- c. a disk mounted on said shaft for both rotational movement about its rotational axis of symmetry and generally vertical movement along said shaft; and
- d. means mounted on said shaft for adding increments of weight to said disk at different vertical elevations of said disk up said shaft.

4,107,990
FLUIDIC FLOW AND VELOCITY SENSOR

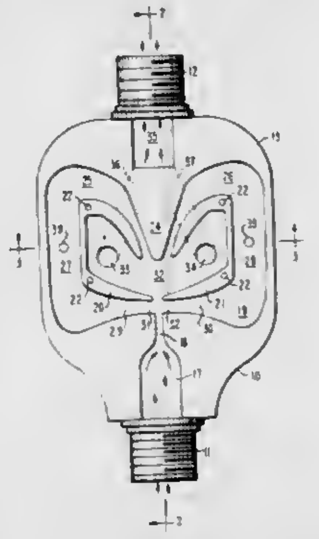
Carl G. Ringwall, Scotia, N.Y., assignor to General Electric Company, Wilmington, Mass.

Filed Nov. 2, 1976, Ser. No. 738,067

Int. Cl.² G01F *1/20*

U.S. Cl. 73—194 B **9 Claims**

1. A flowmeter having inlet and outlet passages adapted to be connected in a fluid conduit for sensing fluid flow through said conduit comprising:
- a. a housing having wall portions forming a jet interaction chamber,
- b. fluid accelerating means connected to the inlet passage and arranged to generate and direct a fluid jet through the interaction chamber,
- c. venting conduit means leading from the chamber to the outlet passage,
- d. a pair of fluid receiver means disposed in said interaction chamber on opposite sides of the jet for receiving differentially variable portions of fluid from the jet in response to lateral deflection of the jet from a center position,
- e. means forming control ports disposed on opposite sides of the jet upstream of the jet interaction chamber for laterally deflecting the jet, said control ports being positioned closely adjacent to the base of said fluid jet to provide lateral deflection by virtue of the differential pressure existing on opposite sides of the jet, the area of said ports being such that a small percentage of the total fluid jet passing through the interaction chamber passes through said ports, whereby the input and output fluid flow resistance varies proportionally to the fluid velocity,
- f. feedback conduit means interconnecting the receiver means and the control ports to cause oscillation of the jet by application on a negative feedback differential pressure signal thereto,
- g. means forming part of said interaction chamber to prevent pressure differentials on opposite sides of the jet in the interaction chamber due to fluid entrainment, thereby preventing lateral jet deflection in said chamber and attachment of the jet to the wall of said chamber, whereby the flowmeter operates in an extended flow range which includes laminar as well as turbulent flow conditions for the fluid passing through the interaction chamber, and
- h. means sensing the jet oscillation frequency to indicate flow rate through said conduit.



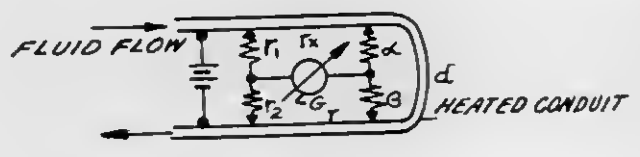
4,107,991
RESISTANCE BRIDGE-TYPE FLOWMETER

James M. Benson, Hampton, Va., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Jul. 20, 1977, Ser. No. 817,522

Int. Cl.² G01F *1/68*

U.S. Cl. 73—204 **9 Claims**



1. A fluid flowmeter comprising:
- an electrically and thermally conductive conduit, said conduit having an electrical resistance which varies as a function of temperature;
- means for passing electrical current through said conduit thereby heating it;
- a resistance bridge joined to said conduit at spaced points along the conduit, said points defining at least one conduit segment;
- means for passing fluid through the conduit to vary the temperature and resistance of said segment so as to affect the balance of said bridge; and
- a meter operatively associated with the bridge for displaying the condition of balance of said bridge.

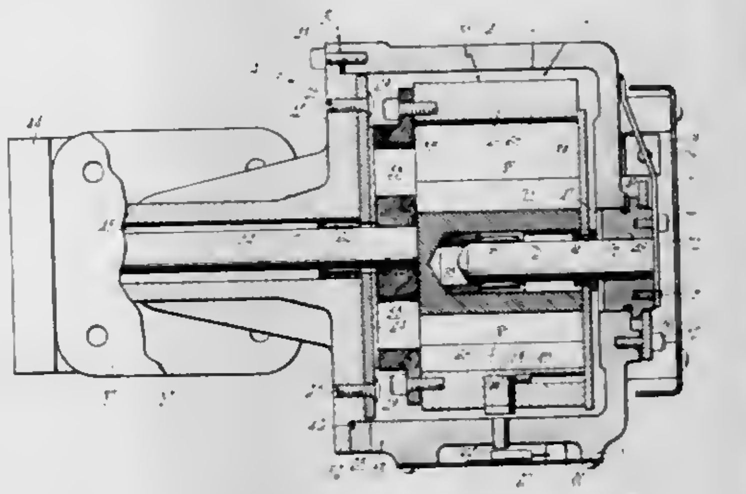
4,107,992
FLUID METER

Coates F. Bateman, West Hartford, and Louis Soltanoff, Stamford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Feb. 4, 1977, Ser. No. 765,685

Int. Cl.² G01F *3/06*

U.S. Cl. 73—260 **15 Claims**



1. A positive displacement rotary fluid meter comprising a housing, an enclosed rotor assembly rotatably mounted within the housing having an outer ring rotatably mounted about a first axis, an inner rotor rotatably mounted within the outer ring about an axis parallel and eccentric to the axis of the outer ring and with an annular chamber therebetween, a pair of axially spaced transverse end members for the annular chamber, and a plurality of generally radially extending and angularly spaced vanes connected to the outer ring and inner rotor and dividing the annular chamber into a plurality of separate positive displacement chambers which expand and contract during rotation of the rotor assembly, the housing having a transverse sidewall in flush engagement with one of the transverse end members of the rotor assembly and separate inlet and outlet passageways with respective generally diametrically opposed inlet and outlet ports in said one sidewall, said one transverse end member of the rotor assembly having a plurality of axial openings for the plurality of positive displacement chambers respectively, each in communication with the respective positive displacement chamber and in alternating communication with the inlet and outlet ports as the respective positive displacement chamber expands and contracts respectively during rotation of the rotor assembly, and magnetically operated pulse generator means comprising fixed magnetically responsive pickup means operative to generate an electrical pulse, and a plurality of pickup operating means mounted on the rotor assembly for operating the pickup means to generate an electrical pulse for each predetermined increment of rotation of the rotor assembly, the rotor assembly being axially shiftable to vary its axial force against said transverse housing sidewall and the housing having fluid therein externally of the enclosed rotor assembly and operative to bias the rotor assembly axially against said transverse housing sidewall.

4,107,993

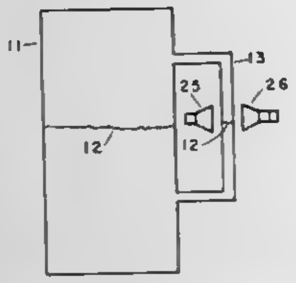
METHOD AND APPARATUS FOR LEVEL MEASUREMENT USING MICROWAVES

Thomas J. Shuff, Dickinson, and Robert W. Sims, Pasadena, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,386

Int. Cl.² G01G *23/28*

U.S. Cl. 73—290 R **7 Claims**



1. The method of continuously indicating the level of a liquid in a vessel comprising: generating microwaves, directing the microwaves through said vessel, measuring the unabsorbed microwave energy, and determining the level of the liquid from said unabsorbed microwave energy.

4,107,994

LEVEL DETECTOR

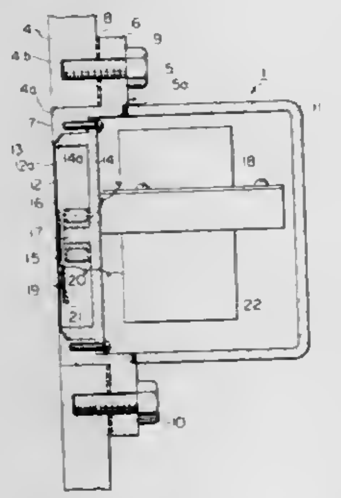
Masaaki Sogo, Kobe, Japan, assignor to Sanko Air Plant Ltd., Osaka, Japan

Filed Jul. 13, 1976, Ser. No. 704,807

Claims priority, application Japan, Jul. 21, 1975, 50-88340

Int. Cl.² G01F *23/26*

U.S. Cl. 73—290 V **7 Claims**



1. A level detector for use in detecting whether the level of contents in a container has reached a predetermined level, said detector comprising:

coil means for producing an electromagnetic force;

driving means for intermittently supplying pulse signals to said coil;

vibrating plate means having a surface substantially flush with the surface of the inner wall of the container, said coil means in close proximity to said vibrating plate means so that said plate means is intermittently vibrated by said electromagnetic force, the vibrating condition of said plate means changing depending on whether or not said contents contact said plate means;

mechanical vibrating-electric converter means for converting the vibrations of said plate means into an electric signal with changes on the attenuation time of the intermittent vibrations of said plate means, said converter means attached to said vibrating plate means having one end attached to said vibrating plate means and means secured to the other ends of the piezo-electric element to produce a distortion effect to said piezo-electric element under inertial influence of said means; and

detecting means for detecting changes in said electric signal caused by changes in said attenuation time, to thereby determine if the level of the container contents has reached said predetermined level.

4,107,995

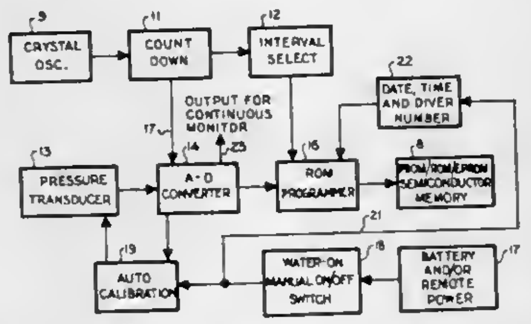
RECORDER FOR DECOMPRESSION DATA

James Raymond Ligman, 93 Manzanita Ln., Santa Barbara, Calif. 93105, and Richard Fred Jones, 335 Rosemead, Santa Barbara, Calif. 93110

Filed Sep. 13, 1976, Ser. No. 722,710

Int. Cl.² G01F *23/18;* G01L *9/00*

U.S. Cl. 73—300 **16 Claims**


9
CRYSTAL OSC.
11
COUNT DOWN
12
INTERVAL SELECT
22
DATE, TIME AND DIVER NUMBER
OUTPUT FOR CONTINUOUS MONITOR
17
14
23
16
8
13
PRESSURE TRANSDUCER
A-D CONVERTER
ROM PROGRAMMER
PROM/ROM/EPROM SEMICONDUCTOR MEMORY
21
19
AUTO CALIBRATION
18
WATER-ON MANUAL ON/OFF SWITCH
17
BATTERY AND/OR REMOTE POWER

1. A system for monitoring on shipboard and recording the pressure to which an underwater diver is subjected as a function of time, comprising:

(a) a shipboard display device for indicating time and pressure;

(b) a pressure transducer carried by the diver and having an electronic output that is conducted to the shipboard pressure display;

(c) a clock having a periodic electronic output located at one of said diver or shipboard locations and connected to said shipboard time display;

(d) and an electronic recorder located at one of said diver or shipboard locations and connected to said pressure transducer and said clock to record periodically the instantaneous pressure,

whereby the instantaneous pressure and time are observed on shipboard and a record of pressure versus time is obtained on the recorder for any selected period of time.

4,107,996

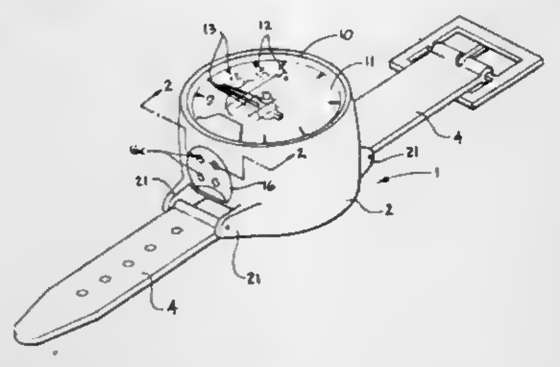
PRESSURE GAUGE

Ashley J. Hollingsworth, Atherton, and Ralph B. Shamlian, San Francisco, both of Calif., assignors to Farallon Industries, Inc., Belmont, Calif.

Filed Nov. 28, 1975, Ser. No. 636,045

Int. Cl.² G01F *23/14;* G01L *7/08*

U.S. Cl. 73—300 **10 Claims**



1. A pressure gauge comprising:

means forming a housing having a bore through one wall and including a compressible medium;

a pointing means;

means forming a faceplate for bearing indicia;

a rack-and-pinion gear assembly having a rack and a gear for

rotating said pointing means relative to said indicia as said rack is moved;

means forming a flexible rolling diaphragm having no appreciable spring gradient within a predetermined range of stroke, said diaphragm being disposed to lie in contact with one end of said rack in said bore and being movable under the influence of a pressure differential between the interior of said housing and ambient pressure for moving said rack with no appreciable stretching of the material of which said diaphragm is made throughout said stroke;

means for sealing said diaphragm in said bore; and

means for returning said rack and said pointing means to an initial position upon the removal of said pressure differential from said diaphragm.

4,107,997

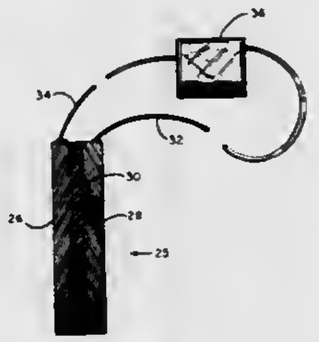
ALLOY SENSOR

Alvin A. Snaper, Las Vegas, Nev., assignor to Advanced Patent Technology, Incorporated, Las Vegas, Nev.

Filed Sep. 15, 1975, Ser. No. 613,528

Int. Cl.² G01F *23/24;* C22C *11/06, 30/04*

U.S. Cl. 73—304 R **8 Claims**



3. A composition comprising 20–45% each by weight lead, tin and zinc and up to about 0.1% by weight copper and up to 0.1% by weight tellurium.

4. The composition of claim 3 wherein said amounts of copper and tellurium are between about 0.01 and 0.1%.

6. A method of measuring the level of an aqueous composition comprising exposing said composition to an electrode of an alloy of claim 4, detecting the magnitude of current passing from said electrode and determining the surface area of said electrode exposed to said composition which is directly proportional to said current magnitude.

4,107,998

PETROL TANK GAUGES

Kenneth James Taylor, Pascoe Vale South, Australia, assignor to Stewart-Warner Corporation, Chicago, Ill.

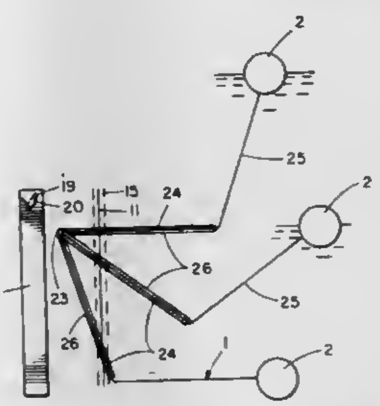
Filed Apr. 30, 1976, Ser. No. 681,813

Claims priority, application Australia, Apr. 30, 1975, PC1412; Mar. 29, 1976, 12452/76

Int. Cl.² G01F *23/10*

U.S. Cl. 73—313 **8 Claims**

1. A sender device adapted for use in a system for indicating the amount or level of a liquid in a vessel with a meter which is non-linearly responsive to a sender current, comprising; substantially straight elongate resistance member adapted to be connected to an indicator, an elongated substantially straight contact member pivotally mounted about an axis closely spaced to said resistance member, said contact member being movable in overlapping relation and in sliding engagement with said resistance member to provide a resistance which varies in accordance with a non-linear function of contact member movement, said contact member being connected to a float member by means of a curved or bent float arm extending from the end of the contact member opposite the pivot axis of the contact member.



4,107,999

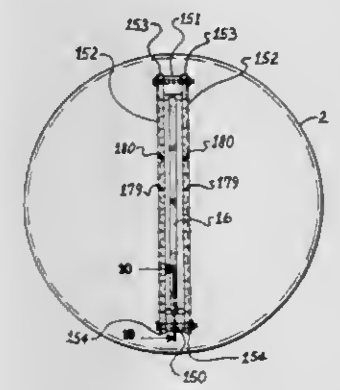
AUTOMATIC OIL LEVEL MAINTAINING SYSTEM

James R. Lang, Littleton, Colo., assignor to The Mechanex Corporation, Denver, Colo.

Division of Ser. No. 709,441, Jul. 28, 1976, Pat. No. 4,091,894. This application May 31, 1977, Ser. No. 801,590

Int. Cl.² G01F *23/02*

U.S. Cl. 73—326 **4 Claims**



1. In a system for maintaining a desired level of oil in the crankcase of an engine; said system having a reservoir for containing oil, the improvement comprising;

a first connective member in fluid flow communication with a lower portion of a wall of said reservoir;

a second connective member in fluid flow communication with an upper portion of said wall of said reservoir;

a breakable, elongated, liquid level indicating means in fluid flow communication with each said first and said second connective member for indicating visually the amount of oil in said reservoir;

each said first and second connective member having a first side substantially normal to a surface of said reservoir wall and a second side substantially normal to said surface of said reservoir wall, each said first side and said second side of each of said connective members being substantially parallel to said liquid level indicating means;

an opening through each of said connective members from said first side to said second side; each of said openings being out of fluid flow communication with said reservoir;

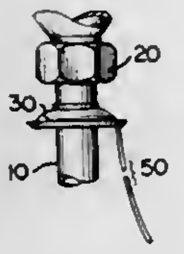
a rigid guard member extending from said first side of said first connective member to said first side of said second connective member and a rigid guard member extending from said second side of said first connective member to said second side of said second connective member;

each of said guard members being shaped in cross-section so as to increase the ability to withstand impact without deformation and having an opening at each of two ends; and attachment means passing through each of said openings in each of said guard members and through said opening in each of said connective members for rigidly attaching a guard member to each of said two sides of said connective members for being on each of two sides of said liquid level indicating means for aiding in preventing damage to said liquid level indicating means.

4,108,000
GAUGE GLASS PROTECTOR

Orlin R. Norris, Parsippany, N.J., assignor to JeNor, Morristown, N.J.

Filed May 5, 1977, Ser. No. 793,994
Int. Cl.^{2} G01F *23/02*
U.S. Cl. 73—328 **7 Claims**



1. A gauge glass protector apparatus for protecting the vertical gauge glass on a boiler type of liquid containing pressure vessel, said apparatus comprising:

- a grommet means for frictionally engaging said gauge glass and holding said apparatus in place against said gauge glass;
- a downwardly sloping skirt means for directing liquid away from said gauge glass, said downwardly sloping skirt means being attached to said grommet means;
- an upwardly sloping rim connected around the edge of said downwardly sloping skirt means at a juncture, said upwardly sloping rim forming a collector trough between said rim and said downwardly sloping skirt means; and
- a collector trough drainage hole means located substantially at the juncture between said upwardly sloping rim and said dowardly sloping skirt means,
- wherein liquid travelling down said vertical glass gauge impinges upon said grommet means and is carried away from the area of said glass gauge by said downwardly sloping skirt means and into said collector though at which location said liquid harmlessly passes through said trough drainage hole means.

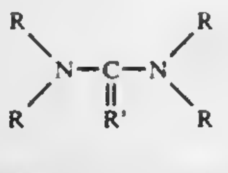
4,108,001
UREA COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County, and David C. Phillips, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 23, 1976, Ser. No. 726,039
Int. Cl.^{2} C09K *3/00;* G01K *3/00, 11/00;* C08K *5/21;* C08L *63/00*
U.S. Cl. 73—339 R **30 Claims**

1. A composition curable at room temperature comprising at least one urea compound and a solution of a room temperature, air-dryable epoxy resinous carrier stable at 60° C when cured, and unreactive with said urea compound, said urea compound being selected from the group consisting of t-butylurea, hydroxyurea, n-butylurea, sym-diethylurea, 1,3-dimethylurea, ethylurea, phenylurea, thiourea, and urea.

13. A thermal detection system for electrical apparatus cooled by a gas stream, comprising a thermoparticulating coating on a portion of said electrical apparatus exposed to said gas stream and a monitor for detecting the presence of thermoparticulated particles in said gas stream, said coating comprising a solid layer of a room temperature, air-dried epoxy or polyester resinous carrier containing a urea compound having the general formula

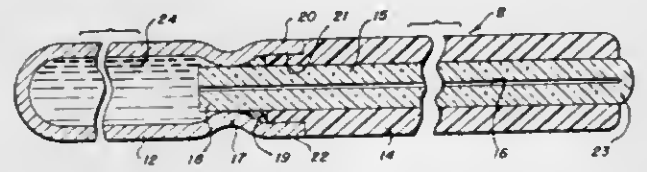


where each R is independently selected from hydrogen, hydroxyl, and alkyl to C_{20}, and R' is oxygen or sulfur.

4,108,002
DISPOSABLE THERMOMETER

Charles L. Rowe, 787 E. Illinois Rd., Lake Forest, Ill. 60045, and Ronald A. Lewis, 1085 Barnard Dr., Buffalo Grove, Ill. 60090

Filed Dec. 16, 1976, Ser. No. 751,474
Int. Cl.^{2} G01K *5/08, 5/22*
U.S. Cl. 73—371 **17 Claims**

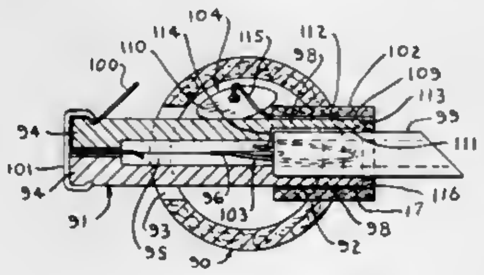


1. A throwaway thermometer comprising: an elongated element formed of a molded synthetic resin and having an axial bore; a layer of glass in said bore for effectively precluding gaseous diffusion into said bore and defining an inner capillary bore; means at one end of said element defining a reservoir communicating with one end of said capillary bore; temperature indicating scale means associated with said element; means sealingly closing the other end of said capillary bore at the other end of the element, said layer of glass being outwardly exposed at said other end of the element; and an indicator liquid in said reservoir and capillary bore under a preselected effectively maintained vacuum pressure.

4,108,003
DEVICE FOR OBTAINING A SAMPLE OF LIQUID

Robert F. McDevitt, P.O. Box 551, Ogden Dunes, Portage, Ind. 46368

Division of Ser. No. 720,697, Sep. 7, 1976, which is a continuation of Ser. No. 565,396, Apr. 7, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,709
Int. Cl.^{2} G01N *1/12*
U.S. Cl. 73—425.4 R **15 Claims**

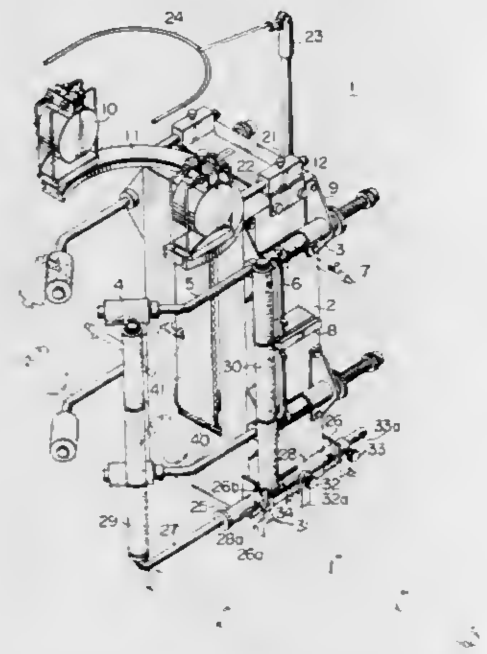


1. A device for obtaining a sample of liquid from a supply thereof, said device comprising a pair of elongated half sections, each of said sections being provided with an enlarged portion provided with a recess and a smaller channel portion, first means and second means respectively securing said enlarged portions and said channel portions together whereby said recesses and said channel portions respectively form a chamber and an elongated opening, a tube having an inner extremity secured in said opening and an outer extremity provided with an entrance for a liquid for flow into said chamber via said tube, and manipulatible means having a portion interposed between at least one of said channel portions and said second means whereby to facilitate their separation after a sample is received by the device.

4,108,004
SELF-PROPELLED PIPE INSPECTING APPARATUS

Osamu Murakami, Tokyo, Japan, assignor to Kett Electric Laboratory, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 831,020
Claims priority, application Japan, Sep. 13, 1976, 51-123093[U]
Int. Cl.^{2} G01N *29/04*
U.S. Cl. 73—432 R **19 Claims**



1. A self-propelled pipe inspecting apparatus comprising (a) fault detecting means, (b) pipe cramping means, and (c) a mobile carriage, and characterized in that (a) said cramping means include at least two arms extending outwardly of said mobile carriage; the outer ends of said arms being bent at a certain angle to the axis of respective arms; said bent ends of said arms carrying rollers engageable with a pipe to be inspected; the other ends of said arms being secured to said mobile carriage so that said ends are movable along and rotatable around the longitudinal axes of respective arms; and said arms being biased by resilient means so as to retract said rollers toward said mobile carriage, and in that (b) said mobile carriage has an elastic running surface; a pipe to be inspected being held between said biased rollers of said cramping means and said resilient running surface; whereby said mobile carriage can run along said pipe in the lengthwise direction of the latter.

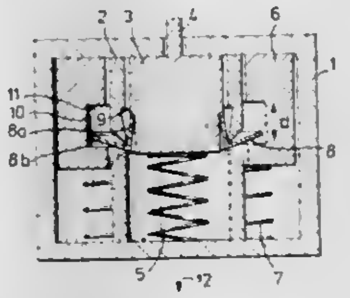
4,108,005
VEHICLE DECELERATION SENSING DEVICE

Claes Gustav Erik Yngve Tisell, Strangnäs; Lärs-Göran Svensson, Upsala; Gustav Sven Erik Karlstedt; Gustav Yngve Thorstensson, both of Sollentuna, and Joho Fredrik Alf Hartmann, Djursholm, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 21, 1977, Ser. No. 789,650
Int. Cl.^{2} G01P *15/02;* B60R *21/02*
U.S. Cl. 73—514 **1 Claim**

1. A vehicle carried device for sensing and providing an indication when the duration and magnitude of vehicle deceleration exceed predetermined values comprising:

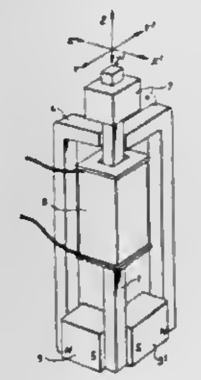
- a first mass body (6) arranged to be displaced in a first direction (12) as the result of an occurring deceleration of a certain magnitude of the vehicle;
- a second mass body (3, 4) with the ability to be displaced in said direction as the result of an occurring deceleration of the vehicle;
- blocking member means (8) movable into a predetermined stable first position for preventing displacement of said second mass body in said direction, said blocking member means comprising a cup spring with a cup part (8*b*) having an inner periphery and locking tongues (8*a*) disposed around the inner periphery to lock the second mass body (3, 4) when said blocking member means is in said predetermined stable position;
- actuating member means (11) operatively associated with said first mass body for transferring the blocking member means from said first position into second position as a result of the first mass body being displaced a predetermined distance (*d*) by deceleration of the vehicle, said actuating member means transferring said blocking member means by moving said cup part from a first to a second position thereby freeing said locking tongues from said second mass body, the second mass body being displaceable in said direction by deceleration of the vehicle when said blocking member means is in said second position, the displacement of said second mass body providing an indication that the duration and magnitude of the deceleration of the vehicle exceed predetermined values;
- rectilinear guide means (2) for guiding the movement of said first mass body and said second mass body; a first spring (7) operatively associated with said first mass body (6), said first mass body being displaceable in said direction (12) against the action of said first spring only when the vehicle is given a deceleration of a predetermined magnitude; and
- a second spring (5) operatively associated with said second mass body (3, 4), said second mass body being displaceable in said direction (12) against the action of said second spring.



4,108,006
ACCELEROMETERS

Derek Oscar Walter, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Mar. 25, 1977, Ser. No. 781,452
Claims priority, application United Kingdom, Mar. 30, 1976, 12747/76
Int. Cl.^{2} G01P *15/08*
U.S. Cl. 73—517 R **4 Claims**

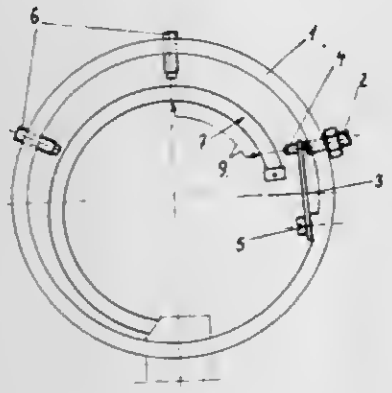


1. An accelerometer for detecting or measuring accelerations includng an elongate member which is caused to vibrate

when the accelerometer is subjected to an acceleration above a threshold value wherein the member is capable of vibrating in more than one plane and, in vibrating, causes a change to occur in a physical parameter of the accelerometer which is other than a dimensional change due to distortion, said member having a cross-sectional shape such that it has characteristic but different frequencies of vibration in two planes at right angles to one another, the vibrations of said member in two given planes causing recognisably different changes to occur in the said physical parameter which changes are characteristic of vibrations in the said two given planes, said elongate member being supported at one end thereof and the accelerometer also including two magnets or magnetisable elements disposed substantially at right angles to each other in the region of the support and in the two given planes, a pole piece associated with each magnet or magnetisable element and terminating at a face confronting the member across a spacial gap at a position remote from the support, an electrical pickup coil disposed around the elongate member at a position intermediate the support and the gap, the coil serving, when energised to produce two magnetic circuits, each circuit passing through the member, across the appropriate air gap, to a magnetic/magnetisable element via a pole piece, the construction of the accelerometer being such that when subject to an acceleration parallel to or having a component parallel to at least one of the two given planes, the elongate member will vibrate causing a change in the extent of at least one spacial gap and a voltage at terminals of the pick-up coil as a result of a change in flux linkages with the turns of the pick-up coil due to changes in flux of the magnetic circuits.

4,108,007
MANOMETERS WITH MEASUREMENT RANGE MULTIPLICATION

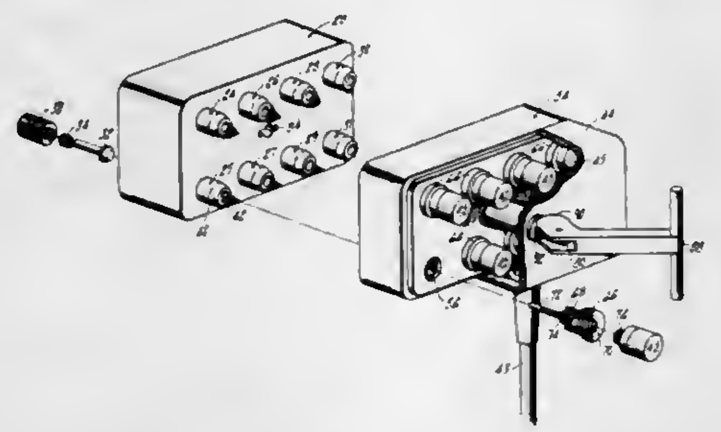
Kurt Neubeck, Miltenberg, Main; Karl-Heinz Schwing, Amorbach, and Kurt Klein, Röllfeld, all of Fed. Rep. of Germany, assignors to Alexander Wiegand GmbH u. Co., Armaturen- u. Manometeneabrik, Klingenber, Fed. Rep. of Germany
Filed May 20, 1977, Ser. No. 798,827
Int. Cl.² G01L *7/04*
U.S. Cl. 73—732 **4 Claims**



2. A manometer comprising a casing, a tube spring metering element mounted therein having a fixed end and a free end, first means responsive to a predetermined degree of expansion movement of said element to change the effective spring rate thereof so that a unit of subsequent expansion movement indicates an increased rate of increase of the pressure to be measured, said first means comprising a yieldable stop member disposed in the path of movement of said free end, and second means to selectively increase and decrease the resistance offered by said member to movement of said free end, said first means comprising a leaf spring having a fixed end and a free end, the fixed end of said leaf spring being secured to the casing by a stop screw, said second means comprising a first stop member carried by said casing in engagement with one side of the free end of said leaf spring and a second stop member at the other side of said free end of said leaf spring engageable with the free end of said tube spring metering element.

4,108,008
QUICK CONNECT MULTIPLE FLUID/ELECTRICAL TRANSDUCER APPARATUS

Terence W. Jowett, Avon, Conn., and Harvey A. Smith, Hampden, Mass., assignors to United Technologies Corporation, Hartford, Conn.
Filed Oct. 26, 1977, Ser. No. 845,510
Int. Cl.² G01L *7/00*
U.S. Cl. 73—756 **3 Claims**



1. A quick disconnect, multiple fluid/electrical transducer apparatus comprising:

a port block comprising a plurality of ports adapted to be connected to fluid lines in a vehicle or other structure having fluid lines, the parameters of which are desired to be sensed, each of said ports including a valve seat and a valve resiliently urged against the corresponding one of said valve seats, each of said valves selectively blocking the passage of fluid outwardly from the related one of the fluid lines through the related port;

a transducer block having a plurality of fluid-to-electrical transducers disposed therein said transducer block adapted for engagement with said port block, said transducer block having a fluid passage in fluid communication with each of said fluid-to-electrical transducers disposed for alignment and fluid communication with the corresponding ports of said port block when said two blocks are mutually engaged, said transducer block having a plurality of pushers, one for each of said ports, each operative to disengage a corresponding one of said resiliently seated valves away from the corresponding valve seat when said blocks are mutually engaged, thereby to open said fluid lines into fluid communication with said ports, and thereby with said passages and transducers, only when said blocks are mutually engaged;

a cable disposed to said transducer block independently of said port block including a plurality of electrical connections to respective ones of said fluid-to-electrical transducers; and

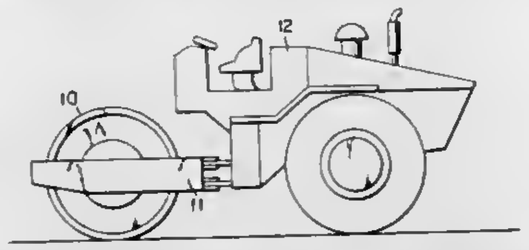
means for releasably securing said blocks in mutual, aligned engagement, whereby said transducers are electrically connected via said cable irrespective of mutual engagement of said blocks but fluid connection between said transducers and said lines is selectively made only through the releasable mutual, aligned engagement.

4,108,009
VARIABLE-FORCE VIBRATOR

Masao Fuchigami, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jul. 29, 1976, Ser. No. 709,646
Claims priority, application Japan, Jul. 29, 1975, 50-104120[U]; Jul. 29, 1976, 51-104121[U]
Int. Cl.² F16H *33/00*
U.S. Cl. 74—61 **5 Claims**

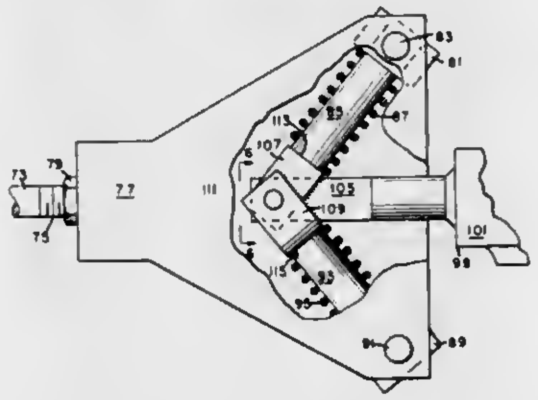
1. In a vibrator, the combination of a rotatable hollow shaft, drive means for imparting rotation to said hollow shaft, a first eccentric weight fixedly mounted on said hollow shaft, a second eccentric weight rotatably mounted on said hollow shaft,

reciprocating means mounted within said hollow shaft for movement in its axial direction, a fluid actuated cylinder for linearly moving said reciprocating means relative to said hollow shaft, and means interconnecting said second eccentric weight with said reciprocating means for directly translating the linear motion of said reciprocating means into controlled rotary motion of said second eccentric weight relative to said hollow shaft, whereby the angular position of said second eccentric weight on said hollow shaft can be adjustably varied with respect to said first eccentric weight for correspondingly changing the vibratory force developed by the vibrator.



4,108,010
CONVEYOR-TYPE, HYDRAULIC-POWERED, MATERIAL-SPREADING APPARATUS

Bruce W. Taylor, Mechanicville, and Gregory J. Murray, Saratoga Springs, both of N.Y., assignors to Tarrant Manufacturing Company, Saratoga Springs, N.Y.
Division of Ser. No. 634,032, Nov. 21, 1975, Pat. No. 4,023,689. This application Feb. 18, 1977, Ser. No. 770,203
Int. Cl.² F16H *21/44*
U.S. Cl. 74—100 R **4 Claims**

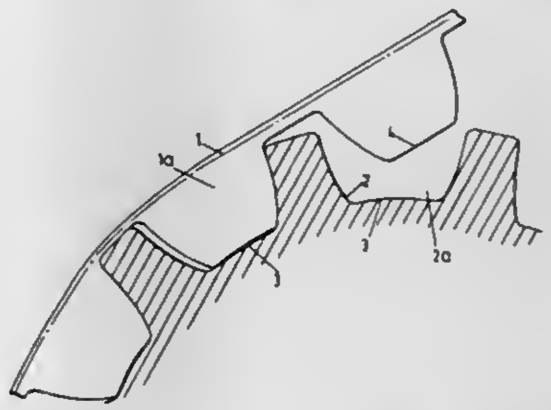


1. A snap-action device for operative use with a member having a reciprocable element therein and a reciprocating rod to reciprocate and slam said reciprocable element in a direction of travel opposite to the direction of travel of said reciprocating rod, said snap-action device comprising a bifurcated mounting plate, two spring-mount guides, two spring mounts and two springs, said mounting plate mounting said spring-mount guides, said spring-mount guides freely receiving said spring mounts, said spring mounts carrying said springs, said mounting plate fixedly carrying said reciprocating rod, and said spring mounts and reciprocable element being joined in pivotal relationship.

4,108,011
SYNCHRONOUS DRIVE BELT AND PULLEY CONFIGURATION THEREFOR

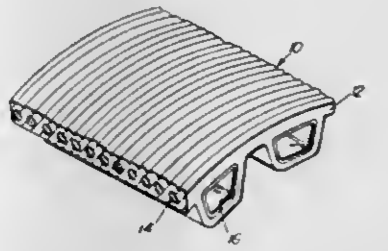
Michael John William Gregg, Lisburn, and David Bell, Bangor, both of Northern Ireland, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 4, 1977, Ser. No. 765,575
Claims priority, application United Kingdom, Feb. 13, 1976, 05794/76
Int. Cl.² F16H *7/00;* F16G *1/28*
U.S. Cl. 74—229 **10 Claims**

1. In combination, (A) an endless synchronous drive belt formed of a resilient elastomer, reinforced with one or more reinforcing members extending along and thereby defining the pitch line, with a succession of identical teeth uniformly spaced apart by their pitch P, wherein each tooth has at least part of its fore and its aft flank surfaces shaped in cross-section as the arc of a circle of radius W, both said arcs being centered on the pitch line at centers spaced at a distance W apart; and (B) a pulley having a plurality of identical peripheral belt-engaging teeth defining between themselves pulley cavities, each pulley cavity having at least part of its fore and its aft surfaces shaped in cross-section as the arc of a circle centered on the pitch circle, the pitch circle radius being the outer radius of the pulley at the pulley tooth periphery plus the distance between the base of the belt between the teeth, and the belt pitch line; wherein the tip of each tooth and the base of each cavity are relatively shaped so that when the belt engages with the pulley compressive stress is exerted from the base of the cavity through each engaging belt tooth.



4,108,012
POWER TRANSMISSION BELT

John Craig Warner, Ithaca, N.Y., and Mark William Gravel, Keokuk, Iowa, assignors to Borg-Warner Corporatinn, Chicago, Ill.
Filed Dec. 10, 1976, Ser. No. 749,495
Int. Cl.² F16G *1/28, 5/00*
U.S. Cl. 74—231 C **5 Claims**



1. A power transmission belt comprising an elastomeric body, reinforcing tension means in said body, laterally positioned hollow stiffening members of multiple piece construction in said body and connected to said reinforcing tension means, said stiffening member being longitudinally spaced and extending substantially the width of said elastomeric body.

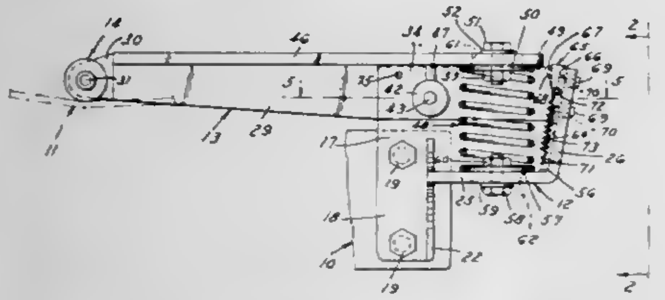
4,108,013
CONSTANT TENSION APPARATUS FOR FLEXIBLE ENDLESS DRIVE MEANS

Richard F. Sragal, 1701 Westbrook, Madison Heights, Mich. 48071
Filed Mar. 28, 1977, Ser. No. 782,007
Int. Cl.² F16H *7/12, 7/10*
U.S. Cl. 74—242.11 C **10 Claims**

1. In a constant tension apparatus for flexible endless drive belts, the combination comprising:

(a) a support means;

(b) a lever arm pivotally mounted on said support means;
(c) a belt engagement member operatively mounted on said lever arm;
(d) biasing means carried on said support means and engageable with said lever arm for normally moving the lever arm in one direction to maintain the belt engagement member on the belt with a constant tension; and,

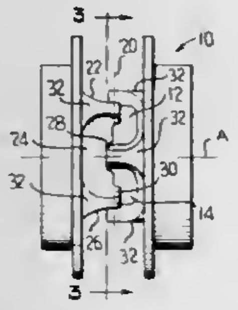


(e) a continuous engagement non-return means carried on the support means and engagable with the lever arm for preventing movement of the lever arm in the other direction to maintain the lever arm in operative engagement with the drive belt.

4,108,014
OBLIQUE LAY SPROCKET WHEEL AND CHAIN CONSTRUCTION

Kenneth D. Schreyer, Clarence, and Harold V. Hawkins, Williamsville, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,426
Int. Cl.^{2} F16H *55/30;* F16G *13/02*
U.S. Cl. 74—243 H **4 Claims**



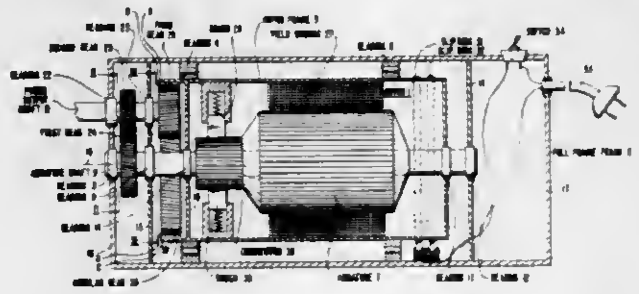
1. In an oblique lay pocket wheel for exerting tension on a chain trained thereover as the wheel is rotated, which comprises a body adapted to be rotated about a drive axis and having a transverse center plane normal to said axis, said body having a cylindrical portion extending on opposite sides of said center plane, a first series of chain link pockets in said cylindrical portion on one side of said center plane and circumferentially spaced from each other around said axis to present interrupted cylindrical portions therebetween, a second series of chain link pockets in said body on the other side of said center plane and circumferentially spaced from each other around said axis to present interrupted cylindrical portions therebetween, the pockets of said second series being circumferentially staggered with respect to the pockets of said first series whereby successive links of a chain may be received successively in the pockets of said first and second series thereof with the outer barrel of each link which is received in a pocket of said first series lying on a cylindrical portion separating adjacent pockets of said second series, and vice versa, whereby the plane of each such link lies at a fixed angle θ with respect to said center plane, the improvement wherein:

the end of each of said first series of pockets which trails, with respect to the direction of rotation of the wheel, extends radially outwardly to an associated cylindrical portion and projects at its radially outward portion past said center plane from said one side to said other side thereof and the end of each of said second series of pockets which trails, with respect to the direction of rotation of the wheel, extends radially outwardly to an associated cylindrical portion and projects at its radially outward portion past said center plane from said other side to said one side thereof whereby the load bearing point between each link and its pocket is substantially in line with said center plane.

4,108,015
FULL TORQUE DIFFERENTIAL SYSTEM

James N. Yanke, Bellingham, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 23, 1977, Ser. No. 809,374
Int. Cl.^{2} F16H *1/12, 1/20*
U.S. Cl. 74—421 A **2 Claims**



1. A full torque differential system for utilizing all forward and backward torques of an electric motor to produce a forward output torque, said full torque differential system comprising

a full torque frame of substantially cylindrical configuration;
a motor frame of substantially cylindrical configuration coaxially freely rotatably mounted in the full torque frame;
a motor having an armature shaft coaxially freely rotatably mounted in the motor frame and an armature coaxially mounted on the armature shaft;
an annular gear coaxially mounted in the motor frame;
a partition in the full torque frame substantially perpendicular to the axis of the armature shaft and spaced from and parallel to a base end of said full torque frame;
a power output shaft rotatably mounted in the partition and base end of the full torque frame and extending in spaced parallel relation with the armature shaft, said power output shaft extending outside said full torque frame;
a first gear coaxially affixed to and rotatable with the armature shaft;
a second gear coaxially affixed to and rotatable with the power output shaft and coupled to the first gear; and
a third gear coaxially affixed to and rotatable with the power output shaft in spaced relation with the second gear and coupled to the annular gear whereby mechanical power is applied from the annular gear to the output shaft via the third gear and power produced by the motor is applied from the first gear to the output shaft via the second gear so that all the motor torque is applied to the output shaft and essentially no torque is applied to the full torque frame.

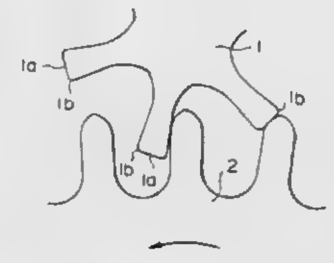
4,108,016
DEVICE OF PREVENTING REVERSE TRANSMISSION OF MOTION IN A GEAR TRAIN

Kenichi Muranishi, Ena, Japan, assignor to Ricoh Watch Co., Ltd., Nagoya, Japan

Filed Mar. 3, 1977, Ser. No. 773,846
Claims priority, application Japan, Mar. 3, 1976, 51-22993
Int. Cl.^{2} F16H *55/06, 55/04*
U.S. Cl. 74—462 **7 Claims**

1. A device for preventing reverse transmission of motion in a gear train comprising a drive gear having teeth which are broadened towards the tip and a driven gear meshed together

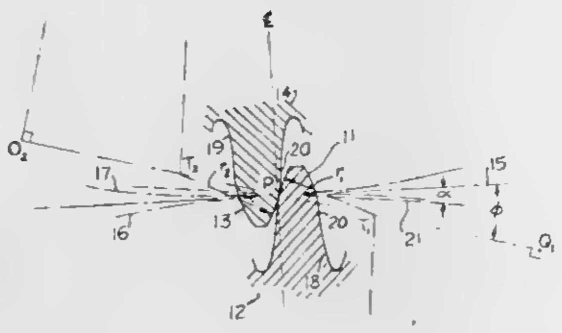
with said drive gear whereby rotative motion is transmitted from said drive gear to said driven gear but not from said driven gear to said drive gear due to a blockage created by the teeth of said drive and driven gears.



4,108,017
STANDARD-PITCH GEARING

William Spence Rouverol, P.O. Box 9122, Berkeley, Calif. 94709

Filed Mar. 16, 1977, Ser. No. 778,260
Int. Cl.^{2} F16H *55/06*
U.S. Cl. 74—462 **31 Claims**



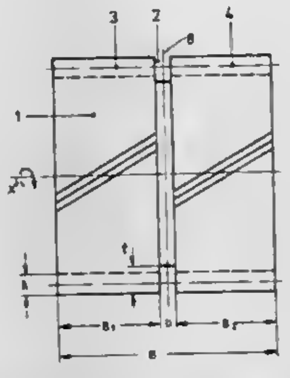
1. In a pair of mating gears,
teeth having working profiles in the transverse plane for which the radius of relative curvature at the pitch point is substantially smaller than the radius of relative curvature at the pitch point for involute gears of the same size and pressure angle, but greater than one and one-tenth tooth modules,
the whole depth of the teeth of one of said pair being greater than two and six-tenths tooth modules,
the tooth pitch angle in the transverse plane for neither of said pair being greater than 10°.

4,108,018
GEAR DRIVE WITH SINGLE-HELIX GEARS

Erich John, Augsburg; Albert Oesterle, Ottmarshausen, and Erich Pollak-Banda, Augsburg, all of Germany, assignors to Zahnräderfabrik Renk Aktiengesellschaft, Augsburg, Germany

Filed Feb. 16, 1977, Ser. No. 769,203
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607636
Int. Cl.^{2} F16H *57/04;* F01M *11/00*
U.S. Cl. 74—467 **10 Claims**

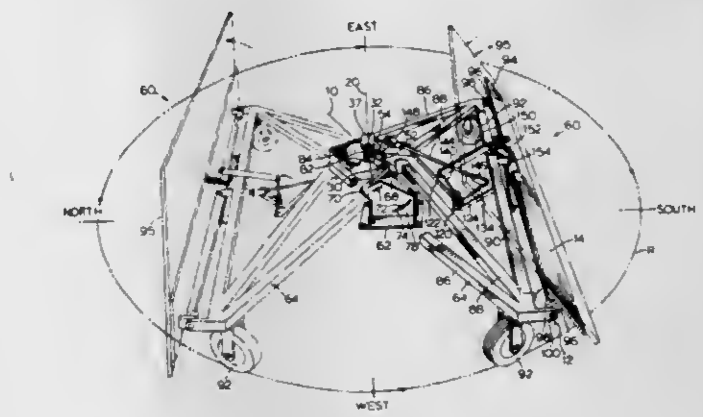
1. A transmission comprising a pinion gear meshing with a further gear, each of said gears being formed with single-helix gear teeth and said gears meshing with each other in a meshing region, each of said gears being provided with at least one circumferential groove open in the direction of and registering with the groove of the other gear, said grooves having depths at least equal to the height of the teeth of the respective gear, and an oil deflector disposed in said grooves in said region.



4,108,019
SOLAR TRACKING DEVICE

Roger J. Martin, 1 Annesley Ave., Toronto, Ontario, Canada (M4G 2T5)

Filed May 19, 1977, Ser. No. 798,547
Int. Cl.^{2} F16H *21/40, 21/52;* F24J *3/02*
U.S. Cl. 74—469 **4 Claims**



1. A solar tracking device comprising,
(a) a base member,
(b) a main driving shaft having a longitudinal first axis, said main drive shaft being mounted on said base for rotation about said first axis and being supported with said first axis extending parallel to the axis of rotation of the earth, said main drive shaft having a power output end,
(c) drive means connected to said main drive shaft for rotatably driving it about said longitudinal axis at one revolution per day,
(d) a carriage supported for azimuthal rotation, in a first plane which is angularly inclined with respect to said first axis, about a second axis which extends perpendicular to said first plane,
(e) a tracking head mounted on said carriage for altitudinal rotation about a third axis which is disposed in said first plane and spaced radially outwardly from said second axis and extends tangential to an arc generated from said second axis,
(f) azimuthal drive means comprising,
  (i) a universal joint having a centre of gyration, a driving yoke, a driven yoke and a cross member, said cross member having driving arms connected to the driving yoke and driven arms connected to the driven yoke, the driving arms and driven arms having axes extending perpendicular to one another and intersecting said centre of gyration, the axis of the driven arms being oriented to extend perpendicular to said third axis, said driven yoke being connected to said main drive shaft and said driven yoke being connected to said carriage with its axis of rotation aligned with said second axis,

such that rotation of said main drive shaft drives said carriage about said second axis at an angular velocity which varies in accordance with the azimuthal velocity of the sun,

(g) altitude drive means comprising,
  (i) an altitude drive arm projecting radially from said main drive shaft and having a first point thereon which describes an arc in a second plane which is perpendicular to said longitudinal axis of said main drive shaft and which intersects the longitudinal axis at a second point which is at the centre of gyration of said universal joint, said first point being oriented so that a line extending between said first point and said second point is parallel to the rays of the sun at the equinox,
  (ii) linkage means extending between said first point on said altitude drive arm and said tracking head to maintain said tracking head at a fixed angle with respect to said line,
  (iii) means for adjusting the angular position of said tracking head with respect to said linkage means to alter said fixed angle in accordance with the declination of the sun.

4,108,020
STEERING WHEEL COVER

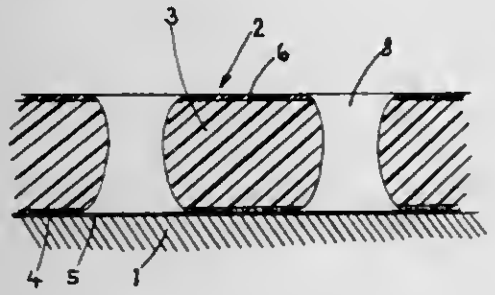
Reinhold Fleischmann, Fichtenstr. 7 8492 Furth I. Wald, and Erich Schach, Ilsenburger Str. 10, 3388 Bad Harzburg, both of Germany

Filed Mar. 8, 1976, Ser. No. 664,523

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1975, 7523050[U]

Int. Cl.² B62D *1/06*

U.S. Cl. 74—558 **6 Claims**



1. A steering wheel cover for enveloping the crown of an automobile steering wheel comprising:
  a band of foam material having a pair of broad opposed surface skins, one of said skins defining an outer surface which is to be gripped by the hand in use and the other of said skins defining an inner surface for direct contact with the crown of the steering wheel; and
  a plurality of perforations passing through said band from one surface skin to the other, the entire peripheral walls of said perforations being nonporous.

4,108,021
TRANSFER CASE

James Edwin MacAfee, Grosse Isle, Mich.; John W. Winkler, and Karl Budde, both of Toledo, Ohio, assignors to Jeep Corporation, Detroit, Mich.

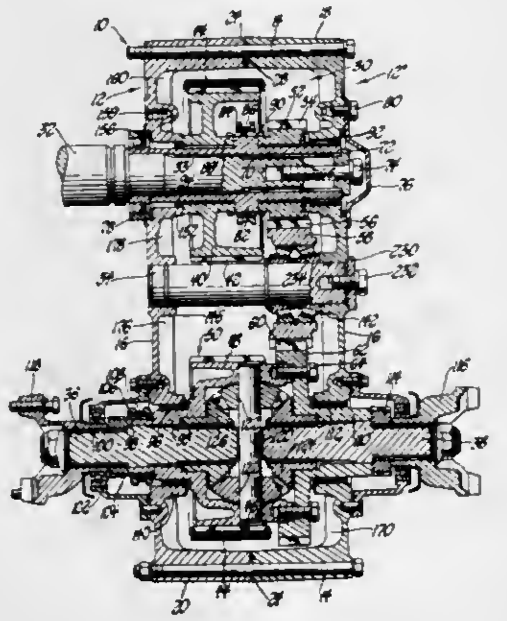
Continuation of Ser. No. 642,099, Dec. 18, 1975, abandoned.

This application Apr. 22, 1977, Ser. No. 790,109

Int. Cl.² F16H *57/02, 1/38, 1/40*

U.S. Cl. 74—606 R **21 Claims**

1. A transfer case comprising: a housing, said housing being made up of a pair of identical castings; each of said castings having an end wall, an endless skirt projecting from said end wall, and a mounting flange projecting outwardly from the end of said skirt remote from said end wall; said pair of castings being disposed in opposed relationship with a mounting flange of one of said castings secured to the mounting flange of the other of said castings, said castings cooperating to define a compartment within said housing; an input shaft rotatably mounted in the end wall of each of said castings; a pair of output shafts, one of said output shafts being rotatably supported in the end wall of one of said castings and the other of said output shafts being rotatably supported in the end wall of the other of said castings, said output shafts projecting from said housing in opposite directions; and power transmitting means connecting said input shaft with said output shafts for transmitting power from said input shaft to said output shafts.



4,108,022
DEVICE FOR CONTROLLING THE SPEED SHIFT OPERATION OF AN AUTOMATIC TRANSMISSION

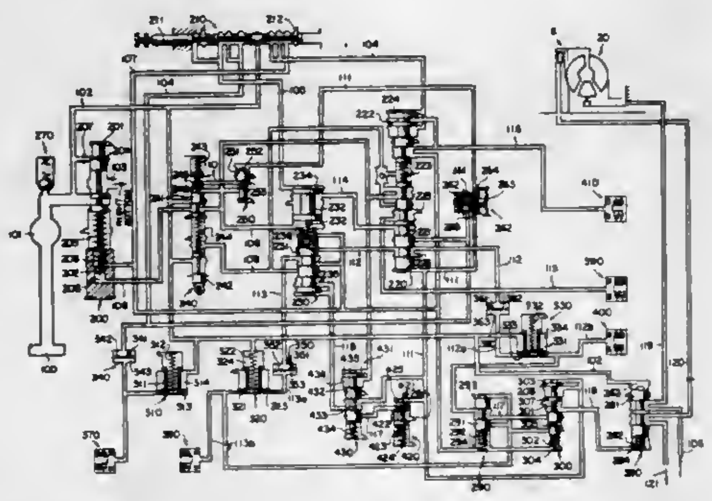
Hajime Arai, Aichi, and Kiyoshi Ohnuma, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 27, 1976, Ser. No. 736,098

Claims priority, application Japan, Mar. 9, 1976, 51-25379

Int. Cl.² F16H *47/00*

U.S. Cl. 74—645 **6 Claims**



1. In an automatic fluid transmission comprising an input shaft, an output shaft, a planetary gear mechanism provided between said input and output shafts, and friction engaging means adapted to be selectively engaged or disengaged so as to establish a plurality of forward speed ranges and a reverse range, a device for controlling the speed shift operation of said transmission comprising:
  an oil pressure source;
  a pressure regulating valve for regulating the oil pressure supplied from said oil pressure source to generate a line pressure;
  servo chambers adapted to receive said line pressure and to actuate friction engaging means;
  a governor valve for generating a first oil pressure signal which represents vehicle speed;
  a throttle valve for generating a second oil pressure signal which represents engine load;
  at least one shift valve actuated by the balance between said first oil pressure signal and said second oil pressure signal so as to selectively supply oil pressure to said servo chambers; and
  a valve composite including a first change-over valve actuated by said first oil pressure signal and a second change-over valve actuated by said second oil pressure signal and adapted to intercept the supply of said first oil pressure signal to said shift valve only when said first oil pressure signal is below a first predetermined value and said second oil pressure signal is above a second predetermined value.

4,108,023
GEAR SYSTEM

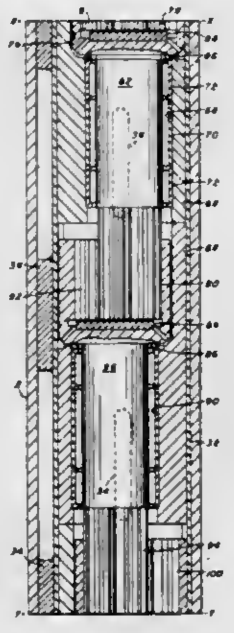
Marion A. Garrison, Denver, Colo., assignor to Empire Oil Tool Company, Denver, Colo.

Continuation of Ser. No. 568,496, Apr. 16, 1975, abandoned.

This application Jan. 21, 1977, Ser. No. 761,108

Int. Cl.² F16H *1/28;* **E21B** *5/00*

U.S. Cl. 74—804 **2 Claims**



1. A reduction gear system comprising a pair of sets of meshing pinions and internal gears, said pair of sets including a first set and a second set, each of said sets including a single pinion in direct mesh with a single internal gear having a substantially larger diameter than said single pinion, the axis of said single pinion being parallel to the axis of said single internal gear but spaced therefrom, a first shaft connecting the internal gear of the first set to the pinion of the second set, a second shaft supporting the pinion of the first set, a third shaft supporting the internal gear of the second set, the axes of said second and third shafts being in alignment and parallel to but spaced from the axis of the first shaft, and means for rotatably supporting said shafts.

4,108,024
INDEXING DEVICES

Heinz Ditzel, and Werner Ditzel, both of Hainstrasse 27-29, 6369 Schoneck 1, Germany

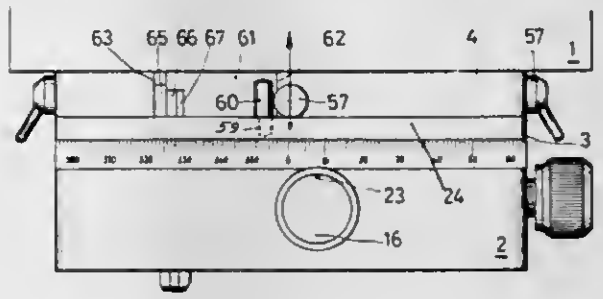
Filed Nov. 4, 1975, Ser. No. 628,649

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1974, 2452340; May 6, 1975, 2520022

Int. Cl.² B23B *29/24;* **B23Q** *17/00*

U.S. Cl. 74—813 L **1 Claim**

1. An indexing device comprising first, second and third discs substantially coaxial with one another, said first, second and third discs being rotatably mounted relative to each other; first and second engagement means formed of said first and second discs are releasably engageable to latch said first and second discs in any selected relative angular position; said second and third discs having respective abutment surfaces; gage means positioned between said abutment surfaces for angularly positioning said second and third discs relative to each other by turning each of said discs until said gage means abuts both of said abutment surfaces; clamping means including a clamping member movable in an axial direction of said discs for clamping said second and third discs against relative turning; said second disc having therein a first radially extending passage and said third disc having therein a second passage extending transversely to said first passage and communicating with the latter; said clamping means including a first pin with an eccentric portion, being positionable in said first passage; a second pin received in said second passage; and retaining means formed of said third disc arranged to engage said second pin for limiting movement of the latter lengthwise of said second passage, said eccentric portion engaging said second pin whereby turning of said first pin enables movement, said second pin extending lengthwise of said second passage into clamping engagement with said retaining means; said first and said second engagement means being defined by a series of parallel bores arranged in said first disc positioned at a predetermined angular spacing along a circle extending concentrically therewith, said second engagement means being in the form of an indexing pin arranged parallel in the second disc which indexing pin slides into any selected bore; said bores and indexing pin forming coarse preadjusting means to permit coarse adjustment of said first disc relative to said second disc and relative to said third disc clamped to said second disc; said second disc having an abutment surface in the form of a pin projecting from said disc, said pin coacting with said gage means associated wth said second and third discs, and said gage means being disposed at an angular spacing different than the predetermined angular spacing of said bores to thereby define fine adjusting means for adjusting said first disc clamped to said second disc, relative to said third disc engaged with said second disc after coarse adjustment of said first disc relative to said second disc.



4,108,025
AIRCRAFT HEAD-UP DISPLAY UNIT MOUNT ADJUSTMENT TOOL

Clifton E. Stine, Ridgecrest; Woodrow D. Chartier, Jr., and Mike A. Caponegro, both of China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

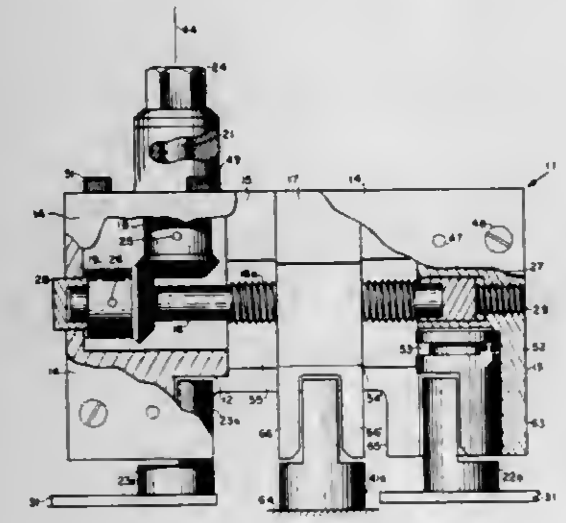
Filed May 27, 1977, Ser. No. 801,277

Int. Cl.² B25B *9/04*

U.S. Cl. 81—3 R **11 Claims**

1. An alignment tool for adjusting the position of a first body relative to a second body, comprising:
  a frame having
    attachment means for fastening said frame to said first body,
    a top block,
    a bottom block,

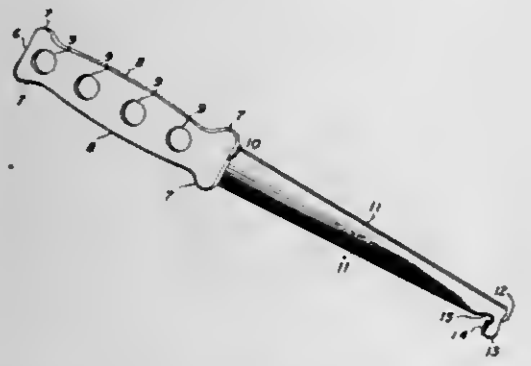
first and second side plates joining said top and bottom blocks,
a driven shaft having a threaded central portion, said shaft being rotatably retained by said top and bottom blocks,
an input shaft rotatably retained in said bottom block,
an input gear rigidly retained to said input shaft,
a driven gear rigidly retained to said driven shaft and maintained in driven engagement with said input gear, and



means for applying torque to said input shaft;
an adjusting member slidably attached to said frame and restrained to translation between first and second positions;
means on said adjusting member cooperating with said driven shaft for causing translation of said adjusting member between said first and second positions; and
said adjusting member having means for applying driving force against said second body.

4,108,026
TOOL FOR REMOVING ROCK CLIMBING CAPTIVE DEVICES

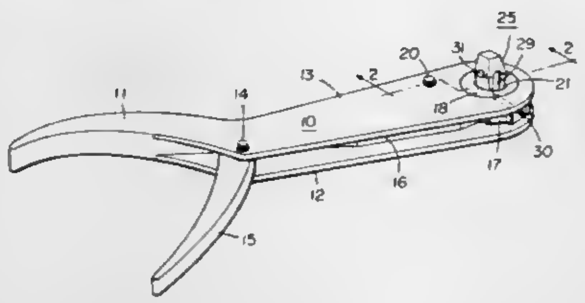
Gordon K. Anderson, 14632 Pacific St.; Steven M. Leuck, 14801 Briarcliff Pl., both of Tustin, Calif. 92680, and Gary L. Ruhl, 104 Crescent Dr., Ft. Scott, Kans. 66701
Filed May 31, 1977, Ser. No. 801,852
Int. Cl.² B25B *9/00*
U.S. Cl. 81—3 R **3 Claims**



1. A tool for removing rock climbing captive devices comprising a substantially flat, rigid handle; a plurality of aligned holes spaced longitudinally along said handle; opposing lateral appertenances on the front and rear ends of the handle; a blade extending longitudinally from and integral with said front end of said handle; said blade being tapered away from said handle and including an offset hook on its end opposite the end integral with said handle; opposed recesses, one being at the junction of said blade and offset hook substantially facing said handle and the other being on the exterior of said hook facing in the longitudinal direction.

4,108,027
RATCHET WRENCH WITH DOUBLE SWIVELLING DRIVE SHAFT

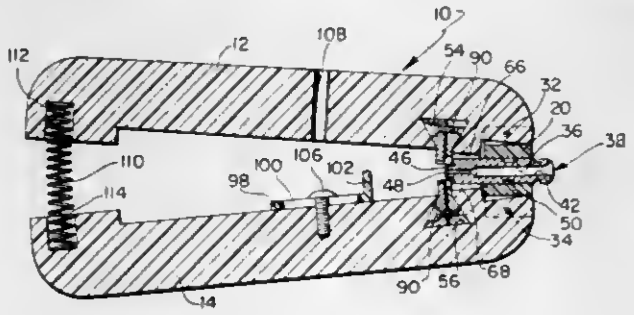
Paul E. Lenker, Davenport, Iowa, assignor to Davenport Tool Co., Eldridge, Iowa
Filed Apr. 14, 1977, Ser. No. 787,526
Int. Cl.² B25B *13/46*
U.S. Cl. 81—60 **5 Claims**



1. In a ratchet wrench including a ratchet member and a socket drive member mounted for rotation about a common axis relative to the remainder of the wrench, the ratchet member having a drive aperture therein about said axis, the drive member and ratchet member drive aperture having corresponding side walls disposed about said axis, the drive member having a pair of axially spaced drive portions each of which includes portions of the drive member side walls between two axially spaced locations therealong, one of the drive portions being disposed in the ratchet member drive aperture with its side walls in opposed relation to the ratchet member drive aperture side walls for driving rotation of the drive member about said axis by the ratchet member, the other of the drive portions projecting beyond one face of the wrench to removably slidably receive thereon the drive aperture of a socket for driving rotation of the socket by the drive member, and means retaining the drive member in the drive member aperture, the improvement wherein the drive member can swivel relative to the ratchet member and a socket disposed on the projecting drive portion as aforesaid can simultaneously swivel relative to the drive member, said improvement comprising the side walls of each drive portion each having a generally convex configuration such that the cross-sectional areas of each drive portion at said locations therealong are less than cross-sectional areas of the drive portion between said locations.

4,108,028
WIRE STRIPPER HAVING REPLACEABLE BLADES

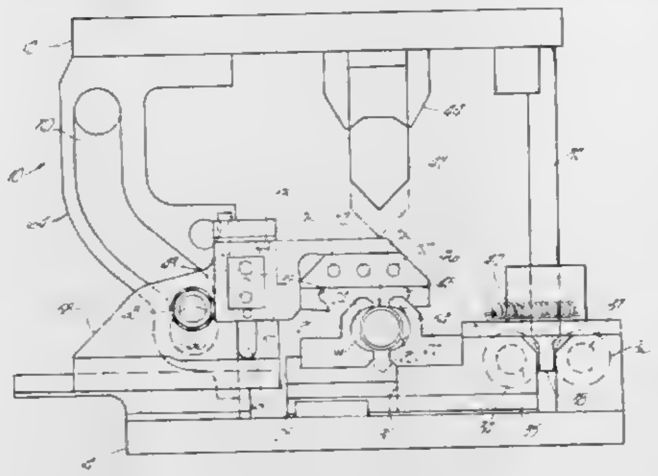
Joseph A. Perrino, Rehoboth, Mass., assignor to Micro Electronics, Inc., Newport, R.I.
Filed Feb. 22, 1977, Ser. No. 770,984
Int. Cl.² H02G *1/12*
U.S. Cl. 81—9.5 B **3 Claims**



1. A device for stripping insulation from relatively small diameter electrical wire, comprising a pair of hand-held elongated grip members, means for pivotally interconnecting said grip members at one end thereof, the other ends of said grip members being movable relative to each other to provide for the pivotal movement of said members to and from a closed stripping position thereof, an elongated tubular guide located in said interconnecting means intermediate the said grip members and receiving therein in guiding relation the lead-in portion of a wire from which insulation is to be stripped, a reduced projection formed on the innermost end of said tubular guide, each of said grip members having a laterally extending slot formed therein, opposed blade assemblies removably secured in the slots in said grip members for movement with said grip members to the closed position thereof, each of said blade assemblies including an inner and outer holder element having flat opposed faces, a flat blade element located between the flat opposed faces of the holder elements in sandwiched relation and having a cutting edge in which a notch is formed, wherein the opposed blades in the closed stripping position define an opening of predetermined size for receiving the wire from which insulation is to be stripped, each of said holder elements having a circular notch formed therein that is aligned with the notch in the adjacent blade element, the diameter of the notch in said outer holder element being greater than the diameter of the notch in said inner holder element, the notches in the outer holder element of both blade assemblies forming an opening when the grip members are moved to the closed stripping position, the size of which is just slightly larger than that of said reduced projection, so that the reduced projection is received in snug-fitting relation between the notches of the outer holder elements, thereby axially aligning said tubular guide and wire extending therethrough and centering said wire for engagement by said blade elements during the severing of the wire insulation during said stripping operation, whereafter a longitudinal retracting movement of said wire will strip the insulation from the lead-in portion thereof that has been threaded through said tubular guide.

4,108,029
CUT-OFF DIE SET

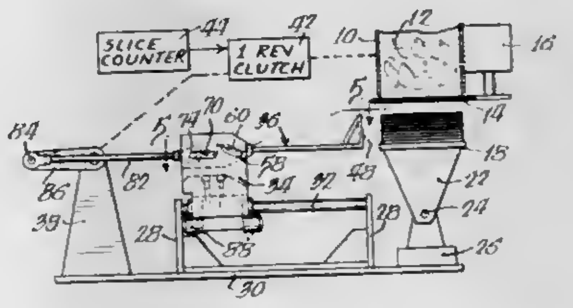
Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.
Filed May 23, 1977, Ser. No. 799,205
Int. Cl.² B26D *1/56, 3/16*
U.S. Cl. 83—54 **16 Claims**



1. A cut-off die set for use in an elongated stock cut-off apparatus of the type including a ram mechanism for operating said cut-off die set, said die set comprising:
clamping means adapted to be operated by said ram mechanism clamping said die set to said stock;
a main cut-off blade, and means operated by said ram mechanism causing said main cut-off blade to move to sever said stock after said clamping means clamps said die set to said stock;
notching means for notching said stock periphery prior to said severing by said main cut-off blade at the point on said stock at which said severing is initiated, said notching means including: a notching blade, means producing notching of said stock by drawing said notching blade across said stock prior to severing of said stock by said main cut-off blade;
means repositioning said notching blade in said initial position after said main cut-off blade has severed said stock at said notching point, whereby said notching and return strokes of said notching blade occur before and after respectively of said severing movement of said main cut-off blade.

4,108,030
SLICE EJECTOR FOR SLICING MACHINES

George G. Griswold, Fort Wayne, Ind., assignor to Peter Eckrich and Sons, Inc., Fort Wayne, Ind.
Filed Sep. 7, 1977, Ser. No. 831,299
Int. Cl.² B26D *4/46, 4/56*
U.S. Cl. 83—77 **7 Claims**



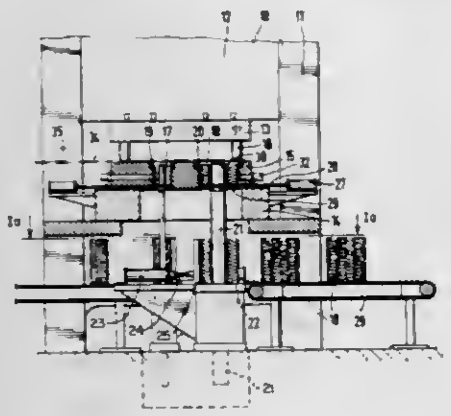
1. a stack ejector comprising:
a stack receiving platform having a pair of stack supporting surfaces separated by an elongated space;
a carriage mounted for reciprocation movement towards and away from said platform generally in the direction of said space;
means for reciprocating said carriage;
a stack engaging assembly movably mounted on said carriage and movable therewith through said space and further movable on the carriage between a first position intersecting a plane encompassing said surfaces and a second position not intersecting said plane; and
means on said carriage for (a) moving said stack engaging assembly from said first position to said second position at one extreme position of movement of said carriage, (b) maintaining said stack engaging assembly in said second position until the other extreme position of movement is reached, (c) moving said stack engaging assembly to said first position when said other extreme position is reached, and (d) maintaining said stack engaging assembly in said first position until said one extreme position is reached.

4,108,031
ALIGNING AND STACKING ARRANGEMENT

Karl Dangelmaier, Göppingen-Holzheim, and Alfred Kottmann, Donzdorf, both of Germany, assignors to L. Schuler GmbH, Germany
Filed Feb. 14, 1977, Ser. No. 768,343
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605983
Int. Cl.² B30B *15/32*
U.S. Cl. 83—90 **32 Claims**

1. An alignment and stacking arrangement for stampings manufactured in a continuous stamping operation by a stamping machine having a punch and an associated punch matrix, the alignment and stacking arrangement comprising:
at least one stacking channel means arranged at the punch matrix for receiving stampings produced by the stamping machine during a continuous stamping operation,
means associated with said at least one stacking channel means for forming an intermediate stack of stampings upon a produced stack of stampings reaching a predetermined height including at least one selectively engageable locking pawl means for reducing a clearance of the at least

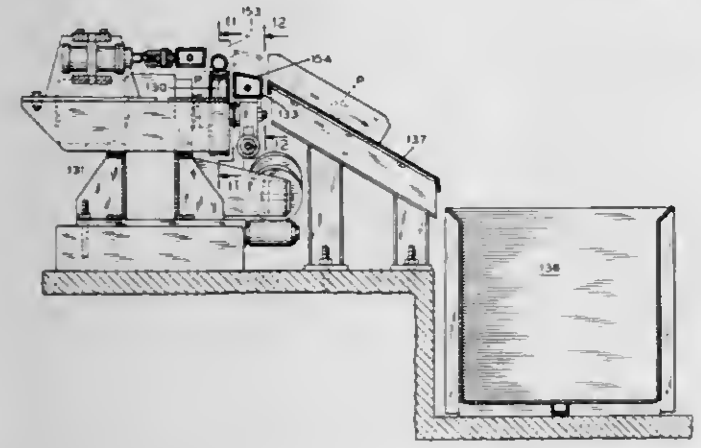
one stacking channel means, said locking pawl means extending into the clearance of the at least one stacking channel means only during the formation of an intermediate stack of stampings, and at least one mandrel means arranged within said at least one stacking channel means



for receiving the intermediate stack of stampings during the formation of an intermediate stack of stampings, and
means for conveying the stack of stampings having the predetermined height from the stamping machine during the formation of the intermediate stack of stampings.

4,108,032
MULTIPLE BLADE SCRAP SAW FOR PIPE MILL

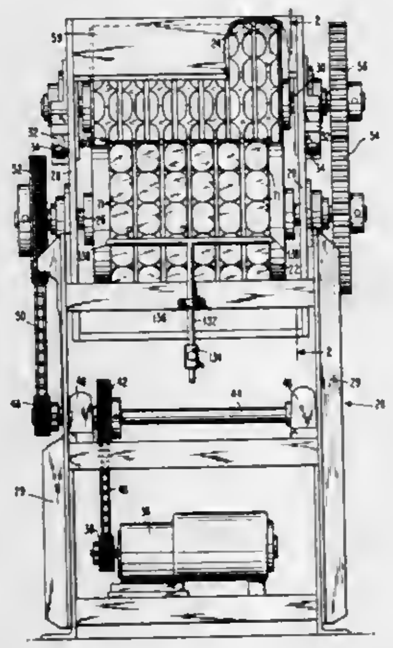
William R. Scheib, Sewickley, Pa., and Ralph M. Shaffer, Jr., Huffman, Tex., assignors to Aetna-Standard Engineering Co., Ellwood City, Pa.
Division of Ser. No. 661,371, Feb. 25, 1976, Pat. No. 4,022,092. This application Dec. 6, 1976, Ser. No. 747,941
Int. Cl.^{2} B26D *7/06*
U.S. Cl. 83—106 **1 Claim**



1. A scrap kick-out conveyor for a continuous buttweld pipe mill installation provided with a scrap cut-off saw between the forming and welding mill and subsequent processing mills, which comprises
(a) stock advancing conveyor rolls located on the pass line downstream of the scrap saw,
(b) inboard and outboard lateral guide rails on opposite sides of the pass line for guiding and confining pipe stock supported on said conveyor rolls,
(c) means for retracting at least selected portions of the outboard guide rail,
(d) means for diverting at least selected portions of the inboard guide rail to lie at an angle across the pass line to divert oncoming cut scrap pipe sections off of the outboard side of the conveyor,
(e) means for receiving diverted scrap pipe sections for disposal, and
(f) an inclined apron provided adjacent the outboard guide rail,
(g) said selected portions of the outboard rail being downwardly retractable and having a downwardly inclined upper surface to facilitate gravity discharge of scrap pipe diverted from the pass line.

4,108,033
ROTARY CUTTING DEVICE FOR FORMING STRIPS OF SHAPED ARTICLE PREFORMS

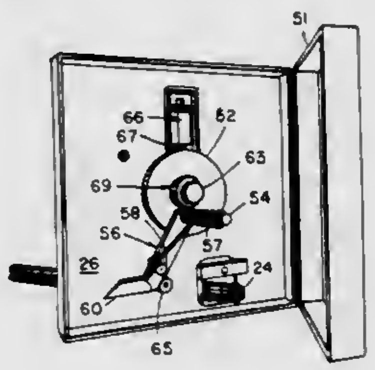
William E. Bembenek, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.
Filed May 4, 1976, Ser. No. 682,904
Int. Cl.^{2} B23D *25/12*
U.S. Cl. 83—122 **6 Claims**



1. Apparatus for cutting a plurality of ribbons of article preforms having a desired shape and a plurality of ribbons of trim from a thin, wide ribbon of material, comprising
a first roller and a second roller rotatably mounted juxtaposed to each other with their axes parallel, said first and second rollers defining a bite between their cylindrical surfaces;
a plurality of article cutter inserts, said first roller having a plurality of spaced-apart article insert grooves extending around the circumference and on the cylindrical surface thereof, said article cutter inserts being removably mounted in said article insert grooves in abutting position to provide a plurality of rows of article cutter inserts projecting from the surface of said first roller and extending circumferentially therearound, each of said plurality of rows of article cutter inserts having opposed, undulating cutting edge sides defining the desired shape of said ribbons of article preforms;
a plurality of trim cutter inserts, said second roller having a plurality of spaced-apart trim insert grooves extending around the circumference and on the cylindrical surface thereof, said trim cutter inserts being removably mounted in said trim insert grooves in abutting position to provide a plurality of rows of said trim cutter inserts projecting from the surface of said second roller and extending circumferentially therearound, each of said plurality of rows of trim cutter inserts having opposed undulating sides forming cutting edges which are spaced apart and extend circumferentially around said second roller, and are shaped to closely, interfittingly receive said cutting edges of said article cutter inserts at the bite of said first and second rollers, and
said article insert grooves and said trim insert grooves being arranged on said first and second rollers so that said circumferential rows of article cutter inserts and said circumferential rows of trim cutter inserts cooperate with each other at said bite to be brought into shearing engagement at said bite upon rotation of said first and second rollers for cutting a ribbon of material introduced into said bite into transversely alternating ribbons of article preforms and ribbons of trim;
means for rotating said first and said second rollers to pass said article cutter inserts forming each of said plurality of circumferential rows of article cutter inserts, and said trim cutter inserts forming each of said plurality of circumferential rows of trim cutter inserts through said bite so that mating ones of said article cutting edges and said trim cutting edges are brought into shearing engagement to thereby cut a ribbon of material fed to said bite into said ribbons of articles and said ribbons of trim.

4,108,034
SNAP CUTTER APPARATUS FOR PAPER TUBES

Anthony Vincent Thomas, Prospect Heights, Ill., assignor to Precision Paper Tube Company, Wheeling, Ill.
Filed Jun. 13, 1977, Ser. No. 806,106
Int. Cl.^{2} B26D *3/16*
U.S. Cl. 83—361 **5 Claims**

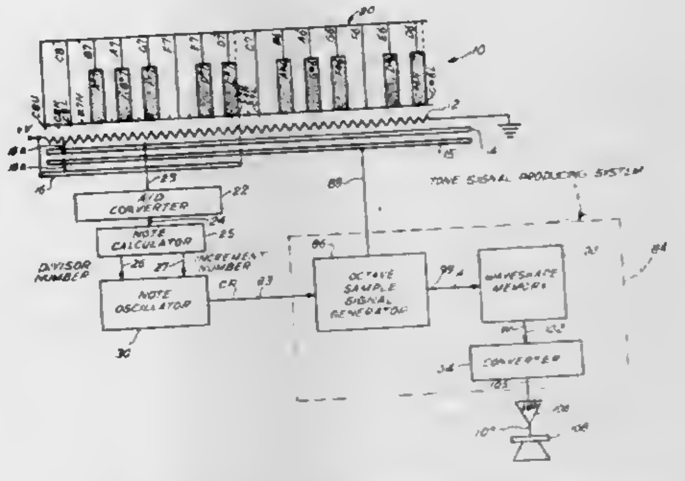


1. In apparatus for cutting paper tubes of small diameter including means for moving formed tubes through a cutting station, the improvement comprising: free-hanging sensor means adapted to be moved by the distal free end of a tube after passing through said cutting station; means responsive to the movement of said sensor means for generating a signal; cutter means including a knife adapted to swing through an orbit to sever said tube at said cutter station; and timer means responsive to said signal for actuating said cutter means for one cycle of operation, said cutter means comprising a shaft, a disc mounted on said shaft, a stub shaft mounted on said disc, said knife being rotatably mounted on said stub shaft, spring means mounted on said stub shaft for preloading said knife, and means for stopping said knife at a predetermined position in said orbit, prior to severing said tube, whereby said spring will be wound when said disc is rotated prior to release of said knife in cutting said tube.

4,108,035
MUSICAL NOTE OSCILLATOR

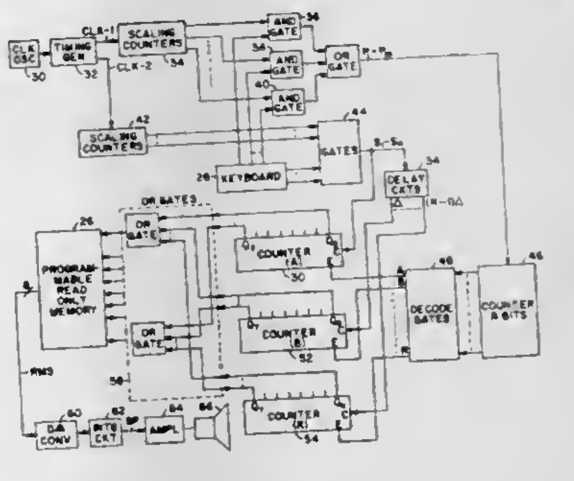
Sydney A. Alonso, Strafford, Vt. 05072
Filed Jun. 6, 1977, Ser. No. 803,535
Int. Cl.^{2} G01F *1/00*
U.S. Cl. 84—1.01 **24 Claims**

1. A digital electronic musical instrument capable of producing notes in narrow, controllable frequency intervals comprising:
means for selecting a desired note having a fundamental frequency;
digital oscillator means for cyclically performing incrementing operations over a variable range at a variable increment, for generating a carry pulse and a remainder when the range is exceeded, and for readjusting the range in proportion to the remainder in response to each carry pulse;
digital calculator means responsive to said means for selecting which automatically calculates the values of the range and increment so that the repetition rate of the carry pulses is a multiple of the fundamental frequency; and
means for producing the desired note in response to at least some of the carry pulses, whereby the pitch of the desired note can be modified by changing the relationship between the range and increment.



4,108,036
METHOD OF AND APPARATUS FOR ELECTRONICALLY GENERATING MUSICAL TONES AND THE LIKE

Frank H. Slaymaker, 134 Glen Haven Rd., Rochester, N.Y. 14609
Filed Jul. 31, 1975, Ser. No. 600,687
Int. Cl.^{2} G10H *1/00*
U.S. Cl. 84—1.01 **20 Claims**



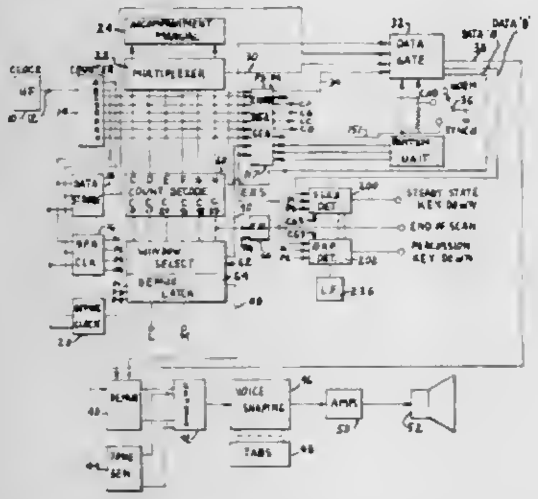
12. Apparatus for generating musical and the like tones which comprises
means for storing successive samples which define the impulse response which characterize the special characteristics of said tones,
means for providing repetitive signals having selected repetition rates, and
means responsive to said repetitive signals and operative upon said samples in said storing means for convolving said impulse response therewith for generating said tones with different pitches corresponding to the repetition rate of said repetitive signals.

4,108,037
ELECTRONIC ORGAN HAVING DIFFERENT SELECTABLE MODES OF PLAYING THE ACCOMPANIMENT KEYBOARD

John William Robinson, and Brian Norris Wilcox, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.
Filed Aug. 2, 1976, Ser. No. 710,791
Int. Cl.^{2} G10H *1/00*
U.S. Cl. 84—1.03 **20 Claims**

1. In an electronic organ having tone generator means,

transducer means, keyers controlling the supply of tone signals from the generator means to the transducer means, keyboard means comprising playing keys, multiplexer means having an output and including a clock driven counter producing a pluaality of data words at the output thereof and operable for cyclically scanning said keyboard and developing a data stream at the output of the multiplexer means on each scan comprising time displaced data bits in which key down signals corresponding to depressed ones of said playing keys appear in respective time slots, and demultiplexer means adapted to receive a data stream and operable for actuating said keyers in conformity with key down signals in the data stream, memory means in which a plurality of data words are stored which are equal to the data words developed by said counter on respective counts, said memory means having output means, playing key controlled means adapted to be made effective for causing said memory means to supply a single one of its data words at a time to the output means thereof, a comparator having one input supplied by the output of the counter and the other input supplied by the output means of said memory means, said comparator having an output at which a data stream is developed in which key down signals appear when the inputs to the comparator are equal, and selector means operable to connect either one only of said multiplexer means output and the output of said comparator to said demultiplexer means for supplying a data stream thereto and for causing said key controlled means to be effective when the output of said comparator is connected to said demultiplexer means.



4,108,038
TIME SHARED TONE KEYING SYSTEM IN ELECTRONIC MUSICAL INSTRUMENT

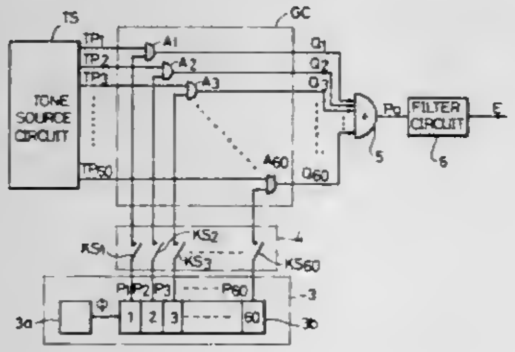
Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 30, 1976, Ser. No. 671,861

Claims priority, application Japan, Apr. 4, 1975, 50-41022; Apr. 8, 1975, 50-42670; Apr. 9, 1975, 50-43806

Int. Cl.² G10H *1/02*

U.S. Cl. 84—1.03 **8 Claims**



1. An electronic musical instrument comprising:

a tone source signal generator for simultaneously generating a plurality of square wave tone signals, each of an audible frequency corresponding to a respective note of a scale having several octaves and each on a separate output of said tone source signal generator;

a sequence pulse generator having a plurality of separate outputs, each corresponding to a respective separate output of said tone source signal generator, said sequence pulse generator being operative in repetitive cycles to sequentially produce in each cycle a respective sequence pulse at each separate output thereof in the order of sequence of the notes of said scale, the sequence pulses produced at each said separate output having an ultra-audible repetition frequency;

a plurality of AND circuits equal in number to the number of separate outputs of said tone source signal generator, each AND circuit being directly connected at its input to a respective one of said tone source signal generator outputs;

a key switch circuit including respective key switches for each note of said scale, each key switch being operable upon depression of its associated note key to connect the corresponding separate output of said sequence pulse generator to the input of the AND circuit to which the corresponding separate output of said tone source signal generator is directly connected, whereby each AND circuit will pass to its output all sequence pulses received at its input from said sequence pulse generator by way of said key switch circuit during the duty cycles of the tone signal received at the AND circuit input; and

an OR circuit connected in common at its input to all of the outputs of the respective AND circuits for combining the sequence pulses at all said AND circuit outputs and thereby obtaining at the OR circuit output a train of tone signal pulses corresponding to the depressed keys.

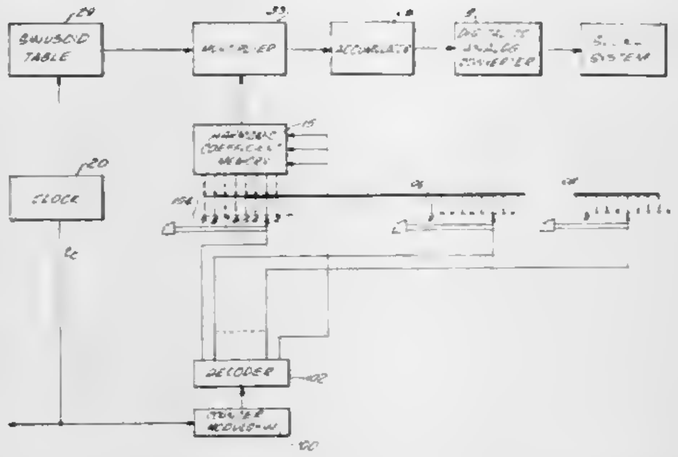
4,108,039
SWITCH SELECTABLE HARMONIC STRENGTH CONTROL FOR A TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Aug. 9, 1976, Ser. No. 712,737

Int. Cl.² G10H *1/02*

U.S. Cl. 84—1.19 **6 Claims**



1. In a computer organ or the like in which individual tones are generated by calculating data corresponding to the amplitudes of a plurality of points of the waveform of a selected tone, the date being calculated by summing for each point the product of a stored coefficient value and a sinusoid value for each of a predetermined number of harmonics, apparatus for preselecting the tonal quality by selectively modifying the calculated data comprising: an addressable memory for storing at least one set of coefficient values, means for generating addresses in a predetermined sequence, and means coupling the address generating means to the memory for addressing and reading out a selected one of the coefficient values from the memory at a time, said means including switch means for

preselectively changing the sequence in which the memory is addressed in response to the addressing means to change the sequence in which each of the coefficient values is read out of memory, whereby the coefficient values used in the calculation of the data may be selectively varied.

4,108,040
ELECTRONIC MUSICAL INSTRUMENT

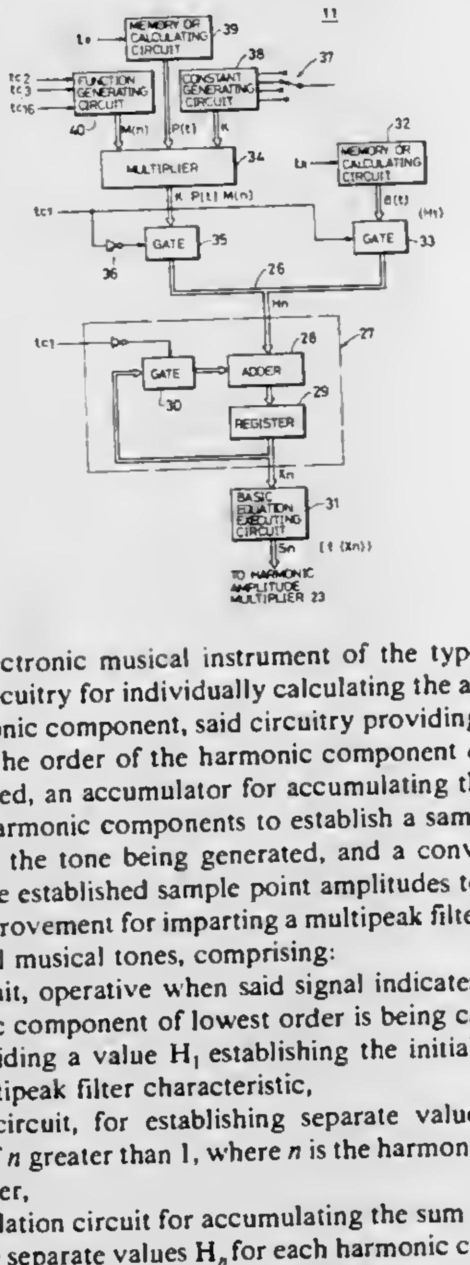
Masanobu Chibana; Tsuyoshi Futamase, and Hideo Yamada, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 17, 1976, Ser. No. 742,586

Claims priority, application Japan, Nov. 19, 1975, 50-139005

Int. Cl.² G10H *1/02*

U.S. Cl. 84—1.19 **6 Claims**



11
MEMORY OF CALCULATING CIRCUIT
39
FUNCTION GENERATING CIRCUIT
CONSTANT GENERATING CIRCUIT
38
37
40
M(n)
P(t)
K
MULTIPLIER
34
MEMORY OF CALCULATING CIRCUIT
32
GATE
35
36
GATE
33
26
GATE
ADDER
28
27
29
30
REGISTER
Xn
BASIC EQUATION EXECUTING CIRCUIT
31
Sn
TO HARMONIC AMPLITUDE MULTIPLIER 23

1. In an electronic musical instrument of the type having calculating circuitry for individually calculating the amplitude of each harmonic component, said circuitry providing a signal indicative of the order of the harmonic component currently being calculated, an accumulator for accumulating the amplitudes of all harmonic components to establish a sample point amplitude for the tone being generated, and a converter for converting the established sample point amplitudes to musical tones, the improvement for imparting a multipeak filter characteristic to said musical tones, comprising:

a first circuit, operative when said signal indicates that the harmonic component of lowest order is being calculated, for providing a value H_1 establishing the initial point of said multipeak filter characteristic,

a second circuit, for establishing separate values H_n for values of n greater than 1, where n is the harmonic component order,

an accumulation circuit for accumulating the sum of H_1 plus all of the separate values H_n for each harmonic component or order lower than that of the harmonic component currently being evaluated to obtain an accumulated value

$$Xn = H_1 + \sum_{n=2}^{i-1} H_n$$

where i is the current harmonic component order,

multipeak filter means connected to receive the output of said accumulation circuit, for providing a multipeak filter relative amplitude value in accordance with the accumulated value X_n received from said accumulation circuit.

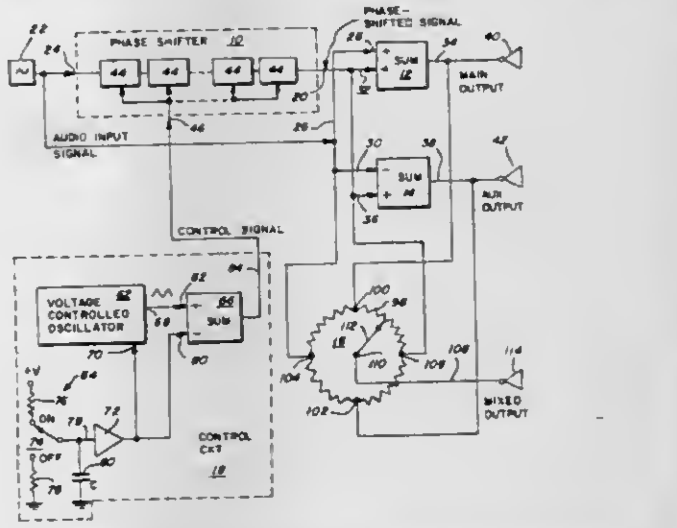
4,108,041
PHASE SHIFTING SOUND EFFECTS CIRCUIT

Robert A. Moog, East Aurora, N.Y., and Roger Flavius Cox, Northbrook, Ill., assignors to Norlin Music, Inc., Lincolnwood, Ill.

Filed Jun. 25, 1976, Ser. No. 700,250

Int. Cl.² G10H *1/02*

U.S. Cl. 84—1.24 **30 Claims**



1. In a special sound effects circuit having a phase shifter for developing a signal shifted in phase with respect to an input signal, said phase shifter having a characteristic frequency at which phase shifting commences, means for combining the phase shifted and input signals, and means for periodically modulating the characteristic frequency, a modulation control circuit, comprising:

means for generating a control signal;

means responsive to the control signal for altering the rate of periodic modulation; and

means responsive to the control signal for unidirectionally varying the characteristic frequency as the rate of periodic modulation is changed.

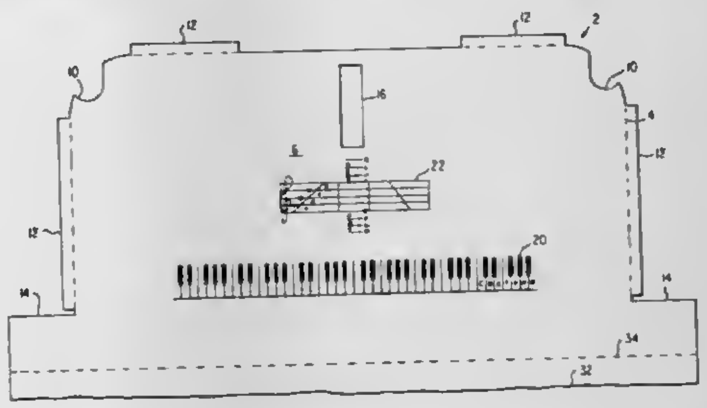
4,108,042
MUSIC TEACHING MACHINE

Harry Blau, 1431 Ocean Ave., Apt. 1412, Santa Monica, Calif. 90401

Filed Jun. 6, 1977, Ser. No. 803,441

Int. Cl.² G09B *15/02*

U.S. Cl. 84—471 R **8 Claims**



6. A music teaching machine comprising a rotatable disc having predetermined information thereon sandwiched between a first and second panel having a cut out provided therein for selectively displaying said information on said discs, said improvement comprising:

a piano keyboard printed on said first panel;

a pointer slidable coupled to said first panel for pointing out keys in response to information displayed in said cut out in said first panel;

at least one finger rest provided in said first and second panel; and

a strip extension provided along an edge of said first and second panels adjacent said pointer and extending from said first and second panels whereby said strip extension is pressed into a chest of an operator by a finger of said operator engaged with said finger rest and said music teaching machine is comfortably supported such that said operator can easily read the information displayed and can easily operate said pointer.

4,108,043
ANCHORAGE APPLIANCE

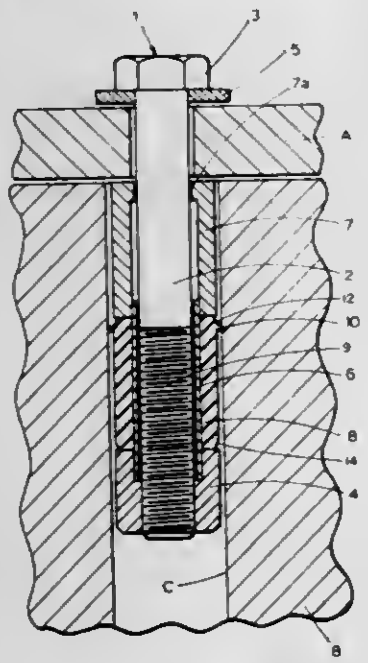
Otto Herman Varga, Bradford-on-Avon, England, assignor to Resilient Grip Limited, Bristol, England

Filed Jun. 28, 1977, Ser. No. 811,126

Claims priority, application United Kingdom, Aug. 2, 1976, 32043/76

Int. Cl.^{2} F16B *13/06*

U.S. Cl. 85—70 **6 Claims**



1. An anchorage appliance comprising a bolt having a head and a threaded stem, a nut on said stem, a metal sleeve permanently associated with the nut and encircling the stem, a cylindrical annular body of elastomeric material, for example rubber, mounted on the sleeve and having one end thereof abutting the nut, a metal collar telescoping over the sleeve, the elastomeric body being subjectible to axial compressive force between annular abutment surfaces on the nut and on the collar when the nut moves up the threaded stem towards the bolt head, the nut, the collar and the elastomeric body when unstressed together having external cylindrical surfaces of similar diameter, a narrow outwardly projecting annular flexible flange on the elastomeric body adjacent the other end of the cylindrical annular body, the flange having an overall diameter which is 7 to 15% larger than that of the collar, the nut and the elastomeric sleeve when the latter is in unstressed condition.

4,108,044
DEVICE FOR GREASING MUZZLE-LOADING BULLETS

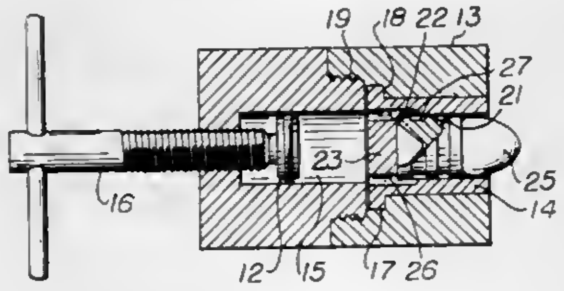
Richard Brown, 468 Metzgar St., Half Moon Bay, Calif. 94019

Filed Mar. 21, 1977, Ser. No. 779,330

Int. Cl.^{2} F42B *31/02*

U.S. Cl. 86—19 **6 Claims**

1. A portable, pocket size device for greasing muzzle-loading type bullets comprising a stock having a grease-containing chamber, hand-operable piston means for forcing grease through the chamber, a removable die attachable to an open end of the stock chamber in axial alignment therewith, the cylindrical adapter removably held by the die against the open end of the stock chamber, the adapter having a base portion to limit the depth of insertion of a bullet into the adapter and an inner portion defining a passage around the base portion such that grease in the chamber can be forced by the piston through the passage and into the grooves of the bullet.



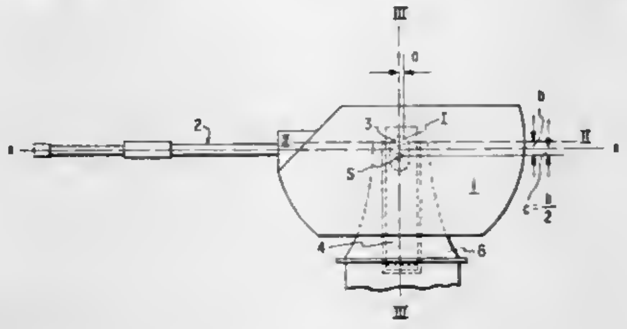
4,108,045
WEAPON MOUNTING ARRANGEMENT

Rolf Herbst, Obervellmar, Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Germany Germany

Filed Aug. 2, 1971, Ser. No. 168,362

Int. Cl.^{2} F41H *5/20*

U.S. Cl. 89—36 K **3 Claims**



1. In a cardanically suspended movable turret having a tubular weapon mounted therein so that the bore axis of the barrel of said weapon intersects the vertical rotational axis of said movable turret and a center of gravity which is always vertically displaced from and below said bore axis of the barrel of said weapon and the elevation axis of the cardanic suspension of said turret, but which moves between a first position when the turret is fully loaded with ammunition and a second position when the turret contains no ammunition, the improvement wherein said weapon is mounted in said turret so that said bore axis of the barrel of said weapon lies in between said elevation axis of the cardanic suspension of said turret and said center of gravity of said turret, and when said turret and said weapon are aligned so as to cause said center of gravity to be vertically displaced from said elevation axis of the turret suspension along said vertical rotational axis, the vertical distance along said vertical rotational axis between said bore axis and said elevation axis is approximately equal to the vertical distance along said vertical rotational axis between said bore axis and the average position of said center of gravity of said turret whereby the effective path of the recoil force of said weapon, which path is along the bore axis of said weapon, is moved toward the center of gravity of said turret and consequently the torque exerted on the turret during the firing is reduced.

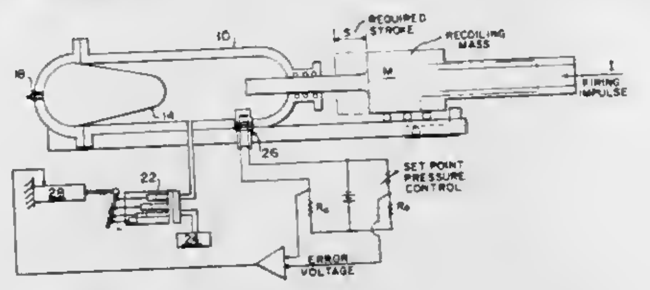
4,108,046
LIQUID-GAS CONSTANT FORCE RECOIL SPRING

Louis J. Kiraly, Brook Park, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1975, Ser. No. 584,666

Int. Cl.^{2} F16F *5/00, 9/08*

U.S. Cl. 89—43 A **3 Claims**



1. A constant-force liquid-gas spring comprising:

a cylinder defining a first region comprising a gastight bladder, the interior of said bladder filled with a gas, and a second region filled with a low bulk modulus liquid in direct contact with the exterior of said bladder; and

a piston entering into said second region of said cylinder, said piston and cylinder being movable relative to each other, whereby the energy of the inward motion of said piston is stored in said spring by the compression of both said liquid and said gas;

means for introducing liquid into said cylinder including:

a pump: and

a reservoir for storing said liquid, said pump being coupled to said reservoir for pumping liquid to and from said cylinder; and

a pressure sensor located within said second region of said cylinder, said pressure sensor controlling said pump in response to the pressure existing in said second region.

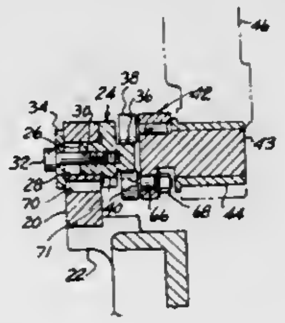
4,108,047
GEAR CROWNING MACHINE CAM

Walter Frankiw, Detroit, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 514,330, Oct. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 349,226, Apr. 9, 1973, Pat. No. 3,875,847. This application Sep. 12, 1977, Ser. No. 832,388

Int. Cl.^{2} B23F *19/06*

U.S. Cl. 90—1.6 R **2 Claims**



1. A gear finishing machine comprising a frame, a slide movable horizontally on said frame, a gear support table mounted on said slide for reciprocation with said slide and for rocking movement relative to said slide about an axis perpendicular to the direction of reciprocation, camming means for controlling rocking of said table in timed relation to slide travel comprising cam and cam follower devices operatively connected between said frame and said table, one of said devices being carried by said frame and the other of said devices being carried by said table, said cam device comprising an elongated cam bar having opposed parallel camming surfaces and means for angularly adjusting said bar about an axis parallel to the rocking axis of said table, said cam follower device comprising a pair of spaced rollers engageable with one of said parallel surfaces, a second pair of spaced rollers engaging the other of said parallel surfaces in opposing relation to said first mentioned pair of rollers, means for independently adjusting each of the rollers of one pair toward and away from said cam bar to provide precisely controlled engagement by all four of said rolls with said bar to provide precisely identical tilting movement of said table in opposite directions as said table is traversed in opposite directions, said cam bar being adjustable into parallelism with the path of reciprocation of said table to cause said cam bar and rollers to function as the sole means for maintaining said table against tilting during reciprocation thereof.

4,108,048
AXIAL PISTON PUMP OR PUMPING MACHINE

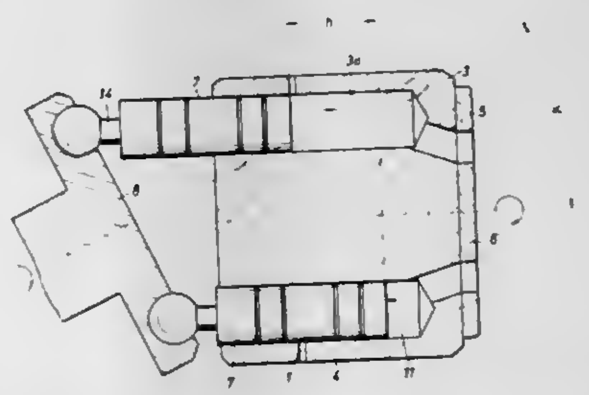
Wilhelm Gauss, Bildechingen; Henricus Van Logten, and Arthur Krüger, both of Horb, of Germany, assignors to Brueninghaus Hydraulik GmbH, Horb am Neckar, Germany

Filed Oct. 27, 1976, Ser. No. 736,268

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548730

Int. Cl.^{2} F01B *13/04*

U.S. Cl. 91—6.5 **7 Claims**



1. An axial piston pump apparatus defined by a cylinder block with clinders; a distributor plate with kidney-shaped control openings for distributing flow to said cylinders; pistons guided in said cylinders; said cylinder block having channels for releasing liquid pressure in the cylinders within an area between said kidney-shaped control openings; wherein: said channels are arranged in said cylinder block and feed into said cylinders in an area of the cylinder walls; a swash plate connected to said pistons for actuating said pistons in said cylinders, said channels being uncovered by said pistons, and at least two of said channels are arranged at varying distances from said distributor plate in an area of the cylinder walls so that an increasing number of said channels are uncovered by said pistons extend out of said cylinders in response to increased inclination of said swash plate.

4,108,049
VARIABLE TORQUE FLUID DEVICE

Joseph M. Lawson, P.O. Box 518, Natchez, Miss. 39102

Continuation-in-part of Ser. No. 570,187, Apr. 21, 1975, abandoned. This application Jun. 30, 1976, Ser. No. 701,360

Int. Cl.^{2} F01B *13/04*

U.S. Cl. 91—478 **3 Claims**

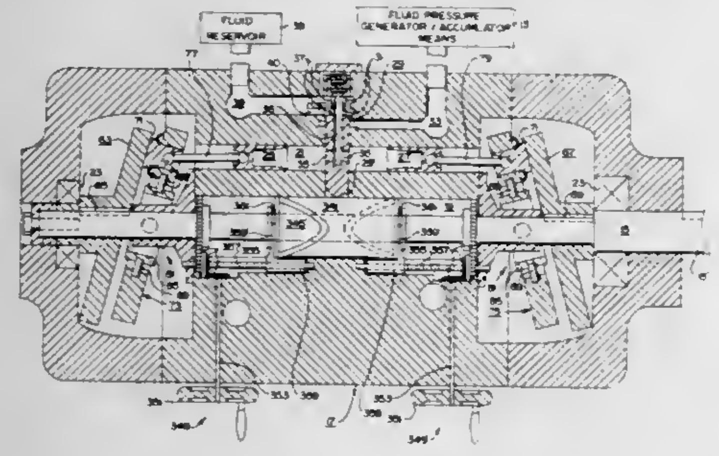
1. A fluid displacement device comprising:

(a) body means having a plurality of chambers and having first and second port means for allowing a fluid to be introduced into and expelled from said plurality of chambers;

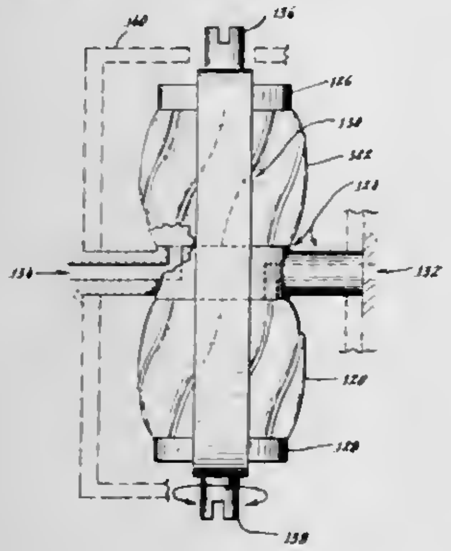
(b) movable means associated with said plurality of chambers for increasing and decreasing the displacement volume of said plurality of chambers;

(c) shaft means operably coupled with said movable means,

(d) fluid distribution means for controlling fluid flow between said plurality of chambers and said first and second port means of said body means, said fluid distribution means including valve means associated with each of said plurality of chambers for movement between a first position allowing fluid to flow between said first port means and at least one of said plurality of chambers and a second position allowing fluid to flow between said second port means and at least one of said plurality of chambers, said fluid distribution means including actuating means for moving said valve means between the first and second positions, said actuating means including a single cam means attached to said shaft means for rotation therewith to move said valve means between the first and second positions responsive to the rotation of said shaft means, said cam means including an elongated cylinder having a first recessed portion on one end thereof and a second recessed portion on the other end thereof, said cam means being laterally movable on said shaft means, said cam means being composed of two separate pieces with one of said first and second recessed portions provided on each piece and with each piece adapted to selectively overlap a portion of the other and to be laterally movable on said shaft means independently of the other.



4,108,050
FLUID-DRIVEN TORSIONAL OPERATORS FOR TURNING ROTARY VALVES AND THE LIKE
Henry M. Paynter, 35 Scotland Rd., Reading, Mass. 01867
Continuation of Ser. No. 497,280, Aug. 14, 1974, abandoned.
This application May 17, 1976, Ser. No. 686,740
Int. Cl.^{2} F01B *19/04*
U.S. Cl. 92—48 **5 Claims**



1. A double-acting fluid-driven torsional operator adapted to turn through a predetermined angular operating range comprising;

a fixed frame;

first and second torsional actuators mounted on said frame; said actuators each including:

first and second flexible, thin-walled elastomeric shells,

said first and second shells defining first and second fluid chambers therein, respectively,

said first and second shells each having first and second coupling members at the opposite ends thereof and being fastened in fluid-tight relationship with the opposite ends of the respective shell,

each of said shells having a longitudinal axis extending through the first and second coupling members at its opposite ends and having a plurality of inextensible, flexible load-bearing strands bonded thereto and extending between and interconnecting the first and second coupling members at opposite ends of the respective shell, and

each respective shell developing an outwardly bowing arcuate shape when fully inflated with said plurality of strands of each shell deflecting into outwardly bowing meridian arcs uniformly spaced about the axis of the shell when the respective shell is fully inflated;

the first coupling member of both of said actuators being fixed to said frame for preventing rotation of both of said first coupling members;

rotatable means interconnecting the second coupling members of both of said actuators for causing said second coupling members to turn simultaneously;

said first and second fluid chambers within the respective first and second shells being separate one from another;

said first and second actuators being pre-twisted in opposite senses with respect to said rotatable means so that fluid admitted into the first of said chambers will exert torque for causing rotation of said rotatable means in a first sense while fluid admitted into the second of said chambers will exert torgue for causing rotation of said rotatable means in the opposite sense;

when said operator is turned to a first limit of said predetermined angular operating range, said shell of said first actuator being twisted about its axis into a fluted configuration with a series of circumferentially spaced ridges and valleys with each strand being twisted about said axis and with the strands of said shell extending along said valleys;

when said operator is turned to a second limit of said predetermined angular operating range, said shell of said second actuator being twisted about its axis into a fluted configuration with a series of circumferentially spaced ridges and valleys with each strand being twisted about said axis and with the strands of said shell extending along said valleys;

means defining a first fluid port for feeding pressurized fluid at pressures P_1 into said first chamber for inflating said first shell for causing said first shell to untwist about its axis and to bow outwardly while partially untwisting the strands thereof,

thereby exerting first torque in a first sense on said rotatable means for angularly moving said rotatable means in said first sense,

means defining a second fluid port for feeding pressurized fluid at pressures P_2 into said second chamber for inflating said second shell for causing said second shell to untwist about its axis and to bow outwardly while partially untwisting the strands thereof,

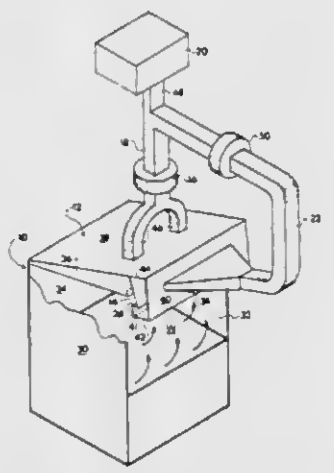
thereby exerting second torque in a second sense on said rotatable means for angularly moving said rotatable means in a second sense,

by virtue of all of which:

a. the angular position of said rotatable means is proportional to the difference between said pressures P_1 and P_2 throughout said angular operating range, and

b. the angular position of said rotatable means is stable at any angular position throughout said angular operating range.

4,108,051
VENTILATING SYSTEM FOR INDUSTRIAL MACHINES
Marion L. Eakes, Greensboro, N.C., assignor to Marion L. Eakes Company, Greensboro, N.C.
Division of Ser. No. 683,733, May 6, 1976, Pat. No. 4,050,367.
This application May 9, 1977, Ser. No. 794,718
Int. Cl.^{2} F23J *11/00*
U.S. Cl. 115 LH **5 Claims**



1. Ventilating system for industrial machines of the type carrying out a process on a work table at which a substantial amount of contaminated exhaust gases are generated, said system comprising:

a. an exhaust means positioned above and spaced from the work table and having at least one partially open side;

b. said exhaust means including a hood extending over and covering the area above said work table, said hood including:

i. an upper wall having at least one first conduit means extending therefrom through which the contaminated exhaust gases exit from said hood;

ii. a lower wall having at least one inlet therethrough generally parallel to and generally coextensive with said open side through which said contaminated exhaust gases enter said hood;

iii. a front plenum portion of said exhaust hood including an air nozzle slightly in front of and below said inlet and directed toward said inlet;

iv. said hood means otherwise enclosed from the atmosphere therearound;

c. a second conduit means connecting said first conduit means and said front plenum portion;

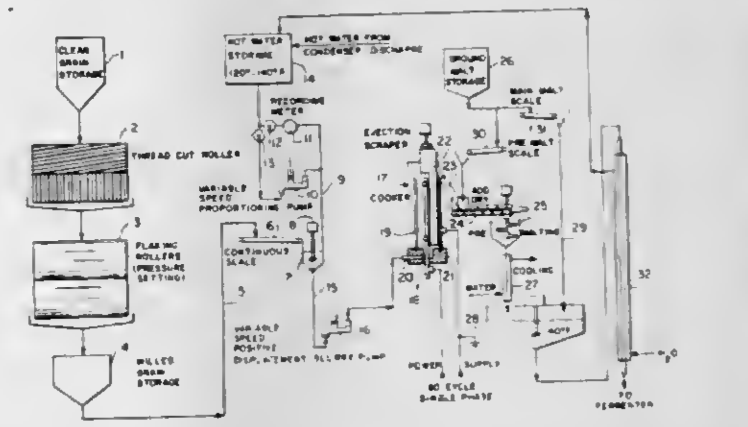
d. a gas separating means in said first conduit means downstream of the point where said second conduit means is connected;

e. separating means in said first conduit means upstream of said gas separating means for separating a portion of said contaminated exhaust gases and sending a first portion thereon into said second conduit means and the second portion thereof on to said filtering means; and

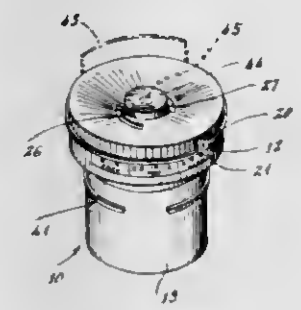
f. fan means for applying negative pressure to said inlet and directing said contaminated exhaust gases into and through said first and second conduit means.

4,108,052
APPARATUS FOR PRODUCING ALCOHOL FROM GRAINS OF STARCH MATERIALS
Newton T. Cunningham, 1324 Garfield Ave., Wyomissing, Pa. 19610
Continuation-in-part of Ser. No. 637,865, Dec. 4, 1975, Pat. No. 4,035,515. This application Apr. 21, 1977, Ser. No. 789,702
Int. Cl.^{2} A23L *1/00;* C12C *11/00*
U.S. Cl. 99—275 **4 Claims**

4. An apparatus for producing ethyl alcohol from cereal grains, said apparatus comprising; means for cutting and breaking certain grain into small fragments; means for continuously adding water at a temperature of about 120° to 140° F to the said grain fragments so as to form a water slurry thereof; a holding vessel for retaining said grain slurry; a cooking unit; means for passing said slurry into said cooking unit; said cooking unit having a central electrode positioned within an electrically conductive outer cylindrically shaped wall forming a chamber around said central electrode, said central electrode and outer cylindrical wall having first and second end portions respectively; support means positioned at the first ends of said central electrode and cylindrical outer wall for supporting same; a power source connected across said central electrode and said outer conductive wall whereby the electrical path for said power source is completed through the said slurry to thereby cause said slurry to be heated and means positioned near the second end of said outer conductive wall for collecting and removing the resulting gelled mash from said cooking unit.



4,108,053
VARIABLE BREW COFFEE MAKER
Richard C. Vink, Essex, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Mar. 29, 1976, Ser. No. 671,418
Int. Cl.^{2} A47J *31/10*
U.S. Cl. 99—306 **6 Claims**



1. A drip coffee maker operable with a supply of heated water, a quantity of ground coffee, and a brewed-coffee receptacle, which includes a variable-strength coffee-brewing assembly removably placeable atop said receptacle and comprising a brewing basket defining a brewing space for containing said ground coffee and an overflow duct by-passing said brewing space, a water-spreader container removably attached atop the brewing basket and defining a water-collection space and an overflow chamber, a water-distribution plate atop said water-spreader container, said water-distribution plate being provided with first and second apertures, and valve means for variably blocking water flow through each of said apertures, said valve means comprising a port of said water-spreader container positionable in adjacent and blocking relationship with said apertures, and said water-distribution plate being movable relative to said water-spreader container for effecting said variable blocking, said water-distribution plate, said water-spreader container and said brewing basket being longitudinally alignable, whereby heated water received by said water-distribution plate flows proportionately, as controlled by said valve means, (i) through said first aperture, said overflow

chamber, and said overflow duct into said receptacle, and (ii) through said second aperture, said water-collection space, and said brewing space into said receptacle to provide brewed coffee of the desired strength.

4,108,054

SAFETY INTERLOCK DEVICE IN AN ELECTRICALLY DRIVEN HOUSEHOLD MIXING APPARATUS

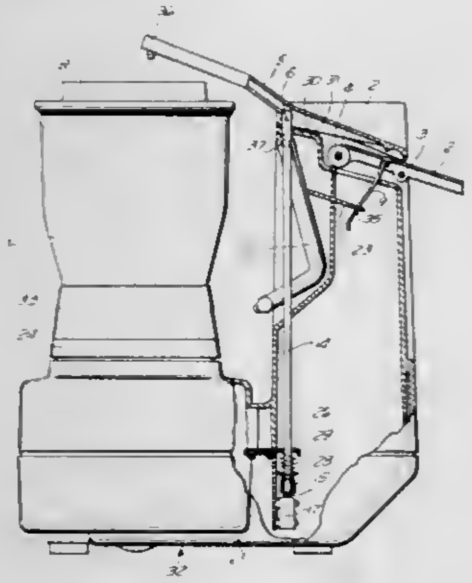
Ingo Klöcker, Ennepetal; Oswald Gibiec, Wuppertal; Paul-Ulrich Uibel, Ennepetal, and Dieter Garn, Schwelm, all of Fed. Rep. of Germany, assignors to Vorwerk & Co Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,966

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651237

Int. Cl.^{2} A47J ***27/18;*** **B01F** ***7/16***

U.S. Cl. 99—348 **22 Claims**



1. In an electrically driven household mixing apparatus having a housing, a drive motor located in the housing and having an electric circuit means for operating the motor, a container including a body portion and a removable cover, and a heating arrangement for heating the container and having a further electric circuit means for sensing and controlling the temperature of the container, a safety interlock device comprising

a safety switch operatively connected with said electric circuit means and movable between an on position in which it permits operation of the motor and heating arrangement and an off position in which it does not permit such operation;

a switching rod mounted for longitudinal movement between a switch-on position causing said switch to move to its on position, and a switch-off position causing the switch to move to its off position;

a holding lever pivotally mounted on said switching rod and having an end portion, said holding lever being turnable between a closed position in which said end portion abuts against the cover when the latter is present, and an open position in which said end portion is withdrawn from the cover;

an arm provided with a temperature sensing element operatively connected with the further electrical circuit means of the heating arrangement, and movable between a proximal position in which said temperature sensing element contacts a wall of the container so as to sense the temperature of the latter, and a distal position in which said temperature sensing element is withdrawn from the wall of the container;

an actuating lever mounted for pivotal movement between a first position in which it keeps said holding lever in said closed position and through the intermediary of said holding lever keeps said switching rod in the switch-on position thereof and a second position in which the actuating lever does not keep the holding lever in its closed position and does not keep the switching rod in its switch-off position;

and a transmission element mounted on said actuating lever and operative when the latter is moved to its first position for moving said arm with said sensing element to its proximal position.

4,108,055

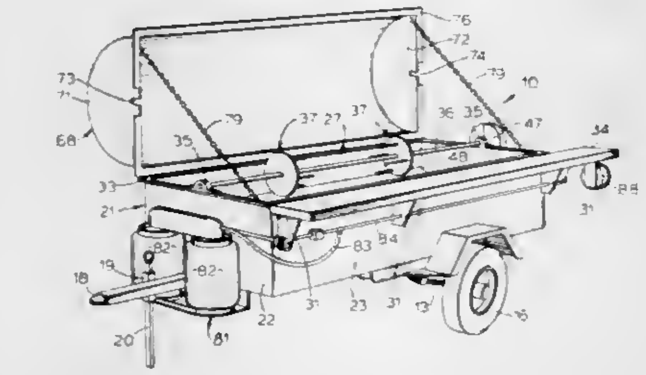
MOBILE BROILER ROTISSERIE APPARATUS

James Simmons, 5225 St. Joseph Ave., Stevensville, Mich. 49127

Filed Apr. 14, 1977, Ser. No. 787,580

Int. Cl.^{2} A47J ***37/04***

U.S. Cl. 99—421 H **4 Claims**



1. A mobile broiler rotisserie apparatus, comprising:

trailer frame means including road engaging wheel means and hitch means for connection to a vehicle;

an open top chamber having sidewalls and a bottom wall mounted on said trailer frame means, said chamber including support means adjacent the upper edge of a pair of sidewalls to the open top chamber;

rotatable food supporting means rotatably supported on said support means in spaced relation from said bottom wall of said chamber;

controllable heat generating means positioned in the spacing between said food supporting means and said bottom wall for cooking foods supported on said food supporting means;

hood means pivotally secured to an upper edge of said open top chamber and movable between open and closed positions relative to said open top of said chamber means;

elongated trough means mounted in said chamber and above said controllable heat generating means and in vertical alignment with said rotatable food supporting means, one of said walls of said chamber having an opening therein, the longitudinal axis of said trough means extending parallel to the axis of rotation of said rotatable food supporting means and at an incline to the horizontal downwardly out through said opening in one of said walls of said chamber, said trough means occupying the range of 15 to 25 percent of the width of said chamber viewed in a direction parallel to said axis of rotation; and

drive means operatively connected to said rotatable food supporting means and having a rotatable output characteristic in the range of 0.5 to 1.0 rpm whereby the juice from foods mounted on said rotatable food supporting means will fall therefrom during cooking and into said trough means and whereby the heat from said heat generating means will maintain the collected juice in said trough means in liquid form so that it will flow down the incline of said trough means and out through said opening for external collection.

4,108,056

APPARATUS FOR STORING CHEESE LOAVES AND FOR PERIODICALLY TURNING THEM UPSIDE DOWN

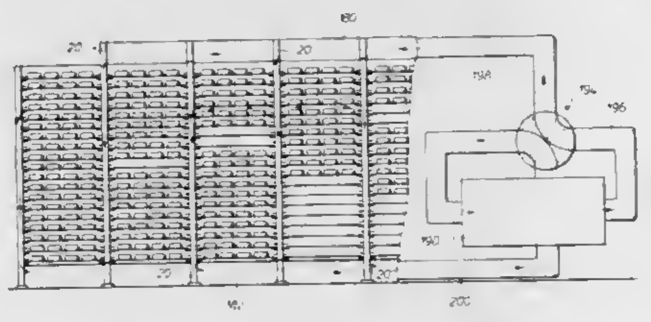
Gerrit Jan Van Elten, Barneveld, and Antonius Hurkmans, Baarn, both of Netherlands, assignors to Tech. Ontwikkelingsbureau Van Elten B.V., Netherlands

Continuation of Ser. No. 571,088, Apr. 24, 1975, Pat. No. 4,015,519. This application Jan. 25, 1977, Ser. No. 762,469

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2421515

Int. Cl.^{2} A01J ***25/16;*** **A23B** ***4/08***

U.S. Cl. 99—452 **5 Claims**



1. An apparatus for storing cheese loaves comprising an array of adjacent units, each unit constituting a multiplicity of horizontal open-end guideways in super-imposed relationship, each guideway accommodating loaves of cheese, the height of each guideway being in excess of the height of each loaf, each unit having opposite hollow walls extending parallel to said guideways, air-circulating means supplying and withdrawing air to and from the individual units for control conditioning of the cheese within said units, such air circulating means including a fan and air-ducting means for supplying air through one of said walls of each unit and withdrawing air from the other one of said walls of each unit, respectively, the air-conducting means including air outlet openings and air suction openings distributed all over the walls of the unit, the opposite hollow walls of at least some of said units having internal longitudinal partitions subdividing the internal space of said hollow wall into a pair of ducts, each of which communicates with some of said air outlet and suction openings, conducting means establishing communication from each of said ducts with said air circulating means, said conducting means including adjustable control valves.

4,108,057

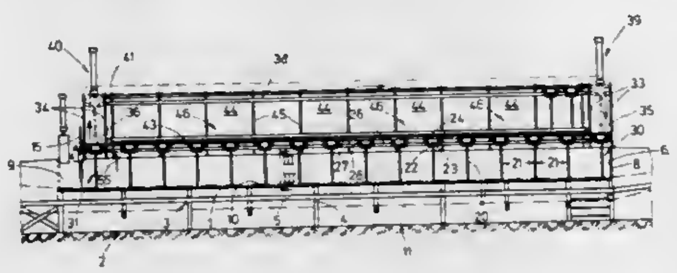
DEVICE FOR CONTINUOUS PRODUCTION OF CHEESE MATERIAL

Gottfried Hain, Lehen; Günter Doble; Josef Geist, both of Rott, Inn, and Rainer Schmidt, Leben Nr. 5, all of Fed. Rep. of Germany, assignors to Alpma Alpenland Maschinenbau Hain and Co. K.G., Fed. Rep. of Germany

Filed Jan. 28, 1976, Ser. No. 652,949

Int. Cl.^{2} A01J ***25/16;*** **A23C** ***19/02***

U.S. Cl. 99—452 **9 Claims**



1. A device for continuous production of cheese material through coagulation of milk comprising a horizontal trough-shaped container having edges and an inlet end and an outlet end, a flexible inner wall covering the container wall on the inside, which inner wall forms an endless band around the edges of the container, means feeding milk to the inlet end of the container, drive means urging the forward movement of the flexible inner wall at such a velocity that the milk coagulates on its way from the inlet end to the outlet end of the container, cutting means for the coagulate at the outlet end of the container, whereby said coagulate in the form of cut cheese curd is removed by the inner wall on the outlet side, partitions corresponding to the cross section of the container which are horizontally spaced in relation to each other, a rail guide for the partitions, means for lowering the partitions into the container at the inlet end, means for lifting the partitions from the container at the outlet end in front of the cutting device, and a return rail guide for the partitions, said return rail guide connecting the lifting means with the lowering means.

4,108,058

CHEESE-MAKING APPARATUS

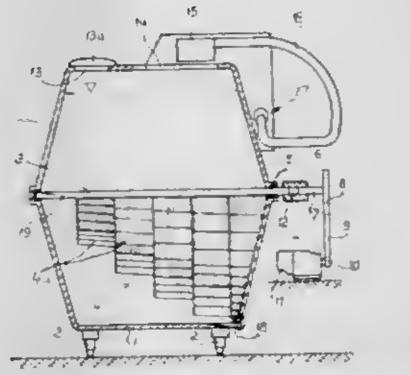
Claes Bertil Sjoholm, Malmo, and Karl J. G. Martensson, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 12, 1976, Ser. No. 676,070

Claims priority, application Sweden, Apr. 18, 1975, 7504503

Int. Cl.^{2} A10J ***25/06***

U.S. Cl. 99—466 **16 Claims**



1. Cheese-making apparatus comprising an immobile container for cheese curd, said container being in the form of a body of revolution having an axis, a tool movable within the container and having cutting means and separate stirring means for cutting and subsequent stirring of cheese curd, and a drive shaft connected with the tool and arranged to rotate the tool about said axis of the container, said apparatus being characterized in that the immobile container is disposed with its said axis substantially horizontal and that said tool is arranged to cut and stir cheese curd situated above as well as below said axis of the container, said apparatus comprising also driving means for rotating said shaft and tool through a plurality of revolutions during a cutting operation and then through another plurality of revolutions during a stirring operation.

4,108,059

METHOD AND MEANS FOR PEELING PINEAPPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

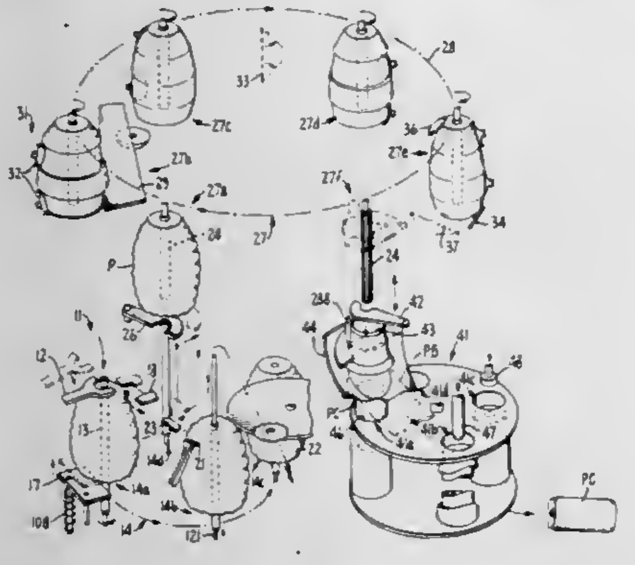
Filed Jun. 21, 1976, Ser. No. 697,779

Int. Cl.^{2} A23N ***4/20, 7/00***

U.S. Cl. 99—543 **39 Claims**

1. In a pineapple peeler, means for positioning a pineapple with its core axis extending in a predetermined direction, pineapple moving means adjacent the positioning means to engage and move the pineapple along a path in alignment with said direction, pineapple coring means in a position to receive the pineapple and to cut a hole axially and centrally through the core of the pineapple, yielding means adjacent the coring means to engage the pineapple while it is being cored and yieldably resisting movement of the pineapple in said direction, and disengaging means to disengage the pineapple moving means from the pineapple whereupon said yielding means

moves the pineapple relative to said coring means in a direction opposite to said direction, thus spacing an end of the pineapple from the coring means to enable cutting of said end from the pineapple.



4,108,060

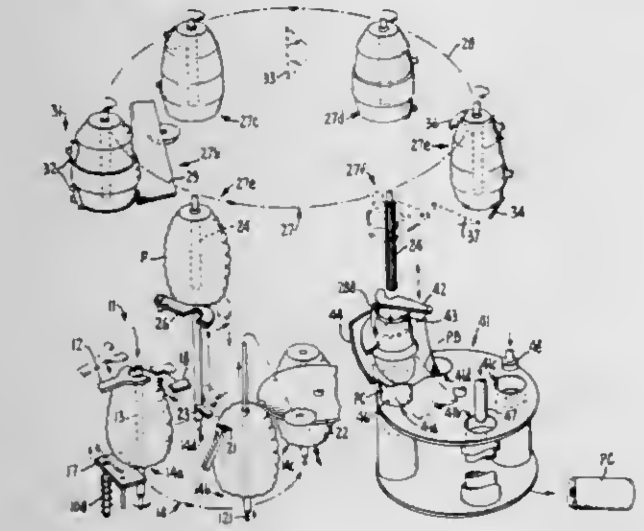
METHOD AND MEANS FOR PEELING PINEAPPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 697,779, Jun. 21, 1976. This application Apr. 11, 1977, Ser. No. 786,615

Int. Cl.^{2} A23N *7/08*

U.S. Cl. 99—591 **9 Claims**



1. A rotary cutter for peeling pineapples and the like comprising: a movable mounting head for supporting the cutter, a circular disc supported centrally on a shaft which is mounted on said mounting head, said disc having a plurality of teeth disposed about the periphery of the disc having at least the leading edge thereof sharpened to provide a cutting surface, said disc having a concave face opposite the shaft wherein said peripheral teeth cut an ovoid shaped path through the outer layer of the pineapple, and at least one upstanding spur disposed on the disc on the side opposite said concave face and substantially normal to the disc and having a sharp leading edge to cut the peeled material into segments, a pair of gauge shoes connected to said mounting head, one gauge shoe being disposed on each side of said cutter periphery for limiting the depth of penetration of the cutter teeth into said fruit surface as the pineapple is indexed into the cutter station, said gauge shoes each including bar members connected to said mounting head for movement therewith and having a recess defined therein adjacent said circular disc, flexible members attached to said bar members adjacent said recesses for engaging the fruit which conform to the shape of the fruit so that said gauge shoes contact the fruit over an enlarged surface area, said flexible members extending across said bar member recesses to form a cradle which conforms to surface irregularities of a pineapple, said guage members contacting incoming fruit to move said mounting head and said cutter in accordance with the size and shape of that incoming fruit whereby the cutter encounters the fruit to be peeled at a desired depth and attitude.

4,108,061

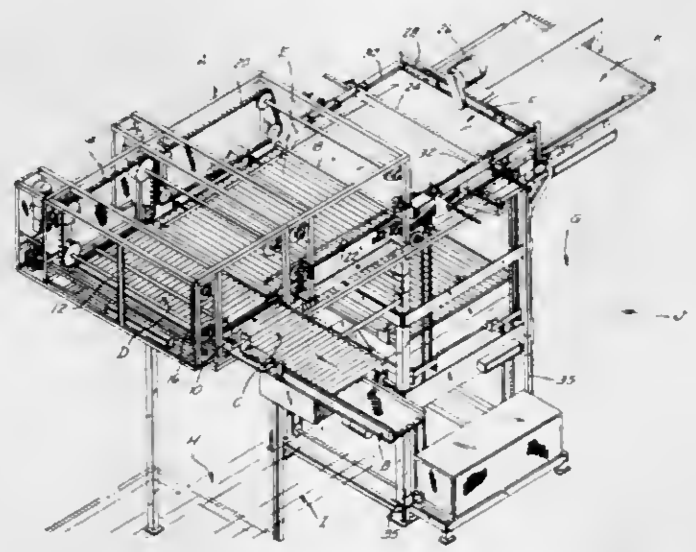
PALLETIZER WITH TIER SHEET INSERTER AND BANDING MEANS

Robert E. Bowser, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Jan. 24, 1977, Ser. No. 761,583

Int. Cl.^{2} B65B *13/14*

U.S. Cl. 100—7 **23 Claims**



1. In a palletizer of the type having a hoist shaft, a hoist, means for moving said hoist within said shaft, a retractable draw plate located above said shaft and means for forming a set of objects to be palletized and for positioning same on said draw plate, when said draw plate is in the unretracted position, the improvement comprising means associated with said shaft at a point below said draw plate for strapping said set of objects together, said hoist moving means being effective, when actuated, to move said hoist to a position wherein said set of objects is aligned with said strapping means, after the retraction of said draw plate.

4,108,062

APPARATUS FOR BINDING A CROP BALE

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 742,178, Nov. 16, 1976, Pat. No. 4,074,623. This application Sep. 15, 1977, Ser. No. 833,566

Int. Cl.^{2} B65B *13/28*

U.S. Cl. 100—11 **14 Claims**

1. In apparatus for baling and binding loose material into a compacted bale, said apparatus being of the type wherein a bale is progressively formed and incrementally advanced through a baling chamber by intermittently packing successive charges of new material against a source of yieldable resistance across the path of travel of the bale, the improvement including:

a pair of separate binding strands and a pair of separate respective sources of supply therefor;

a tier positioned alongside the path of travel of the bale; and

mechanism for presenting the strands in unison to said tier before and after the packing cycle of each bale, respectively,

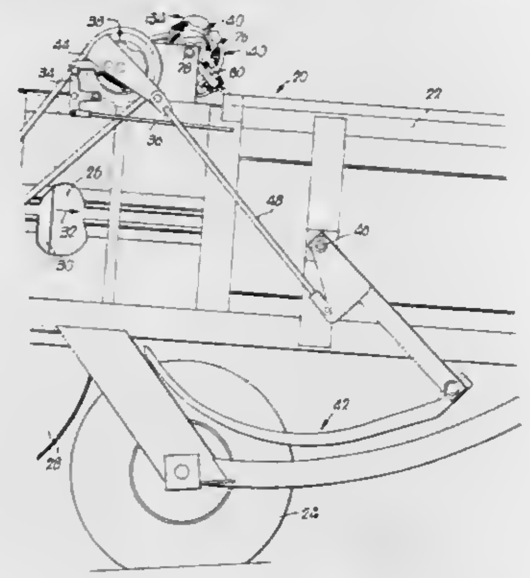
said tier being operable twice during the binding of each bale to connect the strands together into a complete loop about

the bale having a pair of points of connection of the strands,

said mechanism and said tier being cooperable before the start of a packing cycle to connect the strands together a first time and form an open-ended bight from the strands that extends across the path of travel of the bale in position to receive the charges thereof,

said sources of supply being operable to pay out additional lengths of both strands simultaneously as said bight is thereafter lengthened by the forming and advancing bale,

said mechanism and said tier being further cooperable after the completion of a packing cycle to close the bight and connect the strands together a second time whereby to complete the loop about the bale, the second connecting of strands for one bale and the first connecting of strands for the next succeeding bale being carried out successively.



4,108,063

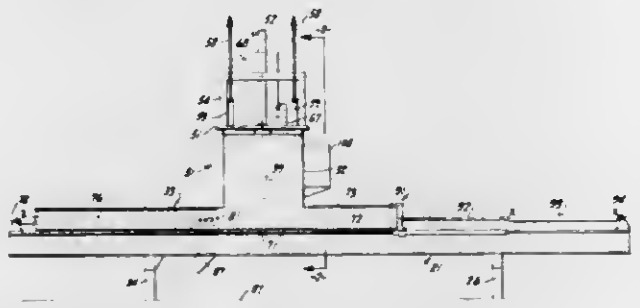
HYDRAULIC BAGGING PRESS

Arthur J. Randolph, 4711 Sonoma Hwy., Santa Rosa, Calif. 95405

Filed Sep. 19, 1977, Ser. No. 834,714

Int. Cl.^{2} B30B *15/30*

U.S. Cl. 100—53 **8 Claims**



1. A hydraulic bagging press comprising

a vertical hydraulic cylinder having a perforated ram slidably engaging walls of a vertical chamber for compressing material disposed therein,

screw feed means feeding divided material into said vertical chamber below said ram therein,

A horizontal hydraulic cylinder having a perforated horizontal ram slidably engaging the walls of an open-ended chamber disposed across the bottom of said vertical chamber and communicating therewith whereby said vertical ram compresses material into said horizontal chamber,

a hydraulic operated back-up plate mounted for controlled movement toward and away from the open end of said horizontal chamber for controllably holding a bag about the open end thereof,

said horizontal ram being moveable to compress said material into the open end of said horizontal chamber against a bag end held thereat by said back-up plate and further moveable with said back-up plate to remove a bag with compressed material therein, and

exhaust means communicating with each of said rams on the sides thereof toward the respective cylinders for withdrawing air and entrained particles of said material from said press.

4,108,064

FEEDING APPARATUS FOR DEVICE FOR FORMING BALES OF INCOHERENT MATERIAL

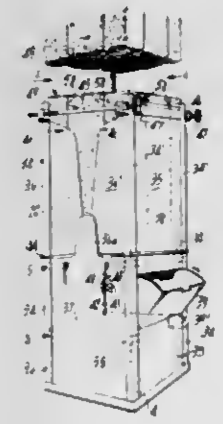
Giorgio Ceribelli, Via Privata Pienza, 18, Milan, Italy (20142)

Division of Ser. No. 523,374, Nov. 12, 1974, Pat. No. 3,998,147. This application Mar. 29, 1976, Ser. No. 671,443

Claims priority, application Italy, Nov. 16, 1973, 31481 A/73; Sep. 4, 1974, 26922 A/74

Int. Cl.^{2} B30B *15/30*

U.S. Cl. 100—187 **4 Claims**



1. An apparatus for compressing material comprising: a hollow chamber defined by a plurality of walls, at least two of the walls being opposite and spaced apart from each other, a piston-plate, means for moving the piston-plate in the chamber between maximum inner and outer limits, a hopper in one of the walls located between the two maximum limits of movement of said piston-plate through which material can be introduced into the chamber, a plurality of engaging means located at the maximum outer limit of the piston-plate for engaging said compressed material and stopping rearward movement thereof, adjusting means for adjusting the distance between portions of the opposite walls located beyond the outer limit of the piston-plate, each wall including first and second portions, the first portions of adjacent walls being connected to each other, the second portions of the opposite walls being hinged to their respective first portions, a pair of adjustable tie-rods connected at the outer end of said opposite walls for adjusting and maintaining the distance therebetween, said hinged first portions of the walls being provided on both sides with symmetrical semi-walls for forming the second portions of the other walls, the first portions of the other walls each including an upward extension located outwardly of the semi-walls for holding the latter in place.

4,108,065

CAN COMPACTOR

Harold Victor Unger, Greenville, Ohio, assignor to Treaty Products Incorporated, Greenville, Ohio

Filed Dec. 27, 1976, Ser. No. 754,118

Int. Cl.^{2} B30B *15/30*

U.S. Cl. 100—215 **2 Claims**

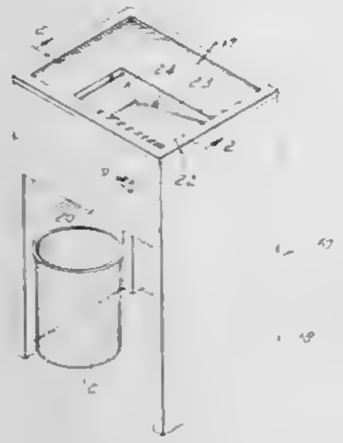
1. In a can compactor, the combination comprising

a frame,

a generally vertical anvil mounted in said frame,

a base plate,

a ram movable horizontally toward and away from said anvil,
means for moving said ram toward and away from said anvil,
and means for guiding said cans comprising a generally horizontal imperforate top panel having a bottom wall portion inclined downwardly and inwardly from one edge beyond the center of said top panel and terminating in an opening spaced from the ram,
said inclined portion guiding cans for rolling movement toward the anvil,



means associated with said ram to define a stop for a row of cans rolling toward said ram,
said means defining a stop including an inclined top wall extending downwardly and rearwardly from said ram,
said top wall terminating below the upper edge of the ram whereby the upper edge of the ram defines said stop,
said inclined top wall of said ram including a secondary stop to further prevent rearward movement of the cans along said inclined top wall,
and means for retaining the can in the space between said anvil and said ram to permit said ram to be moved and thereby compact the can.

4,108,066

DEVICE FOR PRINTING BRAILLE

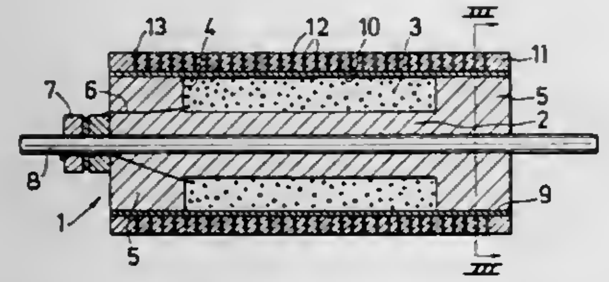
Lars-Eric Andersson, 91 A Nygatan, Skelleftea, Sweden (S-93100)

Filed Dec. 16, 1976, Ser. No. 751,331

Claims priority, application Sweden, Dec. 30, 1975, 7514768

Int. Cl.² B44B *5/02;* B41J *3/32*

U.S. Cl. 101—22 **2 Claims**



1. A device for printing Braille, said device comprising a magnetizable core, an outer layer on said core provided with holes arranged in a pattern for composing a text to be printed, pins of a magnetizable material, an inner layer of magnetizable material inside said outer layer and covering the holes therein, said pins being of greater length than the thickness of said outer layer and being adapted upon contact with the magnetizable material to be attracted thereto and thereby to remain in their respective holes, said magnetizable core and inner and outer layers forming a roller, said outer layer being constituted as a sleeve fitted on said inner layer for common rotation therewith, said holes in the outer layer extending radially in said sleeve, said core including two end portions between which is a depression, an electrical winding in said depression to magnetize said core, the outer layer being of a non-magnetizable material having ends affixed to said core, the magnetizable core being an electromagnet, said core, inner layer and outer layer being substantially coextensive in length, an axle coaxially mounted in and rotatably supporting said core, and a slip ring on said axle and coupled electrically to said winding.

4,108,067

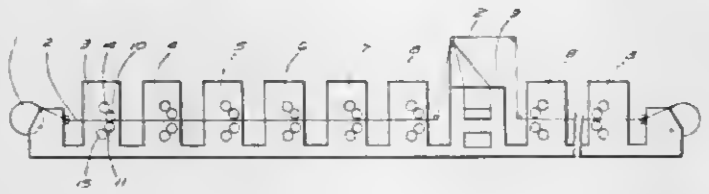
METHOD AND APPARATUS FOR CONTINUOUSLY PRINTING UNCASED FOLDED BOOKS

Hans-Dieter Werner, Leipzig, Germany, assignor to Veb Polygraph Leipzig, Leipzig, Germany

Continuation of Ser. No. 285,521, Aug. 31, 1972, abandoned. This application Sep. 18, 1974, Ser. No. 507,300

Int. Cl.² B41F *13/02*

U.S. Cl. 101—224 **2 Claims**



1. A method of producing folded uncased books in a continuous operation, comprising the steps of advancing an imprintable web continuously through a plurality of successively arranged book-page printing stations, so that spaced incremental blank web sections of identical length become successively located at the respective stations; engaging a first blank web section of the moving web at one of said stations with a plate cylinder which imprints it with a first continuous sequence of book pages having a first starting page number and a first terminal page number, while refraining from imprinting those sections of said moving web which are at this time located at the other stations; engaging a different second blank web section of the moving web at a book-page printing station following said one station with another plate cylinder which imprints it with a second continuous sequence of book pages having a second starting page number which follows said first terminal page number and also having a second terminal page number, while refraining from imprinting those sections of said moving web which are at this time located at all other stations including said one station; continuing the preceding steps until each of said stations has imprinted a respectively different blank web section of the moving web with a continuous sequence of book pages wherein the page numbers of each sequence differ from the page numbers of all other sequences; and thereafter cutting, assembling and folding the imprinted sections of the moving web to convert the latter into a folded uncased book.

4,108,068

INK AGITATOR

Gerard Edouard Lambert, Saint-Cloud, and Roger Begis, Chaville, both of France, assignors to Seveg, S.A., Sevres, France

Continuation of Ser. No. 686,455, May 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 549,324, Feb. 12, 1975, abandoned. This application Apr. 28, 1977, Ser. No. 791,688

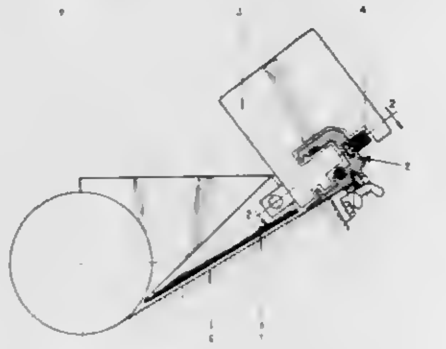
Claims priority, application France, Feb. 12, 1974, 74 04603

Int. Cl.² B41F *31/02*

U.S. Cl. 101—363 **4 Claims**

1. In an ink agitating apparatus for ink fountains of printing machines, the combination comprising:
an elongated ink fountain having an inclined blade defining a bottom wall of the ink fountain and an ink roller mounted tangential to the bottom portion of the blade for rotation on a longitudinal axis of said ink fountain;

a replaceable ink agitator device adapted to be removably mounted above said ink fountain;
means providing a support for said replaceable ink agitator device adjacent the top portion of said blade;
said ink agitator device including a self-driven mobile assembly including an ink agitator in the form of a tapered elongated element rotatable about its longitudinal axis and operable to agitate ink in said ink fountain when located adjacent said inclined blade with its tapered tip projecting into a crevice formed between said roller and said bottom wall of the ink fountain;
said ink agitator device further including a beam, means for removably fastening said beam on said support means with said beam extending parallel to said longitudinal axis of said ink fountain, said beam including means providing a guide track for supporting said mobile assembly for linear displacement along said ink fountain with said ink agitator element projecting into said ink fountain and located adjacent said inclined blade, said beam having a U-shaped cross section with a pair of parallel arms, said arms extending substantially parallel to said inclined blade and the open side of said beam between said arms facing said ink fountain, said beam having a rack extending lengthwise of said beam on the inside of one of said arms;



said mobile assembly including a reversible motor, drive means connecting said motor to rotate said agitator element including an agitator shaft supporting said agitator element and extending parallel to said arms through said open side and between said arms into the hollow of said beam, means in rolling engagement with both said arms for supporting said mobile assembly for linear displacement along said beam, said assembly supporting means including a pair of spaced rollers carried by said agitator shaft in rolling engagement with one of said arms and a pair of casters carried one on each side of said agitator shaft in a fore-and-aft direction in rolling engagement with the other of said arms, said casters having an axis of rotation parallel to said agitator shaft which is adjustable in a direction normal to said arms, adjustment of the axis of rotation of said casters providing means for adjusting said casters and rollers into smooth rolling contact with both said arms, a pinion fixed for rotation with said agitator shaft meshing with said rack on said guide track, and drive means connecting said motor to rotate said pinion for both rotating said agitator and linearly displacing said assembly along said track.

4,108,069

ON-PRESS PRINTING PLATE LOCKING SYSTEM

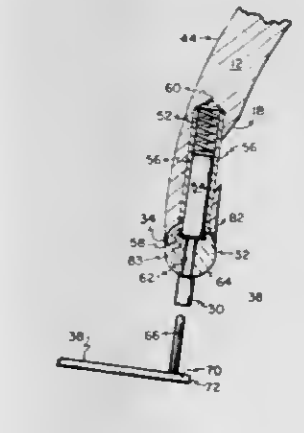
Fred W. Standiford, 22577 Margarita Dr., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 130,090, Apr. 1, 1971. This application Mar. 16, 1973, Ser. No. 342,186

Int. Cl.² B41F *27/12*

U.S. Cl. 101—415.1 **7 Claims**

1. An on-press flexible printing plate locking system for printing press saddles which are semicylindrical in shape and have first and second opposite longitudinal side edges which are substantially parallel to the axis of the cylinder of a rotary printing press and are adapted to be secured to the outside surface of said cylinder, and which are capable of supporting a thin flexible printing plate on the outside face of said saddle, said locking system comprising:
securing means attached to and positioned along said first longitudinal side edge of said saddle for securing a first side edge of said thin flexible printing plate to said saddle while said saddle is attached to said cylinder of said press;
a support member journaled to and positioned along said second longitudinal side edge of said saddle by journal means;
a plurality of outwardly extending register pins secured to said support member and positioned to register with pin openings formed along a second side edge opposite said first side edge of said flexible printing-plate;
locking means for locking said support member in a printing-plate-secured position in which said thin flexible printing plate is secured to said saddle, said locking means being comprised of a spring loaded slug located internally in the structure of said saddle and at least one notch formed in said support member to be opposite said spring loaded slug when said support member is in said printing-plate-secured position, said notch substantially conforming to the cross-sectional dimensions of said slug and shaped to



receive a portion of said slug so that when said support member is rotated to said printing-plate-secured position said slug is urged by said spring into said notch;
rotation tool means which is mechanically applied to said support member to impart rotational torque to said support member to secure said flexible printing plate to said saddle with said saddle attached to said cylinder, said rotation tool means having at least one edge with pin openings formed therealong which register with said register pins secured to said support member when said rotation tool is mechanically applied to said support member so that rotational torque may be imparted to said support member via said pins;
an unlatching pin hole which is smaller in cross section than said notch and which extends from said notch through the center of said support member to the surface of said support member opposite said notch; and
an unlatching pin substantially conforming to the dimensions of said unlatching pin hole and positioned along said edge of said rotation tool means to coact with said unlatching pin hole to allow said slug to be forced out of said notch upon application of said tool means to said support member for removing said thin flexible printing plate.

4,108,070

EXPLOSIVE OBSTACLE WIRE

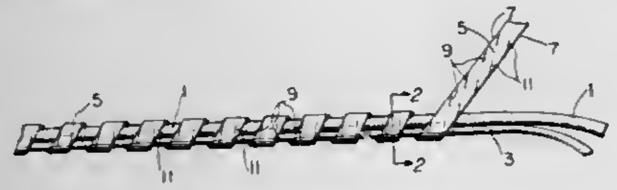
Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Continuation-in-part of Ser. No. 757,201, Jan. 6, 1977, which is a continuation-in-part of Ser. No. 676,067, Apr. 12, 1976, Pat. No. 4,015,506. This application Jul. 20, 1977, Ser. No. 817,196

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.^{2} F42B *23/00;* E04H *17/04*

U.S. Cl. 102—8 14 Claims



1. An explosive obstacle wire comprising: an explosive cord; a strip wrapped around said cord, said strip including portions adapted for deformation outwardly to a hazardous configuration; and a strand positionally adapted for supporting said cord and said strip; whereby initiation of said cord can deform said portions outwardly to said hazardous configuration.

4,108,071

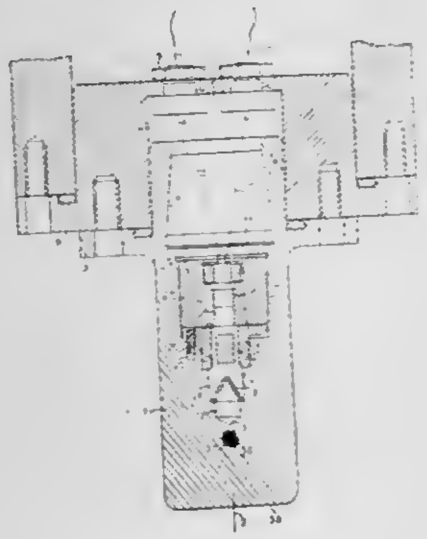
CUTTING DEVICE HAVING A SHAPED CHARGE IN A CAVITY OF REVOLUTION

Georges Joseph Nabúcet, 19, rue du Gué Fleuri, Le Relecq Kerhuon, and Michel André Champ, 35 rue Erwan Marec, Brest, both of France

Filed Jun. 22, 1976, Ser. No. 698,797

Int. Cl.^{2} F42B *3/08*

U.S. Cl. 102—24 HC 8 Claims



1. A device having a shaped charge comprising a cone-shaped liner generating a planar perforating jet, said charge being provided with a cavity of revolution and comprising a body having relatively high mechanical resistance in which is provided a blind hole of revolution comprising at the bottom a first cylindrical-conical portion having a first bore, above the said first portion, a second and a third portion serving to support a member of revolution having two cylindrical channels opening, on the one hand in the second portion and on the other hand in a tube provided in the said member, the channels being symmetrical with respect to the common axis of the blind hole and the cone-shaped liner, the tube, the channels and the second portion above the cone-shaped liner being filled with explosive which can be the same as that constituting the charge whose cone-shaped liner is its lining, the tube being surmounted by a detonator, the plane of the two channels defining the direction of the cutting jet generated by the detonation of the shaped charge.

4,108,072

ARMOR-PIERCING PROJECTILE HAVING SPACED CORES

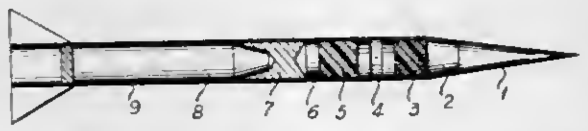
Walter Louis Adolf Trinks, Rhöndorf, and Wolfgang Ferdinand Struth, Weil am Rbein, both of Fed. Rep. of Germany, assignors to Deutsch-Franzosisches Forschungsinstitut, St. Louis, France

Filed Dec. 27, 1965, Ser. No. 517,188

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1964, 1428679

Int. Cl.^{2} F42B *13/06*

U.S. Cl. 102—52 12 Claims



1. An armor-piercing projectile comprising a hard-core having armor-piercing properties, means axially spaced a substantial distance in front of said core and capable of piercing an armor plate to form an opening therein of sufficient size to enable substantially unimpeded passage of said hard-core through said armor plate to a second armor plate to be pierced by said hard-core, and an intermediate layer filling the space between said hard-core and said means and constituted of a substance, having an accoustic impedance which is substantially different from the accoustic impedance of said core and said means.

4,108,073

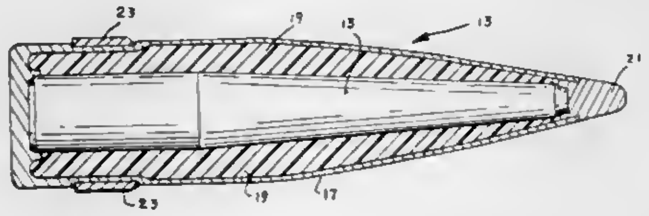
ARMOR PIERCING PROJECTILE

Dale M. Davis, Freeport, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 553,854

Int. Cl.^{2} F42B *13/04*

U.S. Cl. 102—52 2 Claims



1. An armor piercing projectile suitable for firing through a rifled gun bore, said projectile comprising, a long thin penetrator core element having a tapered forward portion, a monocoque jacket substantially surrounding said core and in spaced relation thereto, a rigid inert filler material disposed between said core and said jacket for supporting said core throughout substantially all of its length, and centering means including a separate nosepiece insertable into the open forward end of said jacket and engaging the forwardmost portion of said core for holding said core in the central area of said projectile, the rearwardmost portion of said core engaging the base portion of said jacket thereby providing the required strength, rigidity and mass properties to said projectile during acceleration through the gun bore while at the same time providing for superior penetration against specific targets.

4,108,074

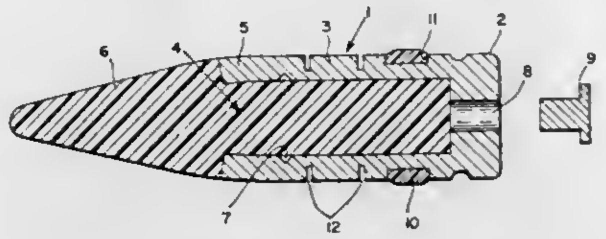
FRANGIBLE TARGET PRACTICE PROJECTILE

Rudolph W. Billing, Jr., Littleton, and Charles M. Conlon, Jr., Andover, both of Mass., assignors to Avco Corporation, Wilmington, Mass.

Filed Apr. 27, 1977, Ser. No. 791,216

Int. Cl.^{2} F42B *9/20*

U.S. Cl. 102—92.7 9 Claims



1. A combination steel and plastic projectile for a round of ammunition used in target practice comprising:

a cylindrical steel cup having an open interior cavity therein defined by side and botton walls, said bottom wall having an aperture constructed therein to allow the release of hot gases therefrom;

a plastic nose element injection molded into the cup and extending outward therefrom to form an ogive for the projectile;

means to lock the nose element in the interior cavity;

a rotating band injection molded to the periphery of the cup; and

means to plug the aperture after assembly of the projectile.

4,108,075

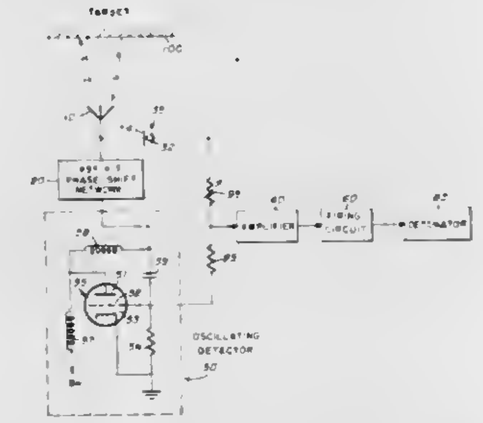
MEANS FOR SUPPRESSING OSCILLATOR-GENERATED NOISE IN DOPPLER PROXIMITY FUZES

Wilbur S. Hinman, Jr., Arlington, Va.; Helmut Sommer, Bethesda, and Louis M. Tozzi, Takoma Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 9, 1959, Ser. No. 805,348

Int. Cl.^{2} F42C *13/04*

U.S. Cl. 102—214 4 Claims



1. In a doppler proximity fuzing system including an oscillating detector providing diode detection, an antenna to which the output of said oscillating detector is coupled, and an amplifier to which the detected signal from said oscillating detector is fed, the improvement comprising means for suppressing oscillator-generated noise, said means including a 45° r-f phase shift network connected between the output of said oscillating detector and said antenna, diode detection means connected to said antenna and poled oppositely to the diode detection provided by said oscillating detector, the detected signal from said diode detection means being fed to said amplifier along with the detected signal from said oscillating detector, and means to which at least one of said detected signals is fed prior to application to said amplifier for adjusting the magnitude of the detected oscillator-generated noise appearing in one of said detected signals to be substantially equal to the magnitude of the detected oscillator-generated noise appearing in the other of said signals.

4,108,076

METHOD FOR REMOVING BALLAST FROM RAILROAD TRACKS

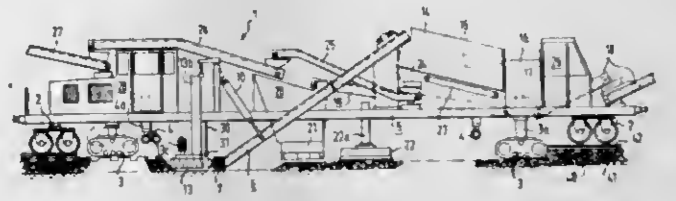
Fritz Knape, Mainzer Strasse 18, 8000 Munich 40, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,611

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550391

Int. Cl.^{2} E01B *27/06*

U.S. Cl. 104—2 5 Claims



1. A method of removing ballast from a railroad track having first, second, and third consecutive sections, the track in each section including rails and ballast under the rails which method comprises:

(a) removing said rails from said second section;

(b) placing a car on said first section,

  (1) the car carrying a digging conveyor and drive means for the conveyor,

  (2) the car including rail engaging wheels transmitting at least a portion of the weight of the placed car to the rails of said first section;

(c) passing said conveyor through the ballast under the engaged rails of said first section and over said car in a closed loop, whereby said conveyor is partly embedded in said ballast;

(d) moving said car on said track in a direction from said first section toward said third section until a part of said car is located above the ballast of said second section;

(e) transferring said portion of said weight from said rail engaging wheels to a cross country vehicle supporting said part of the car and movably engaging the ballast of said second section;

(f) further moving said car in said direction while supported on said vehicle until said wheels are located above said third section;

(g) engaging said wheels with the rails of said third section and transferring said portion of said weight from said vehicle to the engaged wheels;

(h) additionally moving said car in said direction;

(i) keeping said conveyor, while extending in said closed loop, partly embedded in said ballast during said moving, said further moving, and said additionally moving of said car until said conveyor engages the ballast of said third section; and

(j) driving said conveyor in said loop during said moving, said further moving, and said additionally moving, whereby ballast is removed from each of said first, second, and third sections.

4,108,077
RAIL VEHICLES WITH PROPULSION ENERGY RECOVERY SYSTEM

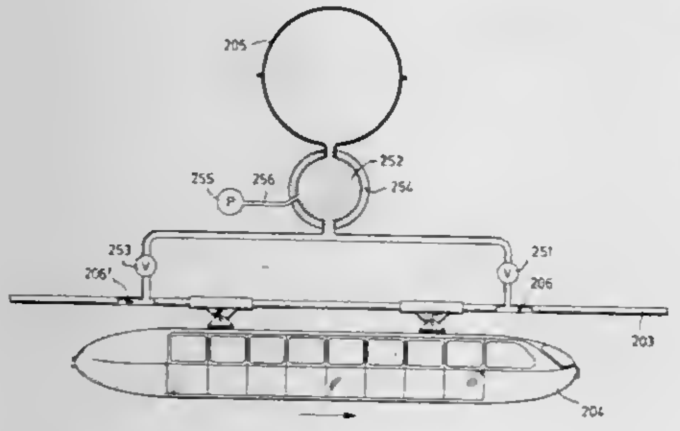
Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen bei Stuttgart, Fed. Rep. of Germany

Filed Jun. 9, 1975, Ser. No. 585,366

Claims priority, application Austria, Jun. 7, 1974, 4720/74; Aug. 6, 1974, 6411/74

Int. Cl.² B61B *13/12*

U.S. Cl. 104—156 **7 Claims**



1. A rail vehicle having propulsive machinery arranged outside the vehicle and apparatus for transmitting propulsive momentum to the vehicle, characterized in that said apparatus acts on the vehicle only along the length of path necessary for the acceleration of the vehicle, in that the vehicle is supported by a tubular guide rail of a magnetically permeable material, in that a piston structurally connected to said vehicle and containing magnetic elements is slidable within said tubular guide rail to make a linear magnetic coupling with said guide rail, and in that compressed air is utilized to propel the piston during the acceleration phase of the vehicle and where the piston serves to compress air during the deceleration phase of the vehicle, which compressed air is later used to propel the vehicle.

4,108,078
COUPLING APPARATUS ON A CIRCULATING TOW CONVEYOR

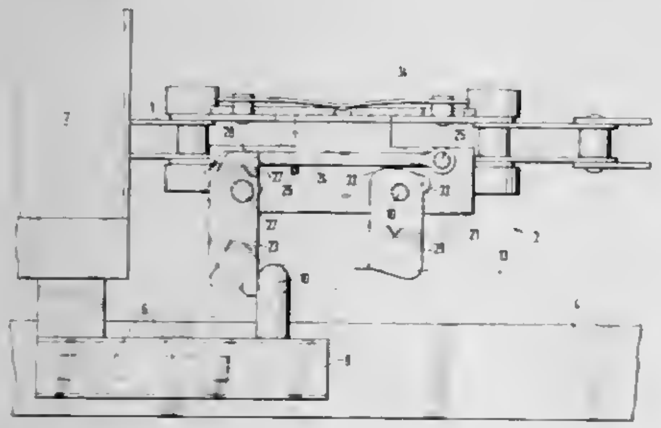
Erich Kuwertz, Trippstadt, Germany, assignor to Pfalzstahlbau GmbH, Trippstadt, Germany

Filed Mar. 2, 1977, Ser. No. 773,838

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609371

Int. Cl.² B61B *10/02*

U.S. Cl. 104—172 S **1 Claim**



1. In a coupling apparatus for a circulating tow conveyor of the type having a tow chain and carriages which run on a track at least a portion of which is parallel to the tow chain and having coupling means between the tow chain and the carriages which coupling means comprises at least one swingable and lockable catch finger on the tow chain and a cooperative catch means on the carriages, the improvement comprising at least one housing on the tow chain, said catch finger being mounted in said housing for pivotal movement about a horizontal axis extending transversely of the feed direction and having a first contact portion extending into the path of the cooperative catch means on the carriages and a second contact portion, an arresting locking lever pivotally mounted in said housing, said locking lever having one end thereof adapted to press against said second contact portion of said catch finger to prevent pivotal movement of the lever in the direction to move the first contact portion opposite to the feed direction, a loosening lever pivotally mounted in said housing at such a distance from the catch finger as to not interfere with the pivotal movement of the latter, said loosening lever being mounted for pivotal movement in the feed direction and also opposite to the feed direction to move the locking lever out of contact with said second contact portion of the catch finger, stationary means in the path of the tow chain adapted to operate said loosening lever opposite to the feed direction to release the locking lever when the carriage is to be released from the tow chain, said loosening lever being pivoted in the feed direction by contact with the cooperative catches on said carriages to a position out of the path of movement of said cooperative catches whereby carriages can be shoved past the catch finger and the locking lever of the tow chain in the feed direction of the tow chain, said carriages being normally retained for movement by the catch finger.

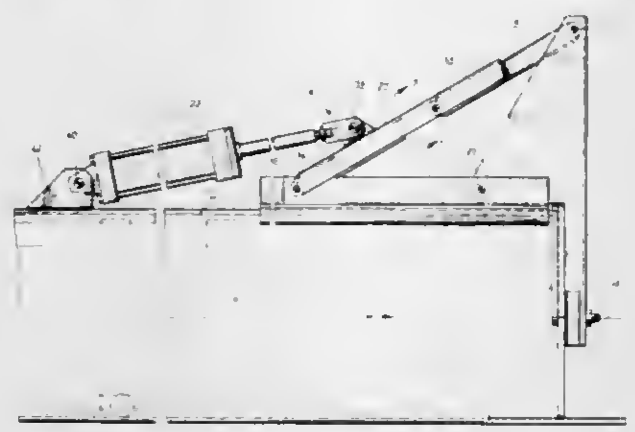
4,108,079
RELEASABLE STOP FOR A VEHICLE MOVING THROUGH A CONDUIT

Marion R. Carstens, Atlanta, and Homer J. Bates, Roswell, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Nov. 24, 1976, Ser. No. 744,616

Int. Cl.² B61B *13/10;* **B65G** *51/30*

U.S. Cl. 104—252 **3 Claims**



1. A releasable stop for releasably stopping a vehicle moving by air pressure through a conduit having an opening therein comprising,

a stop gate pivotally supported at a point outside of said conduit for movement through said opening into and out of a position transverse to the path of movement of a vehicle in the conduit,

first and second arms pivotally connected together by a first pivot connection, the first arm being pivotally connected to the gate by a second pivot connection, and the second arm being pivotally connected to a support by a third pivot connection, said first and second arms when aligned moving the stop gate to said position transverse to the movement of said vehicle and said aligned arms being positioned generally parallel to the path of movement of said vehicle for absorbing the impact of said vehicle,

an air piston and cylinder assembly connected to one of the arms for moving said arms for rotating the stop gate into and out of the path of movement of a vehicle in the conduit,

coacting stop shoulders on the first and second arms for aligning the first pivot connection substantially in a dead center position with the second and third pivot connections when the stop gate is moved into the path of movement of a vehicle whereby the impact of a vehicle engaging the stop gate will be transmitted to the support instead of to the piston and cylinder assembly and said stop gate will be locked in the closed position, and

said stop gate is sized and shaped to entirely block the conduit to provide a dead end air cushion when moved into the path of the vehicle.

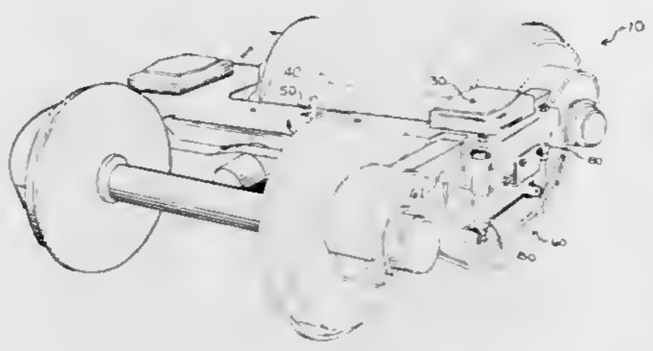
4,108,080
RAILWAY CAR TRUCK AND SIDE BEARING ASSEMBLY

Gerald D. Garner, Florissant; James C. Hammonds; Jan D. Holt, both of St. Charles, and Conway H. Melcher, Kirkwood, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 572,930, Apr. 29, 1975, Pat. No. 4,030,424. This application Dec. 1, 1976, Ser. No. 746,453

Int. Cl.² B61F *5/14;* **C10M** *5/00, 7/00;* **F16C** *33/24*

U.S. Cl. 105—199 CB **4 Claims**



1. In a railway car truck car body assembly including spaced side frames, each supported by the journal bearings of a pair of spaced, transversely extending wheel axles; a bolster extending transversely between said side frames; a spring assembly supported on said spaced side frames and engaging a spring receiving assembly integral with the lower surface of said bolster; said spring assembly effective to cushion said truck; said bolster having a center bearing; and a pair of side bearings mounted upon said bolster on either side of said center bearing adapted to receive the weight of the car body; a railway car body having a depending center portion engaging said center bearing; and transversely spaced depending side portions engaging said side bearings on either side of said depending center portion; the improvement comprising: each of said side bearings having an upper surface made of a first low friction material; said depending side portions each having a lower surface engaging said upper surface made of a second low friction material; one of said first and second low friction materials being at least one of nylon, polyesters, polycarbonates, polyacetals and polysulfones; and the other of said first and second low friction materials comprising polytetrafluoroethylene; whereby the weight of the car body is taken by said side bearings, and whereby the coefficient of friction between said upper and lower surfaces is sufficiently low that said truck easily rotates with respect to said car body.

4,108,081
ARRANGEMENT FOR LOCKING A FREIGHT CONTAINER TO A BASE, PARTICULARLY A TRAILER OR WHEEL FRAME

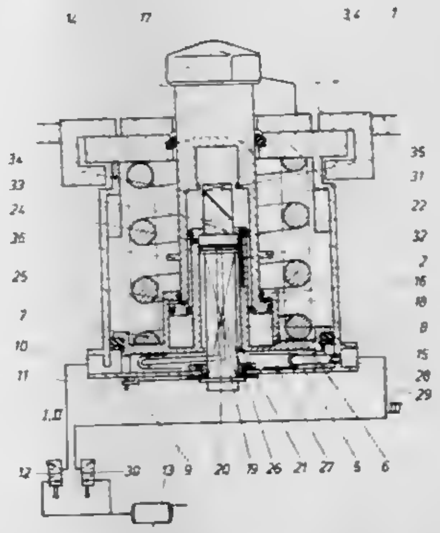
Roland Blanz, Heidelberg, Fed. Rep. of Germany, assignor to Graubremse GmbH, Heidelberg, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,778

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539081

Int. Cl.² B61D *17/00*

U.S. Cl. 105—366 B **16 Claims**



1. An arrangement for locking a freight container to a wheeled base comprising: brackets on said freight container; grooved curve guide means; spring-loaded clamping bolts on said base and engaging said brackets on said freight container with both form and force linkage; each of said clamping bolts having a locking head and being movable from a clamping position to a release position by a rotary lifting motion with said grooved curve guide means; a pressure-charged spring-loaded piston rotatable relative to a clamping bolt, said piston having a first hollow extension, said clamping bolt being held axially displaceable in said first hollow extension of said piston; said piston having a second hollow extension, said grooved curve guide means being located between the clamping bolt and said piston at the upper end of said second hollow extension of said piston; two opposite power sources for applying the relative motion of said clamping bolt and said piston along said grooved curve guide means; a container being horizontally slidable onto the wheeled base, said clamping bolt and said piston being axially displaceable relative to each other, said two power sources displacing said clamping bolt and said piston toward or away from each other along said grooved curve guide means.

4,108,082
CONTAINER LOCKING DEVICE

Güenther Liebscher, Wiesbadeo-Kohlheck, and Güenter Christ, Geisenheim Rhg, both of Fed. Rep. of Germany, assignors to Lermer Apparatebau GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,434

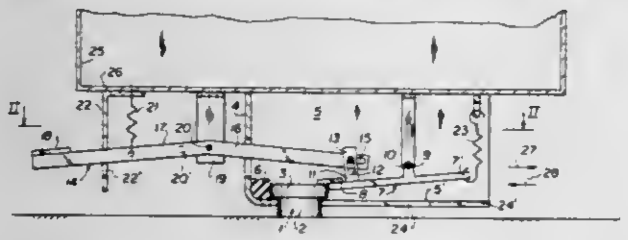
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 7629359

Int. Cl.² B60P *7/08;* **B61D** *45/00;* **B64D** *9/00;* **B65J** *1/22*

U.S. Cl. 105—464 **8 Claims**

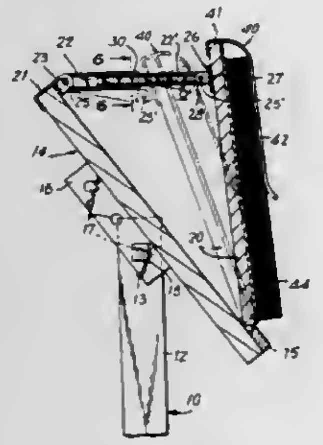
1. An apparatus for locking a transport trolley to a floor, comprising anchor means rigidly secured to said floor to define a locking position, stop means and guide means secured to the trolley engaging said anchor means when a trolley is moved against said stop means and into said locking position, a set of locking means, securing means for attaching said locking means to said trolley, said set of locking means including locking lever means, and actuating lever means, said locking lever means and said actuating lever means each having first and

second ends, said securing means including first and second journal means for respectively supporting said locking lever means and said actuating lever means, said first lever ends extending substantially toward each other, said second lever ends extending substantially in opposite directions,. means operatively interconnecting said locking lever means and said actuating lever means, said first lever end of said locking lever means engaging said anchor means in a locking manner in said locking position, and spring means biasing said actuating lever means and said locking lever means in a locking direction to engage said anchor means, said second end of said actuating lever means being operable against the bias of said spring means for shifting said locking lever means out of locking engagement with said anchor means, the first lever end of the locking lever means is also biased by gravity toward said anchor means, and said actuating lever means are journalled intermediate the first and second ends of the actuating lever means so that the first lever end of the actuating lever means is also biased by gravity toward said anchor means, whereby the combined weight of the locking lever means and of the actuating lever means tend to maintain the locking lever means in the locking position.



4,108,083
PORTABLE WRITING AND READING TABLE ASSEMBLY

Albert Espinosa, 838 Riverside Dr., New York, N.Y. 10032
Filed May 4, 1977, Ser. No. 793,810
Int. Cl.² A47F *5/12*
U.S. Cl. 108—6 **2 Claims**



1. A portable writing and reading table assembly comprising:

a pair of spaced-apart stands, each including a generally flat base and an upstanding post secured to said base, said posts of each of said stands each having a plurality of transversely-extending, vertically spaced-apart holes formed therethrough adjacent the top end thereof;

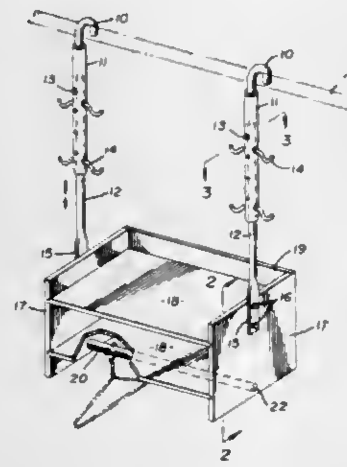
a generally flat rectangular writing board, having an elongated holding bar mounted across the lower end thereof, and extending outwardly from the front face thereof, said board also having a flange having a plurality of spaced-apart holes formed therethrough, which depends from each of the lateral edges thereof and which are alignable with the holes of said posts;

means for rotatably mounting said board between and on said posts of said stands, to permit rotational movement of said board about an axis perpendicular to the longitudinal axes of said posts and for locking said writing board at a desired angle of inclination relative to said axes of said posts, said mounting and locking means comprising at least one bolt having an enlarged bolt head at one end, and a threaded portion at its other end which is receivable within the aligned holes of said posts and flanges, and at least one wing nut threadable receivable on said threaded portion of said bolt, for locking said board at a desired angle of inclination, said plurality of holes in said posts and flanges permitting adjustment of the height of said writing board; and

a generally flat reading board, having a lower end which rests upon said holding bar, and means for removably and adjustably mounting said reading board on said writing board, so as to permit pivotal movement of said reading board about its lower end and so as to permit adjustment of the angle of inclination of said reading board relative to the plane of said writing board, said adjustable mounting means including a generally U-shaped bracket frictionally and removably mountable on said writing board on a generally T-shaped bracket secured to the rear face of said reading board and a pair of elongated, hollow, tubular members, one of which is pivotably coupled to said U-shaped bracket on said writing board and the other of which is pivotably coupled to said T-shaped bracket, each of said members having at least one hole formed therethrough, and one of said members being receivable within the other member so as to permit alignment of said hole of said one member with that of said other member, said mounting means also including a pin, one end of which has an enlarged head portion and the other end of which is insertable within the pair of opposing, aligned holes of said members for securing said members together, and for fixing said reading board at a desired angle of inclination relative to the plane of said writing board.

4,108,084
CHILD'S SHELF AND GARMENT HANGER RACK

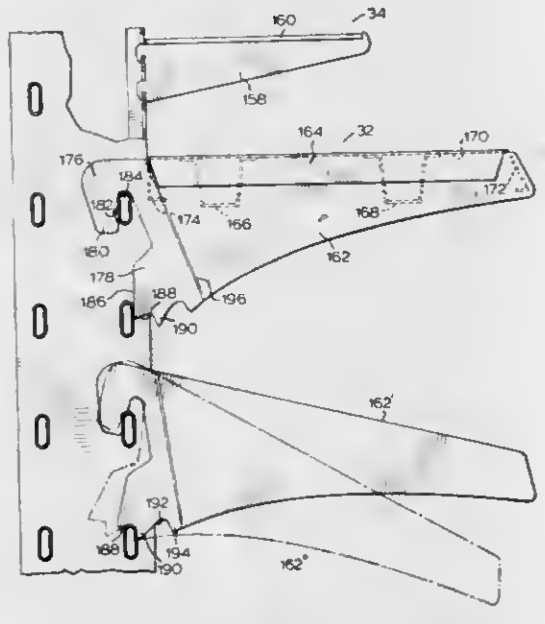
Robert Fink, 6780 Tanglewood Dr., Youngstown, Ohio 44512
Filed Feb. 25, 1976, Ser. No. 661,345
Int. Cl.² A47B *41/04*
U.S. Cl. 108—29 **1 Claim**



1. In a child's shelf and garment hanger rack the combination of a pair of vertically spaced horizontally disposed shelves and end members positioned on and secured to the opposite ends of said shelves and extending below and above said shelves, a bar positioned between and supported on said end members below said shelves in spaced parallel relation to said shelves and upstanding longitudinally adjustable support members on said end members midway between the front and back edges thereof, garment hanging members carried by said support member and means for suspending said support members and said shelves from a clothes hanger bar in a clothes closet, said means comprising hook configurations on the upper ends of said adjustable support members said end members take the form of side panels and a back panel is secured to said side panels and to one edge of each of said shelves and wherein the back panel extends above said shelves to register with said end members.

4,108,085
DISPLAY STRUCTURE

Charles Grey Shepherd, Oakville, and Brian Donald Yeoman, Milton, both of Canada, assignors to J.A. Wilson Display Limited, Mississauga, Canada
Filed Mar. 14, 1977, Ser. No. 777,187
Claims priority, application Canada, Nov. 16, 1976, 265817
Int. Cl.² A47B *9/00, 3/00, 57/20*
U.S. Cl. 108—108 **8 Claims**



1. An upright for use in display gondolas of a type having a wall to which shelving can be attached, the upright being for use in the construction of the wall for attachment of the shelving and comprising:

a pair of central portions spaced from one another in parallel relationship;

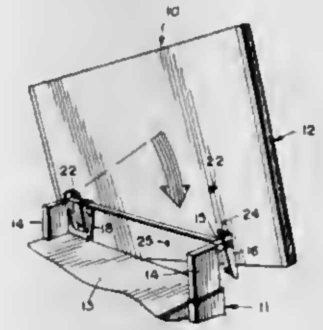
means bridging the central portions at a plurality of locations spaced equally along the length of the upright to receive heavy duty shelf supports the bridging means comprising deformations created in at least one of the central portions and attached to the other of the central portions; and

a pair of flanges lying in a common plane perpendicular to the central portions and respectively dependent one from each of the central portions in directions away from one another, each of the flanges defining openings spaced along the length of the flanges to receive light duty shelf supports and the thickness of the material of the flanges being less about said openings than the thickness of the central portions and less than the thickness of the remainder of the flanges.

4,108,086
DRAFTING BOARD AND SUPPORT STRUCTURE THEREFOR

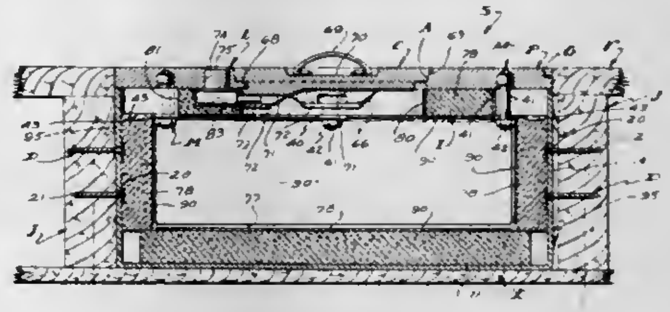
Leonard J. Yindra; David F. Evans, and Joseph R. Klug, all of Manitowoc, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 21, 1975, Ser. No. 624,415
Int. Cl.² A47B *3/06*
U.S. Cl. 108—157 **23 Claims**

1. A tiltable table top and base assembly comprising a base adapted to rest upon a floor surface and having bracket means mounted for pivotal movement about a horizontal pivot axis, a table top detachably secured to said bracket means for pivotal movement therewith from a substantially vertically disposed position to a substantially horizontally disposed position, one of said table top and bracket means, when in the vertically disposed position, having a pair of generally horizontal bearing surface portions and the other of said table top and bracket means having a pair of laterally-spaced connectors independently and slidably engagable with said surface portions, said bearing surface portions being laterally spaced and horizontally aligned relative to each other, said bearing surface portions and said connectors engaging each other at locations intermediate the upper and lower limits of said table top and along the backside thereof when said table top is in its vertically disposed position, whereby, in assembling said table top and said base, one end of said table top when in the substantially vertically disposed position may be lifted and supported by first positioning one of said connectors in sliding engagement with one of said bearing surface portions, and thereafter, the opposite end of said table top may be lifted and supported by positioning the other of said connectors in engagement with another of said bearing surface portions, and means anchoring said table top to said bracket means against independent relative movement.



4,108,087
FLOOR SAFE

Walter C. Sebesta, 8651 Foothill Blvd., Cucamonga, Calif. 91730
Filed Nov. 30, 1977, Ser. No. 855,972
Int. Cl.² E05G *1/024*
U.S. Cl. 109—51 **10 Claims**



1. In combination, a wood floor structure including at least two elongate laterally spaced and parallel floor joists with flat, vertical opposing sides, and a flat horizontal floor in overlying fixed supported engagement with the joists and having a vertical rectangular opening between the joists, a floor safe including a rectangular upwardly opening box-like metal body with a flat horizontal bottom wall and flat vertical side walls with upper edges defining an upwardly disposed rim about the open top of the body, said body corresponding generally in plan configuration with the opening in the floor and slidably engageable therethrough; said body is arranged between the joists with opposite side walls in substantial flat bearing engagement with said opposing sides of the joists, in alignment with the opening in the floor and with said rims spaced a predetermined distance below the top surface of the floor, fastening means securing the body to the joists and including apertures in said opposite side walls and elongate fasteners engaged through the apertures and into the joists from within the body and through the open top thereof, a flat horizontal cover plate corresponding in plan configuration with the body

arranged in the opening in the floor and in overlying relationship with the body with its bottom surface engaged with said rim; said cover plate has a central vertical access opening, coupling means releasably securing the cover plate in tight clamped engagement with the body and comprising laterally inwardly projecting brackets on the side walls, vertical threaded studs on the cover plate depending through the brackets and nuts engaged on said studs and advanced upwardly into tight engagement with said brackets, said brackets, studs and nuts being engageable from above the floor through the access opening and at the interior of the body, a closure plate releasably engaged in the access opening and locking means carried by the cover plate and releasably engaging the closure plate to releasably secure the closure plate in the access opening.

4,108,088

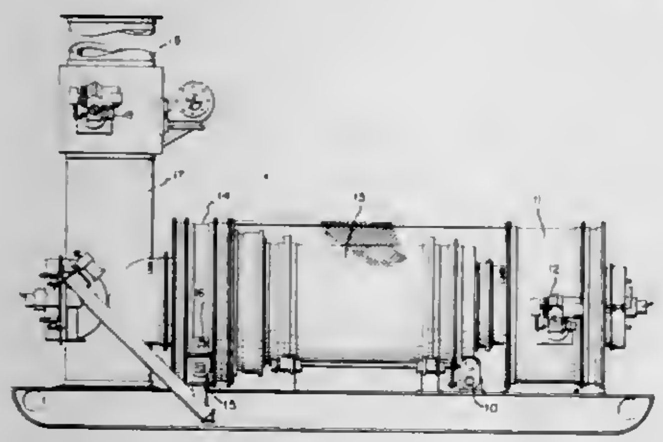
ROTARY INCINERATOR

Roy B. Burden, Jr., Makaha, Hi., assignor to Met-Pro Systems, Inc., Lansdale, Pa.

Filed Nov. 24, 1976, Ser. No. 744,591

Int. Cl.² F23G *5/06*

U.S. Cl. 110—246 **10 Claims**



1. Material treatment apparatus comprising:
- a substantially horizontal rotating heated chamber, wet material to be dried being supplied to one end of said rotating chamber,
- a helical conveyor on the inside of said rotating chamber for transporting said material from one end of said chamber to the other end of said chamber,
- a plurality of elongated flexible metallic heat scavening elements secured at the ends thereof to said helical conveyor so that each flexible element lies in contact with said wet material when it is in the bottom of said rotating chamber, and wherein said flexible elements move to a hanging position as said chamber rotates to a position wherein the flexible element is at the top thereof, and
- a primary burner fired by auxiliary fuel at said one end, gases from said primary burner blowing through the length of said drum and into contact with said flexible elements when they are disposed in a hanging position, the wet material clinging to said flexible elements having the moisture therein volatized by said gases, the remaining dry material being transported to the other end of said rotating chamber by said helical conveyor.

4,108,089

AGRICULTURAL IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

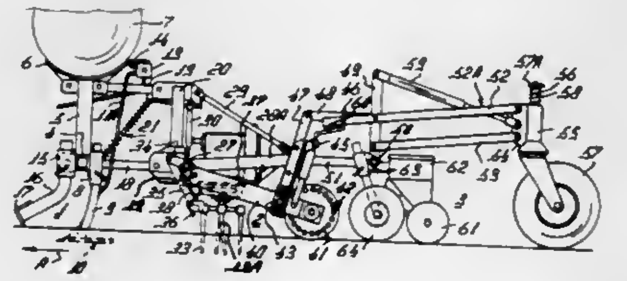
Filed Aug. 23, 1976, Ser. No. 716,570

Claims priority, application Netherlands, Aug. 22, 1975, 7509938

Int. Cl.² A01C *23/02*

U.S. Cl. 111—7 **16 Claims**

1. An agricultural implement comprising frame means and a plurality of tined cultivating members mounted on an elongated portion of said frame, said members having respective upwardly extending shafts and being rotatable about corresponding axes defined by said shafts, driving means connected to said members and rotating said members to work the soil, the front of said frame means including a supporting structure that is linked to said frame portion by a first parallelogram linkage being positioned in front of said members and soil penetrating tools mounted on said supporting structure, said tools having fluid distribution means in communication with a fluid container of said implement to distribute fluid in advance of said cultivating members, at least one seeding device being mounted on a second parallelogram linkage of said frame means and said device being positioned to the rear of said members, said supporting structure comprising coupling means and said second linkage including a forward trestle having coupling points connected to said coupling means, the rear of said frame means being linked to supporting ground wheel means, said tools comprising tined members and said tined members being freely rotatable about respective upwardly extending axes responsive to contact with the soil.



4,108,090

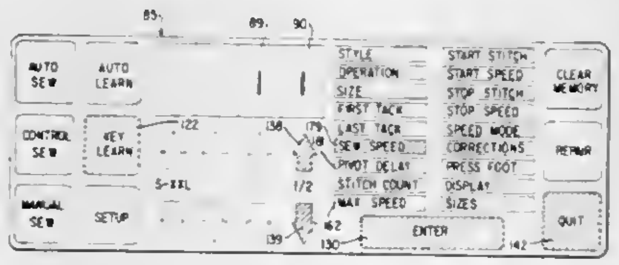
PROGRAMMABLE VARIABLE SPEED FOR SEWING MACHINE

John Vernon Landau, Jr., Mt. Lakes, and Frederick Alexander Rupinski, Lyndhurst, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,887

Int. Cl.² D05B *19/00*

U.S. Cl. 112—121.11 **22 Claims**



1. A programmable sewing machine adapted to perform a series of sequential operations on a work material, said programmable sewing machine comprising:
- a sewing machine frame;
- a sewing needle supported by said frame for selectively repeated movement from a down position through a work material to an up position and return to a down position;
- a looptaker supported by said frame for cooperation with said sewing needle in the formation of stitches;
- a reversible work material feed system supported by said frame and including feeding means for passing work material in a path between said needle and said looptaker;
- a single continuously variable speed drive means for selectively actuating said sewing needle, said looptaker and said work material feed system in stitch forming synchronism with each other to provide variable speed sewing;
- manual treadle means for continuously variable speed actuation of said variable speed drive means; and
- means for recording a speed profile of said variable sewing speed as generated by manual actuation of said manual treadle means.

4,108,091

ELECTRONIC CIRCUITS FOR SEWING MACHINES

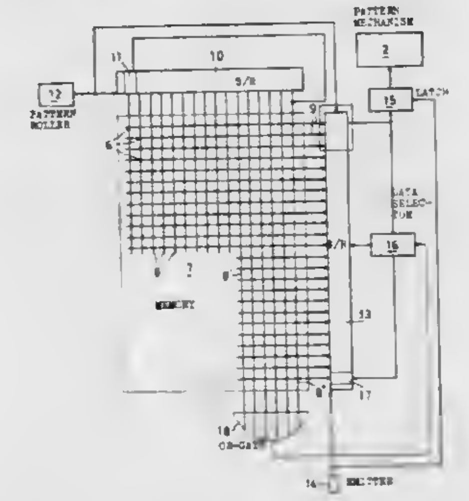
Per-Goran Hedstrom, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed Mar. 23, 1976, Ser. No. 669,629

Claims priority, application Sweden, Jun. 18, 1975, 7506986

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 E **15 Claims**



1. A control unit for a pattern sewing machine including a movable main shaft mechanism for mechanically positioning stitch-forming members and a memory unit for controlling such mechanism, from which stitch position determining code words belonging to a specific pattern, can be selected by an operator, comprising:
- a shift register (13) having cells connected to output lines from said memory; means for parallel loading of said code words into said shift register cells; and means for shifting said code words in relation to the movement of the main shaft of the sewing machine so that for each stitch in said pattern, code words belonging thereto are output to said positioning mechanism from said shift register.

4,108,092

ZIG-ZAG SEWING MACHINE

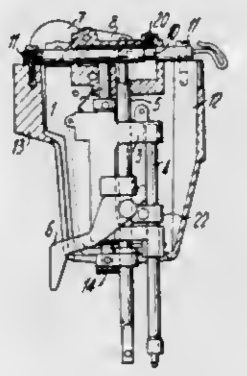
Marcel Fresard, Petit-Lancy, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Dec. 13, 1976, Ser. No. 750,123

Claims priority, application Switzerland, Dec. 18, 1975, 16449/75

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 R **3 Claims**



1. In a zig-zag sewing machine including, an upper arm having a head at its free end, a principal driving shaft disposed in said upper arm having a free end in said head, a plate disposed in said head transversely to said upper arm, a cradle having a shaft connected to said plate, a needle bar slidably mounted in said cradle, the improvement comprising, a cylindrical bar mounted transversely in said head at right angles to said principal shaft, said plate pivotally suspended by its upper edge from said cylindrical bar, a member fixedly attached to said needle bar and having a bore, a crank connecting rod having a gudgeon engageable within said member bore, and securing means cooperating with and disposed adjacent the lower portion of said plate and adjustably securable to said head to maintain alignment between said member bore and gudgeon by manipulation of said securing means to alter the disposition of said plate about said cylindrical bar.

4,108,093

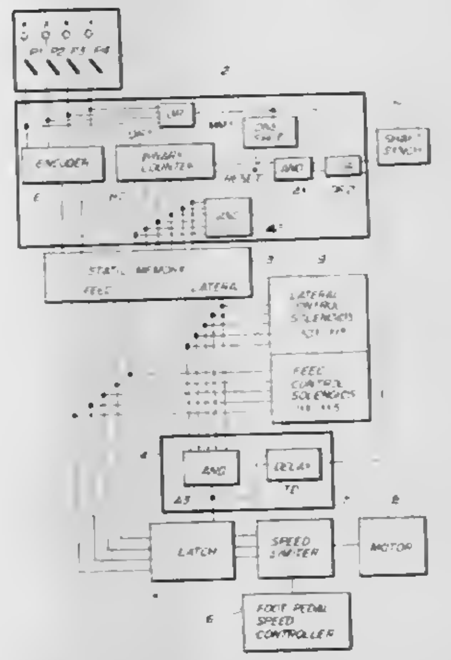
PATTERN STITCHING SPEED CONTROL SYSTEM FOR ELECTRONIC SEWING MACHINES

Kazuo Watanabe, Hachioji; Tosiaki Kume, Tachikawa; Hideaki Takenoya, Hachioji; Toshihide Kakinuma, Tokyo, and Hachiro Makabe, Fussa, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 737,084, Oct. 29, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,416

Int. Cl.² D05B *3/02, 69/18*

U.S. Cl. 112—158 E **11 Claims**



1. In a sewing machine, in combination, a sewing needle mounted for reciprocatory penetration into work being sewn and also mounted for lateral shifting movement; a drive motor reciprocating the needle; motor-control means for controlling the operation of the drive motor; lateral-control means for controlling the lateral shifting movement of the needle; work-feeding means for feeding work to the sewing needle; feed-control means for controlling the operation of the work-feeding means; a static memory storing pattern information representing the stitches in a plurality of different multi-stitch stitching patterns and also motor-speed-control information for the different stitching patterns; pattern selecting means for selecting the stitching pattern to be sewn; information-transmitting means responsive to the pattern selection for transmitting from the static memory to the lateral-control means and the feed-conrol means the pattern information associated with the selected pattern and for transmitting from the static memory to the motor-control means the motor-speed-control information associated with the selected pattern.

4,108,094

RUFFLING ATTACHMENT

Karl Weigert, Englishtown, N.J., assignor to Reliable Attachment Company, New York, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,128

Int. Cl.² D05B *35/08*

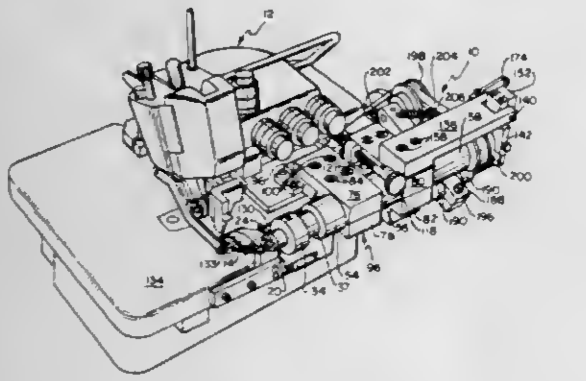
U.S. Cl. 112—134 **12 Claims**

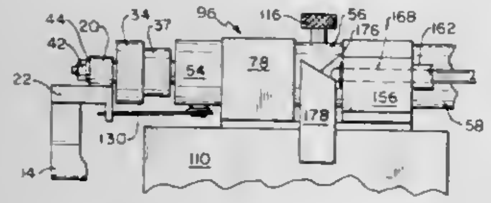
1. A sewing machine attachment, comprising:

(a) finger means positioned, configured and dimensioned to grip a fabric disposed on the work table of a sewing machine when said finger means is advanced toward the needle of said machine;

(b) support means adapted to be secured to said sewing machine;

(c) power coupling means rotatably mounted on said support means;





(d) means for coupling a continuous rotary motion to said power coupling means; and

(e) mounting means for rotatably supporting said finger means on said power coupling means at a point removed from the axis of rotation of said power coupling means whereby said mounting means is rotated and imparts a reciprocating motion to said finger means.

4,108,095

ROTARY LOOP TAKER FOR SEWING MACHINE

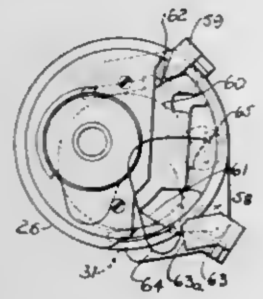
Tadao Kohara, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Dec. 1, 1976, Ser. No. 746,410

Claims priority, application Japan, Dec. 20, 1975, 50-172346[U]; Dec. 26, 1975, 50-180359[U]

Int. Cl.² D05B *57/14*

U.S. Cl. 112—184 **2 Claims**



1. In a sewing machine, a loop taker mechanism comprising a vertical shaft, a rotatable casing having a hook formed on an edge of the casing wall and rotatable on said shaft, a cam secured to the underside of said casing, a bobbin carrier rotatably supported in said casing, said carrier having on its upper surface a pair of spaced abutment faces, an adjustable escapement yoke mounted for oscillation about an axis parallel to said shaft, said yoke comprising first and second parts, the first part having a horizontal member including a forked portion embracing said cam and having an upstanding arm terminating in a first horizontal beak, said second part having a horizontal member superimposed on said first mentioned horizontal member and having an upstanding arm terminating in a second horizontal beak, each of said beaks cooperating with a respective abutment face in such a manner that one of said beaks always is in engagement with one of said abutment faces so as to prevent rotation of said bobbin carrier, the oscillation of said escapement yoke effecting alternate spacing between each pair of beaks and abutment faces for the passage of an upper thread loop, a guide plate overhanging one of said beaks, the leading edge of said guide plate serving to retain the thread loop released from said hook so as to prevent the thread loop from moving behind said beak, and means for adjustably securing said first and second parts together to effect adjustment in the engagement of respective pairs of said beaks and abutment faces.

4,108,096

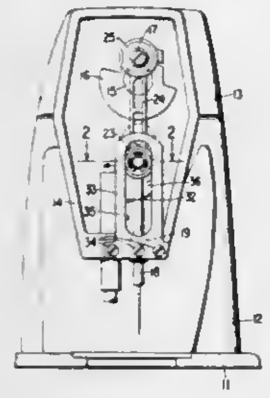
NEEDLE BAR DRIVE STABILIZING ARRANGEMENT

Heinrich Ciecior, Ettlingen, Fed. Rep. of Germany, assignor to The Singer Company, New York, N.Y.

Filed May 16, 1977, Ser. No. 797,101

Int. Cl.² D05B *55/14*

U.S. Cl. 112—221 **1 Claim**



1. A needle bar drive stabilizing arrangement for the needle bar reciprocating mechanism of a sewing machine having a frame, a drive shaft journalled in said frame and carrying a crank pin, a needle carrying bar endwise reciprocally mounted in bearings in the frame and having a lateral drive stud secured thereon, and a connecting link having at one extremity a hub embracing the crank pin and at the other extremity a hub embracing the drive stud which is secured on the needle bar, and a guide member fastened to the machine frame and formed with a guide slot having sidewalls parallel to the needle carrying bar one at each side of the drive stud, characterized by this that a cylindrical antifriction bearing is provided of which the inner bearing race is fitted on the drive stud and the outer bearing race is arranged with clearance between the guide slot sidewalls so that during each stroke of the needle bar the outer bearing race will be urged into rolling contact with one guide slot sidewall during acceleration of the needle bar and into rolling contact with the opposite guide slot sidewall during deceleration of the needle bar.

4,108,097

DEVICE ON A SEWING MACHINE FOR SEVERING THREAD CHAINS

Helmut Gross, Kaiserslautern, and Kurt Klundt, Hirschborn, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen G.m.b.H., Fed. Rep. of Germany

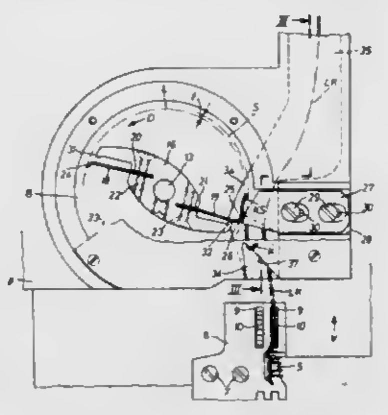
Filed Jul. 15, 1977, Ser. No. 816,162

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640557

Int. Cl.² D05B *65/06*

U.S. Cl. 112—287 **8 Claims**

1. A device on a sewing machine for severing a thread chain, comprising a driven movable cutting knife having a cutting edge, a stationary counterknife disposed alongside said driven cutting knife, means for driving said cutting knife through a path to move it alongside said fixed counterknife with its cutting edge spaced slightly away from said fixed counterknife as it moves past said fixed counterknife, elastic means mounting said driven cutting knife for elastic deflection and displacement, means for directing a thread chain so that it is selectively moved over said counterknife to a deflection position in the path of movement of said movable cutting knife, said movable cutting knife being deflectable by said thread chain to move it to a movement path which brings it into the range of cooperative cutting interengagement with said stationary counterknife.



4,108,098

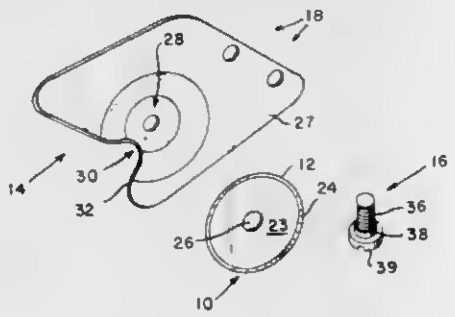
THREAD CUTTER

John H. Keeton, P.O. Box 278, Taylor Blvd., Campbellsville, Ky. 42718

Filed Dec. 20, 1976, Ser. No. 752,302

Int. Cl.² D05B *65/00*

U.S. Cl. 112—289 **6 Claims**



1. A thread-cutting assembly for use with a sewing machine comprising

a circular metal cutting disk having a circumferential cutting edge;

guard means for preventing access to the majority of the circumferential cutting edge of said disk but exposing a portion of the disk circumferential cutting edge, the guard means being metal having a greater temper than the metal of the disk so that said guard means sharpens said disk cutting edge upon relative rotative engagement movement therebetween;

means for mounting said disk to said guard means so that said disk rotates with respect to said guard means about an axis when thread to be cut by said disk is brought into engagement with the exposed portion thereof so that a new cutting surface is exposed; and

means for operatively mounting said guard means to a sewing machine.

4,108,099

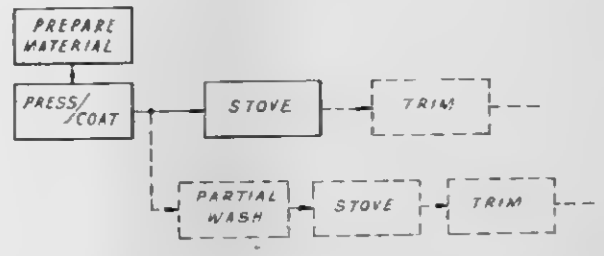
METHOD AND APPARATUS FOR FORMING A COATED CONTAINER

Fred Fidler, Cuffley, and Joseph C. Holt, Greenford, both of England, assignors to Metal Box Limited, England

Filed Oct. 18, 1976, Ser. No. 733,275

Int. Cl.² B21D *51/26*

U.S. Cl. 113—120 A **20 Claims**



1. A method of forming an externally coated container body from a starting article in a press, said method comprising the steps of placing a starting article in a press, applying a water reducible coating material to the starting article while the starting article is in the press, then actuating the press to press the starting article into the container body utilizing the coating material as both a lubricant and a coolant during the pressing with the coating material remaining on the formed container body as an overall external coating, and removing the externally coated container body from the press with the coating in a hardenable condition.

4,108,100

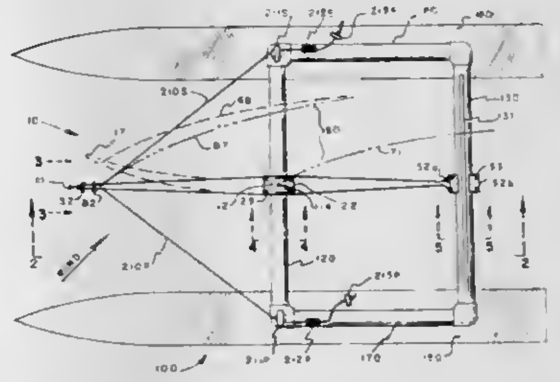
RIGGING BASE FOR PLURAL-HULL SAILING CRAFT AND METHODS FOR SAIL CONTROL

Robert Stuart Jamieson, 3705 Stephen M. White Dr., San Pedro, Calif. 90731

Filed Jun. 9, 1977, Ser. No. 804,875

Int. Cl.² B63H *9/04*

U.S. Cl. 114—102 **14 Claims**



1. An improved rigging-base system for a plural-hull sailing craft, comprising:

(a) elongated spar means adapted for attachment of rigging, and further adapted for being mounted longitudinally on a plural-hull sailing craft with at least one arm of said spar means projecting outward beyond any structure of said craft upon which said spar means is mounted,

said arm being capable of substantial controllable lateral deflection at its outer end,

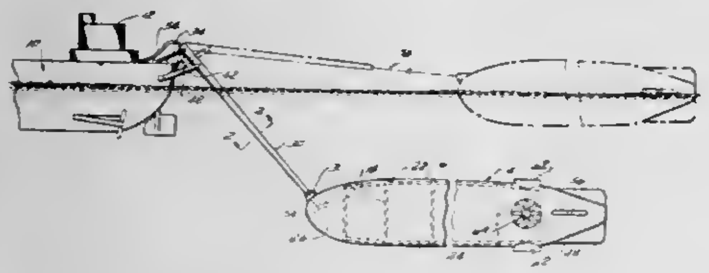
(b) attaching means, whereby standing and running rigging may be attached to said spar means,

(c) a plurality of mounting means for mounting said spar means on said plural-hull sailing craft,

first said mounting means being adapted for mechanically connecting said spar means to first hull-interconnecting structure of said sailing craft, second said mounting means being adapted for mechanically connecting said

spar means to second hull-interconnecting structure of said sailing craft,
(d) mast step means for mounting the foot of the mast of said sailing craft whereby downthrust forces exerted by said mast may be transmitted to said spar means,
whereby reaction forces exerted by said spar means responsive to upward components of tension in said rigging attached to said spar means will oppose a substantial portion of said downthrust forces, thereby reducing the forces to be resisted by said hull-interconnecting structures and hulls of said sailing craft, and further whereby the weight of said hulls and said hull-interconnecting structures may be reduced.

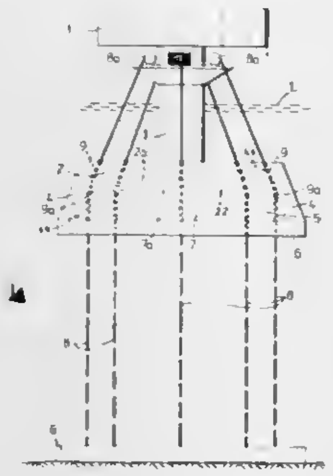
4,108,101
TOWING SYSTEM FOR CARGO CONTAINERS
Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.
Filed Dec. 6, 1976, Ser. No. 747,630
Int. Cl.^{2} B63B *21/56*
U.S. Cl. 114—245 **9 Claims**



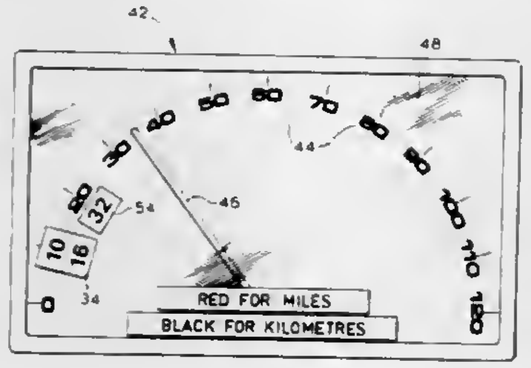
1. Apparatus for transporting cargo in a body of water comprising a self-propelled surface vessel, a submergible elongated cargo container, a boom including a semi-rigid continuous structure capable of transferring lateral forces producing a moment about one end of the boom to the other end of the boom, means coupling one end of the boom to the stern of the surface vessel, and means coupling the other end of the boom to the forward end of the cargo container, the means coupling the boom to the surface vessel including drive means for adjusting the angle in a vertical plane between the axis of the boom and the surface vessel to raise and lower the cargo vessel by means of the boom, and means holding the boom at any selected angle against any lateral force exerted on one end of the boom by the cargo container tending to rotate the boom about the end connected to the surface vessel, whereby the boom acts to hold the end of the cargo vessel at a selected depth relative to the surface vessel, the length of the boom being such that the lower end extends downwardly into the water substantially below the draft of the surface vessel, whereby the boom holds the forward end of the container at a depth below the influence of the wake of the vessel, the boom being sufficiently rigid to resist lateral or vertical forces imposed on the lower end by the cargo container.

4,108,102
ANCHORABLE, FLOATING PLATFORM
Karl Olof Lindström, Karlskrona, Sweden, assignor to Karlskronavarvet AB, Karlskrona, Sweden
Filed Dec. 15, 1976, Ser. No. 754,267
Claims priority, application Sweden, Dec. 19, 1975, 7514420; Nov. 9, 1976, 7612441
Int. Cl.^{2} B63B *35/44*
U.S. Cl. 114—264 **9 Claims**

1. Anchorable, floating platform for extraction of oil and gas from the bottom of the sea, comprising an upper portion which is over the water surface; a lower portion which is at least to the greater part submerged into the water surface; a closed column connecting the upper portion with the lower portion and allowing internal transportation of persons between the two portions; a ring of ballast tanks provided on the lower portion; means to stabilize the platform wherein said ring of ballast tanks extends below the bottom of the lower portion, so that a bowl-shaped space open at the bottom is formed by the ballast tanks and the bottom of the lower portion; means for blowing pressurized air at superatmospheric pressure into the bowl-shaped space under the bottom of the lower portion for forming an air cushion under the lower portion; and anchor wires passing the ring of ballast tanks.



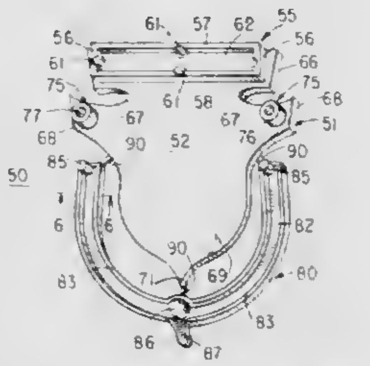
4,108,103
UNIT CONVERSION LABEL
Felix Ammar, 130 Sylvan Ave., Scarborough, Ontario, Canada
Filed Jul. 11, 1977, Ser. No. 814,739
Int. Cl.^{2} G01P *1/08*
U.S. Cl. 116—116 **13 Claims**



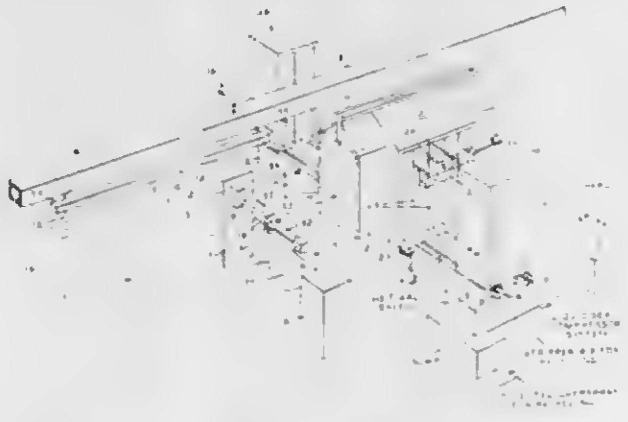
1. A multi-purpose numerical conversion label which comprises; a planar sheet bearing a first sequence of numerical indicia, an adhesive coating on a rear surface of said planar sheet, and a backing sheet peelably underlying said adhesive coating, said planar sheet being severed between each pair of indicia of said first sequence of indicia to permit ready peeling from said backing sheet of a plurality of portions of said planar sheet, each such portion bearing a single indicium of said first sequence, a second sequence of numerical indicia being provided on said label with the indicia of said second sequence in alignment with respective ones of the indicia of said first sequence and each having a predetermined constant mathematical relationship with the aligned indicium of said first sequence and each indicium of said first and second sequences being visible on observation of said front surface of said planar sheet.

4,108,104
ONE PIECE PLASTIC MOLDED STRUCTURAL UNIT AND DOOR KNOCKER CONSTRUCTED THEREFROM
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed Jun. 29, 1977, Ser. No. 811,168
Int. Cl.^{2} G01K *1/26;* **B28B** *21/00*
U.S. Cl. 116—148 **14 Claims**

1. An integrally connected one piece molded synthetic organic resin structure, for easy assembly into a door knocker capable of producing a predetermined audible sound, comprising a synthetic organic resin base having at least a portion of the rear surface thereof flat, a synthetic organic resin arm connected to said base at spaced apart points by at least two relatively thin struts, each of the struts being easily severed to separate said arm from said base, at least one boss receiving means on one of said arm and the front surface of said base and integral therewith, at least one boss on the other of said arm and the front surface of said base and integral therewith extending therefrom sized to snap fit within said boss receiving means and to be frictionally engaged and maintained thereby, said arm having a size such that when said boss and said boss receiving means are frictionally engaged said arm has a free end thereof overlying a portion of said base which is normally urged toward said base, said arm being flexible to permit the free end thereof when said boss is frictionally engaged and maintained by said boss receiving means to be bent away from said base without breaking said arm, said boss and boss receiving means cooperating with said arm thus mounted on said base to cause said arm to snap back toward and against said base upon release of said arm from the bent away position thereof, thereby striking said base with a predetermined force to make an audible sound.

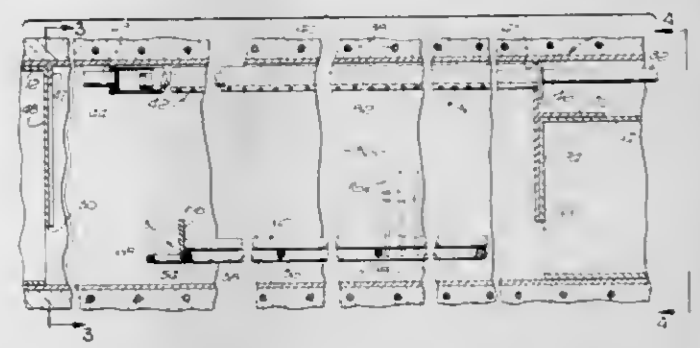


4,108,105
PART GAGING CONTROL FOR LIQUID SPRAY SYSTEM
Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.
Filed Apr. 2, 1976, Ser. No. 672,848
Int. Cl.^{2} B05C *5/00, 15/00*
U.S. Cl. 118—2 **28 Claims**



1. In a paint spray system, an apparatus for gaging the width of a workpiece to be painted, which comprises
(a) means for conveying workpieces through said paint spray system,
(b) a plate-like element positioned adjacent said conveying means and displaceable to contact a workpiece on said conveying means,
(c) a plurality of normally-opened switching means, each being mechanically linked to said plate-like element whereby the displacement of plate-like element sequentially closes said switching means, one at a time, whereby each of said switching means corresponds to a predetermined forward position range of said plate-like element, when in a closed condition,
(d) a plurality of storage means, each being assigned to one of said predetermined forward position ranges of said plate-like element,
(e) a voltage supply means,
(f) electrical control means interconnecting said voltage supply means with each of said storage means through the switching means corresponding to the predetermined forward position range assigned to said storage means, and
(g) said electrical control means being operative upon contact between the plate-like element and the workpiece to apply the electrical energy of said voltage supply means to the storage means corresponding to the forward position range occupied by the plate-like element at said contact through the switching means operated in said occupied forward position range.

4,108,106
CROSS-FLOW REACTOR
Alfred R. Dozier, Huntington Beach, Calif., assignor to Tylan Corporation, Torrance, Calif.
Filed Dec. 29, 1975, Ser. No. 644,997
Int. Cl.^{2} C23C *13/08*
U.S. Cl. 118—49 **15 Claims**



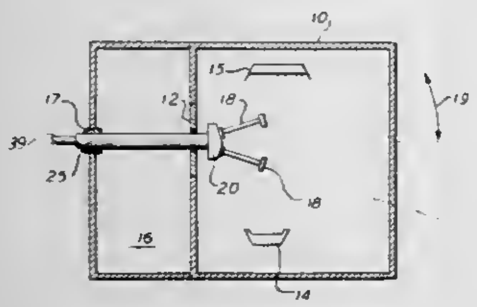
1. A cross-flow reactor for processing of a plurality of at least three units of semiconductor material, each unit being formed of a wafer having a substantially planar surface, comprising:
means for defining an elongate chamber into which can be inserted said plurality of units of semiconductor material which are to be contacted with process gas;
carrier means for disposing said units with their planar surfaces vertically directed;
means for heating said chamber along a substantial length thereof to a desired temperature sufficient for desired reaction of said process gas with said semiconductor material;
means for distributing process gas to a plurality of at least three discrete locations within said chamber spaced from each other and spaced inwardly from the ends of said chamber length for travel of said gas across the longitudinal axis of said chamber as gas flows along a plurality of spaced paths for single pass traversal thereof; and
means for exhausting said gas flows from said chamber after said single pass;
said distributing means comprising at least one elongate manifold tube, for receiving said process gas, disposed longitudinally within said chamber along said heated chamber length and formed with an opening at each said location for cross-flow therefrom of said process gas, said manifold tube being formed with a closed end downstream of said heated chamber length and wherein said distribution means includes at least one imperforate conduit tube within and extending along said manifold tube for delivering said process gas along said heated chamber length for counterflow of said process gas in said manifold tube from said closed end to said locations.

4,108,107

ROTATABLE SUBSTRATE HOLDER FOR USE IN VACUUM

Glen R. Scheuermann, Oakland, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 1, 1976, Ser. No. 672,691
Int. Cl.^{2} C23C *13/02*
U.S. Cl. 118—49.1 **11 Claims**



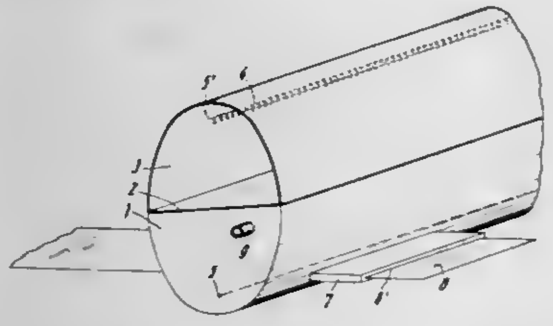
1. A holder for supporting and rotating at least two substrates in the vicinity of a coating source inside a vacuum chamber, comprising:
(a) a hollow support shaft for supporting the substrates for rotation about a main axis;
(b) a stub shaft for supporting each substrate for rotation about an individual axis;
(c) a means fixed to the support shaft for rotatably mounting each stub shaft;
(d) a drive shaft inside the support shaft and independently rotatable with respect to the support shaft;
(e) a gear fixed to each stub shaft;
(f) a central gear fixed to the drive shaft and engaging each stub shaft gear for rotating each stub shaft about its individual axis as the drive shaft is rotated with respect to the support shaft; and
(g) a housing for shielding each gear from the coating source wherein the housing has an opening for allowing gas to pass between the inside of the housing and the interior of the support shaft.

4,108,108

APPARATUS FOR METALLIZING STRIPS, SHEETS OR THE LIKE

Hermann Johannes Schladitz, Munich, Fed. Rep. of Germany, assignor to Schladitz-Whiskers AG., Zug, Switzerland

Continuation of Ser. No. 486,956, Jul. 10, 1974, abandoned. This application May 21, 1976, Ser. No. 688,560
Int. Cl.^{2} C23C *13/08*
U.S. Cl. 118—49.1 **6 Claims**



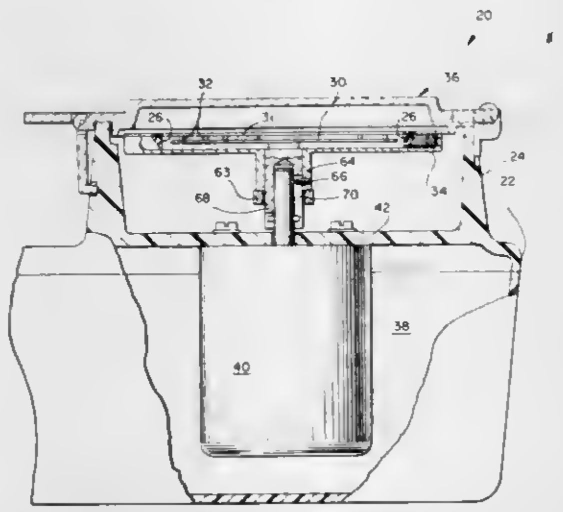
1. An apparatus for metallizing sheet material by thermal decomposition of a gaseous metallic compound comprising:
a metallizing chamber,
inlet means coupled to said chamber for permitting said gaseous metallic compound to be supplied to said chamber;
means coupled to said chamber for enabling said sheet material to be continuously passed through said chamber while maintaining a gaseous atmosphere of said metallic compound adjacent said sheet material inside said chamber; and
optical means about said metallizing chamber for generating a narrow, elongated high temperature zone adjacent one surface of said material, said high temperature being sufficient to cause thermal decomposition of said compound and metallization of said material, and said zone being sufficiently localized to confine heating of said material to said one surface.

4,108,109

BLOOD FILMING APPARATUS

J. P. Barger, Winchester, and Joseph A. Holroyd, Nabnasset, both of Mass., assignors to Dynatech Corporation, Burlington, Mass.

Filed May 13, 1974, Ser. No. 469,099
Int. Cl.^{2} B05C *13/02*
U.S. Cl. 118—52 **17 Claims**



1. In a centrifuge apparatus, comprising a sample support member, adapted to receive a liquid sample on a sample-receiving surface and to achieve the distribution of said liquid sample as a film over said sample-receiving surface, as said sample-receiving surface is rotated in the plane of said surface the improvement wherein said apparatus comprises waste-receiving and retaining means positioned about the periphery of a sample support member and adapted to receive and hold excess liquid from a plurality of said liquid samples spun off the sample-receiving surface as it rotates, and means to rotate said waste receiving means and said sample support member at substantially the same rpm;
and wherein said waste-receiving and retaining means also forms means to protect other internal surfaces of the apparatus from any contamination with said waste blood and wherein said waste-receiving and retaining means further forms a barrier means to avoid reverse flow of waste blood therefrom.

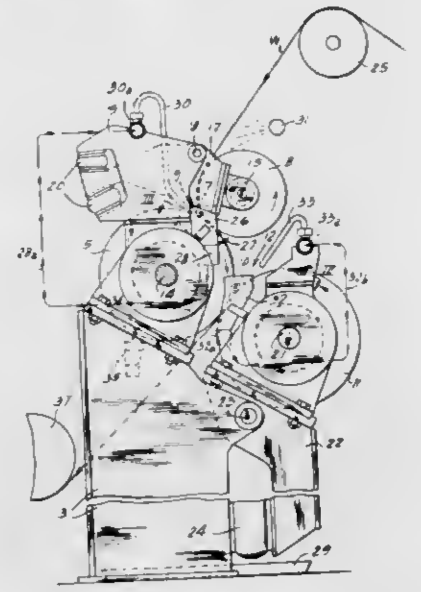
4,108,110

APPARATUS FOR COATING BOTH SIDES OF A TRAVELLING WEB

Kenneth William Berry, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 17, 1977, Ser. No. 778,506
Int. Cl.^{2} B05C *3/132*
U.S. Cl. 118—412 **20 Claims**

1. Apparatus for puddle coating both sides of a travelling web, comprising:
first and second horizontal rolls providing a first nip and defining a first generally upwardly directed puddle trough over said first nip;
a third horizontal roll forming a second nip with said second roll below said first nip and defining a second puddle trough opening generally upwardly for coating material;
means for supplying said puddle troughs with respective puddles of coating material;
whereby one side of a web is adapted to be coated by running it through the first puddle trough and nip while its opposite side is in running engagement with the first roll and thereby protected from the coating material in the first puddle trough and continuously thereafter said opposite side is adapted to be coated by running the web through the second puddle trough and the second nip while said first side is in running engagement with said second roll and thereby protected from the coating material in the second puddle trough;



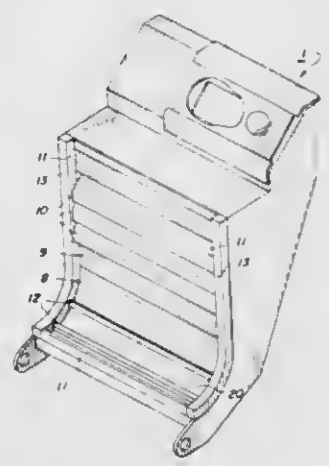
and means for preventing migration to said second trough of coating material which may be carried from said first trough on the ends of said second roll.

4,108,111

DEVELOPER HOUSING

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,157
Int. Cl.^{2} G03G *15/08*
U.S. Cl. 118—655 **4 Claims**



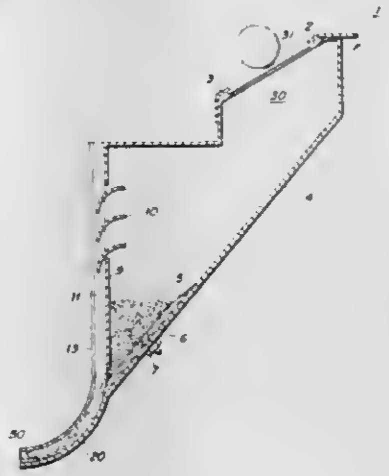
1. A tank developing system for developing latent magnetic images on magnetizable imaging members with magnetic toner, comprising: a developer housing having formed therein a chamber for the storage of magnetic toner, a wall member of said housing extending below said chamber; an opening in said housing in communication with said chamber; the wall member below said chamber being shaped to conform to a predetermined path of travel of a magnetizable imaging member; means for selectively varying the size of said opening; baffle means for removing airborne toner from the vicinity of the magnetizable imaging member and located above said opening; and resilient seal forming means affixed to said one wall on the side thereof opposite said chamber and adapted to contain toner between said one wall, said resilient seal forming means and said magnetizable imaging member along said predetermined path of travel.

4,108,112

DEVELOPER HOUSING

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,162
Int. Cl.^{2} G03G *15/08*
U.S. Cl. 118—655 **5 Claims**



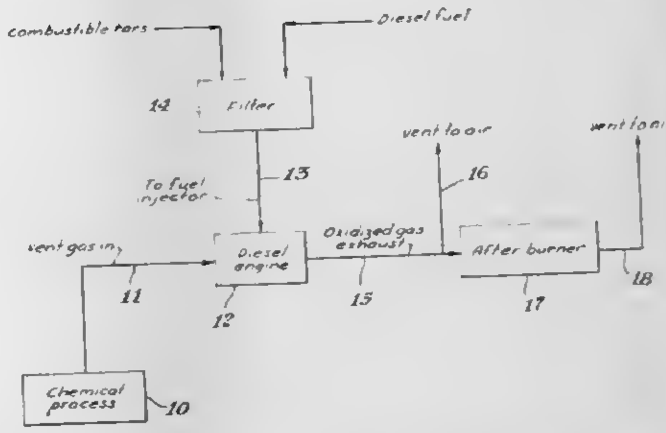
1. In magnetic development apparatus of the type having a development zone defined at least in part by a sloping wall member along which magnetic toner migrates under the influence of gravity, the improvement comprising: a magnetic flux channeling member comprising magnetically permeable material of low magnetic retentivity; and baffle means affixed to said sloping wall member upon the side thereof contacted by toner during development.

4,108,113

METHOD FOR REDUCING CONCENTRATION OF HARMFUL OR OFFENSIVE VAPORS IN THE ATMOSPHERE

Edward E. Timm, Beaverton, and Donald I. Townsend, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1976, Ser. No. 684,595
Int. Cl.^{2} F02B *43/08*
U.S. Cl. 123—3 **2 Claims**



1. A method for reducing the concentration of a halogenated hydrocarbon compound, in a vapor phase of said compound, prior to releasing the vapor phase compound into the atmosphere, the method comprising:
mixing the vapor phase halogenated hydrocarbon compound with a sufficient amount of air to provide an oxidizable vapor phase mixture;
feeding the oxidizable vapor phase mixture into the combustion chamber of a Diesel engine, while the engine is operating;

compressing the oxidizable vapor phase mixture in the combustion chamber sufficiently for the vapor phase mixture to reach ignition temperature;

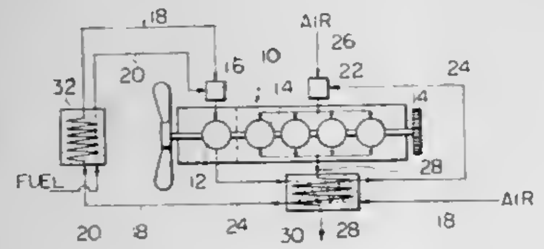
injecting a vapor phase fuel component into the combustion chamber, to mix with the oxidizable vapor mixture and thereby provide a vapor phase fuel mixture;

igniting the vapor phase fuel mixture to initiate an oxidation reaction which produces a vapor phase reaction product containing less than 20 percent by volume of the halogenated hydrocarbon compound; and

discharging the vapor phase reaction product from the engine into the atmosphere.

4,108,114
FUEL REFORMER FOR GENERATING GASEOUS FUEL CONTAINING HYDROGEN AND/OR CARBON MONOXIDE

Katuaki Kosaka, Saitama, and Zene Ueno, Fuchu, both of Japan, assignors to Nissan Motor Company, Limited, Japan
Filed May 26, 1976, Ser. No. 690,311
Claims priority, application Japan, May 27, 1975, 50-62487
Int. Cl.^{2} F02B *43/08, 75/16, 3/00*
U.S. Cl. 123—3 **15 Claims**



1. A fuel reformer for carrying out a fuel-reforming reaction which gives a gaseous fuel containing as combustible components at least one of hydrogen and carbon monoxide through partial oxidation of at least one fuel selected from hydrocarbon fuels, alcohols, and nitrogen-hydrogen compounds without using any catalyst, the reformer comprising:

a single reaction chamber in the form of a combustion chamber of a compression-ignition internal combustion engine;

a piston adapted to compress a gas in said reaction chamber at a compression ratio in the range from about 14 to about 20;

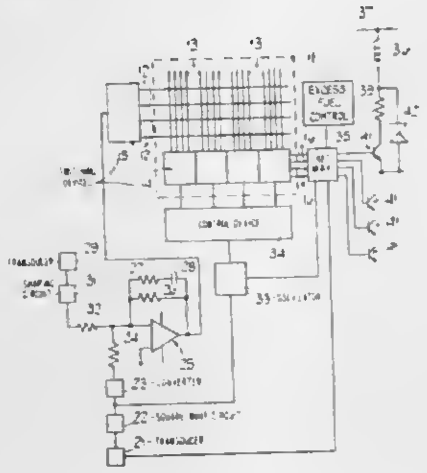
a heat exchanger arranged to transfer heat from the reaction product discharged from said reaction chamber to at least one component of a gaseous mixture to be supplied to said reaction chamber;

a fluid feed means for selectively supplying to said reaction chamber either an oxygen-containing gas selected from the group consisting of oxygen and air when said heat exchanger is too cold to support said fuel-reforming reaction or said gaseous mixture comprising said at least one fuel and said oxygen-containing gas when said heat exchanger is sufficiently hot enough to support said fuel-reforming reaction, the amount of oxygen in said gaseous mixture being sufficient to accomplish partial oxidation but insufficient to accomplish complete oxidation of said at least one fuel in said gaseous mixture; and

a fuel injection means for pressurizing said at least one fuel and injecting the pressurized fuel into said reaction chamber only when said fluid feed means supplies said oxygen-containing gas alone to said reaction chamber in such a quantity that the injected fuel undergoes a complete oxidation.

4,108,115
FUEL INJECTION SYSTEMS FOR COMPRESSION IGNITION ENGINES

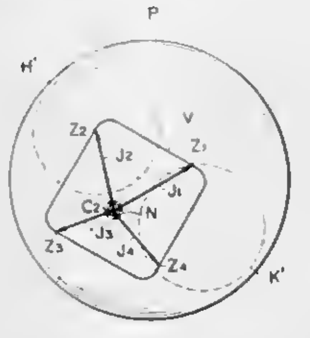
Malcolm Williams, Solihull, and Christopher Robin Jones, Alcester, both of England, assignors to Lucas Electrical Company, Limited, Birmingham, Eogland
Continuation of Ser. No. 584,166, Jun. 5, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,740
Claims priority, application United Kingdom, Jun. 7, 1974, 25306/74
Int. Cl.^{2} F02B *3/00*
U.S. Cl. 123—32 EB **4 Claims**



1. A fuel injection system for a compression ignition engine comprising a first transducer producing an electrical output representing demand, a second transducer producing an electrical output representing engine speed, a memory device having first and second inputs and an output, said device being programmed to produce an output having a magnitude dependent on the magnitude of said inputs, means coupling the second transducer to said first input to represent engine speed, means coupling a combination of the output of the output of the first and second transducers to said second input to represent the load on the engine, and control means operable by the output from the memory device for determining the quantity of fuel injected to each cylinder of the engine, the system operating without any feedback representing the quantity of fuel injected wherein said means coupling the outputs of the first and second transducers to the second input includes a virtual earth summing amplifier, the transducers producing outputs increasing monotonically with demand and speed respectively.

4,108,116
COMBUSTION CHAMBER AND NOZZLE ARRANGEMENT FOR DIRECT FUEL INJECTION TYPE DIESEL ENGINE

Tadao Ohta, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan
Filed Jun. 6, 1977, Ser. No. 803,914
Claims priority, application Japan, Jun. 9, 1976, 51-67265
Int. Cl.^{2} F02B *3/00*
U.S. Cl. 123—32 A **1 Claim**



1. In a diesel engine including a cylinder, a cylinder head, a piston slidably disposed in the cylinder and having a quandrangular cavity in its crown offset from the center of the piston, and a fuel injector nozzle disposed in the cylinder head and offset with respect to the center of the cavity for injecting four jets of fuel directed at points on the respective side walls of the cavity equidistant from the adjacent corners thereof, the improvement characterized by the rotational orientation of the cavity being such that:

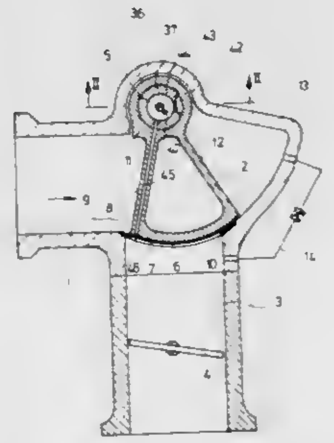
a. the two longest and the two shortest fuel jet distances are equal in length,

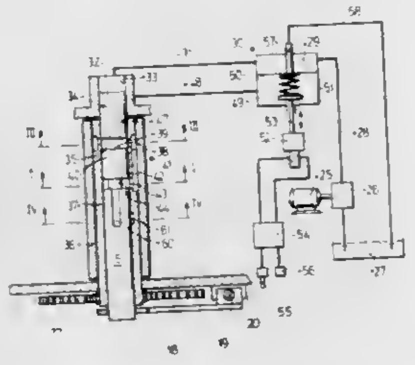
b. a line connecting the geometric center of the cavity and the center of the nozzle bisects the angles between the two longest and the two shortest fuel jet directions, and

c. the difference between the lengths of the longest and shortest fuel jet distances is minimized.

4,108,117
FUEL METERING SYSTEM

Gerbard Stumpp, Stuttgart; Wolf Wessel, Oberriexingen; Volkhard Stein, and Wolfgang Ripper, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 15, 1976, Ser. No. 741,642
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554725
Int. Cl.^{2} F02B *3/00*
U.S. Cl. 123—33 A **23 Claims**





1. In a fuel injection system which includes an air flow responsive member located substantially within the induction tube and further includes fuel metering means, coupled to said air flow responsive member, said induction tube further containing an arbitrarily controlled throttle, the improvement comprising:

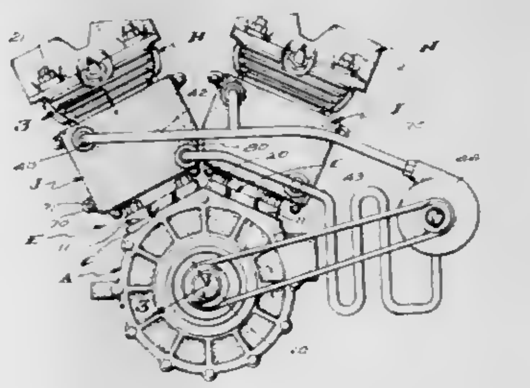
air flow aperture means in said induction tube upstream of said throttle;

said air flow responsive member is disposed upstream of said aperture means and is a movable valve element whose cross section in a plane parallel to the air flow is substantially a sector of a circle, said sector defining a narrow end, an arc-shaped wide end, and side walls therebetween, said valve element being disposed to pivot at its narrow end about a shaft lying adjacent to one side of the induction tube, such that one of said side walls is substantially perpendicular to the incoming air flow and its edge adjacent to said arc shaped end cooperates with said aperture means to thereby define a variable free flow cross section for air through said induction tube; and

said fuel metering means is located in and around the pivotal shaft of said valve element and fuel is metered thereby as a function of the pivotal position of said valve element and is delivered to the induction tube in the immediate vicinity of said edge of said valve element.

4,108,118
WATER JACKETED CYLINDER

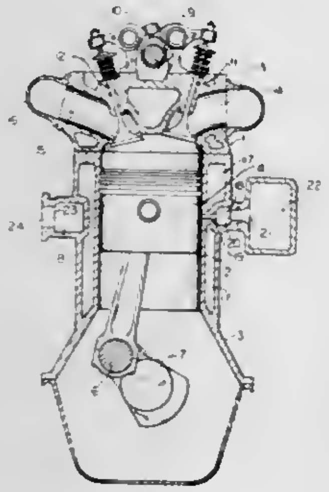
Robert Jay George, 4248 Via Marina, Marina Del Rey, Calif. 90291
Filed Dec. 9, 1976, Ser. No. 748,951
Int. Cl.^{2} F01P *3/02*
U.S. Cl. 123—41.57 **4 Claims**



1. A reciprocating cylinder and piston internal combustion engine comprising a crank case, a crank shaft rotatably carried by the case on a horizontal axis, a cylinder unit including an elongate tubular cylindrical body defining a central upwardly and downwardly opening bore, means mounting the body on the case to project substantially vertically and upwardly therefrom with its lower end communicating with the interior of thd case, an air-cooled head structure with fuel supply, ignition and gas exhaust means positioned at and closing the upper end of the bore, means securing the head to the body, a piston and ring assembly slidably engaged in the bore and a connecting rod pivotally and rotatably connected with and extending between the piston assembly and the crank shaft, said cylinder unit including a jacket structure with a cylindrical side wall in radial outward spaced relationship about the body and having upper and lower ends in sealed engagement with the body below the head and above the case, said jacket and body defining an annular longitudinally extending chamber about the body, a water inlet port in the jacket, a water outlet port in the jacket spaced from the inlet port, a re-circulating pump with an inlet and an outlet, a fluid conducting delivery line from the pump outlet to the inlet port, a fluid conducting return line from the outlet port to the pump inlet and a volume of heat transfer fluid in the chamber, pump and lines; said body has a hot spot at its upper portion and at one side thereof where the piston assembly is urged to generate friction heat upon each downward power stroke of the piston in the cylinder, said inlet port being positioned in the jacket and disposed to direct fluid flowing therethrough and into said chamber toward and across the said hot spot.

4,108,119
BOTTOM CYCLE MANIFOLD FOR FOUR-STROKE INTERNAL COMBUSTION ENGINES

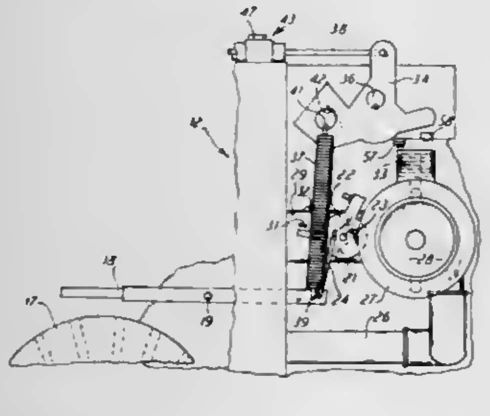
Edward Milton McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610
Filed Jan. 19, 1977, Ser. No. 760,560
Int. Cl.² F02B *75/02*
U.S. Cl. 123—75 C **1 Claim**



1. A four-stroke cycle piston driven internal combustion engine, said engine containing a plurality of cylinders fixedly attached to a crankcase, poppet valves for the induction of air-fuel charges into said cylinder, said poppet valves being located in combustion chambers above said cylinders, poppet valves for the exhausting of combustion gases from said cylinders also located in said combustion chambers, pistons slidably mounted within said cylinders, connecting rods pivotally mounted in said pistons at one end and rotatively mounted on crankpins at the other end, aligned arms fixedly attached to each end of said crankpins, opposing said arms between said crankpins being fixedly attached to each end of axially aligned shafts forming a plurality of crank throws of a crankshaft, said crankshaft being rotatively mounted in journals in said crankcase, a plurality of side ports in said cylinder walls at a level which is above the face of said pistons when said pistons are at the bottom of their stroke, a manifold connecting said sideports, a duct opening into said manifold leading directly to a pressurized air source, another duct opening in said manifold leading directly to ambient atmosphere.

4,108,120
GOVERNOR CONTROL FOR AN INTERNAL COMBUSTION ENGINE

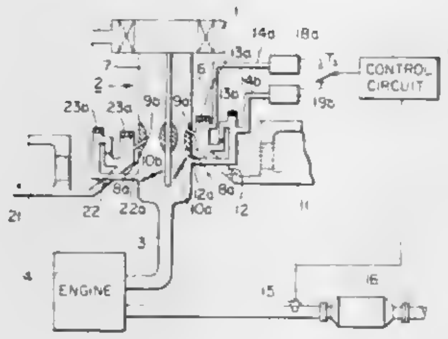
Neill Carl Woelffer, Racine, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.
Filed Feb. 25, 1977, Ser. No. 771,927
Int. Cl.² F02D *11/02, 11/08*
U.S. Cl. 123—103 B **11 Claims**



1. In a governor control for an internal combustion engine, an engine, a pivotally mounted throttle plate movable between open and closed positions, a member movably mounted for movement in self-response to the speed of the engine and being operatively connected with said throttle plate for moving said throttle plate relative to said open and closed positions, a tension spring operatively connected with said member for yieldingly urging said member toward a position corresponding to the open throttle position, an operator-controlled mechanism connected with said spring and thereby be operatively connected with said throttle plate for manually moving said throttle plate toward the open and closed positions, the improvement comprising said operator-controlled mechanism including a movably mounted control mechanism having a first position corresponding to a fast engine speed and having a second position corresponding to a slow engine speed, said control mechanism being free of restriction and movable away from the slow engine speed position and having a third position which is located past the fast engine speed position and which corresponds to an engine speed faster than the fast engine speed, and an additional spring operatively connected with said control mechanism for yieldingly urging said control mechanism from said third position toward second position.

4,108,121
CLOSED LOOP MIXTURE CONTROL SYSTEM USING A TWO-BARREL CARBURETOR

Hidehiro Minami, No. 1403, Matano-cho, Totsuka-ku, Yokohama City, and Makio Waku, 1-22-6,, Moto-machi, Urawa City, both of Japan
Filed Mar. 9, 1976, Ser. No. 665,257
Claims priority, application Japan, Mar. 24, 1975, 50-39116
Int. Cl.² F02D *35/00*
U.S. Cl. 123—119 EC **7 Claims**



1. A closed loop mixture control system for an internal combustion engine of a roadway vehicle, comprising:

a two-barrel carburetor having a primary barrel having a venturi and throttle and a secondary barrel in said carburetor for both receiving fuel and air when depression at the venturi of said primary barrel falls below a predetermined value, the cross-sectional dimension of the primary barrel being smaller than that of the secondary barrel so that evaporation of fuel inducted to the primary barrel is promoted as compared to the evaporation of fuel inducted to the secondary barrel;

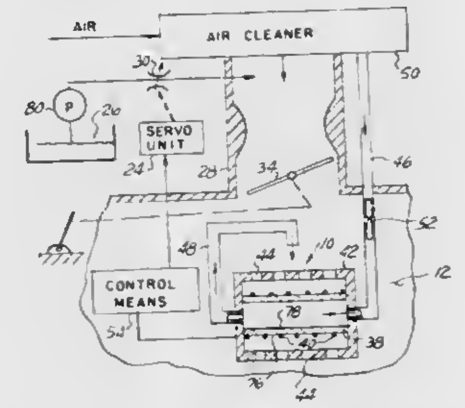
means for producing a control signal corresponding to the difference between an air-fuel ratio of the mixture combusted in the engine and a stoichiometric air-fuel ratio of the mixture;

primary and secondary metering systems associated with the primary and secondary barrels, respectively, for proportioning air and fuel supplied to said engine, said primary metering system comprising a main mixture supply nozzle disposed in the venturi of the primary barrel, means defining an auxiliary mixture supply port disposed in the closed position of the throttle of the primary barrel, a first mixture control valve associated with said main mixture supply nozzle, a second mixture control valve associated with said auxiliary mixture supply port, a throttle position detector operatively connected to the throttle of the primary barrel, and means for selectively coupling said control signal to said first and second control valves in response to a predetermined throttle position of the primary barrel and effective so that said control signal is applied to the second control valve for part throttle operation and to the first control valve for full throttle operation; and

means for controlling said primary metering system in accordance with said control signal.

4,108,122
AIR/FUEL RATIO FOR AN INTERNAL COMBUSTION ENGINE CONTROLLED BY GAS SENSOR IN INTAKE MANIFOLD

Daniel Dewey Barnard, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Continuation of Ser. No. 573,508, Apr. 30, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,378
Int. Cl.² F02B *33/00;* F02M *25/00*
U.S. Cl. 123—119 EC **8 Claims**



1. In a fuel management system for an internal combustion engine wherein the fuel and air are mixed in a mixture control means and distributed through intake manifold means to the cylinders of the engine, a system for controlling the air/fuel ratio in the fuel mixture comprising:

variable fuel delivery means for controlling the amount of fuel discharged into the mixture control means;

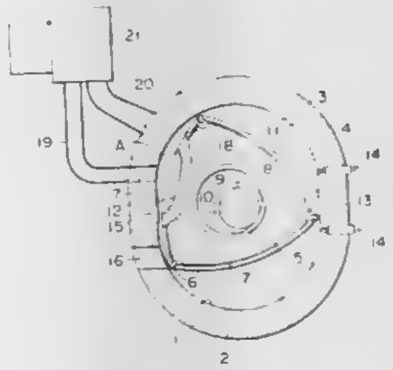
sensor means positioned in the intake manifold means for directly sensing the oxygen partial pressure in the fuel mixture flowing thereby, said sensor having an electrical characteristic which varies in response to changes in said oxygen partial pressure; and

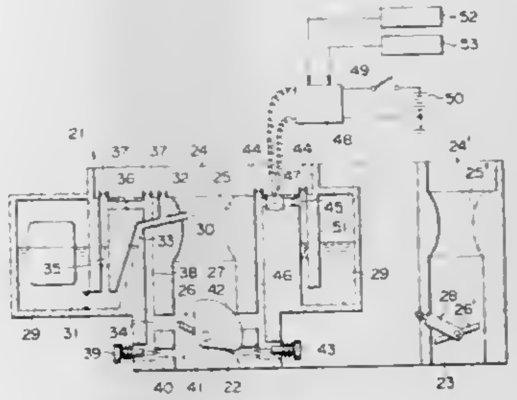
control means responsive to said electrical said sensor for controlling said variable fuel delivery means and controlling the quantity of fuel discharged into the mixture control means in accordance with a function of said electrical characteristic.

4,108,123
CARBURETOR

Ryozo Ito, Toyota, and Akira Tokuda, Oobu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto and Aisan Kogyo Kabushiki Kaisha, Oobu, both of, Japan
Filed Mar. 29, 1977, Ser. No. 782,345
Claims priority, application Japan, Jul. 30, 1976, 51-91638; Jul. 30, 1976, 51-91639
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 EC **7 Claims**

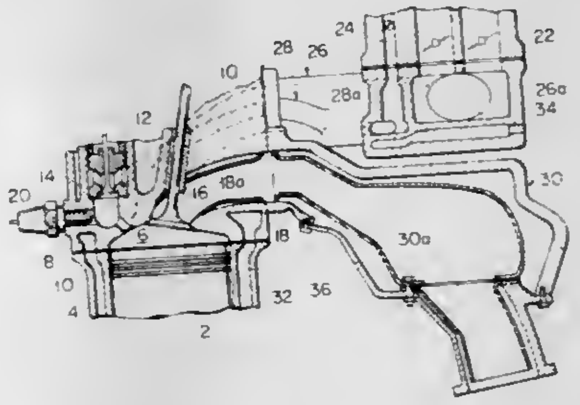
1. A carburetor for use with a stratified-charged rotary piston engine, comprising a first supply system having an air flow passage, a throttle valve, a main fuel supply system and a main slow/idle fuel supply system, and a second supply system having an air flow passage and a throttle valve which is operationally co-related with the throttle valve in said first supply system, wherein the improvement comprises a second slow/idle fuel supply system provided in one of said first and second supply systems said second slow/idle fuel supply system having a control valve which selectively intercepts the flow of fuel through said second slow/idle fuel supply system, a first sensing means for sensing the speed condition of the engine, a second sensing means for sensing the temperature condition of the exhaust gas of the engine, and the control means for controlling said control valve depending upon the information received from said first and second sensing means in a manner such that the flow of fuel through said second slow/idle fuel supply system is intercepted when the engine speed is above a predetermined low level and the exhaust gas temperature is above a predetermined value.





4,108,124
MANIFOLD SYSTEM

Yasuhiko Nakagawa, Fujisawa, and Kosabro Mukai, Tokyo, both of Japan, assignors to Nissan Motor Company, Ltd., Japan
Filed Apr. 9, 1976, Ser. No. 675,624
Claims priority, application Japan, Apr. 10, 1975, 50-43537
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AC **4 Claims**



1. In an engine system:

an internal combustion engine comprising a cooling system having a cooling liquid passageway with a thermostat and a pump for the cooling liquid, and an engine block having an auxiliary combustion chamber, a main combustion chamber and a passage interconnecting said auxiliary and said main combustion chambers;

a main intake manifold having a first riser and at least one first manifold passage extending from said first heat riser toward said main combustion chamber;

an auxiliary intake manifold having a second heat riser and at least one second manifold passage extending from said second heat riser toward said auxiliary combustion chamber;

means for supplying a lean air-fuel mixture to said first riser to supply the air-fuel mixture to said main combustion chamber through said main intake manifold;

means for supplying a rich air-fuel mixture to said second heat riser to supply the rich air-fuel mixture to said auxiliary combustion chamber through said auxiliary intake manifold;

a cooling liquid passage having an inlet thereof connected to that portion of said cooling liquid passageway of said cooling system which is adjacent and upstream of said thermostat to introduce hot cooling liquid having circulated through said engine block into said cooling liquid passage, said cooling liquid passage having an outlet thereof connected to that portion of said cooling liquid passageway of said cooling system which permits return flow of the cooling liquid back to said pump,

said cooling liquid passage and said first heat riser having a first common wall through which heat is transferred from the cooling liquid within said cooling liquid passage to the lean air-fuel mixture within said first heat riser.

said cooling liquid passage and said second heat riser having a second common wall through which heat is transferred from the cooling liquid within said cooling liquid passage to the rich air-fuel mixture within said second heat riser;

said first common wall forming the bottom of said first heat riser, said second common wall forming the bottom of said second heat riser;

an exhaust manifold connected to said main combustion chamber to receive exhaust gases from combustion within said main combustion chamber, said exhaust manifold being out of heat conductive contact with said main intake manifold and said auxiliary intake manifold;

whereby the lean and rich air-fuel mixtures are heated with the cooling liquid passage without causing an appreciable drop of the temperature of the exhaust gases within said exhaust manifold.

4,108,125

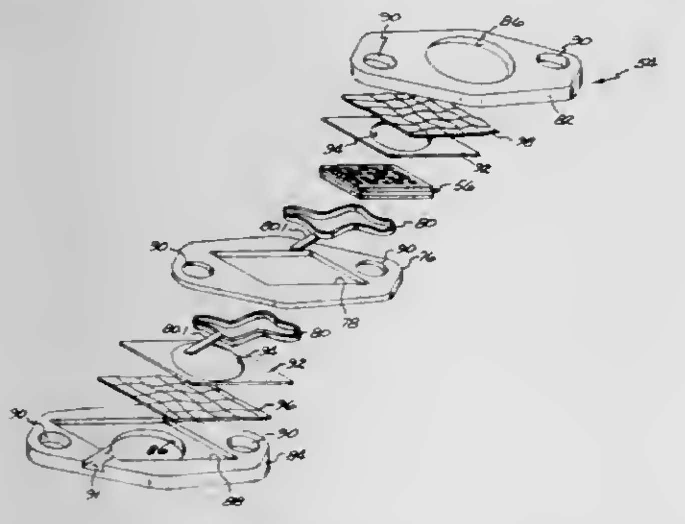
HIGH EFFICIENCY EARLY FUEL EVAPORATION CARBURETION SYSTEM

Leo Marcoux, Rehoboth, and Peter G. Berg, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 10, 1976, Ser. No. 722,310

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 F **8 Claims**



1. A carburetion system comprising carburetor means having an air-fuel passage, an air-inlet to the air-fuel passage, a fuel inlet to the air-fuel passage for mixing fuel with air in the air-fuel passage, and an outlet from the air-fuel passage for delivering a mixture of air and vaporized fuel to an engine, heater means comprising a body of electrical resistor material of positive temperature coefficient of resistivity having a plurality of heater passages extending in a pattern in spaced side-by-side relation to each other through the body between opposite ends of the body defining a plurality of webs of the resistor material between the heater passages, electrically conductive contact means in electrical engagement with the resistor material on the inner walls of the heater passages, a first electrically conductive interconnection coating on one end of the resistor body electrically connecting the contact means in alternate ones of the heater passages together at said one end of the body, a second electrically conductive interconnection coating on the opposite end of the resistor body electrically connecting the contact means in the other heater passages together at said opposite end of the body, means for directing electrical current through the body between contact means connected to said first coating and contact means connected to said second coating, and means mounting the resistor body for passing at least part of at least one constituent of said air-fuel mixture through the heater passages in heat-transfer relation to the resistor body to facilitate vaporizing of the fuel constituent of the air fuel mixture.

4,108,126

FUEL FEED DEVICE OF AN INTERNAL COMBUSTION ENGINE

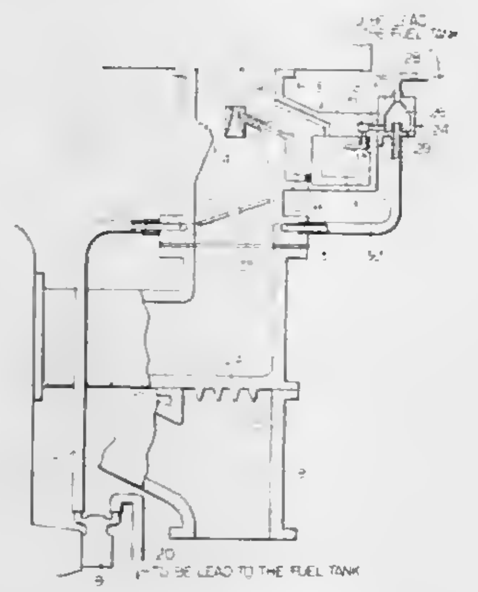
Masakatsu Sanada, Toyota, and Masahiko Nakada, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1977, Ser. No. 793,637

Claims priority, application Japan, Mar. 15, 1977, 52-27559

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 E **9 Claims**



1. A fuel feed device of an internal combustion engine, comprising:

a carburetor having a float chamber therein;

a fuel reservoir; a fuel supply passage communicating said float chamber with said fuel reservoir and having a passage portion arranged to cool said carburetor and to vaporize the low boiling components in the fuel by the heat of said carburetor, and;

a separating means disposed in said fuel supply passage between said passage portion and said float chamber for respectively separating low boiling components and high boiling from the fuel and for removing said low boiling components from the fuel fed into said float chamber.

4,108,127

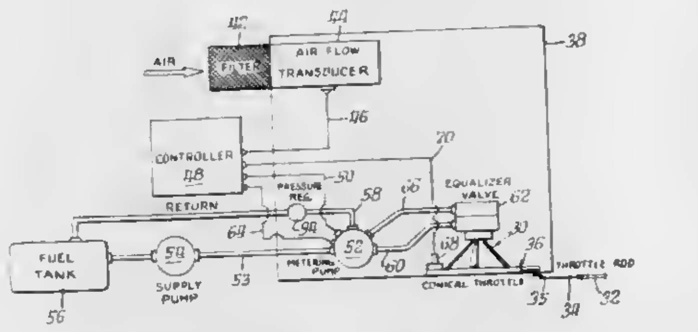
MODULATED THROTTLE BYPASS

Leonard Lee Chapin, and James Walter Merrick, both of El Paso, Tex., assignors to Autotronic Controls, Corp., El Paso, Tex.

Filed Apr. 1, 1977, Ser. No. 783,614

Int. Cl.^{2} F02D *1/04, 35/00, 33/00;* F02B *15/00*

U.S. Cl. 123—124 R **24 Claims**



1. An auxiliary air control system for an internal combustion engine having an intake manifold to which the flow of air is controlled by operation of a main throttle valve operated by an engine operator, said system comprising

means defining an air passage bypassing said main throttle valve through which air may pass to said intake manifold without passing through said main throttle valve,

valve means for controlling the flow of air through said air passage, said valve means including at least one valve member mounted for movement to control opening of said air passage for controlling air flow therethrough, and drive means responsive to a valve control signal for driving said valve member to move to a controlled position in said air passage, and

control means including a manifold pressure sensor responsive to manifold pressure by producing a manifold pressure signal systematically related to manifold pressure, means for establishing a manifold pressure reference signal corresponding to a predetermined manifold pressure, means responsive to said manifold pressure signal and said manifold pressure reference signal by producing a manifold pressure control signal for causing said drive means to drive said valve member to the controlled position whereat air flow through said air passage produces a sensed manifold pressure corresponding to said predetermined manifold pressure, and means for applying said manifold pressure control signal to said drive means as said valve control signal.

13. An auxiliary air control system for an internal combustion engine having an intake manifold to which the flow of air is controlled by operation of a main throttle valve operated by an engine operator, said system comprising

means defining an air passage bypassing said main throttle valve through which air may pass to said intake manifold without passing through said main throttle valve,

valve means for controlling the flow of air through said air passage, said valve means including at least one valve member mounted for movement to control opening of said air passage for controlling air flow therethrough, and drive means responsive to a valve control signal for driving said valve member to move to a controlled position in said air passage, and

control means including an air flow sensor responsive to the total flow of air into said intake manifold by producing an air flow signal systematically related to the rate of total air flow into said manifold, means for establishing an air flow reference signal corresponding to a predetermined rate of total air flow into said manifold suitable for engine idling, means responsive to said air flow signal and said air flow reference signal by producing an air flow control signal for causing said drive means to drive said valve member to the controlled position whereat air flow through said air passage produces a sensed total rate of air flow into said manifold corresponding to said predetermined rate of air flow, and means for applying said air flow control signal to said drive means as said valve control signal.

4,108,128

FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

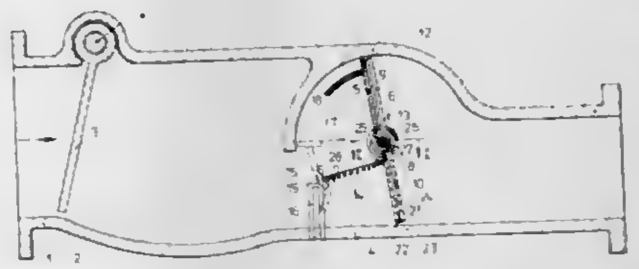
Heinrich Knapp, Leonberg-Silberberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 23, 1976, Ser. No. 744,363

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555996

Int. Cl.^{2} F02M *39/02*

U.S. Cl. 123—139 AW **12 Claims**



1. In a fuel supply system for an internal combustion engine, said engine including an air induction tube containing an air flow rate meter and, seriatim, an arbitrarily actuated throttle plate pivoting on a shaft, said air flow rate meter being subjected to a restoring force and being coupled operatively to a fuel metering valve assembly for the purpose of metering out fuel to the induced air in relation to the air flow rate, the improvement comprising:

a fuel mixture generating member, mounted to pivot around said shaft of said throttle plate;

a bulging region of the induction tube configured to receive a portion of said pivoting mixture generating member during pivotal motions thereof;

adjustable spring means, attached to said mixture generating member to urge the same to pivot in the opposite direction from that urged by the air flow; whereby said mixture generating member is displaced by the air flow and tends to follow the motions of said throttle plate, the force of said spring means being such that the pressure drop across said mixture generator in the upper region of the partial engine load domain is selectable and is reducible in the full-load position of said throttle plate.

4,108,129

SAFETY GROUP FOR DIESEL ENGINES

Armand Rognon, 22 rue Géo-Lufbéry, Chauny (Aisne), France

Filed Nov. 22, 1976, Ser. No. 743,912

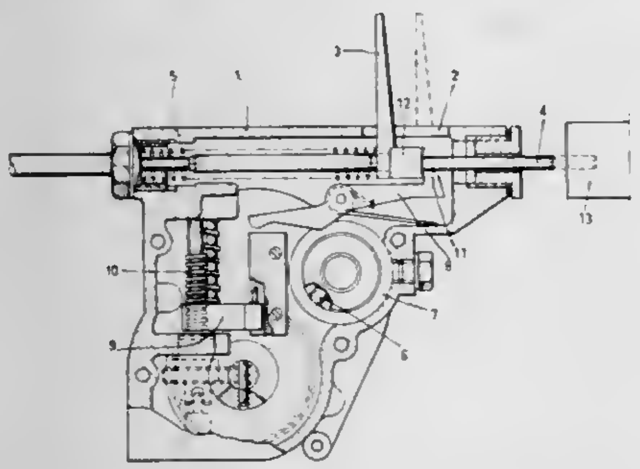
Claims priority, application France, Dec. 1, 1975, 75 36721

Int. Cl.^{2} F02B *77/08*

U.S. Cl. 123—139 AZ **8 Claims**

1. In a diesel engine including a fuel pump, with a fuel pump rack-bar, air intake manifolds, each incorporating a throttle plate, means for actuating said throttle plates, and a power supply for said actuating means: a safety control system comprising a safety shut-down mechanism, means for controlling said throttle plate actuating means and connected to said power supply, an oil pressure release valve connected to said safety shut-down mechanism, an unsafe engine operating condition detecting means for controlling said release valve, said safety shut-down mechanism including a spring loaded piston engaging said rack-bar, a trigger engaging said piston, a governor driven by the engine and responsive to engine over-speeding, a sliding member responsive to failure in engine lubricating oil pressure, said governor and sliding member being capable of actuating said trigger for disengaging said trigger from said piston and thus releasing said piston, whereby said rack-

bar engaged by said piston is urged, under the action of said spring, to idle position, a lever being fixedly secured to said piston and extending outwardly of said safety shut-down mechanism for actuating said controlling means.



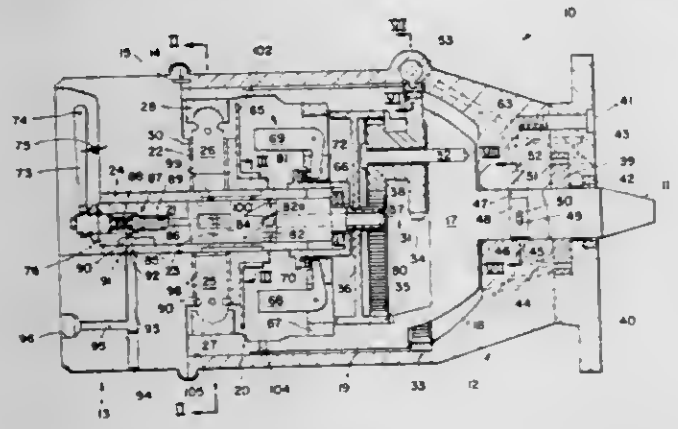
4,108,130
FUEL INJECTION PUMP

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 18, 1977, Ser. No. 798,053

Int. Cl.² F02M *41/06*

U.S. Cl. 123—139 AQ **14 Claims**



1. A distributor fuel pump assembly for an engine having a plurality of cylinders comprising:

a housing including a generally hollow cylindrical first portion and a second portion affixed to the first portion to form a substantially closed interior cavity, said second portion having a plurality of ports adapted for connection to the plurality of engine cylinders;

a first rotating assembly journalled for rotation in said cavity, said first rotating assembly defining an eccentric inner bore proximate said second portion, said first rotating assembly including an integrally formed shaft means extending outwardly of said cavity distal of said second portion;

a second rotating assembly journalled for rotation in said second portion and extending inwardly of said eccentric bore;

planetary gear means including a ring gear associated with said housing for drivingly connecting said first rotating assembly with said second rotating assembly to cause said second rotating assembly to rotate at a predetermined speed proportional to the speed of rotation of said first rotating assembly;

governor means associated with said second rotating assembly for causing axial movement in said cavity of said second rotating assembly in a first direction away from said first rotating assembly proportional to increased speed of rotation of said second rotating assembly;

means responsive to engine speed for rotating said ring gear relative to said housing;

means for communicating fluid to the interior of said cavity;

radially oriented piston means formed in said second portion, said piston means including a cylinder, a piston mounted for reciprocation in said cylinder and a slipper adapted to engage the eccentric inner bore of the first rotating assembly, said slipper associated with said piston, and resilient means for urging said piston radially outwardly, said piston means for increasing the pressure of said fluid communicated thereto;

first passage means in said second rotating assembly for periodically communicating an amount of pressurized fluid from said cavity to the inner end of the cylinder of said radially oriented piston means;

second passage means also in said second rotating assembly and angularly displaced from said first passage means a predetermined amount for receiving said amount of pressurized fluid at a relatively higher pressure from said piston means and at a rotative position of said shaft determined by the means responsive to engine speed, said second passage means for communicating said amount of higher pressurized fluid to one of the plurality of ports adapted for connection to the plurality of cylinders.

4,108,131
CAPACTIVE DISCHARGE IGNITION CIRCUIT

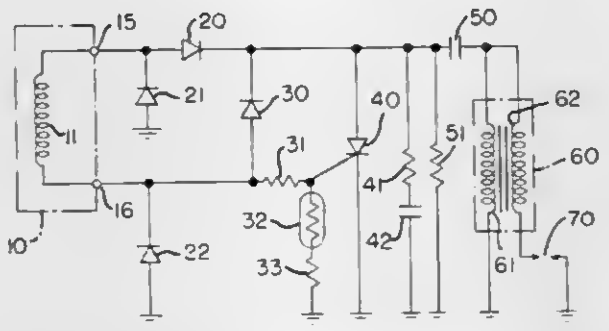
Suetaroo Sbibukawa, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan

Filed Sep. 7, 1976, Ser. No. 720,640

Claims priority, application Japan, Sep. 5, 1975, 50-107015

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 CC **15 Claims**



1. A capacitive discharge ignition circuit for an internal combustion engine comprising:

a magneto operably connected to the engine and having at least one winding;

a spark plug transformer having primary and secondary windings;

a storage capacitor connected to said magneto winding for being charged with the output voltage of said magneto during the first half cycle thereof;

a thyristor connected to said storage capacitor for forming a discharge circuit for said storage capacitor together with said primary winding:

resistance means connected to the gate of said thyristor across which the voltage appears during the second half cycle, the voltage across said resistance means being applied to the gate of said thyristor,

a diode for forming a closed circuit together with said thyristor and said resistance means so as to remove the voltage from said gate once said thyristor is fired; and

further comprising a diode connected between said magneto winding and a reference potential so that it conducts thereby inhibiting the output of said magneto winding from being applied to said resistance means during the first half cycle.

4,108,132
INTERNAL COMBUSTION ENGINE HAVING AN IMPROVED INLET VALVE ARRANGEMENT

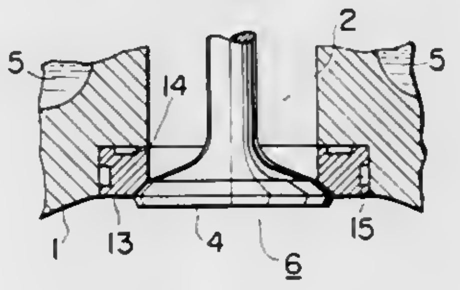
Yoshimasa Hayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 9, 1976, Ser. No. 740,235

Claims priority, application Japan, Nov. 10, 1975, 50-151719[U]

Int. Cl.² F01L *3/00*

U.S. Cl. 123—188 S **7 Claims**



1. In an internal combustion engine, a cylinder head having an inlet port which opens into a combustion chamber, a valve seat insert securely disposed in an orifice of the inlet port, and an inlet valve having a head seatable on said valve seat insert to prevent fluid communication between the combustion chamber and the inlet port, the improvement comprising:

thermal insulation means arranged between said valve seat insert and said cylinder head and adapted to insulate a sufficient portion of the interface defined between the valve seat insert and the cylinder head so that during the operation of the internal combustion engine the transfer of heat from the valve seat insert and the valve head to the cylinder head is limited to raise the temperature of the valve seat insert and the valve and to reduce the thickness of the layer of air-fuel mixture in contact with and in the immediate vicinity of the surfaces of the valve seat insert and the valve head exposed to the interior of the combustion chamber.

4,108,133
INTERNAL COMBUSTION ENGINE HAVING AN AUXILIARY COMBUSTION CHAMBER WITHOUT AN INTAKE VALVE

Masami Konishi, Toyota; Norihiko Nakamura, Mishima; Tatsuo Kobayashi, and Toyokazu Baika, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 538,405, Jan. 3, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,463

Claims priority, application Japan, Jul. 31, 1974, 49-87802; Jul. 31, 1974, 49-87803; Jul. 31, 1974, 49-87804

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.² F02B *23/00*

U.S. Cl. 123—191 S **4 Claims**

1. An internal combustion engine comprising:

a cylinder;

a cylinder head;

a reciprocable piston snugly received in said cylinder;

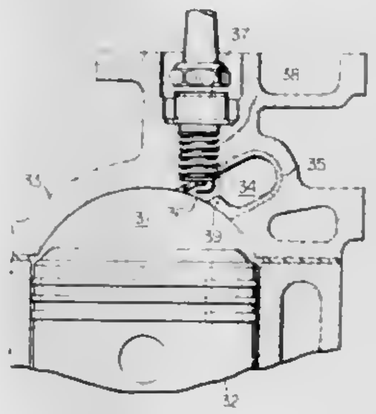
said cylinder head and said piston defining a main combustion chamber therebetween;

means defining a blind hole in said cylinder head, the open end of said blind hole opening into said main combustion chamber and the opposite end of said blind hole most remote from said main combustion chamber being completely closed;

an auxiliary combustion chamber shell defining an auxiliary combustion chamber therein, said shell being pressedly fitted in said blind hole from the main combustion chamber so that the entire exterior surface of the auxiliary combustion chamber shell tightly contacts the wall of the blind hole, said auxiliary combustion chamber having no intake valve;

a passage communicating said auxiliary combustion chamber with said main combustion chamber; and

an ignition spark plug having an electrode positioned in said passage whereby a substantially uniform lean fuel-air mixture, drawn into the main combustion chamber through an intake valve on the intake stroke of the piston, is forced into the auxiliary combustion chamber on the compression stroke of the piston and ignited and burned thereby igniting and burning the lean fuel-air mixture in the main combustion chamber by the torch flame via said passage from the auxiliary combustion chamber.



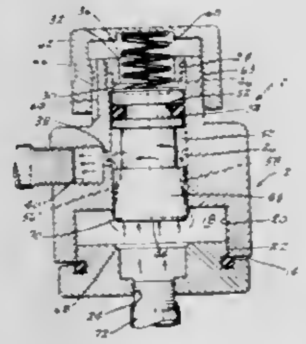
4,108,134
MODULATOR VALVE

Jerry P. Malec, 10524 E. Pine, Tulsa, Okla. 74116

Filed Jun. 25, 1976, Ser. No. 699,937

Int. Cl.² F01M *1/00*

U.S. Cl. 123—196 R **9 Claims**



1. A modulator valve assembly comprising,

a valve body having an elongated bore formed therein having opposite ends, said valve body having a first compartment area formed therein adjacent one end of said bore and communicating therewith,

a fluid inlet opening in said body communicating with said first compartment area,

a fluid discharge opening formed in said valve body communicating with said bore intermediate the ends thereof,

a piston slidably mounted in said bore,

said piston having a first cylindrical portion at one end thereof with a diameter substantially equal to the diameter of said bore, said first cylindrical portion having an end portion positioned adjacent said first compartment area,

said piston having a reduced diameter portion intermediate the ends thereof between said first cylindrical portion and the other end of said piston,

a seal means embracing said piston between said reduced diameter portion and said other end of said piston which sealably and slidably engages the wall surface of said bore,

said piston having at least one elongated metering slot formed in the periphery of said first cylindrical portion, said metering slot having one end thereof spaced from said end portion of said first cylindrical portion and having a second end communicating with said reduced diameter portion, said slot being substantially V-shaped in cross-section and progressively increasing in depth and width from its said one end to its said second end,

said piston being movable in one direction in said bore in response to inlet fluid pressure exerted on said end portion of said first cylindrical portion, said piston being movable between a first position whereby said metering slot communicates with said inlet opening and said first compartment area to a second position whereby said metering slot does not communicate with said fluid inlet opening and said first compartment area, said reduced diameter portion communicating with said fluid discharge opening when said piston is in at least its said first position,

a spring means in said bore normally urging said piston towards its said first position,

and means maintaining said spring means in said bore.

4,108,135

ARRANGEMENT FOR EXTERNAL OILING OF CYLINDER LINERS OF INTERNAL COMBUSTION ENGINES

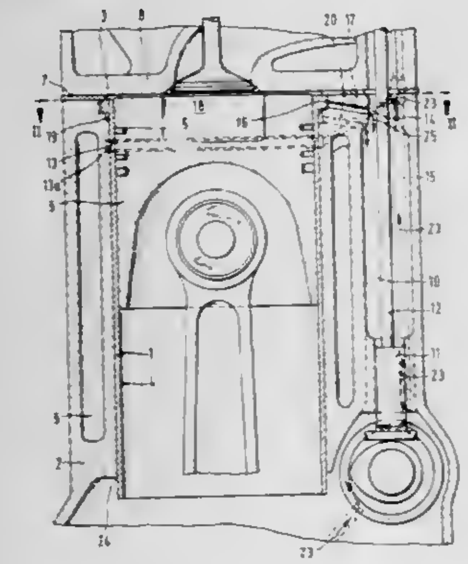
Heribert Kubis, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,884

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621348

Int. Cl.² F01M *1/00*

U.S. Cl. 123—196 R **7 Claims**



1. An internal combustion engine which comprises:

a cylinder block having a bore;

a cylinder head arranged above said cylinder block and connected thereto;

a cylinder liner detachably inserted into said bore so as to form at least a minimal clearance between said cylinder liner and said cylinder block, said cylinder liner having a radially outwardly extending flange provided at the cylinder head end of said cylinder liner;

a piston reciprocably mounted in said cylinder liner, and with said cylinder head defining a combustion chamber, at least one piston ring associated with said piston;

annular chamber means provided in at least one of said cylinder block and said cylinder liner and located therebetween, at least one annular space being formed between said cylinder liner and said cylinder block and being located between said annular chamber means and said cylinder head as close as possible to the latter in order to prevent oil pressure build up between the cylinder liner and the cylinder block;

a feed line communicating with said annular chamber means and adapted to supply oil at a predetermined pressure to said annular chamber means; and

means permitting escape of said oil from said minimal clearance between said cylinder liner and said cylinder block, whereby said oil flows into said annular chamber, slowly seeps downwardly through the clearance between the bore and the cylinder liner in order to prevent fretting corrosion between the innerwall of the cylinder block and the outer surface of the cylinder liner, and flows out through said escape means.

4,108,136

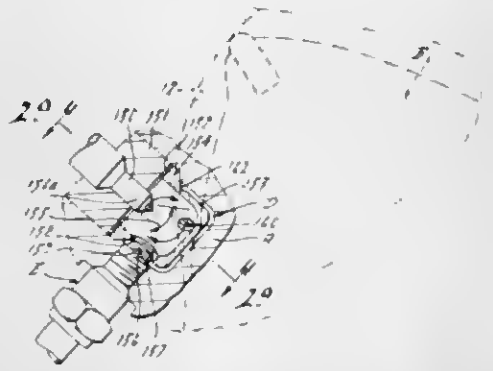
INTERNAL COMBUSTION ENGINE CONTROL SYSTEM

Laszlo Hideg, Dearborn, and Robert P. Ernest, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 636,184, Nov. 28, 1975, Pat. No. 4,060,058. This application May 26, 1976, Ser. No. 691,050

Int. Cl.² F02B *53/10*

U.S. Cl. 123—209 **5 Claims**



1. A prechamber fuel injection system for use in an Otto cycle rotary internal combustion engine having wells defining a main combustion chamber which undergoes rotation and translation, the combination comprising:

(a) a heat conductive thin wall capsule having a generally spherical interior portion and an open end opposite said spherical portion,

(b) means for selectively providing spark ignition within said capsule and having spark ignition electrodes arranged on an axis and with a gap therebetween projecting into said prechamber,

(c) fuel injection means arranged to close the open end of said capsule except for a heat conductive nozzle extending centrally through said closed end, said fuel injection means being effective to inject a conical spray of fuel droplets into said prechamber with the axis and spread of said conical spray arranged to prevent concentrations of droplets throughout said prechamber and to prevent direct contact of droplets with said electrodes,

(d) walls defining an outlet from said capsule through which a gaseous mixture from said main combustion chamber of said engine is introduced to said capsule, said outlet having an axis generally tangent to the spherical interior volume of said capsule to induce toroidal flow upon introduction of said gaseous mixture from said main combustion chamber, the axes of said cone, spark electrodes and outlet are each at generally right angles with respect to each other.

4,108,137

ROTARY PISTON ENGINES

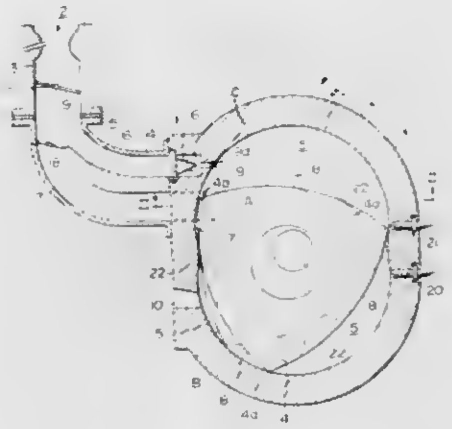
Kenichi Yamamoto; Yutaka Hirose, and Tooru Maeda, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Division of Ser. No. 639,705, Dec. 11, 1975, Pat. No. 4,030,454. This application May 4, 1976, Ser. No. 682,896

Claims priority, application Japan, Feb. 28, 1975, 50/25480; Feb. 28, 1975, 50-25481; Apr. 1, 1975, 50-40032; Sep. 29, 1975, 50-118092

Int. Cl.² F02B *53/06*

U.S. Cl. 123—242 **16 Claims**



1. Rotary piston engines which comprise a casing including a rotor having an inner wall of a multi-lobed trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define therein a cavity of multi-lobed trochoidal configuration and a substantially polygonal rotor disposed in said cavity for rotation with apex portions in sliding engagement with the inner wall of the rotor housing so that working chambers of variable volume are defined between the inner wall of the rotor housing and flanks of the polygonal rotor, first intake port means formed in said rotor housing, second intake port means formed in at least one of said side housings and having an effective area which is larger than that of the first intake port means, first intake passage means connected with the first intake port means, second intake passage means connected with the second intake port means, means for supplying fuel to said first and second intake passage means, throttle valve means provided in said first intake passage means, control valve means provided in said second intake passage means, and control means for closing said control valve means under an engine load below a predetermined value and opening under the engine load beyond said predetermined valve so that the fuel is supplied to said working chamber only through said first intake port means when the engine load is below the predetermined value.

4,108,138

COOKING OVEN AND METHOD OF MANUFACTURE

Christian Petin, 8 The Hemlocks, Roslyn Estates, N.Y. 11576, and Robert Richardson, Glen Head, N.Y., assignors to Christian Petin, Roslyn Estates, N.Y.

Filed Jul. 1, 1976, Ser. No. 701,564

Int. Cl.² A21B *1/28*

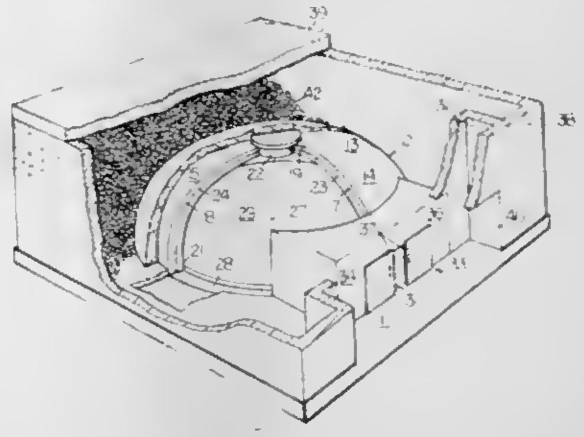
U.S. Cl. 126—19 R **3 Claims**

2. The method of making an oven comprising the steps of:

casting refractory fire-resistant sectors of a hemispherical dome, each sector being defined by a small end and a large end and hemispherically longitudinal edges between the large end and the small end;

casting a substantially flat refractory base to form a cooking surface for simultaneously receiving food to be cooked and burning solid fuel on different areas of the cooking surface;

assembling a plurality of the sectors to form a dome with only a single opening in a limited region of the lower portion thereof adjacent the base, said single opening serving as an access opening for the food and solid fuel and also comprising the only egress opening for the discharge of combustion products from said oven; and



sealing the abutting edges of the sectors together with fire-resistant mortar.

4,108,139

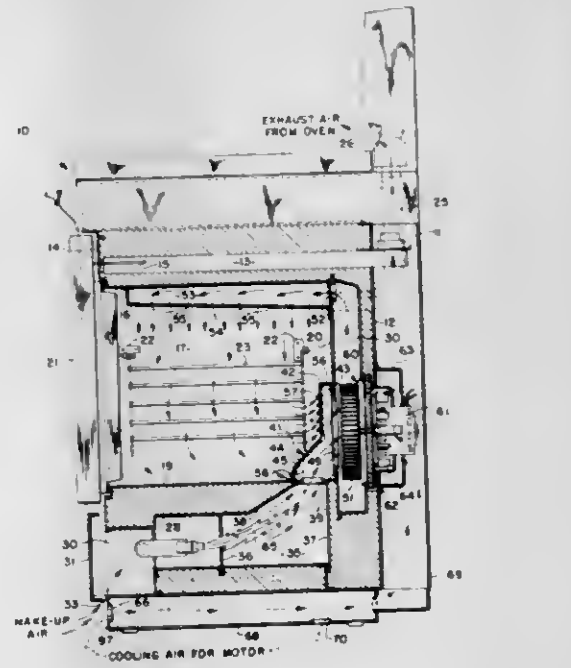
CONVECTION OVEN

John W. Gilliom, and Robert H. McFarland, both of Mansfield, Ohio, assignors to The Tappan Company, Mansfield, Ohio

Filed Apr. 12, 1976, Ser. No. 675,958

Int. Cl.² A21B *1/00;* **F24C** *1/00;* **A23C** *3/00*

U.S. Cl. 126—21 A **31 Claims**



1. In a blower powered convection oven, a blower which receives an outflow of the oven air to be recirculated and an inflow of heated room air for charging the oven, the oven being vented, an air mixing chamber having an inlet portion, a mixing portion and an outlet portion, means providing communication between said outlet portion and the inlet of the blower, means for delivering the oven outflow to the inlet portion of the mixing chamber, and means for delivering the heated room air likewise to said inlet portion, whereby the oven outflow and heated room air are comingled in passage through the mixing portion of the chamber and supplied as a mixture thereof to the inlet of the blower for hot air feed to the oven.

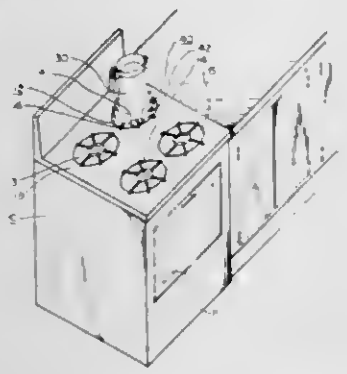
4,108,140

COFFEE POT HOLDER FOR RECREATIONAL VEHICLE STOVE AND THE LIKE

Martin H. Wolze, 3007 Hermosa Ave., La Crescenta, Calif. 91214

Filed Dec. 3, 1976, Ser. No. 747,201
Int. Cl.² F24C *15/10*

U.S. Cl. 126—24 **2 Claims**



1. A pot retainer for cooking stoves comprising an elongated flexible member of sheet metal including a wall portion which is bendable to define a generally tubular shape;

a plurality of leg members extending laterally from said wall portion whereby said leg members define a plurality of outward extending feet for engagement with the periphery of a burner opening in a cooking stove to retain said member in a generally tubular shape and adjacent to said opening;

the spring characteristic of said flexible member tending to return the member to a generally planar position to mechanically bias said feet radially outward against the periphery of said opening;

wherein said leg members are angled inward when said member is in a generally tubular shape, and said feet are angled outward to define a region for locking against the periphery of said burner opening.

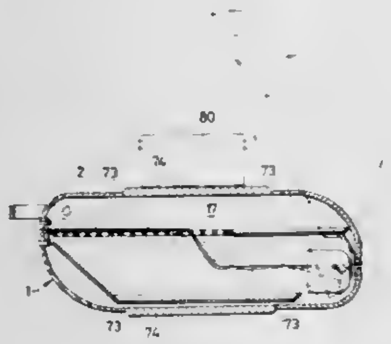
4,108,141

GRILLING APPARATUS

Hans Bauer, Dettiogen, Teck, Germany, assignor to Dietzmentall GmbH & Co. KG., Unterensioger, Germany

Filed May 27, 1976, Ser. No. 690,379
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1975, 7526494[U]; Oct. 24, 1975, 2547585
Int. Cl.² A47J *37/00;* F24B *3/00*

U.S. Cl. 126—41 R **5 Claims**



1. In a grill assembly, a grill tub having a planar lower surface, a heating element disposed in the tub, a hood having a planar upper surface, the hood and tub having identical shapes, means mounting the hood for pivotal movement with respect to the tub between a closed position and at least one open position, the upper surface of the hood exhibiting a first aperture, and a first insert member supported within the first aperture and having a peripheral surface cooperable with the surrounding first aperture to define at least one first circumferential air passage therebetween, the first air passage effecting communication between the outside air and the interior of the assembly when the hood is in the closed position, the hood and the grill tub defining identical axially coextensive unitary housings each having a relatively deep section and an adjacent relatively shallow section, the pivotal mounting means supporting the hood in confronting axially coextensive symmetrical relation with the grill tub when the hood is in its closed position whereby the shallow section of the hood overlies the deep section of the tub and the deep section of the hood overlies the shallow section of the tub to yield a substantially closer contour, the upper surface of the hood conforming to the lower surface of the tub, the shallow section of the tub being disposed rearwardly of the deep section thereof, and the heating element being disposed in the shallow section of the tub and extends above the upper surface of the shallow section of the tub.

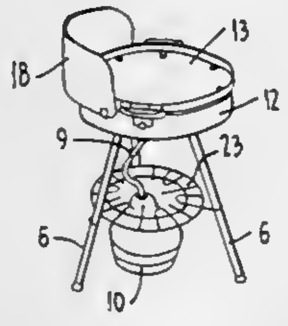
4,108,142

PORTABLE BARBEQUE

Leslie Barson, Ormond, and Frederick Charles Davis, Knoxfield, both of Australia, assignors to Companion Pty. Limited, Australia

Filed Jun. 28, 1976, Ser. No. 700,531
Int. Cl.² A47J *37/00*

U.S. Cl. 126—41 R **11 Claims**



1. A gas fired barbeque comprising a support structure, a hotplate detachably supported on the structure, burner means beneath the hotplate for heating the hotplate, a plurality of apertures in the hotplate spaced around the hotplate at or near its periphery, the apertures being positioned wholly around the hotplate and confined to the periphery, a receptacle beneath the hotplate, the apertures acting to drain fat and other liquids liberated during a cooking operation on the hotplate into said receptacle, clip means associated with the receptacle for removably securing the hotplate to to the receptacle whereby the receptacle can be readily separated from the hotplate for cleaning after use.

4,108,143

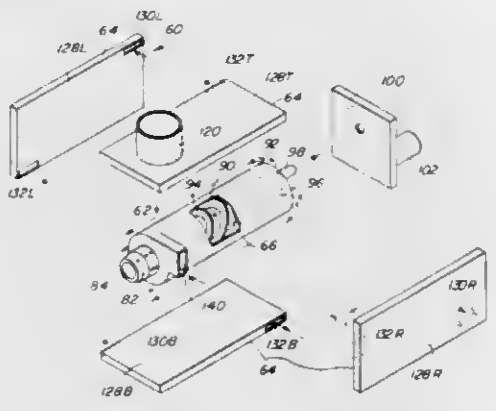
FORCED AIR HEATER BLOWER

Bradley A. Pelsue, Lakewood, and Allan E. Beavers, Littleton, both of Colo., assignors to T.A. Pelsue Company, Englewood, Colo.

Filed Apr. 20, 1977, Ser. No. 789,104
Int. Cl.² F24H *3/06*

U.S. Cl. 126—110 B **12 Claims**

1. A heater blower comprising: a hollow box-like housing having a first partition wall dividing the interior thereof into two separate compartments, air intake means communicating the interior of the first of said two compartments for introducing fresh air therein, a second partition wall dividing the interior of the second of said two compartments into a third and fourth compartment, fan means mounted within an opening in that portion of the first partition wall separating the first and third compartments for bringing fresh air into the latter, a third partition wall dividing the fourth compartment into a combustion air intake chamber and an exhaust chamber, openings in the housing communicating the interiors of both the combustion air intake and exhaust chambers, a combustion chamber located within the third compartment opening into the fourth compartment through the second partition wall, means comprising a burner connectable to a source of fuel located within the fourth compartment in position to direct a flame into the interior of the combustion chamber, a jacket encasing the combustion chamber in heat exchange relation therearound cooperating therewith to define a heat exchanger having an inlet and an outlet sealed against the products of combustion, a serially-connected series of ducts encasing the jacketed combustion chamber so as to define an exhaust passage therebetween having an inlet connected to receive the hot gaseous products of combustion from the combustion chamber and an outlet connected to deliver same to the exhaust chamber, said ducts having an inlet connected to receive fresh air from the fan means and an outlet connected to deliver same to the inlet of the heat exchanger, the portions of said ducts between the inlet and outlet defining a circuitous passage alongside said exhaust passage effective to preheat the fresh air preparatory to delivering same to the heat exchanger, and the interior of said heat exchanger being partitioned to define an extension of said circuitous passage alongside said exhaust passage effective to take the preheated air and further heat same in advance of discharging it from the heat exchanger outlet.



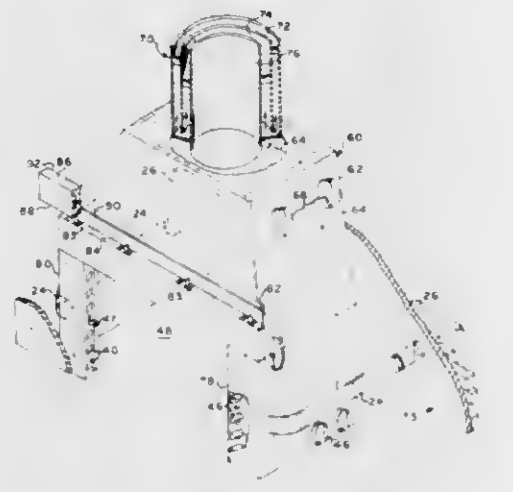
4,108,144

SUPPLEMENTAL AIR SUPPLY FOR A FIREPLACE

Murray O. Wilhoite, Huntsville, Ala., assignor to Martin Industries, Inc., Huntsville, Ala.

Filed Feb. 7, 1977, Ser. No. 766,135
Int. Cl.² F24B *7/00*

U.S. Cl. 126—120 **5 Claims**



1. A fireplace comprising:

a firebox having an open front;

first and second manifolds, said manifolds being positioned on either side of said open front of said firebox;

air inlet means for introducing air into each of said manifolds;

a series of adjustably openable louvered openings on facing sides of said manifolds; and

a plurality of deflectors positioned adjacent to the louvered openings and oriented upward in the direction of air flow out of said manifolds, whereby air is directed from each of said manifolds toward an upper central region of said open front of the fireplace and then into the fireplace.

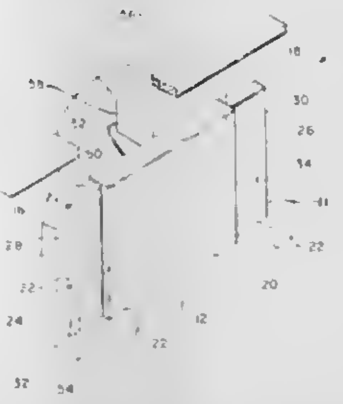
4,108,145

FIREPLACE CLOSURE

Jean M. Klomser, and Jeffrey L. Klomser, both of Rte. 7, Box 128, Chapel Hill, N.C. 27514

Filed May 4, 1977, Ser. No. 793,632
Int. Cl.² F24C *15/10*

U.S. Cl. 126—140 **10 Claims**



1. An adjustable fireplace closure adapted to close various size fireplace openings, said adjustable fireplace closure comprising: a central closure section including an impervious face panel and having an open area formed therein; first and second adjustable side sections operatively associated with said central closure section with each side section including an impervious face panel and movably mounted in the open area of said central closure section and movable from an inner retracted position to an outer extended position with respect to said central closure section, whereby the effective width of said fireplace closure may be adjusted by moving said first and second side sections between said inner and outer positions; and retaining means secured to said fireplace closure and extending therefrom and including means for attachment to a fireplace structure, such that said fireplace closure may be firmly retained adjacent a fireplace opening by attaching said retaining means to a portion of the adjacent fireplace structure.

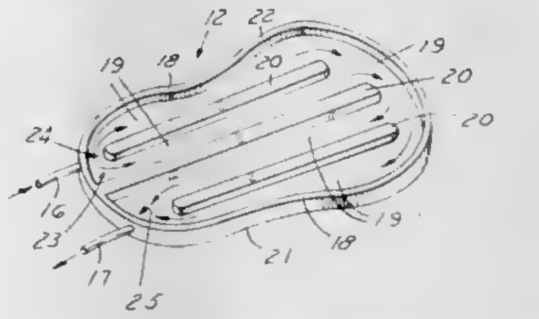
4,108,146

BENDABLE THERMAL PACK UNIT

Theodore Alan Golden, 1063 Ardmore, Birmingham, Mich. 48084

Filed May 16, 1977, Ser. No. 797,029
Int. Cl.² A61F *7/00*

U.S. Cl. 128—400 **10 Claims**



1. A relatively thin bendable thermal pack unit adapted to be molded to conform closely to the contours of a portion of a human body and to retain the molded shape when positioned to circulate a thermal fluid to heat or cool adjacent skin areas

to aid in healing and the like, said thermal pack unit comprising a bendable plastic-like web having at least one channeled space formed in a surface thereof to form a fluid path for the circulation of a thermal fluid, a relatively thin sheet of non-resilient bendable material secured over said channeled surface of said plastic-like web for sealing the top of said channeled space, said relatively thin sheet being bendable to conform to a given contour and adapted to retain that contour to aid in keeping the positioned thermal pack unit in place upon a portion of a human body, and means coupled to outlets in the channeled space for circulating thermal fluid therein to heat or cool areas of the human body adjacent the non-channeled surface of said plastic-like web.

4,108,147

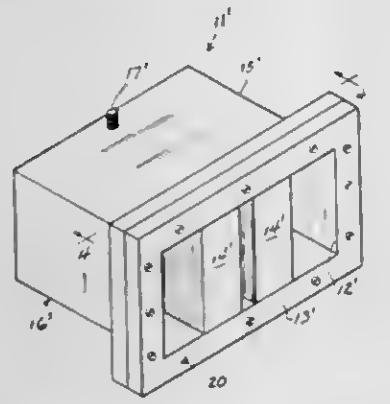
DIRECT CONTACT MICROWAVE DIATHERMY APPLICATOR

Gideon Kantor, Garrett Park, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,590

Int. Cl.^{2} A61N *5/02*

U.S. Cl. 128—404 **10 Claims**



1. A direct contact microwave diathermy applicator comprising a waveguide defining a cavity and having an open front end and vertical walls, a pair of spaced-apart, parallel, tetrafluoroethylene dielectric loading slabs secured in said cavity of said waveguide and extending lengthwise toward said open front end, and means including a connecting terminal positioned substantially symmetrically to connect said waveguide to the output of a microwave diathermy machine, whereby wave propagation is effected in the TEM mode and substantially uniform heating can be effected.

4,108,148

PACER WITH AUTOMATICALLY VARIABLE A-V INTERVAL

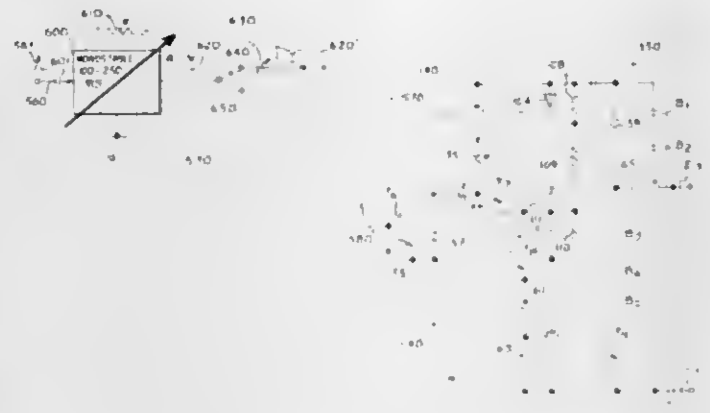
Robert Lee Cannon, III, Waltham, Mass., assignor to Sheldon Thaler, Princeton, N.J.

Filed Nov. 3, 1976, Ser. No. 738,418

Int. Cl.^{2} A61W *1/36*

U.S. Cl. 128—419 PG **7 Claims**

1. In an atrial synchronous device for stimulating the heart of a patient, said device comprising terminal means for connection to said patient's heart, timing means for establishing timing intervals based on a basic interval, pulse generator means for generating a ventricular stimulation impulse on said terminal means at the end of each of said timing intervals to effect a beating action of the ventricle of said heart, first means for detecting the beating action of the atrium of said heart, means responsive to the operation of said first detecting means for generating an A-V interval pulse, said timing means including control means responsive to said A-V interval pulse for varying said timing interval relative to said basic interval within a predetermined range, the completion of a said varied timing interval coinciding with the completion of a respective said A-V interval pulse, and means responsive to at least said ventricular stimulation impulse for resetting said timing means, the improvement wherein said A-V interval pulse generating means comprises means responsive to successively detected beating actions of the atrium of said heart for automatically controlling the interval of the respectively generated A-V interval pulse as a function of the interval between said successively detected atrial beating actions.



4,108,149

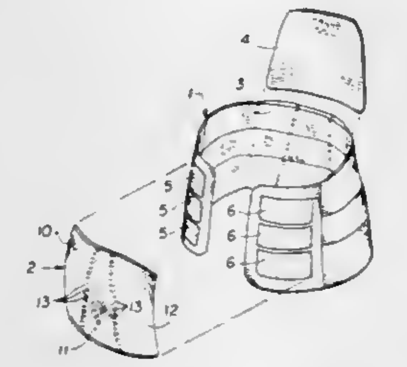
MATERNITY BRACE

Ignatius F. Castiglia, 500 E. 77th St., New York, N.Y. 10021

Filed Jan. 6, 1977, Ser. No. 757,153

Int. Cl.^{2} A41C *1/08*

U.S. Cl. 128—579 R **12 Claims**



1. An appliance for pregnant women, comprising:

a substantially elastic belt-like section having respective free end portions, said elastic section being adapted to extend across a rear body portion of a wearer, and to extend from an upper level in the vicinity of the upper part of the abdomen to a lower level in the vicinity of the lower part of the abdomen of a wearer;

a substantially rigid sheet-like member carried by said substantially elastic belt-like section in a substantially central portion of said substantially elastic belt-like section for engagement against a predetermined portion of the body of a wearer in the vicinity of the lower back of the wearer;

a completely separable inelastic front panel having opposing end portions and dimensioned to overlie and bear against substantially the complete abdomen of a wearer; and

contact-type connecting means including contact-type engagement areas at said opposing end portions of said inelastic front panel and at the free end portions of said substantially elastic belt-like section for continuously adjustably connecting each of said opposing end portions of said inelastic front panel to a respective free end portion of said substantially elastic belt-like section at a continuously variable plurality of positions relative to said free end portions with said end portions of said inelastic front panel always in overlying contact with their respective free end portion of said substantially elastic belt-like section to substantially prevent horizontal and vertical relative movement therebetween at the contact areas so that said inelastic front panel is substantially symmetrically locatable relative to said substantially elastic belt-like section at a plurality of orientations with said inelastic front panel overlying and elastically biased against substantially the complete abdominal area of the body of a wearer and so that said appliance is continuously adjustable to different sizes and different orientations of said front panel to accommodate growth of the abdominal area of a pregnant woman.

4,108,150

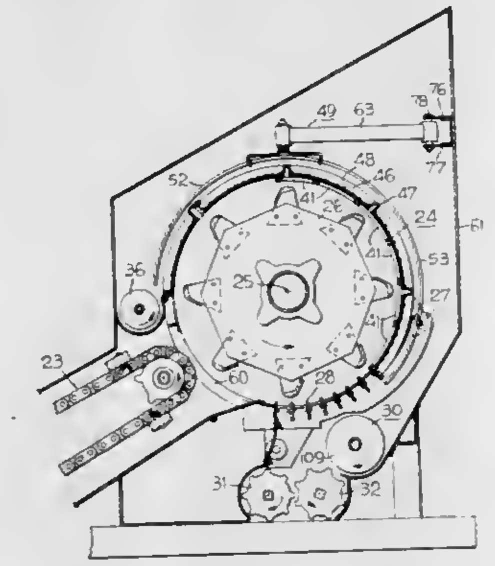
AGITATOR FOR AN AXIAL FLOW CYLINDER

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 23, 1977, Ser. No. 780,532

Int. Cl.^{2} A01D *41/12*

U.S. Cl. 130—27 H **8 Claims**



1. In a combine the combination comprising:

a frame;

a horizontally disposed threshing cylinder mounted on said frame for rotation about an axis,

a cylindrical cage secured to said frame in surrounding relation to said threshing cylinder having radial openings circumferentially thereabout permitting egress of threshed material,

means causing axial flow of material from one axial end of said cage to the other as said threshing cylinder is rotated, and

an agitator mechanism including spaced mechanical fingers adjacent the top exterior of said cage and drive means oscillating said fingers to disturb accumulation of material on the top side of said cage.

4,108,151

GAMMA ALUMINA FILLED PAPER WRAPPER FOR SMOKING ARTICLES

R. Hugo Martin, and William F. Owens, Jr., both of Pisgah Forest, N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Continuation of Ser. No. 639,293, Dec. 10, 1975, abandoned. This application Mar. 10, 1977, Ser. No. 776,183

Int. Cl.^{2} A24D *1/02*

U.S. Cl. 131—9 **4 Claims**

1. A combustible cigarette paper that is effective in selectively reducing the vapor phase constituents in tobacco smoke, comprising cellulose fibers and a gamma alumina filler, substantially free of other crystalline forms of alumina said cigarette paper containing from 50 to 80% of said gamma alumina filler based on the weight of the filled paper, said gamma alumina filler pulverized to pass through a 300-mesh screen.

4,108,152

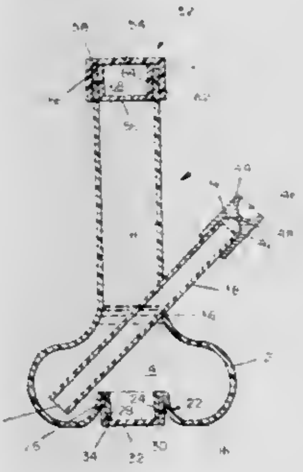
STORAGE COMPARTMENT CAP FOR LIQUID-FILTERED SMOKING DEVICE

Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Continuation-in-part of Ser. No. 699,372, Jun. 24, 1976, which is a continuation-in-part of Ser. No. 509,941, Sep. 27, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,270

Int. Cl.^{2} A24B *5/04. 5/08;* **A24F** *1/02. 1/30*

U.S. Cl. 131—173 **5 Claims**



1. In a smoking device having

a container for housing a volume of fluid and including means defining a first opening therein;

means defining a second opening within said container;

tubular means open at both ends thereof, inserted through said second opening means such that one end of said tubular means is immersed within said volume of fluid while the other end thereof projects outwardly of said container;

smoking bowl means, for housing a predetermined volume of tobacco, mounted upon said other end of said tubular means and fluidically connected to said tubular means,

the improvement comprising a cap means removably mounted upon said container so as to cover and seal said first opening, said cap comprising:

a first cup member having a substantially inverted U-shaped configuration;

a second cup member having a substantially U-shaped configuration, disposed interiorly of said first cup member, said cup members defining said storage compartment therebetween;

said second cup member having a flange formed about the upper, external periphery thereof; and

said flange being in contact with the interior wall of said first cup member so as to separate the outer peripheral wall of said second member from the interior wall of said first member and thereby define an annular space therebetween for accommodating said container means defining said first opening.

4,108,153

QUICK EXTINGUISHING ASH TRAY

Edward K. Pearson, Cold Spring Harbor, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,426

Int. Cl.^{2} A24F *13/18, 19/14*

U.S. Cl. 131—235 R **4 Claims**

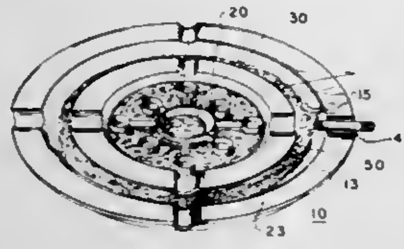
1. An ash tray formed of

an outer circular tray

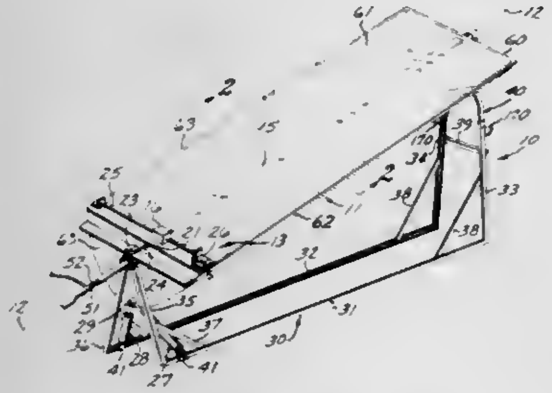
an inner circular tray and

a bracket fitted inside the inner circular tray, in which

the inner tray rests on the base of the outer tray, being positioned in place by upraised detent means on said base, said detent means located to provide an annular recess between the external walls of the inner and outer tray, with said bracket formed of a central open ring member joined to outward radially projecting spokes, with each spoke terminating in an open ring, said bracket fixed to the side of the inner tray and positioned above the base of said inner tray.



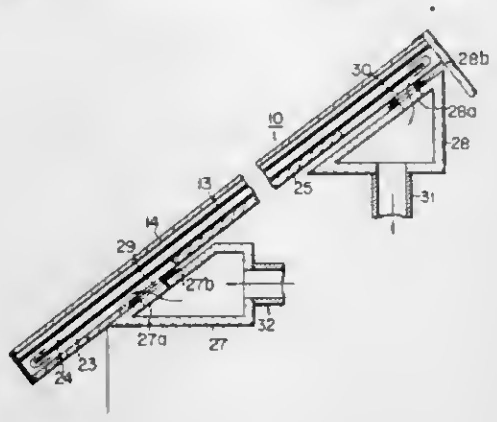
4,108,154
SOLAR ENERGY COLLECTION SYSTEM
David H. Nelson, Twentynine Palms, Calif., assignor to Homer Van Dyke; Mark Dorian; Dave Van Dyke and George Lerg, part interest to each
Filed Nov. 22, 1976, Ser. No. 744,290
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **31 Claims**



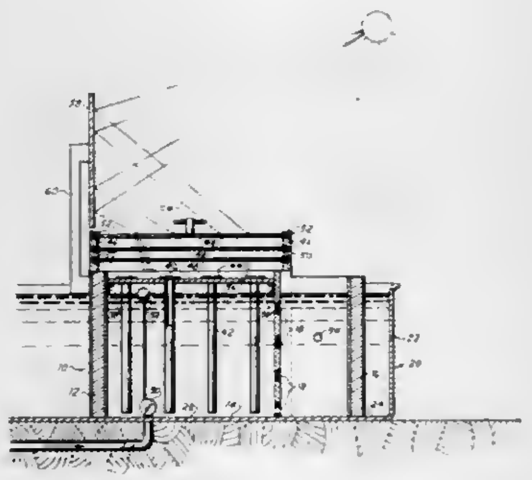
1. In a solar energy collection mechanism in which a solar collector or a reflector trough is mounted upon a support to rotate about an axis under the control of a drive mechanism, thereby varying the elevation of the center of gravity of said collector or trough, to maintain reflected rays of the sun in focus on a solar energy collection means, the improvement comprising a transverse guide, "a counterweight mounted on said collector or trough and laterally movable along said transverse guide relative to said collector or trough to maintain said collector or trough in stabilized" gravitational equilibrium, and damping means connected between said solar collector or said reflector trough and said support to inhibit spurious rotation of said mechanism.

4,108,155
HOT AIR TYPE SOLAR HEAT-COLLECTING APPARATUS
Hisao Koizumi, Zushi; Yoshinosuke Kawada, Yokohama, and Sadao Fujimura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd. and Toshiba House Living Industry Co., Ltd., both of Tokyo, Japan
Filed Dec. 23, 1976, Ser. No. 753,825
Claims priority, application Japan, Dec. 26, 1975, 50-158589
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **12 Claims**

1. A hot air type solar heat-collecting apparatus which comprises a base; a pair of parallel-extending plenum ducts which are supported on the base and lie on the same inclined plane of the roofing of a dwelling and whose upper walls are respectively provided with a plurality of openings formed at predetermined intervals along the lengthwise direction of said plenum ducts; at least one solar heating-collecting unit which extends over the upper walls of both plenum ducts and is provided with an inlet and outlet facing the respective openings of the plenum ducts; and packing means provided between the upper walls of both plenum ducts on one hand and the inlet and outlet of the respective solar heat-collecting unit on the other wherein said packing means has first elastic packing members each so disposed on the upper wall of each of the plenum ducts as to surround the openings of each duct and second elastic packing members each so disposed on the lower surface of each solar heat-collecting unit so as to surround the inlet and outlet of the respective solar heat-collecting units, the first packing and second packing members being engaged to thereby provide a frictional engagement between the plenum ducts and the respective solar heat-collecting unit and an air-tight communication between the openings of the plenum ducts and the inlet and outlet of the respective solar heat-collecting unit.



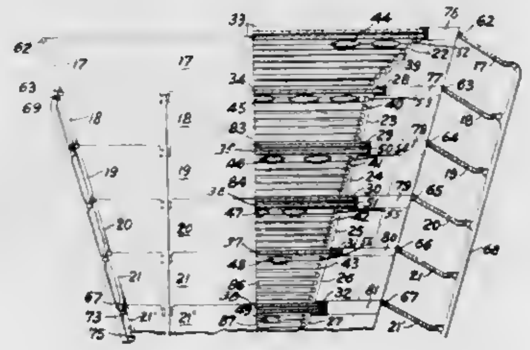
4,108,156
SOLAR-HEATED STOCK TANK
Spencer B. Sitter, Santa Fe, N. Mex., assignor to Jay Taylor, Amarillo, Tex.
Filed Mar. 2, 1977, Ser. No. 773,486
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **36 Claims**



1. In a water tank for livestock having
a. a tank body with
 (i) a tank floor and
 (ii) at least one insulated tank wall,
b. said tank body enclosing a tank volume,
c. water within said tank body,

The method of maintaining a stock tank free of ice comprising in combination with the above:
d. permitting sunlight to shine through a transparent covering, thereby
e. heating the volume of air and water beneath said transparent covering, and
f. retaining the heat energy within said volume by trapping said air beneath said transparent covering within said tank volume, thereby
g. producing a "hothouse" effect within said tank volume, thereby
h. heating said water to a temperature above that at which water freezes,
j. conducting water from the tank body to a drinking vessel for livestock to drink from, and
k. heating the water in the drinking vessel by convection heating from the tank body.

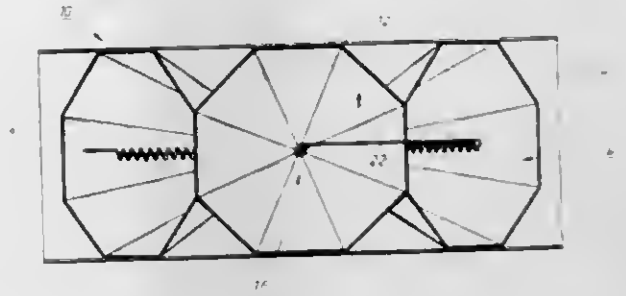
4,108,157
SOLAR ENERGY COLLECTOR
Jerry Gorniak, 2317 E. 43rd St., Erie, Pa. 16510
Continuation-in-part of Ser. No. 577,259, Jul. 13, 1975, Pat. No. 4,029,077. This application Mar. 18, 1977, Ser. No. 779,079
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **3 Claims**



1. A solar collector comprising a fluid path for a liquid having a plurality of turns disposed generally in a hollow pyramidal body,
a plurality of storage tanks,
a plurality of first lenses,
a first sheet means supporting said lenses,
said first lenses having spaced from them a first fluid path for liquid,
said first fluid path for liquid being disposed a distance from said lenses a distance substantially equal to the focal length of said first lenses,
means to conduct said liquid from said fluid path to a heat battery,
said fluid path comprising a first coil of tubing,
a second sheet of rigid material disposed generally parallel to said first sheet,
and a third sheet of rigid material spaced from said second sheet generally parallel to said first sheet of material supporting a sheet of water,
a plurality of second lenses fixed to said second sheet of material to the underside thereof,
and second lenses being spaced from said sheet of water a distance substantially equal to the focal length of said second lenses,
a plurality of louvers,
hinge means swingably supporting said louvers on said body, and means for opening and closing said louvers.

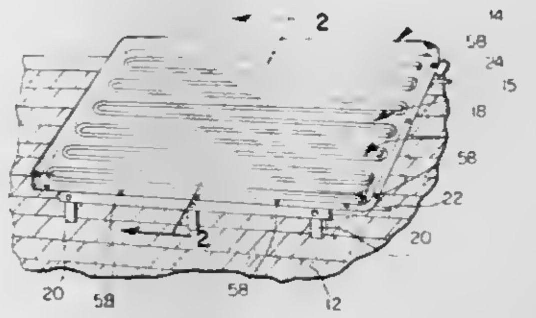
4,108,158
SOLAR ENERGY POWERED HEAT GENERATOR
Aloysius C. Kracklauer, Conroe, Tex., assignor to Sparkler Filters, Inc., Conroe, Tex.
Filed Mar. 28, 1977, Ser. No. 781,982
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **3 Claims**

1. A solar energy powered heat generator comprising:
(a) a housing;
(b) a plurality of continuously disposed, conical shaped collecting structures supported within said housing, each of said collecting structures defined by a plurality of triangular-shaped glass mirrors interconnected in a single row in a configuration to provide a common junction of the respective corners of the mirrors and to provide an open face directed for receiving solar energy, the open face being defined by respective sides of the mirrors and the common junction being defined by the corners of the mirrors opposite the respective faces; and



(c) a plurality of elongated heat transfer structures supported within the respecting collecting structures, said heat transfer structures including a plurality of serially connected, segments of coiled tubing extending radially from said common junction and substantially centrally within the respective collecting structure.

4,108,159
SOLAR COLLECTOR
Ion L. Wendel, St. Petersburg, Fla., assignor to James L. Lowe, St. Petersburg, Fla.
Continuation-in-part of Ser. No. 596,513, Jul. 16, 1975, abandoned. This application May 16, 1977, Ser. No. 797,468
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **21 Claims**

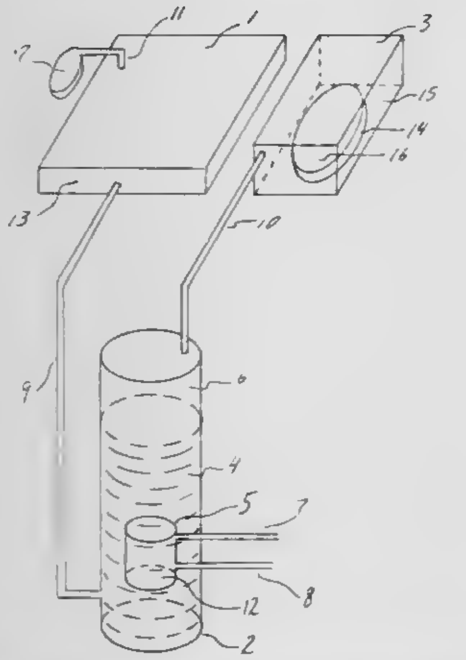


1. A heat pan and tube type solar collector comprising, a heat plate of self-supporting, substantially rigid material having an upper face and peripheral edge portions substantially coplanar with said face, tube means extending along and fixed to said face in heat transfer relationship therewith for circulation through said tube means of a fluid to be heated; and a solar energy transmitting cover having a top spaced from and extending across said face and said tube means and having side means depending from said top to said peripheral edge portions of the plate for passage of solar energy through said top and side means of the cover to the heat plate and tube means, and means fixing said cover directly to said heat plate.

4,108,160
SOLAR WATER HEATING APPARATUS
William Anthony Harper, 7727 Baseline Rd., Boulder, Colo. 80303
Filed Jun. 21, 1977, Ser. No. 808,716
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**

1. Apparatus for transducing solar energy into direct presurized fluid control and transfer of a heat absorbent transport medium used in a domestic hot water system, comprising:
a substantially inflexible fluid-tight solar heat collector of predetermined dimensions;

a first fluid volumetrically confined in said collector, said first fluid having a phase transition temperature beyond the predetermined range developed by said collector;
means providing for the pressurized transfer of a predetermined portion of said first fluid beyond said collector;
a second fluid volumetrically confined within said collector, said second fluid having a predetermined vaporization phase transition temperature point within the predetermined range developed by said collector; and,
means of transporting a heat absorbent medium between a heat exchange means and a solar heat collecting means which respones to said pressurized first fluid as developed by the solar heat induced phase transition of said second fluid.



4,108,161
GRAFT FORMING DEVICE

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039

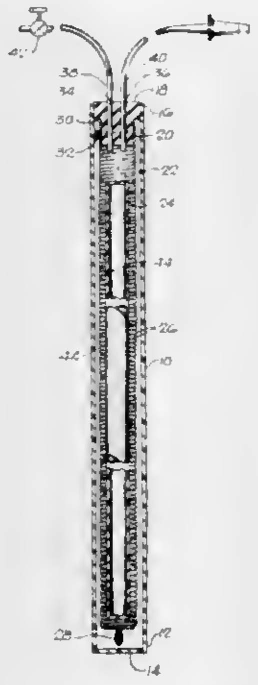
Continuation-in-part of Ser. No. 626,070, Oct. 28, 1975. This application Nov. 8, 1976, Ser. No. 739,650

The portion of the term of this patent subsequent to Dec. 6, 1994, has beeo disclaimed.

Int. Cl.² A61B *19/02*

U.S. Cl. 128—1 R **10 Claims**

1. A device for use in the preparation of a graft for blood vessels comprising a hollow tubular member formed of a fluid impervious material and open at one end, a removable closure adapted to engage the open end of the tubular member in sealing relation, an elongate flexible porous base member suspended from the closure into the hollow tubular member, said porous base member being dimensioned in the crosswise direction to be less than that of the hollow tubular member to provide a spaced relation between the porous base member and the inner wall of the tubular member, said porous base member having axially spaced corrugations to enable the base member to be stretched in the axial direction and bendable in all of the directions without collapse, a passage through said removable closure for insertion of a member connecting the interior of the hollow tubular member with a source of blood, and another sealable passage communicating with the interior of the hollow tubular member for the removal of gases from within the tubular member co-incident with the introduction of blood therein.



4,108,162
TWISTED WIRE BRUSH WITH THREADED ASSEMBLY FOR COLLECTING CELLS

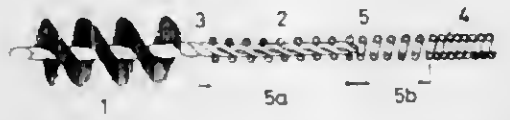
Kiyoshi Chikasbige, 946-2, Otagaya, Tsurugashima-machi, Iruma-gun, Saitama, and Teruo Ohuchi, No. 13-10, Kamifukuoka 4-chome, Kamifukuoka-shi, Saitama, botb of Japan

Filed Dec. 21, 1976, Ser. No. 753,073

Claims priority, application Japan, Dec. 28, 1975, 50-158463

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 B **7 Claims**



1. A brush for collecting cells for examination, comprising; a twisted wire root portion having hairy materials extending radially outwardly from an end portion thereof, said materials being held between two twisted wires of said root portion; and an elongated flexible wire winding having a tip portion threadingly engaging said twisted wire root portion, the pitch of said tip portion being greater than the pitch of a remaining portion of said winding such that the lay of said wire root portion matches the pitch of said tip portion.

4,108,163
PUNCTURE PROBE FOR MEASURING HEAT TRANSFER OR BLOOD CIRCULATION OF LIVING TISSUES

Wolfgang Fleckenstein, and Volker Thiemann, both of Kiel, Germany, assignors to Drägerwerk Aktieogesellschaft, Lübeck, Germany

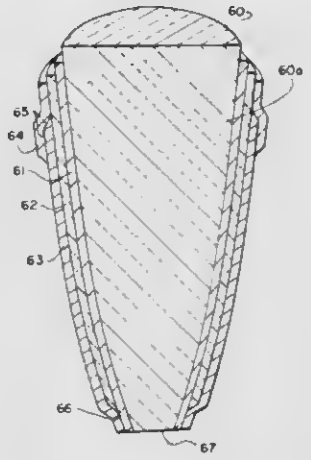
Filed Nov. 4, 1976, Ser. No. 738,826

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549559

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 H **11 Claims**

1. A puncture probe for measuring heat transfer or blood circulation of living tissues, particularly in man, comprising a probe support having a tip, first and second oppositely connected thermocouples each formed of an outwardly extending layer of a thermoelectric material and of a common connecting layer of a different thermoelectric material, one of said thermocouples being heated and arranged in the range of said probe tip, the other of said thermocouples being unheated and arranged at a spaced location on said probe support, said first thermocouple having an outwardly extending layer arranged in the vicinity of said tip and a connecting layer comprising a plurality of superposed thin conductor films separated by insulating thin films except in an area forming a contact zone between said conductive films on the surface of said support probe, said second thermocouple having an outwardly extending layer comprising a thin conductive film contacting said connecting layer.



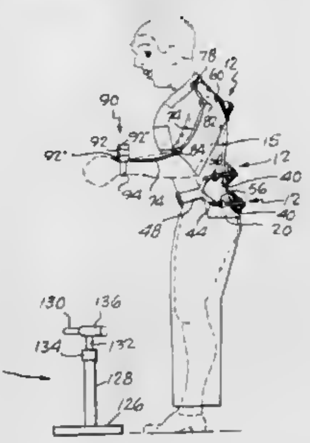
4,108,164
STANDARD BENDING PROFILE JACKET

Henry W. Hall, Sr., 941 Avon Rd., West Palm Beach, Fla. 33401

Filed Oct. 1, 1976, Ser. No. 728,632

Int. Cl.² A61B *5/10*

U.S. Cl. 128—25 **26 Claims**



17. The apparatus as set forth in claim **16**, wherein said supporting means further comprises a third elastic strap which traverses the thoracic portion of the spine, a third potentiometer means being connected thereto.

4,108,165
TRANSDUCER PROBE FOR PULSE-ECHO ULTRASONIC EXPLORATION

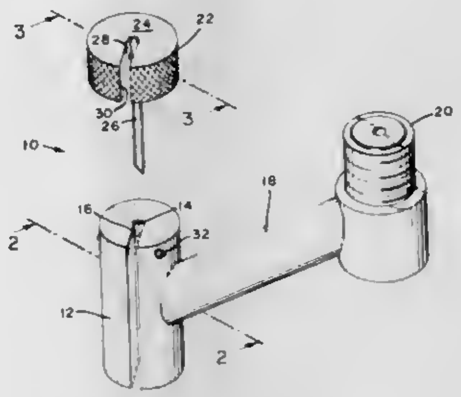
Edward L. Kopp, Centre Hall; Paul A. Meyer, and James N. Sabol, botb of Lewistown, all of Pa., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Jun. 20, 1977, Ser. No. 808,066

Int. Cl.² A61B *5/10*

U.S. Cl. 128—2 V **10 Claims**

1. A transducer probe for pulse-echo ultrasonic exploration of a biological body comprising in combination a housing, a piezoelectric wafer disposed in said housing and adapted to be acoustically coupled to said body, electrical connections coupled to said wafer for applying electrical pulse signals to said wafer and providing electrical signals responsive to acoustic echo signals received by said wafer, a backing layer contacting one side of said wafer for damping acoustic energy received by said wafer, a bore disposed substantially centrally through the thickness of said wafer and extending through said backing layer and housing, and a radial slot extending from said bore to the periphery of said housing wherein the improvement comprises:



cap means having a depending stem adapted to extend into said bore coupled to said housing for rotation with respect to said housing; said cap means and stem having aligned radial slots for providing when said cap means is rotated on said housing to cause the slot of said cap means and of said stem to be out of registry with respect to the slot in said housing a bore which encircles a surgical instrument inserted into the bore, and for providing when said respective slots are in registry a radial slot for removing said transducer probe in a lateral direction from around said instrument.

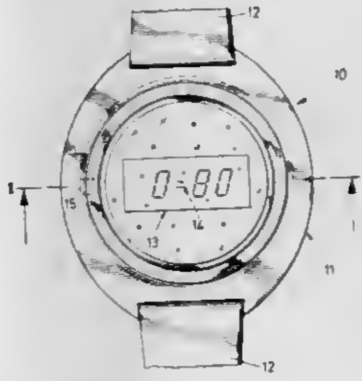
4,108,166
CARDIAC FREQUENCY MEASURING INSTRUMENT

Walter Scbmid, Babnhofstrasse 7 - 9, D 8870 Günzburg, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 687,708

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.06 F **14 Claims**



1. A cardiac frequency measuring instrument including a minaturized digital circuit frequency measuring device adapted to be carried on the arm of a patient, measuring electrodes adapted to be attached to the body of the patient for generating an electrical signal in response to the heart beat frequency of the patient, a cable for carrying electrical signals generated by said electrodes connecting the frequency measuring device with said measuring electrodes carried on the body, an optical display electrically coupled to said frequency measuring device for visually displaying the frequency measured by said frequency measuring device and corresponding to the heart beat frequency of the patient, and a housing means having the size of a wrist watch for containing said frequency

measuring device and said optical display, said cardiac frequency measuring instrument requiring relatively low electrical power consumption for digital measurement and display of the cardiac frequency, said frequency measuring device including a resonant amplifier, connected as a high pass filter, for automatically suppressing the amplification and display of motional artifacts, thereby reducing error between the displayed heart beat frequency and the actual heart beat frequency; said cardiac frequency measuring instrument including a standby means for assuming a standby configuration having a power consumption only a fraction of the normal power consumption, said standby means being responsive to an absence of electrical signals representing the heart beat frequency so that said cardiac frequency measuring instrument automatically assumes said standby configuration whenever there is an absence of electrical signals representing the heart beat frequency from said measuring electrodes for a predetermined time interval.

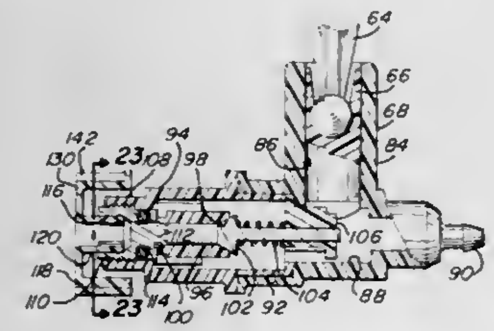
4,108,167
DENTAL SYRINGE

Clarence J. Hickman; Donald W. Ruehmann, and Christopher W. Elkins, all of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Jan. 31, 1977, Ser. No. 764,280

Int. Cl.² A61H *9/00*

U.S. Cl. 128—66 **12 Claims**



2. In a device which includes a supply of liquid, a pump for propelling said liquid, means for delivering the propelled liquid to a point of use and a control for adjusting the pressure of the delivered liquid, the improvement comprising:

said control including a passage through which said liquid is propelled by action of said pump, a bypass for said passage and a valve for adjustably throttling the amount of said liquid conducted in said bypass;

said valve including a rotatable stem carried within a sleeve having means defining a pair of stops circumferentially displaced around the axis of said sleeve, and said stem having a cylindrical surface concentric with said axis;

a control knob having a pair of radial abutments respectively cooperative with said stops to limit rotation of said knob around said axis between corresponding positions of high and low pressure of the propelled liquid outletting said pump;

said knob also including a tube engageable concentrically with said cylindrical surface and fixedly secured thereto during assembly when one of said stops is engaged with one of said abutments while said stem is at one limit of rotation.

4,108,168
HIP SPLINT DEVICE

William A. Craig, 326 Viewcrest Rd., Glendale, Calif. 91202

Filed Feb. 10, 1977, Ser. No. 767,350

Int. Cl.² A61F *3/00*

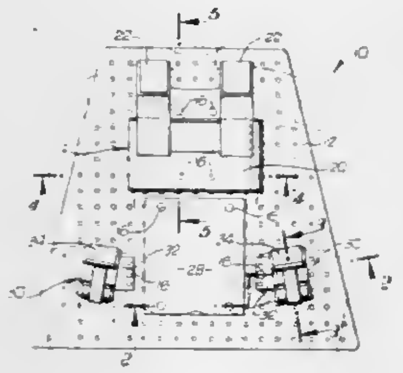
U.S. Cl. 128—80 A **9 Claims**

1. A hip splint device for maintaining hip flexion above 90° in the treatment of congenital hip conditions in small children comprising:

a planar support member;

adjustable shoulder harness means removably mounted on the upper portion of said back support member;

a pair of spaced thigh cuff anchoring members mounted on said back support member below said shoulder harness means, each of said thigh cuff anchoring members including a loop member; and



a pair of thigh cuff members each pivotally mounted to each of said loop members of said thigh cuff anchoring members and having fastening means, said thigh cuff members being adapted to maintain hip flexion of a child's hips above 90°.

4,108,169
HARDENABLE SHEET MATERIALS FOR SURGICAL SPLINTS

Robert Sydney Richard Parker, Little Hallingbury, near Bishop's Stortford, England, assignor to National Research Development Corporation, England

Division of Ser. No. 525,731, Nov. 21, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 701,608

Claims priority, application United Kingdom, Nov. 29, 1973, 55471/73

Int. Cl.² A61F *5/04*

U.S. Cl. 128—89 R **57 Claims**

1. A surgical splint comprising a flexible web and a poly(carboxylate)cement, said poly(carboxylate)cement having been formed by addition of water to a water-hardenable sheet comprising said flexible web having adhered thereto a cement-forming material, said cement-forming material comprising a water-soluble poly(carboxylic acid) or a precursor thereof that forms a poly(carboxylic acid) on contact with water and an ion-leachable inorganic particulate material which together form a cement upon contact with water.

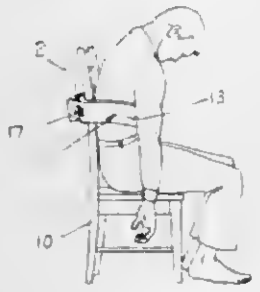
4,108,170
PATIENT SUPPORT STRAP

Donald C. Spann, 5 Fernwood Ct., Greenville, S.C. 29607

Filed Mar. 24, 1977, Ser. No. 780,762

Int. Cl.² A61F *13/00*

U.S. Cl. 128—134 **1 Claim**



1. A support strap as for a seated patient to prevent slumping of the patient as when losing consciousness consisting essentially of:

an elongated strap constructed of synthetic foam material;

said strap being of substantially rectangular cross-section and having opposed faces of a width on the order of about three inches and opposed edges of a thickness on the order of about one inch;

the length of said strap being sufficient to pass about a chair and the girth of the patient;

a length of Velcro fastener hook tape secured on one of said faces adjacent an end of said strap;

a length of Velcro fastener loop tape secured on the other of said faces adjacent the other end of said strap; and

said Velcro fastener tapes being of sufficient length to afford adjustability to said support strap when joined to accommodate a variety of patients and chairs;

whereby an extensive area of support contact with the patient is provided together with limited yieldability.

4,108,171
BREATHING APPARATUS

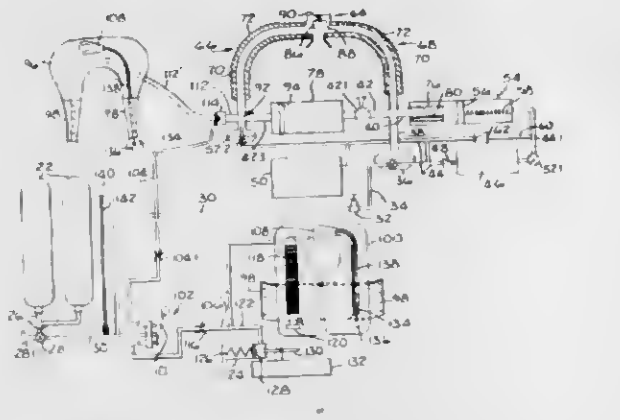
Roland John Nyman, 59, 16th St., Parkhurst, Johannesburg, Transvaal Province, and Johann George van der Walt, 74 Rose St., Riviera, Pretoria, Transvaal Province, both of South Africa

Filed Jun. 9, 1976, Ser. No. 694,451

Claims priority, application South Africa, Jun. 11, 1975, 75/3762

Int. Cl.² A62B *7/00*

U.S. Cl. 128—142.2 **12 Claims**



1. Breathing apparatus comprising:

(a) a source of breathing mixture;

(b) inlet means for inhalation of said breathing mixture to a user and outlet means for recovering exhalation from a user;

(c) a variable volume chamber communicating with said outlet means for receiving a portion of said each exhalation;

(d) first flow path means from said variable volume chamber to said inlet means for returning said portion of each exhalation to said inlet means for rebreathing;

(e) means for discharging from the apparatus the remainder of each exhalation;

(f) normally closed valve means of the demand type having an outlet communicating with said inlet means and an inlet and including means responsive to pressure at said inlet means for opening said valve upon the user of the apparatus inhaling;

(g) a first reservoir;

(h) a second reservoir having an inlet and an outlet;

(i) second flow path means connecting said source of breathing mixture with said first reservoir and said inlet of said second reservoir;

(j) valve means in said second flow path means for providing flow of said breathing mixture from said source to said first and second reservoirs only during exhalation by the user;

(k) non-return valve means in said second flow path means adjacent said inlet of said second reservoir preventing flow therefrom;

(l) third flow path means connecting said outlet of said second reservoir with said first reservoir and said inlet of said normally closed valve means and including further non-return valve means between said first and second reservoirs permitting flow from said second reservoir towards said first reservoir;

(m) further normally closed valve means in said third flow path means between said outlet of said second reservoir and said further non-return valve means and arranged to be opened by said means responsive to said pressure at said inlet means upon the user of the apparatus inhaling;

(n) pressure detecting means for sensing pressure in said first and second reservoirs; and

(o) stop means including means responsive to said pressure detecting means for limiting the maximum volume to which said variable volume chamber can expand during exhalation in dependence on the detected magnitude of the sensed pressure in said first and second reservoirs at the end of the preceding inhalation;

(p) whereby the volume of exhaled breathing mixture which said variable volume chamber retains is dependent upon the volume of breathing mixture inhaled.

4,108,172
CARBON DIOXIDE ABSORPTION CANISTER FOR USE WITH ANALGESIA EQUIPMENT

George B. Moore, Jr., 23203 56th W., Mountlake Terrace, Wash. 98043

Continuation of Ser. No. 616,857, Sep. 25, 1975, abandoned. This application Jun. 14, 1977, Ser. No. 806,446

Int. Cl.² A61M *16/00*

U.S. Cl. 128—188 **14 Claims**

1. In an apparatus for administering a gaseous anesthetic to a patient including a gas supply machine for metering selected amounts of anesthetic gas, a mask for supplying said gas to a patient, said mask having an inlet and an outlet, an inhalation conduit coupled to the inlet of said mask and operatively coupled to receive gas from said gas machine, and an exhalation conduit coupled to the outlet of said mask, an improved carbon dioxide absorption canister operatively coupled to said inhalation and exhalation conduits comprising:

a container having a side wall, a bottom wall, and an open top, said side wall and said bottom wall defining a cavity therein for holding medium to absorb carbon dioxide from gas present within said cavity, said side wall and said bottom wall of said container being composed of a transparent, resinous material, said bottom wall having a well therein extending downwardly from the inside surface of said bottom wall outwardly toward the outside surface of said bottom wall and terminating short thereof, said bottom wall further including a bore communicating between said well and the exterior of said bottom wall,

a first check valve having an annular body positioned in said well and extending upwardly from the inside surface of said bottom wall, said first check valve including means for admitting gas into said cavity through said bore and for preventing gas from escaping from said bore, said check valve being constructed so that the operation thereof can be visually monitored through the walls of said container,

first fitting means associated with the bore on the bottom of the container for operatively coupling said exhalation conduit to the bore on the bottom of said container,

a lid for covering the open top of said container, said lid having an outlet therein,

means for securing said lid to said container,

means associated with said lid and said container for forming a fluid-tight seal therebetween when said lid is covering the open top of said container,

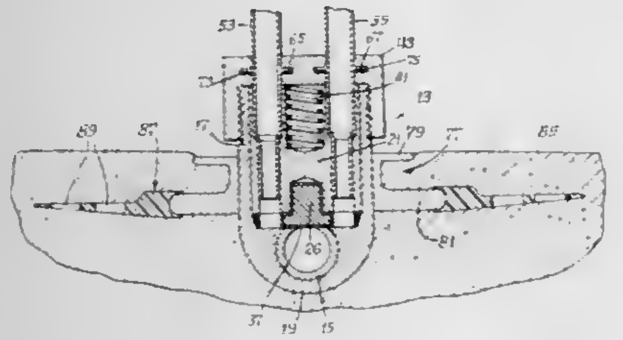
a second check valve positioned in the outlet in said lid, said second check valve including means for allowing gas to escape from said cavity through said outlet and for preventing gas from entering said outlet, said container, said lid and said first and second check valves cooperating to define a unidirectional fluid path from said first fitting means, through said cavity, and to said outlet, and,

second fitting means associated with the outlet on said lid for operatively coupling said outlet to said inhalation conduit and to said gas machine.

4,108,173
BLOOD ACCESS DEVICE

Victor Slivenko, San Diego, and Michael R. Emken, Encinitas, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Apr. 11, 1977, Ser. No. 786,499
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—214 R **9 Claims**

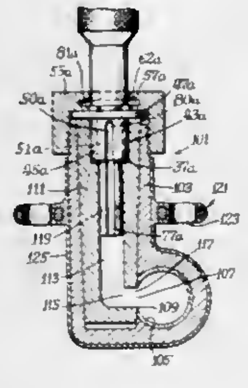


1. A device to provide access to the circulatory system of a living body for simultaneous withdrawal from and return of blood to the system comprising a tubular conduit of generally circular cross section insertable in a living blood vessel; a generally cylindrical housing having one closed end and extending transversely of and adjoining said conduit at the closed end, the point of adjoining being centered with respect to the closed end of said housing such that the axes of the conduit and the housing form a right angle between them and intersect one another, the wall of said conduit intersecting said housing at said point of adjoining and said housing having a length sufficient to extend from the blood vessel to a point outside the living body; an aperture in the conduit wall at the point of intersection of said conduit with said housing to provide fluid communication between the two; a valve body in said housing, said valve body having therethrough a pair of spaced apart longitudinal passages located to be alignable with said aperture at a given rotative position of said valve body, said valve body being adapted to receive a catheter tip in each of said longitudinal passages and in fluid communication therewith, and said valve body being coaxially rotatable in said housing between positions of alignment and nonalignment of said passages and said aperture to selectively establish fluid communication between the circulatory system and the catheters when inserted in said valve body; and means for forming a seal around said aperture, the seal being maintained in all rotative positions of said valve body.

4,108,174
CATHETER INTERLOCK SYSTEM

Victor Slivenko, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 764,207, Jan. 31, 1977. This application Apr. 13, 1977, Ser. No. 787,077
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—214 R **5 Claims**

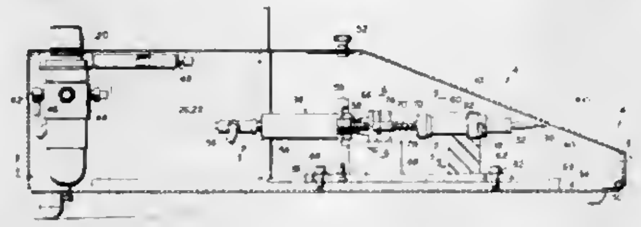


1. A catheter interlock system comprising a blood access device having at least one conduit adapted for insertion in the circulatory system of a living body; a housing having an open end, the interior of said housing being in fluid communication with the conduit; a coaxially rotatable valve body in said housing, said valve body having an axial bore in its outer end; a cannula receptacle inserted and affixed in the axial bore of said valve body, said receptacle having a flange overlying the outer ends of said valve body; a catheter tip adapted for insertion in and engagement with said cannula receptacle; a lug on the outer surface of said catheter tip extending outwardly at right angles to the axis of the catheter; and a cap over the open end of said housing, valve body and cannula receptacle, said cap being of the screw type and having a shoulder for bearing against the flange of the cannula receptacle to provide compression to retain said valve body in a rotatively seated condition in said housing, said cap being provided with a generally circular orifice and a key slot adjacent the circumference of the orifice and said cap having a circumferential slot in the inner wall thereof adjoining said key slot, said key slot serving as a passageway for said lug to enter said circumferential slot and said lug securing the position of the catheter after insertion thereof in said cannula receptacle and after rotation of the catheter to engage the lug in said circumferential slot.

4,108,175
CATHETER INSERTION APPARATUS

Dale W. Orton, 9716 Laurel St., Omaha, Nebr. 68134

Filed Jan. 28, 1977, Ser. No. 763,706
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—214.4 **10 Claims**



1. Catheter insertion apparatus comprising, in combination:

an elongated hollow needle for insertion into a catheter and, with the catheter, into a vein;

a nose portion adjacent the needle for insertion into a catheter and against a flaring portion of the catheter;

chamber means, including

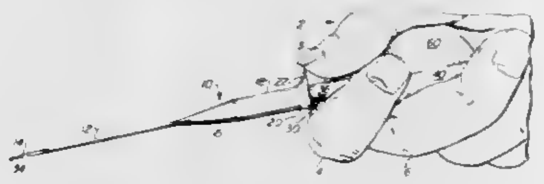
- a first chamber adjacent the nose portion and communicating with the needle to receive a flow of blood from the needle;
- a second chamber adjacent to and communicating with the first chamber and movable relative to the first chamber to provide a partial vacuum in the first chamber to enhance the flow of blood through the needle into the first chamber; and

valve means located in said chamber means for providing a one-way flow of blood into the first chamber and a one-way flow of air out of the second chamber.

4,108,176
AUTOMATIC INJECTING APPARATUS

Carl W. Walden, Ulysses, N.Y., assignor to Agri-Bio Corporation, Jacksonville, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,364
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—218 A **39 Claims**



1. In an automatic injection device comprising:

(a) a work plate on which an animal to be injected can be positioned, said work plate having an aperture therein;

(b) a syringe mounted on the opposite side of said work plate from the side on which the animal to be injected is positioned during use of the device;

(c) first means for moving said syringe back and forth between a first position wherein said syringe is entirely withdrawn on said opposite side of said work plate and a second position wherein the needle of said syringe protrudes through the aperture in said work plate; and

(d) second means for detecting the presence of an animal to be injected in position on said work plate and for activating said first means, the improvement wherein said first means comprises:

(e) a fluid motor;

(f) third means for filtering the fluid input to said fluid motor;

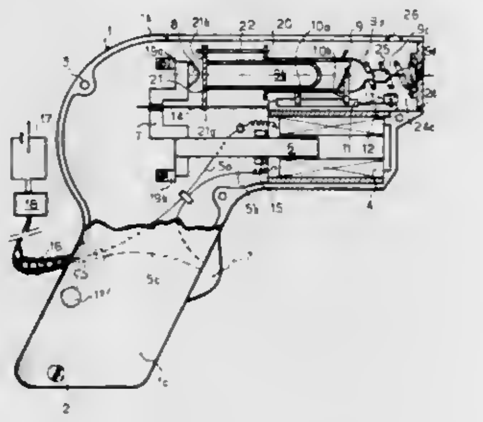
(g) fourth means for controlling the pressure of the fluid input to said fluid motor; and

(h) fifth means for venting an accidental increase in the pressure of the fluid input to said fourth means.

4,108,177
AUTOMATIC INJECTOR DEVICE

Michel Louis Paul Pistor, 87, Boulevard Suchet, Paris, France (75016)

Filed Apr. 13, 1977, Ser. No. 787,142
Claims priority, application France, Apr. 23, 1976, 76 12126
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—218 A **12 Claims**



1. An automatic injector device comprising:

a frame;

a removable injection syringe comprising a syringe body, a syringe piston and at least one injection needle;

a syringe cradle carrying said syringe body and forming therewith a syringe-cradle assembly which is slidably mounted with respect to said frame by means of guiding means;

drive means coupled to said syringe-cradle assembly for actuating said syringe-cradle assembly in reciprocating motion between a retracted rear position which is a nonoperative position of said injector device and an operative front position corresponding to the injection position, and for actuating said syringe piston with respect to said syringe body;

stop means located on said frame and delimiting said front position of said syringe-cradle assembly;

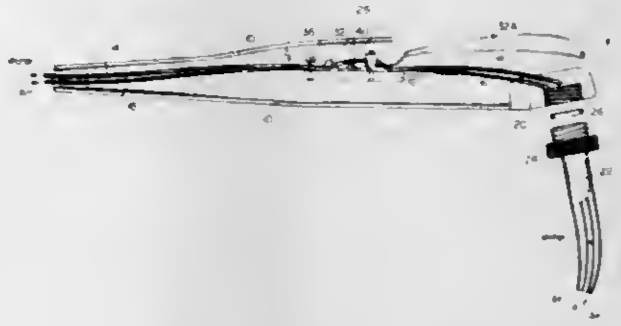
said drive means including an electromagnet actuating a magnetic core connected to a movable member bearing upon said syringe piston, said drive means driving said syringe piston simultaneously with said syringe-cradle assembly in rectilinear displacement towards its front position and then only driving said syringe piston when said syringe-cradle assembly reaches its front position, said drive means further including resilient means for resiliently returning said syringe-cradle assembly to its retracted rear position; and

control means for selectively energizing said electromagnet.

4,108,178
PINCH VALVE SYRINGE

Frank A. Betush, Santa Monica, Calif., assignor to Progessive Machine Products, Inc., Los Angeles, Calif.

Filed Apr. 28, 1977, Ser. No. 791,735
Int. Cl.^{2} A61M *3/00*
U.S. Cl. 128—224 **9 Claims**



1. A unit for controlling the flow of a fluid including: a base; an elongated resilient strip having a first bend therein adjacent a first end thereof and extending toward said base and having a second bend therein extending away from said base; an arm mounted on said base in a position displaced from the base and extending across said second bend in said strip, said second bend being normally biased by said strip towards said arm; a flexible tube extending between the base and the first bend in said strip to be pinched thereby and further extending between the arm and the second bend to be further pinched thereby; means attaching said first end of said strip to said base to establish the amount of pinching of the tube by said first bend so as to establish the rate of flow of fluid through the tube; and means at the other end of said strip to move the strip toward the base and away from the arm so as to release the tube from the pinching effect of said second bend and said arm.

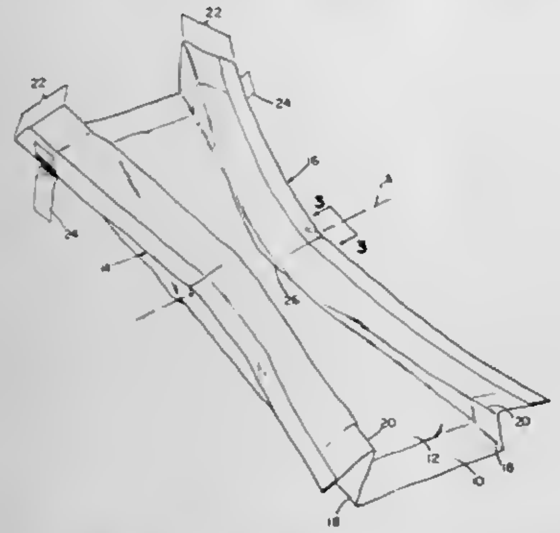
4,108,179
DISPOSABLE DIAPER

Charles Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

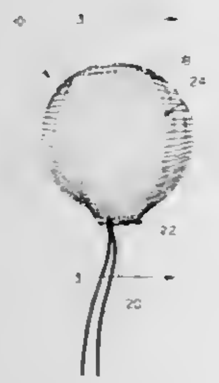
Filed Sep. 13, 1973, Ser. No. 396,835
Int. Cl.^{2} A61F *13/16*
U.S. Cl. 128—284 **16 Claims**

1. A disposable diaper comprising a flexible, waterproof

back sheet and an overlying absorbent pad, the diaper having a series of longitudinal folds forming said back sheet and pad into a box pleat configuration which includes a pair of outwardly directed flaps, each flap defined by an outermost longitudinal fold and the adjacent diaper lateral edge, each said flap being longitudinally foreshortened.

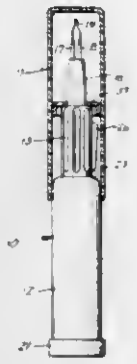


4,108,180
REUSABLE TAMPON
Doris B. Moehrle, P.O. Box 261, Southbridge, Mass. 01550
Filed Dec. 20, 1976, Ser. No. 752,602
Int. Cl.^{2} A61F *13/00*
U.S. Cl. 128—285 8 Claims



1. A reusable tampon device comprising a body of nontoxic, flexible, dry compressible menses absorptive material adapted for constrictive movement past the vaginal opening and for expanded conformation with wall portions of the vagina upstream of said opening, said body completely enveloped in an outer porous structure adapted to lie essentially flat in open relaxed disposition and forming a bag therefor and having at least one open mesh fibrous material layer, said bag in turn having an opening for receipt of said body and a draw string alternatively passing over, under and through said open mesh material along peripheral portions thereof to form said bag and for closing said opening so as to completely encompass said body therein and for opening said bag to permit removal of said body therefrom after use, said draw string adapted for outward extension from said bag and through said vaginal opening to form means for withdrawing said device from the vagina after passage of menses through said bag and absorption by said body when said device is in use and for at least partial circumferential envelopment of said body to compress the same when said device is not in use.

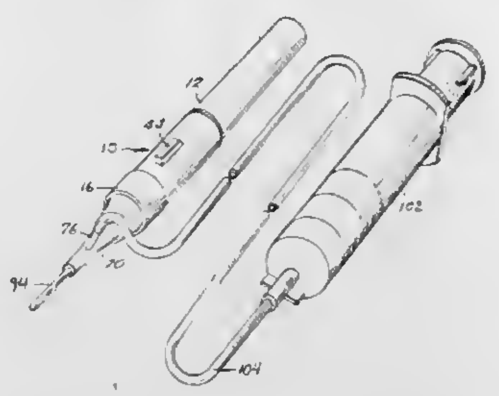
4,108,181
CAUTERY DEVICE FOR OPHTHALMIC OR THE LIKE SURGICAL APPLICATION
George P. Saliaris, Worthington, Ohio, assignor to Unicare Systems, Inc., Columbus, Ohio
Filed Jan. 28, 1977, Ser. No. 763,580
Int. Cl.^{2} A61B *17/38*
U.S. Cl. 128—303.1 12 Claims



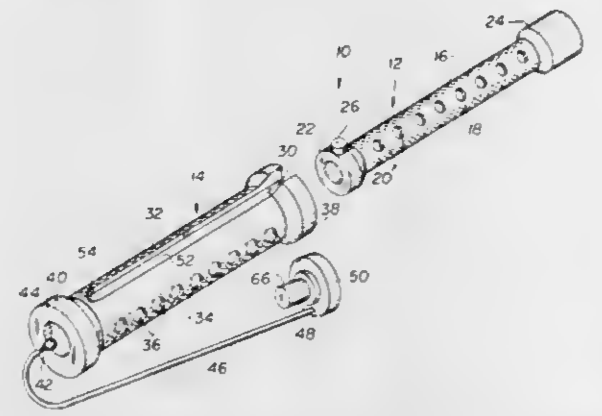
1. A disposable, self-contained cautery comprising an elongate tubular housing defining a battery-holder cavity at a base end and a reduced cavity at a finger-grip end which forwardly projects for said base end, said reduced cavity being of lesser diametral proportions than said battery-holder cavity and the end of said battery-holder cavity opposite said finger-grip end being closed, there being an interior generally radial shoulder formation in the inner surface of said housing at the juncture of said base and finger-grip ends, first and second spaced electrodes carried at a forward end of said finger-grip end opposite said base end and projecting longitudinally beyond said forward end, a heater-wire tip connecting the forwardly projecting ends of said electrodes and projecting forwardly thereof, one of said electrodes extending a first distance within said housing to the battery-holder cavity for contact with the forward terminal of an inserted battery, the other of said electrodes extending within said finger-grip end and for a distance less than said first distance, said finger-grip end of said housing having a switch-access opening local to the angular region of adjacency to said other electrode, and a switch subassembly comprising an elongate longitudinally extending stiffly compliant metal strip with an insulating finger-engageable actuator element secured to one side of said strip at one end thereof, said actuator element being radially positioned and movable within said access opening and said strip having relatively close and opposite substantially right-angle bends near said actuator element to define a radially outward offset in axially forward locating abutment with said shoulder, and means at the closed end of said battery-holder cavity providing an axially rearward locating abutment for the other end of said strip and electrically conductive connection of said strip to the rear terminal of an inserted battery, thereby controlling the positioning of said actuator element in said access opening.

4,108,182
RECIPROCATION VITREOUS SUCTION CUTTER HEAD
Robert M. Hartman, Clearwater, and Arthur F. Trott, Largo, both of Fla., assignors to Concept Inc., Clearwater, Fla.
Filed Feb. 16, 1977, Ser. No. 769,191
Int. Cl.^{2} A61B *17/32*
U.S. Cl. 128—305 12 Claims

1. A surgical cutting device comprising a housing, motor means mounted inside said housing, means to energize said motor means, a shaft mounted to said motor means inside said housing, a cutter head removably secured to said housing, said cutter head comprising a body, an elongated tube secured to said cutter head body, a blade positioned in said tube and adapted to be reciprocated within said tube, said tube provided with an aperture therein to allow said blade to come in contact with tissue, drive transfer means mounted in said cutter head, said drive transfer means comprising a cam connected to said shaft, a cam follower assembly mounted in said cutter head engaging said cam, said blade means mounted to said cam follower thereby transmitting motion from said motor means to said blade means, said cutter head defining a passage-way communicating with said tube and adapted to supply a vacuum from an external source to said tube so that tissue sheared off by the reciprocation of said blade inside said tube will be carried off into said passage-way.

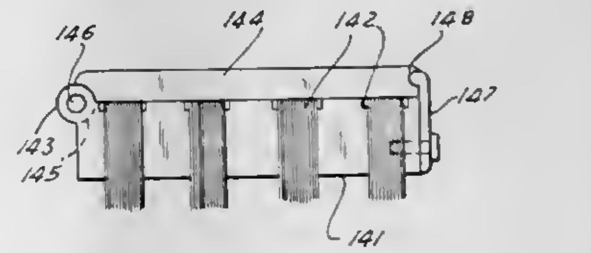


4,108,183
DIFFERENTIAL HAIR CURLER
Peter Mauro, 355 S. Oyster Bay Rd., Plainview, N.Y. 11803
Filed Jun. 13, 1977, Ser. No. 805,830
Int. Cl.^{2} A45D *2/14*
U.S. Cl. 132—42 A 1 Claim



1. An improved differential hair curler of the type comprised of a hair-curling core unit and a cooperating hair-curling outer unit operatively arranged to be disposed in telescoped relation with each other, said core unit having an open-ended through bore and an outer hair curling diameter and said outer unit having a through bore larger than said core outer diameter so as to define a clearance space therebetween for supporting small-radius turns of hair curled about said core unit and a larger outer diameter to support large-radius turns of hair curled about said outer unit, the improvements thereto comprising a radially extending projection located on said core unit adjacent that end thereof which is inserted into said outer unit, said outer unit having a longitudinal slot therein open at one end thereof and adapted to both slidably receive said core unit projection for guided movement thereinto and closed at its other end to retain said projection therein and a strand of hair in curled relation about and behind said core unit projection preparatory to the subsequent curling of said strand of hair about said outer unit, said slot being bounded by side walls effectively confining said core unit projection therebetween so as to prevent rotation of said core unit within said outer unit and thus prevent any inadvertent unraveling of said strand of hair in said supported curled position on said core unit during the sliding of said core into said outer unit, and an elastomeric string connected to one end of said outer unit remote from said open end of said slot to extend in spanning relation between said one end of said outer unit and over to and into retaining engagement with the open end of the bore of said core unit adjacent said open end of said slot that is remote from said projection so as to be adapted to be stretched over the hair in said supported curled positon on said outer unit to engage over the same to prevent any inadvertent unraveling thereof and whereby the urgency in said stretched elastomeric string also maintains said core unit in said telescoped position within said outer unit with said projection maintained in the closed end of said slot and said core within said through bore of said outer unit.

4,108,184
CLAMP DEVICES FOR USE IN SELECTIVELY ALTERING HAIR COLOR
Shila Morganroth, 1225 Waterbury Rd., Highland, Mich. 48031
Division of Ser. No. 592,764, Jul. 2, 1975, which is a contiouation-in-part of Ser. No. 481,695, Jun. 25, 1974. This application Nov. 4, 1976, Ser. No. 738,910
Int. Cl.^{2} A45D *8/00*
U.S. Cl. 132—46 R 5 Claims



1. A device for use in selectively altering hair color comprising a pair of bars hinged together at one end having opposed hair engaging surfaces to receive a strand of hair between them, said bars having aligned bottom surfaces permitting the bars to be placed around a strand of hair close to the scalp, means for removably holding the bars with said surfaces in gripping relation to a strand of hair between them, and a hair protecting shield connected to a bar and extendingly only transversely away from the gripping surface adapted to be positioned between a strand gripped by said bars and surrounding hair underlying said shield whereby said strand of hair may be formed by combing and be held in one hand of a person while the clamp in open position is moved transversely across the strand and then closed upon it.

4,108,185
GREASELESS COSMETIC ARTICLE FOR APPLYING MAKE-UP TO THE EYELIDS
Jean P. Boulogne, L'Hay-les-Roses; Thibaud Hochmann, Champigny-sur-Marne; Jacques Michelet, Longjumeau, and Bruno P. Morane, Paris, all of France, assignors to L'Oreal, Paris, France
Filed Dec. 20, 1976, Ser. No. 752,806
Claims priority, application France, Jan. 28, 1976, 76 02282
Int. Cl.^{2} A45D *33/00*
U.S. Cl. 401—88 18 Claims

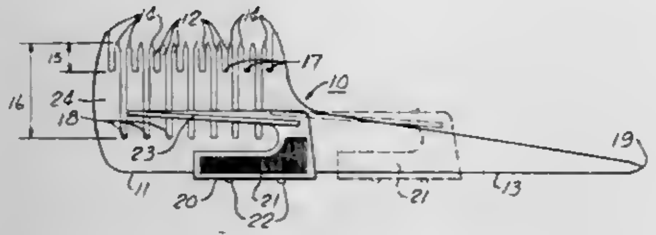
1. In a cosmetic article for directly applying a greaseless cosmetic, said article comprising a solid support coated with at least one impregnating layer carrying a coating layer containing a cosmetic, the improvement according to which the impregnating layer comprises at least one hydrosoluble polymer deposited in solution on the support, and said coating layer comprising a homogenous mixture containing

(a) a product which is thixotropic in aqueous suspension;
(b) a polymeric binder capable of forming a gel in an aqueous medium, said binder forming, when mixed with said thixotropic product in an aqueous medium, a thixotropic mixture having a high viscosity; and
(c) a mixture of cosmetic powders comprising at least one pigment.

4,108,186

COMB FOR SUBDIVIDING HAIR STRANDS

Victor Esposto, Pittsburgh, Pa., assignor to Frost Enterprises, Inc., Pittsburgh, Pa.
Filed Sep. 27, 1976, Ser. No. 726,563
Int. Cl.^{2} A45D *24/00*
U.S. Cl. 132—124 2 Claims

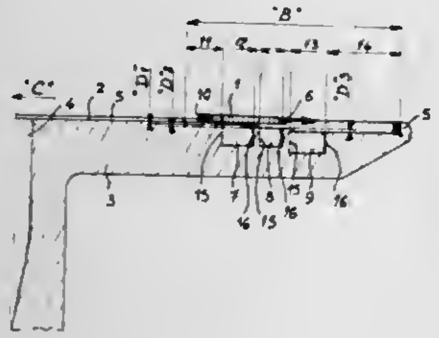


1. A comb for subdividing hair strands comprising an elongated comb root base having a series of parallel comb teeth extending off one edge thereof with the depth of the root space between adjacent teeth from the teeth tops alternately varying between shallow and deep, a slide member slidably secured to said root base to slide longitudinally therealong, a finger extending from said slide member and longitudinally along a side face of the comb between said shallow and deep root spaces to segregate hair strands lying in said deep root spaces at will by sliding said slide member along said root base.

4,108,187

AUTOMATIC SORTER FOR PIECES OF MONEY OR SIMILAR OBJECTS AS A FUNCTION OF THEIR DIAMETER

Nicolas Bezsilko, Tourcoing, France, assignor to S. A. Vandeputte & Cie, Tourcoing, France
Filed May 3, 1976, Ser. No. 682,375
Claims priority, application France, Sep. 22, 1975, 75 29691
Int. Cl.^{2} G07D *3/00*
U.S. Cl. 133—3 A 2 Claims

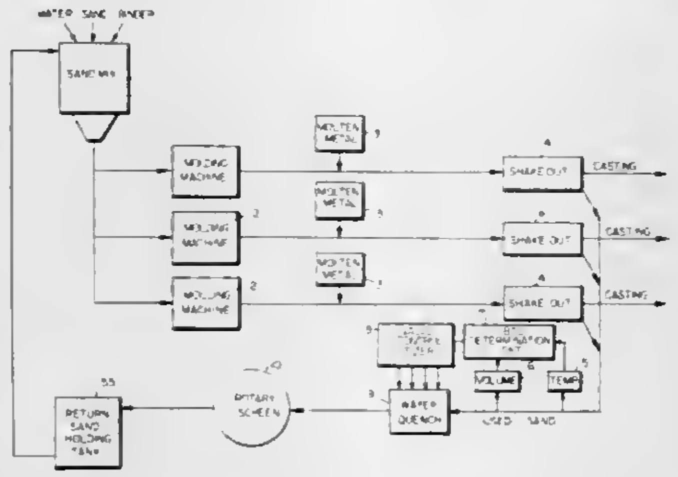


1. In an automatic sorter for pieces of money and similar objects having a rotating disc, an upper surface for said disc, at least one circular groove in said upper surface, an internal edge for said groove located on the side of the center of said disc, an external edge for said groove located on the side of the periphery of said disc, said groove dividing the upper surface of said disc into several portions on which the pieces of money are displaced sliding flat under the action of centrifugal force resulting from the rotation of said disc moving the pieces of money from the center of the disc, the improvement comprising, when said disc is seen in axial cross-section, a portion of said surface adjacent said internal edge of said groove being at a level at least slightly higher than that of a portion of said surface adjacent said external edge of said groove whereby the pieces of money are prevented from engaging said external edge of the groove and also whereby said internal edge of the groove prevents the pieces of money from returning towards the center of the disc.

4,108,188

SAND COOLER CONTROL SYSTEM

Carl R. McMullen, Waverly, Tenn., and Gary M. Schlageter, Carpinteria, Calif., assignors to Foundry Technology, Inc., Waverly, Tenn.
Filed Jul. 25, 1977, Ser. No. 818,655
Int. Cl.^{2} B08B *3/02;* B22C *5/08*
U.S. Cl. 134—57 R 5 Claims

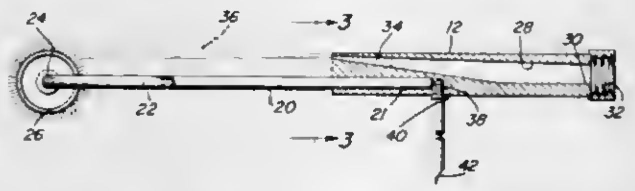


1. In a control system for an apparatus used for cooling recycled foundry said in a sand cast foundry, having:
conveyor for transporting the foundry sand material,
a non-contact depth gage disposed along the path of the conveyor for generating an electrical signal representing the depth of the material on said conveyor;
a non-contact temperature sensor disposed along the path of the conveyor for generating an electrical signal representing the temperature of the material on said conveyor as a function of heat radiated by said material;
a spray means for spraying water on the mold forming material on said conveyor positioned downstream from said depth gage and temperature sensor; and
a control means responsive to said depth gage signal and said temperature sensor signal for controlling the volume of cooling agent dispensed from said spray means; the improvement comprising,
a multiplier for generating an analog signal from said depth gage signal and said temperature sensor signal; an analog-to-digital converter responsive to said multiplier analog signal for producing a plurality of digital signals as a function of the magnitude of said analog signal; and
switching means responsive to said outputs of said analog-to-digital converter for activating said spray means.

4,108,189

PAINT ROLLER CLEANER AND DRYER

Floyd H. Claiborne, 318 Louise Ave., and Roggie C. Ray, P.O. Box 366, both of Gallatin, Tenn. 37066
Filed Feb. 7, 1977, Ser. No. 766,034
Int. Cl.^{2} B08B *3/02*
U.S. Cl. 134—138 2 Claims

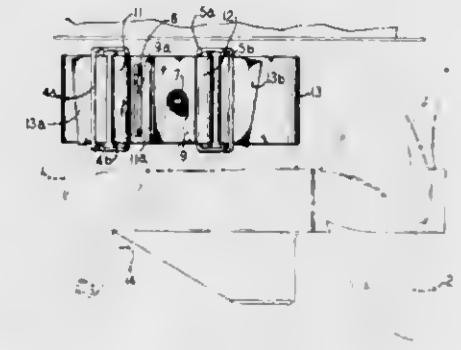


1. A paint roller assembly including an elongated handle having opposite end faces, an elongated frame having one base end portion anchored in one end of said handle with said frame projecting endwise outwardly from the corresponding end face of said handle and including a second free end portion disposed generally normal to the longitudinal axis of said handle, a paint roller journaled from said free end portion with a first plane generally normal to said roller and containing said longitudinal axis passing through said roller centrally intermediate its opposite ends, said frame, intermediate said base and free end portions including a laterally offset portion disposed to one side of the longitudinal axis of said handle extending between and rigidly interconnecting said base and free end portions, said handle having a substantially straight longitudinally extending water passage forward therethrough and opening endwise outwardly of the opposite end faces of said handle, the inlet end portion of said passage opening through the end face of said handle remote from said roller including coupling means for removably coupling the discharge end of a water supply conduit thereto, the outlet end portion of said passage opening outwardly of the end of said handle adjacent said roller tapering in the transverse dimension of said passage disposed transverse to the axis of rotation of said roller and increasing in the transverse dimension thereof normal to a second plane substantially normal to the first mentioned plane and intersecting with said roller along a short chord plane thereof, whereby the terminal end of said outlet end portion defines an elongated discharge slot for discharging a fan-shaped stream of water therefrom along said second plane, said roller assembly being entirely free of shroud structure even partially shrouding said roller, said coupling means comprising a threaded female coupling supported from said handle for removably threaded connection of a threaded male coupling on the discharge end of said water supply conduit to said handle in communication with said passage.

4,108,190

FLUSHING TECHNIQUE AND APPARATUS FOR OUTBOARD AND STERN-DRIVE MOTORS

Gordon R. Carlson, 19 James Pl., Metuchen, N.J. 08840
Filed Sep. 22, 1976, Ser. No. 725,478
Int. Cl.^{2} B08B *3/02, 9/00*
U.S. Cl. 134—167 R 8 Claims

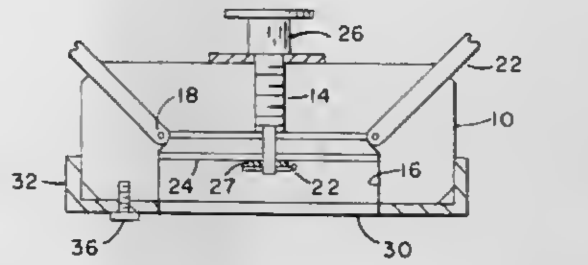


1. A flushing system for outboard and sterndrive motors having an external motor housing which includes at least two water intake ports substantially spaced apart around the periphery of said housing, said system comprising:
a belt of resilient elastomer material substantially impervious to water which is constructed and arranged to wrap around and adhere to that portion of the external motor housing which includes said spaced apart water intake ports,
locking means for securely fastening the two terminal portions of said belt to retain said belt in said wrap-around position,
said belt including means comprising an opening constructed in said wrap-around position to register with at least one said water intake port of said housing,
said means comprising an opening including a fitting for accommodating a hose terminal,
wherein in said wrap-around position a portion of said belt adheres to another one of said ports and is constructed and arranged to operate as a valve flap which opens and closes in response to the waxing and waning of the pressure of water passing into said motor housing through said hose terminal.

4,108,191

FAN MESH DISRUPTER

Arthur T. Merriam, Wellesley Hills, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 17, 1975, Ser. No. 614,389
Int. Cl.^{2} A45F *1/04*
U.S. Cl. 135—2 1 Claim



1. An expandable-retractable fan mesh disrupter for use in camouflaging equipment attached thereto, said disrupter comprising: a hub provided with a threaded top opening, said hub having a plurality of radial slots equally spaced about its outer periphery, the bottom of said hub being provided with a counter-bored recess; a split ring disposed in said recess; a plurality of mesh supporting ribs attached to said split ring, said ribs being disposed in said slots; camouflage mesh connected to said ribs; a locking plate located in said recess to engage and support the ends of said ribs; means for securing said locking plate to said hub whereby said ribs may be moved thereon to expand or retract camouflage mesh disrupter, said securing means including a lock screw for engaging said threaded top opening and a cotter pin at the lower end of said lock screw for engaging said locking plate, and a spacer cup connected to said hub and a flange extending upward from said cup and surrounding said hub to limit movement of said ribs in said radial slots.

4,108,192

METHOD FOR SEWAGE REMOVAL FROM MULTI-HOUSEHOLD CONNECTIONS

Harald Richard Michael, Hamburg, Germany, assignor to Electrolux GmbH, Germany
Filed Oct. 27, 1976, Ser. No. 736,209
Int. Cl.^{2} E03F *1/00*
U.S. Cl. 137—1 3 Claims

1. A method for the disposal of sewage from multi-household connections, the sewage from each household connection comprising the total wastewater from the household, in which a specific volume of sewage is first collected and then suctioned off by means of vacuum, and in which air is released into the vacuum pipe following the sewage, characterized in that the collection of the sewage takes place at each household respectively and in relatively small quantities about 5 to 30 liters, and in that the amount of air subsequently released into the vacuum pipe amounts to two to fifteen times the volume of the sewage.

4,108,193

PIPELINE METHOD FOR TRANSPORTING VISCOUS HYDROCARBONS

Kenoth H. Flournoy, Levelland; Ricardo L. Cardenas, and Joseph T. Carlin, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.
Filed Mar. 8, 1976, Ser. No. 664,712
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.^{2} F17D *1/17;* B01F *17/00*
U.S. Cl. 137—13 6 Claims

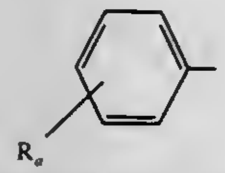
1. In the transportation of viscous hydrocarbons by pipeline, the improvement which comprises introducing into said pipeline with said hydrocarbons an aqueous solution comprising

from about 0.01 to about 2.0 weight percent of an anionic surfactant selected from the group consisting of:

(A) compounds of the formula:

$RO(CH_2CH_2O)_gSO_3M$

wherein R is selected from the group consisting of alkyl of from 8 to 25 carbon atoms and

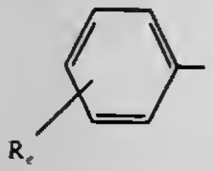


wherein R_a is alkyl of from 8 to 20 carbon atoms, g is an integer of from 1 to about 20 and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and the ammonium ion;

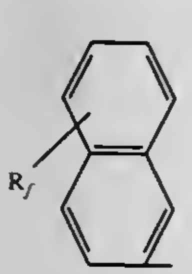
(B) sulfonates of the formula:

$R_dO(CH_2CH_2O)_hCH_2CH_2SO_3M$,

wherein R_d is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R_e is alkyl of from 8 to 20 carbon atoms and

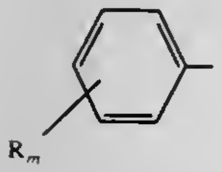


wherein R_f is alkyl of from 1 to 10 carbon atoms; *h* is an integer of from 1 to 24 and M has the same meaning as described in (A);

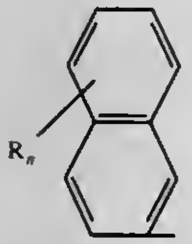
(C) sulfonates of the formula:

$R_kO(C_2H_4O)_r—(C_3H_6O)_s—(C_2H_4O)_t\ CH_2CH_2SO_3M$,

wherein R_k is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R_m is alkyl of from 8 to 20 carbon atoms, and

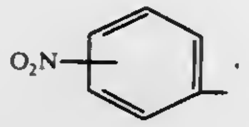


wherein R_n is alkyl of from 1 to 10 carbon atoms; *r* is an integer of from 1 to about 18; *s* is an integer of from about 1 to about 12; *t* is an integer of from 1 to about 20, and the sum of $r + s + t$ is not more than 30, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M has the same meaning as described in (A) above, and

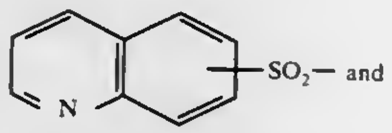
(D) mixtures of the above described surfactants; from about 0.01 to about 1.0 weight percent of an alkalinity agent selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide and mixtures thereof and from about 0.01 to about 0.50 weight percent of a material selected from the group consisting of (a) a guanidine salt, (b) an oxyalkylated nitrogen-containing aromatic compound having the formula:

$R_v(OR_w)_xOH$,

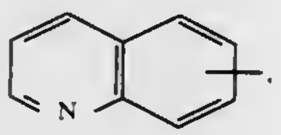
wherein R_v is selected from the group consisting of:



(a)



(b)



(c)

wherein R_w is alkylene of from 2 to 4 inclusive carbon atoms and x is an integer of from about 5 to about 50 (c) mixtures of (a) and (b) above, and wherein amount of the said aqueous solution introduced in the said pipeline ranges from about 10 to about 40 percent by volume based on the volume of the hydrocarbon.

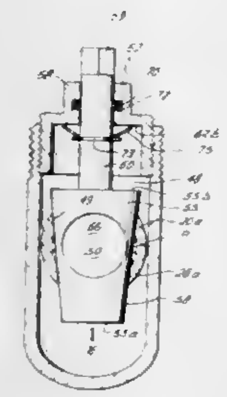
4,108,194
METHOD AND APPARATUS FOR A TAPERED PIPELINE SEAL

George W. Harrison, and Charles O. Huff, both of Houston, Tex., assignors to Team, Inc., Alvin, Tex.

Filed Sep. 27, 1976, Ser. No. 726,813

Int. Cl.^{2} F16L *55/07*

U.S. Cl. 137—15 **2 Claims**



1. A method of sealing a longitudinal bore in a pipeline including the steps of:

(a) forming a housing for mounting with a pipeline, said housing including two sections;

(b) said method of forming said sections including the steps of:

positioning and securing longitudinal arcuate members relative to the pipeline with transversely positioned communication members; and

(c) mounting said first and second sections around the pipeline such that the arcuate members are mounted with and parallel to each other around the pipeline to form a sheath and wherein the communication members mounted with each of said arcuate sections are axially aligned with each other and transverse to the sheath and pipeline;

(d) drilling and reaming a tapered hole in the communication members and through and transverse to the arcuate members and pipeline such that the communication members are enabled to communicate with each other through such tapered opening;

(e) inserting a tapered plug into the tapered hole to prevent communication between the longitudinal bore of the pipeline to thereby seal off the bore of the pipeline.

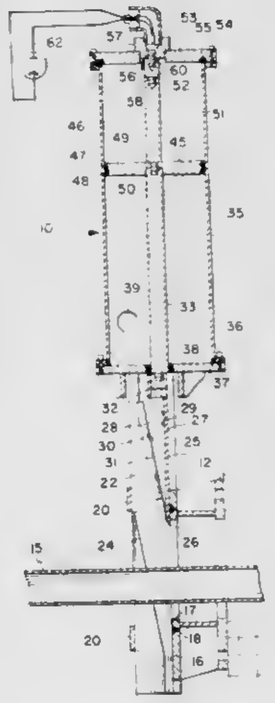
4,108,195
QUICK-CLOSING FIRE GATE

Henry K. Berry, 31 Towne Square Dr., Newport News, Va. 23607

Filed Jun. 23, 1977, Ser. No. 809,205

Int. Cl.^{2} F16K *17/40*

U.S. Cl. 137—68 A **8 Claims**



1. For production facilities utilizing conveyors for transportation of materials from one area, through a barrier and into another area, a quick-closing fire gate located at such barrier and comprising in combination:

a housing having a passageway extending from a flat forward surface through the entire length of said housing and being of sufficient size to allow the passage of a conveyor and materials thereon to pass therethrough;

first and second inclined plane members positioned adjacent said housing forward surface directly before said passageway such that the inclined surfaces slope toward said housing forward surface from top to bottom;

a flat blade, having a sharpened base and front and back sides, translatable from a starting position above, to a terminating position before said housing forward surface of sufficient dimension to cover said passageway;

means for guiding said blade from said starting to said terminating position;

third and fourth inclined plane members attached to said blade back side and positioned such that the inclined surfaces thereof contact said inclined surfaces of said first and second inclined plane members and press said blade front side against said housing forward surface;

a fixed cylinder containing a reciprocal piston therein, said piston having a line of action through said blade starting and terminating positions;

means to operatively connect said piston to said blade to thereby control the translation of said blade by said piston;

means to create a pressure differential within said cylinder across said piston such that the pressure above said piston is the greater;

an explosive bolt piercing said cylinder above said piston and having means to hold said piston against the force of said differential pressure such that said blade is maintained at said starting position;

triggering means connected to said explosive bolt for sensing an identified variation in the surroundings about said fire gate and communicating a detonation signal to said explosive bolt whereby said explosive bolt is fragmented to thereby release said piston, said pressure differential forcing said piston rapidly away from said bolt causing said blade to translate from said starting position, said sharpened blade base severing said conveyor during such translation and said inclined surfaces of said third and fourth inclined plane members contacting and sliding along said inclined surfaces of said first and second inclined plane members such that said blade is pressed flat against said housing forward surface and prevented from rebounding from said terminating position thereby closing said passageway in a very short time.

4,108,196
BALL VALVES

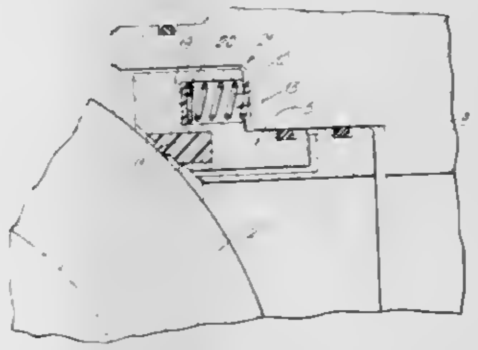
Michael Arnold Calvert, Kirkcaldy, Scotland, and David Joseph Senger, Hammond, La., assignors to TK Valve Limited, Dunfermline, Scotland

Filed Dec. 9, 1976, Ser. No. 748,905

Claims priority, application United Kingdom, Nov. 13, 1976, 47380/76

Int. Cl.^{2} F16K *13/04*

U.S. Cl. 137—72 **14 Claims**



1. A ball valve, especially for use between adjacent sections of a pipe line conducting an inflammable fluid, said ball valve comprising a valve housing a valve ball in said housing and having a through-passage, a trunnion in said housing projecting into a first socket in said ball, a control shaft projecting into and drivingly engaging a second socket in said ball diametrally opposed to said first socket, a pair of annular valve seat members made of metal and spaced axially of the pipe line, and spring means urging said seat members into sealing engagement with the ball; in which a heat-sensitive bush is provided between said trunnion and the peripheral wall of said first socket and between said control shaft and the peripheral wall of said second socket, and said spring means presses against heat-sensitive material; whereby, in the event of fire or excessive heat reaching a ball valve in a pipe line, and the valve is turned to its closed position, said bushes disintegrate, and said heat-sensitive material disintegrates so that the valve seat members are no longer spring urged, and the ball moves axially of the pipe line, under pressure of the fluid in the pipe line, and pushes the downstream valve seat member into sealing contact with the valve housing.

4,108,197

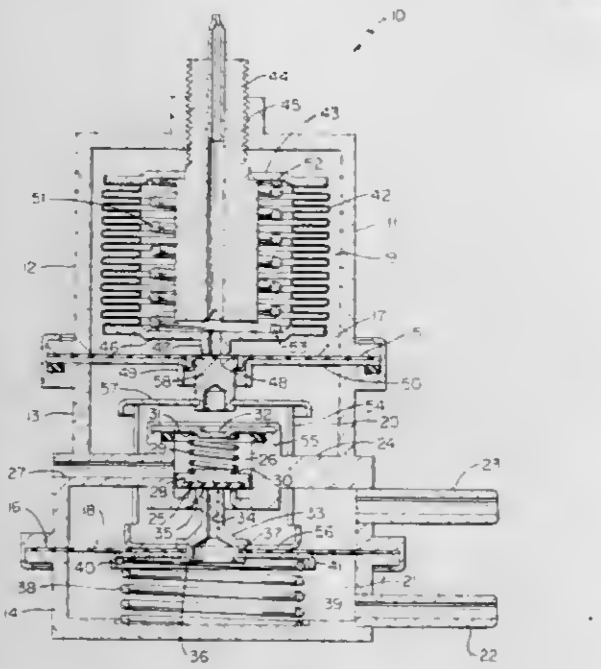
CONDITION RESPONSE DIFFERENTIAL VACUUM REGULATOR AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Concord, Tenn., assignor to Robertsbaw Controls Company, Richmond, Va.

Filed Feb. 23, 1977, Ser. No. 771,163

Int. Cl.^{2} F16K *17/36*

U.S. Cl. 137—81 **2 Claims**



1. In a differential vacuum regulator having an input chamber and an output chamber and control means for providing an output signal in said output chamber that has a constant differential value from the value of an input signal in said input chamber, said regulator having condition responsive means independent from the value of said input signal for varying said differential value in relation to the condition being sensed by said condition responsive means, said regulator having a spring that has an effective force that provides said constant differential value, said condition responsive means being operatively associated with said spring to vary said effective force thereof in response to variations in the condition being sensed thereby to thereby vary said differential value, said condition responsive means having a movable member that is moved relative to said regulator upon changes in said sensed conditions, said movable member being operatively interconnected to said spring to oppose the force direction of said spring, said movable member comprising a bellows construction, said regulator having vent means interconnected to said outlet chamber, said spring force tending to open said vent means, said bellows construction expanding in a direction that tends to oppose said spring force, said vent means being intermediate said bellows construction and said spring, the improvement wherein said regulator has a cage-like member surrounding said vent means and operatively interconnecting said bellows construction and said spring together.

4,108,198

MULTIROTARY ENERGY CONVERSION VALVE

Will Clarke England, 7310 Eastcrest Dr., Austin, Tex. 78752

Continuation-in-part of Ser. No. 466,874, May 2, 1974, Pat. No. 4,044,562, and a continuation-in-part of Ser. No. 467,482, May 2, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,573

Int. Cl.^{2} G05D *7/00*

U.S. Cl. 137—194 **12 Claims**

1. A multirotary energy conversion valve for fluids comprising:

(a) a sealed valve casing;

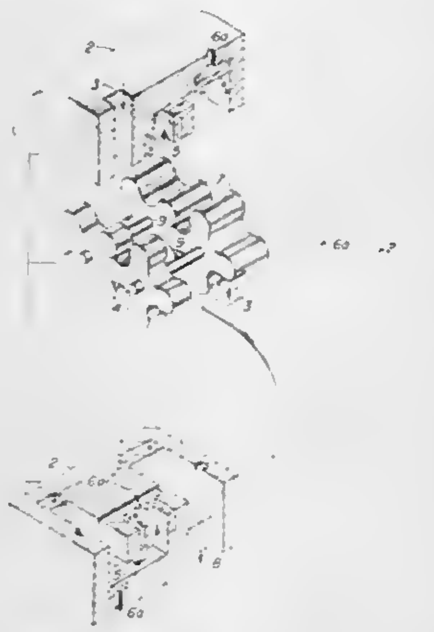
(b) a pair of continuously meshing inlet rotors of constant volumetric displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing;

(c) a pair of continuously meshing outlet rotors of constant volumetric displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing; said outlet rotors having torque characteristics and volumetric displacement rates quantitatively unequal to the torque characteristics and volumetric displacement rates of said inlet rotors;

(d) an inlet passage in said valve casing leading to the reappearing volumetric displacement said of said meshing inlet rotors;

(e) an outlet passage in said valve casing leading from the vanishing volumetric displacement side of said meshing outlet rotors;

(f) an enclosed channel in said valve casing leading from the vanishing volumetric displacement side of said meshing inlet rotors to the reappearing volumetric displacement side of said meshing outlet rotors;



(g) at least one rotary linkage rotatably mounted completely inside said sealed valve casing whereby said rotary linkage does not extend outside of said casing, connecting one inlet rotor and one outlet rotor for synchronous rotation about one axis with said rotary linkage; and

(h) said fluid subject to energy conversion in said multirotary energy conversion valve due to the interaction of said meshing inlet rotors and said meshing outlet rotors and said fluid in said enclosed channel whereby there is at least an interchange in the kinetic and potential energies of said fluid.

4,108,199

ISOLATING VALVES

Maurice Bonafous, Oloron, France, assignor to Applications Mechaniques et Robinetterie Industrielle, Paris, France

Filed Mar. 11, 1976, Ser. No. 665,766

Claims priority, application France, Mar. 11, 1975, 75 07569

Int. Cl.^{2} F16K *1/226, 1/44, 24/02*

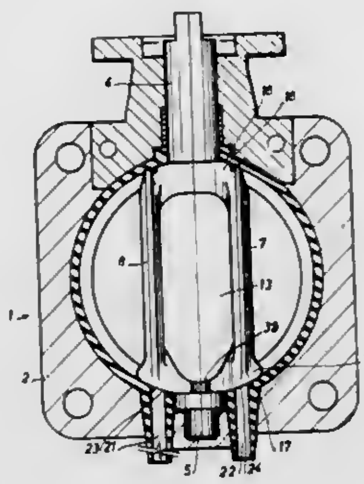
U.S. Cl. 137—312 **11 Claims**

1. An isolating butterfly valve, comprising:

a valve body having an upstream portion and a downstream portion, and orifice means between said upstream and downstream portions;

a pair of joined discs axially spaced in the direction of fluid through-flow and housed within said body, means including spindles pivotally mounting said pair of discs for rotation in said valve body between a valve closed position closing off said upstream and said downstream portions and a valve open position opening said upstream and said downstream portions to each other;

closing means separate from said spindles on said discs for closing said orifice means in the valve open position and opening said orifice means into said valve body in the valve closed position, said closing means being controlled by the rotation of said spindle, said orifice means being positioned between said discs in the valve closed position for opening the space between said discs to the exterior of the valve; and



a flexible sleeve covering the interior of said valve body and together with said discs forming corresponding bearing surfaces and constituting a double upstream/downstream seal between said valve body and said discs in the valve closed position.

4,108,200

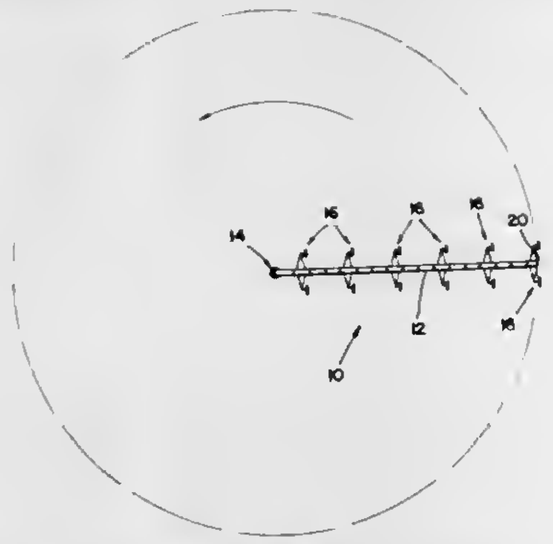
BRAKE APPARATUS FOR IRRIGATION LINE

Gail Cornelius, Portland, Oreg., assignor to R. M. Wade & Co., Portland, Oreg.

Filed Dec. 1, 1976, Ser. No. 746,456

Int. Cl.^{2} B05B *3/06*

U.S. Cl. 137—344 **16 Claims**



1. Irrigation line braking apparatus comprising:

frame means for supporting an irrigation line;

drive means comprising rotatable support means mounted to said frame means and on which the frame means are supported with the support means on the ground; rotary drive means rotatably mounted relative to the frame means and rotatable upon supply of water pressure thereto; and means operatively coupling said rotary means and rotatable support means for providing that the rotary means apply driving torque therethrough to the rotatable support means;

brake means operatively associated with said rotary drive means for providing braking means of the irrigation line upon water pressure supplied to said rotary means falling below a certain level, and for providing release of braking of the irrigation line upon water pressure supplied to said rotary means rising above said certain level.

4,108,201

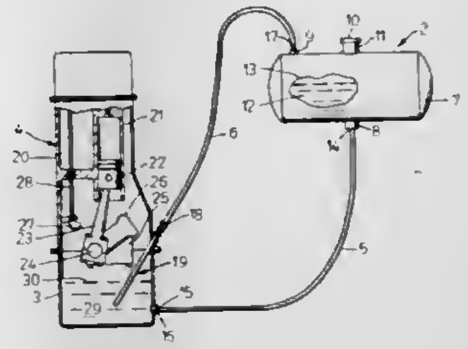
SENSING PROBE FOR GRAVITY INDUCED FLOW LIQUID LEVEL REGULATOR

James R. Lang, Littleton, Colo., assignor to The Mechanex Corporatinn, Denver, Colo.

Filed Feb. 14, 1977, Ser. No. 768,206

Int. Cl.^{2} F16K *21/20*

U.S. Cl. 137—393 **15 Claims**



1. In a sensing conduit for a gravity induced flow liquid level regulator, said sensing conduit having a first end adapted for being sealingly connected to fluid flow communication with a liquid reservoir and a second end being open and being adapted for extending into a liquid containing sump and having position maintenance means for maintaining said second end at a desired level within said sump and for maintaining said first end at a level above said second end, the improvement comprising:

a tubular shield surrounding said open end of said sensing conduit and a portion of said sensing conduit above said open end of said sensing conduit, said shield further extending a substantial distance beyond said open end of said sensing conduit and terminating in an end having a liquid flow passage, said end of said shield having said liquid flow passage being adopted for being immersed a substantial distance into a pool of liquid in said sump when said open end of said sensing conduit is maintained at the desired level in said sump for enabling said liquid in said sump to flow into and out of said shield;

means for maintaining said shield and said sensing conduit in fixed position relative to each other; and

a longitudinal fluid flow passage formed between an exterior surface of said sensing conduit and an interior surface of said shield, said longitudinal fluid flow passage extending upwardly from said open end of said sensing conduit and vent means in said shield for placing said longitudinal fluid flow passage in fluid flow communication with an air space above said liquid in said sump for enabling air to flow through said vent means and said longitudinal fluid flow passage to said open end of said sensing conduit.

4,108,202

BALL COCK HAVING VERTICALLY ADJUSTABLE OUTLET TUBE

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631

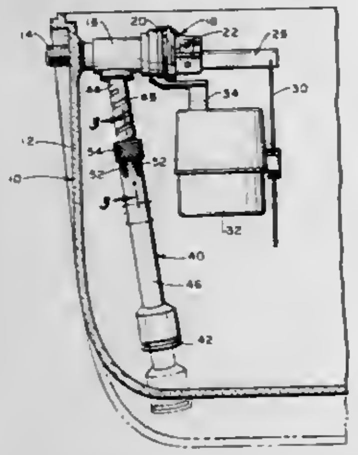
Filed Jul. 19, 1976, Ser. No. 706,484

Int. Cl. F16k *31/18;* F16l *15/02*

U.S. Cl. 137—436 **4 Claims**

1. In a ball cock for controlling the level of liquids such as water in a tank, the ball cock being of the type having an inlet tube with an outer end in communication with a water supply through a tank wall, a generally vertical outlet tube for the flow of water downwardly therethrough within said tank, a float controlled valve between an inner end of said inlet tube and an upper end of said outlet tube, and a water outlet opening communicating into said tank at a lower end extremity of said outlet tube; the improvements comprising: said outlet tube having vertically end telescoping upper and lower parts internally vertically communicating during varying amounts of said vertical end telescoping; generally radially extending and interengaged adjustment means between said tube upper and

lower parts normally positively resisting at least straight vertical movement between said tube upper and lower parts but being selectively operable for increasing and decreasing said tube upper and lower part end telescoping to selectively vary the downward vertical extension of said outlet tube from said valve, said adjustment means including a spiral groove on one of said outlet tube upper and lower parts and a rigid radial projection on the other of said upper and lower parts, said rigid radial projection normally being positively engaged into said spiral groove with relative rotation between said tube upper and lower parts causing increasing and decreasing of said tube upper and lower part end telescoping, said adjustment means also including selectively operable release means operable at any upper and lower part end telescoping for permitting upon operation thereof total radial separation between said spiral groove and said rigid radial projection to thereby permit free relative vertical movement as well as complete vertical separation between said outlet tube upper and lower parts.



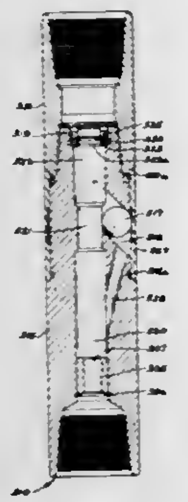
4,108,203
CHECK VALVE ASSEMBLY

Cicero C. Brown, deceased, late of Houston, Tex. (by Joe R. Brown, executor), assignor to Brown Oil Tools, Inc., Houston, Tex.

Division of Ser. No. 495,901, Aug. 8, 1974, Pat. No. 4,040,441. This application May 9, 1977, Ser. No. 794,713

Int. Cl.^{2} F16K *15/04*

U.S. Cl. 137—496 **11 Claims**



1. A check valve assembly for permitting unrestricted flow in one direction and limited flow in the reverse direction comprising:

(a) a valve body having a longitudinal flowbore comprising first and third concentric sections connected by a second concentric section of restricted diameter;

(b) seat means carried by said valve body at one end of said third flowbore section;

(c) recess means in said valve body communicating with said flowbore near the junction of said second and third flowbore sections;

(d) ball closure means carried in said recess means out of said flowbore but movable into said flowbore for sealing engagement with said seat means, in response to a predetermined rate of reverse flow through said check valve assembly, to block reverse flow of fluids through said check valve assembly;

(e) equalizing passage means in said valve body providing fluid communication between said recess means and said first flowbore section; and

(f) tubular sleeve means mounted in said first flowbore section for limited movement from a first position downstream of said second flowbore section to a second position immediately adjacent said second flowbore section in response to reverse flow of fluid through said check valve means above said predetermined rate.

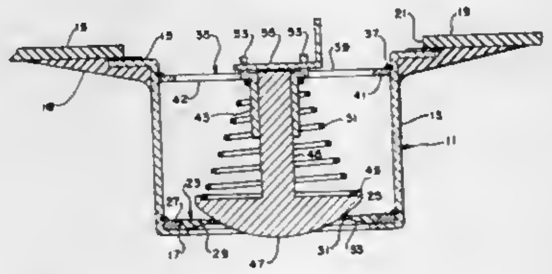
4,108,204
PRESSURE RELIEF VALVE

Ronald H. Day, Mill Valley, Calif., assignor to C. J. Hendry Company, San Francisco, Calif.

Filed May 13, 1976, Ser. No. 686,025

Int. Cl.^{2} F16K *15/06*

U.S. Cl. 137—543.13 **3 Claims**



1. A pressure relief valve comprising a housing having one end thereof adapted to be secured at a wall of a fluid containing vessel about an opening therein, a rigid flange at the opposite end thereof defining a valve passage therein, an entirely flexible valve seat having an opening therein and being secured in said valve passage adjacent said rigid flange, a piston having a sealing surface at one end thereof, said piston being sufficiently large to engage said flexible valve seat about the entire periphery of the opening therein but sufficiently small to pass freely through said valve passage in the rigid flange, said piston being slidably disposed within said housing whereby said sealing surface is movable toward and away from said valve seat, said valve seat comprising "O" ring means for engagement with said sealing surface, and an annular flexing portion thinner than the diameter of said "O" ring means and integrally connected to said "O" ring means, a conical volute spring disposed about said piston, the large diameter end of said spring being urged against said one end of the piston, and means for restraining the small diameter end of said spring against movement whereby said spring resiliently urges the sealing surface toward the valve seat.

4,108,205
VALVE ARRANGEMENT

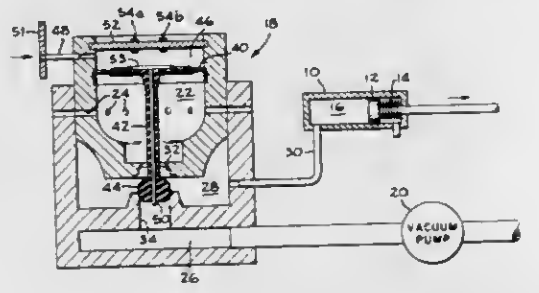
Jack S. Hawley, Berkeley, Calif., assignor to Pneumeric Corp., Castro Valley, Calif.

Filed Feb. 28, 1977, Ser. No. 772,461

Int. Cl.^{2} F16K *11/04*

U.S. Cl. 137—554 **2 Claims**

1. A valve arrangement for amplifying the effect of the application of the atmosphere on, or its removal from an air pressure responsive element, such as a bellows or a pneumatic cylinder, comprising in superposition an air admission chamber, an evacuation chamber and intermediately thereof a conduit leading to the air pressure responsive element, said chambers and said conduit having vertically aligned openings establishing communication between said air admission chamber and said conduit and between said evacuation chamber and said conduit, a stopper movable between said openings to close one or the other, and means for actuating said stopper comprising a flexible diaphragm forming the ceiling of said air admission chamber, a stem attached to said diaphragm and mounting said stopper, an air pressure responsive actuating chamber having said diaphragm as its floor and a transparent ceiling, an air admission opening, and a channel leading from said evacuation chamber through said stem to said control chamber, relatively spaced strips of conductive material arranged circumferentially in and around said transparent ceiling and a ring of conductive material arranged upon said diaphragm to act as a switch for activating visible or audible signals whenever said diaphragm reaches its highest position.



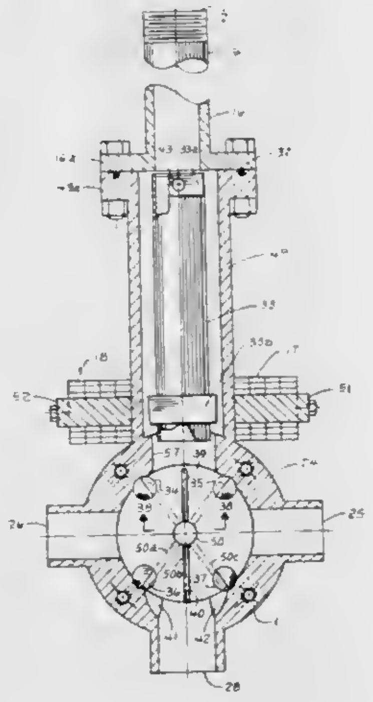
4,108,206
HERMETICALLY SEALED FOUR-WAY VALVE

Donald C. Mountain, 2812 King Rd., North Kingsville, Ohio 44068

Filed Aug. 30, 1976, Ser. No. 718,988

Int. Cl.^{2} F16K *11/10*

U.S. Cl. 137—596.17 **14 Claims**



1. A four-way electromagnetically controlled valve having a vane housing with a plurality of exit ports and an internal rotating vane for switching the flow from one exit port to another exit port, a pivoting flow nozzle, electromagnet means for pivoting the flow nozzle from side to side, the fluid discharge of the said pivoting nozzle turning said rotating vane, a stop means for holding the vane in final fluid delivery position, and electromagnets for holding the vane against said stop means.

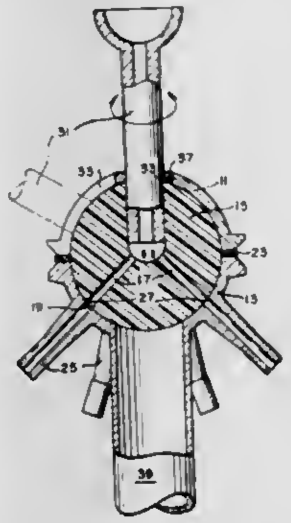
4,108,207
MULTIPLE-PORT VALVE

Thomas J. Doody, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1977, Ser. No. 787,137

Int. Cl.^{2} F16K *5/06, 11/087*

U.S. Cl. 137—625.47 **10 Claims**



1. A multiple-port valve assembly for interconnecting a primary conduit with one or more of a plurality of secondary conduits comprising:

a first generally hemispherical socket having a slotted opening that movably receives said primary conduit;

a second generally hemispherical socket rotatably and sealingly attached to said first socket to define a generally spherical volume within the two sockets;

said second socket having a plurality of openings each in fixed communication with one of said plurality of secondary conduits;

a generally spherical, solid plug rotatably received within said spherical volume within the two sockets, said plug having a first passageway for receiving an open end portion of said primary conduit and having a plurality of secondary passageways each extending from said first passageway to one of a plurality of ports within the outer surface of said plug, the plurality of ports being alignable each with at least one of said plurality of openings within said second hemispherical socket by rotation of the plug about an axis coinciding with the received primary conduit end portion, by tilting the primary conduit within the slotted opening of the first hemispherical socket and by rotating the first hemispherical socket along with the spherical plug in relation to the second hemispherical socket.

4,108,208
MIXING TAP

Paul Saffio von Corpon, 1, Rue du Village, Genthod, Geneva, Switzerland (1294)

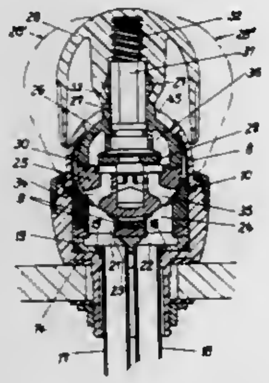
Filed Feb. 22, 1977, Ser. No. 770,746

Int. Cl.^{2} F16K *11/18, 5/06*

U.S. Cl. 137—636.3 **8 Claims**

1. A manually-adjustable mixing tap of the type comprising a spherical control member fluid-tightly swivelably mounted inside a tap body and carrying a manoeuvring handle comprising screw means for actuating a valve mounted in an inner mixing chamber of the control member, the control member having at least three peripheral openings for the inlet and outlet of liquids into and from the mixing chamber, said tap body having ducts cooperating with and selectively connecting said liquid inlet and outlet openings as a function of the position of the control member, the rate of flow from the mixing chamber being a function of the position of the valve, annular lips carried by the tap body, each annular lip surround-

ing one of the liquid inlet ducts at a location facing the control member, and a flexible annular tongue disposed in an annular chamber formed between the control member and the tap body, said annular chamber communicating with the liquid inlet ducts and surrounding an opening of the tap body through which said handle passes, said lips and tongue being fluid-tightly applied on the spherical surface of the control member by pressure of the liquids to provide fluid-tightness between the control member and the tap body.



4,108,209

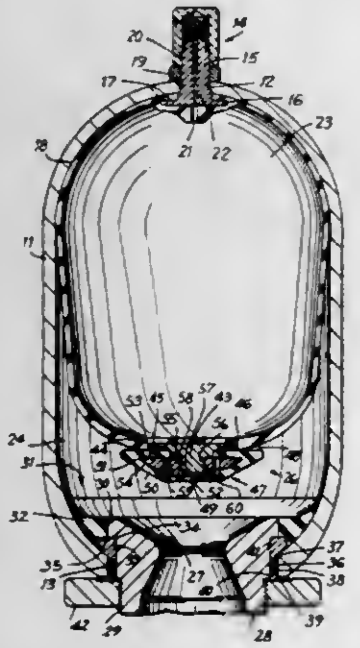
SILENT-ACTING HYDRAULIC ACCUMULATOR DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, CA

Filed Apr. 25, 1977, Ser. No. 790,324

Int. Cl.² F16L ***55/00***

U.S. Cl. 138—30 **3 Claims**



1. A silent acting hydraulic accumulator-pulsation dampener device comprising, in combination, a pressure vessel including a gas charging port at one end and an oil port at the other end, said oil port including a removable flared valve seat portion directed toward the interior of said vessel, a distensible elastomeric bladder assembly mounted within said vessel and dividing the same into two chambers in communication, respectively, with said oil port and said gas charging port, a metallic insert member fixed to an end portion of said bladder in opposed relation to said oil port, said insert member including a base embedded in the wall of said bladder with no portion of said insert extending into said chamber communicating with said gas charging port, a stop shoulder spaced from said base and directed toward said valve seat, and a threaded stem projecting beyond said shoulder, and a replaceable valve member mounted on said stem, said valve member comprising a frustoconic elastomeric shell portion sized to pass through said oil port and including a major base engaging said end portion of said bladder, a minor base of smaller diameter directed toward said seat, and side walls tapered to conform to the flare of said seat, an internal, upwardly open cavity formed within said shell portion and including an undercut annular groove, and a metallic retainer member disposed within said cavity and including flange portions extending into said undercut groove to lock said retainer member to said shell, said retainer member including an axially directed, internally threaded bore in registry with said upward opening in said shell, said opening being sized to expose upwardly facing portions of said retainer surrounding said bore; said bore being threadedly connected to said stem of said insert member, with said upwardly facing portions of said retainer engaged against said stop shoulder of said insert member, whereby said shell is mounted to said end of said bladder for movement into sealing and unsealing positions of said valve seat responsive to expansion and contraction of said bladder.

4,108,210

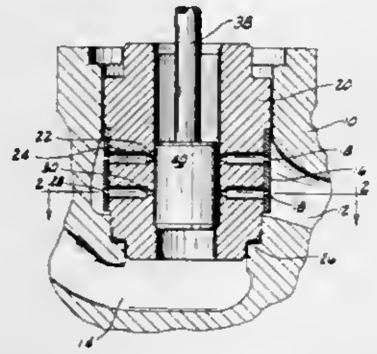
CONTROL VALVE TRIM ASSEMBLY

Fred J. Luthe, and Allen E. Hays, both of Marshalltown, Iowa, assignors to Fisher Controls Company, Marshalltown, Iowa

Continuation of Ser. No. 404,820, Oct. 9, 1973, abandoned. This application Sep. 2, 1976, Ser. No. 719,754

Int. Cl.² F16K ***47/08***

U.S. Cl. 138—42 **6 Claims**



1. In a fluid control valve having an inlet and an outlet, a cavitation-resistant valve trim cage comprising:

a first cage member having an annular wall and having a set of first flow-restricting orifices in said wall;

an inner second cage member having an annular wall, said inner second cage member being received within said first cage member and having its outer surface in circumferential engagement with the inner surface of said wall of said first cage member, said wall of said inner second cage member having a set of second flow-restricting orifices and having enlarged flow passages communicating between said sets of first and second orifices;

the centerline of each of said second flow-restricting orifices corresponding with the centerline of said enlarged flow passages;

said first and inner second cage members being positioned such that the centerline of any orifice of said set of second flow-restricting orifices corresponds to the centerline of the aligned orifice of said set of first flow-restricting orifices;

said first and second orifices each having radiused inlet portions having a radius of curvature between 30 and 80 percent of the diameter of said orifices;

said second orifices each being diametrically opposed to another in said wall of said second cage member; and

wherein flow through said cage members is from outside said first cage member to inside said second inner cage member,

whereby the fluid jets through said diametrically opposed second orifices expend energy impinging upon one another rather than on the valve body or internal valve elements.

4,108,211

ARTICULATED, FOUR-WAY BENDABLE TUBE STRUCTURE

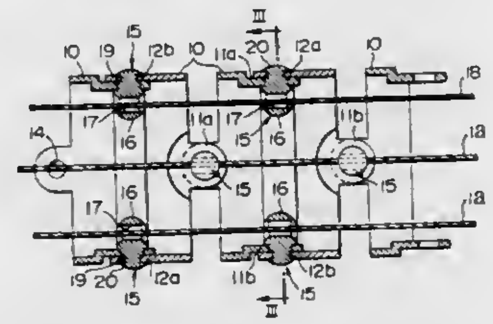
Hitoshi Tanaka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 21, 1976, Ser. No. 678,736

Claims priority, application Japan, Apr. 28, 1975, 50-58151[U]; Jun. 3, 1975, 50-74968[U]

Int. Cl.² F16L ***11/18***

U.S. Cl. 138—120 **8 Claims**



1. An articulated tube structure which can be bent selectively in four different directions by means of pull members extending therethrough, comprising in combination, a plurality of relatively short elementary tubes arranged end-to-end with uniform spacings therebetween and having a common axis when in alignment, a pair of lugs formed in diametrically opposite positions on one end of each of said elementary tubes, said pair of lugs being depressed radially inwardly of each said elementary tube so as to underlie the adjacent elementary tube, there being a first pair of pivot holes formed respectively in each of said pair of lugs on each of said elementary tubes, there being a second pair of pivot holes formed in diametrically opposite positions in the other end of each of said elementary tubes, said second pair of pivot holes in each of said elementary tubes being angularly spaced around said axis 90° from said first pair of pivot holes and being aligned respectively with said first pair of pivot holes in the next adjacent pair of lugs lying thereunder and thereby forming two pairs of aligned pivot holes for each of said tubes with one of said pairs being at each end of the tube and with said pairs being angularly spaced 90° around said axis with respect to each other, a plurality of pivot members corresponding in number with said aligned pivot holes and associated respectively therewith, each of said pivot members having a shank portion which is snugly received in its aligned holes to provide a pivotal connection therebetween and also having a bracket portion positioned toward said axis and having a bore therethrough which is parallel to said axis, whereby there are four of said bores upon said pivot members of each of said tubes which are angularly spaced 90° from each other with respect to said axis, and four pull members extending the length of said tube structure in parallel relationship when said tubes are in axial alignment and extending through the respective bores with each pull member extending through a bore of a pivot member for each of said tubes.

4,108,212

CORRUGATED FLEXIBLE METAL TUBING AND METHOD AND APPARATUS FOR MAKING SAME

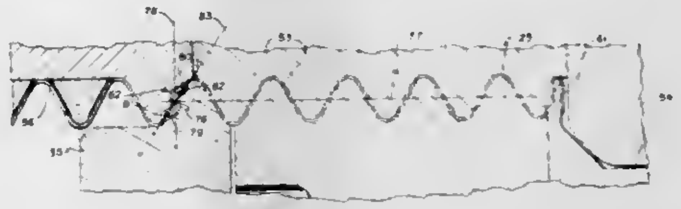
Leroy E. Anderson; Michael P. Schmidt, and William W. Weaver, all of Detroit Lakes, Minn., assignors to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Filed Feb. 9, 1976, Ser. No. 656,389

Int. Cl.² F16L ***11/16***

U.S. Cl. 138—122 **20 Claims**

1. A corrugated cylindrical tube comprised of a single narrow strip of formable material helically wound into contiguous convolutions and defining a tube having adjacent circumferentially extending corrugations therein, said corrugations each having a bottom bounded by opposed radially extending legs, said strip having marginal portions each with a free edge supported at opposite sides thereof and reversed upon itself in opposite directions to form a U-shaped seam element at each side thereof having opposed legs, the free edge of each of said marginal portions being received between the legs of one of said seam elements of the convolution of said strip contiguous thereto and thereby cooperatively defining a radially extending seam and comprising a common leg of a corrugation for the contiguous convolutions of said strip, each of said seam elements being deformed intermediate its ends in cooperative interlocking relation at a plurality of radially spaced locations along the slope of the corrugation leg which said seam elements comprise, each of said seam elements being deformed at each of said locations in a direction opposite to that of its adjacent deformation.



4,108,213

METHOD AND APPARATUS FOR A WEAVING MACHINE FOR FORMING A FABRIC SELVEDGE

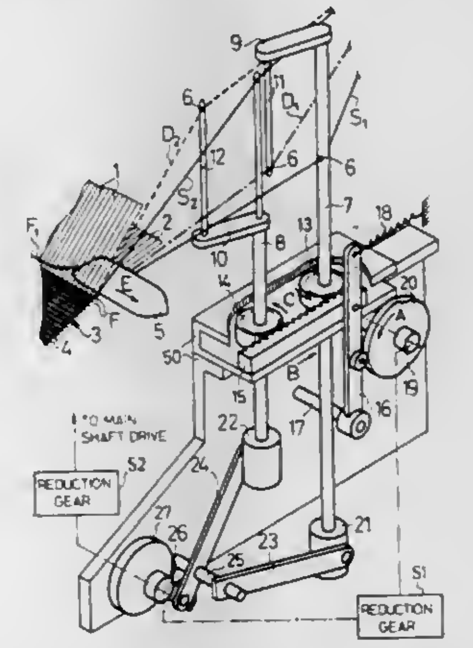
Peter Guttinger, Tann-Rüti, Switzerland, assignor to Ruti Machinery Works Ltd, Ruti, Switzerland

Filed Mar. 21, 1977, Ser. No. 779,780

Claims priority, application Switzerland, Mar. 25, 1976, 3728/76

Int. Cl.² D03D ***47/40***

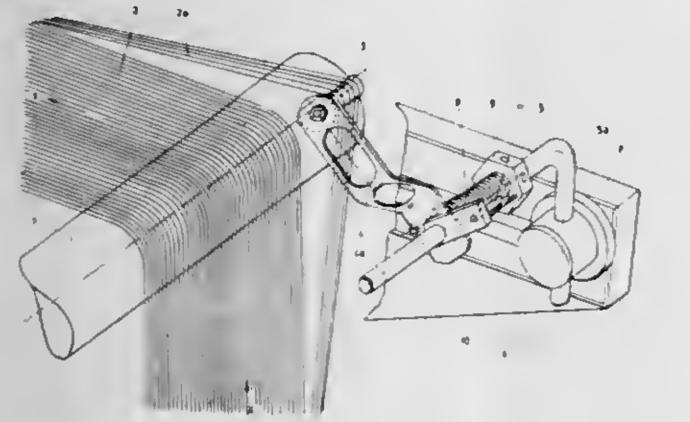
U.S. Cl. 139—54 **15 Claims**



4. An apparatus for forming a fabric selvedge on a loom with two crossing threads and two noncrossing threads, having guide eyelets for associating a crossing thread and a noncrossing thread in each case, threads D_1, S_1, and threads D_2, S_2, with one another as a pair of selvedge threads, said guide eyelets for each pair of selvedge threads being situated substantially adjacent one another, and having holding means for the guide eyelets of the crossing and noncrossing threads and with first and second driving means coupled with these holding means, the first driving means being provided for the shed forming movements of all the holding means and the second driving means for the pivoting movement of the holding means, comprising the guide eyelets of the crossing threads, characterized in that the first driving means and the second driving means are so controlled that the pivoting movement of

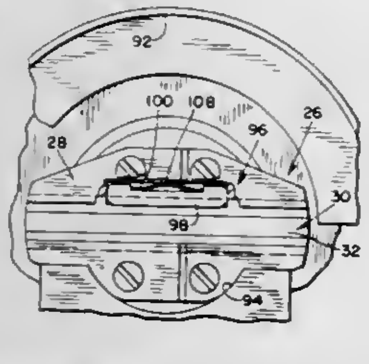
the holding means for the guide eyelets of the crossing threads D_1, D_2 is carried out in each case after each second shed forming movement.

4,108,214
WEAVING LOOM WITH TENSION ADJUSTOR FOR WARP EDGE THREADS
Hubert Peter van Mullekom, Deurne, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands
Filed Jan. 10, 1977, Ser. No. 758,127
Claims priority, application Netherlands, Jan. 20, 1976, 7600568
Int. Cl.² D03D *49/00*
U.S. Cl. 139—97 **2 Claims**



1. A weaving loom in which the back beam is mounted for carrying out a limited translational movement for compensating the variations in tension in the warp threads passing over it, which variations are caused by the periodic changes of the shed, characterized in that an auxiliary guide for a plurality of warp edge threads is provided at at least one end of the back beam for adjusting tension deviations in the edge threads with respect to the average warp thread tension, said guide being mounted to carry out a translational movement, independently of the back beam, under the influence of an adjustable load imparted to it, and said guide being formed by a roller, the axis of which extends parallel to that of the back beam, said roller being rotatably mounted on an arm which in turn is rotatably mounted on a shaft extending parallel to the back beam axis and is spring-loaded in the direction turned away from the back beam.

4,108,215
CONTROL MECHANISM FOR GRIPPER SHUTTLES
John H. Osgood, Westboro, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.
Filed Oct. 20, 1976, Ser. No. 734,142
Int. Cl.² D03D *47/24*
U.S. Cl. 139—438 **9 Claims**



1. Shuttle control apparatus for looms operating with gripper shuttles comprising:

a. a shuttle box having an elongated opening along one side thereof and at least two generally opposed elongated surfaces extending inwardly from said elongated opening for guiding a shuttle therebetween;

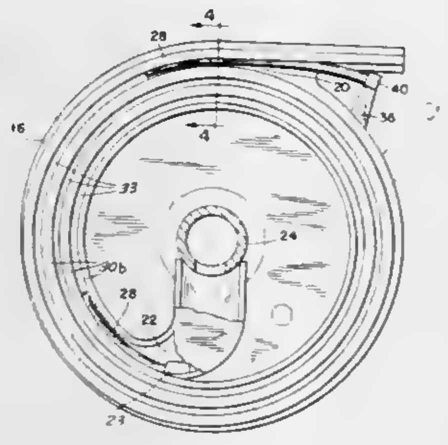
b. a braking member movable toward and away from said opening;

c. means for moving said braking member toward said opening for engaging and braking a shuttle which enters said shuttle box and away from said opening for disengaging from said shuttle and thereby allowing said shuttle to be picked out of said shuttle box;

d. means for positioning a shuttle to a predetermined location within said shuttle box after it has been braked; and

e. a restraining member extending along a portion of at least one of said elongated surfaces for restraining a shuttle against sliding movement between said surfaces to maintain it in said predetermined location after it has been positioned and which allows said shuttle to be picked out of said shuttle box.

4,108,216
YARN DISPENSING APPARATUS FOR A LOOM AND THE METHOD THEREOF
Karl W. Wueger, Ward St., North Brookfield, Mass. 01535
Filed Nov. 11, 1974, Ser. No. 522,402
Int. Cl.² D03D *47/36*
U.S. Cl. 139—452 **19 Claims**



1. A yarn dispensing apparatus for a loom comprising:

(a) a conduit having an opening at each end thereof and a continuous opening which extends from one of said end openings to the other along one side of said conduit;

(b) a valve for sealing said continuous opening;

(c) means for creating an air flow through said conduit from one of said end openings to the other upon sealing of said continuous opening to draw a loop of yarn from a source of supply into said conduit through said one end opening; and

(d) control means for actuating said valve so that said continuous opening is alternately unsealed to allow said yarn to be withdrawn from said conduit through said continuous opening to said loom and sealed to allow an additional length of said yarn to be drawn into said conduit from said source of supply.

4,108,217
METHOD AND APPARATUS FOR FORMING AND TRIMMING LEADS
John Kellogg Westberg, II, Boulder, Colo., assignor to Formistor Corporation, Vail, Colo.
Filed Jun. 13, 1977, Ser. No. 805,762
Int. Cl.² B21F *45/00*
U.S. Cl. 140—105 **15 Claims**

1. Apparatus for forming and trimming the leads of electronic components, the apparatus comprising:

an index disc mounted for rotation around an axis and having defined in the periphery thereof indentations adapted to accomodate electronic components;

a motor;

indexing means connecting the motor to the index disc and adapted to rotate the index disc in an intermittent manner;

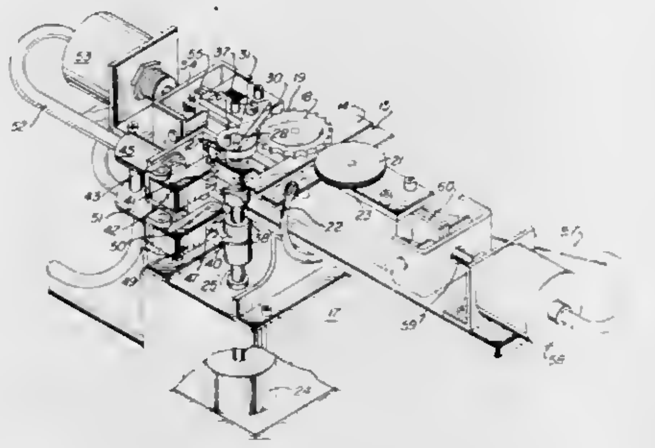
an idler disc positioned adjacent the index disc to form an interface therewith and mounted for rotation around an axis substantially parallel to the axis of the index disc;

means to lock the index disc against rotation when the index disc is not engaged for rotation by the indexing means;

first and second timing means operably connected to the motor;

first and second drive means each connected for activation by the first and second timing means, respectively;

first and second die means carried one each by the first and second drive means, the first and second die means being positioned adjacent to but axially spaced from the index disc and idler disc and adapted to converge adjacent the interface between the index disc and idler disc;



feed means adapted to supply electronic components to the interface between the index disc and idler disc;

whereby electronic components may be supplied to the index disc and accomodated in an indentation therein, intermittently advanced by the motor driving through the indexing means to the interface position between the index disc and idler disc whereupon the first and second timing means activates the first and second drive means to converge the first and second dies adjacent the index disc and idler disc interface to trim and form leads projecting from the electronic component into the path of the converging dies.

4,108,218
METHOD OF PREPARING A REACTION CHAMBER
John H. Estes, Wappingers Falls; Stanley Kravitz, Fishkill, and John T. Brandenburg, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed Jun. 25, 1976, Ser. No. 699,754
Int. Cl.² B65B *3/04;* B01J *21/04, 23/22*
U.S. Cl. 141—1 **7 Claims**

1. The method of preparing a reaction chamber containing particulate contact medium in a gravity-packed bed having at operating temperature a solid substantially continuous phase of cooled fused-solid and a discontinuous phase of said particulate support medium, the component portions of said particulate support medium being positioned substantially uniformly through the supporting matrix of said fused solid, said cooled matrix being bonded, internally each portion to an adjacent portion, and externally to the wall of said reaction chamber, through which bed fluid passes as it contacts the surface of said contact medium at operating temperature which comprises

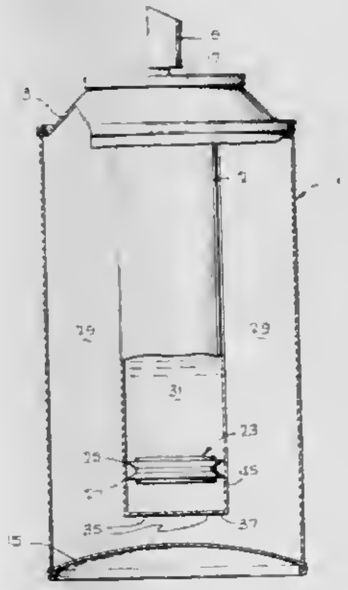
(a) forming a mixture containing (i) a fluid suspending medium and (ii) at least one finely-divided solid selected from the group consisting of oxides of a catalytic metal of Group V B, Group VI B, and Group VII B of the Periodic Table and compounds thermally decomposable to said oxide, which solid is fusible at temperature above said operating temperature and solid at said operating temperature;

(b) contacting said mixture and a particulate support medium thereby uniformly coating said particulate support medium with said finely-divided solid, said finely-divided solid being present in amount of a 0.1 w %–25 w % of the total of said finely-divided solid and said support medium;

(c) heating said coated particulate support medium, as a gravity-packed bed filling the inside of said reaction chamber and in contact with the walls thereof, to a temperature at least as high as the fusion temperature of said finely-divided solid whereby said finely-divided solid fuses and forms a substantially continuous matrix within which the particulate support medium is present as discontinuous phase; and

(d) quiescently cooling said fused solid to temperature below its fusion temperature thereby forming a solidified matrix, occupying the interior of said chamber and substantially fixed therein, having at operating temperature a substantially continuous solid phase of said cooled fused-solid and a discontinuous phase of said particulate support medium, the component portions of said particulate support medium being positioned substantially uniformly through the supporting matrix of said fused solid, said cooled matrix being bonded, internally each portion to an adjacent portion, and externally to the wall of said reaction chamber.

4,108,219
AEROSOL DISPENSER WITH INNER CONTAINER AND PISTON
Josepb Shulsinger, 26907 Indian Peak Rd., Rancho Palos Verdes, Calif. 90274
Filed May 25, 1977, Ser. No. 800,298
Int. Cl.² B65D *83/14*
U.S. Cl. 141—3 **4 Claims**

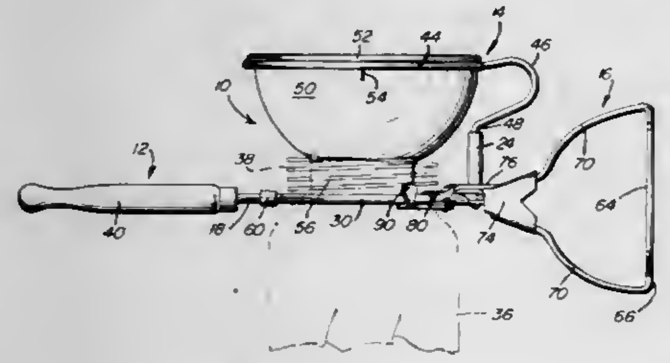


1. (New) A spray container comprising
a first cylinder including
  a continuous side wall
  a pair of end walls sealed to said side walls and,
  an aerosol valve in one of said end walls
a second cylinder within said first cylinder and sealed to said one of said end walls about said aerosol valve, piston means within said second cylinder including
means on said piston means for forming a seal about said piston means with at least a portion of the internal surface of said second cylinder wall and having
  a wall having
    at least one aperture in said second cylinder wall so located as to always be on a first side of said piston means regardless of the axial position of the latter within said second cylinder at least one additional aperture in said second cylinder so located as to provide fluid communication between the volume within said second cylinder on a second side of said piston and the volume within said first cylinder but outside of said second cylinder, when said piston is

located at an axial position within said second cylinder at least a predetermined distance from said aerosol valve.

4,108,220
MULTIPLE USE CANNER

Stanley J. Pantek, 4244 Pantek Park, Attica, Mich. 48412
Filed Jun. 23, 1977, Ser. No. 809,438
Int. Cl.² B65B *3/04*
U.S. Cl. 141—98 10 Claims



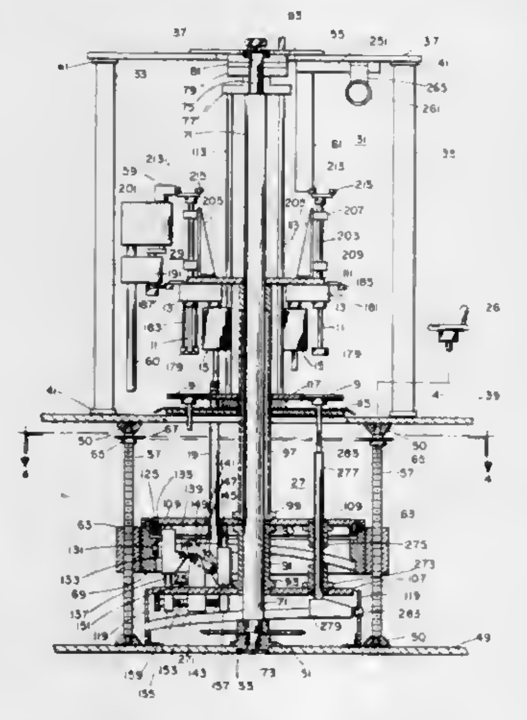
1. A multiple use canner comprising a pair of elongated handle members, means pivotally interconnecting said handle members, jaw means on each of said handle members disposed in opposed relation for movement toward and away from each other, a gripping assembly forming an extension of the handle members, means detachably securing the gripping assembly to the handle members, said gripping assembly including a pair of jaw members oriented in perpendicular relation to the jaw means and movable toward and away from each other in response to pivotal movement of the handle members in relation to each other to enable the jaw means to engage a supporting structure when disposed in one plane and the jaw members to clampingly engage a support when oriented in a plane perpendicular to the first mentioned plane.

4,108,221
CONTAINER FILLING MACHINE

Gerhart William Freimuth, Flemington, and Jerold Samuel Weiner, Spotswood, both of N.J., assignors to Gerhart Engineering & Machine Co., Somerville, N.J.
Filed Aug. 6, 1976, Ser. No. 712,054
Int. Cl.² B65B *3/32*
U.S. Cl. 141—146 12 Claims

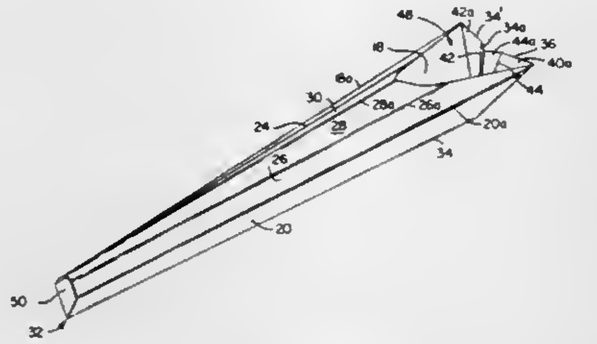
1. In a container filling machine, the combination comprising:

a plurality of container platforms;
a bulk supply tank for storing fluid;
a plurality of piston pumps each including a piston rod;
a plurality of nozzles;
a plurality of valves, each one of said valves being associated with and having an individual piston pump and individual nozzle connected thereto, said nozzle projecting downward from said valve above a particular one of said container platforms;
means for delivering fluid from said bulk supply to said valves;
means for operating said valves to deliver fluid from said bulk supply tank into said piston pumps during a charging cycle, and from said piston pumps into said nozzles during a discharge cycle;
cam controlled pumping means including: a barrel-like pump actuating cam having a track; and cam follower means resting partially within and guided by said track, for providing pumping movement correspondence with the profile of said track; said cam controlled pumping means providing in combination with said valve operating means, greater than 180° of machine time for continuously discharging fluid from said nozzles during the discharge cycle; and
stroke adjusting means including: a plurality of crank levers pivotally connected between said cam follower means and individual ones of said piston rods of said piston pumps, respectively; and means for controlling the pivoting of said plurality of crank levers for providing infinite adjustability in a range between zero and maximum stroke of the stroke of said piston pumps without necessitating changing of the profile of said pump actuating cam.



4,108,222
COLLAPSIBLE DISPOSABLE FUNNEL

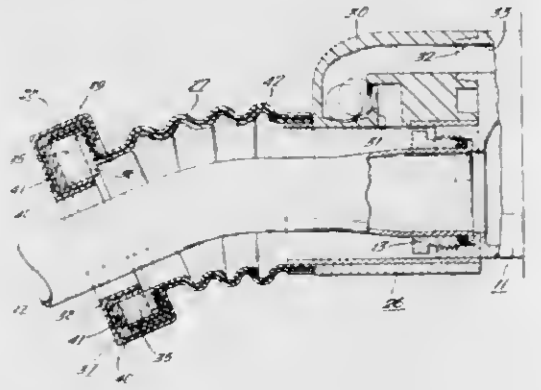
George Kaufman, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,530
Int. Cl.² B65B *39/00*; B67C *11/02*
U.S. Cl. 141—337 5 Claims



1. A collapsible funnel comprising a body portion and a moveable dam forming an integral part of said body portion, said body portion having a cross section defined perimetrically by two bottom panels separated by a fold line extending longitudinally along said panels and being folded along said fold line into a V-shaped disposition at the lower portion of said cross section, said bottom panels subtending and connecting with multiple panel walls arranged in polygonal disposition at the upper portion of said cross section to provide a fluid inlet on one end of said connected multiple wall panels adjacent said dam, a fluid outlet on the opposite end of said connected panels, said connected panels remote from said dam defining an enclosed fluid passageway for said funnel leading from said fluid inlet to said fluid outlet, said dam being formed into a movable vertically disposed wedge-like configuration by a series of fold lines having a common vertex along said bottom panel fold line, forward and rearward movement of said dam being accomplished by application and release of pressure respectively against the side edges of said funnel.

4,108,223
VAPOR RECEIVING SYSTEM FOR A DISPENSING NOZZLE

William B. Hansel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.
Filed Mar. 8, 1976, Ser. No. 664,445
Int. Cl.² B65B *3/04*
U.S. Cl. 141—392 24 Claims



1. A vapor receiving system for use on a dispensing nozzle having a housing and a discharge spout, the vapor receiving system being designed to receive the vapors displaced through the fillpipe from the tank being filled and to be in fluid communication with a recepticle for receiving the vapors displaced from the tank, the vapor receiving system comprising:

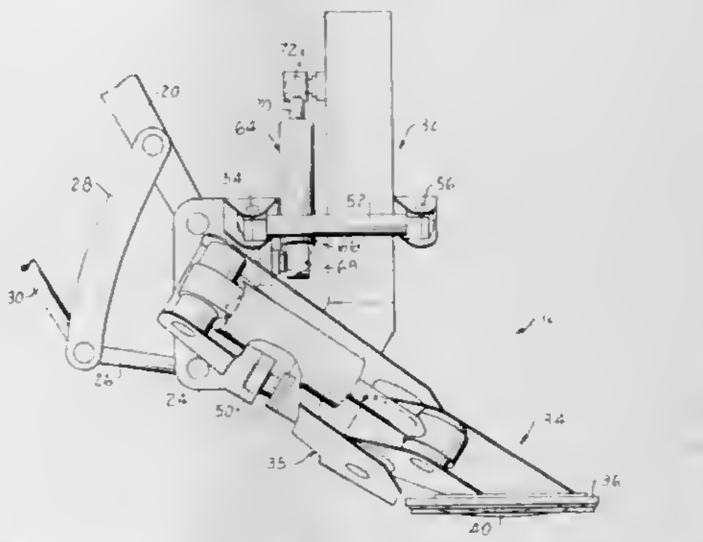
(a) means defining a vapor receiving chamber surrounding the discharge spout of the nozzle and having one end for connection to the nozzle housing;
(b) a sealing section connected to the other end of the vapor receiving chamber and having a sealing face for meeting the fillpipe opening; and
(c) means for covering the sealing face of the sealing section so that a tight seal is obtained between the fillpipe and the sealing face, said covering means including,
  (i) reinforcement means, and
  (ii) flexible material impregnating the reinforcing means to form a thin, smooth flexible layer wherein the reinforcement means in the flexible material enables maximum strength and flexibility to be imparted to the covering means to increase the probability of obtaining a tight seal between the sealing face and the fillpipe.

4,108,224
TREE SHEAR TILTING MECHANISM

Leon A. Wirt, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 13, 1976, Ser. No. 731,966
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 E 15 Claims

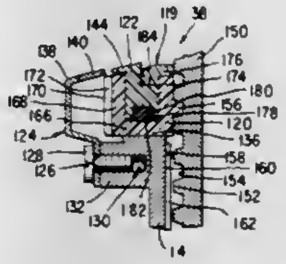
1. A mounting apparatus for a tree shear mechanism of a vehicle, said tree shear mechanism comprising a frame and shear means operatively mounted thereto, said mounting apparatus comprising:

a body;
means mounting the body to the vehicle;
pivot means interconnecting the body and frame of the tree shear mechanism for providing pivoting of the frame and shear means relative to the body generally about a longitudinal axis of the vehicle;
link means interconnecting the body and frame for guiding movement of the frame as the frame is pivoted relative to the body about the longitudinal axis of the vehicle through the pivot means interconnecting the body and frame; and
means for so pivoting the frame relative to the body.



4,108,225
DEPTH-OF-CUT MECHANISM FOR ROUTERS

Charles Edward Hestily, Greenville, S.C., assignor to The Singer Company, New York, N.Y.
Continuation-in-part of Ser. No. 736,916, Oct. 29, 1976, Pat. No. 4,051,880. This application May 12, 1977, Ser. No. 796,507
Int. Cl.² B27C *5/10*
U.S. Cl. 144—134 D 4 Claims



1. A portable electric router comprising:

(a) a base having an open top and a flat bottom defining a reference plane,
(b) a motor housing having a threaded section slidably received in the base, and free to move vertically, but restrained from rotation therein,
(c) a motor journaled in the motor housing and carrying a bit at its lower end,
(d) a pointer fixedly connected to the base adjacent the open top thereof and extending radially outwardly therefrom,
(e) a ring member including an outer ring within which an inner ring is entrapped,
(f) the ring member being nestable upon the open top of the base,
(g) the outer ring being threadedly connected to the motor housing,
(h) the inner ring having calibrated outward extension, and
(i) the inner ring being selectively rotative independently of, or in combination with the outer ring relative to the pointer to permit vertical adjustment of the motor housing to a predetermined depth-of-cut of the bit relative to the reference plane.

4,108,226
VENEER PRODUCTION

L. F. Bornstein, Atlanta, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jan. 3, 1977, Ser. No. 758,908

Int. Cl.^{2} B27M *1/06*

U.S. Cl. 144—327 **7 Claims**

1. A method for the production of softwood veneer comprising the steps of:

(a) soaking softwood logs in a vat containing hot water and a conditioning agent comprising urea; said urea being present in said vat in a concentration of from about 0.003% to about 2% by weight; and

(b) peeling a veneer from said logs.

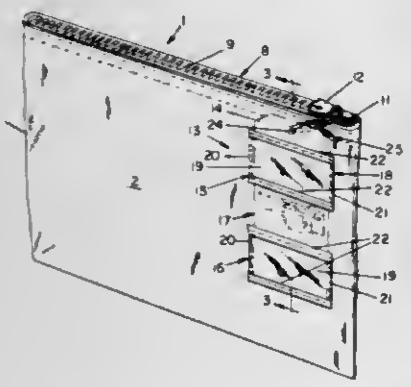
4,108,227
MAILING BAG WITH ADDRESS CARD MOUNTING POCKET

Cletus D. Bonner, Beaver, Pa., assignor to Strayer Coin Bag Company, Inc., New Brightoo, Pa.

Filed Dec. 29, 1977, Ser. No. 865,737

Int. Cl.^{2} A45C *13/42*

U.S. Cl. 150—15 **6 Claims**



1. A bag for carrying mail or the like comprising two overlying panels of similar size and shape secured along their two peripheral sides and bottom edges to form a main pocket therebetween, said top edges being unsecured to provide a mouth, a slide fastener connected to said panels along said top edges for opening and closing said main pocket mouth, a card pocket including spaced upper and lower sections covered with transparent material and an exposed open mid portion therebetween, an address card removably inserted beneath said pocket sections and having spaced upper and lower address portions thereon and a blank mid portion therebetween whereby said addresses are covered by said transparent material and said exposed mid portion is accessible for receiving and cancelling postage.

4,108,228
VEHICLE WHEEL WITH RUBBER TIRE

Reinhard Tiemann, Hemmingen, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Nov. 26, 1975, Ser. No. 635,662

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456420

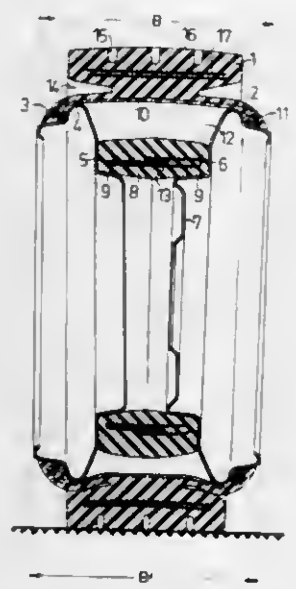
Int. Cl.^{2} B60B *9/10*

U.S. Cl. 152—7 **11 Claims**

1. In combination:

a vehicle wheel comprising a split rim having separate independent rim discs without rigid connection to each other, each rim disc having lateral wheel flanges axially spaced from each other for receiving tire beads radially outwardly thereon and also having rim extensions respectively connected to and directed radially inwardly from said wheel flanges and defining with each other an annular space extending radially inwardly therebetween with regard to the largest diameter surface of said wheel flanges;

a solid rubber tire having beads resting radially on the axial outside of, and held respectively by, said lateral wheel flanges, said wheel flanges exerting outwardly directed axial forces upon said beads by means of spring tension, and said tire exerting inwardly directed axial forces on said rim discs, said tire extending across said annular space and being adapted to be partially deflected thereinto during springing-in of said tire; and



additional intermediate coaxial means located between said rim discs and radially inwardly between said wheel flanges for supporting and detachably connecting said rim discs and for resisting said inwardly directed axial forces of said tire, said solid rubber tire and said additional intermediate coaxial means being individual parts which are assembled together safely under tensile and pressure forces into a functional unit without the necessity of any bonding connections, said tire and said coaxial means being suitably capable of being taken apart again for interchange and replacement purposes.

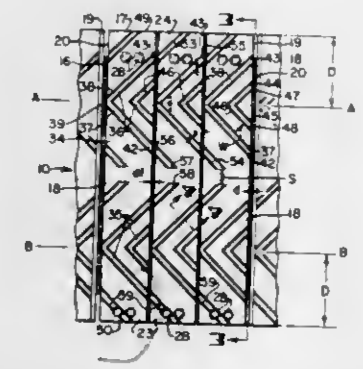
4,108,229
TRACTION ELEMENT FOR REMOVABLE TRACK

Eugene T. Herman, Saint Marys, Ohio, assignor to The Goodyear Tire & Rubber Compaoy, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,433

Int. Cl.^{2} B60C *11/00*

U.S. Cl. 152—175 **4 Claims**



1. A track for an annular resilient tire comprising a flexible belt, a plurality of substantially rigid elongated shoes extending transversely of said belt and being mounted on said belt at spaced-apart positions along said belt, each of said shoes having a belt-engaging surface, a ground-engaging surface, a leading edge, a trailing edge and end edges, substantially rigid raised traction bars on said ground-engaging surface, all of said bars being in groups at spaced-apart positions transversely of said belt on said ground-engaging surface or being supplementary separate traction bars, each of said groups having a pair of bars positioned at acute angles to said leading and trailing edges with said pair of bars extending from first spaced-apart positions on said ground-engaging surface at said trailing edge to a single position on said ground-engaging surface at said leading edge, each of said groups having a second pair of traction bars in substantially parallel relationship to said pair of traction bars and extending from spaced-apart positions on said trailing edge located between said first-mentioned spaced-apart positions on said trailing edge to an intermediate position between said leading and trailing edges and said supplementary traction bars extending from said leading edge and in substantial alignment with at least some of said bars of said groups so that the spaces between all of said bars are open at said trailing edge for passage of earth and cleaning of said shoes during operation.

4,108,230
TIRE STUDS

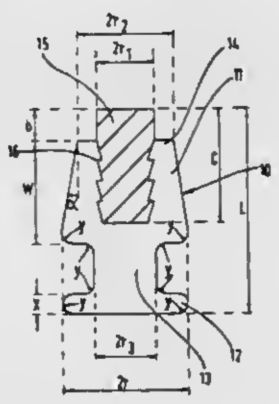
Robert Bond, Lichfield, England, assignor to Dunlop Limited, England

Filed Jun. 28, 1976, Ser. No. 700,526

Claims priority, application United Kingdom, Jul. 5, 1975, 28455/75

Int. Cl.^{2} B60C *11/14*

U.S. Cl. 152—210 **1 Claim**



1. A tire stud having a body of circular cross-section with a maximum radius r of 0.00275 meter ± 0.0005 meter, said body having a tip portion embedded in one end of said body and protruding above said body by a distance b of 0.00125 meter ± 0.00025 meter, said tip portion having a circular cross-section with a radius r_1 of 0.0015 meter ± 0.0002 meter, said stud having an overall length L of 0.010 meter ± 0.0005 meter, and being dimensioned such that the expression

$$\frac{a_1(a_2 + a_3)a_4}{(a_5 + a_6 + a_7)}$$

lies between the limits 3.3×10^5 and 8.2×10^5 where:

$$a_1 = \frac{31.831}{(r_1)^2}$$

$$a_2 = 67468.8r$$

$$a_3 = \frac{0.0705221r}{(b + 0.00043)^2}$$

$$a_4 = (7000.0b + 3.0)r^2$$

$$a_5 = 21476.0r(0.015 + b - L)$$

$$a_6 = 7560117.0r^2(b + 0.00043)$$

$$a_7 = \frac{0.02245r(0.015 + b - L)}{(b + 0.00043)^2}$$

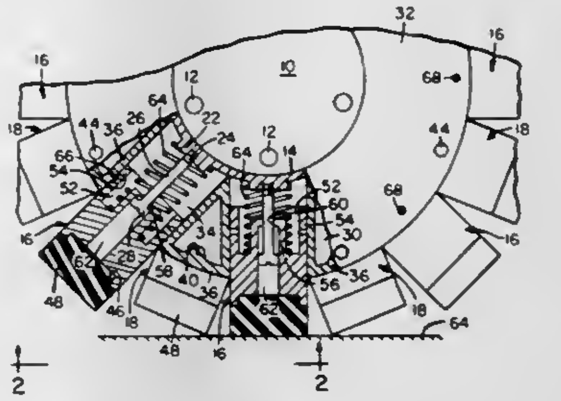
4,108,231
VEHICLE WHEEL

Leonard J. Holchuk, 2053 Lake St., Elmira, N.Y. 14901

Filed Oct. 6, 1976, Ser. No. 730,205

Int. Cl.^{2} B60C *7/18*

U.S. Cl. 152—290 **6 Claims**



1. A vehicle wheel comprising

a hub,

first and second equally-sized, spaced, coaxial disks, said first disk surrounding said hub and being coplanar therewith,

a first plurality of triangularly shaped members disposed between said first and second disks and being secured thereto, each of said first plurality of members having two identical opposed planar rectangular walls which are secured together at one edge thereof,

a first right circular cylinder which is coaxial with said hub, a first end of said first cylinder being secured to said hub and said first disk, the end of said first cylinder opposite said first end being secured to said second disk, said one edge of said two planar walls of each of said first plurality of members being affixed to said first cylinder, said first plurality of triangularly shaped members being equally spaced around said first cylinder, the space between each of the adjacent ones of said first plurality of members forming along with the adjacent portions of said first and second disks a first plurality of equally spaced chambers, the opposite walls of each chamber being parallel,

a first plurality of feet, one of said feet being disposed in each of said first plurality of chambers and being capable of radial movement, that portion of each of said feet nearest said first cylinder having at least one cavity therein,

means for restricting movement of each of said feet beyond a predetermined distance from said first cylinder so that those portions of said feet remote from said first cylinder tend to lie in a substantially circular arc, and

at least one spring disposed between each of said feet and said first cylinder, one end of each spring being fixedly mounted with respect to said first cylinder, the other end of each spring being disposed within its respective cavity.

4,108,232
SHIELD FOR SEALING A TUBELESS TIRE ON A SPOKED WHEEL RIM

Robert O. Simpson, Cuyaboga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 28, 1976, Ser. No. 736,686

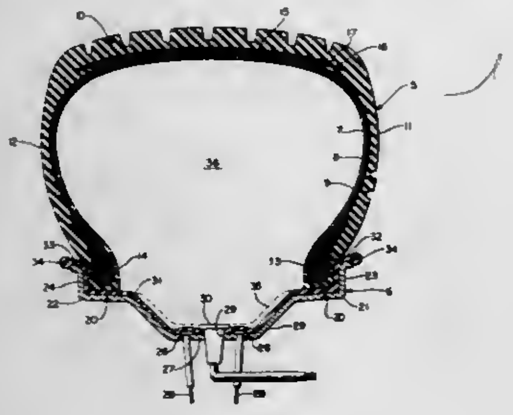
Int. Cl.^{2} B60C *5/08*

U.S. Cl. 152—365 **2 Claims**

1. A shield for sealing openings in a U-shaped well formed in the cylindrical base of a conventional, spoked wheel rim on which a conventional tubeless tire is mounted, comprising:

(a) a generally cylindrical fluid impervious, elastic annulus dimensioned to at least cover the base between flanges of the wheel rim; and

(b) transversely extending folds arcuately spaced centrally of the annulus at a position to cover the U-shaped well for controlling movement of the central portion of the annulus into the well of the wheel rim.

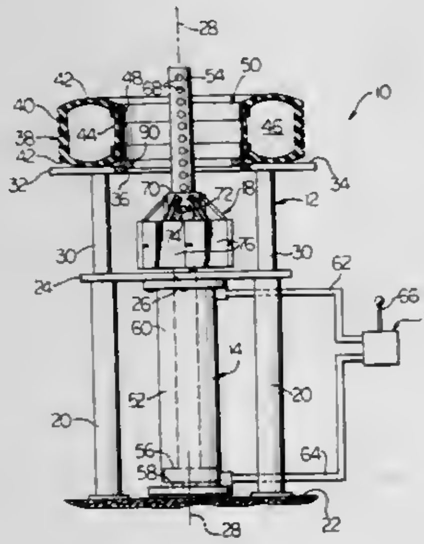


4,108,233

TIRE AND CENTER SUPPORT ASSEMBLING APPARATUS

Terry G. Baer, Edelstein, and Wayne A. Klopfenstein, Princeville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 30, 1977, Ser. No. 782,670
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.37 **7 Claims**



1. A tire and center support assembling apparatus, for installing a split rim into a tire, comprising:

a tire supporting frame having a central axis;

a powered actuator connected to the frame and having a movable element; and

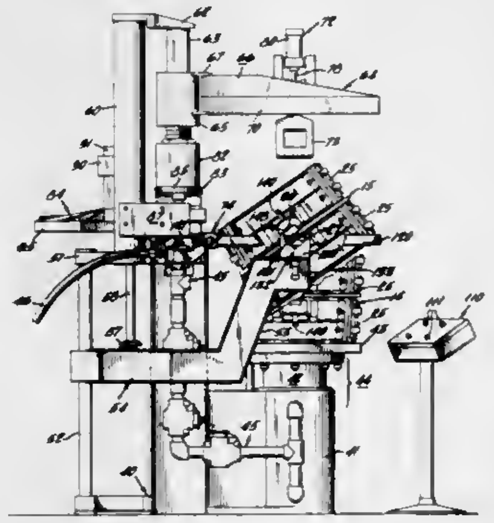
shoe assembly means for expanding the rim into a preselected interference fit position within the tire in response to selective movement of the element of the actuator along the axis, the shoe assembly means having a plurality of similar shoes individually having a radially outer cylindrical surface portion and linkage means for radially moving and expanding each of the shoes in a plane perpendicular to the central axis into engagement with the rim while maintaining the outer cylindrical surface portions collectively in generally concentric and aligned relation with the central axis, the linkage means being connected to the movable element.

4,108,234

METHOD AND MACHINE FOR PRODUCING SAND MOLDS

Thomas R. Shine, 782 Richards Rd., Wayne, Pa. 19087

Filed Apr. 19, 1977, Ser. No. 788,813
Int. Cl.² B22C *17/00, 17/08*
U.S. Cl. 164—38 **2 Claims**



1. The method of producing a sand mold in a flask assembly having a cope and drag with trunnions thereon, and a matchplate, comprising:

a. supporting the flask assembly drag up with sand in the drag;

b. jolting the flask assembly to settle the sand within the drag;

c. placing a bottom board on top of the drag sand;

d. vertically picking up the flask assembly at the trunnions and rolling the flask assembly over to place the flask assembly in a cope-up position, and lowering the flask assembly vertically back down, to receive sand within the cope;

e. filling the cope with sand;

f. squeezing the sand within the flask assembly;

g. vertically raising the flask assembly to an upper position, and retaining the cope by means of the cope trunnions, with the squeezed sand therein, at said upper position;

h. lowering, in a vertical direction only, the drag, with the squeezed sand therein, and the matchplate, to a position below the cope;

i. removing the matchplate from the drag and swinging it to one side of the drag;

j. vertically raising the drag and sand therein up to the cope to reunite the drag to the cope to form the completed sand mold;

k. vertically lowering the cope and drag and sand mold therein to a lower position; and

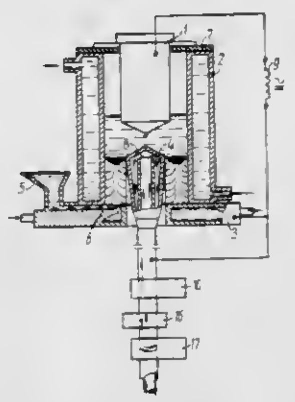
l. opening the cope and drag flasks and raising vertically the cope and drag flask to an upper position, while allowing the sand mold to remain at the lower position, wherein all movements of the cope and drag are limited to vertical movement only.

4,108,235

ELECTROSLAG REMELTING APPARATUS HAVING RELATIVE MOLD MOVEMENT AND PROVISION FOR INTRODUCTION OF SLAG

Boris Evgenievich Paton, ul. Kotsjubinskogo 9, kv. 21; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt 87, kv. 14; Leonty Vasilievich Chekotilo, ulitsa Scherbakova, 49-a, kv. 10; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3; Viktor Leonidovich Artamonov, ulitsa Sovetskaya 9, kv. 4; Rodimir Ivanovich Garkaljuk, ulitsa Bolshaya, kitaevskaya, 142 korpus 14, kv.33; Viktor Anatolievich Timchenko, ulitsa Vladimirskaya 98/3, kv. 36; Evgeny Fedorovich Malichenko, prospekt Entuziastov 7/12, kv. 161; Leonid Mikhailovich Stupak, Brest-Litovsky prospekt 39, kv. 9, and Rudolf Solomonovich Dubinsky, Brestlitovsky prospekt 11, kv. 15, all of Kiev, U.S.S.R.

Continuation of Ser. No. 124,836, Mar. 16, 1971, abandoned, which is a division of Ser. No. 771,165, Oct. 28, 1968, abandoned. This application Sep. 17, 1974, Ser. No. 506,719
Int. Cl.² B22D *27/02*
U.S. Cl. 164—252 **37 Claims**



1. A device for electroslag remelting of metal comprising: a mold defining a remelting zone by the lower portion thereof: at least one consumable electrode disposed in said mold with its lowermost end in said remelting zone; means connected to said device for applying electrical power to said electrode to melt the same: means connected to said mold for supporting, enabling and controlling axial movement of said mold during remelting; means engaging said electrode and for supporting and controlling movement of said electrode: a cooled core disposed at least in part inside of said mold for forming an internal cavity in the ingot being built-up from said consumable electrode; and means for introducing molten slag to said remelting zone including a slag conducting aperture located in the structure of said mold lower portion.

4,108,236

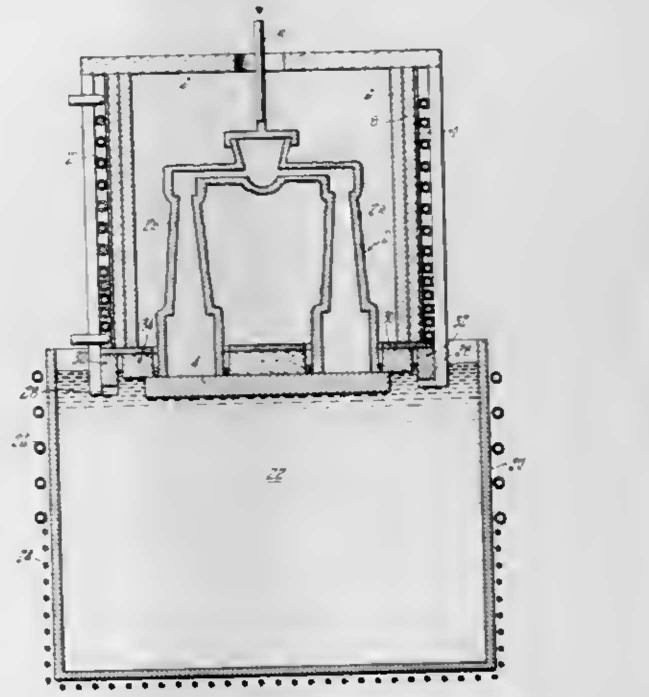
FLOATING HEAT INSULATING BAFFLE FOR DIRECTIONAL SOLIDIFICATION APPARATUS UTILIZING LIQUID COOLANT BATH

Richard W. Salkeld, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 21, 1977, Ser. No. 789,752
Int. Cl.² B22D *27/04*
U.S. Cl. 164—338 R **6 Claims**

1. In a casting apparatus for the directional solidification of molten metal wherein the apparatus includes a heating furnace having an open end through which a heated mold containing molten metal is withdrawn, a liquid cooling bath positioned beneath the open end of the furnace and means for gradually withdrawing the heated mold from the furnace, through the open end and immersing it in the cooling bath, the improvement comprising:

a heat insulating baffle positioned between the open end of the furnace and the liquid cooling bath, the baffle being constructed to have a density less than that of the liquid coolant so that it floats on the bath surface during the solidification process, the baffle having at least one opening therethrough aligned beneath the open furnace end to permit mold withdrawal from the furnace, through the baffle and into the cooling bath, the baffle surrounding the mold as it is withdrawn toward the cooling bath to minimize heat loss therefrom until the mold is immersed, said minimization of heat loss substantially improving the thermal gradient in the mold, said floating baffle also reducing vaporization of the liquid coolant during mold withdrawal and providing a smooth bath surface for uniform cooling.

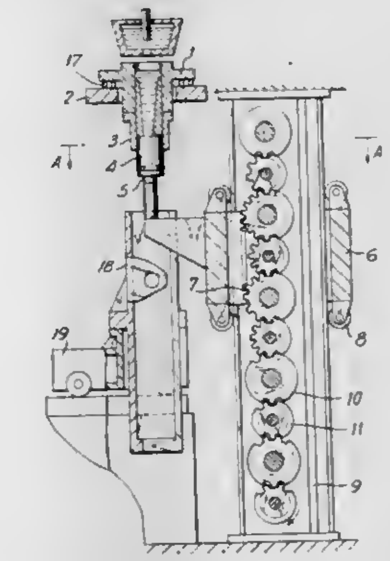


4,108,237

MACHINE FOR SEMICONTINUOUS CASTING OF METALS

Mikhail Yakovlevich Brovman, ulitsa N.Kurchenko, 12, kv. 22; Ivan Konstantinovich Marchenko, ulitsa Lenina, 6, kv. 94; Nikolai Mikhailovich Kozy, ulitsa Parkovaya, 45, kv. 78; Ilya Lukyanovich Veligura, ulitsa B.Khmelnitskogo, 15, kv. 21; Ivan Fedorovich Bairakov, ulitsa Shmidta, 28, kv. 1, all of Kramatorsk; Evgeny Tikhonovich Dolbenko, ulitsa Garibaldi, 10, kv. 93, Moscow; Jury Evgenievich Kan, Ananievsky pereulok, 7/14, kv. 49, Moscow, and Abram Vladimirovich Leites, Simferopolsky bulvar, 29, kv. 2-131, Moscow, all of U.S.S.R.

Filed Mar. 18, 1977, Ser. No. 779,083
Int. Cl.² B22D *11/08*
U.S. Cl. 164—425 **5 Claims**



1. A machine for semicontinuous casting of metals, comprising: a mold; a frame on which said mold is mounted; a vertical

guide column arranged parallel to the withdrawal axis of an ingot near the mold; a carriage mounted movably along said vertical column and carrying a dummy bar on a cantilevered end extending to the mold; means for withdrawing said ingot from the mold and for driving the carriage with said dummy bar, said means comprising a driving electric motor, a reduction gear and a rack-and-gear drive, a toothed rack of said rack-and-gear drive being fixed directly on said carriage, gear wheels of said rack-and-gear drive having teeth in mesh with teeth of said rack, said gear wheels being arranged in succession along said column, said electric motor and said reduction gear being mounted stationary at a sufficient distance from the zone of withdrawal of said ingot from a mold; and braking means to compensate for withdrawal forces increasing as the ingot is being drawn, so that a constant load on the driving electric motor is maintained.

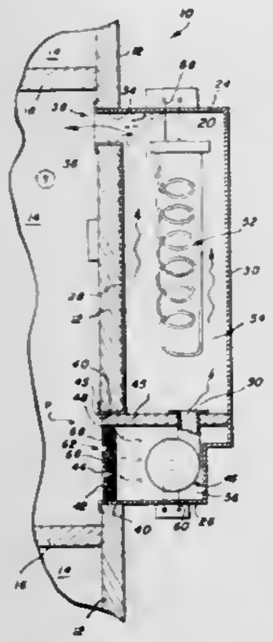
4,108,238
ENERGY SAVING DEVICE FOR HABITABLE BUILDING ENCLOSURES HAVING A HEAT CHANGING SYSTEM

Robert F. Vary, 320 S. Channel, Round Lake, Ill. 60073, and Anthony C. Mamo, Arlington Heights, Ill., assignors to Robert F. Vary, Round Lake, Ill. and BVM Ltd., Arlington Heights, Ill.

Filed Aug. 24, 1976, Ser. No. 717,177

Int. Cl.^{2} F28F *27/02;* F24H *9/02, 9/08;* F28F *9/22*

U.S. Cl. 165—57 **16 Claims**



1. In a building construction embodying a habitable enclosure,
- a temperature varying system for maintaining a predetermined temperature in said enclosure,
- a housing for said temperature varying system which housing is exposed to outdoor temperature influences,
- an upper register constituting an opening for passage of air between the upper portions of said habitable enclosure and said housing, and
- a lower register constituting an opening for passage of air between the lower portions of said habitable enclosure and said housing,
- the improvement consisting of a uni-directional non-rigid flap valve means interposed in at least one of said registers to allow passage of air in one direction when the air in said enclosure is being desirably temperature adjusted by said temperature varying system, and to prevent passage of air in the opposite direction when the air in said enclosure is being undesirably temperature adjusted due to outdoor temperature influence.

4,108,239
HEAT PIPE

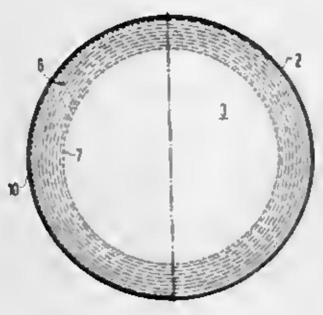
Paul Fries, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 668,929

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1975, 2515753

Int. Cl.^{2} F28D *15/00*

U.S. Cl. 165—105 **8 Claims**



1. A heat pipe adapted to carry an evaporable working fluid comprising:
- a wick disposed within the interior of said pipe so as to form a vapor space therein, said wick including a first layer which is situated adjacent said vapor space and which has a small-pore structure and a second layer which is situated adjacent said first layer and which has a large-pore structure, the diameter of the pores of said first layer being less than one-half the diameter of the pores of said second layer, said first layer constituting the boundary surface of said second layer to said vapor space and being a single layer of fine mesh net.

4,108,240
HEAT EXCHANGER SYSTEM

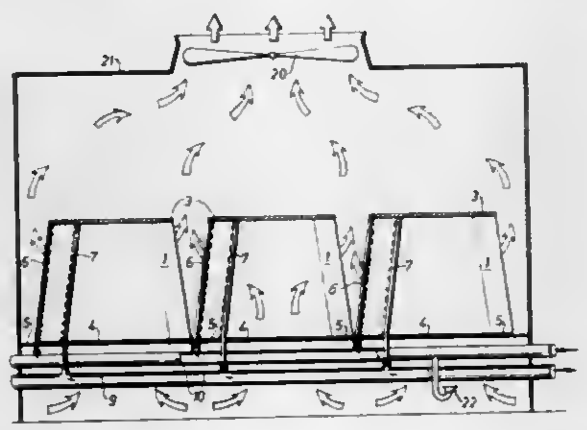
Peter Heinrich Erwin Margen, and Rolf Paul Näslund, both of Nyköping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Apr. 29, 1976, Ser. No. 681,471

Claims priority, application Sweden, May 7, 1975, 7505362

Int. Cl.^{2} F28D *7/00;* F28F *9/22*

U.S. Cl. 165—125 **9 Claims**



1. A heat-exchanger system for heat-exchange between a gas and a liquid comprising:
- (a) a base plate;
- (b) a plurality of plastic tube coil units tightly packed and mounted on said base plate, each of said coil units comprising a length of plastic tubing wound to form said coil, the windings of said coil units being slightly spaced, said coil units having open ends and a hollow interior and wound to present a frusto-conical profile, said frusto-conical coil unit having a larger base and a smaller base, said base plate having an opening therein aligned with and corresponding to the size and shape of the open end of said larger base of said coil unit adjacent thereto;
- (c) closure means covering the open end of said smaller base of said coil unit opposite to that on the base plate;
- (d) means in said closure means for causing gas to flow through the interior of said coil unit windings in a direction generally perpendicular to the conical surface of said coil unit; and
- (e) separate delivery and return means connected to the ends of said tubes for delivering and withdrawing liquid, respectively, from said coils.

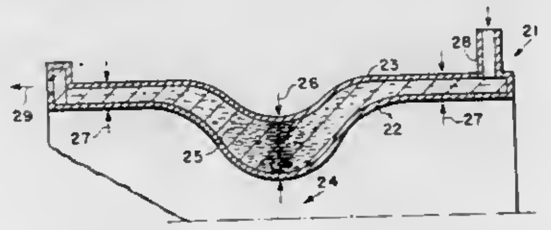
4,108,241
HEAT EXCHANGER AND METHOD OF MAKING

Anthony Fortini, Cleveland, and John M. Kazaroff, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,846

Int. Cl.^{2} F28F *13/00*

U.S. Cl. 165—146 **5 Claims**



1. A Heat exchanger for transferring heat from an environment at one temperature to a heat-transfer fluid or vice-versa, said fluid being supplied from a heat-transfer fluid source, said heat exchanger comprising:
- a chamber formed of a metal having high thermal conductivity and having an inlet and an outlet,
- a porous metal matrix of high thermal conductivity disposed in said chamber, said porous matrix being metallically bonded to said chamber; all points of contact within said metal matrix being metallically bonded; and
- means for directing a heat-transfer medium into said inlet, said heat-transfer medium flowing through said chamber and exhausting through said outlet, said chamber and said porous media having a greater cross-sectional area at areas of high heat exchanger than at positions of low heat exchange, and wherein both the density of said porous metal matrix and the cross-sectional area of said chamber vary along the direction of coolant flow in said chamber in proportion to the variation of heat flux of said chamber along the direction of coolant flow.

4,108,242
JET IMPINGEMENT HEAT EXCHANGER

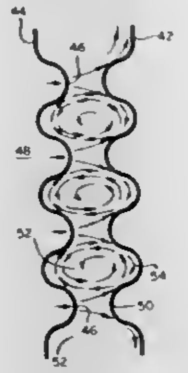
Edward F. Searight, Harvard, and Paul Flanagan, Lexington, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 165,568, Jul. 23, 1971, abandoned. This application Feb. 7, 1973, Ser. No. 330,348

Int. Cl.^{2} F28F *13/12*

U.S. Cl. 165—164 **4 Claims**

1. A heat exchanger comprising:
- (a) a rigid, corrugated, imperforate plate forming a heat exchanging wall; and
- (b) a second rigid plate fixedly mounted relative to said imperforate plate, forming a second wall spaced from and confronting said heat exchanging wall and forming a plenum chamber along the side thereof opposite said heat exchanging wall for confining fluid under a pressure exceeding the pressure between said heat exchanging wall and said second wall, said second wall forming a plurality of openings in substantially parallel rows for directing jets of said fluid against said heat exchanging wall and otherwise being imperforate, said openings in rows being aligned opposite the portions of the corrugations in said heat exchanging wall where the gap between walls is minimum and spaced from said portions of the corrugations for establishing a ratio (x/d) of the distance (x) separating an opening from said heat exchanging wall to the minimum width (d) of the opening not substantially in excess of three, said heat exchanging wall extending away from said second wall intermediate said rows of openings for establishing a relatively large space between said walls intermediate said rows of openings to permit passage of said fluid from adjacent said heat exchanging wall with a minimized interference to said jets of said fluid.



4,108,243
APPARATUS FOR TESTING EARTH FORMATIONS

David W. King, Fort Worth, Tex., and Emmitt Edward Rankin, Aberdeen, Scotland, assignors to Gearhart-Owen Industries, Inc., Forth Worth, Tex. and Petro-Data C.A., Caracas, Venezuela

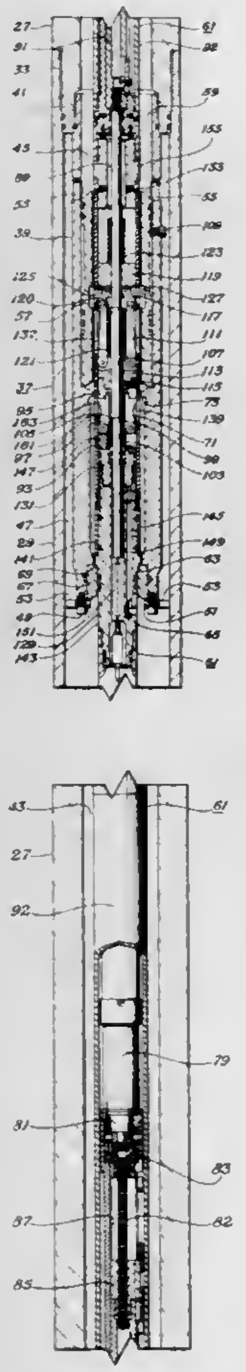
Filed May 27, 1977, Ser. No. 800,903

Int. Cl.^{2} E21B *49/00, 43/00*

U.S. Cl. 166—66 **14 Claims**

1. Apparatus for concurrent surface indication of an earth formation characteristic during a drill stem testing operation, comprising:
- a. a bypass sub to be disposed in a wellbore above the formation to be tested and to be connected to conduit means for communicating fluids via said bypass sub from said formation to aboveground equipment; said bypass sub having a bore extending throughout its length, with said bore having a bypass portion adapted for removably receiving a wireline tool in sealing engagement with said bore, bypass passage means communicating with said bore via upper port means disposed at the upper region of said bypass portion and lower port means disposed at the lower region of said bypass portion; said bypass sub further including sleeve valve means for selectively opening and closing said upper port means;
- b. releasable packer means for permitting fluid flow from the formation to be tested to said bypass sub but otherwise isolating formation fluid below said packer means from wellbore fluids above said packer means;
- c. a wireline tool to be removably received by said bore

bypass portion and including an earth formation characteristic sensor device; and



d. means incorporated in said wireline tool for selectively actuating said sleeve valve means while said wireline tool is in place in said bypass sub.

4,108,244
NATURAL GAS RECOVERY METHOD

Charles F. Cook, and George E. Hays, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

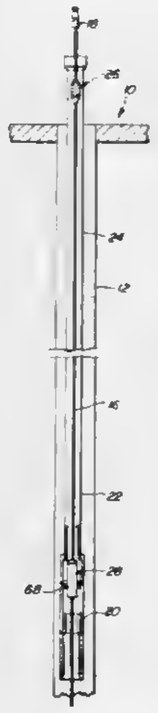
Filed Jun. 3, 1977, Ser. No. 803,100
Int. Cl.^{2} E21B *43/20*
U.S. Cl. 166—268 **7 Claims**

1. In the recovery of hydrocarbon gases enriched with methane from underground natural gas reservoirs having high values of CO_2/CH_4 ratio, the step of injecting at least 500 pounds water per 1,000 cubic feet of relatively CO_2-free methane recovered into said reservoir to flood the reservoir and solubilize CO_2 present in the reservoir in the flood water to produce from said reservoir an enriched gas having a higher CH_4/CO_2 ratio than originally present in said reservoir.

4,108,245
WELL CABLE STOP FOR STRIPPING OPERATIONS

Lucien J. Babineaux, 734 N. Main St., St. Martinville, La. 70582

Filed Aug. 25, 1977, Ser. No. 827,783
Int. Cl.^{2} E21B *31/10*
U.S. Cl. 166—301 **8 Claims**



1. In combination, a sleeve assembly for disposition about a stuck tool support cable immediately above a tubing string supported overshot passed downwardly over said cable during a stripping operation, said sleeve assembly including inwardly retractable outwardly projecting abutment means for engagement with the overshot and support of said sleeve assembly therefrom, and an abutment assembly for removable secure attachment to said cable adjacent the upper end thereof, said sleeve and abutment assemblies including upper and downwardly facing abutment surfaces, respectively, engageable with each other to stop and thereby limit a downward movement of said abutment assembly in the event the cable is dropped and the latter and the abutment assembly fall during the stripping operation, thereby catching the dropped cable by the engagement of the abutment assembly thereon with the overshot supported sleeve assembly and enabling the dropped cable and abutment assembly to be retrieved when the tubing string is pulled from the associated well.

8. The method of preventing accidental loss of a stuck tool support cable down a well bore during a "stripping" operation wherein a tubing string is lowered down into the bore over the cable with a tubular overshot supported from its lower end for engagement with the stuck tool, whereby the tool may be freed and upwardly retrieved with the tubing string to the surface, said method including supporting a tubular stop sleeve from within the overshot through which the cable is freely slidable, and mounting an abutment on the upper end portion of the cable against shifting therealong and with the abutment of a size sufficiently small to freely receive said tubing sections thereover and yet sufficiently large to prevent its passage through said tubular stop sleeve.

4,108,246
CONVERTER TYPE SCALE REMOVER

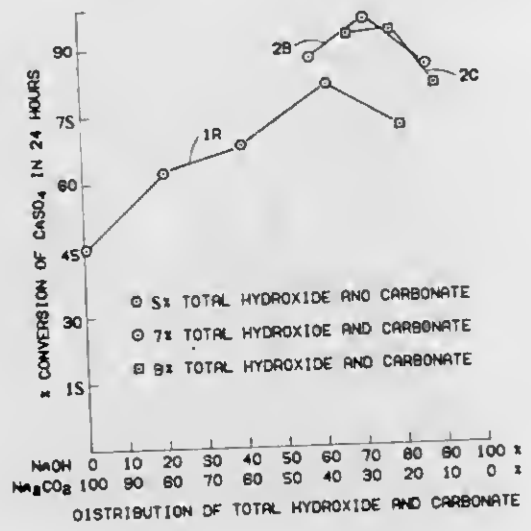
Loyd W. Jones, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 22, 1977, Ser. No. 770,728
Int. Cl.^{2} E21B *43/27, 43/28*
U.S. Cl. 166—312 **6 Claims**

1. A process for removing scale containing calcium sulfate from a well, said process comprising:

(a) introducing into said well an aqueous solution of a gluconate, hydroxide, and carbonate compounds, the cations of said compounds being selected from the group consisting of sodium, potassium, and ammonium, the weight ratio of hydroxide to carbonate being between the number 3:2 to about 5:1, the weight ratio of gluconate to combined hydroxide and carbonate being between 2:1 to about 5:1, the concentration of the combination of gluconate, hydroxide and carbonate being between about 15% and 50% by weight, to convert at least a substantial proportion of said calcium sulfate to an acid-soluble reaction product; and thereafter

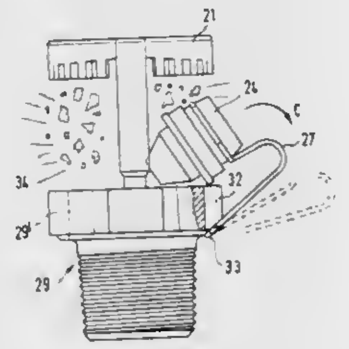
(b) contacting said reaction product with an aqueous acid solution thereby removing said acid-soluble reaction product.



4,108,247
FIRE SPRINKLER HEAD

Johann Georg Mobler, Laugneri, Weggis, Switzerland (CH 6353)

Filed Jan. 25, 1977, Ser. No. 762,557
Claims priority, application Switzerland, Jan. 30, 1976, 1162/76
Int. Cl.^{2} A62C *37/14*
U.S. Cl. 169—38 **3 Claims**



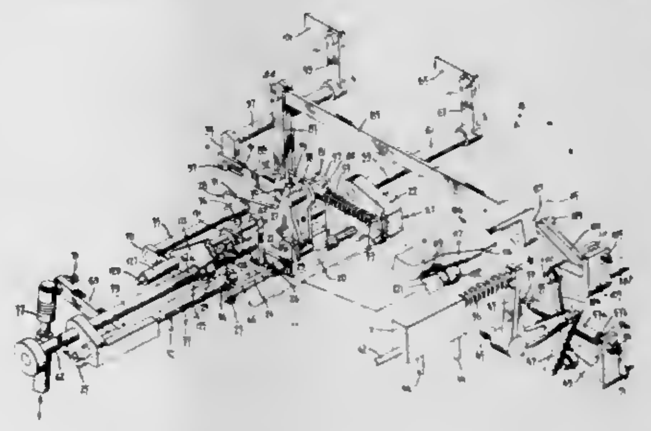
1. A fire sprinkler head which is mountable in a standing, suspended or horizontal position and includes:

a nozzle head;
a deflector plate;
support means connecting the deflector plate to the nozzle head and including at least two support elements fastened to the edge of the deflector plate;
a closure element seated sealingly over the mouth of the nozzle, the closure element having a groove at its perphery;
a trigger element which exerts a closing force on the closure element and is actuable to remove the closing force to leave the closure element free to move clear of the nozzle mouth to allow a jet of water to emerge; and
a length of spring wire which is substantially straight when in an unstressed condition and is mounted so that it lies in said groove tangentially against the periphery of the closure element and also against the perpheries of said support elements thereby to apply a biasing force to the closure element, so that when the closure force is removed and the closure element moves clear of the nozzle mouth, the spring wire, aided by the propulsive force of the water jet, urges the closure element clear of the region of the water jet.

4,108,248
DRAFT AND POSITION CONTROL LINKAGE WITH DEPTH LIMIT FOR A TRACTOR

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 643,584, Dec. 22, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,551
Int. Cl.^{2} A01B *63/112*
U.S. Cl. 172—9 **12 Claims**



10. A control system for a tractor or the like having draft link means vertically shiftable between raised and lowered positions, and signal responsive means operable to either raise, maintain, or lower the draft link means; said control system including:

manually operable draft control means capable of transmitting a desired draft load command signal to said signal responsive means;
draft feedback means including draft load sensing means, said draft feedback means being capable of transmitting a draft feedback signal to said signal responsive means; and
variable position feedback means;
characterized by said variable position feedback means being incapable of moderating the draft feedback signal during a portion of the movement of the draft link means between a fully raised position and an intermediate position and further by being capable of moderating the draft feedback signal as the draft link means move between said intermediate position and a fully lowered position.

4,108,249
AGRICULTURAL IMPLEMENT WITH CONSTANT FRAME ATTITUDE MAINTAINING MECHANISM

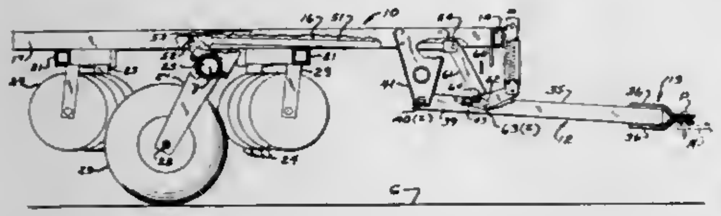
Carl M. Anderson, Claremore, Okla., and Robert L. Poland, Kewanee, Ill., assignors to Chromalloy Farm and Industrial Equipment Co., Kewanee, Ill.

Filed Jul. 1, 1977, Ser. No. 812,321
Int. Cl.^{2} A01B *59/04*
U.S. Cl. 172—328 **16 Claims**

1. In an agricultural implement which comprises a tool supporting frame having a tractor hitch structure hinged to one end thereof for relative vertical movement of the hitch structure about a transverse axis and a transversely extending rockshaft spaced from said transverse axis to which ground engaging wheels are fixed in offset relation to the axis of the rockshaft on which it turns to vertically adjust the wheels and thereby elevate and lower the frame, the improvement wherein,

a lever is pivotally connected to the hitch structure in offset relation to said transverse axis for fore and aft movement of the lever;

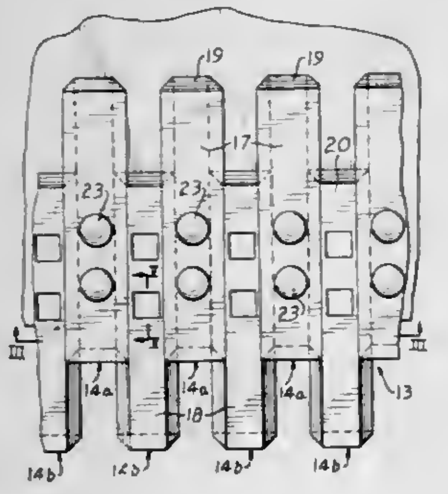
a fore and aft extending rigid link having one end pivotally connected to the rockshaft in offset relation to the axis on which it turns has its opposite end pivotally connected to said lever; and



a spring-loaded link connected between the lever and the tool supporting frame reacts in compression against the lever in either direction of its rotation to constitute a shock absorbing yielding connection between the frame and hitch structure while enforcing a constant attitude of the frame at the different levels to which the frame is elevated and lowered by rotation of the rockshaft.

4,108,250
CUTTING EDGE ASSEMBLY FOR EARTHWORKING DEVICES

Russell D. Merkel, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 27, 1976, Ser. No. 754,641
Int. Cl.² E02F *9/28*
U.S. Cl. 172—719 **14 Claims**



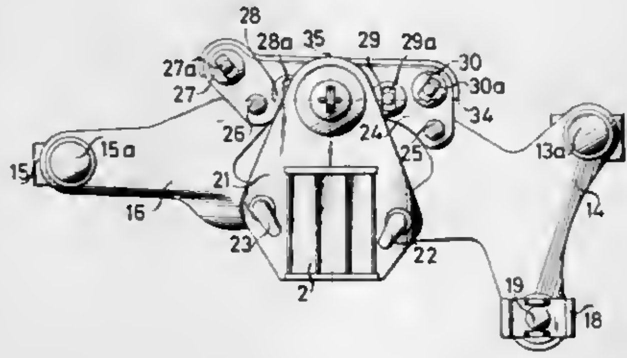
1. A cutting edge assembly detachably secured to the earthworking surface of an earth moving device, said assembly comprising:

several long, narrow, cutting edge members, each of said members having a body with a cutting edge, and with parallel longitudinal marginal portions of reduced thickness so that said body has a first face of one width and an opposite narrower second face, and all of said cutting edge members being mounted on the front marginal portion of the earthworking surface of said device with said longitudinal marginal portions of adjacent members in abutting side-by-side lapped relationship, and said cutting edge members occupying effectively the entire front marginal portion of said earthworking surface;

and means impaling the ones of said marginally lapped cutting edge members which have overlapping marginal portions to detachably secure them to the device and to frictionally clamp to the device the ones of said marginally lapped cutting edge members which have underlapping marginal portions, all of said cutting edge members having a cutting edge which is foremost and which projects forwardly beyond the front margin of the earthworking surface.

4,108,251
VEHICLE WITH ADJUSTING DEVICE FOR EARTH-MOVING SHIELD THEREOF

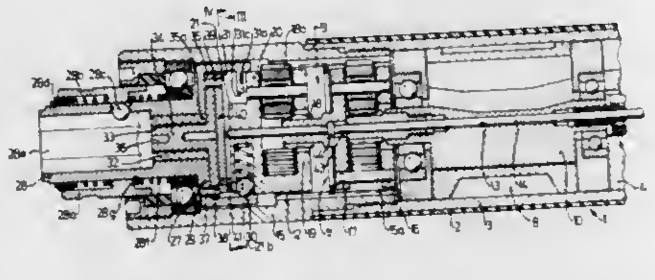
Uwe Rathje, Dortmund-Niederhofen, and Hans Jürgeo Schumacher, Dortmund-Asseln, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany
Continuation of Ser. No. 524,921, Nov. 18, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,692
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1973, 2357495
Int. Cl.² E02F *3/76*
U.S. Cl. 172—789 **1 Claim**



1. In a vehicle, a frame extending forwardly to the front end of the vehicle and supported on wheels at said front end, an earth-moving shield behind said wheels and a shield carrier supporting said shield, supporting and adjusting means for said shield carrier including a support member fixed relatively to said frame, a pair of arms pivotally connected to opposite sides of said support member and extending laterally outwardly therefrom, a pair of piston-cylinder lifting devices each having one of two telescoping elements pivoted to the outer end of one of said arms, the other telescoping elements of said devices being pivotally connected to opposite ends of said shield carrier, a third sideways adjusting piston-cylinder device having one of its two elements connected to the end of the first of one of said arms spaced below the connection to the one of the two piston-cylinder elements to said arm and the other of its elements extending across to the opposite side of said shield carrier with its end pivotally connected to said carrier at a point offset from the pivoted connection of the piston-cylinder element to the second of said one of said arms on that side, an opening through said support member, a bridge member extending transversely across said support member and pivotally connecting said two arms and having a central opening and at least two laterally spaced openings on each side of said central opening and movable to different positions to register selectively one of its openings with the opening in said support member, so that said openings on each side of the central opening will provide for different positions of said shield, said arms being asymmetrically arranged with the pivot connections of the second of said arms to said support member and said bridge member displaced vertically higher than the corresponding pivot connection of the first of said arms, the openings on opposite sides of the central opening in said bridge member being asymmetrical about a vertical plane through said central opening, with the two openings in the side adjacent the first arm being spaced from the central opening a less distance than the pivot connection of said bridge member to said first arm, and the laterally more outward opening in the bridge member on the side adjacent said second arm being spaced farther from said central opening than the pivot connection of said bridge member to said second arm and above said central opening when the bridge member is in its central position, and a locking bolt mounted on said support member and insertable into said registered openings of said bridge member and said support member to lock said bridge in a fixed position on said support member.

4,108,252
POWER DRIVER FOR THREADED FASTENERS

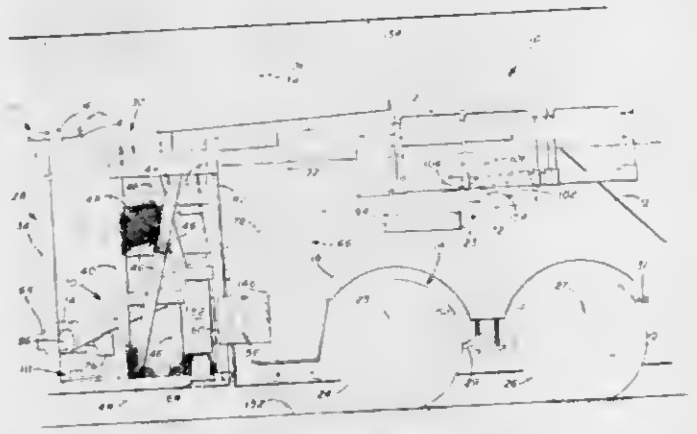
Reinbold Stroezel, Leinfelden-Oberaichen Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Feb. 19, 1975, Ser. No. 550,954
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1974, 2409815
Int. Cl.² B25B *21/00*
U.S. Cl. 173—12 **11 Claims**



1. A power driver for screws, nuts and analogous fasteners, comprising a housing; a drive motor in said housing; a motor-control switch activatable for turning on said drive motor and deactivatable for shutting off said drive motor; an output shaft connectable with a fastener to be driven and coupled with said drive for rotation by the same; and means for deactivating said motor-control switch when the torque on said shaft exceeds a predetermined selectable level, said deactivating means including a plurality of first surfaces each surrounding the axis of rotation of said shaft and each being spaced from said axis by a distance which changes substantially continuously from a maximum value to a minimum value in circumferential direction of said axis, a plurality of transmitting members mounted for torque-dependent shifting in direction radially of said axis, and substantially radially arranged biasing springs urging said members radially outwardly against respective ones of said first surfaces, adjacent ones of said first surfaces being connected via second surfaces defining substantially discontinuous transitions between the respectively adjacent first surfaces.

4,108,253
ELEVATABLE OPERATOR'S COMPARTMENT HAVING A DRILL STEEL GUIDE FOR A MINE DRILLING MACHINE

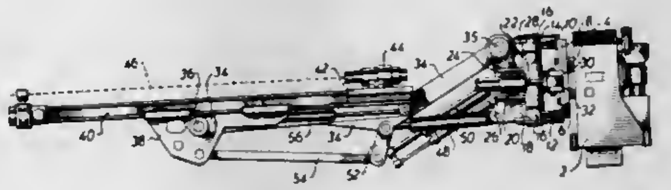
Clarence H. Woodford, II, Fairmont, W. Va., assignor to Mioing Equipment Division, FMC Corporation, Fairmont, W. Va.
Filed Aug. 26, 1977, Ser. No. 828,154
Int. Cl.² E21C *11/02*
U.S. Cl. 173—23 **10 Claims**



1. A mine drilling machine comprising,
a mobile body,
said mobile body having a front end portion,
a drill boom having a front end portion and a rear end portion,
said drill boom rear end portion being secured to said mobile body to permit upward and downward movement of said drill boom front end portion along a predetermined straight-line path,
a drill pot secured to said drill boom front end portion and adapted to move a drill steel along said predetermined straight-line path,
an operator's compartment mounted for slidable movement upwardly and downwardly relative to said mobile body front end portion,
a drill steel guide secured to said operator's compartment and operable to maintain the drill steel aligned with said predetermined straight-line path, and
said operator's compartment being operable to move said drill steel guide in a plane aligned with said predetermined straight-line path.

4,108,254
DRILLING APPARATUS

Ake Jobansson, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden
Continuation of Ser. No. 573,064, Apr. 29, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,469
Claims priority, application Sweden, May 7, 1974, 7406100
Int. Cl.² E21B *5/00*
U.S. Cl. 173—43 **9 Claims**



1. Drilling apparatus comprising
a frame,
a drill boom carrying a fluid operated drill means,
a fluid operated positioning mechanism for moving said boom to different positions,
said mechanism being rotatable about a generally horizontally extending axis with respect to said frame,
a cylindrical sleeve member coaxial with said axis forming a rotational shaft for said mechanism in said frame and comprising mounting means for said mechanism,
a stator unit attached to said frame and forming a unitary support bearing coextensive with said sleeve member and engaging both the inside and outside of said sleeve member for support thereof,
a multiple channel conduit means leading through said cylindrical sleeve member from said frame for conducting operating fluids to said mechanism and flushing fluid and operating fluids for said drill means,
motor drive means comprising a rotary gear train coupled for rotating said cylindrical sleeve member,
said cylindrical sleeve member including a toothed gear wheel on the outer periphery thereof forming the output portion of said rotary gear train.

4,108,255
WELL DRILLING APPARATUS

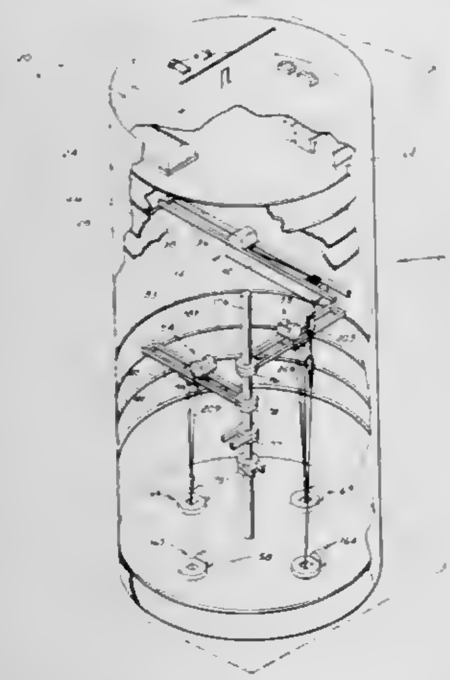
Craig R. Smith, 1317 Center St., Redlands, Calif. 92373
Continuation-in-part of Ser. No. 581,936, May 29, 1975. This application Sep. 1, 1976, Ser. No. 719,573
Int. Cl.² E21B *7/12;* E02B *17/02*
U.S. Cl. 175—9 **15 Claims**

1. A well drilling apparatus located within a confining structure having cylindrical annular vertically extending walls rising from a drilling floor and enclosing:

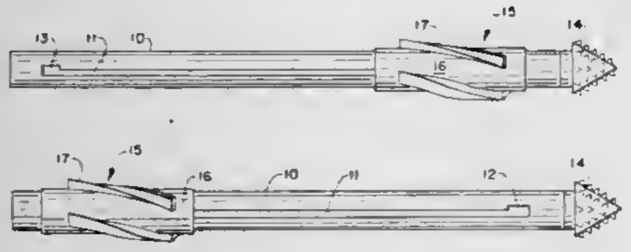
a plurality of rotary drilling tables laterally displaced from each other proximate to said drilling floor and within the confines of said walls each arranged to accommodate separate drilling assemblies including drilling pipe for drilling separate wells at spatially separated locations at said drilling floor;

an upright support extending upward relative to the drilling floor within said confining structure; and

separate drilling draw work assemblies associated with and mounted in vertical displacement from each of said rotary drilling tables for manipulating the drilling pipe and other portions of the drilling assembly utilized with the associated rotary table, wherein each of said separate drilling draw work assemblies is mounted on a separate bridge that extends laterally from said upright support and is supported at said vertically extending walls at a distance above the rotary drilling table with which it is associated.



4,108,256
SLIDING STABILIZER ASSEMBLY
Richard G. Moore, III, Enterprise, W. Va., assignor to Continental Oil Company, Ponca City, Okla.
Filed May 12, 1977, Ser. No. 796,093
Int. Cl.^{2} E21B *7/04*
U.S. Cl. 175—61 8 Claims

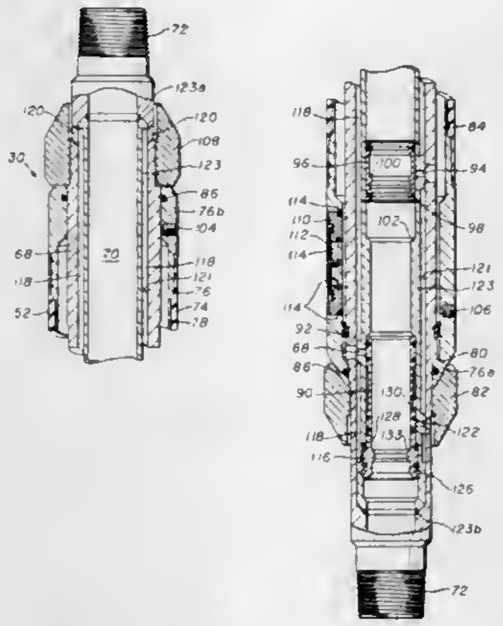


1. A method for drilling a generally horizontal borehole through a subterranean coal bed comprising

(a) boring into said coal bed in a generally horizontal direction with a rotatable drill rod having a drill bit at the end thereof, said drill rod also having a longitudinal slot formed therein and having a lateral offset formed in the slot at the end thereof nearest the drill bit, said drill rod further having a stabilizer means mounted thereon for guided movement along said slot, said stabilizer means being maintained in position near the drill bit by the lateral offset during drilling; and

(b) upon desiring to effect a downward dip in the trajectory of said borehole, partially withdrawing said drill rod, reversing the direction of rotation of said drill rod to effect release of said stabilizer from said lateral offset, reinserting said drill rod whereby said stabilizer slides toward the rear of said slot, and resuming drilling.

4,108,257
APPARATUS FOR CONTROLLING A WELL DURING DRILLING OPERATIONS
Phillip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Houston, Tex.
Division of Ser. No. 634,824, Nov. 24, 1978. This application Sep. 14, 1977, Ser. No. 833,012
Int. Cl.^{2} E21B *23/04, 33/127, 33/129*
U.S. Cl. 175—230 26 Claims



1. A combination for use in a downhole blowout preventer system while drilling a well, the combination comprising:

one structure adapted to be located downhole in a well including:

tubular mandrel means adapted to be located in a well drill string,

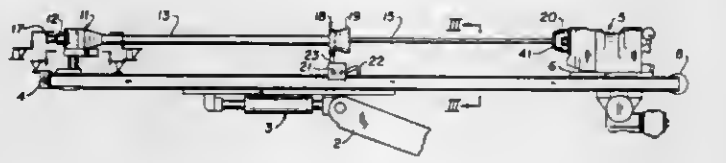
packer means carried by said mandrel means, and

communicating means at least in part in a wall of said mandrel means by-passing said packer means and terminating at the exterior wall of said mandrel means; and

a second structure adapted to be pumpable down a drill string to said one structure including:

means for actuating said packer means and rendering said by-passing communicating means operative.

4,108,258
ROCK DRILLING APPARATUS WITH NOISE REDUCING DRILL ROD COVER
Carl G. B. Ekwall, Saltsjobaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Jul. 21, 1976, Ser. No. 707,349
Int. Cl.^{2} E21B *17/00*
U.S. Cl. 175—320 63 Claims



1. Rock drilling apparatus comprising:

a feed beam having forward and rear ends;

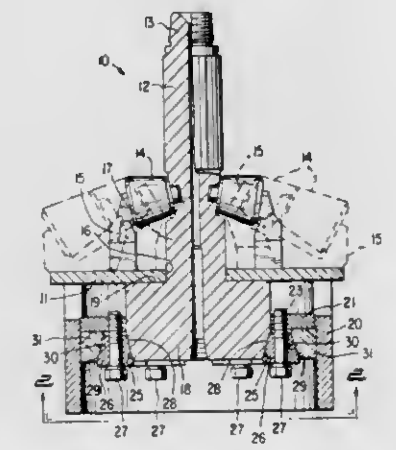
a rock drill slidably mounted on said feed beam for driving a drill rod in a path parallel to said beam;

elongated strip means coupled between said forward end of the feed beam and said rock drill to form a tubular sound muffling cover extending around and along said drill rod to muffle the noise of said drill rod;

spool means for selectively rolling said elongated strip means thereon to vary the length of said muffling cover to adapt it to the variable distance between said forward end of the feed beam and said drill; and

an assembly mounted on the front end of the feed beam forward of the forward end of said elongated strip means, said assembly including a drill rod centralizer and a dust collecting hood having an open front end adapted to contact the working surface of the rock to be drilled and a suction outlet, said muffling cover cooperating with said assembly to completely cover the drill rod from said working face of the rock to said rock drill.

4,108,259
RAISE DRILL WITH REMOVABLE STEM
Robert L. Dixon, Brea, and Malcolm D. Maxsted, Harbor City, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed May 23, 1977, Ser. No. 799,253
Int. Cl.^{2} E21B *9/24*
U.S. Cl. 175—344 7 Claims



1. A raise drill for enlarging a pilot hole into a larger diameter hole comprising:

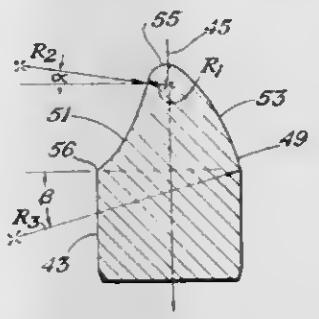
a main bit body having a plurality of cutters rotatively mounted thereon for contacting and disintegrating earth formations surrounding the pilot hole, said main bit body further including a central opening;

a drive stem having an upper end adapted to extend into the pilot hole, said drive stem further including a central shank portion extending into the central opening of said main bit body, and a lower shank portion of a larger diameter than said central shank portion, thereby forming an upwardly facing peripheral shoulder therebetween, said shoulder engaging the margin of the central opening of said main bit body, said drive stem further including a plurality of tapered flat surfaces located about the periphery of the bottom end of the lower shank portion; and

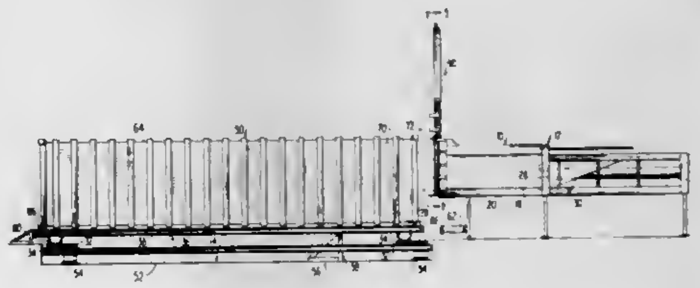
locking means secured to said main bit body for engaging said tapered flat surfaces in order to urge the drive stem shoulder upwardly into locking engagement with said main bit body.

4,108,260
ROCK BIT WITH SPECIALLY SHAPED INSERTS
Rex O. Bozarth, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Apr. 1, 1977, Ser. No. 783,924
Int. Cl.^{2} E21B *9/36*
U.S. Cl. 175—374 7 Claims

1. In combination with a rolling cutter earth boring drill bit of the insert type, a shaped insert having a base integrally joined to a cutting tip, the cutting tip having a leading flank and a trailing flank converging to an elongated single crest, the leading flank being concave as seen in a longitudinal section taken normal to the elongated crest.



4,108,261
METHOD FOR LOADING REFUSE INTO CONTAINERS
Harvey W. Liberman; Paul L. Goranson, both of Knoxville; R. Houston Ratledge, Jr., Maryville, and John C. Salyers, Oak Ridge, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.
Division of Ser. No. 641,375, Dec. 17, 1975. This application May 19, 1977, Ser. No. 798,713
Int. Cl.^{2} G01G *13/02, 5/04;* **B30B** *15/00*
U.S. Cl. 177—120 5 Claims



1. A method of loading a container with refuse comprising the steps of:

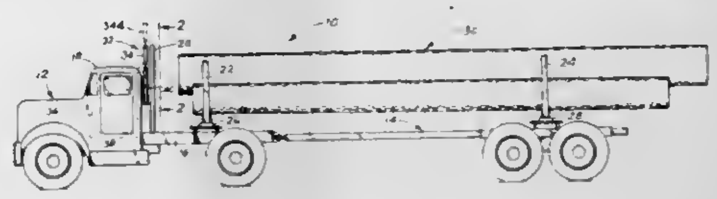
inserting refuse into said container;

weighing said container as loading progresses;

sensing pressure of refuse in said container as loading progresses; and

discontinuing said inserting step when said container has reached either a predetermined weight or a predetermined pressure.

4,108,262
VEHICLE LOAD COUNT-DOWN SYSTEM
Joe H. Anderson, Rte. 1, Box 78, Dexter, Oreg. 97401
Filed Feb. 16, 1977, Ser. No. 769,026
Int. Cl.^{2} G01D *19/08*
U.S. Cl. 177—136 10 Claims



1. A count-down load-monitoring system for a load-carrying vehicle of the type including on-board load-monitoring apparatus, which vehicle is required to carry no more than a certain maximum load, said system in operative condition in a vehicle comprising

count-down load-indicating means mounted on the vehicle for viewing from a distance away from the vehicle, operable to indicate a decreasing, additional load-carrying capacity for the vehicle within a selected range extending below said certain maximum load as load is added to the vehicle, and

informing means for said load-indicating means operatively interposed between the latter and said on-board load-monitoring apparatus and located adjacent the operator's station, operable to cause said load-indicating means, with the additional load-carrying capacity of the vehicle falling within said selected range, to produce a remotely viewable indication reflective of remaining additional load-carrying capacity of the vehicle.

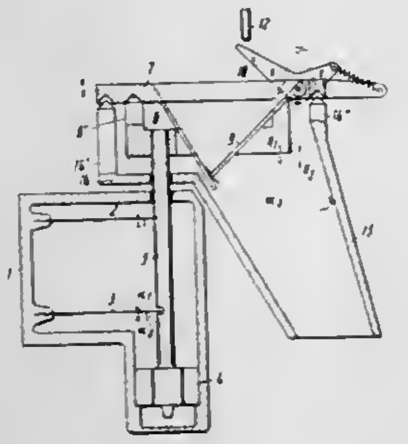
4,108,263
METHOD AND APPARATUS HAVING A VIBRATION-FREE MEASURING PHASE FOR AUTOMATICALLY WEIGHING BULK MATERIAL, MORE PARTICULARLY TOBACCO

Heinz Focke, and Oskar Balmer, both of Verden, Aller, Germany, assignors to Focke & Pfuhl, Verden, Germany

Filed Jun. 14, 1976, Ser. No. 695,693

Int. Cl.² G01G ***19/00, 23/02***

U.S. Cl. 177—145 **8 Claims**



1. In an apparatus for automatically weighing and separating specific individual quantities of a bulk material such as tobacco, said apparatus having a weighing container and a measuring system having a carrier, the improvement comprising: means for separating the weighing container from the carrier during a phase in operation of said apparatus when no measurement takes place, said means including a load frame coupled to said weighing container, a weighing arm coupled to said carrier, a measuring coil attached to said weighing arm and a fixed supporting frame, whereby when the force field of said measuring coil is inoperative, said arm and carrier are lowered thereby effecting a load change between the carrier and said fixed supporting frame to set the load frame upon the fixed supporting frame temporarily separating said weighing container from the carrier.

4,108,264
CABLE TAKE-UP DEVICE FOR ELECTRIC DRIVE VEHICLE

Yujiro Tanaka, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

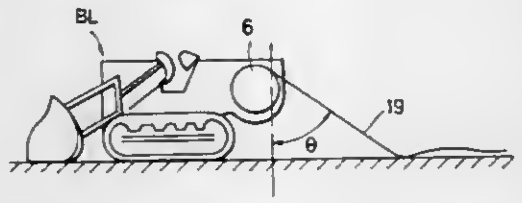
Filed Dec. 20, 1976, Ser. No. 752,595

Claims priority, application Japan, Dec. 29, 1975, 50-157702

Int. Cl.² B60L ***9/04***

U.S. Cl. 180—2 R **7 Claims**

1. A cable take-up device for an electric drive vehicle supplied with electric power through a cable, said device comprising a cable drum rotatable in opposite directions for taking up and unwinding the cable; a reversible DC motor for driving the drum in its cable taking up and unwinding directions; detecting means for electrically detecting slackening, i.e. a slack angle, of said cable, said detecting means including a movable bar arranged to contact said cable and follow the slackening thereof and a transducer actuated by said movable bar to produce a slack angle signal representing the instantaneous magnitude of said slack angle; a slack angle setting device for producing a reference signal representing a preset magnitude of said slack angle; deviation signal generating means responsive to the signals produced by said transducer and slack angle setting device for generating a deviation signal representing the magnitude and sense of any deviation in magnitude of the instantaneous slack angle from the preset slack angle; and control means for controlling said DC motor in response to said deviation signal so as to minimize said deviation signal and thereby maintain the slack angle of the cable substantially constant at said preset magnitude thereof.



4,108,265
HYDROSTATIC-TRANSMISSION CONTROL SYSTEM, ESPECIALLY FOR LIFT AND OTHER INDUSTRIAL VEHICLES

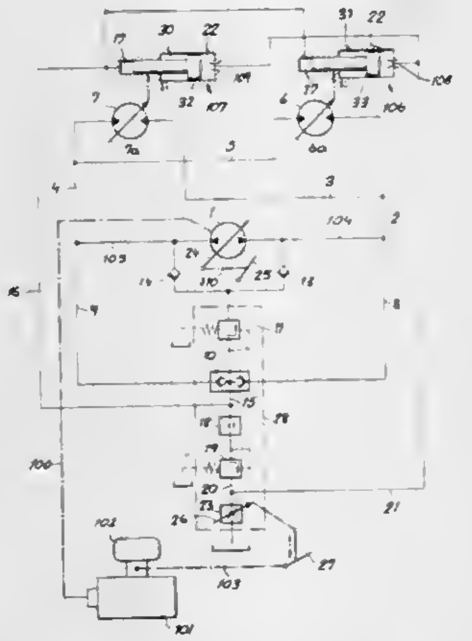
Theodor Abels, Aschaffenburg-Nilkheim, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed May 21, 1976, Ser. No. 688,774

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522719

Int. Cl.² B60K ***17/10***

U.S. Cl. 180—66 R **2 Claims**



1. A vehicle-drive system comprising:
a prime mover;
a pair of driven wheels for propelling said vehicle;
a hydrostatic transmission having variable-displacement pump means formed with an input shaft connected to said prime mover, motor means hydraulically connected to said pump means and formed with at least one output shaft connected to said wheels, and a motor-displacement control element, said transmission having a variable speed ratio between said input shaft and said output shaft depending at least in part upon the position of a pump-displacement control element for regulating the displacement per revolution of said pump means;
at least one operator-controlled actuating member; and
control means operatively connecting said member with said pump-displacement control element, operatively connected to said motor-displacement control element, and effective at low to average speeds of said motor means and said output shaft for establishing said ratio solely as a function of said member and at higher speeds of said motor means and said output shaft controlling said ratio as a function of the motor-displacement element as another operating parameter of the drive system, said motor means comprising a pair of motors having a variable fluid displacement per revolution and respective control elements for establishing the fluid displacement per revolution of said motors, each of said motors being formed with a hydraulic servomotor operatively connected to the respective control element of the motor, said pump means including a reversible hydrostatic pump having a pair of ports, each of said motors having a pair of ports connected to the pair of ports of said pump, said control means comprising a changeover valve having inlet ports respectively connected to the ports of said pump and at least one output port, a first pressure-relief valve connected between said output port and the ports of said pump by respective check valves, a first control line connected with the output port of said changeover valve and one side of each servomotor, a fixed-cross-section throttle connected with said first line, a second pressure-relief valve downstream of said fixed-cross-section throttle, a variable-cross-section throttle downstream of said second pressure-relief valve, a second control line connected between said variable throttle and said second pressure-relief valve and opening into said servomotors on the opposite sides thereof, and means for varying the flow-cross-section of the variable throttle.

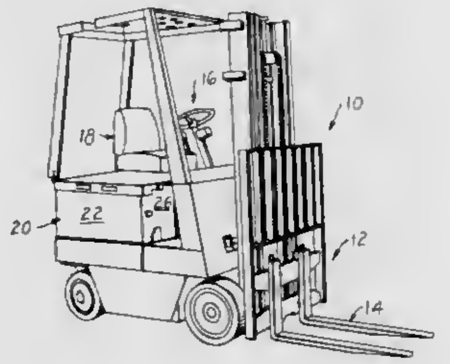
4,108,266
BATTERY ENCLOSURE FOR A LIFT TRUCK

Elias Wojtyna, Strongsville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 28, 1977, Ser. No. 791,092

Int. Cl.² B62D ***25/00***

U.S. Cl. 180—68.5 **8 Claims**



1. A battery enclosure apparatus comprising:
wall means;
a top comprising first and second top portions positionable on the wall means to form a battery enclosure;
a plurality of tabs extending from each top portion;
means defining a plurality of recesses associated with the wall means, each tab being positionable in a recess with the top portions positioned on the wall means to form a battery enclosure, to prevent lifting of the top portions from the wall means;
each top portion being movable laterally of the wall means to move the tabs thereof to positions relative to the wall means wherein each top portion may be lifted from the wall means;
means for selectively securing the first top portion together with the second top portion in position on the wall means to form a battery enclosure; and
first additional tab means secured relative to the wall means and extending toward the top, and second additional tab means secured to at least one of the first and second top portions and positioned relative to the first additional tab means, with the top portion in position on the wall means, to limit movement of the one top portion in a sideward direction relative to the lateral movement thereof allowing lifting of that top portion.

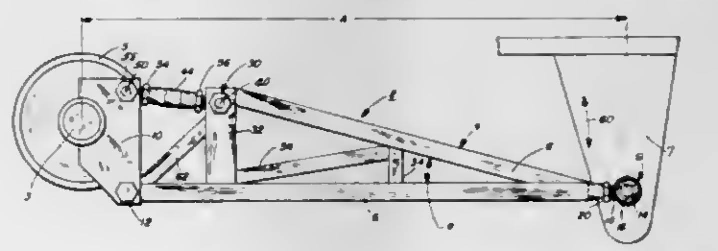
4,108,267
TRACTION DEVICE

Robert Michael Valerio, P.O. Box 153, 5214 Chapel Rd., North Madison, Ohio 44057

Filed Dec. 20, 1976, Ser. No. 752,310

Int. Cl.² B60G ***1/00***

U.S. Cl. 180—71 **4 Claims**



1. A traction device for selectively stabilizing the load and torque characteristics for use in the rear suspension system of a vehicle comprising,
a frame,
said frame including a first frame member,
pivotal connection means operably connected adjacent one end of said frame member and adapted to pivotally connect said one end of the frame member to a vehicle chassis,
pivotal connection means disposed adjacent the other end of said frame member and adapted for pivotally connecting the other end of said frame member to a rear axle of a vehicle,
a second frame member fixedly connected at one end to the first frame member adjacent the first mentioned pivotal connection means,
pivotal connection means disposed adjacent the other end of the second frame member and spaced from said first frame member, and
lengthwise adjustable link means pivotally connected at one end to said third mentioned pivotal connection means and adapted for pivotal connection at the other end to said rear vehicle axle whereby selective adjustment of said link means pivots said first frame member about the second mentioned pivot means so as to raise and lower the end of the first frame member adjacent the first mentioned pivot means.

4,108,268
ACTUATOR FOR SELF-PROPELLED SWEEPER

Thomas S. Block, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Mar. 2, 1977, Ser. No. 773,701

Int. Cl.² B60K ***23/00***

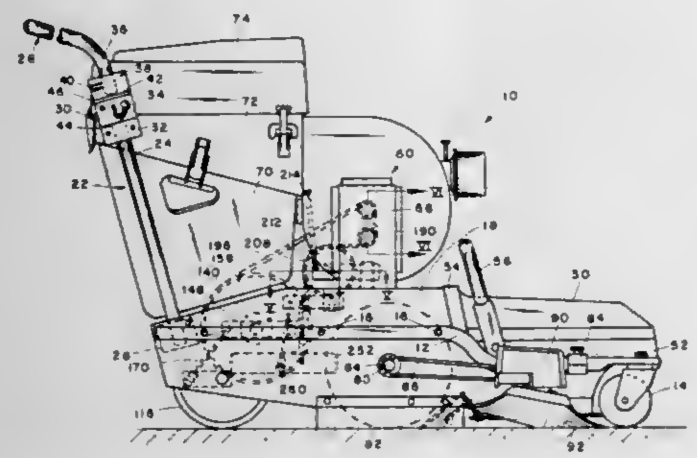
U.S. Cl. 180—74 **18 Claims**

1. A drive actuator for a self-propelled device of the type including a power unit comprising:
a frame;
a wheel shaft supported at its ends for rotational movement on said frame;
a ground engaging wheel rotatably mounted on said wheel shaft;
a jackshaft rotatably mounted and supported at both ends on said frame in spaced relationship with said ground engaging wheel and for limited movement about one end thereof towards and away from said ground engaging wheel, said jackshaft being rotated by said power unit;
linkage means interconnecting said wheel shaft and said jackshaft for moving said jackshaft towards and away

from said ground engaging wheel upon rotation of said wheel shaft;

drive means on said jackshaft for rotating said ground engaging wheel upon rotation of said wheel shaft and movement of said jackshaft;

a handle supported by said frame and including a pivotally mounted portion movable between a first and second position; and



actuator means at least partially enclosed within said handle and shifted by said pivotally mounted portion of said handle for rotating said wheel shaft when said handle portion is moved between said first and said second positions whereby said drive means rotates said ground engaging wheel.

4,108,269

NO-MAN CONTROL SYSTEM FOR WORKING VEHICLES

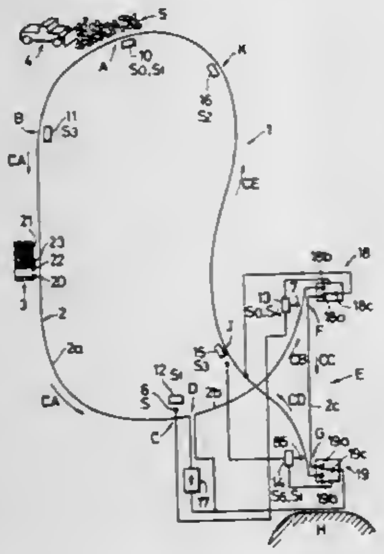
Kiyoharu Nakao, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed May 12, 1977, Ser. No. 796,500

Claims priority, application Japan, Aug. 31, 1976, 51-104543; Oct. 18, 1976, 51-124531; Feb. 15, 1977, 52-15423

Int. Cl.^{2} B62D *1/28*

U.S. Cl. 180—98 **9 Claims**



1. A no-man control system for a working vehicle comprising an induction cable installed along a predetermined running course between a loading station and an unloading station, a detection coil mounted on said. working vehicle to detect current flowing through said induction cable, a steering control device responsive to the signal detected by said detection coil for steering said working vehicle to run along said cable, vehicle position detection means for detecting the position of said vehicle when it reaches a predetermined position, a vehicle speed commanding device responsive to the output of said vehicle position detection means for accelerating and decelerating the vehicle, a vehicle speed control device for controlling the vehicle speed in accordance with the difference between a speed commanded by said vehicle speed commanding device and an actual vehicle speed thereby controlling said vehicle to run along said predetermined running course between said loading and unloading stations, and a switch back station near said unloading station, a substantially triangular running course being formed in said switch back station and having apices at an entrance and exit position, a reverse position and an unloading position, respectively.

4,108,270

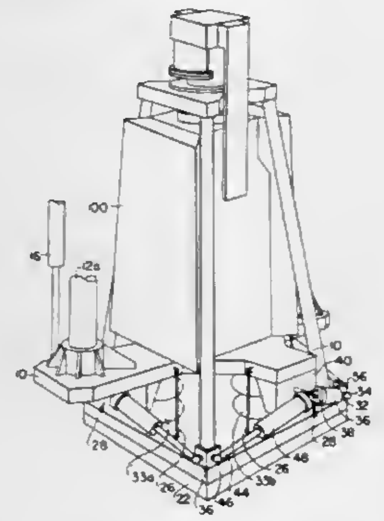
HYDRAULIC STABILIZATION SYSTEM TO POSITION AND ISOLATE A SEISMIC VIBRATOR

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Feb. 9, 1977, Ser. No. 767,181

Int. Cl.^{2} G01V *1/14*

U.S. Cl. 181—114 **15 Claims**



1. In a vibratory seismic energy source adapted to be transported on a vehicle, including a vertically disposed piston and cylinder assembly, a piston rod extending downward from said piston and connected at its lower end to a baseplate, a weight-bearing member positioned above said baseplate, means for applying at least a portion of the weight of said vehicle to said weightbearing member and elastic means for coupling substantially vertical forces from said weight-bearing member to said baseplate, the improvement comprising:

a hydraulic stabilizing means extending between said weight-bearing member and said baseplate for interconnecting said weight-bearing member and said baseplate in order to limit horizontal movement of said baseplate relative to said weight-bearing member and to isolate vibratory motions of said baseplate from said weight-bearing member, said stabilizing means being hydraulically interconnected to permit vertical motion of said baseplate relative to said weight-bearing member.

4,108,271

SEISMIC LAND SOURCE

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

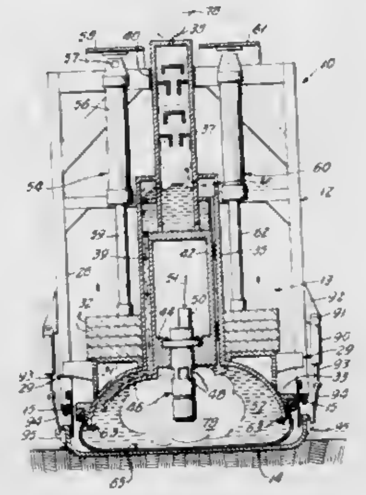
Filed Jun. 10, 1977, Ser. No. 805,522

Int. Cl.^{2} G01V *1/04*

U.S. Cl. 181—119 **20 Claims**

18. In a seismic energy land source for surveying on the earth by transmitting seismic energy impulses into the earth and being of the type having a rigid dome-shaped bell for containing a substantially incompressible liquid such as water with at least one airgun for abruptly releasing high pressure pressurized gas into the liquid in the dome-shaped bell for generating said seismic impulses, said dome-shaped bell being movably mounted in an upright mounting frame for upward

and downward movement of the bell relative to said mounting frame, said bell having a lower rim with a metal pan positioned below said lower rim for engaging the surface of the earth below said bell, said pan being movably mounted in said mounting frame for upward and downward movement relative to said bell and mounting frame, said pan having a rounded shoulder portion with a peripheral wall extending upwardly



from said rounded shoulder portion around said bell, and an elastomeric diaphragm extending across the bottom of said bell above said pan for retaining the liquid in said bell, the improved apparatus for transmitting powerful seismic impulses into the earth comprising: said metal pan having a tapered bottom wall decreasing in wall thickness from said rounded shoulder portion toward the center of said bottom wall.

4,108,272

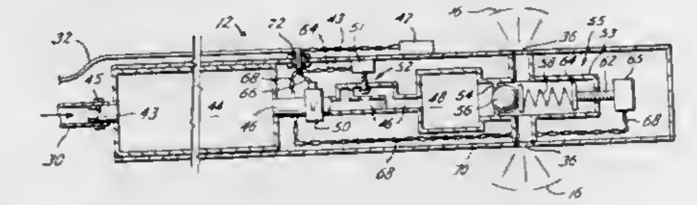
RAPID FIRE AIR GUN

Joho Lloyd Paitson, Galveston, and Robert N. Hendley, Houston, both of Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Filed May 12, 1977, Ser. No. 796,494

Int. Cl.^{2} G01V *1/38*

U.S. Cl. 181—120 **4 Claims**



4. A rapid fire air gun for generating an acoustic chirp signal in a body of water during a recording cycle, for use in seismic exploration, said gun including a firing chamber for containing a volume of compressed air, said firing chamber being interconnected with a compressed air source and having an outlet for periodically discharging air jets, comprising:

a self-excitable valve assembly mounted adjacent said outlet for repeatedly opening and closing said outlet so that jets of compressed air are expelled from said firing chamber each time said valve assembly opens, at the excitation frequency of the valve assembly, said valve assembly including a valve seat, a compliantly-loaded, differential-area valve element for releasably engaging said valve seat, and means for continuously varying the compliant loading of said valve element during said recording cycle to vary the self-excitation frequency of said valve assembly.

4,108,273

POWER ASSISTED STEERING

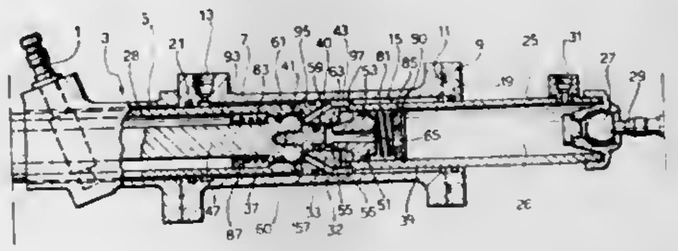
Vincenzo Sarti, Turin; Antonino Bertone, Sant'Antonino (Vercelli), and Enrico Rivetti, Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed May 11, 1977, Ser. No. 795,849

Claims priority, application Italy, Nov. 25, 1976, 69812 A/76

Int. Cl.^{2} B62D *5/08*

U.S. Cl. 180—148 **6 Claims**



1. A hydraulic power assisted steering device comprising:

a support sleeve,

a hollow shaft axially slidable within said support sleeve, the two ends of said hollow shaft projecting from the support sleeve and carrying means for connection to the steerable wheels of the vehicle,

an intermediate section of said hollow shaft, said intermediate section having a radially inwardly directed projecting part, and a radially outwardly directed projecting part having two opposed radial faces,

a control rod axially slidable within said hollow shaft on one side of said intermediate section,

a valve head carried on said control rod and located on the opposite side of said intermediate section,

a portion of said valve head being slidably disposed within said radially inwardly directed projecting part of said intermediate section of said hollow shaft in sealed relation thereto, said two opposed radial faces of said radially outwardly projecting part forming end walls of first and second chambers defined between said hollow shaft and said support sleeve, the face of said intermediate section of said hollow shaft exposed in said first of said two chambers being smaller than the radial face of said intermediate section of said hollow shaft exposed in said second of said two chambers,

means defining a plurality of passages in the walls of said hollow shaft, in said intermediate portion thereof, in said valve head, between said intermediate portion of said hollow shaft and said valve head and between said intermediate portion of said hollow shaft and said control rod,

means for connecting said device into a hydraulic circuit comprising inlet means in communication with the first of said two chambers and outlet means in communication with the portion of said hollow shaft on said opposite side of said intermediate section; said plurality of passages interconnecting said inlet and outlet means in series so that upon displacement of said control rod axially in one direction toward said intermediate section of said hollow shaft the passage therebetween will be restricted to create an increase in pressure in said first of said two chambers resulting in displacement of said hollow shaft in a first direction and upon axially displacement of said control rod in the other direction with respect to said intermediate portion of said hollow shaft the passage between said intermediate section of said hollow shaft and said valve head will be restricted such as to create an increase in pressure in both of said two chambers resulting in displacement of said hollow shaft in the opposite direction due to the difference in areas of said radially faces of said intermediate section of said hollow shaft exposed in said first and second chambers.

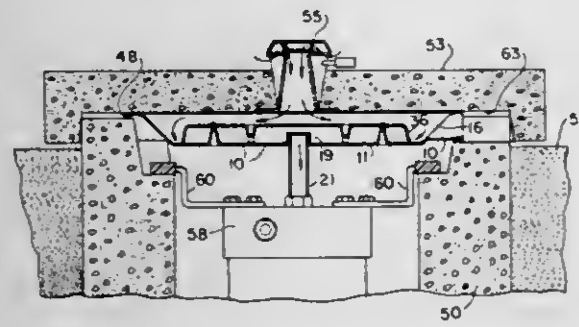
4. A hydraulic power assisted steering device as in claim 1, wherein said control rod is formed with a rack for forming part

of a rack and pinion coupling with a cooperating pinion on the steering column of a vehicle to which the device is fitted.

4,108,274
ACOUSTICAL APPARATUS

John R. Soyder, Fort Wayne, Ind., assignor to Jet Aeration Company, Cleveland, Ohio

Filed Jul. 6, 1976, Ser. No. 702,581
Int. Cl.^{2} F01N *1/00*
U.S. Cl. 181—229 **12 Claims**

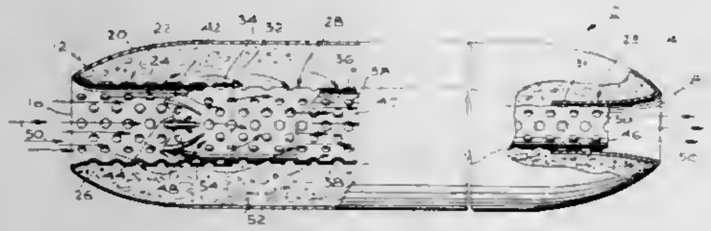


1. An apparatus for reducing acoustical pressure at a tubing, comprising in combination: a first member having first support means with an orifice extending therethrough and first side means; a plurality of first wall means extending from said first support means and extending annularly about said orifice and interposed between said orifice and said first side means of said first member; a second member having second support means and second side means; one of said first and second members being smaller than the other of said first and second members; a plurality of second wall means extending from said second support means and extending annularly about the center of said second support means and interposed between the center of said second support means and said second side means; means mounting said first member to said second member with said first and second wall means forming a passage between said orifice and an opening formed between said first and second side means of said first and second members; and means for connecting one of said first and second members to the tubing with one of said orifice and said opening formed between said first and second side means being in communication with the tubing when connected.

4,108,275
MUFFLER

William M. Black, 251 Longley Way, and R. Bruce McCallum, 1730 Alta Oaks Dr., both of Arcadia, Calif. 91006

Filed May 31, 1977, Ser. No. 801,905
Int. Cl.^{2} F01N *1/04*
U.S. Cl. 181—252 **12 Claims**



1. An improved engine exhaust gas muffler, said muffler comprising, in combination:

a. an outer hollow tubular elongated shell having a gas inlet and a gas outlet;

b. a hollow perforated tubular extension secured and open to the inlet end of said shell and extending within said shell along only a portion of the length thereof substantially coaxially with said shell;

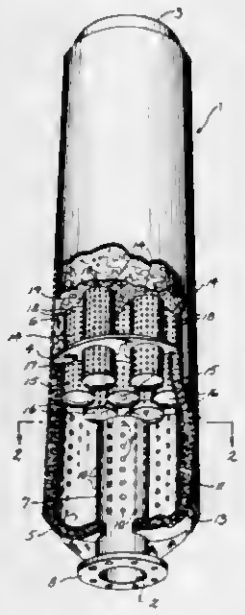
c. a hollow perforated tubular insert having an open upstream free end slideably disposed within the downstream end of said extension and having a downstream end terminating adjacent to the gas outlet end of said shell, said insert being substantially coaxial with said shell, said upstream end of said insert having a terminal portion of smaller diameter than the main body of said insert so as to form with said extension downstream end means for diverting gases, when passing through said shell into a plurality of elongated paths; and,

d. sound deadening means within said shell outside of said extension and insert.

4,108,276
VENT SILENCER

Leonard F. Hall, Brooklyn, and Robert A. Noreen, Stoughton, both of Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Sep. 20, 1976, Ser. No. 724,545
Int. Cl.^{2} F01N *1/08*
U.S. Cl. 181—256 **6 Claims**



1. An acoustical silencer, comprising a housing having an inlet to be connected to a device emitting sound energy and having an outlet, divider means dividing said housing into an upstream chamber communicating with said inlet and a downstream chamber communicating with said outlet, a diffuser disposed within the upstream chamber and connected to said inlet and having at least one aperture therein providing communication between the interior of the diffuser and the inlet chamber, a tube disposed within the downstream chamber with the upstream end portion of the tube projecting beyond said divider means into said upstream chamber and the upstream end of the tube being closed, first port means disposed in the projecting end portion of the tube and providing communication between the upstream chamber and the interior of the tube, a sound absorbing material disposed within the downstream chamber in the space surrounding said tube, and second port means disposed in the portion of the tube located within said downstream chamber and providing communication between the interior of the tube and said space.

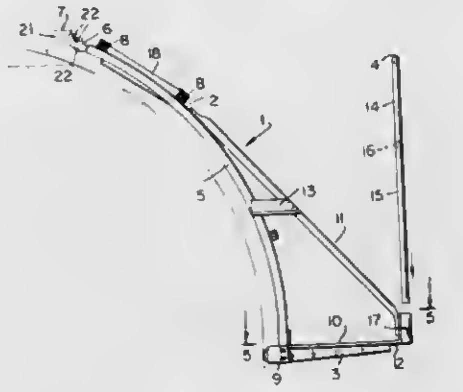
4,108,277
WORK PLATFORM

Leonard Goldstein, and Michael Yashin, both of 660-668 Berriman St., Brooklyn, N.Y. 11208

Filed Apr. 14, 1977, Ser. No. 787,650
Int. Cl.^{2} E04G *3/14, 1/16*
U.S. Cl. 182—82 **6 Claims**

1. A work platform for attachment to a jet engine having a plurality of mountings located on the upper portion of the engine, each comprising upper and lower spaced apart horizontal support pins rigidly located with respect to the engine; the work platform comprising a frame curved to generally

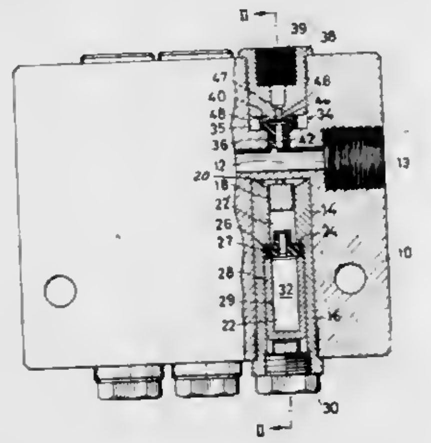
conform with the exterior of a said engine, latch members rigidly attached to and extending from said frame and adapted to attach the frame to said mountings, a platform attached to the frame remove from the latch members and extending horizontally from the frame when the latch members are attached to the mountings, and stop means located adjacent the platform to rest against the engine when said latch members are attached to the mountings, wherein each latch member is positioned to engage a corresponding mounting and has a tapered tongue to facilitate insertion of the latch member into the space between the upper and lower horizontal pins of an associated mounting and a recess adjacent the base of the tongue to engage the lower of the horizontal pins when the latch member is inserted into the space, the tongue having a surface to engage the upper of the horizontal pins upon pivotal motion of the platform into an operational position in which said stops are resting against the engine when the lower horizontal pin is engaged with the recess, the recess being oriented to prevent removal of the latch member from the mounting, by virtue of the cooperation of the latch member with the upper and lower horizontal pins, when the platform is in said operational position.



4,108,278
CONSTANT-QUANTITY OIL DISTRIBUTING VALVE FOR USE IN CENTRAL LUBRICATION SYSTEM

Yoshio Imada, c/o Kabushiki Kaisha Japan Herg, No. 203, Rose-Plaza Kagetsuan, No. 4 20 Namamugi 5-chome, Tsurumi-ku, Yokohama, Japan

Filed Nov. 15, 1976, Ser. No. 741,865
Int. Cl.^{2} F16N *25/00*
U.S. Cl. 184—7 D **1 Claim**



1. A constant-quantity oil distributing valve for use in a central lubrication system, comprising from one side to the other:

an outlet portion provided in an end plug having a build-up portion on the inner end surface thereof, said build-up portion including a passage leading to said outlet port;

valve means including a resilient valve body and a valve seat, said resilient valve body being disposed between said build-up portion and said valve seat, and said valve means further including a passage therein;

an inlet passage communicated with said passage in said valve means;

an oil accumulating chamber which may be communicated with said inlet passage or said port, depending on the elastically deformed positions of said resilient valve body;

a piston facing said oil accumulating means; and

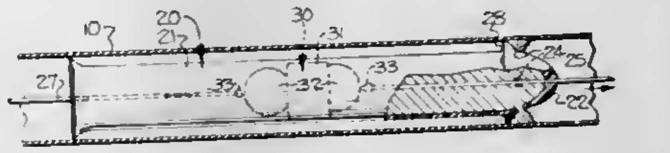
a pressure accumulating chamber, in which a compressible material is filled, and which contains said piston therein;

whereby the axes of said outlet port, said valve means, said oil accumulating means, said piston and said pressure accumulating chamber being in alignment on a line with each other, with the axis of said inlet passage being directed at a right angle to said axes or a common axis of the other components.

4,108,279
DISPENSER AND METHOD FOR APPLYING LUBRICANT OR OTHER MATERIAL TO THE INTERIOR OF A CONDUIT

William B. Marcell, Fort Myers Beach, Fla., assignor to Thomas Industries of Tennessee, Inc., Matthews, N.C.

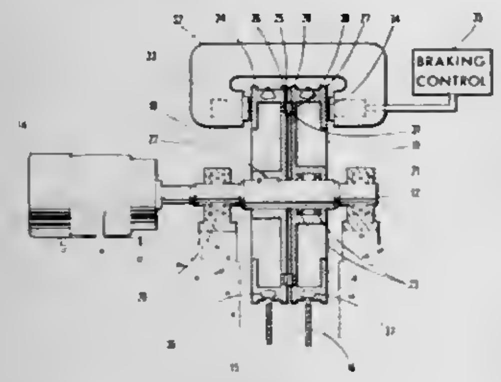
Filed Oct. 20, 1976, Ser. No. 734,234
Int. Cl.^{2} F16N *9/00*
U.S. Cl. 184—15 R **4 Claims**



2. A dispensing device adapted for passage through a conduit while applying a coating material along the interior surface of the conduit, said device comprising an elongate tubular body of external dimensions adapted to pass through the conduit, said tubular body having a hollow interior portion adapted for containing a supply of the coating material therein and having a plurality of openings at circumferentially spaced locations adjacent the leading end thereof communicating with the hollow interior portion of the body and through which the coating material may be dispensed, said elongate tubular body being of an external dimension smaller than the diameter of the conduit and including fin means adjacent the trailing end thereof and extending radially outwardly for engaging the interior surface of the conduit to spread the coating material along the interior surface of the conduit as the dispensing device travels therethrough, said tubular body also including an additional fin means adjacent the leading end thereof and rearwardly of said openings, the respective fin means serving to insure a uniform application of coating material along the entire interior surface of the conduit, an elongate connector having a portion thereof extending axially into the hollow interior portion of said elongate body from one end thereof and being longitudinally movable relative to said body, means provided on a portion of said connector located outside of said body to permit securing the connector to a pulling implement to facilitate pulling the dispensing device through the conduit, and piston means carried by said connector interiorly of the hollow body, and piston means being movable relative to said body in response to said body encountering frictional resistance to passage through the conduit to thereby force coating material from the hollow interior portion of the body as the dispensing device is pulled through the conduit.

4,108,280
PLURAL ROPE FRICTION HOIST WITH BRAKING APPARATUS

Peter DeH. Eastcott, and Peter T. Truman, both of Peterborough, Canada, assignors to Canadian General Electric Company, Ltd., Toronto, Canada
Filed Dec. 27, 1976, Ser. No. 754,188
Claims priority, application Canada, Feb. 13, 1976, 245657
Int. Cl.² B66B *11/08*
U.S. Cl. 187—20 3 Claims

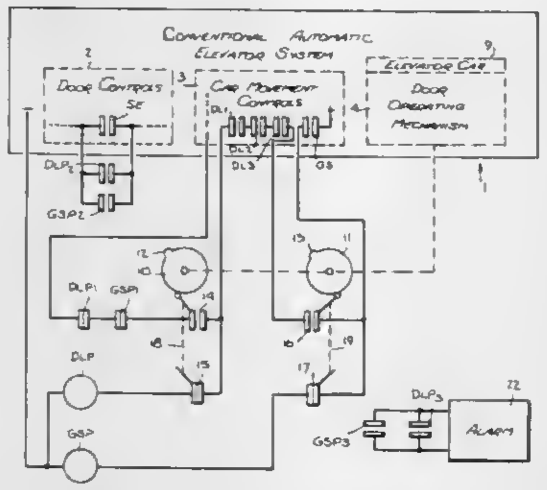


1. A friction hoist comprising:
(a) at least two friction wheels each having a rim portion on a side thereof facing an adjacent wheel and an outwardly directed rim face on the side not facing an adjacent wheel;
(b) means including a common fixed shaft for supporting the friction wheels coaxially with one another and adjacent one another for rotation independently of one another, said friction wheels being arranged for limited axial movement with respect to one another;
(c) a rope looped over each friction wheel and having frictional engagement therewith;
(d) conveyance means suspended by the ropes;
(e) first and second motor means for driving, respectively, said first and second friction wheels for rotating the wheel to raise and lower the conveyance means;
(f) first braking material between said facing rim portions to provide braking with respect to relative movement between adjacent wheels when they are urged together;
(g) braking means having a second braking material for braking engagement with said outwardly directed rim faces; and,
(h) braking control means for actuating said braking means to cause movement of said second braking material into and out of braking engagement with said outwardly directed rim faces, movement of said second braking material into braking engagement with said outwardly directed rim faces applying a braking force to the friction wheels they engage and urging said friction wheels together for engagement with said first braking material.

4,108,281
ELEVATOR DOOR TAMPERING PROTECTION SYSTEM

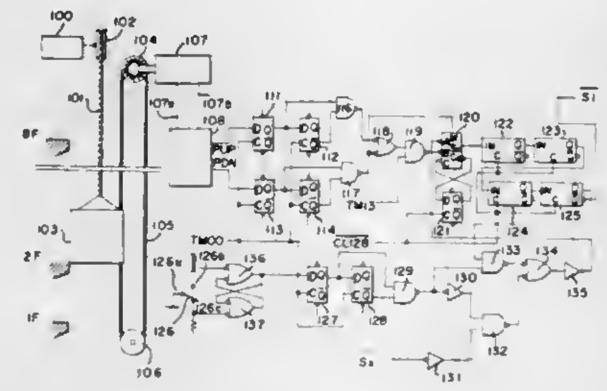
Walter G. Glaser, Montvale, N.J., assignor to G.A.L. Manufacturing Corporation, Bronx, N.Y.
Filed May 5, 1977, Ser. No. 794,019
Int. Cl.² B66B *13/22*
U.S. Cl. 187—29 R 9 Claims

1. In an automatic elevator system having an elevator car with a car door, means mounting said car in a hoistway extending between a plurality of floors in a building, a floor door at each of said floors for providing access to said car, control means including hoisting apparatus for moving said car from one of said floors to another and stopping said car at a floor, door operating means for automatically opening and closing at least said car door when the car is at a floor and switch means operable in accordance with the positions of said car door and each said floor door for controlling said control means and permitting said control means to move said car from said floor to another when said car door and each said floor door is closed, the combination therewith of further switch means operable in accordance with the position of at least one of said car door and said floor door and normally operable prior to the operation of at least part of said first-mentioned switch means, and means connecting said further switch means in circuit with said control means for preventing movement of said car when said part of said first-mentioned switch means is operated prior to operation of said further switch means.



4,108,282
POSITION-INDICATING SIGNAL EQUIPMENT FOR ELEVATOR

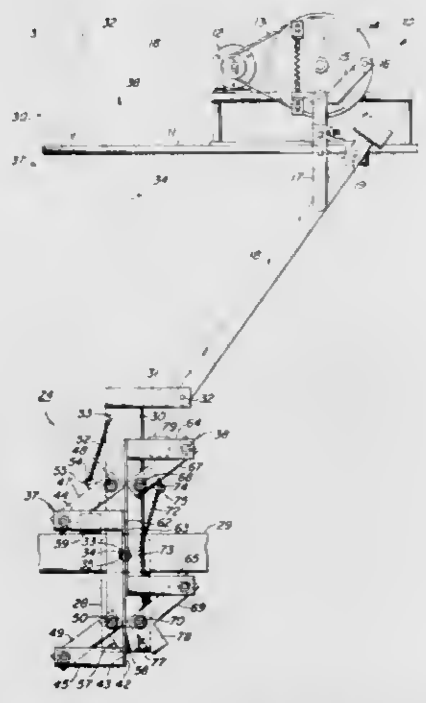
Tsuyoshi Satoh, and Kenzo Tachino, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1976, Ser. No. 721,754
Claims priority, application Japan, Sep. 17, 1975, 50-112464
Int. Cl.² B66B *3/02*
U.S. Cl. 187—29 R 5 Claims



1. A position-indicating signal equipment for an elevator cage is an elevator system for detecting the position by generating pulses depending upon the distance and direction of the elevator cage and by counting the pulses comprising:
a position-pulse generator for generating pulses depending upon the movement of the cage;
a present position detector for detecting the present position of the cage by counting the output pulses of the position-pulse generator;
a floor position read only memory which memorizes floor position signals as data signals of a binary number calculated by providing a binary number for each floor as each address and calculating the absolute distance from the reference position to the floor to the number of output pulses of the position pulse generator;
a plurality of floor position registers for storing the floor position signals;
a plurality of floor indicators for outputing the floor numbers;
a time dividing selector which time-division selects the output of the floor indictors as the addresses of the floor position read only memory and sequentially allots the output of the floor position read only memory to the floor position registers;
a selector indicator for selecting the outputs of the floor number indicators; and
an arithmetic unit for comparing the output of the present position detectors and the output of the floor position registers to generate an output of the result of operation to the floor indicators and the selector indicator;
whereby a signal for indicating the cage position is obtained as the output of the selector indicator.

4,108,283
MASTER OPERATOR FOR VERTICALLY MOVING ELEVATOR CAR DOORS

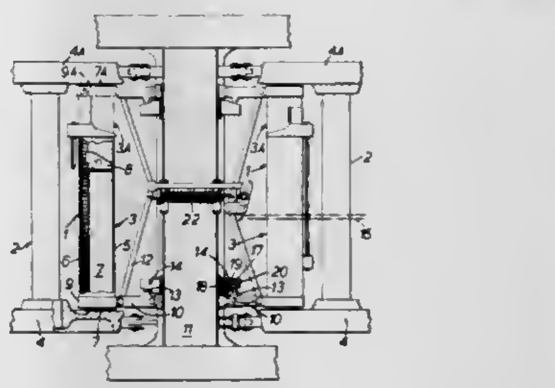
Karl Mangel, 850 N. Dewitt Pl., Chicago, Ill. 60611
Filed Jan. 21, 1977, Ser. No. 761,545
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² B66B *13/12*
U.S. Cl. 187—52 LC 10 Claims



10. In an elevator system including an elevator car having a vertically movable gate and a plurality of vertically movable landing doors respectively located at a plurality of landings, comprising
a driving clutch means rotatably mounted to said gate and having clutch surfaces movable between retracted declutching positions and extended clutching positions,
a plurality of driven clutch members respectively mounted to said landing doors for selected engagement by said driven clutch means to open the door disposed opposite said elevator car when said gate is opened,
each of said driven clutch members comprising
a base member rotatably mounted to the respective landing door, and
a plurality of rollers rotatably mounted to said base member on opposite sides of the axis of rotation of said base member,
the axes of rotation of said rollers being parallel to the axis of rotation of said base member.

4,108,284
RAILWAY BRAKE ASSEMBLIES INCLUDING KNOCK-BACK COMPENSATING MEANS

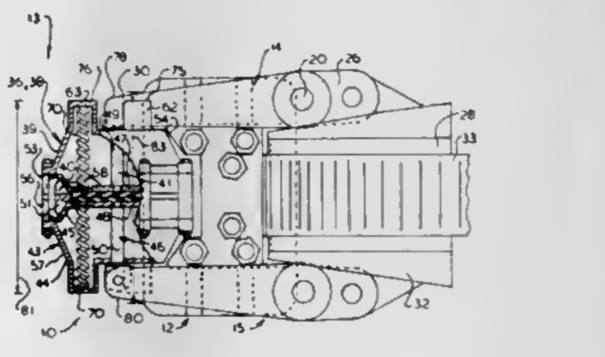
Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed Jun. 8, 1976, Ser. No. 693,798
Claims priority, application United Kingdom, Jun. 9, 1975, 24696/75
Int. Cl.² B61H *13/20*
U.S. Cl. 188—59 14 Claims



1. A brake assembly for a wheel and axle set of a railway vehicle, comprising two rotors having opposed braking surfaces, two braking shoe means, one only associated with each rotor, and a single brake-applying means actuating both braking shoe means, wherein each braking shoe means comprises a friction member engageable with its associated braking surface, a support carrying said friction member and being movable to a datum position under the action of a return force provided by a brake return spring means, a fixed structure, a pivoted link connecting said support to said fixed structure to permit movement of said support towards and away from its associated braking surface in response to operation of said brake-applying means to engage and disengage said friction member with said surface, and resilient means separate from said brake return spring means which biases said pivoted link to a datum position in which said support is held in its said datum position, said resilient means being yieldable when said return force exceeds a predetermined amount to permit movement of said support beyond its datum position in a direction opposite to its brake applying direction and operative to return said support member towards the datum position when the return force is reduced below said predetermined amount, whereby wear of said friction members is equalized.

4,108,285
CALIPER BRAKE ACTUATING CYLINDER

Jacob Kobelt, 6110 Oak St., Vancouver, B.C., Canada (V6M 2W2)
Filed Mar. 21, 1977, Ser. No. 779,914
Int. Cl.² F16D *55/26*
U.S. Cl. 188—72.6 10 Claims



1. A caliper brake actuator for use in a caliper brake assembly, the brake assembly having: a frame, a pair of arm means

hinged to the frame and having inner ends carrying opposed brake shoes and outer ends adapted to cooperate with the actuator; the actuator having an actuator body, a diaphragm and a piston member, the diaphragm and piston member cooperating with the actuator body to permit the piston member to reciprocate within the body to permit the piston member to reciprocate within the body in response to fluid pressure applied to the diaphragm, the brake actuator being further characterized by:

(a) the actuator body having a first cylinder having inner and outer portions, one of the portions having an adjacent hollow projecting portion having a closed outer end with an outer face, the projecting portion defining in part a clearance recess having a size sufficient to accept the outer end of one of the arm means therein so that an outer portion of the arm means is essentially coplanar with the outer face of the projecting portion,

(b) at least two compression springs extending between the piston member and the cylinder, each spring having one end located within the projecting portion and an opposite end cooperating with the piston member, the springs being positioned so as to straddle the clearance recess and to move the piston member when fluid pressure is reduced.

4,108,286

BRAKE DISC FOR AN AXLE OF A RAILWAY VEHICLE

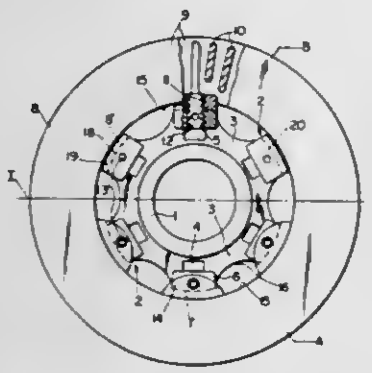
Gregory G. Gagarin, Chevy Chase, Md., assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,130

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2644223

Int. Cl.^{2} F16D ***65/12***

U.S. Cl. 188—218 XL **5 Claims**



1. A brake disc adapted to be mounted on the axle of a railway vehicle and comprising a hub, a brake disc annular element mounted radially on said hub, a plurality of circumferentially spaced cam portions on one of said hub and annular element and extending radially toward the other, the outer surfaces of said cam portions defining a cylinder, a plurality of circumferentially spaced extensions on the other of said hub and annular element and extending radially toward said cam portions and having circumferentially extending grooves thereon to receive said cam portions, a plurality of clamping sleeves seated in radially opposed bores om said cam portions and radial extensions, the other of said hub and annular element having radial recesses therein between said clamping sleeves shaped to accommodate said cam portions on an axial direction such that the annular element is assembled axially over the hub.

4,108,287

DOUBLE-CYLINDER BUFFER

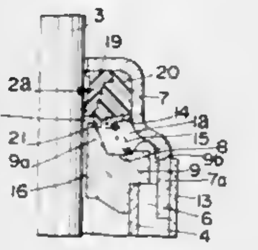
Tetuo Kato, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Apr. 5, 1977, Ser. No. 784,776

Claims priority, application Japan, Apr. 10, 1976, 51-40614

Int. Cl.^{2} F16F ***9/32***

U.S. Cl. 188—315 **4 Claims**



1. A double-cylinder buffer comprising:

an actuation cylinder having a closed lower end and an upper end, said actuation cylinder being filled with oil;

a piston rod extending into said actuation cylinder through said upper end thereof;

a piston secured to the lower end of said piston rod, said piston slidably contacting the inner wall surface of said actuation cylinder, said piston dividing the interior of said actuation cylinder into upper and lower oil chambers, said piston having a damping force producing mechanism;

a rod guide closing said upper end of said actuation cylinder, said rod guide having therethrough an opening through which said piston rod slidably extends, said opening being formed by a surface which is slightly spaced from said piston rod to form a small annular clearance therebetween, said rod guide having an upper surface and an annular projection extending upwardly from said upper surface, said annular projection having a radially outer surface forming a valve seat;

an outer cylinder coaxially surrounding said actuation cylinder and forming therewith an annular reservoir chamber, said reservoir chamber having closed upper and lower ends, said reservoir chamber having a lower portion filled with oil and an upper portion filled with gas;

first passage means communicating between said lower oil chamber of said actuation cylinder and said oil-filled lower portion of said reservoir chamber;

second passage means, including said clearance, extending from said upper oil chamber of said actuation cylinder to said gas-filled upper portion of said reservoir chamber; and

means, positioned in said second passage means, for causing all oil passing through said clearance from said upper oil chamber to pass into said reservoir chamber, and for preventing gas in said reservoir chamber from passing into said upper oil chamber, said means comprising first seal means sealingly engaging said piston rod at a position above said rod guide, for preventing said oil passing through said clearance from said upper oil chamber from escaping from said second passage means, and second seal means having a downwardly extending flexible annular projection having a radially inner surface which sealingly engages said radially outer valve seat-forming surface of said upwardly extending annular projection of said rod guide, whereby said oil passing through said clearance from said upper oil chamber will deflect said annular projection of said second seal means away from said valve seat and will pass to said reservoir chamber, but whereby gas from said reservoir chamber will force said annular projection of said second seal means against said valve seat and thereby seal said second passage means.

4,108,288

CURRENT COLLECTOR SHOE SUSPENSION FOR EXTERNALLY POWERED ELECTRIC VEHICLE

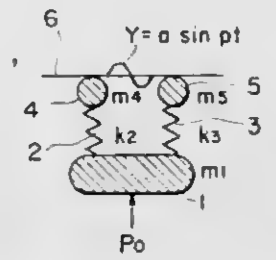
Katsushi Manabe, Tokyo; Fumio Nakama, Musashino, and Kunio Shibayama, Kobe, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki and Japanese National Railways, Tokyo, both of, Japan

Filed Jul. 6, 1977, Ser. No. 813,384

Claims priority, application Japan, Jul. 6, 1976, 51-80101; Jul. 6, 1976, 51-80102

Int. Cl.^{2} B60L ***5/38***

U.S. Cl. 191—49 **6 Claims**



1. In a sliding current collector shoe suspension for an externally powered electric vehicle including at least one current collector with a vibration absorbing assembly pivotally mounted between a current collector shoe and the vehicle for resiliently biasing the shoe toward and into sliding contact with an electric power supply rail, the improvement characterized by: said current collector comprising a plurality of said current collector shoes individually mounted on a common support frame of the vehicle through a like plurality of interconnected vibration absorbing units, each such unit being capable of vibrating independently and said units having different natural resonant frequencies so mutually displaced that their respective vibration characteristic curves overlap.

4,108,289

HYDRAULIC COUPLING WITH A LOCK-UP CLUTCH

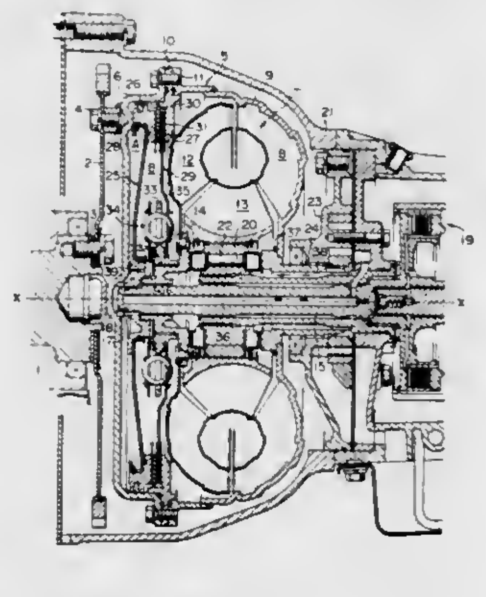
Hajime Arai, Aichi, and Kiyoshi Ohnuma, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 21, 1975, Ser. No. 634,040

Claims priority, application Japan, Jul. 16, 1975, 50/86918

Int. Cl.^{2} F16H ***45/02***

U.S. Cl. 192—3.3 **10 Claims**



1. A transmission comprising:

an input member;

an output member;

a housing mounted to said input member, said housing defining a cylindrical chamber by a front portion thereof and providing an impeller by a rear portion thereof;

a turbine received in said housing and connected to said output member;

a flexible disc which traverses radially said cylindrical chamber and engages fluid tightly, slidably with an inner wall of said cylindrical chamber thereby dividing said cylindrical chamber into a front first chamber and a rear second chamber;

an annular clutch element which includes a portion projecting radially inwardly from said housing, a radially outwardly projecting flange portion affixed to said housing and an integral intermediate portion;

a clutch disc drivingly connected to said output member and axially displaced from said flexible disc;

said intermediate portion of said annular clutch element extending axially forward over the clutch disc and includes a spline means thereon:

an annular element positioned within said spline means preventing relative rotation and permitting axial movement;

said flexible disc and said annular element being forward of said clutch disc and said portion of said annular clutch element which projects radially inwardly being rearwardly of said clutch disc;

a first fluid passage connected to said first chamber, a second fluid passage connected to said second chamber and at least one opening which traverses said flexible disc to connect said first and second chambers;

said opening having a throttling ratio which generates a predetermined pressure difference between said first and second chambers when fluid flows from said first chamber to said second chamber, whereby as the fluid pressure in the first fluid chamber is increased, the fluid pressure in the second fluid chamber is relieved and the opening between the first and second chambers permits a gradual, throttled change in the fluid pressures.

4,108,290

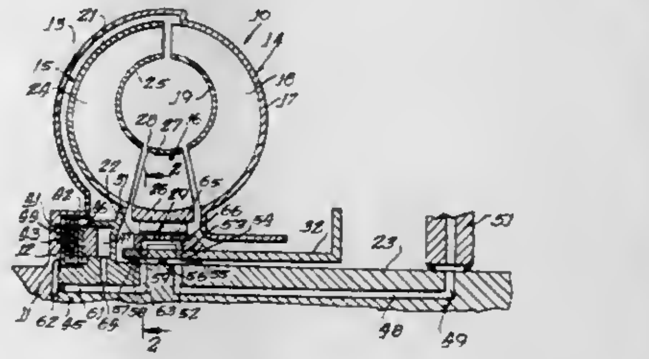
HYDRAULIC TORQUE CONVERTER LOCK-UP CLUTCH

Walter Fisher, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 12, 1976, Ser. No. 741,258

Int. Cl.^{2} F16H ***41/18***

U.S. Cl. 192—3.3 **3 Claims**

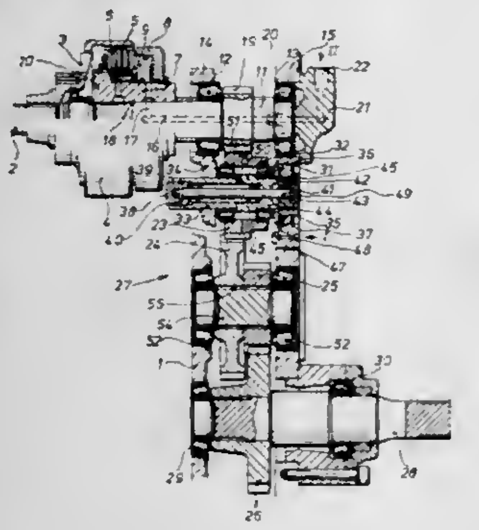


1. A hydraulic lock-up clutch for a torque converter of an automotive vehicle transmission wherein the torque converter includes an impeller operatively connected to an engine input, a turbine operatively connected to an output means, and a stator operatively connected to a stator shaft through a one-way clutch, positive locking means for selectively and drivingly coupling the impeller and turbine to permit the engine input to directly drive said output means and including interleaved clutch plates alternately operatively connected to said engine input and said output means and a hydraulically operated piston actuating said clutch plates, and a two-position rotary valve communicating with said locking means and slidably mounted on the surface of said stator shaft and generally radially aligned with said stator, said rotary valve providing an inner race and said stator providing an outer race for said one-way clutch, an inwardly extending lug on said rotary valve, said stator shaft having a recess receiving said lug and

providing a pair of spaced stops therefor, a compression spring having one end engaging said lug and the opposite end engaging a recess in said stator shaft to yieldably bias the rotary valve in one direction of rotation to a first position resulting in lock-up of said clutch plates, said rotary valve having a first passage adapted to communicate with a source of hydraulic pressure and said piston and a second passage adapted to relieve the hydraulic pressure behind said piston, passages being in radial alignment with said one way clutch, said rotary valve being operated by said one-way clutch and actuated by the stator reaction force from the torque converter, torque multiplication.

4,108,291
POWER TAKE OFF WITH CLUTCH AND BRAKE

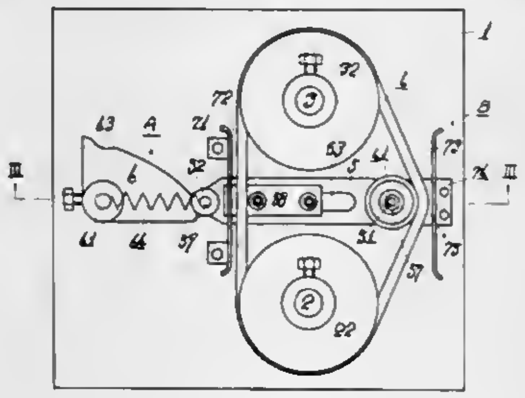
Walter Zenker, Bensberg-Refrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany
Filed May 17, 1976, Ser. No. 686,951
Claims priority, application Fed. Rep. of Germany, May 21, 1975, 2522411
Int. Cl.² F16D *67/04*
U.S. Cl. 192—4 R **9 Claims**



1. A power take off, especially for agricultural and construction vehicles which includes a housing and transmission means therein connecting an input shaft with an output shaft, said transmission means including a train of meshing gears, a supporting journal means stationarily mounted in the housing for at least one of said gears, a friction clutch having input and output parts interposed between the input shaft and a first of said gears and normally biased toward disengaged position and engageable by fluid pressure means, brake means including a brake body engageable with the output part of said clutch and normally biased toward engaged position, said brake means being moveable in a direction parallel to the axis of said clutch, guiding means for said brake means embodied in said journal means, and fluid operable means connected to the brake means for movement thereof in disengaging direction to move said brake body away from the output part of said clutch, the said journal means comprising a tubular element, said brake means including a rod extending axially through and guided by said tubular element, said brake body being connected to one end of said rod and said fluid operable means being connected to the other end of said rod, and a spring within said tubular element acting on said brake means and comprising the means for biasing said brake means toward engaged position.

4,108,292
CLUTCH APPARATUS

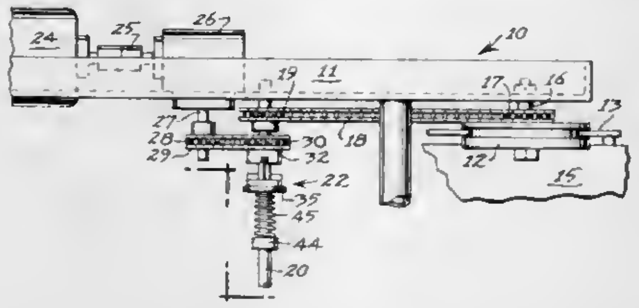
Hazime Takano, 9-15, 4-chome, Kamihozumi, Ibaragi City, Osaka Pref., Japan
Filed Dec. 20, 1976, Ser. No. 752,664
Claims priority, application Japan, Dec. 21, 1975, 50/153129; Jun. 30, 1976, 51-78087
Int. Cl.² F16D *13/76, 67/00*
U.S. Cl. 192—11 **4 Claims**



1. A clutch apparatus comprising a driving pulley, a driven pulley spaced laterally from said driving pulley, a belt loosely engaged around said pulleys and having a length sufficient for causing the belt to be completely spaced from the peripheries of said driving and driven pulleys when the runs of the belt between the driving and driven pulleys are straight and substantially tangential to the peripheries of the driving and driven pulleys, a tension pulley, shifting means on which said tension pulley is mounted and movable generally transverse to the line between the axes of said driving and driven pulleys in one direction with the tension pulley in engagement with one of the runs of said belt for tensioning said belt into engagement with said driving and driven pulleys and movable in the opposite direction for releasing the tension on said belt, and belt holding means positioned along the outer side of the belt runs between the driving and driven pulleys when said tension pulley is moved to a position for releasing the tension on the belt for holding the runs of the belt between the driving and driven pulleys substantially straight and tangential to the peripheries of said driving and driven pulleys, whereby the portions of the belt moving along said runs are prevented from bulging outwardly relative to the circumference of the belt and portions of said belt moving around the driving and driven pulleys are caused to bulge outwardly relative to said driving and driven pulleys and be completely disengaged therefrom.

4,108,293
DRIVE DISCONNECT DEVICE FOR A CLOTH SPREADING MACHINE

Joe M. McHenry, Jr., Hendersonville, Tenn., assignor to Cutters Machine Company, Inc., Nashville, Tenn.
Filed Jan. 24, 1977, Ser. No. 761,814
Int. Cl.² B60L *5/12*
U.S. Cl. 192—67 R **4 Claims**



1. In a cloth spreading machine having a machine frame supported on wheels, including a drive wheel, for rolling movement on a cutting table, and drive motive means on the frame, a drive disconnect device comprising:

(a) a rotary drive shaft drivingly connected to said drive wheel,

(b) an elongated key of limited length having an inboard end and an outboard end and fixed upon said shaft parallel to the rotary axis of said shaft,

(c) a first rotary clutch member having a first clutch face, freely rotatable upon said drive shaft outboard of the outboard end of said key, and drivingly connected to said motive means,

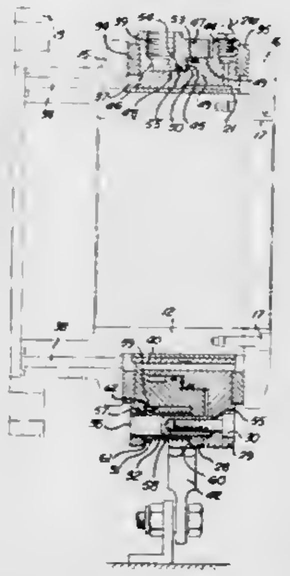
(d) a second rotary clutch member having a second clutch face for driving engagement with said first clutch face, said second clutch member being normally rotatable upon said drive shaft inboard of said first clutch member,

(e) an axial keyway in said second clutch member adapted to receive said key when axially aligned with said key for non-rotatable, axial movement of said second clutch member relative to said shaft, and

(f) spring means on said shaft constantly biasing said second clutch member toward said first clutch member and into frictional engagement with the inboard end of said key in an inoperative position in which said keyway is disaligned with said key.

4,108,294
ROTARY FLUID COUPLINGS

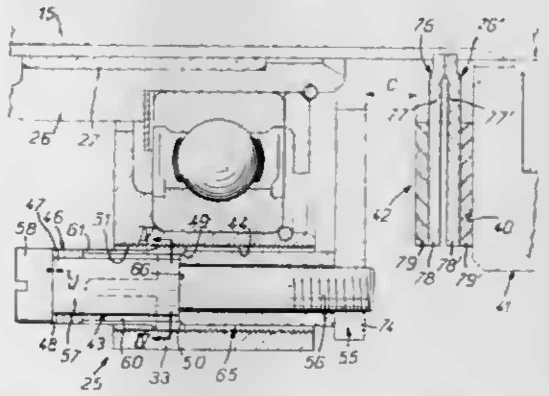
John Stewart, and Roger Charles Stevens, both of Twickenham, England, assignors to Twiflex Couplings Limited, England
Filed Mar. 1, 1976, Ser. No. 662,826
Int. Cl.² F16D *25/00;* **E03B** *1/00*
U.S. Cl. 192—85 R **9 Claims**



1. A rotary fluid coupling for interconnecting stationary and rotary fluid lines comprising a rotary shaft having two axially spaced, axially directed, annular abutment surfaces which face each other, said abutment surface being concentric with said shaft; an axially expandable outer member which encircles the shaft between said two abutment surfaces, there being provided a space for receiving fluid betwen the shaft and the outer member, and respective fluid passages extending within the shaft and the outer member leading to said space for respective connection to rotary and stationary fluid lines; means for preventing rotation of said outer member about the axis of the shaft; and respective releasable first annular sealing means located between each abutment surface on the shaft and an adjacent axial end surface of the outer member for preventing leakage of fluid from said space when the outer member is expanded; the outer member comprising two coaxial annular members which are disposed one within the other for axial movement with respect to each other and to the rotary shaft, each annular member having a respective axial annular end face which is disposed for sealing engagement with the respective one of said first annular sealing means when the outer member is axially expanded, a first of said annular members having an axial bore within which the shaft is rotatably disposed and an outer surface of which the diameter increases in one axial direction, the second annular member having an axial bore of which the diameter increases in correspondence with that of said outer surface of the first annular member in the same axial direction, said outer surface of the first annular member being disposed within the axial bore in the second annular member, there being provided two axially spaced second annular sealing means located within said bore in the second annular member which are sealingly engaged between said outer surface of the first annular member and the wall of the bore in the second annular member whereby a fluid actuation chamber is provided between said axially increasing surfaces and between said sealing means, and means for supplying pressurized fluid between the first and second annular members between said second annular sealing means to urge said two annular members apart thereby to expand the outer member.

4,108,295
INERTIA-BRAKE CONTROL FOR INPUT SHAFT OF GEAR BOX, AND ITS APPLICATION TO CLUTCHES AND UNITS FORMED BY A CLUTCH AND A GEAR-BOX

Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed Feb. 6, 1976, Ser. No. 655,964
Claims priority, application France, Feb. 11, 1975, 75 04156
Int. Cl.² F16D *13/75*
U.S. Cl. 192—111 A **22 Claims**



4. An operating control for an inertia brake for an input shaft of a gear-box, of the kind including a gear box casing, a clutch for coupling said input shaft to a drive unit, a declutching stop carried by said input shaft for declutching said clutch, a friction disc keyed on said input shaft for rotation therewith and for axial sliding thereon, said gear-box casing having a reaction surface engageable by said friction disc, pressure means carried by said declutching stop and adapted, in response to an axial displacement of said declutching stop in a clutch declutching direction, to apply against said reaction surface said friction disc, said brake operating control further comprising unidirectional axial coupling means provided between said declutching stop and said pressure means carried by said declutching stop, said unidirectional axial coupling means being operable on the one hand to permit controlled axial displacement of the pressure means with respect to said declutching stop in the direction opposite to the clutch declutching movement of said declutching stop and on the other hand to prevent such axial displacement, and retaining means positioned for engagement by said pressure means when the declutching stop carrying said pressure means is displaced in the direction opposite to its clutch declutching movement, said declutching stop having a bore rigidly fixed thereon parallel to the axis of said input shaft, said pressure means comprising at least one action finger engaged in said bore, said unidirectional axis coupling means comprising a threaded portion of the cam-engaged ratchet type, rigidly fixed on a selected one of the declutching stop and action finger, and a split socket interposed between said action

finger and the bore in which said action finger is engaged and which has a threaded portion complementary to said first-mentioned threaded portion, said socket being further provided with a radial supporting surface cooperating in abutment with a shoulder fixed on the non-selected one of said declutching stop and action finger, and a conical support surface cooperating by wedging action with a complementary bearing surface fixed on said non-selected one of said declutching stop and action finger.

4,108,296

COIN RECEIVING APPARATUS FOR A VENDING MACHINE

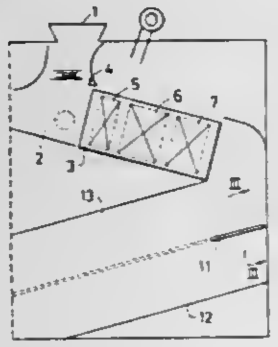
Yukichi Hayashi; Masayuki Tamura; Osamu Sugimoto, all of Sakado; Masayoshi Takizawa, Kitamoto, and Tatsujiro Nishioka, Yokohama, all of Japan, assignors to Nippon Coinco Co., Ltd., Japan

Filed Mar. 22, 1977, Ser. No. 780,153

Claims priority, application Japan, Apr. 8, 1976, 51-39580; Apr. 23, 1976, 51-46262; May 14, 1976, 51-61095[U]

Int. Cl.^{2} G07F *3/02*

U.S. Cl. 194—99 **5 Claims**



1. A coin receiving apparatus for a vending machine comprising:

coin detector means for producing an output corresponding to the diameter of an inserted coin, said coin detector means including a coil so arranged that the magnetic flux thereof is substantially perpendicularly crossing the diameter of the inserted coin passing through a coin detection path;

one or more coin detector means of a differential transformer type sequentially arranged adjacent to said coin detector means in the coin detection path for producing an output corresponding to coin characteristic or characteristics other than the coin diameter;

detection control means for controlling said respective coin detector means and judging whether the inserted coin is true or false in response to the detected outputs from said respective coin detector means, said detection control means comprising a supply source for selectively supplying an exciting power of a frequency corresponding to said respective coin detector means, control means for controlling the selective supply of the power from said supply source to said respective coin detector means in a sequential order corresponding to passage of the inserted coin through said respective coin detector means in the coin detection path thereby to cause said respective coin detector means to successively detect the inserted coin, and discriminating means for discriminating a peak level of the detected output of each of said respective coin detector means; and

coin receipt control means responsive to the true or false judgement output from said detection control means for controlling the receipt or return of the inserted coin; whereby the inserted coin is received in the coin receiving apparatus if the detected outputs from all of said coin detector means indicate that the inserted coin is true.

4,108,297

GUIDE FOR A PRINTING HEAD OF A PRINTING DEVICE

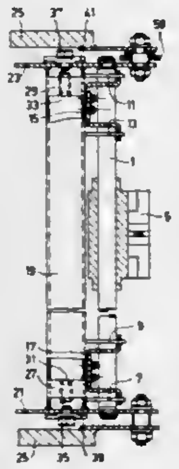
Heinrich Dürr, Wilnsdorf-Niederdielfen, and Lothar Haubrich, Eiserfeld, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,880

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618001

Int. Cl.^{2} B41J *29/02*

U.S. Cl. 400—354 **4 Claims**



1. A printing device which comprises: a frame; a printing head; and a guide for limiting displacement of said printing head parallel to a predetermined printing direction, said guide comprising two parallel round guide rods, first and second guide plates carried on said frame proximate both ends of said guide bar of said side plates extending transversely of said guide rods, said guide rods being connected to the side plates by means of a supporting beam which extends parallel to the printing direction, said side plates including a plurality of projections, said supporting beam being provided on each of its end faces with (1) recesses dimensioned and configured to cooperate with said projections on said side plates, and also with (2) a threaded hole at each end thereof which extends longitudinally, said guide further including a first and second bolts respectively coupling said first and second side plates to said threaded holes in said supporting beam.

4,108,298

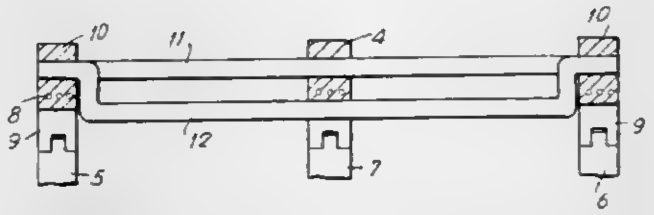
SIEVE STRINGER BELT FOR CONVEYORS

Helmut Klinkicht, Bahnhofstrasse 12, 2000 Barsbuttel, Fed. Rep. of Germany

Filed May 24, 1976, Ser. No. 689,243

Int. Cl.^{2} B65G *17/00*

U.S. Cl. 198—834 **7 Claims**



1. A belt conveyor arrangement, particularly for conveyors of substantially large width comprising, in combination, lateral belts with reinforcing insert means and spaced from each other along the width of the conveyor; at least one supporting belt between said lateral belts, at least one of said belts being a drive belt and having a driving surface, a drive wheel engaging said driving surface for driving said drive belt, said driving surface facing said drive wheel and having a toothed-rack shape; transverse elements connected to said lateral belts and supported by said supporting belt; pot-shaped sleeves mounted on the ends of said transverse elements and inserted into said lateral belts, said sleeves being seated in said lateral belts and carrying said transverse element; said sleeves comprising a disc at one end; a ring-shaped member at the other end; and individual rods connected between said disc and said ring-shaped member, the external diameter of said disc being substantially larger than that of the remaining portion of said sleeve.

4,108,299

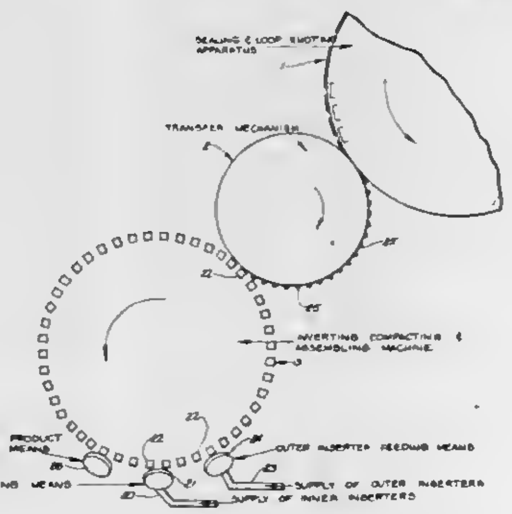
APPARATUS AND METHOD FOR DELIVERING TAMPON SACKS AND INSERTER PARTS TO AN ASSEMBLY TURRET

John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 531,222, Dec. 10, 1974, Pat. No. 4,006,515. This application Jun. 21, 1976, Ser. No. 698,274

Int. Cl.^{2} B65G *47/00*

U.S. Cl. 28—119 **17 Claims**


SEALING & LOOP KNOTTING APPARATUS
TRANSFER MECHANISM
INVERTING COMPACTING & ASSEMBLING MACHINE
ASSEMBLED PRODUCT DISCHARGE MEANS
OUTER INSERTER FEEDING MEANS
INNER INSERTER FEEDING MEANS
SUPPLY OF OUTER INSERTERS
SUPPLY OF INNER INSERTERS
22
22
21
25
25

1. Apparatus for feeding tampon inserters to a tampon assembly turret, a rotatable feeder wheel inclined at an angle of substantially 45°, said wheel comprising spaced inner and outer discs having mating sets of slots therein, drive means for rotating said wheel, holder means overlying said feeder wheel for feeding inserter parts to said wheel, said holder means having a slotted bottom positioned to receive the inserter parts and align them for engagement by the sets of slots in said inner and outer discs, said discs passing through the slotted bottom of said holder means, coacting hold-down rods positioned to maintain the inserter parts in said sets of slots, and mens for transferring the inserter parts from said wheel to the assembly turret.

4,108,300

BAG PACKING APPARATUS

Masao Hayase, Kasugai, and Kazunori Araki, Gifu, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1977, Ser. No. 823,450

Int. Cl.^{2} B65G *19/02;* **B65B** *43/30*

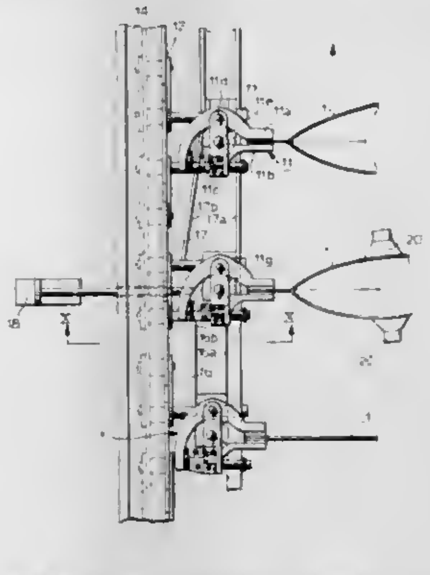
U.S. Cl. 198—479 **1 Claim**

1. An apparatus for packing bags comprising:

a pair of horizontally-spaced, parallel chain conveyors;

a plurality of paired attachement-rods positioned opposite each other on said chain conveyors and projecting toward each other;

clamping means slidably mounted on said attachment-rods for clamping and holding the sides of said bags between said conveyors; and



guide means adjacent said clamping means for sliding said clamping means on said attachment-rods toward and away from said conveyors.

4,108,301

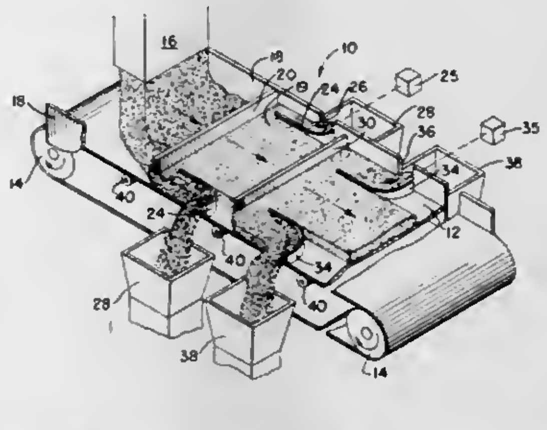
MULTIPLE POINT FEEDER

Norman Kenneth Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 12, 1976, Ser. No. 741,256

Int. Cl.^{2} B65G *15/00*

U.S. Cl. 198—633 **6 Claims**



1. A material handling system for distributing granular solids from a single source to a multiplicity of points, comprising:

a conveyor for transporting the material from a feed source;

a plurality of pairs of arcuate-shaped deflectors, each pair of deflectors being spaced longitudinally along and adjacent the sides of said conveyor for diverting quantities of material toward the sides of said conveyor;

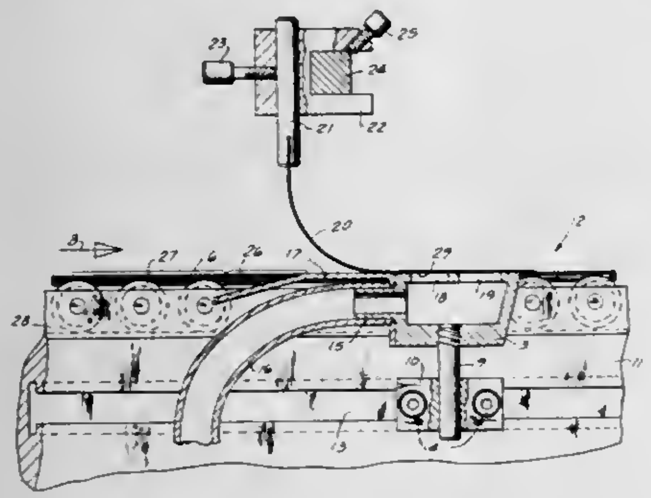
a hopper disposed adjacent to each of said deflectors for receiving the diverted quantity of material; and

a plurality of leveling bars positioned above said conveyor for controlling the thickness of the layer of material on said conveyor, said leveling bars being alternately spaced in the longitudinal direction with respect to said pairs of deflectors to redistribute on the conveyor the material remaining downstream of each pair of said deflectors to provide a layer of material of uniform thickness,

whereby the cooperative relationships among the vertical positions of the leveling bars and the lateral positions of the deflectors accurately control the precise amounts of material diverted from the conveyor to said hoppers.

4,108,302
SUCTION CONVEYOR

Friedrich Wiedemann, St- Sulpice, Switzerland, assignor to J. Bobst & Fils, S.A., Switzerland
Continuation of Ser. No. 561,949, Mar. 25, 1975, abandoned.
This application Oct. 22, 1976, Ser. No. 735,055
Claims priority, application Switzerland, Mar. 27, 1974, 4368/74
Int. Cl.^{2} B65G *17/46*
U.S. Cl. 198—689 **3 Claims**



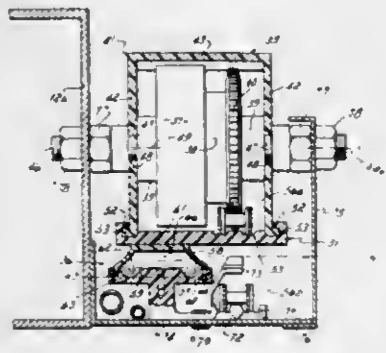
1. In a conveyor device having a belt conveyor with a conveying surface and at least two separate vacuum chambers communicating with a single source of vacuum, each vacuum chamber having a wall with an outer surface and at least one opening extending therethrough, each vacuum chamber being disposed adjacent the belt conveyor with the outer surface lying substantially in the plane of the conveying surface for applying a holding force on a blank being transported by the conveying surface thereacross, the improvement comprising means for controlling the flow through each opening of each vacuum chamber, said means including a separate obturator for each vacuum chamber and means for mounting each obturator, each obturator being a sheet of resilient material having one end being engaged by the means for mounting and another end for engaging the outer surface of its respective vacuum chamber to close each of the openings therein and being displaced from the outer surface and each opening therein by movement of a blank along the outer surface across the opening, said means for mounting holding the one end of the sheet of each obturator at an angle to the plane of the outer surface of its respective vacuum chamber so that the sheet of material self-biases the other end into a position for engaging the outer surface of the respective vacuum chamber so that a moving blank passes over an opening at one of the vacuum chambers, suction is applied thereto and as the moving blank uncovers each opening of the vacuum chamber, the obturator associated therewith blocks flow through each of the uncovered openings into the vacuum chamber.

4,108,303
POWER TRANSMISSION ASSEMBLY FOR AN ACCUMULATOR CONVEYOR

Robert K. Vogt, and Martin A. Heit, both of Cincinnati, Ohio, assignors to The E. W. Buschman Company, Cincinnati, Ohio
Filed Aug. 2, 1976, Ser. No. 710,442
Int. Cl.^{2} B65G *13/02*
U.S. Cl. 198—781 **9 Claims**

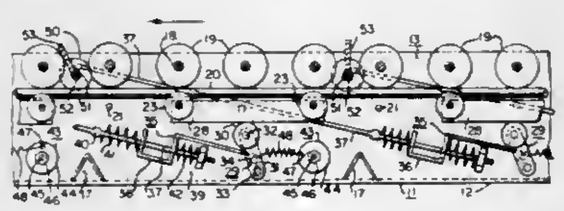
4. An accumulator conveyor of the type having a plurality of separate zones between the inlet end and the discharge end thereof, said conveyor comprising

- at least one article propelling member connected to said conveyor within each zone, said article propelling member being in the form of a roller rotationally mounted to said conveyor powering an article resting thereon within said zone thereacross from the adjacent upstream zone to the adjacent downstream zone, the rollers being in spatial relation relative one to the other,
- a separate power transfer device including a friction wheel rotationally carried in a housing pivotally mounted to said conveyor for each zone associated with said article propelling member, said power transfer device being selectively engageable with and disengageable from said article propelling member for selectively operating said article propelling member, a drive sprocket connected to said friction wheel,
- means for moving each of the power transfer devices to bring the friction wheel thereof into engagement with and into disengagement from the associated article propelling member,
- a flexible drive member in the form of an endless chain operably engaged with the drive sprockets interconnecting all of said power transfer devices and a power source, said flexible drive member continuously powering each power transfer device whether said power transfer device is engaged with or disengaged from its associated article propelling member, and
- a door mountable on the housing carrying the friction wheel of the power transfer device, said door holding said drive chain in operable engagement and functional relation with said power sprocket when the door is in a first position, said door being movable to a second position to release the drive chain and permit disengagement of said drive chain from said power sprocket and said housing.



4,108,304
POWERED ROLLER ACCUMULATION CONVEYOR

Robert J. McKnight, Toms River; Frank J. Neuwirth, Manasquan, and Robert W. Gotham, Toms River, all of N.J., assignors to Unex Conveying Systems, Inc., Jackson, N.J.
Continuation of Ser. No. 713,092, Aug. 10, 1976, abandoned.
This application Feb. 21, 1978, Ser. No. 879,537
Int. Cl.^{2} B65G *13/02*
U.S. Cl. 198—781 **31 Claims**

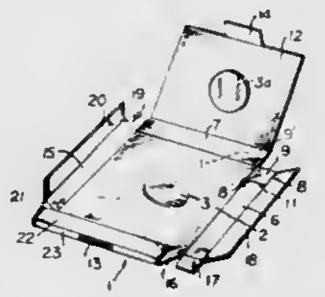


1. An accumulation conveyor comprising a pair of laterally spaced siderails, each having a normally vertical web, a plurality of axles extending between said siderails, a roller rotatably mounted on each axle and adapted to carry articles to be transported by said conveyor, a power-driven propelling member, a plurality of vertically movable rollers supporting the propelling member with adjustable first mechanical means cooperating therewith for urging said rollers upward against the propelling member, said first mechanical means being resilient, and means for detecting the presence of an article on said conveyor, said means being operatively connected to an adjustable second mechanical means which cooperates with said vertically movable rollers for urging a plurality of said rollers selectively either upward or downward to further vary the pressure of said vertically movable rollers against the propelling member by exerting a supplementary force on said vertically movable rollers, said secondary mechanical means including a movable cam means adapted to selectively bias said vertically movable rollers against said propelling member, said secondary mechanical means further including an adjustable tension spring means attached to said cam means and adapted to regulate the bias exerted by said vertically movable rollers against said propelling member, said second mechanical means further including an actuator assembly interconnecting said cam means with said article detecting means and comprising:

a. a slidable member;
b. a rod means slidably secured with respect to said slidable member, said rod means including a first stop means and a second stop means thereon; and
c. a first compression spring means positioned about said rod and abutting said slidable member, said first compression spring means positioned between said second stop means and said slidable member to bias said slidable member with respect to said rod member.

4,108,305
TAPE-MOUNTED ELECTRONIC-COMPONENT PACKAGE

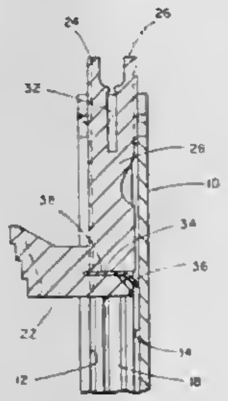
Kisao Komatu, Tokyo, Japan, assignor to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Japan
Filed Jan. 28, 1977, Ser. No. 763,487
Claims priority, application Japan, Jan. 30, 1976, 51-9077
Int. Cl.^{2} B65D *73/02*
U.S. Cl. 206—330 **7 Claims**



1. A box blank for a package for feeding a spirally-wound support tape carrying electronic components held to said support tape by lead wires disposed transversely to said support tape, comprising an essentially square bottom section, a back face and a front face at two opposed edges of said bottom section, said back and front faces each having two edges, first and second side faces at the remaining edges of said bottom section, score lines between each of said faces and said bottom section, each of said side faces having two ends and two edges, an end flap at each end of said first side face, a score line between each of said end flaps and said first side face, a single end flap at that end of said second side face nearer said front face, a score line between said single end flap and said second side face, a cover section of essentially the same size and shape as said bottom section at an edge of said back face, a score line between said cover section and said back face, a tongue at the edge of said cover section opposite that adjacent to said back face, a score line between said tongue and said cover section, a top support flap at an edge of each of said side faces, a score line between each of said side faces and the respective top support flap, a top support section and an inside front face in sequence at said front face, score lines between said front face and said top support section and between said top support section and said inside front face, said top support section having a slot therein for receiving said tongue on said cover section to hold said cover section in closed position when said box blank is assembled, all of said score lines being positioned for folding an inward direction, one of that end of said back face nearer said second side face and that end of said second side face nearer said back face each having a score line transverse to the edges thereof and a short distance from each said that end positioned for folding outward and the edges of said back face and said side face being cut through from said that end to said transverse score line for forming a hinged flap which can open outwardly from said box either from said back or said side face when formed from said box blank for permitting feed of spirally-wound contents from a box made from said blank, and an axial core attached to said bottom section for use in holding said spirally-wound support tape.

4,108,306
CARTRIDGE FOR SUTURE CLIPS

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039
Filed Jun. 20, 1977, Ser. No. 807,967
Int. Cl.^{2} B65D *85/20*
U.S. Cl. 206—339 **2 Claims**

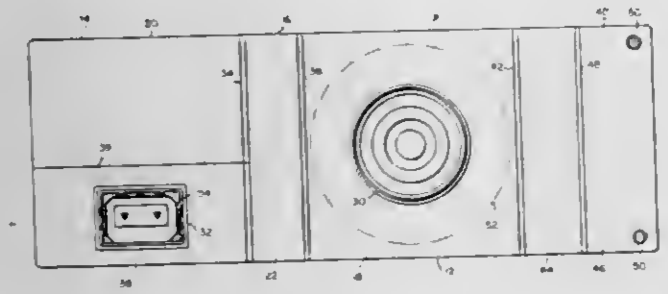


1. A cartridge for feeding pairs of clips simultaneously in laterally spaced apart relation from an elongate housing having a central passage,

- a pair of slots extending through at least the major portion of the housing with a passage in between for receiving a plurality of clips in each slot aligned in end to end relation, with the slots communicating with the central passage through a contiguous opening of smaller dimension than the slots and passage,
- a slide within the passage, and arms extending laterally from the slide through the openings into the slots for engagement with the endmost of the clips in the slots,
- a handle extending from the housing and operatively connected with the slide for endwise displacement through the passage, the improvement in a
- means to permit the slide to move forwardly while preventing rearward movement in the passage comprising a spring clip having a forward end portion received within a slot extending inwardly from the wall of the slide opposite the handle and a trailing end portion which extends beyond the slide into engagement with the adjacent wall of the housing, with the trailing end portion being angled to extend backwardly to permit forward movement of the slide relative to the housing while preventing relative backward movement, in which the spring clip comprises a flat strip of spring metal in which the forward portion is dimensioned to have a length corresponding to the length of the slot in the slide and a trailing portion in which the total length of the strip is greater than the distance between the base of the slot to the adjacent wall of the housing for resilient engagement between the clip and the wall.

4,108,307
STORAGE BINDER

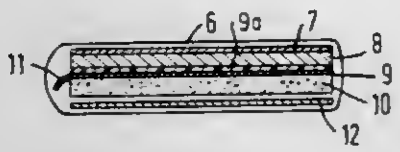
Irene B. Feingold, and Stanley Z. Feingold, both of 420 Pitts Colony Dr., Rochester, N.Y. 14623
Filed May 11, 1976, Ser. No. 685,176
The portion of the term of this patent subsequent to Aug. 16, 1991, has been disclaimed.
Int. Cl.² B65D *85/672*
U.S. Cl. 206—387 **2 Claims**



1. A storage binder for audiovisual material comprising:
(a) a first generally rectangular cover member having an inner and an outer surface,
(b) first mounting bracket means affixed to the inner surface of said first cover member and centered thereon for securing a circular photographic slide tray thereto by friction engagement therewith,
(c) a second generally rectangular cover member having an inner and an outer surface including a storage pocket on the inner surface thereof, said storage pocket extending from the bottom of said second cover member upward and extending across the entire width of the inner surface of said second cover member to thereby cover a substantial portion of the inner surface of said second cover member,
(d) second mounting bracket means affixed to said storage pocket for securing an audio cassette thereto by friction engagement therewith, and
(e) a spine member joining said first and second cover members in a hinged relationship.

4,108,308
PACKAGE FOR INTRAORAL DENTAL X-RAY FILMS

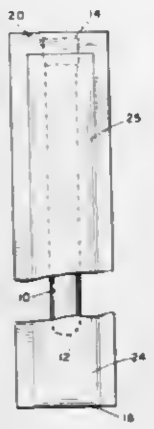
Kurt Franke; Johannes Seissl, and Wilhelm Stuermer, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Nov. 5, 1976, Ser. No. 739,136
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 7535699
Int. Cl.² B81D *81/20;* **B03B** *41/18*
U.S. Cl. 206—455 **2 Claims**



1. An X-ray film package for preparation of intraoral dental X-ray photographs comprising in combination, a pouch having an interior chamber, a sheet of X-ray film having an emulsion layer and positioned within such chamber, and an intensifier foil comprising two surfaces, a photo-luminescent layer on one surface thereof and an adhesive layer coated on another surface thereof, said adhesive coated surface of the intensifier foil being in intimate contact with said emulsion layer and said adhesive coated surface allowing separation of said film and said intensifier foil.

4,108,309
CONTRACEPTIVE CONTAINING DEVICE

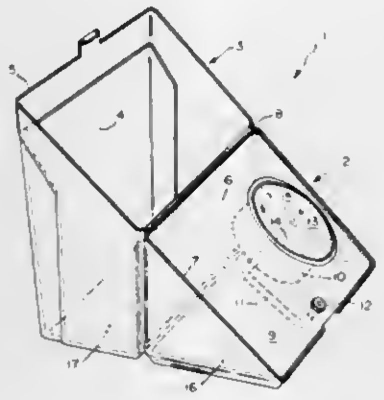
Emanuel H. Bronner, Escondido, Calif., assignor to All One God Faith, Inc., Escondido, Calif.
Continuation-in-part of Ser. No. 732,800, Oct. 13, 1976, Pat. No. 4,027,670. This application Mar. 21, 1977, Ser. No. 779,489
Int. Cl.² A61J *3/08;* **B65D** *77/38*
U.S. Cl. 206—528 **6 Claims**



1. A contraceptive containing device, comprising a contraceptive gel having a pH less than 3.0;
an elongated casing containing the gel, and having an insertion end extending beyond the gel wherein said insertion end has an outer portion, and an inner portion between said outer portion and said gel; and
a hygenically sealed pouch enclosing the casing and having a seal at one end of the pouch which overlaps said outer portion of the insertion end of the casing to secure the casing to the pouch and close the insertion end of the casing; wherein said casing has a weakened region in said inner portion of the insertion end, whereby the casing can be exposed by the application of shear stress at a region in at least one side of the pouch excluding the pouch portion which overlaps the insertion end of the casing to allow removal of a portion of the pouch, and wherein said casing can be removed from the remaining portion of the pouch by pulling on the end of the casing remote from the insertion end to provide a shearing stress in the casing near the insertion end of the pouch for causing said casing to detach from said remaining portion of the pouch.

4,108,310
BLOOD PRESSURE TESTING KIT

Clarence Foster Aldridge, Asheville; Leo Martin Storey, Jr., Biltmore Forest, and Joseph William Cilurzo, Hendersonville, all of N.C., assignors to Sybron Corporation, Rochester, N.Y.
Filed Mar. 2, 1976, Ser. No. 663,034
Int. Cl.² B65D *69/00*
U.S. Cl. 206—570 **2 Claims**

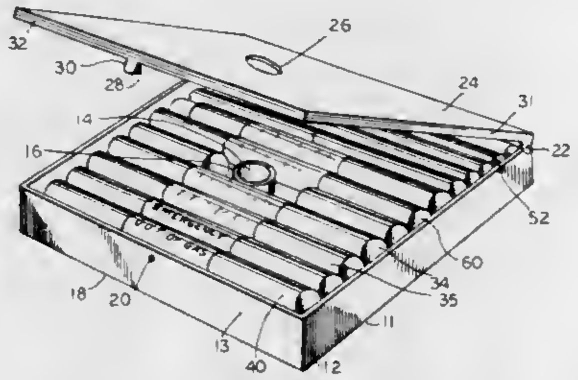


1. A blood pressure testing kit comprising, in combination, a case and blood pressure testing apparatus,

(a) said case having a first commpartment and a second embodiment;
(b) said blood pressure testing apparatus including a cuff element, a valve element, a bulb element, and pressure coupling and tubing elements;
(c) said blood pressure testing apparatus also including a stethoscope and a pressure gauge couplable by said pressure coupling and tubing elements to other said elements;
(d) said stethoscope and said cuff element being receivable in said first compartment for storage therein, and said pressure gauge being mounted in said second compartment for observation;
(e) said case comprising a hollow shell having an open side for providing said first compartment, a lid having an open side for providing said second compartment and for covering the first said open side, and a hinge securing said lid to said shell;
(f) said hinge providing for swinging said lid about said hinge from a closed position wherein one of said compartments substantially closes the other, to an open position exposing the contents of said compartments to simultaneous external manual and visible access from the same point of view in the external environment and for holding said lid in either said position;
(g) said shell having a flat bottom, said lid having a flat top, and in open position said flat bottom and said flat top being substantially coplanar;
(h) said second compartment having a flat plate closing it, the plane of said plate running diagonally of said lid and having the axis of said hinge therein, and said pressure gauge having a substantially planar reading area coplanar with said plate.

4,108,311
SAFETY WARNING KIT

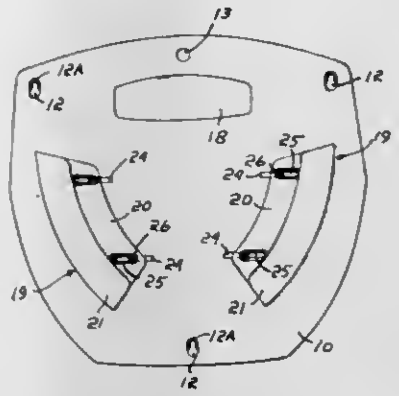
Gilbert McClendon, 1540 N. Carey St., Baltimore, Md. 21217
Filed May 11, 1977, Ser. No. 795,741
Int. Cl.² B65D *79/00*
U.S. Cl. 206—573 **10 Claims**



1. A highway safety warning kit comprising:
a. a container having a body and a cover fitted thereto, the cover defining a thru hole centrally thereof, and the body providing an opening aligned with the hole,
b. a long post which may be fitted into the hole and the opening, the post defining a first opening adjacent one end thereof and a second opening somewhere along the length of the post, and
c. at least one sign comprising a rolled up flat extension spring and attached therealong a flat flexible material having at least four edges, adjacent a first edge of which is provided with a first fastening means, and adjacent a second, distal edge of which is provided a second fastening means, all said fastening means engaging the respective openings in the post,
the combination of the post erected into the container and the sign attached to the post thereby displaying the sign.

4,108,312
HANGER FOR RACQUETS

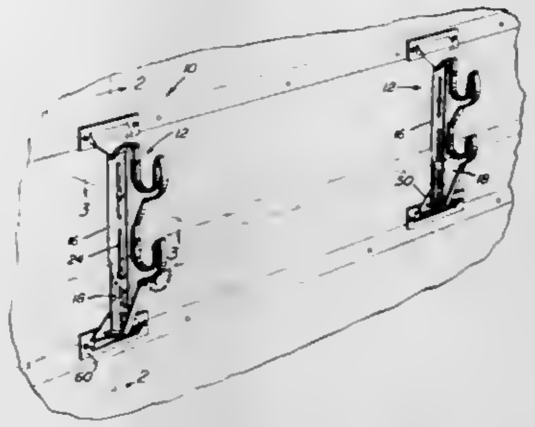
Charles G. Craven, 35 Will Dr., Canton, Mass. 02021
Filed Jun. 30, 1976, Ser. No. 701,163
Int. Cl.² A47F *7/00*
U.S. Cl. 211—13 **4 Claims**



1. A hanger for a plurality of racquets, said hanger comprising a back plate attachable to a door or wall and a pair of holders transversely spaced on said back plate to receive between them depending racquet handles, each holder including a supporting wall and inner and outer retaining walls parallel to the plate and disposed towards the opposite holder, the outer retaining wall spaced from the plate a distance such that said heads are freely received and loosely held by and between said holders, the supporting wall of each holder shaped to be engaged by a major portion of the head of a racquet that curves inwardly from the zone of maximum width towards its handle and the outer wall dimensioned to overlie the margins of the head throughout at least a major part of said portion, and means connecting the inner wall of each holder to the back plate with the inner wall seated thereagainst, said connecting means of each holder including a vertically spaced pair of parallel horizontally slidable connections, to enable the holders to be slid towards and away from each other between predetermined proximate and remote spaced apart relationships as required for the accommodation of racquet heads within a predetermined width range.

4,108,313
VEHICLE MOUNTED GUN RACK WITH MOUNTING BRACKETS

Earl M. Bogar, Jr., P.O. Box 4152, Houston, Tex. 77001
Filed May 12, 1977, Ser. No. 796,474
Int. Cl.² A47F *5/08, 7/00*
U.S. Cl. 211—64 **6 Claims**



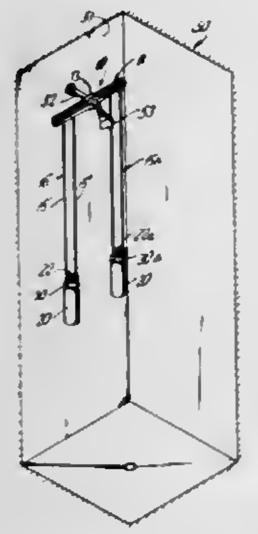
1. A mounting rack for rifles and the like comprising a pair of laterally spaced support members, each support member comprising:
first and second slide elements, each slide element having means thereon for forming a slidable surface and a substantially planar support blade formed thereon, the plane

of each support blade extending away from the planes of the slidable surfaces of the slide elements at an angle, the first slide element comprising a U-shaped longitudinal channel member forming a slide track, the channel member being comprised of a rear wall and two spaced side walls extending perpendicularly to the rear wall, the second slide element being receivable between the spaced side walls from a direction perpendicular to the rear wall, the side walls having laterally aligned elongated slots formed therein and spaced along free edges of the side walls, the support blade of the first slide element being attached to the uppermost end thereof; and,

cradle means disposed on the second slide element and extending outwardly therefrom for receiving the object which is to be mounted on the mounting rack.

4,108,314
APPARATUS FOR STORING TOILETRIES IN A SHOWER

Enrico R. Racca, 23 Meadow St., Brooklyn, N.Y. 11206
Filed Oct. 25, 1977, Ser. No. 844,523
Int. Cl.² A47K *5/00*
U.S. Cl. 211—74 **12 Claims**



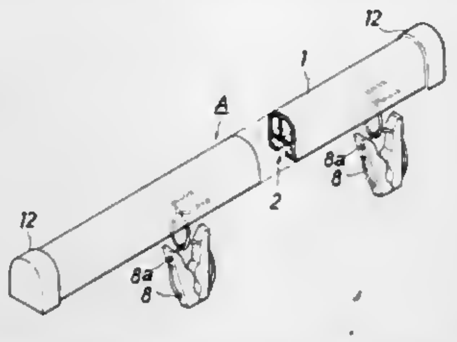
12. An apparatus for storing toiletry bottles within a shower said bottles having a removable screw on cap member comprising:

- a mounting member for attaching the apparatus to the plumbing element of the shower;
- means for securing said mounting member to the plumbing element of the shower;
- a bottle carrier having a central aperture for receiving the neck of one of the toiletry bottles, said aperture having a diameter greater than the exterior diameter of the bottle neck but lesser than the exterior diameter of the bottle cap such that the carrier can be mounted over the bottle neck and secured to the bottle when the bottle cap is screwed onto the bottle neck; and
- means for interconnecting the bottle carrier with the mounting member such that the bottle hangs adjacent the shower wall, said interconnecting means comprising a pair of spaced string members one end of each string being secured to the mounting member the other end of each string being secured to the carrier member on opposite sides of the central aperture of said carrier member.

4,108,315
CLOTHES POLE

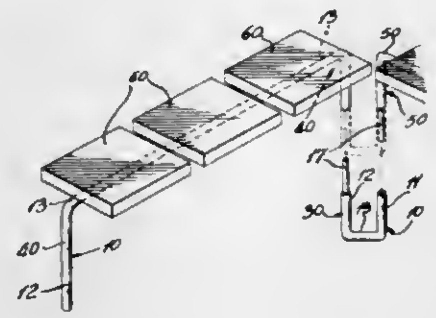
Satoshi Inao, 646, Hachigasaki, Matsudo-shi, Chiba-Ken, Japan
Filed Jun. 16, 1976, Ser. No. 696,618
Int. Cl.² A47H *13/00*
U.S. Cl. 211—124 **1 Claim**

1. A clothes pole assembly comprising a body forming guiding means extending in a longitudinal direction and comprising a pair of upwardly facing spaced apart surfaces and a pair of laterally facing spaced apart surfaces, at least one suspending member comprising a pair of support arms and means for biasing said arms against said laterally facing surfaces, said upwardly facing surfaces constituting means for supporting said arms, said biasing means also comprising means depending from said arms for moving said arms toward and away from said laterally facing surfaces for moving said suspending member along said guiding means, and means for holding washed clothes including means linking said holding means to said depending means, said laterally facing surfaces and said arms including interfitting concave and convex portions for fixing said suspending member in position along said guiding means.



4,108,316
INTERCONNECTIBLE STRUCTURAL TUBULAR MEMBERS

Norman S. Slater, Montreal, Canada, assignor to Norman Slater, Inc., Montreal, Canada
Filed Mar. 31, 1976, Ser. No. 672,394
Int. Cl.² A47F *5/13*
U.S. Cl. 211—199 **3 Claims**

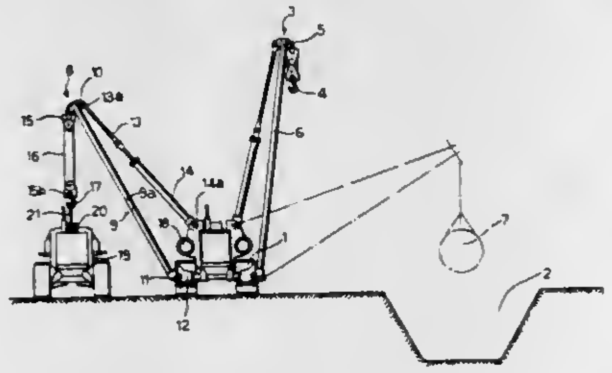


2. A support structure comprising three or more interconnectible structural support members, each support member consisting of an elongated unitary U-shape tubular member of uniform cross-section shape to define opposite side arms and a bridge arm extending across a common end of each said side arms, each of said side.arms having a free end, one of said free ends having a hinge plug of circular cross-section rigidly secured thereto and protruding therefrom, the other free ends being hollow and of circular cross-section to receive a hinge plug of a side arm of a further U-shape tubular member, a second one of said support members being hingeably connected to a first and third one of said support members by receiving said hinge plug of a side arm of said first member in said hollow end of a side arm of said second member and having said hinge plug of the other side arm of said second member received in said hollow end of a side arm of said third member, said bridge arm of said second member being supported upwardly of a support surface by said bridge arms of said first and third members which are resting on said support surface, each of said hinge plugs being received in the hollow free end of the respective side arm in close frictional fit to permit axial rotation of respective ones of said interconnected side arms about said hinge plug in said respective hollow end whereby said interconnected ones of said support members will be self-supporting on said supporting surface and displaceable relative to one another and to any desired position when in use, one side arm of said first member being longer than the

other side arm and substantially equal to the combination of the length of its other side arm and the hingeably interconnected side arm of said second member, one or more lateral support members secured to said bridge arm of said first member and having a planar surface extending transversely to said side arms of said first member.

4,108,317
CONTINUOUS LAYING OF PIPES OF LARGE DIAMETER

Alberto Giovanni Bifani, and Giorgio Maria Bertolino, both of Turin, Italy, assignors to Fiat-Allis Macchine Movimento Terra S.p.A., Lecce, Italy
Filed Apr. 20, 1977, Ser. No. 789,023
Claims priority, application Italy, May 3, 1976, 68072 A/76
Int. Cl.² B66C *23/72*
U.S. Cl. 214—1 PA **6 Claims**



1. Apparatus for laying pipe comprising

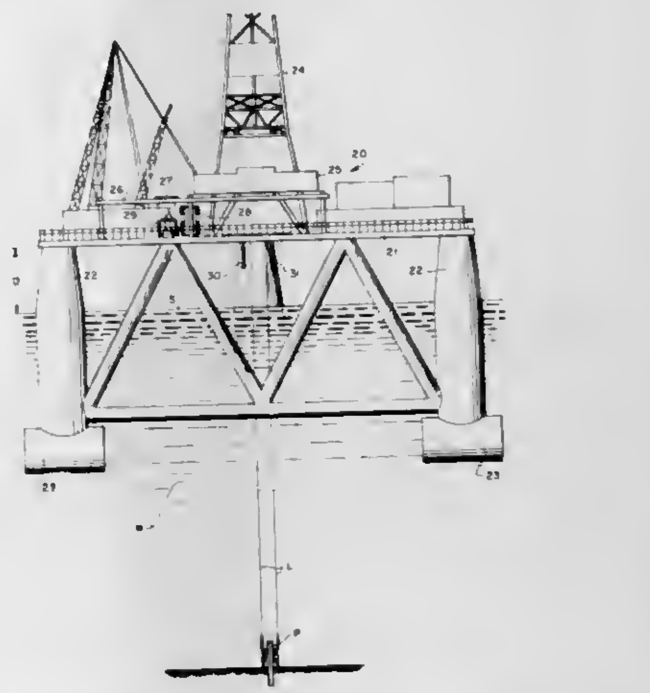
- a first self-propelled vehicle having supported thereon lifting means for engaging an object to be lifted and moved from one position to another position,
- said first self-propelled vehicle also having supported thereon balancing means for engaging a counterweight to counterbalance said vehicle when said lifting means engages an object during lifting and moving of the object from one position to another position, and
- a counterweighting second self-propelled vehicle having supported thereon means for detachably engaging the balancing means of said first self-propelled vehicle to form a counterweight for counterbalancing said first self-propelled vehicle when lifting and moving an object from one position to another position.

4,108,318
APPARATUS FOR OFFSHORE HANDLING AND RUNNING OF A BOP STACK

Walter F. Rode, Richardson, and Bill R. Jones, Dallas, both of Tex., assignors to Sedco, Inc. of Dallas, Texas, Dallas, Tex.
Filed Jun. 7, 1974, Ser. No. 477,284
Int. Cl.² E21B *3/00*
U.S. Cl. 214—1 R **26 Claims**

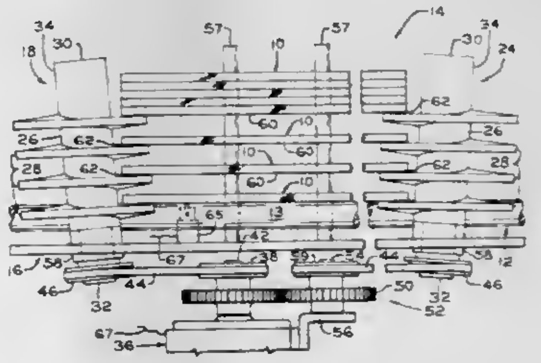
1. A system for handling and substantially continuously constraining a BOP stack as it is lowered from a platform on an offshore drilling vessel into a body of water, comprising:

- movable lifting means mounted on said platform for lifting and moving said BOP stack from a storage position on said platform to a position where it is in line to be run from said platform to the sea bottom; and
- constraining means mounted on said platform for substantially continuously constraining said BOP stack until a substantial portion of said stack is in said body of water and below the splash zone, said constraining means extending downwardly from said platform and terminating above the surface of said body of water a sufficient amount to be above substantial wave action when said vessel is submerged in said body of water at a depth at which BOP running operations are performed, but terminating sufficiently close to the surface of said body of water during such operations to provide constraint against lateral movement of said BOP stack until at least a portion thereof is below said surface.



4,108,319
GLASS ACCUMULATOR

Kenneth J. Kacirek, and Jack E. Rust, both of Fresno, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 22, 1977, Ser. No. 770,553
Int. Cl.² B65G *57/30*
U.S. Cl. 214—6 BA **13 Claims**



1. Sheet accumulator, comprising:

- means for advancing a sheet to be stacked along a predetermined path;
- means for engaging marginal edge portions of the sheet at a distance spaced from adjacent peripheral edge portions of the sheet and for maintaining the sheet portions between the engaged marginal edge portions and adjacent peripheral edge portions free of surface contact; and
- means for moving said engaging means to displace the sheet by said engaging means relative to the predetermined path while continually maintaining portions between the engaged marginal edge portions and adjacent peripheral edge portions of the sheet free of surface contact during sheet displacement.

4,108,320

ALIGNING AND STAMPING ARRANGEMENT

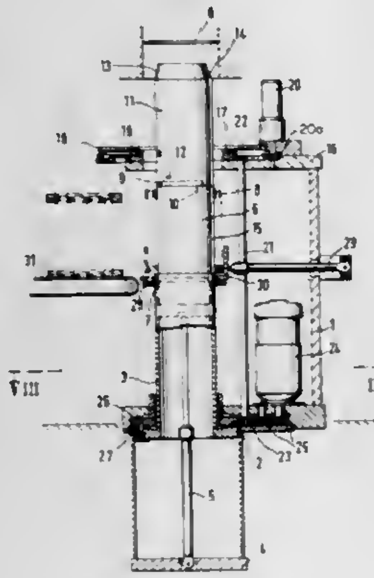
Alfred Bareis, Uhingen; Karl Dangelmaier, Göppingen-Holzheim, and Reinhard Braun, Eislingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,940

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610123

Int. Cl.^{2} B65G *57/16*

U.S. Cl. 214—8 18 Claims



1. An arrangement for aligning and stacking of laminations and for transporting formed stacks of laminations, the laminations having stamped patterns defining a plurality of stampings distributed in a circular configuration about the laminations at equal centering angles, the arrangement comprising:

a stack forming means for receiving laminations fed individually thereto in the same position including at least two stack forming members mounted so as to be selectively separable, said at least two stack forming members being disposed one above the other in a longitudinal direction of the stack forming means so as to form an upper stack forming member and a lower stack forming member,

means for rotatably mounting said stack forming means so as to be rotatable about a longitudinal axis thereof,

means for rotatably driving said stack forming means in a stepwise manner with rotary steps of the driving means being equal to one of a central angle of the stampings of the stamped pattern and a whole number multiple thereof,

means for forming an intermediate stack of laminations at the upper stack forming member including at least one intermediate stack forming member selectively displaceable into and out of an intermediate stack forming area, the stack forming area surrounding the stack forming means at least in an area of the upper stack forming member,

wherein the upper stack forming member is provided with means for accommodating said at least one intermediate stack forming member so as to grip said upper stack forming member and hold the same in a given position,

means for rotatably mounting said intermediate stack forming means, and

means for operatively connecting said intermediate stack forming means with said driving means such that said intermediate stack forming means is rotatably driven in a stepwise manner with rotary steps being equal to one of the central angle of the stampings of the stamped pattern and a whole number multiple thereof.

4,108,321

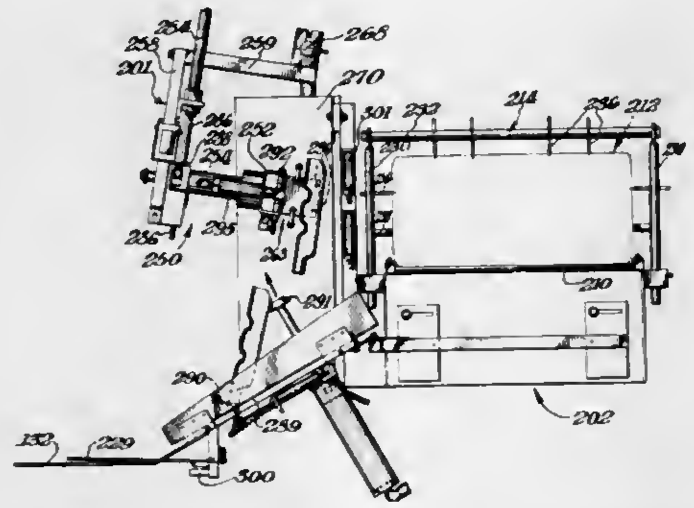
AUTOMATIC PACKING

Louie Russell Lowery, Madison, N.J., assignor to Keyes Fibre Company, Waterville, Me.

Filed Sep. 2, 1976, Ser. No. 719,846

Int. Cl.^{2} B65G *59/10*

U.S. Cl. 214—8.5 A 3 Claims



1. An automatic feed apparatus for supply packing spacer sheets one at a time to a packing station, said apparatus including a stack holder that holds a stack of spacer sheets with the end spacer of the stack in a predetermined feed location, a transfer carrier shiftably mounted for movement between a first location adjacent said predetermined location for gripping the end spacer sheet and a second location where it drops the gripped spacer sheet, a chute under the second location to catch the dropped spacer sheet and slide it down forwardly to a pick-up station, and sheet inverting means connected to automatically rotate predetermined spacer sheets about half a revolution around an axis generally perpendicular to these sheets and also flip these sheets over front-to-back so that they reach the pick-up station so inverted.

4,108,322

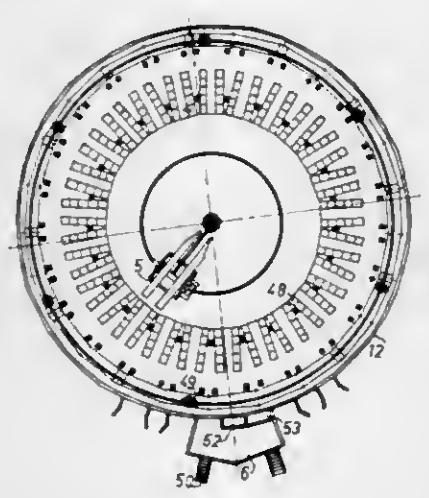
CIRCULAR MULTISTORY BUILDING WITH A CONVEYOR AND ELEVATOR MOVABLE AROUND THE PERIPHERY

Uwe Kochanneck, 81 Neuer Graben, Dortmund, Fed. Rep. of Germany (46)

Continuation-in-part of Ser. No. 450,712, Apr. 29, 1974, abandoned, and a continuation of Ser. No. 466,762, Jul. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 450,712,. This application Apr. 8, 1976, Ser. No. 675,188

Int. Cl.^{2} E04H *6/06*

U.S. Cl. 214—16.1 A 1 Claim



1. A multistory structure comprising:

a car-repair level constituting a story of said structure and including a circularly annular array of car-repair slots occupying substantially all but the center of said car-repair level and between said slots regions adapted to support car-repair workers and tools;

a parts-storage level constituting the story of said structure above said car-repair level and including racks for holding car parts;

conveyor means movable around the periphery of the annular array of said repair level and said parts-storage level for transferring parts therebetween;

a display level constituting a story of said structure and having a peripheral walkway and within said walkway a circularly annular array of display slots occupying substantially all but the center of said display level and each adapted to hold a respective car for show;

an office level above said car-repair, parts-storage, and display levels, constituting a story of said structure, and having offices;

a parking level below said office level, constituting a story of said structure, and including a circularly annular array of parking slots for the storage of cars and occupying substantially all but the center of said parking level;

loading means at said centers for vertically displacing cars in said structure between said slots of said car-repair level, said display level, and said parking level; and

a control center in said structure including control means connected to said loading means and to said conveyor means for operation thereof from said control center.

4,108,323

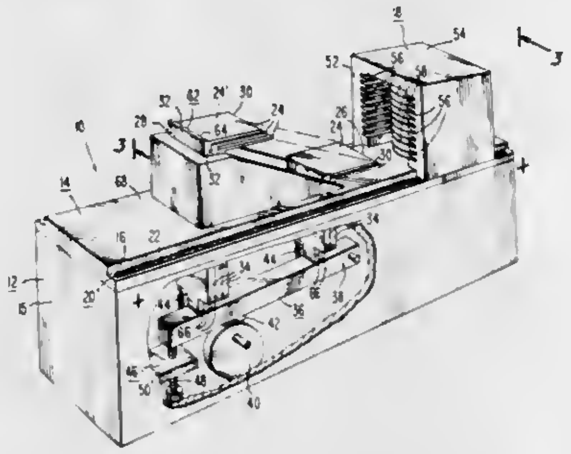
MACHINE FOR CHANGING THE SPACING OF A PLURALITY OF WAFERS

Robert Charles Shambelan, Bridgewater, and Charles Wesley Lindsley, Cresskill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,419

Int. Cl.^{2} B65G *65/04*

U.S. Cl. 214—310 9 Claims



1. A machine comprising:

a plurality of wafer receiving surfaces, said wafer receiving surfaces initially having a first spacing associated therewith;

a base having a top surface above which said wafer receiving surfaces extend,

each said wafer receiving surface being at a different height above said top surface than every other wafer receiving surface; and

means cooperatively engaged with said surfaces for changing said first spacing to a second spacing.

4,108,324

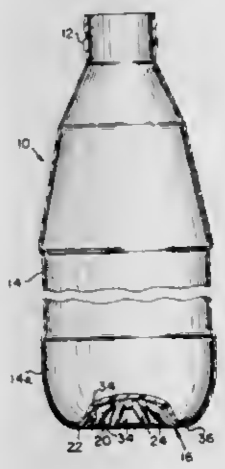
RIBBED BOTTOM STRUCTURE FOR PLASTIC CONTAINER

Suppayan M. Krishnakumar, Attleboro, Mass.; Siegfried S. Roy, Amherst, N.H.; John F. E. Pocock, Nashua, N.H.; Salil K. Das, Amherst, N.H., and Gautam K. Mahajan, Nashua, N.H., assignors to The Continental Group, Inc., New York, N.Y.

Filed May 23, 1977, Ser. No. 799,635

Int. Cl.^{2} B65D *1/02*

U.S. Cl. 215—1 C 5 Claims



1. A container having a sidewall and a bottom structure closing the container at an end portion of the sidewall, the outer surface of the bottom structure comprising a central concavity, a convex heel surrounding the concavity and merging therewith and with the sidewall end portion, the lowermost points of the heel lying in a common plane, and a plurality of ribs interrupting the outer surface of the concavity and distributed in a symmetrical array, each rib extending longitudinally in the direction of the heel and downwardly from an inner portion of the concavity, whereby the outer end portion of each rib is lower than the inner end portion thereof, characterized by the feature that the ribs are hollow.

4,108,325

DEVICE FOR WATERTIGHT STOPPERING OF BOTTLES

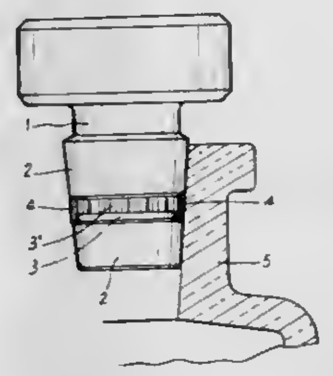
René Emilé Leon Barré, 39, boulevard Bourdon, Paris, France (75004)

Filed Oct. 3, 1977, Ser. No. 838,461

Claims priority, application France, Oct. 5, 1976, 76 29935

Int. Cl.^{2} B65D *39/18*

U.S. Cl. 215—364 5 Claims



1. A device for watertight stoppering of bottles, comprising:

a stopper stem having at least one circumferential groove with a toothed annular surface portion and an adjacent smooth annular surface portion;

and a ring made of flexible matter, clamped on a portion of its internal surface by the teeth formed into said grooves, said ring having a portion thereof radially adjacent said smooth annular surface portion to maintain a perfectly smooth and circular external surface on said ring when said device is installed in a bottle,

said stem further including at least one tapered annular surface adjacent said groove for contacting the interior surface of the bottle.

4,108,326

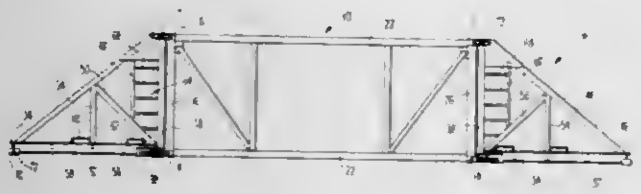
ADAPTER FRAMES TO EXTEND LENGTH OF INTERMODAL CONTAINERS

William A. Bertolini, Butler, N.J., assignor to Bertolini Engineering Co., Inc., Butler, N.J.

Filed Jun. 24, 1977, Ser. No. 809,641

Int. Cl.² B62D *33/08*

U.S. Cl. 220—1.5 **9 Claims**



1. A frame adapted to extend a container at one or both of its ends comprised of a substantially right-triangular member including spaced horizontal longitudinally extending members, spaced transverse members connecting them, transversely spaced vertical members secured to said longitudinal members and forming corners therewith, said vertical members including upper ends opposite said corners, diagonal brace members interconnecting said horizontal and vertical members, indexing protuberances extending horizontally from said upper ends of said vertical members, latching means carried by said upper ends of said vertical members and releasable twist lock means carried by said frame at said corners thereof.

4,108,327

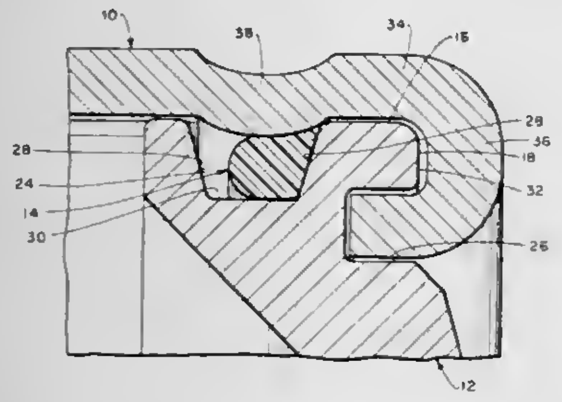
WALL-END SECUREMENT FOR PRESSURE RESERVOIRS HAVING AUTOMATIC SAFETY PRESSURE RELIEF

David E. Shonerd, Anaheim, and Carlos Danze, Huntington Beach, both of Calif., assignors to American Safety Equipment Corporation, Eocino, Calif.

Filed Nov. 8, 1976, Ser. No. 739,957

Int. Cl.² B65D *51/16*

U.S. Cl. 220—3 **16 Claims**



1. In a pressure fluid reservoir having automatic fluid pressure relief above a reservoir predetermined pressure; the combination of: an axially extending tubular wall having an inner end portion terminating outwardly in an outer end portion; a relatively rigid end closure telescoped by said tubular wall end portion, said end closure having an annular recess formed therein opening against said tubular wall inner end portion; a sealing ring in said end closure recess; said wall inner end portion having an annular pressure sealing part formed annularly into said end closure recess against and compressing said sealing ring normally being capable of sealing against fluid flow outwardly around said end closure between said tubular wall and end closure up to said predetermined pressure; positive wall retention means between said wall outer end portion and said end closure for positively securing said wall to said end closure against complete retention separation by forces created by reservoir fluid pressures above said predetermined pressure while being free of fluid pressure sealing between said wall and end closure permitting fluid flow therebetween; said wall and sealing ring being constructed and arranged with selected characteristics such that forces created on said wall by reservoir pressures immediately above said predetermined pressure will deform said wall to move said wall pressure sealing part partially away from said sealing ring to partially release compression therebetween and permit fluid flow between said wall and end closure automatically relieving reservoir pressures rising above said predetermined pressure.

4,108,328

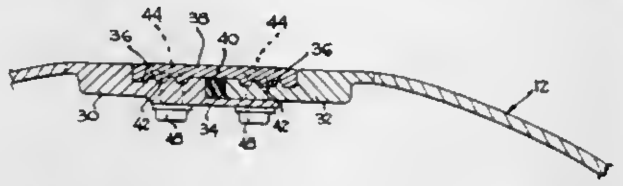
AIRCRAFT FUEL TANK CONSTRUCTION

Darrell Page, Walnut, Calif., assignor to Sargent Fletcher Company, El Monte, Calif.

Filed Nov. 4, 1977, Ser. No. 848,581

Int. Cl.² B65D *7/12*

U.S. Cl. 220—5 A **1 Claim**



1. An aircraft fuel tank construction comprising:

a. a cylindrical center section and a conical end section attached to the front and rear ends of the center section;

b. the center section including a pair of opposing recessed flanges with side walls defining a gap throughout the length of the center section, the outer surface of said flanges having grooves parallel to one another and parallel to the side walls of the flanges, a bottom plate attached to the bottom of one of said flanges and extending under said gap and in juxtaposition with the bottom of the other of said flanges, and a flexible center section seal interposed between and in contact with the side walls of the flanges for sealing said gap;

c. a connecting plate connecting said flanges together, said connecting plate having depending parallel tongues extending into and interlocked with the grooves of said flanges, and the connecting plate being clamped substantially flush with or below the exterior of said tank;

d. the center section further including a recessed end flange carried about its circumference at each end thereof, and each of said end flanges having on its outer face circumferentially extending parallel grooves;

e. each conical end section having a recessed flange carried about its open end, and each of said conical section flanges having on its outer face circumferentially extending parallel grooves;

f. each conical section flange lying adjacent center section end flange at each end of the center section;

g. a split connecting ring joining said conical section flange and center section end flange at each end of the center section, said connecting ring having depending parallel tongues extending into and interlocked with the circumferential grooves of said conical section and center section end flanges, and said connecting ring being clamped substantially flush with or below the exterior of said tank;

h. a cylindrical seal retaining ring underlying the joint between each conical end section and the center section, said retaining rings carrying a pair of O-ring seals for sealing each of said joints, a first of said O-ring seals contacting the inner circumference of said center section and sealing thereby one end of the joint and a second of said O-ring

seals contacting the inner circumference of said conical end section and sealing thereby the other end of said joint;

i. interlocking means for interlocking said seal retaining ring against lateral movement with respect to the joint; and

j. said center section seal lying in a direction tangent to and in sliding contact with the outer surface of the first of said O-ring seals at each end of said center section, and said center section seal completely filling and sealing the gap between the recessed end flanges of the center section at the interface of the seals.

4,108,329

FLAT HIGH PRESSURE CONTAINER

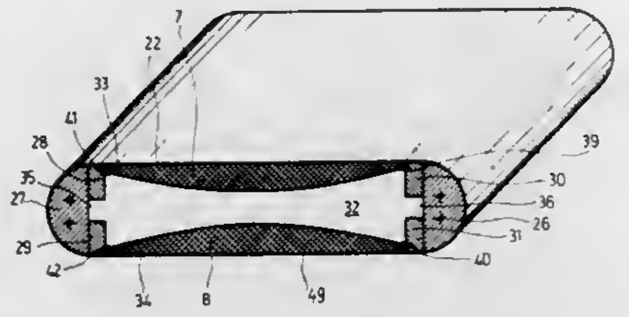
Otto Kabilka, and Thilo Schulz, both of Putzbrunn, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,544

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555727

Int. Cl.² B65D *25/18, 7/42*

U.S. Cl. 220—453 **14 Claims**



1. A flat container having narrow sides and wide sides, especially suitable for confining high internal pressures, comprising side frame means rigid against bending and extending along said narrow sides, resin impregnated filament membrane means having longitudinal edges and inwardly facing convex surfaces means securing said longitudinal edges to said side frame means, said membrane means forming internal container walls, supporting external container wall means of resin impregnated filaments substantially surrounding the container and extending substantially coextensive with said membrane means, said supporting external container wall means being secured to said side frame means, and force transmitting means operatively arranged between said supporting external container wall means and said membrane means, whereby the external wall means take up forces resulting from any expansion deformation of said membrane means to minimize deformations of the container.

4,108,330

EASY OPEN CONTAINER END ASSEMBLY

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 8, 1977, Ser. No. 804,581

Int. Cl.² B65D *41/02*

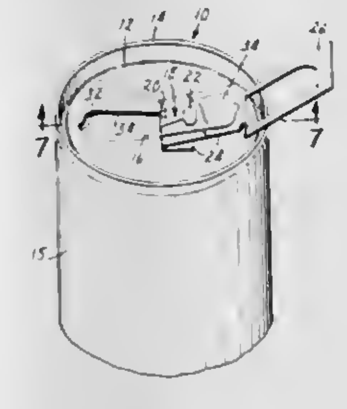
U.S. Cl. 220—260 **14 Claims**

1. A container end assembly comprising:

a container end of flexible sheet material which takes a permanent set when substantially folded, said container end having a generally U-shaped cut defining three sides of an openable aperture in the container end assembly and including a tongue-like portion projecting between the sides and toward the base of the U-shaped cut, said container end having a through opening defined by said U-shaped cut and said tongue-like portion;

a tape adhered to the exterior surface of the container end circumjacent and completely covering said U-shaped cut, the end of said tape adjacent the base of said U-shaped cut being unadhered and having a tab adapted for manual engagement, said tape being peelable from over the U-shaped cut by manually pulling the tab over the tape; and

means for attaching the distal end part of the tongue-like portion to the tape to cause the distal end part to remain attached to the tape and for affording bending of the part of the tongue-like portion between its distal end part and its proximal end back with the tape during such peeling, the bent tongue-like portion taking a permanent set to hold the peeled tape closely adjacent the container end, and adhesion in shear between the tape and bent tongue-like portion restricting separation of the tape from the container end.



4,108,331

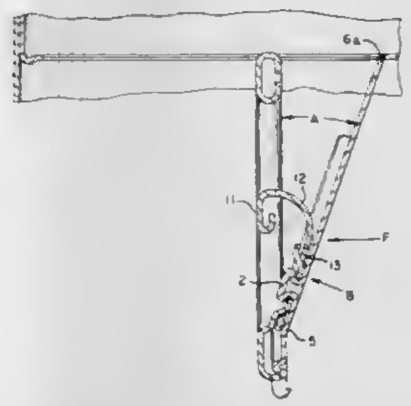
NON-OBSTRUCTING END CLOSURE

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 737,928, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 684,620, May 10, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,562

Int. Cl.² B65D *41/32*

U.S. Cl. 220—269 **28 Claims**



1. For a container having an end panel, an improved nondetachable self-opening end closure of the push-in type including a tab wherein the tab and closure are pushed into the container to provide, upon opening, an unobstructed passageway through the end panel; said end panel having a score line including portions flanking the tab of an extent greater than the length of the tab and defining an opening flap and also having tab securing means, said pull tab comprising a nose portion, an intermediate portion and a grasping portion, said nose portion having means for pressing said flap inwardly thereby rupturing said score line consequent to a predetermined displacement of said pull tab relative to said end panel, said tab having an integrally formed hingeable rivet panel cooperating with said securing means to attach said tab to said end panel, said intermediate portion including combined displacement-limiting retention and force redirecting means cooperating with one of said flap and said rivet panel during opening of the container to limit the angular displacement of said pull tab relative to said flap and to redirect the opening force and thereby upon up-

ward pull urging the tab with the flap into the container to a non-obstructing position substantially completely beneath said end panel

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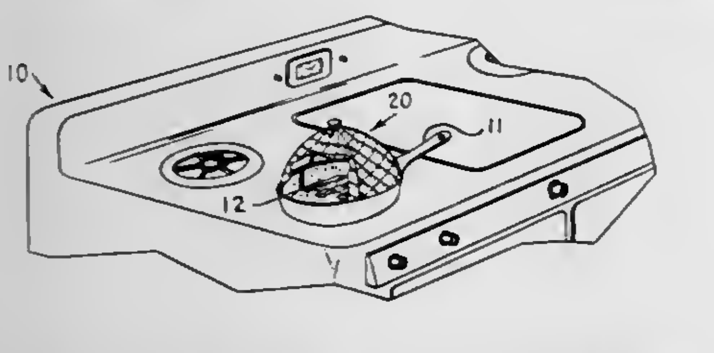
4,108,332

FIRE PROTECTIVE GREASE CATCHER

Anita L. Thompson, 250 Boxer Dr., Reno, Nev. 89512
Filed Dec. 3, 1976, Ser. No. 747,389
Int. Cl.² B65D *51/16, 25/00*
U.S. Cl. 220—370 **5 Claims**

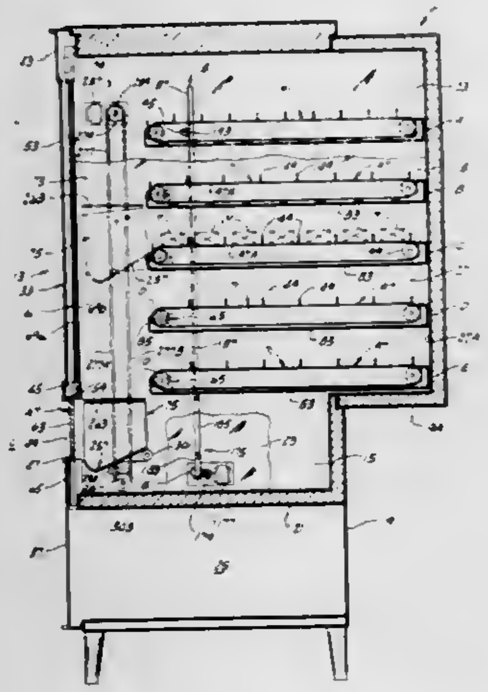


1. A fire protection grease catcher for preventing splatterings from articles being cooked in pans comprising: an arching framework cooperative with a cooking utensil so as to enclose foods being cooked therein; a non metalic fire resistant flexible removable covering upon said framework; means removably securing the base of said cover about said framework; and lifting means from said frame through said cover to lift said framework and covering from their cooperative relationship with the cooking utensil.

4,108,333

ARTICLE VENDOR WITH ELEVATOR

Leonard P. Falk, Florissant; Robert L. Stadler, Overland, and James R. Alford, Florissant, all of Mo., assignors to UMC Industries, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 577,297, May 14, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,428
Int. Cl.² G07F *11/58*
U.S. Cl. 221—13 **46 Claims**



1. An article vendor comprising:

a cabinet having a front, rear and sides with a delivery opening in the front at a delivery level;

a plurality of article dispensers in the cabinet above the delivery level each adapted to hold a row of articles to be vended extending in rear-to-front direction;

the forward ends of the dispensers being spaced rearward from the front of the cabinet so that there is a passage between the front of the cabinet and the forward ends of the dispensers;

each dispenser comprising means for feeding the respective row of articles forward and discharging the forward article off the forward end of the dispenser;

said dispensers being arranged in tiers one above another with the dispensers in each tier located in side-by-side relationship;

the front of the cabinet being windowed for viewing at least the forward articles on the dispensers;

an elevator movable up and down in said passage, said elevator being adapted to occupy a lowered article delivery position at said delivery level for access by a purchaser to an article on the elevator via said delivery opening and being movable to a position at the level of any of said tiers for receiving an article from a dispenser of that tier;

selector means operable by a purchaser for selecting any one of the dispensers for dispensing the forward article therefrom;

means controlled by said selector means for moving the elevator to the level of the tier which includes the selected dispenser;

and means controlled by the selector means for operating the selected dispenser to discharge the forward article therefrom on to the elevator when the elevator is moved to the level of the tier which includes the selected dispenser;

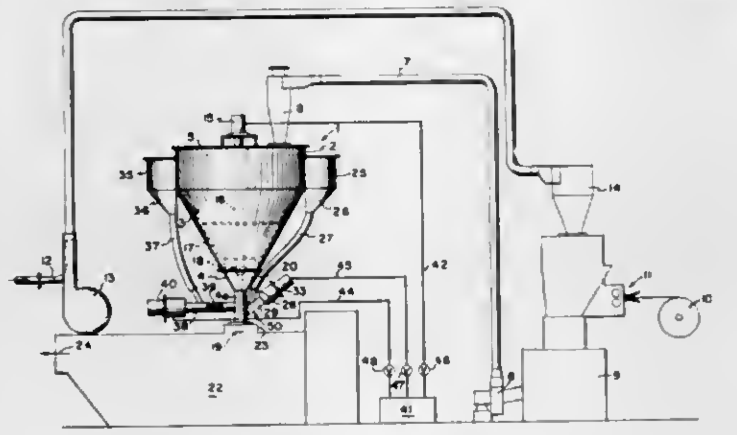
the elevator then being lowered to its article delivery position so that the purchaser may obtain the selected article from the elevator via said delivery opening;

the elevator comprising a tray for receiving the article discharged from a dispenser, the tray being movable up and down in said passage, and also movable rearward in said passage under control of said selector means from a forward position for up and down movement in said passage to a rearward position on reaching the level of the tier including the selected dispenser for receiving the article discharged from the selected dispenser.

4,108,334

APPARATUS FOR FEEDING SCRAP AND BASE PLASTICS MATERIAL TO AN EXTRUDER

Richard W. Moller, Grand Blanc, Mich., assignor to Hydreclaim Corporation, Grand Blanc, Mich.
Filed Dec. 8, 1975, Ser. No. 638,911
Int. Cl.² B01F *7/08, 7/24*
U.S. Cl. 222—136 **15 Claims**

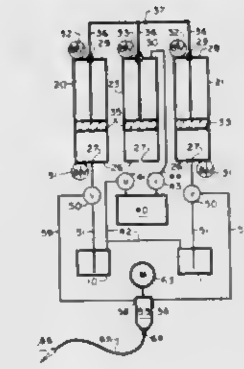


1. Apparatus for mixing fluffy scrap and rigid base material and feeding such mixture to an extruder or the like, said apparatus comprising a scrap hopper; an elongate outlet conduit in communication with said hopper for receiving scrap therefrom; means for introducing fluffy scrap to said hopper; scrap feed means extending through said conduit for feeding scrap therethrough; rigid base material supply means; receiver means communicating with said material supply means for receiving therefrom base material and communicating with said outlet conduit between its ends; and base material feed means including a rotary impeller extending through said receiver means for feeding base material from said receiver means into moving scrap in said outlet conduit, whereby said base material may be added to scrap in said outlet conduit, said scrap feed means comprising a shaft rotatable about its longitudinal axis and having an interrupted helical vane thereon.

4,108,335

APPARATUS FOR PROPORTIONING AND MIXING LIQUIDS

Carl Preston Hoff, and Robert Arthur Martin, both of 731 21st St., Bakersfield, Calif. 93301
Filed Sep. 7, 1976, Ser. No. 720,775
Int. Cl.² B29B *5/06*
U.S. Cl. 222—137 **3 Claims**



1. An apparatus for proportioning and mixing a plurality of liquids comprising:

(A) a plurality of closed containers each containing a respective said liquid;

(B) a plurality of cylindrical compression chambers individual to said containers having predetermined first and second ends;

(C) conduits interconnecting the containers with the first ends of their respective compression chambers;

(D) pistons mounted in the compression chambers for reciprocal movement in their respective chambers;

(E) means rigidly interconnecting the pistons for corresponding movement in their respective chambers;

(F) a pneumatic ram connected to the interconnecting means adapted when energized to force the pistons toward the first ends of their chambers;

(G) a mixing head having an outlet and inlets individual to the compression chambers;

(H) further conduits interconnecting the first ends of the compression chambers and their respective inlets in the mixing head;

(I) a source of air under pressure;

(J) still further conduits interconnecting the source of air and each of the containers as well as the ram; and

(K) valves in said conduits operable to connect the source of air under pressure to the containers to force their contents into their respective chambers and the pistons therein toward the second ends thereof while retracting the ram, and subsequently to isolate the containers from said source and connect the source to the ram to extend the ram forcing the pistons toward the first ends of their chambers to force the contents of the chambers to the mixing head.

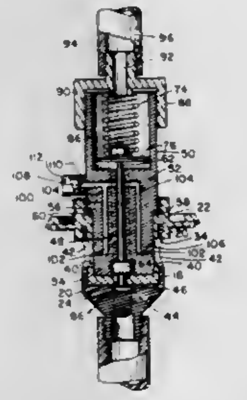
4,108,336

PROBE FOR EXTRACTING TOXIC FLUIDS FROM AN HERMETICALLY SEALED CONTAINER

David L. Anderson, Jr., 23799 Monterey Salinas Hwy. Unit #51, Salinas, Calif. 02889
Filed Jun. 20, 1977, Ser. No. 807,823
Int. Cl.² B67D *5/02*
U.S. Cl. 222—148 **2 Claims**

1. A probe adapted to be inserted into a socket valve for an hermetically sealed container characterized by a tubular body adapted to be sealed in a discharge orifice for a container of a body of toxic liquid, a ported closure plate for said tubular body having a first port defined therein, and a ported closure block supported for angular displacement relative to said closure plate disposed in coaxially aligned, contiguous relation with the closure plate having at a second port defined therein registerable with the first port in response to angular displacement imparted to the closure block, comprising:

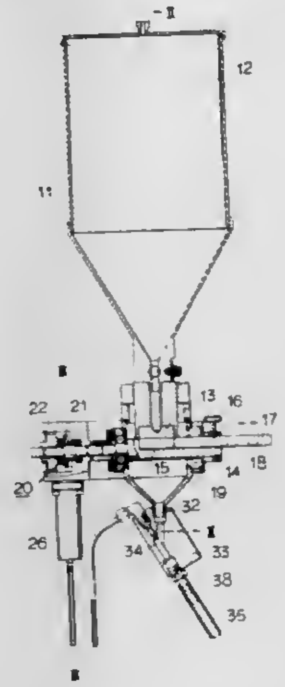
a cylindrical body adapted to be inserted into the tubular body of said socket valve, means defining a fluid conduit extended through said cylindrical body for conducting a stream of fluid from the container, container vent means including a tubular member defining a passageway extending from said first port to ambient atmosphere, and means for coupling the probe to the socket valve including a key projected from the cylindrical body and adapted to be received by the socket valve in coupling engagement therewith.



4,108,337

QUANTITATIVE SUPPLY APPARATUS OF POWDER COLORING AGENT

Tadashi Iijima, 4-22, Daita 3-chome, Setagaya-ku, Tokyo, Japan
Filed Oct. 12, 1976, Ser. No. 731,581
Claims priority, application Japan, Oct. 27, 1975, 50-128372
Int. Cl.² B65D *83/06;* **B67D** *5/54*
U.S. Cl. 222—194 **1 Claim**



1. A quantitative supply apparatus of powder coloring agent comprising:

(A) a container, said container defining a lower end discharge opening;

(B) a rotary shaft having ends, a portion of one end of the shaft being in contact with the lower end discharge opening of said container and said shaft having a measuring groove defined therein, said groove being adjacent the portion of the shaft which is in contact with the discharge opening of the container;

(C) a regulating rod secured to and extending through the other end of the shaft, and extending into the measuring groove thereof, said rod being adjustably slideable, relative to the axis of the rotary shaft to vary the volume of the groove;

(D) a receiving receptacle defining a lower end discharge opening, said receptacle sealingly contacting both the measuring groove of said shaft and the lower end discharge opening of the container;

(E) an ejector having connection with the discharge opening of said receiving receptacle, said ejector defining an inlet and outlet; and

(F) a compressed air conduit connected to the inlet of the ejector and to the outlet thereof.

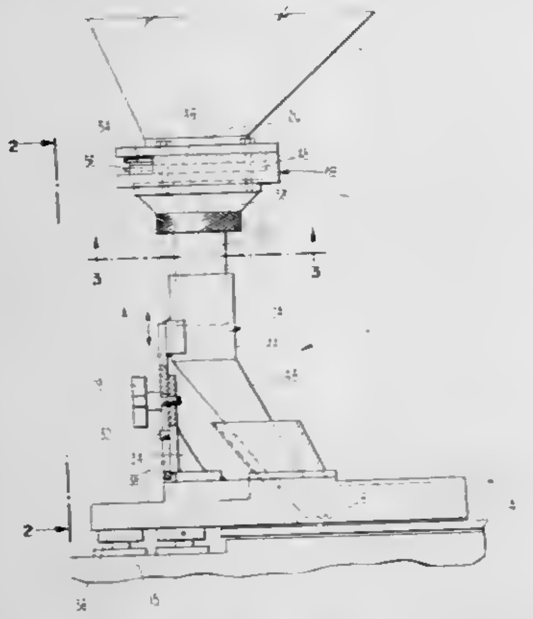
4,108,338
ROTARY TABLETTING PRESS WITH POWDER FEED ADJUSTMENT VALVE

Paul George Howland, Willow Grove, and John Mergle Alexander, Philadelphia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 15, 1977, Ser. No. 824,762

Int. Cl.² B29C *3/00;* B30B *11/08*

U.S. Cl. 222—286 **12 Claims**



1. In a rotary tabletting press including a die table rotatable about an axis, apparatus for feeding tabletting powder to said table, comprising:

a. a storage hopper, mounted on said press, having a bottom powder discharge orifice;

b. a first removable conduit extending downward from said hopper, communicating with said orifice;

c. a second conduit in vertically adjustable telescoping engagement with at least a lower portion of said first conduit, having a discharge end proximate said table for dispensing tabletting powder to said table; and

d. a feed frame, connected to said press, surrounding a lower portion of said second conduit including said discharge end thereof, having a lower surface parallel said table for limiting escape of tabletting powder from said table as tabletting powder is dispensed from said second conduit discharge end.

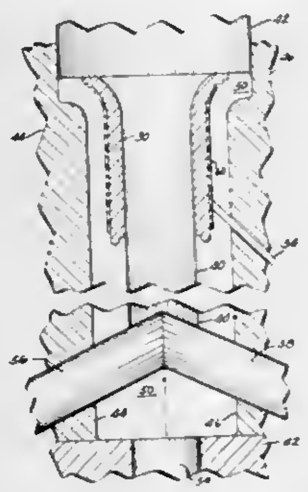
4,108,339
INTEGRAL NOZZLE WITH GAS DELIVERY MANIFOLD

Marvin C. Lunde, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Dec. 13, 1976, Ser. No. 750,177

Int. Cl.² B22D *41/08*

U.S. Cl. 222—591 **9 Claims**



1. An integral ceramic nozzle comprising:

a bore section having a cylindrical wall with an outwardly extending flange at one end and an axially extending cylindrical bore formed therethrough, said bore wall including means for the passage of gas therethrough into said cylindrical bore;

a non gas-permeable ceramic body surrounding said bore section and including a flange at one end surrounding said flange of said bore section and an open opposite end and including a bore extending between said cylindrical bore of said bore section and said open opposite end, said body and bore section defining therebetween a relatively thin elongated hollow annular manifold extending from said flange of said bore section substantially the length of said bore section; and

means for supplying an inert gas to said manifold.

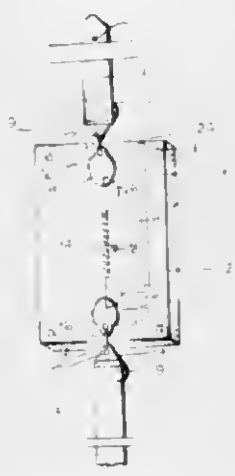
4,108,340
WRIST BAND CASE FOR HOUSING A WATCH AND/OR A MINI COMPUTER OR CALCULATOR

John L. Conn, P.O. Box 4501 Station B., Spartanburg, S.C. 29303

Filed Jun. 11, 1975, Ser. No. 586,084

Int. Cl.² A44C *5/00*

U.S. Cl. 224—4 E **3 Claims**



1. The combination of a wrist watch and computer composite housing with a wrist band therefore, wherein said housing comprises a pair of similar shaped cases mounted together along abutting rear surfaces, one of said cases having a watch with a visible front face and the other of said cases having a computer with a visible front face wherein said front faces are disposed on opposite sides of the composite housing, a longitudinal slot through the center line of the housing formed by said abutting rear surfaces, a wrist band having a central portion mounted in said slot with the ends of the band extending from opposite ends of the slot, said central portion including an elastic section and connecting means swivelly securing the extending end portions of the band to the central portion, wherein said end connecting means are extendible outward of said slot and the central portion of said band is longitudinally slidable in said slot whereby the elastic section permits the composite case to be pulled away from the wrist and the swivel means permits the case to be rotated for exposure of either of the opposite sides.

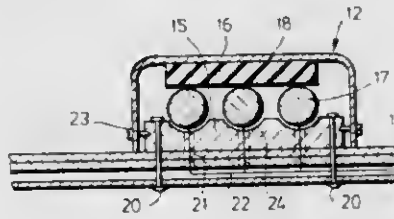
4,108,341
CARRYING BELT FOR BATTERIES

Siegfried Pettinger, 50, Leutstettenerstrasse 50, 813 Starnberg, Fed. Rep. of Germany

Filed Jan. 28, 1976, Ser. No. 652,975

Int. Cl.² A45F *5/00*

U.S. Cl. 224—5 H **2 Claims**



1. A carrier belt made of synthetic plastic material and having a predetermined width, adapted for use with an electrical battery or the like, the belt being usable as a portable current source and having external and internal sides, a buckle, a tongue and at least one compartment on the outside thereof for receiving at least the one electrical battery or the like, the compartment having a width smaller than said predetermined width, the compartment comprising:

a carrier plate formed with at least one recess for receiving the electrical battery or the like, said carrier plate being attached to the belt;

a protective cap attached to said carrier plate;

a pillow of foamed plastic synthetic material disposed between the electrical battery or the like and said protective cap for pressing the electrical battery or the like against said carrier plate and for retaining the electrical battery or the like in said recess;

a protective cover of synthetic and flexible plastic material surrounding the belt, said cover being internal and external sides, the compartment being attached to the external side of said protective cover;

fastening means for attaching said protective cover to said carrier plate;

lead means attachable to the electrical battery or the like, and wherein said carrier plate, said protective cover, and the belt are formed with a first set of openings, respectively, for passage of said lead means to the internal side of the belt, and wherein said protective cover and the belt are formed with a second set of openings, respectively, said carrier plate and said protective cap being made of a material relatively stiff with respect to the belt; and

rivet means passing through said second set of openings for attaching said carrier plate to the belt.

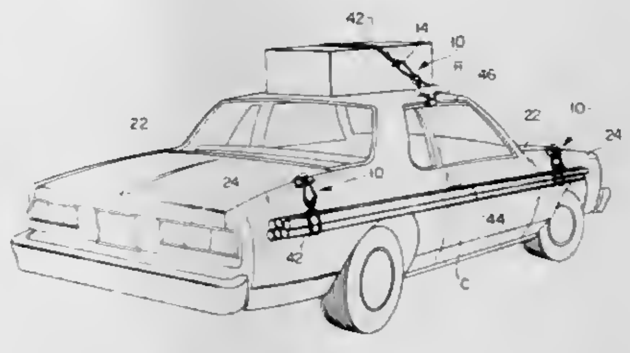
4,108,342
CARRIER ATTACHMENT FOR AUTOMOBILES

Ralph D. Riva, 77 Bellman Ave., Warwick, R.I. 02889

Filed Oct. 3, 1977, Ser. No. 839,101

Int. Cl.² B60R *7/00*

U.S. Cl. 224—42.01 **6 Claims**



1. A device adapted for use in connection with vehicles and the like having hood and trunk enclosures to form a tie down for the support of cargo comprising, a line having a loop portion at one end thereof and an enlarged retaining plug secured thereto at the other end thereof, said retaining plug of a dimension substantially greater than the width of the peripheral spaces between said hood and trunk enclosures and adjacent fenders and adapted for positioning interiorly of said hood or trunk compartment, said line of a dimension less than the width of said spaces so as to project therethrough and outwardly therefrom so that said loop portion extends at least partially outward from said enclosures, and temporary positioning means mounted on said line intermediate the ends thereof and adapted to be positioned outwardly of said compartments, said temporary positioning means adapted to position said device with respect to said fenders prior to closing said hood or trunk enclosures, said temporary positioning means comprising a suction cup having an upwardly projecting shank through which said line extends, said loop portion extending outwardly from said shank.

4,108,343
METHOD OF AND APPARATUS FOR BREAKING AWAY OF PREPUNCHED PIECES OF MATERIAL FROM CURVED OR ARCHED SHEETS OF MATERIAL

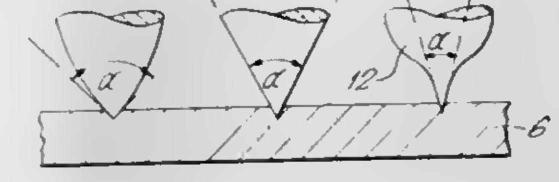
Franz Vossen, Boisbeimer Strasse 58, 4057 Bruggen 1, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,464

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535452

Int. Cl.² B26F *3/00*

U.S. Cl. 225—1 **27 Claims**

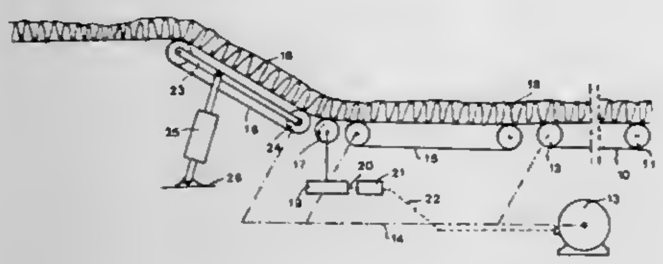


1. A method of breaking pre-punched pieces of material away from flexible sheets of material, comprising the steps of applying the sheet of material to a break-away block, engaging the pieces of material to be broken away, on one side by a pointed component which penetrates into the surface of the piece of material to be broken away only to such an extent as to prevent lateral displacement of the spike in relation to the surface, and on the other side by a counter-pressure mounting support which supports substantially oppositely-disposed portions of the edge of the piece of material to be broken away, moving the pointed component further in the direction of the counter-pressure mounting support whereby the piece of mate-

rial bows under load to such an extent that it loses its hold on said oppositely disposed edge portions, and pushing the piece of material in the bowed condition through the counter-pressure mounting support whereby it is released from the pointed component after leaving said mounting support.

4,108,344
METHOD FOR CONTINUOUS WEIGHING OF A CONTINUOUS BANDFORMED OR MATFORMED MATERIAL, AND AN ARRANGEMENT FOR EXECUTION OF THE METHOD

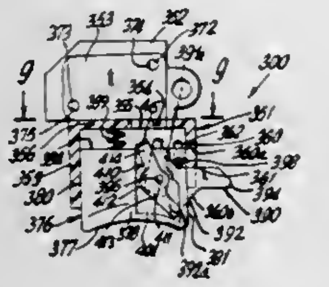
Stellan Dahlberg, Tidan, Sweden, assignor to Rockwool Aktiebolaget, Skovde, Sweden
Filed Mar. 15, 1977, Ser. No. 777,857
Claims priority, application Sweden, Jun. 6, 1976, 76063817
Int. Cl.^{2} B65H *23/22;* B65G *69/00;* G01G *11/14, 13/04*
U.S. Cl. 226—1 **13 Claims**



1. A method for continuous weighing and surface weight control of a comprehensive material in continuous travelling band or mat form, comprising supporting and transporting the material along a first driven conveyor and onto a second driven conveyor spaced a short distance from the discharge end of the first conveyor, the first and second conveyors being oriented to form an upwardly concave obtuse angle such that the band of material deforms and bends through an upwardly concave obtuse angle as it passes from the first conveyor to the second conveyor, continuously weighing the band of material as it passes between said first and second conveyors by passing the deformed and bent band onto and along a third non-driven idler conveyor means located between said first and second conveyors and arranged to continuously sense the weight of the band passing therealong, and varying the speed of said first and second conveyors in response to weight changes sensed by said third conveyor means, but maintaining the speeds of said first and second conveyors equal.

4,108,345
ELECTROMAGNETIC STAPLER AND SAFETY TRIGGER THEREFOR

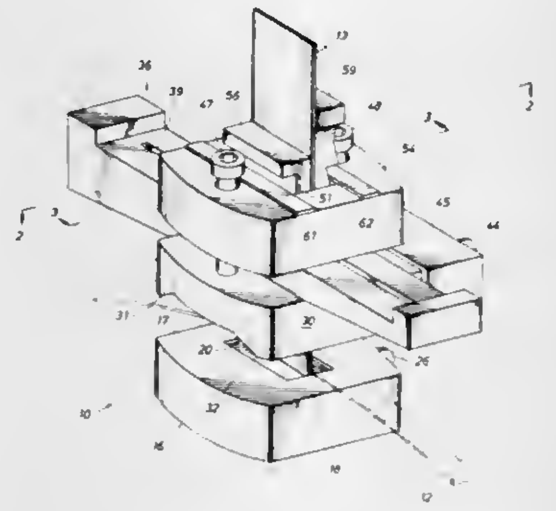
George Frank Manganaro, 141 Malcolm Ave., Garfield, N.J. 07026
Continuation-in-part of Ser. No. 670,649, Mar. 26, 1976, Pat. No. 4,033,500. This application Jun. 16, 1977, Ser. No. 807,020
Int. Cl.^{2} B25C *1/06, 5/10*
U.S. Cl. 227—131 **12 Claims**



1. A trigger for a staple driving tool, said trigger comprising a housing, a member slidably mounted in said housing and being depressable relative to said housing, first means caused by said depressable member to transmit the depressing motion to actuate a switch for completing a repetitive action staple driving circuit, driving action selection means operably mounted with said first means and selectively movable between two positions so that in a first position, said first means being disengaged from said switch by the staple driving action of the tool while said member is depressed, whereby the staple driving will not repeat until said member is again depressed, and in a second position said driving action selection means contacts said switch to actuate said repetitive action driving circuit and remains in contact during said action while said member is depressed, whereby the staple driving circuit action will repeat until said member is released.

4,108,346
ALIGNMENT CLAMP

James Warren Minix, deceased, late of Houston, Tex.; by Richard W. Minix, administrator, 6710 Biggs, Houston, Tex. 77017, and by Helen Minix, administratrix, 14214 Lantern La., Houston, Tex. 77015
Filed Mar. 15, 1976, Ser. No. 666,798
Int. Cl.^{2} B23K *37/04*
U.S. Cl. 228—49 **6 Claims**



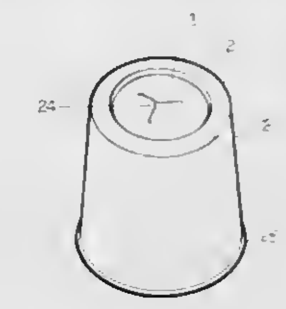
1. An alignment clamp for use in positioning first and second adjacent plates along a common parallel position and spaced from one another which apparatus comprises:
- an elongate strap having upper and lower ends and adapted to extend between a first and second plate to be positioned adjacent to one another;
- a generally planar plate means adapted to engage a surface of said first and second plates to be aligned and having an opening therethrough adapted to receive the lower end of said strap and which opening has a pair of tapered opposing sides with a wedge shaped strap gripping means therein;
- generally parallel upper and lower planar plates means having slots therethrough for receiving said strap and facing angled surfaces adjacent said slots; said angled surfaces being adapted to receive a wedged shaped body for separating said planar plates; the lower planar plate having a surface adapted for engaging the upper surface of the first and second plates to be aligned and the upper planar plate having a gripping means for securing said strap and fixedly positioning said upper planar plate with respect to said strap.

4,108,347
ONE PIECE FOAM CUP

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Feb. 23, 1977, Ser. No. 771,150
Int. Cl.^{2} B65D *21/02, 3/10*
U.S. Cl. 229—1.5 B **4 Claims**

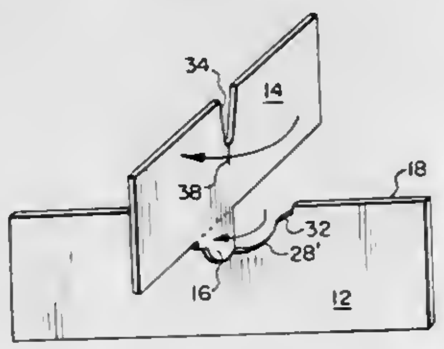
1. A one-piece container manufactured from plastic foam sheet material, said container having a sidewall terminating at

the top with a beaded rim and at the lower end with a closed bottom, said sidewall having at least one overlapped seam running from the rim to the bottom, said sidewall having a uniform thickness from top to bottom yet varying in density from a minimum at the top to a maximum at the bottom, said bottom constructed of two areas, the first area in the form of a concentric ring attached at its outermost extent to the bottom of the sidewall and the second area spanning the central region of the bottom of the cup and attached to said first area, said second area being nearer the top of the container than said first area, said second area containing a centrally positioned bottom closing seam that protrudes downwardly from said second area.



4,108,348
MULTIPLE PARTITION STRUCTURE FOR PAPERBOARD CONTAINER

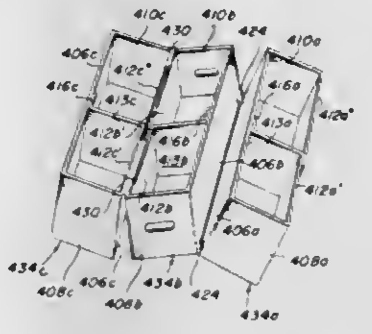
James H. Partain, Norcross, Ga., assignor to Stone Container Corporation, Chicago, Ill.
Filed Sep. 14, 1977, Ser. No. 833,027
Int. Cl.^{2} B65D *5/48, 25/04*
U.S. Cl. 229—15 **23 Claims**



1. In a container formed from a one-piece blank having at least two side walls, a first end wall having a first width and extending between said two side walls and a bottom wall connected together, a first portion of a second end wall hingedly connected along a side free edge of one of said side walls, and a second portion of said second end wall hingedly connected along a side free edge of the second one of said side walls, said first and second portions of said second end wall secured together such that said second end wall width is substantially equal to said first end wall width, the improvement comprising:
- partition means including a first partition panel hingedly secured to one of said portions of said second end wall and extending between said two end walls, a second partition panel secured to a first edge of said first partition panel by folding means integral with said first and second partition panels for folding said second partition panel into engagement with said first partition panel between said side walls substantially perpendicular to said first partition panel.

4,108,349
SPACE DIVIDER FOR CARTONS AND THE LIKE

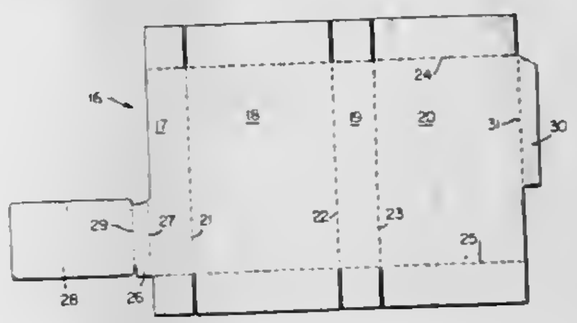
James L. Pfaffendorf, Maple Grove, Minn., assignor to Boise Cascade Corporation, Boise, Id.
Filed Nov. 15, 1977, Ser. No. 851,719
Int. Cl.^{2} B65D *5/48*
U.S. Cl. 229—15 **10 Claims**



1. A space divider for cartons and the like, comprising
- (a) a rectangular planar blank of sheet material including vertical parallel spaced first score lines defining a front panel, first and second side panels, a pair of rear panel sections connected with the free ends of the first and second side panels, respectively, and a divider panel connected with the free end of one of said rear panel sections, the length of said divider panel being generally equal to the length of said side panels;
- (b) one of said panels containing means defining a horizontal first line of fold, the remaining panels each containing throughout substantially the length thereof a linear first cut extending colinearly with respect to said first line of fold, whereby said panels are each divided into a lower first section and an upper second section;
- (c) said front panel, first and second side panels, and rear panel sections being foldable about said first score line to define a tube of rectangular crosssectional configuration, said divider panel being foldable transversely across the tube to a position parallel with the side panels;
- (d) means for connecting the adjacent free ends of said rear panel sections, whereby said first and second panel sections define in the tube first and second cell units, respectively, said divider panel dividing each cell unit into a pair of cells;
- (e) said second cell unit being foldable about said first line of fold to a position in which the external surfaces of the first and second panel sections joined by said first line of fold are in contiguous engagement, thereby to define an open-ended multi-cell space divider the outer periphery of which has a rectangular crosssection.

4,108,350
CARTON WITH INTEGRAL REMOVABLE CARD

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Jul. 1, 1977, Ser. No. 812,156
Int. Cl.^{2} B65D *5/00*
U.S. Cl. 229—37 R **1 Claim**



1. In combination, a carton and integral coupon card constructed from a one piece cut and scored blank of paperboard or the like comprising, a plurality of main body side panels

foldably attached to one another along parallel score lines, end closure flaps foldably attached to the upper and lower ends of said main body side panels and a first glue flap of a length less than the length of said main body side panels foldably attached to an end of one main body side panel, the improvement comprising, a second glue flap and integrally attached coupon card foldably attached to the opposite end of another main body side panel remote from said one main body side panel, said second glue flap having a length less than the length of said main body side panels and arranged on said blank to be longitudinally spaced from said first glue flap along the main body side panel such that the combined length of both said glue flaps is slightly longer than the length of said main body side panels, said first glue flap being adhered to the inside of said side panel to which said second glue flap is attached in the region adjacent to said second glue flap and said second glue flap being adhered to the outside of the side panel to which said first glue flap is attached in the region adjacent to said first glue flap, said arrangement of glue flaps serving to provide a slight overlap of the two glue flaps to form a completely glued joint along the entire length of the carton while placing the first glue flap interiorly of said carton and the second glue flap and attached coupon card exteriorly of said carton, said coupon card being releasibly adhered to the exterior of the body side panel to which the first glue flap is attached and removably attached to said second glue flap along a perforated score line.

4,108,351
ADHERING METHOD

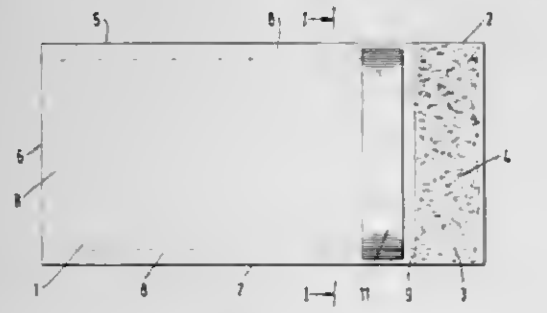
Edmund Alan Hough, Wavre, Belgium, assignor to Imperial Chemical Industries Limited, London, England

Filed May 3, 1976, Ser. No. 682,790

Claims priority, application United Kingdom, May 8, 1975, 19380/75

Int. Cl.² B65D *33/20*

U.S. Cl. 229—62 **4 Claims**



1. An envelope of the self-seal type comprising first and second overlying sheets of flexible material, the opposed surfaces of said sheets having bonded thereto a thermoplastic pile so that the internal surfaces of the envelope are pile surfaced, the other surfaces of said sheets being free of pile, said first sheet being of greater length than said second sheet so as to form a closure flap which can be folded into engagement with a cooperating portion of said other surface of said second sheet, and a layer tack adhesive on said cooperating portion.

4,108,352
CONTINUOUS BUSINESS FORMS ASSEMBLY WITH ANTI-TENTING MEANS

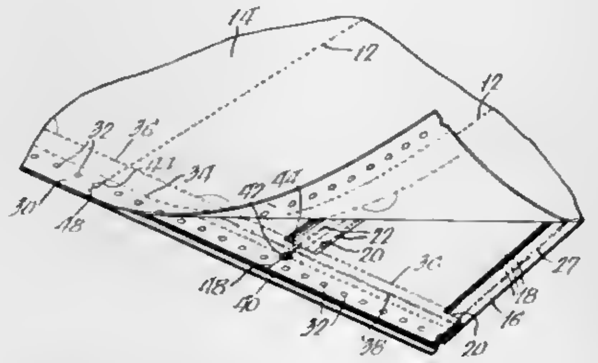
Gordon C. Peschke, Mundelein, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Continuation-in-part of Ser. No. 684,277, May 7, 1976, abandoned. This application Nov. 24, 1976, Ser. No. 744,623

Int. Cl.² B65D *27/10*

U.S. Cl. 229—69 **11 Claims**

1. A continuous business forms assembly comprising a zigzag folded stack of a multiplicity of superimposed, elongated plies of paper, including upper and lower plies and a plurality of intermediate plies, each of said plies being provided with a longitudinally extending, control punch margin, said plies being held in assembled relation by longitudinally extending glue lines between adjacent plies adjacent said control punch margins, individual form lengths in the assembly being delimited by cross lines of weakening in the plies, all of the intermediate plies having notches and being completely severed across their widths at at least some of said cross lines of weakening, said upper and lower plies being at least partially unsevered about said notches and severed between said notches, so that stresses caused by folding said assemblies into said track are relieved to prevent tenting.



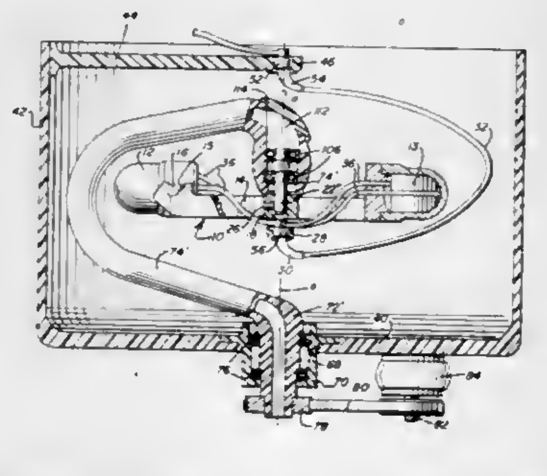
4,108,353
CENTRIFUGAL APPARATUS WITH OPPOSITELY POSITIONED ROTATIONAL SUPPORT MEANS

Richard I. Brown, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 31, 1977, Ser. No. 829,291

Int. Cl.² B04B *9/08*

U.S. Cl. 233—26 **19 Claims**



1. Centrifugal processing apparatus, which comprises:

a stationary base;

a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;

a flexible umbilical cable segment for establishing communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of the processing chamber, said cable segment extending around said processing chamber with the other end of the cable segment being attached substantially on said axis in rotationally locked engagement to the processing chamber;

a one ω turn arm coupled to one side of the processing chamber, around the processing chamber and to a spaced location at the other side of the processing chamber;

first rotatable support means coupling said one ω turn arm to said processing chamber at said one side thereof;

second rotatable support means coupling said one ω turn arm to said stationary base at the other side of the processing chamber; and

means for rotating said turn arm at one ω about said predetermined axis.

4,108,354
GASEOUS MIXTURE ULTRACENTRIFUGE

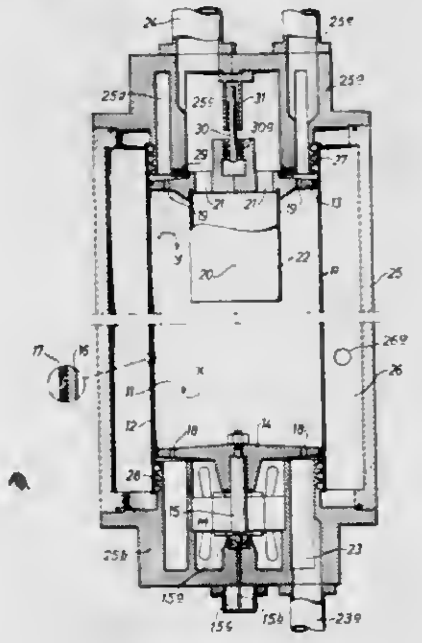
Kristian Dahl Madsen, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Continuation-in-part of Ser. No. 594,738, Jul. 10, 1975, abandoned. This application Apr. 15, 1976, Ser. No. 677,062

Claims priority, application Sweden, Jul. 23, 1974, 7409554

Int. Cl.² B04B *11/06*

U.S. Cl. 233—30 **5 Claims**



1. A gaseous mixture ultracentrifuge comprising a rotatively mounted rotor formed by a hollow cylindrical wall having opposite ends provided with end covers, said rotor having an axis about which the rotor rotates, each of said covers having a plurality of outlet holes formed therethrough and radially spaced from said axis, one of said covers having at least one inlet hole formed therethrough and which is radially spaced from said axis but more adjacent to said axis than are said outlet holes, said rotor having an inside free from non-rotative parts and said covers completely enclosing said inside excepting for said holes, means for rotating said rotor, feeding means for feeding a gaseous mixture to said inlet hole, and collecting means for collecting separated components of the mixture from said outlet holes, said rotor having solid shafts extending on said axis away from said end covers and bearings in which said shafts are rotatively mounted, said feeding and collecting means being non-rotative and spaced radially from said axis and free from said shafts.

4,108,355
ROTARY INDICATING DEVICE PROVIDED WITH A PLURALITY OF INDICATING PLATES

Jusuke Yaguinuma, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,868

Claims priority, application Japan, Oct. 6, 1975, 50-136445[U]

Int. Cl.² G09F *11/06;* **G04B** *19/02*

U.S. Cl. 235—1 C **1 Claim**

1. A rotary indicating device comprising:

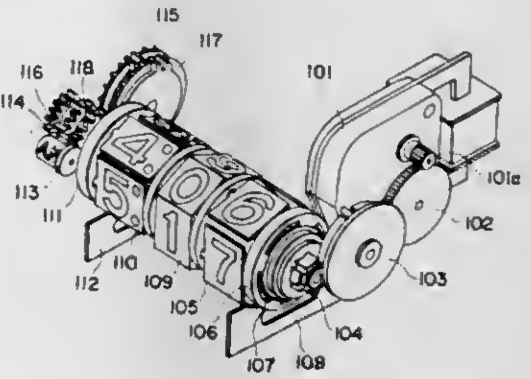
a rotatable drum member having a pair of flange portions opposed to each other;

means defining a plurality of holes in each of said flange portions;

a plurality of indicating plates having a corresponding plurality of projecting portions each of rectangular cross-section and inserted respectively in said holes to make said drum rotatably support said indicating plates;

a turning member having at least one projecting bank portion engageable with said indicating plates to turn them; and

a ring-shaped spring fitted to one of said flange portions and resiliently pressing one of said projecting portions of each of said indicating plates along the diametral direction of said drum.



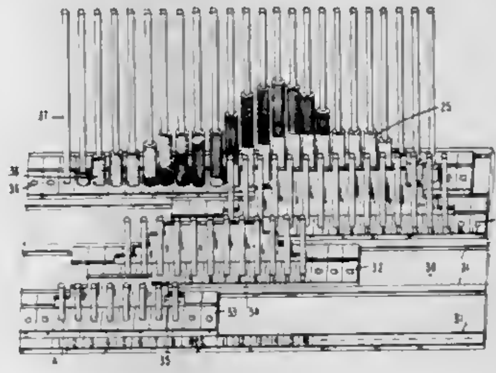
4,108,356
SCHEDULING TOOL

Robert W. Bengtson, Succasunna, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 562,606, Mar. 27, 1975, Pat. No. 4,006,345. This application Oct. 26, 1976, Ser. No. 741,930

Int. Cl.² G06C *27/00;* **G09F** *3/18;* **G09B** *19/18;* **G09F** *5/00*

U.S. Cl. 235—69 **8 Claims**



1. A scheduling tool for establishing an allocation of manpower during a project in which there is a plurality of phases comprising:

a plurality of scheduling elements;

a plurality of receiving means on each scheduling element, each pair of adjacent receiving means being spaced apart the same distance;

a plurality of manpower measuring means, each being adapted to be mounted on one of said receiving means so that it projects in a direction perpendicular to said scheduling element, said manpower measuring means being adapted to be positioned end to end so that several manpower measuring means are mounted on each of said scheduling elements by several of said receiving means;

a plurality of graph cards, each indicating the manpower requirements against time as a product of persons used and unit of time for a particular phase of said project;

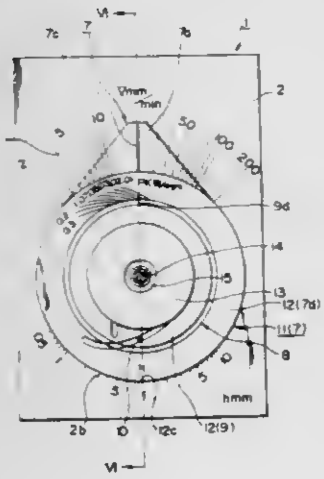
said graph cards being adapted to be mounted each on one of said scheduling elements so that the representation of time is in intervals, each of which is represented linearly a distance equal to said distance between each of said receiving means;

indicating means including a plurality of locating means, each of said locating means adapted to secure a plurality of manpower measuring means end to end; and

a manpower level marker for measuring the length of a number of manpower measuring means positioned end to end and indicating the total as a product of the persons employed and units of time of the manpower represented by said number of manpower measuring means;

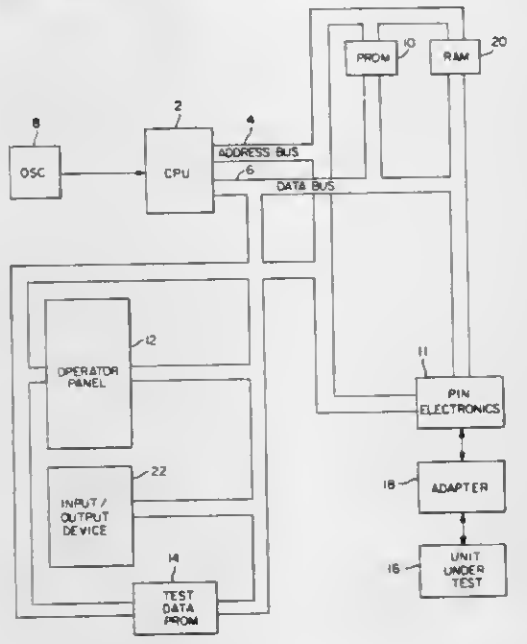
whereby when each one of said plurality of graph cards indicating manpower requirements for a particular phase is mounted on one of said scheduling elements and the plurality of scheduling elements are then aligned so that each graph indicates a duration of a phase and is positioned to indicate a span of time in relation to the duration of the project and said receiving means, representing the same interval of time during said project are in straight alignment so that manpower measuring means can be positioned on said receiving means to the height of said graph card and the manpower measuring means on aligned receiving means can be secured end to end on a locating means to be measured by said manpower level marker and thereby indicate the manpower requirements for a particular interval.

4,108,357
FEED-RATE INDICATOR FOR ELECTROCHEMICAL GRINDING
Kiyoshi Iooue, Tokyo, Japan, assignor to Inoue-Japan Research Incorporated, Kanagawaken, Japan
Filed May 24, 1977, Ser. No. 799,971
Claims priority, application Japan, May 26, 1976, 51-59972
Int. Cl.² G06C *27/00. 3/00:*
U.S. Cl. 235—119 **4 Claims**



1. A device for automatically calculating the feed rate of a workpiece relative to an electrochemical grinding wheel in an electrochemical grinding operation comprising:
- a base plate provided with indicia of the feed rate V along one portion of a circle having a center and indicia of the cutting depth *h* along another portion of a circle having the same center as the first circle;
- a rotatable first member mounted on said plate and rotatable about said center, said first member carrying an index cooperating with said indicia of feed rate V and being provided with indicia of the drive force p per unit width of the cutting area;
- a second member rotatable about said center and provided with an index cooperating with said cutting depth indicia h;
- a third member displaceable on said base and provided with an index cooperating with the indicia *p* of said drive force; and mechanical means connecting said members for mutual and relative movement whereby said indexes cooperate with the respective indicia V, p and h in accordance with the relationship $V = Ap/h + B/\sqrt{h}$, where A and B are constants.

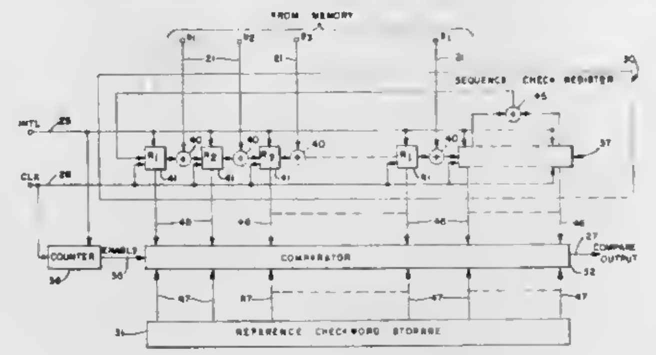
4,108,358
PORTABLE CIRCUIT TESTER
Casimer Niemaszyk, Roselle Park, N.J., and Peter Rothenberg, West Hills, Calif., assignors to The Bendix Corporation, Teterboro, N.J.
Filed Mar. 22, 1977, Ser. No. 779,978
Int. Cl.² G06F *11/00*
U.S. Cl. 235—302 **7 Claims**



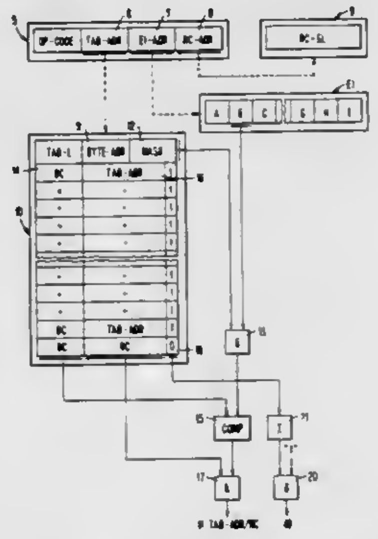
1. A system for testing electrical units, comprising:
- programmable memory means for storing a test program relating to a particular unit to be tested;
- executive memory means for storing an executive test program;
- a central processing unit connected to the programmable memory means for reading the test program stored therein, and connected to the executive memory means for executing the executive test program in accordance with the read test program;
- means connected to the central processing unit, the executive memory means and the unit to be tested, and controlled by the central processing unit for applying the executed executive test program to the unit to be tested; and
- indicating means connected to the programmable memory means, the executive memory means, the central processing unit and the means for applying the executed executive test program to the unit to be tested, and operable by all of said means for indicating test operating instructions and unit test status.

4,108,359
APPARATUS FOR VERIFYING THE EXECUTION OF A SEQUENCE OF CODED INSTRUCTIONS
Richard C. Proto, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 30, 1977, Ser. No. 782,692
Int. Cl.² G06F *11/08*
U.S. Cl. 235—304 **9 Claims**

1. An apparatus for verifying the execution of an input sequence of coded instruction in the form of *i*-bit binary words, where *i* is the number of bits in each binary word, comprising:
- a sequence check register including an *n*-stage feedback shift register for generating a binary sequence, where the number of stages, *n*, of said feedback shift register is greater than $i + 1$, and means for combining the input sequence of binary words with said binary sequence to compute an *n*-bit sequence checkword;
- means for storing a predetermined *n*-bit reference sequence checkword; and
- means connected to said sequence check register and said storage means for comparing bit-by-bit said computed sequence checkword with said stored reference checkword and for producing an error signal when the compared checkwords differ.



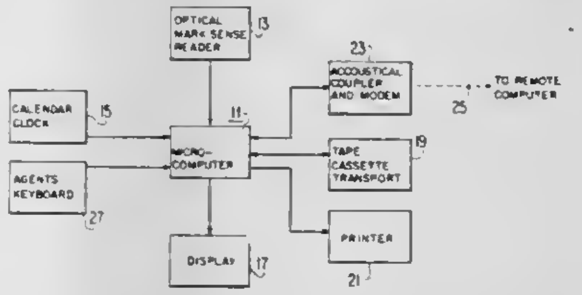
4,108,360
METHOD OF ERROR ANALYSIS AND DIAGNOSIS IN ELECTRONIC DATA PROCESSING SYSTEMS
Walter Beismann, Altdorf; Hans Hermann Lampe, Herrenberg, and Werner Poble, Grafenau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 19, 1977, Ser. No. 834,085
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2654389
Int. Cl.² G06F *11/00*
U.S. Cl. 235—304 **8 Claims**



1. A method for error analysis and diagnosis in electronic data processing systems wherein the system includes in storage a plurality of predefined error images, said method comprising:
- extracting significant error information from a first error image by analyzing the error bytes of said error image;
- extracting significant error information from at least a second error image by analyzing the error bytes of said second error image;
- combining the significant error information from the error bytes of said error images to generate therefrom the address of a predetermined error file; and
- addressing said error file to identify the kind of error and its location.

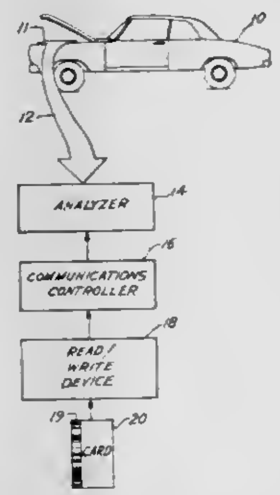
4,108,361
UNIVERSAL MARK SENSE BETTING TERMINAL SYSTEM AND METHOD
Stephen R. Krause, 3607 Anton Farms Rd., Baltimore, Md. 21208
Filed Oct. 12, 1976, Ser. No. 729,807
Int. Cl.² G06K *7/00, 3/00*
U.S. Cl. 235—375 **13 Claims**

1. Apparatus for accepting, validating and recording betting information on slips filled out by the bettor for any one of a plurality of games, comprising in combination:
- (a) a micro-computer means having program storage means for a plurality of games,
- (b) said betting slip having means to select one only of said plurality of games and initiating the program of the selected games in said micro-computer means,
- (c) optical reader means for transferring the betting information from said slips into memory storage under control of the micro-computer means,
- (d) printer means under control of said micro-computer means,



- (e) calendar clock means for supplying time information of each bet,
- (f) tape cassette transport means for recording slip and time information,
- (g) display means,
- (h) agents keyboard means for initiating printout of the information on the tape means in selective manner via the micro-computer means for checking the correctness of the slip, causing rejection of improperly filled out slip, displaying reason for rejection, dislaying amount due from customer and for accepting or rejecting the betting slip.

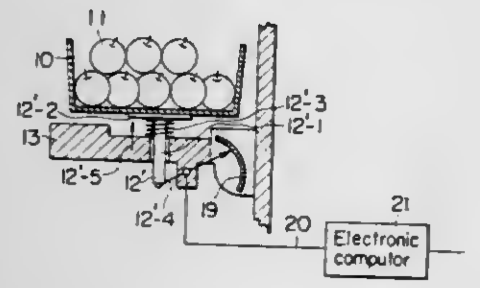
4,108,362
VEHICLE DIAGNOSIS DATA ENTRY SYSTEM
Gerald C. Trussell, Park Ridge, and Robert W. Arnston, Schaumburg, both of Ill., assignors to Sun Electric Corporation, Chicago, Ill.
Filed Jan. 28, 1977, Ser. No. 763,338
Int. Cl.² G01L *3/26;* **G01R** *13/42;* **G06K** *7/00*
U.S. Cl. 235—375 **7 Claims**



1. In an analyzer controlled by a digital processor having a memory for analyzing a vehicular engine, improved apparatus for reading data into the analyzer comprising:
- a sheet bearing specifications of the engine printed in alphanumeric form and bearing a machine-readable digital code representing at least a portion of the specifications;
- coding means for reading said digital code on the sheet and for converting the digital code into electronic digital signals; and
- communication means for transmitting the digital signals to

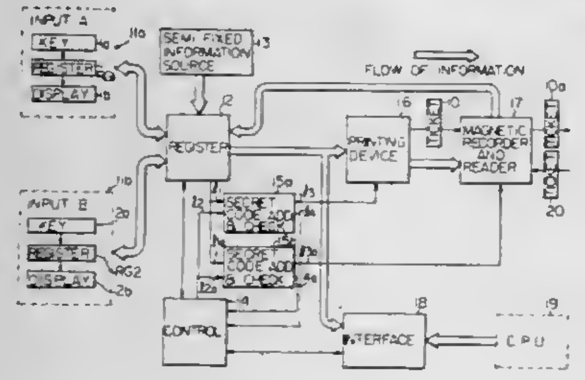
the engine analyzer in a form usable by the engine analyzer, whereby the specifications can be read into the memory of the analyzer.

4,108,363
RECORD CONTROLLED MECHANICAL STORE
Iida Susumu, 1246, Sengokubara, Hakone-cho, Ashigarashimo-gun, Kanawaga-ken, Japan
Filed Jun. 25, 1976, Ser. No. 699,974
Claims priority, application Japan, Jun. 25, 1975, 50-77535; Sep. 8, 1975, 50-108067; Oct. 23, 1975, 50-126900; Oct. 4, 1975, 50-119380; Oct. 28, 1975, 50-128909; Dec. 30, 1975, 50-158712
Int. Cl.² G06K *15/00*
U.S. Cl. 235—383 **32 Claims**



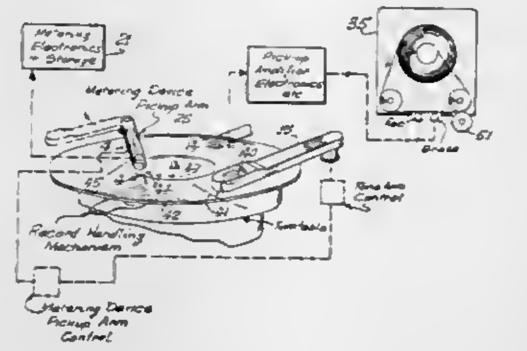
1. A vending machine, comprising:
- a casing; a weighing scale means having at least one retaining vessel for retaining like commodities therein within said casing and a weighing circuit, said weighing scale means weighing said retaining vessel and the retained commodities, and said weighing circuit producing an electric signal correlated to the weight of said weighing vessel and the retained commodities;
- access means having a lock that is normally locked to prevent access through said casing, and that can be released providing access through said casing to said commodities;
- converting means including a computing circuit for comparing the weights of said retaining vessel and retained commodities before and after the removal of commodities from said retaining vessel, and producing an electrical signal output corresponding to a numerical value of the quantity of commodities removed; and
- means for admitting a lock-releasing medium to release the lock of said access means to permit removal of commodities only upon the admission of said medium and prevent the removal of commodities in the absence of said lock-releasing medium.

4,108,364
APPARATUS FOR PROCESSING BETTING TICKETS
Takehiko Tanaka, Kawasaki; Yuzo Wakatsuki, Tokyo, and Toshio Niiya, Fuchu, all of Japan, assignors to Fujitsu Limited and The Japan Racing Association, both of, Japan
Filed Sep. 21, 1976, Ser. No. 725,181
Claims priority, application Japan, Sep. 23, 1975, 50-115271
Int. Cl.² G06K *5/00*
U.S. Cl. 235—419 **7 Claims**



1. An apparatus for processing operator input betting information to issue a betting ticket, and for determining whether said betting ticket is authentic once a betting ticket is returned and presented for payment, said apparatus comprising, in combination:
- forming means responsive to said operator input betting information for forming at least one computed secret code logically in accordance with the input betting information,
- recording means for recording said at least one computed secret code along with said input betting information when said betting ticket is issued,
- reading means for reading said recorded at least one computed secret code and said recorded input betting information when said betting ticket is returned and presented for payment,
- said forming means being additionally responsive to said recorded input betting information read by said reading means for forming at least one additional secret code logically in the same manner as said at least one computed secret code was formed, and
- comparing means for comparing said at least one computed secret code read by said reading means with corresponding said at least one additional secret code formed by said forming means in order to determine coincidence therebetween, whereby to validate the betting ticket returned and presented for payment.

4,108,365
COIN-OPERATED RECORDING MACHINE
Robert M. Hughes, 10009 Banyan, Alta Loma, Calif. 91701
Division of Ser. No. 119,535, Mar. 1, 1971, Pat. No. 3,990,710, which is a continuation-in-part of Ser. No. 739,325, Jun. 24, 1968. This application Jan. 15, 1976, Ser. No. 649,410
Int. Cl.² G06K *15/02, 7/08, 7/10;* G11B *5/86*
U.S. Cl. 235—419 **3 Claims**

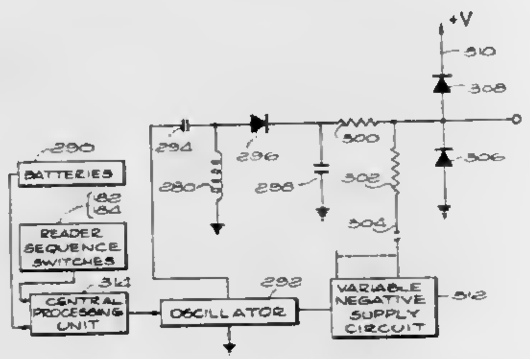

Metering Electronics + Storage
Pick-up Amplifier Electronics
Metering Device Pickup Arm
Record Handling Mechanism
Turntable
Metering Device Pickup Arm Control

1. In a recording apparatus:
- records adapted to be selectively reproduced in said apparatus for producing corresponding recordings,
- said records having digital signal-identifying indicia thereon,
- an automatic record-keeping apparatus for sensing said digital signal indicia on each record being reproduced to identify the recording being made, and
- an indicating apparatus coupled with said record-keeping apparatus including means to print a record of the recordings made.

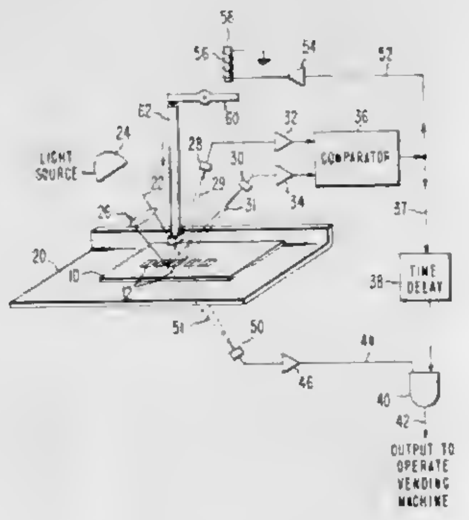
4,108,366
APPARATUS FOR PROVIDING AND SENSING CODED INFORMATION
Leonard J. Genest, Huntington Beach, and Frederick E. Feagin, Tustin, both of Calif., assignors to Monitron Industries, Inc., Santa Ana, Calif.
Continuation-in-part of Ser. No. 430,247, Jan. 2, 1974, Pat. No. 3,926,021, and a continuation of Ser. No. 631,558, Nov. 13, 1975. This application Nov. 8, 1976, Ser. No. 739,881
Int. Cl.² G06K *7/08, 19/06;* G11C *5/02*
U.S. Cl. 235—450 **10 Claims**

1. A system for sensing coded information carried by a card,

said coded information being provided by the relative presence and absence of magnetically reactive material at adjacent limited areas of the card, comprising:
- means adapted to receive said card;
- an alternating current source;
- sensing means comprising a plurality of adjacent sensing coils adapted to be coupled to said alternating current source, each coil being disposed around a respective ferromagnetic core, a respective annular ferromagnetic sleeve encircling each said coil and a ferromagnetic member forming a magnetic path between each core and sleeve, each said sleeve having a cross-sectional configuration in a plane substantially parallel to the plane of the card about the same as the configuration of respective limited areas, said each sleeve containing the magnetic field produced by the coil substantially within the projected wall of said sleeve; and,
- means for aligning said respective limited areas with and in close proximity to said sleeves,
- whereby the relative presence of relatively magnetically reactive material positioned in a respective limited area adjacent to and within the magnetic field of a sensing coil causes a first signal to be produced across said coil and the relative absence of magnetically reactive material positioned in a respective limited area adjacent to and within the magnetic field of a sensing coil causes a second signal to be produced.

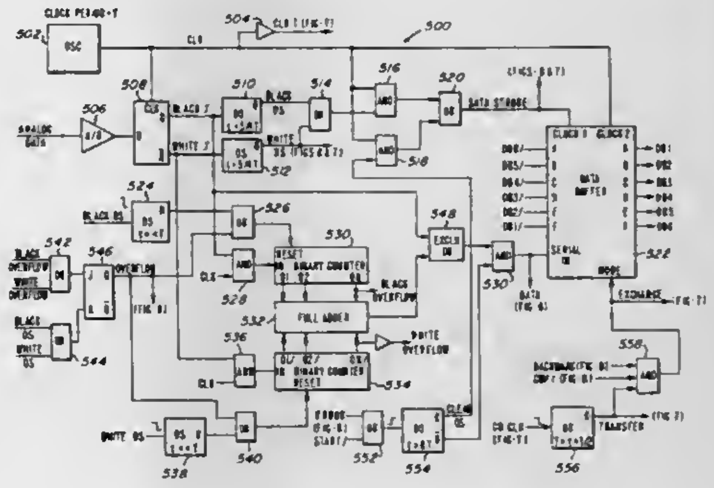


4,108,367
TOKEN AND READER FOR VENDING MACHINES
William James Hannan, Concord, Mass., assignor to RCA Corporation, New York, N.Y.
Filed Feb. 25, 1977, Ser. No. 772,103
Int. Cl.² G06K *7/10, 19/06;* G03H *1/26;* G11C *13/04*
U.S. Cl. 235—457 **4 Claims**



1. A token reader, comprising
- means producing a holographic readout beam,
- means to guide a token containing a plurality of pairs of holograms into the path of said readout beam,
- two photodetectors positioned at predetermined spaced locations to receive respective first order beams from the holograms of an illuminated pair of holograms,
- an electrically-operated means for obliterating a pair of holograms on said token which are positioned in the path of said readout beam, and
- comparator means operative upon the occurrence of equality of electrical outputs of said two photodetectors to actuate said means for obliterating holograms.

4,108,368
CODED RECORD AND METHOD OF AND SYSTEM FOR INTERPRETING THE RECORD
Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Continuation of Ser. No. 104,955, Jan. 8, 1971, abandoned. This application Sep. 29, 1976, Ser. No. 727,393
Int. Cl.² G06K *7/10, 19/06, 9/00*
U.S. Cl. 235—463 **20 Claims**

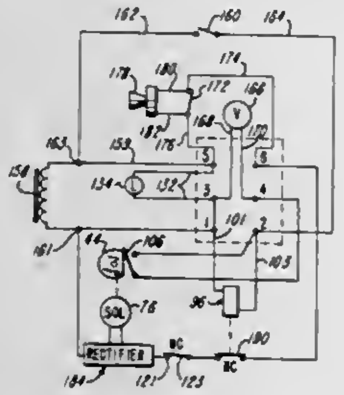


6. A method of translating records binary coded by a sequence of alternate areas of first and second light reflecting characteristics each of which can have one of more than two different widths using a light responsive reader, which method comprises the steps of
- producing relative movement between the reader and the record so that the reader passes over all of the areas,
- producing a sequence of digital reader-controlled signals in which each signal corresponds to the width of one of the areas, including at least a first signal, a second signal following the first signal in the sequence, and a third signal following the second signal in the sequence,
- digitally comparing each two successive signals to determine the relative widths of successive areas, and in particular comparing the first signal to the second signal and comparing the second signal to the third signal,
- and registering binary "1"s and "0"s in accordance with the relative widths of the successive areas.

4,108,369
AUTOMATIC FLUE DAMPER
John Prikkel, III, 2952 Ensley Ave., Dayton, Ohio 45414
Filed Mar. 28, 1977, Ser. No. 781,649
Int. Cl.² F23L *11/00*
U.S. Cl. 236—1 G **15 Claims**

1. In a mechanism for controllably venting gases from the flue of a combustion apparatus, said mechanism comprising a housing for mounting said flue and into which said gases pass, a damper mounted in said housing and movable between a first position opening said housing for the passage of gases therefrom and a second position substantially closing said housing against the passage of gases therethrough, the improvements comprising yieldable means biasing said damper to said first position, motive means for holding said damper against the bias of said yieldable means in said second position, heat sensor means disposed in said housing upstream of said damper for

disabling said motive means upon sensing heated gases in said housing and means for connection in circuit with said motive



means of a thermostat responsive to a medium heated by the combustion apparatus for also disabling said motive means.

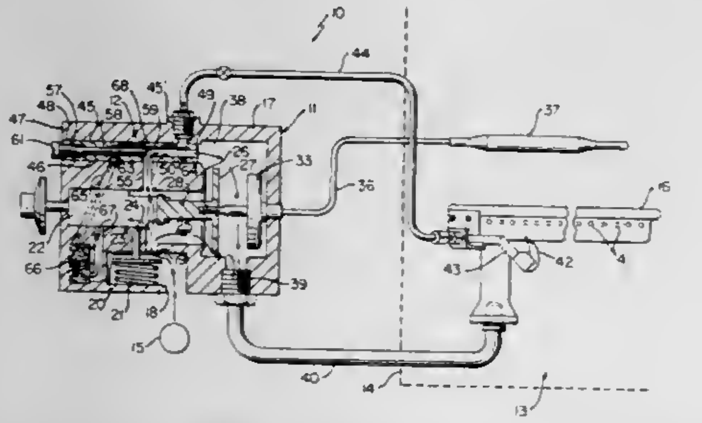
4,108,370
FUEL CONTROL SYSTEM HAVING BY-PASS MEANS AND PARTS THEREFOR AND THE LIKE

Roy C. Deml, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 23, 1977, Ser. No. 771,165

Int. Cl.² F23N *1/00*

U.S. Cl. 236—15 A **27 Claims**



1. In a fuel control system having temperature responsive control means for thermostatically controlling the flow of fuel from a source thereof to a burner means and having adjustable by-pass means by-passing said temperature responsive means for providing a by-pass flow of fuel from said source to said burner means to sustain combustion at said burner means, the improvement wherein said by-pass means comprises a tubular member provided with an inlet and an outlet for respectively being interconnected to said source and said burner means, said tubular member having a passage therein interconnecting said inlet to said outlet, and an adjusting member carried by said tubular member for adjusting the rate of flow of fuel through said passage between said inlet and said outlet of said tubular member and, thus, the amount of fuel being by-passed to said burner means, said tubular member having means for interconnecting said source to a pilot burner means independent of said passage thereof.

4,108,371
DAMPER CONTROL DEVICE

Louis J. Leemhuis, 1855 Sherington Pl. Apt. M214, Newport Beach, Calif. 92663

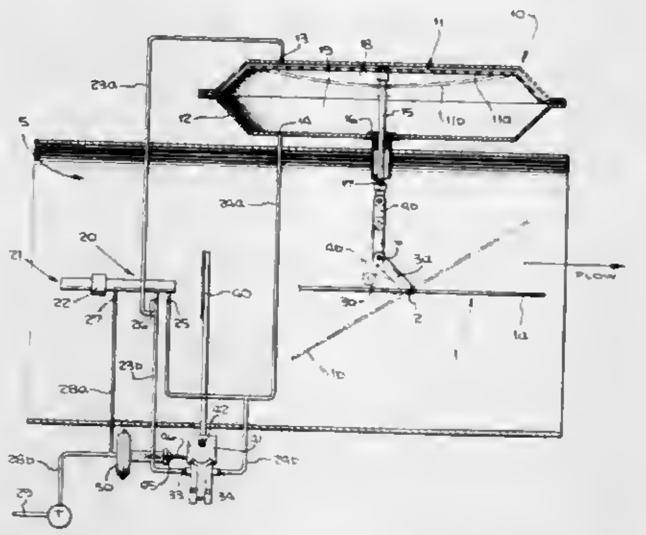
Filed Dec. 9, 1976, Ser. No. 749,160

Int. Cl.² F16K *31/12;* F24F *11/04*

U.S. Cl. 236—49 **14 Claims**

1. In a fluid flow control device for controlling the volume of fluid flow through a conduit to a zone, said device comprising damper means for regulating fluid flow through said conduit to said zone and damper control means for regulating said damper means, the improvement in said damper control means comprising:

- fluid supply means including tube means in said conduit facing into said fluid flow for receiving and diverting a portion of said fluid flow in said conduit:
- transducer means including first and second pressure chambers devided by a movable diaphragm means for moving said damper means in response to movement of said diaphragm means;
- means for deviding and directing said portion of said fluid flow to said first and second chambers to apply the same fluid pressure of said fluid flow to opposite sides of said diaphragm means;



- vent means for selectively venting either of said first and second chambers; and
- vane means including a vane member in said conduit responsive to fluid flow within said conduit and connected to said vent means for operating said vent means to selectively vent either of said first and second chamber to operate said damper means in response to fluid flow in said conduit whereby a constant volume fluid flow can be maintained in said conduit with said device being operated by said portion of said fluid flow diverted from said conduit and said vane means.

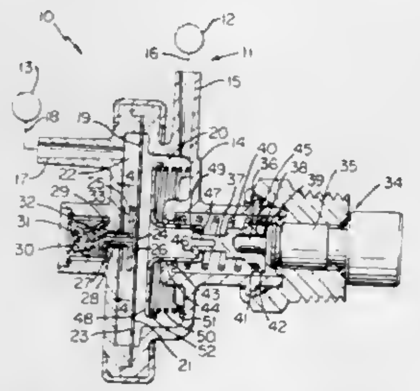
4,108,372
ENGINE CONTROL SYSTEM AND A DIFFERENTIAL VACUUM REGULATOR THEREFOR OR THE LIKE

Harold G. Brakebill, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 1, 1976, Ser. No. 672,593

Int. Cl.² G05D *23/02*

U.S. Cl. 236—86 **4 Claims**



1. A differential vacuum regulator comprising a housing means having an inlet for being interconnected to a vacuum source and an outlet for being interconnected to a vacuum operated device, and valve means carried by said housing means for interconnecting said inlet and said outlet together to produce a certain vacuum level at said outlet when said regulator is sensing a temperature below a certain temperature and for interconnecting said inlet and said outlet together to produce a different vacuum level at said outlet when said regulator is sensing said certain temperature, said valve means comprising a temperature sensing device and a flexible diaphragm that is responsive to the vacuum at said inlet, said diaphragm having an inlet side that is exposed to said inlet and having an outlet side that is exposed to said outlet, said valve means comprising a biasing means for acting on said inlet side of said flexible diaphragm and being controlled by said temperature sensing device, said temperature sensing device rendering said biasing means inactive by holding said biasing means away from said inlet side of said diaphragm when said temperature sensing device is sensing a temperature below said certain temperature and rendering said biasing means active by causing said biasing means to engage and act on said inlet side of said diaphragm when said temperature sensing device is sensing said certain temperature.

4,108,373
METHOD AND AN INSTALLATION FOR THE AIR-CONDITIONING OF GREENHOUSES AND FRAMES

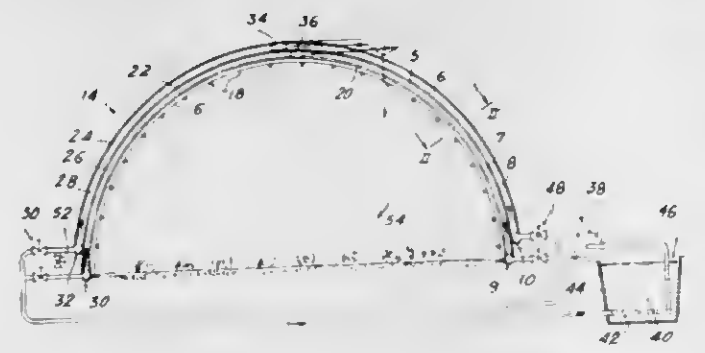
Jean-Pierre J. Chiapale, Le Pontet; Jacques A. Damagnez, Villeneuve-les-Avignon; Pierre M. Denis, Grenoble, and Paul Jourdan, Meylan, all of France, assignors to Commissariat a l'Energie Atomique and Institut National de la Recherche Agronomique, botb of Paris, France

Filed May 14, 1975, Ser. No. 577,358

Claims priority, application France, May 22, 1974, 74 17921; Mar. 19, 1975, 75 08616

Int. Cl.² F24J *3/02;* A01G *9/00*

U.S. Cl. 237—1 A **9 Claims**



1. A method of day and night air-conditioning of an enclosure in which plants are cultivated, at least part of the roofing structure of said enclosure being made up of at least two walls transparent to solar radiation delimiting an intermediate space which is filled with a heat-transporting liquid, wherein:

- (a) during the daytime, the penetration of the solar energy within said enclosure is selectively limited by making use of an optical filter constituted by said liquid containing an additive for selectively absorbing all radiant energy of wavelengths exceeding a threshold value that lies within the range of 6,000 A to 7,500 A and having no potential usefulness for the productivity and growth of the plants, at the same time permitting the greater part of the solar radiant energy that is ptotentially useful to green plants to be absorbed by the leaves of the plants under cultivation,
- (b) during the daytime, the heat absorbed is removed by circulating said liquid in a closed circuit and is stored in a reservoir which is separate from the space formed between said walls,
- (c) during the night, a minimum temperature is maintained within the enclosure by circulating said liquid within said intermediate space,
- (d) measuring the radiative temperature of the plant cover within the enclosure,
- (e) determining a top threshold value of a radiative temperature which is slightly lower than the maximum permissible limit and a bottom threshold value which is slightly higher than the minimum permissible limit, and
- (f) circulating the heat-transporting liquid during the daytime as long as said radiative temperature exceeds said top threshold value and circulating the heat-transporting liquid during the night as long as said radiative temperature is lower than said bottom threshold value.

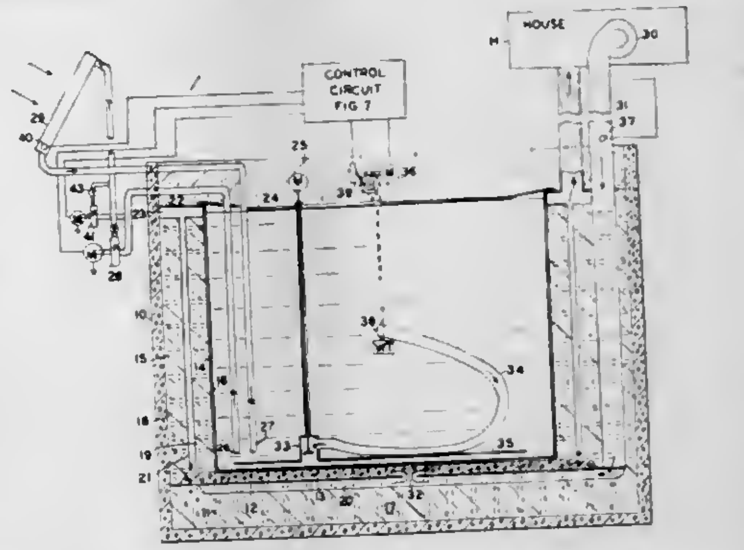
4,108,374
HEAT STORAGE WATER TANK

Floyd A. Lyon, Brookville, and Henry Harrison, Locust Valley, both of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Jul. 29, 1976, Ser. No. 709,587

Int. Cl.² F24D *11/00*

U.S. Cl. 237—1 A **6 Claims**



6. A heat storage tank suitable for solar house heating systems, including:

- a rigidly supported bottom panel,
- a heat exchanger mounted under said bottom panel,
- a bottom air passage connected to said heat exchanger,
- rigidly braced side panels connected to said bottom panel having an inner layer of outside insulation and an outer layer of outside insulation, a continuous side air passage between them, a plenum chamber near the top of said side panels communicating with said air passage whereby air may pass from said bottom air passage through said heat exchanger, through said side air passage to said plenum chamber;
- means connected for transferring heat from a heat source to water contained in said tank, and heat deliver fluid means for delivery of heat from said tank,
- means connected to said tank for circulating water from a controllable height within said tank to the inside bottom surface of said tank, and means in said tank for constraining said circulating water to flow over the inside bottom surface of said tank, whereby the temperature of said tank inside bottom surface is kept substantially equal to the temperature of water at said controllable height.

4,108,375
CONTROL DEVICE AND PROCESS FOR HEATING AN INSTALLATION

Lawrence V. Keeney, Saddlebrook, N.J., assignor to Energy Conservation Devices, Inc., Palisades Park, N.J.

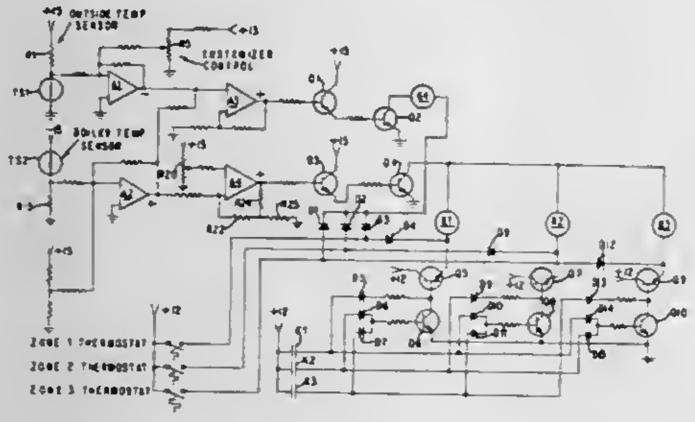
Filed May 13, 1977, Ser. No. 796,654

Int. Cl.² F24D *3/02*

U.S. Cl. 237—8 R **17 Claims**

1. A control means for regulating the operation of a circulating fluid medium system for maintaining the desired temperature within an enclosure having one or more circulating zones comprising: first means for sensing the temperature of the circulating medium at the point of heating and the temperature outside the enclosure and making a comparison between the

two; second means for controlling the input of heat to the circulating medium based on the results of said comparison between the temperature of the circulating medium at the point of heating and outside temperature to the minimum temperature whereby the demand of temperature within each zone is satisfied; and third means for generating a signal representative of the temperature within any zone in the enclosure, wherein



each zone within the enclosure has a separate temperature sensing means and a separate means for circulating said circulating medium, and circuit means so connected such that the circulator associated with the zone which last generates a signal representative of a requirement for heat continues to operate as long as the circulating medium temperature is higher than a predetermined temperature set point.

4,108,376

HEATER UNIT FOR AIR-CONDITIONER IN AUTOMOBILE VEHICLE

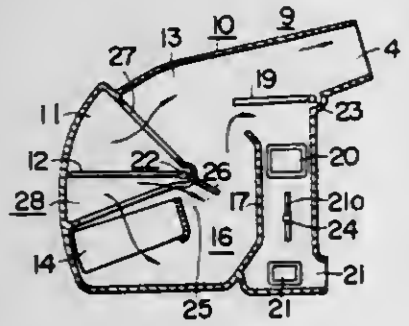
Tamotsu Matsuda, Wako, and Hiroshi Kuroda, Kamifukuoka, both of Japan, assignors to Hooda Giken Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 679,576, Apr. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,561

Claims priority, application Japan, Apr. 30, 1975, 50-59181

Int. Cl.^{2} B60H *1/02*

U.S. Cl. 237—12.3 A **2 Claims**



1. A heater unit for air-conditioner in automotive vehicles which comprises, in combination:

(a) a heat exchanger to warm external cool air introduced into the heater unit through a fresh air inlet opening;

(b) a first bypass provided above said heat exchanger, and to lead the cool air current introduced into the heater unit to the upper part of the vehicle cabin;

(c) a first damper for distributing the cool air current introduced into said heater unit to both said heat exchanger and said first bypass, said first bypass being closed at the time of the maximum warming operation and an entrance to said heat exchanger being closed at the time of the cooling operation by said first damper;

(d) a guide passageway to introduce warm air current which is discharged from said heat exchanger into the cool air current in said first bypass from below at a substantially vertical angle;

(e) a downwardly directing passageway extending from the vicinity of a merging point of said both warm and cool air currents to a plurality of downwardly directing outlet openings in the vehicle cabin in substantially parallel with said guide passageway through a partition wall;

(f) a second damper provided in the vicinity of the merging point of said both warm and cool air currents, and to distribute a major portion of the cool air current through said first bypass to a plurality of upwardly directing current, and a major portion of the warm air current through said downwardly directing passageway to the downwardly directing outlet openings in the vehicle cabin along with a portion of the cool air current;

(g) a second bypass provided at one side of said heat exchanger, and to lead a portion of the cool air current distributed to said heat exchanger by said first damper to the discharging side of said heat exchanger; and

(h) a third damper provided in said second bypass, said third damper being formed integrally with said first damper so as to control the flow rate of the air current through said second bypass corresponding to the position of said first damper.

4,108,377

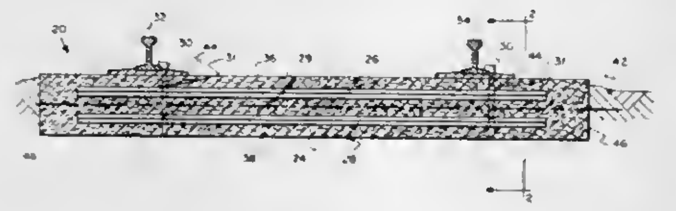
NON-METALLIC-REINFORCED MOLDED CROSSTIE

Edward Potter, 14415 SW. 6th, Beaverton, Oreg. 97005, assignor to Edward Potter, Beaverton and Dant & Russell, Inc., Portland, both of, Oreg.

Continuation-in-part of Ser. No. 588,786, Jun. 20, 1975. This application Mar. 1, 1976, Ser. No. 662,703

Int. Cl.^{2} E01B *3/44*

U.S. Cl. 238—91 **16 Claims**



1. A reinforced railway crosstie comprising a mixture of comminuted lignocellulosic material and binder densified under pressure of at least 1,200 psi and bonded together as densified in the form of an elongate monolithic railway crosstie beam having horizontally-extending length and width dimensions and a vertically-extending thickness dimension, and elongate reinforcing means for strengthening and stiffening said crosstie against bending stress positioned longitudinally within said beam, said reinforcing means being made of wood having substantially straight, clear grain running parallel to the length dimension of said beam, said wood having a tensile strength and modulus of elasticity greater than that of said bonded mixture and being able to withstand compression of at least 1,200 psi applied in a direction transverse to said grain without fracture.

4,108,378

RAILROAD TIE AND TIE PLATE WITH COACTING GROOVES AND PROJECTIONS THAT PREVENT SPIKE KILLING OF THE TIES

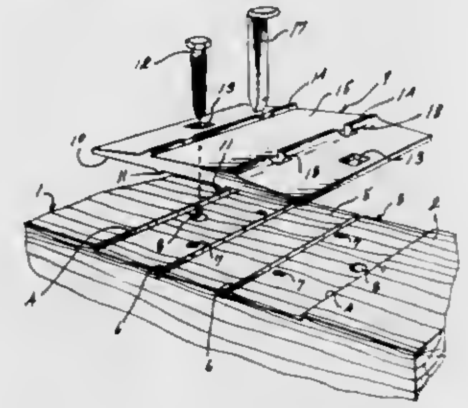
Roger Raymond, 720 Leclerc St., Acton Vale, Canada

Filed Apr. 7, 1977, Ser. No. 785,414

Int. Cl.^{2} E01B *13/02*

U.S. Cl. 238—298 **2 Claims**

1. A railroad tie and tie plate assembly comprising, in combination, a wood tie having a top face and a pair of spaced rabbetted shallow recesses formed into said top face, each recess having a flat bottom surface intermediate a pair of substantially parallel straight shoulders extending substantially orthogonally to said bottom surface and to the length of said wood tie, said bottom surface further having a pair of pre-cut straight grooves made therein, substantially parallel to said shoulders and spaced from each other and from said shoulders, and for each recess, a tie plate made of metal and having a flat underface, straight and parallel side edges and a top surface defining a central surface portion and on each side of said central surface portion a marginal surface portion downwardly inclined from said central surface portion toward the respective side edge and merging with the latter, said tie plate being thicker in the zone of said central surface portion than at said side edges, and further having a pair of spaced parallel ribs integral with said tie plate and upstanding from said top face at the junction of said central surface portion with the respective marginal surface portion, said ribs being substantially parallel with said side edges and adapted to position the sole of a rail resting on said central surface portion, and a pair of straight, spaced parallel ridges integrally formed with said tie plate and protruding from the underface thereof, and complementary to said



grooves, the distance between said side edges being substantially equal to the distance between said shoulders and the distance between the respective ridges and the adjacent side edge of said tie plate being substantially equal to the distance between the respective groove and the adjacent shoulder of said recess, so that said tie plate fits said recess and said ridges fit said grooves without any appreciable lateral play with said underface flat against said bottom surface of said recess, the depth of said recess being substantially equal to the thickness of said side edges, so that the zone of said respective marginal surface portions adjacent said side edges are substantially flush with the top face of said wood tie in their zone adjacent the respective side edges, and said central surface portion is at a higher level than that of said top face of said wood tie, and said tie plate further including spike-receiving apertures made therethrough and extending through the respective ribs.

4,108,379

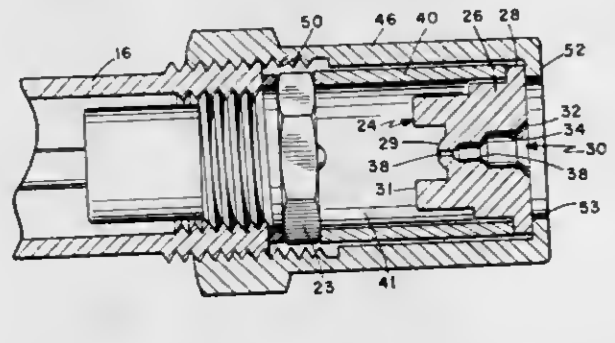
PAINT SPRAY TIP RETAINING AND CLEANING ADAPTER

Herbert Joseph Talley, 1241 Rock Springs Rd., San Marcos, Calif. 92069

Continuation-in-part of Ser. No. 644,763, Dec. 29, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,027

Int. Cl.^{2} B05B *15/02*

U.S. Cl. 239—119 **6 Claims**



1. A cleaning adapter adapted for use with a spray gun of the type having a unidirectional non-reversible spray tip of the type having a barrel with an orifice at one end and an annular retaining flange at the other end detachably mounted normally by a retainer nut directly to the spray gun housing at the outlet of the spray control valve, said adapter comprising:

an elongated inner sleeve having an inner diameter for accommodating said barrel of said spray tip in the reverse direction and having a length exceeding the length of said spray tip between said retaining flange and said one end for accommodating said tip in the reverse direction and having an inner end for engaging said spray gun housing and an outer end for engaging said retaining flange; and

an elongated retaining sleeve having an inner end for engaging said housing, a length and a diameter for accommodating said spacer sleeve and said barrel of said tip and an inwardly extending flange at the outer end for engaging said retaining flange for accommodating and retaining said tip on the outer end of said sleeve in either the forward direction for normal spraying or in a reverse direction for dislodging debris from the orifice of said tip.

4,108,380

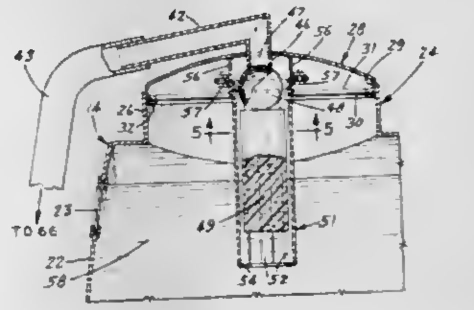
TANK SPREADER

James L. Richardson, St. Paul, Minn., assignor to VEDA, Inc., Long Lake, Minn.

Division of Ser. No. 500,133, Aug. 23, 1974, Pat. No. 4,061,273. This application Mar. 10, 1977, Ser. No. 776,229

Int. Cl.^{2} B05B *1/20*

U.S. Cl. 239—172 **34 Claims**



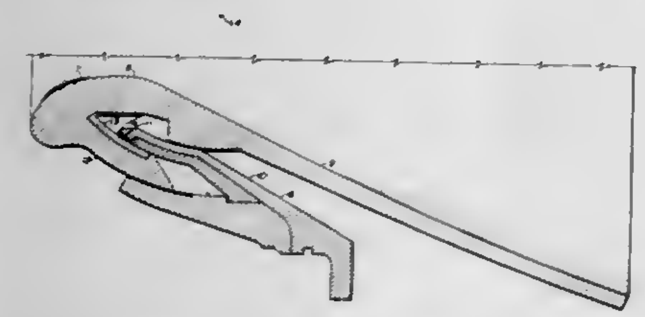
1. A liquid manure spreader comprising: a tank having a chamber for storing liquid manure, said tank having a top portion with a passage open to the chamber, a cover mounted on the tank for closing said passage, means to support the tank for movement along the ground, pump means for selectively evacuating air from the chamber and supplying air under pressure to the chamber, control valve means having a single spool to selectively control the movement of air to and from the tank, a single air line means connecting the valve means with the cover, manure discharge means on the tank for spreading manure when air under pressure is supplied to the tank, manure inlet means allowing manure to move into the tank when air is evacuated from the tank, safety shut-off valve means located inside the tank operable to prevent the evacuation of air from the tank through the air line means in response to the level of the manure in the tank, said shut-off valve means including a valving member, an elongated float for moving the valving member to a closed position in response to the level of the manure in the tank to prevent escape of liquid manure into the line means and pump means, said air line means including a tubular member mounted on the cover, said tubular member having a projection extended below the cover and engageable with said valving member to close the air line means, open cage means secured to said cover and extended downwardly into the tank chamber to confine the valving member and float, said cage means having a plurality of rigid members spaced from each other and surrounding the valving member and float, said spaced members providing elongated openings between the chamber and float whereby the float responds to the level of liquid in the tank chamber to close the air line means, and means attaching the rigid members to the inside of the cover, said means attaching the spaced members to the inside of the cover comprise legs secured to the cover and releasable fastening means connecting the spaced members to the legs

whereby the spaced members, valving member and float can be removed from the cover.

4,108,381

ROCKET NOZZLE BEARING SEAL

Philip C. Sottosanti, Ogden, Utah; William H. Baker, Orangevale, Calif., and William T. Dolling, Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.
Filed Jun. 6, 1977, Ser. No. 803,487
Int. Cl.² B64C *15/04*
U.S. Cl. 239—265.35 8 Claims

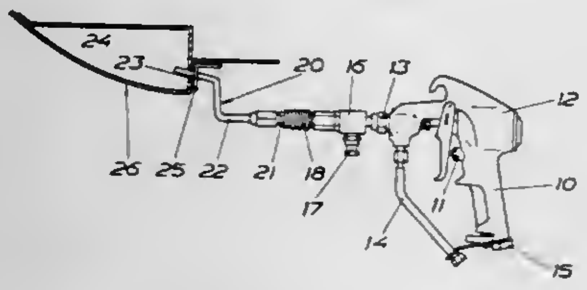


1. In a thrust vectoring, convergent-divergent, nozzle for rockets, having a movable member containing a throat and expansion cone attached, for rotation, to a stationary member that is to be fixed to a rocket that generates high temperature, high pressure, erosive gases, the improvement comprising:
an annular, elastomeric pad bonded into an annular groove, of arcuate cross section, in a surface of the stationary member that is adjacent a surface of the movable member;
a torsion ring of arcuate cross section, having a radius shorter than that of the groove by the thickness of the elastomeric pad bonded to the elastomeric pad; and
a lubricous bearing pad bonded to the torsion ring, so that it bears against the surface of the movable member.

4,108,382

SPRAYING DEVICE

Per-Olof Ryd, and Sten Gunnar Hugo Svensson, both of Skara, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Dec. 16, 1976, Ser. No. 751,212
Claims priority, application Sweden, Dec. 18, 1975, 7514316; Dec. 19, 1975, 7514486
Int. Cl.² B05C *5/02*
U.S. Cl. 239—271 9 Claims

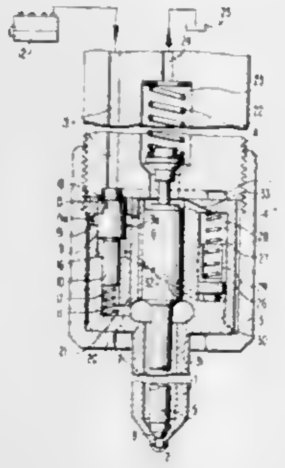


1. Spraying device for applying a coating material on the inner walls of a hollow body through an injection opening in the latter, comprising:
a spray gun having a coating material valve,
an ejector barrel connected downstream of the coating material valve for conducting coating material into the hollow body through the injection opening, and
a positioning means inluding means for engaging the outside of the hollow body for fixing said ejector body at a predetermined direction relative to the hollow body, at a predetermined depth of intrusion in the hollow body and at a predetermined angular position in said hollow body, and for substantially preventing relative movement between said ejector barrel and said hollow body during spraying.

4,108,383

FUEL INJECTION VALVE WITH STEPPED INJECTION

Frank Thoma, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 1, 1976, Ser. No. 662,421
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1975, 2509068
Int. Cl.² B05B *1/32*
U.S. Cl. 239—533.5 34 Claims

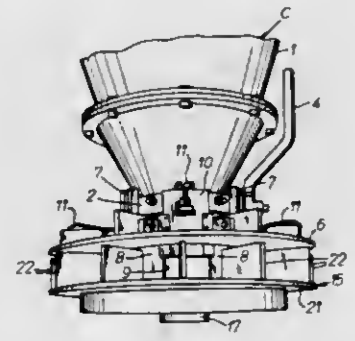


1. A fuel injection valve for internal combustion engines, comprising valve housing means provided with discharge opening means, a valve needle means actuatable in the closing direction by a valve needle closure spring and in the opening direction by the pressure of the fed fuel, a pressure space means formed together with the valve housing means and receiving the valve needle means, said pressure space means being operable to be closed against the outside by a valve seat means for the valve needle means and formed by said housing means, said discharge opening means being located downstream of said valve seat means and representing a predetermined flow resistance, at least two piston means kinematically operatively coupled with one another in at least one direction of movement, said piston means being reciprocable between two axial positions, pressure space means on the inlet-side and outlet-side of the piston means, a return spring positioned on the outlet side of said piston, said piston means being actuatable on the inlet-side thereof by the pressure of the supplied fuel and on the outlet-side also by said return spring, a first essentially unobstructed line connection means operatively connecting the outlet-side piston pressure space means of one of the piston means with the pressure space means of the valve needle means, control edge means defining the axial end of a hollow housing space means open to the piston slide surface of the other piston means, said control edge means being axially offset by a predetermined distance from the inlet-side axial position of the other piston means and being operable to be covered by the other piston means, and a second essentially unobstructed line connection means from the hollow housing space means to the pressure space means of the valve needle means, characterized in that said fuel injection valve is further provided with a reservoir means and a connecting line having a predetermined throttling means for achieving a throttling resistance which is greater than that which exists in said first and second unobstructed connecting line means, and wherein the outlet-side pressure space means of the other piston means is operatively connected with the reservoir means by way of said connecting line means having said predetermined throttling means.

4,108,384

CENTRIFUGAL SLINGING APPARATUS FOR HOT REPAIR OF ELECTRIC FURNACES, LADLES OR THE LIKE

Ernst Egli, Dietikon, Switzerland, assignor to Spribag Aktiengesellschaft, Widen-Mutschellen, Switzerland
Filed Nov. 26, 1976, Ser. No. 745,399
Claims priority, application Switzerland, Nov. 27, 1975, 15415/75
Int. Cl.² F27D *1/16*
U.S. Cl. 239—665 12 Claims

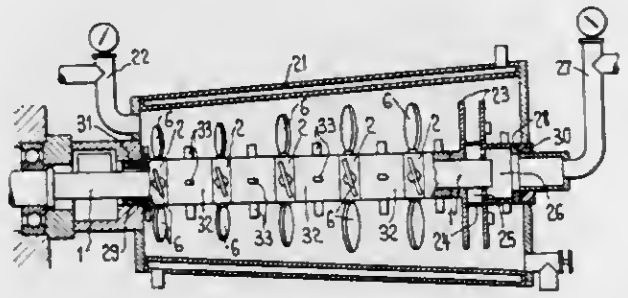


1. Apparatus for hot repair of furnaces by precision centrifuging of refractory material against the damaged location of the lining of the furnace to be repaired, said apparatus comprising a centrifugal slinging machine having a generally horizontally disposed centrifuging wheel to which the refractory material is introduced from above, said centrifuging wheel having a central, upwardly opening chamber, means for dividing said chamber into radial sectors, individual and independently liftable and lowerable metering sliders for selectively and variably closing said sectors.

4,108,385

COLLOIDAL MILL

Friedrich Funk, Refugium, 4713 Matzendorf, Switzerland
Filed Jun. 29, 1976, Ser. No. 701,030
Claims priority, application Switzerland, Jul. 9, 1975, 8941/75; Apr. 27, 1976, 5263/76
Int. Cl.² B02C *23/36*
U.S. Cl. 241—46.04 5 Claims

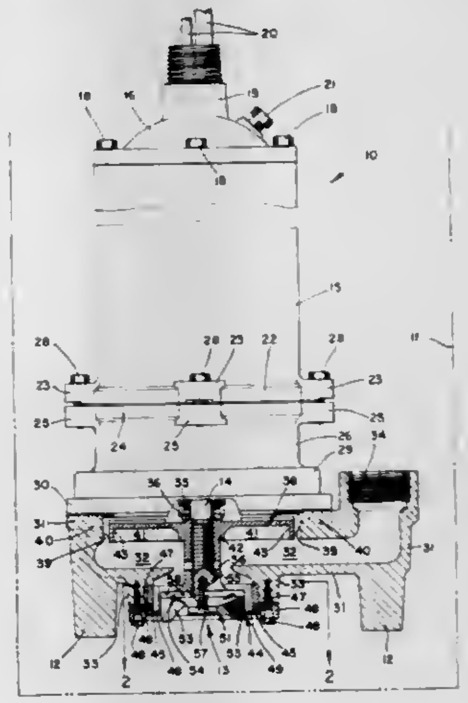


1. A colloidal mill comprising:
a horizontally disposed vessel having a rotatably mounted shaft extending therethrough,
an inlet conduit at one end of said vessel allowing continuous flow into the vessel of material to be treated,
an outlet sieve at the other end of said vessel allowing disintegrated material to leave the vessel,
an outlet conduit at the other end of said vessel for draining the treated material,
a plurality of grinding impellers mounted on said shaft for rotation in said vessel, each impeller comprising a blade which has an axial conveying action and the impellers acting to agitate and rotate said material to be treated, each grinding impeller blade being adjustable in inclination and easily replaceable, at least the outer surfaces of said impeller blades and the inner surface of said vessel in contact with the material being of ceramic material; at least two intermediate grinding impellers have an axial conveying action in opposite directions,
said grinding impellers each comprising a boss rigidly mounted to said shaft, flat blades each removably secured in a holder has a U-shaped profile which receives an edge of the blade and a pin engaging in a bore of the boss.

4,108,386

GRINDER PUMP

William J. Conery, and Terry L. Kiplinger, both of Ashland, Ohio, assignors to McNeil Corporation, Akron, Ohio
Filed Apr. 13, 1977, Ser. No. 787,081
Int. Cl.² B02C *18/40*
U.S. Cl. 241—46.11 13 Claims



1. A grinder pump comprising an axial inlet, a pumping chamber communicating with said inlet, a rotatable shaft extending axially through said chamber and into said inlet, pump impeller means on said shaft outside of but communicating with said chamber, annular ring means in said inlet having teeth forming the internal diameter thereof, impeller means on said shaft and rotatable therewith within said ring means, said impeller means including a disk member the external diameter of which generally corresponds to the internal diameter of said ring means, and at least one blade member extending generally axially of said disk member out of said inlet further than the axial extent of said ring means so that upon rotation of said shaft said pump impeller draws material through said teeth of said ring means and into said chamber for discharge therefrom.

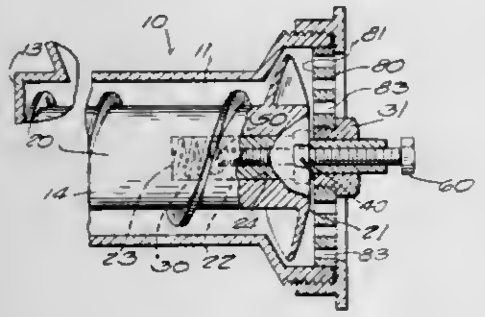
4,108,387

HOLLOW PIN ASSEMBLY FOR FOOD GRINDERS

James G. Weiler, Elkhorn, Wis., assignor to Weiler and Company, Whitewater, Wis.
Filed Mar. 25, 1977, Ser. No. 781,240
Int. Cl.² B02C *18/36*
U.S. Cl. 241—82.5 6 Claims

1. In a food grinder comprising an auger tube containing an auger and having at its downstream end a perforated plate against the upstream face of which a rotating knife is biased, the improvement comprising an external adjusting means at the downstream end of the grinder to adjust the bias of the knife against the upstream face of the perforated plate, and internal bias means controlled by said external adjusting means without disassembling any part of said grinder, the external adjusting means comprising an inner screw threaded pin having an upstream end and a downstream end, and the internal bias means to adjust the bias of the knife comprising an outer

pin in concentric threaded relation to the inner pin, and a compression spring; said inner pin having its upstream end biased by the compression spring and its downstream end accessible from the outside of the grinder; and said outer pin being non-rotatable respecting said auger and said knife and having a downstream facing shoulder bearing against the knife, whereby rotation of the inner pin advances its downstream end against the compression spring to increase the bias of said downstream facing shoulder against the knife, the compression spring and the upstream ends of the inner and outer pins lying within a cavity in the downstream end of the auger.



4,108,388
METHOD FOR CATCHING, SEVERING AND RETHREADING A THREAD AND AN APPARATUS FOR IMPLEMENTING THE METHOD

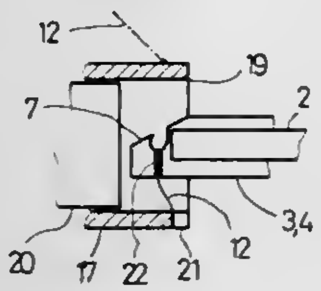
Hugo Schär, Dattlikon, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Apr. 7, 1976, Ser. No. 674,655

Claims priority, application Switzerland, Apr. 16, 1975, 4830/75

Int. Cl.² B65H *67/04, 54/26*

U.S. Cl. 242—18 DD **12 Claims**



1. A method of catching, severing and sucking-off a continuously arriving thread and rethreading said thread onto a new empty bobbin tube, comprising the steps of:

continuously infeeding a thread onto a bobbin tube to form a bobbin package thereon while the thread moves through a thread traversing triangle;

building-up the bobbin package by means of an infed thread on the bobbin tube;

displacing a common thread catching and severing device having knife blades into the zone of the thread traversing triangle when the bobbin package is built-up to a desired size;

initially catching the thread with the knife blades of the common thread catching and severing device within the zone of the thread traversing triangle;

holding and severing the thread by means of the knife blades of the common thread catching and severing device;

continuously sucking-off the incoming thread end by means of a suction device;

retracting such thread end from the zone of the built-up bobbin package;

carrying out a bobbin tube change by removing the built-up bobbin package and inserting a new empty bobbin tube;

following the bobbin tube change laterally inserting the thread end into the new empty bobbin tube;

engaging the thread by means of the new empty bobbin tube;

simultaneously severing the thread with the knife blades from the thread end extending to the suction device when the incoming thread has been positively caught by the new empty bobbin tube; and

thereafter shifting the common thread catching and severing device back into an idle position.

3. The combination with an automatic thread winder for winding-up a continuously arriving thread onto a bobbin tube to form a bobbin package thereon and a bobbin change apparatus for removing the built-up bobbin package and inserting a new bobbin tube onto which there is to be formed a new bobbin package, of an apparatus for catching, severing and sucking-off the continuously arriving thread and rethreading such thread onto the new bobbin tube, said apparatus comprising:

a common thread catching and severing means having knife blades for initially catching and severing the continuously arriving thread as it is wound-up onto the bobbin tube while moving through a thread traversing triangle;

suction means provided with a suction opening cooperating with the common thread catching and severing means;

said knife blades being provided with a common guiding, catching and severing zone;

said common guiding, catching and severing zone being located at the vicinity of the suction opening;

means for supporting and enabling displacement of the common thread catching and severing means into the zone of the thread traversing triangle, for retracting said common thread catching and severing means from the zone of the thread traversing triangle after the continuously arriving thread has been severed by the knife blades of said common thread catching and severing means and the thread end sucked-off by the suction means and, following the bobbin tube change operation, for enabling the common thread catching and severing means together with the sucked-off thread end to be displaced into an end face of the new bobbin tube where the thread is rethreaded onto the new bobbin tube and simultaneously severed by the knife blades after rethreading; and

means for driving the common thread catching and severing means throughout the entire catching, severing, sucking-off and rethreading processes.

4,108,389
DISPENSER FOR A PLURALITY OF ROLLS OF SHEET MATERIAL

Rolla J. Womack, P.O. Box 56, Dawson, Ill. 62520

Filed Nov. 7, 1977, Ser. No. 848,905

Int. Cl.² B65H *19/04*

U.S. Cl. 242—55.3 **8 Claims**

1. A dispensing cabinet for dispensing a plurality of rolls of paper rolled on hollow cores, comprising

a pair of facing double-flanged upper channel tracks mounted in the interior of such cabinet,

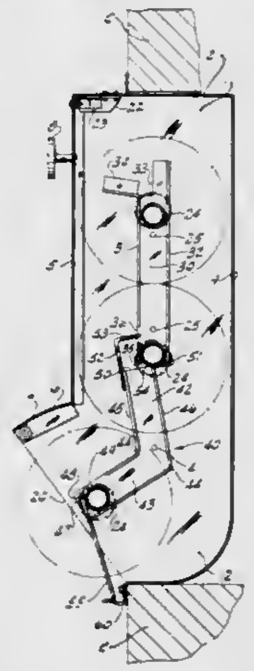
a pair of facing double-flanged lower channel tracks mounted in the interior of such cabinet, and of a length greater than the diameter of such rolled paper,

a plurality of spindles of such length and diameter as to fit slidably in said tracks and through such rolls of paper,

means at the lower end of said lower tracks to establish a position at which such rolled paper may be dispensed,

track openings adjacent to such position establishing means, whereby to permit removal of spindles and cores of spent rolls thereon,

both said pairs of tracks leading downward in said cabinet, one pair being fixed, the other pair being pivotable from a feed angle from which the lower end of each upper channel track is adjacent to and in registration with the corresponding upper end of said lower channel track to a stop angle in which the upper end of one flange of each of the lower channel tracks is out of registration with the adjacent end of the upper channel track, each of the pair of lower tracks having an end projection presented, at said stop angle, intermediate the flanges of the corresponding upper tracks, whereby at such stop angle spindles bearing a roll of paper will be retained atop the end projections of the lower channels in a storage position, and



means to move said pivotable pair of tracks together angularly from such stop angle to such feed angle,

whereby after removal of a spent roll and its spindle, angular pivoting of said pivotable channel tracks will cause a second spindle and a roll thereon to descend from such storage position to such dispensing position.

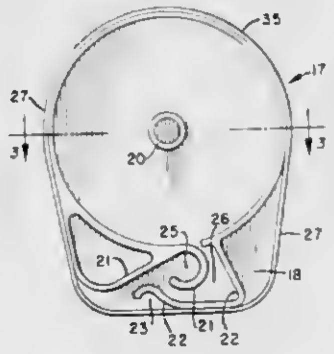
4,108,390
PAPER TAPE CANISTER

Hugh V. Hayes, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,799

Int. Cl.² B65H *19/00*

U.S. Cl. 242—55.53 **4 Claims**



1. An apparatus for dispensing a flexible material comprising:

an enclosed case having therein a first cavity for the storage of a quantity of said material and an opening through which said material may be dispensed; and

a labyrinth formed by a plurality of curved partitions interior to said enclosed case, said labyrinth constituting a tortuous path connecting said first cavity and said opening for the passage of material from said first cavity to said opening, said labyrinth further including a plurality of second cavities formed by said partitions, said second cavities disposed with respect to said path such that material reinserted into said opening will be directed thereinto, thereby prohibiting the reinsertion into said first cavity of material once removed therefrom.

4,108,391
FEEDING SYSTEM FOR MANUFACTURING MACHINES CONSUMING PAPER SUPPLIED IN A CONTINUOUS STRIP

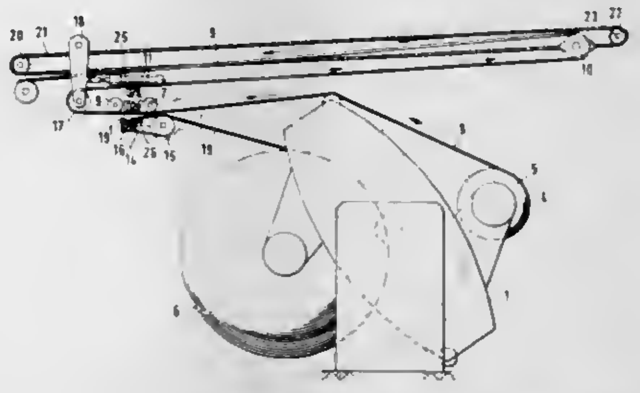
D. Manuel Torres Martinez, Sancho El Fuerte, 21 Pamplona, Spain

Filed Dec. 29, 1976, Ser. No. 755,145

Claims priority, application Spain, Feb. 20, 1976, 218.966[U]; Oct. 16, 1976, 223.836[U]

Int. Cl.² B65H *19/14*

U.S. Cl. 242—58.3 **8 Claims**



1. In a feeding system for manufacturing machines consuming paper supplied in a continuous strip having a first roller for holding a supply reel of paper, a second roller for holding a reserve reel of paper, means for guiding and feeding the strip from said supply reel to said manufacturing machines, means for joining the leading edge of the paper on said reserve reel to the strip from the supply reel, cutting means for cutting the strip from the supply reel whereby the reserve reel is substituted for the supply reel, the improvement comprising:

(a) means for holding a transverse strip of said strip from the reserve reel;

(b) said means for holding having means for forming a buckle completely across said transverse strip said buckle being concave toward the strip from the supply reel;

(c) contacting means for contacting the end of said strip from the reserve reel with the strip being supplied from the supply reel;

(d) contact adhesive means for adhering the end of said strip from the reserve reel to the strip from the supply reel; and

(e) said cutting means being operative to cut completely through the strip from the supply reel in a transverse location aligned with said buckle whereby the cutting means does not touch the strip from the reserve reel.

4,108,392
FISHING REEL

Jean Masclet, Paris, France, assignor to S.E.D.I.C., Montrouge, France

Filed Mar. 7, 1977, Ser. No. 774,999

Claims priority, application France, Mar. 26, 1976, 76 08788; Feb. 8, 1977, 77 03413

Int. Cl.² A01K *89/00*

U.S. Cl. 242—84.21 A **15 Claims**

1. A fishing reel having a body supporting a rotatable spool, a spool driving means, and a spool layering means; wherein:

said spool driving means comprises:

a principal shaft rotatably supported in said body;

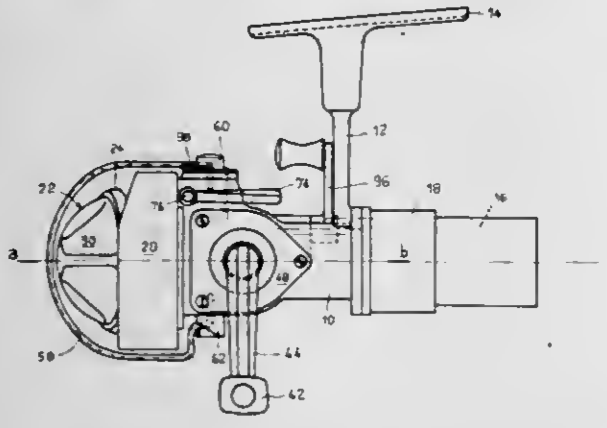
a secondary shaft rotationally connected to said principal shaft, said spool being operatively associated with one end of said secondary shaft; and,

a frame rotatable about said principal shaft and including bearing means coupled with the other end of said secondary shaft and locating said secondary shaft at an angle of inclination relative to said principal shaft, the arrangement being such that rotary movement of said principal shaft transmits a primary movement to said spool for rotation thereof about the axis of said secondary shaft; and

said spool layering means comprises:

a line guide pivoted about an axis fixed relative to said body;

a first assembly including means for pivoting said line guide from a first position in which the line can be wound onto said spool to a second position in which the line is unwound from said spool during casting;



a secondary assembly including means for effecting pivoting of said line guide from the second position to the first position; and,

means for transmitting a secondary movement to said spool ensuring suitable layering of the line onto said spool, said transmitting means including said frame for transmitting the secondary movement to said spool, said frame rotating said spool about the axis of said principal shaft.

4,108,393

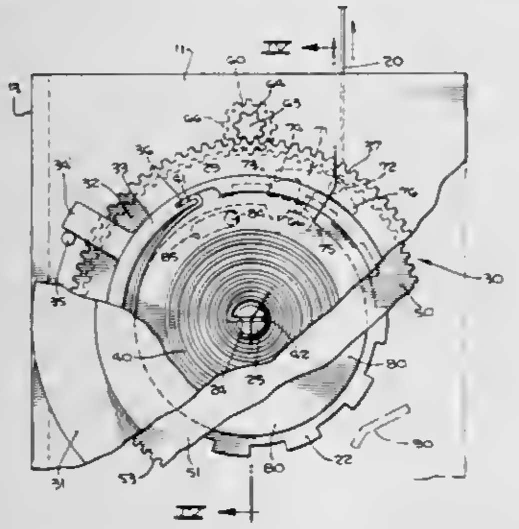
EMERGENCY LOCKING RETRACTOR WITH COMFORT BELT TENSION

Cyril Henderson, Woodland Hills, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Aug. 16, 1976, Ser. No. 714,395

Int. Cl.² A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 **15 Claims**



1. In a safety belt retractor having a belt storage spool and a single spool rewind spring means connected at one end to said spool to produce a first rewind bias on said spool, the improvement in means for reducing the tension applied to the belt when in use due to the bias of said single rewind spring means, comprising the provision of:

means for selectively connecting an opposite end of said spring means to said spool, said means for selectively connecting including means for providing an opposite biasing effect on said spool of a lesser amount than that applied by said one end on said spool, whereby the net effect on said spool will be a second rewind bias on said spool by said single rewind spring means of a lesser amount than said first bias.

4,108,394

SEATBELT RETRACTOR FOR MOTOR VEHICLES

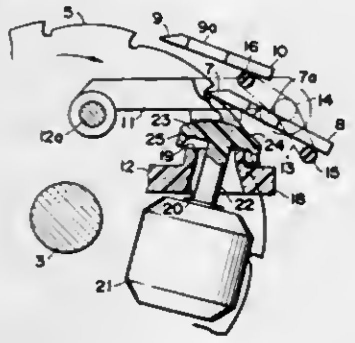
Susumu Oishi, Nagoya, and Masahiro Iwatsuki, Toyoake, both of Japan, assignors to Tokai-Rika-Denki-Seisakusho, Japan

Filed Sep. 16, 1977, Ser. No. 833,819

Claims priority, application Japan, Sep. 17, 1976, 51-125549[U]

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **6 Claims**



1. A seatbelt retractor comprising:

a frame;

a retracting shaft rotatably coupled to said frame which retracts a seatbelt thereon;

at least one locking gear coupled to said retracting shaft;

first and second pawls provided adjacent said locking gear and independently rotatably coupled to said frame such that when said first and second pawl rotate they respectively engage with said locking gear and prevent rotation of said retracting shaft in a seatbelt extending direction;

a rocker arm pivotally supported at a pivot point and having a first catch pin at one end thereof which engages with said first pawl and a second catch pin at the other end thereof which engages with said second pawl such that the first pawl is caused to engage with said locking gear when said rocker arm rotates in one direction about said pivot point and such that said second pawl is caused to engage with said locking gear when said rocker arm rotates in the other direction about said pivot point; and

an acceleration sensing member which causes the pivot point to move during a sudden deceleration of a vehicle such that at least one of said first and second pawls is caused to rotate and engage with said locking gear.

4,108,395

PRESSURE-FREE SEAT BELT RETRACTOR

Robert Boyson Heath, Adelaide, Australia, assignor to Rainsfords Metal Products Proprietary Limited, Australia

Filed Aug. 25, 1976, Ser. No. 717,488

Claims priority, application Australia, Aug. 26, 1975, 2923/75

Int. Cl.² A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107.7 **15 Claims**

1. A pressure free device for a seat belt wherein the belt is carried on a spool which is rotational in a frame and has biasing means urging spool rotation in a belt retraction direction, comprising:

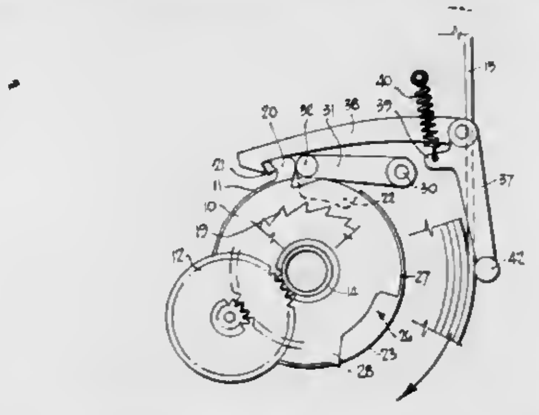
retraction inhibiting means coupled to the spool, and a retraction inhibiting member movable with respect to the frame and releasably engageable with said inhibiting means to inhibit said rotation in the belt retraction direction,

a gate latch movable with respect to the frame,

a gate member mounted for rotation with respect to the frame and clutch means coupling said gate member to said spool, and having associated therewith both a cam surface

engaged by said inhibiting member, and a gate latch engagement surface engageable by said gate latch to restrain gate member rotation in a latch restrained position upon belt withdrawal, and

gate latch release means operable to release said latch from its engagement with said engagement surface when the gate member rotates upon belt retraction,



said cam surface controlling said inhibiting member to engage said inhibiting means only when the gate member rotates upon belt withdrawal beyond its latch restrained position.

4,108,396

BOBBIN FOR TEXTILE YARNS OR THE LIKE

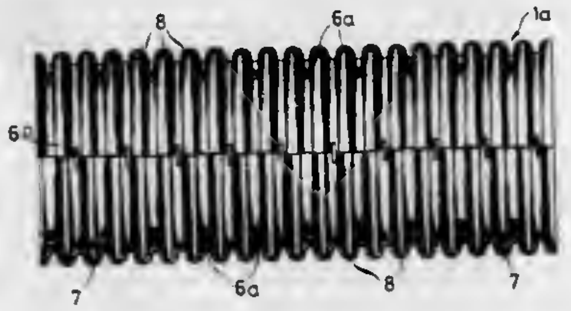
Adalbert Engel, Drosselweg 4, Lörrach, Fed. Rep. of Germany (7850)

Filed Feb. 9, 1976, Ser. No. 656,713

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1975, 2506512

Int. Cl.² B65H *75/20*

U.S. Cl. 242—118.11 **19 Claims**



1. A bobbin for heat- and/or wet-treatment of textile yarns or the like, comprising a hollow liquid-permeable tubular body at least a portion of which consists of synthetic plastic material and at least a portion of which is elastically deformable in radial and axial directions thereof without appreciable changes in the configuration of the internal surface of said hollow body, said body having substantially circumferentially extending alternating abutting larger-diameter and smaller-diameter sections, each of said larger-diameter sections being a circumferentially complete section.

4,108,397

CADDY FOR KNITTING AND CROCHETING YARN

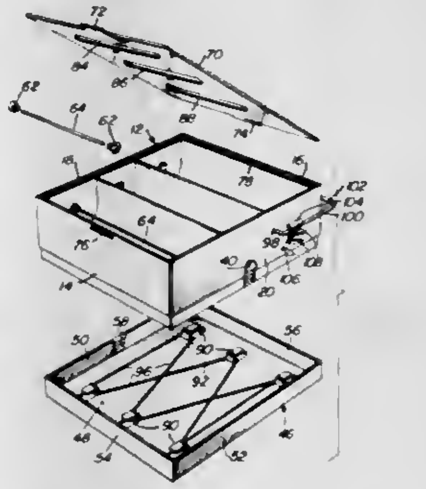
Dorothy M. Hauck, 415 E. Division St., Lockport, Ill. 60441

Filed May 16, 1977, Ser. No. 797,534

Int. Cl.² B65H *49/18*

U.S. Cl. 242—137.1 **10 Claims**

1. A caddy for various yarns to be used in knitting and crocheting, said caddy including an upwardly opening receptacle defining a plurality of upwardly opening individual recesses defined by upwardly concave bottom wall portions, a cover removably secured over the top of said receptacle and including openings formed there-through in vertical registry with said recesses and operative to slidingly receive yarn sections therethrough wound into hanks disposed in said recesses, said receptacle including two pairs of opposite upstanding sides, said bottom wall portions being semi-cylindrical and formed integrally with each other and said sides and extending



lengthwise between one pair of said sides, said sides extend downwardly below said bottom wall portions and the latter define a false bottom for said receptacle, and a generally horizontal bottom structure removably secured under said sides and defining a storage area between said horizontal bottom structure and said false bottom.

4,108,398

MAGNETIC RECORDING TAPE CARTRIDGE

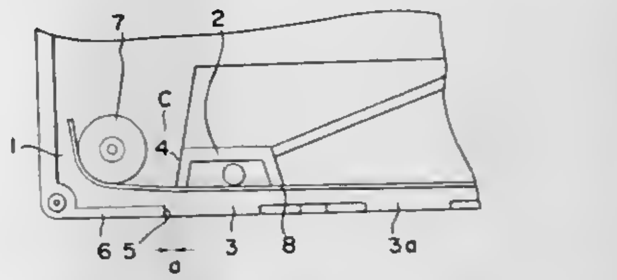
Noritsugu Hashimoto, and Shinichi Kagano, both of Kyoto, Japan, assignors to Hitachi Maxell, Ltd., Ibaragi, Japan

Filed Jun. 9, 1977, Ser. No. 805,032

Claims priority, application Japan, Jun. 10, 1976, 51/75837[U]; Jun. 10, 1976, 51/75842[U]

Int. Cl.² G03B *1/04;* G11B *15/32*

U.S. Cl. 242—199 **5 Claims**



1. A recording tape cassette having top and bottom cases defining an enclosure with a front wall having a plurality of apertures along the front edge thereof, a pair of guide means supported within the enclosure, a tape guide path extending between said guide means and adjacent said apertures, a pair of U-shaped guide walls having a height higher than the width of the recording tape and extending from either the bottom or the top of said cases, and adapted to extend behind the outermost apertures of the front wall and a pair of partition walls, each having a height substantially equal to about one-half of the inner height of the enclosure, each of said partition walls protrudingly extending from the top and bottom portions of said cases behind said plurality of apertures in the front wall of the enclosure and extending to cover all of said apertures, said partition walls being so arranged that the front surface of at least one of the end portions of a partition wall on one of the cases engages with the back surface of the corresponding U-shaped guide walls provided on the other case to cover said outermost aperture of the front wall of the case, said U-shaped guide wall acting as a stopping means through said engagement

with the partition wall to prevent transverse sliding between the top and bottom cases.

4,108,399

HERBICIDAL SEMICARBAZONES

Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

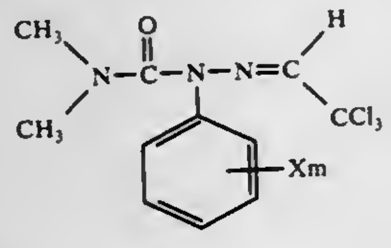
Continuation-in-part of Ser. No. 283,686, Aug. 25, 1972, abandoned. This application May 2, 1974, Ser. No. 466,103

Int. Cl.² C07C *133/02*

5 Claims

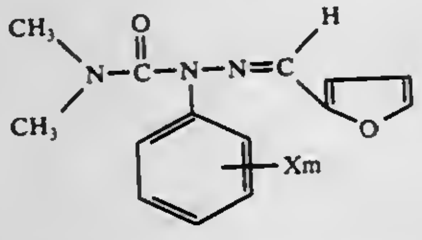
U.S. Cl. 542—417

1. A compound of the formula



wherein X is chlorine, and *m* is 2.

3. A compound of the formula



wherein *m* is 2 and one of X is chlorine and the other is fluorine.

4,108,400

DUAL MODE GUIDANCE SYSTEM

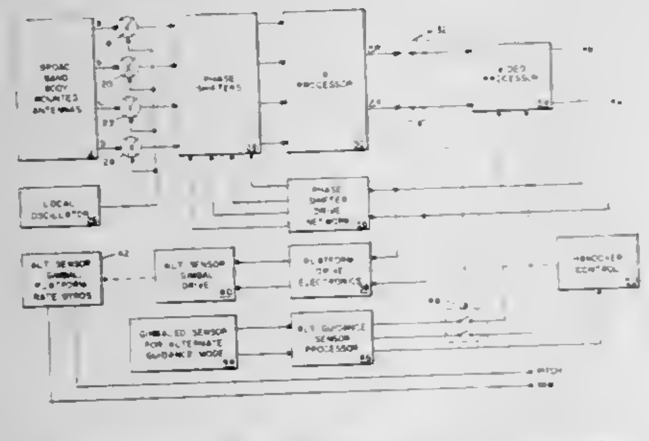
Frederick D. Groutage, Bonita, and Gabriel S. Borunda, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,965

Int. Cl.² F42B *15/10*

9 Claims

U.S. Cl. 244—3.15



1. A multimode missile guidance system comprising:
a missile radome;
an anti-radiation sensor mounted on said radome for outputting on first and second azimuth channels azimuth guidance plane signals and on first and second elevation channels elevation guidance plane signals;
a movable stabilized platform secured within said radome including drive means for positioning thereof;
an alternate mode guidance sensor mounted on said platform;
a first phase shifter means connected in at least one of said azimuth channels;
a second phase shifter means connected in at least one of said elevation channels;
a phase shifter drive network connected to said first and second phase shifter means;
an IF processor connected to the outputs of said first and second phase shifter means for developing detected video guidance signals;
video processor means connected to the output of said IF processor and to said phase shifter drive network for outputting d.c. pitch and yaw signals such that said phase shifter drive network drives said first and second phase shifter means such that the phase differential between said azimuth guidance plane signals on said first and second azimuth channels approaches zero and such that the phase differential between said elevation guidance plane signals on said first and second elevation channels approaches zero to effectuate null tracking;
a platform drive network connected to said video processor means for outputting position command signals to said movable platform drive means; and
an alternate mode guidance sensor processor having an input connected to said alternate mode guidance sensor and an output connected to said video processor means for outputting alternate mode detected video guidance signals.

4,108,401

MOTOR MOUNT FOR USE IN MODEL AIRPLANE

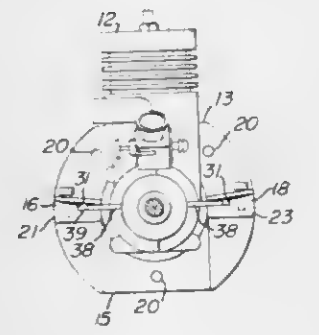
Matthew A. Sullivan, Elkins Park, Pa., assignor to Sullivan Products, Inc., Willow Grove, Pa.

Filed Dec. 7, 1976, Ser. No. 748,339

Int. Cl.² B64D *27/00;* **F16M** *13/00*

11 Claims

U.S. Cl. 244—54



1. A motor mount comprising:
a pair of arms extending outwardly from a mounting plate;
said arms extending in their lengthwise dimension generally perpendicularly from said mounting plate;
said arms being spaced from one another to form a slot for receiving a motor;
each arm having a generally horizontal surface for contacting flanges of a motor to be mounted thereon and an angled surface spaced above and sloping toward said horizontal surface; and
clamping means mounted on said angled surfaces and adapted for contacting upper surfaces of the flanges of the motor and for securing the flanges of the motor between said clamping means and said horizontal surfaces.

4,108,402

AIRCRAFT EMERGENCY LETDOWN SYSTEM

Arthur D. Bowen, Phoenix, Ariz., assignor to Eleanor J. Bowen, Phoenix, Ariz., a part interest

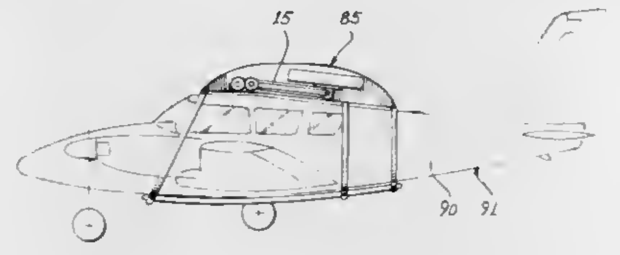
Filed Jan. 13, 1977, Ser. No. 758,960

Int. Cl.² B64D *17/62*

5 Claims

U.S. Cl. 244—139

1. A removable emergency aircraft letdown system for aircraft, said system comprising in combination:
a. at least one positionable platform for supporting at least one parachute sized and configured to support the aircraft at an acceptable rate of descent, each said platform being erectable from a first position to a second position;
b. erection means for erecting each said platform from the first position to the second position and deploying each parachute;
c. a pod juxtaposed with the top of the aircraft fuselage for storing each said platform and said erection means while each said platform is in the first position;
d. attachment means for securing the risers of each parachute to a point in general vertical alignment with the center of gravity of the aircraft;
e. actuation means for operating said erection means; and
f. strap means for securing said pod to said aircraft, said strap means extending downwardly from said pod to encircle the fuselage of the aircraft, said strap means includes a keel disposed longitudinally along the underside of the aircraft fuselage whereby, said system is detachably attachable to the aircraft to provide for descent by parachute of the aircraft in the event of an airborne emergency.



4,108,403

VORTEX REDUCING WING TIP

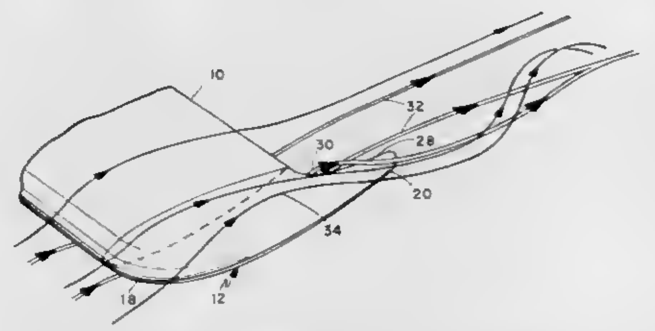
Reginald Vernon Finch, P.O. Box 934, Coronado, Calif. 92118

Filed Aug. 5, 1977, Ser. No. 822,134

Int. Cl.² B64C *21/00*

7 Claims

U.S. Cl. 244—199



1. A counter vortex airfoil tip for countering the vortex created by relative movement between the airfoil and a body of air, said tip comprising:
an inboard end for mounting on the outer end of an airfoil, the inboard end having a configuration substantially conforming to the profile of the airfoil to which said tip is mounted,
said airfoil tip defined by upper and lower surfaces extending outward and curving downward and extending aft at the outboard end thereof to a trailing tip extending approximately one half the length of the inboard end behind the trailing edge of the inboard end, said upper and lower surfaces joined at a leading edge that extends outward and curves downward to a lower edge that extends below the lower surface of said inboard end from the leading edge thereof to the trailing tip, and
said airfoil tip having an airfoil configuration in both its chordwise and spanwise direction.

4,108,404

ARRANGEMENT FOR PROTECTING DATA COMMUNICATION IN A CONTINUOUS AUTOMATIC TRAIN CONTROL SYSTEM

Helmut Ubel, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

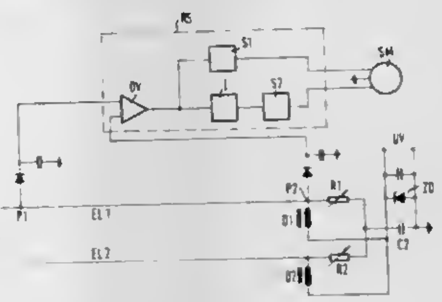
Filed Mar. 28, 1977, Ser. No. 781,827

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622270

Int. Cl.² B61L *21/08*

15 Claims

U.S. Cl. 246—34 CT



1. Apparatus for protecting data communication between vehicles and track conductor loops in a continuous automatic train control system comprising:
track conductor loop means;
automatically controlled resistor means for terminating said track conductor loop means; and
closed loop control means having as a command variable the electrical current or potential difference existing between two points on said track conductor loop means as a result of the occurrence of a standing wave.

4,108,405

LIGHT ASSEMBLY AND FLASHER CIRCUIT

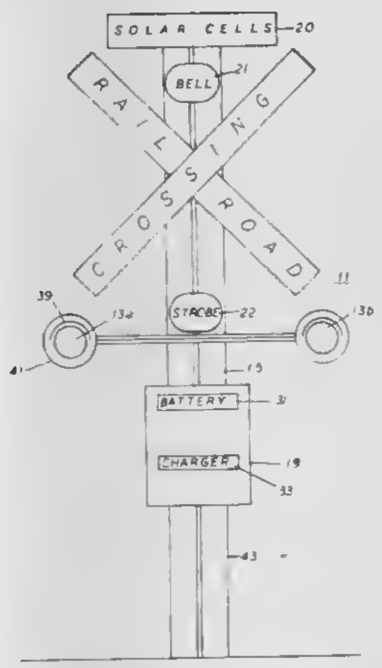
Preston H. Gibson, 226 Debbie Ann Ct., Auburndale, Fla. 33823

Filed Jun. 22, 1977, Ser. No. 809,115

Int. Cl.² B61L *23/08*

3 Claims

U.S. Cl. 246—125



1. A railroad crossing signal device comprising:
a. a T-shaped structure (**15**) with arm ends and lamp housing means at said ends, a center pole with a circuit housing, a battery charger and a battery compartment (**19**) thereat;
b. first and second bulb holders (**25**) in said lamp housing means, a shield (**35**) between said bulb holders, and an aperture (**37**) in said shield so that if one bulb is extinguished the remaining bulb will still provide a signal;
c. pairs of pig-tail lines leading from said circuit housing for

connection to rails including a pair of lead and a pair of lag lines;

d. a filter circuit (45) including a battery coupling connected to said pig-tail lines;

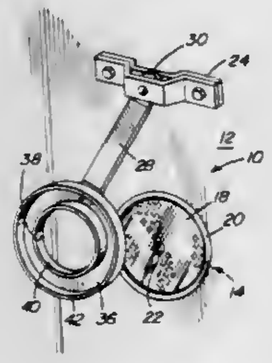
e. a logic circuit (47) coupled to said filter circuit (45) including logic means to ascertain the presence and direction of a train in the lead and lag directions, said logic circuit having output side (73); and,

f. a timer circuit coupled between said logic circuit and said bulbs including an enabling relay, said timer circuit providing a blinking signal to said bulbs.

4,108,406
RAIL CAR SAFETY REFLECTOR
David M. Williams, 501 W. Third St., Apt. 708, Davenport, Iowa 52801

Filed Jan. 16, 1978, Ser. No. 869,623
Int. Cl.² B61L *5/18*

U.S. Cl. 246—474 **8 Claims**



1. A passive visual warning device adapted to be mounted to a surface, comprising:

means mounted on the surface for directing light therefrom;

an arm member;

bracket means mounted on the surface in surmounting relation to the first-mentioned means for mounting the arm member at one end thereof for swinging movement relative to the first-mentioned means;

a cover member mounted on a free end of the arm member and disposed in superimposed relation to the first-mentioned means, the cover member at least partially occluding the first-mentioned means in at least certain positions relative thereto during swinging movement of the arm member and thus the cover member relative to said first-mentioned means; and,

means mounted on the cover member for catching air currents to cause the arm member and the cover member to swing relative to the first-mentioned means.

4,108,407
ADJUSTMENT DEVICE
Walter Lester Cable, Freehold; Derek Sidney Binge, Hamilton Square, and Rudolph Francis Korosec, Manville, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 14, 1975, Ser. No. 595,806
Int. Cl.² F16F *5/00*

U.S. Cl. 248—23 **12 Claims**

1. An adjustment apparatus comprising:

a first member,

a second member, and

a plurality of adjustment devices secured in spaced relationship to said first and second members for orienting said first member with respect to said second member and providing the sole support between said first and second members,

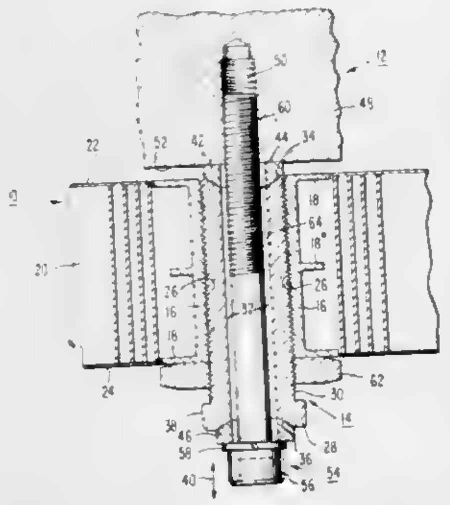
each said adjustment devices comprising,

a body having a first concave spherical seat disposed on one surface thereof and a second concave spherical seat disposed on a second surface thereof on a side opposite said one surface,

means coupled to said body for moveably securing said body to said first member so that said body translates in a first direction with respect to said first member,

a first support means having a spherical seat complementing and contiguous with said first spherical seat,

a second support means having a spherical seat complementing and contiguous with said second spherical seat, and

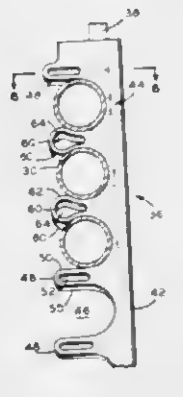


securing means extending through and spaced from said body and from each of said support means and in engagement with said second member for securing each of said support means and said body to said second member and for clamping said first and second support means to said body, whereby said second member is oriented with respect to said first member when said body is translated in said first direction without substantial stresses in said devices and members.

4,108,408
LOOPED TUBE CLAMP SUPPORT
James Paul Butti, Wadsworth, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jun. 3, 1975, Ser. No. 583,330
Int. Cl.² F16L *3/22*

U.S. Cl. 248—68 R **4 Claims**

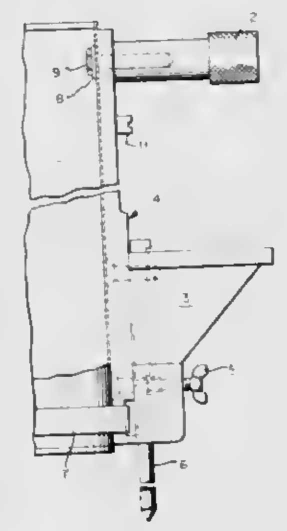


1. A spacer and support device for a heat exchanger having tube portions extending substantically parallel to each other, the device comprising a section formed with recesses to support and space the tube portions and with tabs disposed intermediate the recesses, each tab being formed with an enclosed aperture configuration, the enclosed aperture of each tab being slot like when its corresponding tube portions are set in place in corresponding recesses and adapted to be forcibly deformed to clamp its corresponding tube portions in place while maintaining the enclosed configuration of the aperture.

4,108,409
GOLF BAG ACCESSORY
Joseph Xavier Rombach, 5364 Plover La., Cincinnati, Ohio 45238, and James Hubert Lambert, 3705 Susanna Dr., Cincinnati, Ohio 45239

Filed Apr. 14, 1977, Ser. No. 787,546
Int. Cl.² A63B *55/00*

U.S. Cl. 248—96 **10 Claims**



1. Device, for affixing to a golf bag, comprising:

(a) a rigid, flat, longitudinal side strip of a length not substantially exceeding the length of the golf bag and having an upper end and a lower end, the ends being designated in relation to the upper and lower ends of the golf bag;

(b) a rigid grip handle adapted at one end to receive a pin extending through an aperture in the upper end of the side strip, said pin firmly positioning the grip handle against the side strip;

(c) a rigid press step having a plurality of surfaces forming the top, bottom, front, back and sides of the press step, having substantially the same width as the side strip, having a top to bottom longitudinally extending aperture and a second aperture extending from the front of the press step at a right angle to and intersecting the longitudinal aperture, and adapted to receive a plurality of pins extending through a plurality of apertures in the lower end of the side strip, said pins firmly positioning the press step, at the back, against the side strip, the top of the press step being suitably adapted for being contacted with the bottom of a golfer's shoe;

(d) a rigid holding rod slidably housed in the longitudinal aperture in the press step and pointably adapted at one end for easy penetration into the ground;

(e) a pin movably housed in the second aperture of the press step and adapted to fixedly engage the holding rod;

(f) means for affixing the lower end of the side strip to the golf bag; and

(g) a stop pin at the upper end of the side strip to prevent upward loss of the holding rod from the longitudinal aperture in the press step.

4,108,410
SUPPORT DEVICE FOR A CYLINDRICAL ROTARY MEMBER
Alain Chielens, Marcq-en-Baroeul; Gérard Marchal, Hellemmes, and Michel Gesqulere, Lille, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,280
Int. Cl.² F16C *13/06*

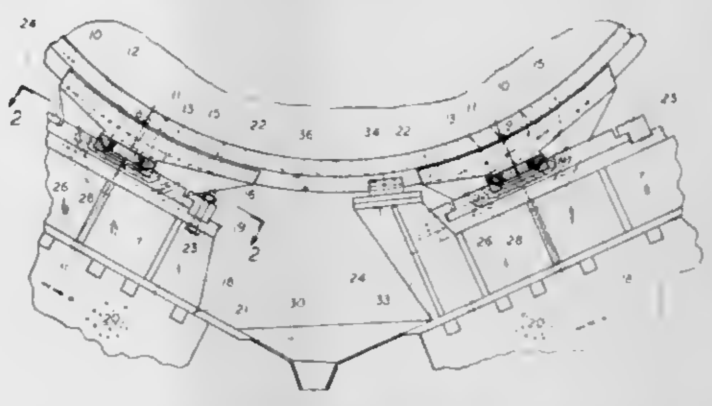
U.S. Cl. 248—130 **11 Claims**

1. A support device for glidably supporting a cylindrical member of large diameter arranged on the support device for rotation about an axis of the member and having a circumferentially extending, circular face portion, comprising

(a) a support having a support surface in gliding contact with the circular face portion to support the cylindrical member, two sides of the support surface extending in the circumferential direction of the circular face portion and defining the length of the support,

(b) a two-part ball-and-socket joint supporting the support for universal movement,

(c) a base supporting the joint, one of the joint parts being affixed to the support and the other joint part being affixed to the base, and

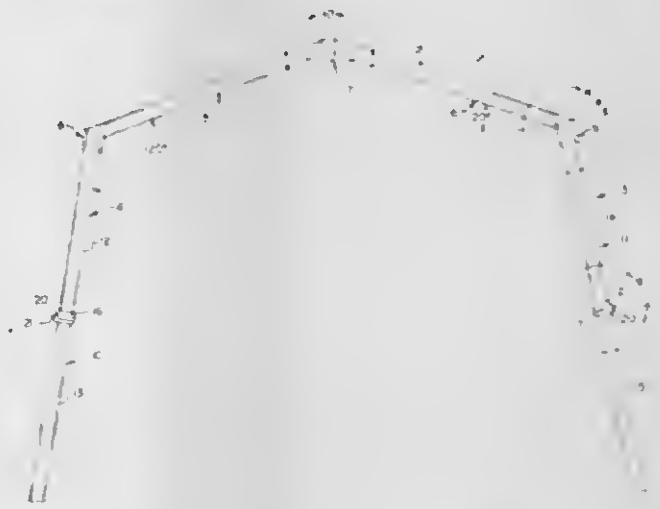


(d) a cheek plate integral with the support and extending from each of the support sides, the cheek plates enclosing the joint and a portion of the base whereby lateral movement of the support is restrained, and the cheek plates being configurated to stiffen the support and adapt the rigidity of the support to that of the circular face portion.

4,108,411
PORTABLE, COLLAPSIBLE HOISTING AND SUPPORTING APPARATUS
Eugene M. Spratt, 2057 Olive Ave., and Robert C. Dominguez, 38675 Paseo Padre Pkwy., #225, both of Fremont, Calif. 94538

Filed Mar. 22, 1977, Ser. No. 780,164
Int. Cl.² F16M *11/32*

U.S. Cl. 248—165 **8 Claims**



7. A portable hoisting apparatus comprising:

an arch-shaped cross member;

hinge means intermediate the ends of the arch-shaped cross member for folding the cross member;

means for attaching hoisting tackle to the cross member;

a first and a second supporting assembly each comprising a first and a second leg member for supporting the ends of the cross member;

means located at the ends of the cross member and at the top of the first and the second leg members in each of the supporting assemblies for slidably interconnecting the cross member and the supporting assemblies;

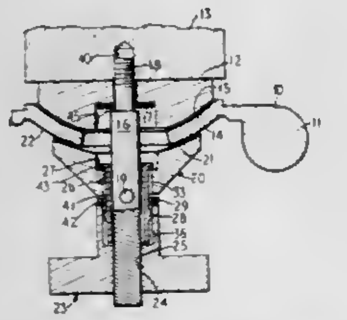
means for pivotably coupling one end of each of the first and the second leg members together for closing and spreading the first and the second leg members together and apart, each of said leg members comprising a first and a second leg section; and

means located intermediate the first and the second leg sections for folding and unfolding the leg sections to reduce the space required for storing the hoisting apparatus when the apparatus is disassembled for storage.

4,108,412

CLAMP FOR TRIPOD DEVICE

Robert Eric Miller, Vaucluse, and Stanley Bishop Jacksoo, Harbord, both of Australia, assignors to Universal Fluid Heads (Aust.) Pty. Limited, Ruschcutters Bay, Australia
Filed Aug. 4, 1977, Ser. No. 821,961
Claims priority, application Australia, Aug. 11, 1976, 6957/76
Int. Cl.^{2} F16M *11/14*
U.S. Cl. 248—181 **5 Claims**



1. Apparatus for clamping a camera tripod top to a mounting platform for a camera head, said tripod top having a body member with an upper socket and the mounting platform having a mating convex under surface, said apparatus comprising:

a clamping bolt having an upper portion secured within the mounting platform and a lower threaded portion;

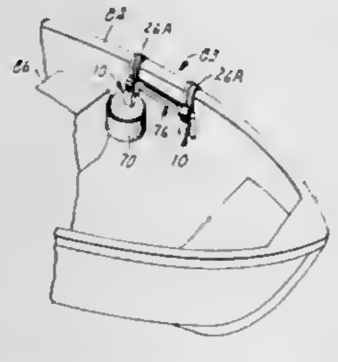
a clamp surrounding said clamping bolt adapted to clamp the mounting platform to the tripod top; and

a handle having a screw threaded small bore adapted to mate with the lower threaded portion of said clamping bolt and a larger bore shaped to accommodate a retaining sleeve, said retaining sleeve being adapted to rotate with said handle and to extend into a clearance bore in said clamp so as to be capable of rotation relative to said clamp but to retain said clamp in location about said clamping bolt when said handle, together with said clamp is removed by unscrewing from said clamping bolt.

4,108,413

CLAMPING DEVICE

Dean L. Goserud, 1981 Princeton Ave., St. Paul, Minn. 55105
Filed Aug. 19, 1977, Ser. No. 826,042
Int. Cl.^{2} A47K *1/08*
U.S. Cl. 248—214 **11 Claims**

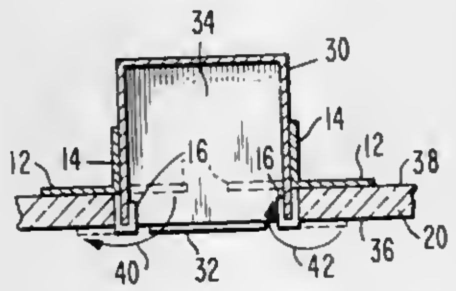


9. A clamping assembly comprising a pair of clamps and an interconnecting bar, each of said clamps comprising a pair of elongated nesting channel shaped elements comprising side flanges interconnected by a web actuating means joining the channel elements of each pair of one another to move said elements toward and away from their nesting relation with one another to receive, grip and release an object to be clamped between the opposing edges of the side flanges of each element, said actuating means attaching each clamp to one end of said interconnecting bar, said bar having a flange at each end thereof abutting the side wall of each clamp, the upper portion of one of the clamping elements of each clamp extending above said interconnecting bar and comprising means to suspend said assembly from a support.

4,108,414

OUTLET BOX FASTENER

Everett A. Grant, Sr., 116 Shaft St., Glace Bay, Nova Scotia, Canada
Filed Nov. 15, 1976, Ser. No. 741,663
Int. Cl.^{2} A47G *29/02*
U.S. Cl. 248—300 **2 Claims**



1. Apparatus for securing an electrical outlet in an opening of a wall member, comprising:

(a) an outlet box having two parallel sidewalls, an upper surface, a lower surface, a first flange extending generally vertically upward from said upper surface, and a second flange extending generally vertically downward from said lower surface, said outlet box positioned within said wall member opening with said flanges flush against the exterior surface of said wall member;

(b) a pair of fastener members, one fastener member adjacent each sidewall of said outlet box, each fastener member consisting of:

(1) a substantially planar first surface member positioned flush against the interior surface of said wall member;

(2) a substantially planar second surface member extending from and generally perpendicular to said first surface member, extending interiorly of said wall member and flush against the adjacent sidewall of said outlet box; and

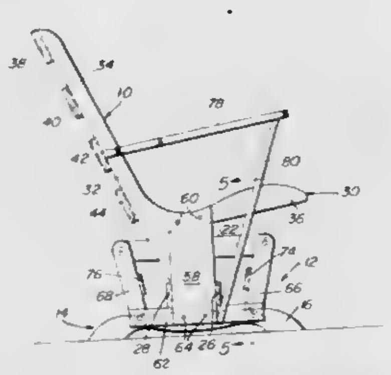
(3) two finger members extending from said first surface member, through said opening to the exterior of said wall member, and over the adjacent sidewall of said outlet box into the interior thereof.

4,108,415

ROCKER SUSPENSION SYSTEM

Guy J. L. Hauray, Granby, and William E. Chapdelaine, Chicopee, both of Mass., assignors to Guyray Industries, Inc. (Entire), South Hadley, Mass.
Filed May 11, 1977, Ser. No. 796,022
Int. Cl.^{2} A45D *19/04*
U.S. Cl. 248—370 **9 Claims**

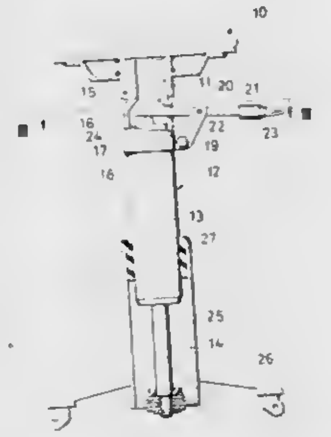
1. A suspension assembly including a base defining upstanding opposite side uprights adapted at their lower ends for stationary support from a horizontal surface, the upper end portion of each of said uprights including an elongated generally horizontal front to rear extending and projecting support head supported therefrom, each of said heads including a pair of elongated front and rear generally vertical support links whose upper end portions are pivotally supported from the front and rear end portions, respectively, of the corresponding head for oscillation about axes extending transversely of said links and heads, said pairs of links being disposed on the remote sides of said heads and uprights, an upper support structure disposed above said heads and including opposite side portions, said opposite side portions including depending support members supported at their upper end portions from said opposite side portions and disposed outwardly of the remote sides of said uprights and links, the lower end portions of said support members each including front and rear anchor points spaced forward and rearward, respectively, of a vertical transverse plane spaced equally between said axes, the lower end portions of said pairs of links being pivotally anchored to the corresponding anchor points of said support member lower end portions for oscillation relative thereto about axes generally paralleling the first mentioned axes and with said pairs of links spaced inwardly of the opposing sides of said support members and the corresponding anchor points, the approximate vertical midportions of the front and rear pairs of links each including a horizontal transverse brace extending and rigidly secured therebetween, the front brace extending between the front pair of links being lapped over the rear sides of the front links and the rear brace extending between the rear pair of links being lapped over the front sides of the rear links, and the opposite end portions of said front and rear braces being engageable with the underside portions of the front and rear extending portions, respectively, of said heads to limit rearward and forward swinging of said front and rear links, respectively.



4,108,416

DEVICE FOR ADJUSTING LENGTH OF GAS SPRING

Toshiro Nagase, Sagamihara, and Susumu Hatakeyama, Yokohama, both of Japan, assignors to Tokico Ltd, Kawasaki, Japan
Filed Sep. 9, 1976, Ser. No. 721,820
Claims priority, application Japan, Sep. 17, 1975, 50-127793[U]
Int. Cl.^{2} A47C *3/22*
U.S. Cl. 248—400 **1 Claim**



1. In apparatus for coupling a force-receiving seat member in adjustably spaced relationship to a support device and of the kind including

an elongate, adjustable length, fluid spring assembly having a cylinder body portion, fluid displacement chamber means within said body portion, a piston reciprocable within said body portion in operably coupled relationship with said fluid displacement chamber means and provided with a piston rod extending from the extremity of said body portion adjacent one end of said assembly, and a length-adjusting valve operably coupled with said fluid displacement chamber means for controlling the fluid therein to define a selected positioning for said piston and provided with a reciprocable valve operating element extending from the opposite extremity of said body portion;

means for reciprocably mounting said body portion on said support device;

means for operably coupling said piston rod with said support device;

means for mounting said force-receiving member on said assembly; and

lever means shiftable into engagement with a part of said valve operating element for actuating the latter;

the improvement of which apparatus comprises:

said assembly further has adjacent the opposite end thereof a coupling portion extending from said opposite extremity of said body portion beyond said valve operating element and serving as said mounting means for said member;

said coupling portion is provided with a cavity therein for receiving the engageable part of said valve operating element and with a lateral lever-clearing opening communicating with said cavity;

there is provided bracket means including a clamping portion for embracing said body portion of said assembly, a riser portion extending from said clamping portion into externally spaced relationship to said opening for pivotally carrying said lever means and means for pivotally mounting said lever means on said riser portion; and

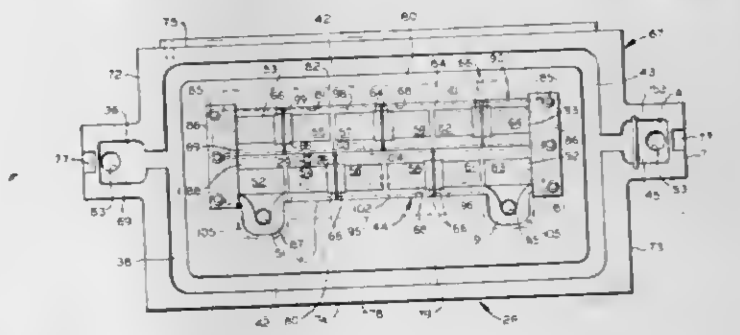
there is provided means for tightening said clamping portion in a selected position on said body portion to mount said bracket means solely on said body portion of said assembly in spaced relationship to said member for supporting said lever means on said assembly in properly positioned operative relationship with said valve operating element and without physical engagement or mechanical connection of said bracket and said lever means with said seat member,

whereby said lever means are mounted and positioned on said assembly independently of said seat member, so that said member may be mounted on said assembly in manner permitting emplacement, removal, replacement or exchange for another member without affecting the mounting and positioning of said lever means upon said assembly or the relationship of said lever means to said valve operating element.

4,108,417

BATTERY POST AND CONNECTOR STRAP MOLD

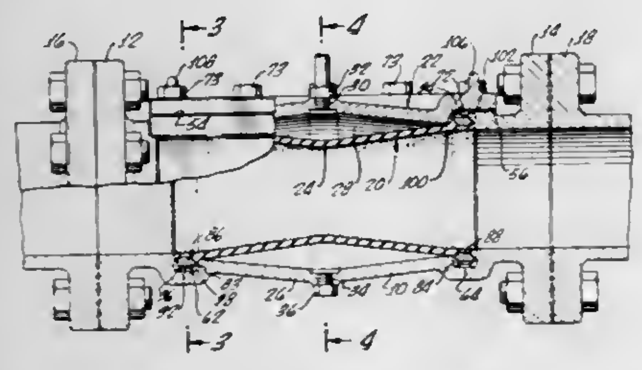
Robert D. Simonton, Fremoot, and Carl D. Schultz, Tiffin, both of Ohio, assignors to Dale Products, Inc., Fremont, Ohio
Filed Jul. 30, 1975, Ser. No. 600,203
Int. Cl.^{2} B22D *27/04, 23/04, 25/04, 35/04*
U.S. Cl. 249—81 **14 Claims**



1. A mold assembly for casting elements onto storage battery

plates comprising a base having a contoured upper surface including a generally horizontal flow channel having an inlet and an outlet spaced apart along the length of said channel for guiding the flow of molten metal along essentially the entire length of said channel between said inlet and outlet, a perimeter wall contiguous to portions of said flow channel of a first height sufficient to constrain molten metal under normal operating conditions of said assembly, a runoff surface contiguous to portions of said flow channel having a second height less said first height whereby the assembly is adapted to pass metal over said runoff surface when the level of molten metal in said channel is raised above said second height and below said first height under normal operating conditions of said assembly, said base being free of mold cavities in which elements are cast; an insert having at least a portion of each of a plurality of mold cavities in its upper surface and adapted to be mounted adjacent said base and separable therefrom, said mold cavities for the elements to be cast being entirely contained upon said insert; means mounting said insert contiguous with said runoff surface; said insert having a contoured upper surface in molten metal flow communication with said runoff surface and being in molten metal tight mating relationship thereto; a heat flow barrier means between said base and said insert; said base having a large thermal mass whereby molten metal flowing in said flow channel is maintained molten; said insert having a small thermal mass relative to that of said base in the portion thereof defining walls of the mold cavities; and a coolant jacket integral with said insert and extending over a majority of the underside of said upper surface upon which said mold cavities are contained whereby molten metal in said cavities can be solidified by admission of coolant to said insert jacket without cooling said base to a degree impeding the flow of molten metal in said flow channel.

4,108,418
FLUID OPERATED PINCH VALVE
Harold W. Ensign, Fullerton, and Clifford V. Zieg, Costa Mesa, both of Calif., assignors to Cla-Val Co., Costa Mesa, Calif.
Filed Jan. 19, 1977, Ser. No. 760,816
Int. Cl.² F16K *7/07*
U.S. Cl. 251—5 **22 Claims**



1. A fluid operated pinch valve comprising

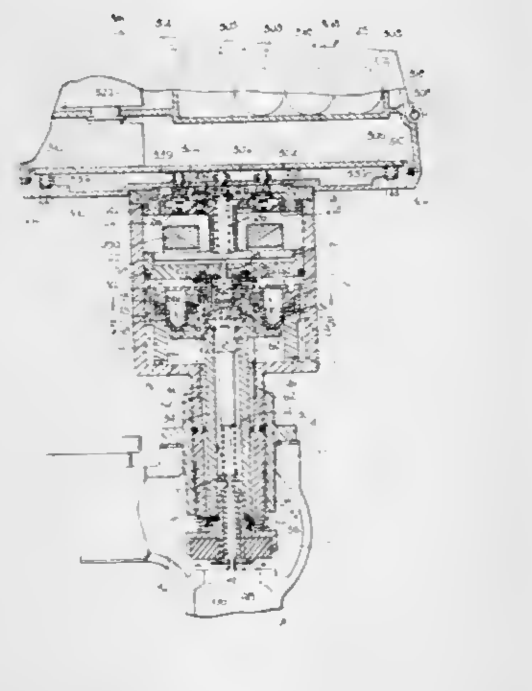
a tubular casing having a flow axis and having connecting end flanges for connecting the casing in a flow line,

a flexible tubular sleeve in said casing and having end sealing sleeve flanges, said casing and sleeve being radially spaced from each other between said end flanges to define an actuating chamber,

said casing including means for admitting fluid under pressure to said chamber, said casing being longitudinally divided for less than its full length to provide a first casing section having an opening spaced radially outwardly of said flow axis by a distance at least equal to an exterior radial dimension of said sleeve, and

a second casing section bridging and overlapping said opening both longitudinally and transversely (bridging said opening) to seal said casing sections to each other and to said sleeve flanges.

4,108,419
PILOT OPERATED VALVE
Oded E. Sturman, and Benjamin Grill, both of Northridge, Calif., assignors to Clifton J. Burwell, Northridge, Calif.
Filed Mar. 1, 1976, Ser. No. 662,360
Int. Cl. F16k *31/02, 31/08*
U.S. Cl. 251—30 **14 Claims**



1. A valve comprising:

a housing means having a lower housing for coupling to a valve body, and an upper housing,

a valve actuating means slideably extending into said lower portion of said valve body for motion between upper and lower positions and for defining a flow passage from said upper housing downward between said lower housing and said valve actuating means;

a valve closure means coupled to the lower portions of said valve actuating means for engaging a valve seat on a valve body when said valve actuating means in in said lower position;

a diaphragm within said upper housing coupled to said valve actuating means;

a diaphragm support member in said upper housing and supporting the outer periphery of said diaphragm, said diaphragm support member and said upper housing cooperating so as to allow fluid flow therebetween;

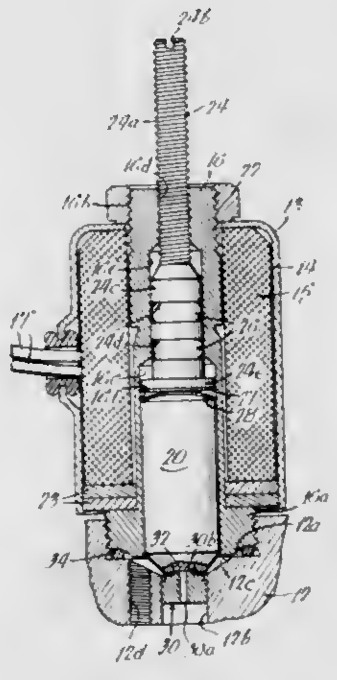
a pilot valve seat member above said diaphragm and mating with the diaphragm adjacent its periphery to define a fluid chamber therebetween, said pilot valve seat member having a pilot valve seat surrounding an opening therethrough;

a separator member above said pilot valve seat member, including means for sealing said pilot valve seat member with respect to said upper housing, said separator member having an opening therethrough concentric with said pilot valve seat;

a flexible member under said separator member to seal said opening therethrough, said flexible member being deflectable between a position against said pilot valve seat and a position spaced away from said pilot valve seat, said separator member and said pilot valve seat member having facingly disposed cooperative surfaces to define a flow passage therebetween; and

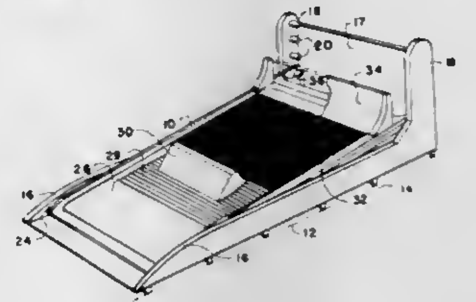
a pilot valve actuating member extending through said opening in said separator member to control the position of said flexible member.

4,108,420
ADJUSTABLE GAS FLOW CONTROL VALVE
Ernest James West, San Jose, and Gary M. Brandenburg, San Carlos, both of Calif., assignors to Thermco Products Corporation, Orange, Calif.
Filed Mar. 21, 1977, Ser. No. 779,611
Int. Cl.² F16K *31/06*
U.S. Cl. 251—129 **3 Claims**



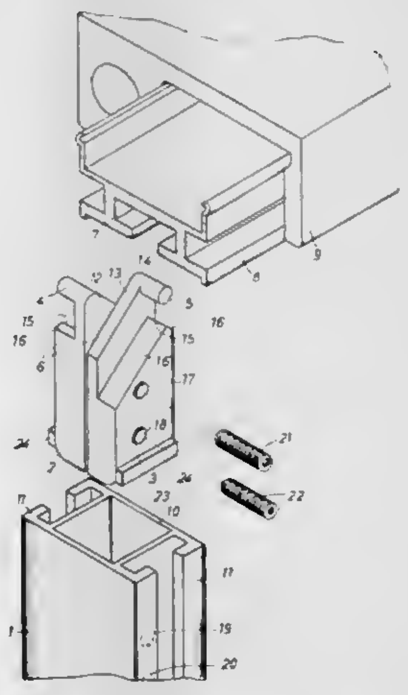
1. A gas flow control valve comprising a base member having a pocket formed to receive a portion of a valve mechanism, said mechanism including a plunger mounted for reciprocation within an elongated sleeve, said sleeve having a bore extending longitudinally therethrough, a first portion of said bore extending from one end of said sleeve being of a diameter to slidably support said plunger and terminating at an annular shoulder, a second portion of said bore extending from said other end of said sleeve and having internal threads formed therein, an elongated stop member having a threaded portion which threadedly engages said second portion of said sleeve bore and having an abutment portion extending into said first portion of said bore, said stop member comprising a piston having a threaded shank received in said second portion of said sleeve, said shank having a portion accessible outside of said sleeve to permit rotation of said piston to translate said plunger longitudinally of said sleeve, said piston being formed with a circular plate forming said abutment portion on the end within said first portion of said sleeve bore, an intermediate portion on said piston between said threaded shank, said plate being of a diameter intermediate the diameters of said plate and of said shank, said bore having a third portion extending between said first and second portions having a diameter intermediate the diameters of said first and second portions, gasket means on said stop member between said abutment portion and said threaded portion to prevent gas leakage through said sleeve, said gasket means comprising at least one O-ring received in an annular channel in said intermediate portion of said piston, said O-ring being compressed in said sleeve against said third portion of said bore, spring means between said plunger and said abutment means, an electrical coil surrounding said sleeve to create an electromagnetic field to move said plunger longitudinally in opposition to said spring means, said base member having a valve seat which is engaged by said plunger to cut off gas flow when said coil is deenergized.

4,108,421
LEVELING UNIT FOR PARKED VEHICLES
James M. Extine, Roseville, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Dec. 7, 1977, Ser. No. 858,258
Int. Cl.² E02C *3/00*
U.S. Cl. 254—88 **4 Claims**



1. A leveling unit for parked vehicles comprising a generally horizontal stand having a vertical front end; ground-engaging means under said stand; a vertically adjustable tire-supporting ramp mounted on said stand; a plurality of spaced fastening means on said front end cooperating with means integral with the front end of said ramp for securing said ramp at a desired angle to said stand; curved, tire-hugging means near said front of said ramp for engaging one side of a vehicle tire and a wedge means for engaging the other side of said tire to prevent movement thereof.

4,108,422
ARRANGEMENT FOR SUPPORTING A RAILING AND THE LIKE
Horst Fleischmann, Munich, Fed. Rep. of Germany, assignor to Gebrüder Kömmerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany
Filed Apr. 22, 1977, Ser. No. 790,139
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618443
Int. Cl.² F16B *7/04*
U.S. Cl. 256—67 **12 Claims**



1. An arrangement for supporting an elongated railing or the like which is provided with a longitudinal T-shaped groove and a slot communicating with said groove, comprising a supporting member having a longitudinally extending inner hollow; a T-shaped clamping element including two clamping members located adjacent one another, said clamping members each having a longitudinally extending first portion and a transversely extending pin-shaped second portion having an

axis, the axis of one of said pin-shaped second portions being substantially parallel to but offset relative to the axis of the other pin-shaped second portion in a direction transverse to said axes thereof and to the elongation of said first portions, said first portions of said clamping elements being insertable in said hollow of said supporting member and movable relative to each other in the direction of elongation of said hollow, said pin-shaped second portions being insertable in the T-shaped groove of said railing; and means for spreading said clamping members apart from each other so as to thereby clamp said first portions in said supporting member and to clamp said pin-shaped second portions in the T-shaped groove of said railing.

4,108,423

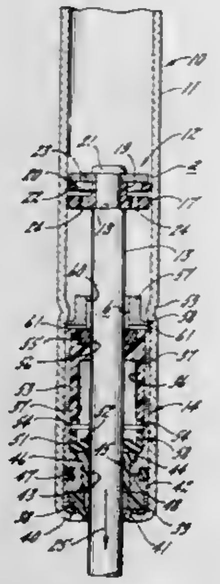
GAS SPRING

John J. Skubal, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jul. 19, 1976, Ser. No. 706,903

Int. Cl.² F16F *5/00*

U.S. Cl. 267—64 R **9 Claims**



1. In a gas spring having a cylinder closed at a first end, a rod slidably projecting into the cylinder through the second end thereof and carrying a piston assembly, and oil and gas under pressure within the cylinder, the combination of, means disposed within said cylinder adjacent said second end and supporting said rod for axial sliding, sealing means disposed within said cylinder adjacent said second end and forming a seal around said rod and between the rod and the cylinder, and a cylindrical member disposed within said cylinder inwardly of said sealing means and fitting snugly within the cylinder, said cylindrical member having an internal cavity forming a reservoir and a capillary passage formed in said member, said passage communicating with said reservoir and with the interior of said cylinder, a portion of the oil in said cylinder being in said reservoir and a portion of the oil being held in said passage by capillary attraction whereby the reservoir is replenished with oil from said passage thereby to maintain a body of oil between said sealing means and the gas in the cylinder.

4,108,424

CAGING DEVICE

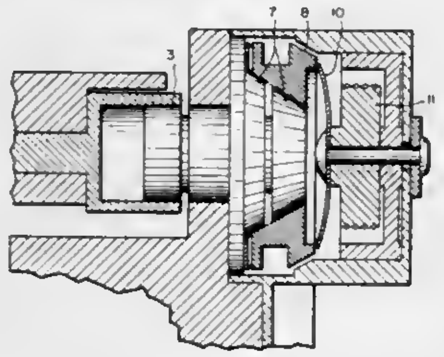
Anthony A. Rizzo, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 29, 1976, Ser. No. 671,197

Int. Cl.² F16F *1/18;* **F16D** *11/06*

U.S. Cl. 267—160 **5 Claims**

1. A caging device comprising:
a tubular shaft,
a shaft extending concentrically through said tubular shaft,
a support mounting said shafts for rotation relative to one another and to said support,
coaxial, axially spaced frusto-conical clutch surfaces on said shafts, respectively, having a common vertex,
a caging member including a conically tapered clutch surface coaxial with and of the same cone angle as said frusto-conical clutch surfaces, and



actuating means for effecting movement of said caging member to and from an engaged caging position, wherein its clutch surface simultaneously engages the clutch surfaces of said shafts to lock the shafts against relative rotation.

4,108,425

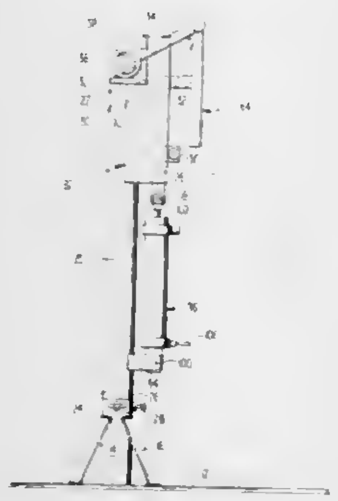
MOTOR WORK STAND

George Frederick Crabtree, P.O. Box 1135, Winter Garden, Fla. 32787

Filed Dec. 28, 1977, Ser. No. 865,349

Int. Cl.² B23Q *1/04*

U.S. Cl. 269—71 **4 Claims**



1. An outboard motor repair stand comprising:
a base with a vertically extending standard projecting therefrom;
a carrier tube slidably engaged on the standard and means to lock the carrier tube at selected height on the standard, the carrier tube having an upper end;
a bracket on the upper end of the tube, the bracket including a horizontal foot and a vertical leg;
a sleeve fixedly secured to the bracket;
an elongated horizontal rod mounted within the sleeve, and having first and second side portions projecting laterally from the sleeve;
an outer bearing assembly on the first side portion of the rod, and an inner bearing on the second side portion thereof;
a radial, outward arm on each of said bearing assemblies;
a motor mounting plate pivotally secured between the arms, and having mounting tabs on one face thereof;
a channel track assembly fixedly secured to the carrier tube and to the bracket adjacent the upper end of the tube;
a hydraulic pump mounted on the rod;
a hydraulic cylinder, including an extensible and retractable ram vertically mounted on the tube below and in alignment with the channel track assembly; hydraulic conduit means extending between and operatively associating the pump with the hydraulic cylinder; and
a trolley assembly having a lower end secured to the ram, an upper end lock section pivotally secured to said mounting tabs on said motor mounting plate, and a series of rollers engaging the channel track assembly.

4,108,426

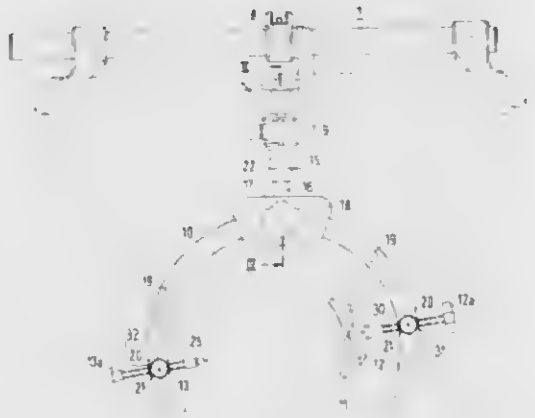
DEVICE FOR HOLDING THE HEAD OF A PATIENT

Harry Lindstroem, Solna, and Sverre Kvaerna, Farsta, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,448

Int. Cl.² A61G *13/00*

U.S. Cl. 269—328 **10 Claims**



1. A device for holding a head of a patient in a fixed position during a surgical operation comprising a base support, a ring-like curved element having a sufficient radius of curvature to enable receiving the head of the patient within the element, means for supporting the ring-like curved element on the base support including a ball and socket joint having means for manually arresting the joint in any desired postion, a pad supported on a rod acting as a headrest, a pin support on a rod for holding a head in a fixed position on said pad, means for mounting the rod supporting said pad on the element and means for mounting the rod supporting the pin on the element, both of said means for mounting being adjustable to enable changing the length of the respective rods extending from the element to clamp the head of the patient between the pad and pin.

4,108,427

FEEDING DEVICE

Shigehiro Komori, Yokohama; Hiroyuki Hattori, Tokyo; Tsuneki Inuzuka, Machida, and Koichi Miyamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

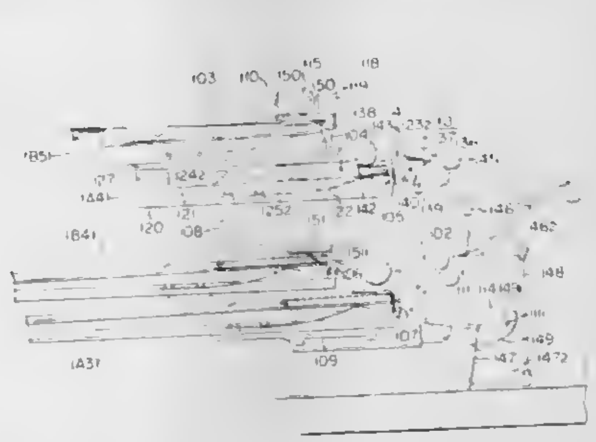
Continuation of Ser. No. 677,124, Apr. 15, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,861

Claims priority, application Japan, Apr. 18, 1975, 50-47250; May 6, 1975, 50-55076

Int. Cl.² B65H *1/28, 3/44*

U.S. Cl. 271—9 **9 Claims**

1. A copy material feeding device, comprising:
a cassette unit provided with a plurality of cassettes each having a copy material feeding portion which is disposed out of vertical alignment with another cassette, wherein said cassettes are mounted on said cassette unit such that the relative distances between the feeding portions of said cassettes are constant at all times;
single feeding means for feeding copy material in a predetermined direction of movement from the feeding portion of a cassette positioned adjacent thereto; and
means for moving said cassette unit in the direction of movement of the copy material to position a selected one of said cassettes with its feeding portion adjacent to said feeding means without moving any of said cassettes relative to said cassette unit.



4,108,428

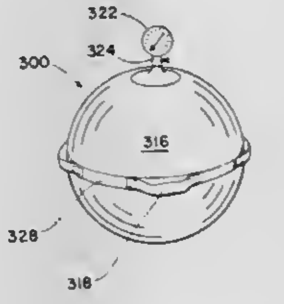
PORTABLE PUNCH POWER GAGE

Harold E. Winterbottom, 1702 Lansing Rd., Glen Burnie, Md. 21061

Filed Apr. 18, 1977, Ser. No. 738,225

Int. Cl.² A63B *69/32*

U.S. Cl. 272—76 **1 Claim**

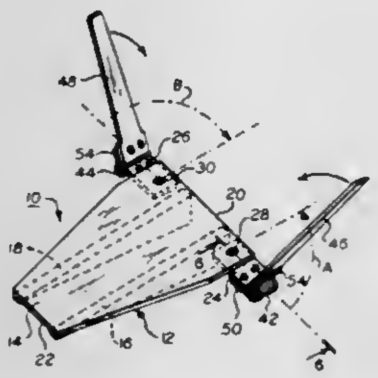


1. In boxing practice apparatus including a punching bag or the like, means for supporting the punching bag, means for indicating punch power, including a pneumatic pressure compartment associated with at least a portion of said punching bag in position for receiving punches during boxing practice, a pneumatic pressure meter, and means connecting said pneumatic pressure compartment with the pneumatic pressure meter for thereby forwarding pressure increase to and indicating punch power on the pneumatic pressure meter as a function of punch-induced pressure increase in said pneumatic pressure compartment, the improvement comprising: the means connecting said pneumatic compartment with the pneumatic pressure meter including a check valve for holding a said pressure increase in the pneumatic pressure meter, the check valve having manually actuable means for releasing pressure from the pneumatic pressure meter through the check valve into the punching bag for resetting the pneumatic pressure meter, the pneumatic pressure meter being located at the top central portion of the punching bag, the punching bag being spherical and the means for supporting including four strap handles equally spaced around the equator thereof located in position for alternatively holding the punching bag with the pneumatic pressure meter facing toward, or away from, or to either side of, a user during boxing practice.

4,108,429

SPRING TYPE EXERCISE DEVICE FOR BREAST MEASUREMENT DEVELOPMENT

Thomas Minichiello, 244 W. 49th St., New York, N.Y. 10019
Filed Jan. 10, 1977, Ser. No. 758,069
Int. Cl.² A63B *21/04*
U.S. Cl. 272—136 **6 Claims**



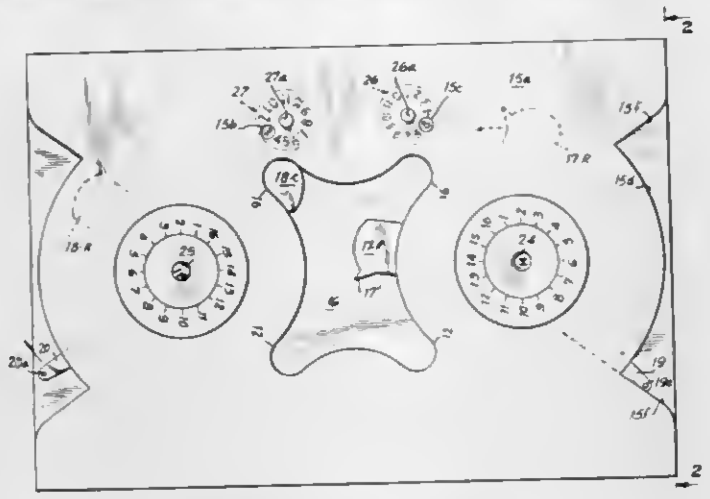
1. A device for exercising female pectoral muscles to achieve breast measurement development, which comprises:
support base means for positioning the supine body of the exerciser so that said base support means accomodates the shoulders and upper back of the exerciser and is held in place on the floor by the weight of the exerciser;
a pair of rigid connecting members attached to the base means and extending outwardly beyond said base means;
pivot means for mounting said pair of connecting members each independently rotatable in a substantially horizontal plane on said support base means to selectively position the connecting members in a plurality of horizontal positions;
a pair of rigid exercise lever arms attached to said connecting members; and
a pair of yieldable spring resistant hinge means for connecting each of said pair of exercise lever arms to each of said connecting members so that said lever arms extend biasedly upward and outward from said support base means, each said pair of yieldable spring resistant hinge means being positioned substantially adjacent to one shoulder of the exerciser,
permitting the rxerciser, in a reclined position with her back on the base means and her arms fully extended, so as to be capable of grasping each of said lever arms, to pull inwardly toward the body's center as far as possible against the biasing force of said yieldabl spring resistant hinge means, then to allow said lever arms to return to their outwardly extending starting position under action of the hinge means, the body motions involved being produced by the full flexion and extension of the pectoral muscles substantially alone.

4,108,430

ACTION GAME

Morton P. Matthew, Litchfield, Conn., and Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11320, assignors to Michael I. Rackman, New York, N.Y.
Filed Jul. 20, 1977, Ser. No. 817,199
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 R **17 Claims**

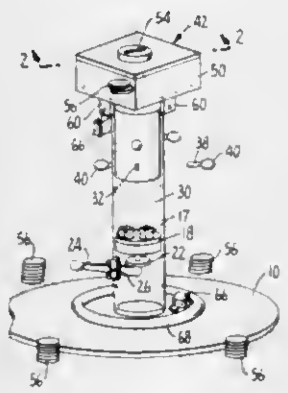
1. An action game for two players comprising a piece for eacb player; a pair of manually operated means associated with respective players for moving the respective pieces along respective paths; means for identifying a play area through which both of said pieces move, less than half of each respective path passing through said play area; a pair of means each for enabling a respective player to select a discrete number of positions through which his respective piece is moved responsive to the operation of the respective manually operated means, both of said enabling means allowing the selection of the same minimum number of positions and the same maximum number of positions, and each of said respective paths having the same number of discrete positions therealong; and means for varying the appearance of each of said pieces when it enters said play area depending upon the presence of absence of the piece of the other player in said play area.



4,108,431

GAME APPARATUS

Manuel Camara, 600 Jennings Ave., Vallejo, Calif. 94590
Filed Aug. 8, 1977, Ser. No. 822,895
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 R **3 Claims**



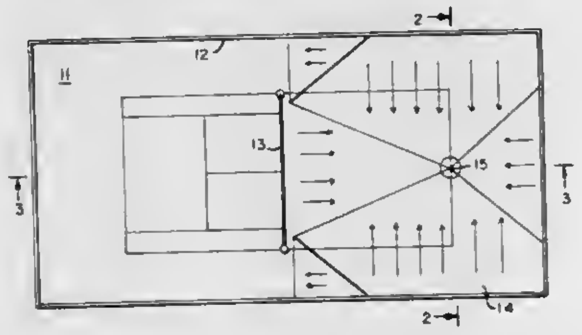
1. Game apparatus comprising a support base, an upright, tubular carrier member mounted on the base, a platform disposed within said member and means mounting the same therein for two-way vertical movement, a pair of dice supported by said platform, means for impacting said platform to throw the dice thereon, said member having a transparent wall portion for the viewing of said dice, a collection box having a coin-slot entryway for chips and the like removably attached to the upper end of said member, a plurality of key-operated locks removably attached to said box and individually effective in the closed condition to prevent the opening of said box, and keys for said locks.

4,108,432

TENNIS BALL COLLECTION, PICK-UP AND PROPELLING SYSTEM

Thomas S. Clark, Monte Sereno; William S. Kennedy, San Jose, and Robert L. Piziali, Stanford, all of Calif., assignors to American Tennis Systems, Inc., Sunnyvale, Calif.
Division of Ser. No. 386,308, Aug. 7, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,081
Int. Cl.² A63B *69/00*
U.S. Cl. 273—29 A **3 Claims**

1. A tennis practice and instruction facility including
a firm surfaced area laid out similar to a tennis court and including a tennis net dividing the area into a playing area and a return area said playing area being formed on a level surface;
the return area surface being gradually sloped to a common point near the center of the area as measured between two sides such that the return area forms a shallow depression of sufficient slope to cause the balls to roll toward the common point;
a tennis ball retrieving and propelling device positioned in the depression at the common point of the return area including means for retrieving individual balls from the common point and means for propelling the balls across the tennis net and into the playing area;

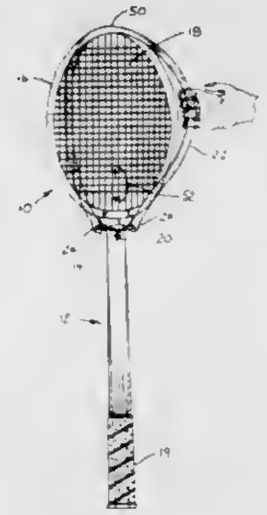


control means positioned in the playing area and connected to the tennis ball retrieving and propelling device and adjustable for regulating the tennis ball retrieving and propelling device to set the direction the ball is propelled into the playing area; and
the tennis ball retrieving and propelling device including means positioned adjacent the surface at the bottom of the depression for contacting and stirring the balls to assure proper cueing of the tennis balls located in the depression and for moving them in serial fashion along a predetermined path for retrieval by the device.

4,108,433

TENNIS RACKET WITH WARM-UP WEIGHT

Bruce B. Althoff, 2602 Windwood Ct., Atlanta, Ga. 30360
Filed Feb. 14, 1977, Ser. No. 768,419
Int. Cl.² A63B *69/38*
U.S. Cl. 273—29 A **7 Claims**

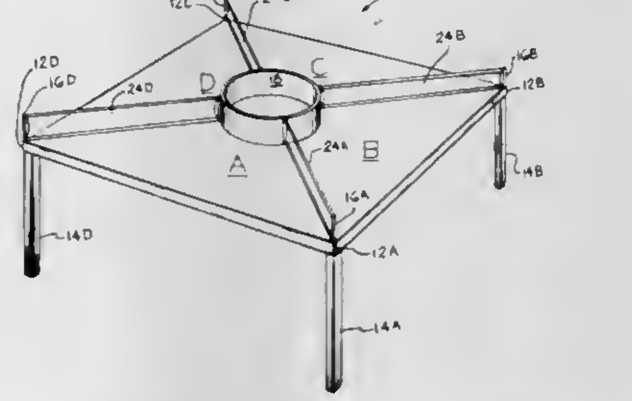


5. A racket having a warm-up device detachably mounted thereto and comprising a racket head having a generally oval shaped periphery, a racket handle mounted to said racket head at a racket throat, a one-piece, elongated, u-shaped, flexible member mounted flush about said oval periphery of said racket head with its ends positioned closely adjacent one another straddling said racket throat, and a flexible connector mounted around said racket throat and secured to said member ends thereby holding said ends snuggly to opposite sides of said racket throat and holding said oval shaped priphery between the legs of said u-shaped cross-section.

4,108,434

MULTI-NET TABLE TENNIS APPARATUS

George Ronald Royer, Toledo, Ohio, assignor to Robert L. Bratton, Swanton, Ohio, a part interest
Filed Mar. 8, 1977, Ser. No. 775,578
Int. Cl.² A63B *61/00*
U.S. Cl. 273—30 **2 Claims**

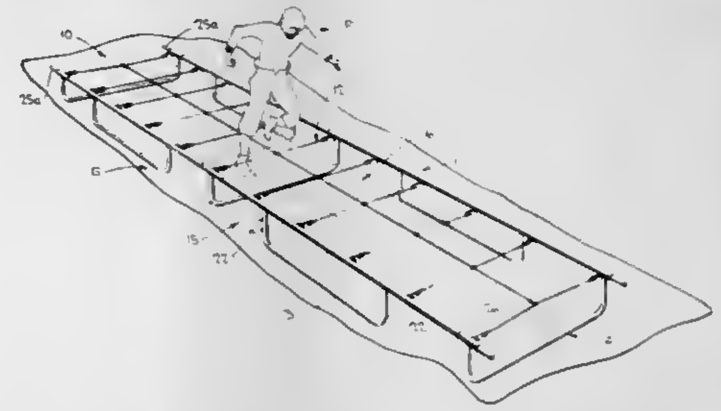


2. A game apparatus for a variation of table tennis comprising:
(a) a playing surface having outer peripheral limits;
(b) a hollow member with an opening located on the upper part thereof, said hollow member extending upwardly from said playing surface and being located in the center of the playing surface and having solid sides around its peripheral circumference for retaining insufficiently hit balls;
(c) four nets extending in radiating fashion from the hollow member to arbitrary points in the outer limits of the playing surface.

4,108,435

PORTABLE RUNWAY WITH LONGITUDINAL SUPPORTS AND TENSION HOLDING MEANS

James T. Coleman, P.O. Box 1341, Paducah, Ky. 42001
Filed Jul. 12, 1976, Ser. No. 704,523
Int. Cl.² A63B *67/00*
U.S. Cl. 273—55 R **6 Claims**



1. A portable runway for use by a runner to practice running along a course on a generally flat surface comprising,
an elongated framework including a plurality of opposed side members forming multiple sections,
means for detachably connecting said side members along each side to provide assembly of said sections,
cross members adapted to support said side members in a spaced relationship to each other and in spaced relationship to said flat surface,
separate longitudinal members adapted to support said side members in a spaced relationship to said flat surface,
said cross support members being of generally U-shaped configuration and extending across said running course only at said connection of said side members,

means connected to said framework and forming a latticework at a predetermined height above said surface and at predetermined spaced intervals to define spaces along said course in which the runner is to place his feet during use for high stepping running,

said running course being free of obstacles below said lattice work and between each of said cross members, to allow freedom of movement of the runner,

said longitudinal support members extending substantially directly below said side members and outside said course to prevent the runner from stepping thereon,

and resilient means on said latticework means having sufficient resiliency to yield sufficiently to permit the runner's feet to engage said surface along said course when stepped on.

4,108,436

AIRED GRIP FOR TENNIS RACKETS

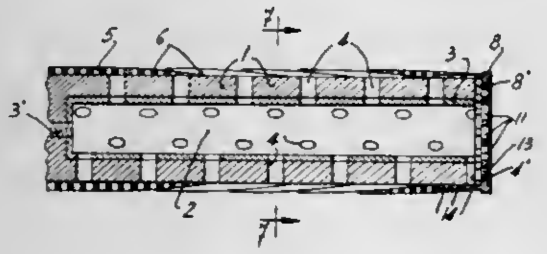
Lamberto Masi, 20016 Pero (Milan), Italy

Filed Dec. 9, 1976, Ser. No. 749,058

Claims priority, application Italy, Dec. 16, 1975, 30337 A/75; Mar. 3, 1976, 21071 A/76

Int. Cl.² A63B *49/08*

U.S. Cl. 273—75 **17 Claims**



1. A handle for tennis rackets and the like, comprising:

an elongated shaft defining a gripping portion and having a longitudinal bore extending axially from the free end of said shaft;

a plurality of passages in said shaft, said passages extending radially from said bore to the outer surface of said shaft, with at least one of said passages being disposed at least partially in the plane of the free end of said shaft;

a plurality of grooves disposed on the outer surface of said shaft;

a tubular reinforcing member disposed within said bore, said tubular member having a plurality of holes extending through the wall of said member and in fluid communication with said passages and grooves;

a cap attached to the free end of said shaft and having a sidewall extending over the free end portion of said shaft and an end wall disposed adjacent to said free end, said sidewall having a plurality of holes extending therethrough, and said end wall having a central aperture aligned with said bore; and

a ventilation chamber defined between the free end of said shaft and the adjacent inner surface of said end wall, and in fluid communication with said grooves and said holes in said sidewall,

said bore, passages, grooves, holes and ventilation chamber being in fluid communication and cooperating to form a plurality of fluid flow paths therethrough to ventilate said shaft.

4,108,437

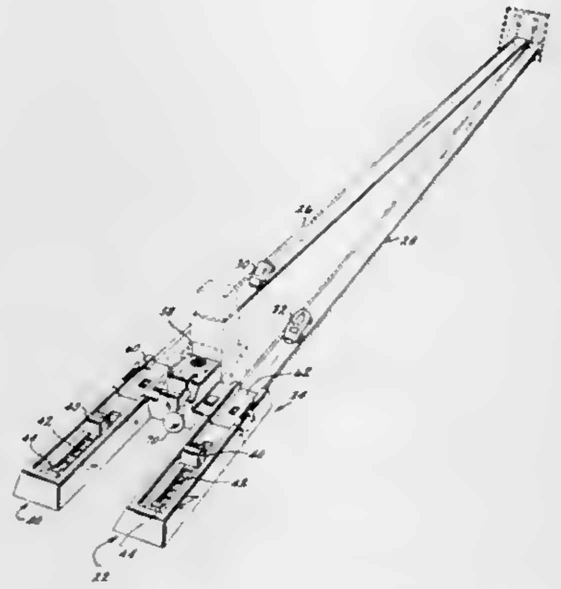
TOY VEHICLE STARTING AND LAUNCHING SET

Nicholas DeAnda, Redondo Beach; Robert F. Dyer, Rancho Palos Verdes, and Roger A. Newbold, Gardeo Grove, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 17, 1977, Ser. No. 759,633

Int. Cl.² A63B *9/14*

U.S. Cl. 273—86 D **8 Claims**



1. In a delayed action starting apparatus for use with toy racing cars or the like, the combination comprising:

a housing;

timer means coupled to said housing and operable under the force of gravity between upper and lower positions;

a spring-biased mechanism pivotally mounted within said housing;

latch means;

means on said timer means adapted to pivot said spring-biased mechanism against the force of its bias to engage said latch means upon movement of said timer means from said lower to said upper position, said means on said timer means being adapted to disengage said latch means upon said timer means reaching said lower position; and

other means mounted within said housing for emitting an audible signal in response to the pivoting of said mechanism under the force of its bias spring when released.

4,108,438

METHOD OF PLAYING A BOARD GAME

Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11230

Filed Nov. 15, 1976, Ser. No. 733,473

Int. Cl.² A63F *7/00*

U.S. Cl. 273—120 R **20 Claims**

1. A method of playing a board game, said board game having the following parts:

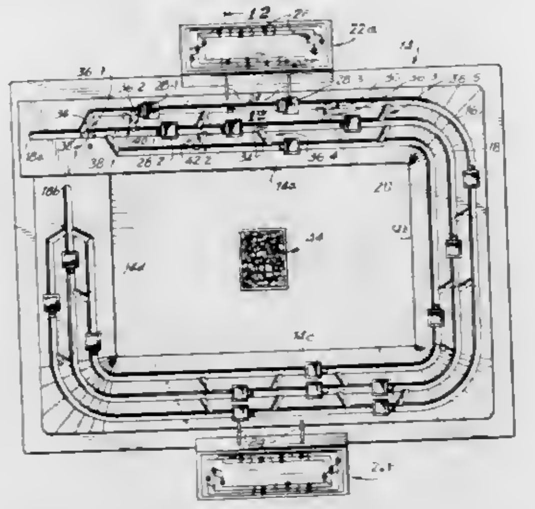
(a) a board having a plurality of tracks with a plurality of interconnecting segments therebetween, and a plurality of identifiable positions along said tracks,

(b) a plurality of switching means adapted to be placed on the board in the regions of said interconnecting segments for defining an operative path from a start point to a finish point and including selected segments of said tracks and selected ones of said interconnecting segments, and

(c) at least two sets of player pieces having a plurality of respective scoring values operatively associated therewith, said pieces being selectively placed by at least two respective players on said identifiable positions, comprising the steps of

(a) the players taking turns and alternately placing their player pieces on selected ones of said identifiable positions, the player pieces then remaining in their respective selected positions throughout the performance of the subsequent steps,

(b) thereafter, the players taking turns and alternately placing switching means on the board in selected ones of said regions until a complete operative path is defined, and



(c) thereafter, examining the scoring values associated with the player pieces which lie along the operative path defined in step (b).

4,108,439

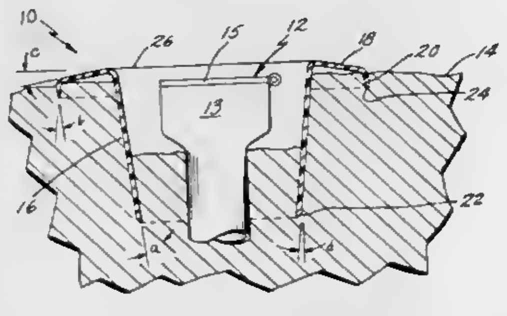
SPRINKLER HEAD LOCATER AND MARKER AND METHOD

Murvail C. McGuire, 7820 Mackinaw Trail, Cadillac, Mich. 49601

Filed Apr. 14, 1976, Ser. No. 676,726

Int. Cl.² B05B *15/06;* A63B *69/36*

U.S. Cl. 273—176 R **12 Claims**



1. In combination, a device for marking the position of and for protecting a sprinkler valve or head and a sprinkler valve or head within the ground; said device comprising:

a single-piece, hollow member positioned around the valve or head and located in the ground, said hollow member having a tapering, inside surface spaced outwardly away from and surrounding the valve or head to provide an internal open space between said inside surface and the valve or head and which opens vertically around the valve or head, said inside surface tapering upwardly and outwardly from a lower end in the ground to an upper end spaced above said valve or head, the opening at said upper end being larger than the opening at said lower end and the valve or head;

flange means adjacent the upper end of said member and extending outwardly from said upper end for contacting the ground to limit the depth of insertion of said member and to stabilize the orientation of said member in the ground and for deflecting equipment and vehicles up and over said valve or head; said flange means extending around said upper end of said member from a position flush with said inside surface of said hollow member at said upper end and downwardly from said position into contact with the ground; said internal open space between said inside surface and valve or head and said opening at said upper end providing sufficient room for operation of the object such as a sprinkler valve or bead while preventing contamination of the object by dirt and debris.

4,108,440

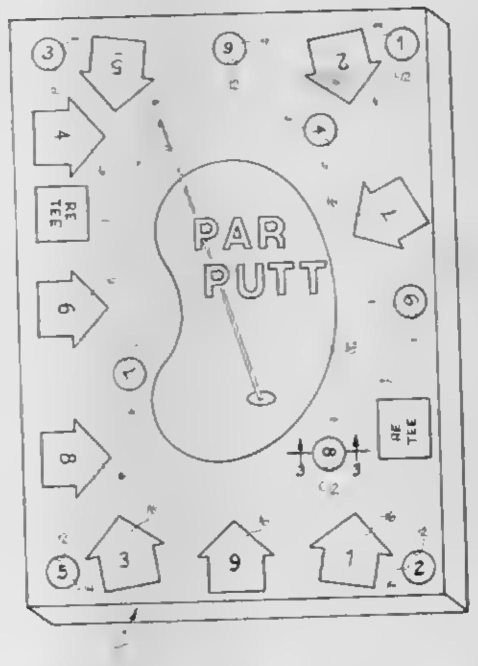
GOLF PUTTING GAME

Delano Delaplaine, 2221 Park Rd., Charlotte, N.C. 28203

Filed Jul. 25, 1977, Ser. No. 818,421

Int. Cl.² A63B *69/36*

U.S. Cl. 273—176 E **5 Claims**



1. A golf putting game comprising a mat of substantial thickness and size in plan formed of foamed resilient material, nine holes cut through said mat of putting cup size and located at selected positions in said mat that allow unobstructed lines of approach from locations along the respective edges of said mat, slices of said foamed material fitting said holes and disposed at the bottom thereof, said foamed material slices bearing indicia of **1** to **9** on one side and **10** to **18** on the other side, indicia markers located around the edges of said mat indicating regular teeing areas for holes **1** to **9** on one side of the mat and for holes **10** to **19** on the other mat side, two auxilarly indicia markers at respective mat edges indicating penalty teeing areas, said regular teeing areas being located for unobstructed approach to the correspondingly indicated hole, a selected one of said penalty teeing areas being located for such approach to the holes, and said mat being reversible to expose holes marked **1** to **9** or holes marked **10** to **18** upon pressing said slices to the bottom of said holes upon each reversal.

4,108,441

GOLF SWING TRAINING APPARATUS AND METHOD

Wynn B. Tredway, Sr., P.O. Box 130, Freeport, Pa. 16229

Filed Feb. 3, 1977, Ser. No. 767,285

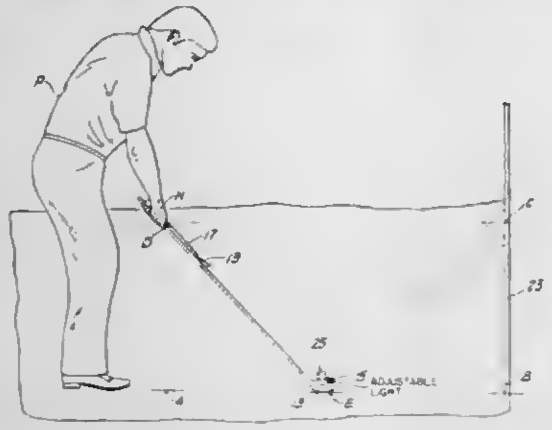
Int. Cl.² A63B *69/36*

U.S. Cl. 273—186 A **3 Claims**

1. The combination comprising:

(a) a training golf club having a head portion; and

(b) a light adjustably mounted to said head portion in such a way that, when said traning golf club is held at a proper position at the top of the backswing by a golf pupil addressing a golf ball or an imaginary golf ball, a beam of light from said light shines along a line extending away



from said golf ball or imaginary golf ball and normal to the intended flight path of said golf ball or imaginary golf ball.

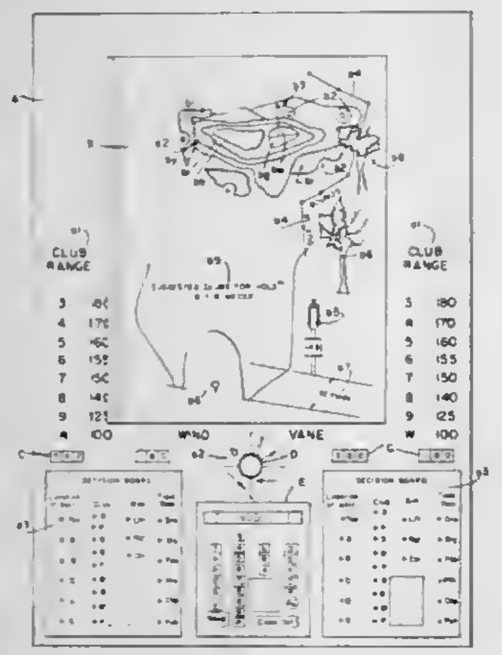
4,108,442
GOLF BOARD GAME APPARATUS

Holland Eldridge Bynam, Hq. 2-36 Infantry, APO New York, N.Y. 09045

Filed Mar. 31, 1976, Ser. No. 672,234

Int. Cl.² A63F *3/00*

U.S. Cl. 273—237 **4 Claims**



1. An indoor golf game apparatus comprising:
(a) a game board having indicia marked thereon relating to golf;
(b) a plurality of hole layout boards, each having a distinctive representation of a golfing hole layout marked thereon;
(c) a wind direction chance means located on said game board for randomly selecting one of several indicia representing various wind directions or no wind direction;
(d) at least one decision board means located on the game board for marking and recording four types of data selections comprising the location of the ball on the hole layout and the player's selections of the type of club, the direction of aim of the shot, and the type of shot he will make in view of the randomly selected wind condition derived by said wind direction chance means;
(e) a calculator means for receiving input of one each of the four types of data relating to the ball location and the player's selections of the type of club, the direction of aim of the shot, and the type of shot he will make in view of the randomly selected wind condition, said calculator means further comprising means for computing and visually displaying a numerical value uniquely based upon the combination of the four input data entered therein; and
(f) a plurality of shot-value card means for determining the location of the ball after each shot on the hole layouts as determined by the numerical value computed by the calculator means and by the randomly selected wind condition or by the numerical value computed by the calculator means alone.

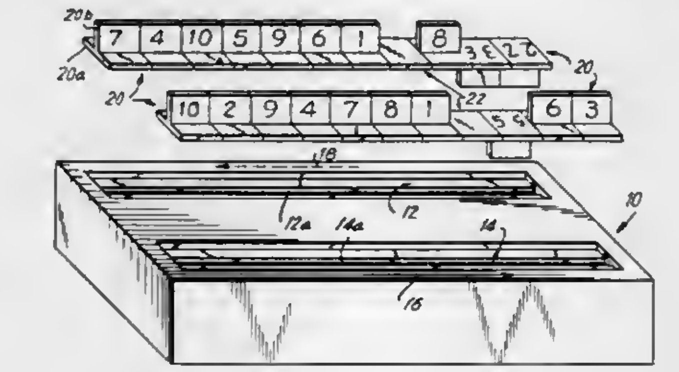
4,108,443
BOARD GAME

Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11230

Filed Mar. 4, 1977, Ser. No. 774,245

Int. Cl.² A63F *3/00*

U.S. Cl. 273—243 **36 Claims**



1. A method for playing a board game, said board game having a board; two sets of player pieces, each of the pieces of each player containing a marking thereon indicative of pieces of the other player which it can capture and pieces of the other player by which it can be captured, said board having two parallel means for linearly positioning respective sets of said player pieces facing each other and facilitating the changing of the relative positions of the player pieces in each set; and means controlled by chance for representing a type of move to be taken by each player in his turn during which such player removes one of his player pieces which remain in play and re-positions it elsewhere in the line of his player pieces which remain in play;

said method comprising the steps of:
(a) the players taking alternate turns,
(b) each player, at the start of his turn, removing from play both those of his pieces which can capture respective facing pieces of the other player, and the captured pieces, and
(c) each player, at the end of his turn, making a move of the type represented by said chance-controlled means.

4,108,444
PHONOGRAPH RECORD PLAYER

Kazuyuki Takizawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,319

Claims priority, application Japan, Nov. 10, 1975, 50-135989

Int. Cl.² G11B *17/06*

U.S. Cl. 274—9 R **13 Claims**

1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging movement across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

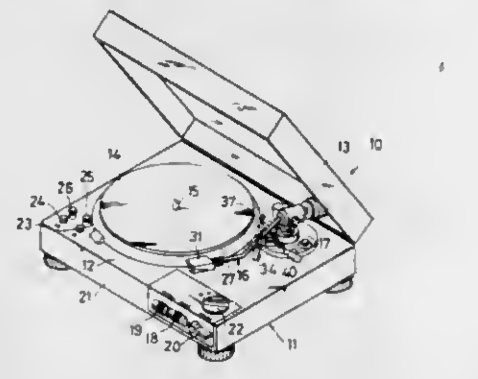
a rotatable control gear having first and second sets of peripheral teeth engageable by said drive gear for respectively effecting lead-in and return movements of said control gear and being separated from each other by diametrically opposed first and second toothless gaps which, when facing toward said drive gear in stop and play positions, respectively, of said control gear, permit the latter to remain at rest while said drive gear continues to rotate, said control gear further having a continuous cam groove therein;

pivotally mounted lever means having a cam follower engaging said cam groove so as to be angularly displaced for effecting said lead-in and return movements of said tone arm during said lead-in and return movements, respectively, of said control gear;

individual lead-in and return clutch means mounted on said control gear at diametrically opposed locations, said lead-in and return clutch means having disengaged positions and engaged positions in which said lead-in and return clutch means are respectively operative for initiating movements of said control gear from said stop and play positions thereof;

a single actuating slide movable from an inoperative position to an operative position for selectively actuating said lead-in and return clutch means to the respective engaged positions when said control gear is in said stop and play positions, respectively; and

electromagnetic means associated with said actuating slide and being energizable for moving the latter to said operative position of the slide.



4,108,445
PHONOGRAPH RECORD PLAYER

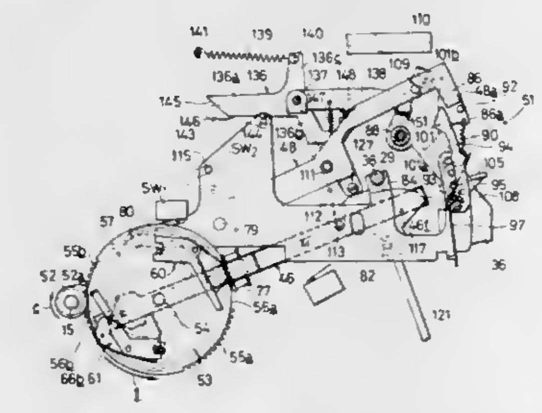
Kazuyuki Takizawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,358

Claims priority, application Japan, Nov. 10, 1975, 50-135989

Int. Cl.² G11B *17/06*

U.S. Cl. 274—9 R **9 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging movement across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a rotatable control gear having first and second sets of peripheral teeth engageable by said drive gear for respectively effecting lead-in and return movements of said control gear and being separated from each other by first and second toothless gaps which, when facing toward said drive gear in stop and play positions, respectively, of said control gear, permit the latter to remain at rest while said drive gear continues to rotate, said control gear further having a continuous cam groove therein which includes a lead-in cam groove portion having connections, at its opposite ends, to adjacent ends of a return cam groove portion, and first and second depressions in opposite side walls, respectively, of said cam groove at said connections, respectively, of the lead-in and return cam groove portions;

pivotally mounted lever means having a cam follower engaging said cam groove for effecting said lead-in and return movements of said tone arm by engagement of said cam follower with said lead-in and return cam groove portions during said lead-in and return movements, respectively, of said control gear wherein said cam follower completely traverses said lead-in and return cam groove portions during said lead-in and return movements;

propelling means operative for initiating movement of said control gear from each of said stop and play positions thereof; and

control gear holding means acting on said lever means to urge said cam follower in one direction into said first depression with said control gear in said stop position and in the opposite direction into said second depression with said control gear in said play position, whereby to hold said control gear against inadvertent movement from each of said stop and play positions in the absence of operation of said propelling means.

4,108,446
PIPE COUPLING SOCKET ASSEMBLIES

Peter Frederick Victor Lloyd, 4, Mynchen End, Beaconsfield, Buckinghamshire, HP9 2AT, England

Filed Dec. 10, 1975, Ser. No. 639,343

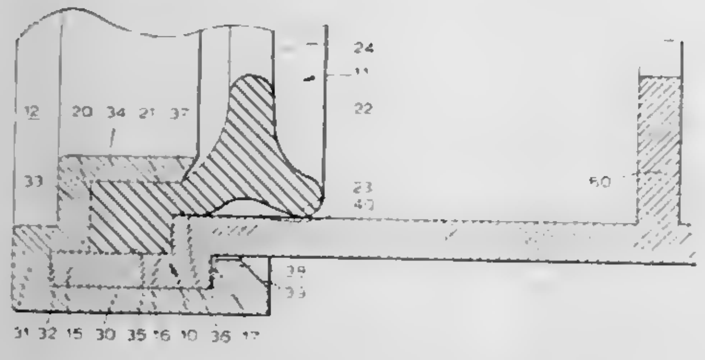
Claims priority, application United Kingdom, Sep. 2, 1975, 36105/75

Int. Cl.² F16J *15/10*

U.S. Cl. 277—101 **13 Claims**

1. A pipe coupling socket assembly comprising a socket having an outer surface and an inner surface and a mouth, a sealing ring positionable within said socket, a locking ring for locking said sealing ring in position, means for securing said locking ring to said socket, said locking ring being of channel section and comprising an outer flange extending adjacent said outer surface of the socket, a first radially outer base portion having an annular recess on the inner, transverse face thereof for receiving said mouth of the socket therein, a second radially inner base portion, and an inner flange, a portion of radially inner surface of said outer flange, the axial inner surface of said first base portion and the radially outer surface of said second base portion defining in combination said annular recess, said second base portion and said inner flange of the locking ring co-operating with said inner surface of the socket

to define a substantially but not completely enclosed annular space, said sealing ring having an annular portion received and

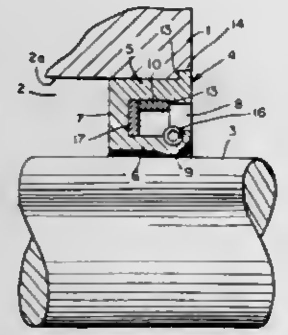


located in said annular space to lock said sealing ring in said position within said socket.

4,108,447

SHAFT SEAL

Harold W. Scholin, 1125 N. Northwest Hwy., Park Ridge, Ill. 60068
Filed Aug. 12, 1977, Ser. No. 823,999
Int. Cl.^{2} F16J *15/32*
U.S. Cl. 277—153 1 Claim



1. A shaft seal assembly adapted to be inserted into the bore of a housing and around a shaft therein comprising,

(a) an annular molded elastomeric sealing member having an annular sealing lip on the inner diameter thereof adapted to be in sealing engagement with a shaft in said bore,

(b) the surface of the outer diameter of said sealing member being in engagement with the inner surface of the bore in which it is located,

(c) an annular recess in said sealing member extending inwardly in an axial direction from one side of said member,

(d) spring means in said recess adapted to yieldingly urge said sealing lip into sealing engagement with the shaft,

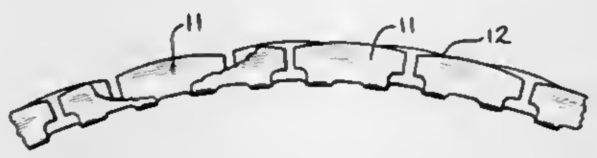
(e) a separate and removable reinforcing ring member having the surfaces thereof extending in a radial direction and positioned against the bottom of said annular recess in unsecured relation to said sealing member, and

(f) a separate and removable split spring ring member, substantially rectangular in cross-section, positioned in said annular recess outwardly of said reinforcing ring member, and adapted to yieldingly urge the surface of the outer diameter of said sealing member into sealing engagement with the inner surface of the bore, the inner surface of said split spring ring member bearing against said reinforcing ring to hold said reinforcing ring in place and prevent outward movement thereof.

4,108,448

PISTON RING ASSEMBLY

George J. Anderson, Hagerstown, and Roscoe Lee Bell, Springport, both of Ind., assignors to Dana Corporation, Toledo, Ohio
Filed Oct. 28, 1976, Ser. No. 736,676
Int. Cl.^{2} F16J *9/02*
U.S. Cl. 277—157 12 Claims

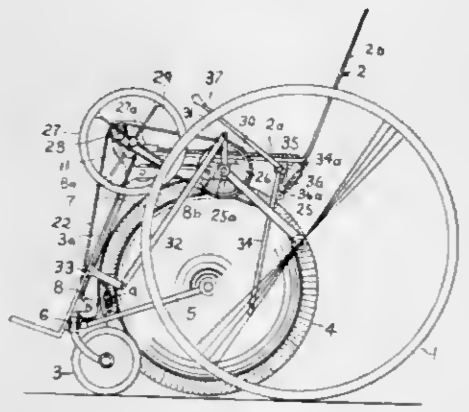


1. A piston ring assembly comprising an outer annular ring including an outer face adapted to slidingly and sealingly engage the wall of a cylinder, said outer ring defining at least one spring receiving recess, said recess comprising a generally annular surface having a predetermined radius, and an annular expansion spring of generally U-shaped cross section having at least one leg extending within said at least one recess and extending outwardly toward said outer face of said outer ring, said at least one leg having a plurality of feet, each of said feet having a surface, at least a portion of said surface of each of said feet being in contact with said annular surface of said recess, wherein said surfaces of said feet have a radius less than said predetermined radius of said recess surface.

4,108,449

STAIR-CLIMBING WHEELCHAIR

Thomas J. Rhodes, 508 Vilage View Pl., Fallbrook, Calif. 92028
Filed Jan. 31, 1977, Ser. No. 764,060
Int. Cl.^{2} B62B *5/02*
U.S. Cl. 280—5.28 14 Claims



1. A wheelchair, the combination of:

(a) a body having a seat structure;

(b) main wheels and secondary wheels mounted on said body for supporting said body while said wheelchair is travelling over a relatively even surface;

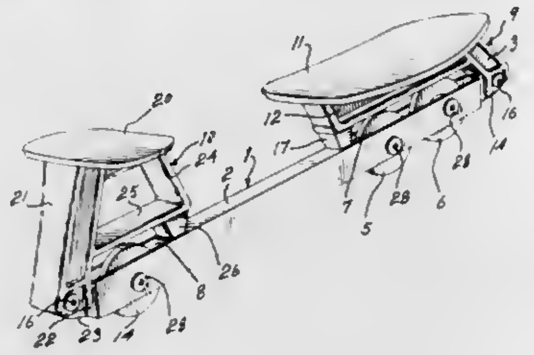
(c) climbing and descending means for said body normally in a non-operating position; and

(d) means for raising said main wheels rearwardly relative to said body and for moving said climbing and descending means into operating position whereby said body is supported by said main wheels and said climbing and descending means for enabling said wheelchair to climb or descend.

4,108,450

ROLLER SKATE

Bernard Cote, 12,270 St. Evariste St., Montreal, Canada
Filed Apr. 26, 1977, Ser. No. 791,008
Claims priority, application United Kingdom, Apr. 28, 1976, 17226/76
Int. Cl.^{2} A63C *17/18*
U.S. Cl. 280—7.13 5 Claims



1. A roller skate including three rollers to be rotatably mounted to the bottom of a shoe in alignment with the longitudinal axis of the shoe, characterized in that the rear and middle rollers are spaced apart a greater distance than the distance between the middle and front rollers, and are located on each side of the vertical line passing through the center of gravity of a person standing up on the skate, the ground contact zone of the front roller being at a higher level than that of the rear and middle rollers, an elongated roller carrying bar and a pair of separate shoe supporting frames securable to a shoe sole and each detachably secured to said bar, whereby bars of different lengths may be secured to the same shoe supporting frames to fit shoes of different sizes, each shoe supporting frame being detachably secured to said bar at two spaced zones, namely: at the front and back of each frame with the rear frame straddling the rear roller and the front frame straddling the middle and front rollers, and wherein the back of the rear frame and the front of the front frame have each a pair of spaced ears straddling the rear and front end portions of said bar respectively and nut and bolt means extending through registering holes in said ears and bar end portions to detachably secure said bar to said frames, and wherein the front of said rear frame and the back of said front frame have downwardly depending studs bearing on the top of said roller carrying bar.

4,108,451

ROLLER SKATES WITH HAND BRAKES

Wilson Scheck, Sr., 2900 SW. 27th St., Gainesville, Fla. 32608
Continuation-in-part of Ser. No. 604,606, Aug. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 478,939, Jun. 13, 1974, abandoned. This application May 16, 1977, Ser. No. 797,479
Int. Cl.^{2} A63C *17/14, 17/08*
U.S. Cl. 280—11.2 1 Claim

1. An improved roller skate in combination with a control belt worn around the user of the skates comprising;

a frame having a top surface and two side surfaces extending perpendicularly down from said top surface,

a carriage bolt extending through a hole in each of said extending surfaces of said frame,

a wheel concentric to said carriage bolt in between said two extending surfaces,

a shoe fixedly attached to the top of said frame,

an ankle support iron fixedly attached to each of said extending surfaces of said frame, said irons extending perpendicular to and above said top surface of said frame,

a disc wheel welded to one side of a rim of said wheel, said control belt fitting around the waist of the user, and

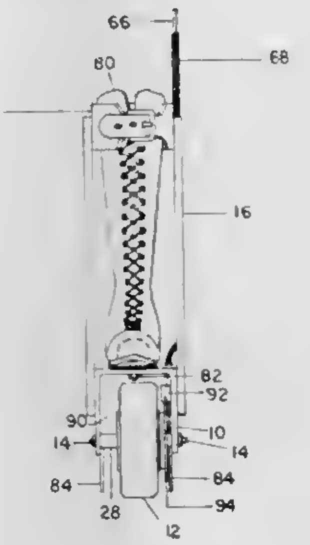
braking means fixedly secured to said belt further consisting of:

a brake grip designed to be moved by hand operation,

a first cable secured to said brake grip,

second cables secured to said first cable, one running to each of of the skates to be worn,

a disc brake connected to the other end of said cable positioned to engage said disc wheel,

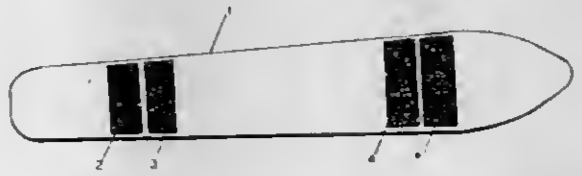


whereby upon the brake grip being squeezed by hand, the cables will move upward causing the disc brake to frictionally engage said disc wheel to decelerate and stop said skate.

4,108,452

SKATE BOARD SAFETY ACCESSORY

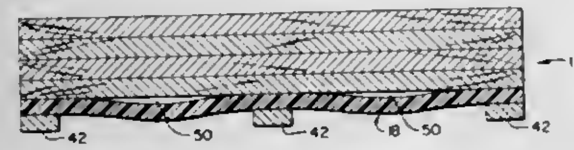
Richard Alan Baron, 26 A Cyprus La., Old Bridge, N.J. 08857
Filed Dec. 6, 1976, Ser. No. 748,275
Int. Cl.^{2} A63C *1/18*
U.S. Cl. 280—11.3 8 Claims



1. An accessory for a skate board, said skate board having a rolling means and an upper, riding surface, said accessory comprising two, interengagable, opposing elements, one of said elements comprising a thin, flexible, base sheet member having two, flat, opposing surfaces, one of said surfaces having a very large number of closely spaced hooking elements of flexible, resilient material attached thereto, with said hooking elements secured to said surface area of said base member generally in a vertical position extending from said surface, and an attaching means on the opposing flat surface, the second of said elements comprising a thin, flexible base member having two, flat, opposing surfaces, one of said surfaces having a very large number of closely spaced flexible loops of resilient material, the number of said loops being substantially greater than the number of hooking elements per unit area of said surface area, and an attaching means on the opposing flat surface area, whereby one of said elements is attachable by its respective attaching means to the riding surface of said skate board and the other of said elements is attachable by its respective attaching means to a foot of a rider of said skate board, so that when said foot having said element attached thereto is caused to contact the opposing member attached to said riding surface of said skate board, a number of said loops will engage a number of said hooking elements to secure the elements generally in a face-to-face relationship.

4,108,453
SNOWMOBILE FLOTATION SKI

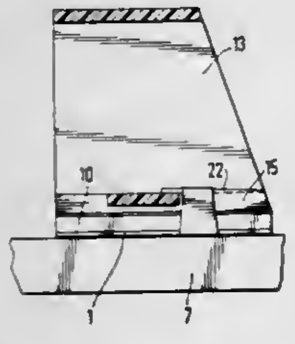
Clair H. Lavalier, 308 2nd St., Parkville, Minn. 55773
Filed Aug. 24, 1976, Ser. No. 717,294
Int. Cl.² B62B *9/04*
U.S. Cl. 280—28 6 Claims



1. A snowmobile ski for use in soft, deep snow, ice, or slush conditions, comprising:
an elongate body member having an upper surface, a lower surface, a generally upwardly curved forward end, and a width at least about 8 inches;
a sheet-like overlay covering the lower surface of the body member and attached to an outer periphery of the lower surface of the body member, forming at least one air pocket in the interstice between the overlay and the lower surface, the overlay being fabricated from a smooth, thin, flexible, air-impervious material;
means for attaching and substantially hermetically sealing the overlay to the outer periphery of the lower surface of the body member, the attachment means holding the overlay snug against said lower surface; and
means attached to the upper surface of the body member for releasable attachment of the ski to a snowmobile.

4,108,454
ARRANGEMENT FOR SECURING A BODY TO A SKI

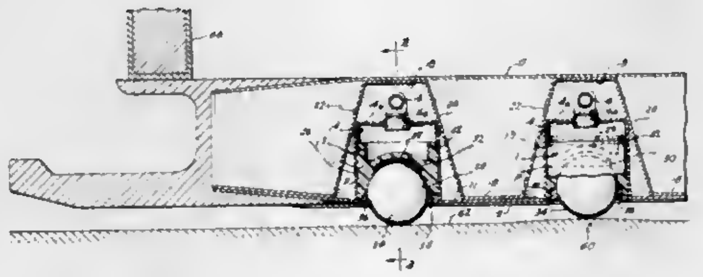
Günter Schwarz, Steinacherstr. 67, 8804 Au-Wadenswil, Switzerland
Filed Jul. 26, 1976, Ser. No. 708,695
Claims priority, application Switzerland, Aug. 6, 1975, 10352/75
Int. Cl.² A63C *5/06*
U.S. Cl. 280—11.37 E 11 Claims



11. An attachment arrangement for securing an upstanding body to a ski, comprising an upstanding body having a substantially plate-shaped base portion, an attachment plate adapted to be secured to the ski, an elastic, resiliently compressible intermediate layer interposed between the base portion and the attachment plate, means extending upwardly from the attachment plate for releasably securing the upstanding body to the attachment plate in a locked position, sliding surface means arranged between said intermediate layer and said base portion and extending substantially parallel to the attachment plate for enabling sliding movement of the upstanding body in a direction relative and substantially parallel to the attachment plate from an unlocked position to said locked position.

4,108,455
CARGO PALLET INCORPORATING RETRACTABLE BALL UNITS

Varnell L. James, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 22, 1975, Ser. No. 642,748
Int. Cl.² B62D *21/18*
U.S. Cl. 280—43.23 12 Claims



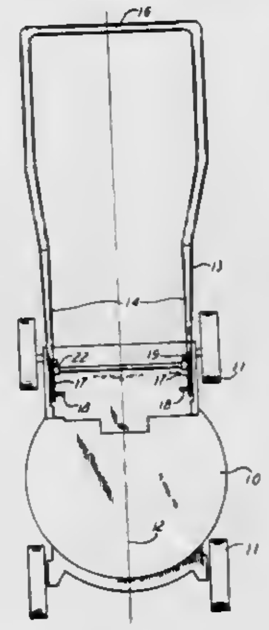
1. A cargo pallet comprising: a substantially flat base including frame means for supporting cargo and for engaging a support surface, said frame means having an upper and lower surface;
a plurality of spaced-apart roller means disposed within said frame means, each roller means including an open-bottomed cylinder attached to said frame means, said cylinders being disposed within a corrugated intermediate member interengaging and supporting said upper and lower surface, and wherein each cylinder is at least partly retained in position by an upturned lip portion formed in said lower surface;
a piston having a lower skirt portion and being retained in a vertically reciprocal, fluid-tight relationship within each said cylinder;
a spherical roller rotatably retained within a semi-spherical chamber defined by said lower skirt portion of each said piston; and,
pneumatic fluid distribution means interconnecting said cylinders, said fluid distribution means adapted to supply said cylinders with a source of pressurized pneumatic fluid; whereby pneumatic fluid is selectively supplied to and exhausted from all cylinders to reciprocate each piston between an upper, retracted position in which each said spherical roller is contained within said pallet base and a lower, extended position in which at least a portion of each said spherical roller protrudes through said lower surface.

4,108,456
LAWN MOWER HANDLE MOUNTING

Neill Carl Woelffer, Racine, and Merlin Howard Grandrud, Sturtevant, both of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.
Filed Jul. 15, 1977, Ser. No. 815,815
Int. Cl.² B62B *3/00*
U.S. Cl. 280—47.37 R 7 Claims

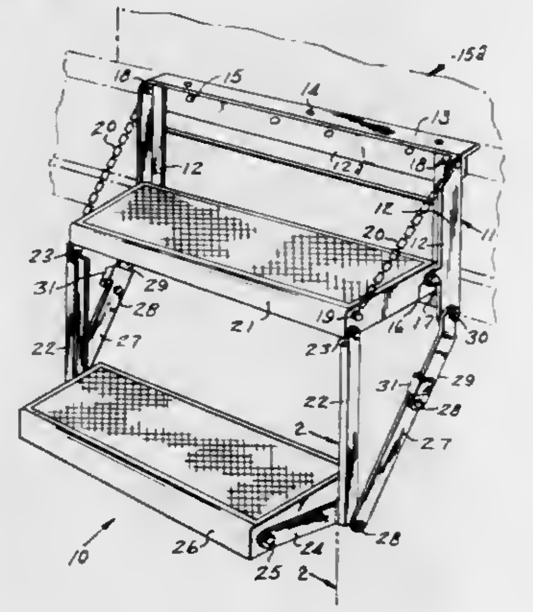
1. A lawn mower handle mounting comprising a mower, a mower handle having two ends repsectively pivotally attached to opposite sides of said mower for up and down pivotal movement and with said ends being spring-urged in the horizontal direction toward the respective opposite sides of said mower, said ends each including a portion spaced from the pivot axis and with each said portion having a fixed vertical dimension, each side of said mower having two surfaces vertically spaced apart and disposed one above the other respectively above and below said handle portions and in contact therewith for securing said handle onto said mower, the respective ones of said two surfaces being angled relative to each other and presenting a wedge-shaped space therebetween and with a portion of each of said mower sides extending between said two surfaces and defining the bottom of said wedge-shaped space, and with the smaller dimension of said wedge-shaped space being less than

said fixed vertical dimension of said leg portions, all for snug mounting of said handle by spring urging said leg portions into said wedge-shaped space and against said two surfaces while being spaced from the respective said mower portions.



4,108,457
CAMPER STEPS

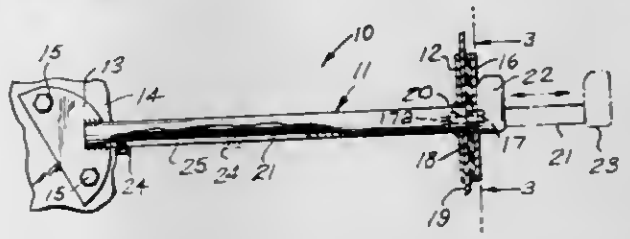
Dale Garrett, Rte. 1, Box 354, Rockaway, Oreg. 97136
Filed Aug. 9, 1976, Ser. No. 712,840
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 2 Claims



1. Foldable steps for use on a camper vehicle or the like comprising:
a frame for mounting on the vehicle;
a first step pivotally connected at its rear portion to said frame for swinging motion between a retracted, substantially vertical position and an extended, substantially horizontal position;
means for limiting the swinging motion of said first step below its extended position;
a pair of spaced-apart channel members, each being pivotally connected to the front portion of opposite sides of said first step generally vertically disposed;
a second step pivotally connected by folding means at opposite sides thereof to said channel members for folding between a retracted position in which said second step is substantially coplanar with said channel members, and an extended position in which said second step extends horizontally outwardly from the bottom region of said channel members;
said folding means including a pair of pins, each projecting outwardly from the rear portion of an opposite side of said second step and received within an associated one of said channel members for slidable movement therewithin, and a pair of rods, each pivotally connected at one end thereof to the front portion of opposite sides of said second step and at its other end to the lower portion of an associated one of said channel members; and
means for maintaining the vertical disposition of said channel members when said first step is extended.

4,108,458
PULL OUT-STEP

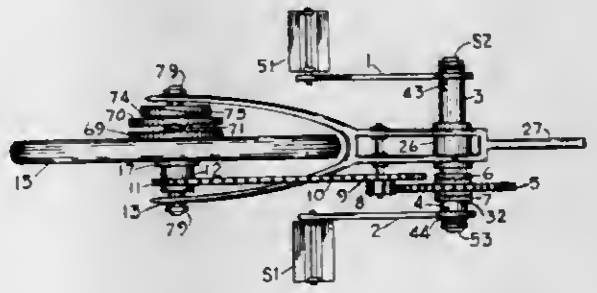
Charles Owens, 412 Neal St., Baytown, Tex. 77520
Filed Dec. 15, 1976, Ser. No. 750,966
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 1 Claim



1. A pull-out step for an automotive vehicle, comprising in combination, a length of pipe, which is received within an opening provided in the lower portion of a front fender of a vehicle, and an opening in a first plate, and one end of said pipe is flush with the outside of said fender, said first plate being in abutment with the inner side of said fender, said pipe being welded to an off-set second plate that is secured rigidly to the chassis of the vehicle by suitable fasteners, a rod slidably received in said pipe, said rod being extendible outward from the exterior of said fender, and a third plate is fixedly secured to the end of the said rod, which extends out of said pipe, and a flat rubber gasket is fixedly secured to said fender and is provided with an opening smaller than the diameter of said rod, so as to retain said rod frictionally against sliding in or out of said pipe when not in use, and a set screw secured in said rod is slidable within a slot of said pipe and prevents rotation of said rod, and when urged against an end of said slot, provides linear stop means for said rod, when it is pulled out of said pipe.

4,108,459
SPRING POWERED BICYCLE

Mario Filippo Alvigini, 217 W. 18th St., New York, N.Y. 10011
Filed Mar. 29, 1977, Ser. No. 782,533
Int. Cl.² B62M *1/04*
U.S. Cl. 280—215 3 Claims



1. A propulsion assembly for a rider propelled vehicle having a frame and a ground engaging wheel mounted on said frame, said assembly comprising: a first sprocket wheel, means drivingly connecting said first sprocket wheel to said ground engaging wheel, a second sprocket wheel, a transmission chain drivingly interconnecting said first and second sprocket wheels, a spur gear drivingly connected to said second

sprocket wheel, a drive wheel gear in meshing engagement with said spur gear, a fixed shaft, two cylindrical oscillating shafts journaled on said fixed shaft, on opposite sides of said drive wheel gear, respectively, a one way clutch interconnecting each of said oscillating shafts to said drive wheel gear, a cylindrical housing journaled on one of said oscillating shafts, two radially extending slots in said one oscillating shaft, fastener means extending through said slots to secure said housing and said fixed shaft to said frame while allowing rotation of said one oscillating shaft within said housing and on said fixed shaft, a lever arm mounted on each of said oscillating shafts, and a foot pedal on the rear portion of each said lever arm whereby said lever arm is depressed backwardly to drive said vehicle.

4,108,460

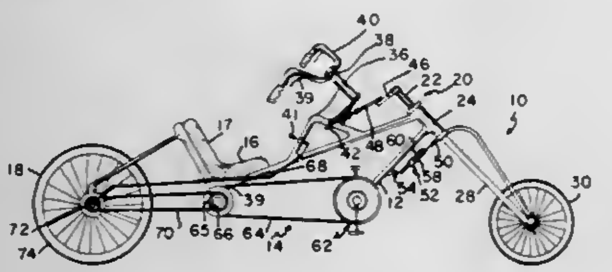
AMPLIFIED CYCLE STEERING SYSTEM

John C. Silva, Jr., P.O. Box 1082, Saugus, Mass. 01906

Filed May 5, 1975, Ser. No. 574,409

Int. Cl.² B62K *21/10, 21/18*

U.S. Cl. 280—236 **12 Claims**



1. A multi-wheel cycle comprising, a steering column rotatably mounted on said cycle at a cant of between 20° and 60° with the longitudinal axis of the cycle frame, a steering wheel mounted on the lower portion of said steering column, an amplified steering system for said cycle including, a first lever means on the upper portion of said steering column sized to describe a relatively small arc per degree turn of said column and wheel, manual steering means rotationally mounted on said cycle on a second rotatable column positioned aft and extending above said first lever means, a second lever means mounted on said second rotatable column below said manual steering means, means operatively connecting said first and second lever means, said second lever means being sized to describe a relatively large arc per degree turn of said manual steering means such that a turn of said manual steering means is amplified to a greater turn of said steering column and wheel and weight-adjustable, anti-jackknifing resilient means including, a rigid arm mounted on the rotatable steering column and tension spring means, adjustable to the weight of the cycle operator, connecting said arm to a portion of the cycle frame and means for adjusting said spring in proportion to the weight of said operator to balance said steering wheel such that any turning of said wheel will pivot said arm against the so-adjusted resistance of said spring to assist in the balanced steering of said cycle.

4,108,461

BICYCLE SPINDLE

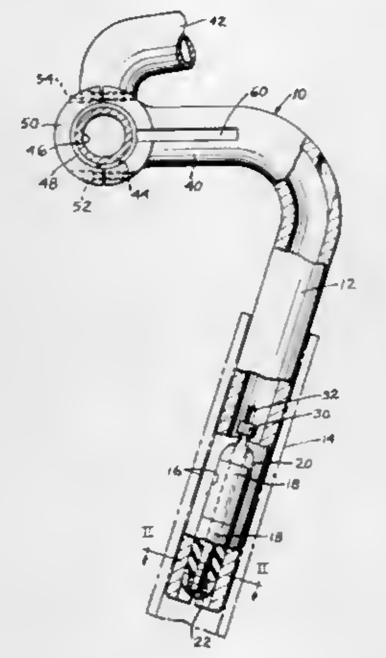
James H. Hopper, 1 Taylor Rd., Hazardville Station, Enfield, Conn. 06082

Filed Apr. 5, 1977, Ser. No. 784,907

Int. Cl.² B62K *21/16, 21/20*

U.S. Cl. 280—279 **6 Claims**

1. In a spindle for connection to the upper region of a bicycle frame, a leg adapted for insertion into the frame from above, a slot formed in the lower portion of said leg, a resilient block in said slot, means accessible from the upper end of said leg for compressing said block axially thereby to expand said block radially to spread said lower portion of said leg, a rigid element fitted into each end of said slot at opposite ends of said block and said means comprises a screw threaded into the lower one of said elements and having a head thereon in the upper side of the upper of said elements.



4,108,462

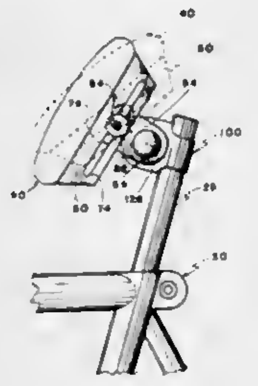
BICYCLE SEAT AND MOUNTING THEREFOR

Lee D. Martin, 2321 E. Murdock, Wichita, Kans. 67214

Filed Feb. 11, 1977, Ser. No. 767,734

Int. Cl.² B62J *1/00*

U.S. Cl. 280—289 E **8 Claims**



1. Apparatus for mounting a bicycle seat upon the seat support post of a bicycle comprising a mounting bracket adapted to be secured to a bicycle seat, a connector secured to the bracket for linear movement relative thereto, means for releasably securing the connector to the bracket in a selected relative position, a clamp means adapted to clampingly engage a bicycle post, said clamp means being pivotally carried by the connector, and a common means for securing the clamp means in a selected pivotal relation to the connector and for actuating the clamp means, said bracket being a channel member comprised of a web connecting a pair of flanges, said flanges having a pair of elongated slots therein, said connector being slidably and guidingly received between the flanges of the bracket, with said means for releasably securing the connector to the bracket comprising threaded means engaging the connector and extending through the slots.

4,108,463

IMPLEMENT SUPPORT LINKAGES

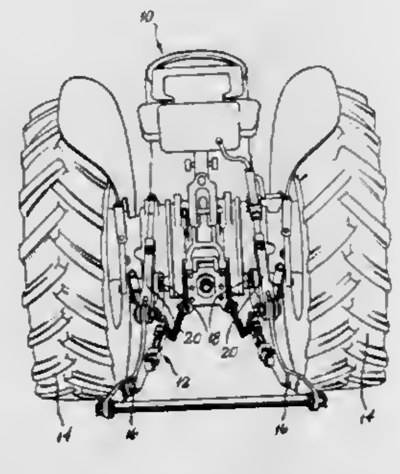
John Leslie Old, Kenilworth, England, assignor to Massey-Ferguson Services N.V., Detroit, Mich.

Filed Dec. 20, 1976, Ser. No. 752,047

Claims priority, application United Kingdom, Dec. 24, 1975, 52791/75

Int. Cl.² B60D *1/14*

U.S. Cl. 280—460 A **10 Claims**



5. An implement support linkage in combination with a vehicle, said implement support linkage comprising:
- a pair of laterally spaced apart rearwardly extending elongated lower draft links, the forward ends of which are connected to laterally spaced apart portions of the vehicle;
- a pair of adjustable stops mounted on the inner rearward side portions of the lower draft links; and
- a pair of laterally spaced apart generally rearwardly extending stabilizers the forward ends of which are connected to the vehicle at locations outwardly of the forward ends of the lower draft links, and each of the stabilizers being provided with a rearward extension which traverses one of said draft links and is adapted to contact an adjustable stop to limit lateral sway of said lower draft links.

4,108,464

COUPLING HOOK FOR A THREE-POINT ATTACHMENT OF A TRACTOR

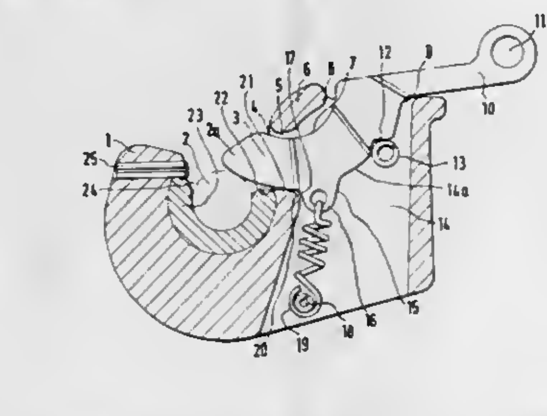
Wilhelm von Allwörden, Erbach i.O, Fed. Rep. of Germany, and Dieter Kunze, Clarendon Hills, Ill., assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,089

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618332

Int. Cl.² B60D *1/10*

U.S. Cl. 280—508 **5 Claims**



1. A coupling hook for a guide-member of a three-point attachment of a tractor comprising a hook member having a hook opening and a pocket opening to a surface of the hook member, there being a passage between said pocket and hook opening, an arcuate latch element displaceable into said hook opening through said passage to block a coupling pin in said hook opening in a locked position and displaceable to a position to release the coupling pin, said latch element having an actuating lever rigidly attached thereto and projecting outwardly through the pocket opening, said latch element having inner and outer curvilinear surfaces opposed from each other, said hook member having a first fulcrum in the vicinity of said pocket opening engageable with said inner curvilinear surface and a second fulcrum in the vicinity of said passage engageable with said outer curvilinear surface, a bolt within said pocket and there being a notch in said outer curvilinear surface engageable with said bolt, said notch engaging said bolt and said outer curvilinear surface engaging said second fulcrum when said latch element is in its locked position.

4,108,465

SKI BRAKE

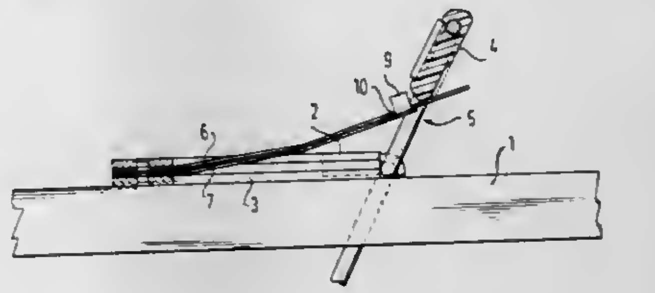
Manfred Schmidt, Sindelfingen, and Heinz Luithlen, Rutesheim, both of Fed. Rep. of Germany, assignors to Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH, Leonberg, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,310

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 7605720

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **4 Claims**



1. A ski brake for a ski comprising a brake member, a bearing member having bearing means formed thereon for pivotably carrying said brake member, spring means for pivoting said brake member about a transverse axis of the ski into a braking position, said spring means comprising a main leaf spring provided on said bearing member extending to said brake member, an attachment member fixed to the ski, said spring means further comprising an additional leaf spring provided on said attachment member, coupling means on said bearing and attachment members for easy detachable connection of said bearing member with said attachment member with said additional leaf spring supporting said main leaf spring, said coupling means further providing a guide for movement of said bearing member longitudinally of the ski, and detachable fixing means on said main and additional springs for interconnecting said springs and securing said bearing member against said movement.

4,108,466

SKI BRAKE

Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jun. 23, 1977, Ser. No. 809,192

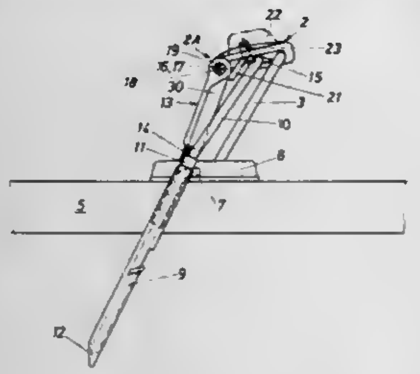
Claims priority, application Austria, Jun. 25, 1976, 4688/76; Jul. 9, 1976, 5033/76

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **10 Claims**

1. In a run-away preventing device for a ski having a bar with brake legs supported on said ski, said bar being movable automatically under spring action into a braking position wherein said brake legs project downwardly from said ski on opposite sides thereof, a holding plate secured to said ski and step-on means pivotally secured to said holding plate, said bar having two extensions extending from each of said brake legs,

one of which is pivotally supported on said holding plate and thereafter extends to said step-on means and the other extension extends directly to said step-on means, the improvement comprising wherein said step-on means includes a lever arm and first pivot means pivotally securing said lever arm to said holding plate, a stepping plate and second pivot means pivotally securing said stepping plate to said lever arm, said second pivot means including an axle fixed to one of said lever arm and said stepping plate and receiving means on the other of said lever arm and said stepping plate for receiving said axle therein and shoulder means on one of said stepping plate and said lever arm and engageable with the other thereof to limit the relative pivotal movement therebetween.



4,108,467

SKI BINDING

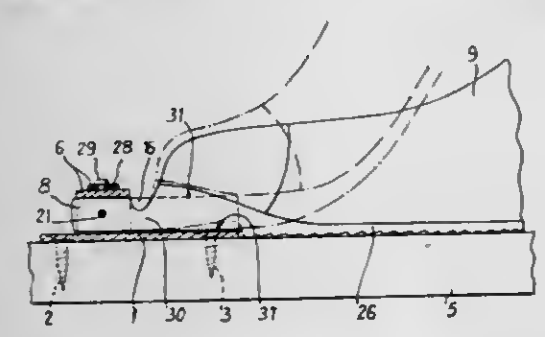
Armand Kreyenbuhl, Samoens, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersbelm, France

Filed Mar. 15, 1976, Ser. No. 666,589

Claims priority, application France, Mar. 17, 1975, 75 08182; Switzerland, Apr. 9, 1975, 4490/75

Int. Cl.² A63C ***9/18***

U.S. Cl. 280—615 **18 Claims**



14. A cross-country ski binding and ski shoe assembly comprising:

a ski shoe including a flexible sole with a relatively rigid integral extension of said sole protruding at the front of the shoe, said rigid extension being flexibly connected to the sole by a thinner section, and surface means on said rigid extension for engaging a binding and surface means on said extension for securing the shoe to the binding.

4,108,468

SLEEPER ADAPTER FOR A COLLAPSIBLE BABY STROLLER

Isidoro Orlanski, 116 Magnolia La., Princeton, N.J. 08540

Filed Dec. 30, 1976, Ser. No. 755,754

Int. Cl.² B62B ***11/00***

U.S. Cl. 280—648 **20 Claims**

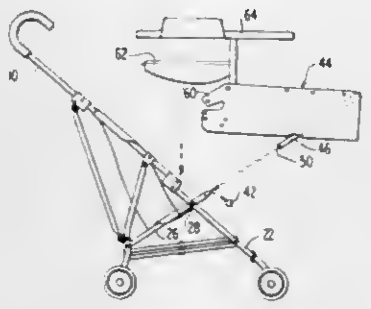
1. A collapsible baby stroller apparatus comprising:

a collapsible frame means including a pair of oppositely disposed parallel elongated seat supporting members;

wheel means connected to said collapsible frame, said wheel means comprising a plurality of wheels all lying in a common plane when said stroller apparatus is in the uncollapsed state, said elongated members having a diagonal relationship with respect to the plane of said wheels in said uncollapsed state;

seat means attached to said collapsible frame;

extension means connected to said parallel elongated members for extending the effective length of said elongated members;



a sling means suspended across said extension means, said sling means including support material which is continuous with the material of said seat means, said sling means creating a first substantially horizontal support plane; and,

a levelling means receivable in said seat means for creating a second horizontal support plane which is substantially coplanar with the first horizontal support plane of said sling means.

4,108,469

SPRING LEG WITH MOUNTING FOR THE FRONT WHEELS OF AUTOMOBILE VEHICLES

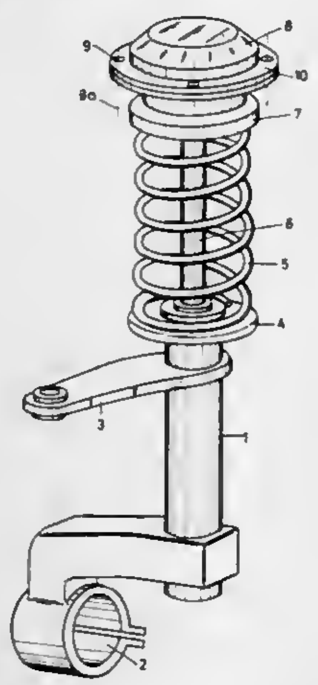
Jörg Schwarzblcb, Mozartstrasse 10, 4803 Stelnhagen, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,191

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630462

Int. Cl.² B60G ***11/58***

U.S. Cl. 280—668 **14 Claims**



1. In a spring leg for an independently suspended front wheel of an automotive vehicle which has a piston-type shock absorber surrounded by a coil spring wherein one end of the spring rests via a spring cup against the shock absorber's piston rod which rests via a ball bearing assembly against the vehicle's body, the improvement comprising a circumferential groove in the upper end of the piston rod of the shock absorber to provide the inner race for the balls of the ball bearing, a first collar-shaped metal ring surrounding the piston rod which has a portion so shaped and positioned to provide a portion of the outer race for the balls of the ball bearing, said first metal ring having a flange radially extending from said shaped portion and for fixing to the body of the vehicle, and a second collar-shaped metal ring surrounding the piston rod axially displaced from said first metal ring and surrounding the piston rod, said second metal ring having a portion so shaped and positioned to complete the outer race for the balls of the ball bearing and having a flange radially extending from said shaped portion for resting against the flange of said first metal ring.

4,108,470

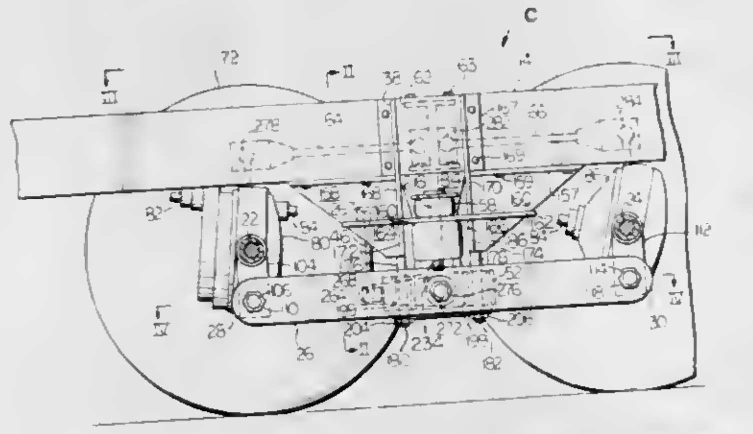
SUSPENSION SYSTEM FOR TANDEM AXLE VEHICLES

David S. Vinton, Mortoo, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 18, 1977, Ser. No. 798,055

Int. Cl.² B62D ***61/00;*** **B60G** ***11/52***

U.S. Cl. 280—677 **6 Claims**



1. A suspension system for tandem axle vehicles, comprising:

a first equalizer beam connected at opposite ends thereof to the tandem axles;

a second equalizer beam spaced from the first equalizer beam and connected at opposite ends thereof to the tandem axles;

first and second spaced frame portions of the vehicle;

a first bracket rigidly connected at a first end thereof to the first frame portion of the vehicle and resiliently connected at a second end thereof to the first equalizer beam;

a second bracket rigidly connected at a first end thereof to the second frame portion of the vehicle and resiliently connected at a second end thereof to the second equalizer beam;

a torque tube assembly connected at opposite ends thereof to the frame portions; and

a crossbeam member connected at opposite ends thereof to the first and second equalizer beams and extending through the torque tube assembly.

4,108,471

SEAT BELT SYSTEM

Yutaka Kondo, and Sbuho Nishina, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 12, 1977, Ser. No. 796,323

Claims priority, application Japan, Jul. 26, 1976, 51-88876

Int. Cl. B60r ***21/10***

U.S. Cl. 280—747 **5 Claims**

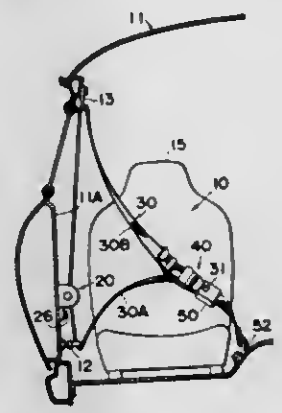
1. A three points seatbelt system wherein in normal use the seatbelt is completely extended and the seatbelt extends diagonally across the shoulder and chest of the user and across the lap of a user, said seabelt system comprising:

a base;

a retractor shaft rotatably supported by said base having a belt passageway there through;

a means for applying a retracting force to said retractor shaft; and

a continuous restraining belt extending through said passageway in said retractor shaft and the two portions of said belt extending from said shaft form a lap and a shoulder belt, said shoulder belt portion of said continuous restraining belt being drawn upwards and being inserted through an upper slip joint, and said lap belt portion of said continuous restraining belt being drawn downwards and being inserted through a lower slip joint.



4,108,472

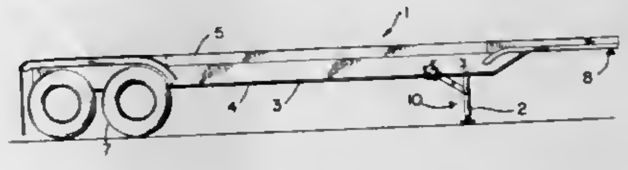
FOLD BACK LANDING GEAR LEG

Gary L. Weir, Dentoo, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 26, 1977, Ser. No. 791,107

Int. Cl. B60s ***9/02***

U.S. Cl. 280—763 **4 Claims**



1. In a trailer underframe baving a pair of laterally spaced longitudinally extending side rails and a pair of longitudinally spaced crossmembers extending therebetween, the improvement comprising a folding landing gear, including:

a pair of downwardly depending legs having intermediate and lower bracing members extending therebetween,

hinge means proximate one of said crossmembers coupling the upper ends of the legs to the side members and accommodating movement of the legs between a vertical trailer supporting position to an essentially horizontal stowed position nestled within the trailer underframe,

bracket means depending from the second of said crossmembers intermediate the side rails,

a longitudinally extending leg rigidifying strut having a lower end portion hingedly secured to said intermediate bracing member and an upper end portion reciprocably carried within said bracket means,

said bracket means including a pair of laterally spaced plates forming a depending clevis-like carrier for said strut and the upper portion of said strut being received therethrough, and

locking means on said strut operatively associated with said bracket means to selectively secure the gear legs in their respective vertical and stowed positions.

4,108,473

PERFECT BOUND SAMPLE BOOK WITH INTEGRAL HANDLE

Manus Coen, Passaic, and Joseph Bonfield, Cliftoo, both of N.J., assignors to Eastern Bindery, Inc., Paterson, N.J.

Filed Oct. 12, 1976, Ser. No. 731,426

Int. Cl.² B42D ***3/00***

U.S. Cl. 281—29 **20 Claims**

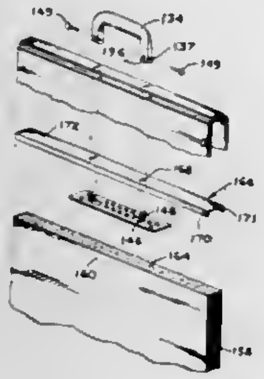
1. A perfect bound sample book comprising:

a leaf bundle;

a carrier;

- bonding means, fastening said carrier to said leaf bundle at the back of said leaf bundle;
- a cover having a spine with passage means therein, said cover disposed about said carrier so as to position said carrier between said cover and said leaf bundle;
- mounting means on said carrier extending away from said leaf bundle, and passing through said passage means in said cover and extending beyond said cover;
- handle means;
- means connecting said handle means to said mounting means on said carrier externally of said cover so that said handle means is connected to said leaves of said book through said carrier, to directly support the leaf bundle independently of the cover.

11. The method of fabricating a perfect bound sample book comprising the steps of:



- forming a group of leaves into a leaf bundle having a substantially planar back surface;
- positioning a carrier against the planar back surface of the leaf bundle with mounting means on said carrier extending from said carrier away from said planar back surface;
- bonding said carrier to the leaf bundle at the planar back surface of said leaf bundle to support the leaf bundle and to binde the leaf bundle;
- positioning a cover about the carrier and the leaf bundle with the mounting means of the carrier passing through passages in the cover alligned with said mounting means, the mounting means extending beyond the cover;
- fastening a handle directly to said mounting means passing through the passages in the cover to directly support the leaf bundle via the carrier independently of the cover, and to position the cover with relation to the leaf bundle.

4,108,474
FIXATION CLAMP FOR AIR PUMP HOSE

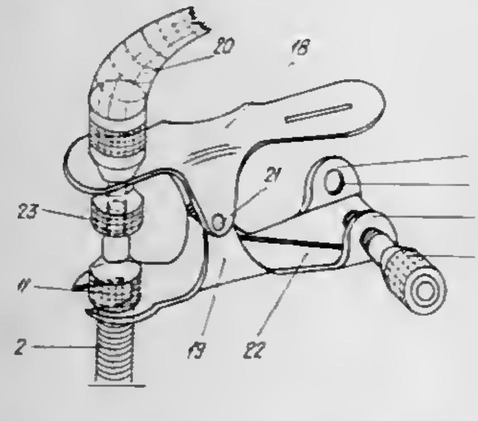
Paul Sigrist, Hauptstrasse 126, Orpund, Switzerland (CH-2552)

Filed Jan. 14, 1977, Ser. No. 759,573

Claims priority, application Switzerland, Jan. 15, 1976, 361/76

Int. Cl.² F16L *35/00*

U.S. Cl. 285—12 **1 Claim**



1. A fixation clamp for connecting a tube valve to an air pump hose comprising a pair of adaptors for mounting on said tube valve and said air pump hose to provide a connection, first and second arm members having work engaging ends for engaging said tube valve or its adaptor and said air pump hose end for biasing them toward each other, means pivotably securing said arms intermediate their ends, spring means between said arms adapted to normally draw said work engaging ends together, said work engaging end of said first arm having a U-shaped recess for engaging said tube valve or its adaptor, said work engaging end of said second arm having an orifice for engaging said air pump hose, and means on one of said arms for holding said adaptors when not in use.

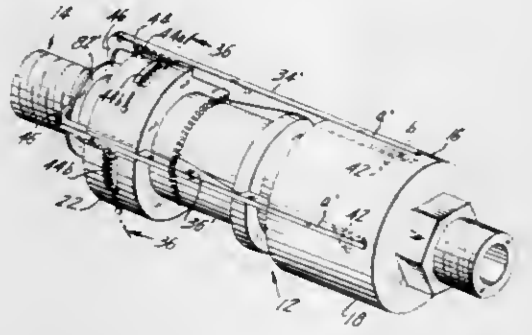
4,108,475
COUPLING DEVICE

Henry Fleischer, Little Falls, N.J. 07424

Division of Ser. No. 479,667, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 427,149, Dec. 21, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,370

Int. Cl.² F16L *21/00*

U.S. Cl. 285—15 **13 Claims**



1. A coupling device comprising, in combination, a socket member and a plug member adapted to be removably and adjustably disposed in said socket member, said plug member including tapered outer walls and inner walls defining a bore running therethrough, and at least one securing means, said socket member comprising a body portion including inner walls defining a tapered passageway or segment, at least one wear resistant lining disposed between said tapered outer walls of said plug member and said tapered passageway of said socket member, said tapered outer walls of said plug member being adapted to seat in an initial portion of said tapered passageway of said socket member, to define said first position, and restricted to said initial position when so seated in that it cannot be moved deeper into the socket member, said plug member and said socket member by means of said lining forming a substantially fluid-tight seal between said members, and only after portions of said lining have worn, said plug member being adapted to be repositioned with respect to said initial portion of said passageway of said socket member to a second portion of said passageway to define a second position and thereby form, by means of said lining, a substantially fluid-tight seal with said socket member, said socket member further including at least one connecting member adapted to engage said securing means of said plug member to retain said plug member in said socket member in substantially fluid-tight engagement, said connecting member of said socket member comprising at least one connecting rod a portion of which is adjustably connected to said body portion of said socket member, said connecting rod being comprised of a first end portion, a second end portion which includes a latch-like member for attaching said connecting rod to said securing means of said plug member, and an intermediate portion, said intermediate portion including at least two rod positioning means comprising at least two teeth disposed along said connecting rod, said socket member further including at least one rod engaging means adapted to engage at least one of said teeth of said connecting rod to fix the position of said connecting rod with respect to said socket member and said plug member, and means to longitudinally adjust said connecting rod with respect to said socket member.

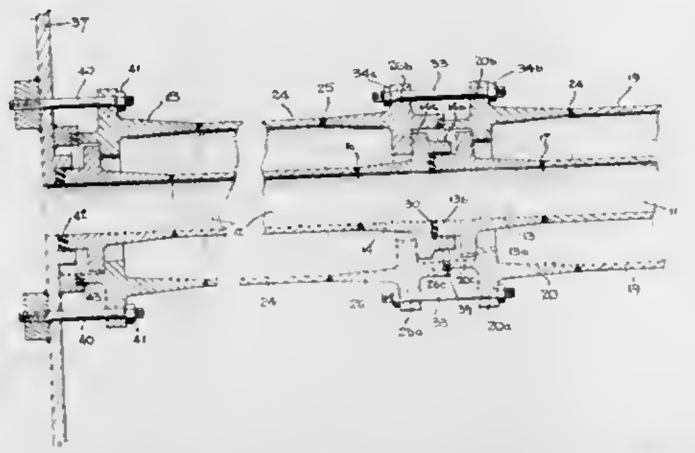
4,108,476
PRECOMPRESSED PIPING SYSTEM FOR HANDLING CRYOGENIC FLUID

Walter H. Krupp, 9350 Bolsa Ave., #61, Westminster, Calif. 92683

Filed Apr. 11, 1977, Ser. No. 786,608

Int. Cl.² F16L *5/02, 25/00, 39/04, 51/00*

U.S. Cl. 285—47 **6 Claims**



1. In a piping system having a plurality of inner pipe sections joined together to form a conduit for carrying fluid and a plurality of outer pipe sections joined together to form an insulating jacket for the inner pipe sections, wherein the improvement includes means at each joinder between pipe sections for precompressing said pipe sections, comprising:

- a first inner pipe section having a coupler including a flange attached to one end thereof, said flange having flat face and flat rear portions lying in planes substantially normal to the longitudinal axis of said first inner pipe section, said coupler further including an annulus extending from the face portion of said flange to form the unattached end of said coupler,
- a first outer pipe section surrounding said first inner pipe section and having a coupler including a flange attached to one end thereof, said outer pipe section flange having a flat face portion and a flat rear portion lying in planes normal to the longitudinal axis of said first outer pipe section and a set of apertures therein, said first inner pipe section being slightly longer than said first outer pipe section such that said one end of said first inner pipe section and the flange thereof extend out from said first outer pipe section beyond said one end of said first outer pipe section,
- a second inner pipe section having a coupler including a flange attached to one end thereof, said second inner pipe section flange having a flat face portion and a flat rear portion lying in planes substantially normal to the longitudinal axis of said second inner pipe section, said second inner pipe section coupler having an annular sleeve extending from the face portion of said second inner pipe section flange to form the unattached end of said second inner pipe section coupler, said sleeve being adapted to fit over the annulus of said first inner pipe section coupler,
- a second outer pipe section having a coupler including a flange attached to one end thereof, said last mentioned flange having a flat face portion lying in a plane substantially normal to the longitudinal axis of said second outer pipe section, and a set of apertures formed therein positioned and formed to mate with the apertures of said first outer pipe section, and
- means for clamping the flanges of said outer pipe sections together with the apertures thereof in alignment so as to draw the flat face portions of said outer pipe section flanges towards each other, the flat face portion of said second outer pipe section flange being drawn into abutment against the flat rear face of said second inner pipe section and the flat face portion of said first outer pipe section flange being drawn into abutment against the flat rear portion of said first inner pipe section, with the sleeve of said second inner pipe section coupler engaging the annulus of said first inner pipe section coupler and applying pressure thereagainst as the outer pipe section flanges are drawn towards each other, thereby longitudinally compressing the first inner pipe section.

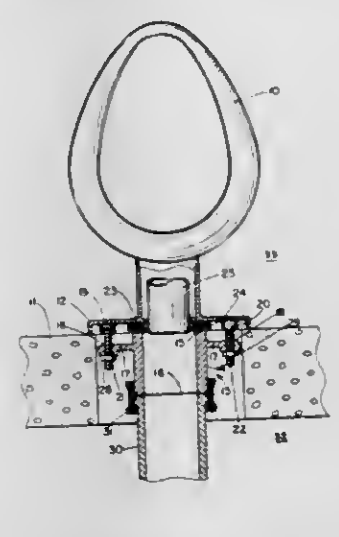
4,108,477
WASTE DRAIN CONNECTION FOR PLUMBING FIXTURES

Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering Co., Industry, Calif.

Filed Dec. 6, 1976, Ser. No. 747,522

Int. Cl.² F16L *55/00*

U.S. Cl. 285—58 **3 Claims**



1. A vandal-proof waste outlet connection providing a removable fluid passageway between the waste drain outlet of a plumbing fixture supported independently from the plumbing pipes coupled to it and a waste-receiving plumbing pipe inlet, said waste drain outlet having a receptacle for receiving a fluid sealing gasket, comprising:

- (a) a pipe having a smooth surface and at least two open ends and a pair of oppositely disposed, radially-extending arms having open portions therethrough and arranged on said pipe intermediate said open ends of said pipe, said arms disposed from said open pipe ends a distance at least as great as the depth of said receptacle for receiving a fluid sealing gasket therein;
- (b) means for aligning one of said open ends of said pipe with said gasket, said gasket being disposed between said receptacle and the rim of said open pipe end, whereby said gasket extends radially beyond said rim, said alignment means disposed on the opposite side of the mounting wall for said independently supported plumbing fixture in the pipe chase area and thereby being inaccessible from outside of the pipe-chase area;
- (c) means for adjustably connecting said arms to said plumbing fixture whereby said arms are movable towards or away from said gasket so that said one of said open ends of said pipe may be coupled in fluid sealing engagement with said gasket and disengaged therefrom as desired, said adjustment means disposed on the opposite side of the mounting wall for said independently supported plumbing fixture in the pipe chase area and thereby being inaccessible from outside of the pipe chase area; and
- (d) a no-hub connection for coupling said one other open end of said pipe in fluid communication with said waste-receiving pipe, said no-hub connection disposed on the opposite side of the mounting wall for said independently-supported plumbing fixture in the pipe chase area and thereby being inaccessible from outside of the pipe-chase area.

4,108,478

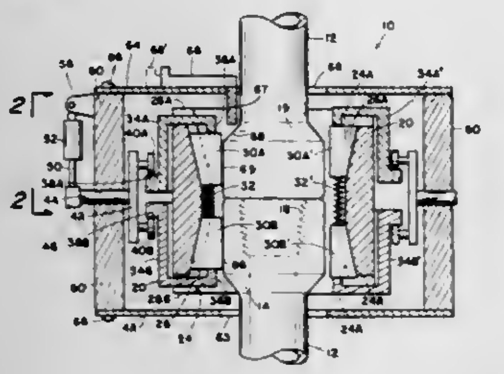
MEANS TO PREVENT RELATIVE ROTATION OF THREADED TOGETHER PIN AND BOX TOOL JOINTS

Paul E. Lynch, Broken Arrow, Okla., assignor to Fenix & Scisson, Inc., Tulsa, Okla.

Filed Jul. 5, 1977, Ser. No. 812,475

Int. Cl.² F16L *55/00*

U.S. Cl. 285—82 **8 Claims**



1. In a rotary drilling system for drilling large-diameter boreholes, in the earth, and using multiple lengths of drill pipes, joined by threaded tool joints, the improvement in means to prevent relative rotation of threaded-together pin and box tool joints, after the tool joint has been made up to the proper torque, comprising:
- (a) cylindrical retainer means positioned to surround a tool joint with an annular space between said tool joint and said retainer means;
- (b) at least one pair of longitudinally slidable wedge or cam means on the inside surface of said retainer means;
- (c) hydraulic means to move said at least one pair of wedge or cam means longitudinally toward each other, along sloping grooves in said inside surface of said retainer means;

whereby as said cam means move toward each other, they move radially inwardly and press on the outer surfaces of said pin and box parts of said tool joints with a selected pressure; whereby said pressure of said cam means on said tool joints prevents relative rotation of said parts of said tool joint.

4,108,479

PIPE COUPLING

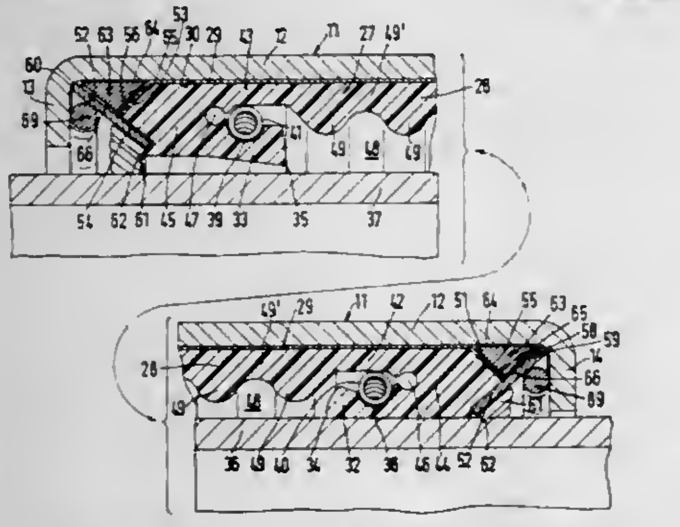
Immanuel Straub, 7323 Wangs, Switzerland

Filed Jul. 15, 1977, Ser. No. 816,269

Claims priority, application Austria, Jul. 21, 1976, 5376/76

Int. Cl.² F16L *17/00*

U.S. Cl. 285—112 **10 Claims**



1. A pipe coupling for coupling together the pipe ends of pipes which are to be interconnected, comprising:
- a housing;
- means for clamping the housing about the pipe ends intended to be interconnected;
- a sealing gasket enclosed in said housing and possessing a substantially C-shaped axial cross-sectional configuration;
- said sealing gasket being open towards the inside and having end faces;
- a respective substantially truncated cone-shaped clamping ring having an inner jacket surface and an outer jacket surface, each said outer jacket surface supporting thereat an associated one of said end faces of said sealing gasket;
- each of said clamping rings being retained at its outer periphery and in the axial direction within said housing and being provided at its inner periphery with claws engaging with the pipe ends when said housing is being clamped; and
- mounting means for clamping said clamping rings within the housing at the region of their outer periphery, said mounting means engaging the outer and inner jacket surfaces of said clamping rings for preventing said clamping rings from being bent when said housing is being clamped.

4,108,480

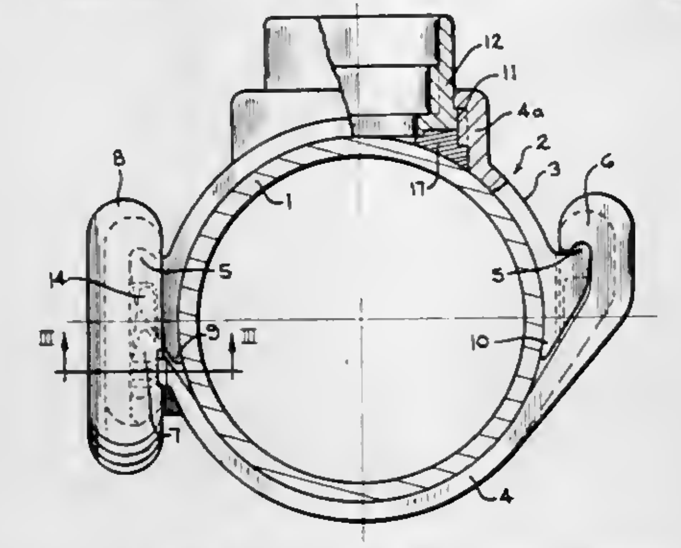
BRANCH PIECE FOR PROVIDING BRANCH CONNECTIONS IN A PIPE

Ernst Ettema, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 486,604, Jul. 8, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,331

Int. Cl.² F16L *41/00*

U.S. Cl. 285—197 **1 Claim**



1. A branch piece for providing a branch connection in pipelines, comprising:
- a first part (3) having a branch opening in a wall surface;
- a second part (4) which is connectible with said first part (3) so that said first and second parts (3 and 4) together surround a pipeline (1);
- said first part (3) being provided on both sides thereof with coupling ears (5) which extend parallel to each other and to the longitudinal axis of said first part (3);
- said second part (4) being provided with a coupling edge (6) on a first side thereof, and a longitudinally-extending inclined ledge (7) on a second side thereof;
- a wedge-shaped member (8) being provided with an inwardly-bent over endface (13), and which serves as an abutment member;
- said wedge-shaped member (8) contacts at least a portion of said longitudinally-extending inclined ledge (7) and at least a portion of one of said coupling ears (5) to connect together said first and second parts (3 and 4);
- said coupling edge (6) being capable of engaging the other one of said coupling ears (5);
- said second part (4) being provided with a lip 16;
- said inwardly-bent over endface (13) of said wedge-shaped member (8) is provided with an extension (13*a*); and
- said extension (13*a*) is disposed behind said lip (16) on said second part (4).

4,108,481

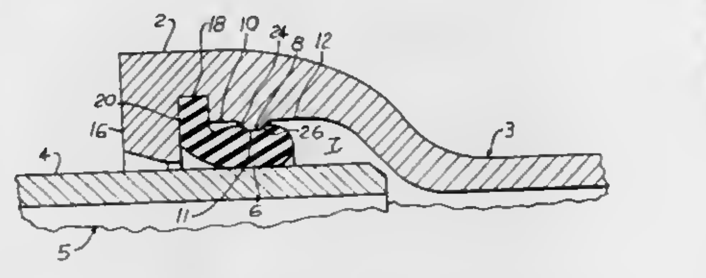
GASKETED PIPE JOINT

Robert Malcolm Graham, Birmingham, Ala., assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Dec. 6, 1976, Ser. No. 747,846

Int. Cl.² F16L *21/04*

U.S. Cl. 285—231 **4 Claims**



1. The combination with a pipe joint including:
- a. an inner pipe with a plain end telescoped into the open end of an outer pipe,
- b. said outer pipe having an axially elongated groove extending radially around its inside surface near said open end,
- c. said axially elongated groove having gasket retaining means and a sealing wall,
- d. said inner pipe having a plain end with an outside sealing wall,
- e. a resilient gasket in said elongated groove,
- f. said resilient gasket having a retaining portion cooperating with said retaining means to prevent said gasket from being dislodged from said joint and a sealing portion, said sealing portion having an outer surface,
- g. the improvement which comprises an integral compression rib located between a forward gasket sealing wall and rear gasket sealing wall of said outer pipe and having a sealing face, said rib protruding radially inwardly into said axially elongated groove, said rib being so positioned that the thickest part of said sealing portion of said gasket contacts said rib and a portion of said outer surface of said sealing portion of said gasket does not contact said forward gasket sealing wall whereby said sealing portion of said resilient gasket is radially compressed between said compression rib and said outside sealing wall of said inner pipe.

4,108,482

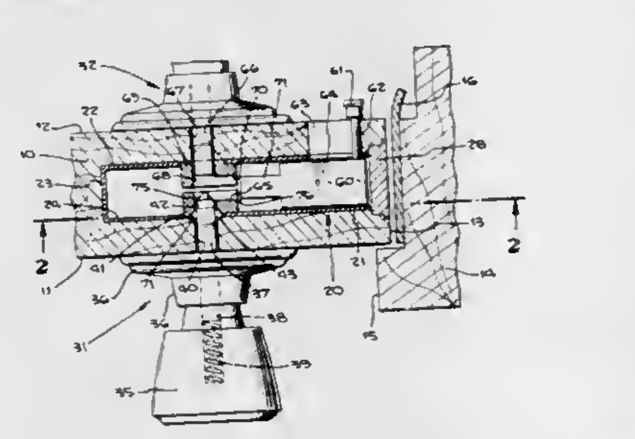
DISENGAGING SPINDLE LOCKING MECHANISM

Hagen Dietrich, Delta; William J. Fane, North Vancouver, and Joseph Potschka, Vancouver, all of Canada, assignors to Norris Industries, South Gate, Calif.

Filed Oct. 20, 1977, Ser. No. 843,939

Int. Cl.² E05B *55/06*

U.S. Cl. 292—165 **9 Claims**



1. In a lock mechanism comprising a frame, a reciprocating latch bolt mounted in the frame, a retract arm movably mounted on the frame in a position of engagement with the latch bolt for withdrawing said latch bolt and a retract hub having a rotatable mounting on the frame in operating engagement with the retract arm, a disengaging spindle locking mechanism for guarding the hub against unauthorized rotation comprising a locking slide having a reciprocatable mounting on the frame, a shoulder on the hub adapted to engage the slide in locking position, means forming a non-circular opening in said hub, a spindle having an axially movable non-rotatable engagement with the non-circular opening in the hub for rotating said hub through a latch bolt actuating cycle, a first cam element on said spindle, a second cam element on an adjacent portion of said slide, said spindle being subject to axial movement by action of said cam elements to a position of disengagement from said hub, whereby to permit rotation of the spindle independent of the hub.

4,108,483

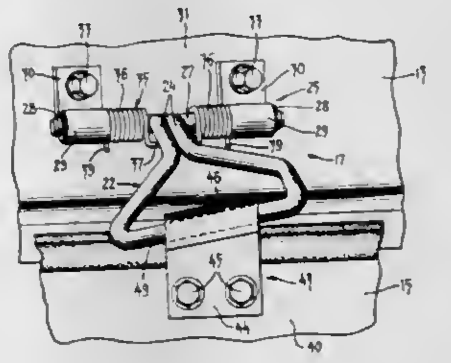
LATCHING DEVICE

John F. Hero, Southfield, and Joseph L. Buccellato, Warren, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 8, 1977, Ser. No. 813,907

Int. Cl.² E05C *3/04*

U.S. Cl. 292—272 **7 Claims**



1. In a latching arrangement for a first door panel and second complemental panel comprising, means for holding said first and second panels at an angle to one another including a handle member, means pivotally mounting said member to said first panel between inoperative and operative positions, means connected to said member and said first panel for normally biasing said member into its inoperative position, and means connected to said second panel to engage said member in its operative position, said member including a peripheral portion opposite said pivotal mounting means and wherein the axis of said peripheral portion is inclined relative to the pivotal axis of said pivotal mounting means of said member, whereby said biasing means urges said member into engagement with said connecting means and said peripheral portion inclination militates against disengagement of said member and said connecting means to maintain them in locking engagement.

4,108,484

COLLAPSIBLE GRAPPLE

Richard R. Malroit, 9142 N. Bennett, Skokie, Ill. 60203

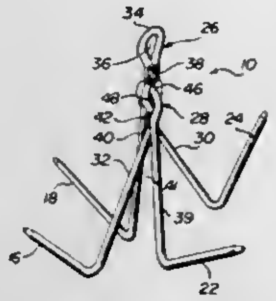
Filed Jan. 4, 1977, Ser. No. 756,730

Int. Cl.² B66C *1/34*

U.S. Cl. 294—66 R **6 Claims**

1. A collapsible grapple comprising first and second substantially planar members, said first member comprising a first pair of elongate shanks and a top portion joined to said shanks for defining a slot therebetween, said first pair of shanks further including lower ends extending outwardly of said slot and terminating in pointed ends to form a first opposing pair of hooks at an angle to and substantially in the plane of said first pair of shanks, said second member comprising a second pair of elongate shanks and a top portion joining said second pair of shanks and said second pair of shanks curving inwardly below said top portion to a first confluence to form a first aperture to receive a connecting line, and curving outwardly below said

first confluence and back inwardly to a second confluence to form a second aperture to receive the first member, said second pair of shanks being spaced to define a slot below said second aperture and having lower ends extending outwardly of said slot and terminating in pointed ends to define a second opposing pair of hooks disposed at an angle to and in the same plane as said second pair of shanks, said top portion of said first



member traversing and pivotally engaging within said second aperture of said second member but confined against any substantial non-pivotal movement with said second pair of hooks generally perpendicular to said first pair of hooks, and with the upper portions of said first pair of shanks adjacent the second confluence positioned for permissive interfering engagement therewith in resisting rotation of the first member about the longitudinal axis of the second member when assembled.

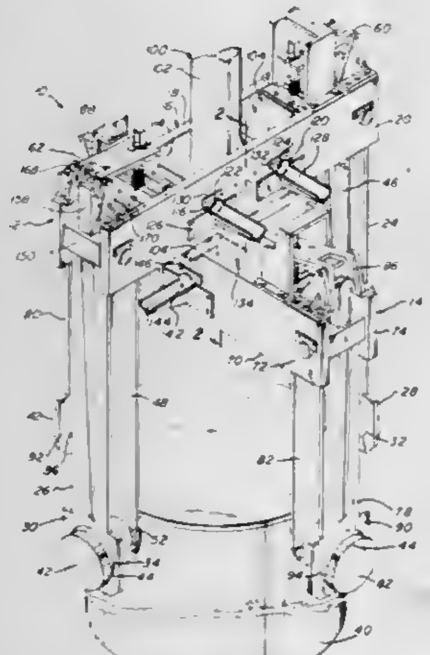
4,108,485
REDUNDANT LIFT BEAM ASSEMBLY

Eugene W. Jennings, Denver, Colo., assignor to Stearns-Roger Corporation, Denver, Colo.

Filed Mar. 22, 1977, Ser. No. 780,235

Int. Cl.² B66C *1/10*

U.S. Cl. 294—67 BC **16 Claims**



1. A lift beam assembly for assisting in the lifting of heavy objects, the lift beam assembly comprising:
 a. an elongated structural body having a means mounted near the midpoint of said body for engaging the hook of a lifting crane,
 b. a pair of lift arm means, one of said arm means being pivotally suspended at each end of said body, said arm means having a suspended end and the arm means is arranged so that the suspended end pivots outwardly in a longitudinal direction beyond the end of said body, a coupling means provided near the suspended end of each lift arm means, said coupling means being provided for connecting the lift arm means to a heavy object to be lifted, and
 c. latching mechanism means attached to each of said lift arm means whereby said lift arm means may be moved independently of the other lift arm means, said mechanism means having a pivotable lever attached at one end to said lift arm means and the opposite end attached to a slidable rod means whereby when said rod means is longitudinally moved the lift arm means pivots accordingly from a closed position where the coupling means connects said heavy object to an open position where said coupling means extends beyond and is free of said object,
 d. said latching mechanism means further including a releasable locking means, said locking means includes a key attached to said slide rod means and arranged so that said rod means can be held against longitudinal movement so that said lift arm means is locked either in said open or closed position.

4,108,486
INFLATABLE THRUST PRODUCING TOOL

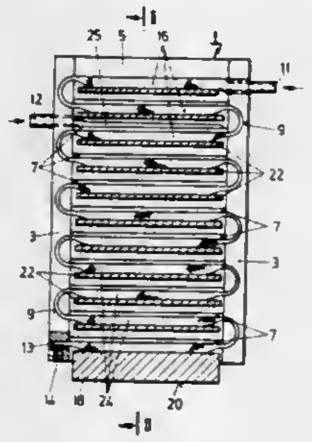
Georg Hirmann, Zurich, Switzerland, assignor to Repapress AG, Romanshorn, Switzerland

Continuation of Ser. No. 600,949, Aug. 1, 1975, which is a division of Ser. No. 450,193, Mar. 11, 1974, Pat. No. 3,924,843. This application Nov. 19, 1976, Ser. No. 743,118

Claims priority, application Switzerland, Mar. 9, 1973, 3498/73

Int. Cl.² B25B *1/00*

U.S. Cl. 294—99 R **7 Claims**



1. Tool comprising a force-producing device having at least one inflatable thrust producing member displaceable so as to apply a given force, a pivotally displaceable member engageable by said inflatable thrust producing member and pivotally displaceable thereby and a member on which said pivotally displaceable member is pivotally mounted on an axis about which the displaceable member pivots, and wherein said pivotally displaceable member is a lever handle movable relative to another member and forming tongs, and wherein said other member is another lever handle, with said inflatable thrust producing member being disposed between both said lever handles, and including resilient means connected to said lever handles for restoring the tongs to their initial open position.

4,108,487
SLEEPER STORAGE BINS

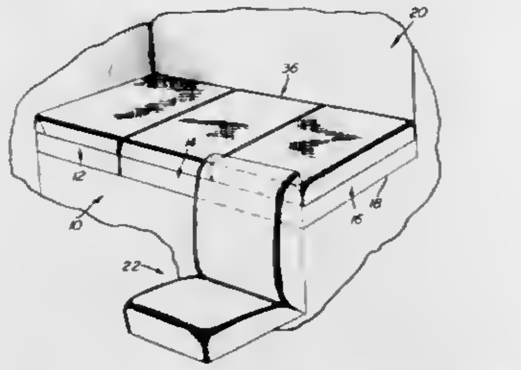
Larry L. Spohn, P.O. Box 54, Crescent, Iowa 51526

Filed Apr. 1, 1977, Ser. No. 783,850

Int. Cl.² B10P *3/34*

U.S. Cl. 296—28 C **4 Claims**

3. In combination, a tractor cab provided with a sleeper, and storage bins arranged in the sleeper for storing articles, the storage bins comprising, in combination:
 (a) a plurality of receptacles arranged immediately adjacent one another in the sleeper of the tractor cab;
 (b) a plurality of lids for covering the receptacles; and
 (c) hinge means connected to the lids and receptacles for pivotally mounting the lids on respective ones of the receptacles, and for supporting a mattress arranged in the sleeper, the hinge means pivotally mounts the lids on the receptacles in two different orientations for swinging movement substantially perpendicular to one another, three receptacles being arranged in side-by-side relation in the sleeper, with a center one of the receptacles having the lid thereof pivotally mounted for swinging toward the back of the cab, and an outside pair of the receptacles having the lids thereof pivotally mounted for swinging away from one another, the arrangement of lids permitting selective access to the receptacles from the interior of the cab.



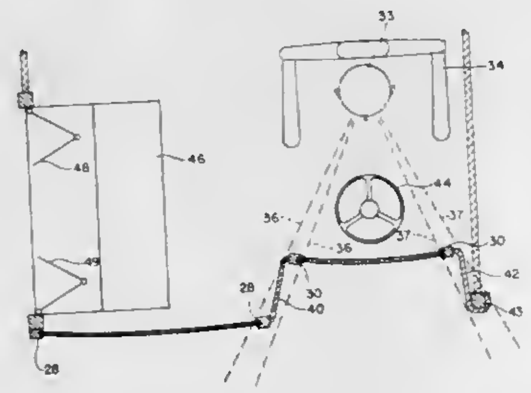
4,108,488
VEHICLE FRONT HAVING ASYMMETRICAL WINDSHIELDS

Keith W. Tantlinger, Coronada, Calif., assignor to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Apr. 6, 1977, Ser. No. 784,954

Int. Cl.² B60J *1/06;* **B60R** *1/00*

U.S. Cl. 296—84 R **9 Claims**



1. A transit vehicle having an improved front end structure comprising:
 a front end having a steering wheel and a driver's seat,
 a pair of windshields mounted in said front end, one of said windshields positioned forwardly of the steering wheel and being referred to as the first or driver's windshield, the other windshield positioned laterally adjacent said first windshield and being referred to as the second windshield,
 a vertical divider is mounted between said first and second windshields,
 said first and second windshields being at different angles from a vertical axis whereby light from the interior lights and light reflections from passenger faces and clothing is reflected rearwardly from the interior surface of said windshields at different angles.

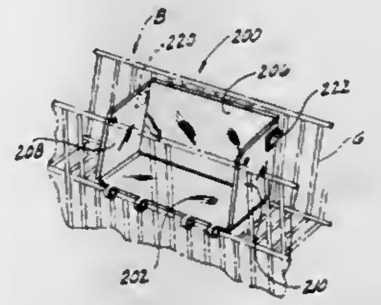
4,108,489
COLLAPSIBLE CHILD SEATS

Marilyn F. Salzman, 355 Dungate Dr., Chesterfield, Mo. 63017

Filed Dec. 20, 1976, Ser. No. 752,065

Int. Cl.² A47D *1/10*

U.S. Cl. 297—37 **6 Claims**



1. In combination, a shopping cart having a child seat structure including a horizontal platform extending along the entire width of said cart between two vertical side walls of said cart; and
 a child seat fitted within said child seat structure, said child seat comprising:
 a first panel having first and second side edges and first and second end edges;
 a second panel having third and fourth side edges and third and fourth end edges;
 said first, second, third and fourth side edges being shorter than the length of said platform;
 first and second restraining flaps, each having a first edge coextensive with and hinged to a respective one of said first and second end edges of said first panel, each of said restraining flaps having a second edge adjoining a respective one of said first edges of said flaps and movable into coextensive relationship with a respective one of said third and fourth end edges of said second panel; and
 securing means for releaseably securing each of said second edges of said restraining flaps in said coextensive relationship;
 said shopping cart having an upstanding forward wall on one side of said platform and an upstanding rearward wall on the opposite side of said platform; said second panel being hinged to said shopping cart along said fourth side edge and being pivotable between a position against said rearward wall and a position on said platform; and, said first panel being affixed to the rearward side of said forward wall,
 wherein, when said second edges of said restraining flaps are in said coextensive relationship, said restraining flaps are spaced from said side walls of said cart to thereby prevent a child placed within said child seat from falling laterally against said side walls of said cart.

4,108,490
FOLDABLE CHAIR

Jose Antonio T. Marin, Hidalgo #214, Santa Ursula, Coapa Mexico City, Mexico

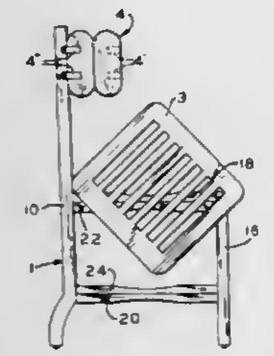
Filed Jul. 5, 1977, Ser. No. 812,820

Int. Cl.² A47C *4/08*

U.S. Cl. 297—42 **7 Claims**

1. In a foldable chair; a generally rectangular, one-piece seat member, a pair of front legs having upper ends, a pair of rear legs, upper and lower pairs of overlapped cross members with each cross member connected at one end to a rear leg and at the other end of the front leg diagonally opposed to the respective rear leg, pivot means pivotally connecting the cross members of each pair at the region of overlap thereof, means including the top cross member of the upper pair of cross members for supporting said seat member in a substantially horizontal position with two front corners respectively in general alignment with said front leg upper ends when the chair is erected,

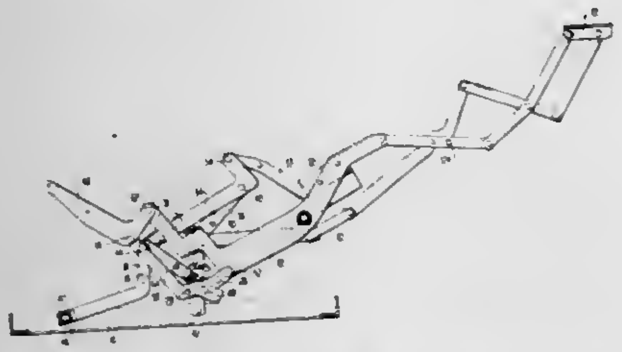
and a single swivel connecting one of said front corners of the seat member to the respective front leg upper end whereby



said seat member is adapted to be moved to a vertical position when the chair is folded.

4,108,491
WALL-AVOIDING RECLINER CHAIR

Walter Clark Rogers, Jr., Denton, N.C., assignor to Royal Development Company, Inc., High Point, N.C.
Filed Apr. 22, 1977, Ser. No. 789,958
Int. Cl.² A47C *1/02*
U.S. Cl. 297—85 **34 Claims**

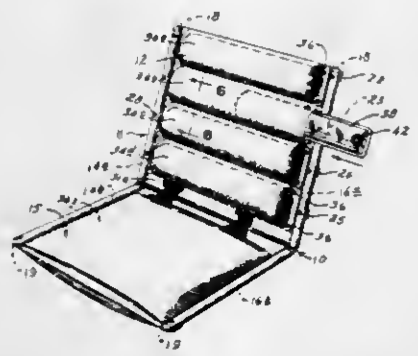


1. A reclining chair comprising in combination: a base, a seat, seat linkage means mounting the seat relative to the base for movement forwardly or rearwardly relative to the base as well as for movement into different reclining positions extending at an angle to the horizontal relative to the base, said linkage means including a carrier link, a seat link fixed to the seat, suspension linkage suspending the seat link from the carrier link for pivotal movement relative to the carrier link, and a mounting linkage pivotally mounting said carrier link relative to the base; a backrest, backrest linkage means pivotally mounting the backrest relative to the seat for movement between a substantially upright position and a number of reclining positions; a footrest, footrest linkage means mounting the footrest relative to the seat for movement between a retracted position adjacent the seat and an extended position projected forwardly from the seat, footrest actuating linkage means independent of the backrest for moving the footrest linkage means to position the footrest in said retracted or extended positions; and an actuating and control linkage interconnecting the footrest actuating linkage means and the mounting linkage for moving the mounting linkage forwardly relative to the base when the footrest is moved to said extended position.

4,108,492
BACK SUPPORT

Billy E. Kirby, 938 Vinecrest La., Richardson, Tex. 75080
Filed Oct. 18, 1974, Ser. No. 515,986
Int. Cl.² A47C *7/46, 27/10*
U.S. Cl. 297—284 **1 Claim**

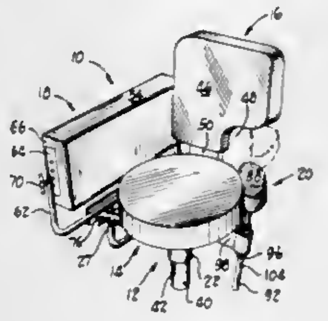
1. A back support comprising: a pair of horizontally spaced vertically extending frame members; vertically spaced horizontally extending frame members; means securing ends of said horizontally extending frame members to said vertically extending frame members; flexible front and rear panels secured together adjacent three edges to form a hollow slip cover having an open end; pockets secured to said front panel of the slip cover forming spaced horizontally extending compartments, each of said compartments being isolated one from the other, said slip cover being positioned over said vertically



extending frame members such that each of said horizontally extending frame members is positioned adjacent to and parallel with one of said compartments; an inflatable cushion in each of said compartments; means on each cushion to vary pressure in each cushion independently of pressure in the other cushions; a seat cushion in said slip cover adjacent the open end thereof.

4,108,493
LOCOMOTIVE CAB SEAT

Glen L. Naus, Rte. 3, Holiday Lake, Willard, Ohio 44890
Filed Mar. 10, 1977, Ser. No. 776,285
Int. Cl.² A47C *3/18, 7/54*
U.S. Cl. 297—337 **3 Claims**

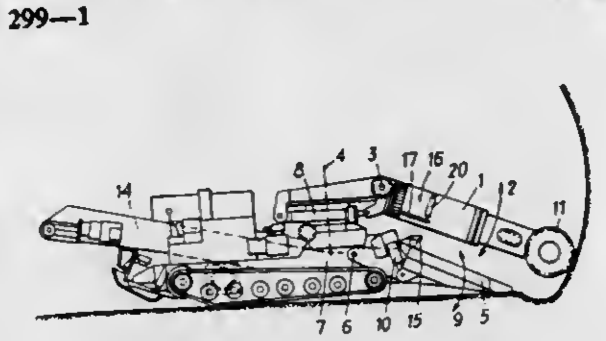


1. In a locomotive cab seat assembly including a rotatable seat portion and a backrest, the seat portion being mounted for rotation independently of the backrest and the backrest being shaped to permit an operator to rotate the seat portion to a sideways-facing position with respect to the backrest, the improvement comprising:

(a) a vertically movable armrest movable between a raised position for supporting an arm of the operator when the operator is facing forwardly and a lowered position for permitting the operator to rotate the seat portion to the sideways-facing position;
(b) support means for supporting the armrest independently of the seat portion so that the seat portion can rotate while the armrest is stationary, the support means including cooperating structure for releasably holding the armrest in the raised position, the cooperating structure being releasable by the operator so that the armrest can be moved to the lowered position;
(c) a second armrest disposed adjacent the seat portion, the second armrest having an upper, arm-supporting surface and a side surface extending from the upper surface to near the seat portion so that the side surface supports the operator's back when the operator is in the sideways-facing position; and
(d) support means for adjustably supporting the second armrest independently of the seat portion, whereby the seat portion can rotate while the second armrest is stationary.

4,108,494
CUTTING MACHINE

Peter Kogler, Knittelfeld, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Austria
Filed May 13, 1977, Ser. No. 796,705
Claims priority, application Austria, May 13, 1976, 3504/76
Int. Cl.² E21C *27/20*
U.S. Cl. 299—1 **6 Claims**

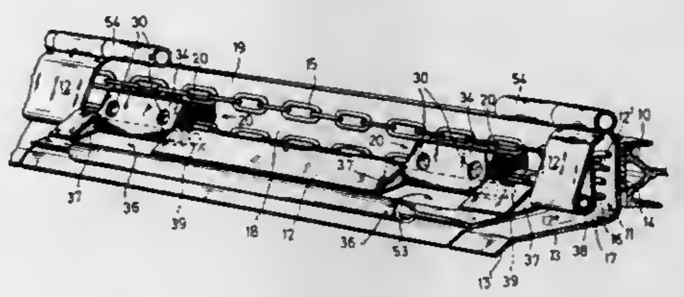


1. A cutting machine having a frame on which a cutting arm is attached, said cutting arm including at least one cutting head which can be swiveled around a horizontal axis and a vertical axis, a loading ramp pivotally attached to said frame and disposed below said cutting arm so that it can be swiveled around a horizontal axis, first hydraulic drive means for effecting the lifting and lowering of said cutting arm, second hydraulic drive means for moving said loading ramp and stopping means responsive to changes in the relative vertical distance between said cutting arm and said loading ramp for stopping further movement of said cutting arm and said loading ramp toward one another when the vertical distance between said cutting arm and said loading ramp does not exceed a first predetermined distance, said stop means including a first and second stop member respectively mounted on said cutting arm and said loading ramp so as to come into engagement with one another as said cutting arm and said loading ramp are pivoted toward one another, at least one of said first and second stop members being movably mounted, said movably mounted stop member including a pivotally mounted elongated actuating member and valve means for relieving pressure in said first and second hydraulic drive means in response to movement of said movable stop member when said first predetermined distance is not exceeded, and the other of said stop members includes an elongated member for mating with the elongated actuating member in said movable stop member, said stop means including two pairs of said first and second stop members said pairs being respectively mounted on opposite sides of said cutting arm and said loading ramp so that as said cutting arm traverses back and forth over said loading ramp the elongated member of one of the two pairs of stop members will abut if said first predetermined distance is not exceeded.

4,108,495
GUIDES FOR MINERAL MINING MACHINES

Alois Hauschopp, Werne, and Wolfgang Peters, Selm, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany
Filed Feb. 23, 1977, Ser. No. 771,266
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607350
Int. Cl.² E21C *35/20*
U.S. Cl. 299—43 **18 Claims**

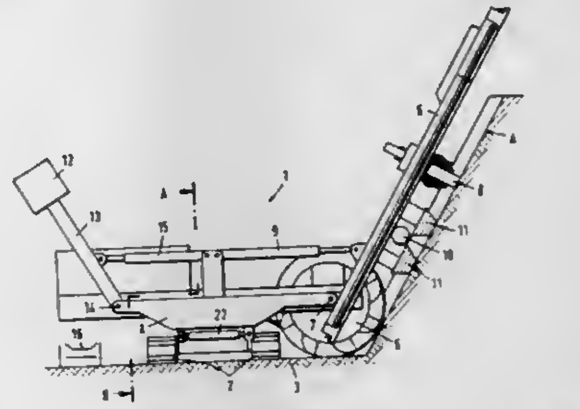
1. In a guide for a mineral mining machine, said guide having means defining upper and lower chain guide passages along which a drive chain for the machine is circulated, cover plates covering the guide passages, and means pivotably mounting the cover plates to permit them to be swung outwards for access to the guide passages, the improvement therein comprising: the defining means including a plurality of separate spacers vertically separating the guide passages, the pivot mounting means taking the form of hinge connections pivoting the cover plates to said spacers, and the cover plates having recesses for



accepting said spacers, the cover plates and said spacers combining to form a continuous ramp-like guide surface.

4,108,496
PADDLE WHEEL PICK-UP

Ernst-Otto Schneidersmann, Duisburg, Germany, assignor to DEMAG Aktiengesellschaft, Duisburg, Germany
Filed Jun. 17, 1977, Ser. No. 807,442
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1976, 2628863
Int. Cl.² E21C *27/24, 35/20*
U.S. Cl. 299—45 **7 Claims**



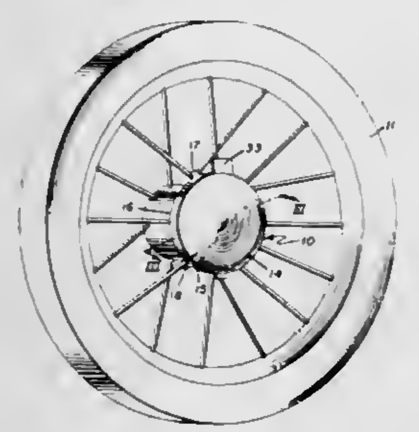
1. A material mining and removal apparatus comprising
(a) a movable carriage;
(b) a frame disposed on said carriage;
(c) a rotatable pick-up wheel mounted on said frame and extending laterally to one side of said carriage toward a surface to be mined and engaging the mine floor; the improvement characterized by
(d) a cutter supporting beam pivotally mounted on said frame adjacent said pick-up wheel and extending laterally toward said surface to be mined;
(e) reversible power means disposed between said carriage and said supporting beam for pivoting said beam into position parallel to a surface to be mined;
(f) a cutting device mounted on said supporting beam; and
(g) power means on said cutting device for moving said cutting device along said beam toward and away from the supporting surface of said carriage and along said surface to be mined;
(h) whereby material removed from a mining surface by said cutter falls into the path of said rotatable pick-up wheel.

4,108,497
HUB CAP

Bruce N. Smith, Seabrook, N.H., assignor to Spherex, Inc., Seabrook, N.H.
Filed Dec. 29, 1976, Ser. No. 755,163
Int. Cl.² B60B *7/06*
U.S. Cl. 301—37 SA **5 Claims**

1. Hub cap for use on a wheel having a plurality of spokes extending radially from a central hub, comprising

(a) a circular main body,
(b) a skirt extending from the periphery of the main body, and
(c) four fingers extending from the skirt, each finger having an enlarged outer end defining a notch on each side for engagement with a spoke, the facing notches of one pair of fingers being spaced for close engagement with a pair of spokes of a 12-spoke wheel which spokes are equidistant, and which are attached alternately from the outer wheel rim to opposite ends of the wheel hub, and the facing notches of the other pair are similarly spaced for engagement with another pair of spokes of the wheel located in a diametrically-located position, while the outer notches of the said one pair are spaced to fit tightly between a pair of spokes of an 8-spoke or 16-spoke wheel which spokes are equidistant, and which are attached alternately from the outer wheel rim to opposite ends of the wheel hub, and the outer notches of the same other pair are similarly spaced to fit tightly between another pair of spokes of the wheel located diametrically across the wheel.



4,108,498
GARBAGE SUCTION PLANT

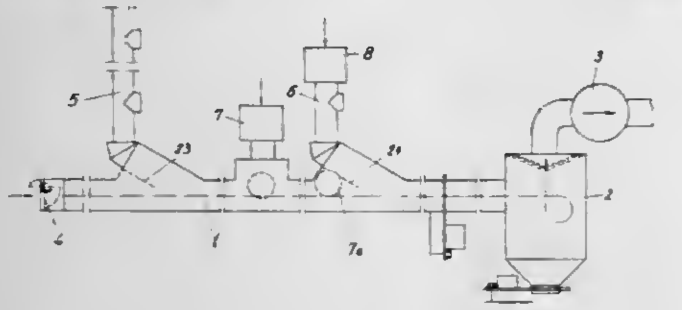
Thomas Valdemar Bentsen, Aarhus, Denmark, assignor to Bruun & Sorensen A/S, Aarhus C, Denmark

Filed Mar. 22, 1976, Ser. No. 668,982

Claims priority, application Denmark, Mar. 21, 1975, 1224/75

Int. Cl.² B65G *53/06*

U.S. Cl. 302—27 **5 Claims**



1. A garbage suction plant using an air suction system and having a number of garbage chutes connected to a common, substantially horizontal transport duct leading to a collecting centre having air suction equipment for creating a suction effect through the duct and the chutes, a plurality of air inlet valve arrangements being provided at predetermined locations of the duct which are situated further away from the collecting centre than connection points of at least some of the garbage chutes, each of said valve arrangements being adapted for opening under the influence of the suction effect in the transport duct and subsequent closing after a predetermined period of time, each of said plurality of air inlet valve arrangements comprising two interconnected valve plates each adapted for closing an opening communicating with said air-suction system, and means for resiliently urging a first of said valve plates against an inner wall surface surrounding said opening, a second of said valve plates being adapted for being urged against an outer wall surface surrounding said opening under influence of said air suction, said valve arrangement being further connected to damping means adapted for determining said predetermined time between opening said first valve plate and closing said second valve plate against the wall opening.

4,108,499
METHOD AND CONTROL SYSTEM FOR CONTROLLING A SUSPENDED IMPLEMENT

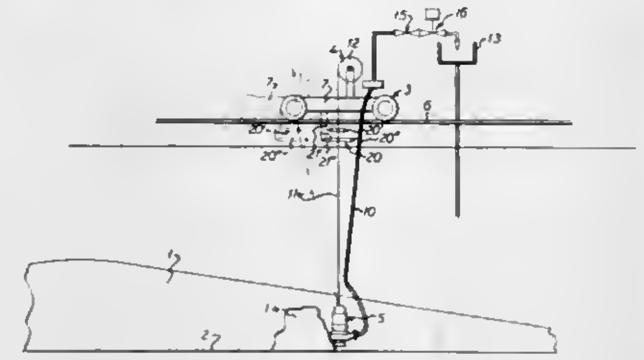
Nils Arne Sandberg, Hassleholm, Sweden, assignor to Ingenjorsfirman N A Sandbergs Industrikonstruktioner AB, Hassleholm, Sweden

Filed Oct. 29, 1976, Ser. No. 737,163

Claims priority, application Sweden, Nov. 3, 1975, 75122655

Int. Cl.² B65G *53/04;* E02F *3/88*

U.S. Cl. 302—34 **7 Claims**



1. Apparatus for controlling the position of a suspended travelling implement in relation to a carriage above and solely supporting said implement through a wire comprising:
conduit means connecting said implement to a receiving means for conveying material thereto;
a flow rate sensor disposed in said conduit which monitors the flow rate of the conveyed material;
first means responsive to said flow rate sensor which alters the length of wire between said carriage and said implement to maintain said flow rate within preset limits so as to compensate for varying density strata of material to be conveyed;
second means for both moving said carriage and therefore said implement along within a certain velocity range;
third means for measuring a lag between said implement and said carriage;
and fourth means for adjusting the velocity of said carriage when said third means measures a lag between said implement and said carriage by an angle said wire defines relative to absolute vertical.

4,108,500
PROCESS AND EQUIPMENT FOR EFFECTING SAVINGS IN COMPRESSED GASES DURING INJECTION OF SOLIDS BY MEANS OF PNEUMATIC CONVEYORS

Walter Stamer, Hamburg, Germany, assignor to Claudius Peters AG and Maxpeters Gesellschaft fuer Verfahrenstechnik mbH, Hamburg, Germany

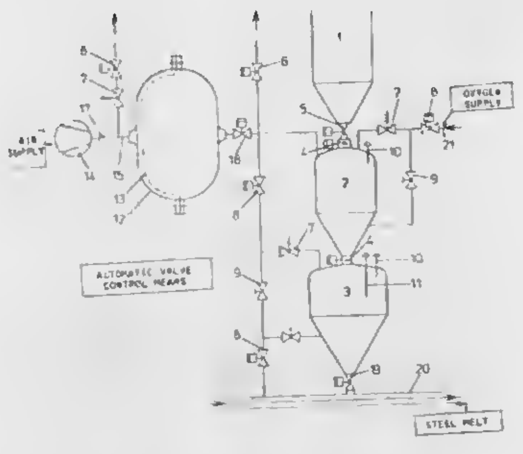
Filed Aug. 31, 1976, Ser. No. 719,169

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538785

Int. Cl.² B65G *53/40*

U.S. Cl. 302—53 **11 Claims**

1. A process of saving gas in the pneumatic injection of particulate solids into a blow line connected with a second container pressurized with the gas, comprising the steps of:
charging the solids in discrete batches into a first pressurizable container:
pressurizing the first container from a reservoir of the compressed gas, while a previous batch of said solids is being injected into the blow line from the second container:
charging the batch of pressurized solids in first container into the second container by connecting the containers to equalize the pressure therebetween, while solids in the second container are being continuously discharged under pressure into the blow line:



cutting off connection between the containers on completion of discharge of an accumulated batch of solids from the first to the second container and subsequently
connecting the first container with the reservoir to pass gas thereto for subsequently pressurizing the first container.

4,108,501
BRAKE ACCELERATOR FOR AIR BRAKE SYSTEM OF A RAILWAY VEHICLE

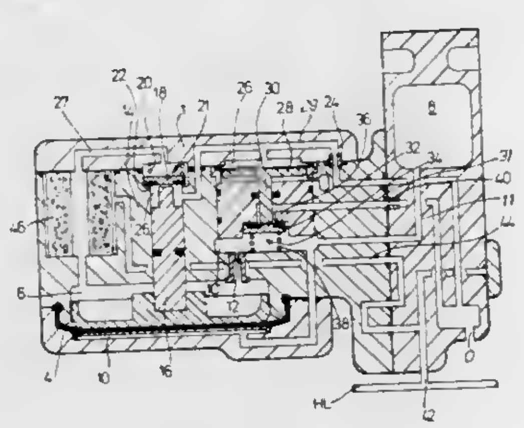
Josef Hintner, and Peter Pick, both of Münich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,745

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638437

Int. Cl.² B60T *17/04*

U.S. Cl. 303—82 **5 Claims**



1. A brake accelerator for drawing off air from the brake line of an air brake system for railway vehicles and comprising a first piston having one side subjected to air pressure in a brake line, means including an expansion chamber connected to the other side of said first piston for subjecting said other side to a control pressure opposing the brake line pressure, there being a throttle opening between said one side of the first piston and the connection from said expansion chamber to said other side of the first piston, first passage means having a second throttle opening therein for connecting said one side of the first piston to the atmosphere, a first valve closing said first passage means, means on said first piston for opening said first valve when the control pressure on the other side of the first piston predominates over the brake line pressure on said one side of the piston, second passage means including a third throttle opening for connecting said expansion chamber to the atmosphere, a second valve closing said second passage means and spring means urging said second valve into the closed position, a pressure accumulation chamber in said first passage means between said second throttle opening and said one side of the first piston, and second piston in said pressure accumulation chamber and having means thereon for actuating said second valve, said second piston acted upon by pressure in said pressure accumulation chamber in a direction to open said valve against the closing force of said spring means.

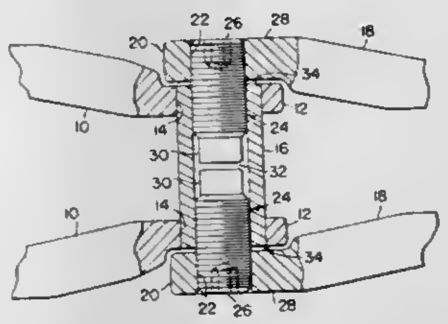
4,108,502
JOINT ASSEMBLY FOR LINKS OF ENDLESS TRACK

William Paul Wohlford, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 28, 1977, Ser. No. 772,690

Int. Cl.² B62D *55/20*

U.S. Cl. 305—14 **1 Claim**



1. An improved track section for a track laying tractor, comprising: a bushing having a threaded interior; a first pair of track links having first ends respectively received on opposite ends of the bushing; a second pair of track links respectively having threaded bores in one of their ends; and first and second threaded fasteners respectively being received in the threaded bores of the second pair of track links and in the opposite ends of bushing.

4,108,503
LINEAR MOTION BALL BEARING

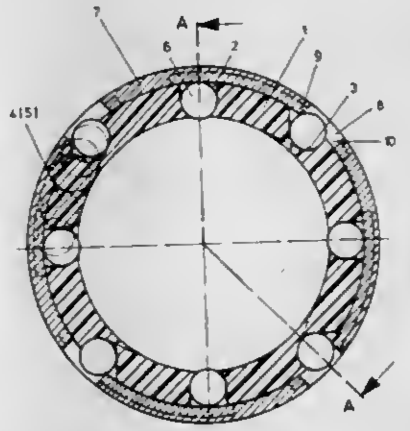
Horst Manfred Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Mar. 21, 1977, Ser. No. 779,692

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612936

Int. Cl.² F16C *31/06*

U.S. Cl. 308—6 C **4 Claims**



1. In a linear motion ball bearing operable with a shaft, the bearing including an outer sleeve, a ball retaining cage situated within the sleeve, the cage having a plurality of continuous

raceways each of which comprises axial loaded and unloaded return races, and curved turn-around races connecting the adjacent ends of said axial races, and a plurality of balls substantially filling said raceways, the sleeve including in the region of each of said unloaded return races a slot extending axially and radially through the sleeve, said slot defined by spaced edges, the improvement in combination therewith wherein said slot has a width at least equal to the diameter of said balls, and said cage and sleeve are relatively rotated about their common longitudinal axis such that balls in said unloaded return race of the cage are engaged by only one edge of said slot which thereby defines with said unloaded return race a space having a width less than said ball diameter, whereby said balls are prevented from falling out of said unloaded return portion of said raceway.

4,108,504
RACEWAY FOR LONGITUDINALLY MOVABLE ROLLING ELEMENT BUSHING

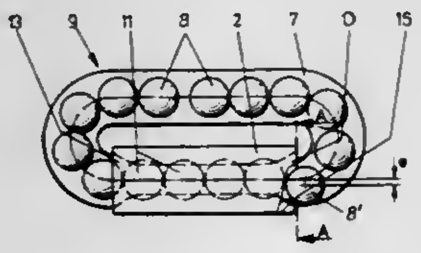
Horst Manfred Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,209

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631808

Int. Cl.² F16C *29/06*

U.S. Cl. 308—6 C **6 Claims**



1. In a bushing adapted for linear movement and including housing means defining at least one path for guiding rolling elements, wherein said path has a raceway portion along which said rolling elements are exposed to loads and a return raceway portion for unloaded rolling elements and joining both ends of said loaded raceway portion, the improvement wherein the ends of said loaded raceway portion have gradually increasing widths away from the longitudinal center portion thereof, but have the same depth, whereby rolling elements entering said loaded raceway portion are subjected to loading prior to being guided laterally by the side walls of said loaded raceway portion.

4,108,505
BEARING ASSEMBLY

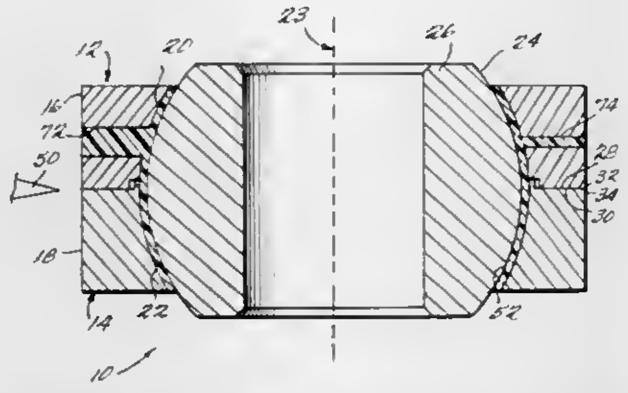
Stanley S. Orkin, Rockville, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Division of Ser. No. 597,632, Jul. 21, 1975, Pat. No. 4,033,019. This application Oct. 12, 1976, Ser. No. 731,816

Int. Cl.² F16C *23/00*

U.S. Cl. 308—72 **1 Claim**

1. An outer bearing element for a self-aligning bearing of the type having a truncated ball as the inner bearing element, said outer bearing element comprising first and second hemispherical ring members, said ring members each having a generally planar mating surface and inner annular surfaces that are symmetrical about a common central axis, said mating surfaces of said ring members being placed in abutting relationship, each of said mating surfaces having inner and outer circumferential edges between which a said mating surface extends, one of said ring members having an annular lip adjacent said respective inner circumferential edge, said other of said ring members having an annular recess adjacent said respective inner circumferential edge, with said lip extending into said recess to define a closed, circumferential cavity about said common central axis, said mating surfaces of said ring members being fusion-bonded together between said outer circumferential edges and said cavity.



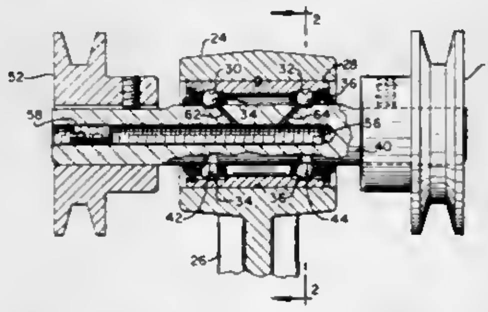
4,108,506
BEARING LUBRICATING SYSTEM

Norbert Osborn, Irving, Tex., assignor to WRR Industries, Inc., Dallas, Tex.

Filed Oct. 26, 1976, Ser. No. 735,267

Int. Cl.² F16C *1/24*

U.S. Cl. 308—187 **8 Claims**



5. A bearing lubricating system comprising:

a shaft having two inner raceways formed therearound, a concentric bore formed in said shaft and passageways communicating between the bore and the inner raceways,

balls having a diameter slightly less than the arc diameter of said raceways for tracking the inner raceway formed around said shaft,

an outer ring having two outer raceways formed therein, the outer raceways in said outer ring having a separation different from the separation between the inner raceways in said shaft such that the balls contact the inner and outer raceways at an angle to a plane perpendicular to the axis of the bearing and where said balls contact the inner raceways on the sides of the inner raceways removed from the points of communication of the passageways between the bore and the inner raceways to prevent the balls from tracking over the opening of the passageways into the inner raceways, and

means for selectively forcing lubricant loaded in the bore through the passageways to the inner raceways where the lubricant lubricates the bearing.

4,108,507
THROUGH-WALL CABLE SUPPORT

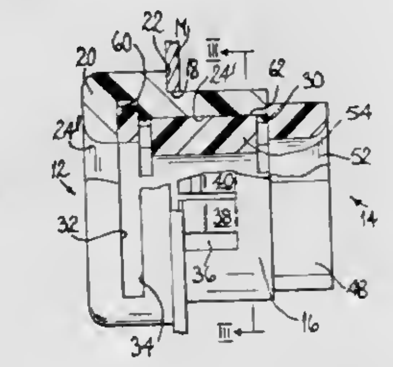
Wolf Renner, Giessen, and Dieter Mauer, Lollar, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Dec. 7, 1976, Ser. No. 748,200

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556878; Dec. 17, 1975, 7540233[U]

Int. Cl.² F16C *27/00*

U.S. Cl. 308—238 **8 Claims**



1. A cable strain relief bushing for insertion into a non-circular opening forming in a panel, comprising; a body having an outer surface which in cross section forms a shape complementary to the panel opening, an enlarged head located at one end of said body to engage one side of the panel, and having retaining means disposed on said body outer surface to engage the opposite side of said panel, said body further having a non-circular bore formed therethrough, and a locking member having wall structure defining a bore therethrough for receiving a cable, said member having at least one movable finger hingedly supported adjacent an opening formed through said locking member wall structure for movement of said finger into said locking member bore through said opening, said body non-circular bore having a minimum cross-section dimension and a maximum cross-sectional dimension and said finger extending from said locking member wall structure to define a maximum cross-sectional dimension of said locking member less than said body member bore maximum cross-section and greater than said body member bore minimum cross-section, whereby rotation of said locking member inserted into said body bore is effective to move said finger through said wall structure opening to contact and grip a cable disposed in said locking member bore.

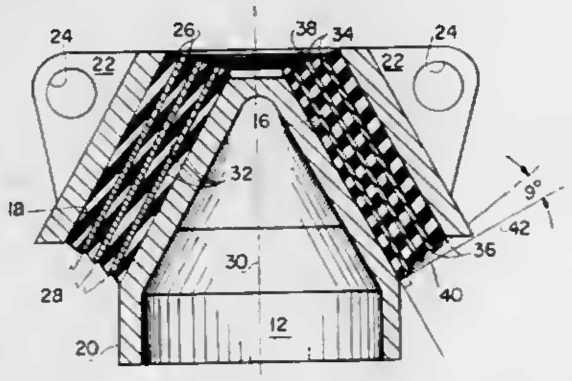
4,108,508
FRUSTROCONICAL LAMINATED BEARING

Ralph L. Clinard, Jr., Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 1, 1977, Ser. No. 764,667

Int. Cl.² F16F *1/38*

U.S. Cl. 308—238 **6 Claims**



1. A laminated bearing comprising a plurality of alternating and bonded together layers of elastomeric material and substantially inextensible material, each of the layers being a frustroconically shaped annulus that has a pair of frustroconical shaped side surfaces and is concentrically disposed about a common axis extending lengthwise of the bearing, the side surfaces of adjacent layers being juxtaposed with and bonded to each other such that the larger diameter end of each layer is disposed adjacent to the larger diameter end of another layer and said larger diameter ends of the layers together define an annular surface of the bearing, said annular surface of the bearing in radial section defining an angle of about 9° with respect to a line which is normal to a frustroconical side surface of a layer, the annular bearing surface being angled with respect to said normal line in a direction toward the smaller diameter ends of the layers with increasing distance along said normal line away from the common axis.

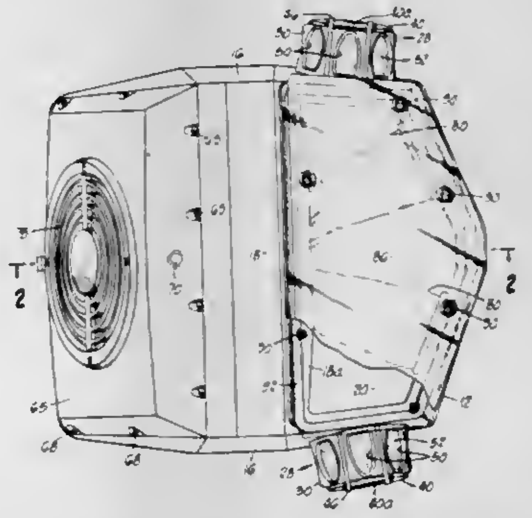
4,108,509
CONTROLLED ENVIRONMENT WORK ENCLOSURE

Meyer Piet, Arcadia, and Dean Gaylord Giles, Valinda, both of Calif., assignors to Futurecraft Corporation, City of Industry, Calif.

Filed Mar. 18, 1977, Ser. No. 779,013

Int. Cl.² B01D *53/34;* **B01L** *1/00*

U.S. Cl. 312—1 **8 Claims**

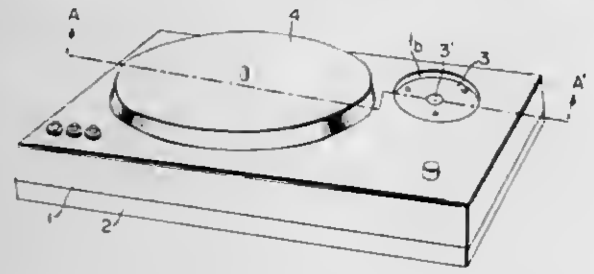


1. A work enclosure for use in dental operatories to enclose an amalgamator within a controlled atmosphere, comprising:

- (a) interconnected front, back, side, bottom, and top walls defining an enclosed work space, said back wall having a forwardly sloping portion and said top wall having a removable viewing panel provided therein;
- (b) a mercury collection sump formed in said bottom wall, said bottom wall being configured to slope downwardly from said front, back, and side walls toward said sump;
- (c) glove means replaceably mounted on said front wall for receiving the hands of an operator and permitting manipulation of the amalgamator;
- (d) air inlets provided in said side walls of said housing on opposite sides of the work space;
- (e) first filter means cooperatively associated with said air inlets for preventing passage therethrough of dust or other particulate material;
- (f) an air outlet provided in said forwardly sloping portion of said back wall rearwardly and above the work space;
- (g) a motorized suction fan carried by said back wall proximate said air outlet for maintaining subatmospheric pressure in said work enclosure and for drawing a stream of air inwardly from said air inlets through said work space and upwardly and rearwardly toward said air outlet; and
- (h) second filter means interposed in said stream of air between said work space and said fan for preventing mercury in vapor form contained therein from escaping from said work enclosure through said air outlet.

4,108,510
RECORD PLAYER CABINET

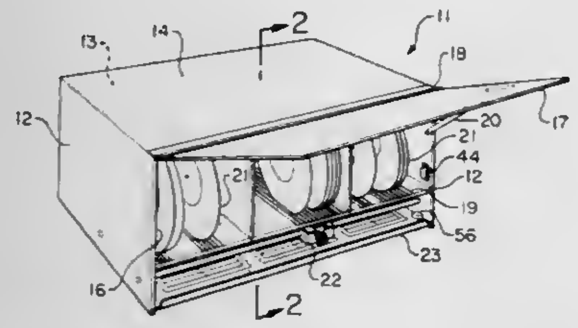
Koichi Iimura, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 9, 1977, Ser. No. 767,211
Claims priority, application Japan, Mar. 19, 1976, 51-34024[U]
Int. Cl.² A47B ***81/06;*** **G11B** ***3/10***
U.S. Cl. 312—8 **6 Claims**



1. A cabinet for a record player comprising
a cabinet body being composed of a rigid material having a vibration attenuation rate characteristic such that a majority of the vibration attenuation rates in a first frequency range are generally greater than those in a second frequency range higher than that of said first frequency range,
a base adhered to the bottom of said cabinet body,
a plate adapted for attachment of a tone arm, said base and plate materials are selected from the group consisting of homogenized chip board, plywood and non-laminated wood, said plate being adhered to the top of said cabinet body,
said base and plate being composed of rigid materials having vibration attenuation rate characteristics such that a majority of the vibration attenuation rates thereof in said second frequency range are greater than the respective corresponding vibration attenuation rates of said cabinet body in said second frequency range to thereby enhance the resonance characteristic of said cabinet in said second frequency range, and
the said vibration attenuation rate characteristic of said cabinet body being such that a majority of the vibration attenuation rates thereof are greater than the respective corresponding vibration attenuation rates of said plate and base in said first frequency range to thereby lessen the tendency for howling to occur.

4,108,511
MODULAR RECORD SELECTOR AND STORAGE APPARATUS

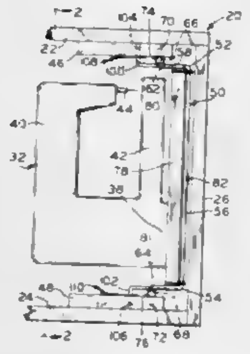
Martin Alfred Spragg, Jr., 422 Wildcroft Dr., Martinez, Calif. 94553
Filed Mar. 23, 1977, Ser. No. 780,462
Int. Cl.² A47B ***81/06***
U.S. Cl. 312—9 **17 Claims**



1. A storage enclosure for recording discs comprising:
a cabinet having two side walls, a rear wall, and a top wall,
a front cover disposed in a front opening opposite said rear wall disposed for movement between an open position exposing the interior of said cabinet and a closed position closing said front opening, said top wall having
a plurality of top grooves on the underside thereof running in a front and rear direction,
a lower platform spaced from said top wall extending between said two side walls and having a plurality of bottom grooves therein facing and each being substantially aligned vertically with one of said top grooves,
lateral slide means extending between said two end walls normal to said grooves,
a carriage mounted on said lateral slide means for lateral movement within said cabinet normal to said grooves,
a selector slide mounted on said carriage for sliding movement in said front and rear direction,
a selector arm extending from said selector slide, whereby alignment with a pair of top and bottom grooves and rear to front movement of said selector slide engages said selector arm with a recording disc engaged at the top and bottom edges by said top and bottom grooves respectively, and the recording disc is urged through said front opening when said front cover is in said open position.

4,108,512
CABINET MOUNTING UNIT FOR FREE ARM SEWING MACHINE

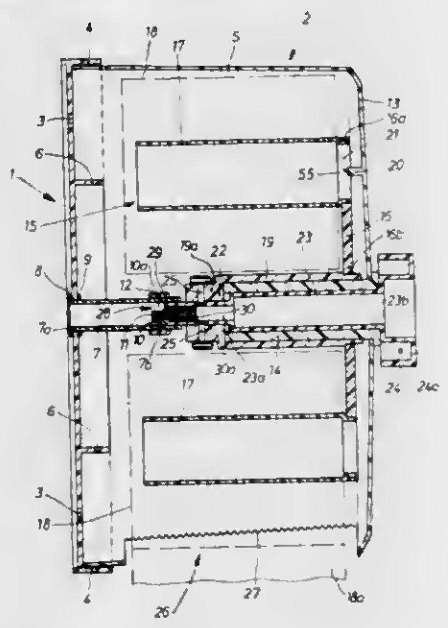
Eugene M. White, 1624 Franklin Ave., Fort Wayne, Ind. 46808
Filed Jun. 20, 1977, Ser. No. 808,099
Int. Cl.² A47B ***81/00***
U.S. Cl. 312—24 **8 Claims**



1. A cabinet mounting unit for free arm sewing machines comprising:
a frame having a pair of opposite side members,
a rear pivot arm,
first pivot means pivotally connecting said rear arm to one of said side members for rotation about a first axis,
a front pivot arm,
second pivot means pivotally connecting said front arm to one of said side members for rotation about a second axis parallel to and displaced from said first axis,
a sewing machine mounting platform,
third pivot means pivotally connecting said platform to said rear arm for rotation about axes parallel to and displaced from said first and second axes,
fourth pivot means pivotally connecting said platform to said front arm for rotation about axes parallel to and displaced from said first, second and third axes,
stop means stationarily connected to and projecting inwardly from said one of said side members so as to be contacted by said front arm at a particular point in its rotation about said second axis thereby supporting said platform at a selected vertical level, and
means associated with said front and rear arms whereby when said arms are urged toward respective positions which are coplanar, said arms undergo a binding action whereby said front arm is pulled inwardly away from said one of said side members so as to clear said stop means and permit said platform to be lowered below said selected vertical level.

4,108,513
PAPER DISPENSER, ESPECIALLY TOILET PAPER DISPENSER

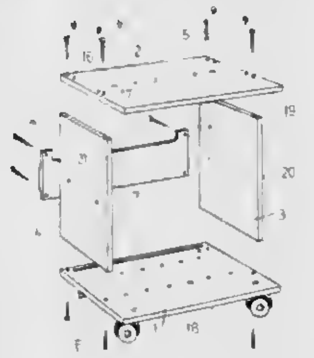
Lars Bengt Lander, Zug, Switzerland, assignor to Cepasy AG, Zug, Switzerland
Filed Mar. 25, 1977, Ser. No. 782,262
Claims priority, application Switzerland, Dec. 17, 1976, 15935/76
Int. Cl.² B65H ***19/00***
U.S. Cl. 312—39 **6 Claims**



1. A paper dispenser for dispensing a web of paper from a paper roll, comprising:
a housing for accommodating therein a plurality of paper rolls;
said housing being provided with an outlet opening for dispensing a paper web withdrawn from its associated roll;
means defining a tear-off edge provided for the housing at the region of the outlet opening for tearing-off a desired length of the paper web to be withdrawn out of the housing;
paper roll-support means arranged in said housing for supporting at least two separate paper rolls; and
means for selectively placing each of the paper rolls into a withdrawal position in front of said outlet opening.

4,108,514
PHONOSTAND

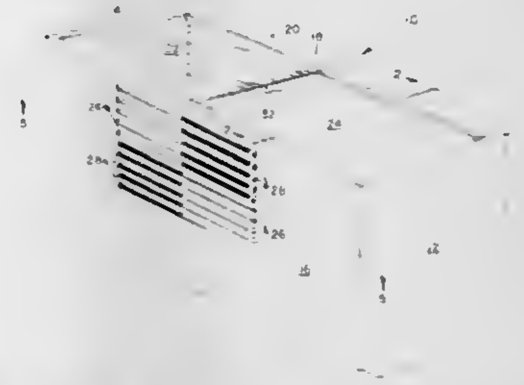
Heinrich Zimmerman, St. Georgen, Schwarzwald, Fed. Rep. of Germany, assignor to Dual Gebrüder Steidinger, St. Georgen, Schwarzwald, Fed. Rep. of Germany
Filed Oct. 18, 1977, Ser. No. 843,432
Int. Cl.² A47B ***53/00, 87/00***
U.S. Cl. 312—107 **5 Claims**



1. A stand for the insertion and setting up, respectively, of electro-acoustic devices of general use, comprising
a bottom plate,
a first cover plate spaced apart from said bottom plate,
two first side walls spaced apart from one another having end face sides disposed abuttingly between said bottom plate and said first cover plate, said two first side walls also having rear end face sides,
first screw means for screwing said bottom plate and said first cover plate onto said end face sides of said two first side walls and forming a base element therewith,
a reinforcement member comprising a plate-shaped plastic molded part having and covering only a portion of the total height of said first side walls disposed against said rear end face sides of said two first side walls,
second screw means for screwing said reinforcement member onto said rear end face sides of both of said two first side walls,
two second side walls having upper end face sides, back end face sides and lower end face sides,
a second cover plate of the same width as that of said first cover plate,
third screw means for screwing said second cover plate on said upper end face sides of both of said two second side walls and forming therewith an assembly element having dimensions substantially corresponding to that of a conventional phonotable,
a second reinforcement member identical to said first-mentioned reinforcement member, said second reinforcement member having a lowermost projecting section,
fourth screw means for screwing said second reinforcement member on said back end face sides of both of said two second side walls in a position with said projecting section of said second reinforcement member projecting downwardly beyond said two second side walls,
said assembly element being mountable on said base element with said lower end face sides of said two second side walls abutting on said first cover plate,
fixing means cooperatively arranged between both of said second side walls of said assembly element and said first cover plate of said base element for bringing said two first side walls and said two second side walls of said base element and said assembly element, respectively, in corresponding alignment coincidence, respectively, upon mounting of said assembly element on said base element,
fifth screw means for screwing said projecting section of said second reinforcement member of said assembly element with said base element, the latter disposed under said assembly element.

4,108,515
DISPLAY CASE

Raymond M. Johnson, 1029 Donaldson Ave., San Antonio, Tex. 78228
Filed Oct. 12, 1976, Ser. No. 731,311
Int. Cl.² A47F ***3/14***
U.S. Cl. 312—119 **6 Claims**



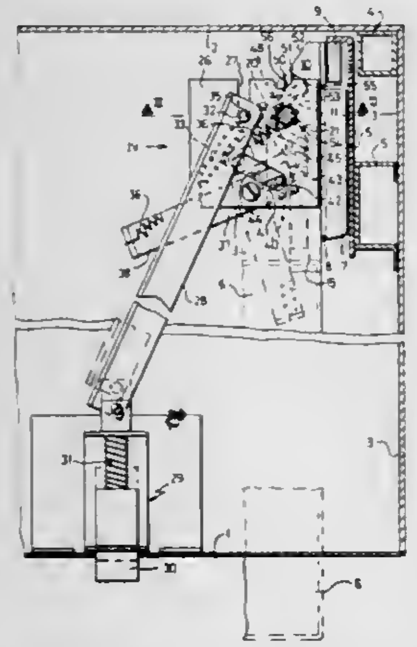
1. A display case comprising:
an enclosed rectangular structure having connected outer walls;
a first of said outer walls being of transparent material removably secured to adjacent walls;

a plurality of trays inside of said enclosed structure parallel to said first outer wall, said trays being slidably carried by parallel supports of a second and third wall, said second and third walls being parallel to each other, but both being perpendicular and adjacent to said first wall;
shaft means connected to each of said trays, said shaft means extending through slot means parallel to said trays in at least one of said second and third walls to a point outside said enclosed structure, said shaft means being slidably movable along said slot means to move said trays for viewing through said first wall;
said parallel supports including groove means in said second and third walls, said slot means being connected to said groove means with said shaft means extending therethrough;
slidable bar means in said groove means, said slidable bar means being carried by said shaft means to cover said slot means; and
roller means attached to said trays for ease of movement of said trays along said groove means.

4,108,516

CENTRAL LOCKING MECHANISM

Eugen Scholl, Gaildorf-Adelbach, Fed. Rep. of Germany, assignor to Wilhelm Bott KG, Gaildorf, Fed. Rep. of Germany
Filed Oct. 7, 1976, Ser. No. 730,470
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2544994
Int. Cl.² E05B *65/46*
U.S. Cl. 312—216 **5 Claims**

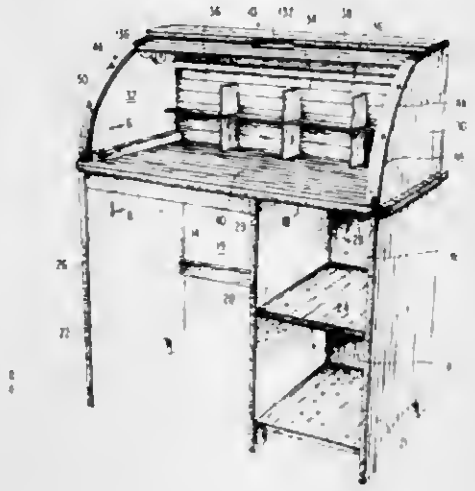


1. A central locking mechanism for an item of furniture having a plurality of drawers arranged side by side or one above the other comprising a blocking projection and a second projection spaced from said blocking projection having a stopping face thereon integral with each of said drawers and arranged transversely to the sliding direction of the respective drawer, a locking bolt extending beyond all of said drawers pivotable about a stationary axis into the path of movement of the blocking projections, said stationary axis extending parallel to the longitudinal axis of the locking bolt so that the closed drawers cannot be withdrawn and said locking bolt, in the locked position of the central locking mechanism, being pivotable against the force of a spring out of the blocked position when an opened drawer is being closed, a driving member, a bistable member coupling said driving member and said locking bolt, said locking bolt being connected to a lever arm which, in the unlocking position of the locking bolt, projects into the path of said stopping face so that the stopping face is engageable with the lever arm when opening a drawer and the locking bolt is pivotable into the locking position.

4,108,517

CHILD'S DESK WITH SLIDE-DOOR AND GUIDEWAY THEREFOR

William R. Tomalinas, Jr., Wapwallopen, and Herbert S. Gurbst, Kingston, both of Pa., assignors to Roth American, Inc., Wilkes-Barre, Pa.
Filed May 24, 1977, Ser. No. 799,975
Int. Cl.² E06B *9/14*
U.S. Cl. 312—297 **2 Claims**

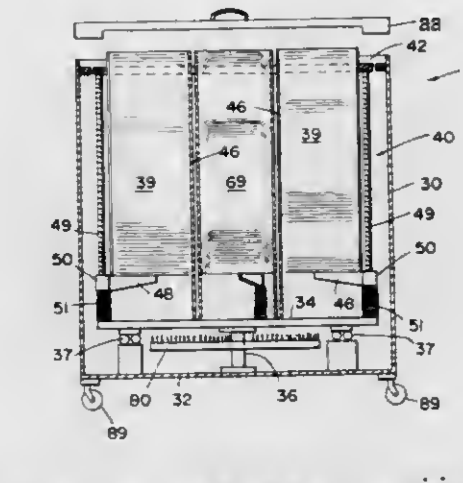


1. A desk with a slide-door for closing an access opening to a horizontal work surface member comprising:
a horizontal work surface member;
a supporting base for supporting said work surface member providing a plurality of compartments below said work surface member;
a rear casing member disposed above the work surface member and having pigeonholes therein;
parallel side members attached to said rear casing member and disposed perpendicularly to the horizontal work surface member, said side members having symmetrical arcuate edge portions, said casing member and said side members defining an access opening to said horizontal work surface;
a first attachment strip secured to one of said parallel side members;
a second attachment strip secured to a vertical wall of said supporting base, said horizontal work surface member being sandwiched between said attachment strips and attached thereto by bolts inserted through the attachment strips and the working surface member;
a slide-door for closing the access opening to the horizontal work surface member including a plurality of elongated slats, disposed so that their longitudinal edges are parallel, said slats being articulated to one another by a flexible backing sheet attached to a longitudinal face of each of the slats; and,
elongated guideway members disposed along the arcuate edge portions of the side members and fastened to the side members by a plurality of fasteners, inserted at spaced intervals through said guideway members into said side members, said guideway members each consisting of:
a base portion;
an elongated skirt portion depending from said base portion;
a first elongated wall portion depending from said base portion intermediate its edges, which, together with said base portion and said skirt portion defines a first, generally U-shaped slot which engages the arcuate edge portion of a side member to serve as an edge molding for the side member, while said base portion remains in a generally perpendicular orientation with respect to said side member; and,
a second elongated wall portion extending from said first wall portion, generally parallel to said base portion, which, together with said first wall portion and said base portion defines a second, laterally opening U-shaped slot for receiving and slidably engaging ends of said slats
wherein said guideway members are formed of flexible plastic and wherein said guideway members are attached to the arcuate edge portions of the side members with fasteners inserted at intervals through the base portions of the plastic guideway members into the arcuate edge portions so that the guideway members conform to the shapes of the arcuate edge portions of the side members.

4,108,518

BANQUET FOOD SERVING APPARATUS

Edy P. Angst, 3737 Woodside Dr., Carson City, Nev. 89741
Filed Mar. 31, 1977, Ser. No. 783,211
Int. Cl.² A47B *85/00*
U.S. Cl. 312—305 **10 Claims**

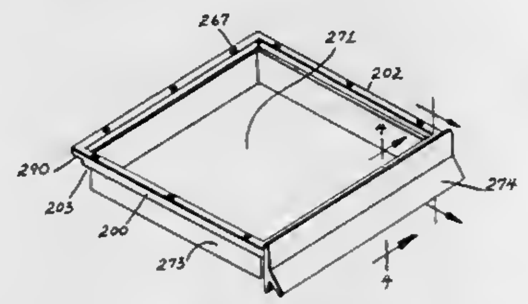


1. Banquet food serving apparatus comprising:
a. a hollow tubular housing closed at one end and having sufficient volume to contain a substantial quantity of food serving plates in a plurality of vertical stacks, said housing being adapted to be supported at said closed end thereof with its axis extending vertically;
b. a turntable mounted within said housing at the closed end thereof for rotation about said vertical axis of said housing;
c. a plurality of support means mounted on said turntable, each of said support means being adapted to support a vertical stack of food serving plates within said housing and including means for selectively moving the one of said vertical stacks of food serving plates supported thereby along said vertical axis of said housing; and
d. drive means for rotating said turntable about said vertical axis of said housing.

4,108,519

PULL TRAY

Robert A. Chervenak, Seattle, Wash., assignor to Comerco, Inc., Tacoma, Wash.
Filed Apr. 27, 1977, Ser. No. 791,315
Int. Cl.² A47B *95/02*
U.S. Cl. 312—320 **15 Claims**

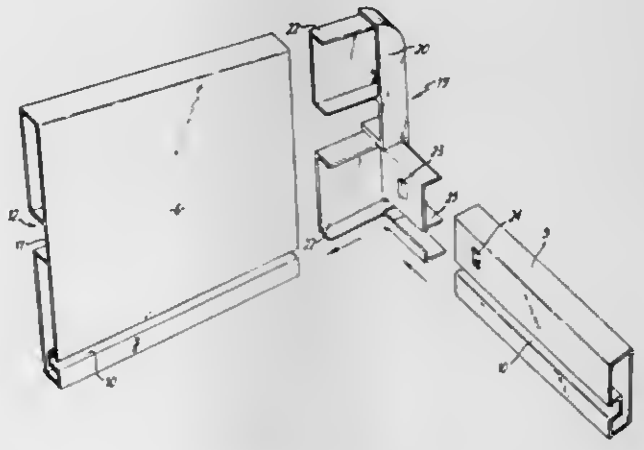


1. A pull tray comprising a horizontal support means adapted to provide support to a plurality of articles, a pair of horizontally extending glide surface means adapted to support said support means within a cabinet and facilitate removal of said pull tray from said cabinet, a front vertically extending flat piece interconnected between said horizontally extending pair of glide surfaces, said front flat piece defining a pair of shoulders at the extreme edges of said front flat piece, a resilient retention means forwardly protruding from said plan flat surface, said shoulders and retention means being adapted to facilitate the selective securing and removal of handle means, said handle means having channel means adapted to slide over said shoulders and when secured to said flat front piece serving to convert said pull tray into a drawer with associated selectively removal handle means.

4,108,520

DRAWERS

Leon George Litchfield, Belper, England, assignor to L. B. (Plastics) Limited, Derby, England
Filed Sep. 15, 1976, Ser. No. 723,499
Claims priority, application United Kingdom, Sep. 17, 1975, 38162/75
Int. Cl.² A47B *47/00*
U.S. Cl. 312—330 R **5 Claims**



1. A drawer construction having front and side walls formed from hollow extruded panels, each panel having at least one box-like section with open ends, the panels being interconnected by corner components each of which comprises a cornerpost having locating members projecting therefrom at right angles to one another and engaged in the open ends of the respective box-like sections, and projecting detents carried on the locating members so as to be depressed when the locating members are inserted to spring out into engagement with apertures in the panels when the locating members are pushed home, the detents on each locating member which engages the front panel being located on the side toward the inside of the drawer so that such detents are not visible when the drawer is viewed from the front.

4,108,521

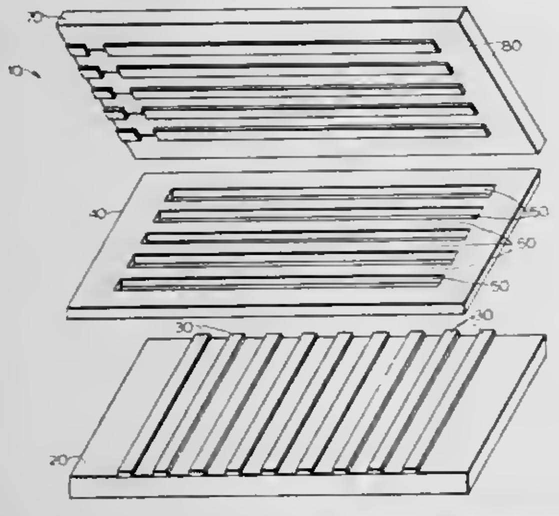
METHOD OF MAKING A DISPLAY PANEL AND THE ANODES THEREFOR

Daniel P. Wicher, Jr., Newton, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Continuation of Ser. No. 718,795, Aug. 30, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,735
Int. Cl.² H01J *9/02*
U.S. Cl. 316—17 **6 Claims**

1. The method of making a display panel comprising the steps of
forming a plurality of parallel cathode strip electrodes on an insulating base plate,
forming conductive runs on a glass face plate, said runs being thin, parallel conductive lines,
screening an organo-metallic substance on said face plate in

a pattern of parallel lines, each line being in contact with one of said conductive runs,

baking said face plate to remove organic substances therefrom and to leave the metallic portion of said substance in said pattern as transparent anode lines which are in contact with said conductive runs,



assembling said base plate and face plate so that said anode lines are disposed transverse to said cathode strips, with an apertured center sheet between the base plate and face plate, said center sheet subdividing said cathode strips into separate operating areas, and

hermetically sealing together the base plate and face plate to form an envelope.

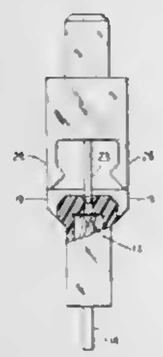
4,108,522
JUMPER PLUG AND SOCKET

Anthony George Favale, Peabody, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1977, Ser. No. 800,079

Int. Cl.² H01R *29/00, 31/08*

U.S. Cl. 339—19 **9 Claims**



1. In combination, a socket comprising an insulating body having a row of boles extending through said body from top to bottom for receiving terminals therein, a pair of shoulders extending along opposite sides of said socket body, parallel to said row of holes, increasing the width of said body in the area of said shoulders, and at least one pair of opposing projections extending beyond the width of said shoulders and dividing said row of holes into sections, and a plurality of first terminals retained in selected holes of said row of holes; and at least one jumper plug for selectively connecting adjacent first terminals comprising an insulating plug body, a pair of interconnected second terminals for mating with said first terminals, said second terminals retained in said plug body and projecting from one end thereof, and a pair of resilient extensions extending from said one body end straddling said second terminals, said extensions cooperating with said socket projections to prevent said plug from bridging holes between socket sections and with said shoulders to force said plug towards said socket when bridging holes within a section.

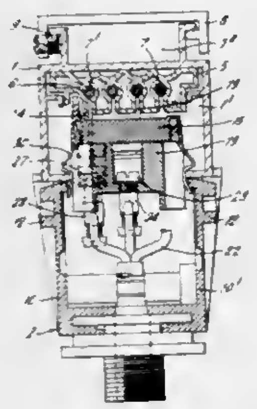
4,108,523
ELECTRIFIED CHANNEL, EQUIPPED WITH A SNAP-ACTING CONNECTOR

Edoardo Bolis, Milan, Italy, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed May 25, 1977, Ser. No. 800,506

Int. Cl.² H01R *13/54*

U.S. Cl. 339—22 B **2 Claims**



1. An electrified channel equipped with a snap-acting connector comprising:

four wire rods located side by side in said channel, one of said rods acting as a neutral wire and the remaining of said rods acting as phases of three distinct electric circuits;

contactors of said connector being elastically engaged with two of said rods when said connector is inserted into said channel;

one of said contactors being disposed in a fixed position to establish contact with said neutral wire when said connector is inserted into said channel;

a movable contactor to establish contact with one of said remaining of said rods according to a selected one of said three circuits;

a body having a cover to provide a guide for said one of said contactors by which a connection is established with said neutral wire;

two semi-caps encircling a portion of said body remote from said cover, said caps being secured to one another by self-tapping screws; and

a seat in which said movable contactor is slidingly fitted to establish a contact with one of said remaining of said rods;

said movable contactor being supported by a pawl which is slidingly fitted in a seat formed in said cover; said seat being formed with suitable notches for retaining said pawl on a selected one of said remaining of said rods.

4,108,524
ELECTRICAL CONNECTION ASSEMBLY AND CONNECTORS THEREFOR

Peter Charles Seligmann, Lombardy East, South Africa, assignor to Aeci Limited, Johannesburg, South Africa

Filed Jun. 15, 1977, Ser. No. 806,828

Claims priority, application South Africa, Sep. 27, 1976, 76/5757

Int. Cl.² H01R *11/08*

U.S. Cl. 339—47 R **11 Claims**

1. Plug and socket connector comprising

a. an insulator body of an elastomeric material having a base partially encircled around its periphery by a wall extending vertically therefrom and a peg extending vertically from the base, the peg being disposed in spaced relationship relative to the wall and defining an open socket therebetween, and

b. an electrical contact pin composed of the spirally wound core on the peg of the bare terminal portion of an insulated

lead wire positioned through the insulator body and its base.

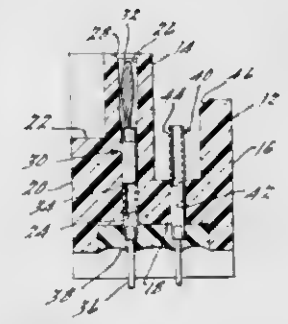
4,108,525
HERMAPHRODITIC EDGEBOARD CONNECTORS

Thomas Christopher Lincoln, Arcadia, Calif., assignor to Microdot Inc., Greenwich, Conn.

Continuation of Ser. No. 733,861, Oct. 19, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 825,971

Int. Cl.² H01R *25/02*

U.S. Cl. 339—49 R **1 Claim**



1. A miniature high density hermaphroditic electrical connector comprising a pair of like, elongated insulating housings each of which is of generally U-shaped transverse cross section having a first leg and a second leg and a bight portion,

a plurality of longitudinally aligned closely spaced bores in said first leg of each housing, each of said bores having a chamfered end,

a plurality of aligned cantilevered twisted wire male electrical contacts supported in said bores, respectively, said male contacts extending into close radially spaced relation to the walls of said bores and terminating short of the ends of said bores, respectively, as to be individually protected and maintained substantially in alignment with the central axis of said bores,

a plurality of aligned closely spaced tubular female contacts in the bight portion of each housing extending parallel to the legs thereof, the bight portion of each housing having a transverse dimension complimentary to the width of said first leg for the acceptance thereof,

each end of the bight portion of each housing having an end closure member extending therefrom and each end of said first leg having complimentary slots therein for the acceptance of end closure members of the other housing,

said first leg of each housing having a recess therein for the acceptance of a second leg of the other housing, and

said housings being adapted to mate with one another with said end closure members of each housing being received by said complimentary slots of the other housing, said second legs of each housing being received by said recess in said first leg of the other housing, and said first leg of each housing extending between the legs of the other housing whereby said male contacts are accepted in said female contacts when said housings are assembled and said male and female contacts are directly supported by the bores in said first leg of each housing.

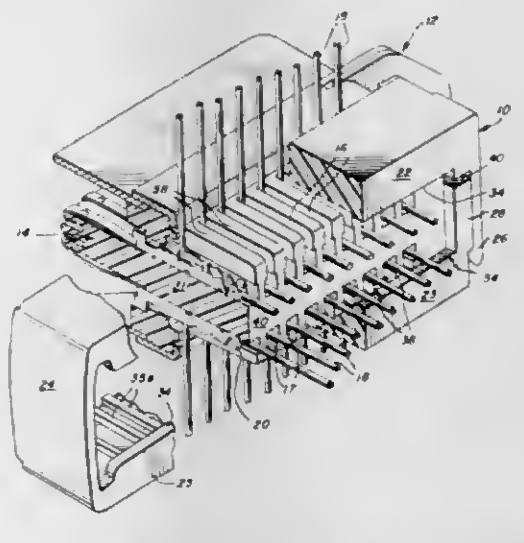
4,108,526
COVER FOR MULTI-WIRE CONNECTOR

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 649,812, Jan. 16, 1976, abandoned. This application May 13, 1977, Ser. No. 796,556

Int. Cl.² H01R *13/58*

U.S. Cl. 339—103 M **14 Claims**



1. A cover construction for use with a multi-wire connector having a plurality of parallel open-sided and open-ended wire-receiving channels defined by connector barriers and having wire engaging means disposed in such channels; said cover construction being formed of a discrete one-piece strip of flexible material adapted to snugly encompass the connector over such channels and having projecting ribs for reception in such connector channels and for interfitting with at least some of the connector barriers in a frictional interlock; each of said ribs being of a length so as to extend over a substantial portion of the length of the channel in which disposed and of a height so as to overlie in adjacent relationship a wire disposed in such channel whereby said ribs retain wires disposed in such wire-receiving channels in engagement with such wire engaging means; opposed end portions of said strip having disengageable interlocking means thereon for maintaining said strip in snug encompassing relation with the connector when in the engaged condition, and for allowing release of the strip from encompassing relation with the connector when in disengaged condition.

4,108,527
STRAIN RELIEF ASSEMBLY

George Harold Douty, Mifflintown; John Edward Lucius, Harrisburg, and Larry Leon Leitzel, Klingerstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 23, 1977, Ser. No. 809,507

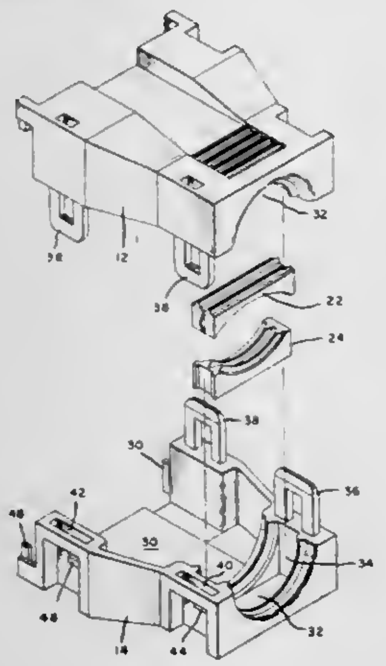
Int. Cl.² H01R *13/58*

U.S. Cl. 339—107 **8 Claims**

1. An improved strain relief assembly comprising:

a pair of hermaphroditic housing members having means to latchingly secure said housing members together, said housing members together defining a cable passage therebetween, at least one recess in each said housing member aligned with a like recess in the other housing member and extending transversely of said passage, and means to engage an associated electrical connector housing; and

at least two cable engaging members each having at least one profiled cable engaging face with at least one ridge extending longitudinally thereacross, said cable engaging members being profiled to be received in said recesses of said housing members;



whereby insertion of a selected pair of cable engaging members into said recesses defines a cable opening of desired size and configuration to clampingly engage an associated cable received therein.

4,108,528
PROBE ACTUATOR ASSEMBLY

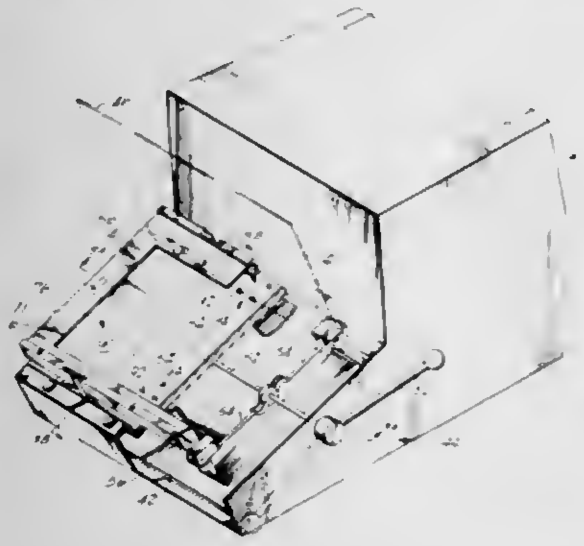
Everett James Long, Claremont, and Elmer W. Muench, Covina, both of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Continuation of Ser. No. 747,611, Dec. 6, 1976, abandoned. This application Jul. 22, 1977, Ser. No. 818,206

The portion of the term of this patent subsequent to Jul. 25, 1994, has been disclaimed.

Int. Cl.^{2} H01R *3/04*

U.S. Cl. 339—117 P **18 Claims**



1. Apparatus for making electrical contact with test points on a test member, comprising:
- means for mounting such a test member at a location for test;
- a plurality of conductive probe heads each having, oppositely facing, a contact side and a bearing side, the contact sides of said probe heads being positioned adjacent said test member location;
- backup means having a bearing side;
- at least one resilient member having one side adjacent the bearing sides of said probe heads and an opposite side adjacent the bearing side of said backup means; and
- means for applying pressure through said backup means and said at least one resilient member to the bearing sides of said probe heads forcing the contact sides thereof in the direction of said test member location, said backup means being harder than and substantially more rigid than said resilient member but sufficiently flexible so that with the probe heads in engagement with such test member in said location therefor the backup means conforms to the shape of the facing surface of such test member and said resilient member deforms so that all of said probe heads are forced into engagement with such test points.

4,108,529
ELECTRICAL FEEDTHROUGH DEVICES

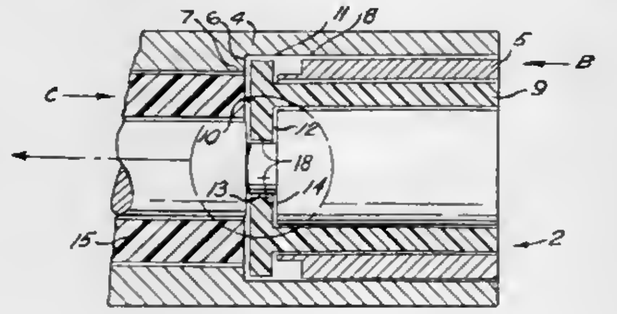
David Roger Evans, Petersfield, England, assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,092

Claims priority, application United Kingdom, Nov. 14, 1975, 47070/75

Int. Cl.^{2} H01R *17/04;* H01B *17/26*

U.S. Cl. 339—177 R **5 Claims**



1. An electrical feedthrough having an elongated conductive sleeve and, disposed within the sleeve a tubular body of dielectric material carrying a conductor, said conductor being physically spaced and electrically insulated by the dielectric body from the sleeve, said tubular dielectric body having a unitary radially projecting flange that projects inwardly of said tubular body and has an inner edge region defining an aperture, said inner edge region being disposed against said conductor and being radially compressibly stressed and deformed so as to exert radial and longitudinal pressure on the surface of the conductor to form a hermetic seal, said dielectric body further having a unitary radially projecting flange that projects outwardly of the tubular body said outwardly projecting flange having an outer region which is physically deformed by having been partially sheared against an edge provided by a first circumferential step formed on the inner surface of an outer part of the sleeve, said partially sheared outer region lying between said first circumferential step portion and a second circumferential step of complimentary shape to said first step portion, said second step being provided on an inner part of the sleeve disposed within said outer part of the sleeve, whereby a hermetic seal with the sleeve is formed, said second step including an outwardly facing circumferential surface located radially inwardly of said edge on said first step portion.

4,108,530
FEMALE TERMINAL AND METHOD OF MAKING SUCH

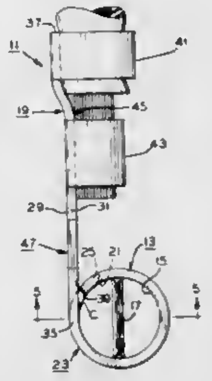
Richard A. Wandler, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 29, 1975, Ser. No. 645,044

Int. Cl.^{2} H01R *13/12*

U.S. Cl. 339—256 SP **21 Claims**

1. A female terminal for receiving in electrical contacting engagement a pair of generally opposite contacts on a spade portion of a male terminal, the female terminal comprising a strip of electrical conductive material having a pair of opposite faces intersecting with a pair of opposite sides, at least one end edge of said strip respectively intersecting with said opposite faces and said opposite sides, a distal portion of said strip including said at least one end edge being displaced with respect to the rest of said strip so as to comprise a generally cylindric section with said at least one end edge being adjacent one of said opposite faces and extending generally in opposed relation therealong between said opposite sides, said one opposite face within said cylindric section defining in part a bore therethrough between said opposite sides, at least one slot in said at least one end edge and intersecting with said bore, and at least one tab integral with said strip and extending therefrom through said one opposite face into said at least one slot and generally circumferentially of said cylindric section to define a part of said bore, said tab and said cylindric section comprising means for effecting constant electrical contact between said bore and the opposite contacts of the spade portion irrespective of any generally diametral position in which the spade portion may be inserted across said bore.



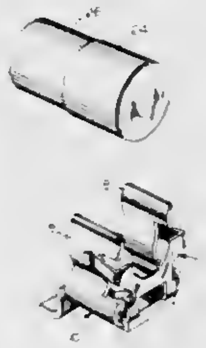
4,108,531
FUSE HOLDER ASSEMBLY FIELD CONVERTIBLE FROM FUSE NON-REJECTING TO REJECTING MODES

Howard Reynolds, New Britain, Conn., assignor to General Electric Company, Plainville, Conn.

Filed Sep. 16, 1977, Ser. No. 833,790

Int. Cl.^{2} H01H *85/24*

U.S. Cl. 339—258 F **12 Claims**



1. A fuse holder assembly field convertible from a non-rejecting mode capable of accepting a fuse terminal to a rejecting mode capable of accepting only a fuse terminal keyed with a special recess, said fuse holder assembly comprising, in combination:
- A. a fixedly mounted fuse clip having a pair of spaced, generally parallel, flexible clamping arms defining therebetween a pocket for receiving a fuse terminal;
- B. a rejection member having an interference element;
- C. means movably mounting said rejection member for movement from a non-rejecting position with said interference element displaced from said pocket and both said clamping arms to a rejecting position with said interference portion disposed within said pocket to obstruct the full insertion therein of a fuse terminal lacking the special recess.

4,108,532
LIGHT BEAM SCANNING DEVICE

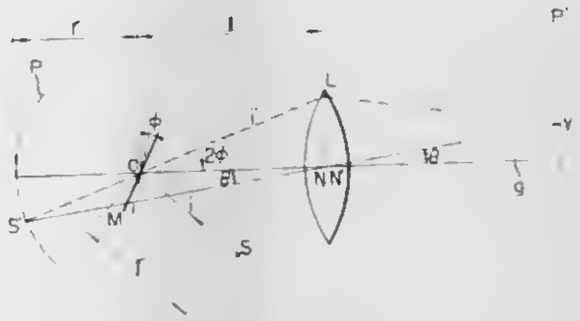
Kazuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,744

Claims priority, application Japan, Jun. 23, 1976, 51-74028; Sep. 10, 1976, 51-108567; May 20, 1977, 52-59158

Int. Cl.^{2} G02B *27/17*

U.S. Cl. 350—6.6 **9 Claims**



9. A scanning optical system comprising:
- deflecting mirror means for providing a scanning operation with a scanning beam;
- driving means for driving said deflecting mirror means to vibrate it so that its rotational angle ϕ is equal to ϕ_0 sin K_1t;
- a light source, disposed at a distance r from the center of said mirror means, for generating a beam toward said deflecting mirror means; and
- focusing lens means, disposed between said deflecting mirror means and a surface to be scanned and having an optical axis passing through the center of said deflecting mirror means, for imaging the beam on the surface to be scanned in a form of spot,
- said focusing lens means having a distortion characteristic represented by

$$y' = \frac{fr\phi_o}{r + l} \int F(\theta)d\theta$$

where y' is the distance measured on the surface to be scanned between the optical axis of said focusing lens means and the spot formed on the surface, l is the distance between the center of said deflecting mirror means and the nodal point of said focusing lens means on the entrance side thereof, and $F(\theta)$ is

$$\frac{l^2 + r^2 + 2l \cdot f(\theta)}{\{r + l \cdot f(\theta)\} \sqrt{\phi_o^2 - \left[\arccos\left\{\frac{1}{r} f(\theta)\right\}\right]^2}}$$

where $f(\theta)$ is $r^2\cos^2\theta - l^2\sin^2\theta - l\sin^2\theta$, and θ is the angle formed between the scanning beam directed toward the entrance side nodal point of said focusing lens means and the optical axis of said focusing lens means.

4,108,533
APPARATUS FOR COMBINING LIGHT EMANATING FROM A LINEAR SCANNING FIELD

Erwin Sick, Icking, and Angelika Staimer, both of Munich, Fed. Rep. of Germany, assignors to Erwin Sick Gesellschaft mit beschränkter Haftung Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,484

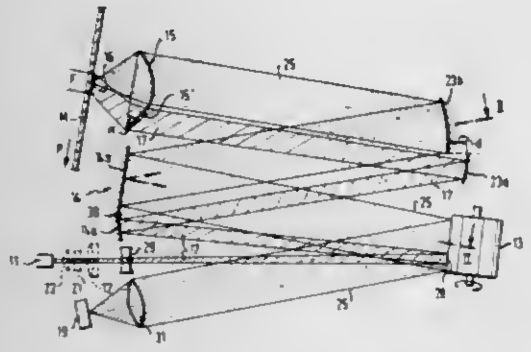
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552331; Nov. 21, 1975, 2552332; Nov. 21, 1975, 2552333

Int. Cl.^{2} G02B *27/17*

U.S. Cl. 350—6.7 **17 Claims**

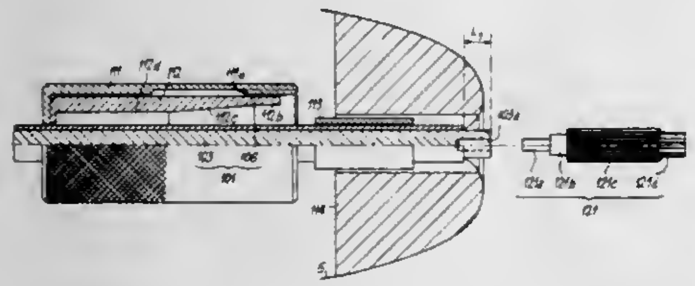
1. In an apparatus for combining light emanating from a linear scanning field on a relatively small receiver via an opti-

cal arrangement producing a scanning light spot with a light ray scanning device onto which a light beam impinges, said arrangement further having optical element means of the transmitting beam of rays located in front of the light ray scanning device, a concave mirror means extending in the scanning direction, and a cylindrical lens parallel to the scanning field and extending in the vicinity of the latter, and in which arrangement the transmitting and receiving beams of rays are separated by pupil separation, characterized by plane mirrors associated with the transmitting and receiving beams of light between the scanning field and the light ray scanning device for bending the receiving beam of rays perpendicular to the scanning direction and in the direction of the intersection point of the optical axis of the transmitting beam of rays located on the light ray scanning device by such an amount that it still strikes the light ray scanning device, but passes beside said optical element means, said concave mirror means comprising a transmitting concave mirror and a receiving concave mirror, and said plane mirrors being arranged between said concave mirrors and said light ray scanning device and tilted towards one another about an axis directed in the scanning direction.



4,108,534
APPARATUS FOR ON-SITE CONNECTION OF CABLES WITH OPTICAL FIBRES

Georges E. Le Noane, Batiment C 43 Ar Sante; André M. Mathern, Route du Busquet Brelevenez, and Gabrielle Morizur, Les Fontaines Bât. L n° 141, all of Lannion, France (22300)
Filed Jan. 25, 1977, Ser. No. 762,312
Claims priority, application France, Mar. 31, 1976, 76 09342
Int. Cl.² G02B *5/14. 5/16*
U.S. Cl. 350—96.21 **11 Claims**



1. Apparatus for on-site connection of two transmission cables comprising optical fibres, each cable having protective armouring enclosing a central core having a periphery formed with regularly spaced grooves and each holding a fibre provided with a thin sheath of uniform thickness, said apparatus comprising:

two extensions having a cylindrical shape and formed with grooves having the same angular pitch as the fibres in the cables to serve as the central core for connection of each cable respectively;

position-locating means for reconstituting the single component without sawing losses;

said position locating means comprising two flat calibrated keys cooperating respectively with two complementary diametrically opposite slots at the free ends of each extension;

means for rigidly holding each core and extension assembly comprising two hemicylindrical shells which are in turn enclosed in a cylindrical sheath;

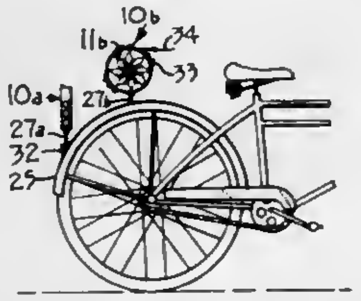
means for aligning and joining the extensions comprising two solid shells having female hemicylindrical inner surfaces cooperating with the male cylindrical surfaces of the extensions and having male biconical outer surfaces which cooperate with two female cones;

said female cones being slideably mounted on the armouring of the non-bared parts of the cables and said two female cones being joined by a connecting nut;

clamping means comprising a threaded plug in the rear part of the cone of the female cones for pressing against the nearest sheath while the other sheath abuts a re-entrant flange in said solid hemicylindrical shells.

4,108,535
SAFETY DEVICE FOR BICYCLE

Harold W. Slaughter, R.R. #2, Fargn, N. Dak. 58102
Filed Dec. 3, 1976, Ser. No. 747,423
Int. Cl.² G02B *5/12*
U.S. Cl. 350—99 **8 Claims**



6. A safety device suitable for mounting on bicycles, comprising, in combination:

a rotatable member having a generally horizontal axis of rotation and configured to rotate about said axis in response to air flow aligned with and air flow transverse to said axis;

a protective shroud comprising a housing encompassing said member and having a generally horizontal longitudinal axis extending between a pair of opposite open ends;

means for mounting said member in said shroud with said axis of rotation aligned with said longitudinal axis;

means for mounting said shroud fixedly with said axes in desired alignment with the direction of a flow of air;

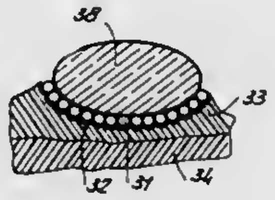
and visual signal reflector means carried by said rotatable member for providing within said shroud a pattern visible in the direction of said axis of rotation which changes in appearance as said rotatable member rotates.

4,108,536
RETROREFLECTIVE ROADWAY SURFACE MARKING TAPE MATERIAL

Ludwig Eigenmann, Vacallo, Canton Ticino, Switzerland
Filed Jan. 14, 1977, Ser. No. 759,559
Claims priority, application Italy, Jan. 14, 1976, 19246 A/76
The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.
Int. Cl.² G02B *5/128*
U.S. Cl. 350—105 **10 Claims**

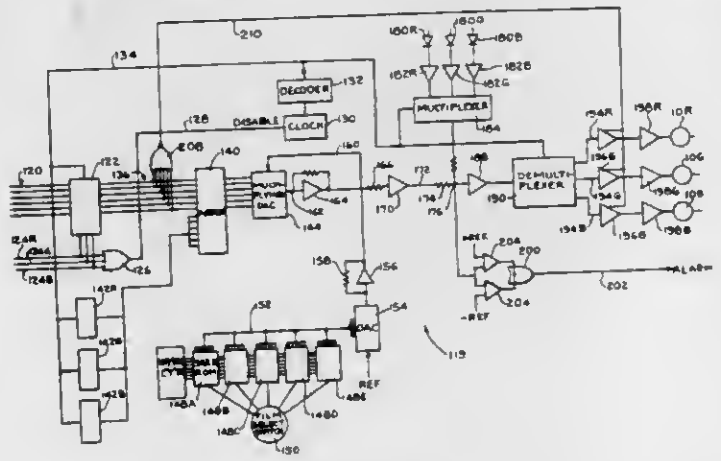
1. A retroreflective roadway surface marking tape material of the type wherein the tape has a given width and has an upper traffic wear resisting upper layer wherein retroreflective systems each comprising a transparent body of essentially rounded cross-sectional configuration are partially embedded into said upper layer and adjacent to reflective means at least to its embedded surface portion,

wherein at least a part of said reflective systems comprises a transparent body consisting of an elongated element of transparent material, having a uniform cross-sectional essentially rounded configuration in any plane perpendicular to its major dimension, the said systems being secured to said tape upper layer at intervals along the length of the tape in directions essentially perpendicular to the direction in which light rays to be retroreflected are supposed to impinge on the tape in service on a roadway surface.



4,108,537
LIGHT VALVE SYSTEM FOR MOTION PICTURE FILM PRINTER

Charles J. Watson, Elgin, and Walter Hrastnik, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Dec. 30, 1976, Ser. No. 756,047
Int. Cl.² G02F *1/03;* G03B *27/28*
U.S. Cl. 350—150 **22 Claims**



1. A light system for producing a modulated color content output beam, comprising:

a light source for producing a beam of substantially white light;

a plurality of band pass filters positioned in said beam path for dividing said beam into a plurality of monochromatic light beams;

an electro-optic value means positionable in each of said monochromatic light beams for attenuating the amount of said light passing therethrough;

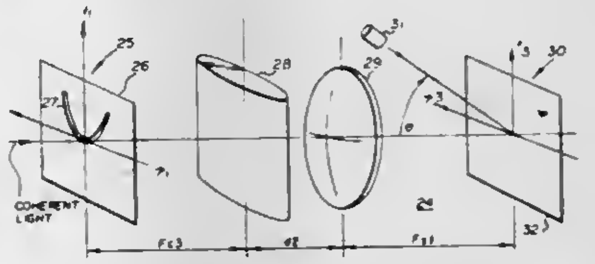
programmable control means for said valve means to modulate the transmission characteristics thereof in response to a predetermined value provided by a plurality of data input means;

multiplexing means connected to said data input means providing a single output to control said valve means; and

a plurality of mirrors positioned in at least some of said monochromatic light beams to recombine said beams into a single beam of modulated color content.

4,108,538
FREQUENCY PLANE FILTERS FOR AN OPTICAL PROCESSOR FOR SYNTHETIC APERTURE RADAR

E. Barry Felstead, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Ottawa, Canada
Filed Mar. 7, 1977, Ser. No. 774,902
Claims priority, application Canada, Apr. 30, 1976, 251565
Int. Cl.² G02B *5/18*
U.S. Cl. 350—162 SF **8 Claims**



1. A method for interferometrically generating a two-dimensional spatial filter, comprising the steps of:

diffracting a source beam of coherent light by passing at least a portion of the source beam through a slit in an opaque screen, the slit having a predetermined width and a curvature defined by a specified function to form a diffracted beam having a predetermined amplitude distribution;

imaging the diffracted beam onto a plane surface of a light responsive photographic plate by conducting the beam transversely through a cylindrical lens having a longitudinal axis disposed in parallel relation with the screen at a distance therefrom equal to the focal length of the cylindrical lens, and transversely through a spherical lens disposed intermediate the cylindrical lens and said plate at a distance from the plate equal to the focal length of the spherical lens, said imaging including predetermined magnification in an azimuth direction of the screen, lenses and plate and Fourier transformation in a direction orthogonal thereto to obtain a predetermined amplitude distribution on the plane surface;

illuminating the plane surface from a reference source of coherent light at a predetermined angle relative to the azimuth direction to obtain a predetermined amplitude transmittance in said plate proportional to the intensity of the exposing light;

developing the plate to obtain said filter in the form of a photographic transparency; and

bleaching the transparency to increase its efficiency.

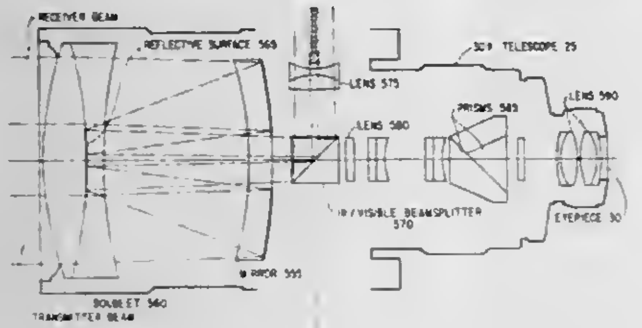
4,108,539
REFLECTING LENS SYSTEM

Alfred Frans Gort, Loveland, Colo., and Charles E. Moore, Rochester, N.Y., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 18, 1976, Ser. No. 742,938
Int. Cl.² G02B *17/08*
U.S. Cl. 350—201 **4 Claims**

1. A telescope comprising:

a concave second surface mirror having a negative refractive lens element, said mirror aligned upon an optical axis; and

a convergent meniscus lens having a concave surface thereof facing the concave surface of said mirror, said lens aligned upon the optical axis and comprising a doublet having a biconvex element, a biconcave element facing said mirror,

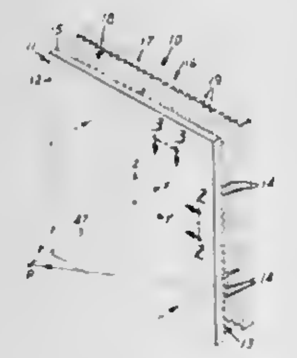


and a spherical reflective convex surface interposed between the elements and facing said mirror.

4,108,540

REFRACTOR-REFLECTOR RADIATION CONCENTRATOR

Raymond H. Anderson, St. Mary's Point, and Dennis F. Vanderwerf, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 17, 1976, Ser. No. 697,017
Int. Cl.^{2} G02B *3/08;* F24J *3/02*
U.S. Cl. 350—211 **25 Claims**



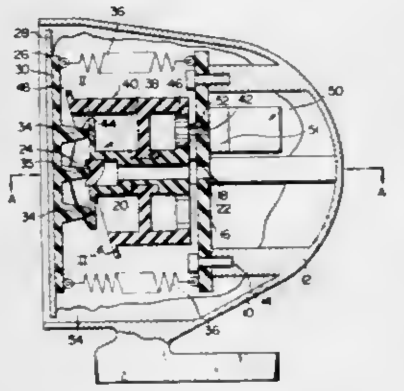
1. An optical concentrator having front and rear portions for collecting and focusing incident radiation into a small area focus in front of the concentrator, said front portion of the concentrator having a linear echelon refractor formed therein; said rear portion of the concentrator having a linear echelon reflector formed therein; and the concentrator further comprising means for joining said refractor and said reflector to form a refractor-reflector structure having the increments of said linear echelon reflector crossed at approximately 90° relative to the increments of said linear echelon refractor for directing radiation incident on the front portion of the concentrator to said focus in front of the concentrator.

4,108,541

ELECTRICALLY CONTROLLED REAR-VIEW MIRROR WITH TWO COAXIAL ROCKING SYSTEMS

Kunihiro Eiraku, Tokyo, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1977, Ser. No. 771,790
Claims priority, application Japan, Feb. 27, 1976, 51-20729
Int. Cl.^{2} G02B *5/08*
U.S. Cl. 350—289 **8 Claims**

1. An electrically controlled rear-view mirror comprising:
a mirror unit including a mirror having a specular surface attached to a surface thereof,
a first rocking system coupled to said mirror unit for continuously reciprocatively rocking said mirror unit or the specular surface of said mirror at a first cycle with a first axis as the center,
a second rocking system coupled to said mirror unit for continuously reciprocatively rocking said mirror unit or the specular surface of said mirror at a second cycle which is different from said first cycle and with a second axis as the center, said second axis being at an angle to said first axis,
a single electric driving means coupled to said first and second rocking systems for driving and stopping both of said first and second rocking systems simultaneously to stop said mirror at a position substantially in the desired direction,
a substrate carrying both said first and second rocking systems and said driving means, and
a center shaft mounted to said substrate, the longitudinal axis of said center shaft defining a central axis of said rear-view mirror,
said first rocking system including a substantially cylindrical inner rotor rotatably supported by said center shaft, the inner rotor having an inner inclined-plate coupled to said mirror and which is inclined at a first prescribed angle to a principal plane of said rear-view mirror, said principal plane being perpendicular to said central axis and being located in the vicinity of said inner inclined plate, and an outside-toothed gear on said inner rotor,
said second rocking system including a substantially cylindrical outer rotor coaxially and rotatably mounted on the outerside of said inner rotor, the outer rotor having an outer inclined-plate coupled to said mirror and which is inclined at a second prescribed angle to said principal plane, said first and second prescribed angles being different, and an inside-toothed gear on said outer rotor, and
said electric driving means being coupled to said toothed gears for turning said respective rotors to adjust the position of the mirror.



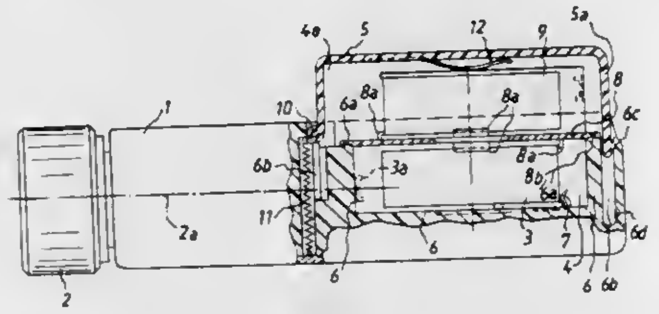
4,108,542

MOTION-PICTURE CAMERA FOR CASSETTE-LOADED FILM

Otto Stemme, Munich; Peter Lermann, Feldkirchen, and Alfred Winkler, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 20, 1976, Ser. No. 752,312
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557274
Int. Cl.^{2} G03B *23/02*
U.S. Cl. 352—72 **15 Claims**

1. In a motion picture camera for use with cassette-loaded film, a combination comprising
a camera housing provided with an internal chamber and having a surface formed with an access opening for said chamber;
a carrier removably mountable in said chamber;
first means for selectively mounting on said carrier one film cassette to be located in said chamber and another film cassette which at least in part projects through said opening and beyond said surface when the one cassette is located in said opening;
a cover for said opening; and
second means mounting said cover on said housing for displacement between a retracted position in which it is

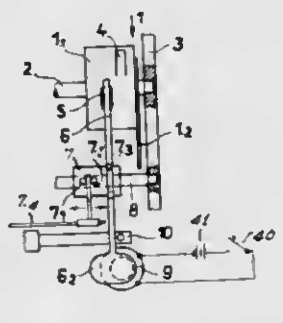
substantially flush with said surface and which it can assume in the absence of the other cassette, and an extended position in which is projects beyond said surface and which it assumes in the presence of the other cassette on said carrier.



4,108,543

CAMERA FOR MOTION AND STILL PICTURES

Rudolf Leistner, Munich, Fed. Rep. of Germany, assignor to Braun AG., Kronberg Taunus, Fed. Rep. of Germany
Continuation of Ser. No. 436,160, Jan. 24, 1974, abandoned, which is a continuation of Ser. No. 11,049, Feb. 13, 1970, abandoned. This application May 30, 1975, Ser. No. 582,208
Claims priority, application Luxembourg, Feb. 27, 1969, 58112
Int. Cl.^{2} G03B *17/46*
U.S. Cl. 352—121 **14 Claims**

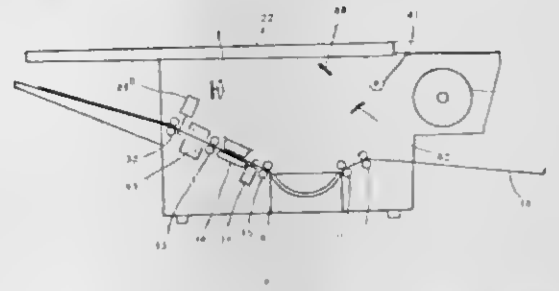


1. A motion picture camera for taking series and individual pictures with film, comprising, in combination:
a housing,
an aperture defined in said housing operable for passing light; said film being so positioned in said housing that a portion thereof is aligned with said aperture for exposing said portion to light;
film advancement means operable for advancing said film to a position wherein another portion will be aligned with said aperture;
moveable shutter means having closed and open positions for blocking and, respectively, unblocking the passage of light through said aperture;
moving means for moving said shutter means between the open and closed positions;
shutter control means operable for arresting said shutter means in its open position; and
primary control means connected to said shutter means, to said film advancement means, and to said shutter control means for operating on a single activation first to activate said moving means to move said shutter means to its closed position, then to activate said film advancement means to advance said film, subsequently to activate said moving means to move said shutter means to its open position, and thereafter to activate said shutter control means to arrest said shutter means in its open position.

4,108,544

DRIVING MECHANISM FOR TRAVELLING ORIGINAL CARRIER IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Akira Mitsuyama, Yamatokoriyama; Hiroaki Uchiyama, Nara, and Masanobu Deguchi, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 22, 1976, Ser. No. 743,941
Claims priority, application Japan, Nov. 21, 1975, 50-143531
Int. Cl.^{2} G03G *15/28*
U.S. Cl. 355—8 **5 Claims**

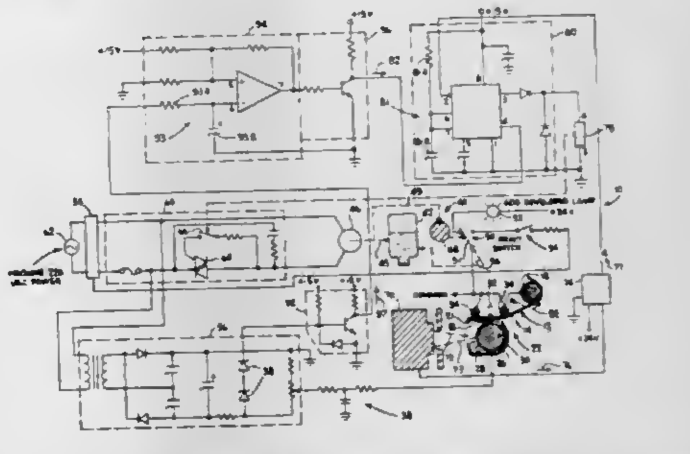


1. In an electrophotographic copying machine having a reciprocating original carrier or having a reciprocating exposure system, a driving system for reciprocating said original carrier or said exposure system comprising:
a motor rotating in a certain direction;
feedforward spring clutch means for transmitting the rotation of the motor to a feed gear in its operative condition;
reverse spring clutch means for transmitting the rotation of the motor to a reverse gear in its operative condition;
transmitting means for transmitting the revolution of the feed gear and the reverse gear to said original carrier or said exposure system; and
control clutch means for selectively operating said feedforward spring clutch means and said reverse spring clutch means, said control clutch means including:
first means for receiving the rotation of said motor;
a cam plate rotatable in unison with said first means;
second means for stopping the cam plate at a first position;
third means for operating the feedforward spring clutch means when the cam plate is stopped at the first position;
fourth means for stopping the cam plate at a second position; and
fifth means for operating the reverse spring clutch means when the cam plate is stopped at the second position.

4,108,545

DEVELOPER SUPPLY CONTROL SYSTEM IN A COPIER

Alton B. Eckert, Jr., Norwalk, and Julius Gluck, Noroton Heights, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.
Filed Dec. 20, 1976, Ser. No. 752,346
Int. Cl.^{2} G03G *15/00;* B05B *5/02*
U.S. Cl. 355—14 **5 Claims**



1. In a copier including a photoreceptor, means for forming an electrostatic latent image on the photoreceptor, a rotatable

applicator for contacting the latent image with developer from a working supply thereof, and means for dispensing a replenishing supply of developer, developer supply control means comprising:

a. means for generating a signal indicative that the working supply of developer is in need of replenishment;
b. means operable in response to said indicating signal for energizing the dispensing means;
c. means for preventing energization of the dispensing means for a first predetermined time interval after the applicator commences rotation and
d. means for maintaining energization of the dispensing means for a second predetermined time interval after energization thereof.

4,108,546

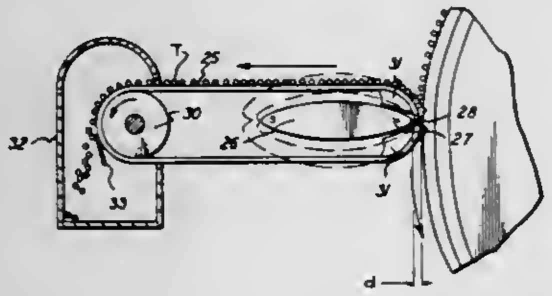
CLEANING APPARATUS AND ELECTROSTATOGRAPHIC REPRODUCING MACHINE

Ivan Rezanka, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,303

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **26 Claims**



1. A cleaning apparatus for an electrostatographic reproducing machine for removing magnetic toner from an imaging surface of said machine, said cleaning apparatus comprising:

means for generating an inhomogeneous magnetic field at said imaging surface comprising;
a magnetic member having at least one magnetic pole arranged in close proximity to said imaging surface with an edge of said member at said pole opposing said imaging surface and being spaced from said imaging surface so as to define a gap extending from said imaging surface to said edge of from about 0.005 inches to about 0.050 inches;
means for receiving said magnetic toner particles removed from said imaging surface and for transporting them away from said imaging surface comprising a transport surface, said transport surface being interposed between said magnetic member and said imaging surface;
said transport surface and said imaging surface being arranged for relative movement with respect to one another; and
the ratio of the longitudinal width of said edge of said magnetic member, as measured in the direction of relative movement, to said gap, comprising from about 0.5 to about 2.

4,108,547

DOCUMENT LOADING FOR COPYING

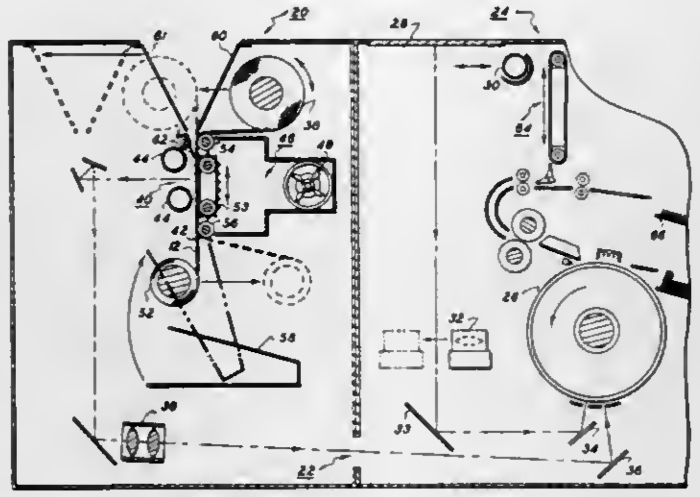
Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 560,755, Mar. 24, 1975, Pat. No. 4,008,956. This application Oct. 27, 1976, Ser. No. 736,051

Int. Cl.² G03B *27/64, 27/62, 27/46*

U.S. Cl. 355—50 **7 Claims**

1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original documents on an elongated windable document holding web having a document supporting side, wherein a spaced pair of oppositely wound scrolls of said web are provided for retaining said documents within said scrolls, wherein said scrolls are normally facing one another and forming a nip with said document supporting side of said web, and wherein said web has a minor intermediate unwound segment extending between said web scroll nip, and wherein means are provided for automatically multiply recirculatingly winding and unwinding said web with the documents thereon through said intermediate segment between one said web scroll and the other said web scroll to multiply recirculatingly expose individual documents on said intermediate segment of said web in a pre-collated order for making said pre-collated copy sheet sets, the improvement in means for loading documents onto said intermediate segment of said web comprising:



means for selectively repositioning at least one of said web scrolls relative to said intermediate segment of said web into a position providing for the loading of documents onto said document supporting side of said intermediate segment of said web,
a scroll shroud means overlying and movable with said one web scroll, and a document loading guide means movable together with said scroll shroud means into a document loading position adjacent said intermediate segment of said web when said one web scroll is so repositioned into said document loading position.

4,108,548

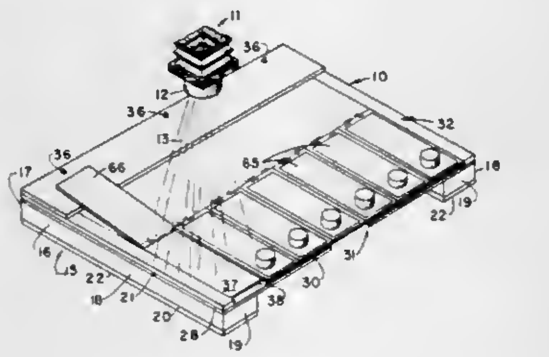
DEVICE FOR EXPOSING PHOTOGRAPHICALLY SENSITIZED SHEETS

Barbara Jean Hawkins, 1622 E. Clinton Ave., Fresno, Calif. 93704

Filed Sep. 12, 1977, Ser. No. 832,593

Int. Cl.² G03B *27/58, 27/44*

U.S. Cl. 355—74 **4 Claims**



1. A device for exposing photographically sensitized sheets comprising:

A. a base having a substantially flat display surface with magnetically attractive portions and adapted to receive one of said sheets in facing engagement thereon;
B. a shield having opposite edges and a fold line extending therealong substantially midway between said edges, said shield being severed from one edge along courses inwardly substantially to said fold line to form a plurality of flap portions independently foldable about the fold line and the shield being darkened with each of said flap portions having a target area of light coloration covering substantially all of the flap portion;
C. means borne by the base for mounting said shield thereon in facing engagement with one of said sheets on the display surface leaving the flap portions thereof free to be folded independently from positions in facing engagement with said sheet to positions folded therefrom exposing the sheet; and
D. magnetically attractive members individually borne by the flap portions remote from said fold line of the shield for magnetic attraction to said magnetically attractive portions of the display surface independently to secure said flap portions in facing engagement with the sensitized sheet sealed from exposure.

4,108,549

POLYCHROMIC REPRODUCTION PROCEDURE USING STRIPPABLE MASKS

Roger R. Hermelin, Olivet, France, assignor to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Sep. 22, 1977, Ser. No. 835,756

Claims priority, application France, Sep. 22, 1976, 76 28443

Int. Cl.² G03B *27/32, 27/28;* G03C *7/04;* G03F *1/00*

U.S. Cl. 355—77 **9 Claims**

1. A polychromatic reproduction procedure for obtaining a reproduction having a plurality of shading degrees for each primary color in the polychromatic system characterized by the fact that only one mask capable of being stripped is required to reproduce all the shading degrees for each primary color, said mask having recorded thereon areas to be shaded a plurality of shading degrees and serving sequentially as the mask for the areas to be most densely shaded and upon stripping as the mask for the areas to be shaded the remaining shading degrees, said procedure comprising:

stripping said mask of the areas to be most densely shaded, placing said mask on said light-sensitive film and underexposing said film to light to form underexposed areas corresponding to the areas to be most densely shaded;
subsequently stripping said mask of the next densest area, replacing said mask on said film and again underexposing said film to light such that the areas to be most densely shaded are again exposed and in addition underexposed areas are formed on said film corresponding to the next densest areas in said mask;
repeating said stripping and underexposing for each of the plurality of shading degrees, each time reexposing the denser areas and forming underexposed areas corresponding to the newly stripped dense area in said mask.

4,108,550

APPARATUS FOR LIFTING AN ELECTROSTATICALLY CHARGED FLEXIBLE RECORDING MATERIAL

Roland Moraw, Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 422,683, Dec. 7, 1973, abandoned. This application Jul. 12, 1976, Ser. No. 704,593

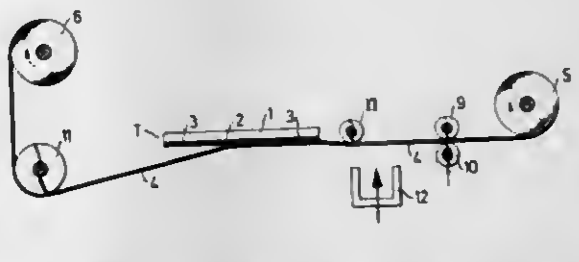
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1972, 2260570

Int. Cl.² G03B *15/00*

U.S. Cl. 355—133 **4 Claims**

1. An apparatus for peeling off an adherent, electrostatically charged, flexible recording material from an electroconductive supporting plate, said material being a film provided with a thermoplastic photoconductor layer, comprising electroconductive supporting plate means composed of a glass plate with a transparent electroconductive layer thereon which is provided with electrode means, said supporting plate means being adapted to contact one side of said material,

guide means for the recording material arranged adjacent to the supporting plate means and so mounted as to project beyond an image plane on said supporting plate means in the direction in which said recording material is to be peeled off,



holding element means positioned upstream of said guide means and said supporting plate means,
and separating means for exerting a lateral pull on said recording material when said material is held by said holding means, whereby said material is progressively separated from said image plane in a wedge-like manner by said separating means.

4,108,551

OBSERVATION AND AIMING APPARATUS, PARTICULARLY ON A VEHICLE

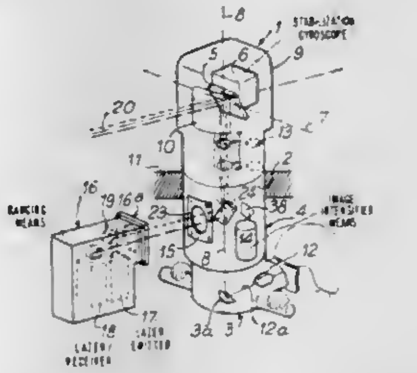
Claude Edmond Georges Weber, Bois-Colombes, France, assignor to Societe d'Etudes et de Realisations Electroniques, Asnieres, France

Filed Dec. 15, 1976, Ser. No. 750,653

Claims priority, application France, Dec. 29, 1975, 75 39960

Int. Cl.² G01C *3/08;* G02B *5/08*

U.S. Cl. 356—4 **12 Claims**

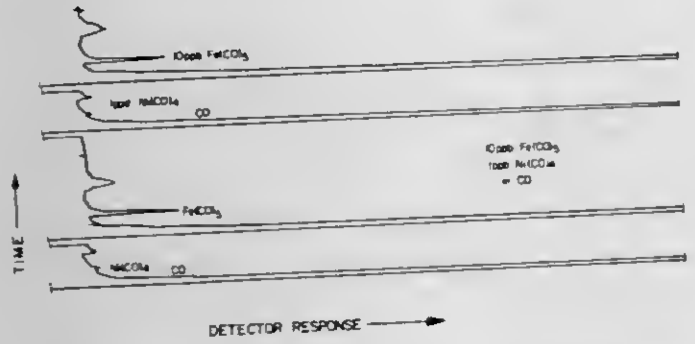


1. A periscope comprising a panoramic sighting head for visually sighting on an object, and a sighting tube in association therewith having at least one eyepiece for an observer, said sighting tube and said sighting head being arranged to have an optical path therebetween, laser telemetry means having an emitter and receiver mounted in association with said sighting head and said sighting tube, a dichroic mirror having a front face reflecting the beam from said laser emitter toward the object and for reflecting the beam from said object toward said laser receiver, a reticule located in front of said dichroic mirror, and a reflecting trihedron located behind said dichroic mirror for causing the reflection of the image of said reticule from the rear face of said dichroic mirror to said eyepiece and image intensifying means for nocturnal vision, said dichroic mirror and said image intensifying means being movably mounted for alternate positioning along the optical path whereby said optical path is common for daytime vision, night-time vision and laser telemetry.

4,108,552
METHOD AND SYSTEM FOR DETECTING ULTRA-TRACE QUANTITIES OF METAL CARBONYLS

Terry Marshall Austin; Eugene Thomas Carroll, both of St. Albans, and Mildred Choi Bowen, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,842
Int. Cl.² G01V *3/30*
U.S. Cl. 356—87 **14 Claims**



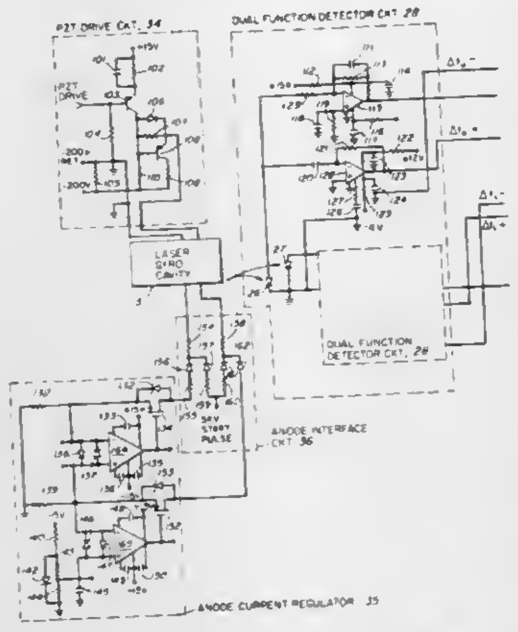
1. A method for detecting ultra trace levels of at least one predetermined metal carbonyl within a fluid matrix comprising the steps of:
(a) sampling said fluid matrix to provide a fluid sample of predetermined volume;
(b) passing said fluid sample together with a carrier gas through a component separator for separating said predetermined metal carbonyl from the other components in said fluid sample;
(c) forming a binary admixture between the separated metal carbonyl component and said carrier gas;
(d) oxidizing said binary admixture in an oxygen rich flame such that a molecular wavelength emission spectrum is generated for said admixture;
(e) optically selecting a predetermined range of wavelengths in the ultraviolet to visible light region of said emission spectrum from between 350 to 625 nanometers inclusive;
(f) electro-optically detecting said predetermined range of wavelengths; and
(g) indicating said detected range.

4,108,553
LASER GYROSCOPE DETECTOR AND PATH LENGTH CONTROL SYSTEM

Albert N. Zampiello, Boxboro, Mass., and Bradley J. Patch, Jr., Owegn, N.Y., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 4, 1977, Ser. No. 756,672
Int. Cl.² G01B *9/02;* **G01P** *9/00*
U.S. Cl. 356—106 LR **14 Claims**

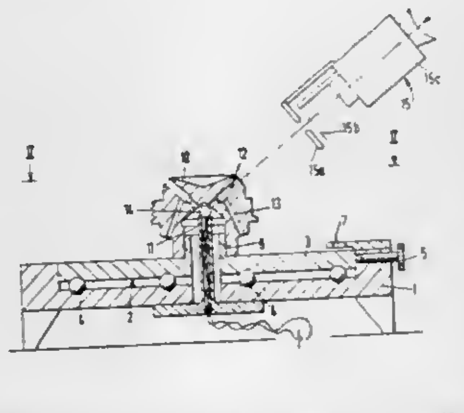
1. In combination:
a laser gyroscope cavity having a closed path for propagation of a plurality of waves, each of said waves being of a different frequency;
at least two detecting means, at least two of said waves being coupled to each of said detecting means; and
first and second filtering means being coupled to each of said detecting means, said first filtering means having a passband below a predetermined frequency and said second filtering means having a passband above said predetermined frequency, said predetermined frequency being below the minimum output signal frequency from said second filtering means produced by rotation of said laser gyroscope cavity, and substantially all the signal power from each of said detecting means of a frequency below said predetermined frequency flowing to the corresponding first filtering means and substantially all the signal power from each of said detecting means of a frequency above said predetermined frequency flowing to the corresponding second filtering means.


PZT DRIVE CKT. 34
DUAL FUNCTION DETECTOR CKT. 28
LASER GYRO CAVITY
DUAL FUNCTION DETECTOR CKT. 29
ANODE INTERFACE CKT. 36
ANODE CURRENT REGULATOR 35

4,108,554
Y-JET TIP TESTER

William Inglis Joyce, Skelmorlie, Scotland, assignor to Babcock & Wilcox, Limited, London, Great Britain

Filed Feb. 17, 1977, Ser. No. 769,761
Int. Cl.² G01B *11/00, 11/27*
U.S. Cl. 356—156 **6 Claims**

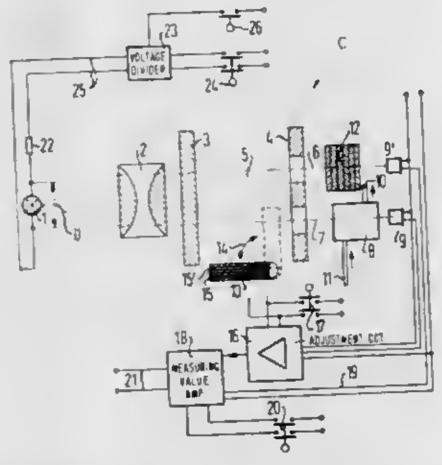


1. An apparatus for testing a plurality of similar bores of a fluid fuel burner tip to determine the similarity in cross section and the disposition of each bore relative to the central axis of the burner tip, a recess formed in the burner tip, the bores diverging from the recess, a member threadably engaged with the burner tip, means fixed relative to the central axis, means associated with the first named means such that a beam of radiation may be passed through one of the bores along a constant path from one to the other of the associated means, means for indicating the amount of radiation that has passed through the bore, the member and one of the associated means being rotatable relative to each other about the central axis so that each bore may be brought into such orientation relative to the beam that an equal amount of radiation will pass through the bore if its cross section and disposition relative to the central axis is similar to that of the first bore.

4,108,555
TWO-BEAM COLORIMETER

Johan Helder, Brugge; Hubert De Steur, Drongen, both of Belgium, and Wolfgang Pernegger, Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 5, 1976, Ser. No. 674,050
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1975, 2518857
Int. Cl.² G01J *3/48*
U.S. Cl. 356—184 **5 Claims**



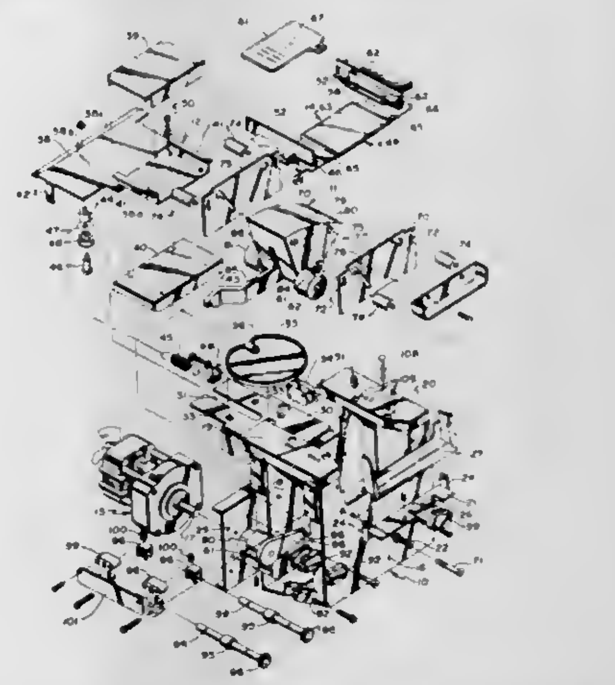
1. A two-beam colorimeter comprising; in combination,
a transparent cuvette for supporting an object liquid during an operational run and susceptible to residual impurities,
first and second photo-sensitive photoelectric devices, said first photo-sensitive device disposed adjacent said cuvette,
an incandescent light source, a condenser spaced from said light source and a diaphragm spaced from said condenser and including first and second apertures aligned with said first and second photo-sensitive devices to pass a measuring light beam and a reference light beam therethrough, respectively,
a reference filter between said second aperture of said diaphragm and said second photo-sensitive device to compensate for the light absorption of said cuvette per se and differences in the operating characteristics of said first and second photo sensitive devices,
selective adjusting filter means movable into said measuring light beam prior to an operational run on the object liquid to compensate for the natural light absorption of the object liquid in said cuvette and movable out of said measuring light beam during an operational run, said selective filter means being selectable in filtering characteristics to match the object liquid,
an adjusting circuit connected to said first photo-sensitive device and operable in a first mode prior to an operational run to set to an attenuation factor representing the object liquid in said cuvette and operable in a second mode during an operational run to correspondingly factor the output of said first photo-sensitive device, and
comparison means connected to said second photo-sensitive device and to said adjusting circuit to provide an signal during an operational run representing the colorimetric character of the object liquid.

4,108,556
PRINTING PISTON ASSEMBLY

Thomas Patrick Connoy, New Brighton, Minn., assignor to Kroy Industries, Inc., Stillwater, Minn.

Filed Sep. 24, 1976, Ser. No. 726,106
Int. Cl.² B41J *1/02;* **B41F** *3/54*
U.S. Cl. 400—48 **19 Claims**

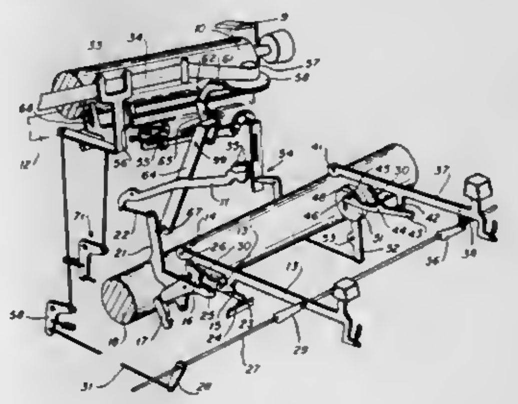
1. In a printing apparatus of the type having a printing station, a force resisting means for resisting a printing force, a force exerting means positioned in printing alignment with said printing station for exerting a printing force toward said force resisting means, and an image carrier and a font element with at least one raised character, each being disposed between said force resisting means and said force exerting means and each being positionable in printing alignment with said printing station wherein said force exerting means comprises:
a generally wedge shaped element having a curved force exerting surface extending through an arc of less than approximately ninety degrees;
support and guide means for supporting and guiding said force exerting surface in rolling movement with respect to said printing station between first and second positions such that a normal printing force is exerted against successive portions of said raised character during said rolling movement to transfer an image of said raised character to said image carrier; and
means for moving said force exerting surface in rolling movement between said first and second positions.



4,108,557
ERROR CORRECTING TYPEWRITER

Jürgen Skrzipek, Berlin, and Helge Reuter, Nuremberg, both of Fed. Rep. of Germany, assignors to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,537
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2606013; Jul. 22, 1976, 2633021
Int. Cl.² B41J *29/16*
U.S. Cl. 400—697.1 **5 Claims**



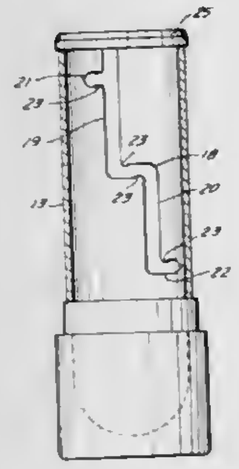
1. An error correcting typewriter having an error correction ribbon,
means for elevating said error correction ribbon opposite the printing point of a typewriter,
means for feeding said error correction ribbon to present a fresh area for elevation opposite said printing point,

a carriage,
means for initiating a backspace action for backspacing said carriage,
a silent type action having a blank type face,
an error correction keylever depressible to a first limit position for initiating operation of said silent type action, and
means responsive to depression of said error correction keylever to said first limit position for operating, in advance of the printing of said blank type face, in sequence, said backspace action, said error correction ribbon elevating means, and said error correction ribbon feeding means, whereby a previously typed character can be erased and a correct character typed in the same character space.

4,108,558
LIPSTICK DISPENSER

Michael Radice, Oakland, and Robert J. Sheffler, Morganville, both of N.J., assignors to Revlon, Inc., New York, N.Y.
Filed Feb. 16, 1977, Ser. No. 769,017
Int. Cl.² A45D *40/06*

U.S. Cl. 401—78 **1 Claim**

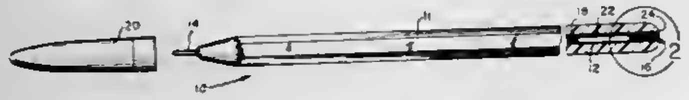


1. An inner cylindrical sleeve for use in a holder for dispensing liquids, said sleeve having a pair of diametrically opposed slots that are adapted to receive a pair of lugs projecting from a movable cup within the sleeve, each of said slots consisting of a lateral portion, two longitudinal portions extending respectively upward and downward from the opposing ends of the lateral portion, and lateral passages near the top end of the upper longitudinal portion and at the bottom end of the lower longitudinal portion, wherein the width of the lateral passages is narrowed at the points where the logitudinal and lateral passages meet.

4,108,559
BALL POINT PEN BACK END CLOSURE

Franklin Dick, and Peter H. Seckel, both of Upper Montclair, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jul. 21, 1976, Ser. No. 707,159
Int. Cl.² B43K *7/02*

U.S. Cl. 401—217 **6 Claims**

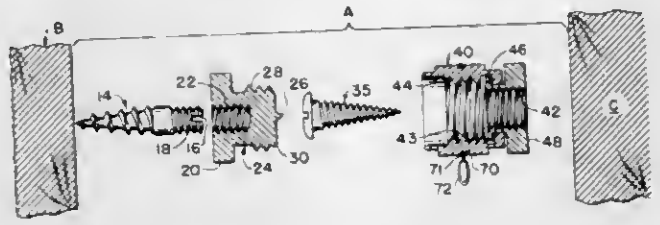


1. An air-permeable plug adapted to act as a positive obstruction to writing fluids typically used in writing implements and comprising a substantially continuous sheath having an inside diameter of between about 0.025 and 0.250 inches and a low twist substantially continuous braided filamentous material having a total denier of between about 3000 and 25,000 encased in said sheath and further characterized by its perviousness to air and its imperviousness to writing fluids when exposed to and contacted therewith.

4,108,560
SIGN MOUNTING FASTENER

Robert Willis Minogue, Hayward, Calif., assignor to Federal Signal Corporation, Chicago, Ill.
Filed Jan. 14, 1977, Ser. No. 759,597
Int. Cl.² F16C *11/00;* **F16D** *1/12, 3/00*

U.S. Cl. 403—33 **7 Claims**

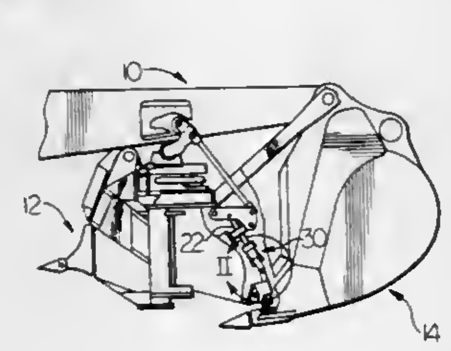


1. A sign fastener comprising a male mounting member; said male member including protruding attachment means for mounting to a surface; a female mounting member; coupling means for connecting said female mounting member to said male mounting member upon relative rotation of said coupling means; said female mounting member defining an aperture for permitting a fastener to pass there through to hold said female mounting member to a surface; relative rotation means on one of said mounting members to permit rotation of said coupling means relative to said mounting members to effect fastening of said sign; and, a scribe mounted to one of said members to permit said members to impress a mark indicating its location on a surface.

4,108,561
APPARATUS FOR FORCIBLY ENGAGING MACHINE ASSEMBLIES

James E. Kelley, Metamora, and Orrin A. Stemler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed May 5, 1977, Ser. No. 794,000
Int. Cl.² F16B *7/10*

U.S. Cl. 403—166 **8 Claims**

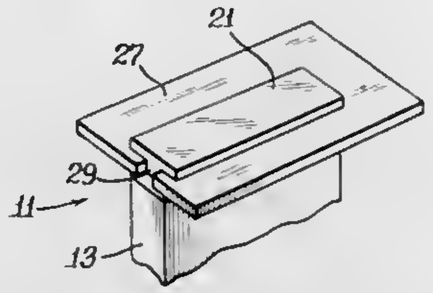


1. In an apparatus having first and second assemblies each having at least one inclined plane, said first assembly including a first member having first and second end portions with said inclined plane on the first end portion, said inclined planes contacting one another at a locking position and releasably fixing said first assembly to said second assembly, the improvement comprising:
means for urging one of the inclined planes into the other inclined plane at a force sufficient for maintaining the inclined planes in forcible contact with each other during vibrational movement of one of said first and second assemblies and during wear of the inclined planes for maintaining locking contact and automatically compensating for said wear, said urging means including a link assembly connected to and positioned between the end portions of the first member.

4,108,562
RELEASABLE COUPLING

James C. Collard, and Wesley G. Martin, both of Manitowoc, Wis., assignors to Kraft, Inc., Glenview, Ill.
Filed Nov. 9, 1977, Ser. No. 849,868
Int. Cl.² F16B *9/02*

U.S. Cl. 403—254 **5 Claims**

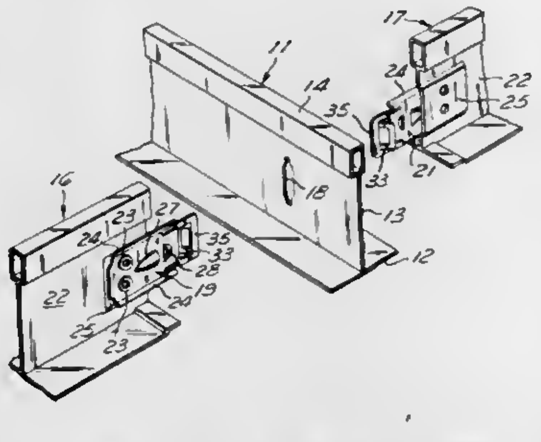


1. A releasable coupling for joining two or more structural components in detented interconnection to one another comprising
(a) a structural member having a first side wall and a second side wall;
(b) at least one channel in each of said first and said second side walls to form a pair of opposed channels separated by a web adjacent an end of said structural member;
(c) the outermost wall of said channels being formed by an end wall member;
(d) at least one lug located at one end of at least one of said channels;
(e) a receiving member having an elongated slot; and
(f) a recess formed adjacent one end of said slot for receiving said lug in detented releasable connection by sliding said slot through said pair of channels;
said end wall member being affixed to said structural member in a manner so that there is no substantial displacement of said end wall member being engaged with said slot of said receiving member.

4,108,563
LOCKING CONNECTION FOR SUSPENSION CEILING SYSTEMS

Donald A. Brown, Westlake; Paul D. LaLonde, Avon Lake, and Gerald L. Koski, Parma, all of Ohio, assignors to Donn Products, Inc., Westlake, Ohio
Continuation-in-part of Ser. No. 625,572, Oct. 24, 1975. This application Aug. 11, 1976, Ser. No. 713,287
Int. Cl.² F16B *7/22*

U.S. Cl. 403—347 **24 Claims**

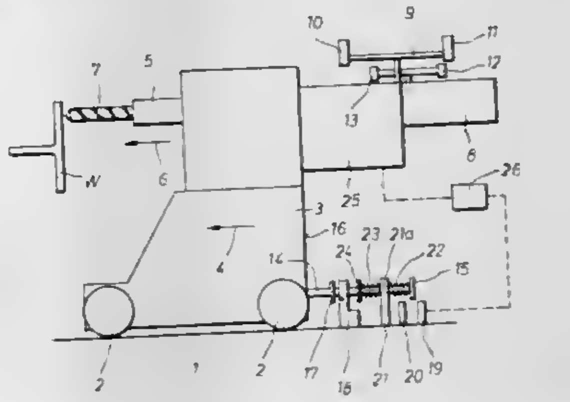


1. A locking connection for a planar grid system or the like which includes a plurality of parallel first support members and a plurality of second support members which extend perpendicular to and between said first members comprising a web provided by said first members formed with a slot opening therethrough, an end connector on each of said second members, each end connector being proportioned so that two of them are insertable through said slot openings from opposite directions in abutting side-by-side relationship to lock a pair of said second members together on opposite sides of an associated first member, said end connectors each providing an opposed pair of surfaces which extend substantially perpendicular to the associated second members and interlocking with opposed surfaces on the other connector when two end connectors are inserted in opposite directions through said slot, said interlocking surfaces operating to positively position said end connectors and their associated second members in a predetermined axial position and prevent relative axial movement therebetween toward and away from each other, said slot preventing lateral separation of said end connectors and preventing disengagement of said interengaging surfaces, each end connector also including a laterally extending portion which engages said web on the side thereof remote from the associated second member to prevent withdrawal of each end connector from said slot independent of the other connector whereby a single connector may be installed and locked in said slot, said laterally extending portion operating after one connector is installed in said slot to prevent the insertion of a second connector on the incorrect side of said one connector.

4,108,564
DRILLING DEVICE WITH TOOL CARRIER SUPPORTED BY A CARRIAGE DISPLACEABLE IN DRILLING DIRECTION

Werner Peddinghaus, Sprockhovel, and Ludwig Regenbrecht, Gevelsberg, both of Fed. Rep. of Germany, assignors to Werner Peddinghaus, Bruchhausen, Fed. Rep. of Germany
Continuation of Ser. No. 611,645, Sep. 9, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,696
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1974, 2410337
Int. Cl.² B23B *39/14*

U.S. Cl. 408—10 **20 Claims**



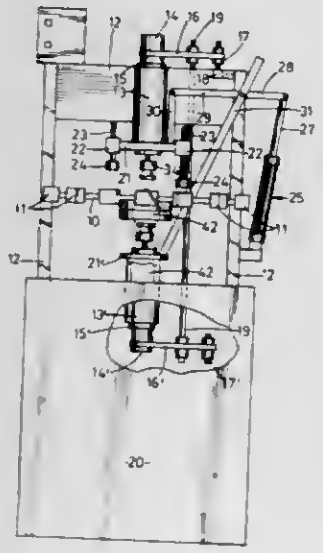
1. A drilling device for workpieces of different sizes, which includes: a support, a carriage reciprocable on said support in the drilling direction of said drilling device, a tool carrier adapted to receive a drilling tool and supported by said carriage and movable on said carriage, variable speed power operable means between said carriage and said tool carrier for causing the latter to feed said drilling tool carrier thereby toward and through a workpiece, said carriage including an extension movable therewith, a switching element secured to said extension so as to be movable therewith, a first switch on said support connected to said power operable means and located in the path of said switching element for actuation of said first switch by said switching element, an abutting element connected to said extension in spaced relationship to said switching element, first stationary bearing means on said support located on that side of said abutting element which faces towards said switching element, said first stationary bearing means being spaced from said abutting element by a distance slightly greater than the distance by which in said switching element is spaced from said first switch when said drilling device is in a non-drilling position, and means associated with

said tool carrier and said carriage and operable in response to said tool carrier having moved in a first direction into contact with a workpiece mounted to be drilled to move said carriage in a second direction opposite to said first direction by a distance to cause said switch element to close said first switch to thereby bring about a reduction in the speed of said power operable means and thereby said tool carrier in the direction toward the workpiece to be drilled.

4,108,565
POTATO PROCESSING

Jacobus Wilhelmus Janssen, 3 Lincoln St., Brooklyn, Wellington, New Zealand

Filed Jul. 21, 1977, Ser. No. 817,918
Int. Cl.² B23B *39/22;* **B23G** *1/20*
U.S. Cl. 408—37 **13 Claims**



1. A potato processing apparatus comprising a rotatable potato receiving means having a number of receptacles, a potato processing station provided adajcent said receiving means, said station having potato compressing, cutting and removing means, the rotation of said receiving means being synchronised with operation of the processing station such that with a potato located on a receptacle the compressing means operating to firmly lodge said potato within said receptacle and said cutting means then being engageable with said potato so as to cut it into a substantially spherical shape and said removing means then being able to cause said substantially spherical potato to be removed from said potato receiving means.

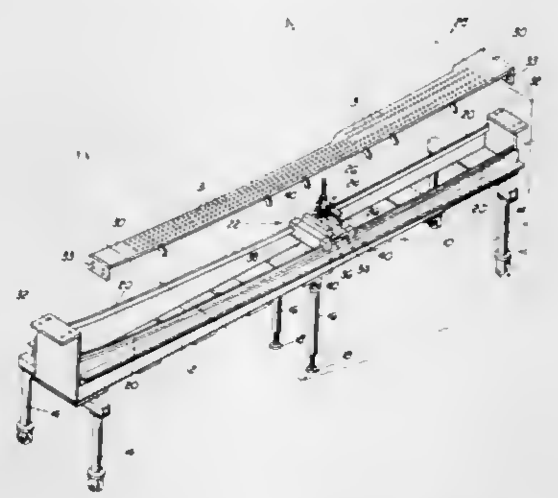
4,108,566
MECHANIZED CONTOUR-FOLLOWING DRILL MACHINE

Everett E. Jones, 3801 S. Oliver, Wichita, Kans. 67210

Filed Jul. 18, 1977, Ser. No. 816,530
Int. Cl.² B23B *47/28, 49/02*
U.S. Cl. 408—115 R **7 Claims**

1. A mechanized contour-following drilling machine, the machine orienting a drill spindle of a drill assembly perpendicular to a plane tangent to a contoured surface to be drilled, the machine comprising:

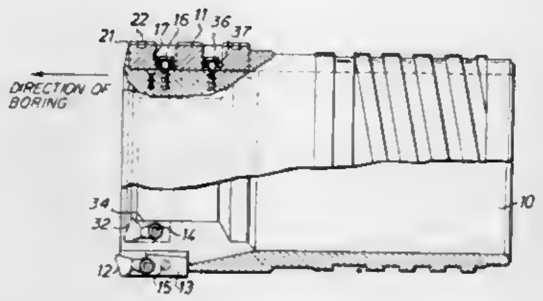
- a drill stand;
- a pair of parallel rails disposed in a spaced relationship from each other and mounted on top of said stand, said rails contoured to correspond with the contoured surface to be drilled which is disposed adjacent thereto; and
- means for supporting the drill spindle of the drill assembly on top of said rails and perpendicular thereto, and guiding the drill assembly along the length of said rails, and laterally between said rails.



4,108,567
BORING TOOL

Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation of Ser. No. 648,016, Jan. 12, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,656
Claims priority, application Sweden, Jan. 20, 1975, 7500542
Int. Cl.² B23B *51/00, 41/02*
U.S. Cl. 408—224 **2 Claims**



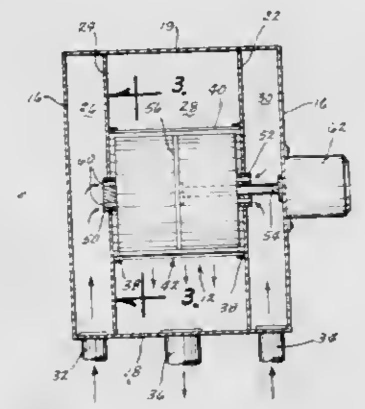
1. A boring tool, for making or enlarging a hole in metal, of the kind having the cutting action divided between several cutting inserts whose paths overlap with each other, the boring tool comprising:

- a head portion comprising a body having a periphery, a longitudinal axis, a working end, a shank end situated longitudinally opposite said working end, said working end including a working face, a guide pad disposed on said periphery adjacent said working end for engaging a side of a bore being formed, said guide pad including a leading end directed toward said working face;
- an outer insert including a cutting edge and located at said periphery with said cutting edge projecting from said working face;
- an inner insert including a cutting edge and located at the end face between said longitudinal axis and said outer insert,
- said leading end of said guide pad axially leads said cutting edge of said inner insert toward said working end.

4,108,568
FAN ROTOR MEANS

Darold I. Townsend, 730 Cherry St., Cherokee, Iowa 51012

Filed Jun. 8, 1977, Ser. No. 804,546
Int. Cl.² F01B *3/02*
U.S. Cl. 415—98 **5 Claims**



1. A rotor fan comprising,

- a housing having first and second spaced apart opposing walls forming a first interior chamber,
- a plurality of baffle members extending between said first and second walls and securely mounted in a generally perpendicular relationship thereto to form a cylindrical cage with said first chamber,
- rotor blade means rotatably mounted within said cylindrical cage, said means comprising a plurality of interconnected blade elements longitudinally parallel to said baffle plates and extending from the inside edge of said baffle members toward the longitudinal center line of said cylindrical cage, said blade elements terminating prior to said centerline to form a cylindrical bore about said centerline,
- means for rotating said rotor blade means,
- an outlet tube extending from said interior chamber to the exterior to allow air flow out of said interior chamber,
- air inlet means to introduce air into said bore to be propelled by said blade elements through said baffle member and out said outlet tube,
- said baffle members being plates having first and second legs with the angle between said first leg and second leg being an obtuse angle and said baffle members being disposed between an securely attached at each end to a pair of ring shaped rims,
- one of said rims securely mounted to the interior of said first wall and the other of said rims securely mounted to the interior of said second wall with said first leg of said plate being more or less tangential to the outer circumference of said rim and said second leg projecting inwardly therefrom.

4,108,569
LUBRICATED MECHANICAL SEALS FOR PUMPS

Michael Leslie Ryall, and James Rennie Robertson, both of Glasgow, Scotland, assignors to Weir Pumps Limited, Glasgow, Scotland

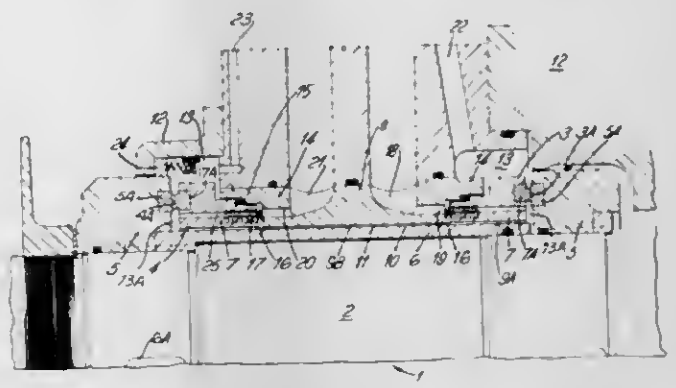
Filed May 26, 1976, Ser. No. 690,081
Claims priority, application United Kingdom, May 28, 1975, 23262/75
Int. Cl.² F04D *29/12;* **F16J** *15/16, 15/40, 15/54*
U.S. Cl. 415—112 **5 Claims**

1. In a machine installation having a rotary shaft extending through a through-bore in a wall of the installation, which wall bounds a high pressure environment of working fluid within the installation from a low pressure external environment; a high pressure shaft seal assembly to seal against the escape of working fluid through said through-bore to (a) the low pressure external environment, said shaft seal assembly comprising:

- (a) a seal housing at said through-bore;
- (b) a pair of axially spaced mechanical seals located in said seal housing, a first one of said seals being located nearer to the high pressure environment than the other second seal, each seal comprising rotor and stator portions with the stator portions of the seals located intermediate the rotor portions, the stator and rotor portions of each seal providing a sealing interface;
- (c) means for urging the stator and rotor portions of each seal into sealing engagement at said sealing interface;
- (d) an inner chamber for sealing medium located radially inwardly of each sealing interface;
- (e) inlet duct means in the housing for the supply of high pressure sealing and lubricating fluid to the inner annular chamber of said first seal at a pressure above that of said high pressure environment, said inlet duct means including conduit means in the stator portion of said first seal;
- (f) passage means for directing sealing and lubricating fluid from said inner chamber of said first seal to the inner chamber adjacent the sealing interface of the second seal;

and

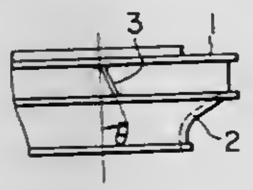
- (g) an elongate restriction clearance in said passage means to reduce the pressure of the sealing and lubricating fluid passing to the inner chamber of the second seal to a pressure which is relatively small amount above that of the low pressure external environment.



4,108,570
FRANCIS-TYPE RUNNER FOR PUMP-TURBINE

Masahiro Yamabe, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 23, 1976, Ser. No. 744,452
Claims priority, application Japan, Feb. 4, 1976, 51-10383
Int. Cl.² F01D *5/04*
U.S. Cl. 416—186 R **1 Claim**



1. A Francis-type runner for water pump-turbines comprising a crown ring, a shroud ring and a plurality of runner blades interconnected therebetween, each of said blades satisfying the following relations where $0.09 \leqq B/D \leqq 0.03$:

	$15^\circ \leqq \theta \leqq 35^\circ$
in the case where	$10^\circ \leqq \gamma \leqq 19^\circ$,
and	$20(\gamma - 12.3)/9^\circ = \theta$
in the case where	$19^\circ \leqq \gamma \leqq 28^\circ$,

where

D = a diameter of a circle circumscribing the outer ends of the respective runner blades;

B = a height of the outer end of the runner blade between the crown ring and the shroud ring;

γ = an angle between the tangent at the outer end of the runner blade to the curved surface thereof and the tangent at the outer end of the runner blade to the circle circumscribing the outer ends of the respective runner blades, both tangents being in a horizontal plane close to the crown ring; and

θ = an angle which the outer edge of the runner blade forms relative to a vertical plane passing through the center axis of the runner; whereby dual characteristics of operation showing a double efficiency are eliminated.

4,108,571

BLADED ROTOR ASSEMBLY FOR A GAS TURBINE ENGINE

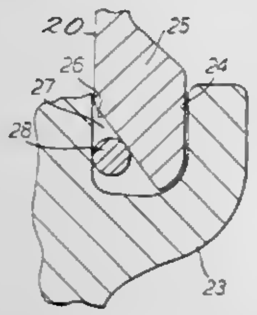
Robert James Mawson, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 1, 1977, Ser. No. 764,690

Claims priority, application United Kingdom, Feb. 11, 1976, 5335/76

Int. Cl.² F01D *5/32*

U.S. Cl. 416—221 **7 Claims**



1. A bladed rotor assembly for a gas turbine engine comprising: a plurality of blades each having a root portion, a blade carrying member having a plurality of slots in its periphery, each slot being arranged to receive and engage the root portion of one of said blades to radially retain the same to said blade carrying member, and lock members in engagement with said blades and said blade carrying member for preventing longitudinal movement of the root portion of each of the blades in the slots in at least one direction, at least one of the engagements comprising a projection defining an undercut and an edge of each of the lock members engaging in said undercut, said edge of each of said lock members having a chamfered edge which cooperates with a surface of said undercut to form a tapered groove therebetween having a section which reduces in a radially outward direction, and a wedging member separate from said lock members and from said undercut, said wedging member being mounted in said tapered groove and cooperating with both said chamfered edge of each of said lock members and said surface of said undercut so that in operation of the bladed rotor assembly centrifugal effects on said wedging member cause the wedging member to tend to move radially outward in the tapered groove to longitudinally wedge said edge of each of said lock members in said undercut against a wall of the same.

4,108,572

COMPOSITE ROTOR BLADE

Charles Elmore Platt, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1976, Ser. No. 753,742

Int. Cl.² F01D *5/14;* F11D *5/28*

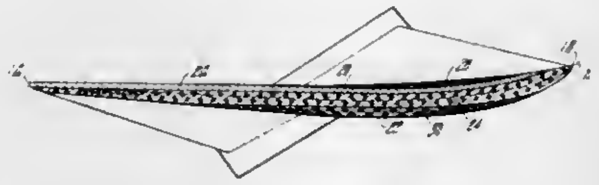
U.S. Cl. 416—230 **7 Claims**

1. A composite rotor blade of the type adapted for use in a turbomachine and having a leading edge, a pressure side and a suction side, the improvement comprising:

a core of high strength, high modulus fibers embedded in a metal matrix with the fibers extending in the spanwise direction through the blade;

a sheet of titanium adhered to the pressure side of said core and extending from the leading edge over approximately 75 percent of the blade chord;

a first laminate of crossply composite material of high strength, high modulus fibers embedded in a metal matrix which is adhered to said titanium sheet in the midchord region of the blade; and



a second laminate of crossply composite material of high strength, high modulus fibers embedded in a metal matrix which is adhered to the suction side of said blade core.

4,108,573

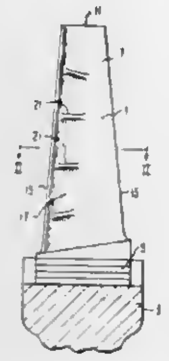
VIBRATORY TUNING OF ROTATABLE BLADES FOR ELASTIC FLUID MACHINES

John T. Wagner, Upper Darby, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1977, Ser. No. 762,545

Int. Cl.² F01D *5/10*

U.S. Cl. 416—236 A **1 Claim**



1. A method for tuning an array of rotatable blades each having an airfoil portion with concave and convex surfaces which come together at leading and trailing edges and are disposed immediately downstream of an array of stationary blades, the method comprising the steps of:

providing ribs on the concave surface of the rotatable blades, the ribs being generally disposed parallel to the flow of fluid across the rotatable blades and extending from the trailing edge to the intermediate portion of the concave surface so that the trailing edge of the rotatable blades are tuned to vibrate at known frequencies, and

setting the number of stationary blades in the array of stationary blades at a number which will produce excitation at a frequency that will not correspond to the known frequencies of the trailing edge of the rotatable blades.

4,108,574

APPARATUS AND METHOD FOR THE INDIRECT MEASUREMENT AND CONTROL OF THE FLOW RATE OF A LIQUID IN A PIPING SYSTEM

Thomas S. Bartley, and Quinlan T. Rosenblath, Jr., both of Mobile, Ala., assignors to International Paper Company, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,214

Int. Cl.² F04B *49/06, 49/08*

U.S. Cl. 417—19 **31 Claims**

1. Apparatus for continuously controlling the rate of flow of a liquid in a piping system in agreement with a desired flow rate, the apparatus comprising:

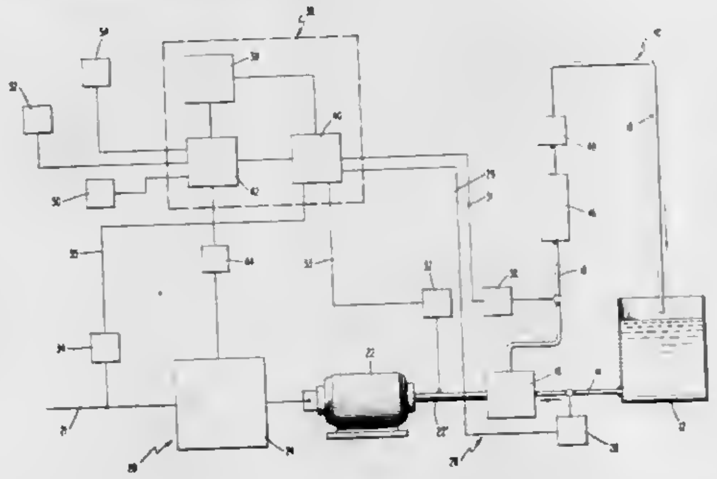
(a) a centrifugal pump;

(b) means for driving said pump, said driving means having a continuously variable speed capability;

(c) means for indirectly and continuously measuring the instantaneous rate of flow of the liquid in the piping system, said indirect measuring means including

(A) means for sensing at least two flow-related variables, said flow-related variables being associated with said pump and said driving means, said sensing means also including means for generating and transmitting signals representative of the instantaneous value of each of the sensed variables;

(B) calculating means including



(i) memory means containing stored therein a set of mathematical relationships relating flow rate to said two flow-related variables,

(ii) converter means for receiving the transmitted signals and transforming the signals into a first converted signal representative of flow rate by use of the stored mathematical relationships, and

(iii) means for comparing a reference signal representing the desired flow rate with said first converted signal and for determining the error therebetween; and

(d) control means responsive to said error varying smoothly the speed of said variable speed drive means.

4,108,575

OBTAINING DESIRED FLOW RATE FROM ROLLER PUMP DESPITE VARYING THE HOSE MEANS

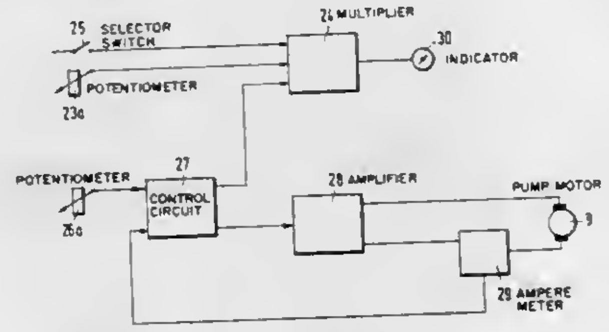
Wilfried Schäl, Bad Homburg-Dornholzhausen, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie K.G., Bad Homburg, Fed. Rep. of Germany

Filed Jun. 3, 1976, Ser. No. 692,373

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1975, 2535650

Int. Cl.² F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—53 **2 Claims**



1. A method for operating a peristaltic roller pump so as to maintain a constant delivery rate of blood to a delivery port of an external blood circulatory system despite use of hose types of different diameters in the pump comprising the steps of: providing a first electrical signal representing the number of hoses used, providing a second electrical signal representing the diameter of the hose used, providing a third electrical signal representing the speed of a motor driving said roller pump, supplying said first, second and third electrical signals to analog computer means for calculating a flow rate representing signal from said first, second, and third electrical signals, displaying said flow rate representing signal, adjusting the motor speed signal in accordance with the displayed flow rate in order to obtain indication of a desired flow rate, and supplying the adjusted motor speed signal to the drive motor for driving said pump to produce the desired flow rate.

4,108,576

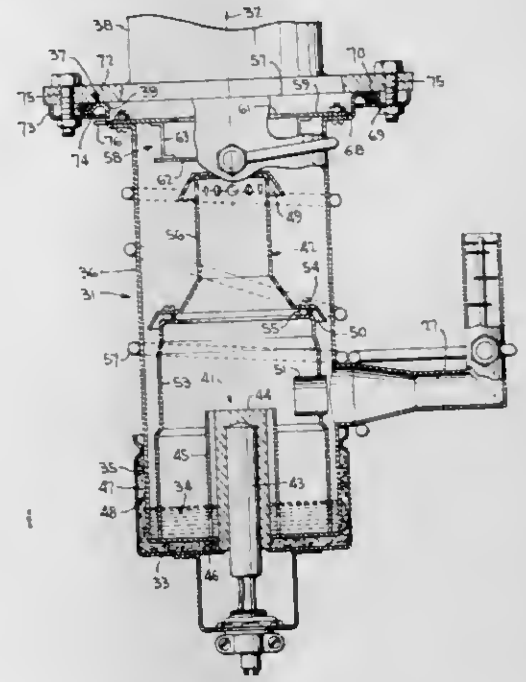
LOW COST, THERMALLY EFFICIENT DIFFUSION PUMP

Arthur A. Landfors, Sharon, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 6, 1976, Ser. No. 702,653

Int. Cl.² F04F *9/00*

U.S. Cl. 417—153 **22 Claims**



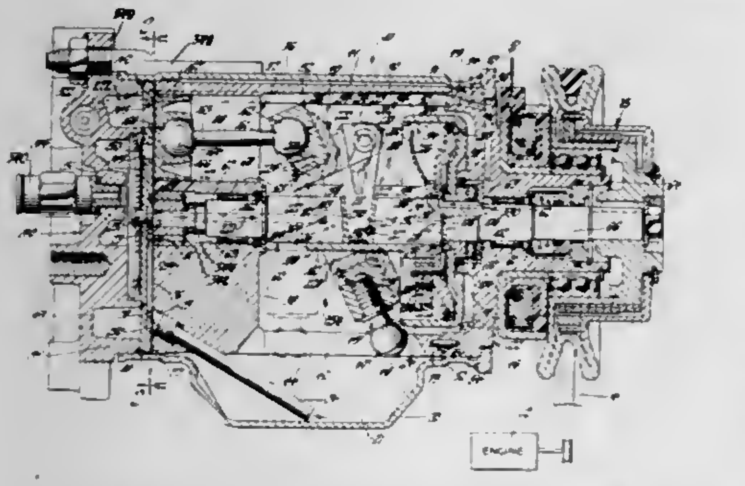
1. A diffusion pump for connection between a high vacuum chamber and a fore line leading to a fore pump comprising a body assembly including a cool cylindrical wall portion having a longitudinal centrally located axis, a pool of diffusion pump fluid at the bottom of the body assembly, a boiler for heating the fluid to a vapor state, a jet assembly concentric with the axis, a flow path for the vapor from the surface of the pool to the jet assembly, each jet assembly including at least one annular nozzle concentric with the axis for directing the vapor downwardly and outwardly against the cool wall portion, the cool wall portion condensing the vapor striking it into a liquid that flows downwardly along the cool wall toward the pool, an annular flange concentric with the axis and at the top of the body assembly for enabling the pump to be sealingly connected to the high vacuum chamber, a floor for confining the bottom of the pool, the body assembly having a wall segment for confining the periphery of the pool, a centrally disposed heating surface, the improvement being that the entire body assembly, including the cool wall portion, the wall segment, the flange and the floor are formed from a single piece of sheet metal deep drawn to: (1) have rounded corners between the wall segment and pool bottom as well as between the cool wall portion and the flange, (2) form the flange and floor, (3) form a downwardly depending annular flange connected to the floor by a rounded corner, the downwardly depending flange being formed by deep drawing the body assembly, the downwardly depending flange being bonded to the heating surface, said boiler including a cylindrical heating surface centrally located in the pool and extending axially from the bottom of

the pool to the surface of the pool, said surface being surrounded by a separator tube having openings close to the bottom of the pool so that liquid at the bottom of the pool enters an annular space between the separator and the heating surface close to the bottom of the pool and rises in the annular space while being heated to vaporization.

4,108,577
VARIABLE DISPLACEMENT COMPRESSOR

Byroo L. Brucken, Miamisburg, and Dennis A. Black, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1977, Ser. No. 804,932
Int. Cl.^{2} F04B *1/12;* F16H *23/00*
U.S. Cl. 417—222 **2 Claims**

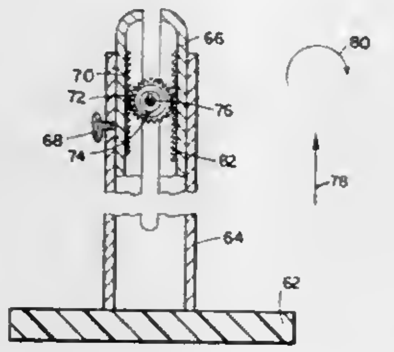


1. In A variable output compressor having a housing including a front end cover and a rear cylinder block, a crankcase in said housing, a drive shaft having its one end journaled in said rear cylinder block and its other end extending through an opening in said front end cover, said cylinder block having a plurality of cylinder bores formed therein substantially parallel to the axis of said shaft, pistons arranged to reciprocate in said cylinder bores, a wobble plate operated in response to rotation of said shaft and drivingly connected to said pistons, compressor output modulation means for varying the angle of inclination of said wobble plate relative to said drive shaft and thus the stroke of said pistons, said modulation means including an expansible hydraulic chamber actuator having an axially movable member for actuating said modulating means, an oil pump driven by said shaft, oil inlet passage means for conducting oil from said crankcase to the inlet of said pump, and oil outlet passage means for conducting oil from the outlet of said pump to said front end cover, the improvement comprising an axial protruding integral tubular extension on said front end cover outer surface surrounding said shaft other end, a front journal bearing on said shaft other end supported in said tubular extension, a radially extending passage in said front end cover having its outer end in communication with said oil outlet passage means, said expansible chamber actuator including a cup-shaped cylinder located in said housing adjacent said front end cover, said cylinder closed end having a forwardly extending tubular extension surrounding said shaft and fixedly secured thereto, whereby said cylinder is supported on said shaft in a concentric manner for rotation therewith, said axially movable member including a disc-shaped piston telescopically received in said cylinder rearwardly facing open end defining with said cylinder an expansible hydraulic chamber, an axially extending recess in the shaft portion surrounded by said cylinder tubular extension, said recess extending a predetermined distance beyond the forward and rearward ends of said cylinder tubular extension so as to define an axial open ended passage therewith providing fluid flow communication between the inner end of said radial passage and said expansible chamber; whereby said pump oil outlet passage means, including means for controlling flow of oil from said pump, is in communication with said expansible chamber for effecting movement of said disc-shaped piston and the resultant angle of inclination of said wobble plate.

4,108,578
RACK AND PINION WAVE MOTOR POWER PLANT

George Corey, 6340 Lankershim Blvd., N. Hollywood, Calif. 91606

Filed Aug. 24, 1976, Ser. No. 717,107
Int. Cl.^{2} F04B *17/00, 35/00;* F16H *19/04*
U.S. Cl. 417—331 **7 Claims**



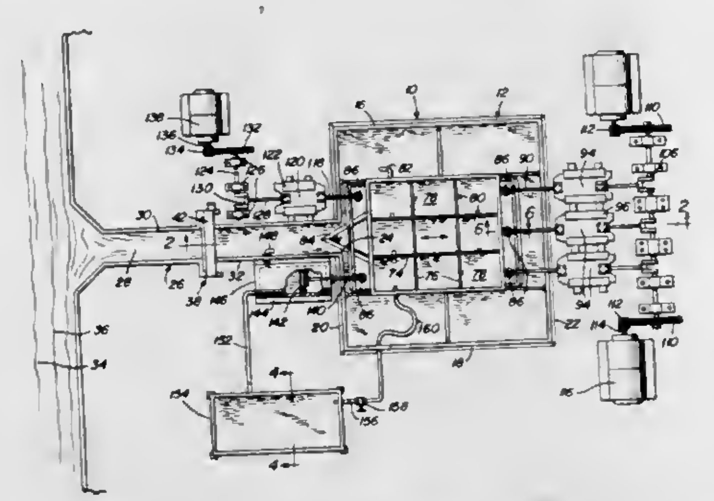
1. An apparatus for extracting and converting energy from ocean waves comprising a plurality of floats, a plurality of pumps, said plurality of pumps each having input shafts, said input shafts causing said pumps to convert oil from a low pressure state to a high pressure state when said input shafts are rotated, means to cause said input shafts to be rotated dependent upon the elevational heights of said plurality of floats, wherein said means to cause said input shafts to be rotated includes a plurality of shafts, one end of at least one of said plurality of shafts fixedly secured to a respective one of said plurality of floats, at least one rack, means whereby said rack is lockingly selectively secured to said at least one of said plurality of shafts along the length thereof, at least one pinion, a portion of the length adjacent the other end of said at least one of said plurality of shafts having the teeth of said rack continuously engaging the teeth of said at least one pinion, said pinion causing at least one of said input shafts to rotate as said at least one pinion is caused to rotate by the vertical displacement of said rack, and means to convert said oil to said high pressure state independent of the direction of vertical travel of each of said plurality of floats during a change in said elevational height, said plurality of floats being disposed bouyantly supported by a body of water, a motor, said motor being secured to a body of land, said body of land located adjacent said body of water, at least one pipe, said at least one pipe fluidly communicating said oil in said high pressure state to said motor.

4,108,579
WAVE MOTOR

Antero Martinez, and Estrella Martinez, both of P.O. Box 1631, Santo Domingo, Dominican Republic

Filed Oct. 12, 1976, Ser. No. 731,566
Int. Cl.^{2} F04B *17/00, 35/00*
U.S. Cl. 417—333 **12 Claims**

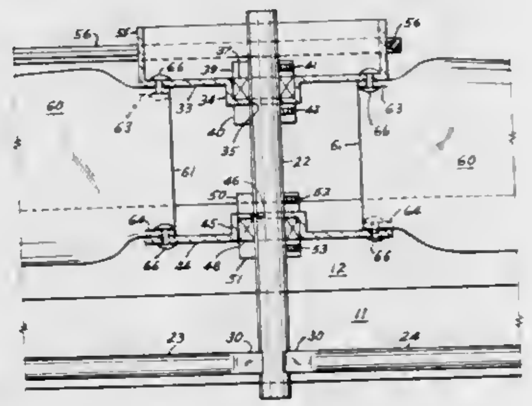
1. In combination, a basin, one side of said basin opening toward and in opposition to a source of waves moving theretoward, a buoyant body mounted within the basin for guided reciprocal movement therein toward and away from said one side and for vertical shifting in said basin during said reciprocal movement, a rotary shaft member journaled for rotation about a fixed axis, and drive means operatively connecting said body to said shaft member for driving the latter in response to reciprocation of said body in said basin, said body including at least one upstanding guide on the side thereof remote from said one side of said basin, said drive means including an elongated horizontal drive member, one end of said drive member including follower means captively engaged with said guide for relative vertical shifting between said guide and follower means, stationary horizontal guide means, the other end of said drive member being guidingly engaged with said guide means for horizontal shifting relative thereto, and pitman means drivingly connecting said drive member to said shaft.



4,108,580
ATTIC FANS

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

Filed Dec. 8, 1976, Ser. No. 748,417
Int. Cl.^{2} F04B *35/04*
U.S. Cl. 417—362 **19 Claims**



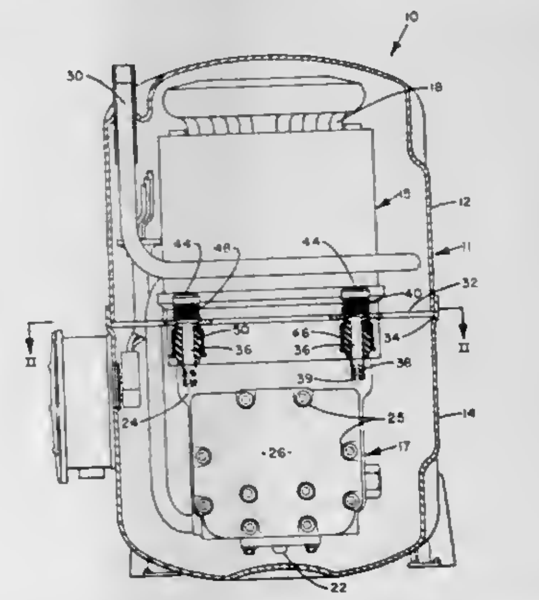
1. Fan apparatus, comprising a plurality of identical radially disposed equally circularly spaced elongate angular fan blades each having radially disposed opposite longitudinal edges, a stationary central shaft, first and second spaced plates each disposed substantially perpendicular to said shaft and rotatably fixed to said shaft, the inner end of each said fan blade extending angularly between said first and second plates and being connected to said first plate at the radially inner end of one of its said longitudinal edges and being connected to said second plate at the radially inner end of the other of its said longitudinal edges, and each said fan blade extending radially outward of said plates beyond said connections, one of said plates having means at its side opposite said connections of said inner ends of said longitudinal blade edges thereto for engagement by a drive belt disposed therearound to rotate said plates and blades about said shaft.

4,108,581
SUSPENSION SYSTEM FOR MOTOR-COMPRESSOR UNIT

Kenneth H. Miller, Syracuse, and Tadek M. Kropiwnicki, W. Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,519
Int. Cl.^{2} F04B *17/00;* F16F *15/00*
U.S. Cl. 417—363 **1 Claim**

1. In a suspension system for mounting a motor-compressor unit within a hermetically sealed shell, the improvement comprising:
- connecting means permanently secured to said shell; .
- anchoring means secured to said motor-compressor unit at approximately the center of gravity of the mass defined by said unit, including a plurality of rigid members spaced about a selected surface of said compressor of said unit;
- individual spring means attached to each of said anchoring means and supported by said connecting means for yieldably suspending said unit within said shell;
- a separate retaining member provided in spaced relation to each of said anchoring means; and
- a resilient member disposed in said space between said retaining member and said anchoring means to substantially occupy the whole of said space when said motor-compressor unit is in a static state, the inner surface of said resilient member being in intimate contact with the outer surface of said anchoring means, and the outer surface thereof being in contact with the inner surface of said retaining member, whereby said resilient member will be compressed between the opposed surfaces of said anchoring means and said retaining member to limit any motion of said motor-compressor unit in an angular direction about the horizontal axis of said unit, will be further compressed between opposed surfaces of said motor-compressor unit and said retaining member to limit motion of said motor-compressor in either vertically upward or downward directions within said shell, and will be further compressed between opposed surfaces of said anchoring means and said retaining member, and said retaining member and said motor-compressor unit to limit motion of said unit about the vertical axis of said unit.



4,108,582
CASING FOR GEAR PUMP OR MOTOR

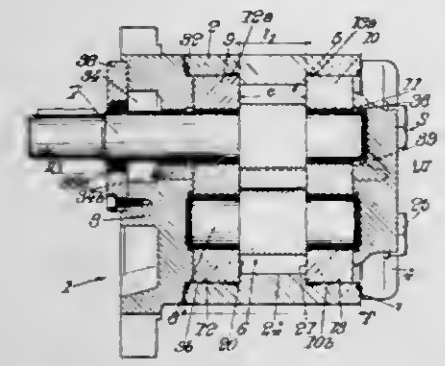
Georges Bitton, Oullins, France, assignor to Rexroth-Sigma, Venissieux, France

Filed Dec. 6, 1976, Ser. No. 747,936
Claims priority, application France, Dec. 16, 1975, 75 38554
Int. Cl.^{2} F04C *15/02;* B23P *15/00*
U.S. Cl. 418—132 **11 Claims**

1. A volumetric machine comprising:
- a tubular casing having first and second axial ends, said casing having an inlet and outlet for working fluid;
- first and second end plates closing said first and second casing ends respectively;
- first and second rigid bearings received in said casing adjacent said first and second end plates respectively;
- first and second meshing gearwheels each received in said casing between said first and second bearings; and
- means for balancing each of said first and second bearings, said balancing means comprising a chamber defined be-

tween each said bearing and said adjacent end plate and means for admitting to each said chamber a fluid at a pressure increasing with a working pressure of said working fluid; said casing having an internal shoulder between said bearings, said shoulder having an axial length to limit the axial distance between the proximate faces of said bearings to a value greater than the axial length of each said gearwheel; in which machine the improvement comprises:

means for mechanically clamping said shoulder of said casing between said bearings and said end plates; said shoulder having an axial length in an unclamped condition thereof such that the difference between said axial length of said shoulder and said axial length of each said gearwheel is greater than a predetermined axial operating clearance between said gearwheel and said bearings; said clamping means exerting on said shoulder in the clamped condition thereof in the normal operating condition of the machine a force resiliently deforming said shoulder so that said difference is reduced to a value at most equal to said operating clearance, the axial length of the casing being such that, after the shoulder has been clamped between the bearings, a clearance is left between each end face of the casing and the adjoining end plate.



4,108,583

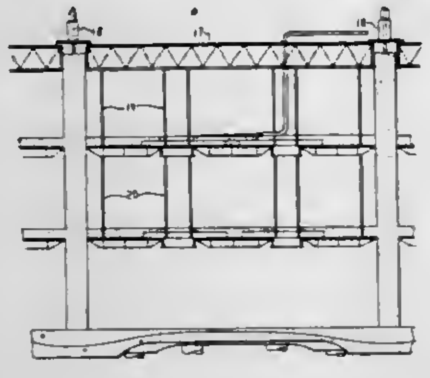
VERTICALLY MOVING SLIP FORMS

Peter Edington Ellen, Turramurra, Australia, assignor to Elspan International Limited, Causeway Bay, Hong Kong

Filed Dec. 6, 1976, Ser. No. 747,869

Int. Cl.^{2} E04G *11/22*

U.S. Cl. 425—65 1 Claim



1. A formwork system comprising a platform adapted to be supported from vertical elements of a structure and being associated with raising means whereby it may be raised in relation to said vertical elements, the platform having a plurality of hollow vertically extending housing means depending from its underside, there being associated with each housing means at least one and up to five vertically spaced horizontal formwork members, the spacing being at distances corresponding to a storey height of the structure, each formwork member being hingedly attached to a housing means and being adapted to be moved from a vertical position in which it lies within the periphery of a corresponding housing means to which it is attached, to a horizontal position in which it can be attached to and supported by an adjacent housing means, said system being so arranged that when all said formwork members are in a horizontal position, concrete floors can be cast at each level and thereafter said formwork members may be directed downwardly to the said vertical position to permit the platform to be raised by said raising means, thereby drawing with it the vertically extending housing means and formwork members contained therein through holes left in the concrete floors during casting of the concrete floors.

4,108,584

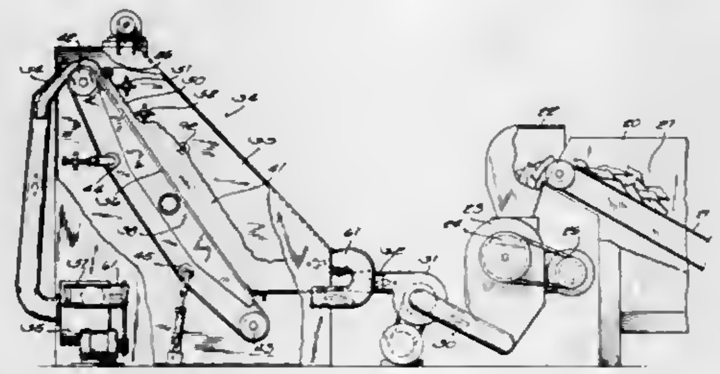
FLUFF DISTRIBUTOR

Edmund A. Radzins, Sheboygan Falls, and Gene F. Kiela, Kohler, both of Wis., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 17, 1977, Ser. No. 759,954

Int. Cl.^{2} B29C *13/00*

U.S. Cl. 425—83.1 10 Claims



1. A fluff distributor for supplying a plurality of converting machines operable at different rates of speed requiring different volumes of fluff, said fluff distributor comprising a fluff chamber, a plurality of vacuum screens in said chamber and onto which screens fluff is laid in batts, separately controllable drive mechanism for said screens whereby each screen can be independently driven at the same or different desired rates of speed whereby the volume of fluff output from said chamber for each said screen is similarly separately controllable.

4,108,585

APPARATUS FOR THE CONTINUOUS PRODUCTION OF FOAM PLASTIC BLOCKS OF RECTANGULAR CROSS-SECTION

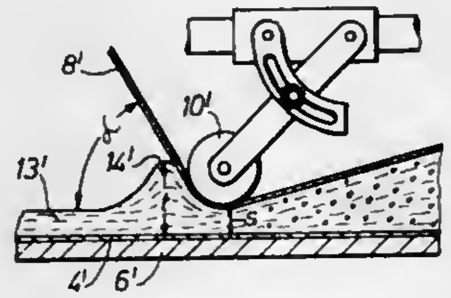
Ferdinand Proksa, Leverkusen; Reiner Raffel, Siegburg, and Ferinand Althausen Neunkirchen-Seelscheld, all of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Jun. 24, 1976, Ser. No. 699,419

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557572

Int. Cl.^{2} B29D *27/04*

U.S. Cl. 425—89 7 Claims



1. In an apparatus for the continuous production of foam plastic blocks of rectangular cross-section comprising an endless conveyor belt whose upper run is provided with side walls, an unwinding unit adjacent said belt for supplying a bottom and side sheet for covering the upper run of the belt and the side walls, a mixture application device downstream of said unwinding unit for supplying foamable liquid to said bottom sheet, a levelling device downstream of said mixture application device for effecting levelling of the said liquid before foaming commences, and an unwinding station operatively associated with said mixture application device for feeding a sheet to cover the mixture as it passes beneath the levelling device, the improvement wherein said levelling device comprises a levelling means for providing a gap between the sheet for covering the mixture and the bottom sheet at the position of said levelling device and for causing a build-up of liquid immediately upstream of said gap, and wherein the angle between the sheet for covering the mixture and the upper run of the belt is at least 60°.

4,108,586

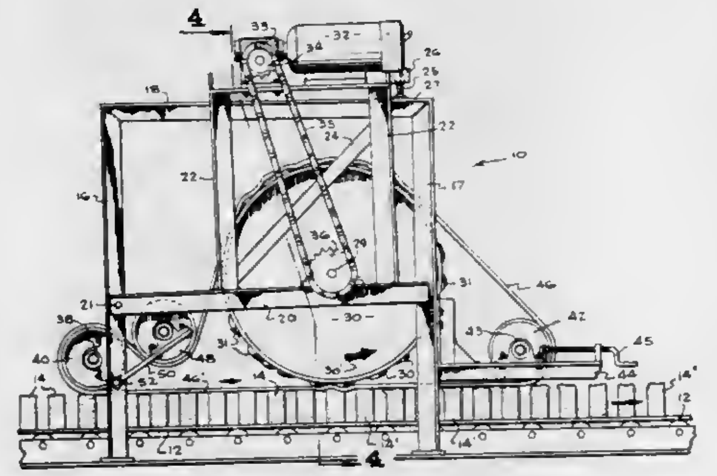
APPARATUS FOR FORMING IRREGULAR SHAPED BRICK

Lucius C. Gresham, Jr., Henderson, Tex., assignor to Henderson Clay Products, Inc., Henderson, Tex.

Division of Ser. No. 683,803, May 6, 1976, Pat. No. 4,078,038. This application Aug. 29, 1977, Ser. No. 828,966

Int. Cl.^{2} B28B *3/12*

U.S. Cl. 425—89 7 Claims



1. Apparatus for forming brick or the like of irregular configuration having a handmade appearance comprising a brick conveyor means, means for driving said brick conveyor means at a constant speed for feeding individual raw pliable brick members along a feed path, a flexible sheet member positioned above said brick conveyor means to engage the upper surface of brick members conveyed thereon, means for supporting and moving said flexible sheet member at the same speed and in the same direction as said brick conveyor means, force applying means for applying force through discrete portions of said flexible sheet member to press said discrete portions toward said brick conveyor means against and into any brick members on the brick conveyor means to effect a permanent deformation of said brick members without changing the relative positions of said brick members on said conveyor means, wherein said flexible sheet member comprises a horizontal flight of an elastic rubber-like belt loop and said means for supporting and moving said flexible sheet member includes upstream and downstream roller members supporting said horizontal flight of said belt loop so that said horizontal flight at least partially rests on the upper surfaces of brick members on said brick conveyor means.

4,108,587

PRODUCTION OF COMPOSITE CONTAINERS

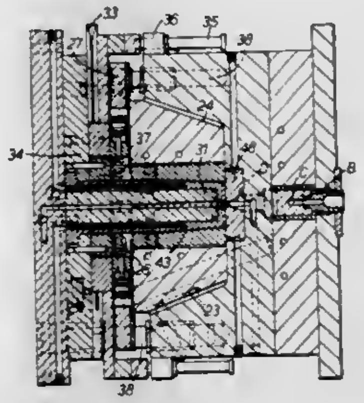
Kenneth Francis Rumball, Great Bookham, England, assignor to Airfix Industries Limited, London, England

Filed Apr. 11, 1977, Ser. No. 786,573

Claims priority, application United Kingdom, Apr. 9, 1976, 14691/76

Int. Cl.^{2} B29D *3/00;* B29F *1/00;* B29C *6/00*

U.S. Cl. 425—112 13 Claims



1. Apparatus for making a composite container from a planar blank of sheet material which includes an end panel and side panels each of which is foldable relative to the end panel from the planar condition to that position which it will occupy in forming the container, the apparatus comprising a core tool and a cavity tool which are movable relative to one another along a tool path between an open condition in which a blank in planar form can be positioned in a first location between the tools with the end panel intersecting said path and a closed condition in which the core tool is received by the cavity tool and in which the tools define a blank cavity in which they will clamp a blank between them with the panels folded to their relative final positions for forming the container and a mould cavity defining the shape of at least seam means for uniting edges of the blank juxtaposed by the folding of the panels,

injection means to inject mouldable material into the mould cavity,

blank guide means for positioning a blank in said first position and,

blank positioning means relative to which the tools are movable during relative movement toward the closed condition and which define a blank edge guide engageable by a blank edge during the folding and insertion of the blank into the cavity tool, to set that edge at a predetermined position relative to the mould cavity and positioned outside the path of the finished container during ejection of the finished container from the apparatus.

4,108,588

APPARATUS FOR PROCESSING MOLTEN LIQUID PLASTICS, PARTICULARLY FOR EXTRUSION OF PLASTICS

Rudolph Paul Fritsch, Stuttgart, Fed. Rep. of Germany, assignor to C.F. Scheer & Cie., Stuttgart, Fed. Rep. of Germany

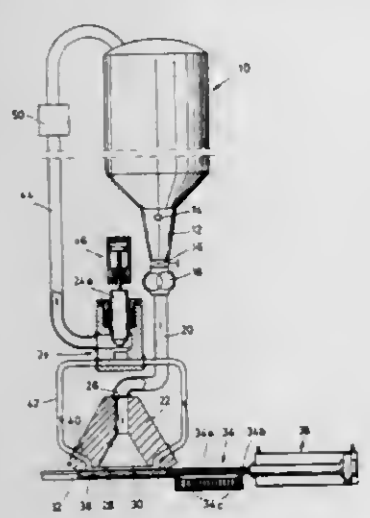
Division of Ser. No. 612,467, Sep. 11, 1975, Pat. No. 4,066,097. This application May 4, 1977, Ser. No. 793,727

Int. Cl.^{2} B29F *3/00*

U.S. Cl. 425—185 4 Claims

1. Apparatus for forming plastic melts into strands or filaments, comprising distributing means; delivery means to deliver plastic melt from a container to said distributing means; said distributing means including a chamber, an inlet in communication with said delivery means and said chamber to receive a plastic melt feed stream from said container for flow into said chamber, said chamber having a first outlet opening for the plastic melt to be formed, a closing member and an interchangeable member, said first outlet opening being closable with said closing member and being adapted to be in juxtaposition with one face of said interchangeable member,

said one face having a plurality of openings for passage of the plastic melt to be formed, guide means mounted to guide said closing member and said interchangeable member for sliding movement parallel to the plane of said first outlet opening and to positions juxtaposed with respect to said first outlet opening; said distributing means further including a back-flow line and valving means, and a second outlet communicating with said container via said back-flow line and said valving means for controlling the back-flow of the plastic melt to the container; and flushing means including a flow passageway communicating with said chamber at a point upstream of said first outlet opening, and in the immediate vicinity thereof, said passageway being connected with said second outlet via said valving means.



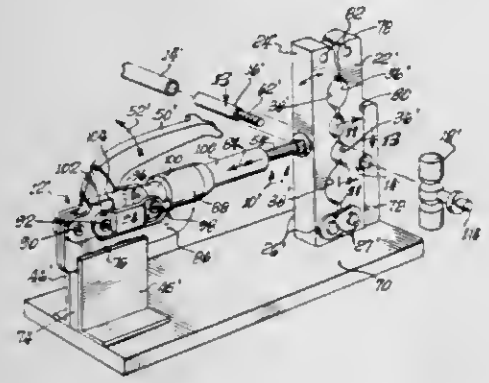
4,108,589
TOOL FOR FLARING PLASTIC PIPE

Robert E. Bunch, 2754 Arrow Hwy., Sp. 22, LaVerne, Calif. 91750

Continuation-in-part of Ser. No. 671,749, Mar. 30, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,337

Int. Cl.^{2} B29C ***17/02***

U.S. Cl. 425—393 **3 Claims**



1. A tool for flaring the free end of plastic pipe and the like including a mandrel adapted to be inserted in the free end of the pipe to be flared and a flaring head operably mounted to the mandrel to engage the free end of the pipe, the improvement comprising:

a base operatively associated with said mandrel and flaring head and having an upstanding wall surface;

a first bar member engaging said upstanding wall surface;

a second bar member hingedly connected to one end of said first bar member;

removable hinge means operatively associated with said bar members and capable of hingedly connecting either desired pair of adjacent ends of said bar members, whereby said second bar member is adapted to be removably engaged with said first bar member; and

clamping means having an overcenter closure maintaining mechanism affixed to said base positioned to bear against said second bar member at a midpoint therealong for releasable engagement thereof with the first bar member, each of said bar members including a plurality of matching transverse notches disposed therein to form pairs which have predetermined non-semicircular arcuate walls sized to accommodate particular size pipes therebetween and to provide positive engagement between said notches and a plastic pipe arranged therein, whereby said mandrel disposed in said pipe is held from rotational and longitudinal movement by compression of said pipe thereon by a pair of said notches.

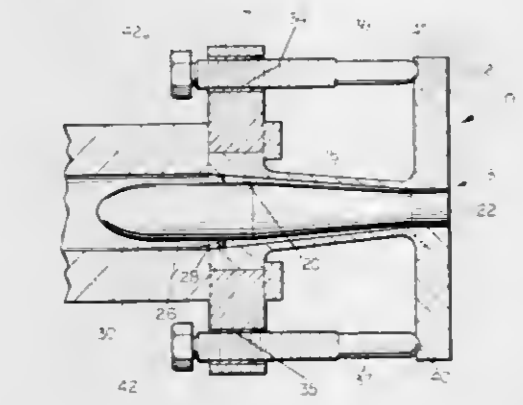
4,108,590
EXTRUSION HEAD

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 7, 1977, Ser. No. 766,323

Int. Cl.^{2} B29D ***23/04***

U.S. Cl. 425—466 **2 Claims**



1. An extrusion head for the formation of tubular articles from molten material furnished by means for furnishing a material to be extruded which comprises, in combination:

a generally spool-shaped die member having a forward flange portion, and a rear flange portion connected by a hub portion, said hub portion including a bore, having inner sidewalls, extending completely therethrough and through said forward and rear flange portions, said rear flange portion being adapted to be rigidly connected to a structural portion of such a means for furnishing a material to be extruded and connectable to allow introduction of molten material into said bore;

an extrusion mandrel having an outside diameter less than the inside diameter of said bore and inserted into substantially the entire length of said bore in facing relationship with said bore inner sidewalls;

means positioned adjacent said rear flange portion, for supporting said extrusion mandrel in said bore in a fixed location; and

means operatively associated with said forward flange portion for deflecting said forward flange portion and said connecting hub portion relative to said extrusion mandrel to correct out of concentric formation of said tubular article by physical distortion of said bore inner sidewalls relative to said fixed extrusion mandrel.

4,108,591
LASER COMBUSTOR APPARATUS

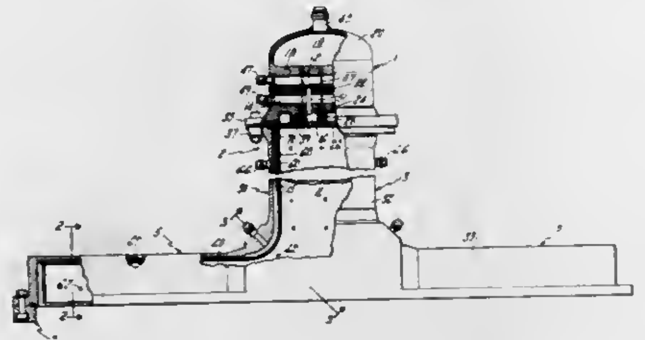
William J. Egan, Jr., Lake Park, and Lloyd M. Mazer, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,771

Int. Cl.^{2} H01S ***3/01***

U.S. Cl. 431—121 **6 Claims**

1. A laser combustor apparatus including an injector, a combustor and a transition manifold, said injector having a plurality of aligned chambers, an oxidizer chamber, a barrier chamber, a fuel chamber, a coolant chamber, said coolant chamber having a porous wall, said wall facing said combustor, conduit means connecting said barrier chamber to said coolant chamber, restriction means for maintaining the pressure in said barrier chamber higher than the pressure in said oxidizer and fuel chambers, second conduit means connecting said fuel chamber to said combustor through said porous wall, third conduit means connecting said oxidizer chamber through said barrier chamber and fuel chamber and directed through the center of said second conduit means to said combustor.



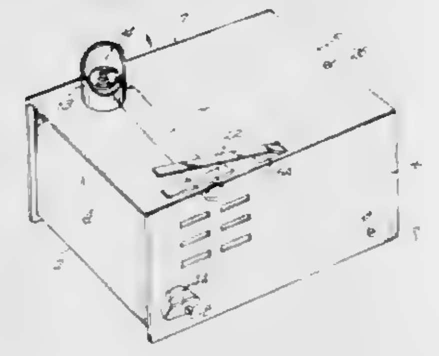
4,108,592
IGNITER FOR GAS FIRED TORCHES

Carl Fair, 316 SE. Pine, Roseburg, Oreg. 97470

Filed Oct. 28, 1976, Ser. No. 736,749

Int. Cl.^{2} F23Q ***3/00***

U.S. Cl. 431—128 **1 Claim**



1. A device for igniting gas fired torches, comprising in combination,

a housing,

electrical components located within said housing and including an arcing component projecting through a housing top wall to locate arcing electrodes exteriorly of said wall, said components including a switch having contacts closing a circuit to said arcing component,

a hood open at one side and disposed about the exterior portion of said arcing component, said hood serving to confine gas emitted from a torch tip for ignition purposes, said hood in threaded engagement with the arcing component and serves to lock the same in place on said housing wall, and

an elongate control arm for said switch projecting outwardly through an opening in said wall and adapted for downward displacement by a torch tip to close said switch while the torch tip end is in register with the hood opening for ignition of the torch.

4,108,593
METHOD OF HEAT TREATING PULVERULENT OR GRANULAR RAW MATERIALS AND KILN PLANT THEREFOR

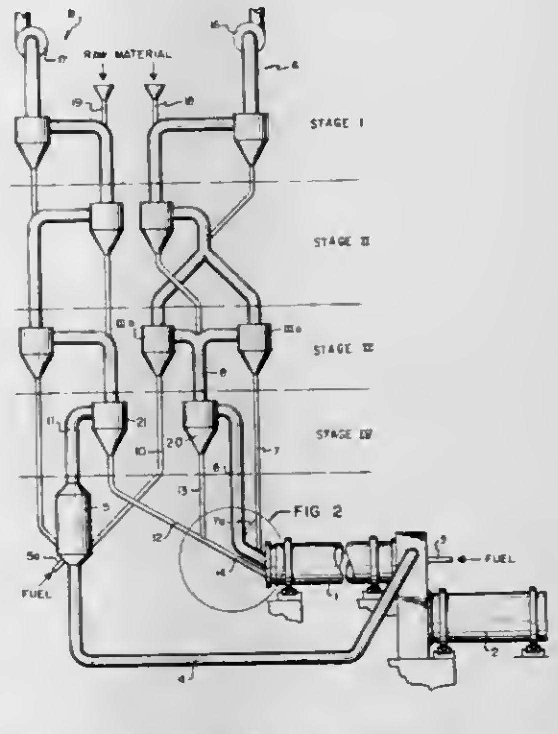
Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Oct. 27, 1976, Ser. No. 736,240

Claims priority, application United Kingdom, Oct. 27, 1975, 44073/75

Int. Cl.^{2} F27B ***15/00, 7/02***

U.S. Cl. 432—14 **7 Claims**



1. A method for heat treating pulverulent or granular raw material in a plant including a kiln having an upper material inlet end portion and a lower material outlet end portion, cooling means communicating with the lower material outlet end portion of the kiln for cooling the material exiting therefrom, at least two multi-stage preheater strings, the first preheater string having a last stage, a riser pipe communicating the upper material inlet end portion of the kiln with the last stage of the first preheater string to direct hot kiln exit gases from the upper material inlet end portion of the kiln to the last stage of the first preheater string, calcining means connected to the second preheater string, means communicating said calcining means with said cooling means comprising:

(a) directing raw material to each of said multi-stage preheater strings;

(b) introducing hot kiln exit gases upwardly through the first preheater string so as to contact the raw material and effect heat exchange between the raw material and the hot kiln gases;

(c) introducing heated cooling air from the cooling means to the calcining means of said second preheater string to be used as combustion and preheating air;

(d) dividing the preheated raw material of the first preheater string into at least two divisional flows;

(e) controlling said first divisional flow so as to include substantially the maximum amount of raw material which can be substantially completely calcined exclusively by the kiln exit gases;

(f) directing said first divisional flow of raw material from the first preheater string generally toward the upper material inlet end portion of the kiln at a location and in a direction to cause said first divisional flow of material to be entrained within the hot gases exiting the kiln in the kiln riser pipe so as to be at least substantially completely calcined therein;

(g) directing the hot kiln exit gases and said entrained first divisional flow of material to the first preheater string;

(h) separating said at least substantially completely calcined first divisional flow of material from the hot kiln exit gases;

(i) directing said second divisional flow of raw material from the first preheater string to the calcining means of the second preheater string to be combined with the raw material preheated in the second preheater string;

(j) at least partially calcining the second divisional flow of material in the calcining means of the second preheater string;

(k) combining the materials from the first and second preheater strings; and

(l) directing the combined materials to the upper material inlet end portion of the kiln at a location upstream with respect to the flow of kiln exit gases, of the point of entrainment of said first divisional flow of material, and in such a direction so as to avoid entrainment by the hot kiln exit gases and pass down through the kiln for further heat treatment.

4,108,594

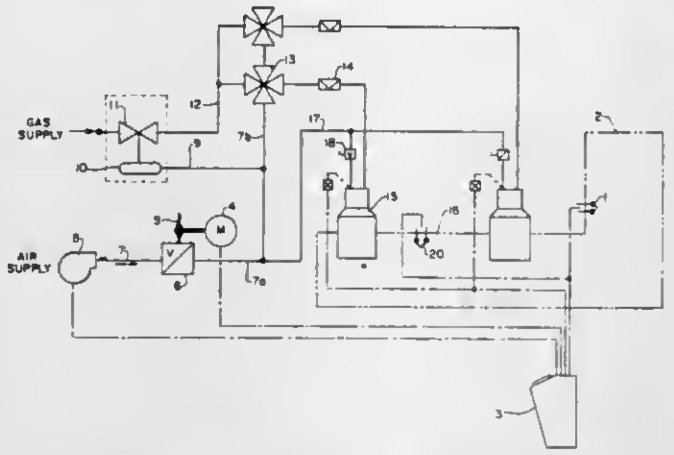
METHOD FOR FUEL/AIR FEED PRESSURE CONTROL BY STACK TEMPERATURE

Henry John Venetta, Warren; Raymond Edward Singrey, Williamsfield, and John Edward Coughlin, Youngstown, all of Ohio, assignors to Venetta, Inc., Warren, Ohio

Filed Dec. 6, 1976, Ser. No. 748,131

Int. Cl.^{2} F27D *7/00*

U.S. Cl. 432—24 **3 Claims**



1. A method of heating metal in a furnace comprising burning a compressed air and gaseous fuel mixture in a furnace and thereby heating the metal, flowing the hot exhaust gases to an exhaust stack, measuring the temperature of the gases as they are being exhausted, automatically controlling the pressure of the fuel-air mixture supplied to the furnace dependent upon the exhaust gas temperature, and reducing the pressure when excessive temperatures exist in the exhaust gas but maintaining a constant excessive fuel-to-air ratio at all times to provide a reducing atmosphere in the furnace.

CHEMICAL

4,108,595

METHOD FOR COLORING TEXTILE FABRICS AND FABRICS PRODUCED THEREFROM

Charles Pappas, Tiverton, R.I., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 575,465, May 7, 1975, abandoned. This application Aug. 26, 1976, Ser. No. 718,450

Int. Cl.^{2} D06P *7/00*

U.S. Cl. 8—1 A **15 Claims**

1. A method for using a dye to simulate a printed effect in a flocked fabric composed of a substrate, which is not receptive to the dye, and a flock, which is receptive to the dye and is present in a predetermined design pattern, comprising:

(a) pleating the flocked fabric;

(b) distributing said dye onto the pleated fabric such that only the flock, which is receptive to the dye, is dyed;

(c) unpleating the flocked fabric; and

(d) subjecting the flocked fabric to fixation conditions to permanently fix the dye to the flock.

4,108,596

RECOVERY OF CHROMIUM VALUES FROM WASTE STREAMS BY THE USE OF ALKALINE MAGNESIUM COMPOUNDS

Donald C. Hemming, Whitesboro; Robert E. Hahn, Utica, both of N.Y., and John W. Robinson, Jr., Glen Mills, Pa., assignors to Revere Copper and Brass, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 595,147, Jul. 11, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,583

Int. Cl.^{2} C14C *3/06;* **C01G** *37/00*

U.S. Cl. 8—94.27 **7 Claims**

1. A process for the recovery of chromium values from an aqueous solution containing same, comprising:

(a) contacting an acidic solution having a pH of up to about 4 and containing sulfate ion and containing trivalent chromium ion at a concentration of from about 0.1 to 20 grams of chromium per liter with an alkaline earth metal compound consisting essentially of a magnesium compound selected from the group consisting of magnesium oxide and magnesium hydroxide in an amount sufficient to neutralize the acidity of the solution to a pH of about 4 together with at least about 4 molar equivalents of said compound per 3 molar equivalents of trivalent chromium to form an amorphous solid, grainy, easily settleable chromium containing precipitate and a solution having a final pH of from 7 to 10; and

(b) separating the precipitate formed in step (a) from the solution at a temperature of between about 15° and 48° C.

7. The process of claim 1 wherein the precipitate separated in step (b) is redissolved in sulfuric acid to produce a leather tanning solution.

4,108,597

PROCESS FOR IMPARTING PUCKER AND COLOR EFFECTS TO FABRICS

Klaus Karl Mueller, Armonk, N.Y., and James Osborn E. Loughlin, Lubbock, Tex., assignors to Cotton Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 657,648, Feb. 12, 1976. This application Feb. 18, 1977, Ser. No. 769,886

Int. Cl.^{2} D06M *1/08. 13/00*

U.S. Cl. 8—115 **22 Claims**

1. A process for imparting durable pucker and color effects to an undyed, dyed or printed, cured, polymer containing, crosslinked, cellulose-fiber containing durable press fabric composed of 100% cotton or of a blend containing at least 40% cotton fiber, which process comprises:

(a) applying an aqueous caustic solution containing 25 to 33.3% caustic soda by weight to the crosslinked fabric in selected areas thereof and also applying to said crosslinked fabric a surface active agent either as part of the said caustic solution or as a separate solution which is applied and dried prior to application of said caustic solution, said caustic solution being of sufficient concentration to destroy said polymer and cellulose crosslinks in said selected areas, said wetting agent being capable of causing said printing paste to penetrate the fibers of said crosslinked fabric in the absence of elevated temperatures, and said wetting agent being alkali resistant if applied as part of said caustic solution;

(b) allowing the caustic treated fabric to stand substantially at room temperature in a substantially tension-free state for from about 2 to about 20 minutes until said caustic treated portions have shrunk to produce flat uncrosslinked areas and contiguous unshrunk, puckered areas; and

(c) washing, neutralizing, rinsing and drying the puckered fabric.

4,108,598

DURABLE PRESS PROCESS

George L. Payet, Cincinnati, Ohio, assignor to The Strike Corporation, Cincinnati, Ohio

Filed Dec. 2, 1976, Ser. No. 746,743

Int. Cl.^{2} D06M *9/12, 13/12*

U.S. Cl. 8—115.7 **16 Claims**

1. A durable press process for cellulosic fiber-containing fabrics which comprises treating the cellulosic fiber-containing fabric with aqueous formaldehyde and a catalyst capable of catalyzing the crosslinking reaction between formaldehyde and cellulose, heat curing said treated fabric by introducing the treated fabric into a heating zone and gradually increasing the temperature of the heating zone thereby gradually increasing the temperature of the heated fabric to prevent the loss of an amount of formaldehyde which will reduce the overall extent of curing.

10. A durable press process for cellulosic fiber-containing fabrics which comprises treating the cellulosic fiber containing fabric with aqueous formaldehyde and a catalyst capable of catalyzing the crosslinking reaction between formaldehyde and cellulose, heat curing said treated fabric by passing said treated fabric through zones of increasing temperatures to produce heat curing by gradually increasing the temperature of the treated fabric to prevent the loss of an amount of formaldehyde which will reduce the overall extent of curing.

4,108,599

HIGH WATER CONTENT EMULSION CLEANING

Miguel Coll-Palagos, Rye, and James H. Surridge, Stony Point, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 9, 1976, Ser. No. 647,960

Int. Cl.^{2} B08B *3/00*

U.S. Cl. 8—137 **17 Claims**

1. A process for reclaiming and regenerating spent drycleaning solvent from an emulsion consisting essentially of an organic drycleaning solvent, water and a surfactant, said process comprising breaking said emulsion by electrolysis in the presence of an electrolyte or by contacting said emulsion with an effective amount of a demulsifying compound, and recovering said organic drycleaning solvent therefrom by distillation, wherein the organic drycleaning solvent and water in said emulsion are present in a ratio by volume of about 7:93 to about 95:5 parts of the water to the organic dry cleaning solvent.

4,108,600

FABRIC CONDITIONING ARTICLES AND PROCESSES

Louis Fay Wong, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 26, 1977, Ser. No. 791,079

Int. Cl.^{2} D06L *1/16;* **B05C** *11/00*

U.S. Cl. 8—137 **24 Claims**

1. A fabric conditioning article especially designed for conditioning fabrics in a clothes washer and dryer comprising:

(A) a water-insoluble, closed receptable having at least a part of one wall comprising a porous material;

(B) an effective amount of a fabric conditioning composition in the form of individual or agglomerated particles, said particles being coated with a water-soluble/dispersible material and enclosed within the receptacle of (A); and

(C) an amount of a solid, particulate agent selected from the group consisting of electrolytes, pH control agents and mixtures thereof sufficient to make the coatings of (B) water-insoluble/indispersible in the volume of wash water in which they are used, said agent enclosed within the receptacle of (A);

wherein the agent of (C) is physically separated from the particles of (B) within the receptacle of (A).

4,108,601

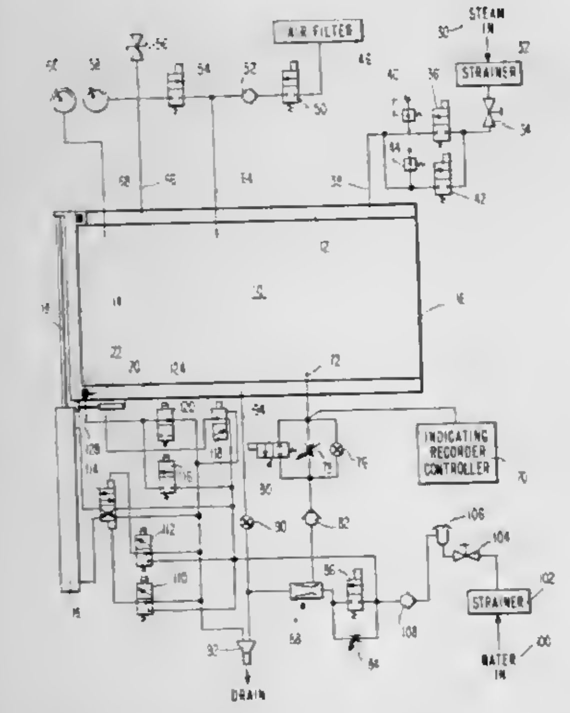
STEAM STERILIZING APPARATUS

Robert Wolff, Mantoloking, N.J., assignor to Better Built Machinery Corporation, Saddle Brook, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,440

Int. Cl.² A61L *3/00, 5/00*

U.S. Cl. 21—96 **5 Claims**



1. A sterilizing apparatus comprising:

(a) A sterilizing chamber having an open front, a back, and sides;

(b) A closed jacket encompassing said sides and permitting the circulation of steam peripherally about said sides;

(c) Door means mounted to said chamber and adapted sealingly to close the front of said chamber;

(e) First means interconnecting said jacket and said chamber for fluid communication and including first valve means for opening and closing said fluid communication;

(f) Second means automatically to open said first valve means at the commencement of the sterilizing in said chamber and closing said first valve means at the end of said sterilizing;

(g) Third means, including a low pressure line and a relatively high pressure line, connected in parallel with each other, connected to said jacket to supply steam to said jacket at two different pressures;

(h) Second valve means mounted in said high pressure line for controlling flow of steam therethrough; and

(i) Temperature sensitive means responsive to the temperature in said chamber and actuating said second valve means to supply steam at the relatively high pressure to said jacket until a predetermined temperature is reached and then closing said second valve means, and subsequently actuating said second valve means in response to a subsequent reduction in the temperature in said chamber.

4,108,602

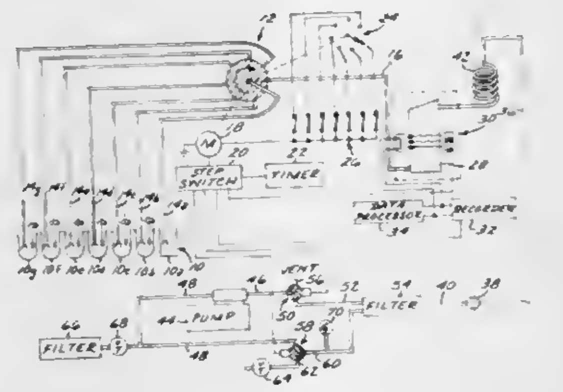
SAMPLE CHANGING CHEMICAL ANALYSIS METHOD AND APPARATUS

William A. Hanson, Westlake Village, and Graham S. S. Barr, Canoga Park, both of Calif., assignors to Hanson Research Corporation, Northridge, Calif.

Filed Oct. 20, 1976, Ser. No. 734,089

Int. Cl.² G01N *1/14, 1/18*

U.S. Cl. 23—230 R **68 Claims**



1. A method of analyzing a liquid chemical sample which comprises the steps of:

(a) drawing a liquid chemical sample from a source thereof through a first fluid flow path into a flow cell of a chemical analyzer by application of partial vacuum to said flow cell through a second fluid flow path,

(b) analyzing said sample in said flow cell, and

(c) forcing said sample from said flow cell back through said first flow path to said source by application of gas pressure to said second fluid flow path.

4,108,603

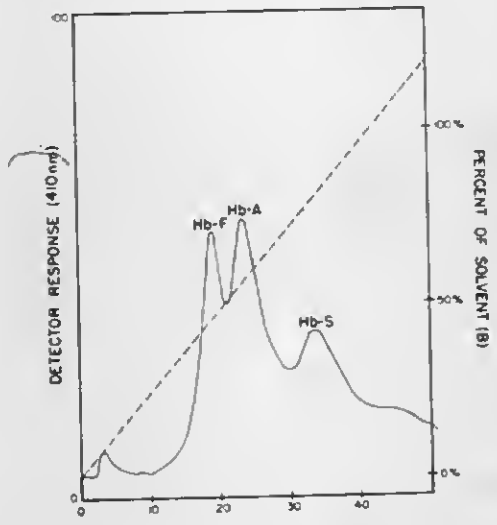
METHOD FOR RAPID ANALYSIS OF HEMOGLOBIN VARIANTS BY HIGH SPEED LIQUID CHROMATOGRAPHY

Frederick E. Regnier, West Lafayette, Ind., and Shung-Ho Chang, St. Louis, Mo., assignors to Purdue Research Fnundation, West Lafayette, Ind.

Filed May 18, 1977, Ser. No. 798,135

Int. Cl.² G01N *31/08, 33/16*

U.S. Cl. 23—230 B **18 Claims**



1. A method for rapid analysis of hemoglobin variants by high speed liquid chromatography, said method comprising:

providing a bonded phase inorganic support at a separation area with said bonded phase being capable of separating predetermined hemoglobin variants;

passing hemoglobin variants through said separation area and into contact with said bonded inorganic support thereat to separate said predetermined hemoglobin variants; and

obtaining the profiles of said predetermined hemoglobin variants passed through said separation area.

4,108,604

ANALYTICAL METHOD FOR TNT IN WATER

Carl A. Heller, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1977, Ser. No. 816,225

Int. Cl.² G0IN *21/06, 33/18, 33/22*

U.S. Cl. 23—230 R **8 Claims**

1. A method for determining whether or not trinitrotoluene is present in water comprising the steps of:

A. allowing a sample of said water to flow over an ion exchange resin that is coated with a fluorescent dye; and

B. observing whether or not the fluorescence of the dye changes.

4,108,605

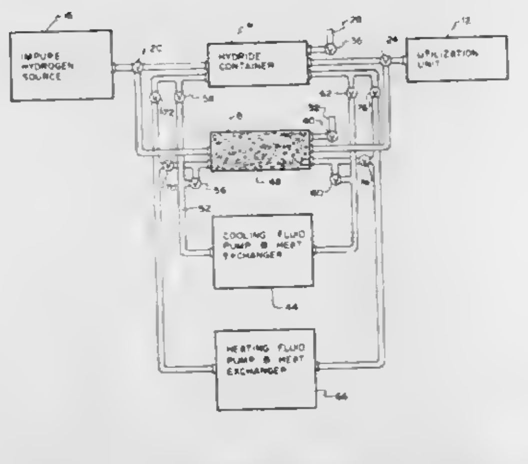
HYDROGEN PURIFICATION AND STORAGE SYSTEM

Roger E. Billings, Provo, Utah, assignor to Billings Energy Corporation, Provo, Utah

Filed May 4, 1976, Ser. No. 682,836

Int. Cl.² B01J *7/00, 8/02;* **C01B** *1/28*

U.S. Cl. 23—252 R **9 Claims**


IMPURE HYDROGEN SOURCE
HYDRIDE CONTAINER
UTILIZATION UNIT
COOLING FLUID PUMP & HEAT EXCHANGER
HEATING FLUID PUMP & HEAT EXCHANGER

1. A system for purifying hydrogen for supply thereof to a hydrogen utilization unit comprising

first holding means,

a hydride forming alloy disposed in said first holding means and adapted to adsorb hydrogen and certain impurity gases when exposed to the hydrogen and certain impurity gases,

means for introducing a mixture of hydrogen and certain impurity gases into said first holding means to enable adsorbtion of hydrogen and some of said impurity gases by said hydride forming alloy held therein,

means for heating said hydride forming alloy in said first holding means to thereby cause said alloy to release either hydrogen or impurity gases previously adsorbed thereby,

means for conveying hydrogen from said first holding means to the hydrogen utilization unit,

first valve means coupled into said conveying means for controlling the conveyance of hydrogen from said first holding means to the utilization unit, and

second valve means coupled into said first holding means for selectively enabling impurity gases released from said alloy to vent from said first holding means through said second valve means.

4,108,606

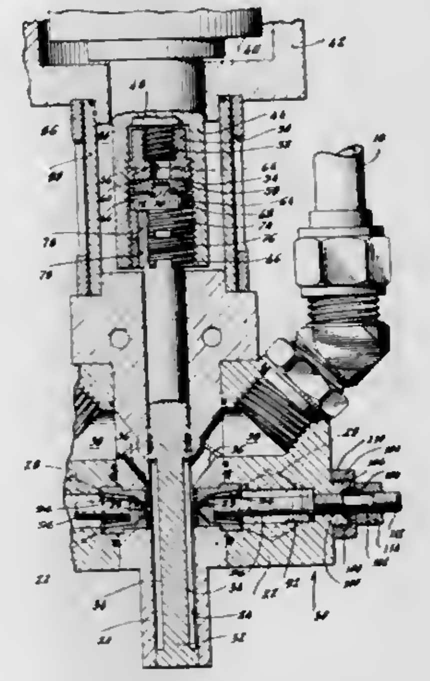
UNIVERSAL COUPLING FOR REACTION INJECTION MOLDING MACHINE

Robert Dean Wingard, Kent, Ohio, assignor to The Upjohn Company, Kalamazoo

Filed Dec. 22, 1976, Ser. No. 753,463

Int. Cl.² B29D *27/02;* **F16D** *3/04*

U.S. Cl. 23—252 R **10 Claims**



1. A mixing head for a reaction injection molding machine comprising:

A. a body having

1. a bore which defines a mixing chamber;
2. a plurality of inlet conduits to said bore, and
3. a plurality of outlet conduits from said bore, each spaced axially from one inlet conduit,

B. a plunger mounted for relative axial reciprocal movement in said body bore between a recycle and an injection position having a plurality of by-pass channels, each of which provides fluid communication between one inlet and one outlet conduit when the plunger is in the recycle position,

C. axially reciprocable means mounted on said body for selectively moving said plunger between its recycle and injection positions, said reciprocable means being disposed for movement along an axis generally colinear to that of said plunger

D. a universal coupling linking said moving means and said plunger,

whereby slight non-colinearity of said plunger and said moving means is accommodated by said universal coupling to minimize the tendency for binding of the plunger in said bore due to said non-colinearity.

4,108,607

BLOOD GAS SIMULATOR

Bert David Pearson, Round Lake Beach, Ill., and Richard J. Kissane, Los Alamos, N. Mex., assignors to Baxter Travenol Laboratnries, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 615,749, Sep. 22, 1975, abandoned. This application Jan. 30, 1976, Ser. No. 653,686

Int. Cl.² A61M *1/03;* **G01N** *31/00, 33/16*

U.S. Cl. 23—253 R **7 Claims**

1. A system for use in evaluating the efficiency of a blood oxygenator, comprising:

(a) a deoxygenator means for deoxygenating a quantity of blood having a blood inlet, a deoxygenating gas inlet and a deoxygenating blood outlet;

(b) said deoxygenator including

(1) a hollow substantially upright mixing section having

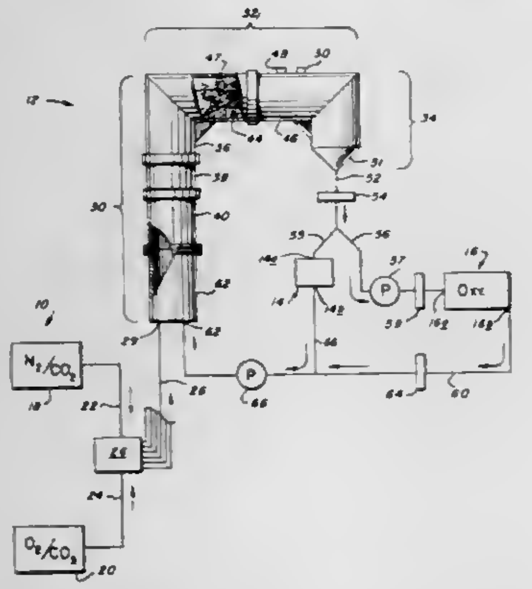
said blood inlet and said deoxygenating gas inlet in the lower portion of said section;

(2) a hollow substantially transversely oriented defoaming section connected with said mixing section for receiving blood which has been mixed with said gas and wherein said mixture is defoamed; and

(3) a hollow collection section connected with said defoaming section for receiving defoamed blood from said defoaming section, said collection means including outlet means through which deoxygenated blood exits said deoxygenator;

(c) a source for deoxygenating gas to be mixed with said blood which is connected with said gas inlet;

(d) a blood oxygenator means having an inlet and an outlet, with said inlet being connected with the outlet of the deoxygenator means so that deoxygenated blood is directed into said oxygenator means, and with said oxygenator means outlet being connected with said deoxygenator means blood inlet for directing oxygenated blood to said deoxygenator means;



(e) sampling and testing means communicating with said oxygenator means for obtaining and testing samples of the blood entering said oxygenator means and exiting said oxygenator means for determining the efficiency of a blood oxygenator;

(f) an overflow reservoir connected with said deoxygenator blood outlet for receiving from said deoxygenator, blood in excess of the capacity of the oxygenator means; and

(g) conduit means connected with said reservoir and deoxygenator means for returning said excess blood to said deoxygenator means.

4,108,608

DILUTING AND DISPENSING PROBE FOR BLOOD SAMPLE PREPARATION

Francis William Maher, Jr., Milford, and Vladimir Valentine Pirc, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 669,015, Mar. 22, 1976, Pat. No. 4,016,828. This application Jan. 13, 1977, Ser. No. 758,999

Int. Cl.^{2} G01N *1/14*

U.S. Cl. 23—259 **4 Claims**

1. A sampling probe for diluting and dispensing a blood sample comprising:

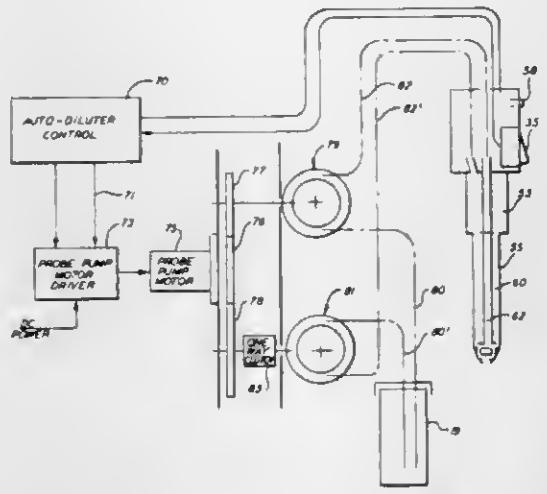
a. coaxially disposed hollow cylindrical members defining sample and diluent conduits;

b. a mixing region in flow communication with said conduits;

c. an outlet and an inlet duct placing said mixing region in flow communication with the exterior of the probe;

d. first and second reversible positive displacement pumps each having respective flow means constituting fluid intakes and fluid discharges when operating in a forward direction and visa versa in reverse direction;

e. flow coupling means connecting the forward direction fluid intake means of both said pumps to a source of diluent and each of the forward direction fluid discharge flow means to one of said probe conduits, said pumps and flow coupling means being normally filled with diluent in operation;



f. a reversible motor drive means and gearing coupling said motor to said pumps; and

g. a one way clutch disposed between said drive means and one of said pumps having its forward operation discharge flow means connected to said diluent conduit of the probe, said clutch being oriented to render said one pump inoperative during reverse operation of said pump drive motor.

4,108,609

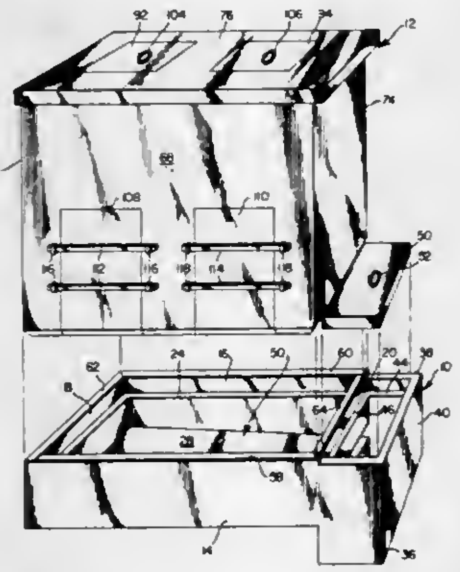
COMPOST CONTAINER

Manfred Wilbelm August Petzinger, Rte. 7, Box 87, Elizabethtown, Ky. 42701

Filed Aug. 4, 1977, Ser. No. 821,849

Int. Cl.^{2} C05F *9/02*

U.S. Cl. 23—259.1 **7 Claims**



1. A compost container including:

a. a base section, including side, end and bottom walls, providing a first housing to receive fertilizer sap, collecting means for receiving the fertilizer sap, and access means in said collecting means for permitting selective removal of the fertilizer sap therefrom,

b. an upper section mounted on said base section providing a second housing to receive decomposable garbage and waste, said upper section including side, end and first top walls providing said second housing, and grill means placed across the corners of the second housing between the side and end walls thereof to prevent the accumulation of garbage and waste in the corners of the second housing and to permit circulation of air in the second housing,

c. a floor between said base and upper section for supporting the decomposable garbage and waste,

d. said floor having means for permitting fertilizer sap to gravitate from the upper section to the base section, and

e. access means in said upper section to permit decomposable garbage and waste to be added to, and removed from, the second housing.

4,108,610

METHOD OF AND APPARATUS FOR COMPACTING COKING COAL

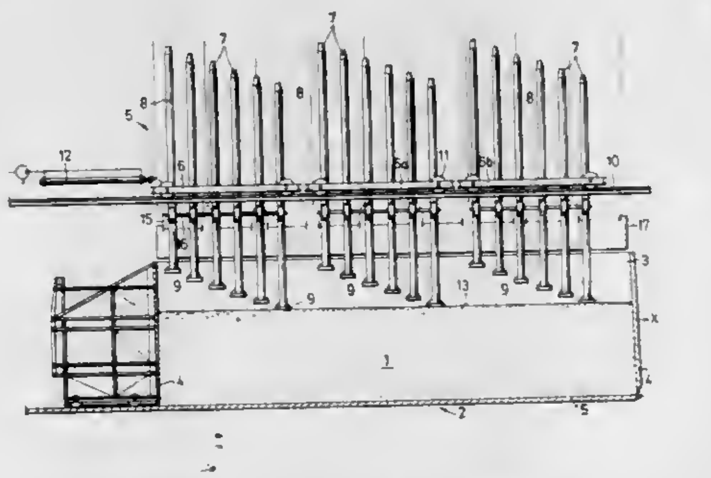
Kurt Leibrock, Fürstenhausen, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellscbaft, Bochum, Fed. Rep. of Germany

Filed Feb. 1, 1977, Ser. No. 764,697

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603954

Int. Cl.^{2} C10L *5/00*; B30B *11/00*

U.S. Cl. 44—10 G **12 Claims**



1. In a method of forming a compact coking coal body to be charged into a coking oven in an elongated pounding box with a plurality of punners having respective feet and mounted adjacent each other in at least one punner carriage adapted to be reciprocated lengthwise of the pounding box, the steps of continuously feeding a predetermined amount of coking coal into the pounding box for the coking coal to establish an upper surface therein; raising and lowering the adjacent punners in the same punner carriage in a timed alternate succession at least during said feeding step; and so reciprocating the punner carriage during said raising and lowering step that the feet of the punners contact the upper surface of the coking coal over respective contact regions which overlap each other at least to an extent sufficient for two of the punners of the same punner carriage to substitute for the punner situated therebetween in the event of malfunction of the latter.

7. Apparatus for forming a compact coking coal body to be charged into a coking oven, comprising an elongated pounding box; at least one punner carriage mounted for reciprocation longitudinally of said pounding box; a plurality of punners mounted on said punner carriage for reciprocation therewith and for movement relative thereto along substantially vertical paths and having respective feet; means for moving said punners relative to said punner carriage at least while a predetermined amount of the coking coal is being continuously fed into said pounding box to establish an upper surface therein; and means for so simultaneously reciprocating said punner carriage that said feed of said punners contact the upper surface of the coking coal over respective contact regions which overlap each other to an extent sufficient for two of said punners to substitute for the punner situated therebetween in the event of malfunction of the latter.

4,108,611

PLASTIC FUEL, PRODUCTS MADE THEREFROM AND A NOVEL METHOD FOR STARTING AND PROMOTING FIRES USING THE FUEL

Myrna R. Youdelman, 7 Tennyson St., Hartsdale, N.Y. 10530

Filed May 14, 1973, Ser. No. 359,907

Int. Cl.^{2} C10L *11/00*; C06F *3/02*

U.S. Cl. 44—38 **3 Claims**

1. A method for initiating and promoting a friendly fire, which comprises directly contacting a primary source of combustible fuels with a piece of cast, bulk polymerized solid acrylic plastic polymer of a monomer selected from the group consisting of lower alkyl esters of alkacrylic acids and lower alkyl esters of acrylic acid, the acrylic plastic being of a size and shape designed and adapted to be readily contacted with the primary source of fuel and igniting the acrylic plastic, whereby the acrylic plastic burns to an extent sufficient to ignite said primary combustible fuel and promote a friendly fire therewith and wherein the piece of acrylic plastic has a minimum major dimension of about 2 inches.

2. A match comprising a matchstick, which in turn is comprised of an elongated piece of a solid acrylic plastic polymer of a monomer selected from the group consisting of lower alkyl esters of alkacrylic acids and lower alkyl esters of acrylic acid, and a match head, formed at one end of the matchstick, comprising a material which is ignitable by friction.

4,108,612

DERIVATIZED ETHYLENE/POLAR MONOMER POLYMERS OF IMPROVED PERFORMANCE

Albert Rossi, Warren, and Harold N. Miller, Millington, botb of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

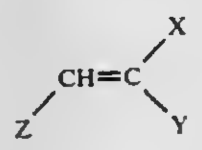
Filed Apr. 4, 1977, Ser. No. 784,121

Int. Cl.^{2} C10L *1/14*

U.S. Cl. 44—62 **9 Claims**

1. A fuel oil composition of improved low temperature flow properties which comprises a major proportion of a middle distillate fuel and about 0.005 to 0.15 weight percent of a low temperature flow improver which is a copolymer which has been chlorinated so as to contain between about 5 to 25 wt. % chlorine, said copolymer having a number average molecular weight in the range of about 1500 to 20,000, said copolymer being improved in its flow improving properties by said chlorination, said copolymer consisting essentially of about 75 to 95 mole % of ethylene and at least one polar free-radical polymerizable comonomer selected from the group consisting of:

vinyl alcohol carboxylic acid esters, acrylates, α-alkyl acrylates, itaconates, maleates, fumarates, all of the general formula:



$$\overset{Z}{}\text{CH}=\text{C}\begin{smallmatrix}X\\Y\end{smallmatrix}$$

wherein,

Z is a hydrogen atom or —COOR';

X is a hydrogen atom or a C_1 to C_8 alkyl group;

Y is a —OOCR or —COOR' group;

R is a hydrogen atom or a C_1 to C_8 alkyl group; and

R' is a C_1 to C_8 hydrocarbyl group.

4,108,613

POUR POINT DEPRESSANTS

Kenneth A. Frost, Jr., San Rafael, Calif., assignor to Chevron Researcb Company, San Francisco, Calif.

Filed Sep. 29, 1977, Ser. No. 837,798

Int. Cl.^{2} C10L *1/22*

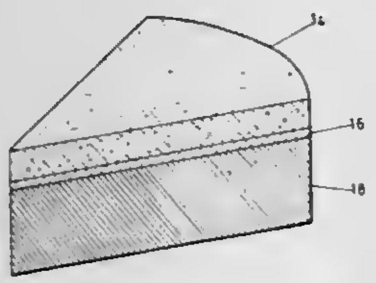
U.S. Cl. 44—62 **11 Claims**

1. A material useful as a pour point depressant for hydrocarbonaceous fuels and oils comprising a mixture of:

(1) the reaction product of an epoxidized alpha-olefin containing from 14 to 30 carbon atoms and a nitrogen-containing compound selected from ammonia, an amine, a polyamine, or a hydroxyamine; and
(2) an ethylene-olefin copolymer having a molecular weight in the range 1000 to 100,000.

4,108,614
ZIRCONIUM LAYER FOR BONDING DIAMOND COMPACT TO CEMENTED CARBIDE BACKING

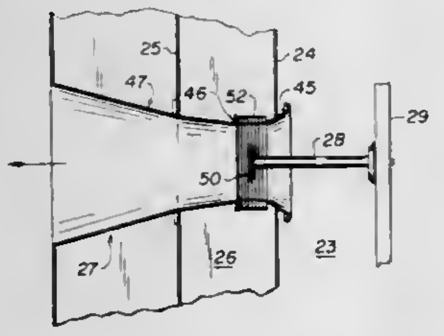
Robert Dennls Mitchell, 713 Balnagafk, Cnr. Banket & Paul Nel, Hillbrow, Johannesburg, South Africa
Filed Mar. 31, 1977, Ser. No. 783,312
Claims priority, application Soutb Africa, Apr. 14, 1976, 76/2258
Int. Cl.^{2} B24D *3/06*
U.S. Cl. 51—295 **5 Claims**



1. An abrasive body comprising a diamond compact bonded to a cemented carbide backing by means of a continuous zirconium layer, the thickness of which is less than 0.5 mm, the diamond compact being substantially free of graphite and having a bonding matrix selected from a metal of Group VIII of the Periodic Table and an alloy containing one or more such metals and at least 70 percent by volume of diamond particles, and the cemented carbide backing being selected from cemented tantalum carbide, cemented tunsten carbide and cemented titanium carbide and mixtures thereof.

4,108,615
VANED ANODE FOR HIGH-INTENSITY IONIZER STAGE OF ELECTROSTATIC PRECIPITATOR

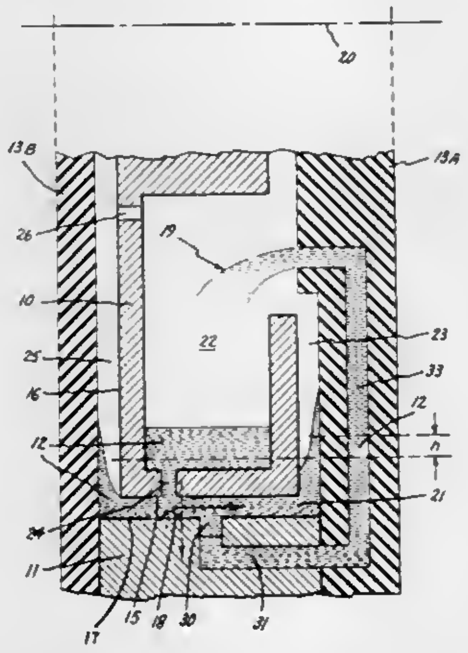
Dale J. Satterthwaite, Bellevue, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Apr. 7, 1977, Ser. No. 785,469
Int. Cl.^{2} B03C *3/00*
U.S. Cl. 55—2 **10 Claims**



1. The method of preventing particulate deposition on the walls of a venturi diffuser which acts as the anode in a co-axial high-intensity ionizer wherein particulate-laden gases pass through a high-intensity corona discharge maintained within the throat region of said venturi comprising the steps of:
providing a source of particulate-free gas; and
injecting said particulate-free gas into the throat region of said venturi interior in a substantially laminar flow along the wall thereof substantially the same direction as said particulate-laden gas stream whereby said particulate-laden gas stream is enveloped within said particulate-free gas stream.

4,108,616
LIQUID-GAS PHASE SEPARATION FOR SELF-CONTAINED LIQUID METAL CURRENT COLLECTORS

Burton D. Hatch, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 625,130, Oct. 23, 1975, Pat. No. 4,027,183. This application Feb. 10, 1977, Ser. No. 767,372
Int. Cl.^{2} B01D *19/02;* **H02K** *13/00*
U.S. Cl. 55—48 **6 Claims**



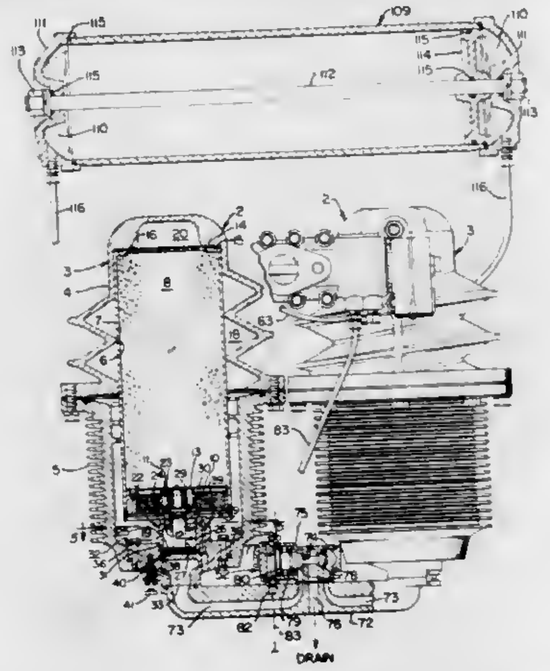
1. In an acyclic machine, a method of removing gas from liquid metal situated in a gap between a rotor collector ring and a housing encircling said rotor collector ring, said method comprising:
rotating said rotor collector ring so as to impart tangential velocity to the liquid metal in said gap;
conducting liquid metal from said gap to a chamber contained in, and rotating with, said rotor collector ring;
collecting in said chamber the liquid metal conducted thereto;
drawing off, at a radially-inward location in said chamber, displaced gas having floated to the surface of the liquid metal in said chamber; and
returning liquid metal, from which entrained gas has been separated, to said gap through an opening at a radially-outward location in said chamber.

4,108,617
DUAL FILTER ASSEMBLY

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corp., Salem, Va.
Filed Feb. 7, 1977, Ser. No. 766,437
Int. Cl.^{2} B01D *53/00*
U.S. Cl. 55—162 **11 Claims**

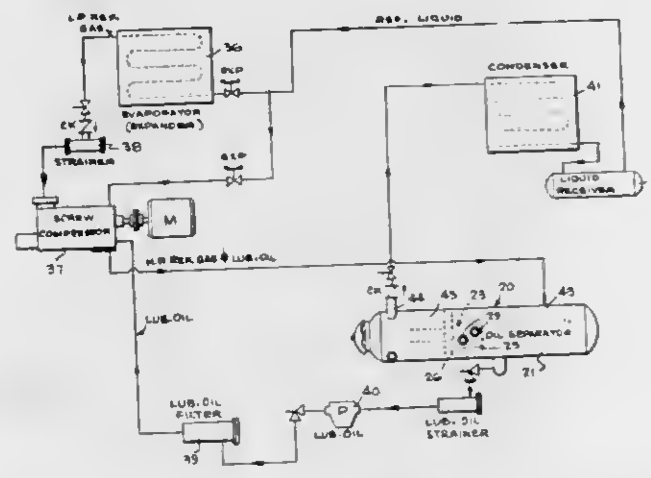
1. A filter assembly for compressed gas comprising a pair of filter units connected to a source of unfiltered compressed gas for receiving said gas therefrom, control means for alternating said gas from said source between said filter units, each of said units containing a desiccant, means for alternating each unit between filtering and purging cycles for respectively adsorbing a contaminant from said gas by and regenerating said desiccant, and a purge tank containing a floating piston and divided thereby into a pair of compartments each connected to an outlet of a different one of said units, each of said compartments alternately storing filtered gas from the outlet of the connected filter unit during a filtering cycle thereof and during a purging cycle thereof and under gas pressure from said other compartment discharging said stored gas back to said connected unit for reverse-flow purging of said desiccant therein.

5. A filter assembly for compressed gas comprising a pair of filter units, each having an inlet for receiving compressed gas, a desiccant in said filter unit, inlet valve means for alternately opening said inlets and directing said compressed gas therethrough to said filter units for alternate filtering thereby, each of said units alternating between filtering and purging cycles for respectively adsorbing a contaminant from said gas by said desiccant and regenerating said desiccant by a reverse flow of purge gas therethrough, each unit having a single drain for discharging therefrom both said purge gas and non-adsorbed contaminants accumulated therein, drain valve means for closing and opening said single drain of each unit while said inlet thereof is respectively opened and closed, and means for delaying opening of said drain valve means of each unit until said inlet thereof is closed.



4,108,618
ANTI-FOAM CHAMBER FOR SCREW COMPRESSOR OIL SEPARATOR

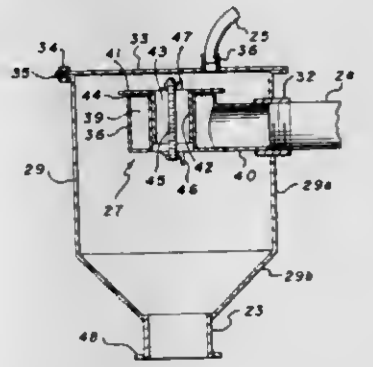
Anthony C. Schneider, Etters, Pa., assignor to Freezing Equipment Sales, Inc., York, Pa.
Filed Feb. 23, 1977, Ser. No. 771,353
Int. Cl.^{2} B01D *19/02*
U.S. Cl. 55—178 **1 Claim**



1. In a multi-compartment oil-gas separator which comprises a shell, an oil-gas inlet, a gas outlet, an oil outlet and other connecting means, the improvement comprising an anti-foam chamber comprising a curved wall member, a portion of the oil-gas separator shell wall itself, connecting parallel plates which form and close the ends of the anti-foam chamber, open ended liquid and gas equalizing legs, said liquid equalizing leg being connected to the bottom side of the curved wall member terminating at a point adjacent to the bottom of the oil-gas separator shell, said gas equalizing leg connected to the top side of the curved wall member with the other end of the equalizing leg open and terminating at a point adjacent to the top of the oil-gas separator shell, the anti-foam chamber having view ports mounted through the oil separator shell wall, said anti-foam chamber disposed within the oil-gas volume of the oil separator shell, downstream of the oil-gas inlet and upstream of the gas outlet.

4,108,619
DEGASSER SPRAY VESSEL

Victor Quin Phillips; Phil Harmon Griffin, and Martin James Sharki, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 754,856, Dec. 27, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,282
Int. Cl.^{2} B01D *19/00*
U.S. Cl. 55—192 **9 Claims**



1. In a system for separating gas from liquid, the combination comprising:
a peripheral wall section forming a vessel;
a top sealably secured to said peripheral wall section;
a lower vessel section closing the bottom of said peripheral wall section;
inlet means connected to said vessel;
outlet means connected to said lower vessel section and located below said inlet means, said outlet means including means for allowing said gas and liquid to exit from vessel and blocking entrance of gas into said vessel; and
spray deflector means in said vessel, connected to said inlet means, arranged to spray a radial spray pattern against the inner wall of said vessel, said spray deflector means including vacuum creating means for creating a vacuum in said vessel wherein said vacuum creating means includes an opening extending through said spray deflector means thereby providing open communication between said lower vessel section and said vessel.

7. A closed system for the separation of a substantial amount of entrapped gas from a fluid such as drilling mud, comprising:
a generally vertical enclosed vessel having a sealed top and bottom;
fluid inlet means passing through a wall of said vessel into the interior thereof;
fluid discharge means in the lower portion of said vessel, said fluid discharge means including means for allowing said gas and fluid to exit from said vessel but preventing gas from entering said vessel; and
a spray assembly located inside said vessel and adapted for emitting a radial outward spray pattern against the inside of the vessel wall, said spray assembly comprising an annular chamber having two concentric vertical walls and an annular bottom plate with a central opening therethrough and a deflector having a flat annular plate and an open central spool attached thereto, said deflector plate being in close proximity to the top of said vertical walls and forming an annular gap with the outer wall, said spool

arranged for close-fitting relationship with said inner vertical wall, with open gas communication from above said spray assembly to below said spray assembly through said central opening thereby providing means for creating a vacuum within said vessel.

4,108,620

DEVICE FOR THE SEPARATION OF GASEOUS MIXTURES INTO COMPONENTS OF DIFFERENT MOLECULAR MASS

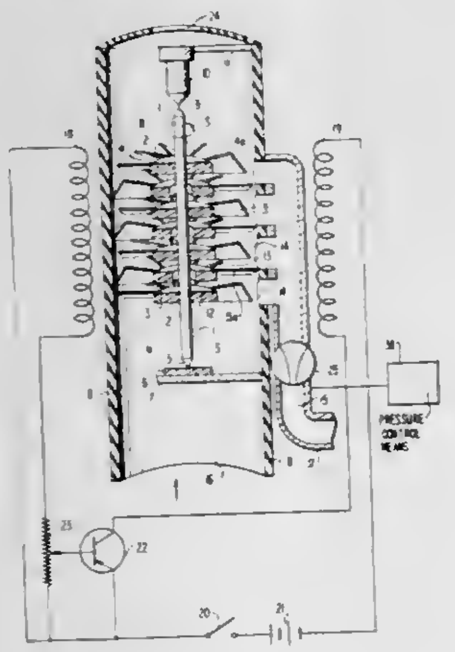
Gotthold Bohme, Oberursel; Erich Robens, Friedrichsdorf; Horst Binder, Karben-Petterweil, and Dieter Langbein, Bad Homburg, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1976, Ser. No. 680,083

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1975, 2518201

Int. Cl.² B01D *45/14*

U.S. Cl. 55—210 **12 Claims**



1. A device for separation of gaseous mixtures into components of differing molecular mass, comprising:

- (a) a generally cylindrical stationary casing having a gaseous mixture inlet and at least two gas outlets for the separated gas components;
- (b) a rotor axle mounted within said casing coincident with its longitudinal axis;
- (c) a plurality of spaced apart rotor discs attached to said rotor axle and extending radially therefrom, each of said rotor discs having blades at their periphery and at least two said rotor discs being formed of magnetic material;
- (d) a plurality of spaced apart stator discs attached to the interior of said casing, extending radially inwardly between said rotor discs;
- (e) an electrical power source;
- (f) current amplification and retification means connected to said power source and to an electrical coil;
- (g) said electrical coil being connected to said electrical power source and disposed adjacent the exterior of said housing such that electrical current passing through said coil generates a magnetic moment in said rotor discs of magnetic material so as to rotate said rotor axle and said rotor discs;
- (h) delivery tube means connected to one of said at least two gas outlets; and
- (i) control means connected to said delivery tube means and which keeps the total pressure in the gaseous mixture below 10 Pa.

4,108,621

PROCESS OF PRODUCING SOFT APERTURE FILTER

Yoshiyuki Asahara, Higashiyamato, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo

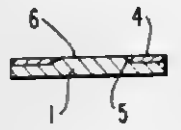
Filed Dec. 16, 1976, Ser. No. 751,300

Claims priority, application Japan, Dec. 19, 1975, 50/152251

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.² C03C *15/00;* C03B *11/08;* C03C *19/00*

U.S. Cl. 65—30 R **6 Claims**



1. A method for producing a soft edged aperture filter to prevent Fresnel diffraction at the edge of a glass rod which comprises

- a. diffusing silver into a glass plate having a base composition comprising
  - i. 55 to 72 mole percent SiO_2,
  - ii. 15 to 35 mole percent Na_2O,
  - iii. 0 to 5 mole percent divalent oxide or oxides other than ZnO,
  - iv. 4 to 15 mole percent ZnO,
  - v. 0 to 5 mole percent Al_2O_3, and
  - vi. at least one of Sb_2O_3 and As_2O_3 in an amount of 2 to 5 weight percent of the base composition

  with a fused bath containing at least one silver salt in an amount of 14 to 60 mole percent, said glass plate having on a first surface thereof a glass projection portion which does not extend to any side of the glass plate, wherein said diffusion is into the projection and into said first surface and bottom surface of the plate, and subsequently
- b. removing said glass projection portion down to said first surface having said diffused silver without disturbing said first surface and removing the diffused bottom surface, to thereby provide a light transmittance gradient arranged in a circle on the glass plate, the gradient being a lowering of the light transmittance between the first and bottom surfaces of the glass plate in the radial direction from the inner to the outer portion of the circle.

4,108,622

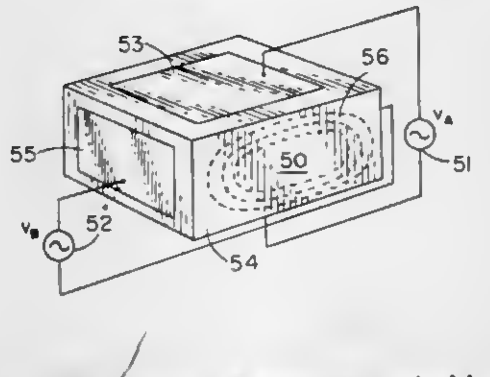
METHOD OF MAKING MINIATURE COUPLING LENS

William E. Martin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 590,539, Jun. 26, 1975, Pat. No. 4,025,157. This application Feb. 22, 1977, Ser. No. 770,332

Int. Cl.² C03C *21/00*

U.S. Cl. 65—30 R **7 Claims**



1. A method of fabricating a miniature optical lens for coupling determinable wavelengths of light energy from the emitting surface area of a source having a known index of refraction comprising:

selecting a semiconductor material transparent to said determinable wavelengths of light energy and having an index of refraction substantially matching that of said source;

shaping said material to a configuration of pairs of parallel rectangular flat surfaces of maximum dimensions less than one hundred microns including at least one such surface substantially the same in size and shape as said emitting surface area;

inducing gradual variation in the composition of said semiconductor material between at least one of said pairs of parallel rectangular flat surfaces for causing a predetermined gradient index of refraction thereacross in said semiconductor material, producing a desired focal length for said determinable wavelengths of light energy along on axis orthogonal to said gradient index of refraction.

4,108,623

ELECTRONIC CONTROL SYSTEM FOR GLASSWARE AND OTHER THERMOPLASTIC ARTICLES FORMING MACHINES

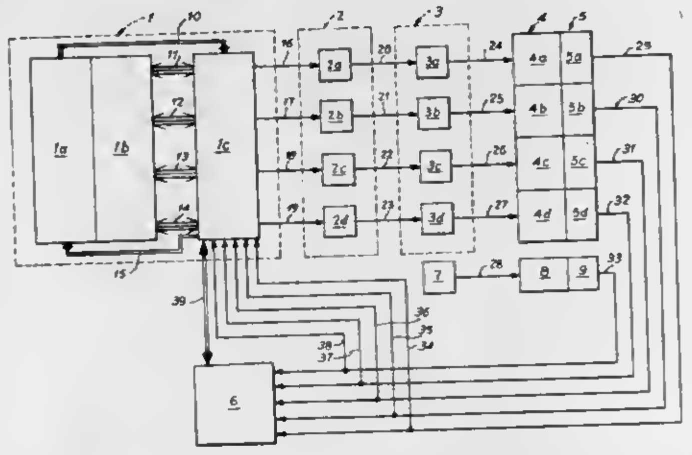
Luis Cardenas-Franco, Monterrey, N. L., Mexico, assignor to Investigacion Fic Fideicomiso, Monterrey, N.L., Mexico

Filed Oct. 18, 1977, Ser. No. 843,200

Claims priority, application Mexico, Jun. 6, 1977, 169360

Int. Cl.² C03B *9/40*

U.S. Cl. 65—163 **15 Claims**



1. An electronic control system for glassware or other thermoplastic articles forming machines of the kind having at least one unitary forming section comprising glass gob feeding and distribution means; glass gob guiding channel means for guiding said gobs from said feeding and distribution means; a blank forming station having blank mold means to receive glass gobs from said guiding channel means and parison formimg means to cooperate with said blank mold means to form a parison; a blow molding station and/or a take out station having closeable split blow mold means, transfer means for transferring said formed parisons from said blank forming station, blowing means for injecting a stream of air into said parisons and blow the same to form finished ware, and take out means for removing said finished ware from the machine; said electronic timing control system comprising preprogrammed controller means capable of sequentially controlling all the ware forming operations of said machine, and having a fixed memory to store the sequence of operations and the timing of fixed variables of said sequence and a floating memory to store the timing of certain other variables of said sequence; constant frequency pulse generator means to act as a real time clock to measure the timing and duration of each operation sequentially controlled by said controller means in real times; glass gob release sensor means to detect the instant when a glass gob is cut and released from said glass gob feeding and distribution means and feedback a signal to said controller means for triggering the initiation of a ware forming cycle of the machine; temperature sensor means to detect the passage of a glass gob from said guiding channel means to said blank mold means and feedback a signal to said controller means for timely controlling the removal of said guiding channel means and the introduction and initiation of the operation of said parison forming means in intimate relationship with actual arrival of a glass gob into said blank mold means; pressure sensor means to detect the instant when said parison forming means commence to work on a glass gob and feedback a signal to said controller means for triggering the time count of the remaining ware forming operations; and operator panel means having digital switch means for feeding a timetable subprogram to said floating memory, variable frequency oscillator means for simulating the feedback signal from said glass gob release sensor means when said feedback signal is absent, and mode of operation selector switch means for selecting a mode of operation from at least manual operation of the main mechanisms of the machine, test operation without a glass load in the machine, and automatic operation with a glass load in the machine.

4,108,624

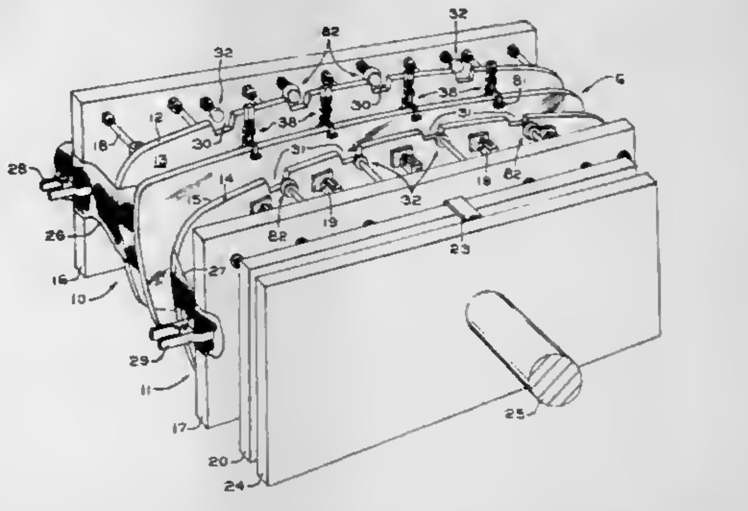
SUPPORTING A GLASS SHEET FOR PRESS BENDING

George Richard Claassen, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 22, 1977, Ser. No. 808,762

Int. Cl.² C03B *23/02*

U.S. Cl. 65—273 **5 Claims**



1. An apparatus for press bending glass sheets, comprising:

first and second bending molds having respective first and second opposed complementary shaping surfaces corresponding to the desired shape for the glass sheets;

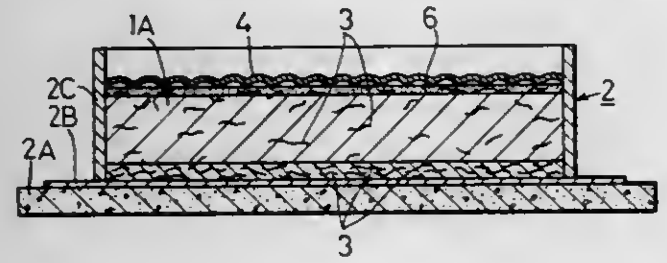
means for reciprocating the bending molds toward each other so as to press a heat-softened glass sheet vertically hung from tongs between the shaping surfaces into a shape in which a lower end of at least one set of tongs is tilted from its vertically hanging position toward the first shaping surface;

a first notch in the upper edge of the first shaping surface and a second notch in the upper edge of the second shaping surface, said notches being aligned with each other so as to receive a lower end portion of said tilting tong set when the shaping surfaces engage a glass sheet; and

tong stop means including a tong contacting surface behind the second shaping surface horizontally aligned with and facing the second notch, and means for rigidly mounting the tong contacting surface onto the second bending mold at a distance behind the second notch sufficient to come into non-yielding contact with a lower end portion of said tilting tong set as the portions of the shaping surface around the second notch come into engagement with a glass sheet and to limit the degree to which the tilting tong set may return toward its freely hanging vertical position.

4,108,625
METHOD OF, AND APPARATUS FOR PRODUCING FERTILIZER BY UTILIZING EARTHWORMS

Tokio Okada, Yokkaichi, Japan, assignor to Okada Seimen Yugen Kaisha, Yokkaichi, Japan
Filed Nov. 24, 1976, Ser. No. 744,772
Claims priority, application Japan, Nov. 26, 1975, 50-141878
Int. Cl.^{2} C05F *11/08*
U.S. Cl. 71—9 **9 Claims**

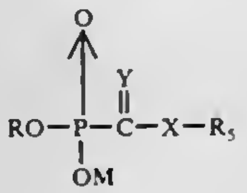


1. A method of producing a natural fertilizer, comprising:
forming a layer of fermented vegetable matter which is maintained in a moistened condition;
breeding earthworms in said layer, in which said earthworms eat said vegetable matter and discharge feces on said layer;
gathering said feces; and
refining said feces, whereby said fertilizer is obtained.

4,108,626
ALKOXYCARBONYLPHOSPHONIC ACID DERIVATIVE BRUSH CONTROL AGENTS

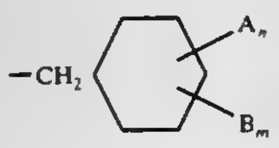
Colin Leslie McIntosh, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 616,837, Sep. 25, 1975, Pat. No. 4,033,749, and a continuation-in-part of Ser. No. 474,536, May 30, 1974, Pat. No. 3,943,201, which is a continuation-in-part of Ser. No. 397,723, Sep. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 381,620, Jul. 23, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,790
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.^{2} A01N *9/36*
U.S. Cl. 71—76 **5 Claims**

1. A method of retarding plant growth in woody plants consisting essentially of applying to the plant an effective amount of

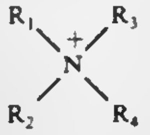


$$RO-\overset{\overset{O}{\uparrow}}{\underset{\underset{OM}{|}}{P}}-\overset{\overset{Y}{\|}}{C}-X-R_5$$

wherein
R is M; alkyl of 1 to 8 carbon atoms, optionally substituted with a chlorine, bromine, fluorine, or iodine; alkenyl of 3 to 8 carbon atoms; or



wherein
A is chlorine or methyl,
B is chlorine or methyl,
n is 0 or 1, and
m is 0 or 1;
R_5 is alkyl of 1 - 6 carbon atoms, alkenyl of 3 to 4 carbon atoms, or benzyl;
X is oxygen or sulfur; and
Y is oxygen or sulfur, provided that when Y is sulfur, X is sulfur; and when X is sulfur, R is not hydrogen; and at least one of X and Y is sulfur;
M is hydrogen, sodium, lithium, potassium, calcium, magnesium, zinc, manganese, barium, or

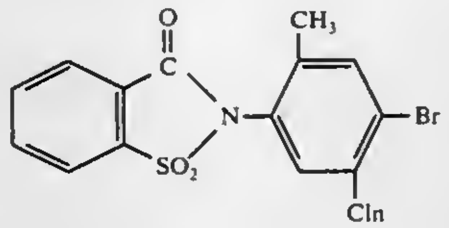


wherein
R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;
R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;
R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms; and
R_4 is hydrogen or alkyl of 1 to 12 carbon atoms,
provided that the total number of carbon atoms in R_1, R_2, R_3, and R_4 is less than 16.

4,108,627
N-(SUBSTITUTED PHENYL) DERIVATIVES OF SACCHARIN

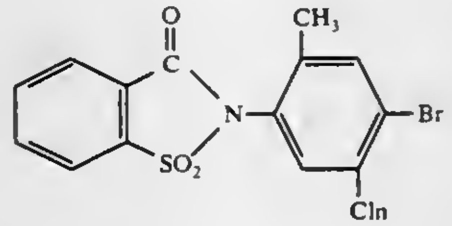
Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
Division of Ser. No. 537,989, Jan. 2, 1975, Pat. No. 4,006,007. This application Oct. 7, 1976, Ser. No. 730,505
Int. Cl.^{2} A01N *5/00;* C07D *275/06*
U.S. Cl. 71—91 **7 Claims**

1. A compound having the formula



wherein *n* is 0 or 1.

3. A method of regulating the growth of leguminous plants which comprises treating said plants with a plant growth regulating effective amount of a compound of the formula

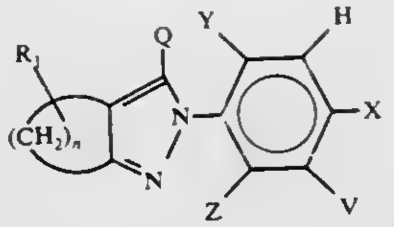


wherein *n* is 0 or 1.

4,108,628
CYCLOALKANOPYRAZOLE HERBICIDES MIXTURES

Anthony David Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 717,014, Aug. 26, 1976, Pat. No. 4,059,434, which is a continuation-in-part of Ser. No. 640,348, Dec. 12, 1975, abandoned, and a continuation-in-part of Ser. No. 622,763, Oct. 15, 1975, abandoned. This application Oct. 12, 1977, Ser. No. 841,452
Int. Cl.^{2} A01N *9/02*
U.S. Cl. 71—92 **21 Claims**

1. A mixture consisting essentially of (1) a compound of the formula

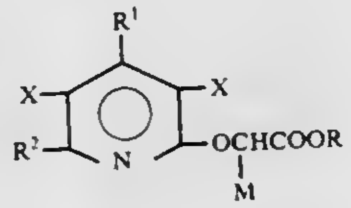


where
n is 3, 4 or 5;
R_1 is hydrogen or methyl;
Q is fluorine, chlorine, bromine or iodine;
X is fluroine, chlorine, bromine, iodine, cyano, methoxy or nitro;
Y is hydrogen, fluorine or chlorine;
Z is hydrogen or fluorine; and
V is hydrogen, fluorine, chlorine or methoxy;
with the proviso that
(a) when *n* is 5, R_1 must be hydrogen, Q must be chlorine or bromine, Z and V must both be hydrogen and Y must be hydrogen or fluorine;
(b) when *n* is 3 or 4 and Q is fluorine or iodine, R_1, Z and V must be hydrogen and Y must be hydrogen or fluorine;
(c) when *n* is 3 and R_1 is methyl, Q must be chlorine or bromine, Y must be hydrogen or fluorine and Z and V must be hydrogen; and
(d) when V is other than hydrogen, X must be fluorine, chlorine or bromine and Z must be hydrogen and (2) a compound selected from the group consisting of 2-tert-butyl-4-(2,4-dichloro-5-isopropyloxophenyl)1,3,4-oxadiazolin-5-one, 2,4-dichlorophenyl-4'-nitrophenyl ether, 2,4,6-trichlorophenyl 4-nitrophenyl ether, S-(2,3,3-trichloroallyl)diisopropythio-carbamate, and Methyl 2-[4-(2,4-dichlorophenoxy(phenoxy))]-propanoate.

4,108,629
HERBICIDAL USE OF ESTERS OF AMINOHALOPYRIDYLOXY ACIDS

Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 342,782, Mar. 19, 1973, abandoned, which is a division of Ser. No. 166,308, Jul. 26, 1971, Pat. No. 3,755,339. This application Dec. 1, 1976, Ser. No. 745,714
Int. Cl.^{2} A01N 9/22
U.S. Cl. 71—94 **8 Claims**

1. A method for controlling the growth of undesirable plant species which comprises applying to plants, plant parts of their habitats a herbicidally effective amount of a compound corresponding to the formula

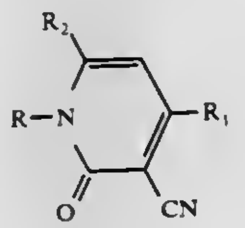


wherein X represents chloro or bromo; R represents alkyl of 1 to 12 carbon atoms or a radical having the formula —$(CH_2$-$)_nOR^3$ wherein *n* represents an integer of from 2 to 4 and R_3 represents lower alkyl of 1 to 4 carbon atoms or phenyl; M represents hydrogen or methyl; R^1 represents hydrogen, loweralkyl of 1 to 4 carbon atoms, amino or loweralkylamino of 1 to 4 carbon atoms; and R^2 represents hydrogen, X, loweralkyl, amino or loweralkylamino, with the proviso that one of R^1 or R^2 is always amino or loweralkylamino and the other of R^1 and R^2 is always other than amino or loweralkylamino.

4,108,630
1-ALKYLPYRID-2-ONES

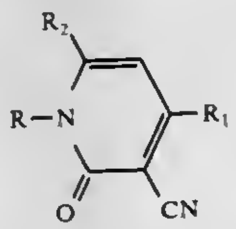
Wayne O. Johnson, Warminster; Michael C. Seidel, Chalfont, and Harlow L. Warner, Hatboro, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Division of Ser. No. 513,987, Oct. 11, 1974, Pat. No. 4,038,065. This application Mar. 25, 1977, Ser. No. 781,254
Int. Cl.^{2} A01N *9/22;* C07D *213/57*
U.S. Cl. 71—94 **7 Claims**

1. A compound of the formula



wherein R is $(C_1–C_{12})$ alkyl, R_1 is methyl or ethyl, R_2 is hydrogen, methyl or ethyl and the physiologically acceptable salts thereof.

4. A method for producing plant growth regulatory activity which comprises applying a plant growth regulatory amount of a compound of the formula



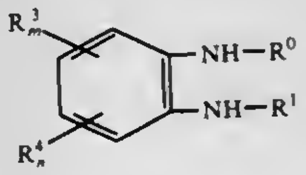
wherein R is $(C_1–C_{12})$ alkyl, R_1 and R_2 are hydrogen, methyl or ethyl and the physiologically acceptable salts thereof to a plant, to plant seeds, or to the habitat of a plant.

4,108,631
RING-SUBSTITUTED N-(2,2-DIFLUOROALKANOYL)-O-PHENYLENEDIAMINE COMPOUNDS

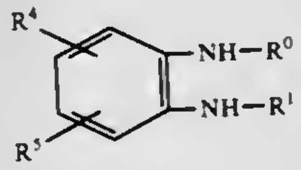
George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 590,226, Jun. 25, 1976, Pat. No. 4,011,341, which is a division of Ser. No. 479,073, Jun. 13, 1974, Pat. No. 3,907,892, which is a continuation-in-part of Ser. No. 277,452, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,857, Jun. 19, 1970, abandoned, and Ser. No. 17,865, Mar. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,998, Mar. 3, 1969, abandoned. This application Dec. 6, 1976, Ser. No. 747,763
Int. Cl.^{2} A01N *9/14, 9/20, 9/28*
U.S. Cl. 71—103 **13 Claims**

1. The method which comprises applying to a plant part a growth-inhibiting amount of an active agent, said active agent being a compound selected from the group consisting of the compounds of the formulae:

I.

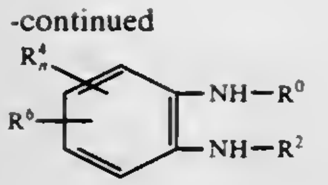


II.



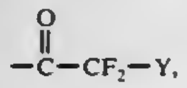
-continued

III.



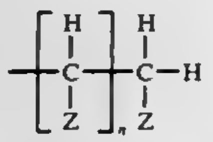
wherein

R^0 represents a 2,2-difluoroalkanoyl radical of the formula



$$-\overset{O}{\overset{\|}{C}}-CF_2-Y,$$

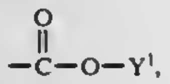
wherein Y represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula



$$-\left[\underset{Z}{\overset{H}{C}}\right]_n-\underset{Z}{\overset{H}{C}}-H$$

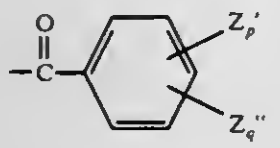
wherein each Z independently represents hydrogen or halogen and *n* represents 0 or 1;

R^1 represents
hydrogen,
radical of the formula



$$-\overset{O}{\overset{\|}{C}}-O-Y^1,$$

wherein Y^1 represents loweralkyl of C_1–C_4 or phenyl,
benzoyl,
furoyl,
naphthoyl, or
substituted benzoyl of the formula



wherein each Z′ independently represents halo or nitro, Z″ represents loweralkyl of C_1–C_4 or loweralkoxy of C_1–C_4, *p* represents 0, 1, or 2, *q* represents 0 or 1, and the sum of *p* and *q* is 1–3;

R^2 represents
R^0,
R^1,
alkanoyl of C_1–C_8,
loweralkenoyl of C_3–C_4,
loweralkynoyl of C_3–C_4,
halogenated loweralkanoyl of C_2–C_4 bearing on any position or positions one or more halogen atoms, each independently selected, subject to the limitation that the alpha position bear at least one substituent moiety selected from the group consisting of hydrogen and halogen of atomic weight from 35 to 127, both inclusive;

each R^3 independently represents halogen;

R^4 represents nitro;

R^5 represents trifluoromethyl difluoromethyl, or difluorochloromethyl, and in compounds of Formula II, R^4 and R^5 are meta to one another;

R^6 represents loweralkylsulfonyl of C_1–C_4 and is located at the 4 or 5 position, and any R^4 group is meta to R^6;

m represents 0–4;

n represents 0–1; and in compounds of Formula I, the sum of *m* and *n* is an integer of from 1 to 4;

subject to the further limitation that where R^1 or R^2 represents hydrogen, the ring position ortho to the —NH—R^1 or —NH—R^2 group bears one of the designated R^3, R^4, or R^5 moieties.

4,108,632
USE OF PHTHALANILIC ACIDS TO REGULATE THE GROWTH OF CORN PLANTS

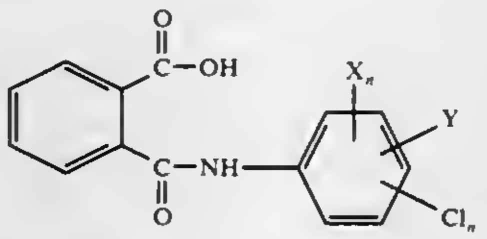
Frederic G. Bollinger; John J. D'Amico, both of St. Louis, and Dale J. Hansen, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,392

Int. Cl.^{2} A01N *9/20, 9/14*

U.S. Cl. 71—115 **6 Claims**

1. A method for altering the development of the reproductive components of a corn plant which comprises applying to said corn plant before or during the early stages of reproductive differentiation an effective, non-lethal amount of a compound having the formula



wherein X is halogen, CF_3 or lower alkoxy; Y is halogen, CF_3, lower alkoxy, phenoxy, SCH_3, hydroxyethyl, or lower alkyl; each *n* is independently 0 or 1; and agriculturally acceptable salts thereof provided that Y cannot be fluorine in the 3 position, when *n* is 0.

4,108,633
ARC FURNACE STEELMAKING

David Engledow, Rotherham, England, assignor to British Steel Corporation, Great Britain

Filed Jun. 8, 1977, Ser. No. 804,744

Claims priority, application United Kingdom, Jun. 14, 1976, 24557/76

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—11 **13 Claims**

1. A method of steelmaking in an electric arc furnace comprising the step of continuously charging a blend of particulate iron-bearing material into said furnace, said blend comprising a first particulate of low carbon iron-bearing material having a carbon content of less than about 1% (as herein defined) a second particulate of high carbon iron-bearing material having a carbon content greater than said first particulate and less than about 4% and a third particulate different from the first and second particulates comprising fragmented steel scrap, the relative proportions of the particulates in the blend and the rate of charging of said blend in said furnace being controlled to:

(a) maximise the utilisation of both the electrical energy supplied to said furnace and the chemical energy generated within said furnace by the charged materials; and

(b) secure the desired carbon content of the steel on tapping said furnace.

4,108,634
PROCESS FOR THERMALLY TREATING FINE-GRAINED SOLIDS

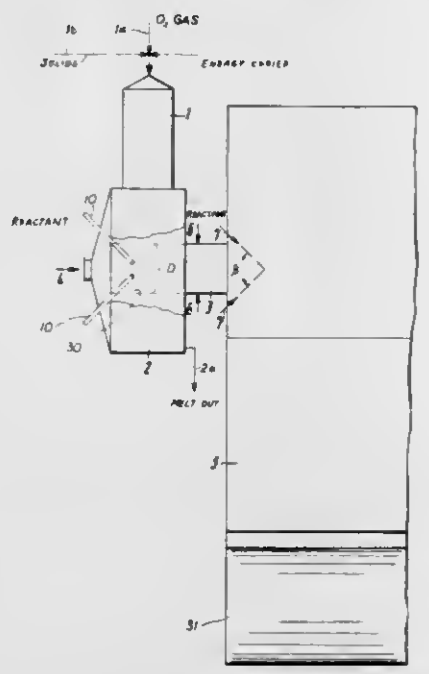
Martin Rahn; Lothar Reh, both of Frankfurt am Main; Bernd Thöne, Friedberg, and Karel Vydra, Bad Nauheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Deutsche Babcock Aktiengesellschaft, Oberhausen, both of Germany

Filed Aug. 11, 1977, Ser. No. 823,858

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716083

Int. Cl.^{2} C21B *15/00*

U.S. Cl. 75—23 **17 Claims**



1. A process for thermally treating particulate solids with a high-oxygen gas comprising the steps of:

(a) mixing said particulate solids with said gas to form a first suspension;

(b) introducing said first suspension to a vertical elongated combustion path at a velocity sufficient to prevent backfiring and reacting said first suspension to form a second suspension, in which the suspended phase consists predominantly of molten particulates;

(c) introducing said second suspension into a cyclone chamber and further separating the components of said second suspension in said cyclone chamber to form a melt and an exhaust gas, said cyclone chamber having an axial outlet in an end wall thereof whereby a core-flow region of gas is formed in said cyclone chamber;

(d) withdrawing said melt from said cyclone chamber through an opening in the lower portion of the shell;

(e) passing said exhaust gas from said outlet over a gas-transfer region immediately into a succeeding cooling chamber, said core-flow region, said gas-transfer region and said feed region defining a gas flow path;

(f) introducing a reactant into said core-flow region or into said exhaust gas immediately downstream thereof.

4,108,635
SOLDER SKIMMINGS RECOVERY PROCESS

James E. Reynolds, Golden, Colo., assignor to Hazen Research Inc., Golden, Colo.

Filed Mar. 26, 1976, Ser. No. 670,695

Int. Cl.^{2} C22B *13/00, 13/04;* **C01C** *1/16;* **C01G** *9/04*

U.S. Cl. 75—24 **6 Claims**

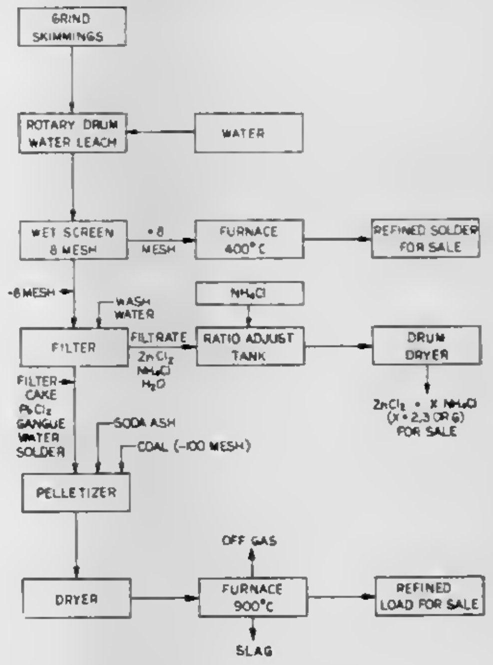
1. A method for recovering solder, zinc chloride and ammonium chloride, and lead from solidified solder skimmings, comprising the following steps:

(a) grinding the skimming to a small size;

(b) water leaching the solder skimmings with violent agitation to both mechanically separate and dissolve both zinc chloride and ammonium chloride thereby freeing occluded pieces of solder and particles of lead chloride;

(c) separating the pieces of solder from the leach slurry;

(d) refining the reclaimed solder by heat to purify it;



(e) filtering the leach slurry to separate ammonium chloride and zinc chloride solution and water from the lead chloride;

(f) recovering a filter cake of predominantly lead chloride; and

(g) recovering lead from the lead chloride.

4,108,636
METHOD OF THE DIRECT REDUCTION OF IRON ORE

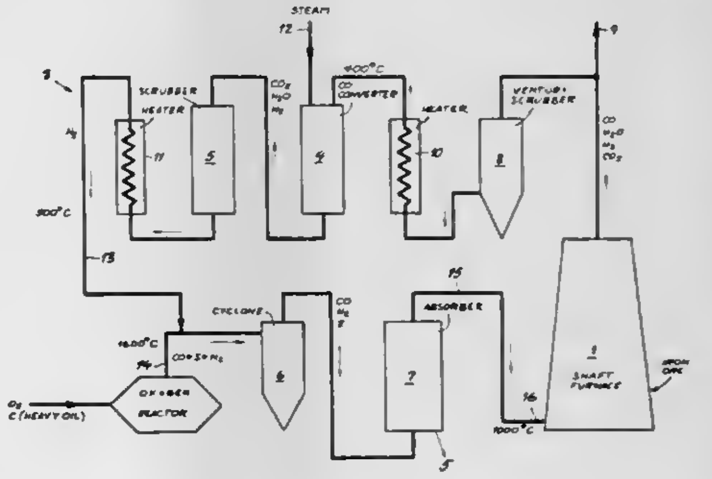
Georg Lange, Voerde, Germany, assignor to Thyssen Purofer GmbH, Dusseldorf, Germany

Continuation-in-part of Ser. No. 722,062, Sep. 9, 1976, and Ser. No. 603,196, Aug. 8, 1975, Pat. No. 4,046,555, said Ser. No. 722,062, is a division of Ser. No. 603,196,. This application Sep. 1, 1977, Ser. No. 829,937

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1974, 2438790

Int. Cl.^{2} C21B *13/02*

U.S. Cl. 75—35 **6 Claims**



1. In the reduction of iron ore wherein the ore is subjected to a reducing gas and a stack gas is produced, the improvement comprising the steps of:

(a) reacting oil and oxygen to make a producer gas of carbon monoxide and hydrogen in a volume ratio of at least about 1:1 and at a temperature above about 1300° C;

(b) treating said stack gas with steam to convert said stack gas into a converter-gas mixture of carbon dioxide and hydrogen;

(c) scrubbing said carbon dioxide out of the converter-gas mixture of step (b) to form a hydrogen-containing gas;

(d) heating said hydrogen-containing gas to a temperature of about 400° C;

(e) adding the producer gas of step (a) to the hydrogen-containing gas of step (d) to form a reducing gas having a volume ratio of carbon monoxide to hydrogen of at most 1:1; and

(f) reducing the iron ore with the reducing gas of step (e).

4,108,637

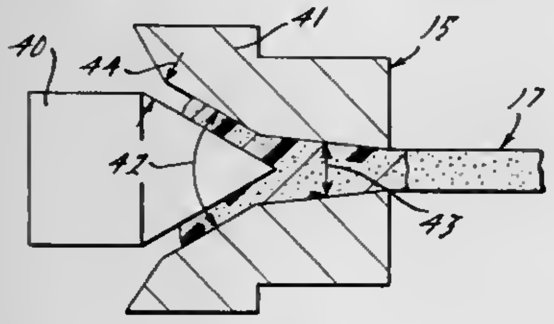
SHEATHED WIRE FEEDING OF ALLOY AND INOCULANT MATERIALS

Adolf Hetke, Livonia, and Walter J. Evans, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 730,095, Oct. 6, 1976, Pat. No. 4,088,477. This application Jul. 25, 1977, Ser. No. 819,017

Int. Cl.² C21C *7/00*

U.S. Cl. 75—53 **4 Claims**



1. An injectable strand useful in producing metallurgical changes in molten metal, comprising:

(a) an elongate strand consisting essentially of a uniform mixture of at least one particulate reaction agent suspended in a solid matrix consisting of a flexible binder vaporizable upon contact with said molten metal, said binder constituting 10–20% by volume of the strand and the remainder being said particulate reaction agent, said strand having the particles of said agent arranged substantially uniformly along the length of said strans as well as transversely thereof to establish substantially uniformity of weight distribution throughout the strand, certain particles of said reaction agent being exposed to the exterior of said strand.

4,108,638

PROCESS FOR SEPARATING NICKEL, COBALT AND COPPER

Sanai Nakabe, Yokohama, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Continuation of Ser. No. 645,422, Dec. 30, 1975, abandoned. This application May 24, 1977, Ser. No. 799,924

Claims priority, application Japan, Jan. 23, 1975, 50-10059

Int. Cl.² C22B *15/00, 23/02*

U.S. Cl. 75—63 **33 Claims**

1. A process for separating at least one of and cobalt from copper comprising the steps of providing a molten mixture containing copper and at least one member selected from the group consisting of nickel and cobalt, metallic iron and carbon, at least some of the mixture being in the form of a matte, and allowing the mixture to form a high carbon ferrous alloy having a carbon content of at least 0.5% and a matte in two separate phases, thereby extracting the major part of said member in the formed high carbon ferrous alloy and the major part of the copper in the formed matte.

4,108,639

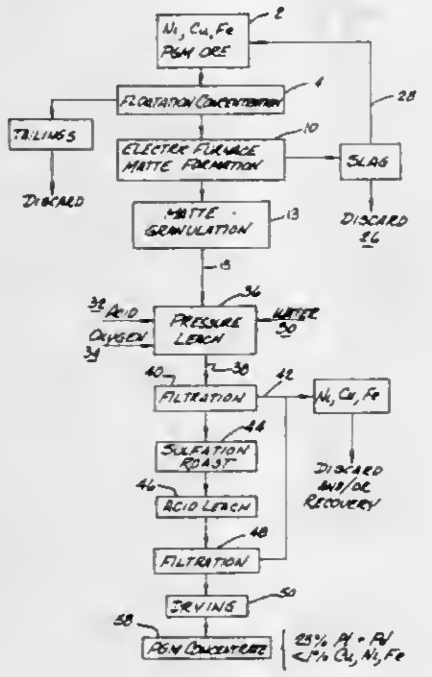
PROCESS FOR RECOVERING PLATINUM GROUP METALS FROM ORES ALSO CONTAINING NICKEL, COPPER AND IRON

Malcolm John Lake, Pickering, and William Richard Noble Snelgrove, Oakville, both of Canada, assignors to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 703,995, Jul. 9, 1976, abandoned. This application May 4, 1977, Ser. No. 793,903

Int. Cl.² C22B *11/04*

U.S. Cl. 75—101 R **27 Claims**



1. A process for the separation of a platinum group metal concentrate from an ore containing iron, nickel and copper in addition to said platinum group metals, which process comprises:

(a) concentrating said ore by flotation to form a concentrate;

(b) subjecting said ore concentrate to electric furnace melting to form a low grade matte;

(c) granulating said matte to form granules;

(d) leaching metals from said granules in the presence of sulfuric acid, oxygen and water;

(e) filtering the leached metals to obtain a filtrate predominately containing dissolved salts of said iron, nickel and copper and a filter cake predominately containing said platinum group metals;

(f) sulfation roasting said filter cake;

(g) acid leaching coper, nickel and iron metals from the roasted filter cake; and

(h) filtering and recovering a solid platinum group metal concentrate from said roasted and leached filter cake.

4,108,640

HYDROMETALLURGICAL PROCESS FOR THE PRODUCTION OF COBALT POWDER FROM MIXED METAL SULPHIDES

Herbert F. Wallace, Sherwood Park, and Donald R. Weir, Fort Saskatchewan, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

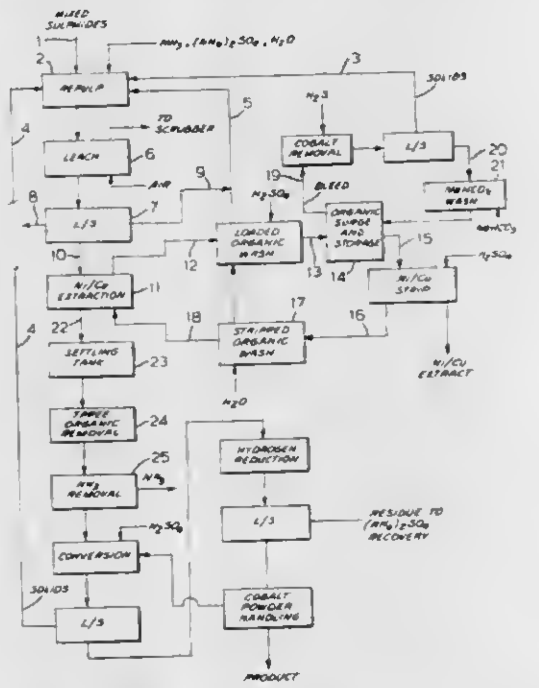
Filed Aug. 11, 1976, Ser. No. 713,325

Claims priority, application Canada, Aug. 25, 1975, 234319

Int. Cl.² C22B *23/04*

U.S. Cl. 75—103 **9 Claims**

1. A process for recovering metallic cobalt from mixed sulphide materials containing sulphides of cobalt and of at least one metal selected from the group consisting of nickel and copper, said process comprising leaching said mixed sulphide materials with an aqueous ammoniacal solution in the presence of oxygen to dissolve cobalt and said at least one metal as ammine sulphates and convert substantially all dissolved cobalt values to the cobaltic form, separating the resulting cobalt and said at least one metal bearing leach solution from undissolved residue and contacting said separated leach solution with a water immiscible liquid organic ion exchange reagent dissolved in an inert organic diluent to selectively substantially completely extract said at least one metal from said leach solution and produce an aqueous cobalt bearing raffinate substantially free of said at least one metal and an organic extractant phase loaded with said at least one metal, washing said loaded organic extractant phase to remove substantially all ammonia therefrom, contacting said loaded and washed organic extractant phase acid solution to strip said at least one metal therefrom, separating the resulting said at least one metal bearing aqueous acid solution from the resulting stripped organic extractant phase, washing said stripped organic extractant with a wash liquid to remove values of said at least one metal therefrom, using said wash liquid after said washing of said stripped organic extractant to effect said washing of said loaded organic extractant, recycling said stripped and washed organic extractant to treat additional leach solution for extraction of said at least one metal therefrom, treating said cobalt bearing raffinate to reduce substantially all cobaltic cobalt values to cobaltous form, and reacting the resultant cobaltous cobalt bearing solution with hydrogen at elevated temperature and pressure to precipitate dissolved cobalt in metallic powder form and recovering said cobalt powder from the reduced end solution.



4,108,641

OXIDATION-RESISTING AUSTENITIC STAINLESS STEEL

Tokio Fujioka; Masayuki Kinugasa; Shozo Iizumi; Shizuhiro Teshima, and Isamu Shimizu, all of Shin-Nanyo, Japan, assignors to Nisshin Steel Company, Limited, Japan

Division of Ser. No. 679,601, Apr. 23, 1977, Pat. No. 4,063,935, which is a continuation-in-part of Ser. No. 529,766, Dec. 4, 1974, abandoned. This application Jul. 11, 1977, Ser. No. 814,808

Claims priority, application Japan, Dec. 22, 1973, 48-142976; Dec. 22, 1973, 48-142977

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.² C22C *38/06, 38/42, 38/48, 38/50*

U.S. Cl. 75—124 **17 Claims**

1. An oxidation-resisting austenitic stainless steel consisting essentially of not more than 0.15% by weight of C, 2.56 – 4.0% by weight of Si, not more than 2.0% by weight of Mn, 8 – 22% by weight of Ni, 16 – 25% by weight of Cr, 0.001 – 0.05% by by weight of at least one alkaline earth metal, 0.001 - 0.1% by weight of at least one rare earth metal and the balance Fe.

4,108,642

ALLOY FOR PREPARING DENTURES THEREFROM

Vincent T. Chiaramonte, Baldwin, N.Y., assignor to Apex Dental Lab. Inc., New York, N.Y.

Filed May 11, 1977, Ser. No. 795,954

Int. Cl.² C22C *30/00, 19/05*

U.S. Cl. 75—134 F **3 Claims**

1. The alloy comprising:

15 to 30% chromium,
30 to 60% nickel,
15 to 30% cobalt,
1 to 5% iron, and
1 to 2% beryllium.

4,108,643

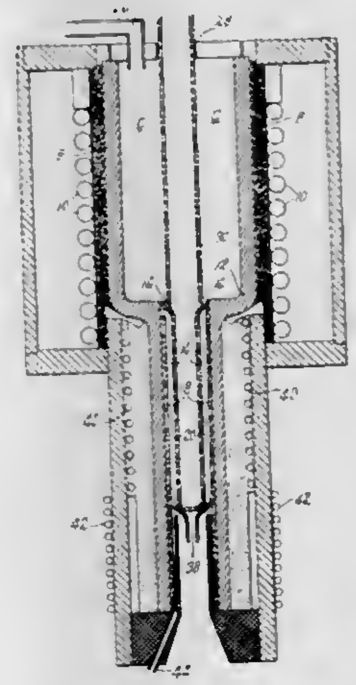
METHOD FOR FORMING HIGH FRACTION SOLID METAL COMPOSITIONS AND COMPOSITION THEREFOR

Merton C. Flemings, Cambridge; Rodney G. Riek, Reading, and Kenneth P. Young, Arlington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 22, 1976, Ser. No. 725,903

Int. Cl.² C22B *4/00;* **C22C** *1/02, 33/00*

U.S. Cl. 75—135 **37 Claims**



1. The method for forming a metal composition having solid discrete degenerate dendrites homogeneously dispersed within a liquid phase of said metal composition which comprises:

a. heating a first metal composition to form a liquid-solid mixture of said first metal composition wherein greater than about 65 weight percent up to a weight percent of primary solids where there is sufficient fusion of the primary solids to each other which prevents the primary solids from sliding along their boundaries when the mixture is subjected to shear forces, and

b. vigorously agitating said liquid-solid mixture in an agitation zone to convert the solid therein to discrete degenerate dendrites derived from said first metal composition, said degenerate dendrites comprising greater than about 65 weight percent of the heated metal composition and wherein the remainder of the heated metal composition is liquid wherein the surface in said agitation zone contacting said liquid-solid mixture is stable against degradation by said liquid-solid mixture and is not wet by said liquid-solid mixture, and

c. continuously monitoring the apparent viscosity or an analog of the apparent viscosity of the liquid-solid mixture thereby to control the heat extracted from said mixture to maintain the primary solids content of said mixture above about 65 weight percent.

4,108,644

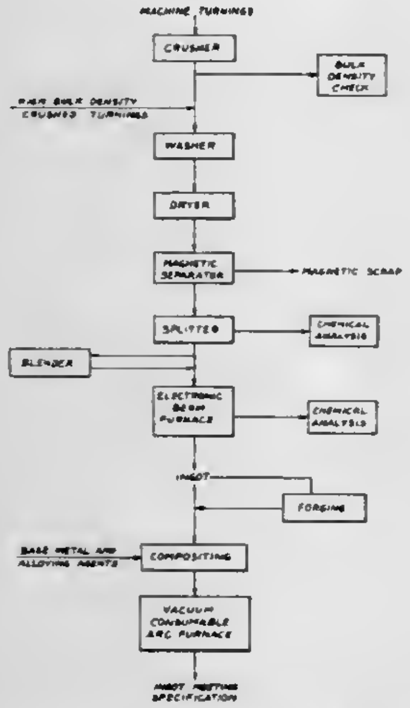
MANUFACTURE OF REACTIVE METALS AND ALLOYS

M. Victor Walberg, Incline Village, Nev., and James H. C. Lowe, Moraga, Calif., assignors to Viking Metallurgical Corp., Verdi, Nev.

Filed Nov. 11, 1976, Ser. No. 740,788

Int. Cl.^{2} C22C *15/00*

U.S. Cl. 75—135 **6 Claims**



1. A method for the manufacture of a reactive metal alloy, comprising collecting revert material of said alloy, a majority of said revert material being machined chips, crushing said revert material, controlling the bulk density of said crushed revert material to above 30 pounds per cubic foot, washing and drying said crushed revert material, melting and casting said revert material into an electrode in an electron beam furnace, analyzing said electrode to determine the chemical composition thereof, compositing said electrode with quantities of prime base metal and alloying agents based upon said analysis, and melting and casting said composited electrode in a consumable electrode vacuum arc furnace.

4,108,645

PREPARATION OF RARE EARTH AND OTHER METAL ALLOYS CONTAINING ALUMINUM AND SILICON

Alec Mitchell, West Vancouver, Canada; James R. Goldsmith, Pittsburgh, Pa., and J. Malcolm Gray, Stamford, Conn., assignors to Molycorp, Inc., White Plains, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,867

Int. Cl.^{2} C22C *21/04*

U.S. Cl. 75—135 **32 Claims**

1. A method for making alloys of aluminum and silicon with a third metal selected from the group consisting of rare earth metals and a metal from Groups 4b, 5b and 6b of the Periodic Table which comprises reducing the oxides of the metals with aluminum in the presence of silicon in a flux system comprising an alkali metal or alkaline earth metal fluoride, an alkaline earth metal oxide, and Al_2O_3 maintained liquid at a temperature between about 1250° C - 1600° C while maintaining the flux basic to suppress the activity of the Al_2O_3 present.

4,108,646

STRONTIUM-BEARING MASTER COMPOSITION FOR ADDITION TO EUTECTIC AND HYPO-EUTECTIC SILICON-ALUMINUM CASTING ALLOYS

Richard J. Gennone, Neptune City, N.J., and Robert D. Sturdevant, East Greenville, Pa., assignors to Kawecki Berylco Industries, Inc., Reading, Pa.

Continuation-in-part of Ser. No. 585,811, Jun. 11, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,553

Int. Cl.^{2} C22C *1/03*

U.S. Cl. 75—148 **24 Claims**

16. A process for modifying the eutectic component of eutectic and hypo-eutectic aluminum-silicon casting alloys comprising adding to said alloy while the alloy is in molten form, a modifying quantity of a master composition, said master composition consisting essentially of a mixture of:

(a) particles of strontium-bearing material consisting essentially of strontium-silicon; and

(b) particles of an aluminous material.

4,108,647

ALLOYS OF NICKEL, CHROMIUM AND COBALT

Stuart Walter Ker Shaw, Sutton Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 8, 1976, Ser. No. 703,563

Claims priority, application United Kingdom, Jul. 17, 1975, 30043/75

Int. Cl.^{2} C22C *19/05*

U.S. Cl. 75—171 **8 Claims**

1. In combination with a nickel-base alloy adapted for use at elevated temperature consisting essentially of, by weight, about 20% to 25% chromium, about 5% to 25% cobalt, up to 3.5% molybdenum, up to 5% tungsten, the tungsten and molybdenum being correlated such that the %W + 0.5(%Mo) is from 0.5% to 5%, about 1.7% to 5% titanium and about 1% to 4% aluminum, the sum of the titanium and aluminum being about 4% to 6.5% with the ratio therebetween being from 0.75:1 to 4:1, from 0.02% to 0.25% carbon, from 0.5% to 3% tantalum, up to 3% niobium, 0.005% to 1% zirconium and up to 2% hafnium, the value of % Zr + 0.5(%Hf) being from 0.01% to 1%, about 0.001% to 0.05% boron, up to about 0.2% in total of yttrium and/or lanthanum, and balance essentially nickel in an amount at least 30%, the improvement comprising a chromium content of more than 22% and carbon and boron contents in ranges of 0.001% to 0.25% carbon and 0.05% to 1% boron provided that when the carbon content is in the range of from 0.02% to 0.25%, the boron content is greater than 0.05% up to 1%.

4,108,648

NICKEL-BASED ALLOY

Galina Vasilievna Zhurkina; Galina Evseevna Moskalenko, both of 2 Frunzenskaya ulitsa, 10, kv. 81; Fedor Fedorovich Khimushin, B. Dorogomilovskaya ulitsa, 29, kv. 26; Nikolai Fedorovich Lashko, Kosinsky pereulok, 18, korpus 3, kv. 272; Klavdia Pavlovna Sorokina, Kosinsky pereulok, 20, korpus 1, kv. 62, all of Moscow; Tamara Mikhailovna Grebtsova, ulitsa Gorkogo, 15, kv. 5, Elektrostal Moskovskoi oblasti, and Evgenia Markovna Kontsevaya, Kotelnicheskaya naberezhnaya, 1/5, korpus A, kv. 15, Moscow, all of U.S.S.R.

Filed Sep. 20, 1976, Ser. No. 724,469

Int. Cl.^{2} C22C *19/05*

U.S. Cl. 75—171 **4 Claims**

1. A nickel-based alloy consisting of carbon, chromium, cobalt, titanium, aluminum, tungsten, molybdenum, yttrium, boron, magnesium, and cerium, said components being present in the following weight %:

carbon	0.05 - 0.10
chromium	15.0 - 18.0
cobalt	10.0 - 17.0
titanium	1.8 - 2.5
aluminum	2.8 - 3.5
tungsten	2.5 - 5.0
molybdenum	6.0 - 7.5
yttrium	up to 0.2
boron	0.005 - 0.02
magnesium	0.005 - 0.05
cerium	0.005 - 0.02
nickel	the balance.

4,108,649

CEMENTED TITANIUM CARBIDE TOOL FOR INTERMITTENT CUTTING APPLICATION

David Moskowitz, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 634,972, Nov. 24, 1975, Pat. No. 4,019,874. This application Oct. 6, 1976, Ser. No. 730,098

Int. Cl.^{2} B22F *3/00, 1/00*

U.S. Cl. 75—203 **1 Claim**

1. A method of making a sintered compact useful as a cutting tool and having improved nose push resistance and increased grain refinement, the method comprising:

(a) blending together a titanium carbide powder, nickel-coated aluminum powder, at least one of molybdenum powder and molybdenum carbide powder, an additive powder having vanadium carbide and titanium nitride,

(b) milling said powders in the presence of a waxy lubricant, cemented carbide media, and acetone for a sufficient time to achieve thorough homogeneity and blending,

(c) drying said blended powders and screening to −20 mesh,

(d) compacting said screened blended powders under a force between 16,000 and 24,000 psi and heating to dewax said compact under a dry hydrogen atmosphere, and

(e) preparing closed graphite trays and inserting said compacted powders thereinto while evacuating the furnace and holding trays to less than one micron mercury, sintering said compact and said close graphite trays at a temperature of about 1400° C for a period of about 1 hour.

4,108,650

PROCESS FOR THE PREPARATION OF MOLYBDENUM BASED ALLOYS WITH SOLID REINFORCING ELEMENTS BY SINTERING

Géraud Fustier, Bonneville; Jean-Paul Langeron, Chatenay Malabry; Joseph de la Bastie, and Jean Carlizza, both of Le Fayet, all of France, assignors to Cime Bocuze, Paris, France

Filed Apr. 23, 1976, Ser. No. 679,823

Claims priority, application France, Apr. 23, 1975, 75 13489

Int. Cl.^{2} B22F *3/14*

U.S. Cl. 75—206 **4 Claims**

1. A process for the preparation of molybdenum based alloys containing titanium and zirconium, or titanium and thorium, as reinforcing elements, comprising,

(a) introducing into molybdenum used in the form of ammonium decamolybdate, zirconium oxide and titanium oxide or thorium nitrate and titanium oxide, as addition compounds, all in the solid state,

(b) mixing the ammonium decamolybdate and addition compounds to obtain an intimate mixture,

(c) reducing the ammonium decamolybdate in the mixture to metallic molybdenum, by hydrogen at about 500° C,

(d) adding and mixing carbon in sufficient quantity to at least partially reduce the addition compounds to the metallic state,

(e) compressing the (d) mixture at a pressure of about 1000 bars to form briquettes, and

(f) sintering the briquettes at a temperature at which the said carbon completes the reduction of the titanium oxide and solution thereof in the molybdenum, while the zirconium oxide or thorium oxide appears as a dispersed phase.

4,108,651

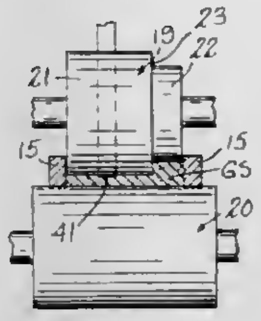
METHOD OF PRODUCING A MULTI-GAGE STRIP OR SHAPE FROM POWDERED METAL

Claude D. Tapley, 77 Woodland Dr., Cheshire, Conn. 06410

Filed May 24, 1976, Ser. No. 689,675

Int. Cl.^{2} B22F *3/18*

U.S. Cl. 75—208 CS **5 Claims**



1. The method of producing a continuous multigage roll-formed strip or shape from powdered metal in a generally rectangular cross-sectional configuration comprising

(a) roll compacting a suitable powdered metal between a set of opposed rolls, one of said rolls having an asymmetrically stepped diameter, to an intermediate configuration having at least one uniformly thicker portion and at least one uniformly thinner portion, said thinner portion having no thickness as great as that in the thicker portion;

(b) sintering said compacted powdered metal multigage strip at a temperature and time suitable for the powdered metal alloy involved; and

(c) further rolling both thicker and thinner portions of the sintered strip with rolls proportioned to effect substantially equal percent reductions in both thicker and thinner portions.

4,108,652

METHOD FOR PRODUCING A SINTERED BODY OF HIGH DENSITY

Kazuki Ogawa, Fukuoka; Mitsue Koizumi, Toyonaka; Mitsuhiko Furukawa, Fukuoka; Yoshimichi Hara, Fukuoka, and Takashi Kitahira, Fukuoka, all of Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Filed Aug. 17, 1976, Ser. No. 715,082

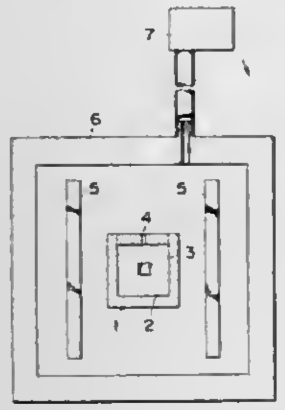
Int. Cl.^{2} B22F *1/04, 3/14*

U.S. Cl. 75—223 **30 Claims**

1. A method for producing a sintered body of high density comprising the following steps:

first step: packing a mixed body of a metal powder, a chloride salt and crushed refractory material into a mold which previously contains the pre-sintered body such that said mixed body covers the entire surface of said pre-sintered body, heating said mold until pure metal having a thickness of more than 8 micron is extracted over the surface of said pre-sintered body so that said extracted metal forms a capsule coating of said metal on said body;

second step: disposing said capsule-coated body obtained from the first step into a heating furnace and filling said heating furnace with a fluid pressure medium such as a nitrogen gas or an inert gas; and



third step: keeping the atmosphere within said furnace at a desired temperature and a desired pressure so as to compress said pre-sintered body at a high temperature by way of said metal-capsule.

4,108,653

PRESSURE-FIXABLE TONER POWDER WITH A THERMOPLASTIC POLYETHYLENE BINDER

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 26, 1976, Ser. No. 735,821

Claims priority, application Netherlands, Jul. 5, 1976, 7607380

Int. Cl.^{2} G03G *13/20, 9/00*

U.S. Cl. 96—1 SD **11 Claims**

1. Pressure-fixable toner powder comprising particles which consist essentially of thermoplastic binder having dispersed therein colorant and, optionally, additives, characterized in that said binder comprises predominantly, in an amount rendering said particles readily fixable to a receiving surface by pressure, a polyethylene having a weight average molecular weight of at least 1,500, a crystallinity of at least 75% and a density of at least 0.93.

4,108,654

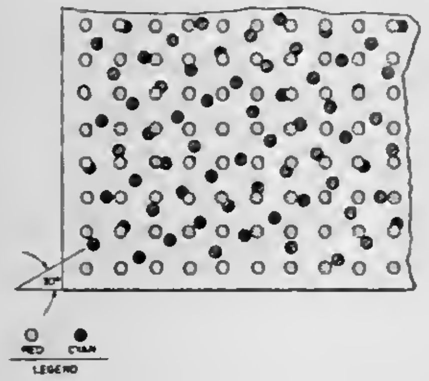
COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A DOCUMENT SCREEN

Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 6, 1974, Ser. No. 467,326

Int. Cl.^{2} G03G *15/01, 13/01;* **G03F** *5/00*

U.S. Cl. 96—1.2 **14 Claims**



1. In a color electrophotographic imaging process comprising one or more sequences wherein an original document is provided at an exposure station, illuminated, and light reflected from said illuminated original document is passed through a color filter and lens system and directed onto a charged photosensitive member sufficient to form a latent electrostatic image thereon, the improvement comprising conducting said imaging process with a document screen positioned proximate to the image face of said original document between said document and said lens system, said document screen comprising:

a clear transparent substrate material having clear areas and bearing colored areas;

said colored areas comprising at least one repetitive pattern of like dots of one color;

said like dots arranged with respect to other like dots at an average like dot inch frequency such that the optical system employed in the electrophotographic process passes the fundamental spatial frequencies and attenuates the harmonic spatial frequencies.

4,108,655

METHOD OF MAKING A THERMO ACTIVE IMAGING MEMBER

Joseph M. Kropac, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,767

Int. Cl.^{2} G03G *13/22, 5/04*

U.S. Cl. 96—1.5 R **16 Claims**

1. A method of preparing a thermo-activated imaging member comprising a donor layer, a receiver layer and sandwiched therebetween a thermo-activator layer in contact with an electrically photosensitive imaging layer capable of being rendered structurally fracturable in response to the combined effects of an applied electric field and exposure to electromagnetic radiation to which said imaging layer is sensitive by means of contact with said thermo-activator at a temperature above the melting point of said activator which comprises the step of:

(1) providing said imaging layer coated on said donor layer;

(2) dispersion coating a thermo-activator onto said imaging layer, and;

(3) fusing said activator into a continuous layer over said imaging layer.

4,108,656

PHOTOCONDUCTIVE MEMBER HAVING A CHARGE GENERATING PIGMENT AND 2,4,7-TRINITROTHIOXANTHONE AS CHARGE TRANSPORT MATERIAL

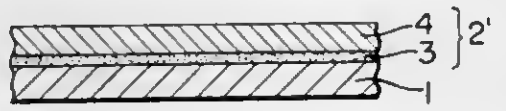
Masafumi Ohta; Mitsuru Hashimoto, and Akio Kozima, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,529

Claims priority, application Japan, Dec. 24, 1975, 50-154428

Int. Cl.^{2} G03G *5/02*

U.S. Cl. 96—1.5 R **9 Claims**



1. An electrophotographic plate comprising an electrically conductive substrate and a photoconductive layer overlying said electrically conductive substrate, said photoconductive layer consisting essentially of a mixture of from 0.1 to 30 percent by weight of charge generating pigment having a particle size of less than 5μ, from 1 to 60 percent by weight of 2,4,7-trinitrothioxanthone and the balance is binder resin.

4,108,657

MULTI-ACTIVE PHOTOCONDUCTIVE ELEMENT WITH AN AGGREGATE AND INORGANIC PHOTOCONDUCTOR

William Mey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 534,978, Dec. 20, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 641,058

Int. Cl.^{2} G03G *5/09, 5/06*

U.S. Cl. 96—1.6 **26 Claims**

1. A photoconductive insulating element having at least two layers comprising an aggregate photoconductive layer in electrical contact with an inorganic photoconductor-containing layer,

(a) said aggregate photoconductive layer comprising a continuous, electrically insulating polymer phase and dispersed in said continuous phase a discontinuous phase comprising a finely-divided, particulate, co-crystalline complex of (i) at least one polymer having an alkylidene diarylene group in a recurring unit and (ii) at least one pyrylium-type dye salt, the particulate, co-crystalline complex of said discontinuous phase having a size of about 0.01 to about 25 microns, said aggregate photoconductive layer having a maximum radiation absorption at a wavelength at least about 10 nm. different from the wavelength of maximum absorption of said pyrylium-type dye salt solubilized with said alkylidene diarylene group-containing polymer in a homogeneous composition,

(b) said inorganic photoconductor-containing layer comprising an inorganic zinc oxide or selenium-containing photoconductor.

4,108,658

PROCESS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Gerardus A. J. Koeleman, Velden, and Johannes H. A. op de Laak, Blerick, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Continuation of Ser. No. 603,417, Aug. 11, 1975, abandoned, which is a division of Ser. No. 451,254, Mar. 11, 1974, Pat. No. 3,924,567. This application Feb. 10, 1977, Ser. No. 767,593

Int. Cl.^{2} G03G *13/08, 13/09*

U.S. Cl. 96—15 D **4 Claims**

1. In a copier including a photoconductor movable in a predetermined path of travel, means for holding a working supply of developer material, a replenishing supply of developer material, means for collecting developer material including an elongated hopper longitudinally extending transverse to said predetermined path of travel, said hopper including a base wall having a centrally disposed aperture, and means for mixing developer material, a process for developing an electrostatic latent image on the photoconductor, said process comprising:

a. moving the photoconductor in said predetermined path of travel;

b. upwardly carrying working developer material from said holding means to said moving photoconductor;

c. contacting the moving photoconductor with carried developer material;

d. collecting the carried developer material in said hopper after the contacting step;

e. adding replenishing developer material to said hopper;

f. mixing the developer material in said hopper; and

g. feeding the developer material in said hopper to said centrally disposed aperture for discharge therethrough to said holding means.

4,108,659

METHOD OF ENGRAVING PRINTING PLATES OF FORMS BY MEANS OF ENERGY BEAMS, ESPECIALLY LASER BEAMS

Mamiliano Dini, Island of Elba, Italy, assignor to European Rotogravure Association, Fed. Rep. of Germany

Continuation of Ser. No. 391,256, Aug. 24, 1973, abandoned. This application Jul. 31, 1975, Ser. No. 600,804

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1972, 2241849

Int. Cl.^{2} G03C *5/00, 5/04*

U.S. Cl. 96—36.3 **12 Claims**

1. A method for engraving a printing surface with an energy beam, said method comprising:

preparing a reflective mask having a plurality of elemental areas which are adapted to reflect and to pass varying amounts of energy from said energy beam, the amount of energy passable by any given area being representative of the tone gradation of a corresponding area of an original to be engraved upon said printing surface and subsequently reproduced thereby in a printing process,

said preparing step including the steps of providing a basic mask material which substantially reflects said energy beam and forming a plurality of individual cells of differing reflectivity in said mask, said reflectivity being inversely related to the depths of corresponding cells to be engraved in said printing surface whereby the reflectivity of the cells in any given area of said mask with respect to the energy beam is inversely proportional to the tone gradation of a corresponding area of the original to be engraved into said printing surface, and energy not reflected is substantially passed through the mask,

providing an energy beam of substantially constant energy value, said energy beam having a cross sectional area encompassing a plurality of said elemental areas over the masked printing surface, and

interposing said mask between said printing surface and the source of said energy beam such that said energy beam simultaneously illuminates a plurality of said individual cells, whereby said elemental areas are etched onto said printing surface corresponding to the amount of energy passed through respectively associated elemental areas of said mask.

4,108,660

FABRICATION OF DIFFRACTIVE SUBTRACTIVE FILTER EMBOSSING MASTER

Michael Thomas Gale, Wettswil, and James Kane, Zumikon, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,304

Claims priority, application United Kingdom, Apr. 7, 1976, 14163/76

Int. Cl.^{2} G03C *5/00*

U.S. Cl. 96—38.2 **6 Claims**

1. A method employing a recording blank for fabricating a master to be used in embossing a diffractive subtractive filter, representing certain picture-image information defined by a spatial arrangement of contiguous white-manifesting regions and non-white manifesting regions, into a thermoplastic film, said recording blank comprising a substrate having a given surface thereof formed of at least one set of spaced line ridges defining a diffraction grating of a given profile and depth, said given surface having a photoresist disposed thereon which fills the spaces between adjacent line ridges and provides a substantially smooth exterior surface; said method comprising the steps of:

(a) exposing said photoresist to light manifesting said certain picture-image information;

(b) removing all of said exposed photoresist from solely said white-manifesting regions thereby to reveal entirely the spaced line ridges of only those portions of said surface of said substrate underlying said white-manifesting regions;

(c) leveling solely said revealed portions of said surface of said substrate to obliterate the spaced line ridges of said white-manifesting regions, and

(d) then removing all of the remaining photoresist to now reveal entirely the spaced line ridges underlying the non-white manifesting regions of said exposed photoresist.

4,108,661

LIPPMANN-EMULSIONS AND REVERSAL PROCESSING THEREOF

Willy Joseph Vanassche, Kontich; Herman Adelbert Philippaerts; René Omer Duville, both of Edegem, and Francois Leon Schelfaut, St. Niklaas, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 3, 1976, Ser. No. 747,344

Claims priority, application United Kingdom, Dec. 12, 1975, 51088/75

Int. Cl.^{2} G03C *5/50, 1/28*

U.S. Cl. 96—59 **4 Claims**

1. In a method of producing a reversal image of an original wherein a photographic material comprising a support and a silver halide Lippmann-emulsion layer the average silver halide grain-size of which is less than 100 nm, is subjected to the following steps: (a) image-wise exposure; (b) developing said image-wise exposed emulsion layer to form a negative silver image; (c) bleaching said negative silver image in the exposed and developed areas, and (d) thereafter rendering by an overall exposure the remaining undeveloped silver halide developable and developing said remaining silver halide or developing the material again in a developer composition comprising a silver halide reducing agent, the improvement which comprises using an emulsion the silver halide grains of which have been chemically sensitized to fog so that a test portion of the emulsion when coated on a support at a coverage of silver halide corresponding to from about 3 g to about 7 g of silver nitrate per sq.m gives a density between about 0.20 and about 0.70 upon development without any exposure for 6 min at 20° C. in a developer of the composition:

hydroquinone: 16.5 g
potassium bromide: 1.7 g
sodium salt of EDTA: 1.7 g
potassium metabisulphite: 40 g
1-phenyl-5-mercaptotetrazole: 35 g
sodium hydroxide and water to make: 1 liter at pH 11.8.

4,108,662

PROCESS FOR DEVELOPING PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS FOR THE GRAPHIC ARTS

Katsumi Hayashi; Yoo Iijima, and Eiichi Okutsu, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

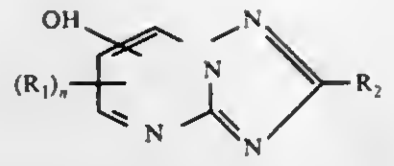
Filed Jan. 26, 1977, Ser. No. 762,594

Claims priority, application Japan, Jan. 28, 1976, 51-8230

Int. Cl.^{2} G03C *5/30*

U.S. Cl. 96—66.5 **6 Claims**

1. A process for developing a photographic light-sensitive material for the graphic arts which comprises image-wise exposing and infectiously developing a silver halide light-sensitive material comprising a support having coated thereon a silver halide emulsion layer containing at least 60 mol% silver chloride with an infectious developing solution comprising (1) a hydroquinone, (2) an alkali, (3) up to 5 g/l of developer of an alkali metal sulfite salt, (4) an aldehyde-alkali metal-bisulfite adduct, and (5) a compound represented by the general formula (I):



(I)

wherein R_1 and R_2, which may be the same or different, each is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an aryl group having up to 12 carbon atoms, or a halogen atom; and n is 1 to 2; and said developer containing potassium ion and sodium ion in a ratio of potassium ion to the sum of potassium and sodium ion of not less than about one-half.

4,108,663

PHOTOGRAPHIC DEVELOPING AGENTS, PROCESS FOR DEVELOPING USING SAME, AND LIGHT-SENSITIVE MATERIALS CONTAINING SAME

Mitsugu Tanaka; Masaki Okazaki; Toshiaki Aono, and Takeshi Hirose, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

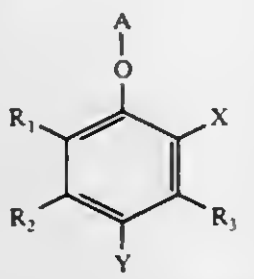
Filed Nov. 3, 1976, Ser. No. 738,420

Claims priority, application Japan, Nov. 7, 1975, 50-133693

Int. Cl.^{2} G03C *3/00, 1/48, 1/06, 5/30*

U.S. Cl. 96—74 **12 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, with a layer of the photographic material containing a photographic developing agent represented by the formula (I):



(I)

wherein one of X and Y is a group which inhibits development on release immediately after a developing agent is oxidized at development and is connected to the benzene ring in the agent represented by formula (I) by a sulfur, selenium or nitrogen atom, and the other of X and Y is an —NH—SO_2—Z group wherein Z is an alkyl group, an aryl group, or a heterocyclic group; A is a hydrogen atom or a group hydrolyzable under alkaline conditions; R_1, R_2 and R_3, which can be the same or different, each is a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, an —S—Z' group wherein Z' is an alkyl group, an aryl group or a heterocyclic group, an —NH—SO_2—Z" group wherein Z" is an alkyl group, an aryl group or a heterocyclic group, an acylamido group, an amino group, a halogen atom, a hydroxy group, or an acyloxy group; and R_1 and R_2 further may combine to form a ring.

4,108,664

LIGHT-SENSITIVE NEGATIVE-WORKING FILM CONTAINING A DIAZO OXIDE SENSITIZER AND A P-TOLUENESULFONYL HALIDE OR A 2,4-DIHALO-S-TRIAZINE

Henri G. J. de Boer, Delft; Gerrit van der Breggen, Krommenie, and Anton Wemmers, Den Hoorn (Delft), all of Netherlands, assignors to GAF Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,566

Int. Cl.^{2} G03C *1/52*

U.S. Cl. 96—75 **2 Claims**

1. A light-sensitive negative working diazo type film comprising:

a. a support,

b. a carrier coating thereon, and,

c. a light-sensitive layer including a diazo oxide sensitizer and an additive therefor, wherein said additive is p-toluenesulfonylchloride or 2,4-dichloro-6-(4'-hydroxyphenyl-amino)-S-triazine, the proportions of sensitizer to additive being about 5–15 parts by weight to about 1–15 parts by weight, respectively.

4,108,665

STABILIZERS FOR PHOTOTHERMOGRAPHIC CONSTRUCTIONS

Gustav Gutman, Maplewood, and Edward Goettert, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 7, 1976, Ser. No. 730,678

Int. Cl.^{2} G03C *1/02, 5/30, 5/24, 1/34*

U.S. Cl. 96—114.1 **5 Claims**

1. A photothermographic imaging layer comprising a reducible silver source, photographic silver halide in catalytic proximity to said silver source, a reducing agent for silver ion, and a binder, said imaging layer being further characterized by the presence of a stabilizing amount of at least one compound selected from

$CRBr_2CR^1R^2R^3$

wherein

R is Br or Cl,
R^1 is independently H, alkyl, phenyl, or naphthyl,
R^2 is independently H, alkyl or phenyl, and
R^3 is OH, alkoxy, trihydrocarbylsiloxy, carbamate, sulfonate, carbonate, phosphate, or carboxylate.

4,108,666

MONOFUNCTIONAL MONOMER-CONTAINING PHOTOSENSITIVE COMPOSITION FOR PHOTORESIST

Nobuyuki Hayashi; Asao Isobe; Katsushige Tsukada, and Toshiaki Ishimaru, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1976, Ser. No. 665,883

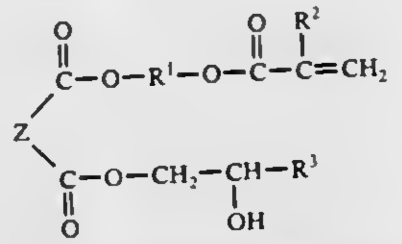
Claims priority, application Japan, Apr. 11, 1975, 50-44719

Int. Cl.^{2} G03C *1/68*

U.S. Cl. 96—115 P **14 Claims**

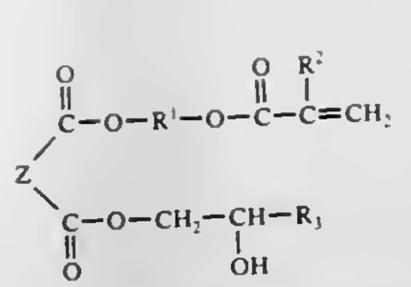
1. A photosensitive composition for a photoresist which comprises (A) a compound having the following general formula:

(t)



wherein Z is a cyclic dibasic acid anhydride moiety, R^1 is an alkylene group having 1 to 3 carbon atoms, R^2 is hydrogen or methyl, and R^3 is hydrogen, methyl, ethyl or —CH_2X in which X is chlorine or bromine, (B) a photopolymerization sensitizer, (C) a polymer capable of giving a film-forming property, (D) a chain transfer agent having a chain transfer constant of more than 10 liters/mole.sec. to polymethyl methacrylate radical at 60° C and (E) a thermal polymerization inhibitor.

8. A laminated photosensitive element for a photoresist which comprises a flexible support and a substantially dry photosensitive layer thereon comprising (A) a compound having the following general formula:



wherein Z is a cyclic dibasic acid anhydride moiety, R^1 is an alkylene group having 1 to 3 carbon atoms, R^2 is hydrogen or methyl, and R^3 is hydrogen, methyl, ethyl or —CH_2X in which X is chlorine or bromine, (B) a photopolymerization sensitizer, (C) a polymer capable of giving a film-forming property, (D) a chain transfer agent and (E) a thermal polymerization inhibitor.

4,108,667

PHOTOGRAPHIC COMPOSITIONS AND ELEMENTS CONTAINING BENZO[A]QUINOLIZINIUM METHINE DYES

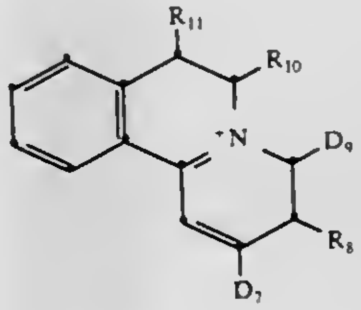
Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 556,499, Mar. 7, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,873

Int. Cl.^{2} G03C *1/16*

U.S. Cl. 96—131 **4 Claims**

1. A light sensitive silver halide composition spectrally sensitized with a cyanine or merocyanine dye wherein one of the nucleu of said dye is a benzo[a]quinolizinium nucleus or a 6,7-dihydrobenzo[a]quinolizinium nucleus, said cyanine or merocyanine dye being represented by the structural formula:



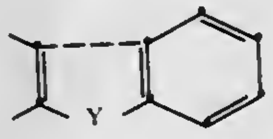
where

- D_7 and D_9 are, independently, lower alkyl, aryl or the atoms required to complete a cyanine dye having a second nucleus selected from the group consisting of a thiazole nucleus, an oxazole nucleus, a selenazole nucleus, a thiazoline nucleus, a quinoline nucleus, an indole nucleus, a pyridine nucleus, an imidazole nucleus and an imidazoquinoxaline nucleus;
  - or a merocyanine dye having a second nucleus selected from the group consisting of a 2-pyrazolin-5-one nucleus, a pyrimidine nucleus, a rhodanine nucleus, a hydantoin nucleus, a thiohydantoin nucleus and an oxazolidinedione nucleus;

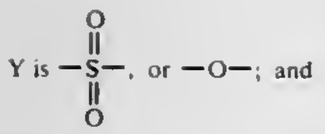
provided that at least one of D_7 and D_9 represents the atoms required to complete a cyanine or merocyanine dye;

R_8 is hydrogen, lower alkyl or aryl; or

R_8 and D_9, taken together, complete a fused carbocyclic ring of 5 or 6 carbon atoms or a fused ring having the structure

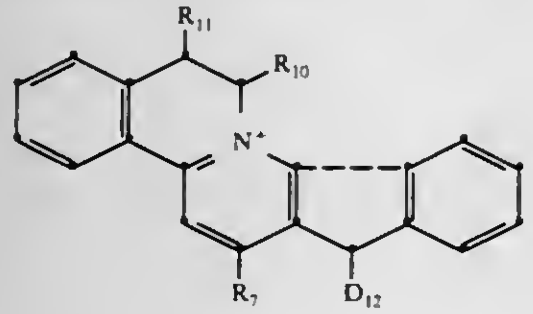


where



Y is $-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-$, or —O—; and

R_{10} and R_{11} are each hydrogen or together form a double bond or a fused benzene ring; or



where
R_7 is lower alkyl or aryl;
R_{10} and R_{11} are each hydrogen or together form a double bond or a fused benzene ring; and
D_{12} represents the atoms required to complete a cyanine dye having a second nucleus selected from the group consisting of a thiazole nucleus, an oxazole nucleus, a selenazole nucleus, a thiazoline nucleus, a quinoline nucleus, an indole nucleus, a pyridine nucleus, an imidazole nucleus and an imidazoquinoxaline nucleus; or a merocyanine dye having a second nucleus selected from the group consisting of a 2-pyrazolin-5-one nucleus, a pyrimidine nucleus, a rhodanine nucleus, a hydantoin nucleus, a thiohydantoin nucleus and an oxazolidinedione nucleus.

4,108,668

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Kaiichiro Sakazume; Noboru Fujimori; Eiichi Sakamoto, all of Hino, and Hidehiko Ishikawa, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 504,952, Sep. 11, 1974, abandoned. This application Apr. 29, 1977, Ser. No. 792,125

Claims priority, application Japan, Sep. 13, 1973, 48-102610

Int. Cl.^{2} G03C *1/18*

U.S. Cl. 96—135 **10 Claims**

1. A light sensitive silver halide photographic material containing at least one sensitizing dye selected from the group consisting of:

(1) 1′-Carbamoylmethyl-3-ethyl-6,7-benzothia-4′-carbocyanine chloride,
(2) 1′-Carbamoylmethyl-3-ethyl-4,5-benzothia-4′-carbocyanine iodide,
(3) 1′-Carbamoylmethyl-3-ethyl-6-methoxy-4,5-benzothia-4′-carbocyanine chloride,
(4) 1′-Carbamoylmethyl-3-ethyl-6′-methyl-4,5-benzothia-4′-carbocyanine chloride,
(5) 1′-Carbamoylmethyl-3-ethyl-6′-methoxy-4,5-benzothia-4′-carbocyanine chloride,
(6) 1′-Diethylcarbamoylmethyl-3-ethyl-4,5-benzothia-4′-cyanine iodide,
(7) Anhydro-1′-carbamoylmethyl-3-(3-sulfopropyl)-5,6-benzothia-4′-carbocyanine hydroxide,
(8) 1′-Carbamoylmethyl-3-ethyl-6,7-benzoselena-4′-carbocyanine chloride, and
(9) 1′-Carbamoylmethyl-3-ethyl-4,5-benzoxa-4′-carbocyanine iodide.

4,108,669

SNOW AND ICE CONTROL COMPOSITION

Joseph V. Otrhalek, Dearborn, and Gilbert Stephen Gomes, Southgate, both of Mich., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Jan. 3, 1977, Ser. No. 756,180

Int. Cl.^{2} C09K *3/18*

U.S. Cl. 106—13 **4 Claims**

1. A snow and ice control composition comprising a particulate calcined montmorillonite clay having a particle size in the range of from about 0.25 mm to about 5 mm, which contains from about 1 to about 20 percent by weight ammonium nitrate and from about 5 to about 9 percent by weight water.

4,108,670

POROUS REFRACTORY METAL BORIDE ARTICLE HAVING DENSE MATRIX

Roger A. Steiger, Canal Fulton, Ohio, and Frederick G. Stroke, McMurray, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,031

Int. Cl.^{2} G01B *35/04*

U.S. Cl. 106—40 R **6 Claims**

1. A cold pressed and sintered refractory Group IVb metal diboride article having an overall density of between about 50 and 90 percent of the theoretical density of the metal diboride and a matrix of at least 95 percent of the theoretical density, the matrix having a microstructure characterized by predominantly contiguous grain boundaries and a fine grain size, the article having between about 5 and 50 percent of its volume in pores of between 4 and 1000 microns in nominal sectional diameter.

4,108,671

DYE-BASED INKS WITH IMPROVED VEHICLES

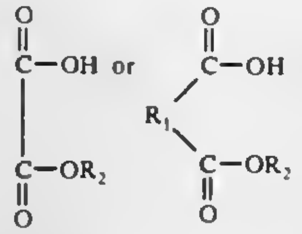
Milton Richlin, 6416 Dorcas St., Philadelphia, Pa. 19111

Filed Apr. 12, 1976, Ser. No. 676,047

Int. Cl.^{2} C09D *11/00*

U.S. Cl. 106—22 **7 Claims**

1. In an ink consisting of a dye and an improved vehicle therefor, the improvement consisting of an improved organic vehicle composed of compounds having the following molecular structure:



where R_1 is an alkyl, alkenyl or aryl group and R_2 is an ester moiety from the group consisting of alkyl, alkenyl or aryl group, with a minimum of one carbon atom, and which may include one or more substituents from the group consisting of —(OH), and —(O).

4,108,672

ALUMINA CORE FOR CASTING DS MATERIALS

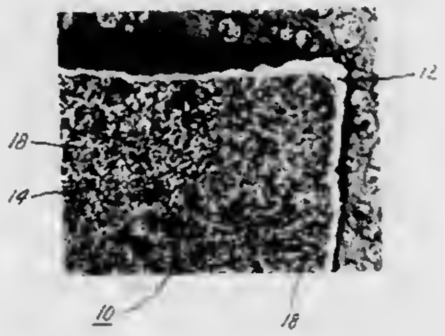
Frederic J. Klug, Amsterdam, and Wayne D. Pasco, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,981

Int. Cl.^{2} B28B *7/30, 7/34*

U.S. Cl. 106—38.9 **6 Claims**

1. A core suitable for use in investment casting comprising
a shaped body of ceramic material including a central portion and an integral outer portion enclosing the central portion therein,
the ceramic material of the central portion is characterized by a porous microstructure, wherein the porosity content is greater than 20 percent by volume, and is characteristic of grains which have undergone vapor phase transport action, and



the ceramic material of the integral outer portion is characterized by a dense layer of the same ceramic material as that of the central portion.

4,108,673

OPTICAL PHOSPHATE GLASS IN WHICH THE LENGTH OF THE LIGHT PATH IS TEMPERATURE INDEPENDENT

Hisayoshi Toratani, Hidaka, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,336

Claims priority, application Japan, Dec. 22, 1976, 51-155374

Int. Cl.^{2} C03C *3/16*

U.S. Cl. 106—47 Q **1 Claim**

1. A phosphate optical glass having an Abbe number in the range of 51 to 33, a refractive index (*nd*) of 1.57 to 1.68, and whose length of the light path is substantially independent of temperature, consisting essentially of in % by weight,

P_2O_5	27 – 55
K_2O	6 – 26
BaO	10 – 50
K_2O + BaO	larger than 35
Al_2O_3	2 – 15
$TiO_2 + Nb_2O_5 + Ta_2O_5$	4 – 20
TiO_2	0 – 14
Nb_2O_5	0 – 20
Ta_2O_5	0 – 7
B_2O_3	0 – 5
Li_2O	0 – 2
Na_2O	0 – 5
MgO	0 – 6
CaO	0 – 8
SrO	0 – 10
ZnO	0 – 10
PbO	0 – 13, and
As_2O_3	0 – 2 .

4,108,674

PHOTOTROPIC OPTICAL GLASS

Georg Gliemeroth, Finthen, Fed. Rep. of Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 541,671, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,437, Aug. 9, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,046

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1974, 2404752

Int. Cl.^{2} C03C *3/26*

U.S. Cl. 106—53 **5 Claims**

1. A phototropic glass having the following starting composition in weight percent:

SiO_2	12.1 to 13.9
P_2O_5	30.4 to 33.9
$Al_2)O_3$	22.5 to 25.7
ZrO_2	1.0 to 2.6
Na_2O	3.0 to 7.5
K_2O	5.3 to 10.5
CaO	3.1 to 5.0
BaO	3.1 to 7.0
SrO	0 to 0.5
PbO	0.4 to 2.5
TiO_2	0.0 to 0.6
La_2O_3	0.00 to 2.0
Ag_2O	0.10 to 1.0
CuO	0 to 0.1

and at least one halogen selected from the group consisting of bromine and chlorine in an amount sufficient to provide upon analysis 0.2-1.0 wt.% of bromine plus chlorine in the glass, said glass upon analysis containing 0.05–0.5 wt.% Ag calculated as Ag_2O, the sum of the alkali earth oxides being 8.6–12.5 wt.%, the sum of the alkali oxides being 11.2–16.2 wt.%, wherein:
the glass contains as the essential phototropic agent a non-crystalline separation phase rich in said silver and said halogen, said silver-rich and halogen-rich, non-crystalline phase separations having a diameter between 40 and 350 A; compared to said non-crystalline separation phase, less than 10% thereof being present in a silver halide crystalline phase; the glass shows substantially no devitrification in the range between 10^1 and 10^5 poises;
the glass has a refractive index n_d between 1.5225 and 1.5238, a linear thermal expansion coefficient between 20° and 300° C of from about 99 to about 105×10^{-7} per degree C, and a sufficient chemical stability, characterized by a titration value in accordance with DIN 12,111 of less than 0.2 ml HC1, and ophthalmic pressing thereof can be made by normal production procedures for such pressings;
the glass can be strengthened chemically by ion exchange in a medium containing potassium ions at a temperature below $10^{14.5}$ poises, whereupon alkali ions smaller than potassium diffuse out of the glass;
and the glass has sufficient of said non-crystalline separation phase to possess the following phototropic properties, as determined by monochromatic transmissions at 545 nm, with excitation by an unfiltered xenon light of an intensity of 2 cal cm^{-2} min^{-1}, at a temperature of 20° C, on 2 mm thick specimens of the glass; a darkening of at least 50% transmission difference and a regeneration of the transmission after 10 minutes of at least 20% after the end of the illumination.

4,108,675

BRICK FOR SLIDING CLOSURE OF VESSEL FOR HOLDING MOLTEN METAL

Yoshimori Tomita, Tajimi; Hideyoshi Ozeki, Gifu, and Hisashi Takashima, Tajimi, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 651,143, Jan. 21, 1976, abandoned. This application May 11, 1977, Ser. No. 795,904

Claims priority, application Japan, Jan. 29, 1975, 50-11400

Int. Cl.^{2} C04B *35/52*

U.S. Cl. 106—56 **10 Claims**

1. In a vessel for holding molten metal which comprises an outlet having a slide closure in the form of a brick, the improvement comprising a brick which is impermeable to said molten metal and is made by forming and subjecting to reducing-burning a composition comprising an acid or neutral refractory material as a base material, 3 to 10% of graphite powder, and a binding agent selected from the group consisting of clay; tar; pitch; a mixture of tar and pitch; lignin; ammonium alginate; and phenolic resins.

4,108,676
MIXED OXIDE COMPOUNDS FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,758

Int. Cl.² C01F *17/00, 7/02;* **C04B** *35/44, 35/50*

U.S. Cl. 106—65 **2 Claims**

1. A ceramic article suitable for use in the casting and directional solidification of advanced superalloy materials comprising

a mixed oxide compound material $La_2O_3 . 11Al_2O_3$, and

a porosity content which is from about 10 percent by volume to about 70 percent by volume.

4,108,677
PROCESS FOR TREATING WASTE SLUDGE FROM COMBUSTION PLANT DESULFURIZATION UNITS AND CEMENTITIOUS PRODUCT OF THE PROCESS

Richard E. Valiga, 1927 Queen's Wood Dr., York, Pa. 17403

Continuation-in-part of Ser. No. 610,269, Sep. 4, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,510

Int. Cl.² C04B *11/00*

U.S. Cl. 106—109 **7 Claims**

1. A method for hardening inorganic aqueous waste sludge which comprises as its non-aqueous ingredient calcium salts selected from the class consisting of calcium sulfate and calcium sulfite and wherein at least 30 percent by weight of the solids are calcium sulfite hemihydrate, including the steps of:

(1) thickening the said sludge by removing at least a portion of the liquid content;

(2) withdrawing a first portion of the thickened sludge, removing volatile liquids from the said first portion and calcining the residual solids from said first portion at 250° to 650° C to produce a dry, calcined intermediate product which comprises essentially dry, cementitious ingredients selected from the class consisting of calcium sulfate soluble anhydrite, calcium sulfate anhydrite and anhydrous calcium sulfite;

(3) withdrawing a second portion of the thickened sludge, and

(4) mixing the said partially dewatered sludge and at least a portion of the said intermediate product to produce a hardenable product.

4,108,678
RELEASE AGENT AND METHOD

Bernard F. Szuhaj, Lombard, and Joseph R. Yaste, Hoffman Estates, both of Ill., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Jan. 12, 1977, Ser. No. 758,716

Int. Cl.² C08L *91/00*

U.S. Cl. 106—243 **4 Claims**

1. A method of preparing a sprayable pan release product comprising mixing lecithin and a tri-glycol ester having fatty acid chains of from 6 to 12 carbon atoms at a temperature sufficient to form a solution thereof, cooling the mixture to about 90° F., adding thereto an alcohol, said alcohol being present in an amount of about 20% to about 25% of the weight of said product, said lecithin being present in the range of about 5% to about 30% with the remainder being a member selected from the class consisting of said tri-glycol ester and a mixture of said tri-glycol ester and a second tri-glycol ester having fatty acid chains of from 16 to 18 carbon atoms, and thereafter placing the mixture in a mechanical dispensing container whereby dispensing is achieved without the use of an aerosol propellant.

4,108,679
PIGMENT COMPOSITION CONTAINING ELEMENTAL CARBON AND PROCESS OF MAKING THE SAME

Michael F. Szczepanik, Allen Park; Joseph F. Sryniawski, Lincoln Park; Adolph Busseman, Detroit, and Robert D. Shannon, Ann Arbor, all of Mich., assignors to Ebonex Corporation, Melvindale, Mich.

Filed Nov. 22, 1976, Ser. No. 744,187

Int. Cl.² C09C *1/48*

U.S. Cl. 106—307 **2 Claims**

1. A process of manufacturing a composition of matter comprising the steps of forming a dry mixture of elemental carbon having a finely particulate structure on the order of 1/100 micron in diameter; a particulate filler of a particle size on the order of 50 to 100 microns in diameter, said elemental carbon particles comprising from 5 – 50% by weight of said mixture; grinding said mixture to reduce the diameter of the filler particles to a size in the range of 1 – 20 microns and produce a deposition of said elemental carbon particles upon the outer surface of said filler particles.

4,108,680
PROCESS FOR REMOVING CALCIUM OXALATE SCALE

James W. Barr, Jr., Rothschild, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 642,452, Dec. 19, 1975, abandoned. This application Mar. 16, 1977, Ser. No. 777,968

Int. Cl.² B08B *3/08*

U.S. Cl. 134—3 **4 Claims**

1. A process for removing calcium oxalate scale from a metal surface of an apparatus used for thermal treatment of aqueous solutions and suspensions which comprises contacting said scale with an aqueous suspension containing from 3% to 25% by weight of nitric acid and from 1% to 10% by weight of manganese dioxide, at a temperature between 20° C. and 95° C., said metal surface being one for which the rate of corrosion caused by said suspension is less than about 30 mils of penetration per year.

4,108,681
METHOD FOR DISSOLVING ASPHALTIC MATERIAL

Michael B. Lawson, and Kenneth J. Snyder, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 607,653, Aug. 25, 1975, Pat. No. 4,033,784. This application May 9, 1977, Ser. No. 794,768

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.² B08B *3/08*

U.S. Cl. 134—20 **18 Claims**

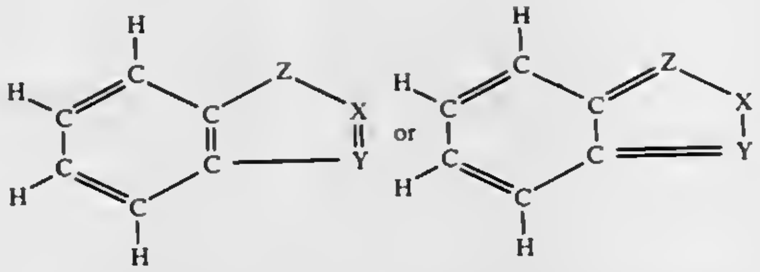
1. A method for dissolving asphaltic material comprising:

establishing contact between said asphaltic material and a composition comprising a liquid aromatic solvent and an additive material soluble in said liquid aromatic solvent, and

maintaining said contact for a time sufficient to dissolve said asphaltic material;

wherein said liquid aromatic solvent has a flash point of at least about 160° F and is a mixture of aromatic compounds selected from alkyl substituted benzene compounds having 1 to 10 carbon atoms per alkyl substituent, naphthalene, and alkyl substituted naphthalene having 1 to 10 carbon atoms per alkyl substituent; and

wherein said additive material is selected from fused heterocyclic ring compounds, alkyl substituted derivatives of said fused heterocyclic ring compounds and mixtures thereof: wherein said fused heterocyclic ring compounds are represented by the general formulae:



and wherein Z, X and Y are selected from nitrogen atoms, oxygen atoms, nitrogen-hydrogen groups and carbon-hydrogen groups wherein at least one of said Z, X, and Y must be nitrogen and wherein said additive is present in said composition in the range of from about 0.1 to about 50 percent by weight of said liquid aromatic solvent, and further

wherein said additive material is not benzotriazole.

4,108,682
PROCESS FOR FLUIDIZED CONTACT

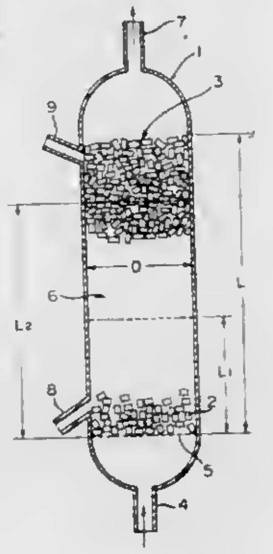
Hiroo Takeda, Kawasaki; Takesbi Kanda, Sagamihara; Yutaka Oguchi, Tokyo, aod Naomasa Asano, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Continuation of Ser. No. 521,030, Nov. 5, 1974, abandoned. This application Sep. 14, 1976, Ser. No. 723,300

Claims priority, application Japan, Nov. 7, 1973, 48/124550; Sep. 25, 1974, 49/109605

Int. Cl.² B01J *8/20, 8/22, 8/34*

U.S. Cl. 134—25 R **10 Claims**



1. A process for fluidized contact by contacting a liquid intimately with solid particles in a contacting vessel, which comprises forming a porous packed bed in at least a part of a contact zone of said contacting vessel by filling the contact zone with a porous packing, accommodating the solid particles in the lower part of the contact zone, introducing the liquid from the bottom of the contacting vessel to form a fluidized layer of solid particles within the contact zone, the upper end of the layer of the solid particles expanded by the fluidization being located within the porous packed bed, and withdrawing the liquid which has made contact from the upper part of the contacting vessel, said contact being performed under the following conditions:

(1) the ratio of superficial volume occupied by the porous packed bed to real volume of the porous packing is at least 1.3,

(2) the ratio of the average pore diameter of the pores of the porous packing to the average particle diameter of the solid particles is 1.1 to 10.0,

(3) $L_2/L = 0.3 - 0.9$ wherein L is the length of the contact zone extending from the bottom of the fluidized layer of solid particles to the top of the porous packed bed, and L_2 is the height of the fluidized layer of solid particles when they are in fluidization, and

(4) $U_{fl} < U_l < 12.0$ (cm/sec.) wherein U_l is the superficial liquid velocity in the contact zone based on the empty cross-section of the contacting vessel and U_{fl} is the minimum fluidization velocity of solid particles caused by the liquid.

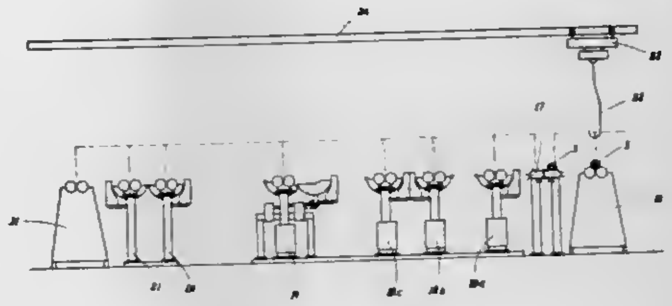
4,108,683
METHOD FOR AUTOMATICALLY PROCESSING PHOTOGRAVURE CURVILINEAR SURFACES

James K. Anderson, 1110 Rostrevor, Louisville, Ky. 40205

Continuation-in-part of Ser. No. 577,898, May 15, 1975, which is a continuation of Ser. No. 392,475, Aug. 29, 1973, abandoned. This application Sep. 10, 1976, Ser. No. 722,015

Int. Cl.² B41C *1/18*

U.S. Cl. 134—27 **6 Claims**



1. A method for processing photogravure curvilinear surfaces comprising the steps of:

placing a first photogravure curvilinear surface onto an etching station;

rotating said first surface and simultaneously therewith spraying an etching solution thereon for a preselected period of time;

removing said first surface from said etching station, then placing said first surface onto an etch terminating station;

rotating said first surface and simultaneously therewith spraying an etch terminating solution thereon for a preselected period of time; and,

removing said first surface from said etch terminating station, the time of residence of said surface at each of said stations being generally the same thereby prompting the sequential continuous movement of surfaces from station to station.

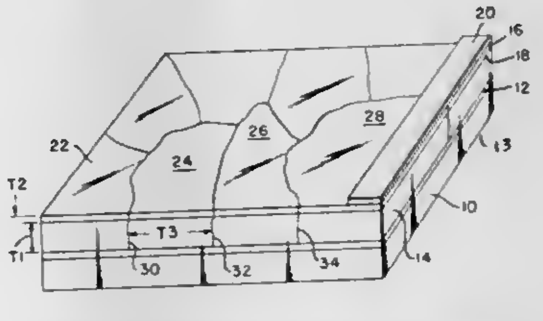
4,108,684
LARGE GRAIN THIN FILM POLYCRYSTALLINE P-INP/N-CDS SOLAR CELL

Kenneth W. Zanio, Agoura, and Lewis M. Fraas, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 735,560, Oct. 26, 1976. This application Sep. 29, 1977, Ser. No. 838,032

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 TF **2 Claims**



1. In a solar cell having adjacent layers of P and N type polycrystalline semiconductor material which define a PN junction boundary, the improvement comprising a layer of

N-type polycrystalline cadmium sulfide disposed on a chosen substrate material and having large grains with lateral grain boundaries on the order of about 20 micrometers or greater, and a layer of polycrystalline P-type indium phosphide disposed on said layer of polycrystalline cadmium sulfide and having a thickness on the order of between 1.0 and 4.0 micrometers and further having large replicated grain boundaries with lateral dimensions and spacings approximately the same as the lateral dimensions and spacings of said large grains of cadmium sulfide, whereby the lateral grain dimensions in said cadmium sulfide and indium phosphide layers are maximized while the quantity of indium in said solar cell is minimized.

4,108,685

SEMICONDUCTOR DEVICE MANUFACTURE

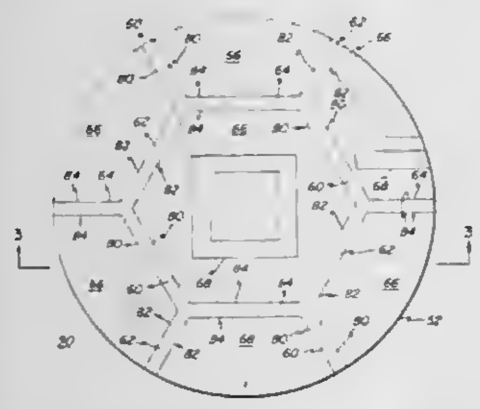
Mike F. Chang, Liverpool; Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 665,276, Mar. 9, 1976, Pat. No. 4,040,868. This application Mar. 31, 1977, Ser. No. 783,167

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.^{2} H01L *21/225*

U.S. Cl. 148—1.5 **34 Claims**



1. An improved method for migrating a melt of aluminum-rich semiconductor material through a solid body of the semiconductor material including the process steps of:

(a) selecting a body of single crystal semiconductor material, wherein the semiconductor material is one selected from the group consisting of silicon, silicon carbide, germanium and gallium arsenide, and having two major opposed surfaces comprising the top and bottom surfaces thereof, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least one of the major surfaces which is one selected from the group consisting of **(111)**, **(100)** and **(110)**, a vertical axis substantially perpendicular to the opposed major surfaces, and a first preferred crystal axis substantially parallel with the vertical axis and substantially perpendicular to the opposed major surfaces;

(b) vapor depositing a layer of aluminum metal on the major surface having a preferred planar crystal orientation, the layer having a preferred width and a preferred thickness and so oriented as to form at least one aluminum metal wire having a longitudinal axis substantially aligned parallel with a second preferred crystal axis of the crystal structure of the material of the body;

(c) heating the body and the layer of aluminum metal to an elevated temperature of from about 577° C to about 660° C for a predetermined period of time sufficient to alloy the aluminum metal of the layer to at least that portion of the semiconductor material of the major surface of the body in contact therewith;

(d) heating the body and the alloyed aluminum metal wire to a predetermined elevated temperature sufficient to form a melt of aluminum-rich semiconductor material on the surface of the body;

(e) establishing a temperature gradient substantially parallel to the vertical axis of the body and the first axis of the crystal structure; and

(f) migrating the melt of aluminum-rich semiconductor material through the solid body, substantially aligned with the first axis of the crystal structure, to a predetermind depth beneath that major surface to form a planar region of recrystallized material of the body having solid solubility of the aluminum metal of the layer therein.

4,108,686

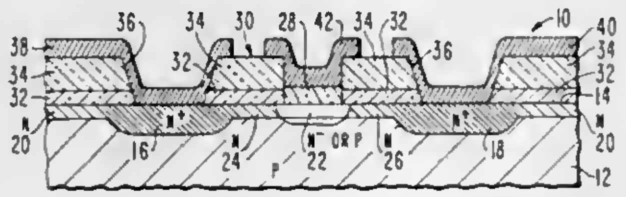
METHOD OF MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR BY IMPLANTED DOUBLE COUNTERDOPING

Lewis Alfred Jacobus, Jr., Middlesex, N.J., assignor to RCA Corp., New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,065

Int. Cl.^{2} H01L *7/54, 29/78*

U.S. Cl. 148—1.5 **7 Claims**



1. A method of making an insulated gate field effect transistor in a body of semiconductor material of one type conductivity and having a surface, said transistor having a channel region of predetermined length adjacent to said surface comprising the steps of

forming a source region and a drain region each having a conductivity type opposite that of said body in said body adjacent to said surface, said regions having a predetermined distance therebetween greater than said predetermined length

forming a zone having a conductivity type opposite to that of said body in said body adjacent to said surface, said zone extending between and being less conductive than said regions,

forming said channel region by introducing conductivity modifiers of said one type into said zone over said predetermined length to convert that portion of said zone toward said one type conductivity, forming a gate insulator on said channel region, and forming a conductive gate on said gate insulator.

4,108,687

PROCESS FOR IMPROVING THE HEAT RESISTANCE OF ZIRCONIUM AND ITS ALLOYS

Marcel Armand, and Daniel Charquet, both of Albertville, France, assignors to Ugine Aciers, Paris, France

Filed Dec. 2, 1976, Ser. No. 746,950

Claims priority, application France, Dec. 12, 1975, 75 39403

Int. Cl.^{2} C22F *1/18*

U.S. Cl. 148—2 **7 Claims**

1. In a process for improving the mechanical and corrosion resistance properties under heat of zirconium and zirconium alloys including up to about 3% hafnium by weight as an impurity and alloying elements selected from the group consisting of Fe, Cr, Ni, Mo, Cu, V, Sn and Nb, and wherein the zirconium or zirconium alloys comprise a significant portion of α phase within the temperature range of 830° to 950° C and which contain between about 150 and 400 ppm of carbon to strengthen the resistance to creep, the improvement comprising: casting the zirconium and zirconium alloys into ingots; effecting carbon solubilization by thermal or themo-mechanical treatment of said zirconium and zirconium alloys within said temperature range during transformation of the ingot into an intermediate product shape wherein a significant portion of α phase is present to solubilize at least a part of the carbon; subsequently transforming the intermediate product shape to a finished product shape by carrying out a further reduction of the intermediate product in the α temperature range to effect ingot dimension reduction of at least about 50%; and annealing the finished product in the α temperature range.

4,108,688

CAST ALUMINUM PLATE AND METHOD THEREFOR

Irwin Broverman, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 30, 1976, Ser. No. 728,366

Int. Cl.^{2} C22F *1/04;* C22C *21/08*

U.S. Cl. 148—3 **16 Claims**

1. An essentially unworked aluminum alloy plate at least 6 inches thick formed from an aluminum alloy consisting essentially of about 3.8-6.0% magnesium, up to 1.0% manganese, silicon as an impurity or as an alloying addition in amounts greater than 0.05% but less than 0.50%, less than 0.50% iron, less than 0.3% copper, less than 0.4% chromium, less than 0.4% zinc and the balance aluminum and inconsequential amounts of other elements, said plate having been D.C. cast directly to size and characterized by having coarse, script-like Mg_2Si eutectic which forms during casting and then said plate having been homogenized at a temperature between about 1020° F and about 1070° F for at least 12 hours to dissolve part of the coarse, script-like Mg_2Si eutectic into the aluminum matrix and transform the remaining coarse, script-like Mg_2Si eutectic to an agglomerated, spherically shaped constituent having a particle size less than 25 microns in maximum dimension, and said plate characterized by exhibiting after fusion welding essentially no microcracks in the heat-affected zone of the plate which forms during welding due to the existence of coarse, script-like Mg_2Si eutectic which forms during casting.

6. A method of preparing an essentially unworked aluminum alloy plate at least 6 inches thick which exhibits essentially no microcracks in the heat-affected zone of said plate when fusion welded due to the existence of coarse, script-like Mg_2Si eutectic which forms during casting comprising the steps of

(a) preparing a molten aluminum alloy consisting essentially of about 3.8-6.0% magnesium, up to 1.0% manganese, silicon as an impurity or an alloying addition in amounts greater than 0.05% but less than 0.50%, less than 0.50% iron, less than 0.3% copper, less than 0.4% chromium, less than 0.4% zinc and the balance aluminum and inconsequential amounts of other elements,

(b) D.C. casting the molten alloy directly to the desired plate size at least 6 inches thick, said plate having coarse, script-like Mg_2Si eutectic which forms during casting, and

(c) homogenizing the D.C. cast aluminum alloy plate at a temperature between about 1020° F and about 1070° F for at least 12 hours, said homogenization dissolving part of the coarse, script-like Mg_2Si eutectic into the aluminum matrix and transforming the remaining coarse, script-like Mg_2Si eutectic to an agglomerated, spherically shaped constituent having a particle size less than 25 microns in maximum dimension.

4,108,689

PROCESS FOR IMPROVING THE SURFACES OF ROLLER BODIES AND BALLS

Wolfgang Peter, Hegnach; Heinz Koch, Fellbach, and Alfred Stubenvoll, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 475,984, Jun. 3, 1974, abandoned. This application Oct. 14, 1976, Ser. No. 732,352

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1973, 2329576

Int. Cl.^{2} C23F *7/10*

U.S. Cl. 148—6.15 R **11 Claims**

1. A process for improving steel surfaces in mutual sliding contact, that have already been treated to obtain minor peak-to-valley height which comprises the steps of degreasing the steel surfaces in a mildly alkaline, aqueous degreasing bath at a pH of about 7 to 10; rinsing the degreased surfaces with cold tap water; browning the surfaces for about 15 to 20 minutes at approximately 128° to 135° C. in a single bath of a saturated aqueous solution of a salt material having approximately the following composition:

80-90% by weight of sodium hydroxide (NaOH)

5-15% by weight of sodium nitrite ($NaNO_2$), and

3-10% by weight of sodium phosphate, dibasic (Na_2HPO_4); and rinsing the surfaces subsequently again with cold tap water.

4,108,690

METHOD FOR PRODUCING AN AMORPHOUS, LIGHT WEIGHT CALCIUM PHOSPHATE COATING ON FERROUS METAL SURFACES

Ferdinand P. Heller, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 674,024, Apr. 5, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 764,096

Int. Cl.^{2} C23F *7/10*

U.S. Cl. 148—6.15 R **14 Claims**

1. A method of producing an amorphous, light weight, tightly adherent calcium phosphate coating on a ferrous metal surface comprising applying, at a temperature of from about 50° F to about 160° F., to a metal surface a coating from an aqueous coating solution consisting of an aqueous solution of calcium phosphate and an oxidizing agent, in which the calcium phosphate is present in an amount of from about 0.01 to about 1.0 moles per liter as measured by the Ca^{++} cation and in which the pH of the solution is between about 3.0 and about 4.2 and said pH is as close as possible to, but does not exceed, the saturation pH of the calcium phosphate at said concentration and said temperature.

4,108,691

ALUMINIUM BASE ALLOYS

Michael James Stowell, Saffron Walden, and Brian Michael Watts, Kedington, both of England, assignors to T.I. (Group Services) Limited, Edgbaston, England

Filed Oct. 28, 1976, Ser. No. 736,745

Claims priority, application United Kingdom, Oct. 29, 1975, 44672/75

Int. Cl.^{2} C22F *1/04*

U.S. Cl. 148—11.5 A **10 Claims**

1. A method of preparing a superplastically deformable aluminium base alloy, in which an aluminium alloy consisting essentially of aluminum and from 2 to 8.5% by weight magnesium and from 0.4 to 1% chromium together with optional minor alloying elements and normal impurities is subjected to hot and cold plastic deformation whereby there is produced in the alloy a stable finely dispersed phase comprising aluminum magnesium and chromium.

4,108,692

ROCK BIT ROLLER CUTTER AND METHOD THEREFOR

John R. Quinlan, Buena Park, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

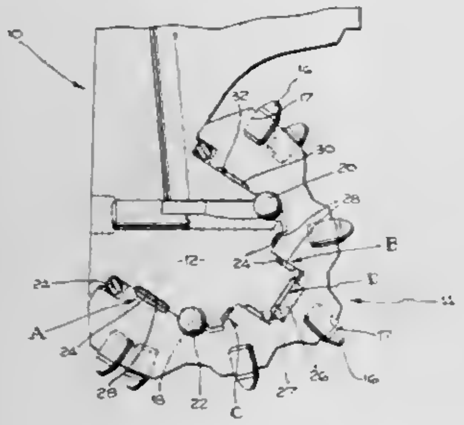
Continuation of Ser. No. 540,440, Jan. 13, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,025

Int. Cl.^{2} C21D *9/22*

U.S. Cl. 148—12.3 **6 Claims**

1. In the manufacture of rock bit roller cutters to be mounted on friction journals, wherein a cutter comprises a roller body having pural peripherally distributed holes, and hard metal inserts press-fitted into said holes in outwardly projecting relation, the steps of forming the roller body of a maraging steel comprising a nickel-cobalt alloy, forming said body holes

therein, then age-hardening the roller body to a hardness of not less than 50 R_c under conditions maintaining dimensions of the



formed holes and thereafter press-fitting hard metal inserts into said roller body holes.

4,108,693

METHOD FOR THE HEAT-TREATMENT OF STEEL AND FOR THE CONTROL OF SAID TREATMENT

Mathurin L'Hermite, Versailles; Raymond Le Bossenec, Fontenay-le-Fleury; Pierre Godart, Plaisir, and François Pierrard, Versailles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 534,301, Dec. 19, 1974, Pat. No. 4,035,203. This application Jun. 1, 1977, Ser. No. 802,521

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.² C21D *1/48*

U.S. Cl. 148—16.5 7 Claims

1. A method of heat treatment of steel which comprises the steps of mixing a nitrogen-containing carrier gas and an active gas including a hydrocarbon selected from the group consisting of the compounds C_2H_4, C_2H_2 and C_2H_6, the mixture containing between 0.2% and 12% by volume of hydrocarbon, continuously introducing the thus formed mixture into a furnace containing the steel to be heat-treated to provide an atmosphere consisting substantially entirely of said mixture around the steel, heating the steel and the surrounding atmosphere to a temperature within the range of from 850° C. to 1050° C., continuously withdrawing the atmosphere from said furnace, measuring the residual content of hydrocarbon in the atmosphere withdrawn from said furnace, comparing the thus measured residual hydrocarbon content with a predetermined hydrocarbon content-level to ascertain the proportion of carbon in the steel, and regulating the flow rate of hydrocarbon in the atmosphere being introduced into the furnace to provide a residual hydrocarbon content corresponding to the desired proportion of carbon in the steel.

4,108,694

CONTINUOUSLY CAST SLABS FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEETS HAVING EXCELLENT MAGNETIC PROPERTIES

Morio Shiozaki; Yozo Suga; Hiromu Fujii, and Kohichi Fujiwara, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

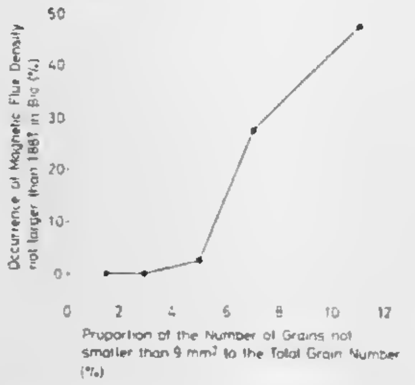
Filed Aug. 10, 1977, Ser. No. 823,451

Claims priority, application Japan, Aug. 10, 1976, 51-94468

Int. Cl.² B22D *27/02, 11/04;* **H01F** *1/04, 1/14*

U.S. Cl. 148—31.55 3 Claims

1. A continuously cast steel slab for production of a grain-oriented electrical steel sheet having excellent magnetic properties in which at least 95% of the total number of grains



constituting an equi-axed crystal zone in said slab has a cross sectional dimension less than 9 mm² per one grain.

4,108,695

STEEL WIRE

Hans Paulitsch; Alfred Babilon; Gerhard Kiefer; Kurt Koerfer, all of Salzgitter-Lebenstedt; Constantin Vlad, Wolfenbüttel, and Ullrich Kock, Salzgitter-Lebenstedt, all of Germany, assignors to Stahlwerke Peine-Salzgitter A.G., Pein, Hann, Germany

Continuation of Ser. No. 503,815, Sep. 6, 1974, abandoned. This application May 6, 1976, Ser. No. 683,783

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1973, 2345738

Int. Cl.² C22C *35/00*

U.S. Cl. 148—39 2 Claims

1. A steel wire adapted for cold drawing, the said wire having

a core portion consisting essentially of fine pearlite, segregated ferrite in said core portion being present in an amount of up to at most about 1% of the core portion, and

a surface portion enclosing said core portion and consisting essentially of fully tempered martensite, the said martensite surface portion constituting at most about 33% of the cross-sectional area of said wire whereby the wire has a good cold deformability for cold drawing operations in spite of its high surface strength.

4,108,696

SOLID PROPELLANT HAVING INCORPORATED THEREIN A FERROCENE COMBUSTION CATALYST

Charles I. Ashmore, Owens Cross Roads; Charles S. Combs, Jr., and William D. Stephens, both of Huntsville, all of Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Apr. 1, 1968, Ser. No. 717,945

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.2 4 Claims

1. A solid composite type propellant comprising in parts by weight of ammonium perchlorate, carboxy-modified polybutadiene, powdered aluminum, tris-(2-methylaziridinyl) phosphene oxide, a dibutylcarbitol formal plasticizer, to which is added as parts by weight in the percentage of 0.1 to 20 a ferrocene compound 1,3-diferrocenyl -1- butene which is of the structure Fc-R-Fc wherein Fc represents a ferrocene group and R is a radical selected from the group consisting of alkyl, cycloalkyl, alkenyl and cycloalkenyl radicals.

4,108,697

NOVEL TRIAMINOGUANIDINE NITRATE PROPELLANTS

Terrence P. Goddard, Aptos, Calif., assignor to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Continuation-in-part of Ser. No. 762,229, Jan. 24, 1977. This application Nov. 22, 1977, Ser. No. 853,917

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.3 4 Claims

1. A propellant comprising, by weight:

(A) a polymeric binder system, in the range 8–35 percent;

(B) curing agents, in the range 0–10 percent;

(C) plasticizing agents, in the range 0–25 percent;

(D) a composition having the general formula

$$x[(NHNH_2)_3CNO_3].(1-x)[((NHNH_2)_3C)_2B_{10}H_{10}]$$

wherein the value of x is between 0.01 and 0.99, in the range 35–90 percent.

4,108,698

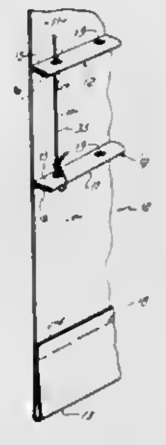
ROMAN SHADE AND METHOD FOR MAKING SAME

Phillip L. Brookshire, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Division of Ser. No. 676,347, Apr. 12, 1976, Pat. No. 4,069,857. This application May 23, 1977, Ser. No. 799,542

Int. Cl.² B29C *27/00;* **A47H** *5/00*

U.S. Cl. 156—60 9 Claims



1. A method of making a plastic Roman shade having a top portion and a bottom portion and a plurality of spaced, horizontally extending pleats extending substantially from one side of said shade to another and between said top and said bottom portions, and pull strings for raising and lowering said shade, said method comprising the steps of:

folding said shade together, between said bottom and top portions, to form folded horizontal pleats,

heat sealing said shade in the areas of said folded pleats, to form said horizontally extending pleats in said shade, and

forming, on at least one side of said shade, pull string guide means in association with said horizontally extending pleats, said guide means for operatively holding shade pull strings therein.

4,108,699

METHOD OF MAKING A FRICTION DISC

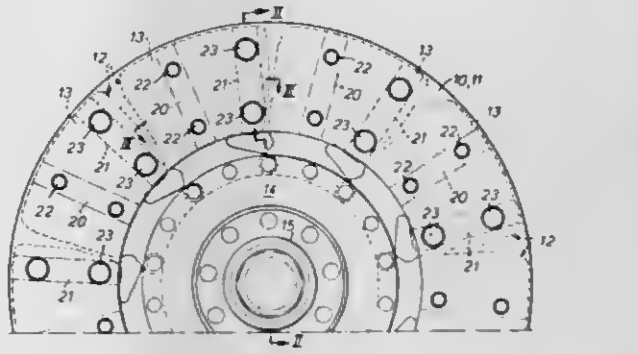
Gérard de Gennès, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Division of Ser. No. 639,123, Dec. 9, 1975, Pat. No. 4,022,310. This application Sep. 14, 1976, Ser. No. 723,302

Int. Cl.² B32B *7/08;* **F16D** *13/64*

U.S. Cl. 156—92 5 Claims

1. A method of manufacture of a friction disc of the progressive engagement type, said method comprising the steps of: first manufacturing three elements constituted by two flat annular friction linings and a cut-out and corrugated support; coating with adhesive at least a part of these elements at least over the regions corresponding to glueing zones which zones include the parts of the corrugations of the support which are in contact with said linings; and carrying out a riveting opera-



tion with rivets in said glueing zones before setting of the adhesive, whereby said rivets play the part of a joint-clamping means during the setting of said adhesive.

4,108,700

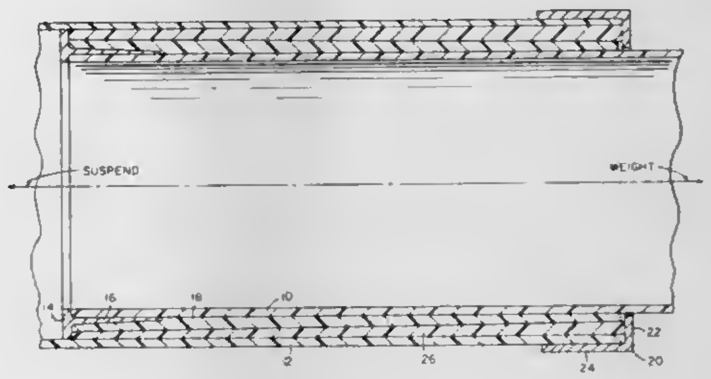
METHOD OF MAKING CONED JOINT FOR JOINING DISSIMILAR DIAMETER FILAMENT WOUND TUBES

Glen A. Clodfelter, Madison, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,329

Int. Cl.² B29C *17/12;* **B32B** *1/10*

U.S. Cl. 156—153 1 Claim



1. A method for joining two filament wound tubes having dissimilar diameters comprising: attaching a step face ring to the mating end of a smaller diameter tube;

overwrapping the smaller diameter tube and part of said ring with a first glass cloth/resin system which tapers inwardly away from said mating end;

curing and preparing the surface of said overwrap to the conical taper required;

adhesively bonding a joint ring to the mating and of a larger diameter tube;

forming a taper joint ring by wrapping a second glass cloth/resin system onto a cone shaped mandrel, said mandrel having a taper substantially the same as that of said first glass cloth/resin system;

grinding the taper joint ring to length and diameter required to fit inside larger diameter tube;

cutting the taper joint ring into two halves;

assembling and bonding said taper joint ring halves into said mating end of said larger diameter tube such that said taper joint ring tapers inwardly from said mating end and abuts said joint ring;

assembling the mating end of the smaller diameter tube within the mating end of the larger diameter tube such that the tapered surface of said first glass cloth/resin system is in mating relationship with the tapered surface of the taper joint ring and the step face ring abuts the taper joint ring;

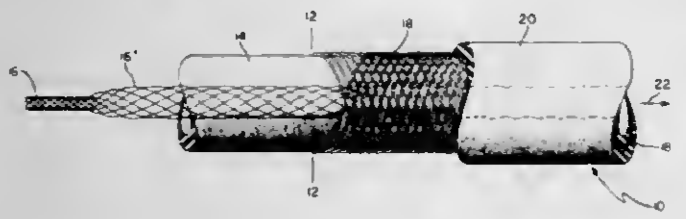
adhesively bonding the exterior of said first cloth/resin system to the interior of the taper joint ring and

hanging the mated tubes vertically until the components are bonded.

4,108,701

METHOD FOR MAKING HOSE INCORPORATING AN EMBEDDED STATIC GROUND CONDUCTOR

John H. Stanley, Libertyville, Ill., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 1, 1977, Ser. No. 802,404
Int. Cl.² B29D *23/04, 23/05;* H01B *7/30*
U.S. Cl. 156—160 6 Claims



1. A method of manufacturing a hose structure incorporating an embedded static ground conductor comprising the steps of:

extruding an elastomeric tube;

pressurizing the tube to effect a substantially rounded cross-section;

shortening a loosely braided wire bundle conductor in its axial direction such that the individual wires of the bundle are formed in a sinusoid transversely of the bundle axis;

compressing the shortened wire bundle in a direction transversely of its axis to flatten and form a ribbon type conductor;

laying the ribbon conductor onto the elastomeric tube parallel to and along the tube axis;

wrapping the tube with a textile material to hold the conductor in position on the tube;

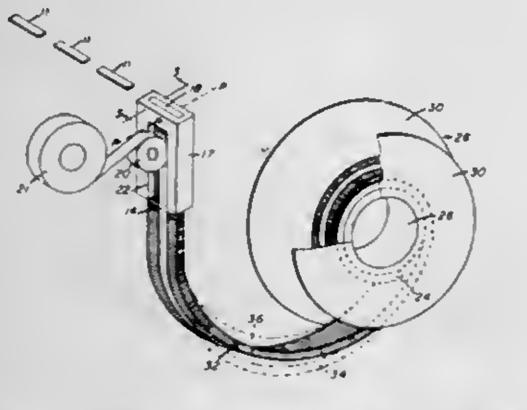
extruding a cover of elastomeric material over the wrapped tube to form an integral hose structure; and

curing the hose structure.

4,108,702

METHOD OF FORMING AN ARTICLE-TAPE PRODUCT

Richard D. Welch, Pittsford, and John E. Iversen, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 615,031, Sep. 19, 1975, which is a division of Ser. No. 483,586, Jun. 27, 1974, abandoned. This application Mar. 11, 1977, Ser. No. 777,237
Int. Cl.² B31C *13/00;* B65B *15/04*
U.S. Cl. 156—192 9 Claims



1. A method of handling a plurality of articles, each having a thick marginal edge and an opposite thinner marginal edge, by adhering the articles to a tape having an adhesive surface to form an article-tape product, said method comprising the steps of:

tilting said articles at said article collection station so that said thick marginal edge of each article is below its opposite thinner marginal edge;

stacking said tilted articles one on top of another at said article collecting station with corresponding thick marginal edges of said articles in alignment;

applying the adhesive surface of the tape to said aligned thick marginal edges of said stack to form an article-tape product;

and removing the article-tape product from the article collecting station.

3. A method for adhering rupturable photographic pods onto a tape to form a photographic pod-tape product wherein the pod is of the type formed from a single sheet of deformable material folded along one marginal edge to form a pair of overlapping rectangular walls secured to one another along the remaining marginal edges to form a cavity containing a liquid photographic processing agent, each pod being thicker along said folded marginal edge than the opposite secured marginal edge, comprising the steps of:

feeding photographic pods one at a time to a pod collecting station with each pod in the same predetermined orientation relative to the station;

tilting said pods at said pod collecting station with said folded marginal edge of each pod lower than said opposite secured marginal edge;

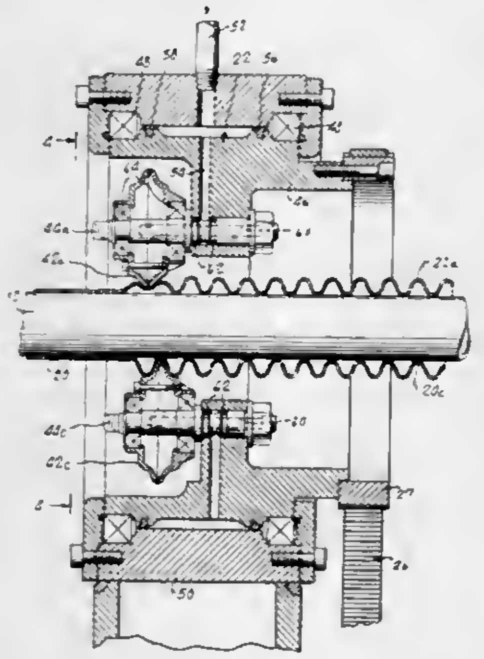
stacking said tilted pods at said pod collecting station to form a stack of tilted pods having said folded marginal edges in register; and

applying the adhesive surface of a tape into engagement with said registered folded marginal edges of said stack to form a photographic pod-tape product.

4,108,703

METHOD AND APPARATUS FOR PRODUCING DOUBLE-WALLED THERMOPLASTIC PIPE

Leslie J. Kovach, 880 Fifth Ave., New York, N.Y. 10021
Filed May 20, 1977, Ser. No. 798,867
Int. Cl.² B29C *15/00;* B29D *23/04*
U.S. Cl. 156—244.13 16 Claims

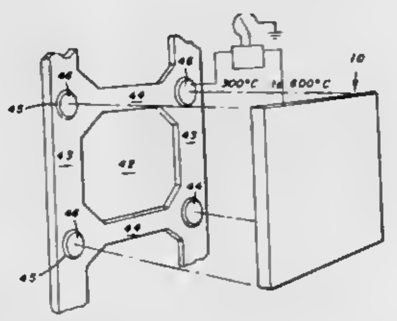


1. A method of producing a double-walled pipe of thermoplastic material comprising forming an outer pipe of thermoplastic material over and concentric with an inner pipe of thermoplastic material, and passing said outer and inner pipes through an assembly which rotates about the longitudinal axis of said pipes and which carries a plurality of freely rotatable forming rollers positioned in a helical path about said pipes, which rollers act by vacuum upon the outer surface of the outer pipe so as to form it into the shape of a helical thread about the outer surface of said inner pipe.

4,108,704

METHOD OF MAKING AN ARRAY OF SOLAR CELLS

William E. Horne, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Division of Ser. No. 764,383, Jan. 31, 1977. This application Aug. 1, 1977, Ser. No. 820,505
Int. Cl.² B29C *19/02, 19/06*
U.S. Cl. 156—272 8 Claims



1. The method of making a bond between a substrate and a solar cell capable of converting incident electromagnetic wave energy into electrical power, the method including the steps of:

locating a glass support pad upon a substrate,

bonding said support pad onto said substrate to provide a smooth, outwardly-facing support surface on the pad,

arranging said solar cell upon the outwardly-facing support surface of the pad,

heating the solar cell and support pad to a temperature within the range of about 300° C to about 600° C,

establishing an electrical field at a desired preselected voltage along the interface region between the solar cell and the support pad in a manner such that said glass support pad has a negative electrical potential with respect to the solar cell,

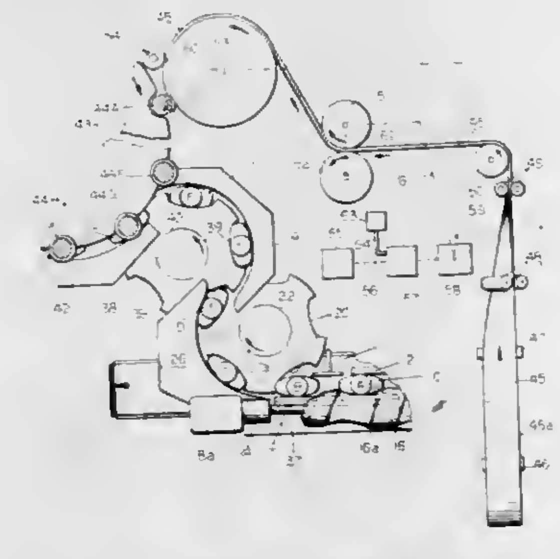
maintaining said electrical field between the heated support pad and the heated solar cell for a period of time sufficient to form a molecular bond, and

thereafter cooling the solar cell and support pad and removing the establishing electrical field.

4,108,705

BOTTLE OPERATED LABEL FEED SWITCH MECHANISM

Clyde F. Hadl, and Shepard L. Harmon, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Apr. 7, 1977, Ser. No. 785,634
Int. Cl.² B26D *5/00*
U.S. Cl. 156—355 4 Claims



1. In a bottle labelling machine having a rotary turret and a plurality of sleeve forming mandrels thereon, pocketed wheel means on the turret beneath the mandrels, the pockets thereof adapted to receive upright bottle and carry them on the turret means connected for driving the turret and its said pocketed means in continuous rotation, in axial alignment with the mandrels, a first power-operated continuously operable, moving horizontal infeed conveyor for advancing bottles thereon in upright position to the turret, a web supply of label material, a feed drum adjacent the turret adapted to feed a length of label material to each of the mandrels moving past the feed drum adjacent the turret adapted to feed a length of label material to each of the mandrels moving past the feed drum at a label loading station, web advancing means engaging said web for moving it to the feed drum, knife means operatively connected to the feed drum for cutting label lengths from said web thereon, the mandrels being operated to wrap said length thereon and form a label sleeve during turret rotation from the sleeve loading station a predetermined advanced distance to a bottle labelling station, the improvement therein comprising:

a timing means along the infeed conveyor for engaging upright bottles moving thereon and equally spacing and timing them to correspond with the turret pockets,

means advancing the upright bottles seriatim from said timing means into the pockets on the turret ahead of the bottle labelling station,

a second power-operated drive means engageable for actuating the feed drum, knife means and web advancing means in unison,

a means for operatively engaging and for disengaging said second drive means including an electrically-operated controller therefor,

a horizontal switch-actuating arm pivotally mounted and biased for movement into the path of the timed upright bottles passing the timing means and pivoted by contact with said timed bottles,

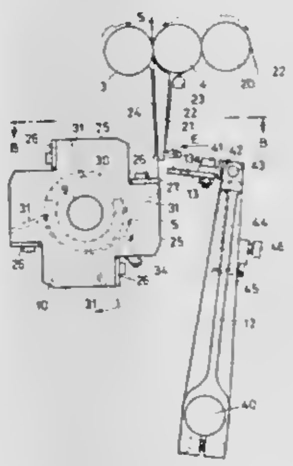
said arm being positioned for contacting said bottles a distance along the path therefor to the bottle labelling station that equals the distance in the mandrel path between the mandrel loading station and the bottle labelling station, and

an energizing circuit connected to said controller and including a switch operated by said arm in response to said bottle contact therewith for operatively engaging said second drive means, whereby labels are fed to the mandrels at the mandrel loading station only in response to said bottles contacting said arm.

4,108,706

LABELLING MACHINE

Jacobus Brands, Eindhoven, Netherlands, and Kurt Thaddey, Buchs, Switzerland, assignors to Prontophot Holding AG, Dubendorf, Switzerland
Filed May 26, 1977, Ser. No. 800,874
Claims priority, application Switzerland, Jun. 2, 1976, 6926/76
Int. Cl.² B65C *9/02, 9/18*
U.S. Cl. 156—384 8 Claims



1. In a labelling machine having a tape reel, a feed device comprising feed rollers for drawing tape from the reel and

feeding it to a cutting device, and means serving to transfer a label which comprises a cut length of the tape to an article which is to be labelled, the improvement comprising, a cyclically operable printing device for printing the tape and being arranged between the reel and the feed device, driving means for cyclically operating feed rollers of the feed device to draw a predetermined length of tape from the reel during each cycle of the machine, a transfer roller to which such a length of the tape is fed by the driving means, said transfer roller having a periphery with four flat areas each angularly displaced by 90° from an adjacent flat area, the periphery of said transfer roller being cut-back between adjacent flat areas to define a step, and four cutters each arranged in a respective one of the steps such that the cutting edge of each cutter is flush with the periphery of the transfer roller, said transfer roller being rotatable stepwise through angular steps of 90° such that in each rotary position of the transfer roller one of the flat areas and one cutting edge of the cutters lies in a common plane with the tape which has been fed by the feed rollers to the transfer roller, a pivotal arm and means for movably mounting a counter-cutter on the arm being arranged opposite to said one flat area and said one cutting edge, said arm being cyclically driven whereby said counter-cutter cooperates with a said cutter on the transfer roller to sever a length of tape and thereby defining a cutting station, the transfer roller having an internal hollow space being connected to a source of vacuum and having radially extending bores leading from the internal space to the flat peripheral areas for holding thereon by vacuum the severed length of tape, a station for transferring a label comprising the severed length of tape to an article which is to be labelled, said transfer roller feeding such length of tape by the cyclically operable transfer roller directly to said transfer station, said transfer station being arranged with respect to the rotary direction of the transfer roller across from the pivotal arm, and said transfer station comprising means for feeding an article to be labelled past the severed length of tape on the transfer roller, said feeding means serving to feed the article in an upright position parallel to the axis of the transfer roller so that the predetermined length of tape drawn from the reel and severed by the cutter and counter-cutter defines the height of the label on the article.

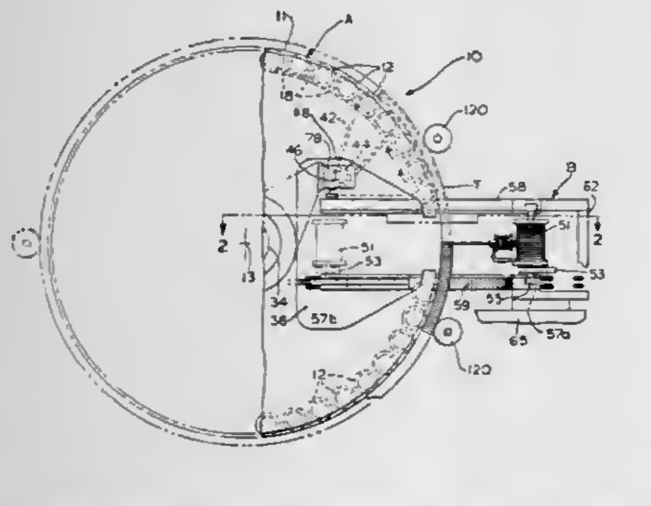
4,108,707
CLOSED TORUS TIRE

Paul E. Appleby, Cuyahoga Falls; Stanley J. Houck, Akron, and Richard B. Nash, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 646,716, Jan. 5, 1976, Pat. No. 4,052,237. This application May 27, 1977, Ser. No. 801,196

Int. Cl.² B29H *17/02, 17/14*

U.S. Cl. 156—397 **5 Claims**



1. An apparatus for building a closed torus tire comprising a rotatable center shaft, first cylindrical support means having a pair of axially spaced apart end plates fixed coaxially and co-rotatably on said shaft, a plurality of rolls mounted in closely spaced parallel cylindrical array coaxially of said shaft and supported rotatably on said end plates, belt means for effecting rotation of said rolls each about its own axis, bearing means mounting said shaft for rotation of said first cylindrical support means to wrap liner stock in sheet form therearound, brake means operable to prevent rotation of said rolls during rotation of said first cylindrical support means, said rolls each having a shoulder near each of its respective ends, the shoulders cooperating to provide seats axially outward respectively of said belt means which seats cooperate to hold the bead cores in coaxial spaced relation relative to said liner stock disposed about said cylindrical array of rolls, an axially extending opening open radially and axially outwardly of said first cylindrical support means, and cord winding means including an oval track frame having a first part and a second part, said first part being mounted in said opening radially inward of the periphery of said first cylindrical support means, said second part being mounted radially and axially outward of said first cylindrical support means, at least one of said parts being movable into a cord winding position in said opening and alternatively to a position out of said opening for allowing said first support means to rotate about its own axis.

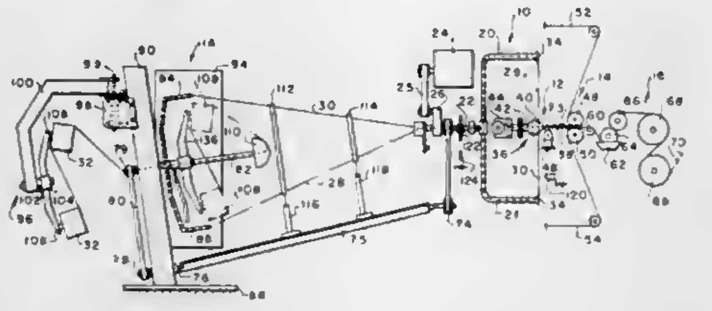
4,108,708
SCRIM MACHINE

Wallace D. Gregory, and James R. Moore, both of Inman, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 539,790, Jan. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 405,055, Oct. 10, 1973, abandoned. This application Jul. 1, 1977, Ser. No. 812,061

Int. Cl.² B32B *31/12*

U.S. Cl. 156—441 **5 Claims**



1. Apparatus for producing non-woven fabric comprising: means to drive said apparatus, yarn guide means including a first pair of yarn guides spaced from one another, creel means for supporting a plurality of yarn packages, a hollow shaft member rotably supported in said apparatus, a plurality of radially directed yarn guide arms connected to shaft member, means operably associated with said creel means to supply yarn from said creel means through said hollow shaft member to said raidally directed yarn guide arms and to wind the yarn about said pair of spaced yarn guides to form reaches of yarn therebetween, a control circuit connecting said drive means to a source of power, a first means in operative relationship with said apparatus to break the control circuit to said drive means, a second means scanning the yarn between said yarn guide means and said yarn guides to allow said first means to break said control circuit to stop said drive means when a yarn break is detected, a third means operably associated with said control circuit and actuated after each scan by said second means to energize said first means upon the detection of a yarn break by said second means and means for combining a sheet of yarns with the yarn reaches between said first pair of spaced yarn guides to form a non-woven fabric, said third means including a ferrous material operably associated with said rotatable yarn guide means, a magnetic sensing means, a first timer to reset the circuit to said drive means when said first timer has timed out, a time controlled switch in operative relationship with said first timer and a second timer activated by said magnetic sensing means to close the circuit to said first timer when said ferrous material is sensed by the magnetic sensing means.

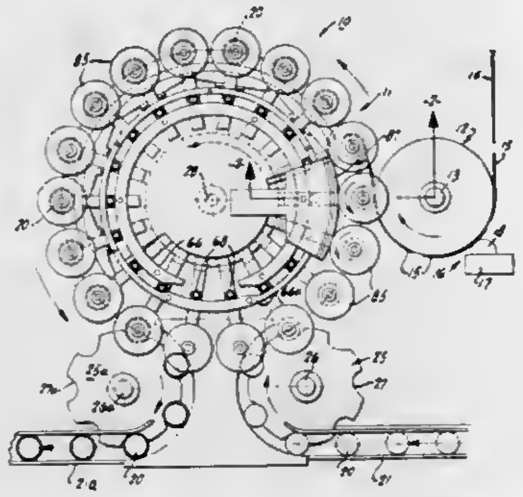
4,108,709
LABEL APPLYING MACHINE

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Jun. 14, 1976, Ser. No. 695,805

Int. Cl.² B65C *3/12*

U.S. Cl. 156—446 **6 Claims**



1. Labeling apparatus for applying labels at high speed to cylindrical containers comprising:

(a) a cylindrical rotary drum having means for gripping the leading end of a label at a label supply station, holding the label on the cylindrical surface of the rotating drum, conveying the label so held to a label applying station and releasing the label to a container at such station,

(b) a container feed for supplying cylindrical containers in rapid succession and in closely spaced array to said label applying station and in tangent contact with the labels at such station, said container feed including means for positively gripping the opposite ends of each container but allowing the container to rotate about its cylinder axis and

(c) container rotating means for rotating each container about its cylinder axis just before and at the time of first contact of the container with the leading edge of a label and during the time that the label is being wrapped around the container, said rotating means acting to cause the leading edge of the label on the drum and the surface of the container tangent to the label to move in the same direction at the instant of contact of the leading edge of the label with the container.

4,108,710
APPARATUS FOR APPLYING LABELS TO CONTAINERS

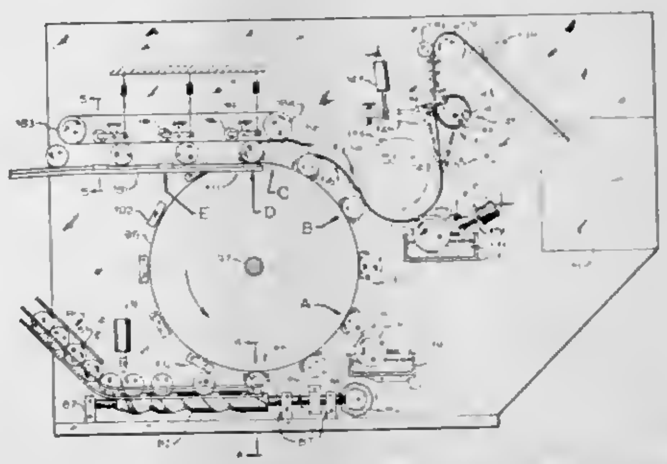
Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Division of Ser. No. 226,064, Feb. 14, 1972, Pat. No. 3,834,963, which is a continuation-in-part of Ser. No. 5,187, Jan. 23, 1970, Pat. No. 3,765,991. This application Jun. 17, 1974, Ser. No. 480,044

Int. Cl.² B65C *9/04*

U.S. Cl. 156—450 **4 Claims**

1. Can labeling apparatus comprising a rotary mounted container drum having can gripping means at circumferentially spaced locations about the periphery for holding cans against rotation about the axes thereof, means rotating said container drum to thus move cans on the drum in a circular arc, a vacuum drum mounted for driven rotation about the axis thereof and disposed with the periphery thereof substantially tangent to the side of cans on said container drum as they move past the vacuum drum, said vacuum drum having peripheral openings controllably connected to a vacuum source for releasably holding can labels on the drum periphery as the vacuum drum rotates and also having a plurality of radial ridges thereacross spaced apart a predetermined distance circumferentially about the periphery of the drum to displace at least a portion of each label radially outward of the drum, such spacing being slightly greater than the length of the individual labels, an adhesive wheel for coating adhesive on each label while on a ridge, means for continuously feeding a parent strip of label material onto the periphery of the vacuum drum with its leading edge held by the vacuum drum and the portion of the parent strip which is to form the trailing edge of the label unsevered from the strip, means operable while said leading edge is held by the vacuum drum for cutting successive labels from the strip at a location ahead of said vacuum drum, means for rotating the vacuum drum to effect movement of individual labels cut from said strip to engage the adhesive wheel at said ridges and then to engage a can at the leading edge of the label, and means releasing successive cans from the container drum at a discharge station and rotating the released cans for wrapping a label about each can to secure the label about the can.



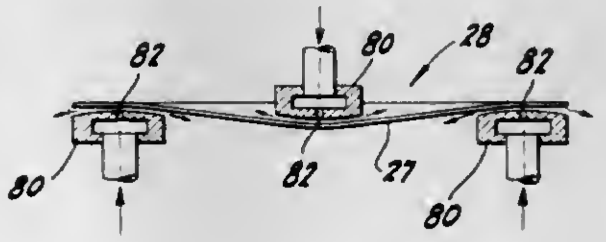
4,108,711
LABEL FEED

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Feb. 23, 1977, Ser. No. 771,327

Int. Cl.² B32B *31/00;* B26D *7/14, 7/06*

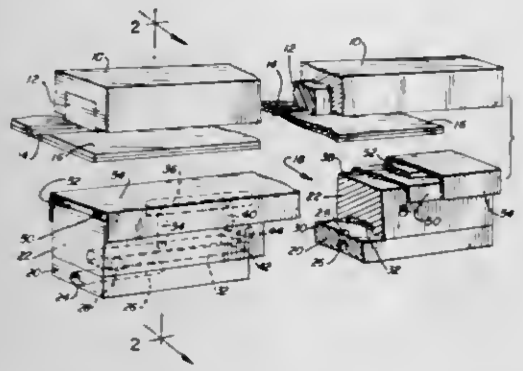
U.S. Cl. 156—497 **1 Claim**



1. In a labeling machine for labeling containers comprising a container feed for supplying containers in sequence to a label applying station, a label feed comprising a label stock feed for continuously supplying a continuous label stock, a label cutting instrumentality for severing individual labels from the continuous label stock so delivered and a rotary label transfer means adapted to pick up each severed label on its surface and to supply the severed label to a container at the label applying station, the improvement which comprises label deforming means interposed between the label stock feed and the label cutting instrumentality for imparting to the label stock a concave-convex shape in transverse cross-section thereby stiffening the label stock and diminishing its tendency to bend in a longitudinal direction and to deviate from its intended path to the cutting instrumentality, said label deforming means being in the form of an air jet instrumentality acting on opposite sides

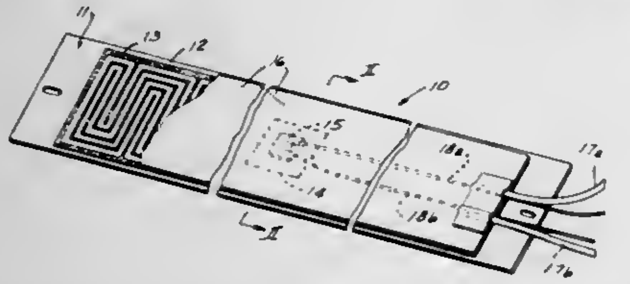
of the label stock to bend the stock along its longitudinal midportion to bow it longitudinally.

4,108,712
HEAT SEALING MACHINE WITH COOLING MEANS
Harry Bala, 2259 N. Kedzie, Chicago, Ill. 60647, and John C. Mowll, 2032 W. Jarvis, Chicago, Ill. 60645
Filed Feb. 22, 1977, Ser. No. 770,604
Int. Cl.^{2} B30B *15/34*
U.S. Cl. 156—498 **11 Claims**



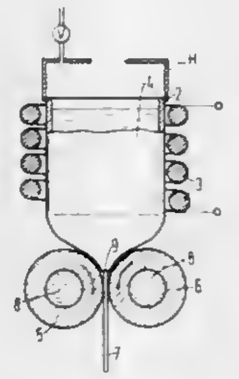
1. Heat sealing apparatus which comprises: a heat seal head; a wire heating element positioned adjacent said heat seal head; said heat seal head having a cooling fluid inlet and a cooling fluid exhaust; said heat seal head defining a longitudinal slot which is located in heat exchange relationship with said wire heating element during heat sealing, said longitudinal slot having a width that is narrower than the width of the wire, to provide wall supports on opposite sides of the wire; and a cooling fluid path coupling said cooling fluid inlet and the cooling fluid exhaust to said longitudinal slot, said cooling fluid exhaust being separate from but coupled to said longitudinal slot with said exhaust terminating away from said wire, whereby during heat sealing the cooling fluid can be circulated from the cooling fluid inlet to a heat exchange relationship with said wire and to the separate exhaust, enabling cooling fluid circulation during heat sealing.

4,108,713
LOW MASS ELECTRIC HEATER
Thomas Anthony Weisz, Wheeling, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Feb. 14, 1977, Ser. No. 768,267
Int. Cl.^{2} B32B *31/00;* **B42C** *19/00;* **H05B** *1/100*
U.S. Cl. 156—499 **20 Claims**



7. A machine for rapid heating of a chemical adhesive used to connnect first and second objects together, comprising:
- (a) a rapid heating, low mass electrical heater having
  - (i) a metal plate comprised of an element selected from the group consisting of magnesium and aluminum, said plate having a thickness of less than 0.1 inch,
  - (ii) an electrical insulating layer on one side of the metal plate,
  - (iii) a resistance type heating element arranged in a pattern on said insulating layer, and
  - (iv) a fast-acting temperature sensing means arranged adjacent said heating element; and
- (b) means for positioning the first and second objects to be bound by the chemical adhesive such that the chemical adhesive is positioned adjacent said electrical heater for heat transfer to the adhesive.

4,108,714
PROCESS FOR PRODUCING PLATE-SHAPED SILICON BODIES FOR SOLAR CELLS
Wolfgang Keller, Munich, and Konrad Reuschel, Vaterstetten, both of Germany, assignors to Siemens Aktieogesellschaft, Berlin & Munich, Germany
Filed Feb. 20, 1976, Ser. No. 659,958
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1975, 2508369
Int. Cl.^{2} B01J *17/16, 17/18*
U.S. Cl. 156—608 **6 Claims**

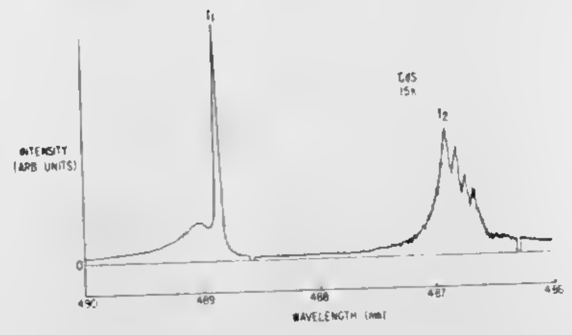


1. A process for producing plate-shaped silicon bodies which are useful in the manufacture of solar cells, comprising:
- positioning a vertically orientated polycrystalline silicon rod on a plate having a slot-like aperture therein:
- generating an annular melt zone about a portion of said rod which is in contact with said slot-like aperture:
- controllably biasing said rod against said slot-like aperture so as to force a stream of molten silicon through said slot-like aperture and into a nip defined by spaced-apart rotating temperature controlled rollers positioned below and in registry with said slot-like aperture so that said nip receives the molten silicon stream and forges such stream into flat ribbon of a thickness corresponding to that of the desired plate-shaped bodies said rollers being maintained at a temperature sufficiently high so as to minimize thermal stress in the silicon; and
- solidifying said ribbon as it travels beyond said nip.

4,108,715
METHOD FOR MACHINING SURFACES OF SEMICONDUCTOR SUBSTRATES
Kiyotsugu Ishikawa, and Kunio Itoh, both of Takatsuki, Japan, assignors to Matsushita Electronics Corporation, Japan
Filed Apr. 14, 1977, Ser. No. 787,427
Claims priority, application Japan, Apr. 20, 1976, 51-45100
Int. Cl.^{2} H01L *21/312*
U.S. Cl. 156—628 **3 Claims**

1. A method for machining the surface of a gallium arsenide crystalline semiconductor substrate, comprising the steps of:
- selectively doping a portion of said substrate surface with aluminum ions to change said surface portion from crystalline gallium arsenide to crystalline gallium aluminum arsenide; and
- selectively etching said substrate surface to remove only the gallium arsenide or the gallium aluminum arsenide portion thereof.

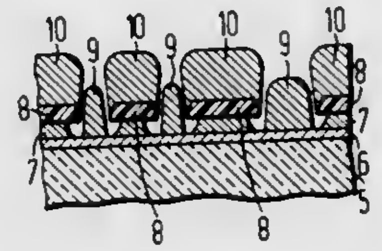
4,108,716
POLISHING OF CdS CRYSTALS
Assunta Anna Pritchard, Brielle, and Sigurd Wagner, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 22, 1976, Ser. No. 752,899
Int. Cl.^{2} C09K *13/04*
U.S. Cl. 156—636 **4 Claims**



1. A process for polishing the cadmium face of a CdS crystalline material by contacting said cadmium face with a chemical polishing agent characterized in that said chemical polishing agent is a hydrochloric acid solution buffered to a pH in the range of about 2.2 to 2.8.

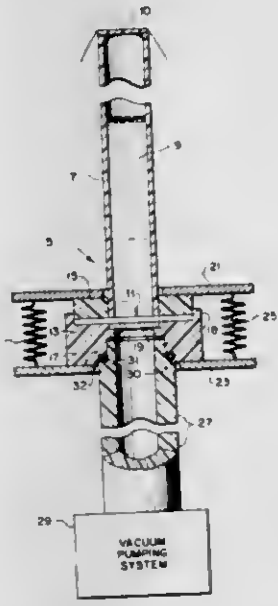
3. A process for polishing the sulfur face of a CdS crystalline material by contacting said sulfur face with a chemical polishing agent characterized in that said chemical polishing agent is a hydrochloric acid solution buffered to a pH in the range of about 0.7 to 1.3.

4,108,717
PROCESS FOR THE PRODUCTION OF FINE STRUCTURES CONSISTING OF A VAPOR-DEPOSITED MATERIAL ON A BASE
Dietrich Widmann, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Jul. 8, 1975, Ser. No. 594,046
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1974, 2432719
Int. Cl.^{2} B05D *5/12*
U.S. Cl. 156—656 **4 Claims**



1. A process for producing a fine structure of an order of magnitude of 1 μm of a material on a surface of a base comprising the steps of:
- providing a base with an auxiliary layer forming a surface, said layer consisting of a metal or metal alloy and having a thickness which may be considerably less than the thickness of the fine structure to be formed;
- providing a mask on the surface of the base, said mask having openings corresponding to the fine structure of material to be applied on the surface of the base;
- providing an etching agent which attacks the auxiliary layer but does not attack the mask;
- etching the exposed portions of the auxiliary layer to a depth at which they are etched entirely away and an underetching of a predetermined width exists beneath the edges of the mask;
- depositing a layer of material over the entire surface with the step of depositing the material being by evaporation or sputtering;
- controlling the amount of depositing so that the layer of material being deposited on the mask and the etched surfaces of the base has a thickness at least as large as said depth and less than a thickness which is necessary for the material deposited on the etched surface to contact the material deposited on the mask;
- subsequently removing the mask with the layer of material deposited thereon; and then
- entirely etching away the remaining portions of the auxiliary layer without substantially etching the fine structure.

4,108,718
VAPOR FILTRATION PROCESS AND SYSTEM
Frank A. Rickey, Jr.; Paul C. Simms, both of Lafayette, Ind., and Neal R. Butler, Acton, Mass., assignors to Purdue Research Foundation, West Lafayette, Ind.
Filed Jan. 27, 1976, Ser. No. 652,831
Int. Cl.^{2} B01D *1/00*
U.S. Cl. 159—30 **2 Claims**



1. A vapor filtration system, comprising:
- a container for receiving water having dissolved materials therein;
- a thin film having one side in contact with said water in said container, said thin film passing water vapor but blocking passage of water and solids therein;
- supporting means for maintaining the relative positioning between said thin film and said container, said supporting means including spring biased clamping means and a porous support engaging said thin film at the other side of said thin film; and
- vacuum supply means providing a pressure differential at the other side of said thin film with water in contact with said thin film being caused to be changed to water vapor and dissolved materials in said water solidified when said water vapor is formed, said solid materials being collected on said thin film as said water vapor passes through said thin film.

4,108,719
METHOD AND APPARATUS FOR GAUGING THE RADIAL SPACING BETWEEN FUEL AND SURROUNDING CLADDING OF A FUEL ROD FOR NUCLEAR REACTORS

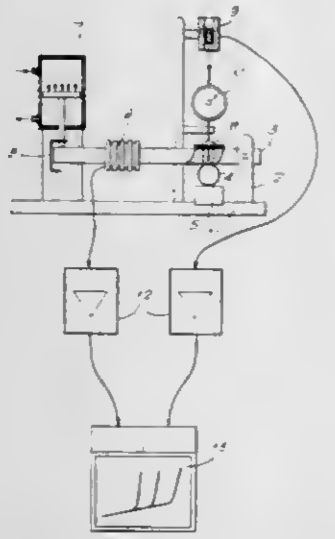
Kai D. Olshausen, Raelingen, Norway, assignor to Institutt for Atomenergi, Kjeller, Norway

Filed Feb. 7, 1977, Ser. No. 766,003

Claims priority, application Norway, Feb. 12, 1976, 760446

Int. Cl.² G21C *17/06*

U.S. Cl. 176—19 R **4 Claims**



1. Method for gauging the radial spacing between fuel and surrounding cladding of a fuel rod for a nuclear reactor comprising the steps

squeezing said cladding until contact is formed with the internal fuel, repeatedly measuring the squeezing force and the corresponding deformation, and correlating the respective measured values in order to determine said contact formation and the corresponding deformation of the cladding in order to obtain a measure of said radial spacing.

4,108,720
CONTROL SYSTEM FOR BOILING-WATER REACTOR

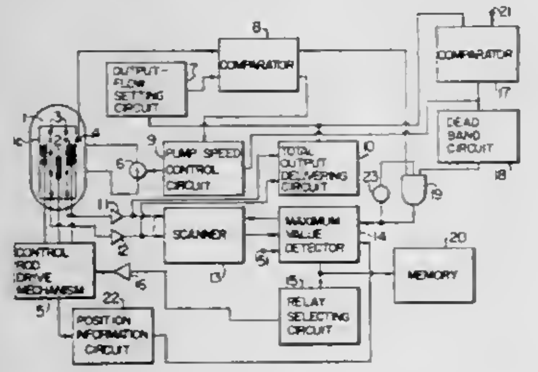
Takao Sato, Ibaraki, and Sakae Sugiyama, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 11, 1975, Ser. No. 595,330

Claims priority, application Japan, Jul. 15, 1974, 49-80127

Int. Cl.² G21C *7/00*

U.S. Cl. 176—20 R **13 Claims**


8
21
COMPARATOR
OUTPUT-FLOW SETTING CIRCUIT
7
COMPARATOR
17
1
3
2
4
16
9
PUMP SPEED CONTROL CIRCUIT
TOTAL OUTPUT DELIVERING CIRCUIT
10
DEAD BAND CIRCUIT
18
6
23
19
11
12
SCANNER
MAXIMUM VALUE DETECTOR
14
20
MEMORY
CONTROL ROD DRIVE MECHANISM
6
13
5
15
22
5
POSITION INFORMATION CIRCUIT
RELAY SELECTING CIRCUIT

1. A system for controlling the output of a boiling-water reactor comprising a reactor core, flow controlling means for controlling the flow of coolant through said reactor core, first detector means for detecting said actual coolant flow and providing an output indicative thereof, second detector means for detecting the output of said reactor and providing an output indicative thereof, and an output controlling means responsive to the outputs of said first and second detector means and a demanded output of said reactor for applying an output control signal to said flow controlling means, said output controlling means including first means responsive to the output of said second detector means for outputting as a limiting value of coolant flow a signal representing a zero coolant flow when said output of said second detector means is smaller than a predetermined reactor output and representing a larger coolant flow with the increase of the output of said second detector means when the output of said second detector means is larger than said predetermined reactor output, second means for comparing the output of said first means with the output of said first detector means, and a third means for comparing said detected reactor output of said second detector means with said demanded output of said reactor, said output controlling means supplying said flow controlling means with a control signal instructing the reduction of coolant flow when an actual coolant flow is larger than said limiting value of coolant flow and said detected reactor output of said second detector means is larger than said demanded output of said reactor.

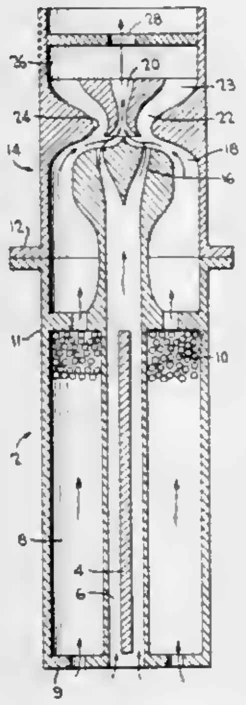
4,108,721
AXISYMMETRIC FLUIDIC THROTTLING FLOW CONTROLLER

Tadeusz M. Drzewiecki, Silver Spring, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,438

Int. Cl.² G21C *7/16*

U.S. Cl. 176—36 R **8 Claims**



1. A fluidic throttling flow controller and nuclear reactor core assembly for controlling the cooling flow from first and second core cooling passages in a nuclear reactor wherein a poison material located in said first passage is movable by means of coolant flow between a reactor shutdown position and a non-shutdown position, said posion material being movable to said shutdown position when a substantially reduced flow occurs in said first passage,

a fluid amplifier including a main jet supplied by said first passage, a control jet supplied by said second passage, a central output, a tangential output, and means to switch flow from said central output to said tangential output when the temperature of the flow through said second passage exceeds a desired switching value; and

a vortex valve including a vortex chamber having a central inlet connected to receive fluid from said central output of said fluid amplifier, tangential control ports connected to receive fluid from said tangential output and produce vortex flow in said vortex chamber when the flow from said fluid amplifier is switched to said tangential output, and a vortex drain;

whereby flow through said flow controller and core assembly is substantially reduced when the temperature of the flow through said second passage exceeds said desired value, and said poison material thereby falls to said shutdown position.

4,108,722
METHOD FOR THE RESTORATION OF AN UNDERGROUND RESERVOIR

Dennis E. Stover, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,597

Int. Cl.² C12B *1/00*

U.S. Cl. 195—1 **6 Claims**

1. A method for the restoration of an underground reservoir subsequent to solution mining of a mineral from a subterranean formation containing said mineral which comprises introducing a sulfate reducing bacteria into said reservoir.

4,108,723
METHOD FOR OPTICAL RESOLUTION OF DL-LYSINE COMPOUNDS

Hideo Hirohara; Shigeyasu Nabeshima, both of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 1, 1977, Ser. No. 829,945

Claims priority, application Japan, Sep. 8, 1976, 51-108277

Int. Cl.² C07B *19/02*

U.S. Cl. 195—2 **20 Claims**

1. A method for producing L-lysine or acidaddition salts thereof from DL-lysine alkyl ester or acid-addition salts thereof, which comprises contacting under a weakly acidic condition an aqueous solution of the DL-lysine alkyl ester or acid-addition salts thereof with a non-specific protease having ability to resolve the DL-lysine alkyl ester or acid-addition salts thereof and being produced by bacteria belonging to the genus Streptomyces and recovering L-lysine or acid-addition salts thereof thus produced.

4,108,724
METHOD FOR PREPARING ANTIBIOTIC P-2563 USING *PSEUDOMONAS FLUORESCENS*

Kiyoshi Nara, Kyoto; Yasuhiro Sumino, Kobe; Mitsuko Asai, Takatsuki, and Shunichi Akiyama, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

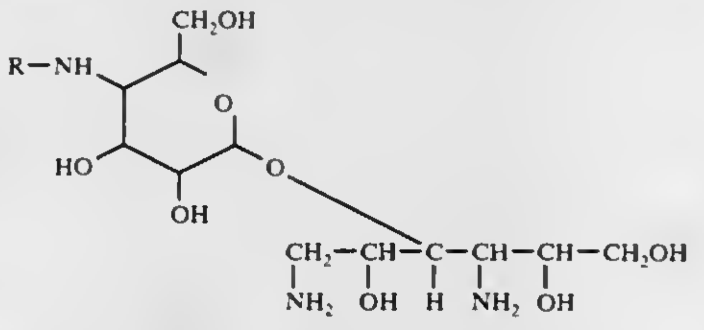
Filed Apr. 7, 1976, Ser. No. 674,310

Claims priority, application United Kingdom, Apr. 11, 1975, 15062/75

Int. Cl.² C12D *9/20*

U.S. Cl. 195—96 **5 Claims**

1. A method for producing antibiotic P-2563 having the formula:



wherein R represents hydrogen or an acyl group, which comprises: cultivating a strain of *Pseudomonas fluorescens* P-2563 (ATCC-31125) in a culture medium contaning assimilable and digestable nitrogen sources until said antibiotic is substantially accumulated therein and recovering the thus accumulated antibiotic.

4,108,725
ANTIBIOTIC COMPLEX

Hiroshi Kawaguchi, Tokyo; Koji Tomita, Kawasaki; Kei-ichi Fujisawa, Kamifukuoka, and Hiroshi Tsukiura, Mitaka, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 627,391, Oct. 30, 1975, Pat. No. 4,012,576, which is a continuation-in-part of Ser. No. 532,137, Dec. 12, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,202

Int. Cl.² C12D *9/20*

U.S. Cl. 195—96 **3 Claims**

1. A process for producing the antibiotic complex Bu-2183 which comprises cultivating Pseudomonas sp. strain D946-B83, A.T.C.C. 31086, in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon under submerged aerobic conditions until a substantial amount of Bu-2183 is produced by said organism in said culture medium.

4,108,726
SARCOIDOSIS TEST

Emanuel Silverstein, Brooklyn, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,432

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **8 Claims**

1. A method for determining angiotensin converting enzyme in untreated human serum which comprises admixing said serum to be tested for angiotension converting enzyme with a substrate to yield L-histidyl-L-leucine in the presence of angiotension converting enzyme, said substrate being selected from the group consisting of angiotensin I and hippuryl-L-histidyl-L-leucine, said substrate being added until said serum comprises about 4% by volume of the admixture thereof with said substrate, adding o-phthaldialdehyde to the resulting admixture in the form of about a 2% solution thereof in an amount such that the concentration thereof is about 0.11% by weight thereof, thereby forming the fluorescent adduct of o-phthaldialdehyde and the resulting produced L-histidyl-L-leucine and spectrofluorimetrically determining the amount of said fluorescent adduct.

4,108,727
METHOD, COMPOSITION AND DEVICE FOR DETERMINING THE SPECIFIC GRAVITY OR OSMOLALITY OF A LIQUID

Sisto Nicholas Stiso, Elkhart, Ind., and Chester L. Sutula, Annandale, N.J., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 23, 1976, Ser. No. 716,962

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **35 Claims**

1. A method for determining the specific gravity or osmolality of a liquid containing a nonionic, ionizable solute, said method comprising

contacting the liquid with an ionizing agent capable of ionizing said nonionic solute therein, and a test means capable, upon contact with a liquid containing said solute in ionized form, of producing a detectable response which is a function of the specific gravity or osmolality of such liquid, and

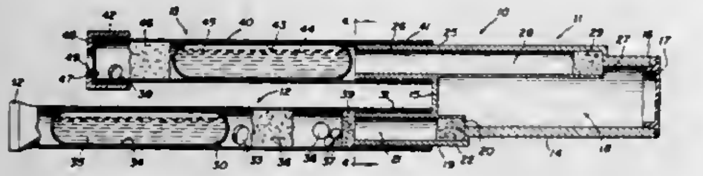
subsequently determining the specific gravity or osmolality of the liquid by detecting the response produced by the test means.

4,108,728

ANAEROBIC LIQUID TRANSPORT APPARATUS

Ernest Elliott Spinner, Grandview; Lowell Donald Miller; Phyllis Eleanor Riely, both of Kansas City, all of Mo.; Carl Fredrick Avery, Jr., Rockford, Ill.; Melvin Wayne Hounsell, Beloit, Wis., and Ben Bruce Howard, Rockford, Ill., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 690,528, May 27, 1976, abandoned. This application Jul. 28, 1976, Ser. No. 709,431
Int. Cl.^{2} C12K *1/04;* B01J *7/00*
U.S. Cl. 195—127 18 Claims



1. An anaerobic liquid storage and transport apparatus comprising:

a liquid receiver means for receiving and holding an anaerobic liquid;

a gas generator container means containing a gas generator for generating a reducing gas;

the gas generator comprising a reducing gas generating solid material, an ampoule containing a liquid which is reactive with the solid material to produce a reducing gas catalytically reactive with oxygen at room temperature, and means in the container means which prevents liquid from flowing from the container means after the ampoule is opened but which permits flow of reducing gas out of the container means;

first means for supplying reducing gas from the gas generator container means to the liquid receiver means, and second means other than said first means for exit of the reducing gas out of the liquid receiver means without flow of liquid therefrom; and

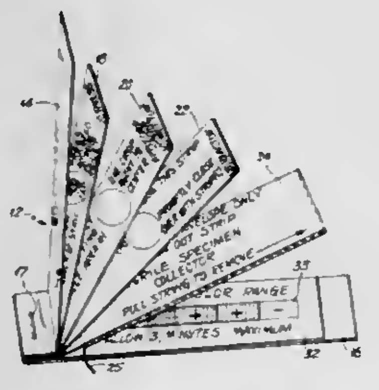
a catalyst positioned to promote reaction between the reducing gas, when produced by the gas generator, and oxygen to thereby produce an anaerobic environment in contact with a liquid placed in the liquid receiver means.

4,108,729

PAPER BOOKLET FOR PRESUMPTIVE DIAGNOSIS OF NEISSERIA GONORRHOEAE IN THE MALE

Frederick C. Mennen, La Porte, Ind., assignor to U.S. Packaging Corp., La Porte, Ind.

Filed May 16, 1977, Ser. No. 797,467
Int. Cl.^{2} C12K *1/04*
U.S. Cl. 195—127 3 Claims



1. A booklet for presumptive diagnosis of Neisseria Gonorrhoeae in the male consisting essentially of four staggered strips, (a) through (d), of bibulous iron-free absorptive material in overlying relation with (a) through (d) lying back to front in the booklet;

strip (a) being a bibulous collector strip having a target circle between its ends for collecting a sample of exudate from the meatus of a male penis in the target circle;

strip (b) overlying strip (a) being a reactor strip consisting of bibulous material impregnated with a chromogen reagent and being substantially color free;

strip (c) overlying strip (b) being a bibulous wettor strip having a wettor target circle overlying said target circle of said collector strip whereby one or two drops of physiological saline applied to the wettor target circle passes through strip (b) to carry chromogen reagent wet with said one or two drops into the target circle of said collector strip to create a color change on the back side of said strip (a) in the presence of Neisseria Gonnorrhoeae in the exudate applied to strip (a);

strip (d) overlying strip (c) consisting of polymer coated material serving to press the one or two drops of physiological saline through (c), (b) and (a);

a gradient color scale range strip located beneath strip (a) whereby subsequent to sampling and pressing, strip (a) can be lifted to achieve an open book effect to view the color change on the back of strip (a) against said gradient color scale range; and

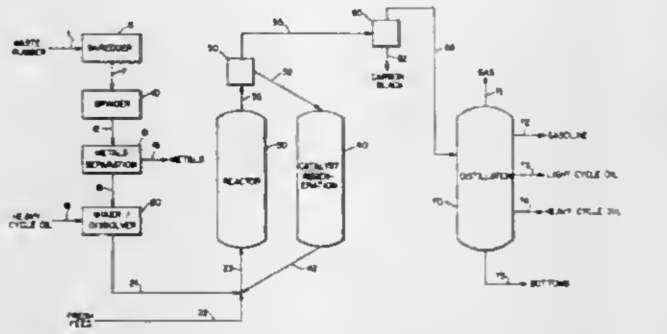
said chromogen reagent selected from the group consisting essentially of p-amino dimethylaniline oxalate, N, N-dimethyl-p-phenylenediamine dihydrochloride, N, N-dimethyl-p-phenylenediamine oxalate, N, N-dimethyl-p-phenylenediamine monohydrochloride and N. N. N' N' tetra-methyl-p-phenylenediamine dihydrochloride.

4,108,730

METHOD FOR TREATMENT OF RUBBER AND PLASTIC WASTES

Nai Yuen Chen, Titusville, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,509
Int. Cl.^{2} C10B *47/24, 53/02, 55/10*
U.S. Cl. 201—2.5 5 Claims



1. A process for converting rubber from tires to distillates including a gasoline fraction which comprises the following sequential steps:

(a) grinding the rubber tires to a particle size within the range from about ¼-inch to ½-inch or less;

(b) separating metals from ground rubber;

(c) slurrying the ground rubber with a selected petroleum-derived stream;

(d) maintaining the slurry at a temperature within the range from about 500° to 700° F for a sufficient time for dissolution of the rubber to occur;

(e) feeding the rubber solution to a fluidized catalytic cracking zone operated at a temperature of 850° F or more, a pressure from subatmospheric to 3 atmospheres, and in the absence of externally added hydrogen;

(f) withdrawing a cracked product having a liquid hydrocarbon component and a solids component;

(g) separating the solids component from the liquid hydrocarbon component, and

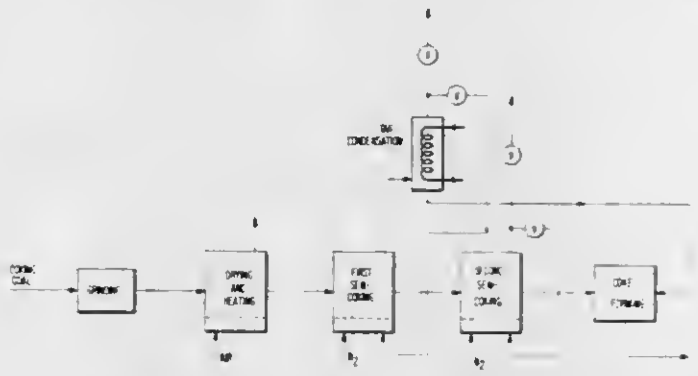
(h) distilling the liquid hydrocarbon component to recover distillates including a gasoline fraction.

4,108,731

COKE PRODUCTION

Luigi Palumbo; Angelo Colletta, and Giampaolo Giromella, all of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Continuation of Ser. No. 528,393, Nov. 29, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,176
Claims priority, application Italy, Nov. 29, 1973, 53985 A/73
Int. Cl.^{2} C10B *47/24, 49/10, 53/04, 57/02*
U.S. Cl. 201—8 1 Claim



1. In a method of producing coke, comprising grinding coking coal containing about 0.64% by weight sulfur, drying and heating the ground coal at a temperature of 200° to 300° C. for 15 to 120 minutes by fluidizing the ground coal with gas consisting essentially of 50 to 100% by volume air, 0 to 50% by volume steam and 0 to 50% by volume nitrogen in addition to that present in said air thereby to produce a dried and heated material; passing said material to a first semicoking stage, heating said material by fluidization in said first semicoking stage at 400° to 600° C. for 10 to 60 minutes while supplying to said first semicoking stage a make-up fluidizing gas comprising 0 to 20% by volume air, 50 to 100% by volume nitrogen in addition to that present in said air, and 0 to 50% by volume steam, thereby to produce semicoke and offgases; cooling said offgases to produce condensed tar and residual gases; passing the semicoke from said first semicoking stage to a second semicoking stage, heating the semicoke by fluidization in said second semicoking stage at 800° to 1,100° C. for 10 to 60 minutes with the production of offgases while supplying to said second semicoking stage a make-up fluidizing gas comprising 0 to 70% by volume air and 30 to 100% by volume nitrogen in addition to that present in said air; and briquetting the semicoke from said second semicoking stage into formed coke; the improvement comprising substantially reducing the residual sulfur content of the formed coke to about 0.4% by weight by recycling to said first semicoking stage at fluidizing gas 15 to 95% by volume of said residual gases; and recycling to said second semicoking stage as fluidizing gas 15 to 95% by volume of said offgases from said second semicoking stage.

4,108,732

HEATING CARBONACEOUS PARTICULATE MATERIAL

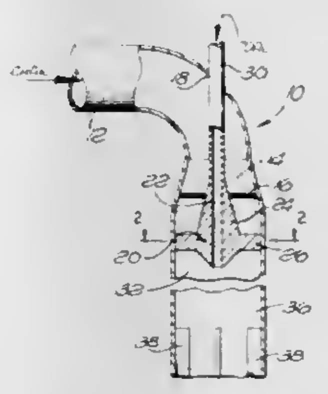
Herbert E. Nuttall, Jr., Albuquerque, N. Mex., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 473,125, May 24, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,208
Int. Cl.^{2} C10B *1/04, 49/06, 49/12, 49/20*
U.S. Cl. 201—22 29 Claims

1. A process for subjecting carbonaceous particulate material to the influence of a stream comprising a heat-supplying particulate material comprising:

a. forming a primary swirling annular stream, substantially free of free oxygen by preventing free oxygen from being mixed with said stream during the formation of said stream, said stream comprising an entrained heat-supplying primary particulate material, said primary swirling annular stream having a central cavity;

b. introducing into said central cavity of secondary stream comprising a fresh carbonaceous particulate material, substantially free of free oxygen by preventing free oxygen from being mixed with said stream prior to and during introduction into said central cavity, said fresh carbonaceous particulate material having an initial chemical composition;



c. subjecting said fresh carbonaceous particulate material to the influence of said heat-supplying primary particulate material thereby causing a transformation of said fresh carbonaceous particulate material into a substance of different chemical composition than said initial chemical composition, said substance comprising a solid product, and preventing free oxygen from being introduced into said reactor; and

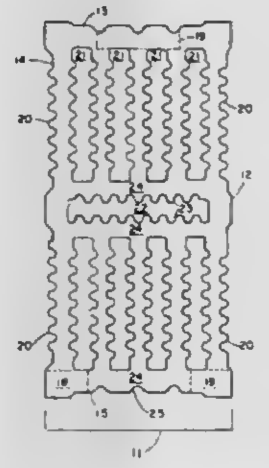
d. removing all material from said reactor.

4,108,733

HIGH EFFICIENCY COKE OVEN REGENERATOR CHECKER BRICK

Donald Joel Gerber, Glenshaw, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1977, Ser. No. 790,667
Int. Cl.^{2} C10B *29/02;* F23L *15/02*
U.S. Cl. 202—267 A 8 Claims



1. A high efficiency coke oven regenerator checker brick, composed of refractory material, comprising:

a. a vertical front side wall, the external face of which is formed of an alternate vertical concave radii, the radius of which is greater than ⅛ inch, and flat surface configuration symetrically positioned about the center of said wall;

b. a vertical right side wall, projecting rearward from the right edge of said front side wall at a 90° angle, the external face of which is formed of a set of alternate vertical concave and convex radii configurations, the radius of which is not less than ⅛ inch, centrally divided by a vertical flat separator surface, with the internal face formed by the opposite relief of the external face;

c. a vertical rear side wall, projecting to the left from the rear edge of said right wall at a 90° angle and running parallel to said front side wall, the external face of which is identical to that of said front side wall;

d. a vertical left side wall forming a connection between the left edges of said rear side wall and said front side wall, projecting from each at a 90° angle, the external and internal faces of said left side wall being identical to those of said right side wall;

e. a horizontal top surface abutting the top edges of said side walls and perpendicular to said side walls;

f. a horizontal bottom surface abutting the bottom edges of said side walls and perpendicular to said side walls;

g. a pair of vertical parallel cross walls connecting said right side wall with said left side wall about the mid points of said side walls, running perpendicular to said left side wall and said right side wall, creating a cross slot between said cross walls which bisects the center of said right side wall and said left side wall, the faces of said cross walls, exposed within said cross slot, being, in respective opposite relief, formed of alternate vertical concave and convex radii configurations, identical to said radii configuration of said right side wall;

h. a plurality of vertical front separator walls running parallel to and between said right side wall and said left side wall, connecting said front side wall to the foremost of said cross walls, said separator walls forming, with themselves and with the internal faces of said right side wall and said left side wall, slots, identical in size and configuration to said slot formed by said faces of said cross walls;

i. a plurality of vertical rear separator walls running parallel to and between said right side wall and said left side wall, connecting said rear side wall to the rearmost of said cross walls, said separator walls forming, with themselves and with the internal faces of said right side wall and said left side wall, slots, identical in size and configuration to said slot formed by said faces of said cross walls;

j. means, fixed to said checker brick, for elevating said checker brick above an object upon which said checker brick is placed, allowing a horizontal open space between said checker brick and said object upon which said checker brick is placed.

4,108,734

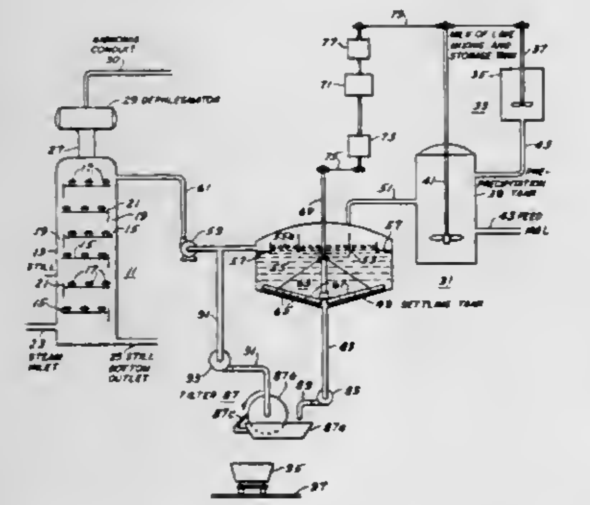
PROCESS FOR THE DISTILLATION OF WEAK AMMONIA LIQUOR

Daniel Kwasnoski, Hellertown; Charles J. Sterner; Russel J. Horst, both of Bethlehem, and Kenneth R. Burcaw, Jr., Easton, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 14, 1976, Ser. No. 695,624

Int. Cl.² B01D *3/38*

U.S. Cl. 203—7 **13 Claims**



1. An improved method of removing both free and fixed ammonia from weak ammonia liquor derived from a coal coking operation while reducing calcium solids accumulation in the still apparatus comprising:

(a) premixing ammonia liquor which contains both substantial free ammonia as ammonium carbonate, ammonium sulfide and ammonium cyanide and fixed ammonia as ammonium chloride, ammonium thiocyanate and ammonium sulfate, prior to initiating any removal of said ammonia by distillation, with lime to pre-precipitate lime compounds from the undistilled liquor,

(b) clarifying the weak ammonia liquor by removing substantially all precipitated lime compounds and undissolved lime from the undistilled liquor, and

(c) passing the pre-precipitated and clarified ammonia liquor into and through an ammonia still countercurrently with a heated gas to strip ammonia from said liquor.

4,108,735

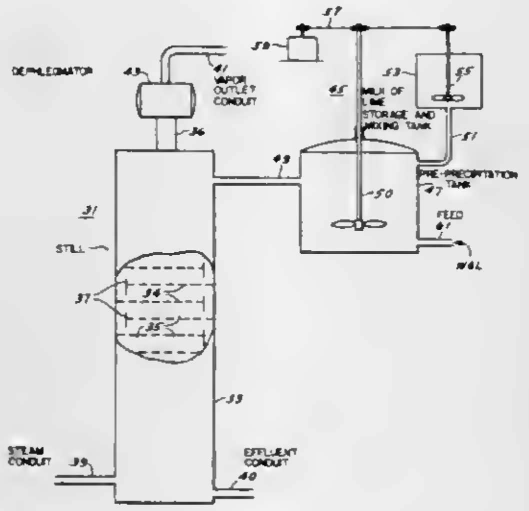
METHOD FOR IMPROVED DISTILLATION OF AMMONIA FROM WEAK AMMONIA LIQUOR

Kenneth R. Burcaw, Jr, Easton; Daniel Kwasnoski, Hellertown, and Eugene M. Rudzki, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 14, 1976, Ser. No. 695,685

Int. Cl.² B01D *3/38*

U.S. Cl. 203—7 **18 Claims**



1. An improved method of distilling weak ammonia liquor containing both free and fixed ammonia derived from a coal coking operation with decreased fouling of the still apparatus comprising:

(a) premixing ammonia liquor which contains both substantial free ammonia as ammonium carbonate, ammonium sulfide and ammonium cyanide and fixed ammonia as ammonium chloride, ammonium thiocyanate and ammonium sulfate prior to initiating any distillation with sufficient lime to pre-precipitate at least most of the principal components of precipitation fouling from the undistilled weak ammonia liquor, and

(b) passing the ammonia liquor subsequent to pre-precipitation with said lime through an ammonia still countercurrently with steam to distill the ammonia liquor and release ammonia from the liquor.

4,108,736

METHOD OF PRODUCING PROTECTIVE COATINGS

Serge Rigo, Drancy, and Julius Siejka, Paris, both of France, assignors to Agence Nationale de Valorisation de la Recherche (Anvar), Neuilly-sur-Seine, France

Filed Nov. 25, 1974, Ser. No. 526,915

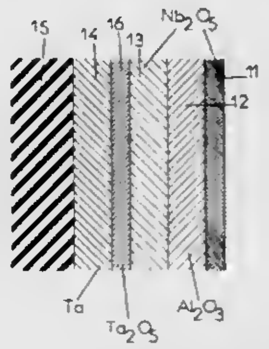
Claims priority, application France, Nov. 23, 1973, 73 41847; Jul. 26, 1974, 74 26017

Int. Cl.² C25D *11/04, 11/26, 11/28, 11/32*

U.S. Cl. 204—1.5 **24 Claims**

1. The method of providing a metallic part susceptible to

corrosion with a corrosion-resistant coating, which comprises depositing onto said metallic part a surface layer of a first material selected from the group of materials consisting of niobium, chromium, tungsten and molybdenum in the metallic state or of a conducting compound or alloy containing said first material, depositing on said surface layer, a top layer of a second metal material different from said first material and selected from the group consisting of aluminum, silicon, gallium, tantalum, uranium and molybdenum, either in the metallic state if it forms itself a semi-conductive or an insulator, or combined or alloyed with at least one other element to form a semi-conductor compound and then subjecting the surface layer to anodic oxidation, thus causing metal of the surface layer to migrate through and onto the metal of the top layer, and forming thereon a coating of an oxide of the one of the metals of the surface layer, and interrupting the anodic oxidation prior to the complete oxidation of the first element of the surface layer, whereby there is formed on the three-layer corrosion-resistant coating of an oxide of the metal of the surface layer, subjacent the top layer, metal of the surface layer still being in the metallic state, the top layer in an oxidized state and an oxide of the metal of the surface layer overlying the top layer.



4,108,737

METHOD OF CONTINUOUS PRODUCTION OF A DUCTILE SUPERCONDUCTING MATERIAL IN THE FORM OF TAPES, FOILS OR WIRES

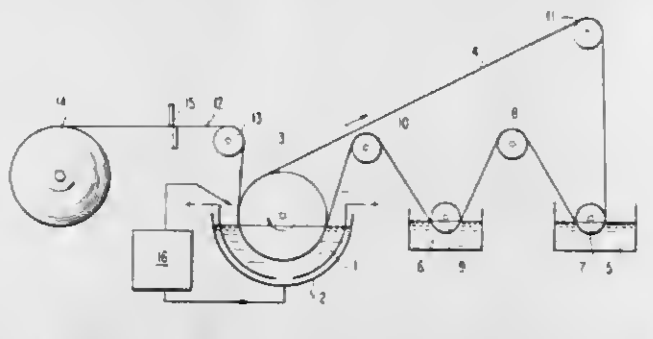
Josef Ehrhardt, Wiesbaden, and Heinrich Winter, Eschborn, both of Germany, assignors to Battelle-Institute, Postfach, Germany

Filed Mar. 29, 1977, Ser. No. 782,381

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613285

Int. Cl.² C25D *1/04, 15/00, 15/02*

U.S. Cl. 204—13 **20 Claims**



1. A method for the continuous production of ductile, superconducting material in the form of tapes, foils or wires comprising the steps of:

(a) preparing submicron particles of a superconducting material, said particles having diameters of between 50 and 2000 A;

(b) suspending said submicron particles in an electrolyte solution containing a wetting agent;

(c) codepositing said submicron superconducting particles and a matrix metal onto a moving substrate by galvanic action;

(d) alternately depositing at least one layer of matrix material having submicron particles dispersed therein and at least one layer of metal onto said deposit;

(e) reducing the cross-sectional dimensions of said deposit; and

(f) applying a coating thereto to isolate the superconducting layers.

4,108,738

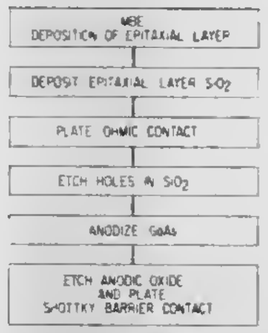
METHOD FOR FORMING CONTACTS TO SEMICONDUCTOR DEVICES

Alfred Yi Cho, Summit, and Martin Victor Schneider, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1977, Ser. No. 770,014

Int. Cl.² C25D *5/02, 7/12*

U.S. Cl. 204—15 **11 Claims**


MBE DEPOSITION OF EPITAXIAL LAYER
DEPOSIT EPITAXIAL LAYER SiO2
PLATE OHMIC CONTACT
ETCH HOLES IN SiO2
ANODIZE GaAs
ETCH ANODIC OXIDE AND PLATE SCHOTTKY BARRIER CONTACT

1. A process for fabricating a Schottky barrier device comprising the steps of:

(a) forming a semiconductor epitaxial layer on a major surface of a semiconductor substrate;

(b) forming an ohmic contact on an opposite major surface of said substrate;

(c) forming a mask on the free surface of said epitaxial layer so as to have an opening which exposes a portion of said free surface;

(d) converting said epitaxial layer in the opening to a stable oxide so as to form a depression in said epitaxial layer filled with said oxide;

(e) leaving said oxide in said depression until step (f) so as to protect said epitaxial layer in said opening from contamination by the atmosphere; and

(f) subjecting the body formed by steps (a) to (e) to a plating solution so that (1) said oxide is removed and said depression in said epitaxial layer is exposed to said solution and, (2) substantially immediately thereafter a metal is deposited in said depression, thereby forming a Schottky barrier contact with said epitaxial layer.

4,108,739

PLATING METHOD FOR MEMORY ELEMENTS

Eiichi Tadokoro, and Tatsuji Kitamoto, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation of Ser. No. 579,162, May 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 503,205, Sep. 4, 1974, abandoned. This application Apr. 12, 1977, Ser. No. 786,926

Claims priority, application Japan, Sep. 4, 1973, 48-99641

Int. Cl.² C25D *3/56, 5/10, 5/14*

U.S. Cl. 204—40 **4 Claims**

1. A method for electroplating in a single electroplating bath which contains nickel and cobalt as the main component and as an additional component phosphorus, said components being either ferromagnetic or non-magnetic in properties, said electroplating bath containing from about 1 to 300 g/l of nickel ions, from about 1 to 300 g/l of cobalt ions and from about 1 to 100 g/l of $NaH_2PO_2.H$ O, said method comprising varying the electric current density during plating from about 0.3A/dm² to about 10A/dm² so that a non-magnetic film is selectively deposited at one electric current density and a ferromagnetic film

is selectively deposited at a second electric current density, thereby forming a plated non-magnetic film containing mainly nickel and cobalt and as an additional component phosphorus and a plated ferromagnetic film, said ferromagnetic and non-magnetic components being selectively deposited at different electric current densities.

4,108,740

HARD, HEAT-RESISTANT NICKEL ELECTRODEPOSITS

William Ronald Wearmouth, Halesowen, England, assignor to The Ioternational Nickel Company, Inc., New York, N.Y.

Filed May 25, 1977, Ser. No. 800,579

Claims priority, application United Kingdom, May 28, 1976, 22299/76

Int. Cl.² C25D *3/12, 1/02, 1/08*

U.S. Cl. 204—11 **19 Claims**

1. An electroformed, hard nickel, screen printing cylinder for exposure in use or manufacture to temperatures exceeding 200° C, said hard nickel portion of said cylinder consisting essentially of, in weight percent: from about 0.007 to about 1% sulfur, sufficient manganese, in the range of from about 0.02 to about 5%, in excess of the stoichiometric amount necessary to form manganese sulfide with the sulfur, to improve embrittlement resistance of said electrodeposit at temperatures exceeding 200° C; and the balance essentially nickel.

4,108,741

PROCESS FOR PRODUCTION OF ALUMINUM

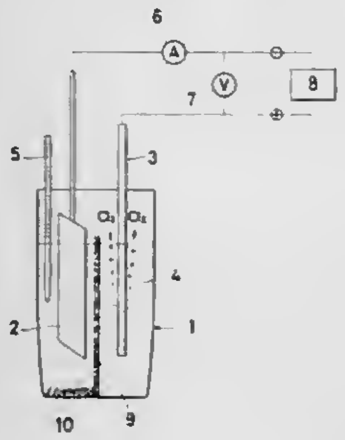
Yoshishige Tsumura, Tokyo, Japan, assignor to Mitsui Aluminum Co., Ltd., Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,457

Claims priority, application Japan, May 26, 1976, 51-59953

Int. Cl.² C25C *3/06*

U.S. Cl. 204—67 **6 Claims**



1. A process for the production of aluminum, which comprises the steps of introducing into an electrolytic cell an electrolytic bath containing 50 to 93% by weight of aluminum chloride and additionally incorporating therein 0.1 to 3% by weight, based on the weight of the bath, of at least one member selected from the group consisting of magnesium salts and calcium salts; electrolyzing said electrolytic bath under conditions of a current density for the anode in the range of from 0.5 A/dm² to 200 A/dm², a current density for the cathode in the range of from 0.5 A/dm² to 200 A/dm², a bath temperature in the range of from 120° C to 250° C and a cell voltage in the range of from 2.7 V to 11.4 V, thereby educing aluminum on the cathode; causing the educed aluminum to come off the cathode and form a precipitate in said electrolytic bath; separating said precipitate from said electrolytic bath; melting said separated precipitate to give rise to an aluminum phase and a fusion slag phase; and isolating said aluminum phase.

4,108,742

ELECTROLYSIS

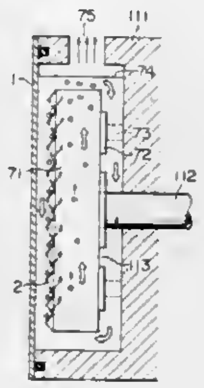
Maoml Seko, Tokyo; Shinsaku Ogawa, and Muneo Yoshida, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 556,484, Mar. 7, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 771,978

Claims priority, applicatioo Japan, Mar. 9, 1974, 49-26775

Int. Cl.² C25B *1/16, 1/26*

U.S. Cl. 204—98 **8 Claims**



1. A process for the electrolysis of an aqueous alkali chloride solution in a bipolar electrolytic cell, the cell being partitioned by a cation exchange membrane into cathode and anode chambers, the cathode and anode being formed of gas permeable metallic plates, said process comprising conducting electrolysis while generating chlorine gas at the anode and hydrogen gas at the cathode and discharging said gases in back of the respective electrodes while controlling the pressure in the cathode chamber so that it is higher than the pressure in the anode chamber, thereby to press the cation exchange membrane towards but not against the anode so that the width of the desalted layer between the membrane and the anode is reduced to a minimum.

4,108,743

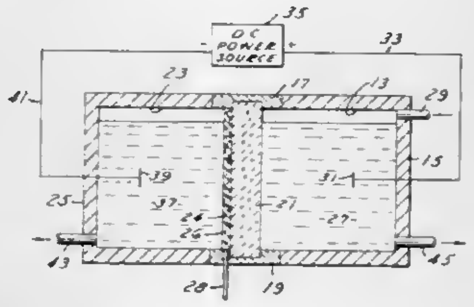
METHOD AND APPARATUS FOR SEPARATING A METAL FROM A SALT THEREOF

Robert W. Minck, Lathrup Village, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 2, 1977, Ser. No. 793,105

Int. Cl.² C25C *3/00*

U.S. Cl. 204—64 R **43 Claims**



1. In an electrochemical method for recovering a metal from an electrically dissociable salt thereof, which comprises: placing said salt in a molten state in contact with one side of a solid electrolyte that is impermeable to said metal, said salt and the anions of said salt, and selectively conductive with respect to the cations of said metal and said salt; providing a first electrode in contact with said salt on one side of said solid electrolyte; providing a second electrode in contact with said metal on the opposite side of said electrolyte; providing a difference of electrical potential between said first electrode and said second electrode in polarity arrangement adapted to cause unidirectional flow of cations of said metal from said salt through said solid electrolyte and convert said cation to elemental metal, said solid electrolyte comprising a crystalline structure consisting of a crystal lattice and cations of said metal which migrate in relation to said crystal lattice under influence of an electric field, at least a major portion by weight of said cyrstal lattice consisting of ions of aluminum and oxygen in crystal lattice combination,

wherein the improvement comprises disposing a molten secondary electrolyte adjacent to and contiguous with said opposite side of said solid electrolyte, said secondary electrolyte comprising a molten salt of said metal being recovered and being (i) ionically conductive to cations of said metal being recovered, (ii) substantially electronically insulating, (iii) substantially insoluble in said recovered molten metal and (iv) nonreactive with said solid electrolyte and said recovered molten metal.

4,108,744

RECOVERY OF THE ZINC CONTAINED IN THE RESIDUAL SOLUTIONS OBTAINED AFTER ELECTROLYTIC DEPOSITION

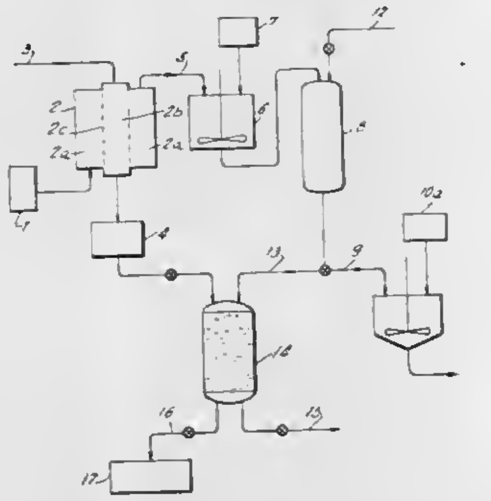
Jean-Pierre Bernat, Pau, and Jean Sors, Bollene, botb of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed Apr. 1, 1977, Ser. No. 783,699

Claims priority, applicatioo France, Apr. 2, 1976, 76 09587

Int. Cl.² C25C *1/16;* **C25D** *21/16, 21/22*

U.S. Cl. 204—119 **11 Claims**



1. A method for recovering zinc and sulfuric acid from a residual aqueous solution containing more than 50 grams of H_2SO_4 per liter which remains after carrying out electrolytic zinc deposition process, the method comprising the following steps:

(a) dialyzing the solution to form a first solution containing the zinc and up to 50 grams per liter of H_2SO_4 and a second solution containing more than 50 grams H_2SO_4 per liter;
(b) adding to the first solution thus obtained at least 4 moles of NaCl per atom of zinc present, whereby the zinc is complexed;
(c) contacting the zinc complexed first solution with an anion exchange resin;
(d) separating the resulting first solution containing substantially no zinc from the anion exchange resin, and
(e) eluting the anion exchange resin to recover the zinc therefrom.

4,108,745

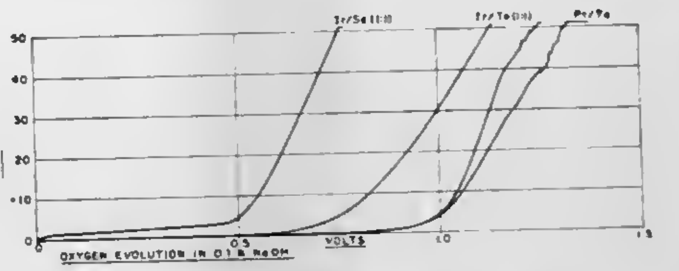
SELENIUM-CONTAINING COATING FOR VALVE METAL ELECTRODES AND USE

Divna Cipris, Morristown, N.J., and Dirk Pouli, Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1977, Ser. No. 786,704

Iot. Cl.² C25B *1/02, 11/08, 11/10*

U.S. Cl. 204—129 **18 Claims**



1. In the process for a electrolytically generating oxygen by passing an electrical current through an acidic or

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4,108,746

METHOD OF OXIDATIVE DEGRADATION OF PHOSPHOROUS ESTERS

Theodore Mill, Palo Alto; Constance W. Gould, Menlo Park, both of Calif.; Joseph Epstein, and Leon J. Schiff, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 8, 1977, Ser. No. 831,564

Iot. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **14 Claims**

1. A method for oxidatively degrading an alkyl methylphosphono compound selected from the group consisting of O-alkyl methylphosphonic acid and its esters to give the oxidation products phosphoric acid, carbon dioxide and water comprising the steps of preparing an aqueous mixture of said alkyl methylphosphono compound, mixing the resulting aqueous mixture with a two to five molar excess of a source of free hydroxy radicals, saturating the resulting solution with UV radiation at a wave length below 300nm to thereby initiate oxidation of the alkyl methylphosphono compound and continuing said irradiation for one to two hours for complete oxidation.

4,108,747

CURABLE COMPOSITIONS AND METHOD FOR CURING SUCH COMPOSITIONS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,149

Int. Cl.² C08F *2/50, 4/00*

U.S. Cl. 204—159.18 **6 Claims**

1. Curable compositions comprising:

(A) a cationically polymerizable organic material selected from the class consisting of oxirane containing organic resins, vinyl organic monomers, vinyl organic prepolymers, cyclic organic ethers, cyclic organic esters, cyclic organic sulfides, cyclic amines and organic silicon cyclics, and
(B) from 0.1% to 10% by weight of the cationically polymerizable organic material of the radiation sensitive sulfonium salt of the formula,

$$[(R)_a(R^1)_b(R^2)_cS]^+[XSO_3]^-,$$

where **R** is a monovalent aromatic organic radical, **R¹** is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, **R²** is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, *a* is a whole number equal to 0 to 3 inclusive, *b* is a whole number equal to

0 to 2 inclusive. *c* is a whole number equal to 0 to 1, where the sum of $a + b + c$ is a value equal to 3, and X is a member selected from aromatic hydrocarbon radicals having from 6-13 carbon atoms, alkyl radicals having from 1-8 carbon atoms, halogenated derivatives thereof and fluorine.

4,108,748
PHOTOFINISHING OF COTTON TEXTILES

Norman A. Portnoy, Hopatcong, N.J.; Jett C. Arthur, Jr.; Matthew F. Margavio, both of Metairie, La., and Marie C. Nelson, New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 28, 1975, Ser. No. 563,257
Iot. Cl.² C08L *1/08;* **B01J** *1/10*
U.S. Cl. 204—159.12 4 Claims

1. A process for imparting to cotton fabrics the desirable durable-press property of wrinkle recovery while retaining the natural properties of untreated cotton, the process comprising:

(a) impregnating an acrylated cotton fabric of about from 0.08 to 0.5 degree of substitution with a 0.5 to 4.0% acrylamide solution in a solvent mixture of water and N,N-dimethylformamide wherein the water content or the N,N-dimethylformamide content can vary from 10 to 100%,

(b) subjecting the wet impregnated acrylated cotton fabric of (a) to a photolyzing treatment consisting of exposing the impregnated fabric to near ultraviolet light of 3100 to 4000 Angstrom units, with maximum intensity of about 3500 Angstrom units, for about from 30 minutes to 22 hours, in an inert atmosphere to initiate a free-radical crosslinking reaction between substituted acrylate groups on cotton as well as substituted acrylate groups and cotton to obtain a crosslinked, durable-press fabric, and

(c) washing and drying the photolyzed acrylated and crosslinked fabric.

4,108,749
IRRADIATION PROCESS FOR THE PREPARATION OF POLY(VINYL CHLORIDE-G-ISOBUTYLENE) COPOLYMERS

Georg Gustav Anton Bohm; Prakash Druman Trivedi, both of Akron, and Joseph Kestutis Valaitis, Brecksville, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 25, 1977, Ser. No. 827,534
Int. Cl.² C08F *8/00*
U.S. Cl. 204—159.17 5 Claims

1. A process for the preparation of a graft copolymer comprising the steps of:

irradiating a quantity of PVC resin to form reactive sites in an environment substantially free from ambient air and extraneous impurities said irradiation dose being more than 2 to about 15 Mrads;

dissolving said irradiated PVC resin in a suitable solvent;

adding a monomeric charge of isobutylene monomer and a catalytic amount of a trialkyl aluminum compound to said irradiated resin dissolved in said solvent at a temperature of from about −70° C to about 0° C whereby said reactive sites and said trialkyl aluminum compound initiate polymerization of said monomer; and,

thereafter terminating the reaction and precipitating the graft copolymer product.

4,108,750
METHOD FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Divisinn of Ser. No. 599,747, Jul. 28, 1975, Pat. No. 4,055,527.
This application Jun. 22, 1977, Ser. No. 808,853
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 R 9 Claims

1. A method of coating an electrically conductive surface which comprises passing an electric current between an electrically conductive anode and an electrically conductive cathode in contact with a water-dispersed coating composition comprising a resinous vehicle which is the addition polymerization reaction product of:

(A) a diene with

(B) an at least partially neutralized reaction product of:

(1) an unsaturated dicarboxylic acid or its anhydride with

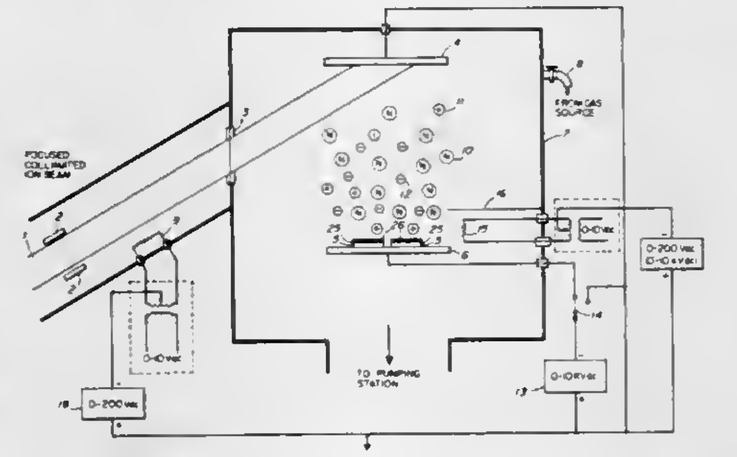
(2) a drying oil

said polymeric reaction product having been prepared in aqueous medium in the presence of an oil-soluble free radical polymerization catalyst and a chain transfer agent.

4,108,751
ION BEAM IMPLANTATION-SPUTTERING

William J. King, 9 Putnam Rd., Reading, Mass. 01867

Filed Jun. 6, 1977, Ser. No. 803,571
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 N 13 Claims



1. Method of depositing onto and implanting into a substrate at least one layer of at least one material comprising directing a primary beam of ions at a target surface of said material at an energy sufficient to sputter neutral atoms and molecules and ionized particles from said target surface material, placing a surface of said substrate in the path of said neutral atoms and molecules and ionized particles, and accelerating said ionized particles towards said substrate surface, thereby increasing the penetration of said particles into said substrate.

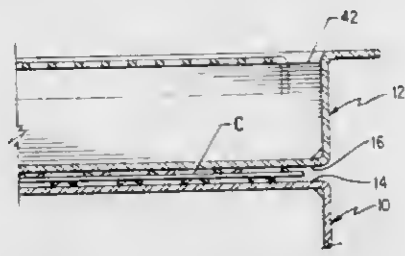
12. Apparatus for ion beam sputtering comprising in combination support means for a substrate, means for directing a primary beam of ions at a target at an energy sufficient to sputter neutral particles and ionized particles from said target towards said substrate, and means for accelerating said ionized particles towards said substrate thereby increasing the penetration of said particles into said substrate.

13. Apparatus of claim 12 wherein said means for accelerating comprises a direct current voltage applied to said substrate.

4,108,752
ELECTROLYTIC CELL BANK HAVING SPRING LOADED INTERCELL CONNECTORS

Gerald R. Pobto, Mentor, and Michael Joseph Kubrin, Chardon, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 31, 1977, Ser. No. 801,552
Int. Cl.² C25B *9/00*
U.S. Cl. 204—256 12 Claims



1. An electrolytic cell bank comprising:

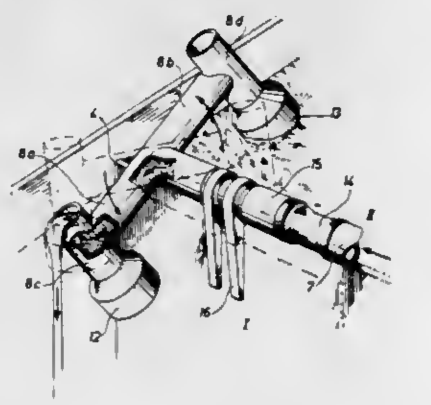
a plurality of electrolytic cell units, each unit comprising an anode pan, a cathode pan, and a separator, said anode pan and separator enclosing an anode compartment having an anode and anolyte therewithin; said cathode pan and separator enclosing a cathode compartment having a cathode and catholyte therewithin; and at least one access port in each of said compartments for adding electrolyte and removing products therefrom, each of said compartments having an exterior face parallel to said separator and

a plurality of conductive strips each having a plurality of louvers having edges thereon defining a plurality of contact points wherein at least one conductive strip is interposed between the exterior face of an anode pan of one cell unit and the adjacent exterior face of a cathode pan of an adjacent cell unit, said louvers being in compressive contact with said exterior faces of both said anode and cathode pans whereby an anode pan of one cell unit, each said conductive strip and a cathode pan of an adjacent cell unit form a bipolar electrode within said electrolytic cell bank.

4,108,753
APPARATUS FOR RECOVERY OF RE-USABLE SUBSTANCES FROM A FIXING BATH IN PROCESSES FOR DEVELOPMENT AND FIXING OF PHOTOGRAPHIC FILMS AND X-RAY FILMS

Östen Lindgren, Solna, Sweden, assignor to AB Metall & Bergprodukter, Solna, Sweden

Division of Ser. No. 632,274, Nov. 17, 1975, Pat. No. 4,042,473.
This application May 6, 1977, Ser. No. 794,475
Claims priority, application Sweden, Dec. 4, 1974, 7415216
Int. Cl.² C25B *13/02*
U.S. Cl. 204—263 5 Claims

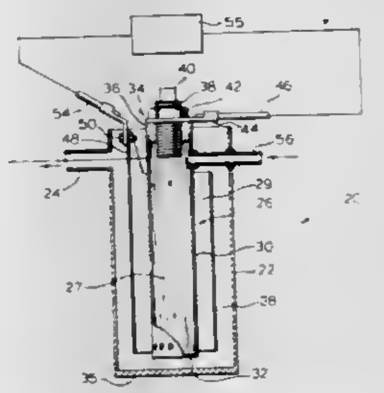


1. Recovery apparatus for the electrolytic recovery of silver from fixing bath solutions obtained by development of photographic films and X-ray films comprising: a tank connected to the development fixing bath, said tank containing the anodes and cathodes for the electrolytic process, and being subdivided into first and second chambers by a separating wall; and a flow guiding device disposed above said separating wall and by means of a rocker and floaters operative to automatically guide the solution flowing from the development fixing baths to the first chamber until this chamber is filled, whereupon silver precipitation is started in this chamber, and to the second chamber which is filled with liquid during the precipitation process in the first chamber, respectively, of which chamber one is connected to sewage and chamber two is connected to a recovery chemicals tank.

4,108,754
CARBON FIBER ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to Ontario Limited, Toronto, Canada

Division of Ser. No. 599,457, Jul. 28, 1975, Pat. No. 4,046,663.
This application Jun. 27, 1977, Ser. No. 810,246
Int. Cl.² C25B *11/02, 11/12, 9/00*
U.S. Cl. 204—263 5 Claims



1. An electrochemical reactor comprising:

a container having means defining at least one inlet and at least one outlet and including means defining an electrolyte flow path between the inlet and the outlet;

a working electrode positioned in the electrolyte flow path, the electrode being of a plurality of carbon fibers arranged in a group with each fiber being generally in side-by-side relationship with other fibers so that each fiber makes numerous electrical connections by contact with other fibers over the length of the fiber and such that the group of fibers exhibits a significant thickness in all directions measured perpendicularly of each fiber so that in use electrolyte must take a tortuous path through the group of carbon fibers, each of the fibers having a relatively good electrical conductivity and having a very small maximum thickness compared with the length of the fiber, the length being such that the fibers individually exhibit no significant resistance to transverse deflection, and means coupled to at least some of the fibers electrically for establishing an electrical potential substantially throughout the electrode; and

a counter-electrode positioned in the container and spaced from the working electrode.

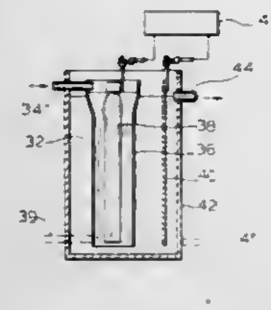
4,108,755
METALLIC FILAMENT ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to Ontario Limited, Toronto, Canada

Division of Ser. No. 599,458, Jul. 28, 1975, Pat. No. 4,046,664. This application Jun. 27, 1977, Ser. No. 810,253

Int. Cl.^{2} C25B *9/00, 11/02*

U.S. Cl. 204—263 **3 Claims**



1. An electrochemical reactor comprising:

a container having means defining at least one inlet and at least one outlet and including means defining an electrolyte flow path between the inlet and the outlet;

a working electrode positioned in the electrolyte flow path, the electrode being of a plurality of metallic filaments arranged in a group with each filament being generally in side-by-side relationship with other filaments so that each filament makes numerous electrical connections by contact with other filaments over the length of the filaments and such that the group of filaments exhibits a significant thickness in all directions measured perpendicularly of each fiber so that in use electrolyte must take a tortuous path through the group of metallic filaments, each of the metallic filaments having a relatively good electrical conductivity and having a very small maximum thickness compared with the length of the filament, the length being such that individually the filaments exhibit no significant resistance to transverse deflection, and means coupled to at least some of the filaments electrically for establishing an electrical potential substantially throughout the electrode; and

a counter-electrode positioned in the container and spaced from the working electrode.

4,108,756
BIPOLAR ELECTRODE CONSTRUCTION

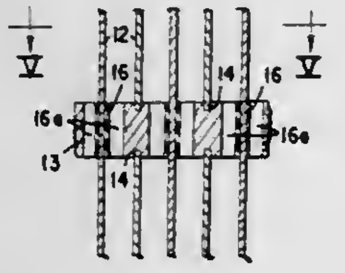
Oronzio de Nora, Milan; Vittorio de Nora, Nassau, The Bahamas, and Placido M. Spaziante, Milan, Italy, assignors to Oronzio de Nora Impianti Electtrochimici S.p.A., Milan, Italy

Division of Ser. No. 514,762, Oct. 15, 1974, Pat. No. 4,032,426. This application Nov. 26, 1976, Ser. No. 745,403

Claims priority, application Italy, Oct. 30, 1973, 30709 A/73

Int. Cl.^{2} C25B *11/00*

U.S. Cl. 204—286 **4 Claims**



1. A bipolar element for vertical electrolyzers comprising an electrically non-conductive, electrolyte inert divider element with a cross-section adapted to the cross-section of the electrolyzer, a plurality of bipolar electrodes passing through said divider element and evenly distributed over the divider element cross-section with the anode portion and cathode portion extending the same distance from the horizontal surfaces of the divider element and means in said divider for allowing smooth upward flow of the electrolyte therethrough.

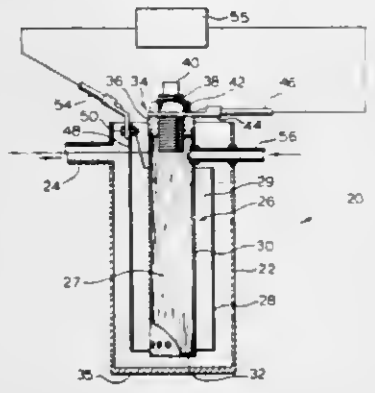
4,108,757
CARBON FIBER ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to 308489 Ontario Limited, Toronto, Canada

Division of Ser. No. 599,457, Jul. 28, 1975, Pat. No. 4,046,663. This application Jun. 27, 1977, Ser. No. 810,254

Int. Cl.^{2} C25B *11/12, 13/04*

U.S. Cl. 204—294 **4 Claims**



1. An electrode for use in an electrochemical reactor, the electrode comprising:

a plurality of carbon fibers arranged in a group with each fiber being generally in side-by-side relationship with other fibers so that each fiber makes numerous electrical connections by contact with other fibers over the length of the fiber and such that the group of fibers exhibits a significant thickness in all directions measured perpendicularly of each fiber so that in use electrolyte must take a tortuous path through the group of carbon fibers, each of the fibers having a relatively good electrical conductivity and having a very small maximum thickness compared with the length of the fiber, the length being such that the fibers individually exhibit no significant resistance to transverse deflection so that as electrolyte flows generally through the plurality of carbon fibers and over the individual fibers, flow eddys will tend to cause continuous transverse movement of the fibers relative to one another to enhance electrolytic action at the electrode; and

means coupled to at least some of the fibers over a discrete portion of the length of the fibers and providing electrical connection means for coupling the electrode to an external electrical circuit.

4,108,758
CONVERSION OF COAL INTO LIQUID FUELS

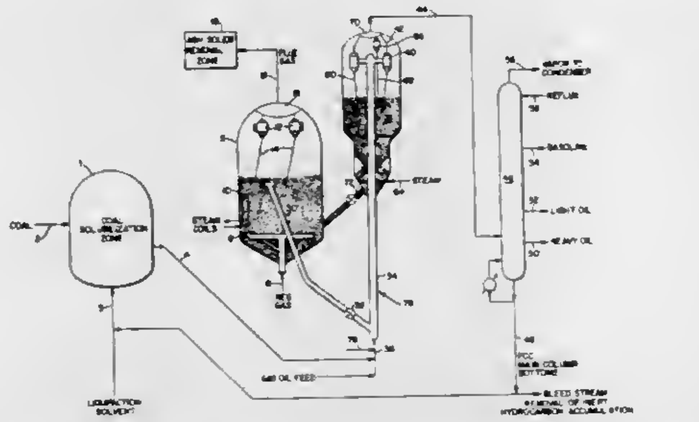
Hans-Juergen Schoennagel, Lawrence Township, Mercer County, and John C. Zahner, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,486

Int. Cl.^{2} C10G *1/04, 1/08*

U.S. Cl. 208—8 **4 Claims**

1. In a process for converting coal into liquid fuel products by solubilizing coal in a thermally stable, highly polycyclic aromatic residual oil at a temperature in the range between about 350° F and 850° F to form a solvated coal solution containing a suspension of ash solids, the improvement which comprises charging the solvated coal solution and suspended ash solids to a fluidized catalytic cracking zone in admixture with gas oil feed under cracking conditions; separating and recovering a hydrocarbon phase and a catalyst-ash solids phase from the catalytic cracking conversion zone effluent; passing the catalyst-ash solids phase into a catalyst regeneration zone; and removing entrained ash solids from flue gas effluent of the catalyst regeneration zone.



4,108,759
PROCESS AND APPARATUS FOR CONVERTING COAL INTO OIL AND OTHER COAL DERIVATIVES

Serenus H. A. Young, Apt. S-3, 1716 Terrell Mill Rd., Marietta, Ga. 30060

Filed Jun. 30, 1975, Ser. No. 591,614

Int. Cl.^{2} C10G *1/08;* **B01G** *11/02;* **B01J** *1/12*

U.S. Cl. 208—10 **25 Claims**

1. A process for converting coal into liquid coal derivatives, which includes continuously gasifying pulverized coal to provide hydrogen and separately and continuously liquefying pulverized coal to provide a liquid effluent containing fractionable oil and a hydrogenating liquid, including the steps of:

a. providing a slurry composed of pulverized coal and a hydrogenating liquid,
b. locating the slurry in a closed, substantially oxygen-free, pressure vessel,
c. heating the slurry in the vessel,
d. maintaining the slurry in the vessel at a selected elevated temperature and superatmospheric pressure,
e. insonating the heated slurry by ultrasonic shock waves radiated into the vessel and
f. introducing hydrogen produced by the gasification of the pulverized coal into the heated slurry during insolation of the heated slurry.

4,108,760
EXTRACTION OF OIL SHALES AND TAR SANDS

Derek Farnham Williams, London, and Terence Geoffrey Martin, Winchcombe, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jul. 24, 1975, Ser. No. 598,653

Claims priority, application United Kingdom, Jul. 25, 1974, 32892/74

Int. Cl.^{2} C10G *1/04*

U.S. Cl. 208—11 LE **17 Claims**

1. A process for the extraction of oil shales and tar sands comprising heating the shale or sand in the presence of an extractant gas selected from the group consisting of

ethylene,
carbon dioxide,
aromatic hydrocarbons having a single benzene ring,
aromatic hydrocarbon having a single benzene ring substituted with not more than 4 carbon atoms in a substituent group,
alicyclic hydrocarbon having at least 5 carbon atoms and not more than 12 carbon atoms,
aromatic hydrocarbon having 2 aromatic rings,
aliphatic hydrocarbon having at least 5 carbon atoms and not more than 16 carbon atoms,
phenol derived from an aromatic hydrocarbon having up to 8 carbon atoms,
alcohol,
aldehyde,
ketone,
ether,
ester,
aliphatic mono, di- and tri-amines having at least 4 and not more than 10 carbon atoms,
acyclic aliphatic amines and
aromatic amines having a benzene ring in the absence of externally supplied hydrogen to extract extractable constituents therefrom, separating the extractant and extract from the residue and recovering the extract from the extractant characterized in that the extractant is a gas phase extractant and the extraction is carried out at a temperature within the range of 0° to 550° C at a pressure not less than the critical pressure, the extractant being above its critical temperature by not more than 200° C and said temperature being within the range of 350° to 550° C when extracting oil shales.

4,108,761
DENITRIFICATION OF CARBONACEOUS FEEDSTOCKS

Morgan C. Sze, Upper Montclair; Abraham P. Gelbein, Plainfield, and Joon T. Kwon, Freehold Township, Monmouth County, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 574,255, May 5, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,208

Int. Cl.^{2} C10G *23/02*

U.S. Cl. 208—254 H **12 Claims**

1. A process for hydrodenitrification of a nitrogen-containing carbonaceous feedstock having a nitrogen content of at least 0.5 weight % comprising:

effecting hydrodenitrification in the presence of a supported sulfided catalyst containing nickel, molybdenum and iron wherein the molybdenum is present in an amount from about 10% to about 20%, by weight, calculated as MoO_3, based on total weight of catalyst, the iron to molybdenum atomic ratio being from about 0.05 to about 0.5 and the nickel to molybdenum atomic ratio being from about 0.3 to about 0.5.

4,108,762
TRANSPARENT CONTAINER INSPECTION APPARATUS

Momir Babunovic, Des Peres; James R. Gender, Kirkwood; Siamac Faani, Ferguson, and Mihai A. Bulboaca, Lemay, all of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

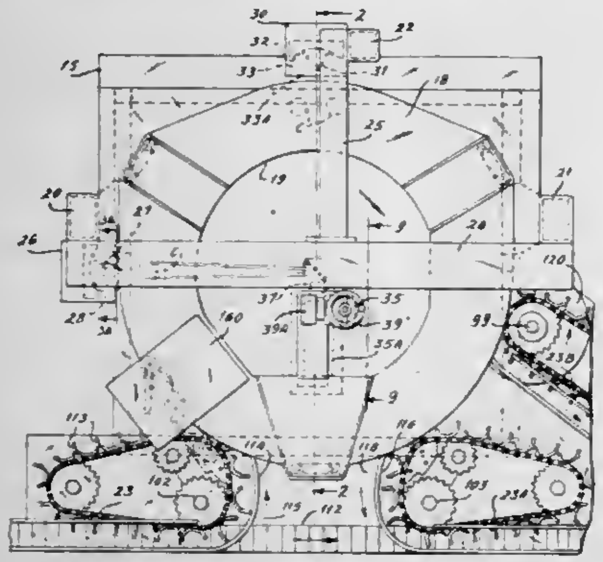
Continuation of Ser. No. 615,562, Sep. 22, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,739

Int. Cl.^{2} B07C *5/342*

U.S. Cl. 209—111.7 T **13 Claims**

1. A method of inspecting transparent containers for foreign objects, said method comprising the steps of gripping and creating a flow of containers in predetermined spaced relation along a curved path having a predetermined radius of curvature, directing the container flow through inspection stations that are spaced apart, causing the motion of the containers through the inspection stations to initiate the inspection steps which at certain stations energizes a source of illumination for passing a beam of light through the containers, directing the emerging lighted container images in directions which are coincident with the predetermined radius of curvature and coinciding at a common place of intersection, directing photosensitive scanning means toward said place of intersection of the lighted images to receive and scan the successive illuminated images for changes in the intensity of the illumination, and turning the gripped containers between inspection stations to align a different side of the containers with the sources of

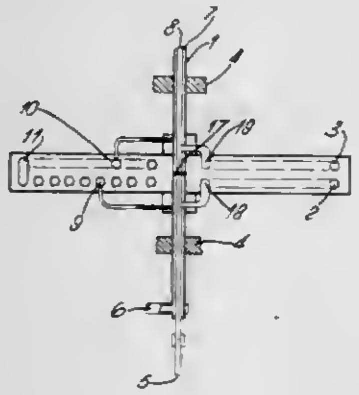
illumination and thereby to present a different illuminated image to the photosensitive means, and controlling the time of energization of the source of illumination so that one lighted image of a container at a time is scanned.



4,108,763

CONTINUOUS TREATMENT OF LIQUID EFFLUENT AND SEWAGE

George Francis Gilbert Clough, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England
Filed May 26, 1977, Ser. No. 800,854
Claims priority, application United Kingdom, Jun. 8, 1976, 23604/76
Int. Cl.² C02C *1/08;* **B01F** *3/04*
U.S. Cl. 210—14 **7 Claims**



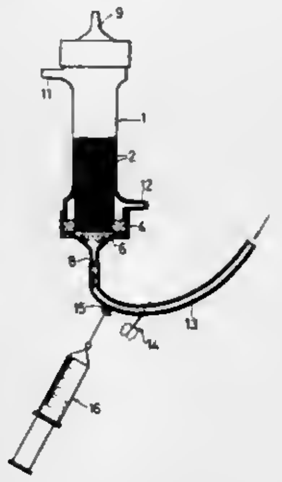
1. A method for the treatment of liquid-borne sewage or effluent in which the liquid is circulated firstly through a tubular coil, the compression coil, which is rotating about a substantially vertical axis, the pressure exerted on the liquid increasing continuously as the liquid passes from the innermost end of the coil to the outermost end of the coil, and secondly through a tubular coil, the decompression coil, which is rotating about a substantially vertical axis, the pressure exerted on the liquid decreasing continuously as it passes from the outermost end of the coil to the innermost end of the coil, an oxygen-containing gas being supplied to the liquid as it passes through the compression coil to flow co-currently with the liquid.

2. An apparatus for the treatment of liquid-borne sewage or effluent comprising a first tubular coil, the compression coil, a second tubular coil, the decompression coil, the two coils communicating with each other at their outer ends, means for rotating the two coils about the same substantially vertical axis, means for introducing the liquid-borne sewage or effluent into the inner end of the compression coil and circulating the liquid successively through the compression coil and the decompression coil, means for supplying an oxygen-containing gas to the liquid circulating in the compression coil to flow co-currently therewith, and means connected to the inner end of the decompression coil for recirculating to the compression coil at least a portion of the sludge carried by the circulating liquid.

4,108,764

METHOD AND APPARATUS FOR REMOVING GAS FROM INTERIOR OF HOLLOW-FIBER PERMEABILITY APPARATUS

Noriaki Kaneko, and Yasushi Joh, both of Yokohama, Japan, assignors to Nippon Ceon Co., Ltd., Tokyo
Filed May 17, 1977, Ser. No. 797,765
Claims priority, application Japan, May 20, 1976, 51-58299
Int. Cl.² B01D *13/00*
U.S. Cl. 210—22 A **55 Claims**



1. A method for removing gas from the interior of a hollow-fiber permeability apparatus in which a permeating region of a housing contains a bundle of hollow fibers, and materials can selectively permeate through the membranes formed by the permeable walls of the hollow fibers, between first and second fluids flowing through said housing inside and outside said fibers respectively, comprising the steps of:

(A), reacting a first material with a second material in at least one part of said apparatus, to produce carbonic acid gas; and

(B) substituting the gas previously existing in the interior of said housing with said produced carbonic acid gas.

4,108,765

MEMBRANE SEPARATION OF METHANOL FROM FORMALDEHYDE AQUEOUS MIXTURES

Cheng H. Lee, Creve Couer, Mo., assignor to Monsanto Company, St. Louis, Mo.
Continuation of Ser. No. 636,396, Dec. 1, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,748
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 R **12 Claims**

1. A process for separating methanol from formaldehyde-aqueous mixtures comprising: contacting the aqueous mixtures consisting of water, methanol and formaldehyde with a first surface of a hydrophobic polymeric membrane selectively permeable to the methanol over the formaldehyde selected from the group consisting of polyolefins, polysilicones, polyurethanes and cellulose tri-long-chain alkanoate; maintaining a second and opposite membrane surface at a lower chemical potential for the methanol than the first membrane surface; permeating a portion of the methanol into and through the membrane; and withdrawing at the second membrane surface a mixture having a higher total concentration of methanol in relationship to formaldehyde than the respective methanol to formaldehyde concentrations contained in the aqueous feed mixtures.

4,108,766

ION EXCHANGE PROCESS WITH COUNTER-CURRENT FRACTIONAL REGENERATION

Sandor Vajna, Reichenbergerstrasse 30 a, 534 Bad Honnef, Germany, assignor to Sandor Vajna, Bad-Honnef, Germany
Continuation of Ser. No. 703,033, Jul. 6, 1976, abandoned, which is a continuation of Ser. No. 636,482, Dec. 1, 1975, abandoned, which is a continuation of Ser. No. 571,876, Apr. 25, 1975, abandoned, which is a continuation of Ser. No. 165,586, Jul. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 754,531, Aug. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 431,479, Feb. 9, 1965, Pat. No. 3,448,043. This application Jul. 22, 1977, Ser. No. 818,035
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1967, 53897
The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.
Int. Cl.² B01D *15/06;* **C02B** *1/76*
U.S. Cl. 210—32 **10 Claims**

1. In an ion exchange process wherein an ion exchange bed is successively charged and discharged during an exchange cycle with an ion, here designated as "X" ion, with "Y" being used to designate the replacing ion and "Z" the oppositely charged ion associated with X and Y, by passing aqueous solutions of said ions therethrough, with the flow thereof during charging being in one direction and during discharging in the opposite direction; the improvement in the charging or discharging of the bed which comprises, in terms of discharging of the bed starting with said bed charged with X ions and filled with water substantially free of X, Y, and Z ions, comprising passing at least four groups of fractions through said bed, as follows:

(1) a first feed group of fractions, containing X, Y and Z ions, the concentration of Z ions remaining substantially constant, the concentration of X ions successively decreasing downwardly to or near to zero and the concentration of Y ions correspondingly increasing
(2) a second feed group of fractions containing Y and Z ions at the concentration of each Y and Z ions substantially equal to the concentration of Z ions in the previous group and free of X ions, being introduced as feed to the process
(3) a third feed group of fractions containing Y and Z ions, the concentrations of which successively decrease to or near to zero, and
(4) a fourth feed group of fractions consisting essentially of pure water free of X, Y, and Z ions;

recovering from said bed at least 3 effluent groups of fractions, as follows:

(a) a first effluent group of fractions containing the displaced water of the bed and a solution containing predominantly X ions and minor amounts of Y ions, both associated with Z ions, which group is removed from the process,
(b) a second effluent group of fractions, identical to said first feed group, and
(c) a third effluent group of fractions, identical to said third feed group;

and collecting said second and third effluent groups and using the same in a subsequent discharge portion of a cycle of said process.

4,108,767

SEPARATION OF AN AQUEOUS OR WATER-MISCIBLE LIQUID FROM A FLUID MIXTURE

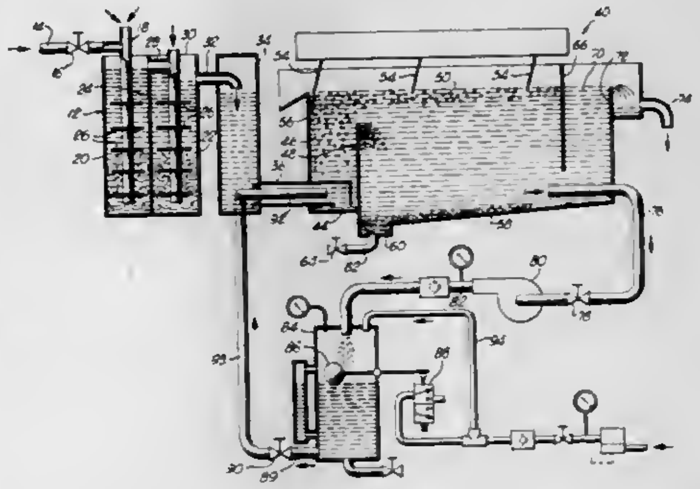
William D. Cooper, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed Sep. 2, 1975, Ser. No. 609,249
Int. Cl.² B01D *11/04, 17/04*
U.S. Cl. 210—42 S **12 Claims**

1. A process for the removal from a fluid of an aqueous or a water-miscible liquid dispersed in the fluid, which comprises adding to the fluid a water-soluble ferromagnetic composition selected from the group consisting essentially of ferromagnetic iron lignosulfonates, ferromagnetic iron sulfonated tannins, and ferromagnetic sulfonated phenols condensed with an aldehyde, said ferromagnetic composition being prepared by dissolving an iron compound in an aqueous solution of the lignosulfonate, sulfonated tannin, or sulfonated phenol condensed with an aldehyde in an amount at least twice the stoichiometric amount to react with the sulfonate groups and reacting the mixture under conditions for the formation of magnetic iron oxide in the presence of an alkali and having the iron present in ferrous and ferric states, intermixing the ferromagnetic composition with the fluid in the presence of sufficient water to dissolve and mix a portion of the ferromagnetic composition with the dispersed liquid, and passing the fluid containing the ferromagnetic composition mixed with the dispersed liquid through a magnetic field to attract and separate the dispersed liquid containing the ferromagnetic composition from the fluid, said ferromagnetic composition being added to the fluid in a sufficient amount to mix with the dispersed liquid for the dispersed liquid to be attracted by the magnetic field.

4,108,768

METHOD OF CLARIFYING INDUSTRIAL WASTE WATER

Robert V. Sebelik, Forest Park, and Wilfried Schaefer, Des Plaines, both of Ill., assignors to Winchester Chemical Co., Franklin Park, Ill.
Filed Aug. 27, 1976, Ser. No. 718,353
Int. Cl.² B01D *17/04*
U.S. Cl. 210—43 **8 Claims**



1. A method of clarifying an industrial waste water containing hexane soluble oil or grease comprising

raising the pH of the waste water to a value of at least 11.6;
adding calcium chloride to the waste water in an amount of at least 1,700 parts per million parts of waste water to flocculate a substantial portion of said oil or grease;
adding a floc coagulant to said waste water to agglomerate said floc into clumps; and
removing said floc clumps.

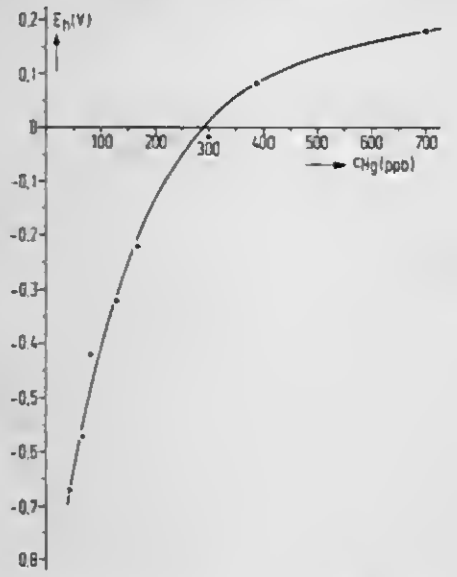
4,108,769

PROCESS FOR REDUCING THE MERCURY CONTENT OF INDUSTRIAL WASTE WATERS

Martin Krieg, Gablingen, and Theo Olffers, Gersthofen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Mar. 22, 1977, Ser. No. 780,126
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613128
Int. Cl.² C02C *5/04*
U.S. Cl. 210—50 **3 Claims**

1. A process for reducing the mercury content of industrial waste waters to about only 50 mg/m³ by precipitating the mercury compounds from the waste waters after having converted the total amount of mercury contained in such waters to the ionic bivalent oxidation state by adjusting first the waste

water to a pH-value of 4.5 or less by the addition of hydrochloric acid or sulfuric acid, and then adding such an amount of chlorine, chlorinated water or sodium hypochlorite that a content of from 2 to 50 mg of active chlorine per liter waste water is present, which comprises subsequently adding to the waste water, pre-treated in this way, iron (II) ions until a content of from 0.1 to 1.5 g of such ions per liter of waste water



is attained, then adjusting a redox potential of from −0.1 to −0.8 volts, relative to the normal hydrogen electrode by addition of a chemical agent increasing the pH selected from the group consisting of alkali lyes and calcium hydroxide thus reducing the bivalent mercury ions to insoluble mercury (I) salt, and precipitating it together with the iron oxide hydrates formed, and finally eliminating the precipitated products.

4,108,770

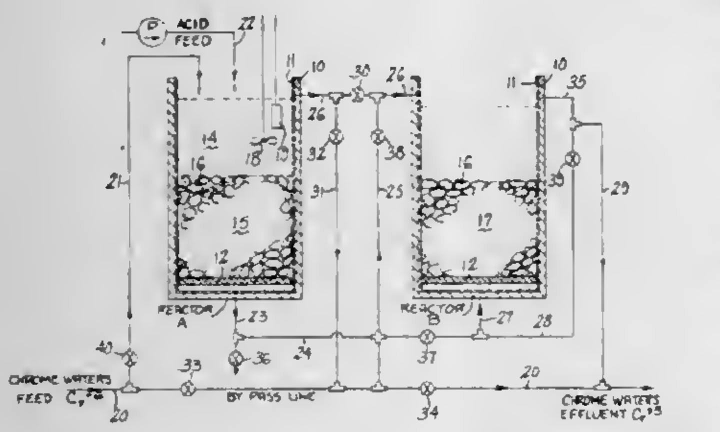
CHROMIUM REDUCTION PROCESS

Clarence H. Roy, Oak Ridge Dr., Bethany, Conn. 06510

Continuation of Ser. No. 606,024, Aug. 20, 1975, abandoned, which is a continuation of Ser. No. 430,735, Jan. 4, 1975, abandoned, which is a continuation of Ser. No. 270,711, Jul. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 83,120, Dec. 10, 1970, abandoned. This application Oct. 18, 1976, Ser. No. 733,354

Int. Cl.² C02C *5/02*

U.S. Cl. 210—50 **8 Claims**



1. A continuous process effective by gravity flow for the substantially complete reduction of hexavalent chromium compounds in industrial process waters containing the same to trivalent chromium compounds with minimal sludge formation, comprising the steps of:

(a) adjusting and maintaining the pH of said waters to 1.0 to 2.1 by addition of sulfuric acid to acidify said waters, and

(b) reactably contacting said waters by continuous gravitational flow through a bed of non-powdery elemental iron particles, said particles having a volume equivalent to particles of at least ¼ inch in length and width and about ¼ inch in thickness, whereby at least stoichiometric proportions of sulfuric acid and said hexavalent chromium compounds are maintained in said waters while said waters are in contact with said bed.

4,108,771

ELIMINATION OF ODORS FROM ORGANIC WASTES

Josef Weiss, Stockholm, Sweden, assignor to Weiss & Co.; Kemiska Konsultbyran A.G. and Chemical Consults Corp., Ltd., all of Stockholm, Sweden

Continuation of Ser. No. 643,821, Dec. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 439,879, Feb. 6, 1974, abandoned. This application May 27, 1977, Ser. No. 801,350

Int. Cl.² C02B *1/34;* C02C *1/40, 5/04*

U.S. Cl. 210—50 **3 Claims**

1. A method of reducing air-polluting odors including odor-producing compounds of organic sulfur compounds and ammonia emanating from a solids-containing waste product selected from the group consisting of organic waste products produced by metabolic processes including animal and human wastes, organic industrial wastes and sewage sludges which comprises,

forming a mixture of said odorous solids-containing waste product with an effective odor-abating amount of an aqueous acid solution containing by weight about 3 to 25% sulfuric acid, about 3 to 20% of an oxidizing agent selected from the group consisting of water soluble persulfates, nitrates, chlorates and permanganates of ammonium ion and alkali metals sufficient to oxidize said solids-containing waste product and substantially reduce the odor thereof and about 10 to 40% of a sulfur precipitating agent selected from the group consisting of water-soluble ferrous and ferric compounds sufficient to form precipitates with sulfur contained in said odor-producing compounds,

and maintaining said mixture at a pH not exceeding 6.5 until said odor has been substantially abated.

4,108,772

SLUDGE DISINFECTION

Samuel Ray Alexander, Houston, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 672,034, Mar. 30, 1976, abandoned. This application Feb. 1, 1977, Ser. No. 764,581

Int. Cl.² C02B *3/10*

U.S. Cl. 210—64 **2 Claims**

1. A method of disinfecting biological sludge, said sludge having a TSS value between about 8,000 and 30,000 ppm and a VSS value between about 4,000 and 15,000 ppm, comprising contacting said sludge with a stabilizing amount of zinc and adjusting the basicity of the zinc/sludge mixture to a pH of about 10 to 11.

4,108,773

OIL SALVAGER

Salvatore Macaluso, 6 Firwood Dr., Farmingville, N.Y. 11738

Continuation-in-part of Ser. No. 762,296, Jan. 25, 1977, abandoned. This application Oct. 11, 1977, Ser. No. 840,953

Int. Cl.² B01D *17/02*

U.S. Cl. 210—122 **9 Claims**

1. A contaminent salvager; comprising:

(a) chamber means of a size and configuration to receive and hold a predetermined quantity of fluid having a contaminent, said contaminent being of a lesser density and immiscible with said fluid, and wherein said chamber is sized to permit separation of said fluid and contaminent into immiscible layers.

(b) carrying means for positioning said chamber means in a body of fluid which may have a contaminent floating upon its surface, wherein said carrying means is a water-going vessel of the catamaran type having a pair of pontoons disposed one to each side of said chamber means;

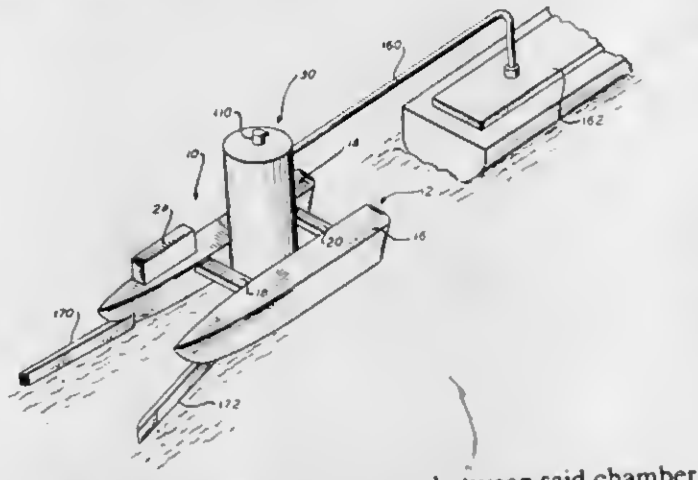
(c) means to fill said chamber means to an operating level;

(d) buoyancy regulation means comprising the elements of contaminated fluid inlet means leading directly into said chamber means proximate a lower portion thereof and being disposed between said pontoons;

fluid outlet means leading directly from said chamber means proximate said lower portion thereof and spaced from said contaminated fluid inlet means;

contaminent outlet means disposed proximate an upper portion of said chamber means;

atmosphere communication means connecting said upper portion of said chamber means to the atmosphere above said position of said contaminent outlet mean;



means for creating relative movement between said chamber means and the contaminated fluid so that contaminated fluid enters said inlet means; the contaminent floating up through said predetermined quantity of fluid to form a layer thereupon; and

at least one fluid door means disposed below the level of said inlet and outlet means, and being openable and closable to the body of fluid to permit selective communication therewith, said elements functioning singly or in any combination thereof to maintain said salvager at a substantially constant buoyancy.

4,108,774

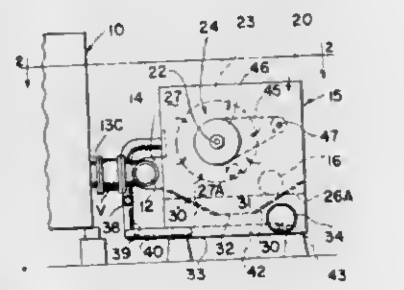
CONTAINER WASHER HAVING EXTERNAL LABEL FILTER AND SEPARATOR WITH FILTER FLUSHING MEANS

Momir Babunovic, Des Peres, and Donald E. Whitlock, Creve Coeur, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Oct. 13, 1976, Ser. No. 732,025

Int. Cl.² B08B *9/08*

U.S. Cl. 210—167 **11 Claims**



1. In container washer apparatus for clearing labels which have become detached from containers from container washing solution, the improvement in the container washer apparatus of: a casing structure external to the container washer formed with a filter chamber and a discharge chamber in flow communication, conduit means connected between said container washer and said filter chamber for delivery thereto of washing solution burdened with labels, filter means in said filter chamber positioned for intercepting labels in the washing solution as it flows into said discharge chamber, first washing solution circulating means connected between said discharge chamber and said container washer for establishing a flow of washing solution burdened with labels into said filter chamber and washing solution substantially free of labels back to said container washer; and second washing solution circulating means including label separator means having an inlet connected into said filter chamber to receive washing solution burdened with labels intercepted by said filter means the connection of said separator means with said filter chamber subjecting said separator means to a hydrostatic head pressure, said separator means having a first outlet for discharge of labels and a second outlet for discharge of washing solution substantially free of labels, and a conduit connected to said second outlet and extending to a discharge end adjacent said filter means in said filter chamber for applying washing solution to said filter means for dislodging labels from said filter means.

4,108,775

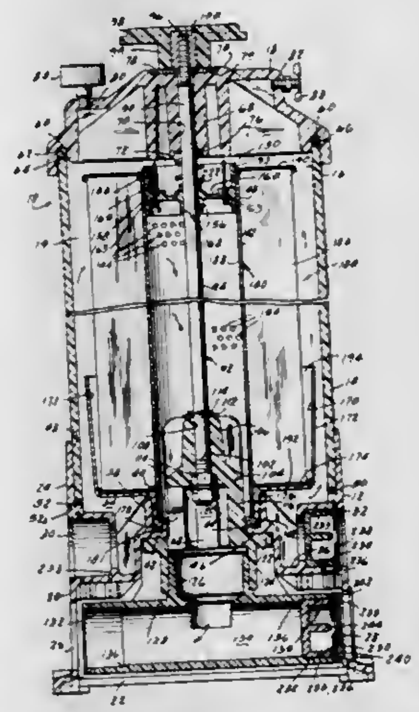
CARTRIDGE FILTER

Robert D. Wilkes; Alan H. Peters, both of Little Rock, Ark., and Virgil J. Jacuzzi, Islington, Canada, assignors to Jacuzzi Bros. Inc., Little Rock, Ark.

Filed Apr. 21, 1977, Ser. No. 789,699

Int. Cl.² E04H *3/20*

U.S. Cl. 210—169 **13 Claims**



1. A filter adapted for use in a swimming pool water purification system, comprising:

a filter housing having inlet and discharge ports;

a core assembly carried removably within said housing and including a hollow perforate core connecting with the discharge port,

a coreless filter cartridge disposed on and about said perforate core with a readily disassemblable longitudinal sliding fit and having a filter media to filter water flowing from said inlet port through said filter and said core to said discharge port;

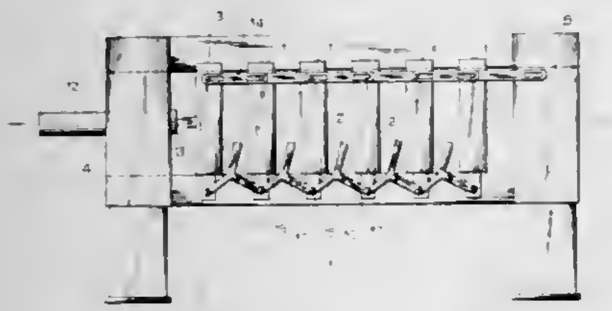
said filter cartridge being adapted to be readily and inexpensively replaced inasmuch as said cartridge is without a core;

and a cup-shaped pollutant trapping member secured fixedly in assembly with the lower end of said core and supporting said filter cartridge so that the assembly can be handled as a unit for removal and replacement with respect to the filter housing.

4,108,776
FILTER PRESS

Masayoshi Kubo, and Hideaki Katayama, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,822
Int. Cl.² B01D *25/12*
U.S. Cl. 210—224 **2 Claims**



1. A filter press comprising:
a filter press frame;
at least one pair of parallel filter frames slidably mounted in said frame, a filter chamber being created between said pair of filter frames;
liquid-feed member means between said pair of filter frames for feeding liquid to be processed into said filter chamber between said parallel frames;
pivotable link member means connected to each filter frame of said pair of filter frames and to said liquid-feed member means between said frames for maintaining said liquid-feed member means between said frames when said frames are moved together and apart;
a filter cloth on each side of said liquid-feed member means between said feed member means and said adjacent filter frames; and
moving means connected to said filter frames for sliding said frames together and pulling said frames apart.

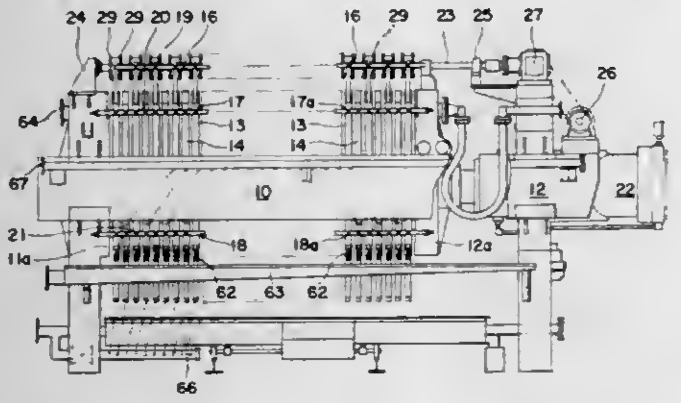
4,108,777
FILTER PRESS

Tetsuya Kurita, Takarazuka; Seiichi Suwa, Yao; Masayuki Nakamura, Osaka, and Takashi Torii, Izumi, all of Japan, assignors to Kurita Machinery Manufacturing Co., Ltd., Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,675

Claims priority, application Japan, Oct. 29, 1976, 51-130671; Jun. 25, 1977, 52-75671; Aug. 1, 1977, 52-92854; Aug. 1, 1977, 52-92855

Int. Cl.² B01D *25/38*
U.S. Cl. 210—225 **6 Claims**



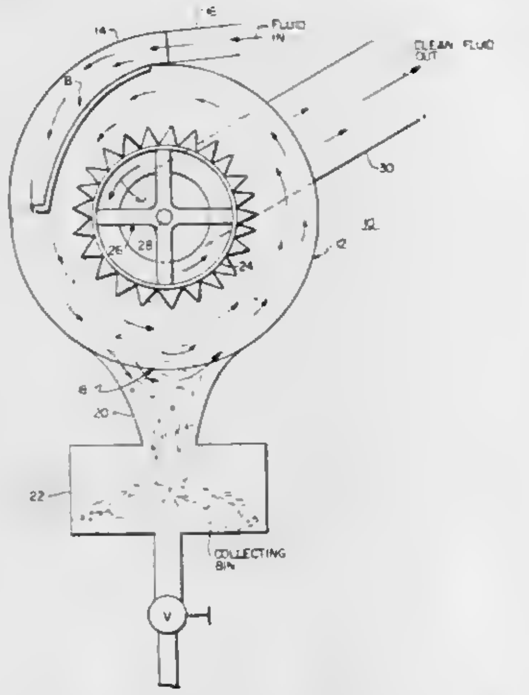
1. A filter press which comprises, in combination:
a machine framework including fixed and movable heads, said movable head being supported in position for movement between projected and retracted positions in a direction towards and away from the fixed head, respectively;
a plurality of filter plates supported in position between the fixed and movable heads in face-to-face relation to each other, said filter plates being compressed together to a substantially watertight closure between said fixed and movable heads in response to movement of the movable head from the retracted position towards the projected position and being separated from each other when and so long as said movable head is held in the retracted position, each of said filter plates having first and second filtering surfaces opposed to each other and respectively facing towards the fixed and movable heads;
means for guiding said filter plates to permit the filter plates to be moved incident to the movement of the movable head between the retracted and projected positons;
a filter medium provided for each filter plate, said filter medium being composed of first and second webs of filter cloth adapted to respectively cover the first and second filtering surfaces of any one of the filter plates, each of said first and second filter webs being supported for movement between an operative position, in which the filter web covers the filtering surface of the corresponding filter plate, and an inoperative position in which such filter web is brought clear of such filtering surface of the corresponding filter plate;
a tensioning and winding roll assembly provided for each filter plate and carried by and positioned below the filter plate, said tensioning and winding roll assembly comprising a hollow cylindrical roll, to which the adjacent ends of the respective first and second filter webs of any pair are anchored, and means for biasing said cylindrical roll in one direction about the longitudinal axis of said cylindrical roll with the first and second filter webs of the corresponding pair forced to be wound up around said cylindrical roll;
a support bar positioned between each adjacent two of the filter plates and to which the other end of any one of the first and second filter webs of one pair and the other end of the other of the first and second filter webs of the next adjacent pair are anchored;
a pair of winding elements provided for each filter plate and positioned on respective sides of and above each adjacent two of the filter plates;
a pair of elongated connecting members provided for each pair of the winding elements, said connecting members of each pair being connected at their one end to the opposite ends of the corresponding support bar and at their other end to the corresponding winding elements;
means operable when said movable head is in the retracted position for driving said winding elements of any pair to bring said first and second filter webs of the corresponding pair to the operative position against the biasing means of the associated tensioning and winding roll assembly and to allow the first and second filter webs of said any pair to be drawn onto the associated tensioning and winding roll assembly by the action of the biasing means, selectively; and
a pair of juxtaposed guide rolls carried by each filter plate and positioned below the tensioning and winding roll assembly, said first and second filter webs of the pair, which extend from the associated support bars towards the tensioning and winding roll assembly, being turned respectively around said guide rolls to assume a substantially U-shaped configuration.

4,108,778
SELF-CLEANING FILTER AND VORTEXER

Steven J. Lambert; Bertha E. Lambert, and Warren G. Lambert, all of 2142 Cornwall St., Germantown, Tenn. 38138

Continuation-in-part of Ser. No. 661,367, Feb. 25, 1976, abandoned. This application Mar. 21, 1977, Ser. No. 779,542
Int. Cl.² B01D *35/16, 33/06, 45/12*
U.S. Cl. 210—297 **43 Claims**

1. A combination self-cleaning fluid filter and vortexer means for separating particulates from an entraining fluid comprising:
a substantially cylindrical cannister having a tangentially directed inlet port communicating with the interior thereof and a particulate collecting port spaced from said inlet;
a clean fluid outlet port disposed substantially coaxially with the longitudinal axis of said cannister;
filter means mounted over said outlet port within said cannister;
said filter means being mounted over said outlet port for rotation in the same direction as the flow of entraining fluid and particulates entering said cannister from said inlet to preclude caking of said filter means with said particulate material by dynamic self-cleaning action;
arcuate baffle means intermediate said filter means and said tangentially directed inlet port in said cylindrical cannister enhancing vortex flow in the fluid and for shielding said filter means from direct impingement of fluid material from said inlet port;
said baffle means dividing the flow of fluid material in said vortexer to mix cleaner fluid with fluid material from said inlet port on one side thereof and to direct the flow of cleaner fluid about said filter means on the other side thereof; and
said filter means comprises a self-rotatable filter rotatable by means of the tangentially directed inlet fluid, said filter means including a plurality of outwardly projecting finger members formed by Corolis curves.



13. A combination fluid filter and vortexer means for separating particles from an entraining fluid comprising:
a substantially cylindrical cannister having a tangentially directed inlet port communicating with the interior thereof and a particulate collecting port spaced from said inlet;
a clean fluid outlet port disposed substantially coaxially with the longitudinal axis of said cannister;
a filter means being mounted over said outlet port for rotation in the same direction as the flow of entraining fluid and particulates entering said cannister from said inlet to preclude caking of said filter means with said particulate material by dynamic self-cleaning action;
said filter means includes a plenum chamber substantially coaxially arranged with the longitudinal axis of said cannister and including means for supporting filter elements;
said plenum chamber further includes means for directing the flow of clean fluid from the cannister; and
said filter means comprises a self-rotatable filter rotatable by means of the tangentially directed inlet fluid, said filter means including a plurality of outwardly projecting finger members formed by Corolis curves.

4,108,779
OIL WELL FLUIDS AND DISPERSANTS

Leroy L. Carney, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 356,239, May 1, 1973, abandoned, Ser. No. 500,999, Aug. 27, 1974, abandoned, and Ser. No. 543,723, Jan. 24, 1975, abandoned, which is a division of Ser. No. 353,060, Apr. 20, 1973, Pat. No. 3,896,031, said Ser. No. 500,999, is a division of Ser. No. 417,431, Nov. 19, 1973, Pat. No. 3,850,248. This application Apr. 15, 1976, Ser. No. 677,199
Int. Cl.² C09K *7/02, 7/06*
U.S. Cl. 252—8.5 P **19 Claims**

1. A water-in-oil emulsion spacer fluid which is compatible with drilling fluids and cement compositions and which can be used effectively in a well to separate various types of fluids, cement compositions and combinations thereof without significant alteration in the rheological properties, said spacer fluid comprising about 40–60 parts by volume of a hydrocarbon oil; about 40–60 parts by volume fresh water having, before inclusion of the spacer fluid, a dissolved chloride salt content of less than 1,000 parts per million and a total hardness of less than 500 parts per million; and about 15–40 pounds of an emulsifier composition per barrel of said spacer fluid; said emulsifier composition consisting essentially of about 1–20 weight percent of a first fatty acid amide, wherein the fatty acid precursor contains about 12–18 carbon atoms and the amide contains about 16–22 carbon atoms and about 0.5–10 pounds per barrel of spacer fluid of a surfactant-dispersant comprising a mixture of sulfonated lignin and a second fatty acid amide; wherein for said surfactant-dispersant, said sulfonated lignin is mixed with said second fatty acid amide in an amount equal to about 25–75% of said mixture; wherein said first fatty acid amide is the reaction product of a di-lower alkanol amine and said fatty acid; and wherein the amine precursor of the second fatty acid amide is an alkyl or aryl amino sulfonic acid, wherein the alkyl or aryl radicals contain 1–6 carbon atoms.

18. A water-in-oil emulsion drilling fluid having good stability at high temperature and to the addition of weighting materials comprising oil, water, a basic emulsifier and a surfactant-dispersant effective for dispersing conventional weighting materials in said emulsion comprising a mixture of liquid oleyl amide and sulfonated lignin; said basic emulsifier consisting essentially of a mixture of the reaction product of oleic acid and diethanolamine to form an oleyl amide mixed with dimerized oleic acid; wherein the liquid oleyl amide of said surfactant-dispersant is mixed with the sulfonated lignin in an amount equal to 25–75% of said mixture and the amine precursor is an alkyl or aryl amino sulfonic acid; wherein the alkyl or aryl radicals contain 1–6 carbon atoms; and wherein the dimerized oleic acid is present in said mixture in an amount up to about 30%.

4,108,780
DUSTLESS SOIL RELEASE-SOURING COMPOSITIONS FOR USE IN LAUNDERING

Paul Vernon Thomas, Berwyn, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 19, 1977, Ser. No. 816,994
Int. Cl.² D06M *15/08*
U.S. Cl. 252—8.6 **14 Claims**

1. A substantially dustless powdered composition consisting essentially of spray-dried acrylic resin and a dedusting amount of one or more organic alcohols selected from the group consisting of 2-hexyldecyl alcohol and iso-tridecanol.

4,108,781
PRODUCTION OF POLYESTER TIRE YARN

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 617,547, Sep. 29, 1975, Pat. No. 4,054,634. This application Feb. 18, 1977, Ser. No. 770,124

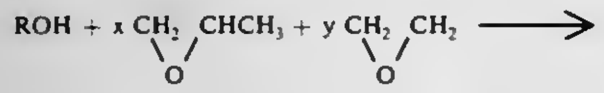
The portion of the term of this patent subsequent to May 1, 1990, has been disclaimed.

Int. Cl.² D06M *13/18*

U.S. Cl. 252—8.9 **6 Claims**

1. A two-part fiber finish composition, particularly for application to polyethylene terephthalate yarn prepared by a process involving spinning and drawing steps, said yarn to be made into tire cord using a single-dip treatment, said two-part finish composition consisting of:

(a) a first finish composition consisting essentially of a polyalkylene glycol compound which is a mixed polyoxyethylated-polyoxypropylated monether prepared in accordance with the equation:

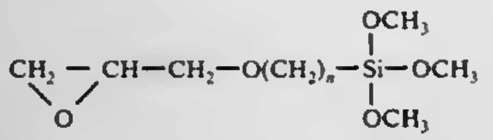


$$\mathrm{ROH} + x\,\underset{\diagdown O \diagup}{\mathrm{CH_2\;CHCH_3}} + y\,\underset{\diagdown O \diagup}{\mathrm{CH_2\;CH_2}} \longrightarrow$$

$$\mathrm{RO(C_2H_4O,\ C_3H_6O)_{x+y}H}$$

where R is an alkyl group having 1 to 8 carbon atoms, *x* and *y* are the number of moles of propylene oxide and ethylene oxide, respectively, and wherein ethylene oxide comprises 40 to 60 percent by weight of the combined total of ethylene oxide and propylene oxide and $x + y$ has a value to produce a molecular weight of from 500 to 850, said first finish composition being applied to the yarn prior to drawing said yarn; and

(b) a second finish composition consisting essentially of an aqueous solution of about 70 to 95 parts by weight of said mixed polyoxyethylated-polyoxypropylated monoether, about 5 to 30 parts by weight of a silane having the structural formula:



wherein n = 2 to 5, and a sufficient amount of a water-soluble alkaline catalyst to adjust the pH of the finish composition to 8 – 10, said second finish composition being applied as an overfinish to the yarn after drawing said yarn.

4,108,782
FOAMING AND SILT SUSPENDING AGENT

James L. Thompson, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 713,168, Aug. 10, 1976, and a continuation-in-part of Ser. No. 716,508, Aug. 23, 1976, Pat. No. 4,028,257, which is a continuation of Ser. No. 527,577, Nov. 27, 1974, abandoned. This application Apr. 27, 1977, Ser. No. 791,628

Int. Cl.² E21B *43/27, 43/26*

U.S. Cl. 252—8.55 C **29 Claims**

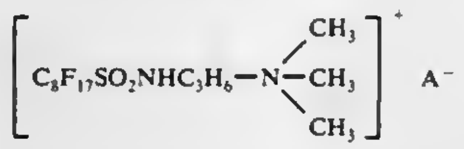
1. A composition suitable for imparting foaming and silt suspending properties to aqueous based fluids of the type suitable for use in treating subterranean formations, comprising a blend of:

(A) at least one alkyltrimethylammonium chloride, wherein the alkyl chain length is from 8 to 18 carbon atoms and the mode alkyl chain length is 12 or 14 carbon atoms;

(B) an amine oxide selected from the group consisting of bis-(2-hydroxyethyl) cocoamine oxide, dimethylhexadecylamine oxide, and dimethyl-hydrogenated tallowamine oxide;

(C) an adduct of trimethyl-1-heptanol plus seven moles of ethylene oxide; and

(D) a perfluorinated surfactant of the formula



wherein A^- is Cl^-, F^-, I^-, or Br^-; wherein

Components (A) and (B) are in a synergistic weight ratio to one another within the range of from about 99:1 to about 1:99;

Components (C) and (D) are in a weight ratio to one another of from about 1:1 to about 40:1, and

the combined amounts of Components (A) and (B) and the combined amounts of Components (C) and (D) in said composition are such that said composition can be diluted with an aqueous based fluid to yield a foamable fluid containing Components (A) and (B) in a combined concentration of from about 0.035 to about 0.5 weight percent and Components (C) and (D) in a combined concentration of from about 0.03 to about 0.1 weight percent.

4,108,783
HALOALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

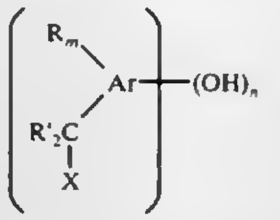
David Eugene Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 459,424, Apr. 9, 1974, abandoned. This application May 10, 1976, Ser. No. 684,818

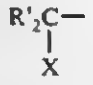
Int. Cl.² C10M *1/30*

U.S. Cl. 252—54.6 **22 Claims**

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting (A) at least one alpha haloalkyl hydroxy aromatic compound of the general formula



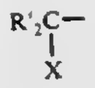
wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, X is a halogen atom, each R' is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in both the R' groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



$$\mathrm{R'_2}\underset{\mathrm{X}}{\mathrm{C}}-$$

group, with

(B) at least one alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} hydrocarbyl carboxylic acids and anhydrides, esters, and amides thereof, the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one



$$\mathrm{R'_2}\underset{\mathrm{X}}{\mathrm{C}}-$$

group.

4,108,784
HYDROXYALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

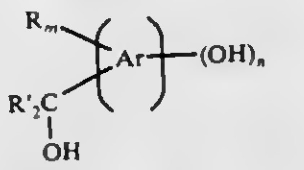
Charles Peterson Bryant, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 459,750, Apr. 9, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,101

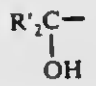
Int. Cl.² C10M *1/24*

U.S. Cl. 252—56 R **22 Claims**

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting (A) at least one alpha hydroxyalkyl hydroxy aromatic compound of the general formula



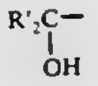
wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, each R' is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in the R' groups does not exceed 36 (ii) where m exceeds 1, one of the R groups can also be a



$$\mathrm{R'_2}\underset{\mathrm{OH}}{\mathrm{C}}-$$

group, with

(B) at least one hydrocarbyl, alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} carboxylic acids and anhydrides, esters, and amides thereof; the reaction of (A) with (B) resulting in the formation of carbon-to-carbon bond, said bond including the carbon of at least one



$$\mathrm{R'_2}\underset{\mathrm{OH}}{\mathrm{C}}-$$

group.

4,108,785
BLENDS OF MINERAL OIL AND MODIFIED TRIGLYCERIDES USEFUL FOR METAL WORKING

Robert Joseph Sturwold, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 627,852, Nov. 3, 1975, Pat. No. 4,067,817. This application Jul. 27, 1977, Ser. No. 819,649

Int. Cl.² C10M *1/24*

U.S. Cl. 252—56 R **7 Claims**

1. A lubricant composition comprising 0.1 to 99.5 parts by weight hydrocarbon oil having 100° F viscosity up to about 500 SUS and 0.5 to 99.9 parts of a modified triglyceride which is the reaction product of (a) 50–84 parts triglyceride derived predominantly from C_{12}–C_{18} fatty acids, (b) 2–36 parts polyoxyalkylene glycol having average molecular weight less than about 2000 and (c) 7–48 parts aliphatic or cycloaliphatic hydrocarbon dicarboxylic acid containing 18–54 carbon atoms, said reaction conducted until at least 25% reduction in acid value, based on the initial charge, is obtained.

4,108,786
MAGNETIC DRY DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Hiroshi Takayama, Moriguchi, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company Ltd., Osaka, Japan

Filed Dec. 16, 1975, Ser. No. 641,285

Int. Cl.² G03G *9/14*

U.S. Cl. 252—62.1 P **12 Claims**

1. A magnetic dry toner for electrostatic photography consisting essentially of spherical particles of a composition comprising a fine powder of a magnetic material having a particle size not exceeding 100 mμ and being dispersed in a binder resin, said powdery magnetic material being triiron tetroxide and being present in an amount of 25 to 75% by weight based on the composition, said binder resin being a synthetic resin which becomes adhesive upon the application of heat or pressure, said spherical particles of said composition having such a particle size distribution that particles having a particle size larger than 44 μ occupy up to 10% of the total particles and particles having a particle size smaller than 2 μ occupy up to 10% of the total particles, wherein said fine powder of the magnetic material is distributed predominantly in the surface layer portion of each spherical particle and said spherical particles have a volume resistivity not higher than 1×10^{11} Ω-cm as measured in a magnetic field of about 680 gauss under a voltage of 1000 V, and said spherical particles have such a distribution structure that the index of surface distribution (I. D.) expressed by the following formula is at least 10^2:

$$\mathrm{I.\ D.} = (R_2/R_1)$$

wherein R_1 stands for a volume resistivity (Ω-cm) of said spherical particles as measured in a magnetic field of about 680 gauss under a voltage of 1000 V, and R_2 stands for a volume resistivity (Ω-cm), as measured in the same manner as above, of spherical particles formed by melting a mixture having the same composition as that of said spherical particles, blending it homogeneously and intimately in the molten state and molding the melt into particles having the same size as that of said spherical particles.

4,108,787
PROCESS FOR PRODUCING FERROMAGNETIC IRON OXIDE

Kouichi Masaki, Odawara; Teruya Shinjo, Takarazuka; Yasuo Tamai, and Tatsuji Kitamoto, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Dec. 22, 1975, Ser. No. 642,826

Claims priority, application Japan, Dec. 20, 1974, 49-147089; Dec. 20, 1974, 49-147090

Int. Cl.² C01G *49/06*

U.S. Cl. 252—62.56 **3 Claims**

1. A process for producing ferromagnetic iron oxide containing superparamagnetic material which comprises in sequence:

(a) forming an aqueous iron (II) salt solution,

(b) neutralizing 30 to 60 wt. % of the iron (II) salt in said solution by adding an alkali to the solution at a temperature of 30° to 40° C to form a slurry of colloidal $Fe(OH)_2$ particles having dissolved therein iron (II) salt,

(c) completely oxidizing said $Fe(OH)_2$ particles to $Fe(OH)_3$ by blowing air through the colloid at a rate of 5 to 30 l/min. at 30° to 40° C,

(d) neutralizing 90 to 95% of said iron (II) salt based on the total amount of salt in the solution of step (a) at a temperature of 70° to 90° C to precipitate a layer of $Fe(OH)_2$ on said particles of step (c),

(e) completely oxidizing said layer of $Fe(OH)_2$ to $Fe(OH)_3$ by bubbling air through said slurry at a rate of 5 to 30 l/min at 70° to 90° C,

(f) completely neutralizing the remaining iron (II) said with the addition of alkali under the conditions of step (d) without bubbling air through said slurry to precipitate $Fe(OH)_2$ and effect the formation of an $Fe(OH)_3$ layer on the particles of step (e),

(g) dehydrating the particles of step (e) at a temperature of 300° to 700° C.,

(h) reducing the particles obtained in step (g) with a reducing gas at 300° to 500° C and

(i) oxidizing the particles of step (g) to a Berthollide compound or maghemite, containing superparamagnetic material.

4,108,788

LIQUID DIELECTRIC COMPOSITION DERIVED FROM THE ALKYLATION PRODUCT OF BENZENE WITH ETHYLENE

Johann G. D. Schulz, Pittsburgh; Charles M. Selwitz, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 21, 1977, Ser. No. 817,694
Int. Cl.² C10M *3/10. 3/12;* H01B *3/22*
U.S. Cl. 252—63 **12 Claims**

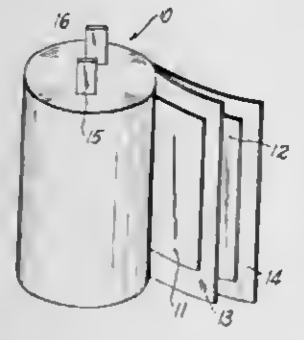
1. A liquid dielectric composition obtained as a result of a process which comprises reacting benzene with ethylene in the presence of an alkylation catalyst to obtain an alkylation product containing largely unreacted benzene, ethylbenzene, polyethylbenzenes and heavier products, separating benzene, ethylbenzene and polyethylbenzenes from said alkylation product and thereafter recovering from said heavier products by distillation while in contact with a basic material selected from the group consisting of Group I and Group II alkali metals and alkaline earth metals, their oxides and hydroxides a fraction having a boiling point in the temperature range of about 255° to about 420° C. as said liquid dielectric composition.

4,108,789

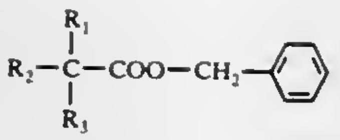
DIELECTRIC COMPOSITIONS CONTAINING BENZYL ESTERS

Pierre Jay, Saint-Didier au Mont d'Or, and Ghislain Schwachhofer, Le Mas Rillier Ol-Miribel, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 716,563, Aug. 23, 1976, abandoned. This application Jun. 14, 1977, Ser. No. 806,454
Claims priority, application France, Aug. 28, 1975, 75 26954
Int. Cl.² H01B *3/20*
U.S. Cl. 252—64 **12 Claims**



1. A dielectric composition comprising a liquid mixture of at least two dielectric compounds comprising at least one benzyl ester having the formula I:



$$R_2-\overset{\overset{\displaystyle R_1}{|}}{\underset{\underset{\displaystyle R_3}{|}}{C}}-COO-CH_2-C_6H_5$$

wherein:

R_1 is hydrogen or alkyl; and

R_2 and R_3 are alkyl, the total number of carbon atoms contained in R_1, R_2 and R_3 being between 3 and 20.

4,108,790

CORROSION INHIBITOR

Zisis Andrew Foroulis, Mendham, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 195,081, Nov. 2, 1971, abandoned, Ser. No. 140,125, May 4, 1971, abandoned, Ser. No. 104,477, Jan. 6, 1971, Pat. No. 3,711,246, and Ser. No. 91,612, Nov. 20, 1970, abandoned, said Ser. No. 140,125, is a continuation-in-part of Ser. No. 820,303, Apr. 29, 1969, abandoned. This application Aug. 15, 1975, Ser. No. 604,918
Int. Cl.² C23F *11/12. 11/16*
U.S. Cl. 252—175 **13 Claims**

1. A method for inhibiting oxidative corrosion of metal parts in a recirculating cooling water system having dissolved oxygen and chlorine therein, which comprises adding to said water a corrosion inhibitor composition comprised of about 30 to about 90 parts by weight of an alkali metal or ammonium gluconate and about 70 to about 10 parts by weight of a polyphosphate, wherein said added polyphosphate is selected from the group consisting of alkali metal polyphosphate and ammonium polyphosphate, the combined concentration of said gluconate and said polyphosphate being at least 25 ppm.

4,108,791

HIGH RESILIENCY POLYURETHANE FOAMS

George James Wasilczyk, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1977, Ser. No. 763,953
Int. Cl.² C08K *9/02, 3/36*
U.S. Cl. 252—182 **4 Claims**

1. A polyol containing from about 0.25 to about 10.0 percent by weight of an inorganic filler having a pH from about 6.5 to about 8, and an average effective particle size of less than 7 microns, wherein said polyol is selected from the group consisting of (A) polyether diols and triols having an average hydroxyl equivalent weight of from about 900 to about 2500, (B) polyester diols having an average hydroxyl equivalent weight of from about 900 to about 2500 and (C) mixtures thereof.

4,108,792

CALCIUM HYPOCHLORITE COMPOSITION CONTAINING MAGNESIUM AND PROCESS FOR MAKING SAME

Douglas A. Farmer, Jr., West Haven, and John A. Wojtowicz, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 25, 1977, Ser. No. 781,372
Int. Cl.² C01B *11/06;* C11D *3/395;* D06L *3/08*
U.S. Cl. 252—187 H **10 Claims**

1. In a process for the manufacture of a solid calcium hypochlorite composition wherein an aqueous slurry comprising hydrated lime is chlorinated to form an aqueous chlorinated slurry containing calcium hypochlorite and further processing said chlorinated slurry to recover a solid calcium hypochlorite composition, the improvement which comprises:

(a) employing a hydrated lime having about 97% to about 50% by weight calcium hydroxide and more than about 0.5% by weight magnesium based on the total dry weight of said hydrated lime,

(b) terminating said chlorination reaction when from about 75% to about 99.5% by weight of said calcium hydroxide is chlorinated and from 0% to about 5% by weight of said magnesium is chlorinated to form an aqueous chlorinated slurry containing substantially water-insoluble and unchlorinated magnesium compounds and calcium hypochlorite, and

(c) further processing said chlorinated slurry to remove a solid calcium hypochlorite composition having admixed therein said substantially water-insoluble and unchlorinated magnesium compounds.

4,108,793

LIQUID CRYSTAL CELL

Joseph Anthony Castellano, North Brunswick, and Michael Thomas McCaffrey, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 40,996, May 25, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,566
Int. Cl.² G07F *1/16*
U.S. Cl. 252—299 **8 Claims**

1. An electro-optical cell comprising a layer of a liquid crystal composition disposed between electrodes said liquid crystal composition comprising a mixture of a nematic liquid crystal compound with an optically active isomer of a compound the racemic mixture of which is nematic.

4,108,794

OIL IMMERSION LIQUID FOR FLUORESCENCE MICROSCOPES

Ken Yonekubo, Tama, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Feb. 6, 1976, Ser. No. 655,949
Claims priority, application Japan, Feb. 14, 1975, 50-18025
Int. Cl.² C09K *3/00*
U.S. Cl. 252—408 **2 Claims**

1. In a process for using a fluorescent microscope for studying materials which fluoresce in which an oil immersion objective is employed, the improvement consisting of using silicone oil having a refractive index Nd = 1.40 as the oil immersion liquid.

4,108,795

METHOD OF REGENERATING COKE-CONTAMINATED CATALYST WITH SIMULTANEOUS COMBUSTION OF CARBON MONOXIDE

Charles L. Hemler, Mt. Prospect, and Laurence O. Stine, Western Springs, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 654,260, Feb. 2, 1976, abandoned. This application Nov. 1, 1976, Ser. No. 737,358
Int. Cl.² B01J *21/20, 29/38;* C10G *11/04. 11/18*
U.S. Cl. 252—419 **34 Claims**

1. A method for regenerating a coke-contaminated catalyst which has become spent as a result of its use in a hydrocarbon cracking reactor with simultaneous carefully-controlled combustion of CO which comprises the steps of:

(a) introducing said coke-contaminated catalyst into a catalyst regeneration zone;

(b) passing into said regeneration zone, independently of coke-contaminated catalyst and free of the reactor feed stock and in an amount equivalent to from about 0.1 to about 30 wt. ppm of the circulating catalyst inventory on an elemental metal basis to promote the combustion of CO to CO_2, a solution comprising a CO oxidation promoter consisting essentially of noble metal compounds in a solvent selected from the group consisting of water and hydrocarbons;

(c) passing an oxygen-containing regeneration gas into said regeneration zone in an amount selected to burn coke from said coke-contaminated catalyst and to provide sufficient excess oxygen to accomplish the desired amount of CO combustion;

(d) reacting a first portion of said oxygen-containing regeneration gas with said coke-contaminated catalyst in said regeneration zone at oxidation conditions including a temperature within the range of from about 1100° F to about 1450° F and a pressure in the range of from about atmospheric to about 50 psig selected to remove coke from said coke-contaminated catalyst, to produce a flue gas containing CO and sufficient to cause combustion of CO to CO_2 in the presence of said oxidation promoter thereby producing regenerated catalyst and flue gas; and

(e) simultaneously contacting said flue gas and a second portion of said oxygen-containing regeneration gas with said CO oxidation promoter in said regeneration zone in the presence of said regenerated catalyst at said oxidation conditions, thereby (i) making a controlled quantity of exothermic heat of reaction available for operation of said regeneration zone, and (ii) decreasing the amount of CO in said flue gas to a CO concentration such that the CO_2 to CO ratio is greater than about 1.5.

17. In a process for regenerating a coke-contaminated catalyst which has become spent as a result of its use in a hydrocarbon cracking reactor wherein said coke-contaminated catalyst and an oxygen-containing regeneration gas are passed into a regeneration zone maintained at oxidizing conditions which include a temperature within the range of from about 1100° to 1450° F and a pressure in the range of from about atmospheric to about 50 psig and coke is therein oxidized to produce regenerated catalyst and flue gas containing CO_2 and CO, a method of controlling the CO concentration in said flue gas within a predetermined CO concentration range such that the CO_2 to CO ratio is greater than about 1.5 which method comprises the steps of:

(a) passing into said regeneration zone independently of said coke-contaminated catalyst and free of the reactor feed stock a first amount equivalent to from about 0.1 to about 30 wt. ppm of the circulating catalyst inventor on an elemental metal basis of a solution comprising a CO oxidation promoter selected from the group consisting of a platinum compound and a palladium compound in a solvent comprising water or a hydrocarbon compound;

(b) passing into said regeneration zone said oxygen-containing regeneration gas in an amount stoichiometrically sufficient to convert at least a portion of the CO to CO_2;

(c) converting in said regeneration zone, at conversion conditions including the presence of said CO oxidation promoter and regenerated catalyst, at least a portion of the CO to CO_2 to produce flue gas containing CO_2 and CO;

(d) analyzing said flue gas to determine a measured CO concentration and comparing said measured CO concentration with said predetermined CO concentration range; and,

(e) passing into said regeneration zone a second amount of said solution equivalent to from about 0.005 to about 10 wt. ppm of the circulating catalyst inventory on an elemental metal basis sufficient to maintain said measured CO concentration within said predetermined CO concentration range.

4,108,796

TREATMENT OF TRANSITION METAL COMPOUND

Anthony David Caunt, Welwyn Garden City; Michael Stanley Fortuin, Tarporley, and Ian Gabriel Williams, Letchworth, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 30, 1975, Ser. No. 627,451
Claims priority, application United Kingdom, Oct. 30, 1974, 46966/74
Int. Cl.² B01J *31/02*
U.S. Cl. 252—429 B **17 Claims**

1. A process for the treatment of a compound of a transition metal which comprises grinding a titanium trihalide in the

presence of from 5 up to 75% molar, relative to the titanium trihalide, of an organic Lewis Base compound which is an organo-phosphorus compound selected from the group consisting of hexamethylphosphoric triamide, N,N,N', N'-tetramethylethyl phosphorodiamidate; N,N,N', N', N''-pentamethyl-N''-β-dimethylamino-ethylphosphoric triamide; 2-dimethylamino-1,3-dimethyl-1,3,2-diazaphospholidine-2-oxide octamethylpyrophosphoramide, hydrocarbyl phosphines, hydrocarbyl phosphine oxides, hydrocarbyl phosphites, and hydrocarbyl phosphates and from 1 up to 50% molar, relative to the titanium trihalide, of a titanium tetrahalide, wherein the amount of the organic Lewis Base is such as to provide at least one functional group for each molecule of the titanium tetrahalide.

4,108,797
CATALYST FOR SELF IGNITION OF FUELS
Richard E. Rice, Arlington, Mass., assignor to Comstook & Wescott, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 561,591, Mar. 24, 1975, abandoned, and a continuation-in-part of Ser. No. 601,228, Aug. 1, 1975, Pat. No. 4,047,876. This application Sep. 30, 1977, Ser. No. 838,318

Int. Cl.^{2} B01J *21/04, 23/40*

U.S. Cl. 252—466 PT **5 Claims**

1. A catalyst for the combustion of a methanol fuel comprising:

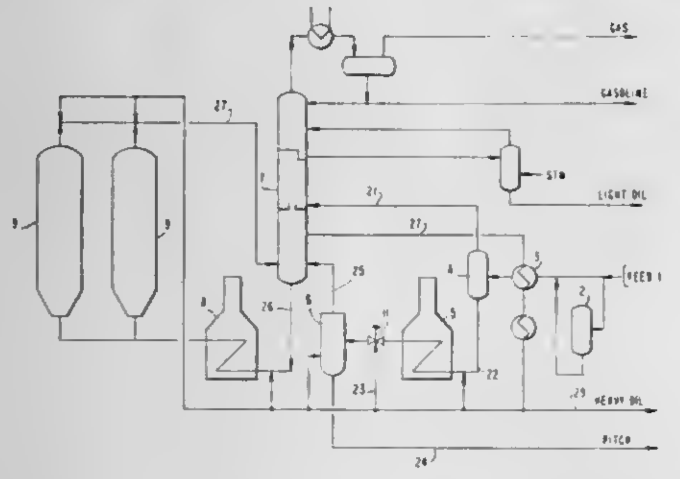
a body of porous, fuel absorbent alumina, and an amount of one or more metals of the platinum family integrated with a major portion of the surface of said alumina, the amount of said metals integrated with said alumina being sufficient to provide a ratio of about 16 to 60% by weight of the integrated portion so that a catalyst body which has been exposed to hypernormal humidity can self-ignite said fuel.

4,108,798
PROCESS FOR THE PRODUCTION OF PETROLEUM COKE
Morgan C. Sze, Upper Montclair; Thomas M. Bennett, Scotch Plains; Andre A. Simone, Parsippany, all of N.J.; Kiyoshige Hayashi, Tokyo, Japan; Mikio Nakaniwa, Ome, Japan; Nobuyuki Kobayashi, and Yoshihiko Hase, both of Ichihara, Japan, assignors to The Lummus Company, Bloomfield, N.J. and Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1976, Ser. No. 702,647

Int. Cl.^{2} C10G *9/14, 37/02;* C10B *55/00*

U.S. Cl. 252—502 **12 Claims**



1. A process for producing high crystalline petroleum coke from a petroleum feedstock, comprising:

heat soaking a petroleum feedstock at a temperature of at least 230° C for at least 5 minutes in the presence of 30 to 200 parts per million of added dissolved sulphur in the form of at least one member selected from the group consisting of elemental sulphur, mercaptan and carbon disulfide, said petroleum feedstock being a residual heavy oil having no greater than 1.5 wt.% sulphur which is selected from the group consisting of virgin crude oil, distillation residues, cracked residues and hydrodesulfurized distillation and cracked residues;

heating the heat-soaked feedstock to effect controlled thermal cracking thereof at a pressure of no greater than 50 kg/cm^{2}G and to a final temperature of from 450° C to 530° C;

separating non-crystalline substances as pitch to produce a pitch free feed;

recovering a heavy cokable residue from the pitch free feed;

heating said heavy cokable residue to coking temperatures; and,

subjecting the heated heavy cokable residue to delayed coking to produce high crystalline petroleum coke.

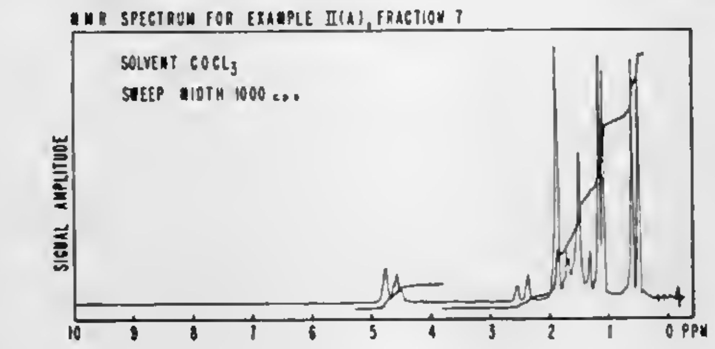
Reconsideration and allowance of this application are requested.

4,108,799
SUBSTITUTED ACETONAPHTHONE PERFUME COMPOSITIONS
William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

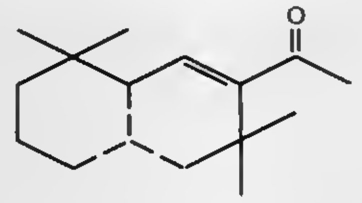
Division of Ser. No. 740,890, Nov. 11, 1976, Pat. No. 4,076,749. This application Jul. 28, 1977, Ser. No. 819,873

Int. Cl.^{2} C11B *9/00*

U.S. Cl. 252—522 **2 Claims**



1. A perfume composition having a vetiver character comprising (i) a composition of matter consisting of a mixture of three compounds defined by the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond in an olfactorily effective amount and (ii) at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones other than ketones contained in said mixture (i), nitriles, esters and lactones.

4,108,800
CLEANING COMPOSITION
Helmut H. Froehlich, Wilmington, Del., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 562,245, Mar. 26, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 755,751

Int. Cl.^{2} C11D *1/72*

U.S. Cl. 252—541 **3 Claims**

1. In a powdered cleaning composition comprising about from 30% to 90% particulate polymeric urea-formaldehyde and about from 10% to 70% fluid, the urea-formaldehyde

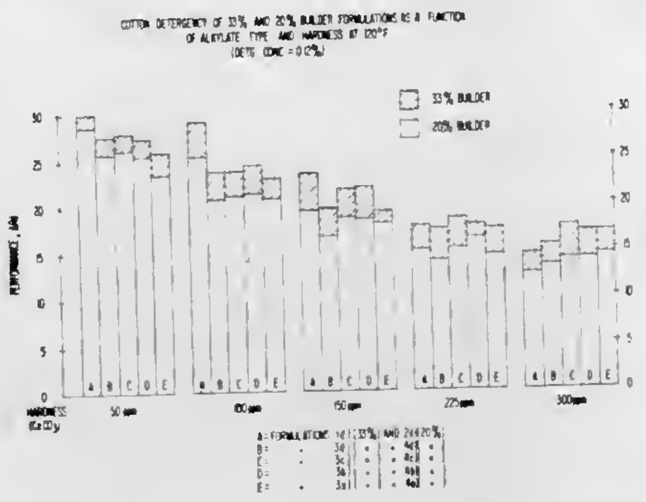
polymer having a particle size of about from 10 to about 105 microns and the fluid consisting essentially of up to 100% water containing sufficient surfactant to give a surface tension of less than 40 dynes per centimeter and up to 100% of an organic liquid selected from high boiling hydrocarbon solvents, tetrachloroethylene, methylchloroform, 1,1,2-trichloro-1,2,2-trifluoroethane, an aliphatic alcohol containing from 1 to 4 carbon atoms and mixtures of these, the improvement wherein the composition further comprises about from 0.25% to 5.0%, by weight of the cleaning composition, of a polyethylene oxide having a molecular weight of at least about 20,000 and the organic liquid comprises up to about 40% of the fluid in the composition.

4,108,801
DETERGENT COMPOSITIONS AND PROCESSES UTILIZING SAME
Thomas Christ, O'Fallon, Ill., and Robert P. Langguth, Overland, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1976, Ser. No. 755,098

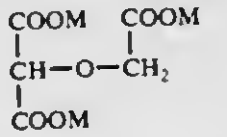
Int. Cl.^{2} C11D *1/02, 3/08*

U.S. Cl. 252—544 **14 Claims**



1. A composition comprising: a. a blend of linear alkyl benzene sulfonates in approximately 1/1 ration by weight, one of said sulfonates having an average carbon number in the alkyl chain of 13–14 and a second of said sulfonates having an average carbon number in the alkyl chain of 11–12, the average carbon number in the alkyl chains of said blend being 12–13, and

b. at least 5% by weight of said blend of a compound of the formula:



$$\begin{array}{lll} \mathrm{COOM} & & \mathrm{COOM} \\ | & & | \\ \mathrm{CH}{-}\mathrm{O}{-} & & \mathrm{CH_2} \\ | & & \\ \mathrm{COOM} & & \end{array}$$

wherein M is selected from the group consisting of alkali metal, ammonium, and $NH+(Ch_2CH_2OH)_3$.

4,108,802
QUATERNARY AMMONIUM POLYMERS AND PHOTOGRAPHIC MATERIALS CONTAINING SAME
Peter John Wright, Ilford, England, assignor to CIBA-GEIGY AG, Basel, Switzerland

Filed May 20, 1976, Ser. No. 688,516

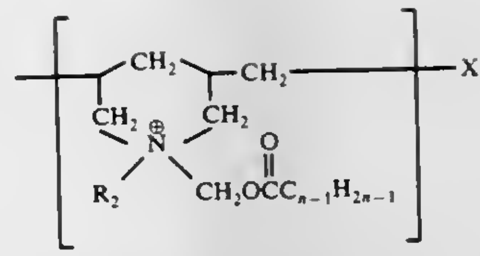
Claims priority, application United Kingdom, Jun. 4, 1975, 24131/75

Int. Cl.^{2} C08F *22/40, 26/02*

U.S. Cl. 526—17 **8 Claims**

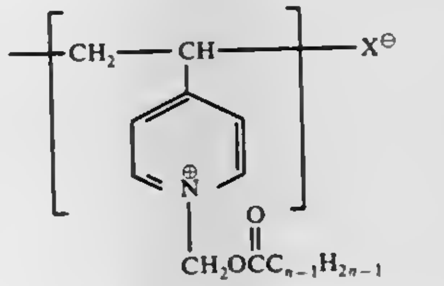
1. A polymeric material which comprises repeating units of the formulae

(A)



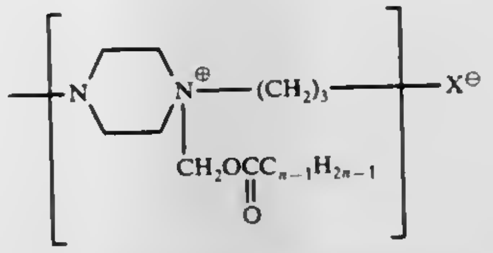
wherein R_2 is alkyl of 1 to 7 carbon atoms, X is a chloride or bromide anion and *n* is an integer of 1 to 15,

(B)



wherein X is a chloride or bromide anion and *n* is an integer of 1 to 15, or

(C)



wherein X is a chloride or bromide anion and *n* is an integer of 1 to 15.

4,108,803
PHOTOPOLYMERIZABLE EPOXY RESINS CONTAINING PENDANT UNSATURATED ESTER OR AMIDOMETHYL GROUPS
George Edward Green, Stapleford, and John Sidney Waterhouse, Cherry Hinton, both of England, assignors to Ciba-Gigy Corporation, Ardsley, N.Y.

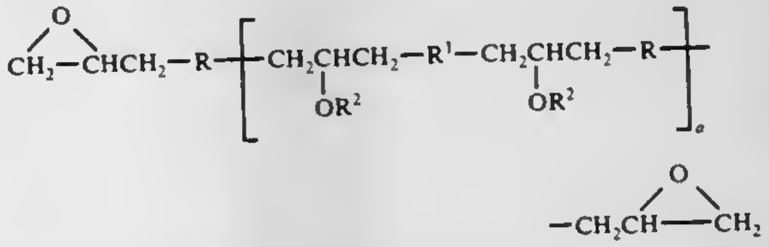
Filed Mar. 10, 1977, Ser. No. 776,446

Claims priority, application United Kingdom, Mar. 23, 1976, 11598/76; Jul. 16, 1976, 29792/76

Int. Cl.^{2} C08G *59/16*

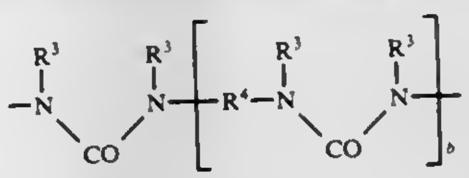
U.S. Cl. 96—76 R **7 Claims**

1. Epoxide resins of the formula



where

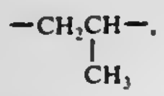
a is an integer of average value of at least 1 and at most 100, each R and R^1 represents a group of formula



or $—O—(OC)_c—R^5—(CO)_c—O—$,

each R^2 represents a hydrogen atom or a group of formula $—(CH_2NH)_dCOC(R^6)═CH_2$, with the proviso that at least 1 of the 2*a* groups R^2 represents $—(CH_2NH)_dCOC(R^6)═CH_2$,

each R^3 denotes an alkyl group of 1 to 4 carbon atoms, or conjointly each pair represents a group of formula $—CH_2CH_2—$, $—C(R^7R^8)CO—$,



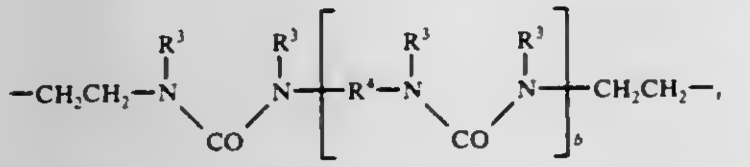
$$—CH_2\underset{\displaystyle CH_3}{\underset{|}{CH}}—,$$

$—CH_2CH_2CH_2—$, $—COCO—$, $—COCOCO—$, or $—COC(OH)_2CO—$,

R^4 represents a divalent aliphatic, cycloaliphatic, or araliphatic radical of 1 to 8 carbon atoms,

b, *c*, and *d* are each zero or 1,

R^5 represents a straight or branched chain aliphatic group of 2 to 20 atoms or, providing *c* is 1, it may alternatively represent a group of formula



R^6 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, and

R^7 and R^8 each represent a hydrogen atom or a methyl or ethyl group.

4,108,804

PROCESS FOR PREPARATION OF CHROMATOGRAPHY SOLID SUPPORTS COMPRISING A NUCLEIC ACID BASE-EPOXY GROUP CONTAINING POROUS GEL

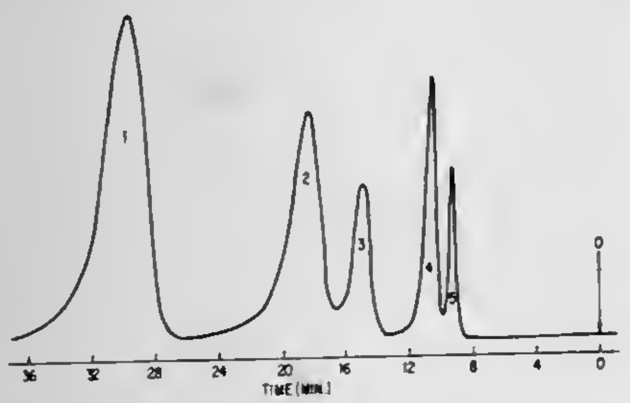
Toru Seita; Akihiko Shimizu; Yoshio Kato, and Tsutomu Hashimoto, all of Shin-nanyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,767

Claims priority, application Japan, Dec. 23, 1975, 50-152860; Dec. 27, 1975, 51-157879

Int. Cl.^{2} C08L *5/00*

U.S. Cl. 521—121 **9 Claims**



1. A chromatography solid support prepared by reacting at a temperature of 50° to 200° C a nucleic acid base, a related compound thereof or a mixture thereof, selected from a group consisting of adenine, guanine, thymine, uracil, cytosine, theophylline, hypoxanthine, 6-mercaptopurine and 5-halopyrimidine, with an epoxy group-contaning porous gel having a pore size of less than 1mμ, a cross-linking density of 5 to 30 mole % and a gel size of 2 to 200 mμ, in a solvent in the presence of a carbonate, wherein the amount of said nucleic acid base is 0.4 to 3 equivalents relative to the number of epoxy groups in the porous gel, and the carbonate is present in an amount of 1 to 30 mole % based on the number of epoxy groups in the porous gel.

4,108,805

STRUCTURALLY REGULATED POLYPHOSPHAZENE COPOLYMERS

Ronald L. Dieck, Evansville, Ind., and Edwin J. Quinn, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sep. 6, 1977, Ser. No. 830,692

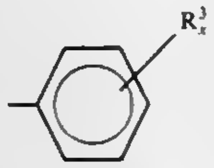
Int. Cl.^{2} C08G *79/02*

U.S. Cl. 521—180 **21 Claims**

1. A structurally regulated polyphosphazene copolymer represented by the general formula

$$—N_3P_3(Cl_5)(OR^1)—_n$$

where *n* is greater than 2 to about 600 and where R^1 represents



wherein R^3 is located in the meta or para positions on the phenoxy ring, and represents lower alkyl, lower alkoxy, halo, cyano, nitro, substituted lower alkyl or substituted lower alkoxy wherein the substituents are nitro, cyano, halo, or lower alkoxy and *x* is 0 to 3.

4,108,806

THERMOPLASTIC EXPANDABLE MICROSPHERE PROCESS AND PRODUCT

William E. Cohrs, Midland, and Roland E. Gunderman, Clare, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 205,289, Dec. 6, 1971, abandoned. This application Dec. 21, 1973, Ser. No. 427,298

Int. Cl.^{2} B01F *15/00*

U.S. Cl. 521—54 **7 Claims**

1. A process for the incorporation of expandable thermoplastic synthetic resinous monocellular microspheres having a thermoplastic resinous shell, a volatile liquid foaming agent therein within a heat plastifiable matrix material which, at its heat plastification temperature does not act as a rapid solvent for the microspheres to cause the destruction thereof by solvent action or heat plastify at a temperature sufficiently high that the microspheres are destroyed by thermal degradation, the steps of the method comprising

admixing the microspheres and matrix forming material,
heat plastifying the matrix material and
mechanically working the mixture to form a matrix about the microspheres without causing expansion thereof, subsequently
passing the mixture into a zone of lower pressure wherein the microspheres expand to form a plurality of hollow, generally monocellular particles within the matrix, and
cooling the mixture below the heat plastifying temperature.

4,108,807

ORGANO-METALLATE POLYMERS AND PROCESSES FOR THE MANUFACTURE THEREOF

Karl Heinz Hilterbaus, Georgsmarienhütte, and Franz Gottfried Reuter, Lemförde, both of Fed. Rep. of Germany, assignors to Chemic-Anlagenbau Bischofsheim GmbH, Osnabruck; Reuter Technologie GmbH, Lemforde and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, all of, Fed. Rep. of Germany

Filed Jul. 19, 1976, Ser. No. 706,199

Claims priority, application United Kingdom, Jul. 18, 1975, 30303/75

Int. Cl.^{2} C08G *18/18, 18/38*

U.S. Cl. 521—118 **18 Claims**

1. A method of making an organo-metallate polymer comprising reacting, in liquid phase, a mixture containing:

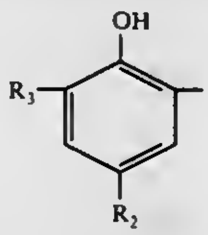
A. A pseudohalide compound selected from the group consisting of organic isocyanates and thioisocyanates having at least two isocyanate or thioisocyanate groups, and organic thiocyanates and selenocyanates having at least two thiocyanate or selenocyanate groups

B. An aqueous alkaline solution of a metallate comprising a soluble salt of a compound having the formula

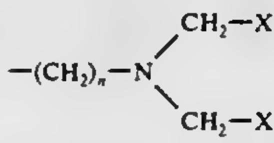
$$H_n(MeX_m)$$

in which X is oxygen or sulfur, Me is a metal capable of forming an anion with X, and *n* and *m* are whole numbers, whereby said metallate; on a dry basis being present in an amount of about at least about 17.5 to about 210.5 parts by weight per 100 parts by weight of pseudohalide compound,

C. A catalyst for catalyzing a pseudohalide reaction, said catalyst being a tertiary amine of the general formula:



in which formula the radicals R_1, R_2 and R_3, which may be the same or different, each represents a hydrogen atom or a radical of the general formula:



in which *n* is an integer of from 1 to 25 and the radicals X_1 and X_2, which may be the same or different, each represents a hydrogen atom or an alkyl radical having 1 to 25 carbon atoms and which may be substituted by primary and/or secondary hydroxyl groups, at most two of the radicals R_1, R_2 and R_3 being hydrogen atoms.

16. A process according to claim 1 wherein the reaction is carried out in the presence of a blowing agent.

4,108,808

NOVEL OXYALKYLATED POLYOL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 26, 1976, Ser. No. 745,049

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 521—181 **56 Claims**

15. A rigid cellular interpolymer prepared by curing a reactive liquid oxyalkylated polyol prepolymer in the presence of a foaming agent and an acid catalyst, the said oxyalkylated polyol prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1-8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol and being oxyalkylated with about 1-10 moles of an alkylene oxide containing about 2-4 carbon atoms, the said oxyalkylated polyol prepolymer having a viscosity of about 1000-500,000 centipoises at 25° C. and containing about 1.1-6 moles of interpolymerized aldehyde and about 3.1-15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith.

4,108,809

NOVEL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 29, 1976, Ser. No. 745,628

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 521—136 **63 Claims**

1. A reactive liquid composition which may be cured in the presence of an acid catalyst to produce a rigid flame retardant interpolymer, the said composition consisting essentially of (1) a liquid prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1-8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol, the said prepolymer having a viscosity of about 100-500,000 centipoises at 25° C, and containing about 1.1-6 moles of interpolymerized aldehyde and about 3.1-15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith, and (2) about 1-10 moles of unpolymerized furfuryl alcohol for each mole of the said interpolymerized hydroxy aromatic compound.

15. A rigid flame retardant cellular interpolymer prepared by curing a reactive liquid composition in the presence of a foaming agent and an acid catalyst, the said composition consisting essentially of (1) a liquid prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1-8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol, the said prepolymer having a viscosity of about 100-500,000 centipoises at 25° C. and containing about 1.1-6 moles of interpolymerized aldehyde and about 3.1-15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith, and (2) about 1-10 moles of unpolymerized furfuryl alcohol for each mole of the said interpolymerized hydroxy aromatic compound.

4,108,810

METHOD FOR MAKING CROSSLINKED RESIN FOAMS FROM AT LEAST ONE DICARBOXYLIC ACID, AT LEAST ONE ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID ANHYDRIDE AND A POLYISOCYANATE

Ann Marie Baker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1977, Ser. No. 843,015

Int. Cl.^{2} C08J *9/00, 9/08*

U.S. Cl. 521—129 **10 Claims**

1. In a method of making crosslinked ethylenic polymer

resin foams, the improvement which comprises making a storage-stable foamable solid intermediate by admixing and interacting in a reaction mixture at temperature above the melting point thereof but below about 100° C, at least one organic polyisocyanate, at least one dicarboxylic acid, and at least one ethylenically unsaturated dicarboxylic acid cyclic anhydride, allowing carbon dioxide to evolve from the reaction mixture, subsequently adding to the reaction mixture a pre-combined mixture of catalyst and surfactant, subsequently adding to the reaction mixture a small amount of water, maintaining the reaction mixture at temperature below about 100° C until the reaction mixture begins to harden, then cooling the reaction mixture to solid state.

4,108,811

COMPOSITION PROCESS FOR AQUEOUS BASE COATINGS FOR CORRODIBLE METALS

Paul Sheppard Eckhoff, Melville, N.Y., assignor to International Minerals & Chemical Corp., Libertyville, Ill.

Continuation-in-part of Ser. No. 382,040, Jul. 23, 1973, Pat. No. 3,919,145, and Ser. No. 615,067, Sep. 19, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 747,015

Int. Cl.^{2} C09D *3/66, 3/72*

U.S. Cl. 260—22 TN **30 Claims**

1. A water base latex composition for coating corrodible surfaces consisting essentially of (1) an aqueous resin binder formed by blending an aqueous dispersion of a film-forming polymer selected from the group consisting of acrylic and vinyl acetate polymers and (2) an aqueous alkaline emulsion of a polyurethane resin, wherein said polyurethane resin is the reaction product of a diisocyanate with an hydroxylic oil-modified resin intermediate, wherein said intermediate is (a) the alcoholysis product of a synthetic or natural drying oil or semi-drying oil and one or more polyhydric alcohols or (b) the reaction product of one or more polyhydric alcohols and one or more acids selected from the group consisting of monomeric and polymeric drying and semi-drying fatty acids.

4,108,812

AQUEOUS PRINTING INKS

Erwin Grueninger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Dec. 1, 1975, Ser. No. 636,815

Claims priority, application Sweden, Dec. 5, 1974, 7416159

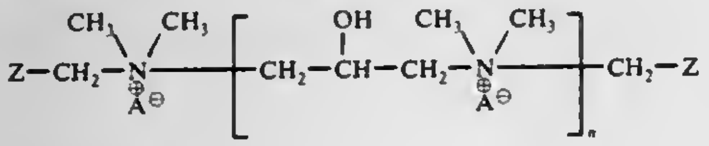
Int. Cl.^{2} B32B *21/06;* **C09D** *11/02;* **D21C** *5/02*

U.S. Cl. 260—24 **14 Claims**

1. A storage-stable aqueous printing ink comprising (1) an anionic dyestuff, (2) a cationic fixing agent which is a hydrosoluble polymer produced by cross-linking a polyamide amine containing the functional groups of formula

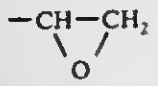
$$\begin{array}{l} HN-CH_2-CH_2-NH-CH_2-CH_2-N- \\ H-CO-(CH_2)_4-CO \end{array}$$

with a bifunctional alkylating agent of formula



$$Z-CH_2-\overset{CH_3\ \ CH_3}{\underset{A^{\ominus}}{\overset{\oplus}{N}}}-\left[CH_2-\overset{OH}{CH}-CH_2-\overset{CH_3\ \ CH_3}{\underset{A^{\ominus}}{\overset{\oplus}{N}}}\right]_n-CH_2-Z$$

where $A^{\oplus}$ is an anion,
n is 0 to 3, and
Z is



or $-CH(OH)-CH_2Cl$ in such proportions that all epoxy or halogenohydrin groups in the crosslinking agent capable of effecting alkylation are reacted without producing a water-insoluble product, and (3) a sufficient amount of ammonia or a volatile amine to inhibit premature reaction between said cationic fixing agent and said anionic dyestuff.

4,108,813

CEMENTITIOUS FLOORING COMPOSITION CONTAINING MIXTURE OF INTERMESHING PARTICLES OF SUBSTANTIALLY SPHERICAL QUARTZ SAND

Albert Lee Roberts, 4309 Paseo De Las Tortugas, Torrance, Calif. 90505

Filed Dec. 17, 1973, Ser. No. 425,274

Int. Cl.^{2} C08L *31/02*

U.S. Cl. 260—29.6 S **20 Claims**

1. A cementitious composition suitable for spray application in the formation of a dense floor structure, said composition consisting essentially of:

about 58 to about 70 percent by weight of a mixture of intermeshing particles of substantially spherical quartz sand;

said mixture including a weight fraction of relatively large size particles and a weight fraction of relatively small size particles;

the weight ratio of the relatively large size particles with respect to the relatively small size particles ranging from about 3:1 to about 1:1 and the ratio of the average diameter of the relatively large size particles with respect to the average diameter of the relatively small size particles ranging from about 2:1 to about 3:1;

a finely ground Portland cement;

a plastic-in-water emulsion having a solids content of about 20 to about 50 percent by weight of the emulsion;

the plastic in sand emulsion being an acrylic plastic which is present in the form of minute spherical particles having a particle size of about 0.05 to about 50 microns and said plastic being capable of forming a tacky film at ambient temperatures and bonding to the substantially spherical quartz sand;

a flow control material in an amount sufficient to provide the composition with laminar flow properties during spray application;

said composition having a low water-to-cement ratio in the range of about 0.4 to about 0.5, **with the water being furnished by said emulsion and**

said composition having a Brookfield viscosity of about 2,000 to about 5,000 centipoisers as measured at 20 rpm with a Brookfield Synchroelectric Viscometer, Model LVF, using a number 3 spindle,

whereby said composition may be sprayed onto a generally horizontal support surface in the formation of a dense floor structure having a low void content and being substantially free from surface cracking or crazing and with the composition being sufficiently fluid to provide flow and leveling after application to the support surface.

4,108,814

AQUEOUS POLYURETHANE DISPERSIONS FROM SOLVENT-FREE PREPOLYMERS USING SULFONATE DIOLS

Helmut Reiff, New Martinsville, W. Va.; Wolfgang Wenzel, Leverkusen; Jürgen Grammel, Cologne, and Dieter Dieterich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 614,730, Sep. 18, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,206

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1974, 2446440

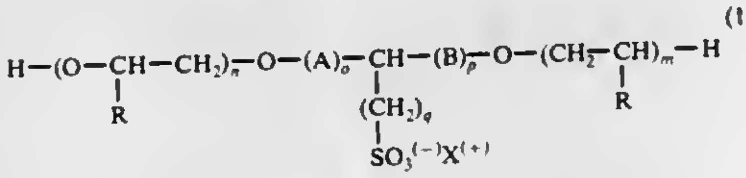
Int. Cl.^{2} C08G *18/12, 18/38, 18/84*

U.S. Cl. 260—29.2 TN **9 Claims**

1. A process for preparing water soluble polyurethanes comprising

a. forming a prepolymer in the absence of solvent at temperatures between about 30° and 120° C and an NCO to OH ratio of between about 1.05 and 6 by reacting

i. sulphonate containing diols having a melting point or softening point below 120° C of the general formula



$$H-(O-\underset{R}{CH}-CH_2)_n-O-(A)_o-\underset{\underset{SO_3^{(-)}X^{(+)}}{(CH_2)_q}}{CH}-(B)_p-O-(CH_2-\underset{R}{CH})_m-H \qquad (I)$$

wherein

A and B, which may be the same or different, each represents a divalent aliphatic hydrocarbon group containing from 1 to 6 carbon atoms,

R represents hydrogen, an aliphatic hydrocarbon group containing 1 to 4 carbon atoms or a phenyl group,

$X^{(+)}$ represents an alkali metal cation or when $n + m > 0$ or when $q \neq 1$ an ammonium group which may be substituted.

n and m, which may be the same or different, each represents an integer between 0 and 30 inclusive

o and p represent 0 or 1, and

q represents an integer of from 0 to 2 with,

ii. polyisocyanates of the formula

(2) $Q(NCO)_2$ wherein

Q represents C_4 to C_{12} alkyl, C_6 to C_{15} cycloalkyl, C_6 to C_{15} aryl or C_7 to C_{15} aralkyl, and

iii. dihydroxy compounds having molecular weights of about 1000 to 6000 selected from the group consisting of polyesters, polyethers, polythioethers, polyacetals, polycarbonates or polyester amides, and

b. chain extending the prepolymer with water and water soluble diamines having molecular weights of about 32 to 600 and exclusively primary or secondary amino groups the proportion of reactants being so selected that the final polymer has a sulphonate group content of about 0.1 to 6 wt. %.

4,108,815

HEAT-CURABLE LACQUER OF LOW SOLVENT CONTENT, BASED ON AN EPOXIDE RESIN

Thaddeus Audykowski, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,963

Claims priority, application Switzerland, Aug. 16, 1974, 11256/74

Int. Cl.^{2} C08K *5/09, 5/10;* **C08L** *63/00*

U.S. Cl. 260—29.2 EP **15 Claims**

1. A heat-curable lacquer of low solvent content, characterized in that it contains

(A) from 90–10% by weight of a compound having two or more glycidyl groups; and

(B) from 10–90% by weight of a solution containing 50–95% by weight of 4,4'-(2-acetoxy-1,3-glyceryl)di-anhydrotrimellitate or the corresponding tetracarboxylic acid of said di-anhydrotrimellitate.

4,108,816

CROSS-LINKABLE EMULSIFYING AGENTS AND AQUEOUS EMULSIONS CONTAINING THE SAME

George L. Brown, Scotch Plains, and Albert C. Chen, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 606,811, Aug. 22, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 827,777

Int. Cl.^{2} C08L *61/28, 63/00*

U.S. Cl. 260—29.4 R **5 Claims**

1. A thermally cross-linkable emulsifying agent consisting essentially of the transetherification reaction product of a polyoxyethylene glycol having a molecular weight in the range of from about 1,000 to about 20,000, with an excess of aminoplast resin sufficient to enable one molecule of the aminoplast resin to be reacted onto each end of the glycol, said aminoplast resin being etherified with methanol and said transetherification reaction being carried out at a temperature of from 100°-120° C. in the presence of an acid catalyst while removing alcohol.

4,108,817

AUTODEPOSITED COATINGS

Frank P. Lochel, Jr., Lansdale, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Dec. 30, 1976, Ser. No. 755,921

Int. Cl.^{2} C23F *7/00*

U.S. Cl. 260—29.6 E **15 Claims**

2. An autodepositing composition containing solid resin particles and of the type which is effective in forming on a metallic surface an autodeposited resinous coating by dissolving metal ions from the metal surface in amounts which cause the resin particles to deposit on the surface in a manner such that there is a continuous buildup of organic coating having combined therewith an acid inhibitor soluble in said composition in an amount effective to reduce or prevent the tendency of said composition to form coatings which have defects such as pinholes, blisters, craters or bridges said amount being less than that amount which substantially deters or prevents said composition from forming an autodeposited coating or an autodeposited coating having the desired thickness.

4,108,818

PROCESS FOR THE MELT-SHAPING OF ACRYLONITRILE POLYMERS

Kenji Odawara, and Shoichi Takeuchi, both of Okayama, Japan, assignors to Japan Exlan Company Limited

Filed Mar. 2, 1976, Ser. No. 663,281

Claims priority, application Japan, Mar. 3, 1975, 50-26283

Int. Cl.^{2} C08L *33/20, 51/00*

U.S. Cl. 260—29.6 AQ **7 Claims**

1. A process for the melt-shaping of acrylonitrile polymers, characterized in that an acrylonitrile polymer composition consisting essentially of acrylonitrile polymer, water and acrylonitrile which is obtained by uniformly mixing 30 – 90 weight percent of an acrylonitrile polymer, 1 – 56 weight percent of water and 2 – 63 weight percent of acrylonitrile is heated at the autogeneous pressure or above, and the melt is shaped into a desired form.

4,108,819

PROCESS FOR PRODUCING AN AQUEOUS DISPERSION OF VINYL ACETATE-ETHYLENE COPOLYMER INCLUDING AN EPOXIDE COMPOUND

Takeo Oyamada; Shinobu Tsuru; Choji Tomizawa, all of Ichihara, and Yoshito Taira, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 648,659, Jan. 13, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 790,062

Claims priority, application Japan, Jan. 14, 1975, 50-6599; Jul. 16, 1975, 50-87528

Int. Cl.^{2} C08L *63/10, 31/02*

U.S. Cl. 260—29.6 NR **22 Claims**

1. A process for producing an aqueous dispersion of vinyl acetate-ethylene copolymer containing an epoxide resin, which comprises emulsion-polymerizing vinyl acetate, wherein at least one epoxide resin having at least two epoxy groups per molecule is dissolved therein, and ethylene at a pH value of 3 to 7, so that the ratio of vinyl acetate and ethylene is in the range of 60–95: 40–5 by weight and the content of the epoxide resin is in the range of 0.5 to 60% by weight, based on the total weight of the solid resin components.

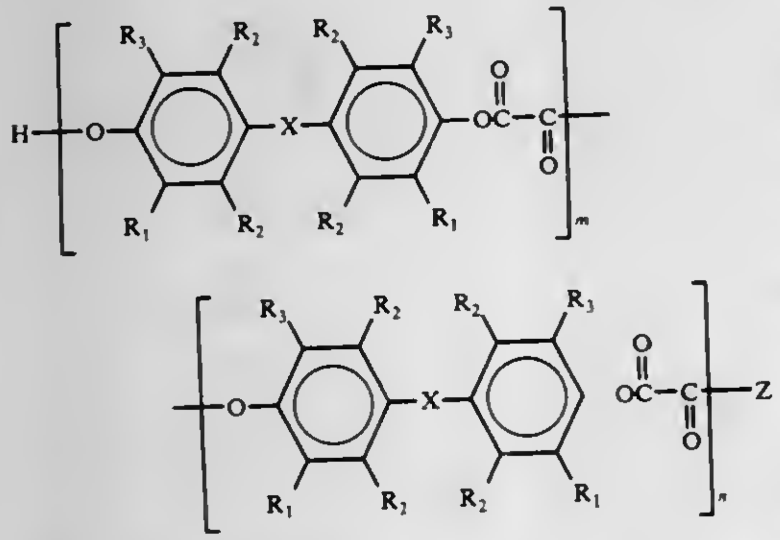
4,108,820

POLYCARBONATE COMPOSITION CONTAINING OLIGOMERIC-POLYMERIC OXALATE PLASTICIZER

Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

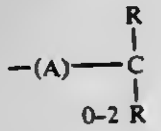
Filed Dec. 8, 1976, Ser. No. 748,470
Int. Cl.^{2} C08K *5/36*
U.S. Cl. 260—30.8 R **8 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an oligomeric-polymeric oxalate of the following formula:



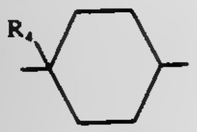
wherein R$_1$ is independently selected from the group consisting of hydrogen, halogen or C$_1$ to C$_{12}$ alkyl; R$_2$ is independently selected from the group consisting of hydrogen or C$_1$ to C$_5$ alkyl; R$_3$ is independently selected from the group consisting of hydrogen, halogen or C$_1$-C$_2$ alkyl; X is selected from the group consisting of:

(a)



$$-(A)_{0-2}-\overset{R}{\underset{R}{\overset{|}{\underset{|}{C}}}}$$

wherein A is



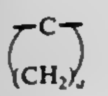
and R$_4$ is hydrogen or C$_1$–C$_4$ alkyl; R is independently selected from the group consisting of hydrogen, C$_1$–C$_{15}$ alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C$_1$–C$_5$ alkyl;

(b) $—CH_2CH_2—$

(c) $—CH_2B—CH_2—$

wherein B is C$_1$–C$_{16}$ alkylene or arylene of 6 to 14 carbon atoms;

(d)

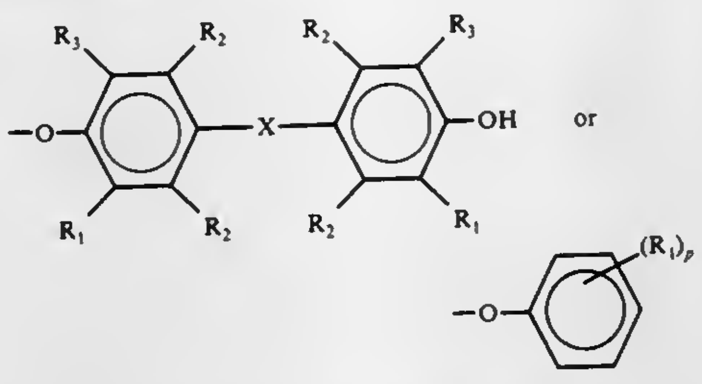


wherein *a* is an integer of 3 to 15;

(e) —O—

(f) —S—

m and *n* are integers from 0 to 80 provided the sum of *m* and *n* is at least 2; and Z is



wherein R$_1$, R$_2$, R$_3$ and X are as previously defined; *p* is an integer of 0–5.

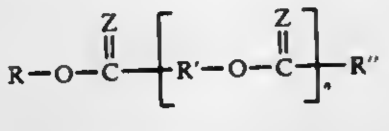
4,108,821

POLYCARBONATE COMPOSITION CONTAINING IMINATED AND THIONATED CARBONATE PLASTICIZERS

Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

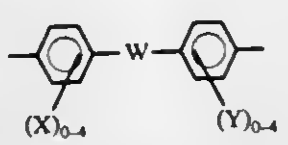
Filed Dec. 8, 1976, Ser. No. 748,467
Int. Cl.^{2} C08K *5/41, 5/29*
U.S. Cl. 260—30.8 R **7 Claims**

I. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer of the following formula:



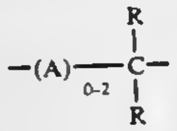
$$R-O-\overset{\overset{Z}{\|}}{C}-\left[R'-O-\overset{\overset{Z}{\|}}{C}\right]_n-R''$$

wherein R and R'' are independently selected from the group consisting of C$_1$ to C$_{30}$ alkyl, aryl of 6 to 14 carbon atoms and substituted aryl wherein the substituents are C$_1$ to C$_{30}$ alkyl, halogen, C$_1$ to C$_{30}$ alkoxy, aryloxy of 6 to 14 carbon atoms, alkythio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms, R' is selected from the group consisting of C$_1$ to C$_{30}$ alkylene, arylene of 6 to 14 carbon atoms, alkarylene of 7 to 30 carbon atoms, aralkylene of 7 to 30 carbon atoms and



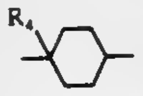
wherein W is selected from the group consisting of:

(a)



$$-(A)_{0-2}-\overset{R}{\underset{R}{\overset{|}{\underset{|}{C}}}}-$$

wherein A is



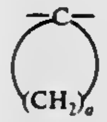
and R$_4$ is hydrogen or C$_1$–C$_4$ alkyl; R is independently selected from the group consisting of hydrogen, C$_1$–C$_{15}$ alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C$_1$–C$_5$ alkyl;

(b) $—CH_2CH_2—$

(c) $—CH_2B\text{-}CH_2—$

wherein B is C$_1$–C$_{16}$ alkylene or arylene of 6 to 14 carbon atoms;

(d)

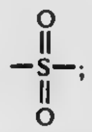


wherein a is an integer of 3 to 15;

(e) —O—;

(e) —S—;

(f)



$$-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-;$$

X and Y are independently selected from the group consisting of halogen and C$_1$–C$_{12}$ alkyl; Z is =S or =N—R$_5$, wherein R$_5$ is C$_1$–C$_{30}$ alkyl, aryl of 6 to 12 carbon atoms, or substituted aryl wherein the substituents are C$_1$–C$_{15}$ alkyl or halogen; *n* is 0 or 1.

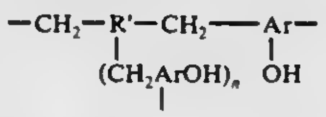
4,108,822

CURABLE RESIN COMPOSITIONS

Alfred Gerald Edwards, Stourport-on-Severn, and Glyn Islwyn Harris, Hagley, both of England, assignors to Albright & Wilson Ltd., Warley, England

Continuation-in-part of Ser. No. 431,828, Jan. 9, 1974, Pat. No. 3,923,721. This application Aug. 13, 1975, Ser. No. 604,434
Claims priority, application United Kingdom, Apr. 16, 1975, 14620/75
Int. Cl.^{2} C08G *61/28, 61/24*
U.S. Cl. 260—32.8 R **21 Claims**

1./ A resin composition which comprises (a) a resin having repeating units of the formula



$$-CH_2-\underset{\underset{|}{(CH_2ArOH)_n}}{\underset{|}{R'}}-CH_2-\underset{OH}{\underset{|}{Ar}}-$$

wherein R' is selected from the group consisting of divalent and trivalent aromatic hydrocarbyl groups and divalent and trivalent di(aromatic hydrocarbyl)oxy groups, and Ar is a residue formed by removal of two nuclear hydrogen atoms from a phenolic compound having 1–3 hydroxyl groups and at least two nuclear hydrogen atoms, and *n* is 0 or 1, and (*b*) a condensate in an amount of 15%-35% by weight (based on the total weight of resin and condensate), said condensate being (i) derived from formaldehyde and melamine and (ii) capable of reacting with said resin (a) to form a cured product, and said resin composition being in an uncured or or partially cured form.

4,108,823

COMPOSITION FOR COMPENSATING INSUFFICIENT ADAPTATION OF DENTURE BASE

Masakiyo Yoshimura, and Yasukazu Yamaguti, both of Osaka, Japan, assignors to Shionogi & Co., Ltd. and Kabushiki Kaisha Kyowa, both of, Japan

Filed Dec. 15, 1977, Ser. No. 860,957
Claims priority, application Japan, Dec. 18, 1976, 51-152618
Int. Cl.^{2} C08K *5/05*
U.S. Cl. 260—33.4 PQ **2 Claims**

1. A composition for compensating the insufficient adaptation of a denture base to the ridges on the jaws or the palate, which comprises polyvinyl acetate, polybutene and ethanol in a weight proportion of 65 – 85 : 2 – 7 : 10 – 35.

4,108,824

LOW-TEMPERATURE CURABLE SATURATED EPOXY RESIN COMPOSITIONS

Mark F. Dante, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 11, 1977, Ser. No. 814,369
Int. Cl.^{2} C08G *59/02;* **C08K** *5/05, 5/15*
U.S. Cl. 260—33.2 EP **7 Claims**

1. A curable composition prepared by reacting a saturated epoxy resin with a curing amount of an aliphatic amine for from about 15 to 60 minutes in the presence of an organic solvent selected from the group consisting of aliphatic alcohols, glycols, and glycol ethers, and wherein the weight ratio of the epoxy resin - amine adduct to organic solvent is from 25:75 to 95:5.

4,108,825

FLAME RETARDANT HEAT-CURABLE SILICONE COMPOSITIONS CONTAINING CERIC HYDRATE

William R. Hayes, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 774,830, Mar. 7, 1977, abandoned. This application Jan. 13, 1978, Ser. No. 869,336
Int. Cl.^{2} C08L *83/04*
U.S. Cl. 260—37 SB **12 Claims**

1. A silicone composition curable to a flame retardant elastomer comprising a product obtained by mixing

- (a) 100 parts by weight of a triorganosiloxy endblocked polydiorganosiloxane fluid wherein each organic radical is selected from a group consisting of methyl, ethyl, vinyl, phenyl, and 3,3,3-trifluoropropyl radicals, there being an average of 2 vinyl radicals per molecule and only one vinyl radical bonded to any one silicon atom, there being from 0 to 50 inclusive percent 3,3,3-trifluoropropyl radicals based on the total number of organic radicals in the polydiorganosiloxane fluid, there being from 0 to 10 inclusive percent of phenyl radicals based on the total number of organic radicals in the polydiorganosiloxane fluid, the fluid having a viscosity of from 0.2 to 30 Pa s measured at 25° C.,
- (b) an organohydrogensiloxane having an average of at least 2.1 silicon-bonded hydrogen atoms per molecule, no silicon atom having bonded thereto more than one silicon-bonded hydrogen atom, said molecules consisting essentially of units selected from the group consisting of $H(CH_3)SiO$ units, R_2SiO units, $H(CH_3)_2\ SiO_{\frac{1}{2}}$ units, and $R_3SiO_{\frac{1}{2}}$ units, R being selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms inclusive, phenyl and 3,3,3-trifluoropropyl radicals, the amount of organohydrogensiloxane being sufficient to provide from 1.2 to 3 inclusive silicon-bonded hydrogen atoms for every silicon-bonded vinyl group in the polydiorganosiloxane fluid,
- (c) from 5 to 100 parts by weight of a reinforcing silica filler having a surface area of at least 50 square meters per gram and having the surface thereof treated with an organosilicon compound to control crepe-aging of the curable silicone composition so that the viscosity does not rise above 250 Pa s at 25° C. during the shelf life of the composition,
- (d) a platinum catalyst, soluble in (a), and providing at least 1 part by weight of platinum for every one million parts by weight of the polydiorganosiloxane fluid (a), and
- (e) from 0.1 to 3 parts by weight of ceric hydrate wherein the cerium atoms are in the tetravalent state, the other atoms of the compound are hydrogen atoms and oxygen atoms, said hydrogen atoms are present as —OH radicals, H_2O molecules or both, and said hydrogen atoms are present in an amount, determined as H_2O molecules, from 1 to 10 weight percent inclusive based on the total weight of ceric hydrate.

4,108,826
FURFURYL ALCOHOL-HEXAALKOXYMETHYLMELAMINE FOUNDRY BINDERS

Hugh C. Anderson, Palatine, and Russell B. Lembke, Crystal Lake, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jun. 20, 1977, Ser. No. 808,022
Int. Cl.² C08K *3/36, 7/14*
U.S. Cl. 260—395 B **15 Claims**

1. A composition comprising a mixture of monomeric furfuryl alcohol and hexaalkoxymethylmelamine, in which the hexaalkoxymethylmelamine is present in an amount sufficient to provide from 2 to 40 percent by weight based on the weight of the mixture.

4,108,827
COLORLESS ALLYL DIGLYCOL CARBONATE

Norman U. La Liberte, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 13, 1976, Ser. No. 749,901
Int. Cl.² C08K *5/56*
U.S. Cl. 260—42.21 **11 Claims**

1. An optically clear, colorless, ophthalmic quality lens comprising about 16 parts allyl diglycol carbonate and between about 0.05 and 0.15 parts of a composition comprising 40 parts of a member selected from the group consisting of maleic anhydride, maleic acid, the products of reaction of propylene glycol, ethylene glycol, and glycerin with maleic anhydride or maleic acid, and mixtures thereof, and between about 0.5 and 1.5 parts of a mixture consisting essentially of 10 parts cobalt acetyl acetonate and between 0.4 and 1.2 parts copper acetyl acetonate.

4,108,828
POLYLACTAM COMPOSITION CONTAINING HEXAORGANO DISTANNANE

Jean W. Bouchoux, Nutley, and William A. Larkin, Morristown, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Division of Ser. No. 430,690, Jan. 4, 1974, Pat. No. 3,954,738. This application Jun. 16, 1975, Ser. No. 586,960
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.² C08K *5/57;* **C08G** *69/14*
U.S. Cl. 260—45.75 H **4 Claims**

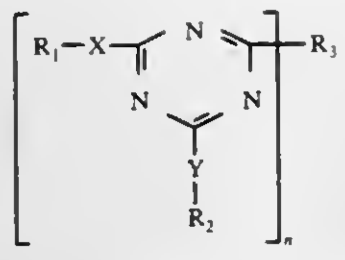
1. In a fiber-and film-forming lactam polymer composition which contains between 0.05 and 5%, based on the weight of said polymer, of an alkali metal salt of said lactam, the improvement which resides in the presence in said composition of between 0.5 and 100%, based on the weight of said alkali metal salt, of a hexaorgano distannane exhibiting the formula $R_3{}^2SnSnR_3{}^3$, wherein R^2 and R^3 are each selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms.

4,108,829
PIPERIDYL-TRIAZINE DERIVATIVES AS STABILIZERS FOR SYNTHETIC POLYMERS

Paolo Cassandrini, Bologna, and Antonio Tozzi, Sasso Marconi, both of Italy, assignors to Chimosa Chimica Organica S.p.A., Pontecchio Marconi, Italy

Filed Jun. 23, 1976, Ser. No. 699,163
Claims priority, application Italy, Dec. 18, 1975, 52769 A/75
Int. Cl.² C08K *5/34;* **C07D** *251/26*
U.S. Cl. 260—45.8 NT **24 Claims**

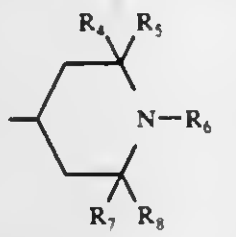
1. A method of increasing the light stability of a synthetic polymer, comprising adding to a composition of material of said synthetic polymer, an amount of a compound having the formula



(I)

wherein

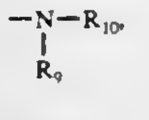
R_1, R_2, same or different, are hydrogen, hydroxyl, straight or branched chain C_1 to C_{18} alkyl, C_5 to C_{18} cycloalkyl, substituted or not substituted C_6 to C_{18} aryl, C_7 to C_{18} aralkyl or a piperidine radical of formula (II)



(II)

in which R_4, R_5, R_7, R_8, same or different, are selected from C_1 to C_6 alkyl and R_6 is selected from H, O, C_1 to C_{12} alkyl, C_2 to C_{12} alkenyl or alkinyl,

a group

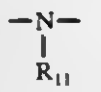


$$-\underset{\displaystyle R_9}{\underset{|}{N}}-R_{10},$$

in which R_9, R_{10}, same or different,

are selected from hydrogen, a C_1 to C_8 alkyl, a C_5 to C_8 cycloalkyl or a C_6 to C_8 aryl;

X, Y, same or different, are —O—, —S— or



$$-\underset{\displaystyle R_{11}}{\underset{|}{N}}- \quad ,$$

R_{11} being selected from H, a straight or branched chain C_1 to C_{18} alkyl, C_5 to C_{18} cycloalkyl, C_6 to C_{18} aryl, C_7 to C_{18} aralkyl or a piperidine radical of formula (II);

the radicals R_1—X—, R_2—Y—, taken as a single substituent group representing a radical of a nitrogenous heterocyclic compound having 5 to 8 atoms linked to the triazine ring by means of a distributed nitrogen atom of said radical, as well as representing Cl— and Br—;

n is an integer from 2 to 6;

R_3 is an n-valent residue derived from a polyalcohol, a polymercaptan or a polyamine by reaction of the active H atoms thereof with a halogen atom of a monohalogen triazine;

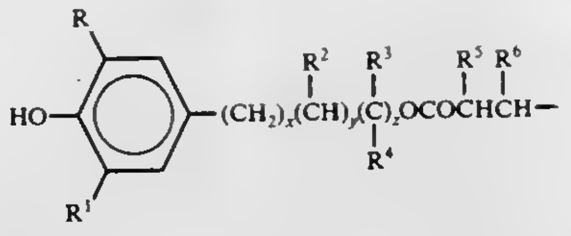
in the formula (I) there is in at least one of the radicals R_1—X—, R_2—Y—, R_3, at least one piperidine radical of formula (II) present, effective to increase the light stability of said synthetic polymer.

4,108,830
SULFUR-CONTAINING PHENOLIC ANTIOXIDANTS

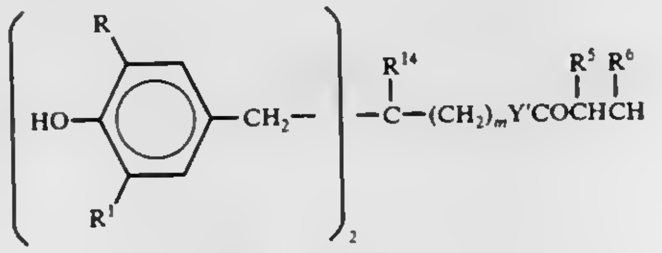
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 597,804, Jul. 21, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,105
Int. Cl.² C07C *69/34, 69/74, 69/76, 103/19, 103/24;* **C08R** *5/36*
U.S. Cl. 260—45.85 S **8 Claims**

1. A compound having the following structural formula: AXA wherein A and A¹ are selected from structures I and II as follows:

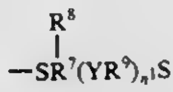


(I)



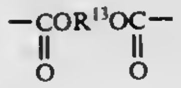
(II)

and X is



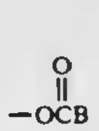
$$-\overset{\overset{\displaystyle R^8}{|}}{S}R^7(YR^9)_{n^1}S-$$

wherein Y' is —O— or —NH— and wherein R and R^1 are selected from the group consisting of tertiary alkyl radicals having 4 to 8 carbon atoms and cycloalkyl radicals having 5 to 12 carbon atoms, R^2, R^3, R^4, R^5, R^6 and R^8 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, R^7 is selected from the group consisting of alkylene radicals having 2 to 6 carbon atoms, cycloalkylene radicals having 5 to 12 carbon atoms and alkyl cycloalkylene radicals having the structural formula $-R^{11}-R^{10}-[R^{12}]_{n^2}-$, wherein R^9 is an alkylene radical having 2 to 6 carbon atoms, Y is selected from the group consisting of —O—, —S—, 1,4 phenylene and



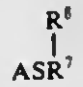
$$-\underset{\underset{\displaystyle O}{\|}}{C}OR^{13}O\underset{\underset{\displaystyle O}{\|}}{C}-$$

and wherein n^1 is 0 or 1, $x+y+z$ is 0 or a whole number from 2 to 12, R^{10} is a cycloalkylene radical having from 5 to 12 carbon atoms, R^{11} and R^{12} are alkylene radicals having from 1 to 6 carbon atoms and n^2 is 0 or 1, and wherein R^{13} is an alkylene radical having from 2 to 6 carbon atoms which can be substituted or unsubstituted with one or two groups of the structure



$$-O\overset{\overset{\displaystyle O}{\|}}{C}B$$

wherein B conforms to structural formula



$$A\overset{\overset{\displaystyle R^8}{|}}{S}R^7$$

and wherein R^{14} is selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms and phenyl and *m* is 0 or 1 with the proviso that when Y' is —O—, *m* is 1.

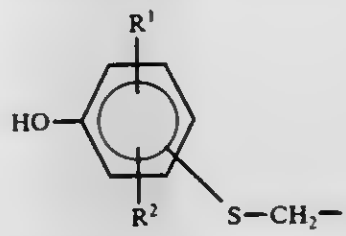
7. A polymer prepared from ethylenically unsaturated monomers having incorporated therein a compound according to claim 1.

4,108,831
HYDROXYALKYLTHIO PHENOLIC ANTIOXIDANTS

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

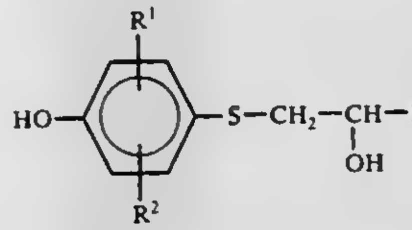
Filed Jun. 2, 1975, Ser. No. 583,064
Int. Cl.² C08K *5/36;* **C07C** *149/36*
U.S. Cl. 260—45.95 C **9 Claims**

1. A conjugated diene polymer susceptible to oxidative degradation having incorporated therein a stabilizing amount of a compound having the following structural formula:



wherein R^1 and R^2 are selected from the group consisting of hydrogen and hydrocarbon radicals containing 1 to 12 carbon atoms, R^3 is a monohydroxy or dihydroxy substituted radical containing 1 to 11 carbon atoms, at least one carbon atom of which is a part of a noncyclic aliphatic portion of the radical, the aliphatic portion of R^3 containing the hydroxy substitution, with the proviso that when R^3 contains 2 hydroxy substituents the substituents are located on different carbon atoms, and wherein the thio radical is attached to the phenolic ring in a position ortho or para to the hydroxy group.

7. A compound having the following structural formula



wherein R^1 and R^2 are selected from the group consisting of hydrogen and hydrocarbon radicals containing 1 to 12 carbon atoms and wherein R^4 is selected from the group consisting of hydrogen, methyl and phenyl with tbe proviso that when R^4 is hydrogen R^1 and R^2 are hydrocarbon radicals containing 1 to 12 carbon atoms.

4,108,832
SILACYCLOPENTYL-BIS-EPSILON-CAPROLACTAM

James R. Hahn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 644,379, Dec. 29, 1975, Pat. No. 4,012,375. This application Nov. 22, 1976, Ser. No. 743,820
Int. Cl.² C08G *77/04*
U.S. Cl. 528—32 **1 Claim**

1. A method of increasing the molecular weight of an organosiloxane having silicon-bonded hydroxyl radicals comprising mixing silacyclopentenyl-bis-epsilon-caprolactam and the organosiloxane.

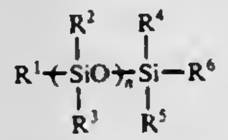
4,108,833
SILICONE RUBBER COMPOSITIONS

Masayuki Hatanaka, Gunma; Makoto Matsumoto, Ashikaga, and Masaharu Yonezawa, Oota, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 743,234
Claims priority, application Japan, Dec. 24, 1975, 50-155352
Int. Cl.² C08J *9/02*
U.S. Cl. 528—31 **11 Claims**

1. A silicone rubber composition consisting essentially of

(A) 100 parts by weight of diorganopolysiloxane having the formula



$$R^1\!\left(\underset{\displaystyle R^3}{\overset{\displaystyle R^2}{\underset{|}{\overset{|}{Si}}}}O\right)_{\!n}\underset{\displaystyle R^5}{\overset{\displaystyle R^4}{\underset{|}{\overset{|}{Si}}}}-R^6$$

wherein R^1, R^2, R^3, R^4, R^5 and R^6, which can be the same or different, are organo groups selected from the group consisting of alkyl, vinyl and phenyl, with the provisos that from 0.01 to 2.0 mole percent thereof are vinyl and there are at least two vinyl groups in the molecule, from zero to 10 mole percent thereof are phenyl, and the remainder thereof are alkyl, the average number of R^1 to R^6 groups being from 1.98 to 2.02, per one silicon atom, and n is a number from 50 to 10000 on the average,

(B) from 0.1 to 10 parts by weight of organohydrogenpolysiloxane having at least two Si-H bonds in the molecule, and the average degree of polymerization is from 6 to 5,000,

(C) from 0.0001 to 0.2 parts by weight of (O) valent platinum-(III) phosphor complex, and

(D) from zero to 200 parts by weight of inorganic filler.

4,108,834
THERMOPLASTIC POLYESTERS

Lothar Buxbaum, Lindenfels, Odenwald, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 31, 1977, Ser. No. 801,940

Claims priority, application Switzerland, Jun. 11, 1976, 7418/76

Int. Cl.² C08G *63/68*

U.S. Cl. 528—289 **12 Claims**

1. A linear thermoplastic polyester, having a relative viscosity of 1.1 to 3.5 measured on a solution of 1 gram of polyester in 100 ml of a solvent consisiting of equal parts of phenol and symmetrical tetrachloroethane at 30° C, which comprises the condensation product in about a 1:1 molar ratio of diacids (a) and (a') with diols (b) and (c) so that the composition of the polyester comprises

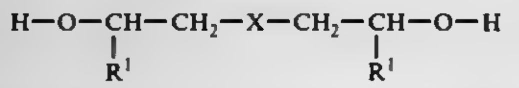
in the diacid component of the polyester

(a) from 35 to 50 mol %, based on the total polyester, of radicals of aromatic dicarboxylic acids; and (a') from 15 to 0 mol %, based on the total polyester, of radicals of aliphatic dicarboxylic acids; and

in the diol component of the polyester

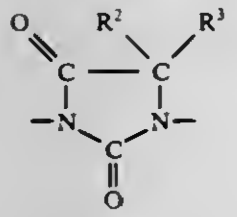
(b) from 25 to 49 mol %, based on the total polyester, of radicals of at least one aromatic diol, and

(c) from 25 to 1 mol %, based on the total polyester, of radicals of at least one diol of the general formula I

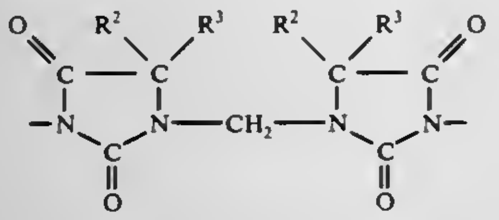


$$H-O-\underset{R^1}{CH}-CH_2-X-CH_2-\underset{R^1}{CH}-O-H \qquad (I)$$

wherein R^1 represents a hydrogen atom, methyl, ethyl or phenyl, and X represents a radical of the formulae I*a* to I*f*



(Ia),



(Ib),

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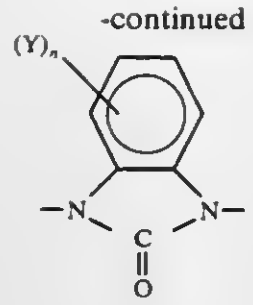
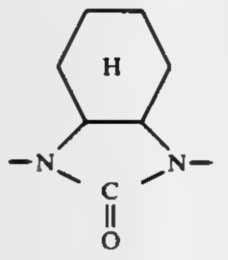
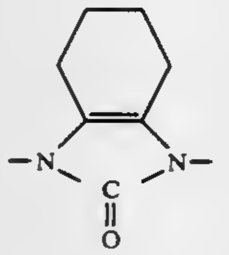


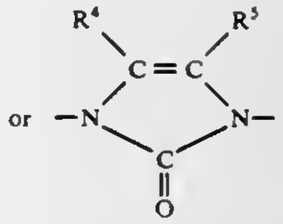
(Ic),



(Id),



(Ie),



(If)

wherein R^2 represents a hydrogen atom, methyl or ethyl, R^3 represents methyl, ethyl, propyl or isopropyl, R^4 and R^5 represent phenyl which can be partially or completely chlorinated or brominated, and Y represents a chlorine or bromine atom, and *n* represents nought or a number from 1 to 4; with the proviso that a portion of up to at most 10 mol % of the diol radicals of the formula I can be replaced by other aliphatic or cycloaliphatic diol radicals; and

wherein the radicals (a) and (a') are attached to radicals (b) and (c) through ester linkages in a random distribution.

4,108,835
PHENYLATED AROMATIC HETEROCYCLIC POLYMERS

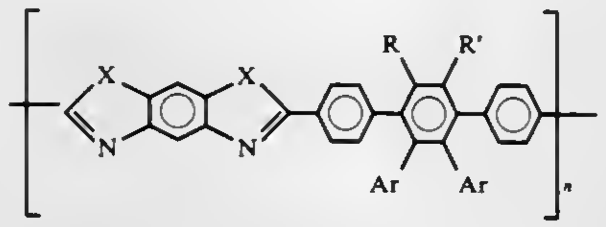
Fred E. Arnold, Centerville, Ohio, and James F. Wolfe, Menlo Park, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1977, Ser. No. 811,345

Int. Cl.² C08G *73/22, 75/32*

U.S. Cl. 528—183 **8 Claims**

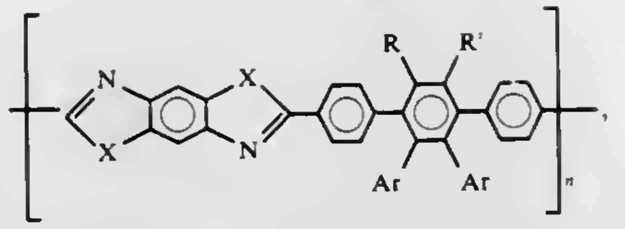
1. A para-ordered aromatic heterocyclic polymer consisting essentially of repeating units having a structure as represented by one of the following formulas:



(a)

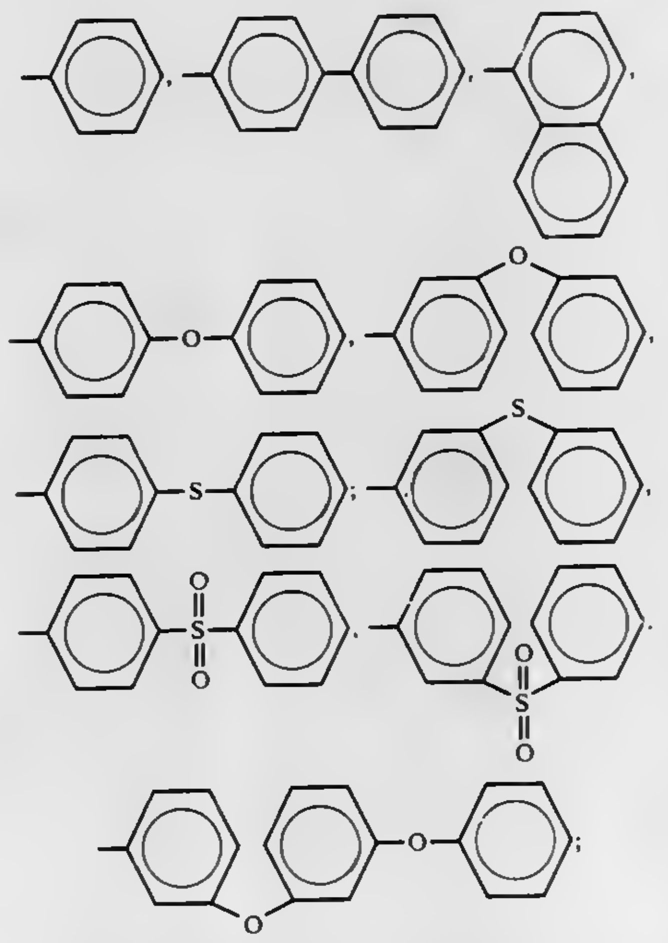
or

-continued

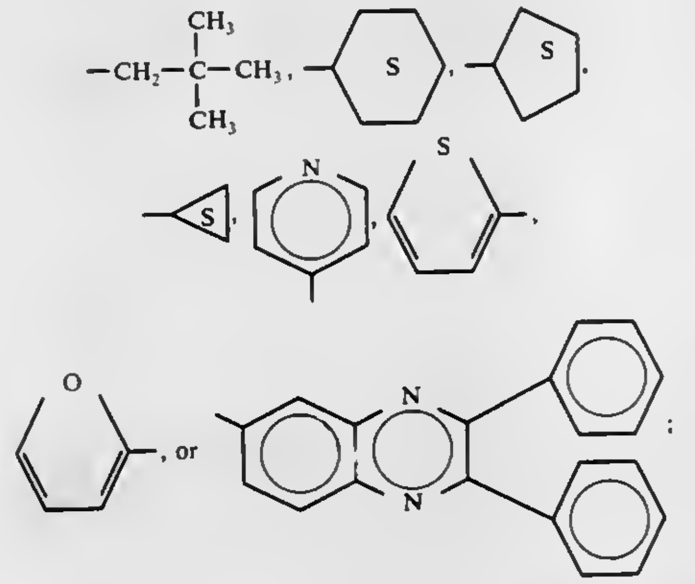


(b)

wherein X in each formula is S or O; Ar is



R and R' are hydrogen, a monovalent aromatic radical as listed above, $-CH_2-CH_3$, $-CH_2-CH_2-CH_3$, $-CH_2-CH_2-CH_2-CH_3$,



and *n* is an integer equal to the number of repeating units and has a value such that the polymer has an intrinsic viscosity of 2 to 12 dl/g as determined in methanesulfonic acid at 30° C.

4,108,836
PROCESS FOR SYNTHESIZING ACETYLENE-SUBSTITUTED POLYIMIDES AND POLYIMIDES THEREOF

Norman Bilow, Encino, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 3, 1977, Ser. No. 773,887

Int. Cl.² C08G *73/12*

U.S. Cl. 528—128 **8 Claims**

1. A method for preparing an acetylene end-capped polyimide oligomer, or a monomer mixture which is a precursor to such an oligomer, that is soluble in low-boiling non-toxic solvents and suitable for forming lacquers with high solids content comprising the steps of preparing an alcohol soluble ester by reacting two moles of a dianhydride with a lower aliphatic alcohol thereby forming an alcohol solution with said ester, adding one mole of a diamine to said solution while agitating said solution to form a solution of monomeric reactants containing some amic esters or amine salts and causing said esters or salts to react with two moles of an aminoarylacetylene whereby an alcohol soluble oligomer is formed.

4,108,837
POLYARYLENE POLYETHERS

Robert N. Johnson, New Market, and Alford G. Farnham, Mendham, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 295,519, Jul. 16, 1963, abandoned, Ser. No. 446,715, Apr. 8, 1965, abandoned, Ser. No. 643,840, Jun. 6, 1967, abandoned, and Ser. No. 688,302, Dec. 6, 1967, abandoned. This application Feb. 28, 1972, Ser. No. 230,091

Int. Cl.² C08G *65/40, 75/20*

U.S. Cl. 528—126 **63 Claims**

1. A substantially linear thermoplastic polyarylene polyether composed of recurring units having the general formula:

$$\left(O-E-O-E' \right)$$

where E is the residuum of a dihydric phenol and E' is the residuum of a benzenoid compound having an inert electron withdrawing group in one or more of the positions ortho and para to the valence bonds having a sigma* value above about +0.7, and where both of said residuum are valently bonded to the ether oxygens through aromatic carbon atoms with the provisos that E and E' may not both include a divalent sulfone group and may not both include a divalent carbonyl group linking two aromatic nuclei.

4,108,838
PROCESS FOR THE PRODUCTION OF SOLID THERMOPLASTIC TERPOLYMERIZATE OF TRIOXANE

Herbert Amann, and Gerhard Morlock, both of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1976, Ser. No. 655,358

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1975, 2505110

Int. Cl.² C08G *2/24, 2/10*

U.S. Cl. 528—249 **11 Claims**

1. Process for the production of a solid thermoplastic terpolymer of trioxane, said process comprising polymerizing trioxane in the presence of a prepolymer having recurring units consisting essentially of about 87 to about 99 weight percent units derived from at least one cyclic formal and about 13 to about 1 weight percent units derived from diglycerin diformal, and in the presence of a cationic catalyst.

4,108,839

PHOTOSENSITIVE POLYALDEHYDES AND USE IN PHOTOIMAGING

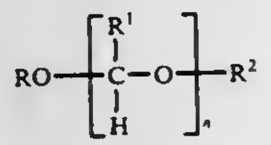
William John Chambers, Wilmington, and Robert Paul Foss, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1977, Ser. No. 760,935

Int. Cl.^{2} C08G *2/28, 2/32, 2/36*

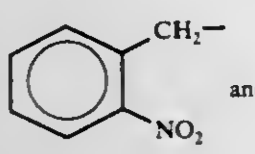
U.S. Cl. 528—270 **6 Claims**

1. A photosensitive polyaldehyde having the formula:



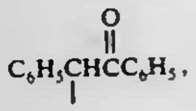
$$RO-\left[\underset{H}{\underset{|}{\overset{R^1}{\overset{|}{C}}}}-O\right]_n-R^2$$

wherein R is a photosensitive end group selected from



(a)

and

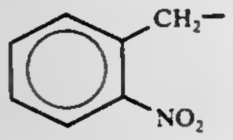


$$C_6H_5\underset{|}{CH}\overset{\overset{O}{\|}}{C}C_6H_5,$$

(b)

R^1 is H or n-alkyl of 1–5 carbon atoms,

R^2 is (a) n-alkanoyl of 1–4 carbon atoms or (b) n-alkanoyl of 1–4 carbon atoms or



when R^1 is H, and

n is a positive integer of about 10–4000.

4,108,840

UREA-URETHANE-ACRYLATE RADIATION CURABLE COATING COMPOSITIONS AND METHODS OF MAKING SAME

Charles B. Friedlander, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 15, 1977, Ser. No. 787,820

Int. Cl.^{2} C08G *18/67, 18/42, 18/08;* **C08L** *75/06*

U.S. Cl. 528—46 **26 Claims**

1. Radiation polymerizable resin comprising the reaction product of:

a. a prepolymer moiety having a plurality of isocyanato groups;

b. water in an amount sufficient to react with only a portion of the isocyanato groups of said prepolymer moiety to form in said reaction product at least one urea group linking two prepolymer moieties; and

c. a polyfunctional compound containing at least one functional group which is reactive with an isocyanato group of said prepolymer moiety and which polyfunctional compound after reaction with said isocyanato group provides at least one ethylenic functional group in said reaction product.

4,108,841

THERMOPLASTIC POLYESTERS AND PROCESSES FOR THEIR MANUFACTURE

Jürgen Habermeier, Pfeffingen, Switzerland, and Lothar Buxbaum, Lindenfels, Odenwald, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

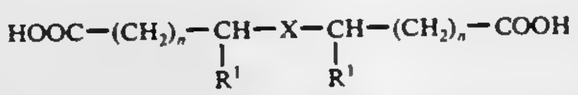
Filed May 9, 1977, Ser. No. 795,350

Claims priority, application Switzerland, May 12, 1976, 5934/76

Int. Cl.^{2} C08G *63/68*

U.S. Cl. 528—289 **14 Claims**

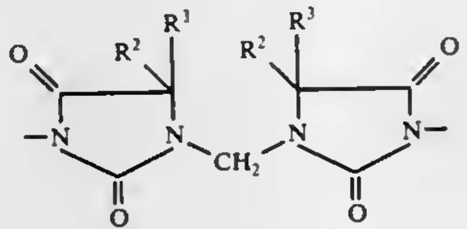
1. A linear thermoplastic polyester, obtained from aromatic and aliphatic dicarboxylic acids and diols, which has a relative viscosity of 1.2 to 3.5, measured at 30° C in a solution of 1 g of polyester in 100 ml of a solvent which consists of equal parts of phenol and symmetrical tetrachloroethane, which contains, relative to the polyester, (a) 0 to 49.5 mol % of radicals of at least one aliphatic and/or aromatic dicarboxylic acid, (b) 50 to 0.5 mol % of radicals of at least one dicarboxylic acid of the general formula I



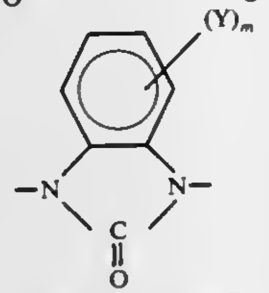
$$HOOC-(CH_2)_n-\underset{R^1}{\underset{|}{CH}}-X-\underset{R^1}{\underset{|}{CH}}-(CH_2)_n-COOH$$

(I)

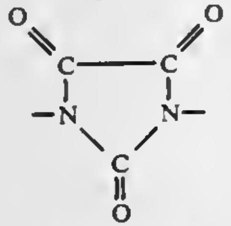
in which the two R^1 independently of one another each denote a hydrogen atom or alkyl with 1 to 12 C atoms, n represents identical or different numbers from 0 to 12, the C content of the $(CH_2)_n$ and R^1 groups together being at least 2, and X denotes a N,N-heterocyclic radical of the formulae IIa to IIf



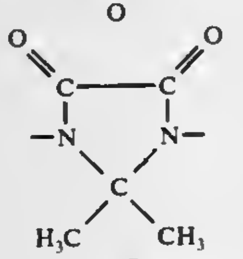
(IIa),



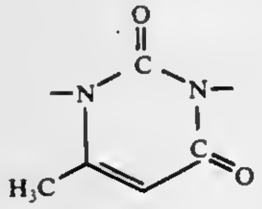
(IIb),



(IIc),



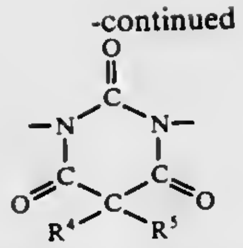
(IId),



(IIe)

or

-continued



(IIf)

in which R^2 represents a hydrogen atom or the methyl or ethyl group and R^3 represents the methyl, ethyl, propyl or isopropyl group, R^4 and R^5 each denote the methyl, ethyl or phenyl group, Y represents a bromine atom or chlorine atom and m is nought or denotes a number from 1 to 4, and (c) 50 mol % of radicals of at least one aliphatic or cycloaliphatic diol, as co-condensed radicals.

4,108,842

PREPARATION OF POLYURETHANE UREAS USING AS HARDENERS MIXTURES OF WATER, AMINES, ALDIMINES AND KETIMINES

Eberhard Konig, Leverkusen; Josef Pedain, Cologne; Karl-Arnold Weber, Leverkusen, and Manfred Hajek, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 5, 1977, Ser. No. 822,297

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637115

Int. Cl.^{2} C08G *18/32, 18/14;* **C08K** *5/41, 5/07*

U.S. Cl. 528—61 **11 Claims**

1. A process for the preparation of polyurethane ureas comprising reacting a prepolymer containing isocyanate groups and a hardener mixture containing amino groups in the presence of water, and optionally in the presence of solvents, characterized in that the hardener mixture comprises compounds corresponding to the following general formulae

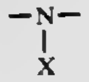
$H_2N-R-NH_2$ (A)

$H_2N-R-N{=}R_1$ (B)

$R_1{=}N-R-N{=}R_1$ (C)

wherein

R represents a divalent aliphatic, cycloaliphatic or araliphatic group having from 2 to 18 carbon atoms which may in addition contain —O— or



$$-\underset{X}{\underset{|}{N}}-$$

(wherein X represents $-H$, $-CH_3$, $-C_2H_5$, $-C_3H_7$ or $-C_4H_9$); and

R_1 represents an aliphatic or cycloaliphatic group such as is formed by removal of oxygen from a ketone or aldehyde having from 2 to 8 carbon atoms; in which mixture the following molar ratios are to be observed:

$(A/B + C)$ = from about 1:20 to 1:3

(B/C) = from about 1:2 to 2:1 and

$A + B + C/H_2O$ = from about 1:1.4 to 1:20.

4,108,843

COPOLYMERS OF POLYPARABANIC ACIDS AND POLYAMIDE-IMIDES

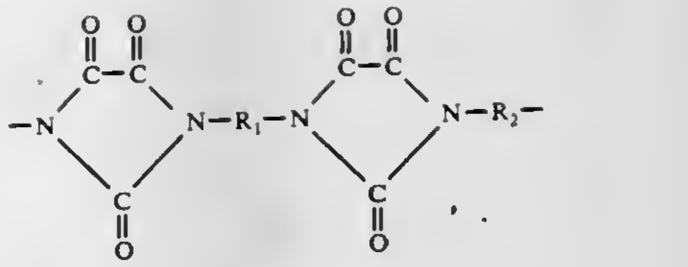
Augustin T. Chen, Cheshire, and Kemal B. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 5, 1977, Ser. No. 812,918

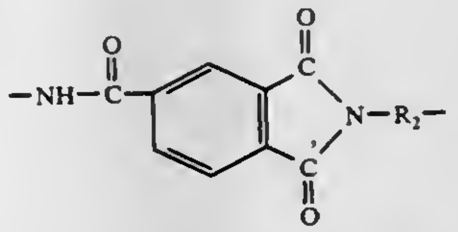
Int. Cl.^{2} C08G *18/00*

U.S. Cl. 528—74 **9 Claims**

1. A copolymer characterized by the presence in random arrangement of each of the following recurring units:



and



wherein R_1 represents a member selected from the group consisting of alkylene from 1 to 15 carbon atoms, inclusive, arylene from 6 to 12 carbon atoms, inclusive, and aralkylene from 7 to 25 carbon atoms, inclusive, and R_2 is the residue of an organic diisocyanate $R_2\,(NCO)_2$ the relative proportions of the numbers of each of the recurring units in the molecule being within the range of 4:1 to 1:4.

4,108,844

PHOTOSENSITIVE POLYESTERS

Wasaburo Kawai, Nishinomiya, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

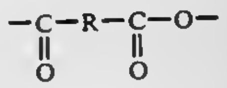
Filed Feb. 22, 1977, Ser. No. 770,847

Claims priority, application Japan, Feb. 25, 1976, 51/20253

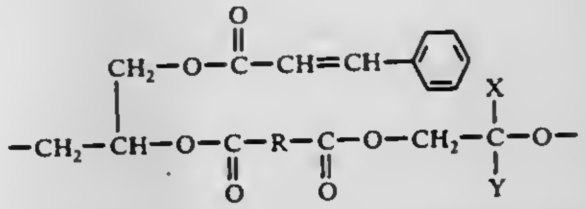
Int. Cl.^{2} C08G *63/00*

U.S. Cl. 526—217 **4 Claims**

1. A photosensitive polyester composed of at least five repeating units each of the formula:



$$-\underset{O}{\underset{\|}{C}}-R-\underset{O}{\underset{\|}{C}}-O-$$



wherein, X is selected from the group consisting of a hydrogen atom, alkyl groups having one to four carbon atoms, a phenyl group and a cinnamoyl-oxymethyl group, Y is selected from the group consisting of a hydrogen atom and alkyl groups having one to four carbon atoms and R is —CH═CH—.

4,108,845

HIGHLY SHRINKABLE ACRYLIC FIBRES OR FILAMENTS

Ulrich Reinebr; Alfred Nogaj, and Günter Lorenz, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1976, Ser. No. 653,241

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2504079

Int. Cl.^{2} C08F *28/00*

U.S. Cl. 526—240 **3 Claims**

1. A highly shrinkable dry-spun fiber or filaments of an acrylonitrile polymer which contains at least 50% by weight of acrylonitrile and up to 50% by weight of at least one other ethylenically unsaturated monomer being copolymerizable with acrylonitrile which has a tensile strength of at least 2

p/dtex and a shrinkage capacity in boiling water of at least 35%.

4,108,846
SOLID PHASE SYNTHESIS WITH BASE N ALPHA-PROTECTING GROUP CLEAVAGE

Johannes Arnold Meienhofer, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, New Jersey 07110
Filed Feb. 1, 1977, Ser. No. 764,605
Int. Cl.² C07C *103/52*
U.S. Cl. 260—112.5 R **6 Claims**

1. In the solid phase synthesis of peptides wherein a first Nα-amino protected amino acid is covalently coupled to a solid phase peptide synthesis resin the Nα-amino protecting group is cleaved off and the resulting free amino group is coupled via peptide linkage to the carboxyl group of a second Nα-amino protected amino acid and the cycle repeated until the desired peptide sequence has been obtained and then said peptide is cleaved from said resin,

the improvement comprising using base labile Nα-amino protecting groups on each of said amino acids and using base to cleave said protecting groups in each cycle.

4,108,847
METHOD FOR PREPARING BLAND PROTEIN ENRICHED PRODUCTS FROM GRAIN GLUTEN

Howard Lee Creinin, Worthington, Ohio, and Michael Shemer, Haifa, Israel, assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Sep. 9, 1977, Ser. No. 831,777
Int. Cl.² A23J *1/12*
U.S. Cl. 260—112 G **5 Claims**

1. A method for preparing a bland, protein enriched product which comprises:

(a) forming an aqueous slurry of a crude grain gluten containing oil and water soluble constituents at a pH between about 6.5 and 10.0 at a temperature at least about 70° C wherein the ratio of water to gluten is at least about 15:1 on a dry weight basis;
(b) agitating the gluten slurry to form an oil and water emulsion;
(c) separating the gluten from the emulsion containing oil and water soluble constituents; and
(d) drying the separated gluten.

4,108,848
METHOD FOR HARDENING GELATIN

Teiji Habu; Hisashi Yamaguchi; Takashi Sasaki; Tsuneo Wada; Masayuki Matsumoto; Takayoshi Omura, and Hiroki Ishii, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Oct. 3, 1974, Ser. No. 511,917
Claims priority, application Japan, Oct. 8, 1973, 48 112325
Int. Cl.² C09H *7/00*
U.S. Cl. 260—117 **7 Claims**

1. A method for hardening gelatin, which comprises treating the gelatin with a combination of a compound having at least two vinylcarbonyl groups in the molecule and a compound having at least two vinylsulfonyl groups in the molecule.

4,108,849
PROCESS FOR EXTRACTING AND PROCESSING GLYCOPROTEINS, MUCOPOLYSACCHARIDES AND ACCOMPANYING SUBSTANCES

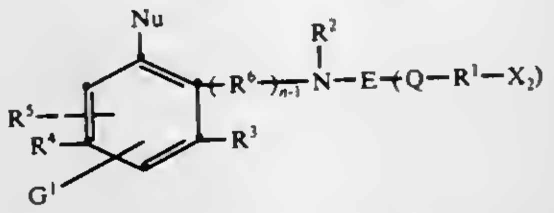
André Thomas, 8, rue Pierre et Marie Curie, 75005 Paris, France
Filed Feb. 24, 1975, Ser. No. 552,061
Claims priority, application France, Feb. 25, 1974, 74 06369; Aug. 8, 1974, 74 27513; Feb. 11, 1975, 75 04148
Int. Cl.² A23J *1/20*
U.S. Cl. 260—122 **13 Claims**

1. In a process for extracting glycoproteins and mucopolysaccharides from animal or plant matter containing the same by extraction with aqueous medium, the improvement which comprises conducting the extraction at a pH between 7.5 and 9.5, heating said aqueous extract to a temperature of 100° to about 110° C, and without adding additional reagents separating precipitate from the aqueous extract and recovering the aqueous extract.

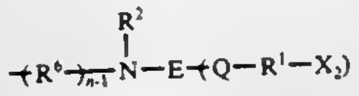
4,108,850
POSITIVE-WORKING IMMOBILE PHOTOGRAPHIC AZO COMPOUNDS

Donald Lee Fields, Rochester; Richard Paul Henzel, Webster; Philip Thiam Shin Lau, and Richard Allan Chasman, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 511,568, Oct. 2, 1974, Pat. No. 3,980,499.
This application Apr. 23, 1976, Ser. No. 679,623
Int. Cl.² C07C *107/00, 107/04;* C09B *43/12*
U.S. Cl. 260—162 **47 Claims**

1. A compound according to the formula:



wherein Nu is an oxidizable nucleophilic group or a precursor therefor; E is carbonyl or thiocarbonyl; Q is a bivalent group providing a mono atom linkage between E and R¹ and is an amino group providing a mono atom nitrogen linkage, an oxygen atom, a sulfur atom or a selenium atom; G¹ is a substituent as defined for Nu or a dialkylamino group; R⁶ is a bivalent alkylene group or a substituted alkylene group containing from 1–3 atoms in the bivalent linkage; *n* is a positive integer of 1 or 2; R¹ is an aromatic group containing from 6–20 carbon atoms or an alkylene group or a substituted alkylene group containing 1–12 carbon atoms; R² is an alkyl group, a cycloalkyl group or a substituted alkyl group containing from 1–40 carbon atoms, an aryl group or a substituted aryl group containing from 6–20 carbon atoms, or the substituent X¹; R³, R⁴ and R⁵ are each a mono atom group which is a hydrogen atom or a halogen atom, a polyatomic group which is an alkyl group, a cycloalkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, or a sulfamyl group, the substituent X¹ or a 5- to 7-membered cyclic group formed with Nu and R⁵ or G¹ and R⁴ or R³, and the substituents for R³ and R⁵ or R⁴ and R⁵ when on adjacent positions on the ring may be taken together to form a 5- or 6-membered ring with the carbon atoms to which they are attached, with the provision that, when R¹ is an alkylene group or a substituted alkylene group, R³ and R⁴ are polyatomic groups, and when G¹ is a substituent defined for Nu, an adjacent R³ or R⁴ can be the group:



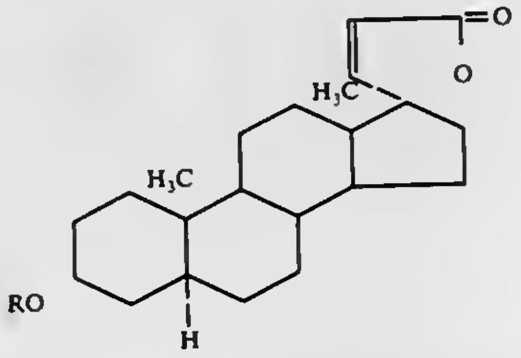
$$-(R^6)_{n-1}-\overset{\overset{\displaystyle R^2}{|}}{N}-E-(Q-R^1-X_2)$$

X¹ is provided in at least one of R², R³, R⁴ or R⁵ and is a ballasting group or an azo dye moiety, provided one of X¹ or (Q—R¹—X₂) is an azo dye moiety, and one of X¹ and (Q—R¹—X₂) is a ballasting group which contains at least 8 carbon atoms and is of a size sufficient to render said compound immobile in an alkali-permeable layer of a photographic element.

4,108,851
3β,17-DIHYDROXY-5α,17α-PREGN-20-ENE-21-CARBOXYLIC ACID γ-LACTONE AND ESTERS THEREOF

Edward A. Brown, Glenview, and Frank B. Colton, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.
Filed Jul. 20, 1977, Ser. No. 817,318
Int. Cl.² C07J *71/00*
U.S. Cl. 260—239.57 **3 Claims**

1. A compound of the formula

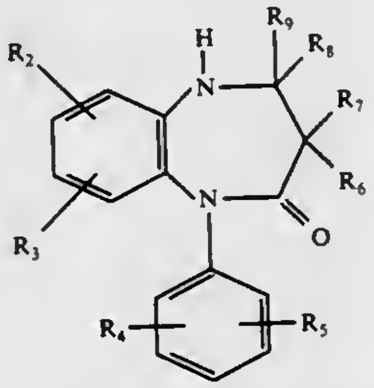


wherein R represents 1-oxoalkyl containing fewer than 9 carbons.

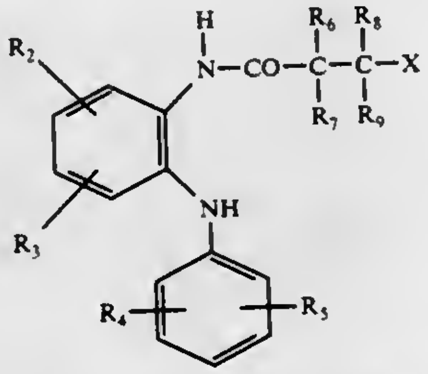
4,108,852
PROCESS FOR PREPARING 1,5-BENZODIAZEPINE-2-ONES

Oskar Bub, Ludwigshafen am Rhein, Fed. Rep. of Germany, assignor to Knoll AG., Ludwigshafen am Rhein, Fed. Rep. of Germany
Continuation of Ser. No. 20,413, Mar. 17, 1970, abandoned. This application Feb. 4, 1977, Ser. No. 765,696
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1969, 1913536; Oct. 24, 1969, 1953647
Int. Cl.² C07D *243/12*
U.S. Cl. 260—239.3 B **4 Claims**

1. The method of making a 1-aryl-2,3,4,5-tetrahydro-1H-1,5-benzodiazepin-2-one of the formula



wherein R₂, R₃, R₄, and R₅ are the same or different and are each hydrogen, lower alkyl, lower alkoxy, or trifluoromethyl; and R₆, R₇, R₈, and R₉ are the same or different and are each hydrogen or lower alkyl, which method comprises reacting a substituted 2-diphenyl amine of the formula



wherein X is halogen, with an alkali metal amide in liquid ammonia or with an alkali carbonate in a polar aprotic solvent at a temperature from 80° to 200° C., thereby directly to cyclize said amine.

4,108,853
N,15-DIDEHYDRO-15-DEOXO-PYRIMIDINO-(4,5-b)RIFAMYCIN S

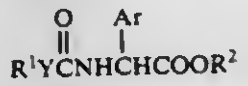
James R. McCarthy, and Jimmie L. Moore, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 31, 1977, Ser. No. 802,214
Int. Cl.² C07D *241/36;* A61K *31/505*
U.S. Cl. 544—245 **1 Claim**

1. The compound N,15-didehydro-15-deoxo-pyrimidino(4,5-*b*)rifamycin S.

4,108,854
PROCESS FOR PREPARING SUBSTITUTED GLYCINES

John G. Gleason, Cornwall Heights, Pa.; Kenneth G. Holden, Haddonfield, N.J., and Nelson C. F. Yim, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.
Division of Ser. No. 589,962, Jun. 24, 1975, Pat. No. 3,994,954, which is a division of Ser. No. 447,468, Feb. 28, 1974, Pat. No. 3,920,730. This application Aug. 16, 1976, Ser. No. 714,723
Int. Cl.² C07D *473/00*
U.S. Cl. 544—277 **5 Claims**

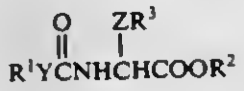
1. A process for preparing a compound of the formula:



$$R^1Y\overset{\overset{\displaystyle O}{\|}}{C}NH\overset{\overset{\displaystyle Ar}{|}}{C}HCOOR^2$$

where:
- R¹ is lower alkyl of one to four carbon atoms, β,β,β-trichloroethyl, benzyl, p-nitrobenzyl or p-methoxybenzyl;
- Y is O or S;
- Ar is an aromatic or heteroaromatic group; and
- R² is hydrogen or an easily-removable carboxyl protective group

comprising reacting a compound of the formula:



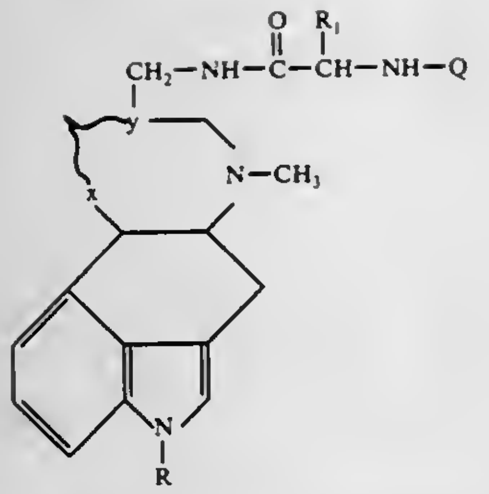
$$R^1Y\overset{\overset{\displaystyle O}{\|}}{C}NH\overset{\overset{\displaystyle ZR^3}{|}}{C}HCOOR^2$$

where:
- R¹, Y and R² are unchanged during the reaction and are as defined above except that R² cannot be hydrogen when ZR³ is phenoxy;
- Z is O or S; and
- R³ is lower alkyl of one to four carbon atoms, phenyl or benzyl, the phenyl or benzyl group being unsubstituted or substituted with one or two lower alkyl, lower alkoxy, hydroxy, halo, nitro, amino or acetamido groups with a compound having an aromatic or heteroaromatic group capable of replacing said ZR³ group.

4,108,855
COMPOUNDS OF ERGOLENE AND ERGOLINE STRUCTURE AND METHOD FOR THE PREPARATION THEREOF

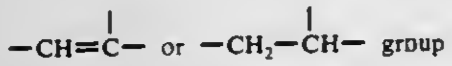
Erzsébet Magó nee Karácsony; Sándor Bajusz; József Borsi; Ildikó Kiraly; Endre Csányi, and Istvan Polgári, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary
Filed Mar. 2, 1977, Ser. No. 773,792
Claims priority, application Hungary, Mar. 9, 1976, GO 1332
Int. Cl.² C07D *457/02*
U.S. Cl. 260—285.5 **10 Claims**

1. A compound of the formula



(I)

wherein R stands for a hydrogen atom or a methyl group, *x y* stands for a



$$-CH{=}\overset{|}{C}- \text{ or } -CH_2-\overset{|}{C}H- \text{ group}$$

and Q designates a hydrogen atom or a benzyloxycarbonyl- or N-tert.-butyloxycarbonyl protective group, and R_1 represents the side-chain of a natural α-amino acid selected from the group consisting of Arg—, Tryp—, Phe—, Ser—, Leu—, Val—, Meth—, Tyr—, His— and Prol— side-chain, and the pharmaceutically acceptable acid addition salts thereof.

4,108,856

CHLORINATION PROCESS FOR PRODUCING 2,3,5-TRICHLOROPYRIDINE

Roy Dennis Bowden, and Thomas Seaton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 25, 1977, Ser. No. 845,389

Claims priority, application United Kingdom, Oct. 26, 1976, 44408/76

Int. Cl.^{2} C07D *213/04*

U.S. Cl. 260—290 HL **6 Claims**

1. A process for the production of 2,3,5-trichloropyridine which comprises interacting 3,5-dichloropyridine with chlorine at a temperature in the range from 300° C to 460° C.

4,108,857

IMIDAZOLYLMETHYL METHANOBENZAZOCINES

Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 605,272, Aug. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 133,400, Apr. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 856,157, Sep. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 642,224, May 29, 1967, abandoned, which is a continuation-in-part of Ser. No. 405,244, Oct. 20, 1964, Pat. No. 3,382,249. This application Feb. 28, 1977, Ser. No. 772,984

Int. Cl.^{2} C07D *221/26*

U.S. Cl. 260—293.54 **4 Claims**

1. 1,2,3,4,5,6-Hexahydro-3-(Y)-6-(R^1)-11-(R^2)-2,6-methano-3-benzazocine wherein Y is (1-lower alkylimidazol-5-yl)methyl, R^1 is lower alkyl and R^2 is hydrogen or lower alkyl.

4,108,858

POLYOLEFIN QUATERNARY PYRIDINIUM SALTS

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 613,369, Sep. 15, 1975, Pat. No. 4,056,531, which is a division of Ser. No. 395,221, Sep. 7, 1973, abandoned, which is a division of Ser. No. 255,223, May 19, 1972, Pat. No. 3,778,371, which is a continuation-in-part of Ser. No. 138,758, Apr. 29, 1971, abandoned. This application Oct. 29, 1976, Ser. No. 736,842

Int. Cl.^{2} C07D *213/04*

U.S. Cl. 260—294.8 E **9 Claims**

1. A high molecular weight quaternary pyridinium salt effective as a detergent in distillate fuels and as a dispersant in lubricating oils, said pyridinium salt being soluble in said fuels and lubricating oils, said pyridinium salt having a substantially saturated poly-C_{2-4} olefin hydrocarbon group having an average molecular weight of from about 800 to 1,400 bonded to the pyridinium nitrogen atom, the anions of said pyridinium salt being selected from the group consisting of halides, phosphate, C_{1-12}alkylphosphate, di-C_{1-12}alkyl phosphate, borate, C_{1-12}alkylborate, nitrite, nitrate, carbonate, bicarbonate, C_{1-12}alkanoate, and di-C_{1-12}alkyl dithiocarbamate, and O,O-di-C_{1-12}alkyl dithiophosphate.

4,108,859

MICROBICIDAL (PYRIDINYLAMINO) ALKYL GUANIDINES

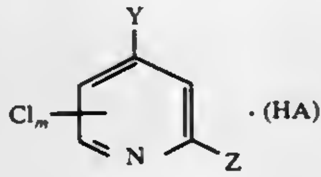
Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1977, Ser. No. 804,038

Int. Cl.^{2} C07D *213/53*

U.S. Cl. 260—296 R **11 Claims**

1. A (pyridinylamino)alkylguanidine of the formula



wherein:

one of Y and Z is —H, —Cl, —CCl_3 or —CN and the other is —NH—R^1—N=C(NHR^2)$_2$,

m is 1, 2 or 3,

n is 1 or 2,

R^1 is an alkylene group of 3 to 8 carbons,

R^2 is —CH_3 or —C_2H_5, independently in each occurrence, and

HA is a pharmaceutically acceptable acid.

4,108,860

TRIAZOLOBENZISOTHIAZOLE-1,1-DIOXIDES

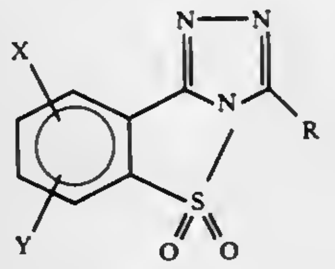
Peter C. Wade, Pennington, N.J.; B. Richard Vogt, Yardley, Pa., and Thomas P. Kissick, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 3, 1978, Ser. No. 875,018

Int. Cl.^{2} C07D *275/04;* **A61K** *31/425*

U.S. Cl. 260—304 A **7 Claims**

1. A compound of the formula



wherein

R is hydrogen, lower alkyl, phenyl or substituted phenyl wherein the phenyl substituent is halogen, lower alkyl, lower alkoxy or nitro; and

X is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; and

Y is hydrogen, halogen or lower alkoxy, with the proviso that when Y is other than hydrogen, X represents the same substituent as Y.

4,108,861

AZETOTHIAZOLE-5-YL-3-HALOMETHYL-2-BUTENOIC ACID DERIVATIVES AND THE PREPARATION OF 5-THIA-1-AZABICYCLO-[4.2.0]-2-OCTENE-2-CARBOXYLIC ACID DERIVATIVES FROM THEM

Yoshito Kishi; Shinichi Nakatsuka, and Hideo Tanino, all of Cambridge, Mass., assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

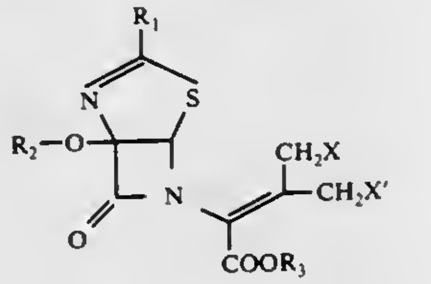
Continuation of Ser. No. 627,577, Oct. 31, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,582

Claims priority, application Japan, Nov. 6, 1974, 49-128477

Int. Cl.^{2} C07D *513/04, 501/02*

U.S. Cl. 260—306.7 C **14 Claims**

1. A compound of the formula



wherein

R_1 is lower alkyl, aryloxy(lower)alkyl or ar(lower)alkyl,

R_2 is lower alkyl,

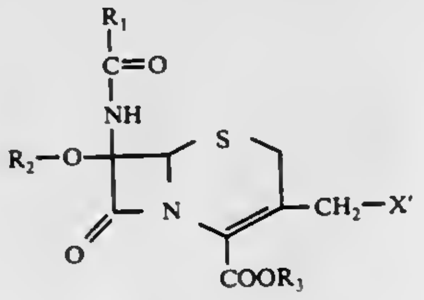
$COOR_3$ is esterified carboxy selected from lower alkoxycarbonyl and ar(lower)alkoxycarbonyl,

X is halogen selected from bromine and chlorine, and

X' is hydrogen or halogen selected from bromine and chlorine,

said aryl and said ar each constituting phenyl, tolyl or xylyl.

8. A process for the preparation of compound of the formula:



comprising dissolving a compound according to claim 1 in a conventional solvent to form a solution, then allowing said solution to stand at ambient temperature.

4,108,862

3-(4-CHROMANYLAMINO)-2-OXAZOLIDINONES

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,124

Int. Cl.^{2} C07D *263/26*

U.S. Cl. 260—307 C **2 Claims**

1. The compound 3-(4-chromanylamino)-2-oxazolidinone tetartohydrate.

2. The compound 3-[(6-amino-4-chromanyl)amino]-2-oxazolidinone hydrochloride.

4,108,863

COPPER PHTHALOCYANINE OF NOVEL CRYSTAL FORM

Atsushi Komai, Takatsuki; Naoyuki Shirane, Toyonaka; Yuji Ito, Amagasaki; Sadao Terui, Osaka, and Michikazu Ninomiya, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Dec. 27, 1976, Ser. No. 754,738

Claims priority, application Japan, Jan. 1, 1976, 51-157

Int. Cl.^{2} C09B *47/04*

U.S. Cl. 260—314.5 **1 Claim**

1. Copper phthalocyanine of a novel crystal form which by measurement using CuKα radiation of $\lambda = 1.5418$ A.U. shows an X-ray diffraction pattern having peaks at Bragg's angles 2θ equal to about 8.6°, 17.2°, 18.3°, 23.2°, 25.3°, 26.5°, and 28.8°.

4,108,864

TRICYCLOUNDECENE-1,2,3,4,9,9-HEXAHALO-5,6-DIACYL COMPOUNDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Filed Nov. 23, 1976, Ser. No. 744,335

Int. Cl.^{2} C07C *61/12;* **C07D** *209/94, 307/93*

U.S. Cl. 260—326 C **13 Claims**

1. A tricycloundecene-1,2,3,4,9,9-hexahalo-5,6-diacyl compound selected from the group consisting of 1,2,3,4,9,9-hexahalo-1,4,4a,5,6,8a-hexahydro-1,4-methanonaphthalene-5,6,-dicarboxylic acid compounds, 1,2,3,4,9,9-hexahalo-1,4,4a,5,8,8a-hexahydro-1,4,-methanonaphthalene-5,6-dicarboxylic acid compounds and 1,2,3,4,9,9-hexahalo-1,4,4a,7,8,8a-hexahydro-1,4-methanonaphthalene-5,6-dicarboxylic acid compounds wherein the said acid compounds are selected from the group consisting of free acids and acid salts, esters, acyl halides, amides, imides, and anhydrides thereof.

4,108,865

THIOPHENE COMPOUNDS AND THE PRODUCTION THEREOF

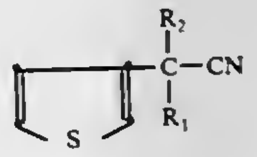
Charles Pigerol, Saint-Ouen; Paul de Cointet de Fillain, Sisteron; Claude Grain, Volonne, and Jacques Le Blay, Luisant, all of France, assignors to Labaz, Paris, France

Continuation of Ser. No. 501,854, Aug. 29, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,927

Int. Cl.^{2} C07D *333/00;* **A01N** *9/00*

U.S. Cl. 260—329 R **1 Claim**

1. A novel thiophene derivative corresponding to the general formula:



wherein R_1 represents a cyclohexyl radical and R_2 represents a hydrogen atom.

4,108,866

SULPHOXIDES

Bernard Tramier, Pau; Raymond Delourme, Billere, and Philippe Fresnel, Castres, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

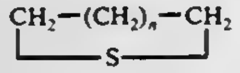
Continuation of Ser. No. 644,718, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 545,487, Jan. 30, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,638

Int. Cl.^{2} C07D *333/02*

U.S. Cl. 260—329 R **3 Claims**

1. An improvement in the method of producing organic

sulphoxides selected from the group consisting of dialkyl sulphoxides bearing a total of 2 to 36 carbon atoms, their corresponding hydroxy-substituted alkyl sulphoxides and polymethylene sulphoxides having 2 to 6 carbon atoms, by oxidizing a sulfide selected from the group consisting of dialkyl sulfides of formula $R^1—S—R^2$ having a total of 2 to 36 carbon atoms and wherein R^1 and R^2 are chosen from a group consisting of alkyl and hydroxyalkyl groups, and polymethylene sulfides of formula



wherein *n* is an integer of 0 to 4, with hydrogen peroxide in a reaction medium of an aqueous acidic medium and a solvent selected from the group consisting of benzene, toluene, hexane, heptane, dichloroethane, chloroprene, propyl acetate and isobutyl acetate, said solvent forming an azeotropic mixture with between 5 and 20% by weight of water, said solvent having the capacity for dissolving the dialkyl sulfides, while leaving the sulphoxide substantially undissolved at a temperature substantially below the boiling point of said mixture, and

separating the sulphoxide formed from the reaction medium by distilling the azeotropic mixture from the solvent after the oxidation has been effectuated and allowing said medium to cool to the point where a precipitation of sulphoxide is formed.

4,108,867
2-AMINOTHIOPHENES

David Boyd Baird; Alan Thomas Costello; Brian Ribbons Fishwick; Robert David McClelland, and Peter Smith, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

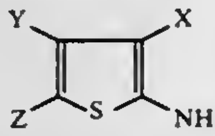
Continuation-in-part of Ser. No. 324,190, Jan. 16, 1973, abandoned. This application May 1, 1974, Ser. No. 466,059

Claims priority, application United Kingdom, Jan. 28, 1972, 4046/72; Jan. 8, 1973, 965/73

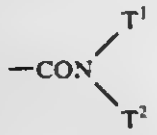
Int. Cl.² C07D *333/24;* **A01N** *9/00;* **C09B** *27/00*

U.S. Cl. 260—332.2 C **6 Claims**

1. A compound of the formula:-



wherein X is selected from the group consisting of lower alkyl sulphonyl, phenylsulphonyl, cyano, carboxylic acid, lower alkoxycarbonyl, lower alkoxy lower alkoxycarbonyl and carbonamido of the formula

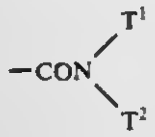


$$-CON\begin{matrix} \diagup T^1 \\ \diagdown T^2 \end{matrix}$$

wherein T^1 is selected from hydrogen, lower alkyl and phenyl, and T^2 is selected from hydrogen and lower alkyl;

Y is selected from hydrogen, lower alkyl, phenyl and nitrophenyl;

and Z is selected from the group consisting of nitro, cyano and carbonamido of the formula



$$-CON\begin{matrix} \diagup T^1 \\ \diagdown T^2 \end{matrix}$$

wherein T^1 is selected from hydrogen, lower alkyl and phenyl, and T^2 from hydrogen and lower alkyl.

4,108,868
3-(HYDROXYHYDROCARBYLSECONDARYAMINO)-THIOPHENE 1,1-DIOXIDES AND POLYURETHANES CHAIN EXTENDED THEREWITH

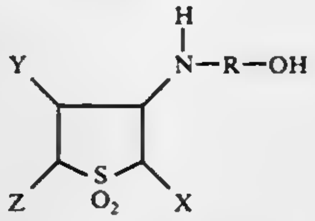
Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 434,470, Jan. 18, 1974, Pat. No. 3,887,503. This application Feb. 24, 1975, Ser. No. 552,497

Int. Cl.² C07D *333/48;* **C08K** *5/05*

U.S. Cl. 260—332.1 **4 Claims**

1. As a new chemical compound, a chain extending agent for a polyurethane which is a long chain polyol-polyisocyanate reaction product, said agent being bifunctional with respect to ability to react with isocyanate and being a 3-hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxide having the following structural formula



wherein X, Y and Z are hydrogen and R is an open chain alkylene group having 2 to 10 carbon atoms substituted with a phenyl group.

4,108,869
PREPARATION OF AN ACETAL FROM A DIOL AND ACROLEIN

Harry Bughird Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 25, 1977, Ser. No. 827,597

Int. Cl.² C07D *319/04*

U.S. Cl. 260—340.7 **20 Claims**

1. In a continuous process for reacting acrolein with a polyol in the presence of an acid catalyst to form a cyclic acetal and water, the improvement comprising reacting an aliphatic 1,3-diol of 3 to 10 carbon atoms at a temperature of from 0° to 100° C with acrolein at a mole ratio of diol:acrolein of from 1.5:1 to 10:1 in the presence of a soluble acid catalyst and simultaneously therewith, separating by solvent extraction the cyclic acetal and water formed by contacting countercurrently a solvent with said reactants at a weight ratio of 0.2:1 to 10:1 of solvent:acrolein to extract the cyclic acetal as it is formed with the solvent while extracting water as it is formed with the 1,3-diol, said solvent being a nonpolar hydrocarbon or chlorohydrocarbon solvent which is immiscible with the 1,3-diol and which boils at −10° to 300° C.

4,108,870
STEREOCONTROLLED SYNTHESIS OF α-MULTISTRIATIN

Josef Fried, and William J. Elliott, both of Chicago, Ill., assignors to University of Chicago, Chicago, Ill.

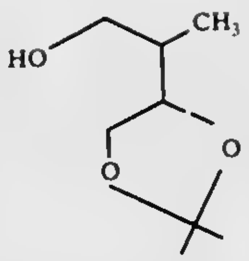
Filed Jun. 6, 1977, Ser. No. 803,734

Int. Cl.² C07D *317/08*

U.S. Cl. 260—340.9 R **7 Claims**

1. A stereocontrolled synthesis of an isomeric mixture containing a major portion of α-multistriatin and a minor portion of γ-multistriatin comprising the steps of:

(a) forming (2'RS, 4SR')-2'-(2,2-dimethyl-1,3-dioxacyclopent-4-yl)-1'-propyl tosylate by a reaction of the acetonide alcohol having the structure



with tosyl chloride;

(b) forming (2'RS, 4SR)-2'-(2,2-dimethyl-1,3-dioxacyclopent-4-yl)-1'-iodopropane by reaction of the tosylate obtained in step (a) with NaI;

(c) forming (2'RS, 4SR)-2'-(2,2-dimethyl-1,3-dioxacyclopent-4-yl)-4'-ξ-methylhept-5'-one by preparing the enolate of 3-pentanone with lithium diisopropylamide and alkylating the enolate with the iodopropane obtained in step (b); and

(d) forming a mixture comprising a major amount of α-multistriatin and a minor amount of γ-multistriatin by removing the acetonide group and cyclizing the ketone obtained in step (c).

4,108,871
NOVEL BENZOPYRAN DERIVATIVES

Ulrich Eder; Gerhard Sauer; Gregor Haffer; Jurgen Ruppert, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

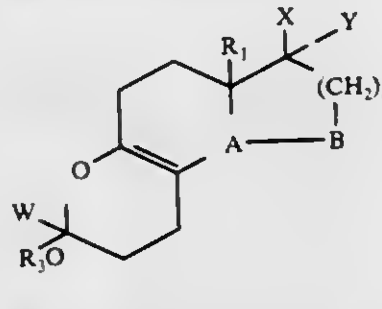
Division of Ser. No. 367,509, Jun. 6, 1973, Pat. No. 3,962,280. This application Mar. 5, 1976, Ser. No. 664,315

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1972, 2228473; Jun. 8, 1972, 2228475

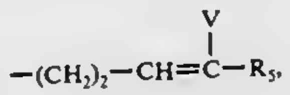
Int. Cl.² C07D *311/04*

U.S. Cl. 260—345.2 **12 Claims**

1. A benzopyran of the formula



wherein —A—B— is $>CH—CH_2—$ or $>C{=}CH—$; *n* is the integer 1 or 2; R_1 and R_3 each are lower alkyl; X is hydroxy, acyloxy wherein acyl is the acyl radical of an unsubstituted or phenyl substituted alkanoic acid of 1–10 carbon atoms, unsubstituted or phenyl substituted alkoxy of 1–10 carbon atoms; Y is hydrogen or together with X represents =O; and W is



$$-(CH_2)_2-CH=\overset{\overset{\large V}{|}}{C}-R_5,$$

wherein V is halogen; R_5 is lower alkyl.

4,108,872
7-DIMETHYLAMINO-4-CHROMANONE

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,125

Int. Cl.² C07D *311/22*

U.S. Cl. 260—345.2 **1 Claim**

1. The compound 7-dimethylamino-4-chromanone.

4,108,873
O-(CARBOXYMETHYL)-4-CHROMANONE OXIME

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,103

Int. Cl.² C07D *311/04*

U.S. Cl. 260—345.2 **1 Claim**

1. The compound O-(carboxymethyl)-4-chromanone oxime.

4,108,874
PRODUCTION OF MALEIC ANHYDRIDE

Koji Moriya, and Itsuo Furuoya, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 21, 1975, Ser. No. 560,802

Claims priority, application Japan, Apr. 9, 1974, 49-40566; May 22, 1974, 49-58117

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **2 Claims**

1. In a method for producing maleic anhydride by oxidation of a hydrocarbon having not less than four carbon atoms in gaseous phase in the presence of a catalyst, the improvement wherein the catalyst comprises (a) vanadium oxide, (b) phosphorus oxide and (c), thallium oxide the amount of vanadium oxide relative to phosphorus oxide being from about 1:1 to about 1:5 based on the atomic ratio of vanadium to phosphorus, the amount of vanadium oxide relative to thallium oxide, being from about 1:2 to about 20:1 based on the atomic ratio of vanadium to thallium.

4,108,875
PROCESS FOR THE PRODUCTION OF ACYL CYANIDES
(B)

Herbert Klenk; Heribert Offermanns, both of Hanau, and Werner Schwarze, Frankfurt, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

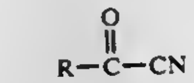
Filed Jun. 2, 1977, Ser. No. 802,942

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708182

Int. Cl.² C07D *307/36;* **C07C** *57/00, 63/06*

U.S. Cl. 260—347.8 **30 Claims**

1. In a process for the production of on acyl cyanide of the formula



(I)

$$R-\overset{\overset{O}{\|}}{C}-CN$$

where R is alkyl having 2 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted by phenyl or halogen, cycloalkyl having 3 to 8 carbon atoms in alkyl group, cycloalkyl having 3 to 8 carbon atoms substituted by 1 to 3 carbon atom alkyl or halogen with the proviso that any phenyl or halogen substituent on the alkyl or any halogen substitutent on the cycloalkyl is not on the carbon atom adjacent to the carbonyl group or R is naphthyl, five membered heterocyclic group, substituted naphthyl of substituted phenyl wherein the substituent on the naphthyl or phenyl is halogen, nitro, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms by reacting an acyl halide of the formula.

$$R — CO — Hal$$

(II)

where Hal is chlorine or bromine with a mixture consisting of 0.1 to 5 equivalent of an alkali metal cyanide and 0.05 to 2 equivalents of a copper (I) salt the improvement comprising carrying out the reaction at a temperature of about 50° to 180° C in the presence of a carbocylic acid nitrile which is inert under the reaction conditions.

4,108,876

5-METHYL-ALPHA[(METHYLTHIO)METHYL]-2-FURAN ACROLEIN

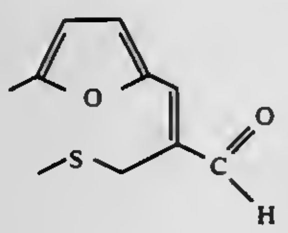
Donald Arthur Withycombe, Lincroft; Anne Hruza, Bricktown; Manfred Hugo Vock, Locust; Christopher Giacino, Califon; Braja Dulal Mookherjee, Holmdel; Alan Owen Pittet, Atlantic Highlands, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 753,462, Dec. 22, 1976, Pat. No. 4,064,279. This application Aug. 24, 1977, Ser. No. 827,211

Int. Cl.^{2} C07D *307/46*

U.S. Cl. 260—347.2 **1 Claim**

1. 5-Methyl-alpha[(methylthio)methyl]-2-furan acrolein having the structure:



4,108,877

PROCESS FOR THE PRODUCTION OF ACYL CYANIDES (A)

Herbert Klenk; Heribert Offermanns, both of Hanau, and Werner Schwarze, Frankfurt, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

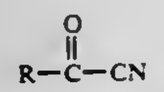
Filed Jun. 2, 1977, Ser. No. 802,944

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708183

Int. Cl.^{2} C07D *307/36;* **C07C** *57/00, 63/06*

U.S. Cl. 260—347.8 **22 Claims**

1. A process for the production of an acyl cyanide of the formula



$$R-\overset{\overset{\large O}{\|}}{C}-CN \qquad (I)$$

where R is alkyl having 1 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted by phenyl or halogen, cycloalkyl having 3 to 8 carbon atoms in alkyl group, cycloalkyl having 3 to 8 carbon atoms substituted by 1 to 3 carbon atoms alkyl or halogen with the proviso that any phenyl or halogen substituent on the alkyl or any halogen substituent on the cycloalkyl is not on the carbon atom adjacent to the carbonyl group or R is naphthyl, five membered heterocyclic group, substituted naphthyl or substituted phenyl wherein the substituent on the naphthyl or phenyl is halogen, nitro, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms comprising reacting at a temperature of about 50° to 180° C an acyl halide on the formula

$$R - CO - Hal \qquad (II)$$

where Hal is chlorine or bromine with CuCN in the presence of a mixture consisting of 1 to 10 equivalents of a carboxylic acid nitrile which is inert under the reaction conditions and about 0.5 to 20 parts by weight of an organic solvent which is inert under the reaction conditions, said solvent being a hydrocarbon, halohydrocarbon, ether or ester.

4,108,878

PGD$_2$ ANALOGS

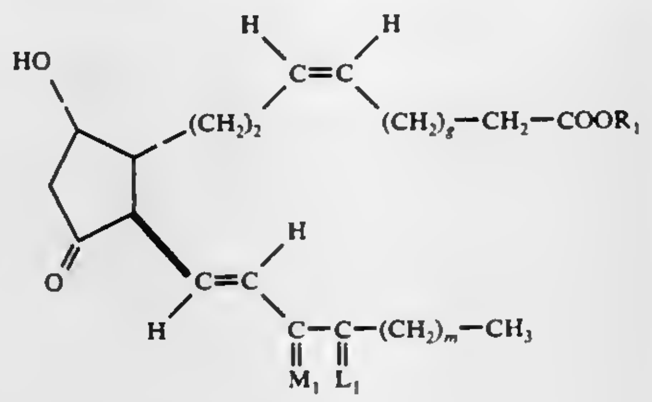
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Jan. 3, 1977, Ser. No. 756,096

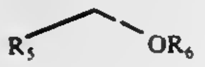
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—408 **16 Claims**

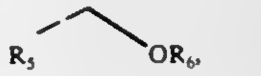
1. A prostaglandin analog of the formula



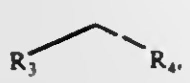
wherein g is one, 2, or 3;
wherein m is one to 5, inclusive;
wherein M_1 is

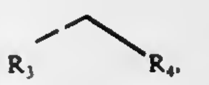


or

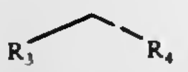


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is

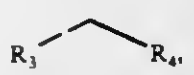




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,108,879

HARD BUTTER

Seigi Minowa; Yasuo Toyoshima; Nozomi Yasuda, and Toshiro Tanaka, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 789,770

Claims priority, application United Kingdom, Jan. 20, 1977, 2225/77

Int. Cl.^{2} C09F *7/08;* **C11C** *3/14*

U.S. Cl. 260—405.6 **9 Claims**

1. A hard butter consisting essentially of (a) 10 to 90% by weight of a first hardened oil obtained by hydrogenating and isomerizing palm olein which has an iodine value of at least 55 and is substantially free of tri-saturated glycerides, a first oil fraction obtained by fractionating said first hardened oil and removing low melting and/or high melting substances therefrom, or mixtures of said first hardened oil and said first oil fraction, and (b) 90 to 10% by weight of a second hardened oil obtained by hydrogenating and isomerizing a vegetable oil or fat other than palm oil, said vegetable oil or fat being substantially free of tri-saturated glycerides and having a linoleic acid content of 30 to 55% by weight, based on the total constituent fatty acids, a second oil fraction obtained by fractionating said second hardened oil and removing low melting and/or high melting substances therefrom, or mixtures of said second hardened oil and said second oil fraction, wherein the iodine value of said hard butter is 50 to 75, the trans-isomer content of said hard butter is at least 25% by weight, the palmitic acid content of said hard butter is 15 to 40% by weight based on the total consitutent fatty acids, the stearic acid content of said hard butter is 2 to 10% by weight based on the total constituent fatty acids and the oleic acid content of said hard butter is 55 to 75% by weight based on the total constituent fatty acids.

4,108,880

ESTERS OF RETINOIC ACID

Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1975, Ser. No. 628,177

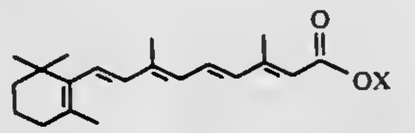
Int. Cl.^{2} C09F *5/08;* **C11C** *3/00*

U.S. Cl. 260—410.5 **7 Claims**

1. An ester of all-trans-retinoic acid selected from the group consisting of:

(A) esters of all-trans-retinoic acid having the following formula:

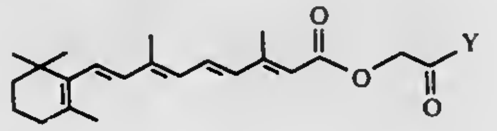
(I)



wherein X is mixed m and p-vinylbenzyl; and

(B) esters of all-trans-retinoic acid having the following formula:

(II)



wherein Y is a member selected from the group consisting of: 4-methoxyphenyl; 4-hydroxyphenyl; 4-methylphenyl; 4-ethoxyphenyl; 4-acetoxyphenyl; 2-naphthyl; 4-biphenyl; 2,5-dimethoxyphenyl; 2,4-dimethylphenyl; 3,4-diacetoxyphenyl; 3,4,5-trimethoxyphenyl; and 2,4,6-trimethylphenyl.

3. 4-(all-trans-retinoyloxyacetyl)-methoxybenzene according to claim 1.

4,108,881

SYNTHESIS OF ZEOLITE ZSM-11

Louis Deane Rollmann, Princeton, N.J., and Ernest William Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,992

Int. Cl.^{2} C07F *5/06;* **C01B** *33/28*

U.S. Cl. 260—448 C **17 Claims**

1. A synthetic crystalline aluminosilicate zeolite having a formula in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.5\text{–}10.0)R : (0\text{–}0.5)M_2O : Al_2O_3 : xSiO_2$$

wherein M is an alkali metal ion, R is an alkylenediamine having from 7 to 12 carbon atoms or an organic cation derived therefrom, and x is from 10 to 1000, and having the X-ray powder diffraction pattern substantially as set forth in Table I of the specification.

16. The method for preparing the crystalline aluminosilicate zeolite defined in claim 1 which comprises preparing a mixture containing sources of an alkali metal, an oxide of aluminum, an oxide of silicon, water and an alkylenediamine having from 7 to 12 carbon atoms and having a composition, in terms of mole ratios of oxides, within the following ranges:

$SiO_2/Al_2O_3 = 10\text{–}1000$
$H_2O/SiO_2 = 5 \propto 200$
$OH^-/SiO_2 = 10^{-10}\text{–}1.0$
$M/SiO_2 = 0.1\text{–}2.0$
$R/SiO_2 = 0.01\text{–}2.0$

wherein R is an alkylenediamine having 7 to 12 carbon atoms, and M is an alkali metal ion, and maintaining the mixture at a temperature of at least 50° C until the crystals of said zeolite are formed.

4,108,882

METHOD OF PREPARING METHYLSILOXANES AND METHYLCHLORIDE

Louis G. Mahone, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

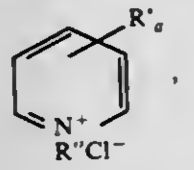
Filed Oct. 27, 1977, Ser. No. 846,066

Int. Cl.^{2} C07F *7/08*

U.S. Cl. 260—448.2 E **22 Claims**

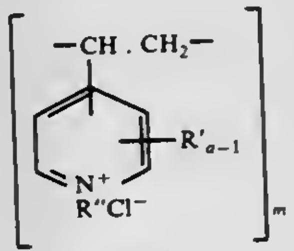
1. In a method for reacting a silane of the formula (1) R_nSiCl_{4-n} with (2) MeOH to produce siloxanes of the formula $R_nSiO_{4-n/2}$ and MeCl in which R is an alkyl radical of 1–4 carbon atoms and n is 2 or 3, the improvement comprising heating a mixture of (1) and (2) in amounts of not more than a 30% mole excess of either reactant in contact with a quaternary ammonium halide salt catalyst selected from the group consisting of

(1) pyridinium chlorides of the formula



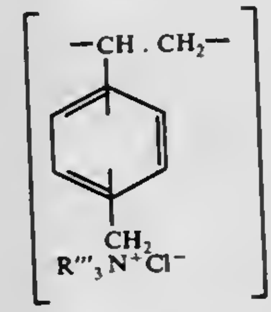
(2) compounds of the formula $R'''_4N^+Cl^-$,

(3)



and

(4)



where R' is any hydrocarbon radical having 18 or less carbon atoms; a is an integer from 0–5; m is an integer greater than 1; R'' is a lower alkyl radical; and R''' is selected from the group consisting of methyl, hydroxyalkyl radicals of 2–4 inclusive carbon atoms, aromatic hydrocarbon radicals, and $ArCH_2$— radicals in which Ar is an aromatic hydrocarbon radical, there being no more than 18 carbon atoms total in the R''' groups.

4,108,883

PROPIONIMIDATE HYDROHALIDES

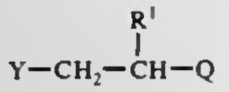
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 706,086, Jul. 16, 1976, Pat. No. 4,044,009, which is a division of Ser. No. 467,332, May 6, 1974, Pat. No. 4,007,200. This application Dec. 20, 1976, Ser. No. 752,497

Int. Cl.^{2} C07C *119/18*

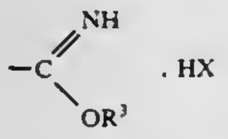
U.S. Cl. 260—453 RW **6 Claims**

1. A compound having the formula



$$Y-CH_2-\overset{\overset{R^1}{|}}{C}H-Q$$

wherein *Y* is R^2O, R^2 being alkyl (C_1–C_{10}), aryl (C_6–C_{10}) or aralkyl (C_7–C_{11}), R^1 is hydrogen, methyl or phenyl and Q is



wherein R^3 is alkyl (C_1–C_4), hydroxyalkyl (C_2–C_4) or alkoxyalkyl (C_2–C_4) and X is a halogen.

4,108,884

HYBRID PERFLUOROALKYLENE ETHER THIOIMIDATE ESTER MONOMERS

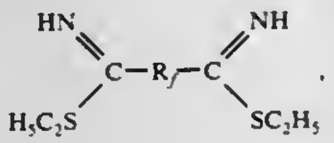
Robert C. Evers, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 21, 1977, Ser. No. 817,657

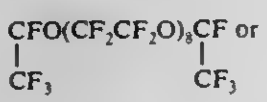
Int. Cl.^{2} C07C *119/18*

U.S. Cl. 260—453 RW **5 Claims**

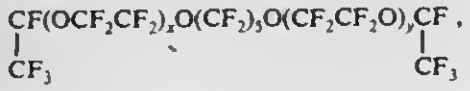
1. A thioimidate ester having the following formula:



wherein R_f is



$$\underset{\underset{CF_3}{|}}{C}FO(CF_2CF_2O)_x\underset{\underset{CF_3}{|}}{C}F \text{ or}$$



$$\underset{\underset{CF_3}{|}}{C}F(OCF_2CF_2)_xO(CF_2)_5O(CF_2CF_2O)_y\underset{\underset{CF_3}{|}}{C}F,$$

where $(x+y)$ equals 5 or 6.

4,108,885

SALTS OF THIOCARBAMIC ESTERS WITH FUNGICIDAL AND FUNGISTATIC ACTION

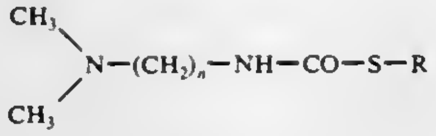
Georg-Alexander Hoyer, and Ernst Albrecht Pieroh, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 109,073, Nov. 10, 1970, abandoned, which is a division of Ser. No. 746,711, Jul. 18, 1968, Pat. No. 3,649,674. This application Sep. 20, 1976, Ser. No. 724,820

Int. Cl.^{2} C07C *153/09;* A01N *9/12*

U.S. Cl. 260—455 A **3 Claims**

1. A salt of the compound having the general formula



wherein *n* is an integer from 2 to 4 and R is an alkyl radical having from 2 to 4 carbon atoms, with an organic or inorganic acid.

4,108,886

THIOPROPANOYLAMINO ACID DERIVATIVES

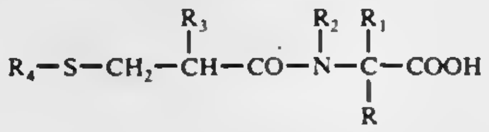
Miguel Angel Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 11, 1977, Ser. No. 776,792

Int. Cl.^{2} C07C *153/09;* C07D *207/04;* C07C *61/06, 101/04*

U.S. Cl. 260—455 R **7 Claims**

1. A compound of the formula



$$R_4-S-CH_2-\overset{\overset{R_3}{|}}{C}H-CO-\overset{\overset{R_2}{|}}{N}-\underset{\underset{R}{|}}{\overset{\overset{R_1}{|}}{C}}-COOH$$

wherein R and R_1 each is lower alkyl,

R_2 and R_3 each is hydrogen or lower alkyl;

or R_1 joins with R to complete a cyclopentane ring; and

R_4 is hydrogen, lower alkanoyl or benzoyl.

4,108,887

DIVINYL STILBENES AS OPTICAL BRIGHTENERS

Fritz Fleck, Bottmingen, and Juerg Heller, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

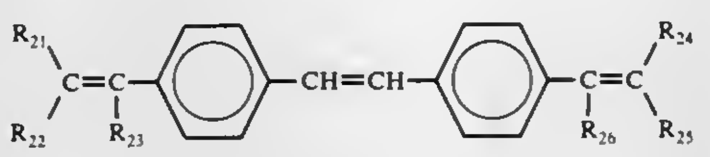
Filed Jan. 29, 1976, Ser. No. 653,506

Claims priority, application Sweden, Feb. 5, 1975, 1474/75

Int. Cl.^{2} C07C *63/60, 69/76, 121/70, 147/06*

U.S. Cl. 260—465 H **23 Claims**

1. A compound of formula I''



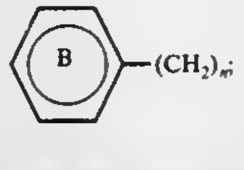
I''

in which

R_{21} and R_{24}, independently, are —CN, —COOR''' or Rx—SO_2—,

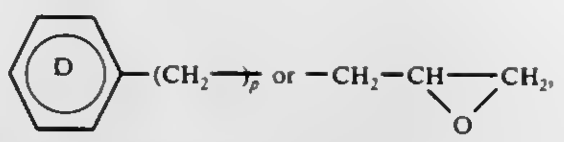
R_{22}, R_{23}, R_{25} and R_{26}, independently, are hydrogen or unsubstituted C_{1-4}alkyl,

Rx is methyl; C_{2-6}alkyl, unsubstituted or mono-substituted by C_{1-4}alkoxy or C_{1-4}-alkoxy-C_{2-6}alkoxy; phenyl, unsubstituted or substituted by up to three substituents selected from up to three selected from C_{1-3}alkyl and halogen, up to two from C_{1-3}alkoxy and up to one —SO_3M group; a radical



naphthyl or mono-sulphonaphthyl,

R''' is M; methyl; C_{2-6}alkyl, unsubstituted or mono-substituted by hydroxy, C_{1-4}-alkoxy-C_{1-4}alkoxy-C_{2-6}-alkoxy, C_{2-6}-hydroxyalkoxy; cyclohexyl, unsubstituted or substituted by up to 3 C_{1-2}alkyls; phenyl, unsubstituted or substituted by up to three substituents selected from up to three selected from C_{1-3}alkyl and halogen, up to two from C_{1-3}alkoxy and up to one —SO_3M group; a radical



n and *p*, independently, are 1 or 2,

M is hydrogen or a non-chromophoric cation, and

rings B and D, independently, are unsubstituted or substituted by up to three substituents selected from up to two from C_{1-3}alkyl and up to two from halogen.

4,108,888

PROCESS FOR PREPARING CYANO-ENOL ETHERS

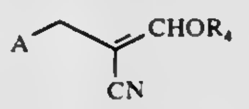
Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 590,755, Jun. 26, 1975, Pat. No. 4,033,962. This application Feb. 18, 1977, Ser. No. 770,321

Int. Cl.^{2} C07C *121/75*

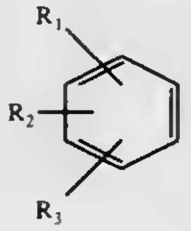
U.S. Cl. 260—465 F **1 Claim**

1. A process for preparing an enol ether of the formula



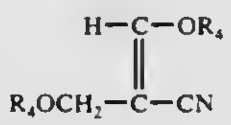
VIIb

wherein A is aryl which comprises reacting an aromatic benzene derivative of the formula



IV

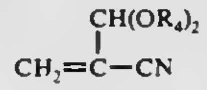
wherein R_1, R_2 and R_3, independently, are hydrogen, lower alkyl, lower alkoxy or non-conjugated lower alkenyl, with an acrylonitrile selected from the group consisting of a compound of the formula



$$\begin{array}{c} H-C-OR_4 \\ \| \\ R_4OCH_2-C-CN \end{array}$$

V

and a compound of the formula



$$CH_2=\overset{\overset{CH(OR_4)_2}{|}}{C}-CN$$

VI

wherein R_4 is, independently, lower alkyl, in the presence of an acid catalyst.

4,108,889

PREPARING ALKANE PHOSPHONIC ACIDS AND INTERMEDIATES

Daniel Stedman Connor, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 19, 1976, Ser. No. 743,186

Int. Cl.^{2} C07F *9/38*

U.S. Cl. 260—502.4 R **7 Claims**

1. Process for preparing long chain alkane phosphonic acids, said process comprising the steps of

(a) reacting alpha olefin with cation exchange resin to convert at least about 98% of the alpha olefin to obtain high yields of internally unsaturated olefin while minimizing dimer formation, said alpha olefin being a straight chain or branched aliphatic olefin containing from 12 to 22 carbon atoms, said cation exchange resin being a macroreticular resin of the strong acid type in the hydrogen form and having a moisture content ranging by weight from about 3% to about 15%, said reaction being carried out at a temperature ranging from about 80° to about 130° C;

(b) reacting resulting internally unsaturated olefin with dimethyl phosphite to produce non-terminally substituted alkanephosphonic acid dimethyl ester; and

(c) reacting said dimethyl ester with anhydrous hydrogen chloride or anhydrous hydrogen bromide to displace the methyl groups as methyl halides.

4,108,890

NITRO OR AMINO PHENYLENEBIS(CARBONYLIMINO)DINAPHTHALENETRISULFONIC COMPOUNDS AS COMPLEMENT INHIBITORS

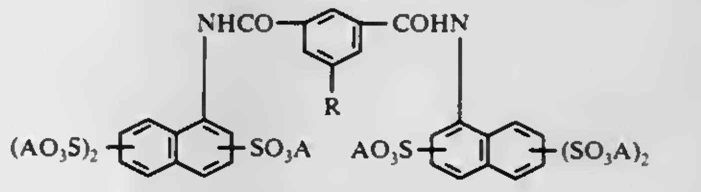
Seymour Bernstein, New City, N.Y.; Robert Herman Lenhard, Paramus, N.J., and Ransom Brown Conrow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 684,690, May 10, 1976, Pat. No. 4,051,176. This application Jul. 5, 1977, Ser. No. 813,131

Int. Cl.^{2} C07C *143/52*

U.S. Cl. 260—507 R **7 Claims**

1. A compound selected from those of the formula:



wherein R is NO_2 or NH_2; and A is hydrogen, alkali metal or alkaline earth, with the proviso that each A is identical in the same compound.

4,108,891

PROCESS FOR OXIDATION OF MONOSACCHARIDES

Kenichi Hattori, Musashino; Bunji Miya; Morio Matsuda, both of Wakayama; Mutsuo Ishii, Oomiya; Hisashi Saito, Higashimurayama; Hiroshi Watanabe, Kawagoe, and Hidemitu Takizawa, Saitama, all of Japan, assignors to Kao Soap Co., Ltd. and Kawaken Fine Chemicals Co., Ltd., both of Tokyo, Japan

Filed Feb. 3, 1977, Ser. No. 765,203

Claims priority, application Japan, Sep. 21, 1976, 51-113376

Int. Cl.^{2} C07C *51/26, 59/17*

U.S. Cl. 260—528 **11 Claims**

1. In a process for oxidizing monosaccharides to carboxylic acid derivatives in which a monosaccharide is reacted with oxygen or an oxygen-containing gas, in the presence of a palladium-carbon catalyst, the improvement wherein: said catalyst has a palladium particle size in the range of from 40 to 70 Angstroms and is prepared by suspending activated carbon in an aqueous solution of an alkali metal hydroxide or carbonate, then adding an aqueous solution of a palladium salt to said suspension at a temperature of from 30° C to lower than 60° C to adsorb said palladium salt on said activated carbon, then adding an aqueous solution of formaldehyde to said suspension to reduce said palladium salt to palladium metal and then recovering the palladium-carbon catalyst from the suspension, the amount of said alkali metal hydroxide or carbonate in said suspension being sufficient to maintain the pH of said suspension at a value of at least 9 after adsorption of the palladium salt on the activated carbon has been completed.

4,108,892

BICYCLOALKYL DERIVATIVES OF PROSTAGLANDINS: 11-DEOXY-PGE$_1$ ACIDS AND ESTERS

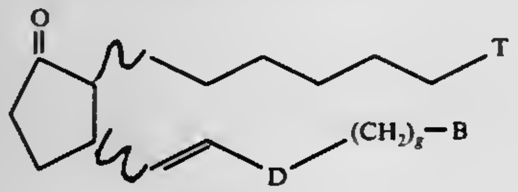
Warren Dexter Woessner; Charles John Sih; Harold Clinton Kluender; Henry Clifford Arndt, and William Gerard Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 657,221, Feb. 11, 1976, Pat. No. 4,074,063. This application Jul. 22, 1977, Ser. No. 818,056

Int. Cl.^{2} C07C *177/00*

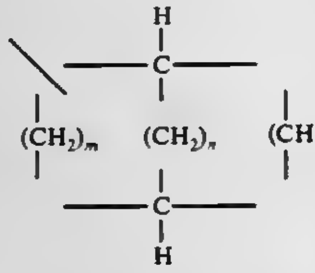
U.S. Cl. 260—514 D **7 Claims**

1. A compound having the formula



wherein

- g is an integer having a value of from 0 to 10;
- D is a R-hydroxymethylene or S-hydroxymethylene radical;
- T is an alkoxycarbonyl having from 1 to 3 carbon atoms inclusive in the alkyl chain, carboxyl or pharmacologically acceptable nontoxic carboxy salts; and
- B is a bicycloalkyl radical of the formula



where m and p are integers having a value of from 1 to 4; n is an integer having a value of from 0 to 4 such that n is not 1 when m and p are both 2; and the sum of m, n and p is greater than or equal to 3 and where the point of attachment of the alkyl chain $(CH_2)_g$ to the bicycloalkyl radical is in the $(CH_2)_m$ bridge or bridgehead position.

4,108,893

PURIFICATION OF AN AQUEOUS SOLUTION OF ACRYLAMIDE

Shiro Asano; Kobei Shizuka, both of Mobara; Junji Mikami, Takaishi; Kenichi Hirakawa, Takaishi, and Mutsuo Matsumura, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated

Filed Jan. 27, 1977, Ser. No. 762,842

Claims priority, application Japan, Feb. 17, 1976, 51-15480

Int. Cl.^{2} B01D *15/04*

U.S. Cl. 260—561 N **5 Claims**

1. In the purification of acrylamide aqueous solutions obtained in a process which comprises reacting in the liquid phase acrylonitrile with water in the presence of a copper-containing catalyst which contains 1–1000ppm of metallic copper, distilling off from the thus obtained crude solution unreacted acrylonitrile and a part of the water substantially in the absence of oxygen, and thereafter purifying the resultant aqueous solution by means of ion exchange resin treatment, the improvement which comprises contacting said crude aqueous solution of acrylamide with a gas selected from the group consisting of oxygen and oxygen-containing gases, the amount of the oxygen dissolved in the solution being at least 4ppm, and thereafter subjecting the aqueous solution to a dual treatment first with a strongly acidic cation exchange resin and then with a weakly basic anion exchange resin.

4,108,894

AMIDINES

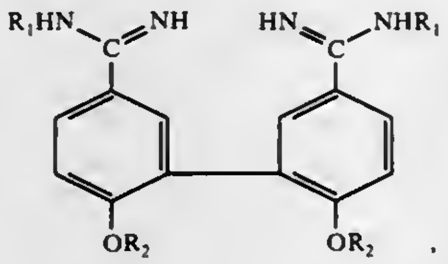
Peter W. Sprague, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 748,861, Dec. 10, 1976. This application Nov. 21, 1977, Ser. No. 853,691

Int. Cl.^{2} C07C *123/00*

U.S. Cl. 260—564 R **10 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is phenyl or phenyl substituted with one or two methoxy, halogen or trifluoromethyl groups; and R_2 is hydrogen or alkyl of 1 to 12 carbon atoms.

4,108,895

PROCESS FOR PREPARING CYCLOALKANONE OXIMES

Tsuneyuki Kondo, Iwakura, and Akio Kuroda, Nagoya, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,056

Claims priority, application Japan, Oct. 26, 1974, 49-123526; Oct. 26, 1974, 49-123530

Int. Cl.^{2} C07C *131/02*

U.S. Cl. 260—566 A **18 Claims**

1. A continuous process for preparing a cycloalkanone oxime which comprises:

(1) contacting a nitrogen compound selected from the group consisting of nitrogen oxides and nitrosyl compounds with an aqueous or an alcoholic solution containing stannous ion, copper ion and chlorine ion wherein the amount of copper is more than 0.01 mole % on the basis of stannous ion, at a temperature of 0 to 100° C under atmospheric or superatmospheric pressure to prepare hydroxylamine,

(2) causing the hydroxylamine to react with an excess amount of a cycloalkanone having 5 to 12 carbon atoms at a temperature of 0 to 50° C to form a cycloalkanone oxime,

(3) separating the cycloalkanone oxime from the reaction mixture by extraction with an organic solvent selected from the group consisting of aliphatic or alicyclic ethers and carboxylic esters having a carbon number of 4 to 12 at a pH of less than 4.5,

(4) recovering the cycloalkanone oxime from the extract of the step (3),

(5) treating the raffinate of the step (3) under atmospheric or superatmospheric pressure at a temperature of 0° to 100° C under a reducing condition for conversion of stannic ion formed in the step (1) to stannous ion, and

(6) recycling the stannous ion to the step (1).

4,108,896

ANTHRACENE DERIVATIVES

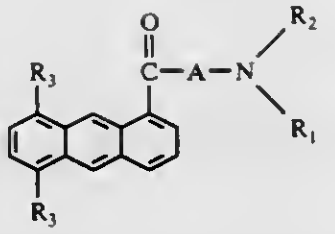
Laird F. Miller, Loveland, Ohio, and Robert W. Fleming, Ann Arbor, Mich., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Dec. 21, 1972, Ser. No. 317,247

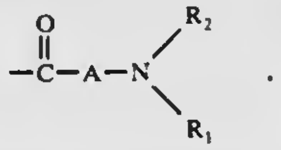
Int. Cl.^{2} C07C *97/10*

U.S. Cl. 260—570.5 C **5 Claims**

1. A bis-basic ketone of anthracene having the general formula:



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than the 1-position of the alkenyl group, and when R_1 and R_2 are taken together with the nitrogen atom to which they are attached, represent the pyrrolidinyl, piperidino or morpholino radical; R_3 is selected from the group consisting of hydrogen and the radical



with the proviso that one and only one such R_3 group is hydrogen; and the pharmaceutically acceptable acid addition salts thereof.

4,108,897

BENZYLHYDROXYLAMINE ETHERS

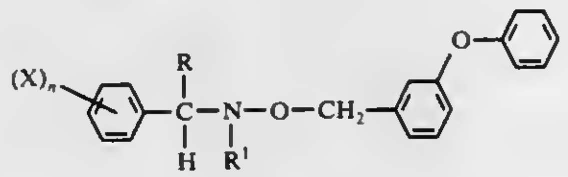
Arthur C. Henry, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 14, 1977, Ser. No. 777,245

Int. Cl.^{2} C07C *87/28*

U.S. Cl. 260—570.8 R **1 Claim**

1. A compound of the formula:



wherein n is 0 or 1, X is lower halogen, R is hydrogen or alkyl of from 1 to 6 carbon atoms, and R^1 is hydrogen or alkyl of from 1 to 6 carbon atoms.

4,108,898

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

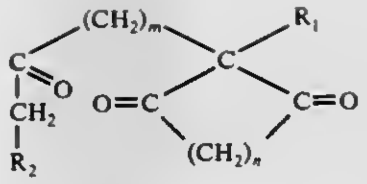
Division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 14, 1976, Ser. No. 723,127

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

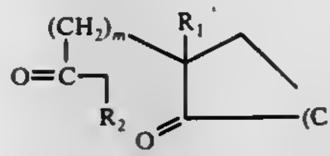
Int. Cl.^{2} C07C *45/00*

U.S. Cl. 260—586 C **2 Claims**

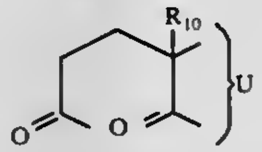
1. A process for the preparation of optically active compounds by means of a stereoselective ring closure which process comprises cyclizing a member of the group consisting of compounds of the formulae



I

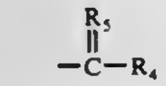


IX



XI

where R_1 is lower alkyl, aryl, aralkyl, lower alkenyl or lower alkynyl; R_2 is hydrogen, lower alkyl, aryl, aralkyl and $—(CH_2)_pR_3$ where p is an integer between 0 and 2 inclusive and R_3 is



$$-\overset{\overset{\displaystyle R_5}{\|}}{C}-R_4$$

where R_4 is hydrogen or lower alkyl and R_5 is lower alkylenedioxy or arylenedioxy; n is an integer between 1 and 5 inclusive and m is an integer between 1 and 4 inclusive; R_{10} is hydrogen or lower alkyl; and U is the remainder of the B, C and D rings of the steroidal molecule,

in the presence of an optically active α or β-aminoalcohol or α- or β-aminoacid.

4,108,899

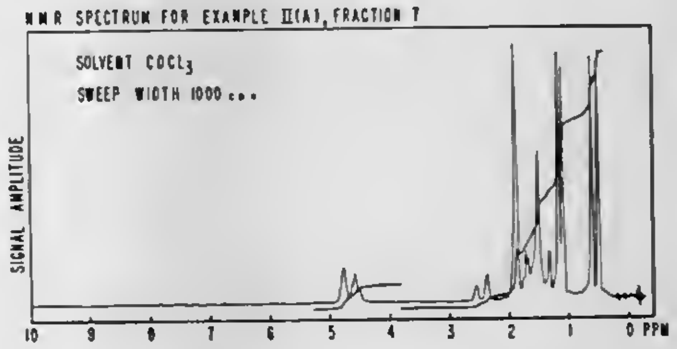
PROCESS FOR PREPARING MIXTURES OF SUBSTITUTED-HEXAHYDRO-ACETONAPHTHONES

William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

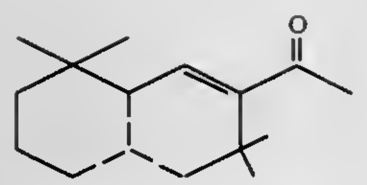
Division of Ser. No. 740,890, Nov. 11, 1976. This application Jul. 28, 1977, Ser. No. 819,956

Int. Cl.^{2} C07C *45/00*

U.S. Cl. 260—586 C **1 Claim**



1. A process comprising the steps of reacting 3-chloromesityl oxide with myrcene thereby forming a chlorine containing Diels-Alder adduct and then dehydrochlorinating the said Diels-Alder adduct to form an acetyl conjugated cyclohexadiene and cyclizing said acetyl conjugated cyclohexadiene to form a mixture of compounds defined by the structure:



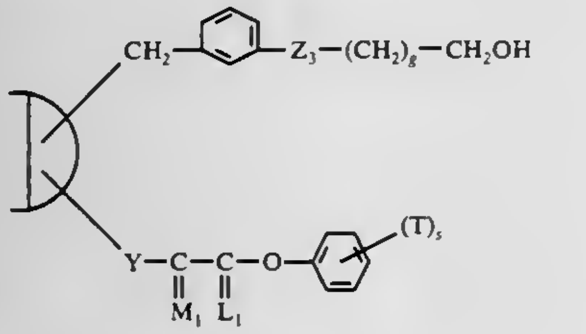
wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond.

4,108,900
2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-ω-PHENOXY-PGA$_1$ OR 9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

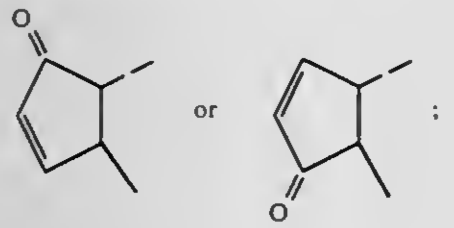
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,020
Int. Cl.^{2} C07C *49/82, 49/84*
U.S. Cl. 260—590 C 29 Claims

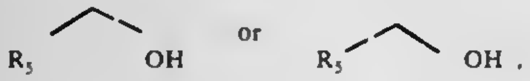
1. A prostaglandin analog of the formula



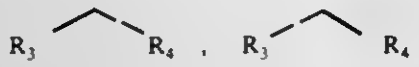
wherein Z_3 is oxa or methylene;
wherein D is



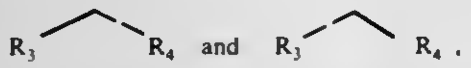
wherein Y is trans-CH═CH-;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



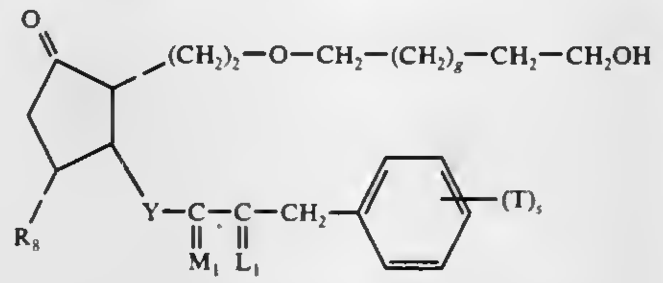
wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein g is 1, 2, or 3; and
wherein s is 0, 1, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,108,901
COMPOSITION AND PROCESS 2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENYL-PGE$_1$COMPOUNDS

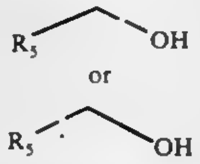
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,023
Int. Cl.^{2} C07C *49/84*
U.S. Cl. 260—590 C 39 Claims

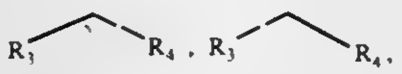
1. A prostaglandin analog of the formula



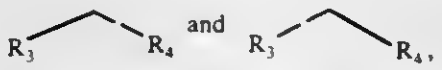
wherein R_8 is hydrogen or hydroxy; wherein Y is trans—CH═CH—, wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



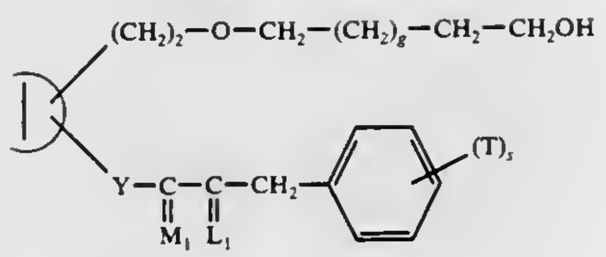
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, eith the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more that two T's are other than alkyl.

4,108,902
2-DECARBOXY-2-HYDROXYMETHYL-5-OXA-ω-PHENYL-PGA$_1$ OR 9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

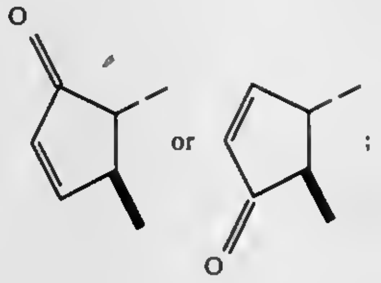
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,025
Int. Cl.^{2} C07C *49/84*
U.S. Cl. 260—590 C 39 Claims

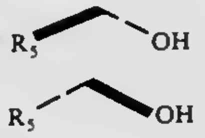
1. A prostaglandin analog of the formula



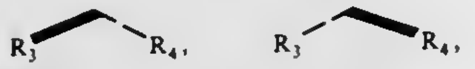
wherein D is



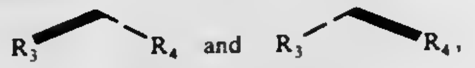
wherein Y is trans-CH═CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



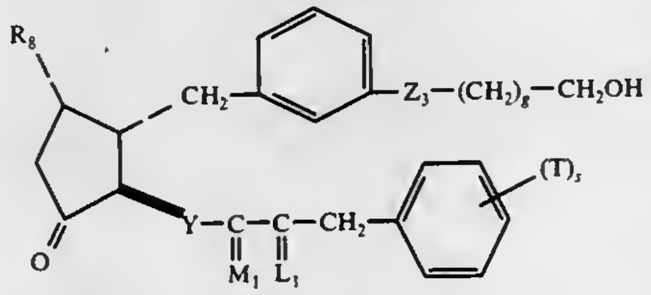
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, eith the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,108,903
2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-ω-PHENYL-PGD$_1$ COMPOUNDS

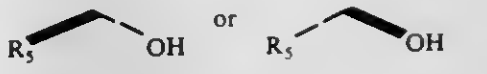
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602.
This application Aug. 5, 1977, Ser. No. 822,037
Int. Cl.^{2} C07C *49/82, 49/84*
U.S. Cl. 260—590 C 39 Claims

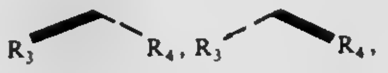
1. A prostaglandin analog of the formula



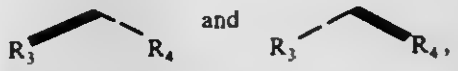
wherein Z_3 is oxa or methylene;
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH═CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is 1, 2, or 3; and
wherein s is 0, 1, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

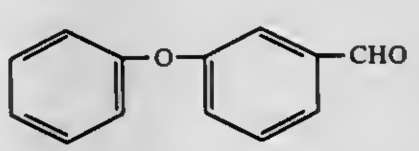
4,108,904
PROCESS FOR THE PREPARATION OF M-PHENOXYBENZALDEHYDE

Dale Gordon Brown, Hopewell, N.J., and William Wayne Brand, Painesville, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 22, 1976, Ser. No. 726,017
Int. Cl.^{2} C07C *45/00*
U.S. Cl. 260—600 R 10 Claims

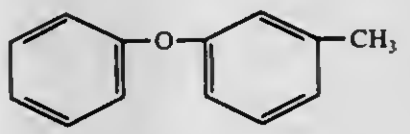
1. A process for the preparation of a compound of formula:

I



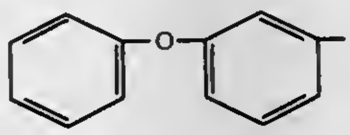
comprising halogenating with bromine, chlorine or sulfuryl chloride a compound of formula:

IV



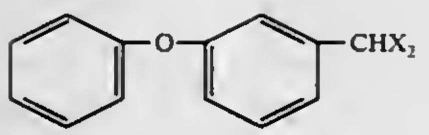
in a solvent of carbon tetrachloride or benzene with 1.2 to 2 molar equivalents of the halogenating agent at about the boiling point of the solvent selected, in the presence of 0.5% to 10% by weight of the formula (IV) compound of a free radical initiator of 2,2'-azobis(2-methylpropionitrile, 2-t-butylazo-2-cyanopropane, lauroyl peroxide or benzoyl peroxide for a period of time sufficient to essentially complete the reaction and obtain a mixture of compounds of formulae:

II



and

-continued



III

wherein X is a bromine or chlorine

reacting the halogenated mixture with 1.0 to 2.0 molar equivalents of hexamethylenetetramine in a solvent of aqueous C_1-C_3 alcohol or aqueous C_2-C_3 alkanoic acid; and

hydrolyzing the thus obtained mixture with a dilute mineral acid.

4,108,905

CATALYTIC REACTIONS

Geoffrey Wilkinson, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation-in-part of Ser. No. 99,501, Dec. 18, 1970, abandoned. This application Jun. 5, 1974, Ser. No. 476,566

Claims priority, application United Kingdom, Dec. 31, 1969, 63503/69; May 22, 1970, 24933/70

Int. Cl.^{2} C07C *45/02*

U.S. Cl. 260—604 HF **9 Claims**

1. A process for the production of butyraldehyde by the catalytic hydroformylation of propylene which is characterized by producing normal/iso product ratio of greater than 10:1 by bringing into intimate contact the following reactants a, b, c and d at a temperature and pressure such that they react together to produce the said product;

a. gaseous propylene;

b. hydrogen;

c. carbon monoxide, the hydrogen and carbon monoxide being present in a molar ratio within the range of from 1:15 to 2:1; and

d. a catalytically effective quantity of a hydrido carbonyl complex of rhodium which includes two phosphorus-containing stabilizing donor ligands selected from the group consisting of triphenylphosphine and triphenylphosphite; the improvement in said hydroformylation process consisting essentially of carrying out the said reaction in a rapidly stirred liquid medium consisting of at least one of the said phosphorus-containing stabilizing donor ligands in liquid form, the quantity of said ligand being such that the molar ligand to complex ratio is within the range 200:1 to 5000:1 and including the steps of removing from contact with the said liquid medium a product substantially composed of gaseous butyraldehyde and condensing said product.

4,108,906

HALOGENATED ARYL COMPOUNDS AND PROCESSES FOR PREPARING THE SAME

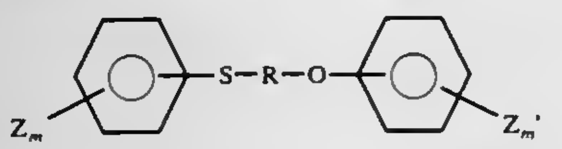
Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, Jun. 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,838

Int. Cl.^{2} C07C *149/00*

U.S. Cl. 260—609 R **2 Claims**

1. A halogenated aryl compound having the formula



wherein R is an alkylene group having from 1 to 6 carbon atoms, Z is selected from the group consisting of bromine or chlorine, and *m* and *m'* are integers having a value of 1–5.

4,108,907

PROCESS FOR THE PREPARATION OF POLYALKYLBENZENE HYDROPEROXIDES

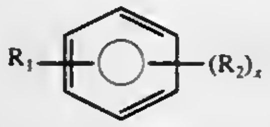
Hans Dressler, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 1, 1976, Ser. No. 701,811

Int. Cl.^{2} C07C *179/02*

U.S. Cl. 260—610 B **10 Claims**

1. In a process for the hydroperoxidation of polyalkylbenzenes of the formula:



wherein R_1 is an alkyl group having three to six carbon atoms, one of which is a tertiary carbon; and R_2 is an alkyl group having one to six carbon atoms and x is an integer from 1 to 3 and that have a poor solubility in sulfolane, which comprises contacting said polyalkylbenzene in the liquid phase with oxygen or an oxygen-containing gas mixture at a temperature of 75° to 150° C in the presence of sulfolane in an amount of 25 to 150 percent by weight based on the amount of said polyalkylbenzene, the improvement comprising:

(a) contacting said polyalkylbenzene in the liquid phase with oxygen to oxidize the polyalkylbenzene at least by about 10 percent based on the amount of polyalkylbenzene before the addition of the 25 to 150 percent by weight of sulfolane and the continuation of the oxidation in order to effect a homogeneous solution of said polyalkylbenzene and sulfolane at reaction conditions.

4,108,908

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF THIO-ACID COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,008

The portion of the term of this patent subsequent to Jun. 20, 1995 has been disclaimed.

Int. Cl.^{2} C07C *27/00, 37/00, 41/00, 45/00*

U.S. Cl. 568—730 **18 Claims**

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.0–9.0 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, cobaltous, or chromic metal complex of a thio acid.

4,108,909

N-ALKYLATED CRESYLIC ACIDS VIA DIRECT ALKYLATION IN A LIQUID PHASE

Bruce Eugene Leach, and Charles M. Starks, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 650,225, Jan. 19, 1976, abandoned. This application Nov. 18, 1976, Ser. No. 742,931

Int. Cl.^{2} C07C *39/08, 39/06*

U.S. Cl. 568—766 **7 Claims**

1. A method for the production of a phenolic compound containing predominantly n-alkylated side chains by contacting a compound selected from the group consisting of resorcinol, phenol, isomerized xylenols, hydroquinone, o-cresol, p-cresol and m-cresol with an n-alkanol having from 4 to 10 carbon atoms and wherein direct alkylation is carried out at pressures of from about 1 atmosphere to about 20 atmospheres, temperatures of from about 200° C to about 400° C in the presence of an alumina catalyst derived from aluminum alkoxide hydrolysis.

4,108,910

PROCESS FOR THE STABILIZATION OF METHYLENE CHLORIDE

Marcel Godfroid, Wavre, and Roger Gerkens, Braine-l'Alleud, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Apr. 22, 1977, Ser. No. 790,153

Claims priority, application Belgium, May 3, 1976, 17358

Int. Cl.^{2} C07C *17/40*

U.S. Cl. 260—652.5 R **15 Claims**

1. Process for the stabilisation of methylene chloride, comprising adding a mixture of stabilisers comprising at least one vicinal epoxide and at least one aliphatic monoether to the methylene chloride.

4,108,911

SELECTIVE HYDROGENATION OF CYCLOPENTADIENE TO FORM CYCLOPENTENE USING RANEY NICKEL CATALYST AND POLYOL REACTANT

Lawson G. Wideman, Akron, and Jay G. Bryson, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 11, 1977, Ser. No. 850,579

Int. Cl.^{2} C07C *5/06, 5/16*

U.S. Cl. 260—666 A **5 Claims**

1. A process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in the liquid phase by contacting cyclopentadiene wih hydrogen in the presence of a hydrogenation catalyst comprising a highly dispersed form of nickel selected from the group consisting of Raney nickel or a modified Raney nickel in which a polyol selected from the group consisting of 1,2-ethanediol, 1,2-propanediol, 1,3-propanediol, 1,2,3-propanetriol, 1,2-butanediol, 1,4-butanediol, 1,3-butanediol, 1,2,4-butanetriol and 1,2,3-propanetriol is employed in the reaction mixture in the volume ratio of the polyol to cyclopentadiene of from 1/1 to 4/1.

4,108,912

TWO-STAGE HYDROGENATION OF BENZENE TO FORM CYCLOHEXANE USING NICKEL CATALYST

Toshisade Takemura; Shohzaburo Sugi; Kenji Nagata, all of Tokuyamashi, and Ryohhei Yahagi, Ichiharashi, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,964

Claims priority, application Japan, May 19, 1976, 51-56709

Int. Cl.^{2} C07C *5/10*

U.S. Cl. 260—667 **1 Claim**

1. In the known process for producing cyclohexane by the hydrogenation of benzene in the presence of a catalyst consisting of nickel and nickel oxide supported on diatomaceous earth under hydrogenation conditions, the improvement which comprises

(1) providing two separate multitubular catalytic reaction zones,

(2) filling the first of said catalytic reaction zones with a catalyst having an activity reduced by the treatment of the amount of benzene corresponding to about one-fourth of the amount of benzene treatment,

(3) filling the second of said catalytic reaction zones with a catalyst having a high activity and which has not been subject to the treatment set forth in (2),

(4) passing benzene sequentially through said first catalytic reaction zone and then thru said second catalytic reaction zone until the catalytic activity in said first catalytic reaction zone is reduced to almost zero,

(5) replacing the spent catalyst in said first catalytic reaction zone with highly active catalyst,

(6) passing benzene to be hydrogenated through said second catalytic reaction zone and then through said first catalytic reaction zone until the catalytic activity in said second catalytic reaction zone is reduced to almost zero,

(7) replacing the spent catalyst in said second catalytic reaction zone with highly active catalyst, and

(8) repeating the above sequence of catalyst replacement steps and benzene flow any desired number of times.

4,108,913

DEHYDROGENATION PROCESS

Roger W. Spoerke, Akron, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 23, 1974, Ser. No. 508,478

Int. Cl.^{2} C07C *5/38*

U.S. Cl. 260—669 R **16 Claims**

1. A dehydrogenation process which comprises contacting a dehydrogenatable hydrocarbon at dehydrogenation conditions with a catalyst comprising a mixture of (1) at least one metal oxide selected from the group consisting of tungsten oxide, molybdenum oxide and chromium oxide with (2) vanadium oxide, the molar ratio of these oxides of (1) calculated as WO_3, MoO_3, Cr_2O_3 to the V_2O_5 of (2) ranging from 3/1 through 1/3, said mixture having been heated to at least about 600° C. to about 900° C. to react these oxides of (1) and (2) and prior to use, subsequently exposing the product to a reducing agent selected from the group consisting of hydrogen, ammonia, hydrazine, carbon monoxide, methane, ethane, propane and butane at a temperature from about 400° C. to about 800° C. for a period from about 5 minutes to about 8 hours.

4,108,914

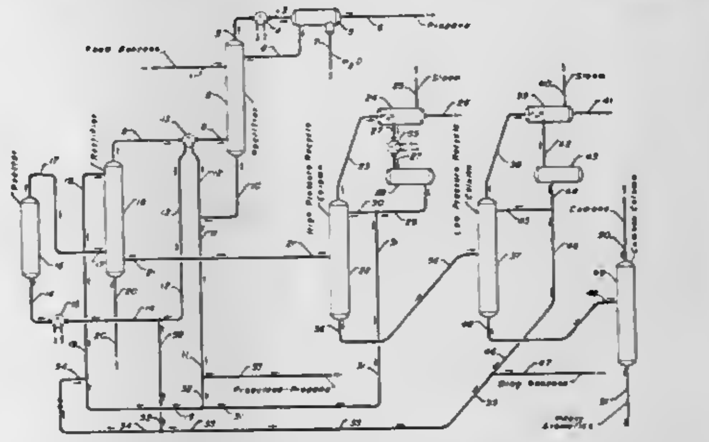
AROMATIC HYDROCARBON ALKYLATION PROCESS

Steve A. Gewartowski, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 27, 1977, Ser. No. 791,619

Int. Cl.^{2} C07C *3/52*

U.S. Cl. 260—671 R **6 Claims**



1. In the process for the production of alkylaromatic hydrocarbons by the alkylation of benzene with an acyclic olefin having from two to five carbon atoms per molecule wherein the olefin is supplied to the process in admixture with a paraffin having the same number of carbon atoms per molecule as the olefin; the olefin, the paraffin and benzene are contacted with an alkylation catalyst in a reaction zone to produce a reaction zone effluent stream comprising benzene, the alkylaromatic hydrocarbon and the paraffin; the reaction zone effluent stream is passed into a first fractionation zone which produces a first bottoms stream comprising benzene, the alkylaromatic hydrocarbon and the paraffin; and said first bottoms stream is passed into a second fractionation zone comprising a recycle fractionation column and wherein benzene is recovered for recycling to the reaction zone and the alkylaromatic hydrocarbon is removed in a bottoms stream; the improvement which comprises passing said first bottoms stream into a first recycle fractionation column, operated at a bottoms temperature of about 480° F. and pressure of about 385 psig effective to produce a net overhead stream consisting essentially of benzene

and substantially all said paraffin in said first bottoms stream and a second bottoms stream comprising benzene and the alkylaromatic hydrocarbon; passing said second bottoms stream into a second recycle fractionation column operated at a bottoms temperature of about 480° F. and a lower pressure than said first recycle fractionation column, generating steam possessing a temperature of about 280° F. by the condensation of overhead vapors removed from said second recycle fractionation column, and withdrawing from said second recycle fractionation column a net overhead liquid stream consisting essentially of substantially pure benzene and a third bottoms stream comprising the alkylaromatic hydrocarbon; and recovering said alkylaromatic hydrocarbon from said third bottoms stream in a third fractionation column.

4,108,915

PROCESS FOR THE SEPARATION OF ETHYLBENZENE

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 595,838, Jul. 14, 1975, Pat. No. 4,028,428. This application Sep. 30, 1976, Ser. No. 728,499

Int. Cl.² C07C *15/28, 15/30*

U.S. Cl. 260—674 SA **15 Claims**

1. A process for separating ethylbenzene and xylenes from a feed mixture comprising ethylbenzene and a plurality of xylene isomers which process employs an adsorbent comprising a type X or type Y zeolite essentially completely exchanged with strontium cations and which process comprises the steps of:

(a) maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed stream at a downstream boundary of said purification zone;

(d) maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

(e) passing said feed mixture into said adsorption zone at adsorption conditions to effect the selective adsorption of said xylene isomers to the substantial exclusion of ethylbenzene by said adsorbent in said adsorption zone and withdrawing a raffinate output stream comprising ethylbenzene from said adsorption zone;

(f) passing a desorbent material comprising toluene into said desorption zone at desorption conditions to effect the displacement of said xylene isomers from the adsorbent in said desorption zone;

(g) withdrawing an extract output stream comprising said xylene isomers from said desorption zone; and

(h) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone said feed input stream, a raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of said extract output and raffinate output stream.

4,108,916

PURIFICATION OF SATURATED HYDROCARBONS

Whitney Harris Mears, Pittsfield, Mass., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 8, 1976, Ser. No. 740,152

Int. Cl.² C07C *9/02*

U.S. Cl. 260—676 R **18 Claims**

1. A method of producing a saturated hydrocarbon selected from the group consisting of n-butane, isobutane and propane with less than about 5 parts per million of unsaturated contaminants comprising the steps:

(a) passing a saturated hydrocarbon containing more than about 5 parts per million of unsaturated contaminants through a sulfuric acid scrubber for a length of time sufficient to remove unsaturated contaminants in excess of 5 parts per million, and

(b) passing the outflow from the sulfuric scrubber through a basic demister to remove sulfuric acid mist from the saturated hydrocarbon.

4,108,917

ISOMERIZATION OF TERPENE COMPOUNDS

Freddy Wattimena, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1977, Ser. No. 836,808

Claims priority, application United Kingdom, Oct. 4, 1976, 41051/76

Int. Cl.² C07C *5/26*

U.S. Cl. 260—677 R **9 Claims**

1. A process for the conversion of bicyclic terpene compounds selected from the class consisting of pinane, alpha-pinene, beta-pinene and mixtures thereof into open-chain or acyclic isomers thereof which comprises heating the terpene starting material to a temperature of at least 300° C in the presence of a solid material comprising a metal or metal oxide selected from the class consisting of alkali metals, alkaline earth metals, transition metals and mixtures thereof supported on a carrier having a specific surface area in the range of about 0.01 to about 20 m^2/g.

4,108,918

OXIDATIVE DEHYDROGENATION OF OLEFINS TO DIOLEFINS

Frederic H. Hoppstock, Massillon, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 614,383, Sep. 18, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,217

Int. Cl.² C07C *11/12*

U.S. Cl. 260—680 E **10 Claims**

1. A process of oxidative dehydrogenation which comprises subjecting at least one hydrocarbon from the group of butene-1, butene-2, 2-methyl-1-butene, 2-methyl-2-butene, 3-methyl-1-butene, n-pentene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 4-methyl-2-pentene, 3-methyl-1-pentene, 3-methyl-2-pentene and 3-ethyl-1-butene to oxidative dehydrogenation conditions while said hydrocarbons are in the presence of a catalyst consisting essentially of a mixture of cobalt molybdate ($CoMoO_4$) and at least one of chromium oxide (CrO_3 or Cr_2O_3), said catalyst mixture being calcined for at least one hour at 400° to 1100° C. prior to use, in which the relationship of the chromium to cobalt and molybdenum expressed as the atomic ratio of chromium (Cr) to the total of the cobalt and molybdenum (CoMo) ranges from about 0.1/1 to about 5/1.

4,108,919

OXIDATIVE DEHYDROGENATION OF OLEFINS TO DIOLEFINS

Frederic H. Hoppstock, Massillon, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 614,383, Sep. 18, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,218

Int. Cl.² C07C *11/12*

U.S. Cl. 260—680 E **10 Claims**

1. A process of oxidative dehydrogenation which comprises subjecting at least one hydrocarbon from the group of butene-1, butene-2, 2-methyl-1-butene, 2-methyl-2-butene, 3-methyl-1-butene, n-pentene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 4-methyl-2-pentene, 3-methyl-1-pentene, 3-methyl-2-pentene and 3-ethyl-1-butene to oxidative dehydrogenation conditions while said hydrocarbons are in the presence of a catalyst consisting essentially of a mixture of zinc molybdate ($ZnMoO_4$) and at least one of chromium oxide (CrO_3 or Cr_2O_3), said catalyst mixture being calcined for at least 1 hour at 400° to 1100° C. prior to use, in which the relationship of the chromium to zinc and molybdenum expressed as the atomic ratio of chromium (Cr) to the total of the zinc and molybdenum (ZnMo) ranges from about 0.1/1 to about 5/1.

4,108,920

OLIGOMERIZATION OF OLEFINS

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 645,116, Dec. 29, 1975, Pat. No. 4,048,108. This application Jun. 1, 1977, Ser. No. 802,334

Int. Cl.² C07C *3/10*

U.S. Cl. 260—683.15 B **11 Claims**

1. A process for the oligomerization of an olefin containing from 3 to 6 carbon atoms which comprises oligomerizing said olefin at oligomerization conditions in the presence of a catalyst which has been prepared by heating a metal oxide which possesses surface hydroxyl groups with hydrogen or nitrogen at a temperature of from about 350° C. to about 550° C., impregnating the thus heated metal oxide with a solution of titanium tetrafluoride, cold rolling the impregnated oxide for a period of time ranging from about 0.5 to about 4 hours, then steam drying the composite at a temperature of about 100° C. and further drying the composite at a temperature in the range of from about 200° to about 600° C. in an inert atmosphere, and thereafter recovering the resultant oligomer.

4,108,921

PROCESS FOR POLYMER LITHIATION IN GRAFT POLYMERIZATION

Arthur W. Langer, Jr., Plainfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 562,826, Apr. 28, 1975, which is a continuation of Ser. No. 309,359, Nov. 24, 1972, abandoned and a continuation-in-part of Ser. No. 61,813, Aug. 6, 1970, Ser. No. 60,772, Aug. 3, 1970, Ser. No. 886,008, Dec. 17, 1969, Ser. No. 886,009, Dec. 17, 1969, Ser. No. 690,054, Dec. 13, 1967, and Ser. No. 690,076, Dec. 13, 1967, said Ser. No. 309,359, is a continuation-in-part of Ser. No. 81,181, Oct. 15, 1970, which is a continuation-in-part of Ser. No. 825,384, May 16, 1969, which is a continuation-in-part of Ser. No. 589,240, Oct. 25, 1966, Pat. No. 3,451,988, which is a continuation-in-part of Ser. No. 266,188, Mar. 19, 1963, abandoned, said Ser. No. 61,813, is a continuation-in-part of said Ser. No. 825,384, said Ser. No. 886,008, and said Ser. No. 886,009, each is a division of said Ser. No. 690,054, which is a continuation-in-part of Ser. No. 560,110, Jun. 24, 1966, abandoned, which is a continuation-in-part of Ser. No. 505,976, Nov. 1, 1965, abandoned, which is a continuation-in-part of Ser. No. 359,534, Apr. 3, 1964, Pat. No. 3,458,856, which is a continuation-in-part of said Ser. No. 266,188, said Ser. No. 690,076, is a continuation-in-part of said Ser. No. 560,110, abandoned. This application Aug. 12, 1976, Ser. No. 713,685

Int. Cl.² C08F *8/42, 255/06, 283/00, 289/00*

U.S. Cl. 260—827 **8 Claims**

1. A process for preparing graft polymers which comprises contacting an anionically polymerizable monomer with a polymer-Li•tertiary chelating polyamine complex in which the Li•tertiary chelating polyamine moiety of the complex is attached to carbon atoms of units within the polymer, said units being selected from the group consisting of at least one methyl or methylene radical attached to a nitrogen, silicon, sulfur, phosphorus or oxygen atom.

4,108,922

ANTISTATIC FIBER CONTAINING MULTIPLE BRANCHED PROPOXYLATED-ETHOXYLATED POLYALKYLENEPOLYAMINES AND MONOAMINES AND THEIR CHAIN-EXTENDED REACTION PRODUCTS

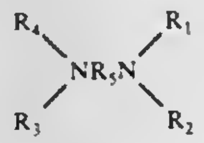
Lamberto Crescentini, Chester; Gene Clyde Weedon, Richmond, and Rodney Lee Wells, Chester, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 193,567, Oct. 28, 1971, abandoned, and a continuation-in-part of Ser. No. 239,905, Mar. 31, 1972, abandoned, said Ser. No. 239,905, is a continuation-in-part of Ser. No. 185,816, Oct. 1, 1971, abandoned. This application Oct. 11, 1972, Ser. No. 294,971

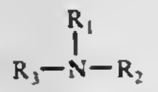
Int. Cl.² C08L *63/00, 77/00*

U.S. Cl. 260—830 P **14 Claims**

1. An antistatic polyamide fiber, said fiber containing between about 1 percent and 12 percent by weight of at least one reaction product of a diepoxide with a branched alkylene amine having a molecular weight above 1,500 said amine selected from the group consisting of compounds represented by the formulas:



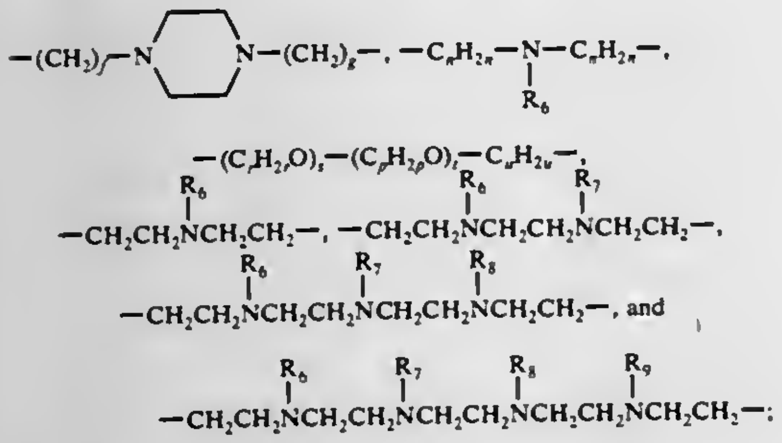
(A)



$$R_3-\overset{\overset{\displaystyle R_1}{|}}{N}-R_2$$

(B)

where R_1, R_2, R_3 and R_4 are independently selected from monovalent hydrocarbon radicals having 1 to 20 carbon atoms derived from aliphatic, aromatic, cycloaliphatic, aromatic-aliphatic, heterocyclic hydrocarbons or $-(C_rH_{2r}O)_m(C_pH_{2p}O)_q-H$; R_5 is at least one of the alkylene difunctional radicals having 2 to 15 carbon atoms and a radical selected from



$-C_nH_{2n}-\underset{R_6}{\underset{|}{N}}-C_nH_{2n}-$, $-(C_rH_{2r}O)_s-(C_pH_{2p}O)_t-C_uH_{2u}-$, $-CH_2CH_2\overset{R_6}{\overset{|}{N}}CH_2CH_2-$, $-CH_2CH_2\overset{R_6}{\overset{|}{N}}CH_2CH_2\overset{R_7}{\overset{|}{N}}CH_2CH_2-$, $-CH_2CH_2\overset{R_6}{\overset{|}{N}}CH_2CH_2\overset{R_7}{\overset{|}{N}}CH_2CH_2\overset{R_8}{\overset{|}{N}}CH_2CH_2-$, and $-CH_2CH_2\overset{R_6}{\overset{|}{N}}CH_2CH_2\overset{R_7}{\overset{|}{N}}CH_2CH_2\overset{R_8}{\overset{|}{N}}CH_2CH_2\overset{R_9}{\overset{|}{N}}CH_2CH_2-$;

R_6, R_7, R_8 and R_9 are independently selected from R_1, R_2, R_3, R_4, H or another monovalent hydrocarbon radical having 1 to 20 carbon atoms as defined for R_1, R_2, R_3 and R_4, provided that at least one of R_1, R_2, R_3 and R_4, R_6, R_7, R_8, or R_9 is $-(C_rH_{2r})_m(C_pH_{2p}O)_q-H$, where n is 3 to 6; *r*, *p* and *u* are 2, 3, or 4; *s*, *t*, *m*, *q* are 0 to 100; $m + q$ must be > 5; *s* and *t* must be < 100; *f*, *g* are 0 or 2 to 6; were *j* and *k* are each 1 to 250, and said diepoxide being reactive with the end of the moiety $-(C_rH_{2r}O)_m(C_pH_{2p}O)_q-H$ and yieldig a difunctional chain extending radical, said reaction product being predominantly branched, the mole ratio of said diepoxide to said amine (A) and/or (B) being from about 0.7/1.0 to 1.0/1.0

4,108,923
POLY(METHYL METHACRYLATE) COMPOSITION

William C. Mast, Stow; Richard G. Bauer, Kent, and Tom M. Wathen, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 486,149, Jul. 5, 1974, abandoned. This application Sep. 10, 1975, Ser. No. 612,134

Int. Cl.² C08L *63/00, 51/00*

U.S. Cl. 260—836 **2 Claims**

1. A method of preparing a composition, characterized by having a white light transmission efficiency in the range of about 85 to about 92 percent, a notched Izod impact strength in the range of about 8 to about 30 in. lbs, a flex modulus in the range of about 200,000 to about 300,000 psi, a Shore D hardness in the range of about 75 to about 85, a tensile strength in the range of about 3000 to about 5000 psi, a haze value in the range of about 2 to about 10 percent and a heat distortion temperature in the range of about 180° to about 220° C. (66 psi), which comprises a solid external dispersant phase and a discrete microdispersed solid internal phase, said external and internal phases having individual white light refractive indices within about 1 percent of each other in the range of about 1.45 to about 1.55 at 23° C., which comprises

(A) forming an initial, liquid, external phase dispersant by free radical polymerizing, at a temperature in the range of about 35° to about 85° C., up to about 25 percent and sufficient to form a syrup having a viscosity in the range of about 200 to about 10,000 centistokes at 25° C., a comonomer mixture comprised of about 80 to about 98 weight percent methyl methacrylate and, correspondingly, about 20 to about 2 weight percent of at least one comonomer selected from styrene, vinyl toluene, α-methylstyrene, acrylonitrile and methacrylonitrile,

(B) forming a microdispersion by mixing and dispersing with 100 parts by weight of said liquid, external phase dispersant about 2 to about 15 parts by weight of a crosslinked graft polymer having a particle size in the range of about 0.1 to about 10 microns; where said cross-linked graft polymer is the product of free radical copolymerizing a mixture which comprises

(1) about 92 to about 99.9 weight percent of a mixture comprised of (a) about 50 to about 99 weight percent of at least one monomer selected from the group consisting of methacrylate, 2-ethyl hexyl acrylate and methyl methacrylate and, correspondingly, (b) about 1 to about 50 weight percent of at least one monomer selected from styrene, α-methylstyrene, acrylonitrile and methacrylonitrile and, correspondingly,

(2) about 8 to about 0.1 weight percent of at least one polyfunctional monomer selected from the group consisting of divinylbenzene, allyl methacrylate, glycidyl acrylate, glycidyl methacrylate, triallyl cyanurate, 1,3-butylene dimethacrylate and ethylene glycol dimethacrylate, where in the preparation of the graft polymer, a portion of the acrylate (1-a) is reserved and then added along with additional free radical initiator after the polymerization of the initial monomers (1-a) and (1-b).

4,108,924
STABILIZED CHLORINE-CONTAINING RESIN COMPOSITION

Katsuo Akagane, Ashiya; Teruho Adachi, and Kunimasa Kamio, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 25, 1976, Ser. No. 661,553

Claims priority, application Japan, Feb. 26, 1975, 50-24334

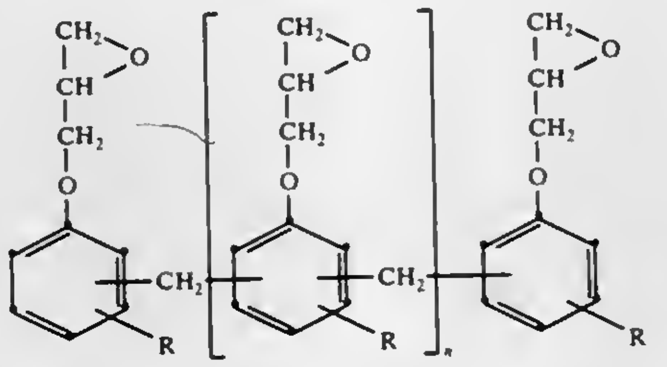
Int. Cl.² C08K *5/15*

U.S. Cl. 260—837 PV **6 Claims**

1. A composition comprising

A. a rigid chlorine-containing polymer selected from the group consisting of (1) a homopolymer of vinyl chloride, (2) a homopolymer of vinylidene chloride, (3) a copolymer of vinyl chloride or vinylidene chloride with ethylene, propylene, acrylonitrile, styrene, a vinyl ester, a vinyl ether, a vinylidene halide, methyl methacrylate, a dialkyl fumarate or a dialkyl maleate, and (4) an ethylene-vinyl acetate polymer or ethylene-alkyl acrylate polymer having vinyl chloride or vinylidene chloride grafted thereon, and

B. a novolac type epoxy compound of the formula



wherein R is hydrogen or a $C_1 - C_4$ alkyl group in the position ortho or para to the epoxy group, and *n* is a number of from 5 to 15, **the weight ratio of the epoxy compound to** 100 parts by weight of the chlorine-containing polymer being 0.03 to 10 parts by weight.

4,108,925
THERMOPLASTIC MOLDING COMPOSITIONS OF RUBBER MODIFIED COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN α,β-UNSATURATED CYCLIC ANHYDRIDE

Gim Fun Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 527,140, Nov. 25, 1974. This application Nov. 19, 1975, Ser. No. 633,418

Int. Cl.² C08L *51/04, 51/06, 51/08*

U.S. Cl. 260—876 R **8 Claims**

1. A thermoplastic molding composition which comprises:

(a) from 40–95 parts by weight of a rubber modified copolymer of a vinyl aromatic compound and an α,β-unsaturated anhydride; and

(b) from 5–60 parts by weight of an emulsion graft polymerization pproduct of an acrlic monomer alone or in admixture with a styrene monomer on a rubbery diene homopolymer or styrene-diene copolymer backbone.

4,108,926
REACTIVE PLASTICIZER FOR THERMOPLASTIC POLYSULFONE RESINS

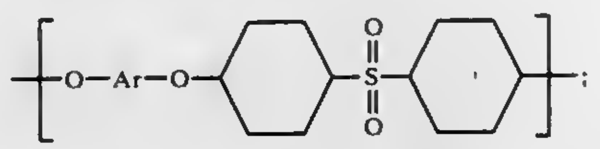
Fred E. Arnold, Centerville; Gerard A. Loughran, Kettering, both of Ohio, and Anthony Wereta, Jr., Sunny Vale, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1976, Ser. No. 736,287

Int. Cl.² C08L *29/10, 49/00, 51/08, 81/06*

U.S. Cl. 260—874 **3 Claims**

1. A composition consisting essentially of a polyphenylsulfone thermoplastic having repeating units of the formula



wherein Ar is a divalent aromatic radical; and a plasticizing amount of 4,4'-bis(3-ethynylphenoxy)diphenylsulfone.

4,108,927
METHOD OF MAKING LEAD SHOT

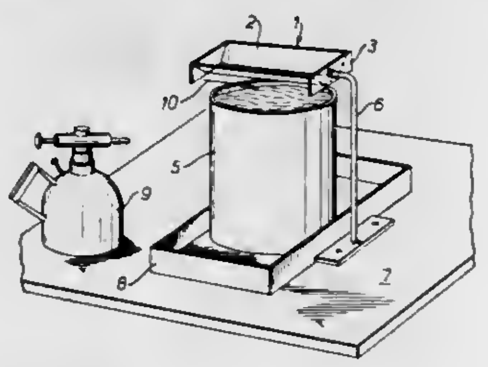
James A. Francis, 5 Chakola Ave., Hornsby Heights, 2077 Sydney, N.S.W., Australia; Brian G. Francis, 24 Grove St., Raunds, Northamptonshire, and Frederick L. Francis, 1 Bedford Rd., Rushden, Northamptonshire, both of England

Filed May 13, 1976, Ser. No. 686,241

Claims priority, application United Kingdom, May 13, 1975, 20100/75

Int. Cl.² B01J *2/06*

U.S. Cl. 264—13 **4 Claims**



1. A method of making lead shot which comprises allowing molten lead to pass through apertures in the base of a container and fall therefrom as molten droplets into a bath of cold water disposed not more than about 2 inches vertically below the container, and solidifying the molten droplets in the cold water to form shot, wherein the droplets fall from the base of the container through a heating zone disposed between the base of the container and the said bath where the droplets are heated and assume a close to perfectly spherical shape before entering the bath, wherein the droplets are heated in the heating zone by a flame of burning gas disposed laterally across the path of the falling droplets so that the droplets pass through the flame before entering the cold water.

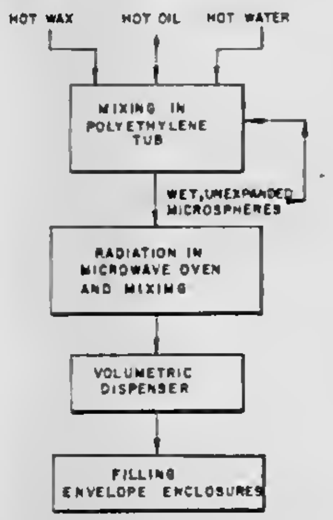
4,108,928
METHOD OF PRODUCING A VISCOUS FLOWABLE PRESSURE-COMPENSATING FITTING COMPOSITION FROM HOLLOW THERMOPLASTIC MICROBLENDS WITH THE USE OF HIGH FREQUENCY HEATING AND DISPENSING THE COMPOSITION INTO A SEALABLE, FLEXIBLE, PROTECTIVE ENCLOSURE MEANS

Jack C. Swan, Jr., Boulder, Colo., assignor to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 663,213, Mar. 2, 1976, abandoned. This application Sep. 16, 1976, Ser. No. 723,912

Int. Cl.² B29D *27/00*

U.S. Cl. 264—26 **54 Claims**


HOT WAX
HOT OIL
HOT WATER
MIXING IN POLYETHYLENE TUB
WET, UNEXPANDED MICROSPHERES
RADIATION IN MICROWAVE OVEN AND MIXING
VOLUMETRIC DISPENSER
FILLING ENVELOPE ENCLOSURES

1. The method of rapidly heat-expanding by radiation-heating in liquid medium, discrete, hollow, expandable microbeads having a thermoplastic resinous shell and thermally-responsive blowing agent contained therein, to effect good, nondestructive, rapid expansion of the microbeads, which comprises:

(a) preparing a selectively vented, expansion system of said microbeads in a temperature-compensating liquid medium having first and second different liquid materials not identically susceptible to heating in the presence of a high frequency electrical field,

(i) said first liquid material is characterized by readily absorbing high frequency electrical energy from a heat-generating, high frequency electrical field and by having and thereupon radpily reaching a prevailing boiling point within said system in the vicinity of the expansion temperature of said microbeads and which, upon being rapidly boiled and essentially escaping by being vented from the system, effects a cooling action on the microbeads,

(ii) said second liquid material is characterized by having a prevailing boiling point within said system in excess of that of said first liquid material and providing within the system and upon said venting of first liquid material from the system, a heat sink for the microbeads, and

(iii) said expandable microbeads being characterized by sufficiently absorbing high frequency energy from a heat-generating, high frequency electrical field so as to be heated, followed by the heated microbeads being subjected to said cooling action effected by first liquid material being rapidly boiled and vented from the system, followed by the heated microbeads being subjected to said heat sink provided by said second liquid material;

(b) subjecting said system to radiation-heating by a heat-generating, high frequency electrical field of frequency and duration sufficient to rapidly expand said microbeads within the system while said first and second liquid materials maintain the temperature of the microbeads contained therein in the vicinity of their expansion temperature, so that said radiation-heating effectively heats said liquid medium and microbeads within the system, whereupon said first liquid material rapidly attains its prevailing boiling point in the vicinity of the expansion temperature of the heated microbeads, said first liquid material rapidly boils and essentially escapes by being vented from the system and thereby effects a cooling action on the heated microbeads and consequently maintains their temperature in the vicinity of their expansion temperature, the liquid medium remaining and present in the system during the rapid vented escape of first liquid material having a substantially constant temperature, and said second liquid material remains in the system following said vented escape of first liquid material and consequently maintains the temperature of the heated microbeads in the vicinity of their expansion temperature by effecting a cooling action on heated microbeads by providing a heat sink which prevents heated microbeads contained therein from being heated to a temperature sufficiently high so as to cause them to melt or fuse together, or to be destroyed, while also providing for any continued expansion of the heated microbeads at a temperature in the vicinity of their expansion temperature;

said expansion of the microbeads by radiation-heating being rapidly effected and maintained at a temperature in the vicinity of the expansion temperature of the microbeads by means of the individual shells thereof rapidly being heat-softened and thermally-responsive blowing agent contained therein exerting an expanding pressure thereon, to effect good, but nondestructive, rapid expansion of the microbeads at a temperature in the vicinity of their expansion temperature; and,

(c) selectively discontinuing said radiation-heating to provide said heat-expanded microbeads in the resultant liquid medium.

41. The method of producing and dispensing into sealable, flexible, protective enclosure means, viscous, flowable, pressure-compensating fitting composition having therein, a discontinuous phase of discrete, lightweight, sturdy, resilient, hollow, thermoplastic, resinous, in situ heat-expanded microbeads formed by rapidly heat-expanding by radiation-heating in liquid medium, discrete, hollow, expandable microbeads having a thermoplastic resinous shell and thermally-responsive blowing agent contained therein, which method comprises:

(a) preparing a selectively vented, expansion system of discrete, hollow, expandable microbeads having a thermoplastic resinous shell and thermally-responsive blowing agent contained therein, wherein said microbeads are in a temperature-compensating liquid medium having first and second different liquid materials not identically susceptible to heating in the presence of a high-frequency electrical field,

(i) said first liquid material comprises water and is characterized by readily absorbing high frequency electrical energy from a heat-generating, high frequency electrical field and by having and thereupon rapidly reaching a prevailing boiling point within said system in the vicinity of the expansion temperature of said microbeads and which, upon being rapidly boiled and essentially escaping by being vented from the system, effects a cooling action on the microbeads,

(ii) said second liquid material comprises a member of the group consisting of (1) oil and (2) oil and wax, and is characterized by having a prevailing boiling point within said system in excess of that of said first liquid material and providing within the system and upon said venting of first liquid material from the system, a heat sink for the microbeads, and

(iii) said expandable microbeads being characterized by sufficiently absorbing high frequency energy from a heat-generating, high frequency electrical field so as to be heated, followed by the heated microbeads being subjected to said cooling action effected by first liquid material being rapidly boiled and vented from the system, followed by the heated microbeads being subjected to said heat sink provided by said second liquid material;

(b) subjecting said system to radiation-heating by a heat-generating, high frequency electrical field of frequency and duration sufficient to rapidly expand said microbeads within the system while said first and second liquid materials maintain the temperature of the microbeads contained therein in the vicinity of their expansion temperature, so that said radiation-heating effectively heats said liquid medium and microbeads within the system, whereupon said first liquid material rapidly attains its prevailing boiling point in the vicinity of the expansion temperature of the heated microbeads, said first liquid material rapidly boils and essentially escapes by being vented from the system and thereby effects a cooling action on the heated microbeads and consequently maintains their temperature in the vicinity of their expansion temperature, the liquid medium remaining and present in the system during said vented escape of first liquid material having a substatantially constant temperature, and said second liquid material remains in the system following the rapid vented escape of first liquid material and consequently maintains the temperature of the heated microbeads in the vicinity of their expansion temperature by effecting a cooling action on heated microbeads by providing a heat sink which prevents heated microbeads contained therein from being heated to a temperature sufficiently high so as to cause them to melt or fuse together, or to be destroyed, while also providing for any continued expansion of heated microbeads at a temperature in the vicinity of their expansion temperature;

said expansion of the microbeads by radiation-heating being rapidly effected and maintained at a temperature in the vicinity of the expansion temperature of the microbeads by means of the individual shells thereof rapidly being heat-softened and thermally-responsive blowing agent contained therein exerting an expanding pressure thereon to effect good, but nondestructive, rapid expansion of the microbeads at a temperature in the vicinity of their expansion temperature;

(c) selectively discontinuing said radiation-heating to provide said heat-expanded microbeads in second liquid material and thereupon producing pressure-compensating fitting composition which is characterized by having a viscous, flowable, continuous phase comprising wax and oil, and having therein, a discontinuous phase of discrete, lightweight, sturdy, resilient, hollow, thermoplastic, resinous, in situ heat-expanded microbeads;

(d) delivering said fitting composition to volumetric dispensing means at an elevated temperature sufficient to facilitate its flow to and from said dispensing means; and,

(e) selectively dispensing a desired volume of said fitting composition from said dispensing means into sealable, flexible, protective enclosure means.

4,108,929
HOT PRESSED SILICON CARBIDE

Svante Prochazka, Ballston Lake, and William J. Dondalski, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 503,008, Sep. 3, 1974, abandoned, which is a division of Ser. No. 378,918, Jul. 13, 1973. This application Jun. 11, 1976, Ser. No. 695,246

Int. Cl.^{2} C04B *35/52*

U.S. Cl. 264—29.1 **7 Claims**

1. A method of making a hot-pressed silicon carbide ceramic body containing elemental carbon only in the form of minute particles interspersed throughout said body, said body having a density of at least 98% of theoretical density and having improved high temperature mechanical properties comprising the steps of

(a) forming a substantially homogeneous dispersion consisting essentially of a submicron powder of silicon carbide, a boron additive selected from the group consisting of boron and boron carbide, wherein the amount of the boron additive is equivalent to about 0.3–3.0% by weight of boron, and about 0.5 to 3.0% by weight of elemental carbon, and

(b) hot pressing the dispersion in an inert atmosphere at a temperature of about 1,900°–2,000° C. and at a pressure of about 5,000–10,000 psi for a sufficient time ranging from about 10 minutes to about 60 minutes to produce said hot-pressed silicon carbide body.

4,108,930
HIGH-ALUMINA CEMENT

Oliver W. Crinkelmeyer, Tulsa, and Earl F. Morris, Wagoner, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 431,270, Jan. 7, 1974, Pat. No. 3,922,172. This application Jul. 1, 1974, Ser. No. 484,497

Int. Cl.^{2} E02D *29/10*

U.S. Cl. 264—32 **4 Claims**

1. A method of cementing in a borehole wherein the cement is subjected to a variety of temperatures ranging from below about 32° F to above freezing temperatures which comprises:

cementing in said borehole employing a hydraulic cement slurry comprising, as percent by weight,

(a) a high-alumina cement,

(b) calcium sulfate from about 5 to about 30 percent, based on the weight of high-alumina cement,

(c) water, from about 35 to about 50 percent based on the total weight of (a) and (b), and

(d) a halide salt selected from the group consisting of NaCl or KCl, from about 5 to about 15 percent, based on the weight of water.

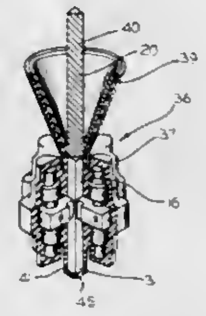
4,108,931
SYSTEM OF MAKING MOLDS FOR INVESTMENT CASTING

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Continuation of Ser. No. 541,230, Jan. 15, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,514

Int. Cl.^{2} B29C *1/02, 29/00*

U.S. Cl. 264—37 **12 Claims**



7. The method of making a multiple cavity mold for investment casting utilizing a sprue form and plurality of patterns each formed with a gate section, said method comprising:

forming the patterns and the gate sections from, and coating the exterior of the sprue form with, a mixture of polyethylene glycol having a molecular weight that is at least in the range having as the lower limit approximately 1,300 to approximately 1,600 and having as the upper limit 15,000 to 20,000, and powdered graphite, wherein the graphite comprises in the range of from approximately 35 to approximately 60 percent by weight of the mixture,

adhering the gate sections of the patterns to the sprue form coating at a location on the sprue form spaced from one end of the sprue form and in a uniform spacing about the sprue form,

encasing the said patterns and sprue form, to the exclusion of said sprue form one end, with mold forming material to form an investment mold whereby said one end of the sprue form is exposed from the thus formed mold,

heating the sprue form by applying heat to said one end thereof to melt the sprue form coating,

removing the sprue form from the mold to define the mold sprue opening and expose the portions of the respective pattern gate sections, that were adhered to the sprue form coating, to the resulting mold sprue opening,

water leaching the gate sections and the respective patterns from the mold at room temperature, to form in the mold its investment cavities and a channel for each such cavity communicating between the respective cavities and the mold sprue opening,

and drying the mold.

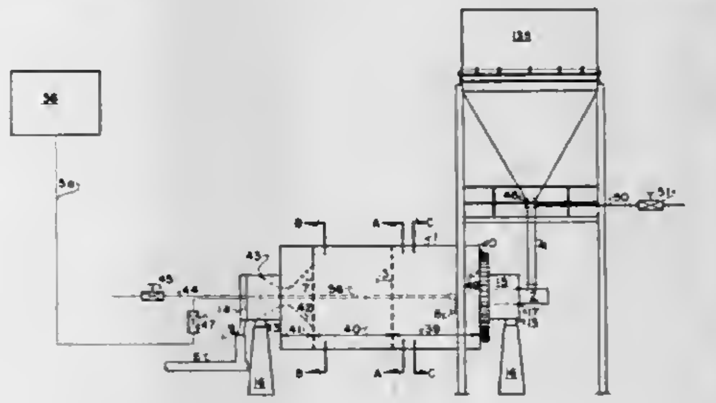
4,108,932
METHOD OF AGGLOMERATING POWDERS

Robert B. Takewell, Borger, Tex.; Paul W. Brandoo, Havre de Grace, Md., and Paul R. Odom, Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 663,424, Mar. 3, 1976, abandoned, which is a continuation of Ser. No. 450,013, Mar. 11, 1974, abandoned, which is a division of Ser. No. 186,113, Oct. 4, 1971, Pat. No. 3,803,283. This application Mar. 4, 1977, Ser. No. 774,281

Int. Cl.^{2} B01J *2/12*

U.S. Cl. 264—37 **1 Claim**



1. A method of agglomerating finely divided clays into pellets with a packing density greater than 60 lbs/ft^3, said method comprising the steps of:

(a) introducing finely divided clay having a moisture content of about 1.5 to 5% by weight into one end of a rotating cylindrical drum having an inlet end, an axis of rotation, and a discharge end and tumbling said material therein;

(b) contacting said tumbling clay with a liquid wetting agent in said drum wherein said clay begins to curl back and tumble down the side of said rotating drum;

(c) spraying said liquid wetting agent at said curl in the form of a spray having an angle that the spray makes with a vertical line through the axis of rotation of said drum in the range of 35° to 85° and a spray angle and an angle of inclination, as shown at (23) and (24) of FIGS. 6*a* and 6*b* respectively of said drawings, of about 30°;

(d) continuing rotation of said drum at a speed below the critical speed RS_c, defined by

$$RS_c = 76.6/\sqrt{D}$$

wherein D is the diameter of the drum in feet, to form pellets having a size range exhibiting maximum effective packing density of from about 60 to 70 pounds per cubic foot; and

(e) removing pellets that would pass through a tight-mesh screen from near the discharge end of said rotating drum and discharging said pellets into the incoming stream of finely divided clay at the inlet end of said rotating drum to provide seeds and nuclei for pellet initiation;

(f) removing pellets that would not pass through a large-mesh screen from near the discharge end of said rotating drum, grinding said pellets, and discharging said pellets into the incoming stream of finely divided clay at the inlet end of said rotating drum to provide seeds and nuclei for pellet initiation;

(g) discharging pellets from said drum that would pass through a large-mesh screen, but would not pass through a tight-mesh screen, such pellets having a packing density greater than 60 lbs/ft^3,

wherein the tight-mesh screen and the large-mesh screen are defined to produce a pelleted clay consisting of compacted pellets of varying sizes which efficiently utilize available voids in the arrangement of closely packed uniform spherical pellets comprising a gradation of pellets with from 25 to 55% of the pellets being retainable on a 5 mesh screen, from 30 to 55% of the pellets being retainable on a 10 mesh screen but capable of passing through a 5 mesh screen, from 5 to 25% of the pellets being retainable on a 20 mesh screen but capable of passing through a 10 mesh screen, 0.5 to 5% of the pellets being retainable on a 40 mesh screen but capable of passing through a 20 mesh screen, and less than 2% of the pellets capable of passing through a 40 mesh screen.

4,108,933

METHOD OF MANUFACTURING STEAM-CURED POROUS CONCRETE PRODUCTS

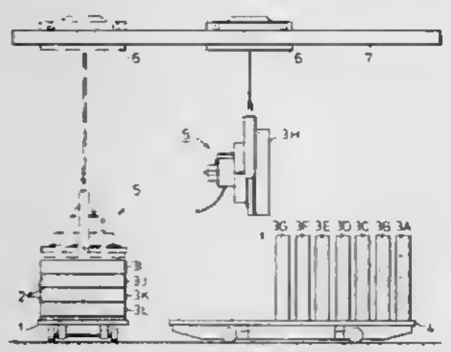
Rolf Erik Göransson, Åkarp; Gösta Harald Eriksson, Södertälje; Øystein Kalvenes, Grödinge, and Percy Svensson, Rönninge, all of Sweden, assignors to Internationella Siporex AB, Malmo, Sweden

Filed Mar. 28, 1977, Ser. No. 782,219

Claims priority, application Sweden, Apr. 6, 1976, 7604016

Int. Cl.^{2} B20B *3/00*

U.S. Cl. 264—42 **4 Claims**



1. A method of manufacturing steam-hardened cellular concrete slabs comprising the steps:

(a) molding from a concrete mass a cellular body of at least approximately parallelepipedic shape that in a certain stage of solidification of the mass is self-supporting but still capable of being cut into regular pieces,

(b) making a plurality of vertically spaced, horizontally extending cuts in said body while the same is resting on a first support to thereby divide said body into a plurality of slab-forming slices,

(c) removing said slices one-by-one by lifting away from said first support the body slice that from time-to-time is the uppermost one,

(d) canting said lifted slices and depositing them in succession in their canted position in side-by-side but mutually spaced relationship on a second support, so that their broad sides are exposed for subsequent steam contact, and

(e) forwarding said second support with the canted body slices thereon into an autoclave, in which the slices are subsequently steam-hardened to form the desired slabs.

4,108,934

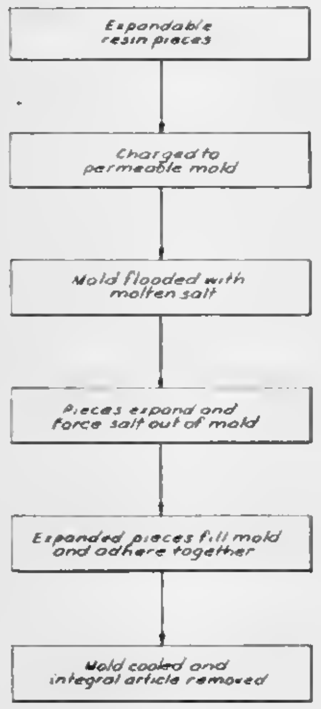
MOLDING EXPANDABLE THERMOPLASTIC RESINS

Louis C. Rubens, and Willard E. Alexander, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 23, 1976, Ser. No. 669,551

Int. Cl.^{2} B29D *27/00*

U.S. Cl. 264—53 **14 Claims**


Expandable resin pieces
Charged to permeable mold
Mold flooded with molten salt
Pieces expand and force salt out of mold
Expanded pieces fill mold and adhere together
Mold cooled and integral article removed

1. A method of making shaped articles of organic polymer resins having a cellular structure by molding heat-expandable thermoplastic resin in a mold having a mold cavity, which comprises charging into the mold cavity a heat-expandable normally solid thermoplastic resin material comprising a normally solid thermoplastic resin component and a blowing agent, said resin material being in the form of discrete pieces or segments, and flooding the mold cavity and the said pieces or segments of resin material therein with a molten salt, which salt melts to a stable liquid and is maintained at a temperature which is above the softening and expansion temperatures of said resin material and wherein said resin component is self-supporting at the molten salt temperature, and wherein the mold walls defining the mold cavity are permeable to the flow therethrough of fluids but not of the resin therein, said pieces or segments of said heat-expandable resin material being charged to the mold cavity in amount capable of free expansion at the temperature of said molten salt to volume at least 110% of the volume of said mold cavity, whereby said pieces or segments of said expandable resin material are heated by the molten salt and expand, and the resulting expanding pieces or segments force the molten salt from the mold cavity and adhere together, and the resulting expanded cellular resin material substantially fills the cavity, then cooling the mold and the resulting shaped article therein and removing from the mold the resulting integral shaped article of resin having a cellular structure.

4,108,935

METHOD FOR FORMING SOLID FRICTION MATERIAL STRUCTURES

Edward Moneghan, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 18, 1975, Ser. No. 633,054

Int. Cl.^{2} B29C *3/04*

U.S. Cl. 264—68 **18 Claims**

1. A method of producing molded bodies of friction material, such as brake pads and brake blocks, which comprises the steps of:

a. mixing predetermined quantities of dry friction material including asbestos fibers, thermosetting resin powder and friction modifying particles to obtain a supply of light and fluffy, dry homogeneously mixed ingredients.

b. withdrawing said mixed ingredients from said supply,

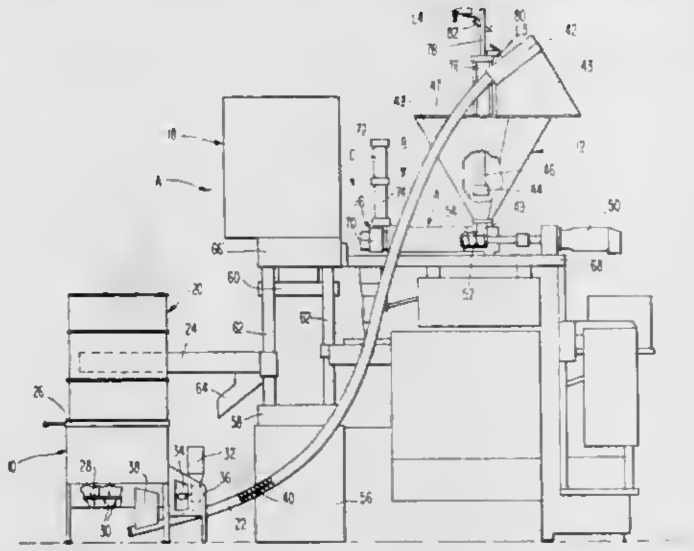
c. moving said withdrawn mixed ingredients along a closed path, initial movement of said mixed ingredients after withdrawal being through a closed mechanical conveyor portion of said closed path, to an incremental charge measuring and forming position;

d. applying heat and pressure to said moving mixed ingredients along a portion of said closed path to effect partial plasticization thereof so said mixed ingredients reach said incremental charge measuring and forming position as a partially plasticized flow of uniform density, capable of being molded, but only if such molding is performed within a predetermined time;

e. measuring and forming successive separate incremental charges from said partially plasticized flow;

f. molding said incremental charges, within said predetermined time, under heat and pressure to form precured molded bodies of friction material; and

g. curing said precured molded bodies under heat.



4,108,936

PROCESS FOR DYEING WET-SPUN AROMATIC POLYAMIDES IN GEL FORM

Gerhard Dieter Wolf; Ralf Miessen; Hans Egon Kunzel, all of Dormagen, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,676

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1974, 2438545

Int. Cl.^{2} D06P *5/00;* B01D *47/06*

U.S. Cl. 264—78 **10 Claims**

1. A process for the production of dyed filaments of aromatic polyamides which comprises continuously dyeing wet-spun gel filaments of an aromatic polyamide which is not modified with acid or basic groups before, during, or after stretching, in an aqueous bath containing at least one cationic or anionic water-soluble dye in dissolved form.

4,108,937

METHOD OF MAKING HOLLOW ARTICLES FROM PLASTIC MATERIAL

Pierre Martineu, and Jean-Francois Gregoire, both of Chalon-sur-Saone, France, assignors to Carnaud Total Interplastic, Chalon-sur-Saone, France

Filed Feb. 20, 1976, Ser. No. 659,975

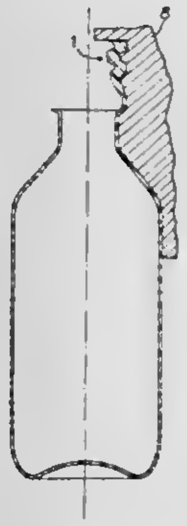
Claims priority, application France, Feb. 20, 1975, 75 05251; Aug. 6, 1975, 75 24499

Int. Cl.^{2} B29C *17/07*

U.S. Cl. 264—89 **2 Claims**

1. A process of manufacturing biaxially oriented hollow bodies from an elongated, generally cylindrical amorphous crystalline thermoplastic polyester parison which includes a neck part from which a neck is to be formed, comprising the steps of:

expanding said parison in a preform mold to form a preform while keeping said preform in an amorphous condition and then axially stretching said preform, including said neck part, at a temperature greater than, but close to, the glass transition temperature, to cause a substantial decrease in the diameter thereof, and expanding the preform, to an extent sufficient to cause biaxial orientation of the preform,



solidifying said preform in the biaxially oriented state and then thermostabilizing said preform,

and then deforming said preform at a temperature greater than, but close to, the glass transition temperature to produce said biaxially oriented hollow body.

4,108,938

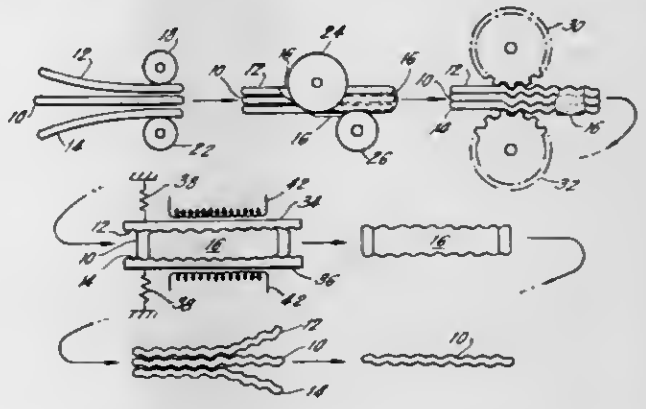
METHOD FOR SHAPING A PLASTIC MEMBRANE

Solomon Rosenblatt, Montclair, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 19, 1976, Ser. No. 706,793

Int. Cl.^{2} B27J *5/00*

U.S. Cl. 264—127 **13 Claims**



1. A method for shaping a plastic membrane, comprising the steps of:

placing the membrane between two covering layers, thereby forming a three layer composite;

applying forces to the composite to reshape it; and

setting the reshaped membrane to cause it to retain its new shape while it remains part of the composite.

4,108,939

POROUS POLYMERIC BEARING

Clifford Wilbelm Anderson, Pine Island; Kenneth John Mack, Lake City, and Jerry Thomas Martin, Plainview, all of Minn., assignors to International Business Machines Corporatinn, Armonk, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,381
Int. Cl.^{2} C08L *61/06*

U.S. Cl. 264—129 **17 Claims**

1. An antifriction bearing in which at least the material forming the bearing surface comprises at least two heterogenous interlocked phases of irregular shape; one of said phases being polyphenylene sulfide and the other being a cured phenolic resin; the presence of said cured phenolic resin providing highly interconnected voids within such compounded structure adaptable for impregnation with a liquid lubricant.

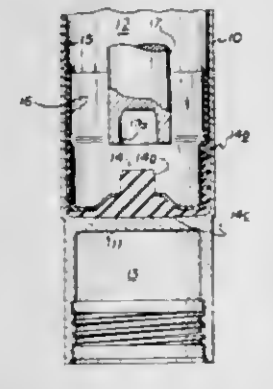
4,108,940

COLD MOLDING OF FLEXIBLE ARTICLES

Jacques Ratté, Ste-Foy, and Pierre Carignan, Charlesbourg, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Continuation-in-part of Ser. No. 663,995, Mar. 4, 1976, abandoned. This application Dec. 28, 1976, Ser. No. 754,960
Claims priority, application Canada, Feb. 6, 1976, 245228
Int. Cl.^{2} B29D *3/02*

U.S. Cl. 264—140 **15 Claims**



7. A method of manufacturing an uncured, flexible head-end insulator for use in the propellant chamber of a rocket motor, said method comprising the steps of:

(a) forming a sheet material comprising about 20 to 50% by weight of a substantially uncured carboxyl-terminated polybutadiene binder having dispersed therethrough an asbestos reinforcing material in an amount of from about 80% to about 50% by weight, at least about half of said reinforcing material being in fibrous form and the balance in the form of floats;

(b) processing said sheet material into strips, discs or shreds;

(c) maintaining said strips, discs or shreds at sufficiently low temperature to at least inhibit curing thereof; and

(d) cold-molding said strips, discs or shreds in a substantially uncured condition to form said uncured head-end insulator.

4,108,941

SHEAR MOLDING OF REINFORCED LATCH

Gary H. Kermoian, Whittier, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.

Continuation of Ser. No. 680,248, Apr. 26, 1976, abandoned. This application Jun. 16, 1977, Ser. No. 807,263
Int. Cl.^{2} B29C *17/08*

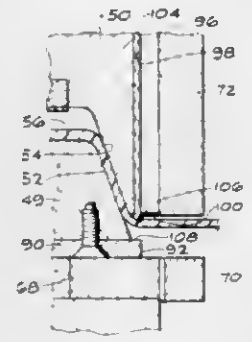
U.S. Cl. 264—154 **9 Claims**

1. In the shear molding of a container by forming a softened sheet of organic polymer material between male and female mold parts, in which said sheet is introduced between male and female mold parts arranged to close, said mold parts having male and female die surfaces respectively in confronting relation and shaped to define the contours of the surfaces of said container upon closure of said molds, the improvement for forming a latch opening and a reinforced area adjacent thereto in one operation, said improvement comprising:

releasably disposing at the exterior of said male mold part in the region of said latch opening a vertical flat die face forming a backwall for the path of travel of said sheet thereon;

releasably disposing above said backwall a vertically reciprocable shear member with a flat surface confronting said flat die face, and an anterior end portion formed as a die face;

moving said female mold part toward said male mold part to form said container;



sliding said shear member vertically past said die face and spaced therefrom, but at a distance less than the thickness of said sheet so as to separate a portion only of said sheet without sliding contact between said shear member and die face, said portion being spaced from all edges of said sheet so as to form an opening through said sheet;

carrying said separated sheet portion and proximate adjacent portions of said sheet away from said opening in a downward direction; and

compressing said separated sheet in a region defined by the anterior end portion of said shear member and opposite die surfaces to reinforce and to add strength and rigidity to a portion of the container structure adjacent said latch opening.

4,108,942

POLYPHENYLENE POLYMERS AND METHODS FOR MAKING THE SAME

Alan J. Chalk, Scotia, and Alfred R. Gilbert, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1972, Ser. No. 237,169
Int. Cl.^{2} C08F *4/66, 38/00*

U.S. Cl. 260—875 **3 Claims**

1. The process for making polyphenylene polymers which comprises polymerizing, in the presence of a titaniumaluminum catalyst of the formula $TiCl_4/Al(C_2H_5)_2Cl$ made by the reaction of $Al(C_2H_5)_2Cl$ and $TiCl_4$ in a molar ratio of from 1.5 to 5 mols of the $Al(C_2H_5)_2Cl$ per mol of the $TiCl_4$, (a) a phenyl acetylene compound selected from the class consisting of phenyl acetylene and m-tolyl acetylene and (b) diethynyl benzene, whereby from 25 to 75% by weight of the phenyl acetylene compound is first interacted with the diethynyl benzene in the presence of the titanium-aluminum catalyst, and the remainder of the phenyl acetylene compound is added after the aforesaid initial reaction.

4,108,943

RUBBER MODIFIED FIRE RETARDANT POLYMER COMPOSITIONS

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 644,492, Dec. 29, 1975, Pat. No. 4,048,263. This application Jul. 5, 1977, Ser. No. 812,557
Int. Cl.^{2} C08L *23/00*

U.S. Cl. 260—878 R **10 Claims**

1. A polymeric molding composition comprising:

(a) from 48 to 94 percent by weight based on the total weight of the molding composition of a rubber modified polymer which is the product of polymerizing:
  (1) from 55 to 85 percent by weight of a styrene monomer;
  (2) from 5 to 25 percent by weight of a maleic anhydride monomer; and
  (3) from 10 to 20 percent by weight of a brominated monomer selected from the group consisting of bromophenyl acrylates, bromophenyl methacrylates, bromoneopentyl acrylate and bromoneopentyl methacrylates with the proviso that the amount of bromine in the polymer is at least 6 percent by weight in the presence of
  (4) from 1 to 30 percent by weight of a graftable rubber substrate

(b) from 3 to 12 percent by weight based on the total weight of the molding composition of a metal oxide;

(c) from 3 to 25 percent by weight based on the total weight of the molding composition of a smoke suppressant which is selected from the group consisting of smoke suppressing hydrates, carbonates and borates; and

(d) from 0 to 15 percent by weight of a brominated aromatic fire retardant additive.

4,108,944

METAL SALTS OF MODIFIED ANHYDRIDE RESIN

James J. Tazuma, Stow, and Mario D. Zadra, Barberton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 699,910, Jun. 24, 1976, Pat. No. 4,071,669. This application Sep. 22, 1977, Ser. No. 835,615
Int. Cl.^{2} C08F *8/42*

U.S. Cl. 260—879 **8 Claims**

1. A metal salt of an anhydride-modified resin prepared by the method which comprises reacting in an aqueous medium (A) about 0.4 to about one equivalent of a water soluble salt selected from chlorides and nitrates of metals selected from zinc, aluminum, lead and cobalt and one equivalent of (B) the sodium or potassium salt of the acid of said anhydride modified resin, where said resin acid salt is prepared by reacting an aqueous solution of a hydroxide selected from at least one of sodium hydroxide and potassium hydroxide with said anhydride-modified resin where said anhydride-modified resin is comprised of about 45 to about 55 mole percent units derived from maleic anhydride and, correspondingly, about 55 to about 45 mole percent units derived from a piperylene/methyl branched monoolefin backboned resin comprising about 40 to about 70 weight percent units derived from piperylene and correspondingly about 60 to about 30 weight percent units derived from at least one methyl branched chain α or β monoolefin containing 4 to 6 carbon atoms, where the weight ratio of piperylene to said branched monoolefin is in the range of about 0.8/1 to about 2/1, where said anhydride modified resin is prepared by the method which comprises the steps of (1) reacting about 30 to about 60 parts by weight maleic anhydride or reacting about 10 to about 25 parts by weight maleic anhydride if an organo peroxide catalst is used at a temperature in the range of about 150° to about 250° C with 100 parts by weight of a basic hydrocarbon-derived resin having a softening point in the range of about 10° to about 50° C. prepared by polymerizying in the presence of a catalyst selected from boron trifluoride etherate, a monomer mixture which comprises about 40 to about 70 weight present piperylene, and correspondingly, about 60 to about 30 weight percent of at least one monoolefin selected from methyl branched chain α or β monoolifins containing 4 to 6 carbon atoms, where the weight ratio of piperlene to said branched chain monoolefin is about 0.8/1 to about 2.0/1 and (2) removing unreacted maleic anhydride, if any, preferably by distillation.

4,108,945

STAR POLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Lewis J. Fetters, and Le-Khac Bi, both of Akron, Ohio, assignors to The University of Akron, Akron, Ohio

Continuation of Ser. No. 488,676, Jul. 15, 1974, Pat. No. 3,985,830. This application Mar. 3, 1976, Ser. No. 663,541
The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.
Int. Cl.^{2} C08F *297/04*

U.S. Cl. 260—880 B **7 Claims**

1. A star polymer product comprising:

a nucleus having a plurality of molecules of a linking compound selected from the group consisting of aliphatic and aromatic diisocyanates, and aliphatic and aromatic diepoxides, diketones and dialdehydes having up to about 12 carbon atoms;

at least ten polymeric arms linked to said nucleus wherein said polymeric arms are formed from conjugated dienes and the ratio of molecules of linking compound to the number of polymeric arms in said star polymer is at least 6:1; and

characterized in that:

the number average molecular weight of said star polymer product is at least 500,000 and the intrinsic viscosity thereof ranges from about 0.1 to about 2.0 dl/gm.

4,108,946

GRAFT-POLYMER COMPOSITION OF RUBBER FOR REINFORCING CROSSLINKED RESIN

Kazumasa Kamada; Ryoji Handa, both of Ohtake; Norihisa Kusakawa, Yamaguchi, and Keita Yamamoto, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 10, 1973, Ser. No. 358,932
Claims priority, application Japan, May 15, 1972, 47-047823
Int. Cl.^{2} C08L *51/00, 33/00*

U.S. Cl. 260—881 **3 Claims**

1. A thermoplastic graft polymer composition excellent in weather and impact resistance and appearance which is obtained by emulsion-graft-polymerizing 5 to 1,900 parts by weight of monomer mixture of 10 - 90% by weight of at least one aromatic vinyl compound and 90 to 10% by weight of at least one ethylenically unsaturated compound having the general formula $CH_2 = CRX$, wherein R is H or CH_3, and X is CN or $COOR_1$ where R_1 is an alkyl group having 1 to 4 carbon atoms (total 100% by weight), in the presence of a latex containing 100 parts by weight of two-layered crosslinked acrylic rubber particles having a degree of swelling of 3 to 15 and obtained by seed-polymerizing 70 to 90 parts by weight of a mixture of 60% by weight or more of at least one acrylic ester, 39.9% by weight or less of at least one monomer copolymerizable therewith and 0.1 to 10% by weight of at least one crosslinking monomer having at least two non-conjugated C = C bonds (total 100% by weight), in the presence of 30 to 10 parts by weight (solids) of a latex (particle size 0.04 to 0.24μ) of a crosslinked rigid resin having a glass transition temperature of at least 50° C and a decomposition temperature of at least 240° C and consisting of 40 to 70% by weight of styrene, 15 to 50% by weight of methyl-methacrylate, 10 to 30% by weight of acrylonitrile, and 0.01 to 3% by weight of a crosslinking monomer.

4,108,947

THERMOPLASTIC ELASTOMER COMPOSITION

Kazuo Kimura; Masao Hirano; Isao Sugita, and Ryuzo Fujita, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1976, Ser. No. 679,973

Claims priority, application Japan, Apr. 30, 1975, 50-51421

Int. Cl.^{2} C08L *9/00, 23/00, 47/00*

U.S. Cl. 260—889 **13 Claims**

1. A thermoplastic elastomer composition consisting essentially of (A) 2 to 50% by weight of a polybutadiene having a 1,2-addition unit content of 70% or more and an intrinsic viscosity [η] of 0.7 dl/g or more as measured in toluene at 30° C, (B) 20 to 90% by weight of at least one olefinic rubber selected from the group consisting of random ethylene-propylene copolymer and random ethylene-propylene-non-conjugated diene copolymer and (C) 5 to 60% by weight of a polyolefin resin, 30 to 95% by weight of the total polymer components, up to 90% by weight of said polybutadiene and up to 90% by weight of said olefinic rubber being soluble in 1,2,3,4-tetrahydronaphthalene when the composition is heated at 210° C for 3 hours in 1,2,3,4-tetrahydronaphthalene under reflux.

4,108,948

COMPATIBILIZATION OF THERMOPLASTIC COPOLYMERS

Ervin G. Pritchett, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 794,786

Int. Cl.^{2} C08L *23/08*

U.S. Cl. 260—897 B **29 Claims**

1. A method for the compatibilization of materials normally incompatible with each other which comprises mixing (a) a thermoplastic copolymer of an alkenyl aromatic monomer and an alkenyl nitrile monomer, (b) a thermoplastic copolymer of ethylene and a vinyl ester having a melt flow rate less than about one measured according to ASTM D-1238, Condition E, in the presence of a compatibilization effective amount of (c) an acid compatibilization agent prior to, concurrently with, or subsequent to, mild-crosslinking of copolymer (b) for a period of time sufficient to achieve compatibilization of copolymer (a) and (b).

4,108,949

O-HYDROXY (ALKOXY) PHENYLTHIOMETHYLENE DI(ORGANOPHOSPHORUS) COMPOUNDS AND PROCESS FOR MAKING SAME

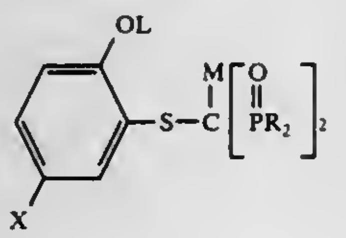
Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1977, Ser. No. 756,507

Int. Cl.^{2} C07F *9/32, 9/50*

U.S. Cl. 260—932 **13 Claims**

1. As a composition of matter,



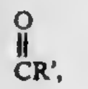
where

L is H or R',

R' is alkyl of 1 to 6 carbon atoms,

M is H, Cl or Br

X is Br, Cl, F, CF_3, NO_2, CN, CO_2R', SO_2R',or

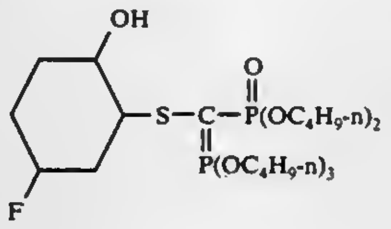


$$\overset{\overset{\displaystyle O}{\|}}{C}R',$$

and

R is phenyl, alkyl of 1 to 3 carbon atoms, or OR'.

9. Process for preparation of tetrabutyl (2-butoxy-5-fluorophenylthio)methylenediphosphonate which comprises heating the compound



at a temperature of 125° C to 200° C.

4,108,950

PROCESS FOR PREPARING ORGANOPHOSPHORUS AND ORGANOPHOSPHONO FLUORINES

Joseph Epstein, Baltimore, and George T. Davis, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1977, Ser. No. 792,427

Int. Cl.^{2} C07F *9/14;* **A01N** *9/36*

U.S. Cl. 260—986 **5 Claims**

1. A process for preparing toxic organophosphorus-fluorine and organophosphono-fluorine compounds in situ comprising the step of mixing a phosphorus ester selected to produce a corresponding organophosphorus-fluoridate, in an aprotic solvent with a solution of tetraethylammonium fluoride in said solvent to produce a low concentration solution of anticholinesterase active organophosphorus-fluoridate.

4,108,951

ACCELERATOR PUMP SYSTEM

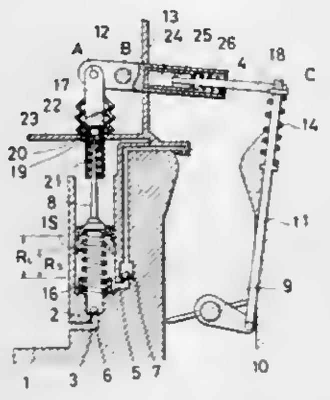
Takao Niwa; Mamoru Yoshioka, and Takao Tate, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 2, 1977, Ser. No. 773,548

Claims priority, application Japan, Dec. 28, 1976, 51-157418

Int. Cl.^{2} F02M *7/08*

U.S. Cl. 261—34 B **3 Claims**



1. An accelerator pump assembly for delivering fuel to an engine carburetor which includes a throttle valve, said assembly comprising flow means for delivering fuel through said pump assembly into said carburetor, a rocker arm assembly having a first and a second end, said rocker arm assembly being pivotally mounted at a point intermediate said ends, connecting rod means interconnecting said first end of said rocker arm assembly with said throttle valve of said carburetor to effect pivotal movement of said rocker arm assembly about said intermediate pivot point in response to movement of said throttle valve, a pump plunger assembly mounted to extend from said second end of said rocker arm assembly and reciprocally movable through an injection stroke in response to movement of said throttle valve to inject fuel through said flow means into said carburetor, first thermally responsive means interposed between said intermediate pivot point of said rocker arm assembly and said first end thereof to expand and contract the distance therebetween in response to ambient temperature, and second thermally responsive means interposed as part of the length of said plunger assembly to expand and contract said length thereof by which said plunger assembly extends from said second end of said rocker arm assembly in response to ambient temperature thereby to alter the injection stroke of said plunger assembly, said first and said second thermally responsive means altering the stroke characteristics of said pump plunger assembly in response to ambient temperature conditions thereby to adjust the quantity of fuel injected into said carburetor in accordance with changes in ambient temperature.

4,108,952

VARIABLE VENTURI TYPE ENGINE CARBURETOR

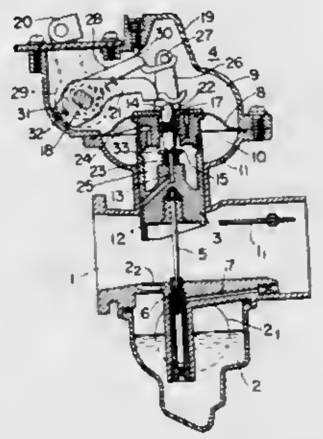
Suminari Iwao, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1977, Ser. No. 789,456

Claims priority, application Japan, Apr. 23, 1976, 51-51186[U]

Int. Cl.^{2} F02M *9/06*

U.S. Cl. 261—44 R **10 Claims**



1. A variable venturi type carburetor comprising, in combination:

(a) a carburetor main body;

(b) an air intake passageway formed in said carburetor main body;

(c) a piston type throttle valve provided in the air intake passageway and which also serves as a variable venturi;

(d) a pressure receiving part provided on the upper part of said throttle valve, and having a function of opening the throttle valve upon receipt thereinto of an intake negative pressure of the engine;

(e) control means for opening and closing the throttle valve which is supported on the rotational shaft within said pressure receiving part, and restricts said throttle valve to a predetermined degree of opening by closing and opening the valve in association with the throttle valve operation; and

(f) compulsory valve opening means interposed between said throttle valve and said throttle valve control means interlocked with the valve operation, said compulsory valve opening means following movement of said control means for opening and closing the throttle valve, and having a function of forcibly opening said throttle valve from its lowest degree of opening to a predetermined degree of opening when said control means moves toward the throttle valve opening direction.

4,108,953

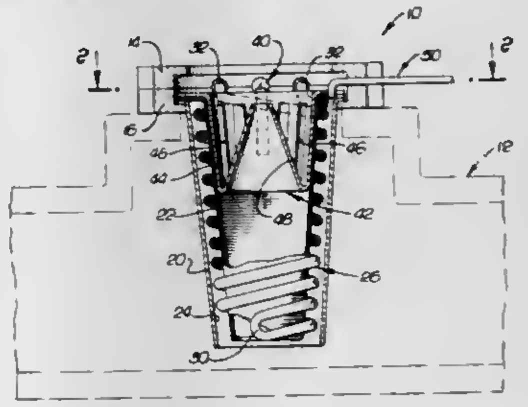
FUEL VAPORIZING DEVICE

Andrew Rocco, 21207 S. Avalon, Space 194, Carson, Calif. 90745

Continuation-in-part of Ser. No. 683,325, Jul. 19, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,194

Int. Cl.^{2} F02M *23/12, 31/12*

U.S. Cl. 261—142 **8 Claims**



1. In a fuel vaporizing device for installation between a carburetor and an intake manifold of an internal combustion engine with the device extending into the intake manifold, the combination of:

(a) a heat conducting tubular housing having an open, upper inlet end and an open, lower outlet end;

(b) means for mounting said housing between the carburetor and the intake manifold of the engine with the housing extending downwardly into the intake manifold;

(c) a heat conducting screen within and coaxial with and substantially parallel to said housing, there being an annular space between said housing and said screen;

(d) a heat conducting helical coil within said annular space and coaxial with said housing and said screen, said helical coil being in contact with said screen and spaced radially inwardly from said housing; and

(e) means for heating said helical coil.

4,108,954

PROCESS OF PRODUCING SHAPED STRUCTURES OF CROSSLINKED ELASTOMERIC POLYURETHANE

Karl Heinz Hilterhaus, Georgsmarienhutte, Oesede, and Franz Gottfried Reuter, Lemforde, both of Germany, assignors to Chemie-Anlagenbau Bischofsheim GmbH, Osnabruck and Reuter Technologie GmbH, Lemforde, both of Germany

Filed Nov. 10, 1975, Ser. No. 630,491

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1974, 2459757

Int. Cl.^{2} B29D *7/02;* **C08G** *18/08, 18/32*

U.S. Cl. 264—216 **19 Claims**

1. A process for producing crosslinked elastomeric shaped polyurethane structures from crosslinked polyurethanes dissolved in solvents, comprising

(a) providing an NCO pre-adduct dissolved in a solvent;

(b) providing a solution of solvent and at least one agent selected from the group of crosslinking agents and chain propagating agents, said at least one agent being selected from the group consisting of hydrazines, hydrazine derivatives, diamines, and polyols, with the proviso that, if only two hydrogen atoms active according to Zerewitinov are present in these agents, an agent must be additionally used which contains at least three hydrogen atoms of different activities according to Zerewitinov;

(c) continuously admixing the NCO pre-adduct solution into the solution of at least one agent selected from the group consisting of crosslinking agents and chain propagating agents over a period of time during which the viscosity is constantly measured, until the viscosity is within a range where the addition of smaller and smaller amounts of

NCO pre-adduct solution results in an ever growing rise in viscosity;

(d) terminating the addition of said pre-adduct solution when the viscosity of the admixture has reached a level at which the addition of even the minutest amount of NCO pre-adduct solution would result in instantaneous gelling, the NCO pre-adduct solution being added in an amount such that the final solution has a solids content between 15 and 35% by weight;

(e) shaping the admixture; and

(f) removing said solvent from the shaped mixture.

4,108,955

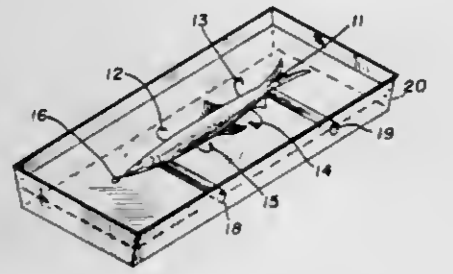
METHOD FOR MAKING A FISHING LURE

Joseph R. Thom, 1217 Johnson Ave., Point Pleasant, N.J. 08742

Filed Mar. 21, 1977, Ser. No. 779,626

Int. Cl.^{2} B29C *5/00;* **B29D** *3/00*

U.S. Cl. 264—222 **7 Claims**



1. A method for making a fishing lure comprising the steps:
pouring mold material into a mold form to provide a lower part of a mold;
embedding a specimen of a bait fish partially into said mold material in said lower part of said mold;
embedding hooks of a given shape in the surface of said lower part of said mold adjoining said specimen of bait fish;
embedding an eye of a given size adjoining the head of said specimen of bait fish;
embedding at least one rod within said lower part of said mold between said bait fish and one of the edges of said mold;
pouring additional mold material into said mold form to cover all of the elements embedded in said lower part of said mold, and to provide an upper part of said mold;
allowing said mold material to harden or set;
separating said upper part of said mold from said lower part of said mold;
removing said specimen of bait fish, said hooks, said eye, and said rods from said mold;
positioning a series of inserts comprising hooks of said given shape, and eye of said given size, with suitable interconnecting means, in the respective cavities in said mold;
clamping said upper part of said mold to said lower part of said mold;
positioning said mold so that a cavity in said mold formed by one of said rods is pointing upwards;
pouring molding material into said mold through said cavity in said mold formed by said one of said rod cavities until said mold cavities are filled;
allowing said molding material to harden;
separating said upper and said lower parts of said mold;
removing said molded fishing lure from said mold;
cutting off any projections from said rod portions of said mold to produce a finished fishing lure.

4,108,956

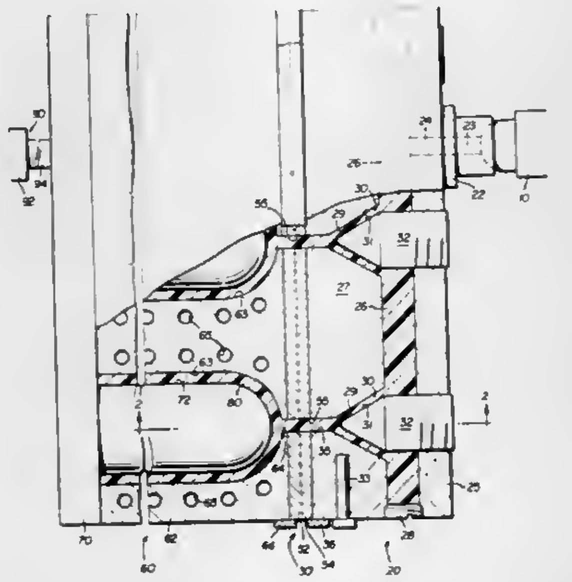
INJECTION MOLDING METHOD AND APPARATUS

Soo-Il Lee, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 21, 1977, Ser. No. 761,095

Int. Cl.^{2} B29F *1/03, 1/08*

U.S. Cl. 264—329 **15 Claims**



1. In an injection molding assembly: a heated runner housing having a sprue opening to receive plasticized material under pressure from an injection head, a plurality of branch runner lines, and a transverse runner cavity interconnecting the sprue opening with the branch runner lines; a cooled mold assembly adjacent the heated runner housing, the mold assembly including mold sections defining a plurality of mold cavities, with each cavity having an injection port in alignment with the branch runner lines of the heated runner housing, the improvement of: a composite, laminated, slidable gate valve interposed between the cooled mold assembly and the heated runner housing, said laminated valve including a thermally conductive layer contacting the mold assembly and a thermally insulating layer contacting the runner housing, the gate valve having a plurality of openings formed therethrough which are selectively positioned in alignment with the branch runner lines and the injection ports to establish communication therebetween to accommodate the flow of heated plastic material from the heated runner housing into the cooled mold assembly, displacement means selectively moving the slidable gate valve to align the valve openings with the branch lines and mold injection ports and to displace the valve openings from such alignment to block the flow of plastic material into the mold cavities; the composite gate valve being effective to thermally segregate the cooled mold cavity from the adjacent heated runner housing in order to (1) facilitate the cooling of the molded article, (2) reduce cycle time, and (3) prevent the formation of a cold plastic slug in the runner housing.

12. In a method of forming a plastic article by injection molding, the steps of:

(a) injecting heated, flowable plastic material under pressure from a delivery port in a heated runner housing, through a flow passageway in a composite slidable gate valve, and into a sprue opening of an internal mold cavity of a cooled mold assembly, the slidable gate valve being interposed between the heated runner housing and the cooled mold assembly, and said composite valve comprising a layer of insulating material contacting the heated runner housing and a layer of heat conductive material contacting the cooled mold assembly;

(b) displacing the slidable gate valve in a direction essentially perpendicular to the direction of plastic flow from the runner housing to the mold cavity thereby displacing the flow passageway in the gate valve out of alignment with the delivery port and the sprue opening to block plastic flow;

(c) simultaneously (i) cooling the plastic material within the mold cavity and (ii) heating additional plastic material within the runner housing; and

(d) during the performance of steps (a)-(c), (i) thermally segregating the adjacent heated runner housing and the cooled mold assembly by use of the insulating material layer of the slidable gate valve and (ii) cooling the material in the sprue opening by the conductive material layer of the slidable gate valve.

4,108,957

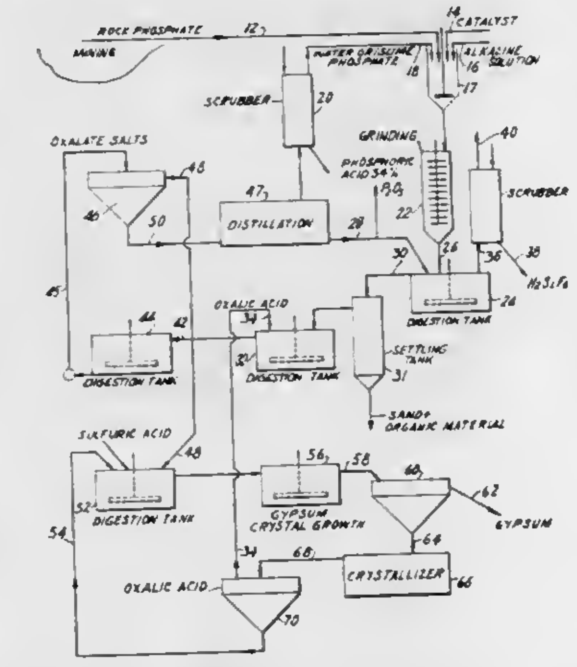
METHOD FOR MANUFACTURE OF PHOSPHORIC ACID FROM PHOSPHATE ROCK

Robert Michel, c/o Toren, McGeady and Stanger P.C., 521 Fifth Ave., New York, N.Y. 10017

Continuation-in-part of Ser. No. 665,330, Mar. 9, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,855

Int. Cl.^{2} C01G *43/00*

U.S. Cl. 423—3 **15 Claims**



1. A method for the manufacture of phosphoric acid from phosphate rock comprising

(a) mixing crushed phosphate rock with a stoichiometric excess of phosphoric acid in the presence of water to form a slurry and heating the slurry at a temperature and for a period of time sufficient to convert the rock into a calcium monophosphate;

(b) adding oxalic acid to the heated slurry to form a slurry of precipitated calcium oxalate therein; and

(c) recovering the phosphoric acid from the slurry resulting from step (b).

4,108,958

EXTRACTION OF CU(II), FE(III), NI(II), CO(II), CD(II), ZN(II), CA(II) AND MG(II) METAL VALUES USING 2-HYDROXY IMINOACETIC ACIDS

Riekert Kok, and Abraham J. van der Zeeuw, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

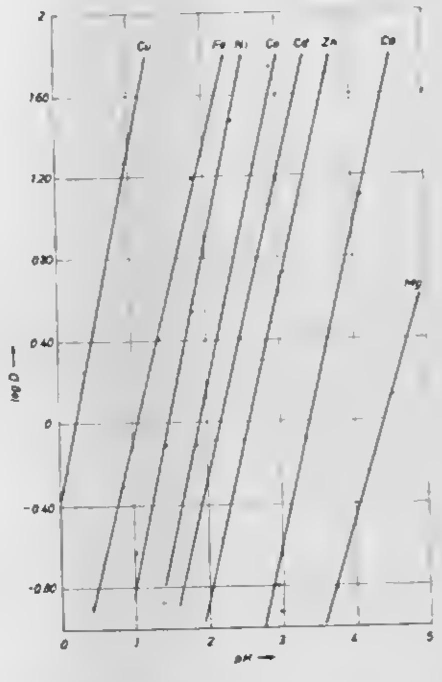
Division of Ser. No. 723,115, Sep. 14, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,108

Claims priority, application United Kingdom, Sep. 18, 1975, 38379/75

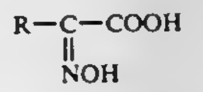
Int. Cl.^{2} C01G *3/00, 9/00, 51/00, 53/00*

U.S. Cl. 423—24 **6 Claims**

1. In the process of selectively extracting at least one metal value of the group consisting of copper (II), iron (III), nickel (II), cobalt (II), cadmium (II), zinc (II), calcium (II) and magnesium (II) from an acidic aqueous medium using an organic solvent and a complexing agent at a pH between about 0.0 and about 4.5, separating organic and aqueous layers and extracting the metal ions from the organic layer with a mineral acid



solution, the improvement which consists of using as the complexing agent a compound having the formula



$$\mathrm{R{-}\underset{\underset{\displaystyle NOH}{\|}}{C}{-}COOH}$$

where R is an aryl group having between 1 and 3, inclusive, aliphatic groups attached thereto, where the total aliphatic carbons are at least 4.

4,108,959

PROCESS FOR TREATING A WASTE GAS

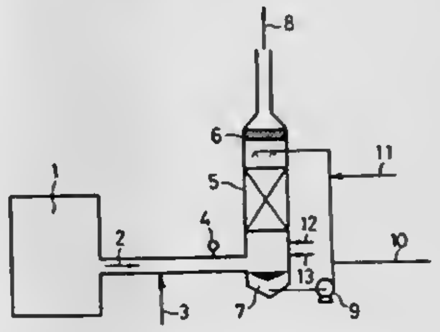
Atsushi Tatani; Setsuo Omoto, and Yoshihiro Shiraishi, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 29, 1977, Ser. No. 820,383

Claims priority, application Japan, Aug. 2, 1976, 51-91334

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—240 **7 Claims**



1. A process for treating a waste gas containing SO_2 and HCl which comprises determining the amount of HCl in said waste gas and supplying at least one magnesium salt selected from the group consisting of $MgSO_4$, $MgSO_3$, MgO, $MgCO_3$ and $Mg(HSO_3)_2$ in an amount corresponding to the amount of HCl, and additionally supplying $CaCO_3$ or $Ca(OH)_2$ as an absorbent for SO_2 to a column for treating said waste gas.

4,108,960
COMPOSITIONS CONTAINING DITHIONITES

Roland Albert Leigh, Port Elizabeth, South Africa, assignor to BOC Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,613

Int. Cl.² C01B *17/66*

U.S. Cl. 423—265 **2 Claims**

1. An essentially anhydrous composition containing metal dithionite and at least one aromatic carbonyl compound selected from the group consisting of vanillin, ethyl vanillin and benzoin as a stabilizer therefor, wherein the metal dithionite constitutes at least 50% by weight of the composition and the aromatic carbonyl compound constitutes from 0.1% to 5% by weight of the composition.

4,108,961
PROCESS OF STABILIZATION OF ANHYDROUS DIBASIC CALCIUM PHOSPHATE AGAINST FLUORINE IONS WITH AZACYCLOALKANE-2,2-DIPHOSPHONIC ACIDS

Walter Plöger, Hilden, and Claus Gutzschebauch, Neuss, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

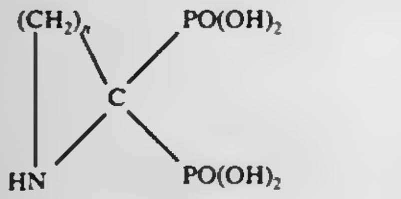
Filed Dec. 1, 1975, Ser. No. 636,736

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456808

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—265 **5 Claims**

1. A process for stabilizing anhydrous dibasic calcium phosphate against reaction with fluorine ions consisting essentially of suspending anhydrous dibasic calcium phosphate in an aqueous medium at a pH of from 5 to 10, containing from 0.01% to 5% by weight based on the content of dibasic calcium phosphate of an azacycloalkane-2,2-diphosphonic compound selected from the group consisting of (A) compounds of the formula



wherein *n* is an integer from 3 to 5, and (B) water-soluble salts thereof, and separating said stabilized anhydrous dibasic calcium phosphate.

4,108,962
PROCESS OF STABILIZATION OF ANHYDROUS DIBASIC CALCIUM PHOSPHATE AGAINST FLUORINE IONS WITH 3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONIC ACID

Walter Plöger, Hilden, and Claus Gutzschebauch, Neuss, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 1, 1975, Ser. No. 636,737

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456693

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—265 **5 Claims**

1. A process for stabilizing anhydrous dibasic calcium phosphate against reaction with fluorine ions consisting essentially of suspending anhydrous dibasic calcium phosphate in an aqueous medium at a pH of from 5 to 10, containing from 0.01% to 5% by weight based on the content of dibasic calcium phosphate of a diphosphonic compound selected from the group consisting of (A) 3-amino-1-hydroxypropane-1,1-diphosphonic acid, and (B) water-soluble salts thereof, and separating said stabilized anhydrous dibasic calcium phosphate.

4,108,963
PROCESS FOR PURIFYING PHOSPHORIC ACID

Jean-Pierre Cuer, Colombes, and Antoine Floreancig, Mitry Mory, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 586,712, Jun. 13, 1975, abandoned. This application May 16, 1977, Ser. No. 797,181

Claims priority, application France, Jun. 25, 1974, 74 22031

Int. Cl.² C01B *25/16*

U.S. Cl. 423—321 S **13 Claims**

1. A method for purifying crude wet-process phosphoric acid containing at least one of vanadium or chromium as anionic metallic complexes which comprises, in combination:

(A) treating crude wet-process phosphoric acid with sufficient amounts of a sulfide or metallic iron in aqueous medium to convert said anionic complexes of high oxidation levels to cationic forms of lower oxidation levels;

(B) extracting the treated crude wet-process phosphoric acid of Step (A) with a water-immiscible solvent selected from the group consisting of monoalcohols and ethers having four to eight carbon atoms or mixtures thereof at a temperature of 20° to 60° C.;

(C) removing cationic impurities from the treated medium of Step (B) by separating phosphoric acid containing anionic impurities in the water-immiscible solvent;

(D) re-extracting the separated water-immiscible solvent of Step (C) at a temperature of 20° to 60° C. with water to permit the phosphoric acid and anionic impurities to be reextracted into a second aqueous phase;

(E) contacting the second aqueous phase with a water-immiscible alkaline liquid medium having a poor dissolving power for phosphoric acid and containing from about 5% to 100% of a secondary or tertiary amine having from 18 to 60 carbon atoms so that the anionic impurities are transferred to said alkaline liquid medium; and

(F) physically separating the second aqueous phase containing purified phosphoric acid.

4,108,964
PROCESS FOR THE MANUFACTURE OF SILICON DIOXIDE

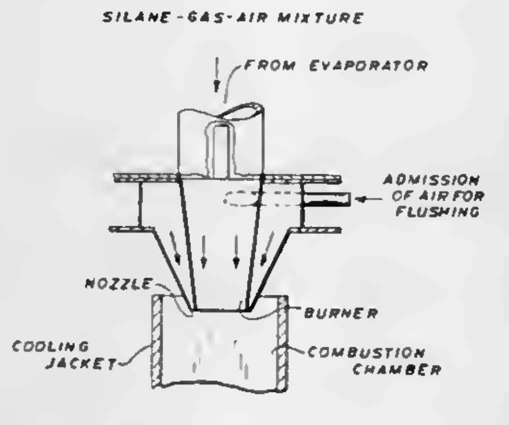
Günter Kratel, Durach-Bechen; Ernst Mühlhofer, Durach, and Franz Schreiner, Sulzberg, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,502

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620737

Int. Cl.² C01B *33/12*

U.S. Cl. 423—336 **5 Claims**



1. A process for the manufacture of highly disperse silicon dioxide by reacting gaseous organosilane and other gases that burn to form water other than gaseous organosilane and with oxygen-containing gases in a flame which comprises the steps of:

evaporating the organosilane in such a manner that the level of liquid organosilane is held constant, at a vapor pressure of 0.2 to 1.2 atmospheres gage and at most at a temperature of 45° above the boiling point of the particular organosilane,

maintaining the temperature of the vapor until mixing with said other gases and said oxygen-containing gases occurs,

metering the gas mixture resulting from the mixing through a cone-shaped inlet into a combustion chamber,

flushing oxygen-containing gases through means surrounding the inlet into the combustion chamber, and

indirectly but positively cooling said combustion chamber.

4,108,965
$(NF_4)_2NIF_6$ HIGH ENERGY SOLID PROPELLANT OXIDIZER AND METHOD OF PRODUCING THE SAME

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1976, Ser. No. 732,623

Int. Cl.² C01G *53/00*

U.S. Cl. 423—351 **4 Claims**

1. An improved, high energy, fluorine containing oxidizer consisting of a compound having NiF_6^{--} as an anion, and an energetic cation.

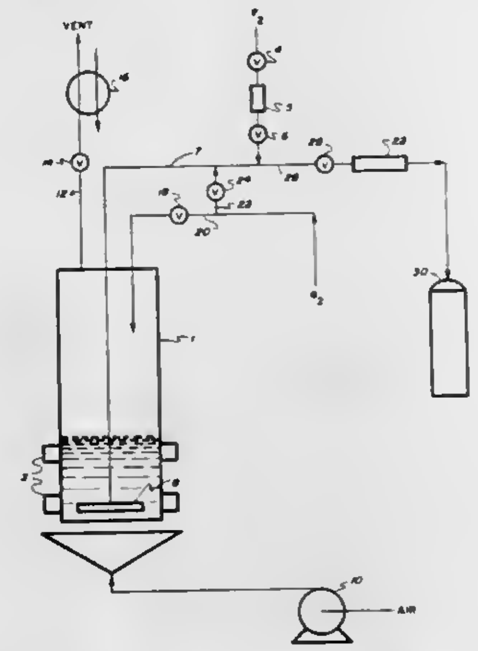
4,108,966
PREPARATION OF IODINE PENTAFLUORIDE BY DIRECT FLUORINATION OF MOLTEN IODINE

John Theodore Lileck, Tamaqua, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Oct. 26, 1977, Ser. No. 845,695

Int. Cl.² C01B *7/24*

U.S. Cl. 423—466 **8 Claims**



1. A process for producing iodine pentafluoride from iodine and gaseous fluorine which comprises contacting said fluorine with iodine in a molten state in a reaction zone maintained at a temperature in the range of about 114° to 280° and at a pressure in the range of about 160 to 7,600 kilopascals to effect a reaction between said fluorine and molten iodine and recovering the resulting iodine pentafluoride.

4,108,967
PROCESS FOR PREPARING SULPHUR HEXAFLUORIDE

Joachim Massonne, Hanover, and Wilfried Becher, Heilbronn-Neckargartach, both of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

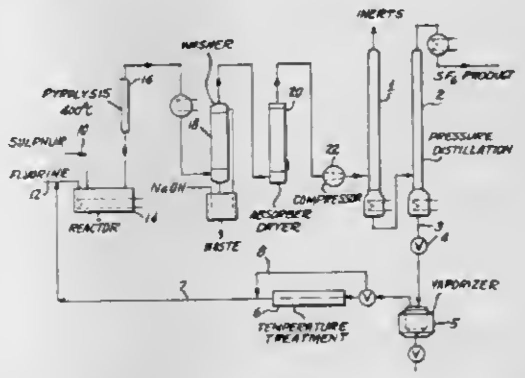
Division of Ser. No. 550,159, Feb. 14, 1975, Pat. No. 4,039,646. This application Jun. 15, 1977, Ser. No. 806,674

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1974, 2407492

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Int. Cl.² C01B *17/45*

U.S. Cl. 423—469 **9 Claims**



1. In a process for the production of sulphur hexafluoride SF_6 including the steps of reacting fluorine and molten sulphur, whereby a mixture of SF_6 together with higher- and lower-boiling by-products is produced, removing said lower-boiling by-products from said mixture, and separating a portion of said SF_6 from said higher boiling by products, whereby a residue of said SF_6 containing a minor portion of higher-boiling by-products results, the improvement comprising the step of recycling said residue back to said reacting step.

4,108,968
CONTROL OF PURITY AND PARTICLE SIZE IN PRODUCTION OF ALUMINUM CHLORIDE

Stanley C. Jacobs, Lower Burrell, Pa.; Larry K. King, Maryville, Tenn., and Bernard J. Racunas, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 765,458, Feb. 3, 1977, abandoned. This application Jul. 21, 1977, Ser. No. 817,822

Int. Cl.² C01F *7/58*

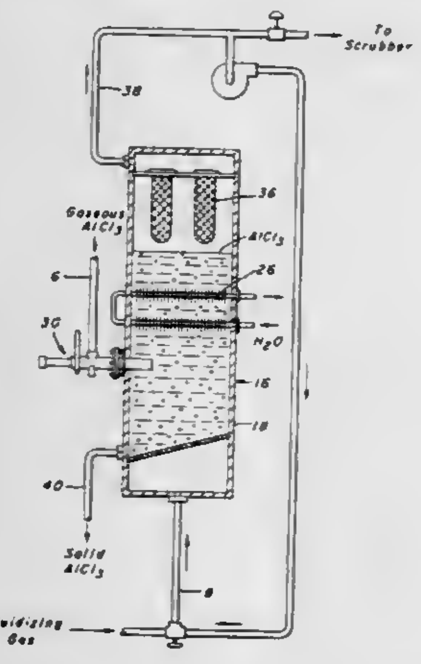
U.S. Cl. 423—495 **3 Claims**

1. In the process for the production of aluminum chloride having a particle size range and purity suitable for subsequent electrolytic reduction to metallic aluminum by the chlorination of a material containing a compound of aluminum wherein other chlorides are also formed which must be separated from the aluminum chloride prior to said electrolytic reduction, the improvement in purity control and particle size control which comprises:

(a) passing gaseous aluminum chloride at a temperature of about 250° C into a fluidized bed of aluminum chloride particles at an entrance velocity of from 18 meters/second to 90 meters/second;

(b) condensing aluminum chloride in the fluidized bed at a temperature of 60°–80° C; and

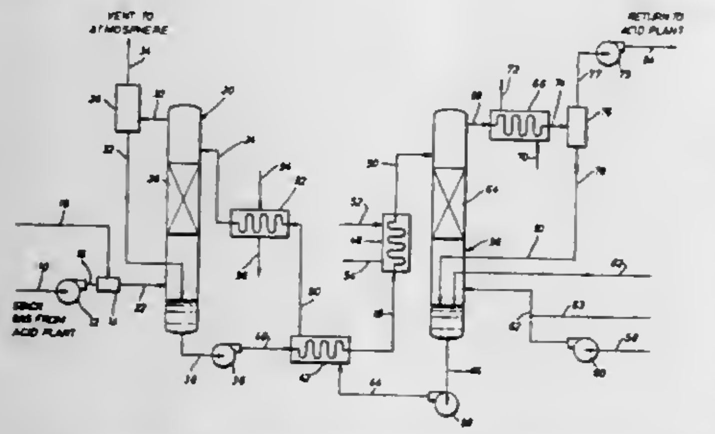
(c) removing particles of condensed aluminum chloride from a point adjacent the bottom of the fluidized bed thereby providing particles of aluminum chlorides characterized by a particle size range of 1-500 microns, a purity of at least 99.5% by weight, and a $TiCl_4$ content of less than 0.008% by weight.



4,108,969

PROCESS FOR THE REMOVAL OF SO_2 FROM A STACK GAS, ABSORPTIVE MEDIUM FOR USE IN PROCESS AND PROCESS FOR PREPARING THE ABSORPTIVE MEDIUM

George G. Merkl, 46 Sunset Ct., Haworth, N.J. 07641
Division of Ser. No. 598,170, Jul. 22, 1975, Pat. No. 4,012,487, which is a continuation-in-part of Ser. No. 346,772, Apr. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 86,364, Nov. 2, 1970, abandoned, Continuation-in-part of Ser. No. 515,311, Oct. 16, 1974, abandoned, which is a continuation of Ser. No. 238,290, Mar. 27, 1972, abandoned. This application Jul. 27, 1976, Ser. No. 708,940
Int. Cl.² C01F *7/68*
U.S. Cl. 423—560 **9 Claims**



1. A process for producing an absorptive medium capable of removing quantities of SO_2 from gas streams which comprises:
contacting activated aluminum with SO_2 gas in an aqueous medium at a pH between about 0.5 and 4.0 and at a temperature between about 40° F and 120° F until a solution is formed having a specific gravity between about 1.05 and 1.5; and thereafter
removing any unreacted aluminum and precipitated or suspended material from said soltuion;
said activated aluminum having been formed by wetting substantially pure aluminum with a second metal selected from the group consisting of mercury, indium, gallium and alloys of indium/gallium in the presence of a source of protons selected from aqueous acid solutions and aqueous alkaline solutions until at least the surface layer of said aluminum has been permeated with said second metal.

4,108,970

PROCESS FOR PRODUCING LITHIUM NIOBATE AND LITHIUM TANTALATE

Albert Anthony Ballman, Woodbridge, and Murray Robbins, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jul. 21, 1976, Ser. No. 707,718
Int. Cl.² C01G *33/00, 35/00;* C01D *15/00*
U.S. Cl. 423—593 **4 Claims**

1. A process for synthesizing double oxide compounds with nominal formula $LiMO_3$ in which M is selected from the group consisting of niobium and tantalum, comprising the steps of
(a) dissolving suitable lithium compound selected from the group consisting of lithium methoxide and lithium ethoxide and M compounds selected from the group consisting of M methoxide, M ethoxide, M pentafluoride, M pentachloride and M pentabromide in an organic solvent consisting essentially of at least one alcohol selected from the group consisting of ethanol and methanol, said lithium and M compounds dissolved in an organic solvent in approximately equally molar amounts,
(b) adding this solution to an alcohol-base solution consisting essentially of at least one alcohol with 3 or 4 carbon atoms and at least one basic compound selected from the group consisting of ammonia, quaternary ammonium salts, organic amines with up to 10 carbon atoms and heterocyclic nitrogen basic compounds said addition resulting in coprecipitate mixed hydroxide compound,
(c) separating and drying the resulting coprecipitate mixed hydroxide compound,
(d) heating the separated and dried coprecipitate to a temperature between 500° and 800° C so as to convert the hydroxide compound to the double oxide compound.

4,108,971

METHOD OF MANUFACTURE OF SPHERICAL ALUMINA PARTICLES

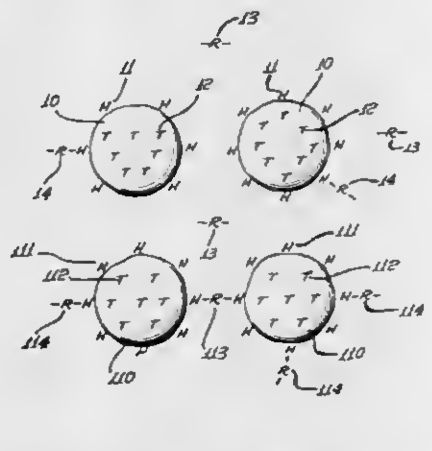
Shizuo Takumi, Kamakura; Toshio Hashimoto, and Masaru Tatsushima, both of Isehara, all of Japan, assignors to Nikki-Universal Co., Ltd., Tokyo, Japan
Filed Sep. 23, 1977, Ser. No. 836,065
Claims priority, application Japan, Feb. 25, 1977, 52-20117
Int. Cl.² C01F *7/02*
U.S. Cl. 423—428 **5 Claims**

1. In a method of manufacturing substantially spherical alumina particles comprising commingling alumina hydrosol with a weak base which has a strong buffering action and is thermally decomposable at elevated temperature, dispersing the resulting mixture as droplets in a suspending medium to effect gelation thereby forming substantially spherical alumina hydrogel particles, thereafter ageing said hydrogel particles in said suspending medium, then ageing said hydrogel particles in aqueous ammonium hydroxide solution, then washing said particles in water, then drying and calcining same to obtain spherical alumina particles, the improvement which comprises:
the step of ageing said hydrogel particles in aqueous ammonium hydroxide solution is performed by contacting said particles with an aqueous ammonium hydroxide solution having an ammonia concentration in the range of from about 0.05 wt.% to about 0.5 wt.% for a first time period of at least one hour and then subjecting the thus aged particles to further ageing by contacting said particles with aqueous ammonium hydroxide solution for a second time period of at least about six hours and during said second time period continuously increasing the concentration of ammonia in said solution from an initial ammonia concentration in the range of from about 0.05 wt.% to about 0.5 wt.% up to a final ammonia concentration in the range of from about 0.8 wt.% to about 2.5 wt.%.

4,108,972

IMMUNOLOGICAL REAGENT EMPLOYING RADIOACTIVE AND OTHER TRACERS

William J. Dreyer, 2369 Highland, Altadena, Calif. 91001
Continuation-in-part of Ser. No. 451,485, Mar. 15, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 631,378
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² A61K *43/00;* G01N *33/16*
U.S. Cl. 424—1 **21 Claims**



1. A reagent for use in immuno-assay, comprising
(a) water suspendible particles selected from the group consisting of acrylamide, acrylic acid and polyacrylic acid and derivatives thereof, polymers of styrene and derivatives thereof, agar, agarose, and cellulose acetate, each particle containing a plurality of radioactive tracer atoms distributed generally throughout the volume of the particle,
(b) the particles having coupled thereto a multiplicity of molecules of a substance selected from the group consisting of antibodies, antigens and portions and equivalents thereof.

4,108,973

IMMUNOASSAY FOR CATECHOLAMINES

Richard William Avenia, Nutley, and Benjamin Pecherer, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Aug. 25, 1976, Ser. No. 717,786
Int. Cl.² G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 **12 Claims**

1. A method for assaying for individual epinephrine type catecholamines selected from epinephrine, metanephrine, synephrine and phenylephrine in a test sample which method comprises in combination:
(A) determining the total epinephrine type catecholamine concentration by conducting an immunoassay on said test sample utilizing an antibody having specificity for epinephrine type catecholamines;
(B) treating an aliquot of said test sample with iodine at pH 7.4 so as to selectively convert any epinephrine present in said test sample to a form which is not bound by said antibody, treating said aliquot with excess aqueous sulfite solution so as to reduce any remaining iodine, adjusting the pH of the resulting solution to that required for said immunoassay and then determining the epinephrine type catecholamine concentration by conducting said immunoassay on said resulting solution representing the sum total of metanephrine, synephrine and phenylephrine present in said test sample;
(C) treating a second aliquot of said test sample with iodine at pH 8.6 so as to selectively convert any epinephrine and metanephrine present in said test sample to forms which are not bound by said antibody, treating said aliquot with excess aqueous sulfite solution, adjusting the pH to a level compatible for said immunoassay and then determining the concentration of epinephrine type catecholamines by conducting said immunoassay on said test solution, said concentration representing the sum total of synephrine and phenylephrine present in said test sample; and
(D) treating a third aliquot of said test sample with iodine at pH 9.2 so as to selectively convert any epinephrine, metanephrine and synephrine present in said test sample to forms which are not bound by said antibody, treating said aliquot with excess aqueous sulfite solution, adjusting the pH to a level compatible for said immunoassay and then determining the concentration of epinephrine type catecholamine by conducting said immunoassay on said test sample, said concentration representing the phenylephrine present in said test sample;
wherein the concentration of epinephrine is determined by subtracting the concentration found in Step (B) above from that of Step (A); the concentration of metanephrine is determined by subtracting the concentration found in Step (C) above from that of Step (B); and the concentration of synephrine is determined by subtracting the concentration found in Step (D) above from that of Step (C).

4,108,974

RADIOIMMUNOASSAY FOR THYROID HORMONE

Paul F. Wegfahrt, Oakland; Nathan Lewin, Corte Madera, and James F. Monthony, Albany, all of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.
Filed Aug. 27, 1976, Ser. No. 718,308
Int. Cl.² G01N *33/16*
U.S. Cl. 424—1 **19 Claims**

1. An improved radioimmunoassay for a thyroid hormone selected from the group consisting of thyroxine and triiodothyronine in an aqueous sample, which comprises contacting hydrolyzed cross-linked polyacrylamide particles, of about 0.1-10 microns in size in the unhydrolyzed form, said particles forming a substantially stable homogeneous hydrophylic suspension with said aqueous sample through the assay, said particles having bonded thereto, by covalent bonds, antibodies against the said thyroid hormone member to be determined, the aqueous sample containing said member and a corresponding thyroid hormone member labeled with a radioactive isotope to bind part of said labeled member and unlabeled member to said antibody to produce a two phase system comprising a solid phase containing said bound part of labeled member and unlabeled member and a liquid phase containing unbound labeled member and unlabeled member, separating the two phases from each other, and measuring the radioactivity of at least one of said solid and liquid phases, the value of said radioactivity being a function of the concentration of the said member in the aqueous sample.

4,108,975

RADIOIMMUNOASSAY SYSTEM

Richard Harold Hales, West Jordan, Utah, assignor to Becton, Dickinson and Company, Rutherford, N.J.
Filed Mar. 4, 1977, Ser. No. 774,277
Int. Cl.² G01N *33/16;* A61K *43/00;* B01J *1/22*
U.S. Cl. 424—1 **17 Claims**

1. In a method of radioimmunoassay wherein an antigen bearing sample and a radioactive labelled antigen are brought into contact with an immobilized immunoadsorbent to form a fraction bound to the immunoadsorbent and an unbound fraction and wherein the concentration of the antigen is determined as a function of the bound or unbound fraction, or both, the improvement comprising:
flowing an antigen bearing sample and a radioactive labelled antigen into contact with an immunoadsorbent comprised of a solid particulate substrate having covalently bound thereto antibodies specific to the antigen to form a bound and unbound fraction,
said antibody including carboxyl and amine functional groups,
said substrate including a barrier coating having attached thereto functional groups selected from the group consist-

ing of acyl azide, chlorothioformate, epoxide, carbonate, thiocarbonate, isocyanate, cyanuric chloride, polyazide, polychlorothioformate, polyepoxide, polycarbonate, polythiocarbonate, polyisocyanate, polycyanuric chloride, polyimidocarbonate, polyaldehyde and polythiol,

said antibody being conjugated to said substrate by reaction between one of said carboxyl and amine groups with one of said functional groups attached to said substrate through said barrier coating,

regenerating the immunoadsorbent by releasing substantially all of the antigens bound to the immunoadsorbent by rinsing said immunoadsorbent with an eluting solvent,

detecting the labelled antigen in at least one or both of the unbound fraction and the bound fraction released by said eluting solvent, and

reusing the immunoadsorbent for further assays of further samples containing the antigen to which said antibodies are specific.

4,108,976
AUTOMATED DIRECT SERUM RADIOIMMUNOASSAY

Max G. Reese, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Mar. 4, 1977, Ser. No. 774,390

Int. Cl.^{2} A61K *43/00;* G01N *33/16, 23/00*

U.S. Cl. 424—1 **10 Claims**

1. In a process for automated radioimmunoassay of an antigen sample by flowing the sample through a chamber containing an immobilized immunoadsorbent composed of particulate substrate having antibodies specific to the antigen covalently bound thereto, and wherein the sample contains proteins tending to plug up the particulate substrate, the improvement comprising:

diluting the sample to a consistency for free unplugged flow through the immobilized immunoadsorbent,

preincubating the sample with an antibody specific to the antigen in said sample being assayed together with a known amount of a radioactive labelled antigen to form a mixture including
  (a) unlabelled antigen bound to the antibody,
  (b) labelled antigen bound to the antibody,
  (c) free unbound unlabelled antigen, and
  (d) free unbound labelled antigen;

providing a chamber containing an immobilized immunoadsorbent including a solid particulate substrate having covalently bound thereto an antibody specific to said antigen and in an amount in excess of the sum of the free unbound labelled and unlabelled antigen,

flowing said mixture through said chamber to form two fractions, one of which is the free unbound labelled and unlabelled antigen bound to the antibody on said substrate and the second being the labelled and unlabelled antigen bound to the antibody during the preincubation step, whereby said second fraction passes through said chamber and said first fraction binds to the immobilized immunoadsorbent,

flowing an eluting solution through said chamber to effect release of said first fraction,

counting the radioactivity of at least one or both of the fractions leaving said chamber as a function of the quantity of the antigen sought to be assayed in said sample and rinsing the chamber for subsequent assays of other samples of the same antigen.

4,108,977
METHOD OF PRODUCING IMPROVED ANTIPERSPIRANT COMPOSITION

Divaker B. Kenkare, South Plainfield, and Durland K. Shumway, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,562

The portion of the term of this patent subsequent to Sep. 12, 1995 has been disclaimed.

Int. Cl.^{2} A61K *7/38*

U.S. Cl. 424—46 **11 Claims**

1. A method for making an antiperspirant composition comprising co-spray drying together a liquid mixture of (a), urea, and (b)an aqueous solution of aluminum chloride and (c) aluminum chlorhydrate to form an impalpable powder containing about 1–10% of component (a), about 6–12% of component (b) and about 78–92% of component (c).

4,108,978
DENTAL COMPOSITIONS

Salvatore Mazzanobile, Haworth, and Robert John Hillermeier, Fair Lawn, both of N.J., assignors to Beecham Inc., Clifton, N.J.

Continuation of Ser. No. 461,228, Apr. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 297,500, Oct. 13, 1972, abandoned. This application Feb. 2, 1976, Ser. No. 654,198

Claims priority, application United Kingdom, Oct. 20, 1971, 48671/71

Int. Cl.^{2} A61K *7/18*

U.S. Cl. 424—49 **6 Claims**

1. An oral hygiene composition in the form of a translucent dentifrice gel consisting essentially of: (a) from about 3 to about 14% of a silica xerogel of average particle size diameter of 25–30 microns; (b) from about 5.0 to about 10% of silica aerogel; (c) from about 1.0 to about 1.5% of sodium carboxymethylcellulose; (d) from about 20 to about 30% of glycerol; (e) from about 20 to about 50% of sorbitol; and (f) from about 1.05 to about 2.0% of sodium lauryl sulphate, the balance being water and agents for flavouring, sweetening and thickening said composition and providing it with anti-corrosive properties.

4,108,979
DENTIFRICE PREPARATIONS COMPRISING ALUMINUM AND A COMPATIBLE ABRASIVE

Joseph C. Muhler, Howe; Mark S. Putt, and Carl J. Kleber, both of Fort Wayne, all of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 2, 1976, Ser. No. 710,438

Int. Cl.^{2} A61K *7/16*

U.S. Cl. 424—49 **10 Claims**

1. A method for reducing decalcification and solubility of dental enamel and the incidence and severity of dental caries comprising the application to the teeth of a fluoride-free dentifrice preparation comprising a nontoxic and anticariogenically effective amount of at least one water-soluble aluminum salt and a dental abrasive consisting essentially of a member selected from the group consisting of purified, calcined kaolin, calcined aluminum silicate, silica, alumina, and mixtures thereof.

4,108,980
PROCESS OF PREPARING MATERIALS HAVING CALCIUM AND PHOSPHATE COMPONENTS

Edward John Duff, Sandbach, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 633,052, Nov. 18, 1975, abandoned, which is a continuation of Ser. No. 431,946, Jan. 9, 1974, abandoned. This application Mar. 4, 1977, Ser. No. 774,351

Claims priority, application United Kingdom, Jan. 11, 1973, 1633/73; Jul. 25, 1973, 35459/73; Jul. 25, 1973, 35470/73; Jul. 25, 1973, 35471/73; Jul. 30, 1973, 36095/73; Jul. 30, 1973, 36096/73; Jul. 31, 1973, 36428/73; Sep. 12, 1973, 32835/73

Int. Cl.^{2} A61K *7/16, 7/18;* A01N *11/00*

U.S. Cl. 424—52 **4 Claims**

1. A process of supplying fluoride to teeth comprising applying to the teeth a source of fluoride ions and an orthophosphoric acid solution having a pH of about 3–4, then neutralizing the pH to about 7 with an aqueous neutralizing solution containing calcium ions and phosphate ions, wherein there is present about a stoichiometric amount of the phosphate ions relative to the calcium ions, the neutralizing solution having a pH of about 7.

4,108,981
ALKALINE ORAL COMPOSITIONS COMPRISING ALUMINUM AND A CARBOXYLIC ACID

Joseph C. Muhler, Howe; Mark S. Putt, and Carl J. Kleber, both of Fort Wayne, all of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 2, 1976, Ser. No. 710,439

Int. Cl.^{2} A61K *7/24*

U.S. Cl. 424—55 **10 Claims**

1. A method for reducing the incidence and severity of dental caries comprising the application to the teeth of a preparation comprising:

an anticariogenically effective and non-toxic amount of at least one water-soluble aluminum salt;

a non-toxic amount of a member selected from the group consisting of stable carboxylic acids and water-soluble salts thereof; and

a carrier suitable for use in the oral cavity,

the pH of said composition lying in the range of about 7.0–9.0, and

the molar ratio of complexing carboxylic acid or salt thereof to aluminum ion being at least about 1.1.

4,108,982
4-(2-IMIDAZOLIN-2-YL) AMINOPYRAZOLES

Herman Amschler, Radolfzell, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Germany

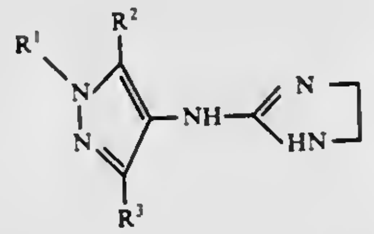
Filed Oct. 19, 1976, Ser. No. 733,866

Claims priority, application Luxembourg, Oct. 20, 1975, 73608

Int. Cl.^{2} C07D *403/12;* A61K *7/15*

U.S. Cl. 424—73 **11 Claims**

1. A physiologically-active and pharmaceutically-acceptable 4-(2-imidazolin-2-yl)aminopyrazole of the formula



wherein each of R^1, R^2 and R^3 is, independently a hydrogen atom (—H), alkyl having up to 7 carbon atoms, alicyclic hydrocarbyl having from 3 to 7 ring carbon atoms and optionally lower-alkyl substituted, phenyl, substituted phenyl, phenylalkyl or nuclearly-substituted phenylalkyl; the alkyl of phenylalkyl and of substituted phenylalkyl having from 1 to 4 carbon atoms and any substituent of substituted phenyl or of substituted phenylalkyl being a member selected from the group consisting of halo, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, trifluoromethyl and nitro;

or a pharmacologically-acceptable acid-addition salt thereof.

11. A process for strengthening hair or making it more erect which comprises applying thereto an effective amount of a product according to claim 1.

4,108,983
VIRAL ONCOLYSATE VACCINE FOR STIMULATING THE IMMUNE MECHANISM OF MAMMALS TO SPECIES-SPECIFIC TUMORS

Marc K. Wallack, Cherry Hill, N.J., assignor to The Wistar Institute, Philadelphia, Pa.

Filed Jun. 1, 1976, Ser. No. 691,486

Int. Cl.^{2} A61K *39/12;* C12K *9/00*

U.S. Cl. 424—89 **17 Claims**

1. A method of forming a vaccine capable of stimulating the immune mechanism of mammals to species-specific tumors comprising infecting cells of a species-specific tumor in vitro with a virus having a lytic action on the cells of said tumor, said virus comprising vaccinia virus and being substantially less pathogenic for said mammal than is said tumor, maintaining said virus infected cells under culture conditions until a viral oncolysate is formed and harvesting said oncolysate.

4,108,984
COMPOSITIONS AND METHODS FOR THE TREATMENT OF ATHLETE'S FOOT

Masataro Sato, No. 28-26 Fukuokamachi 2-chome, Takamasatu, Japan

Filed Jan. 14, 1977, Ser. No. 759,492

Int. Cl.^{2} A61K *37/48*

U.S. Cl. 424—94 **4 Claims**

1. A method for treating wet athlete's foot on a patient in need of said therapy comprising applying a dry mixture of (1) montmorillonite in finely powdered form with (2) pyroligneous acid in a weight ratio of 4 to 1 and (3) a very small quantity of papain enzyme to the affected area in an amount sufficient to keep the affected area dry and to ameliorate the wet athlete's foot.

4. A composition for the treatment of dermatomycosis pedis comprising a dry mixture of finely powdered montmorillonite and pyroligneous acid in a weight ratio of about 4 to 1, a small quantity of papain enzyme present in an amount of about 1/5000 by weight of the mixture, and further including about 0.5% of lysozyme hydrochloride.

4,108,985
DIHYDROCYCLOSPORIN C

Artur Rüegger, Bottmingen, and Max Kuhn, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

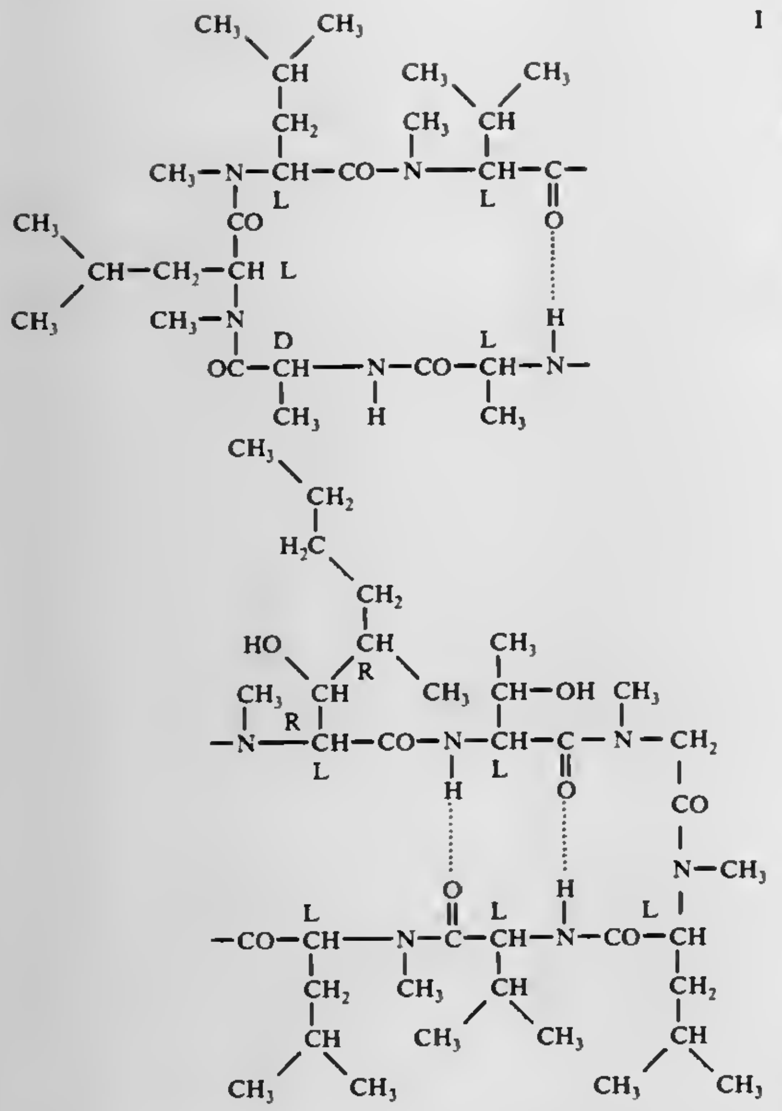
Filed Oct. 27, 1976, Ser. No. 736,106

Claims priority, application Switzerland, Nov. 4, 1975, 14195/75

Int. Cl.^{2} A61K *31/16;* C07D *259/00*

U.S. Cl. 424—177 **9 Claims**

1. Dihydrocyclosporin C of formula



5. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4,108,986

N²-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

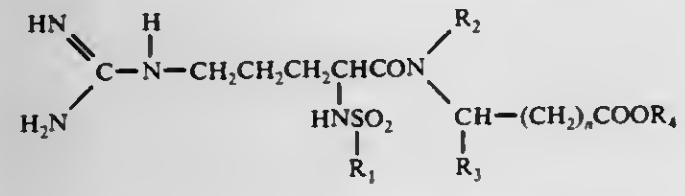
Continuation-in-part of Ser. No. 656,870, Feb. 10, 1976, which is a continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, and a continuation-in-part of Ser. No. 671,568, Mar. 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,654

Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

Int. Cl.² A61K *37/02;* C07C *103/52*

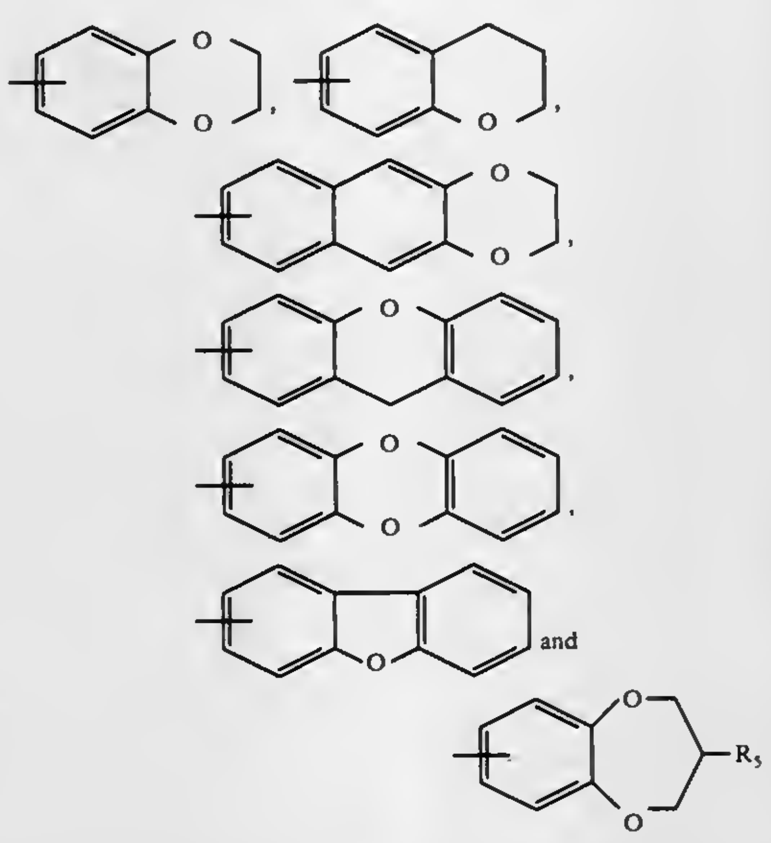
U.S. Cl. 424—177 **9 Claims**

1. N²-arylsulfonyl-L-argininamides having the formula (I):



$$\begin{matrix} HN \\ \quad\ \ \backslash\backslash \\ & C-\overset{H}{\overset{|}{N}}-CH_2CH_2CH_2\underset{\underset{R_1}{\overset{|}{HNSO_2}}}{\underset{|}{CH}}CON \\ \ \ / \\ H_2N \end{matrix} \begin{matrix} \ /R_2 \\ \\ \ \backslash\underset{\underset{R_3}{|}}{CH}-(CH_2)_nCOOR_4 \end{matrix} \qquad (I)$$

and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl, naphthyl subsituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl and C_1–C_{10} alkoxy, phenyl, phenyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino, C_7–C_{12} aralkyl,



wherein R_5 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α -carboxyaralkyl, C_3–C_{10} cycloalkyl and C_4–C_{10} cycloalkylalkyl; R_3 is selected from the group consisting of C_1–C_5 alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl, C_7–C_{12} aralkyl and ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and *n* is an integer or 0, 1 or 2.

4,108,987

CYCLIC HEXAPEPTIDES

Daniel F. Veber, Ambler; Stephen F. Brady, Philadelphia, and Sandor L. Varga, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 710,491, Aug. 2, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,501

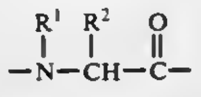
Int. Cl.² A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 **11 Claims**

1. The peptides having the structure:

cyclo[(N-alkylamino acid)-X-(N-alkylamino acid)'-X-(N-alkylamino acid)"-X]

wherein (N-alkylamino acid), (N-alkylamino acid)' and (N-alkylamino acid)" have the structure:



$$-\overset{R^1}{\overset{|}{N}}-\overset{R^2}{\overset{|}{CH}}-\overset{O}{\overset{\|}{C}}-$$

wherein R^1 is a lower alkyl group having 1 to 3 carbon atoms and R^2 is hydrogen and methyl or R^1 and R^2 are $—CH_2—_n$, *n* being an integer 2 or 3, and form a 4- or 5-membered ring; and X is D- or L-Ala, D- or L-Phe, D- or L-Leu, D- or L-p-halophenylalanyl or D- or L-p-nitrophenylalanyl, with the proviso that when R^1 is methyl and R^2 is hydrogen, X is not D-Ala.

4,108,988

INSECTICIDAL HYDRAZONE PHOSPHATES AND PHOSPHONATES

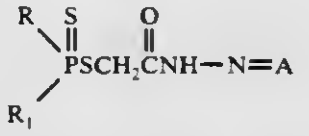
Llewellyn W. Fancber, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 5, 1977, Ser. No. 812,956

Int. Cl.² A01N *9/36;* C07F *9/165*

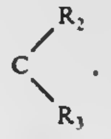
U.S. Cl. 424—211 **26 Claims**

1. A method of combatting insects comprising applying to the insect or the habitat thereof an insecticidally effective amount of a compound having the formula



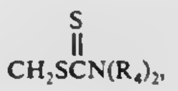
$$\begin{matrix} R \\ \ \ \backslash \\ \ \ / \\ R_1 \end{matrix}\overset{S}{\overset{\|}{P}}SCH_2\overset{O}{\overset{\|}{C}}NH-N=A$$

in which R is lower alkyl or lower alkoxy; R_1 is lower alkoxy; A is cycloalkyl, lower alkyl-substituted cycloalkenyl or



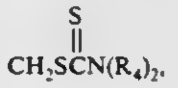
$$C\begin{matrix} /R_2 \\ \backslash R_3 \end{matrix} .$$

R_2 is alkyl, aryl, aralkyl, cycloalkyl, hydrogen or



$$CH_2S\overset{S}{\overset{\|}{C}}N(R_4)_2,$$

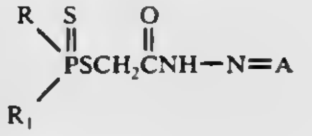
R_3 is aryl, aralkyl, cycloalkyl or



$$CH_2S\overset{S}{\overset{\|}{C}}N(R_4)_2,$$

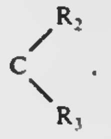
and R_4 is lower alkyl.

3. A compound having the formula



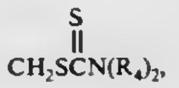
$$\begin{matrix} R \\ \ \ \backslash \\ \ \ / \\ R_1 \end{matrix}\overset{S}{\overset{\|}{P}}SCH_2\overset{O}{\overset{\|}{C}}NH-N=A$$

in which R is lower alkyl or lower alkoxy; R_1 is lower alkoxy; A is cycloalkyl, lower alkyl-substituted cycloalkenyl or



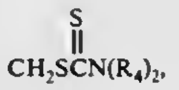
$$C\begin{matrix} /R_2 \\ \backslash R_3 \end{matrix} .$$

R_2 is alkyl, aryl, aralkyl, cycloalkyl, hydrogen or



$$CH_2S\overset{S}{\overset{\|}{C}}N(R_4)_2,$$

R_3 is aryl, aralkyl, cycloalkyl or



$$CH_2S\overset{S}{\overset{\|}{C}}N(R_4)_2,$$

and R_4 is lower alkyl.

4,108,989

2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE-7,8-DIONES

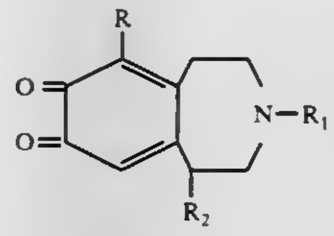
Kenneth George Holden, Haddonfield, N.J., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Apr. 1, 1977, Ser. No. 783,574

Int. Cl.² A61K *31/55;* C07D *223/16*

U.S. Cl. 424—244 **6 Claims**

1. A compound of the formula:



in which:

R is hydrogen or halo;

R_1 is lower alkyl having from 1 to 5 carbon atoms, lower alkanoyl having from 1 to 5 carbon atoms, benzyl, phenethyl, carbobenzyloxy, or hydroxyethyl; and

R_2 is phenyl, or phenyl which is optionally substituted with a lower alkyl having from 1 to 5 carbon atoms, halo, lower alkoxy having from 1 to 4 carbon atoms, hydroxy or thiomethyl;

and the pharmaceutically acceptable nontoxic salts thereof.

6. The method of producing dopaminergic activity in an animal in need of such activity which comprises administering internally a nontoxic sufficient amount of the compound of claim 1.

4,108,990

METHOD OF KILLING BACTERIA AND FUNGI

Hans Plum, Heessen; Max Buschhoff, Luenen, and Aleoa Cejka, Dortmund, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

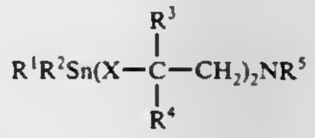
Filed Jun. 11, 1976, Ser. No. 695,125

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526711; Mar. 16, 1976, 2610931

Int. Cl.² A01N *9/12*

U.S. Cl. 424—245 **14 Claims**

1. The method of killing bacteria and fungi which comprises bringing them into contact with a pesticidally-effective amount of a diorgano tin compound of the formula



$$R^1R^2Sn(X-\underset{R^4}{\underset{|}{\overset{R^3}{\overset{|}{C}}}}-CH_2)_2NR^5$$

wherein R^1 and R^2 are alkyl having 1–10 carbon atoms, alkenyl having 1–10 carbon atoms, cycloalkyl, or aromatic; R^3 and R^4, taken alone, are the same or different and are hydrogen, alkyl having 1–10 carbon atoms or alkenyl having 1–10 carbon atoms; R^3 and R^4, taken together, are doubly bound oxygen; R^5 is hydrogen, alkyl having 1 to 10 carbon atoms, alkenyl having 1 to 10 carbon atoms, cycloalkyl, or a member selected from the group consisting of phenyl, naphthyl, m-tolyl, p-tolyl, m-methoxyphenyl, p-methoxyphenyl, benzyl, and 5-acetamido-2-ethoxy phenyl; and X is oxygen or sulfur.

4,108,991

N-AMINOSULFENYL DERIVATIVES OF ALDICARB

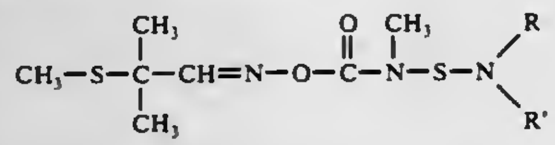
Tetsuo Roy Fukuto, Riverside, Calif., and Allan Lindsay Black, Balmain, Australia, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 6, 1976, Ser. No. 747,752

Int. Cl.^{2} C07C *131/00;* A01N *9/12*

U.S. Cl. 424—248.5 **10 Claims**

1. A compound of the formula



wherein R and R′ are each independently straight or branched chain alkyl of 1 to 6 carbon atoms, phenyl or phenylalkyl wherein the alkyl portion is straight or branched chain of 1 to 3 carbon atoms, or R and R′ taken together with the nitrogen form a piperidine, morpholine, pyrollidine, piperazine or hexahydroazepine ring.

4,108,992

CEPHALOSPORIN ANALOGUES AND COMPOSITIONS

Michael John Pearson, Roffey, and Clive Leslie Branch, South Holmwood, both of England, assignors to Beecham Group Limited, Great Britain

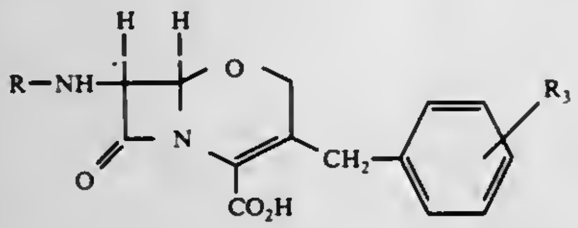
Division of Ser. No. 684,078, May 7, 1976. This application Feb. 7, 1977, Ser. No. 766,213

Claims priority, application United Kingdom, May 10, 1975, 19744/75

Int. Cl.^{2} A01N *9/00, 9/22;* C07D *265/00, 273/00*

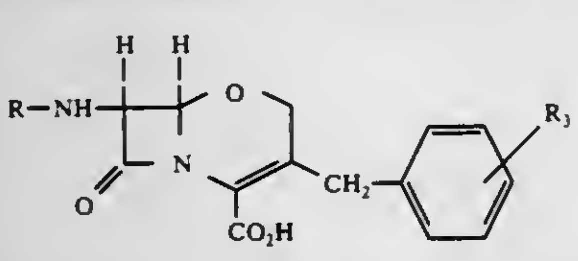
U.S. Cl. 424—248.53 **12 Claims**

1. A compound of the formula



wherein R is D-α-hydroxy-benzylcarbonyl and R$_3$ is hydrogen, carboxylic acid, carboxamido or an esterified carboxylic acid of 1-10 carbons in the ester portion.

5. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein R is D-α-hydroxy-benzylcarbonyl and R$_3$ is hydrogen, carboxylic acid, carboxamido or an esterified carboxylic acid of 1-10 carbons in the ester portion, in combination with a pharmaceutically acceptable carrier.

4,108,993

3-OXO-5,6-DIHYDRO-1,2,4-OXADIAZINES USEFUL AS ANTIANDROGENIC AGENTS

Claude Bonne, Bry-sur-Marne; Jacques Perronnet, Paris, and André Tecbe, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

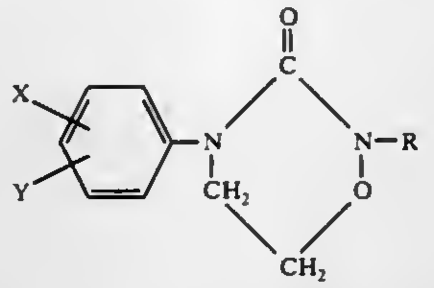
Filed Oct. 5, 1976, Ser. No. 729,763

Claims priority, application France, Oct. 15, 1975, 75 31566

Int. Cl.^{2} A01N *9/00, 9/22*

U.S. Cl. 424—248.57 **4 Claims**

1. A method of treating symptoms of hyperandrogenicity in warm-blooded animals comprising topically applying to the skin or mucous of warm blooded animals an antiandrogenically effective amount of a compound of the formula



wherein X and Y are individually selected from the group consisting of hydrogen, halogen, —CF$_3$, —NO$_2$ and alkylthio of 1 to 4 carbon atoms and R is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, benzyl and hydroxymethyl.

4,108,994

5-THIAZOLE-METHANE-AMINES, AND THEIR USE AS ANTILIPOLYTICS

André Poittevin, Vaires-sur-Marne; Pierre Henri Derible, Le Perreux, and Robert Fournex, Paris, all of France, assignors to Roussel Uclaf, Paris, France

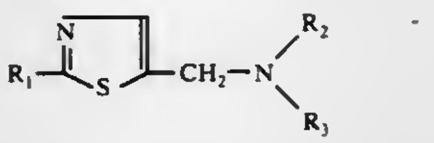
Filed Sep. 8, 1976, Ser. No. 721,370

Claims priority, application France, Sep. 12, 1975, 75 28095; Mar. 31, 1976, 76 09337

Int. Cl.^{2} C07D *277/38;* A61K *31/425*

U.S. Cl. 424—250 **14 Claims**

1. A 5-thiazole-methane-amine selected from the group consisting of (1) compounds having the formula



wherein R$_1$ represents an alkyl having from 1 to 6 carbon atoms and R$_2$ and R$_3$ represent members selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, hydroxyalkyl having 1 to 6 carbon atoms, and taken together with the nitrogen atom form a member selected from the group consisting of pyrrolidin-1-yl, imidazolidin-1-yl, 3-methyl-imidazolidin-1-yl, 3-ethyl-imidazolidin-1-yl, pyrazolidin-1-yl, 2-methyl-pyrazolidin-1-yl, piperidin-1-yl, piperazin-1-yl, 4-methyl-piperazin-1-yl, 4-ethyl-piperazin-1-yl, 4-propyl-piperazin-1-yl, 4-butyl-piperazin-1-yl, hexahydropyridazin-1-yl, 2-methyl-hexahydro-pyridazin-1-yl, hexahydropyrimidin-1-yl and 3-methyl-hexahydro-pyrimidin-1-yl and (2) its acid addition salts with non-toxic, pharmaceutically-acceptable acids.

12. A method for the treatment of hyperlipemia and diabetis in warm-blooded animals suffering from the same comprising administrating to said warm-blooded animals an amount to lower the level of plasmatic free fatty acids in the blood and hypoglycemically effective amount of at least one compound of claim 1.

4,108,995

HYDROXYHEXYL-ALKYLXANTHINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING HYDROXYHEXYL-ALKYLXANTHINES

Werner Mohler, Hofheim; Manfred Jayme, Rüsselsheim; Heinz-Joachim Hinze, Wiesbaden; Jaromir Komarek, Wiesbaden; Mario Reiser, Wiesbaden, and Alfons Söder, Frankfurt-Schwanheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

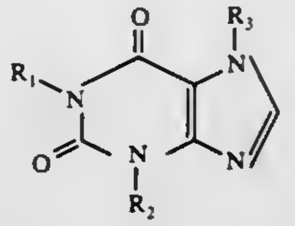
Filed Jul. 5, 1974, Ser. No. 485,869

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1973, 2335170

Int. Cl.^{2} A61K *31/52;* C07D *473/06*

U.S. Cl. 424—253 **21 Claims**

1. A physiologically-acceptable and pharmacologically-active cerebral-blood-flow-improving compound of the formula



(I)

wherein

one of R$_1$, R$_2$ and R$_3$ is 4-, 5- or 6- hydroxyhexyl;
one of R$_1$, R$_2$ and R$_3$ is alkyl having from 2 to 12 carbon atoms; and
one of R$_1$, R$_2$ and R$_3$ is a hydrogen atom (-H) or alkyl having from 1 to 12 carbon atoms; and

R$_2$ being alkyl or hydroxyhexyl; or a physiologically-acceptable acid-addition salt of such compound.

4,108,996

(—)-APOVINCAMINOL LAURIC ACID ESTER AND CEREBRAL VASODILATORY COMPOSITION THEREOF

Csaba Lörincz; Maria Bolyos; Kálman Szisz; Laszlo Szporny; Egoo Karpati, and Eva Palosi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 7, 1976, Ser. No. 703,207

Claims priority, application Hungary, Jul. 18, 1975, RI 573

Int. Cl.^{2} A61K *31/445;* C07D *519/04*

U.S. Cl. 424—256 **2 Claims**

1. (—) -apovincaminol lauric acid ester or a pharmaceutically acceptable salt thereof.

4,108,997

DIURETIC [2]BENZOPYRANO[4,3-B]PYRIDINES AND PROCESS THEREFOR

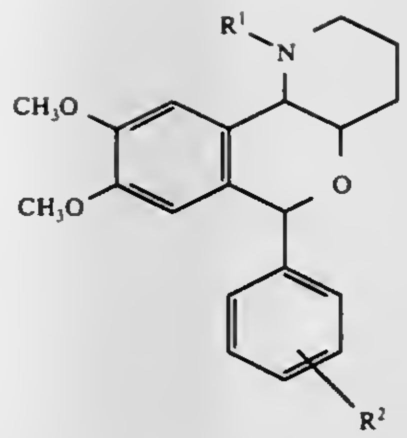
Jean A. Gauthier, Montreal; Leslie G. Humber, Doilard des Ormeaux, and Clara Revesz, Montreal, all of Canada, assignors to Ayerst, McKenna & Harrisoo Limited, Montreal, Canada

Filed Dec. 20, 1976, Ser. No. 752,655

Int. Cl.^{2} A61K *31/445;* C07D *491/04*

U.S. Cl. 424—256 **10 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl or lower cycloalkyl(lower)alkyl and R^2 is hydrogen or halo, or a therapeutically acceptable acid addition salt thereof.

8. A method for increasing the excretion of urine in a mammal which comprises administering to said mammal an effective diuretic amount of a compound of claim 1, or a therapeutically acceptable salt thereof.

4,108,998

FURO[3,4-B]QUINOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM

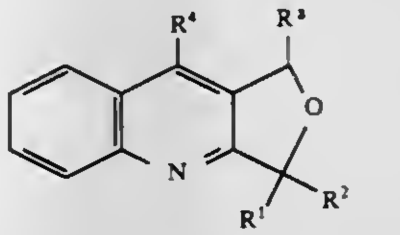
Christopher A. Demersoo, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corp., New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,779

Int. Cl.^{2} A61K *31/47;* C07D *491/14*

U.S. Cl. 424—258 **22 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl; R^2 is lower alkyl; R^3 is hydrogen or a radical of formula (CH$_2$)$_n$NR^{7}R^8 wherein *n* is an integer from 1 to 6 and R^7 and R^8 each is lower alkyl; and R^4 is hydrogen, chloro, bromo or a radical of formula Y-X wherein Y is O or NH and X is 2,2,6,6-tetramethyl-4-piperidinyl or a radical of formula Z-R^9 wherein Z is lower alkylene or hydroxy (lower) alkylene and R^9 is phenyl, 1-pyrrolidinyl, 2-oxo-1-pyrrolidinyl, 3-pyridyl or a radical of formula NR^{10}R^{11} wherein R^{10} and R^{11} each is hydrogen, lower alkyl or hydroxy (lower) alkyl, or a therapeutically acceptable salt thereof.

19. A method for treating hypertension in a mammal which comprises administering to said mammal an effective antihypertensive amount of a compound of claim 1, or a therapeutically acceptable salt thereof.

20. A method for treating microbial infections in a mammal which comprises administering to said mammal an effective antimicrobial amount of a compound of claim 1, or a therapeutically acceptable salt thereof.

21. An antihypertensive composition comprising an effective amount of a compound of claim 1, or a therapeutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

22. An antimicrobial composition comprising an effective amount of a compounds of claim 1, or a therapeutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,108,999
THIAZOLO[3,4-b]ISOQUINOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PHARMACEUTICAL METHODS USING THEM

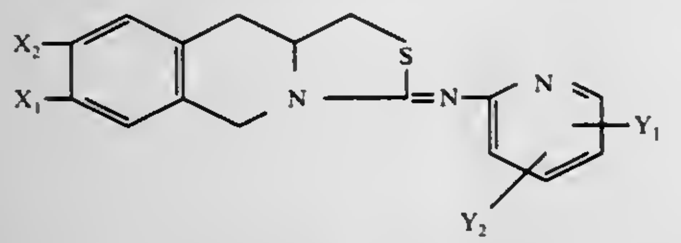
Daniel Farge, Sylvestres Thiais; Alain Jossin, Saint Cloud; Gérard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Republique-Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 22, 1977, Ser. No. 770,757

Int. Cl.^{2} C07D *513/14;* **A61K** *31/47*

U.S. Cl. 424—258 **9 Claims**

1. A thiazolo[3,4-b]isoquinoline derivative of the formula:



wherein X_1 represents hydrogen, halogen, methoxy or cyano, X_2 represents hydrogen, halogen or methoxy, or X_1 and X_2 together represent methylenedioxy, and Y_1 and Y_2 each represent hydrogen, halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, alkylthio of 1 through 4 carbon atoms, hydroxy, or diacetylamino, and its non-toxic pharmaceutically acceptable acid addition salts.

8. A pharmaceutical composition for the treatment of medicinal and other gastritis and gastralgias and the treatment of ulcers which comprises an effective amount of a thiazolo[3,4-b]isoquinoline derivative as claimed in claim 1, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutically acceptable carrier.

9. A method for the treatment of medicinal and other gastritis and gastralgias and the treatment of ulcers in a patient which comprises administering to the patient an effective amount of a thiazolo[3,4-b]isoquinoline derivative as claimed in claim 1 or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,109,000
5-BENZYLPICOLINIC ACID DERIVATIVES

Osamu Tanabe; Akiro Obayashi, both of Uji; Teruya Nakamura, Muko; Osamu Suzuka; Masao Murayama, both of Kyoto, and Hiromu Murai, Otsu, all of Japan, assignors to Nippon Shinyaku Co., Ltd. and Takara Shuzo Co., Ltd., both of, Japan

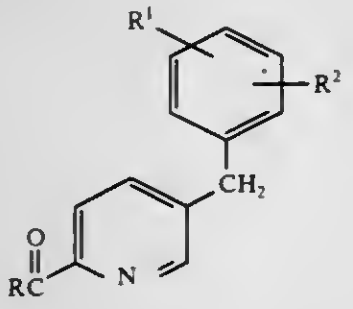
Continuation-in-part of Ser. No. 648,626, Jan. 13, 1976, abandoned, and Ser. No. 607,039, Aug. 22, 1975, Pat. No. 4,009,077, which is a continuation-in-part of Ser. No. 582,766, Jun. 2, 1975, abandoned. This application Jun. 16, 1976, Ser. No. 696,549

Claims priority, application Japan, Jan. 22, 1975, 50-9998; Jan. 22, 1975, 50-9999; Jan. 22, 1975, 50-10000; Jan. 22, 1975, 50-10001; Jan. 22, 1975, 50-10002; Jan. 22, 1975, 50-10003

Int. Cl.^{2} A61K *31/44;* **C07D** *213/69*

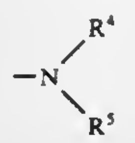
U.S. Cl. 424—263 **26 Claims**

1. A compound of the formula:



wherein

R is hydroxy, lower alkoxy or



in which each of R^4 and R^5, independently of the other, is hydrogen, lower alkyl, benzyl, phenethyl or phenyl; and

each of R^1 and R^2, independently of the other, is hydrogen, lower alkyl, halo, lower alkoxy, nitro, amino, acetamido, hydroxy or acetoxy,

and the pharmaceutically acceptable salts thereof.

25. The method of effecting a hypotensive response in humans and other animals which comprises administering thereto a compound according to claim 1.

4,109,001
ARYL-SUBSTITUTED TRIAZOLYL PROPIONIC ACIDS

Robert Thomas Buckler, Edwardsburg, Mich., and Elva Kurchacova, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 763,504, Jan. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 706,065, Jul. 16, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,523

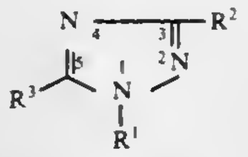
Int. Cl.^{2} C07D *249/08;* **A61K** *31/41*

U.S. Cl. 424—269 **12 Claims**

1. 3-[3-phenyl-1,2,4,(1H)-triazol-5-yl]propionic acid monohydrate, and pharmacologically acceptable, non-toxic salts thereof.

11. A therapeutic method for treating algia in an individual for whom such therapy is indicated, comprising:

administering to the individual an effective analgesic amount of a compound of the formula



and pharmacologically acceptable, non-toxic salts thereof wherein:

R^1, R^2 and R^3 are always dissimilar;

R^1 is selected from the group consisting of monochlorophenyl and di-chlorophenyl;

R^2 is 2-carboxyethyl; and

R^3 is hydrogen.

4,109,002
FUNGICIDAL 3-PHENYL-5-(SUBSTITUTED METHYL) ISOXAXOLES

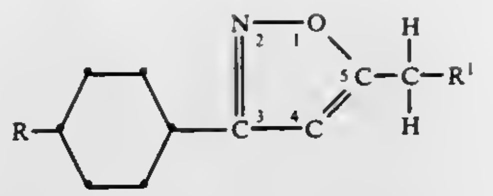
James D. Davenport; Barry A. Dreikorn, both of Indianapolis, Ind., and A. Frederick Elsasser, Columbus, Ohio, assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 14, 1976, Ser. No. 695,669

Int. Cl.^{2} A01N *9/22, 9/28*

U.S. Cl. 424—272 **7 Claims**

1. A fungicidal method of reducing the adverse effects of fungal foliar phytopathogens which comprises applying to the phytopathogens on the foliage of host plants an effective phytopathogen-inhibiting amount of a compound of the formula



wherein

R represents
 chloro,
 bromo,
 fluoro,
 trifluoromethyl, or
 hydrogen;

R^1 represents
 isothiocyanato.

4,109,003
PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

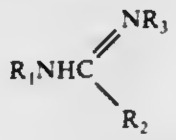
Division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application May 5, 1977, Ser. No. 794,179

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

Int. Cl.^{2} A61K *31/415;* **C07D** *233/64*

U.S. Cl. 424—273 R **7 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$$\mathrm{Het}-CH_2-S-(CH_2)_n-$$

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; n is 2 or 3; R_2 is SR_4; R_3 is hydrogen, lower alkyl or R_1; and R_4 is lower alkyl, or a pharmaceutically acceptable addition salt thereof.

7. A method of blocking histamine H_2-receptors, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim 1.

4,109,004
HALOGENATED ALKYLSULPHONYL-BENZIMIDAZOLES

Albert Percival, Hauxton, England, assignor to Fisons Limited, England

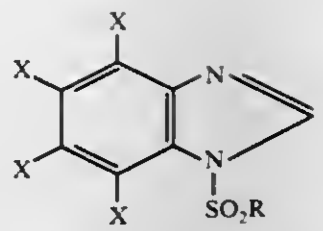
Filed Aug. 22, 1977, Ser. No. 826,817

Claims priority, application United Kingdom, Aug. 25, 1976, 35306/76

Int. Cl.^{2} C07D *235/22;* **A61K** *31/415*

U.S. Cl. 424—273 R **11 Claims**

1. A substituted benzimidazole of the formula:



(I)

wherein at least two of the radicals X are halogen and the remainder are hydrogen, and R represents an alkyl radical of 1 to 6 carbon atoms.

8. A method of combating protozoa in an animal, which method comprises administering to said animal an anti-protozoally effective amount of a compound claimed in claim 1.

4,109,005
METHOD OF INCREASING RATE OF GASTRIC EMPTYING WITH PYRROLIDINYLBENZAMIDES

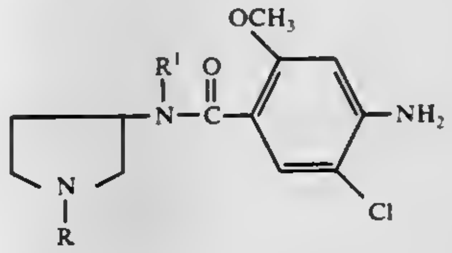
Carl D. Lunsford, and Reevis S. Alphin, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed May 11, 1977, Ser. No. 795,827

Int. Cl.^{2} A61K *31/40*

U.S. Cl. 424—274 **5 Claims**

1. The method of increasing the rate of gastric emptying in mammalian subjects which comprises administering orally or parenterally thereto an effective amount of compounds selected from those having the formula:



wherein;

R is methyl or cyclohexyl having 3–12 carbon atoms,

R^1 is hydrogen or methyl, and

the pharmaceutically acceptable salts thereof.

4,109,006
1,4-DITHIINOXIDES

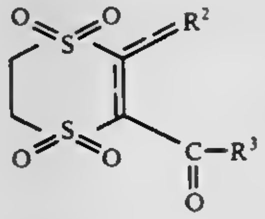
Richard C. Johnson, Ambler, and Peter L. deBenneville, Philadelphia, both of Pa., assignors to Warren-Teed Laboratories, Inc., Columbus, Ohio

Filed Oct. 12, 1976, Ser. No. 731,154

Int. Cl.^{2} A61K *31/385;* **C07D** *339/00, 339/02, 339/08*

U.S. Cl. 424—277 **12 Claims**

1. A pharmaceutical composition useful in treating gastric ulcers which comprises an effective amount of a compound of the formula:



wherein R^2 is hydrogen, lower alkyl or cyano and R^3 is lower alkoxy, lower alkylamino or di-lower alkylamino in a pharmaceutically acceptable carrier.

4,109,007

MITICIDAL MIXTURES AND METHOD UTILIZING A MACROTETROLIDE COMPOUND

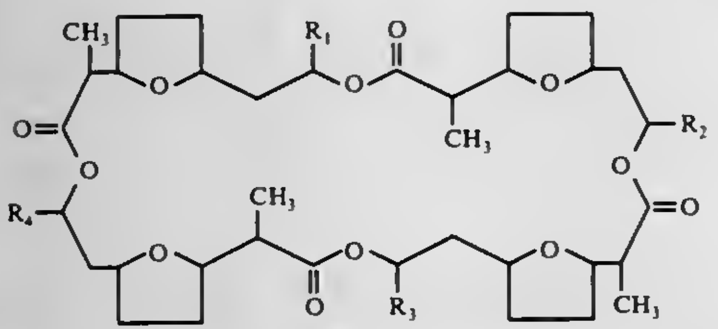
Silas S Sharp, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 818,082, Jul. 22, 1977, abandoned, which is a division of Ser. No. 746,107, Nov. 30, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,411

Int. Cl.² A01N *9/02, 9/20, 9/28*

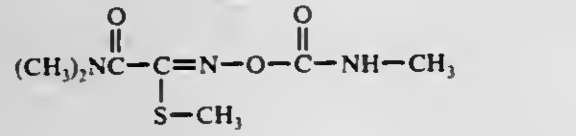
U.S. Cl. 424—279 **3 Claims**

1. A miticidally effective mixture consisting essentially of



(I)

and



$$(CH_3)_2N\overset{O}{\overset{\|}{C}}-\underset{S-CH_3}{\underset{|}{C}}=N-O-\overset{O}{\overset{\|}{C}}-NH-CH_3$$

(III)

wherein

R_1, R_2, R_3 and R_4 are each selected from the group consisting of methyl and ethyl and

the ratio of III to I is from 4:1 to 16:1.

4,109,008

HYDRAZINE DERIVATIVES USEFUL AS ANTI-HYPERTENSIVES

Jean-Calude Cognacq, Garches; Bernard Schweisguth, Meudon, and Jean-Marie Teuloo, La Celle Saint-Cloud, all of France, assignors to Hexachimie, Rueil-Malmaison, France

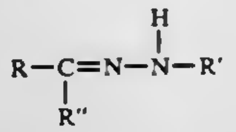
Filed Dec. 29, 1976, Ser. No. 755,194

Claims priority, application United Kingdom, Jan. 7, 1976, 562/76

Int. Cl.² C07D *235/26, 403/12;* **A61K** *31/415*

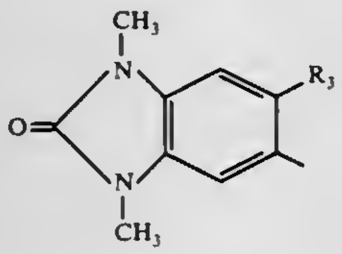
U.S. Cl. 424—273 R **8 Claims**

1. A hydrazine derivative of the formula:

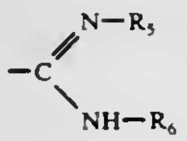


$$R-\underset{R''}{\underset{|}{C}}=N-\overset{H}{\overset{|}{N}}-R'$$

in which R is the radical of formula:



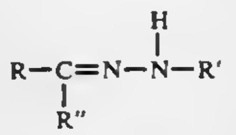
wherein R_3 is hydrogen, methyl or methoxy, R′ is a radical of formula:



in which R_5 and R_6 are each hydrogen and R″ is hydrogen and the pharmaceutically acceptable addition salts with non-toxic acids of said hydrazine derivative.

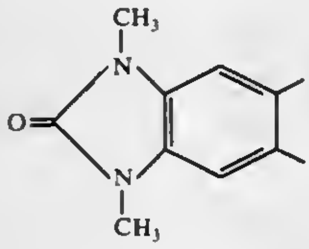
5. An anti-hypertensive composition comprising, in association with a compatible pharmaceutical carrier, an effective amount of at least one compound as claimed in claim 1.

7. A hydrazine derivative of the formula:



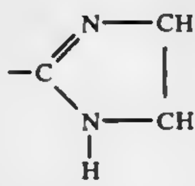
$$R-\underset{R''}{\underset{|}{C}}=N-\overset{H}{\overset{|}{N}}-R'$$

in which R is the radical of formula:



wherein R_3 is hydrogen, methyl or methoxy,

R′ is an imidazolinyl radical of formula:



R″ is hydrogen, and the pharmaceutically acceptable addition salts with non-toxic acids of said hydrazine derivative.

4,109,009

ANALGESIC, RELAXANT, AND ANTI-INFLAMMATORY CYCLOPENTANOL DERIVATIVES

Jean Buendia, Nogent-sur-Marne, and Jeanine Schalbar, Suresnes, both of France, assignors to Roussel Uclaf, Paris, France

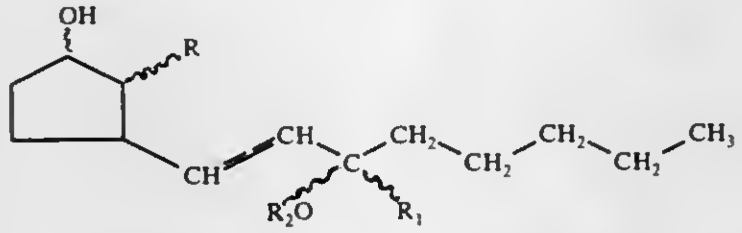
Filed Aug. 24, 1976, Ser. No. 717,048

Claims priority, application France, Aug. 29, 1975, 75 26616

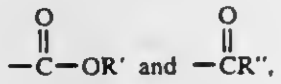
Int. Cl.² A61K *31/045, 31/35;* **C07D** *309/22, 309/06*

U.S. Cl. 424—283 **19 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of



$$-\overset{O}{\overset{\|}{C}}-OR' \text{ and } -\overset{O}{\overset{\|}{C}}R'',$$

R′ is selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms and a non-toxic, pharmaceutically acceptable cation, R″ is alkyl of 1 to 6 carbon atoms, R_1 is selected from the group consisting of hydrogen and straight or branched chain, saturated and unsaturated alkyl of 1 to 4 carbon atoms and R_2 is selected from the group consisting of hydrogen and tetrahydropyranyl, the wavy lines connecting R and —OH to the cyclopentane ring and —OR_2 and R_1 to the chain indicates that the substituents may be in either of the possible positions on the carbon atoms to which they are attached and the dotted line indicates the optional presence of a double bond.

13. A method of relieving pain and inflammation in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound of claim 1.

17. A method of relaxing smooth muscles in warm-blooded animals comprising administering to warm-blooded animals a smooth muscle relaxant effective amount of at least one compound of claim 1.

4,109,010

ANTI-MICROBIAL COMPOSITIONS

Roy C. Sias, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 15, 1974, Ser. No. 442,948

Int. Cl.² A01N *9/00*

U.S. Cl. 424—289 **2 Claims**

1. An anti-microbial formulation containing from about 0.5 to about 50 weight percent of an ammoniated zinc compound selected from the group consisting of

a. ammoniated zinc salts of alkylaryl sulfonic acids wherein the alkyl portion contains from 1 to 16 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

b. ammoniated zinc salts of benzene sulfonic acid containing an average of 0.5 to 6.0 molecules of ammonia per molecule of zinc;

c. ammoniated zinc salts of alkyl hydroxy sulfonic acids wherein the alkyl portion contains from 12 to 20 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

d. ammoniated zinc salts of olefin sulfonic acids wherein said olefin portion contains from 12 to 20 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

e. ammoniated zinc salts of alkyl sulfates wherein said alkyl portion contains from 10 to 16 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

f. ammoniated zinc salts of diphenylalkane sulfonic acids wherein the alkyl portion contains a total of from 2 to about 16 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc; and

g. combinations thereof;

from about 98.5 to about 20 weight percent water; and from about 1 to about 30 weight percent of an alcohol selected from the group consisting of alkanols containing from about 2 to about 4 carbon atoms, and dihydroxyalkanols containing from about 2 to about 4 carbon atoms.

4,109,011

INSECTICIDE CARBAMATES OF N-(POLYCHLOROALLYL)-AMINO-PHENOLS

Paolo Piccardi, Milan; Paride Paolucci; Franco Gozzo, both of S. Donato Milanese (Milan); Angelo Longoni, Milan; Vincenzo Dongiovanni, Milan, and Giovanni Renis, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

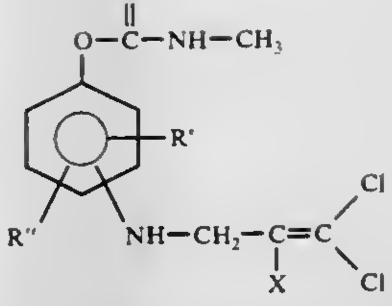
Continuation-in-part of Ser. No. 680,921, Apr. 28, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,332

Claims priority, application Italy, May 2, 1975, 22949 A/75

Int. Cl.² A01N *9/12, 9/20;* **C07C** *125/06*

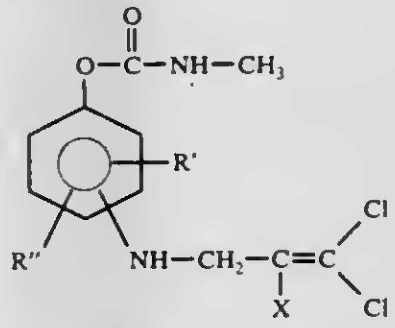
U.S. Cl. 424—300 **7 Claims**

1. An insecticidal agent, said agent being a compound having the general formula:



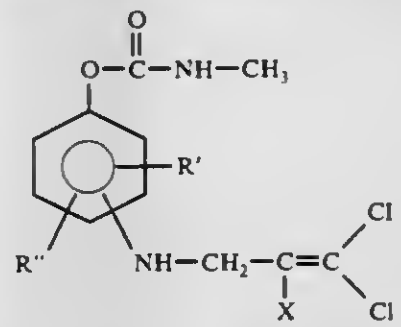
where X is selected from the group consisting of H, Cl and S-R‴ where R‴ is selected from the group consisting of lower alkyl and phenyl; and R′ and R″ are the same or different and are selected from the group consisting of H and C_1–C_4 alkyls.

2. An insecticidal composition comprising, in admixture, an insecticidally effective amount of an insecticidal agent having the general formula:



where X is selected from the group consisting of H, Cl and S-R‴ where R‴ is selected from the group consisting of lower alkyl and phenyl; and R′ and R″ are the same or different and are selected from the group consisting of H and C_1–C_4 alkyls, and an inert carrier therefor.

7. A method of combatting insect infestations for longer periods of time in the field comprising spraying said insect or its food, habitat or environment with an insecticidally effective amount of an insecticidal agent having the general formula:



where X is selected from the group consisting of H, Cl and S-R‴ where R‴ is selected from the group consisting of lower alkyl and phenyl; and R′ and R″ are the same or different and are selected from the group consisting of H and C_1–C_4 alkyls, said compound having a longer persistence in the field.

4,109,012

PREPARATION OF FRENCH FRIES

Paul Edward Bates, Woodlawn; John Ronald Hughes, Colerain Township, Hamilton County, and Nahid Zoueshtiagh, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 578,970, May 19, 1975, abandoned, which is a continuation of Ser. No. 428,513, Dec. 26, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,437

Int. Cl.² A23L *1/00*

U.S. Cl. 426—302 **12 Claims**

1. A process for the preparation of a mealy textured work-

able coherent potato dough adapted to the formation of french fry potato pieces which comprises:
- (a) baking whole unpeeled potatoes until they are completely cooked;
- (b) peeling said baked potatoes;
- (c) comminuting said peeled baked potatoes using a minimum amount of work to obtain and maintain a mealy textured comminuted baked potato material; and
- (d) forming a mealy textured coherent workable dough from said mealy textured baked potato material using a minimum amount of work on said baked potato material to avoid a large amount of breakup of individual potato cells and a corresponding increase in free starch.

4,109,013
SUBSTITUTED PROPANOL-(2) DERIVATIVES OF HYDROXAMIC ACIDS AND THE USE THEREOF AS HYPOLIPEMIC DRUGS

Helmut Grill, Vaterstetten; Rainer Hans Zschocke, Munich; Josef Wagner, Grünwald; Gernot Hofrichter, Vaterstetten, all of Fed. Rep. of Germany, and P. Stefan Janiak, Basel, Switzerland, assignors to Klinge Pharma GmbH & Co., Munich, Fed. Rep. of Germany

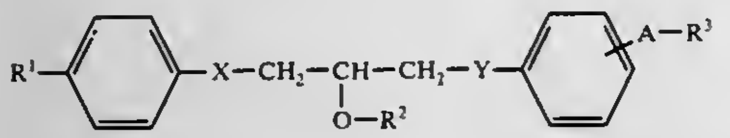
Division of Ser. No. 641,982, Dec. 18, 1975, Pat. No. 4,073,935. This application Nov. 9, 1977, Ser. No. 849,766

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2460689

Int. Cl.^{2} **A61K** *31/185;* **C07C** *83/10*

U.S. Cl. 424—315 **7 Claims**

1. A 1,3-disubstituted propanol-(2) derivative of the general formula



or its therapeutically acceptable salt, where X and Y stand for —O—;

$R^1 = -Cl$, or $-C(CH_3)_3$;

$R^2 = -H$;

A = a valence bond, a vinylene group, or an ethylene group;

$R^3 = -CONHOH$.

7. A method for treating hyperlipemia which comprises administering to a subject in need of such treatment, a therapeutically effective dose of a compound according to claim 1.

4,109,014
PHARMACEUTICAL, COMPOSITIONS CONTAINING SUBSTITUTED 4′-HYDROXYPHENYL GUANIDINES AND METHODS OF USING SAME

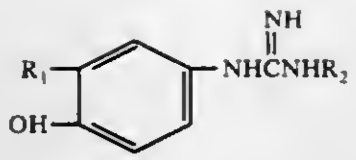
Robert Chung-Huan Liu, and John Lawrence Hughes, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Division of Ser. No. 518,925, Oct. 29, 1974, Pat. No. 4,014,934, which is a continuatinn-in-part of Ser. No. 460,815, Apr. 15, 1974, Pat. Nn. 3,908,013, which is a division of Ser. No. 73,244, Sep. 17, 1970, abandoned. This application Jan. 25, 1977, Ser. No. 762,358

Int. Cl.^{2} **A61K** *31/155*

U.S. Cl. 424—326 **6 Claims**

1. A pharmaceutical composition consisting of a pharmaceutical grade carrier and a therapeutically effective vasoconstrictive amount of a guanidine compound of a non-toxic acid addition salt thereof, said compound having the formula:



wherein: R_1 is hydroxyl, methyl or hydroxymethyl; and R_2 is hydrogen or methyl.

6. The method of treating a host requiring vasoconstriction comprising administering to said host from about 1 mg to about 5 mg per kilogram of host body weight of a compound according to claim 1 or a non-toxic acid addition salt thereof to provide vasoconstriction in said host.

4,109,015
PROSTANE DERIVATIVES

Peter Robert Marsham, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

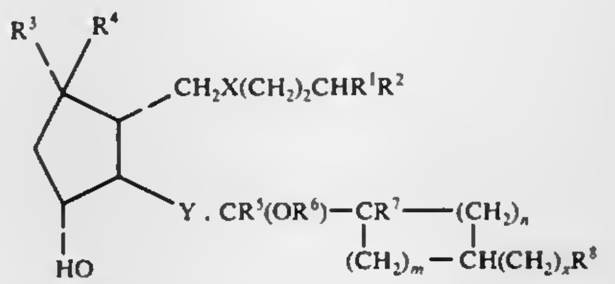
Division of Ser. No. 691,297, Jun. 1, 1976. This application Jan. 26, 1978, Ser. No. 872,647

Claims priority, application United Kingdom, Jun. 13, 1975, 25378/75

Int. Cl.^{2} **C07C** *177/00;* **A61K** *31/055; 31/06; 31/085*

U.S. Cl. 424—341 **7 Claims**

1. A prostane derivative of the formula:



wherein R^1 is hydroxymethyl, R^2, R^5 and R^6 are each hydrogen, R^3 is hydroxy and R^4 is hydrogen, X is ethylene or cis-vinylene, Y is ethylene or trans-vinylene, R^7 is hydrogen or C_{1-4}alkyl, R^8 is phenyl or naphthyl which is unsubstituted or is substituted by halogen, nitro, phenyl, or C_{1-4}alkyl, halogenoalkyl or alkoxy, *m* and *n*, which may be the same or different, are each 1 or 2, and *x* is 0 or 1.

4,109,016
ANAESTHETIC COMPOSITION

John Stewart Moilliet, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 637,680, Dec. 4, 1975, Pat. No. 4,080,389. This application Oct. 31, 1977, Ser. No. 847,026

Claims priority, application United Kingdom, Dec. 6, 1974, 52834/74

Int. Cl.^{2} **A61K** *31/08*

U.S. Cl. 424—342 **3 Claims**

3. A method for producing anaesthesia in a warm-blooded animal which comprises administering by inhalation to said animal an anaesthetically-effective amount of 2-chloro-1,2,2-trifluoroethyl difluoromethyl ether together with sufficient oxygen to maintain respiration.

4,109,017
METHOD FOR CLARIFICATION OF FRUIT JUICE

Ekkehard Grampp, Ober Ramstadt, Darmstadt; Reinbold Schmitt, Zwingenberg, and Reinhold Urlaub, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 28, 1976, Ser. No. 755,085

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607532

Int. Cl.^{2} **A23L** *2/30*

U.S. Cl. 426—51 **5 Claims**

1. In a method for the clarification of fruit juice by treatment thereof with pectinase at a temperature between 35° and 55° C. and subsequent settling in the presence of gelatin and silica sol, the improvement which comprises carrying out the settling at a temperature between 35° and 55° C.

4,109,018
LOW CALORIE DIET BREAD

Jerome B. Thompson, Rte. 3, Box 231, Cumberland, Md. 21502

Continuation-in-part of Ser. No. 690,501, May 27, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,499

Int. Cl.^{2} **A21D** *2/36, 2/34*

U.S. Cl. 426—62 **12 Claims**

1. A dough composition for making a bread product, said dough composition comprising wheat flour, water, salt, yeast, fermentable sugar, said dough composition containing from about 3 to about 9 parts by weight of an added vital wheat gluten, from about 5 to about 12 parts by weight of a protein material selected from the group consisting of lowfat soy flour, nonfat dry milk, dried yeast flour, cottonseed flour, and mixtures thereof, from about 10 to about 20 parts by weight of an alpha cellulose flour, and from about 0.5 to about 6 parts by weight of a hydrophilic gum selected from the group consisting of synthetic cellulose ethers, gum guar and gum tragacanth and mixtures thereof, all of said ingredients being expressed as parts by weight per 100 parts of wheat flour.

4,109,019
PROCESS FOR IMPROVED RUMINANT FEED SUPPLEMENTS

William Percy Moore, P.O. Box 943, Hopewell, Va. 23860

Continuation-in-part of Ser. No. 633,029, Nov. 18, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,758

Int. Cl.^{2} **A23K** *1/06, 1/22*

U.S. Cl. 426—69 **5 Claims**

1. A method for preparation of feeds, highly palatable to ruminant animals, having increased protein equivalent content and said protein equivalent having improved properties of delayed release, by the reaction of fermented proteinaceous agricultural products with carbamides catalyzed by aliphatic dicarboxylic acids comprising:
- a. combining one to ten parts fermented proteinaceous agricultural products with one part of carbamide solution containing an aliphatic dicarboxylic acid having between 4 and 6 skeletal carbons, said dicarboxylic acid amounting to between 0.05 and 5.0% of the total reaction mixture, in a first stage reactor fitted with internal rotating blades to provide mechanical mixing and to destroy the physical integrity of the fermented products thereby producing a homogeneous liquid, maintaining reactor temperatures between 70° and 105° C, injecting heated stripping gases amounting to between 10 and 30% by weight of the carbamide solution into the homogeneous liquid to remove low boiling impurities which cause poor feed palatability, venting the stripping gases containing said impurities from the reactor, and retaining the homogeneous liquid reactants in the first stage reactor for a period of time between 1 and 10 minutes;
- b. feeding the homogeneous liquid effluent from the first stage reactor to the second stage reactor and spraying the liquid into said second stage reactor as discrete, finely divided droplets;
- c. completing the catalytic reaction of the finely divided droplets of carbamide and fermented agricultural products to form solid adduct product particles by fluidizing the said carbamide and fermented agricultural products in an upwardly flowing stream of heated gases, wherein the retention time of the carbamides and fermented agricultural products in the second stage reactor is between 15 and 300 seconds, at temperatures between 85° and 160° C;
- d. removing the solid adduct product from the heated zone of the second stage reactor and cooling said product to 40°–70° C.

4,109,020
METHOD OF PRODUCING CRISP REHEATED FRENCH FRIED POTATOES

Harold Gorfien, Framingham; Abdul R. Rahman, Natick, and Donald E. Westcott, Actoo, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1977, Ser. No. 812,080

Int. Cl.^{2} **A23L** *1/216*

U.S. Cl. 426—241 **7 Claims**

1. A method of producing crisp, non-rubbery, reheated french fried potatoes which comprises the steps of par-frying fresh potato pieces in deep fat to a light cream-colored surface appearance, separating the par-fried potato pieces from said deep fat, heating said par-fried potato pieces until the weight thereof is reduced by from about 10 to about 23 percent by weight, further frying said potato pieces in deep fat at about 375° F. for from about 1 to about 3 minutes, separating said potato pieces from said deep fat, freezing said potato pieces, storing said potato pieces in the frozen state until time for consumption thereof, and heating said potato pieces with microwave energy sufficiently to render them palatable.

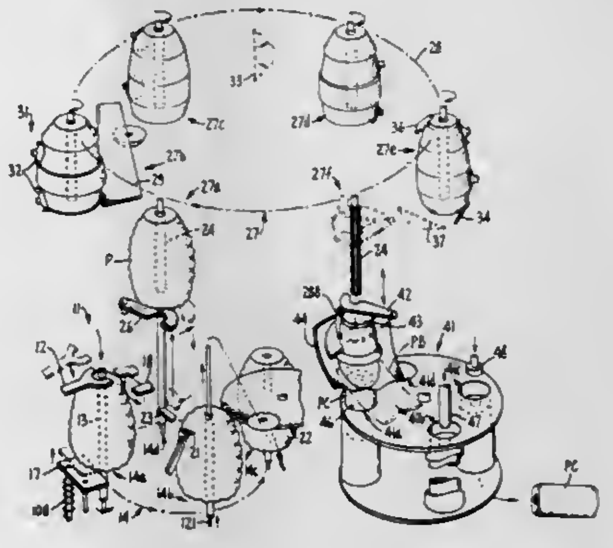
4,109,021
METHOD OF PEELING PINEAPPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 697,779, Jun. 21, 1976. This application Apr. 11, 1977, Ser. No. 786,614

Int. Cl.^{2} **A23L** *1/212;* **A23N** *7/00;* **A23P** *1/00*

U.S. Cl. 426—482 **5 Claims**



1. A method for processing pineapples comprising, centering a pineapple about its core axis, positioning the pineapple with its core extending in a predetermined direction, moving the pineapple along a path in alignment with said predetermined direction using a pineapple moving means, forming a hole centrally of the pineapple and of a diameter less than the fibrous central core of the pineapple using a coring means, said coring means being adjacent a yielding means, said yielding means engaging the pineapple while it is being cored and

yieldably resisting movement of the pineapple in said predetermined direction, moving a height setting finger over the pineapple higher than the upper end of the pineapple, disengaging the pineapple moving means from the pineapple, whereupon the yielding means moves the pineapple relative to the coring means in a direction opposite to said predetermined direction until the pineapple contacts the height setting finger thus spacing an end of the pineapple from the coring means to enable cutting of said end from the pineapple, severing one end from said pineapple on a plane normal to the core axis, transferring the pineapple to an indexable turret, supporting the transferred pineapple upon said central hole, indexing said turret to advance said pineapple to a first peeling station, rotating said pineapple about its core axis at said peeling station, peeling spaced circumferential bands from the outer surface of said rotating pineapple to a predetermined depth while maintaining the ovoid profile of the pineapple, indexing said turret to advance said pineapple to a second peeling station, severing the other end from said pineapple on a plane normal to the core axis as said pineapple is moved to said second peeling station, rotating said pineapple about its core axis at said second peeling station, peeling the remaining outer surface between said first peeled spaced bands to blend the peeled areas smoothly while maintaining the ovoid profile of the pineapple, trimming the juncture of said ends and ovoid peeled surface of the pineapple in a plane substantially bisecting the included angle formed at said juncture by an intersection of each end and a peeled surface to a depth required to remove any remaining eyes, the juncture formed adjacent said other end being trimmed with a fixed trimming means and the juncture formed adjacent said one end being trimmed with a movable trimming means, the position of said movable trimming means being adjusted in accordance with the height of the pineapple undergoing peeling, and transferring said peeled pineapple from said indexable turret.

4,109,022

FLAVORING WITH TRANS, E-1-CROTONOYL-2,2,6-TRIMETHYLCYCLOHEXANE

Douwe Rienk de Haan, Soest, and Dirk Karel Kettenes, Putten, both of Netherlands, assignors to P.F.W. Beheer B.V., Amersfoort, Netherlands

Filed Apr. 28, 1976, Ser. No. 681,202

Claims priority, application United Kingdom, Oct. 26, 1972, 49368/72

Int. Cl.² A23L *1/235*

U.S. Cl. 426—538 **8 Claims**

1. A fruit flavoring composition, for flavoring a food product, to which has been added trans, E-1-crotonoyl-2,2,6-trimethylcyclohexane in an amount which is effective to impart a fresh, fruity flavor to said flavoring composition.

4,109,023

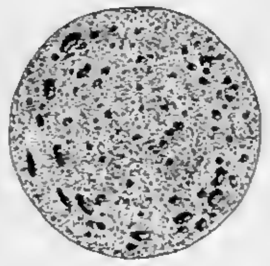
POROUS YEAST LEAVENED DOUGH PRODUCT

Dugan Allan Rucker, Kansas City, Mo.; Louis Albert Wollermann, Prairie Village, and Jack Kern Krum, Leawood, both of Kans., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,189

Int. Cl.² A21D *2/14, 2/36*

U.S. Cl. 426—549 **4 Claims**



1. A yeast leavened dough product having a high and uniform level of porosity containing for each 100 parts by weight of flour from about 0.20 to 5.0 parts by weight of rice flour and from about 0.06 to 1.0 part by weight of fumaric acid.

4,109,024

POTATO PRODUCT

Charles W. Cremer, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Division of Ser. No. 432,777, Jan. 11, 1974, Pat. No. 3,987,210, which is a continuation of Ser. No. 874,037, Nov. 4, 1969, abandoned. This application Jun. 28, 1976, Ser. No. 700,628

Int. Cl.² A23L *1/10*

U.S. Cl. 426—550 **10 Claims**

1. An edible dry potato product for use in producing French fried potatoes from finely divided dehydrated potatoes comprising: (A) between 50% and 92% by weight of dehydrated potatoes of a particle size less than 5 mesh sieve (U.S. sieve series), (B) between 5% and 45% by weight of high-amylose starch characterized as containing more than 35% by weight amylose, (C) between 1% and 30% weight of a cold-water-dispersible starch characterized as having a starch pasting temperature of less than 120° F. and serving as a binder for the potato product when the dry potato product is mixed with water at a mixing temperature of less than 120° F., and (D) less than 15% by weight of taste- and texture-modifying components.

4,109,025

PROTEIN ENRICHED BAKED GOODS

Robert M. Lauck, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 15, 1976, Ser. No. 750,947

Int. Cl.² A21D *2/34, 13/08*

U.S. Cl. 426—551 **10 Claims**

1. A process for preparing a leavened dough mixture for the production of leavened baked goods normally containing shortening which comprises replacing at least part of the shortening requirement of said baked goods with a whey protein concentrate containing at least 25% protein wherein the protein is substantially undenatured and non-oxidized, said concentrate being in an amount effective to improve the volume of said baked goods.

4,109,026

PROCESS FOR PRODUCING COMPACTED, DEHYDRATED, UNCOOKED CABBAGE AND CABBAGE PRODUCT THEREOF

Abdul R. Rahman, Natick, and Stephen G. Haralampu, Belmont, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1977, Ser. No. 818,701

Int. Cl.² A23B *7/02, 7/06, 7/14*

U.S. Cl. 426—640 **5 Claims**

1. A process for the preparation of compacted, dehydrated, uncooked cabbage, which comprises the steps of:

a. subdividing the leaves of fresh cabbage,
b. covering the subdivided cabbage with a solution of sodium metabisulfite,
c. removing the excess of said solution of sodium metabisulfite from said cabbage,
d. blanching the subdivided cabbage with heated air beginning with air at a temperature of about 90°-95° C. and gradually decreasing the temperature of said air to about 50°-60° C. over a period of about 15-25 minutes at a rate substantially in a straight line relation to the time elapsed,
e. partially drying said cabbage by means of heated air at about 50°-75° C. until the moisture content of said cabbage is from about five to about eight percent by weight,
f. partially rehydrating said cabbage by applying thereto an aqueous solution of a food grade surface-active agent selected from the group consisting of polyoxyethylene sorbitan monostearate and polyoxyethylene sorbitan monooleate until the moisture content of said cabbage is increased to from about 10 to about 20 percent,
g. equilibrating said aqueous solution of said surface-active agent throughout said cabbage,
h. compressing said cabbage to a compression ratio of from about 7:1 to about 15:1, and
i. redrying the compressed cabbage by means of heated air until its moisture content is no greater than 5 percent.

4,109,027

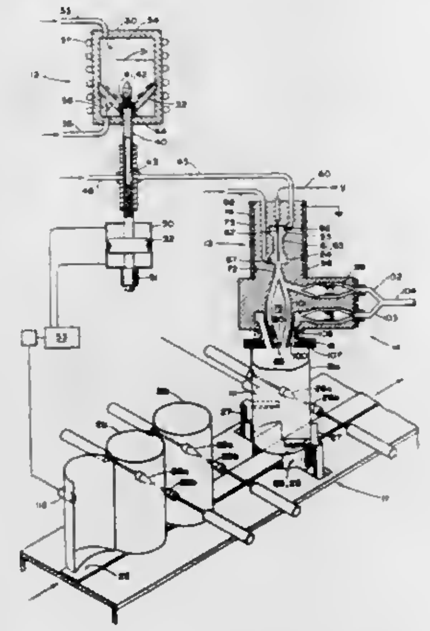
ELECTROSTATIC COATING APPARATUS AND METHOD

James R. Crose, Chelmsford, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 21, 1976, Ser. No. 651,162

Int. Cl.² B05D *1/06;* **B05B** *5/02*

U.S. Cl. 427—28 **13 Claims**



1. An electrostatic powder deposition method comprising entraining particles of powder in gas; thereafter supplying a like charge to the particles of powder by feeding the gas entrained powder into a cylindrical chamber having two enlarged symmetrical bell subchambers and a narrower connecting throat all aligned on a longitudinal axis, and an ejection opening centered in the outer end of one of the enlarged bells on the longitudinal axis, and circulating the powder about an electrode that extends through the chamber on the chamber's longitudinal axis, the entrained powder being fed into the outer end of the enlarged bell not having the ejection opening along its outer cylindrical surface in a first vortex direction of rotation and toward the throat and additional gas being fed into the outer end of the opposite enlarged bell in a second vortex having a reverse direction of rotation and toward the throat, bringing about a reaction between the vortexes by causing them to come together causing oscillatory movement of the particles of the entrained powder, providing improved exposure to electrical charging and a pulsing of the entrained powder and gas out the ejection opening; thereafter injecting the charged powder into the enclosure having an open volume therein bounded by at least one wall; sealing the enclosure with substantially all of the powder in the open volume and thereafter depositing the powder on said wall due to the charge on the particles.

4,109,028

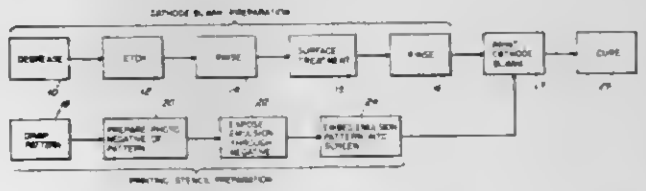
FABRICATION OF CATHODES FOR ELECTRODEPOSITION

Edwin Lewis Owen, Concord, and David William Marshall, North Reading, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 716,838, Aug. 23, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 804,996

Int. Cl.² C25D *1/04*

U.S. Cl. 427—58 **14 Claims**



1. The method of preparing a cathode for use in the electroforming of thin metallic filaments in a predetermined pattern comprising the steps of

(a) partially masking a porous planar member to provide a masked region corresponding to said predetermined pattern;
(b) providing an electrically conductive metal cathode base having a planar surface;
(c) cleaning said planar surface;
(d) overlying the cleaned planar surface with said porous planar member;
(e) printing a non-conductive material through said porous member and onto said planar surface;

whereby said predetermined pattern is formed on said planar surface intermediate said non-conductive material printed onto said planar surface.

4,109,029

HIGH RESOLUTION ELECTRON BEAM MICROFABRICATION PROCESS FOR FABRICATING SMALL GEOMETRY SEMICONDUCTOR DEVICES

Faik S. Ozdemir, Thousand Oaks, and Dall D. Loper, Fresno, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 24, 1977, Ser. No. 761,934

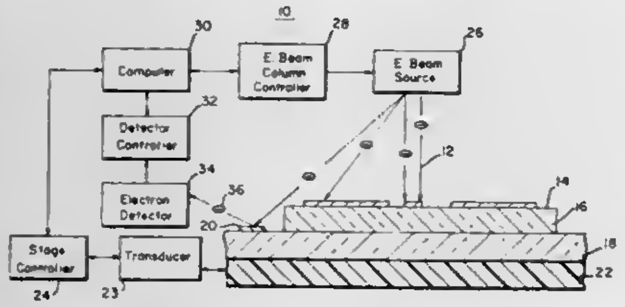
Int. Cl.² H01L *29/48*

U.S. Cl. 427—84 **13 Claims**

1. A process for fabricating small geometry semiconductor devices having contact electrodes of different metals or metal alloys comprising the steps of:

(a) forming a first mask on the surface of a semiconductor body and having one or more openings therein positionally referenced to a first alignment mark,

(b) depositing at least one metal electrode in one of said openings to thereby form one type of electrical contact at the surface of said semiconductor body,
(c) depositing a second alignment mark in another of said openings so that said second alignment mark is registered to said one or more openings in said first mask,
(d) forming a second mask on the surface of said semiconductor body and having an opening therein which is positionally referenced to said second alignment mark, and
(e) depositing another metal electrode in said second opening to thereby form a different type of metal contact on the surface of said semiconductor body and precisely spaced from said one metal electrode, whereby both of said metal electrodes are referenced to said second alignment mark.



4,109,030

METHOD FOR THERMALLY OXIDIZING SILICON

Marian Briska, and Ewald Eiseobraun, both of Boeblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,747

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550371

Int. Cl.^{2} C23C *11/00*

U.S. Cl. 427—93 **9 Claims**

1. A method of thermally oxidizing a silicon substrate comprising:
heating said substrate to elevated temperatures between about 900° to about 1100° C, and
exposing said heated substrate to an atmosphere wherein the gaseous reactants consist essentially of oxygen and nitrosyl chloride in the range of about 1:1 to about 20:1.

4,109,031

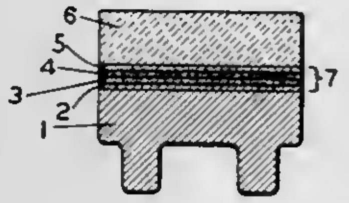
STRESS RELIEF OF METAL-CERAMIC GAS TURBINE SEALS

William D. Marscher, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,669

Int. Cl.^{2} B22F *5/00, 7/00*

U.S. Cl. 427—191 **4 Claims**



1. A process for modifying the magnitude of the thermal stresses between the metal and ceramic components of a bonded article having an interlayer of mixed metal-ceramic composition between the metal and ceramic components with the interlayer having a characteristic softening temperature, which comprises:
(a) providing an article consisting of a metal component and a ceramic component separated by an interlayer of mixed metal-ceramic composition;
(b) heating the article to a temperature in excess of the softening point of the intermediate layer;
(c) preferentially cooling the metal component to a temperature below the softening temperature of the intermediate layer while the ceramic component and intermediate layer remain at a temperature above the softening point of the intermediate layer; and
(d) allowing the article to cool at a substantially uniform rate until the entire article is below the softening point of the intermediate layer.

4,109,032

METHOD FOR TREATING LIGHTWEIGHT, NON-CEMENTITIOUS BUILDING MATERIAL

Jeffery L. Barrall, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 23, 1976, Ser. No. 744,273

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—255 **6 Claims**

1. A process for inhibiting efflorescence of a cement-free, sodium silicate/inorganic aggregate composition which comprises treating said composition with a reactive silane of the formula R_nSiCl_m wherein R is C_1 to C_4 alkyl, C_1 to C_4 alkoxy or mixtures thereof, and *n* and *m* are 0 to 4, with the proviso that when *m* is 0 at least one R is C_1 to C_4 alkoxy.

4,109,033

PROCESS FOR IMPREGNATING CONCRETE WITH POLYMERS

Paul R. Blankenhorn, 106 Horseshoe Cir., Pennsylvania Furnace, Pa. 16865; Philip D. Cady, P.O. Box 158, Lemont, Pa. 16851; Donald E. Kline, 1210 E. Branch Rd., State College, Pa. 16801, and Richard E. Weyers, 3276 Highridge Trail, Madison, Wis. 53713

Continuation-in-part of Ser. No. 584,249, Jun. 6, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,022

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—314 **8 Claims**

1. In the process of impregnating large volumes of concrete in the field, such as roadbeds, walkways, and bridge decks, with a polymer or a monomer for in situ polymerization wherein it is necessary to dry said concrete prior to impregnation, the improvement of employing a temperature measurement to determine moisture content which comprises
(1) determining the appropriate dryness for impregnation of said concrete by heating said concrete until a temperature-indicating device below the surface and within the concrete at the desired depth of monomer penetration indicates a minimum temperature of about 230° F., and
(2) impregnating the concrete to the desired depth with said polymer or monomer composition.

4,109,034

METHOD OF AND APPARATUS FOR CONTROLLING THICKNESS OF COATING APPLIED TO MOVING FABRIC

Henry W. Welch, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

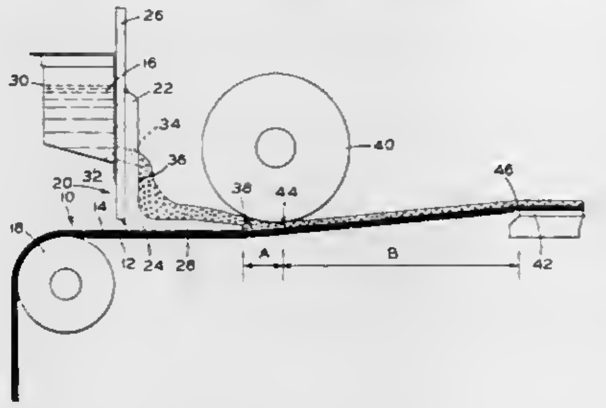
Filed Oct. 12, 1977, Ser. No. 841,304

Int. Cl.^{2} B05D *3/12*

U.S. Cl. 427—355 **3 Claims**

1. A method of controlling the thickness of a coating applied to moving fabric comprising the steps of:
(a) providing a fabric to be coated on one side,
(b) moving said fabric between a first point and a second point with the side of said fabric to be coated facing up, said fabric having no support under its lower side as it moves between said first and second points,
(c) depressing said moving fabric across its width at a point intermediate said first and second points so that the upper side of the fabric at said intermediate point is below a plane through said first and second points,

(d) applying a coating onto the upper side of said moving fabric adjacent said intermediate point between said intermediate point and said second point, while said moving fabric remains depressed at said intermediate point, and



(e) controlling the thickness of the applied coating across the fabric's width at a point adjacent the coating application location such that the distance between the intermediate point and the second point is several orders magnitude greater than the distance between the intermediate point and the point where the thickness is being controlled.

4,109,035

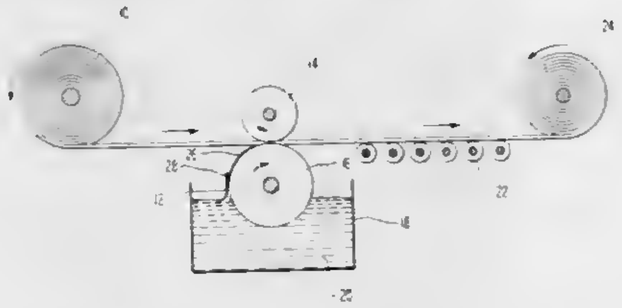
TENSION WIRE METERING OF APPLICATOR ROLL

Rolf Edward Christensen, Wallingford, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 19, 1977, Ser. No. 788,778

Int. Cl.^{2} B05D *1/28;* **B05C** *1/12*

U.S. Cl. 427—365 **3 Claims**



1. In the method of manufacturing a heat activatable fabric conditioning product comprising:
feeding a flexible absorbent substrate to a nip formed by a rotating upper roller and a rotating lower roller;
applying a quantity of liquid, fabric conditioning agent to the lower roller;
doctoring a film of said liquid on said lower roller;
compressing said substrate in said nip while in contact with said film to impregnate the liquid into the substrate, and
removing said impregnated substrate from said nip;
wherein the improvement comprises tension wire doctoring the liquid to form the film on the lower roller by setting a gap between the wire and the lower roller and, the wire being unsupported except at its end sections, retaining the gap by tensioning the wire.

4,109,036

ARTIFICIAL CHRISTMAS TREE

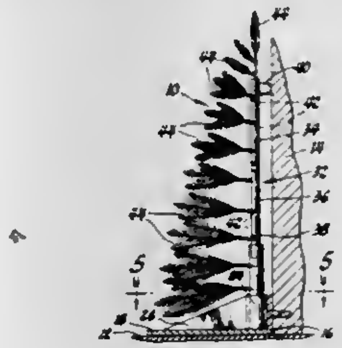
Gary Richard Lloyd, and Rita Rae Lloyd, both of 11438 Elm, Taylor, Mich. 48180

Filed Apr. 15, 1977, Ser. No. 787,896

Int. Cl.^{2} A47G *33/06*

U.S. Cl. 428—8 **1 Claim**

1. In combination with a horizontal floor and a vertical wall, an artificial Christmas tree comprising:
a horizontal base plate disposed on the floor;
a tubular member supported in a vertical position with its lower edge attached to the base plate such that the upper end of the tubular member forms a socket;
fastener means for connecting the tubular member to the vertical wall adjacent the floor such that the fastener means cooperate with the base plate in preventing movement of the tubular member away from the wall;
an elongated trunk having a lower end and an upper end, the lower end being removably received in the socket such that the trunk is disposed in a substantially vertical position adjacent the wall, said trunk having a plurality of longitudinally spaced branch-receiving openings;



a plurality of branches, each being received in a branch-receiving opening so as to be supported about the longitudinal axis of the trunk in an arc less than 360° but greater than 90° such that the branches collectively cooperate in simulating the foilage of a Christmas tree;
the upper end of the trunk being horizontally movable with respect to the wall; and
a bumper connected to the trunk adjacent the upper end thereof between the trunk and the wall such that the upper end of the trunk is spaced from the wall.

4,109,037

LAMINATED PACKING MATERIALS

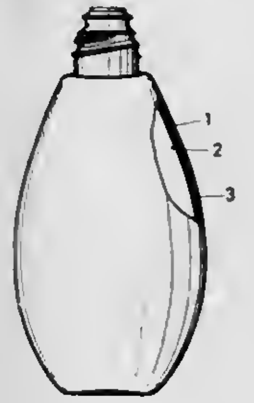
Shigezo Nohara, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Japan

Continuation-in-part of Ser. No. 463,173, Apr. 22, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,584

Claims priority, application Japan, Apr. 30, 1973, 48-47753

Int. Cl.^{2} B65D *1/00;* **B32B** *27/08*

U.S. Cl. 428—35 **7 Claims**



1. A laminated packing material which comprises at least one layer A containing resinous material A and at least one layer B containing resinous material B, said layers A and B having been extruded simultaneously and heat-bonded together so that at least one layer A is in direct contact with at least one layer B, said resinous material A containing more than 50 mole % of acrylonitrile units, said resinous material B being a member selected from the group consisting of polyethylene, polypropylene and an ethylene-vinyl acetate copolymer containing not greater than 8 mole % of vinyl acetate units, at least one of any of said layers A and B further containing an additive selected from the group consisting of (1) ethylene-

vinyl acetate copolymers containing more than 5 mole % of vinyl acetate units and (2) ionomers prepared by adding a metal hydroxide, metal lower alcoholate or metal salt of a lower aliphatic acid to a copolymer of a major proportion of ethylene and minor proportion of acrylic acid or methacrylic acid,

with the provisos that (1) when said additive is contained in said layer A, then there are from 2 to 30 parts by weight of said additive in said layer A based on 100 parts of said resinous material A, (2) when said additive is contained in said layer B and said resinous material B is polyethylene or polypropylene, then there are from 2 to 15 parts by weight of said additive in said layer B based on 100 parts of said resinous material B, and (3) when said additive is contained in said layer B and said resinous material B is an ethylene-vinyl acetate copolymer containing not greater than 8 mole % of vinyl acetate units, then said additive is said ionomer and there are from 2 to 15 parts by weight of said additive in said layer B based on 100 parts by weight of said resinous material B.

4,109,038
SUEDE-LIKE RAISED WOVEN FABRIC AND PROCESS FOR THE PREPARATION THEREOF

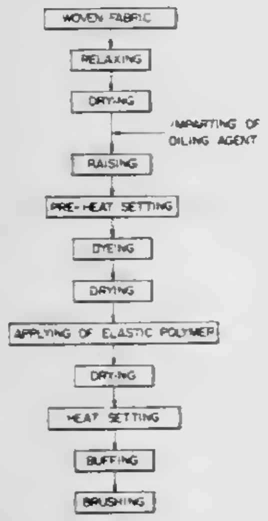
Kazushige Hayashi, Ibaraki; Iwao Fujimoto, Waki; Toshio Morishita, Iwakuni; Norihiro Minemura; Norio Yoshida, both of Ibaraki; Kiyotaka Ozaki, Iwakuni, and Takanori Shinoki, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 23, 1977, Ser. No. 799,818

Claims priority, application Japan, Mar. 17, 1977, 52-28627

Int. Cl.^{2} B32B *7/00*

U.S. Cl. 428—91 **12 Claims**



1. A suede-like raised woven fabric of interwoven warp yarns and weft yarns which comprises:
(a) a plurality of warp yarns, the total denier of a single warp yarn ranging from 50 to 300 denier;
(b) a plurality of weft yarns, a single weft yarn having a total denier of from 50 to 500 and being a single twist filament yarn, a loopy textured filament yarn or mixtures thereof, and constituted of a bundle of fine fibers obtained from hollow composite fibers, each composed of at least four alternating segments of fiber forming polyester and fiber forming polyamide components which are mutually adhered side-by-side and encompass a hollow space, and which extend along the longitudinal axis of the fiber to form a tubular body, said bundle of fine fibers having raised and unraised portions, the hollow composite fibers in the raised portions being separated into fine fibers having an average monofilament denier of from 0.05 to 0.4 denier and the hollow composite fibers in the unraised portions being separated into fine fibers having an average monofilament denier of above 0.4 but not exceeding 0.8 denier; and
(c) an elastic polymer applied thereto.

6. A process for the preparation of a suede-like raised woven fabric which comprises the steps of:
(1) providing hollow composite fibers, each composed of at least four alternately arranged components of fiber-forming polyester and fiber-forming polyamide which are mutually adhered side-by-side and encompass a hollow space, and which extend along the longitudinal axis of the fiber to form a tubular body, said composite fiber having a denier of from 1 to 10, and said each component having a denier of from 0.05 to 0.4;
(2) forming said hollow composite fibers into a yarn selected from the group consisting of a single twist filament yarn and a loopy textured filament yarn having a size of from 50 to 500 denier;
(3) weaving a fabric whose weft is the yarn comprising said hollow composite fibers and whose warp is a yarn having a size of from 50 to 300 denier;
(4) dividing said hollow composite fibers constituting said weft yarn into fine fibers to form a bundle of fine fibers by a raising operation, wherein said bundle of fine fibers consists of raised and unraised portions, the average monofilament denier of said raised portion being in the range of from 0.05 to 0.4 denier and the average monofilament denier of said unraised portion being in a range of above 0.4 but not exceeding 0.8 denier;
(5) applying a solution of an elastic polymer to said fabric; and
(6) solidifying said elastic polymer.

4,109,039
CARPET BACKING WITH RUBBER LATEX-SOLID POLYVINYL CHLORIDE RESIN COMPOSITION

Robert H. McCoy, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Oct. 27, 1976, Ser. No. 736,025

Int. Cl.^{2} D05C *17/02;* **B32B** *27/30*

U.S. Cl. 428—95 **11 Claims**

1. A method of backsizing a carpet comprising providing an aqueous carpet backsizing composition comprising a rubber latex and solid polyvinyl chloride resin particles having a weight average particle size of from 85 to 150 microns, the weight ratio of dry rubber solids to polyvinyl chloride resin being within the range of from 85:15 to 55:45, applying the said aqueous composition to the back of the carpet, and thereafter drying the applied composition at an elevated temperature below the flux temperature of the polyvinyl chloride resin to provide a carpet backsized with the said composition in a non-cellular state.

4,109,040
CUSHIONING DUNNAGE PRODUCT PRODUCED FROM CUSHIONING DUNNAGE MECHANISM

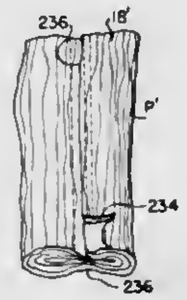
Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corporation, Eastlake, Ohio

Division of Ser. No. 573,615, May 1, 1975, Pat. No. 3,923,048. This application Nov. 22, 1976, Ser. No. 743,704

Int. Cl.^{2} B32B *3/04*

U.S. Cl. 428—129 **5 Claims**

1. A machine produced lightweight compressible flexible cushioning dunnage product of pad-like configuration formed from a plurality of superimposed webs of separate paper sheets, the lateral edges of which have been rolled loosely inwardly into generally abutting relation, and then crumpled generally radially inwardly, and comprising a central compressed section running lengthwise for the length of the product and lateral pillow-like sections, and pressure sensitive adhesive means formed integral on the outermost web initially adjacent a lateral edge thereof and coacting therewith in said central section of said product for aiding in maintaining said abutting relation in said central section, for retaining the product in said pad-like form.



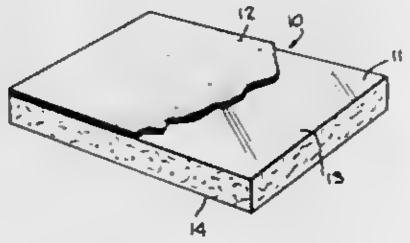
4,109,041
CONSTRUCTION PANEL WITH NON-SKID SURFACE AND METHOD OF FABRICATION

Stephen J. Tellman, Patterson, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 708,306, Jul. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,346, Oct. 30, 1975, which is a continuation of Ser. No. 488,709, Mar. 6, 1974, abandoned. This application Nov. 4, 1977, Ser. No. 848,485

Int. Cl.^{2} B32B *5/16*

U.S. Cl. 428—147 **14 Claims**



1. An improved construction panel comprising:
a structural sheet of material selected from the group consisting of particleboard, hardboard, plywood, fiberboard, and combinations thereof, said sheet having at least one smooth surface; and
a layer of elastomeric particles generally uniformaly distributed over and bonded to at least one smooth surface of said sheet, said particles being separated to expose a substantial part of said surface and being of a size which effectively preserves the smoothness of said surface while imparting a non-slip characteristic thereto.

9. The method of producing a particleboard panel comprising the steps of generally uniformly distributing elastomeric particles on a caul plate in an amount in the range of from about 10 to about 20 pounds of particles per one thousand square feet of caul plate area, said particles forming a thin layer of spaced particles, depositing wood flakes admixed with a binder over said particles to form a composite mat, and curing said binder to form said particleboard panel while bonding said elastomeric particles to the surface thereof.

13. The method of producing a particleboard panel comprising the steps of depositing wood flakes admixed with a binder on a caul plate to produce a mat, prepressing said mat, generally uniformly distributing elastomeric particles over a surface of the prepressed mat in an amount in the range of from about 10 to about 20 pounds of particles per one thousand square feet of mat surface, said particles forming a thin layer of spaced particles which expose a substantial part of the mat surface, and curing said binder to form said particleboard panel while bonding said elastomeric particles to the surface thereof.

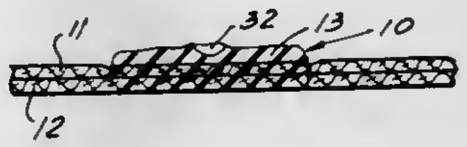
4,109,042
BEAD SEAM CONSTRUCTION AND METHOD OF FORMING

Lewis W. Estes, and Paul W. Johns, both of Kewanee, Ill., assignors to The Schaffer Company, Kewanee, Ill.

Filed Nov. 8, 1976, Ser. No. 739,731

Int. Cl.^{2} B32B *3/02*

U.S. Cl. 428—193 **12 Claims**



1. A seam construction, comprising:
(a) a pair of juxtaposed layers of porous sheet material in contact with each other; and
(b) a bead of cured nitrile latex material disposed on one side of one of said layers remote from the other layer, a portion of said bead material extending transversely through said one layer and transversely into the pores of said other layer, at least one edge of said bead being sharply defined by the substantial absence of bead material in the immediately adjacent porous sheet material.

4,109,043
LOW PRESSURE MELAMINE RESIN LAMINATES

Darwin Fiske DeLapp, New Canaan, Conn., assignor to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,719

Int. Cl.^{2} B32B *27/42, 3/10, 5/16*

U.S. Cl. 428—206 **10 Claims**

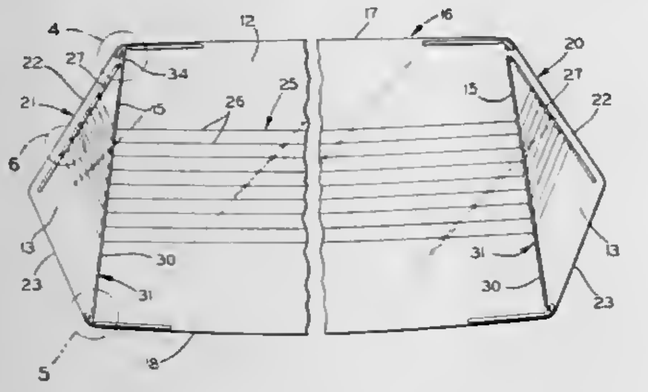
1. A heat and pressure consolidated article comprising
A. a self-supporting substrate and
B. a decorative, cellulosic paper sheet having a basis weight of at least about 40 pounds per 3,000 square foot ream, containing at least about 60% α-cellulose and being impregnated with a composition of matter comprising a mixture of
  1. an aqueous melamine/formaldehyde resin solution wherein the melamine to formaldehyde ratio thereof ranges from about 1:1.6 to about 1:2.5,
  2. from about 2.5% to about 30.0%, by weight, based on the weight of the resin solids of (1), of an elastomer comprising
    a. an ethylene/vinyl chloride copolymer containing a comonomer supplying from about 0.5% to about 7.0%, by weight, based on the total weight of (a), of amide groups,
    b. a polyurethane resin containing from about 3.0% to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups, or
    c. a butadiene/acrylonitrile polymer containing from about 1% to about 10%, by weight, based on the total weight of (c), of carboxyl groups, said elastomer having a particle size of up to about 20,000 Angstroms, and
  3. from about 0.25 to about 1.25%, by weight, based on the total weight of solids in said composition, of an alkylene polyamine having the formula

$$H_2N—CH_2CH_2NH]_nCH_2CH_2NH_2$$

wherein *n* is a whole, positive integer of 0–3, inclusive.

4,109,044
ELECTRICALLY HEATED WINDOW HAVING SHARPLY BENT PORTIONS

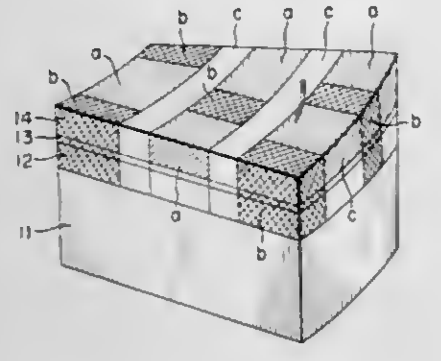
James G. Marriott, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Aug. 27, 1976, Ser. No. 718,154
Int. Cl.^{2} C03B *23/02;* H05B *3/06*
U.S. Cl. 428—210 **12 Claims**



1. A glass sheet adapted to be sharply bent about at least one line extending transversely of said sheet comprising: a first circuit formed of electrically conducting material imprinted on one surface of said glass sheet and including a pair of bus bars and a plurality of spaced electrically conducting lines extending between and connected at their opposite ends to said bus bars, at least one electrically conducting path formed of electrically conducting material imprinted on said one surface between said bus bars and coincident with the line about which it is desired to bend the sheet, said electrically conducting path extending transversely across and intersecting said conducting lines and adapted to be connected at the opposite ends thereof to a source of power to form a second circuit on said glass sheet surface, each of said bus bars being interrupted to form discontinuities on opposite sides of each connection between said conducting lines and said bus bars, respectively.

4,109,045
INFORMATION RECORDING MEDIUM

Takeshi Goshima, Tokyo, and Kiyonobu Endo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 411,733, Nov. 1, 1973, abandoned. This application Nov. 8, 1976, Ser. No. 739,988
Claims priority, application Japan, Nov. 6, 1972, 48-110943
Int. Cl.^{2} H04N *5/76, 5/84*
U.S. Cl. 428—212 **5 Claims**



1. A recording medium which comprises:
(a) a base;
(b) a first layer disposed directly on said base, said first layer being selectively sensitive to a first irradiated light beam such that the exposed portions and the unexposed portions of said first layer have different solubilities in a given solvent to permit either the exposed or the unexposed portions to be removed;
(c) a second layer disposed above said first layer, said second layer being selectively sensitive to a second irradiated light beam such that the exposed portions and the unexposed portions of said second layer have different solubilities in a given solvent to permit either the exposed or unexposed portions to be removed and wherein said second layer is substantially transmissive at least with respect to the first irradiated light beam to permit exposure of said first layer by the first light beam; and
(d) an intermediate layer interposed between said first and second layers to prevent direct contact of said first and second layers, said intermediate layer being chemically non-reactive with and incapable of diffusing into such first and second layers, wherein said intermediate layer is substantially transmissive at least with respect to the fist irradiated light beam to permit exposure of said first layer to the first irradiated light beam which passes through said second layer and is sensitive to one of the irradiated beams, the sensitivity of said intermediate layer being at a level between that of said first layer and that of said second layer.

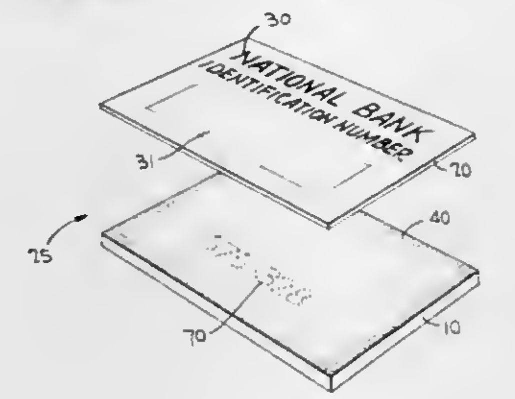
4,109,046
FLEXIBLE MULTI-LAYER MAGNETIC RECORDING MEDIA

Fritz Hammon; Manfred Ohlinger; Horst Grosselfinger, all of Frankenthal; Heinz Stritzinger; Job-Werner Hartmann, both of Ludwigshafen, all of Fed. Rep. of Germany; Eduard Schoenafinger, Jenesien, Italy, and Walter Schneider, Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Dec. 3, 1976, Ser. No. 747,355
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556188
Int. Cl. H01f *10/02*
U.S. Cl. 428—216 **1 Claim**

1. A magnetic recording medium comprising a non-magnetic flexible base and, applied thereto, two superposed magnetizable layers, each from 0.3 to 15 μm thick, of a homogeneous mixture of acicular chromium dioxide in an organic synthetic binder with further additives, wherein the magnetizable layer adjacent to the base contains a chromium dioxide with a specific surface area, measured by the BET method, of from 15 to 25 m^2/g and the outer magnetic layer contains a chromium dioxide with a specific surface area, measured by the BET method, of from 26 to 35 m^2/g.

4,109,047
RUB-ON SECURITY CARDS

Donald M. Fredrickson, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.
Filed Jul. 6, 1977, Ser. No. 813,247
Int. Cl.^{2} B41M *5/00, 5/12*
U.S. Cl. 428—307 **36 Claims**



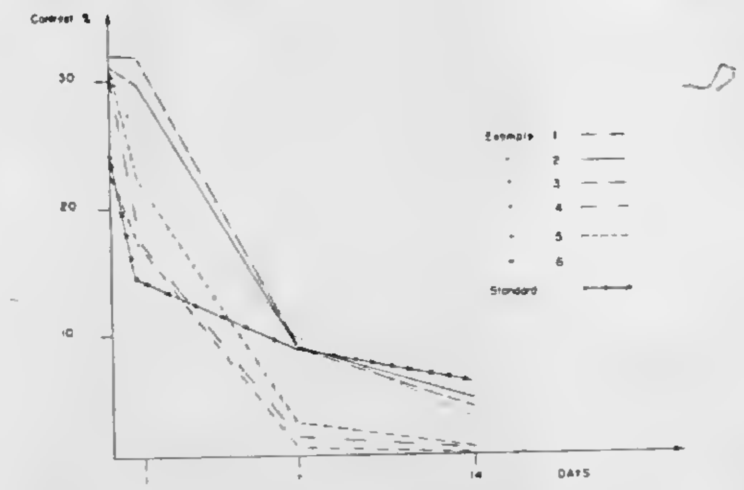
1. A multilayered card which contains initially invisible information that is capable of becoming permanently visible in the shape of information-relaying indicia upon pressure treatment of the card, the construction of the card being such that any information development and detection by either an authorized or an unauthorized person becomes manifestly and permanently evident, said card comprising:
a first layer;
a second layer coextensively arranged in an overlying adjacent relationship to said first layer;
a first initially colorless, color developer composition disposed in a first continuous coating between the inner facing surfaces of said first and second layers; and
a second initially colorless, color precursor compound disposed in a second continuous coating between said inner facing surfaces of said first and second layers adjacent said first continuous coating, said color developer composition and said color precursor compound being capable of interreacting chemically when pressed into intimate contact to produce a colored mark and being disposed to be pressed into such contact upon the application of pressure to an outer, exposed surface of at least one of said first and second layers;
and an initially colorless desensitizing substance disposed on one of said coatings in a configuration which presents said correspondingly configured material, said substance being capable of preventing said interreaction in the areas of said coatings in contact therewith to thus form said information-relaying indicia.

3. The card of claim 1 wherein said substance is on said first coating and functions by neutralizing the color-developing properties of the underlying composition.

8. The card of claim 3 wherein said second coating comprises a multiplicity of minute, discrete pressure-rupturable microcapsules containing said compound.

4,109,048
RECORDING MATERIAL CONTAINING GAMMA-ALUMINA

Guido Dessauer, Dusseldorf-Gerresheim; Kurt Ramlow, Schafflund; Kurt Riecke, Kempen, and Franz Wirnitzer, Flensburg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Düsseldorf-Oberkassel, Fed. Rep. of Germany
Filed Jan. 18, 1977, Ser. No. 760,274
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601865
Int. Cl.^{2} B32B *5/16;* B41M *5/16*
U.S. Cl. 428—325 **11 Claims**



1. In a recording material including a fibrous web and a pigment composition secured to the fibers of said web and capable of converting a substantially colorless member of the group consisting of crystal violet lactone, malachite green lactone, benzoyl leuco methylene blue, and N-phenylleukauramine to a colored dye, the improvement in the pigment composition which consists in said composition including at least 10 percent by weight of a mixture of γ-alumina and precursors of γ-alumina, said mixture containing 1 to 30 percent chemically bound water volatile at 1000° C, and said precursors being hydrated forms of aluminum oxide capable of being converted substantially completely to γ-alumina when heated from 300° to 1000° C.

4,109,049
COLOR DEVELOPING COATING USING UNREFINED CLAYS ON PAPER

Thomas D. Thompson, Flemington, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.
Division of Ser. No. 606,975, Aug. 22, 1975, Pat. No. 4,022,735. This application Apr. 27, 1976, Ser. No. 680,723
Int. Cl.^{2} B32B *5/16*
U.S. Cl. 428—331 **4 Claims**

1. A color developing coated paper comprising a paper sheet having applied thereto a coating consisting essentially of a mixture of a dispersing agent, a paper coating adhesive and a reactive pigment consisting essentially of a mixture of a salt of a polyvalent cation, a ligand, kaolinite and a member selected from the group unrefined bentonite and unrefined montmorillonite.

4,109,050
COATED SILICON-BASED CERAMIC COMPOSITES AND METHOD FOR MAKING SAME

Richard L. Mehan, Scotia, and Charles R. Morelock, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 9, 1976, Ser. No. 748,930
Int. Cl.^{2} B32B *9/04*
U.S. Cl. 428—332 **7 Claims**

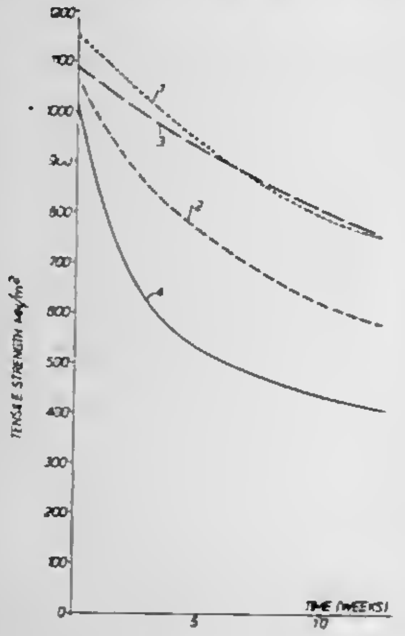
1. A method of reducing the tendency of a silicon-based ceramic, selected from the class consisting of a silicon carbide containing ceramic, and a silicon nitride containing ceramic, from reacting with a metallic surface at elevated temperatures to form metallic silicides which comprises
(1) etching the surface of the silicon-based ceramic composite to effect the removal of surface silicon,
(2) substantially filling the cavity of the resulting etched silicon-based ceramic composite formed during step (1) with an inorganic oxide mixture comprising a blend of aluminum oxide and silicon oxide and
(3) firing the treated silicon-based ceramic of (2) to a temperature of up to 1250° C resulting in the conversion of the inorganic oxide mixture to an adherent ceramic coating.

4,109,051
POLYHYDROXY AROMATIC COATING COMPOSITIONS FOR REINFORCING GLASS FIBERS USED IN CEMENTITIOUS PRODUCTS

David Ralph Cockram, Wigan, England, assignor to Pilkington Brothers Limited, St. Helens, England
Division of Ser. No. 485,659, Jul. 3, 1974, Pat. No. 3,954,490. This application Jan. 6, 1976, Ser. No. 646,785
Claims priority, application United Kingdom, Jul. 3, 1973, 31657/73
Int. Cl.^{2} C04B *7/02;* D02G *3/00*
U.S. Cl. 428—375 **34 Claims**

1. Glass fibres for use as reinforcement in cementitious products, said fibres being coated with a composition which consists essentially of a protective material to reduce deterioration of the glass fibres, said protective material being non-polym-

eric, a monocyclic or polycyclic aromatic compound which has at least three hydroxyl groups on the aromatic ring or when a polycyclic compound is employed, on at least one of the aromatic rings.



4,109,052
ELECTROCONDUCTIVE TRANSPARENCY
Jerrel Charles Anderson, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 12, 1977, Ser. No. 796,185
Int. Cl.^{2} B32B *15/08, 27/36;* **B44F** *1/06;* **G03G** *7/00*
U.S. Cl. 428—409 **12 Claims**

1. A laminate film having an optical transparence greater than 40% and a surface resistivity of at most 10^7 ohms per square, said laminate comprising a substrate layer of a substantially transparent organic, polymeric material, a coupling layer of crosslinked acrylic, polymeric material bonded to one surface of said substrate layer, and a vaporized metal layer bonded to the coupling polymer layer; the optical transparence of said laminate and of any of its component layers being measured with respect to incident light having a wavelength of 550mμ, perpendicular to the surface of said laminate or component layer.

4,109,053
SIZING PAPER WITH STABLE DISPERSIONS OF HYDROCARBON RESINS
Paul Harwood Aldrich, Greenville, Del., assignor to Hercules Incorporated, Wilmington, Del.
Division of Ser. No. 413,065, Nov. 5, 1973, Pat. No. 3,941,736. This application Dec. 15, 1975, Ser. No. 640,821
Int. Cl.^{2} D21D *3/00*
U.S. Cl. 428—413 **7 Claims**

1. In the method of sizing paper wherein a hydrocarbon resin is applied to paper fibers in the process of preparing sized paper, the improvement wherein there is employed in the sizing of the paper an essentially stable aqueous hydrocarbon resin dispersion consisting essentially of, by weight, from about 5.5 parts to about 50 parts solids and from about 94.5 parts to about 50 parts water; the solids content consisting essentially of, by weight, (a) from about 5 parts to about 45 parts hydrocarbon resin particles and (b) from about 0.5 part to about 10 parts of a water-soluble cation polymeric dispersing agent, component (a) being a hydrocarbon resin from ethylenically unsaturated hydrocarbon monomers having a ring and ball softening point of from about 45° C. to about 150° C., a molecular weight of from about 350 to about 2000, and an acid number of less than about 1, component (b) being selected from the group consisting of (i) a water-soluble polyaminopolyamide--epichlorohydrin resin, (ii) a water-soluble alkylenepolyamine--epichlorohydrin resin and (iii) a water-soluble poly(diallylamine)--epichlorohydrin resin.

4,109,054
COMPOSITES OF GLASS-CERAMIC-TO-METAL, SEALS AND METHOD OF MAKING SAME
Stephan J. Burgyan, Lakewood, Ohio, assignor to Ferro Corporation, Cleveland, Ohio
Filed May 19, 1976, Ser. No. 688,018
Int. Cl.^{2} B32B *17/06, 15/04*
U.S. Cl. 428—433 **4 Claims**

1. In a composite comprising one glass component bonded to at least one copper-base alloy component comprising 2 to 12% aluminum and the balance essentially copper, said alloy component, just prior to bonding said glass component thereto, having had an Al_2O_3 containing oxide film on the bonding surface thereof, the improvement consisting essentially of the glass component having the following composition:

B_2O_3	2 to 5 Wt. %
PbO	85 to 90 Wt. %
F_2	2 to 8 Wt. %
SiO_2	3 to 7 Wt. %

the foregoing components totalling 100 Wt. % as they vary within their indicated ranges.

4,109,055
LAMINATED WINDSHIELD WITH IMPROVED INNERLAYER
Joseph Cherenko, Valencia, and Charles W. Lewis, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 682,538, May 3, 1976, Pat. No. 4,039,720. This application May 4, 1977, Ser. No. 793,674
Int. Cl.^{2} B32B *17/10, 27/42;* **C08J** *3/28*
U.S. Cl. 428—437 **15 Claims**

1. A method for making a safety glass laminate comprising the steps of:

a. preparing a transparent film of a thermoplastic polyvinyl acetal polymer which comprises a photoinitiator in an amount effective to initiate crosslinking of said film;
b. laminating said film to a transparent ply of a material selected from the group consisting of glass and rigid transparent plastics; and
c. irradiating the exposed surface of the film with actinic radiation to effect crosslinking of the exposed surface thereby improving its resistance to abrasion in the presence of organic solvents.

9. A transparent polymer film for use as an innerlayer in a bilayer safety glass laminate consisting essentially of a thermoplastic polyvinyl butyral polymer and an effective amount of photoinitiator which upon actinic irradiation is capable of initiating crosslinking of said film, especially at an exposed surface thereof.

4,109,056
STARCH/LATEX CAST COATINGS FOR PAPER
Gerald Craig, Hamilton; Wilbur G. Evans, Oxford, and Everett L. Potts, Jr., Hamilton, all of Ohio, assignors to Champion International Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 574,718, May 5, 1976, abandoned. This application Jan. 26, 1977, Ser. No. 762,522
Int. Cl.^{2} B32B *23/08, 27/10;* **C08L** *3/02*
U.S. Cl. 428—512 **13 Claims**

1. A non-proteinaceous binder for cast surface coating of paper which comprises an aqueous admixture of acid hydrolyzed hydroxyethyl ether corn starch; a first styrene-butadiene polymer latex having a particle size of from about 800 to about 1300 angstroms, said first latex being characterized by a solids content of between about 45.0 and about 47.0%, a maximum 200 mesh residue of about 0.075 grms/900 mls., a pH of about 3.8 to about 4.8, a maximum Brookfield viscosity of about 100 cps. and a surface tension of about 43.0 to about 49.0; and a second styrene-butadiene polymer latex having a particle size of from about 1350 to about 1650 angstroms, said second latex being characterized by a solids content of between about 47.0 and about 49.0%, a maximum 200 mesh residue of about 0.05 gms./900 mls, a pH of between about 5.5 and about 6.5, a maximum Brookfield viscosity of about 300 cps., and a surface tension of from about 49.0 to about 55.0; said starch and said first and second latices being adjusted in relative proportions of about 1:2:2 dry weight of said composition such that said composition has a pH of between about 9.5 and about 10, and a solids content of about 55 to about 60%.

12. Paper cast surface coated with said binder of claim 1.

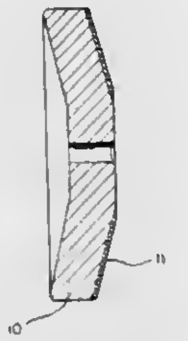
4,109,057
METHOD FOR ACCELERATED CURING OF PHENOLIC RESIN ADHESIVES
Nobutaka Nakamura; Yukio Saeki, and Shigeru Nemoto, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan
Filed May 23, 1977, Ser. No. 799,639
Claims priority, application Japan, May 24, 1976, 51-59072
Int. Cl.^{2} B32B *21/08;* **C08L** *5/00*
U.S. Cl. 428—528 **9 Claims**

1. A method for accelerated curing of a phenolic resin adhesive comprises adding powdered green tea to a thermosetting phenolic resin at about ambient temperature and curing said thermosetting resin by heating.

8. An adhesive composition prepared according to the method of claim 1.

9. A plywood article which is bonded with the adhesive composition of claim 8.

4,109,058
X-RAY TUBE ANODE WITH ALLOYED SURFACE AND METHOD OF MAKING THE SAME
William D. Love, Waukesha, and Robert E. Hueschen, Hales Corners, both of Wis., assignors to General Electric Company, Schenectady, N.Y.
Filed May 3, 1976, Ser. No. 682,509
Int. Cl.^{2} B22F *3/00*
U.S. Cl. 428—553 **13 Claims**



1. An anode for a rotating anode x-ray tube which anode has an exposed area on which an electron beam may impinge to cause production of x-radiation, said anode comprising:

a body comprised of refractory metal, and
a surface layer alloy on said body constituting said exposed area for said electron beam to impinge directly thereon, said layer composed of a ternary alloy wherein fine tungsten and molybdenum particles are both completely coated with rhenium to provide a true and homogeneous alloy.

7. An anode for a rotating anode x-ray tube which has a sufficiently high power rating to enable use of said tube for general x-ray diagnostic purposes, said anode having an exposed area on which an electron beam may impinge to cause production of x-radiation, said anode comprising:

a body comprised of refractory material,
a surface layer on said body constituting said exposed area for said electron beam to impinge directly thereon, said surface layer being composed of a ternary alloy of tungsten, rhenium and molybdenum, said ternary alloy being formed in a process including completely coating fine tungsten and molybdenum particles with rhenium derived from a solution containing a rhenium compound, said anode being made by the method comprising:
mixing powdered molybdenum and perrhenic acid where the acid is in sufficient amount to provide enough rhenium for completely coating the particles of said powder with rhenium when said acid is reduced to rhenium,
adding to said mixture powdered tungsten and then adding more perrhenic acid in an amount to provide sufficient rhenium for the amount of rhenium that is desired in the final mixture so that said mixture will have the amounts of tungsten, rhenium and molybdenum desired in an electron impingement surface layer of said anode,
after neutralizing the perrhenic acid, applying sufficient heat to dry the powder mixture, then reducing the rhenium to pure metal which is in intimate contact with the other refractory metal powders, by heating said powder mixture to a temperature in the range from 800° C to 1200° C in a hydrogen atmosphere,
pressing said dried mixture as a surface layer with additional powdered refractory metal constituting the body of said anode,
subjecting the composite of said surface layer and said body to intense pressure,
heating said composite to a temperature in the range from 2300° C to 2500° C to obtain a solid solution alloy in the surface layer and to densify the entire sintered body, and
hot forging said composite at temperatures in the range of 1300° C to 1700° C to achieve further densification of said composite.

9. An anode for a rotating anode x-ray tube which has a sufficiently high power rating to enable use of said tube for general x-ray diagnostic purposes, said anode having an exposed area on which an electron beam may impinge to cause production of x-radiation, said anode comprising:

a body comprised of refractory material,
a surface layer on said body constituting said exposed area for said electron beam to impinge directly thereon, said surface layer being composed of a ternary alloy of tungsten, rhenium and molybdenum, said ternary alloy being formed in a process including completely coating fine tungsten and molybdenum particles with rhenium derived from a solution containing a rhenium compound, pressing a layer of said coated particles to a layer of metal particles, which comprise said body, subjecting the composite of said layer and said body to high temperature to convert said layer to a solid solution alloy, and hot forging said composite to densify it.

4,109,059
FLUX-CORED WIRE FOR ELECTRIC ARC WELDING
Robert De Haeck, St. Pieters-Kapelle, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, Anderlecht, Belgium
Continuation of Ser. No. 587,554, Jun. 17, 1975, Pat. No. 4,106,399. This application Feb. 23, 1977, Ser. No. 771,333
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.^{2} B23K *35/22*
U.S. Cl. 428—558 **10 Claims**

1. Flux-cored wire for automatic or semi-automatic electric arc welding of low-carbon or low-alloy steel as obtained by using the following manufacturing process comprising the following successive steps:

(1) Preparing a powder mixture of a composition falling within the following weight limits:

46 to 84% of iron powder (zero alloy to maximum 10% alloy);

4 to 8% of refined ferromanganese having from 80 through 85% of its composition manganese;

2 to 8% of powder of the class consisting of ferrosilicon alone, having 45% silicon, and as another category within the class a chemical consisting of calcium silicon, CaSi, up to 7% of the total powder mixture, and also optionally ferrosilicon, FeSi, with the calcium silicon, CaSi, to make the rest of the particular amount within the above range of 2 to 8%;

10 to 20% of powder of the class consisting of calcium fluoride, CaF_2, alone, and as another category within the class a chemical consisting of sodium fluoride, NaF, up to 10% of the total powder mixture and also optionally calcium fluoride, CaF, with the sodium fluoride, NaF, to make the rest of the particular amount within the above range of 10 to 20%;

0 to 6% of powder of the class consisting of calcium carbonate, $CaCO_3$, alone, and as other categories within the class a chemical which consists of another alkaline earth carbonate up to 5% of the total powder mixture, and a chemical which consists of magnesium oxide, MgO, up to 5% of the total powder mixture, with in each of these latter cases also optionally calcium carbonate, $CaCO_3$, to make the rest of the particular amount within the above range of 0 to 6%;

0 to 2% of powder of the class consisting of SiO_2, Al_2O_3, potassium feldspar and mixtures of SiO_2 and one of the other two;

0 to 2% of potassium titanate;

(2) Mixing the foregoing mixture with 1 to 3% of silicate in powder form;

(3) Baking the resultant product at 570° C to 620° C for from 105 through 150 minutes;

(4) Introducing the resultant product within a sheath of low-carbon (from 0.03% carbon through 0.09% carbon) or low-alloy (from 0.1% of alloying metal through 10% alloying metal) steel, in the proportion of from 30 through 60 grams of the product for each 100 grams of the sheath.

4,109,060

POROUS ELECTRODE FOR A CHEMO-ELECTRIC CELL AND A METHOD OF PREPARING THE SAME

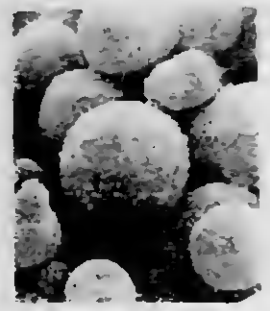
Bo Eric Christer Andersson, Tåby; Lars Ivar Carlsson, and Rolf Christer Roland Johnsson, both of Åkersberga, all of Sweden, assignors to Svenska Utvecklingsaktiebolaget (SU) Swedish National Development Co., Stockholm, Sweden

Filed Dec. 3, 1976, Ser. No. 747,317

Claims priority, application Sweden, Dec. 8, 1975, 7513813

Int. Cl.^{2} B27F *3/00*

U.S. Cl. 425—566 **59 Claims**



1. A porous electrode for a chemo-electric cell comprising reduced and sintered particles of an active electrode material wherein the particles of the active electrode material are sintered together to porous grains, which in turn are sintered together to a porous, coherent electrode body having a structure that is built up with inelastically deformed contact areas between the grains and with a well defined ratio between the average size of the pores within the electrode body and the average size of the pores within the grains, which ratio is above 1:1.

9. In a method of preparing a porous electrode for a chemo-electric cell comprising reduced and sintered together particles of an active electrode material, by starting from particles of a reducible compound and heating the same in a reducing atmosphere for reduction thereof and pressing and sintering the reduced compound into a coherent electrode body, the improvement which comprises forming from the particles, before the heating in a reducing atmosphere, porous grains having a relatively homogeneous size, heating the grains in a reducing atmosphere at the sintering temperature of the electrode material, whereby the particles within each grain sinter together, and pressing and sintering the reduced grains so that they will sinter together to a porous, coherent electrode body having inelastically deformed contact areas between the grains and a ratio between the average size of the pores within the electrode body and the average size of the pores within the grains above 1:1.

4,109,061

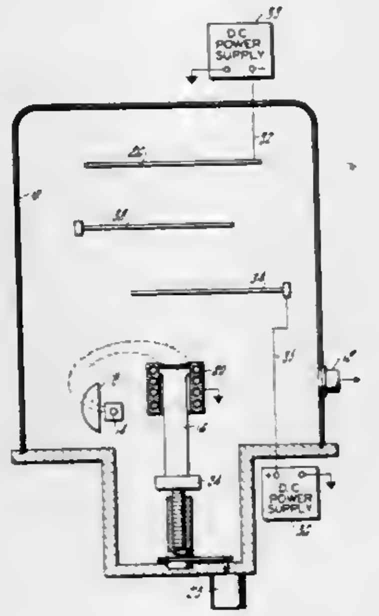
METHOD FOR ALTERING THE COMPOSITION AND STRUCTURE OF ALUMINUM BEARING OVERLAY ALLOY COATINGS DURING DEPOSITION FROM METALLIC VAPOR

Harry A. Beale, Jupiter, Fla.; Thomas E. Strangman, Manchester, and Edward W. Taylor, Richland, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1977, Ser. No. 858,912

Int. Cl.^{2} B32B *15/00;* C23C *15/00*

U.S. Cl. 428—678 **21 Claims**



6. A method for coating a substrate with an oxidation and thermal crack resistant MCrAlY-type overlay coating wherein coating deposition is effected by exposing the substrate to a metallic vapor, comprising:

(a) initially for a preselected time, biasing the substrate at a small negative potential of about −10 volts to about −80 volts relative to ground while a portion of the vapor is ionized to deposit a compositonally and structurally modified layer being characterized by the MCrAlY composition being sufficiently depleted in aluminum to render the layer ductile as compared to an MCrAlY layer of normal composition and by freedom from harmful leader defects; and

(b) terminating biasing of the substrate for the remainder of deposition to deposit an oxidation resistant MCrAlY coating layer of normal composition on said first modified layer, said first layer serving as a preferred secondary substrate during subsequent deposition to reduce the number and severity of leader defects in the oxidation resistant layer deposited thereon and as a ductile barrier layer during subsequent high temperature service to inhibit thermal crack propagation to the substrate.

7. A coated substrate produced by the method of claim 6.

4,109,062

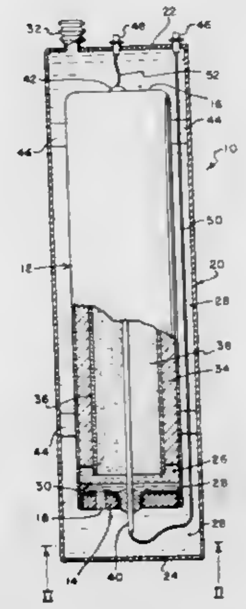
SUBMERSIBLE BATTERY APPARATUS

Joseph F. McCartney, Solana Beach, and Charles R. Gundersen, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1977, Ser. No. 835,766

Int. Cl.^{2} H01M *14/00*

U.S. Cl. 429—6 **15 Claims**



1. A submersible battery apparatus with improved current flow rate comprising:

a battery having top and bottom casing ends, one of the battery casing ends having an aperture,

a pressure compensated housing having top and bottom ends;

said battery being mounted in the housing with the aperture in the battery casing end directed downwardly within and facing the bottom end of the housing;

said battery containing a liquid electrolyte; and

said housing containing a liquid which has a higher specific gravity than the electrolyte and is non-reactive therewith;

whereby gases generated by the battery are retained within the battery casing and battery power is increased with increased submergence.

4,109,063

COMPOSITE BODY

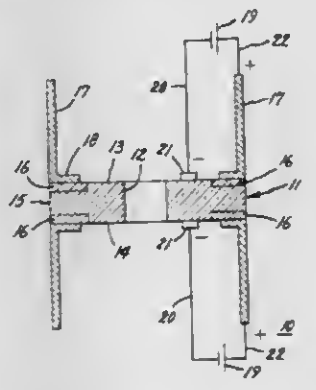
Bruce S. Dunn, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 17, 1977, Ser. No. 807,406

Int. Cl.^{2} H01M *2/02*

U.S. Cl. 429—30 **8 Claims**

1. A composite body comprising a substrate with opposite major surfaces, the substrate comprising a solid ion-conductive electrolyte material region and at least a portion of at least one major surface of a solid ion-insulating material region, and a moderately deformable metallic element bonded directly to the ion-insulating material of the substrate, the metal of the metallic element different from the metal of the mobile ions of the solid metallic ion-conductive electrolyte material region.



4,109,064

BATTERY PACKS

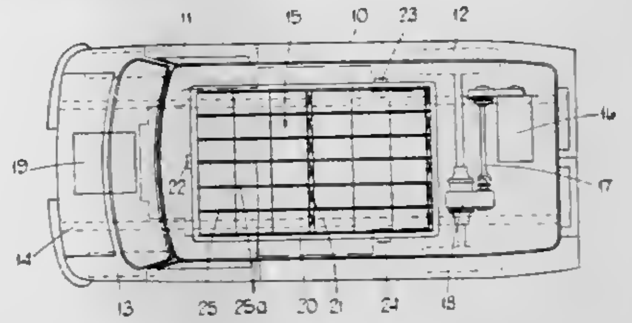
Peter Stuart Warner, Henlow, and John Richard Bicht, Hemel Hempstead, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 29, 1977, Ser. No. 792,169

Claims priority, application United Kingdom, May 8, 1976, 19032/76

Int. Cl.^{2} H01M *2/10*

U.S. Cl. 429—66 **2 Claims**



1. A battery pack comprising a plurality of batteries, a structure in which the batteries are mounted, said structure including at least one wall generally parallel to planes of the plates of the batteries respectively, spring devices mounted between the batteries and said wall of the structure to exert a force in the direction transverse to the planes of the plates of the batteries, each spring device comprising a base plate and a number of blade spring elements mounted thereon, the blade spring elements being arranged in rows at opposite sides of the base plate alternately.

4,109,065

RECHARGEABLE AQUEOUS ZINC-HALOGEN CELL

Fritz G. Will, Scotia, and Fay W. Secor, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

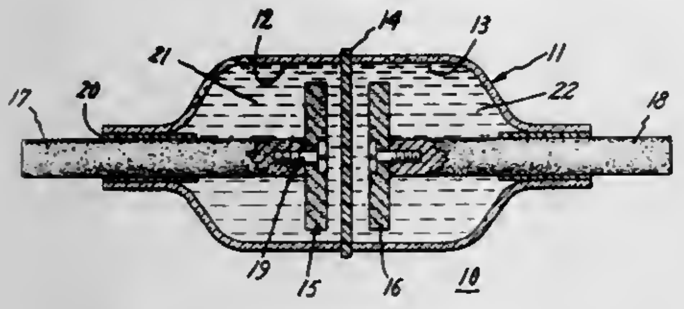
Filed Aug. 10, 1977, Ser. No. 823,409

Int. Cl.^{2} H01M *10/24*

U.S. Cl. 429—105 **4 Claims**

1. A rechargeable aqueous zinc-halogen cell comprising a casing, an ion exchange membrane in the casing defining a positive and negative electrode compartment, an electrode substrate in each compartment, at least the electrode substrate

in the positive compartment consisting of vitreous carbon, and an aqueous electrolytic solution containing a zinc salt selected from the class consisting of zinc bromide, zinc iodide and mixtures thereof in both compartments.



4,109,066
POLYACRYLIC ACID MEMBRANES FOR ELECTROCHEMICAL USE

Richard Dick, Paris; Georges Feuillade, Arpajon; Robert Gedessaud, Massy Palaiseau, and Louis Nicolas, Neuilly sur Seine, all of France, assignors to Compagnie Generale d'Electricite and Institut National de Recherche Chimique Appliquee Ircha, both of Paris, France

Filed Dec. 14, 1977, Ser. No. 860,649

Claims priority, application France, Dec. 14, 1976, 76 37573

Int. Cl.^{2} H01M *10/04, 2/16*

U.S. Cl. 429—145 **18 Claims**

1. Semi-permeable membrane having a microporous structure comprising a first polymer and a second polymer intimately mixed together, wherein the first polymer is chosen from among the following polymers: polyacrylic acid, and methacrylic acid, or a mixture of these polymers; the average molecular weight of these polymers lying between 10,000 and a few million; wherein the second polymer is soluble in water and is chosen from among the following polymers: polyvinylpyrrolidone, polyvinylic alcohol, and a copolymer containing vinylpyrrolidone or vinylic alcohol sequences, or a mixture of these polymers; and wherein the microporous structure of the membrane is obtained by immersion, in an electrolyte, of a film whose composition by weight is as follows:

20 to 70% of the first polymer;

20 to 70% of the second polymer;

0 to 40% of a plasticizer of the preceding polymers, chosen from among the following substances: N-methylpyrrolidone, glycerol sulfolane, and hexamethylphosphoramide; and

0 to 20% of an organic or inorganic basic compound.

4,109,067
POLYMER COMPOSITIONS EVOLVING REDUCED AMOUNTS OF NOXIOUS GASES ON COMBUSTION

Gary L. Deets, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 22, 1977, Ser. No. 817,942

Int. Cl.^{2} C08K *5/16*

U.S. Cl. 526—4 **3 Claims**

1. A polymer composition comprising a styrene/acrylonitrile copolymer and a diene rubber substrate with styrene and acrylonitrile grafted thereon which on thermal decomposition generates hydrogen cyanide, which composition comprises from 1 to 10 percent by weight of an organometallic complex comprising EDTA and a metal having an atomic number between 24 and 30, the percentage being based on the polymer composition.

4,109,068
RADIATION SENSITIVE VINYL HYDROPHILIC COPOLYMERS

John Graham Allen, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

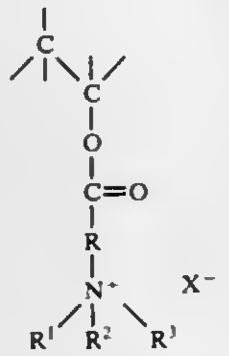
Continuation of Ser. No. 518,892, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 259,607, Jun. 5, 1972, abandoned. This application Sep. 7, 1976, Ser. No. 720,799

Claims priority, application United Kingdom, Jun. 9, 1971, 19668/71

Int. Cl.^{2} C08L *23/00, 25/00*

U.S. Cl. 526—9 **11 Claims**

1. A polymeric composition comprising a copolymer containing (a) vinyl alcohol units and (b) units derived from a vinyl ester of structure



where R is a divalent organic group, R^1, R^2 and R^3 are organic substituents and X^- is an anion, the molar ratio of units (a):(b) being 1 to 100 to 1000 to 1 and units (a) and (b) form at least 80% of the copolymer.

4,109,069
HORIZONTAL AUTOCLAVE FOR THE BULK PREPARATION OF POLYMERS AND COPOLYMERS ON A BASIS OF VINYL CHLORIDE

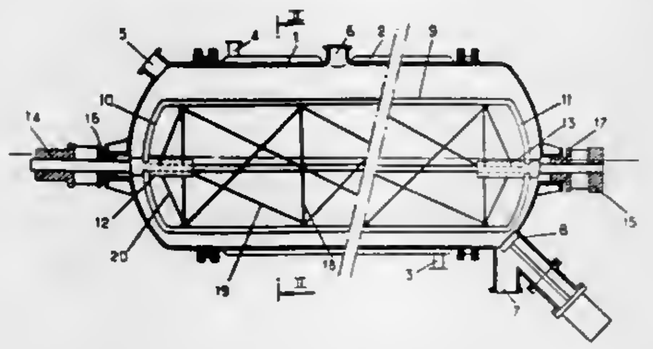
Michel Azemar, Irigny, and Lucien Viglieccа, Caluire, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 634,834, Nov. 24, 1975. This application Mar. 11, 1977, Ser. No. 776,587

Claims priority, application France, Dec. 4, 1974, 74 39613

Int. Cl.^{2} C08F *2/02, 114/06*

U.S. Cl. 526—65 **3 Claims**



1. A method for the bulk preparation of polymers and copolymers on a basis of vinyl chloride in two steps, carried out in separate apparatuses, according to which there is effected, in a first step known as prepolymerization step, a limited polymerization with high turbulence agitation until a conversion factor of the monomer or monomers of the order of 7% to 15% is obtained, and then in a second step a final polymerization operation with slow stirring speed sufficient to insure a good thermostatic control of the reaction medium until the end of the polymerization or copolymerization reaction, said method being characterized by the fact that the final polymerization operation is effected in the autoclave equipped with a stirrer system of the frame type having one or more coaxial frames mounted for rotational movement about a horizontal axis eccentrically spaced downwardly from the axis of the autoclave whereby the blades of the frame pass in close proximity to the bottom wall of the autoclave and remote from the top wall of the autoclave in which the ratio of the diameter of the cylinder generated by the frames to the diameter of the autoclave is within the range of 0.5 to 0.95.

4,109,070
METHOD OF PRODUCING OPTICALLY CLEAR HYDROPHILIC COPOLYMERS AND CONTACT LENSES

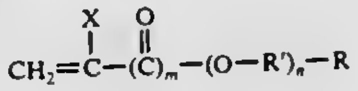
Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Wesley-Jessen Inc., Chicago, Ill.

Filed Jun. 7, 1977, Ser. No. 804,260

Int. Cl.^{2} C08F *220/20;* **C08L** *31/02;* **C02B** *3/00*

U.S. Cl. 526—77 **15 Claims**

1. In the process of making optically clear hydrophilic copolymers formed by copolymerizing a glycol monoester of acrylic or methacrylic acid with an alkoxy monomer having the formula:



$$CH_2{=}\overset{\overset{\displaystyle X}{|}}{C}{-}(\overset{\overset{\displaystyle O}{\|}}{C})_m{-}(O{-}R')_n{-}R$$

wherein R is a C_1–C_4 straight or branched chain alkoxy group, R' is a C_2 or C_3 straight or branched chain alkylene group, X is hydrogen or a methyl group, *m* is either 1 or 0, and *n* is an integer from 1 to 20, the improvement comprising distilling at least said alkoxy monomer under high vacuum and low temperature prior to copolymerization, promptly adding to said distilled monomer an amount of polymerization inhibitor below that which would inhibit copolymerization, but sufficient to provide a hydrated copolymer of high optical clarity, and then copolymerizing said monomer and said glycol monoester to form said hydrophilic copolymer.

4,109,071
PROCESS FOR THE POLYMERIZATION OF OLEFINS

Eugene Berger, Brussels, and Charles Blenfait, Keerbergen, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Apr. 9, 1976, Ser. No. 675,320

Claims priority, application Luxembourg, Apr. 14, 1975, 72278

Int. Cl.^{2} C08F *4/02, 10/02*

U.S. Cl. 526—114 **24 Claims**

1. A process for the polymerization and copolymerization of alpha-olefins with comprises carrying out said polymerization or copolymerization in the presence of a catalyst system comprising:

(A) an organo-metallic compound of a metal of Groups Ia, IIa, IIb, IIIb, and IV of the Periodic Table; and

(B) a solid catalyst complex formed by reacting, with one another;

(1) at least one magnesium compound (M) having at least one organic radical-oxygen-magnesium or halogen-magnesium bond therein; with

(2) at least one titanium compound (T) having at least one organic radical-oxygen-titanium or halogen-titanium bond therein; with

(3) at least one zirconium compound (Z) having at least one organic radical-oxygen-zirconium or halogen-zirconium bond therein; and with

(4) at least one aluminum halide (A); said oxygen containing organic compounds of magnesium, titanium and zirconium contain at least one metal to oxygen to organic radical sequence and the organic radical contains from 1 to 20 carbon atoms; said halogen containing compounds of magnesium, titanium and zirconium contain at least one halogen to metal bond sequence; said compounds (M), (T), (Z) and (A) are used in amounts which satisfy the equation

$$\left(\frac{Zr}{Ti}\right)\cdot\left(\frac{X}{Mg + Zr + Ti}\right) > 3$$

wherein Mg, Zr, Ti and X represent the amounts, in gram-equivalents, of magnesium, zirconium, titanium and halogen of said compounds.

4,109,072
ADDITION POLYMERS OF UNSATURATED IMIDAZOLINES

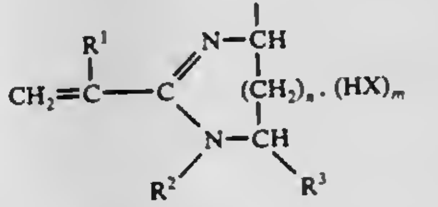
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247. This application Dec. 22, 1975, Ser. No. 643,729

Int. Cl.^{2} C08F *26/06*

U.S. Cl. 526—258 **12 Claims**

1. A vinyl addition homopolymer of a monomer having the formula



wherein *n* and *m* are, individually, 0 or 1, X is an anion, R^1 is hydrogen, methyl or phenyl and R^2, R^3 and R^4 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}), being colorless and free of non-amidine imino carboxyl, ester and amide groups, unreacted nitrile groups and unreacted polyamine.

4,109,073
POLYMERIZATES OF OLEFINIC NITRILES CONTAINING INDENE

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

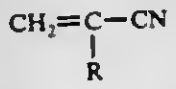
Filed Jun. 15, 1977, Ser. No. 806,847

Int. Cl.^{2} C08F *32/08, 26/00, 4/30*

U.S. Cl. 526—280 **6 Claims**

1. The polymer composition resulting from the copolymerization in the presence of a free-radical initiator of

(A) from about 35 to 70% by weight of at least one nitrile having the structure



$$CH_2{=}\underset{\underset{\displaystyle R}{|}}{C}{-}CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from about 10 to 50% by weight of a vinyl halide, and

(C) from about 5 to 20% by weight of indene,

wherein the given percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C).

4,109,074

PROCESS FOR PREPARING A HYDROPHILIC WATER INSOLUBLE POLYMER AND THE RESULTING POLYMER AND POLYMER ARTICLES

Charles P. Creighton, Alden, and Charles R. Teschemacher, Buffalo, both of N.Y., assignors to Alden Optical Laboratories, Inc., Alden, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,774

Int. Cl.^{2} C08F *120/20;* G02C *7/02, 7/04*

U.S. Cl. 526—320 **1 Claim**

1. A contact lens or contact lens blank manufactured from a hydrophilic water insoluble water expandable acrylic polymer; said polymer being prepared by a process consisting essentially of heating a composition consisting essentially of ethylene glycol monomethacrylate; said composition being heated to a temperature of from about 100° to about 165° C for from about 30 to about 360 minutes and annealed at a temperature of about 135° C for about 2 hours, said composition being essentially free from polymerization catalysts and initiators and said composition containing less than about 0.05 weight percent ethylene glycol dimethacrylate.

4,109,075

SEPARATION OF SACCHARIDES BY EXCLUSION CHROMATOGRAPHY

Irving F. Deaton, LaGrange Park, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 9, 1976, Ser. No. 694,258

Int. Cl.^{2} C07H *1/06*

U.S. Cl. 536—1 **5 Claims**

1. A process for separating saccaharides by exculsion chromatography comprising the steps of

- a. supplying a feed mixture of saccharides to a molecular exclusion chromatography zone,
- b. collecting from the zone a first fraction containing the least diffusible saccharides of the mixture, said first fraction containing predominantly the highest molecular weight saccharides,
- c. collecting subsequent fractions of saccharides from the zone, including a second fraction containing predominantly intermediate molecular weight saccharides and a third fraction containing predominantly lower molecular weight saccharides,
- d. continuously eluting said zone, with the elution being carried out first with said first fraction and then with water, and
- e. recovering the fractions from the zone.

4,109,076

5-IMINODAUNOMYCIN

David W. Henry, Chapel Hill, N.C., and George L. Tong, Cupertino, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 8, 1977, Ser. No. 831,438

Int. Cl.^{2} C07G *3/00, 11/00*

U.S. Cl. 536—4 **2 Claims**

1. 5-Iminodaunomycin and its pharmaceutically acceptable acid addition salts.

4,109,077

ANTIBIOTIC DERIVATIVES OF XK-62-2 COMPOUNDS

Kunikatsu Shirahata, Columbus, Ohio; Shinji Tomioka, Machida, Japan; Takashi Nara, Tokyo, Japan; Hideo Matsushima, Kawasaki, Japan, and Isao Matsubara, Machida, Japan, assignors to Abbott Laboratories, North Chicago, Ill.

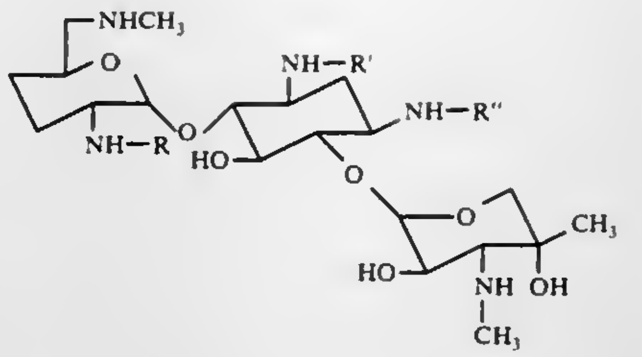
Continuation of Ser. No. 531,768, Dec. 11, 1974, abandoned. This application Jun. 3, 1976, Ser. No. 692,333

Claims priority, application Japan, Dec. 12, 1973, 48-137827

Int. Cl.^{2} C07H *15/24*

U.S. Cl. 536—17 **5 Claims**

1. A compound having the formula



wherein R is α-hydroxy-γ-aminobutyryl and R' and R'' is hydrogen or α-hydroxy-γ-aminobutyryl and at least one of R' and R'' is α-hydroxy-γ-aminobutyryl and the other is hydrogen or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,109,078

N-(POLYSACCHARIDYL)-NITROGEN HETEROCYCLES, ESPECIALLY PYRIMIDINE OR PURINE BASES, AND PROCESS FOR THEIR PREPARATION

Helmut Vorbrüggen, and Ulrich Niedballa, both of Berlin, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

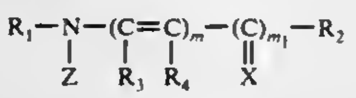
Filed Mar. 26, 1976, Ser. No. 670,741

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2514275

Int. Cl.^{2} C07H *19/06, 19/16*

U.S. Cl. 536—26 **15 Claims**

1. An N-(polysaccharidyl)-nucleoside of the formula



$$R_1-\underset{\displaystyle Z}{\underset{|}{N}}-(\underset{\displaystyle R_3}{\underset{|}{C}}=\underset{\displaystyle R_4}{\underset{|}{C}})_m-(\underset{\displaystyle X}{\underset{\|}{C}})_{m_1}-R_2$$

wherein Z is a polysaccharide moiety of a carbohydrate of at least 10 monosaccharide units and linked by a glycoside bond to the nitrogen atom, whose OH groups are free or blocked by alkanoyl, carbocyclic arylalkyl or carbocyclic aroyl, each of up to 10 carbon atoms;

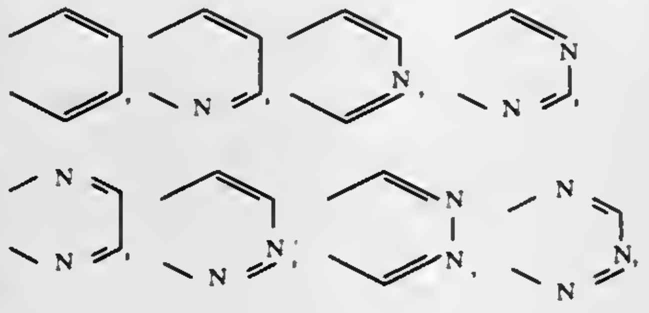
X is O or S;

m is 0 or 1;

m_1 is 0 or 1;

R_1 and R_2 collectively are saturated or unsaturated alkylene of 1-4 carbon atoms or a corresponding saturated or unsaturated alkylene wherein 1-2 carbon atoms in the chain are replaced by a nitrogen atom or a corresponding alkylene or aza-substituted alkylene substituted by 1 or 2 of lower alkyl, lower alkenyl carbocyclic aryl, carbocyclic aralkyl, carbocyclic aroyl or alkanoyl, alkoxy, carbocyclic acyloxy or alkanoyloxy, alkoxycarbonyl or dialkylaminocarbonyl, each of up to 10 carbon atoms, trifluoromethyl, hydroxy, oxo, carboxamido, amino, nitro, nitriloxo or halogen;

R_3 and R_4 each are hydrogen, alkyl of up to 6 carbon atoms, alkoxycarbonyl of up to 6 carbon atoms, alkylaminocarbonyl of up to 6 carbon atoms, carboxyl or nitrile or collectively are



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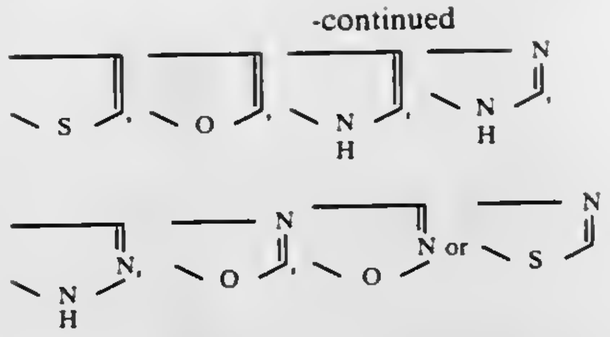


or a corresponding saturated divalent group or a corresponding divalent group substituted by lower alkyl, lower alkenyl, carbocyclic aryl carbocyclic aralkyl, carbocyclic aroyl, alkanoyl, alkoxy, carbocyclic aroyloxy, alkanoyloxy, alkoxycarbonyl or dialkylaminocarbonyl, each of up to 10 carbon atoms, trifluoromethyl, hydroxy, oxo, carboxamido, amino, nitro, nitriloxo or halogen.

4,109,079

STABILIZED S-ADENOSYL-L-METHIONINE PREPARATIONS

Toshihisa Kawahara; Goro Motoki; Kazuo Uchida, and Hiroshi Yoshino, all of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Oct. 14, 1976, Ser. No. 732,287

Claims priority, application Japan, Oct. 16, 1975, 50-123775; Apr. 9, 1976, 57-39313

Int. Cl.^{2} C07H *19/16*

U.S. Cl. 536—26 **12 Claims**

1. A stabilized dry S-adenosyl-L-methionine preparation which comprises S-adenosyl-L-methionine or a pharmaceutically acceptable salt thereof and an effective amount of a lithium salt which is pharmaceutically acceptable and is soluble in an acidic solution of the S-adenosyl-L-methionine or a pharmaceutically acceptable salt thereof and does not make the solution alkaline.

4,109,080

ION EXCHANGE COMPOUNDS ON CELLULOSE BASIS AND PROCESS FOR THE MANUFACTURE THEREOF

Karl Heinrich Lieser, Seeheim, and Peter Burba, Lampertheim, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Hannover, Fed. Rep. of Germany

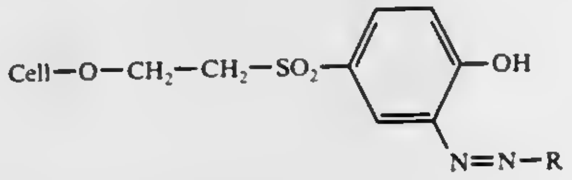
Filed Jun. 29, 1977, Ser. No. 810,963

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629542

Int. Cl.^{2} C08B *11/00*

U.S. Cl. 536—43 **3 Claims**

1. Ion exchange compounds based on cellulose and having the formula



wherein R is a group forming chelate complexes with metal ions and Cell is the cellulose.

4,109,081

1-(3,5-DISUBSTITUTED-2,4,6-TRIIODOPHENYL)-3-(POLYHYDROXY-ALKYL)UREA COMPOUNDS

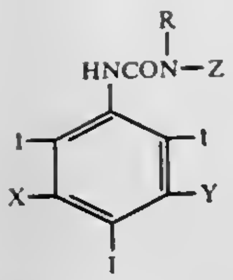
Kenneth R. Smith, Black Jack, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed May 15, 1975, Ser. No. 577,850

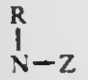
Int. Cl.^{2} C07H *5/06*

U.S. Cl. 536—53 **9 Claims**

1. A compound of the formula:



wherein X and Y are each selected from the group consisting of lower alkoxy, hydroxy-(lower alkoxy), lower alkoxy-(lower alkoxy), lower acylamino, lower acylamino-(lower alkyl), lower acylamino-(lower acylamino), hydroxy-lower acylamino, N-(lower alkyl)-lower acylamino, N-hydroxy (lower alkyl) lower acylamino, N-(polyhydroxy lower alkyl) lower acylamino, lower alkylsulfonamido, N-(lower alkyl)-lower alkylsulfonamido, 3,3-bis-(lower alkyl)ureido, lower perfluoroacylamino, carbamyl, N-(lower alkyl) carbamyl, N-(hydroxy lower alkyl)carbamyl, N,N-di-(lower alkyl)carbamyl, N,N-di-(hydroxy lower alkyl)carbamyl, lower alkoxy-(lower acylamino), lower alkoxyalkoxy-(lower acylamino), hydroxy and hydroxy-lower alkyl and



$$\overset{\displaystyle R}{\overset{|}{N}}-Z$$

is the monovalent residue of an aldosamine in which N is a nitrogen atom, Z is a polyhydroxylic residue, and R is selected from the group consisting of hydrogen, lower alkyl, hydroxy-lower alkyl and polyhydroxy-lower alkyl, said monovalent residue containing not more than 7 carbon atoms in its chain.

4,109,082

TRANS,TRANS-2,3,4,5-TETRADEHYDRO-PGI$_1$, COMPOUNDS

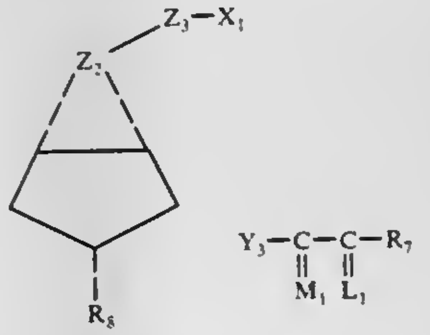
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 3, 1977, Ser. No. 821,541

Int. Cl.^{2} C07D *307/93*

U.S. Cl. 542—426 **42 Claims**

1. A prostacyclin analog of the formula



wherein Z_3 is trans—CH=CH—,

wherein Y_3 is

(1) trans—CH=CH—,

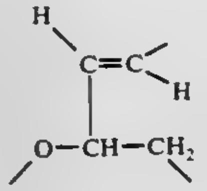
(2) cis—CH=CH—,

(3) —CH_2CH_2—, or

(4) —C≡C—

wherein Z_2 is

(1)



or

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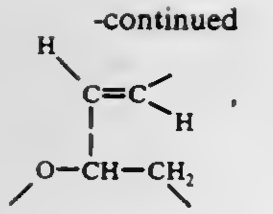
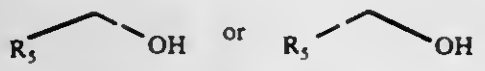
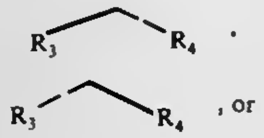


(2)

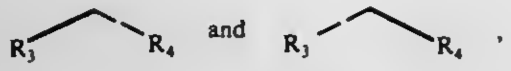
wherein R_h is hydrogen, hydroxy, or hydroxymethyl; wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is

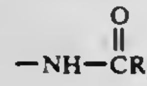


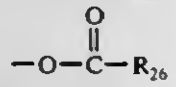
a mixture of

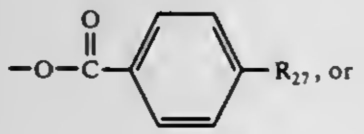


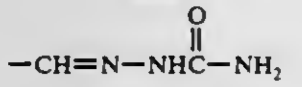
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein X_1 is

(1) —$COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

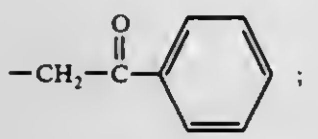

$$-NH-\overset{O}{\overset{\|}{C}}R_{25}$$
(a)


$$-O-\overset{O}{\overset{\|}{C}}-R_{26}$$
(b)


(c)


$$-CH=N-NH\overset{O}{\overset{\|}{C}}-NH_2$$
(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{27} is hydrogen or acetamido; inclusive, phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

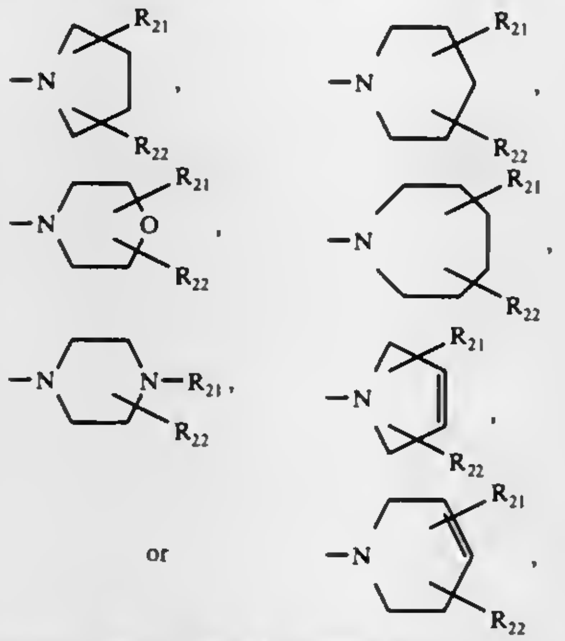
(2) —CH_2OH;

(3) —$CH_2NL_2L_3$ wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; or

(4) —COL_4, wherein L_4 is

(a) amino of the formula -$NR_{21}R_{22}$; wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive; carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms; and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein R_{21} and R_{22} are as defined above;

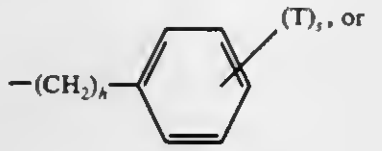
(c) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

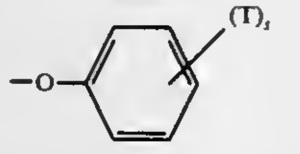
(d) sulphonylamino of the formula —$NR_{23}SO_2R_{21}$, wherein R_{21} and R_{22} are as defined above; or

(e) hydrazino of the formula —$NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula —$NR_{21}R_{22}$, as defined above, or cycloamino, as defined above.

wherein R_7 is

(1) —$(CH_2)_m$—CH_3,


(2)


(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that no more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when X_1 is —$CH_2NL_2L_3$.

4,109,083

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

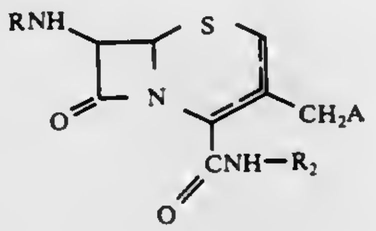
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 658,292, Feb. 17, 1976, Pat. No. 4,039,532, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,214

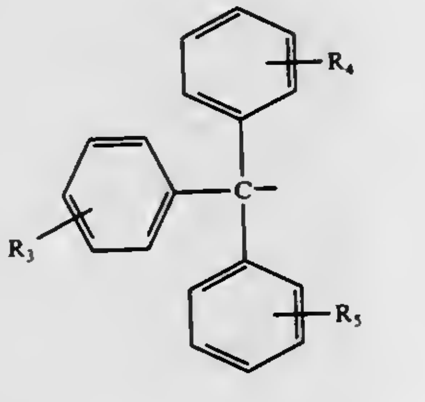
Int. Cl.² C07D *501/36*

U.S. Cl. 544—26 **6 Claims**

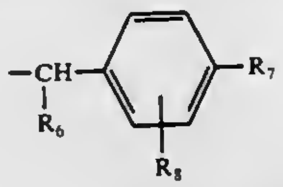
1. A compound selected from the group consisting of



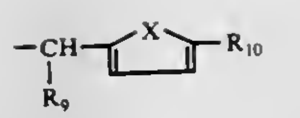
wherein
R is is selected from the group consisting of 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl, benzyloxycarbonyl and



wherein
R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl;
A is selected from the group consisting of 1-methyl-5-tetrazolylthio and 2-methyl-1,3,4-thiadiazolyl-5-thio; and
R_2 is selected from the group consisting of



R_2 is selected from the group consisting of
wherein
R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein
R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,109,084

THIOOXIME CEPHALOSPORIN DERIVATIVES

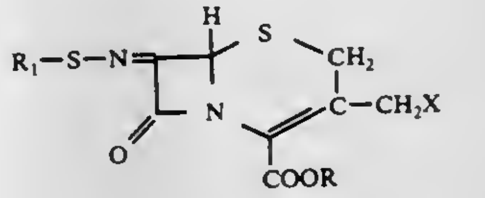
Eric M. Gordon, West Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 8, 1976, Ser. No. 748,425

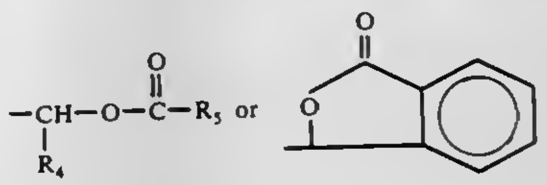
Int. Cl.² C07D *501/26, 501/48*

U.S. Cl. 544—29 **12 Claims**

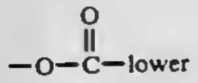
1. A compound of the formula:



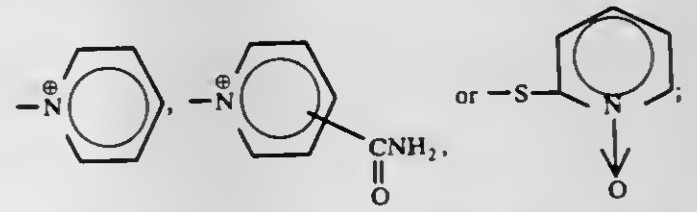
wherein R is hydrogen, lower alkyl of 1 to 4 carbons, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, tri(lower alkyl) silyl, lower alkoxymethyl,



X is hydrogen,


$$-O-\overset{O}{\overset{\|}{C}}-\text{lower}$$

alkyl wherein alkyl is of 1 to 4 carbons,



R_1 is lower alkyl of 1 to 4 carbons, phenyl, or phenyl having a halo, lower alkyl of 1 to 4 carbons, or lower alkoxy of 1 to 4 carbons substituent; R_4 is hydrogen or lower alkyl of 1 to 4 carbons; and R_5 is lower alkyl of 1 to 4 carbons.

4,109,085

7-AMINO-3-SUBSTITUTED-CEPHEM COMPOUNDS

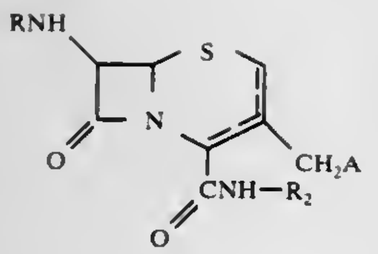
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 658,292, Feb. 17, 1976, Pat. No. 4,039,532, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,215

Int. Cl.² C07D *501/16*

U.S. Cl. 544—30 **2 Claims**

1. A compound selected from the group consisting of

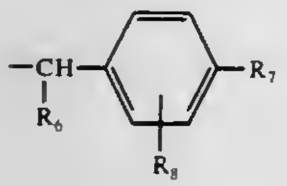


wherein

R is hydrogen

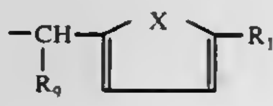
A is hydrogen and

R_2 is selected from the group consisting of



wherein

R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein

R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,109,086

3,6-DIHYDRO-2H-1,2-OXAZINES

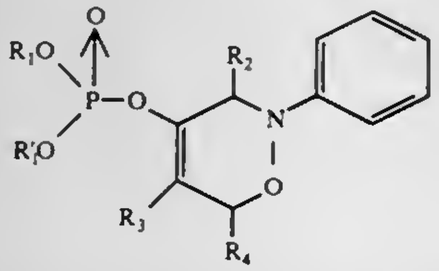
Kaspar F. Burri, West Caldwell, N.J.; Frank Kienzle, Therwill, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.Y.

Division of Ser. No. 618,853, Oct. 2, 1975, Pat. No. 4,025,584, which is a division of Ser. No. 497,598, Aug. 15, 1974, Pat. No. 3,933,948. This application Feb. 7, 1977, Ser. No. 766,301

Int. Cl.^{2} C07D *265/02*

U.S. Cl. 544—63 **4 Claims**

1. A compound of the formula



wherein each of R_1 and R_1' is lower alkyl, phenyl, phenyl substituted by one or more lower alkyl, fluoro, chloro, bromo, nitro and lower alkoxy groups or benzyl and each of R_2, R_3 and R_4 is hydrogen or lower alkyl.

4,109,087

1,4- AND 4,10-DIHYDRO-4-OXO-PYRIMIDO[1,2-A]BENZIMIDAZOLE-3-CARBOXYLIC ACID AMIDES

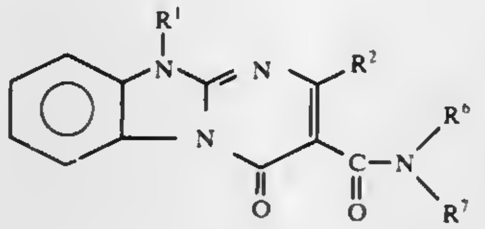
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 696,329, Jun. 15, 1976, Pat. No. 4,072,679. This application Dec. 12, 1977, Ser. No. 860,021

Int. Cl.^{2} C07D *487/04*

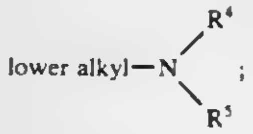
U.S. Cl. 544—115 **12 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen, lower alkyl, phenyl-lower alkyl or



$$\text{lower alkyl}-N\begin{matrix}R^4\\ \\ R^5\end{matrix}\;;$$

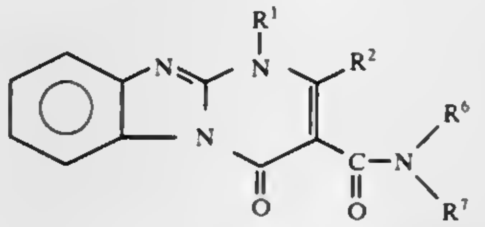
R^2 is hydrogen or lower alkyl;

R^4 and R^5 each is lower alkyl;

R^6 and R^7 together with the nitrogen form an unsubstituted or substituted pyrrolidino, piperidino, piperazinyl, morpholino or thiamorpholino radical wherein the substituent is hydroxy-lower alkyl or one or two lower alkyl groups;

and physiologically acceptable salts thereof.

2. A compound of the formula



wherein R^1, R^2, R^6 and R^7 have the same meaning as in claim 1, and physiologically acceptable salts thereof.

4,109,088

2-(INDENYLOXYMETHYL) MORPHOLINE DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Yuji Kawashima, Kiyose; Tadao Kojima, Shiraoka; Kunihiro Niigata, Ageo; Takashi Fujikura, Hachioji; Yoshihisa Nozaki, Tokyo; Shiro Tachikawa, Omiya; Shinji Usuda, Matsudo, and Soichi Kagami, Kawaguchi, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

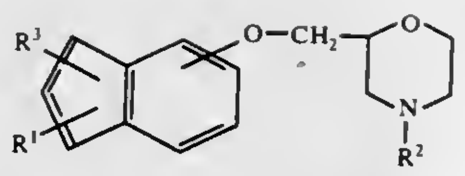
Continuation-in-part of Ser. No. 669,884, Mar. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 646,844, Jan. 5, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,320

Claims priority, application Japan, Jan. 29, 1975, 50-12177; Dec. 25, 1975, 50-155647

Int. Cl.^{2} C07D *265/30*

U.S. Cl. 544—174 **13 Claims**

1. A 2-(indenyloxymethyl)morpholine compound of the formula:



wherein R^1 and R^3 each represents a hydrogen atom, a lower alkyl group or a phenyl group, R^2 is a hydrogen atom, a lower alkyl group, a cycloalkyl group having 5-6 carbon atoms, a phenyl group, or a benzyl group, one of the dotted lines representing a single bond and the other is a double bond and the non-toxic pharmaceutically acceptable acid addition salts thereof including tautomeric mixtures thereof.

4,109,089

METHOD OF PREPARING CYANURIC ACID

Mario G. R. T. de Cooker, Sittard, and Antonius J. M. Hermus, Eindhoven, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 19, 1977, Ser. No. 834,663

Claims priority, application Netherlands, Sep. 23, 1976, 7610557

Int. Cl.^{2} C07D *251/32*

U.S. Cl. 544—192 **9 Claims**

1. A process for preparing cyanuric acid, comprising:

heating a solution of urea, biuret or a mixture of urea and biuret in a molten salt solvent comprising ammonium nitrate, wherein the concentration of urea and/or biuret is kept below 500 grams per kg of solution.

forming cyanuric acid and ammonia in said solution, and reducing during the reaction the concentration of said ammonica in said solution.

4,109,090

A PROCESS FOR PREPARING MELAMINE

Rudolf van Hardeveld, and Petrus F.A.M. Hendriks, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Mar. 17, 1977, Ser. No. 778,743

Claims priority, application Netherlands, Mar. 26, 1976, 7603164

Int. Cl.^{2} C07D *251/60*

U.S. Cl. 544—201 **17 Claims**

1. In a process for preparing melamine wherein molten urea is atomized and sprayed into at least one fluidized bed composed at least partly of catalytically active material contained in a reactor, by means of a two-phase sprayer using an atomizing gas selected from the group consisting of ammonia or a mixture of ammonia and carbon dioxide, in which reactor a temperature of between about 300° and 500° C and a pressure of between about 1 and 25 atmospheres are maintained, and wherein said sprayer is comprised of a liquid feed tube adapted for the supply of molten urea, terminating with a liquid outflow opening and positioned around the axis of the sprayer and coaxially within a gas feed tube adapted for the supply of atomizing gas and terminating with a sprayer outflow opening, said liquid and gas feed tubes being adapted such that said gas feed tube extends beyond the liquid outflow opening of said liquid feed tube, the improvement wherein, in said sprayer,

said gas feed tube near the sprayer outflow opening has an inner wall section that tapers narrower towards the sprayer outflow opening, at an angle α of between 70° and 90° with respect to the sprayer axis, and continues by way of a rounded shoulder into a comparatively short outflow channel ending at said sprayer outflow opening, said rounded shoulder having a radius of between 0.1 and 0.4 times the smallest diameter of said outflow channel,

said liquid feed tube has an outer wall, and an end face between said outer wall and liquid outflow opening chamfered at an angle α' of between 70° and 90° with respect to the sprayer axis thereby forming a conical channel with an average apex of between 140° and 180° between said chamfered end face and the tapered inner wall section of the gas feed tube,

and further wherein the passage area of the conical channel at the end adjacent to said outflow channel is no greater than such passage area at any other place within said conical channel, the smallest passage area of said outflow channel is no greater than the smallest passage area of said conical channel, and the smallest diameter of the outflow channel is between 1.0 and 1.6 times the diameter of the liquid outflow opening.

4,109,091

DERIVATIVES OF 1,4- AND 4,10-DIHYDRO-4-OXO-PYRIMIDO[1,2-a]BENZIMIDAZOLE-3-CARBOXYLIC ACID AMIDES

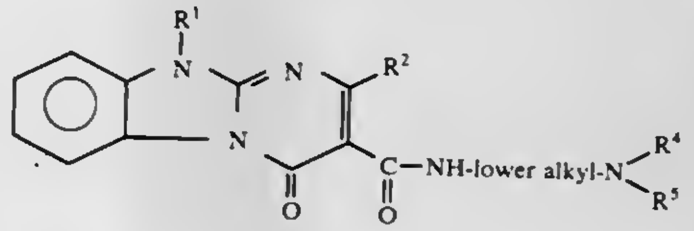
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 696,329, Jun. 15, 1976, Pat. No. 4,072,679. This application Dec. 12, 1977, Ser. No. 859,790

Int. Cl.^{2} A61K *31/415;* **C07D** *487/04*

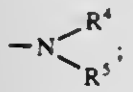
U.S. Cl. 544—250 **8 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen, lower alkyl, phenyl-lower alkyl or lower alkyl

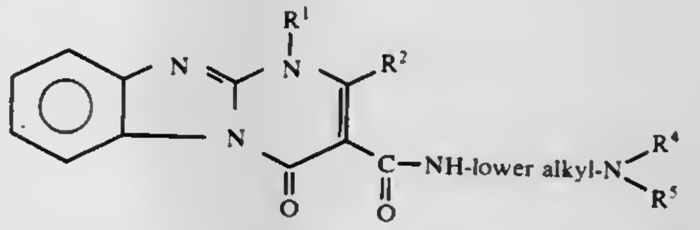


$$-N\begin{matrix}R^4\\ \\ R^5\end{matrix}\;;$$

R^2 is hydrogen or lower alkyl;

R^4 and R^5 each is lower alkyl; and physiologically acceptable salts thereof.

2. A compound of the formula



wherein R^1, R^2, R^4 and R^5 have the same meaning as in claim 1, and physiologically acceptable salts thereof.

4,109,092

PREPARATION OF 2-(PYRIDINYL)-4-PYRIMIDINAMINES

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,379

Int. Cl.^{2} C07D *401/04*

U.S. Cl. 544—328 **8 Claims**

1. The process which comprises reacting PY-carboxamidine with α-chloroacrylonitrile in the presence of an acid-acceptor to produce 2-PY-4-pyrimidinamine where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents.

4,109,093

PROCESS FOR MAKING 2-(4′-AMINOPHENYL) 5-AMINO BENZIMIDAZOLE

Aimé Joseph Arsac, Condrieu, and Pierre Frank, Saint-Clair-Du-Rhone, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 7, 1976, Ser. No. 647,240

Claims priority, application France, Jan. 14, 1975, 75 00924; Nov. 18, 1975, 75 35129

Int. Cl.^{2} C07D *235/18*

U.S. Cl. 548—334 **2 Claims**

1. A process for the preparation of 2-(4′-amino phenyl)-5-amino benzimidazole (DAPBI) wherein p.nitrobenzoic acid is condensed with aniline to obtain N-(4′nitrobenzoyl)-aniline, the N-(4′-nitrobenzoyl)-aniline is dinitrated at a temperature of between 0° and 25° C. in the presence of concentrated sulphuric acid and concentrated nitric acid to obtain N-(4′-nitrobenzoyl)-2,4-dinitroaniline, the N-(4′-nitrobenzoyl)-2,4-dinitroaniline is reduced to the corresponding triamine, and the deshydrocyclization of the triamine is carried out to obtain the DAPBI, wherein the improvement consists essentially of: treating p.nitrobenzoic acid with a halogenating agent in an inert aliphatic solvent medium to form the acid halide, and carrying out the condensation of the acid halide with aniline in the said inert aliphatic solvent medium with stoichiometric proportions of p.nitrobenzoic acid and aniline without isolating the acid halide; extracting the N-(4′-nitrobenzoyl)-aniline from the solvent medium with sulphuric acid and dinitrating it in its sulphuric acid solution with stoichiometric proportion of nitric acid without intermediate isolation of the N-(4′-nitrobenzoyl-)aniline.

4,109,094

METHOD FOR QUATERNIZING IMIDAZOLINES

Bhupendra C. Trivedi, Worthington; Robert A. Grimm, Columbus, and R. B. McConnell, Dublin, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 27, 1977, Ser. No. 809,988

Int. Cl.^{2} C07D *233/16*

U.S. Cl. 548—347 **4 Claims**

1. A process for quaternizing an imidazoline product provided by the cyclization of a diamidoamine obtained by condensing an ethylene-alkylene triamine and a higher fatty acid or functional equivalent thereof, which comprises the steps: (a) reacting said imidazoline product with a quaternizing agent selected from the group consisting of a lower alkyl halide, a lower dialkyl sulfate, benzyl chloride and benzyl bromide on a basis of about a mole of said agent per mole of the starting amidoamine condensate; (b) basifying the reaction mixture with an alkaline metal alkoxylate to the extent of neutralizing the protonated species formed in step (a); (c) reacting the basified mixture of step (b) with a number of equivalents of quaternizing agent about equal to that of base used in step (b); and sequentially repeating steps (b) and (c) until the non-quaternized content of the reaction mixture is less than about 3 weight percent.

ELECTRICAL

4,109,095

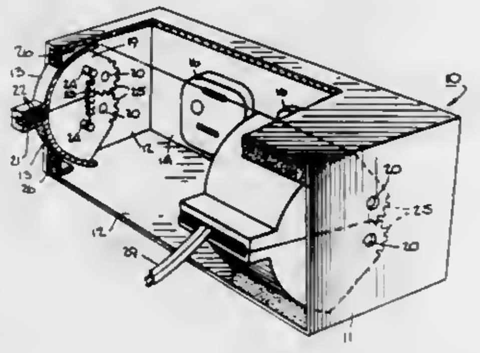
WEATHERPROOF ELECTRICAL OUTLET BOX COVER

David A. Kling, Martinsville, and Charles W. Bell, Maplewood, both of N.J., assignors to Mulberry Metal Products, Inc., Union, N.J.

Filed Oct. 28, 1976, Ser. No. 736,578

Int. Cl.^{2} H02G *3/18*

U.S. Cl. 174—67 **10 Claims**



1. A weatherproof electrical outlet box cover comprising
a housing having side walls, defining an opening and a back wall for receiving at least one electrical outlet, said back wall being disposed in alignment with said opening;
a pair of lids pivotally mounted on said housing to close over said opening, each said lid having a recess at an edge thereof facing a recess in said other cover;
means for moving said lids between a closed position over said opening to an opened position to provide access to the interior of said housing and an electrical outlet therein; and
a pair of resilient sealing strips, each said sealing strip being disposed in a respective recess for abutting against the other of said sealing strips and for sealingly engaging about a cord of an electrical appliance plugged into the electrical outlet.

4,109,096

CONDITIONING SUPPORTS OF MICRO-PLATES OF INTEGRATED CIRCUITS

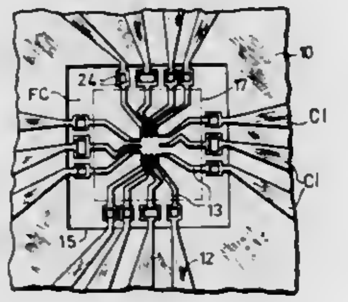
Gerard Debaine, Chatillon sur Seine Bagneux, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris

Filed Jan. 27, 1976, Ser. No. 652,803

Claims priority, application France, Jan. 29, 1975, 75 02802

Int. Cl.^{2} H05K *1/04;* H01L *23/48*

U.S. Cl. 174—68.5 **13 Claims**



1. A support for integrated circuit chips to be mounted on an interconnecting base provided with conductive areas, said support comprising:
- a flexible strip made of an inextensible insulating material having equidistant openings disposed along the axis thereof:
- a plurality of sets of interface conductors carried by said strip, each set being associated with a respective opening, said conductors of each said sets being arranged, on one of the faces of the strip, in a pattern of fingers extending cantilever-wise towards the centre of a respective opening, said conductors being electrically independent from each other and each interface conductor comprising a portion attached to said strip and an overhanging portion having a contact region which is located at a distance from the edge of said respective opening and which is intended to be soldered to a corresponding conductive area on the interconnecting base, said overhanging portion including a main part of constant width which terminates, near the free inner end of said conductor, in a straight terminal part narrower than said main part, and an open-centred structure located between the contact region of said conductor and the portion of that conductor which is attached to said strip, said open-centred structure having sides with width of which is substantially equal to half the width of said main part.

4,109,097

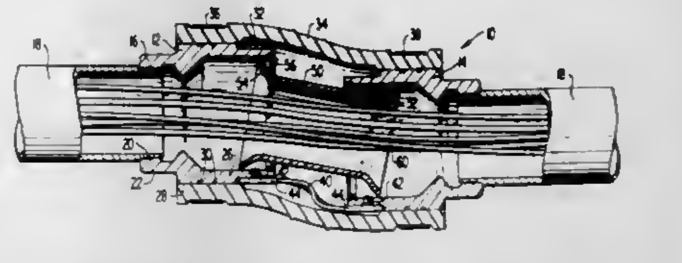
EXPANSION-DEFLECTION COUPLING

Richard C. Berry, Camillus, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Mar. 1, 1977, Ser. No. 773,369

Int. Cl.^{2} H02G *15/08*

U.S. Cl. 174—86 **6 Claims**



1. An expansion-deflection coupling comprising a pair of identical hub fittings each having a first annular portion of a predetermined internal diameter adapted to be secured to a conduit and a second annular portion having a larger internal diameter, a rigid tubular raceway having each end thereof moveably disposed within the second annular portion of a respective hub fitting, resilient flexible sleeve means secured to the outer surface of said second annular portion of each hub and extending between said hubs and grounding strap means secured to the end of said second annular portion of each hub and extending between said hubs.

4,109,098

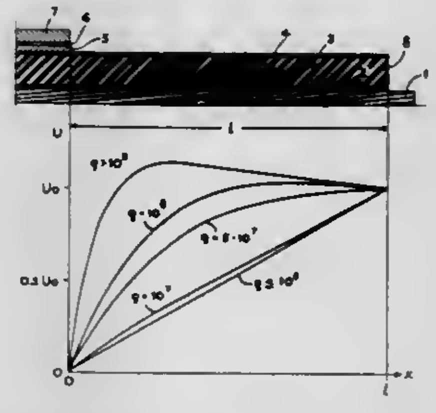
HIGH VOLTAGE CABLE

Mats Gunnar Olsson, Stockholm; Carl Ove Tollerz, Brnmma, and Sven Gunnar Wretemark, Stockholm, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 681,768, Apr. 29, 1976, abandoned, which is a continuation of Ser. No. 540,870, Jan. 14, 1975, abandoned. This application Sep. 1, 1976, Ser. No. 719,368

Int. Cl.^{2} H01B *9/02*

U.S. Cl. 174—106 SC **6 Claims**



1. A high voltage cable comprising:
an inner conductor, an inner semiconducting layer surrounding said conductor,

an insulation layer surrounding said inner semiconducting layer, an outer semiconducting layer surrounding said insulation layer, said outer semiconducting layer being strongly bonded to said insulation layer and having an electrical surface resistivity measured along the outer surface of the outer semiconducting layer and being within the range of 10^7 and 10^9 ohm/square and essentially voltage independent;

a further semiconducting layer surrounding said outer semiconducting layer in surface engagement therewith, said further semiconducting layer having an outer sheet resistivity of at most 10^6 ohm/square;

shielding means including metal wires encompassing said further semiconducting layer;

said cable further comprising an end for connection purposes at which said shielding means and said further semiconducting layer being removed to leave said inner conductor projecting therebyond covered, in succession, by said inner semiconducting layer, said insulation layer and said outer semiconducting layer, and a semiconductor connection between said outer semiconducting layer and said inner conductor, the combination of said value of surface resistivity of said outer semiconducting layer and said bonding of the outer semiconducting layer to said insulation layer providing a voltage gradient between the free end of the inner conductor and the edge of the shielding means of sufficiently low value to prevent corona at the edge of the shielding means while minimizing creeping current paths and flash over.

4,109,099

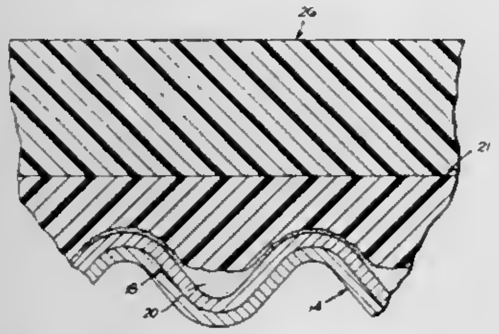
DUAL JACKETED CABLE

Matthew Raymond Dembiak, Clifton, N.J., and Wayne McCall Newton, Lilburn, Ga., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation of Ser. No. 655,360, Feb. 5, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,716

Int. Cl.^{2} H01B *7/28*

U.S. Cl. 174—107 **6 Claims**



1. A cable, which comprises:

a core;

a corrugated metallic shield surrounding the core and having an outwardly facing major surface and an inwardly facing major surface which faces the core; and

an extruded covering of polymeric material which surrounds and is in intimate contact with at least portions of the outwardly facing major surface of the metallic shield, and which includes:

- an outer layer comprising a material which is capable of withstanding exposure to temperatures of at least 212° F; and
- an inner layer interposed between the outer layer and the corrugated metallic shield and having a thickness at least slightly greater than the depth of the corrugations of the metallic shield and comprising a material having a notch sensitivity which is substantially less than that of the material of the outer layer to maintain the structural integrity of the cable notwithstanding corrugation imprint of the inner layer by the metallic shield.

4,109,100

REVERBERATION COMPENSATING COMMUNICATION SYSTEM

Manfred G. Unkauf, Franklin, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 7, 1976, Ser. No. 720,913

Int. Cl.^{2} H04L *27/24*

U.S. Cl. 178—67 **5 Claims**

1. In a communication system wherein a sequence of code words is modulated on a carrier in synchronism with a sequence of message symbols for transmission of a message, a receiving system for reception of said message comprising:

a set of matched filters, individual ones of said filters being matched to the modulation of respective ones of said code words for extracting a symbol of said message;

means coupled to one of said filters for tracking the amplitudes of symbols extracted by said filter, said tracking means providing a synchronization signal designating the time of occurrence of a maximum amplitude of said symbols;

means synchronized to said tracking means for sequentially selecting symbols from each of said filters; and

means coupled to said selecting means and including a feedback loop for filtering a sequence of symbols to recover said message, said feedback loop including an integrator and a comparator, said comparator signaling the occurrence of a symbol when the magnitude of an output signal of said integrator exceeds a predetermined reference value.

4,109,101

CORRELATIVE CONVERTER BETWEEN A 2^n-ARY CODE SEQUENCE AND A 2^{n+1}-PHASE CARRIER PULSE SEQUENCE

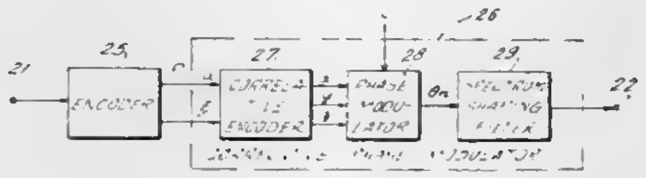
Toshihiko Mitani, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jun. 2, 1976, Ser. No. 691,974

Claims priority, application Japan, Jun. 4, 1975, 50-67851

Int. Cl.^{2} H04L *27/24*

U.S. Cl. 178—67 **10 Claims**



1. A correlative phase modulator for converting a binary information signal into an eight phase psk signal, said correlative phase modulator comprising:

first encoder means responsive to said binary information signal for generating one of four possible quaternary signals during each of a plurality of successive time periods, the particular one of said four possible quaternary signals generated during each of said time periods being determined by said binary information signal;

second encoder means responsive to said quaternary signals for generating one of eight possible octernary signals during each of said time periods, the particular one of said eight possible octernary signals generated during any given one of said time periods being determined by a predetermined law of correlation between the quaternary signals generated during two successive time periods, said second encoder means generating said octernary signals in such a manner that any of the eight possible octernary signals may be generated during each of said time periods;

eight phase modulator means responsive to said octernary signals for eight-phase modulating a carrier signal as a function of said octernary signals.

4,109,102

PHASE SYNCHRONIZING CIRCUIT

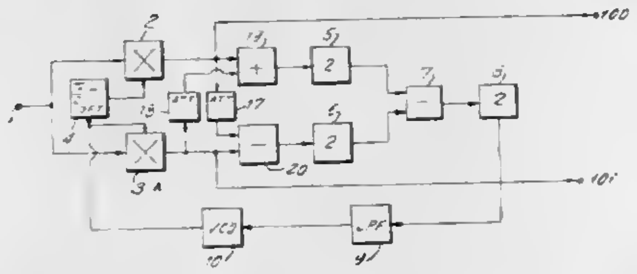
Yasuharu Yoshida, and Yoshimi Tagashira, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,910

Claims priority, application Japan, Dec. 2, 1975, 50-144265; Jan. 30, 1976, 51-9068; Apr. 8, 1976, 51-39742

Int. Cl.^{2} H04L *7/00*

U.S. Cl. 178—69.1 **11 Claims**



8. A 2^n-phase PSK demodulator, n being a positive integer greater than or equal to 2, comprising:

(a) variable frequency generator means for generating 2^{n-1} phase comparison signals, the frequency and absolute phase of each of said phase comparison signals being determined by a phase error signal applied to said variable frequency generator means, the relative phase of each of said 2^{n-1} phase comparison signals being displaced from the remaining said phase comparison signals by $2K\ \pi/2^n$ radians, where K is an integer meeting the relationship $0<K<2^{n-1}$;

(b) 2^{n-1} phase detectors, each of said phase detectors for generating a demodulated output signal representative of a phase comparison between an incoming 2^n-phase PSK signal and a different one of said phase comparison signals;

(c) 2^p-phase shifting means, p being $0\leqq p\leqq n-1$, each of said phase shifting means for shifting the phase of the demodulated output signal generated by a respective one of said phase detectors by $\pi/2^{n+1}$ radians;

(d) means for synthesizing the outputs of said phase shifting means to generate said phase error signal.

4,109,103

SPEECH SIMULATOR

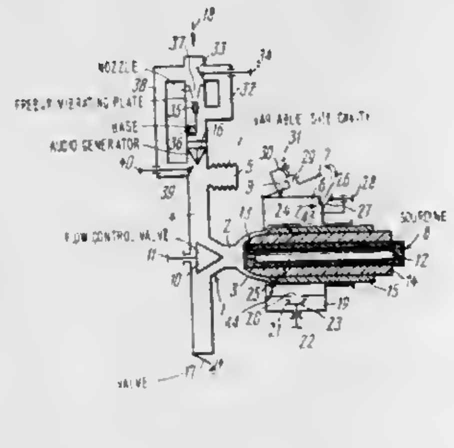
Nikolai Grigorievich Zagoruiko, Morskoi prospekt 21, kv. 28, and Alexandr Borisovich Kolmogorov, ulitsa Zorge 237, kv. 36, both of Novosibirsk, U.S.S.R.

Filed Apr. 14, 1976, Ser. No. 676,897

Claims priority, application U.S.S.R., Apr. 15, 1975, 2126341

Int. Cl.^{2} G10L *1/10*

U.S. Cl. 179—1 SG **8 Claims**



1. A speech simulator comprising:

interconnected first and second pipes;

a mouthpiece;

a sourdine which is movable within at least a portion of said mouthpiece;

a closed, variable-sized cavity,

said first pipe communicating with said mouthpiece,

said second pipe being hermetically connected to said closed, variable-size cavity;

a main resonator having an outlet communicating with the atmosphere, and a lid arranged to selectively open and close said outlet, said main resonator being hermetically connected to said mouthpiece and receiving said sourdine, said first and second pipes and said mouthpiece and said main resonator together forming an air duct; and air supply means for supplying air to said air duct successively along the following general path: said second pipe, said first pipe, said mouthpiece and said main resonator.

4,109,104

VOCAL TIMING INDICATOR DEVICE FOR USE IN VOICE RECOGNITION

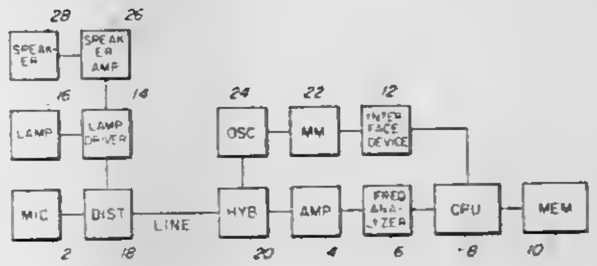
Toshihiko Toyoshima, Tokyo, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1976, Ser. No. 698,651

Claims priority, application Japan, Aug. 15, 1975, 50-099364

Int. Cl.^{2} G10L *1/02*

U.S. Cl. 179—1 SD **5 Claims**



1. In a voice recognition system which recognizes the vocal utterances spoken by an individual into a microphone by converting the voice utterances into electrical signals, said electrical signals being further converted into a plurality of characteristics which are compared by a data processing device to stored characteristics, the improvement comprising:

means responsive to a signal from said data processing device to provide a timing signal,

means responsive to said timing signal for signalling to said individual a time start when vocal utterances are to be made into said microphone, and

means responsive to said signalling means for generating a control signal for activating said data processing device at a time during which or slightly after a predetermined time period, the time start following which said vocal utterances are to be made and the time when said data processing device is activated being selected to reduce the standby time of said data processing device.

4,109,105

EARPHONE MOUNTING IN SAFETY HELMET FOR MOTORCYCLE RIDERS

Richard J. Von Statten, Jr., 211 Chicory La., Buffalo Grove, Ill. 60090

Filed Feb. 7, 1977, Ser. No. 765,927

Int. Cl.^{2} H04B *1/38*

U.S. Cl. 179—1 VE **6 Claims**

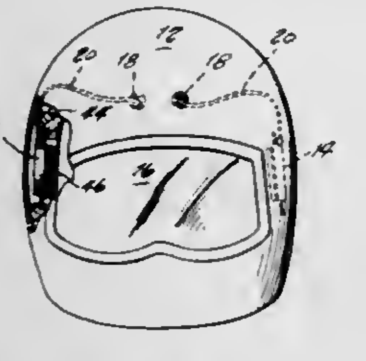
1. In a motorcycle having a magnetic cartridge playback device mounted thereto, the playback device producing two audio voltage signals, the playback device having an output receptacle to which the two audio voltage signals are coupled, the improvement comprising:

a cable, one end of said cable having a first plug for removable insertion into said output receptacle, the other end of said cable being bifurcated into two cable branches, the free ends of the branches being electrically coupled to two second plugs, the first plug coupling said two audio voltage signals into said cable, each of the two second plugs being electrically coupled to one of said two audio voltage signals,

a motorcycle helmet, said helmet having a resilient rubber-like lining affixed to the interior portions thereof,

a pair of speakers, each of said pair of speakers fixedly secured within an opening in said lining,

a cloth-like screen, said screen fixedly secured to the exposed surface of said lining covering said opening,



a pair of input receptacles, said pair of input receptacles fixedly secured to said helmet, said pair of input receptacles for removable insertion of said two second plugs therein, said two second plugs electrically coupling the two audio voltage signals to said pair of input receptacles, and

means to electrically couple said two audio voltage signals from said pair of input receptacles to said pair of speakers.

4,109,106
AUDIOMETER

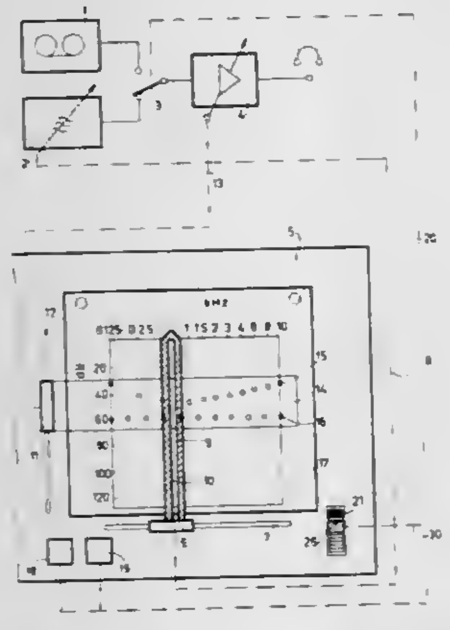
Rainer Voss, Oststeinbek, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,876

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615903

Int. Cl.² A61B *4/07*

U.S. Cl. 179—1 N **8 Claims**



1. An audiometer comprising, an audio-frequency tone generator whose frequency is variable in steps by means of a first slider which locks in different locking positions, an amplifier whose output signal is variable by means of a second slider which is movable perpendicularly to the direction of movement of the first slider, first and second marking templets connected to said first and second sliders, respectively, each marking templet extending substantially perpendicularly to the direction of movement of its respective slider and parallel to the direction of movement of the other slider, a speech source including a sound carrier, a switch for selectively connecting the output of the sound carrier or the audio-frequency tone generator to the input of the amplifier, and means coupled to the first slider comprising a number of locking strips corresponding to the number of tests to be performed with the audiometer so that for each test a selected strip is in an operating position in which it determines the various locking positions of the first slider.

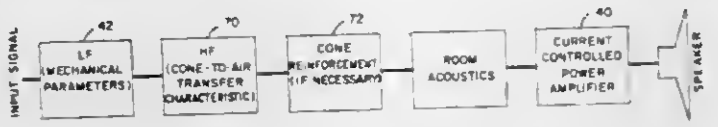
4,109,107
METHOD AND APPARATUS FOR FREQUENCY COMPENSATION OF ELECTRO-ACOUSTICAL TRANSDUCER AND ITS ENVIRONMENT

Warren Benefield Boast, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 5, 1977, Ser. No. 812,786

Int. Cl.² H04R *3/04*

U.S. Cl. 179—1 D **17 Claims**


INPUT SIGNAL
42
LF (MECHANICAL PARAMETERS)
70
HF (CONE-TO-AIR TRANSFER CHARACTERISTIC)
72
CONE REINFORCEMENT (IF NECESSARY)
ROOM ACOUSTICS
40
CURRENT CONTROLLED POWER AMPLIFIER
SPEAKER

1. A system for compensation for frequency dependent characteristics of an electro-acoustical transducer having a movable cone and associated mechanical response parameters and driven by current amplifier circuit means, comprising:

first compensation circuit means in circuit with said amplifier circuit means for processing an input audio signal to compensate said signal for the mechanical response parameters of said transducer in the region of resonance of said mechanical response parameters; and

second compensation circuit means in circuit with said amplifier circuit means and said first compensation circuit means for processing said audio signal to compensate said signal for the cone-air transfer characteristic of said transducer;

the compensated signal of said first and second compensation circuit means being coupled to said amplifier circuit means.

11. A method for compensating for the mechanical response parameters, cone-air transfer characteristic and cone breakup characteristic of an electro-acoustical transducer having a cone and mechanical response parameters, comprising: measuring the anechoic acoustic response of said transducer while driving said transducer with a constant coil current over a predetermined frequency range; connecting a first compensation circuit means having a resonant frequency corresponding to the measured resonance of said mechanical response parameters in circuit with said transducer, said first compensation circuit means having limited effect outside of the region of resonance of said mechanical response parameters; connecting a second compensation circuit means in circuit with said transducer, said second compensation circuit means having a resonance corresponding to the resonance of said cone-air transfer characteristic; and connecting a third compensation circuit means in circuit with said transducer, said third compensation circuit means having a resonance corresponding to the resonance of cone breakup and reinforcing the signal to said transducer in the region surrounding said cone breakup resonant frequency.

13. A method for compensating for the acoustical characteristics of a room exhibiting a resonance effect comprising placing a speaker in said room at a predetermined location, placing a microphone in said room at a first predetermined location, energizing said speaker with a source of pink noise over a predetermined frequency range, measuring the response at said microphone for a plurality of locations and for a plurality of orientations, averaging said response characteristics over said frequency range and accounting for the pink noise characteristics of said source to generate a resonance acoustical characteristic for said room, connecting a resonant compensation circuit

in series with said speaker, said compensation circuit having the resonance frequency corresponding to the resonance frequency of said measured acoustical characteristic for said room.

15. A method for compensating for the mechanical parameter resonance and the air-diaphragm transfer characteristic of a microphone having a diaphragm and mechanical response parameters comprising: defining the electrical response of said microphone for a constant amplitude of sound pressure level input over a frequency range; connecting a first compensation circuit means in circuit with said microphone, said first compensation circuit means having a resonant frequency corresponding to the mechanical parameter resonance of said microphone; and connecting a second compensation circuit means in circuit with said microphone and said first compensation circuit means, said second compensation circuit means having a resonance corresponding to the resonance of said air-diaphragm transfer characteristic of said microphone.

4,109,108
ATTENUATION OF SOUND WAVES IN DUCTS

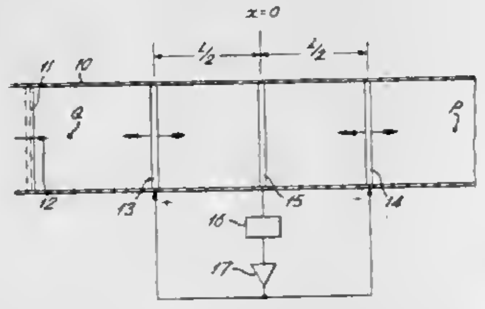
Brian Coxon, Whitley Bay, and Hubert Geoffrey Leventhall, London, both of England, assignors to National Research Development Corporation, London, England

Filed Sep. 7, 1977, Ser. No. 831,289

Claims priority, application United Kingdom, Oct. 1, 1976, 40832/76

Int. Cl.² E04B *1/99;* **G10K** *11/04*

U.S. Cl. 179—1 P **6 Claims**



1. A method of attenuating a sound wave propagating in a given direction along a duct through a fluid contained in the duct comprising detecting sound at a first position within the duct; and emitting sound into the duct at two positions spaced from the first position, one in the given direction and one in the opposite direction, so that the first position at which sound is detected is a null point at which sound radiations in the fluid emanating only from said two spaced positions substantially cancel; the sound emitted at the two positions being in relative antiphase and at equal amplitudes and at such phases relative to the phase of the detected sound that the resultant of the sound radiations emitted in the given direction substantially attenuates said sound wave propagating along the duct.

4,109,109
METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF SIGNAL COMPONENTS OF PREDETERMINED FREQUENCY IN MULTIFREQUENCY PCM SIGNAL

Claude Auguste Molleron, Fontenay-aux-Roses, France, assignor to Societe Anonyme de Telecommunications, Paris, France

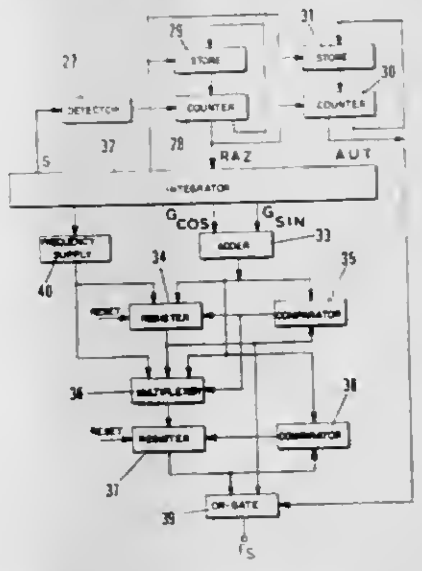
Filed Jan. 26, 1976, Ser. No. 652,647

Claims priority, application France, Jan. 31, 1975, 75 03125

Int. Cl.² H04J *3/12*

U.S. Cl. 179—15 BY **5 Claims**

1. A method for detecting the presence of signal components of a predetermined frequency in multifrequency PCM signals, wherein said frequencies belong to a group of standard frequencies, said signals are grouped into words distributed in time slots of a reference frame and the instantaneous value of each of the incoming signals is stored, said method comprising the steps of: integrating, for each of the time slots of a reference frame and for each of the standard frequencies, the product of the instantaneous value of the incoming signal by the instantaneous value of a digital signal characteristic of one of the standard frequencies along two separate paths, the said characteristic signal being in sine form following one of the paths and in cosine form following the other path; and calculating the sum of the absolute values of the results obtained following each of the paths, said sum having a high value when said predetermined frequency is present in the incoming signal, and being close to zero in the opposite case.



4,109,110
DIGITAL-TO-ANALOG CONVERTER

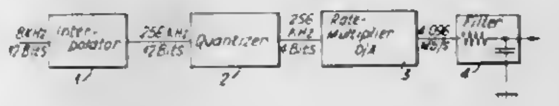
Michael John Gingell, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 642,876, Dec. 22, 1975, abandoned. This application May 16, 1977, Ser. No. 796,919

Claims priority, application United Kingdom, Feb. 20, 1975, 07157/75

Int. Cl.² H04J *15/00;* **H03K** *13/24*

U.S. Cl. 179—15 AP **11 Claims**



1. A digital-to-analog converter for a pulse code modulated (PCM) signal having a plurality of code groups and a given sampling rate comprising:

interpolating means having said PCM signal coupled thereto for increasing said given sampling rate of said PCM signal;

means for selecting a predetermined number of the most significant bits of each of said code groups of said increased sampling rate PCM signal;

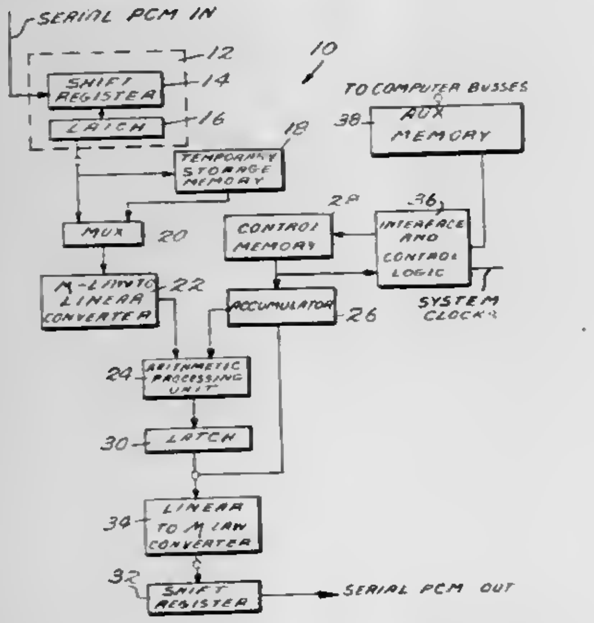
means for decoding said predetermined number of most significant bits at a rate corresponding to said increased sampling rate to derive a pulse stream having a mean density which is proportional to an analog signal represented by said plurality of code groups;

means for selecting at least some of the least significant bits of each code of said code groups of said increased sampling rate PCM signal for deriving an error signal; and feedback means for digitally adding said error signal to subsequently digitally sampled code groups.

4,109,111
METHOD AND APPARATUS FOR ESTABLISHING CONFERENCE CALLS IN A TIME DIVISION MULTIPLEX PULSE CODE MODULATION SWITCHING SYSTEM

Steven R. Cook, Columbia, Md., assignor to Digital Switch Corporation, McLean, Va.

Filed Aug. 23, 1977, Ser. No. 827,093
Int. Cl.^{2} H04M *3/56*
U.S. Cl. 179—18 BC **11 Claims**



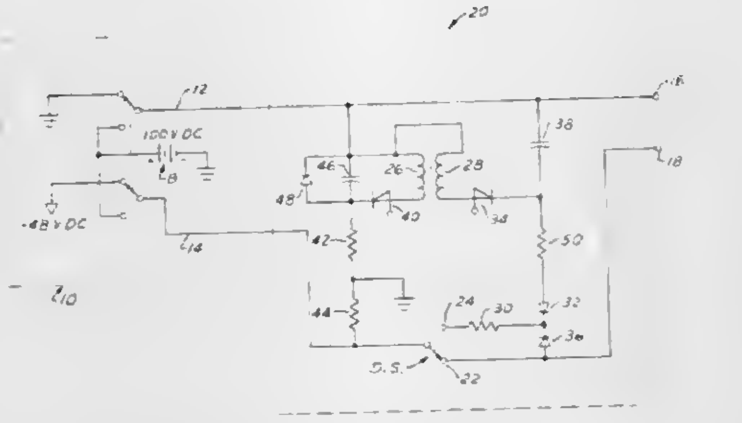
1. A time division multiplex communication system of the type wherein samples from a plurality of channels are represented as respective bytes of digital data, said bytes of data being combined to form a bit stream of sequential digital bits, bytes from respective ones of said plurality of channels occurring in said bit stream in a predetermined order, said system comprising:

- an accumulator;
- a memory having respective predetermined locations corresponding to each of said channels;
- means, responsive to said bit stream, for, upon occurrence of a byte from a respective channel of a predetermined group of channels, generating a difference signal indicative of the difference between a quantity indicative of the contents of the predetermined memory location corresponding to said respective channel and the contents of said accumulator;
- means, responsive to said difference signal for storing said difference in said accumulator to replace the previous contents of said accumulator;
- means, responsive to said difference signal, for generating an output byte indicative of said difference;
- means, responsive to said bit stream, for storing in the predetermined memory location corresponding to each particular channel each byte of said bit stream from that channel, each subsequent byte representative of a new sample from the particular channel replacing the previous contents of the predetermined memory location corresponding to the particular channel after the quantity indicative of the previous contents are subtracted from said accumulator contents;
- means for deriving the sum of the difference stored in said accumulator and a quantity indicative of said subsequent byte; and
- means for storing said sum in said accumulator to replace said difference.

4,109,112
TELEPHONE ISOLATION DEVICE

Donald E. Denman, and Samuel L. Haring, both of Mansfield, Ohio, assignors to Del-Tronics Associates, Inc., Mansfield, Ohio

Continuation of Ser. No. 690,622, May 27, 1976, abandoned.
This application Oct. 11, 1977, Ser. No. 840,774
Int. Cl.^{2} H04M *1/00;* H04B *3/46*
U.S. Cl. 179—81 R **19 Claims**



9. Component circuitry comprising: switch means having an input and first and second outputs and being adapted to connect said first output to said input when in a first condition and to connect said second output to said input when in a second condition, a first resistance having one end connected to said second output, a first diode connected between the other end of said resistance and said first output, a power terminal, a branch circuit connected between the other end of said resistance and said power terminal, a second diode in said branch circuit, said diodes being back to back to prevent current of a given polarity from flowing from said input through said diodes, and first actuating means connected to said power terminal for changing said switch means from said first condition to said second condition when a current of said given polarity is supplied to said power terminal.

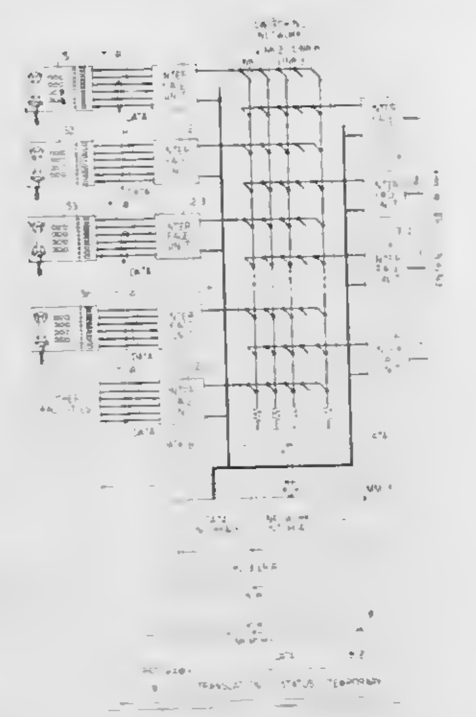
4,109,113
COMMUNICATION SYSTEM OPTIMIZED POOLED LINE ARRANGEMENT

Charles Eugene Allison, Jr., Holmdel; Francis Michael Fenton, Middletown; Tse Lin Wang, Matawan, and Carl Dennis Weiss, Little Silver, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1977, Ser. No. 847,214
Int. Cl.^{2} H04Q *3/64*
U.S. Cl. 179—99 **13 Claims**

1. A line pool control arrangement for use in a communication system having a plurality of stations, each station having access to any one of a number of lines serving said system by the momentary operation of a button at a telephone station set having a plurality of such buttons, said line pool control arrangement comprising

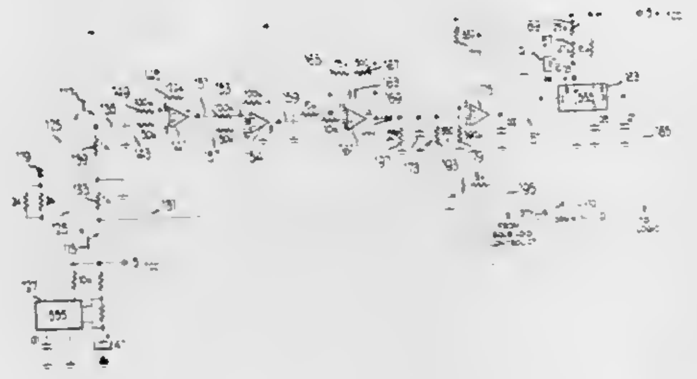
- means responsive to the enabling of certain ones of said buttons at each said station for enabling a communication connection to one line in a pool of said lines associated with said enabled button,
- means for assigning a first priority to a set of said lines in said line pool such that when a pool line button is enabled at any said station only those idle lines in said set of lines having a first priority can become connected to said enabling station,
- means for assigning a second priority to certain other of said lines outside said line pool such that when a pool line button is operated at any said station and all of said lines in said line pool set of lines are busy a communication connection is established to an available one of said other lines having said second priority.



4,109,114
PROGRAMMABLE PHONOGRAPH DEVICE

Ralph H. Baer, Manchester, N.H., and Donald K. Fletchic, Arlington Heights, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jul. 14, 1976, Ser. No. 705,138
Int. Cl.^{2} G11B *19/14*
U.S. Cl. 179—100.4 D **9 Claims**



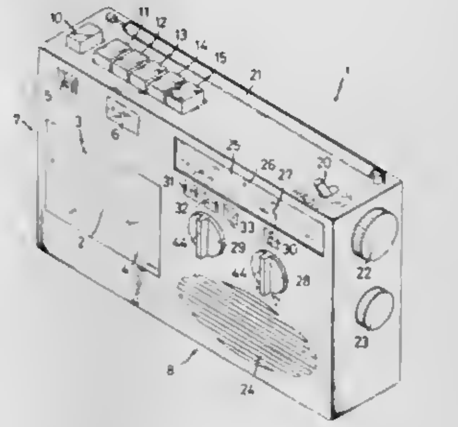
1. A programmable phonograph device providing automatic sound track selection from a record having a plurality of sound track bands spaced apart by a plurality of intraband land areas, comprising:

- an electro-optic scanner including a light emitting diode and two phototransistors;
- land sensing means including a differential amplifier having first and second inputs, means for supplying a first signal corresponding to the current flowing in one of said phototransistors to said first input, means for supplying a second signal corresponding to the current flowing in the other one of said phototransistors to said second input, and means for deriving an output signal proportional to the difference between said first and second signals at the output of said differential amplifier, and
- programable control logic means controlled by said output signal for storing a predetermined selection of sound track bands to be played and positioning the stylus on the record to play said preselected record bands.

4,109,115
MAGNETIC RECORDING APPARATUS WITH A PLURALITY OF SIGNAL RECEIVING DEVICES

Harunori Yamamnto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 607,955
Claims priority, application Japan, Aug. 29, 1974, 49-99228; Aug. 29, 1974, 49-99230
Int. Cl.^{2} G11B *31/00*
U.S. Cl. 179—100.11 **25 Claims**



1. A combination comprising:

- A. magnetic recording apparatus;
- B. a first receiving means to receive electromagnetic wave signals in a first band of frequencies and to produce therefrom a first audio signal;
- C. second receiving means to receive electromagnetic signals in a second band and to produce therefrom a second audio signal;
- D. third receiving means to receive electromagnetic signals in a third band and to produce therefrom a third audio signal;
- E. audio signal monitoring means;
- F. first selecting means to connect either of said audio signals, selectively, to said recording apparatus to record the selected audio signal;
- G. second selecting means to connect either of said audio signals, selectively, to said monitoring means; and
- H. mechanical interlocking means to prevent either of said audio signals from being connected to said recording apparatus while the other of said audio signals is connected to said monitoring means, said first selecting means selectively connecting any of said audio signals to said recording apparatus, said second selecting means selectively connecting any of said audio signals to said monitoring means, and said mechanical interlocking means selectively connecting either of said first or second audio signals to said recording apparatus while said third audio signal is connected to said monitoring means, or selectively connecting either of said first or second audio signals to said monitoring means while said third audio signal is connected to said recording apparatus.

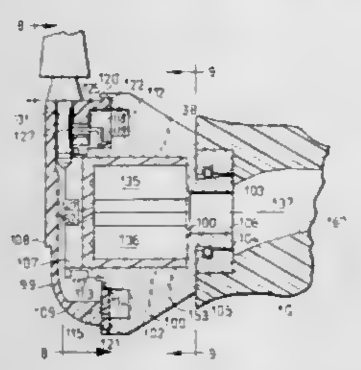
4,109,116
HEARING AID RECEIVER WITH PLURAL TRANSDUCERS

John A. Victoreen, 1314 Druid Rd., Maitland, Fla. 32751

Filed Jul. 19, 1977, Ser. No. 817,021
Int. Cl.^{2} H04R *25/00*
U.S. Cl. 179—107 E **10 Claims**

1. A hearing aid comprising output transducing means for translating an amplified electrical signal into audible sound pressures and having a pair of transducers, a case housing said transducers and having a sound pressure outlet passageway, and means within and rigidly fixing said transducers to said case, each of said transducers having housing/component, a vibratably drivable diaphragm with opposite faces and located within said housing component, an acoustically sealed cham-

ber located within said housing component at one of said faces, and a sound pressure chamber located within said housing component at the other of said faces, said housing component having an outlet that communicates with said sound chamber and with the outlet of said passageway, said diaphragm being arranged in a face to face relation with respect to the other said diaphragms, said sound pressures having wave lengths that exceed the maximum dimension of each of said diaphragms-,and each of said transducers having means located within its housing component for driving its diaphragm in phase with but in opposite directions to the diaphragm of the other transducer.



4,109,117

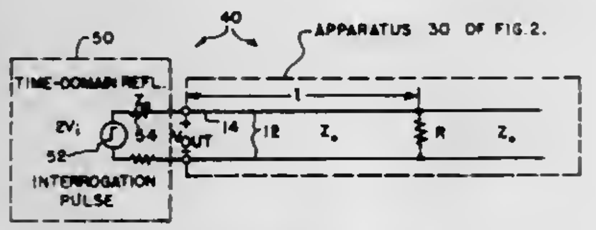
RANGE DIVISION MULTIPLEXING

Edwin H. Wrench, Jr.; Jay C. Hicks, both of San Diego, and Joseph F. McCartney, Solana Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 2, 1977, Ser. No. 831,278

Int. Cl.^{2} H04B *1/58;* **H04J** *3/08;* **G01V** *1/22;* **H04Q** *9/00*

U.S. Cl. 179—175.3 F **8 Claims**



APPARATUS FOR INTERROGATING THE CABLE.

1. Apparatus for range division multiplexing, comprising:
- a coaxial cable having a characteristic impedance of Z_o, and defining an input end and an output end;
- a first plurality of N transducing means, disposed along and connected to the cable at distances of $l, 2l, \ldots, Nl$, from the input end of the cable, the means being able to transduce a voltage into an impedance which is substantially a resistance $R, R \gg Z_o/2$; and
- a second plurality of N transducing means, for transducing a physical parameter into a voltage, the output of each means being connected to an input of one of the first transducing means;
- with the result that, upon connection of a time-domain reflectometer at the input of the cable, impedance discontinuities at each location along the cable of the N first transducing means may be detected.

4,109,118

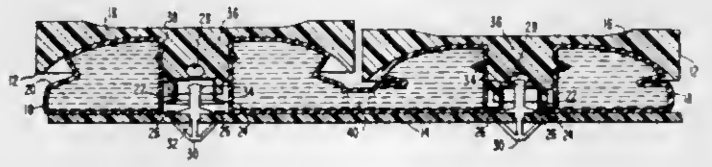
KEYSWITCH PAD

Victor Kley, 2212 Byron St., Berkeley, Calif. 94702

Filed Sep. 1, 1976, Ser. No. 719,408

Int. Cl.^{2} H01H *9/20, 13/50*

U.S. Cl. 200—5 E **38 Claims**



32. A keyswitch pad comprising
- a backing member
- at least two keyswitches mounted on the backing member,
- a key cap in each keyswitch spaced from the backing member,
- switch contact means in each keyswitch actuated by depression of the key cap,
- a bag in each keyswitch disposed between the key cap and the backing member,
- said bags having respective upward extending portions annularly disposed and concentrically engaging the underneath sides of the respective key caps,
- a fluid filling the bags and having a pressure to urge at least one of the key caps to a raised position, and
- a coupling tube connecting the bags of each adjacent pair of the keyswitches so that the bags are in fluid communication with each other.

4,109,119

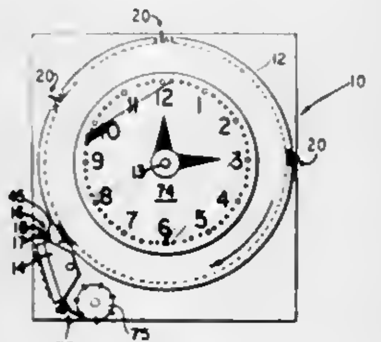
PROGRAM CONTROL DEVICE

Harry C. Baelz, Warminster, and Harrison E. Cassel, Perkasie, both of Pa., assignors to Schulmerich Carillons, Inc., Sellersville, Pa.

Filed Nov. 8, 1976, Ser. No. 739,609

Int. Cl.^{2} H01H *43/00;* **F16H** *53/00*

U.S. Cl. 200—38 BA **6 Claims**



1. A program control device comprising a continuously rotatably driven program control body having a periphery thereof; a plurality of stationary, actuable programming members positioned adjacent said periphery at different locations transverse to the direction of rotation of said control body; a tab having an integral body segment with a length and a plurality of integral, selectively removable contact segments aligned in an array along said length, said tab further having a support segment centrally located therein and extending from said body segment in a direction normal to said length and away from said array of contact segments, said support segment having a notch therein; said program control body having a plurality of discs each fixed in a plane perpendicular to the axis of rotation of said body, each of said discs having at least one radial notch at the periphery thereof, said notches being aligned transversely for demountably supporting said tab on said discs adjacent said periphery such that said contact segment array extends transversely of said program control body, a first of said discs being centrally positioned to receive said tab support segment so that the disc notch and the support segment notch interfit, and being of a thickness adapted to provide a friction fit between said disc and said support segment, whereby said programming members are selectively engaged during transport of said tab past said members.

4,109,120

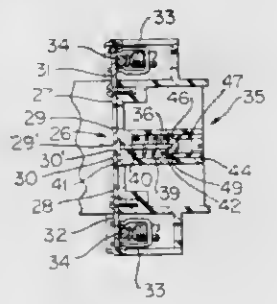
ELECTRICAL UNIT HAVING A BUS-BAR AND A SELECTOR AND METHOD OF MAKING THE SAME

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 27, 1976, Ser. No. 736,210

Int. Cl.^{2} H01R *13/70*

U.S. Cl. 200—51 R **9 Claims**



1. In an electrical unit having a frame provided with a terminal and a bus-bar electrically interconnected to said terminal for transmitting electrical current between said terminal and desired means electrically interconnected to said bus-bar, said bus-bar having a pair of bus-bar sections spaced from each other and having a selector for electrically interconnecting said bus-bar sections together when said selector is in one position relative to said frame and for electrically disconnecting said bus-bar sections from each other when said selector is in another position relative to said frame, the improvement wherein said selector comprises an electrical connector that wedges against both of said bus-bar sections when said selector is in said one position thereof, said bus-bar sections respectively having adjacent ends thereof disposed spaced from each other and respectively having end edges disposed spaced and parallel to each other, said electrical connector wedging against both of said adjacent ends of said bus-bar sections when said selector is in said one position thereof, said electrical connector having a substantially flat triangularly shaped part that defines a pair of angled edges that respectively wedge against said adjacent ends of said bus-bar sections when said selector is in said one position thereof, said triangular part of said connector wedging against said end edges when disposed transverse thereto by said selector being in said one position thereof and being disposed spaced inwardly from and parallel to said end edges when said selector is in said other position thereof.

8. In a method of making an electrical unit having a frame provided with a terminal and a bus-bar electrically interconnected to said terminal for transmitting electrical current between said terminal and desired means electrically interconnected to said bus-bar, said bus-bar having a pair of bus-bar sections spaced from each other and having a selector for electrically interconnecting said bus-bar sections together when said selector is in one position relative to said frame and for electrically disconnecting said bus-bar sections from each other when said selector is in another position relative to said frame, the improvement comprising the steps of forming said selector with an electrical connector that wedges against both of said bus-bar sections when said selector is in said one position thereof, and forming said eletrical connector with a substantially flat triangularly shaped part that defines a pair of angled edges that respectively wedge against adjacent ends of said bus-bar sections when said selector is in said one position thereof to dispose said flat triangular part transverse to spaced parallel end edges of said adjacent ends and to dispose said flat triangular part spaced inwardly from said parallel to said end edges when said selector is in said other position thereof.

4,109,121

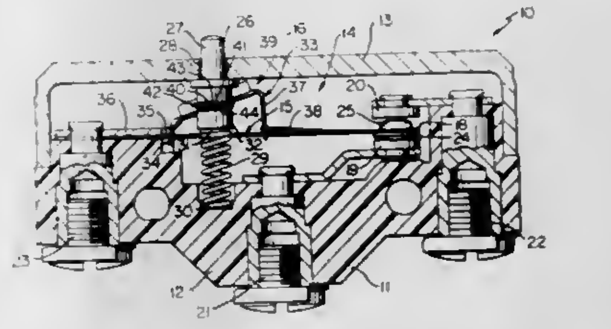
ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Werner R. Bauer, Radnor, and William N. Smith, Hatboro, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 22, 1976, Ser. No. 707,635

Int. Cl.^{2} H01H *5/18*

U.S. Cl. 200—67 E **11 Claims**



1. An electrical switch construction comprising a housing means carrying a pair of spaced contact stops and a snap switch blade having a contact portion for being snapped between said stops when said blade is moved overcenter, and a movable actuator means carried by said housing means for moving said blade overcenter in one direction when said actuator means is moved in one direction thereof and for moving said blade overcenter in the opposite direction when said actuator means is moved in the opposite direction thereof, said actuator means having adjustable means for adjusting the movement differential of said actuator means, said actuator means including an actuator plunger, said actuator means including an actuator spring that is moved by movement of said actuator plunger, said actuator spring being operatively interconnected to said blade to move said blade as said actuator spring is moved, said adjustable means of said actuator means comprising an adjustable gap in said actuator plunger that defines a pair of spaced shoulders on said actuator plunger that are adapted to respectively engage said actuator spring.

4,109,122

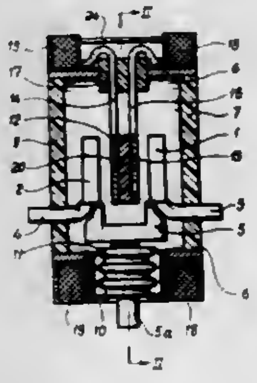
VACUUM SWITCH WITH INTERMITTENTLY ENERGIZED ELECTROMAGNETIC COIL

Joseph H. F. G. Lipperts, Hengelo (O), Netherlands, assignor to Hazemeijer B.V., Hengelo (O), Netherlands

Filed Mar. 1, 1977, Ser. No. 773,273

Int. Cl.^{2} H01H *33/66*

U.S. Cl. 200—144 B **6 Claims**

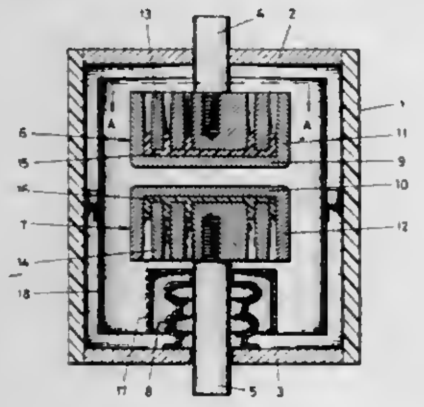


1. A vacuum switch which comprises:
- an evacuated envelope;
- two stationary contact elements mounted within said evacu-

ated envelope such that an electrically insulating gap is formed therebetween;
an electromagnetic coil capable of producing a magnetic field in the region of said gap between said contact elements and substantially in parallel with the width of said gap;
two metal discs positioned with said gap between said contact elements, an electrically insulating disc separating said two metal discs, each of said two metal discs being supported by separate coil terminal means connected to said electromagnetic coil, and
a movable U-shaped contact element mounted within said evacuated envelope such that the end portions of said U-shaped contact element are positionable to contact each of said two stationary contact elements and act to electrically bridge the gap therebetween.

4,109,123
VACUUM SWITCH

Joseph H. F. G. Lipperts, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands
Filed Jan. 31, 1977, Ser. No. 764,238
Int. Cl.^{2} H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**

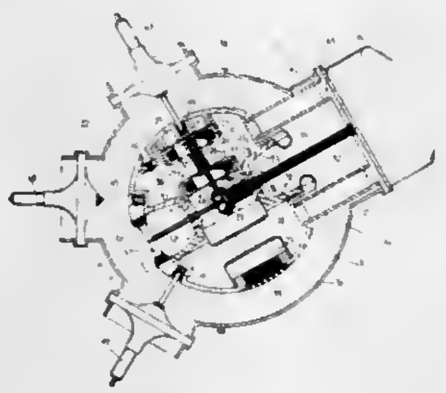


1. A vacuum switch comprising means forming a gas-tight sealed evacuated envelope and having therein a stationary contact element and a movable contact element movable towards or away from the stationary contact element, at least one of the contact elements consisting of a disc-shaped contact portion and a bush-shaped portion connected to or integral with the periphery of the disc-shaped portion and extending in a direction away from the associated contact element, a spiral conductor positioned radially within the bush-shaped contact portion and being electrically connected in series with the associated contact element, the spiral conductor producing an electric field in order to improve the current interruption characteristics of the vacuum switch.

4,109,124
CIRCUIT-BREAKERS FOR HIGH VOLTAGES

Rintje Boersma, Harmelen, and Gijsbert Waldemar Irik, Bilthoven, both of Netherlands, assignors to Coq B.V., Utrecht, Netherlands
Filed Mar. 26, 1976, Ser. No. 670,963
Claims priority, application Netherlands, Apr. 7, 1975, 7504130
Int. Cl.^{2} H01H *33/54*
U.S. Cl. 200—148 B **25 Claims**

1. A circuit-breaker for high voltages comprising a metal casing, at least one monophase switching unit which is insulatedly accommodated in the casing, said switching unit comprising at least one pair of electrically conductive fixed connecting members, at least one insulator to keep said connecting members spaced apart and electrically separated, at least one pair of relatively movable cooperating contacts to make and break electrical connection between said members; at least two terminal bushings extending through the wall of the casing, each one of said bushings being adapted to connect a connecting member with an end of the electric circuit to be controlled, each connecting member being in the form of a cap in the shape of a hollow segment of a sphere and the two connecting members being disposed in spaced opposition with said insulator interposed therebetween.



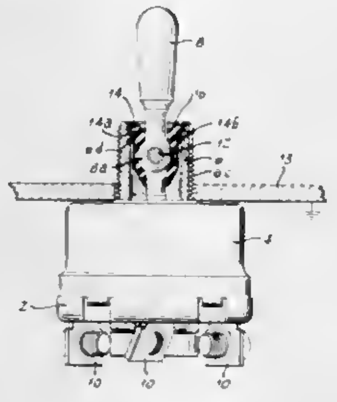
4,109,125
CONTACT ARRANGEMENT FOR AN ELECTRIC ARC-ELECTRODE CONSISTING OF GRAPHITE AND A METHOD FOR THE MANUFACTURE THEREOF

Keith Nelson Melton, Fislisbach, and Renata Sebalj, Neuenhof, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland
Filed Apr. 5, 1976, Ser. No. 673,549
Claims priority, application Switzerland, May 28, 1975, 6805/75
Int. Cl.^{2} H01H *1/02*
U.S. Cl. 200—268 **5 Claims**

1. A contact arrangement particularly for high-voltage power switches having a gaseous isolation means, comprising:
an electric arc-electrode consisting of a graphite member;
a contact spud consisting essentially of a metal having a high melting point selected from the group consisting of molybdenum, molybdenum-based alloys, wolframite and wolframite-based alloys being disposed in at least the surface portion of said electrode; and
a soldering layer containing at least one carbideforming metal disposed between said graphite member and contact spud and connecting said contact spud to said electric arc-electrode.

4,109,126
CONDUCTIVE COATING ON SWITCH LEVER SEAL FOR RFI ELIMINATION

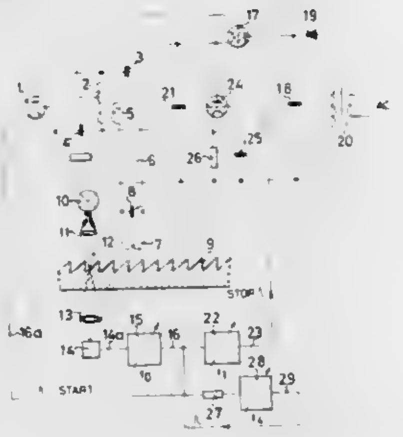
Werner B. Halbeck, Mequon, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Oct. 28, 1976, Ser. No. 736,391
Int. Cl.^{2} H01H *9/04, 9/12*
U.S. Cl. 200—302 **7 Claims**



1. An electric switch comprising:
a switch housing at least partly of metal having an opening therein and normally being grounded in use;
a metal switch actuator extending out through said opening so as to be accessible for operation to actuate the switch;
means mounting said metal switch actuator in said opening;
a resilient seal within said opening closing the space around said metal switch actuator to seal the interior of said switch housing from the outside and being flexible to afford relatively unimpeded movement of said metal switch actuator, said seal having first and second surfaces in sealing engagement with said actuator and said housing, respectively, and third and fourth surfaces exposed to the inside of said housing and to the outside, respectively;
and a conductive elastomeric coating on and covering at least one of said exposed surfaces of said seal and adhering thereto electrically groundng said metal switch actuator through said housing to avoid RFI radiation therefrom.

4,109,127
APPARATUS AND METHOD FOR CASE HARDENING STEEL TOOLS BY APPLICATION OF HEATING PULSES

Frank Früngel, Herwigredder 105a, 2000 Hamburg 56, BRD, Fed. Rep. of Germany
Division of Ser. No. 489,946, Jul. 18, 1974. This application Feb. 25, 1976, Ser. No. 661,165
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1973, 2337684
Int. Cl.^{2} H05B *5/04*
U.S. Cl. 219—7.5 **6 Claims**

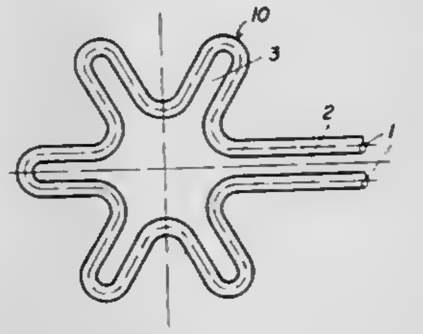


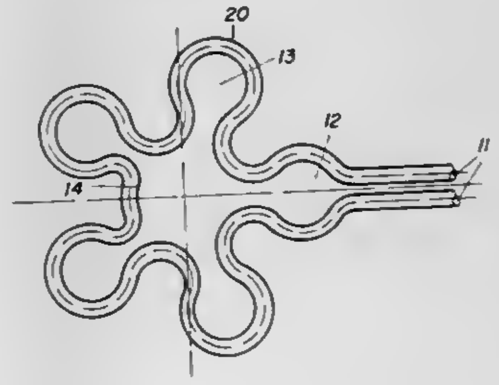
1. Apparatus for case hardening a predetermined portion of the surface of a steel tool, comprising, in combination, first means including inductive coupling means for applying at least a first and second pulse to said predetermined portion of said surface, thereby heating said portion; second means connected to said first means for adjusting the pulse width of said pulses to pulse widths below 100 milliseconds; and third means connected to said first means for adjusting the time interval between said first and second pulse.

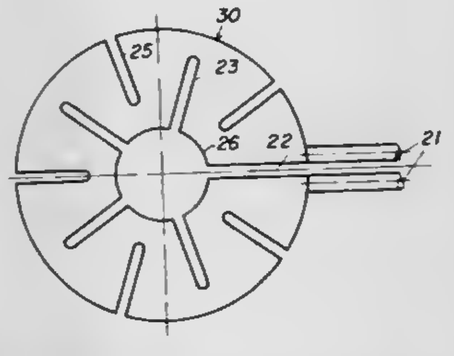
4,109,128
METHOD FOR THE PRODUCTION OF SEMICONDUCTOR RODS OF LARGE DIAMETER AND DEVICE FOR MAKING THE SAME

Franz Kohl, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemitronik Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany
Filed Aug. 17, 1976, Ser. No. 715,073
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538854
Int. Cl.^{2} H05B *5/18;* B01D *9/00*
U.S. Cl. 219—10.43 **3 Claims**

1. An induction heating coil for the production of dislocation-free monocrystalline semiconductor rods of large diameters, said coil being a single turn coil the ends of which merge into the current supply lines, said coil encircling its center point in three to seven, approximately circular, similar loops, which follow one after another, and merging into the current supply lines at a curve remote from the center, said loops each defining a recess corresponding to the free space formed between the ends of the coil as they merge into the current supply lines, the recesses being arranged in a circle about the axis of rotation passing through the center of the coil, wherein the distance between said free space and the neighboring recesses is equal to the distance between two adjacent recesses.

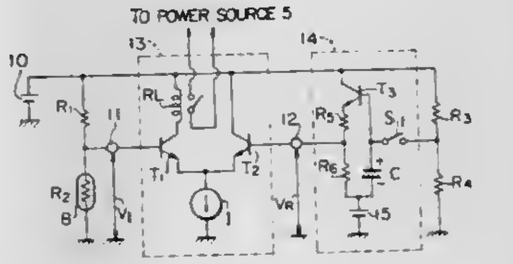






4,109,129
HIGH FREQUENCY ENERGY APPARATUS HAVING AUTOMATIC FINAL TEMPERATURE COMPENSATOR

Kenji Satob, and Mitsuru Watanabe, both of Yokohama, Japan, assignors to Hitachi Heating Appliances Co., Ltd., Japan
Filed Dec. 21, 1976, Ser. No. 752,851
Int. Cl.^{2} H05B *9/06*
U.S. Cl. 219—10.55 B **23 Claims**



1. A high frequency energy apparatus for heating an object with high frequency energy, comprising:

a heating chamber for containing and heating said object;
means for generating the high frequency energy;
means for introducing to said heating chamber the high frequency energy generated by said high frequency energy generating means;
means for relatively measuring the temperature of the object being heated;
means for controlling the amount of the high frequency energy supplied to said heating chamber from said high frequency energy generating means when the value measured by said measuring means reaches a value corresponding to a predetermined reference value; and
reference value correcting means for automatically varying said predetermined reference value in the same direction of change with the lapse of the heating time.

4,109,130

ELECTRIC WELDER OUTPUT CONTROL DEVICE

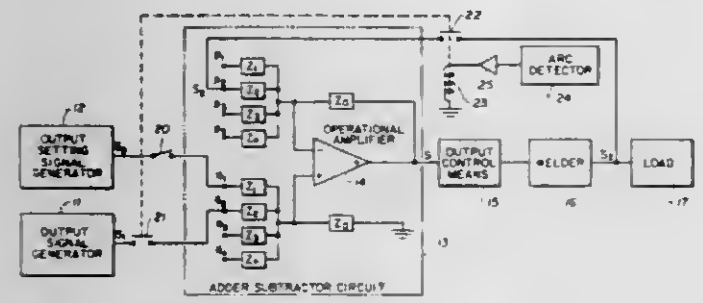
Takeshi Oku, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 481,070, Jun. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 310,698, Nov. 30, 1972, abandoned. This application Apr. 26, 1976, Ser. No. 679,976

Claims priority, application Japan, Nov. 30, 1971, 46-96998; Nov. 30, 1971, 46-97001

Int. Cl.^{2} B23K *9/10*

U.S. Cl. 219—130.21 **2 Claims**



1. An output control device for an electric welder, comprising
   - (a) an adder-subtractor circuit comprising a differential type operational amplifier and having first, second and third input terminals connected to said amplifier, and an output terminal for providing an output signal S,
   - (b) first signal generating means coupled to said first input terminal for applying thereto a signal S_1 indicating a desired output of an electric welder,
   - (c) second signal generating means coupled to said second input terminal for continuously applying thereto a signal S_0 for setting the open-loop initial transient output of said electric welder to approximate the desired steady state operating output of said welder,
   - (d) controller means connected to receive the output voltage S of said adder-subtractor circuit so as to control the output of said electric welder,
   - (e) means for coupling said electric welder to said output control device,
   - (f) means associated with said welder to provide an output signal S_2 corresponding to the actual output of said welder which is to be controlled by said device,
   - (g) feedback means connected to feed back the signal S_2 from an output terminal of said electric welder to said third input terminal, the output S of said adder-subtractor circuit being so selected as to be
     $S = aS_0 + b(S_1 - S_2)$, where a is the ratio of the output S of said adder-subtractor circuit to the input signal S_0 in the absence of other input signals to the adder-subtractor circuit which is applied to said second input terminal and is less than a level at which said operational amplifier is saturated and b is a ratio of said output S to the input signals S_1 and S_2 in the absence of other input singals to the adder-subtractor circuit applied to said first and third input terminals respectively, whereby the closed-loop steadystate output of said electric welder may be controlled in response to said output S of said adder-subtractor circuit and
   - (h) switching means for initially precluding closed-loop operation of said welder and subsequently enabling said feedback means by said signals S_1 and S_2 to said first and third input terminals respectively, only when a welding arc is struck, said signal S_0 continuing to be applied to said second input terminal after the arc is struck.

4,109,131

WELDING-, CUTTING-, OR HEATING TORCH

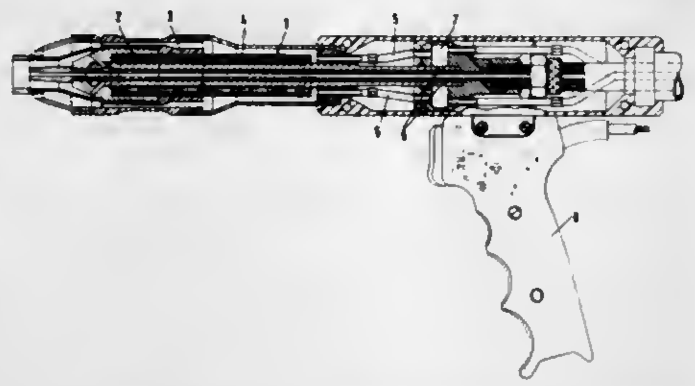
Jürgen Schlüter, Laatzen, Fed. Rep. of Germany, assignor to E. Schlüter Fachhandel Für Schweisstechnik, Laatzen

Filed Apr. 29, 1977, Ser. No. 792,301

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619177

Int. Cl.^{2} B23K *9/00*

U.S. Cl. 219—137.62 **19 Claims**



1. A welding-, cutting-, or heating-torch in which a gas is used for operation of the torch, comprising a torch head having an outlet nozzle with an outlet end; a torch housing rearwardly spaced from said torch head; connecting means in form of outer sleeve means connecting said torch head with said torch housing and forming gas passage means having a front end communicating with said outlet nozzle and a rear end in said torch housing; means for feeding gas necessary for the operation of the torch into said rear end of said gas passage means so that such gas passes through said gas passage means and leaves the latter through said front end thereof; and elongated hermetically closed heat transmitting means confined in its entirety within said torch for automatically transporting heat from a heat receiving zone which is adjacent said torch head is shielded from the gas passing through said gas passage means to a heat releasing zone which is rearwardly of said heat receiving zone is impinged by the gas passing through said gas passage means, whereby a region of the torch head which is heated to a high temperature during operation is cooled.

4,109,132

AUTOMATIC WELDING MASK SHUTTER LENS SYSTEM

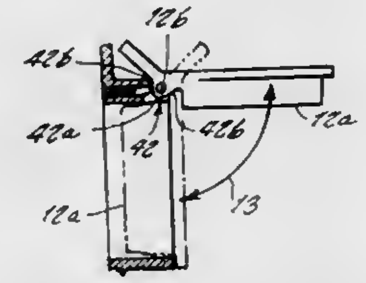
Aristotel Butoi, 689 Seneca Ave., Ridgewood, N.Y. 11227

Filed Feb. 22, 1977, Ser. No. 770,638

Int. Cl.^{2} B23K *9/32*

U.S. Cl. 219—147 **1 Claim**

1. An automatic welding mask shutter lens system, comprising in combination, a welding helmet having a window opening on a front side thereof, a shutter lens mounted in a lens frame, said frame being pivotable about a pin so to selectively fit in said window opening when said frame is in a vertical position, or extend forwardly outward therefrom when said frame is in a horizontal position, and an electrical system operated by a push button on a welding rod holder for pivoting said lens frame between said vertical and horizontal positions; said electrical system including an iron bar formed on said lens frame and protruding upwardly therefrom at an angle of 17 degrees along an axis passing transversely through said pivot pin, an electromagnet rigidly mounted on said helmet front side and being located above said frame pivot pin, said iron bar being pivotable across a center of a magnetic field space under said electromagnet so that when said frame is vertical, said iron bar is tilted forwardly, and when said frame is horizontal, said iron bar is tilted rearwardly; said electromagnet being in an electric circuit with a switch in a handle of said welding rod holder, and which is operated by said pushbutton, an on-off switch for selective connection to either a 110v. or 220v. power source and a circuit breaker; and a spring-biased detent pin on said helmet bearing against a cam face on said lens frame forcing said frame to travel over a cam rise between a cam notch at each end of said cam, so that said frame travels a full distance of said travel and thereafter is retained in either a fully horizontal or fully vertical position.



4,109,133

ELECTRICALLY HEATED REAR WINDOW FOR AUTOMOTIVE VEHICLES

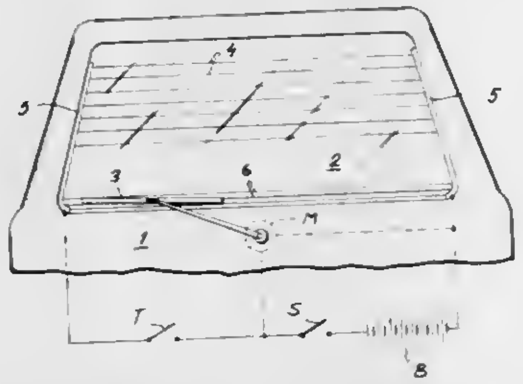
Edgar Hänle, Wettstetten, and Ferdinand Piëch, Ingolstadt, both of Germany, assignors to Audi Nsu Auto Union AG, Neckarsulm, Germany

Filed Feb. 18, 1976, Ser. No. 659,018

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2507037

Int. Cl.^{2} A47L *1/16;* **H05B** *3/26;* **B60S** *1/02*

U.S. Cl. 219—203 **10 Claims**



1. A rear window assembly for an automotive vehicle comprising:
a rear window;
a wiper for said window having a blade adapted to sweep across the same and having a rest position over a limited portion of the width of said window along the lower edge thereof;
an array of substantially uniformly spaced primary resistance-heating conductors bonded to said window over an upper zone thereof, the lower zone of said window below said upper zone and above said lower edge being free from resistance-heating conductors and having an unobstructed field of view;
at least one secondary resistance-heating conductor disposed and bonded to said window below said lower zone in the immediate region of and extending over said rest position along only said lower edge for heating said rest position of said wiper to release said blade under freezing conditions upon electrical energization of said at least one secondary conductor, said at least one secondary conductor being spaced from the lowermost conductor of said array by a distance greater than the spacing of the primary conductors of said array and extending across the bottom portion of said lower zone of said window free from conductors; and
means for energizing said conductors.

4,109,134

POWER CONTROL CIRCUIT AND ELECTRO(PHOTO)GRAPHIC APPARATUS EMPLOYING SAME

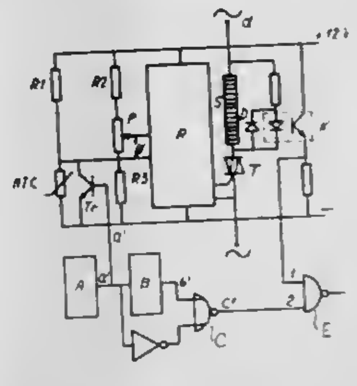
Jozef Marie Van Herten, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Aug. 2, 1976, Ser. No. 710,398

Claims priority, application Netherlands, Aug. 8, 1975, 7509461

Int. Cl.^{2} H05B *1/00, 1/02*

U.S. Cl. 219—216 **10 Claims**



1. A safety circuit for controlling the power transmitted by a switching element connected in series with a power element on an a.c. voltage source, said switching element forming part of a control circuit for regulating the current supply to the power element, comprising in addition to said control circuit means for blocking periodically the transmission of power by said switching element under control by said control circuit and means effective in intervals of the interruption of said transmission by said blocking means for detecting whether power is then being transmitted to the power element.

4,109,135.

HIGH EFFICIENCY FUSER ROLL ASSEMBLY FOR XEROGRAPHIC MATERIAL

Henry Thomas Minden, Concord, and Richard W. Premo, Shrewsbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

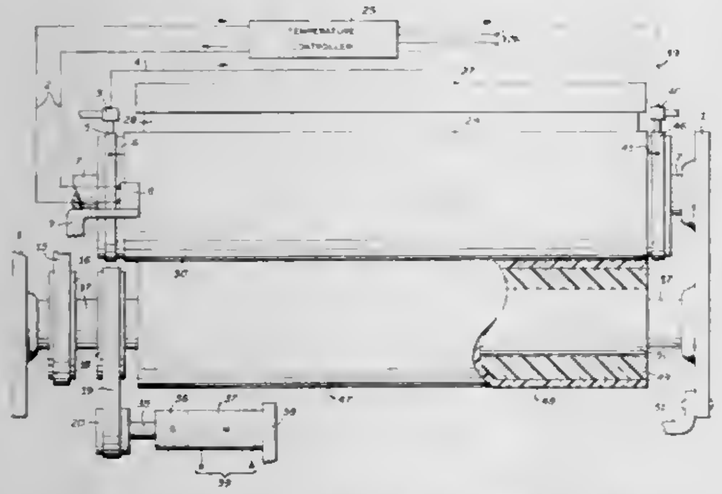
Filed Apr. 25, 1977, Ser. No. 790,505

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—216 **4 Claims**

1. An efficient fuser roll assembly for use in a xerographic copier including:
frame means,
shaft means journalled within said frame means,
thermally insulating roll means disposed coaxially upon said shaft means and having cylindrical outer surface means and first and second ends,
first and second slip ring means bonded in intimate relation at said cylindrical outer surface means at the respective first and second ends thereof,
heater means in the form of a flat tape having a predetermined electrical resistance bonded in intimate relation at said cylindrical outer surface means and coupled between said first and second slip ring means, and
a thin layer of electrically insulative tetrafluoroethylene resin enveloping said heater means and said thermally

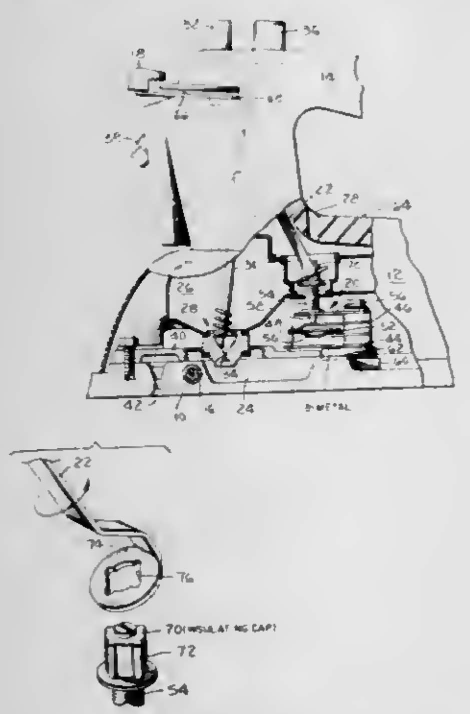
insulating roll means for forming the active fusing surface of said fuser roll assembly and providing a direct conduc-



tive heat path between said heater means and said active fusing surface.

4,109,136
THERMOSTAT CONTROLLED FLATIRON

Charles A. Balchunas, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.
Filed Feb. 4, 1977, Ser. No. 765,641
Int. Cl.² D06F *75/26;* **H05B** *1/02;* **H01H** *37/12*
U.S. Cl. 219—252 **5 Claims**

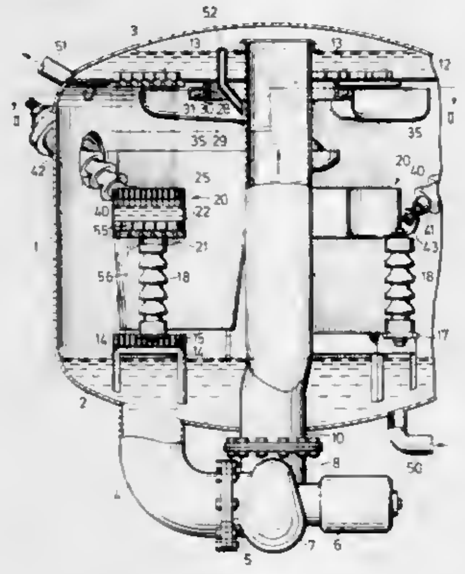


1. In an electric flatiron having an electrically heated soleplate provided with a central upstanding boss thereon, a handle on said soleplate, said handle including a front portion located forwardly and upwardly of said boss, said handle containing a temperature adjusting lever in front portion thereof with said lever being pivoted in said handle, an improved temperature regulating assembly comprising,

- a snap action thermostat for regulating the temperature of said soleplate supported on said boss and having a substantially vertically movable adjusting screw to vary the thermostat settings,
- an insulated cap fixedly connected to the top of said screw for rotation therewith,
  - said cap having an outer splined surface,
- a rod connected at one end to said lever forwardly of said screw for rotation by lever movement,
  - said rod having an offset portion at its other end loosely fitted in driving engagement over the splined surface of said cap,
  - said offset portion being slidable vertically over the splined surface thereby forming a universal-like connection between said rod and screw as the rod is rotated by said lever to turn said screw and vary the thermostat setting.

4,109,137
ELECTRIC STEAM GENERATOR

Jaroslav Zabelka, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland
Filed Sep. 7, 1976, Ser. No. 720,737
Claims priority, application Switzerland, Jan. 30, 1976, 1188/76
Int. Cl.² H05B *3/60;* **F22B** *1/30;* **H01C** *10/02*
U.S. Cl. 219—285 **8 Claims**



1. In an electric steam generator, the combination comprising

- a vessel;
- at least one horizontally extending dish-shaped electrode in said vessel for receiving and heating a supply of water and having openings therein forming outlets for the received water to form vertical water jets;
- a distribution means located above said at least one electrode, said distribution means having a chamber to receive water, said chamber including a horizontal bottom having a group of openings above each of said at least one electrode for directing vertical water jets against and into each of said at least one electrode;
- means mounted for movement between each of said at least one electrode and said distribution means for selectively intercepting the flow of water in said water jets between said distribution means and each of said at least one electrode; and
- means for selectively moving said intercepting means across said latter water jets to intercept and to divert away from each of said at least one electrode a number of said latter water jets proportional to the distance moved between each of said at least one electrode and said distribution means.

4,109,138
FAN-HEATER APPLIANCE WITH ADJUSTABLE FAN SPEED

Helmut Ohnmacht, Kandel, Pfalz, Fed. Rep. of Germany, assignor to Firma Fritz Eichenauer, Fed. Rep. of Germany
Filed Jul. 14, 1976, Ser. No. 705,275
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531687
Int. Cl.² F24H *3/04;* **A45D** *20/10;* **H05B** *3/02*
U.S. Cl. 219—364 **5 Claims**

1. A fan-heater appliance, comprising a housing, a low voltage fan motor for producing a flow of air within said housing, a resistance heating wire coiled linearly to form a series of tips

with at least one row of coils transverse to the direction of said air flow, and means for securing said at least one row of coils within said housing, a plurality of the tips of the coils being each placed within a respective headed tubular rivet with the heads of all the tubular rivets being arranged in a continuous path, and a current collector connected in an electrical circuit

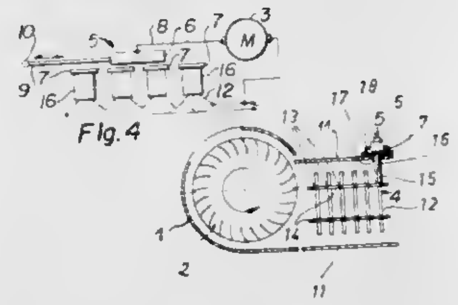
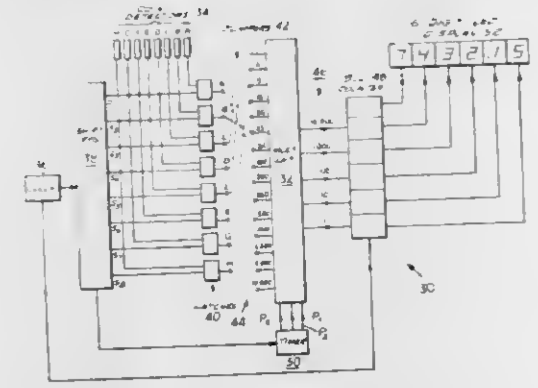


Fig. 4

with said fan motor, said current collector being moveable along said path in electrically conductive contact with selected ones of the heads of the tubular rivets and means for selectively displacing said current collector over said tubular rivets so as to provide an almost stepless adjustment of said fan motor speed over a relatively large rotational speed range.

4,109,139
MULTI-NATIONAL COIN TOTALIZER

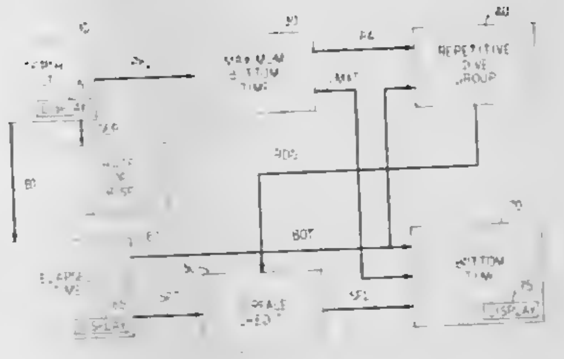
Lonnie S. McMillian, Huntsville, and Harold G. Culp, Union Grove, both of Ala., assignors to Systems & Technic S.A., Nyon, Switzerland
Continuation of Ser. No. 460,531, Apr. 12, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,058
Int. Cl.² G07D *9/00*
U.S. Cl. 235—92 CN **15 Claims**



1. A coin totalizer device comprising coin identification means for producing coin identification signals, coin value adding means, terminal means including two sets of terminals, one set for said identification signals and the other for said adding means, and means supporting said terminal sets adjacent one another and adapting said terminals to receive variable interconnections in order to provide scaling of the coin identification signals in accordance with the values of said coins in different countries, a multiplying circuit connected to said adding means, said other set of terminals comprising input terminals for said multiplying circuit, said multiplying circuit being adapted to produce a pre-selected multiplication at each of said input terminals, the number of said input terminals being greater than that necessary for totalizing the coinage of any single one of a pre-selected group of countries.

4,109,140
DIVER'S CONTROL AND INDICATION APPARATUS

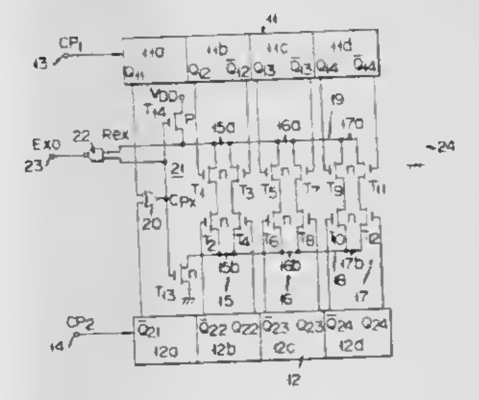
Richard Henry Etra, 67-40 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Apr. 19, 1977, Ser. No. 788,749
Int. Cl.² G07C *1/10*
U.S. Cl. 235—92 MT **18 Claims**



1. Diver's apparatus comprising depth determining means including means for determining the peak depth attained during a dive, means responsive to said peak depth determination for generating a digital representation of the allowable bottom time for said dive, means for generating a digital representation of the bottom time elapsed during said dive, and means responsive to said allowable bottom time representation and said elapsed bottom time representation for generating a visual indication of the bottom time remaining for said dive.

4,109,141
COUNTER OUTPUT DETECTOR CIRCUIT

Minoru Sasaki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Sep. 2, 1977, Ser. No. 830,148
Claims priority, application Japan, Sep. 9, 1976, 51-107266
Int. Cl.² H03K *21/10*
U.S. Cl. 235—92 CA **4 Claims**

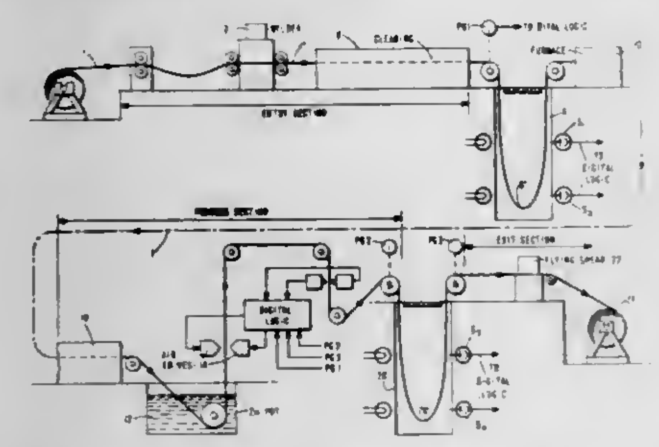


1. A counter output detector circuit comprising:

- a counter for counting input pulses and including first binary memory units which are connected in series and produce binary output signals ("1" or "0") and their negated binary output signals "$\overline{1}$" or "0"), respectively;
- a memory device for storing reference data therein to be compared with the output data from said counter and which includes second binary memory units of the same number as of said first ones, producing binary output signal ("1" or "0") and their negated binary output signals ("$\overline{1}$" or "0"), respectively;
- a plurality of switching circuits which receive as control input signals said binary output signals and their negated output signals from the pairs of corresponding said first and second memory units of said counter and said memory device except the pair of corresponding said first and second memory units at the first stage thereof, and open the paths between first and second terminals when the

contents coincide between said first and second memory units;
an exclusive OR circuit receiving at the input at least one output signal of said first stage binary memory unit of said counter and at least one output signal of said first stage binary memory unit of said memory device and producing a coincident signal when the contents coincide between said first stage memory units;
a first switching transistor which is connected between a common connection line of said first terminals and a power source and is made nonconductive when receiving said coincident signal from said exclusive OR circuit;
a second switching transistor which is connected between a common connection line of said second terminals and the ground, and is made conductive when receiving said coincident signal of said exclusive OR circuit; and
a gate circuit receiving at the input a signal carried on said common connection line of said first terminal and the output signal of said exclusive OR circuit and providing a coincident output signal when the data outputs are coincident between said counter and said memory device.

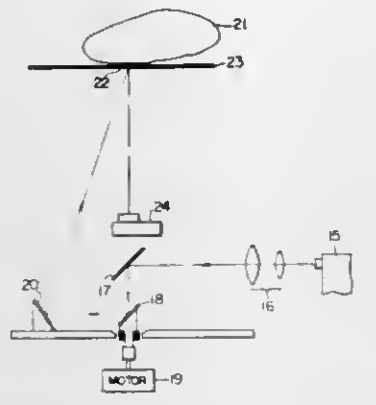
4,109,142
PROCESS DATA TRACKING SYSTEM
Gerald J. Readal, Pittsburgh; John R. Tiskus, and William J. Tomcanin, both of Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed Jul. 29, 1974, Ser. No. 492,960
Int. Cl.² B21C *51/00*
U.S. Cl. 235—92 DN **8 Claims**



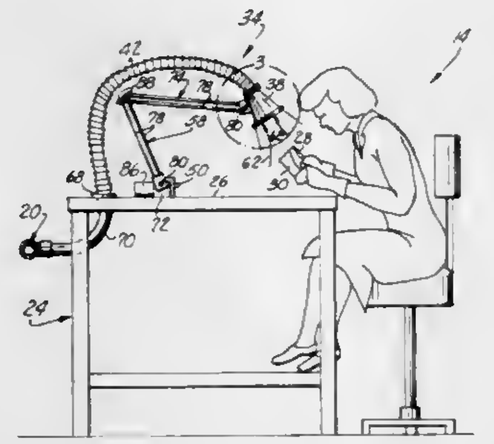
1. In a continuous strip processing line which includes means for variable strip storage, a method for tracking the accumulation of strip in said storage means comprising: incrementing a counter in response to signals representative of
incremental strip movements into the storage means; decrementing said counter in response to signals representative
of incremental strip movement out of said storage means; forcing the content of said counter to a predetermined reference
length in response in intermittent signals indicative of the existence of a known accumulation of strip in the storage means.

4,109,143
OPTICAL READER
Tetsuo Yamaguchi; Toshihide Hane; Hidehiro Ochial, and Shuzi Harada, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 18, 1976, Ser. No. 697,479
Int. Cl.² G06C *15/00;* **G06K** *7/10, 9/00*
U.S. Cl. 235—462 **1 Claim**

1. An optical reader system comprising an object to be read having at least two pieces of coded information thereon, with each piece of information having a unique control code associated with it, scan means for producing scanning light to be projected onto said object, photo-electric conversion means for converting scattered light produced by the scan and reflected from said object to an electrical signal, means for detecting said at least two pieces of coded information and associated control codes from said electrical signal and means for sorting and storing said at least two pieces of coded information in accordance with said associated control codes.

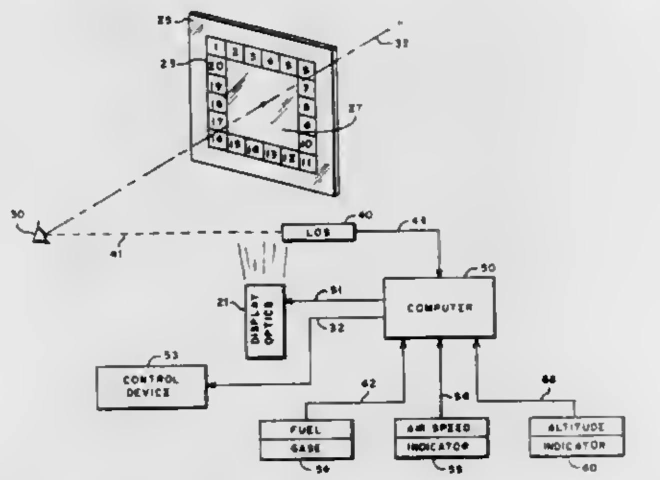


4,109,144
DUST COLLECTION AND ILLUMINATION SYSTEM
Albert J. Vidmar, Mentor, Ohio, assignor to Sherwood Refractories Inc., Cleveland, Ohio
Filed Aug. 11, 1975, Ser. No. 603,353
Int. Cl.² F21V *33/00*
U.S. Cl. 362—247 **12 Claims**



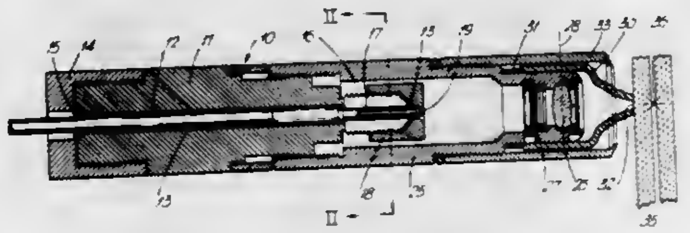
1. An apparatus for use in illuminating a work surface and removing dust particles from the area adjacent the work surface, said apparatus comprising a reflector having inner surface means for at least partially defining a light bulb receiving cavity having front and rear end portions and for reflecting light from the bulb toward the front end portion of the cavity, electrical socket means for supporting a light bulb in said cavity, a flexible conduit connected in fluid communication with the rear end portion of said cavity, blower means connected in fluid communication with said flexible conduit means for inducing a flow of air and dust particles from the area adjacent the work surface through said cavity and into said conduit means, rigid concuit means for connecting said flexible conduit means with said blower means, connector means connected with the work surface for connecting said flexible conduit means in fluid communication with said rigid conduit means, and support means connected with said reflector for supporting said reflector above the work surface, said support means being adjustable to flex said conduit and change the position of said reflector relative to the work surface.

4,109,145
APPARATUS BEING CONTROLLED BY MOVEMENT OF THE EYE
Carl P. Graf, Forrest Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 20, 1974, Ser. No. 471,409
Int. Cl.² G01J *1/20*
U.S. Cl. 250—201 **8 Claims**



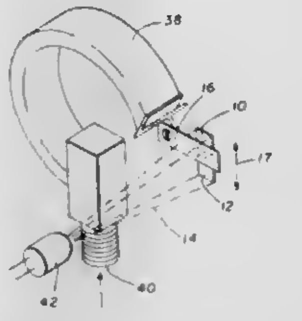
1. In combination:
a surface to be observed, including a display area and a plurality of trigger areas adjacent thereto which represent different control functions desired to be performed;
means continuously giving an output representing the location of the point of intersection of an observer's line of sight with said surface;
means deriving, from said output, signals indicative that the observer has fixated for a predetermined time period on any of said trigger areas;
and means for performing one of the control functions in accordance with said signals.

4,109,146
PRESSURE ACTUATED LIGHT PEN
Garth Decker Hillman, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 25, 1977, Ser. No. 790,430
Int. Cl.² G02B *5/14*
U.S. Cl. 250—227 **6 Claims**



1. A pressure actuated light pen comprising:
a tubular body having front and rear parts;
means for connecting one end of an optical fibre bundle to said rear part, the end of said bundle at a predetermined position in said body;
a retractable tubular tip member mounted at said front part and axially slidable from an extended position to a retracted position;
an aperture at a forward end of said tip member;
resilient means urging said tip member to said extended position;
a lens system in said body positioned to image said aperture on the end of said fibre bundle, a light image at said aperture focussed on said end of said fibre bundle when said tip member is retracted to a predetermined position.

4,109,147
OPTICAL POSITION SENSOR
William Albert Heske, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed May 10, 1976, Ser. No. 684,610
Int. Cl.² G01D *5/34*
U.S. Cl. 250—231 P **24 Claims**



1. Position sensing apparatus comprising in combination:
(a) a pair of spaced apart elements having radiation sensitive surfaces of predetermined active area, each of said elements being adapted to emit a discrete analog electrical signal of magnitude continuously correlated to its relative active surface area to which radiation is exposed;
(b) a radiation source for emitting radiation energy to which said elements are sensitive and positioned to project its emitted radiation in a uniform path toward the active surface areas of said elements;
(c) an opaque vane at an intermediate location between said source and said elements and transversely movable at least bidirectionally through an operating range in said radiation path for relatively varying the exposed active surface areas of said elements and said correlated signals emitted therefrom; and
(d) analog-digital circuit means operable to receive the correlated separate signals from each of said elements and to emit continuously a digital output signal correlated to the active surface area of said elements to which radiation is interrupted or uninterrupted at any given position throughout the operating range of said vane.

4,109,148
TRANSPARENT PLATES WITH A RADIOGRAPH THEREON AND PROCESS FOR THE PREPARATION THEREOF
Eric Jaulmes, Paris, France, assignor to Ateliers de la Motobecane, Pantin, France
Filed Mar. 10, 1977, Ser. No. 776,312
Claims priority, application France, Mar. 15, 1976, 76 07378
Int. Cl.² G03B *41/16*
U.S. Cl. 250—321 **10 Claims**

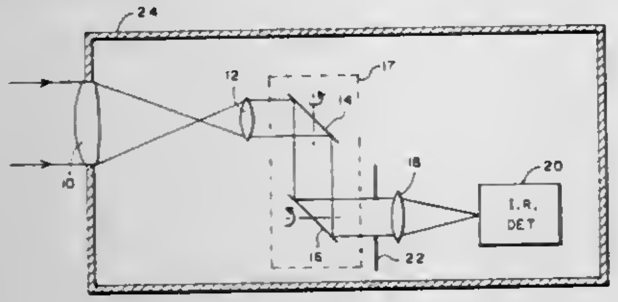
1. Process for obtaining a transparent plate whose transparency at every point is a function of the coordinates of this point, and wherein the function represents a voltage which is

obtained by placing a photocell on one side of the transparent plate and a light-emitting member on the other side of the plate opposite to the photocell, and the voltage is obtained at the exit of the photocell to form a curve characteristic of a three-dimensional form, comprising the steps of:

preparing at least one test-piece having a predetermined thickness of an X-ray absorbing material;
radiographing the test-piece with X-rays to form a radiograph of the test-piece;
recording the output voltage of the photocell illuminated by the light-emitting member through the support of the radiograph of the test-piece thus obtained;
forming the curve which is characteristic of the variable thickness of the three-dimensional form from the test-piece;
determining the variable thickness of the three-dimensional form from the curve;
forming the three dimensional form having a contour base homothetic to the surface of the transparent plate, the form having a thickness at every point substantially equal to the thickness of the test piece as measured from the base and corresponding to the voltage obtained at that point, the form being made from a material capable of absorbing X-rays; and
radiographing the three-dimensional form with X-rays to form a radiograph on the transparent plate, the transparent plate being the support of the radiograph thus obtained.

4,109,149
SHADE REDUCING APERTURE STOP FOR THERMAL IMAGING SYSTEMS

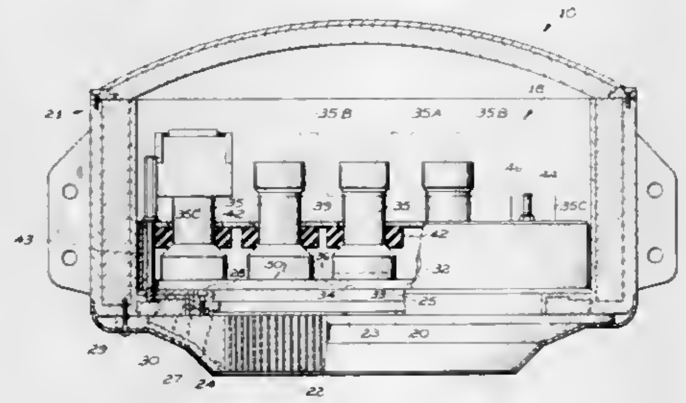
Irving R. Abel, Lexington, and Bruce R. Reynolds, Hudson, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 3, 1977, Ser. No. 802,996
Int. Cl.² G01J *1/00;* G02B *21/06*
U.S. Cl. 250—347 9 Claims



1. A thermal imaging system comprising:
telescope means for receiving thermal radiation from a scene;
scanning means for receiving thermal radiation from the telescope means and scanning the scene;
imaging lens means for imaging thermal radiation received from the scanning means at an image plane;
infrared detector means positioned proximate the image plane for producing output signals in response to the thermal radiation;
housing means for housing the telescope means, the scanning means, the imaging lens means, and the infrared detector means; and
aperture stop means positioned proximate the imaging lens means for preventing thermal radiation from the housing means from being received by the infrared detector means.

4,109,150
SCINTILLATION CAMERA WITH THE SCINTILLATORS IN DIFFERENT PLANES

Ronald J. Martone, Cheshire; Samuel C. Goldman, Bethany, and Clifford C. Heaton, Meriden, all of Conn., assignors to Picker Corporation, Cleveland, Ohio
Division of Ser. No. 121,445, Mar. 5, 1971, abandoned. This application Sep. 13, 1973, Ser. No. 396,762
Int. Cl.² G01T *1/20*
U.S. Cl. 250—368 12 Claims



1. A scintillation camera comprising:
(a) an array of scintillation responsive devices including at least one centrally disposed scintillation responsive device surrounded by others of said scintillation responsive devices;
(b) light emitting means for emitting flashes of light to said scintillation responsive devices in response to incident radiation stimuli; and,
(c) certain of said scintillation responsive devices being positioned substantially within the same plane and a centrally disposed one of sqid scintillation responsive devices being positioned out of said plane.

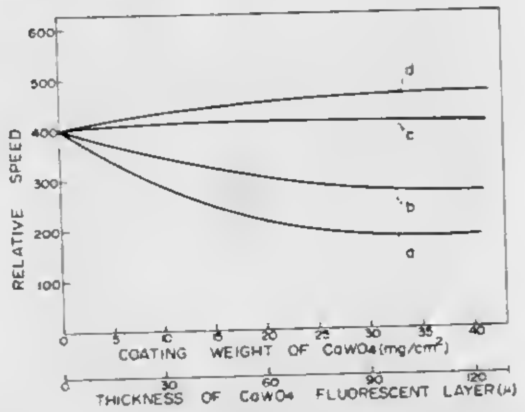
4,109,151
DUAL FILAMENT X-RAY TUBE USED IN PRODUCTION OF FLUOROSCOPIC IMAGES

Viktor W. Pleil, Wheaton, Ill., assignor to Picker Corporation, Cleveland, Ohio
Continuation of Ser. No. 537,730, Dec. 31, 1974, abandoned. This application May 12, 1977, Ser. No. 796,064
Int. Cl.² G01N *23/22;* H01J *7/44*
U.S. Cl. 250—460 7 Claims

1. A method of operating an X-ray tube, the X-ray tube being used to produce fluoroscopic images in a system and of the type having a cathode structure including a pair of filaments for emitting electrons to an X-ray generating anode structure, the method comprising the steps of:
(a) energizing a selected one of the filaments while leaving the other filament de-energized to cause the energized filament to emit electrons;
(b) applying a voltage potential between the anode structure and the energized filament to produce a flow of electrons to the anode structure; and,
(c) applying a bias voltage potential between the energized filament and the cathode structure to control the flow of electrons to the anode structure between two X-ray producing operating levels, the step of applying including the alternate steps of:
(i) applying one bias voltage between the cathode structure and the electron emitter to allow a high flow of electrons; and,
(ii) applying a second bias voltage to reduce the flow of electrons, the alternate steps respectively producing streams of X-rays of respectively larger and smaller intensities, the electron emitter being switched between its operating levels in synchronism with another component of the system.

4,109,152
X-RAY INTENSIFYING SCREENS

Yuji Aoki, Odawara; Keiji Shimiya, Hiratsuka; Norio Miura, Isehara; Etsuo Mori, and Yujiro Suzuki, both of Odawara, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan
Filed Jul. 26, 1977, Ser. No. 819,043
Claims priority, application Japan, Aug. 13, 1976, 51-96846; Dec. 3, 1976, 51-145325
Int. Cl.² G01J *1/58*
U.S. Cl. 250—486 12 Claims



1. An X-ray intensifying screen comprising a support having formed thereon a first fluorescent layer composed of a complex halide phosphor represented by the formula shown below and further having formed on said first fluorescent layer a second fluorescent layer composed of a calcium tungstate phosphor:

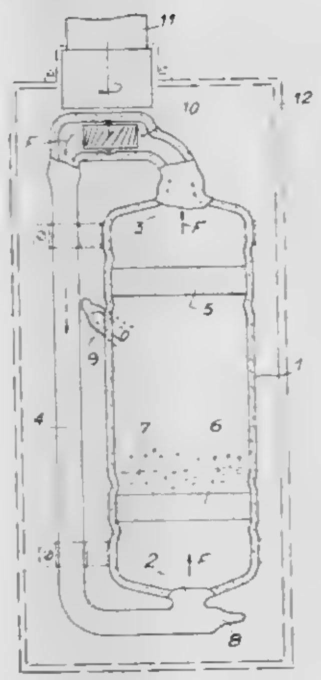
$(Me_{1\text{-}f}Mg_f)F_2.aMe'X_2.bKX'.cMe''SO_4{:}dEu^{2+},eTb^{3+}$

wherein Me, Me' and Me'' each represents at least one of the alkaline earth metals of the group consisting of barium, strontium and calcium; X and X' each represents at least one of chlorine and bromine; and *a, b, c, d, e* and *f* are numbers defined by one of the following five combinations

1. $0.80 \leqq o_1 \leqq 1.50$, $0.10 \leqq b_1 \leqq 1.50$, $c_1=0$, $0.001 \leqq d_1 \leqq 0.20$, $e_1=0$ and $f_1=0$;
2. $0.30 \leqq o_2 \leqq 1.50$, $0.10 \leqq b_2 \leqq 2.00$, $0.01 \leqq c_2 \leqq 1.00$, $0.001 \leqq d_2 \leqq 0.20$, $e_2=0$ and $f_2=0$;
3. $o_3=1$, $b_3=0$, $c_3=0$, $0.01 \leqq d_3 \leqq 0.10$, $0<e_3 \leqq 0.05$ and $f_3=0$;
4. $o_4=1$, $b_4=0$, $c_4=0$, $0.001 \leqq d_4 \leqq 0.20$, $e_4=0$ and $0<f_4 \leqq 1$; and
5. $o_5=1$, $0<b_5 \leqq 1.5$, $c_5=0$, $0.001 \leqq d_5 \leqq 0.20$, $e_5=0$ and $0<f_5 \leqq 1$.

4,109,153
VARIABLE-FLUENCE NEUTRON SOURCE

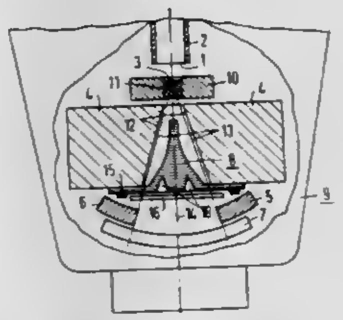
Guy Brachet, Breuillet; Pascal Demichel, Paris; Yvon Prigent, Marcoussis, and Jean Charles Riche, Draveil, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 9, 1976, Ser. No. 749,166
Claims priority, application France, Dec. 17, 1975, 75 38734
Int. Cl.² G21G *4/02*
U.S. Cl. 250—499 8 Claims



1. A variable-fluence neutron source utilizing a known reaction of the (a,n) type between a radioactive emitter and a target wherein the emitter is a powder within a closed chamber, a carrier fluid which constitutes the target, said powder in its normal quiescent bed state being sufficently compact so as to provide a self absorption of any generated radiation and means for fluidizing the powder emitter in said carrier fluid within said chamber by means for pumping said carrier fluid through a compact layer of the emitter powder for forming a fluidized suspension of the emitter powder from the layer in a homogeneous fluidized bed in said chamber to provide a neutron source of intensity varying with the pumping rate.

4,109,154
X-RAY BEAM COMPENSATION

Leonhard Taumann, Lafayette, Calif., assignor to Applied Radiation, Walnut Creek, Calif.
Filed Mar. 18, 1977, Ser. No. 779,025
Int. Cl.² G01J *1/00*
U.S. Cl. 250—503 9 Claims



1. An electron accelerator comprising:
(a) an electron beam;
(b) a target means exposed to the electron beam for producing x-ray deceleration radiation in the shape of a cone;
(c) a massive conical compensating means for flattening the radiation intensity distribution arranged centrally in the cone of the x-ray radiation, said compensating means

having a decreasing conical shape towards the target means, and a base away from the target means;

(d) said decreasing conical shape merging into a cylindrical portion having a frontal surface adjacent the target means; and

(e) a recess means positioned adjacent the base of the compensating means and having a given depth for compensating portions of the x-ray radiation in the cylindrical portion outwardly from the center of the radiation cone, said portions being those portions of the x-ray radiation intercepted by the cylindrical portion which are additional to those portions intercepted in a conical embodiment of the compensating means.

4,109,155

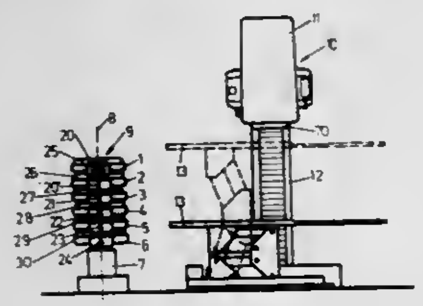
GAMMA CAMERA

Edgar Tschunt, Erlangen; Winfried Platz, Ratsberg; Ulrich Bär, Nuremberg, and Lothar Heinz, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 324,063, Jan. 16, 1973, abandoned. This application Jun. 14, 1974, Ser. No. 479,425

Int. Cl.² G21K *1/02*

U.S. Cl. 250—505 **4 Claims**



1. In combination with a gamma camera, a collimator exchangeably located in the ray inlet of the camera, a plurality of reserve collimators, and holders carrying said reserve collimators, a device for supporting said holders, said device comprising a column on the floor, and means connected with said column and supporting said holders swingably one above each other, a further column on the floor separated from the first-mentioned column and means swingably supporting the camera upon said further column, the column supporting the holders being located at such distance from the column supporting the camera that the swinging ranges of said holders and of said camera relatively to the centers of the collimators touch each other at least one location, and means providing for the exchange of a collimator between one of said holders when swung to said one location of its swinging range and the ray inlet of the camera when the camera has been swung about the further column to said one location of its swinging range.

4,109,156

COLLIMATING DEVICE FOR X-RAYS

Charles H. Schroeder, P. O. Box 9414, Raytown, Mo. 64133

Filed Feb. 7, 1977, Ser. No. 765,969

Int. Cl.² G21K *1/00*

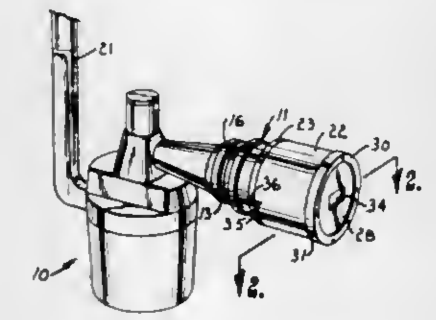
U.S. Cl. 250—505 **10 Claims**

1. A collimating device for use with a substantially tubular member which is attachable to an X-ray generator and which has an open end for providing an X-ray beam that may be used in intra-oral radiography, said collimating device comprising:

a substantially hollow member large enough to fit around the open end of said tubular member and having walls which are impervious to X-rays;

an end portion of said hollow member presenting a substantially rectangular opening through which X-rays may pass in a beam of substantially rectangular shape; and

means for detachably mounting said hollow member on the tubular member with said walls surrounding the open end thereof and with said rectangular opening spaced a preselected distance from said open end.



4,109,157

APPARATUS FOR ION-NITRIDING

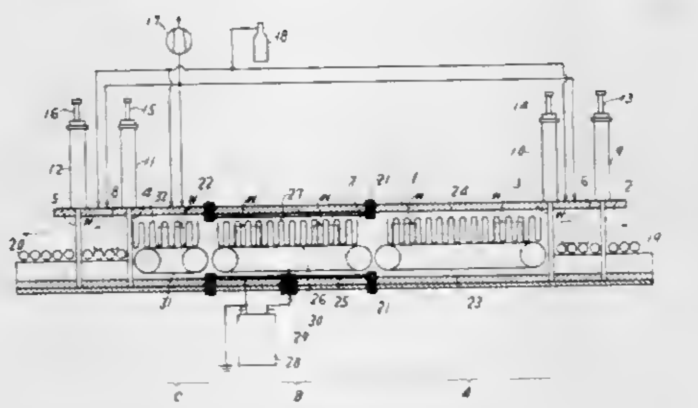
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Ruruitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 8, 1976, Ser. No. 748,453

Claims priority, application Japan, Dec. 18, 1975, 50/152086; Dec. 22, 1975, 50/174062[U]

Int. Cl.² B01K *1/00*

U.S. Cl. 250—531 **5 Claims**



1. An apparatus for ion-nitriding comprising:

(a) a vacuum chamber sectioned into a heating area having insulating chamber walls and a discharge nitriding area having electrically conductive chamber walls;

(b) a first transferring means disposed in said heating area for transferring a workpiece;

(c) heating means disposed in said heating area for pre-heating the workpiece up to the temperature at which the workpiece can be glow discharge nitrided;

(d) electrically conductive transferring means disposed in said discharge nitriding area for receiving the pre-heated workpiece from said first transferring means;

(e) heat-retaining means disposed in said discharge nitriding area for maintaining the pre-heated workpiece at a temperature suitable for glow discharge nitriding; and

(f) discharge means to generate glow discharge between said conductive chamber wall of said discharge nitriding area as anode and said electrically conductive transferring means as cathode.

4,109,158

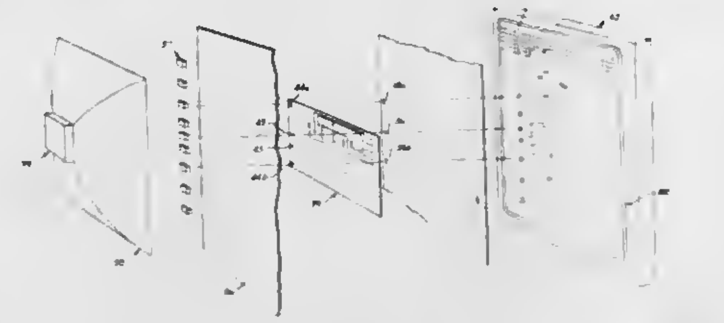
APPARATUS FOR POSITIONING A PAIR OF ELEMENTS INTO ALIGNED INTIMATE CONTACT

Frank Henning Blitchington, and George David Hudson, both of Richmond, Va., assignors to Western Electric Company, Inc., New York, N.Y.

Filed May 27, 1976, Ser. No. 691,043

Int. Cl.² G01N *21/30*

U.S. Cl. 250—548 **18 Claims**



9. Apparatus for positioning a first element having a plurality of slots formed therein at selected locations into aligned intimate contact with a second element having a plurality of windows formed therein at selected locations alignable with the slots of the first element, which comprises:

means for adjustably supporting the second element with the plurality of windows being generally in a selected position;

means for moveably transporting the first element into a position spaced from and adjacent to the second element with the plurality of slots being thereby generally alignable with the plurality of windows;

means responsive to the general alignment of the plurality of slots of the first element with the plurality of windows of the second element for controlling movement of the transporting means and adjustment of the supporting means to accurately align the slots and windows and thereby position the spaced first and second elements in precise alignment;

means responsive to the precise alignment of the first and second elements for gripping at least an adjacent portion of the first element and moving the gripped portion into interfacing engagement with the second element while retaining the precise alignment;

means responsive to the interfacing engagement of the first element with the second element for forming an airtight enclosure and for sealing within the airtight enclosure at least the interfacing engaging portions of the first and second elements; and

means responsive to the forming of the airtight enclosure and acting upon the portions of the first and second elements within the airtight enclosure for urging the interfacing engaging portions into intimate contact in the precise alignment.

4,109,159

METHOD AND AN AUTOMATIC DEVICE FOR ANALYZING VARIATIONS IN THE TRANSPARENCY OF A SAMPLE

Michel Onillon, Vert le Grand; Pierre Roche, Maisons-Alfort, and Jean Thenard, Versailles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

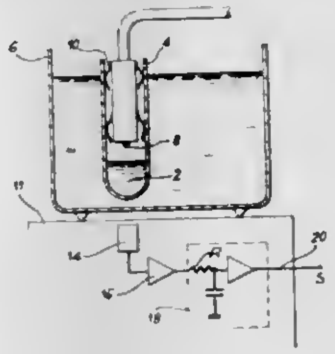
Filed May 24, 1977, Ser. No. 799,935

Claims priority, application France, Jun. 3, 1976, 76 16785

Int. Cl.² G01N *21/28*

U.S. Cl. 250—564 **11 Claims**

5. A device for analyzing time-dependent variations in transparency of a sample in which said variations have a high-slope region followed by a low-slope region, wherein said device comprises means for generating a first signal B which is representative of the time-dependent variations of said transparency, means for generating a second signal A which is variable in time from an initial instant t_0, means for generating a first pulse at the initial instant t_0, means for generating the signal A, said means being provided with means for making said signal representative of the initial slope of the signal B at the beginning of its high-slope region, means for periodically comparing said slope with the slope of the signal B, means for generating a second pulse when the slope of the signal B becomes higher than the initial slope measured, and means for measuring the time interval which elapses between the first and the second pulses.



4,109,160

CONTROL SYSTEM FOR HYDROELECTRIC POWER STATION SYSTEM

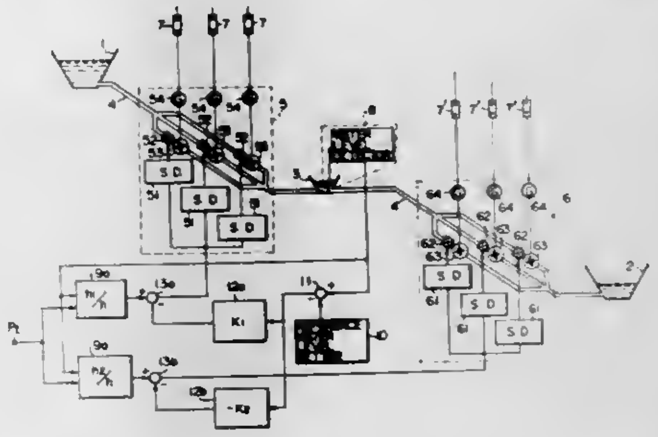
Masuo Goto; Akira Isono; Tunehiko Takakusagi; Masanobu Araki; Haruo Ishikawa, and Yukio Yamaguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 11, 1976, Ser. No. 713,579

Claims priority, application Japan, Aug. 13, 1975, 50-97556

Int. Cl.² F15B *1/06*

U.S. Cl. 290—52 **15 Claims**



1. A control system for hydroelectric power station system including three water reservoir means having different water levels and connected in cascade through water channels therebetween and power stations in the respective water channels, in which load instructions applied to said respective power stations are corrected according to the water level of said intermediate reservoir and the operating condition of said respective power stations.

4,109,161

MEMORY CIRCUIT WITH PROTECTION CIRCUIT

Hiroshi Iijima, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Feb. 8, 1977, Ser. No. 766,815

Claims priority, application Japan, Feb. 9, 1976, 51-13055

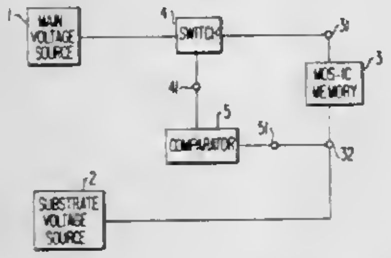
Int. Cl.² G11C *7/02*

U.S. Cl. 307—87 **3 Claims**

1. A memory circuit with a protection circuit, comprising:

a memory circuit having first and second voltage input terminals to which first and second voltages are supplied, said memory circuit operating in response to said first and second voltages, said memory circuit comprising a plurality of MOS-IC memory elements whose substrate input terminals are connected in series to be supplied with said second voltage and whose main voltage terminals are connected to each other to be supplied in parallel with said first voltage,

a comparator connected to said second voltage input terminal and generating a control signal when the voltage at said second voltage input terminal is below a given level; and



a switching circuit connected between said first voltage input terminal and said memory circuit and responsive to said comparator for cutting off said first voltage when said control signal is generated, whereby said switching circuit may be opened when a voltage at said second voltage input terminal falls below said given level.

4,109,162

MULTI-STAGE INTEGRATED INJECTION LOGIC CIRCUIT WITH CURRENT MIRROR

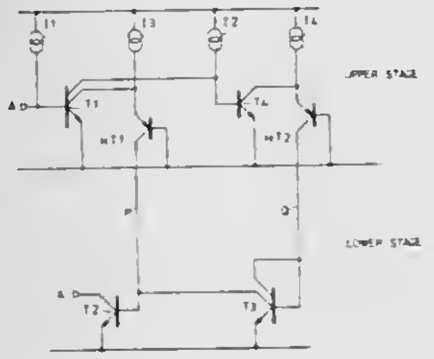
Rolf Heuser, Ellerau, Fed. Rep. of Germany, and George Albert Govaert, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,194

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1975, 2538910

Int. Cl.^{2} H03K *19/08*

U.S. Cl. 307—203 **5 Claims**



1. A circuit comprising

a voltage supply terminals;

a plurality of circuit stages including a first upper stage and a second lower stage connected in series across the voltage supply terminals;

Said first upper stage including a first switching transistor of the first conductivity type having an emitter, a base and one or more collectors;

a first auxiliary transistor of the second conductivity type having an emitter, a base and a collector; a first signal input and a current injector being connected to said base of said first switching transistor; a collector of said first switching transistor being connected to the emitter of said first auxiliary transistor; the emitter of said first switching transistor and the base of said first auxiliary transistor being connected together;

said second lower stage including a second switching transistor of the first conductivity type having an emitter, a base and a collector; the collector of said first auxiliary transistor being connected to the base of said second switching transistor; and current mirror means connected to the base and the emitter of said second switching transistor which functions to drain charge therefrom when the latter is turned off; the collector of said second switching transistor being connected to a signal output.

4,109,163

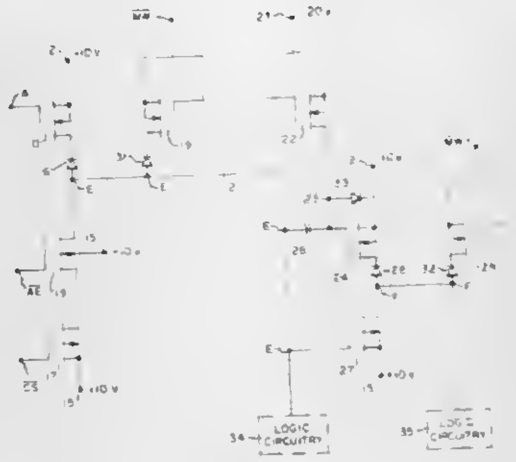
HIGH SPEED, RADIATION HARD COMPLEMENTARY MOS CAPACITIVE VOLTAGE LEVEL SHIFT CIRCUIT

James R. Cricchi, Catonsville, and Michael D. Fitzpatrick, Linthicum, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1977, Ser. No. 776,805

Int. Cl.^{2} H03K *5/02, 19/08;* **G11C** *8/00;* **H03K** *19/34*

U.S. Cl. 307—205 **15 Claims**



1. A complementary MOS voltage level shift circuit comprising:

an input stage having a plurality of MOS transistor inputs and an output, said input stage operative to generate, in response to a sequence of input signals applied to said transistor inputs, a first voltage swing of a first predetermined amount between a positive voltage potential and a first negative voltage potential, said input stage having a first section including a first N-channel depletion mode MOS transistor coupled to said first negative voltage potential and a second section including a first P-channel enhancement mode MOS transistor coupled to said positive potential;

a first voltage potential limiting means coupling said first and second sections and coupled to the output of said input stage;

a voltage level shift stage having an input, said input coupled to the output of said input stage, said shift stage including two MOS transistors operatively coupled in a push-pull configuration to alternately turn ON and OFF in a coordinated manner in response to said first voltage swing to generate a second voltage swing of a second predetermined amount greater than the first predetermined amount of said first voltage swing;

DC blocking means coupling one of the transistors in said shift stage to the input of said shift stage.

4,109,164

CIRCUITRY FOR GENERATING RAMP TYPE SIGNALS

LaVerne A. Caron, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 28, 1977, Ser. No. 772,604

Int. Cl.^{2} H03K *4/08, 3/78*

U.S. Cl. 307—228 **8 Claims**

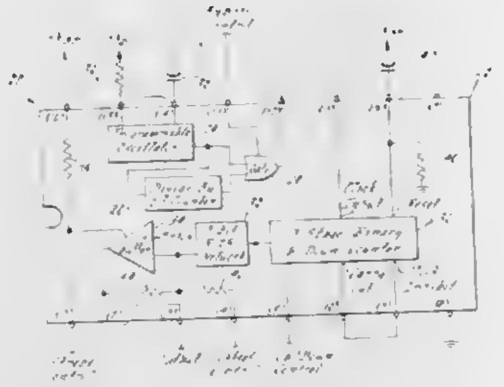
1. A circuit comprising:

an input terminal for receiving a repetitive input signal;

an output terminal;

means including a counter circuit coupled to said input terminal for registering in its count occurrences of said input signal and providing an analog signal whose magnitude is representative of its count;

an output buffer stage receiving said analog signal and providing a corresponding output signal, and control circuitry coupled with said output stage, said control circuitry comprising,



offset control means for offsetting the output signal of said buffer stage in accordance with an offset control signal,

and, strobe control means providing for selective transmission of the output signal of said buffer stage to said output terminal in accordance with a strobe control signal.

4,109,165

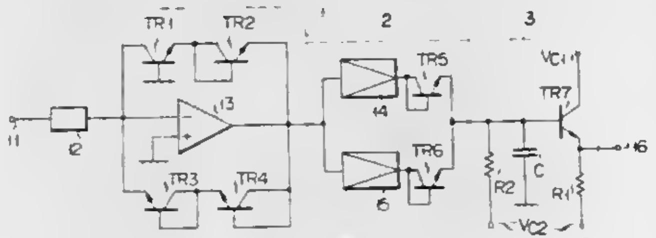
RMS CIRCUIT

Masayuki Katakura, Yokohama, and Hisashi Yamada, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki Japan

Filed Feb. 14, 1977, Ser. No. 768,367

Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—229 **4 Claims**



1. An RMS circuit comprising:

a logarithmic amplifying circuit including an operational amplifier provided with a signal input terminal and an output terminal,

a first feedback circuit for the feedback of one of the positive and negative components of the input signal formed of first and second *npn* transistors whose emitter-collector paths are connected in series between the input and output terminals of the operational amplifier,

the base and collector of the second *npn* transistor being connected together,

a second feedback circuit for the feedback of the other of the positive and negative components of the input signal formed of third and fourth *npn* transistors whose emitter-collector paths are connected in series between the input and output terminals of the operational amplifier,

the base and collector of each of the third and fourth *npn* transistors being connected together,

the first feedback circuit and operational amplifier being combined to form a first logarithmic amplifying section,

the second feedback circuit and operational amplifier being combined to form a second logarithmic amplifying section,

a fullwave rectifying circuit coupled to said output terminal for subjecting an output signal from the logarithmic amplifying circuit to fullwave rectification,

the fullwave rectifying circuit being connected to receive a signal from the logarithmic amplifying circuit corresponding to twice the logarithmic value of an input signal supplied to the logarithmic amplifying circuit and to produce a signal corresponding to the logarithmic value of a square of an input signal supplied to the logarithmic amplifying circuit, and

a smoothing circuit coupled to said rectifying circuit for smoothing an output signal from the fullwave rectifying circuit.

4,109,166

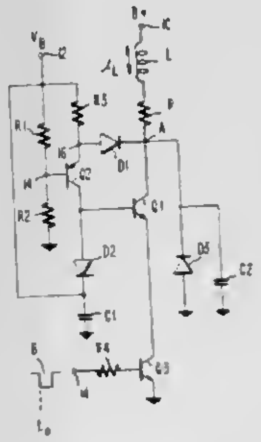
CLAMPING CIRCUIT

Charles Albert Clark, Jr., Chatsworth, and Kenneth Charles Adam, Thousand Oaks, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,035

Int. Cl.^{2} H03K *5/08*

U.S. Cl. 307—237 **12 Claims**



1. In combination:

first and second transistors of opposite conductivity types, each having base, emitter and collector electrodes, the collector electrode of the first transistor being connected to the base electrode of the second transistor;

means for maintaining the base electrode of the first transistor at a fixed potential with respect to ground, which is in the forward direction relative to the potential at the emitter electrode of said first transistor during the clamping of the collector electrode of said second transistor described below;

means for supplying emitter current to said first transistor, thereby conditioning said first transistor to supply its collector current as base drive current for said second transistor;

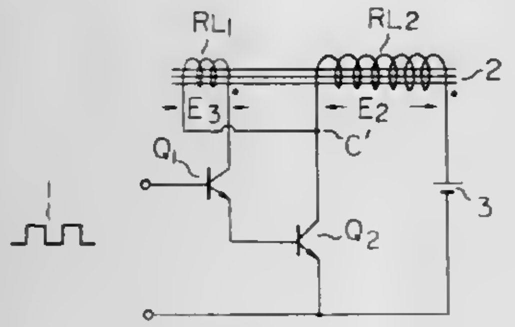
means coupled between the emitter and collector electrodes of said second transistor for conditioning said second transistor to conduct collector-to-emitter current; and

clamping means connected between said emitter electrode of said first transistor and said collector electrode of said second transistor which is poled to conduct in the forward direction during conduction of current through the collector electrode-to-emitter electrode path of said second transistor for clamping the collector electrode of said second transistor to a voltage related to that at the base electrode of said first transistor.

4,109,167
TRANSISTOR AMPLIFIER APPLYING LARGE OUTPUT CURRENTS TO A LOAD

Isamu Kaji, 48-38, Yamashina-Higashino-Yashiro, Higashiyama-ku, Kyoto, and Naoyuki Maeda, 671-1, Aza Higashikoken, Oaza Inuyama, Inuyama-shi, Aichi-ken, both of Japan

Filed Dec. 28, 1976, Ser. No. 754,954
Claims priority, application Japan, May 21, 1976, 51-58841
Int. Cl.^{2} H03K *17/00*
U.S. Cl. 307—270 **9 Claims**



1. In a circuit arrangement wherein a load is connected across a secondary winding of an output transformer having primary winding means wound on a core in series with a source of direct current and an amplifier consisting of a plurality of transistors comprising a driving transistor and a power transistor in a Darlington configuration, each of said transistors including an emitter, a collector and a base, the emitter of said driving transistor being tied to the base of said power transistor,

the improvement wherein said primary winding means comprises a main winding and an ancillary winding connected in series opposition between said source and said amplifier, the collector of said power transistor being connected to a terminal of said main winding, the collector of said driving transistor being connected to said terminal by way of said ancillary winding, the emitter of said power transistor being connected to the other terminal of said main winding by way of said source, the turn ratio of said main and ancillary windings being such that said power transistor saturates in a conduction phase, the voltage developed across said ancillary winding in said conduction phase being substantially equal to the difference between the voltage across the main winding added to the source voltage and the combined collector/emitter voltage of said driving transistor and base/emitter voltage of said power transistor.

4,109,168
CURRENT-TO-FREQUENCY CONVERTER

David Lee Raymond, Arcadia, Calif., assignor to Analog Technology Corporation, Irwindale, Calif.

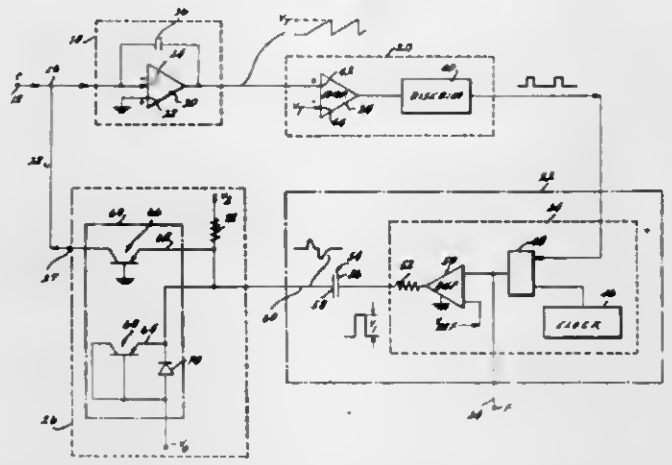
Filed Jan. 19, 1977, Ser. No. 760,686
Int. Cl.^{2} H03K *1/16*
U.S. Cl. 307—271 **23 Claims**

1. A circuit for generating a current pulse containing an accurately-determined minute quantity of electrical charge, comprising:

a current pulse generator for generating, in response to an input signal, an output current pulse containing a precise, pre-determined quantity of electrical charge; and

a current divider connected to said current pulse generator for dividing each current pulse supplied by said current pulse generator and having an output terminal at which a small constant fraction of each current pulse is presented,

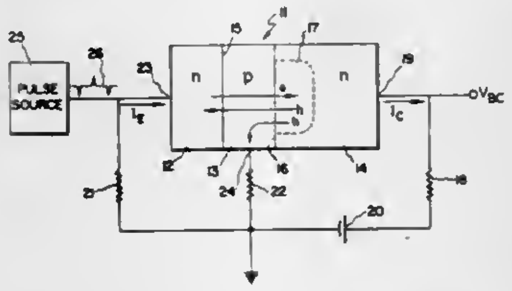
said current divider further comprising a pair of transistors connected in parallel to receive each current pulse, one of said transistors providing a conductive path to the output terminal and the other of said transistors providing a conductive shunt path for each current pulse, said transistors being biased to operate at different operating points of their characteristics, at which the conductances of the transistors are in a predetermined ratio, a small substantially constant fraction of each current pulse supplied by said current pulse generator being conducted through said one of said transistors to the output terminal.



4,109,169
AVALANCHE MEMORY TRIODE AND LOGIC CIRCUITS

Wirojana Tantraporn, and Se Puan Yu, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,543
Int. Cl.^{2} H03K *17/00;* H01L *29/88*
U.S. Cl. 307—302 **20 Claims**



1. A semiconductor circuit for use selectively in memory and logic applications comprising

a controlled avalanche memory triode operable at microwave frequencies and comprising contiguous emitter, base, and collector regions each having a terminal and defining emitter-base and base-collector junctions, said emitter and collector regions being of one conductivity type and said base region being of the other conductivity type, said collector region further having an avalanche zone of limited lateral extent,

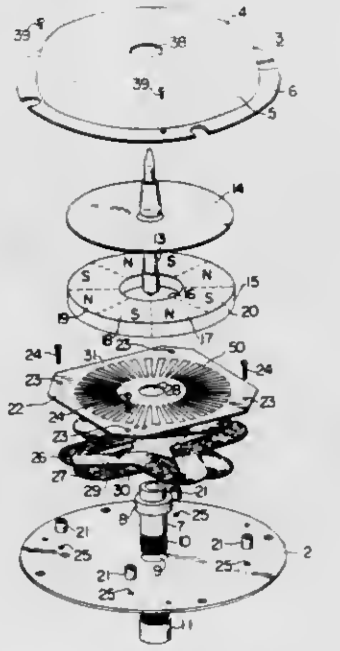
bias means for applying a reverse bias voltage to said base-collector junction sufficient to cause low ratio avalanche multiplication of charge carriers injected into said collector region, and

pulse source means for supplying input signals with a predetermined interval therebetween effectively in circuit between said emitter and base terminals, one input signal having a polarity to forward-bias said emitter-base junction while the succeeding input signal has a polarity to reverse-bias said emitter-base junction, said one input signal functioning to switch a selected circuit parameter at one of said terminals from a first to a second magnitude which persists until the application of the succeeding input signal switches the selected circuit parameter back to said first magnitude.

4,109,170
ELECTRIC MOTOR HAVING FREQUENCY GENERATOR

Masahiko Fujita; Toshihiko Gotoh, both of Yokohama, and Hiroshi Hagino, Omiya, all of Japan, assignors to Hitachi, Ltd. and Japan Servo Co., Ltd., both of, Japan

Filed Oct. 19, 1976, Ser. No. 733,779
Claims priority, application Japan, Oct. 22, 1975, 50-126441
Int. Cl.^{2} H02K *11/00*
U.S. Cl. 310—68 R **13 Claims**



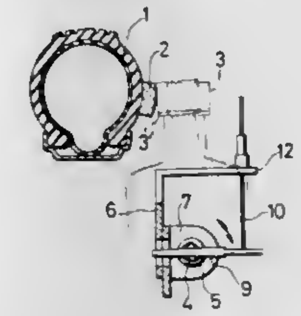
1. An electric motor incorporating a frequency generator comprising a rotary shaft, a disk-shaped multipolar magnet having a plurality of magnetizable sectors, said sectors being magnetized to exhibit poles of different polarities at both thicknesswise ends, adjacent ones of said sectors being poles of reverse polarities, a pair of flat driving coils disposed parallely with and spaced from said magnet and within a field of said magnet, and a flat speed detecting coil disposed parallely on and spaced from said magnet and within a magnetic field of said magnet, said driving coils and said speed detecting coil being arranged to be nonrotatable, each of said driving coils having a plurality of driving portions interlinking with magnetic flux of said magnet, said speed detecting coil having $2n + 1$ radially extending generating wire elements corresponding to each one of said magnetic poles, said wire elements being serially connected, whereby said speed detecting coil acts as a frequency generator producing a signal having a frequency corresponding to a revolution speed of said magnet, when said driving coils are supplied with electrical power.

4,109,171
DEVICE FOR INDICATING THE DIRECTION OF DRIVING OF A VEHICLE

Yoshikatsu Furusawa, No. 19, Aza Uwamichi, Kemanai Towada-machi, Kazuno-shi, Akita-ken, Japan

Filed Feb. 11, 1977, Ser. No. 767,763
Claims priority, application Japan, Dec. 15, 1976, 51-151373
Int. Cl.^{2} H02K *7/00*
U.S. Cl. 310—75 C **4 Claims**

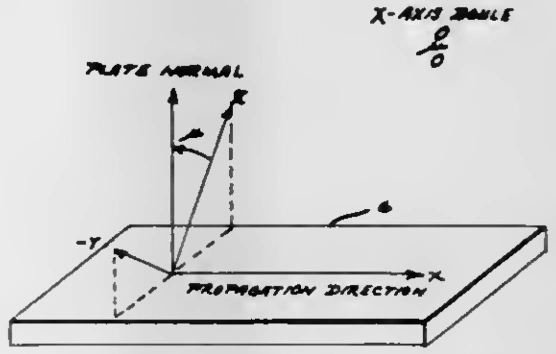
1. In a device for emitting a signal in a driven vehicle such as a bicycle, said device including a miniature power generator employed for producing electric power and for emitting said signal in such a manner that the rotor of said miniature generator is driven by the rotation of the wheel of the vehicle by tilting the miniature generator to a position at which said rotary head of said miniature generator contacts at least a portion of said wheel, the improvement wherein said rotary head of said miniature generator contacts a strip of rubber-like substance fixed to the side surface of a wheel tire made of a rubber-like substance, said strip covering only a segment of the circumference of said tire and projecting sideways to permit contact with said rotary head of said miniature power generator.



4,109,172
HIGH PIEZOELECTRIC COUPLING-TEMPERATURE COMPENSATED BERLINITE SUBSTRATE MEMBER FOR SURFACE ACOUSTIC WAVE DEVICES

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,107
Int. Cl.^{2} H01L *41/10*
U.S. Cl. 310—313 **1 Claim**



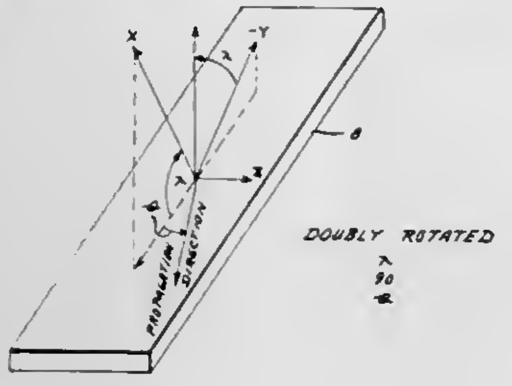
1. A surface acoustic wave device substrate member of single crystal berlinite having an acoustic surrface wave propagation surface defined by a plane that substantially coincides with the Euler angles Lambda = 0.0°, mu = 80.4°, and Theta = 0.0°.

4,109,173

HIGH PIEZOELECTRIC COUPLING, LOW DIFFRACTION LOSS, TEMPERATURE COMPENSATED BERLINITE SUBSTRATE MEMBERS FOR SURFACE ACOUSTIC WAVE DEVICES

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,108
Int. Cl.^{2} H01L *41/10*
U.S. Cl. 310—313 2 Claims



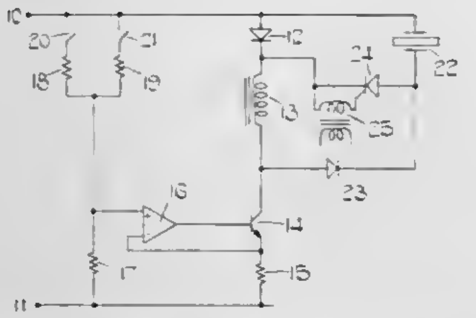
1. A surface acoustic wave device substrate member of single crystal berlinite having an acoustic surface wave propagation surface that substantially coincides with the Euler angles Lambda = 76.8°, μ = 90.0°, and Theta = 11.5°.

4,109,174

DRIVE CIRCUITS FOR A PIEZOELECTRIC STACK

Duncan Barry Hodgson, Whitnash near Leamington Spa, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 4, 1977, Ser. No. 765,645
Claims priority, application United Kingdom, Feb. 24, 1976, 7157/76
Int. Cl.^{2} H01L *41/10*
U.S. Cl. 310—316 16 Claims



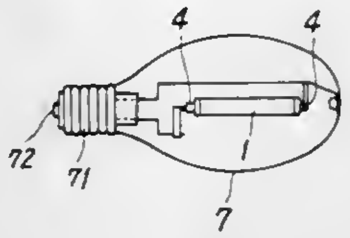
1. A drive circuit for a piezo-electric crystal stack comprising an inductor, a first circuit through which said inductor can be connected across a D.C. supply to establish a current flow therethrough, said first circuit including means for rapidly reducing the current flowing to the inductor from the source of supply, a second circuit through which energy is transferred to said crystal stack from the inductor when the current flowing from the source of supply is reduced, and means for transferring energy to the inductor from the crystal stack when it is required to increase the current flow in the inductor.

4,109,175

HIGH PRESSURE SODIUM VAPOR DISCHARGE LAMP

Yoshiaki Watarai, Takatsuki; Haruo Yamazaki, Moriyama; Naoki Saito; Masayuki Yamaguchi, both of Takatsuki; Takio Okamoto, Kusatsu, and Hidezo Akutsu, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Mar. 14, 1977, Ser. No. 777,149
Claims priority, application Japan, Mar. 19, 1976, 51-30190; Sep. 20, 1976, 51-113429; Sep. 20, 1976, 51-113432
Int. Cl.^{2} H01J *61/18*
U.S. Cl. 313—112 11 Claims



1. A high pressure sodium vapor discharge lamp comprising an alumina tube envelope containing therein sodium, inert starting gas, a buffer gas source being at least one member selected from the group consisting of mercury and cadmium and discharge electrodes sealed in the envelope, in which an inner diameter d in nm of said tube envelope and an average potential gradient E in v/cm have the relation

$$E \geqq 37.7 - 2.05d.$$

and said lamp further comprising

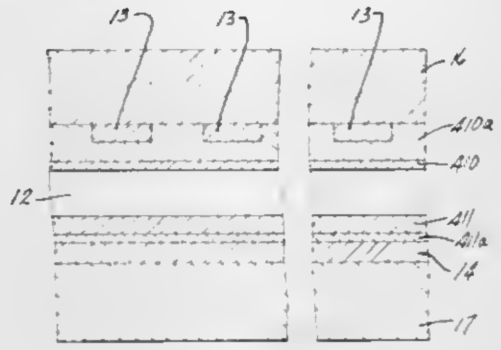
a radiation suppressing means for selectively absorbing radiation of wave length longer than 620 nm, said radiation suppressing means being formed at least partly to surround said tube envelope.

4,109,176

INSULATING DIELECTRIC FOR GAS DISCHARGE DEVICE

Roger E. Ernsthausen, Luckey; Michael E. Fein, and Bernard W. Byrum, Jr., both of Toledo, all of Ohio, assignors to Owen-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 291,956, Sep. 25, 1972, abandoned, which is a division of Ser. No. 217,395, Jan. 12, 1972, abandoned. This application Jun. 16, 1975, Ser. No. 587,499
Int. Cl.^{2} H01J *61/30, 61/35*
U.S. Cl. 313—220 38 Claims



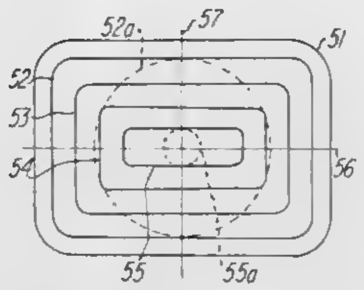
1. In a gas discharge device containing at least two electrodes, at least one of the electrodes being insulated from the gas by a dielectric member, the improvement wherein at least one dielectric member contains an electrically non-conductive insulating source of at least one element selected from copper, silver, cadmium, mercury, and zinc.

4,109,177

CATHODE-RAY TUBE HAVING APERTURED MASK

Richard Hugh Godfrey, and Albert Maxwell Morrell, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 22, 1971, Ser. No. 165,098
Int. Cl.^{2} H01J *29/07, 29/32*
U.S. Cl. 313—402 16 Claims



1. In a cathode-ray tube comprising:
(1) an evacuated envelope,
(2) a luminescent viewing screen within said envelope, said viewing screen comprising a plurality of different color light-emitting areas arranged in repetitive order,
(3) means for projecting a plurality of electron beams toward said screen for exciting said screen to luminescence, said plurality of beams being equal in number to said plurality of different colors,
(4) and means including an apertured mask closely spaced from said viewing screen for selectively defining to the viewer during the operation of said tube an array of discrete excited luminescent areas in said screen, which areas are graded in size with the largest areas being in the central portion of the screen and the smallest areas being in the peripheral portions of the screen,

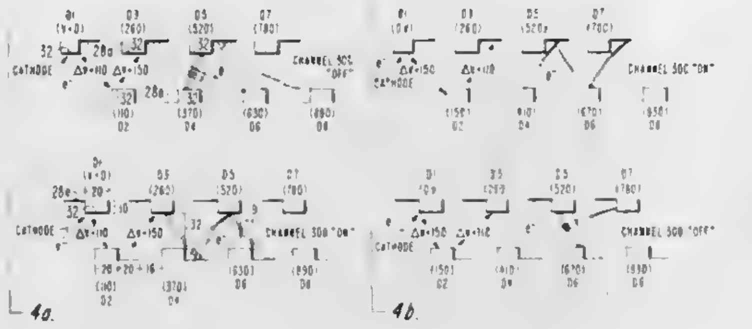
the improvement wherein defined areas of equal size are located on one of a family of closed noncircular curves, each curve having a major horizontal axis and a minor vertical axis intersecting at about the center of said screen and being generally symmetrical about said axes.

4,109,178

ELECTRON MULTIPLIER WITH SWITCHABLE BEAM CONFINEMENT STRUCTURE

Carmen Anthony Catanese, Rocky Hill; John Guiry Endriz, and Scott Allen Keneman, both of Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 5, 1977, Ser. No. 794,132
Int. Cl.^{2} H01J *29/41*
U.S. Cl. 315—12 R 19 Claims



1. An electron multiplier, comprising:

at least two spaced substrates of electrically insulating material;

a cathode at one end of said substrate;

a plurality of parallel dynodes on the surfaces of said substrates which face each other; said dynodes on one of said surfaces being in staggered relation to said dynodes on the other of said surfaces with at least some of said dynodes including a nonplanar structure periodically along the length thereof, said nonplanar structure forming a plurality of substantially parallel spaced channels, said channels extending from said cathode and traversing said parallel dynodes; and

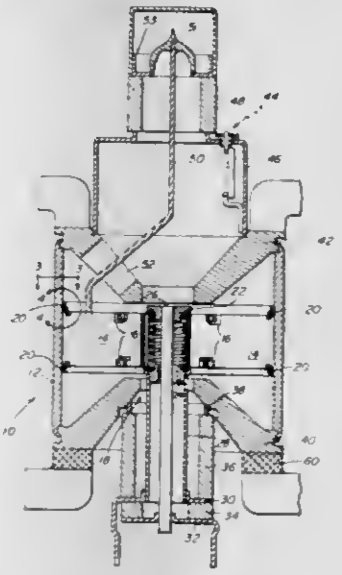
means responsive to a first set of discrete electrical potentials applied to separate ones of said dynodes for establishing a relatively high electron multiplier gain condition in at least one of said channels while simultaneously establishing a relatively low electron multiplier gain condition in channels adjacent thereto, said means being responsive to a second set of discrete electrical potentials applied to separate ones of said dynodes for establishing a relatively low electron multiplier gain condition in said one channel while simultaneously establishing a relatively high electron multiplier gain condition in said adjacent channels.

4,109,179

MICROWAVE TUBE ASSEMBLY

John J. McKinnon, East Falmouth, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1977, Ser. No. 756,301
Int. Cl.^{2} H01J *25/587*
U.S. Cl. 315—39.75 10 Claims



1. A microwave magnetron comprising:

an anode cylinder having end walls connected thereto;

a plurality of anode vanes extending inwardly from the interior surface of said anode cylinder spaced from said end walls; and

a plurality of retainer rings formed into recesses in said vanes and said rings urging said anode vanes against said inner surface of said anode cylinder.

4,109,180

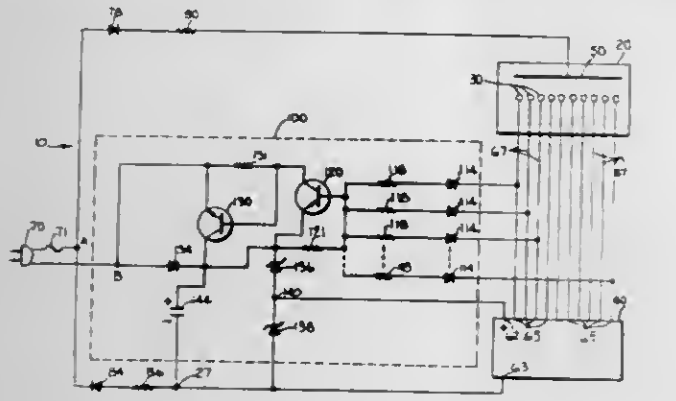
AC-POWERED DISPLAY SYSTEM WITH VOLTAGE LIMITATION

James A. Ogle, Neshanic Station, and James Y. Lee, Kendall Park, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 23, 1977, Ser. No. 809,357
Int. Cl.^{2} H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV 11 Claims

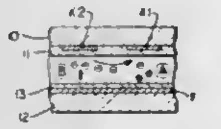
1. A display system which is to be powered by an AC power supply, and which has a first terminal and a second terminal for receiving the AC signal, comprising:
(a) a gas discharge display panel having an anode and a plurality of cathodes, said anode being connected to said first terminal;
(b) circuit means connected to said cathodes for energizing selected ones of said cathodes; and
(c) voltage limiting means connected to said second terminal

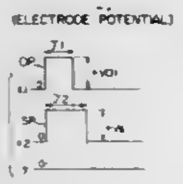
and to said circuit means for limiting the amount of current flowing through said display system in response to



the voltage across said circuit means, to thereby limit the voltage across the circuit means to a preselected level.

4,109,181
DRIVING SYSTEM AND METHOD FOR SHIFTING A DISCHARGE SPOT IN A PLASMA DISPLAY PANEL
Kenji Murase; Sei Sato; Hisashi Yamaguchi, and Hirofumi Kashiwara, all of Hyogo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 29, 1977, Ser. No. 782,454
Claims priority, application Japan, Mar. 29, 1976, 51-34626
Int. Cl.² H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **36 Claims**





1. A method of shifting a discharge spot in an A.C. type gas discharge panel having at least one common electrode covered by a dielectric material and disposed on a first substrate and at least first and second further electrodes spaced from each other disposed on a second substrate to face to said common electrode and covered by a corresponding dielectric surface, said dielectric surfaces of said common electrode and said further electrodes being spaced from each other to define therebetween a gas discharge space with said first and second further electrodes facing said common electrode across said discharge space to define corresponding first and second adjacent gas discharge cells, comprising the steps of:

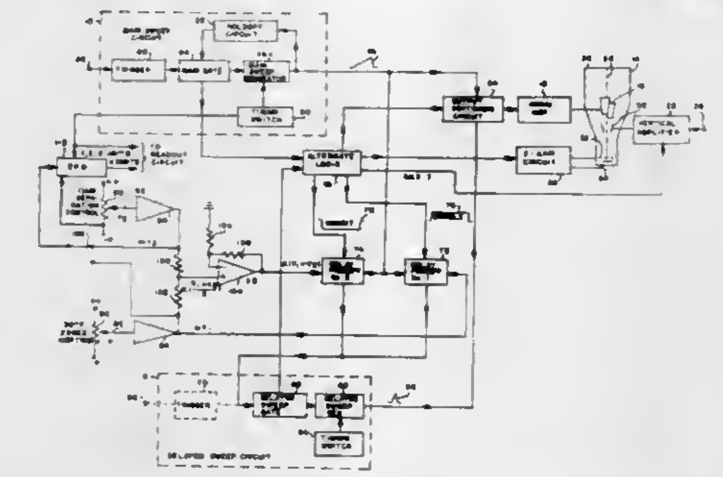
establishing a discharge spot in said first cell,

applying a priming discharge pulse of a given polarity and first predetermined duration to said first further electrode to produce a priming discharge in said corresponding first cell with respect to said adjacent second cell,

applying a shift pulse of said given polarity to said second further electrode of a second, longer duration than said first predetermined duration, and

terminating said priming discharge pulse prior to termination of said shift pulse, said shift pulse thereby producing a lateral field between said first and second cells for transferring to said second cell components of the priming discharge of said first cell, thereby to facilitate the initiation of a discharge at said second cell for shifting said discharge spot to said second cell.

4,109,182
DELAYED SWEEP SYSTEM FOR AN OSCILLOSCOPE
Oliver Dalton, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Continuation-in-part of Ser. No. 532,089, Dec. 12, 1974. This application Mar. 10, 1976, Ser. No. 665,645
Int. Cl.² G01R *13/28*
U.S. Cl. 315—392 **4 Claims**



1. In an oscilloscope for displaying an input waveform, said oscilloscope including a cathode-ray tube provided with deflection means, a dual delayed time base system comprising:

a first base generator triggered in time relation with said input waveform to produce a main sweep waveform, said first time base generator including means for adjusting the sweep rate of said main sweep waveform;

means for generating first and second selectable voltage levels;

comparator means for comparing said main sweep waveform to said first and second voltage levels so that first and second trigger pulses are generated in accordance therewith;

a second time base generator triggered in timed relation with said first and second trigger pulses to produce a delayed sweep waveform, said second time base generator including means for adjusting the sweep rate of said delayed sweep waveform; and

logic circuit means for alternately enabling and inhibiting said first and second voltage levels so that said comparator means generates said first trigger pulse during the generation of a main sweep waveform and said second trigger pulse during the generation of the next succeeding main sweep waveform.

4,109,183
THIRD CHANNEL OSCILLOSCOPE DISPLAY FOR TRIGGER SIGNAL
Joe K. Millard, and Eldon C. Cornish, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 12, 1976, Ser. No. 675,667
Int. Cl.² G01R *13/28*
U.S. Cl. 315—392 **1 Claim**

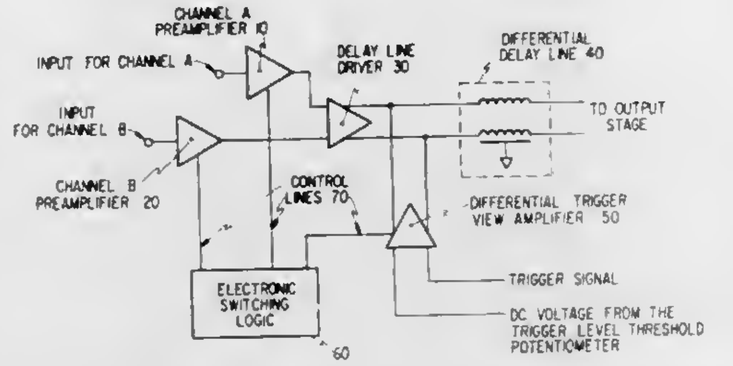
1. In a triggerable oscillographic instrument for providing a display of input electrical signals, the instrument comprising means for generating first and second deflection signals responsive to first and second input electrical signals, horizontal sweep means responsive to an output of a trigger threshold detector which compares a trigger signal to a selectable trigger level threshold, and means for generating a third vertical deflection signal in response to said trigger signal, the improvement comprising:

means for generating a clock signal;

first and second flip-flops, each having a clock input coupled to receive the clock signal, each having complementary first and second outputs, each having a data input, the data input of said second flip-flop coupled to the first output of said first flip-flop;

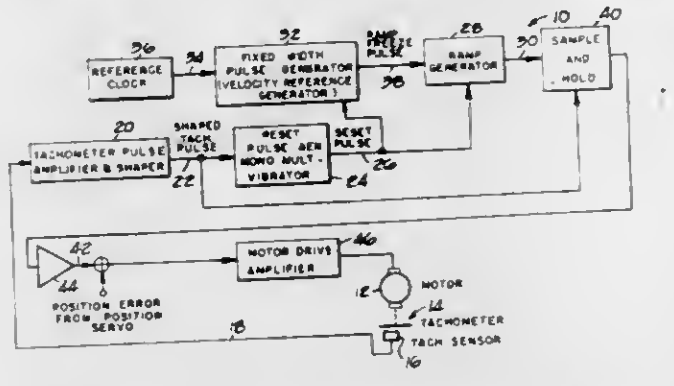
a first NAND gate responsive to the first outputs of said first and second flip-flops and with the output thereof coupled to the data input of said first flip-flop;

means for selectively disabling the second flip-flop and presetting the first output therefrom to a predetermined voltage; and


CHANNEL A PREAMPLIFIER 10
INPUT FOR CHANNEL A
INPUT FOR CHANNEL B
CHANNEL B PREAMPLIFIER 20
DELAY LINE DRIVER 30
DIFFERENTIAL DELAY LINE 40
TO OUTPUT STAGE
CONTROL LINES 70
DIFFERENTIAL TRIGGER VIEW AMPLIFIER 50
ELECTRONIC SWITCHING LOGIC
60
TRIGGER SIGNAL
DC VOLTAGE FROM THE TRIGGER LEVEL THRESHOLD POTENTIOMETER

means for enabling and disabling said means for generating first, second and third deflection signals in response to the output of said first NAND gate, the second output of said first flip-flop, and the second output of said second flip-flop respectively.

4,109,184
METHOD AND APPARATUS FOR PROVIDING A STABLE, HIGH GAIN SERVO SYSTEM
Donald William Weber, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 19, 1976, Ser. No. 668,667
Int. Cl.² H02P *5/00*
U.S. Cl. 318—327 **14 Claims**


REFERENCE CLOCK
FIXED WIDTH PULSE GENERATOR (VELOCITY REFERENCE GENERATOR)
RAMP GENERATOR
SAMPLE AND HOLD
TACHOMETER PULSE AMPLIFIER & SHAPER
SHAPED TACH PULSE
RESET PULSE GEN MONO MULTI-VIBRATOR
RESET PULSE
MOTOR DRIVE AMPLIFIER
MOTOR
TACHOMETER
TACH SENSOR
POSITION ERROR FROM POSITION SERVO

1. A servo system for controlling an operating variable of a mechanism, comprising:

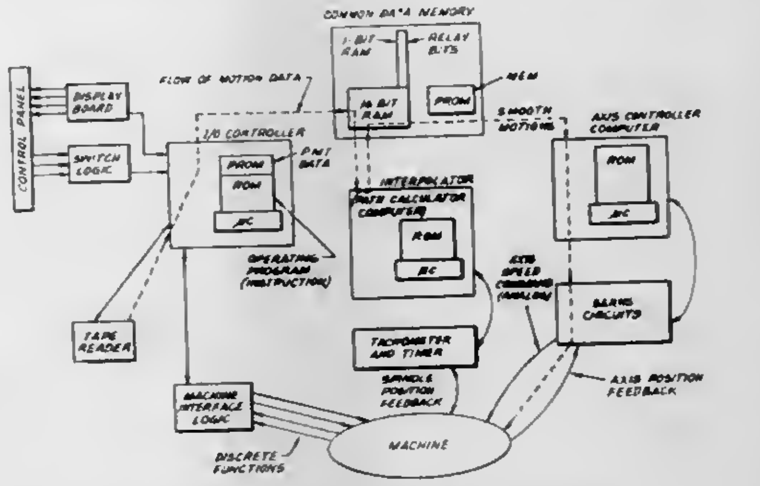
means coupled to the mechanism for generating a ramp signal having an amplitude that varies with time to a level determined by the state of the operating variable;

means for generating clock pulses at a rate greater than the rate of occurrence of said ramp signal;

ramp interrupt means coupled to the ramp signal generating means and the clock pulse generating means for interrupting the amplitude variation of the ramp signal upon the occurrence of a clock pulse following the initiation of the ramp signal to maintain said ramp amplitude constant for a period corresponding to a predetermined number of clock pulses and for recommencing the ramp signal's amplitude variation with time at the end of the period; and

means coupled to the ramp signal generating means for detecting the recommenced ramp signal to initiate the generation of a drive signal for controlling the operating variable of the mechanism in accordance with the detected ramp signal.

4,109,185
SERVO SYSTEM EMPLOYING DIGITAL COMPONENTS
Stanley G. Froyd, San Marino; Raymond C. Ue, Monterey Park, and John Paul Buchanan, Monrovia, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Dec. 27, 1976, Ser. No. 754,909
Int. Cl.² G05B *19/24*
U.S. Cl. 318—571 **20 Claims**



1. A control system for a rotating axis comprising

digital counting means for generating a continuous series of binary counts, each count comprising a plurality of bits,

means for converting said series of binary counts into two series of binary words, the binary value of said words corresponding to two sine wave values ninety degrees out of phase

digital to analog converter means for converting each series of binary words into corresponding voltage levels,

a resolver rotatably coupled to said axis, for receiving said voltage levels from said digital to analog converters for use as reference voltage sine waves, and for outputting a sine wave varying in phase in relation to the rotation of said axis,

a zero crossing detector for converting each resolver output sine wave into a binary pulse having a changing state at each point in time when said sine wave crosses zero,

latch means responsive to the changing state of said detector pulse for storing said digital counting means count at the time when said detector pulse changes state, said count being a digital signal representation of said axis actual position,

input means for generating a digital signal corresponding to a commanded position of said axis,

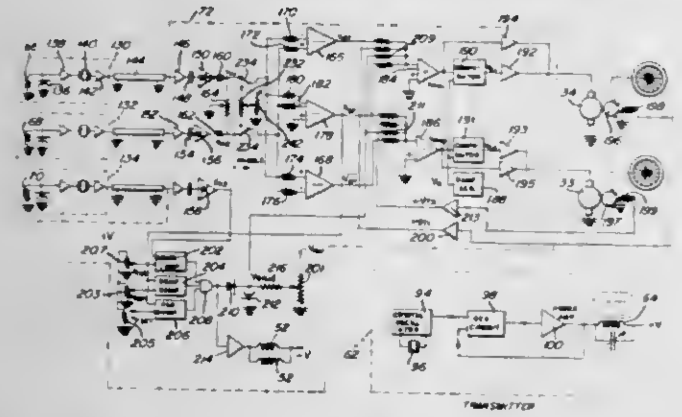
summing junction means for subtracting said actual position digital signal from said commanded position digital signal to produce a velocity error signal, and

an axis drive means for rotating said axis at a rate proportional to the value of said velocity error signal.

4,109,186
SELF-PROPELLED GOLF CART
Anthony Farque, Fayetteville, Ark., assignor to Gettig Engineering & Manufacturing Co., Inc., Spring Mills, Pa.
Division of Ser. No. 461,809, Apr. 17, 1974, Pat. No. 3,976,151, which is a division of Ser. No. 166,051, Jul. 26, 1971, Pat. No. 3,812,929. This application Aug. 23, 1976, Ser. No. 716,762
Int. Cl.² B60K *27/06;* **B62D** *11/02*
U.S. Cl. 318—587 **8 Claims**

1. A guidance and speed control system controlled by a distance signal originating from a control point, comprising a plurality of substantially spaced signal receivers adapted to simultaneously receive said distance signal at different energy levels determined by their relative spacing from said control point, speed control means comprising amplifier means connected to said receivers and adapted to generate a signal by summing the signal energy levels from two of the said receiv-

ers for generating a speed control signal, direction control means comprising two directional amplifier means responsive to the difference between the signal energy levels from said two receivers for generating directional control signals, and



gate means connected to said speed control means through comparator means adapted to develop a stop signal when the signal energy level is outside of predetermined maximum and minimum limits.

4,109,187

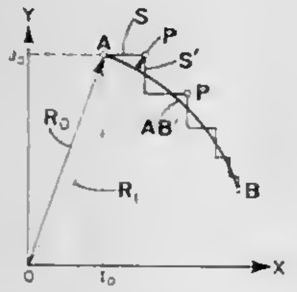
CONTOUR CONTROL SYSTEM INCLUDING CUTTER RADIUS COMPENSATION

Walter A. Steinberg, Huntington Station, and Howard E. Parker, Syosset, both of N.Y., assignors to Autonumerics, Inc., Hauppage, N.Y.

Filed Sep. 22, 1975, Ser. No. 615,361

Int. Cl.^{2} G05B *19/24*

U.S. Cl. 318—572 **23 Claims**



1. A control system for controlling movement of a machining means relative to a workpiece support means in accordance with a set of predetermined input instructions corresponding to a prescribed path of movement in at least two directions with respect to a common origin, wherein X and Y, respectively, represent the total excursions in said two directions, I and J represent coordinates of one end of a main contour vector along said X and Y excursions, respectively, said main contour vector having its other end coincident with said common origin, and *i* and *j* represent the lengths of components, along said X and Y excursions, respectively, of one end of a sub-contour vector having its other end coincident with said one end of said main contour vector, said control system comprising:

main contour logic means for generating output signals for controlling the relative movement of said machining and support means in at least one of the X and Y directions as a function of the relative magnitudes of I and J and the algebraic sign of a main contour error determined from the values of I and J;

sub-contour logic means for generating output signals for controlling said relative movement in at least one of the X and Y directions as a function of the relative magnitudes of *i* and *j* and the algebraic sign of a sub-contour error determined from the values of *i* and *j*;

cross-error logic means for determining the algebraic sign of a cross-error $E = Ij - iJ$; and

cutter compensation control logic means coupled to said main contour control logic means, said sub-contour control logic means, and said cross-error logic means for selectively enabling one or the other of said main and sub-contour control logic means depending on the algebraic sign of said cross-error.

4,109,188

INDEX DEVICE FOR TOOL STORAGE MAGAZINE

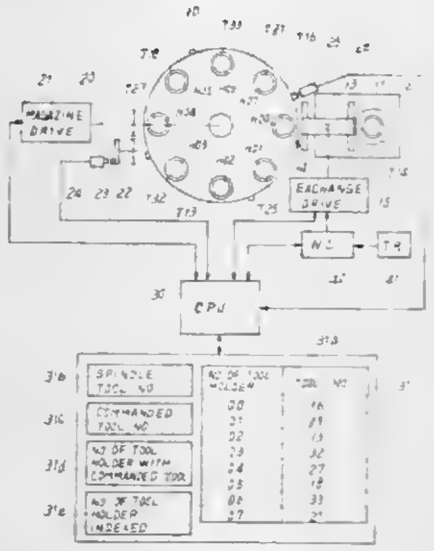
Yoshio Shima, Obbu; Shigeo Noda, Nagoya, and Kaoru Owa, Aichi, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Jan. 17, 1977, Ser. No. 759,676

Claims priority, application Japan, Nov. 6, 1976, 51-133644

Int. Cl.^{2} G05B *19/28*

U.S. Cl. 318—602 **6 Claims**



1. An index device for indexing a rotatable magazine, having a plurality of tool holding devices which store a variety of tools and are addressed in a numerical order, to a predetermined tool change position for a tool exchange operation between a tool indexed at the tool change position and a tool held in a spindle of a machine tool by means of a tool exchange device comprising:

means for generating an index signal each time each tool holding device is indexed to the tool change position;

means mechanically responsive to rotational movement of the magazine for generating a check signal each time any one of the tool holding devices having one of an odd number address code and an even address code is indexed to the tool change position;

means for rotating said rotatable magazine;

means for commanding in a binary code a tool to be indexed to the tool change position;

first memory means for storing a binary coded number of a tool held in the spindle;

second memory means for storing a relationship between binary coded numbers of the tool holding devices and the tool held in the respective tool holding devices;

third memory means responsive to said command means for storing a binary coded number of the commanded tool;

fourth memory means responsive to said index signal generating means for storing a binary coded number of a tool holding device indexed at the tool change position;

means responsive to said command means for searching for a number of a tool holding device holding the commanded tool from said second memory means;

fifth memory means responsive to said searching means for storing the searched number of the tool holding device;

means for determining a rotational direction of said magazine in accordance with a difference in the contents stored in said fourth and fifth memory to thereby cause said rotating means to rotate said magazine and for checking coincidence of the contents in said fourth and fifth memory means;

abnormality check means for checking, in accordance with said check signal generating means and said fourth memory means, whether a tool holding device holding the commanded tool is correctly indexed to the tool change position after the coincidence of the contents in said fourth and fifth memory means has been found and for causing said rotating means to stop rotation of said magazine to thereby cause a tool exchange operation to be performed when the abnormality is not found; and

means for loading the content of said third memory means into said first memory means and for loading the content of said first memory means into said second memory means after the tool exchange operation has been completed.

4,109,189

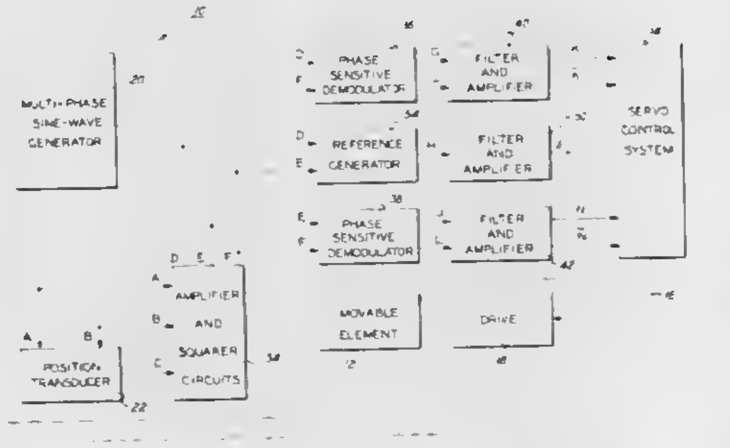
PHASE-SENSITIVE TRANSDUCER APPARATUS WITH IMPROVED SIGNAL OFFSET MEANS

James O. Jacques, Tracy, and Robert Dale Carlson, Danville, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1976, Ser. No. 737,972

Int. Cl.^{2} G05B *1/02*

U.S. Cl. 318—608 **19 Claims**



1. A phase-sensitive transducer apparatus comprising:

first and second relatively movable members, said first relatively movable member having a plurality of windings and said second relatively movable member having a winding;

means for applying a first input signal to one of the windings of said first relatively movable member and a second input signal to another of the windings of said first relatively movable member, an output signal being developed on the winding of said second relatively movable member, said first and second input signals being sinusoidal in nature of substantially identical frequency and peak amplitude and being phase-displaced by a predetermined amount, and said output signal being substantially constant in peak amplitude and variable in phase during relative movement of said first and second relatively movable members;

means responsive to said first input signal and to said output signal for generating a position signal indicative of the relative movement of said first and second relatively movable members, said position signal alternating during such relative movement between first and second voltage levels;

means responsive to said first input signal and to said second input signal for generating a d-c reference signal having a voltage level substantially equal to the voltage level of said position signal when said first input signal and said output signal are phase-displaced by said predetermined amount; and

comparator means responsive to said position signal and to said d-c reference signal for offsetting said position signal by an amount represented by the voltage level of said d-c reference signal.

4,109,190

CIRCUIT FOR INCREASING THE OPERATING SPEED RANGE OF A VELOCITY SERVO SYSTEM

Lawrence S. McNaughton, Waynesboro, Va., assignor to General Electric Company, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,930

Int. Cl.^{2} G05B *11/36*

U.S. Cl. 318—609 **3 Claims**

1. A velocity servo system for driving a motor to control the movement of a member comprising:

a. means coupled to the motor for generating a signal indicative of the actual velocity of the member being driven by the motor;

b. integrator means, responsive to a commanded velocity signal indicative of the desired velocity of movement of the member and to the actual velocity signal, for generating a position error signal; and

c. means responsive to the difference between the position error signal and the actual velocity signal for generating a signal to drive the motor.

4,109,191

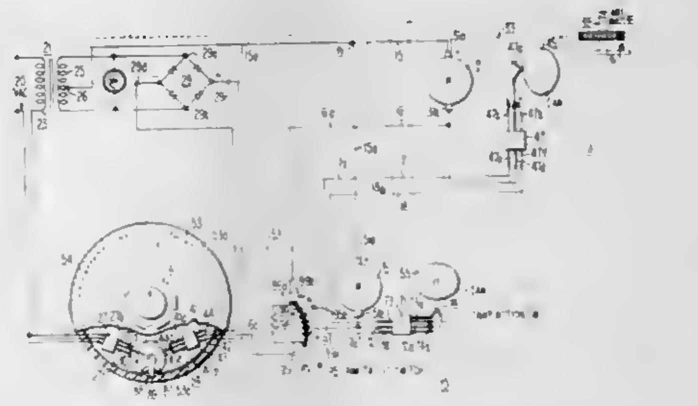
ROTATOR WITH REMOTE INDICATOR AND SELF-SYNCHRONIZATION

John David Callaghan, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,224

Int. Cl.^{2} G05B *11/14*

U.S. Cl. 318—673 **6 Claims**



1. In an antenna rotator of the type including a first remote drive motor for rotating a remote shaft and a control unit including a second motor for driving an indicator-control member into alignment with a preselect member whereupon said motors are de-energized, the improvement for self-synchronization and de-energization of the two motors when the shaft has been rotated to an end stop position comprising:

coupling means for applying energizing potentials to said first motor,

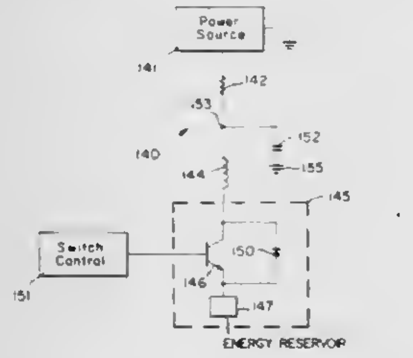
means coupled to said coupling means and responsive to increased current levels along said coupling means caused when said first motor is prevented from rotation by the end stop for applying said energizing potentials directly to said second motor causing direct energization thereof and alignment of the indicator-control member with the preselect member whereby both motors are synchronized and de-energized.

4,109,192
LOW POWER REACTIVE DRIVE CIRCUIT FOR CAPACITIVE LOADS

Ronald Brent Burbank, Olathe, Kans.; Bruce S. Eisenhart, Agoura, Calif.; James R. Hall, Cypress, Calif., and James M. Hamilton, Hawthorne, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 25, 1976, Ser. No. 699,924
Int. Cl.^{2} H03K *3/53*

U.S. Cl. 320—1 **5 Claims**



1. A reactive drive circuit for driving a capacitive load comprising in combination:

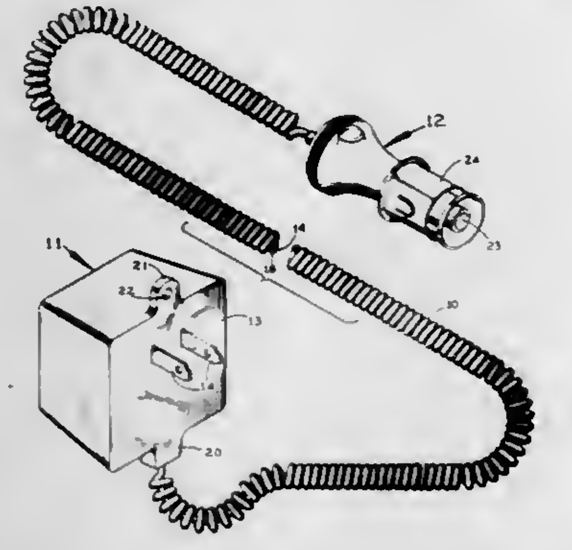
(a) inductive means;
(b) an energy reservoir;
(c) switching network means, said switching network comprising first and second oppositely poled unidirectional conducting branches at least one branch of which includes a controllable switch;
(d) switch control means coupled to said switching network means for controlling the opening and closing of said controllable switch; and
(e) wherein said inductive means, said energy reservoir and said switching network means are coupled in series with one another and are coupled to said capacitive load such that said capacitive load is discharged through said inductive means and said first conducting branch into said energy reservoir; and said capacitive load is charged primarily by energy reapplied thereto from said energy reservoir through said second conducting branch and said inductive means.

4,109,193
SELF-CONTAINED VEHICLE BATTERY CHARGER

James R. Schultheis, Dade County, Fla., assignor to Timco Engineering, Inc., Miami, Fla.

Filed Jan. 3, 1977, Ser. No. 756,133
Int. Cl.^{2} H02J *7/00*

U.S. Cl. 320—2 **12 Claims**



1. Apparatus for charging from an A.C. power socket the battery on an automotive vehicle having a cigarette lighter socket with a pair of electrical terminals connected respectively to the ungrounded and grounded terminals of the vehicle battery, said apparatus comprising:

an electrical plug which is manually insertable and removable into and out of the cigarette lighter socket on the vehicle, said plug being complementary to the lighter socket and having electrical terminals which respectively engage the ungrounded and grounded terminals of the lighter socket when the plug is inserted therein;
an insulated power cord having a pair of electrically conductive wires therein connected at one end to the terminals of said plug;
a housing located at the opposite end of the power cord and having a pair of electrically-conductive prongs projecting therefrom for insertion in the A.C. power socket to physically mount said housing directly on the power socket;
a step-down transformer in said housing having its input connected across said prongs and its output operatively connected to the wires of the power cord;
a rectifier having its input operatively connected across the output of said transformer to rectify the step-down voltage output of the transformer, said rectifier having its output operatively connected to the terminals of said plug for supplying the rectified step-down voltage thereto;
and a manually operable selector switch operatively connected between the output of said rectifier and said plug for selectively determining the charging rate, said selector switch being in said plug and comprising a first fixed contact connected conductively to the output of said rectifier, a second fixed contact, current limiting resistor means connected between said second fixed contact and said conductive connection to the output of said rectifier, and a mobile contact connected to the plug terminal which is engageable with the ungrounded terminal of the lighter socket and selectively engageable either with said first fixed contact to supply full charging current to the plug or with said second fixed contact to supply a trickle charge current to the plug.

4,109,194
DIGITAL FEEDBACK CONTROL UTILIZING ACCUMULATED REFERENCE COUNT TO REGULATE VOLTAGE OUTPUT OF SWITCHING REGULATOR

Norman Richards Miller, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

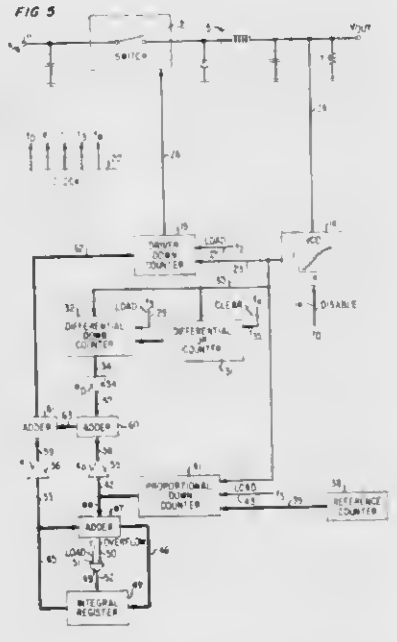
Filed Jun. 9, 1977, Ser. No. 805,018
Int. Cl.^{2} G05F *1/56*

U.S. Cl. 323—17 **15 Claims**

5. A digital feedback control for a switching regulator comprising:

means for driving a switching device in said switching regulator including
means for generating a signal frequency responsive to a signal magnitude at an output of said switching regulator;
means for generating a first count representative of a derivative of said signal magnitude at an output of said switching regulator;
means for generating a second count representative of an error of said signal magnitude at an output of said switching regulator from a predetermined desired signal magnitude;
means for generating a third count representative of an integral of the error of said signal magnitude at an output of said switching regulator by summing successive second counts to achieve an accumulated count; and

summing said first, second, and third counts to attain a summed count therefrom and decrementing said summed



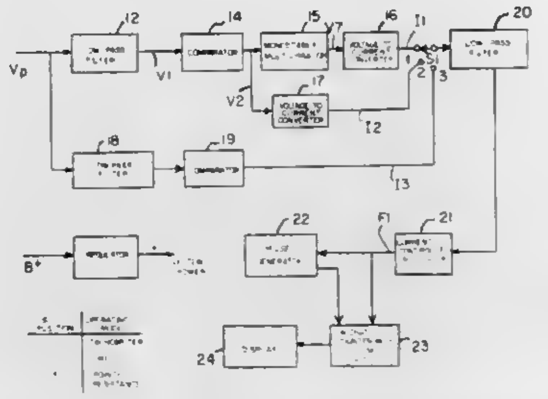
count with said signal frequency to determine a conduction interval of said switching device.

4,109,195
DIGITAL DWELL-TACHOMETER WITH POINTS RESISTANCE INDICATION CAPABILITY

Harold R. Palmer, 10704 Blossom La., Silver Spring, Md. 20903

Filed May 9, 1977, Ser. No. 794,843
Int. Cl.^{2} F02P *17/00*

U.S. Cl. 324—15 **6 Claims**



1. A digital dwell tachometer with points resistance indication capability comprising:

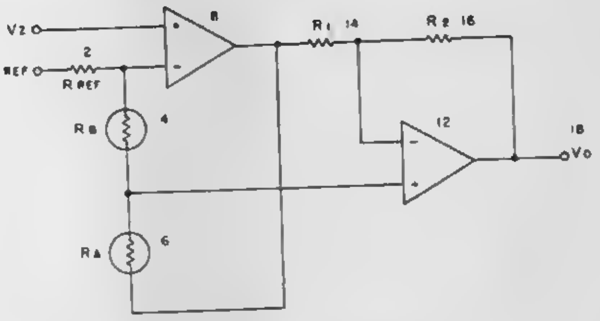
means for producing a filtered ignition voltage waveform;
means for producing a first control signal whose average level is proportional to the engine dwell angle;
means for producing a second control signal whose average level is proportional to engine RPM (rotations per minute);
means for producing a third control signal whose value has the binary characteristic of being zero for acceptable ignition points resistance and positive for non acceptable points resistance;
mode select switch means for selecting the operating mode dwell, tachometer or points resistance indication;
means for producing a fourth control signal whose average frequency is proportional to the average level of either the first, second or third control signals depending upon the position of the mode select switch;
means for producing a fifth control signal having a pulse width interval inversely proportional to the number of engine cylinders;
cylinder select switch means for selecting the pulse width of the fifth control signal;
means of counting and converting into a digital display format the number of cycles of the fourth control signal which occur during the pulse width interval of the fifth control signal; and
means of digitally displaying the number of cycles of the fourth control signal which occur during the pulse width interval of the fifth control signal.

4,109,196
RESISTANCE MEASURING CIRCUIT

Joseph P. Carmody, Willow Grove, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 3, 1976, Ser. No. 747,422
Int. Cl.^{2} G01R *27/02*

U.S. Cl. 324—62 **10 Claims**



1. A resistance measuring circuit comprising

a constant current source means,
a first resistance means,
a second resistance means connected in series with said first resistance means across said constant current source means,
a first differential amplifier means having a first input, a second input and an output, said amplifier having a second input gain which is twice a first input gain,
first circuit means connecting a combined signal developed across both of said resistance means to said first input and
second circuit means connecting a signal developed across one of said resistance means to said second input, whereby an output signal from said amplifier means is the difference between the signals applied to said first and second inputs.

4,109,197
PRF DETECTION SYSTEM AND METHOD

Milton R. Lang, Jr., Catonsville, and William A. O'Berry, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

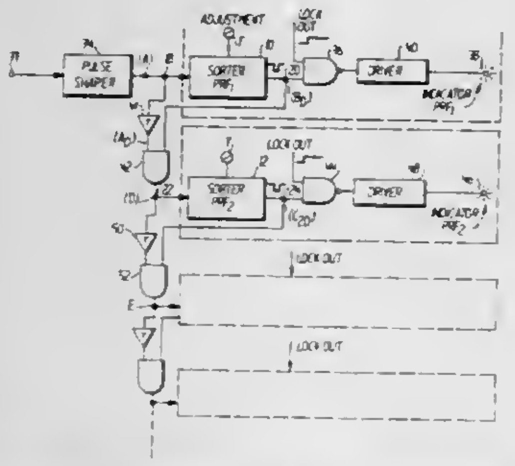
Filed Mar. 15, 1973, Ser. No. 341,646
Int. Cl.^{2} G01R *23/02*

U.S. Cl. 324—78 F **11 Claims**

10. A method comprising the steps of:

a. receiving an input signal;
b. examining the received signal for a signal having a first selected PRF;
c. blanking from the received signal, in response to the detection, in the examined signal of a signal having the

first selected PRF, the detected signal to provide a first signal; and



d. examining the first signal for a signal having a second selected PRF.

4,109,198

PEAK LEVEL INDICATING ELECTRONIC CIRCUIT

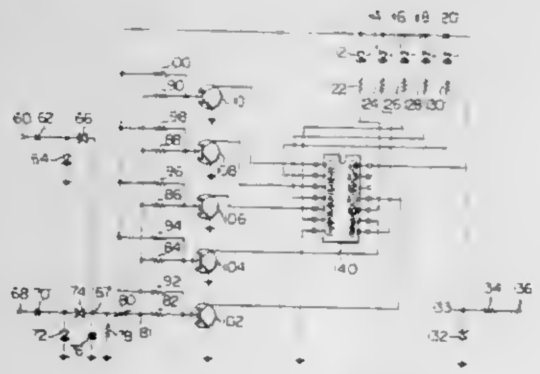
Shoji Ueoo, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Sep. 7, 1976, Ser. No. 721,046

Claims priority, application Japan, Sep. 8, 1975, 50/122791

Int. Cl.^{2} G01R *19/16;* H03K *5/20*

U.S. Cl. 324—103 P **13 Claims**



12. A circuit for indicating the peak value of an AC input signal comprising:

a single, monopolar, high voltage DC power supply terminal to which the circuit is connected,

rectifier means including at least one semi-conductor diode, said rectifier means being responsive to the AC input signal for deriving a DC signal having a polarity opposite to that at the terminal and a magnitude directly related to the amplitude of the AC signal,

a transistor having a base, an emitter and collector, one of which is connected to ground, the impedance state between the emitter and collector being either only high or low depending upon the magnitude of a bias voltage at the base,

means for connecting the high voltage terminal and the DC signal to the base so that the transistor is biased into the first impedance state for a zero DC signal amplitude and is biased into the second impedance state for a DC signal amplitude above a predetermined value, said rectifier means including circuit elements causing the DC signal voltage applied to the base of the transistor to have a tendency to increase away from zero as temperature increases, said means for connecting biasing the transistor in the low impedance state while the DC signal has a zero amplitude, increases in ambient temperature having a tendency to cause the transitor to be switched from the low impedance state to the high impedance state at a lower DC current for the base, and

on-off indicator means connected to be responsive to the impedance state between the emitter and collector so that the indicator means is in first and second of its states in response to the impedance being in the first and second states, respectively,

whereby the combined tendencies of the circuit elements and the transistor tend to maintain the switching characteristics of the transistor and energization of the indicator constant over a substantial ambient temperature range.

4,109,199

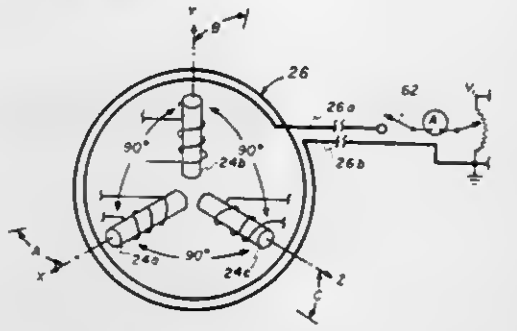
THREE AXIS MAGNETOMETER CALIBRATION CHECKING METHOD AND APPARATUS

Raymond L. Ball, Panama City; Paul G. Leverone, Panama City Beach, and Warren H. Biegler, Panama City, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1977, Ser. No. 842,840

Int. Cl.^{2} G01R *35/00, 33/02*

U.S. Cl. 324—202 **7 Claims**



1. Magnetic field sensing apparatus including a magnetometer having a first, second, and third mutually orthogonal sensors responsive to magnetic field components along first, second, and third mutually orthogonal axes, respectively, and instrumentation means for individually measuring the responses of said sensors, said apparatus being characterized by the improvement comprising:

an electrically energizeable calibration checking coil, lying in a plane disposed at substantially like angles to each of said orthogonal axes, for subjecting each of said sensors to a predetermined change in magnetic field condition;

electrical control means, connected to said coil for energizing said coil with a predetermined current flow to provide said predetermined change in magnetic field condition at selected times, whereby changes in calibration of said magnetometer are detectable; and

support means, interconnecting said magnetometer and said coil means, for maintaining said like angles.

4,109,200

POSITION SENSING DIFFERENTIAL TRANSFORMER SYSTEM WITH MEANS TO CONVERT THE OUTPUT TO AN ABSOLUTE VALUE

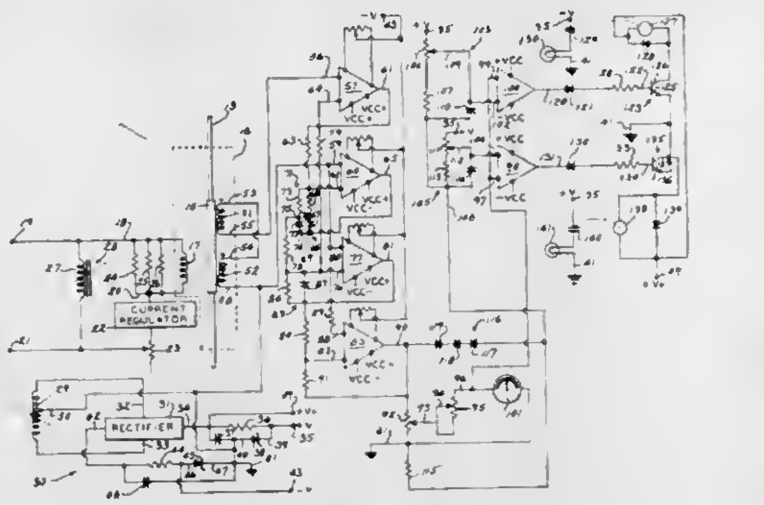
Dennis A. McNulty, Tipp City, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jun. 24, 1976, Ser. No. 699,467

Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—208 **11 Claims**

1. A measuring apparatus, comprising a position sensing member, a variable differential transformer having a movable coupling element operatively connected to said position sensing member and an output connected to a varying energy source and an output providing an alternating output signal varying in amplitude and phase in response to the selective movement of said coupling element according to the selective movement of said sensing member, translating means for converting an A.C. signal to a D.C. signal and having an input operatively connected to said transformer output and having a position signal output providing a first predetermined magnitude D.C. absolute value position signal in response to a first predetermined position of said coupling element and a second predetermined magnitude D.C. absolute value position signal different than said first magnitude D.C. absolute value position signal in response to a second predetermined element position spaced from said first position, a first signal source having first reference signal means and connected to the position signal output of the translating means to produce a first reference signal varying in accordance with said position signal, a second signal source having a second reference signal means and connected to the position signal output of the translating means to produce a second reference signal varying in accordance with said position signal, and a detector including a first signaling circuit having a first input operatively connected to said position signal output and a second input connected to said first signal source, a second signaling circuit having a third input connected to said position signal output and a fourth input connected to said second signal source, said first signaling circuit responding to a first predetermined differential magnitude at said first and second inputs in response to said first magnitude D.C. absolute value position signal and providing a first signaling output indicative of said first element position, said second signaling circuit responding to a second predetermined differential magnitude at said third and fourth inputs in response to said second magnitude D.C. absolute value signal and providing a second signaling output indicative of said second element position.



4,109,201

MEASURING BRIDGE FOR AN INSPECTION OR CHECKING DEVICE BY MEANS OF EDDY CURRENTS

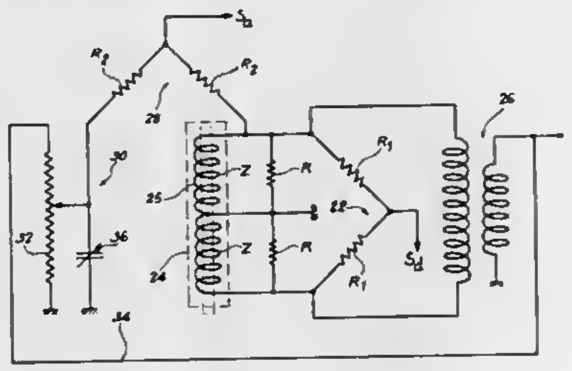
Michel Pigeon, Bures-sur-Yvette, and Robert Saglio, Massy, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 21, 1977, Ser. No. 761,073

Claims priority, applicatioo France, Jan. 22, 1976, 76 01727

Int. Cl.^{2} G01R *33/12*

U.S. Cl. 324—227 **1 Claim**



1. Measuring double bridge for a device for inspecting and also checking by eddy currents, said double bridge comprising both an absolute measuring bridge and a differential measuring bridge, said differential measuring bridge comprising a first pair of branches constituted by two resistors R1 and a second pair of branches constituted by two windings, two supplementary resistors R being connected in parallel to the two windings with the midpoints of said resistors R and said windings being grounded, said first pair of branches and said second pair of branches being connected in parallel to a supply transformer, a first output for a differential measuring signal connected between said two resistors R1 of said first pair of branches; said absolute measuring bridge comprising a first pair of branches constituted by two resistors R2 and a second pair of branches constituted by one of said windings of said second pair of branches of said differential measuring bridge connected at its ungrounded end to one end of one of the resistors R_2 and by a voltage compensating circuit comprising a variable capacitor grounded at one end and connected at the other end to one end of the other resistor R_2 and to the tap of a potentiometer connected to said transformer and a second output for an absolute measuring signal connected between the other ends of said two resistors R2 of said first pair of branches.

4,109,202

TRAFFIC SWITCHING IN COMMUNICATIONS SATELLITES

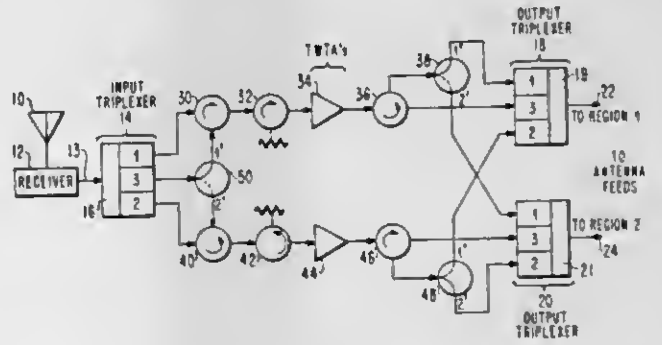
Chandra Mohan Kudsia, Dollard-des-Ormeaux; Harry John Moody, Pierrefonds, and Lorne Allan Keyes, Montreal, all of Canada, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,656

Claims priority, application United Kingdom, Aug. 24, 1976, 35194/76

Int. Cl.^{2} H04B *7/20;* H03H *7/46*

U.S. Cl. 325—3 **8 Claims**



6. In combination,

a first signal path including a first input band-pass filter for signals in a first frequency band, an input circulator, an amplifier, an output circulator and a first output band-pass filter for signals in said first frequency band,

a second signal path including a second input band-pass filter for signals in a second frequency band, an input circulator, an ampifier, an output circulator and a second output band-pass filter for signals in said second frequency band,

a third input band-pass filter for signals in a third frequency band selectably connectable to the input circulator in said first or second paths, and

two additional output band-pass filters for signals in said third frequency band, each coupled to an output circulator in a respective one of said first and second signal paths.

4,109,203

DELTA-MODULATION ENCODER

Ludwig Desire' Johan Eggermont; Eise Carel Dijkmans, and Karel Riemens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,078

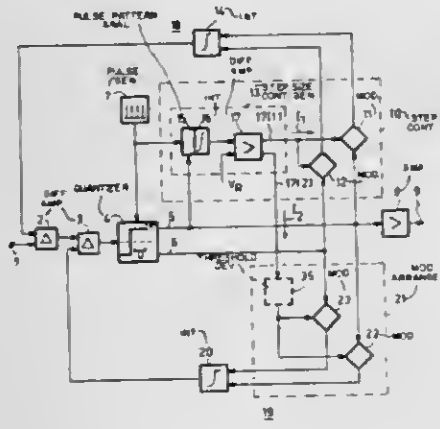
Claims priority, application Netherlands, Jun. 12, 1975, 7506986

Int. Cl.^{2} H03K *13/22*

U.S. Cl. 325—38 B **4 Claims**

1. A delta-modulation encoding arrangement for informa-

tion signals comprising an input circuit which comprises a cascade circuit of a decoding arrangement and a comparison circuit coupled to said decoding arrangement, input means for receiving said information signals and for providing it to said cascade circuit, and output means for providing an output signal; a quantizing device means having an input coupled to said input circuit output means, and an output means for producing delta-modulation output pulses; a pulse generator coupled to said quantizing device; a feedback circuit coupled between said quantizing device output means and said cascade circuit and including dynamic compression step-size control device means for varying the energy contents of the delta modulation output pulses applied to said cascade circuit; and compensation means comprising a modulation arrangement having an input coupled to said quantizing device output means for receiving said delta-modulation output pulses, an output, and a control signal input means coupled to one of said device means for receiving a control signal derived from said output pulses, and an integrator coupled between said modulation arrangement output and said cascade circuit.



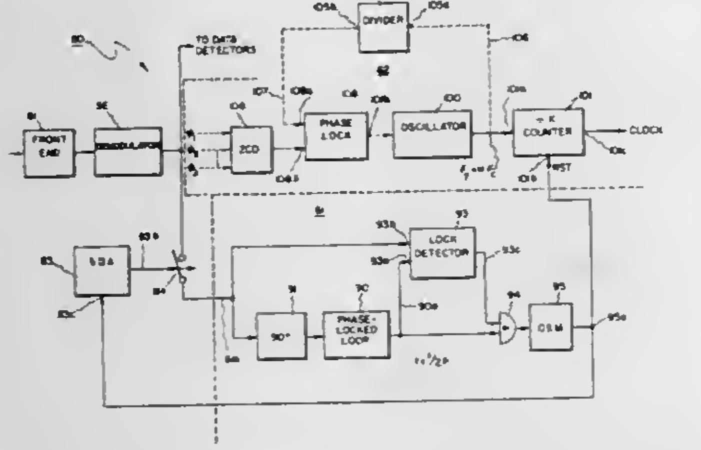
4,109,204
APPARATUS AND METHOD FOR WIDEBAND COMMUNICATION WITH SUPPRESSION OF HARMONIC INTERFERENCE

Thomas G. Kincaid, Burnt Hills, and Charles A. Stutt, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,614

Int. Cl.² H04L *25/08*

U.S. Cl. 325—38 R **21 Claims**



1. A method for transmitting information with a desired bandwidth while suppressing interference thereto from harmonics of a system-wide signal, comprising the steps of:

(a) providing a data carrier having a frequency essentially midway between an adjacent pair of harmonics of the system-wide signal;

(b) transforming each of a plurality of bits of the information into a signal comprising a pair of like-polarity pulses, each pulse having a time duration T;

(c) setting a time interval P between the pair of pulses to be essentially equal to twice the reciprocal of the frequency difference between the frequency of the data carrier and the frequency of the adjacent harmonics of the system-wide signal;

(d) modulating one of the parameters of the data carrier with the pulse-pair signal to be transmitted;

(e) transmitting the modulated data carrier to a receiving end; and

(f) detecting the pulse-pair signal to recover at the receiving end each bit of data therein.

4,109,205
FREQUENCY MODULATION SIGNALLING SYSTEM EMPLOYING AN ELECTRICAL FILTER DEVICE

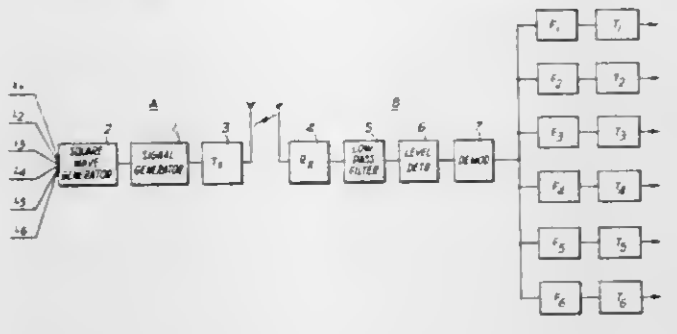
Ernest James Moorey, Ivybridge, England, assignor to M. L. Engineering (Plymouth) Limited, Slough, England

Filed Apr. 6, 1976, Ser. No. 674,722

Claims priority, application United Kingdom, Apr. 12, 1975, 15123/75

Int. Cl.² H04B *1/00, 7/24*

U.S. Cl. 325—45 **5 Claims**



1. An electrical signalling system comprising:

a transmitter station having a signal generator arranged to generate an electrical oscillatory signal of a predetermined fundamental frequency;

modulation means at the transmitter station for frequency-modulating the said signal with a preselected modulation signal frequency including a resistance-capacitance circuit including a capacitor in series with a resistor, first and second transistor switching elements operative to connect the said circuit to two different stabilized voltages, and third and fourth transistor switching elements connected to opposite sides of the said capacitor from the first and second switching elements and connected to the first and second switching elements respectively whereby in operation the third switching element conducts when the first switching element conducts to cause charging of said capacitor through the said resistor in one sense and the fourth switching element conducts when the second switching element conducts, to cause charging to reverse the polarity of said capacitor through the said resistor in the opposite sense, with the same time constant, and an output circuit connected to the resistance-capacitance circuit to derive therefrom a square wave voltage output with a mark-to-space ratio of substantially unity;

means for transmitting the said signal;

a receiving station for receiving said signal;

demodulation means at the receiver station for extracting the modulation signal frequency;

a filter device connected to the demodulation means, said filter device being tuned to the said modulation signal frequency and providing a corresponding output signal only when said modulation signal is present in sufficient amplitude; and

timer means adapted to provide an output only when the said output signal of the filter device is present for a predetermined time interval, the said filter device comprising a transistor amplifier stage having a frequency selective positive feedback circuit responsive to said modulation signal frequency, and such that failure of any component of the feedback circuit results in a reduction in the overall gain of the amplifier stage.

4,109,206
SIGNAL STRENGTH METER DRIVE CIRCUIT

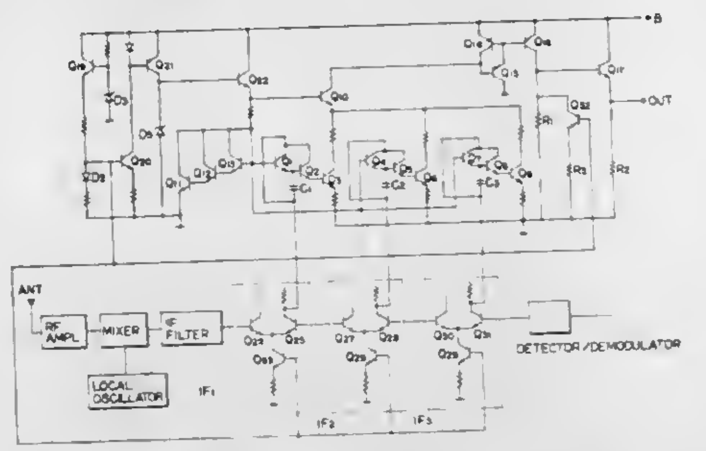
Tatsuo Numata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,611

Claims priority, application Japan, Jun. 17, 1976, 51-70353

Int. Cl.² H04B *1/16*

U.S. Cl. 325—319 **8 Claims**



1. In a signal strength meter drive circuit for a radio receiver or tuner including a plurality of intermediate frequency amplifiers, means for rectifying the outputs of said amplifiers, amplifier means for summing said rectified outputs, said amplifier means including a load resistor, an output circuit for shifting the level of the voltage across said load resistor for driving said meter, and circuit means for supplying biasing voltages to the above circuit components, the improvement characterized by:

shunt circuit means connected in parallel with said load resistor and including variable conduction means controlled by said biasing circuit means, whereby said shunt circuit means draws off a proportion of said load resistor current to thereby compensate for variations in the voltage characteristics of the various circuit components.

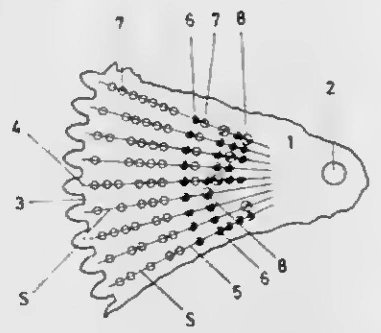
4,109,207
CODING MEMBER FOR PROGRAMMING OF A RADIO COMMUNICATION APPARATUS

Ole Simon Petersen, Aalborg, Denmark, assignor to S. P. Radio A/S, Aalborg, Denmark

Filed Oct. 27, 1976, Ser. No. 736,246

Int. Cl.² G08C *9/08;* H01H *19/63;* H04B *1/06*

U.S. Cl. 325—455 **6 Claims**



1. A coding member for programming of a radio communication apparatus, in which the frequency selected is synthesized using a programmable frequency divider with a dividing figure N, and in which the coding member may be secured in a number of positions using an indexing mechanism, each position corresponding to a communication channel, the above coding member being provided with a number of rows of spaces placed in a direction which is mainly perpendicular to that in which the coding member is moved when adjusted to a particular channel, and that the intersection points on the coding member between a radial corresponding to a communication channel and a row of spaces will be a code combination selected from different mechanical code representations from a group of code representations which include empty spaces, empty spaces each with a threaded hole and projections, and some of the projections are permanent and some of the projections are semi-permanent so that expressions of mechanical coding will include binary codes in both permanent and semi-permanent mechanical representation along each radial and whereby the presence of a projection in any row in a radial can be used to close a corresponding contact in a set of contacts corresponding to the number of rows of spaces.

4,109,208
WAVEFORM PRODUCING SYSTEM

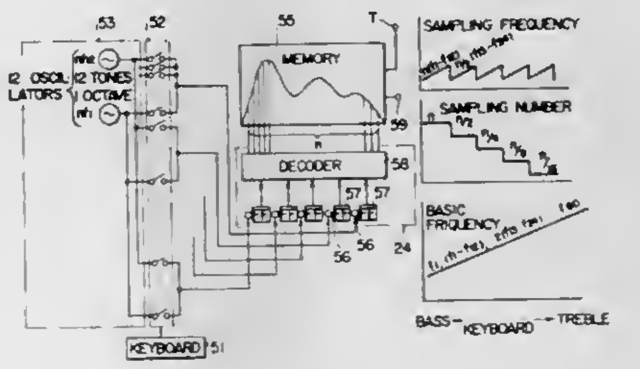
Norio Tomisawa; Takehisa Amano, both of Hamamatsu; Yasuji Uchiyama, Hamakita, and Takatoshi Okumura, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 276,103, Jul. 28, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,951

Claims priority, application Japan, Jul. 31, 1971, 46-57830; Sep. 16, 1971, 46-71245; Sep. 31, 1971, 46-57831; Sep. 22, 1971, 46-73441

Int. Cl.² H03B *19/00*

U.S. Cl. 328—13 **9 Claims**



1. A waveform producing system comprising:

a plurality of switches, each of said switches corresponding to a respective basic output frequency,

a clock signal generator means having a plurality of outputs connected to said switches for generating a plurality of clock pulse trains, each of said clock pulse trains having a frequency which is a multiple of at least one of said basic output frequencies,

means for memorizing the wave shape of a predetermined waveform, said memory means including a plurality of memory elements each of which stores a predetermined value of said waveform corresponding to the amplitude of the predetermined waveform at respective sampling intervals of said waveform,

decoder means connected to said memory means for coupling addressing signals thereto, said decoder means including a plurality of outputs, one each connected to a respective memory element,

means interconnecting said switches and said decoder means and responsive to said clock pulse trains for energising said decoder means in accordance with the switch closed and the frequency of the clock pulse train coupled thereto, wherein addressing signals are provided at the outputs of said decoder at the frequency of said connected clock pulse train, and wherein the total number of the addressing signals provided at the output terminals of said decoder decreases as the selected basic output frequency selected by the corresponding closed switch increases as different selected switches are closed to thereby maintain the frequency at which said memory elements are addressed within a predetermined small range, and

means responsive to said addressed memory elements for reading out the waveform stored in said memory means, said read-out waveform having a basic output frequency corresponding to the closed switch.

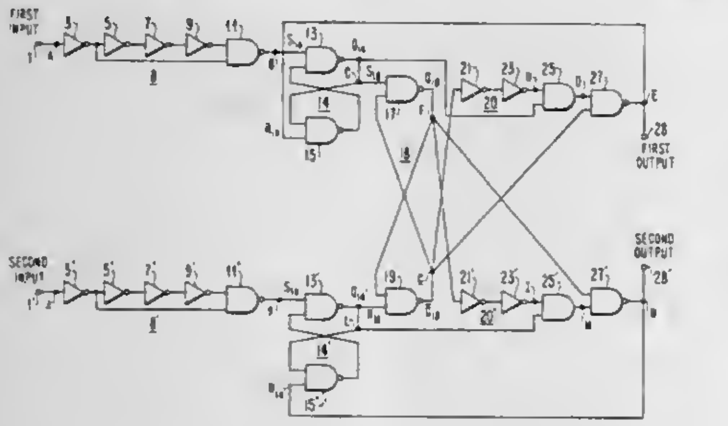
4,109,209
PULSE STAGGERING CIRCUIT

Otto Herbert Bismarck, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,152

Int. Cl.² H03K *3/64*

U.S. Cl. 328—60 **8 Claims**



1. A pulse-staggering circuit for providing first and second output pulse trains responsive to first and second input pulse trains, with the pulses in said first and said second output pulse trains appearing in the same order in time as those in said first and second input pulse trains, respectively, but staggered in time, said pulse staggering circuit comprising:

first bistable circuit means placed into a first of its states in response to each pulse of said first input pulse train, for producing a first control signal, and placed into a second of its states responsive to a first reset signal;

second bistable circuit means placed into a first of its states in response to each pulse of said second input pulse train, for producing a second control signal, and placed into a second of its states responsive to a second reset signal;

third bistable circuit means having a set input receptive of a set signal corresponding to said first control signal, and having a reset input receptive of a third reset signal corresponding to said second control signal, said third bistable circuit means of a type responsive to either the occurrence of said set signal in the absence of said third reset signal, for producing a first blocking signal and extinguishing a second blocking signal, or to the occurrence of said third reset signal in the absence of said set signal for both producing said second blocking signal and extinguishing said first blocking signal;

first gating means receiving as input signals said first control and second blocking signals, responsive to the concurrence of said first control signal and the absence of said second blocking signal, for producing a first output signal, applied as the first reset signal to said first bistable circuit means, to extinguish said first control signal, and consequently to extinguish said first output signal; and

second gating means receiving as input signals said second control and first blocking signals, responsive to the concurrence of said second control signal and the absence of said first blocking signal, for producing a second output signal, applied as the second reset signal of said second bistable circuit means to extinguish said second control signal, and consequently to extinguish said second output signal.

4,109,210
METHOD OF GENERATING A VARIABLE TRAIN OF PULSES

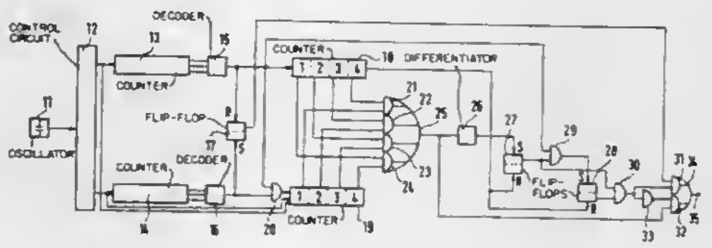
Albrecht Gerlach, Freiamt; Dieter Holzmann, Freiburg, both of Germany; Daniel Mlyoek, Wolfgantzen, France, and Dirk Hoffmeister, Mahlberg, Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 766,991

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608268

Int. Cl.² H03K *3/64*

U.S. Cl. 328—61 **4 Claims**



1. A method of generating a train of pulses which is variable in N selectable increments during a period T, which period is divided into two sub-periods T1 and T2, said train of pulses applied to the input of a filtering element to generate a continuously variable dc voltage, comprising:

allotting n ($n = 0, 1, 2 \ldots N$) increments n pulses whose duration B is equal to the period T divided by the number N of increments;

generating m pulses of the n pulses where $m = 0, 1, 2 \ldots M$; ($M < N$) in one sub-period T1 of the period T and the remainder of the n pulses in the other sub-period T2 of the period T such that for $n \leqq M$, m pulses are lined up in the sub-period T1 with no space therebetween and for $M < n \leqq N$, k bursts ($k = 1, 2 \ldots K; K = (N-M)/M$) of M unspaced pulses of the duration B are formed from the n pulses, which bursts are distributed substantially evenly over the sub-period T2 and, for $k > K/2$, follow each other at least partly with no space therebetween, those pulses not forming a full burst are generated as m unspaced pulses in the sub-period T1.

4,109,211
VARIABLE THRESHOLDING CIRCUIT FOR CONVERTING AN ANALOG SIGNAL TO A BINARY SIGNAL

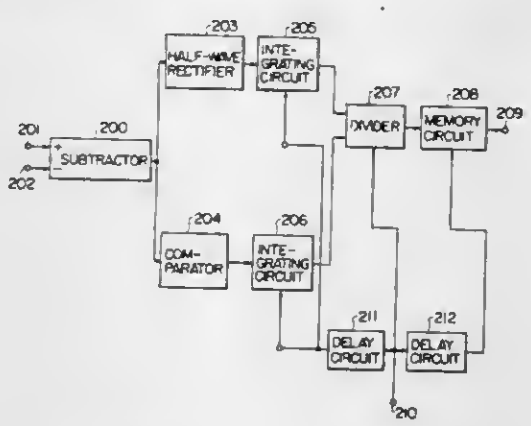
Michibiro Mese, Hachioji; Masakazu Ejiri, Tokorozawa; Seiji Kashioka, Kokubunji; Takafumi Miyatake, Hachioji, and Tosbimitsu Hamada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 16, 1976, Ser. No. 649,809

Claims priority, application Japan, Jan. 16, 1975, 50-6266; Nov. 14, 1975, 50-136379

Int. Cl.² H03K *5/18*

U.S. Cl. 328—116 **12 Claims**



1. A variable thresholding circuit comprising:

first means, to which an analog signal is applied;

second means coupled with said first means, for converting said analog signal into binary signals with a variable threshold level; and

third means coupled with said first and second means, for controlling said threshold level of said second means, said third means comprising

fourth means for storing a predetermined threshold level;

fifth means coupled with said first and fourth means, for calculating a value related to a required threshold level from average levels of the upper and lower portions of said analog signal which have levels higher and lower than said predetermined threshold level, respectively;

sixth means coupled with said fifth means, by which the output of said fifth means is compared with a predetermined value; and

seventh means coupled with said second, fourth, fifth and sixth means, for calculating said threshold level of said second means from the outputs of said fourth and fifth means, the output of said seventh means supplied to said second means in response to the output of said sixth means in such a manner that the threshold level of said second means is controlled.

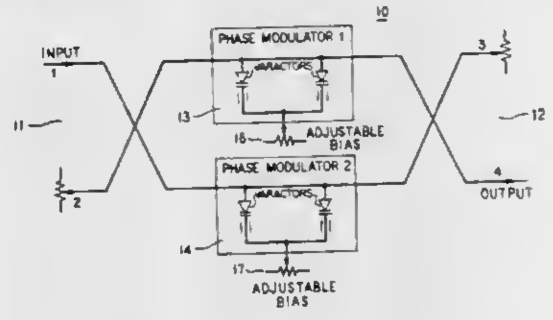
4,109,212
COMPLEMENTARY DISTORTION CIRCUIT

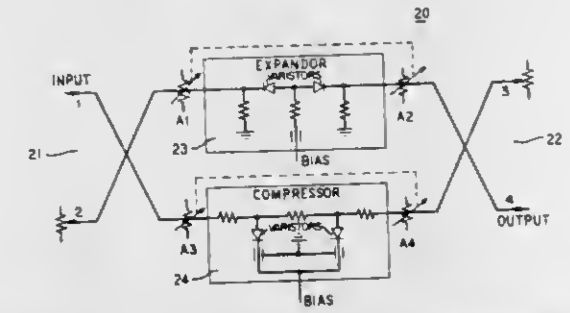
John Robinson Donnell, Exeter, N.H.; George Ludwig Heiter, Andover, and Hotze Miedema, Boxford, both of Mass., assignors to Bell Telephone Laboratories, Iocorporated, Murray Hill, N.J.

Filed Oct. 29, 1976, Ser. No. 736,995

Int. Cl.² H03B *1/04*

U.S. Cl. 328—163 **10 Claims**





1. A distortion compensating circuit for a signal path subject to distortion characterized by:

means for dividing the signal in said signal path into two components of equal amplitude but differing phase;

a first, non-linear phase modulator for introducing a phase-shift into one of said components, said phase-shift being proportional to the instantaneous signal power in said component;

a second, non-linear phase modulator for introducing a phase-shift into the other one of said components, said phase-shift being proportional to the instantaneous signal power in said component; and

means, connected to the output of said first and second phase modulators, for re-combining said phase-shifted components.

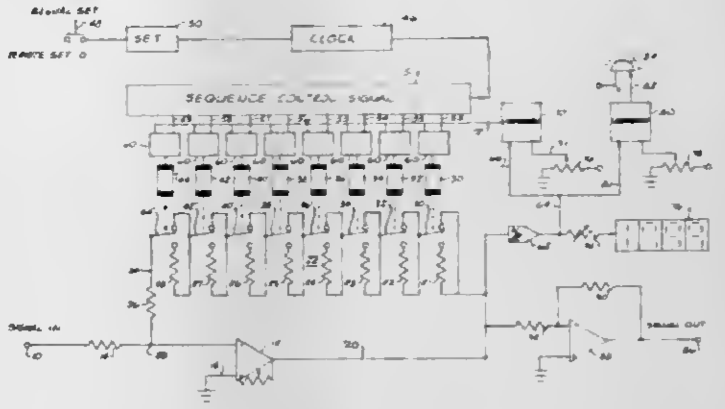
4,109,213
DIGITAL AUTOMATIC GAIN AMPLIFIER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an Invention of; Larry D. Holley, Merritt Island, and James O. Ward, Titusville, both of Fla.

Filed Mar. 24, 1977, Ser. No. 780,729

Int. Cl.² H03F *1/00, 1/36*

U.S. Cl. 330—2 **6 Claims**



1. An apparatus for adjusting the amplitude of a reference signal to a predetermined level so as to permit subsequent data signals to be interpreted correctly, said apparatus comprising:

(a) an operational amplifier;

(b) a feedback circuit connected between an output terminal and an input terminal of said operational amplifier;

(c) a plurality of resistors;

(d) a reference voltage source;

(e) a comparator comparing an output voltage of said amplifier with said reference voltage and generating a compared signal;

(f) a bank of relays;

(g) each of said relays operably connected to a respective resistor of a plurality of resistors;

(h) means for selectively energizing said relays according to said compared signal from said comparator for connecting selected ones of said resistors in said feedback circuit until said output signal from said amplifier equals said reference voltage;

(i) said means for selectively energizing said relays including:

(i) a sequence control circuit having a plurality of output terminals,

(ii) means for enabling said sequence control circuit sequencially generating a signal on said plurality of output terminals,

(iii) a plurality of logic control circuits each of which is connected between a respective output terminal of said sequence control circuit and a respective relay for energizing a respective relay responsive to receiving a signal from said sequence control circuit, and

(iv) means for applying said compared signal to said logic control circuits for deenergizing said relays when said output voltage of said amplifier exceeds said reference voltage.

4,109,214
UNBALANCED-TO-BALANCED SIGNAL CONVERTER CIRCUIT

W. Eric Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1977, Ser. No. 802,170

Int. Cl.² H03F *3/45, 3/04;* H03G *3/00*

U.S. Cl. 330—254 **19 Claims**

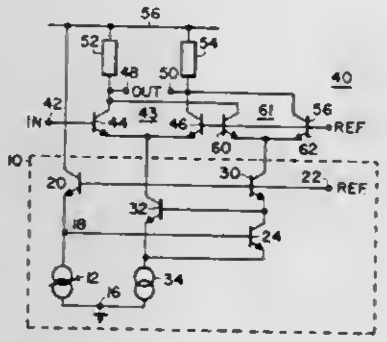
15. An unbalanced-to-balanced signal converter circuit for providing a pair of balanced output signals with magnitudes the sum of which is virtually equal to the magnitude of a control signal, including in combination:

driver circuit means for providing the unbalanced signal;

signal control means for providing the control signal;

first and second electron control means each having main electrodes and a control electrode, said control electrodes of said first and second electron control means being electrically coupled to said driver circuit means such that one is rendered conductive while the other is rendered non-conductive, said first electron control means conducting a signal having a magnitude substantially equal to the magnitude of the unbalanced signal, said main electrodes of said second electron control means being electrically coupled with said signal control means; and

third and fourth electron control means each having main electrodes and a control electrode, said third and fourth electron control means being electrically coupled to said first and second electron control means such that one is rendered conductive while the other is rendered nonconductive, said main electrodes of said third electron control means being electrically coupled in series with said main electrodes of said second electron control means so that the signals through said second and third electron control means constantly have virtually equal magnitudes, said main electrodes of said fourth electron control means being electrically coupled to said signal control means in parallel with said main electrodes of said second electron control means so that the magnitude of the signals through said second and fourth electron control means virtually equals the magnitude of said control signal, said control electrode of said fourth electron control means being electrically coupled to said first and second electron control means such that said fourth electron control means conducts a current having a magnitude virtually equal to the magnitude of the unbalanced input signal so that said third electron control means provides one of the balanced output signals and one of said first and fourth electron control means provides the other of the balanced output signals, the sum of the magnitudes of the balanced output signals thereby being virtually equal to the magnitude of the control signal.



4,109,215
DUAL MODE OUTPUT AMPLIFIER FOR A SAMPLE AND HOLD CIRCUIT

Donald Thomas Comer, Los Gatos; Daniel Joseph Dooley, Saratoga; George Erdi, Palo Alto, and Paul Raymond Henneuse, San Jose, all of Calif., assignors to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Apr. 27, 1977, Ser. No. 791,272

Int. Cl.^{2} H03F *3/45*

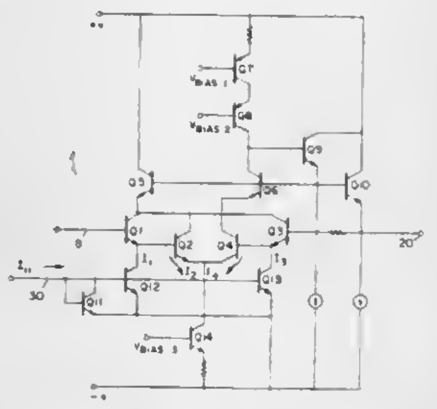
U.S. Cl. 330—254 **10 Claims**

1. An output amplifier for a sample and hold circuit having at least two distinct operative modes including a sample mode and a hold mode and thereby defining different slew rates and input bias currents comprising:

means for receiving a first input signal that may have a random waveshape;

means for receiving a second input signal having at least two distinct levels, one high and defining thereby a sample mode and one low, defining thereby a hold mode;

means for mirroring said second input signal current to selected emitter node elements of the amplifier capable of influencing the slew rate thereof;



means for changing the response characteristics of said amplifier in response to said mirrored second input signal current so as to conform the amplifier to one of said at least two distinct operative modes.

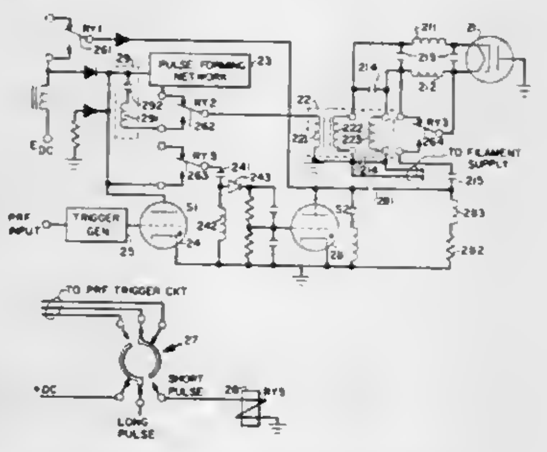
4,109,216
MICROWAVE GENERATOR

Reuben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1977, Ser. No. 802,349

Int. Cl.^{2} H03B *9/10;* H03K *3/55*

U.S. Cl. 331—87 **10 Claims**



1. A dual mode microwave generator comprising:

a resonant cavity generator;

a first modulator electrically connected to said resonant cavity generator for applying a first electrical pulse thereto, said first modulator being selectively actuatable to apply said first electrical pulse having one of two different heights, the first pulse height being sufficient to cause said resonant cavity generator to output a pulse of microwave energy of substantially the same duration as said first pulse, and said second pulse height being sufficient to hold said resonant cavity generator in the Hartree voltage region where microwave oscillation therein is incipient; and

a second modulator electrically connected to said resonant cavity generator and actuated to supply a second electrical pulse thereto during the application of said first electrical pulse having said second pulse height, the second pulse being of a shorter duration than said first electrical pulse and of an amplitude to cause said resonant cavity generator to produce a microwave energy output for substantially the same duration as said second pulse.

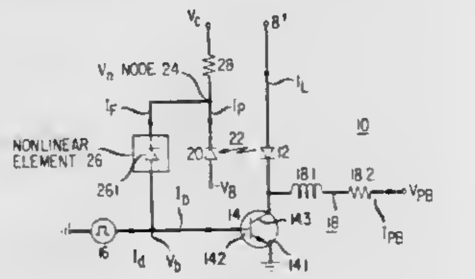
4,109,217
STABILIZATION CIRCUIT FOR JUNCTION LASERS

Charles Arthur Brackett, Summit, and Richard Grant Smith, Basking Ridge, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1976, Ser. No. 749,357

Int. Cl.^{2} H01S *3/10*

U.S. Cl. 331—94.5 S **4 Claims**



1. A stabilization circuit comprising a drive transistor connected in common emitter configuration and having emitter, base and collector electrodes; a junction laser coupled between said collector and emitter electrodes; a photodetector coupled to said emitter electrode; a portion of the radiated output from said laser being coupled to said photodetector; and means for coupling an input signal between said base and emitter electrodes; characterized in that:

said photodetector is coupled between a voltage node of said circuit and said emitter electrode; and

a nonlinear rectifying junction element is coupled between said node and said base electrode.

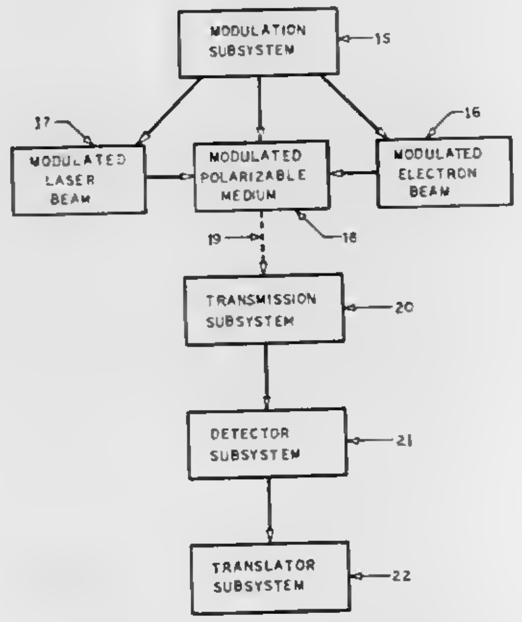
4,109,218
METHOD FOR THE GENERATION OF FREQUENCY-TRANSFERRED ELECTROMAGNETIC WAVES

Stanley Schneider, 26628 Fond du Lac Rd., Rancho Palos Verdes, Calif. 90274, and Richard Spitzer, 2946 Claremont Blvd., Berkeley, Calif. 94705

Filed Mar. 28, 1975, Ser. No. 563,178

Int. Cl.^{2} H01S *3/30, 3/10*

U.S. Cl. 332—7.51 **1 Claim**



1. A method for generating highly directional frequency-transferred electromagnetic waves of narrow frequency band encompassing a specific controllable frequency, said method comprising,

adjusting the frequency of an incident electromagnetic wave of narrow frequency band, the properties of an incident beam of moving electrically charged particles, and the polarizability characteristics of a polarizable medium capable of supporting electromagnetic shock radiation at the frequency of said generated waves, to values required to produce said generated radiation at said specific transferred frequency,

bringing said incident electromagnetic wave and said incident charged particles together in said medium so as to cause said incident wave to stimulate by acceleration said charged particles to radiate in said medium

utilizing said medium to reradiate electromagnetic waves at said transferred frequency and to focus said generated waves in specific directions,

and making said generated waves available for further application.

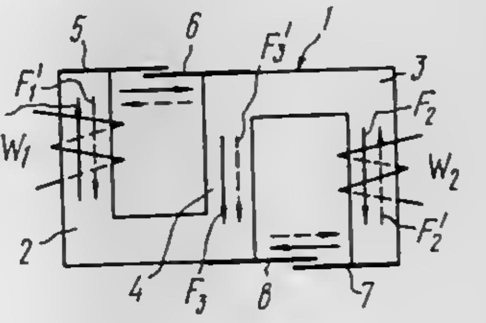
4,109,219
ELECTROMAGNETIC SWITCHING DEVICE

Konkordy Innokentievich Kharazov, ulitsa Valtera Ulbrinkhta 13/3, korpus 15, kv. 110; Gennady Viktorovich Netsvetaev, ulitsa Generala Karbysheva 1, kv. 62, and Valery Ivanovich Trofimov, Yaroslavskoe shosse 8, korpus 1, kv. 159, all of Moscow, U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,152

Int. Cl.^{2} H01H *51/24*

U.S. Cl. 335—78 **5 Claims**



1. An electromagnetic switching device comprising: a magnetic circuit having a center and at least two open side legs; two control windings, one of said windings being placed on each of said open side legs; at least two magnetically responsive contacts, each contact having at least two contact members, one of said contact members of at least one of said magnetically responsive contacts being placed on each of said open legs; said magnetic circuit having a shape that when a first control signal is fed to one of said control windings a larger magnetic flux is produced in the side leg with an energized winding, said larger flux switching the closest magnetically responsive contact, and a lesser magnetic flux in the side leg with a de-energized winding, said lesser magnetic flux switching off the closest contact, said magnetic fluxes being reversed when a second control signal of opposite polarity is fed to the other of said control windings.

4,109,220
CATHODE RAY TUBE ASSEMBLIES

Norman Eli Peart, Grotton, Near Oldham, England, assignor to Limited Ferranti, Holllowood, England

Filed Oct. 22, 1976, Ser. No. 734,878

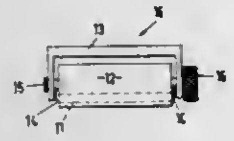
Claims priority, application United Kingdom, Oct. 24, 1975, 43836/75

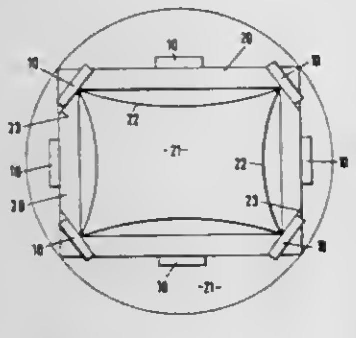
Int. Cl.^{2} H01F *7/00*

U.S. Cl. 335—212 **4 Claims**

1. A cathode ray tube assembly including a cathode ray tube having an envelope and a screen, a plurality of permanent magnets each having a pair of pole pieces for at least partially correcting pin cushion and barrel distortion of displays on the screen of the cathode ray tube, a support for each magnet secured to an associated predetermined position in relation to the envelope of the cathode ray tube, at least one magnet being adjustably mounted, to vary the intensity of the field of the magnet upon the electron beam produced within the cathode

ray tube, by comprising at least part of a member rotatably mounted on the associated support, and means to clamp the member in its required rotational position on its associated support, each support for a rotatable member being generally U-shaped with a member rotatably mounted between the arms thereof, is of ferro-magnetic material so as to comprise a shunt for the magnet, and is so arranged that at least one air gap of an adjustable width is provided within the magnetic circuit including the shunt to additionally vary the intensity of the field of the adjustable magnet upon the electron beam produced within the cathode ray tube.





4,109,221

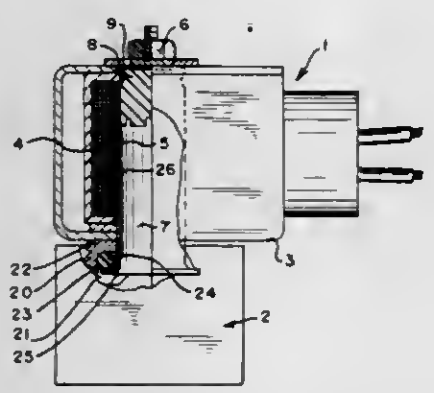
RETAINING MEANS FOR A SOLENOID ASSEMBLY

Jude A. Paull, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 9, 1976, Ser. No. 748,830

Int. Cl.^{2} H01F *3/00*

U.S. Cl. 335—251 **7 Claims**



1. In a solenoid valve having a one piece core tube, a top plug in an outer end of said core tube, said core tube having a thin cylindrical side wall, and an integrally formed, continuous, thin top wall, the improvement comprising fastening means mounted to said top wall without penetrating through said top wall, said fastening means having a member extending outwardly from said top wall, said member having means for engaging a fastener formed in it, said fastening means being welded to said core tube and extending outwardly from the closed end thereof, and a fastener intermounted with said fastening means.

4,109,222

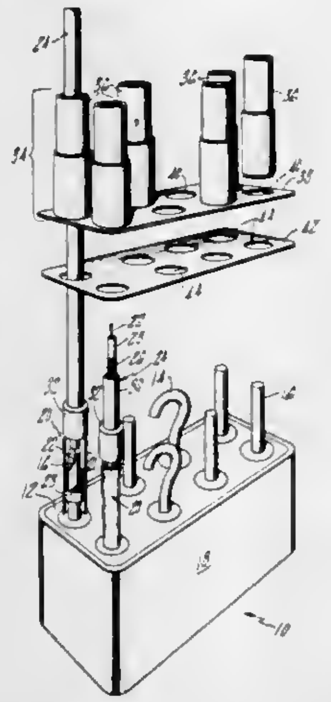
RELAY AND RF ADAPTOR ASSEMBLY

Paul A. Frano, Windsor Locks; Robert W. Bowman, Enfield; Donald F. Drapeau, Windsor, and Marino Kain, Bloomfield, all of Conn., assignors to HI-G Incorporated, Windsor Locks, Conn.

Filed Nov. 14, 1975, Ser. No. 631,874

Int. Cl.^{2} H01F *7/00*

U.S. Cl. 335—301 **10 Claims**



1. A miniature relay assembly comprising an electrically conductive header with a flat face and terminals supported thereon including a plurality of radio frequency signal-carrying pins projecting from the header, and a radio frequency adaptor comprising a one-piece preformed subassembly of unitary construction having an electrically conductive adaptor body including a planar supporting base with at least as many holes therein as there are radio frequency signal-carrying pins, said holes for the RF signal-carrying pins extending through the adaptor body, the adaptor body defining a plurality of hollow coaxial cable receiving shells surrounding each of said holes for the RF signal-carrying pins, the shells being permanently secured to and interconnected by the planar supporting base of the adaptor body, the base of the adaptor body and the face of the header being integrally secured to one another to complete an electrically conductive ground path, whereby the shells are common to electrical ground and serve as radio frequency shields.

4,109,223

MULTIPLE CHOKE ASSEMBLY

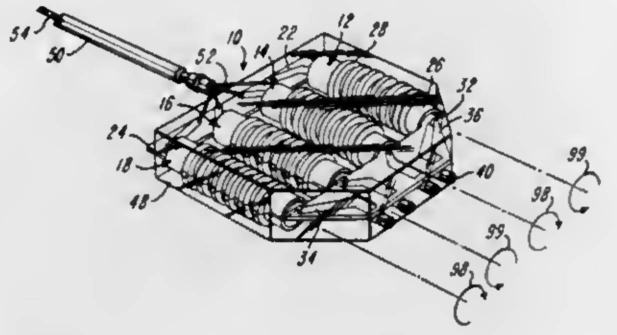
Robert Henry Tenkman, Cincinnati; Alan George Furler, Dayton, and Edward F. McGinnis, Jr., Waynesville, all of Ohio, assignors to NDM Corporation, Dayton, Ohio

Continuation of Ser. No. 617,431, Sep. 29, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 773,855

Int. Cl.^{2} H01F *15/04, 27/28*

U.S. Cl. 336—84 C **6 Claims**

1. A patient block for minimizing the passage of electrosurgery currents through electrocardiograph electrodes contacting the body of a patient undergoing electrosurgery, comprising: a plurality of electrically separate and spaced apart chokes, and potting means surrounding said chokes and filling the spaces between said chokes, each said choke having a start portion and a termination portion, each said choke having first means projecting through said potting means for electrical connection of one of its start and termination portions to one of said electrodes, and each said choke having second means projecting through said potting means for electrical connection of the other of its start and termination portions to an electrocardiograph monitor, adjacent chokes in said patient block having opposite lays so as to minimize arcing between said adjacent chokes should one of said chokes not be electrically connected to a body contact electrode.



4,109,224

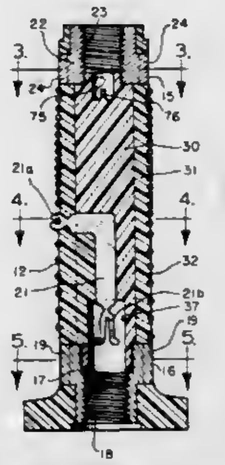
PRECISION INJECTION-MOLDED COIL FORM AND METHOD AND APPARATUS FOR MANUFACTURE

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Continuation of Ser. No. 762,637, Jan. 26, 1977, abandoned, which is a continuation of Ser. No. 676,682, Apr. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 639,421, Dec. 10, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,209

Int. Cl.^{2} H01F *27/30*

U.S. Cl. 336—192 **14 Claims**



1. An injection-molded coil form having a precision surface for supporting an inductance winding, comprising, in combination:

- a generally cylindrical core member including a longitudinally extending channel and a communicating axially aligned bore at one end;
- a contact member seated in said channel including a connector portion extending into said bore and a tap portion projecting radially from said core member;
- a pair of electrically conductive end fittings secured to respective ends of said core member, one of said end fittings including a central bore communicating with said axially aligned bore in said core and forming in conjunction with said connector portion of said contact member electrical connection means for said winding; and
- a thin plastic over-layer molded over said core member for supporting said inductance winding, said tap portion projecting through said layer for connection to said winding.

4,109,225

TEMPERATURE REGULATOR AND SAFETY THERMOSTAT

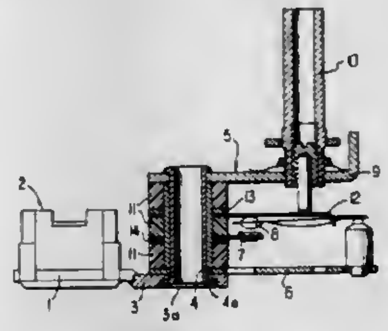
Walter Hollweck, Nuremberg, Fed. Rep. of Germany, assignor to Inter Control Hermann Köhler Elektrik GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,749

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546274

Int. Cl.^{2} H01H *71/16*

U.S. Cl. 337—42 **3 Claims**



1. In an assembly including a temperature regulator sensing the temperature to be regulated and controlling an electric current flow therethrough as a function of the sensed temperature and a safety thermostat interrupting the current flow independently of the operation of the temperature regulator upon sensing a predetermined temperature; the safety thermostat having a heat conducting baseplate; the improvement comprising a heat conducting means for mechanically connecting said temperature regulator and said safety thermostat with one another into a unitary structure and for simultaneously supplying the heat to be sensed to said temperature regulator and said safety thermostat; said heat conducting means including a member constituting an extension of said baseplate and projecting beyond said safety thermostat and a rivet passing through said extension and holding together components of said temperature regulator; first movable contact means connected to and forming part of said temperature regulator and second movable contact means connected to and forming part of said safety thermostat; said first and second movable contact means being structurally separate from said safety thermostat and said temperature regulator, respectively.

4,109,226

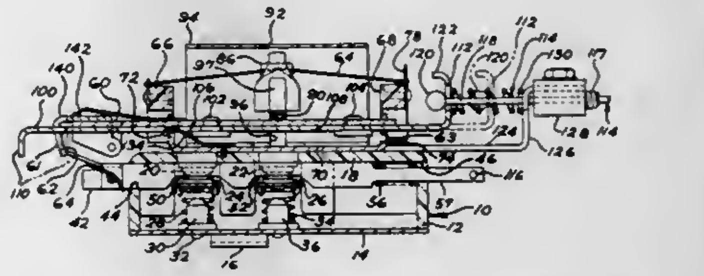
DISCONNECT SWITCH WITH RESET MECHANISM

Teamus Bowling, Fern Creek, and Benjamin M. Thomson, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 1, 1977, Ser. No. 773,195

Int. Cl.^{2} H01H *71/18*

U.S. Cl. 337—130 **8 Claims**

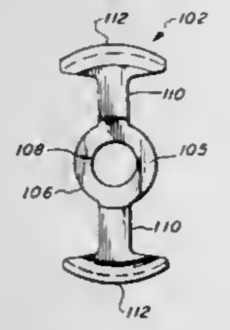


1. A ground fault disconnect switch for controlling the flow of current in a circuit and interrupting the flow in the event of a predetermined high current, said switch comprising a housing with fixed and movable electric contact means for making and breaking the circuit, biasing means for holding the movable contact means in engagement with the fixed contact means, biased actuator means for forcing the movable contact means away from the fixed contact means, and latch means for disabling the actuator means, an adjustable thermal-responsive

means acting upon the said latch means for holding the latch means in engagement with the said actuator means, whereby a predetermined current flow in the circuit causes the thermal-responsive means to release the latch means from engagement with the actuator means so the actuator means is free to open the switch contacts; the invention comprising a manual latch reset mechanism for cocking the actuator means so the actuator means is disabled, said reset mechanism including a remote controlled biased bar that is carried by the latch means and is movable with respect thereto.

4,109,227
CONTACT ASSEMBLY FOR HIGH VOLTAGE FUSE

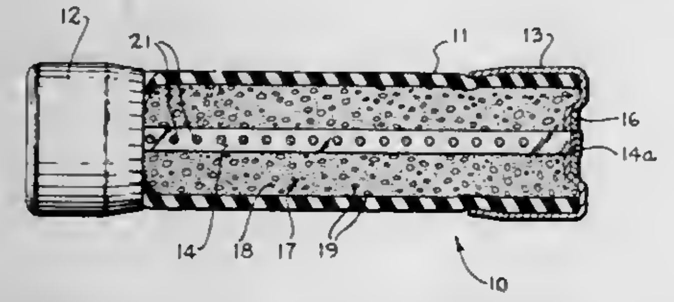
Bruce A. Biller, Chicago, and Henry W. Scherer, Mt. Prospect, both of Ill., assignors to S&C Electric Company, Chicago, Ill.
Filed Nov. 11, 1976, Ser. No. 741,028
Int. Cl.^{2} H01H *85/16*
U.S. Cl. 337—252 12 Claims



1. A contact assembly for a high voltage fuse comprising:
a contact bridge having center portion with an opening through the center portion, said contact bridge including arms projecting outwardly from the center portion, said arms having means for engaging the interior of the fuse to retain the contact bridge in a fixed position;
a contact element having a first end dimensioned to fit into said opening in said center portion, said contact element being attached to said bridge by swaging, said contact element having a second end extending from said contact bridge, said second end being connected to a fusible member within the fuse.

4,109,228
CURRENT LIMITING FUSE WITH RESINOUS ARC-QUENCHING FILLER

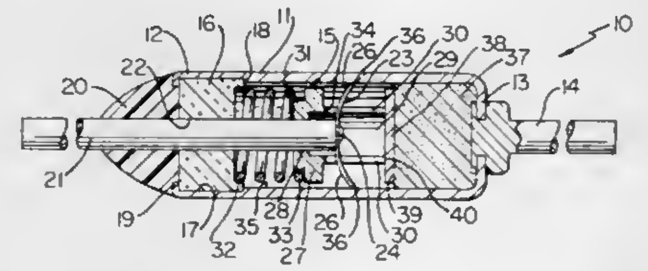
Daniel A. Wycklendt, Milwaukee, and Martin Hudis, Wauwatosa, both of Wis., assignors to Electric Power Research Institute, Inc., Pala Alto, Calif.
Filed Apr. 18, 1977, Ser. No. 788,241
Int. Cl.^{2} H01H *85/18*
U.S. Cl. 337—276 5 Claims



1. A current limiting fuse construction comprising a hollow casing of electric insulating material, electroconductive terminal elements carried by said casing and an elongate fuse element disposed electrically between said terminal elements for passing current therebetween, arc-quenching filler material within said casing, said filler material comprising a body of loose granular insulating material submerging the fuse element therein, substantially larger heat responsive gasevolving polymer resin particles relative to said granular material distributed substantially uniformly throughout said insulating material to increase the average arc gradient, said particles being vaporizable in response to heat for cooling an arc defined between ruptured portions of the fuse element while remaining substantially free of carbon after being so vaporized to preclude further conduction after vaporization thereof.

4,109,229
THERMALLY ACTUATABLE ELECTRICAL SWITCH SUBASSEMBLY THEREOF

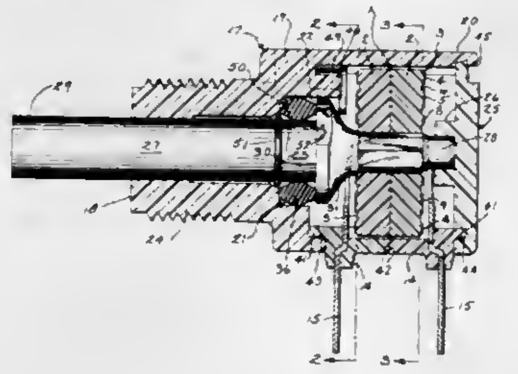
Emil Robert Plasko, Washington Township; Montgomery County, Ohio, assignor to Emerson Electrical Co., St. Louis, Mo.
Filed Aug. 23, 1976, Ser. No. 716,579
Int. Cl.^{2} H01H *37/76*
U.S. Cl. 337—408 14 Claims



1. In a thermally actuatable electrical switch construction having a deformable contact member normally disposed in electrical contact with a stationary contact member while a temperature sensitive member of said construction is in a solid condition and being deformed out of contact with said stationary contact member by deforming means of said construction when said temperature sensitive member is rendered non-solid by sensing a temperature above a predetermined temperature, the improvement wherein said deformable contact member is deformed in a direction toward said temperature sensitive member by said deforming means when said temperature sensitive member is rendered non-solid, said deformable contact member being carried by a lead that projects into said construction and is secured thereto by an insulating end plug.

4,109,230
COMPACT ELECTRICAL CONTROL

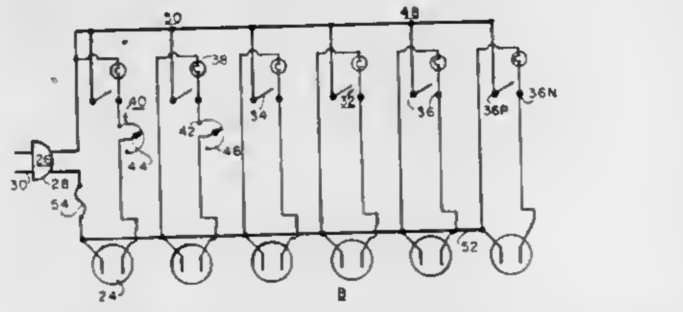
Sydney W. Frey, Jr., Brookfield, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed Feb. 16, 1977, Ser. No. 768,998
Int. Cl.^{2} H01C *10/32*
U.S. Cl. 338—164 3 Claims



1. An electrical control comprising:
(a) a housing having a base portion, side walls extending rearward of the base portion to define a hollow interior, an annular seal cavity in the body portion having a circumferential wall and an axial end wall which opens upon the hollow interior, a bushing on the base portion opposite said side walls and seal cavity, and a cover at the rear of said side walls with an internal bearing opening upon the housing interior and in alignment with said bushing;
(b) a shaft received in said bushing extending through said seal cavity, and with an end journal in said bearing, said shaft having a radial extending flange having a pressure face facing said seal cavity end wall to define the axial extent thereof;
(c) a rotary unit within said housing mounted on said shaft that is between said pressure face and said end journal;
(d) terminal members extending through said housing side walls with connection portions outside said housing and contact fingers within said housing engaging said rotary unit; and
(e) an annular, resilient seal having an axial length exceeding its radial thickness and circumferentially extending beveled faces, said seal being positioned in the seal cavity and axially compressed between the pressure face of the flange of said shaft and the cavity end wall to prevent shaft end play and radially compressed between the cavity circumferential wall and the shaft to provide liquid tight seals.

4,109,231
PORTABLE SWITCH AND DIMMER CONTROL CONSOLE

Robert S. Krouse, 2316 Manning St., Philadelphia, Pa. 19103
Filed Mar. 24, 1977, Ser. No. 780,921
Int. Cl.^{2} H01C *10/50*
U.S. Cl. 338—200 14 Claims

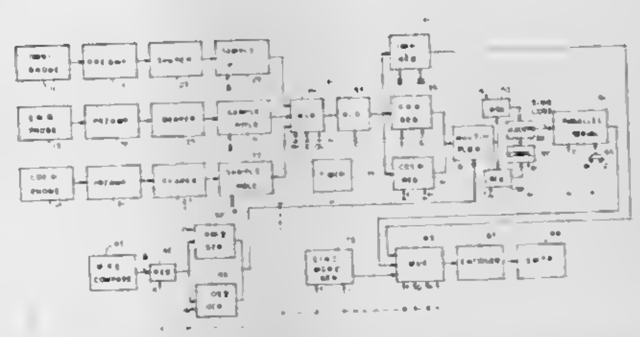


1. A portable switch and dimmer control for controlling a plurality of electrically energized devices which comprises:
a casing;
control means mounted on said casing to manually control devices; and
an electrical control circuit operated by said control means, said control circuit comprising a plurality of individual fixture control circuits,
at least one variably resistant fixture control circuit, and means for interchangeable electrical engagement of fixtures with said control circuit,
wherein at least some of the individual fixture control circuits and the variably resistant fixture control circuit are connected in parallel.

4,109,232
CORRECTION AND TRANSMISSION SYSTEM FOR DIRECTIONAL TARGET INFORMATION

Albert M. Bates, Southampton; Wayne H. Sandford, Jr., Warrington, and Anthony J. Madera, Doylestown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 6, 1977, Ser. No. 804,041
Int. Cl.^{2} G01S *3/80*
U.S. Cl. 340—6 R 12 Claims

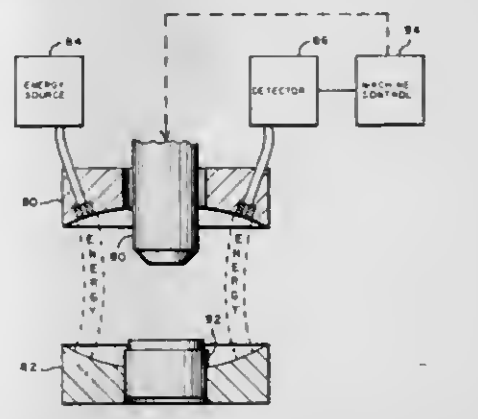
1. A system for correcting the bearing of a target from one reference to another, comprising:
first receiving means for alternately producing respective signals indicative of the sine and cosine of the bearing θ to the target from the one reference;
reference means for alternately producing respective signals indicative of the sine and cosine of the angular deviation ϕ between the references;
multiplying means synchronously receiving said sine θ, cosine θ, sine ϕ and cosine ϕ signals for producing signals indicative of sin θ sinϕ, cos θ cos ϕ, sin θ cos ϕ and cos θ sinϕ, respectively; and



adding means sequentially receiving the multiplying means signals for producing signals indicative of sine γ and cosine γ wherein $\gamma = \theta - \phi$.

4,109,233
PROXIMITY SENSOR

Clifford W. Erickson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 534,997, Dec. 20, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,091
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.^{2} H04B *11/00*
U.S. Cl. 340—15 19 Claims



1. A proximity sensor for sensing the presence of an object within a first spatial volume positioned between second and third spatial volumes, the proximity sensor comprising:
a beam resonant cavity wherein the beam resonant cavity comprises concave curved surfaces facing one another and separated from one another along an axis;
energy source means for introducing energy into the beam resonant cavity, substantially all of the energy resonating in a predetermined pattern within the first spatial volume; and
detector means for sensing a change in the resonant condition of the energy caused by the presence of an object in the pattern.

4,109,234
ANTI SKID FAULT DETECTION CIRCUIT

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 27, 1976, Ser. No. 662,053
Int. Cl.^{2} B60T *8/00*
U.S. Cl. 340—52 B 5 Claims

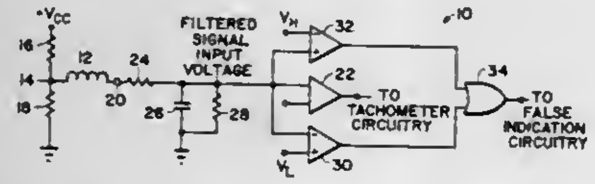
1. A fault detecting circuit for an anti-skid control system which is adapted to be operatively coupled to a sensing means thereof that includes a sensing coil, the fault detecting circuit

being suitable for detecting open circuit or either end shorted to ground conditions of the sensing coil, the fault detecting circuit comprising:

bias supply means connected to a first terminal of the sensing coil, said bias supply means buffering said first terminal from ground reference potential for providing a predetermined bias potential thereat;

first circuit means connected to a second terminal of the sensing means which has a predetermined frequency transfer characteristic for providing an output signal having an amplitude which is limited within a predetermined range under normal operating conditions of the anti-skid control system, said output signal being outside said predetermined range when either of said first and second terminal of the sensing coil is short circuited to said ground reference potential or said sensing coil is open circuited; and

second circuit means connected to said first circuit means being responsive only to said output signal therefrom falling outside said predetermined range for sensing open or short circuit conditions of the sensing coil.

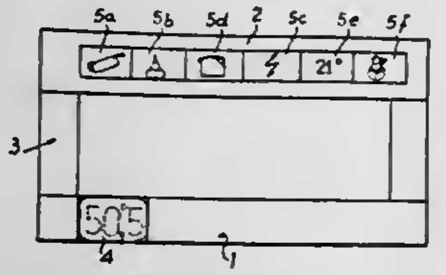


4,109,235

ELECTRONIC-DISPLAY INSTRUMENT PANELS FOR AUTOMOTIVE VEHICLES

Pierre Marcel Bouthors, Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobile Peugeot, both of, France

Continuation of Ser. No. 504,239, Sep. 9, 1974, abandoned, which is a continuation of Ser. No. 294,997, Oct. 4, 1972, abandoned. This application May 4, 1976, Ser. No. 683,222
Claims priority, application France, Oct. 29, 1971, 71.39061
Int. Cl.² G08B *19/00*
U.S. Cl. 340—52 F **17 Claims**



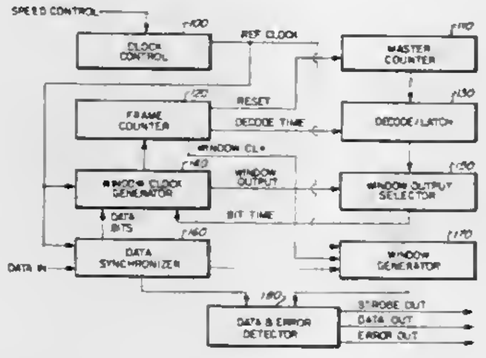
1. An electronic-display instrument panel for motor vehicles, adapted to display values of data signals emitted from sensing devices detecting various parameters of functions and physical conditions, comprising a frame and at least first and second small display panels incorporated in the frame, a signal pulse counter, the first display panel comprising a luminous digit display means connected to said counter for displaying values of counted pulses, the second display panel comprising conventional symbol designs and means for illuminating said designs, said symbol designs being associated with the displayed values, said instrument panel further comprising a clock member connected to said counter for emitting constant periodic signals during which pulses received by said counter are counted, a plurality of means connected to said sensing devices for converting voltages of data signals emitted by said sensing devices into other signals to be transmitted to said counter, said converting means including a first means for converting the voltage of the signals of a first sensing device emitting frequency pulses, and a plurality of second means for converting the voltage of signals of the other sensing devices concerning a plurality of parameters, a first switching member, connected to said first means for converting, for transmitting to said counter data concerning a single function parameter and on request data concerning sequences of different parameters, a multiple second switching member having a plurality of switches which are connected to said plurality of second means for converting and said second display panel, a third means connected to said first and second switching members and to said clock member for converting into frequency pulses the voltage of signals transmitted by said second means for converting, means for selecting data sequences concerning a plurality of parameters of functions and physical conditions and connected to said clock member and to said first and second switching members, means connected to said sequences selecting means for starting on request under the control of the vehicle driver switching of different data sequences, means connected to said luminous display means for adjusting the luminous intensity of the display on said first display panel, and means connected to said second means for converting the voltage of signals of sensing devices and to said second multiple switching member for energizing by priority alarm devices when predetermined thresholds of the values displayed for various parameters are overstepped.

4,109,236

APPARATUS FOR DIGITAL DATA RECOVERY FROM MASS STORAGE DEVICES

Edward Roald Besenfelder, Phoenix; Steve Garner Cantrell, Glendale, and Charles Peter Cobeen, Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 17, 1977, Ser. No. 807,711
Int. Cl.² G11C *29/00;* **G11B** *27/00*
U.S. Cl. 340—146.1 F **4 Claims**



1. A digital data recovery apparatus for mass storage devices comprising:

a programmable clock control circuit for providing a reference clock output;

a data synchronizer connected to said clock control circuit and a data input signal for providing an output data signal synchronized with the reference clock, a data two output signal indicating a logic "1" to logic "0" transition of the data input, and a signal clock synchronized with the reference clock, one of said signal clocks being generated for each transition of the data input;

a window clock generator connected to said clock control circuit and data synchronizer for providing a signal clock +3 signal and a plurality of output signals for determining the number of reference clocks that have occurred since the previous signal clock;

a window output selector connected to the window clock generator for selecting a one of the plurality of output signals from said window clock generator;

a frame counter connected to said window clock generator, said frame counter for providing a window clock output, a count up output, a load reset output, and a reset output and having programmable means for varying the number of signal clock +3 pulses necessary to generate the load-reset output signal;

a master counter connected to said frame counter for accumulating the number of count up pulses generated during a preprogrammed number of data frames called for by the frame counter;

a decoder/latch connected to said load reset output and to said master counter for providing a plurality of output signals to the window output selector, said output signals selecting a one of the output signals of the window clock generator;

a window generator connected to said clock control circuit, said data synchronizer, and said frame counter for providing a phase time output and a data time output; and,

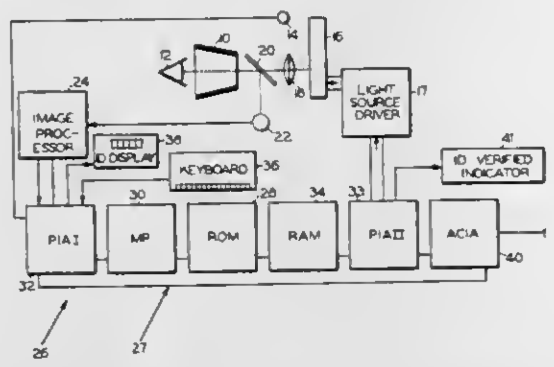
a data and error detector responsive to the phase-time and data-time outputs from said window generator and the synchronized data from the data synchronizer for providing a data output and an error output.

4,109,237

APPARATUS AND METHOD FOR IDENTIFYING INDIVIDUALS THROUGH THEIR RETINAL VASCULATURE PATTERNS

Robert B. Hill, P.O. Box 2006, Longview, Wash. 98632

Filed Jan. 17, 1977, Ser. No. 759,901
Int. Cl.² G06K *9/00;* **A61B** *3/10*
U.S. Cl. 340—146.3 E **14 Claims**



1. The method of identifying a person by his retinal vasculature pattern comprising:

(a) scanning an eye of the person with a light source arranged in a selected pattern,

(b) detecting that portion of the light source pattern which is reflected from the retina of the eye,

(c) locating each intercept of the light source pattern with a blood vessel in the retina, thereby creating an intercept pattern of the retina, and

(d) comparing said intercept pattern with a reference intercept pattern, and thereby determining the identity or non-identity of the same.

4,109,238

APPARATUS FOR VERIFYING CHECKS PRESENTED FOR ACCEPTANCE

Robert V. Creekmore, E. Marietta, Ga., assignor to 1st Natl. Bank of Atlanta, Atlanta, Ga.

Filed Oct. 6, 1975, Ser. No. 619,663
Int. Cl.² H04Q *9/00*
U.S. Cl. 340—149 A **7 Claims**

1. System for verifying the check presentation history of a number of persons who may present various types of checks for acceptance, irrespective of their current checking account status or availability of such persons, comprising:

at least one input terminal disposed at a location where checks may be presented for acceptance by customers;

said input terminal having means operative to accept and read any of a plurality of customer identification cards each of which contains machine-readable information corresponding to an individual customer and also operative to produce a customer identification signal in the input terminal;

said input terminal having variable data entry means operable by the customer to provide a code input signal corresponding to a predetermined personal code whic has been previously selected by the customer;

said input terminal having form handling means operative to receive a customer-supplied form suitable for imprinting;

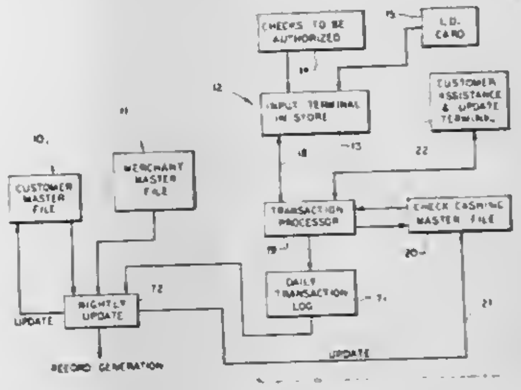
said input terminal having means operative to print authorization indicia on said customer-supplied form in response to an authorization signal supplied to said input terminal;

said input terminal having function selection means operable by the customer to provide check category signals corresponding to certain predetermined categories of checks which may be presented for acceptance;

data transmission means operative to supply information signals including said customer identification signal, said code input signal, and said category signal from said input terminal to a remote location;

transaction processing means disposed at said remote location and connected to receive information signals from said data transmission means;

said transaction processing means including information storage means operative to provide stored signals corresponding to the predetermined personal code previously selected by each customer, corresponding to certain previously authorized categories of checks which will be approved for acceptance if presented by a particular customer, and corresponding to a predetermined maximum number of times each such authorized category may be approved for acceptance for particular customers within a certain period of time;



said transaction processing means including signal processing means responsive to said stored signals and to said information signals received along said data transmission means from an input terminal to compare the personal code input signal from the input terminal with the stored predetermined personal code signal for that customer, said transaction processing means being operative in response to a comparison showing nonidentity of said input and stored personal code signals to provide a code error signal for transmission along said data transmission means to that input terminal; and

said transaction processing means including means operative in response to a comparison showing identity of said input and stored personal code signals to compare a received desired check category signal with said stored signals in said information storage means to provide an authorization control signal indicating whether or not said desired category is authorized for that customer and whether the present request for acceptance will exceed said predetermined maximum utilization of such category; and

means operative to transmit said authorization control signal to said input terminal.

4,109,239

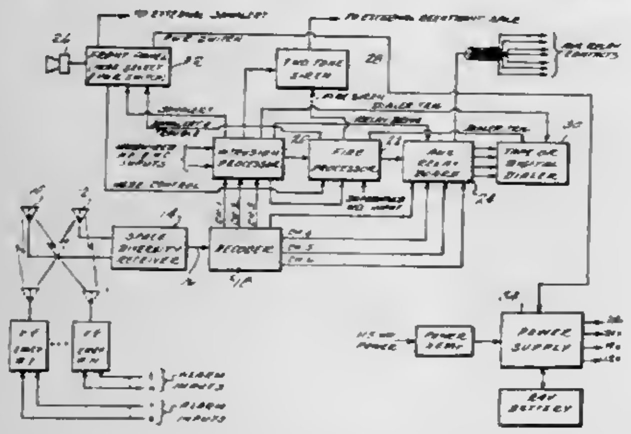
RADIO FREQUENCY ALARM SYSTEM INCLUDING TRANSMITTING, CODING AND DECODING CIRCUITRY

Glenn A. Davis, Lilburn, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Sep. 30, 1975, Ser. No. 618,239

Int. Cl.² G08B *1/08*

U.S. Cl. 340—539 **16 Claims**



1. An alarm system for signalling at a central receiving location one of a plurality of possible alarms transmitted thereto by a plurality of remotely located alarm sensing and transmitting units, said system comprising:

a plurality of remotely located alarm sensing and transmitting units, each such unit comprising

at least one sensor means for sensing a predetermined alarm condition and for providing a corresponding electrical alarm condition, and

radio transmitter means connected to said sensor means for transmitting electromagnetic signals in response to said electrical alarm condition, said electromagnetic signals having at least a signal component thereof which is repetitively shifted in frequency between at least first and second frequencies chosen from among a plurality of predetermined frequencies, said shifts in frequency occurring at a predetermined switching rate,

receiving means at said central receiving location including a radio receiver means for receiving said electromagnetic signals and a decoder means connected thereto for detecting the presence of said at least two predetermined first and second frequencies as well as for detecting the switching rate therebetween and for then producing a corresponding alarm output only if both of said first and second predetermined frequencies and said predetermined switching rate are concurrently present;

said decoder means comprising

a first plurality of frequency detectors, each adapted to detect a respectively corresponding one of said plurality of predetermined frequencies if present in said signal component of the electromagnetic signals and to produce a corresponding signal at its output in response thereto,

switching rate detection means connected between the outputs of said first plurality of frequency detectors for producing an output signal in response to detection of said predetermined switching rate, and

logic means connected to receive the outputs of said first plurality of frequency detectors and of said switching rate detection means for producing an alarm output respectively representative of a particular one of a plurality of possible alarms corresponding to said first and second frequencies and to said predetermined switching rate;

said switching rate detection means comprising

a bistable means connected for setting to a first stable state in response to an output from a predetermined one of said first plurality of frequency detectors and for resetting to a second stable state in response to an output from any other one of said first plurality of frequency detectors thereby producing an output signal having a frequency representative of the switching rate in said signal component of the electromagnetic signals between a first frequency corresponding to said predetermined frequency detector and a second frequency corresponding to one of the other frequency detectors, and

second frequency detector means connected to receive the output signal from said bistable means and to produce an output when a predetermined frequency corresponding to said predetermined switching rate is detected.

4,109,240

IONIZATION-TYPE FIRE SENSING SYSTEM

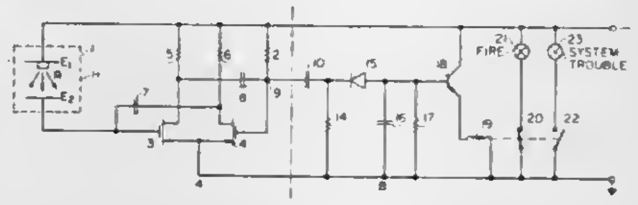
Andreas Scheidweiler, Uerikon, Switzerland, assignor to Cerberus AG., Mannedorf, Switzerland

Continuation-in-part of Ser. No. 525,969, Nov. 21, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,750

Claims priority, application Switzerland, Nov. 26, 1973, 16598/73; Oct. 14, 1976, 13037/76

Int. Cl.² G08B *17/10*

U.S. Cl. 340—629 **20 Claims**



1. Smoke or fire sensing system to provide an alarm output signal upon sensing of smoke or fire aerosols within a supervised space having

an ionization chamber including a source of radiation (R) and at least two electrodes (E1, E2) between which an ion current can flow, the ionization chamber being exposed to the atmosphere in the space to be supervised,

and an evaluation circuit (A, B) connected to the ionization chamber and responsive to change in ion current flow of the ionization chamber when smoke or fire aerosols penetrate the chamber,

wherein the evaluation circuit comprises

two field effect transistors (FET's) (3, 4), each having a source electrode, a drain electrode and a gate electrode;

two drain resistors (5, 6) and two gate resistors (1, 2), the drain and gate resistors, respectively, being connected to respective FET's (3, 4);

two cross-connected capacitors (7, 8), one capacitor, each, being respectively connected to the drain electrode of one FET and to the gate electrode of the other FET to provide a cross-connecting feedback path and connect said FET's in a multivibrator oscillator circuit providing for generation of a pulse train formed by cyclically recurring pulses, the pulse repetition rate (PRR) of said pulse train depending on the value of the respective drain and gate resistors (1, 2; 5, 6);

at least one of said resistors being formed by the ionization chamber to change the pulse repetition rate of the multivibrator oscillator circuit upon presence of smoke or fire aerosols in the supervised space, and hence in the ionization chamber;

a pulse rate detector connected to the drain electrode of one of the FET's including summing means (16, 17) summing the pulses delivered from the multivibrator oscillator circuit during a predetermined time interval;

and an alarm response circuit (18, 19, 20,22; 21, 23) providing an alarm output signal when the sum of the pulses in the predetermined time interval changes from a predetermined value.

4,109,241

LIQUID CRYSTAL DISPLAYS

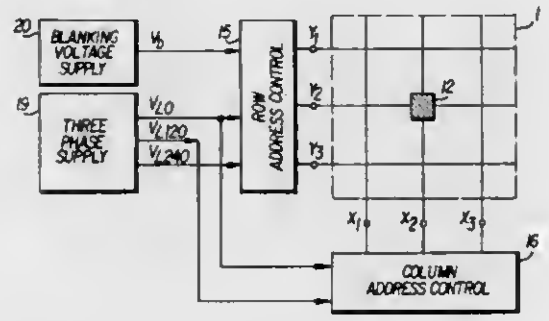
Ian Alexander Shanks, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of Great Britain and Northern Ireland, London, England

Filed Dec. 10, 1975, Ser. No. 639,434

Claims priority, application United Kingdom, Dec. 11, 1974, 53685/74

Int. Cl.² G02F *1/13*

U.S. Cl. 340—324 M **9 Claims**



1. A liquid crystal display comprising a layer of liquid crystal material contained between two slides at least one of which is transparent, the slides carrying spaced electrodes arranged to provide a plurality of intersections whereby the display can be addressed in matrix form. and further comprising means for applying across the liquid crystal layer at a plurality of electrode intersections a blanking voltage to turn the layer into an on state, means for applying across selected intersections previously turned on a voltage substantially below a threshold voltage level to turn the layer at those selected intersections to an off state, and means for applying to the layer at electrode intersections, a voltage close to a threshold value at other times.

4,109,242

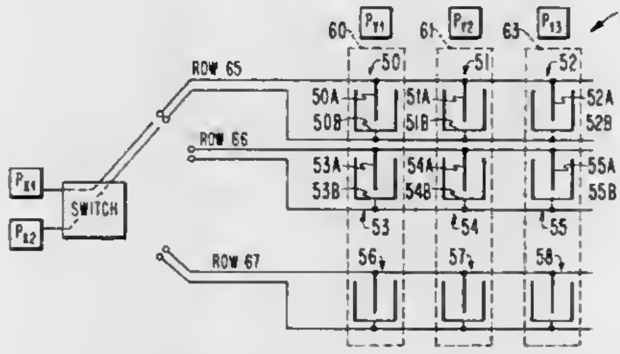
MATRIX ADDRESS SYSTEM USING ERASE OPERATION

Donald Jones Channin, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 758,995

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 M **11 Claims**



1. In a display device of the type including a plurality of liquid crystal electro-optical elements interconnected into rows and columns and addressing means for generating a first predetermined optical information response in selected ones of said elements in a selected row, and a second predetermined optical information response in non-selected elements of said selected row,

said elements being excited in accordance with a predetermined excitation characteristic in response to excitation signals applied thereto and being erased in accordance with a predetermined erase characteristic in response to erase signals applied thereto, the improvement wherein

said elements are of a type having an erase characteristic that is non-linear with respect to changes in applied erase signals; and

said addressing means comprises:

means for applying an initial excitation signal to all elements in said selected row to generate in said elements an initial excitation response;

means for applying, subsequent to the application of said initial excitation signal to said selected row, a first erase signal to said selected elements and a second erase signal to said said elements, and first erase signal effecting in said selected elements said first predetermined optical information response and said second erase signal effecting a differing amount of erasure than said first erase signal to generate in said non-selected elements said second predetermined optical information response.

4,109,243

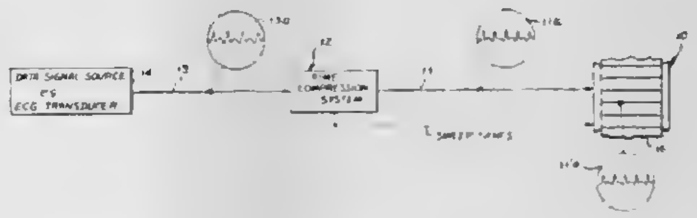
DATA SEQUENCE DISPLAY SYSTEM AND TIME-COMPRESSION SYSTEM THEREFOR

Christopher Cameron Day, Newtonville, and Robert Lee Cannon, Waltham, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1976, Ser. No. 680,017

Int. Cl.² G06K *15/18*

U.S. Cl. 340—324 R **14 Claims**



1. A system for the cyclical time-compression of a signal waveform comprising:

a recirculating memory of predetermined time-quantized length, said memory providing a storage delay corresponding with the product of said predetermined time-quantized length and the number of passes through said memory;

means having successive samples of the signal waveform extended thereto and being responsive to first timing signals for entering respective said samples of the signal waveform into said memory;

means for generating and applying a plurality of said first timing signals to said data entry control means throughout a time-compression cycle, said first timing signals recurring at an interval corresponding with the interval between successive samples of the signal waveform, said first timing signals having an interval such as to cause precession of the samples in the memory, and a predetermined number of the samples being entered in said memory during a first fraction of each time-compression cycle;

means responsive to second timing signals for selectively interrogating said memory and providing read out of the respective interrogated samples; and

means for generating and applying said second timing signals to said memory interrogation means following a time delay comprising said first fraction of each time-compression cycle, the remaining fraction of each said time-compression cycle being a compressed-time cycle in which the timing of said second timing signals is such that the storage delay of said recirculating memory is decremented from a maximum to a minimum over said compressed-time cycle whereby said interrogated samples cumulatively substantially represent the signal waveform in time-compression.

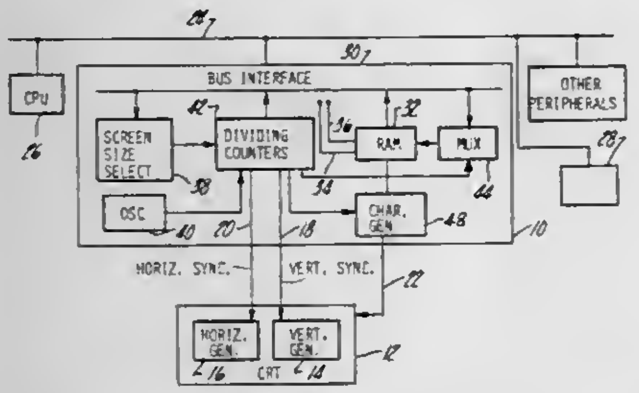
4,109,244
DIGITAL PROCESSOR FOR GENERATING ALPHANUMERIC DISPLAY ON A CATHODE RAY TUBE

Richard G. Barnich, Grand Blanc, and Timothy M. Hakeem, Pinckney, both of Mich., assignors to Process Computer Systems, Inc., Saline, Mich.

Filed Sep. 8, 1976, Ser. No. 721,285

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—324 AD **10 Claims**



1. A video display system comprising: a random access memory storing a plurality of character codes; a video display device; an oscillator; a chain of digital dividers connected to the output of the oscillator; horizontal and vertical position generators connected to points in the digital divider chain and to the video display device to control the position of the display point on the device as a function of the condition of the dividers in the chain; a character generator connected to the random access memory, the digital divider chain and the video display operative to control the instantaneous illumination of the video display as a function of the condition of the dividers in the chain and the character code stored in the random access memory; and a memory counter connected to the digital chain and operative to control the character code provided by the random access memory to the character generator as a function of the condition of the dividers in the chain.

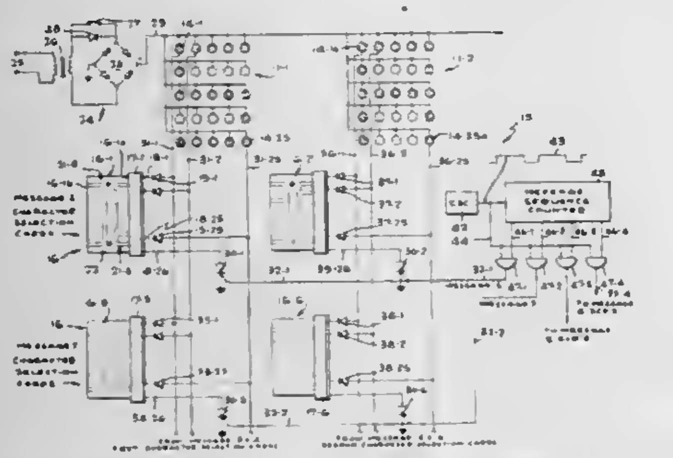
4,109,245
PROGRAMMABLE ELECTRONIC SIGN

Robert A. Hedin, 41272 Village Lake Rd., Novi, Mich. 48050

Filed Feb. 17, 1976, Ser. No. 658,484

Int. Cl.^{2} G09F *9/32*

U.S. Cl. 340—334 **5 Claims**



1. A programmable electronic sign, comprising: a set of individual character displays mounted in alignment to form a sign, each display having a plurality of illuminable segments which when selectively energized form an image of a selected character;

a corresponding set of selectable programming cards each associated with a respective one of said displays, each card containing indicia designating the specific segments to be illuminated in the associated display to produce on that display a character defined by that card;

means utilizing said set of programming cards and interconnected with said displays for energizing in each display only the segments specified by the associated program card, each display thereby containing an illuminated image of the defined character, the characters together forming a selected message;

each of said programming cards contains a printed circuit having conductive strips corresponding to display segments to be illuminated, and wherein said means for energizing comprises;

a respective socket for receiving and making electrical contact to each programming card in said set,

a power source, and

electrical interconnection means for connecting power from said source to each of said displays via the associated programming card and socket, so that for each display only the segments corresponding to said conductive strips in the associated programming card printed circuit are energized;

said power source comprises rectifier means providing unfiltered, rectified ac power and wherein said electrical interconnection means includes a silicon controlled rectifier in circuit with each programming card, so that power is supplied to the display segments via that silicon controlled rectifier and the associated programming card printed circuit, and trigger means for providing a trigger signal to said silicon controlled rectifiers for substantially the entire duration of time that the characters selected by said programming cards are to be displayed, said silicon controlled rectifiers going off at the end of the ac half cycle next following termination of said trigger signal as said unfiltered power approaches ground potential;

each of said displays comprises an $n \times m$ matrix of lamps, wherein

said programming card printed circuit has a common contact and $(n \times m)$ other contact locations, said circuit having a conductive path extending from said common contact to those contact loctions corresponding to display segments to be illuminated,

wherein said common contact is connected via said socket to a silicon controlled rectifier, all of the other contact locations being connected via said socket to respective segments of the associated display,

a source of unfiltered, rectified ac power connected to all of said segments, said silicon controlled rectifier being in the return path to said source, so that when said silicon controlled rectifier is switched on, a power connection is completed via said silicon controlled rectifier, said common contact, and said programming card printed circuit to said corresponding display segments, and

trigger means for providing a trigger signal to turn on said silicon controlled rectifier for a duration of time during which said display is to be illuminated, said silicon controlled rectifier being turned off after termination of said trigger signal the next time that said unfiltered power approaches ground potential.

4,109,246
ALARM SYSTEM WITH REPEAT OF ALARM INTERRUPTED FOR PRIORITY ALARM

Ignas Budrys, Betbel, and Robert W. Right, Huntington, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,939

Int. Cl.^{2} G08B *19/00*

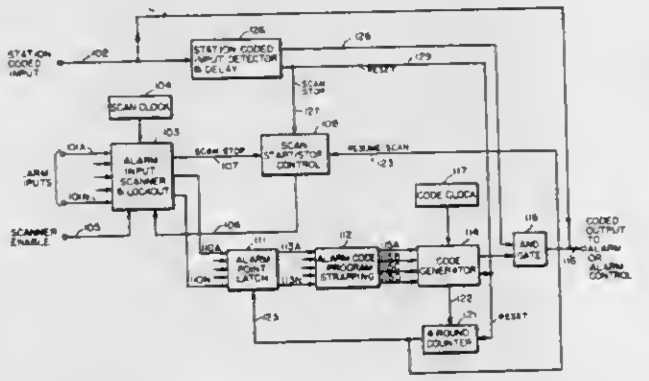
U.S. Cl. 340—518 **9 Claims**

1. An alarm annunciator for respoqding to signals indicative of predetermined conditions on any one of a plurality of alarm input leads and for activating a code generator to generate a unique code indicative of the one of the plurality of alarm input

leads on which the signal was received and comprising in combination:

(a) a station coded input lead coupled to said alarm annunciator and on which a distinctive code signal is transmitted for a limited period of time in response to a predetermined nonstandard condition;

(b) priority means responsive to the initiation of transmission of said distinctive code signal on said station coded input lead for terminating the generation of any unique code being generated in response to a signal on any one of said plurality of alarm input leads and for transmitting the distinctive code signal received on said station coded input lead; and



(c) control means coupled to said priority means and responsive to the conclusion of the transmission of said distinctive code signal received on said station coded input lead for initiating the resumption of the unique code terminated in response to the initiation of said distinctive code signal on said station coded input lead irrespective of the then current status of said nonstandard condition.

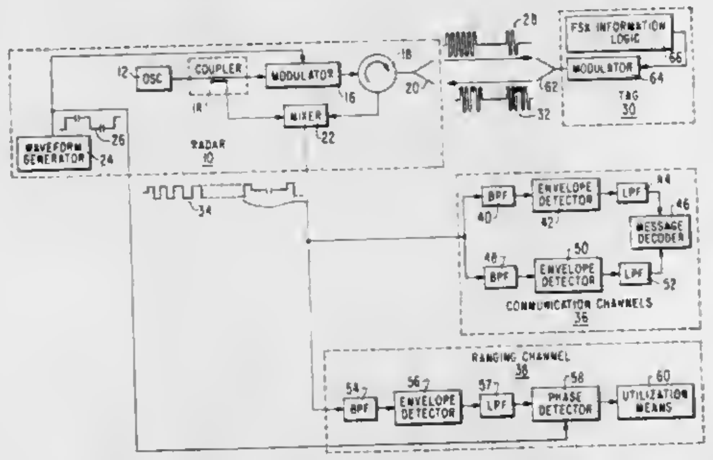
4,109,247
CLUTTER FREE COMMUNICATIONS RADAR

Gerald Stanley Kaplan, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 593,120, Jul. 3, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,337

Int. Cl.^{2} G01S *9/56, 9/58*

U.S. Cl. 343—6.5 R **2 Clalms**



1. In a system for detecting the presence and range of a cooperating remote unit from an interrogating station in an environment of non-cooperating objects, said interrogating station transmitting a modulated interrogation signal at one particular carrier frequency for reception at said remote unit, said interrogation signal being modulated in accordance with a predetermined waveform, said remote unit, in response to said interrogation signal, radiating back to said interrogating unit at said one particular carrier frequency an information bearing reply signal, said reply signal being modulated in accordance with any one of a plurality of signals having differing predetermined frequencies, each of said predetermined frequencies being representative of a given value of said information at said remote unit, said non-cooperating objects, in response to said interrogation signal, radiating back to said interrogating station, skin-reflections of said interrogation signal, said interrogating station comprising:

first means for transmitting said modulated interrogation signal, including means for generating a sample signal indicative of said one particular carrier frequency;

second means comprising a mixer, responsive to said reply signals, said skin-reflections, and said sample signal, for generating a difference signal having distinguishable components respectively representative of said reply signals from said remote unit and said skin-reflections from said non-cooperating objects;

said component representative of said reply signals having characteristics respectively indicative of said information and the range between said remote unit and said interrogating station;

third means comprising a plurality of channels each of which includes a bandpass filter (BPF) receptive of said difference signal, each center-tuned to a respective one of said predetermined frequencies, said third means also comprising means receptive of the respective output signals of said BPFs for determining the presence of the respective predetermined frequencies for extracting thereby said information from said reply signal; and

fourth means comprising an additional BPF receptive of said difference signal for passing a signal having a band of frequencies essentially equal to the total bandwidth of all of said respective third means BPFs and further comprising means cooperating with said additional BPF for detecting said characteristic indicative of said range for determining the range between said remote unit and said interrogating station.

4,109,248
RADAR SYSTEMS

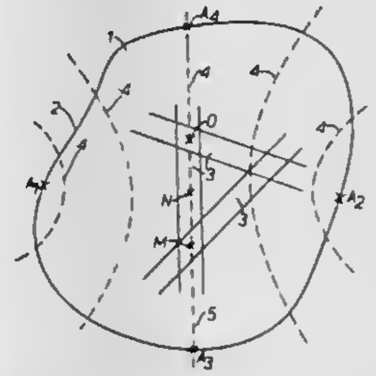
Philip Neville George Knowles, Aldwick, and Christopher Pell, Horndean, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,214

Claims priority, application United Kingdom, Aug. 28, 1974, 37504/74; Jun. 14, 1975, 25484/75

Int. Cl.^{2} G01S *9/56*

U.S. Cl. 343—6.5 R **17 Claims**



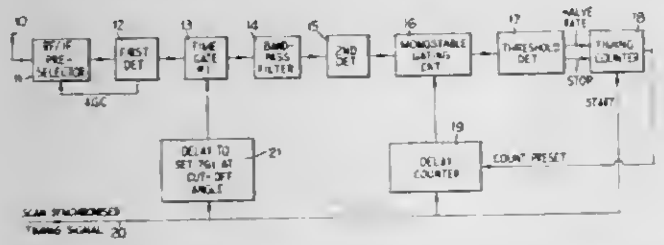
1. A method of selectively interrogating secondary surveillance radar transponders carried by vehicles located within a predetermined ground area for the purpose of identifying and locating those vehicles within that ground area, the method comprising the steps of radiating a first pair of interrogate pulses to cause the transponders located in a band of said area to be interrogated, determining the position of a required one of said transponders, radiating pairs of suppression pulses to cause all but a required one of the transponders in said band to be suppressed, radiating a second pair of interrogate pulses to cause the required one of said transponders to be interrogated and receiving the reply transmitted from the said one transponder for identification and location purposes.

5. Apparatus for selectively interrogating secondary surveil-

lance radar transponders carried by vehicles located within a predetermined ground area for the purpose of identifying and locating those vehicles within that ground area comprising means for radiating a first pair of interrogate pulses to cause the transponders located in a band of said area to be interrogated, means for determining the position of a required one of said transponders, means for radiating pairs of suppression pulses to cause all but a required one of the transponders in said band to be suppressed, means for radiating a second pair of interrogate pulses to cause the required one of said transponders to be interrogated and for receiving the reply transmitted from the said one transponder for identification and location purposes, wherein said means for radiating a first pair of interrogate pulses include first and second aerials, and means for positioning said first and second aerials on the perimeter of the predetermined area in spaced apart relationship, and said means for radiating pairs of suppression pulses include a third aerial, and means for positioning said third aerial on the perimeter of said area.

14. Apparatus for selectively interrogating secondary surveillance radar transponders carried by vehicles located within a predetermined ground area for the purpose of identifying and locating those vehicles within that ground area, comprising means for radiating a first pair of suppression pulses for causing transponders located in a first band of said area to be suppressed for a first predetermined period, means for radiating a second pair of suppression pulses to cause all the remaining transponders located within the predetermined area to be suppressed for a second predetermined period, means for radiating a pair of interrogate pulses after the expiration of said first period but before the expiration of said second period in a second band of said area which is transverse to said first band to be interrogated for causing the transponders located in said second band of said area that is common with said first band of said area to be interrogated, wherein said means for radiating a first pair of suppression pulses comprise first and second aerials, and means for positioning said first and second aerials on the perimeter of the predetermined area in spaced apart relationship, and wherein said means for radiating a pair of interrogate pulses comprise third and fourth aerials, and means for positioning said third and fourth aerials on the perimeter of said predetermined area in spaced apart relationship, and spaced from the first and second aerials.

4,109,249
SCANNING BEAM RECEIVER
Paul Barton, Bishop's Stortford, England, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Feb. 28, 1977, Ser. No. 772,551
Int. Cl.² G01S *1/16, 1/54*
U.S. Cl. 343—108 M **4 Claims**



1. In an air navigation system in which a ground based equipment scans a colimated beam of radio frequency energy over a predetermined sector of space in at least one angular coordinate and also transmits a phase-coherent reference signal offset from the frequency of said beam and a timing signal identifying a corresponding predetemined instantaneous angle of said beam scan and including airborne receiving apparatus for determining a navigational angle within said angular coordinate with respect to said ground station in accordance with the elapsed time between reception of said timing signal and said scanning beam, comprising:

first means comprising a receiver responsive to said phase-coherent, frequency-offset reference signal and to signals of said beam received as said beam scans across the location of said airborne receiving apparatus for coherently detecting said beam signals to produce a first detected signal;

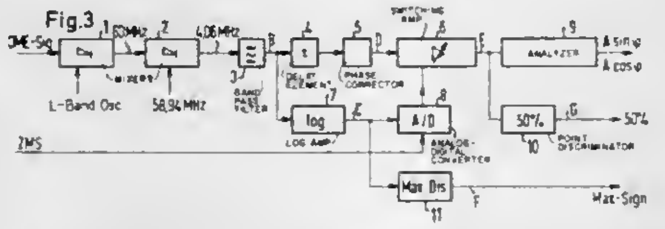
second means within said airborne receiving apparatus responsive to said timing signal for inhibiting the output of said first means for angles of said scanning beam outside a predetermined limit angle;

third means comprising a bandpass filter responsive to said second means for suppressing that portion of the frequency spectrum generated within said first means corresponding to Doppler Components earlier and later in time than that received from the substantial center of said beam, as said beam scans across the location of said airborne receiving apparatus;

and fourth means within said airborne receiving apparatus comprising means for generating a tracking gate surrounding at least the central portion of said beam and for determining the center thereof.

4,109,250
CIRCUIT FOR THE COMPARATIVE VECTOR MEASUREMENT OF RADIO SIGNAL PULSES WHICH ARRIVE APPROXIMATELY SIMULTANEOUSLY IN A PLURALITY OF RECEIVERS
Erwin Vacbenauer, Haar, and Bernd Mueller, Poecking, both of Germany, assignors to Siemens Aktiengesellschaft, Berlln & Munich, Germany
Filed Dec. 23, 1976, Ser. No. 753,884
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1976, 2600687
Int. Cl.² G01S *5/06*
U.S. Cl. 343—112 R **10 Claims**

Fig.3



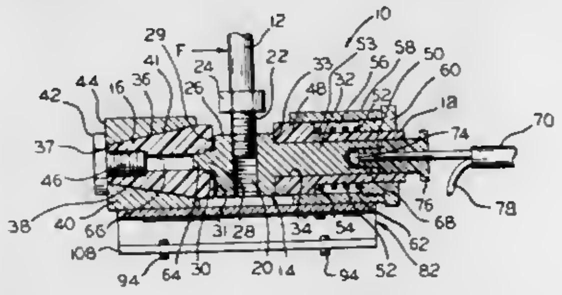
1. In a circuit for the comparative vector measurement of keyed radio signal pulses which can exhibit large level differences, in particular DME pulses which arrive virtually simultaneously at a plurality of receivers in a system of the type wherein, in each receiver the pulses are fed to a switching amplifier having an amplification which can be adjusted in steps and the reduction of which is effected automatically with the rise of the leading edge of the relevant signal pulse, and wherein when the relevant switching amplifier has been passed through by a signal pulse and at a specific measuring time for all the receivers the instantaneous amplitudes and instantaneous phases of the measuring signals are measured, the improvement comprising:

a delay device connected ahead of the switching amplifier for receiving and delaying the signal pulses for a predetermined interval;

a logarithmic amplifier connected to also receive the undelayed signal pulses; and

an analog-digital converter connected to said logarithmic amplifier and to the switching amplifier to adjust the amplification thereof prior to receipt of the delayed signal pulses.

4,109,251
ADJUSTABLE ANTENNA MOUNTING BRACKET
James B. MacDougall, 236 E. Wood St., New Lenox, Ill. 60451
Filed Jul. 8, 1976, Ser. No. 703,615
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—715 **11 Claims**



1. A device for varying the position of an antenna comprising:

a spindle including means for connecting to said antenna and an outward extending rod portion;

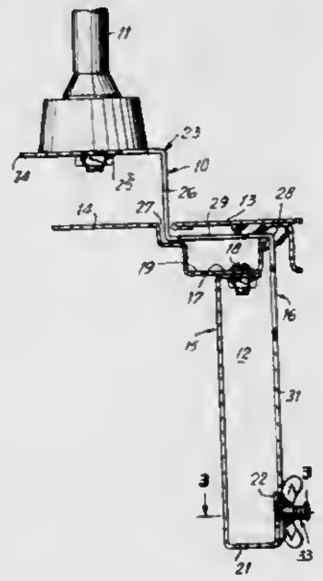
lock means including an end member having a groove formed therein and a lug protruding out from the spindle for engagement with the groove for locking the spindle at the fixed position, the position of the groove determining the fixed position;

a spring for retaining said lug in said groove, said spindle being movable in the direction for compressing said spring when the spindle is in said fixed position, said lug being dis-engaged from the groove upon the application of an external force for sufficiently compressing said spring;

a cylindrical member having an opening for receiving said rod portion and including an outer collar; and

a wall, said spring being positioned between the collar and the wall, the movement of the rod portion toward the spring causing said cylindrical member to move responsively for compressing the spring, for unlocking the spindle from the fixed position to enable said spindle to be rotated away from the fixed position for moving the antenna to a non-operative position.

4,109,252
ANTENNA MOUNT ATTACHED TO VEHICLE TRUNK INTERIOR
Morris Hacker, Bayside, and Dominick Padilla, Bronx, both of N.Y., assignors to RMS Electronics, Inc., Bronx, N.Y.
Filed Aug. 16, 1976, Ser. No. 714,575
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—715 **4 Claims**



1. An antenna mount, which comprises:

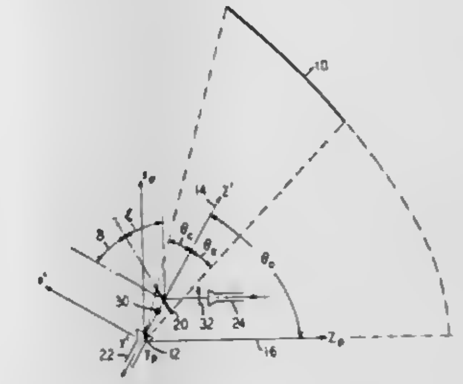
(a) a bracket member to be received within the trunk of a vehicle and having a first mounting flange adapted to be secured to the rain channel of the trunk and a second mounting flange integral therewith adapted to be generally vertically disposed and having at least one rib or groove element extending longitudinally thereof;

(b) a separable mounting member to extend from outside of the vehicle, beneath the closed lid of the vehicle trunk and inside the trunk, and comprising a first, mount section for mounting an antenna outside of the vehicle, and a second, support section having at least one rib or groove element extending longitudinally thereof and adapted to be generally vertically disposed within the vehicle trunk and aligned with the rib or groove element on the bracket member;

(c) bolt means extending through the second mounting flange of the bracket member and the support section of the mounting member; and

(d) nut means for engaging the bolt means and releasably securing the mounting member to the bracket member with the rib and groove elements on the respective mounting flange and support sections thereof engaging one another and thereby preventing both longitudinal and lateral movement of said members relative to one another when the antenna mount is disposed to mount an antenna to the vehicle.

4,109,253
METHOD AND APPARATUS FOR SUBSTANTIALLY REDUCING CROSS POLARIZED RADIATION IN OFFSET REFLECTOR ANTENNAS
Ta-Shing Chu, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Feb. 22, 1977, Ser. No. 770,392
Int. Cl.² H01Q *19/06, 15/22*
U.S. Cl. 343—756 **4 Claims**



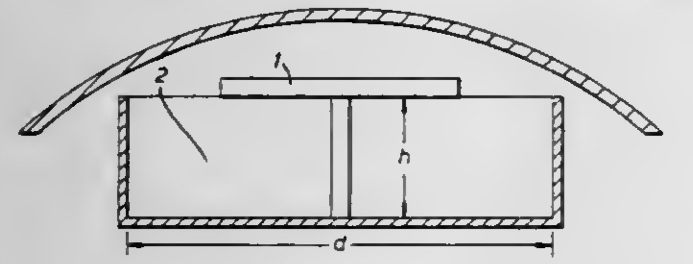
2. A cross polarization suppressed offset antenna arrangement comprising:

a curved focusing offset main reflector which inherently introduces cross polarization components in a beam of polarized electromagnetic radiation when reflecting said beam in either direction between the aperture and a first focal point thereof; and

a polarization grid comprising a plurality of parallel spaced-apart elements disposed both between the offset main reflector and the first focal point along the feed axis of said beam of electromagnetic radiation and at an angle to a plane normal to the feed axis of said beam which approximates one-half of the magnitude of the angle between said feed axis and the axis of the offset main reflector, the elements of the polarizing grid being arranged to pass therethrough the electromagnetic radiation polarized in a first direction and to reflect electromagnetic radiation polarized in a second direction orthogonal to said first direction and propagating in said beam between the main reflector and a second focal point while concurrently introducing cross polarization components which are both approximately equal and of opposite sign to the cross polarization components introduced by said main reflector to effect overall cross polarization cancellation.

4,109,254
DIPOLE RADIATORS FOR FEEDING A PARABOLIC REFLECTOR

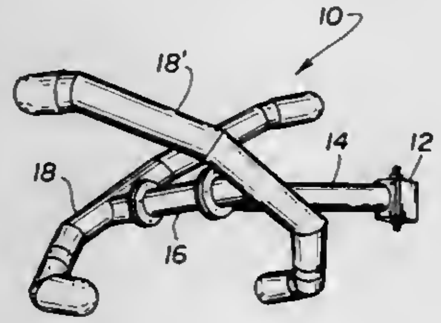
Edmund Wergiliusz Woloszczuk, Chelmsford, England, assignor to The Marconi Company Ltd., Chelmsford, England
Filed Sep. 20, 1976, Ser. No. 724,554
Claims priority, application United Kingdom, Sep. 20, 1975, 38682/75; Dec. 1, 1975, 49345/75
Int. Cl.² H01Q *21/26*
U.S. Cl. 343—797 **13 Claims**



1. A dipole radiator which comprises, in combination:
a shallow cavity presenting a mouth;
two crossed half wave dipole radiators disposed near said mouth of the shallow cavity and each consisting of two elements; and
means for feeding said dipole elements with r.f. energy, said means comprising a metal rod having four longitudinally extending slots therein dividing said rod, for a portion of its length, into four parts, two of said parts being connected to the respective two elements of one of said dipole radiators and the other two of said parts being connected to the respective two elements of the other of said dipole radiators.

4,109,255
OMNIDIRECTIONAL BROADBAND CIRCULARLY POLARIZED ANTENNA

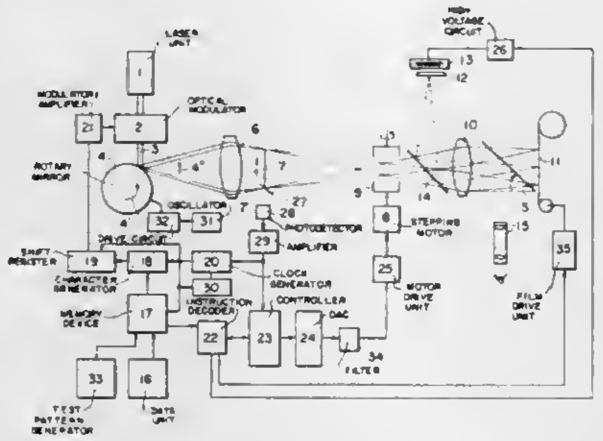
Thomas B. Silliman, 108 Market St., Newburgh, Ind. 47630
Filed Mar. 21, 1977, Ser. No. 779,619
Int. Cl.² H01Q *1/36*
U.S. Cl. 343—853 **5 Claims**



1. A circularly polarized antenna comprising
a first arcuate half loop radiating element approximately λ/2 in length;
a second arcuate half loop radiating element approximately λ/2 in length; each of said radiating elements consisting of a long hollow electrically conductive member and a short hollow electrically conductive member isolated from each other by an insulator;
radiating element coaxial feed line means within each said long conductive member having a center conductor electrically connected to said short conductive member;
said half loops positioned with their mid points opposite each other and the ends of the half loops oriented inwardly relative to a circumscribing cylinder, the plane of said half loops being at an angle to each other; and
means for feeding said center conductors 180° out of phase.

4,109,256
LASER COMPUTER OUTPUT MICROFILMER

Masahiro Ohnishi, Asaki, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 12, 1977, Ser. No. 796,281
Int. Cl.² G03B *41/00;* G01D *9/42*
U.S. Cl. 354—4 **4 Claims**



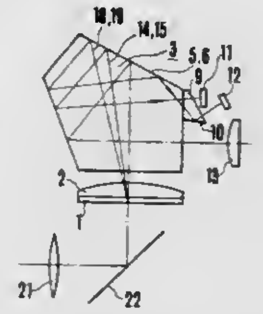
1. In a laser driven computer output microfilmer including a laser source, means for modulating the intensity of the output beam from the source in accordance with an input data pattern, a first rotatable mirror for repetitively deflecting the modulated beam in a first scanning direction, a second rotatable mirror for deflecting the beam in a second scanning direction, means for synchronizing the rotation of the second mirror with that of the first mirror, whereby the output beam is doubly deflected in a full frame scanning mode, and means for recording the modulated and doubly deflected output beam on a recording medium, means for monitoring the optical registration, focusing, intensity, of the beam, comprising:
a. step-operable drive means coupled to said second mirror,
b. means for generating a test pattern signal defining character images occupying only a portion of the full scanning frame, said signal including an instruction signal for controlling said drive means in a multi-step manner to skip the beam over the remaining, unoccupied portion of the frame,
c. means coupling said test pattern signal to said intensity modulating means,
d. means coupling said instruction signal to said drive means, whereby a partial frame test pattern is repetitively displayed at an increased frame scan rate, and
e. optical means for viewing said displayed test pattern.

4,109,257
REFLEX CAMERA WITH A BUILT-IN EXPOSURE METERING APPARATUS

Youichi Okuno, Yokohama; Takehiko Kiyohara, Zama; Tokuichi Tsunekawa, Yokohama, and Teiji Hashimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo
Continuation of Ser. No. 579,879, May 22, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,368
Claims priority, application Japan, May 31, 1974, 49-61542
Int. Cl.² G03B *7/00*
U.S. Cl. 354—23 R **7 Claims**

1. A single lens reflex camera which comprises:
an objective lens;
a focusing screen on which an image of an object is formed by said objective lens;
a pentagonal roof prism which has a entrance surface, two roof surfaces, a front reflection surface and an exit surface;
an eyepiece facing the exit surface of the pentagonal roof prism;

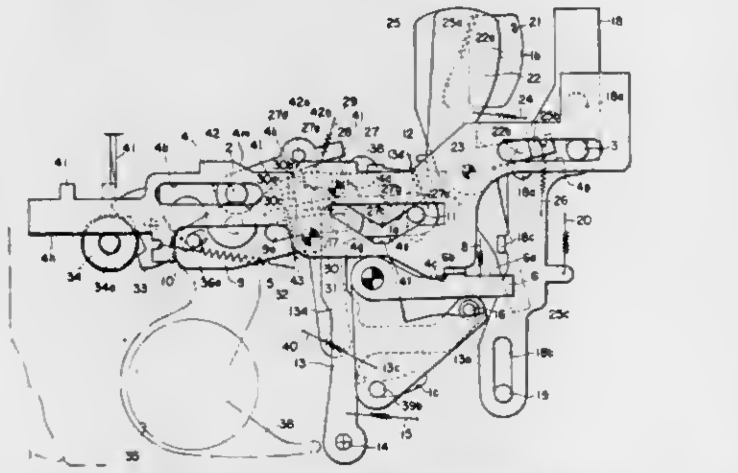
an optical means having a first surface, a second surface and a third surface, said third surface being a total reflection surface, said first surface being cemented on the upper portion of the exit surface of the pentagonal roof prism, so that a light beam entering the entrance surface of the pentagonal roof prism from the focusing screen and reflected by the roof surfaces, the front reflection surface and again said roof surfaces to said upper portion of the exit surface of the pentagonal roof prism at an angle of total reflection can pass said exit surface of the pentagonal roof prism, and wherein said light beam having passed the exit surface of the pentagonal roof prism is reflected by



said third surface of said optical means, said second surface having no total reflection angle with respect to a light beam coming from said third surface of said optical means and wherein a light beam entering the entrance surface of the pentagonal roof prism from the focusing screen and reflected by the roof surfaces and the front reflection surface to said upper portion of the exit surface of the pentagonal roof prism is passed through said first and second surfaces directly; and
photo detecting means to which a light beam passing through said second surface of the optical means is directed.

4,109,258
SHUTTER FOR CAMERAS

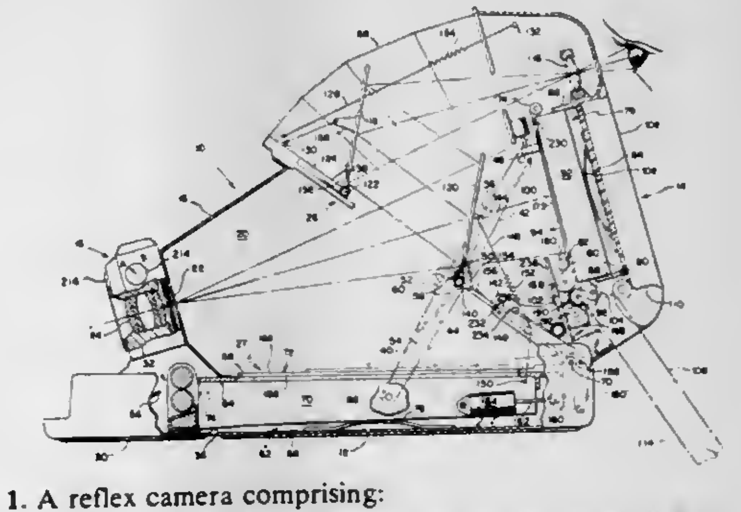
Kunio Arisaka, Urawa, and Hiroyuki Harada, Kawaguchi, both of Japan, assignors to Copal Company Limited
Filed Jan. 18, 1977, Ser. No. 760,425
Claims priority, application Japan, Jan. 20, 1976, 51-5190; Jan. 26, 1976, 51-7466[U]; Jan. 29, 1976, 51-9191[U]
Int. Cl.² G03B *7/08, 9/08*
U.S. Cl. 354—38 **9 Claims**



1. A shutter for cameras comprising: shutter blades which are also diaphragm blades; a driving member movable between cocked and uncocked positions and capable of moving at a constant speed upon release of the shutter; an intermediate lever member operatively connected with said driving member and with said shutter blades, said intermediate lever member having a shiftable pivot thereon for determining the operated amount of said shutter blades; a clutch pawl lever member pivoted on said driving member and engaged with said intermediate lever member; and a judging lever member pivoted on said driving member and engageable with said clutch pawl lever member whereby said intermediate lever member is reciprocated to open and close said shutter blades by said clutch pawl lever member being locked by said judging lever member when said driving member is moved from its cocked position to its uncocked position following shutter release, said judging lever member being disengaged from said clutch pawl member so that said intermediate lever member may be held in an immovable state when said driving member is moved from its uncocked position to its cocked position.

4,109,259
EXPOSURE PREVENTING SHADE

Fred P. Tarr, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jun. 29, 1977, Ser. No. 810,935
Int. Cl.² G03B *17/50*
U.S. Cl. 354—86 **4 Claims**



1. A reflex camera comprising:
means for locating a film cassette having an exposure aperture in position for exposure of a film unit contained therein;
means for initiating an exposure cycle;
means for light shielding the film unit during viewing of a subject to be photographed, said light shielding means includes an opaque shade having an exposure aperture therein, said opaque shade being mounted closely adjacent said locating means for movement between a first position wherein it covers and prevents exposure of the film unit and a second position wherein said exposure aperture in said opaque shade is located in alignment with an exposure aperture in the film cassette, said movement into said second position being in response to actuation of said exposure initiating means;
a pair of elongate rollers mounted adjacent said locating means, said rollers being mounted in position to receive the film unit therebetween as it is being advanced from its exposure position within the film cassette, following exposure, and spread a processing fluid across a photosensitive element of the film unit;
means for driving at least one of said rollers; and
means coupled to said driving means and said light shielding means for moving the shade from said second position to said first position as the exposed film unit is being advanced away from said exposure position by said rollers

4,109,260

SUPERIMPOSING DEVICE FOR USE IN A DATA-RECORDING CAMERA

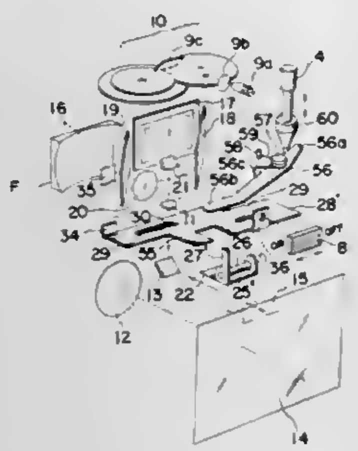
Susumu Fujita; Yoichi Hamada, both of Kobe, and Makoto Kuboshima, Sagamihara, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Nov. 17, 1977, Ser. No. 852,188

Claims priority, application Japan, Nov. 19, 1976, 51-139668; Nov. 19, 1976, 51-155911[U]

Int. Cl.^{2} G03B *13/02, 17/24*

U.S. Cl. 354—106 **10 Claims**



1. A superimposing device for use in a data-recording camera including a shutter mechanism for interposing data on a film over an image of an object comprising:

- a source of light which produces a light image of said data;
- means for defining a first optical path for projecting a light image of an object on the film surface upon release of said shutter mechanism employed in the camera;
- means for defining a second optical path for projecting said data light image on said film surface at a predetermined portion thereof upon release of said shutter mechanism;
- blocking means provided adjacent said film surface and means for changing the condition of said blocking means between a blocking condition, in which said blocking means intercepts said first and second optical path light images to block the light directed to said predetermined portion of said film surface, and an open condition, in which said blocking means is released from blocking said first and second optical paths; and
- means for causing said blocking means to change to said blocking condition before the exposure of said light image of the object on said film surface for preventing said predetermined portion of said film which is constituting a background of the data from being exposed by the light image of the object so that the data is clearly formed in said predetermined portion of said film.

4,109,261

CAMERA FOR TAKING THREE DIMENSIONAL PHOTOGRAPHS

Chi Y. Law, 7845 Cambie St., Vancouver, Canada

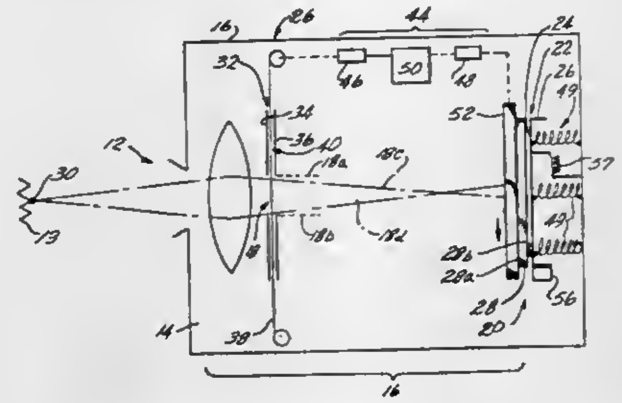
Filed Feb. 3, 1977, Ser. No. 765,230

Int. Cl.^{2} G03B *35/00*

U.S. Cl. 354—112 **10 Claims**

1. A photographic camera for three dimension photography comprising:

- a housing having an opening to the interior for light rays;
- means for immovably locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;
- optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong extending transversely to the direction of the path from a first side to a second side of the path, the optical means comprising
  - a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements of width P which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact with the surface of such located photosensitive material,
- the optical means being characterized in that it changes, by a predetermined distance Y, on such surface of the photosensitive material, the position of light rays which come from a substantially common point on such scene and which extend along said first and second sides of said path;



- means for blocking the received light rays at said first position;
- an aperture movable transversely across said path at said first position, from said first side to said second side, for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements; and
- means for so moving said aperture for a predetermined time for exposure while simultaneously and synchronously moving said screen, substantially throughout said predetermined time for exposure, in substantially the same direction as the light rays sequentially expose said photosensitive material and over a distance substantially equal to the sum of P + Y to thereby expose a substantially continuous unreversed image of the scene on the photosensitive material.

4,109,262

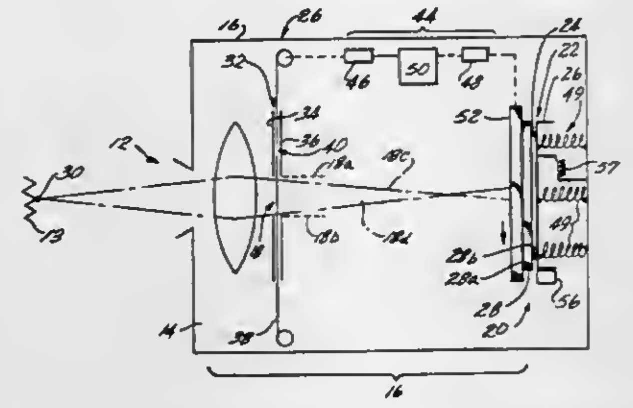
THREE DIMENSIONAL CAMERA HAVING LENTICULAR SCREEN MOVING APPARATUS

Chi Y. Law, 7845 Cambie St., Vancouver B.C., Canada (V6P 3J1)

Filed Feb. 3, 1977, Ser. No. 765,232

Int. Cl.^{2} G03B *35/00*

U.S. Cl. 354—112 **25 Claims**



1. A photographic camera for three dimension photography comprising:

- a housing having an opening to the interior for light rays;
- means for immovably locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;
- optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong extending transversely to the direction of the path from a first side to a second side of the path, the optical means comprising
  - a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements of width P which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact with the surface of such located photosensitive material,
  - the optical means being characterized in that it changes, by a predetermined distance Y, on such surface of the photosensitive material, the position of light rays which come from a substantially common point on such scene and which extend along said first and second sides of said path;
- means for blocking the received light rays at said first position;
- an aperture movable transversely across said path at said first position, from said first side to said second side, for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements; and
- means for so moving said aperture for a predetermined time for exposure, while simultaneously and synchronously moving said screen, substantially throughout said predetermined time for exposure, in substantially the same direction as the light rays sequentially expose said photosensitive material and over a distance substantially equal to the sum of P + Y to thereby expose a substantially continuous unreversed image of the scene on the photosensitive material;
- said means for locating comprising means for applying a substantially uniform pressure, over at least the portion of said photosensitive material for exposure, against said lenticular screen for maintaining uniform contact therebetween;
- said means for moving comprising means for moving said screen relative to said photosensitive material, initially prior to the exposure time, to thereby cause any deformations of the photosensitive material to be smoothed out prior to the exposure time.

4,109,263

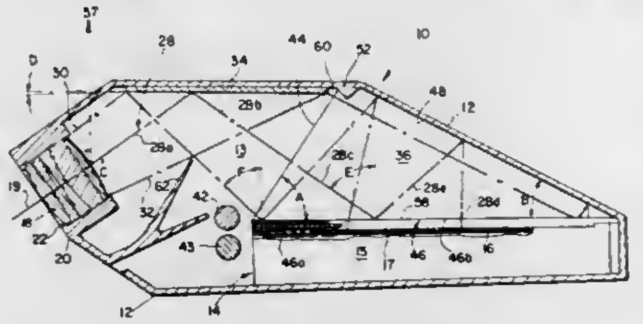
COMPACT PRISM CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1976, Ser. No. 720,004

Int. Cl.^{2} G03B *17/17*

U.S. Cl. 354—150 **30 Claims**



1. A compact camera for producing an image of an object on film having its photosensitive surface coincident with a film plane, said camera comprising:

- a housing that encloses an exposure chamber;
- lens means mounted on said housing for focusing at said film plane light from within a selected angular field of view; and
- prism means located within said exposure chamber for forming a folded optical path between said lens means and said film plane and having a first face in light receiving optical alignment with said lens means, a second face that overlies and is closely spaced from said film plane and forms a first angle with respect to said first face, said second face being in optical alignment with said first face for receiving and redirecting at least partially by total internal reflection light incident along said optical path on said first face, and a third face that forms an acute second angle with respect to said second face, said first angle being greater than said second angle, said third face being in optical alignment with said second face for receiving and reflecting said internally reflected light onto said second face for transmission through said second face to said film plane.

4,109,264

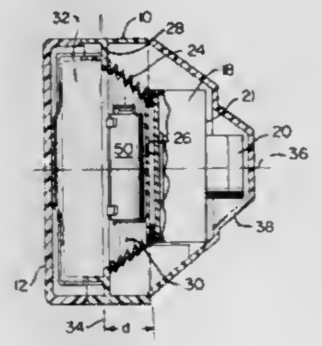
BATTERY MOUNT FOR COLLAPSIBLE CAMERAS

Donato F. Pizzuti, Saugus, and Irving S. Lippert, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1976, Ser. No. 719,840

Int. Cl.^{2} G03B *17/04*

U.S. Cl. 354—187 **4 Claims**

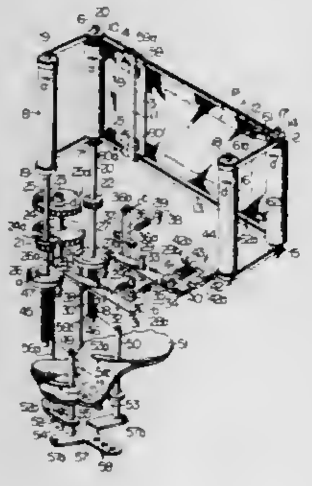


1. A photographic camera comprising:

- a film housing having front and rear faces and including a displaceable rear cover for facilitating the insertion of a film pack into, and its subsequent removal from, said film housing;
- a shutter housing assembly having front and rear faces and containing means including electrical equipment for exposing film, said assembly including a central lens aperture opening through the rear face thereof;
- means for supporting said shutter housing assembly for movement between an extended operative position spaced with respect to said film housing and a retracted position located towards said film housing from said operative position; and
- a collapsible bellows to establish a light-tight chamber between the rear face of said shutter housing assembly and the front face of said film housing;
- said shutter housing assembly including means for supporting an elongated electric battery within said chamber with the battery extending parallel to the film plane of said camera and in fixed relation to, and closely adjacent, said rear face of said shutter housing assembly, the batteries and said battery supporting means being spaced forwardly of but immediately adjacent the camera's film plane when said shutter housing assembly is in its said retracted position so that the batteries are immediately visible and directly accessible at such times as said displaceable cover is opened, said battery supporting means comprising:
  - a frame secured by a light-tight seal about the periphery thereof to said bellows, said frame defining a rearwardly projecting light baffle about said lens aperture

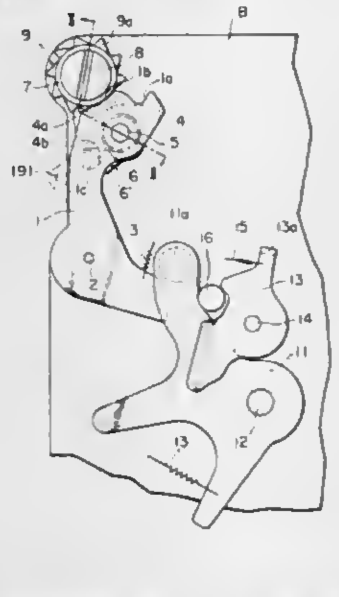
and a pair of battery nests on opposite sides of said light baffle;
- a fixed bus strip positioned beyond said light baffle at one end of and extending between said nests, and a battery terminal at the other end of each of said nests;
- fixed battery retaining brackets respectively located adjacent one end of each said nest to retain one end of a battery positioned in each of said nests; and
- a releasable clip positioned beyond said light baffle at said other end of each said nest to retain the opposite ends of batteries positioned therein, said releasable clip comprising a one-piece pivotable member having a bar portion supporting a pair of ring-like battery engaging portions at opposite ends thereof.

4,109,265
FOCAL PLANE SHUTTER
Akihiko Hashimoto, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Dec. 15, 1976, Ser. No. 750,822
Claims priority, application Japan, Dec. 25, 1975, 50-155296; Dec. 25, 1975, 50-155297
Int. Cl.² G03B *9/28*
U.S. Cl. 354—244 **11 Claims**



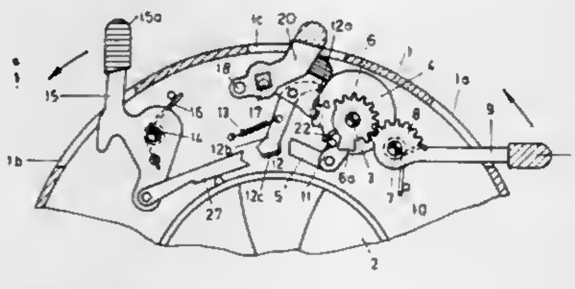
1. A focal plane shutter comprising:
- a first and a second shutter blind;
- a first take-up drum and a first winding drum supporting first and second ends of said first blind, respectively;
- a second take-up drum and a second winding drum supporting first and second ends of said second blind, respectively;
- a first blind winding pinion and a second blind winding pinion mounted on said first blind winding drum and said second blind winding drum, respectively, for integral operation with said first blind winding drum and said second blind winding drum, respectively;
- means for driving said first blind winding pinion and said second blind winding pinion in a shutter winding direction responsive to a shutter charging operation;
- said drive means comprising a first and a second shutter winding sector shaped gear adapted to rotate into meshing engagement with said first and said second blind winding pinions, respectively, in response to a shutter charging operation, each of said sector-shaped gears having a predetermined orientation prior to the initiation of a shutter charging operation;
- each of said first and second sector-shap gears having a gap formed therein, said gap in said first gear and said gap in said second gear formed at a location which is opposite to said first and second winding pinions, respectively, when said first and second gears are in said predetermined positions, whereby said first and second gears are maintained out of meshing engagement with said first and second pinions, respectively, when a shutter charging operation does not take place, said gears being positioned such that said first blind winding pinion precedes said second blind winding pinion in rotation when a shutter charging operation is initiated.

4,109,266
BRAKING MECHANISM FOR FOCAL PLANE SHUTTERS
Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Japan
Filed Apr. 18, 1977, Ser. No. 788,657
Claims priority, application Japan, Apr. 19, 1976, 51-49110[U]
Int. Cl.² G03B *9/40, 9/08*
U.S. Cl. 354—246 **6 Claims**



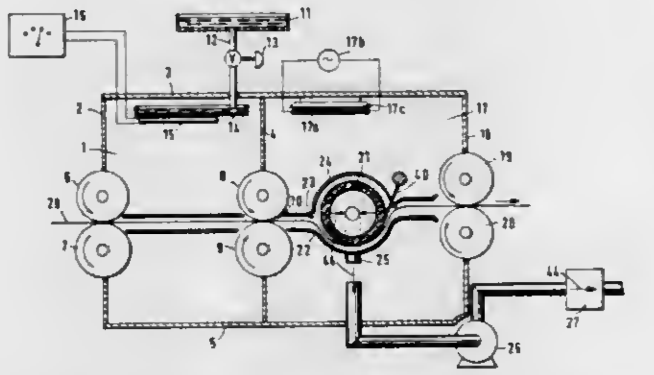
1. A braking mechanism for focal plane shutters comprising a shutter base plate, a shutter blade actuating member supported rotatably on said base plate to run shutter blades, a brake operating member supported rotatably on said blade actuating member and capable of taking its operating position and its non-operating position, a brake wheel supported rotatably with a friction on said base plate and having thereon a plurality of engaging portions engageable with said brake operating member, and a stopper provided on said base plate to end the operation of said shutter blade actuating member, said brake operating member being engaged with said brake wheel to apply a braking force to said shutter blade actuating member a little before said shutter blade actuating member collides with said stopper.

4,109,267
SHUTTER CONTROL APPARATUS FOR CAMERA DEVICES
Richard Theurer, Hofen (Enz), Fed. Rep. of Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Fed. Rep. of Germany
Filed Mar. 25, 1976, Ser. No. 670,322
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514169
Int. Cl.² G03B *9/66*
U.S. Cl. 354—266 **18 Claims**



11. Operating means for use with a control means to open and close the blades of a camera shutter mechanism in a housing, which comprises:
- a manually actuatable first operating member movable for cocking the camera shutter blade control means and provided with an observable first portion external to the housing,
- a manually actuable second operating member movable for releasing the camera shutter blade control means and provided with an observable second portion external to the housing,
- a pair of opposed separate axle means upon which the first and second operating members are respectively adapted to rotate for movement for correspondingly cocking and releasing the shutter blade control means,
- respective return spring means individually actuatable after the corresponding cocking and releasing movement to return the first and second operating members to their original positions,
- observable indicating means movable into one or the other of two indicating states in accordance with the actuation of one or the other of the operating members, and
- observable associated coding means concordantly provided between the individual indicating states of the indicating means and the corresponding operating members, including a first coding on the first portion of the first operating member external to the housing and on the indicating means in concordance with one of the indicating states thereof and a second coding on the second portion of the second operating member external to the housing and on the indicating means in concordance with the other of the indicating states thereof, for thereby providing an observable concordant indication of the state of the shutter mechanism.

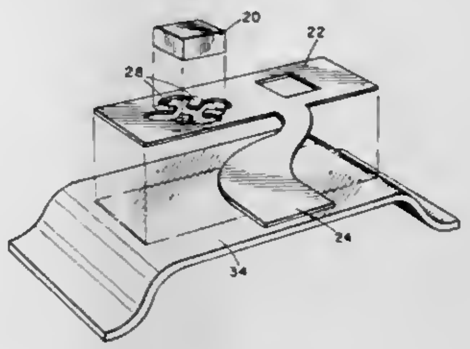
4,109,268
APPARATUS FOR DEVELOPING A PHOTOSENSITIVE MATERIAL USING A VAPOROUS AMMONIA-CONTAINING DEVELOPER
Herbert Schröter, Taunusstein, and Eckehard Stein, Frankfurt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed Apr. 13, 1977, Ser. No. 787,273
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616812
Int. Cl.² G03D *7/00*
U.S. Cl. 354—299 **14 Claims**



1. In a diazo copier comprising a first developing chamber for developing a diazo material employing an ammonia-containing vaporous developer, a second chamber adjacent an output aperture of the first developing chamber, a source of heat and a suction device for drawing off developer escaping from the second developing chamber through an output aperture and for removing developer from the diazo material,

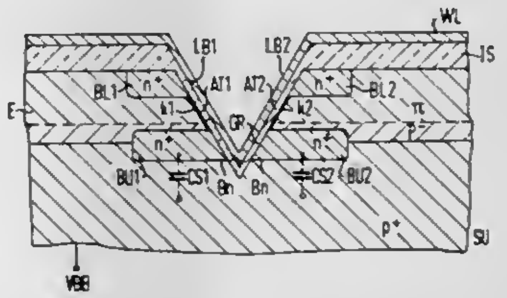
the improvement comprising a rotatably mounted porous hollow roller means forming part of said suction device positioned in said second chamber, suction duct means connected to said roller means, and there being no heat-conducting means between the source of heat and transport means provided for bringing the copying material in contact with the hollow suction roller means.

4,109,269
OPTO-COUPLER SEMICONDUCTOR DEVICE
John Alva Hatch, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Dec. 27, 1976, Ser. No. 754,339
Int. Cl.² H01L *31/12*
U.S. Cl. 357—19 **3 Claims**



1. An opto-coupler semiconductor device comprising in combination:
- a support member,
- a sensor integrated circuit mounted on said support member,
- a conducting tape having an aperture therethrough,
- a light emitting diode positioned and mounted on said conducting tape for directing light through said aperture in said conducting tape,
- a transparent spacing and mounting tape having an adhesive on both sides thereof extending over said sensor integrated circuit and mounting said light emitting diode on said sensor integrated circuit so that said light emitting diode is aligned with and accurately spaced from said sensor integrated circuit for directing light thereto.

4,109,270
SEMICONDUCTOR STORE
Paul Werner voo Basse, Wolfratshausen, and Rüdiger Hofmann, Muncih, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Apr. 22, 1977, Ser. No. 789,953
Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619713
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **5 Claims**



1. A semiconductor store comprising a semiconductor substrate of a highly doped semiconductor material of one conductivity type, an epitaxial layer on one surface of said substrate of the same conductivity type and of low doping, a buried layer lying partly in said substrate and partly in said epitaxial layer, said buried layer being of the pposite conductivity type and of high doping, a highly doped second layer of the same conductivity type as said buried layer in the outer surface of said epitaxial layer, a V-shaped groove extending through said second layer, said epitaxial layer and through said buried layer and penetrating into said substrate, an insulating

layer covering said epitaxial layer and the walls of said V-shaped groove, a layer of conductive material covering said insulating layer, in each side of said groove there being arranged a selector transistor which consists of a sub-portion of said buried layer, a sub-portion of said second layer and a conductor path portion of said conductor path, and said storage capacitor which is connected to said selector transistors consisting of a blocking layer which is formed by a sub-portion of said buried layer and said semiconductor substrate.

4,109,271

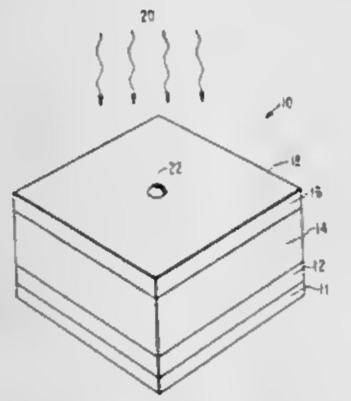
AMORPHOUS SILICON-AMORPHOUS SILICON CARBIDE PHOTOVOLTAIC DEVICE

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1977, Ser. No. 801,239

Int. Cl.² H01L *27/14*

U.S. Cl. 357—30 **13 Claims**



1. A photovoltaic semiconductor device comprising:

a first layer of amorphous silicon prepared by a glow discharge in silane and a doping gas, said first layer being of one conductivity type:

a second layer of amorphous silicon prepared by a glow discharge in silane contiguous to said first layer, said second layer being substantially intrinsic;

a third layer of amorphous silicon carbide prepared by a glow discharge in a mixture of silane, a hydrocarbon and doping gases contiguous to said second layer and spaced opposite said first layer, said third layer having an incident surface opposite said second layer on which solar radiation is capable of impinging, said third layer being of a conductivity type opposite that of said first layer and having a bandgap energy in the range of about 2.2 eV to 3.2 eV;

a substrate contiguous to and electrically contacting said first layer; and

means for electrically contacting said third layer.

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LATERAL BIPOLAR TRANSISTOR

Heiner Herbst, Haar, and Ruediger Mueller, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,780

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529951

Int. Cl.² H01L *27/12, 29/06, 29/72*

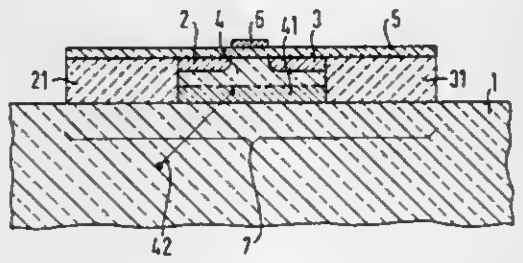
U.S. Cl. 357—35 **8 Claims**

1. A lateral bipolar transistor comprising:

(a) a silicon film epitaxially deposited on an electrical insulating substrate;

(b) a portion of said silicon film forming a base zone of first conductivity type therein, said base zone portion of the silicon film having at a surface thereof a laterally extending emitter zone of depth less than the base zone and of second conductivity type and a laterally extending collector zone of depth less than the base zone and of second conductivity type providing increased emitter and collector junction surfaces with respect to said base;

(c) a highly doped zone of first conductivity type having a higher impurity concentration than said base zone arranged below and in contact with said base zone and below said laterally extending emitter and collector zones at a boundary between said silicon film and the electrical insulating substrate for reducing minority carrier recombination at the insulating substrate; and



(d) an emitter terminal zone connected to the emitter zone and a collector terminal zone connected to the collector zone, said terminal zones having the same conductivity type as said emitter and collector zones and having a depth at least as great as the base zone.

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CONTACT ELECTRODE FOR SEMICONDUCTOR COMPONENT

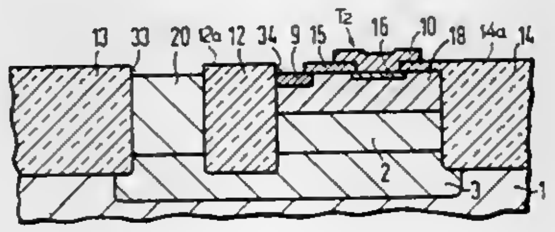
Andreas Glasl, Haar, and Helmuth Murrmann, Ottobrunn, both Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 603,938, Aug. 12, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 811,267

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1974, 2439408

Int. Cl.² H01L *29/72, 27/02, 27/12*

U.S. Cl. 357—35 **1 Claim**



1. In a semiconductor device comprised of at least two zones of different conductivity type, each of which is provided with at least one electrode for an integrated circuit, the improvement comprising:

wherein one electrode is an emitter electrode consisting of an initially undoped polycrystalline silicon which is subsequently implantation or diffusion doped;

an emitter zone located below and contiguous with said emitter electrode, said emitter zone having a penetration depth in the range of about 0.2 to 0.7 μm;

a base zone located at least partially below said emitter zone and spaced from said emitter electrode, said base zone having a penetration depth in the range of about 0.2 to 0.7 μm;

a collector zone located below and contiguous with said emitter zone;

a buried layer located at least partially below and partially contiguous with said collector zone;

a pair of spaced-apart oxide layers having face surfaces located perpendicularly to the plane containing said emitter electrode, said spaced-apart oxide layers abutting to side surfaces of said base zone and side surfaces of said collector zones, at least one of said spaced-apart oxide layers abutting to a side surface of said emitter zone; and

a relatively highly conductive zone located between said emitter electrode and one of said spaced-apart oxide layers and in contact with said buried layer.

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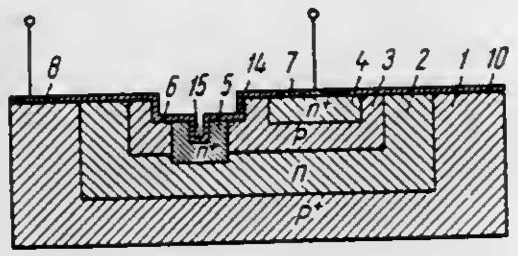
SEMICONDUCTOR SWITCHING DEVICE WITH BREAKDOWN DIODE FORMED IN THE BOTTOM OF A RECESS

Nikolai Mikhailovich Belenkov, Teply stan, mikroraion 6, korpus 93, kv. 236; Anatoly Ivanovich Kurnosov, prospekt Mira, 190a, kv. 20, and Evgeny Efremovich Malitsky, ulitsa Begovaya, 15, kv. 9, all of Moscow, U.S.S.R.

Filed Jan. 8, 1976, Ser. No. 647,360

Int. Cl.² H01L *29/74, 29/06*

U.S. Cl. 357—38 **4 Claims**



1. A semiconductor switching device which has a semiconductor crystal comprising: a first base region of a certain conductivity type; a second base region of a conductivity type opposite to said first base region that is disposed in said first base region and extends mainly on one of the basic surfaces of the crystal; a first additional region of the same conductivity type as said first base region disposed in the second region, extending on the same surface; a second additional region of the same conductivity type as said first base region, disposed in the second region at the bottom of a first recess provided in said main surface of the crystal so that it has no contact with lateral walls of the recess, at least a part of said second additional region being disposed in said first base region, adjacent to said second base region, the concentration of the impurity on the surface of said second additional region being higher than that of said first base region, said second additional region and said first base region being of one conductivity type, and a second recess being provided within the bottom of said first recess in the additional region, the lateral walls of said second recess having no contact with the boundaries of said second additional region.

4,109,275

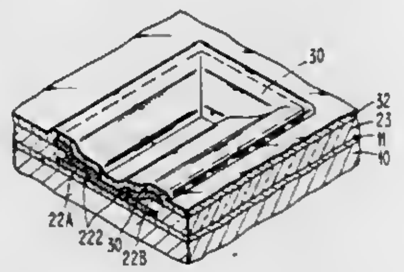
INTERCONNECTION OF INTEGRATED CIRCUIT METALLIZATION

Homi G. Sarkary, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,240

Int. Cl.² H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **20 Claims**



1. In a semiconductor integrated circuit array comprising a semiconductor substrate, a dielectric layer on said substrate, a plurality of semiconductor devices integrated in said substrate, and an electrical conductor pattern on said layer electrically connected to at least one of said devices, the improvement comprising

(A) at least one selected discrete region of said pattern comprising a plurality of spaced portions for electrical connection to each other wherein said portions coextend over and on an imperforate portion of said layer,

(B) a dielectric coating over said conductor pattern and said layer,

(C) a via opening through said coating extending to and terminating short of said layer, with said via opening in register with the gaps between said portions exposing adjacent segments thereof intermediate and spaced from the outermost lateral edges of said conductor portions, and

(D) a second conductor pattern extending through said via holes in electrical contact with said segments, including top surface portions thereof, and in dielectric insulated relationship to said substrate in the area of said gap between said portions.

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MEMORY READ/WRITE ORGANIZATION FOR A TELEVISION SIGNAL PROCESSOR

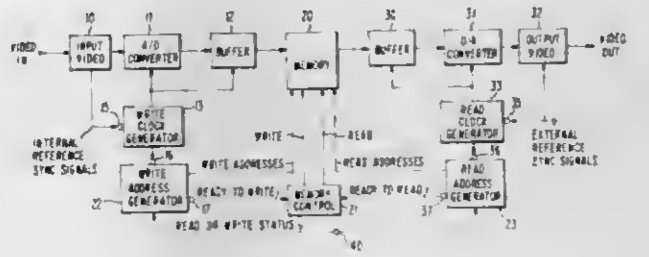
Robert Sherman Hopkins, Jr., Marlton; Arthur James Banks, Cherry Hill, and Robert Adams Dischert, Burlington, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,949

Claims priority, application United Kingdom, Mar. 19, 1976, 11113/76

Int. Cl.² H04N *5/78, 9/46*

U.S. Cl. 358—4 **3 Claims**



1. Television signal synchronizer apparatus for providing field conversions between an input video signal and an output video signal, said input and output video signals being non-synchronous, comprising:

input and output video processing means adapted to be coupled to memory storage means;

a source of independent reference signals having a non-variant field sequence;

memory control means including memory input means for writing said input video signal into said memory storage means and memory output means for reading said output video signal out of said memory storage means;

means for developing field identification signals from one of said input video signal or said independent reference signal;

means for developing a source of field conversion signals from said field identification signals and said non-variant field sequence signal, and

delay means coupled to said memory input and said memory output means responsive to said source of field conversion signals and said field identification signals for modifying the writing and reading of data in and out of said memory storage means so as to provide field conversions consistent with said non-variant field sequence.

4,109,277

APPARATUS FOR READING A RECORD CARRIER

Eric Christian Schylander, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 653,082, Jan. 28, 1976, abandoned. This application Jan. 13, 1977, Ser. No. 759,059
Claims priority, application Netherlands, Oct. 17, 1975, 7512186
Int. Cl.^{2} H04N *5/78*
U.S. Cl. 358—8 **10 Claims**

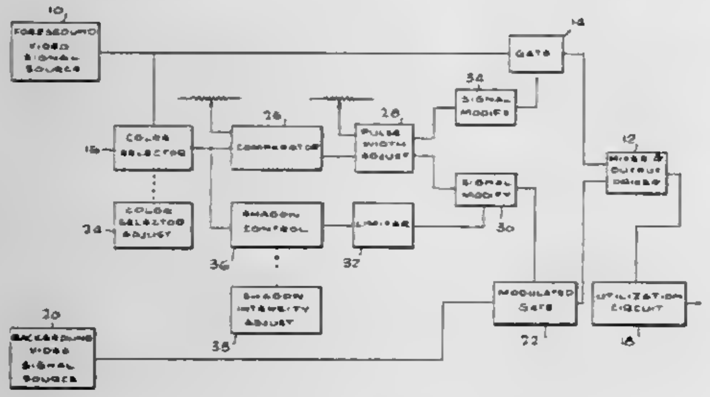
1. An apparatus for reading a record carrier on which a television signal is recorded, said signal comprises horizontal synchronizing pulses and burst signals which are coupled to these horizontal synchronizing pulses, said burst signals consisting of a number of periods of a carrier wave with a frequency which is an integral multiple of half the line frequency, said read apparatus comprising a time error correction device for correcting time errors in the read-out television signals, a time error detector means for detecting said time errors and for supplying a corresponding control signal to the time error correction device, said time error detector means comprising a keying signal generator means triggered by the horizontal synchronizing pulses for supplying a keying signal having a predetermined phase relationship with said horizontal synchronizing pulse, said phase relationship being such that the beginning of the keying signal each time lies within the time interval occupied by the burst signal, a zero passage detector means for detecting the first zero passage of the burst signal which appears after the beginning of said keying signal, a measuring circuit means for measuring the time interval between the beginning of this keying signal and the next zero passage of the burst signal which is detected and for supplying a corresponding correction signal, said keying signal generator means further comprising means for adjusting the phase of the keying signal relative to the horizontal synchronizing pulse depending on the correction signal.

4,109,278

VIDEO TRAVELING MATTE SYSTEM

James A. Mendrala, San Fernando, and Harold L. Peterson, Hollywood, both of Calif., assignors to Sonex International Corp., Burbank, Calif.

Filed Mar. 21, 1975, Ser. No. 560,583
Int. Cl.^{2} H04N *9/535*
U.S. Cl. 358—22 **34 Claims**



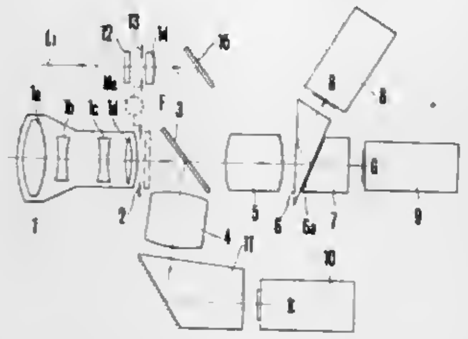
1. In an arrangement in which the video signal from a first source is processed and thereafter compared with a reference in comparator means to generate generally squarewave pulses, the pulses controlling the relative gating of the video signal from the first source and a video signal from a second source to an output, the improvement comprising means for increasing the width of each pulse generated by the comparator means by a selected amount to prevent formation of a matte outline in a composite image generated by the video signals from the first and second sources, and means associated with the means for increasing the width of the pulse controlling the width increase to a selected amount sufficient to expand an image created from one of said signals into a region normally occupied by the matte outline.

4,109,279

TELEVISION CAMERA OPTICS WITH A LIGHT GUIDE FOR CAMERA ADJUSTMENT

Ryusbo Hirose, Machida, and Kotaro Wakui, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha and Nippon Hoso Kyokai, both of Tokyo, Japan

Continuation of Ser. No. 689,912, May 25, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,207
Claims priority, application Japan, May 28, 1975, 50/63891
Int. Cl.^{2} H04N *9/09;* **G02B** *27/14*
U.S. Cl. 358—55 **9 Claims**



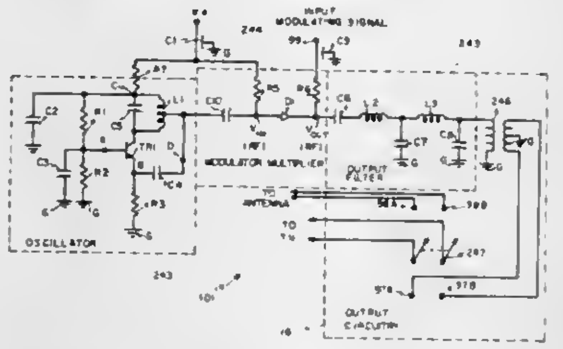
1. A television camera optical system for viewing a scene and having a light guide for camera adjustment comprising:
(a) a television lens group including a front lens group,
(b) a plurality of photo-detecting means,
(c) a color separation means positioned substantially between said front lens group and said photo-detecting means,
(d) a primary shading means positioned on the object side of said color separation means and receiving light from the scene through said front lens group.
(e) a light guiding path outside said television lens group for transmitting light from the scene and in which a transparent means and an adjustable secondary shading means are positioned, and
(f) a beam splitting means positioned on the image side of said primary shading means at a location substantially coincident with a point of intersection of the optical axis of said light guiding path and said television lens group.

4,109,280

TELEVISION INTERFACE DEVICE

Glen R. Dash, Watertown, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 28, 1976, Ser. No. 700,647
Int. Cl.^{2} H04N *7/10, 5/44;* **H04B** *1/06*
U.S. Cl. 358—86 **9 Claims**



9. An interface device for use in connection with a television receiver and operable to connect a local RF signal to the receiver, that comprises, in combination: oscillator means to produce said local RF signal; and diode multiplier means comprising a diode connected to receive at its output or cathode an input sync pulse and video modulation that form a composite video signal that serves as a modulating signal and to receive at its input or anode the local RF signal and being operable to multiply the two to effect modulation of the RF signal by said modulating signal, said diode multiplier means further including a resistor connected between the input of the modulating signal and said output or cathode.

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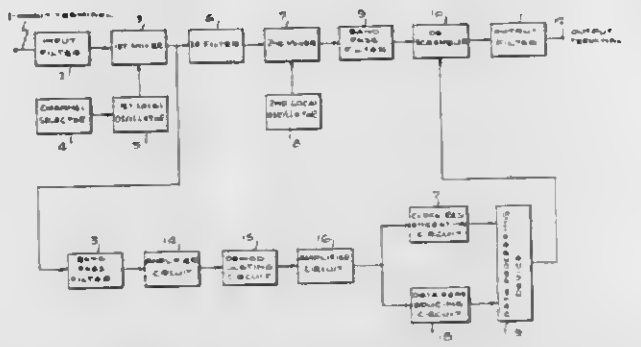
TERMINAL DEVICE FOR CATV

Tetsuo Kanazashi, and Tsuyoshi Fujiwara, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,592
Claims priority, application Japan, May 7, 1976, 51-51964
Int. Cl.^{2} H04N *1/44*
U.S. Cl. 358—114 **4 Claims**



2. In a CATV system transmitting within a selected bandwidth a plurality of video channels of different frequencies and also a data signal at a selected adjacent frequency downstream to individual subscriber's terminals, the combination comprising:
frequency converter means controllable by a subscriber for converting the selected bandwidth to a selected frequency range in which a chosen video channel is at a predetermined frequency;
video signal processing means responsive to the predetermined frequency for providing the desired video program;
data signal extracting means coupled to derive the fundamental, unconverted, data signal frequency from the output of the frequency converter means; and
means responsive to the unconverted data signal frequency for deriving digital data therefrom.

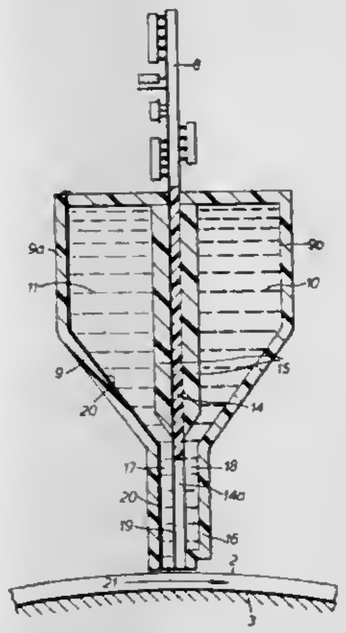
4,109,282

APPARATUS AND METHOD FOR PRINTING INFORMATION ONTO A SURFACE

Penrose David Robertson, and George Franklin Coulouris, both of London, England, assignors to National Research Development Corporation, London, United Kingdom

Filed Jan. 28, 1977, Ser. No. 763,491
Claims priority, application United Kingdom, Feb. 5, 1976, 4638/76
Int. Cl.^{2} H04N *5/76;* **G01D** *15/16;* **H04N** *1/24*
U.S. Cl. 358—127 **12 Claims**

1. Printing apparatus for applying ink to a surface to be printed, comprising
(a) first and second reservoirs containing different inks, respectively;
(b) writing head means connected with said reservoirs for writing information on the surface with said inks, said writing head means including
(1) a body member defining a nib;
(2) said nib containing a duct which terminates at one end in an orifice adjacent the surface; and
(3) a flap valve arranged in said duct for defining first and second ink flow passageways the other ends of which are connected with said first and second reservoirs, respectively;
(c) means for producing relative movement between the writing head and the surface in a direction causing ink to be supplied in a line from said passageways; and



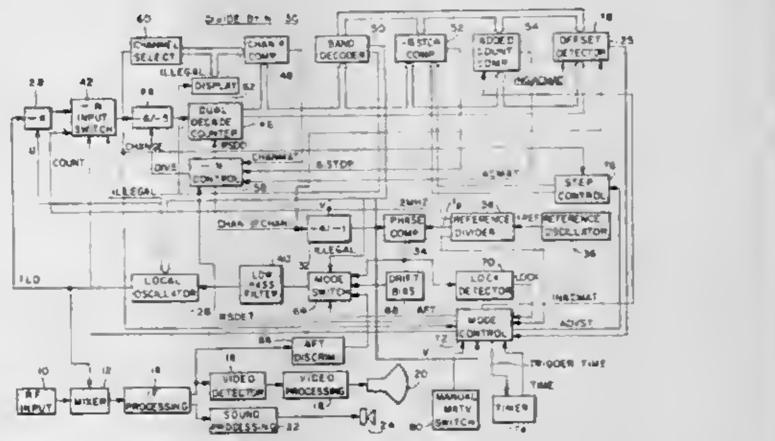
(d) control means for displacing said flap to selectively obturate said passageways, respectively, whereby information may be written selectively in said line as a function of the degree of mixing of said different inks.

4,109,283

FREQUENCY COUNTER FOR A TELEVISION TUNING SYSTEM

Robert Morgan Rast, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,588
Int. Cl.^{2} H04N *5/44, 5/50;* **H04B** *1/16, 1/32*
U.S. Cl. 358—191 **13 Claims**



1. In a system for tuning a television receiver to the various channels a viewer may select, apparatus comprising:
local oscillator means for generating a local oscillator signal;
counter means for generating a frequency divided signal by counting a predetermined number of periods of said local oscillator signal, said predetermined number being proportional to the frequency of said local oscillator signal;
means for generating a reference frequency signal;
phase control means for generating a control signal representing the phase and frequency deviation between said frequency divided signal and said reference frequency signal;
mode switching means for selectively coupling said control signal to said local oscillator means; said mode switching means initially coupling said control signal to said local oscillator means;
said local oscillator means changing the frequency of said local oscillator signal in response to said control signal until said frequency divided signal and said reference

frequency signal to be in a predetermined phase and frequency relation;

said counter means accumulating a nominal number of counts during a predetermined portion of said frequency divided signal when said frequency divided signal and said reference signal are in said predetermined phase and frequency relationship;

means for generating a lock signal when said frequency divided signal and said reference frequency signal are in said predetermined phase and frequency relationship;

said mode switching means decoupling said control signal from said local oscillator means in response to said lock signal;

means for generating a count signal when said control signal is decoupled from said local oscillator means, said count signal having a duration with a predetermined time relationship to said reference frequency signal;

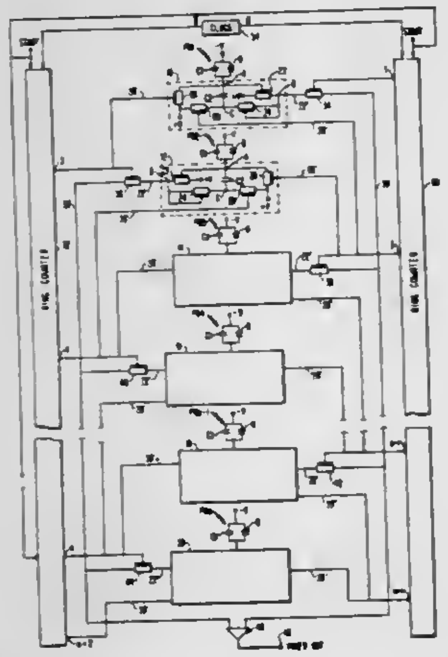
means responsive to said count signal for disabling said counter means from counting when said control signal is decoupled from said local oscillator means except during the duration of said count signal; and

means for generating an offset signal representing the deviation between the count accumulated by said counter means during a time interval corresponding to said predetermined portion of said frequency divided signal when said control signal is decoupled from said local oscillator means and said nominal number of counts, said offset signal being coupled to said mode switching means to control the coupling of said control signal to said local oscillator means.

4,109,284

SELF-SCANNING PHOTO-SENSITIVE CIRCUITS

James Darrell Tompkins, Essex, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 641,193, Dec. 15, 1975, Pat. No. 4,023,048.
This application Nov. 15, 1976, Ser. No. 741,656
Int. Cl.^{2} H04N *3/12;* H01J *39/12;* H03K *3/353*
6 Claims
U.S. Cl. 358—212



1. Self-scanning photo-sensitive circuits comprising

an array of light sensitive devices capable of producing charge variations,

a charge amplification circuit coupled to each of the devices of the array, said amplification circuit including a source follower having a control electrode connected to one of said light sensitive devices, said source follower including a first field effect transistor having a threshold voltage loss and said amplification circuit including means for compensating for the effects of said threshold voltage loss,

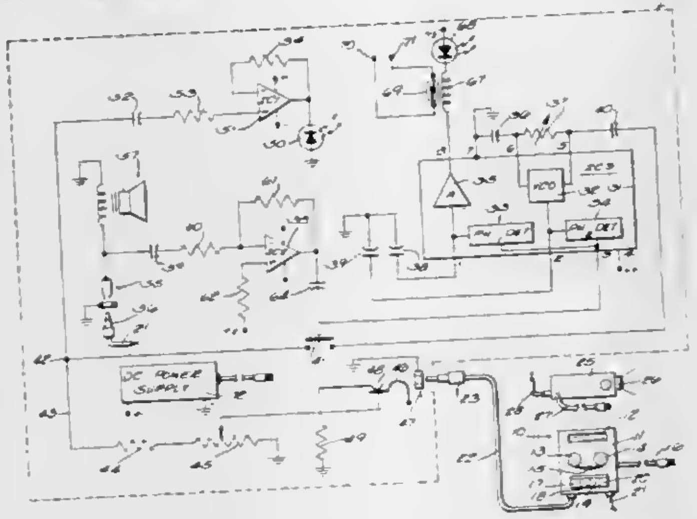
a common output line coupled to each of said amplification circuits, and

means for applying pulses to each of said amplification circuits to produce video signals from said light sensitive devices sequentially onto said common output line.

4,109,285

TAPE MACHINE AND SLIDE PROJECTOR SYNCHRONIZING DEVICE

Elso Jose Figueira Legey, 1501 Mower Ct., Wauwatosa, Wis. 53213
Filed Mar. 14, 1977, Ser. No. 777,385
Int. Cl.^{2} G11B *27/22*
13 Claims
U.S. Cl. 360—80



1. Apparatus for use with an intermittently operable picture projector and an audio tape machine to record picture change signals on a tape and to operate the projector in response to occurrence of said signals during playback of the tape, said apparatus comprising:

output circuit means to which an input of a tape recorder may be coupled to enable recording change signals on a tape, said output circuit means including a manually operable switch,

input circuit means to which an output of said tape recorder may be coupled to enable receiving said change signals along with audio signals recorded on said tape,

a decoder device comprising a voltage controlled oscillator having output means coupled to said output circuit means, said oscillator being for producing pulse change signals at a predetermined frequency, said device also having input means coupled with said input circuit means for receiving said change signal pulses, and phase sensitive means coupled therewith, and operative to compare the phase relationship of signals from said voltage controlled oscillator and said change signals from said tape, and semiconductor switch means which change state in response to said phase sensitive means sensing that said signals from said oscillator and said change signals are substantially in phase, and

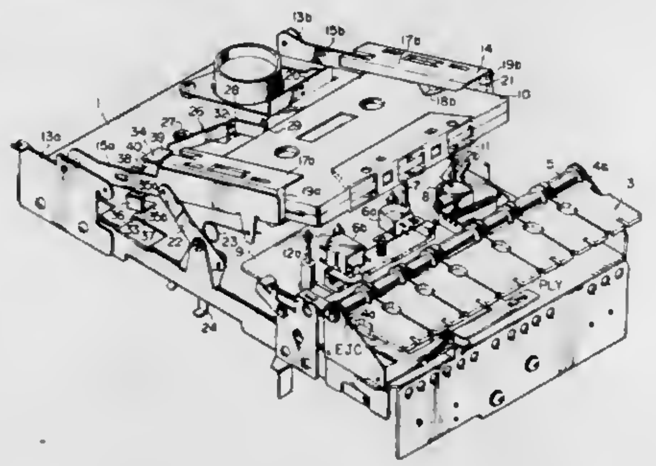
means responsive to a change of state by said semiconductor switch means by controlling said projector to change a picture.

4,109,286

CASSETTE TAPE RECORDER WITH CASSETTE EJECT MECHANISM

Hiromasa Katsurayama, and Nobuhiro Hirabayashi, both of Nagoya, Japan, assignors to Shin-Shirasuna Electric Corp., Nagoya, Japan
Filed Apr. 21, 1977, Ser. No. 789,513
Claims priority, application Japan, Apr. 30, 1976, 51-50410; Aug. 10, 1976, 51-95060; Aug. 10, 1976, 51-95061
Int. Cl.^{2} G11B *23/04. 15/10. 15/24*
6 Claims
U.S. Cl. 360—96

1. A cassette tape recorder including cassette receiving means having an opening through which a cassette may be inserted or removed, said cassette receiving means being pivotable so as to selectively assume a position in which it is inclined with respect to the chassis of the tape recorder to permit insertion or removal of the cassette and a position in which it is parallel to said chassis to permit a magnetic tape within the cassette fully inserted in said cassette receiving means to be engaged by magnetic head means, characterized by a cassette eject mechanism comprising cassette force-out means mounted on said cassette receiving means at the opposite side thereof from said opening, said cassette force-out means being pivotable between a first position in which one end thereof is extended into said cassette receiving means so as to be engageable by the back wall of the cassette inserted in said cassette receiving means and a second position in which said one end is substantially repelled from said cassette receiving means upon said cassette being fully inserted in said cassette receiving means, said cassette force-out means being spring-biased toward said first position, and lock means mounted on said cassette receiving means for acting to lock said cassette force-out means in said second position when said cassette force-out means is pivoted to said second position against said spring bias upon the cassette being fully inserted in said cassette receiving means when in said inclined position and to unlock said cassette force-out means when said cassette receiving means with the cassette fully inserted therein is pivoted from said inclined position to said parallel position, said cassette force-out means being adapted to be resiliently pivoted from said second position to said first position by the action of said spring bias to cause said one end to force the cassette from said cassette receiving means when said cassette receiving means with the cassette fully inserted therein is pivoted from said parallel position to said inclined position.

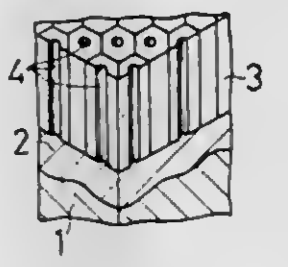


4,109,287

PROCESS FOR RECORDING INFORMATION OR SOUND AND PROCESS FOR PREPARATION OF RECORDING MATERIALS USED THEREFOR

Satosbi Kawai, Chigasaki; Hajime Sato, Hiratsuka, and Toshimatsu Sakai, Odawara, all of Japan, assignors to Pilot Man-Nun-Hitsu Kabushiki Kaisha, Tokyo
Continuation-in-part of Ser. No. 326,102, Jan. 23, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 543,006
Claims priority, application Japan, Apr. 14, 1972, 47-37421
Int. Cl.^{2} G11B *5/74;* C25D *5/00. 11/00;* C09D *5/23*
2 Claims
U.S. Cl. 360—131

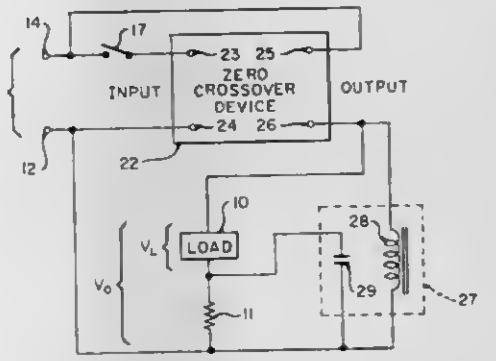
1. A method for recording information or sound which comprises providing a magnetic recording element having a regular orientation and comprising aluminum or an aluminum alloy containing a predominant proportion of aluminum having on the surface thereof an anodic oxide film of numerous micro pores regularly arranged with a cener-to-center distance between adjacent micro pores within the range of 400-2000A, each of the micro pores being substantially completely filled by electrolytical deposition with a metal or alloy derived from at least one member selected from the group consisting of cobalt salts, nickel salts, chromium salts and iron salts, and magnetizing the magnetic recording element with magnetic flux generated from a magnetic head.



4,109,288

OVERLOAD PROTECTION SYSTEM

Sidney G. Berenson, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio
Filed Dec. 9, 1976, Ser. No. 748,991
Int. Cl.^{2} H02H *9/00*
2 Claims
U.S. Cl. 361—58



1. In an overload protection system for a circuit having an inductive load with a ferromagnetic material core:

means for initiating the application of an alternating voltage across said inductive load at substantially a zero crossover instant, comprising zero crossover means having an input and an output and being adapted to receive a sinusoidal voltage at its input and provide a sinusoidal voltage at its output at a time corresponding to the zero crossing of said sinusoidal voltage at its input; and

means for limiting the magnitude of an initial portion of said applied alternating voltage across said inductive load, comprising an impedance connected in series with said inductive load, switch means shunting said impedance, and means responsive to the sinusoidal voltage at the output of said zero crossover means for closing said switch means a selected time after receipt of the sinusoidal voltage at the output.

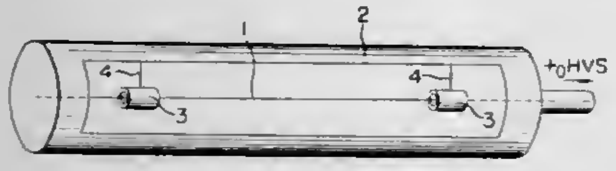
4,109,289

CORONA DISCHARGER

Tsukasa Kuge, and Koichi Tanigawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 27, 1976, Ser. No. 709,078
Claims priority, applicatioo Japan, Aug. 4, 1975, 50-94905
Int. Cl.^{2} H01T *19/00*
8 Claims
U.S. Cl. 361—230

1. In a corona discharger having a corona discharge wire to which a voltage is applied to induce discharge, the improvement comprising:

a member for absorbing vibration of the discharge wire, said member being disposed to make contact with the discharge wire at least during vibration thereof; and

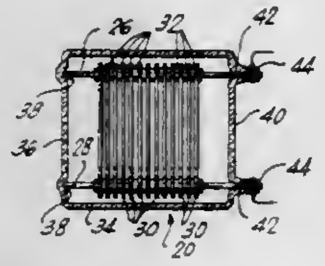


a supporting member, independent of said discharge wire, for supporting said vibration absorbing member for movement in response to vibration of the discharge wire.

4,109,290
MEANS FOR GENERATING A NEGATIVE CHARGE

James C. Gallagher, San Diego, Calif., assignor to APSEE, Incorporated, San Diego, Calif.

Filed Apr. 18, 1977, Ser. No. 788,118
Int. Cl.² H01J *3/04*
U.S. Cl. 361—231 8 Claims

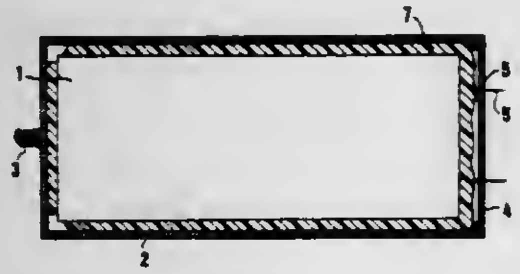


1. An electrical discharge generator comprising:
a source of electrical energy having a pair of terminals, a pair of spaced conducting plates separately connected to said pair of terminals of said source of electrical energy;
dielectric means coating said conducting plates, said dielectric means having a high coefficient of secondary election emission;
chamber means enclosing said conducting plates;
and a gas within said chamber.

4,109,291
IMPREGNATED CONDENSER CONSTRUCTION FOR ELECTRIC POWER TRANSMISSION

Charles Bozzini, Charleroi, Belgium, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Mar. 17, 1977, Ser. No. 778,622
Claims priority, application Belgium, Mar. 17, 1976, 17264
Int. Cl.² H01G *1/02*
U.S. Cl. 361—272 4 Claims

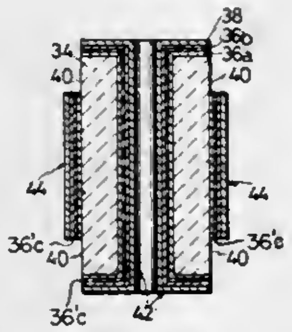


1. A condenser comprising:
a closed tank;
a predetermined number of insulating casings fitting into said tank there being voids between the insulating casings and between the casings and the inner wall of the tank;
individual condenser windings, each of said windings closely fitting into one of said casings, said windings being treated with an insulating liquid, and
wherein the total volume of the voids between said insulating casings in said tank is greater than the total volume of said insulating liquid of said windings whereby emission of gas from the condensers may be absorbed in the voids.

4,109,292
CERAMIC CAPACITOR WITH NICKEL-SOLDER ELECTRODES

Masayoshi Shibayama, Haruna; Yuji Nakano, Komochi, and Youji Shimizu, Haruna, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo

Filed Aug. 4, 1976, Ser. No. 711,445
Claims priority, application Japan, Aug. 8, 1975, 50-95930
Int. Cl.² H01G *1/005. 4/06*
U.S. Cl. 361—321 6 Claims

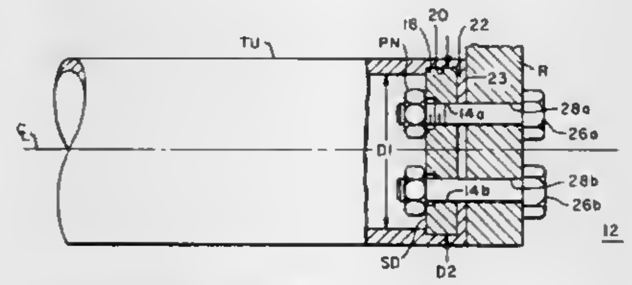


1. A capacitor comprising a tube of ceramic, and inner and outer electrodes formed on said ceramic tube so as to be electrically insulated from each other, each of said inner and outer electrodes comprising a first nickel layer formed on and in direct contact with said ceramic tube, an insulating layer formed on said first nickel layer, an unfired second nickel layer overlying said insulating layer, and a plated solder layer overlying said second nickel layer.

4,109,293
TUBULAR CONDUCTOR FOR METAL CLAD SWITCHGEAR

Norman Davies, Levelgreen, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 15, 1977, Ser. No. 768,938
Int. Cl.² H02B *1/04*
U.S. Cl. 361—341 7 Claims

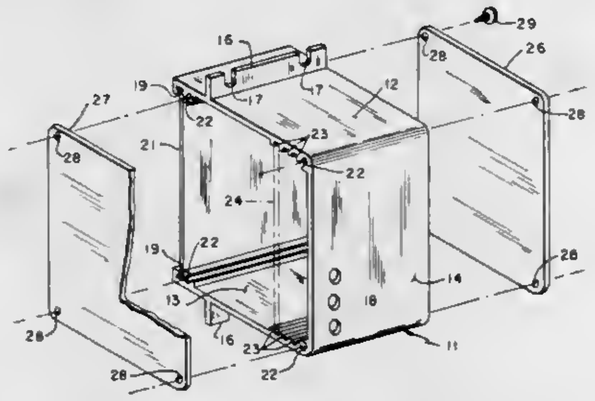


1. Metal clad switchgear, comprising:
a. metal cabinet means;
b. bus bar riser means disposed within said cabinet means and adapted to be interconnected with an external circuit;
c. load line means disposed within said cabinet means and adapted to be interconnected with a load;
d. a hollow cylindrical electrical conductor, said hollow conductor having a transverse annular groove in the inner surface thereof proximate one end thereof;
e. flange means disposed in said annular groove;
f. first securing means disposed in said flange means, said bus bar riser having an opening therein, one surface of said bus bar riser being disposed flush agaqinst said end of said hollow conductor transverse to the centerline thereof, said opening aligning with said first securing means of said flange means;
g. second securing means, said second securing means having a portion which protrudes through said opening in said bus bar riser to cooperate with said first securing means in said flange means to hold said bus bar riser against said end of said hollow conductor in a state of compression; and
h. circuit control means disposed within said cabinet means in disconnectable disposition with said load line means, said circuit control means having a circular disconnecting terminal which is disposed in disconnectable connection with the other end of said hollow cylindrical conductor.

4,109,294
MOUNTING ENCLOSURE FOR KEY TELEPHONE UNIT CIRCUIT SECTIONS

John Richard Mason, Thousand Oaks, and Arthur L. Foreman, Newhall, both of Calif., assignors to Dracon Industries, Chatsworth, Calif.

Filed Dec. 30, 1976, Ser. No. 755,542
Int. Cl.² H02B *1/00*
U.S. Cl. 361—399 14 Claims



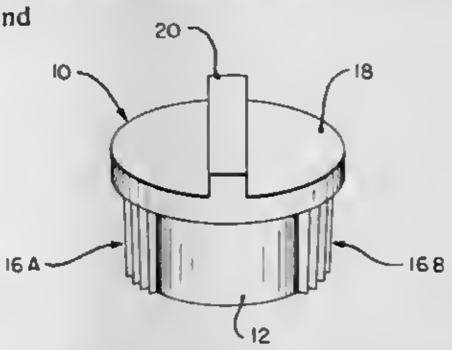
10. A mounting enclosure for a high power dissipation electrical circuit, comprising:
a U-shaped body extrusion having a top, bottom and front wall, said body extrusion including outwardly extending mounting flanges on said top and bottom walls, rear facing cover grooves in said top and bottom walls, opposed facing interior circuit board retaining grooves in said top and bottom walls, and spaced fastener channels on the interior of said U-shaped extrusion,
a rear cover extrusion having a length substantially the same as said enclosure width and a height equal to the height of said front wall, means for mating said facing rear cover grooves with each side of said rear cover extrusion, whereby said rear cover is retained in said rear cover grooves, said rear cover extrusion having additional fastener channels extending parallel to said means for mating,
a first side cover, said first side cover operating as a heat sink, means for mounting high power dissipation circuit components on said first side cover,
a second side cover,
said first and second side covers each having a pattern of holes therein aligned with said spaced and additional fastener channels,
and a plurality of fastening screws formed to pass through said holes and engaging the walls of said spaced and additional fastener channels, thereby securing said first and second side covers in position.

4,109,295
SOLDERLESS CIRCUIT BOARD COMPONENT

Paul M. Rostek, San Diego, and John F. Baeyertz, Escondido, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1977, Ser. No. 820,654
Int. Cl.² H05K *1/04*
U.S. Cl. 361—401 5 Claims

1. A circuit board component comprising:
a cylindrical body element;
an electrical component mounted within said cylindrical body element;
electrically conductive material positioned on portions of the outer surfaces of said body element;
leads connecting said electrical component to said electrical conductive material through said cylindrical body element; and

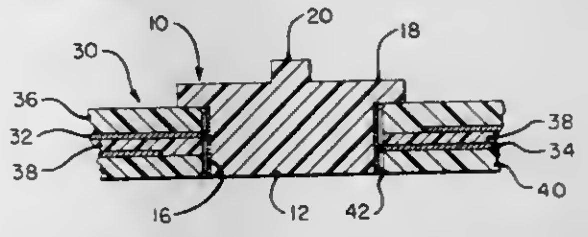


serrations in the electrically conductive material for engaging a contact area on a circuit board.

4,109,296
MACHINE INSERTABLE CIRCUIT BOARD ELECTRONIC COMPONENT

Paul M. Rostek, San Diego, and John F. Baeyertz, Escondido, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1977, Ser. No. 820,655
Int. Cl.² H05K *1/04*
U.S. Cl. 361—401 7 Claims



1. A circuit board component particularly adaptable to being mounted in a circular opening through a multi-layered circuit board comprising:
a cylindrical element having a diameter corresponding to the diameter of the circular opening through the multi-layered circuit board so as to affect a snug fit between said component and the multi-layered circuit board;
at least two recessed sectors in the outer surface of said cylindrical element; and
electrically conductive material positioned in said recessed sectors, said recessed sectors and said electrically conductive material being of a depth and thickness, respectively, which will facilitate the flow of an electrically conductive bonding material between said electrically conductive material and the layers of the multi-layered circuit board which are directly opposed from a respective recessed sector.

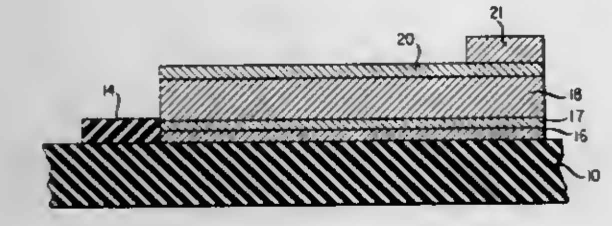
4,109,297
CONDUCTION SYSTEM FOR THIN FILM AND HYBRID INTEGRATED CIRCUITS

Nathan George Lesh, deceased, late of Bethlehem, Pa.; by Merchants National Bank of Allentown, executor, Lehigh County, Pa.; Joseph Michael Morabito, Bethlehem, Pa., and John Henry Thomas, III, Pickerington, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 576,711, May 12, 1975, Pat. No. 4,016,050. This application Mar. 25, 1977, Ser. No. 781,294
Int. Cl.² H05K *1/04*
U.S. Cl. 361—402 9 Claims

1. A circuit including thin film elements and electrical interconnections of a desired resistivity on the major surface of an insulating substrate, said interconnections comprising:
a first metal layer comprising titanium with a thickness in the range 1,500–3,000 A formed on said substrate;
a second metal layer comprising copper with a thickness in

the range 25,000–40,000 A formed over said first metal layer;
a third metal layer comprising nickel with a thickness in the range 8,000–20,000 A formed on said second layer; and

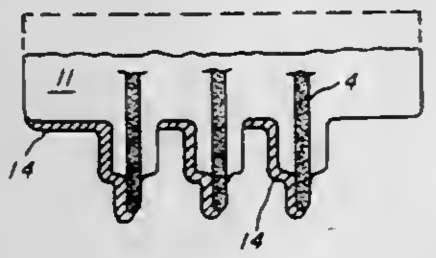


a fourth metal layer comprising gold with a thickness in the range 15,000–25,000 A formed on at least portions of said third metal layer.

4,109,298
CONNECTOR WITH PRINTED WIRING BOARD STRUCTURE

Stephen L. Hanni, Richardson, and Dudley B. Johnson, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1976, Ser. No. 708,502
Int. Cl.^{2} H05K *1/04*
U.S. Cl. 361—412 **10 Claims**

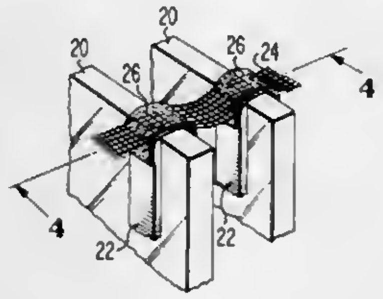


1. A printed wiring board connector, comprising:
(a) a first sheet metal substrate including at least two finger-like projections extending outwardly from the central portion of said first substrate;
(b) a first layer of insulating material covering said first substrate including said finger-like projections and the peripheral edge of said sheet metal substrate, said insulating material further extending outwardly of said first substrate in the area between said at least two finger-like projections;
(c) a first layer of conductive material affixed to selected areas of said first layer of insulating material and said at least two finger-like projections;
(d) a second layer of conductive material affixed to said first layer of insulating material at the peripheral edge of said first sheet metal substrate, including the peripheral edge of the insulating material extending outwardly of the first substrate;
(e) notch means for severing said second layer of conductive material between said at least two finger-like projections, said notch means confronting the insulating material extending outwardly of the first substrate;
(f) a second substrate having at lest two apertures for receiving said at least two finger-like projections;
(g) a second layer of insulating material covering, at least in part, said second substrate; and
(h) a third layer of conductive material affixed to said second layer of insulating material covering at least part of the peripheral area of said apertures, for making electrical contact with said first layer of conductive material when said finger-like projections, are inserted into said apertures.

4,109,299
ELECTRICAL CONNECTION BETWEEN CONDUCTORS ON SPACED PLATES

Louis Salvatore Cosentino, Belle Mead; John Guiry Endriz, Plainsboro, and George Fairbank Stockdale, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,803
Int. Cl.^{2} H05K *1/04*
U.S. Cl. 361—412 **4 Claims**

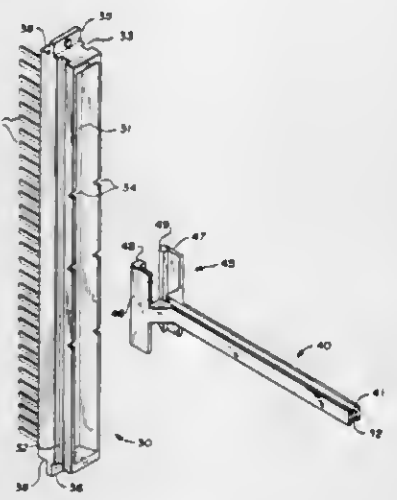


1. An apparatus including
a plurality of spaced plates, either of an electrically conductive material or having an electrical conductor on a surface thereof with each of said conductors extending to an edge of its respective plate,
a substantially flat perforated interconnector of an electrically conductive material extending across each of said edges of said plates adjacent said conductors and along a portion of said surface of each plate engaging the plate or the conductor on said surface, and
an electrically conductive bonding material on said interconnector at each of said plates, said bonding material extending through the openings in the interconnection so as to secure the interconnection to the plates and electrically connect said interconnector to the conductor on each of said plates.

4,109,300
CIRCUIT CARD CONNECTOR AND SUPPORT DEVICE

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sep. 16, 1977, Ser. No. 833,639
Int. Cl.^{2} H02B *1/02*
U.S. Cl. 361—415 **8 Claims**



1. A circuit card connector and support device adapted to mount within a printed circuit card cage comprising:
a connector with a plurality of surfaces, including a first surface with receiving means extending in a longitudinal direction and adapted to provide electrical connection to a first edge of at least one circuit card and second and third surfaces each in direct opposition to each other and each perpendicular to said first surface, said second and third surfaces each further including a longitudinally oriented channel;
a support device with a plurality of surfaces, including a first surface with a longitudinally oriented channel so disposed as to receive the second edge of said circuit card therein and second and third surfaces each in direct opposition to each other and each perpendicular to said first surface, said second and third surfaces each including guide means arranged to mutually engage said channels on said connector slidably positionable along said channels, said first surface of said support device positioned perpendicular to said first surface of said connector.

4,109,301
ADAPTOR FOR PHOTOGRAPHIC FLASH DEVICE

Yutaka Wakimura, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Nov. 10, 1976, Ser. No. 740,673
Claims priority, application Japan, Nov. 14, 1975, 50-155405[U]
Int. Cl.^{2} G03B *15/02*
U.S. Cl. 362—7 **12 Claims**

1. A removable adaptor for exchangeably juxtaposing a supplementary optical panel, such as a light-converging, — diffusing, — attenuating or color-balancing filter panel in front of the substantially rectangular flashing plane of a photographic flash device body that has peripheral sidewall means which recede back from said flashing plane and include at least two opposed surfaces having first detent means provided thereon,
said adaptor including:
substantially rectangular frame means including structure for receiving said panel therein;
rearwardly projecting mounting flange means having at least two opposed surfaces having second detent means provided thereon which are complementary with the first detent means and so arranged that when the mounting flange means is moved sufficiently axially towards the photographic flash device, the flange means becomes at least partially radially coincident with the peripheral sidewall means of the photographic flash device and the respective first and second detent means become engaged for removably mounting the adapter upon the photographic flash device; and
a forwardly expanding, frusto-pyramidal hood extending between and connecting together the mounting flange means and the frame means.

4,109,302
FLIP FLASH HAVING AUTOMATIC INDICATOR CONTROL

Richard R. Wareham, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

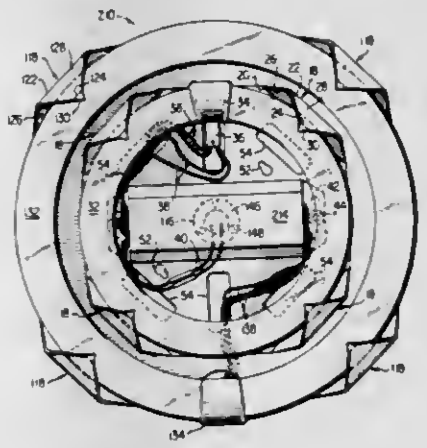
Filed Dec. 1, 1976, Ser. No. 746,587
Int. Cl.^{2} G03B *15/02*
U.S. Cl. 362—10 **17 Claims**

1. In a flash assembly adapted to be alternately mounted on a camera in first and second orientations and including at least one unfired flash lamp in operative relationship with the camera only when said flash assembly is mounted on said camera in said first orientation and at least one other unfired flash lamp in operative relationship with the camera only when said flash assembly is mounted on the camera in said second orientation, said flash assembly further including one means for indicating that said first flash lamp has not been fired and another means for indicating that said other flash lamp has not been fired, both said one and said other indicating means comprising means actuatable from an initial condition indicating that its said respective lamp has not yet been fired to a subsequent condition indicating that its said respective lamp has been fired, the improvement comprising: means automatically responsive to said flash assembly being mounted on the camera in said first orientation, when the camera is disposed in its normal flash mode operating position, for controlling said other means for indicating so as to at least obscure the indication of its initial condition and responsive to said flash assembly being mounted on the camera in said second orientation, when the camera is disposed in its said normal flash mode operating position, for controlling said one means for indicating so as to at least obscure the indication of its initial condition such that only the indicating means of the operatively mounted lamp is effective for indicating to the operator its said initial condition.

4,109,303
FLUORESCENT LIGHT FIXTURE

Joseph F. Hetherington, Levittown, Pa., assignor to Joseph F. Hetherington, Levittown, Pa.

Filed Jul. 26, 1976, Ser. No. 708,647
Int. Cl.^{2} H05B *33/02*
U.S. Cl. 362—216 **11 Claims**



1. A fluorescent light fixture adapted to be mechanically connected to an internally threaded incandescent-type lamp socket disposed within means having a planar supporting surface, comprising:
an externally threaded incandescent-type lamp plug for threadedly-engaging said socket;
an electrical ballast member electrically connected to said plug;
at least one fluorescent light element electrically connected to said ballast member; and
means for mounting and supporting said plug, said ballast member, and said fluorescent light element upon at least one surface thereof, the surface upon which said plug is mounted being planar, wherein said mounting means comprises a flat plate which includes means integral therewith for mounting and supporting said light element thereon and wherein said plate has a square configuration, and is fabricated of a semi-rigid, flexible, and resilient plastic, the corners of said square plate being permanently deformed so as to overlap the remaining base portion of said plate in a spaced relationship therewith and thereby define therewith a socket within which said light element may be disposed,
whereby said integral mounting means comprises said deformed corner portions which thereby define semi-rigid, flexible and resilient clip members overlapping said light element so as to removably secure said light element witin said socket in a snap-in fashion and whereby when said plug is threadedly engaged with said socket, said planar surface of said mounting means is able to be stably mounted upon said supporting surface in a flush manner.

4,109,304

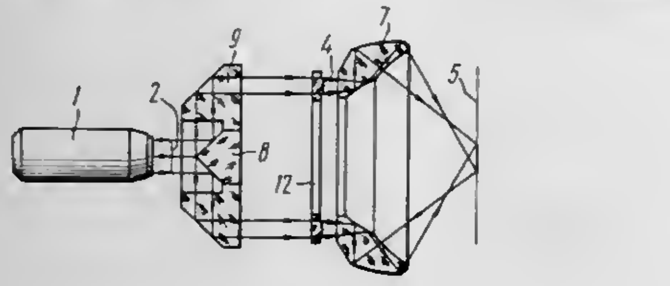
DEVICE FOR COHERENT LIGHTING OF OBJECTS

Vladimir Vasilievich Khvalovsky, ulitsa S. Kovalevskoi, 13, korpus 3, kv. 79; Sergei Nikolaevich Natarovsky, Lermontovsky prospekt, 8/10 kv. 17, both of Leningrad; Valentin Iosifovich Nalivaiko, Akademicbesky gorodok, ulitsa Shkolnaya, 5, kv. 48, Moskovskaya oblast, Podolsky raion, and Vladimir Lvovich Vorontsov, ulitsa Kustodieva, 20, korpus 1, kv. 39, Leningrad, all of U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,382

Int. Cl.^{2} F21V *11/00*

U.S. Cl. 362—259 **5 Claims**



1. A device for coherent lighting of objects, comprising: a laser which emits a coherent light beam of parallel rays along a predetermined optical axis; a light beam transforming means for transforming said coherent light beam of parallel rays, emitted by said laser, into an infinite number of parallel-ray light beams travelling at an angle to one another, said light beam transforming means being arranged along said optical axis across the path of said light beam emitted by said laser, and condenser means situated along said optical axis at the side of said light-beam transforming means opposite from said laser for receiving said infinite number of light beams from said light beam transforming means and for directing the thus-received light beams to an object situated along said optical axis beyond said condenser means at the side thereof opposite from said light beam transforming means for illuminating said object, inner and outer annular coaxial reflecting means arranged along said optical axis across the path of said light beam, between said laser and said light beam transforming means, said inner and outer reflecting means respectively including annular reflecting surfaces each of which forms at least part of a cone whose axis coincides with said optical axis and whose vertex is pointed toward said laser away from said light beam transforming means, said inner reflecting means receiving light from said laser and directing the latter light radially away from the optical axis and said outer reflecting means receiving the light from said inner reflecting means and redirecting the same along a cylinder which coaxially surrounds said optical axis, thus forming a cylindrical beam of light received by said light beam transforming means and transmitted by the latter to said condenser means.

4,109,305

RELOCATABLE SUSPENDED LIGHT FIXTURE

Donald F. Claussen, Willow Street, and Ronald A. Gagnon, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 23, 1976, Ser. No. 679,693

Int. Cl.^{2} F21S *3/00;* **F21V** *19/02*

U.S. Cl. 362—418 **3 Claims**

1. A suspended ceiling system with relocatable lighting means,

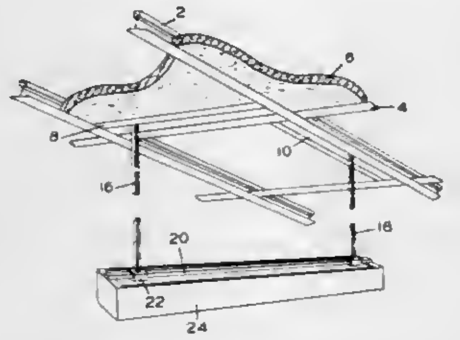
  (a) said suspended ceiling system comprising:

    (1) runner members with horizontal flanges forming a grid system, and

    (2) ceiling boards mounted on the horizontal flanges of the runner members,

  (b) said relocatable lighting means comprising:

    (1) at least two track means, each of said track means being removably supported by a horizontal flange of at least two runner members, said track means being readily removable from one part of the ceiling system to another part of the ceiling system, each of said track means having a horizontal flange to support the edge of the ceiling board formerly supported by the horizontal flange of the runner member now supporting the track means, and



    (2) means for supporting a light fixture from said track means, said means for supporting the light fixture from the track means being at least two support posts, one end of each post being movably connected to the track means with the opposite ends of the support posts being connected to the light fixture.

4,109,306

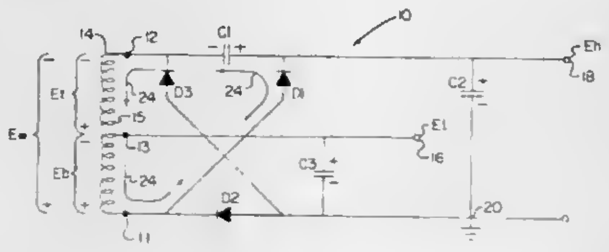
POWER SUPPLY

William B. Mason, Arlington, Tex., assignor to Teccor Electronics, Inc., Euless, Tex.

Filed Oct. 6, 1977, Ser. No. 839,803

Int. Cl.^{2} H02M *7/10*

U.S. Cl. 363—61 **7 Claims**



1. A power supply, for use with a transformer winding having first and second terminals and an intermediate terminal therebetween, said lower power supply comprising:

output terminals for a low voltage, higher voltage and a common voltage;

a first diode connected from said first winding terminal to said higher voltage output terminal;

a second diode connected from the first winding terminal to the common terminal, said diodes being connected to conduct oppositely with respect to current flowing from said first winding terminal;

a first capacitor connected from the higher voltage terminal to said second terminal;

a second capacitor connected from the higher voltage terminal to the common terminal;

a third capacitor having one lead thereof connected both to said intermediate winding terminal and to said low voltage terminal, and

a third diode connected from the common terminal to the second winding terminal, said second and third diodes being connected to conduct in the same direction with respect to current flowing from said common terminal.

4,109,307

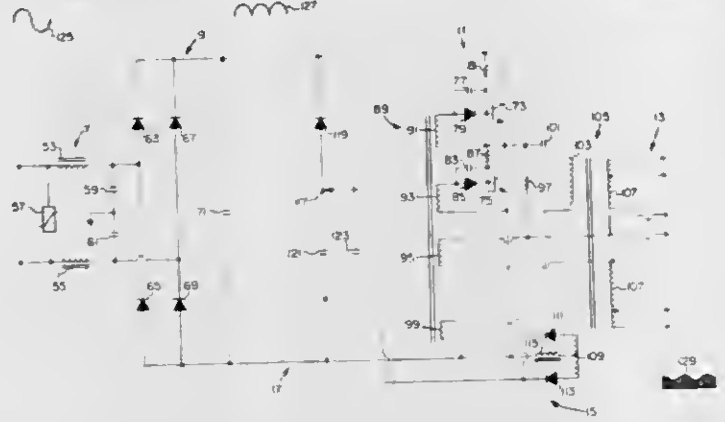
HIGH POWER FACTOR CONVERSION CIRCUITRY

William C. Knoll, Turbotville, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 4, 1977, Ser. No. 793,875

Int. Cl.^{2} H02M *7/00*

U.S. Cl. 363—101 **9 Claims**



1. A high power factor conversion circuit comprising:

an AC potential source;

a full-wave DC rectifier means coupled to said AC potential source and providing a pulsating DC potential;

a high frequency inverter means coupled to said DC rectifier means and including a series connected inductor and capacitor circuit;

a load circuit coupled to said series connected inductor and capacitor circuit of said high frequency inverter means;

a feedback rectifier circuit means coupled to said high frequency inverter means; and

feedback circuit means including a series connected isolating diode and charge storage capacitor shunting said DC rectifier means with a junction therebetween coupled to said feedback rectifier circuit whereby high frequency energy from said inverter means is applied to said charge storage capacitor and utilized to convert said pulsating DC potential to a substantially uniform DC potential.

4,109,308

CIRCUIT FOR CONVERTING A.C. VOLTAGE INTO A D.C. VOLTAGE

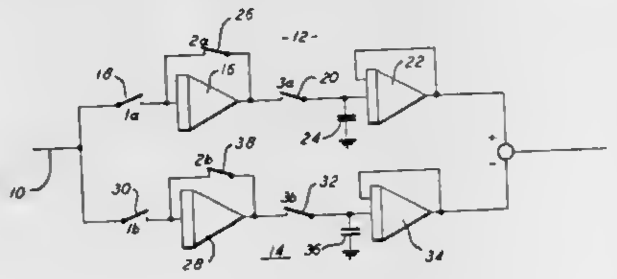
Günther Georg Rödel, Uhldingen-Muhlhofen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., Gmbh, Uberlingen, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,165

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626927

Int. Cl.^{2} H02M *7/12*

U.S. Cl. 363—125 **10 Claims**



1. A circuit for converting an a.c. voltage into a d.c. voltage comprising, in combination:

a first and second channel respectively associated with alternate half-waves of an applied a.c. voltage to be converted and the other alternate half-waves of the applied a.c. voltage to be converted, each channel comprising:

an integrator circuit with an input and an output;

a first controlled switch coupled between the applied a.c. voltage to be converted and said integrator circuit input for connecting the applied a.c. voltage to be converted to said integrator circuit input during the half-wave of said a.c. voltage associated with the channel in which said integrator circuit is located;

an analog memory circuit for storing an analog signal;

a second controlled switch coupled between said integrator circuit output and said analog memory and operative during a part of the half-wave which the channel is not associated with to connect said integrator circuit output to said memory circuit; and

a differential amplifier coupled to each said analog memory to form the d.c. voltage.

4,109,309

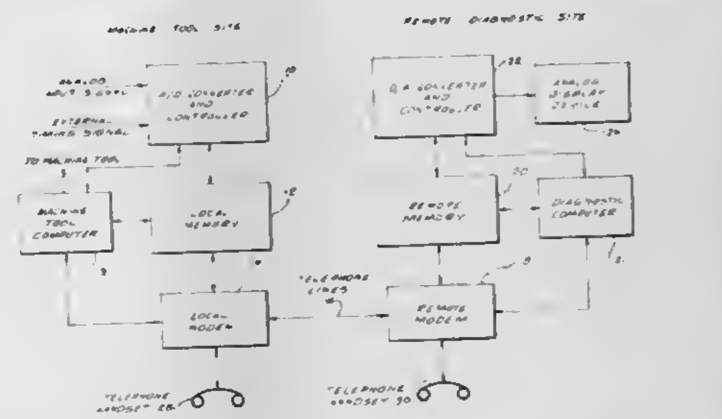
METHOD AND APPARATUS FOR REMOTE DISPLAY OF ANALOG SIGNALS OCCURRING IN COMPUTER CONTROLLED MACHINE TOOLS

Richard Johnstone, and Lyle D. Ostby, both of Brookfield, Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 9, 1977, Ser. No. 767,142

Int. Cl.^{2} G06F *3/05, 15/46*

U.S. Cl. 364—120 **17 Claims**



1. Apparatus for displaying an analog signal which occurs in a computer controlled machine tool circuit on an analog display device which is located in a site remote from the machine tool site, comprising:

probe means for picking up the desired analog signal in said machine tool circuit;

an analog to digital converter coupled to the output of said probe means for converting said analog signal into a sequence of digital signals each of which represents the instantaneous amplitude of said analog signal at a corresponding time;

means for applying the digital output of said analog to digital converter to a first memory which is associated with said machine control computer for storage;

means for transmitting said sequence of digital signals stored in said first memory to said remote site;

means at said remote site for receiving said transmitted sequence of digital signals;

a second memory at said remote site;

means for applying said received sequence of a digital signals to said second memory for storage;

a digital to analog converter at said remote site;

means for applying said sequence of digital signals stored in said second memory to said digital to analog converter for conversion into an approximation of said analog signal; and

analog display means coupled to the output of said digital to analog converter for displaying said approximation of said analog signal.

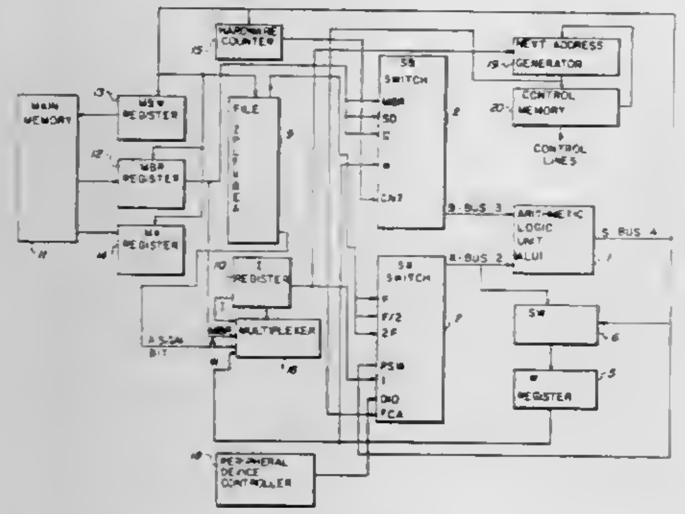
4,109,310
VARIABLE FIELD LENGTH ADDRESSING SYSTEM HAVING DATA BYTE INTERCHANGE

Alfred W. England, Los Angeles; Louis M. Krasny, Beverly Hills, and Edward F. Narey, Carson, all of Calif., assignors to Xerox Corporatioo, Stamford, Conn.

Filed Aug. 6, 1973, Ser. No. 385,763

Int. Cl.^{2} G06F *9/12, 13/00*

U.S. Cl. 364—200 3 Claims



1. In a microprogrammable digital computer including main memory means for storing fixed length instruction and data words in storage locations having fixed boundaries corresponding to the length of said fixed length instruction and data words, a varible field length addressing system comprising:

arithmetic logic unit means for performing logic operations on said fixed length data words,

register means coupled to said arithmetic logic unit means for storing said fixed length data words prior to, during, and after logic operations upon said fixed length data words by said arithmetic logic unit means, and coupled to said main memory means for transferring said fixed length instruction and data words therebetween,

control memory means responsive to said fixed length instruction words stored in said register means for branching to a corresponding plurality of microinstruction subroutines stored internally in said control memory means to accomplish an instruction's requested variable field length addressing function, for executing said microinstruction subroutines, and for executing said branching to any one of a plurality of microinstruction subroutines in one execution cycle, said control memory means being coupled to said register means and said arithmetic logic unit means to control performance of said variable field length addressing function, said control memory means comprising:

a microinstruction subroutine for determining the type, number and sequence of operations to be performed by said arithmetic logic unit means and said register means to enable implementation of the variable field length addressing function,

next address generator means responsive to said microinstruction subroutine and to the state of said register means for determining the location of the next microinstruction to be executed, and for executing it,

control line means responsive to said microinstruction subroutine and coupled to said register means and said arithmetic logic unit means for carrying signals that force said arithmetic logic unit means and said register means to perform those operations determined by said microinstruction subroutine, and

said register means includes swapping circuit means for interchanging portions of a fixed length data word stored in said register means during a single microinstruction subroutine execution cycle.

4,109,311
INSTRUCTION EXECUTION MODIFICATION MECHANISM FOR TIME SLICE CONTROLLED DATA PROCESSORS

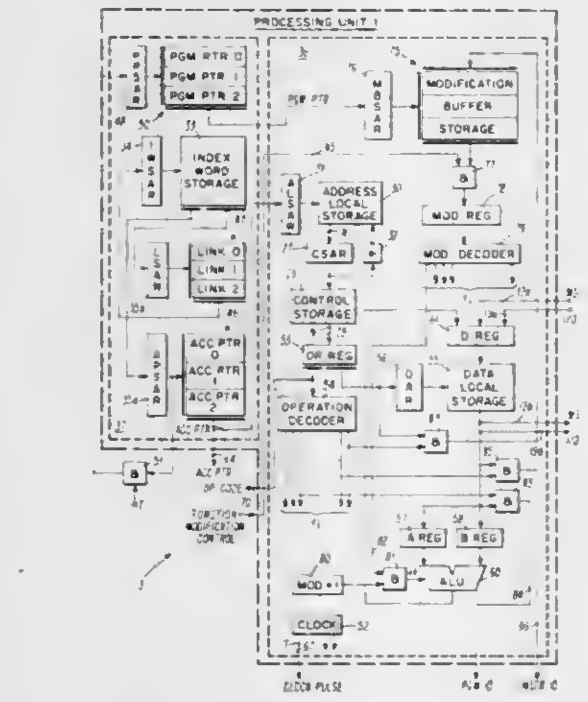
Arnold Blum, Gechingen; Horst von der Heyden, Boeblingen; Fritz Irro, Boeblingen; Stephan Richter, Boeblingen; Helmut Schaal, Dettenhausen, and Hermann Schulze-Schoelling, Gaertringen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1976, Ser. No. 725,757

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555963

Int. Cl.^{2} G06F *9/19*

U.S. Cl. 364—200 6 Claims



1. In a data processing system, the combination comprising:

an instruction storage mechanism for storing instructions belonging to a plurality of different programs and including an address mechanism for accessing the stored instructions;

an instruction execution mechanism for receiving and executing the accessed instructions one at a time;

a time slice control mechanism for controlling the sequence in which the instructions are supplied to the execution mechanism for causing the instructions from the different programs to be executed in an interleaved manner by supplying them to the execution mechanism during interleaved time slice intervals and including circuitry for issuing a program identifier for each time slice interval and for supplying each program identifier to the instruction storage address mechanism for determining the program to be accessed during a particular time slice interval;

circuitry for supplying condition signals representing the occurrences of predetermined conditions in the data processing system;

and a function modification mechanism responsive to the occurrence of a predetermined program identifier and one of the condition signals for modifying the function of at least one of the instructions in the program identified by such program identifier.

4,109,312
METHOD AND APPARATUS FOR MEASURING AND INDICATING THE UNBALANCE OF A ROTOR

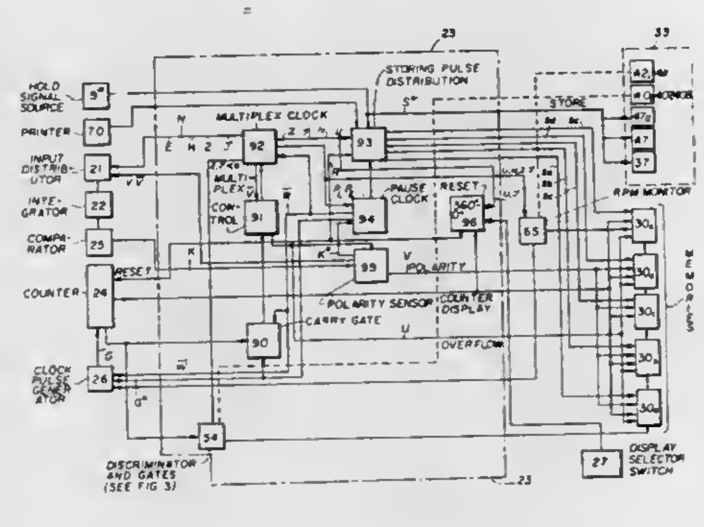
Rudolf Beutel, Traisa, Fed. Rep. of Germany, assignor to Firma Carl Schenk AG, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,453, Dec. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 547,345, Feb. 5, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,918

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1974, 2405764

Int. Cl.^{2} G01M *1/22;* **G06F** *15/20*

U.S. Cl. 364—508 14 Claims



1. A circuit arrangement for the digital display of unbalance representing analog input signals derived from a rotor rotating at a given rpm, comprising analog input signal distributor means for receiving said analog input signals, source means of reference signals, control circuit means, signal integrating means and polarity determining circuit means connecting said input signal distributor means to said control circuit means in that order, clock pulse generator means and counter means connected to said control circuit means to determine the duration of each signal integration by said integrating means for deriving digital signals corresponding to said analog input signals, a plurality of memory means, said control circuit means being connected to supply digital values corresponding to said digital signals to said memory means, a corresponding plurality of indicator units, means interconnecting each of said indicator units with a respective memory means, and constant display means connected to said control circuit means and to said indicator units, said constant display means including selector switch means for selecting a number of characteristic constant values to be displayed corresponding to the dimension of an unbalance, wherein said selector switch means provide a selectable switch position for each characteristic value, and wherein said constant display means comprise logic signal combining means connected to said selector switch means for combining the signals received from said selector switch means in accordance with said characteristic constant values, said logic signal combining means being further connected to receive control signals from said control circuit means to determine the storing of combined signals in said logic signal combining means, said logic signal combining means further comprising decoder means for decoding the combined signals, said decoder means being connected to said indicator units for determining the digital display of the unbalance representing signals with their respective units and the decimal point position.

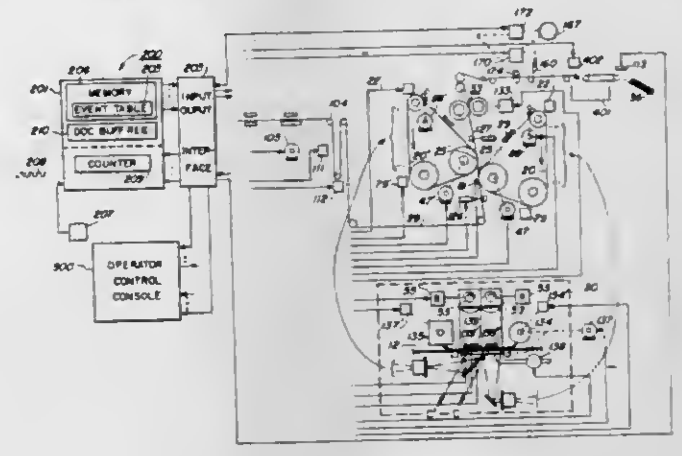
4,109,313
PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

James M. Donohue, Los Alamitos, Calif., and Bernard C. Fisk, Dallas, Tex., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,662, Aug. 12, 1974. This application Nov. 3, 1975, Ser. No. 628,019

Int. Cl.^{2} G06F *15/20;* **G03G** *15/00*

U.S. Cl. 364—518 6 Claims



1. In an electrostatic type reproduction machine for producing copies of originals, the machine having a movable photoreceptor and a series of discretely operated components cooperable with the photoreceptor and one another to electrostatically produce copies, the combination of:

counting means for generating an actuating signal when said counting means reaches a preset reference count;

control means to successively reset said counting means to a new predetermined count associated with the next one of said machine components to be operated;

clock means to drive said counting means whereby said counting means counts starting from said predetermined count to said preset reference count; and

means responsive to said actuating signal to operate said machine component.

4,109,314
AUTOMATIC FRUIT ANALYZER

Stephen F. Meyer, Columbus; Amiel R. Helle, Westerville, and Leo J. Niese, Toledo, all of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 8, 1976, Ser. No. 748,850

Int. Cl.^{2} G06F *15/46;* **G01N** *33/02*

U.S. Cl. 364—552 2 Claims

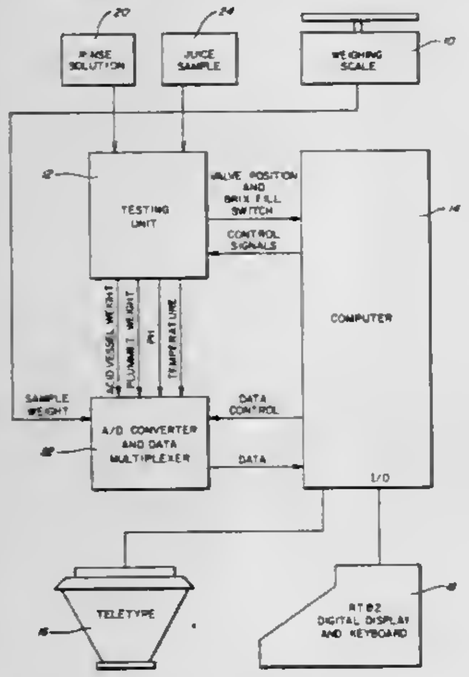
1. A liquid analyzer for testing liquid comprising:

(a) a soluble solids testing means for use in determining the soluble solids content of said liquid, said soluble solids testing means including a first vessel for receipt of a quantity of liquid, a plummet suspended in said first vessel from a first weight transducer, and a temperature transducer for detecting the temperature of said sample;

(b) an acid testing means for use in determining the acid content of said liquid, said acid testing means including a second vessel for receipt of a quantity of liquid and supported by a second weight transducer, a PH transducer mounted to detect the PH of said sample, a stirrer for mixing the contents of said second vessel and an alkali source connected through an alkali inlet valve to deliver alkali to said second vessel;

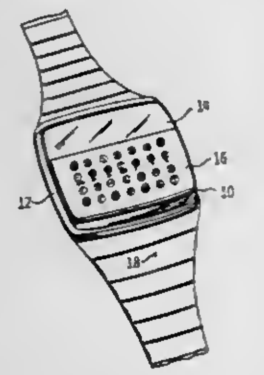
(c) a network of valved fluid conveying conduits interconnected with said soluble solids testing means and said acid testing means; and

(d) controlling, computing and storage means associated with said soluble solids testing means, said acid testing means, and said fluid conveying conduits for automatically recording data representing the weight of said plummet suspended in said first vessel when empty, for loading liquid through said fluid conveying conduits into said vessels, for recording data representing the temperature of the liquid in said first vessel, the weight of the plummet in said liquid and the weight of the liquid in said second vessel, for actuating the stirrer, for opening the alkali inlet valve and delivering alkali into the quantity of liquid to titrate said quantity of liquid to a selected PH, for recording data representing the weight of the titrated second quantity of liquid in the second vessel, and for computing the acid and soluble solids content of said liquid.



4,109,315
WRISTWATCH CALCULATOR WITH SELECTIVELY SCANNED KEYBOARD

Michael Pan, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 30, 1976, Ser. No. 718,741
Int. Cl.² G06F *7/38, 15/02;* **G04B** *19/30*
U.S. Cl. 364—705 **1 Claim**



1. A watch calculator comprising:

a keyboard having key switches arranged in a matrix having rows and columns of key switches;

keyboard scanner means connected to the keyboard including row and column scanning circuits for scanning the rows and columns of key switches to detect and locate a closed key switch;

calculator circuit means coupled to the keyboard scanner means for accepting and performing arithmetic operations on numerical entries from the keyboard;

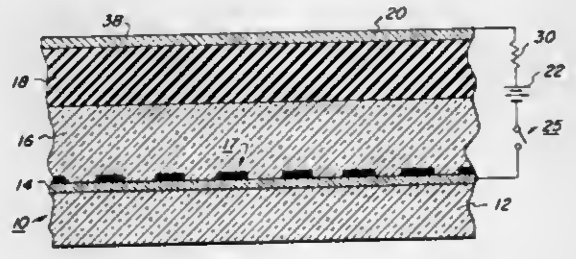
display means connected to the calculator circuit means for displaying numerical data;

watch circuit means connected to the display means for storing and periodically updating data representing time; and

mode control means coupled to the calculator circuit means and the keyboard scanner means for placing the calculator circuit means in an active mode upon the actuation of one of a predetermined number of key switches in the keyboard and placing the calculator circuit means in an inactive mode in response to the completion of an arithmetic operation by the calculator circuit means, and for producing a signal to inhibit the keyboard scanner means when the calculator circuit means is in the active mode.

4,109,316
METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN IMAGE RECORDING DEVICE

Jan S. Snyder, Upland, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 21, 1976, Ser. No. 650,827
Int. Cl.² G11C *13/00*
U.S. Cl. 365—127 **25 Claims**



1. A method for forming a negative image on a surface of an image recording device, said image comprising information in the form of deformations on said surface, comprising the steps of:

(a) providing an image recording device comprising a layer of photoconductive material, an electric field deformable elastomer layer adjacent said layer of photoconductive material and a deformable conductive layer adjacent said elastomer layer,

(b) subjecting said image recording device to an electric field,

(c) generating illuminating radiation to which the photoconductive layer is responsive,

(d) illuminating said photoconductive layer with said radiation whereby substantially uniform deformations are created on said elastomer layer,

(e) removing the electric field applied to said image recording device,

(f) modulating said radiation in accordance with information to be formed on said elastomer layer as deformations, and

(g) directing said information modulated radiation to selected areas of said image recording device whereby the deformations created on said elastomer layer which correspond to said selected areas are erased.

4,109,317
MAGNETIC THIN FILM STORAGE DEVICE

Herbert Henkler; Hermann Deichelmann; Roland Koenig; Volker Koch, all of Ludwigshafen, and Bernd Roeger, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Feb. 20, 1976, Ser. No. 659,895
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1975, 2509287
Int. Cl.² G11C *19/08*
U.S. Cl. 365—133 **2 Claims**

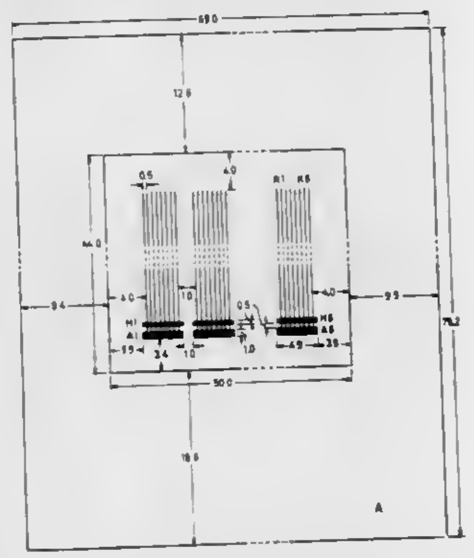
1. A magnetic thin film storage device, comprising a flat support to which a ferromagnetic layer has been applied, which layer contains regions of different coercivity, lower-coercivity regions in the form of strip-like channels and enlarged areas being surrounded by regions of higher coercivity, and also comprising electric conductor means extending in planes parallel with the support and serving to produce local

magnetic fields required to propagate magnetic domains into the lower-coercivity regions;

wherein there are provided groups of straight parallel channels, with all the channels of a group terminating in one enlarged area;

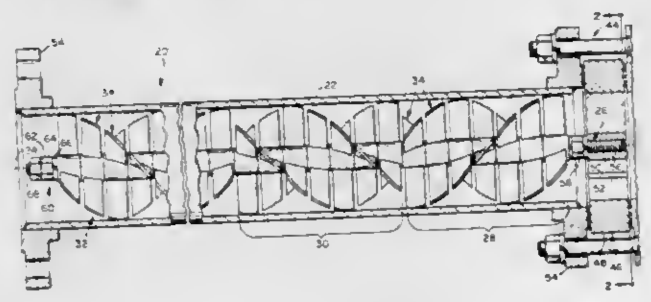
wherein the magnetic field needed for selecting a channel within a group is produced by means of a comb-like arrangement of electric conductors, the longitudinal conductor of which crosses all the channels of the group in the neighborhood of the enlarged area and the connecting leads of which extend between the channels; and

wherein the magnetic fields needed for domain propagation and shrinkage is produced by a single conductor covering the entire enlarged area as well as the adjacent channel regions so that said conductor when activated causes the magnetic domains present in the channels terminating in said enlarged area to be propagated, individually and consecutively, into said enlarged area.



4,109,318
FLUID INJECTION AND SAMPLING DEVICE FOR AN IN-LINE BLENDER

William F. Hutchings, Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.
Filed Apr. 15, 1977, Ser. No. 788,096
Int. Cl.² B01F *5/00*
U.S. Cl. 366—140 **6 Claims**



1. A device for mixing a fluid comprising:

(a) a conduit having a hollow interior disposed about a central axis;

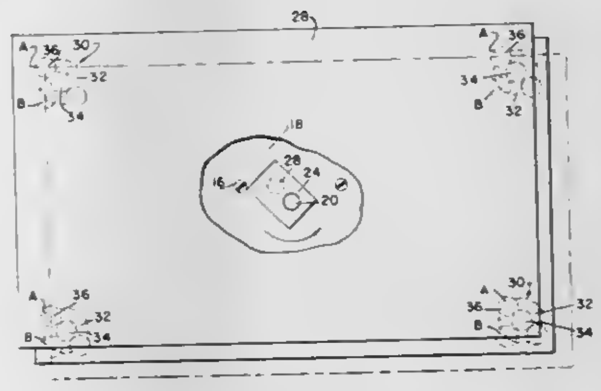
(b) a shaft extending longitudinally through said conduit along said axis;

(c) a plurality of stationary mixing stages extending in series along said axis within said conduit, each of said mixing stages defining a plurality of spiral channels within the hollow interior of said conduit; and

(d) retaining means affixed to said shaft at one end thereof, said retaining means being adapted to prevent axial movement of said shaft within said conduit and comprising:
  (i) a frame having an outer surface and a hollow interior defining an inner surface therefor, said inner surface being disposed about said central axis, and said frame being positioned axially adjacent one end of said conduit;
  (ii) a hub disposed about said central axis and affixed to one end of said shaft;
  (iii) a plurality of vanes connected to said hub and to said inner surface for supporting said hub within said frame and for dividing the hollow interior of said frame into a plurality of flow channels, said flow channels being aligned with said spiral channels to form a continuation of said spiral channels; and
  (iv) means in said frame for placing each of said flow channels in fluid communication with a point external the outer surface of said frame.

4,109,319
AGITATOR FOR LABORATORY TUBES AND FLASKS AND THE LIKE

J. Wayne Brandt, Lutherville, Md., assignor to Spectroderm International, Fairfax, Va.
Filed Dec. 18, 1975, Ser. No. 642,231
Int. Cl.² B01F *11/00*
U.S. Cl. 366—219 **3 Claims**



1. An agitator testing device comprising a housing with a horizontal top forming a lower plate, another plate disposed in spaced relationship with said lower plate and forming an upper plate, a single eccentric member disposed centrally of said upper plate and rigidly secured thereto by a single vertical pin extending downwardly from the upper plate and extending into said eccentric and secured thereto for rotation therewith, at least three bearing means disposed equally about said eccentric member, each bearing means comprising circular flanges secured to the top surface of said lower plate with central upwardly extending pins, and downwardly extending pins secured to said upper plate having there bottom ends resting on said circular flanges and their sides in frictional contact with said central upwardly extending pin but without being fixedly secured thereto, and a motor disposed centrally of said housing having a shaft extending through said lower-plate and directly and fixedly connected to said eccentric to permit translating orbital movement of the upper plate.

DESIGN PATENTS

GRANTED AUG. 22, 1978

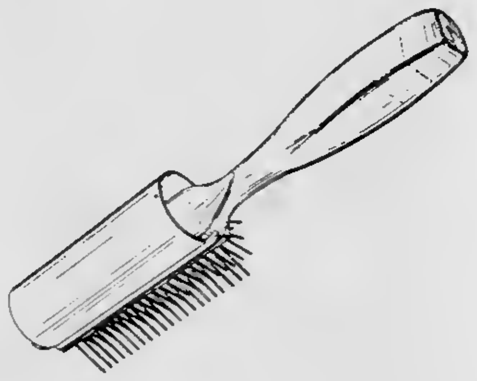
ERRATA

For CLASS	See PATENT NO.
D15-032	249,088

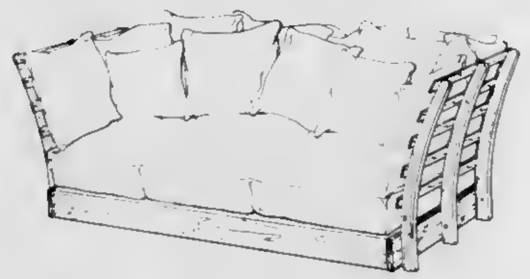
DESIGNS

AUGUST 22, 1978

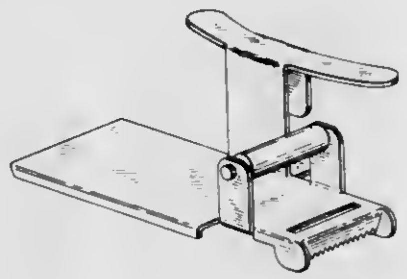
248,996
HAIRBRUSH
Renato Brunas, c/o Renbow International Ltd., 44 B Islington Park St., London, England
Continuation of Ser. No. 729,468, Oct. 4, 1976, abandoned. This application Nov. 29, 1976, Ser. No. 745,761
Claims priority, application United Kingdom, Apr. 2, 1976, 975161/76
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



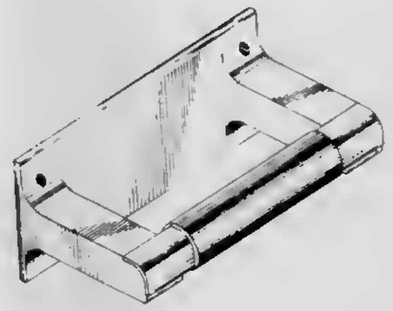
248,997
SOFA OR THE LIKE
Jim Peed, 1405 - 6th Street Cir., NW., Hickory, N.C. 28601
Filed Jun. 24, 1976, Ser. No. 699,320
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



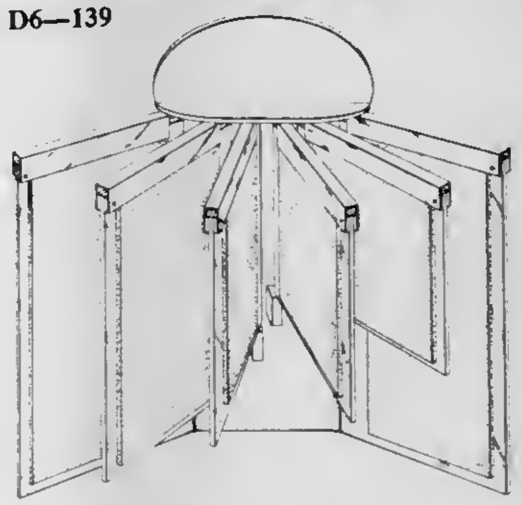
248,998
COMBINED TOILET PAPER HOLDER AND SHELF FOR LAVATORIES
Jan G. L. S. Kullenbäck, Wrangelsgatan 7B, Göteborg, Sweden
Filed May 5, 1976, Ser. No. 683,500
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—91



248,999
PAPER ROLL HOLDER
Bennie L. House, P.O. 577, Hickory Ridge, Ark. 72347
Filed Apr. 4, 1977, Ser. No. 784,621
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

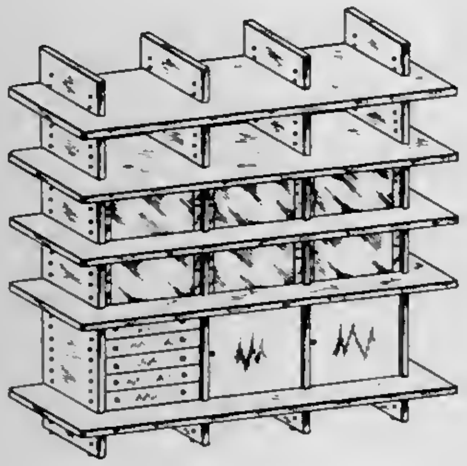


249,000
DISPLAY STAND FOR JEWELRY CHAIN
Earle G. Simmons, 25 Westchester Way, Warwick, R.I. 02886
Filed Aug. 15, 1977, Ser. No. 824,844
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—139



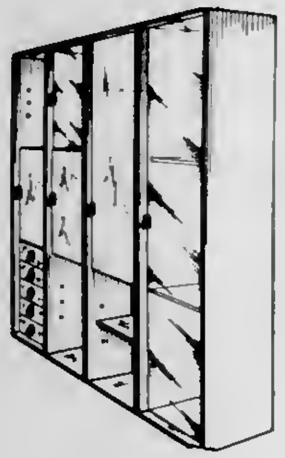
249,001
STORAGE SHELF UNIT

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Italy
Filed Jul. 14, 1975, Ser. No. 595,406
Claims priority, application Italy, Jan. 15, 1975, 60905 B/75; Jan. 15, 1975, 60904 B/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



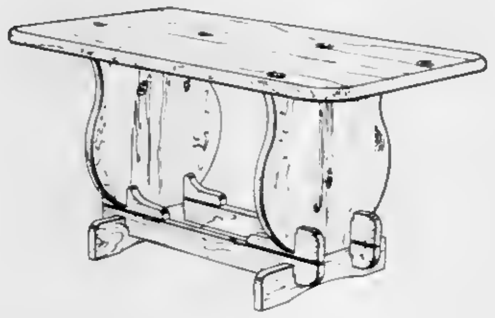
249,002
CABINET

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Italy
Filed Mar. 15, 1976, Ser. No. 667,159
Claims priority, application Italy, Sep. 15, 1975, 22283 B/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



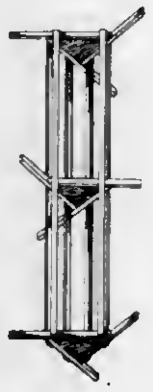
249,003
TABLE

Thomas A. Alexander, 1318 Yale St., Apt. A, Santa Monica, Calif. 90404
Filed Dec. 3, 1976, Ser. No. 747,260
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



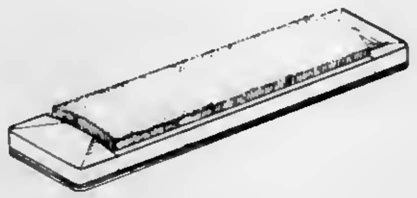
249,004
STAND FOR POTTED PLANTS

Richard G. Crouse, 35 Sherwood Rd., Cockeysville, Md. 21030
Filed Apr. 18, 1977, Ser. No. 788,688
Term of patent 14 years
Int. Cl. D6—*04, 06*
U.S. Cl. D6—145



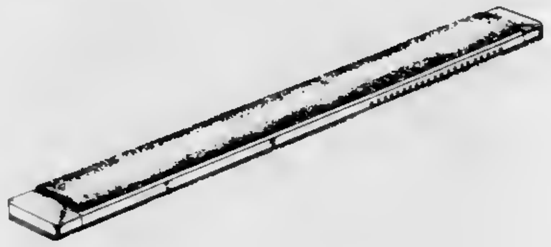
249,005
SHOWER CURTAIN HOLDER

Waldo Dezura, Apt. 601, 235 Keith Rd. West, Vancouver, British Columbia, Canada
Filed Jul. 19, 1976, Ser. No. 706,284
Term of patent 14 years
Int. Cl. D6—*10;* D23—*02*
U.S. Cl. D6—208.1



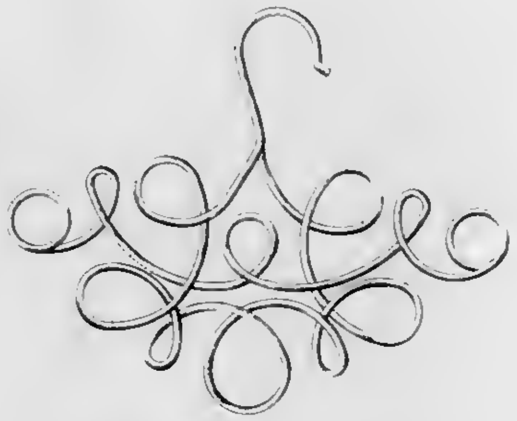
249,006
SHOWER CURTAIN HOLDER

Waldo Dezura, Apt. 601, 235 Keith Rd. West, Vancouver, British Columbia, Canada
Filed Jul. 19, 1976, Ser. No. 706,285
Term of patent 14 years
Int. Cl. D6—*10;* D23—*02*
U.S. Cl. D6—208.1



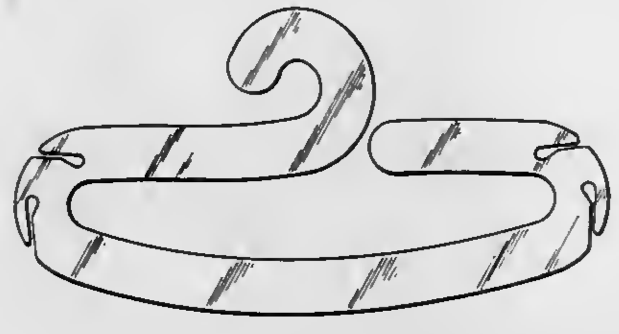
249,007
SCARF HANGER

Gladys Knobel, 340 Greenbay Rd., Glencoe, Ill. 60022, and Theodore Prisland, 632 Melody La., Highland Park, Ill. 60035
Filed Sep. 30, 1977, Ser. No. 838,212
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247



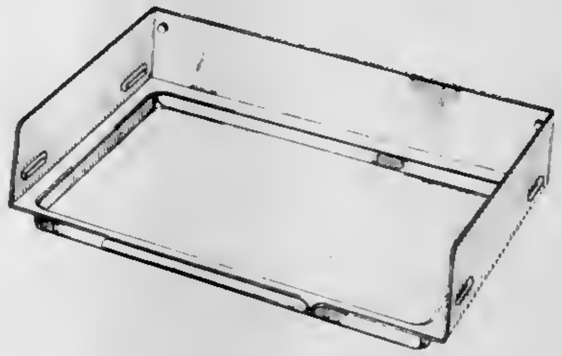
249,008
HANGER

Herbert Levitt, Yonkers, N.Y., assignor to Warnaco Inc.
Filed Jan. 26, 1978, Ser. No. 872,743
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254



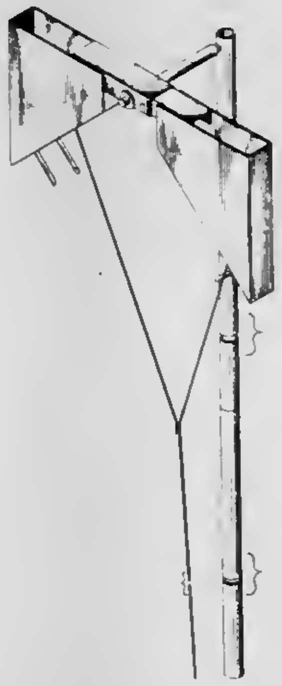
249,009
BROILER PAN OR SIMILAR ARTICLE

Lawrence L. Grove, Allentown, and Paul V. Snyder, Whitehall, both of Pa., assignors to General Electric Company
Filed Jun. 14, 1976, Ser. No. 696,119
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—91



249,010
GUTTER CLEANER

Grover C. Currie, Rte. 1, Box 345-C, Lenoir, N.C. 28645
Filed Sep. 13, 1976, Ser. No. 722,680
Term of patent 14 years
Int. Cl. D7—*05;* D23—*01*
U.S. Cl. D7—161



249,011
FIREPLACE GRATE

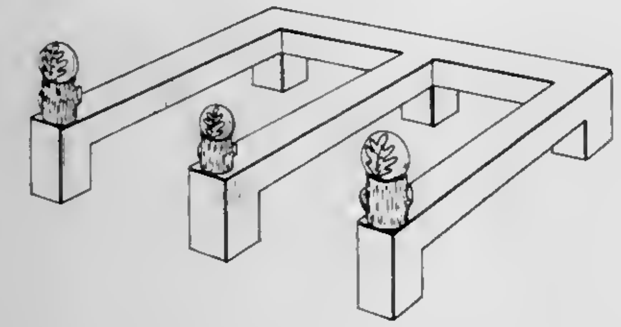
Rodger L. Jones, and Hoyt A. Scott, both of 1137-2 N. Fayetteville St., Asheboro, N.C. 27203

Filed Mar. 10, 1977, Ser. No. 776,467

Term of patent 14 years

Int. Cl. D7—*08*

U.S. Cl. D7—207



249,012
WEED CUTTER

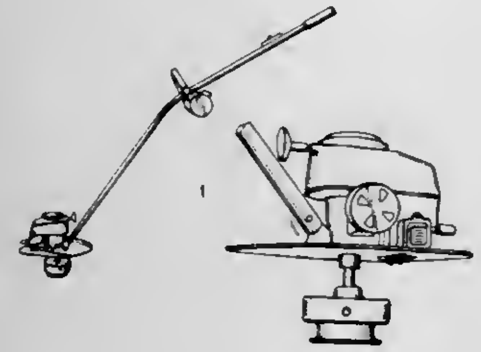
Robert G. Everts, 2118 E. Birchwood Ave., Mesa, Ariz. 85204

Filed Mar. 29, 1976, Ser. No. 671,347

Term of patent 14 years

Int. Cl. D8—*03*

U.S. Cl. D8—8



249,013
GOLF SAND-TRAP SMOOTHING IMPLEMENT

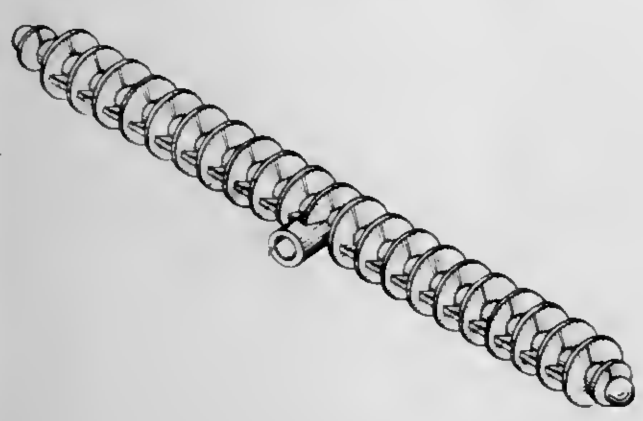
Edward W. Carman, P.O. Box V, Elmer, N.J. 08318

Continuation-in-part of Ser. No. 712,267, Aug. 6, 1976, abandoned. This application Nov. 12, 1976, Ser. No. 741,482

Term of patent 14 years

Int. Cl. D8—*01*

U.S. Cl. D8—13



249,014
IMPLEMENT FOR FINISHING JOINTS BETWEEN TILES

Johannes Groeneveld, Hauptstrasse 51, D-6 Frankfurt am Main-Kalbach, Fed. Rep. of Germany

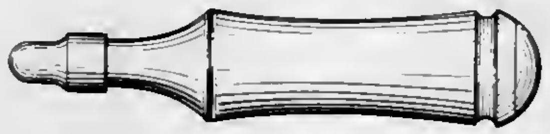
Filed Mar. 1, 1976, Ser. No. 662,466

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 73 AR 509/75

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—45



249,015
PIPE CUTTER

Bruce Ernest Matthews, Warrandyte, and Ronald Day, Mt. Evelyn, both of Australia, assignors to The Stanley Works Pty. Ltd., Nunawading, Australia

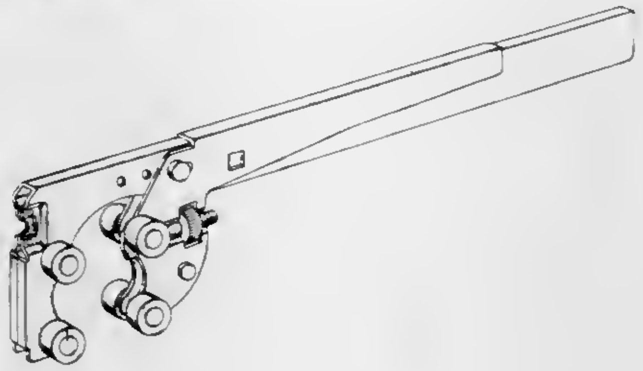
Filed Feb. 16, 1977, Ser. No. 769,030

Claims priority, application Australia, Aug. 19, 1976, 69866/76

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—60



249,016
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE

Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Fed. Rep. of Germany

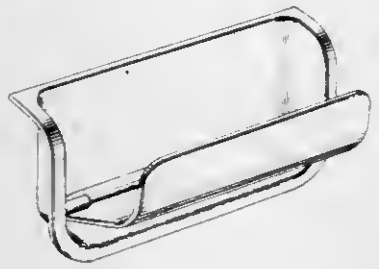
Filed Jan. 30, 1976, Ser. No. 653,854

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 6 AR 137/75

Term of patent 14 years

Int. Cl. D8—*06*

U.S. Cl. D8—306



249,017
SASH LOCK

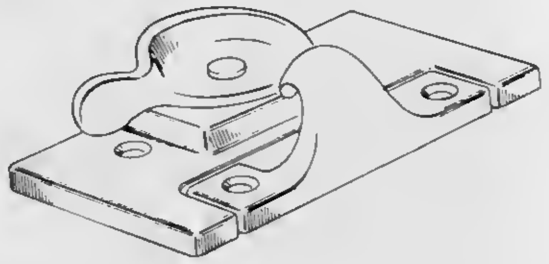
Michael Costello, 304 Meridian St., East Boston, Mass. 02128

Filed Aug. 25, 1977, Ser. No. 827,817

Term of patent 14 years

Int. Cl. D8—*07*

U.S. Cl. D8—337



249,018
GUARD PLATE FOR A SASH LOCK

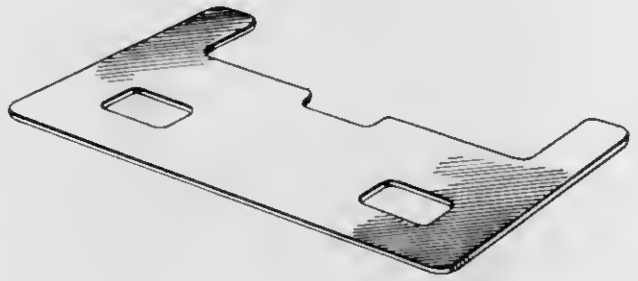
Michael Costello, 304 Meridian St., East Boston, Mass. 02128

Filed Aug. 25, 1977, Ser. No. 827,818

Term of patent 14 years

Int. Cl. D8—*07*

U.S. Cl. D8—343



249,019
COMBINED HOOK AND ANCHORAGE CASING

Lars Fredriksson, Växjö, Sweden, assignor to K A Bergs Smide AB

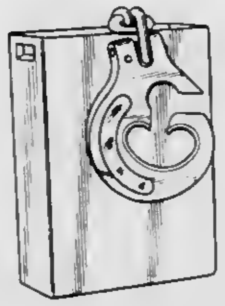
Filed Nov. 13, 1975, Ser. No. 631,470

Claims priority, application Sweden, May 14, 1975, 751022

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—367



249,020
CARGO HOLD DOWN BINDER

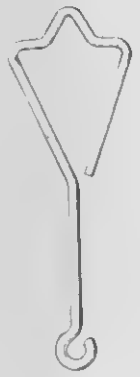
John Raniero, Box 204, Gearhart, Oreg. 97138

Filed Dec. 20, 1976, Ser. No. 752,882

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—382



249,021
JAR

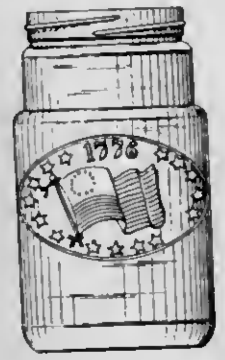
Floyd E. Pettengill, Lancaster, Ohio, assignor to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 567,462, Apr. 14, 1975, Pat. No. Des. 242,222. This application Aug. 24, 1976, Ser. No. 717,071

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—85



249,022

BLANK FOR A DISPOSABLE TRAY

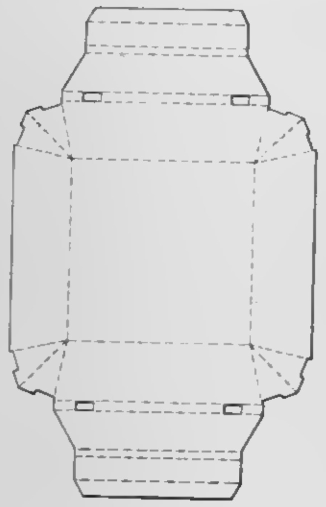
Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Sep. 13, 1976, Ser. No. 722,616

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—245



249,023

DISPENSING TOP FOR GRANULATED MATERIAL

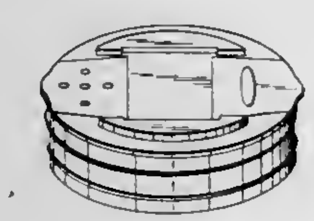
John B. Ames, 100 Valley Rd., Marion, Ala. 36756

Filed Jul. 29, 1976, Ser. No. 709,596

Term of patent 14 years

Int. Cl. D9—*07*

U.S. Cl. D9—257



249,024

INCLINED VIEWING DIGITAL WRISTWATCH CASE

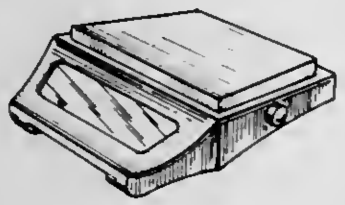
Marvin Ackerman, 856 Somerset Dr., Sunnyvale, Calif. 94087

Filed Nov. 22, 1976, Ser. No. 743,715

Term of patent 14 years

Int. Cl. D10—*02*

U.S. Cl. D10—30



249,025

DIAL FOR CLOCK

Kenji Nakamura, Kamakura, Japan, assignor to L C Chemical Company, Limited, Tokyo, Japan

Filed Aug. 25, 1975, Ser. No. 607,183

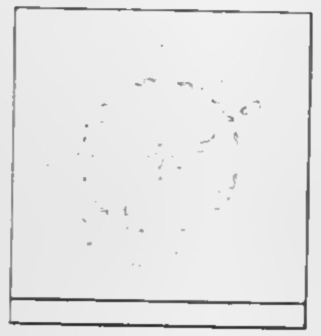
Claims priority, application Japan, Mar. 28, 1975, 50-12226

The portion of the term of this patent subsequent to May 10, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D10—*07*

U.S. Cl. D10—125



249,026

MONEY CLIP ALARM UNIT FOR CASH REGISTERS AND THE LIKE

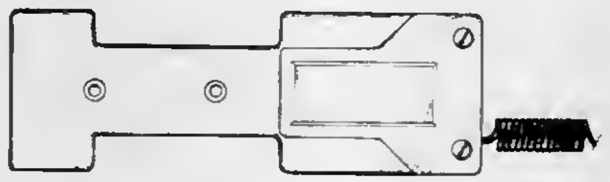
Mark Norman Lepow, Santa Ana, Calif., assignor to American Security Equipment Company, Carson, Calif.

Filed Mar. 23, 1977, Ser. No. 780,654

Term of patent 14 years

Int. Cl. D10—*05*

U.S. Cl. D10—106



249,027

ORNAMENT

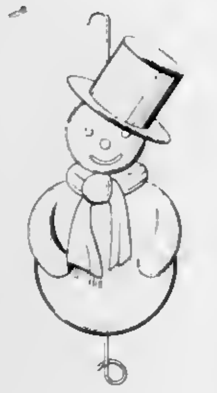
Joseph Dibble, 577 Market St., Elmwood Park, N.J. 07407

Filed Mar. 8, 1977, Ser. No. 775,537

Term of patent 14 years

Int. Cl. D11—*05*

U.S. Cl. D11—125



249,028

STATUETTE

William Raymond Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Ltd.

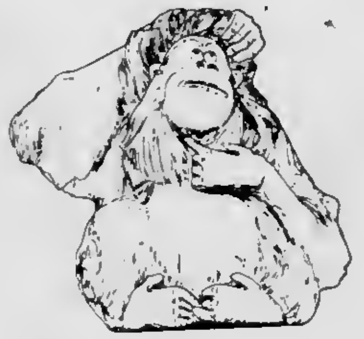
Filed Mar. 11, 1977, Ser. No. 776,546

Claims priority, application United Kingdom, Oct. 26, 1976, 977642/76

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—158



249,029

STATUETTE

William Raymond Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Ltd.

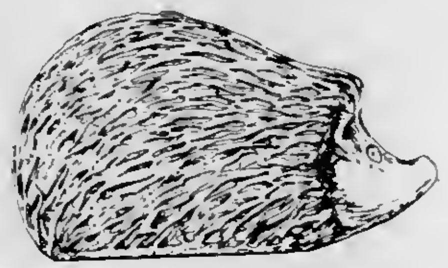
Filed Mar. 11, 1977, Ser. No. 776,547

Claims priority, application United Kingdom, Oct. 26, 1976, 977643/76

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—158



249,030

STATUETTE

William Raymond Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Ltd.

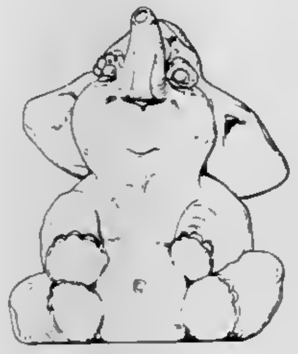
Filed Mar. 11, 1977, Ser. No. 776,548

Claims priority, application United Kingdom, Oct. 26, 1976, 977641/76

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—158



249,031

COMBINED HAND TRUCK AND LADDER

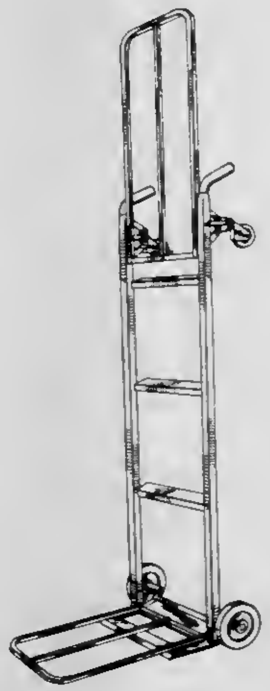
Phil Keith Tarran, San Diego County, Calif., assignor to Lords III Research & Development Co., Escondido, Calif.

Filed Mar. 25, 1977, Ser. No. 781,421

Term of patent 14 years

Int. Cl. D12—*02*

U.S. Cl. D12—25

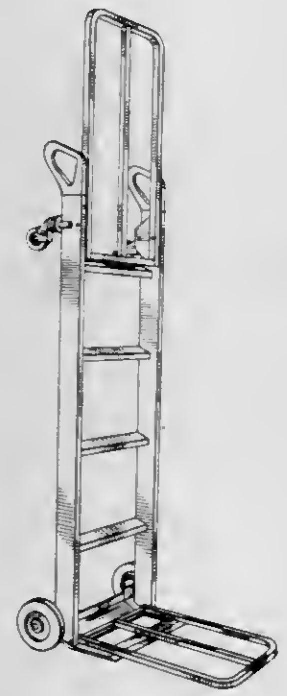


249,032

COMBINED HAND TRUCK AND LADDER

Phil Keith Tarran, County of San Diego, Calif., assignor to Lords III Research & Development Co., Escondido, Calif.
Filed Mar. 25, 1977, Ser. No. 781,440
Term of patent 14 years
Int. Cl. D12—*02*

U.S. Cl. D12—25

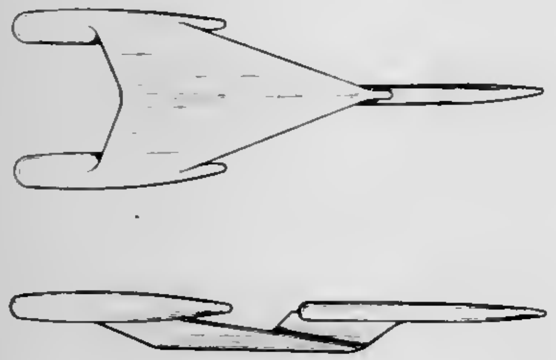


249,033

BOAT HULL

Francis Norman Potter, The Willow, 116 Main St., Burton-Joyce, Nottingham NG 14 5EP, England
Filed Aug. 20, 1976, Ser. No. 716,207
Term of patent 14 years
Int. Cl. D12—*06*

U.S. Cl. D12—62

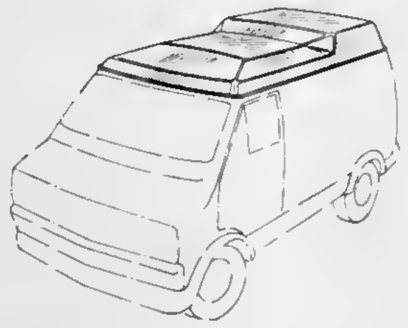


249,034

VAN TOP

Stanley Gene Snyder, 1100 Pioneer Way, El Cajon, Calif. 92020
Filed Feb. 4, 1977, Ser. No. 765,444
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—156

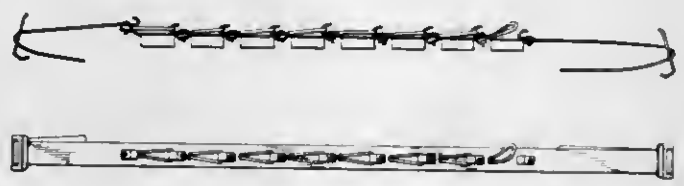


249,035

FLEXIBLE AUTOMOBILE SKI RACK

Wayne L. Martin, 36 Cuesta Way, Walnut Creek, Calif. 94596
Filed Mar. 14, 1977, Ser. No. 777,018
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—157

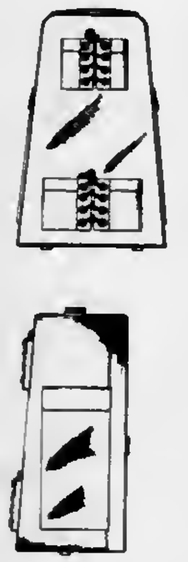


249,036

KNAPSACK FOR A MOTORCYCLE SISSY BAR

Michael W. Ramalia, 207 Perrin, Ypsilanti, Mich. 48197, and William H. Meisling, 325 Becket, Brighton, Mich. 48116
Filed May 26, 1976, Ser. No. 690,232
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—158

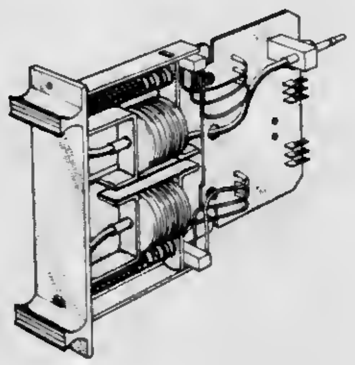


249,037

COMPRESSION SWITCH

Walter Metz, Moosebrunn, Fed. Rep. of Germany, assignor to Metz Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed Sep. 16, 1976, Ser. No. 723,997
Term of patent 14 years
Int. Cl. D13—*03*

U.S. Cl. D13—32

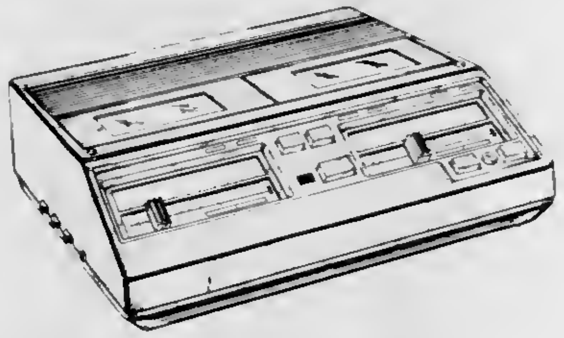


249,038

DICTATING MACHINE

David K. Walz, 1534 N. Decatur Rd., NE., Atlanta, Ga. 30333
Filed Sep. 24, 1976, Ser. No. 726,156
Term of patent 14 years
Int. Cl. D14—*01*

U.S. Cl. D14—3

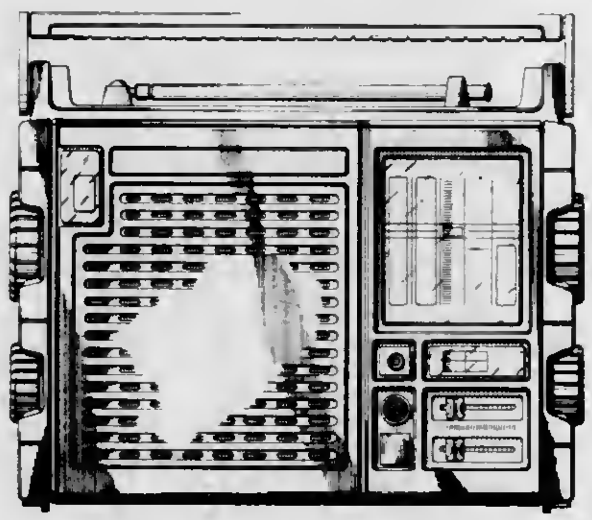


249,039

PORTABLE RADIO

John T. Houlihan, Fayetteville, N.Y., assignor to General Electric Company
Filed Jun. 11, 1976, Ser. No. 695,172
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D14—70

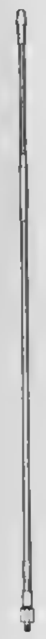


249,040

CENTER LOADED CITIZENS BAND ANTENNA

Don L. Hermansen, 2990 S. Holly Pl., Denver, Colo. 80222, and Ben H. Davis, Jr., Star Rte. 90-A, Morrison, Colo. 80465
Filed Aug. 23, 1976, Ser. No. 716,597
Term of patent 7 years
Int. Cl. D14—*03*

U.S. Cl. D14—86

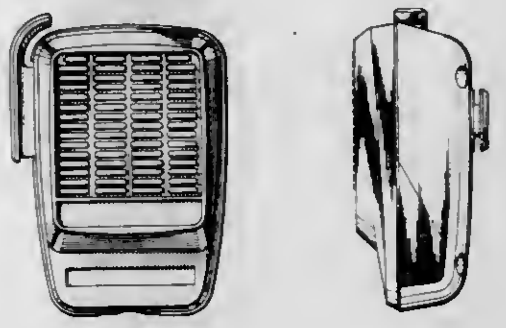


249,041

CB MICROPHONE OR SIMILAR ARTICLE

Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed May 2, 1977, Ser. No. 793,179
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D14—12

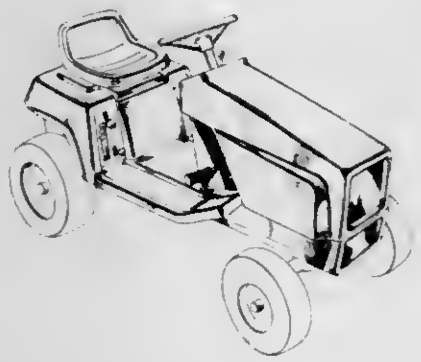


249,042

LAWN AND GARDEN TRACTOR

Darrell W. Hinklin, Richfield, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Jul. 28, 1977, Ser. No. 820,019
Term of patent 14 years
Int. Cl. D12—*09*

U.S. Cl. D15—23

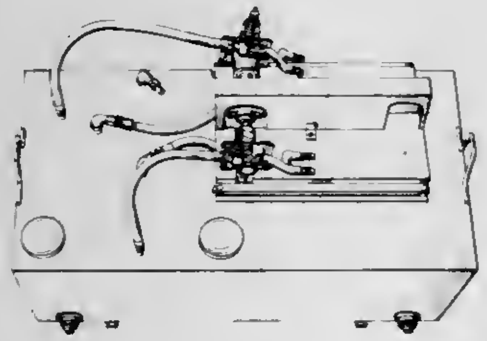


249,043

SPRAY CLEANING UNIT

Thomas J. McMullen, 5529 Park Ave. South, Minneapolis, Minn. 55417
Filed Apr. 28, 1976, Ser. No. 681,023
Term of patent 14 years
Int. Cl. D15—*05*

U.S. Cl. D15—34

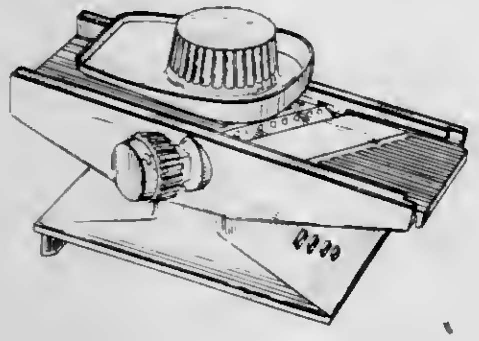


249,044

FOOD SLICER WITH INDEXING TURRET

Samuel J. Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.
Filed Jul. 9, 1976, Ser. No. 704,079
Term of patent 14 years
Int. Cl. D7—*04;* D15—*08*

U.S. Cl. D15—97

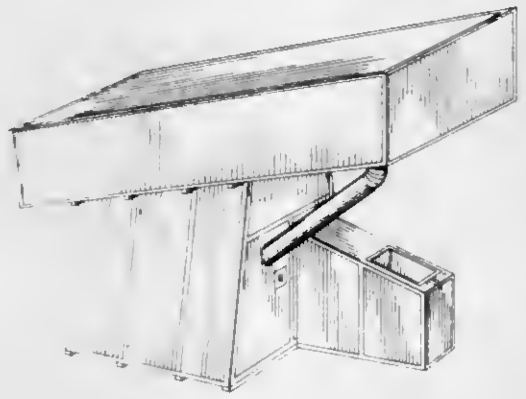


249,045

RECYCLING APPARATUS

John H. Miller, 6412 E. Voltaire Ave., Scottsdale, Ariz. 85254
Filed Dec. 27, 1976, Ser. No. 754,494
Term of patent 14 years
Int. Cl.^{2} D25—*03;* D15—*09*

U.S. Cl. D15—123

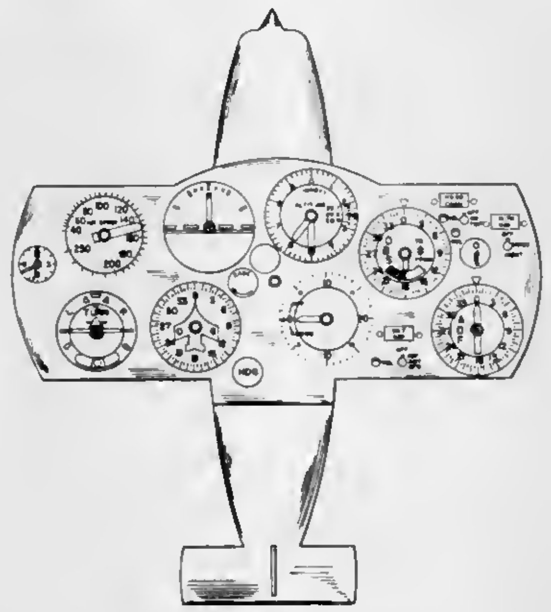


249,046

PORTABLE INSTRUCTIONAL FLIGHT AID DEVICE

William K. Bowman, Jr., Apt. 118, 530 Lee Dr., Coraopolis, Pa. 15108
Filed Jan. 10, 1977, Ser. No. 757,785
Term of patent 14 years
Int. Cl. D19—*07*

U.S. Cl. D19—63

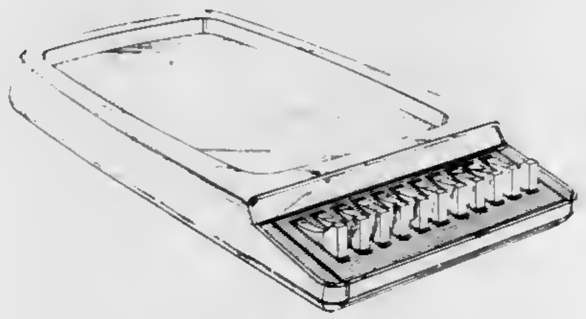


249,047

COMBINED TELEPHONE STAND AND INDEX

Francis Greif, 199 Sussex Gardens, Lancaster Gate, London W.2, England
Filed Jan. 12, 1976, Ser. No. 648,105
Claims priority, application United Kingdom, Jul. 11, 1975, 971807
Term of patent 14 years
Int. Cl. D19—*02*

U.S. Cl. D19—76

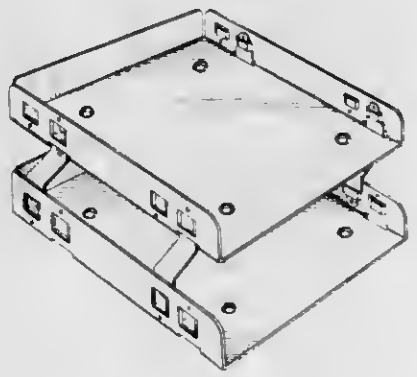


249,048

FILING TRAY

Ronald Drell, and Max I. Epstein, both of Chicago, Ill., assignors to The Vertiflex Company, Chicago, Ill.
Filed Jun. 7, 1976, Ser. No. 693,146
Term of patent 14 years
Int. Cl. D19—*02*

U.S. Cl. D19—92

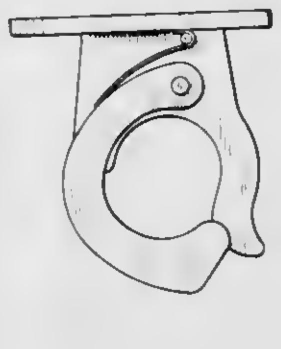


249,049

FISHING ROD SUPPORTING DEVICE

Albert David Black, P.O. Box 3172, Marathon Keys, Fla. 33052
Filed Dec. 10, 1976, Ser. No. 749,465
Term of patent 14 years
Int. Cl. D22—*05*

U.S. Cl. D22—13

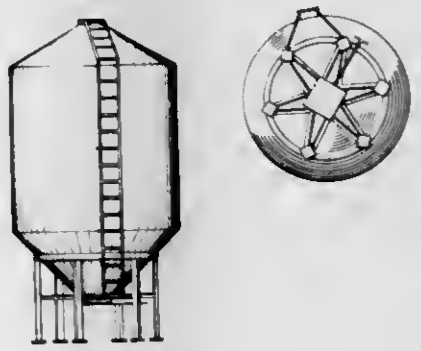


249,050

STORAGE BIN

Elmer Friesen, and Ronald Friesen, both of R.R. #1, Morris, Canada
Filed Mar. 30, 1977, Ser. No. 782,945
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—2

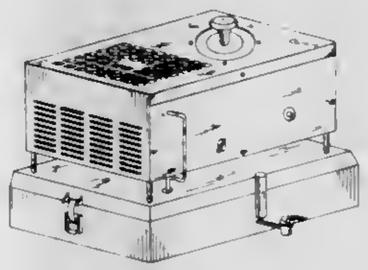


249,051

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,853
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

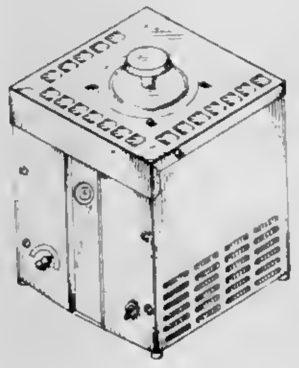


249,052

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,854
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

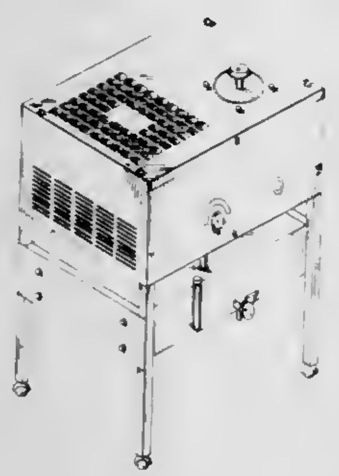


249,053

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,857
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

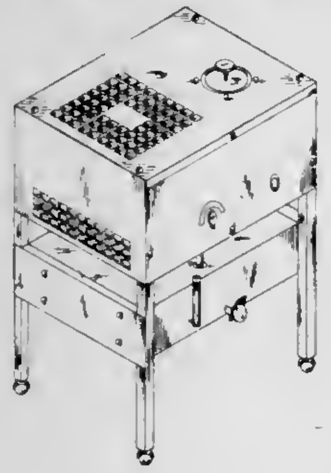


249,054

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,858
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

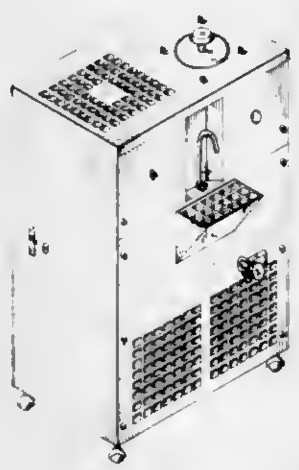


249,055

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,859
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

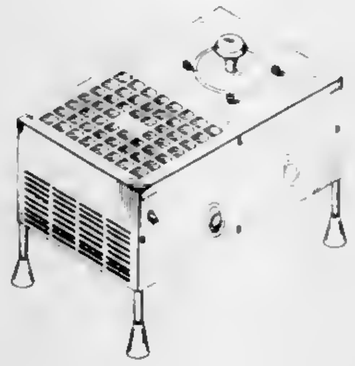


249,056

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,860
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

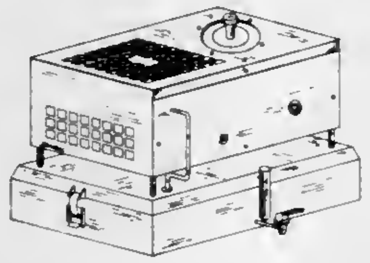


249,057

WATER DISTILLER UNIT

Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 17, 1977, Ser. No. 842,637
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—3

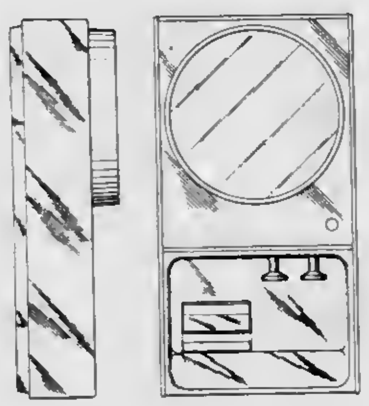


249,058

AFTER BATH DRYER

Arthur Goldstein, 375 Milton Rd., Cambridge, England
Filed Jun. 24, 1976, Ser. No. 699,377
Term of patent 7 years
Int. Cl. D23—*03*

U.S. Cl. D23—74

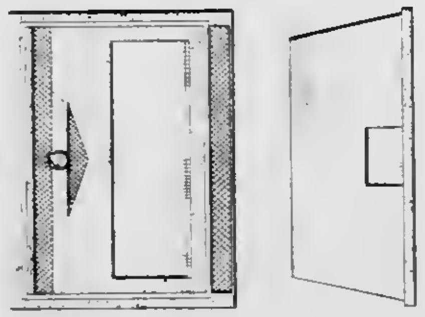


249,059

FIREPLACE UNIT

Alexander J. Moncrieff-Yeates, 8609 Hillside Pl., Fairfax, Va. 22030
Filed Sep. 28, 1976, Ser. No. 727,514
Term of patent 14 years
Int. Cl. D23—*03*

U.S. Cl. D23—94

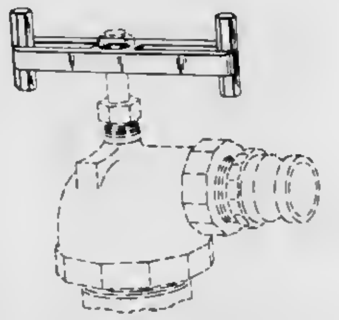


249,060

HYDRANT HANDLE

H. Ronald Ratnik, 222 Weymouth Dr., Rochester, N.Y. 14625
Filed May 25, 1977, Ser. No. 800,292
Term of patent 14 years
Int. Cl. D23—*01*

U.S. Cl. D23—28

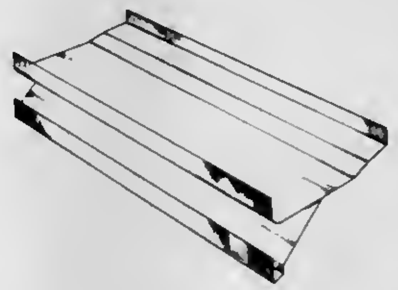


249,061

DRAINABLE BLADE LOUVER HEAD

Joshua R. Dowdell, Jr., 4033 Colgate, Dallas, Tex. 75225, and Paul H. Sanderson, P.O. Box 562, Dallas, Tex. 75065, assignors to Dowco Corporation, Dallas, Tex.
Filed Sep. 13, 1976, Ser. No. 722,620
Term of patent 14 years
Int. Cl. D23—*04*

U.S. Cl. D23—112

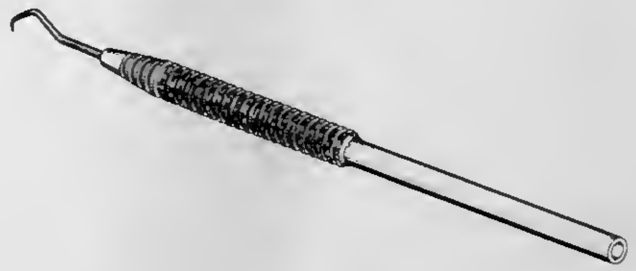


249,062

DENTAL INSTRUMENT

Carl-Goran Crafoord, Djursholm, and John Grieves, Stockholm, both of Sweden, assignors to Norabel AB, Nora, Sweden
Filed Sep. 15, 1977, Ser. No. 833,607
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D24—10

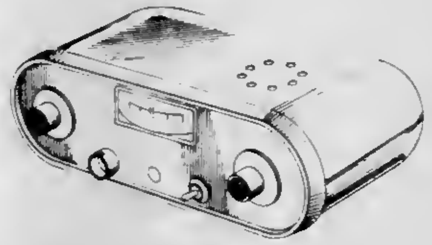


249,063

BIOFEEDBACK TRAINING MODULE

J. Michael James, Cambridge, Mass., assignor to Cyborg Corporation, Boston, Mass.
Filed Apr. 9, 1976, Ser. No. 675,282
Term of patent 14 years
Int. Cl. D24—*01*

U.S. Cl. D24—17



249,064
PORTABLE DEFIBRILLATOR/EKG MONITOR/EKG RECORDER

David B. Smith, Mercer Island; Douglas J. Hill, Renton; James A. Benson, Bellevue, and Paul W. Jones, Bothell, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

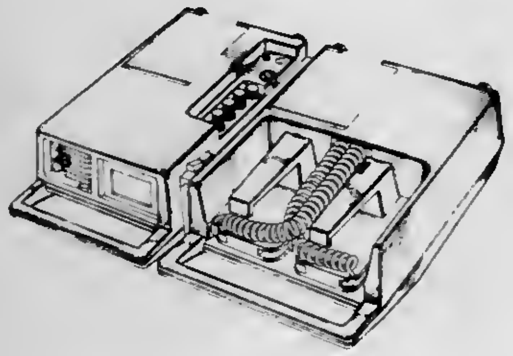
Filed Sep. 3, 1976, Ser. No. 720,117

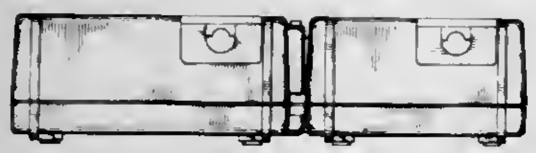
The portion of the term of this patent subsequent to Apr. 26, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—17





249,065
URINARY DRAINLINE SAMPLING PORT ADAPTER

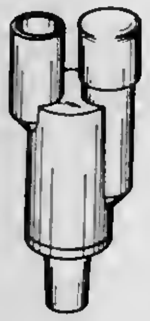
Herbert F. D'Alo, Oakwood Hills-Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,631

Term of patent 14 years

Int. Cl. D23—*01;* D24—*99*

U.S. Cl. D24—53



249,066
URINARY DRAINLINE SAMPLING PORT ADAPTER

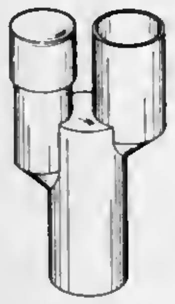
Kenneth E. Pawlak, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,632

Term of patent 14 years

Int. Cl. D23—*01;* D24—*99*

U.S. Cl. D24—53



249,067
URINARY DRAINLINE SAMPLING PORT ADAPTER

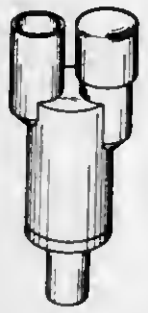
Herbert F. D'Alo, Oakwood Hills-Cary; Kenneth E. Pawlak, Mundelein, and Kenneth H. Knox, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,668

Term of patent 14 years

Int. Cl. D23—*01;* D24—*99*

U.S. Cl. D24—53



249,068
INTERLOCKING WALL UNIT

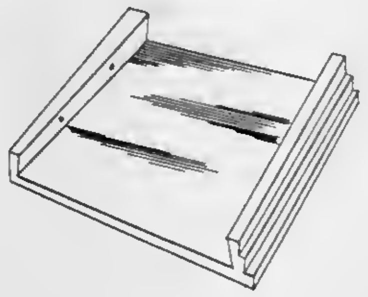
Milton A. Wallace, Bell Haven Park, 3200 NW. 79th St., Apt. 1925, Miami, Fla. 33147

Continuation of Ser. No. 353,464, Apr. 23, 1973, Pat. No. Des. 237,170. This application May 5, 1975, Ser. No. 574,335

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—58



249,069
DECORATIVE SCREEN FOR FACADES

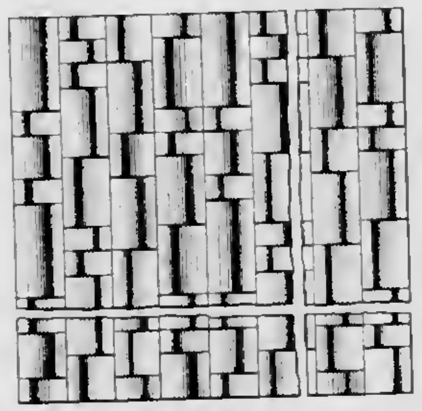
Michael Polifka, Spotswood, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Mar. 19, 1976, Ser. No. 668,601

Term of patent 14 years

Int. Cl. D25—*02*

U.S. Cl. D25—87



249,070
SMOKING DEVICE

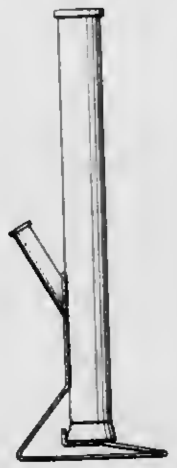
Michael G. Evans, North Hollywood, Calif., assignor to Kevin J. Dawes, North Hollywood, Calif.

Filed Jan. 14, 1977, Ser. No. 759,511

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—03



249,071
WATER PIPE

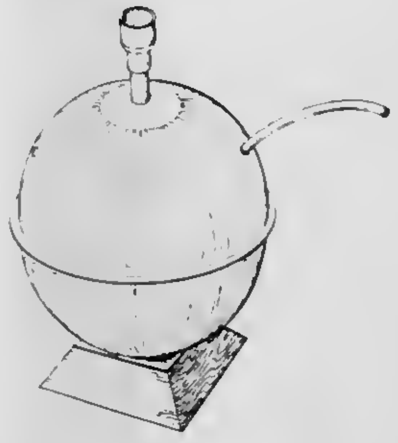
George E. Shepard, Jr., 2919-G Cottage Pl., Greensboro, N.C. 27403

Filed Aug. 15, 1977, Ser. No. 824,868

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—03



249,072
DISPOSABLE RESPIRATORY MASK

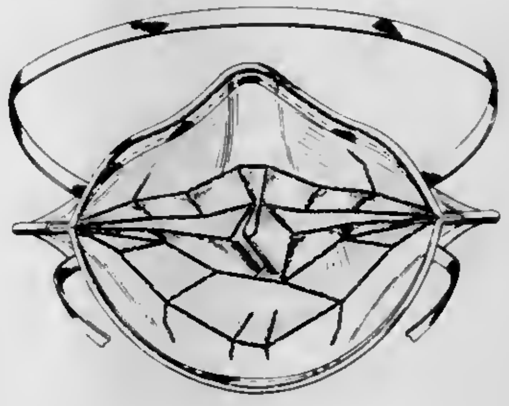
William H. Revoir, Barrington, R.I., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 22, 1976, Ser. No. 743,995

Term of patent 14 years

Int. Cl. 29—*02;* 24—*99*

U.S. Cl. D29—8



249,073
AQUARIUM COVER

James L. Harden, 13223 S. King Dr., Chicago, Ill. 60627

Filed Jun. 13, 1977, Ser. No. 806,017

Term of patent 14 years

Int. Cl. D30—*02*

U.S. Cl. D30—12

FIG 2

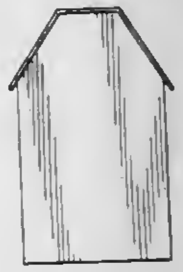
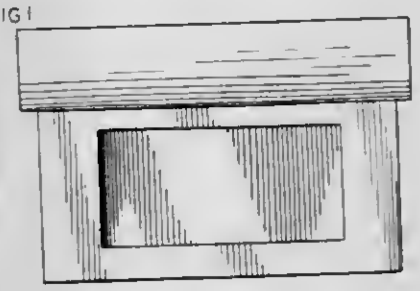


FIG 1

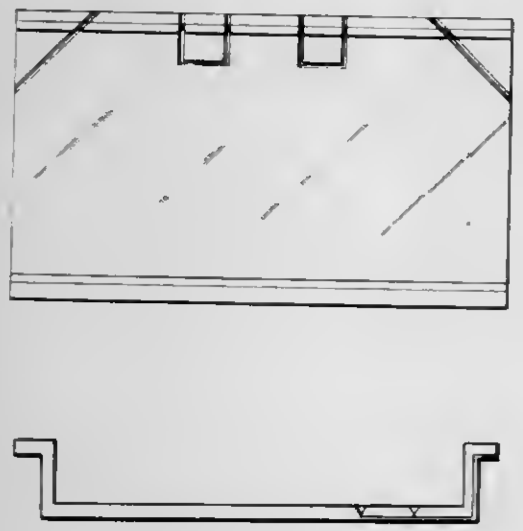


249,074

AQUARIUM COVER

Daniel F. Groth, 14 Brookdale Dr., Wilbraham, Mass. 01095
Filed Aug. 26, 1977, Ser. No. 827,969
Term of patent 14 years
Int. Cl. D30—*02*

U.S. Cl. D30—12

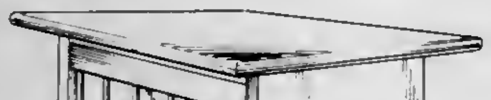


249,075

BIRD FEEDER

Edward Platt, 769 Glenwood Ave. NE., Warren, Ohio 44483
Filed Jul. 8, 1977, Ser. No. 813,821
Term of patent 14 years
Int. Cl. D30—*03*

U.S. Cl. D30—14

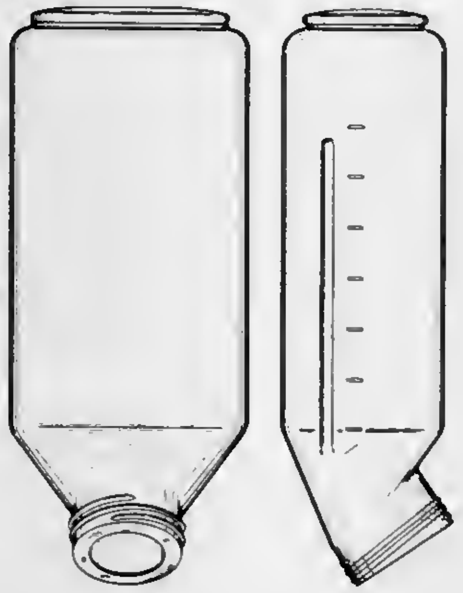


249,076

ANIMAL NURSER

Paul K. Meeker, 412 Park Ave., Kent, Ohio 44240, and Herbert B. Mette, 17246 Greenbrier Dr., Strongsville, Ohio 44136
Filed Aug. 16, 1977, Ser. No. 825,059
Term of patent 14 years
Int. Cl. D30—*03*

U.S. Cl. D30—14

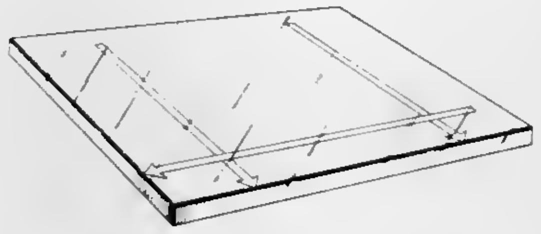


249,077

GOLF SHOT DIRECTOR

Joseph W. Friskel, 102 N. Linn, Frontenac, Kans. 66762
Filed Nov. 14, 1975, Ser. No. 631,857
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—5 CB

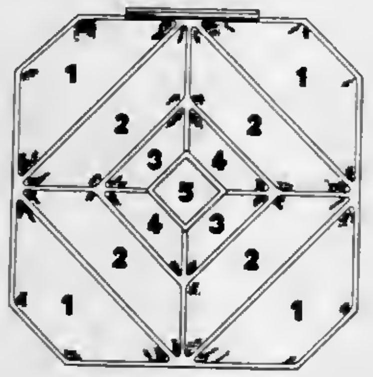


249,078

GAME TARGET

William D. Gutke, 5257 Shelato Way, Carmichael, Calif. 95608
Filed Dec. 1, 1975, Ser. No. 636,650
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—5 PP

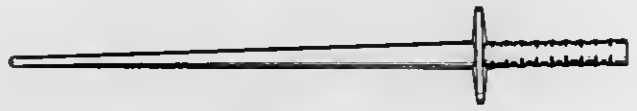


249,079

GAME STICK FOR THROWING OR CATCHING A RING

Walter W. Soderman, and Clifford H. Harman, II, both of Lansing, Mich., assignors to Globe Industrial Sales Company, Lansing, Mich.
Filed Jun. 14, 1976, Ser. No. 695,797
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—5 BC

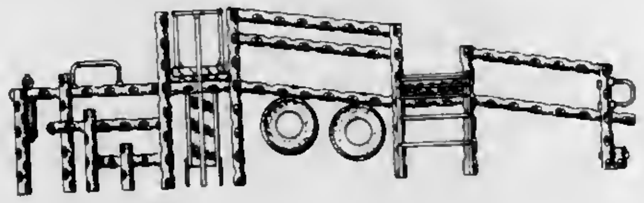


249,080

COMBINED PLAYGROUND CLIMBER AND SLIDE

Donald E. West, Crystal, Minn., assignor to Game Time, Inc., Litchfield, Mich.
Filed Jul. 12, 1976, Ser. No. 704,399
Term of patent 14 years
Int. Cl. D21—*03*

U.S. Cl. D34—5 H

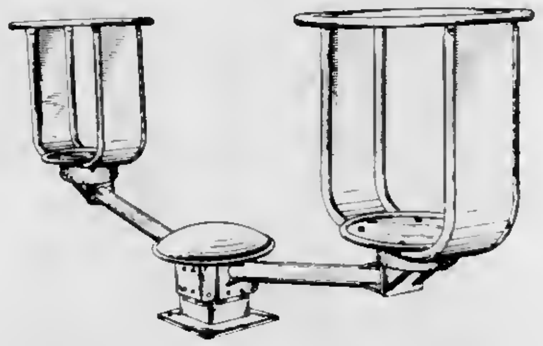


249,081

PLAYGROUND RIDER

Ronald W. Zick, Minneapolis, Minn., assignor to Game Time, Inc., Litchfield, Mich.
Filed Jul. 23, 1976, Ser. No. 708,109
Term of patent 14 years
Int. Cl. D21—*03*

U.S. Cl. D34—5 C

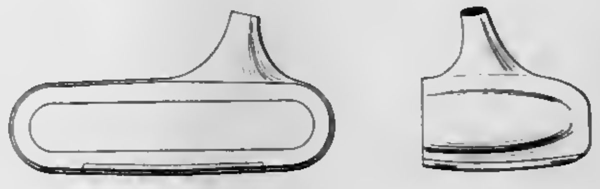


249,082

GOLF PUTTER HEAD

Richard D. McCreary, 4927 Valerie, Bellaire, Tex. 77401
Filed Nov. 26, 1976, Ser. No. 745,372
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—5 GH

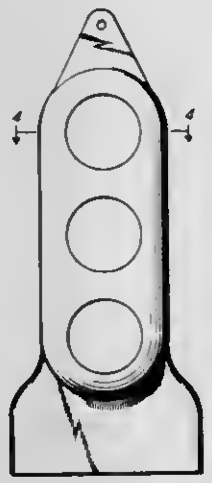


249,083

BALL HOLDER

Roger C. Evans, 10214 Dogwood Ave., Palm Beach Gardens, Fla. 33410
Filed Dec. 1, 1976, Ser. No. 746,594
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—5 CB

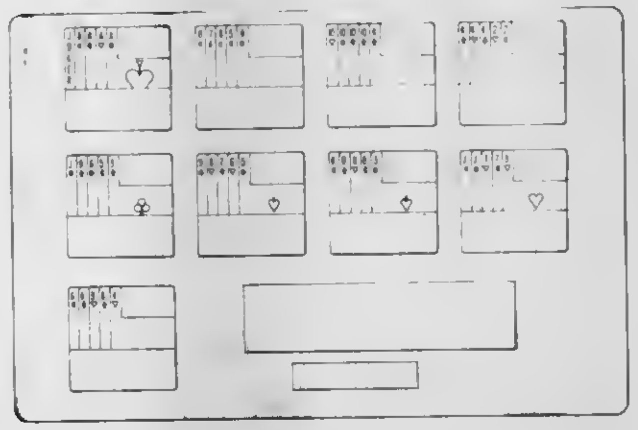


249,084

POKER AID CARD

Robert R. Kowalski, 1161 North Lincoln, Casper, Wyo. 82601
Filed Dec. 8, 1975, Ser. No. 638,750
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—13 A



249,085
TOY POT

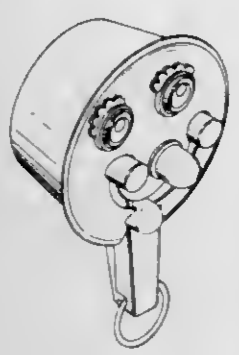
James L. Damascus, Riverdale, N.Y., assignor to Gabriel Industries, Inc., New York, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,190

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 R



249,086
TOY DOG AND SLED

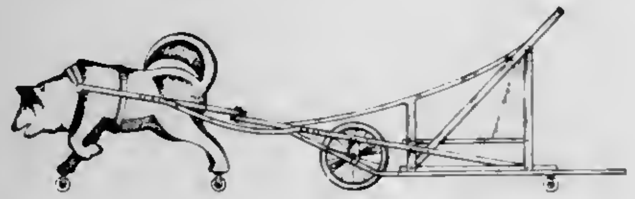
John Tancredi, 81 Pergola Ave., Jamesburg, N.J. 08831

Continuation-in-part of Ser. No. 605,768, Aug. 18, 1975. This application Sep. 29, 1977, Ser. No. 837,892

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 AN



249,087
BIRD FEEDER

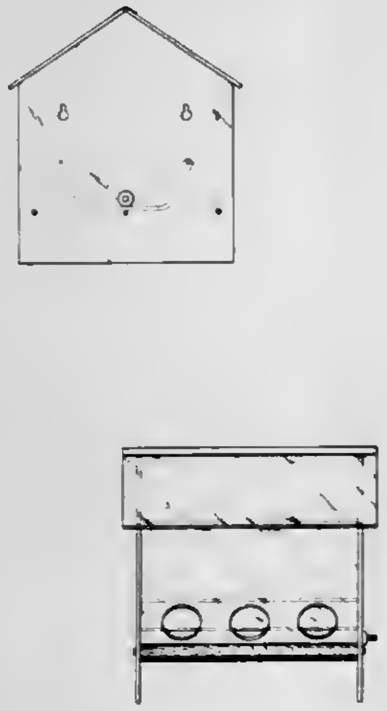
Earle G. Simmons, 25 Westchester Way, Warwick, R.I. 02886

Filed Dec. 19, 1977, Ser. No. 862,294

Term of patent 14 years

Int. Cl. D30—*03*

U.S. Cl. D30—15



249,088
FRONT LIPS FOR DIGGING BUCKET OR THE LIKE

Sten Johan Dahlberg, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

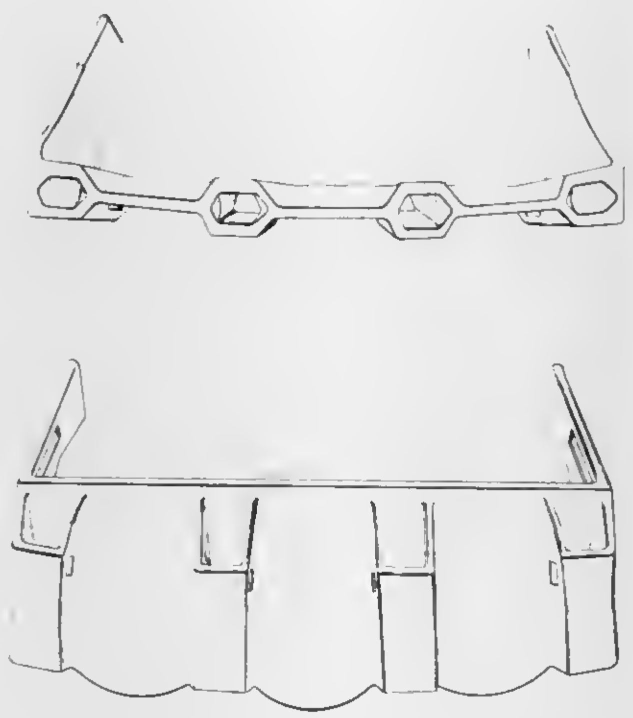
Filed Jul. 5, 1974, Ser. No. 486,263

Claims priority, application Sweden, Jan. 7, 1974, 7425

Term of patent 14 years

Int. Cl. D15—*04*

U.S. Cl. D15—32



249,089
TENNIS BALL PRINTER

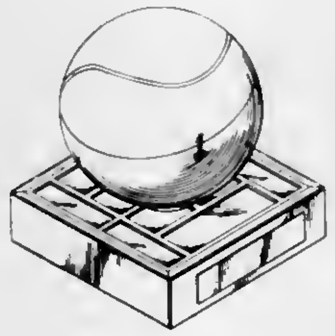
Donald E. Studley, Atlanta, Ga., assignor to Tennis Designs by Studley, Inc., Atlanta, Ga.

Filed Apr. 19, 1976, Ser. No. 677,893

Term of patent 14 years

Int. Cl. D18—*02*

U.S. Cl. D64—10



249,090
CASING FOR AN ELECTRONIC CALCULATOR

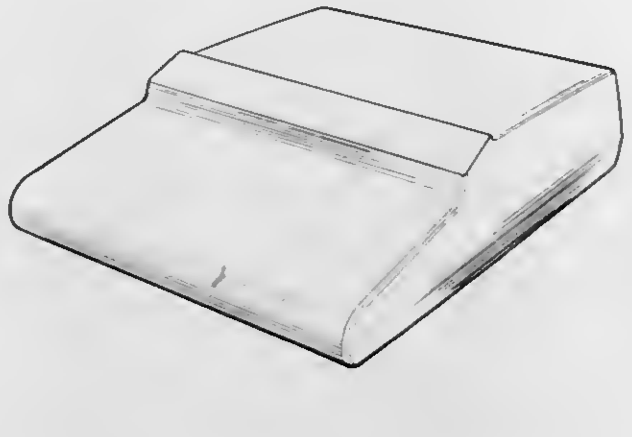
Leroy J. LaCelle, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 18, 1976, Ser. No. 667,912

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D64—11 B



249,091
CONSOLE FOR APPARATUS FOR PERFORMING MATHEMATICAL FUNCTIONS

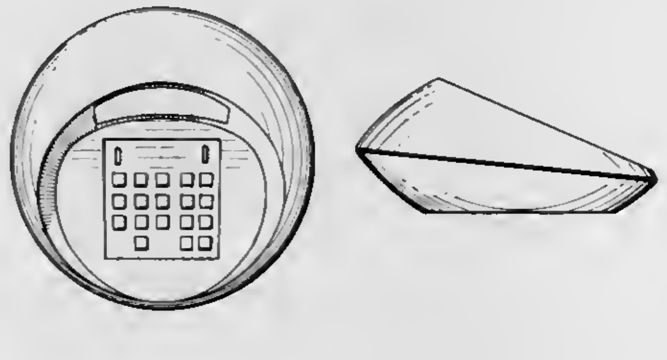
Eric F. Burtis, 45 Melanie La., Atherton, Calif. 94025

Filed Nov. 29, 1976, Ser. No. 745,641

Term of patent 14 years

Int. Cl. D18—*01*; D14—*02*

U.S. Cl. D64—11 B



249,092
ELECTRONIC CALCULATING MACHINE

Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

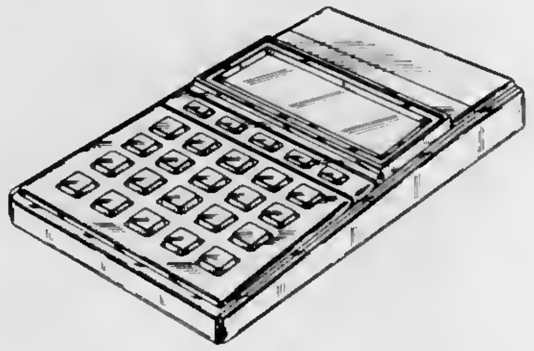
Filed Jul. 25, 1977, Ser. No. 818,821

Claims priority, application Japan, Jan. 26, 1977, 52/2303

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D64—11 B



249,093
ELECTRONIC CALCULATING MACHINE

Shigetoshi Hazama; Matafumi Ikeda; Masafumi Yamagami, and Yoshiaki Kobayashi, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

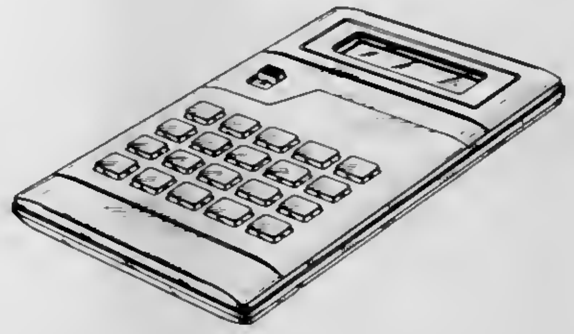
Filed Aug. 23, 1977, Ser. No. 827,176

Claims priority, application Japan, Feb. 23, 1977, 52/6424

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D64—11 B



249,094
TENT

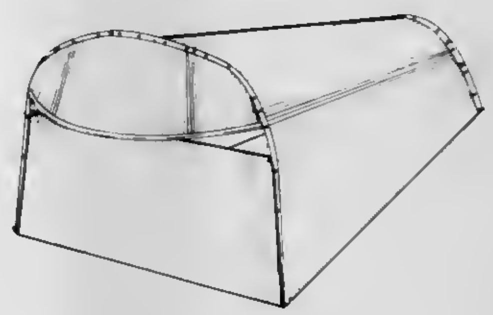
Arthur H. Stewart, Jr., 1904 S. Glendon Dr., Melbourne, Fla. 32901

Filed Sep. 7, 1976, Ser. No. 720,793

Term of patent 14 years

Int. Cl. D21—*04*

U.S. Cl. D88—3 B



249,095
TEXTILE FABRIC

Leo Comensoli, Bondi Junction, Australia, assignor to Speedo Knitting Mills Pty Ltd, Australia

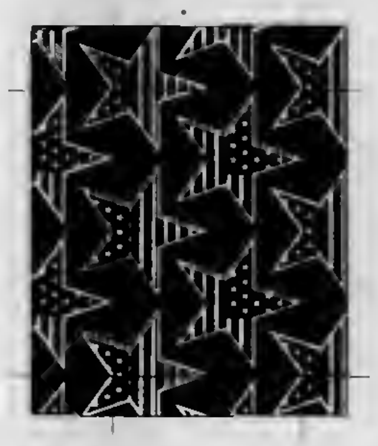
Filed Nov. 24, 1975, Ser. No. 634,412

Claims priority, application Australia, May 29, 1975, 67073/75; May 29, 1975, 67074/75

Term of patent 14 years

Int. Cl. D5—*05*

U.S. Cl. D92—1 FF



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of tbe name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
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Abbott Laboratories: *See—*
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Abel, Irving R.; and Reynolds, Bruce R., to Honeywell Inc. Shade reducing aperture stop for thermal imaging systems. 4,109,149, Cl. 250-347.000.

Abels, Theodor, to Linde Aktiengesellschaft. Hydrostatic-transmission control system, especially for lift and other industrial vehicles. 4,108,265, Cl. 180-66.00R.

Abex Corporation: *See—*
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MacKeigan, Thomas H., 4,107,842, Cl. 30-358.000.

Abrams, D. David, to Mego Corp. Demountable toy house. 4,107,869, Cl. 46-21.000.

ACF Industries, Incorporated: *See—*
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Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Brake booster. 4,107,926, Cl. 60-548.000.

Adam, Kenneth Charles: *See—*
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Adidas Fabrique de Chaussures de Sport: *See—*
Kreyenbuhl, Armand, 4,108,467, Cl. 280-615.000.

Adler, Raphael. Stone and mounting gauge. 4,107,850, Cl. 33-178.00B.

Advanced Circuit Technology: *See—*
Roberts, Joseph A., 4,107,836, Cl. 29-625.000.

Advanced Patent Technology, Incorporated: *See—*
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Agence Nationale de Valorisation de la Recherche (Anvar): *See—*
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Agency of Industrial Science & Technology: *See—*
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Mitsui, Murao; Yokogawa, Kiyoshi; and Fukuyama, Seiji, 4,107,982, Cl. 73-95.000.

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Agri-Bio Corporation: *See—*
Walden, Carl W., 4,108,176, Cl. 128-218.00A.

Air Products & Chemicals, Inc.: *See—*
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Airco, Inc.: *See—*
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Airfix Industries Limited: *See—*
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Aisan Kogyo Kabushiki Kaisha: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
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Aizawa, Tatsuo: *See—*
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Akagane, Katsuo; Adachi, Teruho; and Kamio, Kunimasa, to Sumitomo Chemical Company, Limited. Stabilized chlorine-containing resin composition. 4,108,924, Cl. 260-837.0PV.

Akiyama, Shunichi: *See—*
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Aktiebolaget Atomenergi: *See—*
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Aktiengesellschaft Fr.Mettler's Sohne, Maschinenfabrik: *See—*
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Akutsu, Hidezo: *See—*
Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.

Albertson, Noel F., to Sterling Drug Inc. Imidazolylmethyl methanobenzazocines. 4,108,857, Cl. 260-293.540.

Albright & Wilson Ltd.: *See—*
Edwards, Alfred Gerald; and Harris, Glyn Islwyn, 4,108,822, Cl. 260-32.80R.

Alden Optical Laboratories, Inc.: *See—*
Creighton, Charles P.; and Teschemacher, Charles R., 4,109,074, Cl. 526-320.000.

Aldrich, Paul Harwood, to Hercules Incorporated. Sizing paper with stable dispersions of hydrocarbon resins. 4,109,053, Cl. 428-413.000.

Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, to Sybron Corporation. Blood pressure testing kit. 4,108,310, Cl. 206-570.000.

Alex, Wayne E. Long line coiling apparatus. 4,107,865, Cl. 43-27.400.

Alexander, John Mergle: *See—*
Howland, Paul George; and Alexander, John Mergle, 4,108,338, Cl. 222-286.000.

Alexander, Samuel Ray, to Du Pont de Nemours, E. I., and Company. Sludge disinfection. 4,108,772, Cl. 210-64.000.

Alexander Wiegand GmbH u. Co., Armaturen- u. Manometeneabrik: *See—*
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Alexander, Willard E.: *See—*
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All One God Faith, Inc.: *See—*
Bronner, Emanuel H., 4,108,309, Cl. 206-528.000.

Allen-Bradley Company: *See—*
Frey, Sydney W., Jr., 4,109,230, Cl. 338-164.000.

Allen, John Graham, to Imperial Chemical Industries Limited. Radiation sensitive vinyl hydrophilic copolymers. 4,109,068, Cl. 526-9.000.

Allied Chemical Corporation: *See—*
Cipris, Divna; and Pouli, Dirk, 4,108,745, Cl. 204-129.000.
Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, 4,108,922, Cl. 260-830.00P.
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,108,781, Cl. 252-8.900.
Mears, Whitney Harris, 4,108,916, Cl. 260-676.00R.

Allis-Chalmers Corporation: *See—*
Shaver, J. Lyle, 4,108,150, Cl. 130-27.00H.

Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, to Bell Telephone Laboratories, Incorporated. Communication system optimized pooled line arrangement. 4,109,113, Cl. 179-99.000.

Alonso, Sydney A. Musical note oscillator. 4,108,035, Cl. 84-1.010.

Alpha Industries, Inc.: *See—*
Borzym, Alexander, 4,108,029, Cl. 83-54.000.

Alphin, Reevis S.: *See—*
Lunsford, Carl D.; and Alphin, Reevis S., 4,109,005, Cl. 424-274.000.

Alpma Alpenland Maschinenbau Hain and Co. K.G.: *See—*
Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, 4,108,057, Cl. 99-452.000.

Althausen, Ferdinand: *See—*
Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, 4,108,585, Cl. 425-89.000.

Althoff, Bruce B. Tennis racket with warm-up weight. 4,108,433, Cl. 273-29.00A.

Aluminum Company of America: *See—*
Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., 4,108,968, Cl. 423-495.000.

Alvigini, Mario Filippo. Spring powered bicycle. 4,108,459, Cl. 280-215.000.

Amann, Herbert; and Morlock, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of solid thermoplastic terpolymerizate of trioxane. 4,108,838, Cl. 528-249.000.
Amano, Takehisa: *See—*
  Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.
Amberg, Stephen W., to Owens-Illinois, Inc. One piece foam cup. 4,108,347, Cl. 229-1.50B.
Amchem Products, Inc.: *See—*
  Heller, Ferdinand P., 4,108,690, Cl. 148-6.15R.
  Lochel, Frank P., Jr., 4,108,817, Cl. 260-29.60E.
American Antenna Corporation: *See—*
  Liautaud, James P., 4,109,224, Cl. 336-192.000.
American Cyanamid Company: *See—*
  Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,108,890, Cl. 260-507.00R.
  Brown, Dale Gordon; and Brand, William Wayne, 4,108,904, Cl. 260-600.00R.
  Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,108,883, Cl. 260-453.0RW.
  Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,109,072, Cl. 526-258.000.
American Home Products Corp.: *See—*
  Demerson, Christopher A.; and Humber, Leslie G., 4,108,998, Cl. 424-258.000.
American Hospital Supply Corporation: *See—*
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American Optical Corporation: *See—*
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AMP Incorporated: *See—*
  Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, 4,108,527, Cl. 339-107.000.
Ampex Corporation: *See—*
  Weber, Donald William, 4,109,184, Cl. 318-327.000.
Amschler, Hermann, to Byk Gulden Lomberg Chemische Fabrik GmbH. 4-(2-Imidazolin-2-yl) aminopyrazoles. 4,108,982, Cl. 424-73.000.
Analog Technology Corporation: *See—*
  Raymond, David Lee, 4,109,168, Cl. 307-271.000.
Andersen, Harold Willids; and Harrison, Charles H., to H. W. Andersen Products Inc. Method and apparatus for detecting and controlling a volatile substance. 4,107,976, Cl. 73-52.000.
Anderson, Arnold L., to Velsicol Chemical Corporation. Halogenated aryl compounds and processes for preparing the same. 4,108,906, Cl. 260-609.00R.
Anderson, Carl M.; and Poland, Robert L., to Chromalloy Farm and Industrial Equipment Co. Agricultural implement with constant frame attitude maintaining mechanism. 4,108,249, Cl. 172-328.000.
Anderson, Clifford Wilhelm; Mack, Kenneth John; and Martin, Jerry Thomas, to International Business Machines Corporation. Porous polymeric bearing. 4,108,939, Cl. 264-129.000.
Anderson, David L., Jr. Probe for extracting toxic fluids from an hermetically sealed container. 4,108,336, Cl. 222-148.000.
Anderson, George J.; and Bell, Roscoe Lee, to Dana Corporation. Piston ring assembly. 4,108,448, Cl. 277-157.000.
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Anderson, James K. Method for automatically processing photogravure curvilinear surfaces. 4,108,683, Cl. 134-27.000.
Anderson, Jerrel Charles, to Du Pont de Nemours, E. I., and Company. Electroconductive transparency. 4,109,052, Cl. 428-409.000.
Anderson, Joe H. Vehicle load count-down system. 4,108,262, Cl. 177-136.000.
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., to Manufacturers Systems, Inc. Corrugated flexible metal tubing and method and apparatus for making same. 4,108,212, Cl. 138-122.000.
Anderson, Raymond H.; and Vanderwerf, Dennis F., to Minnesota Mining and Manufacturing Company. Refractor-reflector radiation concentrator. 4,108,540, Cl. 350-211.000.
Andersson, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, to Svenska Utvecklingsaktiebolaget (SU) Swedish National Development Co. Porous electrode for a chemo-electric cell and a method of preparing the same. 4,109,060, Cl. 425-566.000.
Andersson, Lars-Eric. Device for printing braille. 4,108,066, Cl. 101-22.000.
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Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Time shared tone keying system in electronic musical instrument. 4,108,038, Cl. 84-1.030.
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Arai, Hajime; and Ohnuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling the speed shift operation of an automatic transmission. 4,108,022, Cl. 74-645.000.
Arai, Hajime; and Ohnuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic coupling with a lock-up clutch. 4,108,289, Cl. 192-3.300.
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Armand, Marcel; and Charquet, Daniel, to Ugine Aciers. Process for improving the heat resistance of zirconium and its alloys. 4,108,687, Cl. 148-2.000.
Armour Pharmaceutical Company: *See—*
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Arnold, Fred E.; and Wolfe, James F., to United States of America, Air Force. Phenylated aromatic heterocyclic polymers. 4,108,835, Cl. 528-183.000.
Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., to United States of America, Air Force. Reactive plasticizer for thermoplastic polysulfone resins. 4,108,926, Cl. 260-874.000.
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Arsac, Aime Joseph; and Frank, Pierre, to Produits Chimiques Ugine Kuhlmann. Process for making 2-(4'-aminophenyl) 5-amino benzimidazole. 4,109,093, Cl. 548-334.000.
Artamonov, Viktor Leonidovich: *See—*
  Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
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Asahara, Yoshiyuki; and Izumitani, Tetsuro, to Hoya Glass Works, Ltd. Process of producing soft aperture filter. 4,108,621, Cl. 65-30.00R.
Asahi Denka Kogyo K.K.: *See—*
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  Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, 4,108,724, Cl. 195-96.000.

Asano, Naomasa: *See—*
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Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, to Mitsui Toatsu Chemicals, Incorporated. Purification of an aqueous solution of acrylamide. 4,108,893, Cl. 260-561.00N.
ASEA Aktiebolag: *See—*
  Bozzini, Charles, 4,109,291, Cl. 361-272.000.
  Madsen, Kristian Dahl, 4,108,354, Cl. 233-30.000.
Ashland Oil, Inc.: *See—*
  Trivedi, Bhupendra C.; Grimm, Robert A.; and McConnell, R. B., 4,109,094, Cl. 548-347.000.
Ashmore, Charles I.; Combs, Charles S., Jr.; and Stephens, William D., to Thiokol Corporation. Solid propellant having incorporated therein a ferrocene combustion catalyst. 4,108,696, Cl. 149-19.200.
Ateliers de la Motobecane: *See—*
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  Stover, Dennis E., 4,108,722, Cl. 195-1.000.
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  Ekwall, Carl G. B., 4,108,258, Cl. 175-320.000.
  Ryd, Per-Olof; and Svensson, Sten Gunnar Hugo, 4,108,382, Cl. 239-271.000.
Atlas Pacific Engineering Company: *See—*
  Loveland, Malcolm W., 4,108,059, Cl. 99-543.000.
  Loveland, Malcolm W., 4,108,060, Cl. 99-591.000.
  Loveland, Malcolm W., 4,109,021, Cl. 426-482.000.
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Audykowski, Thaddeus, to Ciba-Geigy Corporation. Heat-curable lacquer of low solvent content, based on an epoxide resin. 4,108,815, Cl. 260-29.2EP.
Ausnit, Steven. Separable connective flexible toy assembly. 4,107,870, Cl. 46-28.000.
Austin, Terry Marshall; Carroll, Eugene Thomas; and Bowen, Mildred Choi, to Union Carbide Corporation. Method and system for detecting ultra-trace quantities of metal carbonyls. 4,108,552, Cl. 356-87.000.
Automobile Peugeot: *See—*
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Avenia, Richard William; and Pecherer, Benjamin, to Hoffmann-La Roche Inc. Immunoassay for catecholamines. 4,108,973, Cl. 424-1.000.
Avery, Carl Fredrick, Jr.: *See—*
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Ayerst, McKenna & Harrison Limited: *See—*
  Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,108,997, Cl. 424-256.000.
Azemar, Michel; and Vigliecca, Lucien, to Rhone-Poulenc Industries. Horizontal autoclave for the bulk preparation of polymers and copolymers on a basis of vinyl chloride. 4,109,069, Cl. 526-65.000.
B & H Commercial Inventors & Designers Limited: *See—*
  Cook, Peter Henry; and Holmes, Joseph Arthur Henry, 4,107,853, Cl. 35-35.00H.
B & H Manufacturing Company, Inc.: *See—*
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  Hoffmann, Wolfgang, 4,108,710, Cl. 156-450.000.
  Hoffmann, Wolfgang, 4,108,711, Cl. 156-497.000.
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  Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
Babineaux, Lucien J. Well cable stop for stripping operations. 4,108,245, Cl. 166-301.000.
Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., to Barry-Wehmiller Company. Transparent container inspection apparatus. 4,108,762, Cl. 209-111.70T.
Babunovic, Momir; and Whitlock, Donald E., to Barry-Wehmiller Company. Container washer having external label filter and separator with filter flushing means. 4,108,774, Cl. 210-167.000.
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  Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,109,072, Cl. 526-258.000.
Baelz, Harry C.; and Cassel, Harrison E., to Schulmerich Carillons, Inc. Program control device. 4,109,119, Cl. 200-38.0BA.
Baer, Ralph H.; and Fletchic, Donald K., to Marvin Glass & Associates. Programmable phonograph device. 4,109,114, Cl. 179-100.40D.
Baer, Terry G.; and Klopfenstein, Wayne A., to Caterpillar Tractor Co. Tire and center support assembling apparatus. 4,108,233, Cl. 157-1.370.
Baeyertz, John F.: *See—*
  Rostek, Paul M.; and Baeyertz, John F., 4,109,295, Cl. 361-401.000.
  Rostek, Paul M.; and Baeyertz, John F., 4,109,296, Cl. 361-401.000.
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  Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
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Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, to Imperial Chemical Industries Limited. 2-Aminothiophenes. 4,108,867, Cl. 260-332.20C.
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  Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
Baker, Ann Marie, to Dow Chemical Company, The. Method for making crosslinked resin foams from at least one dicarboxylic acid, at least one ethylenically unsaturated dicarboxylic acid anhydride and a polyisocyanate. 4,108,810, Cl. 521-129.000.
Baker, William H.: *See—*
  Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., 4,108,381, Cl. 239-265.350.
Bala, Harry; and Mowli, John C. Heat sealing machine with cooling means. 4,108,712, Cl. 156-498.000.
Balchunas, Charles A., to General Electric Company. Thermostat controlled flatiron. 4,109,136, Cl. 219-252.000.
Balke-Durr Aktiengesellschaft: *See—*
  Joekel, Alfred; Langen, Hans; and Denner, Peter, 4,107,832, Cl. 29-157.3AH.
Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., to United States of America, Navy. Three axis magnetometer calibration checking method and apparatus. 4,109,199, Cl. 324-202.000.
Ballman, Albert Anthony; and Robbins, Murray, to Bell Telephone Laboratories, Incorporated. Process for producing lithium niobate and lithium tantalate. 4,108,970, Cl. 423-593.000.
Balmer, Oskar: *See—*
  Focke, Heinz; and Balmer, Oskar, 4,108,263, Cl. 177-145.000.
Banks, Arthur James: *See—*
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Bar, Ulrich: *See—*
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  Smejkal, Paul V.; and Baranski, Robert B., 4,107,973, Cl. 72-450.000.
Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, to L. Schuler GmbH. Aligning and stamping arrangement. 4,108,320, Cl. 214-8.000.
Barger, J. P.; and Holroyd, Joseph A., to Dynatech Corporation. Blood filming apparatus. 4,108,109, Cl. 118-52.000.
Barnard, Daniel Dewey, to Bendix Corporation, The. Air/fuel ratio for an internal combustion engine controlled by gas sensor in intake manifold. 4,108,122, Cl. 123-119.0EC.
Barnich, Richard G.; and Hakeem, Timothy M., to Process Computer Systems, Inc. Digital processor for generating alphanumeric display on a cathode ray tube. 4,109,244, Cl. 340-324.0AD.
Baron, Richard Alan. Skate board safety accessory. 4,108,452, Cl. 280-11.300.
Barr, Graham S. S.: *See—*
  Hanson, William A.; and Barr, Graham S. S., 4,108,602, Cl. 23-230.00R.
Barr, James W., Jr., to Sterling Drug Inc. Process for removing calcium oxalate scale. 4,108,680, Cl. 134-3.000.
Barrall, Jeffery L., to Armstrong Cork Company. Method for treating lightweight, non-cementitious building material. 4,109,032, Cl. 427-255.000.
Barre, Rene Emile Leon. Device for watertight stoppering of bottles. 4,108,325, Cl. 215-364.000.
Barry-Wehmiller Company: *See—*
  Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.
  Babunovic, Momir; and Whitlock, Donald E., 4,108,774, Cl. 210-167.000.
Barson, Leslie; and Davis, Frederick Charles, to Companion Pty. Limited. Portable barbeque. 4,108,142, Cl. 126-41.00R.

- Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,109,083, Cl. 544-26.000.
- Barth, Wayne E., to Pfizer Inc. 7-Amino-3-substituted-cephem compounds. 4,109,085, Cl. 544-30.000.
- Bartley, Thomas S.; and Rosenblath, Quinlan T., Jr., to International Paper Company. Apparatus and method for the indirect measurement and control of the flow rate of a liquid in a piping system. 4,108,574, Cl. 417-19.000.
- Barton, Paul, to International Telephone and Telegraph Corporation. Scanning beam receiver. 4,109,249, Cl. 343-108.00M.
- BASF Aktiengesellschaft: *See—*
  - Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.
  - Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
- BASF Wyandotte Corporation: *See—*
  - Narayan, Thirumurti; and Cenker, Moses, 4,108,808, Cl. 521-181.000.
  - Narayan, Thirumurti; and Cenker, Moses, 4,108,809, Cl. 521-136.000.
- Bateman, Coates F.; and Soltanoff, Louis, to Veeder Industries, Inc. Fluid meter. 4,107,992, Cl. 73-260.000.
- Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., to United States of America, Navy. Correction and transmission system for directional target information. 4,109,232, Cl. 340-6.00R.
- Bates, Homer J.: *See—*
  - Carstens, Marion R.; and Bates, Homer J., 4,108,079, Cl. 104-252.000.
- Bates, Paul Edward; Hughes, John Ronald; and Zoueshtiagh, Nahid, to Procter & Gamble Company, The. Preparation of French fries. 4,109,012, Cl. 426-302.000.
- Battelle-Institut e.V.: *See—*
  - Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.
- Battelle-Institute: *See—*
  - Ehrhardt, Josef; and Winter, Heinrich, 4,108,737, Cl. 204-13.000.
- Bauer, Adeline L. Stuffed reversible doll. 4,107,873, Cl. 46-153.000.
- Bauer, Hans, to Dietz-metall GmbH & Co. KG. Grilling apparatus. 4,108,141, Cl. 126-41.00R.
- Bauer, Richard G.: *See—*
  - Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., 4,108,923, Cl. 260-836.000.
- Bauer, Werner R.; and Smith, William N., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 4,109,121, Cl. 200-67.00E.
- Baus, Heinz Georg. Lateral connection member of a partition for a bathing- or shower-cabin. 4,107,878, Cl. 49-125.000.
- Baxter Travenol Laboratories, Inc.: *See—*
  - Brown, Richard I., 4,108,353, Cl. 233-26.000.
  - Pearson, Bert David; and Kissane, Richard J., 4,108,607, Cl. 23-253.00R.
- Bayer Aktiengesellschaft: *See—*
  - Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.
  - Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, 4,108,814, Cl. 260-29.2TN.
  - Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, 4,108,845, Cl. 526-240.000.
  - Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
- BBC Brown, Boveri & Company Limited: *See—*
  - Melton, Keith Nelson; and Sebalj, Renata, 4,109,125, Cl. 200-268.000.
- Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., to United Technologies Corporation. Method for altering the composition and structure of aluminum bearing overlay alloy coatings during deposition from metallic vapor. 4,109,061, Cl. 428-678.000.
- Beavers, Allan E.: *See—*
  - Pelsue, Bradley A.; and Beavers, Allan E., 4,108,143, Cl. 126-110.00B.
- Becher, Wilfried: *See—*
  - Massonne, Joachim; and Becher, Wilfried, 4,108,967, Cl. 423-469.000.
- Beckerman, Joseph W.: *See—*
  - Elfes, Lee E.; and Beckerman, Joseph W., 4,107,951, Cl. 64-14.000.
- Becton, Dickinson and Company: *See—*
  - Hales, Richard Harold, 4,108,975, Cl. 424-1.000.
  - Reese, Max G., 4,108,976, Cl. 424-1.000.
- Becwar, Andrew J.: *See—*
  - Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,107,940, Cl. 62-121.000.
- Beecham Group Limited: *See—*
  - Pearson, Michael John; and Branch, Clive Leslie, 4,108,992, Cl. 424-248.530.
- Beecham Inc.: *See—*
  - Mazzanobile, Salvatore; and Hillermeier, Robert John, 4,108,978, Cl. 424-49.000.
- Begis, Roger: *See—*
  - Lambert, Gerard Edouard; and Begis, Roger, 4,108,068, Cl. 101-363.000.
- Bein, Kenneth E. Apparatus for controlling feed mechanisms of grinding and cutting apparatus. 4,107,883, Cl. 51-165.800.
- Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, to International Business Machines Corporation. Method of error analysis and diagnosis in electronic data processing systems. 4,108,360, Cl. 235-304.000.
- Beitner, Shlomo, to Bipol Ltd. Portable refrigerator unit. 4,107,934, Cl. 62-3.000.
- Belenkov, Nikolai Mikhailovich; Kurnosov, Anatoly Ivanovich; and Malitsky, Evgeny Efremovich. Semiconductor switching device with breakdown diode formed in the bottom of a recess. 4,109,274, Cl. 357-38.000.
- Bell, Charles W.: *See—*
  - Kling, David A.; and Bell, Charles W., 4,109,095, Cl. 174-67.000.
- Bell, David: *See—*
  - Gregg, Michael John William; and Bell, David, 4,108,011, Cl. 74-229.000.
- Bell & Howell Company: *See—*
  - Watson, Charles J.; and Hrastnik, Walter, 4,108,537, Cl. 350-150.000.
- Bell, Roscoe Lee: *See—*
  - Anderson, George J.; and Bell, Roscoe Lee, 4,108,448, Cl. 277-157.000.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.
  - Ballman, Albert Anthony; and Robbins, Murray, 4,108,970, Cl. 423-593.000.
  - Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, 4,107,835, Cl. 29-590.000.
  - Brackett, Charles Arthur; and Smith, Richard Grant, 4,109,217, Cl. 331-94.50S.
  - Chu, Ta-Shing, 4,109,253, Cl. 343-756.000.
  - Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, 4,109,212, Cl. 328-163.000.
  - Favale, Anthony George, 4,108,522, Cl. 339-19.000.
  - Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.
  - Miller, Norman Richards, 4,109,194, Cl. 323-17.000.
  - Pritchard, Assunta Anna; and Wagner, Sigurd, 4,108,716, Cl. 156-636.000.
  - Yi Cho, Alfred; and Schneider, Martin Victor, 4,108,738, Cl. 204-15.000.
- Bellem, Norman A., to Butler Manufacturing Company. Wall panel unit. 4,107,892, Cl. 52-403.000.
- Beloit Corporation: *See—*
  - Berry, Kenneth William, 4,108,110, Cl. 118-412.000.
- Bembenek, William E., to Frito-Lay, Inc. Rotary cutting device for forming strips of shaped article preforms. 4,108,033, Cl. 83-122.000.
- Bendix Corporation, The: *See—*
  - Barnard, Daniel Dewey, 4,108,122, Cl. 123-119.0EC.
  - Niemaszyk, Casimer; and Rothenberg, Peter, 4,108,358, Cl. 235-302.000.
- Bengtson, Robert W., to Foster Wheeler Energy Corporation. Scheduling tool. 4,108,356, Cl. 235-69.000.
- Bennett, Derek J., to Bunker Ramo Corporation. Wave motion isolator between buoy and cable-suspended instrumentation package. 4,107,804, Cl. 9-8.00R.
- Bennett, Thomas M.: *See—*
  - Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
- Benson, James M., to Teledyne, Inc. Resistance bridge-type flowmeter. 4,107,991, Cl. 73-204.000.
- Bentsen, Thomas Valdemar, to Bruun & Sorensen A/S. Garbage suction plant. 4,108,498, Cl. 302-27.000.
- Bentz, Francis: *See—*
  - Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
- Berenson, Sidney G., to NCR Corporation. Overload protection system. 4,109,288, Cl. 361-58.000.
- Berg, Peter G.: *See—*
  - Marcoux, Leo; and Berg, Peter G., 4,108,125, Cl. 123-122.00F.
- Berger, Eugene; and Bienfait, Charles, to Solvay & Cie. Process for the polymerization of olefins. 4,109,071, Cl. 526-114.000.
- Bernat, Jean-Pierre; and Sors, Jean, to Societe Nationale Elf Aquitaine. Recovery of the zinc contained in the residual solutions obtained after electrolytic deposition. 4,108,744, Cl. 204-119.000.
- Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, to American Cyanamid Company. Nitro or amino phenylenebis(carbonylimino)dinaphthalenetrisulfonic compounds as complement inhibitors. 4,108,890, Cl. 260-507.00R.
- Berry, Henry K. Quick-closing fire gate. 4,108,195, Cl. 137-68.00A.
- Berry, Kenneth William, to Beloit Corporation. Apparatus for coating both sides of a travelling web. 4,108,110, Cl. 118-412.000.
- Berry, Richard C., to Crouse-Hinds Company. Expansion-deflection coupling. 4,109,097, Cl. 174-86.000.
- Bertolini Engineering Co., Inc.: *See—*
  - Bertolini, William A., 4,108,326, Cl. 220-1.500.
- Bertolini, William A., to Bertolini Engineering Co., Inc. Adapter frames to extend length of intermodal containers. 4,108,326, Cl. 220-1.500.
- Bertolino, Giorgio Maria: *See—*
  - Bifani, Alberto Giovanni; and Bertolino, Giorgio Maria, 4,108,317, Cl. 214-1.0PA.
- Bertone, Antonino: *See—*
  - Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, 4,108,273, Cl. 180-148.000.
- Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, to Honeywell Information Systems Inc. Apparatus for digital data recovery from mass storage devices. 4,109,236, Cl. 340-146.10F.

- Bethlehem Steel Corporation: *See—*
  - Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., 4,108,735, Cl. 203-7.000.
  - Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.
- Better Built Machinery Corporation: *See—*
  - Wolff, Robert, 4,108,601, Cl. 21-96.000.
- Betush, Frank A., to Progessive Machine Products, Inc. Pinch valve syringe. 4,108,178, Cl. 128-224.000.
- Beutel, Rudolf, to Carl Schenk AG, Firma. Method and apparatus for measuring and indicating the unbalance of a rotor. 4,109,312, Cl. 364-508.000.
- Bezsilko, Nicolas, to S. A. Vandeputte & Cie. Automatic sorter for pieces of money or similar objects as a function of their diameter. 4,108,187, Cl. 133-3.00A.
- Bi, Le-Khac: *See—*
  - Fetters, Lewis J.; and Bi, Le-Khac, 4,108,945, Cl. 260-880.00B.
- Bicht, John Richard: *See—*
  - Warner, Peter Stuart; and Bicht, John Richard, 4,109,064, Cl. 429-66.000.
- Biddlecom, William Gerard: *See—*
  - Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.
- Biegler, Warren H.: *See—*
  - Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., 4,109,199, Cl. 324-202.000.
- Bienfait, Charles: *See—*
  - Berger, Eugene; and Bienfait, Charles, 4,109,071, Cl. 526-114.000.
- Bifani, Alberto Giovanni; and Bertolino, Giorgio Maria, to Fiat-Allis Macchine Movimento Terra S.p.A. Continuous laying of pipes of large diameter. 4,108,317, Cl. 214-1.0PA.
- Biller, Bruce A.; and Scherer, Henry W., to S&C Electric Company. Contact assembly for high voltage fuse. 4,109,227, Cl. 337-252.000.
- Billing, Rudolph W., Jr.; and Conlon, Charles M., Jr., to Avco Corporation. Frangible target practice projectile. 4,108,074, Cl. 102-92.700.
- Billings Energy Corporation: *See—*
  - Billings, Roger E., 4,108,605, Cl. 23-252.00R.
- Billings, Roger E., to Billings Energy Corporation. Hydrogen purification and storage system. 4,108,605, Cl. 23-252.00R.
- Bilow, Norman, to Hughes Aircraft Company. Process for synthesizing acetylene-substituted polyimides and polyimides thereof. 4,108,836, Cl. 528-128.000.
- Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, to Bell Telephone Laboratories, Incorporated. Fabrication of semiconductive devices. 4,107,835, Cl. 29-590.000.
- Binder, Horst: *See—*
  - Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.
- Binge, Derek Sidney: *See—*
  - Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, 4,108,407, Cl. 248-23.000.
- Bio-Rad Laboratories, Inc.: *See—*
  - Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., 4,108,974, Cl. 424-1.000.
- Bipol Ltd.: *See—*
  - Beitner, Shlomo, 4,107,934, Cl. 62-3.000.
- Birum, Gail H., to Monsanto Company. 6-Hydroxy (alkoxy) phenylthiomethylene di(organophosphorus) compounds and process for making same. 4,108,949, Cl. 260-932.000.
- Bismarck, Otto Herbert, to RCA Corporation. Pulse staggering circuit. 4,109,209, Cl. 328-60.000.
- Bitton, Georges, to Rexroth-Sigma. Casing for gear pump or motor. 4,108,582, Cl. 418-132.000.
- Black, Allan Lindsay: *See—*
  - Fukuto, Tetsuo Roy; and Black, Allan Lindsay, 4,108,991, Cl. 424-248.500.
- Black, Dennis A.: *See—*
  - Brucken, Byron L.; and Black, Dennis A., 4,108,577, Cl. 417-222.000.
- Black, William M.; and McCallum, R. Bruce. Muffler. 4,108,275, Cl. 181-252.000.
- Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E. Process for impregnating concrete with polymers. 4,109,033, Cl. 427-314.000.
- Blanz, Roland, to Graubremse GmbH. Arrangement for locking a freight container to a base, particularly a trailer or wheel frame. 4,108,081, Cl. 105-366.00B.
- Blau, Harry. Music teaching machine. 4,108,042, Cl. 84-471.00R.
- Blitchington, Frank Henning; and Hudson, George David, to Western Electric Company, Inc. Apparatus for positioning a pair of elements into aligned intimate contact. 4,109,158, Cl. 250-548.000.
- Block, Thomas S., to Clarke-Gravely Corporation. Actuator for self-propelled sweeper. 4,108,268, Cl. 180-74.000.
- Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, to International Business Machines Corporation. Instruction execution modification mechanism for time slice controlled data processors. 4,109,311, Cl. 364-200.000.
- Boast, Warren Benefield, to Iowa State University Research Foundation, Inc. Method and apparatus for frequency compensation of electro-acoustical transducer and its environment. 4,109,107, Cl. 179-1.00D.
- BOC Limited: *See—*
  - Leigh, Roland Albert, 4,108,960, Cl. 423-265.000.
- Bodenseewerk Perkin-Elmer & Co., Gmbh: *See—*
  - Rodel, Gunther Georg, 4,109,308, Cl. 363-125.000.
- Boehnlein, James E., to PMC Industries, Inc. Profiler. 4,107,848, Cl. 33-174.00P.
- Boeing Company, The: *See—*
  - Horne, William E., 4,108,704, Cl. 156-272.000.
  - James, Varnell L., 4,108,455, Cl. 280-43.230.
- Boersma, Rintje; and Irik, Gijsbert Waldemar, to Coq B.V. Circuit-breakers for high voltages. 4,109,124, Cl. 200-148.00B.
- Bogar, Earl M., Jr. Vehicle mounted gun rack with mounting brackets. 4,108,313, Cl. 211-64.000.
- Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, to Firestone Tire & Rubber Company, The. Irradiation process for the preparation of poly(vinyl chloride-g-isobutylene) copolymers. 4,108,749, Cl. 204-159.170.
- Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, to Battelle-Institut e.V. Device for the separation of gaseous mixtures into components of different molecular mass. 4,108,620, Cl. 55-210.000.
- Boise Cascade Corporation: *See—*
  - Pfaffendorf, James L., 4,108,349, Cl. 229-15.000.
- Bolis, Edoardo, to ITT Industries, Incorporated. Electrified channel, equipped with a snap-acting connector. 4,108,523, Cl. 339-22.00B.
- Bollinger, Frederic G.; and D'Amico, John J., to Monsanto Company. N-(substituted phenyl) derivatives of saccharin. 4,108,627, Cl. 71-91.000.
- Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., to Monsanto Company. Use of phthalanilic acids to regulate the growth of corn plants. 4,108,632, Cl. 71-115.000.
- Bolt Associates, Inc.: *See—*
  - Chelminski, Stephen V., 4,108,271, Cl. 181-119.000.
- Bolton, Theodore S.; and High, Charles N., to Carrier Corporation. Apparatus for reducing exterior condensation in an air conditioner. 4,107,939, Cl. 62-89.000.
- Bolyos, Maria: *See—*
  - Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.
- Bonafous, Maurice, to Applications Mechaniques et Robinetterie Industrielle. Isolating valves. 4,108,199, Cl. 137-312.000.
- Bond, Robert, to Dunlop Limited. Tire studs. 4,108,230, Cl. 152-210.000.
- Bonfield, Joseph: *See—*
  - Coen, Manus; and Bonfield, Joseph, 4,108,473, Cl. 281-29.000.
- Bonne, Claude; Perronnet, Jacques; and Teche, Andre, to Roussel Uclaf. 3-Oxo-5,6-dihydro-1,2,4-oxadiazines useful as antiandrogenic agents. 4,108,993, Cl. 424-248.570.
- Bonner, Cletus D., to Strayer Coin Bag Company, Inc. Mailing bag with address card mounting pocket. 4,108,227, Cl. 150-15.000.
- Bordine, Darrell E. Greenhouse equipment. 4,107,875, Cl. 47-62.000.
- Borg-Warner Corporation: *See—*
  - Fisher, Walter, 4,108,290, Cl. 192-3.300.
  - Warner, John Craig; and Gravel, Mark William, 4,108,012, Cl. 74-231.00C.
- Bornstein, L. F., to Georgia-Pacific Corporation. Veneer production. 4,108,226, Cl. 144-327.000.
- Borsi, Jozsef: *See—*
  - Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
- Borunda, Gabriel S.: *See—*
  - Groutage, Frederick D.; and Borunda, Gabriel S., 4,108,400, Cl. 244-3.150.
- Borzym, Alexander, to Alpha Industries, Inc. Cut-off die set. 4,108,029, Cl. 83-54.000.
- Bouchoux, Jean W.; and Larkin, William A., to M&T Chemicals Inc. Polylactam composition containing hexaorgano distannane. 4,108,828, Cl. 260-45.75H.
- Bougon, Pierre Paul Andre, to Le Materiel Telephonique. Training system for simulating an animated scene. 4,107,854, Cl. 35-25.000.
- Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., to L'Oreal. Greaseless cosmetic article for applying make-up to the eyelids. 4,108,185, Cl. 401-88.000.
- Bourque, Rene, to Garcia Corporation, The. Fast closing athletic boot. 4,107,856, Cl. 36-115.000.
- Bouthors, Pierre Marcel, to Regie Nationale des Usines Renault; and Automobile Peugeot. Electronic-display instrument panels for automotive vehicles. 4,109,235, Cl. 340-52.00F.
- Bowden, Roy Dennis; and Seaton, Thomas, to Imperial Chemical Industries Limited. Chlorination process for producing 2,3,5-trichloropyridine. 4,108,856, Cl. 260-290.0HL.
- Bowen, Arthur D., to Bowen, Eleanor J., a part interest. Aircraft emergency letdown system. 4,108,402, Cl. 244-139.000.
- Bowen, Eleanor J.: *See—*
  - Bowen, Arthur D., 4,108,402, Cl. 244-139.000.
- Bowen, Mildred Choi: *See—*
  - Austin, Terry Marshall; Carroll, Eugene Thomas; and Bowen, Mildred Choi, 4,108,552, Cl. 356-87.000.
- Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., to BRS, Inc. Athletic shoe having laterally elongated metatarsal cleat. 4,107,858, Cl. 36-134.000.
- Bowling, Teamus; and Thomson, Benjamin M., to General Electric Company. Disconnect switch with reset mechanism. 4,109,226, Cl. 337-130.000.

Bowman, Robert W.: *See*—
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.

Bowser, Robert E., to Simplimatic Engineering Co. Palletizer with tier sheet inserter and banding means. 4,108,061, Cl. 100-7.000.

Bozarth, Rex O., to Hughes Tool Company. Rock bit with specially shaped inserts. 4,108,260, Cl. 175-374.000.

Bozzini, Charles, to ASEA Aktiebolag. Impregnated condenser construction for electric power transmission. 4,109,291, Cl. 361-272.000.

Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, to Commissariat a l'Energie Atomique. Variable-fluence neutron source. 4,109,153, Cl. 250-499.000.

Brackett, Charles Arthur; and Smith, Richard Grant, to Bell Telephone Laboratories, Incorporated. Stabilization circuit for junction lasers. 4,109,217, Cl. 331-94.50S.

Brady, Stephen F.: *See*—
Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., 4,108,987, Cl. 424-177.000.

Brakebill, Harold G., to Robertshaw Controls Company. Condition response differential vacuum regulator and method of making the same. 4,108,197, Cl. 137-81.000.

Brakebill, Harold G., to Robertshaw Controls Company. Engine control system and a differential vacuum regulator therefor or the like. 4,108,372, Cl. 236-86.000.

Branch, Clive Leslie: *See*—
Pearson, Michael John; and Branch, Clive Leslie, 4,108,992, Cl. 424-248.530.

Brand, William Wayne: *See*—
Brown, Dale Gordon; and Brand, William Wayne, 4,108,904, Cl. 260-600.00R.

Brandenburg, Gary M.: *See*—
West, Ernest James; and Brandenburg, Gary M., 4,108,420, Cl. 251-129.000.

Brandenburg, John T.: *See*—
Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., 4,108,218, Cl. 141-1.000.

Brandenstein, Manfred: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.

Brandon, Paul W.: *See*—
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,108,932, Cl. 264-37.000.

Brands, Jacobus; and Thaddey, Kurt, to Prontophot Holding AG. Labelling machine. 4,108,706, Cl. 156-384.000.

Brandt, J. Wayne, to Spectroderm International. Agitator for laboratory tubes and flasks and the like. 4,109,319, Cl. 366-219.000.

Bratton, Robert L.: *See*—
Royer, George Ronald, 4,108,434, Cl. 273-30.000.

Braun AG.: *See*—
Leistner, Rudolf, 4,108,543, Cl. 352-121.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Progressive timbering device. 4,107,931, Cl. 61-45.00D.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,107,931, Cl. 61-45.00D.

Braun, Reinhard: *See*—
Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, 4,108,320, Cl. 214-8.000.

Brawand, Franklin M. Tag line and butt hook constructions. 4,107,825, Cl. 24-115.00R.

Breitenstein, Charles Thomas, to Spiral Step Tool Company. Drill pre-pointing machine. 4,107,882, Cl. 51-118.000.

Bright, Robert G.: *See*—
Andrzejewski, Heinz; Kruschwitz, Werner; and Bright, Robert G., 4,107,898, Cl. 52-716.000.

Briska, Marian; and Eisenbraun, Ewald, to International Business Machines Corporation. Method for thermally oxidizing silicon. 4,109,030, Cl. 427-93.000.

Bristol-Myers Company: *See*—
Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.

British Steel Corporation: *See*—
Engledow, David, 4,108,633, Cl. 75-11.000.

Bronner, Emanuel H., to All One God Faith, Inc. Contraceptive containing device. 4,108,309, Cl. 206-528.000.

Brookshire, Phillip L., to Clopay Corporation. Roman shade and method for making same. 4,108,698, Cl. 156-60.000.

Broverman, Irwin, to Kaiser Aluminum & Chemical Corporation. Cast aluminum plate and method therefor. 4,108,688, Cl. 148-3.000.

Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich. Machine for semicontinuous casting of metals. 4,108,237, Cl. 164-425.000.

Brown, Cicero C., deceased (by Brown, Joe R., executor), to Brown Oil Tools, Inc. Check valve assembly. 4,108,203, Cl. 137-496.000.

Brown, Dale Gordon; and Brand, William Wayne, to American Cyanamid Company. Process for the preparation of m-phenoxybenzaldehyde. 4,108,904, Cl. 260-600.00R.

Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., to Donn Products, Inc. Locking connection for suspension ceiling systems. 4,108,563, Cl. 403-347.000.

Brown, Donald W. Sign opening, closing and locking device. 4,107,864, Cl. 40-601.000.

Brown, Edward A.; and Colton, Frank B., to G. D. Searle & Co. 3β,17-Dihydroxy-5α,17α-pregn-20-ene-21-carboxylic acid γ-lactone and esters thereof. 4,108,851, Cl. 260-239.570.

Brown, George L.; and Chen, Albert C., to Mobil Oil Corporation. Cross-linkable emulsifying agents and aqueous emulsions containing the same. 4,108,816, Cl. 260-29.40R.

Brown, Joe R., executor: *See*—
Brown, Cicero C., deceased, 4,108,203, Cl. 137-496.000.

Brown Oil Tools, Inc.: *See*—
Brown, Cicero C., deceased, 4,108,203, Cl. 137-496.000.

Brown, Richard. Device for greasing muzzle-loading bullets. 4,108,044, Cl. 86-19.000.

Brown, Richard I., to Baxter Travenol Laboratories, Inc. Centrifugal apparatus with oppositely positioned rotational support means. 4,108,353, Cl. 233-26.000.

Brown, Roger Alan. Process for making a batt of modified basis weight profile and lengthwise uniformity. 4,107,822, Cl. 19-163.000.

BRS, Inc.: *See*—
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,107,858, Cl. 36-134.000.

Brucken, Byron L.; and Black, Dennis A., to General Motors Corporation. Variable displacement compressor. 4,108,577, Cl. 417-222.000.

Brueninghaus Hydraulik GmbH: *See*—
Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, 4,108,048, Cl. 91-6.500.

Bruun & Sorensen A/S: *See*—
Bentsen, Thomas Valdemar, 4,108,498, Cl. 302-27.000.

Bryant, Charles Peterson, to Lubrizol Corporation, The. Hydroxyalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,108,784, Cl. 252-56.00R.

Bryson, Jay G.: *See*—
Wideman, Lawson G.; and Bryson, Jay G., 4,108,911, Cl. 260-666.00A.

Bub, Oskar, to Knoll AG. Process for preparing 1,5-benzodiazepine-2-ones. 4,108,852, Cl. 260-239.30B.

Buccellato, Joseph L.: *See*—
Hern, John F.; and Buccellato, Joseph L., 4,108,483, Cl. 292-272.000.

Buchanan, John Paul: *See*—
Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, 4,109,185, Cl. 318-571.000.

Buckler, Robert Thomas; and Kurchacova, Elva, to Miles Laboratories, Inc. Aryl-substituted triazolyl propionic acids. 4,109,001, Cl. 424-269.000.

Budde, Karl: *See*—
MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, 4,108,021, Cl. 74-606.00R.

Budrys, Ignas; and Right, Robert W., to General Signal Corporation. Alarm system with repeat of alarm interrupted for priority alarm. 4,109,246, Cl. 340-518.000.

Budzich, Tadeusz. Load responsive valve assemblies. 4,107,923, Cl. 60-427.000.

Buendia, Jean; and Schalbar, Jeanine, to Roussel Uclaf. Analgesic, relaxant, and anti-inflammatory cyclopentanol derivatives. 4,109,009, Cl. 424-283.000.

Bulboaca, Mihai A.: *See*—
Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.

Bunch, Robert E. Tool for flaring plastic pipe. 4,108,589, Cl. 425-393.000.

Bunker Ramo Corporation: *See*—
Bennett, Derek J., 4,107,804, Cl. 9-8.00R.

Bunn, George Edward: *See*—
Andrew, Gordon Edward; and Bunn, George Edward, 4,107,918, Cl. 60-39.710.

Burba, Peter: *See*—
Lieser, Karl Heinrich; and Burba, Peter, 4,109,080, Cl. 536-43.000.

Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., to Hughes Aircraft Company. Low power reactive drive circuit for capacitive loads. 4,109,192, Cl. 320-1.000.

Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., to Bethlehem Steel Corporation. Method for improved distillation of ammonia from weak ammonia liquor. 4,108,735, Cl. 203-7.000.

Burcaw, Kenneth R., Jr.: *See*—
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.

Burck, Joseph M.: *See*—
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., 4,107,872, Cl. 46-103.000.

Burden, Roy B., Jr., to Met-Pro Systems, Inc. Rotary incinerator. 4,108,088, Cl. 110-246.000.

Bureau de Recherches Geologiques et Minieres: *See*—
Hermelin, Roger R., 4,108,549, Cl. 355-77.000.

Burgyan, Stephan J., to Ferro Corporation. Composites of glass-ceramic-to-metal, seals and method of making same. 4,109,054, Cl. 428-433.000.

Burri, Kaspar F.; Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 3,6-Dihydro-2H-1,2-oxazines. 4,109,086, Cl. 544-63.000.

Burroughs Corporation: *See*—
Ogle, James A.; and Lee, James Y., 4,109,180, Cl. 315-169.0TV.
Wieber, Daniel P., Jr., 4,108,521, Cl. 316-17.000.

Burwell, Clifton J.: *See*—
Sturman, Oded E.; and Grill, Benjamin, 4,108,419, Cl. 251-30.000.

Buschhoff, Max: *See*—
Plum, Hans; Buschhoff, Max; and Cejka, Alena, 4,108,990, Cl. 424-245.000.

Busseman, Adolph: *See*—
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.

Butler Manufacturing Company: *See*—
Bellem, Norman A., 4,107,892, Cl. 52-403.000.

Butler, Neal R.: *See*—
Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., 4,108,718, Cl. 159-30.000.

Butoi, Aristotel. Automatic welding mask shutter lens system. 4,109,132, Cl. 219-147.000.

Butti, James Paul, to Babcock & Wilcox Company, The. Looped tube clamp support. 4,108,408, Cl. 248-68.00R.

Buxbaum, Lothar, to Ciba-Geigy Corporation. Thermoplastic polyesters. 4,108,834, Cl. 528-289.000.

Buxbaum, Lothar: *See*—
Habermeier, Jurgen; and Buxbaum, Lothar, 4,108,841, Cl. 528-289.000.

BVM Ltd.: *See*—
Vary, Robert F.; and Mamo, Anthony C., 4,108,238, Cl. 165-57.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Amschler, Hermann, 4,108,982, Cl. 424-73.000.

Bynam, Holland Eldridge. Golf board game apparatus. 4,108,442, Cl. 273-237.000.

Byrum, Bernard W., Jr.: *See*—
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,109,176, Cl. 313-220.000.

C. Cowles & Company: *See*—
Skarzynski, Thaddeus S.; and Swisher, James A., 4,107,959, Cl. 70-159.000.

C.F. Scheer & Cie.: *See*—
Fritsch, Rudolph Paul, 4,108,588, Cl. 425-185.000.

C. J. Hendry Company: *See*—
Day, Ronald H., 4,108,204, Cl. 137-543.130.

Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, to RCA Corporation. Adjustment device. 4,108,407, Cl. 248-23.000.

Cady, Philip D.: *See*—
Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E., 4,109,033, Cl. 427-314.000.

Callaghan, John David, to RCA Corporation. Rotator with remote indicator and self-synchronization. 4,109,191, Cl. 318-673.000.

Calvert, Michael Arnold; and Senger, David Joseph, to TK Valve Limited. Ball valves. 4,108,196, Cl. 137-72.000.

Camara, Manuel. Game apparatus. 4,108,431, Cl. 273-1.00R.

Campbell Chain Company: *See*—
Fink, Richard H., 4,107,917, Cl. 59-85.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Felstead, E. Barry, 4,108,538, Cl. 350-162.0SF.
Ratte, Jacques; and Carignan, Pierre, 4,108,940, Cl. 264-140.000.

Canadian General Electric Company, Ltd.: *See*—
Eastcott, Peter DeH.; and Truman, Peter T., 4,108,280, Cl. 187-20.000.

Cannon, Robert Lee: *See*—
Day, Christopher Cameron; and Cannon, Robert Lee, 4,109,243, Cl. 340-324.00R.

Cannon, Robert Lee, III, to Thaler, Sheldon. Pacer with automatically variable A-V interval. 4,108,148, Cl. 128-419.0PG.

Canon Kabushiki Kaisha: *See*—
Goshima, Takeshi; and Endo, Kiyonobu, 4,109,045, Cl. 428-212.000.
Hirose, Ryusho; and Wakui, Kotaro, 4,109,279, Cl. 358-55.000.
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.
Kuge, Tsukasa; and Tanigawa, Koichi, 4,109,289, Cl. 361-230.000.
Minoura, Kazuo, 4,108,532, Cl. 350-6.600.
Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.

Cantrell, Seals R. Portable dock. 4,107,932, Cl. 61-48.000.

Cantrell, Steve Garner: *See*—
Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, 4,109,236, Cl. 340-146.10F.

Caponegro, Mike A.: *See*—
Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., 4,108,025, Cl. 81-3.00R.

Cardenas-Franco, Luis, to Investigacion Fic Fideicomiso. Electronic control system for glassware and other thermoplastic articles forming machines. 4,108,623, Cl. 65-163.000.

Cardenas, Ricardo L.: *See*—
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,108,193, Cl. 137-13.000.

Cargile, William P. Method and apparatus for testing shock absorbers and the like. 4,107,975, Cl. 73-11.000.

Carignan, Pierre: *See*—
Ratte, Jacques; and Carignan, Pierre, 4,108,940, Cl. 264-140.000.

Carl Schenk AG, Firma: *See*—
Beutel, Rudolf, 4,109,312, Cl. 364-508.000.

Carlin, Joseph T.: *See*—
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,108,193, Cl. 137-13.000.

Carlizza, Jean: *See*—
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.

Carlson, Gordon R. Flushing technique and apparatus for outboard and stern-drive motors. 4,108,190, Cl. 134-167.00R.

Carlson, Robert Dale: *See*—
Jacques, James O.; and Carlson, Robert Dale, 4,109,189, Cl. 318-608.000.

Carlsson, Lars Ivar: *See*—
Andersson, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, 4,109,060, Cl. 425-566.000.

Carmody, Joseph P., to Honeywell Inc. Resistance measuring circuit. 4,109,196, Cl. 324-62.000.

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Carney, Leroy L., to Halliburton Company. Oil well fluids and dispersants. 4,108,779, Cl. 252-8.50P.

Caron, LaVerne A., to Chrysler Corporation. Circuitry for generating ramp type signals. 4,109,164, Cl. 307-228.000.

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Bolton, Theodore S.; and High, Charles N., 4,107,939, Cl. 62-89.000.
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,108,261, Cl. 177-120.000.
Miller, Kenneth H.; and Kropiwnicki, Tadek M., 4,108,581, Cl. 417-363.000.

Carroll, Eugene Thomas: *See*—
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Carstens, Marion R.; and Bates, Homer J., to Georgia Tech Research Institute. Releasable stop for a vehicle moving through a conduit. 4,108,079, Cl. 104-252.000.

Carter, William Edward; and Cosentino, Italo Americo, to Modular Conceptual Systems, Inc., by said William E. Carter. Self-contained comfort station. 4,107,795, Cl. 4-313.000.

Casillo, Santo. Crocheting tool. 4,107,953, Cl. 66-1.00R.

Cassandrini, Paolo; and Tozzi, Antonio, to Chimosa Chimica Organica S.p.A. Piperidyl-triazine derivatives as stabilizers for synthetic polymers. 4,108,829, Cl. 260-45.8NT.

Cassel, Harrison E.: *See*—
Baelz, Harry C.; and Cassel, Harrison E., 4,109,119, Cl. 200-38.0BA.

Castellano, Joseph Anthony; and McCaffrey, Michael Thomas, to RCA Corporation. Liquid crystal cell. 4,108,793, Cl. 252-299.000.

Castiglia, Ignatius F. Maternity brace. 4,108,149, Cl. 128-579.00R.

Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, to RCA Corporation. Electron multiplier with switchable beam confinement structure. 4,109,178, Cl. 315-12.00R.

Caterpillar Tractor Co.: *See*—
Baer, Terry G.; and Klopfenstein, Wayne A., 4,108,233, Cl. 157-1.370.
Bailey, John M., 4,108,130, Cl. 123-139.0AQ.
Dezelan, Joseph E., 4,107,924, Cl. 60-445.000.
Gordon, Phillip B., Jr.; and Hunt, Keats E., 4,107,927, Cl. 60-605.000.
Kelley, James E.; and Stemler, Orrin A., 4,108,561, Cl. 403-166.000.
Merkel, Russell D., 4,108,250, Cl. 172-719.000.
Vinton, David S., 4,108,470, Cl. 280-677.000.
Wirt, Leon A., 4,108,224, Cl. 144-34.00E.

Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, to Imperial Chemical Industries Limited. Treatment of transition metal compound. 4,108,796, Cl. 252-429.00B.

Cejka, Alena: *See*—
Plum, Hans; Buschhoff, Max; and Cejka, Alena, 4,108,990, Cl. 424-245.000.

Cenker, Moses: *See*—
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Central Research Institute of Electric Power Industry: *See*—
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Central Soya Company, Inc.: *See*—
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Ceribelli, Giorgio. Feeding apparatus for device for forming bales of incoherent material. 4,108,064, Cl. 100-187.000.

Chalk, Alan J.; and Gilbert, Alfred R., to General Electric Company. Polyphenylene polymers and methods for making the same. 4,108,942, Cl. 260-875.000.

Chambers, William John; and Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Photosensitive polyaldehydes and use in photoimaging. 4,108,839, Cl. 528-270.000.

Champ, Michel Andre: *See*—
Nabucet, Georges Joseph; and Champ, Michel Andre, 4,108,071, Cl. 102-24.0HC.

Champion International Corporation: *See*—
Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., 4,109,056, Cl. 428-512.000.
Tellman, Stephen J., 4,109,041, Cl. 428-147.000.

Chang, Joseph Jawshin, to Western Electric Company, Inc. Method of fabricating a printed circuit board. 4,107,837, Cl. 29-625.000.

- Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Semiconductor device manufacture. 4,108,685, Cl. 148-1.500.
- Chang, Shung-Ho: *See—*
  - Regnier, Frederick E.; and Chang, Shung-Ho, 4,108,603, Cl. 23-230.00B.
- Channin, Donald Jones, to RCA Corporation. Matrix address system using erase operation. 4,109,242, Cl. 340-324.00M.
- Chapdelaine, William E.: *See—*
  - Hauray, Guy J. L.; and Chapdelaine, William E., 4,108,415, Cl. 248-370.000.
- Chapin, Leonard Lee; and Merrick, James Walter, to Autotronic Controls, Corp. Modulated throttle bypass. 4,108,127, Cl. 123-124.00R.
- Chapman, Derek D., to Eastman Kodak Company. Photographic compositions and elements containing benzo[a]quinolizinium methine dyes. 4,108,667, Cl. 96-131.000.
- Charquet, Daniel: *See—*
  - Armand, Marcel; and Charquet, Daniel, 4,108,687, Cl. 148-2.000.
- Chartier, Woodrow D., Jr.: *See—*
  - Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., 4,108,025, Cl. 81-3.00R.
- Chasman, Richard Allan: *See—*
  - Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.
- Chekotilo, Leonty Vasilievich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
- Chelminski, Stephen V., to Bolt Associates, Inc. Seismic land source. 4,108,271, Cl. 181-119.000.
- Chemic-Anlagenbau Bischofsheim GmbH: *See—*
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
- Chemical Consults Corp., Ltd.: *See—*
  - Weiss, Josef, 4,108,771, Cl. 210-50.000.
- Chemie-Anlagenbau Bischofsheim GmbH: *See—*
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,954, Cl. 264-216.000.
- Chemiefaser Lenzing Aktiengesellschaft: *See—*
  - Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, 4,107,827, Cl. 28-246.000.
- Chen, Albert C.: *See—*
  - Brown, George L.; and Chen, Albert C., 4,108,816, Cl. 260-29.40R.
- Chen, Augustin T.; and Onder, Kemal B., to Upjohn Company, The. Copolymers of polyparabanic acids and polyamide-imides. 4,108,843, Cl. 528-74.000.
- Chen, Nai Yuen; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Method for treatment of rubber and plastic wastes. 4,108,730, Cl. 201-2.500.
- Cherenko, Joseph; and Lewis, Charles W., to PPG Industries, Inc. Laminated windshield with improved innerlayer. 4,109,055, Cl. 428-437.000.
- Chervenak, Robert A., to Comerco, Inc. Pull tray. 4,108,519, Cl. 312-320.000.
- Chevron Research Company: *See—*
  - Frost, Kenneth A., Jr., 4,108,613, Cl. 44-62.000.
- Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, to Commissariat a l'Energie Atomique; and Institut National de la Recherche Agronomique. Method and an installation for the air-conditioning of greenhouses and frames. 4,108,373, Cl. 237-1.00A.
- Chiaramonte, Vincent T., to Apex Dental Lab. Inc. Alloy for preparing dentures therefrom. 4,108,642, Cl. 75-134.00F.
- Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,108,040, Cl. 84-1.190.
- Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, to Fives-Cail Babcock. Support device for a cylindrical rotary member. 4,108,410, Cl. 248-130.000.
- Chikashige, Kiyoshi; and Ohuchi, Teruo. Twisted wire brush with threaded assembly for collecting cells. 4,108,162, Cl. 128-2.00B.
- Chimosa Chimica Organica S.p.A.: *See—*
  - Cassandrini, Paolo; and Tozzi, Antonio, 4,108,829, Cl. 260-45.8NT.
- Chmiel, Horst, to Linde Aktiengesellschaft. Method of and apparatus for the deep freezing of biological substances. 4,107,937, Cl. 62-64.000.
- Christ, Guenter: *See—*
  - Liebscher, Guenther; and Christ, Guenter, 4,108,082, Cl. 105-464.000.
- Christ, Thomas; and Langguth, Robert P., to Monsanto Company. Detergent compositions and processes utilizing same. 4,108,801, Cl. 252-544.000.
- Christe, Karl O., to Rockwell International Corporation. $(NF_4)_2NiF_6$ High energy solid propellant oxidizer and method of producing the same. 4,108,965, Cl. 423-351.000.
- Christensen, Rolf Edward, to Scott Paper Company. Tension wire metering of applicator roll. 4,109,035, Cl. 427-365.000.
- Christiansen, Soren Bent, to F. L. Smidth & Co. Method of heat treating pulverulent or granular raw materials and kiln plant therefor. 4,108,593, Cl. 432-14.000.
- Chromalloy Farm and Industrial Equipment Co.: *See—*
  - Anderson, Carl M.; and Poland, Robert L., 4,108,249, Cl. 172-328.000.
- Chrysler Corporation: *See—*
  - Caron, LaVerne A., 4,109,164, Cl. 307-228.000.
- Chu, Ta-Shing, to Bell Telephone Laboratories, Incorporated. Method and apparatus for substantially reducing cross polarized radiation in offset reflector antennas. 4,109,253, Cl. 343-756.000.
- CIBA-GEIGY AG: *See—*
  - Wright, Peter John, 4,108,802, Cl. 526-17.000.
- Ciba-Geigy Corporation: *See—*
  - Audykowski, Thaddeus, 4,108,815, Cl. 260-29.2EP.
  - Buxbaum, Lothar, 4,108,834, Cl. 528-289.000.
  - Habermeier, Jurgen; and Buxbaum, Lothar, 4,108,841, Cl. 528-289.000.
- Ciecior, Heinrich, to Singer Company, The. Needle bar drive stabilizing arrangement. 4,108,096, Cl. 112-221.000.
- Cilurzo, Joseph William: *See—*
  - Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, 4,108,310, Cl. 206-570.000.
- Cime Bocuze: *See—*
  - Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.
- Cincinnati Milacron Inc.: *See—*
  - Jessup, Wilbur F., 4,107,881, Cl. 51-103.00R.
- Cipris, Divna; and Pouli, Dirk, to Allied Chemical Corporation. Selenium-containing coating for valve metal electrodes and use. 4,108,745, Cl. 204-129.000.
- Citizen Watch Co., Ltd: *See—*
  - Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, 4,107,915, Cl. 58-23.00R.
- Cla-Val Co.: *See—*
  - Ensign, Harold W.; and Zieg, Clifford V., 4,108,418, Cl. 251-5.000.
- Claassen, George Richard, to PPG Industries, Inc. Supporting a glass sheet for press bending. 4,108,624, Cl. 65-273.000.
- Claiborne, Floyd H.; and Ray, Roggie C. Paint roller cleaner and dryer. 4,108,189, Cl. 134-138.000.
- Clark, Charles Albert, Jr.; and Adam, Kenneth Charles, to RCA Corporation. Clamping circuit. 4,109,166, Cl. 307-237.000.
- Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., to American Tennis Systems, Inc. Tennis ball collection, pick-up and propelling system. 4,108,432, Cl. 273-29.00A.
- Clarke-Gravely Corporation: *See—*
  - Block, Thomas S., 4,108,268, Cl. 180-74.000.
- Claudius Peters AG and Maxpeters Gesellschaft fuer Verfahrenstechnik mbH: *See—*
  - Stamer, Walter, 4,108,500, Cl. 302-53.000.
- Claussen, Donald F.; and Gagnon, Ronald A., to Armstrong Cork Company. Relocatable suspended light fixture. 4,109,305, Cl. 362-418.000.
- Clendening, Francis Joseph, Jr.; and Rose, Elva Lincoln, to Du Pont de Nemours, E. I., and Company. Yarn treating jet. 4,107,828, Cl. 28-254.000.
- Clinard, Ralph L., Jr., to Lord Corporation. Frustroconical laminated bearing. 4,108,508, Cl. 308-238.000.
- Cline, Harvey E.: *See—*
  - Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,108,685, Cl. 148-1.500.
- Clodfelter, Glen A., to United States of America, Army. Method of making coned joint for joining dissimilar diameter filament wound tubes. 4,108,700, Cl. 156-153.000.
- Clopay Corporation: *See—*
  - Brookshire, Phillip L., 4,108,698, Cl. 156-60.000.
  - Lee, Maw Huei, 4,107,877, Cl. 49-28.000.
- Clough, George Francis Gilbert, to Imperial Chemical Industries Limited. Continuous treatment of liquid effluent and sewage. 4,108,763, Cl. 210-14.000.
- Coal Industry (Patents) Limited: *See—*
  - Williams, Derek Farnham; and Martin, Terence Geoffrey, 4,108,760, Cl. 208-11.0LE.
- Cobeen, Charles Peter: *See—*
  - Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, 4,109,236, Cl. 340-146.10F.
- Cockram, David Ralph, to Pilkington Brothers Limited. Polyhydroxy aromatic coating compositions for reinforcing glass fibers used in cementitious products. 4,109,051, Cl. 428-375.000.
- Coen, Manus; and Bonfield, Joseph, to Eastern Bindery, Inc. Perfect bound sample book with integral handle. 4,108,473, Cl. 281-29.000.
- Coggiola, James P., to General Electric Company. Steam iron. 4,107,860, Cl. 38-77.830.
- Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, to Hexachimie. Hydrazine derivatives useful as anti-hypertensives. 4,109,008, Cl. 424-273.00R.
- Cohrs, William E.; and Gunderman, Roland E., to Dow Chemical Company, The. Thermoplastic expandable microsphere process and product. 4,108,806, Cl. 521-54.000.
- Coleman, James T. Portable runway with longitudinal supports and tension holding means. 4,108,435, Cl. 273-55.00R.
- Colgate-Palmolive Company: *See—*
  - Duff, Edward John, 4,108,980, Cl. 424-52.000.
  - Kenkare, Divaker B.; and Shumway, Durland K., 4,108,977, Cl. 424-46.000.
  - Schaar, Charles, 4,108,179, Cl. 128-284.000.
- Coll-Palagos, Miguel; and Surridge, James H., to Stauffer Chemical Company. High water content emulsion cleaning. 4,108,599, Cl. 8-137.000.
- Collard, James C.; and Martin, Wesley G., to Kraft, Inc. Releasable coupling. 4,108,562, Cl. 403-254.000.

- Colletta, Angelo: *See—*
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- Colton, Frank B.: *See—*
  - Brown, Edward A.; and Colton, Frank B., 4,108,851, Cl. 260-239.570.
- Columbus McKinnon Corporation: *See—*
  - Schreyer, Kenneth D.; and Hawkins, Harold V., 4,108,014, Cl. 74-243.00H.
- Combs, Charles S., Jr.: *See—*
  - Ashmore, Charles I.; Combs, Charles S., Jr.; and Stephens, William D., 4,108,696, Cl. 149-19.200.
- Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, to Precision Monolithics, Inc. Dual mode output amplifier for a sample and hold circuit. 4,109,215, Cl. 330-254.000.
- Comerco, Inc.: *See—*
  - Chervenak, Robert A., 4,108,519, Cl. 312-320.000.
- Commissariat a l'Energie Atomique: *See—*
  - Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.
  - Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.
  - Onillon, Michel; Roche, Pierre; and Thenard, Jean, 4,109,159, Cl. 250-564.000.
  - Pigeon, Michel; and Saglio, Robert, 4,109,201, Cl. 324-227.000.
- Compagnie Generale d'Electricite: *See—*
  - Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.
- Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris": *See—*
  - Lamy, Jacques Edouard, 4,107,933, Cl. 61-107.000.
  - Patinet, Jean-Francois; and Guiomard, Claude, 4,107,802, Cl. 9-400.000.
- Compagnie Honeywell Bull (Societe Anonyme): *See—*
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- Companion Pty. Limited: *See—*
  - Barson, Leslie; and Davis, Frederick Charles, 4,108,142, Cl. 126-41.00R.
- Comstook & Wescott, Inc.: *See—*
  - Rice, Richard E., 4,108,797, Cl. 252-466.0PT.
- Concept Inc.: *See—*
  - Hartman, Robert M.; and Trott, Arthur F., 4,108,182, Cl. 128-305.000.
- Conery, William J.; and Kiplinger, Terry L., to McNeil Corporation. Grinder pump. 4,108,386, Cl. 241-46.110.
- Conibear, Frank; and Verstraaten, Peter, to Woodstream Corporation. Actuator. 4,107,868, Cl. 43-88.000.
- Conlon, Charles M., Jr.: *See—*
  - Billing, Rudolph W., Jr.; and Conlon, Charles M., Jr., 4,108,074, Cl. 102-92.700.
- Conn, John L. Wrist band case for housing a watch and/or a mini computer or calculator. 4,108,340, Cl. 224-4.00E.
- Connor, Daniel Stedman, to Procter & Gamble Company, The. Preparing alkane phosphonic acids and intermediates. 4,108,889, Cl. 260-502.40R.
- Connoy, Thomas Patrick, to Kroy Industries, Inc. Printing piston assembly. 4,108,556, Cl. 400-48.000.
- Conrow, Ransom Brown: *See—*
  - Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,108,890, Cl. 260-507.00R.
- Continental Group, Inc., The: *See—*
  - Khoury, Nick S., 4,108,331, Cl. 220-269.000.
  - Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.
- Continental Gummi-Werke Aktiengesellschaft: *See—*
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- Continental Oil Company: *See—*
  - Leach, Bruce Eugene; and Starks, Charles M., 4,108,909, Cl. 568-766.000.
  - Moore, Richard G., III, 4,108,256, Cl. 175-61.000.
  - Sias, Roy C., 4,109,010, Cl. 424-289.000.
- Cook, Charles F.; and Hays, George E., to Phillips Petroleum Company. Natural gas recovery method. 4,108,244, Cl. 166-268.000.
- Cook, Peter Henry; and Holmes, Joseph Arthur Henry, to B & H Commercial Inventors & Designers Limited; and Cook, Peter Henry. Educational toys. 4,107,853, Cl. 35-35.00H.
- Cook, Steven R., to Digital Switch Corporation. Method and apparatus for establishing conference calls in a time division multiplex pulse code modulation switching system. 4,109,111, Cl. 179-18.0BC.
- Cooper, William D., to Georgia-Pacific Corporation. Separation of an aqueous or water-miscible liquid from a fluid mixture. 4,108,767, Cl. 210-42.00S.
- Copa, Company Limited: *See—*
  - Arisaka, Kunio; and Harada, Hiroyuki, 4,109,258, Cl. 354-38.000.
- Copal Company Limited: *See—*
  - Inoue, Nobuyoshi, 4,109,266, Cl. 354-246.000.
  - Yaguinuma, Jusuke, 4,108,355, Cl. 235-1.00C.
- Copelin, Harry Bugbird, to Du Pont de Nemours, E. I., and Company. Preparation of an acetal from a diol and acrolein. 4,108,869, Cl. 260-340.700.
- Coq B.V.: *See—*
  - Boersma, Rintje; and Irik, Gijsbert Waldemar, 4,109,124, Cl. 200-148.00B.
- Corey, George. Rack and pinion wave motor power plant. 4,108,578, Cl. 417-331.000.
- Cornelius, Gail, to R. M. Wade & Co. Brake apparatus for irrigation line. 4,108,200, Cl. 137-344.000.
- Cornish, Eldon C.: *See—*
  - Millard, Joe K.; and Cornish, Eldon C., 4,109,183, Cl. 315-392.000.
- Cosentino, Italo Americo: *See—*
  - Carter, William Edward; and Cosentino, Italo Americo, 4,107,795, Cl. 4-313.000.
- Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, to RCA Corporation. Electrical connection between conductors on spaced plates. 4,109,299, Cl. 361-412.000.
- Costello, Alan Thomas: *See—*
  - Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.
- Cote, Bernard. Roller skate. 4,108,450, Cl. 280-7.130.
- Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Hydroxyalkylthio phenolic antioxidants. 4,108,831, Cl. 260-45.95C.
- Cotton Incorporated: *See—*
  - Mueller, Klaus Karl; and Loughlin, James Osborn E., 4,108,597, Cl. 8-115.000.
- Cotton, Worth, Jr.; and Hunter, A. Reese, to Industrial Air, Inc. Modular building panel with heat nonconducting means. 4,107,891, Cl. 52-394.000.
- Coughlin, John Edward: *See—*
  - Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, 4,108,594, Cl. 432-24.000.
- Coulouris, George Franklin: *See—*
  - Robertson, Penrose David; and Coulouris, George Franklin, 4,109,282, Cl. 358-127.000.
- Courtaulds Limited: *See—*
  - Robinson, Frank; and Whatmough, Nigel Stephen, 4,107,955, Cl. 66-176.000.
- Cousino, Walter F. Impact actuated lawn mower. 4,107,906, Cl. 56-246.000.
- Cox, Roger Flavius: *See—*
  - Moog, Robert A.; and Cox, Roger Flavius, 4,108,041, Cl. 84-1.240.
- Coxon, Brian; and Leventhall, Hubert Geoffrey, to National Research Development Corporation. Attenuation of sound waves in ducts. 4,109,108, Cl. 179-1.00P.
- CPC International Inc.: *See—*
  - Deaton, Irving F., 4,109,075, Cl. 536-1.000.
- Crabtree, George Frederick. Motor work stand. 4,108,425, Cl. 269-71.000.
- Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., to Champion International Corporation. Starch/latex cast coatings for paper. 4,109,056, Cl. 428-512.000.
- Craig, William A. Hip splint device. 4,108,168, Cl. 128-80.00A.
- Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., to United States of America, Air Force. Assessment of flaw growth potential in structural components. 4,107,980, Cl. 73-88.00R.
- Craven, Charles G. Hanger for racquets. 4,108,312, Cl. 211-13.000.
- Creekmore, Robert V., to 1st Natl. Bank of Atlanta. Apparatus for verifying checks presented for acceptance. 4,109,238, Cl. 340-149.00A.
- Creighton, Charles P.; and Teschemacher, Charles R., to Alden Optical Laboratories, Inc. Process for preparing a hydrophilic water insoluble polymer and the resulting polymer and polymer articles. 4,109,074, Cl. 526-320.000.
- Creinin, Howard Lee; and Shemer, Michael, to Miles Laboratories, Inc. Method for preparing bland protein enriched products from grain gluten. 4,108,847, Cl. 260-112.00G.
- Cremer, Charles W., to A. E. Staley Manufacturing Company. Potato product. 4,109,024, Cl. 426-550.000.
- Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, to Allied Chemical Corporation. Antistatic fiber containing multiple branched propoxylated-ethoxylated polyalkylenepolyamines and monoamines and their chain-extended reaction products. 4,108,922, Cl. 260-830.00P.
- Cricchi, James R.; and Fitzpatrick, Michael D., to Westinghouse Electric Corp. High speed, radiation hard complementary MOS capacitive voltage level shift circuit. 4,109,163, Cl. 307-205.000.
- Crinkelmeyer, Oliver W.; and Morris, Earl F., to Dow Chemical Company, The. High-alumina cement. 4,108,930, Cl. 264-32.000.
- Crivello, James V., to General Electric Company. Curable compositions and method for curing such compositions. 4,108,747, Cl. 204-159.180.
- Crompton & Knowles Corporation: *See—*
  - Osgood, John H., 4,108,215, Cl. 139-438.000.
- Crooks, Frederick. Load-bearing walls and similar structures. 4,107,899, Cl. 52-747.000.
- Crose, James R., to W. R. Grace & Co. Electrostatic coating apparatus and method. 4,109,027, Cl. 427-28.000.
- Cross River Products, Inc.: *See—*
  - Sloan, James L.; and Meeker, Greg W., 4,107,817, Cl. 16-20.000.
- Crouse-Hinds Company: *See—*
  - Berry, Richard C., 4,109,097, Cl. 174-86.000.
- Csanyi, Endre: *See—*
  - Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
- Cuer, Jean-Pierre; and Floreancig, Antoine, to Produits Chimiques Ugine Kuhlmann. Process for purifying phosphoric acid. 4,108,963, Cl. 423-321.00S.

Culp, Harold G.: *See—*
McMillian, Lonnie S.; and Culp, Harold G., 4,109,139, Cl. 235-92.0CN.
Cunningham, Newton T. Apparatus for producing alcohol from grains of starch materials. 4,108,052, Cl. 99-275.000.
Curt G. Joa, Inc.: *See—*
Radzins, Edmund A.; and Kiela, Gene F., 4,108,584, Cl. 425-83.100.
Cutler-Hammer, Inc.: *See—*
Halbeck, Werner B., 4,109,126, Cl. 200-302.000.
Cutters Machine Company, Inc.: *See—*
McHenry, Joe M., Jr., 4,108,293, Cl. 192-67.00R.
Dahlberg, Stellan, to Rockwool Aktiebolaget. Method for continuous weighing of a continuous bandformed or matformed material, and an arrangement for execution of the method. 4,108,344, Cl. 226-1.000.
Dai Nippon Toryo Co., Ltd.: *See—*
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
Daimler-Benz Aktiengesellschaft: *See—*
Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, 4,108,689, Cl. 148-6.15R.
Thoma, Frank, 4,108,383, Cl. 239-533.500.
Dale Products, Inc.: *See—*
Simonton, Robert D.; and Schultz, Carl D., 4,108,417, Cl. 249-81.000.
Dalton, Oliver, to Tektronix, Inc. Delayed sweep system for an oscilloscope. 4,109,182, Cl. 315-392.000.
Damagnez, Jacques A.: *See—*
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.
D'Amico, John J.: *See—*
Bollinger, Frederic G.; and D'Amico, John J., 4,108,627, Cl. 71-91.000.
Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,108,632, Cl. 71-115.000.
Dana Corporation: *See—*
Anderson, George J.; and Bell, Roscoe Lee, 4,108,448, Cl. 277-157.000.
Unger, Ronald James; and Spoonamore, John Gilbert, 4,107,984, Cl. 73-113.000.
Dangelmaier, Karl; and Kottmann, Alfred, to L. Schuler GmbH. Aligning and stacking arrangement. 4,108,031, Cl. 83-90.000.
Dangelmaier, Karl: *See—*
Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, 4,108,320, Cl. 214-8.000.
Dant & Russell, Inc.: *See—*
Potter, Edward, 4,108,377, Cl. 238-91.000.
Dante, Mark F., to Shell Oil Company. Low-temperature curable saturated epoxy resin compositions. 4,108,824, Cl. 260-33.2EP.
Danze, Carlos: *See—*
Shonerd, David E.; and Danze, Carlos, 4,108,327, Cl. 220-3.000.
Dardoufas, Kimon Constantine: *See—*
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,108,781, Cl. 252-8.900.
Dart Industries Inc.: *See—*
Dick, Franklin; and Seckel, Peter H., 4,108,559, Cl. 401-217.000.
Das, Salil K.: *See—*
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.
Das, Suryya K.: *See—*
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,108,750, Cl. 204-181.00R.
Das Gupta, Sankar: *See—*
Fleet, Bernard; and Das Gupta, Sankar, 4,108,754, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, 4,108,755, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, 4,108,757, Cl. 204-294.000.
Dash, Glen R., to Massachusetts Institute of Technology. Television interface device. 4,109,280, Cl. 358-86.000.
Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, to Eli Lilly and Company. Fungicidal 3-phenyl-5-(substituted methyl) isoxaxoles. 4,109,002, Cl. 424-272.000.
Davenport Tool Co.: *See—*
Lenker, Paul E., 4,108,027, Cl. 81-60.000.
Davies, Norman, to Westinghouse Electric Corp. Tubular conductor for metal clad switchgear. 4,109,293, Cl. 361-341.000.
Davis, Dale M., to United States of America, Air Force. Armor piercing projectile. 4,108,073, Cl. 102-52.000.
Davis, Frederick Charles: *See—*
Barson, Leslie; and Davis, Frederick Charles, 4,108,142, Cl. 126-41.00R.
Davis, George T.: *See—*
Epstein, Joseph; and Davis, George T., 4,108,950, Cl. 260-986.000.
Davis, Glenn A., to Scientific-Atlanta, Inc. Radio frequency alarm system including transmitting, coding and decoding circuitry. 4,109,239, Cl. 340-539.000.
Davis, William F., to Motorola, Inc. Anti skid fault detection circuit. 4,109,234, Cl. 340-52.00B.
Dawson, Chester H., to Remington Arms Company, Inc. Method and machine for detecting and correcting tension of saw blades. 4,107,983, Cl. 73-100.000.
Day, Christopher Cameron; and Cannon, Robert Lee, to American Optical Corporation. Data sequence display system and time-compression system therefor. 4,109,243, Cl. 340-324.00R.
Day, Ronald H., to C. J. Hendry Company. Pressure relief valve. 4,108,204, Cl. 137-543.130.
de la Bastie, Joseph: *See—*
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.
DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., to Mattel, Inc. Toy vehicle starting and launching set. 4,108,437, Cl. 273-86.00D.
Deaton, Irving F., to CPC International Inc. Separation of saccharides by exclusion chromatography. 4,109,075, Cl. 536-1.000.
deBenneville, Peter L.: *See—*
Johnson, Richard C.; and deBenneville, Peter L., 4,109,006, Cl. 424-277.000.
de Boer, Henri G. J.; van der Breggeo, Gerrit; and Wemmers, Anton, to GAF Corporation. Light-sensitive negative-working film containing a diazo oxide sensitizer and a p-tolueoesulfonyl halide or a 2,4-dihalo-S-triazine. 4,108,664, Cl. 96-75.000.
de Cooker, Mario G. R. T.; and Hermus, Antonius J. M., to Stamicarbon, B.V. Method of preparing cyanuric acid. 4,109,089, Cl. 544-192.000.
Deere & Company: *See—*
Wohlford, William Paul, 4,108,502, Cl. 305-14.000.
Deets, Gary L., to Monsanto Company. Polymer compositions evolving reduced amounts of noxious gases on combustion. 4,109,067, Cl. 526-4.000.
de Fillain, Paul de Cointet: *See—*
Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, 4,108,865, Cl. 260-329.00R.
de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Inertia-brake control for input shaft of gear box, and its application to clutches and units formed by a clutch and a gear-box. 4,108,295, Cl. 192-111.00A.
de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Method of making a friction disc. 4,108,699, Cl. 156-92.000.
Deguchi, Masanobu: *See—*
Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, 4,108,544, Cl. 355-8.000.
de Haan, Douwe Rienk; and Kettenes, Dirk Karel, to P.F.W. Beheer B.V. Flavoring with trans, E-1-crotonoyl-2,2,6-trimethylcyclohexane. 4,109,022, Cl. 426-538.000.
De Haeck, Robert, to La Soudure Electrique Autogene, Procedes Arcos. Flux-cored wire for electric arc welding. 4,109,059, Cl. 428-558.000.
Dehaine, Gerard, to Compagnie Honeywell Bull (Societe Anonyme). Conditioning supports of micro-plates of integrated circuits. 4,109,096, Cl. 174-68.500.
Deichelmann, Hermann: *See—*
Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
Del-Tronics Associates, Inc.: *See—*
Denman, Donald E.; and Haring, Samuel L., 4,109,112, Cl. 179-81.00R.
Delaplaine, Delano. Golf putting game. 4,108,440, Cl. 273-176.00E.
DeLapp, Darwin Fiske, to Formica Corporation. Low pressure melamine resin laminates. 4,109,043, Cl. 428-206.000.
Delourme, Raymond: *See—*
Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, 4,108,866, Cl. 260-329.00R.
DEMAG Aktiengesellschaft: *See—*
Schneidersmann, Ernst-Otto, 4,108,496, Cl. 299-45.000.
Dembiak, Matthew Raymond; and Newton, Wayne McCall, to Western Electric Company, Incorporated. Dual jacketed cable. 4,109,099, Cl. 174-107.000.
Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corp. Furo[3,4-b]quinoline derivatives and pharmaceutical compositions and metbods employing them. 4,108,998, Cl. 424-258.000.
Demi, Roy C., to Robertshaw Controls Company. Fuel control system having by-pass means and parts therefor and the like. 4,108,370, Cl. 236-15.00A.
Demichel, Pascal: *See—*
Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.
Denis, Pierre M.: *See—*
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.
Denman, Donald E.; and Haring, Samuel L., to Del-Tronics Associates, Inc. Telephone isolation device. 4,109,112, Cl. 179-81.00R.
Denner, Peter: *See—*
Joekel, Alfred; Langen, Hans; and Denner, Peter, 4,107,832, Cl. 29-157.3AH.
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., to Oronzio de Nora Impianti Electtrochimici S.p.A. Bipolar electrode construction. 4,108,756, Cl. 204-286.000.
de Nora, Vittorio: *See—*
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,108,756, Cl. 204-286.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 1,4- and 4,10-Dihydro-4-oxo-pyrimido[1,2-a]benzimidazole-3-carboxylic acid amides. 4,109,087, Cl. 544-115.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1,4- and 4,10-dihydro-4-oxo-pyrimido[1,2-a]benzimidazole-3-carboxylic acid amides. 4,109,091, Cl. 544-250.000.
Derible, Pierre Henri: *See—*
Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, 4,108,994, Cl. 424-250.000.
Dessauer, Gnido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, to Feldmuhle Aktiengesellschaft. Recording material containing gamma-alumina. 4,109,048, Cl. 428-325.000.

De Steur, Hubert: *See—*
Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, 4,108,555, Cl. 356-184.000.
Deutsch-Franzosisches Forschungsinstitut: *See—*
Trinks, Walter Louis Adolf; and Struth, Wolfgang Ferdinand, 4,108,072, Cl. 102-52.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Switch selectable harmonic strength control for a tone synthesizer. 4,108,039, Cl. 84-1.190.
Deutsche Babcock Aktiengesellschaft: *See—*
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.
Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Amann, Herbert; and Morlock, Gerhard, 4,108,838, Cl. 528-249.000.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,875, Cl. 260-347.800.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,877, Cl. 260-347.800.
Devlin, Gerard P. Athletic shoe construction. 4,107,857, Cl. 36-129.000.
Dezelan, Joseph E., to Caterpillar Tractor Co. Pump upgrading system. 4,107,924, Cl. 60-445.000.
Diamond Shamrock Corporation: *See—*
Pohto, Gerald R.; and Kubrin, Michael Joseph, 4,108,752, Cl. 204-256.000.
Dick, Franklin; and Seckel, Peter H., to Dart Industries Inc. Ball point pen back end closure. 4,108,559, Cl. 401-217.000.
Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, to Compagnie Generale d'Electricite; and Institut National de Recherche Chimique Appliquee Ircha. Polyacrylic acid membranes for electrochemical use. 4,109,066, Cl. 429-145.000.
Didier Engineering GmbH.: *See—*
Steimann, Franz, 4,107,879, Cl. 49-465.000.
Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Structurally regulated polyphosphazene copolymers. 4,108,805, Cl. 521-180.000.
Dieterich, Dieter: *See—*
Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, 4,108,814, Cl. 260-29.2TN.
Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, to Norris Industries. Disengaging spindle locking mechanism. 4,108,482, Cl. 292-165.000.
Dietz-metall GmbH & Co. KG.: *See—*
Bauer, Hans, 4,108,141, Cl. 126-41.00R.
Digital Switch Corporation: *See—*
Cook, Steven R., 4,109,111, Cl. 179-18.0BC.
Dijkmans, Eise Carel: *See—*
Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, 4,109,203, Cl. 325-38.00B.
Dini, Mamiliano, to European Rotogravure Association. Method of engraving printing plates of forms by means of energy beams, especially laser beams. 4,108,659, Cl. 96-36.300.
Dischert, Robert Adams: *See—*
Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, 4,109,276, Cl. 358-4.000.
Ditzel, Heinz; and Ditzel, Werner. Indexing devices. 4,108,024, Cl. 74-813.00L.
Ditzel, Werner: *See—*
Ditzel, Heinz; and Ditzel, Werner, 4,108,024, Cl. 74-813.00L.
Dixon, Robert L.; and Maxsted, Malcolm D., to Smith International, Inc. Raise drill with removable stem. 4,108,259, Cl. 175-344.000.
Dohras, Bruce W., to Monarch Marking Systems, Inc. Coded record and method of and system for interpreting the record. 4,108,368, Cl. 235-463.000.
Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie K.G.: *See—*
Schal, Wilfried, 4,108,575, Cl. 417-53.000.
Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G.: *See—*
Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, 4,107,909, Cl. 57-5.000.
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Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, 4,108,057, Cl. 99-452.000.
Dolbenko, Evgeny Tikhonovich: *See—*
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.
Dolco Packaging Corporation: *See—*
Kermoian, Gary H., 4,108,941, Cl. 264-154.000.
Dolling, William T.: *See—*
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Dominguez, Robert C.: *See—*
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Dondalski, William J.: *See—*
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Dongiovanni, Vincenzo: *See—*
Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.
Donn Products, Inc.: *See—*
Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., 4,108,563, Cl. 403-347.000.
Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Complementary distortion circuit. 4,109,212, Cl. 328-163.000.
Donohue, James M.; and Fisk, Bernard C., to Xerox Corporation. Programmable controller for controlling reproduction machines. 4,109,313, Cl. 364-518.000.
Doody, Thomas J., to United States of America, Energy. Multiple-port valve. 4,108,207, Cl. 137-625.470.
Dooley, Daniel Joseph: *See—*
Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.
Dorian, Mark: *See—*
Nelson, David H., 4,108,154, Cl. 126-270.000.
Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, to AMP Incorporated. Strain relief assembly. 4,108,527, Cl. 339-107.000.
Dow Chemical Company, The: *See—*
Baker, Ann Marie, 4,108,810, Cl. 521-129.000.
Cohrs, William E.; and Gunderman, Roland E., 4,108,806, Cl. 521-54.000.
Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,108,930, Cl. 264-32.000.
McCarthy, James R.; and Moore, Jimmie L., 4,108,853, Cl. 544-245.000.
McKendry, Lennon H., 4,108,629, Cl. 71-94.000.
Rubens, Louis C.; and Alexander, Willard E., 4,108,934, Cl. 264-53.000.
Thompson, James L., 4,108,782, Cl. 252-8.55C.
Timm, Edward E.; and Townsend, Donald I., 4,108,113, Cl. 123-3.000.
Tong, Yulan C., 4,108,859, Cl. 260-296.00R.
Wasilczyk, George James, 4,108,791, Cl. 252-182.000.
Dow Corning Corporation: *See—*
Hahn, James R., 4,108,832, Cl. 528-32.000.
Hayes, William R., 4,108,825, Cl. 260-37.0SB.
Mahone, Louis G., 4,108,882, Cl. 260-448.20E.
Dozier, Alfred R., to Tylan Corporation. Cross-flow reactor. 4,108,106, Cl. 118-49.000.
Dracon Industries: *See—*
Mason, John Richard; and Foreman, Arthur L., 4,109,294, Cl. 361-399.000.
Draftex Development AG: *See—*
Andrzejewski, Heinz; Kruschwitz, Werner; and Bright, Robert G., 4,107,898, Cl. 52-716.000.
Dragerwerk Aktiengesellschaft: *See—*
Fleckenstein, Wolfgang; and Thiemann, Volker, 4,108,163, Cl. 128-2.00H.
Drapeau, Donald F.: *See—*
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.
Dreikorn, Barry A.: *See—*
Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,109,002, Cl. 424-272.000.
Dresser Industries, Inc.: *See—*
Heske, William Albert, 4,109,147, Cl. 250-231.00P.
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,108,619, Cl. 55-192.000.
Dressler, Hans, to Koppers Company, Inc. Process for the preparation of polyalkylbenzene hydroperoxides. 4,108,907, Cl. 260-610.00B.
Dreyer, William J. Immunological reagent employing radioactive and other tracers. 4,108,972, Cl. 424-1.000.
Drzewiecki, Tadeusz M.; and Manion, Francis M., to United States of America, Army. Axisymmetric fluidic throttling flow controller. 4,108,721, Cl. 176-36.00R.
Dual Gebruder Steidinger: *See—*
Zimmerman, Heinrich, 4,108,514, Cl. 312-107.000.
Dubey, Michael B.: *See—*
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Dubinsky, Rudolf Solomonovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
Duff, Edward John, to Colgate-Palmolive Company. Process of preparing materials having calcium and phosphate components. 4,108,980, Cl. 424-52.000.
Dumesnil, Eugene F., Jr., to Tip Top Industries, Inc. Tray having paint transfer roller for pad painters. 4,107,815, Cl. 15-257.050.
Dunlop Limited: *See—*
Bond, Robert, 4,108,230, Cl. 152-210.000.
Dunn, Bruce S., to General Electric Company. Composite body. 4,109,063, Cl. 429-30.000.
Du Pont de Nemours, E. I., and Company: *See—*
Alexander, Samuel Ray, 4,108,772, Cl. 210-64.000.
Anderson, Jerrel Charles, 4,109,052, Cl. 428-409.000.
Chambers, William John; and Foss, Robert Paul, 4,108,839, Cl. 528-270.000.
Clendening, Francis Joseph, Jr.; and Rose, Elva Lincoln, 4,107,828, Cl. 28-254.000.
Copelin, Harry Bugbird, 4,108,869, Cl. 260-340.700.

McIntosh, Colin Leslie, 4,108,626, Cl. 71-76.000.

Sharp, Silas S. 4,109,007, Cl. 424-279.000.

Wolf, Anthony David, 4,108,628, Cl. 71-92.000.

Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,109,003, Cl. 424-273.00R.

Durr, Heinrich; and Haubrich, Lothar, to U.S. Philips Corporation. Guide for a printing head of a printing device. 4,108,297, Cl. 400-354.000.

Duville, Rene Omer: *See—*

Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, 4,108,661, Cl. 96-59.000.

Dyer, Robert F.: *See—*

DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., 4,108,437, Cl. 273-86.00D.

Dynatech Corporation: *See—*

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E. R. Squibb & Sons, Inc.: *See—*

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Denzel, Theodor; and Hoehn, Hans, 4,109,091, Cl. 544-250.000.

Gordon, Eric M., 4,109,084, Cl. 544-29.000.

Ondetti, Miguel Angel, 4,108,886, Cl. 260-455.00R.

Sprague, Peter W., 4,108,894, Cl. 260-564.00R.

Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,108,860, Cl. 260-304.00A.

E. Schluter Fachhandel fur Schweisstechnik: *See—*

Schluter, Jurgen, 4,109,131, Cl. 219-137.620.

E. W. Buschman Company, The: *See—*

Vogt, Robert K.; and Heit, Martin A., 4,108,303, Cl. 198-781.000.

Eakes, Marion L., to Marion L. Eakes Company. Ventilating system for industrial machines. 4,108,051, Cl. 115 LH-.

Eastcott, Peter DeH.; and Truman, Peter T., to Canadian General Electric Company, Ltd. Plural rope friction hoist with braking apparatus. 4,108,280, Cl. 187-20.000.

Eastern Bindery, Inc.: *See—*

Coen, Manus; and Bonfield, Joseph, 4,108,473, Cl. 281-29.000.

Eastman Kodak Company: *See—*

Chapman, Derek D., 4,108,667, Cl. 96-131.000.

Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.

Mey, William, 4,108,657, Cl. 96-1.600.

Welch, Richard D.; and Iversen, John E., 4,108,702, Cl. 156-192.000.

Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, to Kontekla Oy. Rain water roof outlet or similar for a building. 4,107,929, Cl. 61-14.000.

Ebonex Corporation: *See—*

Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.

Eckert, Alton B., Jr.; and Gluck, Julius, to Pitney-Bowes, Inc. Developer supply control system in a copier. 4,108,545, Cl. 355-14.000.

Eckhoff, Paul S., to International Minerals & Chemical Corp. Composition process for aqueous base coatings for corrodible metals. 4,108,811, Cl. 260-22.0TN.

Edamura, Mizuo: *See—*

Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Novel benzopyran derivatives. 4,108,871, Cl. 260-345.200.

Edwards, Alfred Gerald; and Harris, Glyn Islwyn, to Albright & Wilson Ltd. Curable resin compositions. 4,108,822, Cl. 260-32.80R.

Egan, William J., Jr.; and Mazer, Lloyd M., to United Technologies Corporation. Laser combustor apparatus. 4,108,591, Cl. 431-121.000.

Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, to U.S. Philips Corporation. Delta-modulation encoder. 4,109,203, Cl. 325-38.00B.

Egli, Ernst, to Spribag Aktiengesellschaft. Centrifugal slinging apparatus for hot repair of electric furnaces, ladles or the like. 4,108,384, Cl. 239-665.000.

Ehrhardt, Josef; and Winter, Heinrich, to Battelle-Institute. Method of continuous production of a ductile superconducting material in the form of tapes, foils or wires. 4,108,737, Cl. 204-13.000.

Eigenmann, Ludwig. Retroreflective roadway surface marking tape material. 4,108,536, Cl. 350-105.000.

Eiraku, Konihiro, to Mitsui Mining & Smelting Co., Ltd. Electrically controlled rear-view mirror with two coaxial rocking systems. 4,108,541, Cl. 350-289.000.

Eisenbraun, Ewald: *See—*

Briska, Marian; and Eisenbraun, Ewald, 4,109,030, Cl. 427-93.000.

Eisenhart, Bruce S.: *See—*

Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.

Ejiri, Masakazu: *See—*

Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.

Ekwall, Carl G. B., to Atlas Copco Aktiebolag. Rock drilling apparatus with noise reducing drill rod cover. 4,108,258, Cl. 175-320.000.

Electric Power Research Institute, Inc.: *See—*

Satterthwaite, Dale J., 4,108,615, Cl. 55-2.000.

Wycklendt, Daniel A.; and Hudis, Martin, 4,109,228, Cl. 337-276.000.

Electrolux GmbH: *See—*

Michael, Harald Richard, 4,108,192, Cl. 137-1.000.

Elfes, Lee E.; and Beckerman, Joseph W., to Massey-Ferguson Inc. Coupling. 4,107,951, Cl. 64-14.000.

Eli Lilly and Company: *See—*

Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,109,002, Cl. 424-272.000.

O'Doherty, George O. P., 4,108,631, Cl. 71-103.000.

Elkins, Christopher W.: *See—*

Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,108,167, Cl. 128-66.000.

Ellen, Peter Edington, to Elspan International Limited. Vertically moving slip forms. 4,108,583, Cl. 425-65.000.

Elliott, William J.: *See—*

Fried, Josef; and Elliott, William J., 4,108,870, Cl. 260-340.90R.

Elsasser, A. Frederick: *See—*

Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,109,002, Cl. 424-272.000.

Elspan International Limited: *See—*

Ellen, Peter Edington, 4,108,583, Cl. 425-65.000.

Emerson Electric Co.: *See—*

Pauli, Jude A., 4,109,221, Cl. 335-251.000.

Emerson Electrical Co.: *See—*

Plasko, Emil Robert, 4,109,229, Cl. 337-408.000.

Emery Industries, Inc.: *See—*

Sturwold, Robert Joseph, 4,108,785, Cl. 252-56.00R.

Emken, Michael R.: *See—*

Slivenko, Victor; and Emken, Michael R., 4,108,173, Cl. 128-214.00R.

Empire Oil Tool Company: *See—*

Garrison, Marion A., 4,108,023, Cl. 74-804.000.

Endo, Kiyonobu: *See—*

Goshima, Takeshi; and Endo, Kiyonobu, 4,109,045, Cl. 428-212.000.

Endriz, John Guiry: *See—*

Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, 4,109,178, Cl. 315-12.00R.

Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, 4,109,299, Cl. 361-412.000.

Energy Conservation Devices, Inc.: *See—*

Keeney, Lawrence V., 4,108,375, Cl. 237-8.00R.

Engel, Adalbert. Bobbin for textile yarns or the like. 4,108,396, Cl. 242-118.110.

England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., to Xerox Corporation. Variable field length addressing system having data byte interchange. 4,109,310, Cl. 364-200.000.

England, Will Clarke. Multirotary energy conversion valve. 4,108,198, Cl. 137-194.000.

Engledow, David, to British Steel Corporation. Arc furnace steelmaking. 4,108,633, Cl. 75-11.000.

Ensign, Harold W.; and Zieg, Clifford V., to Cla-Val Co. Fluid operated pinch valve. 4,108,418, Cl. 251-5.000.

Epstein, Joseph; and Davis, George T., to United States of America, Army. Process for preparing organophosphorus and organophosphono fluorines. 4,108,950, Cl. 260-986.000.

Epstein, Joseph: *See—*

Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., 4,108,746, Cl. 204-158.00R.

Epstein, Robert D. Memorization aids. 4,107,852, Cl. 35-8.00R.

Erdi, George: *See—*

Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.

Erickson, Clifford W., to Honeywell Inc. Proximity sensor. 4,109,233, Cl. 340-15.000.

Eriksson, Gosta Harald: *See—*

Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.

Ernest, Robert P.: *See—*

Hideg, Laszlo; and Ernest, Robert P., 4,108,136, Cl. 123-209.000.

Ernst, Alfred. Durometer according to Rockwell system. 4,107,978, Cl. 73-83.000.

Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Linear motion ball bearing. 4,108,503, Cl. 308-6.00C.

Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Raceway for longitudinally movable rolling element bushing. 4,108,504, Cl. 308-6.00C.

Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., to Owen-Illinois, Inc. Insulating dielectric for gas discharge device. 4,109,176, Cl. 313-220.000.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*

Sick, Erwin; and Staimer, Angelika, 4,108,533, Cl. 350-6.700.

Escher Wyss Limited: *See—*

Siegfried, Armin, 4,107,831, Cl. 29-116.0AD.

Eskeli, Michael. Heat pump with two rotors. 4,107,944, Cl. 62-401.000.

Eskeli, Michael. Thermodynamic compressor. 4,107,945, Cl. 62-499.000.

Espinosa, Albert. Portable writing and reading table assembly. 4,108,083, Cl. 108-6.000.

Esposto, Victor, to Frost Enterprises, Inc. Comb for subdividing hair strands. 4,108,186, Cl. 132-124.000.

Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., to Texaco Inc. Method of preparing a reaction chamber. 4,108,218, Cl. 141-1.000.

Estes, Lewis W.; and Johns, Paul W., to Schaffer Company, The. Bead seam construction and method of forming. 4,109,042, Cl. 428-193.000.

Ethyl Corporation: *See—*

Malec, Robert E., 4,108,858, Cl. 260-294.80E.

Etra, Richard Henry. Diver's control and indication apparatus. 4,109,140, Cl. 235-92.0MT.

Ettema, Ernst, to Wavin B.V. Branch piece for providing branch connections in a pipe. 4,108,480, Cl. 285-197.000.

European Rotogravure Association: *See—*

Dini, Mamiliano, 4,108,659, Cl. 96-36.300.

Evans, David F.: *See—*

Yindra, Leonard J.; Evans, David F.; and Klug, Joseph R., 4,108,086, Cl. 108-157.000.

Evans, David Roger, to Sealectro Corporation. Electrical feedthrough devices. 4,108,529, Cl. 339-177.00R.

Evans, John H., to Stant Manufacturing Company, Inc. Locking gas cap with torque override feature. 4,107,961, Cl. 70-165.000.

Evans, Walter J.: *See—*

Hetke, Adolf; and Evans, Walter J., 4,108,637, Cl. 75-53.000.

Evans, Wilbur G.: *See—*

Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., 4,109,056, Cl. 428-512.000.

Everett/Charles, Inc.: *See—*

Long, Everett James; and Muench, Elmer W., 4,108,528, Cl. 339-117.00P.

Evers, Robert C., to United States of America, Air Force. Hybrid perfluoroalkylene ether thioimidate ester monomers. 4,108,884, Cl. 260-453.0RW.

Extine, James M., to Raymond Lee Organization, Inc., The. Leveling unit for parked vehicles. 4,108,421, Cl. 254-88.000.

Exxon Production Research Company: *See—*

Mifsud, Joseph F., 4,108,270, Cl. 181-114.000.

Exxon Research & Engineering Co.: *See—*

Foroulis, Zisis Andrew, 4,108,790, Cl. 252-175.000.

Langer, Arthur W., Jr., 4,108,921, Cl. 260-827.000.

Rossi, Albert; and Miller, Harold N., 4,108,612, Cl. 44-62.000.

F. L. Smidth & Co.: *See—*

Christiansen, Soren Bent, 4,108,593, Cl. 432-14.000.

Faani, Siamac: *See—*

Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.

Faber, Kurt Heinrich Albert Erich, to Sandvik Aktiebolag. Boring tool. 4,108,567, Cl. 408-224.000.

Fabry, Gyorgy: *See—*

Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.

Fair, Carl. Igniter for gas fired torches. 4,108,592, Cl. 431-128.000.

Fairman, Stanley W. Cooling system. 4,107,942, Cl. 62-305.000.

Falk, Leonard P.; Stadler, Robert L.; and Alford, James R., to UMC Industries, Inc. Article vendor with elevator. 4,108,333, Cl. 221-13.000.

Fancher, Llewellyn W., to Stauffer Chemical Company. Insecticidal hydrazone phosphates and phosphonates. 4,108,988, Cl. 424-211.000.

Fane, William J.: *See—*

Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, 4,108,482, Cl. 292-165.000.

Farallon Industries, Inc.: *See—*

Hollingsworth, Ashley J.; and Shamlian, Ralph B., 4,107,996, Cl. 73-300.000.

Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Thiazolo[3,4-b]isoquinoline derivatives, pharmaceutical compositions containing them and pharmaceutical methods using them. 4,108,999, Cl. 424-258.000.

Farmer, Douglas A., Jr.; and Wojtowicz, John A., to Olin Corporation. Calcium hypochlorite composition containing magnesium and process for making same. 4,108,792, Cl. 252-187.00H.

Farnham, Alford G.: *See—*

Johnson, Robert N.; and Farnham, Alford G., 4,108,837, Cl. 528-126.000.

Farque, Anthony, to Gettig Engineering & Manufacturing Co., Inc. Self-propelled golf cart. 4,109,186, Cl. 318-587.000.

Favale, Anthony George, to Bell Telephone Laboratories, Incorporated. Jumper plug and socket. 4,108,522, Cl. 339-19.000.

Feagin, Frederick E.: *See—*

Genest, Leonard J.; and Feagin, Frederick E., 4,108,366, Cl. 235-450.000.

Federal Signal Corporation: *See—*

Minogue, Robert Willis, 4,108,560, Cl. 403-33.000.

Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Apparatus for spinning textile fibers. 4,107,909, Cl. 57-5.000.

Fein, Michael E.: *See—*

Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,109,176, Cl. 313-220.000.

Feingold, Irene B.; and Feingold, Stanley Z. Storage binder. 4,108,307, Cl. 206-387.000.

Feingold, Stanley Z.: *See—*

Feingold, Irene B.; and Feingold, Stanley Z., 4,108,307, Cl. 206-387.000.

Felder, Donald Wayne. Centrifugal air conditioner. 4,107,936, Cl. 62-5.000.

Feldmuhle Aktiengesellschaft: *See—*

Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.

Felstead, E. Barry, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Frequency plane filters for an optical processor for synthetic aperture radar. 4,108,538, Cl. 350-162.0SF.

Felter, John V. Attic fans. 4,108,580, Cl. 417-362.000.

Fenix & Scisson, Inc.: *See—*

Lynch, Paul E., 4,108,478, Cl. 285-82.000.

Fenton, Francis Michael: *See—*

Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.

Ferranti, Limited: *See—*

Peart, Norman Eli, 4,109,220, Cl. 335-212.000.

Ferro Corporation: *See—*

Burgyan, Stephan J., 4,109,054, Cl. 428-433.000.

Fetters, Lewis J.; and Bi, Le-Khac, to University of Akron, The. Star polymers and process for the preparation thereof. 4,108,945, Cl. 260-880.00B.

Feuillade, Georges: *See—*

Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.

Fiat-Allis Macchine Movimento Terra S.p.A.: *See—*

Bifani, Alberto Giovanni; and Bertolino, Giorgio Maria, 4,108,317, Cl. 214-1.0PA.

Fiat Societa per Azioni: *See—*

Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, 4,108,273, Cl. 180-148.000.

Fidler, Fred; and Holt, Joseph C., to Metal Box Limited. Method and apparatus for forming a coated container. 4,108,099, Cl. 113-120.00A.

Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, to Eastman Kodak Company. Positive-working immobile photographic azo compounds. 4,108,850, Cl. 260-162.000.

Fields, Ellis K., to Standard Oil Company a corporation of Indiana. Tricycloundecene-1,2,3,4,9,9-hexahal-5,6-diacyl compounds. 4,108,864, Cl. 260-326.00C.

Finch, Reginald Vernon. Vortex reducing wing tip. 4,108,403, Cl. 244-199.000.

Fink, Richard H., to Campbell Chain Company. Coupling link locking assembly. 4,107,917, Cl. 59-85.000.

Fink, Robert. Child's shelf and garment hanger rack. 4,108,084, Cl. 108-29.000.

Firestone Tire & Rubber Company, The: *See—*

Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, 4,108,749, Cl. 204-159.170.

Fisher Controls Company: *See—*

Luthe, Fred J.; and Hays, Allen E., 4,108,210, Cl. 138-42.000.

Fisher, Walter, to Borg-Warner Corporation. Hydraulic torque converter lock-up clutch. 4,108,290, Cl. 192-3.300.

Fishwick, Brian Ribbons: *See—*

Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.

Fisk, Bernard C.: *See—*

Donohue, James M.; and Fisk, Bernard C., 4,109,313, Cl. 364-518.000.

Fisons Limited: *See—*

Percival, Albert, 4,109,004, Cl. 424-273.00R.

Fitzpatrick, Michael D.: *See—*

Cricchi, James R.; and Fitzpatrick, Michael D., 4,109,163, Cl. 307-205.000.

Fives-Cail Babcock: *See—*

Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, 4,108,410, Cl. 248-130.000.

Flanagan, Paul: *See—*

Searight, Edward F.; and Flanagan, Paul, 4,108,242, Cl. 165-164.000.

Fleck, Fritz; and Heller, Juerg, to Sandoz Ltd. Divinyl stilbenes as optical brighteners. 4,108,887, Cl. 260-465.00H.

Fleckenstein, Wolfgang; and Thiemann, Volker, to Dragerwerk Aktiengesellschaft. Puncture probe for measuring heat transfer or blood circulation of living tissues. 4,108,163, Cl. 128-2.00H.

Fleer, Ernst-Otto; and Heubeck, Erich, to Siemens Aktiengesellschaft. Device for supplying cooling agents to a dental instrument of a handpiece. 4,107,846, Cl. 32-27.000.

Fleet, Bernard; and Das Gupta, Sankar, to Ontario Limited. Carbon fiber electrode. 4,108,754, Cl. 204-263.000.

Fleet, Bernard; and Das Gupta, Sankar, to Ontario Limited. Metallic filament electrode. 4,108,755, Cl. 204-263.000.

Fleet, Bernard; and Das Gupta, Sankar, to 308489 Ontario Limited. Carbon fiber electrode. 4,108,757, Cl. 204-294.000.

Fleischer, Henry. Coupling device. 4,108,475, Cl. 285-15.000.

Fleischmann, Horst, to Gebruder Kommerling Kunststoffwerke GmbH. Arrangement for supporting a railing and the like. 4,108,422, Cl. 256-67.000.

Fleischmann, Reinhold; and Schach, Erich. Steering wheel cover. 4,108,020, Cl. 74-558.000.

Fleming, Robert W.: *See—*

Miller, Laird F.; and Fleming, Robert W., 4,108,896, Cl. 260-570.50C.

Flemings, Merton C.; Rick, Rodney G.; and Young, Kenneth P., to Massachusetts Institute of Technology. Method for forming high fraction solid metal compositions and composition therefor. 4,108,643, Cl. 75-135.000.

Fletchic, Donald K.: *See—*

Baer, Ralph H.; and Fletchic, Donald K., 4,109,114, Cl. 179-100.40D.

Floreancig, Antoine: *See—*

Cuer, Jean-Pierre; and Floreancig, Antoine, 4,108,963, Cl. 423-321.00S.

Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., to

- Texaco Inc. Pipeline method for transporting viscous hydrocarbons. 4,108,193, Cl. 137-13.000.
- Focke, Heinz; and Balmer, Oskar, to Focke & Pfuhl. Method and apparatus having a vibration-free measuring phase for automatically weighing bulk material, more particularly tobacco. 4,108,263, Cl. 177-145.000.
- Focke & Pfuhl: *See—*
  - Focke, Heinz; and Balmer, Oskar, 4,108,263, Cl. 177-145.000.
- Forbes, Hampton E., Jr., to Westvaco Corporation. Carton with integral removable card. 4,108,350, Cl. 229-37.00R.
- Ford Motor Company: *See—*
  - Hetke, Adolf; and Evans, Walter J., 4,108,637, Cl. 75-53.000.
  - Hideg, Laszlo; and Ernest, Robert P., 4,108,136, Cl. 123-209.000.
  - Minck, Robert W., 4,108,743, Cl. 204-64.00R.
  - Moskowitz, David, 4,108,649, Cl. 75-203.000.
- Foreman, Arthur L.: *See—*
  - Mason, John Richard; and Foreman, Arthur L., 4,109,294, Cl. 361-399.000.
- Forenade Fabriksverken: *See—*
  - Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.
- Formica Corporation: *See—*
  - DeLapp, Darwin Fiske, 4,109,043, Cl. 428-206.000.
- Formistor Corporation: *See—*
  - Westberg, John Kellogg, II, 4,108,217, Cl. 140-105.000.
- Foroulis, Zisis Andrew, to Exxon Research & Engineering Co. Corrosion inhibitor. 4,108,790, Cl. 252-175.000.
- Fortini, Anthony; and Kazaroff, John M., to United States of America, National Aeronautics and Space Administration. Heat exchanger and method of making. 4,108,241, Cl. 165-146.000.
- Fortuin, Michael Stanley: *See—*
  - Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, 4,108,796, Cl. 252-429.00B.
- Foss, Robert Paul: *See—*
  - Chambers, William John; and Foss, Robert Paul, 4,108,839, Cl. 528-270.000.
- Foster Wheeler Energy Corporation: *See—*
  - Bengtson, Robert W., 4,108,356, Cl. 235-69.000.
  - Trozzi, Norman Kenneth, 4,108,301, Cl. 198-633.000.
- Foundry Technology, Inc.: *See—*
  - McMullen, Carl R.; and Schlageter, Gary M., 4,108,188, Cl. 134-57.00R.
- Fournex, Robert: *See—*
  - Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, 4,108,994, Cl. 424-250.000.
- Fraas, Lewis M.: *See—*
  - Zanio, Kenneth W.; and Fraas, Lewis M., 4,108,684, Cl. 136-89.0TF.
- Francis, Brian G.: *See—*
  - Francis, James A.; Francis, Brian G.; and Francis, Frederick L., 4,108,927, Cl. 264-13.000.
- Francis, Frederick L.: *See—*
  - Francis, James A.; Francis, Brian G.; and Francis, Frederick L., 4,108,927, Cl. 264-13.000.
- Francis, James A.; Francis, Brian G.; and Francis, Frederick L. Method of making lead shot. 4,108,927, Cl. 264-13.000.
- Frank, Pierre: *See—*
  - Arsac, Aime Joseph; and Frank, Pierre, 4,109,093, Cl. 548-334.000.
- Franke, Kurt; Seissl, Johannes; and Stuermer, Wilhelm, to Siemens Aktiengesellschaft. Package for intraoral dental X-ray films. 4,108,308, Cl. 206-455.000.
- Frankiw, Walter, to Lear Siegler, Inc. Gear crowning machine cam. 4,108,047, Cl. 90-1.60R.
- Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, to HI-G Incorporated. Relay and RF adaptor assembly. 4,109,222, Cl. 335-301.000.
- Frantz, Virgil L., to Graham-White Sales Corp. Dual filter assembly. 4,108,617, Cl. 55-162.000.
- Frech, Kenneth J.: *See—*
  - Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,918, Cl. 260-680.00E.
  - Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,919, Cl. 260-680.00E.
  - Spoerke, Roger W.; and Frech, Kenneth J., 4,108,913, Cl. 260-669.00R.
- Fredrickson, Donald M., to Moore Business Forms, Inc. Rub-on security cards. 4,109,047, Cl. 428-307.000.
- Freezing Equipment Sales, Inc.: *See—*
  - Schneider, Anthony C., 4,108,618, Cl. 55-178.000.
- Freimuth, Gerhart William; and Weiner, Jerold Samuel, to Gerhart Engineering & Machine Co. Container filling machine. 4,108,221, Cl. 141-146.000.
- Fresard, Marcel, to Mefina S.A. Zig-zag sewing machine. 4,108,092, Cl. 112-158.00R.
- Fresnel, Philippe: *See—*
  - Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, 4,108,866, Cl. 260-329.00R.
- Frey, Sydney W., Jr., to Allen-Bradley Company. Compact electrical control. 4,109,230, Cl. 338-164.000.
- Fried, Josef; and Elliott, William J., to University of Chicago. Stereocontrolled synthesis of α-multistriatin. 4,108,870, Cl. 260-340.90R.
- Friedlander, Charles B., to PPG Industries, Inc. Urea-urethane-acrylate radiation curable coating compositions and methods of making same. 4,108,840, Cl. 528-46.000.
- Friedrich, Rainer: *See—*
  - Schuelein, Rolf G.; and Friedrich, Rainer, 4,107,809, Cl. 15-42.000.
- Fries, Paul, to Siemens Aktiengesellschaft. Heat pipe. 4,108,239, Cl. 165-105.000.
- Frito-Lay, Inc.: *See—*
  - Bembenek, William E., 4,108,033, Cl. 83-122.000.
- Fritsch, Rudolph Paul, to C.F. Scheer & Cie. Apparatus for processing molten liquid plastics, particularly for extrusion of plastics. 4,108,588, Cl. 425-185.000.
- Fritz Eichenauer, Firma: *See—*
  - Ohnmacht, Helmut, 4,109,138, Cl. 219-364.000.
- Froehlich, Helmut H., to Milliken Research Corporation. Cleaning composition. 4,108,800, Cl. 252-541.000.
- Frost Enterprises, Inc.: *See—*
  - Esposto, Victor, 4,108,186, Cl. 132-124.000.
- Frost, Kenneth A., Jr., to Chevron Research Company. Pour point depressants. 4,108,613, Cl. 44-62.000.
- Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, to McDonnell Douglas Corporation. Servo system employing digital components. 4,109,185, Cl. 318-571.000.
- Frungel, Frank. Apparatus and method for case hardening steel tools by application of heating pulses. 4,109,127, Cl. 219-7.500.
- Fuchigami, Masao, to Kabushiki Kaisha Komatsu Seisakusho. Variable-force vibrator. 4,108,009, Cl. 74-61.000.
- Fuchs, Helmut: *See—*
  - Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, 4,107,909, Cl. 57-5.000.
- Fuji Electric Co., Ltd.: *See—*
  - Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,109,260, Cl. 354-106.000.
  - Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, 4,108,662, Cl. 96-66.500.
  - Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.
  - Ohnishi, Masahiro, 4,109,256, Cl. 354-4.000.
  - Tadokoro, Eiichi; and Kitamoto, Tatsuji, 4,108,739, Cl. 204-40.000.
  - Tanaka, Mitsugu; Okazaki, Masaki; Aono, Toshiaki; and Hirose, Takeshi, 4,108,663, Cl. 96-74.000.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Tanaka, Hitoshi, 4,108,211, Cl. 138-120.000.
- Fujii, Hiromu: *See—*
  - Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.
- Fujikura, Takashi: *See—*
  - Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
- Fujimori, Noboru: *See—*
  - Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.
- Fujimoto, Iwao: *See—*
  - Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
- Fujimura, Sadao: *See—*
  - Koizumi, Hisao; Kawada, Yosbinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
- Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, to Nisshin Steel Company, Limited. Oxidation-resisting austenitic stainless steel. 4,108,641, Cl. 75-124.000.
- Fujisawa, Kei-ichi: *See—*
  - Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, 4,108,861, Cl. 260-306.70C.
- Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, to Hitachi, Ltd.; and Japan Servo Co., Ltd. Electric motor having frequency generator. 4,109,170, Cl. 310-68.00R.
- Fujita, Ryuzo: *See—*
  - Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, 4,108,947, Cl. 260-889.000.
- Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Superimposing device for use in a data-recording camera. 4,109,260, Cl. 354-106.000.
- Fujitsu Limited: *See—*
  - Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.
  - Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.
- Fujiwara, Kohichi: *See—*
  - Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.
- Fujiwara, Tsuyoshi: *See—*
  - Kanazashi, Tetsuo; and Fujiwara, Tsuyoshi, 4,109,281, Cl. 358-114.000.
- Fukui, Yutaka: *See—*
  - Urai, Muneharu; Goto, Shuichi; and Fukui, Yutaka, 4,107,829, Cl. 29-91.100.
- Fukuto, Tetsuo Roy; and Black, Allan Lindsay, to University of California, The Regents of the. N-aminosulfenyl derivatives of aldicarb. 4,108,991, Cl. 424-248.500.

- Fukuyama, Seiji: *See—*
  - Mitsui, Murao; Yokogawa, Kiyoshi; and Fukuyama, Seiji, 4,107,982, Cl. 73-95.000.
- Funk, Friedrich. Colloidal mill. 4,108,385, Cl. 241-46.040.
- Furler, Alan George: *See—*
  - Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., 4,109,223, Cl. 336-84.00C.
- Furstenberg, Joachim; and Hencke, Dietmar, to LTG Lufttechnische GmbH. Double twisting machine. 4,107,910, Cl. 57-34.00R.
- Furukawa, Mitsuhiko: *See—*
  - Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.
- Furuoya, Itsuo: *See—*
  - Moriya, Koji; and Furuoya, Itsuo, 4,108,874, Cl. 260-346.750.
- Furusawa, Yoshikatsu. Device for indicating the direction of driving of a vehicle. 4,109,171, Cl. 310-75.00C.
- Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, to Cime Bocuze. Process for the preparation of molybdenum based alloys with solid reinforcing elements by sintering. 4,108,650, Cl. 75-206.000.
- Futamase, Tsuyoshi: *See—*
  - Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,108,040, Cl. 84-1.190.
- Futurecraft Corporation: *See—*
  - Piet, Meyer; and Giles, Dean Gaylord, 4,108,509, Cl. 312-1.000.
- G.A.L. Manufacturing Corporation: *See—*
  - Glaser, Walter G., 4,108,281, Cl. 187-29.00R.
- G. D. Searle & Co.: *See—*
  - Brown, Edward A.; and Colton, Frank B., 4,108,851, Cl. 260-239.570.
- GAF Corporation: *See—*
  - de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, 4,108,664, Cl. 96-75.000.
- Gagarin, Gregory G., to Knorr-Bremse GmbH. Brake disc for an axle of a railway vehicle. 4,108,286, Cl. 188-218.0XL.
- Gagnon, Ronald A.: *See—*
  - Claussen, Donald F.; and Gagnon, Ronald A., 4,109,305, Cl. 362-418.000.
- Gale, Michael Thomas; and Kane, James, to RCA Corporation. Fabrication of diffractive subtractive filter embossing master. 4,108,660, Cl. 96-38.200.
- Gallagher, James C., to APSEE, Incorporated. Means for generating a negative charge. 4,109,290, Cl. 361-231.000.
- Gallagher, Joseph P.: *See—*
  - Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., 4,107,980, Cl. 73-88.00R.
- Gander, Robert J.; and Gurney, John A., to Johnson & Johnson. Esters of retinoic acid. 4,108,880, Cl. 260-410.500.
- Ganellin, Charon Robin: *See—*
  - Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,109,003, Cl. 424-273.00R.
- Garcia Corporation, The: *See—*
  - Bourque, Rene, 4,107,856, Cl. 36-115.000.
- Garkaljuk, Rodimir Ivanovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
- Garn, Dieter: *See—*
  - Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.
- Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., to ACF Industries, Incorporated. Railway car truck and side bearing assembly. 4,108,080, Cl. 105-199.0CB.
- Garrett, Dale. Camper steps. 4,108,457, Cl. 280-166.000.
- Garrison, Marion A., to Empire Oil Tool Company. Gear system. 4,108,023, Cl. 74-804.000.
- Gatzek, Leo E. Rivet making method and rivet. 4,107,805, Cl. 10-27.00R.
- Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, to Brueninghaus Hydraulik GmbH. Axial piston pump or pumping machine. 4,108,048, Cl. 91-6.500.
- Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, to Ayerst, McKenna & Harrison Limited. Diuretic [2]benzopyrano[4,3-b]pyridines and process therefor. 4,108,997, Cl. 424-256.000.
- Gearhart-Owen Industries, Inc.: *See—*
  - King, David W.; and Rankin, Emmitt Edward, 4,108,243, Cl. 166-66.000.
- Gebruder Kommerling Kunststoffwerke GmbH: *See—*
  - Fleischmann, Horst, 4,108,422, Cl. 256-67.000.
- Gedessaud, Robert: *See—*
  - Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.
- Geist, Josef: *See—*
  - Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, 4,108,057, Cl. 99-452.000.
- Geisthoff, Hubert, to Jean Walterscheid GmbH. Protective guard assembly for a universal joint. 4,107,952, Cl. 64-32.00F.
- Gelbein, Abraham P.: *See—*
  - Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., 4,108,761, Cl. 208-254.00H.
- Gender, James R.: *See—*
  - Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.
- General Atomic Company: *See—*
  - Slivenko, Victor; and Emken, Michael R., 4,108,173, Cl. 128-214.00R.
  - Slivenko, Victor, 4,108,174, Cl. 128-214.00R.
- General Binding Corporation: *See—*
  - Weisz, Thomas Anthony, 4,108,713, Cl. 156-499.000.
- General Electric Company: *See—*
  - Balchunas, Charles A., 4,109,136, Cl. 219-252.000.
  - Bowling, Teamus; and Thomson, Benjamin M., 4,109,226, Cl. 337-130.000.
  - Chalk, Alan J.; and Gilbert, Alfred R., 4,108,942, Cl. 260-875.000.
  - Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,108,685, Cl. 148-1.500.
  - Coggiola, James P., 4,107,860, Cl. 38-77.830.
  - Crivello, James V., 4,108,747, Cl. 204-159.180.
  - Dunn, Bruce S., 4,109,063, Cl. 429-30.000.
  - Hatch, Burton D., 4,108,616, Cl. 55-48.000.
  - Huseby, Irvin C.; and Klug, Frederic J., 4,108,676, Cl. 106-65.000.
  - Kincaid, Thomas G.; and Stutt, Charles A., 4,109,204, Cl. 325-38.00R.
  - Klug, Frederic J.; and Pasco, Wayne D., 4,108,672, Cl. 106-38.900.
  - Knight, J. Nelson; and Turner, Roger C., 4,107,833, Cl. 29-460.000.
  - Lee, Gim Fun, Jr., 4,108,925, Cl. 260-876.00R.
  - Love, William D.; and Hueschen, Robert E., 4,109,058, Cl. 428-553.000.
  - Mark, Victor; and Wilson, Phillip Steven, 4,108,820, Cl. 260-30.80R.
  - Mark, Victor; and Wilson, Phillip Steven, 4,108,821, Cl. 260-30.80R.
  - McNaughton, Lawrence S., 4,109,190, Cl. 318-609.000.
  - Mehan, Richard L.; and Morelock, Charles R., 4,109,050, Cl. 428-332.000.
  - Prochazka, Svante; and Dondalski, William J., 4,108,929, Cl. 264-29.100.
  - Reynolds, Howard, 4,108,531, Cl. 339-258.00F.
  - Ringwall, Carl G., 4,107,990, Cl. 73-194.00B.
  - Tantraporn, Wirojana; and Yu, Se Puan, 4,109,169, Cl. 307-302.000.
  - Wandler, Richard A., 4,108,530, Cl. 339-256.0SP.
  - Will, Fritz G.; and Secor, Fay W., 4,109,065, Cl. 429-105.000.
- General Motors Corporation: *See—*
  - Brucken, Byron L.; and Black, Dennis A., 4,108,577, Cl. 417-222.000.
- General Signal Corporation: *See—*
  - Budrys, Ignas; and Right, Robert W., 4,109,246, Cl. 340-518.000.
  - Hutchings, William F., 4,109,318, Cl. 366-140.000.
- Genest, Leonard J.; and Feagin, Frederick E., to Monitron Industries, Inc. Apparatus for providing and sensing coded information. 4,108,366, Cl. 235-450.000.
- Gennone, Richard J.; and Sturdevant, Robert D., to Kawecki Berylco Industries, Inc. Strontium-bearing master composition for addition to eutectic and hypo-eutectic silicon-aluminum casting alloys. 4,108,646, Cl. 75-148.000.
- George, Robert Jay. Water jacketed cylinder. 4,108,118, Cl. 123-41.570.
- Georgia-Pacific Corporation: *See—*
  - Bornstein, L. F., 4,108,226, Cl. 144-327.000.
  - Cooper, William D., 4,108,767, Cl. 210-42.00S.
- Georgia Tech Research Institute: *See—*
  - Carstens, Marion R.; and Bates, Homer J., 4,108,079, Cl. 104-252.000.
- Gerber, Donald Joel, to Koppers Company, Inc. High efficiency coke oven regenerator checker brick. 4,108,733, Cl. 202-267.00A.
- Gerhart Engineering & Machine Co.: *See—*
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- Gerkens, Roger: *See—*
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- Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, to ITT Industries, Incorporated. Method of generating a variable train of pulses. 4,109,210, Cl. 328-61.000.
- Gesquiere, Michel: *See—*
  - Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, 4,108,410, Cl. 248-130.000.
- Gettig Engineering & Manufacturing Co., Inc.: *See—*
  - Farque, Anthony, 4,109,186, Cl. 318-587.000.
- Gewartowski, Steve A., to UOP Inc. Aromatic hydrocarbon alkylation process. 4,108,914, Cl. 260-671.00R.
- Gewerkschaft Eisenhutte Westfalia: *See—*
  - Hauschopp, Alois; and Peters, Wolfgang, 4,108,495, Cl. 299-43.000.
- Gewerkschaft Walter: *See—*
  - Thiehofe, Theodor, 4,107,930, Cl. 61-41.00R.
- Giacino, Christopher: *See—*
  - Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.
- Gibiec, Oswald: *See—*
  - Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.
- Gibson, Preston H. Light assembly and flasher circuit. 4,108,405, Cl. 246-125.000.
- Gilbert, Alfred R.: *See—*
  - Chalk, Alan J.; and Gilbert, Alfred R., 4,108,942, Cl. 260-875.000.
- Giles, Dean Gaylord: *See—*
  - Piet, Meyer; and Giles, Dean Gaylord, 4,108,509, Cl. 312-1.000.
- Gilliom, John W.; and McFarland, Robert H., to Tappan Company, The. Convection oven. 4,108,139, Cl. 126-21.00A.

Gingell, Michael John, to International Standard Electric Corporation. Digital-to-analog converter. 4,109,110, Cl. 179-15.0AP.

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Giromella, Giampaolo: *See—*

Palumbo, Luigi; Colletta, Angelo; and Giromella, Giampaolo, 4,108,731, Cl. 201-8.000.

Glaser, Walter G., to G.A.L. Manufacturing Corporation. Elevator door tampering protection system. 4,108,281, Cl. 187-29.00R.

Glasl, Andreas; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Contact electrode for semiconductor component. 4,109,273, Cl. 357-35.000.

Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., to SmithKline Corporation. Process for preparing substituted glycines. 4,108,854, Cl. 260-252.000.

Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Phototropic optical glass. 4,108,674, Cl. 106-53.000.

Gluck, Julius: *See—*

Eckert, Alton B., Jr.; and Gluck, Julius, 4,108,545, Cl. 355-14.000.

Godart, Pierre: *See—*

L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.300.

Goddard, Terrence P., to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Novel triaminoguanidine nitrate propellants. 4,108,697, Cl. 149-19.300.

Godfrey, Richard Hugh; and Morrell, Albert Maxwell, to RCA Corporation. Cathode-ray tube having apertured mask. 4,109,177, Cl. 313-402.000.

Godfroid, Marcel; and Gerkens, Roger, to Solvay & Cie. Process for the stabilization of methylene chloride. 4,108,910, Cl. 260-652.50R.

Goettert, Edward: *See—*

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Goldammer, Georg: *See—*

Mahrt, Gunter; and Goldammer, Georg, 4,107,820, Cl. 19-81.000.

Golden, Theodore Alan. Bendable thermal pack unit. 4,108,146, Cl. 128-400.000.

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Wright, George C.; and Goldenberg, Marvin M., 4,108,873, Cl. 260-345.200.

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Gonsalves, Mathew W.; and Murillo, Carlos P., to Gonsalves, Santucci, Inc. Foundation system. 4,107,889, Cl. 52-259.000.

Gonsalves, Santucci, Inc.: *See—*

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Goodyear Tire & Rubber Company, The: *See—*

Appleby, Paul E.; Houck, Stanley J.; and Nash, Richard B., 4,108,707, Cl. 156-397.000.

Cottman, Kirkwood S., 4,108,831, Cl. 260-45.95C.

Gregg, Michael John William; and Bell, David, 4,108,011, Cl. 74-229.000.

Herman, Eugene T., 4,108,229, Cl. 152-175.000.

Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,918, Cl. 260-680.00E.

Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,919, Cl. 260-680.00E.

Kline, Richard H., 4,108,830, Cl. 260-45.85S.

Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., 4,108,923, Cl. 260-836.000.

Simpson, Robert O., 4,108,232, Cl. 152-365.000.

Spoerke, Roger W.; and Frech, Kenneth J., 4,108,913, Cl. 260-669.00R.

Stanley, John H., 4,108,701, Cl. 156-160.000.

Tazuma, James J.; and Zadra, Mario D., 4,108,944, Cl. 260-879.000.

Wideman, Lawson G.; and Bryson, Jay G., 4,108,911, Cl. 260-666.00A.

Goranson, Paul L.: *See—*

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Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, to Internationella Siporex AB. Method of manufacturing steam-cured porous concrete products. 4,108,933, Cl. 264-42.000.

Gordon, Eric M., to E. R. Squibb & Sons, Inc. Thiooxime cephalosporin derivatives. 4,109,084, Cl. 544-29.000.

Gordon, Phillip B., Jr.; and Hunt, Keats E., to Caterpillar Tractor Co. Ebullient cooled turbocharger bearing housing. 4,107,927, Cl. 60-605.000.

Goren, Robert N., to Xerox Corporation. Color electrophotographic process employing a document screen. 4,108,654, Cl. 96-1.200.

Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., to United States of America, Army. Method of producing crisp reheated french fried potatoes. 4,109,020, Cl. 426-241.000.

Gorniak, Jerry. Solar energy collector. 4,108,157, Cl. 126-271.000.

Gort, Alfred Frans; and Moore, Charles E., to Hewlett-Packard Company. Reflecting lens system. 4,108,539, Cl. 350-201.000.

Goserud, Dean L. Clamping device. 4,108,413, Cl. 248-214.000.

Goshima, Takeshi; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Information recording medium. 4,109,045, Cl. 428-212.000.

Gotham, Robert W.: *See—*

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Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, to Hitachi, Ltd. Control system for hydroelectric power station system. 4,109,160, Cl. 290-52.000.

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Gotoh, Toshihiko: *See—*

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Gotschy, Friedrich: *See—*

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Gould, Constance W.: *See—*

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Grabb, William C. Access-limiting apparatus. 4,107,967, Cl. 70-427.000.

Graf, Carl P., to Honeywell Inc. Apparatus being controlled by movement of the eye. 4,109,145, Cl. 250-201.000.

Graham, Robert Malcolm, to United States Pipe and Foundry Company. Gasketed pipe joint. 4,108,481, Cl. 285-231.000.

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Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, to Rohm GmbH. Method for clarification of fruit juice. 4,109,017, Cl. 426-51.000.

Grandrud, Merlin Howard: *See—*

Woelffer, Neill Carl; and Grandrud, Merlin Howard, 4,108,456, Cl. 280-47.37R.

Grandt, Alten F., Jr.: *See—*

Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., 4,107,980, Cl. 73-88.00R.

Grant, Everett A., Sr. Outlet box fastener. 4,108,414, Cl. 248-300.000.

Graubremse GmbH: *See—*

Blanz, Roland, 4,108,081, Cl. 105-366.00B.

Gravel, Mark William: *See—*

Warner, John Craig; and Gravel, Mark William, 4,108,012, Cl. 74-231.00C.

Gray, J. Malcolm: *See—*

Mitchell, Alec; Goldsmith, James R.; and Gray, J. Malcolm, 4,108,645, Cl. 75-135.000.

Grebtsova, Tamara Mikhailovna: *See—*

Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.

Green, George Edward; and Waterhouse, John Sidney. Photopolymerizable epoxy resins containing pendant unsaturated ester or amidomethyl groups. 4,108,803, Cl. 96-76.00R.

Greenbaum, George. Inverted V channel culture. 4,107,876, Cl. 47-79.000.

Greer Hydraulics, Inc.: *See—*

Zahid, Abduz, 4,108,209, Cl. 138-30.000.

Gregg, Michael John William; and Bell, David, to Goodyear Tire & Rubber Company, The. Synchronous drive belt and pulley configuration therefor. 4,108,011, Cl. 74-229.000.

Gregoire, Jean-Francois: *See—*

Martineu, Pierre; and Gregoire, Jean-Francois, 4,108,937, Cl. 264-89.000.

Gregory, Wallace D.; and Moore, James R., to Milliken Research Corporation. Scrim machine. 4,108,708, Cl. 156-441.000.

Gresham, Lucius C., Jr., to Henderson Clay Products, Inc. Apparatus for forming irregular shaped brick. 4,108,586, Cl. 425-89.000.

Griffin, Phil Harmon: *See—*

Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,108,619, Cl. 55-192.000.

Grill, Benjamin: *See—*

Sturman, Oded E.; and Grill, Benjamin, 4,108,419, Cl. 251-30.000.

Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, to Klinge Pharma GmbH & Co. Substituted propanol-(2) derivatives of hydroxamic acids and the use thereof as hypolipemic drugs. 4,109,013, Cl. 424-315.000.

Grimm, Robert A.: *See—*

Trivedi, Bhupendra C.; Grimm, Robert A.; and McConnell, R. B., 4,109,094, Cl. 548-347.000.

Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich. Method of checking the valves of aerosol containers for tightness and an apparatus for effecting the same. 4,107,977, Cl. 73-45.300.

Griswold, George G., to Peter Eckrich and Sons, Inc. Slice ejector for slicing machines. 4,108,030, Cl. 83-77.000.

Grocke, Diethelm W. K.; and Jager, Wilfried, to NUTRO Patentverwertungs- und Maschinenhandels GmbH. Process and arrangement for the removal of the packing from packed objects. 4,107,905, Cl. 53-3.000.

Gross, Helmut; and Klundt, Kurt, to Pfaff Industriemaschinen G.m.b.H. Device on a sewing machine for severing thread chains. 4,108,097, Cl. 112-287.000.

Grosselfinger, Horst: *See—*

Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Groutage, Frederick D.; and Borunda, Gabriel S., to United States of America, Navy. Dual mode guidance system. 4,108,400, Cl. 244-3.150.

Grueninger, Erwin, to Sandoz Ltd. Aqueous printing inks. 4/108,812, Cl. 260-24.000.

GTE Automatic Electric Laboratories Incorporated: *See—*

Reimer, William A., 4,109,300, Cl. 361-415.000.

GTE Sylvania Incorporated: *See—*

Knoll, William C., 4,109,307, Cl. 363-101.000.

Guiomard, Claude: *See—*

Patinet, Jean-Francois; and Guiomard, Claude, 4,107,802, Cl. 9-400.000.

Gulf Research & Development Company: *See—*

Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,108,788, Cl. 252-63.000.

Gulf & Western Manufacturing Company: *See—*

Smejkal, Paul V.; and Baranski, Robert B., 4,107,973, Cl. 72-450.000.

Gunderman, Roland E.: *See—*

Cohrs, William E.; and Gunderman, Roland E., 4,108,806, Cl. 521-54.000.

Gundersen, Charles R.: *See—*

McCartney, Joseph F.; and Gundersen, Charles R., 4,109,062, Cl. 429-6.000.

Gurbst, Herbert S.: *See—*

Tomalinas, William R., Jr.; and Gurbst, Herbert S., 4,108,517, Cl. 312-297.000.

Gurney, John A.: *See—*

Gander, Robert J.; and Gurney, John A., 4,108,880, Cl. 260-410.500.

Gutierrez, Enrique H.: *See—*

Ray, Orlando F.; and Gutierrez, Enrique H., 4,107,886, Cl. 52-79.110.

Gutman, Gustav; and Goettert, Edward, to Minnesota Mining and Manufacturing Company. Stabilizers for photothermographic constructions. 4,108,665, Cl. 96-114.100.

Guttinger, Peter, to Ruti Machinery Works Ltd. Method and apparatus for a weaving machine for forming a fabric selvedge. 4,108,213, Cl. 139-54.000.

Gutzschebauch, Claus: *See—*

Ploger, Walter; and Gutzschebauch, Claus, 4,108,961, Cl. 423-265.000.

Ploger, Walter; and Gutzschebauch, Claus, 4,108,962, Cl. 423-265.000.

Guyray Industries, Inc. (Entire): *See—*

Hauray, Guy J. L.; and Chapdelaine, William E., 4,108,415, Cl. 248-370.000.

Gyromat Corporation, The: *See—*

Wiggins, Richard F., 4,108,105, Cl. 118-2.000.

H. W. Andersen Products Inc.: *See—*

Andersen, Harold Willids; and Harrison, Charles H., 4,107,976, Cl. 73-52.000.

Habermeier, Jurgen; and Buxbaum, Lothar, to Ciba-Geigy Corporation. Thermoplastic polyesters and processes for their manufacture. 4,108,841, Cl. 528-289.000.

Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, to Konishiroku Photo Industry Co., Ltd. Method for hardening gelatin. 4,108,848, Cl. 260-117.000.

Hacker, Morris; and Padilla, Dominick, to RMS Electronics, Inc. Antenna mount attached to vehicle trunk interior. 4,109,252, Cl. 343-715.000.

Hadl, Clyde F.; and Harmon, Shepard L., to Owens-Illinois, Inc. Bottle operated label feed switch mechanism. 4,108,705, Cl. 156-355.000.

Haffer, Gregor: *See—*

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.

Hagino, Hiroshi: *See—*

Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, 4,109,170, Cl. 310-68.00R.

Hahn, James R., to Dow Corning Corporation. Silacyclopentyl-bis-epsilon-caprolactam. 4,108,832, Cl. 528-32.000.

Hahn, Robert E.: *See—*

Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., 4,108,596, Cl. 8-94.270.

Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, to Alpma Alpenland Maschinenbau Hain and Co. K.G. Device for continuous production of cheese material. 4,108,057, Cl. 99-452.000.

Hajek, Manfred: *See—*

Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.

Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,108,898, Cl. 260-586.00C.

Hakeem, Timothy M.: *See—*

Barnich, Richard G.; and Hakeem, Timothy M., 4,109,244, Cl. 340-324.0AD.

Halbach & Braun: *See—*

Braun, Ernst; and Braun, Gert, 4,107,931, Cl. 61-45.00D.

Halbeck, Werner B., to Cutler-Hammer, Inc. Conductive coating on switch lever seal for RFI elimination. 4,109,126, Cl. 200-302.000.

Hales, Richard Harold, to Becton, Dickinson and Company. Radioimmunoassay system. 4,108,975, Cl. 424-1.000.

Hall, Henry W., Sr. Standard bending profile jacket. 4,108,164, Cl. 128-25.000.

Hall, James R.: *See—*

Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.

Hall, Leonard F.; and Noreen, Robert A., to Nelson Industries, Inc. Vent silencer. 4,108,276, Cl. 181-256.000.

Halliburton Company: *See—*

Carney, Leroy L., 4,108,779, Cl. 252-8.50P.

Lawson, Michael B.; and Snyder, Kenneth J., 4,108,681, Cl. 134-20.000.

Halm Instrument Co., Inc.: *See—*

Lyon, Floyd A.; and Harrison, Henry, 4,108,374, Cl. 237-1.00A.

Hamada, Toshimitsu: *See—*

Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.

Hamada, Yoichi: *See—*

Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,109,260, Cl. 354-106.000.

Hamilton, James M.: *See—*

Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.

Hamilton, Stuart R. Environmental control system. 4,107,941, Cl. 62-186.000.

Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, to BASF Aktiengesellschaft. Flexible multi-layer magnetic recording media. 4,109,046, Cl. 428-216.000.

Hammonds, James C.: *See—*

Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,108,080, Cl. 105-199.0CB.

Handa, Ryoji: *See—*

Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.

Hane, Toshihide: *See—*

Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

Hanle, Edgar; and Piech, Ferdinand, to Audi Nsu Auto Union AG. Electrically heated rear window for automotive vehicles. 4,109,133, Cl. 219-203.000.

Hannan, William James, to RCA Corporation. Token and reader for vending machines. 4,108,367, Cl. 235-457.000.

Hanni, Stephen L.; and Johnson, Dudley B., to Texas Instruments Incorporated. Connector with printed wiring board structure. 4,109,298, Cl. 361-412.000.

Hansel, William B., to Suntech, Inc. Vapor receiving system for a dispensing nozzle. 4,108,223, Cl. 141-392.000.

Hansen, Dale J.: *See—*

Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,108,632, Cl. 71-115.000.

Hanson Industries Inc.: *See—*

Swan, Jack C., Jr., 4,108,928, Cl. 264-26.000.

Hanson Research Corporation: *See—*

Hanson, William A.; and Barr, Graham S. S., 4,108,602, Cl. 23-230.00R.

Hanson, William A.; and Barr, Graham S. S., to Hanson Research Corporation. Sample changing chemical analysis method and apparatus. 4,108,602, Cl. 23-230.00R.

Hara, Yoshimichi: *See—*

Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.

Harada, Hiroyuki: *See—*

Arisaka, Kunio; and Harada, Hiroyuki, 4,109,258, Cl. 354-38.000.

Harada, Shuzi: *See—*

Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

Haralampu, Stephen G.: *See—*

Rahman, Abdul R.; and Haralampu, Stephen G., 4,109,026, Cl. 426-640.000.

Haring, Samuel L.: *See—*

Denman, Donald E.; and Haring, Samuel L., 4,109,112, Cl. 179-81.00R.

Harmon, Shepard L.: *See—*

Hadl, Clyde F.; and Harmon, Shepard L., 4,108,705, Cl. 156-355.000.

Harper, William Anthony. Solar water heating apparatus. 4,108,160, Cl. 126-271.000.

Harris, Glyn Islwyn: *See—*

Edwards, Alfred Gerald; and Harris, Glyn Islwyn, 4,108,822, Cl. 260-32.80R.

Harrisoo, Anthony William, to Girling Limited. Railway brake assemblies including knock-back compensating means. 4,108,284, Cl. 188-59.000.

Harrison, Charles H.: *See—*

Andersen, Harold Willids; and Harrison. Charles H., 4,107,976, Cl. 73-52.000.

Harrison, George W.; and Huff, Charles O., to Team, Inc. Method and apparatus for a tapered pipeline seal. 4,108,194, Cl. 137-15.000.

Harrison, Henry: *See—*

Lyon, Floyd A.; and Harrison, Henry, 4,108,374, Cl. 237-1.00A.

Hartman, Robert M.; and Trott, Arthur F., to Concept Inc. Reciprocation vitreous suction cutter head. 4,108,182, Cl. 128-305.000.

Hartmann, Job-Werner: *See—*

Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Hartmann, John Fredrik Alf: *See—*

Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.

Hase, Noboru: *See—*

Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, 4,107,969, Cl. 72-148.000.

Hase, Yoshihiko: *See—*

Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Hashimoto, Akihiko, to Olympus Optical Company Ltd. Focal plane shutter. 4,109,265, Cl. 354-244.000.

Hashimoto, Mitsuru: *See—*

Obta, Masafumi; Hashimoto. Mitsuru; and Kozima, Akio, 4,108,656, Cl. 96-1.50R.

Hashimoto, Noritsugu; and Kagano, Shinichi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,108,398, Cl. 242-199.000.

Hashimoto, Teiji: *See—*

Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.

Hashimoto, Toshio: *See—*

Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,108,971, Cl. 423-428.000.

Hashimoto, Tsutomu: *See—*

Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,108,804, Cl. 521-121.000.

Hatakeyama, Susumu: *See—*

Nagase, Toshiro; and Hatakeyama, Susumu, 4,108,416, Cl. 248-400.000.

Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, to Toshiba Silicone Co., Ltd. Silicone rubber compositions. 4,108,833, Cl. 528-31.000.

Hatch, Burton D., to General Electric Company. Liquid-gas phase separation for self-contained liquid metal current collectors. 4,108,616, Cl. 55-48.000.

Hatch, John Alva, to National Semiconductor Corporation. Opto-coupler semiconductor device. 4,109,269, Cl. 357-19.000.

Hattori, Hiroyuki: *See—*

Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.

Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, to Kao Soap Co., Ltd.; and Kawaken Fine Chemicals Co., Ltd. Process for oxidation of monosaccharides. 4,108,891, Cl. 260-528.000.

Haubrich, Lothar: *See—*

Durr, Heinrich; and Haubrich, Lothar, 4,108,297, Cl. 400-354.000.

Hauck, Dorothy M. Caddy for knitting and crocheting yarn. 4,108,397, Cl. 242-137.100.

Hauray, Guy J. L.; and Chapdelaine, William E., to Guyray Industries, Inc. (Entire). Rocker suspension system. 4,108,415, Cl. 248-370.000.

Hauschopp, Alois; and Peters, Wolfgang, to Gewerkschaft Eisenhutte Westfalia. Guides for mineral mining machines. 4,108,495, Cl. 299-43.000.

Hawkins, Barbara Jean. Device for exposing photographically sensitized sheets. 4,108,548, Cl. 355-74.000.

Hawkins, Harold V.: *See—*

Schreyer, Kenneth D.; and Hawkins, Harold V., 4,108,014, Cl. 74-243.00H.

Hawley, Jack S., to Pneumeric Corp. Valve arrangement. 4,108,205, Cl. 137-554.000.

Hayase, Masao; and Araki, Kazunori, to Mitsubishi Jukogyo Kabushiki Kaisha. Bag packing apparatus. 4,108,300, Cl. 198-479.000.

Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, to Fuji Photo Film Co., Ltd. Process for developing photographic light-sensitive materials for the graphic arts. 4,108,662, Cl. 96-66.500.

Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, to Teijin Limited. Suede-like raised woven fabric and process for the preparation thereof. 4,109,038, Cl. 428-91.000.

Hayashi, Kiyoshige: *See—*

Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, to Hitachi Chemical Co., Ltd. Monofunctional monomer-containing photosensitive composition for photoresist. 4,108,666, Cl. 96-115.00P.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Internal combustion engine having an improved inlet valve arrangement. 4,108,132, Cl. 123-188.00S.

Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, to Nippon Coinco Co., Ltd. Coin receiving apparatus for a vending machine. 4,108,296, Cl. 194-99.000.

Hayes, Hugh V., to United States of America, Army. Paper tape canister. 4,108,390, Cl. 242-55.530.

Hayes, William R., to Dow Corning Corporation. Flame retardant heat-curable silicone compositions containing ceric hydrate. 4,108,825, Cl. 260-37.0SB.

Hays, Allen E.: *See—*

Luthe, Fred J.; and Hays, Allen E., 4,108,210, Cl. 138-42.000.

Hays, George E.: *See—*

Cook, Charles F.; and Hays, George E., 4,108,244, Cl. 166-268.000.

Hazemeijer B.V.: *See—*

Lipperts, Joseph H. F. G., 4,109,122, Cl. 200-144.00B.

Lipperts, Joseph H. F. G., 4,109,123, Cl. 200-144.00B.

Hazen Research Inc.: *See—*

Reynolds, James E., 4,108,635, Cl. 75-24.000.

Heath, Robert Boyson, to Rainsfords Metal Products Proprietary Limited. Pressure-free seat belt retractor. 4,108,395, Cl. 242-107.700.

Heaton, Clifford C.: *See—*

Martone, Ronald J.; Goldman, Samuel C.; and Heaton, Clifford C., 4,109,150, Cl. 250-368.000.

Hedin, Robert A. Programmable electronic sign. 4,109,245, Cl. 340-334.000.

Hedstrom, Per-Goran, to Husqvarna AB. Electronic circuits for sewing machines. 4,108,091, Cl. 112-158.00E.

Heinz, Lothar: *See—*

Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.

Heit, Martin A.: *See—*

Vogt, Robert K.; and Heit, Martin A., 4,108,303, Cl. 198-781.000.

Heiter, George Ludwig: *See—*

Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, 4,109,212, Cl. 328-163.000.

Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, to Siemens Aktiengesellschaft. Two-beam colorimeter. 4,108,555, Cl. 356-184.000.

Helgesen, Willy, to Trio Engineering Ltd. Machine for loading fish in boxes. 4,107,904, Cl. 53-142.000.

Helle, Amiel R.: *See—*

Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., 4,109,314, Cl. 364-552.000.

Heller, Carl A., to United States of America, Navy. Analytical method for TNT in water. 4,108,604, Cl. 23-230.00R.

Heller, Ferdinand P., to Amchem Products, Inc. Method for producing an amorphous, light weight calcium phosphate coating on ferrous metal surfaces. 4,108,690, Cl. 148-6.15R.

Heller, Juerg: *See—*

Fleck, Fritz; and Heller, Juerg, 4,108,887, Cl. 260-465.00H.

Hemler, Charles L.; and Stine, Laurence O., to UOP Inc. Method of regenerating coke-contaminated catalyst with simultaneous combustion of carbon monoxide. 4,108,795, Cl. 252-419.000.

Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., to Revere Copper and Brass, Incorporated. Recovery of chromium values from waste streams by the use of alkaline magnesium compounds. 4,108,596, Cl. 8-94.270.

Hencke, Dietmar: *See—*

Furstenberg, Joachim; and Hencke, Dietmar, 4,107,910, Cl. 57-34.00R.

Henderson Clay Products, Inc.: *See—*

Gresham, Lucius C., Jr., 4,108,586, Cl. 425-89.000.

Henderson, Cyril, to American Safety Equipment Corporation. Emergency locking retractor with comfort belt tension. 4,108,393, Cl. 242-107.000.

Hendley, Robert N.: *See—*

Paitson, John Lloyd; and Hendley, Robert N., 4,108,272, Cl. 181-120.000.

Hendriks, Petrus F.A.M.: *See—*

van Hardeveld, Rudolf; and Hendriks, Petrus F.A.M., 4,109,090, Cl. 544-201.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*

Ploger, Walter; and Gutzschebauch, Claus, 4,108,961, Cl. 423-265.000.

Ploger, Walter; and Gutzschebauch, Claus, 4,108,962, Cl. 423-265.000.

Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, to BASF Aktiengesellschaft. Magnetic thin film storage device. 4,109,317, Cl. 365-133.000.

Henneuse, Paul Raymond: *See—*

Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.

Henry, Arthur C., to Shell Oil Company. Benzylhydroxylamine ethers. 4,108,897, Cl. 260-570.80R.

Henry, David W.; and Tong, George L., to SRI International. 5-Iminodaunomycin. 4,109,076, Cl. 536-4.000.

Henzel, Richard Paul: *See—*

Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.

Herbst, Heiner; and Mueller, Ruediger, to Siemens Aktiengesellschaft. Lateral bipolar transistor. 4,109,272, Cl. 357-35.000.

Herbst, Rolf, to Thyssen Industrie Aktiengesellschaft. Weapon mounting arrangement. 4,108,045, Cl. 89-36.00K.

Hercules Incorporated: *See—*

Aldrich, Paul Harwood, 4,109,053, Cl. 428-413.000.

Herman, Eugene T., to Goodyear Tire & Rubber Company, The. Traction element for removable track. 4,108,229, Cl. 152-175.000.

Hermelin, Roger R., to Bureau de Recherches Geologiques et Minieres. Polychromic reproduction procedure using strippable masks. 4,108,549, Cl. 355-77.000.

Hermus, Antonius J. M.: *See—*

de Cooker, Mario G. R. T.; and Hermus, Antonius J. M., 4,109,089, Cl. 544-192.000.

Hern, John F.; and Buccellato, Joseph L., to Massey-Ferguson Inc. Latching device. 4,108,483, Cl. 292-272.000.

Herubel, Jean Frederic, to N. Schlumberger & Cie. Drawing device for sliver. 4,107,821, Cl. 19-127.000.

Heske, William Albert, to Dresser Industries, Inc. Optical position sensor. 4,109,147, Cl. 250-231.00P.

Hesston Corporation: *See—*

White, Allen A., 4,108,062, Cl. 100-11.000.

Hestily, Charles Edward, to Singer Company, The. Depth-of-cut mechanism for routers. 4,108,225, Cl. 144-134.00D.

Hetherington, Joseph F., to Hetherington, Joseph F. Fluorescent light fixture. 4,109,303, Cl. 362-216.000.

Hetke, Adolf; and Evans, Walter J., to Ford Motor Company. Sheathed wire feeding of alloy and inoculant materials. 4,108,637, Cl. 75-53.000.

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Hill, Robert B. Apparatus and method for identifying individuals through their retinal vasculature patterns. 4,109,237, Cl. 340-146.30E.

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Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, to Chemic-Anlagenbau Bischofsheim GmbH; Reuter Technologie GmbH; and Metallgesellschaft Aktiengesellschaft. Organo-metallate polymers and processes for the manufacture thereof. 4,108,807, Cl. 521-118.000.

Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, to Chemie-Anlagenbau Bischofsheim GmbH; and Reuter Technologie GmbH. Process of producing shaped structures of crosslinked elastomeric polyurethane. 4,108,954, Cl. 264-216.000.

Hilti Aktiengesellschaft: *See—*

Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, 4,107,890, Cl. 52-379.000.

Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., to United States of America, Army. Means for suppressing oscillator-generated noise in doppler proximity fuzes. 4,108,075, Cl. 102-214.000.

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Hirmann, Georg, to Repapress AG. Inflatable thrust producing tool. 4,108,486, Cl. 294-99.00R.

Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Method for optical resolution of DL-lysine compounds. 4,108,723, Cl. 195-2.000.

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Hoechst Aktiengesellschaft: *See—*

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Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Apparatus for applying labels to containers. 4,108,710, Cl. 156-450.000.

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Co. KG. Temperature regulator and safety thermostat. 4,109,225, Cl. 337-42.000.

- Holmes, Joseph Arthur Henry: *See—*
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- Holroyd, Joseph A.: *See—*
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- Holt, Jan D.: *See—*
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- Holt, Joseph C.: *See—*
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- Holzmann, Dieter: *See—*
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- Honda Giken Kogyo Kabushiki Kaisha: *See—*
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- Honeywell Inc.: *See—*
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  - Carmody, Joseph P., 4,109,196, Cl. 324-62.000.
  - Erickson, Clifford W., 4,109,233, Cl. 340-15.000.
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- Honeywell Information Systems Inc.: *See—*
  - Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, 4,109,236, Cl. 340-146.10F.
- Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, to RCA Corporation. Memory read/write organization for a television signal processor. 4,109,276, Cl. 358-4.000.
- Hopper, James H. Bicycle spindle. 4,108,461, Cl. 280-279.000.
- Hoppstock, Frederic H.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Oxidative dehydrogenation of olefins to diolefins. 4,108,918, Cl. 260-680.00E.
- Hoppstock, Frederic H.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Oxidative dehydrogenation of olefins to diolefins. 4,108,919, Cl. 260-680.00E.
- Horne, William E., to Boeing Company, The. Method of making an array of solar cells. 4,108,704, Cl. 156-272.000.
- Hornsby, James R., Jr. Propulsion toy. 4,107,871, Cl. 46-83.000.
- Horst, Russel J.: *See—*
  - Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.
- Houck, Stanley J.: *See—*
  - Appleby, Paul E.; Houck, Stanley J.; and Nash, Richard B., 4,108,707, Cl. 156-397.000.
- Hough, Edmund Alan, to Imperial Chemical Industries Limited. Adhering method. 4,108,351, Cl. 229-62.000.
- Hounsell, Melvin Wayne: *See—*
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- Howard, Ben Bruce: *See—*
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- Howland, Paul George; and Alexander, John Mergle, to Pennwalt Corporation. Rotary tabletting press with powder feed adjustment valve. 4,108,338, Cl. 222-286.000.
- Hoya Corporation: *See—*
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- Hoya Glass Works, Ltd.: *See—*
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- Hoyer, Georg-Alexander; and Pieroh, Ernst Albrecht, to Schering AG. Salts of thiocarbamic esters with fungicidal and fungistatic action. 4,108,885, Cl. 260-455.00A.
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- Hudis, Martin: *See—*
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- Hudson, Frederick W., to Xerox Corporation. Developer housing. 4,108,111, Cl. 118-655.000.
- Hudson, Frederick W., to Xerox Corporation. Developer housing. 4,108,112, Cl. 118-655.000.
- Hudson, George David: *See—*
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- Hueschen, Robert E.: *See—*
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- Huff, Charles O.: *See—*
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- Hughes Aircraft Company: *See—*
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  - Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.
  - Ozdemir, Faik S.; and Loper, Dall D., 4,109,029, Cl. 427-84.000.
  - Zanio, Kenneth W.; and Fraas, Lewis M., 4,108,684, Cl. 136-89.0TF.
- Hughes, John Lawrence: *See—*
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- Hughes, John Ronald: *See—*
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- Hughes, Robert M. Coin-operated recording machine. 4,108,365, Cl. 235-419.000.
- Hughes Tool Company: *See—*
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  - Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,108,997, Cl. 424-256.000.
- Hunke, Siegfried H., to Textron, Inc. Cluster type rolling mill. 4,107,971, Cl. 72-237.000.
- Hunt, Keats E.: *See—*
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- Hurkmans, Antonius: *See—*
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- Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Mixed oxide compounds for casting advanced superalloy materials. 4,108,676, Cl. 106-65.000.
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- Hutchings, William F., to General Signal Corporation. Fluid injection and sampling device for an in-line blender. 4,109,318, Cl. 366-140.000.
- Hydreclaim Corporation: *See—*
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- Ihle, Josef, to Ungerer geb. Dollinger, Irma. Machine for flattening strip metal. 4,107,970, Cl. 72-165.000.
- Iijima, Hiroshi, to Nippon Electric Company, Ltd. Memory circuit with protection circuit. 4,109,161, Cl. 307-87.000.
- Iijima, Tadashi. Quantitative supply apparatus of powder coloring agent. 4,108,337, Cl. 222-194.000.
- Iijima, Yoo: *See—*
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- Iimura, Koichi, to Trio Kabushiki Kaisha. Record player cabinet. 4,108,510, Cl. 312-8.000.
- Iizuka, Haruhiko, to Nissan Motor Company, Ltd. Fuel-injection internal combustion engine. 4,107,921, Cl. 60-288.000.
- Iizumi, Shozo: *See—*
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- Illinois Tool Works Inc.: *See—*
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- IMC Chemical Group, Inc.: *See—*
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  - Baird, David Boyd; Costello, Alan Thomas; Fisbwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.
  - Bowden, Roy Dennis; and Seaton, Thomas, 4,108,856, Cl. 260-290.0HL.
  - Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, 4,108,796, Cl. 252-429.00B.
  - Clough, George Francis Gilbert, 4,108,763, Cl. 210-14.000.
  - Hough, Edmund Alan, 4,108,351, Cl. 229-62.000.
  - Marsham, Peter Robert, 4,109,015, Cl. 424-341.000.
  - Moilliet, John Stewart, 4,109,016, Cl. 424-342.000.
- Imsande, Grant A., to Arbrook, Inc. Tacky floor mat with improved peeling provision. 4,107,811, Cl. 15-215.000.
- Inao, Satoshi. Clothes pole. 4,108,315, Cl. 211-124.000.
- Indiana University Foundation: *See—*
  - Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,979, Cl. 424-49.000.
  - Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,981, Cl. 424-55.000.
- Industrial Air, Inc.: *See—*
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- Ingenjorsfirman N A Sandbergs Industrikonstruktioner AB: *See—*
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- Innovative Computer Products: *See—*
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- Inoue-Japax Research Incorporated: *See—*
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- Inoue, Kiyoshi; and Molaug, Ole, to Inoue-Japax Research Incorporated; and Trallfa Nils Underhaug A/S. Feed-rate indicator for electrochemical grinding. 4,108,357, Cl. 235-119.000.
- Inoue, Nobuyoshi, to Copal Company Limited. Braking mechanism for focal plane shutters. 4,109,266, Cl. 354-246.000.
- Institut National de la Recherche Agronomique: *See—*
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- Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
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- International Business Machines Corporation: *See—*
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  - Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, 4,108,360, Cl. 235-304.000.
  - Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.
  - Briska, Marian; and Eisenbraun, Ewald, 4,109,030, Cl. 427-93.000.
  - Sarkary, Homi G., 4,109,275, Cl. 357-68.000.
  - Tompkins, James Darrell, 4,109,284, Cl. 358-212.000.
- International Flavors & Fragrances Inc.: *See—*
  - Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,799, Cl. 252-522.000.
  - Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,899, Cl. 260-586.00C.
  - Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.
- International Minerals & Chemical Corp.: *See—*
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- International Nickel Company, Inc., The: *See—*
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- International Paper Company: *See—*
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- International Standard Electric Corporation: *See—*
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- International Telephone and Telegraph Corporation: *See—*
  - Barton, Paul, 4,109,249, Cl. 343-108.00M.
  - Rucker, Dugan Allan; Wollermann, Louis Albert; and Krum, Jack Kern, 4,109,023, Cl. 426-549.000.
- Internationella Siporex AB: *See—*
  - Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.
- Inuzuka, Tsuneki: *See—*
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- Investigacion Fic Fideicomiso: *See—*
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- Iowa State University Research Foundation, Inc.: *See—*
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- Irik, Gijsbert Waldemar: *See—*
  - Boersma, Rintje; and Irik, Gijsbert Waldemar, 4,109,124, Cl. 200-148.00B.
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  - Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.
- Ishii, Hiroki: *See—*
  - Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.
- Ishii, Mutsuo: *See—*
  - Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
- Ishikawa, Haruo: *See—*
  - Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.
- Ishikawa, Hidehiko: *See—*
  - Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.
- Ishikawa, Kiyotsugu; and Itoh, Kunio, to Matsushita Electronics Corporation. Method for machining surfaces of semiconductor substrates. 4,108,715, Cl. 156-628.000.
- Ishimaru, Toshiaki: *See—*
  - Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, 4,108,666, Cl. 96-115.00P.
- Ishiyama, Takashi: *See—*
  - Saito, Takashi, 4,107,947, Cl. 63-2.000.
- Isobe, Asao: *See—*
  - Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, 4,108,666, Cl. 96-115.00P.
- Isono, Akira: *See—*
  - Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.
- Isuzu Motors Limited: *See—*
  - Ohta, Tadao, 4,108,116, Cl. 123-32.00A.
- Ito, Ryozo; and Tokuda, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Carburetor. 4,108,123, Cl. 123-119.0EC.
- Ito, Yuji: *See—*
  - Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.
- Itoh, Kunio: *See—*
  - Ishikawa, Kiyotsugu; and Itoh, Kunio, 4,108,715, Cl. 156-628.000.
- ITT Industries, Incorporated: *See—*
  - Bolis, Edoardo, 4,108,523, Cl. 339-22.00B.
  - Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, 4,109,210, Cl. 328-61.000.
- Iversen, John E.: *See—*
  - Welch, Richard D.; and Iversen, John E., 4,108,702, Cl. 156-192.000.
- Iwans, Robert C.: *See—*
  - Lamb, Richard C.; and Iwans, Robert C., 4,107,798, Cl. 4-321.000.
- Iwao, Suminari, to Honda Giken Kogyo Kabushiki Kaisha. Variable venturi type engine carburetor. 4,108,952, Cl. 261-44.00R.
- Iwatsuki, Masahiro: *See—*
  - Oishi, Susumu; and Iwatsuki, Masahiro, 4,108,394, Cl. 242-107.40A.
- Izumi, Shinjiro. Forming and filling bags of synthetic plastics materials. 4,107,900, Cl. 53-180.00R.
- Izumitani, Tetsuro: *See—*
  - Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,108,621, Cl. 65-30.00R.
  - Toratani, Hisayoshi; and Izumitani, Tetsuro, 4,108,673, Cl. 106-47.00Q.
- J.A. Wilson Display Limited: *See—*
  - Shepherd, Charles Grey; and Yeoman, Brian Donald, 4,108,085, Cl. 108-108.000.
- J. Bobst & Fils, S.A.: *See—*
  - Wiedemann, Friedrich, 4,108,302, Cl. 198-689.000.
- J. M. Huber Corporation: *See—*
  - Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,108,932, Cl. 264-37.000.
- Jackson, Stanley Bishop: *See—*
  - Miller, Robert Eric; and Jackson, Stanley Bishop, 4,108,412, Cl. 248-181.000.
- Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., to Aluminum Company of America. Control of purity and particle size in production of aluminum chloride. 4,108,968, Cl. 423-495.000.
- Jacobsen Manufacturing Company: *See—*
  - Woelffer, Neill Carl, 4,108,120, Cl. 123-103.00B.
  - Woelffer, Neill Carl; and Grandrud, Merlin Howard, 4,108,456, Cl. 280-47.37R.
- Jacobus, Lewis Alfred, Jr., to RCA Corporation. Method of making an insulated gate field effect transistor by implanted double counterdoping. 4,108,686, Cl. 148-1.500.
- Jacques, James O.; and Carlson, Robert Dale, to Xerox Corporation. Phase-sensitive transducer apparatus with improved signal offset means. 4,109,189, Cl. 318-608.000.
- Jacuzzi Bros. Inc.: *See—*
  - Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., 4,108,775, Cl. 210-169.000.
- Jacuzzi, Virgil J.: *See—*
  - Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., 4,108,775, Cl. 210-169.000.
- Jager, Wilfried: *See—*
  - Grocke, Diethelm W. K.; and Jager, Wilfried, 4,107,905, Cl. 53-3.000.
- James, Stanley L.: *See—*
  - Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,107,858, Cl. 36-134.000.
- James, Varnell L., to Boeing Company, The. Cargo pallet incorporating retractable ball units. 4,108,455, Cl. 280-43.230.
- Jamieson, Robert Stuart. Rigging base for plural-hull sailing craft and methods for sail control. 4,108,100, Cl. 114-102.000.
- Janiak, P. Stefan: *See—*
  - Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.
- Janome Sewing Machine Co. Ltd.: *See—*
  - Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.
- Janssen, Jacobus Wilhelmus. Potato processing. 4,108,565, Cl. 408-37.000.
- Japan Exlan Company Limited: *See—*
  - Odawara, Kenji; and Takeuchi, Shoichi, 4,108,818, Cl. 260-29.6AQ.
- Japan Racing Association, The: *See—*
  - Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.
- Japan Servo Co., Ltd.: *See—*
  - Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, 4,109,170, Cl. 310-68.00R.
- Japan Synthetic Rubber Co., Ltd.: *See—*
  - Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, 4,108,947, Cl. 260-889.000.

- Japanese National Railways: *See—*
  - Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.
- Jaulmes, Eric, to Ateliers de la Motobecane. Transparent plates with a radiograph thereon and process for the preparation thereof. 4,109,148, Cl. 250-321.000.
- Jay, Pierre; and Schwachhofer, Ghislain, to Rhone-Poulenc Industries. Dielectric compositions containing benzyl esters. 4,108,789, Cl. 252-64.000.
- Jayme, Manfred: *See—*
  - Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
- Jean Walterscheid GmbH: *See—*
  - Geisthoff, Hubert, 4,107,952, Cl. 64-32.00F.
  - von Allworden, Wilhelm; and Kunze, Dieter, 4,108,464, Cl. 280-508.000.
- Jeep Corporation: *See—*
  - MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, 4,108,021, Cl. 74-606.00R.
- Jenaer Glaswerk Schott & Gen.: *See—*
  - Gliemeroth, Georg, 4,108,674, Cl. 106-53.000.
- Jennings, Eugene W., to Stearns-Roger Corporation. Redundant lift beam assembly. 4,108,485, Cl. 294-67.0BC.
- JeNor: *See—*
  - Norris, Orlin R., 4,108,000, Cl. 73-328.000.
- Jessup, Wilbur F., to Cincinnati Milacron Inc. Centerless grinding machine. 4,107,881, Cl. 51-103.00R.
- Jet Aeration Company: *See—*
  - Snyder, John R., 4,108,274, Cl. 181-229.000.
- Joekel, Alfred; Langen, Hans; and Denner, Peter, to Balke-Durr Aktiengesellschaft. Method for winding spiral fins onto oval tubing. 4,107,832, Cl. 29-157.3AH.
- Joh, Yasushi: *See—*
  - Kaneko, Noriaki; and Joh, Yasushi, 4,108,764, Cl. 210-22.00A.
- Johansson, Ake, to Linden-Alimak AB. Drilling apparatus. 4,108,254, Cl. 173-43.000.
- John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, to Zahnraderfabrik Renk Aktiengesellschaft. Gear drive with single-helix gears. 4,108,018, Cl. 74-467.000.
- Johns-Manville Corporation: *See—*
  - Lake, Malcolm John; and Snelgrove, William Richard Noble, 4,108,639, Cl. 75-101.00R.
- Johns, Paul W.: *See—*
  - Estes, Lewis W.; and Johns, Paul W., 4,109,042, Cl. 428-193.000.
- Johnson, Bruce K., to Polaroid Corporation. Compact prism camera. 4,109,263, Cl. 354-150.000.
- Johnson, Dudley B.: *See—*
  - Hanni, Stephen L.; and Johnson, Dudley B., 4,109,298, Cl. 361-412.000.
- Johnson & Johnson: *See—*
  - Gander, Robert J.; and Gurney, John A., 4,108,880, Cl. 260-410.500.
  - Rosenblatt, Solomon, 4,108,938, Cl. 264-127.000.
- Johnson, Kenneth M., to Packaging Laminators, Inc. Label structure. 4,107,861, Cl. 40-2.00R.
- Johnson, Matthey & Co., Limited: *See—*
  - Walter, Derek Oscar, 4,108,006, Cl. 73-517.00R.
  - Wilkinson, Geoffrey, 4,108,905, Cl. 260-604.0HF.
- Johnson, Raymond M. Display case. 4,108,515, Cl. 312-119.000.
- Johnson, Richard C.; and deBenneville, Peter L., to Warren-Teed Laboratories, Inc. 1,4-Dithiinoxides. 4,109,006, Cl. 424-277.000.
- Johnson, Robert N.; and Farnham, Alford G. Polyarylene polyethers. 4,108,837, Cl. 528-126.000.
- Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., to Rohm and Haas Company. 1-Alkylpyrid-2-ones. 4,108,630, Cl. 71-94.000.
- Johnsson, Rolf Christer Roland: *See—*
  - Andersson, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, 4,109,060, Cl. 425-566.000.
- Johnstone, Richard; and Ostby, Lyle D., to Kearney & Trecker Corporation. Method and apparatus for remote display of analog signals occurring in computer controlled machine tools. 4,109,309, Cl. 364-120.000.
- Jones, Bill R.: *See—*
  - Rode, Walter F.; and Jones, Bill R., 4,108,318, Cl. 214-1.00R.
- Jones, Christopher Robin: *See—*
  - Williams, Malcolm; and Jones, Christopher Robin, 4,108,115, Cl. 123-32.0EB.
- Jooes, Everett E. Mechanized contour-following drill machine. 4,108,566, Cl. 408-115.00R.
- Jones, Loyd W., to Standard Oil Company (Indiana). Converter type scale remover. 4,108,246, Cl. 166-312.000.
- Jones, Richard Fred: *See—*
  - Ligman, James Raymond; and Jones, Richard Fred, 4,107,995, Cl. 73-300.000.
- Jones, Roy L., to McDonnell Douglas Corporation. Five component strain gauge balance. 4,107,986, Cl. 73-147.000.
- Jorgensen, Arne Roy, to Illinois Tool Works Inc. Combination drilling and wrenching tool. 4,107,800, Cl. 7-158.000.
- Jossin, Alain: *See—*
  - Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.
- Jourdan, Paul: *See—*
  - Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.
- Jowett, Terence W.; and Smith, Harvey A., to United Technologies Corporation. Quick connect multiple fluid/electrical transducer apparatus. 4,108,008, Cl. 73-756.000.
- Joyce, William Inglis, to Babcock & Wilcox, Limited. Y-jet tip tester. 4,108,554, Cl. 356-156.000.
- Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method for electrodeposition. 4,108,750, Cl. 204-181.00R.
- Jung, Rolf, to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik. Manually guided cutting machine for sheet material. 4,107,839, Cl. 30-123.300.
- Kabilka, Otto; and Schulz, Thilo, to Messerschmitt-Boelkow-Blohm GmbH. Flat high pressure container. 4,108,329, Cl. 220-453.000.
- Kabushiki Kaisha Daini Seikosha: *See—*
  - Kondo, Kenichi, 4,107,916, Cl. 58-38.00R.
- Kabushiki Kaisha Komatsu Seisakusbo: *See—*
  - Fuchigami, Masao, 4,108,009, Cl. 74-61.000.
  - Nakao, Kiyoharu, 4,108,269, Cl. 180-98.000.
  - Tanaka, Yujiro, 4,108,264, Cl. 180-2.00R.
- Kabushiki Kaisha Kyowa: *See—*
  - Yoshimura, Masakiyo; and Yamaguti, Yasukazu, 4,108,823, Cl. 260-33.4PQ.
- Kacirek, Kenneth J.; and Rust, Jack E., to PPG Industries, Inc. Glass accumulator. 4,108,319, Cl. 214-6.0BA.
- Kagami, Soichi: *See—*
  - Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshibisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
- Kagano, Shinichi: *See—*
  - Hashimoto, Noritsugu; and Kagano, Shinichi, 4,108,398, Cl. 242-199.000.
- Kahler, Richard W. Storage compartment cap for liquid-filtered smoking device. 4,108,152, Cl. 131-173.000.
- Kain, Marino: *See—*
  - Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.
- Kaiser Aluminum & Chemical Corporation: *See—*
  - Broverman, Irwin, 4,108,688, Cl. 148-3.000.
- Kaji, Isamu; and Maeda, Naoyuki. Transistor amplifier applying large output currents to a load. 4,109,167, Cl. 307-270.000.
- Kakinuma, Toshihide: *See—*
  - Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.
- Kali-Chemie Aktiengesellschaft: *See—*
  - Massonne, Joachim; and Becher, Wilfried, 4,108,967, Cl. 423-469.000.
- Kalvenes, Oystein: *See—*
  - Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.
- Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, to Mitsubishi Rayon Co., Ltd. Graft-polymer composition of rubber for reinforcing crosslinked resin. 4,108,946, Cl. 260-881.000.
- Kamatics Corporation: *See—*
  - Orkin, Stanley S., 4,108,505, Cl. 308-72.000.
- Kamio, Kunimasa: *See—*
  - Akagane, Katsuo; Adachi, Teruho; and Kamio, Kunimasa, 4,108,924, Cl. 260-837.0PV.
- Kan, Jury Evgenievich: *See—*
  - Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.
- Kanagawa, Tadashi; and Nakasa, Hiroyasu, to Central Research Institute of Electric Power Industry. Method of estimating ground pressure. 4,107,981, Cl. 73-88.00E.
- Kanazashi, Tetsuo; and Fujiwara, Tsuyoshi, to Pioneer Electronic Corporation. Terminal device for CATV. 4,109,281, Cl. 358-114.000.
- Kanda, Takeshi: *See—*
  - Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, 4,108,682, Cl. 134-25.00R.
- Kane, James: *See—*
  - Gale, Michael Thomas; and Kane, James, 4,108,660, Cl. 96-38.200.
- Kaneko, Noriaki; and Joh, Yasushi, to Nippon Ceon Co., Ltd. Method and apparatus for removing gas from interior of hollow-fiber permeability apparatus. 4,108,764, Cl. 210-22.00A.
- Kantor, Gideon, to United States of America, Health, Education and Welfare. Direct contact microwave diathermy applicator. 4,108,147, Cl. 128-404.000.
- Kao Soap Co., Ltd.: *See—*
  - Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
- Kaplan, Gerald Stanley, to RCA Corporation. Clutter free communications radar. 4,109,247, Cl. 343-6.50R.
- Karlskronavarvet AB: *See—*
  - Lindstrom, Karl Olof, 4,108,102, Cl. 114-264.000.
- Karlstedt, Gustav Sven Erik: *See—*
  - Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.
- Karpati, Egon: *See—*
  - Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

- Kashioka, Seiji: *See—*
  - Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.
- Kashiwara, Hirofumi: *See—*
  - Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.
- Katakura, Masayuki; and Yamada, Hisashi, to Tokyo Shibaura Electric Co., Ltd. RMS circuit. 4,109,165, Cl. 307-229.000.
- Katayama, Hideaki: *See—*
  - Kubo, Masayoshi; and Katayama, Hideaki, 4,108,776, Cl. 210-224.000.
- Kato, Tetuo, to Tokico Ltd. Double-cylinder buffer. 4,108,287, Cl. 188-315.000.
- Kato, Yoshio: *See—*
  - Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,108,804, Cl. 521-121.000.
- Katsurayama, Hiromasa; and Hirabayashi, Nobuhiro, to Shin-Shirasuna Electric Corp. Cassette tape recorder with cassette eject mechanism. 4,109,286, Cl. 360-96.000.
- Kaufman, George, to Union Carbide Corporation. Collapsible disposable funnel. 4,108,222, Cl. 141-337.000.
- Kawada, Yoshinosuke: *See—*
  - Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
- Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, to Bristol-Myers Company. Antibiotic complex. 4,108,725, Cl. 195-96.000.
- Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, to Yamasa Shoyu Kabushiki Kaisha. Stabilized S-adenosyl-L-methionine preparations. 4,109,079, Cl. 536-26.000.
- Kawai Musical Instrument Mfg. Co., Ltd.: *See—*
  - Deutsch, Ralph, 4,108,039, Cl. 84-1.190.
- Kawai, Satoshi; Sato, Hajime; and Sakai, Toshimatsu, to Pilot Man-Nun-Hitsu Kabushiki Kaisha. Process for recording information or sound and process for preparation of recording materials used therefor. 4,109,287, Cl. 360-131.000.
- Kawai, Wasaburo, to Agency of Industrial Science & Technology. Photosensitive polyesters. 4,108,844, Cl. 526-217.000.
- Kawaken Fine Chemicals Co., Ltd.: *See—*
  - Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
- Kawasaki Jukogyo Kabushiki Kaisha: *See—*
  - Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.
- Kawashima, Yuji: *See—*
  - Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
- Kawecki Berylco Industries, Inc.: *See—*
  - Gennone, Richard J.; and Sturdevant, Robert D., 4,108,646, Cl. 75-148.000.
- Kazaroff, John M.: *See—*
  - Fortini, Anthony; and Kazaroff, John M., 4,108,241, Cl. 165-146.000.
- Kearney & Trecker Corporation: *See—*
  - Johnstone, Richard; and Ostby, Lyle D., 4,109,309, Cl. 364-120.000.
- Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., to Western Electric Company, Incorporated. Arranging randomly positioned articles into preselected positions. 4,107,838, Cl. 29-628.000.
- Keeney, Lawrence V., to Energy Conservation Devices, Inc. Control device and process for heating an installation. 4,108,375, Cl. 237-8.00R.
- Keeton, John H. Thread cutter. 4,108,098, Cl. 112-289.000.
- Keith, Wayland D. Depth indicating and depth controlling devices for earth moving machines. 4,107,859, Cl. 37-126.00A.
- Keller, Wolfgang; and Reuschel, Konrad, to Siemens Aktiengesellschaft. Process for producing plate-shaped silicon bodies for solar cells. 4,108,714, Cl. 156-608.000.
- Kelley, James E.; and Stemler, Orrin A., to Caterpillar Tractor Co. Apparatus for forcibly engaging machine assemblies. 4,108,561, Cl. 403-166.000.
- Kelly, John C.; and Pardo, Brian D., to American Solar King Corporation. Thermal energy method and machine. 4,107,928, Cl. 60-650.000.
- Kemiska Konsultbyran A.G.: *See—*
  - Weiss, Josef, 4,108,771, Cl. 210-50.000.
- Keneman, Scott Allen: *See—*
  - Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, 4,109,178, Cl. 315-12.00R.
- Kenkare, Divaker B.; and Shumway, Durland K., to Colgate-Palmolive Company. Method of producing improved antiperspirant composition. 4,108,977, Cl. 424-46.000.
- Kennecott Copper Corporation: *See—*
  - Owen, Edwin Lewis; and Marshall, David William, 4,109,028, Cl. 427-58.000.
- Kennedy, Benton B. Catfish trap. 4,107,867, Cl. 43-65.000.
- Kennedy, William S.: *See—*
  - Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., 4,108,432, Cl. 273-29.00A.
- Kermoian, Gary H., to Dolco Packaging Corporation. Shear molding of reinforced latch. 4,108,941, Cl. 264-154.000.
- Kessler Products Co., Inc.: *See—*
  - Ullman, Myron E., Jr., 4,107,897, Cl. 52-823.000.
- Kett Electric Laboratory: *See—*
  - Murakami, Osamu, 4,108,004, Cl. 73-432.00R.
- Kettenes, Dirk Karel: *See—*
  - de Haan, Douwe Rienk; and Kettenes, Dirk Karel, 4,109,022, Cl. 426-538.000.
- Keyes Fibre Company: *See—*
  - Lowery, Louie Russell, 4,108,321, Cl. 214-8.50A.
- Keyes, Lorne Allan: *See—*
  - Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, 4,109,202, Cl. 325-3.000.
- Kharazov, Konkordy Innokentievich; Netsvetaev, Gennady Viktorovich; and Trofimov, Valery Ivanovich. Electromagnetic switching device. 4,109,219, Cl. 335-78.000.
- Khimushin, Fedor Fedorovich: *See—*
  - Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
- Khoury, Nick S., to Continental Group, Inc., The. Non-obstructing end closure. 4,108,331, Cl. 220-269.000.
- Khvalovsky, Vladimir Vasilievich; Natarovsky, Sergei Nikolaevich; Nalivaiko, Valentin Iosifovich; and Vorontsov, Vladimir Lvovich. Device for coherent lighting of objects. 4,109,304, Cl. 362-259.000.
- Kiefer, Gerhard: *See—*
  - Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
- Kiela, Gene F.: *See—*
  - Radzins, Edmund A.; and Kiela, Gene F., 4,108,584, Cl. 425-83.100.
- Kienzle, Frank: *See—*
  - Burri, Kaspar F.; Kienzle, Frank; and Rosen, Perry, 4,109,086, Cl. 544-63.000.
- Kikumoto, Ryoji: *See—*
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
- Kimball International, Inc.: *See—*
  - Robinson, John William; and Wilcox, Brian Norris, 4,108,037, Cl. 84-1.030.
- Kimsey, Raymond D.: *See—*
  - Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., 4,107,838, Cl. 29-628.000.
- Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, to Japan Synthetic Rubber Co., Ltd. Thermoplastic elastomer composition. 4,108,947, Cl. 260-889.000.
- Kincaid, Thomas G.; and Stutt, Charles A., to General Electric Company Apparatus and method for wideband communication with suppression of harmonic interference. 4,109,204, Cl. 325-38.00R.
- King, David W.; and Rankin, Emmitt Edward, to Gearhart-Owen Industries, Inc.; and Petro-Data C.A. Apparatus for testing earth formations. 4,108,243, Cl. 166-66.000.
- King, Larry K.: *See—*
  - Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., 4,108,968, Cl. 423-495.000.
- King, William J. Ion beam implantation-sputtering. 4,108,751, Cl. 204-192.00N.
- Kinugasa, Masayuki: *See—*
  - Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.
- Kiplinger, Terry L.: *See—*
  - Conery, William J.; and Kiplinger, Terry L., 4,108,386, Cl. 241-46.110.
- Kiraly, Ildiko: *See—*
  - Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
- Kiraly, Louis J., to United States of America, Navy. Liquid-gas constant force recoil spring. 4,108,046, Cl. 89-43.00A.
- Kirby, Billy E. Back support. 4,108,492, Cl. 297-284.000.
- Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, to Fujisawa Pharmaceutical Co., Ltd. Azetothiazole-5-yl-3-halomethyl-2-butenoic acid derivatives and the preparation of 5-thia-1-azabicyclo[4.2.0]-2-octene-2-carboxylic acid derivatives from them. 4,108,861, Cl. 260-306.70C.
- Kissane, Richard J.: *See—*
  - Pearson, Bert David; and Kissane, Richard J., 4,108,607, Cl. 23-253.00R.
- Kissick, Thomas P.: *See—*
  - Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,108,860, Cl. 260-304.00A.
- Kiszely, Gyorgy: *See—*
  - Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.
- Kitahira, Takashi: *See—*
  - Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.
- Kitamoto, Tatsuji: *See—*
  - Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.
  - Tadokoro, Eiichi; and Kitamoto, Tatsuji, 4,108,739, Cl. 204-40.000.
- Kiyohara, Takehiko: *See—*
  - Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.
- Kleber, Carl J.: *See—*
  - Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,979, Cl. 424-49.000.

  Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,981, Cl. 424-55.000.
Klein, Kurt: *See—*
  Neubeck, Kurt; Schwing, Karl-Heinz; and Klein, Kurt, 4,108,007, Cl. 73-732.000.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of acyl cyanides (B). 4,108,875, Cl. 260-347.800.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of acyl cyanides (A). 4,108,877, Cl. 260-347.800.
Kley, Victor. Keyswitch pad. 4,109,118, Cl. 200-5.00E.
Klimesch, Bernhard: *See—*
  Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, 4,107,890, Cl. 52-379.000.
Kline, Donald E.: *See—*
  Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E., 4,109,033, Cl. 427-314.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Sulfur-containing phenolic antioxidants. 4,108,830, Cl. 260-45.85S.
Kling, David A.; and Bell, Charles W., to Mulberry Metal Products, Inc. Weatherproof electrical outlet box cover. 4,109,095, Cl. 174-67.000.
Klinge Pharma GmbH & Co.: *See—*
  Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.
Klinkicht, Helmut. Sieve stringer belt for conveyors. 4,108,298, Cl. 198-834.000.
Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, to Vorwerk & Co Interholding GmbH. Safety interlock device in an electrically driven household mixing apparatus. 4,108,054, Cl. 99-348.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
  Zenker, Walter, 4,108,291, Cl. 192-4.00R.
Klomser, Jean M.; and Klomser, Jeffrey L. Fireplace closure. 4,108,145, Cl. 126-140.000.
Klomser, Jeffrey L.: *See—*
  Klomser, Jean M.; and Klomser, Jeffrey L., 4,108,145, Cl. 126-140.000.
Klopfenstein, Wayne A.: *See—*
  Baer, Terry G.; and Klopfenstein, Wayne A., 4,108,233, Cl. 157-1.370.
Kluender, Harold Clinton: *See—*
  Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.
Klug, Frederic J.; and Pasco, Wayne D., to General Electric Company. Alumina core for casting DS materials. 4,108,672, Cl. 106-38.900.
Klug, Frederic J.: *See—*
  Huseby, Irvin C.; and Klug, Frederic J., 4,108,676, Cl. 106-65.000.
Klug, Joseph R.: *See—*
  Yindra, Leonard J.; Evans, David F.; and Klug, Joseph R., 4,108,086, Cl. 108-157.000.
Klundt, Kurt: *See—*
  Gross, Helmut; and Klundt, Kurt, 4,108,097, Cl. 112-287.000.
Knape, Fritz. Method for removing ballast from railroad tracks. 4,108,076, Cl. 104-2.000.
Knapp, Heinrich, to Robert Bosch GmbH. Fuel supply system for internal combustion engines. 4,108,128, Cl. 123-139.0AW.
Knight, J. Nelson; and Turner, Roger C., to General Electric Company. Structural support for a refrigerator. 4,107,833, Cl. 29-460.000.
Knoll AG.: *See—*
  Bub, Oskar, 4,108,852, Cl. 260-239.30B.
Knoll, William C., to GTE Sylvania Incorporated. High power factor conversion circuitry. 4,109,307, Cl. 363-101.000.
Knorr-Bremse GmbH: *See—*
  Gagarin, Gregory G., 4,108,286, Cl. 188-218.0XL.
  Hinner, Josef; and Pick, Peter, 4,108,501, Cl. 303-82.000.
Knowles, Philip Neville George; and Pell, Christopher, to Plessey Handel und Investments AG. Radar systems. 4,109,248, Cl. 343-6.50R.
Kobayashi, Nobuyuki: *See—*
  Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
Kobayashi, Tatsuo: *See—*
  Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.
Kobelt, Jacob. Caliper brake actuating cylinder. 4,108,285, Cl. 188-72.600.
Koch, Heinz: *See—*
  Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, 4,108,689, Cl. 148-6.15R.
Koch, Ullrich: *See—*
  Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
Koch, Volker: *See—*
  Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
Kochanneck, Uwe. Circular multistory building with a conveyor and elevator movable around the periphery. 4,108,322, Cl. 214-16.10A.
Koehler-Dayton, Inc.: *See—*
  Lamb, Richard C.; and Iwans, Robert C., 4,107,798, Cl. 4-321.000.
Koeleman, Gerardus A. J.; and op de Laak, Johannes H. A., to Oce-van der Grinten N.V. Process for developing electrostatic latent images. 4,108,658, Cl. 96-15.00D.
Koenig, Roland: *See—*
  Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
Koerfer, Kurt: *See—*
  Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
Kogler, Peter, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Cutting machine. 4,108,494, Cl. 299-1.000.
Kohara, Tadao, to Maruzen Sewing Machine Co., Ltd. Rotary loop taker for sewing machine. 4,108,095, Cl. 112-184.000.
Kohl, Franz, to Wacker-Chemitronik Gesellschaft fur Elektronik-Grundstoffe mbH. Method for the production of semiconductor rods of large diameter and device for making the same. 4,109,128, Cl. 219-10.430.
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, to Tokyo Shibaura Electric Co., Ltd.; and Toshiba House Living Industry Co., Ltd. Hot air type solar heat-collecting apparatus. 4,108,155, Cl. 126-270.000.
Koizumi, Mitsue: *See—*
  Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.
Kojima, Tadao: *See—*
  Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
Kok, Riekert; and van der Zeeuw, Abraham J., to Shell Oil Company. Extraction of Cu(II), Fe(III), Ni(II), Co(II), Cd(II), Zn(II), Ca(II) and Mg(II) metal values using 2-hydroxy iminoacetic acids. 4,108,958, Cl. 423-24.000.
Kolkowski, James J., to Sprague Electric Company. Capacitors with minimum ESR and method of making the same. 4,107,834, Cl. 29-570.000.
Kolmogorov, Alexandr Borisovich: *See—*
  Zagoruiko, Nikolai Grigorievich; and Kolmogorov, Alexandr Borisovich, 4,109,103, Cl. 179-1.0SG.
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Copper phthalocyanine of novel crystal form. 4,108,863, Cl. 260-314.500.
Komarek, Jaromir: *See—*
  Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
Komatu, Kisao, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Tape-mounted electronic-component package. 4,108,305, Cl. 206-330.000.
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Feeding device. 4,108,427, Cl. 271-9.000.
Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Electronic watch having an alarm means. 4,107,916, Cl. 58-38.00R.
Kondo, Tsuneyuki; and Kuroda, Akio, to Toray Industries, Inc. Process for preparing cycloalkanone oximes. 4,108,895, Cl. 260-566.00A.
Kondo, Yutaka; and Nishina, Shuho, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt system. 4,108,471, Cl. 280-747.000.
Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, to Bayer Aktiengesellschaft. Preparation of polyurethane ureas using as hardeners mixtures of water, amines, aldimines and ketimines. 4,108,842, Cl. 528-61.000.
Konig, Franz: *See—*
  Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, 4,107,909, Cl. 57-5.000.
Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine having an auxiliary combustion chamber without an intake valve. 4,108,133, Cl. 123-191.00S.
Konishiroku Photo Industry Co., Ltd.: *See—*
  Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.
  Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eüchi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.
Kontekla Oy: *See—*
  Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,107,929, Cl. 61-14.000.
Kontsevaya, Evgenia Markovna: *See—*
  Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
Kontz, Robert F., to Owens-Illinois, Inc. Extrusion head. 4,108,590, Cl. 425-466.000.
Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., to Krautkramer-Branson, Incorporated. Transducer probe for pulse-echo ultrasonic exploration. 4,108,165, Cl. 128-2.00V.
Koppers Company, Inc.: *See—*
  Dressler, Hans, 4,108,907, Cl. 260-610.00B.
  Gerber, Donald Joel, 4,108,733, Cl. 202-267.00A.
Korosec, Rudolph Francis: *See—*
  Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, 4,108,407, Cl. 248-23.000.
Kosaka, Katuaki; and Ueno, Zene, to Nissan Motor Company, Limited. Fuel reformer for generating gaseous fuel containing hydrogen and/or carbon monoxide. 4,108,114, Cl. 123-3.000.

Koshkin, Lev Nikolaevich: *See—*
  Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,107,977, Cl. 73-45.300.
Koski, Gerald L.: *See—*
  Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., 4,108,563, Cl. 403-347.000.
Kottmann, Alfred: *See—*
  Dangelmaier, Karl; and Kottmann, Alfred, 4,108,031, Cl. 83-90.000.
Kovach, Leslie J. Method and apparatus for producing double-walled thermoplastic pipe. 4,108,703, Cl. 156-244.130.
Kozima, Akio: *See—*
  Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, 4,108,656, Cl. 96-1.50R.
Kozy, Nikolai Mikhailovich: *See—*
  Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.
Kracklauer, Aloysius C., to Sparkler Filters, Inc. Solar energy powered heat generator. 4,108,158, Cl. 126-271.000.
Kraft, Inc.: *See—*
  Collard, James C.; and Martin, Wesley G., 4,108,562, Cl. 403-254.000.
Krasny, Louis M.: *See—*
  England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., 4,109,310, Cl. 364-200.000.
Krassig, Johannes: *See—*
  Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, 4,107,827, Cl. 28-246.000.
Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, to Wacker-Chemie GmbH. Process for the manufacture of silicon dioxide. 4,108,964, Cl. 423-336.000.
Krause, Stephen R. Universal mark sense betting terminal system and method. 4,108,361, Cl. 235-375.000.
Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik: *See—*
  Jung, Rolf, 4,107,839, Cl. 30-123.300.
Krautkramer-Branson, Incorporated: *See—*
  Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., 4,108,165, Cl. 128-2.00V.
Kravitz, Stanley: *See—*
  Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., 4,108,218, Cl. 141-1.000.
Kreyenbuhl, Armand, to Adidas Fabrique de Chaussures de Sport. Ski binding. 4,108,467, Cl. 280-615.000.
Krieg, Martin; and Olffers, Theo, to Hoechst Aktiengesellschaft. Process for reducing the mercury content of industrial waste waters. 4,108,769, Cl. 210-50.000.
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., to Continental Group, Inc., The. Ribbed bottom structure for plastic container. 4,108,324, Cl. 215-1.00C.
Kropac, Joseph M., to Xerox Corporation. Method of making a thermo active imaging member. 4,108,655, Cl. 96-1.50R.
Kropiwnicki, Tadek M.: *See—*
  Miller, Kenneth H.; and Kropiwnicki, Tadek M., 4,108,581, Cl. 417-363.000.
Krouse, Robert S. Portable switch and dimmer control console. 4,109,231, Cl. 338-200.000.
Kroy Industries, Inc.: *See—*
  Connoy, Thomas Patrick, 4,108,556, Cl. 400-48.000.
Krueger, Lynn A. Mobile home skirting. 4,107,888, Cl. 52-169.120.
Kruger, Arthur: *See—*
  Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, 4,108,048, Cl. 91-6.500.
Krum, Jack Kern: *See—*
  Rucker, Dugan Allan; Wollermann, Louis Albert; and Krum, Jack Kern, 4,109,023, Cl. 426-549.000.
Krupp, Walter H. Precompressed piping system for handling cryogenic fluid. 4,108,476, Cl. 285-47.000.
Kruschwitz, Werner: *See—*
  Andrzejewski, Heinz; Kruschwitz, Werner; and Bright, Robert G., 4,107,898, Cl. 52-716.000.
Kubis, Heribert, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Arrangement for external oiling of cylinder liners of internal combustion engines. 4,108,135, Cl. 123-196.00R.
Kubo, Masayoshi; and Katayama, Hideaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Filter press. 4,108,776, Cl. 210-224.000.
Kuboshima, Makoto: *See—*
  Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,109,260, Cl. 354-106.000.
Kubota, Nobunori: *See—*
  Yamana, Makoto; and Kubota, Nobunori, 4,107,911, Cl. 57-56.000.
Kubrin, Michael Joseph: *See—*
  Pohto, Gerald R.; and Kubrin, Michael Joseph, 4,108,752, Cl. 204-256.000.
Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, to RCA Corporation. Traffic switching in communications satellites. 4,109,202, Cl. 325-3.000.
Kuge, Tsukasa; and Tanigawa, Koichi, to Canon Kabushiki Kaisha. Corona discharger. 4,109,289, Cl. 361-230.000.
Kuhn, Charles J. Method for straightening automobile bodies. 4,107,974, Cl. 72-457.000.
Kuhn, Max: *See—*
  Ruegger, Artur; and Kuhn, Max, 4,108,985, Cl. 424-177.000.
Kume, Tosiaki: *See—*
  Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.
Kunise, Satoru: *See—*
  Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.
Kunze, Dieter: *See—*
  von Allworden, Wilhelm; and Kunze, Dieter, 4,108,464, Cl. 280-508.000.
Kunzel, Hans Egon: *See—*
  Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
Kupperman, Dennis: *See—*
  Kupperman, Sam; and Kupperman, Dennis, 4,107,840, Cl. 30-172.000.
  Kupperman, Sam; and Kupperman, Dennis, 4,108,104, Cl. 116-148.000.
Kupperman, Sam; and Kupperman, Dennis, to Rub-A-Venture. Abrasive hand covering. 4,107,840, Cl. 30-172.000.
Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. One piece plastic molded structural unit and door knocker constructed therefrom. 4,108,104, Cl. 116-148.000.
Kurchacova, Elva: *See—*
  Buckler, Robert Thomas; and Kurchacova, Elva, 4,109,001, Cl. 424-269.000.
Kurita Machinery Manufacturing Co., Ltd.: *See—*
  Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, to Kurita Machinery Manufacturing Co., Ltd. Filter press. 4,108,777, Cl. 210-225.000.
Kurnosov, Anatoly Ivanovich: *See—*
  Belenkov, Nikolai Mikhailovich; Kurnosov, Anatoly Ivanovich; and Malitsky, Evgeny Efremovich, 4,109,274, Cl. 357-38.000.
Kuroda, Akio: *See—*
  Kondo, Tsuneyuki; and Kuroda, Akio, 4,108,895, Cl. 260-566.00A.
Kuroda, Hiroshi: *See—*
  Matsuda, Tamotsu; and Kuroda, Hiroshi, 4,108,376, Cl. 237-12.30A.
Kurz, Craven H. Orthodontic appliance. 4,107,844, Cl. 32-14.00A.
Kusakawa, Norihisa: *See—*
  Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.
Kuwertz, Erich, to Pfalzstahlbau GmbH. Coupling apparatus on a circulating tow conveyor. 4,108,078, Cl. 104-172.00S.
Kvaerna, Sverre: *See—*
  Lindstroem, Harry; and Kvaerna, Sverre, 4,108,426, Cl. 269-328.000.
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., to Bethlehem Steel Corporation. Process for the distillation of weak ammonia liquor. 4,108,734, Cl. 203-7.000.
Kwasnoski, Daniel: *See—*
  Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., 4,108,735, Cl. 203-7.000.
Kwon, Joon T.: *See—*
  Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., 4,108,761, Cl. 208-254.00H.
L. B. (Plastics) Limited: *See—*
  Litchfield, Leon George, 4,108,520, Cl. 312-330.00R.
L. Schuler GmbH: *See—*
  Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, 4,108,320, Cl. 214-8.000.
  Dangelmaier, Karl; and Kottmann, Alfred, 4,108,031, Cl. 83-90.000.
La Soudure Electrique Autogene, Procedes Arcos: *See—*
  De Haeck, Robert, 4,109,059, Cl. 428-558.000.
Labaz: *See—*
  Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, 4,108,865, Cl. 260-329.00R.
Labuda, Edward Franklin: *See—*
  Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, 4,107,835, Cl. 29-590.000.
Laing, Nikolaus. Rail vehicles with propulsion energy recovery system. 4,108,077, Cl. 104-156.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
  L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.
Lake, Malcolm John; and Snelgrove, William Richard Noble, to Johns-Manville Corporation. Process for recovering platinum group metals from ores also containing nickel, copper and iron. 4,108,639, Cl. 75-101.00R.
La Liberte, Norman U., to American Optical Corporation. Colorless allyl diglycol carbonate. 4,108,827, Cl. 260-42.210.
LaLonde, Paul D.: *See—*
  Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., 4,108,563, Cl. 403-347.000.
Lamb, Richard C.; and Iwans, Robert C., to Koehler-Dayton, Inc. Self-contained toilet. 4,107,798, Cl. 4-321.000.
Lambert, Bertha E.: *See—*
  Lambert, Steven J.; Lambert, Bertha E.; and Lambert, Warren G., 4,108,778, Cl. 210-297.000.
Lambert, Everette M., to Liberty Vinyl Corporation. Waterbed and frame with pliant supporting sides. 4,107,799, Cl. 5-370.000.
Lambert, Gerard Edouard; and Begis, Roger, to Seveg, S.A. Ink agitator. 4,108,068, Cl. 101-363.000.

Lambert, James Hubert: *See*—
  Rombach, Joseph Xavier; and Lambert, James Hubert, 4,108,409, Cl. 248-96.000.

Lambert, Steven J.; Lambert, Bertha E.; and Lambert, Warren G. Self-cleaning filter and vortexer. 4,108,778, Cl. 210-297.000.

Lambert, Warren G.: *See*—
  Lambert, Steven J.; Lambert, Bertha E.; and Lambert, Warren G., 4,108,778, Cl. 210-297.000.

Lampe, Hans Hermann: *See*—
  Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, 4,108,360, Cl. 235-304.000.

Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris". Apparatus and method for towing a pipeline in a body of water. 4,107,933, Cl. 61-107.000.

Landau, John Vernon, Jr.; and Rupinski, Frederick Alexander, to Singer Company, The. Programmable variable speed for sewing machine. 4,108,090, Cl. 112-121.110.

Lander, Lars Bengt, to Cepasy AG. Paper dispenser, especially toilet paper dispenser. 4,108,513, Cl. 312-39.000.

Landfors, Arthur A., to Varian Associates, Inc. Low cost, thermally efficient diffusion pump. 4,108,576, Cl. 417-153.000.

Lang, James R., to Mechanex Corporation, The. Automatic oil level maintaining system. 4,107,999, Cl. 73-326.000.

Lang, James R., to Mechanex Corporation, The. Sensing probe for gravity induced flow liquid level regulator. 4,108,201, Cl. 137-393.000.

Lang, Milton R., Jr.; and O'Berry, William A., to Westinghouse Electric Corp. PRF Detection system and method. 4,109,197, Cl. 324-78.00F.

Langbein, Dieter: *See*—
  Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.

Lange, Georg, to Thyssen Purofer GmbH. Method of the direct reduction of iron ore. 4,108,636, Cl. 75-35.000.

Langen, Hans: *See*—
  Joekel, Alfred; Langen, Hans; and Denner, Peter, 4,107,832, Cl. 29-157.3AH.

Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Process for polymer lithiation in graft polymerization. 4,108,921, Cl. 260-827.000.

Langeron, Jean-Paul: *See*—
  Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.

Langguth, Robert P.: *See*—
  Christ, Thomas; and Langguth, Robert P., 4,108,801, Cl. 252-544.000.

Lantto, Joseph R. Squeegee with moisture removing means. 4,107,812, Cl. 15-245.000.

Larkin, William A.: *See*—
  Bouchoux, Jean W.; and Larkin, William A., 4,108,828, Cl. 260-45.75H.

Larsen, Tor Grotnes: *See*—
  Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, 4,107,847, Cl. 33-147.00L.

Lashko, Nikolai Fedorovich: *See*—
  Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.

Latash, Jury Vadimovich: *See*—
  Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Lau, Philip Thiam Shin: *See*—
  Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.

Lauck, Robert M., to Stauffer Chemical Company. Protein enriched baked goods. 4,109,025, Cl. 426-551.000.

Lavalier, Clair H. Snowmobile flotation ski. 4,108,453, Cl. 280-28.000.

Law, Chi Y. Camera for taking three dimensional photographs. 4,109,261, Cl. 354-112.000.

Law, Chi Y. Three dimensional camera having lenticular screen moving apparatus. 4,109,262, Cl. 354-112.000.

Lawson, Joseph M. Variable torque fluid device. 4,108,049, Cl. 91-478.000.

Lawson, Michael B.; and Snyder, Kenneth J., to Halliburton Company. Method for dissolving asphaltic material. 4,108,681, Cl. 134-20.000.

Le Materiel Telephonique: *See*—
  Bougon, Pierre Paul Andre, 4,107,854, Cl. 35-25.000.

Leach, Bruce Eugene; and Starks, Charles M., to Continental Oil Company. N-alkylated cresylic acids via direct alkylation in a liquid phase. 4,108,909, Cl. 568-766.000.

Lear Siegler, Inc.: *See*—
  Frankiw, Walter, 4,108,047, Cl. 90-1.60R.

Le Blay, Jacques: *See*—
  Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, 4,108,865, Cl. 260-329.00R.

Le Bossenec, Raymond: *See*—
  L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.

Leco Corporation: *See*—
  Lunde, Marvin C., 4,108,339, Cl. 222-591.000.

Lee, Cheng H., to Monsanto Company. Membrane separation of methanol from formaldehyde aqueous mixtures. 4,108,765, Cl. 210-23.00R.

Lee, Gim Fun, Jr., to General Electric Company. Thermoplastic molding compositions of rubber modified copolymers of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride. 4,108,925, Cl. 260-876.00R.

Lee, Henry L., Jr.; and Orlowski, Jan Alexander, to Lee Pharmaceuticals. Dental adhesive composites. 4,107,845, Cl. 32-15.000.

Lee, James Y.: *See*—
  Ogle, James A.; and Lee, James Y., 4,109,180, Cl. 315-169.0TV.

Lee, Maw Huei, to Clopay Corporation. Garage door operator and door obstruction sensing apparatus. 4,107,877, Cl. 49-28.000.

Lee Pharmaceuticals: *See*—
  Lee, Henry L., Jr.; and Orlowski, Jan Alexander, 4,107,845, Cl. 32-15.000.

Lee, Soo-Il, to Owens-Illinois, Inc. Injection molding method and apparatus. 4,108,956, Cl. 264-329.000.

Lee, Yoon C., to Monsanto Company. Rubber modified fire retardant polymer compositions. 4,108,943, Cl. 260-878.00R.

Leeke, Wallace Richard: *See*—
  Newland, Robert Andrew; and Leeke, Wallace Richard, 4,107,806, Cl. 9-310.00E.

Leemhuis, Louis J. Damper control device. 4,108,371, Cl. 236-49.000.

Legey, Elso Jose Figueira. Tape machine and slide projector synchronizing device. 4,109,285, Cl. 360-80.000.

LeGrady, Carl F. Reinforcing bar locating means. 4,107,895, Cl. 52-687.000.

Leibrock, Kurt, to Saarbergwerke Aktiengesellschaft. Method of and apparatus for compacting coking coal. 4,108,610, Cl. 44-10.00G.

Leifheit International Guenter Leifheit GmbH: *See*—
  Schuelein, Rolf G.; and Friedrich, Rainer, 4,107,809, Cl. 15-42.000.

Leigh, Roland Albert, to BOC Limited. Compositions containing dithionites. 4,108,960, Cl. 423-265.000.

Leistner, Rudolf, to Braun AG. Camera for motion and still pictures. 4,108,543, Cl. 352-121.000.

Leites, Abram Vladimirovich: *See*—
  Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Leitzel, Larry Leon: *See*—
  Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, 4,108,527, Cl. 339-107.000.

Lembke, Russell B.: *See*—
  Anderson, Hugh C.; and Lembke, Russell B., 4,108,826, Cl. 260-395.00B.

Lenhard, Robert Herman: *See*—
  Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,108,890, Cl. 260-507.00R.

Lenker, Paul E., to Davenport Tool Co. Ratchet wrench with double swivelling drive shaft. 4,108,027, Cl. 81-60.000.

Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle. Apparatus for on-site connection of cables with optical fibres. 4,108,534, Cl. 350-96.210.

Lerg, George: *See*—
  Nelson, David H., 4,108,154, Cl. 126-270.000.

Lermann, Peter: *See*—
  Stemme, Otto; Lermann, Peter; and Winkler, Alfred, 4,108,542, Cl. 352-72.000.

Lermer Apparatebau GmbH: *See*—
  Liebscher, Guenther; and Christ, Guenter, 4,108,082, Cl. 105-464.000.

Lesh, Nathan George, deceased; by Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, to Bell Telephone Laboratories, Incorporated. Conduction system for thin film and hybrid integrated circuits. 4,109,297, Cl. 361-402.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. Preparation of 2-(pyridinyl)-4-pyrimidinamines. 4,109,092, Cl. 544-328.000.

Lettau, W. Fred, to Abex Corporation. Tapered block thickness gauge. 4,107,849, Cl. 33-174.00E.

Leuck, Steven M.: *See*—
  Anderson, Gordon K.; Leuck, Steven M.; and Ruhl, Gary L., 4,108,026, Cl. 81-3.00R.

Leventhall, Hubert Geoffrey: *See*—
  Coxon, Brian; and Leventhall, Hubert Geoffrey, 4,109,108, Cl. 179-1.00P.

Leverone, Paul G.: *See*—
  Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., 4,109,199, Cl. 324-202.000.

Lewin, Nathan: *See*—
  Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., 4,108,974, Cl. 424-1.000.

Lewis, Charles W.: *See*—
  Cherenko, Joseph; and Lewis, Charles W., 4,109,055, Cl. 428-437.000.

Lewis, Ronald A.: *See*—
  Rowe, Charles L.; and Lewis, Ronald A., 4,108,002, Cl. 73-371.000.

L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method for the heat-treatment of steel and for the control of said treatment. 4,108,693, Cl. 148-16.500.

Li, George S., to Standard Oil Company, The. Polymerizates of olefinic nitriles containing indene. 4,109,073, Cl. 526-280.000.

Liautaud, James P., to American Antenna Corporation. Precision injection-molded coil form and method and apparatus for manufacture. 4,109,224, Cl. 336-192.000.

Libbey-Owens-Ford Company: *See*—
  Marriott, James G., 4,109,044, Cl. 428-210.000.

Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., to Carrier Corporation. Method for loading refuse into containers. 4,108,261, Cl. 177-120.000.

Liberty Vinyl Corporation: *See*—
  Lambert, Everette M., 4,107,799, Cl. 5-370.000.

Liebscher, Guenther; and Christ, Guenter, to Lermer Apparatebau GmbH. Container locking device. 4,108,082, Cl. 105-464.000.

Lieser, Karl Heinrich; and Burba, Peter, to Riedel-de Haen Aktiengesellschaft. Ion exchange compounds on cellulose basis and process for the manufacture thereof. 4,109,080, Cl. 536-43.000.

Lightning Fasteners Limited: *See*—
  Parsons, John T., 4,107,956, Cl. 66-195.000.

Ligman, James Raymond; and Jones, Richard Fred. Recorder for decompression data. 4,107,995, Cl. 73-300.000.

Lileck, John Theodore, to Air Products & Chemicals, Inc. Preparation of iodine pentafluoride by direct fluorination of molten iodine. 4,108,966, Cl. 423-466.000.

Lincoln, Thomas Christopher, to Microdot Inc. Hermaphroditic edgeboard connectors. 4,108,525, Cl. 339-49.00R.

Lindal, Sir Walter. Prefabricated roof section. 4,107,885, Cl. 52-90.000.

Linde Aktiengesellschaft: *See*—
  Abels, Theodor, 4,108,265, Cl. 180-66.00R.
  Chmiel, Horst, 4,107,937, Cl. 62-64.000.

Linden-Alimak AB: *See*—
  Johansson, Ake, 4,108,254, Cl. 173-43.000.

Lindgren, Osten, to AB Metall & Bergprodukter. Apparatus for recovery of re-usable substances from a fixing bath in processes for development and fixing of photographic films and X-ray films. 4,108,753, Cl. 204-263.000.

Lindsley, Charles Wesley: *See*—
  Shambelan, Robert Charles; and Lindsley, Charles Wesley, 4,108,323, Cl. 214-310.000.

Lindstroem, Harry; and Kvaerna, Sverre, to Siemens Aktiengesellschaft. Device for holding the head of a patient. 4,108,426, Cl. 269-328.000.

Lindstrom, Karl Olof, to Karlskronavarvet AB. Anchorable, floating platform. 4,108,102, Cl. 114-264.000.

Lippert, Irving S.: *See*—
  Pizzuti, Donato F.; and Lippert, Irving S., 4,109,264, Cl. 354-187.000.

Lipperts, Joseph H. F. G., to Hazemeijer B.V. Vacuum switch with intermittently energized electromagnetic coil. 4,109,122, Cl. 200-144.00B.

Lipperts, Joseph H. F. G., to Hazemeijer B.V. Vacuum switch. 4,109,123, Cl. 200-144.00B.

Litchfield, Leon George, to L. B. (Plastics) Limited. Drawers. 4,108,520, Cl. 312-330.00R.

Litton Industrial Products, Inc.: *See*—
  Wayson, Andrew J., 4,107,913, Cl. 57-125.000.

Liu, Robert Chung-Huan; and Hughes, John Lawrence, to Armour Pharmaceutical Company. Pharmaceutical, compositions containing substituted 4'-hydroxyphenyl guanidines and methods of using same. 4,109,014, Cl. 424-326.000.

Lloyd, Gary Richard; and Lloyd, Rita Rae. Artificial Christmas tree. 4,109,036, Cl. 428-8.000.

Lloyd, Peter Frederick Victor. Pipe coupling socket assemblies. 4,108,446, Cl. 277-101.000.

Lloyd, Rita Rae: *See*—
  Lloyd, Gary Richard; and Lloyd, Rita Rae, 4,109,036, Cl. 428-8.000.

Lochel, Frank P., Jr., to Amchem Products, Inc. Autodeposited coatings. 4,108,817, Cl. 260-29.60E.

Long, Everett James; and Muench, Elmer W., to Everett/Charles, Inc. Probe actuator assembly. 4,108,528, Cl. 339-117.00P.

Longoni, Angelo: *See*—
  Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.

Loper, Dall D.: *See*—
  Ozdemir, Faik S.; and Loper, Dall D., 4,109,029, Cl. 427-84.000.

Lord Corporation: *See*—
  Clinard, Ralph L., Jr., 4,108,508, Cl. 308-238.000.

L'Oreal: *See*—
  Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.

Lorenz, Gunter: *See*—
  Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, 4,108,845, Cl. 526-240.000.

Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, to Richter Gedeon Vegyeszeti Gyar Rt. (−)-Apovincaminol lauric acid ester and cerebral vasodilatory composition thereof. 4,108,996, Cl. 424-256.000.

Loshack, Samuel; and Shen, Chah M., to Wesley-Jessen Inc. Method of producing optically clear hydrophilic copolymers and contact lenses. 4,109,070, Cl. 526-77.000.

Loughlin, James Osborn E.: *See*—
  Mueller, Klaus Karl; and Loughlin, James Osborn E., 4,108,597, Cl. 8-115.000.

Loughran, Gerard A.: *See*—
  Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,108,926, Cl. 260-874.000.

Love, William D.; and Hueschen, Robert E., to General Electric Company. X-ray tube anode with alloyed surface and method of making the same. 4,109,058, Cl. 428-553.000.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Method and means for peeling pineapples. 4,108,059, Cl. 99-543.000.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Method and means for peeling pineapples. 4,108,060, Cl. 99-591.000.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Method of peeling pineapples. 4,109,021, Cl. 426-482.000.

Lowe, James H. C.: *See*—
  Walberg, M. Victor; and Lowe, James H. C., 4,108,644, Cl. 75-135.000.

Lowe, James L.: *See*—
  Wendel, Ion L., 4,108,159, Cl. 126-271.000.

Lowery, Louie Russell, to Keyes Fibre Company. Automatic packing. 4,108,321, Cl. 214-8.50A.

LTG Lufttechnische GmbH: *See*—
  Furstenberg, Joachim; and Hencke, Dietmar, 4,107,910, Cl. 57-34.00R.

Lubrizol Corporation, The: *See*—
  Bryant, Charles Peterson, 4,108,784, Cl. 252-56.00R.
  Ripple, David Eugene, 4,108,783, Cl. 252-54.600.

Lucas Electrical Company, Limited: *See*—
  Williams, Malcolm; and Jones, Christopher Robin, 4,108,115, Cl. 123-32.0EB.

Lucas Industries Limited: *See*—
  Andrew, Gordon Edward; and Bunn, George Edward, 4,107,918, Cl. 60-39.710.
  Hodgson, Duncan Barry, 4,109,174, Cl. 310-316.000.
  Warner, Peter Stuart; and Bicht, John Richard, 4,109,064, Cl. 429-66.000.

Lucius, John Edward: *See*—
  Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, 4,108,527, Cl. 339-107.000.

Luithlen, Heinz: *See*—
  Schmidt, Manfred; and Luithlen, Heinz, 4,108,465, Cl. 280-605.000.

Lummus Company, The: *See*—
  Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., 4,108,761, Cl. 208-254.00H.
  Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Lunde, Marvin C., to Leco Corporation. Integral nozzle with gas delivery manifold. 4,108,339, Cl. 222-591.000.

Lunden, Risto Waldemar: *See*—
  Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,107,929, Cl. 61-14.000.

Lunsford, Carl D.; and Alphin, Reevis S., to A. H. Robins Company, Inc. Method of increasing rate of gastric emptying with pyrrolidinylbenzamides. 4,109,005, Cl. 424-274.000.

Lussier, Michel, to Automobiles Peugeot and Hautrifil. Clamping collar. 4,107,824, Cl. 24-27.000.

Luthe, Fred J.; and Hays, Allen E., to Fisher Controls Company. Control valve trim assembly. 4,108,210, Cl. 138-42.000.

Lynch, Paul E., to Fenix & Scisson, Inc. Means to prevent relative rotation of threaded together pin and box tool joints. 4,108,478, Cl. 285-82.000.

Lyon, Floyd A.; and Harrison, Henry, to Halm Instrument Co., Inc. Heat storage water tank. 4,108,374, Cl. 237-1.00A.

M. L. Engineering (Plymouth) Limited: *See*—
  Moorey, Ernest James, 4,109,205, Cl. 325-45.000.

M&T Chemicals Inc.: *See*—
  Bouchoux, Jean W.; and Larkin, William A., 4,108,828, Cl. 260-45.75H.

MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, to Jeep Corporation. Transfer case. 4,108,021, Cl. 74-606.00R.

Macaluso, Salvatore. Oil salvager. 4,108,773, Cl. 210-122.000.

MacArthur, Judy Anne: *See*—
  Scott, Walter Norris; and MacArthur, Judy Anne, 4,107,818, Cl. 17-51.000.

MacDougall, James B. Adjustable antenna mounting bracket. 4,109,251, Cl. 343-715.000.

Mack, Kenneth John: *See*—
  Anderson, Clifford Wilhelm; Mack, Kenneth John; and Martin, Jerry Thomas, 4,108,939, Cl. 264-129.000.

MacKeigan, Thomas H., to Abex Corporation. Eyelet removing punch. 4,107,842, Cl. 30-358.000.

MacKinnon, Richard B. Auto anti-theft device. 4,107,962, Cl. 70-243.000.

Madera, Anthony J.: *See*—
  Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., 4,109,232, Cl. 340-6.00R.

Madsen, Kristian Dahl, to ASEA Aktiebolag. Gaseous mixture ultracentrifuge. 4,108,354, Cl. 233-30.000.

Maeda, Naoyuki: *See*—
  Kaji, Isamu; and Maeda, Naoyuki, 4,109,167, Cl. 307-270.000.

Maeda, Tooru: *See*—
  Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, 4,108,137, Cl. 123-242.000.

Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Compounds of ergolene and ergoline structure and method for the preparation thereof. 4,108,855, Cl. 260-285.500.

Mahajan, Gautam K.: *See*—
  Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.

Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, to Perkin-Elmer Corporation, The. Diluting and dispensing probe for blood sample preparation. 4,108,608, Cl. 23-259.000.

Mahone, Louis G., to Dow Corning Corporation. Method of preparing methylsiloxanes and methylchloride. 4,108,882, Cl. 260-448.20E.

Mahrt, Gunter; and Goldammer, Georg, to Schubert & Salzer. Device for opening and mixing fiber bales. 4,107,820, Cl. 19-81.000.

Main, W. Eric, to Motorola, Inc. Unbalanced-to-balanced signal converter circuit. 4,109,214, Cl. 330-254.000.

Makabe, Hachiro: *See*—
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.

Malec, Jerry P. Modulator valve. 4,108,134, Cl. 123-196.00R.

Malec, Robert E., to Ethyl Corporation. Polyolefin quaternary pyridinium salts. 4,108,858, Cl. 260-294.80E.

Malichenko, Evgeny Fedorovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Malitsky, Evgeny Efremovich: *See*—
Belenkov, Nikolai Mikhailovich; Kurnosov, Anatoly Ivanovich; and Malitsky, Evgeny Efremovich, 4,109,274, Cl. 357-38.000.

Mallinckrodt, Inc.: *See*—
Smith, Kenneth R., 4,109,081, Cl. 536-53.000.

Malroit, Richard R. Collapsible grapple. 4,108,484, Cl. 294-66.00R.

Mamo, Anthony C.: *See*—
Vary, Robert F.; and Mamo, Anthony C., 4,108,238, Cl. 165-57.000.

Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, to Fuji Electric Co., Ltd.; and Japanese National Railways. Current collector shoe suspension for externally powered electric vehicle. 4,108,288, Cl. 191-49.000.

Manganaro, George Frank. Electromagnetic stapler and safety trigger therefor. 4,108,345, Cl. 227-131.000.

Mangel, Karl. Master operator for vertically moving elevator car doors. 4,108,283, Cl. 187-52.0LC.

Manion, Francis M.: *See*—
Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,108,721, Cl. 176-36.00R.

Manley, Paul P., Jr. Lock for stacked materials. 4,107,958, Cl. 70-58.000.

Manno, Joseph T. Knotless minnow rig. 4,107,866, Cl. 43-44.830.

Manufacturers Systems, Inc.: *See*—
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,108,212, Cl. 138-122.000.

Mao, Chung-Ling, to Uniroyal, Inc. 3-(Hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxides and polyurethanes chain extended therewith. 4,108,868, Cl. 260-332.100.

Marcell, William B., to Thomas Industries of Tennessee, Inc. Dispenser and method for applying lubricant or other material to the interior of a conduit. 4,108,279, Cl. 184-15.00R.

Marchal, Gerard: *See*—
Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, 4,108,410, Cl. 248-130.000.

Marchenko, Ivan Konstantinovich: *See*—
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Marconi Company Ltd., The: *See*—
Woloszczuk, Edmund Wergiliusz, 4,109,254, Cl. 343-797.000.

Marcoux, Leo; and Berg, Peter G., to Texas Instruments Incorporated. High efficiency early fuel evaporation carburetion system. 4,108,125, Cl. 123-122.00F.

Margavio, Matthew F.: *See*—
Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., 4,108,748, Cl. 204-159.120.

Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, to Aktiebolaget Atomenergi. Heat exchanger system. 4,108,240, Cl. 165-125.000.

Marin, Jose Antonio T. Foldable chair. 4,108,490, Cl. 297-42.000.

Marion L. Eakes Company: *See*—
Eakes, Marion L., 4,108,051, Cl. 115 LH-.

Marion Laboratories, Inc.: *See*—
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.

Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Polycarbonate composition containing oligomeric-polymeric oxalate plasticizer. 4,108,820, Cl. 260-30.80R.

Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Polycarbonate composition containing iminated and thionated carbonate plasticizers. 4,108,821, Cl. 260-30.80R.

Marriott, James G., to Libbey-Owens-Ford Company. Electrically heated window having sharply bent portions. 4,109,044, Cl. 428-210.000.

Marscher, William D., to United Technologies Corporation. Stress relief of metal-ceramic gas turbine seals. 4,109,031, Cl. 427-191.000.

Marshall, David William: *See*—
Owen, Edwin Lewis; and Marshall, David William, 4,109,028, Cl. 427-58.000.

Marshall, Robert Moore; and Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Production of polyester tire yarn. 4,108,781, Cl. 252-8.900.

Marsham, Peter Robert, to Imperial Chemical Industries Limited. Prostane derivatives. 4,109,015, Cl. 424-341.000.

Martensson, Karl J. G.: *See*—
Sjoholm, Claes Bertil; and Martensson, Karl J. G., 4,108,058, Cl. 99-466.000.

Martin Industries, Inc.: *See*—
Wilhoite, Murray O., 4,108,144, Cl. 126-120.000.

Martin, Jerry Thomas: *See*—
Anderson, Clifford Wilhelm; Mack, Kenneth John; and Martin, Jerry Thomas, 4,108,939, Cl. 264-129.000.

Martin, Lee D. Bicycle seat and mounting therefor. 4,108,462, Cl. 280-289.00E.

Martin, R. Hugo; and Owens, William F., Jr., to Olin Corporation. Gamma alumina filled paper wrapper for smoking articles. 4,108,151, Cl. 131-9.000.

Martin, Robert Arthur: *See*—
Hoff, Carl Preston; and Martin, Robert Arthur, 4,108,335, Cl. 222-137.000.

Martin, Roger J. Solar tracking device. 4,108,019, Cl. 74-469.000.

Martin, Terence Geoffrey: *See*—
Williams, Derek Farnham; and Martin, Terence Geoffrey, 4,108,760, Cl. 208-11.0LE.

Martin, Wayne A., to United States Steel Corporation. Dies for forging and trepanning large diameter couplings and method of forging and trepanning couplings. 4,107,972, Cl. 72-334.000.

Martin, Wesley G.: *See*—
Collard, James C.; and Martin, Wesley G., 4,108,562, Cl. 403-254.000.

Martin, William E., to United States of America, Navy. Method of making miniature coupling lens. 4,108,622, Cl. 65-30.00R.

Martineu, Pierre; and Gregoire, Jean-Francois, to Carnaud Total Interplastic. Method of making hollow articles from plastic material. 4,108,937, Cl. 264-89.000.

Martinez, Antero; and Martinez, Estrella. Wave motor. 4,108,579, Cl. 417-333.000.

Martinez, D. Manuel Torres. Feeding system for manufacturing machines consuming paper supplied in a continuous strip. 4,108,391, Cl. 242-58.300.

Martinez, Estrella: *See*—
Martinez, Antero; and Martinez, Estrella, 4,108,579, Cl. 417-333.000.

Martone, Ronald J.; Goldman, Samuel C.; and Heaton, Clifford C., to Picker Corporation. Scintillation camera with the scintillators in different planes. 4,109,150, Cl. 250-368.000.

Maruzen Petrochemical Co., Ltd.: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Maruzen Sewing Machine Co., Ltd.: *See*—
Kohara, Tadao, 4,108,095, Cl. 112-184.000.

Marvin Glass & Associates: *See*—
Baer, Ralph H.; and Fletchic, Donald K., 4,109,114, Cl. 179-100.40D.
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., 4,107,872, Cl. 46-103.000.

Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing ferromagnetic iron oxide. 4,108,787, Cl. 252-62.560.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Kubis, Heribert, 4,108,135, Cl. 123-196.00R.

Maschinenfabrik Hennecke GmbH: *See*—
Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, 4,108,585, Cl. 425-89.000.

Masclet, Jean, to S.E.D.I.C. Fishing reel. 4,108,392, Cl. 242-84.21A.

Masi, Lamberto. Aired grip for tennis rackets. 4,108,436, Cl. 273-75.000.

Mason, John Richard; and Foreman, Arthur L., to Dracon Industries. Mounting enclosure for key telephone unit circuit sections. 4,109,294, Cl. 361-399.000.

Mason, William B., to Teccor Electronics, Inc. Power supply 4,109,306, Cl. 363-61.000.

Massachusetts Institute of Technology: *See*—
Dash, Glen R., 4,109,280, Cl. 358-86.000.
Flemings, Merton C.; Riek, Rodney G.; and Young, Kenneth P., 4,108,643, Cl. 75-135.000.

Massey-Ferguson Inc.: *See*—
Elfes, Lee E.; and Beckerman, Joseph W., 4,107,951, Cl. 64-14.000.
Hern, John F.; and Buccellato, Joseph L., 4,108,483, Cl. 292-272.000.
Mueller, Otto, Jr., 4,108,248, Cl. 172-9.000.

Massey-Ferguson Services N.V.: *See*—
Old, John Leslie, 4,108,463, Cl. 280-460.00A.

Massonne, Joachim; and Becher, Wilfried, to Kali-Chemie Aktiengesellschaft. Process for preparing sulphur hexafluoride. 4,108,967, Cl. 423-469.000.

Mast, John George, Jr., to Procter & Gamble Company, The. Apparatus and method for delivering tampon sacks and inserter parts to an assembly turret. 4,108,299, Cl. 28-119.000.

Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., to Goodyear Tire & Rubber Company, The. Poly(methyl methacrylate) composition. 4,108,923, Cl. 260-836.000.

Mathern, Andre M.: *See*—
Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle, 4,108,534, Cl. 350-96.210.

Matsubara, Isao: *See*—
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.

Matsuda, Morio: *See*—
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Matsuda, Tamotsu; and Kuroda, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Heater unit for air-conditioner in automobile vehicle. 4,108,376, Cl. 237-12.30A.

Matsumoto, Makoto: *See*—
Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, 4,108,833, Cl. 528-31.000.

Matsumoto, Masayuki: *See*—
Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Matsumura, Mutsuo: *See*—
Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.

Matsushima, Hideo: *See*—
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Oku, Takeshi, 4,109,130, Cl. 219-130.210.
Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

Matsushita Electronics Corporation: *See*—
Ishikawa, Kiyotsugu; and Itoh, Kunio, 4,108,715, Cl. 156-628.000.
Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.

Mattel, Inc.: *See*—
DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., 4,108,437, Cl. 273-86.00D.

Matthew, Morton P.; and Rackman, Michael I., to Rackman, Michael I. Action game. 4,108,430, Cl. 273-1.00R.

Matthews, Paul William, to Babcock Kina Limited. Cleaning heads. 4,107,816, Cl. 15-320.000.

Mauer, Dieter: *See*—
Renner, Wolf; and Mauer, Dieter, 4,108,507, Cl. 308-238.000.

Mauro, Peter. Differential hair curler. 4,108,183, Cl. 132-42.00A.

Mawson, Robert James, to Rolls-Royce Limited. Bladed rotor assembly for a gas turbine engine. 4,108,571, Cl. 416-221.000.

Maxsted, Malcolm D.: *See*—
Dixon, Robert L.; and Maxsted, Malcolm D., 4,108,259, Cl. 175-344.000.

Maxwell, George E., Sr. Mattress suspension system. 4,107,797, Cl. 5-118.000.

Mazer, Lloyd M.: *See*—
Egan, William J., Jr.; and Mazer, Lloyd M., 4,108,591, Cl. 431-121.000.

Mazzanobile, Salvatore; and Hillermeier, Robert John, to Beecham Inc. Dental compositions. 4,108,978, Cl. 424-49.000.

McCaffrey, Michael Thomas: *See*—
Castellano, Joseph Anthony; and McCaffrey, Michael Thomas, 4,108,793, Cl. 252-299.000.

McCallum, R. Bruce: *See*—
Black, William M.; and McCallum, R. Bruce, 4,108,275, Cl. 181-252.000.

McCarthy, James R.; and Moore, Jimmie L., to Dow Chemical Company, The. N,15-Didehydro-15-deoxo-pyrimidino-(4,5-b)rifamycin S. 4,108,853, Cl. 544-245.000.

McCartney, Joseph F.; and Gundersen, Charles R., to United States of America, Navy. Submersible battery apparatus. 4,109,062, Cl. 429-6.000.

McCartney, Joseph F.: *See*—
Wrench, Edwin H., Jr.; Hicks, Jay C.; and McCartney, Joseph F., 4,109,117, Cl. 179-175.30F.

McClelland, Robert David: *See*—
Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.

McClendon, Gilbert. Safety warning kit. 4,108,311, Cl. 206-573.000.

McConnell, R. B.: *See*—
Trivedi, Bhupendra C.; Grimm, Robert A.; and McConnell, R. B., 4,109,094, Cl. 548-347.000.

McCoy, Robert H., to Uniroyal, Inc. Carpet backing with rubber latex-solid polyvinyl chloride resin composition. 4,109,039, Cl. 428-95.000.

McDevitt, Robert F. Device for obtaining a sample of liquid. 4,108,003, Cl. 73-425.40R.

McDonnell Douglas Corporation: *See*—
Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, 4,109,185, Cl. 318-571.000.
Jones, Roy L., 4,107,986, Cl. 73-147.000.

McFarland, Robert H.: *See*—
Gilliom, John W.; and McFarland, Robert H., 4,108,139, Cl. 126-21.00A.

McGinnis, Edward F., Jr.: *See*—
Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., 4,109,223, Cl. 336-84.00C.

McGuire, Murvail C. Sprinkler head locater and marker and method. 4,108,439, Cl. 273-176.00R.

McHenry, Joe M., Jr., to Cutters Machine Company, Inc. Drive disconnect device for a cloth spreading machine. 4,108,293, Cl. 192-67.00R.

McIntosh, Colin Leslie, to Du Pont de Nemours, E. I., and Company. Alkoxycarbonylphosphonic acid derivative brush control agents. 4,108,626, Cl. 71-76.000.

McKee, William H., to TRW Inc. Cover for multi-wire connector. 4,108,526, Cl. 339-103.00M.

McKendry, Lennon H., to Dow Chemical Company, The. Herbicidal use of esters of aminohalopyridyloxy acids. 4,108,629, Cl. 71-94.000.

McKinnon, John J., to Raytheon Company. Microwave tube assembly. 4,109,179, Cl. 315-39.750.

McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., to Unex Conveying Systems, Inc. Powered roller accumulation conveyor. 4,108,304, Cl. 198-781.000.

McMillian, Lonnie S.; and Culp, Harold G., to Systems & Technic S.A. Multi-national coin totalizer. 4,109,139, Cl. 235-92.0CN.

McMullen, Carl R.; and Schlageter, Gary M., to Foundry Technology, Inc. Sand cooler control system. 4,108,188, Cl. 134-57.00R.

McNaughton, Lawrence S., to General Electric Company. Circuit for increasing the operating speed range of a velocity servo system. 4,109,190, Cl. 318-609.000.

McNeil Corporation: *See*—
Conery, William J.; and Kiplinger, Terry L., 4,108,386, Cl. 241-46.110.

McNulty, Dennis A., to A. O. Smith Corporation. Position sensing differential transformer system with means to convert the output to an absolute value. 4,109,200, Cl. 324-208.000.

McWhorter, Edward Milton. Bottom cycle manifold for four-stroke internal combustion engines. 4,108,119, Cl. 123-75.00C.

Mears, Whitney Harris, to Allied Chemical Corporation. Purification of saturated hydrocarbons. 4,108,916, Cl. 260-676.00R.

Measurex Corporation: *See*—
Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, 4,107,847, Cl. 33-147.00L.

Mechanex Corporation, The: *See*—
Lang, James R., 4,107,999, Cl. 73-326.000.
Lang, James R., 4,108,201, Cl. 137-393.000.

Medovar, Boris Izrailevich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Meeker, Greg W.: *See*—
Sloan, James L.; and Meeker, Greg W., 4,107,817, Cl. 16-20.000.

Mefina S.A.: *See*—
Fresard, Marcel, 4,108,092, Cl. 112-158.00R.

Mego Corp.: *See*—
Abrams, D. David, 4,107,869, Cl. 46-21.000.

Mehan, Richard L.; and Morelock, Charles R., to General Electric Company. Coated silicon-based ceramic composites and method for making same. 4,109,050, Cl. 428-332.000.

Meienhofer, Johannes Arnold, to Hoffmann-La Roche Inc. Solid phase synthesis with base N alpha-protecting group cleavage. 4,108,846, Cl. 260-112.50R.

Melcher, Conway H.: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,108,080, Cl. 105-199.0CB.

Melton, Keith Nelson; and Sebalj, Renata, to BBC Brown, Boveri & Company Limited. Contact arrangement for an electric arc-electrode consisting of graphite and a method for the manufacture thereof. 4,109,125, Cl. 200-268.000.

Mendrala, James A.; and Peterson, Harold L., to Sonex International Corp. Video traveling matte system. 4,109,278, Cl. 358-22.000.

Mennen, Frederick C., to U.S. Packaging Corp. Paper booklet for presumptive diagnosis of Neisseria Gonorrhoeae in the male. 4,108,729, Cl. 195-127.000.

Merchants National Bank of Allentown, executor: *See*—
Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.

Merck & Co., Inc.: *See*—
Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., 4,108,987, Cl. 424-177.000.

Merkel, Russell D., to Caterpillar Tractor Co. Cutting edge assembly for earthworking devices. 4,108,250, Cl. 172-719.000.

Merkl, George G. Process for the removal of SO_2 from a stack gas, absorptive medium for use in process and process for preparing the absorptive medium. 4,108,969, Cl. 423-560.000.

Merriam, Arthur T., to United States of America, Army. Fan mesh disrupter. 4,108,191, Cl. 135-2.000.

Merrick, James Walter: *See*—
Chapin, Leonard Lee; and Merrick, James Walter, 4,108,127, Cl. 123-124.00R.

Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, to Hitachi, Ltd. Variable thresholding circuit for converting an analog signal to a binary signal. 4,109,211, Cl. 328-116.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Kabilka, Otto; and Schulz, Thilo, 4,108,329, Cl. 220-453.000.

Met-Pro Systems, Inc.: *See*—
Burden, Roy B., Jr., 4,108,088, Cl. 110-246.000.

Metal Box Limited: *See*—
Fidler, Fred; and Holt, Joseph C., 4,108,099, Cl. 113-120.00A.

Metallgesellschaft Aktiengesellschaft: *See*—
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.

Mey, William, to Eastman Kodak Company. Multi-active photoconductive element with an aggregate and inorganic photoconductor. 4,108,657, Cl. 96-1.600.

- Meyer, Paul A.: *See—*
  - Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., 4,108,165, Cl. 128-2.00V.
- Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., to Reliance Electric Company. Automatic fruit analyzer. 4,109,314, Cl. 364-552.000.
- Michael, Harald Richard, to Electrolux GmbH. Method for sewage removal from multi-household connections. 4,108,192, Cl. 137-1.000.
- Michel, Robert. Method for manufacture of phosphoric acid from phosphate rock. 4,108,957, Cl. 423-3.000.
- Michelet, Jacques: *See—*
  - Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.
- Micro Electronics, Inc.: *See—*
  - Perrino, Joseph A., 4,108,028, Cl. 81-9.50B.
- Microdot Inc.: *See—*
  - Lincoln, Thomas Christopher, 4,108,525, Cl. 339-49.00R.
- Miedema, Hotze: *See—*
  - Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, 4,109,212, Cl. 328-163.000.
- Miessen, Ralf: *See—*
  - Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
- Mifsud, Joseph F., to Exxon Production Research Company. Hydraulic stabilization system to position and isolate a seismic vibrator. 4,108,270, Cl. 181-114.000.
- Mikami, Junji: *See—*
  - Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.
- Miles Laboratories, Inc.: *See—*
  - Buckler, Robert Thomas; and Kurchacova, Elva, 4,109,001, Cl. 424-269.000.
  - Creinin, Howard Lee; and Shemer, Michael, 4,108,847, Cl. 260-112.00G.
  - Stiso, Sisto Nicholas; and Sutula, Chester L., 4,108,727, Cl. 195-103.50R.
  - Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.
- Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., to United States of America, Army. Method of oxidative degradation of phosphorous esters. 4,108,746, Cl. 204-158.00R.
- Millard, Joe K.; and Cornish, Eldon C., to Hewlett-Packard Company. Third channel oscilloscope display for trigger signal. 4,109,183, Cl. 315-392.000.
- Miller, Harold N.: *See—*
  - Rossi, Albert; and Miller, Harold N., 4,108,612, Cl. 44-62.000.
- Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., to Sargent & Greenleaf, Inc. Padlock having knuckle type anti-wedge-attack structure. 4,107,965, Cl. 70-52.000.
- Miller, Kenneth H.; and Kropiwnicki, Tadek M., to Carrier Corporation. Suspension system for motor-compressor unit. 4,108,581, Cl. 417-363.000.
- Miller, Laird F.; and Fleming, Robert W., to Richardson-Merrell Inc. Anthracene derivatives. 4,108,896, Cl. 260-570.50C.
- Miller, Lowell Donald: *See—*
  - Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.
- Miller, Norman Richards, to Bell Telephone Laboratories, Incorporated. Digital feedback control utilizing accumulated reference count to regulate voltage output of switching regulator. 4,109,194, Cl. 323-17.000.
- Miller, Robert Eric; and Jackson, Stanley Bishop, to Universal Fluid Heads (Aust.) Pty. Limited. Clamp for tripod device. 4,108,412, Cl. 248-181.000.
- Milliken Research Corporatioo: *See—*
  - Froehlich, Helmut H., 4,108,800, Cl. 252-541.000.
  - Gregory, Wallace D.; and Moore, James R., 4,108,708, Cl. 156-441.000.
- Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, to Nissan Motor Company, Limited. Method of and apparatus for controlling air/fuel ratio in internal combustion engine. 4,107,920, Cl. 60-276.000.
- Minami, Hidehiro; and Waku, Makio. Closed loop mixture control system using a two-barrel carburetor. 4,108,121, Cl. 123-119.0EC.
- Minck, Robert W., to Ford Motor Company. Method and apparatus for separating a metal from a salt thereof. 4,108,743, Cl. 204-64.00R.
- Minden, Henry Thomas; and Premo, Richard W., to Sperry Rand Corporation. High efficiency fuser roll assembly for xerographic material. 4,109,135, Cl. 219-216.000.
- Minemura, Norihiro: *See—*
  - Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
- Minichiello, Thomas. Spring type exercise device for breast measnrement development. 4,108,429, Cl. 272-136.000.
- Mining Equipment Division, FMC Corporation: *See—*
  - Woodford, Clarence H., II, 4,108,253, Cl. 173-23.000.
- Minix, Helen, administratrix: *See—*
  - Minix, James Warren, deceased; Minix, Richard W., administrator; and Minix, Helen, administratrix, 4,108,346, Cl. 228-49.000.
- Minix, James Warren, deceased; by Minix, Richard W., administrator; and by Minix, Helen, administratrix. Alignment clamp. 4,108,346, Cl. 228-49.000.
- Minix, Richard W., administrator: *See—*
  - Minix, James Warren, deceased; Minix, Richard W., administrator; and Minix, Helen, administratrix, 4,108,346, Cl. 228-49.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Anderson, Raymond H.; and Vanderwerf, Dennis F., 4,108,540, Cl. 350-211.000.
  - Gutman, Gustav; and Goettert, Edward, 4,108,665, Cl. 96-114.100.
  - Patterson, Richard A., 4,108,330, Cl. 220-260.000.
- Minogue, Robert Willis, to Federal Signal Corporation. Sign mounting fastener. 4,108,560, Cl. 403-33.000.
- Minoura, Kazuo, to Canon Kabushiki Kaisha. Light beam scanning device. 4,108,532, Cl. 350-6.600.
- Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, to Asahi Denka Kogyo K.K. Hard butter. 4,108,879, Cl. 260-405.600.
- Mita Industrial Company Ltd.: *See—*
  - Takayama, Hiroshi; and Aizawa, Tatsuo, 4,108,786, Cl. 252-62.10P.
- Mitani, Toshihiko, to Nippon Electric Company, Ltd. Correlative converter between a 2^n-ary code sequence and a 2^{n+1}-phase carrier pulse sequence. 4,109,101, Cl. 178-67.000.
- Mitchell, Alec; Goldsmith, James R.; and Gray, J. Malcolm, to Molycorp, Inc. Preparation of rare earth and other metal alloys containing aluminum and silicon. 4,108,645, Cl. 75-135.000.
- Mitchell, Robert Dennis. Zirconium layer for bonding diamond compact to cemented carbide backing. 4,108,614, Cl. 51-295.000.
- Mitsubishi Chemical Industries Limited: *See—*
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tobru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Satoh, Tsuyoshi; and Tachino, Kenzo, 4,108,282, Cl. 187-29.00R.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Hayase, Masao; and Araki, Kazunori, 4,108,300, Cl. 198-479.000.
  - Kubo, Masayoshi; and Katayama, Hideaki, 4,108,776, Cl. 210-224.000.
  - Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, 4,108,959, Cl. 423-240.000.
- Mitsubishi Rayon Co., Ltd.: *See—*
  - Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.
- Mitsui Aluminum Co., Ltd.: *See—*
  - Tsumura, Yoshishige, 4,108,741, Cl. 204-67.000.
- Mitsui Mining & Smelting Co., Ltd.: *See—*
  - Eiraku, Kunihiro, 4,108,541, Cl. 350-289.000.
- Mitsui, Murao; Yokogawa, Kiyoshi; and Fukuyama, Seiji, to Agency of Industrial Science & Technology. Vessel for atmosphere for use with material testing device. 4,107,982, Cl. 73-95.000.
- Mitsui Toatsn Chemicals, Incorporated: *See—*
  - Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.
- Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, to Sharp Kabushiki Kaisha. Driving mechanism for travelling original carrier in an electrophotographic copying machine. 4,108,544, Cl. 355-8.000.
- Miura, Norio: *See—*
  - Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
- Miya, Bunji: *See—*
  - Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
- Miyamoto, Koichi: *See—*
  - Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.
- Miyatake, Takafumi: *See—*
  - Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.
- Mlynek, Daniel: *See—*
  - Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, 4,109,210, Cl. 328-61.000.
- Mobil Oil Corporation: *See—*
  - Brown, George L.; and Chen, Albert C., 4,108,816, Cl. 260-29.40R.
  - Chen, Nai Yuen; and Yan, Tsoung-Yuan, 4,108,730, Cl. 201-2.500.
  - Rollmann, Louis Deane; and Valyocsik, Ernest William, 4,108,881, Cl. 260-448.00C.
  - Schoennagel, Hans-Juergen; and Zahner, John C., 4,108,758, Cl. 208-8.000.
- Modular Conceptual Systems, Inc.: *See—*
  - Carter, William Edward; and Cosentino, Italo Americo (said William E. Carter assors. to), 4,107,795, Cl. 4-313.000.
- Moehrle, Doris B. Reusable tampon. 4,108,180, Cl. 128-285.000.
- Mohler, Johann Georg. Fire sprinkler head. 4,108,247, Cl. 169-38.000.
- Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, to Hoechst Aktiengesellschaft. Hydroxyhexyl-alkylxanthines and pharmaceutical compositions containing hydroxyhexyl-alkylxanthines. 4,108,995, Cl. 424-253.000.
- Moilliet, John Stewart, to Imperial Chemical Industries Limited. Anaesthetic composition. 4,109,016, Cl. 424-342.000.
- Molaug, Ole, to Trallfa Nils Underhaug A/S. Flexible robot arm. 4,107,948, Cl. 64-2.00P.
- Molaug, Ole: *See—*
  - Inoue, Kiyoshi; and Molaug, Ole, 4,108,357, Cl. 235-119.000.
- Moller, Richard W., to Hydreclaim Corporation. Apparatus for feeding scrap and base plastics material to an extruder. 4,108,334, Cl. 222-136.000.

- Moller, William Michael: *See—*
  - Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, 4,107,835, Cl. 29-590.000.
- Molleron, Claude Auguste, to Societe Anonyme de Telecommunications. Method and apparatus for detecting the presence of signal components of predetermined frequency in multifrequency PCM signal. 4,109,109, Cl. 179-15.0BY.
- Molycorp, Inc.: *See—*
  - Mitchell, Alec; Goldsmith, James R.; and Gray, J. Malcolm, 4,108,645, Cl. 75-135.000.
- Monarch Marking Systems, Inc.: *See—*
  - Dobras, Bruce W., 4,108,368, Cl. 235-463.000.
- Moneghan, Edward, to Pennwalt Corporation. Method for forming solid friction material structures. 4,108,935, Cl. 264-68.000.
- Monitron Industries, Inc.: *See—*
  - Genest, Leonard J.; and Feagin, Frederick E., 4,108,366, Cl. 235-450.000.
- Monroe Auto Equipment Company: *See—*
  - vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,107,814, Cl. 15-250.420.
- Monsanto Company: *See—*
  - Birum, Gail H., 4,108,949, Cl. 260-932.000.
  - Bollinger, Frederic G.; and D'Amico, John J., 4,108,627, Cl. 71-91.000.
  - Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,108,632, Cl. 71-115.000.
  - Christ, Thomas; and Langguth, Robert P., 4,108,801, Cl. 252-544.000.
  - Deets, Gary L., 4,109,067, Cl. 526-4.000.
  - Lee, Cheng H., 4,108,765, Cl. 210-23.00R.
  - Lee, Yoon C., 4,108,943, Cl. 260-878.00R.
  - Shuff, Thomas J.; and Sims, Robert W., 4,107,993, Cl. 73-290.00R.
- Montedison S.p.A.: *See—*
  - Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.
- Monthony, James F.: *See—*
  - Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., 4,108,974, Cl. 424-1.000.
- Moody, Harry John: *See—*
  - Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, 4,109,202, Cl. 325-3.000.
- Moog, Robert A.; and Cox, Roger Flavius, to Norlin Music, Inc. Phase shifting sound effects circuit. 4,108,041, Cl. 84-1.240.
- Mookherjee, Braja Dulal: *See—*
  - Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.
- Moore Business Forms, Inc.: *See—*
  - Fredrickson, Donald M., 4,109,047, Cl. 428-307.000.
- Moore, Charles E.: *See—*
  - Gort, Alfred Frans; and Moore, Charles E., 4,108,539, Cl. 350-201.000.
- Moore, George B., Jr. Carbon dioxide absorption canister for use with analgesia equipment. 4,108,172, Cl. 128-188.000.
- Moore, James R.: *See—*
  - Gregory, Wallace D.; and Moore, James R., 4,108,708, Cl. 156-441.000.
- Moore, Jimmie L.: *See—*
  - McCarthy, James R.; and Moore, Jimmie L., 4,108,853, Cl. 544-245.000.
- Moore, Richard G., III, to Continental Oil Company. Sliding stabilizer assembly. 4,108,256, Cl. 175-61.000.
- Moore, Robert J., to Weed Eater, Inc. Lawn mower with mechanical line feed. 4,107,901, Cl. 56-17.500.
- Moore, William Percy. Process for improved ruminant feed supplements. 4,109,019, Cl. 426-69.000.
- Moorey, Ernest James, to M. L. Engineering (Plymouth) Limited. Frequency modulation signalling system employing an electrical filter device. 4,109,205, Cl. 325-45.000.
- Morabito, Joseph Michael: *See—*
  - Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.
- Morane, Bruno P.: *See—*
  - Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.
- Moraw, Roland, to Hoechst Aktiengesellschaft. Apparatus for lifting an electrostatically charged flexible recording material. 4,108,550, Cl. 355-133.000.
- Morelock, Charles R.: *See—*
  - Mehan, Richard L.; and Morelock, Charles R., 4,109,050, Cl. 428-332.000.
- Morganroth, Shila. Clamp devices for use in selectively altering hair color. 4,108,184, Cl. 132-46.00R.
- Mori, Etsuo: *See—*
  - Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
- Morishita, Toshio: *See—*
  - Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
- Moriya, Koji; and Furuoya, Itsuo, to Takeda Chemical Industries, Ltd. Production of maleic anhydride. 4,108,874, Cl. 260-346.750.
- Morizur, Gabrielle: *See—*
  - Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle, 4,108,534, Cl. 350-96.210.
- Morlock, Gerhard: *See—*
  - Amann, Herbert; and Morlock, Gerhard, 4,108,838, Cl. 528-249.000.
- Morokawa, Shigeru: *See—*
  - Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, 4,107,915, Cl. 58-23.00R.
- Morrell, Albert Maxwell: *See—*
  - Godfrey, Richard Hugh; and Morrell, Albert Maxwell, 4,109,177, Cl. 313-402.000.
- Morris, Charles F. Cylinder ridge grinder. 4,107,884, Cl. 51-245.000.
- Morris, Earl F.: *See—*
  - Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,108,930, Cl. 264-32.000.
- Morris, Earl L., to Acorn Engineering Co. Waste drain connection for plumbing fixtures. 4,108,477, Cl. 285-58.000.
- Morrison, Howard J.: *See—*
  - Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., 4,107,872, Cl. 46-103.000.
- Morton, Douglas Ross, Jr., to Upjohn Company, The. PGD$_2$ analogs. 4,108,878, Cl. 260-408.000.
- Morton-Norwich Products, Inc.: *See—*
  - Wright, George C.; and Goldenberg, Marvin M., 4,108,862, Cl. 260-307.00C.
  - Wright, George C.; and Goldenberg, Marvin M., 4,108,872, Cl. 260-345.200.
  - Wright, George C.; and Goldenberg, Marvin M., 4,108,873, Cl. 260-345.200.
- Moskalenko, Galina Evseevna: *See—*
  - Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
- Moskowitz, David, to Ford Motor Company. Cemented titanium carbide tool for intermittent cutting application. 4,108,649, Cl. 75-203.000.
- Motoki, Goro: *See—*
  - Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,109,079, Cl. 536-26.000.
- Motorola, Inc.: *See—*
  - Davis, William F., 4,109,234, Cl. 340-52.00B.
  - Main, W. Eric, 4,109,214, Cl. 330-254.000.
- Mountain, Donald C. Hermetically sealed four-way valve. 4,108,206, Cl. 137-596.170.
- Mowli, John C.: *See—*
  - Bala, Harry; and Mowli, John C., 4,108,712, Cl. 156-498.000.
- Mueller, Bernd: *See—*
  - Vachenauer, Erwin; and Mueller, Bernd, 4,109,250, Cl. 343-112.00R.
- Mueller, Klaus Karl; and Loughlin, James Osborn E., to Cotton Incorporated. Process for imparting pucker and color effects to fabrics. 4,108,597, Cl. 8-115.000.
- Mueller, Otto, Jr., to Massey-Ferguson Inc. Draft and position control linkage with depth limit for a tractor. 4,108,248, Cl. 172-9.000.
- Mueller, Ruediger: *See—*
  - Herbst, Heiner; and Mueller, Ruediger, 4,109,272, Cl. 357-35.000.
- Muench, Elmer W.: *See—*
  - Long, Everett James; and Muench, Elmer W., 4,108,528, Cl. 339-117.00P.
- Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., to Indiana University Foundation. Dentifrice preparations comprising aluminum and a compatible abrasive. 4,108,979, Cl. 424-49.000.
- Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., to Indiana University Foundation. Alkaline oral compositions comprising aluminum and a carboxylic acid. 4,108,981, Cl. 424-55.000.
- Muhlhofer, Ernst: *See—*
  - Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, 4,108,964, Cl. 423-336.000.
- Mukai, Kosabro: *See—*
  - Nakagawa, Yasuhiko; and Mukai, Kosabro, 4,108,124, Cl. 123-122.0AC.
- Mulberry Metal Products, Inc.: *See—*
  - Kling, David A.; and Bell, Charles W., 4,109,095, Cl. 174-67.000.
- Mullins, Wayne L. Interlocking cementitious building blocks. 4,107,894, Cl. 52-593.000.
- Murai, Hiromu: *See—*
  - Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
- Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, to Yamanouchi Pharmaceutical Co., Ltd. 2-(Indenyloxymethyl) morpholine derivatives. 4,109,088, Cl. 544-174.000.
- Murakami, Osamu, to Kett Electric Laboratory. Self-propelled pipe inspecting apparatus. 4,108,004, Cl. 73-432.00R.
- Muranishi, Kenichi, to Ricoh Watch Co., Ltd. Device of preventing reverse transmission of motion in a gear train. 4,108,016, Cl. 74-462.000.
- Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, to Fujitsu Limited. Driving system and method for shifting a discharge spot in a plasma display panel. 4,109,181, Cl. 315-169.0TV.

- Murata Kikai Kabushiki Kaisha: *See*—
  - Yamana, Makoto; and Kubota, Nobunori, 4,107,911, Cl. 57-56.000.
- Murayama, Masao: *See*—
  - Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
- Murillo, Carlos P.: *See*—
  - Gonsalves, Mathew W.; and Murillo, Carlos P., 4,107,889, Cl. 52-259.000.
- Murray, Gregory J.: *See*—
  - Taylor, Bruce W.; and Murray, Gregory J., 4,108,010, Cl. 74-100.00R.
- Murrmann, Helmuth: *See*—
  - Glasl, Andreas; and Murrmann, Helmuth, 4,109,273, Cl. 357-35.000.
- Musgrave, Daniel Dennis. Magazine engagement means. 4,107,863, Cl. 42-50.000.
- Musgrave, Daniel Dennis. Explosive obstacle wire. 4,108,070, Cl. 102-8.000.
- N. Schlumberger & Cie: *See*—
  - Herubel, Jean Frederic, 4,107,821, Cl. 19-127.000.
- Nabeshima, Shigeyasu: *See*—
  - Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,108,723, Cl. 195-2.000.
- Nabucet, Georges Joseph; and Champ, Michel Andre. Cutting device having a shaped charge in a cavity of revolution. 4,108,071, Cl. 102-24.0HC.
- Nafziger, Joel L. Flush tank system. 4,107,796, Cl. 4-353.000.
- Nagase, Toshiro; and Hatakeyama, Susumu, to Tokico Ltd. Device for adjusting length of gas spring. 4,108,416, Cl. 248-400.000.
- Nagase, Tsuneyuki: *See*—
  - Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki. 4,108,723, Cl. 195-2.000.
- Nagata, Kenji: *See*—
  - Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, 4,108,912, Cl. 260-667.000.
- Nakabe, Sanai, to Sumitomo Metal Mining Company Limited. Process for separating nickel, cobalt and copper. 4,108,638, Cl. 75-63.000.
- Nakada, Masahiko: *See*—
  - Sanada, Masakatsu; and Nakada, Masahiko, 4,108,126, Cl. 123-122.00E.
- Nakagawa, Yasuhiko; and Mukai, Kosabro, to Nissan Motor Company, Ltd. Manifold system. 4,108,124, Cl. 123-122.0AC.
- Nakama, Fumio: *See*—
  - Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.
- Nakamura, Masayuki: *See*—
  - Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
- Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, to Sumitomo Durez Company, Ltd. Method for accelerated curing of phenolic resin adhesives. 4,109,057, Cl. 428-528.000.
- Nakamura, Norihiko: *See*—
  - Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.
- Nakamura, Teruya: *See*—
  - Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
- Nakaniwa, Mikio: *See*—
  - Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
- Nakano, Yuji: *See*—
  - Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, 4,109,292, Cl. 361-321.000.
- Nakao, Kiyoharu, to Kabushiki Kaisha Komatsu Seisakusho. No-man control system for working vehicles. 4,108,269, Cl. 180-98.000.
- Nakasa, Hiroyasu: *See*—
  - Kanagawa, Tadashi; and Nakasa, Hiroyasu, 4,107,981, Cl. 73-88.00E.
- Nakatsuka, Shinichi: *See*—
  - Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, 4,108,861, Cl. 260-306.70C.
- Nalivaiko, Valentin Iosifovich: *See*—
  - Khvalovsky, Vladimir Vasilievich; Natarovsky, Sergei Nikolaevich; Nalivaiko, Valentin Iosifovich; and Vorontsov, Vladimir Lvovich, 4,109,304, Cl. 362-259.000.
- Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, to Takeda Chemical Industries, Ltd. Method for preparing antibiotic P-2563 using *Pseudomonas fluorescens*. 4,108,724, Cl. 195-96.000.
- Nara, Takashi: *See*—
  - Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.
- Narayan, Thirumurti; and Cenker, Moses, to BASF Wyandotte Corporation. Novel oxyalkylated polyol prepolymers, flame retardant interpolymers prepared therefrom, and processes for the preparation thereof. 4,108,808, Cl. 521-181.000.
- Narayan, Thirumurti; and Cenker, Moses, to BASF Wyandotte Corporation. Novel prepolymers, flame retardant interpolymers prepared therefrom, and processes for the preparation thereof. 4,108,809, Cl. 521-136.000.
- Narey, Edward F.: *See*—
  - England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., 4,109,310, Cl. 364-200.000.
- Nash, Bernard J., Jr. Portable tack cleaning machine. 4,107,807, Cl. 15-21.00C.
- Nash, Richard B.; *See*—
  - Appleby, Paul E.; Houck, Stanley J.; and Nash, Richard B., 4,108,707, Cl. 156-397.000.
- Naslund, Rolf Paul: *See*—
  - Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, 4,108,240, Cl. 165-125.000.
- Natarovsky, Sergei Nikolaevich: *See*—
  - Khvalovsky, Vladimir Vasilievich; Natarovsky, Sergei Nikolaevich; Nalivaiko, Valentin Iosifovich; and Vorontsov, Vladimir Lvovich, 4,109,304, Cl. 362-259.000.
- National Controls, Inc.: *See*—
  - Sommer, Thomas R., 4,107,985, Cl. 73-141.00A.
- National Distillers and Chemical Corporation: *See*—
  - Pritchett, Ervin G., 4,108,948, Cl. 260-897.00B.
- National Research Development Corporation: *See*—
  - Coxon, Brian; and Leventhall, Hubert Geoffrey, 4,109,108, Cl. 179-1.00P.
  - Parker, Robert Sydney Richard, 4,108,169, Cl. 128-89.00R.
  - Robertson, Penrose David; and Coulouris, George Franklin, 4,109,282, Cl. 358-127.000.
- National Semiconductor Corporation: *See*—
  - Hatch, John Alva, 4,109,269, Cl. 357-19.000.
- Naus, Glen L. Locomotive cab seat. 4,108,493, Cl. 297-337.000.
- NCR Corporation: *See*—
  - Berenson, Sidney G., 4,109,288, Cl. 361-58.000.
  - Rostek, Paul M.; and Baeyertz, John F., 4,109,295, Cl. 361-401.000.
  - Rostek, Paul M.; and Baeyertz, John F., 4,109,296, Cl. 361-401.000.
- NDM Corporation: *See*—
  - Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., 4,109,223, Cl. 336-84.00C.
- Neiman, Michel, to Societe de Diffusion Neiman. Anti-theft plug for screw-threaded base with a tightening torque limiting device. 4,107,960, Cl. 248-165.000.
- Nelson, David H., to Van Dyke, Homer; Dorian, Mark; Van Dyke, Dave; and Lerg, George, part interest to each. Solar energy collection system. 4,108,154, Cl. 126-270.000.
- Nelson Industries, Inc.: *See*—
  - Hall, Leonard F.; and Noreen, Robert A., 4,108,276, Cl. 181-256.000.
- Nelson, Marie C.: *See*—
  - Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., 4,108,748, Cl. 204-159.120.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-ω-phenoxy-PGA$_1$ or 9-deoxy-9,10-didehydro-PGD$_1$ compounds. 4,108,900, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. Composition and process 2-decarboxy-2-hydroxy-methyl-5-oxa-ω-phenyl-PGE$_1$compounds. 4,108,901, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-5-oxa-ω-phenyl-PGA$_1$ or 9-deoxy-9,10-didehydro-PGD$_1$ compounds. 4,108,902, Cl. 260-590.00C.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-ω-phenyl-PGD$_1$ compounds. 4,108,903, Cl. 260-590.00C.
- Nemoto, Shigeru: *See*—
  - Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, 4,109,057, Cl. 428-528.000.
- Netsvetaev, Gennady Viktorovich: *See*—
  - Kharazov, Konkordy Innokentievich; Netsvetaev, Gennady Viktorovich; and Trofimov, Valery Ivanovich, 4,109,219, Cl. 335-78.000.
- Neubeck, Kurt; Schwing, Karl-Heinz; and Klein, Kurt, to Alexander Wiegand GmbH u. Co., Armaturen- u. Manometeneabrik. Manometers with measurement range multiplication. 4,108,007, Cl. 73-732.000.
- Neuwirth, Frank J.: *See*—
  - McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., 4,108,304, Cl. 198-781.000.
- Neuzil, Richard W.: *See*—
  - Rosback, Donald H.; and Neuzil, Richard W., 4,108,915, Cl. 260-674.0SA.
- Newbold, Roger A.: *See*—
  - DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., 4,108,437, Cl. 273-86.00D.
- Newland, Robert Andrew; and Leeke, Wallace Richard. Anchoring device. 4,107,806, Cl. 9-310.00E.
- Newton, Wayne McCall: *See*—
  - Dembiak, Matthew Raymond; and Newton, Wayne McCall, 4,109,099, Cl. 174-107.000.
- Nicolas, Louis: *See*—
  - Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.
- Niedballa, Ulrich: *See*—
  - Vorbruggen, Helmut; and Niedballa, Ulrich, 4,109,078, Cl. 536-26.000.
- Niemaszyk, Casimer; and Rothenberg, Peter, to Bendix Corporation, The. Portable circuit tester. 4,108,358, Cl. 235-302.000.
- Niese, Leo J.: *See*—
  - Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., 4,109,314, Cl. 364-552.000.
- Niigata, Kunihiro: *See*—
  - Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

- Niiya, Toshio: *See*—
  - Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.
- Nikki-Universal Co., Ltd.: *See*—
  - Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,108,971, Cl. 423-428.000.
- Ninomiya, Michikazu: *See*—
  - Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.
- Nippon Ceon Co., Ltd.: *See*—
  - Kaneko, Noriaki; and Joh, Yasushi, 4,108,764, Cl. 210-22.00A.
- Nippon Coinco Co., Ltd.: *See*—
  - Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.
- Nippon Electric Company, Ltd.: *See*—
  - Iijima, Hiroshi, 4,109,161, Cl. 307-87.000.
  - Mitani, Toshihiko, 4,109,101, Cl. 178-67.000.
  - Yoshida, Yasuharu; and Tagashira, Yoshimi, 4,109,102, Cl. 178-69.100.
- Nippon Gakki Seizo Kabushiki Kaisha: *See*—
  - Aoki, Eiichiro, 4,108,038, Cl. 84-1.030.
  - Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,108,040, Cl. 84-1.190.
  - Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.
- Nippon Hoso Kyokai: *See*—
  - Hirose, Ryusho; and Wakui, Kotaro, 4,109,279, Cl. 358-55.000.
- Nippon Kokan Kabushiki Kaisha: *See*—
  - Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.
- Nippon Oil Company Ltd.: *See*—
  - Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, 4,108,682, Cl. 134-25.00R.
- Nippon Shinyaku Co., Ltd.: *See*—
  - Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
- Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
  - Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.
- Nippon Steel Corporation: *See*—
  - Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.
- Nippon Tungsten Co., Ltd.: *See*—
  - Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.
- Nishina, Shuho: *See*—
  - Kondo, Yutaka; and Nishina, Shuho, 4,108,471, Cl. 280-747.000.
- Nishioka, Tatsujiro: *See*—
  - Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.
- Nissan Motor Company, Limited: *See*—
  - Hayashi, Yoshimasa, 4,108,132, Cl. 123-188.00S.
  - Iizuka, Haruhiko, 4,107,921, Cl. 60-288.000.
  - Kosaka, Katuaki; and Ueno, Zene, 4,108,114, Cl. 123-3.000.
  - Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, 4,107,920, Cl. 60-276.000.
  - Nakagawa, Yasuhiko; and Mukai, Kosabro, 4,108,124, Cl. 123-122.0AC.
- Nisshin Steel Company, Limited: *See*—
  - Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.
- Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Accelerator pump system. 4,108,951, Cl. 261-34.00B.
- Noda, Shigeo: *See*—
  - Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, 4,109,188, Cl. 318-602.000.
- Nogaj, Alfred: *See*—
  - Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, 4,108,845, Cl. 526-240.000.
- Nohara, Shigezo, to Toyo Seikan Kaisha, Ltd. Laminated packing materials. 4,109,037, Cl. 428-35.000.
- Nomura, Yasushi: *See*—
  - Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, 4,107,915, Cl. 58-23.00R.
- Noreen, Robert A.: *See*—
  - Hall, Leonard F.; and Noreen, Robert A., 4,108,276, Cl. 181-256.000.
- Norlin Music, Inc.: *See*—
  - Moog, Robert A.; and Cox, Roger Flavius, 4,108,041, Cl. 84-1.240.
- Norman Slater, Inc.: *See*—
  - Slater, Norman S., 4,108,316, Cl. 211-199.000.
- Norris Industries: *See*—
  - Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, 4,108,482, Cl. 292-165.000.
- Norris, Orlin R., to JeNor. Gauge glass protector. 4,108,000, Cl. 73-328.000.
- North American Philips Corporation: *See*—
  - Vink, Richard C., 4,108,053, Cl. 99-306.000.
- Northern Telecom Limited: *See*—
  - Hillman, Garth Decker, 4,109,146, Cl. 250-227.000.
- Nozaki, Yoshihisa: *See*—
  - Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
- Numata, Tatsuo, to Pioneer Electronic Corporation. Signal strength meter drive circuit. 4,109,206, Cl. 325-319.000.
- NUTRO Patentverwertungs- und Maschinenhandels GmbH: *See*—
  - Grocke, Diethelm W. K.; and Jager, Wilfried, 4,107,905, Cl. 53-3.000.
- Nuttall, Herbert E., Jr., to Occidental Petroleum Corporation. Heating carbonaceous particulate material. 4,108,732, Cl. 201-22.000.
- Nyman, Roland John; and van der Walt, Johann George. Breathing apparatus. 4,108,171, Cl. 128-142.200.
- Nyswander, Reuben E., to United States of America, Navy. Microwave generator. 4,109,216, Cl. 331-87.000.
- O & K Orenstein & Koppel Aktiengesellschaft: *See*—
  - Rathje, Uwe; and Schumacher, Hans Jurgen, 4,108,251, Cl. 172-789.000.
- Obayashi, Akiro: *See*—
  - Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
- O'Berry, William A.: *See*—
  - Lang, Milton R., Jr.; and O'Berry, William A., 4,109,197, Cl. 324-78.00F.
- Occidental Petroleum Corporation: *See*—
  - Nuttall, Herbert E., Jr., 4,108,732, Cl. 201-22.000.
- Oce-van der Grinten N.V.: *See*—
  - Koeleman, Gerardus A. J.; and op de Laak, Johannes H. A., 4,108,658, Cl. 96-15.00D.
  - Peters, Martinus T. J., 4,108,653, Cl. 96-1.0SD.
  - Van Herten, Jozef Marie, 4,109,134, Cl. 219-216.000.
- Ochiai, Hidehiro: *See*—
  - Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.
- O'Connell, Robert M., to United States of America, Air Force. High piezoelectric coupling-temperature compensated berlinite substrate member for surface acoustic wave devices. 4,109,172, Cl. 310-313.000.
- O'Connell, Robert M., to United States of America, Air Force. High piezoelectric coupling, low diffraction loss, temperature compensated berlinite substrate members for surface acoustic wave devices. 4,109,173, Cl. 310-313.000.
- O'Connor, Michael Niall Desmond: *See*—
  - Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,108,883, Cl. 260-453.0RW.
  - Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,109,072, Cl. 526-258.000.
- Odawara, Kenji; and Takeuchi, Shoichi, to Japan Exlan Company Limited. Process for the melt-shaping of acrylonitrile polymers. 4,108,818, Cl. 260-29.6AQ.
- O'Doherty, George O. P., to Eli Lilly and Company. Ring-substituted N-(2,2-difluoroalkanoyl)-o-phenylenediamine compounds. 4,108,631, Cl. 71-103.000.
- Odom, Paul R.: *See*—
  - Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,108,932, Cl. 264-37.000.
- Oesterle, Albert: *See*—
  - John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, 4,108,018, Cl. 74-467.000.
- Offermanns, Heribert: *See*—
  - Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,875, Cl. 260-347.800.
  - Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,877, Cl. 260-347.800.
- Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, to Nippon Tungsten Co., Ltd. Method for producing a sintered body of high density. 4,108,652, Cl. 75-223.000.
- Ogawa, Shinsaku: *See*—
  - Seko, Maomi; Ogawa, Shinsaku; and Yoshida, Muneo, 4,108,742, Cl. 204-98.000.
- Ogden, Ralph. System of making molds for investment casting. 4,108,931, Cl. 264-37.000.
- Ogle, James A.; and Lee, James Y., to Burroughs Corporation. AC-powered display system with voltage limitation. 4,109,180, Cl. 315-169.0TV.
- Oguchi, Yutaka: *See*—
  - Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, 4,108,682, Cl. 134-25.00R.
- Ohkubo, Kazuo: *See*—
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
- Ohling, Robert S., to Acoolco Corporation. Freezing apparatus and method. 4,107,943, Cl. 62-320.000.
- Ohlinger, Manfred: *See*—
  - Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.
- Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser computer output microfilmer. 4,109,256, Cl. 354-4.000.
- Ohnmacht, Helmut, to Fritz Eichenauer, Firma. Fan-heater appliance with adjustable fan speed. 4,109,138, Cl. 219-364.000.

- Ohnuma, Kiyoshi: *See—*
  - Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,022, Cl. 74-645.000.
  - Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,289, Cl. 192-3.300.
- Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, to Ricoh Co., Ltd. Photoconductive member having a charge generating pigment and 2,4,7-trinitrothioxanthone as charge transport material. 4,108,656, Cl. 96-1.50R.
- Ohta, Tadao, to Isuzu Motors Limited. Combustion chamber and nozzle arrangement for direct fuel injection type diesel engine. 4,108,116, Cl. 123-32.00A.
- Ohuchi, Teruo: *See—*
  - Chikashige, Kiyoshi; and Ohuchi, Teruo, 4,108,162, Cl. 128-2.00B.
- Oishi, Susumu; and Iwatsuki, Masahiro, to Tokai-Rika-Denki-Seisakusho. Seatbelt retractor for motor vehicles. 4,108,394, Cl. 242-107.40A.
- Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, to Sumitomo Metal Industries, Ltd. Hot strip coiling mandrel. 4,107,969, Cl. 72-148.000.
- Okada Seimen Yugen Kaisha: *See—*
  - Okada, Tokio, 4,108,625, Cl. 71-9.000.
- Okada, Tokio, to Okada Seimen Yugen Kaisha. Method of, and apparatus for producing fertilizer by utilizing earthworms. 4,108,625, Cl. 71-9.000.
- Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Shosuke Okamoto. N^2-Arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,108,986, Cl. 424-177.000.
- Okamoto, Takio: *See—*
  - Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.
- Okazaki, Masaki: *See—*
  - Tanaka, Mitsugu; Okazaki, Masaki; Aono, Toshiaki; and Hirose, Takeshi, 4,108,663, Cl. 96-74.000.
- Oku, Takeshi, to Matsushita Electric Industrial Co., Ltd. Electric welder output control device. 4,109,130, Cl. 219-130.210.
- Okumura, Takatoshi: *See—*
  - Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.
- Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, to Canon Kabushiki Kaisha. Reflex camera with a built-in exposure metering apparatus. 4,109,257, Cl. 354-23.00R.
- Okutsu, Eiichi: *See—*
  - Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, 4,108,662, Cl. 96-66.500.
- Old, John Leslie, to Massey-Ferguson Services N.V. Implement support linkages. 4,108,463, Cl. 280-460.00A.
- Olffers, Theo: *See—*
  - Krieg, Martin; and Olffers, Theo, 4,108,769, Cl. 210-50.000.
- Olin Corporation: *See—*
  - Farmer, Douglas A., Jr.; and Wojtowicz, John A., 4,108,792, Cl. 252-187.00H.
  - Martin, R. Hugo; and Owens, William F., Jr., 4,108,151, Cl. 131-9.000.
- Olschewski, Armin: *See—*
  - Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
  - Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.
- Olshausen, Kai D., to Institutt for Atomenergi. Method and apparatus for gauging the radial spacing between fuel and surrounding cladding of a fuel rod for nuclear reactors. 4,108,719, Cl. 176-19.00R.
- Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, to Telefonaktiebolaget L M Ericsson. High voltage cable. 4,109,098, Cl. 174-106.0SC.
- Olympus Optical Company Ltd.: *See—*
  - Hashimoto, Akihiko, 4,109,265, Cl. 354-244.000.
  - Yonekubo, Ken, 4,108,794, Cl. 252-408.000.
- Omoto, Setsuo: *See—*
  - Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, 4,108,959, Cl. 423-240.000.
- Omura, Takayoshi: *See—*
  - Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.
- Onder, Kemal B.: *See—*
  - Chen, Augustin T.; and Onder, Kemal B., 4,108,843, Cl. 528-74.000.
- Ondetti, Miguel Angel, to E. R. Squibb & Sons, Inc. Thiopropanoylamino acid derivatives. 4,108,886, Cl. 260-455.00R.
- Onillon, Michel; Roche, Pierre; and Thenard, Jean, to Commissariat a l'Energie Atomique. Method and an automatic device for analyzing variations in the transparency of a sample. 4,109,159, Cl. 250-564.000.
- Onopchenko, Anatoli: *See—*
  - Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,108,788, Cl. 252-63.000.
- Ontario Limited: *See—*
  - Fleet, Bernard; and Das Gupta, Sankar, 4,108,754, Cl. 204-263.000.
  - Fleet, Bernard; and Das Gupta, Sankar, 4,108,755, Cl. 204-263.000.
- op de Laak, Johannes H. A.: *See—*
  - Koeleman, Gerardus A. J.; and op de Laak, Johannes H. A., 4,108,658, Cl. 96-15.00D.
- Orkin, Stanley S., to Kamatics Corporation. Bearing assembly. 4,108,505, Cl. 308-72.000.
- Orlanski, Isidoro. Sleeper adapter for a collapsible baby stroller. 4,108,468, Cl. 280-648.000.
- Orlowski, Jan Alexander: *See—*
  - Lee, Henry L., Jr.; and Orlowski, Jan Alexander, 4,107,845, Cl. 32-15.000.
- Oronzio de Nora Impianti Electtrochimici S.p.A.: *See—*
  - de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,108,756, Cl. 204-286.000.
- Orton, Dale W. Catheter insertion apparatus. 4,108,175, Cl. 128-214.400.
- Osborn, Norbert, to WRR Industries, Inc. Bearing lubricating system. 4,108,506, Cl. 308-187.000.
- Osgood, John H., to Crompton & Knowles Corporation. Control mechanism for gripper shuttles. 4,108,215, Cl. 139-438.000.
- Ostby, Lyle D.: *See—*
  - Johnstone, Richard; and Ostby, Lyle D., 4,109,309, Cl. 364-120.000.
- Otis Engineering Corporation: *See—*
  - Sizer, Phillip S., 4,108,257, Cl. 175-230.000.
- Otrhalek, Joseph V.; and Gomes, Gilbert Stephen, to IMC Chemical Group, Inc. Snow and ice control composition. 4,108,669, Cl. 106-13.000.
- Ottaviano, Gary W., to Ranpak Corporation. Cushioning dunnage product produced from cushioning dunnage mechanism. 4,109,040, Cl. 428-129.000.
- Owa, Kaoru: *See—*
  - Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, 4,109,188, Cl. 318-602.000.
- Owen, Edwin Lewis; and Marshall, David William, to Kennecott Copper Corporation. Fabrication of cathodes for electrodeposition. 4,109,028, Cl. 427-58.000.
- Owen-Illinois, Inc.: *See—*
  - Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,109,176, Cl. 313-220.000.
- Owens, Charles. Pull out-step. 4,108,458, Cl. 280-166.000.
- Owens-Illinois, Inc.: *See—*
  - Amberg, Stephen W., 4,108,347, Cl. 229-1.50B.
  - Hadl, Clyde F.; and Harmon, Shepard L., 4,108,705, Cl. 156-355.000.
  - Kontz, Robert F., 4,108,590, Cl. 425-466.000.
  - Lee, Soo-Il, 4,108,956, Cl. 264-329.000.
- Owens, William F., Jr.: *See—*
  - Martin, R. Hugo; and Owens, William F., Jr., 4,108,151, Cl. 131-9.000.
- Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, to Sumitomo Chemical Company, Limited. Process for producing an aqueous dispersion of vinyl acetate-ethylene copolymer including an epoxide compound. 4,108,819, Cl. 260-29.6NR.
- Ozaki, Kiyotaka: *See—*
  - Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
- Ozdemir, Faik S.; and Loper, Dall D., to Hughes Aircraft Company. High resolution electron beam microfabrication process for fabricating small geometry semiconductor devices. 4,109,029, Cl. 427-84.000.
- Ozeki, Hideyoshi: *See—*
  - Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.
- P.F.W. Beheer B.V.: *See—*
  - de Haan, Douwe Rienk; and Kettenes, Dirk Karel, 4,109,022, Cl. 426-538.000.
- Packaging Laminators, Inc.: *See—*
  - Johnson, Kenneth M., 4,107,861, Cl. 40-2.00R.
- Padilla, Dominick: *See—*
  - Hacker, Morris; and Padilla, Dominick, 4,109,252, Cl. 343-715.000.
- Page, Darrell, to Sargent Fletcher Company. Aircraft fuel tank construction. 4,108,328, Cl. 220-5.00A.
- Paitson, John Lloyd; and Hendley, Robert N., to Western Geophysical Co. of America. Rapid fire air gun. 4,108,272, Cl. 181-120.000.
- Palmer, Harold R. Digital dwell-tachometer with points resistance indication capability. 4,109,195, Cl. 324-15.000.
- Palosi, Eva: *See—*
  - Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.
- Palumbo, Luigi; Colletta, Angelo; and Giromella, Giampaolo, to Centro Sperimentale Metallurgico S.p.A. Coke production. 4,108,731, Cl. 201-8.000.
- Pan, Michael, to Hewlett-Packard Company. Wristwatch calculator with selectively scanned keyboard. 4,109,315, Cl. 364-705.000.
- Pankove, Jacques Isaac, to RCA Corporation. Amorphous silicon-amorphous silicon carbide photovoltaic device. 4,109,271, Cl. 357-30.000.
- Pantek, Stanley J. Multiple use canner. 4,108,220, Cl. 141-98.000.
- Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Propionimidate hydrohalides. 4,108,883, Cl. 260-453.0RW.
- Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Addition polymers of unsaturated imidazolines. 4,109,072, Cl. 526-258.000.
- Paolucci, Paride: *See—*
  - Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dougiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.
- Pap, Laszlo: *See—*
  - Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.
- Pappas, Charles, to United Merchants and Manufacturers, Inc. Method for coloring textile fabrics and fabrics produced therefrom. 4,108,595, Cl. 8-1.00A.

- Pardo, Brian D.: *See—*
  - Kelly, John C.; and Pardo, Brian D., 4,107,928, Cl. 60-650.000.
- Parker, Howard E.: *See—*
  - Steinberg, Walter A.; and Parker, Howard E., 4,109,187, Cl. 318-572.000.
- Parker, Robert Sydney Richard, to National Research Development Corporation. Hardenable sheet materials for surgical splints. 4,108,169, Cl. 128-89.00R.
- Parrish, David Richard: *See—*
  - Hajos, Zoltan George; and Parrish, David Richard, 4,108,898, Cl. 260-586.00C.
- Parsons, John T., to Lightning Fasteners Limited. Narrow fabrics. 4,107,956, Cl. 66-195.000.
- Partain, James H., to Stone Container Corporation. Multiple partition structure for paperboard container. 4,108,348, Cl. 229-15.000.
- Pasco, Wayne D.: *See—*
  - Klug, Frederic J.; and Pasco, Wayne D., 4,108,672, Cl. 106-38.900.
- Patch, Bradley J., Jr.: *See—*
  - Zampiello, Albert N.; and Patch, Bradley J., Jr., 4,108,553, Cl. 356-106.0LR.
- Patinet, Jean-Francois; and Guiomard, Claude, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris". Apparatus for releasing submerged floats. 4,107,802, Cl. 9-400.000.
- Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivaoovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich. Electroslag remelting apparatus having relative mold movement and provision for introduction of slag. 4,108,235, Cl. 164-252.000.
- Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Easy open container end assembly. 4,108,330, Cl. 220-260.000.
- Pauli, Jude A., to Emerson Electric Co. Retaining means for a solenoid assembly. 4,109,221, Cl. 335-251.000.
- Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, to Stahlwerke Peine-Salzgitter A.G. Steel wire. 4,108,695, Cl. 148-39.000.
- Payet, George L., to Strike Corporation, The. Durable press process. 4,108,598, Cl. 8-115.700.
- Paynter, Henry M. Fluid-driven torsional operators for turning rotary valves and the like. 4,108,050, Cl. 92-48.000.
- Pearson, Bert David; and Kissane, Richard J., to Baxter Travenol Laboratories, Inc. Blood gas simulator. 4,108,607, Cl. 23-253.00R.
- Pearson, Edward K., to Raymond Lee Organization, Inc., The. Quick extinguishing ash tray. 4,108,153, Cl. 131-235.00R.
- Pearson, Michael John; and Branch, Clive Leslie, to Beecham Group Limited. Cephalosporin analogues and compositions. 4,108,992, Cl. 424-248.530.
- Peart, Norman Eli, to Ferranti, Limited. Cathode ray tube assemblies. 4,109,220, Cl. 335-212.000.
- Pecherer, Benjamin: *See—*
  - Avenia, Richard William; and Pecherer, Benjamin, 4,108,973, Cl. 424-1.000.
- Pedain, Josef: *See—*
  - Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.
- Peddinghaus, Werner; and Regenbrecht, Ludwig, to Werner Peddinghaus. Drilling device with tool carrier supported by a carriage displaceable in drilling direction. 4,108,564, Cl. 408-10.000.
- Pell, Christopher: *See—*
  - Knowles, Philip Neville George; and Pell, Christopher, 4,109,248, Cl. 343-6.50R.
- Pelsue, Bradley A.; and Beavers, Allan E., to T.A. Pelsue Company. Forced air heater blower. 4,108,143, Cl. 126-110.00B.
- Pennwalt Corporation: *See—*
  - Howland, Paul George; and Alexander, John Mergle, 4,108,338, Cl. 222-286.000.
  - Moneghan, Edward, 4,108,935, Cl. 264-68.000.
  - Thomas, Paul Vernon, 4,108,780, Cl. 252-8.600.
- Peppard, James P. K.: *See—*
  - Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., 4,107,965, Cl. 70-52.000.
- Percival, Albert, to Fisons Limited. Halogenated alkylsulphonyl-benzimidazoles. 4,109,004, Cl. 424-273.00R.
- Perkin-Elmer Corporation, The: *See—*
  - Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, 4,108,608, Cl. 23-259.000.
- Pernegger, Wolfgang: *See—*
  - Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, 4,108,555, Cl. 356-184.000.
- Perrino, Joseph A., to Micro Electronics, Inc. Wire stripper having replaceable blades. 4,108,028, Cl. 81-9.50B.
- Perronnet, Jacques: *See—*
  - Bonne, Claude; Perronnet, Jacques; and Teche, Andre, 4,108,993, Cl. 424-248.570.
- Peschke, Gordon C., to Uarco Incorporated. Continuous business forms assembly with anti-tenting means. 4,108,352, Cl. 229-69.000.
- Peter Eckrich and Sons, Inc.: *See—*
  - Griswold, George G., 4,108,030, Cl. 83-77.000.
- Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, to Daimler-Benz Aktiengesellschaft. Process for improving the surfaces of roller bodies and balls. 4,108,689, Cl. 148-6.15R.
- Peters, Alan H.: *See—*
  - Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., 4,108,775, Cl. 210-169.000.
- Peters, George. Decorative wind velocity and directional indicator. 4,107,989, Cl. 73-189.000.
- Peters, Martinus T. J., to Oce-van der Grinten N.V. Pressure-fixable toner powder with a thermoplastic polyethylene binder. 4,108,653, Cl. 96-1.0SD.
- Peters, Wolfgang: *See—*
  - Hauschopp, Alois; and Peters, Wolfgang, 4,108,495, Cl. 299-43.000.
- Petersen, Ole Simon, to S. P. Radio A/S. Coding member for programming of a radio communication apparatus. 4,109,207, Cl. 325-455.000.
- Peterson, Harold L.: *See—*
  - Mendrala, James A.; and Peterson, Harold L., 4,109,278, Cl. 358-22.000.
- Petin, Christian; and Richardson, Robert, to Petin, Christian. Cooking oven and method of manufacture. 4,108,138, Cl. 126-19.00R.
- Petro-Data C.A.: *See—*
  - King, David W.; and Rankin, Emmitt Edward, 4,108,243, Cl. 166-66.000.
- Pettinger, Siegfried. Carrying belt for batteries. 4,108,341, Cl. 224-5.00H.
- Petzinger, Manfred Wilhelm August. Compost container. 4,108,609, Cl. 23-259.100.
- Pfaff Industriemaschinen G.m.b.H.: *See—*
  - Gross, Helmut; and Klundt, Kurt, 4,108,097, Cl. 112-287.000.
- Pfaffendorf, James L., to Boise Cascade Corporation. Space divider for cartons and the like. 4,108,349, Cl. 229-15.000.
- Pfalzstahlbau GmbH: *See—*
  - Kuwertz, Erich, 4,108,078, Cl. 104-172.00S.
- Pfizer Inc.: *See—*
  - Barth, Wayne E., 4,109,083, Cl. 544-26.000.
  - Barth, Wayne E., 4,109,085, Cl. 544-30.000.
- Philippaerts, Herman Adelbert: *See—*
  - Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, 4,108,661, Cl. 96-59.000.
- Phillips, David C.: *See—*
  - Smith, James D. B.; and Phillips, David C., 4,108,001, Cl. 73-339.00R.
- Phillips Petroleum Company: *See—*
  - Cook, Charles F.; and Hays, George E., 4,108,244, Cl. 166-268.000.
- Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, to Dresser Industries, Inc. Degasser spray vessel. 4,108,619, Cl. 55-192.000.
- Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, to Montedison S.p.A. Insecticide carbamates of N-(polychloroallyl)-amino-phenols. 4,109,011, Cl. 424-300.000.
- Pick, Peter: *See—*
  - Hintner, Josef; and Pick, Peter, 4,108,501, Cl. 303-82.000.
- Picker Corporation: *See—*
  - Martone, Ronald J.; Goldman, Samuel C.; and Heaton, Clifford C., 4,109,150, Cl. 250-368.000.
  - Pleil, Viktor W., 4,109,151, Cl. 250-460.000.
- Piech, Ferdinand: *See—*
  - Hanle, Edgar; and Piech, Ferdinand, 4,109,133, Cl. 219-203.000.
- Pieroh, Ernst Albrecht: *See—*
  - Hoyer, Georg-Alexander; and Pieroh, Ernst Albrecht, 4,108,885, Cl. 260-455.00A.
- Pierrard, Francois: *See—*
  - L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.
- Piet, Meyer; and Giles, Dean Gaylord, to Futurecraft Corporation. Controlled environment work enclosure. 4,108,509, Cl. 312-1.000.
- Pigeon, Michel; and Saglio, Robert, to Commissariat a l'Energie Atomique. Measuring bridge for an inspection or checking device by means of eddy currents. 4,109,201, Cl. 324-227.000.
- Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, to Labaz. Thiophene compounds and the production thereof. 4,108,865, Cl. 260-329.00R.
- Pilgram, Kurt H. G., to Shell Oil Company. Herbicidal semicarbazones. 4,108,399, Cl. 542-417.000.
- Pilkington Brothers Limited: *See—*
  - Cockram, David Ralph, 4,109,051, Cl. 428-375.000.
- Pilot Man-Nun-Hitsu Kabushiki Kaisha: *See—*
  - Kawai, Satoshi; Sato, Hajime; and Sakai, Toshimatsu, 4,109,287, Cl. 360-131.000.
- Pioneer Electronic Corporation: *See—*
  - Kanazashi, Tetsuo; and Fujiwara, Tsuyoshi, 4,109,281, Cl. 358-114.000.
  - Numata, Tatsuo, 4,109,206, Cl. 325-319.000.
- Pirc, Vladimir Valentine: *See—*
  - Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, 4,108,608, Cl. 23-259.000.
- Pistor, Michel Louis Paul. Automatic injector device. 4,108,177, Cl. 128-218.00A.
- Pitney-Bowes, Inc.: *See—*
  - Eckert, Alton B., Jr.; and Gluck, Julius, 4,108,545, Cl. 355-14.000.
- Pittet, Alan Owen: *See—*
  - Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.
- Piziali, Robert L.: *See—*
  - Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., 4,108,432, Cl. 273-29.00A.

- Pizzuti, Donato F.; and Lippert, Irving S., to Polaroid Corporation. Battery mount for collapsible cameras. 4,109,264, Cl. 354-187.000.
- Plasko, Emil Robert, to Emerson Electrical Co. Thermally actuatable electrical switch subassembly thereof. 4,109,229, Cl. 337-408.000.
- Platt, Charles Elmore, to United Technologies Corporation. Composite rotor blade. 4,108,572, Cl. 416-230.000.
- Platz, Winfried: *See—*
  - Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.
- Pleil, Viktor W., to Picker Corporation. Dual filament X-ray tube used in production of fluoroscopic images. 4,109,151, Cl. 250-460.000.
- Plessey Handel und Investments AG: *See—*
  - Knowles, Philip Neville George; and Pell, Christopher, 4,109,248, Cl. 343-6.50R.
- Ploger, Walter; and Gutzschebauch, Claus, to Henkel Kommanditgesellschaft auf Aktien. Process of stabilization of anhydrous dibasic calcium phosphate against fluorine ions with azacycloalkane-2,2-diphosphonic acids. 4,108,961, Cl. 423-265.000.
- Ploger, Walter; and Gutzschebauch, Claus, to Henkel Kommanditgesellschaft auf Aktien. Process of stabilization of anhydrous dibasic calcium phosphate against fluorine ions with 3-amino-1-hydroxypropane-1,1-diphosphonic acid. 4,108,962, Cl. 423-265.000.
- Plum, Hans; Buschhoff, Max; and Cejka, Alena, to Schering Aktiengesellschaft. Method of killing bacteria and fungi. 4,108,990, Cl. 424-245.000.
- PMC Industries, Inc.: *See—*
  - Boehnlein, James E., 4,107,848, Cl. 33-174.00P.
- Pneumeric Corp.: *See—*
  - Hawley, Jack S., 4,108,205, Cl. 137-554.000.
- Pockman, Thomas W.: *See—*
  - Pockman, William W.; and Pockman, Thomas W., 4,107,912, Cl. 57-68.000.
- Pockman, William W.; and Pockman, Thomas W. Metering capstan. 4,107,912, Cl. 57-68.000.
- Pocock, John F. E.: *See—*
  - Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.
- Pohle, Werner: *See—*
  - Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, 4,108,360, Cl. 235-304.000.
- Pohto, Gerald R.; and Kubrin, Michael Joseph, to Diamond Shamrock Corporation. Electrolytic cell bank having spring loaded intercell connectors. 4,108,752, Cl. 204-256.000.
- Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, to Roussel Uclaf. 5-Thiazole-methane-amines, and their use as antilipolytics. 4,108,994, Cl. 424-250.000.
- Poland, Robert L.: *See—*
  - Anderson, Carl M.; and Poland, Robert L., 4,108,249, Cl. 172-328.000.
- Polaroid Corporation: *See—*
  - Johnson, Bruce K., 4,109,263, Cl. 354-150.000.
  - Pizzuti, Donato F.; and Lippert, Irving S., 4,109,264, Cl. 354-187.000.
  - Tarr, Fred P., 4,109,259, Cl. 354-86.000.
  - Wareham, Richard R., 4,109,302, Cl. 362-10.000.
- Polgari, Istvan: *See—*
  - Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
- Pollak-Banda, Erich: *See—*
  - John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, 4,108,018, Cl. 74-467.000.
- Polsky, Lawrence M. Navigation aid for sailing vessels. 4,107,988, Cl. 73-178.00R.
- Ponsinet, Gerard: *See—*
  - Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.
- Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., to United States of America, Agriculture. Photofinishing of cotton textiles. 4,108,748, Cl. 204-159.120.
- Potschka, Joseph: *See—*
  - Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, 4,108,482, Cl. 292-165.000.
- Potter, Edward, to Potter, Edward; and Dant & Russell, Inc. Non-metallic-reinforced molded crosstie. 4,108,377, Cl. 238-91.000.
- Potter, Vernon L., to United States of America, Navy. Low heat loss liquid helium disconnect attachment and system. 4,107,946, Cl. 62-514.00R.
- Potts, Everett L., Jr.: *See—*
  - Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., 4,109,056, Cl. 428-512.000.
- Pouli, Dirk: *See—*
  - Cipris, Divna; and Pouli, Dirk, 4,108,745, Cl. 204-129.000.
- PPG Industries, Inc.: *See—*
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  - Claassen, George Richard, 4,108,624, Cl. 65-273.000.
  - Friedlander, Charles B., 4,108,840, Cl. 528-46.000.
  - Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,108,750, Cl. 204-181.00R.
  - Kacirek, Kenneth J.; and Rust, Jack E., 4,108,319, Cl. 214-6.0BA.
  - Steiger, Roger A.; and Stroke, Frederick G., 4,108,670, Cl. 106-40.00R.
- Precision Monolithics, Inc.: *See—*
  - Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.
- Precision Paper Tube Company: *See—*
  - Thomas, Anthony Vincent, 4,108,034, Cl. 83-361.000.
- Premo, Richard W.: *See—*
  - Minden, Henry Thomas; and Premo, Richard W., 4,109,135, Cl. 219-216.000.
- Prigent, Yvon: *See—*
  - Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.
- Prikkel, John, III. Automatic flue damper. 4,108,369, Cl. 236-1.00G.
- Pritchard, Assunta Anna; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Polishing of CdS crystals. 4,108,716, Cl. 156-636.000.
- Pritchett, Ervin G., to National Distillers and Chemical Corporation. Compatibilization of thermoplastic copolymers. 4,108,948, Cl. 260-897.00B.
- Process Computer Systems, Inc.: *See—*
  - Barnich, Richard G.; and Hakeem, Timothy M., 4,109,244, Cl. 340-324.0AD.
- Prochazka, Svante; and Dondalski, William J., to General Electric Company. Hot pressed silicon carbide. 4,108,929, Cl. 264-29.100.
- Procter & Gamble Company, The: *See—*
  - Bates, Paul Edward; Hughes, John Ronald; and Zoueshtiagh, Nahid, 4,109,012, Cl. 426-302.000.
  - Connor, Daniel Stedman, 4,108,889, Cl. 260-502.40R.
  - Mast, John George, Jr., 4,108,299, Cl. 28-119.000.
  - Wong, Louis Fay, 4,108,600, Cl. 8-137.000.
- Produits Chimiques Ugine Kuhlmann: *See—*
  - Arsac, Aime Joseph; and Frank, Pierre, 4,109,093, Cl. 548-334.000.
  - Cuer, Jean-Pierre; and Floreancig, Antoine, 4,108,963, Cl. 423-321.00S.
- Proefrock, Paul R.: *See—*
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- Progessive Machine Products, Inc.: *See—*
  - Betush, Frank A., 4,108,178, Cl. 128-224.000.
- Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, to Maschinenfabrik Hennecke GmbH. Apparatus for the continuous production of foam plastic blocks of rectangular cross-section. 4,108,585, Cl. 425-89.000.
- Prontophot Holding AG: *See—*
  - Brands, Jacobus; and Thaddey, Kurt, 4,108,706, Cl. 156-384.000.
- Prontor-Werk Alfred Gauthier GmbH: *See—*
  - Theurer, Richard, 4,109,267, Cl. 354-266.000.
- Proto, Richard C., to United States of America, Army. Apparatus for verifying the execution of a sequence of coded instructions. 4,108,359, Cl. 235-304.000.
- Pullman Incorporated: *See—*
  - Weir, Gary L., 4,108,472, Cl. 280-763.000.
- Purdue Research Foundation: *See—*
  - Regnier, Frederick E.; and Chang, Shung-Ho, 4,108,603, Cl. 23-230.00B.
  - Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., 4,108,718, Cl. 159-30.000.
- Putt, Mark S.: *See—*
  - Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,979, Cl. 424-49.000.
  - Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,981, Cl. 424-55.000.
- Quaker Oats Company, The: *See—*
  - Anderson, Hugh C.; and Lembke, Russell B., 4,108,826, Cl. 260-395.00B.
- Quinlan, John R., to Smith International, Inc. Rock bit roller cutter and method therefor. 4,108,692, Cl. 148-12.300.
- Quinn, Edwin J.: *See—*
  - Dieck, Ronald L.; and Quinn, Edwin J., 4,108,805, Cl. 521-180.000.
- R. M. Wade & Co.: *See—*
  - Cornelius, Gail, 4,108,200, Cl. 137-344.000.
- Racca, Enrico R. Apparatus for storing toiletries in a shower. 4,108,314, Cl. 211-74.000.
- Rackman, Michael I. Method of playing a board game. 4,108,438, Cl. 273-120.00R.
- Rackman, Michael I. Board game. 4,108,443, Cl. 273-243.000.
- Rackman, Michael I.: *See—*
  - Matthew, Morton P.; and Rackman, Michael I., 4,108,430, Cl. 273-1.00R.
- Racunas, Bernard J.: *See—*
  - Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., 4,108,968, Cl. 423-495.000.
- Radice, Michael; and Sheffler, Robert J., to Revlon, Inc. Lipstick dispenser. 4,108,558, Cl. 401-78.000.
- Radzins, Edmund A.; and Kiela, Gene F., to Curt G. Joa, Inc. Fluff distributor. 4,108,584, Cl. 425-83.100.
- Raffel, Reiner: *See—*
  - Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, 4,108,585, Cl. 425-89.000.
- Rahman, Abdul R.; and Haralampu, Stephen G., to United States of America, Army. Process for producing compacted, dehydrated, uncooked cabbage and cabbage product thereof. 4,109,026, Cl. 426-640.000.
- Rahman, Abdul R.: *See—*
  - Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., 4,109,020, Cl. 426-241.000.
- Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, to Metallgesellschaft Aktiengesellschaft; and Deutsche Babcock Aktiengesellschaft. Process for thermally treating fine-grained solids. 4,108,634, Cl. 75-23.000.

- Rainsfords Metal Products Proprietary Limited: *See—*
  - Heath, Robert Boyson, 4,108,395, Cl. 242-107.700.
- Ramlow, Kurt: *See—*
  - Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.
- Randall, John P. Floating buffing wheel assembly. 4,107,880, Cl. 51-103.0TF.
- Randolph, Arthur J. Hydraulic bagging press. 4,108,063, Cl. 100-53.000.
- Rankin, Emmitt Edward: *See—*
  - King, David W.; and Rankin, Emmitt Edward, 4,108,243, Cl. 166-66.000.
- Ranpak Corporation: *See—*
  - Ottaviano, Gary W., 4,109,040, Cl. 428-129.000.
- Rast, Robert Morgan, to RCA Corporation. Frequency counter for a television tuning system. 4,109,283, Cl. 358-191.000.
- Rathje, Uwe; and Schumacher, Hans Jurgen, to O & K Orenstein & Koppel Aktiengesellschaft. Vehicle with adjusting device for earth-moving shield thereof. 4,108,251, Cl. 172-789.000.
- Ratledge, R. Houston, Jr.: *See—*
  - Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,108,261, Cl. 177-120.000.
- Ratte, Jacques; and Carignan, Pierre, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Cold molding of flexible articles. 4,108,940, Cl. 264-140.000.
- Ray, Orlando F.; and Gutierrez, Enrique H., to Systems Concept, Inc. Prefabricated building module. 4,107,886, Cl. 52-79.110.
- Ray, Roggie C.: *See—*
  - Claiborne, Floyd H.; and Ray, Roggie C., 4,108,189, Cl. 134-138.000.
- Raymond, David Lee, to Analog Technology Corporation. Current-to-frequency converter. 4,109,168, Cl. 307-271.000.
- Raymond Lee Organization, Inc., The: *See—*
  - Extine, James M., 4,108,421, Cl. 254-88.000.
  - Pearson, Edward K., 4,108,153, Cl. 131-235.00R.
  - Yanke, James N., 4,108,015, Cl. 74-421.00A.
- Raymond, Roger. Railroad tie and tie plate with coacting grooves and projections that prevent spike killing of the ties. 4,108,378, Cl. 238-298.000.
- Raytheon Company: *See—*
  - McKinnon, John J., 4,109,179, Cl. 315-39.750.
  - Unkauf, Manfred G., 4,109,100, Cl. 178-67.000.
  - Zampiello, Albert N.; and Patch, Bradley J., Jr., 4,108,553, Cl. 356-106.0LR.
- RB Toy Development Co.: *See—*
  - Kupperman, Sam; and Kupperman, Dennis, 4,108,104, Cl. 116-148.000.
- RCA Corporation: *See—*
  - Bismarck, Otto Herbert, 4,109,209, Cl. 328-60.000.
  - Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, 4,108,407, Cl. 248-23.000.
  - Callaghan, John David, 4,109,191, Cl. 318-673.000.
  - Castellano, Joseph Anthony; and McCaffrey, Michael Thomas, 4,108,793, Cl. 252-299.000.
  - Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, 4,109,178, Cl. 315-12.00R.
  - Channin, Donald Jones, 4,109,242, Cl. 340-324.00M.
  - Clark, Charles Albert, Jr.; and Adam, Kenneth Charles, 4,109,166, Cl. 307-237.000.
  - Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, 4,109,299, Cl. 361-412.000.
  - Gale, Michael Thomas; and Kane, James, 4,108,660, Cl. 96-38.200.
  - Godfrey, Richard Hugh; and Morrell, Albert Maxwell, 4,109,177, Cl. 313-402.000.
  - Hannan, William James, 4,108,367, Cl. 235-457.000.
  - Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, 4,109,276, Cl. 358-4.000.
  - Jacobus, Lewis Alfred, Jr., 4,108,686, Cl. 148-1.500.
  - Kaplan, Gerald Stanley, 4,109,247, Cl. 343-6.50R.
  - Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, 4,109,202, Cl. 325-3.000.
  - Pankove, Jacques Isaac, 4,109,271, Cl. 357-30.000.
  - Rast, Robert Morgan, 4,109,283, Cl. 358-191.000.
  - Shambelan, Robert Charles; and Lindsley, Charles Wesley, 4,108,323, Cl. 214-310.000.
- Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., to United States Steel Corporation. Process data tracking system. 4,109,142, Cl. 235-92.0DN.
- Rebhun, Charles F., to True Temper Corporation. Weed cutter construction. 4,107,841, Cl. 30-276.000.
- Reese, Max G., to Becton, Dickinson and Company. Automated direct serum radioimmunoassay. 4,108,976, Cl. 424-1.000.
- Regenbrecht, Ludwig: *See—*
  - Peddinghaus, Werner; and Regenbrecht, Ludwig, 4,108,564, Cl. 408-10.000.
- Regie Nationale des Usines Renault: *See—*
  - Bouthors, Pierre Marcel, 4,109,235, Cl. 340-52.00F.
- Regnier, Frederick E.; and Chang, Shung-Ho, to Purdue Research Foundation. Method for rapid analysis of hemoglobin variants by high speed liquid chromatography. 4,108,603, Cl. 23-230.00B.
- Reh, Lothar: *See—*
  - Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.
- Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Aqueous polyurethane dispersions from solvent-free prepolymers using sulfonate diols. 4,108,814, Cl. 260-29.2TN.
- Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Circuit card connector and support device. 4,109,300, Cl. 361-415.000.
- Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, to Bayer Aktiengesellschaft. Highly shrinkable acrylic fibres or filaments. 4,108,845, Cl. 526-240.000.
- Reisdorf, Daniel: *See—*
  - Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.
- Reiser, Mario: *See—*
  - Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
- Reliable Attachment Company: *See—*
  - Weigert, Karl, 4,108,094, Cl. 112-134.000.
- Reliance Electric Company: *See—*
  - Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., 4,109,314, Cl. 364-552.000.
- Remington Arms Company, Inc.: *See—*
  - Dawson, Chester H., 4,107,983, Cl. 73-100.000.
- Renis, Giovanni: *See—*
  - Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.
- Renner, Wolf; and Mauer, Dieter, to USM Corporation. Through-wall cable support. 4,108,507, Cl. 308-238.000.
- Rensch, Eberhard G. Prefabricated building structure. 4,107,893, Cl. 52-775.000.
- Repapress AG: *See—*
  - Hirmann, Georg, 4,108,486, Cl. 294-99.00R.
- Research Corporation: *See—*
  - Silverstein, Emanuel, 4,108,726, Cl. 195-103.50R.
- Resilient Grip Limited: *See—*
  - Varga, Otto Herman, 4,108,043, Cl. 85-70.000.
- Reuschel, Konrad: *See—*
  - Keller, Wolfgang; and Reuschel, Konrad, 4,108,714, Cl. 156-608.000.
- Reuter, Franz Gottfried: *See—*
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,954, Cl. 264-216.000.
- Reuter, Helge: *See—*
  - Skrzipek, Jurgen; and Reuter, Helge, 4,108,557, Cl. 400-697.100.
- Reuter Technologie GmbH: *See—*
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,954, Cl. 264-216.000.
- Revere Copper and Brass, Incorporated: *See—*
  - Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., 4,108,596, Cl. 8-94.270.
- Revesz, Clara: *See—*
  - Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,108,997, Cl. 424-256.000.
- Revlon, Inc.: *See—*
  - Radice, Michael; and Sheffler, Robert J., 4,108,558, Cl. 401-78.000.
- Rexroth-Sigma: *See—*
  - Bitton, Georges, 4,108,582, Cl. 418-132.000.
- Reynolds, Bruce R.: *See—*
  - Abel, Irving R.; and Reynolds, Bruce R., 4,109,149, Cl. 250-347.000.
- Reynolds, Howard, to General Electric Company. Fuse holder assembly field convertible from fuse non-rejecting to rejecting modes. 4,108,531, Cl. 339-258.00F.
- Reynolds, James E., to Hazen Research Inc. Solder skimmings recovery process. 4,108,635, Cl. 75-24.000.
- Rezanka, Ivan, to Xerox Corporation. Cleaning apparatus and electrostatographic reproducing machine. 4,108,546, Cl. 355-15.000.
- Rhodes, Thomas J. Stair-climbing wheelchair. 4,108,449, Cl. 280-5.280.
- Rhone-Poulenc Industries: *See—*
  - Azemar, Michel; and Vigliecca, Lucien, 4,109,069, Cl. 526-65.000.
  - Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.
  - Jay, Pierre; and Schwachhofer, Ghislain, 4,108,789, Cl. 252-64.000.
- Rice, Richard E., to Comstock & Wescott, Inc. Catalyst for self ignition of fuels. 4,108,797, Cl. 252-466.0PT.
- Richardson, David A. Sprouter. 4,107,874, Cl. 47-14.000.
- Richardson, James L., to VEDA, Inc. Tank spreader. 4,108,380, Cl. 239-172.000.
- Richardson-Merrell Inc.: *See—*
  - Miller, Laird F.; and Fleming, Robert W., 4,108,896, Cl. 260-570.50C.
- Richardson, Robert: *See—*
  - Petin, Christian; and Richardson, Robert, 4,108,138, Cl. 126-19.00R.
- Riche, Jean Charles: *See—*
  - Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.
- Richlin, Milton. Dye-based inks with improved vehicles. 4,108,671, Cl. 106-22.000.
- Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
  - Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.

Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.

Richter, Stephan: *See—*

Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.

Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., to Purdue Research Foundation. Vapor filtration process and system. 4,108,718, Cl. 159-30.000.

Ricoh Co., Ltd.: *See—*

Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, 4,108,656, Cl. 96-1.50R.

Ricoh Watch Co., Ltd.: *See—*

Muranishi, Kenichi, 4,108,016, Cl. 74-462.000.

Riecke, Kurt: *See—*

Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.

Riedel-de Haen Aktiengesellschaft: *See—*

Lieser, Karl Heinrich; and Burba, Peter, 4,109,080, Cl. 536-43.000.

Riek, Rodney G.: *See—*

Flemiogs, Merton C.; Riek, Rodney G.; and Young, Kenneth P., 4,108,643, Cl. 75-135.000.

Riely, Phyllis Eleanor: *See—*

Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.

Riemens, Karel: *See—*

Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, 4,109,203, Cl. 325-38.00B.

Rieter Machine Works Ltd.: *See—*

Schar, Hugo, 4,108,388, Cl. 242-18.0DD.

Right, Robert W.: *See—*

Budrys, Ignas; and Right, Robert W., 4,109,246, Cl. 340-518.000.

Rigo, Serge; and Siejka, Julius, to Agence Nationale de Valorisation de la Recherche (Anvar). Method of producing protective coatings. 4,108,736, Cl. 204-1.500.

Ringwall, Carl G., to General Electric Company. Fluidic flow and velocity sensor. 4,107,990, Cl. 73-194.00B.

Ripper, Wolfgang: *See—*

Stumpp, Gerhard; Wessel, Wolf; Stein, Volkhard; and Ripper, Wolfgang, 4,108,117, Cl. 123-33.00A.

Ripple, David Eugene, to Lubrizol Corporation, The. Haloalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,108,783, Cl. 252-54.600.

Riva, Ralph D. Carrier attachment for automobiles. 4,108,342, Cl. 224-42.010.

Rivetti, Enrico: *See—*

Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, 4,108,273, Cl. 180-148.000.

Rizzo, Anthony A., to TRW Inc. Caging device. 4,108,424, Cl. 267-160.000.

RMS Electronics, Inc.: *See—*

Hacker, Morris; and Padilla, Dominick, 4,109,252, Cl. 343-715.000.

Robbins, Kenneth W.; and Ross, Gerald F., to Sperry Rand Corporation. Geothermal well pump performance sensing system and monitor therefor. 4,107,987, Cl. 73-151.000.

Robbins, Murray: *See—*

Ballman, Albert Anthony; and Robbins, Murray, 4,108,970, Cl. 423-593.000.

Robens, Erich: *See—*

Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.

Robert Bosch GmbH: *See—*

Knapp, Heinrich, 4,108,128, Cl. 123-139.0AW.

Stroezel, Reinhold, 4,108,252, Cl. 173-12.000.

Stumpp, Gerbard; Wessel, Wolf; Stein, Volkhard; and Ripper, Wolfgang, 4,108,117, Cl. 123-33.00A.

Wanner, Karl; and Voss, Klaus, 4,107,949, Cl. 64-9.00A.

Wossner, Guoter, 4,107,922, Cl. 60-298.000.

Roberts, Albert Lee. Cementitious flooring composition containing mixture of intermeshing particles of substantially spherical quartz sand. 4,108,813, Cl. 260-29.60S.

Roberts, Joseph A., to Advanced Circuit Technology. Circuit board with self-locking terminals. 4,107,836, Cl. 29-625.000.

Robertshaw Controls Company: *See—*

Bauer, Werner R.; and Smith, William N., 4,109,121, Cl. 200-67.00E.

Brakebill, Harold G., 4,108,197, Cl. 137-81.000.

Brakebill, Harold G., 4,108,372, Cl. 236-86.000.

Demi, Roy C., 4,108,370, Cl. 236-15.00A.

Tyler, Hugh J., 4,109,120, Cl. 200-51.00R.

Robertson, James Reonie: *See—*

Ryall, Michael Leslie; and Robertson, James Rennie, 4,108,569, Cl. 415-112.000.

Robertson, Penrose David; and Coulouris, George Franklin, to National Research Development Corporation. Apparatus and method for printing information onto a surface. 4,109,282, Cl. 358-127.000.

Robinson, Frank; and Whatmough, Nigel Stephen, to Courtaulds Limited. Method of knitting blank for a sleeved garment and product thereof. 4,107,955, Cl. 66-176.000.

Robinson, John W., Jr.: *See—*

Hemming, Donald C.; Haho, Robert E.; and Robinson, John W., Jr., 4,108,596, Cl. 8-94.270.

Robinson, John William; and Wilcox, Brian Norris, to Kimball International, Inc. Electronic organ having different selectable modes of playing the accompaniment keyboard. 4,108,037, Cl. 84-1.030.

Rocco, Andrew. Fuel vaporizing device. 4,108,953, Cl. 261-142.000.

Roche, Pierre: *See—*

Onillon, Michel; Roche, Pierre; and Thenard, Jean, 4,109,159, Cl. 250-564.000.

Rockwell International Corporation: *See—*

Christe, Karl O., 4,108,965, Cl. 423-351.000.

Rockwool Aktiebolaget: *See—*

Dahlberg, Stellan, 4,108,344, Cl. 226-1.000.

Rode, Walter F.; and Jones, Bill R., to Sedco, Inc. of Dallas, Texas. Apparatus for offshore handling and running of a BOP stack. 4,108,318, Cl. 214-1.00R.

Rodel, Gunther Georg, to Bodenseewerk Perkin-Elmer & Co., Gmbh. Circuit for converting a.c. voltage into a d.c. voltage. 4,109,308, Cl. 363-125.000.

Roeger, Bernd: *See—*

Henkler, Herbert; Deichelmano, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.

Rogers, Walter Clark, Jr., to Royal Development Company, Inc. Wall-avoiding recliner chair. 4,108,491, Cl. 297-85.000.

Rognon, Armand. Safety group for diesel engines. 4,108,129, Cl. 123-139.0AZ.

Rohm GmbH: *See—*

Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, 4,109,017, Cl. 426-51.000.

Rohm and Haas Company: *See—*

Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,108,630, Cl. 71-94.000.

Rohr Industries, Incorporated: *See—*

Tantlinger, Keith W., 4,108,488, Cl. 296-84.00R.

Rollmann, Louis Deane; and Valyocsik, Ernest William, to Mobil Oil Corporation. Synthesis of zeolite ZSM-11. 4,108,881, Cl. 260-448.00C.

Rolls-Royce Limited: *See—*

Mawson, Robert James, 4,108,571, Cl. 416-221.000.

Rombach, Joseph Xavier; and Lambert, James Hubert. Golf bag accessory. 4,108,409, Cl. 248-96.000.

Ropchan, George. Teaching aid for mathematics. 4,107,855, Cl. 35-31.00R.

Rosback, Donald H.; and Neuzil, Richard W., to UOP Inc. Process for the separation of ethylbenzene. 4,108,915, Cl. 260-674.0SA.

Rose, Elva Lincoln: *See—*

Clendening, Francis Joseph, Jr.; and Rose, Elva Lincoln, 4,107,828, Cl. 28-254.000.

Rosen, Perry, to Hoffmann-La Roche Inc. Process for preparing cyanoenol ethers. 4,108,888, Cl. 260-465.00F.

Rosen, Perry: *See—*

Burri, Kaspar F.; Kienzle, Frank; and Rosen, Perry, 4,109,086, Cl. 544-63.000.

Rosenblath, Quinlan T., Jr.: *See—*

Bartley, Thomas S.; and Rosenblath, Quinlan T., Jr., 4,108,574, Cl. 417-19.000.

Rosenblatt, Solomon, to Johnson & Johnson. Method for shaping a plastic membrane. 4,108,938, Cl. 264-127.000.

Ross, Gerald F.: *See—*

Robbins, Kenneth W.; and Ross, Gerald F., 4,107,987, Cl. 73-151.000.

Rossi, Albert; and Miller, Harold N., to Exxon Research & Engineering Co. Derivatized ethylene/polar monomer polymers of improved performance. 4,108,612, Cl. 44-62.000.

Rostek, Paul M.; and Baeyertz, John F., to NCR Corporation. Solderless circuit board component. 4,109,295, Cl. 361-401.000.

Rostek, Paul M.; and Baeyertz, John F., to NCR Corporation. Machine insertable circuit board electronic component. 4,109,296, Cl. 361-401.000.

Roth American, Inc.: *See—*

Tomalinas, William R., Jr.; and Gurbst, Herbert S., 4,108,517, Cl. 312-297.000.

Rothenberg, Peter: *See—*

Niemaszyk, Casimer; and Rothenberg, Peter, 4,108,358, Cl. 235-302.000.

Roussel Uclaf: *See—*

Bonne, Claude; Perronnet, Jacques; and Teche, Andre, 4,108,993, Cl. 424-248.570.

Buendia, Jean; and Schalbar, Jeanine, 4,109,009, Cl. 424-283.000.

Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, 4,108,994, Cl. 424-250.000.

Rouverol, William Spence. Standard-pitch gearing. 4,108,017, Cl. 74-462.000.

Rowe, Charles L.; and Lewis, Ronald A. Disposable thermometer. 4,108,002, Cl. 73-371.000.

Roy, Clarence H. Chromium reduction process. 4,108,770, Cl. 210-50.000.

Roy, Siegfried S.: *See—*

Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.

Royal Development Company, Inc.: *See—*

Rogers, Walter Clark, Jr., 4,108,491, Cl. 297-85.000.

Royer, George Ronald, to Bratton, Robert L., a part interest. Multi-net table tennis apparatus. 4,108,434, Cl. 273-30.000.

Rub-A-Venture: *See—*

Kupperman, Sam; and Kupperman, Dennis, 4,107,840, Cl. 30-172.000.

Rubens, Louis C.; and Alexander, Willard E., to Dow Chemical Company, The. Molding expandable thermoplastic resins. 4,108,934, Cl. 264-53.000.

Rucker, Dugan Allan; Wollermann, Louis Albert; and Krum, Jack Kern, to International Telephone and Telegraph Corporation. Porous yeast leavened dough product. 4,109,023, Cl. 426-549.000.

Rudzki, Eugene M.: *See—*

Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., 4,108,735, Cl. 203-7.000.

Ruegger, Artur; and Kuho, Max, to Sandoz Ltd. Dihydrocyclosporin C. 4,108,985, Cl. 424-177.000.

Ruehmann, Donald W.: *See—*

Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,108,167, Cl. 128-66.000.

Ruhl, Gary L.: *See—*

Anderson, Gordon K.; Leuck, Steven M.; and Ruhl, Gary L., 4,108,026, Cl. 81-3.00R.

Rumball, Kenneth Francis, to Airfix Industries Limited. Production of composite containers. 4,108,587, Cl. 425-112.000.

Rupinski, Frederick Alexander: *See—*

Landau, John Vernon, Jr.; and Rupinski, Frederick Alexander, 4,108,090, Cl. 112-121.110.

Ruppert, Jurgen: *See—*

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.

Ruruitsu, Satoshi: *See—*

Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.

Rust, Jack E.: *See—*

Kacirek, Kenneth J.; and Rust, Jack E., 4,108,319, Cl. 214-6.0BA.

Rutherford, Harry T. Cutter blade guard for mowers. 4,107,907, Cl. 56-320.200.

Ruti Machinery Works Ltd: *See—*

Guttinger, Peter, 4,108,213, Cl. 139-54.000.

Ruti-Te Strake B.V.: *See—*

van Mullekom, Hubert Peter, 4,108,214, Cl. 139-97.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by metal complexes of thioacid compounds. 4,108,908, Cl. 568-730.000.

Ryall, Michael Leslie; and Robertson, James Rennie, to Weir Pumps Limited. Lubricated mechanical seals for pumps. 4,108,569, Cl. 415-112.000.

Ryd, Per-Olof; and Svensson, Sten Gunnar Hugo, to Atlas Copco Aktiebolag. Spraying device. 4,108,382, Cl. 239-271.000.

Ryu, Ji-Yong, to UOP Inc. Oligomerization of olefins. 4,108,920, Cl. 260-683.15B.

S. A. Vandeputte & Cie: *See—*

Bezsilko, Nicolas, 4,108,187, Cl. 133-3.00A.

S&C Electric Company: *See—*

Biller, Bruce A.; and Scherer, Henry W., 4,109,227, Cl. 337-252.000.

S.E.D.I.C.: *See—*

Masclet, Jean, 4,108,392, Cl. 242-84.21A.

S. P. Radio A/S: *See—*

Petersen, Ole Simon, 4,109,207, Cl. 325-455.000.

Saarbergwerke Aktiengesellschaft: *See—*

Leibrock, Kurt, 4,108,610, Cl. 44-10.00G.

Sabol, James N.: *See—*

Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., 4,108,165, Cl. 128-2.00V.

Saeda, Shigeru; and Suzaka, Yukinori, to Showa Denko K.K. Method and device for measurement of environmental stress cracking. 4,107,979, Cl. 73-88.00R.

Saeki, Yukio: *See—*

Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, 4,109,057, Cl. 428-528.000.

Saffin von Corpon, Paul. Mixing tap. 4,108,208, Cl. 137-636.300.

Saglio, Robert: *See—*

Pigeon, Michel; and Saglio, Robert, 4,109,201, Cl. 324-227.000.

Saito, Hisashi: *See—*

Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Saito, Naoki: *See—*

Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.

Saito, Takashi, to Saito, Takashi; and Ishiyama, Takashi. Finger tip ornament. 4,107,947, Cl. 63-2.000.

Saizon, Floyd S. Hand-held, electrically operated fish scaler. 4,107,819, Cl. 17-64.000.

Sakai, Toshimatsu: *See—*

Kawai, Satoshi; Sato, Hajime; and Sakai, Toshimatsu, 4,109,287, Cl. 360-131.000.

Sakamoto, Eiichi: *See—*

Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.

Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic materials. 4,108,668, Cl. 96-135.000.

Saliaris, George P., to Unicare Systems, Inc. Cautery device for ophthalmic or the like surgical application. 4,108,181, Cl. 128-303.100.

Salkeld, Richard W., to United Technologies Corporation. Floating heat insulating baffle for directional solidification apparatus utilizing liquid coolant bath. 4,108,236, Cl. 164-338.00R.

Salyers, John C.: *See—*

Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,108,261, Cl. 177-120.000.

Salzman, Marilyn F. Collapsible child seats. 4,108,489, Cl. 297-37.000.

Samuels, Peter B.; and Wood, Ernest C. Graft forming device. 4,108,161, Cl. 128-1.00R.

Samuels, Peter B.; and Wood, Ernest C. Cartridge for suture clips. 4,108,306, Cl. 206-339.000.

Sanada, Masakatsu; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel feed device of an internal combustion engine. 4,108,126, Cl. 123-122.00E.

Sandberg, Nils Arne, to Ingenjorsfirman N A Sandbergs Industrikonstruktioner AB. Method and control system for controlling a suspended implement. 4,108,499, Cl. 302-34.000.

Sandford, Wayne H., Jr.: *See—*

Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., 4,109,232, Cl. 340-6.00R.

Sandor, Joseph: *See—*

Varni, Anselm Francis; and Sandor, Joseph, 4,107,810, Cl. 15-97.00R.

Sandoz Ltd.: *See—*

Fleck, Fritz; and Heller, Juerg, 4,108,887, Cl. 260-465.00H.

Grueninger, Erwin, 4,108,812, Cl. 260-24.000.

Ruegger, Artur; and Kuhn, Max, 4,108,985, Cl. 424-177.000.

Sandvik Aktiebolag: *See—*

Faber, Kurt Heinrich Albert Erich, 4,108,567, Cl. 408-224.000.

Sanko Air Plant Ltd.: *See—*

Sogo, Masaaki, 4,107,994, Cl. 73-290.00V.

Sargent Fletcher Company: *See—*

Page, Darrell, 4,108,328, Cl. 220-5.00A.

Sargent & Greenleaf, Inc.: *See—*

Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., 4,107,965, Cl. 70-52.000.

Sarkary, Homi G., to International Business Machines Corporation. Interconnection of integrated circuit metallization. 4,109,275, Cl. 357-68.000.

Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, to Fiat Societa per Azioni. Power assisted steering. 4,108,273, Cl. 180-148.000.

Sasaki, Minoru, to Tokyo Shibaura Electric Co., Ltd. Counter output detector circuit. 4,109,141, Cl. 235-92.0CA.

Sasaki, Takashi: *See—*

Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, to Chemiefaser Lenzing Aktiengesellschaft. Apparatus for producing synthetic fibers. 4,107,827, Cl. 28-246.000.

Sato, Hajime: *See—*

Kawai, Satosbi; Sato, Hajime; and Sakai, Toshimatsu, 4,109,287, Cl. 360-131.000.

Sato, Masataro. Compositions and methods for the treatment of athlete's foot. 4,108,984, Cl. 424-94.000.

Sato, Sei: *See—*

Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.

Sato, Takao; and Sugiyama, Sakae, to Hitachi, Ltd. Control system for boiling-water reactor. 4,108,720, Cl. 176-20.00R.

Satoh, Kenji; and Watanabe, Mitsuru, to Hitachi Heating Appliances Co., Ltd. High frequency energy apparatus having automatic final temperature compensator. 4,109,129, Cl. 219-10.55B.

Satoh, Tsuyoshi; and Tachino, Kenzo, to Mitsubishi Denki Kabushiki Kaisha. Position-indicating signal equipment for elevator. 4,108,282, Cl. 187-29.00R.

Satterthwaite, Dale J., to Electric Power Research Institute, Inc. Vaned anode for high-intensity ionizer stage of electrostatic precipitator. 4,108,615, Cl. 55-2.000.

Sauer, Gerhard: *See—*

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.

Schaal, Helmut: *See—*

Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.

Schaar, Charles, to Colgate-Palmolive Company. Disposable diaper. 4,108,179, Cl. 128-284.000.

Schach, Erich: *See—*

Fleischmann, Reinhold; and Schach, Erich, 4,108,020, Cl. 74-558.000.

Schaefer, Wilfried: *See—*

Sebelik, Robert V.; and Schaefer, Wilfried, 4,108,768, Cl. 210-43.000.

Schaffer Company, The: *See—*

Estes, Lewis W.; and Jobns, Paul W., 4,109,042, Cl. 428-193.000.

Schal, Wilfried, to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie K.G. Obtaining desired flow rate from roller pump despite varying the hose means. 4,108,575, Cl. 417-53.000.

Schalbar, Jeanine: *See—*

Buendia, Jean; and Schalbar, Jeanioe, 4,109,009, Cl. 424-283.000.

Schar, Hugo, to Rieter Machine Works Ltd. Method for catching, severing and rethreading a thread and an apparatus for implementing the method. 4,108,388, Cl. 242-18.0DD.

Scheck, Wilson, Sr. Roller skates with hand brakes. 4,108,451, Cl. 280-11.200.

Scheib, William R.; and Shaffer, Ralph M., Jr., to Aetna-Standard Engineering Co. Multiple blade scrap saw for pipe mill. 4,108,032, Cl. 83-106.000.

Scheidweiler, Andreas, to Cerberus AG. Ionization-type fire sensing system. 4,109,240, Cl. 340-629.000.

Schelfaut, Francois Leon: *See—*
Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, 4,108,661, Cl. 96-59.000.

Scherer, Henry W.: *See—*
Biller, Bruce A.; and Scherer, Henry W., 4,109,227, Cl. 337-252.000.

Schering AG: *See—*
Hoyer, Georg-Alexander; and Pieroh, Ernst Albrecht, 4,108,885, Cl. 260-455.00A.

Schering Aktiengesellschaft: *See—*
Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.
Plum, Hans; Buschhoff, Max; and Cejka, Alena, 4,108,990, Cl. 424-245.000.
Vorbruggen, Helmut; and Niedballa, Ulrich, 4,109,078, Cl. 536-26.000.

Scheuermann, Glen R., to Airco, Inc. Rotatable substrate holder for use in vacuum. 4,108,107, Cl. 118-49.100.

Schiff, Leon J.: *See—*
Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., 4,108,746, Cl. 204-158.00R.

Schirtzinger, Joseph F., to Sea-Log Corporation. Towing system for cargo containers. 4,108,101, Cl. 114-245.000.

Schladitz, Hermann Johannes, to Schladitz-Whiskers AG. Apparatus for metallizing strips, sheets or the like. 4,108,108, Cl. 118-49.100.

Schladitz-Whiskers AG.: *See—*
Schladitz, Hermann Johannes, 4,108,108, Cl. 118-49.100.

Schlage, Ernest L., to Schlage Lock Company. Selectively rotatable cylinder for a lock. 4,107,966, Cl. 70-364.00A.

Schlage, Ernest L., to Schlage Lock Company. Tally lock. 4,107,968, Cl. 70-436.000.

Schlage Lock Company: *See—*
Schlage, Ernest L., 4,107,966, Cl. 70-364.00A.
Schlage, Ernest L., 4,107,968, Cl. 70-436.000.

Schlageter, Gary M.: *See—*
McMullen, Carl R.; and Schlageter, Gary M., 4,108,188, Cl. 134-57.00R.

Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J. Evaporative refrigeration system. 4,107,940, Cl. 62-121.000.

Schluter, Jurgen, to E. Schluter Fachhandel fur Schweisstechnik. Welding-, cutting-, or heating torch. 4,109,131, Cl. 219-137.620.

Schmid, Walter. Cardiac frequency measuring instrument. 4,108,166, Cl. 128-2.06F.

Schmidt, Manfred; and Luithlen, Heinz, to Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH. Ski brake. 4,108,465, Cl. 280-605.000.

Schmidt, Michael P.: *See—*
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,108,212, Cl. 138-122.000.

Schmidt, Rainer: *See—*
Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, 4,108,057, Cl. 99-452.000.

Schmitt, Reinhold: *See—*
Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, 4,109,017, Cl. 426-51.000.

Schneider, Anthony C., to Freezing Equipment Sales, Inc. Anti-foam chamber for screw compressor oil separator. 4,108,618, Cl. 55-178.000.

Schneider, Martin Victor: *See—*
Yi Cho, Alfred; and Schoeider, Martin Victor, 4,108,738, Cl. 204-15.000.

Schneider, Stanley; and Spitzer, Richard. Method for the generation of frequency-transferred electromagnetic waves. 4,109,218, Cl. 332-7.510.

Schneider, Walter: *See—*
Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Schneidersmann, Ernst-Otto, to DEMAG Aktiengesellschaft. Paddle wheel pick-up. 4,108,496, Cl. 299-45.000.

Schoenafinger, Eduard: *See—*
Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Schoennagel, Hans-Juergen; and Zahner, John C., to Mobil Oil Corporation. Conversion of coal into liquid fuels. 4,108,758, Cl. 208-8.000.

Schoepe, Adolf. Ball cock having vertically adjustable outlet tube. 4,108,202, Cl. 137-436.000.

Scholin, Harold W. Shaft seal. 4,108,447, Cl. 277-153.000.

Scholl, Eugen, to Wilhelm Bott KG. Central locking mechanism. 4,108,516, Cl. 312-216.000.

Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Substituted acetonaphthone perfume compositions. 4,108,799, Cl. 252-522.000.

Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Process for preparing mixtures of substituted-hexahydro-acetonaphthones. 4,108,899, Cl. 260-586.00C.

Schreiber, William L.: *See—*
Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.

Schreiner, Franz: *See—*
Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, 4,108,964, Cl. 423-336.000.

Schreyer, Kenneth D.; and Hawkins, Harold V., to Columbus McKinnon Corporation. Oblique lay sprocket wheel and chain construction. 4,108,014, Cl. 74-243.00H.

Schroder, Herbert. Device for preparing the cleaning of carpet floors. 4,107,808, Cl. 15-41.00R.

Schroeder, Charles H. Collimating device for X-rays. 4,109,156, Cl. 250-505.000.

Schroter, Herbert; and Stein, Eckehard, to Hoechst Aktiengesellschaft. Apparatus for developing a photosensitive material using a vaporous ammonia-containing developer. 4,109,268, Cl. 354-299.000.

Schubert & Salzer: *See—*
Mahrt, Gunter; and Goldammer, Georg, 4,107,820, Cl. 19-81.000.

Schuelein, Rolf G.; and Friedrich, Rainer, to Leifheit International Guenter Leifheit GmbH. Corner sweeping brush disposed on a floor sweeper. 4,107,809, Cl. 15-42.000.

Schulmerich Carillons, Inc.: *See—*
Baelz, Harry C.; and Cassel, Harrison E., 4,109,119, Cl. 200-38.0BA.

Schultheis, James R., to Timco Engineering, Inc. Self-contained vehicle battery charger. 4,109,193, Cl. 320-2.000.

Schultz, Carl D.: *See—*
Simonton, Robert D.; and Schultz, Carl D., 4,108,417, Cl. 249-81.000.

Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, to Gulf Research & Development Company. Liquid dielectric composition derived from the alkylation product of benzene with ethylene. 4,108,788, Cl. 252-63.000.

Schulz, Thilo: *See—*
Kabilka, Otto; and Schulz, Thilo, 4,108,329, Cl. 220-453.000.

Schulze-Schoelling, Hermann: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.

Schumacher, Hans Jurgen: *See—*
Rathje, Uwe; and Schumacher, Hans Jurgen, 4,108,251, Cl. 172-789.000.

Schwachhofer, Ghislain: *See—*
Jay, Pierre; and Schwachhofer, Ghislain, 4,108,789, Cl. 252-64.000.

Schwarz, Gunter. Arrangement for securing a body to a ski. 4,108,454, Cl. 280-11.37E.

Schwarzbich, Jorg. Spring leg with mounting for the front wheels of automobile vehicles. 4,108,469, Cl. 280-668.000.

Schwarze, Werner: *See—*
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,875, Cl. 260-347.800.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,877, Cl. 260-347.800.

Schweisguth, Bernard: *See—*
Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, 4,109,008, Cl. 424-273.00R.

Schwing, Karl-Heinz: *See—*
Neubeck, Kurt; Schwing, Karl-Heinz; and Klein, Kurt, 4,108,007, Cl. 73-732.000.

Schylander, Eric Christian, to U.S. Philips Corporation. Apparatus for reatling a record carrier. 4,109,277, Cl. 358-8.000.

Scientific-Atlanta, Inc.: *See—*
Davis, Glenn A., 4,109,239, Cl. 340-539.000.

Scott Paper Company: *See—*
Christensen, Rolf Edward, 4,109,035, Cl. 427-365.000.

Scott, Walter Norris; and MacArthur, Judy Anne, to Universities Federation for Animal Welfare. Animal euthanasia. 4,107,818, Cl. 17-51.000.

Sea-Log Corporation: *See—*
Schirtzinger, Joseph F., 4,108,101, Cl. 114-245.000.

Sealectro Corporation: *See—*
Evans, David Roger, 4,108,529, Cl. 339-177.00R.

Seaman, Gary G.: *See—*
Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., 4,107,838, Cl. 29-628.000.

Searight, Edward F.; and Flanagan, Paul, to Thermo Electron Corporation. Jet impingement heat exchanger. 4,108,242, Cl. 165-164.000.

Seaton, Thomas: *See—*
Bowden, Roy Dennis; and Seaton, Thomas, 4,108,856, Cl. 260-290.0HL.

Sebalj, Renata: *See—*
Melton, Keith Nelson; and Sebalj, Renata, 4,109,125, Cl. 200-268.000.

Sebelik, Robert V.; and Schaefer, Wilfried, to Winchester Chemical Co. Method of clarifying industrial waste water. 4,108,768, Cl. 210-43.000.

Sebesta, Walter C. Floor safe. 4,108,087, Cl. 109-51.000.

Seckel, Peter H.: *See—*
Dick, Franklin; and Seckel, Peter H., 4,108,559, Cl. 401-217.000.

Secor, Fay W.: *See—*
Will, Fritz G.; and Secor, Fay W., 4,109,065, Cl. 429-105.000.

Secretary of State for Defence in Her Britannic Majesty's Government of Great Britain and Northern Ireland, The: *See—*
Shanks, Ian Alexander, 4,109,241, Cl. 340-324.00M.

Sedco, Inc. of Dallas, Texas: *See—*
Rode, Walter F.; and Jones, Bill R., 4,108,318, Cl. 214-1.00R.

Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, to Hilti Aktiengesellschaft. Fastening assembly for refractory linings. 4,107,890, Cl. 52-379.000.

Seidel, Michael C.: *See—*
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,108,630, Cl. 71-94.000.

Seissl, Johannes: *See—*
Franke, Kurt; Seissl, Johannes; and Stuermer, Wilhelm, 4,108,308, Cl. 206-455.000.

Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu. Process for preparation of chromatography solid supports comprising a nucleic acid base-epoxy group containing porous gel. 4,108,804, Cl. 521-121.000.

Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, to Citizen Watch Co., Ltd. Electronic timepiece. 4,107,915, Cl. 58-23.00R.

Seko, Maomi; Ogawa, Shinsaku; and Yoshida, Muneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolysis. 4,108,742, Cl. 204-98.000.

Seligmann, Peter Charles, to Aeci Limited. Electrical connection assembly and connectors therefor. 4,108,524, Cl. 339-47.00R.

Seligson, Charles. Circular knitting machine provided with a novel striping box. 4,107,954, Cl. 66-133.000.

Selwitz, Charles M.: *See—*
Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,108,788, Cl. 252-63.000.

Senger, David Joseph: *See—*
Calvert, Michael Arnold; and Senger, David Joseph, 4,108,196, Cl. 137-72.000.

Seveg, S.A.: *See—*
Lambert, Gerard Edouard; and Begis, Roger, 4,108,068, Cl. 101-363.000.

Shaffer, Ralph M., Jr.: *See—*
Scheib, William R.; and Shaffer, Ralph M., Jr., 4,108,032, Cl. 83-106.000.

Shambelan, Robert Charles; and Lindsley, Charles Wesley, to RCA Corporation. Machine for changing the spacing of a plurality of wafers. 4,108,323, Cl. 214-310.000.

Shamlian, Ralph B.: *See—*
Hollingsworth, Ashley J.; and Shamlian, Ralph B., 4,107,996, Cl. 73-300.000.

Shanks, Ian Alexander, to Secretary of State for Defence in Her Britannic Majesty's Government of Great Britain and Northern Ireland, The. Liquid crystal displays. 4,109,241, Cl. 340-324.00M.

Shannon, Robert D.: *See—*
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.

Sharki, Martin James: *See—*
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,108,619, Cl. 55-192.000.

Sharp Kabushiki Kaisha: *See—*
Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, 4,108,544, Cl. 355-8.000.

Sharp, Silas S, to Du Pont de Nemours, E. I., and Company. Miticidal mixtures and method utilizing a macrotetrolide compound. 4,109,007, Cl. 424-279.000.

Shaver, J. Lyle, to Allis-Chalmers Corporation. Agitator for an axial flow cylinder. 4,108,150, Cl. 130-27.00H.

Shaw, Stuart Walter Ker, to International Nickel Company, Inc., The. Alloys of nickel, chromium and cobalt. 4,108,647, Cl. 75-171.000.

Sheffler, Robert J.: *See—*
Radice, Michael; and Sheffler, Robert J., 4,108,558, Cl. 401-78.000.

Shell Oil Company: *See—*
Dante, Mark F., 4,108,824, Cl. 260-33.2EP.
Henry, Arthur C., 4,108,897, Cl. 260-570.80R.
Kok, Riekert; and van der Zeeuw, Abraham J., 4,108,958, Cl. 423-24.000.
Pilgram, Kurt H. G., 4,108,399, Cl. 542-417.000.
Wattimena, Freddy, 4,108,917, Cl. 260-677.00R.

Shemer, Michael: *See—*
Creinin, Howard Lee; and Shemer, Michael, 4,108,847, Cl. 260-112.00G.

Shen, Chah M.: *See—*
Loshaek, Samuel; and Shen, Chah M., 4,109,070, Cl. 526-77.000.

Shepherd, Charles Grey; and Yeoman, Brian Donald, to J.A. Wilson Display Limited. Display structure. 4,108,085, Cl. 108-108.000.

Sherritt Gordon Mines Limited: *See—*
Wallace, Herbert F.; and Weir, Donald R., 4,108,640, Cl. 75-103.000.

Sherwood Refractories Inc.: *See—*
Vidmar, Albert J., 4,109,144, Cl. 240-2.00V.

Shibayama, Kunio: *See—*
Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.

Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, to Taiyo Yuden Co., Ltd. Ceramic capacitor with nickel-solder electrodes. 4,109,292, Cl. 361-321.000.

Shibukawa, Suetaroo, to Hitachi, Ltd. Capactive discharge ignition circuit. 4,108,131, Cl. 123-148.0CC.

Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, to Toyoda-Koki Kabushiki-Kaisha. Index device for tool storage magazine. 4,109,188, Cl. 318-602.000.

Shimiya, Keiji: *See—*
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.

Shimizu, Akihiko: *See—*
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,108,804, Cl. 521-121.000.

Shimizu, Isamu: *See—*
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.

Shimizu, Youji: *See—*
Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, 4,109,292, Cl. 361-321.000.

Shin-Shirasuna Electric Corp.: *See—*
Katsurayama, Hiromasa; and Hirabayashi, Nobuhiro, 4,109,286, Cl. 360-96.000.

Shine, Thomas R. Method and machine for producing sand molds. 4,108,234, Cl. 164-38.000.

Shinjo, Teruya: *See—*
Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.

Shinoki, Takanori: *See—*
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.

Shionogi & Co., Ltd.: *See—*
Yoshimura, Masakiyo; and Yamaguti, Yasukazu, 4,108,823, Cl. 260-33.4PQ.

Shioyama, Giichi: *See—*
Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, 4,107,920, Cl. 60-276.000.

Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, to Nippon Steel Corporation. Continuously cast slabs for producing grain-oriented electrical steel sheets having excellent magnetic properties. 4,108,694, Cl. 148-31.550.

Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, to Abbott Laboratories. Antibiotic derivatives of XK-62-2 compounds. 4,109,077, Cl. 536-17.000.

Shiraishi, Yoshihiro: *See—*
Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, 4,108,959, Cl. 423-240.000.

Shirane, Naoyuki: *See—*
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.

Shizuka, Kohei: *See—*
Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.

Shonerd, David E.; and Danze, Carlos, to American Safety Equipment Corporation. Wall-end securement for pressure reservoirs having automatic safety pressure relief. 4,108,327, Cl. 220-3.000.

Shosuke Okamoto: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.

Showa Denko K.K.: *See—*
Saeda, Shigeru; and Suzaka, Yukinori, 4,107,979, Cl. 73-88.00R.

Shuff, Thomas J.; and Sims, Robert W., to Monsanto Company. Method and apparatus for level measurement using microwaves. 4,107,993, Cl. 73-290.00R.

Shulsinger, Joseph. Aerosol dispenser with inner container and piston. 4,108,219, Cl. 141-3.000.

Shumway, Durland K.: *See—*
Kěnkare, Divaker B.; and Shumway, Durland K., 4,108,977, Cl. 424-46.000.

Shuster, Edward J.: *See—*
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,799, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,899, Cl. 260-586.00C.

Siano, James N.: *See—*
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,799, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,899, Cl. 260-586.00C.

Sias, Roy C., to Continental Oil Company. Anti-microbial compositions. 4,109,010, Cl. 424-289.000.

Sick, Erwin; and Staimer, Angelika, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Apparatus for combining light emanating from a linear scanning field. 4,108,533, Cl. 350-6.700.

Siegfried, Armin, to Escher Wyss Limited. Pressure roller. 4,107,831, Cl. 29-116.0AD.

Siejka, Julius: *See—*
Rigo, Serge; and Siejka, Julius, 4,108,736, Cl. 204-1.500.

Siemens Aktiengesellschaft: *See—*
Fleer, Ernst-Otto; and Heubeck, Erich, 4,107,846, Cl. 32-27.000.
Franke, Kurt; Seissl, Johannes; and Stuermer, Wilhelm, 4,108,308, Cl. 206-455.000.
Fries, Paul, 4,108,239, Cl. 165-105.000.
Glasl, Andreas; and Murrmann, Helmuth, 4,109,273, Cl. 357-35.000.
Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, 4,108,555, Cl. 356-184.000.
Herbst, Heiner; and Mueller, Ruediger, 4,109,272, Cl. 357-35.000.
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Lindstroem, Harry; and Kvaerna, Sverre, 4,108,426, Cl. 269-328.000.
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.
Vachenauer, Erwin; and Mueller, Bernd, 4,109,250, Cl. 343-112.00R.
von Basse, Paul Werner; and Hofmann, Rudiger, 4,109,270, Cl. 357-23.000.
Widmann, Dietrich, 4,108,717, Cl. 156-656.000.

Siesto, Joseph T. Belt holding clips, particularly for keys, tools and the like. 4,107,823, Cl. 24-3.00K.

- Sigrist, Paul. Fixation clamp for air pump hose. 4,108,474, Cl. 285-12.000.
- Sih, Charles John: *See—*
  - Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.
- Sih, John C., to Upjohn Company, The. Trans,trans-2,3,4,5-tetradehydro-PGI$_1$, compounds. 4,109,082, Cl. 542-426.000.
- Silliman, Thomas B. Omnidirectional broadband circularly polarized antenna. 4,109,255, Cl. 343-853.000.
- Silva, John C., Jr. Amplified cycle steering system. 4,108,460, Cl. 280-236.000.
- Silverstein, Emanuel, to Research Corporation. Sarcoidosis test. 4,108,726, Cl. 195-103.50R.
- Simmons, James. Mobile broiler rotisserie apparatus. 4,108,055, Cl. 99-421.00H.
- Simms, Paul C.: *See—*
  - Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., 4,108,718, Cl. 159-30.000.
- Simone, Andre A.: *See—*
  - Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
- Simonton, Robert D.; and Schultz, Carl D., to Dale Products, Inc. Battery post and connector strap mold. 4,108,417, Cl. 249-81.000.
- Simplimatic Engineering Co.: *See—*
  - Bowser, Robert E., 4,108,061, Cl. 100-7.000.
- Simpson, Robert O., to Goodyear Tire & Rubber Company, The. Shield for sealing a tubeless tire on a spoked wheel rim. 4,108,232, Cl. 152-365.000.
- Sims, Robert W.: *See—*
  - Shuff, Thomas J.; and Sims, Robert W., 4,107,993, Cl. 73-290.00R.
- Singer Company, The: *See—*
  - Ciecior, Heinrich, 4,108,096, Cl. 112-221.000.
  - Hestily, Charles Edward, 4,108,225, Cl. 144-134.00D.
  - Landau, John Vernon, Jr.; and Rupinski, Frederick Alexander, 4,108,090, Cl. 112-121.110.
- Singh, Baldev: *See—*
  - Lesher, George Y.; and Singh, Baldev, 4,109,092, Cl. 544-328.000.
- Singrey, Raymond Edward: *See—*
  - Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, 4,108,594, Cl. 432-24.000.
- Sitter, Spencer B., to Taylor, Jay. Solar-heated stock tank. 4,108,156, Cl. 126-271.000.
- Sizer, Phillip S., to Otis Engineering Corporation. Apparatus for controlling a well during drilling operations. 4,108,257, Cl. 175-230.000.
- Sjoholm, Claes Bertil; and Martensson, Karl J. G., to Alfa-Laval AB. Cheese-making apparatus. 4,108,058, Cl. 99-466.000.
- Skarzynski, Thaddeus S.; and Swisher, James A., to C. Cowles & Company. Meter box guard lock. 4,107,959, Cl. 70-159.000.
- SKF Kugellagerfabriken GmbH: *See—*
  - Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
  - Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.
- Skrzipek, Jurgen; and Reuter, Helge, to Triumph Werke Nurnberg A.G. Error correcting typewriter. 4,108,557, Cl. 400-697.100.
- Skubal, John J., to Atwood Vacuum Machine Company. Gas spring. 4,108,423, Cl. 267-64.00R.
- Slater, Norman S., to Norman Slater, Inc. Interconnectible structural tubular members. 4,108,316, Cl. 211-199.000.
- Slaughter, Harold W. Safety device for bicycle. 4,108,535, Cl. 350-99.000.
- Slaymaker, Frank H. Method of and apparatus for electronically generating musical tones and the like. 4,108,036, Cl. 84-1.010.
- Slivenko, Victor; and Emken, Michael R., to General Atomic Company. Blood access device. 4,108,173, Cl. 128-214.00R.
- Slivenko, Victor, to General Atomic Company. Catheter interlock system. 4,108,174, Cl. 128-214.00R.
- Sloan, James L.; and Meeker, Greg W., to Cross River Products, Inc. Swivel assembly. 4,107,817, Cl. 16-20.000.
- Smejkal, Paul V.; and Baranski, Robert B., to Gulf & Western Manufacturing Company. Press drive mechanism. 4,107,973, Cl. 72-450.000.
- Smith, Bruce N., to Spherex, Inc. Hub cap. 4,108,497, Cl. 301-37.0SA.
- Smith, Craig R. Well drilling apparatus. 4,108,255, Cl. 175-9.000.
- Smith, Harvey A.: *See—*
  - Jowett, Terence W.; and Smith, Harvey A., 4,108,008, Cl. 73-756.000.
- Smith International, Inc.: *See—*
  - Dixon, Robert L.; and Maxsted, Malcolm D., 4,108,259, Cl. 175-344.000.
  - Quinlan, John R., 4,108,692, Cl. 148-12.300.
- Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Urea composition for forming thermoparticulating coating. 4,108,001, Cl. 73-339.00R.
- Smith, John Lionel, to Andrew Hydraulics International Limited. Device for crimping tubular elements. 4,107,964, Cl. 72-36.000.
- Smith, Kenneth R., to Mallinckrodt, Inc. 1-(3,5-Disubstituted-2,4,6-triiodophenyl)-3-(polyhydroxy-alkyl)urea compounds. 4,109,081, Cl. 536-53.000.
- Smith Kline & French Laboratories Limited: *See—*
  - Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,109,003, Cl. 424-273.00R.
- Smith, Peter: *See—*
  - Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.
- Smith, Richard Grant: *See—*
  - Brackett, Charles Arthur; and Smith, Richard Grant, 4,109,217, Cl. 331-94.50S.
- Smith, William N.: *See—*
  - Bauer, Werner R.; and Smith, William N., 4,109,121, Cl. 200-67.00E.
- SmithKline Corporation: *See—*
  - Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., 4,108,854, Cl. 260-252.000.
  - Holden, Kenneth George, 4,108,989, Cl. 424-244.000.
- Snaper, Alvin A., to Advanced Patent Technology, Incorporated. Alloy sensor. 4,107,997, Cl. 73-304.00R.
- Snelgrove, William Richard Noble: *See—*
  - Lake, Malcolm John; and Snelgrove, William Richard Noble, 4,108,639, Cl. 75-101.00R.
- Snyder, Jan S., to Xerox Corporation. Method and apparatus for inverting the polarity of an input image formed on a surface of an image recording device. 4,109,316, Cl. 365-127.000.
- Snyder, John R., to Jet Aeration Company. Acoustical apparatus. 4,108,274, Cl. 181-229.000.
- Snyder, Kenneth J.: *See—*
  - Lawson, Michael B.; and Snyder, Kenneth J., 4,108,681, Cl. 134-20.000.
- Societe Anonyme de Telecommunications: *See—*
  - Molleron, Claude Auguste, 4,109,109, Cl. 179-15.0BY.
- Societe Anonyme Francaise du Ferodo: *See—*
  - de Gennes, Gerard, 4,108,295, Cl. 192-111.00A.
  - de Gennes, Gerard, 4,108,699, Cl. 156-92.000.
- Societe de Diffusion Neiman: *See—*
  - Neiman, Michel, 4,107,960, Cl. 248-165.000.
- Societe d'Etudes et de Realisations Electroniques: *See—*
  - Weber, Claude Edmond Georges, 4,108,551, Cl. 356-4.000.
- Societe Nationale des Petroles d'Aquitaine: *See—*
  - Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, 4,108,866, Cl. 260-329.00R.
- Societe Nationale Elf Aquitaine: *See—*
  - Bernat, Jean-Pierre; and Sors, Jean, 4,108,744, Cl. 204-119.000.
- Soder, Alfons: *See—*
  - Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
- Sofinowski, Jacob, III, to AAI Corporation. Cartridge magazine. 4,107,862, Cl. 42-50.000.
- Sogo, Masaaki, to Sanko Air Plant Ltd. Level detector. 4,107,994, Cl. 73-290.00V.
- Sokolowski, Daniel E., to United States of America, National Aeronautics and Space Administration. Heat exchanger. 4,107,919, Cl. 165-169.000.
- Sollich, Helmut, to Sollich KG. Method of and apparatus for cooling a cooked confectionery. 4,107,938, Cl. 62-71.000.
- Sollich KG: *See—*
  - Sollich, Helmut, 4,107,938, Cl. 62-71.000.
- Soltanoff, Louis: *See—*
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- Solvay & Cie.: *See—*
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- Sommer, Helmut: *See—*
  - Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., 4,108,075, Cl. 102-214.000.
- Sommer, Thomas R., to National Controls, Inc. Load cell. 4,107,985, Cl. 73-141.00A.
- Sonex International Corp.: *See—*
  - Mendrala, James A.; and Peterson, Harold L., 4,109,278, Cl. 358-22.000.
- Sony Corporation: *See—*
  - Takizawa, Kazuyuki, 4,108,444, Cl. 274-9.00R.
  - Takizawa, Kazuyuki, 4,108,445, Cl. 274-9.00R.
  - Yamamoto, Harunori, 4,109,115, Cl. 179-100.110.
- Sorokina, Klavdia Pavlovna: *See—*
  - Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
- Sors, Jean: *See—*
  - Bernat, Jean-Pierre; and Sors, Jean, 4,108,744, Cl. 204-119.000.
- Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., to Thiokol Corporation. Rocket nozzle bearing seal. 4,108,381, Cl. 239-265.350.
- Spann, Donald C. Patient support strap. 4,108,170, Cl. 128-134.000.
- Sparkler Filters, Inc.: *See—*
  - Kracklauer, Aloysius C., 4,108,158, Cl. 126-271.000.
- Spaziante, Placido M.: *See—*
  - de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,108,756, Cl. 204-286.000.
- Spectroderm International: *See—*
  - Brandt, J. Wayne, 4,109,319, Cl. 366-219.000.
- Sperry Rand Corporation: *See—*
  - Minden, Henry Thomas; and Premo, Richard W., 4,109,135, Cl. 219-216.000.
  - Robbins, Kenneth W.; and Ross, Gerald F., 4,107,987, Cl. 73-151.000.

- Spherex, Inc.: *See—*
  - Smith, Bruce N., 4,108,497, Cl. 301-37.0SA.
- Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, to Marion Laboratories, Inc. Anaerobic liquid transport apparatus. 4,108,728, Cl. 195-127.000.
- Spino, Raymond N.; and Warren, Casimir G. Orthodontic appliance. 4,107,843, Cl. 32-14.00E.
- Spiral Step Tool Company: *See—*
  - Breitenstein, Charles Thomas, 4,107,882, Cl. 51-118.000.
- Spitzer, Richard: *See—*
  - Schneider, Stanley; and Spitzer, Richard, 4,109,218, Cl. 332-7.510.
- Spoerke, Roger W.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Dehydrogenation process. 4,108,913, Cl. 260-669.00R.
- Spohn, Larry L. Sleeper storage bins. 4,108,487, Cl. 296-28.00C.
- Spoonamore, John Gilbert: *See—*
  - Unger, Ronald James; and Spoonamore, John Gilbert, 4,107,984, Cl. 73-113.000.
- Spragg, Martin Alfred, Jr. Modular record selector and storage apparatus. 4,108,511, Cl. 312-9.000.
- Sprague Electric Company: *See—*
  - Kolkowski, James J., 4,107,834, Cl. 29-570.000.
- Sprague, Peter W., to E. R. Squibb & Sons, Inc. Amidines. 4,108,894, Cl. 260-564.00R.
- Spratt. Eugene M.; and Dominguez, Robert C. Portable, collapsible hoisting and supporting apparatus. 4,108,411, Cl. 248-165.000.
- Spribag Aktiengesellschaft: *See—*
  - Egli, Ernst, 4,108,384, Cl. 239-665.000.
- Spuhler, Heinrich, to Aktiengesellschaft Fr.Mettler's Sohne, Maschinenfabrik. Method and apparatus for manufacturing a spun yarn from one or several filaments. 4,107,908, Cl. 57-1.00R.
- Sragal, Richard F. Constant tension apparatus for flexible endless drive means. 4,108,013, Cl. 74-242.11C.
- SRI International: *See—*
  - Henry, David W.; and Toog, George L., 4,109,076, Cl. 536-4.000.
- Sryniawski, Joseph F.: *See—*
  - Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.
- Stadler, Robert L.: *See—*
  - Falk, Leonard P.; Stadler, Robert L.; and Alford, James R., 4,108,333, Cl. 221-13.000.
- Stahlecker, Fritz; and Stahlecker, Hans. Mobile piecing device and method for an open end spinning machine. 4,107,957, Cl. 57-34.00R.
- Stahlecker, Hans: *See—*
  - Stahlecker, Fritz; and Stahlecker, Hans, 4,107,957, Cl. 57-34.00R.
- Stahlwerke Peine-Salzgitter A.G.: *See—*
  - Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
- Staimer, Angelika: *See—*
  - Sick, Erwin; and Staimer, Angelika, 4,108,533, Cl. 350-6.700.
- Stamer, Walter, to Claudius Peters AG and Maxpeters Gesellschaft fuer Verfahrenstechnik mbH. Process and equipment for effecting savings in compressed gases during injection of solids by means of pneumatic conveyors. 4,108,500, Cl. 302-53.000.
- Stamicarbon, B.V.: *See—*
  - de Cooker, Mario G. R. T.; and Hermus, Antonius J. M., 4,109,089, Cl. 544-192.000.
  - van Hardeveld, Rudolf; and Hendriks, Petrus F.A.M., 4,109,090, Cl. 544-201.000.
- Standard Oil Company, The: *See—*
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- Standard Oil Company a corporation of Indiana: *See—*
  - Fields, Ellis K., 4,108,864, Cl. 260-326.00C.
- Standard Oil Company (Indiana): *See—*
  - Jones, Loyd W., 4,108,246, Cl. 166-312.000.
- Standiford, Fred W. On-press printing plate locking system. 4,108,069, Cl. 101-415.100.
- Stanley, John H., to Goodyear Tire & Rubber Company, The. Method for making hose incorporating an embedded static ground conductor. 4,108,701, Cl. 156-160.000.
- Stant Manufacturing Company, Inc.: *See—*
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- Starks, Charles M.: *See—*
  - Leach, Bruce Eugene; and Starks, Charles M., 4,108,909, Cl. 568-766.000.
- Stauffer Chemical Company: *See—*
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  - Fancher, Llewellyn W., 4,108,988, Cl. 424-211.000.
  - Lauck, Robert M., 4,109,025, Cl. 426-551.000.
- Stearns-Roger Corporation: *See—*
  - Jennings, Eugene W., 4,108,485, Cl. 294-67.0BC.
- Steiger, Roger A.; and Stroke, Frederick G., to PPG Industries, Inc. Porous refractory metal boride article having dense matrix. 4,108,670, Cl. 106-40.00R.
- Steimann, Franz, to Didier Engineering GmbH. Door of the self-locking type. 4,107,879, Cl. 49-465.000.
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- Stein, Volkhard: *See—*
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- Steinberg, Walter A.; and Parker, Howard E., to Autonumerics, Inc. Contour control system including cutter radius compensation. 4,109,187, Cl. 318-572.000.
- Stemler, Orrin A.: *See—*
  - Kelley, James E.; and Stemler, Orrin A., 4,108,561, Cl. 403-166.000.
- Stemme, Otto; Lermann, Peter; and Winkler, Alfred, to Agfa-Gevaert AG. Motion-picture camera for cassette-loaded film. 4,108,542, Cl. 352-72.000.
- Stemmle, Denis J., to Xerox Corporation. Document loading for copying. 4,108,547, Cl. 355-50.000.
- Stephens, William D.: *See—*
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- Sterling Drug Inc.: *See—*
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  - Barr, James W., Jr., 4,108,680, Cl. 134-3.000.
  - Lesher, George Y.; and Singh, Baldev, 4,109,092, Cl. 544-328.000.
- Sterner, Charles J.: *See—*
  - Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.
- Stevens, Roger Charles: *See—*
  - Stewart, John; and Stevens, Roger Charles, 4,108,294, Cl. 192-85.00R.
- Stewart, John; and Stevens, Roger Charles, to Twiflex Couplings Limited. Rotary fluid couplings. 4,108,294, Cl. 192-85.00R.
- Stewart-Warner Corporation: *See—*
  - Taylor, Kenneth James, 4,107,998, Cl. 73-313.000.
- Steyert, William A., Jr., to United States of America, Energy. High temperature refrigerator. 4,107,935, Cl. 62-3.000.
- Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., to United States of America, Navy. Aircraft head-up display unit mount adjustment tool. 4,108,025, Cl. 81-3.00R.
- Stine, Laurence O.: *See—*
  - Hemler, Charles L.; and Stine, Laurence O., 4,108,795, Cl. 252-419.000.
- Stiso, Sisto Nicholas; and Sutula, Chester L., to Miles Laboratories, Inc. Method, composition and device for determining the specific gravity or osmolality of a liquid. 4,108,727, Cl. 195-103.50R.
- Stockdale, George Fairbank: *See—*
  - Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, 4,109,299, Cl. 361-412.000.
- Stone Container Corporation: *See—*
  - Partain, James H., 4,108,348, Cl. 229-15.000.
- Storey, Leo Martin, Jr.: *See—*
  - Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, 4,108,310, Cl. 206-570.000.
- Stover, Dennis E., to Atlantic Richfield Company. Method for the restoration of an underground reservoir. 4,108,722, Cl. 195-1.000.
- Stowell, Michael James; and Watts, Brian Michael, to T.I. (Group Services) Limited. Aluminium base alloys. 4,108,691, Cl. 148-11.50A.
- Strangman, Thomas E.: *See—*
  - Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., 4,109,061, Cl. 428-678.000.
- Straub, Immanuel. Pipe coupling. 4,108,479, Cl. 285-112.000.
- Strayer Coin Bag Company, Inc.: *See—*
  - Bonner, Cletus D., 4,108,227, Cl. 150-15.000.
- Strike Corporation, The: *See—*
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- Stritzinger, Heinz: *See—*
  - Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.
- Stroezel, Reinhold, to Robert Bosch GmbH. Power driver for threaded fasteners. 4,108,252, Cl. 173-12.000.
- Stroke, Frederick G.: *See—*
  - Steiger, Roger A.; and Stroke, Frederick G., 4,108,670, Cl. 106-40.00R.
- Struth, Wolfgang Ferdinand: *See—*
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- Stubenvoll, Alfred: *See—*
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- Stuermer, Wilhelm: *See—*
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- Stumpp, Gerhard; Wessel, Wolf; Stein, Volkhard; and Ripper, Wolfgang, to Robert Bosch GmbH. Fuel metering system. 4,108,117, Cl. 123-33.00A.
- Stupak, Leonid Mikhailovich: *See—*
  - Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
- Sturdevant, Robert D.: *See—*
  - Gennone, Richard J.; and Sturdevant, Robert D., 4,108,646, Cl. 75-148.000.
- Sturman, Oded E.; and Grill, Benjamin, to Burwell, Clifton J. Pilot operated valve. 4,108,419, Cl. 251-30.000.
- Sturwold, Robert Joseph, to Emery Industries, Inc. Blends of mineral oil and modified triglycerides useful for metal working. 4,108,785, Cl. 252-56.00R.
- Stutt, Charles A.: *See—*
  - Kincaid, Thomas G.; and Stutt, Charles A., 4,109,204, Cl. 325-38.00R.

Suga, Yozo: *See—*
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Suggs, Charles W. Leaf defoliator assembly for an automatic tabacco harvester. 4,107,902, Cl. 56-27.500.

Sugi, Shohzaburo: *See—*
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Sugiyama, Sakae: *See—*
Sato, Takao; and Sugiyama, Sakae, 4,108,720, Cl. 176-20.00R.

Sullivan, Matthew A., to Sullivan Products, Inc. Motor mount for use in model airplane. 4,108,401, Cl. 244-54.000.

Sullivan Products, Inc.: *See—*
Sullivan, Matthew A., 4,108,401, Cl. 244-54.000.

Sulzer Brothers Ltd.: *See—*
Zabelka, Jaroslav, 4,109,137, Cl. 219-285.000.

Sumino, Yasuhiro: *See—*
Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, 4,108,724, Cl. 195-96.000.

Sumitomo Chemical Company, Limited: *See—*
Akagane, Katsuo; Adachi, Teruho; and Kamio, Kunimasa, 4,108,924, Cl. 260-837.0PV.
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,108,723, Cl. 195-2.000.
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yosbito, 4,108,819, Cl. 260-29.6NR.

Sumitomo Durez Company, Ltd.: *See—*
Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, 4,109,057, Cl. 428-528.000.

Sumitomo Metal Industries, Ltd.: *See—*
Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, 4,107,969, Cl. 72-148.000.

Sumitomo Metal Mining Company Limited: *See—*
Nakabe, Sanai, 4,108,638, Cl. 75-63.000.

Sun Electric Corporation: *See—*
Trussell, Gerald C.; and Arnston, Robert W., 4,108,362, Cl. 235-375.000.

Suntech, Inc.: *See—*
Hansel, William B., 4,108,223, Cl. 141-392.000.

Surridge, James H.: *See—*
Coll-Palagos, Miguel; and Surridge, James H., 4,108,599, Cl. 8-137.000.

Susumu, Iida. Record controlled mechanical store. 4,108,363, Cl. 235-383.000.

Sutula, Chester L.: *See—*
Stiso, Sisto Nicholas; and Sutula, Chester L., 4,108,727, Cl. 195-103.50R.

Suwa, Seiichi: *See—*
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.

Suzaka, Yukinori: *See—*
Saeda, Shigeru; and Suzaka, Yukinori, 4,107,979, Cl. 73-88.00R.

Suzuka, Osamu: *See—*
Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.

Suzuki, Yujiro: *See—*
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.

Svenska Utvecklingsaktiebolaget (SU) Swedish National Development Co.: *See—*
Anderssoo, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, 4,109,060, Cl. 425-566.000.

Svensson, Lars-Goran: *See—*
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.

Svensson, Percy: *See—*
Goransson, Rolf Erik; Erikssoo, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.

Svensson, Sten Gunnar Hugo: *See—*
Ryd, Per-Olof; and Svensson, Sten Gunnar Hugo, 4,108,382, Cl. 239-271.000.

Svoboda, Josef: *See—*
Weigl, Erwin; and Svoboda, Josef, 4,108,466, Cl. 280-605.000.

Swan, Jack C., Jr., to Hanson Industries Inc. Method of producing a viscous flowable pressure-compensating fitting composition from hollow thermoplastic microblends with the use of high frequency heating and dispensing the composition into a sealable, flexible, protective enclosure means. 4,108,928, Cl. 264-26.000.

Swisher, James A.: *See—*
Skarzynski, Thaddeus S.; and Swisber, James A., 4,107,959, Cl. 70-159.000.

Sybroo Corporation: *See—*
Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, 4,108,310, Cl. 206-570.000.

Sylverst, Leroy M. Sea terminal. 4,107,803, Cl. 9-8.00P.

Systems Concept, Inc.: *See—*
Ray, Orlando F.; and Gutierrez, Enrique H., 4,107,886, Cl. 52-79.110.

Systems & Technic S.A.: *See—*
McMillian, Lonnie S.; and Culp, Harold G., 4,109,139, Cl. 235-92.0CN.

Szasz, Kalman: *See—*
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., to Ebonex Corporation. Pigment composition containing elemental carbon and process of making the same. 4,108,679, Cl. 106-307.000.

Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., to Lummus Company, The. Denitrification of carbonaceous feedstocks. 4,108,761, Cl. 208-254.00H.

Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, to Lummus Company, The; and Maruzen Petrochemical Co., Ltd. Process for the production of petroleum coke. 4,108,798, Cl. 252-502.000.

Szporny, Laszlo: *See—*
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

Szuhaj, Bernard F.; and Yaste, Joseph R., to Central Soya Company, Ioc. Release agent and method. 4,108,678, Cl. 106-243.000.

T.A. Pelsue Company: *See—*
Pelsue, Bradley A.; and Beavers, Allan E., 4,108,143, Cl. 126-110.00B.

T.I. (Group Services) Limited: *See—*
Stowell, Michael James; and Watts, Brian Michael, 4,108,691, Cl. 148-11.50A.

Tachibana, Yoshishige, to Toyo Boseki Kabushiki Kaisha. Loop length correction of spirally set textile fabric in processing apparatus. 4,107,801, Cl. 8-152.000.

Tachikawa, Shiro: *See—*
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Tachikawa Spring Co., Ltd.: *See—*
Urai, Muneharu; Goto, Shuichi; and Fukui, Yutaka, 4,107,829, Cl. 29-91.100.

Tachino, Kenzo: *See—*
Satoh, Tsuyoshi; and Tachino, Kenzo, 4,108,282, Cl. 187-29.00R.

Tadokoro, Eiichi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Plating method for memory elements. 4,108,739, Cl. 204-40.000.

Tagashira, Yoshimi: *See—*
Yoshida, Yasuharu; and Tagashira, Yoshimi, 4,109,102, Cl. 178-69.100.

Taira, Yoshito: *See—*
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.

Taiyo Yuden Co., Ltd.: *See—*
Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, 4,109,292, Cl. 361-321.000.

Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, to Richter Gedeon Vegyeszeti Gyar Rt. Method of and apparatus for fluidization. 4,107,851, Cl. 34-10.000.

Takahashi, Kozo: *See—*
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Takakusagi, Tunehiko: *See—*
Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.

Takano, Hazime. Clutch apparatus. 4,108,292, Cl. 192-11.000.

Takara Shuzo Co., Ltd.: *See—*
Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.

Takashima, Hisashi: *See—*
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.

Takayama, Hiroshi; and Aizawa, Tatsuo, to Mita Industrial Company Ltd. Magnetic dry developer for electrostatic photography and process for preparation thereof. 4,108,786, Cl. 252-62.10P.

Takeda Chemical Industries, Ltd.: *See—*
Moriya, Koji; and Furuoya, Itsuo, 4,108,874, Cl. 260-346.750.
Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, 4,108,724, Cl. 195-96.000.

Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, to Nippon Oil Company Ltd. Process for fluidized contact. 4,108,682, Cl. 134-25.00R.

Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, to Idemitsu Petrochemical Co., Ltd. Two-stage hydrogenation of benzene to form cyclohexane using nickel catalyst. 4,108,912, Cl. 260-667.000.

Takenoya, Hideaki: *See—*
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.

Takeuchi, Shoichi: *See—*
Odawara, Kenji; and Takeuchi, Shoichi, 4,108,818, Cl. 260-29.6AQ.

Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., to J. M. Huber Corporation. Method of agglomerating powders. 4,108,932, Cl. 264-37.000.

Takizawa, Hidemitu: *See—*
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,108,444, Cl. 274-9.00R.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,108,445, Cl. 274-9.00R.

Takizawa, Masayoshi: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.

Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, to Nikki-Universal Co., Ltd. Method of manufacture of spherical alumina particles. 4,108,971, Cl. 423-428.000.

Talley, Herbert Joseph. Paint spray tip retaining and cleaning adapter. 4,108,379, Cl. 239-119.000.

Tamai, Yasuo: *See—*
Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.

Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.

Tamura, Masayuki: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.

Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, to Nippon Shinyaku Co., Ltd.; and Takara Shuzo Co., Ltd. 5-Benzylpicolinic acid derivatives. 4,109,000, Cl. 424-263.000.

Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for ion-nitriding. 4,109,157, Cl. 250-531.000.

Tanaka, Hitoshi, to Fuji Photo Optical Co., Ltd. Articulated, four-way bendable tube structure. 4,108,211, Cl. 138-120.000.

Tanaka, Mitsugu; Okazaki, Masaki; Aono, Toshiaki; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Photographic developing agents, process for developing using same, and light-sensitive materials containing same. 4,108,663, Cl. 96-74.000.

Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, to Fujitsu Limited; and Japan Racing Association, The. Apparatus for processing betting tickets. 4,108,364, Cl. 235-419.000.

Tanaka, Toshiro: *See—*
Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, 4,108,879, Cl. 260-405.600.

Tanaka, Yujiro, to Kabushiki Kaisha Komatsu Seisakusho. Cable take-up device for electric drive vehicle. 4,108,264, Cl. 180-2.00R.

Tanigawa, Koichi: *See—*
Kuge, Tsukasa; and Tanigawa, Koichi, 4,109,289, Cl. 361-230.000.

Tanino, Hideo: *See—*
Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, 4,108,861, Cl. 260-306.70C.

Tantlinger, Keith W., to Rohr Industries, Incorporated. Vehicle front having asymmetrical windshields. 4,108,488, Cl. 296-84.00R.

Tantraporn, Wirojana; and Yu, Se Puan, to General Electric Company. Avalanche memory triode and logic circuits. 4,109,169, Cl. 307-302.000.

Tapley, Claude D. Method of producing a multi-gage strip or shape from powdered metal. 4,108,651, Cl. 75-208.0CS.

Tappan Company, The: *See—*
Gilliom, John W.; and McFarland, Robert H., 4,108,139, Cl. 126-21.00A.

Tarr, Fred P., to Polaroid Corporation. Exposure preventing shade. 4,109,259, Cl. 354-86.000.

Tarrant Manufacturing Company: *See—*
Taylor, Bruce W.; and Murray, Gregory J., 4,108,010, Cl. 74-100.00R.

Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for treating a waste gas. 4,108,959, Cl. 423-240.000.

Tate, Takao: *See—*
Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, 4,108,951, Cl. 261-34.00B.

Tatsushima, Masaru: *See—*
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,108,971, Cl. 423-428.000.

Taumann, Leonhard, to Applied Radiation. X-ray beam compensation. 4,109,154, Cl. 250-503.000.

Taylor, Bruce W.; and Murray, Gregory J., to Tarrant Manufacturing Company. Conveyor-type, hydraulic-powered, material-spreading apparatus. 4,108,010, Cl. 74-100.00R.

Taylor, Edward W.: *See—*
Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., 4,109,061, Cl. 428-678.000.

Taylor, Jay: *See—*
Sitter, Spencer B., 4,108,156, Cl. 126-271.000.

Taylor, Kenneth James, to Stewart-Warner Corporation. Petrol tank gauges. 4,107,998, Cl. 73-313.000.

Tazuma, James J.; and Zadra, Mario D., to Goodyear Tire & Rubber Company, The. Metal salts of modified anhydride resin. 4,108,944, Cl. 260-879.000.

Team, Inc.: *See—*
Harrison, George W.; and Huff, Charles O., 4,108,194, Cl. 137-15.000.

Teccor Electronics, Inc.: *See—*
Mason, William B., 4,109,306, Cl. 363-61.000.

Tech. Ontwikkelingsbureau Van Elten B.V.: *See—*
Van Elten, Gerrit Jan; and Hurkmans, Antonius, 4,108,056, Cl. 99-452.000.

Teche, Andre: *See—*
Bonne, Claude; Perronnet, Jacques; and Teche, Andre, 4,108,993, Cl. 424-248.570.

Teijin Limited: *See—*
Hayasbi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.

Tektronix, Inc.: *See—*
Dalton, Oliver, 4,109,182, Cl. 315-392.000.

Teledyne, Inc.: *See—*
Benson, James M., 4,107,991, Cl. 73-204.000.

Teledyne Industries, Inc.: *See—*
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,108,167, Cl. 128-66.000.

Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See—*
Goddard, Terrence P., 4,108,697, Cl. 149-19.300.

Telefonaktiebolaget L M Ericsson: *See—*
Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, 4,109,098, Cl. 174-106.0SC.

Tellman, Stephen J., to Champion International Corporation. Construction panel with non-skid surface and method of fabrication. 4,109,041, Cl. 428-147.000.

Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., to NDM Corporation. Multiple choke assembly. 4,109,223, Cl. 336-84.00C.

Terui, Sadao: *See—*
Komai, Atsushi; Shiraoe, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.

Teschemacher, Charles R.: *See—*
Creighton, Charles P.; and Teschemacher, Charles R., 4,109,074, Cl. 526-320.000.

Teshima, Shizuhiro: *See—*
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.

Teulon, Jean-Marie: *See—*
Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, 4,109,008, Cl. 424-273.00R.

Texaco Inc.: *See—*
Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., 4,108,218, Cl. 141-1.000.
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,108,193, Cl. 137-13.000.

Texas Instruments Incorporated: *See—*
Hanni, Stephen L.; and Johnson, Dudley B., 4,109,298, Cl. 361-412.000.
Marcoux, Leo; and Berg, Peter G., 4,108,125, Cl. 123-122.00F.

Textron, Inc.: *See—*
Hunke, Siegfried H., 4,107,971, Cl. 72-237.000.

Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.

Thaddey, Kurt: *See—*
Brands, Jacobus; and Thaddey, Kurt, 4,108,706, Cl. 156-384.000.

Thaler, Sheldon: *See—*
Cannon, Robert Lee, III, 4,108,148, Cl. 128-419.0PG.

Thenard, Jean: *See—*
Onillon, Michel; Roche, Pierre; and Thenard, Jean, 4,109,159, Cl. 250-564.000.

Thermco Products Corporation: *See—*
West, Ernest James; and Brandenburg, Gary M., 4,108,420, Cl. 251-129.000.

Thermo Electron Corporation: *See—*
Searight, Edward F.; and Flanagan, Paul, 4,108,242, Cl. 165-164.000.

Theurer, Richard, to Prontor-Werk Alfred Gauthier GmbH. Shutter control apparatus for camera devices. 4,109,267, Cl. 354-266.000.

Thiehofe, Theodor, to Gewerkschaft Walter. Method and apparatus for sinking shafts. 4,107,930, Cl. 61-41.00R.

Thiemann, Volker: *See—*
Fleckenstein, Wolfgang; and Thiemano, Volker, 4,108,163, Cl. 128-2.00H.

Thiokol Corporation: *See—*
Ashmore, Charles I.; Combs, Charles S., Jr.; and Stephens, William D., 4,108,696, Cl. 149-19.200.
Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., 4,108,381, Cl. 239-265.350.

Thom, Joseph R. Method for making a fishing lure. 4,108,955, Cl. 264-222.000.

Thoma, Frank, to Daimler-Benz Aktiengesellschaft. Fuel injection valve with stepped injection. 4,108,383, Cl. 239-533.500.

Thomas, Andre. Process for extracting and processing glycoproteins, mucopolysaccharides and accompanying substances. 4,108,849, Cl. 260-122.000.

Thomas, Anthony Vincent, to Precision Paper Tube Company. Snap cutter apparatus for paper tubes. 4,108,034, Cl. 83-361.000.

Thomas Industries of Tennessee, Inc.: *See—*
  Marcell, William B., 4,108,279, Cl. 184-15.00R.
Thomas, John Henry, III: *See—*
  Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.
Thomas, Paul Vernon, to Pennwalt Corporation. Dustless soil release-souring compositions for use in laundering. 4,108,780, Cl. 252-8.600.
Thompsoo, Anita L. Fire protective grease catcher. 4,108,332, Cl. 220-370.000.
Thompson, James L., to Dow Chemical Company, The. Foaming and silt suspending agent. 4,108,782, Cl. 252-8.55C.
Thompson, Jerome B. Low calorie diet bread. 4,109,018, Cl. 426-62.000.
Thompson, Thomas D., to Yara Engineering Corporation. Color developing coating using unrefined clays on paper. 4,109,049, Cl. 428-331.000.
Thomson, Benjamin M.: *See—*
  Bowling, Teamus; and Thomson, Benjamin M., 4,109,226, Cl. 337-130.000.
Thomson, George V. Rolling pin construction. 4,107,830, Cl. 29-110.500.
Thone, Bernd: *See—*
  Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.
Thorstenssoo, Gustav Yngve: *See—*
  Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.
Thyssen Industrie Aktiengesellschaft: *See—*
  Herbst, Rolf, 4,108,045, Cl. 89-36.00K.
Thyssen Purofer GmbH: *See—*
  Lange, Georg, 4,108,636, Cl. 75-35.000.
Tiemann, Reinhard, to Continental Gummi-Werke Aktiengesellschaft. Vehicle wheel with rubber tire. 4,108,228, Cl. 152-7.000.
Timchenko, Viktor Anatolievich: *See—*
  Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
Timco Engineering, Inc.: *See—*
  Schultheis, James R., 4,109,193, Cl. 320-2.000.
Timm, Edward E.; and Townsend, Donald I., to Dow Chemical Company, The. Method for reducing concentration of harmful or offensive vapors in the atmosphere. 4,108,113, Cl. 123-3.000.
Tip Top Industries, Inc.: *See—*
  Dumesnil, Eugene F., Jr., 4,107,815, Cl. 15-257.050.
Tisell, Claes Gustav Erik Yngve; Svenssoo, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstenssoo, Gustav Yngve; and Hartmann, John Fredrik Alf, to Forenade Fabriksverken. Vehicle deceleration sensing device. 4,108,005, Cl. 73-514.000.
Tiskus, John R.: *See—*
  Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., 4,109,142, Cl. 235-92.0DN.
TK Valve Limited: *See—*
  Calvert, Michael Arnold; and Senger, David Joseph, 4,108,196, Cl. 137-72.000.
TMC Corporation: *See—*
  Weigl, Erwin; and Svoboda, Josef, 4,108,466, Cl. 280-605.000.
Tokai-Rika-Denki-Seisakusho: *See—*
  Oishi, Susumu; and Iwatsuki, Masahiro, 4,108,394, Cl. 242-107.40A.
Tokico Ltd.: *See—*
  Kato, Tetuo, 4,108,287, Cl. 188-315.000.
Tokico Ltd: *See—*
  Nagase, Toshiro; and Hatakeyama, Susumu, 4,108,416, Cl. 248-400.000.
Tokuda, Akira: *See—*
  Ito, Ryozo; and Tokuda, Akira, 4,108,123, Cl. 123-119.0EC.
Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
  Komatu, Kisao, 4,108,305, Cl. 206-330.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
  Katakura, Masayuki; and Yamada, Hisashi, 4,109,165, Cl. 307-229.000.
  Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
  Sasaki, Minoru, 4,109,141, Cl. 235-92.0CA.
Tokyo Yogyo Kabushiki Kaisha: *See—*
  Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.
Tollerz, Carl Ove: *See—*
  Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, 4,109,098, Cl. 174-106.0SC.
Tomalinas, William R., Jr.; and Gurbst, Herbert S., to Roth American, Inc. Child's desk with slide-door and guideway therefor. 4,108,517, Cl. 312-297.000.
Tomcanin, William J.: *See—*
  Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., 4,109,142, Cl. 235-92.0DN.
Tomioka, Shinji: *See—*
  Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.
Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Waveform producing system. 4,109,208, Cl. 328-13.000.
Tomita, Koji: *See—*
  Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, to Nippon Kokan Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Brick for sliding closure of vessel for holding molten metal. 4,108,675, Cl. 106-56.000.
Tomizawa, Choji: *See—*
  Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.
Tompkins, James Darrell, to International Business Machines Corporation. Self-scanning photo-sensitive circuits. 4,109,284, Cl. 358-212.000.
Toog, George L.: *See—*
  Heory, David W.; and Toog, George L., 4,109,076, Cl. 536-4.000.
Tong, Yulan C., to Dow Chemical Company, The. Microbicidal (pyridinylamino) alkyl guanidines. 4,108,859, Cl. 260-296.00R.
Tonomura, Shinji: *See—*
  Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
Toratani, Hisayoshi; and Izumitani, Tetsuro, to Hoya Corporation. Optical phosphate glass in which the length of the light path is temperature independent. 4,108,673, Cl. 106-47.00Q.
Toray Industries, Inc.: *See—*
  Kondo, Tsuneyuki; and Kuroda, Akio, 4,108,895, Cl. 260-566.00A.
Torii, Takashi: *See—*
  Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
Torres, Richard J. Wax-stripper and applicator device. 4,107,813, Cl. 15-246.000.
Toshiba House Living Industry Co., Ltd.: *See—*
  Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
Toshiba Silicone Co., Ltd.: *See—*
  Hatanaka, Masayuki; Matsumoto, Makoto; and Yooezawa, Masaharu, 4,108,833, Cl. 528-31.000.
Towmotor Corporation: *See—*
  Wojtyna, Elias, 4,108,266, Cl. 180-68.500.
Townsend, Darold I. Fan rotor means. 4,108,568, Cl. 415-98.000.
Townsend, Donald I.: *See—*
  Timm, Edward E.; and Townsend, Donald I., 4,108,113, Cl. 123-3.000.
Toyo Boseki Kabushiki Kaisha: *See—*
  Tachibana, Yoshishige, 4,107,801, Cl. 8-152.000.
Toyo Kogyo Co., Ltd.: *See—*
  Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, 4,108,137, Cl. 123-242.000.
Toyo Seikan Kaisha, Ltd.: *See—*
  Nohara, Shigezo, 4,109,037, Cl. 428-35.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
  Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, 4,109,188, Cl. 318-602.000.
Toyoshima, Toshihiko, to Xerox Corporation. Vocal timing indicator device for use in voice recognition. 4,109,104, Cl. 179-1.0SD.
Toyoshima, Yasuo: *See—*
  Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, 4,108,879, Cl. 260-405.600.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,022, Cl. 74-645.000.
  Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,289, Cl. 192-3.300.
  Ito, Ryozo; and Tokuda, Akira, 4,108,123, Cl. 123-119.0EC.
  Kondo, Yutaka; and Nishina, Shubo, 4,108,471, Cl. 280-747.000.
  Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.
  Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, 4,108,951, Cl. 261-34.00B.
  Sanada, Masakatsu; and Nakada, Masahiko, 4,108,126, Cl. 123-122.00E.
Tozzi, Antonio: *See—*
  Cassandrini, Paolo; and Tozzi, Antonio, 4,108,829, Cl. 260-45.8NT.
Tozzi, Louis M.: *See—*
  Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., 4,108,075, Cl. 102-214.000.
Trallfa Nils Underhaug A/S: *See—*
  Inoue, Kiyoshi; and Molaug, Ole, 4,108,357, Cl. 235-119.000.
  Molaug, Ole, 4,107,948, Cl. 64-2.00P.
Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, to Societe Nationale des Petroles d'Aquitaine. Sulphoxides. 4,108,866, Cl. 260-329.00R.
Treaty Products Incorporated: *See—*
  Unger, Harold Victor, 4,108,065, Cl. 100-215.000.
Tredway, Wynn B., Sr. Golf swing training apparatus and method. 4,108,441, Cl. 273-186.00A.
Trinks, Walter Louis Adolf; and Struth, Wolfgang Ferdinand, to Deutsch-Franzosisches Forschungsinstitut. Armor-piercing projectile having spaced cores. 4,108,072, Cl. 102-52.000.
Trio Engineering Ltd.: *See—*
  Helgesen, Willy, 4,107,904, Cl. 53-142.000.
Trio Kabushiki Kaisha: *See—*
  Iimura, Koichi, 4,108,510, Cl. 312-8.000.
Triumph Werke Nurnberg A.G.: *See—*
  Skrzipek, Jurgen; and Reuter, Helge, 4,108,557, Cl. 400-697.100.
Trivedi, Bhupendra C.; Grimm, Robert A.; and McConnell, R. B., to Ashland Oil, Inc. Method for quaternizing imidazolines. 4,109,094, Cl. 548-347.000.

Trivedi, Prakash Druman: *See—*
  Bohm, Georg Gustav Antoo; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, 4,108,749, Cl. 204-159.170.
Trofimov, Valery Ivanovich: *See—*
  Kharazov, Konkordy Innokentievich; Netsvetaev, Gennady Viktorovich; and Trofimov, Valery Ivanovich, 4,109,219, Cl. 335-78.000.
Trott, Arthur F.: *See—*
  Hartman, Robert M.; and Trott, Arthur F., 4,108,182, Cl. 128-305.000.
Trozzi, Norman Kenneth, to Foster Wheeler Energy Corporation. Multiple point feeder. 4,108,301, Cl. 198-633.000.
True Temper Corporation: *See—*
  Rebhun, Charles F., 4,107,841, Cl. 30-276.000.
Truman, Peter T.: *See—*
  Eastcott, Peter DeH.; and Truman, Peter T., 4,108,280, Cl. 187-20.000.
Trussell, Gerald C.; and Arnston, Robert W., to Sun Electric Corporation. Vehicle diagnosis data entry system. 4,108,362, Cl. 235-375.000.
TRW Inc.: *See—*
  McKee, William H., 4,108,526, Cl. 339-103.00M.
  Rizzo, Anthony A., 4,108,424, Cl. 267-160.000.
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, to Siemens Aktiengesellschaft. Gamma camera. 4,109,155, Cl. 250-505.000.
Tsukada, Katsushige: *See—*
  Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, 4,108,666, Cl. 96-115.00P.
Tsukiura, Hiroshi: *See—*
  Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.
Tsumura, Yoshishige, to Mitsui Aluminum Co., Ltd. Process for production of aluminum. 4,108,741, Cl. 204-67.000.
Tsunekawa, Tokuichi: *See—*
  Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.
Tsuru, Shinobu: *See—*
  Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., to Marvin Glass & Associates. Action toy for land and water. 4,107,872, Cl. 46-103.000.
Turner, Roger C.: *See—*
  Knight, J. Nelson; and Turner, Roger C., 4,107,833, Cl. 29-460.000.
Twiflex Couplings Limited: *See—*
  Stewart, John; and Stevens, Roger Charles, 4,108,294, Cl. 192-85.00R.
Tylan Corporation: *See—*
  Dozier, Alfred R., 4,108,106, Cl. 118-49.000.
Tyler, Hugh J., to Robertshaw Controls Company. Electrical unit having a bus-bar and a selector and method of making the same. 4,109,120, Cl. 200-51.00R.
Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, to Measurex Corporation. Contacting caliper gauge. 4,107,847, Cl. 33-147.00L.
Tysdal, Daryl D. Flexible covering anchor. 4,107,826, Cl. 24-243.00K.
Uarco Incorporated: *See—*
  Peschke, Gordon C., 4,108,352, Cl. 229-69.000.
Ubel, Helmut, to International Standard. Electric Corporation. Arrangement for protecting data communication in a continuous automatic train control system. 4,108,404, Cl. 246-34.0CT.
Uchida, Kazuo: *See—*
  Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,109,079, Cl. 536-26.000.
Uchiyama, Hiroaki: *See—*
  Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, 4,108,544, Cl. 355-8.000.
Uchiyama, Yasuji: *See—*
  Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.
Ue, Raymond C.: *See—*
  Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, 4,109,185, Cl. 318-571.000.
Ueno, Shoji, to Victor Company of Japan, Limited. Peak level indicating electronic circuit. 4,109,198, Cl. 324-103.00P.
Ueno, Zene: *See—*
  Kosaka, Katuaki; and Ueno, Zene, 4,108,114, Cl. 123-3.000.
Ugine Aciers: *See—*
  Armand, Marcel; and Charquet, Daniel, 4,108,687, Cl. 148-2.000.
Uibel, Paul-Ulrich: *See—*
  Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.
Ullman, Myron E., Jr., to Kessler Products Co., Inc. Soap-in plastic frame for panels. 4,107,897, Cl. 52-823.000.
UMC Industries, Inc.: *See—*
  Falk, Leooard P.; Stadler, Robert L.; and Alford, James R., 4,108,333, Cl. 221-13.000.
Unex Conveying Systems, Inc.: *See—*
  McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., 4,108,304, Cl. 198-781.000.
Unger, Harold Victor, to Treaty Products Incorporated. Can compactor. 4,108,065, Cl. 100-215.000.
Unger, Rooald James; and Spoonamore, John Gilbert, to Dana Corporation. System for maintaining level of oil in engine. 4,107,984, Cl. 73-113.000.
Ungerer geb. Dollinger, Irma: *See—*
  Ihle, Josef, 4,107,970, Cl. 72-165.000.
Unicare Systems, Inc.: *See—*
  Saliaris, George P., 4,108,181, Cl. 128-303.100.
Union Carbide Corporation: *See—*
  Austin, Terry Marshall; Carroll, Eugene Thomas; and Bowen, Mildred Choi, 4,108,552, Cl. 356-87.000.
  Kaufman, George, 4,108,222, Cl. 141-337.000.
Uniroyal, Inc.: *See—*
  Mao, Chung-Ling, 4,108,868, Cl. 260-332.100.
  McCoy, Robert H., 4,109,039, Cl. 428-95.000.
United Merchants and Manufacturers, Inc.: *See—*
  Pappas, Charles, 4,108,595, Cl. 8-1.00A.
United States Gypsum Company: *See—*
  Wendt, Alan C., 4,107,887, Cl. 52-105.000.
United States of America
  Agriculture: *See—*
    Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., 4,108,748, Cl. 204-159.120.
  Air Force: *See—*
    Arnold, Fred E.; and Wolfe, James F., 4,108,835, Cl. 528-183.000.
    Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,108,926, Cl. 260-874.000.
    Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., 4,107,980, Cl. 73-88.00R.
    Davis, Dale M., 4,108,073, Cl. 102-52.000.
    Evers, Robert C., 4,108,884, Cl. 260-453.0RW.
    O'Connell, Robert M., 4,109,172, Cl. 310-313.000.
    O'Connell, Robert M., 4,109,173, Cl. 310-313.000.
  Army: *See—*
    Clodfelter, Glen A., 4,108,700, Cl. 156-153.000.
    Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,108,721, Cl. 176-36.00R.
    Epstein, Joseph; and Davis, George T., 4,108,950, Cl. 260-986.000.
    Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., 4,109,020, Cl. 426-241.000.
    Hayes, Hugh V., 4,108,390, Cl. 242-55.530.
    Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., 4,108,075, Cl. 102-214.000.
    Merriam, Arthur T., 4,108,191, Cl. 135-2.000.
    Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., 4,108,746, Cl. 204-158.00R.
    Proto, Richard C., 4,108,359, Cl. 235-304.000.
    Rahman, Abdul R.; and Haralampu, Stepheo G., 4,109,026, Cl. 426-640.000.
  Energy: *See—*
    Doody, Thomas J., 4,108,207, Cl. 137-625.470.
    Steyert, William A., Jr., 4,107,935, Cl. 62-3.000.
  Health, Education and Welfare: *See—*
    Kantor, Gideon, 4,108,147, Cl. 128-404.000.
  National Aeronautics and Space Administration; administrator; with respect to an invention of:
    Holley, Larry D.; and Ward, James O. Digital automatic gain amplifier. 4,109,213, Cl. 330-2.000.
  National Aeronautics and Space Administration: *See—*
    Fortini, Anthony; and Kazaroff, John M., 4,108,241, Cl. 165-146.000.
    Sokolowski, Daniel E., 4,107,919, Cl. 165-169.000.
  Navy: *See—*
    Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., 4,109,199, Cl. 324-202.000.
    Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., 4,109,232, Cl. 340-6.00R.
    Groutage, Frederick D.; and Borunda, Gabriel S., 4,108,400, Cl. 244-3.130.
    Heller, Carl A., 4,108,604, Cl. 23-230.00R.
    Kiraly, Louis J., 4,108,046, Cl. 89-43.00A.
    Martin, William E., 4,108,622, Cl. 65-30.00R.
    McCartney, Joseph F.; and Gundersen, Charles R., 4,109,062, Cl. 429-6.000.
    Nyswander, Reuben E., 4,109,216, Cl. 331-87.000.
    Potter, Vernon L., 4,107,946, Cl. 62-514.00R.
    Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., 4,108,025, Cl. 81-3.00R.
    Wrench, Edwin H., Jr.; Hicks, Jay C.; and McCartney, Joseph F., 4,109,117, Cl. 179-175.30F.
U.S. Packaging Corp.: *See—*
  Mennen, Frederick C., 4,108,729, Cl. 195-127.000.
U.S. Philips Corporation: *See—*
  Durr, Heinrich; and Haubrich, Lothar, 4,108,297, Cl. 400-354.000.
  Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, 4,109,203, Cl. 325-38.00B.
  Heuser, Rolf; and Govaert, George Albert, 4,109,162, Cl. 307-203.000.
  Schylander, Eric Christian, 4,109,277, Cl. 358-8.000.
  Voss, Rainer, 4,109,106, Cl. 179-1.00N.
United States Pipe and Foundry Company: *See—*
  Graham, Robert Malcolm, 4,108,481, Cl. 285-231.000.
United States Steel Corporation: *See—*
  Martin, Wayne A., 4,107,972, Cl. 72-334.000.
  Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., 4,109,142, Cl. 235-92.0DN.
United Technologies Corporation: *See—*
  Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., 4,109,061, Cl. 428-678.000.

Egan, William J., Jr.; and Mazer, Lloyd M., 4,108,591, Cl. 431-121.000.

Jowett, Terence W.; and Smith, Harvey A., 4,108,008, Cl. 73-756.000.

Marscher, William D., 4,109,031, Cl. 427-191.000.

Platt, Charles Elmore, 4,108,572, Cl. 416-230.000.

Salkeld, Richard W., 4,108,236, Cl. 164-338.00R.

Universal Fluid Heads (Aust.) Pty. Limited: *See—*

Miller, Robert Eric; and Jackson, Stanley Bishop, 4,108,412, Cl. 248-181.000.

Universities Federation for Animal Welfare: *See—*

Scott, Walter Norris; and MacArthur, Judy Anne, 4,107,818, Cl. 17-51.000.

University of Akron, The: *See—*

Fetters, Lewis J.; and Bi, Le-Khac, 4,108,945, Cl. 260-880.00B.

University of California, The Regents of the: *See—*

Fukuto, Tetsuo Roy; and Black, Allan Lindsay, 4,108,991, Cl. 424-248.500.

University of Chicago: *See—*

Fried, Josef; and Elliott, William J., 4,108,870, Cl. 260-340.90R.

Unkauf, Manfred G., to Raytheon Company. Reverberation compensating communication system. 4,109,100, Cl. 178-67.000.

UOP Inc.: *See—*

Gewartowski, Steve A., 4,108,914, Cl. 260-671.00R.

Hemler, Charles L.; and Stine, Laurence O., 4,108,795, Cl. 252-419.000.

Rosback, Donald H.; and Neuzil, Richard W., 4,108,915, Cl. 260-674.0SA.

Ryu, Ji-Yong, 4,108,920, Cl. 260-683.15B.

Upjohn Company, The: *See—*

Chen, Augustin T.; and Onder, Kemal B., 4,108,843, Cl. 528-74.000.

Morton, Douglas Ross, Jr., 4,108,878, Cl. 260-408.000.

Nelson, Norman A., 4,108,900, Cl. 260-590.00C.

Nelson, Norman A., 4,108,901, Cl. 260-590.00C.

Nelson, Norman A., 4,108,902, Cl. 260-590.00C.

Nelson, Norman A., 4,108,903, Cl. 260-590.00C.

Sih, John C., 4,109,082, Cl. 542-426.000.

Wingard, Robert Dean, 4,108,606, Cl. 23-252.00R.

Urai, Muneharu; Goto, Shuichi; and Fukui, Yutaka, to Tachikawa Spring Co., Ltd. Method of manufacturing seat cushions. 4,107,829, Cl. 29-91.100.

Urlaub, Reinhold: *See—*

Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, 4,109,017, Cl. 426-51.000.

USM Corporation: *See—*

Renner, Wolf; and Mauer, Dieter, 4,108,507, Cl. 308-238.000.

Usuda, Shinji: *See—*

Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Vachenauer, Erwin; and Mueller, Bernd, to Siemens Aktiengesellschaft. Circuit for the comparative vector measurement of radio signal pulses which arrive approximately simultaneously in a plurality of receivers. 4,109,250, Cl. 343-112.00R.

Vajna, Sandor, to Vajna, Sandor. Ion exchange process with countercurrent fractional regeneration. 4,108,766, Cl. 210-32.000.

Valaitis, Joseph Kestutis: *See—*

Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, 4,108,749, Cl. 204-159.170.

Valerio, Robert Michael. Traction device. 4,108,267, Cl. 180-71.000.

Valiga, Richard E. Process for treating waste sludge from combustion plant desulfurization units and cementitious product of the process. 4,108,677, Cl. 106-109.000.

Valyocsik, Ernest William: *See—*

Rollmann, Louis Deane; and Valyocsik, Ernest William, 4,108,881, Cl. 260-448.00C.

Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, to Agfa-Gevaert, N.V. Lippmann-emulsions and reversal processing thereof. 4,108,661, Cl. 96-59.000.

vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., to Monroe Auto Equipment Company. Windshield wiper construction. 4,107,814, Cl. 15-250.420.

van der Breggen, Gerrit: *See—*

de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, 4,108,664, Cl. 96-75.000.

van der Lely, Cornelis. Agricultural implements. 4,108,089, Cl. 111-7.000.

van der Walt, Johann George: *See—*

Nyman, Roland John; and van der Walt, Johann George, 4,108,171, Cl. 128-142.200.

Vanderwerf, Dennis F.: *See—*

Anderson, Raymond H.; and Vanderwerf, Dennis F., 4,108,540, Cl. 350-211.000.

van der Zeeuw, Abraham J.: *See—*

Kok, Riekert; and van der Zeeuw, Abraham J., 4,108,958, Cl. 423-24.000.

Van Dort, Jacobus Maurits, to Hollandse Signaalapparaten B.V. Method of manufacturing twistless yarn and yarn obtained by this method. 4,107,914, Cl. 57-164.000.

Van Dyke, Dave: *See—*

Nelson, David H., 4,108,154, Cl. 126-270.000.

Van Dyke, Homer: *See—*

Nelsoo, David H., 4,108,154, Cl. 126-270.000.

van Eekelen, Alex H.: *See—*

vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,107,814, Cl. 15-250.420.

Van Elten, Gerrit Jan; and Hurkmans, Antonius, to Tech. Ontwikkelingsbureau Van Elten B.V. Apparatus for storing cheese loaves and for periodically turning them upside down. 4,108,056, Cl. 99-452.000.

van Hardeveld, Rudolf; and Hendriks, Petrus F.A.M., to Stamicarbon, B.V. A process for preparing melamine. 4,109,090, Cl. 544-201.000.

Van Herten, Jozef Marie, to Oce-van der Grinten N.V. Power control circuit and electro(photo)graphic apparatus employing same. 4,109,134, Cl. 219-216.000.

Van Logten, Henrious: *See—*

Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, 4,108,048, Cl. 91-6.500.

van Mullekom, Hubert Peter, to Ruti-Te Strake B.V. Weaving loom with tension adjustor for warp edge threads. 4,108,214, Cl. 139-97.000.

Varga, Otto Herman, to Resilient Grip Limited. Anchorage appliance. 4,108,043, Cl. 85-70.000.

Varga, Sandor L.: *See—*

Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., 4,108,987, Cl. 424-177.000.

Varian Associates, Inc.: *See—*

Landfors, Arthur A., 4,108,576, Cl. 417-153.000.

Varni, Anselm Francis; and Sandor, Joseph, to Innovative Computer Products. Magnetic disc cleaning machine. 4,107,810, Cl. 15-97.00R.

Vary, Robert F.; and Mamo, Anthony C., to Vary, Robert F.; and BVM Ltd. Energy saving device for habitable building enclosures having a heat changing system. 4,108,238, Cl. 165-57.000.

Veb Polygraph Leipzig: *See—*

Werner, Hans-Dieter, 4,108,067, Cl. 101-224.000.

Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., to Merck & Co., Inc. Cyclic hexapeptides. 4,108,987, Cl. 424-177.000.

VEDA, Inc.: *See—*

Richardson, James L., 4,108,380, Cl. 239-172.000.

Veeder Industries, Inc.: *See—*

Bateman, Coates F.; and Soltanoff, Louis, 4,107,992, Cl. 73-260.000.

Veligura, Ilya Lukyanovich: *See—*

Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Velsicol Chemical Corporation: *See—*

Anderson, Arnold L., 4,108,906, Cl. 260-609.00R.

Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, to Venetta, Inc. Method for fuel/air feed pressure control by stack temperature. 4,108,594, Cl. 432-24.000.

Venetta, Inc.: *See—*

Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, 4,108,594, Cl. 432-24.000.

Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH: *See—*

Schmidt, Manfred; and Luithlen, Heinz, 4,108,465, Cl. 280-605.000.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*

Kogler, Peter, 4,108,494, Cl. 299-1.000.

Verstraaten, Peter: *See—*

Conibear, Frank; and Verstraaten, Peter, 4,107,868, Cl. 43-88.000.

Victor Company of Japan, Limited: *See—*

Ueno, Shoji, 4,109,198, Cl. 324-103.00P.

Victoreen, John A. Hearing aid receiver with plural transducers. 4,109,116, Cl. 179-107.00E.

Vidmar, Albert J., to Sherwood Refractories Inc. Dust collection and illumination system. 4,109,144, Cl. 240-2.00V.

Vigliecca, Lucien: *See—*

Azemar, Michel; and Vigliecca, Lucien, 4,109,069, Cl. 526-65.000.

Viking Metallurgical Corp.: *See—*

Walberg, M. Victor; and Lowe, James H. C., 4,108,644, Cl. 75-135.000.

Vink, Richard C., to North American Philips Corporation. Variable brew coffee maker. 4,108,053, Cl. 99-306.000.

Vinton, David S., to Caterpillar Tractor Co. Suspension system for tandem axle vehicles. 4,108,470, Cl. 280-677.000.

Vixie, Dennis E.: *See—*

Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,107,858, Cl. 36-134.000.

Vlad, Constantin: *See—*

Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.

Vock, Manfred Hugo: *See—*

Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.

Vogt, B. Richard: *See—*

Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,108,860, Cl. 260-304.00A.

Vogt, Robert K.; and Heit, Martin A., to E. W. Buschman Company, The. Power transmission assembly for an accumulator conveyor. 4,108,303, Cl. 198-781.000.

von Allworden, Wilhelm; and Kunze, Dieter, to Jean Walterscheid GmbH. Coupling hook for a three-point attachment of a tractor. 4,108,464, Cl. 280-508.000.

von Basse, Paul Werner; and Hofmann, Rudiger, to Siemens Aktiengesellschaft. Semiconductor store. 4,109,270, Cl. 357-23.000.

von der Heyden, Horst: *See—*

Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.

Von Statten, Richard J., Jr. Earphone mounting in safety helmet for motorcycle riders. 4,109,105, Cl. 179-1.0VE.

Vorbruggen, Helmut; and Niedballa, Ulrich, to Schering Aktiengesellschaft. N-(Polysaccharidyl)-nitrogen heterocycles, especially pyrimidine or purine bases, and process for their preparation. 4,109,078, Cl. 536-26.000.

Vorontsov, Vladimir Lvovich: *See—*

Khvalovsky, Vladimir Vasilievich; Natarovsky, Sergei Nikolaevich; Nalivaiko, Valentin Iosifovich; and Vorontsov, Vladimir Lvovich, 4,109,304, Cl. 362-259.000.

Vorwerk & Co Interholding GmbH: *See—*

Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.

Voss, Klaus: *See—*

Wanner, Karl; and Voss, Klaus, 4,107,949, Cl. 64-9.00A.

Voss, Rainer, to U.S. Philips Corporation. Audiometer. 4,109,106, Cl. 179-1.00N.

Vossen, Franz. Method of and apparatus for breaking away of prepunched pieces of material from curved or arched sheets of material. 4,108,343, Cl. 225-1.000.

Vydra, Karel: *See—*

Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.

W. R. Grace & Co.: *See—*

Crose, James R., 4,109,027, Cl. 427-28.000.

Wacker-Chemie GmbH: *See—*

Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, 4,108,964, Cl. 423-336.000.

Wacker-Chemitronik Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*

Kohl, Franz, 4,109,128, Cl. 219-10.430.

Wada, Tsuneo: *See—*

Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. Triazolobenzisothiazole-1,1-dioxides. 4,108,860, Cl. 260-304.00A.

Wagner, John T., to Westinghouse Electric Corp. Vibratory tuning of rotatable blades for elastic fluid machines. 4,108,573, Cl. 416-236.00A.

Wagner, Josef: *See—*

Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.

Wagner, Sigurd: *See—*

Pritchard, Assunta Anna; and Wagner, Sigurd, 4,108,716, Cl. 156-636.000.

Wakatsuki, Yuzo: *See—*

Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.

Wakimura, Yutaka, to West Electric Company, Ltd. Adaptor for photographic flash device. 4,109,301, Cl. 362-7.000.

Waku, Makio: *See—*

Minami, Hidehiro; and Waku, Makio, 4,108,121, Cl. 123-119.0EC.

Wakui, Kotaro: *See—*

Hirose, Ryusho; and Wakui, Kotaro, 4,109,279, Cl. 358-55.000.

Walberg, M. Victor; and Lowe, James H. C., to Viking Metallurgical Corp. Manufacture of reactive metals and alloys. 4,108,644, Cl. 75-135.000.

Walden, Carl W., to Agri-Bio Corporation. Automatic injecting apparatus. 4,108,176, Cl. 128-218.00A.

Wallace, Herbert F.; and Weir, Donald R., to Sherritt Gordon Mines Limited. Hydrometallurgical process for the production of cobalt powder from mixed metal sulphides. 4,108,640, Cl. 75-103.000.

Wallack, Marc K., to Wistar Institute, The. Viral oncolysate vaccine for stimulating the immune mechanism of mammals to species-specific tumors. 4,108,983, Cl. 424-89.000.

Walter, Derek Oscar, to Johnson, Matthey & Co., Limited. Accelerometers. 4,108,006, Cl. 73-517.00R.

Walter, Lothar: *See—*

Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.

Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.

Wandler, Richard A., to General Electric Company. Female terminal and method of making such. 4,108,530, Cl. 339-256.0SP.

Wang, Tse Lin: *See—*

Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.

Wanner, Karl; and Voss, Klaus, to Robert Bosch GmbH. Tool shank and chuck combination for hammer drill. 4,107,949, Cl. 64-9.00A.

Ward, James O.: *See—*

United States of America, National Aeronautics and Space Administration; Holley, Larry D.; and Ward, James O., 4,109,213, Cl. 330-2.000.

Wareham, Richard R., to Polaroid Corporation. Flip flash having automatic indicator control. 4,109,302, Cl. 362-10.000.

Warner, Harlow L.: *See—*

Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,108,630, Cl. 71-94.000.

Warner, John Craig; and Gravel, Mark William, to Borg-Warner Corporation. Power transmission belt. 4,108,012, Cl. 74-231.00C.

Warner, Peter Stuart; and Bicht, John Richard, to Lucas Industries Limited. Battery packs. 4,109,064, Cl. 429-66.000.

Warren, Casimir G.: *See—*

Spino, Raymond N.; and Warren, Casimir G., 4,107,843, Cl. 32-14.00E.

Warren-Teed Laboratories, Inc.: *See—*

Johnson, Richard C.; and deBenneville, Peter L., 4,109,006, Cl. 424-277.000.

Wasilczyk, George James, to Dow Chemical Company, The. High resiliency polyurethane foams. 4,108,791, Cl. 252-182.000.

Watanabe, Hiroshi: *See—*

Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, to Janome Sewing Machine Co. Ltd. Pattern stitching speed control system for electronic sewing machines. 4,108,093, Cl. 112-158.00E.

Watanabe, Mitsuru: *See—*

Satoh, Kenji; and Watanabe, Mitsuru, 4,109,129, Cl. 219-10.55B.

Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, to Matsushita Electronics Corporation. High pressure sodium vapor discharge lamp. 4,109,175, Cl. 313-112.000.

Waterhouse, John Sidney: *See—*

Green, George Edward; and Waterhouse, John Sidney, 4,108,803, Cl. 96-76.00R.

Wathen, Tom M.: *See—*

Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., 4,108,923, Cl. 260-836.000.

Watson, Charles J.; and Hrastnik, Walter, to Bell & Howell Company. Light valve system for motion picture film printer. 4,108,537, Cl. 350-150.000.

Watson, Sanders Chapman. Stirling engine. 4,107,925, Cl. 60-521.000.

Wattimena, Freddy, to Shell Oil Company. Isomerization of terpene compounds. 4,108,917, Cl. 260-677.00R.

Watts, Brian Michael: *See—*

Stowell, Michael James; and Watts, Brian Michael, 4,108,691, Cl. 148-11.50A.

Wavin B.V.: *See—*

Ettema, Ernst, 4,108,480, Cl. 285-197.000.

Wayson, Andrew J., to Litton Industrial Products, Inc. Air-cooled traveler. 4,107,913, Cl. 57-125.000.

Wearmouth, William Ronald, to International Nickel Company, Inc., The. Hard, heat-resistant nickel electrodeposits. 4,108,740, Cl. 204-11.000.

Weaver, William W.: *See—*

Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,108,212, Cl. 138-122.000.

Weber, Claude Edmond Georges, to Societe d'Etudes et de Realisations Electroniques. Observation and aiming apparatus, particularly on a vehicle. 4,108,551, Cl. 356-4.000.

Weber, Donald William, to Ampex Corporation. Method and apparatus for providing a stable, high gain servo system. 4,109,184, Cl. 318-327.000.

Weber, Karl-Arnold: *See—*

Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.

Weed Eater, Inc.: *See—*

Moore, Robert J., 4,107,901, Cl. 56-17.500.

Weedon, Gene Clyde: *See—*

Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, 4,108,922, Cl. 260-830.00P.

Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., to Bio-Rad Laboratories, Inc. Radioimmunoassay for thyroid hormone. 4,108,974, Cl. 424-1.000.

Weigert, Karl, to Reliable Attachment Company. Ruffling attachment. 4,108,094, Cl. 112-134.000.

Weigl, Erwin; and Svoboda, Josef, to TMC Corporation. Ski brake. 4,108,466, Cl. 280-605.000.

Weiler and Company: *See—*

Weiler, James G., 4,108,387, Cl. 241-82.500.

Weiler, James G., to Weiler and Company. Hollow pin assembly for food grinders. 4,108,387, Cl. 241-82.500.

Weiner, Jerold Samuel: *See—*

Freimuth, Gerhart William; and Weiner, Jerold Samuel, 4,108,221, Cl. 141-146.000.

Weir, Donald R.: *See—*

Wallace, Herbert F.; and Weir, Donald R., 4,108,640, Cl. 75-103.000.

Weir, Gary L., to Pullman Incorporated. Fold back landing gear leg. 4,108,472, Cl. 280-763.000.

Weir Pumps Limited: *See—*

Ryall, Michael Leslie; and Robertson, James Rennie, 4,108,569, Cl. 415-112.000.

Weiss, Carl Dennis: *See—*

Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.

Weiss & Co.: *See—*

Weiss, Josef, 4,108,771, Cl. 210-50.000.

Weiss, Josef, to Weiss & Co.; Kemiska Konsultbyran A.G.; and Chemical Consults Corp., Ltd. Elimination of odors from organic wastes. 4,108,771, Cl. 210-50.000.

Weisz, Thomas Anthony, to General Binding Corporation. Low mass electric heater. 4,108,713, Cl. 156-499.000.

Welch, Henry W., to Armstrong Cork Company. Method of and apparatus for controlling thickness of coating applied to moving fabric. 4,109,034, Cl. 427-355.000.

Welch, Richard D.; and Iversen, John E., to Eastman Kodak Company. Method of forming an article-tape product. 4,108,702, Cl. 156-192.000.

Wells, Rodney Lee: *See—*

Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, 4,108,922, Cl. 260-830.00P.

Wemmers, Anton: *See—*

de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, 4,108,664, Cl. 96-75.000.

Wendel, Ion L., to Lowe, James L. Solar collector. 4,108,159, Cl. 126-271.000.

Wendt, Alan C., to United States Gypsum Company. Sound absorbing system. 4,107,887, Cl. 52-105.000.

Wiechert, Rudolf: *See—*

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.

Wiedemann, Friedrich, to J. Bobst & Fils, S.A. Suction conveyor. 4,108,302, Cl. 198-689.000.

Wiggins, Richard F., to Gyromat Corporation, The. Part gaging control for liquid spray system. 4,108,105, Cl. 118-2.000.

Wilcox, Brian Norris: *See—*

Robinson, John William; and Wilcox, Brian Norris, 4,108,037, Cl. 84-1.030.

Wildhaber, Ernest. Flexible-disk coupling. 4,107,950, Cl. 64-13.000.

Wilhelm Bott KG: *See—*

Scholl, Eugen, 4,108,516, Cl. 312-216.000.

Wilhoite, Murray O., to Martin Industries, Inc. Supplemental air supply for a fireplace. 4,108,144, Cl. 126-120.000.

Dipole radiators for feeding a parabolic reflector. 4,109,254, Cl. 343-797.000.

Wolze, Martin H. Coffee pot holder for recreational vehicle stove and the like. 4,108,140, Cl. 126-24.000.

Womack, Rolla J. Dispenser for a plurality of rolls of sheet material. 4,108,389, Cl. 242-55.300.

Wong, Louis Fay, to Procter & Gamble Company, The. Fabric conditioning articles and processes. 4,108,600, Cl. 8-137.000.

Wood, Ernest C.: *See—*

Samuels, Peter B.; and Wood, Ernest C., 4,108,161, Cl. 128-1.00R.

Samuels, Peter B.; and Wood, Ernest C., 4,108,306, Cl. 206-339.000.

Woodford, Clarence H., II, to Mining Equipment Division, FMC Corporation. Elevatable operator's compartment having a drill steel guide for a mine drilling machine. 4,108,253, Cl. 173-23.000.

Yamamoto, Keita: *See—*

Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.

Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, to Toyo Kogyo Co., Ltd. Rotary piston engines. 4,108,137, Cl. 123-242.000.

Yamana, Makoto; and Kubota, Nobunori, to Murata Kikai Kabushiki Kaisha. Pneumatic spinning apparatus. 4,107,911, Cl. 57-56.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*

Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Yamasa Shoyu Kabushiki Kaisha: *See—*

Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hirosbi, 4,109,079, Cl. 536-26.000.

ratus for controlling thickness of coating applied to moving fabric. 4,109,034, Cl. 427-355.000.

Welch, Richard D.; and Iversen, John E., to Eastman Kodak Company. Method of forming an article-tape product. 4,108,702, Cl. 156-192.000.

Wells, Rodney Lee: *See—*

Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, 4,108,922, Cl. 260-830.00P.

Wemmers, Anton: *See—*

de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Antoo, 4,108,664, Cl. 96-75.000.

Weodel, Ion L., to Lowe, James L. Solar collector. 4,108,159, Cl. 126-271.000.

Wendt, Alan C., to United States Gypsum Company. Sound absorbing system. 4,107,887, Cl. 52-105.000.

Wennerberg, Gunnar: *See—*

Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, 4,107,847, Cl. 33-147.00L.

Wenzel, Wolfgang: *See—*

Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, 4,108,814, Cl. 260-29.2TN.

Wereta, Anthony, Jr.: *See—*

Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,108,926, Cl. 260-874.000.

Werner, Hans-Dieter, to Veb Polygraph Leipzig. Method and apparatus for continuously printing uncased folded books. 4,108,067, Cl. 101-224.000.

Werner Peddinghaus: *See—*

Peddinghaus, Werner; and Regenbrecht, Ludwig, 4,108,564, Cl. 408-10.000.

Wesley-Jessen Inc.: *See—*

Loshaek, Samuel; and Shen, Chah M., 4,109,070, Cl. 526-77.000.

Wessel, Wolf: *See—*

Stumpp, Gerhard; Wessel, Wolf; Stein, Volkhard; and Ripper, Wolfgang, 4,108,117, Cl. 123-33.00A.

West Electric Company, Ltd.: *See—*

Wakimura, Yutaka, 4,109,301, Cl. 362-7.000.

West, Ernest James; and Brandenburg, Gary M., to Thermco Products Corporation. Adjustable gas flow control valve. 4,108,420, Cl. 251-129.000.

Westberg, John Kellogg, II, to Formistor Corporation. Method and apparatus for forming and trimming leads. 4,108,217, Cl. 140-105.000.

Westcott, Donald E.: *See—*

Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., 4,109,020, Cl. 426-241.000.

Western Electric Company, Inc.: *See—*

Blitchington, Frank Henning; and Hudson, George David, 4,109,158, Cl. 250-548.000.

Chang, Joseph Jawshin, 4,107,837, Cl. 29-625.000.

Dembiak, Matthew Raymond; and Newton, Wayne McCall, 4,109,099, Cl. 174-107.000.

Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., 4,107,838, Cl. 29-628.000.

Western Geophysical Co. of America: *See—*

Paitson, John Lloyd; and Hendley, Robert N., 4,108,272, Cl. 181-120.000.

Westinghouse Electric Corp.: *See—*

Cricchi, James R.; and Fitzpatrick, Michael D., 4,109,163, Cl. 307-205.000.

Davies, Norman, 4,109,293, Cl. 361-341.000.

Lang, Milton R., Jr.; and O'Berry, William A., 4,109,197, Cl. 324-78.00F,

Smith, James D. B.; and Phillips, David C., 4,108,001, Cl. 73-339.00R.

Wagner, John T., 4,108,573, Cl. 416-236.00A.

Westvaco Corporation: *See—*

Forbes, Hampton E., Jr., 4,108,350, Cl. 229-37.00R.

Wetzel, Alfred. Shingle-type wall panel. 4,107,896, Cl. 52-537.000.

Weyers, Richard E.: *See—*

Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E., 4,109,033, Cl. 427-314.000.

Whatmough, Nigel Stephen: *See—*

Robinson, Frank; and Whatmough, Nigel Stephen, 4,107,955, Cl. 66-176.000.

White, Allen A., to Hesston Corporation. Apparatus for binding a crop bale. 4,108,062, Cl. 100-11.000.

White, Eugene M. Cabinet mounting unit for free arm sewing machine. 4,108,512, Cl. 312-24.000.

Whitlock, Donald E.: *See—*

Babunovic, Momir; and Whitlock, Donald E., 4,108,774, Cl. 210-167.000.

Wicher, Daniel P., Jr., to Burroughs Corporation. Method of making a display panel and the anodes therefor. 4,108,521, Cl. 316-17.000.

Wickersheim, August, to Wickersheim & Johne Maschinen-und Verpackungsanlagen GmbH. Fully automatic device for packing piece goods, in particular fruits. 4,107,903, Cl. 53-138.00A.

Wickersheim & Johne Maschinen-und Verpackungsanlageo GmbH: *See—*

Wickersheim, August, 4,107,903, Cl. 53-138.00A.

Wideman, Lawson G.; and Bryson, Jay G., to Goodyear Tire & Rubber Company, The. Selective hydrogenatioo of cyclopentadiene to form cyclopentene using Raney nickel catalyst and polyol reactant. 4,108,911, Cl. 260-666.00A.

Widmann, Dietrich, to Siemens Aktiengesellschaft. Process for the productioo of fine structures consisting of a vapor-deposited material on a base. 4,108,717, Cl. 156-656.000.

Wiechert, Rudolf: *See—*

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.

Wiedemann, Friedrich, to J. Bobst & Fils, S.A. Suction conveyor. 4,108,302, Cl. 198-689.000.

Wiggins, Richard F., to Gyromat Corporation, The. Part gaging control for liquid spray system. 4,108,105, Cl. 118-2.000.

Wilcox, Brian Norris: *See—*

Robinson, John William; and Wilcox, Brian Norris, 4,108,037, Cl. 84-1.030.

Wildhaber, Ernest. Flexible-disk coupling. 4,107,950, Cl. 64-13.000.

Wilhelm Bott KG: *See—*

Scholl, Eugen, 4,108,516, Cl. 312-216.000.

Wilhoite, Murray O., to Martin Industries, Inc. Supplemental air supply for a fireplace. 4,108,144, Cl. 126-120.000.

Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., to Jacuzzi Bros. Inc. Cartridge filter. 4,108,775, Cl. 210-169.000.

Wilkinson, Geoffrey, to Johnson, Matthey & Co., Limited. Catalytic reactions. 4,108,905, Cl. 260-604.0HF.

Will, Fritz G.; and Secor, Fay W., to General Electric Company. Rechargeable aqueous zinc-halogen cell. 4,109,065, Cl. 429-105.000.

Williams, David M. Rail car safety reflector. 4,108,406, Cl. 246-474.000.

Williams, Derek Farnham; and Martin, Terence Geoffrey, to Coal Industry (Patents) Limited. Extraction of oil shales and tar sands. 4,108,760, Cl. 208-11.0LE.

Williams, Ian Gabriel: *See—*

Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, 4,108,796, Cl. 252-429.00B.

Williams, Malcolm; and Jones, Christopher Robin, to Lucas Electrical Company, Limited. Fuel injection systems for compression ignition engines. 4,108,115, Cl. 123-32.0EB.

Wilson, Phillip Steveo: *See—*

Mark, Victor; and Wilson, Phillip Steven, 4,108,820, Cl. 260-30.80R.

Mark, Victor; and Wilson, Phillip Steven, 4,108,821, Cl. 260-30.80R.

Wimmer, Adalbert: *See—*

Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, 4,107,827, Cl. 28-246.000.

Winchester Chemical Co.: *See—*

Sebelik, Robert V.; and Schaefer, Wilfried, 4,108,768, Cl. 210-43.000.

Wingard, Robert Dean, to Upjohn Company, The. Universal coupling for reaction injection molding machine. 4,108,606, Cl. 23-252.00R.

Winkler, Alfred: *See—*

Stemme, Otto; Lermann, Peter; and Winkler, Alfred, 4,108,542, Cl. 352-72.000.

Winkler, John W.: *See—*

MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, 4,108,021, Cl. 74-606.00R.

Winter, Heinrich: *See—*

Ehrhardt, Josef; and Winter, Heinrich, 4,108,737, Cl. 204-13.000.

Winterbottom, Harold E. Portable punch power gage. 4,108,428, Cl. 272-76.000.

Wirnitzer, Franz: *See—*

Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.

Wirt, Leon A., to Caterpillar Tractor Co. Tree shear tilting mechanism. 4,108,224, Cl. 144-34.00E.

Wistar Institute, The: *See—*

Wallack, Marc K., 4,108,983, Cl. 424-89.000.

Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., to International Flavors & Fragrances Inc. 5-Methyl-alpha[(methylthio)methyl]-2-furan acrolein. 4,108,876, Cl. 260-347.200.

Woelffer, Neill Carl, to Jacobsen Manufacturing Company. Governor control for an internal combustion engine. 4,108,120, Cl. 123-103.00B.

Woelffer, Neill Carl; and Grandrud, Merlin Howard, to Jacobsen Manufacturing Company. Lawn mower handle mounting. 4,108,456, Cl. 280-47.37R.

Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, to Miles Laboratories, Inc. Bicycloalkyl derivatives of prostaglandins: 11-deoxy-PGE$_1$ acids and esters. 4,108,892,.Cl. 260-514.00D.

Wohlford, William Paul, to Deere & Company. Joint assembly for links of endless track. 4,108,502, Cl. 305-14.000.

Wojtowicz, John A.: *See—*

Farmer, Douglas A., Jr.; and Wojtowicz, John A., 4,108,792, Cl. 252-187.00H.

Wojtyna, Elias, to Towmotor Corporation. Battery enclosure for a lift truck. 4,108,266, Cl. 180-68.500.

Wolf, Anthony David, to Du Pont de Nemours, E. I., and Company. Cycloalkaoopyrazole herbicides mixtures. 4,108,628, Cl. 71-92.000.

Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, to Bayer Aktiengesellschaft. Process for dyeing wet-spun aromatic polyamides in gel form. 4,108,936, Cl. 264-78.000.

Wolfe, James F.: *See—*

Arnold, Fred E.; and Wolfe, James F., 4,108,835, Cl. 528-183.000.

Wolff, Robert, to Better Built Machinery Corporation. Steam sterilizing apparatus. 4,108,601, Cl. 21-96.000.

Wollermann, Louis Albert: *See—*

Rucker, Dugan Allan; Wollermano, Louis Albert; and Krum, Jack Kern, 4,109,023, Cl. 426-549.000.

Woloszczuk, Edmund Wergiliusz, to Marconi Company Ltd., The.

Dipole radiators for feeding a parabolic reflector. 4,109,254, Cl. 343-797.000.

Wolze, Martin H. Coffee pot holder for recreational vehicle stove and the like. 4,108,140, Cl. 126-24.000.

Womack, Rolla J. Dispenser for a plurality of rolls of sheet material. 4,108,389, Cl. 242-55.300.

Woog, Louis Fay, to Procter & Gamble Company, The. Fabric conditioning articles and processes. 4,108,600, Cl. 8-137.000.

Wood, Ernest C.: *See—*

Samuels, Peter B.; and Wood, Ernest C., 4,108,161, Cl. 128-1.00R.

Samuels, Peter B.; and Wood, Ernest C., 4,108,306, Cl. 206-339.000.

Woodford, Clarence H., II, to Mining Equipment Division, FMC Corporation. Elevatable operator's compartment having a drill steel guide for a mine drilling machine. 4,108,253, Cl. 173-23.000.

Woodstream Corporation: *See—*

Conibear, Frank; and Verstraaten, Peter, 4,107,868, Cl. 43-88.000.

Wossner, Gunter, to Robert Bosch GmbH. Equipment for exhaust gas detoxification in internal combustion engines. 4,107,922, Cl. 60-298.000.

Wrench, Edwin H., Jr.; Hicks, Jay C.; and McCartney, Joseph F., to United States of America, Navy. Range division multiplexing. 4,109,117, Cl. 179-175.30F.

Wretemark, Sven Gunnar: *See—*

Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, 4,109,098, Cl. 174-106.0SC.

Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 3-(4-Chromanylamino)-2-oxazolidinones. 4,108,862, Cl. 260-307.00C.

Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 7-Dimethylamino-4-chromanone. 4,108,872, Cl. 260-345.200.

Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. O-(carboxymethyl)-4-chromanone oxime. 4,108,873, Cl. 260-345.200.

Wright, Peter John, to CIBA-GEIGY AG. Quaternary ammonium polymers and photographic materials containing same. 4,108,802, Cl. 526-17.000.

WRR Industries, Inc.: *See—*

Osborn, Norbert, 4,108,506, Cl. 308-187.000.

Wueger, Karl W. Yarn dispensing apparatus for a loom and the method thereof. 4,108,216, Cl. 139-452.000.

Wycklendt, Daniel A.; and Hudis, Martin, to Electric Power Research Institute, Inc. Current limiting fuse with resinous arc-quenching filler. 4,109,228, Cl. 337-276.000.

Xerox Corporation: *See—*

Donohue, James M.; and Fisk, Bernard C., 4,109.313, Cl. 364-518.000.

England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., 4,109,310, Cl. 364-200.000.

Goren, Robert N., 4,108,654, Cl. 96-1.200.

Hudson, Frederick W., 4,108,111, Cl. 118-655.000.

Hudson, Frederick W., 4,108,112, Cl. 118-655.000.

Jacques, James O.; and Carlson, Robert Dale, 4,109,189, Cl. 318-608.000.

Kropac, Joseph M., 4,108,655, Cl. 96-1.50R.

Rezanka, Ivan, 4,108,546, Cl. 355-15.000.

Snyder, Jan S., 4,109,316, Cl. 365-127.000.

Stemmle, Denis J., 4,108,547, Cl. 355-50.000.

Toyoshima, Toshihiko, 4,109,104, Cl. 179-1.0SD.

Yaguinuma, Jusuke, to Copal Company Limited. Rotary indicating device provided with a plurality of indicating plates. 4,108,355, Cl. 235-1.00C.

Yahagi, Ryohhei: *See—*

Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, 4,108,912, Cl. 260-667.000.

Yamabe, Masahiro, to Hitachi, Ltd. Francis-type runner for pump-turbine. 4,108,570, Cl. 416-186.00R.

Yamada, Hideo: *See—*

Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,108,040, Cl. 84-1.190.

Yamada, Hisashi: *See—*

Katakura, Masayuki; and Yamada, Hisashi, 4,109,165, Cl. 307-229.000.

Yamaguchi, Hisashi: *See—*

Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.

Yamaguchi, Masayuki: *See—*

Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.

Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, to Matsushita Electric Industrial Co., Ltd. Optical reader. 4,109,143, Cl. 235-462.000.

Yamaguchi, Yukio: *See—*

Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.

Yamaguti, Yasukazu: *See—*

Yoshimura, Masakiyo; and Yamaguti, Yasukazu, 4,108,823, Cl. 260-33.4PQ.

Yamamoto, Harunori, to Sony Corporation. Magnetic recording apparatus with a plurality of signal receiving devices. 4,109,115, Cl. 179-100.110.

Yamamoto, Keita: *See—*

Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.

Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, to Toyo Kogyo Co., Ltd. Rotary piston engines. 4,108,137, Cl. 123-242.000.

Yamana, Makoto; and Kubota, Nobunori, to Murata Kikai Kabushiki Kaisha. Pneumatic spinning apparatus. 4,107,911, Cl. 57-56.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*

Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Yamasa Shoyu Kabushiki Kaisha: *See—*

Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,109,079, Cl. 536-26.000.

Yamazaki, Haruo: *See—*

Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.

Yan, Tsoung-Yuan: *See—*

Chen, Nai Yuen; and Yan, Tsoung-Yuan, 4,108,730, Cl. 201-2.500.

Yanke, James N., to Raymond Lee Organization, Inc., The, a part interest. Full torque differential system. 4,108,015, Cl. 74-421.00A.

Yara Engineering Corporation: *See—*

Thompson, Thomas D., 4,109,049, Cl. 428-331.000.

Yashin, Michael: *See—*

Goldstein, Leonard; and Yashin, Michael, 4,108,277, Cl. 182-82.000.

Yaste, Joseph R.: *See—*

Szuhaj, Bernard F.; and Yaste, Joseph R., 4,108,678, Cl. 106-243.000.

Yasuda, Nozomi: *See—*

Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, 4,108,879, Cl. 260-405.600.

Yeoman, Brian Donald: *See—*

Shepherd, Charles Grey; and Yeoman, Brian Donald, 4,108,085, Cl. 108-108.000.

Yi Cho, Alfred; and Schneider, Martin Victor, to Bell Telephone Laboratories, Incorporated. Method for forming contacts to semiconductor devices. 4,108,738, Cl. 204-15.000.

Yim, Nelson C. F.: *See—*

Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., 4,108,854, Cl. 260-252.000.

Yindra, Leonard J.; Evans, David F.; and Klug, Joseph R., to American Hospital Supply Corporation. Drafting board and support structure therefor. 4,108,086, Cl. 108-157.000.

Yokogawa, Kiyoshi: *See—*

Mitsui, Murao; Yokogawa, Kiyoshi; and Fukuyama, Seiji, 4,107,982, Cl. 73-95.000.

Yonekubo, Ken, to Olympus Optical Co., Ltd. Oil immersion liquid for fluorescence microscopes. 4,108,794, Cl. 252-408.000.

Yonezawa, Masaharu: *See—*

Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, 4,108,833, Cl. 528-31.000.

Yorio, Albert E.: *See—*

Yorio, Noelle; and Yorio, Albert E., 4,107,963, Cl. 70-337.000.

Yorio, Noelle; and Yorio, Albert E. Key and lock system. 4,107,963, Cl. 70-337.000.

Yoshida, Muneo: *See—*

Seko, Maomi; Ogawa, Shinsaku; and Yoshida, Muneo, 4,108,742, Cl. 204-98.000.

Yoshida, Norio: *See—*

Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.

Yoshida, Yasuharu; and Tagashira, Yoshimi, to Nippon Electric Company, Ltd. Phase synchronizing circuit. 4,109,102, Cl. 178-69.100.

Yoshimura, Masakiyo; and Yamaguti, Yasukazu, to Shionogi & Co., Ltd.; and Kabushiki Kaisha Kyowa. Composition for compensating insufficient adaptation of denture base. 4,108,823, Cl. 260-33.4PQ.

Yoshino, Hiroshi: *See—*

Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,109,079, Cl. 536-26.000.

Yoshioka, Mamoru: *See—*

Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, 4,108,951, Cl. 261-34.00B.

Youdelman, Myrna R. Plastic fuel, products made therefrom and a novel method for starting and promoting fires using the fuel. 4,108,611, Cl. 44-38.000.

Young, Kenneth P.: *See—*

Flemings, Merton C.; Rick, Rodney G.; and Young, Kenneth P., 4,108,643, Cl. 75-135.000.

Young, Rodney Christopher: *See—*

Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,109,003, Cl. 424-273.00R.

Young, Serenus H. A. Process and apparatus for converting coal into oil and other coal derivatives. 4,108,759, Cl. 208-10.000.

Yu, Se Puan: *See—*

Tantraporn, Wirojana; and Yu, Se Puan, 4,109,169, Cl. 307-302.000.

Zabelka, Jaroslav, to Sulzer Brothers Ltd. Electric steam generator. 4,109,137, Cl. 219-285.000.

Zadra, Mario D.: *See—*

Tazuma, James J.; and Zadra, Mario D., 4,108,944, Cl. 260-879.000.

Zagoruiko, Nikolai Grigorievich; and Kolmogorov, Alexandr Borisovich. Speech simulator. 4,109,103, Cl. 179-1.0SG.

- Zahid, Abduz, to Greer Hydraulics, Inc. Silent-acting hydraulic accumulator device. 4,108,209, Cl. 138-30.000.
- Zahner, John C.: *See—*
  - Schoennagel, Hans-Juergen; and Zahner, John C., 4,108,758, Cl. 208-8.000.
- Zahnraderfabrik Renk Aktiengesellschaft: *See—*
  - John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, 4,108,018, Cl. 74-467.000.
- Zampiello, Albert N.; and Patch, Bradley J., Jr., to Raytheon Company. Laser gyroscope detector and path length control system. 4,108,553, Cl. 356-106.0LR.
- Zanio, Kenneth W.; and Fraas, Lewis M., to Hughes Aircraft Company. Large grain thin film polycrystalline P-InP/n-Cds solar cell. 4,108,684, Cl. 136-89.0TF.
- Zenker, Walter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Power take off with clutch and brake. 4,108,291, Cl. 192-4.00R.
- Zhukov, Evgeny Kuzmich: *See—*
  - Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,107,977, Cl. 73-45.300.
- Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna. Nickel-based alloy. 4,108,648, Cl. 75-171.000.
- Zieg, Clifford V.: *See—*
  - Ensign, Harold W.; and Zieg, Clifford V., 4,108,418, Cl. 251-5.000.
- Zimmerman, Heinrich, to Dual Gebruder Steidinger. Phonostand. 4,108,514, Cl. 312-107.000.
- Zoueshtiagh, Nahid: *See—*
  - Bates, Paul Edward; Hughes, John Ronald; and Zoueshtiagh, Nahid, 4,109,012, Cl. 426-302.000.
- Zsalatz, Reinhold: *See—*
  - Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, 4,107,890, Cl. 52-379.000.
- Zschocke, Rainer Hans: *See—*
  - Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.
- 1st Natl. Bank of Atlanta: *See—*
  - Creekmore, Robert V., 4,109,238, Cl. 340-149.00A.
- 308489 Ontario Limited: *See—*
  - Fleet, Bernard; and Das Gupta, Sankar, 4,108,757, Cl. 204-294.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Adams, Dale A. Apparatus for providing energy communication between a moving and a stationary terminal. Re. 29,738, Cl. 350-6.500.
- Aidlin, Joseph W.: *See—*
  - Kessler, Saul, Re. 29,739, Cl. 204-56.00R.
- Bottum, Edward W. Solar collector. Re. 29,737, Cl. 126-271.000.
- Harada, Susumu: *See—*
  - Norimatsu, Hideaki; and Harada, Susumu, Re. 29,741, Cl. 364-431.000.
- Kessler, Saul, to Aidlin, Joseph W. Process for forming an anodic oxide coating on metals. Re. 29,739, Cl. 204-56.00R.
- Miyaoka, Senri: *See—*
  - Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.
- Morio, Minoru: *See—*
  - Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.
- Nippondenso Co., Ltd.: *See—*
  - Norimatsu, Hideaki; and Harada, Susumu, Re. 29,741, Cl. 364-431.000.
- Norimatsu, Hideaki; and Harada, Susumu, to Nippondenso Co., Ltd. Air-fuel ratio feed back type fuel injection control system. Re. 29,741, Cl. 364-431.000.
- Ohgoshi, Akio: *See—*
  - Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.
- Phillips, Harry: *See—*
  - Shea, John J.; and Phillips, Harry, Re. 29,736, Cl. 32-26.000.
- Shea, John J.; and Phillips, Harry, to Xomed Inc. High speed bone drill. Re. 29,736, Cl. 32-26.000.
- Sony Corporation: *See—*
  - Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.
- Xomed Inc.: *See—*
  - Shea, John J.; and Phillips, Harry, Re. 29,736, Cl. 32-26.000.
- Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, to Sony Corporation. Color cathode ray tube of the plural beam, single electron gun type. Re. 29,740, Cl. 315-368.000.

LIST OF DESIGN PATENTEES

- AB Bofors: *See—*
  - Dahlberg, Sten Johan, 249,088, Cl. D15-32.000.
- Abbott Laboratories: *See—*
  - D'Alo, Herbert F., 249,065, Cl. D24-53.000.
  - D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., 249,067, Cl. D24-53.000.
  - Pawlak, Kenneth E., 249,066, Cl. D24-53.000.
- Ackerman, Marvin. Inclined viewing digital wristwatch case. 249,024, 8-22-78, Cl. D10-30.000.
- Alexander, Thomas A. Table. 249,003, 8-22-78, Cl. D6-177.000.
- American Optical Corporation: *See—*
  - Revoir, William H., 249,072, Cl. D29-8.000.
- American Security Equipment Company: *See—*
  - Lepow, Mark Norman, 249,026, Cl. D10-106.000.
- Ames, John B. Dispensing top for granulated material. 249,023, 8-22-78, Cl. D9-257.000.
- Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Blank for a disposable tray. 249,022, 8-22-78, Cl. D9-245.000.
- Benson, James A.: *See—*
  - Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
- Black, Albert David. Fishing rod supporting device. 249,049, 8-22-78, Cl. D22-13.000.
- Bossons, William Raymond, to W. H. Bossons (Sales) Ltd. Statuette. 249,028, 8-22-78, Cl. D11-158.000.
- Bossons, William Raymond, to W. H. Bossons (Sales) Ltd. Statuette. 249,029, 8-22-78, Cl. D11-158.000.
- Bossons, William Raymond, to W. H. Bossons (Sales) Ltd. Statuette. 249,030, 8-22-78, Cl. D11-158.000.
- Bowman, William K., Jr. Portable instructional flight aid device. 249,046, 8-22-78, Cl. D19-63.000.
- Brunas, Renato. Hairbrush. 248,996, 8-22-78, Cl. D4-35.000.
- Burtis, Eric F. Console for apparatus for performing mathematical functions. 249,091, 8-22-78, Cl. D64-11.00B.
- Carman, Edward W. Golf sand-trap smoothing implement. 249,013, 8-22-78, Cl. D8-13.000.
- Comensoli, Leo, to Speedo Knitting Mills Pty Ltd. Textile fabric. 249,095, 8-22-78, Cl. D92-1.0FF.
- Construction Specialties, Inc.: *See—*
  - Polifka, Michael, 249,069, Cl. D25-87.000.
- Costello, Michael. Sash lock. 249,017, 8-22-78, Cl. D8-337.000.
- Costello, Michael. Guard plate for a sash lock. 249,018, 8-22-78, Cl. D8-343.000.
- Crafoord, Carl-Goran; and Grieves, John, to Norabel AB. Dental instrument. 249,062, 8-22-78, Cl. D24-10.000.
- Crouse, Richard G. Stand for potted plants. 249,004, 8-22-78, Cl. D6-145.000.
- Culbertson, Richard, to General Electric Company. CB microphone or similar article. 249,041, 8-22-78, Cl. D14-12.000.
- Currie, Grover C. Gutter cleaner. 249,010, 8-22-78, Cl. D7-161.000.
- Cyborg Corporation: *See—*
  - James, J. Michael, 249,063, Cl. D24-17.000.
- Dahlberg, Sten Johan, to AB Bofors. Front lips for digging bucket or the like. 249,088, 8-22-78, Cl. D15-32.000.
- D'Alo, Herbert F., to Abbott Laboratories. Urinary drainline sampling port adapter. 249,065, 8-22-78, Cl. D24-53.000.
- D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., to Abbott Laboratories. Urinary drainline sampling port adapter. 249,067, 8-22-78, Cl. D24-53.000.
- Damascus, James L., to Gabriel Industries, Inc. Toy pot. 249,085, 8-22-78, Cl. D34-15.00R.
- Davis, Ben H., Jr.: *See—*
  - Hermansen, Don L.; and Davis, Ben H., Jr., 249,040, Cl. D14-86.000.
- Dawes, Kevin J.: *See—*
  - Evans, Michael G., 249,070, Cl. D27-03.000.
- Day, Ronald: *See—*
  - Matthews, Bruce Ernest; and Day, Ronald, 249,015, Cl. D8-60.000.
- Dezura, Waldo. Shower curtain holder. 249,005, 8-22-78, Cl. D6-208.100.
- Dezura, Waldo. Shower curtain holder. 249,006, 8-22-78, Cl. D6-208.100.
- Dibble, Joseph. Ornament. 249,027, 8-22-78, Cl. D11-125.000.
- Dowco Corporation: *See—*
  - Dowdell, Joshua R., Jr.; and Sanderson, Paul H., 249,061, Cl. D23-112.000.
- Dowdell, Joshua R., Jr.; and Sanderson, Paul H., to Dowco Corporation. Drainable blade louver head. 249,061, 8-22-78, Cl. D23-112.000.
- Drell, Ronald; and Epstein, Max I., to Vertiflex Company, The. Filing tray. 249,048, 8-22-78, Cl. D19-92.000.
- Duncan, Farris N.: *See—*
  - Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 249,022, Cl. D9-245.000.
- Epstein, Max I.: *See—*
  - Drell, Ronald; and Epstein, Max I., 249,048, Cl. D19-92.000.
- Evans, Michael G., to Dawes, Kevin J. Smoking device. 249,070, 8-22-78, Cl. D27-03.000.
- Evans, Roger C. Ball holder. 249,083, 8-22-78, Cl. D34-5.0CB.
- Everts, Robert G. Weed cutter. 249,012, 8-22-78, Cl. D8-8.000.
- Floyd, Roger M.: *See—*
  - Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 249,022, Cl. D9-245.000.
- Fratelli Saporiti: *See—*
  - Offredi, Giovanni, 249,001, Cl. D6-157.000.
  - Offredi, Giovanni, 249,002, Cl. D6-164.000.
- Fredriksson, Lars, to K A Bergs Smide AB. Combined hook and anchorage casing. 249,019, 8-22-78, Cl. D8-367.000.
- Friesen, Elmer; and Friesen, Ronald. Storage bin. 249,050, 8-22-78, Cl. D23-2.000.
- Friesen, Ronald: *See—*
  - Friesen, Elmer; and Friesen, Ronald, 249,050, Cl. D23-2.000.
- Friskel, Joseph W. Golf shot director. 249,077, 8-22-78, Cl. D34-5.0CB.

- Gabriel Industries, Inc.: *See—*
  - Damascus, James L., 249,085, Cl. D34-15.00R.
- Game Time, Inc.: *See—*
  - West, Donald E., 249,080, Cl. D34-5.00H.
  - Zick, Ronald W., 249,081, Cl. D34-5.00C.
- General Electric Company: *See—*
  - Culbertson, Richard, 249,041, Cl. D14-12.000.
  - Grove, Lawrence L.; and Snyder, Paul V., 249,009, Cl. D7-91.000.
  - Houlihan, John T., 249,039, Cl. D14-70.000.
- General Foods Corporation: *See—*
  - Pettengill, Floyd E., 249,021, Cl. D9-85.000.
- Globe Industrial Sales Company: *See—*
  - Soderman, Walter W.; and Harman, Clifford H., II, 249,079, Cl. D34-5.0BC.
- Goldstein, Arthur. After bath dryer. 249,058, 8-22-78, Cl. D23-74.000.
- Greif, Francis. Combined telephone stand and index. 249,047, 8-22-78, Cl. D19-76.000.
- Grieves, John: *See—*
  - Crafoord, Carl-Goran; and Grieves, John, 249,062, Cl. D24-10.000.
- Groeneveld, Johannes. Implement for finishing joints between tiles. 249,014, 8-22-78, Cl. D8-45.000.
- Groth, Daniel F. Aquarium cover. 249,074, 8-22-78, Cl. D30-12.000.
- Grove, Lawrence L.; and Snyder, Paul V., to General Electric Company. Broiler pan or similar article. 249,009, 8-22-78, Cl. D7-91.000.
- Gutke, William D. Game target. 249,078, 8-22-78, Cl. D34-5.0PP.
- Hansrote, Robert R. Water distiller unit. 249,051, 8-22-78, Cl. D23-3.000.
- Hansrote, Robert R. Water distiller unit. 249,052, 8-22-78, Cl. D23-3.000.
- Hansrote, Robert R. Water distiller unit. 249,053, 8-22-78, Cl. D23-3.000.
- Hansrote, Robert R. Water distiller unit. 249,054, 8-22-78, Cl. D23-3.000.
- Hansrote, Robert R. Water distiller unit. 249,055, 8-22-78, Cl. D23-3.000.
- Hansrote, Robert R. Water distiller unit. 249,056, 8-22-78, Cl. D23-3.000.
- Hansrote, Robert R. Water distiller unit. 249,057, 8-22-78, Cl. D23-3.000.
- Harden, James L. Aquarium cover. 249,073, 8-22-78, Cl. D30-12.000.
- Harman, Clifford H., II: *See—*
  - Soderman, Walter W.; and Harman, Clifford H., II, 249,079, Cl. D34-5.0BC.
- Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, to Sharp Kabushiki Kaisha. Electronic calculating machine. 249,093, 8-22-78, Cl. D64-11.00B.
- Hermansen, Don L.; and Davis, Ben H., Jr. Center loaded citizens band antenna. 249,040, 8-22-78, Cl. D14-86.000.
- Hewlett-Packard Company: *See—*
  - LaCelle, Leroy J., 249,090, Cl. D64-11.00B.
- Hill, Douglas J.: *See—*
  - Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
- Hinklin, Darrell W., to Toro Company, The. Lawn and garden tractor. 249,042, 8-22-78, Cl. D15-23.000.
- Houlihan, John T., to General Electric Company. Portable radio. 249,039, 8-22-78, Cl. D14-70.000.
- House, Bennie L. Paper roll holder. 248,999, 8-22-78, Cl. D6-97.000.
- Ikeda, Matafumi: *See—*
  - Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
- James, J. Michael, to Cyborg Corporation. Biofeedback training module. 249,063, 8-22-78, Cl. D24-17.000.
- Jones, Paul W.: *See—*
  - Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
- Jones, Rodger L.; and Scott, Hoyt A. Fireplace grate. 249,011, 8-22-78, Cl. D7-207.000.
- K A Bergs Smide AB: *See—*
  - Fredriksson, Lars, 249,019, Cl. D8-367.000.
- Knobel, Gladys; and Prisland, Theodore. Scarf hanger design. 249,007, 8-22-78, Cl. D6-247.000.
- Knox, Kenneth H.: *See—*
  - D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., 249,067, Cl. D24-53.000.
- Kobayashi, Yoshiaki: *See—*
  - Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
- Kowalski, Robert R. Poker aid card. 249,084, 8-22-78, Cl. D34-13.00A.
- Kullenback, Jan G. L. S. Combined toilet paper holder and shelf for lavatories. 248,998, 8-22-78, Cl. D6-91.000.
- L C Chemical Company, Limited: *See—*
  - Nakamura, Kenji, 249,025, Cl. D10-125.000.
- LaCelle, Leroy J., to Hewlett-Packard Company. Casing for an electronic calculator. 249,090, 8-22-78, Cl. D64-11.00B.
- Lepow, Mark Norman, to American Security Equipment Company. Money clip alarm unit for cash registers and the like. 249,026, 8-22-78, Cl. D10-106.000.
- Levitt, Herbert, to Warnaco Inc. Hanger. 249,008, 8-22-78, Cl. D6-254.000.
- Lords III Research & Development Co.: *See—*
  - Tarran, Phil Keith, 249,031, Cl. D12-25.000.
  - Tarran, Phil Keith, 249,032, Cl. D12-25.000.
- Martin, Wayne L. Flexible automobile ski rack. 249,035, 8-22-78, Cl. D12-157.000.
- Matthews, Bruce Ernest; and Day, Ronald, to Stanley Works Pty. Ltd., The. Pipe cutter. 249,015, 8-22-78, Cl. D8-60.000.
- McCreary, Richard D. Golf putter head. 249,082, 8-22-78, Cl. D34-5.0GH.
- McMullen, Thomas J. Spray cleaning unit. 249,043, 8-22-78, Cl. D15-34.000.
- Meeker, Paul K.; and Mette, Herbert B. Animal nurser. 249,076, 8-22-78, Cl. D30-14.000.
- Meisling, William H.: *See—*
  - Ramalia, Michael W.; and Meisling, William H., 249,036, Cl. D12-158.000.
- Mette, Herbert B.: *See—*
  - Meeker, Paul K.; and Mette, Herbert B., 249,076, Cl. D30-14.000.
- Metz Mannheim GmbH: *See—*
  - Metz, Walter, 249,037, Cl. D13-32.000.
- Metz, Walter, to Metz Mannheim GmbH. Compression switch. 249,037, 8-22-78, Cl. D13-32.000.
- Miller, John H. Recycling apparatus. 249,045, 8-22-78, Cl. D15-123.000.
- Moncrieff-Yeates, Alexander J. Fireplace unit. 249,059, 8-22-78, Cl. D23-94.000.
- Nakamura, Kenji, to L C Chemical Company, Limited. Dial for clock. 249,025, 8-22-78, Cl. D10-125.000.
- Norabel AB: *See—*
  - Crafoord, Carl-Goran; and Grieves, John, 249,062, Cl. D24-10.000.
- Offredi, Giovanni, to Fratelli Saporiti. Storage shelf unit. 249,001, 8-22-78, Cl. D6-157.000.
- Offredi, Giovanni, to Fratelli Saporiti. Cabinet. 249,002, 8-22-78, Cl. D6-164.000.
- Ohie, Yoshihisa, to Sharp Kabushiki Kaisha. Electronic calculating machine. 249,092, 8-22-78, Cl. D64-11.00B.
- Olinkraft, Inc.: *See—*
  - Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 249,022, Cl. D9-245.000.
- Pawlak, Kenneth E., to Abbott Laboratories. Urinary drainline sampling port adapter. 249,066, 8-22-78, Cl. D24-53.000.
- Pawlak, Kenneth E.: *See—*
  - D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., 249,067, Cl. D24-53.000.
- Peed, Jim. Sofa or the like. 248,997, 8-22-78, Cl. D6-63.000.
- Pettengill, Floyd E., to General Foods Corporation. Jar. 249,021, 8-22-78, Cl. D9-85.000.
- Physio-Control Corporation: *See—*
  - Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
- Platt, Edward. Bird feeder. 249,075, 8-22-78, Cl. D30-14.000.
- Polifka, Michael, to Construction Specialties, Inc. Decorative screen for facades. 249,069, 8-22-78, Cl. D25-87.000.
- Popeil Brothers, Inc.: *See—*
  - Popeil, Samuel J., 249,044, Cl. D15-97.000.
- Popeil, Samuel J., to Popeil Brothers, Inc. Food slicer with indexing turret. 249,044, 8-22-78, Cl. D15-97.000.
- Potter, Francis Norman. Boat hull. 249,033, 8-22-78, Cl. D12-62.000.
- Prisland, Theodore: *See—*
  - Knobel, Gladys; and Prisland, Theodore, 249,007, Cl. D6-247.000.
- Ramalia, Michael W.; and Meisling, William H. Knapsack for a motorcycle sissy bar. 249,036, 8-22-78, Cl. D12-158.000.
- Raniero, John. Cargo hold down binder. 249,020, 8-22-78, Cl. D8-382.000.
- Ratnik, H. Ronald. Hydrant handle. 249,060, 8-22-78, Cl. D23-28.000.
- Revoir, William H., to American Optical Corporation. Disposable respiratory mask. 249,072, 8-22-78, Cl. D29-8.000.
- Richard Heinze GmbH & Co. KG, Firma: *See—*
  - Spellier, Roland, 249,016, Cl. D8-306.000.
- Sanderson, Paul H.: *See—*
  - Dowdell, Joshua R., Jr.; and Sanderson, Paul H., 249,061, Cl. D23-112.000.
- Scott, Hoyt A.: *See—*
  - Jones, Rodger L.; and Scott, Hoyt A., 249,011, Cl. D7-207.000.
- Sharp Kabushiki Kaisha: *See—*
  - Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
  - Ohie, Yoshihisa, 249,092, Cl. D64-11.00B.
- Shepard, George E., Jr. Water pipe. 249,071, 8-22-78, Cl. D27-03.000.
- Simmons, Earle G. Display stand for jewelry chain. 249,000, 8-22-78, Cl. D6-139.000.
- Simmons, Earle G. Bird feeder. 249,087, 8-22-78, Cl. D30-15.000.
- Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., to Physio-Control Corporation. Portable defibrillator/EKG monitor/EKG recorder. 249,064, 8-22-78, Cl. D24-17.000.
- Snyder, Paul V.: *See—*
  - Grove, Lawrence L.; and Snyder, Paul V., 249,009, Cl. D7-91.000.
- Snyder, Stanley Gene. Van top. 249,034, 8-22-78, Cl. D12-156.000.
- Soderman, Walter W.; and Harman, Clifford H., II, to Globe Industrial Sales Company. Game stick for throwing or catching a ring. 249,079, 8-22-78, Cl. D34-5.0BC.
- Speedo Knitting Mills Pty Ltd: *See—*
  - Comensoli, Leo, 249,095, Cl. D92-1.0FF.
- Spellier, Roland, to Richard Heinze GmbH & Co. KG, Firma. Handle for furniture doors, drawers or the like. 249,016, 8-22-78, Cl. D8-306.000.
- Stanley Works Pty. Ltd., The: *See—*
  - Matthews, Bruce Ernest; and Day, Ronald, 249,015, Cl. D8-60.000.
- Stewart, Arthur H., Jr. Tent. 249,094, 8-22-78, Cl. D88-3.00B.
- Studley, Donald E., to Tennis Designs by Studley, Inc. Tennis ball printer. 249,089, 8-22-78, Cl. D64-10.000.
- Tancredi, John. Toy dog and sled. 249,086, 8-22-78, Cl. D34-15.0AN.

- Tarran, Phil Keith, to Lords III Research & Development Co. Combined hand truck and ladder. 249,031, 8-22-78, Cl. D12-25.000.
- Tarran, Phil Keith, to Lords III Research & Development Co. Combined hand truck and ladder. 249,032, 8-22-78, Cl. D12-25.000.
- Tennis Designs by Studley, Inc.: *See—*
  - Studley, Donald E., 249,089, Cl. D64-10.000.
- Toro Company, The: *See—*
  - Hinklin, Darrell W., 249,042, Cl. D15-23.000.
- Vertiflex Company, The: *See—*
  - Drell, Ronald; and Epstein, Max I., 249,048, Cl. D19-92.000.
- W. H. Bossons (Sales) Ltd.: *See—*
  - Bossons, William Raymond, 249,028, Cl. D11-158.000.
  - Bossons, William Raymond, 249,029, Cl. D11-158.000.
  - Bossons, William Raymond, 249,030, Cl. D11-158.000.
- Wallace, Milton A. Interlocking wall unit. 249,068, 8-22-78, Cl. D25-58.000.
- Walz, David K. Dictating machine. 249,038, 8-22-78, Cl. D14-3.000.
- Warnaco Inc.: *See—*
  - Levitt, Herbert, 249,008, Cl. D6-254.000.
- West, Donald E., to Game Time, Inc. Combined playground climber and slide. 249,080, 8-22-78, Cl. D34-5.00H.
- Yamagami, Masafumi: *See—*
  - Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
- Zick, Ronald W., to Game Time, Inc. Playground rider. 249,081, 8-22-78, Cl. D34-5.00C.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 22, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 4

313	4,107,795
321	4,107,798
353	4,107,796

CLASS 5

118	4,107,797
370	4,107,799

CLASS 7

158	4,107,800

CLASS 8

1 A	4,108,595
94.27	4,108,596
115	4,108,597
115.7	4,108,598
137	4,108,599
	4,108,600
152	4,107,801

CLASS 9

8 P	4,107,803
8 R	4,107,804
310 E	4,107,806
400	4,107,802

CLASS 10

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CLASS 15

21 C	4,107,807
41 R	4,107,808
42	4,107,809
97 R	4,107,810
215	4,107,811
245	4,107,812
246	4,107,813
250.42	4,107,814
257.05	4,107,815
320	4,107,816

CLASS 16

20	4,107,817

CLASS 17

51	4,107,818
64	4,107,819

CLASS 19

81	4,107,820
127	4,107,821
163	4,107,822

CLASS 21

96	4,108,601

CLASS 23

230 B	4,108,603
230 R	4,108,602
	4,108,604
252 R	4,108,605
	4,108,606
253 R	4,108,607
259	4,108,608
259.1	4,108,609

CLASS 24

3 K	4,107,823
27	4,107,824
115 R	4,107,825
243 K	4,107,826

CLASS 28

119	4,108,299
246	4,107,827
234	4,107,828

CLASS 29

91.1	4,107,829
110.5	4,107,830
116 AD	4,107,831
157.3 AH	4,107,832
460	4,107,833
570	4,107,834
590	4,107,835
625	4,107,836
	4,107,837
628	4,107,838

CLASS 30

123.3	4,107,839
172	4,107,840
276	4,107,841
358	4,107,842

CLASS 32

14 A	4,107,844
14 E	4,107,843
15	4,107,845
26	Re.29,736
27	4,107,846

CLASS 33

147 L	4,107,847
174 E	4,107,849
174 P	4,107,848
178 B	4,107,850

CLASS 34

10	4,107,851

CLASS 35

8 R	4,107,852
25	4,107,854
31 R	4,107,855
35 H	4,107,853

CLASS 36

115	4,107,856
129	4,107,857
134	4,107,858

CLASS 37

126 A	4,107,859

CLASS 38

77.83	4,107,860

CLASS 40

2 R	4,107,861
601	4,107,864

CLASS 42

50	4,107,862
	4,107,863

CLASS 43

27.4	4,107,865
44.83	4,107,866
65	4,107,867
88	4,107,868

CLASS 44

10 G	4,108,610
38	4,108,611
62	4,108,612
	4,108,613

CLASS 46

21	4,107,869
28	4,107,870
83	4,107,871
103	4,107,872
153	4,107,873

CLASS 47

14	4,107,874
62	4,107,875
79	4,107,876

CLASS 49

28	4,107,877
125	4,107,878
465	4,107,879

CLASS 51

103 R	4,107,881
103 TF	4,107,880
118	4,107,882
165.8	4,107,883
245	4,107,884
295	4,108,614

CLASS 52

79.11	4,107,886
90	4,107,885
105	4,107,887
169.12	4,107,888
259	4,107,889
379	4,107,890
394	4,107,891
403	4,107,892
537	4,107,896
593	4,107,894
687	4,107,895
716	4,107,898
747	4,107,899
775	4,107,893
823	4,107,897

CLASS 53

3	4,107,905
138 A	4,107,903
142	4,107,904
180 R	4,107,900

CLASS 55

2	4,108,615
48	4,108,616
162	4,108,617
178	4,108,618
192	4,108,619
210	4,108,620

CLASS 56

17.5	4,107,901
27.5	4,107,902
246	4,107,906
320.2	4,107,907

CLASS 57

1 R	4,107,908
5	4,107,909
34 R	4,107,910
	4,107,957
56	4,107,911
68	4,107,912
125	4,107,913
164	4,107,914

CLASS 58

23 R	4,107,915
38 R	4,107,916

CLASS 59

85	4,107,917

CLASS 60

39.71	4,107,918
276	4,107,920
288	4,107,921
298	4,107,922
427	4,107,923
445	4,107,924
521	4,107,925
548	4,107,926
605	4,107,927
650	4,107,928

CLASS 61

14	4,107,929
41 R	4,107,930
45 D	4,107,931
48	4,107,932
107	4,107,933

CLASS 62

3	4,107,934
	4,107,935
5	4,107,936
64	4,107,937
71	4,107,938
89	4,107,939
121	4,107,940
186	4,107,941
305	4,107,942
320	4,107,943
401	4,107,944
499	4,107,945
514 R	4,107,946

CLASS 63

2	4,107,947

CLASS 64

2 P	4,107,948
9 A	4,107,949
13	4,107,950
14	4,107,951
32 F	4,107,952

CLASS 65

30 R	4,108,621
	4,108,622
163	4,108,623
273	4,108,624

CLASS 66

1 R	4,107,953
133	4,107,954
176	4,107,955
195	4,107,956

CLASS 70

52	4,107,965
58	4,107,958
159	4,107,959
165	4,107,961
243	4,107,962
337	4,107,963
364 A	4,107,966
427	4,107,967
436	4,107,968

CLASS 71

9	4,108,625
76	4,108,626
91	4,108,627
92	4,108,628
94	4,108,629
	4,108,630
103	4,108,631
115	4,108,632

CLASS 72

36	4,107,964
148	4,107,969
165	4,107,970
237	4,107,971
334	4,107,972
450	4,107,973
457	4,107,974

CLASS 73

11	4,107,975
45.3	4,107,977
52	4,107,976
83	4,107,978
88 E	4,107,981
88 R	4,107,979
	4,107,980
95	4,107,982
100	4,107,983
113	4,107,984
141 A	4,107,985
147	4,107,986
151	4,107,987
178 R	4,107,988
189	4,107,989
194 B	4,107,990
204	4,107,991
260	4,107,992
290 R	4,107,993
290 V	4,107,994
300	4,107,995
	4,107,996
304 R	4,107,997
313	4,107,998
326	4,107,999
328	4,108,000
339 R	4,108,001
371	4,108,002
425.4 R	4,108,003
432 R	4,108,004
514	4,108,005
517 R	4,108,006
732	4,108,007
756	4,108,008

CLASS 74

61	4,108,009
100 R	4,108,010
229	4,108,011
231 C	4,108,012
242.11 C	4,108,013
243 H	4,108,014
421 A	4,108,015
462	4,108,016
	4,108,017
467	4,108,018
469	4,108,019
558	4,108,020
606 R	4,108,021
645	4,108,022
804	4,108,023
813 L	4,108,024

CLASS 75

11	4,108,633
23	4,108,634
24	4,108,635
35	4,108,636
53	4,108,637
63	4,108,638
101 R	4,108,639
103	4,108,640
124	4,108,641
134 F	4,108,642
135	4,108,643
	4,108,644
	4,108,645
148	4,108,646
171	4,108,647
	4,108,648
203	4,108,649
206	4,108,650
208 CS	4,108,651
223	4,108,652

CLASS 81

3 R	4,108,025
	4,108,026
9.5 B	4,108,028
60	4,108,027

CLASS 83

34	4,108,029
77	4,108,030
90	4,108,031
106	4,108,032
122	4,108,033
361	4,108,034

CLASS 84

1.01	4,108,035
	4,108,036
1.03	4,108,037
	4,108,038
1.19	4,108,039
	4,108,040
1.24	4,108,041
471 R	4,108,042

CLASS 85

70	4,108,043

CLASS 86

19	4,108,044

CLASS 89

36 K	4,108,045
43 A	4,108,046

CLASS 90

1.6 R	4,108,047

CLASS 91

6.5	4,108,048
478	4,108,049

CLASS 92

48	4,108,050

CLASS 96

1 SD	4,108,653
1.2	4,108,654
1.5 R	4,108,655
	4,108,656
1.6	4,108,657
15 D	4,108,658
36.3	4,108,659
38.2	4,108,660
59	4,108,661
66.5	4,108,662
74	4,108,663
75	4,108,664
76 R	4,108,803
114.1	4,108,665
115 P	4,108,666
131	4,108,667
135	4,108,668

CLASS 99

275	4,108,052
306	4,108,053
348	4,108,054
421 H	4,108,055
452	4,108,056
	4,108,057
466	4,108,058
543	4,108,059
591	4,108,060

CLASS 100

7	4,108,061
11	4,108,062
53	4,108,063
187	4,108,064
215	4,108,065

CLASS 101

22	4,108,066
224	4,108,067
363	4,108,068
415.1	4,108,069

CLASS 102

8	4,108,070
24 HC	4,108,071
52	4,108,072
	4,108,073
92.7	4,108,074
214	4,108,075

CLASS 104

2	4,108,076
156	4,108,077
172 S	4,108,078
252	4,108,079

CLASS 105

199 CB	4,108,080
366 B	4,108,081
464	4,108,082

CLASS 106

13	4,108,669
22	4,108,671
38.9	4,108,672
40 R	4,108,670
47 Q	4,108,673
53	4,108,674
56	4,108,675
65	4,108,676
109	4,108,677
243	4,108,678
307	4,108,679

CLASS 108

6	4,108,083
29	4,108,084
108	4,108,085
157	4,108,086

CLASS 109

51	4,108,087

CLASS 110

246	4,108,088

CLASS 111

7	4,108,089

CLASS 112

121.11	4,108,090
134	4,108,094
158 E	4,108,091
	4,108,093
158 R	4,108,092
184	4,108,095
221	4,108,096
287	4,108,097
289	4,108,098

CLASS 113

120 A	4,108,099

CLASS 114

102	4,108,100
245	4,108,101
264	4,108,102

CLASS 116

116	4,108,103
148	4,108,104

CLASS 118

2	4,108,105
49	4,108,106
49.1	4,108,107
	4,108,108
52	4,108,109
412	4,108,110
655	4,108,111
	4,108,112

CLASS 123

3	4,108,113
	4,108,114
32 A	4,108,116
32 EB	4,108,115
33 A	4,108,117
41.57	4,108,118
75 C	4,108,119

103 B 4,108,120
119 EC 4,108,121
4,108,122
4,108,123
122 AC 4,108,124
122 E 4,108,126
122 F 4,108,125
124 R 4,108,127
139 AQ 4,108,130
139 AW 4,108,128
139 AZ 4,108,129
148 CC 4,108,131
188 S 4,108,132
191 S 4,108,133
196 R 4,108,134
4,108,135
209 4,108,136
242 4,108,137

CLASS 126

19 R 4,108,138
21 A 4,108,139
24 4,108,140
41 R 4,108,141
4,108,142
110 B 4,108,143
120 4,108,144
140 4,108,145
270 4,108,154
4,108,155
271 Re.29,737
4,108,156
4,108,157
4,108,158
4,108,159
4,108,160

CLASS 128

1 R 4,108,161
2 B 4,108,162
2 H 4,108,163
2 V 4,108,165
2.06 F 4,108,166
25 4,108,164
66 4,108,167
80 A 4,108,168
89 R 4,108,169
134 4,108,170
142.2 4,108,171
188 4,108,172
214 R 4,108,173
4,108,174
214.4 4,108,175
218 A 4,108,176
4,108,177
224 4,108,178
284 4,108,179
285 4,108,180
303.1 4,108,181
305 4,108,182
400 4,108,146
404 4,108,147
419 PG 4,108,148
579 R 4,108,149

CLASS 130

27 H 4,108,150

CLASS 131

9 4,108,151
173 4,108,152
235 R 4,108,153

CLASS 132

42 A 4,108,183
46 R 4,108,184
124 4,108,186

CLASS 133

3 A 4,108,187

CLASS 134

3 4,108,680
20 4,108,681
25 R 4,108,682
27 4,108,683
57 R 4,108,188
138 4,108,189
167 R 4,108,190

CLASS 135

2 4,108,191

CLASS 136

89 TF 4,108,684

CLASS 137

1 4,108,192
13 4,108,193
15 4,108,194
68 A 4,108,195
72 4,108,196
81 4,108,197
194 4,108,198
312 4,108,199
344 4,108,200
393 4,108,201
436 4,108,202
496 4,108,203
543.13 4,108,204
554 4,108,205
596.17 4,108,206
625.47 4,108,207
636.3 4,108,208

CLASS 138

30 4,108,209
42 4,108,210
120 4,108,211
122 4,108,212

CLASS 139

54 4,108,213
97 4,108,214
438 4,108,215
452 4,108,216

CLASS 140

105 4,108,217

CLASS 141

1 4,108,218
3 4,108,219
98 4,108,220
146 4,108,221
337 4,108,222
392 4,108,223

CLASS 144

34 E 4,108,224
134 D 4,108,225
327 4,108,226

CLASS 148

1.5 4,108,685
4,108,686
2 4,108,687
3 4,108,688
6.15 R 4,108,689
4,108,690
11.5 A 4,108,691
12.3 4,108,692
16.5 4,108,693
31.55 4,108,694
39 4,108,695

CLASS 149

19.2 4,108,696
19.3 4,108,697

CLASS 150

15 4,108,227

CLASS 152

7 4,108,228
175 4,108,229
210 4,108,230
290 4,108,231
365 4,108,232

CLASS 156

60 4,108,698
92 4,108,699
153 4,108,700
160 4,108,701
192 4,108,702
244.13 4,108,703
272 4,108,704
355 4,108,705
384 4,108,706
397 4,108,707
441 4,108,708
446 4,108,709
450 4,108,710
497 4,108,711
498 4,108,712
499 4,108,713
608 4,108,714
628 4,108,715
636 4,108,716
656 4,108,717

CLASS 157

1.37 4,108,233

CLASS 159

30 4,108,718

CLASS 164

38 4,108,234
252 4,108,235
338 R 4,108,236
425 4,108,237

CLASS 165

57 4,108,238
105 4,108,239
125 4,108,240
146 4,108,241
164 4,108,242
169 4,107,919

CLASS 166

66 4,108,243
268 4,108,244
301 4,108,245
312 4,108,246

CLASS 169

38 4,108,247

CLASS 172

9 4,108,248
328 4,108,249
719 4,108,250
789 4,108,251

CLASS 173

12 4,108,252
23 4,108,253
43 4,108,254

CLASS 174

67 4,109,095
68.5 4,109,096
86 4,109,097
106 SC 4,109,098
107 4,109,099

CLASS 175

9 4,108,255
61 4,108,256
230 4,108,257
320 4,108,258
344 4,108,259
374 4,108,260

CLASS 176

19 R 4,108,719
20 R 4,108,720
36 R 4,108,721

CLASS 177

120 4,108,261
136 4,108,262
145 4,108,263

CLASS 178

67 4,109,100
4,109,101
69.1 4,109,102

CLASS 179

1 D 4,109,107
1 N 4,109,106
1 P 4,109,108
1 SD 4,109,104
1 SG 4,109,103
1 VE 4,109,105
15 AP 4,109,110
15 BY 4,109,109
18 BC 4,109,111
81 R 4,109,112
99 4,109,113
100.11 4,109,115
100.4 D 4,109,114
107 E 4,109,116
175.3 F 4,109,117

CLASS 180

2 R 4,108,264
66 R 4,108,265
68.5 4,108,266
71 4,108,267
74 4,108,268
98 4,108,269
148 4,108,273

CLASS 181

114 4,108,270
119 4,108,271
120 4,108,272
229 4,108,274
252 4,108,275
256 4,108,276

CLASS 182

82 4,108,277

CLASS 184

7 D 4,108,278
15 R 4,108,279

CLASS 187

20 4,108,280
29 R 4,108,281
4,108,282
52 LC 4,108,283

CLASS 188

59 4,108,284
72.6 4,108,285
218 XL 4,108,286
315 4,108,287

CLASS 191

49 4,108,288

CLASS 192

3.3 4,108,289
4,108,290
4 R 4,108,291
11 4,108,292
67 R 4,108,293
85 R 4,108,294
111 A 4,108,295

CLASS 194

99 4,108,296

CLASS 195

1 4,108,722
2 4,108,723
96 4,108,724
4,108,725
103.5 R 4,108,726
4,108,727
127 4,108,728
4,108,729

CLASS 198

479 4,108,300
633 4,108,301
689 4,108,302
781 4,108,303
4,108,304
834 4,108,298

CLASS 200

5 E 4,109,118
38 BA 4,109,119
51 R 4,109,120
67 E 4,109,121
144 B 4,109,122
4,109,123
148 B 4,109,124
268 4,109,125
302 4,109,126

CLASS 201

2.5 4,108,730
8 4,108,731
22 4,108,732

CLASS 202

267 A 4,108,733

CLASS 203

7 4,108,734
4,108,735

CLASS 204

1.5 4,108,736
11 4,108,740
13 4,108,737
15 4,108,738
40 4,108,739
56 R Re.29,739
64 R 4,108,743
67 4,108,741
98 4,108,742
119 4,108,744
129 4,108,745
158 R 4,108,746
159.12 4,108,748
159.17 4,108,749
159.18 4,108,747
181 R 4,108,750
192 N 4,108,751
256 4,108,752
263 4,108,753
4,108,754
4,108,755
286 4,108,756
294 4,108,757

CLASS 206

330 4,108,305
339 4,108,306
387 4,108,307
455 4,108,308
528 4,108,309
570 4,108,310
573 4,108,311

CLASS 208

8 4,108,758
10 4,108,759
11 LE 4,108,760
254 H 4,108,761

CLASS 209

111.7 T 4,108,762

CLASS 210

14 4,108,763
22 A 4,108,764
23 R 4,108,765
32 4,108,766
42 S 4,108,767
43 4,108,768
50 4,108,769
4,108,770
4,108,771
64 4,108,772
122 4,108,773
167 4,108,774
169 4,108,775
224 4,108,776
225 4,108,777
297 4,108,778

CLASS 211

13 4,108,312
64 4,108,313
74 4,108,314
124 4,108,315
199 4,108,316

CLASS 214

1 PA 4,108,317
1 R 4,108,318
6 BA 4,108,319
8 4,108,320
8.5 A 4,108,321
16.1 A 4,108,322
310 4,108,323

CLASS 215

1 C 4,108,324
364 4,108,325

CLASS 219

7.5 4,109,127
10.43 4,109,128
10.55 B 4,109,129
130.21 4,109,130
137.62 4,109,131
147 4,109,132
203 4,109,133
216 4,109,134
4,109,135
252 4,109,136
285 4,109,137
364 4,109,138

CLASS 220

1.5 4,108,326
3 4,108,327
5 A 4,108,328
260 4,108,330
269 4,108,331
370 4,108,332
453 4,108,329

CLASS 221

13 4,108,333

CLASS 222

136 4,108,334
137 4,108,335
148 4,108,336
194 4,108,337
286 4,108,338
591 4,108,339

CLASS 224

4 E 4,108,340
5 H 4,108,341
42.01 4,108,342

CLASS 225

1 4,108,343

CLASS 226

4,108,344

CLASS 227

131 4,108,345

CLASS 228

49 4,108,346

CLASS 229

1.5 B 4,108,347
15 4,108,348
4,108,349
37 R 4,108,350
62 4,108,351
69 4,108,352

CLASS 233

26 4,108,353
30 4,108,354

CLASS 235

1 C 4,108,355
69 4,108,356
92 CA 4,109,141
92 CN 4,109,139
92 DN 4,109,142
92 MT 4,109,140
119 4,108,357
302 4,108,358
304 4,108,359
4,108,360
375 4,108,361
4,108,362
383 4,108,363
419 4,108,364
4,108,365
450 4,108,366
457 4,108,367
462 4,109,143
463 4,108,368

CLASS 236

1 G 4,108,369
15 A 4,108,370
49 4,108,371
86 4,108,372

CLASS 237

1 A 4,108,373
4,108,374
8 R 4,108,375
12.3 A 4,108,376

CLASS 238

91 4,108,377
298 4,108,378

CLASS 239

119 4,108,379
172 4,108,380
265.35 4,108,381
271 4,108,382
533.5 4,108,383
665 4,108,384

CLASS 240

2 V 4,109,144

CLASS 241

46.04 4,108,385
46.11 4,108,386
82.5 4,108,387

CLASS 242

18 DD 4,108,388
55.3 4,108,389
55.53 4,108,390
58.3 4,108,391
84.21 A 4,108,392
107 4,108,393
107.4 A 4,108,394
107.7 4,108,395
118.11 4,108,396
137.1 4,108,397
199 4,108,398

CLASS 244

3.15 4,108,400
54 4,108,401
139 4,108,402
199 4,108,403

CLASS 246

34 CT 4,108,404
125 4,108,405
474 4,108,406

CLASS 248

23 4,108,407
68 R 4,108,408
96 4,108,409
130 4,108,410
165 4,107,960
4,108,411
181 4,108,412
214 4,108,413
300 4,108,414
370 4,108,415
400 4,108,416

CLASS 249

81 4,108,417

CLASS 250

201 4,109,145
227 4,109,146
231 P 4,109,147
321 4,109,148
347 4,109,149
368 4,109,150
460 4,109,151
486 4,109,152
499 4,109,153
503 4,109,154
505 4,109,155
4,109,156
531 4,109,157
548 4,109,158
564 4,109,159

CLASS 251

5 4,108,418
30 4,108,419
129 4,108,420

CLASS 252

8.5 P 4,108,779
8.55 C 4,108,782
8.6 4,108,780
8.9 4,108,781
54.6 4,108,783
56 R 4,108,784
4,108,785
62.1 P 4,108,786
62.56 4,108,787
63 4,108,788
64 4,108,789
175 4,108,790
182 4,108,791
187 H 4,108,792
299 4,108,793
408 4,108,794
419 4,108,795
429 B 4,108,796

466 PT 4,108,797
502 4,108,798
522 4,108,799
541 4,108,800
544 4,108,801

CLASS 254

88 4,108,421

CLASS 256

67 4,108,422

CLASS 260

22 TN 4,108,811
24 4,108,812
29.2 EP 4,108,815
29.2 TN 4,108,814
29.4 R 4,108,816
29.6 AQ 4,108,818
29.6 E 4,108,817
29.6 NR 4,108,819
29.6 S 4,108,813
30.8 R 4,108,820
4,108,821
32.8 R 4,108,822
33.2 EP 4,108,824
33.4 PQ 4,108,823
37 SB 4,108,825
42.21 4,108,827
45.75 H 4,108,828
45.8 NT 4,108,829
45.85 S 4,108,830
45.95 C 4,108,831
112 G 4,108,847
112.5 R 4,108,846
117 4,108,848
122 4,108,849
162 4,108,850
239.3 B 4,108,852
239.57 4,108,851
252 4,108,854
285.5 4,108,855
290 HL 4,108,856
293.54 4,108,857
294.8 E 4,108,858
296 R 4,108,859
304 A 4,108,860
306.7 C 4,108,861
307 C 4,108,862
314.5 4,108,863
326 C 4,108,864
329 R 4,108,865
4,108,866
332.1 4,108,868
332.2 C 4,108,867
340.7 4,108,869
340.9 R 4,108,870
345.2 4,108,871
4,108,872
4,108,873
346.75 4,108,874
347.2 4,108,876
347.8 4,108,875
4,108,877
395 B 4,108,826
405.6 4,108,879
408 4,108,878
410.5 4,108,880
448 C 4,108,881
448.2 E 4,108,882
453 RW 4,108,883
4,108,884
455 A 4,108,885
455 R 4,108,886
465 F 4,108,888
465 H 4,108,887
502.4 R 4,108,889
507 R 4,108,890
514 D 4,108,892
528 4,108,891
561 N 4,108,893
564 R 4,108,894
566 A 4,108,895
570.5 C 4,108,896
570.8 R 4,108,897
586 C 4,108,898
4,108,899
590 C 4,108,900
4,108,901
4,108,902
4,108,903
600 R 4,108,904
604 HF 4,108,905
609 R 4,108,906
610 B 4,108,907
652.5 R 4,108,910
666 A 4,108,911
667 4,108,912
669 R 4,108,913
671 R 4,108,914
674 SA 4,108,915
676 R 4,108,916
677 R 4,108,917
680 E 4,108,918
4,108,919
683.15 B 4,108,920
827 4,108,921
830 P 4,108,922
836 4,108,923
837 PV 4,108,924
874 4,108,926
875 4,108,942
876 R 4,108,925
878 R 4,108,943
879 4,108,944
880 B 4,108,945
881 4,108,946
889 4,108,947
897 B 4,108,948
932 4,108,949
986 4,108,950

CLASS 261

34 B 4,108,951
44 R 4,108,952
142 4,108,953

CLASS 264

13 4,108,927
26 4,108,928
29.1 4,108,929
32 4,108,930
37 4,108,931
4,108,932
42 4,108,933
53 4,108,934
68 4,108,935
78 4,108,936
89 4,108,937
127 4,108,938
129 4,108,939
140 4,108,940
154 4,108,941
216 4,108,954
222 4,108,955
329 4,108,956

CLASS 267

64 R 4,108,423
160 4,108,424

CLASS 269

71 4,108,425
328 4,108,426

CLASS 271

9 4,108,427

CLASS 272

76 4,108,428
136 4,108,429

CLASS 273

1 R 4,108,430
4,108,431
29 A 4,108,432
4,108,433
30 4,108,434
55 R 4,108,435
75 4,108,436
86 D 4,108,437
120 R 4,108,438
176 E 4,108,440
176 R 4,108,439
186 A 4,108,441
237 4,108,442
243 4,108,443

CLASS 274

9 R 4,108,444
4,108,445

CLASS 277

101 4,108,446
153 4,108,447
157 4,108,448

CLASS 280

5.28 4,108,449
7.13 4,108,450
11.2 4,108,451
11.3 4,108,452
11.37 E 4,108,454
28 4,108,453
43.23 4,108,455
47.37 R 4,108,456
166 4,108,457
4,108,458
215 4,108,459
236 4,108,460
279 4,108,461
289 E 4,108,462
460 A 4,108,463
508 4,108,464
605 4,108,465
4,108,466
615 4,108,467
648 4,108,468
668 4,108,469
677 4,108,470
747 4,108,471
763 4,108,472

CLASS 281

29 4,108,473

CLASS 285

12 4,108,474
15 4,108,475
47 4,108,476
58 4,108,477
82 4,108,478
112 4,108,479
197 4,108,480
231 4,108,481

CLASS 290

52 4,109,160

CLASS 292

165 4,108,482
272 4,108,483

CLASS 294

66 R 4,108,484
67 BC 4,108,485
99 R 4,108,486

CLASS 296

28 C 4,108,487
84 R 4,108,488

CLASS 297

37 4,108,489
42 4,108,490
85 4,108,491
284 4,108,492
337 4,108,493

CLASS 299

1 4,108,494
43 4,108,495
45 4,108,496

CLASS 301

37 SA 4,108,497

CLASS 302

27 4,108,498
34 4,108,499
53 4,108,500

CLASS 303

82 4,108,501

CLASS 305

14 4,108,502

CLASS 307

87 4,109,161
203 4,109,162
205 4,109,163
228 4,109,164
229 4,109,165
237 4,109,166
270 4,109,167
271 4,109,168
302 4,109,169

CLASS 308

6 C 4,108,503
4,108,504
72 4,108,505
187 4,108,506
238 4,108,507
4,108,508

CLASS 310

68 R 4,109,170
75 C 4,109,171
313 4,109,172
4,109,173
316 4,109,174

CLASS 312

1 4,108,509
8 4,108,510
9 4,108,511
24 4,108,512
39 4,108,513
107 4,108,514
119 4,108,515
216 4,108,516
297 4,108,517
305 4,108,518
320 4,108,519
330 R 4,108,520

CLASS 313

112 4,109,175
220 4,109,176
402 4,109,177

CLASS 315

12 R 4,109,178
39.75 4,109,179
169 TV 4,109,180
4,109,181
368 Re.29,740
392 4,109,182
4,109,183

CLASS 316

17 4,108,521

CLASS 318

327 4,109,184
571 4,109,185
572 4,109,187
587 4,109,186
602 4,109,188
608 4,109,189
609 4,109,190
673 4,109,191

CLASS 320

1 4,109,192
2 4,109,193

CLASS 323

17 4,109,194

CLASS 324

15 4,109,195
62 4,109,196
78 F 4,109,197
103 P 4,109,198
202 4,109,199
208 4,109,200
227 4,109,201

CLASS 325

3 4,109,202
38 B 4,109,203
38 R 4,109,204
45 4,109,205
319 4,109,206
455 4,109,207

CLASS 328

13 4,109,208
60 4,109,209
61 4,109,210
116 4,109,211
163 4,109,212

CLASS 330

2 4,109,213
254 4,109,214
4,109,215

CLASS 331

87 4,109,216
94.5 S 4,109,217

CLASS 332

7.51 4,109,218

CLASS 335

78 4,109,219
212 4,109,220
251 4,109,221
301 4,109,222

CLASS 336

84 C 4,109,223
192 4,109,224

CLASS 337

42 4,109,225
130 4,109,226
252 4,109,227
276 4,109,228
408 4,109,229

CLASS 338

164 4,109,230
200 4,109,231

CLASS 339

19 4,108,522
22 B 4,108,523
47 R 4,108,524
49 R 4,108,525
103 M 4,108,526
107 4,108,527
117 P 4,108,528
177 R 4,108,529
256 SP 4,108,530
258 F 4,108,531

CLASS 340

6 R 4,109,232
15 4,109,233
52 B 4,109,234
52 F 4,109,235
146.1 F 4,109,236
146.3 E 4,109,237
149 A 4,109,238
324 AD 4,109,244
324 M 4,109,241
4,109,242
324 R 4,109,243
334 4,109,245
518 4,109,246
539 4,109,239
629 4,109,240

CLASS 343

6.5 R 4,109,247
4,109,248
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4,108,358
4,108,375
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4,107,954
4,107,963
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4,109,025
4,109,041
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4,109,092
4,109,097
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4,108,065
4,108,084
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4,108,434
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4,108,563
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4,108,698
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4,108,707
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4,108,944
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4,108,956
4,109,012
4,109,040
4,109,044
4,109,054
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4,109,094
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4,109,144
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4,108,244
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4,107,866
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4,108,441
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4,109,006
4,109,032
4,109,033
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4,107,874
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4,107,945
4,107,993
4,108,033
4,108,127
4,108,158
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4,108,194
4,108,198
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4,108,195
4,108,617
4,108,781
4,108,922
4,109,005
4,109,019
4,109,158
4,109,190
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4,108,015
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4,108,455
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4,108,704
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4,109,237
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4,108,152
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4,108,256
4,108,552
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4,107,880
4,108,086
4,108,110
4,108,120
4,108,276
4,108,387
4,108,456
4,108,562
4,108,584
4,108,680
4,108,892
4,109,058
4,109,126
4,109,228
4,109,230
4,109,285
4,109,309

DESIGN PATENTS

1 : 249,023
4 : 249,045
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06 : 249,078
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56 : 249,084

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Board of Appeals Decisions Rendered in the Month of July 1978

Affirmed	209
Affirmed in Part	30
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Total	302

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,427,720, Re. S.N. 915,912, Filed Jun. 16, 1978, Cl. 32/27, HAND DRILLING, Herbert Berman, et al., Owner of Record: *Inventors,* Attorney or Agent: Charles Hieken, Ex. Gp.: 333

3,804,251, Re. S.N. 910,513, Filed May 30, 1978, Cl. 210/83, FLOATAGE COLLECTING APPARATUS AND METHOD, James H. Farrell, et al., Owner of Record: *JBF Scientific Corporation, Burlington, Mass.,* Attorney or Agent: Melvin R. Jenney, et al., Ex. Gp.: 176

3,967,589, Re. S.N. 920,859, Filed Jun. 30, 1978, Cl. 122/4 R, ENERGY GENERATING SYSTEM, Ronald I. Papineau, Owner of Record: *Inventor,* Attorney or Agent: George B. Finnegan Jr., et al., Ex. Gp.: 344

3,978,197, Re. S.N. 921,363, Filed Jul. 3, 1978, Cl. 423/332, WOOD FLY ASH REDUCTION METHOD, Erwin C. Betz, Owner of Record: *Inventor,* Attorney or Agent: James P. Hume, et al., Ex. Gp.: 113

4,020,341, Re. S.N. 913,373, Filed Jun. 7, 1978, Cl. 250/483, GENERATING AND USING COHERENT OPTICAL RADIATION, Ali Javan, Owner of Record: *Inventor,* Attorney or Agent: John N. Williams, Ex. Gp.: 256

4,036,091, Re. S.N. 921,364, Filed Jul. 3, 1978, Cl. 83/319, UNIVERSAL DOUBLE CUT DIE SET, Alexander Borzym, Owner of Record: *Inventor,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 324

4,066,425, Re. S.N. 878,588, Filed Feb. 16, 1978, Cl. 55/242, VENTILATING APPARATUS WITH FILTER EXCHANGE, Louis A. Nett, Owner of Record: *Inventor,* Attorney or Agent: Elwin A. Andrus et al., Ex. Gp.: 177

4,079,480, Re. S.N. 918,738, Filed Jun. 23, 1978, Cl. 16/87 R, CLAMPING APPARATUS, Vernon S. Oase, Owner of Record: *Owens-Corning Fiberglas, Toledo, Ohio,* Attorney or Agent: Ronald C. Hudgens, Ex. Gp.: 353

4,083,723, Re. S.N. 921,677, Filed Jul. 3, 1978, Cl. 96/66.5, PROCESS FOR COLOR PHOTOGRAPHIC PROCESSING, Isao Shimamura, et al., Owner of Record: *Inventor,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 166

PATENT NOTICES

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3,775,070
3,676,154
3,879,456
3,941,012
3,973,808
3,982,582
4,023,570
4,024,968
4,030,307
4,034,545
4,038,682
4,040,346
4,042,380
4,051,314
4,052,383
4,053,517
4,054,431
4,061,638
4,062,902
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4,064,347
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4,071,141
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4,076,628
4,077,537
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4,078,216
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4,079,723
4,080,311
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4,080,721
4,081,472
4,082,615
4,082,664
4,082,750
4,082,968
4,083,005
4,083,769
4,084,226
4,084,227
4,084,358
4,084,796
4,084,855
4,084,887
4,085,031
4,085,055
4,085,213
4,085,240
4,085,473
4,085,616
4,085,687
4,085,789
4,085,819
4,086,024
4,086,082
4,086,432
4,086,518
4,086,652
4,086,704
4,087,220
4,087,504
4,087,595

Dedications

3,072,582.—*Charles Bedell Frost,* Glendora, Calif. POLYETHER-URETHANE FOAMS AND METHODS OF MAKING SAME. Patent dated Jan. 8, 1963. Dedication filed Nov. 15, 1976, by the assignee, *The General Tire & Rubber Company.*

Hereby dedicates to the Public the remaining term of said patent.

3,923,176.—*Edward J. Wynn, Freson,* and *Lee D. Butler,* Kingsburg, Calif. FIRST TABLE FOR A BALE WAGON. Patent dated Dec. 2, 1975. Dedication filed July 3, 1978, by the assignee, *Sperry Rand Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

4,008,850.—*John J. Goodrich,* Rumford, R.I. GUSSETED PINCH BOTTOM BAG. Patent dated Feb. 22, 1977. Dedication filed May 8, 1978, by the assignee, *St. Regis Paper Company.*

Hereby dedicates to the Citizens of the United States of America the remaining term of said patent.

Disclaimers

Reissue No. 28,598.—*Ralph H. Baer,* Manchester, and *William T. Rusch* and *William L. Harrison,* Hollis, N.H. TELEVISION GAMING APPARATUS AND METHOD. Patent dated Oct. 28, 1975. Disclaimer filed Apr. 17, 1978, by the assignee, *Sanders Associates, Inc.*

Hereby enters this disclaimer to claims 1, 2, 5, 6, 13, 14, 15 and 16 of said patent.

3,089,790.—*Lewis Balamuth,* New York, *Claus Kleesattel,* Forest Hills, and *Arthur Kuris,* Riverdale, N.Y. ULTRASONIC CLEANING DEVICES AND METHOD OF CLEANING. Patent dated May 14, 1963. Disclaimer filed Mar. 3, 1978, by the assignee, *Cavitron Corporation.*

Hereby enters this disclaimer to claim 13 of said patent.

3,348,814.—*Robert P. Shaw,* New York, N.Y. METHODS AND MEANS FOR PRODUCING PHYSICAL, CHEMICAL AND PHYSICO-CHEMICAL EFFECTS BY LARGE-AMPLITUDE SOUND WAVES. Patent dated Oct. 24, 1967. Disclaimer filed June 16, 1978, by the assignee, *Macrosonic Process Corporation.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,406,757.—*August B. Baumstimler,* Odessa, Tex. WELL CLEAN-OUT TOOL. Patent dated Oct. 22, 1968. Disclaimer filed June 19, 1978, by the inventor.

Hereby enters this disclaimer to claims 1, 3, 4, 5 and 7 of said patent.

3,854,339.—*Richard Muller,* Worfelden, Germany. PROCESS AND DEVICE FOR BALANCING OF ROTORS. Patent dated Dec. 17, 1974. Disclaimer filed July 7, 1978, by the assignee, *American Hofmann Corporation.*

Hereby enters this disclaimer to claim 10 of said patent.

4,020,204.—*John Scbring Taylor,* Newark, Del., and *Wilbur Thomas Brader,* Media, Pa. VINYL TRANSFER SHEET MATERIAL AND METHOD FOR APPLYING SAME TO VINYL SUBSTRATE. Patent date Apr. 26, 1977. Disclaimer filed July 7, 1978, by the assignee, *FMC Corporation.*

Hereby enters this disclaimer to claims 1–10 of said patent.

4,024,113.—*Vernon G. Ammons,* Glenshaw, Pa. POLYCARBONATE POLYURETHANES BASED AN PARTICULAR ALIPHATIC/CYCLOALIPHATIC POLYCARBONATES. Patent dated May 17, 1977. Disclaimer filed July 3, 1978, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1 through 8 of said patent.

4,034,937.—*William James Fillery,* Belfast, Northern Ireland. POSITION REFERENCE DEVICES. Patent dated July 12, 1977. Disclaimer filed July 6, 1978, by the assignee, *Short Brothers Limited.*

Hereby enters this disclaimer to all claims of said patent.

4,062,881.—*Thomas G. Kugele,* Cincinnati, Ohio. SULFIDE CONTAINING TIN STABILIZERS. Patent dated Dec. 13, 1977. Disclaimer filed July 5, 1978, by the assignee, *Cincinnati Milacron Chemicals, Inc.*

Hereby enters this disclaimer to claims 2, 45, 55, 59 and 60 of said patent.

National Technical Information Service

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The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., S.W.
Washington, D.C. 20324

Patent application 880,748. Method for Increasing the Dispersibility of Aluminum Metal Powders. Filed Feb. 23, 1978.

Patent application 880,812. Planar Liquid Crystal Matrix Array Chip. Filed Feb. 23, 1978.

Patent application 880,910. Switch Debounce Circuit. Filed Feb. 23, 1978.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,045,873. Test Chamber for Alpha Spectrometry. Filed May 12, 1976. Patented Aug. 30, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 838,598. Gas Generating System. Filed Oct. 3, 1977.

Patent application 841,240. Electro-Optical Radio System. Filed Oct. 7, 1977.

Patent application 857,720. Variable Volume Depth Control. Filed Dec. 5, 1977.

Patent application 864,403. Controlled Radius Tether/Termination Assembly. Filed Dec. 27, 1977.

Patent application 864,984. Undersea Tether/Termination Assembly. Filed Dec. 27, 1977.

Patent application 871,562. Safe High Energy Density Battery. Filed Jan. 23, 1978.

Patent application 871,877. Super High Energy Density Battery. Filed Jan. 24, 1978.

Patent application 875,254. Tunable Infrared Detector With Narrow Bandwidth. Filed Feb. 6, 1978.

Patent application 877,633. Serriform Strip Crosstie Memory. Filed Feb. 14, 1978.

Patent application 881,927. Failure-Resistant Pseudo Nonvolatile Memory. Filed Feb. 28, 1978.

Patent application 882,500. Vector Measuring Current Meter. Filed Mar. 1, 1978.

Patent application 889,072. Method of Producing Population Inversion and Lasing at Short Wavelengths by Charge Transfer. Filed Mar. 22, 1978.

Patent application 889,666. Polarization-Independent Optical Switches/Modulators. Filed Mar. 24, 1978.

Patent application 893,545. Laser Scan Converter. Filed Apr. 5, 1978.

Patent 4,023,118. Superheterojunction Laser. Filed Mar. 24, 1975. Patented May 1977. Not available NTIS.

Patent 4,024,067. Processes for the Preparation of Bisbenzoins and Bis-Benzils. Filed Jan. 7, 1976. Patented May 17, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP. 1900 Half St. SW.
Washington, D.C. 20324

Patent application 880,750. Sliding Air Seal for Electronic Assemblies. Filed Feb. 23, 1978.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Services
Div., Federal Bldg., Agricultural Research Service
Hyatsville, Md. 20782

Patent application 839,711. Preparation of Protein Concentrates From Whey and Seed Products. Filed Oct. 5, 1977.

Patent 4,035,349. Inhibiting the Formation of Lysinoalanine. Filed June 9, 1975. Patented July 12, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent 4,078,052. Large Unilamellar Vesicles (LUV) and Method of Preparing Same. Filed June 30, 1976. Patented Mar. 7, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts NW.
Washington, D.C. 20590

Patent application 848,851. Process for Reducing Molten Furnace Slags by Carbon Injection. Filed Nov. 7, 1977.

Patent application 853,700. Cartridge for Grouting an Anchor Element in a Hole of a Support Structure. Filed Nov. 21, 1977.

Patent application 860,249. Recovery of Metals From Sea Nodules. Filed Dec. 13, 1977.

Patent application 870,181. Separation of Plastics by Flotation. Filed Jan. 17, 1978.

Patent application 874,953. Trigger Device for Explosion Barrier. Filed Feb. 3, 1978.

Patent 4,053,305. Recovery of Copper and Silver From Sulfide Concentrates. Filed Oct. 15, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,082,744. Extraction of Copper From Sulfide Ores. Filed July 16, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,066,992. Seismic Mine Monitoring System. Filed Oct. 9, 1975. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,072,015. Borehole Aerostatic Ground Support System. Filed Dec. 30, 1976. Patented Feb. 7, 1978. Not available NTIS.

Patent 4,072,587. Separate Recovery of Silver and Gold From Cyanide Solutions. Filed Apr. 21, 1977. Patented Feb. 7, 1978. Not available NTIS.

Patent 4,072,798. Bioelectric Neutralization of Acid Waters. Filed July 26, 1977. Patented Feb. 7, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 888,125. Substituted-6,7,8,9-Tetrahydro-Pyrido-and 2H-Pyrano (2,3-b)(1,8) Naphthyridines, Stable, Efficient Laser Dyes. Filed Mar. 20, 1978.

Patent 4,029,859. Thermal Sensor and Current Generator. Filed Oct. 14, 1975. Patented June 14, 1977. Not available NTIS.

Patent 4,033,287. Flueric Cartridge Initiator. Filed Oct. 1, 1976. Patented July 5, 1977. Not available NTIS.

Patent 4,040,880. Perchlorate Sensitizing Agent. Filed June 28, 1973. Patented Aug. 9, 1977. Not available NTIS.

Patent 4,043,526. Autopilot Hardover Failure Protection System. Filed Feb. 23, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,047,121. RF Signal Generator. Filed Oct. 16, 1975. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,050,968. Explosive Composition Containing a Hydroxyalkyl Acrylate Copolymer Binder. Filed Apr. 29, 1970. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,339. Variable Time Missile Safety Timer. Filed Dec. 28, 1964. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,054,871. Electromagnetic Intrusion Sensor. Filed Sept. 9, 1974. Patented Oct. 18, 1977. Not available NTIS.

Patent 4,057,803. Adaptive Direction of Arrival Antennae System. Filed Apr. 8, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,061,658. 2,5-Dioicrylfurans. Filed Mar. 23, 1977. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,062,058. Next Address Subprocessor. Filed Feb. 13, 1976. Patented Dec. 6, 1977. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents........ Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents........ Numbers 2,067 to 2,075, inclusive

REISSUES

AUGUST 29, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,742

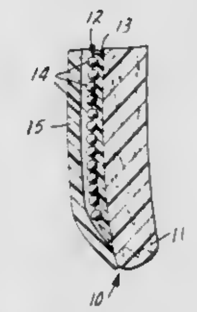
RETROREFLECTIVE PROTECTIVE HELMET

Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Original No. 3,885,246, dated May 27, 1975, Ser. No. 412,920, Nov. 5, 1973. Application for reissue Feb. 24, 1977, Ser. No. 771,541

Int. Cl.^{2} A42B *3/02;* G02B *5/12*

U.S. Cl. 2—412 **3 Claims**



1. A protective helmet comprising a protective shell adapted to be worn on a person's head; a retroreflective layer disposed over substantially all of the outer surface of the protective shell, comprising a layer of binder material and a monolayer of transparent glass microspheres that are partially embedded in the layer of binder material and have a coating of specular reflective material on their embedded surfaces; and a transparent sheet having the shape of the protective shell disposed directly over the retroreflective layer, said sheet being in tight frictional engagement with said retroreflective layer but without optical contact to the exposed surfaces of the microspheres and being attached to the protective shell at least around the periphery of the retroreflective layer so as to provide an airtight sealed pocket between the retroreflective layer and the transparent sheet, whereby the retroreflective layer retroreflects light shined at the helmet under either wet or dry conditions.

Re. 29,743

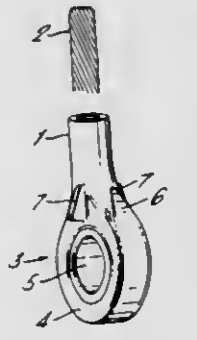
CABLE ATTACHMENTS

Brian Edgar Lund Biram, Johannesburg, South Africa, assignor to C.C.L. Systems Limited, England

Original No. 3,910,055, dated Oct. 7, 1975, Ser. No. 473,546, May 28, 1974. Application for reissue Jul. 5, 1977, Ser. No. 812,549

Int. Cl.^{2} F16G *11/00*

U.S. Cl. 61—45 B **2 Claims**



1. A cable anchor element having a socket at one end for receiving only a straight portion of a cable end therein and a load supporting member at the other end, said cable support element including an intermediate section that includes a plurality of radially extending members which gently converge from a widest point adjacent said load supporting member to a narrowest point surrounding said socket, said cable anchor element being securable in a recess of a wall with said socket end inserted in said recess and said radially extending members of said intermediate section secured in the mouth of said recess so that said load supporting member is exposed to support an external member adjacent said wall, said supporting element comprises at least two hook members, said hook member being rooted to said intermediate sections with said hook members converging gently toward a narrowest point surrounding said socket.

Re. 29,744

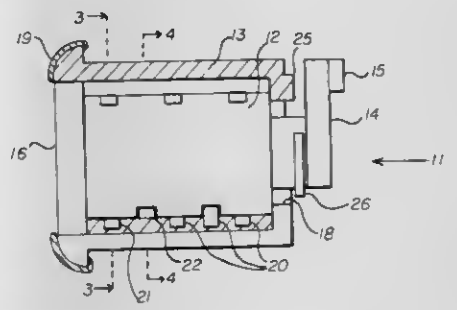
KEY CONTROLLED SECURITY APPARATUS

George P. Patriquin, 69 Lynde St., Gardner, Mass. 01440

Original No. 3,973,421, dated Aug. 10, 1976, Ser. No. 565,777, Apr. 7, 1975. Application for reissue Jul. 13, 1977, Ser. No. 815,259

Int. Cl.^{2} E05B *27/00*

U.S. Cl. 70—364 R **17 Claims**



1. A lock comprising:

a housing;

an actuator means retained by and rotatable between predetermined stations within said housing, said actuator defining a keyway for receiving a key;

operator means for effecting control functions in response to rotation of said actuator means into said predetermined stations;

locking tumbler means coupled between said housing and said actuator means and extending into said keyway, said locking tumbler means being biased in a locking position and movable into a shear position by a proper key in said keyway;

locking tumber blocking means preventing rotational movement of said actuator means from a locked station with said locking tumbler means in said locking positions and allowing rotational movement thereof with said locking tumbler means in said shear positions;

first directional tumbler means coupled between said housing and said actuator means and extending into said keyway, said first directional tumbler means movable between a quiescent position and an active position by a proper key in said keyway;

first blocking means allowing rotation of said actuator means in one direction from said locked station and preventing rotation thereof in the opposite direction with said first tumbler means in said quiescent position, and allowing rotation of said actuator means in said opposite direction from said locked station with said first tumbler means in said active position;

second directional tumbler means coupled between said housing and said actuator means and extending into said keyway, said second directional tumbler means being movable between a primary position and an auxiliary position by a proper key in said keyway; and

second blocking means allowing rotation of said actuator means in said one direction from said locked station with said second tumbler means in said primary position, and allowing rotation of said actuator means in said opposite direction from said locked station and preventing rotation thereof in said one direction with said second tumbler means in said auxiliary position.

Re. 29,745
PRINTER

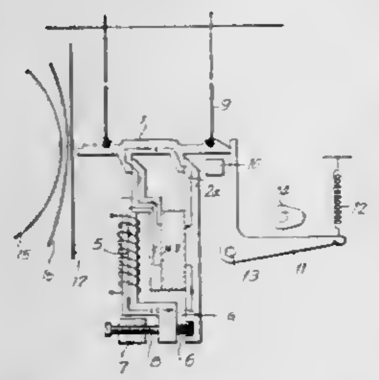
Yoshifumi Gomi, Chino, Japan, assignor to Shinshu Seiki Kabushiki Kaisha and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Original No. 3,878,778, dated Apr. 22, 1975, Ser. No. 322,840, Jan. 11, 1973. Application for reissue Oct. 27, 1976, Ser. No. 736,045

Claims priority, application Japan, Jan. 11, 1972, 47-5379; Jun. 17, 1972, 47-6816

Int. Cl.^{2} B41J *9/38*

U.S. Cl. 101—93.29 **9 Claims**



1. In a printer having respective control means for print hammers which are arranged in a plurality of columns and each of which is displaceable between a rest position and a print position, and having respective deformable elastic bodies maintained in deformed condition by the associated print hammers in the rest position, improved magnetic circuit control means associated with each of said columns for [selectively] holding each said print hammer at its rest position and *selectively* releasing same for displacement to a print position including a permanent magnet [common to at least two of said columns], a first hammer hold magnetic circuit portion associated with each print hammer including a portion of the associated print hammer and a second release magnetic circuit portion associated with each print hammer including release coil means and means for adjusting the magnetic reluctance of the release magnetic circuit portion said release coil means including means for applying signals thereto, said first and second magnetic circuit portions being connected in parallel with said permanent magnet, each of said magnetic circuit control means being adapted to hold said respective hammers in said rest position and to release said respective hammer upon application of a signal to its release coil means by means of said signal applying means in a direction so as to decrease the magnetomotive force applied to said hammer, the energy stored in the respective deformed body displacing said respective hammer from said rest position to said print position upon said decrease in said magnetomotive force.

Re. 29,746
APPARATUS FOR PULPING WASTE PAPER MATERIALS

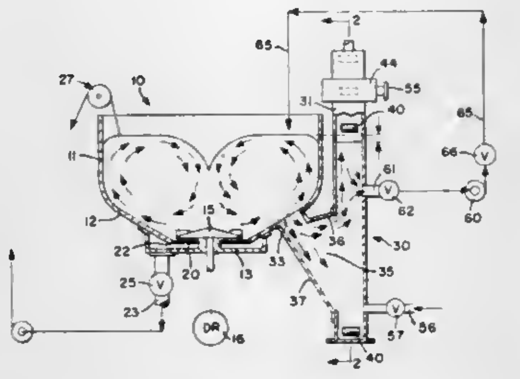
Joseph Walter Couture, Montreal, Canada, assignor to The Black Clawson Company, Middletown, Ohio

Original No. 4,030,671, dated Jun. 21, 1977, Ser. No. 692,885, Jun. 4, 1976. Application for reissue Aug. 5, 1977, Ser. No. 822,379

Claims priority, application Canada, Jun. 16, 1975, 229393

Int. Cl.^{2} B02C *23/36*

U.S. Cl. 241—15 **12 Claims**



1. Apparatus for recovering paper making fiber from waste paper products including substantial quantities of plastic film and other lightweight non-paper contaminants, comprising:

a. a tub for receiving such waste paper products and water to at least a predetermined minimum level,
b. a rotor mounted for rotation in said tub to pulp such waste paper products to aqueous slurry form,
c. means for extracting from said tub a liquid suspension of small particles of less than a predetermined maximum size,
d. an outlet in said tub bottom separate from said extracting means,
e. junk removing means including a casing adjacent said tub and of at least the same height,
f. a chute connecting said outlet with said casing and providing for liquid flow between said tub and said casing,
[g. a pump having its inlet connected with said casing at a level below said minimum level in said tube,]
[h.] *g.* means for [driving said pump to withdraw] *withdrawing* sufficient liquid from said casing to maintain the liquid level in said casing below that in said tub and thereby to induce flow of liquid and lightweight contaminants from said tub to said casing by way of said chute,
[i.] *h.* means [connecting the outlet of said pump with said tub to recirculate] *for recirculating* withdrawn liquid back into said tub, and
[j.] *i.* means for collecting lightweight contaminants in the upper portion of said casing for removal therefrom.

Re. 29,747
LIQUID RING PUMP LOBE PURGE

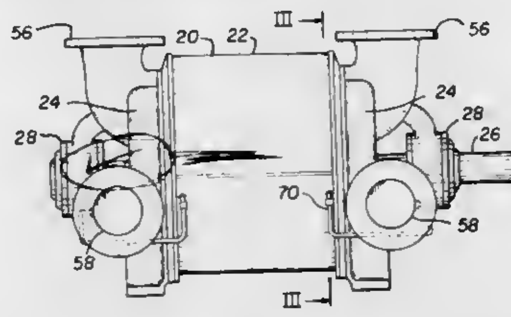
Kenneth W. Roe, Winfield, Ill.; Ernest E. Studwell, East Norwalk, and Robert E. Cooke, West Redding, both of Conn., assignors to Nash Engineering Company, Norwalk, Conn.

Original No. 3,846,046, dated Nov. 5, 1974, Ser. No. 321,602, Jan. 8, 1973. Continuation of Ser. No. 120,421, Mar. 3, 1971, abandoned. Application for reissue Mar. 21, 1977, Ser. No. 779,387

Int. Cl.^{2} F04C *19/00*

U.S. Cl. 417—54 **8 Claims**

1. A method of reducing wear in liquid ring pumps which would result from abrasive action of contaminants carried in the liquid of the ring which method comprises, *determining the region where excessive wear would occur as a result of contaminants carried by the liquid ring*, forming conduit means opening to the interior of the ring chamber at [a] *said* region [where, but for that opening, excessive wear would occur] and during operation of the pump, purging a portion of the ring liquid and a substantial part of the contaminants of the ring through said conduit means.



Re. 29,748
DRY WORKING BLACK IMAGE COMPOSITIONS COMPRISING ORGANIC HALOGEN COMPOUNDS AND ETHYLENE COMPOUNDS

Harry L. Fichter, Jr., Hudson, and James M. Lewis, Aurora, both of Ohio, assignors to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

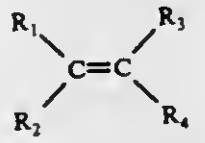
Original No. 3,510,304, dated May 5, 1970, Ser. No. 603,731, Dec. 22, 1966. Application for reissue Dec. 6, 1976, Ser. No. 747,978

Int. Cl.^{2} G03C *5/04, 1/52, 5/24*

U.S. Cl. 96—27 E **11 Claims**

1. A photosensitive composition comprising:

(a) an organic halogen compound having at least three halogen atoms attached to a terminal carbon atom; and
(b) a substantially colorless ethylene compound represented by the formula



$$R_1R_2C{=}CR_3R_4$$

wherein R_1 and R_2 each represent a p-dialkylaminophenyl group in which the alkyl groups are selected from the group consisting of methyl and ethyl, and each of R_3 and R_4 represents a monovalent material selected from the group consisting of H, halogen, alkyl, aryl, and other monovalent groups which do not interfere with the resonance of the ethylenic double bond connecting the two carbon atoms;

said constituents being present in proportions which yield a near neutral or black image when reacted with the products resulting from the photolytic exposure of said organic halogen compound; and

(c) a support for said composition.

6. A dry working photographic process which comprises preparing composition of claim 1 in a thin film; exposing said composition to a pattern of radiant energy, whereby a neutral or nearly black image prints out directly as a result of said exposure; and fixing said image in said composition by heating the same.

8. A dry working photographic process according to claim 6 wherein said exposure comprises an exposure to the equivalent of 0.001 to 1.0 watt seconds/per square centimeter through a negative or positive original whereby an image prints out directly as the result of said exposure.

Re. 29,749
TRIVALENT CHROMIUM ELECTROPLATING BATHS AND ELECTROPLATING THEREFROM

Jeffrey Gyllenspetz, Knaresborough, and Stanley Renton, Penkridge, both of England, assignors to Albright & Wilson Ltd., Oldbury, England

Original No. 3,954,574, dated May 4, 1976, Ser. No. 530,158, Dec. 6, 1974. Application for reissue Aug. 26, 1977, Ser. No. 827,958

Claims priority, application United Kingdom, Jun. 17, 1974, 2665/74; Dec. 13, 1973, 57872/73

Int. Cl.^{2} C25D *3/06, 3/56*

U.S. Cl. 204—43 T **30 Claims**

31. An aqueous electroplating bath for electrodepositing chromium-iron alloys consisting essentially of water, from 0.2 to 0.6 molar trivalent chromium and iron cation in an amount up to saturation for the electrodeposition of chromium-iron alloys, from 0.05 to 0.3 molar bromide, formate in a molar ratio of formate to chromium of from 2:1 to 1:1, from 1 to 3 molar ammonium, from 0.5 to 1 molar borate, from 2.5 to 3.5 molar of anion selected from chloride and sulphate and having a pH between 1 and 4.

PLANT PATENTS

GRANTED AUGUST 29, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,295

PEACH TREE

Grant Merrill, deceased, late of Red Bluff, Calif., by Lucile B. Merrill, executrix, 325 Breese Ave., Red Bluff, Calif. 96080

Filed Jul. 29, 1977, Ser. No. 820,919

Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, which is of medium size, medium vigor, spreading, open, vase-formed, and hardy; foliated with medium size, acuminate, lanceolate, acutely pointed, thin, dark green leaves having a crenate, finely serrate margin and a short, thick petiole, and a regular and very productive bearer of uniform, evenly ripening, large-to-medium size, nearly globose or very broadly ovate, semi-freestone fruit having yellow skin substantially overspread with red, and firm, fine, crisp, meaty, yellow flesh streaked with red; the variety being more particularly characterized–in comparison to the Merrill Gem Free peach—by fruit that ripens at the same time but averages slightly larger in size; the fruit—with fewer split pits—being rounder, more symmetrical, more firm of flesh, and with better shipping quality.

PATENTS

GRANTED AUG. 29, 1978

ERRATA

For CLASS	See PATENT NO.
068-200	4,109,483
074-388 R	4,109,529
166-315	4,109,728
400-124	4,109,776
400-124	4,109,777
400-154.2	4,109,778
400-584	4,109,779
206-326	4,109,876
062-054	4,110,091
062-064	4,110,092
521-063	4,110,264
521-030	4,110,265
521-057	4,110,267
521-177	4,110,268
521-081	4,110,269
521-121	4,110,270
521-111	4,110,271
521-111	4,110,272
521-059	4,110,273
521-157	4,110,274
521-123	4,110,276
528-119	4,110,309
528-119	4,110,310
528-215	4,110,311
528-215	4,110,312
528-090	4,110,313
528-126	4,110,314
528-294	4,110,315
526-068	4,110,316
528-077	4,110,317
528-073	4,110,318
526-017	4,110,319
544-385	4,110,327
544-380	4,110,328
528-170	4,110,364
260-603 R	4,110,403
219-101	4,110,577
179-156 R	4,110,583
364-463	4,110,605
252-522	4,110,626
358-004	4,110,761

PATENTS

GRANTED AUGUST 29, 1978

GENERAL AND MECHANICAL

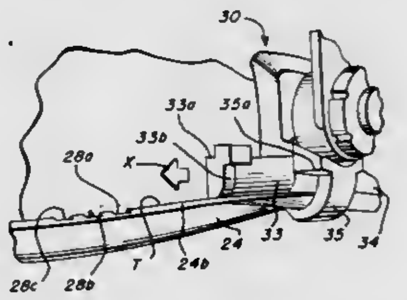
4,109,320
ATTACHING ASSEMBLY

Marshall N. Anderson, Grayslake, Ill., assignor to Sellstrom Manufacturing Company, Palatine, Ill.

Filed Jun. 10, 1977, Ser. No. 805,537

Int. Cl.^{2} A61F *9/06*

U.S. Cl. 2—10 **20 Claims**



1. An assembly for use in attaching a secondary unit to a primary unit wherein the latter is provided with an exterior wall surface and a flange extending from the wall surface and disposed in spaced, substantially face-to-face relation with the wall surface; said assembly comprising at least one removable bracket having a base portion adapted to slidably engage the wall surface, and releasable means extending from said base portion for disposition between the flange and the wall surface and slidably engaging the flange and retaining the bracket in predetermined positions on the primary unit; and means coacting with the bracket base portion for connecting the secondary unit thereto.

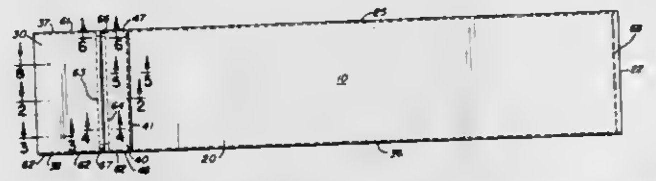
4,109,321
SCARF CONSTRUCTIONS HAVING A SUBSTANTIALLY CONCEALABLE POCKET THEREIN, AND METHODS OF PRODUCING SAME

Rosella Shapiro, 3530 N. Lake Shore Dr., Chicago, Ill. 60657

Filed Jan. 3, 1977, Ser. No. 756,346

Int. Cl.^{2} A41D *23/00*

U.S. Cl. 2—91 **39 Claims**



1. An improved fabric scarf construction having a substantially concealable purse, or pocket thereof, provided within the confines of overlapping fabric and positioned at or in the vicinity of at least one end portion of the scarf, which comprises:

a length of elongated fabric having outer ends and side edges positioned at outer ends and side edges, respectively, of the scarf;

a first, shorter length of fabric having outer and inner ends and side edges; said first, shorter length of fabric being positioned at an end of said elongated fabric in overlapping relationship with only part of the length of said elongated fabric, and having substantially the same width as that of the underlapping portion of said elongated fabric and extending substantially thereacross, so that the overlapping outer end and side edges of the overlapping fabric are positioned at an outer end and side edges, respectively, of the scarf;

said overlapping lengths of fabric being secured together or connected at substantially the outer end of the scarf;

the inner end of said first, shorter length of fabric being folded back substantially thereacross with only part of the remaining length thereof to thereby provide a folded, inner end portion;

a length of a first, elongated zipper tape having adjoining outer and inner edges formed of fabric and zipper teeth, respectively; said first zipper tape being associated with and positioned in substantially underlapping relationship with the folded, inner end portion of said first, shorter length of fabric and extending partly or substantially thereacross with its length of zipper teeth positioned inwardly of the adjoining length of the outer side edge of fabric;

the outer side edge of fabric of said first zipper tape and the associated folded, inner end portion of said first, shorter length of fabirc being secured together or connected substantially thereat;

said side edges of said overlapping fabric formed by said elongated fabric and said first, shorter length of fabric being secured together or connected substantially thereat;

a second, shorter length of fabric having outer and inner ends and side edges; said second, shorter length of fabric being positioned substantially contiguous to the inner end of said first, shorter length of fabric, and being positioned in overlapping relationship with only part of the length of said elongated fabric not overlapped by said first, shorter length of fabric, and having substantially the same width as that of the underlapping portion of said elongated fabric and extending substantially thereacross, so that the overlapping side edges of the overlapping fabric are positioned at side edges of the scarf;

the outer end of said second, shorter length of fabric being secured or connected substantially thereat to said elongated fabric overlapped thereby, and said elongated fabric extending outwardly beyond said outer end of said second, shorter length of fabric;

the inner end of said second, shorter length of fabric being folded back substantially thereacross with only part of the remaining length thereof to thereby provide a folded, inner end portion;

a length of a second, elongated zipper tape having adjoining outer and inner side edges formed of fabric and zipper teeth, respectively; said secnd zipper tape being associated with and positioned in substantially underlapping relationship with the folded, inner end portion of said second, shorter length of fabric and extending partly or substantially thereacross with its length of zipper teeth positioned inwardly of the adjoining length of the outer side edge of fabric of said second zipper tape; the length of the zipper teeth of said second zipper tape being substantially coextensive with the length of the zipper teeth of said first zipper tape;

the zipper teeth of said first and second zipper tapes being constructed, positioned and adapted to be placed in operative relationship with each other, so that the zipper teeth of both of said zipper tapes may be selectively and operatively interconnected and disconnected;

the outer side edge of fabric of said second zipper tape and the associated folded, inner end portion of said second, shorter length of fabric being secured together or connected substantially thereat;

said side edges of the overlapping fabric formed by said elongated fabric and said second, shorter length of fabric being secured together or connected substantially thereat;

the lengths of the folded, inner end portions of both said first and second, shorter lengths of fabric extending substantially across the scarf and being constructed, positioned and adapted to be placed in substantially contiguous relationship to each other and, together, to substantially overhang and thereby substantially conceal from view the zipper teeth of the first and second zipper tapes when those zipper teeth are selectively interconnected;

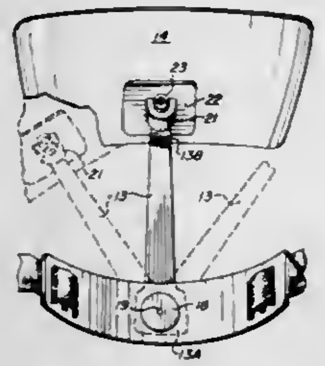
that portion or portions of the length of the substantially contiguous, folded, inner end portions of both said first and second, shorter lengths of fabric extending outwardly beyond one or both of the outer ends of the interconnectable length of zipper teeth to the associated aide edge or edges of the scarf, being secured together of interconnected to each other substantially thereat;

a substantially concealable purse, or pocket thereof, being provided by and within the confines of the overlapping fabric formed by said elongated fabric and first and second, shorter lengths of fabric; said pocket having a selectively closable opening provided by the interconnectable zipper teeth, and through which opening an article may be selectively inserted into and withdrawn from the confines of said pocket; said opening being capable of being opened and closed upon the selective opening and closing of said interconnectable zipper teeth, to thereby selectively open and close said pocket;

said interconnectable zipper teeth being capable of being selectively interconnected by being intermeshed in closed, interlocking relationship and disconnected and opened by being unmeshed in separated relationship; zipper slide member means operatively associated with said interconnectable zipper teeth and being selectively slidable with respect thereto and along a length thereof; said slide member means being constructed and operatively associated with the pair of zipper teeth so as to selectively and alternatively effect the intermeshing and unmeshing of said zipper teeth along at least part of the substantially coextensive length thereof, whereupon said sliding movement of said slide member means causes said slide member means to be selectively and slidably advanced or returned to selectively fasten or unfasten said opening and thereby selectively provide ready access to desired inserted contents of said pocket.

4,109,322
SUN SHIELD

Charlotte A. Ott, 1051 S. Dobson, #65, Mesa, Ariz. 85202
Filed Jun. 9, 1977, Ser. No. 804,911
Int. Cl.^{2} A42B *1/18*
U.S. Cl. 2—177 **2 Claims**



1. A sun shield for providing shade for the head of a wearer comprising:

a substantially flat thin resilient sun shielding member,

an elongated arm member,

a first means for pivotally attaching one end of said arm member to the bottom of said shielding member,

the bottom of said shielding member being provided with a U-shaped clamp for receiving and providing a bearing surface for said one end of said arm member,

a flexible head band having an elastic portion to provide a gripping connection on the head of a wearer, and

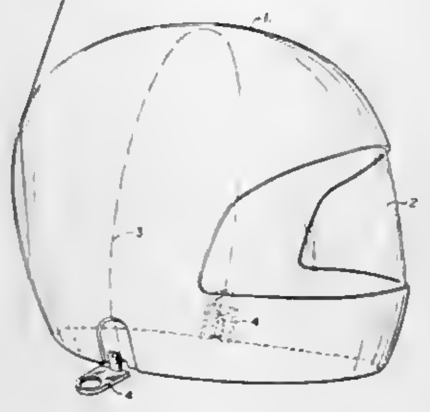
a second means for pivotally attaching the other end of said arm member to the side of said head band,

said head band being provided with a resilient arcuate plastic portion to which said second end of said arm member is pivotally attached,

whereby the pivotal movement of said shielding member relative to said one end of said arm member and the pivotal movement of one end of said arm member relative to said head band provides a plurality of shielding positions of said shielding member relative to and spaced from the head of the wearer.

4,109,323
PROTECTIVE HELMET

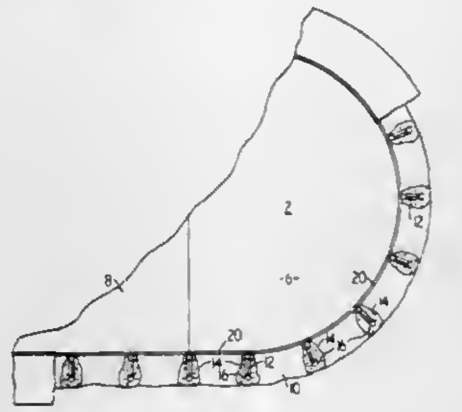
Jan Henner Matthias, Gries, Pinzgau, Austria, assignor to Porsche Design Ferdinand A. Porsche, Austria
Filed Nov. 30, 1977, Ser. No. 855,659
Claims priority, application Austria, Dec. 7, 1976, 9057/76
Int. Cl.^{2} A42B *3/02*
U.S. Cl. 2—410 **5 Claims**



1. Protective helmet with a helmet shell having at least one separating line thereon, said shell being resistant to mechanical stress and formed of a material resistant to melting over a substantial area thereof, comprising an elongate separating device in the form of an electrical resistor element connected to the helmet shell and extending along said at least one separating line of the helmet shell which consists at least partially of easily meltable material, said separating device being provided with at least two electrical terminals to which an electric current source is connectable.

4,109,324
PLASTIC WALL POOL SYSTEM

Kerry J. Cornelius, 22 Springbank Dr., St. Catherines, Ontario, Canada (L2S 2J9)
Filed Jul. 2, 1976, Ser. No. 702,134
Claims priority, application Canada, Apr. 26, 1976, 251059
Int. Cl.^{2} E04H *3/16, 3/18*
U.S. Cl. 4—172.19 **5 Claims**



1. A plastic wall, vinyl liner swimming pool construction comprising:

(a) a plurality of structural foam, injection moulded wall panels detachably connected at their ends to form the shape of a pool construction,

(b) a plurality of hollow X-shaped braces of injection moulded structural foam and filled with a noncompressible material, said wall panels being attached at their tops, centers and bottoms to said braces,

(c) said braces being secured at their lower ends to the perimeter pool construction floor by noncompressible material,

(d) a coping member secured to the upper end of said wall panels,

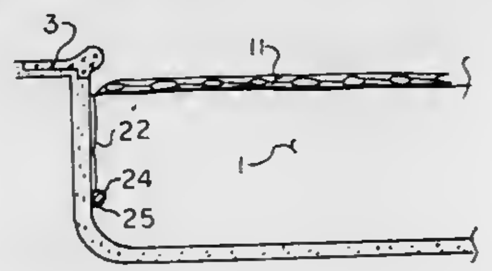
(e) a vinyl pool liner attached at its upper end to said coping, and

(f) a deck around the upper perimeter of the pool construction,

(g) said wall panels, coping and liner being held in suspension by said X shaped braces and the deck being supported thereby; each said X-shaped brace comprising a pair of injection moulded, structural foam X-shaped members wherein the legs of the X are concave, and flange means on each brace half for abutting like flange means on the other brace half with means interconnecting said flanges and halves together to form hollow legs of the X-shaped brace for reception of a noncompressible material therein; and ribs coplanar with and extending outwardly from said brace at the top, bottom and center thereof for attachment of the pool wall panel to said brace.

4,109,325
INFLATABLE SWIMMING POOL COVER SYSTEM

Gregory Donglas Shuff, 311 Avenida Cerritos, Newport Beach, Calif. 92660
Continuation-in-part of Ser. No. 612,846, Sep. 12, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 744,407
Int. Cl.^{2} E04H *3/19*
U.S. Cl. 4—172.12 **3 Claims**



1. An air supportable structure for a swimming pool having peripheral side walls, said structure comprising:

a central cover having a floating position and a raised position and made of two sheets of plastic material bonded together to form an air space there between cover is itself buoyant, when inflated said material being configured and dimensioned to closely approximate the configuration and dimensions of the swimming pool and thereby substantially completely cover the swimming pool water surface and float substantially flat upon the said surface in said floating position of said cover;

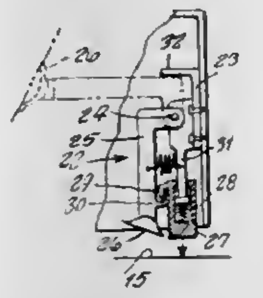
a peripheral skirt made of sheet material of lesser buoyancy than said central cover and having upper edge margins attached to the edge margins of said cover, said skirt being free of attachment to the structure of said swimming pool whereby, in said floating position of said cover, said skirt extends downwardly in submerged relation below the swimming pool water surface;

ballast means attached to the lower edge margins of said skirt, said ballast means being freely movable upwardly and downwardly in the swimming pool water and of sufficient negative buoyancy to maintain said skirt below the swimming pool water surface in said floating position of said cover; and

means for introducing air beneath said cover at a pressure sufficient to lift said cover to said raised position such that a space is provided between said cover and said water surface sufficient for swimming and recreation, said skirt being located generally above the swimming pool water surface in said raised position, with said ballast means located in the swimming pool water.

4,109,326
BATH TUB ENCLOSURE

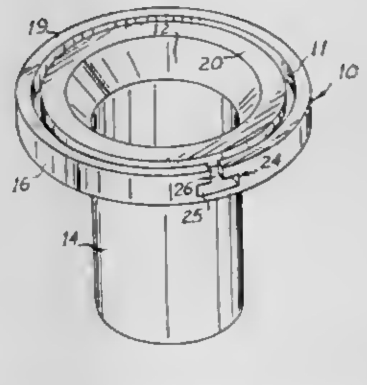
Margaret Holt, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed May 4, 1976, Ser. No. 683,171
Int. Cl.^{2} A47K *3/00*
U.S. Cl. 4—173 R **2 Claims**



1. An enclosure adapted to be mounted over a bath tub on a support surface, said enclosure comprising a shell of box-like shape including integral vertical front and opposite side walls integrally joined with a horizontal ledge for enclosing above the upper rim of said bathtub, said ledge having a resilient inner flap along the inner edge thereof, said flap being adapted to bear against the inner side of said bathtub to form a tight seal therebetween, a movable brace mounted on an inner side of said shell and means secured to said shell retaining said brace in an operative position when said shell is not mounted over the tub, and operative to release said brace for movement to a position against a side of the tub when said shell is mounted over said tub, wherein said means comprises a bracket mounted on an inner side of the shell and having a leg extending downwardly with a sleeve mounted slidably thereon, said brace being pivotally mounted on said bracket, coacting hooks mounted on said sleeve and brace serving to retain said brace in said inoperative position, a compression coil spring mounted between said leg and brace, and a spring mounted in said sleeve engaging said leg to bias said sleeve downwardly towards said support surface whereby engagement of said sleeve with said support surface causes an upward sleeve movement to disengage said hooks and release said brace to a position against the side of the tub.

4,109,327
WATER CLOSET FLANGE WITH CONTINUOUS BOLT SLOT

Basil B. Jones, Rte. 1, Box 536A, St. Cloud, Fla. 32769
Continuation-in-part of Ser. No. 586,161, Jun. 12, 1975, Pat. No. 4,014,053. This application Mar. 22, 1977, Ser. No. 780,068
Int. Cl.^{2} E03D *11/00*
U.S. Cl. 4—252 R **7 Claims**



1. A mounting flange for mounting a water closet, said

mounting flange including a flange having a central opening therethrough, said flange defining a continuous bolt slot, said bolt slot being generally concentric with said opening, said bolt being of a width to receive the bolt portion of a closet bolt and narrower than the base of said closet bolt, said flange further defining a channel beneath and coextensive with said bolt slot and in communication therewith, said channel having a width greater than the narrowest dimension of said base portion of said closet bolt and less than the longest dimension of said base portion of said closet bolt.

4,109,328

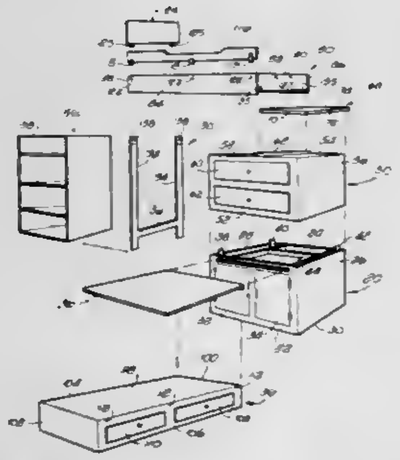
MODULAR FURNITURE SYSTEM

Lewis M. Mason, Pacific Palisades, Calif., assignor to M & S Industries, Inc., Los Angeles, Calif.

Filed Jul. 29, 1977, Ser. No. 820,486

Int. Cl.² A47B *83/00, 87/00*

U.S. Cl. 5—2 R **30 Claims**



1. A modular furniture system comprising:
a plurality of stacked enclosures having an uppermost enclosure;
a plurality of upwardly extending members, each having a first end attached to the inner surface of a lower enclosure and a second end extending upwardly into the volume enclosed by an upper enclosure, said upwardly extending members contracting the inner surfaces of said upper enclosure thereby interlocking said upper and lower enclosures when stacked one on top of the other;
a removable cover for a first top portion of said uppermost enclosure;
an upper rectangular mattress support frame having vertically disposed side walls and end walls;
means for supporting a first end of said upper mattress support frame; and
means for interlocking inner surfaces of said side walls and said end wall of a second end of said upper mattress support frame to a second top portion of said uppermost enclosure so that said upper mattress support frame is supported at said first end by said support means and at a second end by said second top portion of said uppermost enclosure and said removable cover is supported by said first top portion of said uppermost enclosure.

4,109,329

INVALID BED

Earl Silas Tupper, Panama City, Panama, assignor to TUPI (Panama) S.A., Panama City, Panama

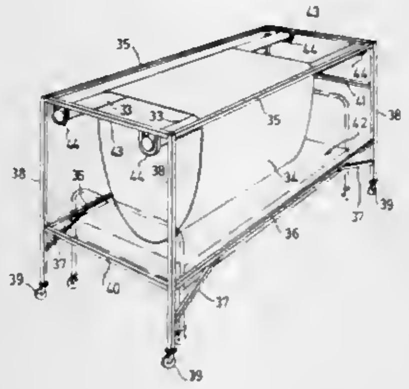
Filed Feb. 2, 1977, Ser. No. 764,939

Claims priority, application United Kingdom, Feb. 10, 1976, 5197/76

Int. Cl.² A61G *7/10*

U.S. Cl. 5—61 **23 Claims**

1. Equipment capable of imparting general relative movement to different parts of the body of a person and overall movement of said body in relation to a support, comprising
(a) a movable frame of a size and configuration sufficient to overlie a hospital bed;
(b) a horizontally mounted rotary drum journalled on said frame;
(c) an endless belt defining in part a loop of flexible material, passing over and hanging beneath said drum from two suspension axes defined in the curved surface of said drum;
(d) said loop being parallel to the longitudinal axis of and wider than the said person is tall in order to accommodate the said person in a lying position; and
(e) drive means mounted on said frame and operatively connected to rotate said drum, whereby the material is moved around in the loop direction and the person is thereby obliged to move within the loop.



4,109,330

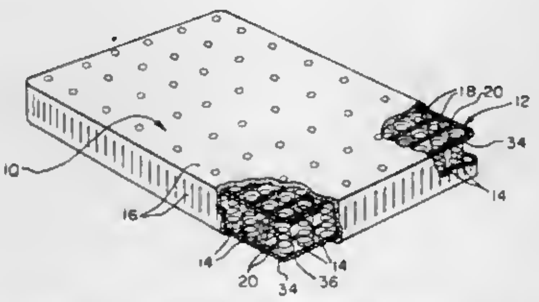
INNERSPRING CONSTRUCTION

Alvin R. Klancnik, Park Ridge, Ill., assignor to Sealy, Incorporated, Chicago, Ill.

Filed Apr. 20, 1977, Ser. No. 789,446

Int. Cl.² A47C *23/04*

U.S. Cl. 5—267 **4 Claims**



1. In a generally rectangular mattress innerspring unit, a spring structure comprising:
a. a plurality of coil springs positioned in a plurality of parallel rows, said springs each including an upper and a lower terminal convolution which terminal convolutions define an upper and a lower surface of the unit and are disposed in close proximity to the terminal convolutions of adjacent coil springs in the same row;
b. a plurality of cross helicals which extend transversely of the rows of springs in both the upper and lower surface of the unit, and lace together adjacent coil springs in each row; and
c. at least one welding means for restricting the rotation of a cross helical about its major axis, which welding means extends between two adjacent revolutions of a cross helical, whereby cross helical spin-out is reduced.

4,109,331

BED HAVING ACOUSTICAL ISOLATION

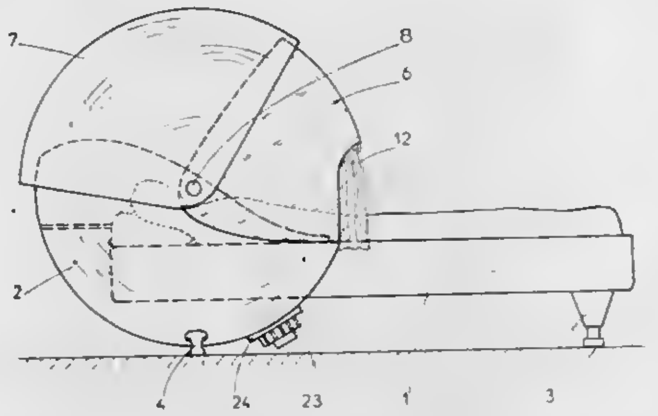
André Champeau, 7, rue Pavis de Chavannes, 75007 Paris, France

Filed Nov. 1, 1976, Ser. No. 737,182

Claims priority, application France, Nov. 7, 1975, 75 34169

Int. Cl.² A47C *21/04*

U.S. Cl. 5—284 **6 Claims**



1. A bed comprising a bed frame, means on said frame providing a sleeping surface, said frame having a head end and a foot end, means at said head end of the bed forming a chamber and including first and second parts, said first part being fixed to said frame, said second part being mounted on said first part for movement between an open position in which the second part is retracted on the first part and a closed position in which the second part is extended from the first part and defines a small opening facing the foot end of the frame, said first and second parts being constituted respectively by a rigid frame, and a sound insulating material and a sound absorbent material on said rigid frame, means for ventilating said chamber, said chamber having a spherical shape with a center in the vicinity of the head of an occupant of the bed, and means connecting said first and second parts for relative articulated movement around a horizontal transverse axis, said bed frame comprising a rigid base portion covered by a sound insulating material and a sound absorbing material.

4,109,332

POLYGONAL BODY, CONSISTING OF PLASTICS SOFT FOAM, AS FILLING MATERIAL FOR CUSHIONS OR THE LIKE

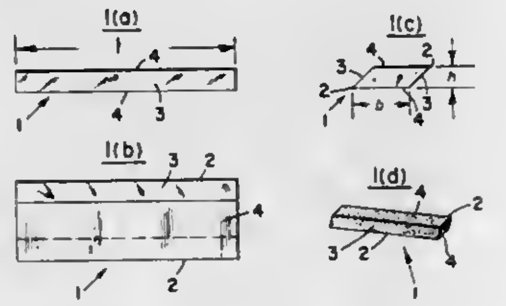
Werner Lück, in der Wiese 3, 429 Bocholt, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,419

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602706

Int. Cl.² B65D *85/30*

U.S. Cl. 5—337 **1 Claim**



1. A cushion, pillow, upholstery or the like having a filling comprising a multitude of homogeneous polygonal pieces of plastics soft foam of polyether having a density between 15 and 40 kilograms per cubic meter, wherein each body is in the form of a four sided rod of rhomboidal section longitudinally and transversely, cut from a foam supply in such a manner that all its side surfaces form surfaces of cut, and wherein the height of each body is smaller than the breadth, and the length is in the range of 1½ times to 5 times the breadth, but not greater than approximately 10 millimeters, said length being approximately 30 millimeters, said breadth being approximately 8 millimeters, and said height being approximately 3 millimeters.

4,109,333

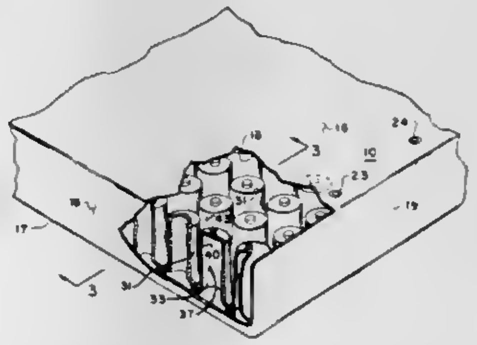
AIR STABILIZED WATER MATTRESS

Thomas George Zmiarovich, Sumnar, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,412

Int. Cl.² A47C *27/08*

U.S. Cl. 5—368 **1 Claim**



1. An inflatable mattress formed with an internal upper chamber and an internal lower chamber, said chambers divided by a shaped internal flexible partition, with the upper chamber bound by the top liner of the mattress and the lower chamber bound by the bottom liner of the mattress, with each chamber provided with independent valve means so that the upper chamber may be filled with water and the lower chamber inflated with air in which the partition is shaped to form a plurality of spaced hollow cylindrical sections extending between the top and the bottom liners of the mattress and spaced from said top and bottom liners, with the interior of said cylindrical sections open to the lower chamber and closed to the top chamber, together with spacer means mounted to the partition to space the cylindrical sections between the top liner and the lower liner.

4,109,334

SMOOTHING MACHINE FOR STITCH SEAMS

Heinrich Bungert; Herbert Wenz, and Klaus Wentz, all of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,649

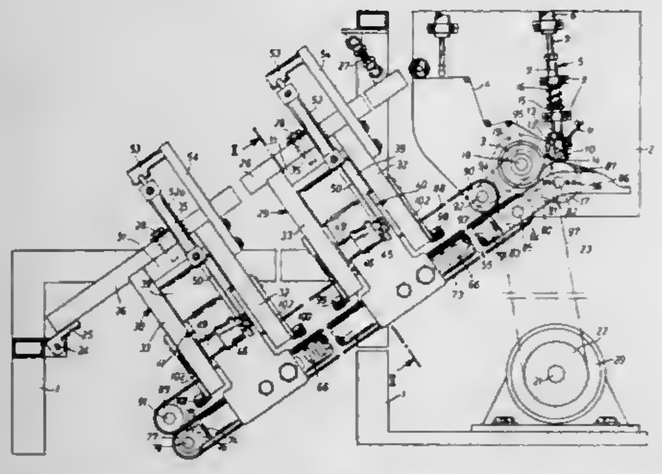
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2661633

Int. Cl.² A43D *11/00*

U.S. Cl. 12—59.5 **10 Claims**

1. In a machine for smoothing stitched seams on shoe shanks, and of the type including a driven friction wheel, cooperable with a friction wheel rotatably mounted on a relatively elongated support over and along which the shoe shanks are fed, for compressing and smoothing the stitched seams, the improvement comprising, in combination, at least two holding elements mounted on said machine and releasably engageable with said support at supporting points thereon spaced longitu-

dinally of said support; and means operable to disengage said holding elements from said support alternately during the



period between successive seam compressing and smoothing operations.

4,109,335

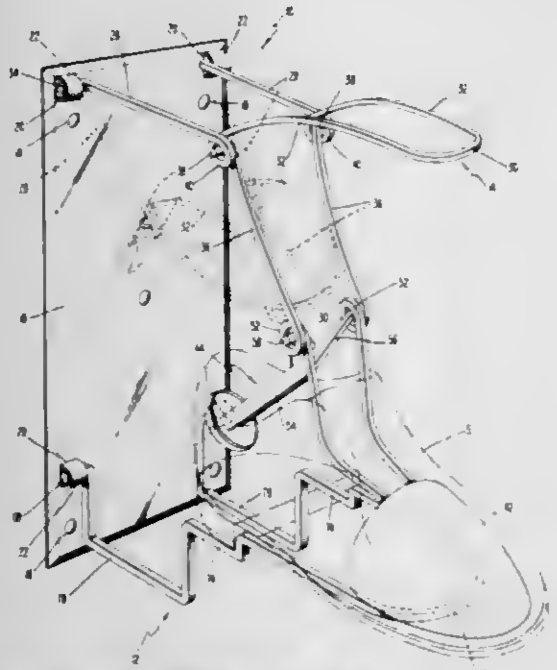
SHOE SUPPORT APPARATUS

Robert C. Randolph, 2300 19th St., NW., Washington, D.C. 20009

Filed Mar. 10, 1977, Ser. No. 776,361

Int. Cl.² A43D *3/14;* **A47L** *23/18*

U.S. Cl. 12—123 **13 Claims**



1. Shoe support apparatus comprising:
base means adapted to be vertically positioned;
shoe support means on said base means for supporting a shoe;
shoe retaining means on said base means for entering and retaining said shoe in an upright position upon said shoe support means;
said shoe support means and said shoe retaining means being pivotably supported on said base means so as to be capable of being alternatively disposed either in a collapsed positioned adjacent the base means or on erected position; and
said shoe retaining means includes a plurality of members pivotally interconnected,
said shoe support means being pivotally mounted for upward movement adjacent the lower portion of said base means;
said shoe retaining means being pivotally mounted for downward movement adjacent the upper portion of said base means;
said shoe retaining means being disposed in an overlying relationship with respect to said shoe support means when disposed in said collapsed position, and means for locking said retaining means in erected position.

4,109,336

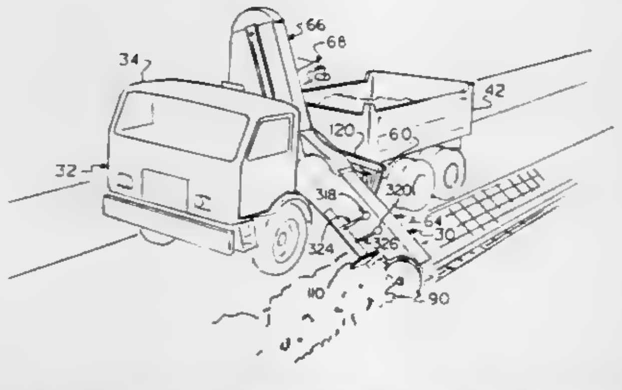
AUTOMATED MACHINERY TO CLEAN DEBRIS FROM ROADSIDE DITCHES, COLLECT IT AND THEN TRANSPORT THE DEBRIS TO A MAJOR COLLECTING AREA FOR DISPOSING

Donald E. Ford, 672 SW. 20th St., Chehalis, Wash. 98532

Continuation-in-part of Ser. No. 490,229, Jul. 22, 1974, abandoned. This application May 11, 1976, Ser. No. 685,367

Int. Cl.² E01H *1/02*

U.S. Cl. 15—3 **6 Claims**



1. A ditch cleaning mechanism for mounting on a vehicle to remove, debris from existing roadside ditches, comprising: a base adapted to be fixedly mounted on a vehicle extending transversely of the vehicle; a slide frame structure slidably and controllably positioned on the base, for movement transversely of the vehicle; a cleaning conveyor pivotally mounted at one of its ends on the slide frame structure for movement from an upright position for legal width highway travel to a selectable, variable downwardly extended position of its other end to approach and match the contour of a roadside ditch edge; an auger rotatably mounted on said other end of the cleaning conveyor and driven with the conveyor; a bucket conveyor mounted on said slide frame structure, and positioned during ditch cleaning operations to receive and to further raise the debris being raised by the cleaning conveyor, following the loosening of the debris upon the rotation of the auger along a bottom of a roadside ditch; a debris collecting chamber on said vehicle, and an essentially longitudinal belt conveyor mounted on said slide frame structure operable during ditch cleaning operations to receive the debris from the bucket conveyor and thereafter discharge the debris into said debris collecting chamber.

4,109,337

AUTOMATED TWO-SIDED CLEANING APPARATUS

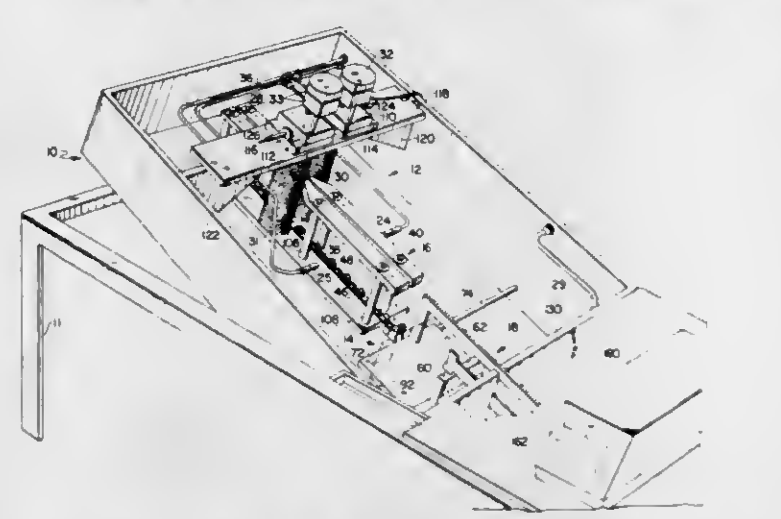
Gary Hillman, Livingston, and Michael Devico, Chatham, both of N.J., assignors to Machine Technology, Inc., East Hanover, N.J.

Filed Dec. 8, 1977, Ser. No. 858,517

Int. Cl.² A46B *13/04*

U.S. Cl. 15—21 D **14 Claims**

1. Apparatus for moving a workpiece from within a cassette through a processing station and back to said cassette, said apparatus comprising:
a frame, said processing station being mounted on said frame;
a cassette receiving station mounted on said frame for receiving said cassette;
guide means extending from said cassette receiving station through said processing station for receiving an edge portion of said workpiece; and
workpiece moving means for moving said workpiece from its position within said cassette along said guide means through said processing station and for moving said workpiece back through said processing station along said guide means to said cassette.



4,109,338

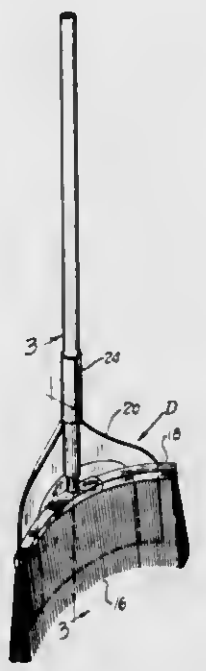
BROOM AND DUSTPAN COMBINATION

Richard H. Mertes, 26727 Brahms Dr., Westlake, Ohio 44145

Filed Oct. 6, 1975, Ser. No. 619,821

Int. Cl.² A46B *15/00;* **A47L** *13/52*

U.S. Cl. 15—105 **2 Claims**



1. In combination, a broom having a handle and a brush comprised of a concavo-convex array of bristles connected to said handle, and a dustpan adapted to be removably mounted on said broom with a portion of said dustpan positioned adjacent one face of said brush to serve as a backing member for said bristles, said dustpan including mounting means engageable with said broom for permitting said dustpan to be adjustably moved toward and away from the distal ends of the bristles to regulate their effective stiffness, said dustpan being flexible, and in its undeformed condition having a curvature substantially conforming to the curvature of said concavo-convex array.

4,109,339

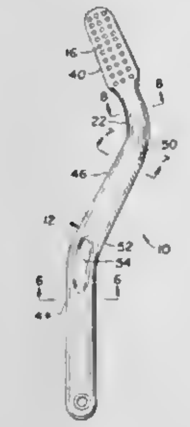
TOOTHBRUSH WITH CURVED HANDLE

Ursula Dietrich, 1588 Wedgewood, Hillsborough, Calif. 94010

Filed Sep. 8, 1977, Ser. No. 831,579

Int. Cl.² A46B *5/02*

U.S. Cl. 15—167 R **7 Claims**



4. A toothbrush adapted for cleaning the teeth of another animal or person, said toothbrush comprising a handle and a head attached to said handle, said handle having a bristle side and including a head segment, a neck segment adjacent said head segment, a grip segment and a shaft segment connecting said grip segment and said neck segment, said neck segment being laterally offset in a double curve from said grip segment along said shaft segment, said shaft segment defining a longitudinal twist in one direction and, at an adjacent portion along said shaft segment, a twist in the opposite direction between said neck segment and said grip segment wherein outer radii of said double curve define banks on said bristle side, said shaft segment further defining a depression on said bristle side adjacent said grip segment adapted to receive a thumb for improving the hand grasp of the brush handle.

4,109,340

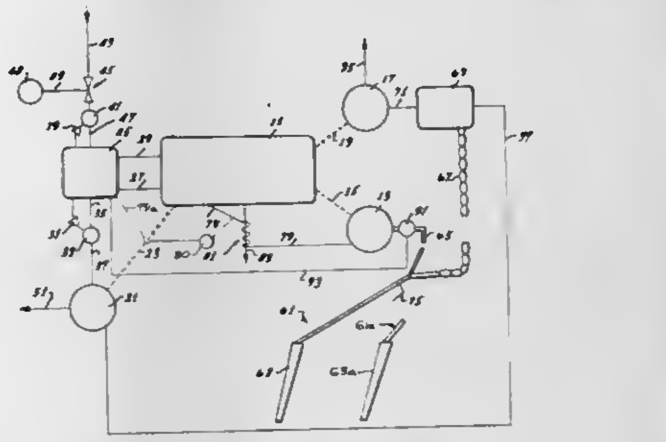
TRUCK MOUNTED CARPET CLEANING MACHINE

Leonard Engene Bates, 13928 W. Tahiti Way, #135, Marina Del Rey, Calif. 90291

Filed Jan. 27, 1977, Ser. No. 762,871

Int. Cl.² A47L *11/34*

U.S. Cl. 15—321 **20 Claims**

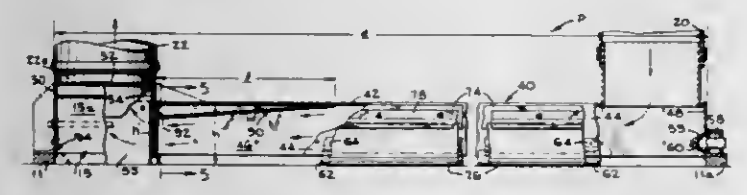


1. A carpet cleaning machine comprising
an internal combustion engine having a coolant system,
a first pump driven by said engine,
means in operative communication with said first pump for injecting a cleaning fluid into a carpet,
a second pump driven by said engine,
means in operative communication with said second pump for withdrawing dirt from a carpet,
a coolant reservoir in fluid communication with said coolant system in said engine,
means for delivering coolant from at least one of said engine

and said reservoir to said first pump for injection into a carpet by said injection means, and
means for replacing coolant, to at least one of said coolant system and said reservoir, thus delivered to said first pump including
means for adding a cleaning solvent to the coolant thus replaced.

4,109,341
UNIDIRECTIONAL FLOW PICKUP HOOD FOR STREET SWEEPERS

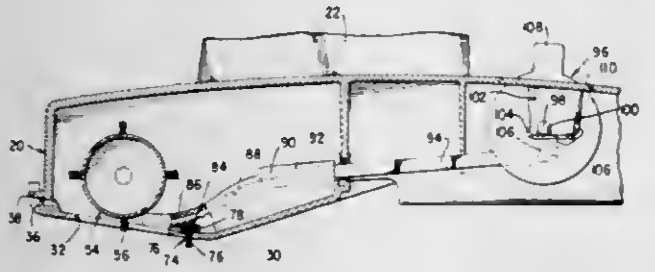
Gregory J. Larsen, Claremont, and Jan A. Hiszpanski, Upland, both of Calif., assignors to FMC Corporation, San Jose, Calif. Continuation of Ser. No. 647,305, Feb. 5, 1976, abandoned. This application Aug. 4, 1977, Ser. No. 821,670
Int. Cl.^{2} E01H *1/08*
U.S. Cl. 15—340 **12 Claims**



12. In a debris pickup system for street sweepers or the like which comprises a vehicle carrying a hopper, blower means for withdrawing air from the hopper, a debris pickup hood having an air inlet duct, and an air outlet line for delivering air and entrained debris from said hood to the hopper; said hood extending laterally of the vehicle and comprising an elongate box-like structure extending laterally of the vehicle, said air inlet duct and said air outlet line being connected adjacent opposite end portions of the hood; the improvement in said hood wherein said hood has top, side and end walls, the interior of said hood cooperating with the swept surface to provide a duct-like air chamber which is substantially unobstructed along its length for chanelling the air from said inlet duct into a substantially unidirectional stream of air from said air inlet duct to said air outlet line, the top wall of said duct-like chamber being inclined downwardly from a zone upstream of said air outlet line to the air outlet line to provide an air deflector for progressively accelerating said unidirectional stream of air and entrained debris as the air stream sweeps the surface and approaches said air outlet line.

4,109,342
VACUUM CLEANER WITH BARE FLOOR CLEANING BRUSH

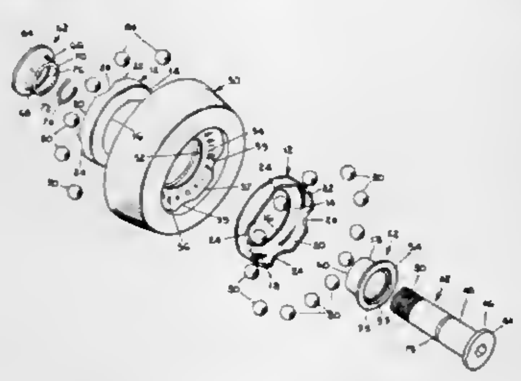
Don W. Vermillion, Anderson, S.C., assignor to The Singer Company, New York, N.Y.
Filed Jul. 29, 1977, Ser. No. 820,177
Int. Cl.^{2} A47L *5/30*
U.S. Cl. 15—373 **3 Claims**



1. In a vacuum cleaning apparatus comprising a chassis having a suction nozzle including an inlet mouth having a leading edge and a trailing edge at the bottom of the chassis, means for creating sub-atmospheric pressure at the nozzle inlet mouth, an elongated agitator brush mounted for rotation within the nozzle intermediate the leading and trailing edges, and motor means for rotatably driving the agitator brush, the improvement comprising an elongated bare floor cleaning brush having a multiplicity of bristles supported on a frame, said frame including a spindle at each longitudinal end journalled in the nozzle adjacent the trailing edge for rotation between a first position with the bristles substantially perpendicular to the nozzle mouth and a second position wherein the bristles are substantially parallel to the nozzle mouth, a gear having a plurality of circumferentially spaced teeth secured to the spindle on one end, a rack mounted for lateral movement within said chassis and having a plurality of teeth at least some of which are in mesh with cooperating teeth of the gear, a lever journalled in the chassis for rotation about an axis parallel to said spindles, and linking means connected at one end in said lever and at another end to said rack, whereby rotation of said lever effects rotation of said brush to a selected one of said positions.

4,109,343
TROLLEY WHEEL ASSEMBLY

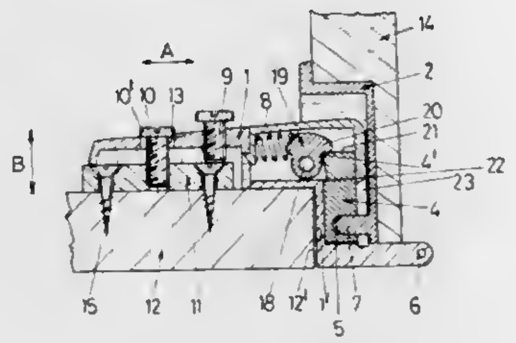
Siegfried K. Weis, Grand Rapids, and Douglas J. Van der Meulen, Shelbyville, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.
Filed May 10, 1976, Ser. No. 684,552
Int. Cl.^{2} E05D *13/02*
U.S. Cl. 16—98 **19 Claims**



1. An antifriction trolley wheel assembly comprising a plastic trolley wheel having a central opening with an axis therethrough; a pair of annular, metallic, outer bearing races positioned back to back with one another in said central opening; said outer bearing races each including an outer surface having an annular, axially inward facing portion, an annular, contoured inner surface portion adapted to receive antifriction bearing means for rotational support of said wheel and outer races, an annular, outer end surface facing axially in a direction opposite to said axially inward facing portion of said outer surface and recessed means positioned axially outwardly of said contoured inner surface for preventing rotation of said outer bearing race with respect to said wheel; said annular, axially inward facing surfaces of said outer races directly contacting and abuttingly engaging one another in said back to back position; said central opening including a central portion having a V-like cross-sectional shape engaging the remainder of said outer surfaces of said outer races except for said abuttingly engaged, annular, axially inward facing surfaces; engaging means on said wheel engaging said outer bearing races including first portions engaging said recessed means for each of said outer bearing races to prevent such rotation and second portions engaging said annular, outer end surfaces of said outer bearing races to prevent axial movement of said outer races away from said back to back position, said engaging means retaining said annular, axially inward facing outer race surfaces in engagement with one another and the remainder of said outer surfaces against said central opening surfaces; axially extending means in said central opening having a pair of inner raceways in registry with the contoured portions of said outer bearing races; and antifriction bearing means disposed between each of said outer bearing races and inner raceways for rotationally supporting said wheel and outer races.

4,109,344
HINGE WITH CLOSING MEANS

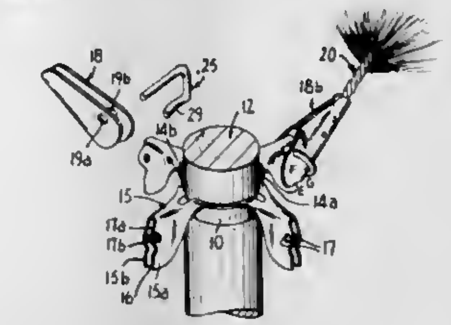
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria
Filed Jun. 29, 1977, Ser. No. 811,446
Claims priority, application Austria, Jul. 19, 1976, 5286/76
Int. Cl.^{2} E05D *11/10*
U.S. Cl. 16—144 **10 Claims**



1. A hinge, particularly for use in hingedly connecting a furniture door to an article of furniture, said hinge comprising:
a hinge arm adapted to be connected to an article of furniture;
a casing adapted to be connected to a furniture door;
a hinge axle pivotally connecting said casing to said hinge arm, such that said casing, and a furniture door adapted to be connected thereto, are pivotable about said hinge axle between an open first position whereat said casing and the furniture door are spaced from said hinge arm, and an article of furniture adapted to be connected thereto, and a closed second position whereat said casing and the furniture door are closely adjacent said hinge arm and the article of furniture;
said casing having extending therefrom a projection;
said hinge arm having freely slidably positioned thereon a sliding device, said sliding device being slidable in a longitudinal direction between a first door-closed position and a second-door-opened position;
said sliding device having therein a recess positioned such that when said casing is in said closed second position thereof said projection of said casing fits into said recess in said sliding device and retains said sliding device in said first door-closed position thereof, such that movement of said casing from said second position to said first position thereof causes sliding movement of said sliding device from said first position to said second position thereof, and such that movement of said casing from said first position to said second position thereof causes sliding movement of said sliding device from said second position to said first position thereof; and
spring biased means acting on said sliding device for retaining said sliding device in said first position thereof when said casing is in said second position thereof, for retarding movement of said sliding device from said first position thereof during an initial portion only of the movement of said sliding device from said first position thereof, for retaining said sliding device in said second position thereof when said casing is in said first position thereof, and for urging said sliding device to said first position thereof during a final portion only of the movement of said sliding device to said first position thereof.

4,109,345
HINGED BRANCH HOLDER

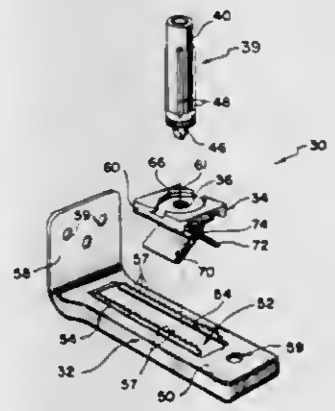
Harry Sargent, Austin, Tex., and Si Spiegel, Briarcliff Manor, N.Y., assignors to American Technical Institute, Inc., Mount Vernon, N.Y.
Filed Feb. 24, 1977, Ser. No. 771,739
Int. Cl.^{2} E05D *1/06, 7/12;* A47G *33/06*
U.S. Cl. 16—149 **4 Claims**



1. A hinge assembly for the connection of limbs to the trunk of an artificial tree comprising
a hollow cylindrical retaining collar having a central axis, connecting means to attached said collar to said trunk, a plurality of radial brackets having a first end attached to said collar and a second end surface, said bracket having parallel opposed sides attached to and extend outwardly from said collar and having a bracket aperture extending through said parallel opposed sides, with the axis of said bracket aperture being substantially orthogonal to the axis of said collar,
a plurality of arms for connecting said limbs to said brackets, each of said arms having a first portion forming a U-shaped channel of sufficient width to engage said second end of said brackets,
said first portion having co-axial apertures so located that when aligned with the bracket apertures will insure alignment between said arm and said bracket, said first portion further having a curved end surface, the major portion of which is convex but terminating in a concave segment said concave segment and said second end surface cooperating to form a divergent angle therebetween as said arm is moved in a downward direction,
a second portion adapted to hold said branch,

4,109,346
PIVOT AND SUPPORT MOUNTING ASSEMBLY

Robert E. Strozier, Atlanta, Ga., assignor to Lawrence Brothers, Inc., Sterling, Ill.
Filed May 31, 1977, Ser. No. 801,647
Int. Cl.^{2} E05D *7/08*
U.S. Cl. 16—151 **13 Claims**



1. A support assembly for use in a door pivot arrangement for a door, or the like, of the type which includes pintle means carried by said door and engaged with said support assembly, said support assembly comprising; a bracket adapted for mounting relative to a door frame and including elongate

channel means formed therein; a support block mountable to said bracket and including a portion positionable in said channel, said support block including recess means for receiving the pintle means carried by said door; inter-engageable means on said bracket and said support block which when engaged resist relative movement of said support block with respect to said bracket, while permitting said relative movement upon disengagement thereof; and spring means adapted to exert a biasing force on said support block when said support assembly is in the assembled condition, said force being exerted in a direction which will tend to produce disengagement of said inter-engageable means, while maintaining the engagement of said pintle means in said recess means, such that when the force exerted by the door on said support block is relieved, movement of said door relative to said bracket will produce relative movement of said support block along said channel.

4,109,347
POWER OPERATED APPARATUS FOR SPLITTING CARCASSES OF SLAUGHTERED ANIMALS

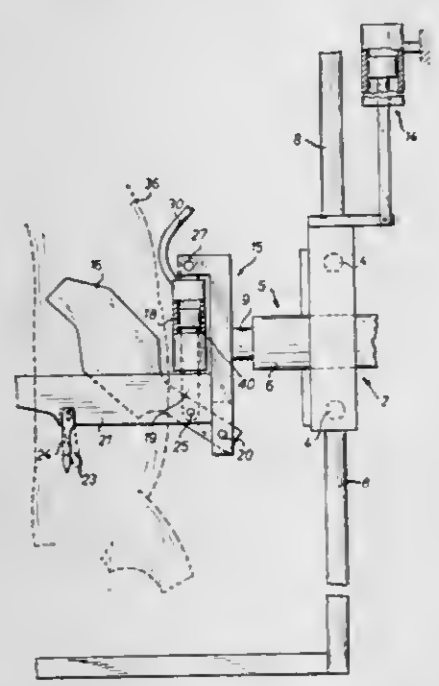
Andre Jolin, Guebwiller, France, assignor to Micarna AG Fleischwarenfabrik, Bazenheid, Switzerland

Filed Dec. 30, 1976, Ser. No. 755,543

Claims priority, application France, Jan. 8, 1976, 140/76

Int. Cl.² A22B *5/20*

U.S. Cl. 17—23 **7 Claims**



1. Apparatus for splitting carcasses of slaughtered animals comprising:

a guiding frame (8) adapted to be located adjacent a suspended carcass to be split;

a carrier (15) supported on said frame (8) and movably mounted thereon for movement including movement in at least a non-vertical direction;

cutting means (16) supported on said carrier and movably mounted thereon;

power-actuated means (18,19,40) for said cutting means (16) supported on said carrier (15),

hand-operable means (9) for manipulating the position of said carrier (15) and thereby said cutting means; and

a downwardly projecting pointed guide pin (23) for said cutting means suitable for introduction into the central opening of the spinal column of the carcass to permit guiding the carrier, and hence said cutting means and said guide pin into, and in alignment with the central opening of the spinal column of the said carcass,

a pair of spaced, essentially parallel vanes (21) projecting from said carrier and secured thereto, each vane being formed with a downwardly directed groove (10) in the surface facing the other vane;

and pivot means (12) pivotably mounted in the grooves of the vanes and connected to the guide pin (23) to secure the guide pin to the vanes for pivotable limited excursion of the vanes to prevent binding of the guide pin in curved portions of the spinal column of a carcass when a guide pin is inserted in the spinal opening of the carcass, and upon movement of the carrier lengthwise relative to the spinal column.

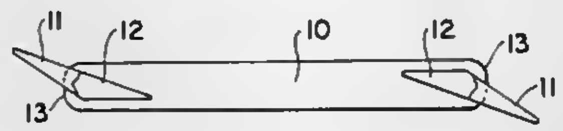
4,109,348
SAFETY CLIPS

Rune Olsson, Hollviksnas, Sweden, assignor to Produnik AB, Malmo, Sweden

Filed Jun. 14, 1977, Ser. No. 806,443

Int. Cl.² B42F *3/00, 13/06*

U.S. Cl. 24—153 **3 Claims**



1. A clip for maintaining sheets in bundle form, said sheets having spaced-apart holes formed therein, comprising:

a resilient member movable between a normal planar position and a non-planar flexed position,

a shoulder member extending from a point adjacent each end of said resilient member, and in a direction substantially perpendicular to the plane of said resilient member, said shoulder members each having a sheet-abutting surface,

an end lug connected to each of said shoulder members and extending in a plane parallel to the planar position of said resilient member for insertion into the spaced-apart holes of said sheets upon flexing of said resilient member,

said sheet-abutting surfaces being spaced apart a distance such that they function to pressingly engage the sheet edges forming the spaced-apart holes of said sheets when said resilient member returns to its normal planar position,

each of said end lugs being spaced from said resilient member to define said sheet-abutting surface therebetween for engaging the sheet edges forming the holes of said sheets and thereby maintain the sheets in a stacked relationship, and

said resilient member further including openings formed therein adjacent each end thereof, one of said shoulder members extending from the outer periphery of each of said openings, and said end lugs connected to said shoulder members extending in opposite directions and extending away from each other, said openings being spaced apart a distance substantially equal to the distance of the spaced-apart holes of said sheets, whereby said holes and said openings are in substantial alignment and are adapted to receive fork members extending therethrough, and whereby said resilient member functions as a reinforcement device for said sheets.

4,109,349
SLIDE FASTENER

Akira Tanaka, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

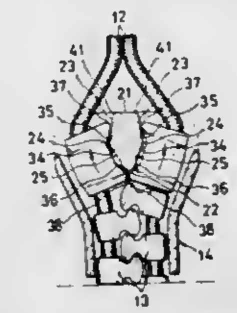
Filed Dec. 22, 1976, Ser. No. 753,480

Claims priority, application Japan, Dec. 29, 1975, 50-177586[U]

Int. Cl.² A44B *19/36*

U.S. Cl. 24—205.11 R **3 Claims**

1. A slide fastener comprising: a pair of stringer tapes; a pair of series of fastener elements; a slider including a pair of spaced apart upper and lower wings interconnected by a neck located centrally of its front end, which neck has a flat front end, a rounded rear end, a pair of tapered flat front surfaces converging from opposite vertices toward said front end, and a pair of tapered flat rear surfaces converging from said opposite vertices toward and merging into said rear end; and a pair of end stop members fixedly secured to respective marginal edges of said tapes at their upper ends in opposed relation to each other, each of said end stop members including a solid body of generally rectangular configuration having a top and a bottom flat face and a front and rear flat end face, and recess formed in its inner side and lying between its inner front and rear corners, said recess having an intermediate flat portion and front and rear flat portions spaced apart by and inclined inwardly toward said slider neck with respect to said intermediate flat portion, said inner front and rear corners of each of said end stop members being rounded, the areas of contact of the pair of end stop members with the slider neck being reduced to a minimum having a gap therebetween when the slider moves into or out of its uppermost position, each end stop body further having a pair of spaced apart rims formed integrally with and projecting from said end stop body throughout the length thereof, said rims being deformable relative to said end stop body from a spread-apart configuration to a compressed-together, substantially parallel configuration to firmly grip said tape edge.



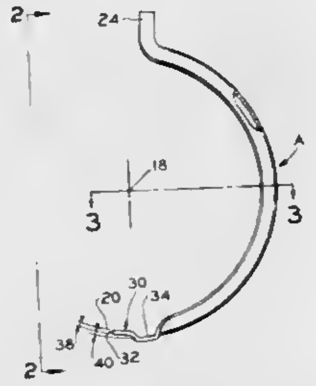
4,109,350
CLAMP BAND

Leon R. Acre, Ovid, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 7, 1976, Ser. No. 730,671

Int. Cl.² A44B *21/00*

U.S. Cl. 24—249 LS **1 Claim**



1. An arcuate clamp band member cooperable with a like member to form a generally circular clamp band, said member including a longitudinal centerline and having a generally U-shaped cross-sectional configuration and a bottom inside surface lying on the periphery of a reference circle, said U-shaped cross-sectional configuration being defined by a generally flat base portion having legs extending upwardly therefrom, said legs being deformed to lie in a common plane with said base portion at one end portion of said member to define a flat end portion having a terminal end and a width substantially greater than the width of the remainder of said member, said member being integrally formed with interdigitating connecting means for cooperating with corresponding interdigitating connecting means on said like member to form a generally circular clamp band with the bottom inside surfaces of the two members lying generally on the periphery of said reference circle, said interdigitating connecting means cooperating to interconnect the members against displacement along and radially of said reference circle, and including a transverse offset portion spaced inwardly from said terminal end, said offset portion being deformed outwardly to have its inside surface located outwardly of said reference circle a distance slightly greater than the thickness of the material from which said member is formed, a slot in said offset portion extending from one side edge of said flat end portion slightly beyond said longitudinal centerline, and said flat end portion from said slot to said terminal end defining a tongue and said tongue having a length perpendicular to said longitudinal center line which is substantially less than one-half the width of said flat end portion perpendicular to said longitudinal center line.

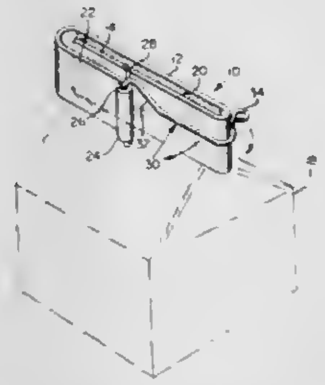
4,109,351
SEALING CLAMP FOR MILK CARTONS AND SIMILAR CONTAINERS

Darius A. Coffey, 13613 Occidental Ave. South, Seattle, Wash. 98168

Filed Jun. 16, 1977, Ser. No. 807,258

Int. Cl.² A44B *21/00*

U.S. Cl. 24—258 **3 Claims**



1. A clamp for resealing the top flap of milk cartons or similar containers comprising:

(a) a U-shaped clamp arm having spaced apart parallel legs configured to slideably enclose said top flap;

(b) a squeezing arm attached to the extremity of one of said legs, said squeezing arm being reversely bent around the extremity of the other of said legs extending substantially parallel thereto, and terminating intermediate the ends of the other of said legs;

(c) lever retaining means located on the terminal extremity of said squeezing arm, said lever retaining means including a hollow cylindrical boss;

(d) lever means associated with said lever retaining means movable in a manner for engaging said other of said legs intermediate its ends deflecting it towards said one of said legs;

(e) said lever means including
  (1) a pivot rod rotatably journaled within said boss,
  (2) said pivot rod having means to limit its longitudinal travel in said boss,
  (3) a squeezing rod connected to one end of said pivot rod,
  (4) said squeezing rod being configured in a manner to extend between said boss and said other of said legs substantially parallel thereto, when said lever means is in its closed position; and

(f) handle means interconnected to said lever means for moving said lever means between a closed position, wherein said lever means is in engagement with said other of said legs, and an open position, wherein said lever means is disengaged from said other of said legs.

4,109,352
FABRIC CROPPING MACHINE

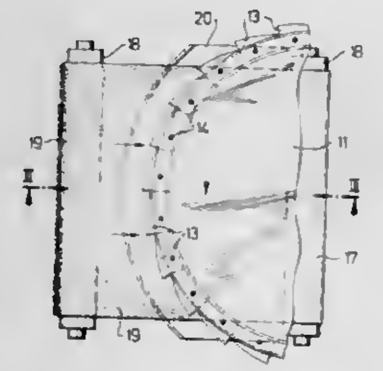
Fritz Büthe, Viersen, Fed. Rep. of Germany, assignor to Johannes Menschner Textilmaschinenfabrik, Vieren, Fed. Rep. of Germany

Filed Mar. 20, 1974, Ser. No. 452,816

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1973, 2314557

Int. Cl.² D06C *13/00*

U.S. Cl. 26—15 R **2 Claims**



1. A machine for cropping or shearing nap of fabrics, comprising a circular disc; means for rotating said disc about the axis of said disc; cutter means secured to the periphery of said disc, radially outwardly projecting therefrom, and having a cutting edge in a plane normal to said axis; and means for guiding an elongated fabric in direction transverse to the width of the elongated fabric along a predetermined path of travel so oriented that the fabric moves into and through a position directly opposed to and beneath said cutting edge of said cutter means in which a portion of the fabric extends parallel to said plane of said cutting edge and in which the cutting edge cuts through the fabric nap across the full width of the fabric, said predetermined path of travel and said plane of said cutting edge being furthermore so oriented relative to each other that an elongated fabric being guided along said path by means for guiding as it passes through said position is generally horizontally disposed with the fabric portion occupying said position being unsupported from below, whereby the presence of knots or bulges on the side of the fabric opposite the side facing the cutting edge will not interfere with the travel of the fabric through said position.

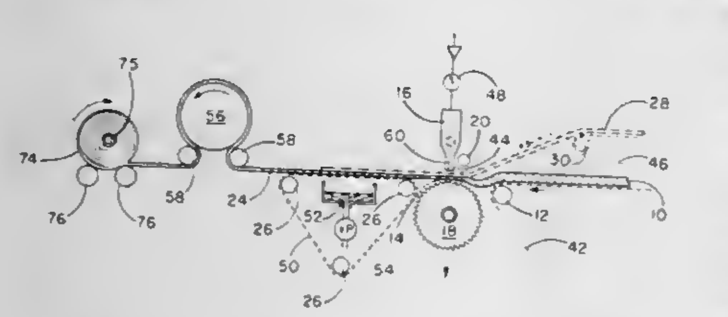
4,109,353
APPARATUS FOR FORMING NONWOVEN WEB

Kenneth J. Mitchell, Neenah, and Kurt W. Ostermeier, Harrison, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 675,883, Apr. 12, 1976, abandoned, which is a division of Ser. No. 536,728, Dec. 27, 1974, Pat. No. 3,966,519. This application Jul. 18, 1977, Ser. No. 816,597

Int. Cl.² D04H *1/46*

U.S. Cl. 28—104 **4 Claims**



1. Apparatus for forming a nonwoven web comprising,
a horn adapted to vibrate at high frequencies of up to about 400,000 cps at an amplitude of about 1 to 30 mils;
an anvil forming patterned nip with said horn;
means for delivering a substantially unbonded fibrous base web to said nip;
means for wetting said base web so that the fibers are mobile when subjected to said high frequency vibrations; and
means for drying said web.

4,109,354
MANUFACTURE OF TAMPONS

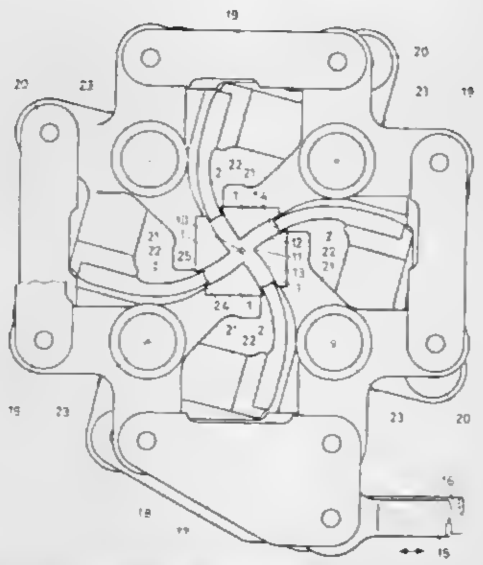
Marcel Ronc, Zurich, Switzerland, assignor to Karl Ruggli AG, Fisibach, Switzerland

Filed May 28, 1976, Ser. No. 691,013

Claims priority, application Switzerland, May 30, 1975, 6973/75

Int. Cl.² D04H *1/22*

U.S. Cl. 28—119 **11 Claims**



1. A machine for manufacturing tampons, which comprises a plurality of pressing dies arranged as a first set around a common central axis for movement along similar arcuate paths between a separated position spaced from said common axis for receiving a tampon blank and a compression position adjacent said axis for compressing the blank into a shaped tampon, each such first die having generally converging arcuately curved concave and convex surfaces which include therebetween an angle equal to about 360° divided by the number of dies in said first set with these surface curvatures when said first set is in said compression position generally mating respectively with the respectively adjacent convex and concave surfaces of other dies of said set situated on either side to define a narrow arcuately curved gap or slot between the mutually mating surfaces of each adjacent pair of first dies; a cooperating plurality of pressing dies arranged in a second set around said axis for movement within the arcuately curved gaps or slots between adjacent pairs of first dies from a separated to a compression position after the first dies are in their compression position, each die in said second set having opposed concave and convex surfaces mating with the curvatures of the mutually facing surfaces of each pair of first dies which define such gap and terminating at its inner end in a compressing face; separate operating means for moving the dies in each set substantially simultaneously between said positions and independently of the other set, and means for loading a tampon blank into the space between the dies while in a separated position and for ejecting the compressed tampon.

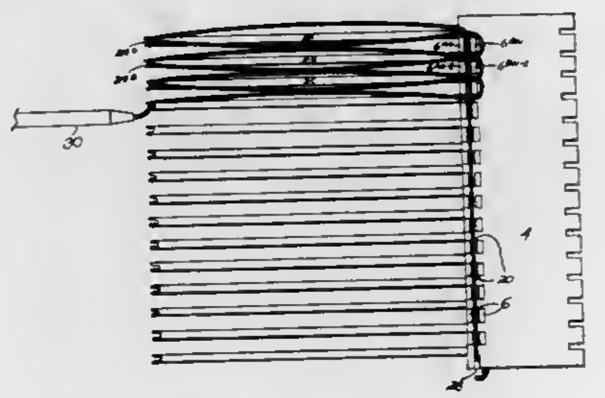
4,109,355
WEAVING SYSTEM, METHOD OF WEAVING AND APPARATUS

Edward Davitian, 575-8 Main St. North, Roosevelt Isl. (NY), N.Y. 10044

Filed Feb. 4, 1977, Ser. No. 765,796

Int. Cl.² D03D *29/00*

U.S. Cl. 28—151 **10 Claims**



1. Weaving apparatus for individually manipulable single fiber fabrication of woven fabrics comprising:
a weaving holding frame having
a plate like base portion having first and second spaced marginal edges,
a first row of longitudinally spaced lugs extending above the surface of said base portion adjacent said first marginal edge thereof,
a second row of longitudinally spaced lugs extending above the surface of said base portion disposed in adjacent spaced relation to said first row of lugs to define fiber receiving channel therebetween, and
a plurality of elongate rod members having one end thereof terminally mounted in said first marginal edge of said base portion and extending outwardly therefrom, each of said rod members having a fiber containing notch at the unmounted terminal end thereof, and
an elongate weaving wand having a lateral cross-section less than the space between adjacent rod members adapted to feed a fiber from one end and to selectively dispose a weft fiber around, over or under an elongate rod member when positioned such that the longitudinal axis of the weaving wand is substantially parallel to the longitudinal axis of the elongate rod member.

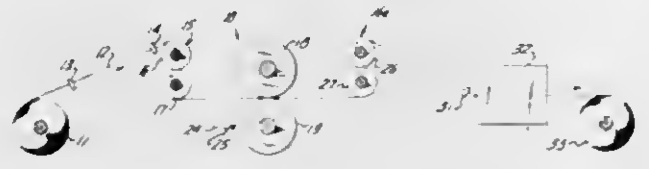
4,109,356
PROCESS FOR TEXTURING SYNTHETIC FIBROUS MATERIAL

Charles P. Mazzone, Dover, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 757,416

Int. Cl.² D02G *1/14*

U.S. Cl. 28—279 **12 Claims**



1. A process for texturing a plurality of synthetic fibrous textile materials, which are in the form of yarns or staple fibers, comprising feeding said textile materials between a set of opposed pressure surfaces while heating said textile materials, one of said surfaces being made of nonresilient material having thereon a raised pattern of closely spaced pyramids wherein the tops of the pyramids are truncated or rounded off and the other surface being made of a resilient material having a pattern of pyramid shaped depressions complementary to the pattern of said first surface whereby each of said textile materials is textured in a random sequence of deformations as different portions of the pyramid pattern sequentially act on each of said textile materials, removing said textile materials from between said pressure surfaces and cooling the textile materials to give a textured product having permanent distortions therein.

4,109,357
YARN SEVERING AND HOLDING APPARATUS

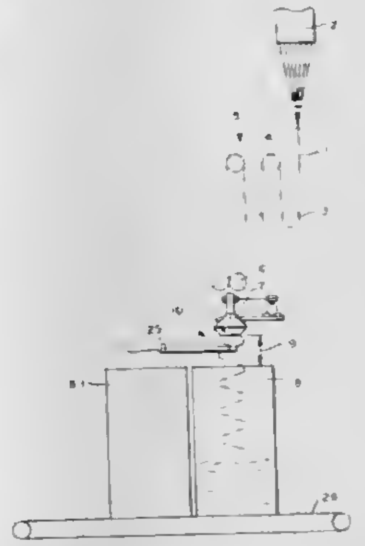
Burghard Burow, Radevormwald, and Norbert Klinkert, Solingen, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 803,749

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626651

Int. Cl.² B65H *54/80*

U.S. Cl. 28—289 **6 Claims**



1. In a spinning can changing system including a depositing device which rotates about a vertical axis, for depositing continuously fed synthetic filamentary yarn, a plurality of spinning cans and means for horizontally transporting said cans so as to move a full can away from, and an empty can into, an operative position underneath said depositing device,
a yarn severing and holding apparatus, said apparatus including:
an arm horizontally extending between said depositing device and said cans and supported for rotation, independently of the drive of said can transporting means, about a stationary vertical axis disposed outside of the range of rotational movement of the depositing device, and
a slide mounted on said arm for traversing movement lengthwise thereof, said slide carrying a severing device and also a holding device for holding the severed end of the yarn leading toward the full can.

4,109,358
METHOD FOR MAKING STORAGE BATTERY GRID FROM LEAD-TIN-ZINC ALLOY

Joseph C. Duddy, Trevose, and Edward R. Hein, Doylestown, both of Pa., assignors to ESB Ray-O-Vac Management Corporation, Philadelphia, Pa.

Division of Ser. No. 241,914, Apr. 7, 1972, Pat. No. 4,035,556, which is a continuation of Ser. No. 135,922, Apr. 21, 1971, abandoned. This application Apr. 22, 1977, Ser. No. 790,128

Int. Cl.² B23P *15/00, 25/00*

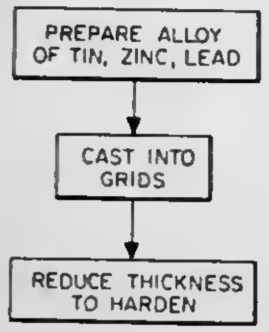
U.S. Cl. 29—2 **4 Claims**

1. A method for the manufacture of storage battery grids from a lead alloy comprising 0.5 to 2.0% zinc and 0.5% to 2.0% tin, wherein the grids produced have a hardness of at least 50 when tested in a superficial hardness tester with a steel

penetration ball 0.50 inch in diameter and a major load of 15 kilograms, said method comprising:

(a) preparing in liquid form said alloy comprising zinc, tin and lead;

(b) casting an ingot therefrom;



(c) working the cast ingot into sheet form by roll means with the metal remaining at room temperature or below to produce a hardened sheet having said hardness value of at least 50; and

(d) shaping by mechanical means battery grids from the hardened sheet.

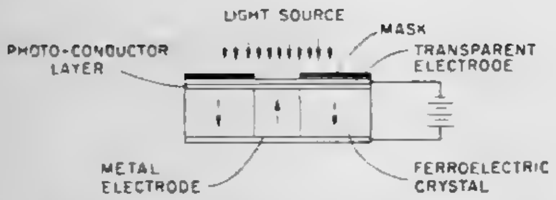
4,109,359
METHOD OF MAKING FERROELECTRIC CRYSTALS HAVING TAILORED DOMAIN PATTERNS

Leslie E. Cross, and Robert E. Newnham, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 7, 1976, Ser. No. 693,808

Int. Cl.² H01L *41/22*

U.S. Cl. 29—25.35 **1 Claim**



1. In a method for preparing a ferroelectric element having a preselected domain pattern, the steps of

applying an electrode to one face of said element;

applying a photoconductive layer to an opposite face of said element;

superimposing a light transparent electrode over said photoconducting layer;

illuminating said transparent electrode with light energy while maintaining a DC voltage of one polarity across said electrodes thereby to align all of the domains in said element in a common direction;

masking selected areas of said transparent electrode with a light blocking material; and

illuminating said masked transparent electrode with light energy while maintaining a DC bias voltage of an opposite polarity across said electrodes, whereby those portions of the ferroelectric element which are beneath the unmasked portions of said photoconductive layer have domains which are anti-parallel to said common direction.

4,109,360
MACHINE WITH PROCESSING HEADS

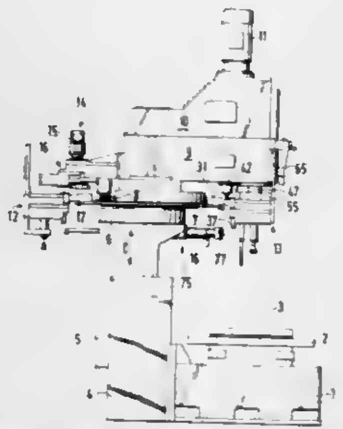
Hans Hillmann, Hirschgraben 19, D 6603 Sulzbach, Saar, Germany

Filed Mar. 10, 1977, Ser. No. 776,429

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610185

Int. Cl.² B23B *39/20;* B23Q *3/157*

U.S. Cl. 29—26 A **9 Claims**



1. In a machine of the type having a base structure, a carrier rotatably mounted on said base structure, a plurality of processing heads each having a rotatable spindle mounted thereon, means for releasably mounting said heads on and rotatable with said carrier at locations such that the spindles are substantially equally spaced apart, carrier drive means mounted on said base structure and engaging said carrier to rotatably drive said carrier, spindle drive means mounted on said base structure and angularly separated from said carrier drive means, the carrier drive means including means for securing said carrier in a preselected rotational position in which a selected one of said processing heads is located adjacent said spindle drive means such that said spindle drive means can be coupled to a spindle therein by a releasable coupling, the improvement wherein said carrier drive means comprises

a rotatable shaft;

a crank mounted on said shaft for rotation therewith;

a slide member mounted in the plane of said crank, said slide member having means defining a recess shaped to receive said crank in only one rotational position of said crank;

means for supporting said slide member for sliding movement toward and away from said shaft in a plane lying at an angle to the axis of rotation of said shaft; and

means for moving said slide member into receiving engagement with said crank in said one rotational position to thereby fix said crank and said carrier drive means in the preselected rotational position.

4,109,361
METHOD AND ARRANGEMENT FOR THE PRODUCTION OF ANNULAR ARTICLES

Albert Hagen, Dortmund; Theodor Kaiser, Hagen-Emst, and Heinz Pöhler, Herdecke-Kirchende, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 488,718, Jul. 15, 1974, Pat. No. 4,003,121. This application Aug. 18, 1976, Ser. No. 715,325

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1973, 2336281

Int. Cl.² B21K *1/04;* C21D *9/40;* B23P *17/00;* B21H *1/12*

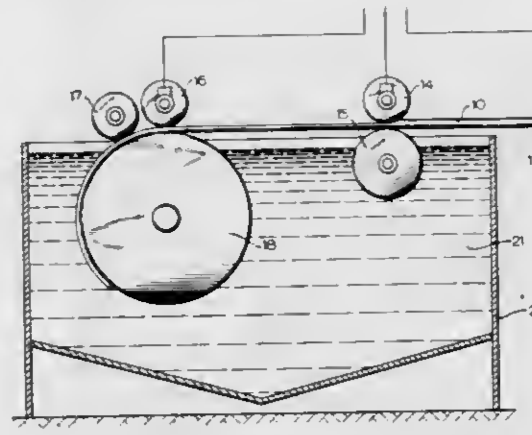
U.S. Cl. 29—148.4 C **8 Claims**

1. The process of making annular articles, particularly wire races for anti-friction bearings, in one continuous operation, the said process comprising, in continuous succession, the following steps:

[1] passing an unshaped blank of a material, adapted to harden upon cooling, through a first heating stage between a first pair of rollers to form a rolled wire, at least one of said rollers being heated;

[2] passing the rolled wire while still hot through a second heating stage where its temperature is raised to the temperature necessary for shaping the wires;

[3] then passing the hot wire through a second pair of rollers, the said rollers being shaping rollers to impart the desired cross section to the wire, at least one of said rollers being electrically heated so as to maintain the wire at said elevated shaping temperature;



[4] thereafter passing the wire through the nib between at least one guide roller and a disk-like coiling member, the said guide roller being electrically heated so as to continue maintaining said wire at said elevated temperature;

[5] coiling said wire about the rim of said disk-like member so as to obtain a series of convolutions of desired diameter;

[6] chilling said coiled wire so as to obtain a hardened member consisting of a plurality of convolutions, and

[7] subdividing the hardened coiled member so as to obtain annular articles of desired width.

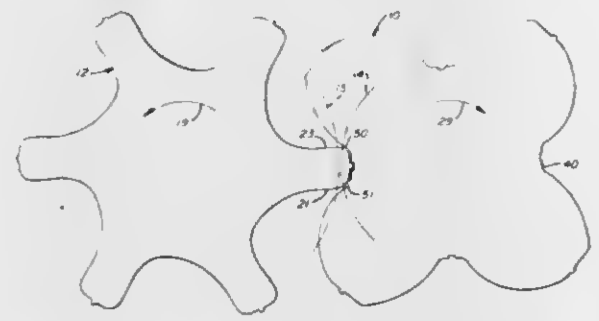
4,109,362
METHOD OF MAKING SCREW ROTOR MACHINE ROTORS

Robert A. Ingalls, Springfield, Vt., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 645,981, Jan. 2, 1976, Pat. No. 4,053,263, which is a continuation of Ser. No. 374,032, Jun. 27, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,366

Int. Cl.² B23P *15/00*

U.S. Cl. 29—156.4 R **8 Claims**



1. A method of producing a male rotor for a screw rotor machine comprising:

hobbing a rotor blank to produce an elongated formed male rotor rotatable about a central longitudinal axis and having a pitch circle centered on such axis and a plurality of elongated helical lobes extending longitudinally of said rotor and circumferentially spaced about said pitch circle so as to provide intervening grooves therebetween with a major portion of each of said lobes extending generally radially outward from such pitch circle with the profile of each of said lobes in a plane perpendicular to such axis having a tip portion and respective generally convex leading and trailing flank portions extending intermediate said tip portion and the root portion of the respective adjacent groove; and

forming of said hobbing process the profile of said leading flank portion of involute curvature extending between said respective root portion and an intermediate point and traversing said pitch circle, and a circular arc portion extending between said intermediate point and said tip portion with said circular arc portion formed of at least two circular arcs of different radii, and the profile of said trailing flank consisting of involute curvature extending between the other of said respective root portions and said tip portion and traversing said pitch circle.

4,109,363
SINGLE PISTON OPERATED CLIP DEVICE

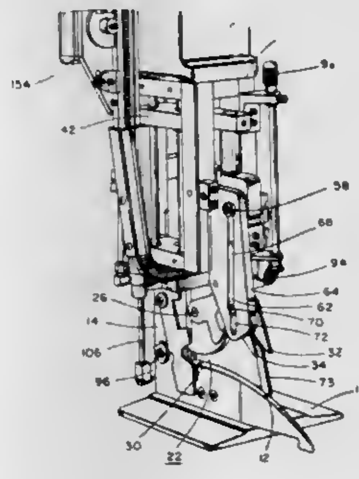
Clyde R. Velarde, Raleigh, N.C., assignor to Rheem Manufacturing Company, New York, N.Y.

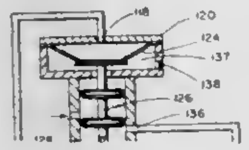
Division of Ser. No. 565,581, Apr. 7, 1975, Pat. No. 4,004,339. This application Jul. 19, 1976, Ser. No. 706,932

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.² B23P *11/00*

U.S. Cl. 29—243.56 **4 Claims**





1. In a clipper mechanism of the type including a main fluid actuated drive cylinder for operating a clip punch and a separate fluid actuated knife cylinder for operating a cut-off knife, the improvement comprising:

cylinder control means including a single input fluid source to the opposite ends of said cylinders,

said control means further including a two position main pilot valve, having a first normally pressurized position whereby pressurized fluid is directed from the source through a first outlet of the main pilot valve by parallel connections to the drive cylinder and the knife cylinder to maintain said cylinders in the punch retracted position and knife unoperated position respectively, and

and a second pressurized position whereby the first outlet is exhausted and fluid is directed from a second outlet of the main pilot valve to the opposite end of the drive cylinder and by a separate parallel connection from the source to the opposite end of the knife cylinder to drive the drive cylinder to a punch extended position and the knife cylinder to the knife operated position respectively, said separate parallel connection from the source to the knife cylinder including a pilot operated knife control valve having a control inlet responsive to the outlet signal of a time delay diaphragm valve, said time delay diaphragm valve having a control port in parallel with the first position of said two position main pilot valve to positively maintain the diaphragm valve in a no outlet signal position during the first normally pressurized position of said two position pilot valve, said diaphragm valve also including restricted orifice time delay means for controlling the time of operation of the diaphragm valve and the outlet signal to the knife control valve when said two position main pilot valve is moved to the second pressurized position, whereby the knife cylinder operation is time delayed.

4,109,364

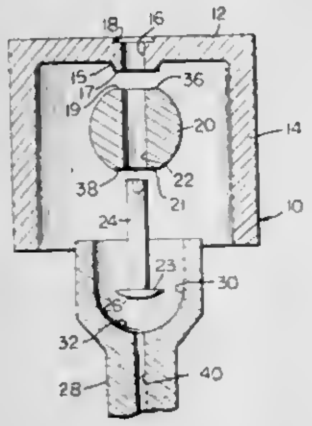
METHOD OF MAKING BALL AND SOCKET JOINT

Ronald R. Wisner, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 723,013, Sep. 13, 1976, Pat. No. 4,070,122. This application Jun. 20, 1977, Ser. No. 807,808

Int. Cl.² B23P *15/10*

U.S. Cl. 29—156.5 R **3 Claims**



1. The method of connecting a piston having a top wall and a skirt to a connecting rod by a ball and socket joint which comprises: forming a ball receiving socket in the end of the rod, placing a ball in the socket and deforming the socket in the end of the rod inwardly about a portion of the ball to hold the ball swivelly captive in the socket, and then connecting the ball to the underside of the top wall of the piston by using a separate fastener.

4,109,365

METHOD FOR FORMING CONTOURED TUBING

Robert Carl Tygart, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,761

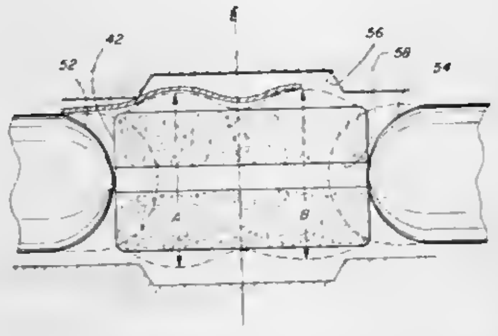
Int. Cl.² B23P *17/00;* **B21D** *9/05*

U.S. Cl. 29—421 R **8 Claims**

1. A method of forming tube stock into a tube having a contoured shape, comprising the steps of:

applying a deforming force to said tube stock in one portion of the area to be contoured while the remainder of the tube stock is free of said deforming force; and

moving the deforming force incrementally along the longitudinal axis of the tube stock through the area to be contoured to form the contoured shape while that portion of the tube stock which is free of said deforming force moves axially relative to the tube stock into the area being contoured such that the hoop strength of the tube stock is substantially retained in the area immediately adjacent to the area being deformed.



4,109,366

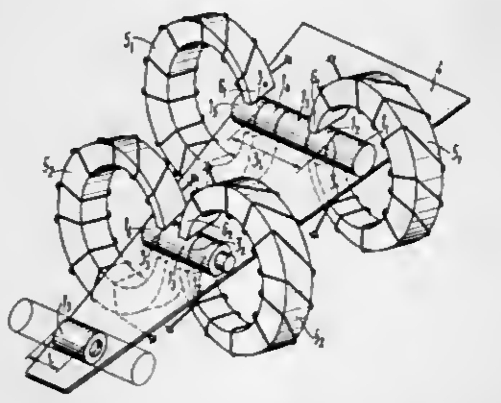
METHOD OF DISMANTLING UNITS

Benyamin Alexandrovich Ioffe, ulitsa Stirnu, 37a, kv. 44, and Robert Karlovich Kalnin, ulitsa Gorkogo, 53, kv. 19, both of Riga, U.S.S.R.

Filed May 11, 1976, Ser. No. 685,356

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **4 Claims**



1. A method for dismantling units made up of current-carrying parts assembled with an interference or with a sliding or running fit: placing said units in a primary alternating magnetic field and orienting said units in said field in a predetermined manner, withdrawing said parts in the course of dismantling in the direction perpendicular to the induction vector of said field, said field having a vibration frequency and induction intensity, and applying the vibration frequency and induction intensity of said field sufficient for creating forces stronger than the forces of cohesion between said parts in a unit being dismantled, the energy generated by the primary magnetic field providing electrodynamic forces for dismantling said units, said forces forming from simultaneous current induction in parts to be separated from each other, the magnetic field having a direction so that current induced in the parts to be separated is distributed so that a separating line formed by said electrodynamic forces due to interaction of magnetic fields in the parts with said primary magnetic field has the greatest density, the forces applied to each said parts being directed opposite to each other, said parts being substantially free of deformation by said forces, said forces being axial forces.

4,109,367

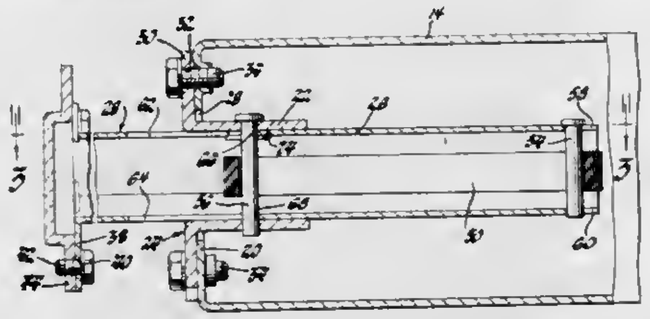
METHOD OF MANUFACTURE ENERGY ABSORBER

Raymond L. Richard, Jr., Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 746,421, Dec. 1, 1976, Pat. No. 4,046,411. This application Jun. 17, 1977, Ser. No. 807,515

Int. Cl.² B23P *19/00*

U.S. Cl. 29—436 **2 Claims**



1. A method of making an impact energy absorbing unit for mounting a bumper assembly to an automotive vehicle comprising the steps of providing flat metallic stock material, blanking a generally rectangular part out of said flat stock with a plurality of spaced longitudinally extending and parallel straps on one end thereof, forming a pair of parallel notches in the other end of said part, forming a pair of laterally spaced slots in the flat stock in a side by side location, rolling the flat stock into a cylindrical body until the side edges thereof are adjacent to one another and said slots are in alignment with each other, joining said edges to one another, bending said straps formed at one end in said flat stock outwardly of said cylindrical body, providing a bracket surrounding said cylindrical body and inserting a pin through said bracket and through one end of said slots in said body, providing a pin for said notches extending across one end of said body, mounting a yieldable band around said pins to thereby provide a yieldable energy absorber unit for yieldably supporting said bumper to said vehicle.

4,109,368

METHOD OF ASSEMBLING A SUB-ASSEMBLY OF A DIAPHRAGM SPRING FRICTION CLUTCH

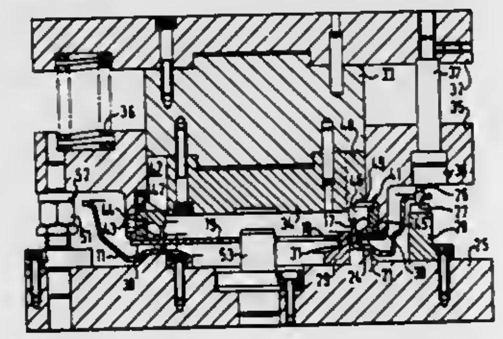
William Ernest Hubbard; Robert Hyde, and Peter Frederick Crawford, all of Leamington Spa, England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Oct. 22, 1976, Ser. No. 735,082

Claims priority, application United Kingdom, Jul. 14, 1976, 29199/76

Int. Cl.² B23P *11/02*

U.S. Cl. 29—446 **7 Claims**



1. A method of assembling a sub-assembly of a diaphragm spring friction-clutch, the components of the sub-assembly comprising a cover, a diaphragm spring having a plurality of radially inwardly directed fingers and which is to be supported by the cover adjacent the radially outer ends of the fingers, the diaphragm spring being conically dished when in its relaxed state, a fulcrum ring which is to be located on the opposite side of the diaphragm spring to the cover, and a plurality of tabs which, before the assembly, extend from the cover in a direction substantially parallel to the axis of the spring, the method including the steps of assembling the diaphragm spring and said fulcrum ring, flattening the diaphram spring, thereby moving the peripheral rim of the spring relative to the cover against the load of the spring, and bending each tab radially outwards by a forming tool over the adjacent arc of the fulcrum ring to support the diaphragm spring on the cover while simultaneously supporting, against radially inward movement, each tab where it extends through the diaphragm spring and, against radially outward movement, each of said arcs of the fulcrum ring.

4,109,369

METHODS OF JOINTING OPTICAL FIBRES

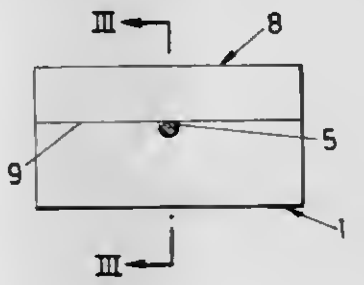
John Edward Taylor, Cookham, England, assignor to BICC Limited, London, England

Filed Feb. 20, 1975, Ser. No. 551,341

Claims priority, application United Kingdom, Feb. 21, 1974, 7964/74

Int. Cl.² B23Q *3/00;* **G02B** *5/14*

U.S. Cl. 29—467 **14 Claims**



1. A method of effecting a joint between two optical fibres which comprises laying on a substantially flat surface of a metallic body that is soft and substantially non-resilient an elongate gauge having a cross-sectional shape and size corresponding to that of each of the optical fibres to be jointed; pressing the gauge into said surface to form in, and between two edges of, the surface a groove of a substantially complementary cross-sectional size; removing the gauge and aligning the two optical fibres in the groove so that neighboring ends of the optical fibres substantially abut; applying to said grooved surface a second body having a flat surface so that the flat surface of said second body is in interfacial contact with the grooved surface; and securing the two bodies together.

4,109,370

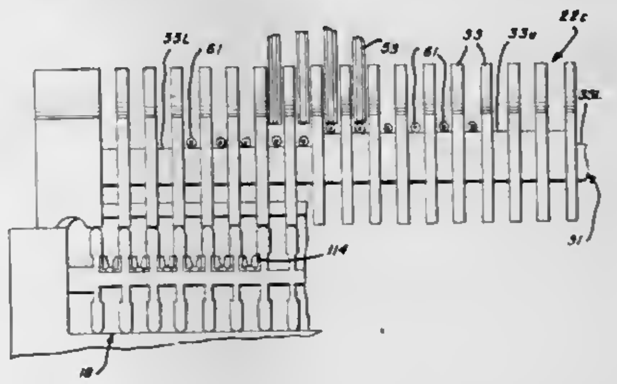
WIRE TERMINATING TOOL

James R. Quigley, Lombard, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Division of Ser. No. 656,580, Feb. 9, 1976, Pat. No. 4,047,294. This application Jun. 17, 1977, Ser. No. 807,364

Int. Cl.² H01R *43/04*

U.S. Cl. 29—566.3 **23 Claims**



1. In an apparatus for effecting solderless termination of a plurality of wires in a connector of the type having a plurality

of channel-shaped recesses, each of said recesses having a wire-engaging terminal disposed therein, the combination comprising first means for supporting a plurality of wires in predetermined, spaced relationship; means for supporting such connector in a position relative to such supported wires whereby each of said wires is disposed in adjacent relationship opposite a channel-shaped recess of said connector; stuffing means for engaging all of said supported wires and for driving the same into said connector recesses into engagement with the terminals therein; said first means including a plurality of wire-guiding channels disposed in alignment above said connector channels in the normal position of apparatus operation; said first means also including a wire shearing edge disposed adjacent the distal ends of said connector channels in substantially the same plane therewith when such connector is located in the supporting means; the wire engaging means having shear edge portions which cooperate with said shearing edge whereby said wires are sheared substantially flush with the connector channel distal edges in the course of being driven into engagement with said connector terminals; said shearing edge having a configuration for effecting a shearing relation with said shear edge portions of said wire-engaging means whereby such wires are not sheared simultaneously.

4,109,371

PROCESS FOR PREPARING INSULATED GATE SEMICONDUCTOR

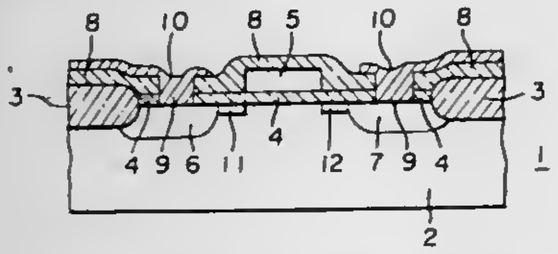
Hiroshi Shibata, and Tsutomu Yoshihara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,943

Claims priority, application Japan, Jan. 6, 1976, 51-983

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—571 **3 Claims**



1. A process for preparing an insulated gate semiconductor which comprises the steps of:

forming a gate electrode on an insulating membrane on a semiconductor substrate;

forming auxiliary regions for shallow source-drain regions having conductive type being opposite to that of said semiconductor substrate in said semiconductor substrate by using said gate electrode as a mask so that the edges of the shallow source-drain regions are self-aligned with the edges of the gate electrode;

forming an insulating membrane for surface protection on said auxiliary regions and said gate region;

forming contact holes in said insulating membrane to reach to said auxiliary regions at positions separated by a desired distance from said gate electrode;

forming source-drain regions having deep junctions in said semiconductor substrate through said contact holes so that the edges of the deep source-drain regions are displaced from the edges of the gate electrode and the contact holes, whereby the source-drain regions comprise a deep part and a shallow part; and

bonding electrode metals to each region in each contact hole.

4,109,372

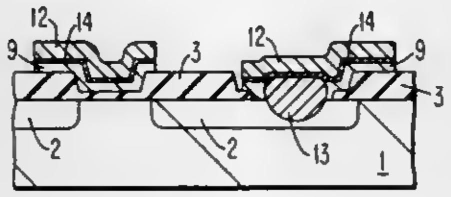
METHOD FOR MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR UTILIZING A SILICON GATE AND SILICIDE INTERCONNECTION VIAS

Robert Michael Geffken, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1977, Ser. No. 793,231

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—571 **9 Claims**



1. In a method for the fabrication of an insulated gate field effect transistor, the steps comprising:

(a) providing a semiconductor substrate of first conductivity type having therein spaced apart diffusions of a second conductivity type forming a gate area therebetween and having superimposed on said structure a dielectric layer;

(b) providing contact holes spaced from said gate area through said dielectric layer and selectively depositing a silicide forming metal therein;

(c) selectively depositing a polycrystalline silicon layer in said gate area between said diffusions on said dielectric layer and upon said selectively deposited silicide forming metal;

(d) depositing a metallic interconnection layer on said polycriptalline silicon layer; and

(e) heating said structure to an elevated temperature to form a conductive metallic silicide contact between said substrate and said metallic interconnection layer.

4,109,373

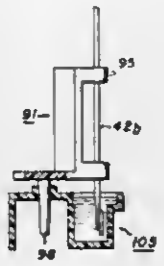
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES

Donald W. Fennessy, Liverpool, and Harry W. Schmitz, Glens Falls, both of N.Y., assignors to General Electric Company, Auburn, N.Y.

Continuation of Ser. No. 556,824, Mar. 10, 1975, abandoned, which is a division of Ser. No. 449,550, Mar. 8, 1974, Pat. No. 3,941,532. This application Jun. 1, 1976, Ser. No. 691,241

Int. Cl.^{2} B29C *6/00;* **H01L** *21/58, 21/60*

U.S. Cl. 29—588 **3 Claims**



1. A method for the manufacture of semiconductor devices wherein a first substantially rigid lead frame is utilized during a first manufacturing operation and a second, resiliently-connected lead frame is utilized during a second manufacturing operation, comprising:

mounting a plurality of sets of lead wires in a rigid primary lead frame;

simultaneously aligning all of said sets of lead wires with a first plurality of work stations by aligning said rigid primary lead frame with said work stations;

mounting a semiconductor device on each of said sets of lead wires and providing electrical connections among said lead wires and said device;

transferring said plurality of sets of lead wires to a segmented lead frame comprising a plurality of separate lead-receiving elements each of which receives one of said sets of lead wires and is resiliently connected with the other ones of said elements;

independently aligning each of said lead-receiving elements with a plurality of second work stations; and

encapsulating said semiconductor pellets and at least a portion of each of said sets of lead wires in an encapsulating material.

4,109,374

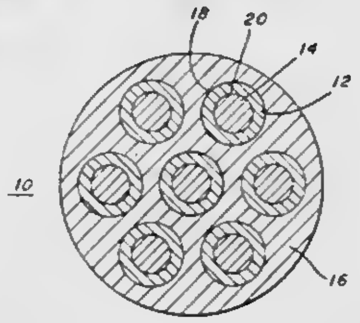
SUPERCONDUCTOR COMPOSITE AND METHOD OF MAKING THE SAME

Clayton N. Whetstone, San Diego, Calif.; Douglas A. Koop, Lower Burrell, and James D. Dowd, Oakmont, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 28, 1975, Ser. No. 608,633

Int. Cl.^{2} H01V *11/00*

U.S. Cl. 29—599 **25 Claims**



1. A method of producing a worked superconductor composite comprising a plurality of individually stabilized superconductor elements in a normally resistive matrix, said method comprising the steps of

(1) providing a composite working stock comprising an aluminum alloy matrix metal said alloy consisting essentially of at least 1% of alloying additions selected from the group consisting of up to 3% Si, up to 6% Cu, up to 2% Mn, up to 10% Mg, up to 10% Zn, up to 0.5% Cr, up to 2% Fe, Ni or Co, balance substantially aluminum and incidental elements and impurities, said aluminum alloy matrix having a substantially high electrical resistivity of 10^{-7} ohm-cm or more at superconducting temperatures said aluminum alloy matrix metal being in the form of workable stock, said aluminum alloy matrix metal having situated therewithin a plurality of spaced substantially parallel elongate tubes of a workable metal superconducting at superconducting temperatures and, situated within said elongate tubular superconductor tubes, stabilizing cores of substantially pure aluminum having an electrical resistivity of 10^{-8} ohm-cm or less and substantially greater than the superconductor tubes but substantially less than the matrix metal at superconducting temperatures, the respective metals for said matrix and superconductor tubular members being selected such that the initial ratio of the flow stress between superconductor and matrix is 8 or less which said flow stress ratio is maintainable at said level of 8 or less substantially throughout metal working operations whereby the superconductor tubes and matrix are laminarly co-reducible by metal working operations:

(2) subjecting said composite working stock to at least one metal working procedure to reduce its cross-sectional area and elongate its length to a substantial extent, said working procedure being conducted so as to favor laminar flow conditions and maintain said flow stress ratio at said level of 8 to 1 or less to uniformly co-reduce said composite stock and each member within said composite stock to provide a superconducting composite body having said stabilizing core members, said superconductor tubular members and said resistive matrix all substantially proportionally reduced in cross sectional size and intimately bonded together.

4,109,375

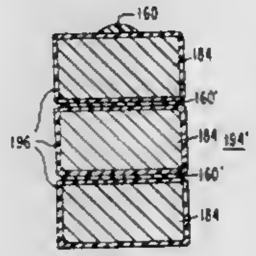
METHOD OF MAKING ADHESIVE COATED ELECTRICAL CONDUCTORS

Kou Chi Lin, Hickory, and Edmund E. Woods, Sharon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 22, 1976, Ser. No. 743,828

Int. Cl.^{2} H01F *7/06*

U.S. Cl. 29—605 **8 Claims**



3. A method of making an electrical coil, comprising the steps of:

providing an elongated electrical conductor having a plurality of sides which define a generally rectangular cross-sectional configurstion,

applying a resinous coating of electrical insulating material to all sides of the electrical conductor,

heating said resinous coating above a predetermined first temperature to solidify it,

providing finely divided particles of an adhesive which are heat fusible at the first temperature,

directing the particles of adhesive against only a selected side of the electrical conductor while the solidified resinous coating is above the first temperature to fuse the particles and provide a coating of adhesive on the selected side having a predetermined thickness dimension and a width dimension which is less than the width of the selected side,

winding said electrical conductor into a coil having a plurality of adjacent conductor turns, with the adhesive coating being between said conductor turns,

softening said coating of adhesive while providing pressure between the conductor turns to reduce the predetermined thickness dimension of the coating of adhesive and provide a spacing between adjacent conductor turns which is less than the predetermined thickness dimension of the coating of adhesive,

and solidifying the coating of adhesive to bond the adjacent conductor turns together.

4,109,376

METHOD OF MANUFACTURING A CIRCUIT BREAKER ASSEMBLY OR THE LIKE

Ronald C. DiLiddo, Kettering, and Dallas E. King, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1977, Ser. No. 809,565

Int. Cl.^{2} H01H *11/00*

U.S. Cl. 29—622 **5 Claims**

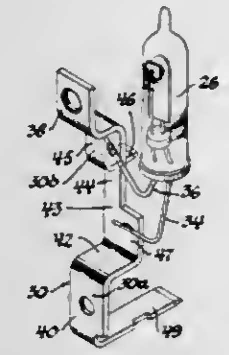
1. The method of making a circuit breaker assembly or the like comprising the steps of:

providing an insulator housing having a cavity defined in part by shelf means and a slot,

providing a one piece sheet metal terminal shaped to include spaced portions adapted to rest on spaced locations of the shelf means located across the slot from each other and a severable web between said spaced portions,

providing an electrical device which fits in a portion of the cavity deeper than the cavity portions defined by the shelf means and which has a pair of wire like leads,

forming a subassembly by permanently securing the pair of wire like leads to respective portions of the terminal located on opposite sides of the thin severable web from each other,



securing the subassembly in the cavity of the insulator housing with the terminal supported on the shelf means and the severable web overlying the slot, and

severing the web and bending at least a portion thereof downwardly into the slot to separate the terminal into two terminal pieces and provide a conductive path comprising one of the terminal pieces, the electrical device and the other of the terminal pieces in a series arrangement.

4,109,377

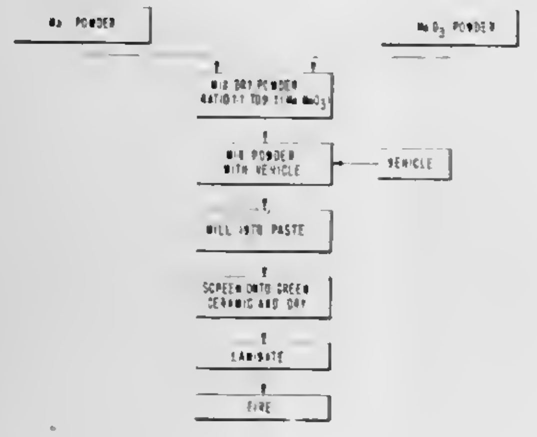
METHOD FOR PREPARING A MULTILAYER CERAMIC

Linda Ann Blazick, Newburgh, and Lewis Franklin Miller, LaGrangeville, both of, NY, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1976, Ser. No. 654,686

Int. Cl.² H05K *3/30, 3/00*

U.S. Cl. 29—626 **16 Claims**



1. In a method for preparing a multilayer ceramic for carrying semiconductor chips comprising:

depositing a particulate mixture of a metal and a metal oxide thereof in the ratio of between about 1:1 to 9:1 in a pattern on at least a portion of unfired ceramic layers;

said metal having high conductivity and a thermal expansion coefficient closely matched to said ceramic;

drying said pattern;

laminating the said plurality of layers of ceramic at a pressure greater than about 2500 pounds per square inch;

firing the laminate at an elevated temperature in a non-oxidizing atmosphere; and

cooling the resulting said multilayer ceramic to room temperature.

4,109,378

METHOD OF MAKING AN ELECTRICAL CONNECTOR

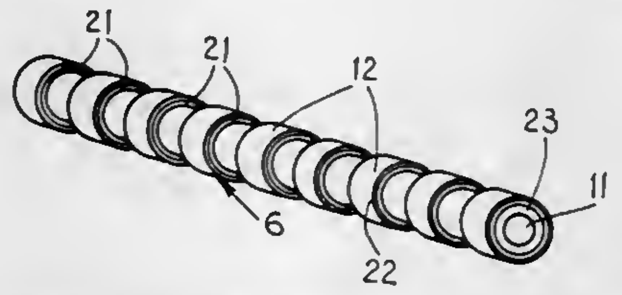
Dennis Davies, Marple, England, assignor to International Computers Limited, London, England

Filed May 3, 1977, Ser. No. 793,337

Claims priority, application United Kingdom, May 15, 1976, 20148/76

Int. Cl.² H01R *43/00*

U.S. Cl. 29—629 **5 Claims**



1. A process for producing an electrical connector element including a flexible radially compressible core and a plurality of spaced circumscribing connector strips axially spaced along the core the connectors being subjected to radial compressive forces when in use, said process comprising the steps of

(a) providing a thin wall tube of predetermined spring characteristics; the tube having inner and outer cylindrical surfaces each with close diametrical dimensional tolerances;

(b) introducing a mandrel into the interior of the tube so as to be effectively co-axial with the tube thereby to define an annular space between the inner cylindrical surface of the tube and the mandrel;

(c) filling said annular space with a material which is curable to provide a core of an elastomeric material with predetermined compression characteristics;

(d) causing the material to cure in such manner as to ensure that the material does not adhere to the mandrel but bonds to the tube inner surface during curing whereby any radially directed tension forces produced during curing are relieved by radial contraction of the material away from the mandrel;

(e) removing circumferential strips of tube material to leave said spaced parallel conductive strips bonded to the core; and

(f) removing the mandrel from the core.

4,109,379

MANIPULATOR FOR THE INSERTION AND EXTRACTION OF PRINTED-CIRCUIT BOARDS INTO AND FROM A HOLDER THEREFOR

Franco Ratti, Milan; Gianantonio Vivarelli, Cesano Boscone; Dario Maganza, Cornaredo, and Emanuele D'Amore, Milan, all of Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed Jnl. 6, 1977, Ser. No. 813,229

Claims priority, application Italy, Jul. 7, 1976, 25079 A/76

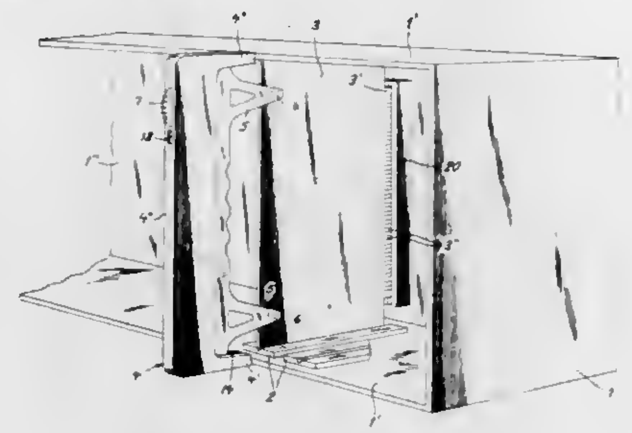
Int. Cl.² H05K *3/30;* **B25B** *27/14*

U.S. Cl. 29—747 **10 Claims**

1. A manipulator for facilitating insertion of a printed circuit board into a holder and subsequent extraction of said board from the holder, the latter having a pair of parallel sidewalls forming guide tracks for respective lateral board edges and further having stationary connectors engageable by coacting connectors on a transverse edge of the inserted board, comprising:

a generally C-shaped frame having a ridge positionable at right angles to said sidewalls in line with a printed-circuit board to be inserted or extracted, said frame further having a pair of legs transverse to said ridge adapted to come to rest on exposed edges of said sidewalls;

a slider received in said frame between said legs, said slider being provided with lug means pointing to the interior of said container upon a positioning of said legs on said exposed edges, said lug means carrying a gripping formation engageable with a mating formation on the associated printed-circuit board;



stop means on said frame defining an extended position remote from said ridge for said slider;

biasing means on said frame urging said slider into said extended position; and

latch means on said frame for selectively locking said slider in said extended position to facilitate the insertion of the associated printed-curcuit board, said slider being withdrawable from said extended position upon deactivation of said latch means for disengaging the connectors of said board from respective connectors of said holder preparatorily to complete extraction of the board from the holder.

4,109,380

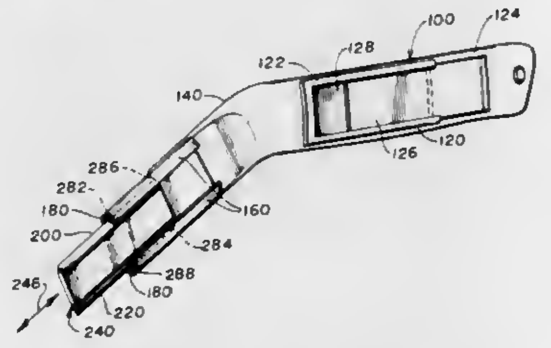
CUTTING TOOL AND BLADE HOLDER FOR REPLACEABLE BLADES

Lloyd E. Anderson, 6408 74th Ave. N., Brooklyn Park, Minn. 55428

Continuation-in-part of Ser. No. 812,587, Jul. 5, 1977, abandoned. This application Jan. 23, 1978, Ser. No. 871,352

Int. Cl.² B26B *5/00*

U.S. Cl. 30—162 **29 Claims**



1. Blade holder adapted to use a replaceable blade, comprising:

(a) body receiving means for slidably receiving blade to be used with the holder; and

(b) edge receiving means for receiving the top and bottom edges of at least a portion of the blade, the means being sized on the order of the edge width but narrower than the blede width whereby the blade is held by the edge receiving means as a cutting edge of the blade engages an object to be cut due to the wedging of the blade body into the edge receiving means.

4,109,381

HYDRAULIC SECATEURS

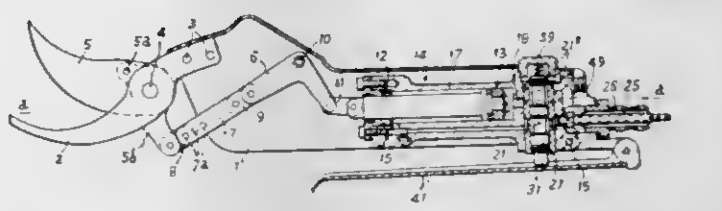
Roger Joseph Pelienc, Route de Villelaure, Pertuis 84120, France

Filed Dec. 14, 1976, Ser. No. 750,526

Claims priority, application France, Dec. 24, 1975, 75 40194; Oct. 15, 1976, 76 31808

Int. Cl.² B26B *15/00*

U.S. Cl. 30—228 **9 Claims**



1. In hydraulic secateurs, of the kind having

(i) a handle

(ii) a pair of relatively movable blades carried by said handle;

(iii) a cylinder body in said handle, having a bore;

(iv) a piston slidable axially in the bore of said cylinder body;

(v) means connecting said piston to one of said blades;

(vi) a spool valve, for control of hydraulic fluid for operating said piston, said valve being disposed in said cylinder body, said valve including a cylindrical jacket disposed in the cylinder body and having its axis perpendicular to the axis of the cylinder bore and a valve spool slidable axially in said jacket,

the improvement which comprises:

(a) said jacket having in its external surface three axially spaced circumferential grooves, a first of said grooves being in permanent communication with an aperture in the cylinder opening into the cylinder bore, a second of said grooves being in permanent communication with a fluid intake passage in said cylinder body, the third of said grooves being in permanent communication with a fluid outlet passage in said cylinder body;

(b) said valve spool having a first axial end position and a second axial end position of movement in said jacket, said valve spool in its first end position placing said first groove in communication with said second groove, said valve spool in its second end position placing said first groove in communication with said third groove.

4,109,382

ENOSSAL IMPLANT

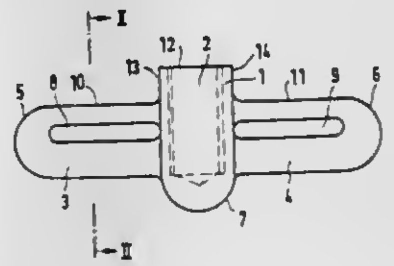
Werner Lutz Koch, Schwalbenweg 5, 3973 Libenau, Germany

Filed Feb. 12, 1976, Ser. No. 657,582

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1975, 2505734; Feb. 13, 1975, 2505914

Int. Cl.² A61C *13/00*

U.S. Cl. 32—10 A **11 Claims**



1. An improved implant for anchoring a denture, said improved implant being surgically introduceable into a cavity in a jaw bone and comprising, in combination:

a rigid upright cylindrical post of pre-selected height and outer diameter with its longitudinal axis defining a first reference axis, said upright cylindrical post having a bottom end within said cavity when said anchoring member is set in said jaw bone;

at least one rigid, generally planar carrying arm laterally attached to said upright cylindrical post having a preselected length in the direction of a second reference axis perpendicular to said first reference axis, a thickness less than said outer diameter of said upright cylindrical post in a direction perpendicular to the plane defined by said first and second reference axes, a top edge and a bottom edge, and a width from said top edge to said bottom edge not greater than the height of said upright cylindrical post in a direction parallel to said first reference axis; and

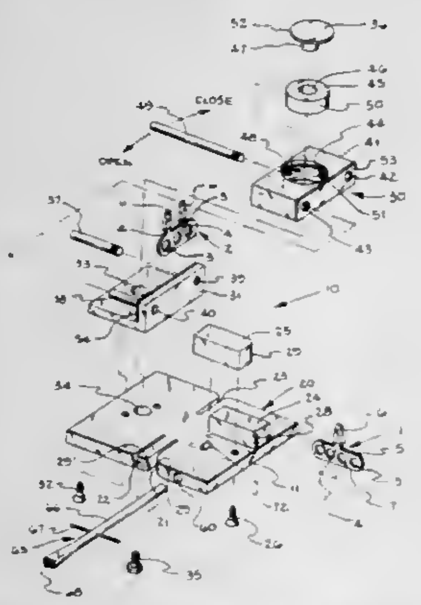
means for fastening said upright cylindrical post of said anchoring member to said denture;

said bottom end of said upright cylindrical post being rounded and extending below said bottom edge of said carrying arm; and

said bottom edge of said carrying arm being continuous, flat, substantially unbroken, and said bottom edge lying in a plane substantially perpendicular to said first reference axis.

4,109,383
DENTAL IMPLANT BENDER

Gerald M. Reed, 660 Valley Rd., Glencoe, Ill. 60022, and George E. Carpin, 398 Owen Ct., Prospect Hts., Ill. 60070
Filed Jun. 21, 1976, Ser. No. 698,190
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A **11 Claims**



1. An apparatus for bending endosteal dental implants having a generally thin planar blade member having a laterally broader dimension than vertical dimension, and having an intermediate neck portion joining said blade member to a head member which is adapted to receive a dental prosthesis, comprising in operative combination:

a. a base member;

b. a plurality of means for gripping the entire vertical dimension of at least a lateral portion of the generally planar blade member of said implant, said gripping means being adapted to leave the head member and neck portion free for rotational or angular bending;

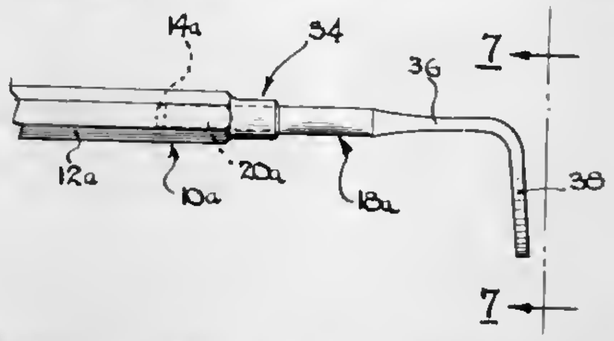
c. at least one of said gripping means comprises a movable-jaw vise assembly secured to said base member, said movable-jaw vise assembly includes an internal cam, a cam-actuated jaw adapted to reciprocate relative to a fixed jaw upon rotational motion of said cam, lever means engaging said cam to impart said rotational motion of said cam, and means for reciprocably guiding said jaw into clamping alignment with said fixed jaw;

d. means for bending said neck relative to said blade so that said head member is oriented in a different angular or a rotational mode, said bending means being adapted to engage said head member while leaving said neck portion free to permit accurate bending thereof;

e. a second of said gripping means comprises means for removably receiving at least a portion of the blade of said implant to permit arcuate bending of said blade which includes a pair of generally parallel faces in opposed, spaced-apart fixed relationship, the distance apart of said faces being predetermined to provide frictionally resistant but slidable retention of said blade member therebetween.

4,109,384
DENTAL TOOLS

Hubert J. Dorian, 10527 Leconte Ave., Los Angeles, Calif. 90024
Continuation of Ser. No. 593,225, Jul. 7, 1975, abandoned. This application Nov. 4, 1977, Ser. No. 848,765
Int. Cl.² A61C *3/02*
U.S. Cl. 32—40 R **16 Claims**



1. A dental tool assembly for performing dental work on the teeth or restorations in the oral cavity of a human being, said tool assembly comprising a handle assembly have an elongated hand-grip portion, said hand-grip portion having a recess formed on one transverse end thereof, a replaceable tool section having a securement end and a working end opposite said securement end, said working end having a contact section sized and shaped to perform dental work on the teeth or restoration in the oval cavity of a human being, said hand-grip portion having said recesses defined by an interior wall and an end wall, said securement end having an extension with an outer surface with a size and shape to fit within and which is closely spaced to the interior wall of said recess, and said extension having an end wall spaced from the end wall of said recess to form a space therebetween, and a heat responsive solder material securement means to retentively, but nevertheless removably, hold the extension on the securement end of said tool section within the recess of said hand-grip portion, said solder material being comprised of a tin-lead alloy composition and essentially surrounding the outer surface of said securement end and bonding the extension on the securement end to the interior wall of said aperature upon heating to a temperature where the composition liquifies and thereafter hardens upon cooling to create a metal bond between the interior wall and said securement end, but which solder material is capable of releasing said securement end on heating of the same to a temperature where the composition liquifies, said composition being applied in such amount that all said composition remains entirely within said recess and any excess thereof being disposed in said space.

4,109,385
METHOD OF STIPPLING, AND STIPPLING MANDREL THEREFOR

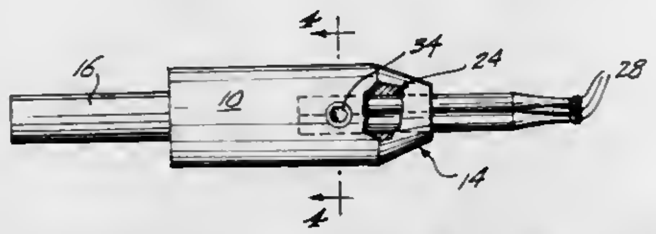
Eric H. Zahn, Bellevue, and Philip W. Martin, Seattle, both of Wash., assignors to Sterndent Corp., Old Greenwich, Conn.
Filed Aug. 19, 1976, Ser. No. 715,650
Int. Cl.² A61C *3/06;* B26D *1/12*
U.S. Cl. 32—59 **3 Claims**

1. A stippling mandrel, comprising:

a tool body adapted to be chucked for rotational drive;

said tool body having a cylindrical cavity extending axially inward at its outer end;

a cluster of similar burr shanks coextensively inserted into and substantially filling said cavity in side-by-side relation, the dimensions of said cluster being such that each shank has line contact with the inner surface of said cavity and with the shanks adjacent thereto; and

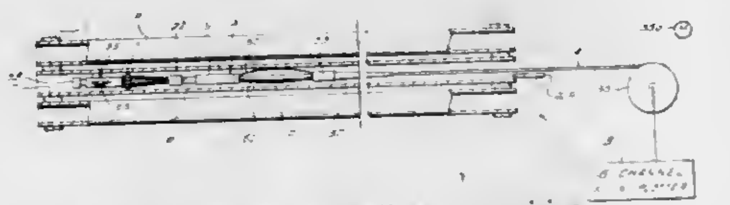


a screw threadedly mounted in the wall of said cavity and having an inner end penetrating said cavity and being disposed to bear in an interstice between an adjacent pair of shanks;

each said shank having a burr on its outer end no larger than the diameter of said shank.

4,109,386
SIGNAL-PRODUCING PIPE CALIPER

John C. Kinley, 5815 Royalton, Houston, Tex. 77027; Clifford E. Anderson; Charles W. Agee, and Harry E. Dieckman, all of Houston, Tex., assignors to John C. Kinley, Houston, Tex.
Filed May 29, 1975, Ser. No. 581,897
Int. Cl.² G01B *05/12*
U.S. Cl. 33—178 F **9 Claims**



1. A signal producing pipe caliper, comprising:

a longitudinal body;

a plurality of caliper feelers releasably mounted on said body for lateral movement relative thereto;

a signal producing system for producing signals responsive to movement of each of said feelers;

said signal producing system having a movement transmitting means operatively engaged by said caliper feelers and responsive to lateral movements of said feelers;

means for mounting the signal producing system with said body;

means for releasably mounting each of said feelers on said body separately from said signal producing system mounting means for permitting removal of each said feeler and replacement with another feeler without disconnecting said signal producing system from said body;

said body has a plurality of longitudinal slots therein, one for each said feeler; and

said feeler mounting means includes a longitudinally slidable sleeve releasably secured with the body which normally extends over a portion of each said feeler and confines same in predetermined longitudinal and radial locations on said body.

5. A signal producing pipe caliper, comprising:

a longitudinal body;

a plurality of caliper feelers releasably mounted on said body for lateral movement relative thereto;

a signal producing system for producing signals responsive to movement of each of said feelers;

said signal producing system having a movement transmitting means operatively engaged by said caliper feelers and responsive to lateral movements of said feelers;

means for mounting the signal producing system with said body;

means for releasably mounting each of said feelers on said body separately from said signal producing system mounting means for permitting removal of each said feeler and replacement with another feeler without disconnecting said signal producing system from said body;

latch means for releasably locking said feelers in a retracted position radially inwardly with respect to said longitudinal body;

latch release means for releasing said latch means while said caliper is in the pipe to be calipered;

a latch receptacle for receiving a portion of each of said feelers; and

a solenoid actuated rod operably connected to said receptacle and remotely operated to inactivate said latch means.

8. A signal producing pipe caliper, comprising:

a longitudinal body;

a plurality of caliper feelers releasably mounted on said body for lateral movement relative thereto;

a signal producing system for producing signals responsive to movement of each of said feelers;

said signal producing system having a movement transmitting means operatively engaged by said caliper feelers and responsive to lateral movement of said feelers;

means for mounting the signal producing system with said body;

means for releasably mounting each of said feelers on said body separately from said signal producing system mounting means for permitting removal of each said feeler and replacement with another feeler without disconnecting said signal producing system from said body;

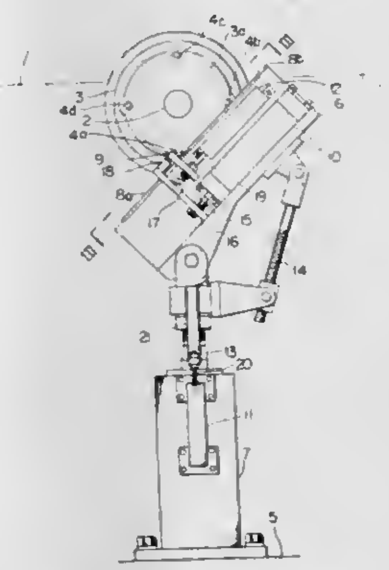
latch means for releasably locking said feelers in a retracted position radially inwardly with respect to said longitudinal body;

latch release means for releasing said latch means while said caliper is in the pipe to be calipered; and

centralizer shoes mounted with said body for resilient engagement with the inside of the pipe to be calipered, and with each shoe being offset longitudinally with respect to the other shoes.

4,109,387
POSITION DETECTING APPARATUS

Noboru Matsuoka, Eniwa, and Kengo Sugiyama, Abiko, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 29, 1976, Ser. No. 755,129
Int. Cl.² G01B *7/31, 7/315*
U.S. Cl. 33—185 V **7 Claims**



1. An apparatus for detecting the position of the center of rotation of a rotary surface having secured thereto a plurality of projections disposed on a concentric pitch circle in said

rotary surface and angularly equidistantly spaced apart from each other, comprising:

position correcting means having a surface movable toward and away from said projections for correcting the angular positions of said projections by rotation of said rotary surface;

first drive means drivingly connected to said position correcting means for moving the position correcting means toward said projections and into engagement with a first one of said projections to rotate said rotary surface until a second one of said projections adjacent to said first projection comes into engagement with said surface of said position correcting means and for thereafter moving said position correcting means away from said projections to be out of engagement with said first and second projections;

position detecting means mounted on said position correcting means and movable along said surface of said position correcting means toward and away from said first and second projections which are in engagement with the surface of said position correcting means for detecting the position of one of said first and second projections;

second drive means drivingly connected to said position detecting means for moving said position detecting means along the surface of said position correcting means toward said first and second projections which are in engagement with said surface of said position correcting means until it comes into engagement with one of said first and second projections, and for thereafter moving said position detecting means along said surface of said position correcting means away from said projections to be out of engagement with any projection;

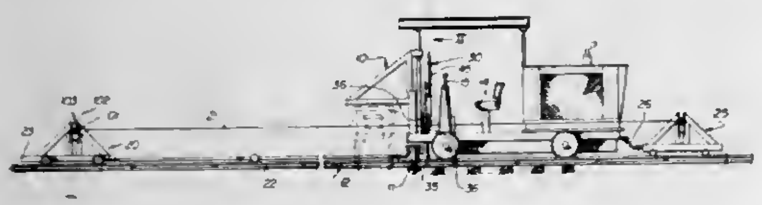
first displacement detecting means for detecting the displacement of said position correcting means during its movement into engagement with said projections and producing a first signal proportional to said displacement;

second displacement detecting means for detecting the displacement of said position detecting means during its movement into engagement with one projection and producing a second signal proportional to said displacement; and

means receiving said first and second signals from said first and second displacement detecting means for calculating the position of the center of rotation of said rotary surface.

4,109,388
NEEDLE INDICATOR FOR RAIL LINER

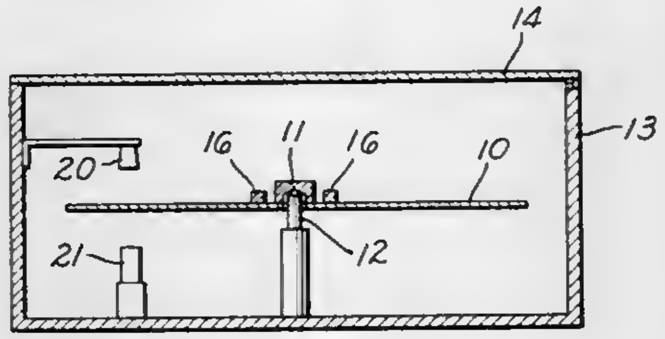
John K. Stewart, Columbia, S.C., assignor to Canron, Inc., New York, N.Y.
Filed Nov. 1, 1976, Ser. No. 739,446
Int. Cl.² E01D ***29/04***
U.S. Cl. 33—287 **11 Claims**



1. An indicator mechanism for an apparatus for correcting the grade and horizontal alignment of railroad track in accordance with a wire reference system having a reference wire tautly extending along said track, said mechanism comprising frame means, the position of said frame means in use being referenced to the existing position of an adjacent section of the railroad track, pivot means mounted on said frame means, a needle indicator mounted on said pivot means to pivot about a horizontal axis generally parallel to the reference wire, a second indicator mounted on said needle indicator for generally vertical, sliding movement thereon, first index means arranged on said frame means to indicate in combination with said needle indicator the existing horizontal alignment of said adjacent section with reference to said reference wire, second index means to indicate in combination with said second indicator the existing grade of said adjacent section with reference to said reference wire wherein, during use of said mechanism, the positions of said needle indicator and second indicator are adjusted by said reference wire in contact with said needle indicator and second indicator.

4,109,389
SHAFT ANGLE TRANSDUCER

Orville R. Balcom, Lomita; Cleve R. Hildebrand, Torrance, and Edward L. Pollard, Santa Ana, all of Calif., assignors to Cetec Corporation, Santa Ana, Calif.
Filed Mar. 8, 1976, Ser. No. 664,550
Int. Cl.² G01C ***17/26***
U.S. Cl. 33—363 K **11 Claims**



1. A sensor for measuring angular motion about a vertical axis including in combination:

a housing;

a radiaton source and a radiation detector fixedly positioned in said housing in spaced relation, with said source directing radiation along a path to said detector; and

a radiation control member having a magnet coupled thereto, with said housing and member having interengaging pivot means spaced from said path and supporting said member in said housing at a single point for pivoting of said member about a vertical axis relative to said housing and for pitch and roll of said member relative to said housing,

a part of said member being disposed between said source and detector and extending across said path whereby pitch and roll of said member will position different radial regions of the member across said path,

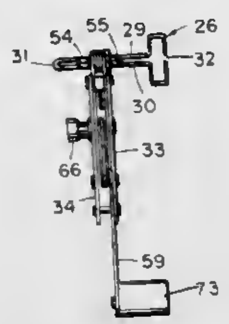
the part of said member between said source and detector having a plurality of radial segments, each segment having discrete opaque and transparent portions separated from corresponding portions of adjacent segments, with the opaque portions having a substantially uniform density and with the transparent portions having a substantially uniform density,

the proportion of said opaque and transparent portions changing from segment to segment as a predetermined function of angular position of the segments about said vertical axis but with said proportion being the same in all said radial regions in each segment so that the transmission characteristic is not adversely affected by pitch or roll,

said source and detector defining a radiation transmission zone along said path of a size to overlie a plurality of adjacent segments.

4,109,390
BOW SIGHT

Kenneth J. Smith, 5402 Newcastle Dr. SE., and Jerry F. Anderson, 5390 Newcastle Dr. SE, both of Kentwood, Mich. 49508
Filed Oct. 14, 1976, Ser. No. 732,508
Int. Cl.² F41G ***1/46***
U.S. Cl. 33—265 **10 Claims**



1. In combination with an archery bow, a bow sight, comprising:

a frame adapted for attachment to a bow adjacent the grip thereof; and

a sighting element having reference sections spaced apart a predetermined distance, said element being mounted on said frame by means providing limited rotation about at least one normally horizontal axis between a first position in which said reference sections are disposed in a substantially vertical plane, and a second position in which said reference sections are disposed in a plane angularly displaced from said first plane, wherein the reference sections are moved downwardly as said sighting element moves from said first position to said second position, in such a manner that when sighting to a target having a predetermined height at an unknown distance, the sighting element is moved until the reference sections correspond to the top and bottom of the target, respectively, and when so positioned, the line of sight defined by the space between said reference sections will correspond to the proper angular orientation of the bow to shoot to said unknown distance.

4,109,391
PORTABLE SURVEYING COMPASS WITH FLUX VALVE AND GYROCOMPASS ALIGNMENT MODES

Willis G. Wing, Glen Head, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Jan. 10, 1977, Ser. No. 758,292
Int. Cl.² G01C ***19/38, 1/02***
U.S. Cl. 33—275 G **15 Claims**

1. A gyroscopic compass comprising:

support means including external casing means,

follow-up container means within said external casing means journaled for rotation about a normally vertical axis,

floated gyroscopic assembly means within said follow-up container means buoyantly supported only by liquid contained within said follow-up container means,

gyroscope rotor means journaled about a normally horizontal axis within said floated gyroscopic assembly means,

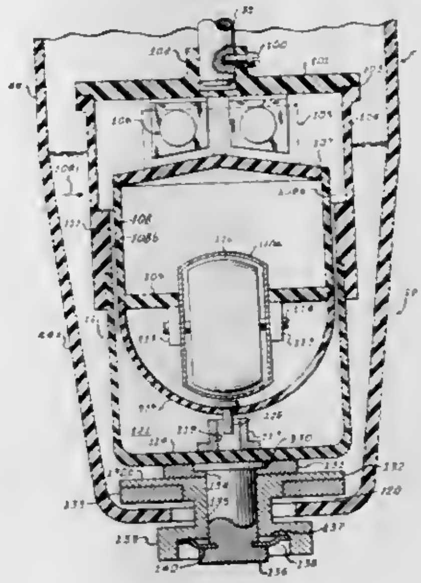
angle pick-off means responsive to the difference between the azimuth position of said floated gyroscopic assembly means and said follow-up container means for developing a first control signal at output terminals thereof,

torquer means responsive to said first control signal for continuously repositioning said floated gyroscopic assembly means to decrease said difference substantially to zero,

flux valve means supported by said follow-up container means for providing a second control signal at output terminals thereof,

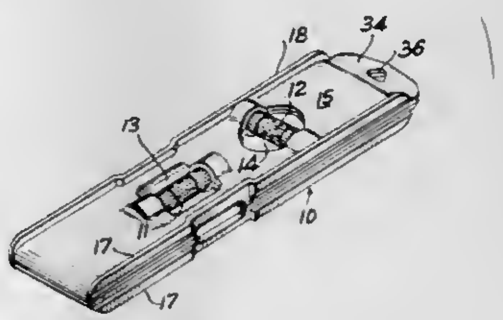
motive means selectively responsive to said first or second control signal for driving said followup container means, sighting means journaled for free rotation with respect to said follow-up means, and

display means responsive to the difference between the azimuth position of said follow-up container means and said sighting means.



4,109,392
POCKET LEVEL

Walter E. Streeter, Coral Springs, Fla., assignor to Mayes Brothers Tool Manufacturing Co., Johnson City, Tenn.
Continuation of Ser. No. 713,187, Aug. 10, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,484
Int. Cl.² G01C ***9/28***
U.S. Cl. 33—381 **9 Claims**



1. A spirit level comprising,

a body and two level vials supported on said body and disposed at right angles to each other,

said body being made up of two substantially identical separate halves, each said half comprising,

a relatively thin planar web,

each said web being disposed in a plane parallel to the other and having a first opening and a second opening spaced axially from each other with the openings of one web being aligned with the openings of the other web,

each said web having a first recess on a first side of a each opening and a second recess on the second side of each opening diametrically opposite said first recess, said recesses adapted to receive the ends of said level vial for positioning the vial at a predetermined position relative to the body,

said recesses being formed by said web material being curved outwardly to form a cavity in the form of a half cylinder adapted to conform to the outside surface of an end of said level vials,

means for holding said webs together with said level vials

therebetween with the ends of said vials disposed in said recesses,
each vial extending across a said opening from one side thereof to the other,
each said web having an inwardly directed rib extending toward the corresponding rib on the other,
said ribs extending around the outer edges of said recesses and around said openings defining marginal edges for said openings and said recesses and around at least a part of the periphery of said webs and holding said webs in spaced relation to each other,
said ribs on each said half resting on the ribs on the other said half providing a spacing between said webs,
energy directors on said ribs for facilitating ultrasonic welding of said ribs together.

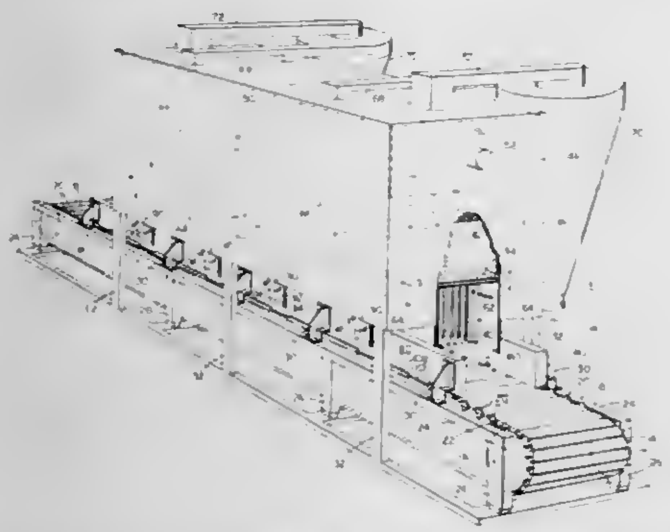
4,109,393
METHOD FOR THE PRODUCTION OF ELECTRODES FOR LEAD-ACID STORAGE BATTERIES

Pavlos Nikolaou, Alicarnassou St. 22, Nea Smyrni, Greece
Filed Jul. 1, 1976, Ser. No. 701,879
Claims priority, application Greece, Jul. 4, 1975, 6957
Int. Cl.² F26B *3/04*
U.S. Cl. 34—22 **6 Claims**

1. A method for the production of lead-acid storage battery electrodes having a grid of lead alloy filled with active materials, consisting essentially of lead oxides, leadpowder, sulphuric acid and water, said method comrising exposing said electrodes to a jet of a gas at 500°to 900°C at a velocity of the order of several meters per second for a time of the order of a few seconds, the time and temperature being related whereby the electrodes are processed without being destroyed to dry the surface of the electrodes while leaving the interior moist, and storing the thus superficially dried electrodes to allow the active materials to react chemically to produce the final electrodes, the electrodes being sufficiently dry to allow them to be brought into contact during storage without sticking.

4,109,394
MATERIAL TREATMENT SYSTEM

Charles W. Hoyt, Belmont, Mass., assignor to Wolverine Corporation, Methuen, Mass.
Filed Jan. 5, 1977, Ser. No. 756,896
Int. Cl.² F26B *17/04*
U.S. Cl. 34—57 B **15 Claims**

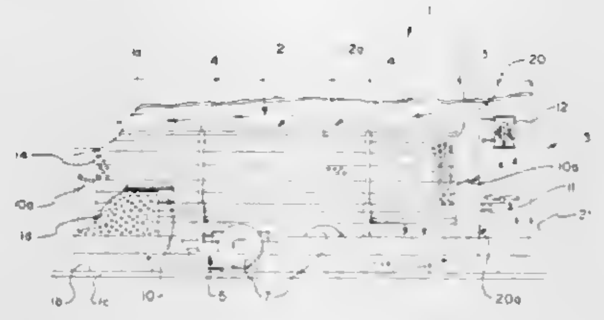


1. In a system for treatment of particulate material comprising a conveyor for transporting particulate material through a treatment zone and a gas flow system for placing particles on the conveyor in fluidized condition as they move through the treatment zone,

the improvement of means along the side of the treatment zone for projecting a gaseous stream downwardly against and inwardly along the transport surface of the conveyor to provide boundary sheath gas flow along the edge of the treatment zone, said boundary sheath gas flow containing particles on said conveyor and contributing to the fluidization of particles on the conveyor at the side boundary of the particle treatment zone.

4,109,395
GREENHOUSE, DRYING, STORING NURSERY SYSTEM

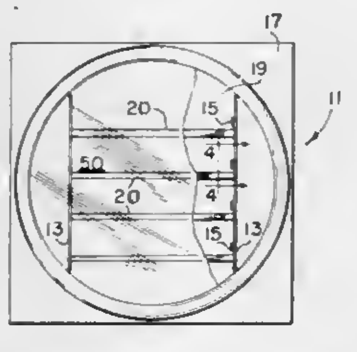
Barney K. Huang, 2008 Varnell Ave., Raleigh, N.C. 27612
Filed Oct. 28, 1976, Ser. No. 736,533
Int. Cl.² F26B *19/00;* F24J *3/02*
U.S. Cl. 34—93 **6 Claims**



1. A multi-purpose structure adapted for use as a drier or greenhouse comprising: a main outer structural housing including a transparent outer surface for allowing available solar radiation to be transmitted through said outer structural housing; at least one rotor structure normally disposed interiorly of said main outer structural housing and exposed to available solar radiation transmitted through said outer structural housing, said rotor structure when used in a drying mode of operation including a cylindrifal wall structure that has the capability to support and hold material; support means normally disposed interiorly of said outer structural housing for supporting said rotor structure interiorly of said outer structural housing, said support means including a portable like trailer having wheel means for allowing said trailer to be moved in and out of said structure; rotor drive means operatively associated with said rotor structure for rotatively driving the same, and a furnace system operatively associated with said multi-purpose structure for circulating air through the interior of said structure and including heating means for heating the air as necessary in order to maintain a desired temperature level within said structure.

4,109,396
METHOD AND APPARATUS FOR AN IMPROVED SHELF AND TRAY ASSEMBLY FOR A FREEZE DRYER

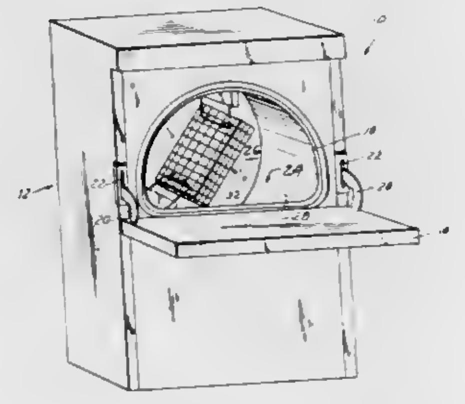
Douglas S. Fraser, New Paltz, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.
Filed Dec. 6, 1976, Ser. No. 747,939
Int. Cl.² F26B *11/18, 25/18*
U.S. Cl. 34—192 **10 Claims**



1. In a freeze drying chamber, at least one shelf and tray assembly comprising a shelf having a substantially flat upper surface, said shelf being hollow and allowing for the rapid circulation of a heat transfer fluid within, a tray for containing material to be freeze dried, said tray having tapered hold-down rails on opposing sides, said chamber having elongated tapered hold-down rails on opposite sides above said shelf, said hold-down rails of said tray tapering in an opposite direction from said hold-down rails of said chamber, said hold-down rails of said shelf mating and locking with said hold-down rails of said tray when said tray is inserted onto said substantially flat upper surface of said shelf, thereby bringing said tray into intimate contact with said upper surface of said shelf and increasing the transfer of thermal energy between said shelf and tray.

4,109,397
ROTATABLE, NON-TUMBLING DRYING RACK

Thomas Edward Daily, Herrin, Ill., assignor to Fedders Corporation, Edison, N.J.
Filed Feb. 9, 1977, Ser. No. 766,939
Int. Cl.² F26B *23/04*
U.S. Cl. 34—239 **8 Claims**

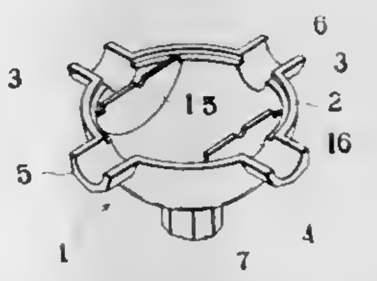


1. A drying rack for a dryer of the type having a rotating drum for preventing tumbling of the articles received in said rack:
an open-work basket portion for receiving articles, said basket comprising a bottom wall, opposed side walls, a front wall and a rear wall;
a cover for said basket portion;
cooperating closing means on said basket portion and said cover for affixing said cover to said basket portion at a preselected one of a plurality of different heights from said bottom wall;
and mounting means for releasably mounting said rack on the drum to prevent tumbling of said rack as the drum rotates, said basket portion comprising a plurality of spaced upstanding rods in each of said side, front and rear walls; and a plurality of vertically spaced substantially horizontal rods extending about said side, front and rear walls; said closing means comprising bifurcated extensions on one edge of said cover adapted to receive one of said horizontal rods therein, and an extendable bifurcated member at the opposite edge of said cover adapted to engage said one of said horizontal rods to connect said cover to said basket portion at the desired height above said bottom wall.

4,109,398
CONSTRUCTION TYPE EDUCATIONAL AND AMUSEMENT DEVICE

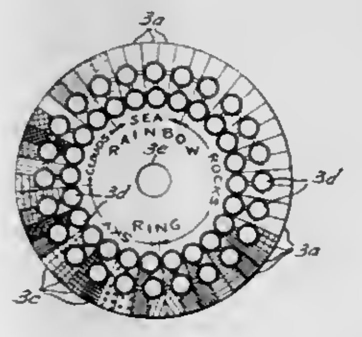
Hiroyuki Hida, Tokyo, Japan, assignor to Mitsubishi Pencil Co. Ltd., Tokyo, Japan
Filed Aug. 16, 1976, Ser. No. 714,354
Claims priority, application Japan, Aug. 16, 1975, 50-99583
Int. Cl.² G09B *25/02;* A63H *33/30, 17/12*
U.S. Cl. 35—13 **28 Claims**

1. In an educational and amusement construction type assembly, first and second hollow substantially identical halves forming a generally symmetrical hollow capsule having a polar diameter and an equatorial plane intersecting the mid-point of said polar diameter, normal thereto, said halves having contacting peripheral edges lying in said equatorial plane, and first and second tubular projections extending radially outwardly from said capsule at the respective ends of a first diameter in said equatorial plane, each said projection being formed by matching semi-cylindrical tubular portions each integral with a respective one of said halves and having contacting edge surfaces lying in said equatorial plane.



4,109,399
PAINT - BY - RAINBOW - RING ART KIT WITH PRESTROKED PANEL

Marko Ivancevich, 423 N. Broadway, Redondo Beach, Calif. 90277
Filed May 22, 1975, Ser. No. 579,957
Int. Cl.² G09B *11/10*
U.S. Cl. 35—26 **4 Claims**



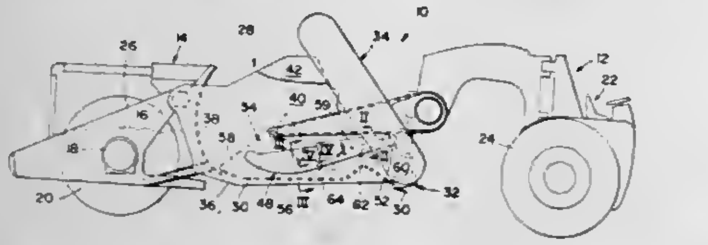
1. The method of producing a painted picture from an art kit comprising the steps of:
employing a thin plastic panel within an art kit upon which is impressed in three dimensions the basic outline of a picture with there being several separate distinct sections of the picture, such as sky, sea, clouds and terrain and each said section including impressed simulated brush strokes;
also employing within the art kit at least one guide print to denote to the user the exact color object location on the thin plastic panel;
comparing the three dimensional basic outline of the panel with the color outline of the sections on the guide print thereby clearly ascertaining the type of section and its color arrangement;
having available within the art kit a plurality of shades of selected colors for each said section and each said shade is preselected to be satisfactory for the picture for representation of the said sections;
selecting a particular said shade for each said section from the respective group of color shades; and
applying a thin coating of the select color shade to its respective said section thereby coloring the said section with the impressed simulated brush strokes showing through the coating of paint.

4,109,400
SCRAPER UNLOADING SYSTEM

Warner G. Richardson, Joilet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 11, 1977, Ser. No. 786,180
Int. Cl.² E02F *9/28;* B60P *1/36*
U.S. Cl. 37—126 AC **9 Claims**

1. A bowl assembly for a construction vehicle comprising

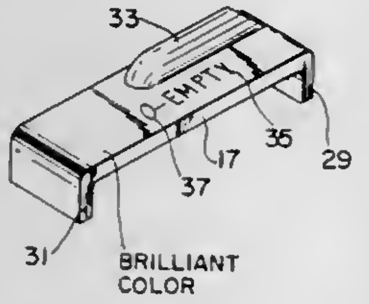
- a pair of laterally spaced first and second sidewalls defining an opening therebelow,
- a movable bowl portion movably mounted on said bowl assembly for movement between a first position covering said opening and a second position exposing said opening,
- actuating means at least substantially disposed within the confines of at least one of said first and second sidewalls for selectively moving said bowl portion between its first and second positions, said actuating means connected to said bowl portion through an elongated slot formed through said one sidewall, and
- masking means for continuously covering said slot upon actuation of said actuating means for moving said bowl portion between its first and second positions.



4,109,401
MAGAZINE CONTENTS INDICATORS

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Aug. 22, 1977, Ser. No. 826,895
Int. Cl.² F41C *25/02*
U.S. Cl. 42—50 **3 Claims**



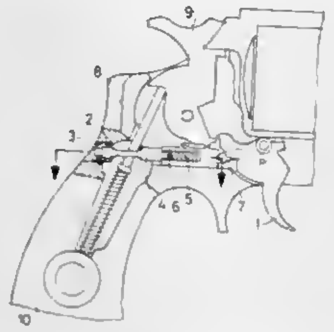
1. A cartridge magazine follower having visible means thereon positionally adapted to facilitate visual determination of whether said follower is so positioned in a magazine that said magazine must necessarily be empty of cartridges, said visible means including a luminescent coloration.

4,109,402
DEVICE FOR REGULATING THE PRESSURE TO BE APPLIED TO THE TRIGGER ON FIREARMS

Inigo Diaz Guardamino, Avda. La Vega, 48 Guernica, Spain

Filed Dec. 17, 1975, Ser. No. 641,446
Claims priority, application Spain, Dec. 28, 1974, 208.736
Int. Cl.² F41C *19/00*
U.S. Cl. 42—65 **1 Claim**

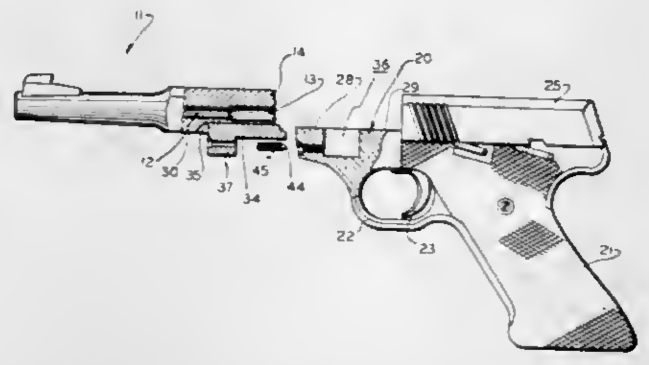
1. A device for regulating the pressure applied to a firing trigger of a fire-arm having a butt comprising a slide linked to said firing trigger, a spring having first and second ends, the first end of said spring bearing against said slide, a link member having first and second ends bearing at its first end against the second end of said spring, threaded means in said butt for moving said link member whereby said spring is compressed, said threaded means having means for permitting rotation thereof from outside said fire-arm, means on said slide for permitting it to move axially without turning, a hole in said link member, and a hammer pushrod passing through said hole.



4,109,403
DETACHABLE BARREL FOR HAND GUNS

Joseph A. Badali, Mountain Green, Utah, assignor to Browning Arms Company, Morgan, Utah

Filed Sep. 25, 1975, Ser. No. 616,618
Int. Cl.² F41C *21/00*
U.S. Cl. 42—75 B **3 Claims**



1. In a firearm of the type having a frame, a detachable barrel mounted in longitudinal alignment on the frame and means for positively connecting the barrel to the frame, the improvement which comprises:

- a well in said frame beneath the chamber end of said barrel;
- a barrel block extending down into said well from attachment to said barrel, said barrel block being in loose fit relation with said well and having a bore in approximately parallel relation with said barrel and countersunk at the forward surface of the barrel block;
- a threaded bore through the forward surface of the frame in open communication with said well and in approximately parallel alignment with the bore in said barrel block but with its axis lower with respect to said barrel than the axis of the bore in said barrel block; and
- a barrel screw threaded through said threaded bore with a tapered lead end in engagement with said countersunk portion of the bore in said barrel block, thereby to urge said barrel down and back with respect to said frame.

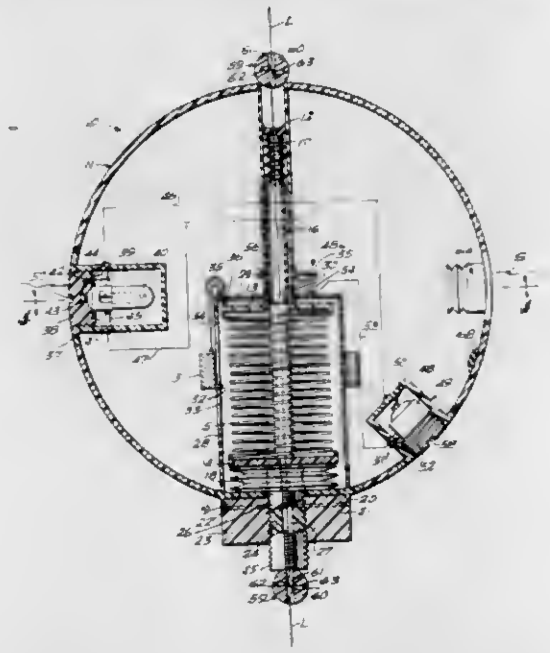
4,109,404
BITE SIGNALLING FISHING BOBBER WITH FLEXIBLE HOUSING

Raymond C. Preeschl, 425 E. 25th St., Hialeah, Fla. 33013

Filed Jul. 19, 1976, Ser. No. 706,498
Int. Cl.² A01K *85/01, 93/00, 97/12*
U.S. Cl. 43—17 **9 Claims**

1. A bite signalling fishing bobber comprising, in combination, a hollow, air pressure inflated, substantially spherical flexible housing, an electrical signalling device within said housing, an energizing circuit for said signalling device, normally open-circuit switch means in said energizing circuit and

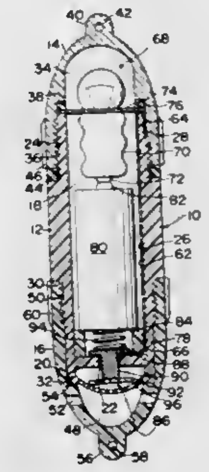
within said housing, means for attaching a fishing line to said housing, said fishing line attaching means comprising a substantially diametrically-extending through opening in said housing through which the fishing line can be threaded, and abutment stop means adjustably positioned along the fishing line in substantially abutting relation with diametrically opposed end portions of said housing, said line attaching means being operative to compressingly distort said flexible housing along the axis of said diametrically-extending through housing opening and thereby vary the cross-sectional shape of said housing along said diametrically-extending axis as a function of tensional stress being imposed along the fishing line from below said housing member while said housing is being floatingly supported from underneath by a body of water, a distortion counteracting spring within said housing and constrained along said diametrically-extending axis thereof, and means responsive to said distortion for close-circuiting said switch means so as to energize said electrical signaling device.



4,109,405
CAPSULE LAMP AS A FISHING TACKLE

Kiyomatsu Ito, No. 15-15, 1-chome, Chuo, Edogawa-ku, Tokyo, Japan

Filed May 3, 1977, Ser. No. 793,374
Claims priority, application Japan, May 19, 1976, 51-6383[U]; Oct. 21, 1976, 51-140643[U]
Int. Cl.² A01K *93/00, 75/02;* **F21V** *33/00*
U.S. Cl. 43—17.5 **12 Claims**



1. A capsule lamp as a fishing tackle, comprising a casing structure consisting of a unitary tubular body having longitudinal first and second end portions and an annular end wall portion axially inwardly recessed from the extreme end of the second end portion and formed with an aperture, said body having an internal groove formed in the inner peripheral wall of the body and extending longitudinally between the extreme end of said first end portion and the inner end face of said annular end wall portion and an external groove formed in the outer peripheral wall of the body and extending substantially in parallel with said internal groove a predetermined length from said extreme end, said external groove being joined to said internal groove through a radial notch formed in the edge of said first end portion, a hollow, light-passing closure element in threadedly mating engagement with said first end portion, and a hollow end fitting in threadedly mating engagement with said second end portion and formed with at least one opening, the end fitting forming a first internal space between the end fitting and the outer end face of said end wall portion; an electric light bulb positioned within said casing structure and having a first terminal element axially projecting within said body away from said closure element and a flange-shaped second terminal element having an outer circumferential portion detachably secured to said edge of said first end portion of said body by means of said closure element and thereby holding the bulb in position partially within said body and partially within said closure element; a dry cell battery positioned within said tubular body and having a first electrode in direct contact with the first terminal element of the light bulb and a second electrode located axially at a predetermined spacing from the inner end face of said end wall portion and forming a second internal space between the inner end face of the end wall portion and said second electrode, said second internal space being in communication with said first internal space through said aperture in said end wall portion; a unitary, electrically conductive element consisting of an elongated intermediate portion detachably received in said internal groove, a first end portion turned back from said intermediate portion through said notch and detachably received in said external groove, said first end portion of the conductive element being partly received in said notch and in contact with the second terminal element of the light bulb, said closure element having a wall portion detachably fast on said first end portion of the conductive element, and a second end portion substantially perpendicularly bent from said intermediate portion and located within said second internal space, the second end portion of the conductive element extending radially inwardly from said internal groove and terminating short of alignment with the aperture in said end wall portion; an electric contact element having an axially inner portion located within said second internal space and an axially outer portion axially projecting out of said tubular body into said first internal space through said aperture, said contact element being movable in its entirety between a first position having said inner portion seated on the inner end face of said end wall portion and a second position axially spaced apart from the inner end face of the end wall portion, the contact element being in contact with said second end portion of the conductive element when the contact element is in one of the first and second positions thereof and being electrically disconnected from the second end portion of the conductive element when the contact element is in the other of said first and second positions; electrically conductive biasing means positioned within said second internal space and seated between said second electrode and said inner portion for urging said contact element toward said position in which said inner portion is seated on the inner face of said end wall portion; and an elastic, electrically non-conductive diaphragm positioned within said first internal space and having an outer peripheral end detachably secured between said tubular body and said end fitting for dividing said first internal space into an inner variable-volume chamber enclosing said outer end portion of said contact element and an outer variable-volume chamber hermetically isolated from said inner variable-volume chamber and open to the outside of said casing structure through said opening, the diaphragm having an elasticity urging the diaphragm axially away from said outer end face of said end wall portion and being deformable into pressing contact with said outer portion of said contact element for axially moving the contact element toward said posi-

tion in which said inner portion is axially spaced apart from the inner end face of said end wall portion as a fluid pressure higher than atmospheric pressure is developed in said outer variable-volume chamber through said opening.

4,109,406
PYROTECHNICAL MOLE TRAP

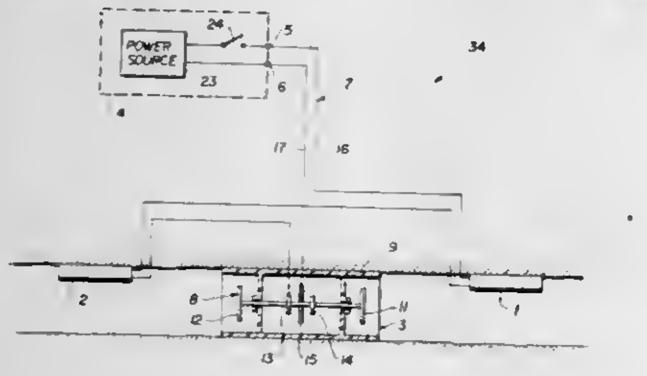
Claude Denninger, Chazay D'Azergues, France, assignor to Sogemaric, Société de Gestion et de Marketing pour Industries de Consommation, Paris and Societe E. Lacroix, Muret, both of, France

Filed Mar. 10, 1977, Ser. No. 776,272

Claims priority, application France, Mar. 30, 1976, 76 09764; Jan. 10, 1977, 77 00951

Int. Cl.² A01M *27/00*

U.S. Cl. 43—84 **11 Claims**



1. A pyrotechnical mole trap of which at least part is intended to be positioned in a mole run, comprising:

an elongate protective envelope which is open at its ends and which is intended to be placed inside the mole run,

an electrical contactor placed inside the protective envelope,

two displaceable triggers mechanically controlling the electrical contactor, each of these triggers being placed at one of the ends of the protective envelope,

two electrically fired deflagrating pyrotechnical charges of which each is placed on the outside of the protective envelope near each of the triggers,

a source of electrical energy,

an electrical circuit which connects together the electrical contactor, the pyrotechnical charges and the source of electrical energy and which is wired in such a way that the action of the mole on either of the triggers closes the electrical circuit and fires the pyrotechnical charge situated in the immediate proximity of that trigger.

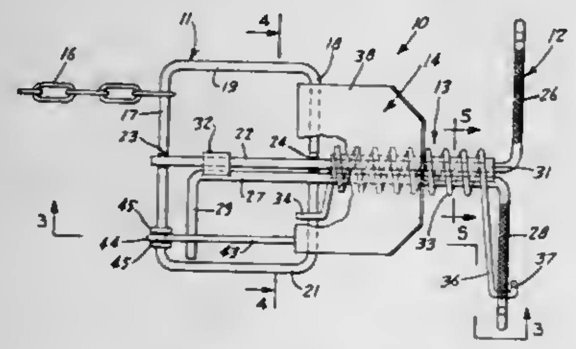
4,109,407
ANIMAL TRAP

Oscar F. Johnson, Rte. 1, McIntosh, Minn. 56556

Continuation-in-part of Ser. No. 621,853, Oct. 14, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,998

Int. Cl.² A01M *23/24, 23/26*

U.S. Cl. 43—85 **31 Claims**



1. An animal trap comprising: a base, animal holding means mounted on the base, said animal holding means having a first rod secured to the base, first animal holding jaw means attached to the first rod, a second rod located adjacent the first rod and extended generally parallel thereto, second animal holding jaw means attached to the second rod and located in general transverse alignment with the first jaw means, means including at least one elongate tubular member secured to the first rod and pivotally mounted on the second rod whereby the second rod is movable relative to the first rod and the first and second jaw means are movable relative to each other between an open position and a closed position, coil spring means surrounding portions of the first rod, second rod and means including at least one elongate tubular member, said coil spring means cooperating with the base and second jaw means to bias the second jaw means to a closed position adjacent the first jaw means, and a trigger mechanism for holding the first and second jaw means in the open position against the force of the spring means, said trigger mechanism having a trip plate pivotally mounted with respect to the base, a movable arm pivotally mounted with respect to the base, said arm having means acting upon the trip plate to releasably hold the trip plate in a set position, and means having a member engageable with the arm to hold the first and second jaw means in the open position, said member being released when the trip plate is moved from the set position by an animal whereby the spring means moves the first and second jaw means to the closed position to trap the animal between said first and second jaw means.

4,109,408
INSECT ELECTROCUTION DEVICE

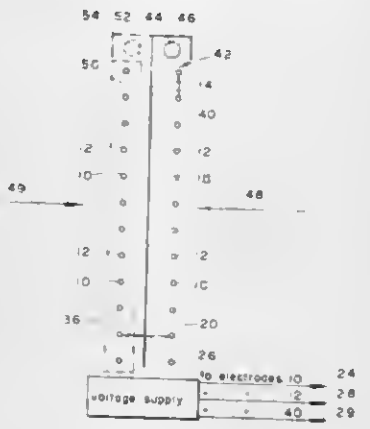
Mordechai Yavnieli, Tel-Aviv, Israel, assignor to AMCOR Ltd., Tel-Aviv, Israel

Filed Jan. 7, 1977, Ser. No. 757,571

Claims priority, application Israel, Jan. 14, 1976, 48833

Int. Cl.² A01M *1/22*

U.S. Cl. 43—112 **25 Claims**



1. Insect electrocution device comprising:

a surface array composed of an arrangement of spaced first electrodes; and

a sheet electrode disposed along a surface spaced from said surface array;

said first electrodes being maintained at a first potential;

said sheet electrode being maintained at a second potential differing from said first potential;

the electrodes forming said surface array being arranged so as to define a first substantially uniform separation therebetween; and

said sheet electrode being spaced from said surface array by a second separation smaller than said first uniform separation.

4,109,409
STRUCTURAL ELEMENT FOR CONSTRUCTION KITS AND METHOD OF MAKING THE ELEMENT

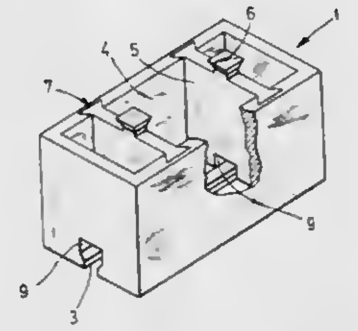
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,565

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626983

Int. Cl.² A63H *33/08*

U.S. Cl. 46—25 **12 Claims**



1. A hollow structural element, particularly for assembly with other structural elements in multielement construction kits, comprising means including an elongated complete circumferential wall bounding an interior space having opposite ends and two pairs of opposite side walls, and an end wall closing one of said ends of said interior space, whereas another of said ends thereof remains open; means for subdividing said interior space, including at least one partition having side portions connectable with said circumferential wall, and an end portion at said open end of said interior space, an undercut coupling projection projecting from said end portion of said one partition at said open end of said interior space in direction away from said end wall outwardly beyond said interior space and engageable in an undercut coupling indentation of another structural element so that in an engaged condition said other structural element bridges said open end of said first-mentioned structural element; and an elongated groove at said end wall and thereby at said closed end of said interior space, said groove extending along the the entire length of said end wall from one to another of one pair of said opposite side walls and having ends which are open thereat, said groove having an undercut portion complementary to said projection for slidably receiving an undercut coupling projection of a further structural element through either of said open ends of said groove.

4,109,410
TOY MOTOR CAR CIRCUIT

Shigeru Saito, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan

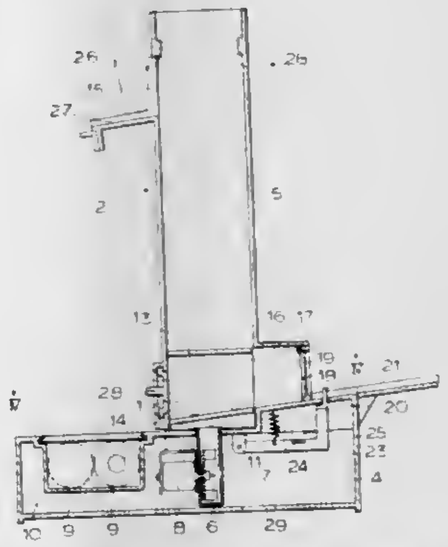
Filed Sep. 8, 1976, Ser. No. 721,413

Claims priority, application Japan, Sep. 19, 1975, 50-128806[U]

Int. Cl.² A63H *29/16*

U.S. Cl. 46—44 **10 Claims**

1. A toy comprising: an upright hollow tower having an upper end formed with an exit opening and a lower end formed with an entrance opening; an elevator vertically displaceable in said tower piston-fashion and having a bottom wall; a ramp having an upper end at said exit opening and a lower end at said entrance opening; a toy motor car displaceable down along said ramp under its own weight and fittable on said bottom wall of said elevator; door means for preventing emission of air from said tower through said entrance opening but for permitting said car to enter said tower through said entrance opening; and means for supplying air under pressure to the interior of said tower beneath said entrance opening and for forming a gas column in said tower capable of vertically displacing said elevator with said car on said bottom wall from a position aligned with said entrance opening to a position aligned with said exit opening.



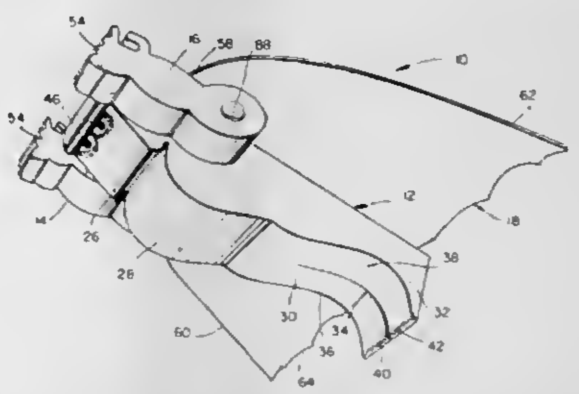
4,109,411
TOY FIGURE GLIDER

Joseph J. Wetherell, Bedford, N.Y.; A. Edward Fogarty, and Bonnie Rose Fogarty, both of Sarasota, Fla., assignors to Ned Strongin Associates, Inc., New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,076

Int. Cl.² A63H *27/00*

U.S. Cl. 46—79 **13 Claims**



1. A toy figure glider comprising a body portion made of a soft and resilient open-cell foam material having a front surface and a flat rear surface,

a pair of arms made of a soft and resilient open-cell foam material and adapted to be movably mounted on the sides of said body portion,

a wing portion comprising a relatively thin sheet of flexible, light-weight, closed-cell foam material which is bendable and has shape-retaining properties, and having a width appreciably greater than the width of said body portion,

said wing portion having connecting means for attaching said wing portion to said body portion with the lower surface of said wing portion closely overlying the flat near surface of said body portion and extending substantially parallel thereto,

and a mounting rod extending transversely through said body portion and through said connecting means for mounting said wing portion on said body portion,

said mounting rod also extending through said arms for pivotally mounting said arms at opposite sides of said body portion,

said pivotally-mounted arms being selectively movable to forwardly-extending and rearwardly-extending positions in which they are parallel to the axis of said body portion for launching of the glider through the air with the body portion substantially horizontal and facing downwardly and the wing portion facing upwardly.

4,109,412
TRACKWAY AND POWERED VEHICLE WITH CHANGEABLE COVERS

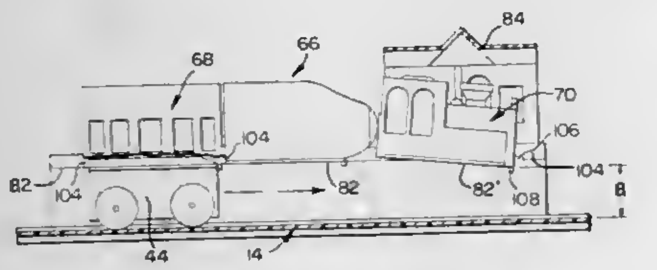
Makoto Saito, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,868

Claims priority, application Japan, Jun. 18, 1976, 51/80873[U]

Int. Cl.² A63H *19/00, 19/34*

U.S. Cl. 46—216 **4 Claims**



1. A toy train and trackway, comprising:
a trackway provided with a section having a base and upstanding side walls opposite one another on respective sides of said trackway, supporting surfaces provided on said walls which include portions that are parallel to said base and portions that slope downwardly from said parallel portions toward said base,
a powered vehicle provided with wheels that move along said trackway and said base of said section, and flanges extending outwardly from said vehicle; and
a plurality of covers for said vehicle, each of said covers provided with flanges extending outwardly therefrom for engaging said supporting surfaces of said side walls of said section and said flanges of said vehicle, said vehicle and trackway being constructed and arranged so that said vehicle, moving over said trackway, can go underneath and completely pass one of said covers as the latter is maintained on said parallel portions, but can go under and pick up one of said covers that is present on said downwardly sloping portions.

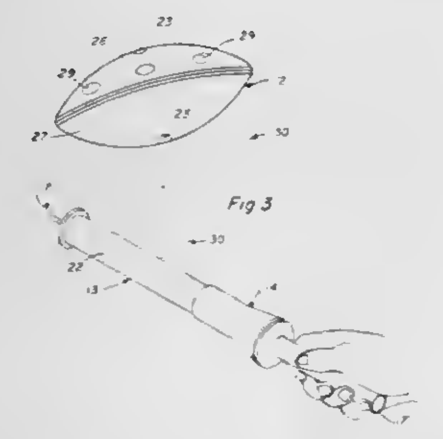
4,109,413
LEVITATION TOY AND METHOD OF OPERATION THEREOF

Paul L. Brown, 982 Lakeview Way, Redwood City, Calif. 94062

Filed Feb. 9, 1977, Ser. No. 767,205

Int. Cl.² A63H *33/26*

U.S. Cl. 46—233 **9 Claims**



1. Equipment for levitating dimensionally convertible shaped levitatable objects; said equipment comprising in combination, a shaped levitatable object of a predetermined dimension and having an opening therethrough, a flat pad for removably holding said object during an electrostatically charging period, and an electrostatically chargeable wand, a flanged handle on one end of said wand, the flange of which has a tapered periphery, an exciter removably seatable upon said tapered periphery of the flange of said handle and slidably as well as rotatably mounted on said wand for inducing an electrostatic charge on said wand while simultaneously inducing an electrostatic charge of the same polarity on said object held on said pad by rolling engagement therewith, and means for lifting said object from said pad after it has received an electrostatic charge and launching the same into space; said means comprising a flexible hook on said wand insertable into said opening and engaging a portion of a charged object adjacent to said opening to lift the charged object from said pad into the air where it is repelled from said wand by the upwardly moving electrostatic lines of force emanating from said electrostatically charged wand and the downwardly moving lines of force emanating from said object and thereby sustained in levitation.

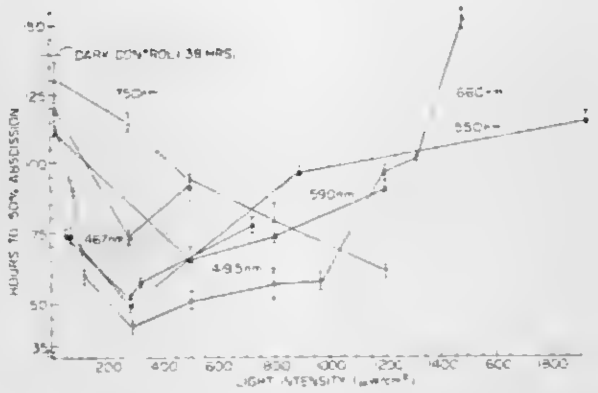
4,109,414
CONTROL OF PLANTS ABSCISSION PROCESSES BY USING SPECIFIC LIGHT SOURCES

Prakash G. Kadkade, Marlborough, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 701,331, Jun. 30, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,407

Int. Cl.² A01G *1/00*

U.S. Cl. 47—58 **13 Claims**



1. A method for regulating the physiological abscission process of parts of plants comprising the step of illuminating the plant during the night period with narrow band light having a predominant wavelength selected from the group consisting of approximately 420nm, 550nm, 660nm and 740nm.

4,109,415
PLANT CARE APPARATUS

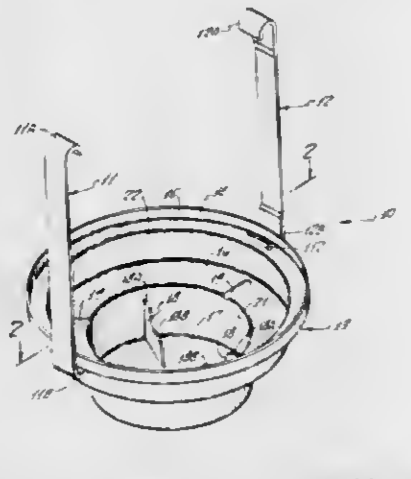
Bruce John Hall, 34352 El Molino, Capistrano Beach, Calif. 92624

Filed Aug. 19, 1976, Ser. No. 715,890

Int. Cl.² A47G *7/02*

U.S. Cl. 47—67 **3 Claims**

1. A receptacle for use with flower pots or the like comprising:
an outer wall having a generally cylindrical configuration;
a bottom member jointed to said outer wall;
a plurality of shoulders of different diameters formed as part of said outer wall, each of said plurality of shoulders defining a support member of different diameter, with the smallest diameter support nearest said bottom member;
a plurality of ribs extending from said bottom member and said outer wall, said ribs being upright walls which extend from said outer wall towards the center of said receptacle, each of said ribs having at least two surfaces for supporting a flower pot;
a pair of removable strap means for engaging the outer wall of said receptacle whereby said receptacle can be suspended from a flower pot or the like, each of said strap means including a relatively thin portion with relatively thickened end portions to impart additional strength thereto, said end portions defining hook attaching means for engaging said apertures;



a pair of apertures in the upper portion of said outer wall to receive end portions of said pair of strap means, said apertures diametrically spaced across said receptacle from each other.

4,109,416
VEHICLE DOOR ARRANGEMENTS

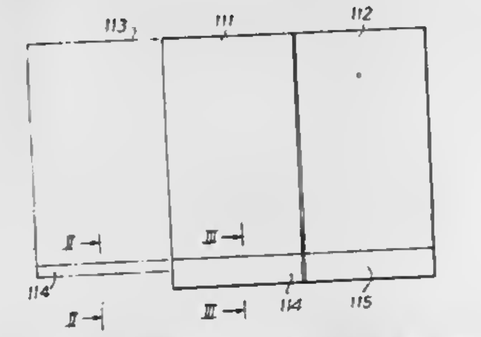
John Chase Newsoo; Geoffrey Robinson Tregoning, and James Baden Digby, all of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., London, England

Continuation of Ser. No. 553,005, Feb. 25, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,864

Claims priority, application United Kingdom, Sep. 27, 1974, 41994/74; Dec. 12, 1974, 53843/74; Mar. 21, 1974, 12758/74

Int. Cl.² E06B *7/28*

U.S. Cl. 49—316 **3 Claims**



1. A vehicle door arrangement comprising an upper main part and a lower edge part for closing a gap between the upper main part of the door and a doorway occupied by the door when in a closed position, and moving means operable to retract said lower edge part upwardly into the door prior to opening of the door from the closed position thereof and for extending the lower edge part downwardly to close the gap upon reaching said closed position, the lower edge part being hollow and deformable, inflatable and deflatable parts of the lower edge part being formed of inflatable and deflatable bladders enclosed within an outer enclosure of the lower edge part, the lower edge part being mounted by attachment to the ends of a rigid partition dividing the bladders, the ends being made accessible at ends of the outer enclosure, and said moving means comprising pneumatic means for inflating and deflating at least selected parts of the lower edge part.

4,109,417
GUIDE DEVICE FOR A SLIDABLE WINDOW OF A VEHICLE

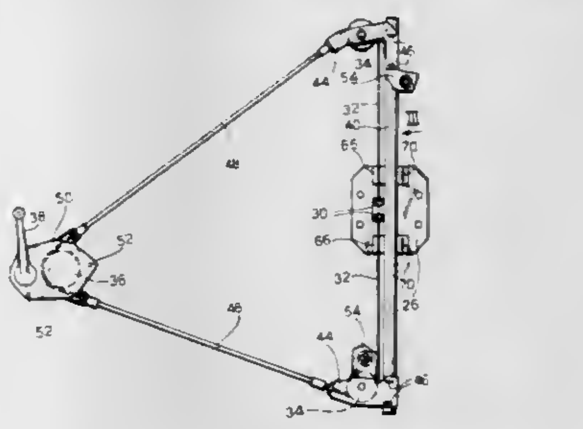
Pier Paolo Fogarollo, Chiavari (Genoa), Italy, assignor to Lames Societa per Azioni, Chiavari (Genoa), Italy

Filed Jun. 9, 1977, Ser. No. 805,043

Claims priority, application Italy, Jun. 21, 1976, 68512 A/76

Int. Cl.² E05F *11/48*

U.S. Cl. 49—352 **4 Claims**



1. A guide device for a slidable window of a vehicle, comprising:
a support member for attachment to a lower edge of the window;
a central guide track extending in the direction of movement of the window, said guide track being tubular and having therein a longitudinal slot, said guide track having means for its attachment to a vehicle door;
a pair of spaced-apart slidable elements having a substantially cylindrical shape and each of which is slidably fitted in said tubular guide;
a pair of spaced-apart attachment elements connected to the window support member, each of said attachment members having a wing protruding through said longitudinal slot and attached to one of said slidable elements;
transmission means for transmitting movement to the support member from a window winding device such as a handle, said transmission means comprising a flexible looped cable having two adjacent ends which are both connected to said support member;
first and second bracket means each attached to one of the ends of said tubular guide; and
a first pulley rotatably mounted on said first bracket means and a second pulley rotatably mounted on said second bracket means, said looped cable being trained tover said pulleys and the latter defining between them a cable path which extends alongside said tubular guide and which includes said cable ends.

4,109,418
AUTOMATIC HONING MACHINE AND METHOD

Günter Ebelt, Westerholt, Fed. Rep. of Germany, assignor to Maschinenfabrik Gluckauf Beukenberg G.m.b.H., Gelsenkirchen, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 765,946

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604857

Int. Cl.² B24B *33/02, 1/00*

U.S. Cl. 51—34 F **15 Claims**

1. An apparatus for honing a circular-section recess in a workpiece with at least one abrasive honing tool, said apparatus comprising:
a support;
a vertical guide on said support;
a cross-member vertically displaceable on said guide;
a counterweight vertically displaceable on said guide;
a flexible member interconnecting said counterweight and said cross-member;

drive means including

a first hydrostatic motor on said support connected to said flexible member, and

a variable-displacement and reversible hydraulic pump connected to said first motor for oppositely vertically displacing said cross-member and said counterweight on said guide;

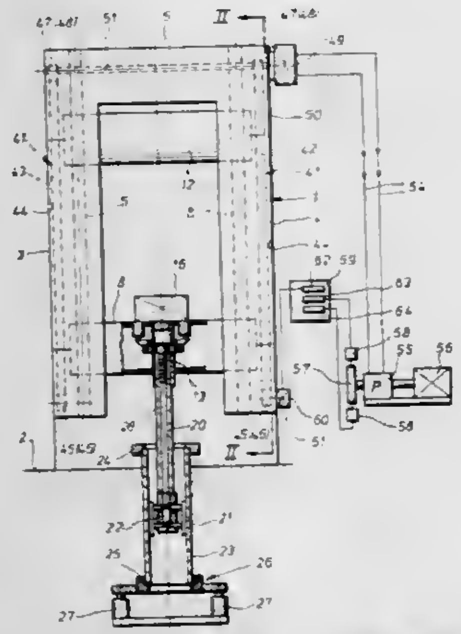
sensor means on said support and connected to said pump for detecting the vertical position of said cross-member and for uniformly decelerating said cross-member and said counterweight to a halt and thereafter uniformly accelerating said cross-member and said counterweight in the opposite direction to reverse the vertical displacement of said cross-member each time each of a pair of vertically spaced end positions is reached;

a tool spindle rotatable about an upright axis on said cross-member;

a second hydrostatic motor on said cross-member connected to said spindle for rotating same about said axis;

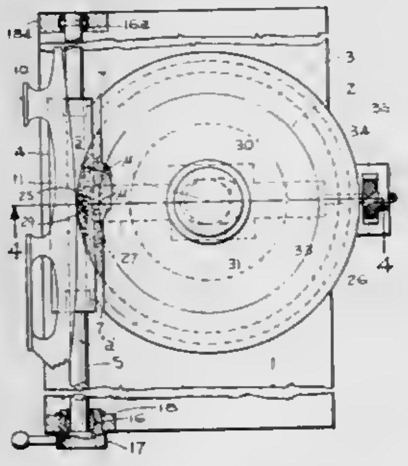
a holder on said spindle for said tool, whereby when said tool is in said recess said first hydrostatic motor can stroke it vertically therein while said second hydrostatic motor rotates it about said axis; and

means on said cross member for pressing said tool radially of said axis against said workpiece at said recess.



4,109,419
ICE SKATE SHARPENING DEVICES

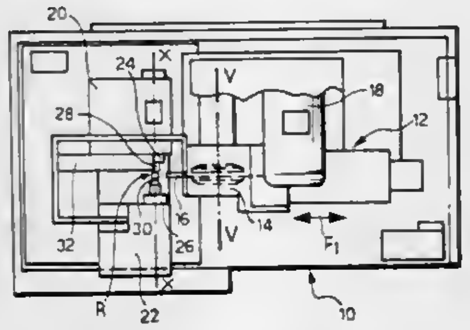
Sidney Broadbent, 5265 W. Quarles Dr., Littleton, Colo. 80123
Filed Jan. 12, 1977, Ser. No. 758,567
Int. Cl.² B24B *9/04*
U.S. Cl. 51—94 R **20 Claims**



1. A skate sharpening device comprising: a driven cutting wheel having a peripheral surface which is an arc of revolution about the cutting wheel's axis; a linear carriageway parallel to the plane of rotation of the cutting wheel; a carriage in longitudinally guided engagement with the carriageway, having skate attachment means clamping the skate in fixed location relative to the carriage with the centerplane of the blade parallel to the carriageway; unrestricted pivotal means for the carriage during sharpening, about an axis in fixed location, permitting transverse motion of the carriage and attached skate, and the centerplane of the blade regardless of its angular motion, to reside normal to the peripheral profile of the cutting wheel at any location of the carriage along the length of the carriageway, with the blade's hollow arcuate skating surface in accurate cutting contact with said peripheral profile of the cutting wheel.

4,109,420
GRINDING MACHINE, PARTICULARLY FOR ROLLERS OF ROLLING ELEMENT BEARINGS

Renzo Rossetto Giaccherino, Turin, Italy, assignor to Famir International S.p.A., Turin, Italy
Filed Jun. 17, 1977, Ser. No. 807,615
Int. Cl.² B24B *5/04, 41/04*
U.S. Cl. 51—105 R **9 Claims**



1. In a grinding machine for grinding rollers of rolling element bearings and like generally cylindrical workpieces having first and second opposed end faces, and comprising:

a machine bed,

first and second supports carried on said machine bed,

first and second mandrels respectively supported on said first and second supports, and axially rotatable about a common axis, said first mandrel being axially fixed with respect to said first support and said second mandrel being axially displaceable with respect to said second support,

a first nose on said first mandrel directed towards said second mandrel,

a second nose on said second mandrel directed towards said first mandrel,

means for driving said first mandrel to rotate about said common axis,

means for effecting axial displacement of said second mandrel with respect to said second support,

a grinding wheel,

grinding wheel support means supporting said grinding wheel for rotation about its axis and for displacement towards and away from a workpiece held between said noses on said first and second mandrels,

the improvement comprising a support seat on said first nose of said mandrel, said support seat having a shape which is a surface of revolution about said common axis of rotation of said two mandrels, for receiving an end face of the workpiece which is shaped with the complementary surface of revolution,

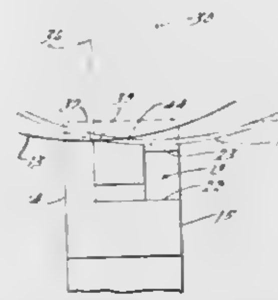
an abutment member having a convex surface of contact supported on said second nose of said second mandrel in such a way that it can freely move in all directions in a plane perpendicular to said common axis of rotation of said two mandrels, for engagement with the opposite end face of a workpiece from that engaged by said seat on said first nose of said first mandrel, and

means for driving said second mandrel to rotate at the same speed and in the same direction at said first mandrel; said

abutment member on said second nose comprises a ball, means defining a planar abutment surface, against which said ball is engageable, on the side of said ball remote from said first noise.

4,109,421
METHOD FOR GRINDING THREAD CUTTING TOOLS

Joseph F. St. Denis, 26545 Oakland, Roseville, Mich. 48066
Filed Mar. 11, 1977, Ser. No. 776,502
Int. Cl.² B24B *1/00, 3/00*
U.S. Cl. 51—288 **2 Claims**



1. In a method for forming both the cutting angle and the relief area on a thread cutting or other form cutting tool having a compound relief angle, the steps of providing a jig supporting surface in a horizontal plane and a jig having a tool supporting surface in a plane having an angular relation to said jig supporting surface plane, the intersection of the planes containing said jig and tool supporting surfaces being perpendicular to a vertical plane containing the cutting edge of said tool, placing said tool in said jig so as to be supported by said tool supporting surface, positioning a grinding wheel axis in said vertical plane, retracting the grinding wheel axis perpendicularly from said plane a distance proportional to the desired relief angle, plunging the grinding wheel below the cutting edge, and feeding the grinding wheel axially to grind both the cutting and compound relief angles simultaneously on the tool.

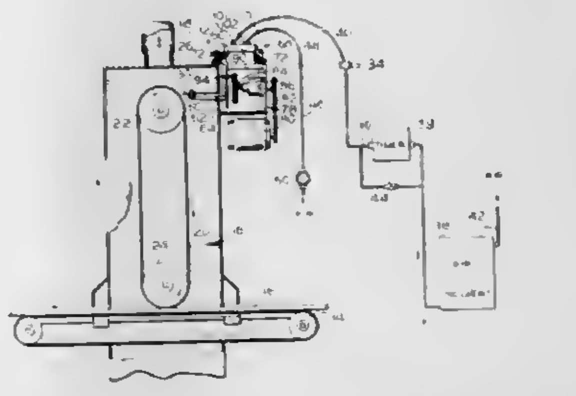
4,109,422
SANDER CLEANING PROCESS

James W. Parsons, Ashland, Oreg., assignor to Parsons Enterprises, Inc., Ashland, Oreg.
Continuation of Ser. No. 673,538, Apr. 5, 1976, abandoned, which is a continuation of Ser. No. 550,151, Feb. 18, 1975, abandoned, which is a continuation of Ser. No. 410,348, Oct. 29, 1973, abandoned, which is a division of Ser. No. 262,621, Jun. 14, 1972, Pat. No. 3,812,622. This application Sep. 30, 1977, Ser. No. 838,400
Int. Cl.² B24B *1/00, 21/18*
U.S. Cl. 51—325 **4 Claims**

1. The method of cleaning an elongated, flexible strip having abrasive particles adhered to one face thereof and abrading therewith comprising:

advancing the strip continuously repeatedly in a predetermined direction along a predetermined path having straight portions and a pair of convex portions with the abrasive particles at the outside of the convex portions to alternately straighten and flex the strip so that the particles are alternately closed and spread apart,

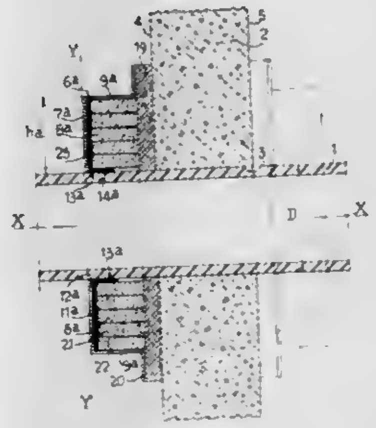
abrading a workpiece with one of the convex portions of the strip,



and spraying a hydrocarbon solvent and air on the other convex portion of the strip travelling over the other convex portion of the path.

4,109,423
FIRE-PROOF DEVICE FOR A TUBE OF FUSIBLE MATERIAL WHICH EXTENDS THROUGH A WALL

Maurice Eugéne Perrain, Nancy, France, assignor to Pont-a-Mousson S.A., Nancy, France
Filed Apr. 5, 1977, Ser. No. 784,756
Claims priority, application France, Apr. 14, 1976, 76 10998
Int. Cl.² E04H *9/00;* F16K *13/00*
U.S. Cl. 52—1 **9 Claims**



1. In a fire-proof device for a tube of fusible material extending through an aperture in a wall of a structure, comprising, in combination with said wall, means defining a case of a material which is substantially nondeformable under the effect of heat and mounted on said wall around the aperture, and means within the case for radially crushing the tube and closing off said aperture when the tube softens under the effect of a fire; the improvement wherein said tube crushing and aperture closing means comprise a mass of a material which is capable of swelling under the effect of heat and is enclosed within the case, the case comprising a front wall, a rear wall substantially parallel to the front wall, two substantially parallel first side walls interconnected by the front wall, and two second side walls interconnected by the front wall, the front wall defining an orifice substantially coaxial with said aperture and through which orifice the tube extends in use of the device, a shutter element movable between an inoperative position in which said orifice is fully open and a passage is allowed for the tube and an operative position in which said orifice and the tube are completely closed by the shutter element, the shutter element being of a material which is substantially non-fusible at service temperatures, that is to say the temperatures which are developed in the course of a fire and having a first part which is substantially planar and substantially perpendicular to a radial direction relative to the axis of the orifice and aperture and is mounted to be movable in said radial direction in the case

substantially in contact with said front wall and second side walls and a second part which lies alongside and is in contact with said front wall and has an extent in said radial direction and an extent in a direction perpendicular to said radial direction which enable said second part to completely close said orifice in said operative position of the shutter element, and the mass of swelling material being disposed in and filling that part of the case located on the opposite side of said first part to the tube and located on the opposite side of said second part to said front wall, the swelling material being capable of swelling in said radial direction sufficiently to shift said shutter element to said operative position of the shutter element.

4,109,424

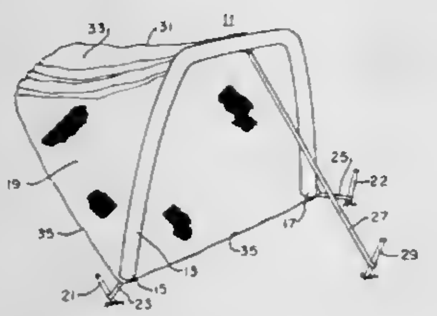
LIGHTWEIGHT AND COMPACTIBLE TENT STRUCTURE

Gerald H. Block, 3111 Deakin St., Berkeley, Calif. 94705

Filed May 25, 1977, Ser. No. 800,567

Int. Cl.^{2} E04B *1/345*

U.S. Cl. 52—2 **9 Claims**



1. A lightweight and compactible tent structure for protecting at least the upper exposed portion of a camper's body, said tent structure comprising

a support member fabricated of a lightweight substantially flexible material wherein the support member can be compacted into a small volume suitable for storing, said support member, however, having sufficient rigidity in its non-compacted condition to stand in a substantially vertical upright position,

means for anchoring said support member to the ground, and

a protective surround attached to said support member and extending therefrom to form an extended end portion which engages the body of a camper who reposes in said tent structure such that the weight of the camper's body engaging said surround and the support provided by said anchored lightweight support member coact to hold said tent structure in a stable upright position.

4,109,425

CIRCULAR TYPE MANHOLES

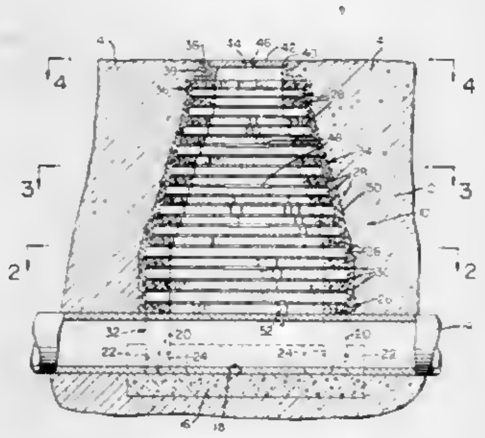
John J. Carlessimo, 29800 W. Eight Mile Rd., Farmington Hills, Mich. 48024

Filed Dec. 13, 1976, Ser. No. 749,810

Int. Cl.^{2} E02D *29/14*

U.S. Cl. 52—21 **2 Claims**

1. A manhole well comprising a vertically disposed generally cylindrical tubular casing disposed in the ground and made of superimposed courses of regularly disposed bricks, said bricks having opposite side faces converging towards the interior of said casing and said bricks being united by means of motar, an open upper end portion for said casing, a removable lid normally obturating said upper end portion, said casing having a right cylindrical portion proximate the bottom thereof and a frusto-conical portion of progressively decreasing diameter disposed between said right cylindrical portion and said upper end portion, a ladder formed of a plurality of superimposed rungs made of generally U-shaped metal rods having ends set in the mortar uniting said bricks, a precast relatively massive base member made of concrete and permanently obturating the lower end of said casing, said base member having a groove formed proximate the periphery thereof for accepting the lower end portion of said casing, and means for hermetically sealing said lower end and said base member about said groove, wherein said base member has a transverse groove disposed on the upper surface thereof, said transverse groove forming a saddle for a conduit disposed therein and projecting across said casing and wherein said casing is provided on its exterior surface with a coating of mortar extending to and engaged with said base member for forming at least in part said means for hermetically sealing said lower end of said casing and said base member about said groove.



4,109,426

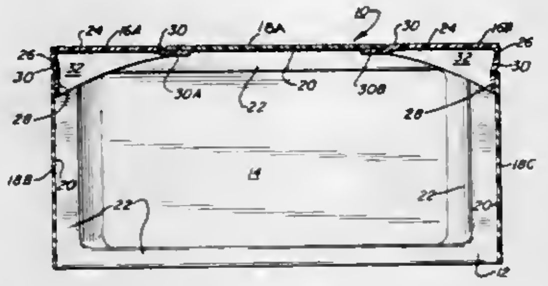
TUB SURROUND

Michael J. Dobija, New Philadelphia, Ohio, assignor to Masonite Corporation, Chicago, Ill.

Filed Mar. 10, 1977, Ser. No. 776,130

Int. Cl.^{2} A47K *3/16*

U.S. Cl. 52—35 **2 Claims**



1. A tub surround comprising: first and second substantially identical corner sections, each including first and second legs aligned substantially perpendicular to each other and of unequal length, each said leg including a planar extending free end along the full height of each said corner section being offset relative to the plane of each such leg;

a first planar panel positioned between said corner sections defining a first wall, said first panel including first and second edges, each said first and second edge underlying one of said free ends;

a second planar panel positioned adjacent said first corner section defining a second wall, said second panel including an edge underlying another free end of said first corner section;

a third planar panel positioned adjacent said second corner section defining a third wall, said third panel including an edge underlying another free end of said second corner section;

said first, second and third panels being of substantially identical configuration and size; and

shelves on each said corner section extending between said first and second legs, said shelves defined on only a portion of the length of each said corner section, said shelves on said first corner section being defined on an upper portion of said first corner section and said shelves on said second corner section being defined on a lower portion of

said second corner section such that upon assembly of said tub surround said shelves on said first corner section are at a different level relative to a tub than the shelves on said second corner section.

4,109,427

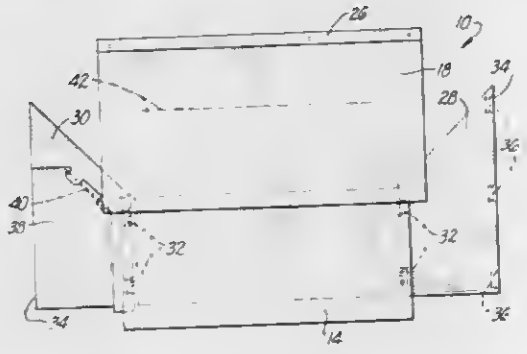
FOLDABLE STRUCTURES CONSIDERED TO BE PRIMARILY USEFUL AS DOGHOUSES

Edward D. O'Brian, 910 Iroquois St., Anaheim, Calif. 92801, and William M. Plachy, 3533 Encinitas Rd., San Marcos, Calif. 92069

Filed Dec. 20, 1976, Ser. No. 752,104

Int. Cl.^{2} E04D *1/36;* E04B *1/344;* A01K *1/02*

U.S. Cl. 52—58 R **9 Claims**



1. A structure having spaced, parallel side walls, a bottom extending between said side walls, a top extending between said side walls, and parallel ends extending between said side walls in which the improvement comprises:

said top, said bottom, and each of said ends each including a set of two parts, the parts of said sets being located adjacent to one another so that each set extends between said side walls,

a first group of hinge means, each hinge means of said first group pivotally connecting a single part of each of said sets to one of said side walls, a second group of hinge means each hinge of said second group pivotally connecting the parts of each set midway between said side walls,

all of said hinge means of both groups which are secured to said top and said bottom having parallel axes,

said hinge means in said first and second groups permitting said structure to be folded between an expanded configuration in which said side walls are spaced from one another and a folded configuration in which said side walls are adjacent to one another,

said hinge means of said first and said second groups are located so as to permit said parts of said bottom to pivot upwardly between said sides when said structure is in said folded configuration and so as to permit said ends and said top to pivot outwardly from between said sides when said structure is in said folded configuration.

4,109,428

ROOF EDGING

Raymond Joseph Aarons, Jindalee, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia

Continuation-in-part of Ser. No. 687,702, May 19, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 840,479

Int. Cl.^{2} E04B *7/06;* E44D *3/40*

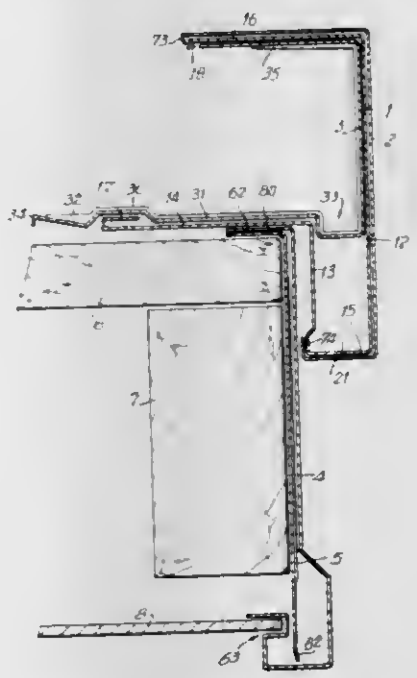
U.S. Cl. 52—94 **6 Claims**

1. An edging strip assembly for tiled roofs comprising: a normally vertical face plate having a lower part and a vertical flange spaced therefrom, an upwardly-facing substantially rectangular channel formed between said lower part of said face plate and said vertical flange;

an upper tile-retaining flange extending rearwardly from an upper edge of said face plate to pass above edge tiles;

a lower tile-retaining flange extending rearwardly from an upper edge of said vertical flange to lie between said edge tiles and their tiling batten;

spaced attachment clips each including a horizontal arm passing between said lower flange and said edge tiles and each clip being pre-engaged within said face plate and said upper flange and assembled as a unit with said face plate; and fastening means for securing said horizontal arm to the tiling batten.



4,109,429

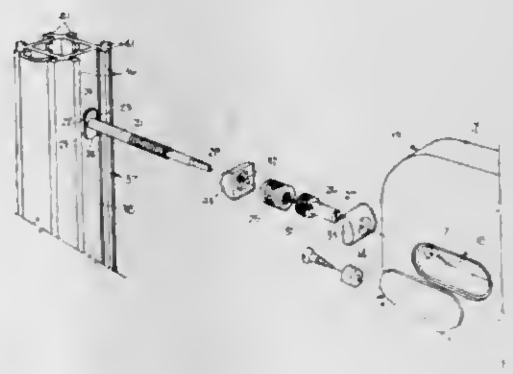
PANEL ERECTION

Hubert James Whisson, 89 King William Rd., Hyde Park, Australia (5061)

Filed Jun. 1, 1977, Ser. No. 802,417

Int. Cl.^{2} E04C *3/32*

U.S. Cl. 52—122 **8 Claims**



1. Means for the erection of a panel assembly wherein a panel member has a clamping hole extending inwardly from one edge thereof, a nut receiving cavity extending inwardly from a side face thereof and intersected by the clamping hole,

a threaded clamping member having a non-circular head at one end, the other end of said member extending into the hole, a nut positionable in the nut receiving cavity to be threadably engaged by the clamping member when located in the clamping hole, a rotation limit sleeve also positionable in the nut receiving cavity and having a non-circular aperture extending therethrough, and also having abutment means thereon which are engageable against abutment surfaces on the panel or means fixed relative to the panel, said other end of the threaded clamping member being a co-operating non-circular end slidable in said non-circular aperture, the limit sleeve being operable to limit rotation of said threaded clamping member to less than 180°, and a post having flanges with inturned beads forming a narrow mouth channel extending along at least one side thereof, the space between the beads and the head shape and size being such that the head can be inserted into the channel but is restrained by the beads from withdrawal therefrom upon rotation of the head within the channel, through an angle of less than 180°.

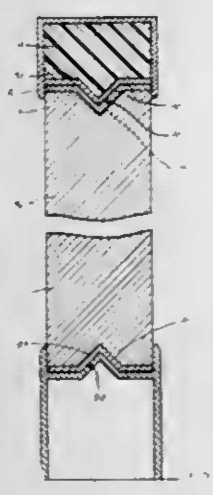
4,109,430
DEMOUNTABLE PARTITION WALL

Ronald George Fuller, P.O. Box 337, Hudson Heights, Quebec JOP IJO, Canada

Filed Aug. 9, 1976, Ser. No. 712,886

Int. Cl.² E04B *2/32*

U.S. Cl. 52—127 **7 Claims**



1. An assembly of wall panels comprising a plurality of like panels assembled between a horizontal bottom runner and a horizontal top runner, wherein the vertical edges of said panels when standing each have longitudinally extending surfaces, each of said surfaces having at least two surfaces inclined one to the other to form a wedge shaped groove with an axis transverse the panel to permit an interlocking mating joint to be formed between adjacent like panels when said edges are interlocked by simple transitional movement of one panel relative to the other in a direction normal to the plane of the panels, the said longitudinally extending surfaces being arranged so that they ae urged into close abutment when said panel is centered between said horizontal runners on a centerline common to an assembly of said panels in edge to edge relationship and biassing means provided to impose a vertical force upon each of said panels when introduced between said runners to center said panel on a centerline common to the said assembly of like panels.

4,109,431
SEALING AND SPACING UNIT FOR MULTIPLE GLAZED WINDOWS

Renato J. Mazzoni, Tarentum, and George H. Bowser, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1974, Ser. No. 454,337

Int. Cl.² E06B *3/66*

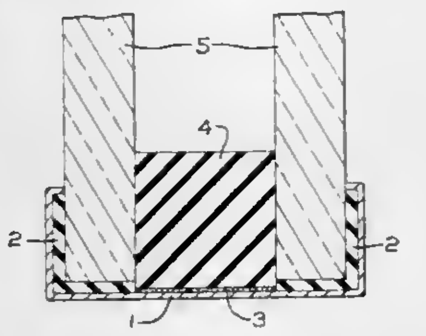
U.S. Cl. 52—172 **2 Claims**

1. A sealing and spacing unit for multiple glazed windows, comprising:

an elongated, flexible, moisture-impervious base;

an elongated, preformed, elastic spacer-dehydrator element having a preshaped cross-section adapted for insertion between opposed marginal edges of a pair of rigid, parallel sheets of a multiple glazed window, said spacer-dehydrator strip comprising a moisture vapor transmittable, polymeric matrix having finely divided particles of desiccant dispersed throughout the matrix;

a thin layer of a non-mastic adhesive which is solid and not cold flowable at room temperature for securing said spacer-dehydrator element to said base in a substantially continuous lengthwise manner; and



a strip of cold flowable, mastic, moisture vapor impervious, sealant composition disposed on said base on each side of said spacer-dehydrator element, wherein said mastic sealant composition is of the following composition:

Ingredient	Percent by Weight
polyisobutylene (viscosity average molecular weight 75,000 to 125,000	15-50
polyisobutylene (viscosity average molecular weight 5,000 to 15,000)	10–45
polybutene	20–50
carbon black	10–45
silica pigment	5-15
zirconium orthosilicate	5-15
zinc oxide	0–5
gamma-glycidoxy-propyltrimethoxysilane	0–5

4,109,432
MULTIPANE INSULATING GLASS PROCESS AND RIM STRIP

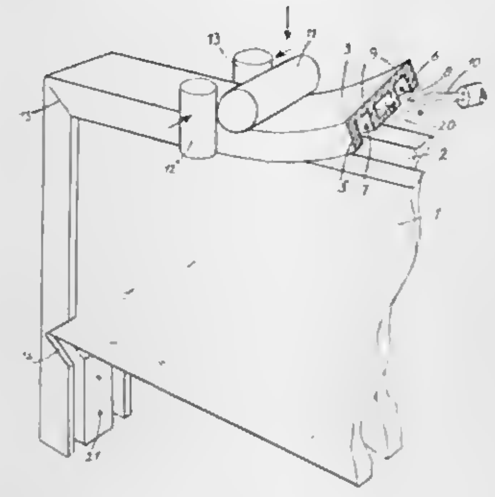
Reiner Pilz, Hohenbachernstr. 4, 8051 Kranzberg, Fed. Rep. of Germany

Filed Jan. 13, 1976, Ser. No. 648,667

Claims priority, appilcation Fed. Rep. of Germany, Jan. 13, 1975, 2501096

Int. Cl.² B32B *1/04;* E04B *2/28;* E06B *3/64*

U.S. Cl. 52—172 **13 Claims**



1. In a multipane insulating glass having at least two panes and a composite rim strip holding the panes in spaced generally parallel relationship and sealingly overlying the edges of the panes and having a diffusion impermeable metallic layer and an adhesive layer adhering the composite rim strip to the space generally parallel panes, the improvement wherein the composite rim strip comprises an extruded plastic untiary structural body having a transverse profile for structurally holding the panes in said spaced generally parallel relationship wherein said diffusion impermeable metallic layer is embedded in and surrounded by said structural body and wherein said adhesive layer comprises a heat melting adhesive anchored to the plastic profile by being pressure extruded jointly therewith.

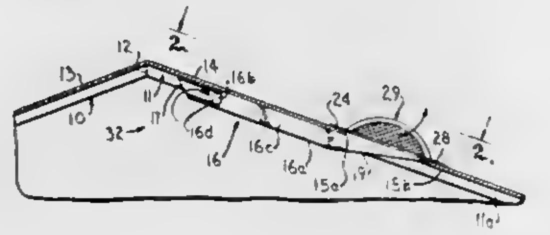
4,109,433
BELOW ROOF VENTILATOR

Perry V. Maze, 701 Morton, Falls City, Nebr. 68355

Filed Jul. 13, 1977, Ser. No. 815,188

Int. Cl.² E04D *13/03*

U.S. Cl. 52—199 **16 Claims**



1. In a roof construction including a plurality of downwardly inclined, substantially parallel, spaced-apart rafters supporting a roof surface structure which rises to a highest roof level or ridge,

ventilator means for venting the zone beneath the roof surface construction, comprising, in combination:

the roof surface construction having an opening therethrough and therein spaced downwardly from said ridge, said opening positioned between two adjacent rafters, extending substantially from one of said rafters to the other, laterally, and being of substantially rectangular shape,

an elongate duct of a width substantially that of the distance between the two said adjacent rafters positioned and closely fitting therebetween under the roof surface structure above said opening, said duct of substantially rectangular transverse cross-sectional shape,

the upper, open end of said duct spaced downwardly from the underside of the roof ridge so that air from the zone under the roof surface structure adjacent the ridge may enter the upper end of the duct,

the lower end of the duct extending substantially to the upper edge of the roof surface opening, and

a wedge-form discharge trough positioned within the roof surface opening of substantially inverted right triangle configuration in longitudinal axial section,

said trough having a substantially rectangular bottom wall connected at its upper end to the bottom wall of the duct and having its lower end overlying the roof surface opening lower edge, whereby to underlie in its length the said roof surface opening, and two side walls of substantially inverted right triangular configuration connected at their lower edges to the side edges of the trough bottom wall and having their upper edges extending out the said roof surface opening closely adjacent the side edges thereof, whereby the said wedge-form discharge trough formed by the said three walls fills the said roof surface opening and completely underlies same,

and means fixing said duct and trough under said roof surface, between said rafters and within and under said roof surface opening, whereby air entering the upper end of the duct under pressure will travel downwardly within said duct and out said trough.

4,109,434
MODULAR BASEBOARD MOLDING

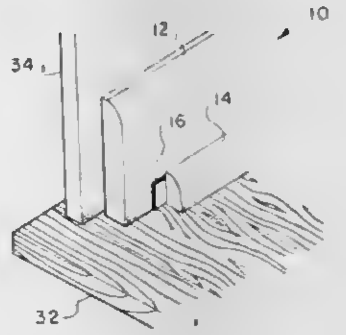
Lawrence F. Katzin, 1414 Scales St., Raleigh, N.C. 27608

Filed Feb. 11, 1977, Ser. No. 767,793

Int. Cl.² E04C *2/38*

U.S. Cl. 52—287 **7 Claims**

1. A modular baseboard molding comprising; an elongated basebord plank having at least a front, a back, a bottom, and two encs; an elongated shoe molding strip having at least a front, a back, a bottom and two ends, the back of said strip lying juxtaposed to the front of said plank with the bottoms of said strip and plank lying substantially in the same plane; and an elongated strip of adhesive type tape for movably fastening said strip to said plank for planar movement between said



juxtaposed surfaces whereby one or both ends of said juxtaposed plank and strip can be cut at the same time for proper fitting of the back of the baseboard plank adjacent a wall or other structure and the bottom of the shoe mold strip can be moved to conform to the contour of the adjacent floor surfaces.

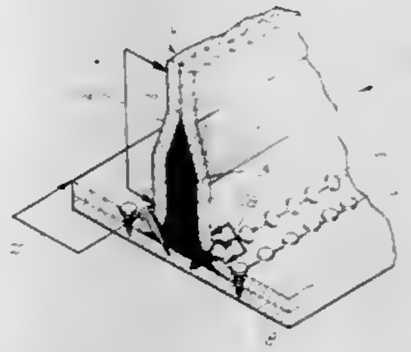
4,109,435
COMPOSITE STRUCTURAL JOINT AND METHOD OF FABRICATION THEREOF

Morris S. Loyd, Northridge, Calif., asslgnor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 26, 1977, Ser. No. 828,122

Int. Cl.² E04C *2/02*

U.S. Cl. 52—309.1 **17 Claims**



1. A reinforced composite structure comprising:

a staged composite panel, said panel having a plurality of fiber composite plies, said plies being adhesively bonded together;

a staged composite web, said web having at least one sheet of fiber composite material, said sheet having at least one layer, said sheet having three portions, a first portion positioned parallel to said panel, a second portion positioned transversely to said panel, and a fillet portion between said first and second portions; and

a plurality of quills infixed in said fillet portion and said panel, said quills having barbs thereon, said barbs engaging the fibers of said panel and said web, said quills joining said fillet portion to said panel whereby said panel and said web can be co-cured as assembled.

4,109,436
REINFORCED FOAM BUILDING PANEL ELEMENT

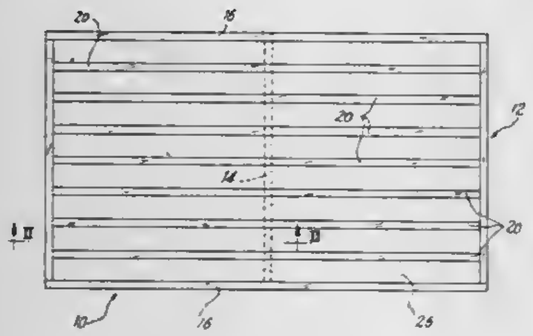
Adrien Berloty, 15, Boulevard du Chateâu, 92200 Neuilly S. Seine, France

Filed Nov. 10, 1975, Ser. No. 630,606

Claims priority, application France, Nov. 27, 1974, 74 38828

Int. Cl.^{2} E04C *2/22*

U.S. Cl. 52—309.2 **9 Claims**



1. A building panel element comprising
(a) a rigid block of insulating foam having two opposed major surfaces and thickness between said surfaces;
(b) a peripheral frame enclosing said foam block substantially from one said major surface to the other;
(c) a plurality of spaced rectilinear thin strip members arranged on one side of said peripheral frame and embedded in said foam block substantially flush with one of said major surfaces and spaced from the other of said major surfaces, each of said strip members being adapted to receive and hold fastening means and to assist in rigidifying said foam block, said foam filling the spaces between said strip members;
(d) said insulating foam contributing substantially to the rigidity of said building panel element.

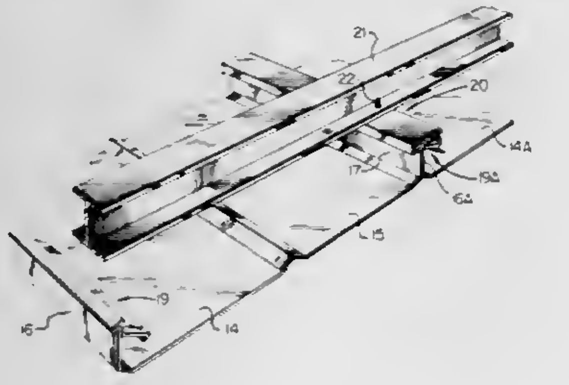
4,109,437
BUILDING PANEL

Wayne H. Player, Mesquite, and Forris W. Barton, Jr., Grand Prairie, both of Tex., assignors to Howmet Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,768

Int. Cl.^{2} E04D *1/06*

U.S. Cl. 52—536 **8 Claims**



1. A roofing panel especially adapted for installation on the underside of a roofing framework comprising:
a generally planar elongated member having upstanding webs along its long sides;
one of said webs being provided with a female mounting and locking means oriented outboard of said web;
said female mounting and locking means comprising:
an integral flange formed at the top of its web into an inwardly extending narrow scabbard having a mouth substantially as wide as two thicknesses of panel forming material;
an outwardly extending substantially planar leg positioned parallel to the surface of said planar member and adapted for abutment against the underside of a ceiling framework member, thereby providing for application of a fastener connecting said roofing panel to said framework member;
and a downwardly extending leg spaced from and substantially parallel to said web, said downwardly extending leg terminating in an inwardly oriented detent rib;
said male locking means comprising:
an integral flange formed at the top of its web into an outwardly extending narrow blade having a thickness substantially equal to two thicknesses of panel forming material;
and an inwardly and downwardly extending leg terminating in an inwardly oriented detent rib;
whereby upon assembly of a pair of said roofing panels into interlocked relation with adjacent webs juxtaposed, the male locking means of one panel is inserted upwardly into the female locking means of the other panel with the detent rib of the male locking means snapped past and above the detent rib of the female locking means and with the narrow blade of the male locking means inserted into the narrow scabbard of the female locking means, and whereby during said assembly, energy for inserting said blade into said scabbard is momentarily stored as spring energy in the flexure of said downwardly extending legs of said male and female locking means.

4,109,438
REINFORCED SEPARABLE SECTIONAL HERMETIC PROTECTIVE COVERING

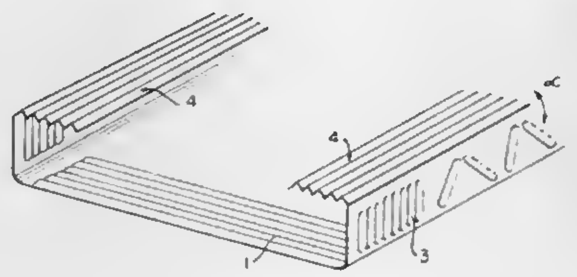
Francisco De la Concha, Emerson No. 116, Colonia Polanco, Mexico City, Mexico

Filed Sep. 4, 1974, Ser. No. 502,660

Claims priority, application Mexico, Aug. 31, 1973, 145890

Int. Cl.^{2} E04C *2/32*

U.S. Cl. 52—630 **3 Claims**



1. A modular member which may be used individually or together with like members joined together to provide a separable reinforced hermetic covering comprising a generally longitudinally extending main portion, a plurality of corrugations extending transversely of said main portion adjacent at least one end thereof and stopping short of the opposite sides of said main portion, said main portion extending to a bend free of corrugations at each side thereof beyond the extent of said transversely extending corrugations, integral flange portions extending generally at from about 90°-135° to said main portion from said bend, a plurality of corrugations extending in said flange portion at about 90°-135° to said main portion and in the vicinity of at least one end of said flange portion, said corrugations in said flange portion stopping short of opposite sides thereof, each of said flange portions extending to a bend free of corrugations beyond the extent of the corrugations of said flange portions and continuing to an inwardly directed portion generally parallel to and overlying said main portion, said inwardly directed portions each having a plurality of corrugations in its surface extending longitudinally for the length of the respective inwardly directed portion and perpendicularly to said corrugations in said main portion.

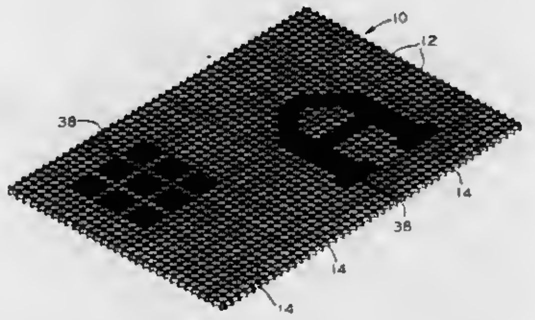
4,109,439
FLOOR MAT HAVING INTERCHANGEABLE DESIGN ELEMENTS

James E. Feasel, Fort Wayne, Ind., assignor to The Airomat Corporation, Fort Wayne, Ind.

Filed Jun. 20, 1977, Ser. No. 808,098

Int. Cl.^{2} E04C *2/42*

U.S. Cl. 52—667 **10 Claims**



1. A mat comprising:
a plurality of parallel flexible first strips and a plurality of parallel flexible second strips extending transversely to and intersecting said first strips so as to form a grid of readily deformable grid squares each comprising a quadrilateral interstitial space bordered by an adjacent pair of said first strips and an adjacent pair of said second strips,
a plurality of interchangeable insert element means disposed respectively within various of said interstitial spaces, and
means associated with said insert element means and the strips bordering their respective said interstitial spaces for removably locking said insert element means in their respective said spaces.

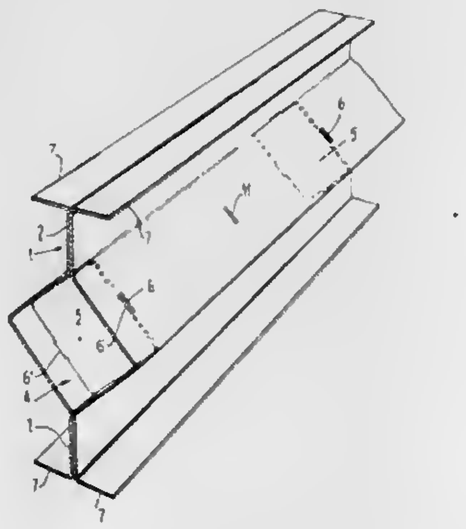
4,109,440
STRUCTURAL SECTION

David Hewitt Bill, 65 Laburnam Street, Blackburn, Victoria, Australia (3130)

Filed Oct. 5, 1976, Ser. No. 729,789

Int. Cl.^{2} E04C *3/30*

U.S. Cl. 52—721 **12 Claims**



1. The combination of a structural section and a connector plate, said structural section comprising two similarly profiled metal sections joined together to define a central box-section, and a plurality of spaced stiffener members located within the box-section to render the box-section substantially rigid, said structural section including two substantially flat mating portions located adjacent to said box-section and said connector plate being formed to engage the surface of one of the mating portions of the structural section as well as said box-section thereof so that loads applied to said structural section through said connector plate are transferred from said one mating portion to said box-section.

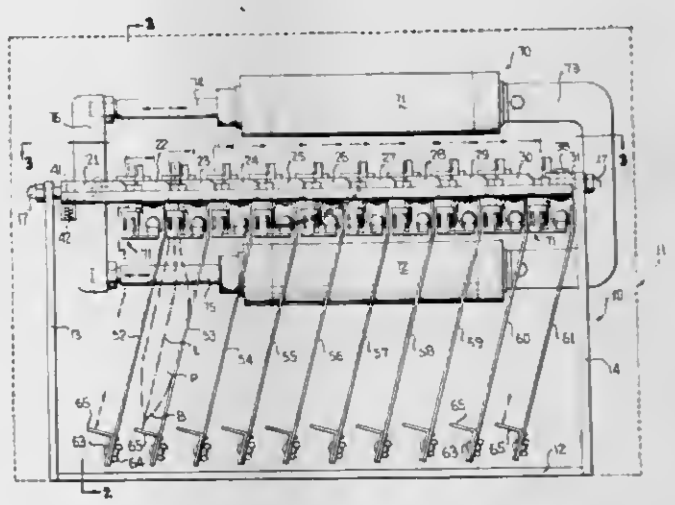
4,109,441
SEALING UNIT FOR AUTOCLAVE STERILIZATION OF FLEXIBLE PACKAGES

Fred B. Shaw, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 569,938, Apr. 21, 1975, Pat. No. 3,991,543. This application Jul. 19, 1976, Ser. No. 706,375

Int. Cl.^{2} B65B *31/02, 55/18*

U.S. Cl. 53—11 **16 Claims**



1. A method of sterilizing contents disposed in open mouthed pouches formed of heat sealable material, said method comprising the steps of gripping each of a plurality of pouches at opposite lateral edges adjacent an open mouth thereof, housing the thus gripped pouches in a chamber, introducing a heated sterilizing media into the chamber with the pouch contents being rendered sterile and the pouches being heated to a sealing temperature, and while the pouches are still housed in the chamber sequentially closing each pouch mouth and automatically hermetically sealing each pouch whereby contents contamination is precluded upon the removal of the pouches from the chamber.

4,109,442
METHOD OF TREATING PLANTS AND MEANS TO BE USED IN THIS CONNECTION

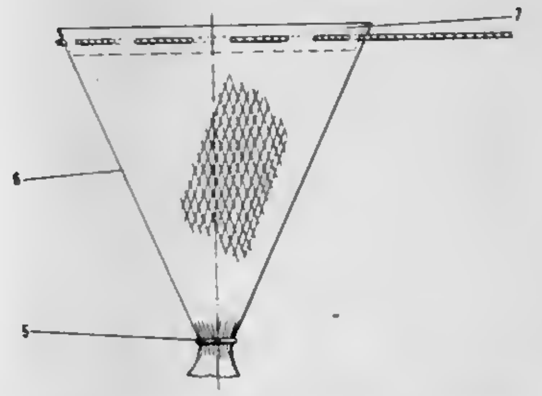
Pieter Cornelis Maasbach, Gerard Scholtenstraat 125a, Rotterdam, Netherlands

Filed Jan. 18, 1977, Ser. No. 760,410

Claims priority, application Netherlands, Jan. 22, 1976, 7600654

Int. Cl.^{2} B65B *43/08, 67/12*

U.S. Cl. 53—29 **3 Claims**



1. A method of treating plants for purpose of transport and storage wherein the root section of the plant to be treated together with earth forming a ball is enveloped by a fabric of organic consumable material, comprising:
threading a plurality of draw cords on peripheral courses through the side wall of a length of tubing formed of flexible organic consumable material, the draw cords

being in substantially equal-length increments along the length of said tubing;

cutting said tubing on transverse planes substantially parallel to and spaced from said cords to provide a plurality of tubing sections having said cord woven therethrough adjacent a first end and being open adjacent a second, opposite end;

cinching said wall at said second end to provide a centralized closure for each of said sections;

distending said first end of one of said sections over and around an exteriorly mounted substantially horizontally disposed ring support;

positioning said root ball through the open distended end of said tubing section and interiorly thereof;

removing said first section end from said ring support; and

drawing said draw cord to tighten said first section end around the stem of the plant above said root ball.

4,109,443

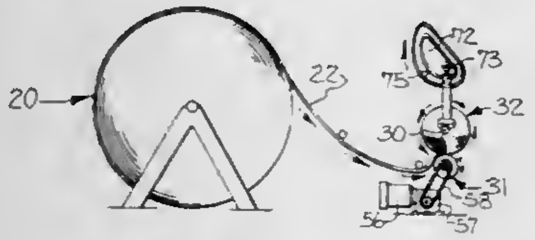
METHOD AND APPARATUS FOR FORMING CONVOLUTE FOAM PACKAGE

Allen Cameron Findlay, Davidson, N.C., assignor to Reeves Brothers, Inc., New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,483

Int. Cl.² B65B *49/00;* B65H *17/06;* B65B *63/04*

U.S. Cl. 53—118 **17 Claims**



8. An apparatus for winding an elongate web of flexible foam sheet material or the like into a highly compact convolute package having substantially uniform layer to layer compression within predetermined limits consistent with the desired compression of the overall package and without detrimental over-compression of any layers, said apparatus comprising

a frame,

a driving roller and a take-up roller, said take-up roller being adapted to have the web convolutely wound thereon to form a convolute package,

means mounting one of said rollers on said frame to define a fixed horizontal axis,

means mounting the other of said rollers along a horizontal axis which is parallel to the axis of said one roller and so as to be operationally movable in a direction substantially perpendicular to and away from the axis of said one roller and such that a nip is formed between the periphery of the package being formed on the take-up roller and the driving roller,

drive means for rotating said driving roller to thereby impart rotation to the package being formed on the take-up roller and to wind the web onto the package, and such that the rollers separate as the package increases in size, and

means operatively connected to said drive means and engageable with the opposite ends of said other roller for controlling the separation of the rollers to a predetermined amount substantially less than the thickness of the web upon each rotation of the package, to thereby control the compression of the package layers and achieve substantially uniform layer to layer compression within said predetermined limits.

4,109,444

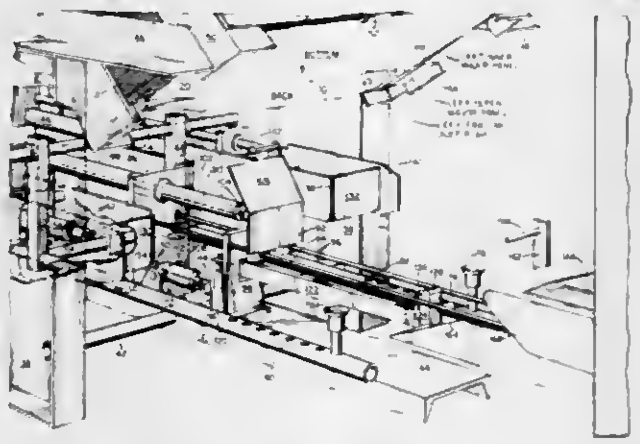
HORIZONTAL CARTONING MACHINE

Richard G. Lee, 780 Boylston St., Boston, Mass. 02109

Filed Apr. 4, 1977, Ser. No. 784,572

Int. Cl.² B65B *43/28*

U.S. Cl. 53—186 **12 Claims**



9. A machine for erecting a collapsed four sided tubular carton to rectangular loading condition, said carton comprised of a top and bottom with panels extending therefrom and a front and back with dust flaps extending therefrom, said machine comprising

a magazine for holding a quantity of collapsed cartons,

means moveable up and down for gripping the bottom of the lowermost carton in said magazine and for moving said carton down to a predetermined carton loading position,

means located in the downward path of travel of said carton to engage said back and progressively cause said back and front to be moved to vertical position by the time said predetermined loading position has been reached,

means operable while said carton is stationary at said loading position for spreading the panels at one end of said carton and for folding in the dust flap of said back at said one end,

subsequently operable means for spreading the panels at the other end of said carton and for folding in the dust flap of said back at said other end while said carton is still stationary at said loading position,

means for moving said carton along a path at right angles to the tubular axis of said carton for a distance greater than the width of said carton,

and means for closing the other dust flaps extending from the said front while said carton is moving,

thereby placing said carton in condition to be received by a carton sealing machine in which said outer and inner panels will be folded over each other and secured together.

4,109,445

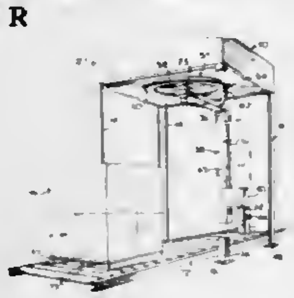
OVERHEAD LOAD-WRAPPING APPARATUS

Michael H. Shulman, 45 Bruce Farm Drive, Willowdale, Ontario, Canada

Filed Jul. 26, 1977, Ser. No. 819,130

Int. Cl.² B65B *13/04*

U.S. Cl. 53—198 R **5 Claims**



1. An apparatus for wrapping a film around a palletized load, comprising:

a frame,

support means for supporting the frame spaced vertically above a location adapted to receive the palletized load,

vertical shaft means supported by the frame, and motive means for rotating the shaft means with respect to the frame,

an arm secured to the shaft means and extending away therefrom substantially horizontally such that the arm and the shaft means rotate together,

a member affixed to the arm and extending downwardly therefrom at a location spaced from the shaft means,

means connected to the said member for supporting a roll of film such that the film can pay out to enwrap the load as the rotating arm carries the roll around the load on a circular path, and a stationary ring concentric with the shaft means and located above the arm, the ring being supported by the frame having a substantially horizontal flange, the arm including bracket means which supports at least one roller for free rotation about a substantially horizontal axis intersecting the axis of said shaft means, the roller running on the upper surface of said flange to support the arm against the downward pull exerted by the weight of the member.

4,109,446

APPARATUS FOR FILLING AND CROWNING BOTTLES

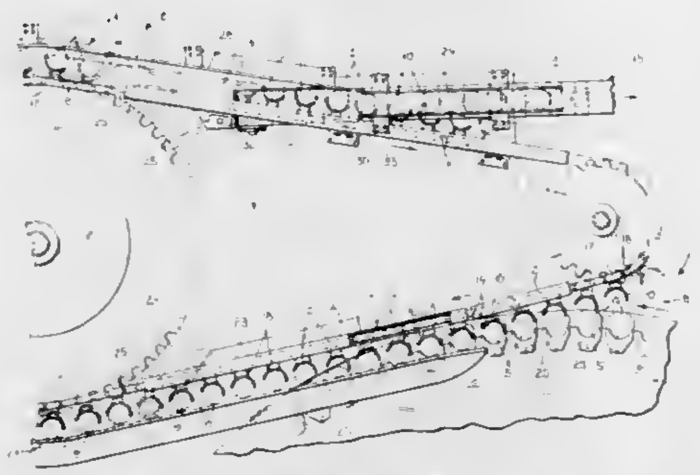
Hans Güenther Krohn, Dortmund-Kirchorde; Friedrich Rademacher, Kamen, both of Fed. Rep. of Germany; Ulrich Petri, and Hans D. Deubel, both of Elm Grove, Wis., assignors to H & K, Inc., New Berlin, Wis.

Filed May 10, 1977, Ser. No. 795,390

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1977, 2707307

Int. Cl.² B65B *3/00*

U.S. Cl. 53—282 **12 Claims**



1. An apparatus for filling and closing containers, comprising a rotary filling means for moving each container in a first generally circular path and filling the container with liquid; rotary crowning means synchronized with the filling means for moving each container in a second generally circular path and applying a crown to each filled container; a discharge conveyor located adjacent the crowning means for discharging crowned containers; and conveying means for conveying the containers from the filling means to the crowning means and for conveying the crowned containers from the crowning means to the discharge conveyor, said conveying means comprising an endless member, a plurality of generally curved pockets carried by the endless member and disposed to receive and hold individual containers, a drive member operably connected to the endless member and mounted on the crowning means and disposed to rotate in synchronization therewith to thereby drive the endless member, an idler member connected to the endless member, said endless member disposed to move in a first generally linear path of travel from the idler member to the drive member with said path of travel being generally tangential to the circular path of travel of the containers on the filling means, whereby the containers are transferred from the filling means to said pockets, said endless member being disposed to move in a second generally linear path of travel from the drive member toward the idler member, said second path of travel being disposed at an angle to the direction of movement of the discharge conveyor, and transfer means for transferring the containers from the pockets to the discharge conveyor as said endless member moves along said second path of travel.

4,109,447

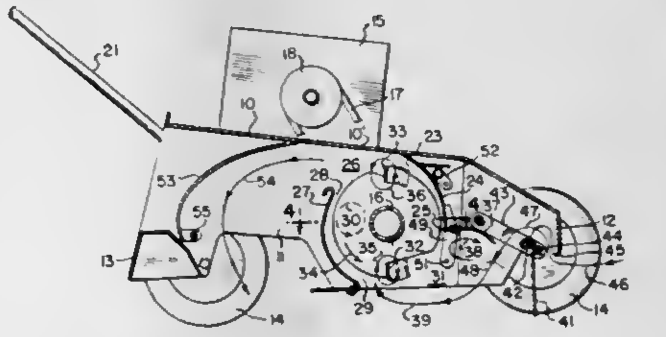
MOWER OF THE CROSS-FLOW BLOWER TYPE WITH BLADES OF OPPOSITE HELIX ANGLE

Hugo S. Ferguson, R.D. #2, Averill Park, New York, N.Y. 12180

Filed Nov. 11, 1976, Ser. No. 741,132

Int. Cl.² A01D *35/24*

U.S. Cl. 56—13.3 **15 Claims**



1. A mower of the cross-flow blower type comprising

(a) a carriage,

(b) a cylindrical rotor mounted on said carriage with the axis thereof substantially horizontal and extending laterally of the carriage,

(c) said rotor having a plurality of sections along the axis thereof with a plurality of circumferentially-spaced approximately helical fixed blades in each section moving in the same path of travel and spaced from the rotor axis to leave the major portion of the interior of the rotor free for air flow through the rotor transversely thereof,

(d) motor means for driving said rotor in a rotational direction such that the lower blades move in the normally forward direction of travel of the mower,

(e) the outer leading edges of the blades being sharp to form cutting edges,

(f) predetermined blades of at least two adjacent sections being of opposite helix angle and having cutting edges which overlap in the axial direction and are angularly spaced about the rotor axis in the overlap region thereof,

(g) the cross-section of said blades having at least a portion on the leading side thereof which slopes backwardly and inwardly with respect to the direction of rotation of the rotor,

(h) and a blower conduit cooperating with said rotor to form therewith a cross-flow blower,

(i) said conduit comprising upper and lower wall sections extending laterally along the length of the rotor and having respective portions close to the rotor at circumferentially spaced positions separating inlet and outlet regions of the blower,

(j) said inlet region opening downwardly and forwardly with a portion of the rotor therein exposed to material to be mowed,

(k) the portions of the mower adjacent the rotor being nonshearingly spaced from the path of travel of said blades.

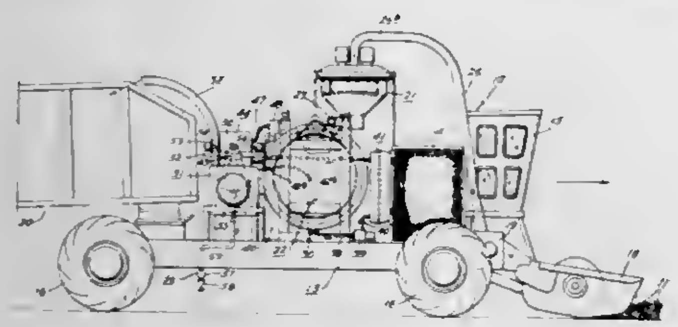
4,109,448
METHOD AND APPARATUS FOR IN-FIELD PROCESSING OF VEGETATION

Donald C. Kline, Allentown, Pa., assignor to Schoeneck Farms, Inc., Nazareth, Pa.

Filed Aug. 11, 1976, Ser. No. 713,349

Int. Cl.² A01D *43/00*

U.S. Cl. 56—13.5 **23 Claims**



11. Apparatus for field processing vegetation, comprising:

a vehicle adapted to travel through a field of vegetation,

means carried by said vehicle for harvesting the vegetation as the vehicle advances,

means carried by said vehicle for cooperating with said harvesting means to separate the harvested vegetation into a fibrous fraction and a liquid containing a plant protein composition and other compositions,

means carried by said vehicle for cooperating with said separating means to fractionate said liquid fraction into a first component containing said plant protein composition and a second substantially protein free component containing said other compositions,

means movable with said vehicle for collecting said fibrous fraction and said plant protein composition, and

means carried by said vehicle for applying said other compositions onto the field as the vehicle advances,

whereby the second liquid component is discarded during harvesting and processing of the vegetation.

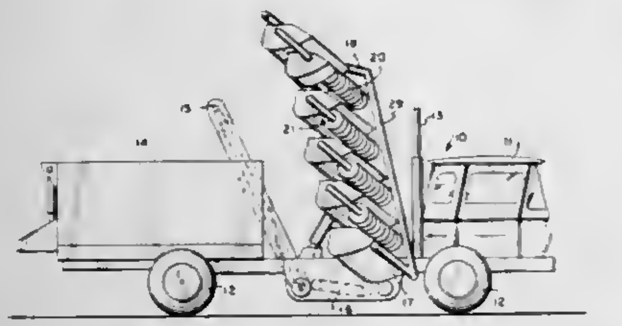
4,109,449
FRUIT PICKING APPARATUS

Otto L. Gibson, 1776 6th St. NW., Winter Haven, Fla. 33880

Filed Jan. 23, 1976, Ser. No. 698,852

Int. Cl.² A01D *46/24*

U.S. Cl. 56—328 R **17 Claims**



1. A fruit picking apparatus comprising in combination:

an elongated boom having an elongated rotatable shaft mounted thereto;

a plurality of rotatable fruit twisting members mounted on said rotatable shaft of said boom to rotate with said shaft, each said rotatable fruit twisting member having a fruit twisting surface thereon;

a plurality of fruit engaging members mounted to said boom, at least one fruit engaging member being mounted adjacent each rotatable fruit twisting member whereby fruit can be engaged between a rotatable fruit twisting member and a fruit engaging member for twisting fruit from its stem; and

a stabilization bar mounted parallel to said rotatable shaft on said elongated boom and coupled to each fruit engaging member to prevent the rotation of said fruit engaging member on said rotatable shaft.

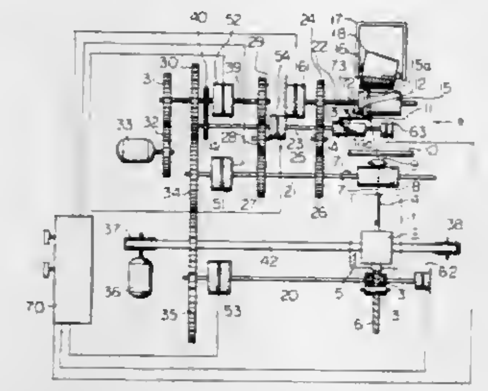
4,109,450
OPEN-END SPINNING MACHINE AND A METHOD OF RESTARTING THE SAME

Yoshiaki Yoshida; Osamu Suzuki, both of Obu, and Keizi Onoue, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 18, 1977, Ser. No. 788,283

Int. Cl.² D01H *15/00, 1/12*

U.S. Cl. 57—34 R **13 Claims**



1. A method of restarting an open-end spinning machine comprising: feed rollers for supplying fibers to a combing roller so as to comb the fibers, a spinning rotor for collecting said combed fibers into a yarn and for twisting said yarn, a pair of draw off roller means forming a contacting line therebetween for withdrawing said yarn from said spinning rotor, a delivery tube disposed at a position between said spinning rotor and said draw off roller means, a traverse guide for traversing said withdrawn yarn along a bobbin supported by cradle means, and a winding drum for frictionally driving said bobbin to wind said yarn around said bobbin and form a conical cheese, said method comprising: on the occasion of stopping said machine, a first step of stopping said traverse motion of said traverse guide to bring said traverse quide to a predetermined position; on the occasion of starting said machine, a second step of rotation both said draw off roller means and said winding drum in a direction opposite to their normal rotating directions; a third step of rotating said feed rollers according to a predetermined program so that the said feed rollers begin to rotate after an end of the yarn is moved back into said spinning rotor where said moved back yarn is pieced up with the newly spun yarn; a fourth step of rotating both said draw off roller means and said winding drum in their normal rotating directions, and starting the traverse motion of said traverse guide so as to move said traverse guide toward a smaller diameter portion of said conical cheese along the axis of said conical cheese when the pieced joint formed between said end of the yarn and said newly spun yarn reaches said contacting line formed between said draw off roller means.

4. An open-end spinning machine comprising:

feed rollers, for supplying fibers to a combing roller so as to comb the fibers;

a spinning rotor for collecting said combed fibers into a yarn and for twisting said yarn;

a pair of draw off roller means forming a contacting line, for withdrawing said yarn from said spinning rotor, having a first means for engaging with and disengaging from a main power source;

a traverse guide for traversing said withdrawn yarn along a bobbin supported by cradle means, said traverse guide being connected to a second means for engaging with and disengaging from said main power source;

a winding drum, for frictionally driving said bobbin to wind said yarn around said bobbin and form a conical cheese, connected to said draw off rollers means by way of transmitting means, and;

controlling means, for controlling the above-mentioned two means according to a predetermined program, by which, on the occasion of stopping said machine, said traverse guide is stopped at a predetermined position and, on the occasion of restarting said machine, said traverse guide is restarted so as to move toward a smaller diameter portion of said conical cheese when a pieced joint formed between an end of said yarn and a newly spun yarn reaches said contacting line formed between said draw off roller means.

4,109,451
METHOD AND DEVICE FOR REMOVING IMPURITIES FROM A SPINNING ROTOR OF AN OPEN-END SPINNING APPARATUS

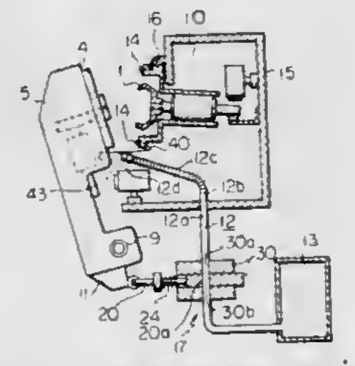
Yasuo Yamada, Kariya; Kazuo Kamiya, Nishio; Iwao Katayama, Chita; Kozo Motobayashi, Nishikasugai, and Yoshiaki Yonemura, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed May 5, 1977, Ser. No. 793,968

Claims priority, application Japan, May 8, 1976, 51-51687

Int. Cl.² D01H *11/00*

U.S. Cl. 57—56 **7 Claims**



3. In an open-end spinning apparatus provided with a spinning rotor and a rotor housing wherein said spinning rotor is rotatably disposed in said rotor housing, a frame body for forming a spinning chamber together with said rotor housing, a combing roller rotatably disposed in said frame body, and a machine frame whereon said frame body is displaceably mounted, a device for removing impurities from said spinning rotor comprising a receiving plate supported by a part of said frame body at a position where, when said frame body is displaced from said rotor housing so that an opening of said rotor housing is created, a part of a space formed at a position ajdacent to said opening can be occupied by said receiving plate, said receiving plate provided with a slit, a suction conduit being connected to said slit of said receiving plate, a suction source connected to said suction conduit, a mechanism for selectively connecting or disconnecting the connection between said suction conduit and said suction source in relation to the motion of changing the disposition of said frame body, whereby, when said frame body is displaced from the engaged position with said rotor housing to a position for cleaning said spinning rotor, said suction conduit is connected to said suction source, while said suction conduit is disconnected from said suction source during a period when said frame body is engaged with said spinning rotor.

4,109,452
SPINNING ROTOR UTILIZED FOR AN OPEN-END SPINNING APPARATUS

Akira Kobayashi, Obu; Kunji Chiba, Kariya; Noriaki Miyamoto, Kariya; Masao Shiraki, Kariya, and Naotake Furukawa, Higashiuramachi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

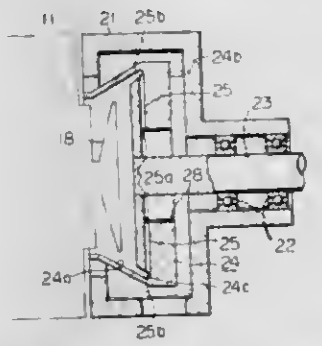
Filed Apr. 13, 1977, Ser. No. 787,026

Claims priority, application Japan, Apr. 17, 1976, 51-43921

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **5 Claims**

1. In an open-end spinning apparatus provided with a fiber feed mechanism, means for separating a bundle of fibers supplied from the fiber feed mechanism into individual fibers, a rotatable spinning rotor for receiving individual fibers delivered from said separating means, means for taking up a yarn formed in said spinning rotor and a yarn guide means for introducing said yarn from said spinning rotor to said takeup means; the improvement wherein said spinning rotor comprises, in combination, a fiber collecting zone formed at an inside wall position having a maximum lateral diameter with respect to a rotational axis thereof, means for discharging air separated from said deposited fibers from inside the chamber of said spinning rotor to a position outside said rotor and means for continuously blowing a plurality of air streams directly toward said fiber collecting zone from a region peripheral to said rotational axis of said spinning rotor, while said rotor is operating.



4,109,453
FIBER SEPARATING DEVICE OF AN OPEN-END SPINNING APPARATUS

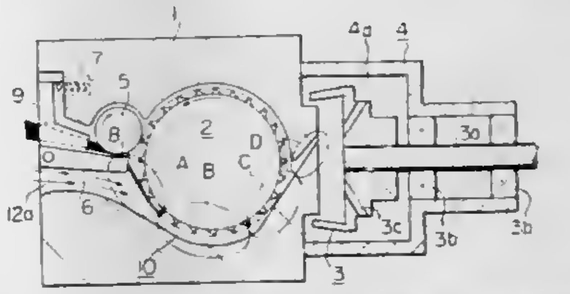
Akira Kobayashi, Obu; Kunji Chiba, Kariya; Noriaki Miyamoto, Kariya; Masao Shiraki, Kariya, and Naotake Furukawa, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Apr. 20, 1977, Ser. No. 789,029

Claims priority, application Japan, Apr. 26, 1976, 51-48327; May 6, 1976, 51-51522

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.91 **10 Claims**



1. An improved fiber separating device disposed in a casing of an open-end spinning apparatus, comprising in combination:

a fiber-bundle supply mechanism and a spinning rotor for forming a yarn from individual fibers separated from said bundle of fibers supplied by said supply mechanism;

a combing roller rotatably disposed in said casing at a position adjacent to said fiber-bundle supply mechanism for separating said bundle of fibers into said individual fibers;

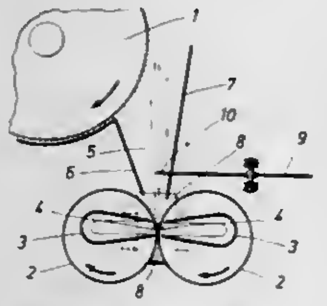
a fiber carrying passage formed in said casing at a position between said fiber-bundle supply mechanism and said spinning rotor in such a condition that a part of a cylindrical surface of said combing roller is positioned therein so that said separated individual fibers are carried through said fiber carrying passage to said spinning rotor;

said fiber carrying passage being provided with a combing section formed at an upstream position thereof, said combing section having a length substantially identical to an average fiber length of material fiber, and;

auxiliary combing means for facilitating the transfer of said individual fibers separated from said bundle of fibers to a part of the cylindrical surface of said combing roller in said combing section.

4,109,454
APPARATUS FOR TWISTING TEXTILE FIBERS

Ernst Fehrer, and Franz Konig, both of Linz, Austria, assignors to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co. K.G. Textilmaschinenfabrik u. Stahlbau, Linz, Austria
Filed Jun. 3, 1977, Ser. No. 803,227
Claims priority, application Austria, Jun. 21, 1976, 4513/76
Int. Cl.^{2} D01H *1/12*
U.S. Cl. 57—58.95 9 Claims



1. Apparatus for spinning textile fibers, comprising two closely spaced apart, perforated suction drums having parallel axes and confronting peripheral surface portions defining between them a region which is triangular in cross-section and adapted to receive fibers flying through a flight region which precedes said triangular region in a direction that is transverse to said axes,

suction means operable to provide a suction zone in each of said confronting peripheral surface portions,

said drums being operable to rotate in the same sense so that fibers received in said triangular region and attracted to said suction zones by the operation of said suction means are twisted together by said drums to form a yarn,

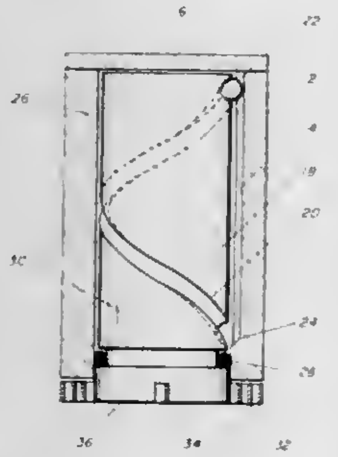
said apparatus comprising further

yarn-withdrawing means operable to withdraw said yarn from said triangular region toward one end thereof while holding said yarn against rotation, and

a throwing member which is operable to move in said flight region toward said one end thereof in a plane which is transverse to said direction.

4,109,455
SPIRAL ORIFICE DASHPOT TIMER

Alexey T. Zacharin, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 26, 1977, Ser. No. 800,775
Int. Cl.^{2} G04F *13/00*
U.S. Cl. 58—1 R 3 Claims



1. A dashpot timer comprising;

a cylindrical housing;

a close-fitting, concentric shaft positioned within said housing and rotatable relative thereto;

a spiral, semi-circular groove on the shaft exterior and a semi-circular groove on the housing interior, thereby forming a circular raceway and communicating with both ends of said shaft and said housing;

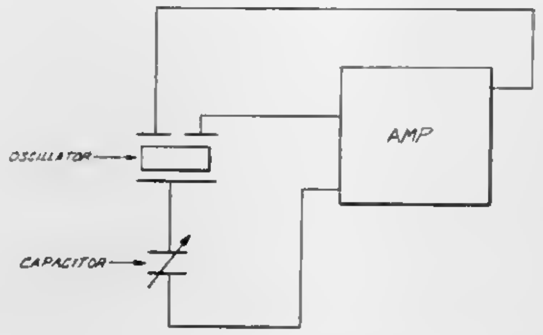
a sphere movably positioned in said raceway;

a viscous fluid filling the space between the shaft and the housing;

means for rotating the shaft relative to said housing; whereby movement of the sphere in said raceway produced by rotation of the shaft relative to the housing forces the viscous fluid to flow through the orifice formed between the sphere and said raceway, thereby delaying said rotation and providing a timing action.

4,109,456
CERAMIC CAPACITOR

Kuniharu Yamada, and Katsuhiro Teraishi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Continuation-in-part of Ser. No. 472,012, May 21, 1974, abandoned. This application Jul. 7, 1975, Ser. No. 593,343
Claims priority, application Japan, May 21, 1973, 48-56568
Int. Cl.^{2} G04C *3/00*
U.S. Cl. 58—23 AC 5 Claims



1. An improved temperature compensating capacitor comprising a ceramic including at least 90 mol % of an admixture of $BaTiO_3$ and $BaSnO_3$, the content of $BaTiO_3$ lying between 80.7 and 84.0 mol % and the content of $BaSnO_3$ lying between 10.0 and 14.0 mol %, and the remainder of the ceramic composition containing at least one oxide selected from a first group consisting of $SrTiO_3$, $CaSnO_3$, $CaTiO_3$ and $MgTiO_3$ in an amount from 1.7 to 7.0 mol % and at least one oxide selected from a second group consisting of SiO_2, Fe_2O_3, MnO_2, CoO, V_2O_5 and CeO_2 in an amount from 0.3 to 0.5 mol %, said capacitor having a Curie point lying within the ambient temperature range and having a change-rate of at least 30% between its Curie point and its Curie point ± 20° C, wherein the change-rate of said capacitor is defined as

$$\frac{C_0 - C_1}{C_0} \times 100\%,$$

C_0 being the capacity of said capacitor at its Curie point, and C_1 being the capacity of said capacitor at its Curie ± 20° C.

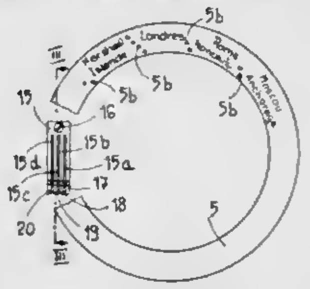
4,109,457
UNIVERSAL ELECTRONIC TIMEPIECE

Claude Laesser, La Chaux-de-Fonds, and Hubert Portmann, Colombier, both of Switzerland, assignors to Ebauches S.A., Switzerland
Filed Nov. 8, 1976, Ser. No. 740,036
Claims priority, application Switzerland, Nov. 19, 1975, 15084/75
Int. Cl.^{2} G04B *19/22*
U.S. Cl. 58—43 4 Claims

1. A universal electronic timepiece which displays the time-belts of the earth, comprising:

a movable indicator of the time-belts;

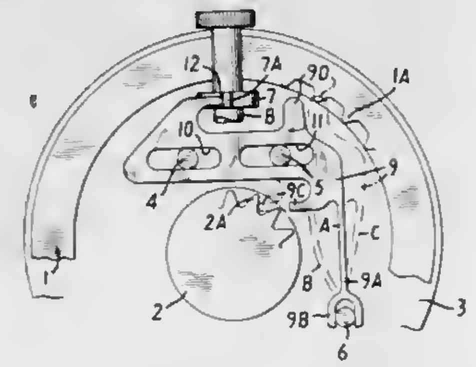
a bed of electric contacts spaced one from another each having respective control members carried by a movable element moving in synchronism with said movable indicator, said contacts and said control members being spaced one from another such that the contacts are closed by said control members in a first order when said indicator is moved in a first direction and closed in a second order when said indicator is moved in a second opposite direction; and



a display device including means for displaying the time in a first time-belt and second means for displaying the time of the time-belt selected by said movable indicator.

4,109,458
DATE AND DAY CORRECTING DEVICE OF A TIMEPIECE

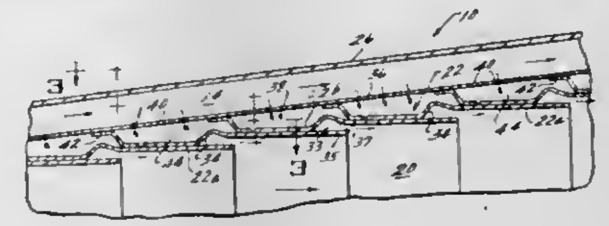
Kelichi Suzuki; Keikichi Takahashi; Elichi Matsuura, and Akinobu Harada, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan
Filed Nov. 24, 1976, Ser. No. 744,926
Claims priority, application Japan, Nov. 27, 1975, 50-160640[U]
Int. Cl.^{2} G04B *27/02*
U.S. Cl. 58—63 7 Claims



1. In a timepiece: a base plate; a day-star wheel mounted for rotation on said base plate; an annular date ring mounted for rotation on said base plate concentrically of said day-star wheel to define an annular space between said day-star wheel and date ring, said date ring having inner teeth facing said day-star wheel; and a day/date correcting device for correcting setting of said day-star wheel and said date ring; wherein said correcting device is comprised of a correcting lever positioned within the space between said day-star wheel and said date ring, said correcting lever having a first protrusion opposite said day-star wheel for engaging said day-star wheel to advance the same when said correcting lever slides to a day correcting position, a second protrusion opposite said date ring for engaging said date ring to advance the same when said correcting lever slides to a date correcting position, and a tab extending therefrom, correcting lever mounting means for slidably mounting said correcting lever on said base plate for sliding between said day correcting position and said date correcting position and a neutral position intermediate said day and date correcting positions whereat neither said first protrusion and said second protrusion engage said day-star wheel and said date ring, respectively, a correcting wheel having a peripheral tooth and being mounted for rotation adjacent said tab of said correcting lever and position to engage said tab upon rotation of said correcting wheel to slide said correcting lever to said day correcting position and said date correcting position according to the direction of rotation of said correcting wheel for effectuating day and date correction, correcting wheel mounting means for mounting said correcting wheel for rotation adjacent said tab of said correcting lever, rotating means manually operable for rotating said correcting wheel to allow manual setting of day and date, and means for returning said correcting lever from said day and date correcting positions to said neutral position after said correcting wheel is rotated to disengage said tooth from said tab.

4,109,459
DOUBLE WALLED IMPINGEMENT COOLED COMBUSTOR

Edward E. Ekstedt; Edwin J. Beck, Jr.; Donald W. Bahr, all of Cincinnati, Ohio, and Barry Weinstein, Georgetown, Mass., assignors to General Electric Company, Cincinnati, Ohio
Continuation of Ser. No. 490,098, Jul. 19, 1974, abandoned, which is a continuation of Ser. No. 305,520, Nov. 10, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,545
Int. Cl.^{2} F02C *7/18*
U.S. Cl. 60—39.66 5 Claims



1. A combustor for use in a gas turbine engine, comprising: a first wall defining a combustion zone, said first wall comprising a plurality of overlapping telescopically co-operating open ended hoops each having an upstream end and a downstream end with an integrally formed radially and circumferentially extending spacer portion rigidly connecting said ends and disposed therebetween, at least one of said hoops fixedly connected to and supported at its upstream and downstream ends against axial and radial movement by the next adjacent respective upstream and downstream hoop, said upstream end and said spacer portion of said one of said hoops overlapping the downstream end of said next adjacent upstream hoop such that a circumferentially extending gap is formed between said spacer portion and said downstream end of said next adjacent upstream hoop;

an outer casing partially defining a first cooling fluid plenum substantially circumscribing the first wall;

a second generally axially continuous wall spaced apart from the first wall and partially defining a second plenum;

a plurality of stiffening ribs disposed between the first and second walls and rigidly connecting said second wall to said hoops for dividing the second plenum into a plurality of circumferentially extending compartments substantially isolated axially from one another, each compartment bounding a preselected portion of the first wall;

a plurality of apertures in said spacer portion for providing communication between preselected of said compartments and said combustion zone for exhausting fluid from said compartments into said combustion zone along and parallel to the first wall; and

a plurality of perforations of predetermined size in said second wall arranged according to a predetermined axial and radial spaced relationship for directing streams of cooling fluid into the compartments and directly against said first wall in individually controlled quantities.

4,109,460

LIQUID FUEL ROCKET ENGINE HAVING ADJUSTABLE NOZZLE THROAT SECTION

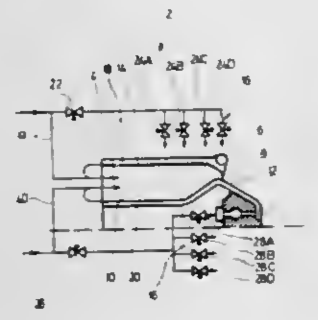
Günther Schmidt, Unterhaching, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Apr. 6, 1976, Ser. No. 674,089

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515845

Int. Cl.² F02K *9/02, 11/02, 1/10*

U.S. Cl. 60—204 **15 Claims**



1. A liquid fuel rocket engine comprising an outer and inner concentrically arranged annular wall each having a plurality of separate segmental cooling jackets extending only over a portion of the circumference of said walls, a head closing one end of said walls, said walls defining a combustion chamber adjacent said head with a throat nozzle adjacent the opposite end opening outwardly for the discharge of thrust gases, the inner one of said walls having a diverging portion extending outwardly of said throat nozzle, means for circulating a propellant component through each of the segmental portions of said inner and outer walls, and control means for varying the amount of propellant component circulated into said segmental portions so as to regulate the expansion and contraction of said inner and outer walls and vary said throat portion cross section in accordance therewith.

4,109,461

METHOD FOR OPERATING INTERNAL COMBUSTION ENGINE

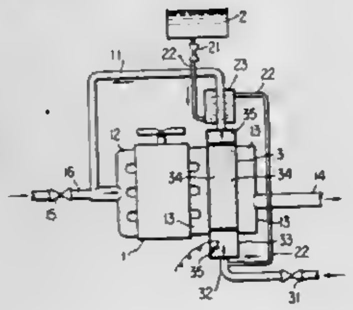
Yoshiyasu Fujitani, and Hideaki Muraki, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusbo, Japan

Filed Apr. 7, 1976, Ser. No. 674,630

Claims priority, application Japan, Apr. 7, 1975, 50-42534

Int. Cl.² F01N *3/08*

U.S. Cl. 60—274 **5 Claims**



1. A method of operating an internal combustion engine comprising the steps of:

placing a reaction cylinder within a passage of exhaust gases being exhausted from an internal combustion engine in sealing relation therewith for the purpose of imparting heat produced in said reaction cylinder to said exhaust gases being exhausted from the engine, said reaction cylinder being filled with a rhodium catalyst for use in partially oxidizing hydrocarbons;

feeding into said reaction cylinder a mixture gas consisting of a hydrocarbon-base fuel and gas which contains oxygen of a quantity providing an oxygen-to-carbon ratio of 0.3 to 1.2;

partially oxidizing said fuel into a reformed gas for lean burn which contains 4.3 to 19.3% of hydrogen, 12.4 to 22.6% of carbon monoxide and 1.0 to 2.4% of methane in a temperature range of 800° C. to 1200° C. to produce reaction heat for maintaining said reaction cylinder in said temperature range;

mixing said reformed gas and a gas containing oxygen of a quantity providing an excess oxygen ratio of 1.1 to 2.0 to obtain a lean mixture gas for lean burn;

feeding said lean mixture gas into said internal combustion engine to operate the engine under such a lean mixture condition as to lower the quantity of nitrogen oxide produced in the exhaust gases;

exhausting exhaust gases to said passage of exhaust gases, which gases contain inflammable gases such as carbon monoxide and hydrocarbon produced due to said lean burn; and

heating said exhaust gases during their passing through said passage of exhaust gases to burn said inflammable gases residual in said exhaust gases by heat from the reaction cylinder which is placed within said passage of exhaust gases and which is maintained in said temperature range of 800° C. to 1200° C.;

whereby pure exhaust gases can be discharged into the atmosphere containing minimal amounts of harmful gases such as nitrogen oxide, carbon monoxide and hydrocarbons.

4,109,462

DEVICE FOR PURIFYING EXHAUST GAS DISCHARGED FROM INTERNAL COMBUSTION ENGINE

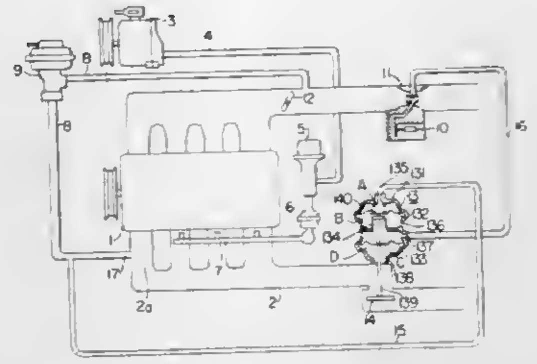
Tokio Kohama, Nishio; Hideki Obayashi, Aichi; Tadashi Ozaki, Nishio, and Hidetaka Nohira, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jldosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 24, 1976, Ser. No. 744,823

Claims priority, application Japan, Dec. 25, 1975, 50/157240

Int. Cl.² F02M *25/06*

U.S. Cl. 60—278 **13 Claims**



1. In an exhaust gas purifying device for use with an internal combustion engine of the type comprising a secondary air supply system for supplying the secondary air into an exhaust system of the engine, and an exhaust gas recirculation system for recirculating a portion of exhaust gas in the exhaust system through an exhaust gas intake port and an exhaust gas recirculation passage into an intake system of the engine, an improvement comprising:

(a) variable restriction means disposed in said exhaust system downstream of said exhaust gas intake port for varying flow cross sectional area of said exhaust system, and

(b) control means for comparing a signal representative of the volume flow rate of recirculated exhaust gas with a signal representative of the volume flow rate of intake air and controlling said variable restriction means in such a way that said signal representative of the volume flow rate of recirculated exhaust gas is made proportional to said signal representative of the volume flow rate of intake air.

4,109,463

EXHAUST REACTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

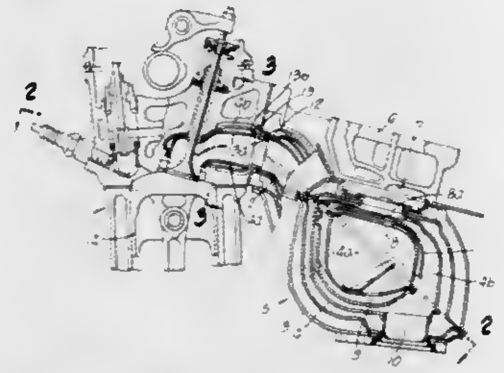
Kiyoyuki Itakura, Asaka; Yohji Ishii, Saltama; Satoru Ohata, and Masao Watanabe, both of Asaka, all of Japan, assignors to Honda Gikeo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,182

Claims priority, application Japan, Nov. 12, 1975, 50-153027[U]

Int. Cl.² F01N *3/10;* **F02B** *19/10*

U.S. Cl. 60—282 **3 Claims**



1. In an internal combustion engine, the combination of: an exhaust passage, an exhaust gas reaction chamber having an upstream inner chamber section connected to receive exhaust gases from said exhaust passage, said reaction chamber including a downstream outer chamber section surrounding said upstream inner chamber section, said inner chamber section having a discharge opening on its downstream side connecting said chamber sections, said inner chamber section also having a small leak hole in a position remote from said discharge opening, an intake mixture passage, heat exchange means for heating the intake mixture from the hot exhaust gases in the outer chamber section, said leak hole being aligned with the heat exchange means to accelerate heating of the intake mixture by means of exhaust gases ejected therethrough during engine warmup operation.

4,109,464

VAPOR GUARD SYSTEM

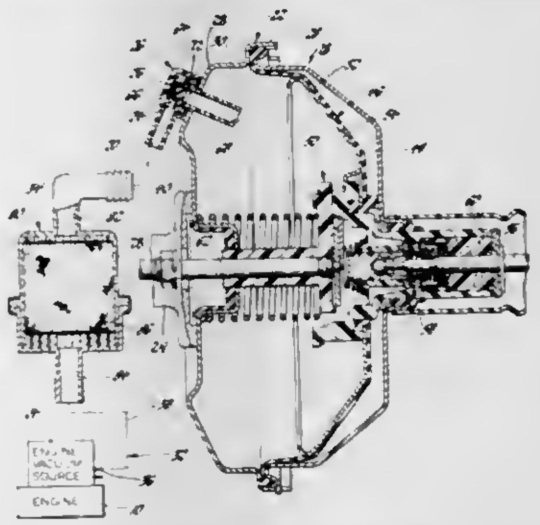
Warren A. Wickland, Lake Orion, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1977, Ser. No. 805,010

Int. Cl.² F15B *21/04*

U.S. Cl. 60—397 **3 Claims**

3. In a power servomotor system having a servomotor operated by differential air pressures with one pressure being atmospheric air and the other pressure being air at other than atmospheric air and generated by a pressure source which also entrains vapors therein which are capable of adversely affecting said servomotor if the vapors enter said servomotor and particularly if the vapors are condensed therein, said servomotor being connected to said pressure source by a fluid conduit, the improvement comprising a vapor trap in said conduit which traps and holds said entrained vapors in other pressure otherpressure air which would otherwise be transmitted to said servomotor from said pressure source during air flow from said pressure source to said servomotor through said fluid conduit, said vapor trap being purged of vapors so trapped therein upon air flow through said fluid conduit from said servomotor to said pressure source.



4,109,465

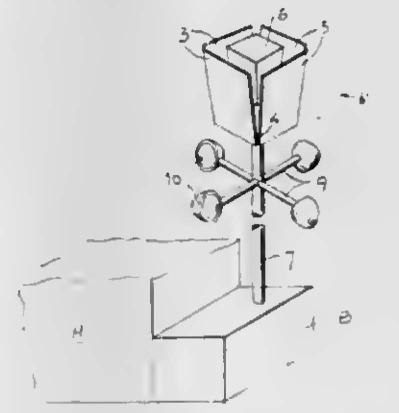
WIND ENERGY ACCUMULATOR

Abraham Plen, 12 Ussishkin St., Tel Aviv, Israel

Filed Jun. 13, 1977, Ser. No. 806,264

Int. Cl.² F15B *1/02, 13/09*

U.S. Cl. 60—398 **6 Claims**



1. An accumulator storing wind energy comprising at least one air pumping device, at least one hinged flap adapted to be turned into the wind, the said air pumping device being actuated by the said flap whenever the latter faces the direction from which wind blows and a container into which the air is pumped, the said air pumping device being connected by a conduit with said container, the whole assembly of above elements being rotatively held, means being provided to cause the assembly constituting the accumulator device to turn with the wind blowing.

4,109,466

HYDRAULIC TRANSMISSION

Roger A. Keech, San Luis Obispo, CA, assignor to Dana E. Keech, San Bernardino and Ronald S. Mullisen, Los Osos, both of, Calif., part interest to each

Filed May 27, 1977, Ser. No. 801,203

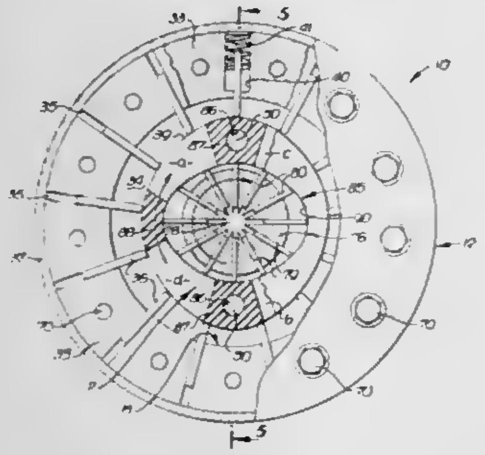
Int. Cl.² F16D *39/00*

U.S. Cl. 60—487 **8 Claims**

1. In a co-axial co-planar combined central hydraulic radial vane pump and peripheral hydraulic radial vane motor functioning in a common cylindrical chamber to form a hydraulic positive displacement power transmission, the combination of:

a flexible, unitary annular common element interposed within said chamber to surround and be engaged by the vanes of said pump and be surrounded and engaged by the vanes of said motor;

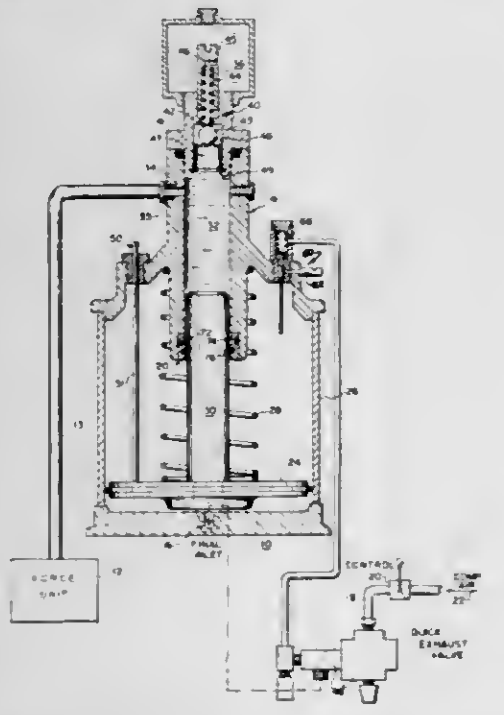
said element having continuous internal and external annular surfaces continually engaging the vanes respectively of said pump and said motor;
said element having continuous parallel polar surfaces making continuous sealing engagement respectively between each of said polar surfaces and one of the end faces of said chamber,



co-axial drive and driven shafts connected respectively to said pump and said common element; and
means operable through said driven shaft to flex the material of said common element to coordinately modify said continuous annular internal and external surfaces thereof and thereby convert said transmission from one drive ratio to another.

4,109,467
HYDRAULIC BOOSTER SYSTEM

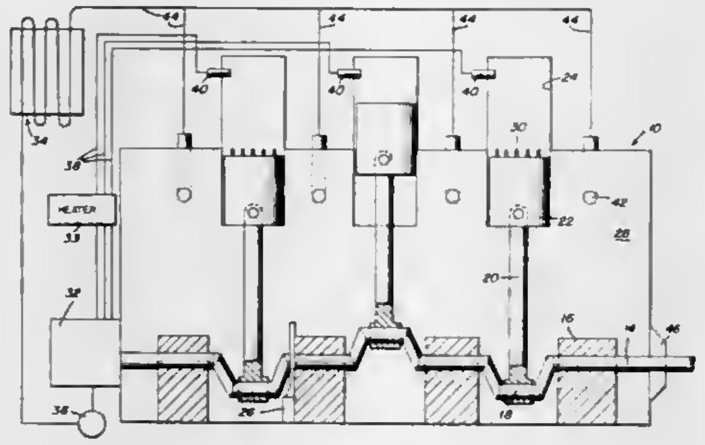
George N. Lukas, 2242 W. Belmont Ave., Chicago, Ill. 60618
Filed Jul. 7, 1976, Ser. No. 703,282
Int. Cl.^{2} B60T *17/22*
U.S. Cl. 60—534 **5 Claims**



1. A hydraulic booster for selectively driving a power unit via a hydraulic circuit, said booster including an air cylinder, an air driven piston reciprocable in said air cylinder, air supply means for selectively energizing said air cylinder to cause reciprocation of said air driven piston, a hydraulic cylinder coaxially disposed and rigidly connected with said air cylinder, a hydraulic piston rigidly connected to said air driven piston, said hydraulic piston having a smaller cross-sectional area than said air driven piston, a body of hydraulic fluid in said hydraulic cylinder, a conduit for transferring hydraulic fluid between said hydraulic cylinder and said power unit, a hydraulic reservoir mounted in said hydraulic cylinder for replenishing the hydraulic fluid therein, a valve unit mounted in said hydraulic cylinder, externally of said hydraulic piston, said valve unit comprising a valve seat in said hydraulic cylinder, a ball movable between a normally open position away from said valve seat permitting hydraulic fluid flow between the reservoir and the hydraulic cylinder to replace any hydraulic losses in the hydraulic cylinder and to return any excess of hydraulic fluid in the hydraulic cylinder to the reservoir and to also permit any air present in the fluid in the hydraulic cylinder to migrate from the hydraulic cylinder to the reservoir, and a closed position on said valve seat preventing fluid communication in either direction between the hydraulic cylinder and the reservoir, a spring bearing on said ball to maintain it in the normally open position when the air cylinder is not energized, means for adjusting the bias of the spring, a piston positioned below the ball to automatically and directly move the ball to its closed position in response to hydraulic fluid pressure surges in the hydraulic cylinder when the air cylinder is energized.

4,109,468
HEAT ENGINE

Willie L. Heath, P.O. Box 122, Dardanelle, Ark. 72834
Filed Apr. 18, 1973, Ser. No. 352,477
Int. Cl.^{2} F01K *25/10*
U.S. Cl. 60—670 **1 Claim**



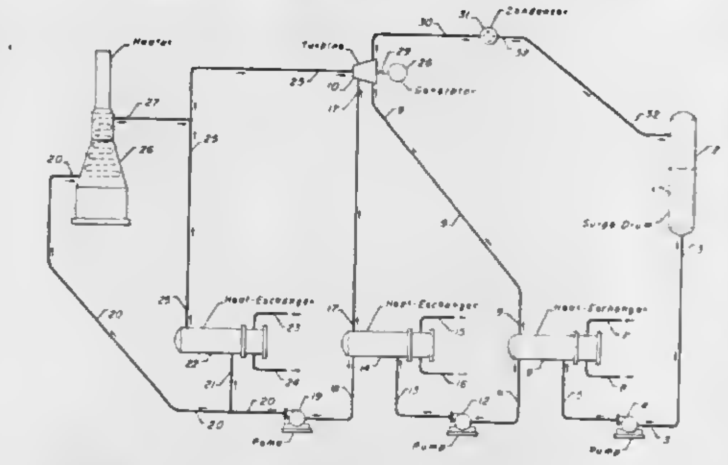
1. A device for converting heat energy into mechanical energy comprising a closed system utilizing a condensible-vaporizable working fluid, said system including a piston and cylinder assembly mounted for relative movement to define an expansible working chamber, means injecting working fluid in the liquid state into the working chamber, exhaust valve means in the working chamber to discharge expanded gaseous working fluid, condensing means receiving gaseous working fluid from the exhaust valve means and changing it to liquid, and pump means supplying liquid working fluid to the injecting means under high pressure, means applying external heat to the working fluid prior to entry into the working chamber, said exhaust valve means being timed whereby at least a portion of the compression movement of the piston will compress gases in the cylinder whereby the heat of compression will heat the gases to heat and expand the injected working fluid into gaseous working fluid to move the piston during its working movement.

4,109,469
POWER GENERATION FROM REFINERY WASTE HEAT STREAMS

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.
Filed Feb. 18, 1977, Ser. No. 770,178
Int. Cl.^{2} F01K *13/00, 25/08*
U.S. Cl. 60—676 **9 Claims**

1. A process for the generation of power which comprises the steps of:

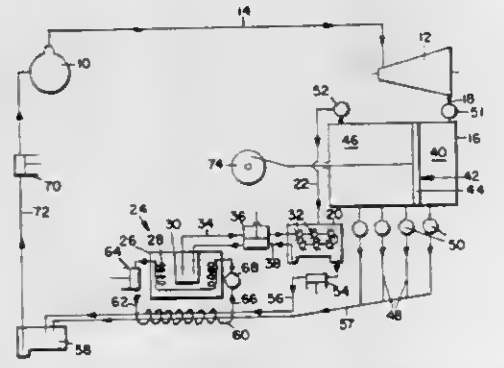
(a) contacting a coolant at elevated pressure with at least one refinery process stream having a temperature sufficient to vaporize a portion of said coolant and separating resultant coolant vapors from unvaporized coolant;
(b) expanding the coolant vapors through a turbine to a lower pressure;



(c) passing said unvaporized coolant into the convection section of a direct-fired heater and therein vaporizing the same;
(d) introducing resultant vapors from said heater into said turbine; and
(e) generating power from the resulting motion of said turbine.

4,109,470
METHOD AND MEANS FOR RECLAIMING MECHANICAL ENERGY AND HOT CONDENSATE FROM EXHAUST STEAM

James Lawrence Cassidy, 66 Prospect St., Turners Falls, Mass. 01376
Filed May 5, 1976, Ser. No. 683,639
Int. Cl.^{2} F01K *9/00*
U.S. Cl. 60—685 **1 Claim**



1. A process for salvaging and recycling all the latent heat energy of exhaust steam comprising:
(a) generating steam in a steam generator;
(b) leading said steam to a turbine for expansion for obtaining useful work;
(c) leading the final exhaust steam through an expansible chamber device;
(d) wherein a vacuum is maintained on the non-working side of said expansible chamber device;
(e) such that the exhaust steam is forced to do work by virtue of its higher residual vapor pressure which brings about condensation of a major portion of the exhaust steam at a temperature near its boiling point during the working stroke of the expansible chamber device;
(f) leading said resulting hot condensate from the major portion to a feedwater tank;
(g) removing the minor portion of the exhaust steam which has not condensed, to a condenser cooled by a controlled spray of refrigerated condensate chilled by a refrigerator;
(h) leading the resulting cold condensate through a heat exchanger attached to the hot coil of the refrigerator prior to delivering it to the feedwater tank;
(i) recycling the contents of the feedwater tank back to the steam generator;
(j) repeating the steps of *a –i* in a continuous cycle; and
(k) recycling the mechanical work done as expedience may require.

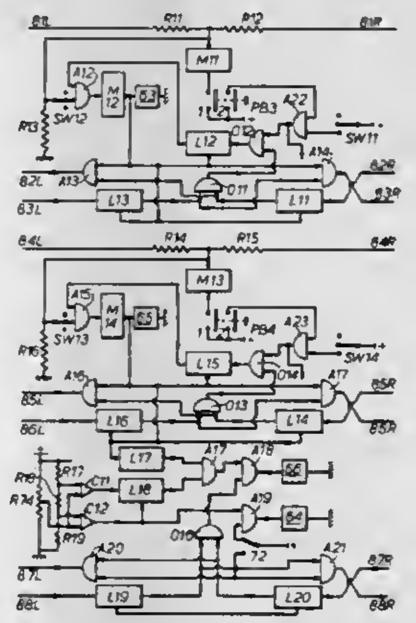
4,109,471
METHOD OF COVERING THE BOTTOM SURFACE IN A GAS CAVERN

Franz X. Sebald, Munich, and Hans-Dieter Hagemann, Hamburg, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany
Filed Sep. 2, 1976, Ser. No. 719,890
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1975, 2539720
Int. Cl.^{2} B65G *5/00;* B01J *1/18*
U.S. Cl. 61—0.5 **10 Claims**

1. In the storage of gaseous hydrocarbons in an underground cavern containing a water sump layer in the bottom thereof having a surface in contact with the gaseous hydrocarbons, the improvement comprising:
covering the surface of said water sump layer with a separation layer by the deposition thereon of a vapor barrier consisting essentially of a carpet of bitumen to prevent the vaporizing of said water into said gaseous hydrocarbons by the injection into said cavern of a mixture of bitumen and a volatile liquid hydrocarbon carrier wherein said carpet of bitumen is formed by the vaporization of said volatile liquid hydrocarbon in said cavern.

4,109,472
LONGWALL MINING APPARATUS

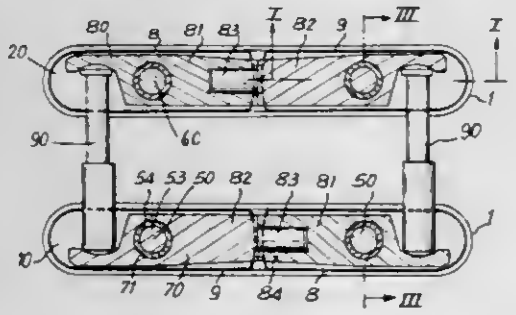
Robert Graham Harris, Longlevens, England, assignor to Dowty Mining Equipment Limited, Tewkesbury, United Kingdom
Filed Jan. 21, 1977, Ser. No. 761,539
Claims priority, application United Kingdom, Jan. 24, 1976, 2787/76
Int. Cl.^{2} E21D *15/44*
U.S. Cl. 61—45 D **11 Claims**



1. Mining apparatus for use on a mineral face comprising a plurality of roof supports arranged in a line along the face, advancing means for each support, an advance prime signal generating means on each support adapted to generate an advance prime signal on completion of a support advance movement, an advance prime signal transmission means between each adjacent pair of supports adapted to feed an advance prime signal only to a support adjacent to the advance prime signal generator giving the prime signal, a plurality of

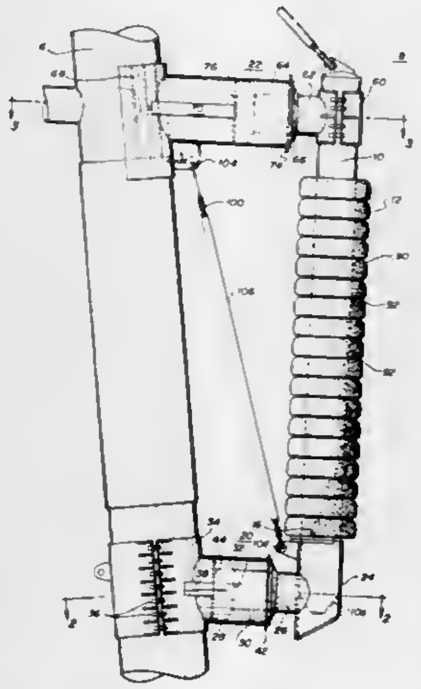
manually operable controls one on each of some or all of the supports, each of which on actuation is adapted to generate an advance enable signal, advance enable signal transmission means extending between all supports connected to receive and to transmit any advance enable signal, and limiting means associated with the enable signal transmission means adapted to ensure that any advance enable signal may not be carried by said enable signal transmission means for more than a predetermined number of supports from the position of generation of an advance enable signal, each said advancing means being adapted to cause advance of the associated support only on receipt of an advance prime signal and an advance enable signal, said predetermined number of supports being less than the number of supports along the face, and the number of supports between any two successive supports having manually operable controls being not more than said predetermined number.

4,109,473
ROOF SUPPORTS
Alfred A. Valantin, Clermont, France, assignor to Charbonnages de France, Paris, France
Filed Jun. 21, 1977, Ser. No. 808,548
Claims priority, application France, Jun. 29, 1976, 76 19718
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **12 Claims**



1. A roof support capable of being moved by a drive mechanism while under permanent load, comprising:
a pair of upper parallel carriages;
a pair of lower parallel carriages;
the pair of upper parallel carriages being disposed above and parallel to the lower pair of parallel carriages;
four endless, articulated tracks, one guided about each respective carriage;
two longitudinally spaced upper cross-members connecting the parallel carriages of the upper pair;
two longitudinally spaced lower cross-members connecting the parallel carriages of the lower pair;
said connecting of these four cross-members being provided by pivotal joint means interpased between each respective cross-member and carriage and providing at least two axes of rotation therebetween;
an upper longitudinal member arranged laterally intermediate the upper parallel carriages and connecting the upper cross-members;
a lower longitudinal member arranged laterally intermediate the lower parallel carriages and connecting the lower cross-members;
said connecting of the longitudinal members with the respective cross-members being provided by pivotal joint means providing at least one axis of rotation therebetween;
means for applying a force upon said cross-members by way of said longitudinal members to separate the upper carriages from the lower carriages for respectively applying the upper carriages against a gallery roof and the lower carriages against a gallery floor.

4,109,474
BUMPER ASSEMBLY SHOCK CELL SYSTEM
James H. Files, New Orleans, La.; John M. Montague, Dallas, and Clarence T. Thomerson, Corsicana, both of Tex., assignors to Regal Tool & Rubber Co., Inc., Corsicana, Tex.
Filed Oct. 15, 1976, Ser. No. 732,653
Int. Cl.² E02B *3/22;* B63B *21/04*
U.S. Cl. 61—48 **6 Claims**

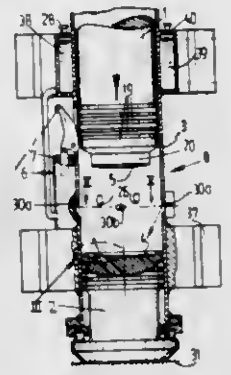


1. A shock cell for a bumper for fending off vehicles traveling adjacent a fixed sturcture which comprises:
(a) an outer cylinder extending from said structure horizontally;
(b) an inner cylinder coupled to said bumper and extending into the open end of said outer cylinder;
(c) an annular rubber cylinder bonded to the inner surface of said outer cylinder and to the outer surface of said inner cylinder for a distance of the order of the diameter of said inner cylinder and with the outer and inner ends having truncated surfaces conical with reference to apexes outside said outer cylinder and inside said inner cylinder respectively; and
(d) a shearable stop plate yieldably secured inside said outer cylinder spaced inwardly from the end of said inner cylinder a distance slightly greater than the thickness of said annular body such that said plate in response to extreme forces being applied to said bumper by the vehicles will shear loose from said outer cylinder to permit travel of said inner cylinder beyond normal limits only in response to said extreme forces.

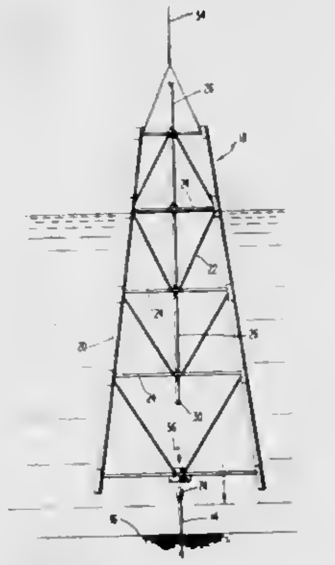
4,109,475
PILE-DRIVING RAM AND METHOD OF CONTROLLING THE SAME
Hans Gunther Schnell, Hamburg, Fed. Rep. of Germany, assignor to Van Kooten B.V., Naarden, Netherlands
Filed Dec. 5, 1975, Ser. No. 638,268
Claims priority, application Netherlands, Dec. 10, 1974, 7416078; Dec. 10, 1974, 7416080
Int. Cl.² E02D *7/02*
U.S. Cl. 61—53.5 **32 Claims**

1. A method of regulating the supply of fuel per stroke cycle to a pile-driving Diesel rammer, comprising the steps of measuring a parameter of the pile during each stroke of the rammer; adjusting the fuel supply per stroke according to the value of said parameter, measured during at least two preceding strokes of the rammer and more in accordance with the fuel

supply adjusted during the stroke which gave the better result; said measuring step comprising measuring the value of the energy induced in the pile by a rammer stroke and integrating the measured value over time.

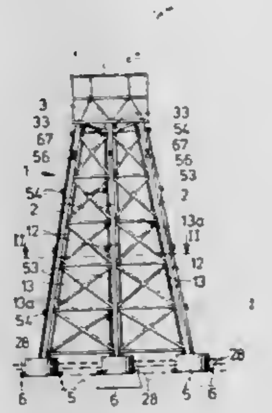


4,109,476
DOCKING AN OFFSHORE STRUCTURE WITH A SUBMERGED FIXTURE
Bert E. Gracia, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.
Filed May 20, 1977, Ser. No. 798,880
Int. Cl.² E02B *17/00*
U.S. Cl. 61—87 **17 Claims**



1. A method of docking an offshore structure with a submerged fixture, said structure having first leg means for engaging the seabed and second means spaced from the leg means for engaging said submerged fixture, comprising the steps of:
positioning said structure in the water above said fixture;
lowering said structure downwardly around said fixture so that said second means engages said fixture and has limited movement in a lateral direction,
interposing alignment means in contacting relation between said second means and said fixture to locate said second means in a predetermined lateral position relative to said fixture; and
with said alignment means maintained in said interposed position for maintaining alignment between said second means and said fixture, lowering said structure relative to said fixture until said first means becomes embedded in the seabed.

4,109,477
OFFSHORE DRILLER RIG
Rudolf Vogel, Salzgitter-Bad, Germany, assignor to Salzgitter Maschinen AG, Salzgitter, Germany
Continuation of Ser. No. 550,725, Feb. 18, 1975, abandoned. This application Dec. 11, 1975, Ser. No. 639,836
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1974, 2407655
Int. Cl.² E02D *17/00, 27/42*
U.S. Cl. 61—87 **108 Claims**

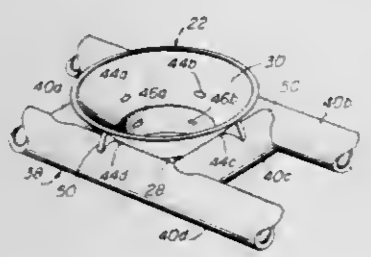


1. An off-shore drilling rig, comprising at least one upright framework structure provided with an upper platform and with a plurality of downwardly extending hollow legs, each leg having a lower end and an upper end through which its interior is accessible from said platform; a plurality of ballastable floats together furnishing at least part of the buoyancy required to maintain the framework structure afloat preliminary to anchoring on the ocean bottom, each of said floats being mounted at one of said lower ends and having a bottom wall and a deformable skirt surrounding said bottom wall and depending downwardly beyond the same; dispensing means provided at the respective floats and having a plurality of apertures located below the bottom wall of the respective float for dispensing of flowable material; means for communicating the interior of each float with the interior of the associated leg and with the region beneath the bottom wall of said float, said communicating means comprising an upper port means for communicating the interior of the respective float with the associated leg, and lower port means in the bottom wall of the respective float, and wherein each leg has a portion extending into the respective float, and said upper port means comprises three equi-angularly spaced openings in said portion; an openended tubular member received in said portion with clearance; a plurality of elastic sealing elements in said clearance intermediate the respective openings, at least one of said sealing elements being inflatable to thereby exert pressure upon said portion and tubular member and also urge the latter into sealing engagement with the other sealing elements; and remote-controllable means connected with said tubular member for effecting axial movement of the same within said portion.

4,109,478
UNITIZED CONDUCTOR GUIDE AND FRAME FOR OFFSHORE DRILLING AND PRODUCTION
Bert E. Gracia, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.
Filed Jan. 5, 1978, Ser. No. 867,116
Int. Cl.² E02D *17/00*
U.S. Cl. 61—86 **5 Claims**

1. Apparatus for guiding a drill conductor from a deck portion of an offshore platform, situated in a body of water, into the bottom of said body of water, comprising

at least one guide member, each said guide member comprising
  an upwardly directed, outwardly flanged, funnel-shaped portion having a conductor receiving upper opening and a smaller, conductor guiding exit aperture, and
  a downwardly directed hollow cylindrical member integrally connected to the funnel-shaped portion at the conductor exit aperture to form a substantially continuous interior guide surface for said conductor,
at least one guide member support structure, each said guide member support structure comprising a plurality of connected structural members supported by said platform and arranged substantially in a plane for defining a support opening

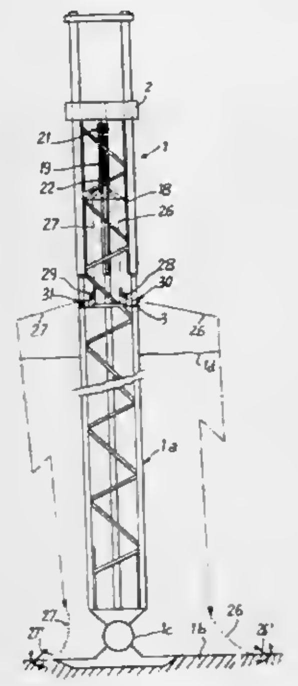


  for passing said cylindrical member of an associated guide member, and
  for supporting said funnel-shaped portion of said associated guide member, said funnel-shaped portion being in contiguous contact with said structural members at at least a plurality of contact positions, and
for each guide member-guide member support pair,
  said funnel-shaped portion contacts said structural members at at least three positions,
  said cylindrical member is snugly nestled against and positioned within said guide member support opening, and
  said guide member and said guide member support are secured to each other at a plurality of said contacting positions.

4,109,479
METHOD AND APPARATUS FOR TENSIONING ANCHOR LINES

Alain Godean, Pau, and Jean-Yves Heas, Bizanos, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France
Filed Oct. 17, 1977, Ser. No. 842,797
Claims priority, application France, Oct. 19, 1976, 76 31394
Int. Cl.^{2} E02B *17/00;* **B63B** *35/44, 21/50*
U.S. Cl. 61—94 **10 Claims**

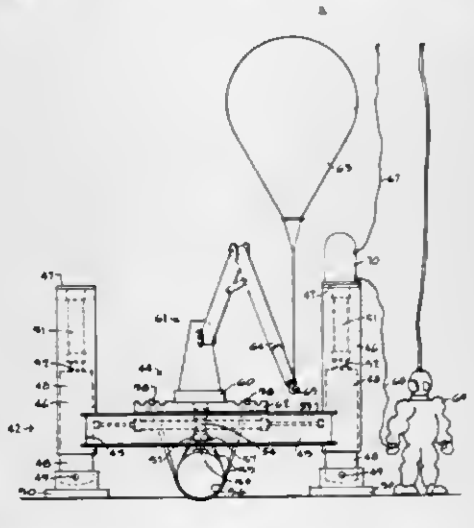
1. Apparatus for tensioning anchor lines connecting a marine structure to the ocean floor characterized in that there is a movable assembly, connecting means for releasably connecting at least one pair of anchor lines to said movable assembly, means mounting said movable assembly for movement vertically on said structure to an upper position and a lower position, a floor fixed to said structure below the lower position of said assembly, a plurality of anchor line stopper devices fixed on said floor in generally opposed relation to each other, a plurality of pulleys between the chain stoppers and the assembly, said movable assembly being suspended from the structure by a pulley system including a fixed block connected to the structure above the upper position of the movable assembly and a movable block connected to the movable assembly, and a cable connecting the pulleys and having one end fixed with respect to one of the blocks, and its other end connected to means for exerting a pulling force, said tensioning apparatus being adapted to tension opposed anchor lines extending from anchors on the ocean floor through the chain stoppers, and



then through the pulleys to the connecting means on the movable assembly.

4,109,480
UNDER WATER CRANE

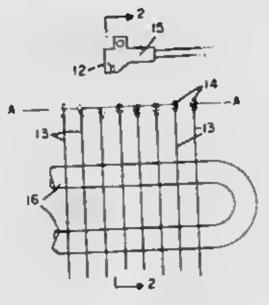
Maurice N. Sumner, Houston, Tex., assignor to The Sea Horse Corporation, Houston, Tex.
Filed Jun. 20, 1975, Ser. No. 588,761
Int. Cl.^{2} F16L *1/00*
U.S. Cl. 61—114 **9 Claims**



1. A crane for use under water comprising:
a frame having a column and a beam connected to said column,
a powered thrusting means for raising and lowering said beam, mounted in said column,
a footing for contacting the marine floor, and articulately attached to a leg, said leg being attached to powered thrusting means, thereby allowing unequal raising and lowering of the beam,
a sled slidably mounted on said beam, said sled having a powered rotary mounted telescoping boom thereon allowing handling of a first load in three degrees of freedom and above said sled while said sled lifts a second load,
a powered thrusting means for lateral movement mounted to said beam,
means coupling said sled to said lateral thrusting means, and means for suspending objects from said sled.

4,109,481
FROST DETECTOR

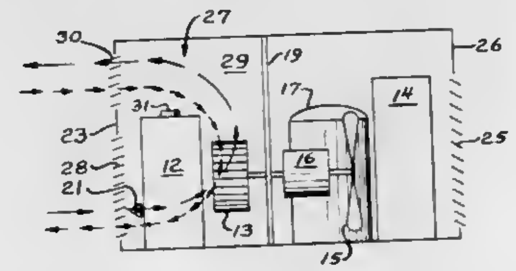
S. Christopher Peek, Hull, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.
Filed Dec. 16, 1976, Ser. No. 751,236
Int. Cl.^{2} F25D *21/02*
U.S. Cl. 62—140 **1 Claim**



1. A frost detector for use in refrigeration apparatus having refrigerant-containing coils equipped with cooling fins comprising an emitter mounted in a support for emitting a narrow beam of pulsed infrared radiation, a detector of narrow field of view mounted in said support for detecting reflected infrared radiation, the emitter and detector being angled toward each other so that the beam of the emitter and the field of view of the detector intersect at a predetermined distance from said support, which distance is about equal to the distance between said support and the plane containing the proximate edges of the cooling fins and wherein the beam emitted by said emitter is between but substantially parallel to a pair of cooling fins.

4,109,482
FAN CONTROL CIRCUIT FOR AIR CONDITIONER

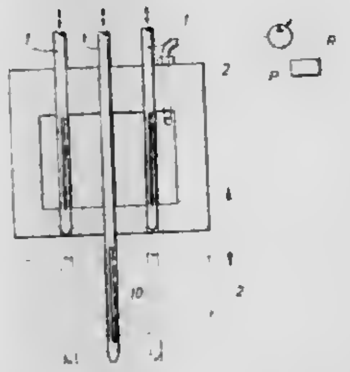
Samuel Joseph Pearson, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 6, 1976, Ser. No. 747,668
Int. Cl.^{2} F25D *17/06*
U.S. Cl. 62—180 **11 Claims**



1. In an air conditioning apparatus including an evaporator, a compressor, air circulating means for circulating room air in heat transfer association with said evaporator, and first temperature responsive means for controlling the operation of said compressor, improved control means for said air circulating means comprising:
  second temperature responsive means operative at temperatures above a predetermined temperature below the temperature at which said first temperature responsive means operates to energize said compressor to energize said air circulating means independent of the operation of said first temperature responsive means and further operative at a temperature below said predetermined temperature to energize said air circulating means only during energization of said compressor by said first temperature responsive means.

4,109,483
APPARATUS FOR PRINTING WEBS

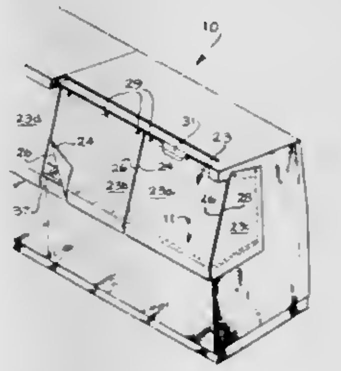
Mathias Mitter, Falkenstr. 57, 4815 Schloss Holte, Fed. Rep. of Germany
Filed Oct. 26, 1976, Ser. No. 735,198
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608005
Int. Cl.^{2} D06B *1/08*
U.S. Cl. 68—200 **53 Claims**



1. An apparatus for printing onto webs, particularly textile webs, comprising support means for supporting a web to be printed in a working plane; mounting means adjacent said support means; a plurality of plunger elements carried by said mounting means in a grid-shaped pattern and each having a free end portion operative for applying a dot of printing medium to a web; moving means for displacing said plunger elements with reference to said web in respective reciprocating cycles during each of which the plunger elements successively assume a retracted position and an advanced printing position in the latter of which the respective free end portion physically contacts said web and applies a dot of printing medium to the same; means for supplying printing medium to be entrained by said plunger elements during the reciprocation thereof; means operable during the respective reciprocating cycles in accordance with a pattern to be printed, for selecting different groupings of individual plunger elements to be displaced to said advanced position by operation of said moving means; and transporting means for effecting movement of at least one of said support means and mounting means relative to the other one thereof parallel to said working plane.

4,109,484
THERMAL PROTECTIVE BARRIER FOR OPEN REFRIGERATED COMPARTMENT

William E. Cunningham, San Carlos, Calif., assignor to Sullivan Company, San Francisco, Calif.
Filed Mar. 3, 1977, Ser. No. 773,930
Int. Cl.^{2} A47F *3/04;* **A47H** *23/00, 3/00, 15/00*
U.S. Cl. 62—256 **5 Claims**



1. A thermal barrier for inhibiting the transfer of energy between the environs and an open refrigerated compartment during limited periods of inactivity comprising pliant panel means sufficiently extensive to cover the opening of said com-

partment, readily releasable fastening means disposed along an edge margin of said compartment, fastening means carried by an edge margin of said panel means for cooperation and engagement with the first named fastening means to retain said panel means disposed to extend across and close said compartment, said panel means comprising a layer of substantially impervious pliant material and a layer of thermal insulating material carried on the inner face of said impervious material.

4,109,485

REFRIGERATOR TRUCK INCLUDING A REFRIGERATING MACHINE IN UNIT CONSTRUCTION

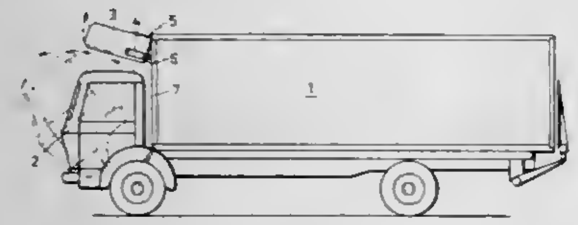
Peter Volker Grosskopf, Am Ruhrstein 25a, 4300 Essen, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,227

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558822

Int. Cl.² F25D *19/00, 19/02*

U.S. Cl. 62—298 **3 Claims**



1. A refrigerator truck comprising an insulated truck body,

a driver's cabin mounted forwardly of said truck body and adjacent thereto, said cabin being pivotally mounted for swinging about its forward lower end thereby raising the rearward upward end of said cabin,

a refrigerating machine positioned directly above said driver's cabin, said cabin being immediately and directly below said refrigerating machine,

means mounting said refrigerating machine to said truck for pivoting said refrigerating machine about an upper rear edge of said refrigerating machine,

said pivotally mounted refrigerating machine including a condenser means, an evaporator means and a motor means and being pivotable therewith,

said truck body having an opening therein for receiving cooled air from said evaporator means, said evaporator means being positioned outside of said truck body and in a position to be free to pivot upwardly relative to said truck body,

said refrigerating machine having a discharge into an air inlet leading into said truck body and means for pivoting said refrigerator machine upwardly sufficiently to allow said driver's cabin to pivot forwardly.

4,109,486

HEATING SYSTEM

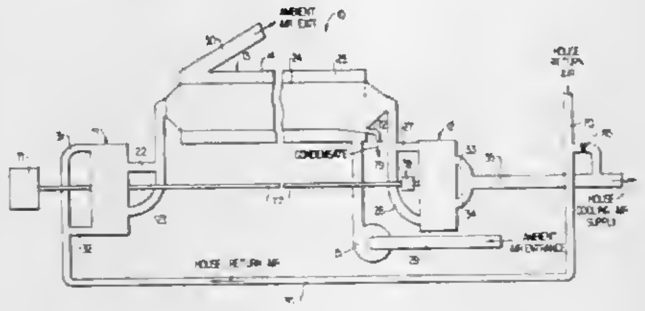
Charles A. Sleck, 2311 N. Front St., Harrisburg, Pa. 17110

Continuation-in-part of Ser. No. 681,575, Apr. 29, 1976. This application Dec. 17, 1976, Ser. No. 751,599

Int. Cl.² F25D *9/00*

U.S. Cl. 62—402 **4 Claims**

1. A heating system which operates with heat extracted from the ambient air, comprising: a compressor having a rotor which rotates about a shaft; an auxiliary motor attached to said compressor to assist in driving said compressor; an expander having a rotor which rotates about a shaft, the shaft of the compressor being connected to the shaft of the expander by a common shaft to allow the shaft of the compressor to be driven by the expander; a heat exchange liner apparatus in fluid communication between said compressor and expander, said heat exchange liner apparatus including an outer case and an inner concentrically mounted liner which together provide an annular chamber therebetween, said annular chamber being in heat exchange relation with said liner; an inlet air conduit including means for providing ambient air to the inlet side of said compressor; and means for passing air through said annular chamber in heat exchange relationship with said heat exchange liner apparatus, wherein said compressor comprises a generally cylindrical rotor, said compressor rotor being provided with a plurality of generally radially extending, slidable vanes; a rotor housing surrounding said compressor rotor and having a generally cylindrically shaped chamber which is concentric with said compressor rotor, the inner surface of said chamber slanting inwardly on opposite sides of said compressor rotor to a point where the inner surface of the chamber is closely adjacent to said compressor rotor on opposite sides of said compressor rotor to provide a pair of compression cavities, each of which is crescent-shaped at one end thereof, on opposite sides of said compressor rotor, the inner surface of said chamber being engaged by said vanes, said vanes being biased outwardly against the inner surface of said chamber; a suction port and a discharge port for each of said compression cavities, each discharge port being located in the crescent-shaped end of its respective cavity and with each suction port being located at the opposite end of its respective cavity, each discharge port having valve means for allowing discharge of gas from said respective cavity at a predetermined pressure.



4,109,487

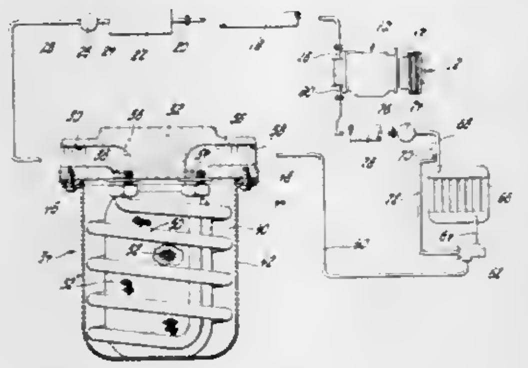
MOISTURE EXTRACTOR

Herbert Carr, Newfane, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 18, 1977, Ser. No. 760,338

Int. Cl.² F25B *43/00*

U.S. Cl. 62—474 **6 Claims**



1. In a refrigerant system having a closed fluid circuit, including flexible hose means with hose walls somewhat permeable to the movement of water therethrough in response to differential humidity between the atmosphere and the refrigerant circuit, an externally accessible dehumidifying apparatus comprising:

enclosure-forming means of water-impermeable material defining an interior space, including a detachable closure member providing access to said interior space;

inlet and outlet forming means to and from said interior space adapted to be fluidly connected in said fluid circuit for flow through said interior space; means including a member of material permeable to the passage of water therethrough separating the interior space of said enclosure into a fluid-carrying portion and a dry atmosphere portion, with said detachable closure member exposed to said atmosphere portion and said inlet and outlet forming means exposed to said fluid-carrying portion;

a quantity of desiccant material within said dry atmosphere portion for holding moisture which passes through said permeable member from said fluid-carrying portion in response to the differential humidity therebetween.

4,109,488

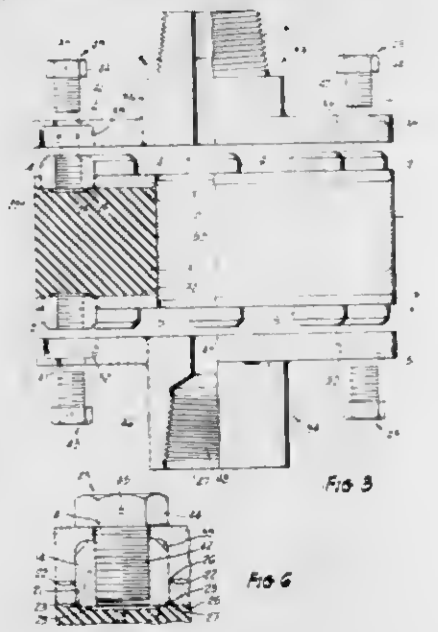
SHOCK ABSORBING ROTARY DRIVE COUPLING

John Thompson Work, Anaheim, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed Nov. 22, 1976, Ser. No. 743,565

Int. Cl.² F16D *3/54;* **F16F** *15/10*

U.S. Cl. 64—11 R **12 Claims**



1. A shock absorbing, rotary drive coupling unit for drivingly connecting a tubular drive shaft means to an axially aligned tubular driven shaft means of a rotary blast hole drill which comprises:

an annular driven plate having an axis alignable with the common axis of said shaft means;

an annular driving plate disposed parallel to and axially spaced from said driven plate;

an annular body of resilient, elastomeric material sandwiched between said plates, one end of said body being bonded to one face of said driven plate and the other end of said body being bonded to the opposed face of said driving plate, said annular plates and said annular body providing an axial passage for the flow of pressurized drilling gas therethrough;

each of said plates having a plurality of circularly arranged lug means projecting generally axially therefrom for respective engagement with complementary driving recess means on said tubular drive shaft means and with complementary driven recess means on said tubular driven shaft means; and

complementary fastener elements cooperative between said plates and the respective drive shaft means and driven shaft means for maintaining said lug means and said lug receiving recess means in said seated engagement.

4,109,489

ELECTRICAL CONNECTING DEVICE FOR A HAND-OPERATED KNITTING MACHINE

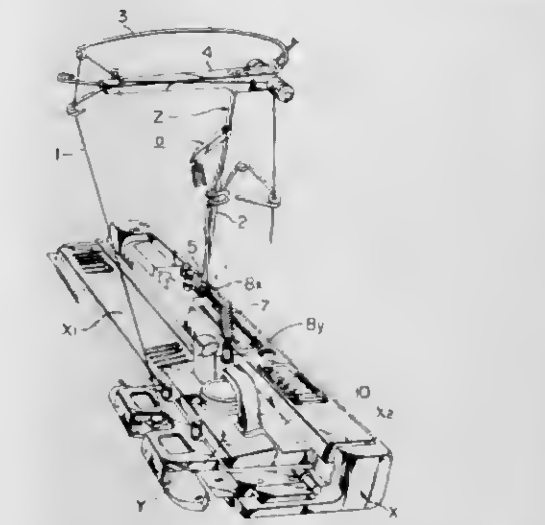
Yasuhiro Iwasaki, Kodaira, Japan, assignor to Silver Seiko Ltd., Kodaira, Japan

Filed Mar. 4, 1977, Ser. No. 774,531

Claims priority, application Japan, Sep. 3, 1976, 51-27123

Int. Cl.² D04B *15/66*

U.S. Cl. 66—75.2 **12 Claims**



1. In a hand-operated knitting machine having a machine body, a needle bed on said machine body, a carriage mounted for sliding movement on the needle bed, first circuit means on the machine body, and second circuit means on the carriage, the improved apparatus for establishing electrical connection between said first and second circuit means, comprising:

a first jack means fixed on the machine body and electrically connected to the first circuit means;

a second jack means fixed on the carriage and electrically connected to the second circuit means;

a flexible electrical connecting cable adapted to provide electrical connection between the first and second circuit means, said connecting cable having a first and a second plug means for mating connection with said first and second jack means respectively;

supporting means on the machine body for supporting a portion of said connecting cable above said needle bed and the carriage; and

means for taking up slack in said cable between said portion of said cable and said second plug means so that said connecting cable is prevented from interfering with operation of the knitting machine.

4,109,490

SLIDING LATCH NEEDLE

Juan Bosch, Mataro, Spain, assignor to Tecnologia Industrial, Proyectos Y Promociones, S.A., Mataro, Spain

Filed Mar. 4, 1977, Ser. No. 774,605

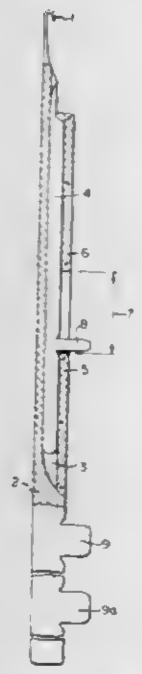
Claims priority, application Spain, Mar. 5, 1976, 445.984

Int. Cl.² D04B *35/06*

U.S. Cl. 66—120 **10 Claims**

1. A needle assembly for use in a knitting machine comprising a shank having one end with a hook thereat, said shank having a longitudinal groove therein, a plate slidably mounted in said groove to form a single unit with said shank, said plate being slidably mounted for movement between an extended position in which the plate cooperates with said hook to close the same and a retracted position in which the hook is open, means on said shank for cooperating with external cams for displacing the shank longitudinally between raised and lowered positions, and stop means forming part of said unit and disposed cooperatively between said plate and said shank for establishing said retracted and extended positions of said plate while retaining said plate in said groove to preserve the integrity of said unit, said stop means comprising stop members

bounding said groove in longitudinally spaced relation, and a lug on said plate positioned to contact said stop members



respectively in said extended and retracted positions and to slide freely therebetween.

4,109,491

THREAD GUIDANCE IN MESH-FORMING MACHINES WITH ROTATING THREAD GUIDES

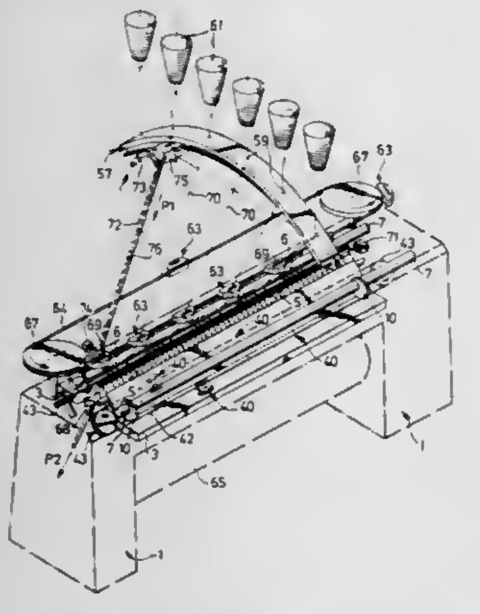
Manfred Schmid, Mörikestr. 8, 7445 Bempflingen; Werner Sommer, Kolpingstr. 51, 7300 Esslingen, and Antonius Vinnemann, am bopserweg, 11 7000 Stuttgart 1, all of Fed. Rep. of Germany

Continuation of Ser. No. 705,285, Jul. 14, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,910

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1975, 2531734

Int. Cl.² D04B *3/06*

U.S. Cl. 66—125 R **24 Claims**



1. A method of automatically feeding to a loop forming machine a plurality of threads by a plurality of first thread guides and a plurality of second thread guides, said method comprising the steps of moving said second thread guides one after the other in one direction along an endless path each second guide having a first position corresponding to the beginning of and a second position corresponding to the end of a fabric produced by said machine; feeding said threads via said second guides to said machine only during movement of said second guides from said first position to said second position; cutting said threads for obtaining thread ends when said second guides arrive at said second position; drawing said thread ends out of said second guides at said second position; returning said thread ends back to said first position so that twisting of said plurality of said threads will not occur; returning said second guides back to said first position along said endless path; and inserting each of said returned thread ends into an associated one of said second returned thread guides at said first position for again feeding the thread associated with said thread end to said machine.

4,109,492

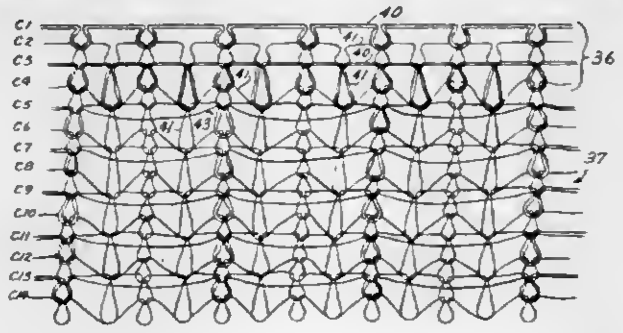
NO ROLL STOCKING AND METHOD

Fred B. Roberts, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 13, 1976, Ser. No. 722,754

Int. Cl.² D04B *9/24, 9/54*

U.S. Cl. 66—172 E **4 Claims**



1. A stocking having a single thickness throughout the length thereof, comprising

a topmost course comprising both elastic yarn and inelastic yarn jersey stitches with *x* wales, wherein *x* is an integer greater than one,

a second course comprising only inelastic yarn jersey stitches, said second course and all succeeding courses having 2*x* wales,

a third course comprising both elastic yarn and inelastic yarn jersey stitches,

a fourth course comprising only inelastic yarn tuck-stitches,

a plurality of alternate courses of floated elastic yarn and inelastic yarn and a plurality of intervening courses of only inelastic yarn providing a relatively wide mock ribbed section, and

an inelastic yarn sock body portion including a toe.

4,109,493

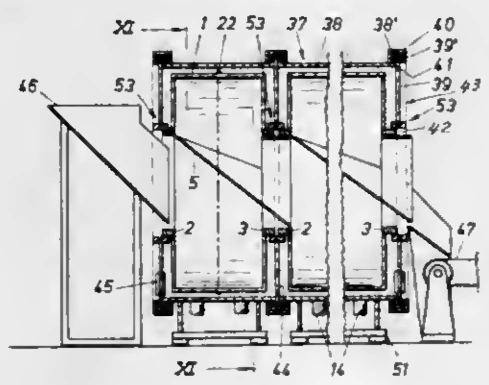
DRUM-TYPE MACHINE FOR THE TREATMENT OF TEXTILE MATERIAL

Ernst Hugenbruch, Glockenstrasse 25, 4000 Düsseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1976, Ser. No. 660,276

Int. Cl.² D06F *31/00*

U.S. Cl. 68—27 **16 Claims**



1. Drum-type machine for the thermal dry or wet treatment of textile material, comprising at least one rotatable, approximately horizontal drum having an axis, an outside surface and two end walls, the drum being surrounded by a nonrotatable housing with end walls, a drive mechanism connected with the drum by a drive means, characterized in that two radially externally exposed bearings spaced from one another in the axial direction of the drum are provided at least in the proximity of the end walls of the drum, the drive means being placed about the drum between the bearings approximately in the center of the drum for contacting the outside surface of the drum and for transmitting the drive force to the drum, the end walls of the drum being provided with central openings for charging and unloading of the textile material, the openings being surrounded by connection pipes forming a portion of the bearings, the bearings being fashioned as slide bearings including bearings shells integral with the end walls of the housing, and further comprising a plurality of drums supported in housings and arranged one behind the other in axial alignment with common bearing shells between adjacent drums, the bearing shells cooperating with the connection pipes of two adjacent drums for forming a sliding bearing thereat.

4,109,494

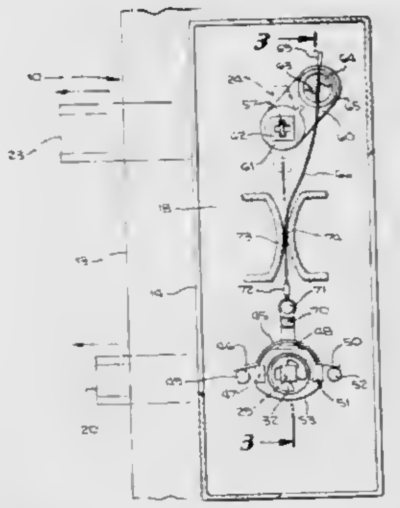
SIMULTANEOUS RETRACT MECHANISM

James G. Allemann, Santa Ana, Calif., assignor to Norris Industries, South Gate, Calif.

Filed May 31, 1977, Ser. No. 802,042

Int. Cl.² E05B *59/00*

U.S. Cl. 70—107 **8 Claims**



1. In a locking device for a door comprising a knob and spindle actuator for a latch bolt for shifting said latch bolt between latched extended and unlatched withdrawn positions, and a dead bolt shaft for a dead bolt lock assembly for shifting a dead bolt between a locked extended position and an unlocked withdrawn position, a linkage comprising a lever arm having a captive end nonrotatably attached to the spindle, a bell crank arm having a captive end nonrotatably attached to the dead bolt shaft and a connector between said bell crank arm and said lever arm, said connector comprising a single flexible member having a fixed attachment to the free end of one of said arms and a second attachment to the free end of the other of said arms, said second attachment being movable endwise relative to said free end of the other of said arms in one direction and immovable endwise relative to said free end of the other of said arms in the other direction whereby the bell crank arm is rotated in response to the action of the lever arm and the lever arm remains undisturbed by rotation of the bell crank arm.

4,109,495

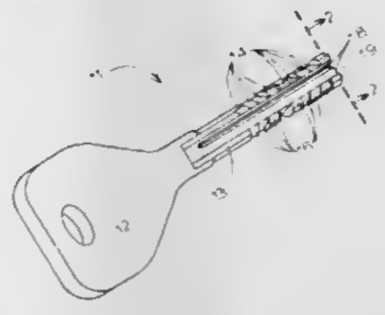
KEY AND TUMBLER CONSTRUCTION

Marvin E. Roberts, 2305 S. Arlington Ave., Reno, Nev. 89509

Continuation-in-part of Ser. No. 671,010, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 505,367, Sep. 12, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,508

Int. Cl.² E05B *15/14, 19/02, 29/08*

U.S. Cl. 70—365 **6 Claims**



1. A key construction for use in cooperation with a lock incorporating rotary disc tumblers, said key having an elongate shank of a generally rectangular shape, said shank having two bittable portions formed thereonto, each of said portions extending lengthwise along said shank, said portions positioned opposite one another with said shank being centrally disposed therebetween, each of said portions being formed as truncated cylindrical segments whose common axis is coincidental with the rotational axis of said key, said shank being formed longitudinally parallel to its rotational axis in any one of a plurality of cross-sectional configurations, each of said configurations being formed with a maximum width across said cross-section of a lesser width than the width of either of said bittable portions.

4,109,496

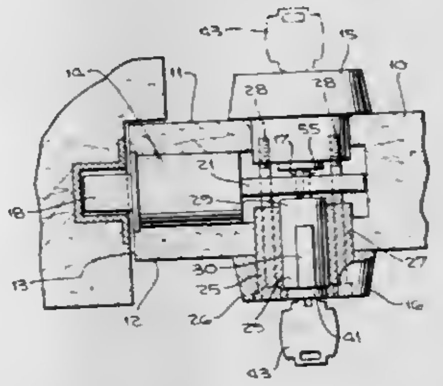
TRAPPED KEY MECHANISM

James G. Allemann, Santa Ana, and Michael W. Grey, South Gate, both of Calif., assignors to Norris Industries, South Gate, Calif.

Filed Dec. 20, 1977, Ser. No. 862,558

Int. Cl.² E05B *11/00*

U.S. Cl. 70—380 **8 Claims**

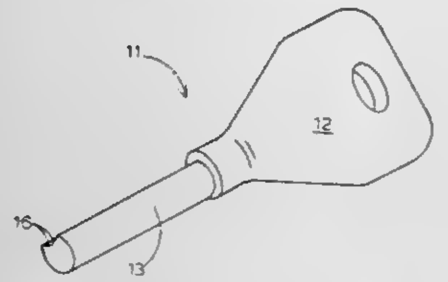


1. A trapped key mechanism for a security type dead locking bolt provided with a rotatable hub in roll back association with the locking bolt for shifting the locking bolt between extended locked position and retracted posiiton, and an inner key actuated mechanism having an inner tail piece in operative engagement with the hub, said inner key actuated mechanism comprising a cylinder, and a cylinder plug having a keyway therein for reception of a key, said plug being rotatably mounted in the cylinder for key operation between an initial position wherein the locking bolt is withdrawn and positions rotatably removed from initial position wherein the locking bolt is extended, there being a sheer line between said plug and said cylinder with spring actuated tumblers acting between said plug and cylinder

across said sheer line, a drive washer for said inner tail piece in axial alignment with the plug and having a drive slot therein, a guide washer intermediate the plug and the drive washer, a spring urged drive pin intermediate the plug and the guide washer and a drive pin guide hole through the guide washer slidably receiving said guide pin and having a position of alignment with the drive slot in said initial position of the keyway, and resilient return means acting between the drive washer and the drive pin guide washer biased to normally urge the drive pin guide washer toward a position effecting disengagement of said drive pin from said drive slot at only said initial position, whereby said key is trapped in said keyway at all positions other than said initial position.

4,109,497
KEY CONSTRUCTION

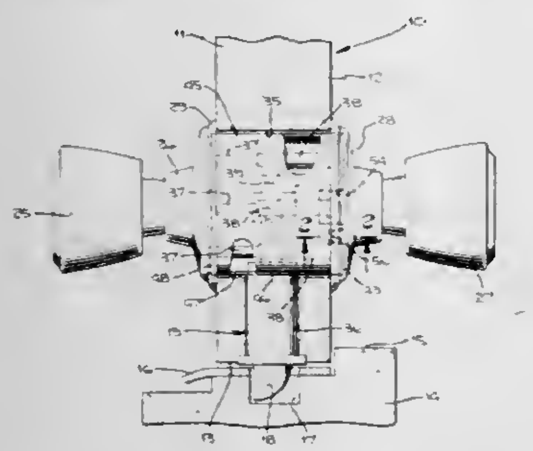
Marvin E. Roberts, 2305 S. Arlington Ave., Reno, Nebr. 89509
Continuation-in-part of Ser. No. 671,010, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 505,367, Sep. 12, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,506
Int. Cl.² E05B *19/02*
U.S. Cl. 70—403 **5 Claims**



1. A key construction prior to code bittings being formed thereinto, said key having a generally circular cylindrical shank, said shank being formed with a vee-shaped groove thereinto, see vee-groove being formed with two sides intersecting in a substantially straight line at the base of said vee-groove, said vee-groove being formed longitudinally along said shank parallel to the axis thereof, said vee-groove having a depth radially into said shank less than the major radius of said shank.

4,109,498
FIRE SLEEVE FOR TUBULAR LOCKS

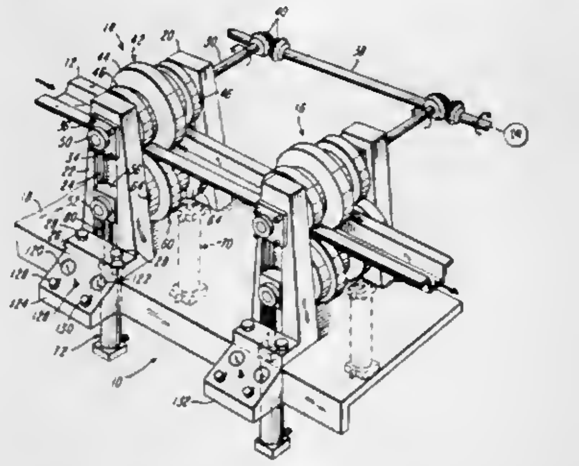
Hagen Dietrich, Delta, Canada, assignor to Norris Industries, South Gate, Calif.
Filed Jun. 23, 1977, Ser. No. 809,175
Int. Cl.² E05B *9/04*
U.S. Cl. 70—449 **6 Claims**



1. In a tubular type lock installation for a door of conventional thickness having a bore therethrough from one face to the other having a length equal to the door thickness and wherein the tubular type lock has a latch bolt subassembly extending from one side and a trim liner and trim cover in overlying relationship, a radially inwardly extending flange on the trim cover spaced from the trim liner forming with the liner a perimetrically located recess means therebetween on one face only of the door, the improvement comprising a fire resistant split sleeve of metallic material having a length at least equal to the length of the bore and a plurality of tabs with end edges of substantially reduced thickness adjacent one end only projecting radially outwardly beyond the perimeter, said sleeve having a potentially outwardly urged condition with a diameter greater than the diameter of the bore and subject to compression to a diameter wherein said tabs lie radially inwardly of the perimetrically located recess means and substantially in diametrical alignment in operative condition, said sleeve in operative condition being partially expanded to a size wherein the perimetrical surface of the sleeve is in substantial engagement with the wall of the bore and the end edges of the tabs are projected into the recess means.

4,109,499
ROLL FORMING APPARATUS AND METHOD

Barlow W. Brooks, and Barlow W. Brooks, Jr., both of Anchorage, Ky., assignors to Roll Forming Corporation, Shelbyville, Ky.
Filed Feb. 16, 1977, Ser. No. 769,225
Int. Cl.² B21D *5/14*
U.S. Cl. 72—181 **29 Claims**

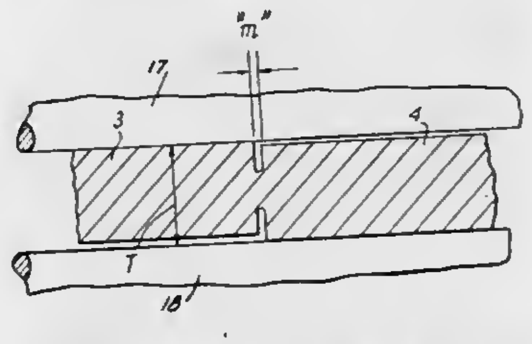


1. In a roll forming machine of the type having a plurality of pairs of rolls for progressively forming stock, at least one roll of one of said pairs of rolls being movable relative to the other roll of said pair of rolls, the improvement comprising means for maintaining a substantially uniform pressure on said rolls and the stock regardless of the thickness of the stock or changes in the thickness of the stock that may occur during a roll forming operation, said means comprising fluid operated means including fluid operated actuators pressing said one roll toward said other roll, and means for adjusting the pressure maintained on said rolls comprising adjustable fluid pressure regulator means.

4,109,500
CREATING LINES OF WEAKNESS IN SHEET MATERIAL

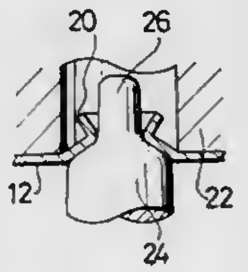
Jozef T. Franek, Chorleywood, England, assignor to Metal Box Limited, Reading, England
Filed Sep. 23, 1974, Ser. No. 508,625
Claims priority, application United Kingdom, Sep. 27, 1973, 45195/73
Int. Cl.² B21B *15/00*
U.S. Cl. 72—203 **6 Claims**

1. Apparatus for making lines of weakness in sheet material, said apparatus comprising at least a pair of parallel rotating shafts having at least one cutter on each of said shafts, said cutters being axially offset and spaced apart transversely of said shafts to coact and cause partial slitting of material conveyed between them, said cutters being operative to offset adjacent portions of sheet material on opposite sides of a line of weakness formed therein out of an original plane of the sheet material, and means for urging the resultant offset sheet material portions back toward a generally planar state.



4,109,501
METHOD FOR THE PRODUCTION OF HEAT EXCHANGER FINS

Toyoo Kozima, Tokyo, Japan, assignor to Hidaka Engineering Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 604,306, Aug. 13, 1975, Pat. No. 4,055,067. This application Mar. 14, 1977, Ser. No. 777,326
Claims priority, application Japan, Sep. 11, 1974, 49-103808
Int. Cl.² B21D *31/02*
U.S. Cl. 72—327 **4 Claims**



1. A method for producing heat-exchanger fins. comprising the steps of:

piercing a sheet of metal to define a plurality of apertures each having a diameter that is smaller than the diameter of the flanged apertures that are to be ultimately formed,

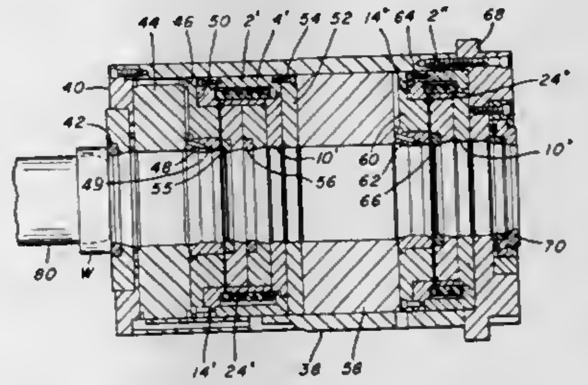
burring said apertures to form a cylinder-like projection having a diameter smaller than the diameter of the flanged apertures to be ultimately formed by using a plurality of first punches each having a diameter smaller than the diameter of the ultimately formed flanged apertures and a plurality of first dies each receiving said punches; and

ironing said cylinder-like projections to form a plurality of flanged apertures of the desired dimention by using a second plurality of punches and dies that have a diameter larger than the first plurality of punches and dies.

4,109,502
CAN MAKING

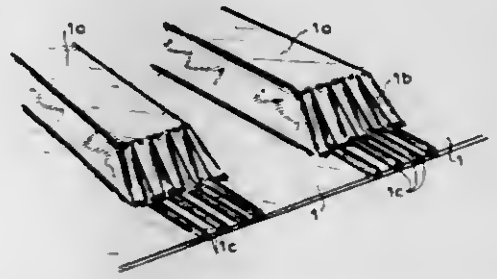
Dennis A. Schaffer, Hendersonville, Tenn., assignor to Carmet Company, Pittsburgh, Pa.
Filed Aug. 26, 1977, Ser. No. 827,908
Int. Cl.² B21D *22/28*
U.S. Cl. 72—349 **12 Claims**

1. A die container comprising an outer ring, two inwardly extending radial members secured to said outer ring in axially spaced relationship so as to provide a peripheral space, a floating ring having a length less than the axial length of said space positioned at the inner end of said space, said floating ring having an outer diameter substantially less than the inner diameter of said outer ring, at least three segments in said space surrounding said floating ring, the thickness of each segment being less than the average distance between said die ring and the outer wall of said peripheral space, resilient means urging said segments inwardly, and means concentric with the normal axis of the die for limiting inward movement of said segments.



4,109,503
METHOD FOR MANUFACTURING METALLIC RIBS ON SHEET STOCK

Jean Francon, rue de la Veronniere, and Francis Francon, rue Ennemond Richard, both of 42400 Saint-Chamond, France
Filed Feb. 2, 1977, Ser. No. 764,969
Claims priority, application France, Feb. 2, 1976, 76 03795; Jun. 15, 1976, 76 19008
Int. Cl.² B21C *37/02*
U.S. Cl. 72—352 **11 Claims**



1. The process of forming a sheet at low pressure to produce therein a longitudinal corrugation having a major length of large cross-section and having ends of minor length which gradually taper from the large cross-section of the major length into the plane of the sheet, the outermost ends of the tapered ends stoping substantially short of the adjacent ends of said sheet, said process comprising:

forming the major length and the two tapered minor lengths of said longitudinal corrugation between matched male and female die members by closing and pressing said die about said sheet;

whereby excess sheet material tends to be present in the region of the sheet longitudinally extending from the ends of the longitudinal corrugation to the adjacent edge of the sheet and whereby said excess material in said region tends to produce wrinkles;

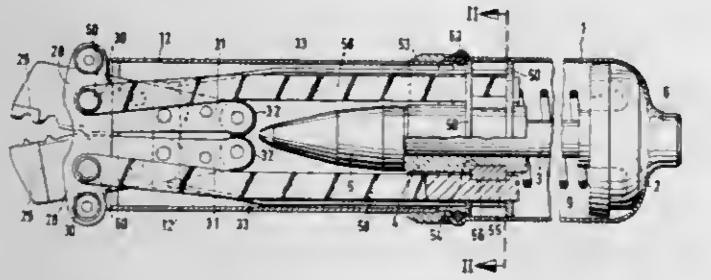
forming a plurality of parallel mini-corrugations in said region with the length of each mini-corrugation being parallel to the length of the longitudinal corrugation and each mini-corrugation being located so that it intersects one of said tapered ends;

whereby said mini-corrugations absorb said excess material while protruding from the plane of said sheet only a minor fraction of the corresponding protrusion of said longitudinal corrugation; and

whereby the corrugated sheet produced by the process does not wrinkle from excess material in said region, and will, with the corrugation protruding upwardly from the plane of the sheet, lie flat.

4,109,504
CRIMPING TOOL FOR PRODUCING SOLDERLESS PERMANENT ELECTRICAL CONNECTIONS

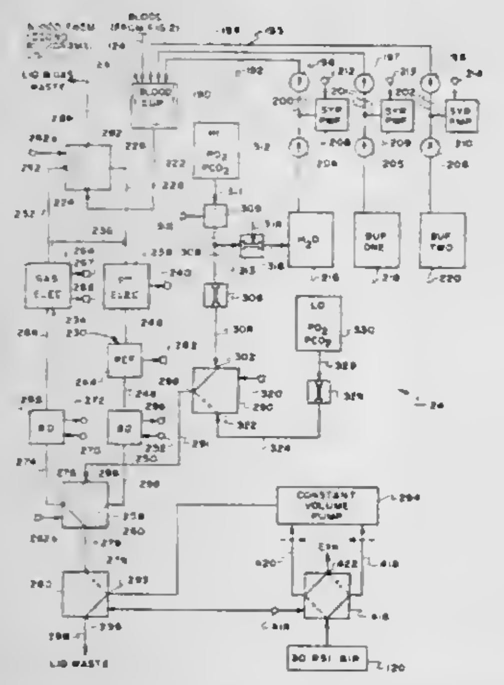
Reiner Rommel, Moldaustrasse 6, 3570 Stadt Allendorf, Fed. Rep. of Germany
Filed Apr. 22, 1977, Ser. No. 789,878
Int. Cl.² B21D *7/06*
U.S. Cl. 72—407 **18 Claims**



1. A crimping tool comprising, in combination: cheek plates; an axially reciprocating piston; a lever drive; said cheek plates being closed and opened by said axially reciprocating piston via said lever drive; securing means linked to said piston drive and operating as a function of the piston motion, said securing means permitting interruption of the piston drive only after complete closure of said cheek plates; said securing means comprises guide means on an actuating lever for turning on and off said cheek plate drive and extending in the direction of piston movement; an abutment slidable along said guide means and located on said piston; said guide means having on one end a point of engagement and having on the other end a point of disconnection at a distance corresponding to the full piston stroke, so that during actuation of said actuating lever said guide means and abutment are engaged for holding said actuating lever in the turned-on position for the duration of a full piston stroke.

4,109,505
AUTOMATED BLOOD ANALYSIS SYSTEM

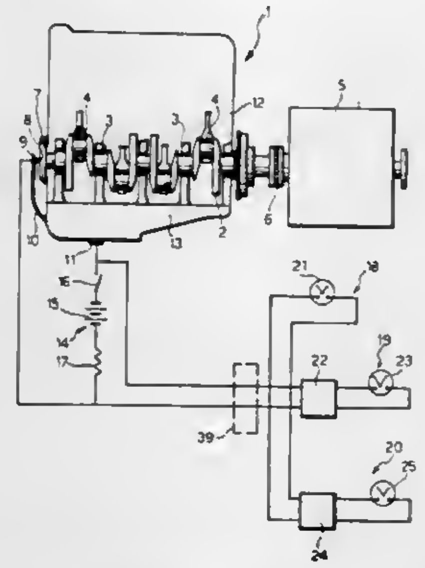
Justin S. Clark, and Lloyd George Veasy, both of Salt Lake City, Utah, assignors to Primary Children's Hospital, Salt Lake City, Utah
Division of Ser. No. 490,603, Jul. 22, 1974, Pat. No. 3,910,256, which is a division of Ser. No. 319,561, Dec. 29, 1972, Pat. No. 3,838,682. This application Apr. 7, 1975, Ser. No. 566,023
Int. Cl.² G01N *27/26*
U.S. Cl. 73—1 R **9 Claims**



1. An automated blood unit to provide a fool proof safety check against calibration drift comprising:
a blood gas tester;
a blood pH tester;
fluid source means providing a source of blood, a source of blood gas test calibration gases, and a source of blood pH test calibration buffer solution; and
means including pumps and valves and operable in response to a controlled program to calibrate said gas tester and said pH tester by applying calibration fluid thereto and sampling the readings thereof, immediately followed by filling said testers with blood and sampling the readings thereof, and then immediately applying said calibration fluids to said testers and taking an additional sampling thereof, whereby said testers are calibrated both immediately before and immediately after the testing of blood such that blood test results may be discarded if before and after calibration readings differ.

4,109,506
DEVICE FOR MONITORING THE LUBRICATION OF THE CRANKSHAFT OF A RECIPROCATING INTERNAL COMBUSTION ENGINE

Cesare Bassoli, and Giorgio Cornetti, both of Turin, Italy, assignors to FIAT Societa per Azioni, Turin, Italy
Filed Nov. 14, 1977, Ser. No. 851,565
Claims priority, application Italy, Dec. 2, 1976, 69882 A/76
Int. Cl.² G01M *15/00*
U.S. Cl. 73—10 **5 Claims**



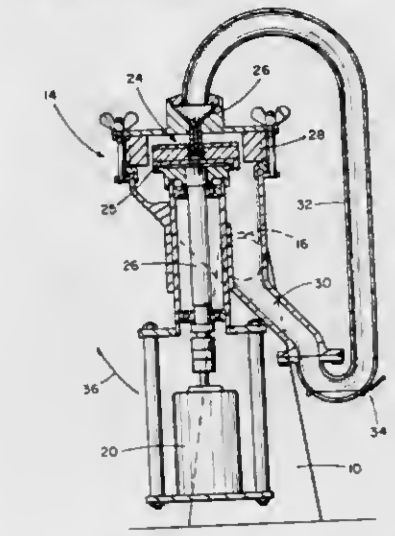
1. In a device for testing the lubrication of the crankshaft of a reciprocating internal combustion engine, said device being connectable to a potentiometer circuit having first and second electrodes, said first electrode being connected electrically to said crankshaft and said second electrode being connected electrically to the engine block, said device including at least a first detector unit including an averaging voltage detector,
the improvement wherein:
said device also inlcudes a second detector unit,
means connecting said second detector unit in parallel with said averaging voltage detector across said potentiometer circuit, said second detector unit comprising a first threshold discriminator circuit, and
a second averaging voltage detector, connected to the output from said threshold discriminator circuit.

4,109,507
RECIRCULATING SHOT TESTING DEVICE

Robert J. Neidigh, Bremen, Ind., assignor to Wheelabrator-Frye Inc., Mishawaka, Ind.
Filed Aug. 16, 1977, Ser. No. 825,092
Int. Cl.² G01N *3/08*
U.S. Cl. 73—12 **8 Claims**

1. A device for life testing particulate comprising:
(a) a target,

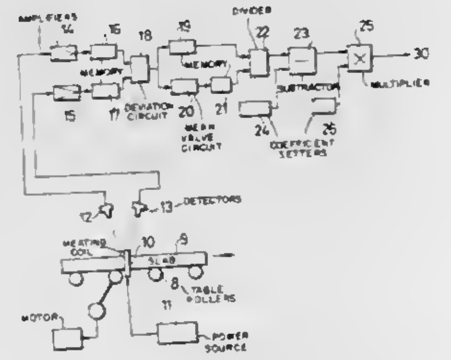
(b) means for projecting said particulate against said target at high velocity, said target and said projecting means mounted on a frame,
(c) means for collecting spent particulate, and
(d) means for returning said particulate from said collecting means to said projecting means by force of gravity, said returning means including



(i) means for rotating said frame at a selected speed,
(ii) a recirculating tube communicating said collecting means with said projecting means,
whereby rotation of said frame causes substantially all of said particulate to move by force of gravity from said collecting means into and through said recirculating tube back to said projecting means.

4,109,508
METHOD OF DETECTING A SURFACE FLAW OF METALLIC MATERIAL

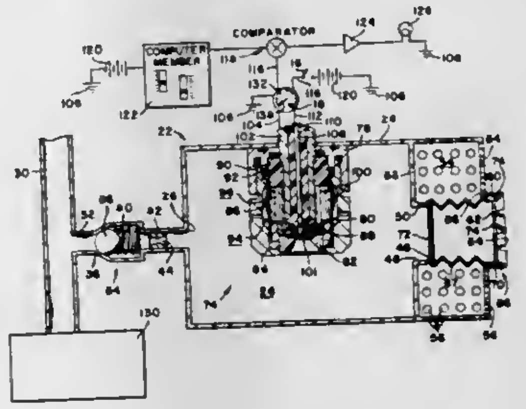
Masaru Fukuyama, Himeji, Japan, assignor to Nipponn Steel Corporation, Tokyo, Japan
Filed Apr. 30, 1976, Ser. No. 682,023
Claims priority, application Japan, Jun. 26, 1975, 50-79905
Int. Cl.² G01N *25/72*
U.S. Cl. 73—15 FD **6 Claims**



1. A method for detecting a surface defect or flaw of metallic material, comprising the steps of:
detecting the surface temperature of the metallic material in a linear manner;
subjecting the surface layer of the metallic material to high-frequency induction heating;
detecting the surface temperature of the same portion of the metallic material as that detected before induction heating;
determining a deviation signal between the surface temperature detected before and after induction heating;
determining a mean value signal of temperature rise from said deviation signal; and
determining the depth of the surface defect or flaw as a function of the ratio of the deviation signal to the mean value signal of temperature rise.

4,109,509
OXYGEN MONITOR AND WARNING DEVICE FOR AN AIRCRAFT BREATHING SYSTEM

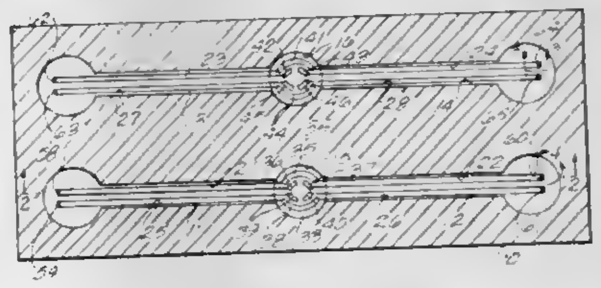
Robert L. Cramer, and John W. Heaneman, both of Davenport, Iowa, assignors to The Bendix Corporation, Southfield, Mich.
Filed Sep. 30, 1977, Ser. No. 838,278
Int. Cl.² G01N *31/00;* A62B *7/14*
U.S. Cl. 73—23 **11 Claims**



1. In an aircraft breathing system having a sensor for monitoring the concentration of oxygen in a source of breathable fluid supplied to a recipient, means for developing a minimum constant absolute pressure in a sample of breathable fluid to maintain the accuracy of the sensor within acceptable limits above a predetermined altitude, said means comprising:
a housing having a chamber therein, said chamber being connected to said sensor, said chamber having a first port connected to said source of breathable fluid and a second port connected to the surrounding environment, said sample of breathable fluid flowing through said chamber to the surrounding environment to provide said sensor with a continuous indication of the breathable fluid supplied to said recipient; and
aneroid means for restricting the flow of the breathable fluid through said second port as a function of altitude to establish said minimum constant absolute pressure in said sample.

4,109,510
FLUID MEASURING APPARATUS

Jerome A. Rodder, 774 Sunshine Dr., Los Altos, Calif. 94022
Filed Apr. 14, 1977, Ser. Nn. 787,468
Int. Cl.² G01N *27/04;* G01F *1/68*
U.S. Cl. 73—27 R **19 Claims**



1. Fluid measuring apparatus comprising:
a housing having an elongated cavity enclosed on its sides;
a first thin elongated hot wire bent in half to extend along the length of the cavity away from a junction;
a second thin elongated hot wire bent in half to extend along the length of the cavity away from the junction;
first means at the junction for supporting the ends of each hot wire in spaced electrically isolated relationship from each other and connecting one end of the first and second hot wires to each other to form in effect a first single hot wire equal in length to the first and second hot wires;
second means spaced along the length of the cavity from the junction for supporting the middle of the first hot wire to

exert tension thereon as the length of the first hot wire changes;

third means spaced along the length of the cavity from the junction for supporting the middle of the second hot wire to exert tension thereon as the length of the second hot wire changes;

means for forming in the housing a fluid entrance to the cavity;

means for forming in the housing a fluid exit from the cavity longitudinally spaced from the entrance so the hot wires lie between the entrance and the exit; and

means for measuring the change in resistance of the hot wires.

17. Fluid measuring apparatus comprising:

a housing having an elongated cavity enclosed on its sides;

a thin elongated hot wire bent in half to extend along the length of the cavity;

means at one area of the cavity for supporting the ends of the hot wire in closely spaced, electrically isolated relationship from each other;

first and second closely spaced rods at another area of the cavity spaced from the one area to support the middle of the wire, the middle of the wire being wrapped around the rods and the rods being deformed to exert tension on the hot wire to keep the hot wire taut as its length changes;

means for maintaining the spacing of the first and second rods;

means for forming in the housing a fluid entrance to the cavity;

means for forming in the housing a fluid exit from the cavity longitudinally spaced from the entrance so the hot wire lies between the entrance and the exit; and

means for measuring the change in resistance of the hot wire.

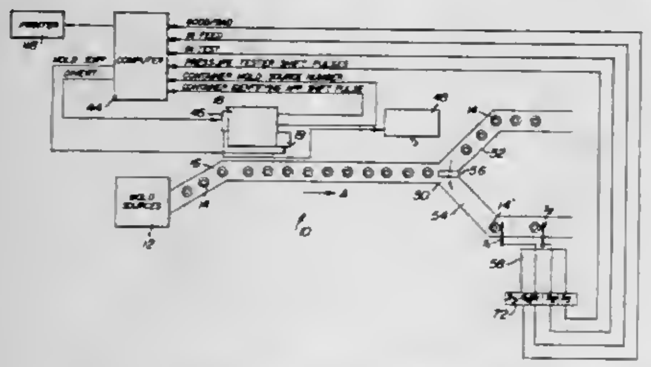
4,109,511
METHOD AND APPARATUS FOR STATISTICALLY TESTING FRANGIBLE CONTAINERS

Whitney S. Powers, Jr., Pine City; Ross L. Hobler, Elmira; Nelson H. Bryant, Ithaca, all of N.Y., and Wilbur J. Allen, Millerton, Pa., assignors to Powers Manufacturing, Inc., Elmira, N.Y.

Continuation-in-part of Ser. No. 712,991, Aug. 8, 1976, Pat. No. 4,081,991. This application Dec. 16, 1976, Ser. No. 751,786

Int. Cl.² B07C *5/34;* G01M *3/36*

U.S. Cl. 73—37.6 19 Claims



6. A method of automatically upgrading a procession of containers produced by plural container mold sources, comprising:

automatically identifying each container produced by said plural container mold sources,

diverting selected identified containers produced by at least one preselected mold source to a pressure test station at a first predetermined rate under computer control

automatically pressure testing the containers diverted at the first predetermined rate to determine whether each diverted container is defective,

selectively diverting other identified containers produced by said preselected mold source at a second predetermined rate effectively greater than said first predetermined rate if at least one of said tested containers is determined to be defective,

automatically pressure testing the containers diverted at the second predetermined rate to determine whether each such diverted container is defective, and

automatically rejecting all other identified containers produced by said preselected mold source over a fixed period of time if at least one of said containers diverted at the second predetermined rate is determined to be defective.

17. Apparatus for statistically testing containers which are moved in a procession to a location at which the containers can be diverted from the procession, each container having identifying indicia in respect to at least one of a plurality of mold sources, comprising:

means for automatically identifying each of said containers according to said identifying indicia provided thereon before said containers are moved to said location at which they can be diverted,

means for automatically tracking the movement of each identified container in said procession to said location,

means disposed at said location for diverting selected identified containers produced by at least one preselected mold source from said procession at a first predetermined rate, and

a test station for testing a physical property of said diverted containers automatically and for providing a signal indicative of whether each tested container is defective.

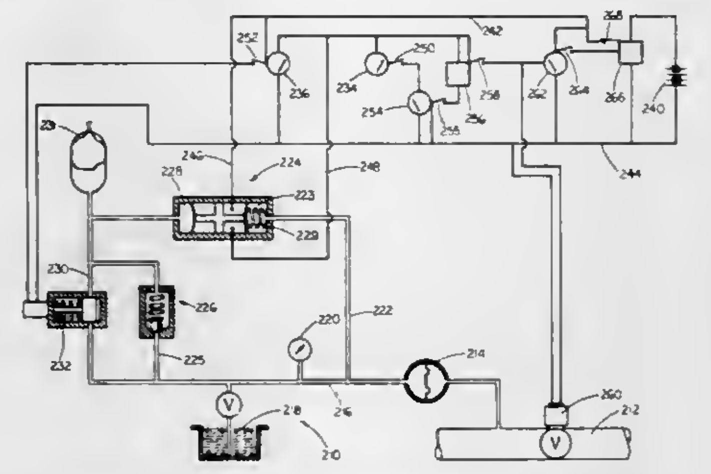
4,109,512
LINEBREAK DETECTION SYSTEM

Howard L. Ledeen, Pasadena, and Franz Schmon, Granada, both of Calif., assignors to Ledeen Flow Control Systems, Sun Valley, Calif.

Continuation-in-part of Ser. No. 718,757, Aug. 30, 1976, Pat. No. 4,051,715. This application Sep. 29, 1977, Ser. No. 837,684

Int. Cl.² G01M *3/28*

U.S. Cl. 73—40.5 R 5 Claims



1. A pipeline pressure drop monitoring system comprising:

means for transmitting an actuating signal in response to each decrease in pipeline pressure of a given increment;

timing means activated by receipt of an acutating signal to deliver an energizing signal for a predetermined period;

output means conditioned while a said energizing signal is imposed thereon to deliver an action signal after a timed delay longer than said predetermined period;

said output means comprising;

a source of electricity;

electrical circuit connected from said source to said output means; and

a normally-open, on delay relay having a switch connected in parallel in said circuit and adapted to be closed after a time delay cycle;

said time delay cycle being longer than said predetermined period and being initiated and continued while a said energizing signal is imposed thereon.

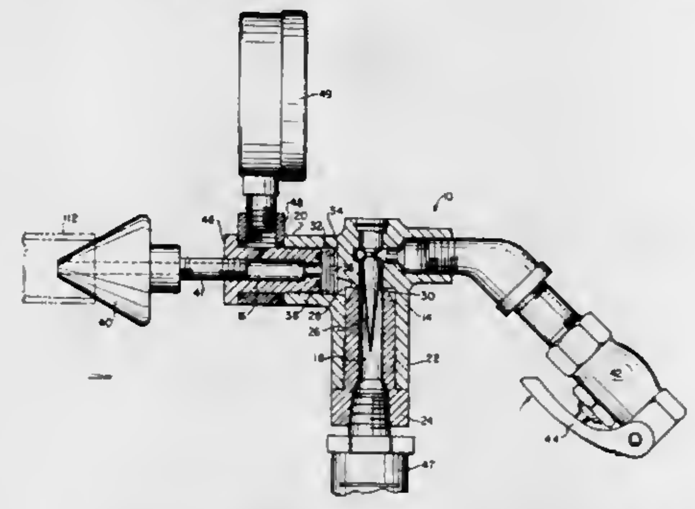
4,109,513
LEAK DETECTOR APPARATUS

Donald E. Schott, Chester, Vt., assignor to Thomas C. Wilson, Inc., Long Island City, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,910

Int. Cl.² G01M *3/28*

U.S. Cl. 73—49.1 32 Claims



1. An apparatus adapted to be positioned in adjacent engaged relation with a member defining a confined space for creating at least a partial vacuum in said confined space which comprises: housing means having a first section and a second section, said second section being angled relative to said first section and configured for gripping; induction means operatively connected to said housing means for selectively inducing sub-atmospheric fluidic pressure therein; valve means operatively positioned within said housing means to selectively permit fluidic communication between a source of relatively compressed fluid and the housing means and between said induction means and said confined space, said valve means including at least a first valve device movable by forces generated within the housing at least to a closed position which forces urge said valve device along a predetermined linear path generally parallel to the axis of said first housing section so as to move said valve device into engagement with a corresponding valve seat so as to seal off fluidic communication between said confined space and induction means to maintain the partial vacuum thereby produced in said confined space for enabling testing of said confined space for fluidic leaks.

4,109,514
RHEOMETER AND USES THEREOF

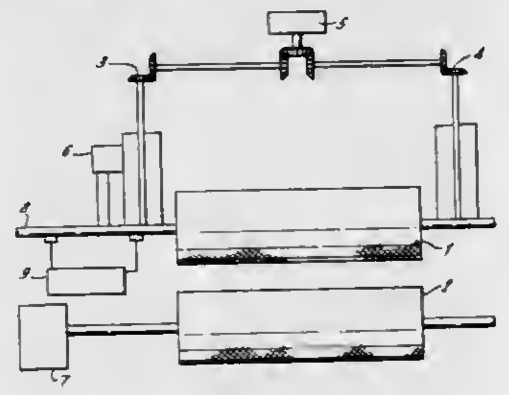
David Hamilton Thomas, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 11, 1977, Ser. No. 767,948

Claims priority, application United Kingdom, Feb. 17, 1976, 6183/76; May 19, 1976, 20676/76

Int. Cl.² G01N *11/00*

U.S. Cl. 73—58 15 Claims



1. A rheometer which comprises:

(a) two rollers disposed in spaced-apart relationship with their axes parallel and located so that they can be placed into contact with opposite sides of a material under test said rollers being rotatable relative to one another while remaining in contact with said material, and means for adjusting the distance between said rollers so that test material of varying thicknesses can be accommodated in the space between them in contact with both rollers under constant and predetermined pressure,

(b) means for rotating one of said rollers and,

(c) means for maintaining the material under test under constant pressures by the surfaces and,

(d) a torque measuring device connected to one of said rollers for measuring the torque imparted to the latter upon rotation of and said roller when test material is under pressure between said rollers.

4,109,515
PHOTOELASTIC STAMPING ANALYSIS

Willard E. Swenson, Jr., Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 10, 1976, Ser. No. 684,526

Int. Cl.² G01N *3/28;* G01B *11/18*

U.S. Cl. 73—88 A 20 Claims

1. A method of analyzing formability, strain level, or a related physical characteristic of a given material for a blank which is formed into a desired shape comprising:

providing a blank of said given material;

applying a flowable photoelastic coating as a single layer directly on a selected surface area of the blank which is to be analyzed and allowing the single layer to fully cure and itself form a tenacious bond directly to the surface of the blank material;

then forming the coated blank into the desired shape; and

subjecting the coating to analysis;

wherein the perimeter of said selected surface area is dammed prior to application of the coating thereto so as to contain the flowable coating within the selected surface area.

4,109,516
CAM PLASTOMETER

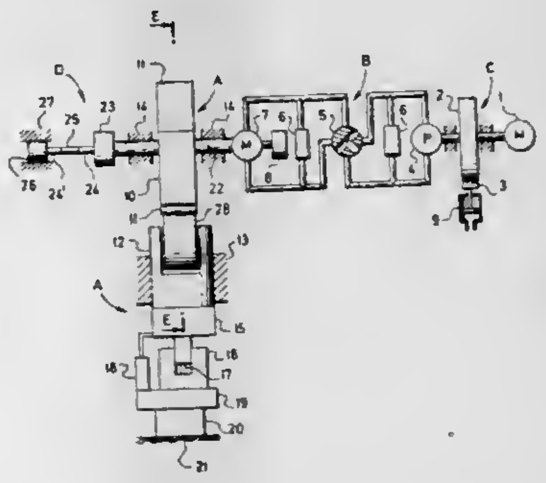
Jan Fuxa, Ostrava, Czechoslovakia, assignor to Vyzkumny ustav hutnictvi zeleza, Dobra, Czechoslovakia

Filed Mar. 23, 1977, Ser. No. 780,315

Claims priority, application Czechoslovakia, Apr. 2, 1976, 2148/76

Int. Cl.² G01N *3/00*

U.S. Cl. 73—93 1 Claim



1. A dynamic cam plastometer for simulating multiple deformation processes, comprising:

a rotatable disc cam having a plurality of peripheral lobes;

a first shaft for rotating said disc;

a second shaft coupled for rotation with said first shaft;

a torsion element connected to said second shaft;

- a hydromotor connected to said first shaft for rotating said shafts and said disc in accordance with a hydraulic control signal corresponding to the magnitude and direction of the desired shaft rotation for rotating said first shaft through a predetermined number of revolutions in accordance with a preset deformation vs. time profile;
- a hydraulic control circuit for generating said control signal, said circuit comprising programming means including a coding disc coupled to said first shaft, a regulating pump and a hydraulic distributor coupled between said pump and said hydromotor;
- means for disposing a first specimen to be tested between said torsion element and a fixed support;
- a cam follower comprising a roller contacting the periphery of said disc, and a displaceable follower element coupled to the roller for linear movement in response to rotation of said cam;
- a rigid jaw coupled to said follower element; and
- means for disposing a second specimen to be tested between said jaw and a fixed rigid surface.

4,109,517
METHOD AND APPARATUS FOR CONTROLLING THE CORRECT ANGULAR ADJUSTMENT OF PERIODIC INJECTION OPERATIONS

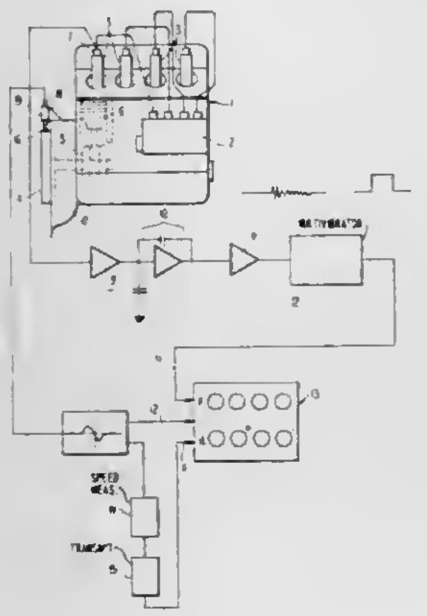
Manfred Dyballa, Aichwald, and Dieter Schutzenauer, Schorndorf, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 20, 1976, Ser. No. 716,204

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1975, 2537219

Int. Cl.² G01M *15/00*

U.S. Cl. 73—119 A **60 Claims**



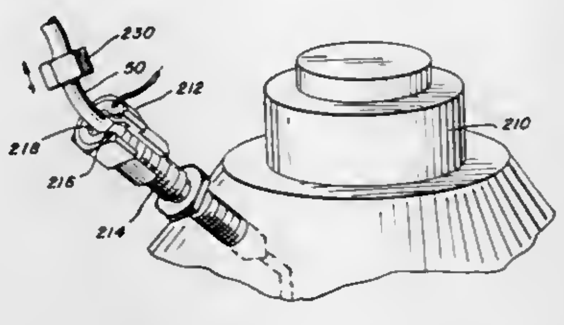
1. A method for determining the correct phase adjustment of periodic injection operations in cyclically operating internal combustion engines relative to a predetermined movement phase of drive unit parts of the internal combustion engine, comprising the steps of acoustically determining the closing of an injection valve of a working space of the engine while the internal combustion engine rotates, determining the time interval between the beginning of the noise representative of the closing of the injection valve with respect to the predetermined movement phase of the drive unit parts belonging to the working space, and utilizing the thus-determined time interval at least indirectly as control value.

4,109,518
ENGINE MONITORING APPARATUS

Joseph L. Dooley, Chicago, and Edward Yelke, La Grange, both of Ill., assignors to Creative Tool Company, Lyons, Ill. Division of Ser. No. 670,058, Mar. 24, 1976, Pat. No. 4,036,050. This application May 11, 1977, Ser. No. 796,008

Int. Cl.² G01M *15/00*

U.S. Cl. 73—119 A **10 Claims**



1. In a performance monitoring system for engines having one or more cylinders adapted to receive fuel injected from a pump through a line and wherein said fuel line is normally terminated at one or more of its ends in a fitting which is sealed by a nut which surrounds the line, a transducer assembly for developing an electrical signal in response to fuel pressure tending to separate the fuel line from said fitting comprising a nut-shaped housing having a first cutaway portion extending axially along one side thereof to allow said housing to be placed around the fuel line, a stress responsive transducer material coupled to said housing for producing an output signal in response to mechanical stress on said housing, said transducer assembly being adapted to replace the nut on said line in coupling said line into sealing engagement with said fitting.

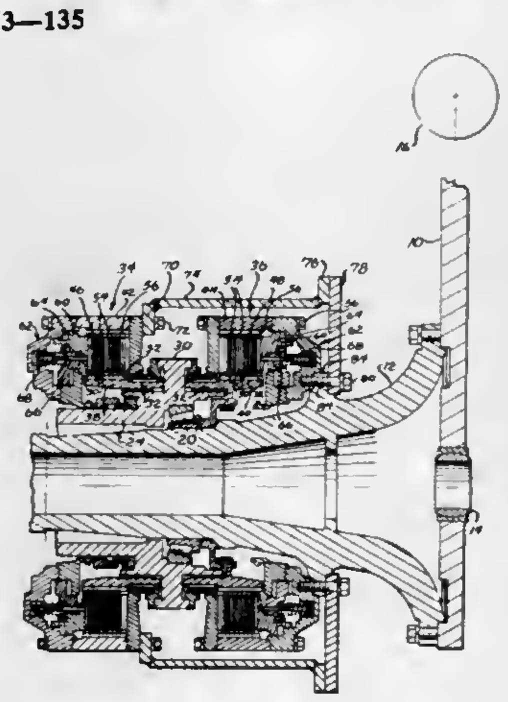
4,109,519
DYNAMOMETER EMPLOYING MULTIPLE DISC BRAKE ASSEMBLIES

Harold H. Bartlett; Charles H. Herr, Jr., and Ivan R. Lamport, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,640

Int. Cl.² G01L *3/18*

U.S. Cl. 73—135 **6 Claims**



1. In a dynamometer, the combination of:
- a base; means, including a shaft, adapted to be coupled to a rotary motive source to be tested;
- a pair of axially spaced, fluid-cooled, disc brakes concentric about said shaft and each having two relatively rotatable members, one of said members of each brake being journalled on said shaft and being affixed to said base thereby journalling said shaft on said base, the other of said members being connected to said shaft for rotation therewith;
- load measuring means connected to each said one member; and
- separate means connecting each said one member to said base whereby braking forces in each brake are transmitted independently to said base through respective ones of said separate means.

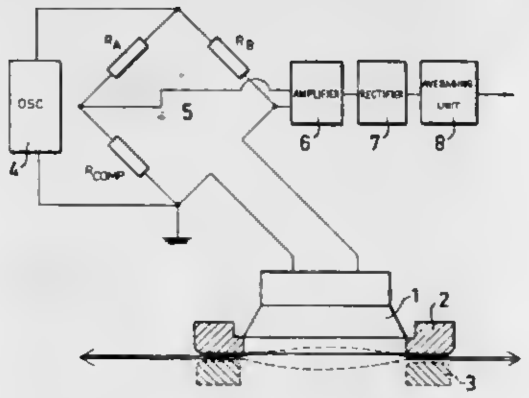
4,109,520
METHOD AND MEANS FOR MEASURING WEB TENSION IN PAPER OR FOILS

Leif Eriksson, Stockholm, Sweden, assignor to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Mar. 23, 1977, Ser. No. 780,518

Int. Cl.² G01L *5/10*

U.S. Cl. 73—143 **8 Claims**



1. A method for measuring the web tension of a running paper or foil web member under tension and having a resonant frequency related to the tension in the web, including the steps of supporting the member in a preselected area including a plurality of spaced supports longitudinally spaced in a direction along the web, subjecting the preselected area of the web to transverse oscillations of constant frequency, said transverse oscillations having an amplitude between two limit values proportional to the web tension, and coupling a measuring means to said area and generating a signal proportional to the amplitude of the transverse oscillations, said frequency selected to approach the fundamental resonant frequency of the web for said web tension.

4,109,521
METHOD AND APPARATUS FOR LOGGING INCLINED EARTH BOREHOLES USING THE MEASURED ACCELERATION OF THE WELL LOGGING INSTRUMENT

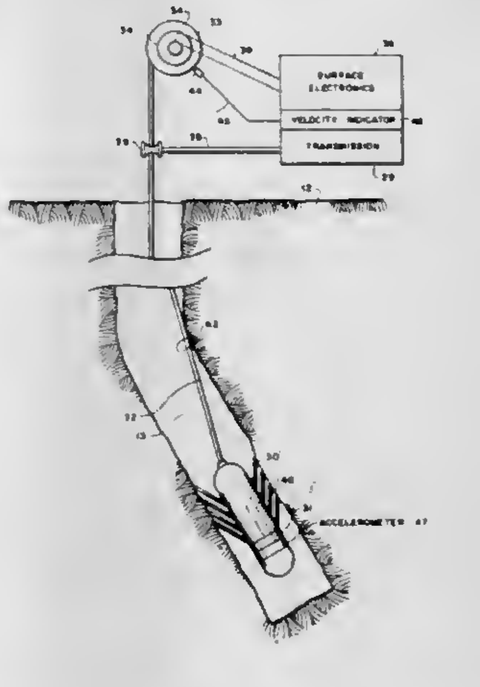
Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,682

Int. Cl.² E21B *47/00*

U.S. Cl. 73—151 **7 Claims**

5. A method for logging the formations surrounding an earth borehole, comprising:
- causing a well logging instrument to traverse an earth borehole by means of a well logging cable from the earth's surface;
- measuring the velocity of said cable at the earth's surface;
- measuring the velocity of said well logging instrument;
- comparing the said cable velocity with the said instrument velocity and generating a signal indicative of the comparison; and



- activating means within said instrument responsive to said signal which facilitates the movement of said instrument through said borehole.

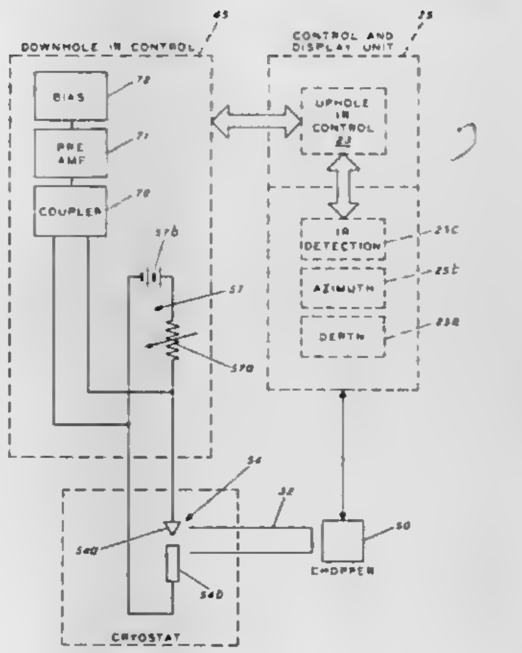
4,109,522
METHOD OF BOREHOLE LOGGING USING PASSIVE JOSEPHSON CURRENT DETECTOR TO DIRECTLY DETERMINE THE PRESENCE OF HYDROCARBONS

Don D. Thompson, Corona Del Mar, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 526,441, Nov. 22, 1974, abandoned, which is a continuation of Ser. No. 241,504, Apr. 6, 1972, abandoned. This application Nov. 4, 1976, Ser. No. 738,990

Int. Cl.² E21B *49/00*

U.S. Cl. 73—154 **23 Claims**



1. Apparatus for indicating the presence of hydrocarbons in an earth formation traversed by a wellbore by passively detecting infrared radiation therefrom due principally to stretching vibration having frequency components in a range of 8400 to 9600 gigahertz, comprising:
- a tool housing for traversing said wellbore;
- a Josephson-type detector tuned to operate with maximum response in a frequency range of about 8400 to 9600 gigahertz, comprising at least two superconducting bodies

positioned within said tool housing defining a current path through a sensing area therebetween;

means for selectively biasing said Josephson-type detector resulting in a Josephson-type current flow;

means connected to said Josephson-type detector for monitoring a change in the Josephson zero-voltage current characteristic of said Josephson-type detector due to the incidence of said infrared radiation from said hydrocarbons falling into said sensing area whereby an electrical signal is produced;

means for indicating said electrical signal as a function of at least depth of said apparatus within said wellbore.

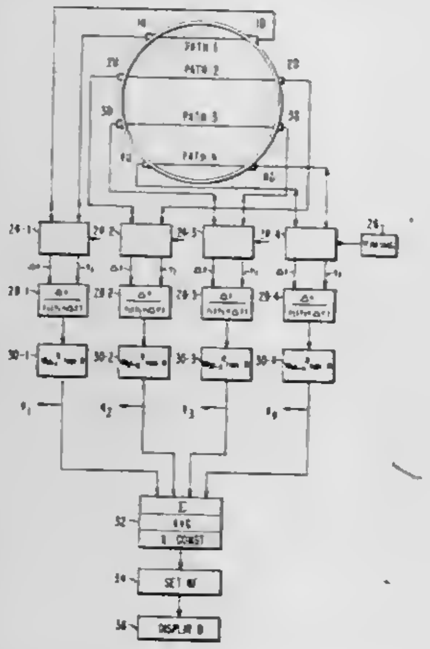
4,109,523
METHOD OF DETERMINING ACOUSTIC FLOW METER CORRECTION FACTOR

Raymond G. Teyssandier, Stevensville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1977, Ser. No. 844,155

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **4 Claims**



1. In acoustic multipath flowmeter apparatus, a method of establishing a flow calculation error and the bounds on that error comprising the steps of:

(A) analytically determining for a first set of chosen parameters, total flow utilizing a generalized formula for velocity profile for distorted flow;

(B) analytically determining, with said same set of parameters, total flow, and individual path flow utilizing a formula for numerical integration;

(C) establishing an error factor between the results of said two determinations;

(D) determining the percentage of total flow for each said path;

(E) recording the relationship between the results of said last named determination and said error factor; and

(F) repeating the above steps for different sets of parameters.

4,109,524
METHOD AND APPARATUS FOR MASS FLOW RATE MEASUREMENT

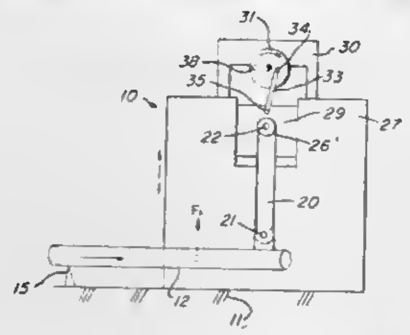
James E. Smith, Boulder, Colo., assignor to S & F Associates, Boulder, Colo.

Filed Jun. 30, 1975, Ser. No. 591,907

Int. Cl.² G01F *1/80*

U.S. Cl. 73—194 B **9 Claims**

8. A method for measuring fluid mass flow through a conduit comprising: inducing fluid flow through at least one conduit section, angularly oscillating at least the one section of the conduit around a pivot point located at an end of the conduit section, and intermittently measuring the torque induced in the conduit section by the fluid flow when the angular velocity of the conduit section is maximum.



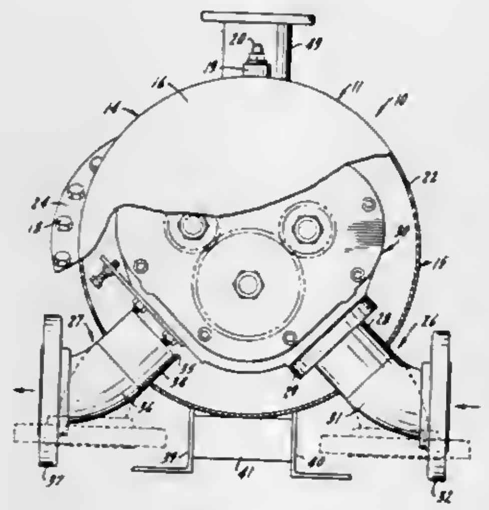
4,109,525
MAXIMUM STRENGTH/WEIGHT FLUID METERING DEVICE

William Jordan Kolb, III, Waukegan, and Karl Otto Laurel, Gurnee, both of Ill., assignors to Liquid Controls Corporation, North Chicago, Ill.

Filed Aug. 31, 1976, Ser. No. 719,265

Int. Cl.² G01F *15/18*

U.S. Cl. 73—201 **2 Claims**



1. In a fluid meter system,

a meter, said meter including

displacement mechanism, and a meter housing which encloses said displacement mechanism,

said meter housing having an inlet and an outlet,

an outer housing for supporting and enclosing the meter,

said outer housing being non-integral with the meter and including

a first, generally hemispherically shaped portion, and

a second, generally hemispherically shaped portion,

said first and second hemispherically shaped portions being constructed and adapted to make abutting contact one to the other along a parting line which generally bisects the hemispherical configuration formed by said portions when assembled one to another, said parting line lying substantially in a single plane,

each of said hemispherically shaped portions having a peripheral flange,

each of said peripheral flanges extending radially outwardly from the center portion of its associated hemispherical portion and being adapted to make abutting contact one to the other when said hemispherical portions are assembled,

an inlet opening and an outlet opening in one of the said hemispherical portions only,

seal means carried by one of said housing portions for making a fluid tight pressure seal with the other of said housing portions,

said inlet opening and said outlet opening being arranged ralative to one another such that a uni-directional line passing through the central portion of the inlet opening and the outlet opening does not intersect the generally circular plane formed by the parting line,

a rigid, upstream conduit in the said one outer housing portion terminating, at its interior, downstream end, at a location within the said one outer housing portion and, at its exterior, upstream end, at a location outside the said one outer housing portion,

means for mounting said meter on the interior, downstream end of said rigid conduit and thereby in a fixed position with respect to the outer housing and in communication with said outer housing inlet,

said mounting means including structure for orienting the meter in any desired one of a plurality of positions with respect to the horizontal, including a position in which the inlet and outlet openings in the said one hemispherical portion are each located vertically above the meter,

a rigid downstream conduit carried by the said one outer housing portion, said rigid downstream conduit terminating, at its upstream end, at a location in communication with the interior of the housing and, at its downstream end, at a location outside the said one outer housing portion,

a rigid inlet connector,

said inlet connector being connectable to the rigid, upstream conduit in such fashion that

the inlet end of the rigid inlet connector can be disposed in a plurality of positions,

a rigid, outlet connector,

said outlet connector being connectable to the rigid downstream conduit in such fashion that

the outlet end of the rigid outlet elbow can be disposed in a plurality of positions,

whereby fluid may be admitted to the outer housing from a plurality of approach directions, and discharged in a plurality of departure directions irrespective of the approach direction, including a position in which fluid is admitted to, and discharged from, the outer housing from an elevation above the meter, and

meter counting shaft means extending outwardly from said metering device and through the wall of said housing in sealed relationship therewith and into contact with auxiliary equipment irrespective of the relative position of the meter to the inlet and outlet openings of the said one hemispherical portion.

4,109,526
TURBINE METER FOR BI-DIRECTIONAL MEASUREMENT OF FLUID FLOW

John B. Rosso, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 8, 1977, Ser. No. 822,488

Int. Cl.² G01F *1/115, 23/00*

U.S. Cl. 73—231 R **5 Claims**

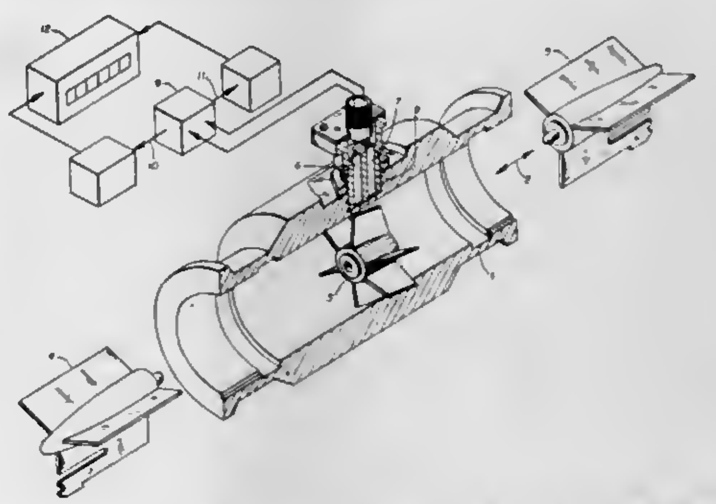
1. A system measuring the flow of fluids in a single path in either of the two directions along the path, including,

a turbine meter with a plurality of metallic blades rotating in a plane normal the path and each blade positioned to provide a cross-section at an angle to the plane of rotation,

a first magnetic pick-up unit mounted at the periphery of the blade tips to generate a first output pulse as each blade tip cuts the magnetic lines of force established by the unit,

a second magnetic pick-up unit mounted at the periphery of the blade tips and in an alignment with the first unit to form an angle with the blade cross-section, whereby the second magnetic pick-up unit generates a second output pulse at a time different than the generation of the first output pulse as each blade tip cuts the magnetic lines of force established by the second unit,

electronic gates connected to the pick-ups to receive the train of pulses from both pick-ups,



a sensing circuit connected to the pick-ups and gates to control which gate will pass the pick-up pulses,

and a counter connected to the gates to accumulate the pulses in the manner dependent upon which direction the turbine meter blades rotate.

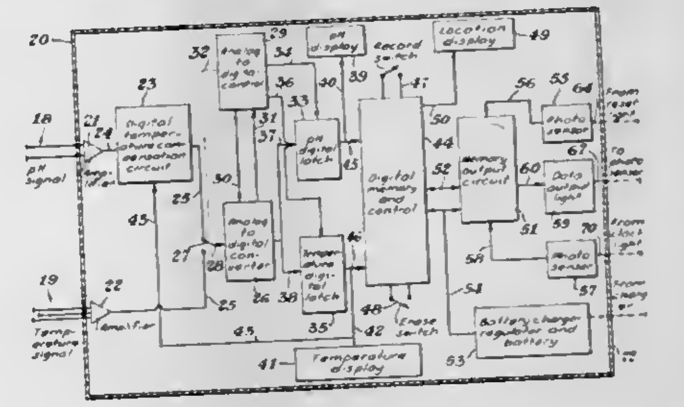
4,109,527
DEVICE FOR MEASURING PH AND TEMPERATURE OF A LIQUID, WHICH INCLUDES A MEMORY

John V. Goode, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 26, 1976, Ser. No. 735,234

Int. Cl.² G01K *1/02*

U.S. Cl. 73—343.5 **5 Claims**



1. An electronic probe device for measuring the pH and the temperature of a liquid medium and storing data relating to said pH and temperature, the device including:

an elongate tubular member having a closed top end, and a connector member defining the bottom end;

the bottom connector being adapted for connection to an electronic probe member, the probe member including means for sensing a pH value and a temperature value in a liquid medium, and for converting the pH and temperature values to an electrical signal;

a display box which is attached to the tubular member, which includes a display panel at the top end of the box, and which includes a first transfer panel at the bottom end of the box;

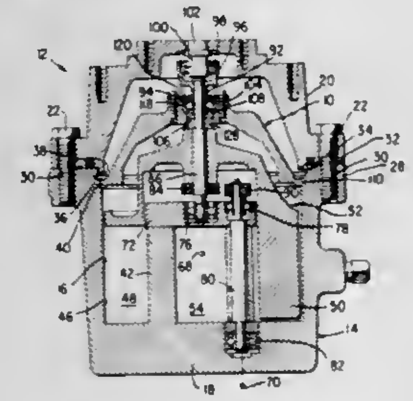
the display panel being adapted for displaying a digital record corresponding to the pH value, the temperature value, and a given location at which each pH and temperature value is obtained;

an electronic master memory system which is contained within the display box, and which is connected into the pH and temperature sensing means of the probe member;

the master memory system including a power source, means for controlling the pH and temperature signals to meet analog-to-digital requirements, means for converting the analog data to digital data, means for storing the digital data relating to pH and temperature values, means for storing data in digital form which relates to the location at which the pH and temperature measurement is taken, and switch means for commanding the stored digital data to appear in the display panel as the digital record.

4,109,528
SPIDER BEARING SUPPORT FOR A METER ROTOR

George William Schneider, Jr., Huntingdon Valley, Pa., assignor to The Singer Company, New York, N.Y.
Filed Mar. 29, 1977, Ser. No. 782,602
Int. Cl.² G01F *3/08, 15/14*
U.S. Cl. 73—253 **12 Claims**

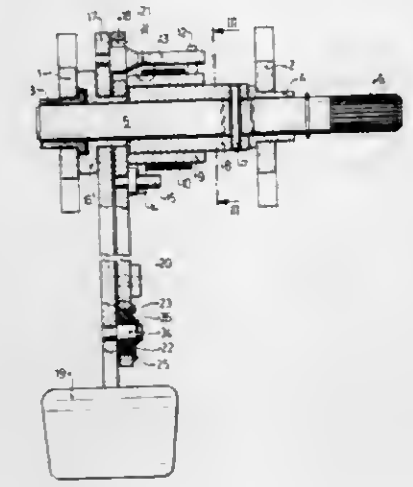


1. A bearing support for a rotor journaled in a housing comprising:
(a) a counterbore axially extending in the housing adjacent one end thereof,
(b) an annular groove formed in the counterbore axially spaced from the bottom thereof,
(c) a spider member disposed in the counterbore concentric to the axis of the rotor,
(d) a hub formed on the spider member to journal the rotor therein, and
(e) a plurality of holding members connected to the spider member and to extend into the annular groove to clamp the spider at the base of the counterbore to prevent axial movement of the spider.

4,109,529
SERVO ARRANGEMENT

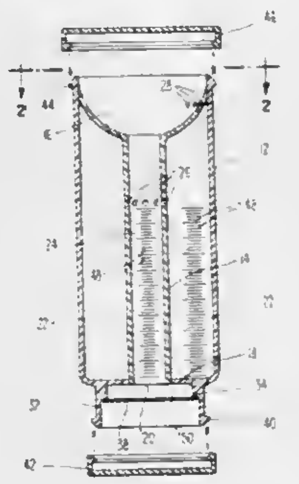
Bernd Niklaus, Rastatt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 29, 1977, Ser. No. 820,130
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2637213
Int. Cl.² F16H *35/00;* **G05G** *1/14;* **F16D** *65/14, 11/06*
U.S. Cl. 74—388 R **14 Claims**

1. A servo arrangement, especially for brake force amplifiers for automotive vehicles, comprising cylinder means mounted for rotation about its axis and adapted to be driven by a servomotor in one direction about said axis; power take-off means; operator controlled force applying means; elastically deformable means connecting said operator controlled force applying means with said power take-off means; coupling means for transmitting the moment imparted to said cylinder means by the servomotor to said power take-off means, said coupling means comprising a multicoil spring wound about said cylinder means and having a hook-shaped end which, as considered in the direction of rotation of said cylinder means, constitutes a rear end of said coil spring, and an opposite front end portion constituted by at least a first quarter of the first winding of the coil spring which extends in spiral form radially outwardly; and means for rendering said coupling means active and inactive in dependence on the elastic deformation of said deformable connecting means and comprising a first entrainment member connected to said power take-off means and adapted to engage said hook-shaped rear end of said coil spring, upon actuation of said force applying means to apply a tension force to the latter to tightly engage the peripheral surface of said rotating cylinder means, and a second entrainment member connected to said operator controlled force applying means and adapted to engage said front end portion of said coil spring, when said force applying means is not actuated, tending thereby to bend the latter outwardly so that the coil spring may slip on the peripheral surface of said cylinder means.



4,109,530
SPECIMEN TRANSFER CONTAINER

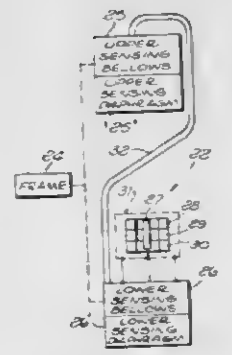
Hyun Jung Kim, Cherry Hill, N.J., assignor to Steven M. Diamond, Easton, Pa., a part interest
Filed Apr. 29, 1977, Ser. No. 792,214
Int. Cl.² G01F *11/28*
U.S. Cl. 73—427 **4 Claims**



1. A transfer container for the receiving, storing and dispensing of liquid specimens including:
a cylindrical first storage chamber having an open top inlet and an open bottom outlet;
a sealed annular second chamber encircling said first storage chamber, being concentric therewith, and having a common wall therebetween;
an outwardly open receiving basin forming the upper wall of said second storage chamber and having a discharge outlet connected to said open top inlet of said first storage chamber;
first passage means interconnecting said first storage chamber and said second storage chamber, said first passage means consisting of a plurality of apertures in said common wall between said first storage chamber and said second chamber at a location above said bottom outlet in said first storage chamber, whereby liquid in said first storage chamber can overflow into said second storage chamber;
second passage means interconnecting said second storage chamber and said receiving basin, said second passage means consisting of a plurality of apertures in the common wall between said basin and said second storage chamber, whereby liquid in said second storage chamber can flow into said basin; and
normally closed closure means adapted to open selectively open said bottom outlet of said first storage chamber.

4,109,531
FLUID SENSING SYSTEMS

Victor N. Lawford, Pasadena, and David F. Sacarisen, Saugus, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Jul. 11, 1977, Ser. No. 814,317
Int. Cl.² G01N *9/26;* **G01F** *23/14*
U.S. Cl. 73—438 **2 Claims**

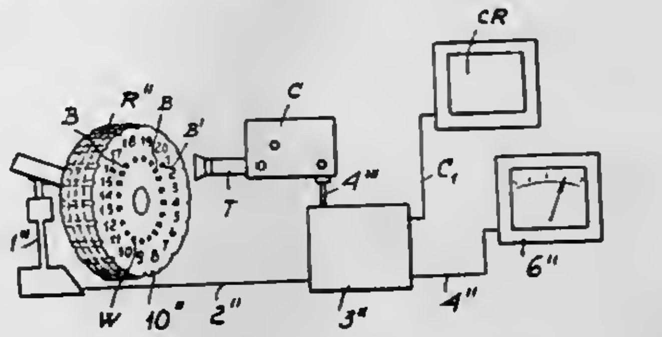


1. A densitometer comprising: a frame; first and second means fixed relative to said frame in positions at the top and bottom thereof, respectively, said first and second means including first and second hollow shells, respectively, closed on the bottom thereof by first and second bellows, respectively, each of said first and second shells being sealed but having one opening thereinto, a conduit having a first end sealed through the opening in said first shell and a second end sealed through the opening in said second shell; a first incompressible fluid filling both of said shells and said conduit; first and second diaphragms partially defining fluid tight first and second spaces with said first and second bellows, respectively; second and third incompressible fluids filling said first and second spaces, respectively, said first, second and third fluids being the same or different, both of said diaphragms facing downwardly; third means connected from one of said first and second bellows to produce an electrical output signal directly proportional to the difference between the pressure at the respective locations of said first and second diaphragms, respectively; and utilization means connected from the output of said third means.

4,109,532
APPARATUS FOR DETERMINING THE AMOUNT AND LOCATION OF UNBALANCE IN A ROTATING WHEEL OF A VEHICLE

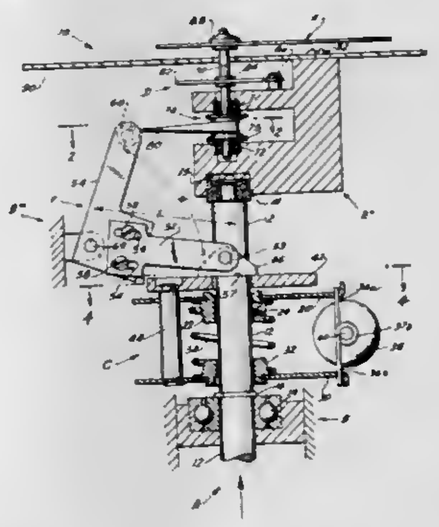
Giuseppe Donato, Via Mac Mahon, 77, Milan, Italy
Filed May 17, 1976, Ser. No. 687,115
Claims priority, application Italy, May 23, 1975, 23681 A/75
Int. Cl.² G01M *1/28*
U.S. Cl. 73—457 **2 Claims**

1. An apparatus for determining the amount and location of unbalance in a rotating wheel of a vehicle while the wheel is mounted on the vehicle, comprising a mechanical pulse pick-up means responsive to the vibrations of the wheel to be balanced, said pick-up means being effective to convert mechanical pulses into electrical pulses, a circumferentially graduated dial adaped for removable attachment to said wheel centrally thereof for rotation therewith, said dial having a plurality of alternatingly photoelectrically activating and disactivating marks distributed over a circumference, a photocell device responsive to alternating photoelectrical activation and disactivation induced by said plurality of marks, an unbalance indicating gauge capable of indicating the amount of unbalance of the wheel to be balanced, a digital storage counter and an apparatus control circuitry unit adapted to process the electrical pulses received from said pick-up means and said photocell device and to send them to said unbalance indicating gauge and to said digital storage counter, said digital storage counter being adapted to count the energization and de-energization of said other photocell by said plurality of marks and to store the figure corresponding to one of said marks at the maximum unbalance as indicated by said unbalance indicating gauge, thereby allowing an operator to read simultaneously said figure of maximum unbalance indicated by said digital storage counter and the amount of maximum unbalance indicated by said unbalance indicating gauge.



4,109,533
TACHOMETER

Richard J. Broadman, W. Simsbury, and Richard D. May, Weston, both of Conn., assignors to Jones Instrument Corporation, Stanford, Conn.
Filed Dec. 27, 1976, Ser. No. 754,401
Int. Cl.² G01P *3/18*
U.S. Cl. 73—498 **31 Claims**



1. Apparatus for deflecting a pointer in proportion to the rotational speed of a shaft comprising:
(A) a support;
(B) governor means mounted on said support including an input member adapted to be operatively connected to the shaft for rotation therewith and an output member movable in a given direction to a degree generally related to the rotational speed of the shaft;
(C) indicator means including a drum rotatably mounted on said support, a pointer operatively connected to said drum for movement therewith, and a flexible member at least partially wound about said drum, said drum being rotated by the unwinding of said flexible member therefrom; and
(D) an angled lever pivotably mounted on said support with

one leg operatively bearing on said output member for motion therewith and the other leg secured to a portion of said flexible member for unwinding said flexible member from said drum, the effective angle defined by said legs being manually adjustable for calibration purposes but being fixed during normal operation of said apparatus.

4,109,534

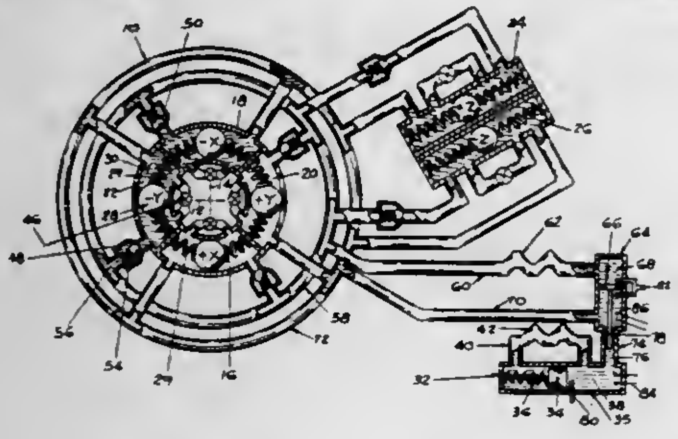
APPARATUS FOR MONITORING ACCELERATION

William Charles Albert, Boonton, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jun. 13, 1977, Ser. No. 806,027

Int. Cl.^{2} G01P *7/00;* F42C *15/24*

U.S. Cl. 73—503 **23 Claims**



1. An apparatus for monitoring acceleration of a body comprising;

- (a) a casing having at least one cavity disposed in a predetermined relationship to the axes of the body when secured thereto;
- (b) a proof mass disposed in said cavity, said proof mass adapted to move in said cavity in response to an acceleration of the body for a period of time, said movement proportional to the time integral of said body acceleration;
- (c) damping fluid disposed in said cavity;
- (d) a first chamber including,
  - (i) a first float member disposed therein,
  - (ii) means for urging said float member from a first position in said chamber to a second position therein in a predetermined time,
  - (iii) fluid, disposed in said chamber, said float member submerged in said fluid in a neutrally buoyant condition, such that said float member is insensitive to the acceleration of the body,
  - (iv) fluid passage means connecting the portion of said chamber between said float member and one end thereof to the portion of said chamber disposed on the other side of said float member; and
- (e) means responsive to the movements of said proof mass and communicating with said float member such that the movement of said float member is interrupted if the time integral of the body acceleration exceeds a predetermined amount.

4,109,535

DIAPHRAGM SEAL FOR PRESSURE SENSING INSTRUMENT

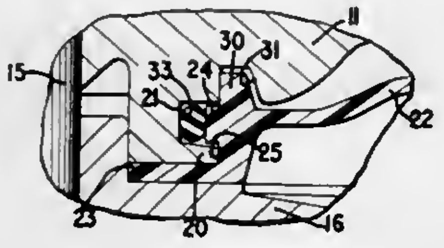
Charles J. Reed, South Euclid, and Clarea K. Cook, Aurora, both of Ohio, assignors to Ametek, Inc., New York, N.Y.

Continuation of Ser. No. 526,610, Nov. 25, 1974, abandoned. This application Sep. 8, 1976, Ser. No. 721,437

Int. Cl.^{2} G01L *7/08*

U.S. Cl. 73—706 **3 Claims**

1. In a diaphragm assembly device for connecting a source of pressure to a pressure sensing instrument, the combination of a pressure responsive diaphragm consisting essentially of fluorocarbon resins a coupling flange having a coupling surface and a coupling flange recess in said coupling surface, means for connecting said recess with a pressure responsive instrument, an annular flange projection on said coupling flange at the coupling surface thereof and extending inwardly into said recess to define a first annular flange groove adjacent said projection and opening radially toward said diaphragm, a second annular flange groove formed in said flange inwardly of said first annular flange groove and opening axially toward said diaphragm, said diaphragm having a peripheral annular diaphragm groove therein defining a first annular diaphragm projection on one side thereof and a second annular diaphragm on the other side thereof, said flange projection being receivable within said diaphragm groove for releasably retaining said diaphragm on said coupling flange, a third annular projection on said diaphragm extending axially and being receivable within said second annular flange groove, a compressible sealing ring positioned in said first annular flange groove and peripherally contacting said diaphragm, said sealing ring being entrapped between at least three walls of said flange and said diaphragm, and a process flange means connected to said coupling flange and baving a surface spaced therefrom, said process flange means having a connection with a source of pressure to be sensed, said first annular diaphragm projection positioned between the coupling surface of said coupling flange and said surface of said process flange so as to grip said first annular diaphragm projection therebetween.



4,109,536

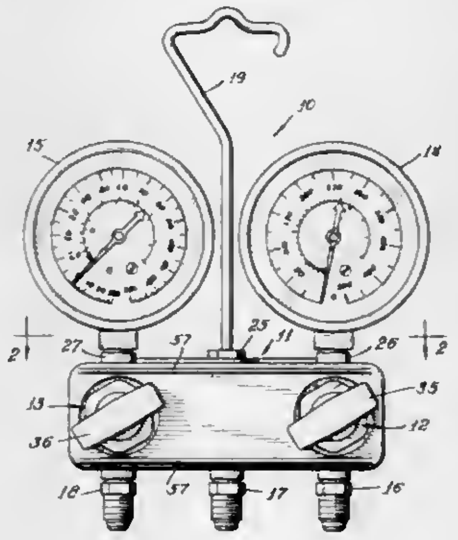
FLUID TEST DEVICE

Richard V. Strybel, Elk Grove Village, Ill.

Filed Apr. 21, 1977, Ser. No. 789,732

Int. Cl.^{2} G01L *7/00*

U.S. Cl. 73—756 **11 Claims**



1. A fluid test device comprising:

- a T-connector comprising an assembly of independently prefabricated machined elements including a center body defining a center port, a first transverse element secured to said center body and defining a left side port, a second transverse element secured to said center body and defining a right side port, and interconnecting passages;
- a left valve having a prefabricated machined body defining a first port arranged to be connected to said T-connector first transverse element in communication with said left side port, a second port, and a third port;

- a left gauge connected to said second port;
- means defining a hose connection to said third port;
- a right valve having a prefabricated machined body defining a fourth port arranged to be connected to said T-connector second transverse element in communication with said right side port, a fifth port, and a sixth port;
- a right gauge connected to said fifth port;
- means defining a hose connection to said sixth port, said left and right valves having front-operated manual operating means and said gauges having front-reading dials, said valves defining prefabricated machined structures;
- means removably sealingly securing said valve bodies to said T-connector elements; and
- an outer cover removably enclosing the assembled T-connector, left valve and right valve, said cover closely fitting said assembly and including wall portions juxtaposed to said valves and said center body to provide a compact enclosure of said T-connector and valves.

4,109,537

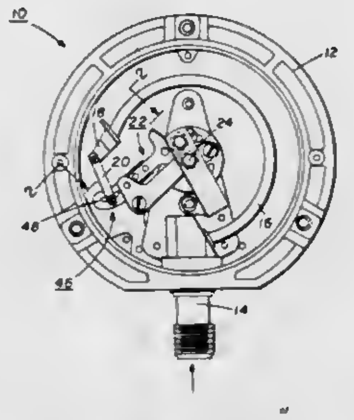
MOVEMENT CONSTRUCTION FOR A PRESSURE RESPONSIVE INSTRUMENT

Joseph E. Gorgens, Trumbull, and Matthew Gerald Morris, Jr., Fairfield, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 7, 1977, Ser. No. 775,007

Int. Cl.^{2} G01L *7/04*

U.S. Cl. 73—756 **7 Claims**



1. In a pressure operative instrument including a Bourdon tube, a gear movement for transmitting displacement of the Bourdon tube to an output drive and link means for connecting the free end of said Bourdon tube to the input of said movement, the improvement for connecting said link means to said movement input and comprising fastener means including a nut integrally formed near one end of an elongated spring clip, support means displaced from said movement input for supporting said spring clip near its other end in a grip engagement against said movement input with its nut in fastening relation at the connecting location thereof, and screw means to cooperate with said nut for connecting said link with said nut as said connecting location.

4,109,538

STARTER BRACKET FOR LAWN MOWERS

Martin J. Glenday, 5010 Sand Lake, Rte.1, Onsted, Mich. 49265, and Cecil G. Blank, 1734 Wellesley Dr., Toledo, Ohio 43606

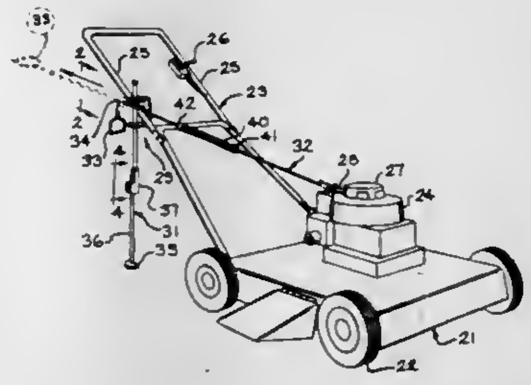
Filed Jul. 14, 1977, Ser. No. 815,725

Int. Cl.^{2} F02N *3/02, 3/04*

U.S. Cl. 74—6 **10 Claims**

1. A starter bracket for a machine having an engine and a pull-cord starting device, said bracket comprising, in combination,

- a. a clamp for mounting said bracket in selected position on a frame that is stationary relative to the engine,
- b. a post carried by said clamp that is alternatively positionable in a support position and in a storage position,
- c. an extension cable having on one end means for coupling said cable to the pull-cord and on the other end means engageable by a user's foot or hand, and
- d. a guide on said clamp for said cable.



4,109,539

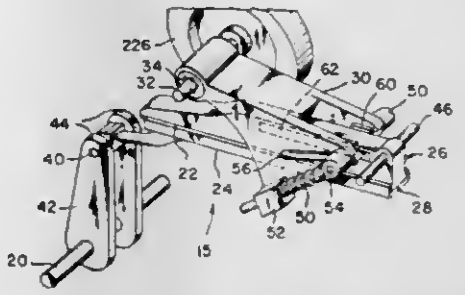
DYNAMIC POWER BOOSTER

Christiaan Cornelis Feleus, P.O. Box 5035, Kent, Wash. 98031

Filed May 20, 1977, Ser. No. 798,927

Int. Cl.^{2} F16H *21/38*

U.S. Cl. 74—36 **6 Claims**



1. A dynamic power booster comprising in combination:

- a. a crank lever having a first fixed pivot point and an associated power source for rotating said crank lever about said first pivot point;
- b. a crank pin connected to said crank lever end portion;
- c. a lever assembly having a first lever slideably connected by sliding means to a second lever;
- d. said first lever connected to said crank pin;
- e. a second fixed pivot point at said second lever and a sliding guide means positioned between said sliding means of said lever assembly and said second fixed pivot point;
- f. a one way clutch being a third fixed pivot point;
- g. an oscillating arm connected to said one way clutch at one end and arranged in cooperating connection with said sliding guide means at its other end;
- h. said sliding guide means having pin means for connection to said oscillating arm and shock absorbing means pivotally connected to said pin means and mounted on said oscillating arm for preventing a dead lock condition of said oscillating arm with said lever assembly; and
- i. an output shaft connected to said one way clutch; whereby upon activation of said associated power source said crank lever is rotated about said first fixed pivot point for extending and contracting said lever assembly by said crank pin in an oscillating movement about said second fixed pivot point thereby oscillating said oscillating arm through said sliding guide means about said one way clutch means for imparting an intermittent rotation to said output shaft having more torque than said associated power source input torque.

4,109,540

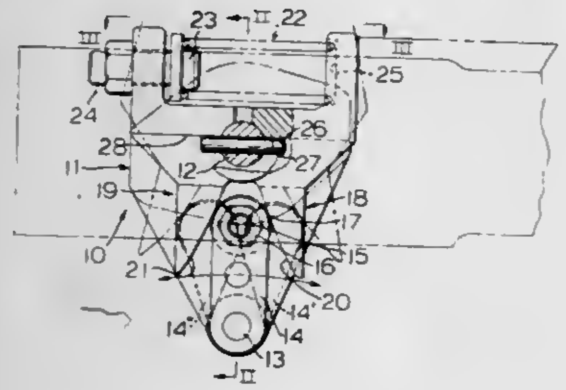
OVERTRAVEL CONTROL MECHANISM FOR HYDROSTATIC TRANSMISSIONS

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 24, 1977, Ser. No. 809,727

Int. Cl.^{2} F16H *21/44;* G05G *7/04*

U.S. Cl. 74—96 **12 Claims**



1. A control mechanism comprising

rotary output means,

a pair of first and second lever means pivotally mounted for movement relative to said output means,

rotary input means engageable with a first end of each of said first and second lever means for alternately pivoting said first and second lever means in response to rotation of said input means in opposite directions,

drive means connected to said output means and engageable with second ends of said first and second lever means, and

spring means connected between the second ends of said first and second lever means for normally urging the first ends thereof into engagement with said input means.

4,109,541

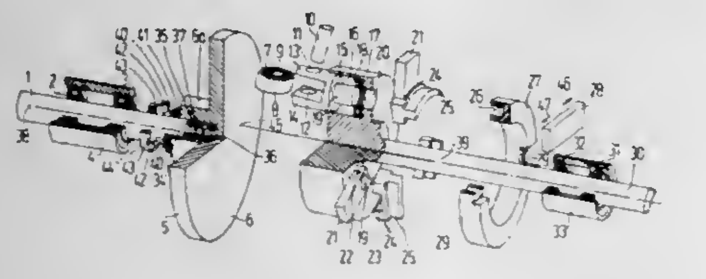
FRICTION GEAR

Gerhard Jesse, Am Bostelkerg 147, 3001 Hellendorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 464,908, Apr. 29, 1974, abandoned. This application May 17, 1976, Ser. No. 686,714

Int. Cl.^{2} F16H *15/08*

U.S. Cl. 74—194 **23 Claims**



1. An improved friction gear, with an infinitely variable transmission ratio, comprising:

a first shaft having an end and having a central, longitudinal axis about which it rotates;

a second shaft having an end and having a central, longitudinal axis about which it rotates;

means for supporting the first and second shafts for rotation so that relative movement between the rotational axes of the first and second shafts is prevented, so that the rotational axis of the second shaft is parallel to but offset from the rotational axis of the first shaft, and so that the end of the first shaft is adjacent to and faces the end of the second shaft;

an axial bearing surface means mounted on the end of the first shaft such that the bearing surface means is disposed adjacent to the end of the second shaft and in a first plane which is substantially perpendicular to the rotational axes of the first and second shafts;

at least two roller means, with each roller means having an axis about which it rotates;

means for mounting the roller means on the end of the second shaft adjacent to the bearing surface means so that the roller means run on the surface of the bearing surface means;

axially symmetrical guiding surface means having a central longitudinal axis;

means interconnecting the mounting means and the guiding surface means for aligning the roller means so that the axes of the roller means are directed towards a straight line which extends parallel to the rotational axes of the first and second shafts, which lies in a second plane defined by the rotational axes of the first and second shafts and which is coaxial with the longitudinal axis of the guiding surface means; and

means for changing the transmission ratio including means for moving the guiding surface means so that its longitudinal axis is moved in a direction perpendicular to the rotational axes of the first and second shafts in the second plane.

4,109,542

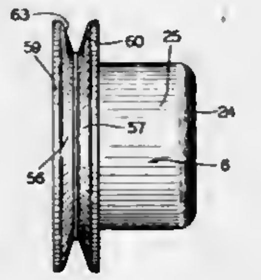
SPUN V-GROOVED SHEET METAL PULLEY WITH THICK HUB WALL INTEGRAL WITH THIN SIDE WALL

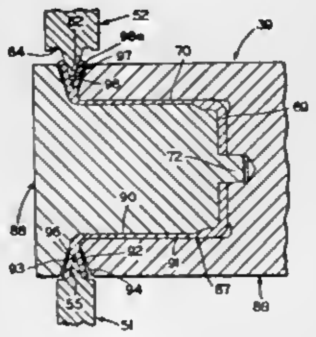
Derald H. Kraft, Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Division of Ser. No. 593,653, Jul. 7, 1975, Pat. No. 3,995,474. This application Oct. 14, 1976, Ser. No. 732,527

Int. Cl.^{2} F16H *55/44, 55/36*

U.S. Cl. 74—230.8 **6 Claims**





1. Spun V-grooved sheet metal pulley construction of the type having a cup shape provided with a flat circular hub wall of generally uniform metal thickness with a central opening formed in the hub wall for mounting a hub on the pulley, and a generally axially extending side wall integrally connected to the outer periphery of the hub wall and terminating in an integral pair of annular angularly extending V-groove flange walls forming a V-shaped pulley groove; the improvement in which the generally axially extending side wall has a metal thickness less than the metal thickness of the integrally connected hub wall to provide the pulley with a reinforced hub wall integral with the thinner side wall.

4,109,543

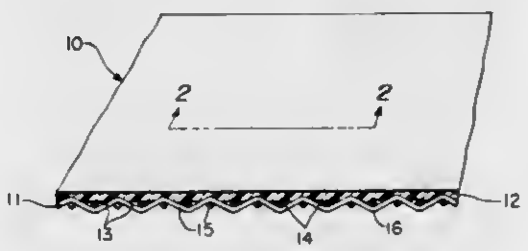
FLEXIBLE COMPOSITE LAMINATE OF WOVEN FABRIC AND THERMOPLASTIC MATERIAL AND METHOD OF MAKING SAID LAMINATE

Anthony J. Foti, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 10, 1976, Ser. No. 684,827

Int. Cl.^{2} F16G *1/00*

U.S. Cl. 74—231 P **18 Claims**



1. A composite laminated web of relatively light to medium gauge of from about 0.076mm to about 0.370mm (0.30 inches to 0.145 inches) comprised of a hot melt type thermoplastic material and a closely woven textile fabric material formed of spun yarns constructed primarily of staple polyester fibers wherein the thermoplastic material covers and is bonded to at least one face of said fabric by adhesion of the thermoplastic to minute fibrils of the spun polyester yarn and penetrates into the interstices thereof a maximum of from about 15% to about 75% but does not penetrate a substantial amount to strike through the yarn structure thereof thereby permitting an optimum amount of flexibility of said web.

4,109,544

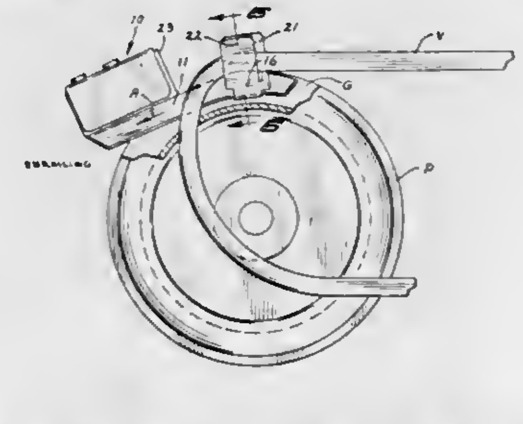
V-BELT MANIPULATING TOOL

Robert E. Clark, Minneapolis, Minn., assignor to Thexton Manufacturing Company, Minneapolis, Minn.

Filed Mar. 4, 1977, Ser. No. 774,452

Int. Cl.^{2} F16H *7/08*

U.S. Cl. 74—242.7 **14 Claims**



1. A V-belt manipulating tool for use with tapered grooves of pulleys, comprising

an elongate and flexibly and compressibly resilient base of rubber-like material and having a tapered transverse shape to be received snugly into and follow the contour of the pulley groove, and

an elongate rigid ear on the base and extending outwardly therefrom to engage and manipulate a V-belt, the ear having a rigid mounting clip embracing the exterior of the elongate base and affixed thereto, the clip having a transversely tapered shape conforming to and following the tapered transverse shape of the base to lie flush against the pulley at both sides of the tapered groove of the pulley and minimize tipping of the ear relative to the pulley.

4,109,545

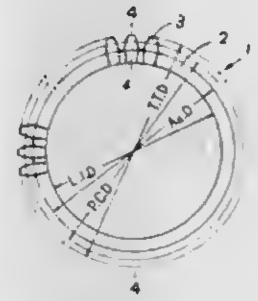
NOISELESS SPUR GEARS

Enakichi Hayasaka, 543-1, Ogikuba Odawara-shi, Kanagawa-ken, Japan

Filed Jan. 26, 1977, Ser. No. 762,578

Int. Cl.^{2} F16H *55/12, 55/30*

U.S. Cl. 74—447 **11 Claims**



1. A noiseless spur gear comprising in combination:

a. a ring defining the rim of the gear;

b. radial teeth disposed around said ring, and integral therewith, said radial teeth having a greater modulus of elasticity than the ring so as to have a large backlash;

c. a holding two-disc mechanism disposed on both sides of said ring including an aperture for mounting said two discs on an axle, said aperture defining the rotational center of said gear; and,

d. holding means holding said ring including slippage means so that the rotational center of the ring may be slightly moveable in relation to said defined rotational center, whereby said construction provides for a linear inclination of the tooth center line, the elliptical deformation of the rim and the rotational vibration of the gear teeth.

4,109,546

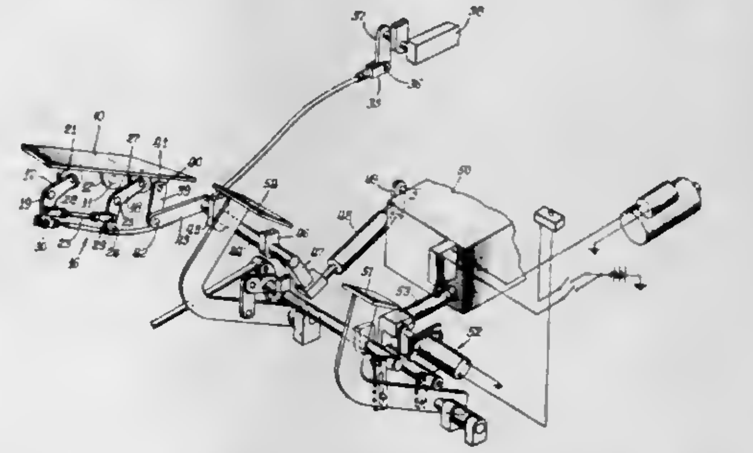
COMBINED THROTTLE AND TRANSMISSION SYSTEM

James H. Povejsil, Willoughby, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jan. 17, 1977, Ser. No. 760,067

Int. Cl.^{2} G05G *9/00, 1/14;* F15B *15/18*

U.S. Cl. 74—474 **15 Claims**



1. A control linkage mechanism for simultaneously and proportionately controlling a unidirectional control element and a bidirectional control element by a single control member, the combination comprising:

an operator input control member mounted for rocking motion in either direction from a neutral position;

a bidirectional control element remotely positioned from said input control member and mounted for bidirectional movement from a neutral position;

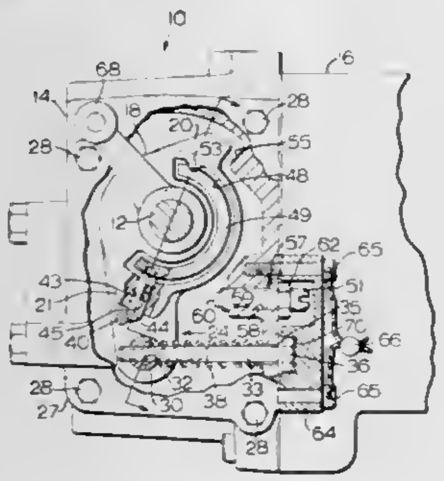
first control linkage means for connecting said input control member to said bidirectional control element for movement of said bidirectional control element in either one of two directions;

a unidirectional control element remotely positioned from said input control member and mounted for movement in a single direction from a neutral position;

second control linkage means for connecting said input control member to said unidirectional control element for movement of said unidirectional control element in a single direction from the neutral position thereof upon movement of said input control member in either direction from the neutral position thereof and comprising first and second bellcranks mounted adjacent said input control member, each of said bellcranks having a first arm disposed for engagement by said input control member, said first and second bellcranks being so mounted adjacent said pedal that pivotal movement of said input control member in one direction engages the first arm of one of said bellcranks and pivots one of said bellcranks in a first direction about its axis, and so that pivotal movement of said input control member in another direction engages the first arm of the other of said bellcranks and pivots said other bellcranks in said first direction about its axis and

link means for connecting said unidirectional control element to said bellcranks for movement therewith from its neutral position in said single direction.

4,109,547
DETENT MECHANISM
Paul D. Jacobson, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 17, 1977, Ser. No. 759,681
Int. Cl.^{2} G05G *5/04*
U.S. Cl. 74—526 **8 Claims**



1. An adjustable detent assembly comprising:

a housing;

a control shaft mounted in said housing and rotatable in first and second directions;

collar means fixedly associated with said control shaft for rotation therewith, said collar means having first and second radially extending projections, said first projection defining a radially oriented bore;

detent means reciprocally movable in the radially oriented bore;

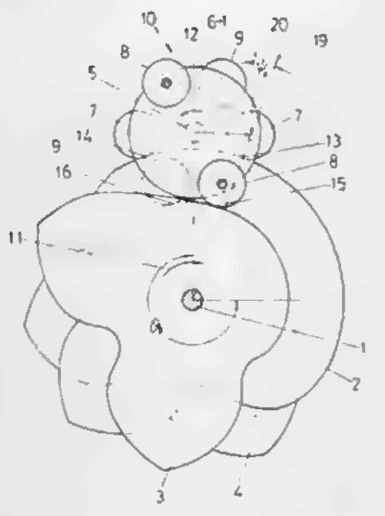
resilient means mounted in said collar means for urging said detent means radially outwardly;

fixed stop means for limiting rotation of said control shaft in said first direction;

adjustable stop means for limiting rotation of said shaft in said second direction;

detent stop means positionable circumferentially relative said shaft and cooperating with said detent means for providing opposition to rotation of said collar means by the control shaft.

4,109,548
PARALLEL INDEXING CAM STRUCTURE
Shigeyuki Shinohara, 5-52-1-510 Jingumae, Shibuya-ku, Tokyo, and Hiroshi Makino, R1-31, 1-2-10 Kitashin, Kofu City, Yamanashi Prefecture, both of Japan
Filed Jul. 9, 1976, Ser. No. 704,094
Claims priority, application Japan, Jun. 27, 1975, 50-90840[U]
Int. Cl.^{2} F16H *53/06;* B23B *29/24;* B23Q *17/00*
U.S. Cl. 74—569 **1 Claim**



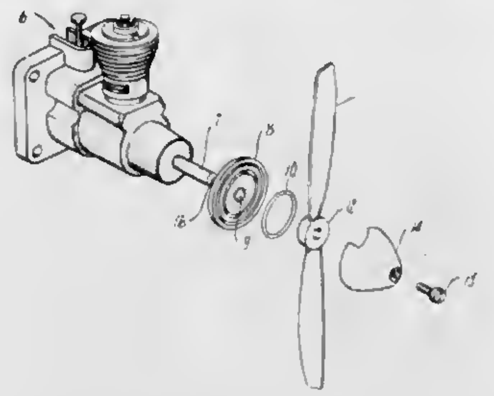
1. A parallel indexing cam structure of the type having an input shaft and an output shaft parallel to the input shaft and cam means on said shafts for causing the input shaft to control the movement of the output shaft so that the output shaft achieves controlled intermittent motion, said cam means being an improved cam means comprising:

a locking cam and a pair of further cams rigidly secured to said input shaft at predetermined angular positions relative to each other, said three cams having profiles for driving said output shaft through a predetermined angle upon rotation of said input shaft through a predetermined index angle θ_h and for causing said output shaft to undergo a dwell period during the further rotation of said input shaft through an angle of 360 minus $\theta_h{}^\circ$; and

cam follower means rigidly secured to said output shaft and having a plurality of spider plates spaced in the direction of the length of said output shaft and three sets of cam follower rollers, each set rotatably mounted between respective pairs of adjacent spider plates and spaced around the periphery of the spider plates, two rollers of one set of said three sets contacting said locking cam and one roller of each of the remaining sets of rollers contacting a respective one of the further cams, and said locking cam having a larger profile circle along the cam periphery contacting the cam rollers in the dwell position of said output shaft than said further cams, whereby said locking cam holds said output shaft in the dwell position with high accuracy and stiffness during the dwell period.

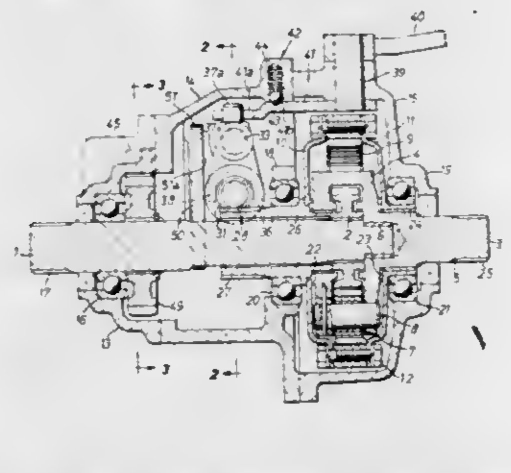
4,109,549
DYNAMIC BALANCER FOR ROTATING BODIES AND METHOD OF MANUFACTURING SAME
Raymond A. Vincent, 9307 Marion Crescent, Detroit, Mich. 48239
Filed Jun. 28, 1976, Ser. No. 700,084
Int. Cl.^{2} F16F *15/22;* F16C *1/00;* F16D *63/00;* G01M *1/00*
U.S. Cl. 74—573 F **6 Claims**

1. A balancer mechanism for dynamically balancing a motor-driven rotatable assembly comprising, in combination, a body adapted to be rotated about an axis of rotation, the body having a face generally radial with respect to the said axis and having a circular shoulder on the face coaxial with the said axis in the direction away from the face so that the shoulder and the adjacent area of the face define an undercut annular recess adapted for positive retention of a slightly radially expanded metal ring therein; a hollow substantially rigid but slightly radially expanded ring lodged in the said recess bearing against the said face and shoulder, the ring defining a closed toroidal cavity, the shoulder having a depth of slightly less than the sectional diameter of the ring before said radial expansion; and



a flowable material of substantial density contained within the said cavity, the volume of the material being within the range of approximately one-third to approximately one-half of the volume of the cavity so that the ring and flowable material are effective to counteract unbalance of the assembly during rotation thereof.

4,109,550
STEPLESS SPEED CHANGE SYSTEMS
Yoshinobu Murayama, Sakai, Japan, assignor to Kubota Ltd., Osaka, Japan
Filed Feb. 15, 1977, Ser. No. 768,899
Int. Cl.^{2} F16H *37/06, 47/04*
U.S. Cl. 74—691 **13 Claims**



1. In a power transmission system in which the torque delivered to input means is subjected to the desired speed deduction by planetary speed reduction means and then transmitted to output means, a stepless speed change system comprising:

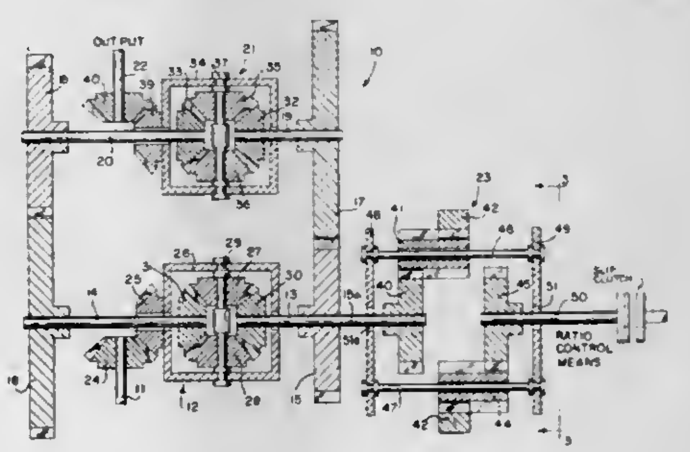
first transmitting means operatively connected to the input means, said first transmitting means comprising a gear mounted on an input shaft and a gear mounted on a shaft for driving a disk shaft;

second transmitting means operatively connected to an inner ring of the planetary speed reduction means, said second transmitting means comprising a worm wheel formed on an inner ring and a worm shaft having a worm meshing with the worm wheel; and

stepless speed change means provided between the first and second transmitting means and including means for operating the stepless speed change system, said stepless speed change means comprising a disk operable by said first transmitting means and provided on the disk shaft and a roller incorporated into the second transmitting means and shiftable diametrically of the disk in a direction intersecting the axis of rotation of the disk, said disk being in contact with an outer surface of the disk and the disk being pressed against the roller by hydraulic pressure, said roller further being mounted on said worm shaft rotatable therewith and shiftably axially thereof;

whereby when the operating means is operated the torque from the input means is transmitted to the inner ring to cause the inner ring to be halted or to be rotated in a positive or reversed direction with stepless speed change, the torque being transmitted also to the output means to bring the output means to a halt or into positive or reverse rotation with stepless speed change.

4,109,551
VARIABLE SPEED GEAR RATIO TRANSMISSION APPARATUS
Allen R. Nemec, 5 S. 571 Tuthill, Naperville, Ill. 60540
Filed Jan. 12, 1977, Ser. No. 758,652
Int. Cl.^{2} F16H *37/06*
U.S. Cl. 74—705 **14 Claims**



1. An variable gear ratio transmission for infinite selection of speeds between the absolute operative limits thereof, said transmission comprising:

input differential means for dividing an input rotational force into first and second divided input rotational forces;

an input shaft rotationally coupled to and driving said input differential means;

first and second divided input gear means for transmitting said first and second divided input rotational forces, each of said gear means for transmitting mounted on a shaft driven by said input differential means;

first and second receiving gear means for engaging said first and second divided input gear means and for receiving the first and second divided input rotational forces transmitted therefrom;

output differential means coupled to and driven by said first and second receiving gear means for combining the first and second divided input rotational forces;

an output shaft rotationally coupled to and driven by said output differential;

inhibitor means coupled to said first divided input gear means for applying a variable load thereto, whereby the speed of said first divided input gear means may be varied with the result that the speed of said second divided input gear means is reciprocally varied, thereby to reciprocally vary also the speed of said output shaft by means of said output differential means, said inhibitor means comprising:

an inhibitor connecting gear rotationally connected to the shaft of said first divided input gear means;

a first pinion gear having a proximal longitudinal portion engaging said inhibitor connecting gear;

a stationary ring gear having interior teeth engaged by a distal longitudinal portion of said first pinion gear;

a second pinion gear having a proximal longitudinal portion engaging the teeth of said ring gear at 180° to said first pinion gear;

means for connecting said pinion gears for synchronous circular motion in said ring gear;

a variable load inhibitor control gear engaging a distal longitudinal portion of said second pinion gear;

a variable load inhibitor control shaft mounting said variable load inhibitor control gear for rotation; and

rotational control means connected to said variable load inhibitor shaft for controlling the speed of rotation thereof.

4,109,552

INDEXING MECHANISM FOR ROTATABLE ELEMENT OF MACHINE-TOOL

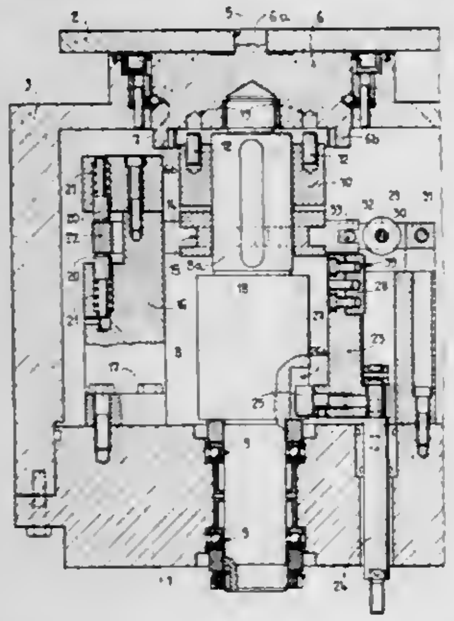
Markus Imoberdorf, Oensingen, Switzerland, assignor to Imoberdorf & Co., Oensingen, Switzerland

Filed Dec. 13, 1976, Ser. No. 749,601

Claims priority, application Switzerland, Dec. 18, 1975, 16455/75

Int. Cl.² B23Q *17/02, 17/18*

U.S. Cl. 74—813 L **10 Claims**



1. An indexing mechanism comprising, a rotatable element, a shaft arranged coaxial to said rotatable element, a control member capable of effecting alternative go-and-back movements in a direction which is parallel to the axis of rotation of said rotatable element, means defining a groove in said shaft at least a portion of which is helicoidal means connected to said control member engaged in said groove whereby the alternative movements of the control member transmit an oscillating rotative movement to said shaft, a control cam constructed and arranged to effect go-and-back movements synchronised with the alternative go-and-back movements of said control member, a driving member, clutch means between said driving member and said rotatable element, means mounting said driving member on said shaft against angular movement relative thereto yet capable of axial movement therealong between first and second positions, the first position being a clutch engaged position whereat said driving member is rigid with said rotatable element and the second position being a clutch disengaged position whereat said driving member is not rigid with said rotatable element, said cam being effective to control the axial movements of said driving member whereby during the go movements of the control member and of the cam, the driving member engages the rotatable element while, during the back movements of the control member and of the cam, said driving member is released from said rotatable element and is disengaged from said rotatable element during the movement thereof in backward direction, and lever means establishing the connection between said cam and said driving member.

4,109,553

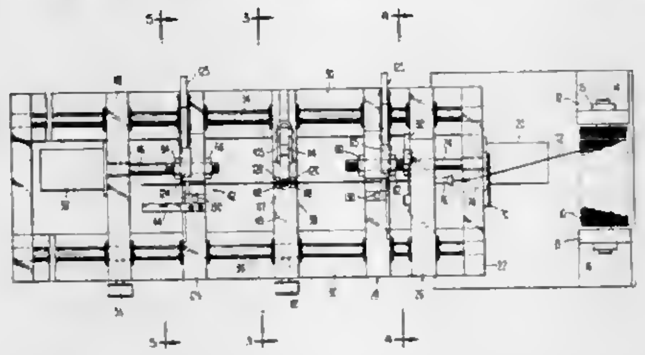
SEMIAUTOMATIC TWISTED WIRE CABLE STRIPPER

John Halmer Drinkard, Jr., Exton, and Charles Eugene Walton, II, Downingtown, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 20, 1977, Ser. No. 808,071

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.51 **24 Claims**



1. An apparatus for fully stripping insulation coatings from both sets of adjacent end portions of a predetermined length of insulated and pretwisted electrical conductor wire pair and simultaneously untwisting both sets of adjacent end portions of said pretwisted electrical conductor wire pair, comprising:

a frame;

wire guiding means disposed on said frame for feeding said pretwisted wire pair substantially lineraly with respect to said frame preparatory to stripping said insulation;

center clamping means supported on said frame beyond said wire guiding means in the direction of feeding of said pretwisted wire pair and including a movable clamp for releasably gripping said pretwisted wire pair;

first spreader means supported on said frame between said wire guiding means and said center clamping means for separating the wires of the first end of said pretwisted wire pair at a section of said pretwisted wire pair between two points where the wires of said pretwisted wire pair cross over each other, whereby a first separation is created between the wires;

first wire stripper means supported on said frame and adjacent to said first spreader means for receiving the first separated section of the pretwisted wire pair, for severing the insulation of each of the wires of the first end section, for gripping the end portion of the insulation of each wire of the first end section and for guiding the untwisting of the first end portions of the pretwisted wire pair;

first means supported on said frame on the wire guiding means side of said first wire stripper means and connected to said first wire stripper means for moving said first wire stripper means toward said wire guiding means, whereby said first wire stripper means strips the insulation from the first adjacent end portions of the pretwisted wire pair and simultaneously untwists the first adjacent end portions of the pretwisted wire pair;

second spreader means supported on said frame beyond said center clamping means in the direction of feeding of said pretwisted wire pair for separating the wires of the second end of said pretwisted wire pair at a section of said pretwisted wire pair between two points where the wires of said pretwisted wire pair cross over each other, whereby a second separation is created between the wires;

second wire stripper means supported on said frame and adjacent to said second spreader means for receiving the second separated section of the pretwisted wire pair, for severing the insulation of each of the wires of the second end section, for gripping the end portion of the insulation of each wire of the second end section and for guiding the untwisting of the second end portions of the pretwisted wire pair;

second means supported on said frame beyond said second stripper means in the direction of feeding of said pretwisted wire pair and connected to said second wire stripper means for moving said second wire stripper means away from said center clamping means, whereby said second wire stripper means strips the insulation from the second adjacent end portions of the pretwisted wire pair and simultaneously untwists the second adjacent end portions of the pretwisted wire pair; and

means connected to said first and second moving means for simultaneously activating said first and second moving means.

4,109,554

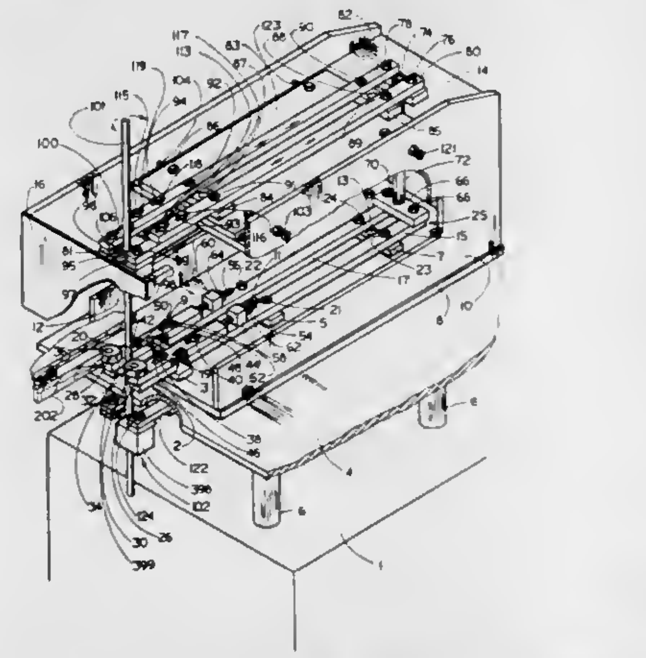
FEED GUIDE ATTACHMENT FOR BAND SAW MACHINES

Arthur J. Rhodes, 2601 Benoch Ave., Louisville, Ky. 40216, and William J. Rhodes, 3343 Campground Rd., Louisville, Ky. 40211

Filed Jan. 14, 1977, Ser. No. 759,260

Int. Cl.² B26D *1/54*

U.S. Cl. 83—565 **9 Claims**



1. A guide attachment for band saw machines comprising:

a pair of parallel spaced lower support members secured to a head frame of a band saw machine, one of the lower support members extending along the front of the head frame, the other extending along the back, the lower support members being pivotally attached in substantially the center of each support member, the pivot points being in alignment with each other;

a pair of parallel spaced lower side arm link members pivotally attached at opposed ends to the lower support members;

the lower link members extending outwardly beyond the lower front support member, each lower link member having a guide roller attached at the outwardly extending portion for rotation about vertically extending parallel axes and engageable with a template; and,

cooperating means for positioning a band saw blade in parallel alignment with the contour of the outer periphery of the template.

4,109,555

UNIVERSAL DOUBLE CUT DIE SET

Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Division of Ser. No. 695,242, Jun. 11, 1976, Pat. No. 4,036,091. This application May 27, 1977, Ser. No. 801,059

Int. Cl.² B26D *7/26*

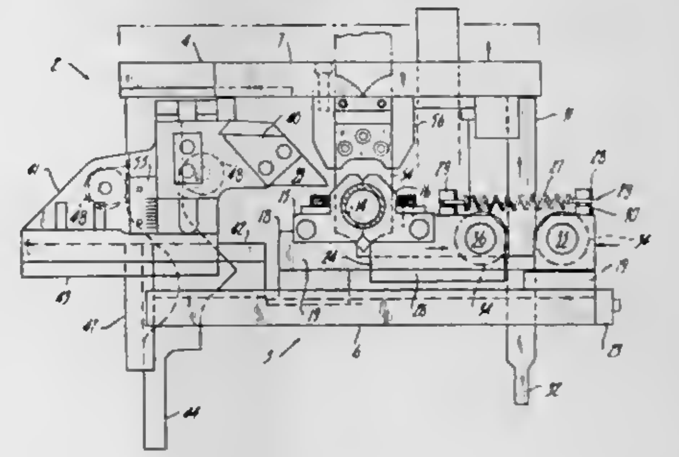
U.S. Cl. 83—700 **2 Claims**

1. In a cutoff die set including two relatively movable die shoes, and a cutoff blade mounted to one of said die shoes so as to be driven thereby, an improved mounting arrangement for said cutoff blade comprising:

means for mounting said cutoff blade;

mounting means for alternatively mounting said cutoff blade in a longitudinally offset position with respect to said one die shoe;

said mounting arrangement including a thrust surface fixed with respect to said die shoe engaging an end surface of said cutoff blade opposite the cutting edge in a first mounted position of said cutoff blade;



a clamping plate having a surface adapted to be interposed between said end surface and said thrust surface and in engagement with both of said surfaces in a second longitudinally offset position of said cutoff blade;

whereby said blade may be adapted to cutting different dimensioned workpieces along the direction of said longitudinal axis, and may be resharpened after breakage thereof.

4,109,556

EXPANSION DOWEL

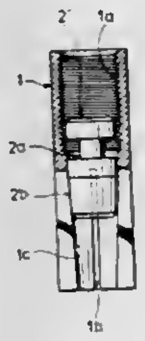
Helmut Vollmer, Balzers; Karl Ernst Udert, Triesen, both of Liechtenstein, and Hans Oechsle, Nenzing, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 20, 1977, Ser. No. 789,225

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1976, 2617212

Int. Cl.² F16B *13/06*

U.S. Cl. 85—84 **10 Claims**

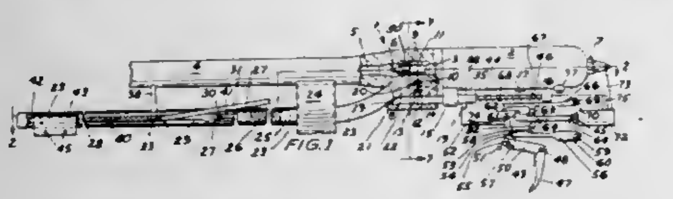


1. Expansion dowel to be secured in a borehole comprising an axially elongated sleeve having a leading end and a trailing end with a bore extending axially therethrough from the leading end to the trailing end, said sleeve being slotted over a portion of the length thereof from the leading end toward the trailing end, the bore in said sleeve having a tapered configuration with the surface thereof diverging from the leading end toward the trailing end in the axially extending region of the slotted portion of said sleeve, an expansion body insertable into the bore in said sleeve and being disposed in surface contact with the bore at least within the tapered portion thereof and being axially displaceable therethrough for expanding said

sleeve radially outwardly into anchoring engagement within a borehole, wherein the improvement comprises that said expansion body inserted into the bore in said sleeve having a leading end facing toward the leading end of said sleeve and an oppositely directed trailing end with an axially extending front region extending from the leading end toward the trailing end and an axially extending rear region extending from the trailing end toward the leading end, and said rear region having at least one axially extending annular shaped cross sectional constriction spaced radially inwardly of the adjacent axially extending exterior surfaces of said rear region and said constriction defining a deformable section being capable of deforming in the axial direction, after said expansion body has exerted a certain expansion pressure for anchoring said sleeve in the borehole, for assuring a predetermined distance between the trailing end of said sleeve and tbe trailing end of said expansion body.

4,109,557
GAS RIFLE

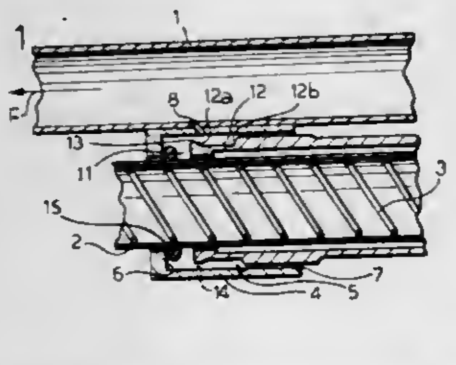
Charles D. Zancha, 7137 Janey St., Shreveport, La. 71108
Filed Apr. 6, 1977, Ser. No. 785,101
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **9 Claims**



1. A gas rifle comprising:
(a) a barrel having a barrel bore;
(b) a combustion chamber communicating with said barrel;
(c) a breechblock pivotally mounted in said barrel and having a breechblock bore registering with said barrel bore when said breechblock is in firing configuration;
(d) loading means for supplying a projectile or bullet in said breechblock bore when said breechblock is pivoted into loading configuration;
(e) gas supply means for supplying a combustible gas and oxygen to said combustion chamber; and
(f) ignition means for supplying a spark in said combustion chamber to ignite said gas and said oxygen and propel said bullet from said barrel.

4,109,558
SEMI-AUTOMATIC GUN

Giannantonio Panigoni, Brescia, Italy, assignor to Luigi Franchi S.p.A., Brescia, Italy
Filed Oct. 13, 1976, Ser. No. 732,059
Claims priority, application Italy, Nov. 21, 1975, 29528 A/75
Int. Cl.² F41D *5/04*
U.S. Cl. 89—191 A **4 Claims**



1. A semi-automatic gun having a cartridge magazine which extends parallel to the barrel of the gun and a gas operated device for the actuation of a reloading mechanism of the gun, said actuation device comprising:

a cylinder fixed to the barrel of said gun and surrounding a portion of said cartridge magazine, said cylinder and said portion of said cartridge magazine defining an annular chamber closed at one end and open at the other end;

means defining at least one gas transfer duct passing through said barrel and said cylinder;

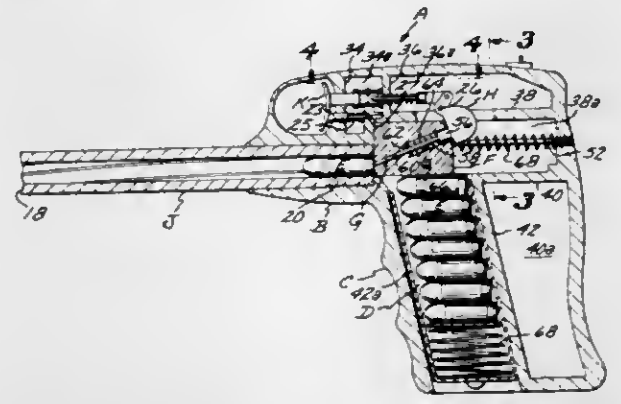
a tubular piston surrounding said magazine and projecting at one end into said annular chamber, said piston being slidable along said annular chamber, a end face of said piston at said one end thereof and said closed end of said annular chamber defining between them a power chamber;

said tubular piston includes an outer surface and means defining at least one annular groove in said outer surface adjacent said one end of said piston, said annular groove being coaxial to said piston and having side walls of unequal height; and

a gas transfer passage communicating between said power chamber and said annular groove in said piston, said gas transfer duct which passes through said barrel of said gun and said cylinder being positioned such that gases flowing therethrough from the interior of said barrel when said gun is fired impinge upon said groove in said tubular piston.

4,109,559
PISTOL STRUCTURE

Floyd William Davis, 1320 Florida Ave., Long Beach, Calif. 90802
Filed Apr. 7, 1977, Ser. No. 785,438
Int. Cl.² F41D *11/02*
U.S. Cl. 89—195 **4 Claims**

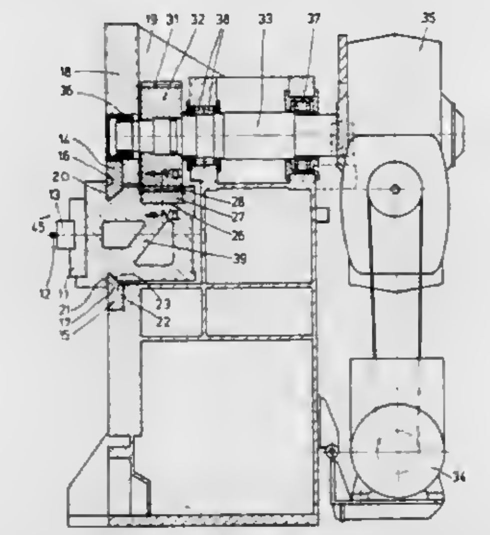


1. A pistol that includes a barrel, a housing situated rearwardly of said barrel and extending thereabove, a hollow handle depending from said housing, a spring-loaded cartridge magazine in said handle that at all times urges cartridges in said magazine upwardly, a recoil actuated assembly in said housing that includes a breech block that reciprocates between first and second positions, said breech block when in said first position permitting said spring loaded magazine to move an uppermost one of said cartridges into coaxial alignment with said barrel and when moving towards said second position forcing said uppermost cartridge into said barrel and detonating said uppermost cartridge, said pistol being characterized by a trigger assembly disposed above said barrel and longitudinally movable relative to said housing and so operatively associated with said recoil actuated assembly that when said trigger assembly is moved from a first to a second position, said uppermost cartridge is fired by movement of said breech block to said second position and said trigger assembly so long as it remains in said second position permitting cartridges in said magazine to be sequentially advanced to said firing position to be detonated by said breech block as the latter moves to said second position, said trigger assembly including a trigger disposed above said barrel and forwardly of said housing, which trigger is removably engageable by a forefinger of the hand of a user when the balance of the fingers of said hand encircle said handle and the rearward portions of said housing and handle are cradled in said hand, and the recoil force from said pistol being exerted on

substantially the center of the palm if said hand to provide a minimum of leverage, and said pistol due to said minimum leverage having a minimum tendency to pivot upwardly relative to said hand when said pistol is fired.

4,109,560
HORIZONTAL EXTERNAL BROACHING MACHINE

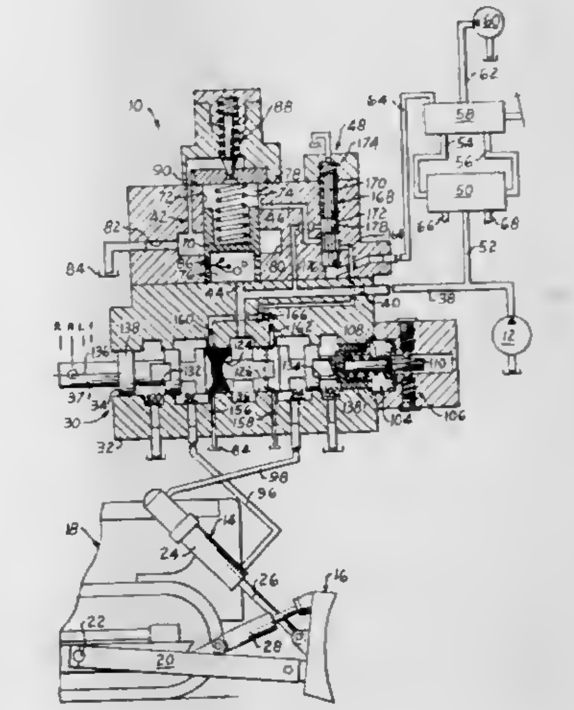
Gustav Esser, Solingen, Germany, assignor to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH, Solingen, Germany
Filed Dec. 13, 1976, Ser. No. 750,198
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633098
Int. Cl.² B23D *41/08*
U.S. Cl. 90—96 **4 Claims**



1. A horizontal external broaching machine comprising a horizontal machine frame having respective upper and respective lower vertical and inclined guide surfaces; a horizontally movable tool slide having respective upper and respective lower vertical and inclined guide surfaces and being disposed on said horizontal machine frame, said tool slide serving to receive a broaching tool, being supported laterally and vertically by its said vertical and inclined guide surfaces on said vertical and inclined guide surfaces of said machine frame, at least two of said vertical guide surfaces of said machine frame being disposed in a common vertical plane for receiving horizontal forces and at least said lower, inclined guide surface, which is inclined in relation to the vertical and in relation to the horizontal being provided on said machine frame for absorbing vertical forces and receiving said lower, inclined guide surface of said tool slide; a toothed rack on said slide, said rack extending in direction of movement of said tool slide; a driving pinion provided with corresponding teeth meshed with said rack, said pinion being adapted to be driven via a connecting shaft by a drive motor; and wherein the center of gravity of said tool slide is disposed on one side of said guide surfaces and said rack together with said drive pinion is disposed on said one side of said surfaces, said drive pinion being arranged vertically above said rack, and said rack and said drive pinion are provided with helical teeth which during driving in a broaching direction are acted on by a force, directed in direction of said shaft connected to said drive pinion and intensifying bearing forces acting on said guide surfaces for said tool slide.

4,109,561
CONTROL VALVE ARRANGEMENT WITH A PRECONDITIONED RELIEF VALVE AND A FLOW FORCE COMPENSATED VALVE SPOOL

John A. Junck, and Larry W. Lorimor, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 26, 1976, Ser. No. 745,508
Int. Cl.² F15B *11/08, 13/04*
U.S. Cl. 91—451 **6 Claims**



1. In a control valve arrangement, for regulating fluid communication between a source of fluid under pressure and a double-acting motor, of the type having a housing defining a bore, an inlet chamber in communication with the bore and the pressure source, a pair of service chambers in communication with the bore and the motor for actuation thereof, and a pair of drain chambers in communication with the bore; a pressure transmitting circuit connected to the housing and in communication with the bore; a relief valve in responsive communication with the pressure transmitting circuit for variably controlling the pressure in the inlet chamber; and a single spool reciprocably disposed in the bore of the housing and having a plurality of spaced, raised lands for blocking communication between the inlet chamber, the service chambers, and the drain chambers in a neutral position; wherein the improvement comprises:

a pair of drain passages in communication with the bore;

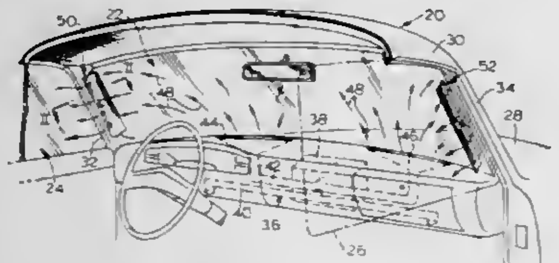
metering slot means in the spool for communicating fluid from the inlet chamber radially outwardly to a selected one of the service chambers and to the motor for operation thereof and for communicating return fluid from the other service chamber radially inwardly to a selected one of the drain chambers in a working position; and

opening means in the spool for communicating the circuit with the drain passages and unloading the relief valve in the neutral position, for communicating the selected one of the service chambers to the circuit for variably loading the relief valve in a preconditioning position of the spool between the neutral and working positions, and for communicating the selected one of the service chambers to the circuit for variably loading the relief valve in the working position.

4,109,562
DEFOGGING DEVICE

Carl D. MacDonald, 17 Ottaway, Barrie, Ontario, Canada (M4L 2W6)

Filed Nov. 2, 1976, Ser. No. 738,263
Int. Cl.^{2} B60H *1/24*
U.S. Cl. 98—2.19 **7 Claims**



1. In a motor vehicle having: a body structure which includes a windshield, two generally upright pillars at opposite sides of said windshield, and at least one side window disposed rearwardly of the windshield; and a heater system having heated air outlet means adjacent a lower edge of said windshield arranged to direct heated air upwardly and laterally outwardly over the inner surface of the windshield;

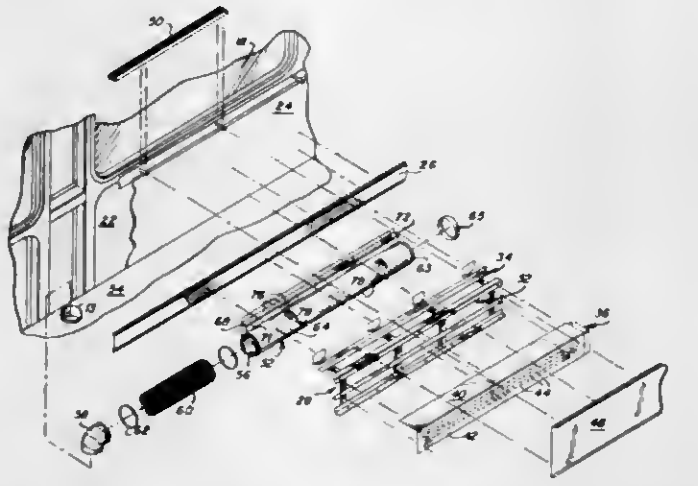
the improvement comprising a side window defogging device associated with at least one of said pillars and disposed in the path of heated air directed over the inner surface of the windshield towards said pillar from said heated air outlet means, the device being manufactured as an initially separate unit and including a vane member, and means mounting the member on the body structure of the vehicle, said vane member defining an air deflecting surface which is spaced from said vehicle body structure and which is arranged to deflect approaching heated air towards the inner surface of said side window, and said mounting means including a member attached to the body structure of the vehicle, and means coupling said mounting member with said vane member, said mounting member being flexible to conform with the contour of the part of the body structure to which it is attached, and defining an attachment face having thereon a pressure sensitive adhesive coupling said member with said vehicle body structure.

4,109,563
LOW NOISE FLUID DISTRIBUTOR

George W. Schleicher, Addison, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Oct. 6, 1976, Ser. No. 730,236
Int. Cl.^{2} F24F *13/04*
U.S. Cl. 98—40 C **10 Claims**

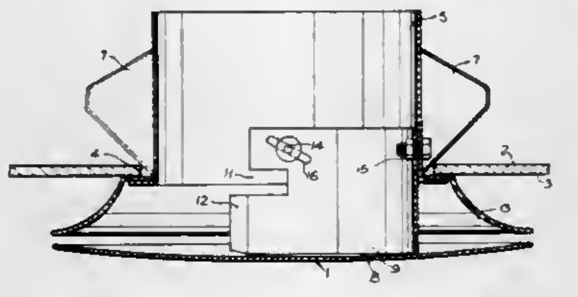
1. A low noise fluid distributor comprising a housing, said housing defining first, second, and third chambers,
said first chamber having an inlet adapted to be coupled to a source of primary fluid,
at least one fluid outlet nozzle defined in said first chamber, said nozzle defining a fluid inlet in said second chamber,
said second chamber including at least one nozzle defining a fluid outlet for said second chamber, said outlet nozzle for said second chamber in fluid communication with said third chamber,
said first chamber adapted to be in fluid communication with a source of secondary fluid, and
a fluid outlet in said third chamber adapted to allow the passage of mixed secondary and primary fluids,
said first chamber including a damper defining said outlet nozzle in said first chamber, said damper being adjustable to define the transverse dimension of said nozzle,
said damper having an arcuate configuration defining a converging-diverging nozzle.



4,109,564
VENTILATION ELEMENT WITH TUBULAR CONNECTOR FOR INSERTION INTO AN OPENING IN A CEILING OR A WALL

Lennart Widerby, Jönköping, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Continuation-in-part of Ser. No. 741,681, Nov. 15, 1976, Pat. No. 4,078,476. This application Dec. 28, 1976, Ser. No. 755,049
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1975, 7537113[U]
Int. Cl.^{2} F24F *13/00*
U.S. Cl. 98—40 N **6 Claims**



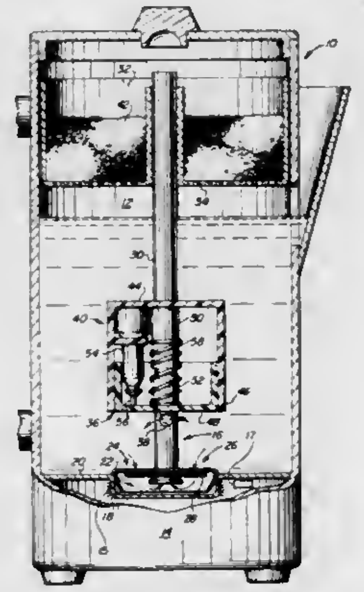
1. A ventilation element for mounting into an opening in a partition characterized in that said ventilation element comprises a cylindrical connector having wings extending tangentially from its outside surface, and a diffuser having a cylindrical wall telescopically introduced into said connector and interconnected by means of fasteners which are guided in oblique slots in one of said telescoping parts, said slots being inclined towards the zone of introduction in the same circumferential direction as said wings, the cylindrical wall of the diffuser being cut off in axial direction to form a radial opening and being rigidly connected to a cover disc to form a barrier against the radial flow of air beyond said radial opening.

4. A ventilation element for mounting into an opening in a partition characterized in that said ventilation element comprises a cylindrical connector having stop means for engaging one surface of the partition for limiting axial displacement of said connector through said opening, and flexible wings extending tangentially from its outside surface, said wings having an inclined surface facing said stop means at an angle less than 90° with the axial length of the connector for engaging the opposite surface of the partition affording rotation of said connector in one direction about its axis and resisting rotation of said connector in the opposite direction, and a diffuser having a cylindrical wall telescopically introduced into said connector and interconnected by means of fasteners which are slidable and guided in oblique slots in one of said telescoping parts, said slots being inclined towards the zone of introduction in the same circumferential direction as said wings, whereby rotation of the diffuser in said one direction may rotate the connector, and rotation of the diffuser in said opposite direction affords adjustment of the diffuser axially relative to the connector.

4,109,565
COFFEE PERCOLATOR

Robert R. Tucker, 3212 E. Captain Dreyfus, Phoenix, Ariz. 85032

Filed Apr. 29, 1977, Ser. No. 792,466
Int. Cl.^{2} A47J *31/053*
U.S. Cl. 99—283 **10 Claims**



1. In a coffee percolator including:
(a) a single chamber for holding a quantity of fluid in said percolator, said chamber having an upper and a lower portion;
(b) a heating element disposed in the lower portion of said percolator for heating the fluid in said chamber;
(c) switch means including a first thermostat for initially actuating said heating element and for deactivating said heating element after the fluid attains a first temperature;
(d) pump means including a hollow tube having an upper and a lower opening and extending upwardly from the lower portion of said chamber for pumping heated fluid into the lower opening of said tube, upwardly through said tube and out of the upper opening in said tube; and
(e) a coffee ground receptacle disposed in said chamber about the upper portion of said tube and having a perforated lower surface for retaining coffee grounds, for receiving heated fluid discharged from the upper opening of said tube and for releasing heated coffee flavored fluid from the lower surface of said receptacle into said chamber;

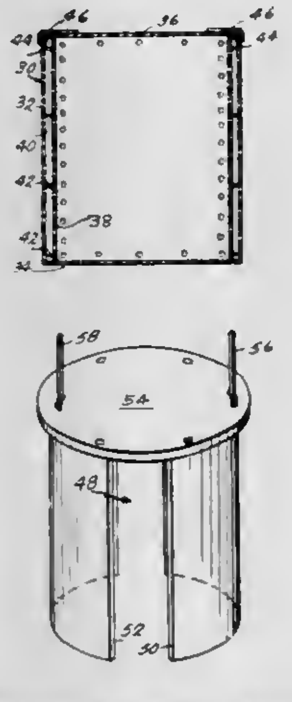
the improvement comprising:
(a) temperature actuated pump control means coupled to said pump means for deactivating said pump means when the temperature of the fluid in said chamber is less than a second temperature below the first temperature including
  (i) an aperture disposed in said pump means for releasing fluid under pressure from said pump means and thereby disabling said pump means; and
  (ii) thermostatically actuated valve means for closing off said aperture when the temperature of the fluid in said chamber exceeds the second temperature and for uncovering said aperture when the temperature of the fluid in said chamber falls below the second temperature;

whereby only fluid having a temperature greater than the second temperature passes over the coffee grounds in said receptacle and the flow of heated fluid over the coffee grounds is terminated by said first thermostat when the temperature of the fluid reaches the first temperature.

4,109,566
FOOD CONTAINER HAVING ELECTRODE POCKETS

Knut Birger Vigerstrom, Stockholm, Sweden, assignor to Electro-Food AB, Sweden

Continuation-in-part of Ser. No. 292,787, Sep. 27, 1972, Pat. No. 3,877,360. This application Apr. 15, 1975, Ser. No. 568,365
Claims priority, application Sweden, Sep. 29, 1971, 12342/71
Int. Cl.^{2} A23L *1/01*
U.S. Cl. 99—358 **14 Claims**

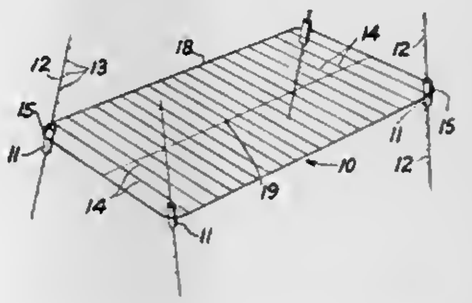


1. A container for heating foodstuff contained therein comprising an electrically insulating outer wall forming a sealed enclosure for the foodstuff, perforated inner electrically insulating wall means within the enclosure forming at least two pockets between said inner wall means and said outer wall for receiving at least two spaced apart electrodes which are adapted to be connected to an electrical supply source, said outer wall having means defining apertures communicating with said pockets and removable closure means cooperating with said outer wall immediately adjacent said pockets for closing said apertures whereby removal of said removable closure means opens said pockets through said apertures for receiving the electrodes.

4,109,567
CAMP GRILL

Michael H. Gage, 3505 Woodhaven Dr., Erie, Pa. 16506, and Phillip H. Zacks, 636 Hilltop Rd., Erie, Pa. 16509

Filed Dec. 30, 1975, Ser. No. 645,410
Int. Cl.^{2} A47J *33/00, 37/00, 37/07*
U.S. Cl. 99—450 **3 Claims**



1. A camp grill comprising a grill top generally rectangular in shape and having an outer marginal wire,

spaced, laterally-extending support wires having their ends supported on said marginal wire and affixed thereto,

a hollow, cylindrical leg holder fixed to said marginal wire at each corner thereof,

each said leg holder having an axially-extending slot extending from end to end therein forming a path through which lugs can move from a position spaced from one end of said cylindrical holder to a position spaced from another end of the particular cylindrical holder,

a plurality of legs,

each said leg being generally cylindrical in shape and having an outside diameter slightly smaller than the inside diameter of each said hollow, cylindrical holder and slidably received in the hollow of said leg holder,

axially-spaced lugs fixed to said legs,

each said lug having a width less than the width of said slot in said leg holder and being adapted to slide through said slot for adjusting the position of said legs and to be rotated to underlie said leg holder in use whereby said lugs support said grill on said legs selectively at different positions.

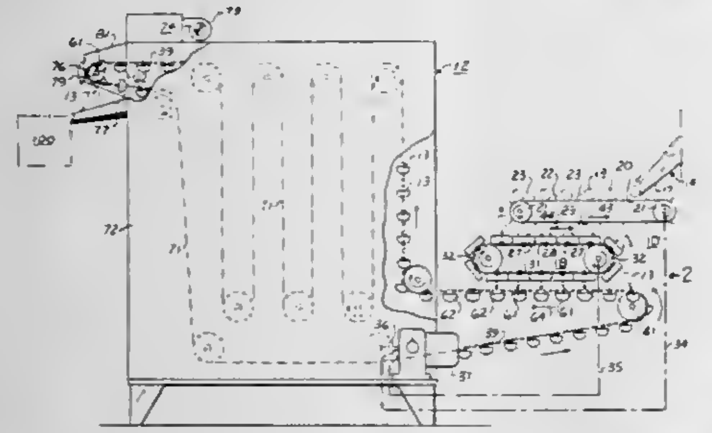
4,109,568
DISTRIBUTING AND PROCESSING APPARATUS

Frank J. Herrera, Downey, and Rodger G. Ponce, Los Angeles, both of Calif., assignors to Casa Herrera, Inc., Los Angeles, Calif.

Division of Ser. No. 497,006, Aug. 13, 1974, Pat. No. 3,976,188. This application Apr. 2, 1976, Ser. No. 673,188

Int. Cl.² A23L *1/00*

U.S. Cl. 99—477 **3 Claims**



1. Apparatus for proofing lumps of dough, comprising in combination:

an endless conveyor including an endless conveyor loop and rotary means including a wheel for supporting said endless conveyor loop;

a series of first means on said conveyor for transporting lumps of dough;

a series of second means on said conveyor for transporting lumps of dough, said second means being spaced from said first means, and said first and second means being staggered relative to each other and comprising cups and means for tiltably mounting said cups on said endless conveyor loop;

means for loading lumps of dough into said first and second means;

means for deriving transported lumps of dough from said first and second means including means for selectively tilting said cups, said tilting means having a shaft for said rotary means, and means for positioning said shaft in a path of said cups for successive impingement of said cups upon said shaft, said shaft extending concentrically of said wheel;

enclosure means for said endless conveyor and said first and second means; and

means for providing inside said enclosure means a proofing environment for said lumps of dough.

4,109,569
DOUGH MAKEUP LINE FOR THE SELECTIVE PRODUCTION OF DIFFERENT KINDS OF BREAD

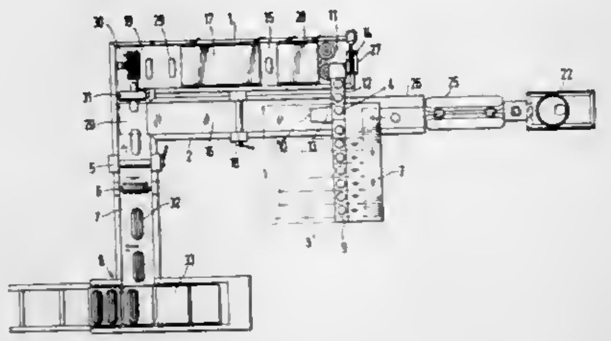
Kate Kemper, Wybuelstrasse, 6, 8702 Zurich-Zollikon, Switzerland

Filed Mar. 22, 1976, Ser. No. 669,098

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1975, 2512776

Int. Cl.² A21C *13/02, 3/02, 5/00*

U.S. Cl. 99—483 **20 Claims**



1. A dough makeup line for the selective mechanized processing of a mass of bread dough into molded dough pieces of one of several sizes and shapes, for different kinds of bread, which are to be baked in a bread baking oven, the makeup line comprising in combination:

means for dividing the mass of dough into a succession of dough pieces and means for rounding the dough pieces;

a proofer for the fermenting of the rounded dough pieces, the proofer including a dough piece delivery device; and

at least two dough piece molding lines extending away from the proofer, the molding lines including dough piece conveying means and dough piece molding means adapted to shape the dough pieces in different ways; and wherein

the dough piece delivery device of the proofer includes means for selectively setting the delivery of the proofed dough pieces so as to take place to the one or the other of the dough piece molding lines.

4,109,570
APPARATUS FOR PITTING PEACHES

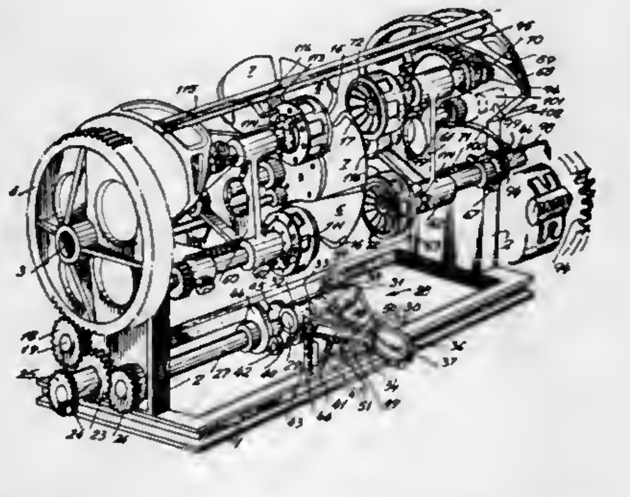
Jesus Antonio Silvestrini, Codoy Cruz, Argentina, assignor to California Processing Machinery, San Ramon, Calif.

Filed Dec. 11, 1975, Ser. No. 639,706

Claims priority, application Argentina, Aug. 14, 1975, 260021

Int. Cl.² A23N *4/12;* A47J *25/00;* A23N *4/22*

U.S. Cl. 99—551 **25 Claims**



1. Apparatus to part to bisect and destone fruits of the peach type comprising first means for receiving a fruit, producing a partial cut on its pulp thus defining two adhered halves and gripping the stone of the fruit while rotating same about a first axis, fluid operated means for resiliently engaging and gripping both halves and rotating them in opposite directions about their center axis until the freeing of both halves, one with respect to the other, and of both halves from the stone, while the stone remains gripped by said first means, a supply of a fluid, communicating means for communicating said supply of fluid to said fluid operated means, first and second valve means for valving said communicating means; second means responsive to fruit being engaged by said fluid operated means to actuate said first valve means into an open mode, third means actuated responsive to a predetermined rotation of said first means to actuate said second valve means into an open mode for connecting said fluid supply to said fluid operated means, fourth means to actuate said fluid operated means in said center axis rotation mode during a predetermined rotation of said first means and fifth means responsive to a predetermined rotation of said first means and connected to said second valve means to cause release of the fruit halves and connected to said first means to cause release of the stone.

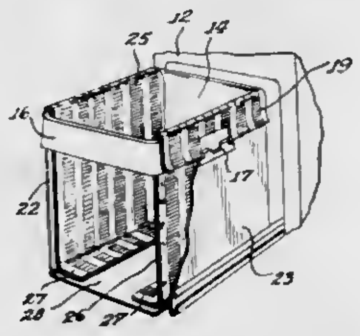
4,109,571
REFUSE COMPACTION METHOD

Charles Rogers Difley, and William Roy McDonald, both of Danville, Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 14, 1977, Ser. No. 815,602

Int. Cl.² B30B *13/00*

U.S. Cl. 100—35 **10 Claims**



1. The method of bagging refuse in a refuse compactor having an upwardly opening compaction receptacle defining an upper edge portion, an upright sidewall, and a bottom wall, comprising the steps of:

installing an upwardly opening bag in the receptacle with a bottom portion superposed on said receptacle bottom wall, a sidewall portion juxtaposed to said receptacle sidewall, and a top portion turned over said receptacle upper edge;

installing a plurality of sets of stacked paper sheets in lining relationship to said bag with the upper portions of said sheets turned over said turned-over top portion of the bag;

securing the overlying upper portions of the sheets and top portion of the bag to the upper edge portion of the receptacle;

depositing and compacting refuse in the sheet-lined bag;

releasing the secured upper portion of the sheets and top portion of the bag from the upper edge portion of the receptacle; and

gathering the upper portions of the sheets and top portion of the bag.

4,109,572
PRINTING MACHINE FOR FLAT ARTICLES

Pierre Roulleau, 19 rue Berlioz, Oyonnax, France (01 104)

Filed May 9, 1977, Ser. No. 795,360

Claims priority, application France, May 17, 1976, 76 15583

Int. Cl.² B41F *17/00*

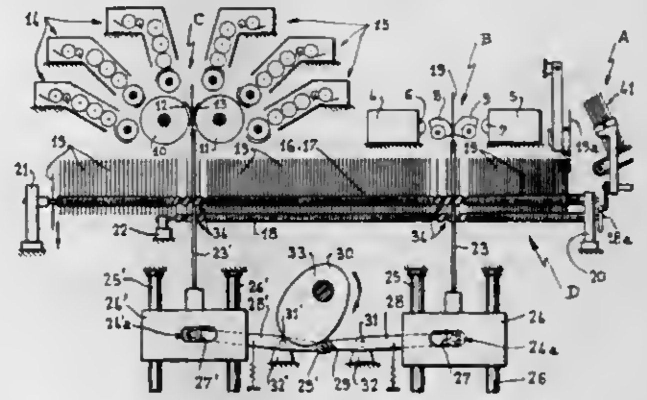
U.S. Cl. 101—37 **10 Claims**

1. A machine to print flat circular disc-like articles such as the central portions of phonograph records, the machine comprising:

conveyor means to advance substantially horizontally the articles to be printed standing on the conveyor means in successive substantially vertical transverse planes, the conveyor means comprising substantially horizontal parallel screws with each article to be printed being retained on edge in corresponding threads of said parallel screws, and said conveyor means having an upstream end onto which the articles are loaded;

at least one printing station disposed above said conveyor means and having means operative to contact said central portion of the article when it is raised above the conveyor means into said printing station;

vertically reciprocating means below the conveyor means and operative to raise each successive article from said conveyor means into said printing station and then lower it downwardly onto said conveyor means;



drive means for rotating in unison said screws to advance the articles, and said drive means vertically reciprocating said reciprocating means during a predetermined portion of each rotation of said screws; and

each of said screws having an expanded pitch zone of increased thread pitch located opposite to each station and reciprocating means, wherein the thread approaching the expanded zone is separate from the thread departing the expanded zone, and wherein the departing thread begins in the zone circumferentially spaced from the approaching thread by an angular displacement equal to said predetermined portion of one rotation of said screws.

4,109,573
ARTICLE, SCREEN AND SQUEEGEE DRIVE FOR SCREENPRINTER

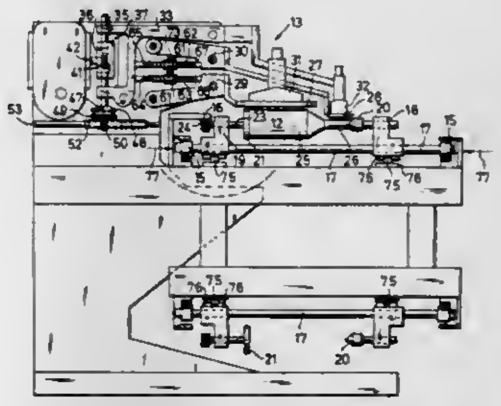
Karl Strauch, Kirchlengern, and Wilfried Kammann, Bnnde, both of Germany, assignors to Werner Kamman Maschinenfabrik, Buende, Fed. Rep. of Germany

Continuation nf Ser. No. 541,411, Jan. 6, 1975, Pat. No. 4,005,649. This application Jul. 6, 1976, Ser. No. 702,861

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1974, 2402836

Int. Cl.² B41F *15/10, 15/30*

U.S. Cl. 101—38 R **29 Claims**



1. In a screen-printing machine for printing on rotatably-held objects of different diameters, a combination comprising support means; at least one printing staton on said support

means and past which an object to be printed travels in a path in a predetermined direction, and which includes a movable printing screen and a cooperating movable squeege; means for uniformly rotating said object to be printed at a fixed number of revolutions per unit time, including a gear and a rack extending along said path, said rack being fixed in position on said support means and located at said one printing station so as to be stationary in said direction of movement and also meshing with said gear to rotate said object at a constant rate of peripheral speed for an object of a given diameter; means for moving said squeege at a constant rate of speed; means for adjusting the speed of movement and the stroke of said printing screen whenever an object of a different diameter and therefore of a different peripheral speed than before is to be printed, whereby the periphery of each object is printed at a uniform speed; mounting means for mounting said priming screen, and mounting means for mounting said squeegee; a movable element connected between both of said mounting means and mounted on a support which is movable to-and-fro in said path; and drive means for imparting to-and-fro movements to said movable element so as to effect relative movement between said printing screen and said squeegee.

4,109,574
CONTROL SYSTEM FOR POSITIONING UNITS EXHIBITING DEAD TIMES

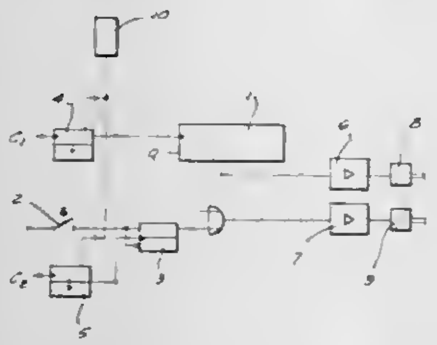
Karl-Heinz Förster, Dresden; Werner Lein, and Hartmut Heiber, both of Radebeul, all of German Democratic Rep., assignors to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, German Democratic Rep.

Filed Mar. 29, 1977, Ser. No. 782,541

Claims priority, application German Democratic Rep., Mar. 29, 1976, 192087

Int. Cl.^{2} B41F *13/00, 33/16*

U.S. Cl. 101—216 **7 Claims**



1. An improved control system for a variable-speed cyclically operating printing machine, the control system being of the type including clocked control means having a clock input receiving printing-machine-synchronized clock signals, the clocked control means being operative for generating activating signals in dependence upon the number of received clock signals, the control system furthermore including at least one positioning unit connected to receive activating signals from the clocked control means but exhibiting a dead time in its response to activating signals, the duration of the dead time not varying linearly with the speed of operation of the printing machine, whereby the fraction of a printing-machine operating cycle constituted by the duration of the dead time varies as the speed of operation of the printing machine varies, the improvement comprising the provision of speed-signal generating means operative for generating a speed signal whose value varies in correspondence to the speed of operation of the printing machine; and time-delay means connected to receive the speed signal and connected to the clocked control means and operative for compensating for the varying fractional relationship between the printing-machine operating-cycle duration and the deadtime duration by introducing, into the transmission of an activating signal from the control means to the positioning unit, a compensatory time delay whose duration varies in dependence upon variations in the value of the speed signal.

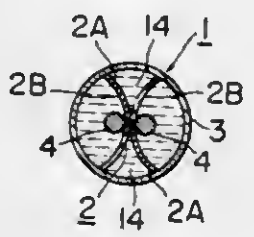
4,109,575
BLASTING METHOD AND DEVICE

Hiroshi Hashimoto, Chigasaki, Japan, assignor to Tobishima Kensetsu Kabushiki Kaisha, Japan

Filed Mar. 21, 1977, Ser. No. 779,658

Int. Cl.^{2} F42B *3/00;* **F42D** *3/00*

U.S. Cl. 102—22 R **3 Claims**



1. In a method for blasting a rock, a concrete structure, or a like object, which comprises boring a plurality of holes in the object; placing into each of said holes a cylindrical casing containing therein an incompressible fluid such as water, an explosive substance with an electric blasting cap, and electric conductors leading from said blasting cap outward for connection to an outside detonating device; tamping a stuffing into the opening of each hole; and then detonating said explosive substance thereby to generate a shock wave in said fluid; the improvement wherein said plurality of holes are bored in the object in a row and at positions spaced apart respectively by a specific distance; a deflector comprising two reflective concave-surfaces of semicircular cross-section mutually secured in back-to-back relation and containing an explosive substance at each of said reflecting surfaces is enclosed in each of said cylindrical casings; each of said casings containing therein respectively said deflector and explosive substance is inserted into each of said holes whereafter each of said holes is stuffed by tamping; and said explosive substances in all of said holes are exploded simultaneously thereby to fracture the object in the direction along which the shock wave is transmitted.

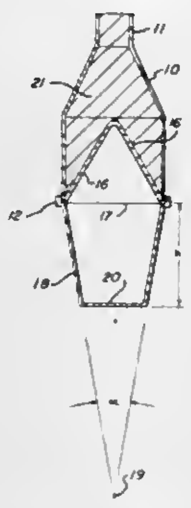
4,109,576
SHAPED CHARGE WITH ENHANCED PENETRATION

Robert E. Eckels, 2101 Youngfield, Golden, Colo. 80401

Continuation-in-part of Ser. No. 587,911, Jun. 18, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,732

Int. Cl.^{2} F42B *3/08*

U.S. Cl. 102—24 HC **17 Claims**



1. A shaped explosive charge enhancement and stand-off structure in which the shaped charge has a cone on the order

of about 60°, comprising in combination with a housing for the explosive having the cone lined.

(a) a frusto-conical rigid structure having its small end about two-thirds of the diameter of the base of the cone and perpendicular to the longitudinal axis of the cone, and its larger end about the same area as the base of the cone and perpendicular to the longitudinal axis of the cone and arranged to register with the base of the cone,

(b) the longitudinal axis of the frusto-conical structural being coincidental with the longitudinal axis passing through the cone,

(c) the inside wall of said frusto-conical structure being smooth in a longitudinal direction, so as to provide an unhindered path for gases travelling longitudinally along the wall,

(d) means for securing said structure to the shaped charge, and

(e) the inner wall of said structure converging from its large to its small end at a closing angle ranging from about 8°-17° at 1.5 cone diametes stand-off to a closing angle of about 30° at from about 0.9 to 0.4 cone diameters stand-off and arranged so that no portion of a generated jet particulates contacts the inner wall, and the velocity of the generated jet is increased to produce substantially increased penetration in a target material.

4,109,577
DEVICE FOR BOTTOM UNIT FOR PROJECTILE

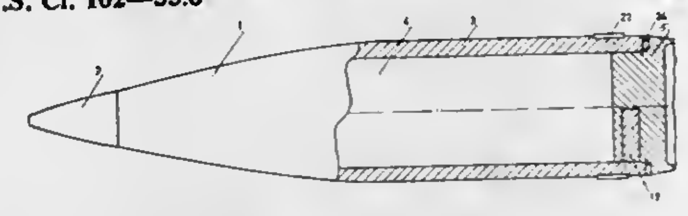
Nils Gunnar Björkqvist; Hans Arne Edgar Franzén, and Karl Ingmar Wenzel Johansson, all of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Jun. 21, 1976, Ser. No. 697,899

Claims priority, application Sweden, Jul. 4, 1975, 7507705

Int. Cl.^{2} F42B *4/12*

U.S. Cl. 102—35.6 **7 Claims**



1. An improved bottom plug for a projectile of the type having a tubular casing defining an interior space closed at its bottom end by said bottom plug, said space enclosing a smoke or illuminating charge and an expulsion charge for forcing said bottom plug and said smoke or illuminating charge from said casing, said bottom plug comprising:

a first part having a substantially cylindrical outer envelope surface portion configured to fit within and close said bottom end of said casing, and an end surface also defining said interior space;

said first part defining a recess extending within said first part and opening only through its said cylindrical envelope surface portion to form an unbroken cylindrical surface for said bottom plug between said recess and said end surface at said first part;

and a second part comprising a centering weight located within said recess, each of said first and second parts being eccentric relative to a central rotational axis of the projectile but jointly forming when said centering weight is in said recess, a substantially centric mass relative to said axis;

whereby said second part is normally maintained within said recess but moves laterally out of the path of said smoke or illuminating charge in response to centrifugal forces when said bottom plug separates from said casing.

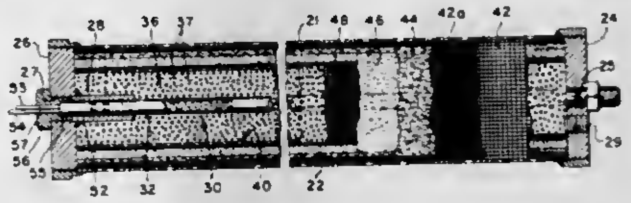
4,109,578
FLUID GENERATOR

George W. Goetz, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 591,910, Jun. 30, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,749

Int. Cl.^{2} B60R *21/08*

U.S. Cl. 102—39 **22 Claims**



1. A device for producing inflating fluid for use with an inflatable occupant restraint in a vehicle, said device comprising:

(a) elongated housing means including means defining a plurality of radial flow fluid discharge ports distributed along substantially the length of said housing means;

(b) gas generating means disposed within said housing means, said generating means including,

  (i) booster charge means including a first combustible chemical material;

  (ii) elongated casing means disposed within said housing means, and having said booster charge means disposed therewithin and in direct contact with the internal surface thereof, said casing means comprising an elongated tubular member extending substantially the full length of said elongated housing means, said tubular member having the wall thereof thin with respect to the smallest transverse dimension thereof; and formed of frangible material;

  (iii) sustaining charge means including a second combustible chemical material capable of producing a compressible fluid upon ignition by said booster charge means, said sustaining charge means being disposed in annular arrangement about said casing means, said second combustible material having a burn rate substantially slower than the burn rate of said first chemical material, said second combustible material being formed of granules which, upon ignition by said booster means, burn so as to form a residue of solid porous sinters, and said annular sustaining means burns to discharge fluid outwardly through said discharge ports;

(c) means within said housing means defining an annular plenum zone communicating with each of said fluid ports, with said plenum zone being disposed about and receiving the fluid discharge from said sustaining charge means;

(d) initiator means disposed adjacent one end of said casing means for igniting said booster charge means, whereupon activation of said initiator means, said booster charge means ignites and progressively ruptures said casing means along the length thereof and progressively longitudinally ignites the portions of said sustaining charge means adjacent said sustaining charge means adjacent said casing means for radially outward burning of said sustaining charge means; and

(e) connector means adapted for connecting said initiator means to a source of activation.

4,109,579
PRACTICE AMMUNITION DEVICE

Harry R. Carter, Moscow, Pa., assignor to Carter Pol Development Corp., Moscow, Pa.

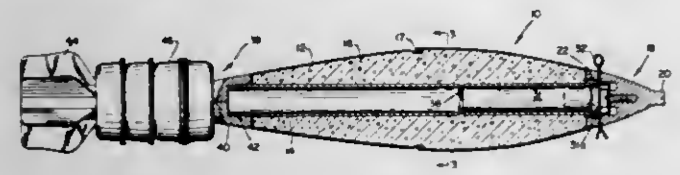
Filed Oct. 29, 1976, Ser. No. 737,144

Int. Cl.^{2} F42B *13/22*

U.S. Cl. 102—41 **10 Claims**

1. A practice shell comprising an outer casing; tubular means mounted coaxially within and spaced from said casing substan-

tially throughout its length; cementitious ballast means substantially filling the space between said casing and tubular means, said cementitious ballast means being of suitable composition so that, when mixed with water, it sets up rapidly between said casing and tubular means, it develops high early strength, and it expands upon setting to substantially completely fill the space between said casing and tubular means; a nose assembly connected to the forward end of said tubular means; a firing pin assembly mounted within said nose assembly; and a signal device mounted within said tubular means and adapted to be detonated by said firing pin assembly upon impact of said nose assembly with a target.



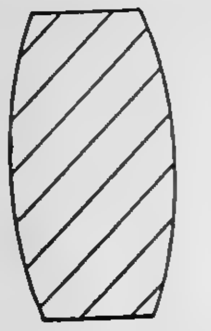
4,109,580
ARMOR PLATE PENETRATOR

Patrick J. Devine, Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 660,526, Feb. 23, 1976, abandoned. This application Mar. 10, 1977, Ser. No. 776,341

Int. Cl.² F42B *13/06*

U.S. Cl. 102—52 **1 Claim**



1. In an armor piercing round having a case wall including propellant therewithin and a projectile disposed at a forward portion of said case wall, said projectile including a penetrator or core therewithin, said projectile being carried by a non-discarding sabot, said sabot having a windshield associated therewith, and means for igniting said propellant within said case for propelling said projectile forwardly with said sabot and windshield from said case at a high rotational speed, in combination therewith, the improvement comprising said penetrator or core having a non-circular transverse cross-section and a center of gravity and weight substantially identical with said penetrator or core, said nondiscarding sabot having an internal configuration mating generally with the external configuration of said non-circular transverse cross-section penetrator, a non-circular transverse cross-section penetrator which includes;

a barrel shaped elongated penetrator member having a transverse cross-section having oppositely disposed symetrically shaped convex sides positioned along a major axis of an axis of rotation of said projectile, said barrel shaped elongated penetrator member having greater mass closer to said axis of rotation than mass further removed therefrom, said penetrator member cross-sectional configuration increasing said projectile shatter velocity and improving the gyroscopic stability of said projectile.

4,109,581
PROJECTILE FOR AN INFANTRY RIFLE

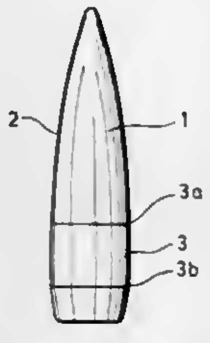
Ludwig Six, Karlsruhe, Germany, assignor to Mauser-Werke Aktiengesellschaft, Germany

Filed May 3, 1971, Ser. No. 140,291

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1970, 2041305

Int. Cl.² F42B *11/26*

U.S. Cl. 102—92.1 **5 Claims**



1. Projectile, particularly for infantry weapons and light automatic weapons, comprising a small-calibered solid projectile body made of soft iron with an extremely high starting speed, provided with a conical guide portion between its ends whose largest and smallest diameters are each greater than the smallest diameter of the rifling in the barrel of the weapon through which the projectile is intended to travel.

4,109,582
TWIST-REDUCING RINGS FOR STABILIZED PROJECTILES

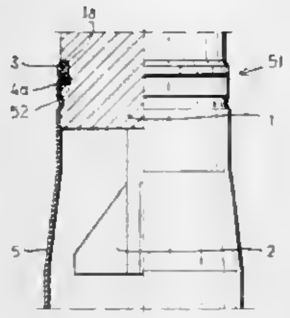
Heinz Haep, Dusseldorf, and Georg Schumacher, Niederkruechten, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 11, 1976, Ser. No. 740,790

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551389

Int. Cl.² F42B *31/00*

U.S. Cl. 102—93 **9 Claims**



1. In a stabilized projectile having charge-carrying jacket means extending forwardly and separable from an associated cartridge, the jacket means having an annular groove on the outer periphery thereof, and twist-reducing ring means rotatably carried in the annular groove for relative rotation concentric with the axis of the projectile, the improvement wherein the twist-reducing ring means comprises a plurality of identical, axially aligned first ring segments disposed in circumferentially successive abutting relation, the first segments cooperating to form a first closed annulus; and in which the projectile further comprises means for removably retaining the cooperating first segments in the annular groove prior to separation of the jacket means from the cartridge.

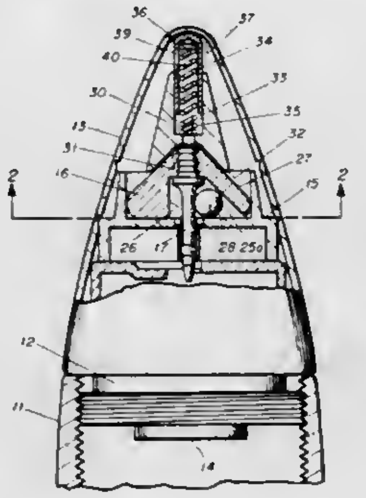
4,109,583
PROJECTILE FUZE

Melvin Eneman, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 675,429, Apr. 9, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,306

Int. Cl.² F42C *15/22*

U.S. Cl. 102—244 **4 Claims**



1. In a point detonating spin stabilized projectile having a tapered forward nose member and a fuze forward housing secured in said nose member,

said fuze forward housing having a central longitudinal passage accommodating a longitudinally movable firing pin, said fuze forward housing having a forwardly opening recess containing a firing pin assembly, said firing pin assembly including said firing pin and an element having a plurality of slotted inclined walls a camming ball adjacent each of said slotted inclined walls, each of said balls being responsive centrifugal force for forwardly camming said firing pin assembly to arm said firing pin, said firing pin assembly having a conically tapered forward external surface portion,

a graze sensor having a tapered rearwardly opening recess defining a camming surface in at least partial contact with said conical surface portion, said graze sensor having a forwardly opening cylindrical recess,

a rearwardly opening tubular sleeve slidably mounted in said cylindrical recess, and

a compression spring in said sleeve for forwardly biasing said sleeve against said nose member.

4,109,584
TRACK SWITCHING DEVICE FOR TWO-RAIL TYPE TRACKS

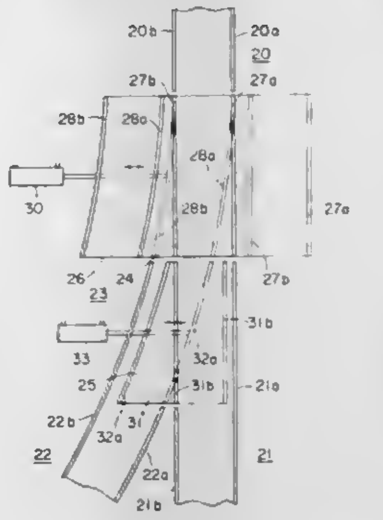
Kiyoshi Mihirogi, Odawara, Japan, assignor to Japan Airlines Co., Limited, Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,365

Int. Cl.² E01B *7/00, 25/12*

U.S. Cl. 104—130 **4 Claims**

1. A track switching device for two-rail type tracks for guiding magnetic floating type rolling stock including drive means with a protruding portion positioned between the two rails of said track, said device comprising first, second and third tracks, first and second movable means, said first movable means having two rails and being positioned at the joint of the first track and the second and third tracks to which said first track is selectively coupled, each of said first, second and third tracks having two parallel rails, said two rails of said first movable means being positioned such that when said first movable means is moved to switch the tracks, said two rails of the first movable means are moved between the two outer rails of said second and third tracks for coupling a selected one of said two rails of the first movable means to a selected one of inner rails of said second and third tracks and for providing sufficient space between said rails for said protruding portion of said vehicle drive means; said second movable means being positioned between said first track and said first movable means and having track means engageable with said first, second, and third tracks and said first movable means.



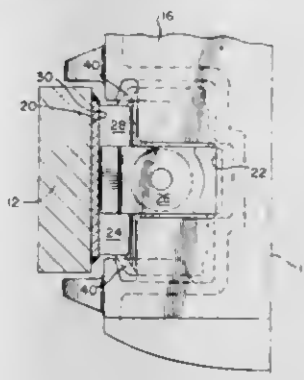
4,109,585
FRICTIONALLY SNUBBED RAILWAY CAR TRUCK

Albert F. Brose, St. Louis, Mo., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 23, 1976, Ser. No. 753,789

Int. Cl.² B61F *5/06, 5/12, 5/24, 5/50*

U.S. Cl. 105—197 DB **8 Claims**



1. A friction apparatus for a railway car truck comprising: a side frame having a substantially upright column partially defining a bolster opening; a bolster resiliently supported in said opening for vertical movement therein; a vertical planar friction surface on said column; guiding surfaces on said bolster; a friction shoe comprising a substantially planar wall, a vertical spring pocket and wings projecting laterally outward from said spring pocket and having guided surfaces; a spring in said spring pocket urging said wings into engagement with said guiding surfaces thereby guiding said wall into engagement with said friction surface; said wing guided surfaces being inclined toward said wall and said guiding surfaces to form an angle with said guiding surfaces having its apex adjacent said spring pocket to tend to rotate said friction shoe about the spring.

4,109,586

UNIVERSALLY SUSPENDED SNUBBING RAILWAY AXLE TRUCK

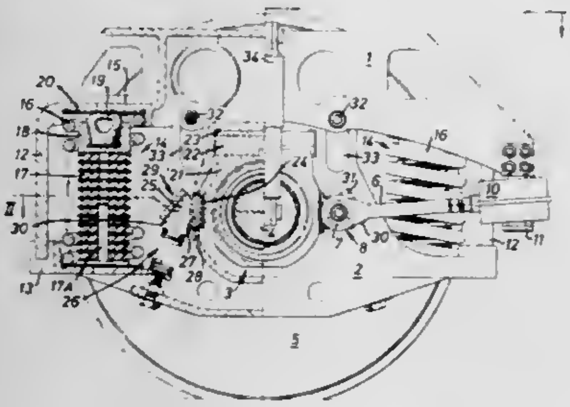
Alan H. Briggs, and Eric Timmons, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Feb. 18, 1977, Ser. No. 770,047

Claims priority, application United Kingdom, Feb. 20, 1976, 6849/76

Int. Cl.^{2} B61F *3/00, 5/36, 5/38, 5/50*

U.S. Cl. 105—224 A **10 Claims**



1. A railway wagon suspension unit comprising
a saddle
an axle journal housing accommodated in the saddle, the saddle being mounted for lateral rocking movement relative to the axle journal housing
a frame mounted over the saddle, the frame being vertically moveable relative to the saddle in response to vertical loads applied to the frame,
suspension means disposed between the frame and the saddle and including
load springs for vertical support, and
a friction block mounted on the saddle and firmly biassed against the axle journal housing whereby to provide substantially constant frictional forces against lateral motion between the saddle and the housing independently of vertical loading on the frame.

4,109,587

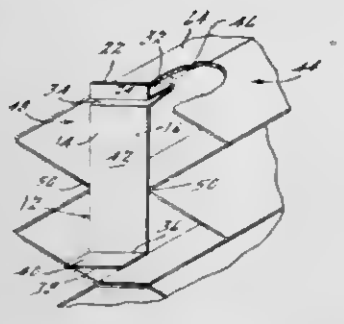
LOAD SPACER SUPPORT

Bernard George Janson, Jr., Withamsville, Ohio, assignor to Narad, Inc., Wayne, Mich.

Filed Jan. 27, 1977, Ser. No. 763,043

Int. Cl.^{2} B60P *7/14, 7/16;* **B61D** *45/00, 49/00*

U.S. Cl. 105—490 **10 Claims**



1. A load spacer device comprising:
a multicelled honeycombed collapsible load spacer;
a support means for said load spacer comprising:
- a first generally vertical flange portion adapted to be secured to a vertical surface;
- a second generally horizontal flange portion spaced from said first flange portion adapted to be supported by a horizontal surface;
- a main body portion interconnecting said first vertical and second horizontal flange portions; and
- said main body portion being provided with a generally horizontal supporting flange portion secured to said load spacer so as to support said load spacer between opposing spaced apart vertical surfaces.

4,109,588

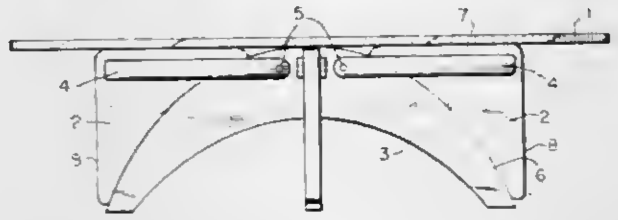
ADJUSTABLE HEIGHT TABLE

Richard J. Powers, 3622 Milford Mill Rd., Baltimore, Md. 21207

Filed Nov. 11, 1977, Ser. No. 850,635

Int. Cl.^{2} A47B *85/00*

U.S. Cl. 108—12 **8 Claims**



1. A table adjustable between a lower and an upper position which comprises:
a table top;
a plurality of interlocking leg members having a maximum height equal to the table top height at its lower position;
a plurality of table top support members, each of said support members having a first support surface upon which the table top rests when in its lower position and a second support surface disposed at a right angle to said first surface, said table top resting upon said second support surface when in its upper position;
arm members fixedly connected to said support members and pivotally connected to said leg members and adapted to pivot through a 90° arc whereby there is provided support means for said table top in a lower and an upper position.

4,109,589

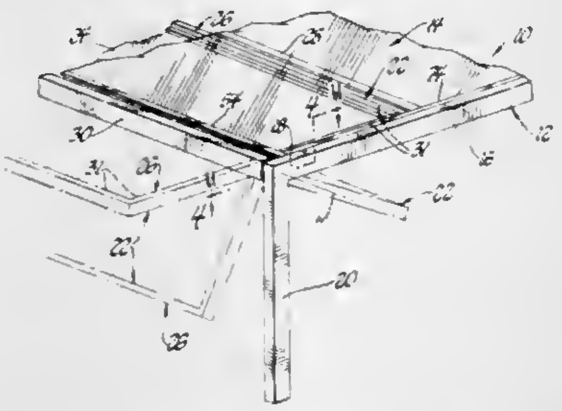
END LEAF TABLE

Alfred E. Ruckriegel, and David W. Buehler, both of Jasper, Ind., assignors to Winzeler Stamping Company, Montpelier, Ohio

Filed Jul. 7, 1977, Ser. No. 807,945

Int. Cl.^{2} A47B *1/04*

U.S. Cl. 108—63 **12 Claims**



1. A glass top table comprising: a pair of spaced side frames each of which has a longitudinally extending upper frame member with opposite ends and a pair of legs having upper ends connected to the ends of the upper frame member so as to extend downwardly therefrom; a table top of glass extending laterally between the upper frame members of the side frames and longitudinally between the ends thereof; a pair of end leaves each of which includes a frame and a glass leaf supported thereby; a pivotal connection supporting each end leaf frame on the side frames at adjacent ends of the upper frame members thereof for movement therebetween about a horizontal axis between an inwardly extending lower storage position below the glass table top and an outwardly extending upper use position in alignment with the glass table top; and means for positioning the end leaves in either the storage or use positions.

4,109,590

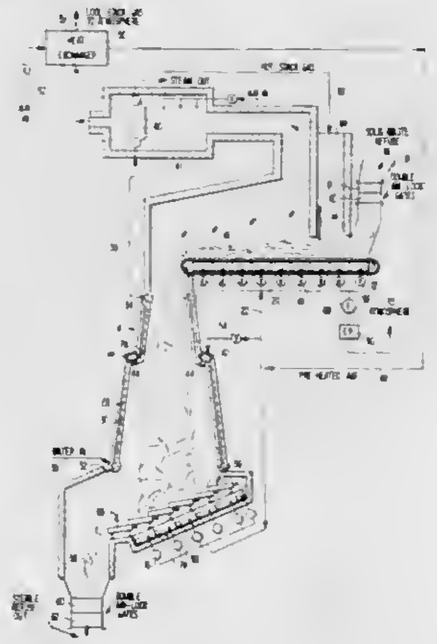
APPARATUS AND METHOD FOR PRODUCING GAS

Vaughn Mansfield, Gallatin, Tenn., assignor to Mansfield Carbon Products, Inc., Gallatin, Tenn.

Filed Dec. 3, 1976, Ser. No. 747,194

Int. Cl.^{2} F23G *5/00;* **F23L** *9/00;* **F23J** *1/02*

U.S. Cl. 110—235 **5 Claims**



1. In combination,
a horizontal chain grate furnace having
- input and output ends,
- means for feeding solid municipal refuse onto the chain grate at the input end,
- means for spreading said material onto said chain grate to form a bed thereon,
- zoned airbox means beneath the grate for supplying air in controlled amounts to the material in the bed,

a vertical shaft furnace having an upper end connected to the output end of the horizontal furnace and a lower end,
an incremental feeder for discharging sterile ash residue from the lower end of the shaft furnace,
means for supplying controlled amounts of air into the shaft furnace at a plurality of spaced locations between the upper and lower ends thereof, and
means for exhausting gases from said furnaces.

4,109,591

BUTTONHOLE SEWING PRESSER DEVICE WITH INTERLOCK FINGER

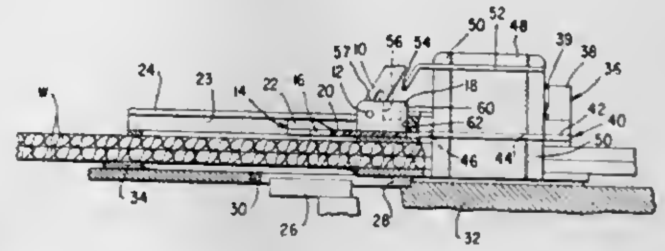
Joseph G. Rakacs, Toms River, N.J., assignor to The Singer Company, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,354

Int. Cl.^{2} D05B *3/24*

U.S. Cl. 112—76 **3 Claims**

1. A buttonhole sewing presser device of the type having a presser foot adapted to be secured to a vertically shiftable sewing machine presser bar, a traveling shoe positionable upon work fabrics being stitched and slidably engaged on the presser foot, a work engaging plate positionable under the work fabrics being stitched, and means interconnecting said work engaging plate and said traveling shoe insuring sliding movement of said work engaging plate together with said travelling shoe relatively to said presser foot with capacity for movement of said traveling shoe toward and away from said work engaging plate when said presser foot is lowered and raised, the improvement which comprises interengagable interlock elements carried on said presser foot and on said work engaging plate, said interlock elements being shiftable out of engagement so as to free said traveling shoe when said presser foot is lowered, and into engagement so as to prevent sliding movement of said traveling shoe relatively to said presser foot when said presser foot is raised.



4,109,592

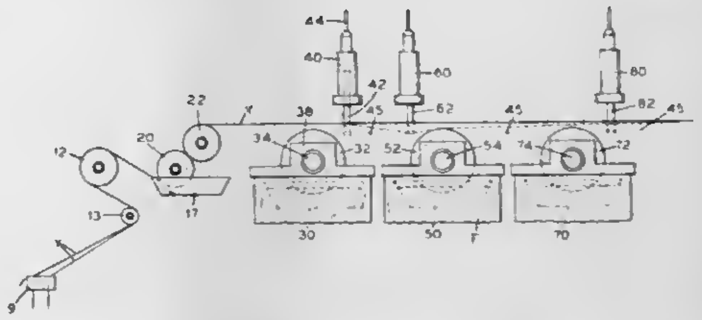
MENDING YARN IN THE SELVEDGE OF TUFTED CARPETING

Clifford Aldene Bryant, Dalton, Ga., assignor to West Point-Pepperell, Inc., West Point, Ga.

Filed Nov. 29, 1976, Ser. No. 745,974

Int. Cl.^{2} D05C *15/34*

U.S. Cl. 112—79 A **20 Claims**



1. Apparatus for dyeing yarn ends individually at predetermined positions along their lengths and manufacturing tufted carpeting therefrom to produce a predetermined multi-colored complex pattern therein comprising a series of troughs for different dye baths,
- means feeding a sheet of yarn ends from a supply to said baths in succession,
- dyeing means associated with each trough to cause segments of said yarn ends to receive dye from each trough,
- a plurality of banks of movable yarn guides for individual yarn ends or groups of yarn ends, there being at least one bank of yarn guides associated with each dyeing means,
- pattern control means to move each yarn guide individually to cause yarn carried by it to be dyed segmentally while a predetermined length of yarn passes,
- in combination with means feeding a group of mending yarn ends from said supply along a side of said sheet,
- means feeding said group of mending yarn ends over said baths,
- movable yarn guide means for at least one yarn end of said mending group, there being at least one mending yarn guide means associated wth each bath,
- and control means to cause said mending-yarn-guide means to move the yarn ends of said mending group and to cause them to be dyed segmentally while a predetermined length of yarn passes,
- and means to conduct said yarn sheet and said group mending yarn ends to a tufting machine, and
- a tufting machine having needles in which the individual yarn ends of said yarn sheet and said mending yarns are threaded, and by which the yarn ends are needled through

a backing sheet to produce carpeting with the predetermined pattern.

4,109,593
MACHINE FOR MAKING A TEXTILE PRODUCT

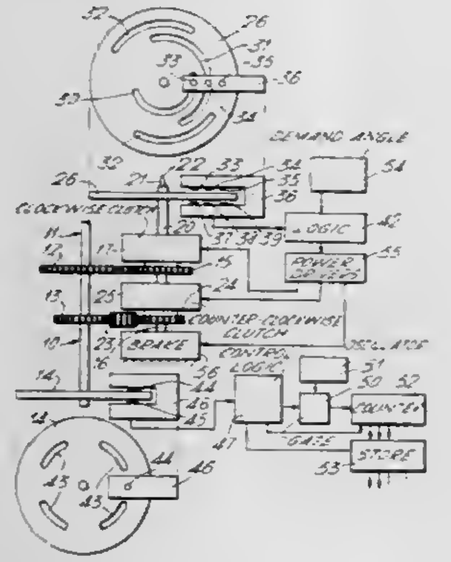
William John Barnes, Disley; Barry John Belcher, Reading, and John Kenneth Harvey, London, all of England, assignors to Newroyd Limited, England

Filed Feb. 28, 1977, Ser. No. 772,839

Claims priority, application United Kingdom, Mar. 4, 1976, 8752/76

Int. Cl.² D05C ***15/30***

U.S. Cl. 112—79 A **17 Claims**



1. A machine for making a textile product comprising a head, a rotatably mounted needle carrier shaft which is carried by said head and which is arranged to be set in a plurality of predetermined angular positions around the longitudinal axis thereof, yarn feeding means for feeding at least one yarn to a needle carried by said shaft, a first motor for driving the yarn feeding means, reciprocating means for reciprocating the said needle carrier shaft so that the said yarn may be applied to a base material, second and third motors for respectively traversing said head in two orthogonal linear directions over the base material, and programmed control means which ensure at all times during production that a needle carried by the needle carrier shaft always faces forwardly with respect to the direction of movement of the head, the control means being controlled in dependence upon the speed of reciprocation of the needle carrier shaft, and the control means controlling the operation of the first, second and third motors in dependence both on said program and on said speed of reciprocation.

4,109,594
TUFTING MACHINE MALFUNCTION DETECTION DEVICE

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540; P. Frank Eiland, Stamford, Conn.; David R. Jacobs, New Canaan, Conn., and Geza C. Ziegler, Stamford, Conn., assignors to Abram N. Spanel, Princeton, N.J.

Filed Jun. 30, 1977, Ser. No. 811,968

Int. Cl.² D05C ***15/16***

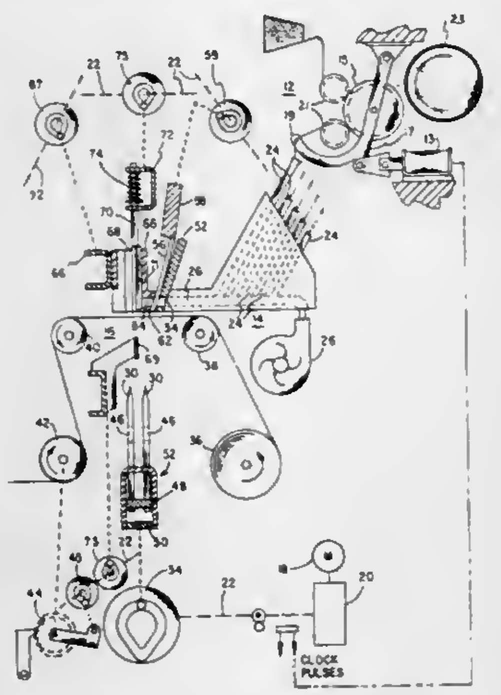
U.S. Cl. 112—79 R **19 Claims**

1. A method of tufting wherein the improvement comprises an improved method of detecting malfunctions, said method of tufting comprising the steps of:

pneumatically transporting yarn strands to a loading station with respect to yarn bit-applying elements;
severing said yarn strands to form yarn bits;
applying the yarn bits to a backing layer with said bit-applying elements; and,
utilizing a light detection system within said loading station to detect the presence of yarn after the tufting cycle, which presence of yarn indicates a malfunction.

7. A method of tufting wherein the improvement comprises utilizing an improved malfunction detection system comprising the steps of:

providing severed yarn bits in a loaded position with respect to bit-applying elements at tufting stations;



applying the severed yarn bits to a backing layer by said bit-applying elements during a tufting cycle;
searching by means of light source and receiver means for any yarn in the tufting stations after the tufting cycle is completed, the detection of such yarn indicating a machine malfunction; and
signalling a malfunction when such yarn is detected.

4,109,595
MULTIDIFFERENTIAL DEVICE

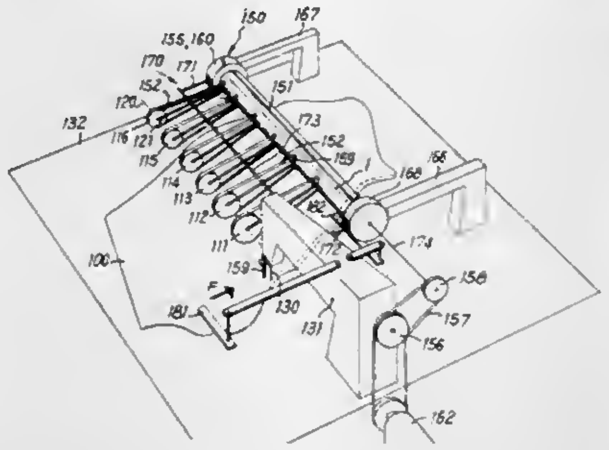
Jean-Paul Ducol; Dominique Gobry, both of Saint-Julien les Villas; Jean-Pierre Raisin, Troyes, all of France, assignors to Institut Textile de Fance, and Agence Nationale de Valorisation de la Recherche (ANVAR), both of France

Filed Jun. 7, 1976, Ser. No. 694,066

Claims priority, application France, Jun. 13, 1975, 75 18648; Jul. 22, 1975, 75.22895

Int. Cl.² D05B ***19/00, 27/08***

U.S. Cl. 112—121.11 **21 Claims**



1. A multidifferential device of the type comprising a plurality of differentials, whereby each comprises a differential holder with at least two epicyclic gears and two planetary gears and in which the imaginary rotation axis of all the differential holders and planetary gears is the same, whereby the differential holders and planetary gears are designed as rotary members whereof two serve as input members and one serves as the output member and which comprise two end members and, between them, a plurality of intermediate members in which an end input or output member is constituted as a planetary gear, whereby the epicyclic gears of every other intermediate differential holder member is located at the same radial level relative to said rotation axis, in which a plurality of intermediate differential holder members each comprises an external or internal planetary gear path on both of its faces and at least one inner or outer epicyclic gear and in which each end member comprises a planetary gear, wherein it comprises at least two output members, wherein each of the members can be an input member or an output member, wherein all the members idle in rotation but are immobile in axial displacement of the same common support axis wherein each intermediate member constitutes at the same time a differential holder and a planetary gear, wherein each member comprises in its peripheral area a connecting member able to cooperate with a driving or driven member, wherein each input or output member comprises a circular disc and wherein each disc of an input or output member comprises, facing the adjacent member a toothed rim as well as at least one epicyclic gear wheel on the one hand mounted on said disc between the toothed rim and either the periphery of said disc or the common shaft and on the other able to cooperate with the toothed rim of the adjacent member.

8. An automatic guidance installation for placing an article in front of a work point associated with the implacement of a tool, following a random but predetermined path, said installation constituting the application of the multidifferential device according to claim 1 and being more particularly intended for the guidance of textile articles to be assembled by sewing and associated with a sewing machine equipped with a work table, said machine being of the type comprising, in addition to a work area, a rectilinear member able to impart to that portion of the article located adjacent the work point a translational movement in accordance with a predetermined direction; a detecting means provided upstream of the work point for determining the position of a portion of the edge of the article relative to the work point; a drive mechanism which is able to come into contact with the article at a plurality of points located on a straight line passing through said work point and perpendicular to the drive direction of the rectilinear drive member, and being operable to impart to the said article in the area of the contact points a pivotal movement about a point located on said straight line and constituting a momentary center of curvature of a portion of a curve passing at the considered moment through the work point and associated with said article; the drive mechanism further comprising a plurality of drive rollers, a main drive motor, a reversible auxiliary motor controlled by the detecting means and a differential, one input of which is mechanically connected to the main drive motor and the other input of which is mechanically connected to the auxiliary motor; the output of said differential controlling one of the drive rollers; the guidance installation further comprising, in the drive mechanism, a plurality of equal diameter pressure and drive rollers arranged above the work table, mounted so as to idle in rotation and at equal distance from one another on a common shaft whose vertical projection coincides with a straight line which is perpendicular to the direction of the translational movement imparted on the article by the rectilinear drive member and which passes through the work point; a multidifferential device equipped with a plurality of output members each connected kinematically to one of said rollers and two input members; a reversing device placed between the main motor and the second input member of the multidifferential device; a single auxiliary differential having one planetary gear input thereof cooperating with the output of the reversing device and the planetary gear output cooperating with the second input member of the multidifferential device; the differential holder input thereof cooperating with the output of the reversible auxiliary motor; and the input member which is connected to the main drive motor being located at least approximately in the same vertical plane as the said rectilinear drive member.

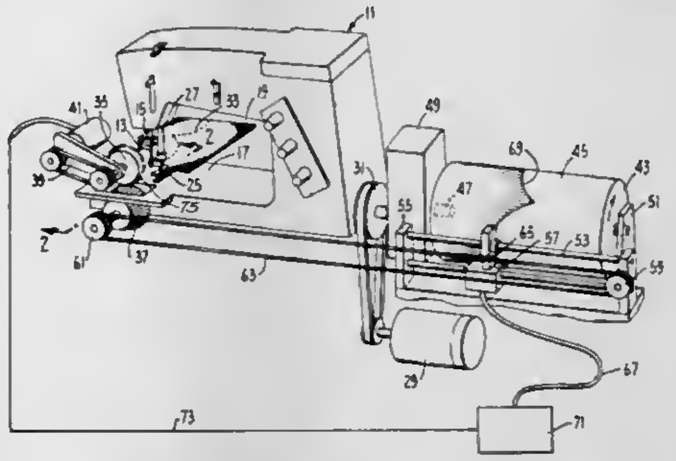
4,109,596
AUTOMATIC STITCHING PATTERN CONTROL SYSTEM FOR A SEWING MACHINE

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed Jun. 23, 1977, Ser. No. 809,305

Int. Cl.² D05B ***19/00***

U.S. Cl. 112—121.11 **8 Claims**

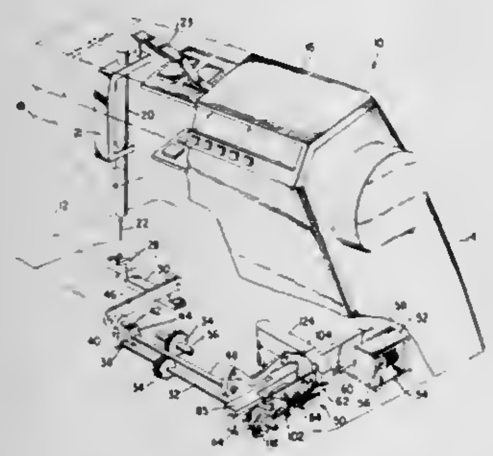


1. For a sewing machine of the type including:
a working surface adapted to carry fabric being sewn,
means holding a sewing needle for reciprocation back and forth in repetitive stitching cycles through the fabric and through the working surface,
means as part of the sewing machine for advancing fabric across the working surface in one direction, and
a motor source connected to reciprocate the needle,
an improved stitching pattern control system, comprising:
  means positioned adjacent said working surface for controlling the orientation of the fabric with respect to the needle as the fabric is advanced over the working surface, thereby to change the direction of stitching being placed on the fabric,
  means provided adjacent said work surface for mechanically sensing by contact with the fabric any such change of direction,
  pattern means driven in synchronism with said needle from said motor source but independent of the fabric itself for setting the desired direction of stitching the fabric as a function of the fabric position with respect to the needle along said one direction, and
  means continuously receiving said desired fabric stitching direction setting and receiving an indication of the actual fabric stitching direction from said mechanical sensing means for automatically causing said fabric orientation controlling means to change the orientation of the fabric with respect to said needle as it is advanced in said one direction in a manner to equalize the desired and actual direction, whereby the stitching direction settings of the pattern means control the stitching pattern of the fabric.

8. An automated fabric guide device for a sewing machine of the type having a reciprocating sewing needle and a work surface for supporting the fabric as it is advanced under the reciprocating needle, the fabric guide device comprising a rotatable guide wheel fixedly mounted ahead of the needle with respect to the direction of fabric advancement through the sewing machine, the guide wheel bearing against one surface of the fabric and being rotatable about an axis which is non-parallel to the direction of fabric advancement, a detectable pattern having a stitch line thereon, detector means adjacent the stitch line pattern for monitoring a portion of the pattern and for producing a control signal representative of changes in the relative positions of the stitch line pattern and the detector means, servo motor means for rotating the guide

wheel in response to the control signal, and means, including the guide wheel, for effecting controlled relative movement between the stitch line pattern and the detector means in synchronism with movement of the fabric relative to the work surface so as to maintain the detector means centered over the stitch line of the pattern.

4,109,597
ELECTRO-MECHANICAL ACTUATOR
Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, New York, N.Y.
Filed Aug. 31, 1977, Ser. No. 829,405
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 E **4 Claims**



1. In a sewing machine having a drive shaft, stitch forming instrumentalities which includes a variable feed mechanism, a feed shaft driven by said drive shaft, and means for generating a low level variable electrical signal corresponding to desired positions of said stitch forming instrumentalities, an electro-mechanical actuator comprising:

a movable block having a pair of coplanar inclined surfaces opening on opposite sides thereof;

means for intermittently positioning said block in response to said electrical signal;

a pair of adjacent limbs having opposing feelers for closing upon said inclined surfaces, said limbs being pivotally mounted such that the angular positioning of said limbs will vary dependent on the position of said block;

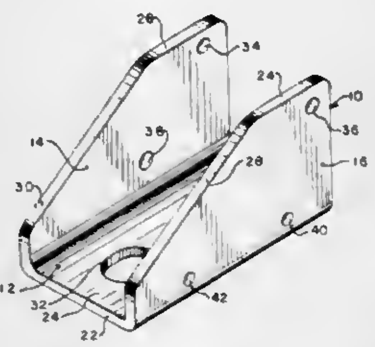
means for closing and opening said limbs alternately to operation of said positioning means; and,

means cooperating with said limbs for transferring the movement of said limbs derived from the varying angular position thereof, to said stitch forming instrumentality.

4,109,598
METHOD OF MAKING A UNITARY FRAME FOR A WINCH
Robert C. Kucher, 5200 Airport Way South, Seattle, Wash. 98108, and Terence W. Dahl, 6117-183rd Pl. Southwest, Lynnwood, Wash. 98036
Division of Ser. No. 251,218, May 8, 1972, abandoned. This application Jun. 23, 1975, Ser. No. 589,588
Int. Cl.² B21D *53/00*
U.S. Cl. 113—116 HH **4 Claims**

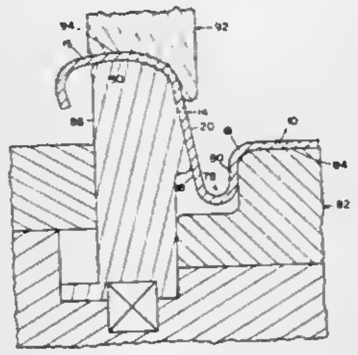
1. A method for making a frame for an apparatus, said frame comprising:

a. a base;
b. a first side;
c. a second side;
d. said first and said second sides projecting outwardly from said base;
e. said frame being a unitary structure and of a thickness of at least 3/16 inch;
f. said method comprising forming a piece of metal to have a ridge, a first outer surface, a second outer surface, a first inner surface and a second inner surface, and in an elevation view presenting a configuration of a V-shaped piece of metal;
g. working said V-shaped piece of metal to form the outer part of said first outer surface to be adjacent the inner part of said first outer surface, and to form the outer part of said second outer surface to be adjacent the inner part of said second outer surface, and in an elevation view presenting a configuration of a W-shaped piece of metal; and,



h. working said W-shaped piece of metal to, substantially, remove said ridge with the inner part of said first outer surface and inner part of said second outer surface being, substantially, a continuous surface and defined as a base and, said first outer surface becoming the surface of said first side and said second outer surface becoming the surface of said second side.

4,109,599
METHOD OF FORMING A PRESSURE RESISTANT END SHELL FOR A CONTAINER
Freddy R. Schultz, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Nov. 4, 1977, Ser. No. 848,517
Int. Cl.² B21D *51/44*
U.S. Cl. 113—121 C **14 Claims**



1. A method of forming a pressure resistant end shell for a container comprising the steps of:

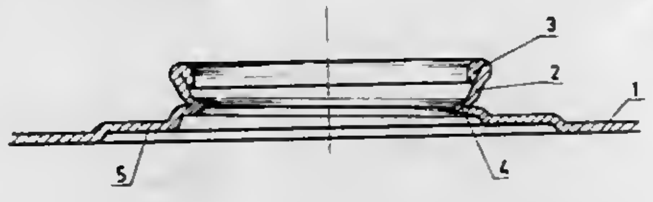
providing a sheet metal end shell having interior and exterior surfaces respecting its intended use on a container, a central wall portion in the end shell, a frustoconical wall portion around the central wall portion projecting upwardly and outwardly with respect to the exterior surface of the central wall portion, and a radially outwardly projecting peripheral flange around the outer edge of the frustoconical wall portion;

supporting the central wall portion with a first supporting means disposed against the interior surface thereof opposite said frustoconical wall portion substantially concentrically of the end shell to within less than approximately 97.5% of the diameter of the central wall portion;

supporting the peripheral flange with a second supporting means disposed against at least a portion of the exterior surface thereof; and

reducing the distance between the peripheral flange and the central wall portion by moving at least one of the supporting means toward the other to form the outer peripheral portion of the central wall portion downwardly and inwardly toward the first supporting means into the shape of a reinforcing channel around the central wall portion.

4,109,600
PROCESS FOR APPLYING A THREADED SEAT IN A METAL PLATE
Willem Pieter Post, Burg.Arriensweg 7, Diepenveen, Netherlands
Filed Dec. 11, 1975, Ser. No. 639,924
Claims priority, application Netherlands, Nov. 13, 1975, 7513282
Int. Cl.² B21D *51/00*
U.S. Cl. 113—121 R **3 Claims**



1. A process for providing an internally threaded seat on a metal plate, such as the wall of a drum, comprising the steps of:

making a hole in the plate;

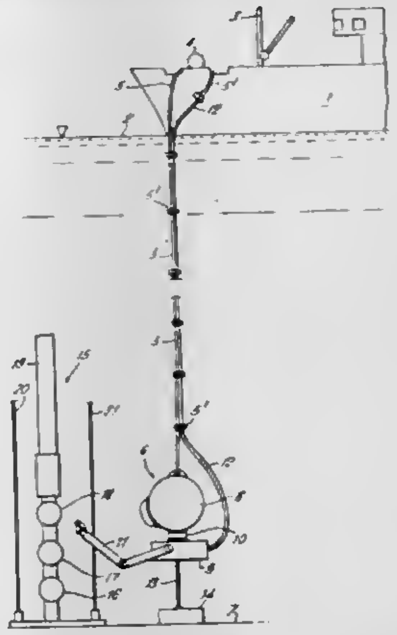
drawing a generally cylindrical collar from the plate periphery around said hole approximately at a right angle to the plane of the plate, said cylindrical collar having at the conclusion of said drawing step an internally directed annular disc at the outer end thereof and a single screwline formed in its base by said drawing step and extending upwardly from a beginning point in the plane of said plate over the lower portion of the height of said collar, said drawing further providing a widening at the base of said collar in the area of said beginning point and of sufficient width and height to include both the beginning and the end of said single screwline;

bending said annular disc inwardly to form a continuous flange about the outer end of said collar; and

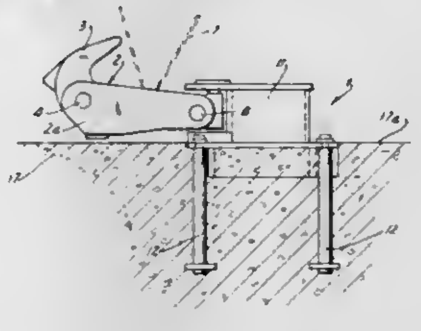
pressing axially on the opposite ends of said collar whereby the portion thereof between said continuous flange and said plate carrying said formed single screwline is deformed inwardly to form a thread.

4,109,601
VESSEL FOR WORKING UNDER WATER
Carl M. Ronnevig, Haugesund, Norway, assignor to Skipsaksjeselskapet Suderoy, Haugesund, Norway
Filed Dec. 1, 1976, Ser. No. 746,541
Claims priority, application Norway, Dec. 8, 1975, 754144
Int. Cl.² B63G *8/00*
U.S. Cl. 114—314 **7 Claims**

1. In a vessel for working under water at any level from the lower water bottom to the upper water surface, the vessel having a service section carrying working tool devices thereon and propulsion means, and a residence chamber detachably mounted on said service section, the residence chamber having an atmospheric pressure therein and including monitoring means therein for controlling the working tool devices; the improvement comprising that the residence chamber has a substantially spherical shape with an outer smooth surface free from protruding elements, the residence chamber being connected to a carrier vessel on the water surface thereof by a hoisting wire, whereby in case the protruding working devices of the service section are hooked or wedged during an underwater operation, the spherical smooth residence chamber can be detached from the service section and hoisted to the carrier vessel, with said working tool devices of the service section being so mounted thereon to permit detachment of the residence chamber and provide an escape path for the substantially spherical residence chamber during the hoisting operation and wherein the vessel includes controllable buoyancy means operatively connected to the service section to predeterminely control the level of the service section and the residence chamber from the lower water bottom to the upper water surface.



4,109,602
HAWSER HOOK
Siegfried Voss, Bremerhaven-W., Fed. Rep. of Germany, assignor to Aktien-Gesellschaft "Weser", Bremen, Fed. Rep. of Germany
Filed Dec. 21, 1976, Ser. No. 752,846
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558746
Int. Cl.² B63B *21/04*
U.S. Cl. 114—218 **10 Claima**

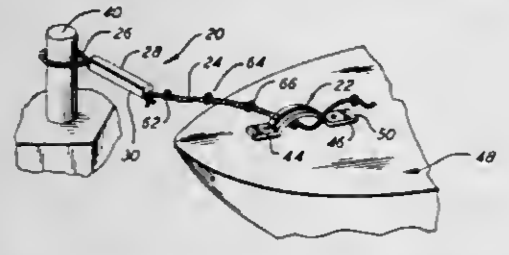


1. A hawser hook, particularly for use in mooring ships to piers and similar mooring structures, comprising an anchoring element rigidly connected to a respective mooring structure and projecting from an exposed surface of the latter; a hook element having a mounting portion and a free portion spaced from said mounting portion; means for mounting said hook element on said anchoring element for movement at least toward and away from the exposed surface; and means for so supporting said hook element that the same is suspended from said anchoring element immediately adjacent and with spacing from the exposed surface when no external force is applied thereto while said free portion thereof abuts the exposed surface upon loading thereof.

4,109,603
BOAT MOORING APPARATUS
Stephen Franklin Guthmann, 1 Brandon Rd., DeWitt, N.Y. 13214
Filed Oct. 20, 1976, Ser. No. 734,290
Int. Cl.² B63B *21/00*
U.S. Cl. 114—230 **18 Claims**

10. A boat mooring cleat apparatus for enabling quick releas-

able mooring of a boat to a mooring post means by a mooring line having an associated diameter and a plurality of longitudinally spaced apart bulges therealong, said bulges having associated diameters greater than said mooring line diameter, said cleat apparatus comprising a pair of substantially parallel spaced apart arched members comprising a convex and a concave side defining an arched slot for insertably receiving a portion of one end of said mooring line, said arched slot being narrower in width than said associated diameter of any one of said bulges, said spaced apart arched members defining a stop member on the concave sides of said arched members for an adjacent one of said bulges of said inserted mooring line end portion for preventing removal of said inserted mooring line end portion from said cleat apparatus by a force along said mooring line while enabling both quick insertion of said mooring line end portion and quick intentional removal of said inserted mooring line end portion from said arched slot by a sufficient force substantially normal to said mooring line, each pair of ends of said arched members being in transverse registration, means to interconnect each pair of ends and to mount each said interconnected pair of ends on a support, said arched members being configured to extend away from the support adjacent to each pair of ends and thereafter to extend along and spaced from said support, both arched members being configured to extend back to the support, said spaced apart arched members also defining an aperture, which aperture is spaced away from the longitudinal center of said arched members, for insertion of a bulge along said mooring line, the diameter of said aperture being slightly larger than the associated diameters of said bulges, mounting means adjacent to said pair of ends closest to said aperture intended to be fastened to said support such that said aperture is positioned further away from said mooring post means than said pair of ends remote from said aperture, said arched slot enabling a predetermined slippage of said inserted mooring line within said arched slot dependent upon the longitudinal extent between the pair of ends remote from said aperture and said aperture.



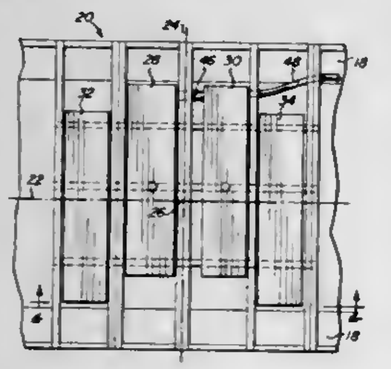
4,109,604
FRESH WATER SUPPLY AND WASTE WATER RETENTION SYSTEM

Richard E. Reed, Scottsdale, Ariz., assignor to CAF Industries, Phoenix, Ariz.

Filed May 31, 1977, Ser. No. 801,619

Int. Cl.^{2} B63B *35/00*

U.S. Cl. 114—270 **16 Claims**



1. In a floating carrier for transporting land based recreational vehicles on a body of water, said carrier including

(a) float means for bouyantly supporting said carrier above the water, said carrier having a center of gravity; and

(b) a deck disposed above and coupled to said float means for supporting said vehicle;

said vehicle including

(a) an inlet for receiving fresh water into said vehicle;

(b) an outlet for draining waste water from said vehicle; and

(c) means for controlling the flow of fresh water within said vehicle;

a fresh water supply and waste water retention system having a midpoint and forming a part of said carrier for maintaining the center of gravity of said system substantially constant as fresh water is supplied to said vehicle and waste water is received from said vehicle, said system comprising in combination:

(a) fresh water container means for storing fresh water and for supplying fresh water to said inlet of said vehicle, symmetrically disposed about a selected lateral axis of said carrier, the midpoint of said system passing through the selected lateral axis of said carrier; and

(b) waste water container means coupled to said outlet for storing waste water drained from said vehicle, symmetrically disposed about the selected lateral axis of said carrier;

whereby drawing fresh water from said fresh water container means and draining waste water into said waste water container means will have substantially no effect on the center of gravity of said system or the center of gravity of said carrier/-vehicle combination.

4,109,605
SCARECROW SYSTEM

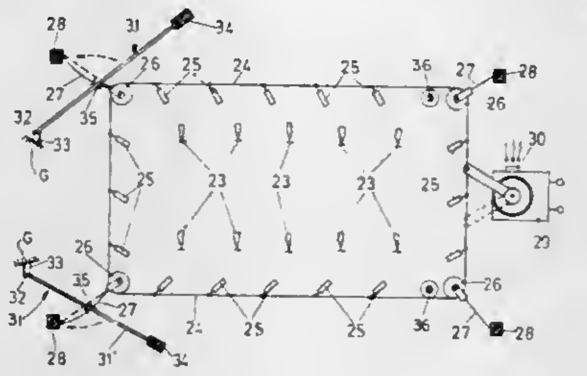
Emil Bächli, Haupstrasse 156, CH-5304 Endingen/AG., Switzerland

Filed Apr. 21, 1977, Ser. No. 789,506

Claims priority, application Switzerland, Aug. 18, 1976, 010497/76

Int. Cl.^{2} G08B *13/00;* G09F *19/12*

U.S. Cl. 116—22 A **17 Claims**



1. A scarecrow system for the protection of plants in horticultural plots and fields against predatory attack by animals, especially bird flocks, which comprises:

a main tow line (**24**) and scarecrow devices (**25**) attached thereto;

support means (**26, 27, 28, 31'**) to support said main tow line in a circuitous path amongst the plants (**23**) to be protected against animal attack;

drive means (**29, 30**) attached to said main said main line (**24**) for linearly moving saidmain tow line; and

movable auxiliary scarecrow devices (**31, 34**) operably connected to at least some of said support means (**26, 27**) and actuated upon movement of said main tow line, said auxiliary scarecrow devices (**31, 34**) being secured to a fixed position (G) and actuated by said main tow line (**24**) to move rotatingly from a rest position in arcuate motion perpendicular with respect to the path of the main tow line upon movement of said tow line (**24**).

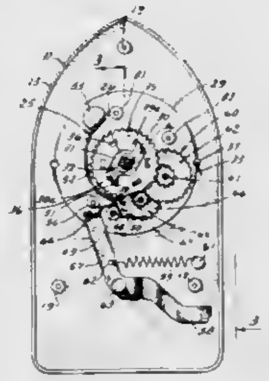
4,109,606
SELF-ENERGIZED ALARM DEVICE

Clarence W. Jorgensen, deceased, late of Gurnee, Ill., and by Elva Mae Jorgensen, executrix, 5023 Darlene Dr., Gurnee, Ill. 60031

Filed Jun. 29, 1977, Ser. No. 811,895

Int. Cl.^{2} G08B *3/02*

U.S. Cl. 116—94 **10 Claims**



1. A self-energized alarm device operable between a movable and a stationary member comprising:

means defining a housing member for mounting on said movable or on said stationary member;

anchor means for mounting on said movable or said stationary member opposite said housing member;

contact means movable carried by said housing member;

linkage means connecting said contact means with said anchor means;

an alarm member carried by said housing, said alarm member including:

biasing means;

means to activate said biasing means;

means to maintain said biasing means under tension and to release said tension on said biasing means;

a striker arm member;

means to operatively connect said striker arm member with said biasing means to effect a reciprocating movement of said striker arm member upon release of said tension of said biasing means;

a sound producing element carried by said housing member and constructed and arranged to be contacted by said striker arm member;

said means to maintain said biasing means under tension and to release said tension including an actuating element having a portion positioned for temporarily interfering relation with respect to said contact means, so that when a predetermined tension is placed on said linkage means, said contact means contacts said portion of said actuating element to release said tension on said biasing means and activate said striker arm member to contact said sound producing element.

4,109,607
REFERENCE INDEX FOR INSTRUMENT DIALS

Charles Donovan Summers, 1259 Yellowwood Dr., Columbus, Ohio 43229

Filed Jan. 27, 1977, Ser. No. 759,439

Int. Cl.^{2} G01L *7/14;* G09F *9/00*

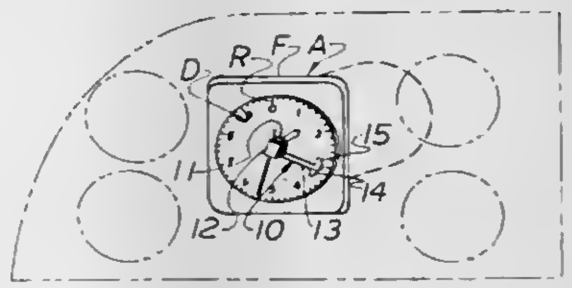
U.S. Cl. 116—129 A **17 Claims**

1. A reference index for dial-type instruments with a face having a circular indicia ring comprising

a mounting pivot including a base plate and an elongated pivot pin having a longitudinally extending pivot pin axis, said pivot pin secured to said base plate in perpendicular relationship thereto, said base plate adapted to be rigidly affixed to the face of the instrument in coaxially positioning the pivot pin relative to the indicia ring for projection outwardly from the instrument's face,

a mounting block positionable on said mounting pivot in retained relationship and selectively revolvable about said pivot pin axis,

an indicator carried by said mounting block for revolution therewith in a plane perpendicular to said pivot pin axis, said indicator having an elongated arm projecting ransversely to said pivot pin axis for movement in the plane of revolution and an indicator index carried by said arm at a position radially outward from the pivot pin axis so as to be in cooperative indicating relationship to the indicia ring when said mounting pivot is affixed to the instrument, said elongated arm having an end journalled in said mounting block to enable revolution of the arm about a longitudinally extending axis of the arm, said indicator index including at least one reference tab of plate form extending transversely to said arm, said tab positionable in either parallel or perpendicular relationship to the instrument's face in accordance with selective revolution of said arm about its longitudinally extending axis.



4,109,608
SOUND PRODUCING DEVICE

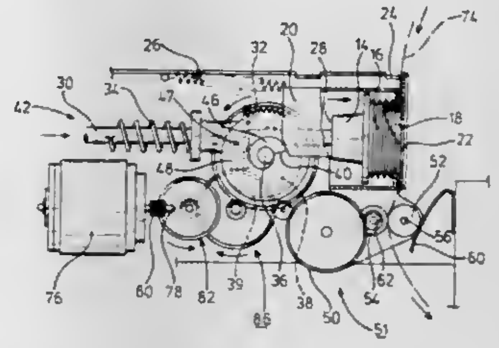
Shigeo Horikawa, No. 1-15-3, Taihel, Sumida-ku, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,677

Claims priority, application Japan, Mar. 22, 1977, 52-31380

Int. Cl.^{2} A63H *5/04;* G10K *10/10*

U.S. Cl. 116—137 R **10 Claims**



1. A sound producing device comprising:

a frame having an opening at one end thereof;

a hermetically sealable cylindrical bag member including a bellows section that is extensible and compressible axially of said frame, said bag member being mounted on said frame for movement relative thereto and having at one end of the bag member an opening coaxial with the opening in said frame;

means for feeding and positioning a sheet of rupturable material between the openings in said frame and bag members for blocking the opening in said bag member;

a pushing and force developing assembly mounted within said frame including a push rod connected to said bag member and extending coaxially with the opening therein, spring means connected operatively between said frame and said push rod and first cam means adapted to urge said push rod against the bias of said spring means and to thereby extend the bellows section of said bag member and at the desired time to release said push rod for movement in the opposite direction under the influence of the force developed by said spring means and to thereby compress said bellows section;

a movable inner frame carried within said frame, said movable inner frame enclosing said bag member and connected thereto adjacent the opening in said bag member;

second cam means engageable with said movable inner frame and adapted to urge same and said bag member in a first direction such that said bag member is hermetically sealed by closing of the opening therein by said sheet of rupturable material, said first and second cam means being formed such that said push rod is not releasable by said first cam means until said second cam means has urged said movable inner frame to shift the bag member into hermetically sealed relationship with said sheet;

and drive means for driving said first and second cam means and said sheet feeding and positioning means.

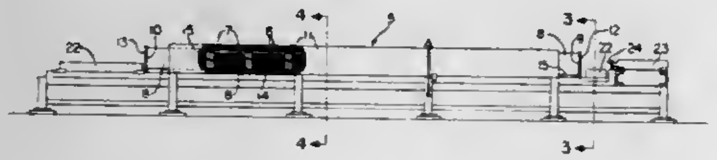
4,109,609
VACUUM-PRESSURIZED IMMERSION COATER

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 3, 1976, Ser. No. 682,710

Int. Cl.² B05C *3/10*

U.S. Cl. 118—50 **3 Claims**



1. An apparatus for coating a continuous element, such as a wire tire cord while in the wound condition on a spool, comprising:

(a) at least one elongated chamber having openings at opposing ends, cover plate members at said ends to permit the passage of said spool and for sealing from the ambient atmosphere, said chamber having a length to accomodate a plurality of spools in end-to-end relationship and having a transverse cross section larger than the transverse cross section of said spool;

(b) a trackway extending longitudinally of said chamber for guiding said spool through the chamber along a generally horizontal pathway;

(c) means for moving said spool along the trackway in axially aligned, end-to-end relation with other spools on the trackway;

(d) means for circulating liquid coating to the chamber;

(e) means for creating at least a partial vacuum in the chamber;

(f) means coacting with the vacuum creating means (e) for alternately creating fluid pressure in the chamber;

(g) said means for moving includes a cylinder disposed exteriorly of the pipe adjacent said opening in the pipe through which the spools pass into the chamber, a piston reciprocable within the cylinder, and means connected to the piston and disposed exteriorly of the cylinder for engaging said spool and moving it into the pipe when one of said cover plate members is removed from said opening;

(h) means disposed adjacent each of the opposing ends of the pipe for supporting at least one spool; and

(i) means for mounting the spool support means (h) for movement to and from said adjacent opposing ends of the pipe and in cooperative relationship with said means for moving (c); whereby the spools are positioned for entry into the mouth of the pipe and caught at the exit the pipe.

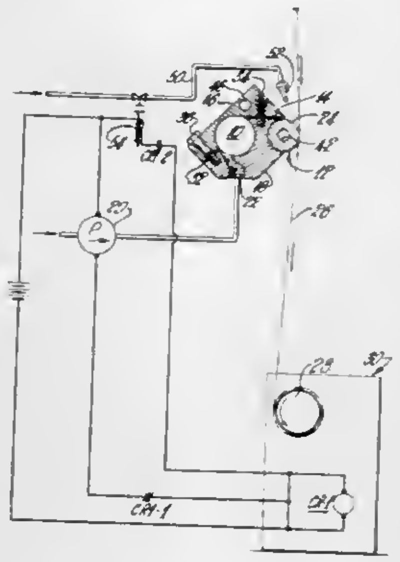
4,109,610
TEXTILE SIZE APPLICATOR WITH A TEMPERATURE CONTROLLING FLUID

Kantilal R. Parbhoo, Reynoldsburg; Jerome P. Klink, Granville; John P. Calland, Pataskala, and Gerald L. White, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 20, 1976, Ser. No. 752,368

Int. Cl.² B05C *1/04*

U.S. Cl. 118—202 **5 Claims**



1. Apparatus for applying a size to a strand comprising:

(a) a reservoir for storing said size;

(b) an applicator member having a surface upon which said strand contacts said size, said applicator member being a non-rotational member;

(c) conduit means adapted to deliver said size from said reservoir to the applicator surface as a film, said conduit means being defined by the opening of two opposed block members, and the configuration of said conduit means being alterable by altering the distance between said two opposed block members; and,

(d) a passageway in each of said block members for the passage of a temperature-controlling fluid, said passageways being connected in series.

4,109,611
COATING DEVICE

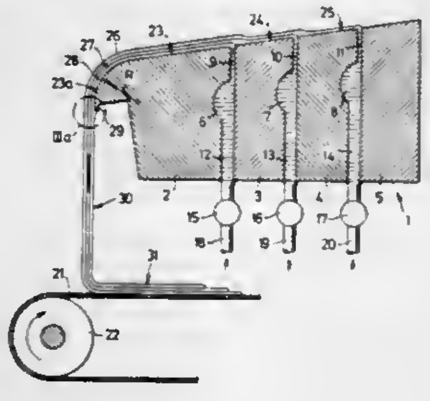
Fritz Fahrni, Islikon, and Anton Zimmermann, Montagny-la-Ville, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 9, 1977, Ser. No. 775,922

Claims priority, application Switzerland, Mar. 30, 1976, 3955/76

Int. Cl.² B05C *5/00*

U.S. Cl. 118—325 **10 Claims**



1. A device for coating a travelling web of material with a coating liquid, said device comprising:

means for transporting a web along a path of travel; and

a coating hopper positioned above said path of travel and extending substantially at right angles thereto, said hopper including a pouring lip, said coating hopper having at least one slide surface for producing a liquid curtain which falls freely onto the web to be coated, said pouring lip having a first rectilinear sharp edge with a radius of curvature not exceeding 0.1 mm, said sharp edge being spaced by a distance of from 0.7 to 2.5 mm from an imaginary vertical plane which is tangent to a first boundary surface of said pouring lip, on the coating liquid side thereof, in the operative position of the hopper.

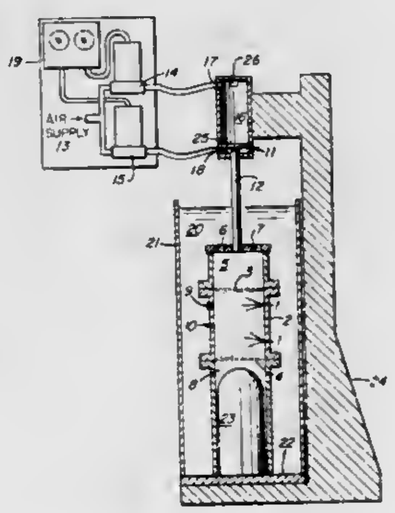
4,109,612
ELECTROLESS PLATING APPARATUS FOR DISCRETE MICROSIZED PARTICLES

Anton Mayer, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 16, 1975, Ser. No. 613,849

Int. Cl.² B05C *3/04*

U.S. Cl. 118—417 **1 Claim**



1. Apparatus for electroless plating discrete, microsized particles with a uniformly thick coating of a material which may be deposited by electroless techniques which comprises:

(a) means for containing a solution of a material useful for electroless plating,

(b) the solution contained in said containment means,

(c) particle containment means submerged within said solution for containing a plurality of said discrete, microsized particles, said means for containing said particles having first and second screened openings opposed therein with the interstices of said screened openings of a size which permits free flow of solution therethrough but which does not permit the passage of said discrete, microsized particles therethrough, said particle containment means comprising a first hollow cylinder with said first and second screens at the ends thereof, and

(d) motor means for establishing a reciprocating motion of said particle containment means within said solution, said reciprocating motion being substantially along the axis of said opposed screened openings in said first hollow cylinder, wherein said motor means is connected to one end of a reciprocating drive means, said reciprocating drive means being connected at its other end to a second hollow cylinder, said second hollow cylinder being joined to one screened end of said first hollow cylinder and of substantially the same diameter as said first hollow cylinder, and

(e) piston and cylinder means axially aligned with said first and second hollow cylinders for forcing said solution from within said cylinder means and into said first hollow cylinder when said hollow cylinder is moving toward said piston means and for creating a suction within said cylinder means and drawing solution thereto from within said first hollow cylinder when said first hollow cylinder is moving away from said piston means, said cylinder means being attached to the other screened end of said first hollow cylinder.

4,109,613
STEAM BOILERS

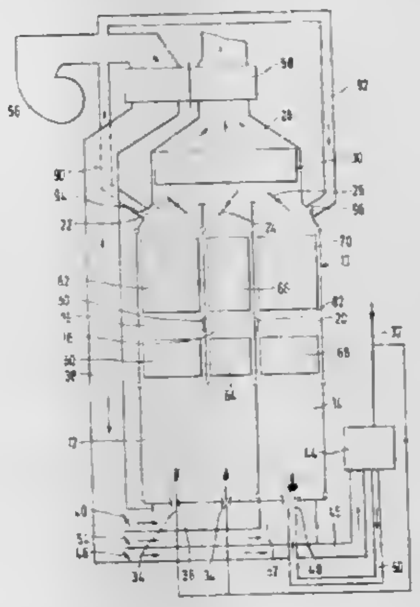
Robert Leslie James Hayden, London, and Alan Bell, Cookham, both of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jun. 6, 1977, Ser. No. 803,817

Claims priority, application United Kingdom, Jun. 5, 1976, 18441/76

Int. Cl.² F22B *33/00;* F23C *1/08;* F22G *1/00*

U.S. Cl. 122—1 R **10 Claims**



1. A steam boiler comprising:

a heavy oil burning furnace,

a separate clean fuel burning furnace,

a first pass through which combustion gases from said heavy oil burning furnace travel,

a second pass through which combustion gases from said clean fuel burning furnace travel, and

a superheater tube bank, chosen from a single superheater tube bank and a finishing or highest temperature superheater tube bank, positioned in said second pass and swept by combustion gases from said clean fuel burning furnace.

4,109,614
BOILER FOR THE COMBUSTION OF LIQUID OR GASEOUS FUELS

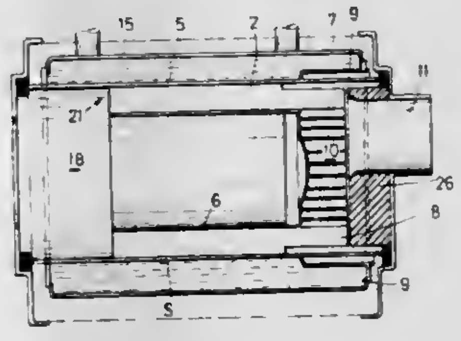
Hans Viessmann, Im Hain, 3559 Battenberg, Eder, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 781,642

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613186

Int. Cl.² F22B *7/12*

U.S. Cl. 122—149 **9 Claims**



1. A boiler for the combustion of liquid or gaseous fuels, which comprises

(a) a water-containing jacket housing having an inner wall defining an interior space,

(b) a cylindrical sleeve defining a fuel combustion chamber arranged in the interior space, and having an open end and a closed end,

(c) a flue gas reversing chamber in the interior space at the open end of the combustion chamber and in communication therewith to receive flue gas therefrom,

(d) a flue gas collecting chamber in the interior space at the closed end of the combustion chamber,

(e) a flue gas discharge in communication with the flue gas collecting chamber for discharging the flue gas from the collecting chamber, and

(f) a series of circumferentially space U-shaped elongated sheet metal members surrounding the cylindrical fuel combustion chamber and defining flue gas channels for conducting flue gas from the reversing to the collecting chamber, each of the sheet metal members consisting of two legs and a base interconnecting the legs, the legs having outwardly bent longitudinal edges, longitudinally extending seams welding the outwardly bent edges of the legs to the inner wall of the jacket housing, the bases of the elongated sheet metal members being in contact with the cylindrical sleeve, and the members being compressed between the inner wall of the jacket housing and the cylindrical sleeve.

4,109,615

APPARATUS FOR CONTROLLING THE RATIO OF AIR TO FUEL OF AIR-FUEL MIXTURE OF INTERNAL COMBUSTION ENGINE

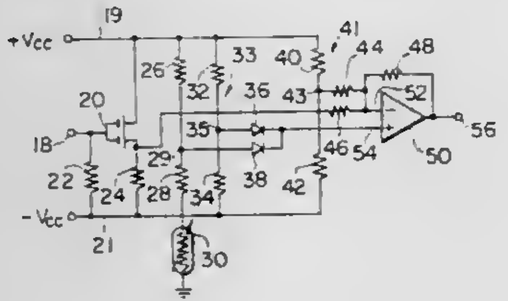
Masaharu Asano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 20, 1975, Ser. No. 624,294

Claims priority, application Japan, Oct. 21, 1974, 49/121168; May 14, 1975, 50/55985

Int. Cl.^{2} F02M ***7/00;*** **F02B** ***3/00***

U.S. Cl. 123—32 EE 9 Claims



1. Apparatus for feedback control of the ratio of air to fuel of an air-fuel mixture supplied to an internal combustion engine, which apparatus comprises:

a first sensor for sensing a component of exhaust gases of an internal combustion engine and generating an electrical signal representative thereof;

a differential signal generator connected to the first sensor for generating an electrical signal representative of the differential value between the signal from the sensor and a reference signal; and

control means connected to the differential signal generator for controlling an actuator in response to the differential value therefrom to regulate the mass ratio of air to fuel, the improvement comprising:

a second sensor (30) for sensing engine temperature being connected to the differential signal generator and continuously changing the reference signal value in response to the sensed engine temperature to optimize the mass ratio of air to fuel at cold engine start;

the differential signal generator including, a first and a second amplifier (20, 50), the first amplifier being connected to the first sensor for amplifying the electrical signal derived therefrom, a first signal generator (33) for generating a first signal with a fixed value, said first signal generator comprising a voltage divider for generating a divided voltage corresponding to the first signal and connected over a first diode (36) to the second amplifier, a second signal generator (26, 28) for generating a second signal, being connected to the second sensor, the second signal being variable in magnitude in response to the engine temperature to decrease with increase of the engine temperature, said second signal generator comprising a voltage divider for generating a second divided voltage corresponding to the second signal, the second signal generator being connected over a second diode (38) to the second amplifier, said second diode, means connecting the first and the second diodes in a configuration effective to apply a higher voltage of the first and the second divided voltage to the second amplifier, and the second amplifier being connected to the first and the second signal generator for selectively receiving the first and second signals as the reference signal and for generating the electrical signal representative of the differential value therebetween.

4,109,616

INJECTION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Richard Zechnall, and Günther Baumann, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

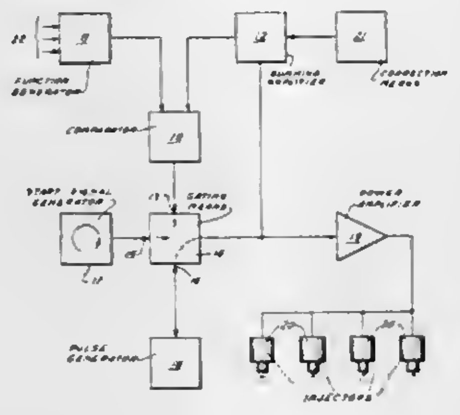
Continuation of Ser. No. 29,348, Apr. 2, 1970, Pat. No. 3,990,412. This application Nov. 8, 1976, Ser. No. 740,050

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1969, 1917487

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.^{2} F02B ***3/00***

U.S. Cl. 123—32 EA 6 Claims



1. In an internal combustion engine having injection means, an arrangement for controlling the quantity of fuel injected by controlling the length of injection time of each injection, comprising, in combination, first signal furnishing means furnishing, as a function of at least one operating parameter of said internal combustion engine, a first signal signifying the desired injection time; means furnishing a start signal for starting an injection; control means responsive to said start signal for furnishing an opening signal to said injection means, said opening signal maintaining said injection means open during application of said opening signal; means connected to said control means for deriving from said opening signal a second signal having at any instant a value dependent upon the duration of said opening signal up to that instant; comparator means receiving said first and second signals and furnishing a terminating signal when said second signal has achieved a predetermined relationship to said first signal; and means for terminating said injection upon generation of said terminating signal.

4,109,617

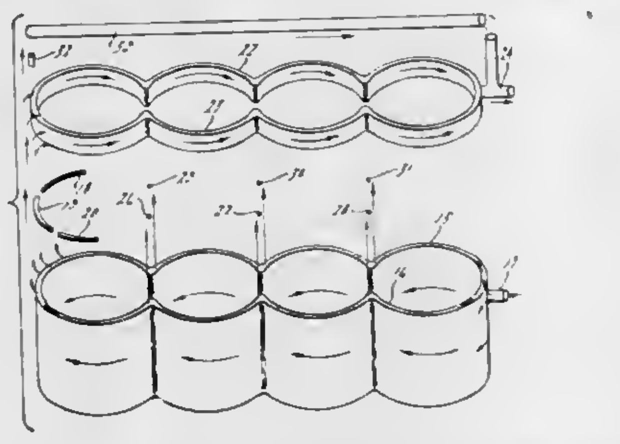
CONTROLLED FLOW COOLING SYSTEM FOR LOW WEIGHT RECIPROCATING ENGINE

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1976, Ser. No. 753,343

Int. Cl.^{2} F01P ***3/02***

U.S. Cl. 123—41.74 35 Claims



1. An engine head having a body consisting of a cast metal having a thermal conductivity exceeding 0.28 calories-cm. per second-cm.^{2} - ° C., said body having a flat plane bottom and having opposed sides, the body comprising:

(a) first walls defining a series of cylindrical combustion chamber portions arranged side-by-side, each extending through the bottom of said head, each chamber being the site of an intense periodic heat source during engine operation,

(b) second walls defining a plurality of exhaust gas passages, each extending between one chamber portion and one side of said head, said exhaust passages serving as a second site of an intense heat source during engine operation,

(c) third walls defining a plurality of valve guide cylinders extending from the top of said head into each chamber, said third walls having a portion serving as a separation between said exhaust gas passages and said valve guide cylinders,

(d) first means defining a pair of streamlined liquid cooling flow paths extending in parallel along the sides of each of said chamber portions through said first walls, and

(e) second means defining a streamlined, liquid cooling flow path disposed in said portion of said third walls separating said valve guide cylinders and exhaust gas passages, said first and second means being effective to carry heat away from said heat source sites at a rate equal to or greater than the thermal conductivity of said light metal.

4,109,618

ROTARY PISTON POWER CONVERTING DEVICES

Leslie E. Daniels, Agincourt, Canada, assignor to Rotary Power Development Limited, Agincourt, Canada

Filed Jan. 19, 1977, Ser. No. 760,689

Int. Cl.^{2} F02B ***57/00;*** **F01B** ***13/04***

U.S. Cl. 123—43 C 3 Claims

1. An apparatus, comprising:

a substantially disc-like rotor having an outer circumferential surface and two side walls, the rotor being adapted to rotate about a central axis, the rotor defining a plurality of piston chambers each extending from the outer circumferential surface inwardly at an angle to a radiant from said axis, each chamber opening through both side walls,

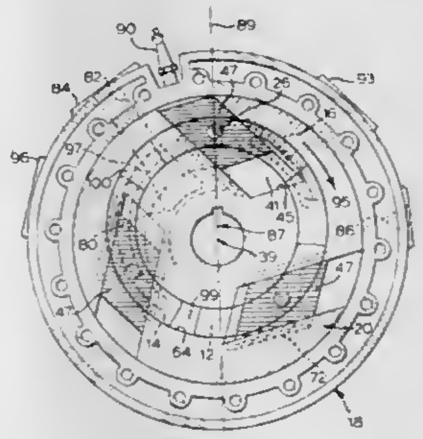
a piston in each chamber,

each piston being pivoted to at least one arcuate drive segment located adjacent one side wall of the rotor,

structure defining a stationary enclosure for said rotor, said structure also defining, adjacent said one side wall of the rotor, an annular recessed channel in which the arcuate drive segments are received, the recessed channel being eccentric with respect to said central axis of the rotor, whereby rotation of the rotor within said stationary enclosure is simultaneous with reciprocatory movement of the pistons in the respective piston chambers,

a fuel inlet manifold in said stationary structure communicating with a first port opening into the piston chambers inwardly of the pistons over a portion of the arc through which a piston is moving outwardly with respect to the rotor;

an exhaust passageway in said stationary structure communicating with a second port opening into the piston chambers outwardly of the pistons at a location advanced in the sense of rotation from the place where a piston is furthest outward, but short of the place where a piston is furthest inward,



by-pass passages in said rotor to allow compressed gas in the part of a piston chamber inwardly of a piston to be transferred to the part of the same piston chamber which is outwardly of the piston when the piston is at or near its innermost position,

means on the stationary structure for initiating combustion of compressed gas outwardly of a piston when the piston is at or near its outermost position, and

further passages connected with further ports communicating with at least one said annular recessed channel where the varying arcuate separations between the segments as the rotor rotates are increasing and decreasing, said further passages being employed to circulate oil for lubrication and cooling.

4,109,619

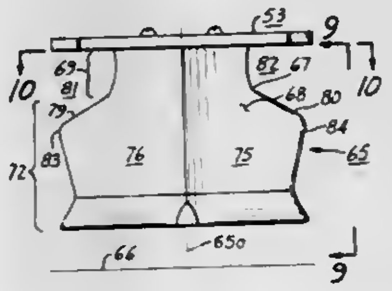
FLOW CONTROL INSERT FOR INTERNAL COMBUSTION ENGINE INTAKE MANIFOLDS

George O. Morris, Newport Beach, Calif., assignor to Fred C. Offenhauser, Newport Beach, Calif., a part interest

Filed Dec. 12, 1975, Ser. No. 640,234

Int. Cl.^{2} F02B ***75/18***

U.S. Cl. 123—52 R 31 Claims



1. An insert for the receiver of a manifold which receives fuel/air mixture and in turn supplies the mixture through a plurality of runners to respective internal engine combustion chambers, the receiver having an inlet opening, a bottom wall and a sidewall, the runners having exit openings in the sidewall

spaced apart from one another around the receiver and below the inlet opening, said insert comprising: a body having a boundary surface in the path of mixture flowing into the receiver from the inlet opening and having an axis facing toward and substantially aligned with said incoming mixture, the portion of the boundary surface which is to be placed nearest to said inlet opening having a surface perimeter extends in planes normal to said axis, which surface is non-circular and and at least in part relieved to form concave curved lines with said normal planes in order to form with the sidewall a plurality of paths for flow of said mixture, the portion of the boundary surface which is to be remote from the inlet opening having a surface configuration to encourage flow of mixture through the exit ports.

4,109,620

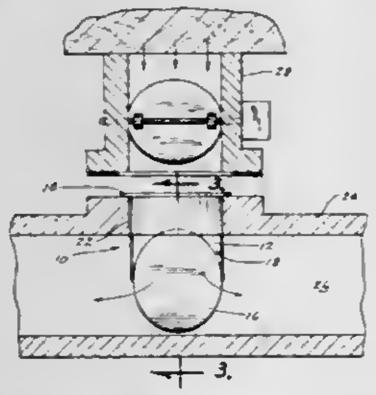
CARBURETION MODIFYING DEVICE

George M. Webb, Ames, Iowa

Filed Apr. 18, 1977, Ser. No. 788,262

Int. Cl.^{2} F02B *29/04*

U.S. Cl. 123—52 M **9 Claims**



9. In combination with an internal combustion engine having a plurality of cylinders, an intake manifold and a carburetor, said intake manifold having an intake throat in communication with said carburetor, said intake manifold having a fuel-air passageway connecting said throat and said cylinders, said passageway having upper and lower wall portions, the invention comprising,

a sleeve member adapted to be received and securely mounted within said throat, said sleeve having top and bottom portions, and

an eliptical-shaped deflecting partition securely mounted within said sleeve at said bottom portion to deflect the fuel-air mixture from said intake throat into said fuel air passageway, said eliptical deflecting partition having a major and minor axis with said sleeve mounted within said throat so that said minor axis is approximately parallel to the direction of flow of fuel-air mixture in said passageway to said cylinders.

4,109,621

INTERNAL COMBUSTION TYPE PILE DRIVER

Hiroshi Hashimoto, Akashi, and Kyozo Kimura, Kobe, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,617

Int. Cl.^{2} F02B *75/02*

U.S. Cl. 123—65 SP **4 Claims**

1. An internal combustion type pile driver comprising:

a cylinder having a cylinder wall;

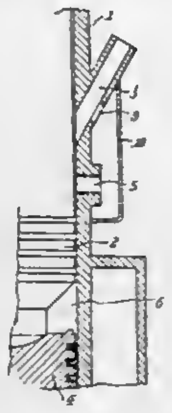
an anvil fitted into the bottom of said cylinder;

a piston in said cylinder above said anvil;

an air intake/exhaust port fixedly provided through said wall thereof above said anvil and communicated with the atmosphere,

said cylinder having a choke opening through said wall thereof between said air intake/exhaust port and said anvil and communicated with the atmosphere; and

plug means fitted into said choke opening for regulating the pressure between the inside said cylinder and the atmosphere through said choke openings, said plug means being comprised of at least one first plug fittable into said choke openings, said first plug having a bore therethrough and a second plug fittable into said choke opening, said second plug being solid.



4,109,622

TWO STROKE ENGINES

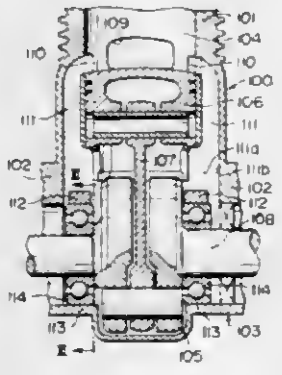
Tetsuzo Fujikawa, Kobe, and Noriaki Fujii, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 14, 1976, Ser. No. 750,453

Claims priority, application Japan, Dec. 16, 1975, 50-150373

Int. Cl.^{2} F02B *33/04*

U.S. Cl. 123—73 A **3 Claims**



1. Crankcase precompression type two stroke internal combustion engine comprising an integral main body block which includes a cylinder block section having a cylinder bore defined therein and a crankcase upper section, a crankcase lower section connected to the crankcase upper section of the body block to define a crankchamber together with the crankcase upper section, a cylinder head connected with the cylinder block section of the body block, a piston slidably received in the cylinder bore, a crankshaft rotatably disposed in said crankchamber and connected with said piston through a connecting rod, scavenging ports formed in the cylinder block section to open to the cylinder bore, scavenging passages formed in said body block so as to extend substantially parallel with the cylinder bore and having upper ends respectively connected with the scavenging ports, said scavenging passages having substantially straight lower ends communicating with the crankchamber, said crankcase lower section having semicircular recessed means in said crankchamber for receiving bearing means for the crankshaft, and retaining means provided in said crankchamber and secured to the crankcase lower section for cooperation with the recessed means so that said bearing means is retained in the crankchamber on the recessed means of the crankcase lower section.

4,109,623

REGULATOR FOR AUXILIARY AIR INJECTION AT THE INTAKE OF INTERNAL COMBUSTION ENGINES

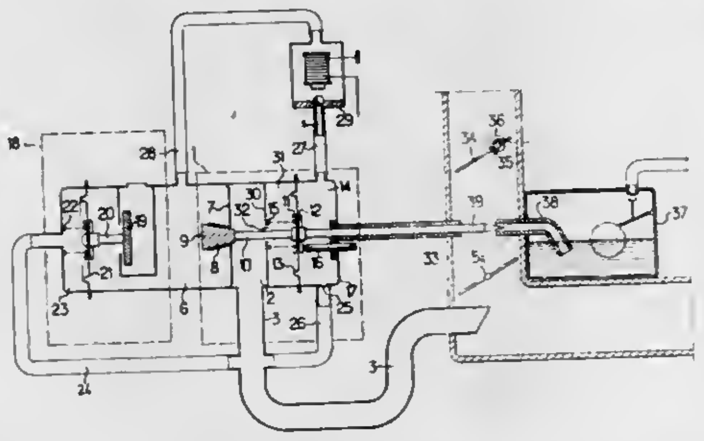
Jean-Pierre Rivere, Paris, France, assignor to Regie Nationale des Usines Renault, France

Filed Jul. 8, 1976, Ser. No. 703,331

Claims priority, application France, Jul. 11, 1975, 75 21960

Int. Cl.^{2} F02M *7/24*

U.S. Cl. 123—119 EC **5 Claims**



1. A regulating system for auxiliary air injection at the intake manifold of an internal combustion engine comprising means defining an intake chamber adapted for communication with the intake manifold of an internal combustion engine; means defining an intermediate compartment having an opening for passage of air from said intermediate compartment to said intake chamber; pressure-regulating means for supplying air to said intermediate compartment at a pressure proportional to the intake manifold pressure; and opening-regulating means for regulating passage of air through said opening and including:

a metering valve within said opening;

a membrane connected to said metering valve for actuation thereof;

means defining an outer compartment having a first wall defined at least in part by said membrane;

means defining a first conduit connecting said outer compartment with said intake chamber;

a first choke in said first conduit for controlling the rate of air flow therethrough;

a spring urging said metering valve in a direction to block passage of air through said opening;

means defining a second conduit connecting said outer compartment with said intermediate compartment;

probe means adapted for insertion into the exhaust line of the internal combustion engine for providing an indication of the oxygen content of the engine exhaust;

an electrically-actuated valve in said second conduit; and

means for supplying to said electrically-actuated valve a pulsed actuating current having a pulse frequency dependent upon the speed F of the internal combustion engine and a pulse duration proportional to $S/\sqrt{F}$, where S is the integrated value of the engine exhaust oxygen content indication.

4,109,624

VACUUM REGULATION VALVE IN AN EXHAUST GAS RECIRCULATION SYSTEM

Masayuki Wasblo, Hadano, and Tetsuya Harada, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Atsugi Motor Parts Company, Limited, Atsugi, both of, Japan

Filed Dec. 28, 1976, Ser. No. 754,946

Claims priority, application Japan, Dec. 29, 1975, 50-178247[U]

Int. Cl.^{2} F02M *25/06*

U.S. Cl. 123—119 A **8 Claims**

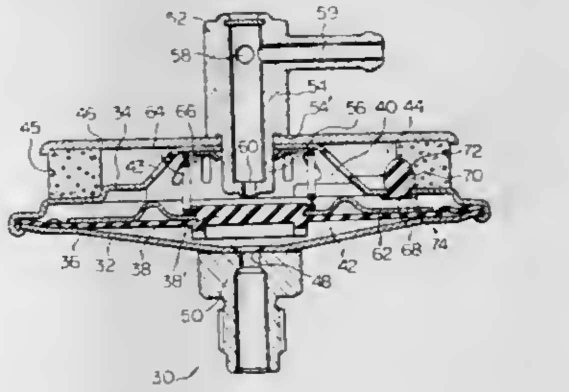
1. In an exhaust gas recirculation system having a recirculation passageway connecting an intake manifold of an internal combustion engine with an exhaust manifold for recirculating a portion of the exhaust gas therethrough, an exhaust gas recirculation valve with a vacuum chamber in the recirculation passageway, a vacuum line connecting a venturi section of a carburetor of the engine with the vacuum chamber, and a vacuum regulation valve operable to regulate the vacuum in said vacuum line for maintaining the proportion of the quantity of the recirculated exhaust gas to the quantity of air admitted into the intake manifold nearly constant, the vacuum regulation valve comprising:

a casing composed of first and second dish shaped members;

an end plate of a generally flat configuration resting on said first dished shape member for defining therebetween a generally annular space;

an air filter lodged in said space;

a flexible diaphragm with an integral valve portion disposed within said casing to cooperate with said first and second dished shaped members to define first and second chambers respectively, said first chamber in communication with the atmosphere through said air filter and said second chamber fluidly in communication with said recirculation passageway;



an air vent conduit member including a connector portion resting on said end plate and a stem portion projecting inwardly of said first chamber, said connector portion formed with branched passages respectively connected to said vacuum line and said stem portion formed with an air vent port in communication with said branched passages, said air vent port adapted to cooperate with the valve portion of said diaphragm which is movable between a first position closing said air vent port and a second position opening same;

a hacking plate made of a metal sheet secured on said diaphragm on the side facing said first dish shaped member and movable with said diaphragm;

a coiled spring disposed between said backing plate and said first dish shaped member for urging the valve portion of said diaphragm toward said second portion;

a fastening means for fixedly assembling said air vent conduit member, said end plate and said casing together; and

a buffer means for preventing said backing plate from striking said first dish shaped member.

4,109,625

EXHAUST GAS PURIFYING DEVICE FOR INTERNAL COMBUSTION ENGINE WITH AUXILIARY COMBUSTION CHAMBERS

Hideo Kawamura, Yamatu, and Kimi Kubota, Chigasaki, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,749

Claims priority, application Japan, Jan. 31, 1976, 51-10381[U]

Int. Cl.^{2} F02D *25/06*

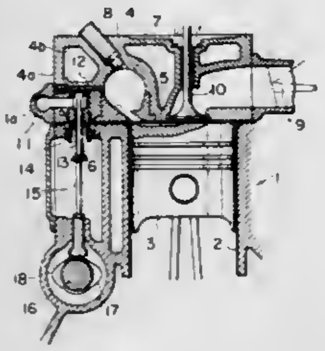
U.S. Cl. 123—119 A **3 Claims**

1. In an exhaust gas purifying apparatus for a compression ignition type of internal combustion engine including a plurality of cylinders, a cylinder head and a piston reciprocatingly disposed in each cylinder, each cylinder having a main combustion chamber within each cylinder and an auxiliary com-

bustion chamber in said cylinder head communicating therewith through an open port, and an exhaust gas outlet in said head communicating with each main combustion chamber, the improvements characterized by:

(a) an exhaust gas expansion manifold arranged on an outer wall of said cylinder head,

(b) a plurality of exhaust gas passage means individually communicating each auxiliary combustion chamber with said manifold so that said auxiliary combustion chambers are in communication with each other,



(c) a plurality of valves individually disposed in each passage means for opening or closing the communication between said auxiliary combustion chamber and said manifold, and

(d) valve control means for selectively opening each valve when its associated piston is near the bottom of its power expansion stroke simultaneously with the opening of another valve when its associated piston is near the bottom of its intake suction stroke, whereby exhaust gas from one auxiliary combustion chamber is coolingly expanded into the manifold and then drawn into another auxiliary combustion chamber.

4,109,626

FUEL SUPPLY CONTROL SYSTEM WITH FEEDBACK FUEL PIPE FOR INTERNAL COMBUSTION ENGINE

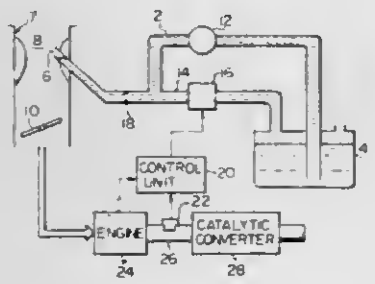
Shigeo Aono, Seki, and Makoto Anzai, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 21, 1976, Ser. No. 678,926

Claims priority, application Japan, Apr. 22, 1975, 50-48201

Int. Cl.^{2} F02M *39/00;* **F02D** *1/06, 37/04*

U.S. Cl. 123—139 AW **5 Claims**



1. A fuel supply control system for a carburetor of an internal combustion engine including; a fuel reservoir; a discharging nozzle positioned in a venturi of an intake pipe connected to the intake manifold of the engine; a first fuel pipe extending between said fuel reservoir and said discharging nozzle; wherein the improvement comprises:

(a) a fuel pump provided in said first fuel pipe for supplying fuel from said reservoir to said discharging nozzle;

(b) an orifice disposed in said first fuel pipe downstream of said fuel pump;

(c) a second fuel pipe extending between said fuel reservoir and said first fuel pipe downstream of said fuel pump and upstream of said orifice, said second fuel pipe being arranged to feedback the fuel downstream of said fuel pump to said fuel reservoir; and

(d) fuel flow rate control means provided in said second fuel pipe to control the amount of fuel being fed back to said fuel reservoir in response to a signal representing at least one selected engine operating condition for regulating the height of fuel surface in said discharging nozzle in accordance with the amount of fuel fed back, the amount of fuel sucked into said intake pipe being regulated by both of the magnitude of the vacuum in said intake pipe and the height of the fuel surface in said discharging nozzle.

4,109,627

TWO-SPEED FUEL INJECTION PUMP GOVERNOR

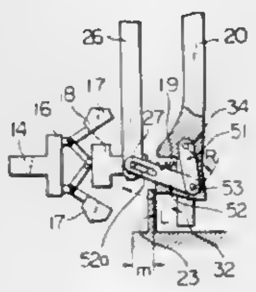
Mitsuo Uchino, and Seizi Takahashi, both of Higashi Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,206

Claims priority, application Japan, Nov. 5, 1975, 50-150823[U]

Int. Cl.^{2} F02D *1/04*

U.S. Cl. 123—140 R **12 Claims**



1. In a two-speed fuel injection pump governor for an engine, comprising flyweight means rotated at a speed proportional to the engine speed, a speed control member for controlling the speed of the engine, and limiting linkage means operatively connecting the speed control member to the flyweight means to progressively limit movement of the flyweight means in a fuel injection increasing direction as the speed control member is moved toward a maximum speed demand position such that the amount of fuel injection increase during low speed regulation is reduced in proportion to the engine load.

4,109,628

ADJUSTABLE REGULATION GOVERNOR

Robert H. Miller, Peoria, and Harold C. Davidson, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 8, 1976, Ser. No. 739,419

Int. Cl.^{2} F02D *1/04;* **F16H** *55/16*

U.S. Cl. 123—140 R **12 Claims**

1. Apparatus for selectively varying the spring rate of a helical spring comprising:

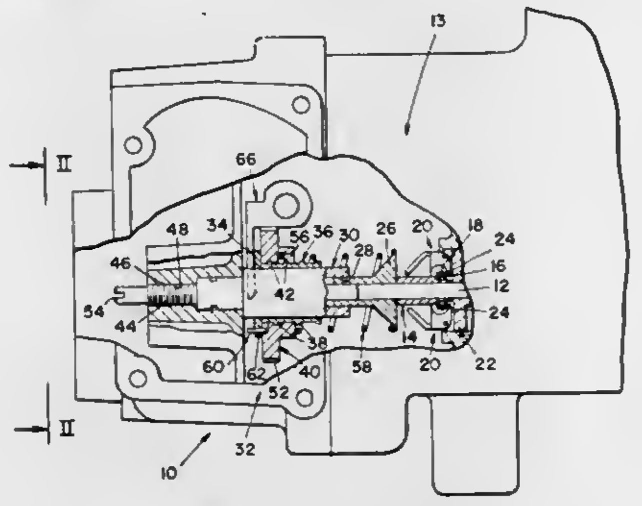
a first member defining threads of a first pitch;

a second member defining threads of the first pitch in threaded engagement with the threads of the first member;

the second member defining helical channel means of a second pitch different from the first pitch;

a reaction member;

the helical spring being in contact with the reaction member and having a portion disposed through the helical channel means;



whereby rotation of the second member relative to the first member selectively varies the spring rate of the helical spring.

4,109,629

FUEL INJECTION PUMPING APPARATUS

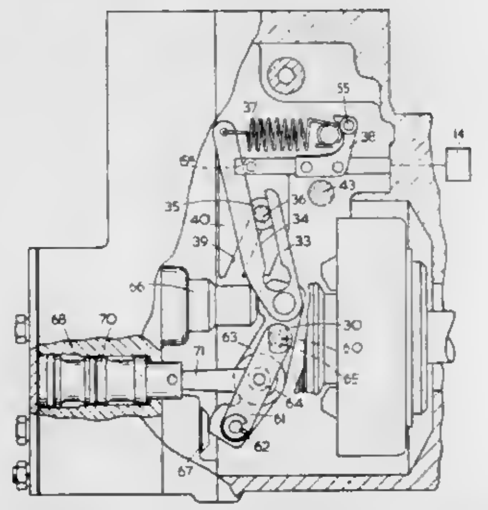
James Charles Potter, London, England, assignor to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 587,886, Jun. 18, 1975, abandoned, which is a continuation of Ser. No. 457,475, Apr. 1, 1974, abandoned. This application Oct. 29, 1976, Ser. No. 737,034

Claims priority, application United Kingdom, Apr. 1, 1974, 16486/74

Int. Cl.^{2} F02D *1/04*

U.S. Cl. 123—140 R **6 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an associated internal combustion engine, comprising an injection pump having an axially movable control rod for determining the amount of fuel delivered by the injection pump at each injection stroke, governor means comprising a first pivotal link mounted about a fixed axis, a second pivotal link pivotally connected at one end to the first link at a position removed from said fixed axis, a slot defined in said second link, pivot means located in said slot, operator-adjustable means for adjusting the position of said pivot means within said slot, said second link being operatively connected at its other end to said control rod, a spring biased weight mechanism responsive to the speed of the associated engine, a servo-mechanism for effecting movement of the said first link about said fixed axis, an operating member for the servo-mechanism, means coupling said operating member to said weight mechanism so that movement of the weight mechanism with increasing speed will effect, through the servo-mechanism, movement of said first link in a direction to reduce the fuel supply to the engine and vice versa, said servo-mechanism acts to isolate the weight mechanism from forces acting on the control rod.

4,109,630

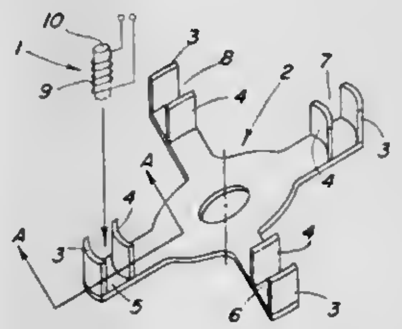
BREAKERLESS ELECTRONIC IGNITION SYSTEM

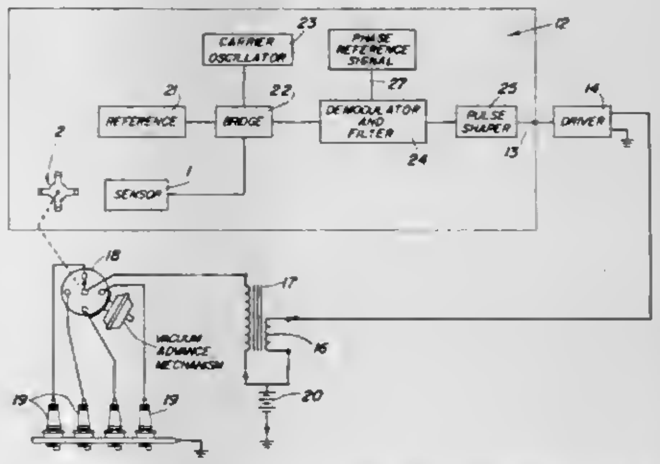
William E. Richeson, Jr., Fort Wayne, and Gerald L. Kray, Butler, both of Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed May 17, 1976, Ser. No. 687,269

Int. Cl.^{2} F02P *1/00*

U.S. Cl. 123—148 E **5 Claims**





1. A timing signal source for an internal combustion engine, comprising:

a rotatable means having at least one tyne of a ferro-magnetic material and adapted to be coupled to the engine for providing a relative angular rotation therewith;

a sensor means including an inductor mounted in close proximity to said rotatable means and having an impedance which varies as a function of the relative angular position between the sensor means and the tyne of said rotatable means for providing a predetermined sensor property at a predetermined rotational position of the engine;

a reference means including an inductor for providing a predetermined impedance;

a signal generating means having output terminals for providing a constant frequency carrier signal;

a bridge network means having at least first and second parallelled signal branches connected to the output terminals of said signal generating means and having said sensor means connected in the first branch and said reference means connected in the second branch for providing a predetermined relationship of signal currents in the first and second branches at said predetermined rotational position of the engine; and

a detector means connected to said bridge means for detecting said predetermined relationship of signal currents in the first and second branches and for providing in response thereto an output signal indicative of said predetermined rotational position of the engine.

4,109,631
IGNITION SYSTEMS OF INTERNAL COMBUSTION ENGINES

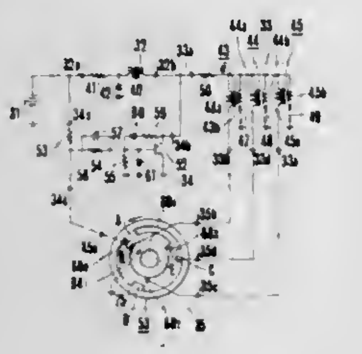
Hiroyasu Miyao, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 13, 1976, Ser. No. 732,041

Claims priority, application Japan, Oct. 17, 1975, 50-141520[U]; Jun. 23, 1976, 51-74683

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 CA **9 Claims**



1. An ignition system of an internal combustion engine, comprising a source of direct current, a reactor, and a primary winding of an ignition transformer connected in series in a direct current conductive circuit, a secondary winding on said transformer for supplying a spark plug of said internal combustion engine, and a circuit including an interrupter connected in parallel with said primary winding.

2. An ignition system of an internal combustion engine comprising a source of direct current, a reactor circuit, an ignition transformer circuit, and a gate circuit said ignition transformer circuit including at least one ignition transformer having a primary winding and a secondary winding, said primary winding being connected in series direct current conductive circuit across said DC source through said reactor circuit, said secondary winding being connected across a spark plug of said internal combustion engine, and means for ON/OFF-controlling said gate circuit at a predetermined period, said gate circuit being connected in parallel with said primary winding and when closed short-circuiting said primary winding of said ignition transformer and storing electromagnetic energy in said reactor circuit, and when opened supplying said stored electromagnetic energy in said reactor circuit, and when opened supplying said stored electromagnetic energy and current from said DC source to said primary winding thus inducing high voltage in said secondary winding for operating said spark plug.

4,109,632
GTO IGNITION CIRCUIT

Ronald Robert Brooks, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,916

Int. Cl.² F02P *7/00;* **H03K** *17/72*

U.S. Cl. 123—148 E **15 Claims**

1. An ignition circuit for an internal combustion engine, comprising:

first and second terminals for receiving an operating voltage and a reference voltage, respectively;

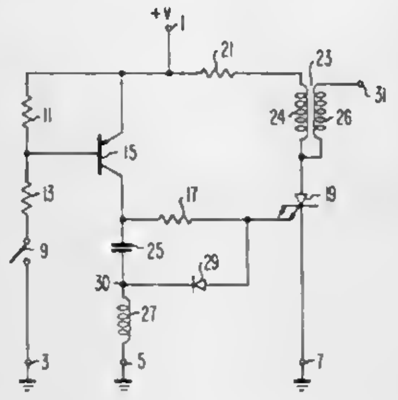
timing switch means responsive to the crankshaft position of the engine selectively to provide a conductive path between said first terminal and a third terminal;

a capacitor connected between said third and a fourth terminal;

an inductor connected between said fourth and second terminals in a series resonant circuit with said capacitor and responding to conduction of said timing switch means to build up a self-induced field;

bistable switching means having a control electrode and having a selectively conductive main current path which becomes conductive after sufficiently large current of a first polarity is applied to said control electrode and nonconductive after sufficiently large current of a second polarity opposite to said first polarity is applied to said control electrode;

an ignition coil having primary and secondary windings with said primary winding being connected in series with said main current path of said bistable switching means between said first and second terminals;



a resistor connected between said third terminal and the control electrode of said bistable switching means; and

unidirectionally conductive means connected between said fourth terminal and the control electrode of said bistable switching means with a poling to conduct the current supplied by said inductor during collapse of its self-induced field.

4,109,633
SPARK-PLUG FOR AUTOMOBILE INTERNAL COMBUSTION ENGINE

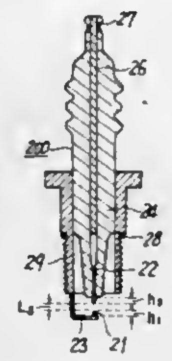
Hiroyuki Mitsudo, Kawanishi, and Masazumi Yoshida, Amagasaki, both of Japan, assignors to New Cosmos Electric Company Limited, Osaka, Japan

Filed Sep. 7, 1976, Ser. No. 720,798

Claims priority, application Japan, Sep. 16, 1975, 50-110873; Sep. 16, 1975, 50-110874; Oct. 2, 1975, 50-118270; Oct. 17, 1975, 50-124267; Oct. 31, 1975, 50-130484; Nov. 17, 1975, 50-137279; Dec. 3, 1975, 50-142908; Dec. 3, 1975, 50-142909; Dec. 3, 1975, 50-142910; Dec. 3, 1975, 50-142911; Feb. 9, 1976, 51-012249; Feb. 14, 1976, 51-014407

Int. Cl.² F02P *1/00;* **H01T** *13/20, 13/28*

U.S. Cl. 123—169 EL **37 Claims**



1. An electric spark-plug for automobile internal combustion engine comprising:

a metallic screw portion to be engaged with an internal combustion engine,

an electrode terminal part,

an electric insulator for supporting said screw part and said electrode terminal part in a coaxial relation, keeping them insulated from each other, and

at least a pair of electrodes, the pair including a first electrode and a second electode,

said first electrode being supported by a supporter formed on the metallic screw part,

said second electrode being rod-shaped and electrically connected to said electrode terminal part by means of a central conductor disposed on the axis of said screw part and in said insulator,

said first electrode and said second electrode being supported insulatedly from each other by means of said insulator, keeping a given ignition gap between their discharging faces,

characterized in that:

fluid resistance against gas flow of flame nucleus of said electrodes is decreased in a manner to have an ability of ignition that is defined by capability to ignite and burn a lean gas mixture of isobutane and air under the conditions of normal temperature (T) of about 20° C, the pressure of lean gas mixture equals 1 atmospheric pressure (density index $\epsilon \approx 1$), excess air ratio (F) of more than 1.25 and electrode gap distance (L_s) of less than 2mm, so that the following ignition conditional inequality applies thereby to decrease the thermal conductance G from the flame nucleus to the electrodes:

$$J > \frac{G}{V}\left\{ \frac{\exp(E_b/RT}{(\alpha - 1)B\epsilon^{n+m^*}} \cdot \frac{(n + 4.773\, mF)^{n+m^*}}{3.773^{\gamma m}\, n^n m^{m^*} (X_t - X_i)^{n+m^*} F^{m^*}} \right\} \tag{1}$$

wherein J, ϵ and m^* are given by

$$J = [E_b(T_s - T_o) + RT_s^2]/\pi RT_s^2.$$

$$\epsilon \doteq [(760 - p^-) / 760]\, R_c.$$

$$m^* = (1 + \gamma)m.$$

wherein V is the nucleating volume size and is represented by an equation of $V=\theta L_s$ wherein θ is a proper constant and L_3 is the electrode gap distance, T is a temperature of the nucleating volume, T_o is the temperature of the electrodes, X_i is a molar density in 1 atmospheric pressure of incombustible gases other than nitrogen, F, ϵ p^- and R_c are excess air ratio, density index of molecules, absolute value of negative pressure (mm Hg) in intake pipe and compression ratio at the time of ignition, respectively, in the gas mixture, J being practically a constant when the dependences of the singular point temperature T_s upon the variable quantities V, G, X_i, F and ϵ are sufficiently small, E_b is an activation energy in Arrhenius' equation, and is a constant inherent to individual fuel, n and m are the molecularities of reaction of fuel and oxygen, respectively, γ is a parameter showing the participation degree of nitrogen molecules in reaction process, α is a multiplication factor of chain carriers, R is a gas constant, B, X_t and π are constants, respectively.

4,109,634
APPARATUS FOR MODIFYING AN INTERNAL COMBUSTION ENGINE

Arthur Garabedian, 1111 Glenview Dr., Fullerton, Calif. 92634, assignor to Dudley B. Frank and Arthur Garabedian, both of Santa Ana, Calif.

Continuation of Ser. No. 503,718, Sep. 6, 1974, Pat. No. 4,019,479. This application Mar. 4, 1977, Ser. No. 774,343

Int. Cl.² F02D *9/00;* **F02M** *13/04*

U.S. Cl. 123—198 F **8 Claims**

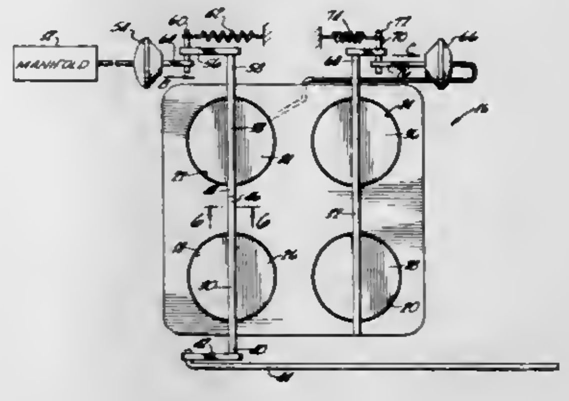
1. A split engine comprising:

a pair of carburetor barrels, each connected to independently controlled cylinders of said engine;

a first throttle valve for selectively closing one of said pair of barrels;

a second throttle valve for selectively closing the other of said pair of barrels;

first means for selectively opening said first throttle valve; and



second means responseive to said first means for selectively openiog said second throttle valve when said first throttle valve is opened a predetermined distance.

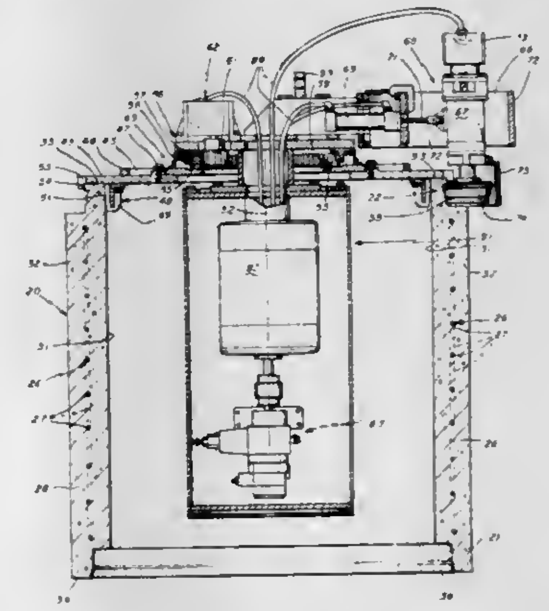
4,109,635
MACHINE GROOVED JOINT ON HOLLOW CONCRETE CYLINDERS

John C. Rossborough, 8 Upper Flanders Rd., Amherst, N.H. 03031

Filed Sep. 10, 1976, Ser. No. 722,266

Int. Cl.² B28D *1/16*

U.S. Cl. 125—10 **7 Claims**



1. The method of machining an annular groove around the exterior surface of the spigot end of a reinforced concrete manhole riser by means of a circular track frame mounted across said spigot end, a carriage mounted to move around the circular track, a linear track extending radially on said carriage, a cutter head movable along said linear track and a rotary cutter depending from said head, said method comprising the steps of

precisely centering said circular track frame relative to the longitudinal axis of said riser,

power moving said carriage around said circular track frame at a controlled velocity,

power rotating said rotating cutter of said cutter to rotate in a horizontal plane on a vertical axis;

and power moving said cutter head along said linear track to a position thereon to form an annular groove in said spigot end said groove having an inner wall at a predetermined, uniform radial distance from said axis as said carriage travels in a circular path around said axis.

7. The method of machining an annular groove around the

spigot end of a manhole riser, by means of a rotary cutter head movable radially on the linear track of a carriage, the carriage being movable in a circular path around a frame, supported across said spigot end, said method comprising the steps of

power rotating the cutter of said cutter bead

power moving said cutter head and cutter inwardly on said linear track to form a part of a groove in said spigot end to a predetermined depth and

power moving said cutter head, cutter and track on said carriage in a circular path around said spigot end at a uniform radial distance from the central longitudinal axis of said riser to complete said groove around said spigot

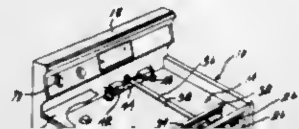
4,109,637
LATCH MECHANISM FOR PYROLYTIC RANGE

Claude Drouin, Montmagny, Canada, assignor to Les Industries BFG Limitee, Montmagny, Canada

Filed Jan. 6, 1977, Ser. No. 757,433

Int. Cl.² F23M *7/00*

U.S. Cl. 126—197 **5 Claims**



associated reflector outside of the periphery of its parabolic configuration,

electric means for moving said reflectors independently of said frame in unison through a similar arc partially around the portion of the tube associated with each of the reflectors for maintaining said reflectors with the axis of their curvature approximately in a plane containing the sun's center, and

means for sensing the position of the sun for energizing said electric means for moving said frame and said reflectors independently of each other to orient and maintain said

pump is operated by a sequence of pulses each being composed of a plurality of full AC waves.

4,109,640
SOLAR HEATING SYSTEM

Lynwood L. Smith, 2915 Pink Hill Rd., Kinston, N.C. 28501

Filed Apr. 12, 1976, Ser. No. 676,534

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **8 Claims**

spigot end of a manhole riser, by means of a rotary cutter head movable radially on the linear track of a carriage, the carriage being movable in a circular path around a frame, supported across said spigot end, said method comprising the steps of
- power rotating the cutter of said cutter head
- power moving said cutter head and cutter inwardly on said linear track to form a part of a groove in said spigot end to a predetermined depth and
- power moving said cutter head, cutter and track on said carriage in a circular path around said spigot end at a uniform radial distance from the central longitudinal axis of said riser to complete said groove around said spigot end.

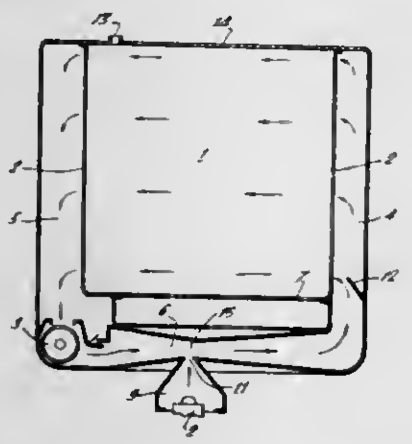
4,109,636
FORCED CONVECTION OVENS

Donald Richard Burge, London, England, assignor to British Gas Corporation, England

Filed Dec. 22, 1976, Ser. No. 753,433

Int. Cl.^{2} A21B *1/26*

U.S. Cl. 126—21 A **2 Claims**



1. A forced convection oven having an openable chamber defining a cooking zone, which openable chamber includes top, bottom, back and two side walls, said side walls including apertured side panels therein; a passageway exteriorly of but communicating with said zone; fan means, located in said passageway, for circulating a hot gaseous medium through said passageway and said zone; a combustion chamber; a fuel burner associated with said combustion chamber whereby, in operation, hot combustion burner gases issuing from said combustion chamber mix with the circulating gaseous medium in said passageway and enter said zone; and means for venting said zone to atmosphere; the improvement wherein said passageway is of substantially U-shaped form including two vertical limbs and surrounds said bottom wall and said two apertured side panels, the base part of said U-shaped passageway defining a pressure-reducing throat having a restricted portion positioned beneath, but spaced from, said bottom wall, the two vertical limbs of said U-shaped passageway defining inlet and outlet manifolds, exteriorly adjacent a respective one of said two side panels, for communicating said passageway with said zone through the apertures in said side panels; said combustion chamber being located below said throat with the outlet thereof communicating with the restricted portion of said throat, said fan means being located in said passageway upstream of said throat and arranged in operation forcibly to circulate the hot gaseous medium of air and hot combustion products from said burner substantially horizontally across said zone from said inlet manifold to said outlet manifold.

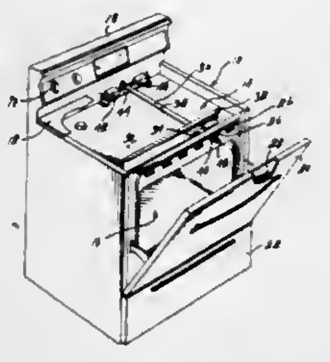
4,109,637
LATCH MECHANISM FOR PYROLYTIC RANGE

Claude Drouin, Montmagny, Canada, assignor to Les Industries BFG Limitee, Montmagny, Canada

Filed Jan. 6, 1977, Ser. No. 757,433

Int. Cl.^{2} F23M *7/00*

U.S. Cl. 126—197 **5 Claims**



1. A combination pyrolytic range, having a high temperature self cleaning cycle and a latch mechanism therefor comprising an oven structure, an oven cavity defined in said oven structure and a door for covering said oven cavity, and a locking mechanism for said door during said self-cleaning cycle comprising: a latch arm pivotally mounted to said oven structure and adapted to move between a door locking position and a door unlocked position, said door having means for receiving said latch arm, said arm having one end extending towards said door for locking engagement therewith; a pair of solenoids mounted to said structure, each solenoid including a movable magnet bar coupled to said latch arm whereby said bars are simultaneously displaceable for each separate energization of said solenoids; a first of said bars being actuatable, when the solenoid associated therewith is energized, to move said arm to said door locking position; a second of said bars being actuatable, when the solenoid associated therewith is energized, to move said arm in said door unlocked position; and spring means maintaining said arm in each position reached by said arm.

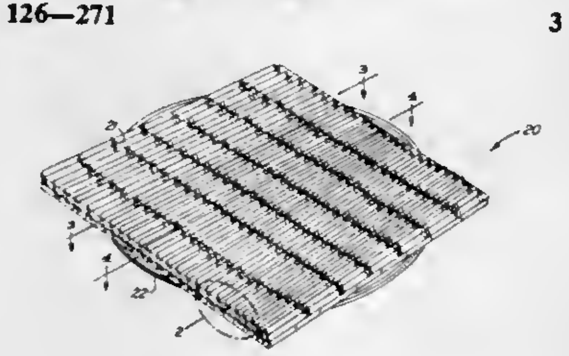
4,109,638
SOLAR ENERGY CONVERTER CAROUSEL

William C. Matlock, and Patricia Matlock, both of 2123 S. Priest #216, Tempe, Ariz. 85282

Filed Apr. 4, 1977, Ser. No. 784,581

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. An improved heat exchange means comprising:
- a frame,
- said frame being rotatably mounted on a support for movement through an arcuate path,
- at least a pair of juxtapositioned reflectors,
- each of said reflectors comprises a trough having a reflecting surface having a parabolic configuration,
- means for pivotally mounting each of said reflectors in a parallel arrangement on said frame,
- a fluid bearing tube extending longitudinally of each of said reflectors on said frame and approximately disposed with the axis of a portion of said tube in the focal zone of an associated reflector outside of the periphery of its parabolic configuration,
- electric means for moving said reflectors independently of said frame in unison through a similar arc partially around the portion of the tube associated with each of the reflectors for maintaining said reflectors with the axis of their curvature approximately in a plane containing the sun's center, and
- means for sensing the position of the sun for energizing said electric means for moving said frame and said reflectors independently of each other to orient and maintain said frame and reflectors with their axes of curvature of their reflective surfaces approximately in a plane containing the sun's center,
- said means for sensing the position of the sun comprising an electric motor mounted on said frame for driving said frame sequentially back and forth around at least a portion of said support,
- whereby the reflection of the sun's rays are concentrated by said reflectors in a line image along said portions of said tubes.

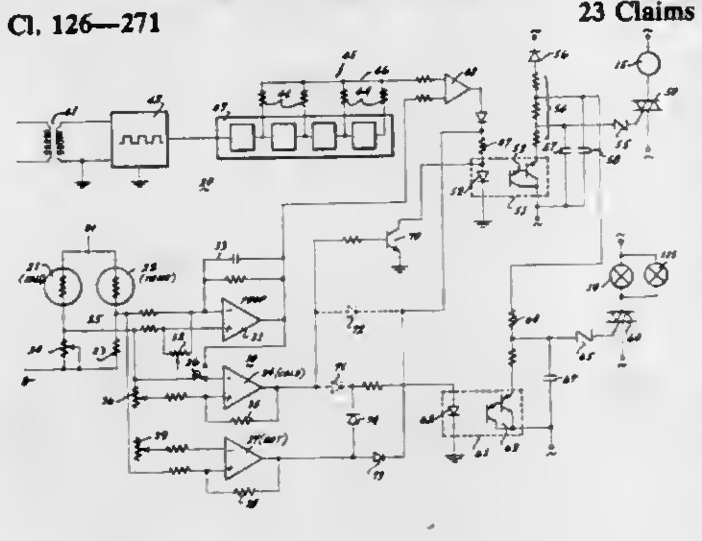
4,109,639
SOLAR HEATING SYSTEM

Partick J. Keegan, Van Nuys, Calif., assignor to Rho Sigma, North Hollywood, Calif.

Filed Jun. 13, 1977, Ser. No. 805,695

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **23 Claims**



1. In a system for transferring thermal energy between a storage tank for water and a solar heat exchanger and collector, there being a pump for pumping water from the tank through the heat exchanger and back into the tank, a first temperature sensitive element for sensing the temperature of the water as leaving the heat exchanger or as being held therein; a second temperature sensitive elememt for sensing the temperature of the water in the tank or as leaving the tank; and a bridge circuit which includes the first and second element and adjusted to provide for a signal representing the effective difference in temperature; the combination comprising: a difference amplifier connected across the bridge circuit to receive said bridge circuit signal and to provide an output signal proportionate to said difference;
- a staircase signal generator providing a stepwise increasing signal on a cyclically repetitive basis, the steps occurring in synchronism with an AC voltage;
- a comparator connected to receive said output signal and said staircase signal and providing a pulse train at a pulse rate frequency corresponding to the cyclic repetition of the staircase signal, the pulses having duration in proportion to said difference but in unit steps equal to an AC cycle; and
- an AC operated control circuit for the pump and responsive to said pulses to turn the pump on and off at instants corresponding to AC signal zero crossings so that the pump is operated by a sequence of pulses each being composed of a plurality of full AC waves.

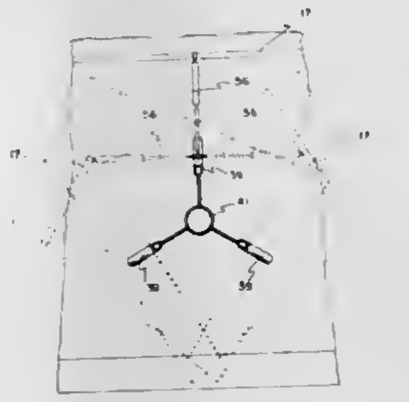
4,109,640
SOLAR HEATING SYSTEM

Lynwood L. Smith, 2915 Pink Hill Rd., Kinston, N.C. 28501

Filed Apr. 12, 1976, Ser. No. 676,534

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **8 Claims**



1. In a solar heating system including operatively connected solar energy heat exchanger means, heat storage means, and use heat exchanger means, the improvement comprising: a solar heat exchanger support base; a shaft rotatively mounted on said base; said solar energy heat exchanger means mounted on said shaft; a drive means operatively connected to said shaft; control means operatively connected to said drive means for progressively rotatively driving said shaft and a tilt support means toggly connected to said solar heat exchanger at one end and to a fixed point off center from the rotative axis of said shaft at the other end whereby said panel, when rotated to follow the movement of the sun, will automatically tilt to follow the up and down movement of said sun.

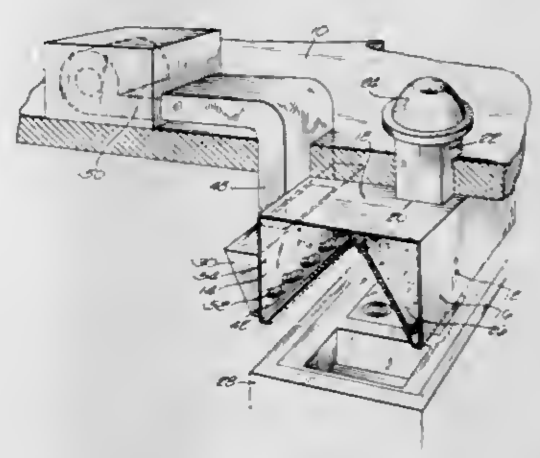
4,109,641
ADAPTER MANIFOLD FOR VENTILATION HOOD

Dean L. Hunzicker, Verona, Wis., assignor to Air Master Systems, Inc., Fort Atkinson, Wis.

Filed May 25, 1977, Ser. No. 800,386

Int. Cl.^{2} F24C *15/20*

U.S. Cl. 126—299 D **6 Claims**



1. In combination a ventilating hood having spaced front and rear walls which cooperate to define a lower hood inlet, a top wall connected to said front and rear walls, an exhaust outlet in said top wall, a grease filter located between said hood inlet and said exhaust outlet and the improvement comprising an adapter manifold for supplying outside untempered air to the hood, said manifold having walls defining an elongated air chamber having an inlet connectable to an untempered air source, one of said walls containing a plurality of openings, a

plurality of tubes, and means for mounting said tubes in said openings to provide communication with said air chamber, and said manifold being adapted to be mounted on said hood front wall with said tubes extending through openings in said hood wall to direct untempered outside air into said hood between said filter and said hood outlet.

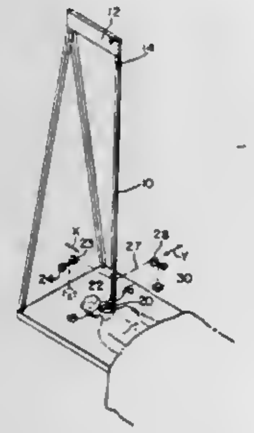
4,109,642
APPARATUS FOR ULTRASONIC ARTERIOGRAPHY

John M. Reid, and Merrill P. Spencer, both of Seattle, Wash., assignors to Institute of Applied Physiology & Medicine, Seattle, Wash.

Continuation-in-part of Ser. No. 240,349, Apr. 3, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,423

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 V **24 Claims**



1. A method of detecting the flow picture in vessels in human tissue containing moving sound scatterers, comprising:
   transmitting and receiving the reflections of an ultrasonic continuous sound wave focused to a width of less than half the diameter of the vessel at a depth where sound scatterers are located through a sound transmitting medium into the tissue in a small region expected to contain the vessels being investigated, thus receiving flow information from said small region to the exclusion of surrounding regions;
   detecting the presence of the moving scatterers in the vessels within said small region using the doppler effect;
   systematically transmitting and receiving over the desired vessel to produce a clearly defined pattern; and
   converting the ultrasonic reflected signals to a visually detectable output.

4,109,643
PERFUSION METER

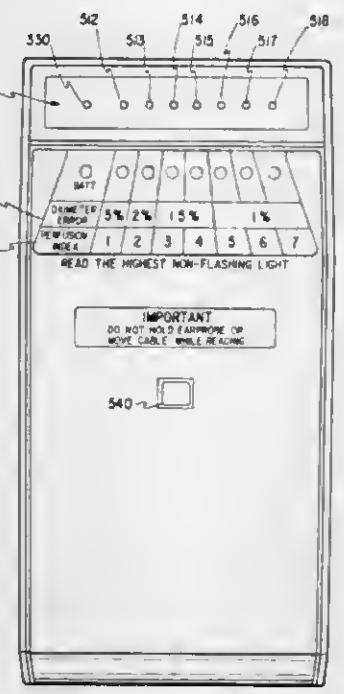
Albert K. Bond, Burlington; Edwin B. Merrick, Stow, and Larry Lee Nielsen, Burlington, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 17, 1976, Ser. No. 696,973

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2 L **3 Claims**

1. Apparatus for measurement of pulsatile blood flow rate through a tissue area, said apparatus comprising:
   input means having a light-emissive device and a photosensitive device for providing a first electrical signal in response to pulsatile variations in the quantity of light from said light-emissive device which passes through said tissue and which falls on said photosensitive device;
   second means coupled to the input means for providing a second electrical signal which has a logarithmic relationship to said first electrical signal;
   display means coupled to the second means for providing a visual indication in response to said second electrical signal, said display means including a plurality of indicators, a corresponding legend, and means for activating said indicators in response to said second electrical signal;
   said legend comprising a first set of symbolic markings approximately representing an average pulsatile blood flow rate; and



   said legend further comprising a second set of symbolic markings representing the approximate error to be expected in an oximeter reading at the corresponding blood flow rate.

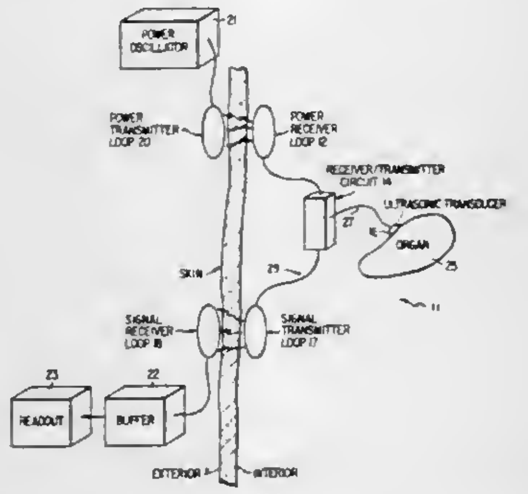
4,109,644
MINIATURE IMPLANTABLE ULTRASONIC ECHOSONOMETER

Gilbert K. Kojima, Mountain View, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,721

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 V **1 Claim**



1. An implantable biomedical echosonometer for taking real-time dimensional measurements of an organ in an animal comprising:
   A. a sealed implantable assembly comprising:
      a. a power receiver loop,
      b. a transformer with a primary winding and low and high voltage secondary windings; said power receiver loop being coupled to said primary winding, said loop being remote from said primary winding whereby said loop can be easily located directly below said animal's skin;
      c. means for converting the output of said low voltage winding to a regulated d-c voltage;

      d. means for producing timing pulses;
      e. means coupled to said high voltage winding and said producing means for generating high voltage pulses at a rate set by said timing pulses;
      f. an ultrasonic transducer adapted to be affixed to the organ to be measured;
      g. a signal transmitter loop; and
      h. a high gain amplifier powered by said regulated d-c voltage, the input of said amplifier being coupled to said pulse generating means and said transducer, the output of said amplifier being coupled to said signal transmitter loop, said amplifier being operable to amplify the pulses from said pulse generating means and echo waveforms received by said transducer caused by ultrasonic reflections from interfaces in said organ, said signal transmitter loop being remote from said amplifier so that said signal transmitter loop can be easily positioned directly beneath said animal's skin;
   B. a power transmitter loop adapted to be disposed outside the animal's skin near said power receiver loop;
   C. a power oscillator connected to said power transmitter loop, said oscillator and loop being operable to inductively transmit electric power to said power receiver loop;
   D. a signal receiver loop adapted to be disposed outside said animal's skin near said signal transmitter loop; and
   E. means for reading out signals inductively coupled to said signal receiver loop from said signal transmitter loop.

4,109,645
DEVELOPMENT OF INSTRUMENTS MEASURING BODY RESISTANCE TO ION AND IONOPHORESIS APPLICATIONS

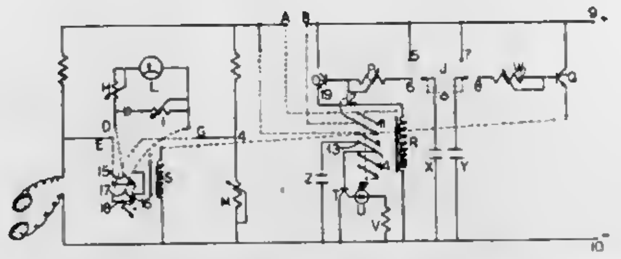
Sancio Bacchelli, 12, via Indipendenza, Bologna, Italy

Filed May 17, 1976, Ser. No. 687,333

Claims priority, application Italy, May 23, 1975, 3420 A/75; Dec. 11, 1975, 3614 A/75

Int. Cl.² A61B *5/05*

U.S. Cl. 128—2.1 Z **4 Claims**



1. An instrument for measuring body resistance to ion and ionophoresis applications, comprising
   a reading circuit means including a reading meter for providing a reading of resistance values after an established period during which the resistance values become stable,
   a principal circuit including electrodes adapted to be positioned on the body, a bridge means operatively connected to said electrodes and to said reading circuit means for measuring body resistance derived from said electrodes and for supplying the measurement to said reading circuit means and two transistor means for initially obstructing current to said bridge means,
   two condenser means releaseably operatively connected to said two transistor means, respectively, through said bridge means, for discharging and activating said two transistor means, said two condenser means for cooperating with said bridge means for providing a discharging time thereof equal to a time necessary for the body resistance values to become stable,
   two relay means being operatively connected to said two transistor means, respectively, and one of said two relay means being operatively connected to said reading circuit means, said relay means being activated by current circulating in said two transistor means, respectively, and said one of said relay means for closing said reading circuit means when one of said two transistor means is activated during the discharging time of one of said two condenser means and for connecting said reading circuit means to said bridge means after said one condenser means discharges.

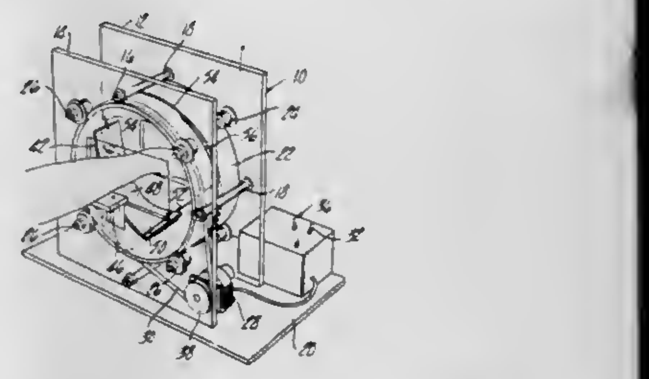
4,109,646
AUTOMATIC BLOOD PRESSURE CUFF APPLICATOR

Robert B. Keller, Ann Arbor, Mich., assignor to Weisman & Allen, Madison Heights, Mich.

Filed Dec. 20, 1976, Ser. No. 752,567

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 C **19 Claims**



1. An arrangement for encircling a body member with an inflatable flexible cuff comprising:
   an inflatable flexible cuff adapted to be extended with separated ends;
   support means for positioning a body member with respect to said flexible cuff;
   means for disposing said cuff in an extended position opposite a body member positioned by said support means;
   means for restraining movement of one end of said flexible cuff with respect to said support means;
   means for moving the other end of said flexible cuff about a body member supported by said support means to overlap said one end whereby said flexible cuff encircles said body member, said means for moving including a rotary member extending about said support means and said flexible cuff and connected to said other end of said cuff and further including means rotatably supporting said rotary member for rotation about said support means and said flexible cuff; and
   means for inflating said flexible cuff after rotation of said rotary member to encircle said body member.

4,109,647
METHOD OF AND APPARATUS FOR MEASUREMENT OF BLOOD FLOW USING COHERENT LIGHT

Michael D. Stern, Rockville, and Donald L. Lappe, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

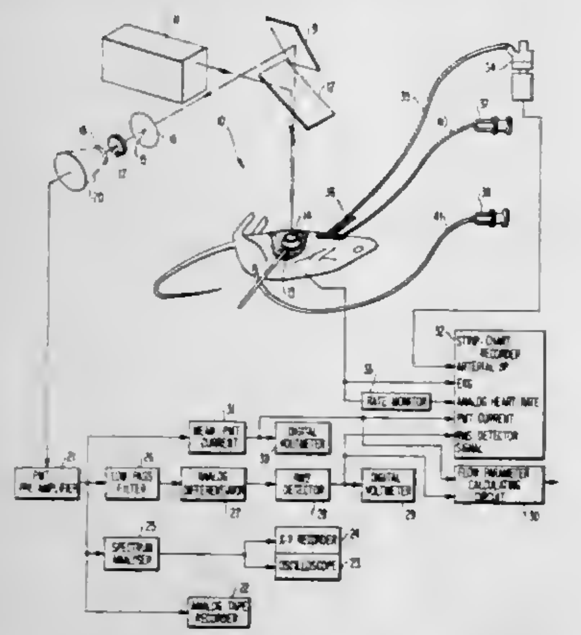
Filed Mar. 16, 1977, Ser. No. 778,083

Int. Cl.² G01P *3/36*

U.S. Cl. 128—2.05 F **39 Claims**

24. An apparatus for measuring the flow of flowing material, the apparatus comprising:
   means for illuminating at least a portion of the flowing material with coherent light;
   means for collecting backscattered light from the material;
   photo-detector means responsive to the collected light for developing a broadened spectrum of low frequency signals, said photo-detector means producing a mean current and having a substantially constant shot noise output S;
   means coupled to said photo-detector means and responsive to its output for developing an output signal I representative of the mean current thereof;
   weighted detector means coupled to said photo-detector and

responsive to the broadened spectrum of low frequency signals for developing an output signal R; and



calculating circuit means coupled to said weighted detector means and to said means for developing an output signal I and responsive to outputs thereof for producing an output signal F representative of the flow.

4,109,648
ELECTRODE ASSEMBLIES

John Reginald Larke, Birmingham; Colin Barber, Underwood, and David John Cotterill, Birmingham, all of England, assignors to National Research Development Corporation, London, England

Filed Dec. 15, 1976, Ser. No. 750,853

Claims priority, application United Kingdom, Dec. 18, 1975, 51855/75

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 E **11 Claims**

1. An electrode assembly for application to the skin to detect electrophysiological signals, comprising a self-supporting body of hydrogel material, and an electrochemically inert elongate member having carbon therein to render it conductive, said member projecting from said body with one end portion thereof embedded in and connected to said body.

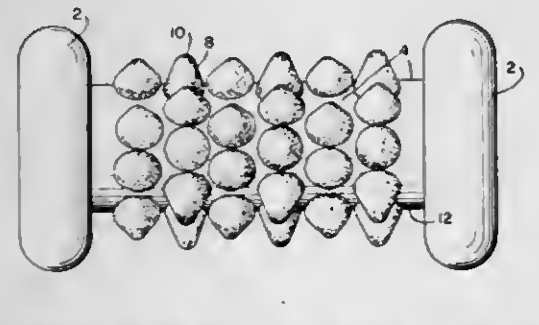
4,109,649
FOOT MASSAGER

Arthur N. Iyomasa, 888 Mililani St., PH, Honolulu, Hi. 96813

Filed Aug. 30, 1976, Ser. No. 718,606

Int. Cl.² A61H *15/00*

U.S. Cl. 128—57 **8 Claims**



1. A foot massaging apparatus comprising toroidal members freely rollable on a flat supporting surface and spaced a distance greater than transverse dimensions of a foot, an intermediate concentric cylindrical member of diameter less than the diameter of the toroidal members connecting the toroidal members; the outer surface of the cylindrical member having a plurality of parallel annular rows of closely spaced projections arranged in staggered meshing relationship to engage the bottom of a foot under pressure and massage said foot when the toroidal members are rolled on the supporting surface.

4,109,650
RESERVOIR WITH HANDLE AND COVER

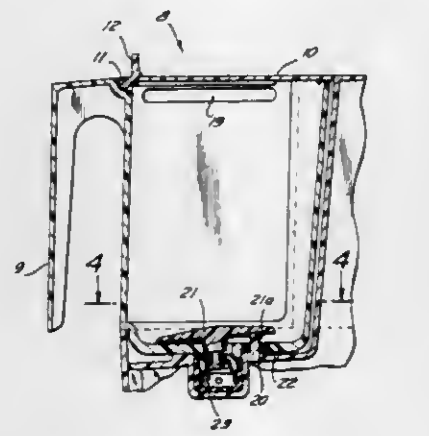
Michel Peclard, Fianarantsoa, Madagascar, assignor to Les Products Associes LPA SA, Switzerland

Filed Apr. 6, 1976, Ser. No. 674,151

Claims priority, application Switzerland, Apr. 8, 1975, 004422/75

Int. Cl.² A61H *9/00*

U.S. Cl. 128—66 **6 Claims**



1. A buccal hygiene apparatus comprising a casing enclosing a hydraulic pump and motor unit, a handpiece connected to the casing by a flexible tubing, and a reservoir removably fitable on the casing in a position for supplying water to the pump and motor unit via an outlet in the bottom of the reservoir, said outlet having valve means for closing it when the reservoir is removed from the casing and opening it when the reservoir is fitted on the casing, characterized in that the reservoir is of smaller dimensions than the casing, a gripping member is provided on the reservoir, a lid is provided on the reservoir having a projection adjacent the gripping member to enable opening of the lid by the thumb of a hand holding the gripping member, and a slot is provided in the upper part of one of the walls of the reservoir to prevent overflow and reduce spilling, said slot being defined by portions of one of the walls of the reservoir, the wall portions completely surrounding the slot.

4,109,651
ANESTHETIC GAS EXHAUST SYSTEM

Allan M. Steigerwald, 9860 SW. Eagle La., Beaverton, Oreg. 97005

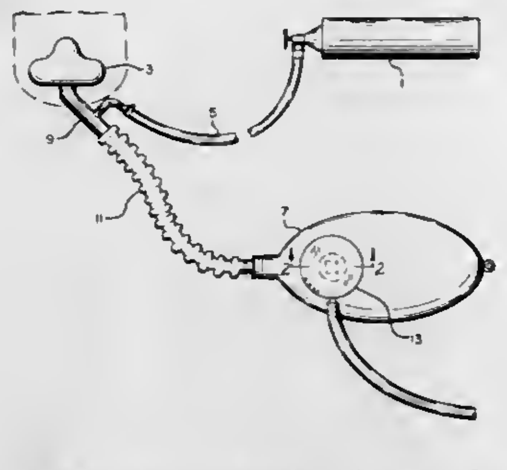
Filed Nov. 19, 1975, Ser. No. 633,225

Int. Cl.² A61M *16/00*

U.S. Cl. 128—145.8 **6 Claims**

6. An overflow gas discharge control and exhaust system for a non-rebreathing apparatus of the type including a breathing bag formed of a resiliently deformable material and provided with a bleed opening in a wall thereof sized to be blocked by the thumb of an apparatus operator, said system comprising in combination:

an operator thumb actuated valve device including a body adapted to be fixed to said breathing bag within said bleed opening and an actuator fixed to said body, said body including a bottom wall, a base portion depending from said bottom wall and cooperating therewith to define an annular groove, said groove receiving portions of said wall of said bag peripherally bounding said bleed opening in a resilient manner and in fluid sealed relationship, a cylindrical side wall upstanding from said bottom wall, a pedestal portion upstanding from said bottom wall and disposed concentrically inwardly of said side wall, said bottom and side walls cooperating to define a cavity bounding said pedestal portion and having an open end bounded by a rim portion of said side wall, said rim portion forming an outwardly opening annular shoulder, said pedestal portion defining a valve seat arranged within and normally communicating with said cavity, an inlet passageway extending from said valve seat through said pedestal portion and said bottom wall and said base portion for placing said valve seat in flow communication with said breathing bag when said body is fixed thereto, an outlet passageway extending through said side wall of communication with said cavity, and said actuator is in the form of a disc shaped diaphragm formed of resiliently deformable material and having a peripherally extending bead snap fitted over said annular shoulder of said rim portion whereby to fix said diaphragm to said side wall for closing said open end of said cavity, said diaphragm tending to assume a rest position spaced from said valve seat and being deformable by application of operator thumb pressure thereto to assume an operative position in engagement with said valve seat, whereby to block flow communication between said cavity and said inlet passageway; and



a flexible tube fixed to said outlet passageway for flow communication with said cavity, said tube being of a length sufficient to exhaust gas passing from said breathing bag through said valve device at a point relatively remote from said bleed opening.

4,109,652
METHOD FOR REGULATING CHARACTERISTICS OF A GAS STREAM

Alan L. Gooden, 1214 5th Ave., Neptune, N.J. 07753

Filed Apr. 22, 1976, Ser. No. 679,340

Int. Cl.² A61M *15/00*

U.S. Cl. 128—212 **9 Claims**

1. In a process for regulating the characteristics of a gas stream flowing in a system serving a respiratory tract, the steps of:

temperature treating a liquid;

dividing said temperature treated liquid into liquid droplets independently of said gas stream;

introducing said liquid droplets into direct contact with said gas stream while maintaining said droplet introduction and gas stream flow separate and distinct from each other so that any change in one will be independent of the other and (passively with respect to the flow dynamics of the gas stream) so that heat can be exchanged between said gas stream and said droplets when they interface without affecting system pressure or flow;

conducting said gas stream to said respiratory tract after interfacing with said droplets; and

regulating the temperature of said liquid so as to establish and maintain the temperature of said gas stream at a desired level at said respiratory tract.

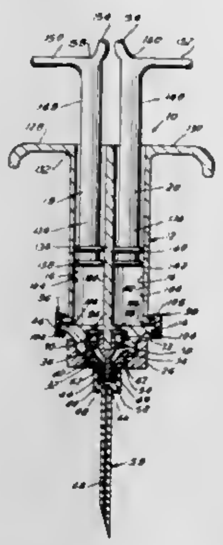
4,109,653
SUCCESSIVE DELIVERY MULTIPLE BARREL SYRINGE

George Kozam, Tenafly, and Pat Romanelli, Harrington Park, both of N.J.

Filed Feb. 22, 1977, Ser. No. 770,741

Int. Cl.² A61M *5/00*

U.S. Cl. 128—218 R **10 Claims**



1. A successive delivery multiple barrel syringe comprising a body having a plurality of parallel bores, a plurality of individually-depressible plungers extending respectively into said bores, said body having an externally-threaded lower end portion formed with a bottom cavity, a valve body member extending into said cavity and having a plurality of through bores, each communicating with one of the parallel bores of said syringe body, a retainer member having an internally-threaded portion engaging the externally-threaded lower end portion of said syringe body and underlying a portion of said valve body member for releasably clamping the latter in a mounted position within said cavity, said valve body member having a lower body extension projecting below said retainer member and including needle mounting means, a hollow needle mounted on said needle mounting means, the through bores of said valve body member connecting each of the respective bores of said syringe body with said hollow needle, and a plurality of one-way valve means, disposed, one each, in said through bores of said valve body member, and disposed to permit the flow of fluid from each of said parallel bores of said syringe body to said needle and to prevent the flow of fluid in the reverse direction, thereby permitting selective successive depression of said plungers to cause fluids placed in said parallel bores to flow in succession through said needle without mixing of said fluids within said syringe body.

4,109,654
SINGLE STROKE DISPENSING APPARATUS

Lee R. Bolduc, St. Petersburg, Fla., and Eugene A. Dickhudt, New Brighton, MN, assignors to Population Research, Inc., Clearwater, Fla.

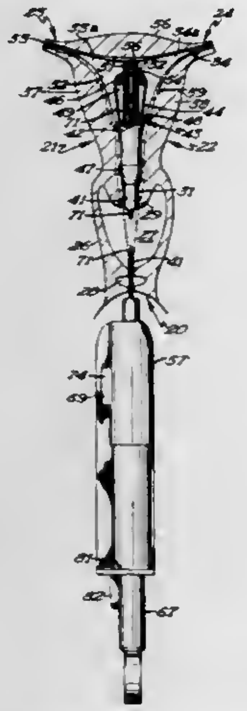
Filed Aug. 10, 1976, Ser. No. 713,294

Int. Cl.² A61M *1/00*

U.S. Cl. 128—235 **20 Claims**

1. In dispensing apparatus for dispensing materials into the Fallopian tubes of a female primate, including means for dispensing materials into the uterine cavity of the female primate, means for expanding within the uterine cavity for moving the dispensed materials from the uterine cavity into the Fallopian tubes, and means for controlling the means for dispensing materials and the means for expanding, improved means for controlling comprising: first drive assembly means for control-

ling the means for expanding; and the first drive assembly means including bias means for limiting maximum pressure of



the means for expanding and for substantially regulating the pressure of the expansion means.

4,109,655

MULTI-PENETRATION VACCINATION APPARATUS

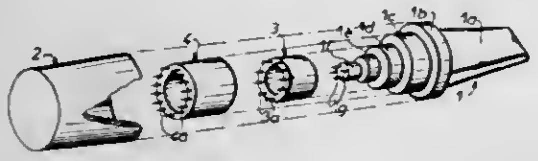
Georges Chacornac, Saint-Etienne-Loire, France, assignor to Manufacture Francaise d'Armes et Cycles de Saint-Etienne Manufrance, Saint-Etienne-Loire and Institut Pasteur, Paris-Seine, both of, France

Filed Oct. 15, 1976, Ser. No. 732,643

Claims priority, application France, Oct. 16, 1975, 75 32385; Nov. 10, 1975, 75 35241

Int. Cl.² A61B *17/20*

U.S. Cl. 128—253 **30 Claims**



1. Multi-penetrating vaccination apparatus comprising manually engageable mounting means, at least one sleeve comprising means including a plurality of points for penetrating the skin of a patient, said mounting means including a projection with a plurality of points for penetrating the skin of the patient, support means on said mounting means for removable engagement of said sleeve thereon, and means for supplying vaccine to said points with the sleeve engaged on the support means for innoculation of the vaccine into a subject when said points penetrate the skin.

4,109,656

APPARATUS FOR USE WITH INSUFFLATORS

James Herbert Goethel, West Chester, and Edwin Lowe Sohngen, Cincinnati, both of Ohio, assignors to Sybron Corporation, Rochester, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,256

Int. Cl.² A61M *13/00*

U.S. Cl. 128—266 **1 Claim**

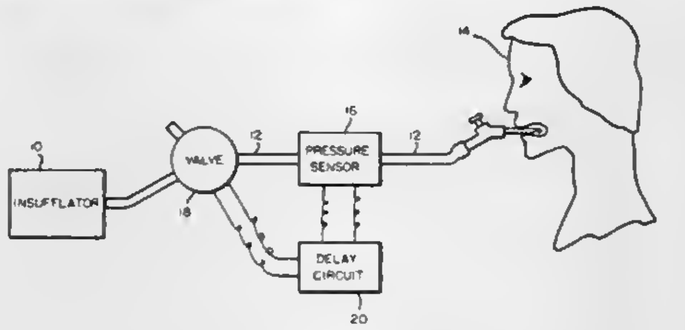
1. Apparatus for use with an insufflator comprised of:

an insufflator having an output;

a breather tube switchably connected to the output of said insufflator and to ambient air;

pressure sensor means arranged in communication with said breather tube so as to transmit a first signal when a patient inhales upon said tube;

delay circuit means being in electrical communication with said sensor and transmitting a second signal a predetermined time after said first signal but during the latter part of said inhalation cycle; and



a diverter valve connected between said breather tube and the output said insufflator and including means in electrical communication with said delay circuit and responsive to said second signal to first connect the patient to ambient air and then, upon receipt of the second signal, to switch the patient to the output of said insufflator.

4,109,657

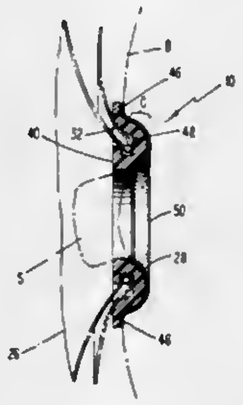
BODY PROFILED SURGICAL DRAINAGE APPLIANCE

Russell Settle Carrington, 6804 Atwood St., District Heights, Md. 20028

Filed Oct. 19, 1976, Ser. No. 733,921

Int. Cl.² A61F *5/44*

U.S. Cl. 128—283 **8 Claims**



1. A body profiled, surgical drainage appliance to be worn by a user, comprising:

a plate member having a body engaging side and a bag supporting side, said member including a central aperture for receiving a stoma extending through a surgically created abdominal opening;

said bag supporting side including a substantially flat surface portion defining a plane and having an annular channel formed therein around said central aperture;

an integral ring member totally recessed into the bag supporting side of said plate member and defining one wall of said annular channel, said ring member having an annular flange for supporting a fecal bag around said stoma, said flange having an outer end parallel to said plane, said outer end of said flange extending toward but not beyond said plane;

said body engaging side of said plate member and the wall of said central aperture being defined by a continuously curved, body engaging surface to accommodate said channel within said plate member, said curved surface being operative to press skin inwardly at the abdominal opening for retaining the stoma in an extended position for drainage of body fluids into said bag, the flange of said ring member extending outwardly from the body of the user, when worn, within the natural contour of the user's body; and

means for mounting said plate member to the body of the user.

4,109,658

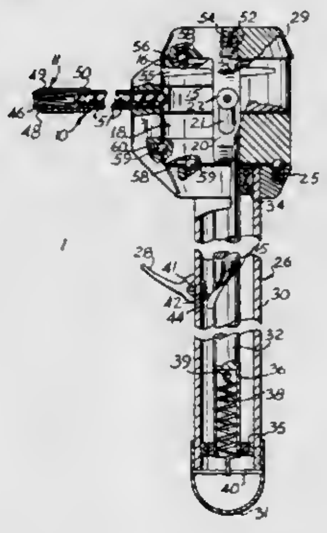
NEEDLE HOLDING DEVICE WITH PICK-UP MEANS

Joe L. Hughes, 4981 Lake Fjord Pass, Marietta, Ga. 30060

Filed Feb. 4, 1977, Ser. No. 765,447

Int. Cl.² A61B *17/06*

U.S. Cl. 128—340 **7 Claims**



1. A needle holding device comprising a holding means for selectively grasping and releasing a first end of a surgical needle, a pick-up means for selectively grasping and releasing a second end of said needle, said pick-up means being adjacent to and movable towards and away from said holding means, actuating means for selectively moving said pick-up means towards and away from said holding means and camming means for determining when said holding means grasps and releases said first end of said needle and for determining when said pick-up means grasps and releases said second end of said needle, said holding means including a first clamp for receiving said first end of said needle and first operating means extending from said first clamp to said camming means, said pick-up means including a second clamp for receiving said second end of said needle and second operating means extending from second clamp to said camming means, said camming means including a first operating cam means, said first operating means including first cam follower means riding on said first operating cam means, said holding means being so constructed and arranged that, on motion of said first operating cam means, said first cam follower means will activate said first operating means to operate said first clamp, said camming means further including a second operating cam means, said second operating means including second cam follower means riding on said second operating cam means, said pick-up means being so constructed and arranged that, on motion of said second operating cam means, said second cam follower means will activate said second operating means to operate said second clamp.

4,109,659

EVAGINATION CATHETERS

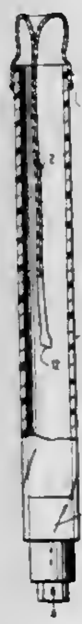
David S. Sheridan, Argyle, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jul. 19, 1976, Ser. No. 706,819

Int. Cl.² A61M *25/00*

U.S. Cl. 128—349 R **1 Claim**

1. In an evagination catheter comprising a substantially rigid tube, a flexible hose shorter in length than said tube, the proximal end of said hose being in fluidtight engagement with the distal end of said tube, said hose being inserted into said tube and structured to be exserted therefrom upon introduction of fluid pressure through the proximal end of said tube, and valve means on the distal end of said hose structured to remain closed when said hose is inserted in said tube and to open when said hose is completely exserted from the tube, the improvement wherein said valve means consists of a port cut through the side wall of said hose adjacent the distal end, the tip of the hose distal of said port being inverted forming a cup-shaped pendant on said hose which is inserted into the hose through said port forming a removable stopper for said port, said improvement being formed by providing a substantially rigid tube open at both ends and a flexible hose shorter in length and smaller in diameter than said tube, said hose having a closed end and an



open end, cutting a port in the side of the hose adjacent said closed end having the tip of the hose's closed end pendant upon the hose, turning said tip inside out forming a cup-shaped pendant on the hose and inserting it into the hose through said port forming a stopper for said port, inserting the stoppered hose into said tube leaving a short section of the open end of said hose external of said tube, folding said short section of hose back over the outside of said tube and forming a fluid-tight connection between said folded back short section of hose and the adjoining outside of said tube.

4,109,660

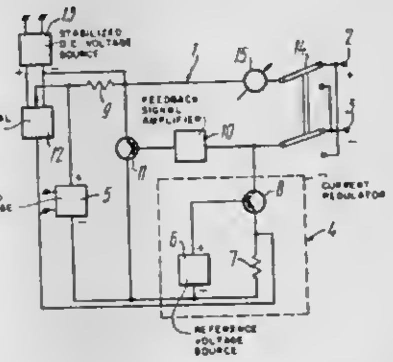
METHOD OF TOOTH ANESTHETIZING DURING DENTAL TREATMENT AND DEVICE FOR EFFECTING SAME

Nikolai Alexandrovich Nesmeyanov, Inzhenernaya ulitsa, 46, Nalchik; Ivan Alexandrovich Nesmeyanov, ulitsa Kuusinena, 25, kv. 31, Moscow, and Anatoly Alexandrovich Nesmeyanov, Kaluzhsky pereulok, 7, kv. 93, Leningrad, all of U.S.S.R.

Filed Jan. 5, 1977, Ser. No. 756,847

Int. Cl.² A61N *1/34*

U.S. Cl. 128—419 R **12 Claims**


13
STABILIZED D.C. VOLTAGE SOURCE
1
15
14
2
3
9
FEEDBACK SIGNAL AMPLIFIER
DIFFERENTIAL AMPLIFIER
12
10
11
STABILIZED D.C. VOLTAGE SOURCE
5
8
CURRENT REGULATOR
4
6
7
REFERENCE VOLTAGE SOURCE

1. In a device for anesthetizing a tooth in the course of dental treatment, positive and negative terminals edapted respectively to be connected with a dental instrument and a part of a patient's body such as an ear lobe, for providing a given voltage drop in the patient's body, a stabilized d.c. voltage source

having a pair of terminals, and electrical circuit means connecting said terminals of said voltage source respectively to said positive and negative terminals, said circuit means including a current regulator means which includes a transistor having a collector electrically connected to said negative terminal by said circuit means, and said circuit means including a negative feedback circuit means formed in part by said voltage source and connected between the latter and said collector for maintaining a constant current therein.

4,109,661

FOOTWEAR

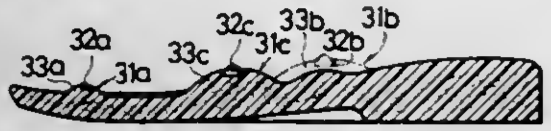
Tatsuo Fukuoka, No. 3-3, 2-chome, Shinminamifukushima, Tokushima-chi, Japan

Filed Nov. 3, 1976, Ser. No. 738,579

Claims priority, application Japan, Nov. 14, 1975, 50-155738[U]; Nov. 21, 1975, 50-158859[U]; Dec. 25, 1975, 50-177168[U]; Jun. 2, 1976, 51-72358[U]

Int. Cl.^{2} A61F *5/14*

U.S. Cl. 128—582 **21 Claims**



1. An article of footwear including a bottom portion having at least one pressure projection for pressing against a part of the skin surface of the foot of the wearer of the footwear, each said pressure projection comprising a pressure projection body and a pressure core attached in the pressure projection body, said pressure projection body being softer than said projection core, and said projection core being relatively hard and fixed at the upper portion of said pressure projection body.

4,109,662

FLAVORING COMPOSITIONS CONTAINING ALKYL-2,3-DIHYDRO-3(1'-HYDROXYALKYLIDENE)-2-OXO-5-ALKYL-FURAN-4-CARBOXYLATES

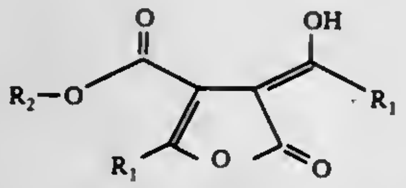
Brian J. Willis, Bergenfield, N.J.; Frank Fischetti, Jr., Flushing, and Robert G. Eilerman, Hempstead, both of N.Y., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Continuation-in-part of Ser. No. 601,482, Aug. 4, 1975, abandoned. This application Jun. 22, 1976, Ser. No. 698,742

Int. Cl.^{2} A24B *3/12;* **A24D** *1/18*

U.S. Cl. 131—2 **13 Claims**

1. A smoking compositin comprising a smoking material and at least 0.0001% by weight of an alkyl-2,3-dihydro-3-(1'-hydroxyalkylidene)-2-oxo-5-alkyl-furan-4-carboxylate having the formula:



in which R_1 is a straight or branched chain alkyl having less than 6 carbon atoms and R_2 is a straight or branched chain alkyl having less than 7 carbon atoms, cyclopentyl or cyclohexyl.

4,109,663

TOBACCO PRODUCT CONTAINING A THERMO-GELABLE β-1,3-GLUCAN-TYPE POLYSACCHARIDE

Kazuo Maeda, Yokohama; Katuichi Noguchi, Tokyo; Masuo Kawabata, Yokohama; Shigehiko Sato, Tokyo, and Yukio Sato, Ibaraki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Flied Oct. 7, 1975, Ser. No. 620,351

Claims priority, application Japan, Oct. 17, 1974, 49-120189; Apr. 30, 1975, 50-52863; Indonesia, Jul. 14, 1975, 5332

Int. Cl.^{2} A24D *1/18;* **A24B** *3/14*

U.S. Cl. 131—2 **52 Claims**

1. A process for producing a smoking tobacco product, which comprises incorporating a thermo-gelable β-1,3-glucan-type polysaccharide into a smoking material.

4,109,664

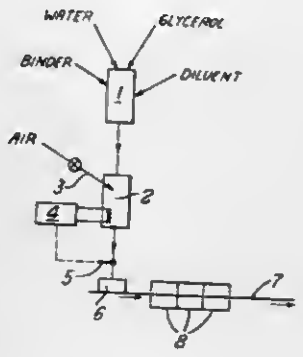
SMOKING MATERIALS

Roger W. Hedge, Lymington, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 555,603, Mar. 5, 1975, abandoned. This application Mar. 1, 1977, Ser. No. 773,342

Int. Cl.^{2} A24D *1/18*

U.S. Cl. 131—2 **10 Claims**



1. A tobacco substitute, which comprises; a mixture of

(a) a binder which comprises a water-soluble, thermo-gelling, methoxyl-substituted cellulose having a methoxyl degree of substitution of at least 1.5 groups per anhydroglucose unit;

(b) a water-insoluble, inorganic diluent, said binder amounts to 7 to 13% and the diluent to 75 to 85% by weight of the tobacco substitute; and

(c) closed air cells dispersed throughout the mixture of (a) and (b).

4,109,665

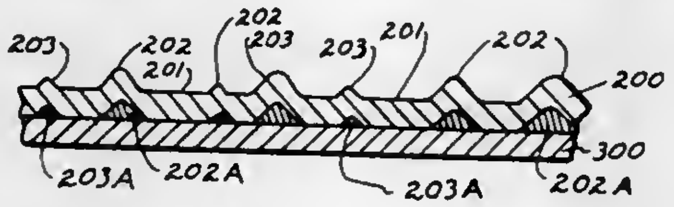
DECORATED CIGAR WRAPPERS

Frederick D. Godfrey, Jr., Maplewood, N.J.; John J. Fedro, Wilkes-Barre, Pa., and Robert I. Sinclair, Mendham, N.J., assignors to Consolidated Cigar Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 727,054

Int. Cl.^{2} A24B *3/14;* **D21H** *5/16*

U.S. Cl. 131—15 C **44 Claims**



1. A sheet of manufactured cigar wrapper material having opposed surfaces and a pre-determined cross-sectional thickness, said wrapper having a vein-like pattern embossed through said cross-sectional thickness to form a raised vein-like pattern on one of said opposed surfaces and a complimentary depressed vein-like pattern on said opposite surface, wherein the depressed pattern on said opposed surface is filled with a filler material in order to reinforce said embossed pattern.

4,109,666

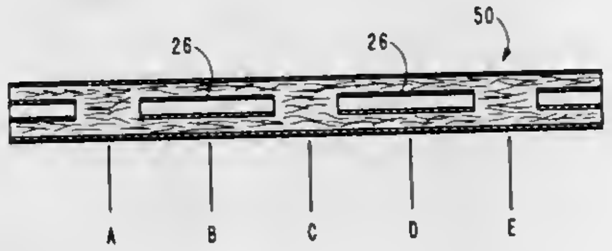
CIGARETTE FILTER

Veilo Norman, Raleigh, and Charles M. Moogalian, Durham, both of N.C., assignors to Ligett Group Inc., Durham, N.C.

Filed Mar. 1, 1976, Ser. No. 662,624

Int. Cl.^{2} A24D *1/04*

U.S. Cl. 131—261 B **1 Claim**



1. A cylindrical article comprising a plurality of tubes of equal length being axially aligned and spaced apart given and equal distances along said axis, a layer of compacted filter material positioned circumferentially about said tubes and extending the length of said cylindrical article, said filter material frictionally holding said tubes in position along said axis and said filter material being compacted to a state of greater density in the area surrounding said tubes and to a state of lesser density in the area extending between said tubes and a cylinder of plug wrap material about said layer of filter material for maintaining said filter material in its relative density states.

4,109,667

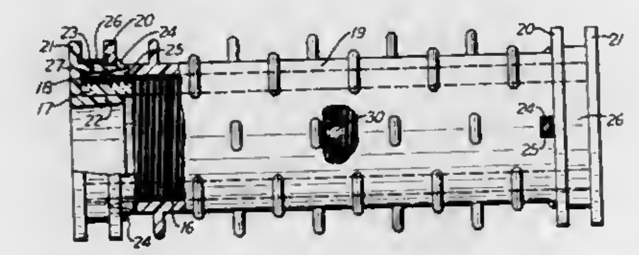
HAIR SETTING ROLLER

Virgil P. Quirk, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Filed Nov. 8, 1976, Ser. No. 739,550

Int. Cl.^{2} A45D *2/12*

U.S. Cl. 132—33 R **8 Claims**



1. In a hair setting roller for use with apparatus having a pair of laterally spaced electric supply contacts and a permanent magnet between them, a dielectric cylinder, an electrical resistance magnetic heating element encircling the cylinder and secured thereto and adapted to be attracted by said magnet, and circular electric contacts electrically connected to the ends of said element, said contacts encircling the opposite ends of said cylinder in spaced relation with said element for engaging said supply contacts while said magnet overcomes a force tending to separate said roller and magnet, whereby to heat said element electrically, said resistance heating element having a magnetic permeability that decreases as its temperature increases until the attraction of the magnet and said element for each other becomes weaker than said separating force acting on the roller.

4,109,668

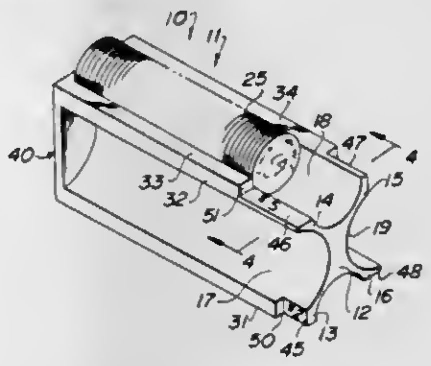
COIN COUNTER

Joseph J. Malacheski, 130 E. Division St., Wilkes-Barre, Pa. 18702

Continuation of Ser. No. 639,360, Dec. 10, 1975, abandoned. This application May 26, 1977, Ser. No. 800,652

Int. Cl.^{2} G07D *9/02*

U.S. Cl. 133—8 R **4 Claims**



1. A coin counter comprising an elongate body of generally polygonal cross-sectional outline for resting on a selected side and having a plurality of grooves extending longitudinally of said body for respectively receiving stacks of coins, each of said grooves being located laterally within and substantially occupying a respective side of said body, said grooves extending into said body toward each other and terminating short of each other to leave of the body material a central longitudinally extending spine and a plurality of longitudinally extending ribs outstanding from said spine toward and terminating at respective corners of said body, an end member at one end of each groove adjacent to one end of said body for abutting engagement with a stack of coins received in the respective groove, and indicia associated with each groove at a predetermined distance from the respective end member to indicate a desired quantity of coins in the respective groove, said grooves each extending beyond the associated indicia and opening through the body end opposite to said one body end for supporting a wrapper in position to engage about coins in the respective groove, and said indicia being defined by a cut formed in each rib facing generally outwardly in the same direction as the associated groove and extending chordally of the associated groove entirely through the respective rib for tactile sensing.

4,109,669

ELECTRONIC FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Jean Pierre Rivere, Paris, France, assignor to Regie Nationale des Usines Renault and Societe dite Automobiles Peugeot, both of Boulogne-Billancourt, France

Division of Ser. No. 435,211, Jan. 21, 1974, Pat. No. 3,949,713. This application Apr. 30, 1975, Ser. No. 572,945

Claims priority, application France, Jan. 19, 1973, 73.01898

Int. Cl.^{2} F02B *3/00*

U.S. Cl. 137—101.19 **5 Claims**

1. A servo loop for assuring a proportionality between the flow of a first fluid and the flow of a second fluid, comrising:

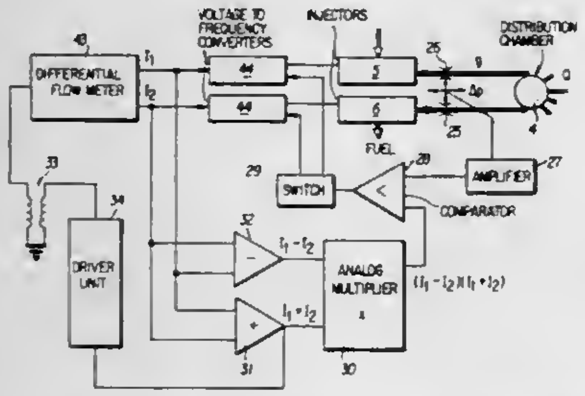
a differential flow meter for measuring the mass flow of said first fluid,

a path for the flow of the second fluid including a supply, a first inlet control injector, a fluid system using at least a portion of the flow supplied, and an outlet control injector connected in a series flow relationship, said injectors coupled to and driven by said differential flow meter;

a pair of voltage-to-frequency converters coupled between said differential flow meter and said injectors for driving said injectors;

a differential pressure sensor coupled between said injectors for sensing differences in pressure therebetween,

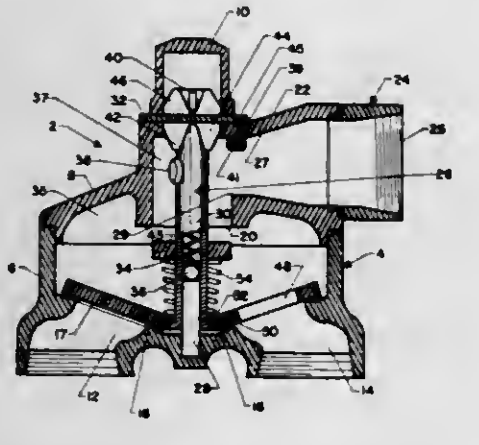
comparator means coupled to said differential flow meter and to said differential pressure sensor for comparing the outputs thereof; and



control means coupled to the output of said comparator means and to said voltage-to-frequency converters for controlling said flow of said second fluid in response to the output of said comparator means.

4,109,670
COMBINATION CHECK FLOW CONTROL AND SELECTOR VALVE

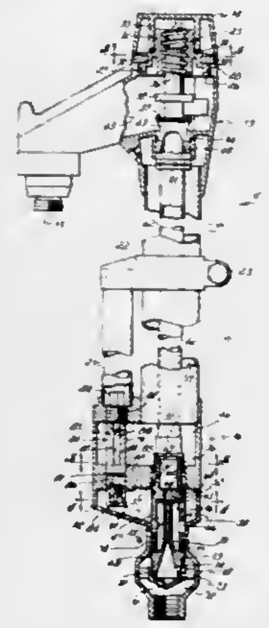
Roger D. Slagel, Plantation, Fla.
Continuation of Ser. No. 360,685, May 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 196,486, Nov. 8, 1971, abandoned. This application Jan. 13, 1975, Ser. No. 540,492
Int. Cl.² F16K *21/00*
U.S. Cl. 137—119 **9 Claims**



1. A multi-port sequencing valve comprising:
a housing having a central fluid receiving chamber, a chamber inlet, a housing inlet in fluid communication with said chamber inlet of said chamber, and a plurality of outlets disposed substantially on the side opposite of said central chamber from said chamber inlet, said outlets having a surrounding inner surface substantially concave in shape;
a sequencing outlet sealing valve means having at least one aperture disposed therethrough and a sealing surface for contact with said inner surface of said housing,
said outlet sealing valve means having a lower sloping engaging surface for engagement with said outlet surface to close at least some of said outlets, said lower sloping engaging surface of said outlet sealing valve means having a slope less than said surrounding inner surface of said housing to provide initial opening of said outlet sealing valve means in a non-fluid flow condition,
a stem means connected to said housing;
said stem means including a reciprocally movable portion with one end connected to the central portion of said outlet sealing valve means, said movable portion positioned centrally said housing;
a control valve means connected to said movable portion of said stem means and positioned on said movable portion to move into said chamber inlet to provide a barrier to fluid within said chamber inlet from passing out through said chamber inlet;
a biasing means connected to said movable portion of said stem means for rotating normally opening said outlet sealing valve means and positioning said control valve means within said chamber inlet when fluid stops flowing through said chamber inlet into said chamber, fluid flow through said housing moves said control valve means out of said chamber inlet and said outlet sealing valve means into sealing engagement with said inner surface of said housing,
a cam means connected to said stem;
said cam means including a first portion connected to said housing and a second cam portion connected to said stem for engagement with said first portion to rotate said outlet sealing valve means during reciprocal movement of said movable portion of said stem;
said first portion connected to said housing and being removably connected to said housing whereby said first portion of said cam means may be easily replaced.

4,109,671
SANITARY YARD HYDRANT

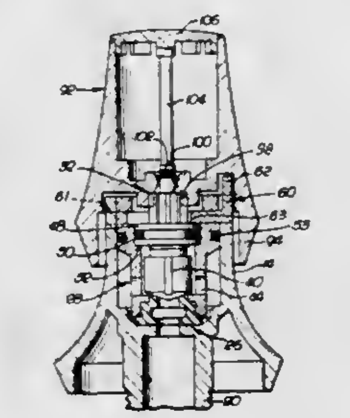
James L. Hughes, and William E. Broerman, both of Cincinnati, Ohio, assignors to Industrial Valve Analysis Inc., Cincinnati, Ohio
Filed May 3, 1976, Ser. No. 682,497
Int. Cl.² E03B *9/14*
U.S. Cl. 137—282 **9 Claims**



1. A nonfreezing, sanitary hydrant mechanism adapted to be connected to an inlet line disposed below the frost line of the earth and to discharge water through a discharge opening, said hydrant comprising:
a head;
a main valve body adapted to be disposed below the frost line, and having an upper and a lower chamber formed therein;
a transverse wall dividing said upper and lower chambers and having two openings formed therein;
a stand pipe extending upwardly from said main valve body and interconnecting the head and said upper chamber of the main valve body;
means for connecting the valve body to the inlet line;
a flow tube disposed within said stand pipe and being in fluid communication with said discharge opening through said head;
the lower portions of said flow tube and stand pipe and the interior of said valve body chambers providing a receptacle for storing below frost line water drained from said head and the upper portion of said flow tube;
an ejector member passing through one opening in said transverse wall and including a peripheral wall, a venturi tube mounted within said peripheral wall in spaced relationship thereto, said peripheral wall having openings extending therethrough;
said ejector member being in fluid communication with said flow tube;
said ejector member including flow control means;
said ejector member being movable between first and second positions;
said ejector member in said first position causing said flow control means to seal off said inlet line;
said transverse openings in said ejector wall being disposed in fluid communication with said lower chamber, whereby fluid is free to drain from said head and flow tube into said lower chamber and into the lower portion of said stand pipe in the first position;
said ejector member in said second position causing said flow control means to open said inlet line for flow through said venturi and flow tube to said discharge opening;
said ejector member being in sealed engagement with said transverse wall when said ejector member is in said second position;
said ejector member and flow tube defining a conduit structure through said upper chamber in fluid communication with said head in the second position;
said ejector member in said second position further causing said peripheral wall openings to be disposed in the lower portion of the valve body chamber to connect the interior of said valve body to said venturi, whereby water stored in the main valve body and said stand pipe is ejected from said hydrant;
float and check valve means for controlling flow through said second opening in said transverse wall;
and actuating means for selectively shifting said ejector from one of said positions to the other.

4,109,672
SNAP-IN VALVE CARTRIDGE

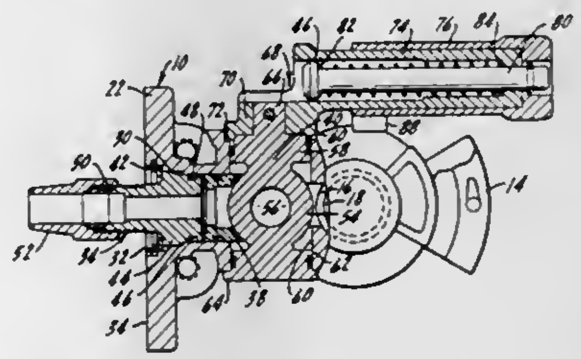
Robert S. Szemeredi, Sunland, Calif., assignor to Price-Pfister Brass Mfg. Co., Pacoima, Calif.
Filed Jul. 29, 1977, Ser. No. 820,396
Int. Cl.² F16K *3/10*
U.S. Cl. 137—315 **16 Claims**



2. In a plumbing fixture:
a. a valve body having a cup providing a valve recess;
b. a valve mechanism in the recess including a non-rising valve stem projecting upwardly of the recess;
c. a hollow handle for operating the valve stem and having a skirt encompassing the valve body cup;
d. companion axially separable snap coupling members carried respectively at the end of the stem and on the inside of said handle, one of said coupling members being movable radially upon axial separation there between; and
e. a dog member releasably mounted at the top of said handle and having a part positioned to restrict radial movement of said one of said coupling members whereby said stem and said handle are secured together for conjoint angular movement.

4,109,673
COMBINATION GLADHAND AND SHUTOFF COCK

Charles Horowitz, Niles, and Frederic Lissau, Chicago, both of Ill., assignors to Sloan Valve Company, Chicago, Ill.
Filed Aug. 23, 1976, Ser. No. 716,378
Int. Cl.² F16K *27/08;* F16L *35/00*
U.S. Cl. 137—381 **1 Claim**



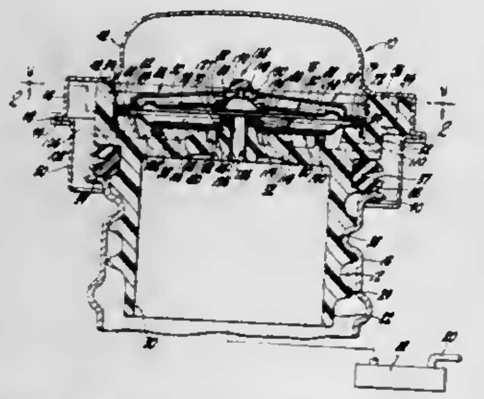
1. In a combination gladhand and shutoff cock, a gladhand body having an air inlet and an air outlet, a flow passage through said body connecting said inlet and outlet,
a valve chamber in said body in fluid communication with said flow passage and a rotatable valve member positioned in said valve chamber for controlling flow through said passage, a tubular member for rotating said valve member attached to one end thereof,
a latch member slidably mounted on said tubular member, said latch member comprising a generally cylindrical hollow body portion, a gripping portion adjacent to one end of said latch member body portion, a cover portion extending from said latch member body portion and positioned to seat upon and to close said air outlet when said rotatable valve member closes said air passage, and a latching portion on said latch member movable between latched and unlatched positions, said latching portion of said latch member cooperating with said gladhand body when in the latched position to prevent rotation of said latch member and said rotatable valve member when said rotatable valve member is in a closed position,
a rod axially positioned within said tubular member, said rod having an increased diameter head at one end, with the other end of said rod extending into and being attached to said latch member,
a spring positioned on said rod, said spring normally biasing said latching portion of said latch member to said latching position.

4,109,674
PRESSURE AND VACUUM RELIEF VALVE ASSEMBLY

David A. Beale, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed May 25, 1977, Ser. No. 800,198
Int. Cl.² F16K *17/26*
U.S. Cl. 137—493.9 **2 Claims**

1. A pressure and vacuum relief valve assembly for a liquid container comprising means including a vacuum diaphragm and a wall cooperatively providing a vacuum relief chamber, a vent passage communicating said vacuum relief chamber with atmosphere, means including a pressure diaphragm exposed on an atmospheric side to atmosphere and cooperating on an opposite pressure side with said vacuum diaphragm to provide a control chamber, said diaphragms each having an aperture therein, a pressure vent passage for communicating said control chamber with the interior of a container through the aperture in said vacuum diaphragm, said vacuum diaphragm normally sealingly engaging about the aperture therein with said wall and operable to disengage therefrom to provide for communication between said vacuum relief chamber and the interior of the container only upon a predetermined reduction in pressure in the container below atmospheric pressure, means

including a valve seal element extending through the aperture of said pressure diaphragm, said valve seal element having first and second valve seal means on the respective pressure and atmospheric sides of said pressure diaphragm, said pressure diaphragm normally sealingly engaging about the aperture therein with said first valve seal means and operable to disengage therefrom to provide for communication between atmosphere and said control chamber only upon a pressure increase in the container to a predetermined value above atmospheric pressure, and said second valve seal means arranged relative to said first valve seal means so as to be sealingly engaged by second pressure diaphragm about the aperture therein to prevent any communication between said control chamber and atmosphere upon the occurrence of a pressure surge in said control chamber exceeding said predetermined value above atmospheric pressure whereby leakage from the container through said aperture in said pressure diaphragm is positively prevented.



4,109,675

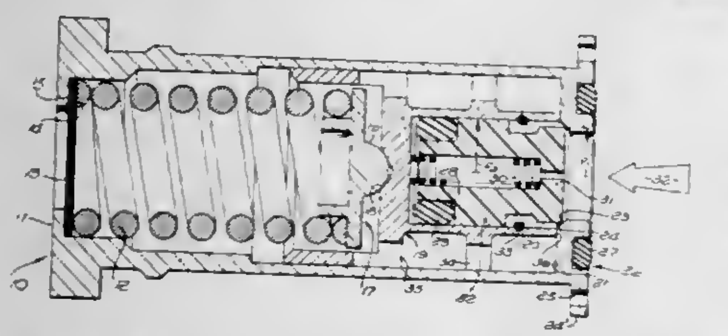
RELIEF VALVE

Ali Acar, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,955

Int. Cl.^{2} F16K *17/04*

U.S. Cl. 137—494 **8 Claims**



1. A fluid flow control device, said device comprising: a barrel having a cylindrical internal surface; a hollow, cylindrical poppet guided for reciprocation independent of rotation inside said barrel, said barrel having an annular inwardly extending flange at one end thereof, said poppet having a closed end and an open end movable to abut said flange, said poppet being adapted to provide a path for the fluid flow from inside thereof between said open end thereof and said flange, and around the exterior thereof but inside said barrel axially toward said closed end, said flange having a hole therethrough to allow fluid under pressure to enter said poppet through said flange bole, said poppet open end being larger than and adapted to close off said flange hole, said flange bole having a beveled interior surface; a cylinder slidable inside said poppet, said cylinder having an annular corner movable into and out of sealing engagement with said surface; an auxiliary spring mounted on said poppet to bias said corner against said surface, said cylinder having an unbalanced force radius at said corner somewhat less than that where said cylinder slides against the interior of said poppet; spring means to bias said poppet open end into abutment with said flange; and a lost motion connection between said poppet and said cylinder.

4,109,676

FILTERS

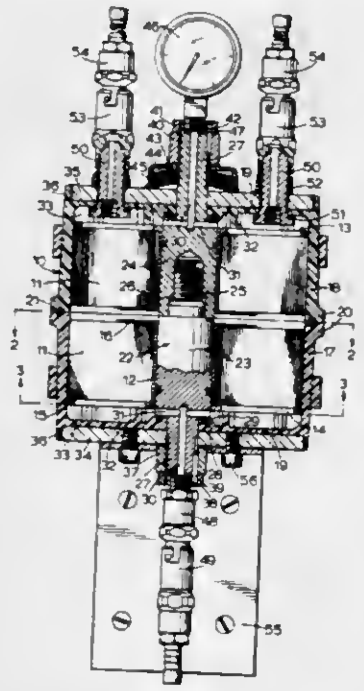
Ernest James Price, Solihull, England, assignor to E. J. Price (Developments) Limited, Birmingham, England

Filed Dec. 14, 1976, Ser. No. 750,452

Claims priority, application United Kingdom, Dec. 17, 1975, 51546/75

Int. Cl.^{2} F16K *45/02*

U.S. Cl. 137—550 **12 Claims**



1. A casing for a filter comprising at least two relatively movable body portions which together define a chamber for receiving filter means, said chamber having fluid inlet and outlet means arranged that when filter means is received within the chamber fluid passing there through from the inlet to the outlet means is constrained to pass through the filter means, said body portions being relatively movable with respect to each other between a closed position wherein said chamber is fluid-tight and an open position, and resilient means operative on said body portions to resist relative movement there between, said resilient means being yieldable to permit the body portions to move to their open position and fluid to escape from said chamber between said body portions wherever the pressure of the fluid in the chamber exceeds a predetermined value.

4,109,677

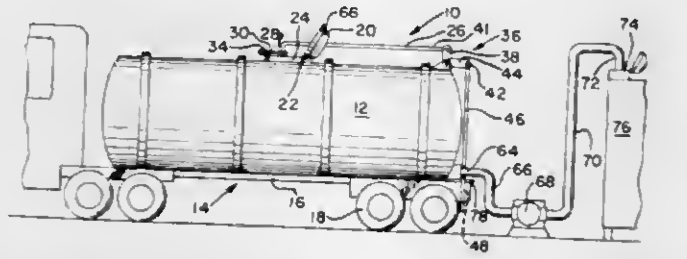
PROTECTIVE DEVICE FOR STORAGE TANKS

Richard E. Burnside, 1020 N. Mayler St., Marengo, Ill. 60152

Continuation-in-part of Ser. No. 636,411, Dec. 1, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,962

Int. Cl.^{2} F16K *45/00*

U.S. Cl. 137—586 **3 Claims**



1. In combination, a mobile, liquid containing tank having a vent unit situated generally atop said tank, a cover member disposed over said vent unit and adapted to be moved between a closed position covering said vent unit and an open position permitted access to said vent unit, a drain opening disposed generally at the bottom of said tank, said opening being adapted to accept a connection to a drain conduit, a guard unit for said drain opening and a guard unit guide means mounting said guard unit for free but limited movement between a first guard position blocking the connection of said conduit to said drain opening and a second position permitting said connection, a movable guard unlocking member mounted on said tank, said guard unlocking member having one portion pivotally attached to said tank, another portion adapted for engagement with said cover member when said cover member is closed, said cover-engaging portion being free to move to another position when said cover member is open, a free end portion for connection to said guard unit, and means connecting said guard unit and said guard unlocking member, said connecting means including a rigid rod member and a pivotally mounted rocker, said rod member being attached at one end thereof to said free end portion of said guard unlocking member and at the other end thereof to one arm of said rocker, and means attaching the other arm of said rocker to a portion of said guard unit, whereby said guard unit is held in said first position by engagement between said portion of said guard unlocking member and said cover when said cover member is closed, and whereby, when said cover member is opened, said guard unlocking member is free to move so that said guard unit is freely movable to said second position.

4,109,678

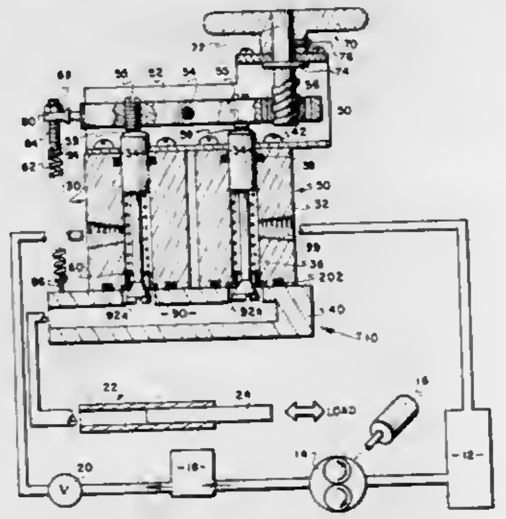
FLUID CONTROL VALVE ASSEMBLY

Leonard Chapman, 13760 Chandler Blvd., Van Nuys, Calif. 91401

Filed Feb. 25, 1977, Ser. No. 771,961

Int. Cl.^{2} F15B *13/04*

U.S. Cl. 137—596.2 **9 Claims**



1. A control valve assembly for controlling the admission
and
discharge of fluid to, and from, fluid-powered actuator means,
comprising:
a pair of identical control valves, with each of said valves including a cylindrical bore passing through a valve body, a cylindrical tappet reciprocable in one end of said bore and protruding therefrom, sealing means between said bore and said tappet to prevent egress of fluid from the bore, a valve seat provided with a circular channel coaxial with said bore inset into the other end of the bore, a conical valve head removably secured to said tappet by means of an elongated valve stem, and resilient spring means entrapped in said bore between said tappet and said valve seat for urging said valve head into fluid-sealing contact with said channel;
fluid manifold means in communication with said other end of the bore of each of said pair of control valves said fluid manifold means having an inlet/outlet means for communicating with a fluid-powered actuator means;
fastener means, for securing said pair of control valves to a surface of said manifold means;
valve actuating means, including a carrier member secured to at least one of said valve bodies, a rocking beam pivotably secured to said carrier member and superimposed above the protruding portions of said tappets in said valves, and operating means for controllable pivoting of said rocking beam from a neutral position equally spaced from both of said tappets into bearing contact with either tappet; and
fluid port means communicating with said bore in each of said control valves, intermediate between said tappet and said valve seat, adapted to interconnect one of said valves with a source of pressurized fluid and the other of said valves with a sink for fluid, whereby, by selective pivoting of said rocking beam through said operating means, said actuating means may be placed in communication with either said source or said sink.

4,109,679

CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES

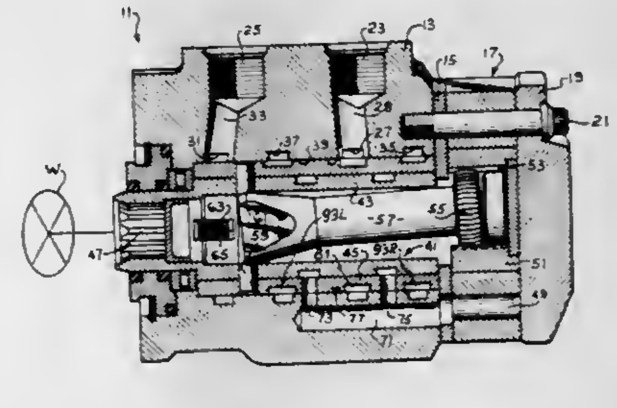
Oliver Wendell Johnson, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 679,607, Apr. 23, 1976, Pat. No. 4,033,377, which is a continuation of Ser. No. 507,015, Sep. 18, 1974, abandoned. This application Jan. 24, 1977, Ser. No. 761,832

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.^{2} B62D *5/08*

U.S. Cl. 137—596.13 **18 Claims**



16. Valve means for use in a controller of the type including a housing defining an inlet port, a supply passage communicating therewith, an outlet port, first and second control fluid ports and first and second control fluid passages communicating therewith, respectively, a fluid meter including a metering member movable to measure the volume of fluid passing therethrough, first and second fluid meter passages communicating with said fluid meter means, means operatively associated with said metering member to impart follow-up movement to said valve means in response to movement of said metering member, said valve means defining an axis of rotation and a central reference plane disposed perpendicular to said axis, said valve means comprising:

(a) a primary valve member defining first and second annular meter grooves and first and second axial pressure passages communicating with said first and second meter grooves, respectively;
(b) a follow-up valve member disposed about said primary valve member, defining a neutral position relative thereto and defining pressure port means adapted to communicate with said supply passage and disposed adjacent said central reference plane;
(c) said first axial pressure passage extending a sufficient

distance to communicate with said pressure port means when said valve members are relatively displaced in one direction from said neutral position, said second axial pressure passage extending a sufficient distance to communicate with said pressure port means when said valve members are relatively displaced in the other direction from the neutral position;

(d) said follow-up valve member defining first and second meter ports disposed to be in continuous fluid communication with said first and second meter grooves, respectively, and adapted to be in commutating fluid communication with said first and second fluid meter passages, respectively;

(e) said follow-up valve member further defining first and second operating ports oppositely and approximately equally disposed about said central reference plane and adapted to be in continuous fluid communication with said first and second control fluid passages, respectively; and

(f) said primary valve member defines a first axial operating passage communicating with said first meter groove and being disposed to communicate with said first operating port when said valve members are relatively displaced in said other direction, and a second axial operating passage communicating with said second meter groove and being disposed to communicate with said second operating port when said valve members are relatively displaced in said one direction.

4,109,680

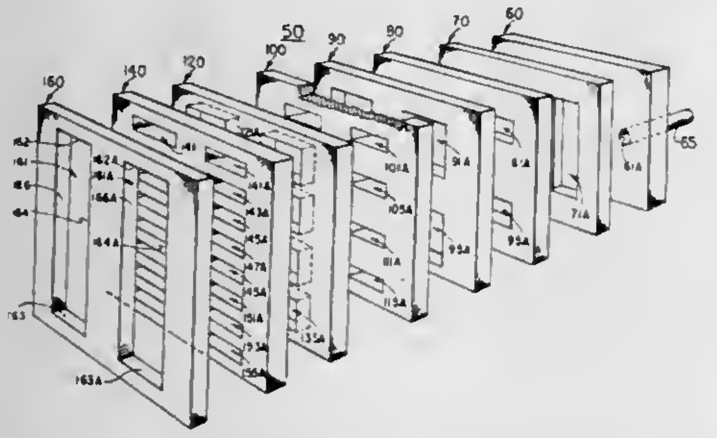
PLATE TYPE FLUID DISTRIBUTING DEVICE

Ardis R. Lavender, 6 Starlight Dr., Clarks Summit, Pa. 18411

Filed Jan. 3, 1977, Ser. No. 756,094

Int. Cl.² F16L ***55/02***

U.S. Cl. 137—599 **13 Claims**



1. A device for distributing fluid comprising a series of plates in stack configuration, one outermost plate in said stack of plates having an aperture therein defining an inlet, the other outermost plate in said stack of plates having an aperture therein defining an outlet, each intermediate plate having an aperture therein in fluid communication with apertures in abutting plates in said stack such that the fluid flow subdivides into a plurality of fluid flow paths between said inlet and outlet, a first set of alternate plates in said stack wherein each plate in the set has the same number of apertures as the preceding plate in the stack with the total area of the apertures being substantially increased compared to the total area of the apertures in the preceding plate in the stack, a second set of alternate plates in said stack wherein each plate in the set has twice the number of apertures as the preceding plate in the stack, whereby fluid from said inlet subdivides into a plurality of fluid flow paths to distribute fluid at said outlet evenly.

4,109,681

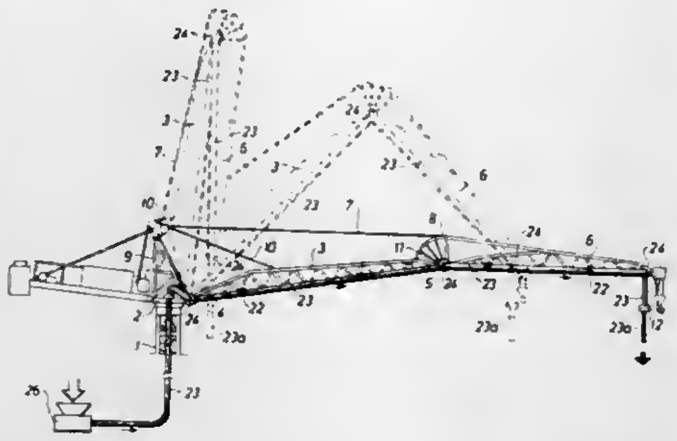
HOISTING CRANE FOR BUILDING PURPOSES

John Edvard Lennart Stahl, Bromma, Sweden, assignor to Tornborg & Lundberg AB, Bristagatan, Sweden

Continuation of Ser. No. 467,361, May 6, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,080

Int. Cl.² B67D ***5/00***

U.S. Cl. 137—615 **1 Claim**



1. A hoisting crane for building purposes, comprising

(a) a tower,

(b) an inner jib section pivotably mounted in the region of the top of the tower,

(c) an outer jib section having roughly the same length as the inner jib section and being pivotably mounted at the outer end of the inner jib section,

(d) a bow-shaped guide means for a control rope running between the inner end of the outer jib section and the broach of the tower, said control rope being adapted to steer the angular position of the outer jib section relative to the inner jib section in correspondence to the slewing angle of the inner jib section relative to the tower so that the outer end of the outer jib section takes substantially the same level independent of said slewing angle,

(e) means for slewing the inner jib section between a substantially horizontal or slightly upwards directed position, in which the outer jib section takes a substantially horizontal position to an almost vertical upward-directed position in which the outer jib section takes a substantially vertical downward-directed position,

(f) pipe means on said tower and said inner and outer jib sections for the pumping of concrete to a portioning means at the outer end of the outer jib section, said pipe means being provided with rotary couplings acting around horizontal axis at the pivot axis of the inner and outer ends of the inner and outer jib sections, respectively, and a rotary coupling acting around a vertical axis in the upper part of the tower, and

(g) a hoist controlled lifting hook mounted adjacent the outer end of said outer jib.

4,109,682

DIRECTIONAL CONTROL VALVE

Ellidi N. Gudjonsson, Lindarflot 37, Gardabaer, Iceland

Filed Jan. 31, 1977, Ser. No. 764,080

Int. Cl.² F15B ***13/04***

U.S. Cl. 137—625.23 **11 Claims**

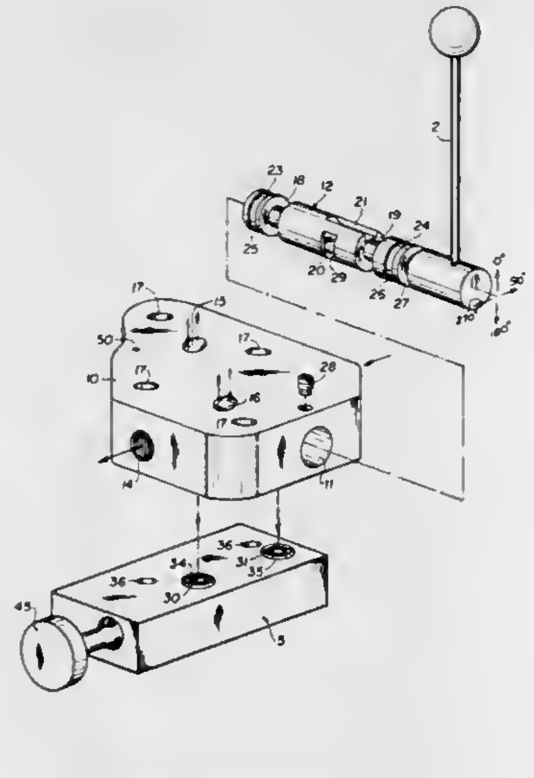
1. A valve comprising:

a valve body (**10**) having a valve bore (**11**) therein, a first port (**13**) for receiving a pressure fluid, a second port (**14**) for discharging pressure fluid, and third and fourth ports (**15, 16**) for connection to an output utilization device, said first, second, third and fourth ports (**13–16**) all being in communication with said valve bore (**11**); and

an elongated generally rod-shaped valve spool (**12**) rotatably received in said valve bore (**11**), said valve spool having a first circumferential recess (**18**) which is in communication with said third port (**15**); a second circumferential recess

(**19**) spaced from said first circumferential recess (**18**) and in communication with said fourth port (**16**); a through bore (**20**) located between said first and second circumferential recesses and at a given axial position of said valve spool such that it is in selective communication with said first and second ports (**13, 14**); a first straight groove (**22**) which is in selective communication with said first port (**13**) and which extends axially of said valve spool (**12**) from at least said given axial position of said valve spool to said first circumferential recess (**18**); a second straight groove (**21**) which is in selective communication with said first port (**13**) and which extends axially of said valve spool (**12**) from at least said given axial position of said valve spool to said second circumferential recess (**19**), said first and second grooves (**22, 21**) being on diametrically opposite sides of said valve spool and said through bore (**20**) having an axis which is substantially perpendicular to the longitudinal axis of said valve spool, said axis of said through bore (**20**) being substantially perpendicular to a plane passing through said first and second grooves; and a further groove (**29**) in said valve spool at each end of said through bore (**20**), said further grooves being substantially perpendicular to said first and second grooves (**22, 21**) and out of communication with said first and second grooves, the angular communication of said through bore (**20**) with said first and second ports (**13, 14**) being greater than that of said first and second grooves (**22, 21**); and

means for rotating said valve spool (**12**) in said valve bore (**11**) whereby when said through bore (**20**) of said valve spool is in full communication with said first and second ports (**13, 14**), the output utilization device is shunted and rendered in the off condition, when said first groove (**22**) is in full communication with said first port (**14**), the output utilization device is operated at maximum in a first direction and when said second groove (**21**) is in full communication with said first port the output utilization device is operated at maximum in an opposite direction.



4,109,683

THROTTLE VALVE

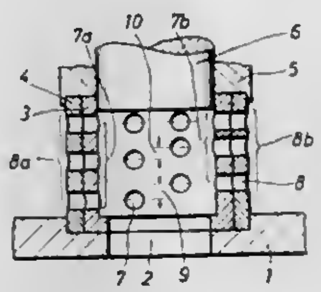
Wilhelm Strache, Bremen, Fed. Rep. of Germany, assignor to Gestra-KSB Vertriebsgesellschaft, Bremen, Fed. Rep. of Germany

Filed Nov. 24, 1976, Ser. No. 744,550

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555752

Int. Cl.² F16K ***47/14;*** **F15D** ***1/14***

U.S. Cl. 137—625.3 **9 Claims**



1. A throttle valve, comprising:

a throttle member including at least two telescopically and coaxially disposed, substantially cylindrical jackets, each of said jackets having an equivalent number of groups of radially-extending throughflow bores distributed over at least a portion of the circumference thereof, the bores in each group being spaced apart from one another such that their axes lie in spaced apart planes normal to the longitudinal axes of said jackets, at least the axes of some of the bores of one group being offset relative to the axes of corresponding bores of an other group in a longitudinal axial direction of said jackets up to a maximum distance equivalent to the cross-section dimensions of said bores, the degree of said offset of corresponding bores of different groups differs from corresponding planes of axes to corresponding planes of axes, said jackets being rotatable relative to another so that, in a first position, the throughflow bores of said one group and said other group of one of said jackets are, respectively, at least partially alignable with the throughflow bores of said one group and said other group of the other of said jackets and, in a second position, the throughflow bores of said one group and said other group of one of said jackets are, respectively, at least partially alignable with the throughflow bores of said other group and said one group of the other of said jackets; and

a slide-locking portion coaxially disposed relative to said jackets, at least one of said locking portion and said throttle member being longitudinally axially displaceable to permit relative movement therebetween so as to permit opening and closing of said bores.

4,109,684

METHOD AND APPARATUS FOR REPAIRING LEAKS IN WATER HEATERS

Robert R. Fernandez, 221 W. 57th St., B-85, Loveland, Colo. 80537

Filed Apr. 14, 1977, Ser. No. 787,508

Int. Cl.² F16L ***55/18***

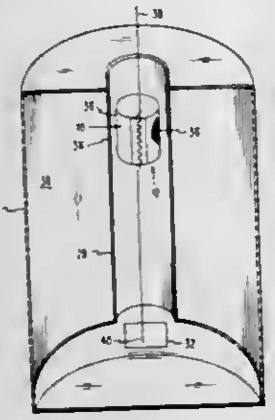
U.S. Cl. 138—97 **3 Claims**

1. Apparatus for repairing a leak in a length of pipe, the apparatus comprising:

a sealant-coated, generally cylindrical metallic repair section having a spring temper characteristic and being formed to include a first longitudinal edge and a second longitudinal edge that overlaps the first longitudinal edge;

a pair of mating lacing members attached to the outer surface of said repair section, one of said pair of mating lacing members being attached along said second longitudinal edge and the other one of said pair of mating lacing members being attached a predetermined distance away from said first longitudinal edge such that said repair section is in a compressed cylindrical position when said mating lacing members are in a laced position;

a lacing pin securing the mating lacing members in said laced position, thereby maintaining the repair section in the compressed cylindrical position; and

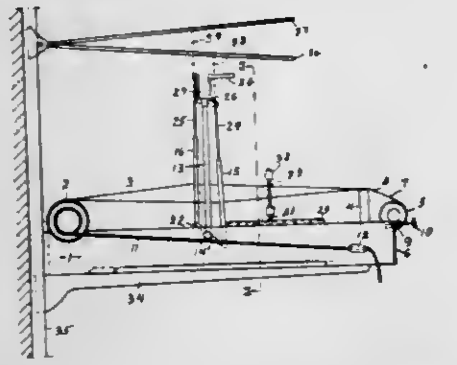


means for removing said lacing pin after the repair section has been coaxially positioned inside the length of pipe adjacent the leak, whereupon the repair section is permitted to spring to an expanded cylindrical position, thereby exerting a force against the inside surface of the pipe to form a permanent sealant layer in the area of the leak to effect repair thereof.

4,109,685

HORIZONTAL HAND WEAVING LOOM

J. Ollie Westin, Sjovagen 7, S-183 52 Taby, Sweden
Filed Dec. 2, 1975, Ser. No. 636,838
Claims priority, application Sweden, Dec. 4, 1974, 7415035
Int. Cl.^{2} D03D *29/00*
U.S. Cl. 139—33 **7 Claims**

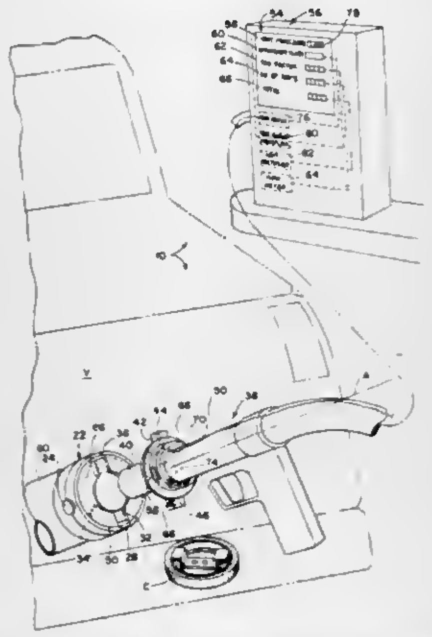


1. A horizontal hand weaving loom mountable on horizontal supports comprising a horizontal basic frame in which a warp beam and a cloth beam are rotatably mounted; a lineraly displaced beater with reed; a support frame projecting above the basic frame connected to the basic frame and carried by a horizontal shaft, said support frame being positioned between the warp beam and the cloth beam; a manually operable means mounted on the support frame which is connected by a link means to each one of at least two harnesses, said harnesses being positioned adjacent the support frame, said operable means adapted for raising and lowering the harnesses, the bottom portions of said harnesses being directly connected by hinge means to a rocker arm, said rocker arm being pivotably mounted about said horizontal carrying shaft in the support frame and connected to said at least two harnesses to operate said harnesses, said harnesses hinging freely between said manually operable means and each said rocker arm.

4,109,686

TAX ADJUSTING VEHICLE GASOLINE FILLER EQUIPMENT

Jacque R. Phillips, 835 Fountain Ave., Lancaster, Pa. 17601
Filed Jul. 6, 1977, Ser. No. 813,350
Int. Cl.^{2} B65B *3/04*
U.S. Cl. 141—1 **6 Claims**

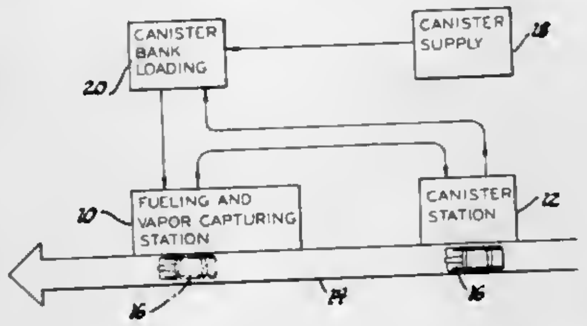


1. The method of apportioning surtax in dispensing fuel through a nozzle rotatably associatable with a filler tube in a fuel receiver in accordance with the fuel efficiency classification of the receiver, consisting of the steps:
   (a) constraining rotatability of the nozzle with respect to the filler tube to a limit evidencing fuel efficiency classification of the receiver;
   (b) requiring rotation of the nozzle to said limit when associated with the filler tube prior to fuel dispensing; and
   (c) indicating the degree of rotation of the nozzle, as a measure of surtax apportionable; thereby apportioning surtax in accordance with fuel efficiency classification of the receiver.

4,109,687

VEHICLE ASSEMBLY-LINE FUELING EMISSION CONTROL METHOD

Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 24, 1977, Ser. No. 780,600
Int. Cl.^{2} B65B *31/00*
U.S. Cl. 141—5 **2 Claims**

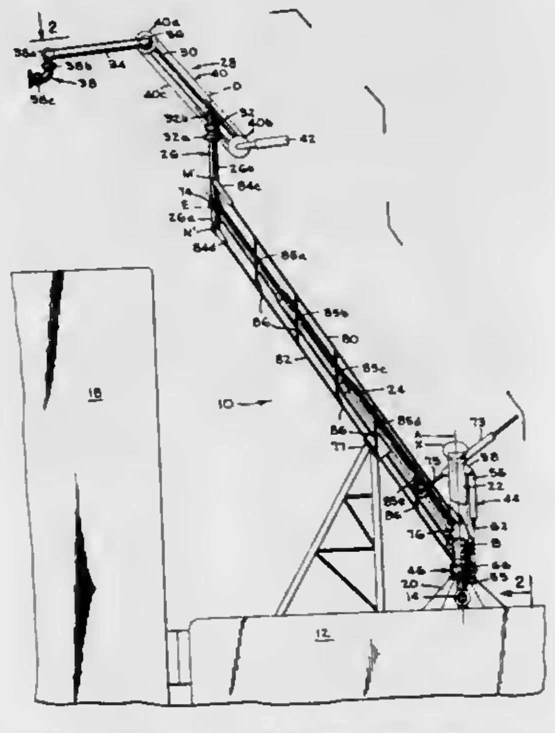


1. A method of capturing vapor displaced from fuel tanks in vehicles during fueling on a vehicle assembly line comprising the steps of
   (1) delivering fuel to the fuel tanks and collecting the vapor-air mixture displaced from the fuel tanks during fuel delivery thereto,
   (2) delivering the collected vapor-air mixture to a plurality of parallel arranged fuel vapor adsorbing devices destined for usage in fuel vapor collecting systems in vehicles,
   (3) replacing the fuel vapor adsorbing devices used in step (2) with fresh such devices prior to their reaching their full fuel vapor storage capacity, and
   (4) installing the fuel vapor adsorbing devices replaced in step (3) in assembly line vehicles prior to delivering fuel to the fuel tanks thereof.

4,109,688

ATTITUDE MAINTAINING MECHANISM FOR A MARINE LOADING ARM

Neal E. Jameson, Orange, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Aug. 8, 1977, Ser. No. 822,977
Int. Cl.^{2} B65B *3/04*
U.S. Cl. 141—387 **9 Claims**



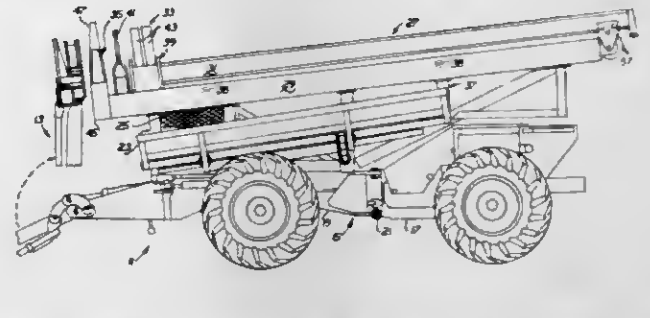
1. In fluid transport apparatus having means defining mounting structure, an inner fluid conducting conduit section pivotally connected at its inner end on a first axis to said mounting structure, an outer fluid conducting conduit section, said outer fluid conduit section pivotally connected to the outer end of said inner fluid conducting conduit section on a second axis, the improvement comprising first and second linear control members parallel to said inner fluid conducting conduit section, means pivotally connecting the inner ends of said control members to said mounting structure on opposite sides, respectively, of said first axis, and means pivotally connecting the outer ends of said control members to said outer fluid conducting conduit section on opposite sides, respectively, of said second axis.

4,109,689

APPARATUS FOR PROCESSING TREES

Donald G. Castine, Eggertsville, N.Y., assignor to Eaton Yale Ltd., Woodstock, Canada
Filed Jun. 16, 1977, Ser. No. 806,968
Int. Cl.^{2} B27L *1/00*
U.S. Cl. 144—2 Z **14 Claims**

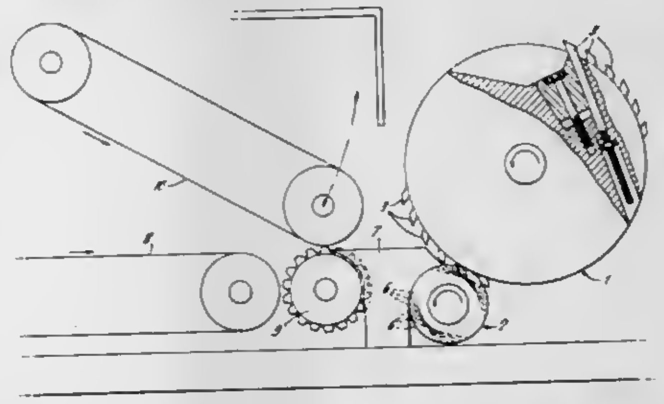
1. In apparatus for processing trees, a processing boom assembly comprising a first stationary elongated boom member; a second elongated boom member disposed parallel to said first boom member and mounted for axial movement relative thereto; a processing head mounted on said second boom member for axial movement along said second boom member; a clamp assembly mounted on said first boom member adjacent one end thereof for movement away from and toward said one end; and drive means acting on said movable boom member, said processing head and said clamp assembly, said drive means being effective to move said processing head and said clamp assembly relatively away from one another in a first condition of operation and to move said processing head and said clamp assembly relatively toward one another in a second condition of operation.



4,109,690

CHIPPER

Niilo Nikodemus Berg, Helsinki, Finland, assignor to Rauma-Repola OY, Finland
Filed Dec. 20, 1976, Ser. No. 752,424
Claims priority, application Finland, Dec. 23, 1975, 753629
Int. Cl.^{2} B27L *11/08*
U.S. Cl. 144—163 **4 Claims**

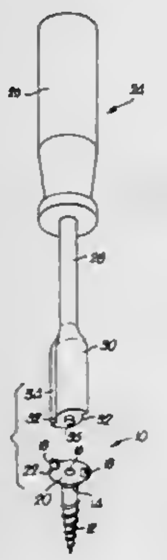


1. A chipper for chipping various wood material, such as entire trees, branches, tree tops, bushes, and small trees, said chipper having a feed end and an output end, said chipper comprising:
   (a) a rotatable, cylindrical blade drum having a plurality of finger-shaped blades projecting from the cylindrical surface of said blade drum, said blades being spaced from each other in the longitudinal direction of said blade drum;
   (b) a cylindrical, rotatable counter-blade, rotatable in the same direction as the blade drum about an axis parallel to that of said blade drum;
   (c) a plurality of recesses provided on the surface of the rotatable counter-blade arranged to coincide with the finger-shaped blades on the surface of the blade drum, said recesses corresponding in shape to the shape of said blades, said blade drum and rotatable counter-blade being spaced sufficiently close so as not to permit chipped wood to pass between the cylindrical surfaces of said blade drum and rotatable counter-blade;
   (d) means connected to the blade drum and rotatable counter-blade for synchronously rotating said blade drum and said counter-blade to successively position each blade in its corresponding recess; and
   (e) a stationary counter-blade at the feed end of the chipper so mounted as to be in close proximity to the cylindrical surface of the rotatable counter-blade and to the rotating blades on the blade drum.

4,109,691

COMBINATION TORQUE RELEASE SCREW AND SCREW DRIVER

Floyd Leroy Wilson, 1015 Moro St., Manhattan, Kans. 66502
Filed Dec. 21, 1977, Ser. No. 862,740
Int. Cl.² B28D *15/00*
U.S. Cl. 145—50 D **2 Claims**



1. The combination of a driving tool and a torque release screw fastener frictionally coupled to said tool in a relationship for screwing of the fastener into a workpiece, said combination comprising:

a driving tool, including--

a handle;

an elongated shank secured to the handle;

a driving head located on said shank remote from handle and including--

a substantially cylindrical main body portion which presents a screw-engaging lowermost face having a centrally located, axially extending, indexing projection extending therefrom; and

a pair of circumferentially spaced cam projections located on said main body portion and extending outwardly therefrom, corresponding parts of said cam projections being spaced apart about 180° on said main body portion, said projections each presenting a smoothly arcuate outer surface extending tangentially from said main body portion, there being a lug-engaging surface extending outwardly from the outermost terminus of each arcuate, outer surface, the diameter of said main body portion combined with the widths of said pair of cam projections being greater than said diameter;

a torque release screw fastener frictionally coupled to said tool in a driving relationship, said fastener including--

an elongated, threaded shank;

a head secured to said shank and presenting--

an upper face engageable with said screw-engaging face of said main body portion, said head including structure defining a central, axially extending opening through said upper face for rotatably receiving said indexing projection; and

a pair of spaced, upstanding lugs frangibly secured to said upper face and located at the periphery of the upper face about 180° apart, each of said lugs presenting an inner, upstanding operating edge and a surface-engaging face, the shortest distance between said operating edges being slightly greater than said diameter of the main body portion but less than said diameter combined with the widths of said cam projections,

said lugs being frangibly coupled to said head such that the lugs will transmit torque to said head up to a predetermined level, but will break free from the head when torque is applied thereto greater than said predetermined level,

said main body portion and head being oriented such that--

said main body portion is between said lugs with the lowermost face of the main body portion in engagement with the upper face of said head and said indexing projection is received in said head opening,

the outer surfaces of said cam projections are respectively in frictional engagement with a corresponding adjacent lug operating edge for frictionally coupling said fastener to said tool,

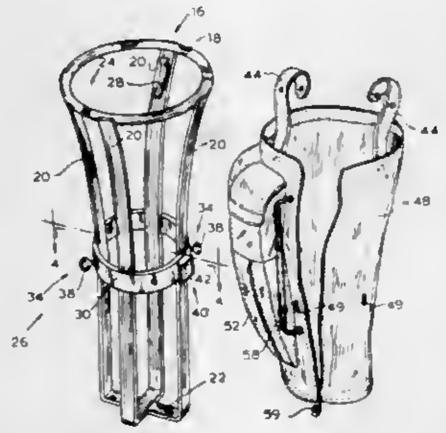
said lug-engaging surfaces are respectively located adjacent to a surface-engaging face of one of said lugs, and

said main body portion is rotatable relative to said head when said fastener is fully screwed into said workpiece for causing engagement between said lug-engaging surfaces and the corresponding adjacent faces of said lugs in order that, when a torque in excess of said predetermined torque is applied to said lugs by said tool, said lugs break free of said head.

4,109,692

ENCAPSULATING DEVICE FOR GAS CYLINDER

Roland H. Brown, 13409 Cooch Ct., Tampa, Fla. 33618
Filed Jun. 30, 1977, Ser. No. 811,487
Int. Cl.² B65D *61/00*
U.S. Cl. 150—52 R **6 Claims**

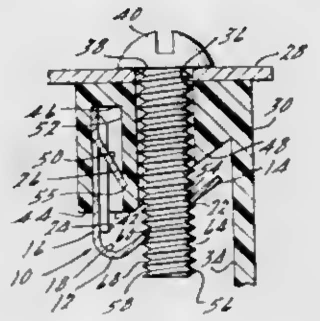


1. An encapsulating device for a gas cylinder having a valve and gauge assembly thereon for use with emergency medical equipment, said encapsulating device comprises an open cage assembly to enclose and protect the gas cylinder and valve and guage assembly, said open cage assembly comprises a protective ring disposed adjacent the valve and gauge assembly and a base to support the gas cylinder held in fixed spaced relation relative to each other by a plurality of legs extending therebetween to permit operation of the gas cylinder while within said encapsulating device, a first retainer means comprising an elongated flexible spring member movable between a first and second position attached to the upper portion of one of said legs wherein the lower portion of said spring member is disposed to engage the upper portion of the gas cylinder when in said first position to secure the gas cylinder device in said encapsulating device and to disengage the upper portion of the gas cylinder when in said second position to permit removal of the gas cylinder from said encapsulating device, a second retainer means to retain the gas cylinder within said open cage assembly comprising a retainer ring disposed to surround the gas cylinder at the mid portion thereof and a holding means to fixedly engage the gas cylinder for retention thereof in said encapsulating device, said protective ring being at least twice the diameter of said base such that said legs extending therebetween follow the natural anatomical contour of the patient's legs when in use, said encapsulating device further comprising an attachment means fixedly attached to said retainer ring for the removable attachment of said encapsulating device to the wall of a structure for storage.

4,109,693

FASTENER

Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 25, 1974, Ser. No. 526,887
Int. Cl.² F16B *37/02, 37/04*
U.S. Cl. 151—41.75 **1 Claim**



1. A self-retaining fastener for lockingly engaging, upon rotational tightening, a longitudinally, non-rotationally inserted screw, and for preventing longitudinal, non-rotational removal thereof, the

(A) a retaining portion adapted to be non-rotationally positioned proximate the end opposite that end from which the screw is to be inserted of a clearance bore adapted to receive said screw, said retaining portion comprising a retaining arm resiliently attached to said locking portion and forming an acute included angle therewith, said retaining arm including a spring tab extending outward from one side of said retaining arm; and

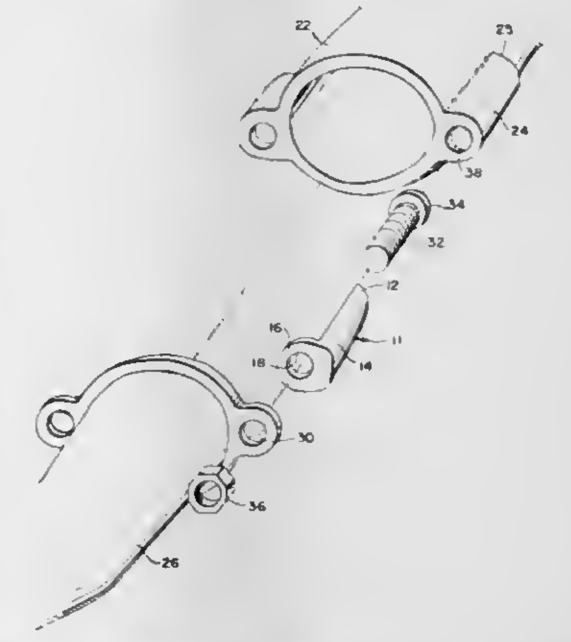
(B) a generally flat locking portion resiliently cantilever carried by said retaining portion and having formed therethrough a generally circular aperture sized to accept the major diameter of said screw, said locking portion having a relaxed position wherein said locking portion is disposed in an angular relationship relative to the axis of the clearance bore such that the axis of said aperture describes an acute angle with the axis of the clearance bore, said aperture when said locking portion is in the relaxed position hwaving a proportion on a plane normal to the axis of said bore which is smaller than the major diameter of said screw said locking portion being movable in response to the insertion of said screw through said clearance bore to a loaded position wherein the axis of said aperture is more nearly coincident with the axis of said clearance bore thereby allowing the ratcheting insertion of said screw; and being further movable in response to tightening engagement of the inserted screw to a locked position wherein the surfaces of the locking portion adjacent the clearance bore threadedly engage the screw.

4,109,694

CLAMP REPAIR UNIT

Raymond Jones, 152 E. Market St., Long Beach, N.Y. 11561
Filed May 11, 1976, Ser. No. 685,278
Int. Cl.² F16B *43/00*
U.S. Cl. 151—69 **3 Claims**

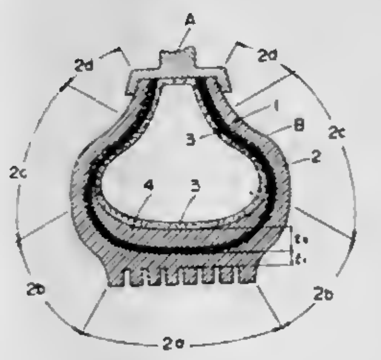
1. A clamp repair unit to fit about a typical boss as found on a casting so as to retain a suitable fastener thereto, the unit comprising a unitary part formed of rigid metallic material having a half-hollow preferably semi-circular in cross section body portion, at one end of which is a transversely extending relatively flat fastener retaining portion defining a bearing surface defining a peripherally closed hole therethru into which a fastener, such as a bolt may fit, and at the other end the half-hollow body portion is closed forming a hook to fit behind and clampingly engage the boss so that the hook transfers the full tension load from the fastener to the boss.



4,109,695

PUNCTURE-PROOF TUBELESS TIRES

Teruhiko Miyazato, 18-7, Shiomi-cho, Sasebo-shi, Nagasaki-ken, Japan
Filed Nov. 1, 1976, Ser. No. 737,767
Claims priority, application Japan, Nov. 14, 1975, 50/136156
Int. Cl.² B60C *21/08*
U.S. Cl. 152—347 **7 Claims**



1. A puncture-proof tubeless tire which comprises:

(a) an outer first rubber layer consisting of a crown having a tread with patterned portions, shoulders, side walls and bead portions;

(b) a cord layer provided on the inner surface of the outer first rubber layer;

(c) a reinforcing second rubber layer provided on the inside of the cord layer at its region corresponding at least to the crown and the shoulders; and

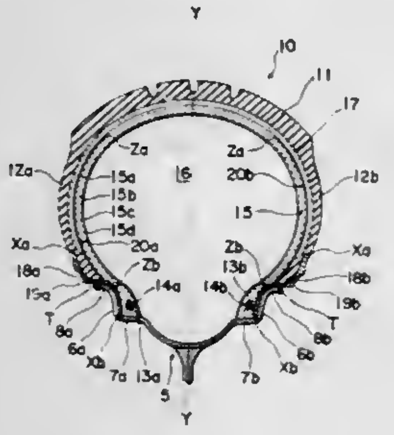
(d) a lining agent present in the interior of the tire, said lining agent comprising a mixture of an adhesive, 20 to 60 percent of diethylene glycol based on the weight of the adhesive and rubber particles dispersed in the mixture.

4,109,696

PNEUMATIC TIRE FOR MOTORCYCLE

Eiji Nakasaki, Kakogawa, and Hishashi Shirashoji, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Aug. 4, 1976, Ser. No. 711,614
Claims priority, application Japan, Dec. 25, 1975, 50-157023
Int. Cl.² B60C *9/10*
U.S. Cl. 152—354 R **1 Claim**



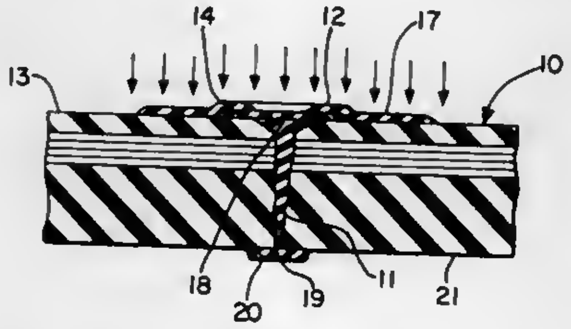
1. A pneumatic tire for use on a motorcycle, which comprises a tire cover made of a rubber material and having a tread portion, a pair of opposed side walls integrally extending from respective side edges of the tread portion, and a pair of opposed bead portions integrally extending from respective free ends of the individual side walls, said bead portions being adapted to firmly engage with associated rim flanges of a wheel rim, said tire cover including bead cores embedded respectively in the bead portions and a reinforcing structure for preventing the tire from collapsing when it is at least partially deflated which comprises a carcass structure embedded in the tire cover adjacent the inner surface thereof, said carcass structure having a plurality of plies of textile cords which are alternately disposed on a bias with respect to each other and at a predetermined cord angle relative to the midcircumferential plane of the tire, said carcass structure having both ends turned up around the respective bead cores and secured in position adjacent the free ends of the side walls, at least one reinforcement layer substantially forming a part of the carcass structure and made of a plurality of metallic cords impregnated with a rubber material, said reinforcement layer being laid down on a bias relative to the carcass structure and at a cord angle within the range of from 20° and 45° relative to the midcircumferential plane of the tire and having both ends terminating adjacent respective boundaries between the side walls and the bead portions without being turned up around the associated bead core, at least one pair of side reinforcing layer made of a hard rubber material and respectively embedded in between the carcass structure and the reinforcement layer in spaced and substantially opposed relation to each other, each of said side reinforcing structure having an outer periphery, which is situated at a point corresponding to the boundary between the tread portion and the adjacent side wall, and an inner periphey which is situated at a point corresponding to a shoulder of the rim flange when the tire is mounted on the wheel rim, said reinforcing structure representing the principal reinforcing portion of the tire, each of said side walls having an outwardly protruding and circumferentially extending excrescence integrally formed therewith at a portion of the side wall which may contact an outer periphery of the corresponding one of the rim flanges when the tire is mounted on the wheel rim and at least one pair of protective layers made of a hard rubber material, each of said protective layers being applied to outer surfaces of the excrescence and said bead portions.

4,109,697

METHOD AND PATCH USED IN THE REPAIR OF A PNEUMATIC TIRE

Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1977, Ser. No. 782,251
Int. Cl.² B60C *21/00*
U.S. Cl. 152—367 **11 Claims**



1. A method of patching a puncture such as a nail hole, in a pneumatic tire, comprising:

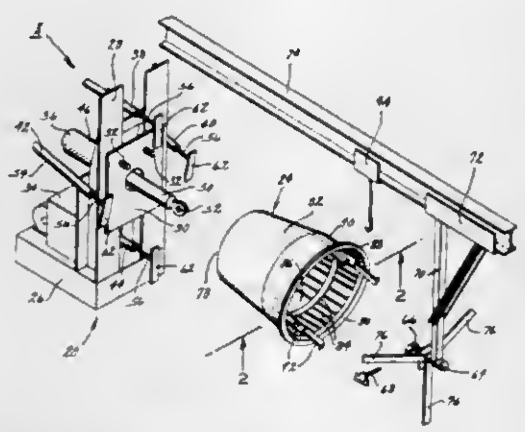
(a) covering the puncture with a patch adjacent the inner peripheral surface of the tire;
(b) interposing unvulcanized rubbery material between the patch and puncture;
(c) directing fluid pressure and heat against the patch to compress the patch against the tire and unvulcanized rubbery material to force the material into the puncture, and vulcanize the material driven into the puncture, and bond the patch to the inner peripheral surface of the tire; and
(d) restricting the outward movement of the unvulcanized rubbery material beyond the patch so as to force said rubbery material into the puncture when pressure is exerted on the patch and rubbery material.

4,109,698

MACHINE FOR INSTALLING GIANT TIRES ON ONE-PIECE RIMS

Vallie D. West, 724 N. Washington, and Jesse Kennedy, 201 S. Illinois, both of Du Quoin, Ill. 62832

Filed May 18, 1977, Ser. No. 797,997
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.2 **17 Claims**



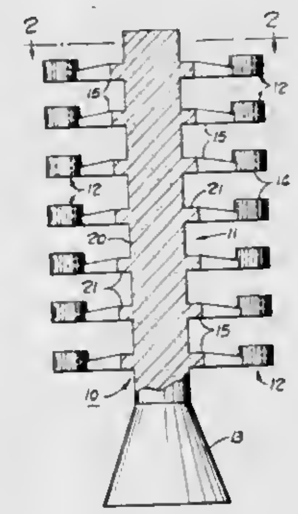
1. A machine for installing a tire on a rim having flanges at its ends and a channel-shaped portion between the flanges, said machine comprising: a frame; a tapered guide having a large end which corresponds generally in diameter to the outer diameter of a flange on a flanged rim and a small end which is small enough to fit into a tire to be mounted on the rim; means for positioning the guide in a fixed position with respect to the frame and for securing the guide against the rim with the large end of the guide aligned with one of the flanges on the rim such that the large end of the guide forms a tapered approach to the periphery of that flange; and first, second and third fluid operated cylinders on the frame, each cylinder having a pressing shoe that is independent of other pressing shoes and moves generally along, but slightly outwardly from, the tapered surface of the guide and is further positioned such that it will bear facewise against the sidewall of the tire positioned around the guide, the first cylinder being located intermediate the second and third cylinders so that the shoes on the second and third cylinders will bear against the sidewall of the tire to the sides of the location at which the shoe for the first cylinder bears against the sidewall; whereby the cylinders maneuver the tire over the tapered guide and onto the rim such that the inner margins of the sidewalls are between the flanges on the rim.

4,109,699

PATTERN ASSEMBLY

Robert R. Miller, Shaker Heights, and Robert A. Horton, Chesterland, both of Ohio, assignors to Precision Metalsmiths, Inc., Cleveland, Ohio

Continuation of Ser. No. 511,458, Oct. 2, 1974, abandoned. This application Mar. 5, 1976, Ser. No. 664,241
Int. Cl.² B22C *7/02*
U.S. Cl. 164—244 **7 Claims**



1. A pattern set-up for use in the lost pattern process of investment casting comprising:

(a) a center tree including a stem and a plurality of collars which project from the sides of said stem and are spaced apart along its length,
(b) the laterally projecting width of each collar from the side of said stem to the outside of the collar measured along a diameter of said stem being smaller than said diameter,
(c) the juncture of each of said collars with said stem being structurally continuous about said stem and extending substantially the full axial thickness of the collar,
(d) a plurality of patterns arranged about said collars, and
(e) gate members extending from said patterns and having end portions connected to said collars.

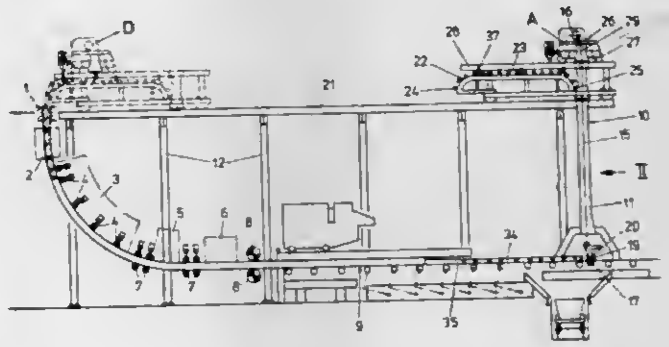
4,109,700

ARRANGEMENT FOR INTRODUCING A FLEXIBLE STARTER BAR INTO A CONTINUOUS CASTING PLANT

Werner Scheurecker, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-and Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 11, 1977, Ser. No. 776,540
Claims priority, application Austria, Mar. 23, 1976, 2112/76
Int. Cl.² B22D *11/08*
U.S. Cl. 164—426 **10 Claims**

1. In an arrangement for introducing a flexible starter bar, having a head end, a foot end and a starter bar head, from above into a continuous casting plant of the type including a mould, a strand guide following the mould, an introduction part for introducing said starter bar into the strand guide, a lifting mechanism for gripping and lifting the starter bar, a transporting car provided with a sliding or roller path having an arcuate front end part and an arcuate rear end part, the starter bar being movable to the introduction part by the transporting car, and a conveying means for the starter bar provided on the transporting car, the improvement which is characterized in that the conveying means is designed as



a displacement car located on the transporting car and being movable in the longitudinal direction of the sliding or roller path for introducing the starter bar into the introduction part, and

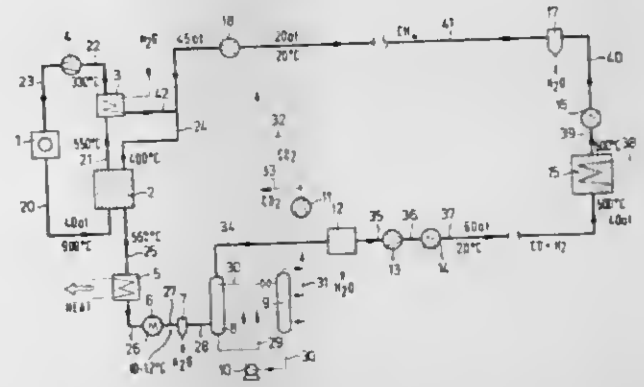
first and second catch means provided on the displacement car to engage with the starter bar.

4,109,701

METHOD OF CONVEYING HEAT ENERGY

Friedrich Hilberath, Walberberg, and Johannes Teggers, Wesseling, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG., Cologne, Fed. Rep. of Germany

Filed Aug. 1, 1975, Ser. No. 601,214
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1974, 2437975
Int. Cl.² F28C *3/02;* C09K *5/00*
U.S. Cl. 165—1 **3 Claims**



1. In the method of conveying heat energy from a location of heat production to a location of heat consumption wherein methane is endothermically reacted in the presence of water vapor at elevated temperature and pressure at a location of heat production to a gaseous mixture comprising carbon monoxide, water, carbon dioxide, hydrogen, and methane, the gaseous mixture is conveyed to a location of heat consumption, the gaseous mixture is exothermically reacted to re-form methane and the heat energy generated thereby is utilized, the improvement comprising:

after production of said gaseous mixture and before the gaseous mixture is conveyed to a location of heat consumption, removing carbon dioxide from the gaseous mixture, freeing the gaseous mixture of water vapor and water to an extent that the water vapor content in the mixture is not more than that which would exist at normal pressure and ambient temperature;

conveying the so-treated gaseous mixture to a location of heat consumption; and utilizing the so-treated gaseous mixture for the exothermic re-formation of methane in a dry methanization step without steam addition at elevated pressures of between 10 and 100 atmospheres gauge and at temperatures of between about 400° and 650° C.

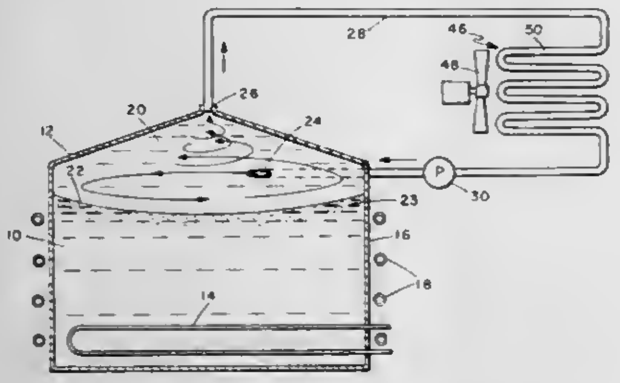
4,109,702
ENERGY STORAGE AND RETRIEVAL AS HEAT

Norman Donald Greene, Box 148, Sun Valley Rd., Del Mar, Calif. 92014

Filed Aug. 6, 1976, Ser. No. 712,353

Int. Cl.^{2} F28D *21/00*

U.S. Cl. 165—1 **20 Claims**



1. The method of storing energy and retrieving such stored energy as heat, that includes

(a) providing a liquid system that consists essentially of a salt melt lower layer, an upper layer of additive liquid other than water which is immiscible with the salt melt, and an emulsion of said melt and additive liquid intermediate said upper and lower layers,

(b) effecting latent heat transfer from the melt to the additive liquid within the emulsion layer, and transferring heat from the additive liquid,

(c) maintaining active flowing movement of the emulsion to enhance said latent heat transfer, and which results in formation of salt crystals, and

(d) gravitating said crystals downwardly in the melt away from the emulsion.

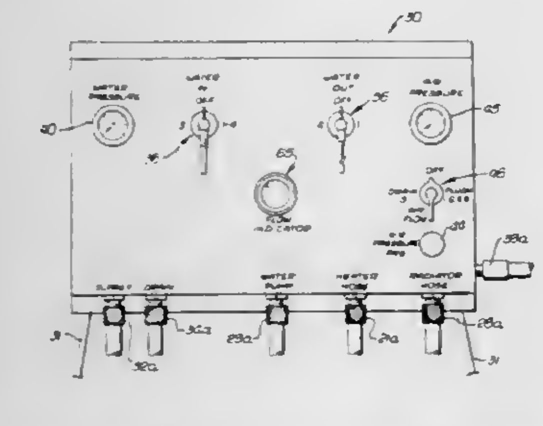
4,109,703
ENGINE COOLING SYSTEM FLUSHING APPARATUS AND METHOD

John A. Babish, Glendora; Larry K. Arnot, Duarte, and Douglas C. Appel, Glendora, all of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Filed Nov. 11, 1976, Ser. No. 741,065

Int. Cl.^{2} F28G *9/00*

U.S. Cl. 165—1 **18 Claims**



17. The method of flushing an internal combustion engine liquid cooling system, the system including a liquid coolant heat radiator and the engine having cooling passages, said method including

(a) providing a controlled pressurized flow of flushing liquid and entrained gas bubbles,

(b) and passing said flow alternately through

(i) the radiator in a reverse direction, independently of the engine coolant passages,

(ii) the engine coolant passages in a reverse direction, independently of the radiator,

(iii) the radiator in a forward direction, independently of the engine coolant passages,

(iv) the engine coolant passages in a forward direction, independently of the radiator.

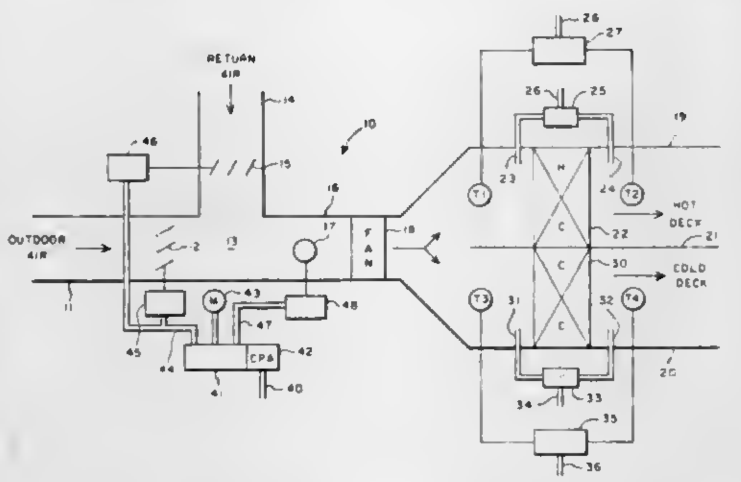
4,109,704
HEATING AND COOLING COST MINIMIZATION

Donald H. Spethmann, Arlington Hts., Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 28, 1977, Ser. No. 781,898

Int. Cl.^{2} F25B *29/00;* F24F *3/10*

U.S. Cl. 165—16 **21 Claims**



1. In an air conditioning system having a supply duct and return air and outdoor air dampers to mix the air in said supply duct, a hot deck supplied with air from said supply duct and heating means to heat the air in said hot deck, and a cold deck supplied with air from said supply duct and cooling means to cool the air in said cold deck, a control system for minimizing the cost of the energy to heat the air in the hot deck and cool the air in the cold deck, said control system comprising:

first means for supplying a first signal dependent upon the amount of heating done in the hot deck;

second means for supplying a second signal dependent upon the amount of cooling done in the cold deck;

weighting means for adjusting the weighting to be given to said first and second signals;

comparison means connected to said first means, said second means and said weighting means for producing an output dependent upon the difference between the amount of cooling and the amount of heating and adjusted for the difference between the relative weighting of the first and second signals;

control means connected to the output of said comparison means and adapted to control the return air and outdoor air damper to control the temperature of the air in the supply duct according to said first and second signal as weighted by said weighting means.

4,109,705
HEAT EXCHANGE IN VENTILATION INSTALLATION

Knut Bergdahl, Kvartsgrand 4, 852 52 Sundsvall, Sweden

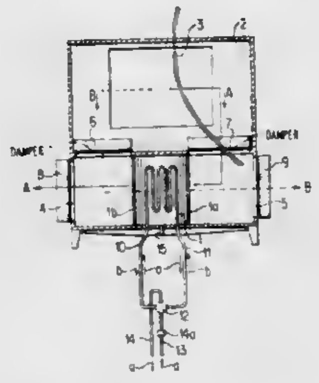
Division of Ser. No. 529,525, Dec. 4, 1974, Pat. No. 3,980,129. This application Jun. 15, 1976, Ser. No. 696,272

Claims priority, application Sweden, Dec. 4, 1973, 73163263

Int. Cl.^{2} F25B *29/00*

U.S. Cl. 165—17 **7 Claims**

1. Apparatus for recovering heat in a ventilation installation having an air supply duct and an air exhaust duct, comprising a heat exchanger to transfer heat from said exhaust air to the supply air, said heat exchanger having means to direct the exhaust air from said exhaust duct to flow longitudinally through the exchanger from one end to the other end, means to direct heat exchange medium from said supply duct to flow through the exchanger with opposed flow, and reversing means to reverse concurrently during operation of the heat exchanger both the air flow and the medium flow whereby said exhaust air is directed to flow through the exchanger from the said other end to the said one end.



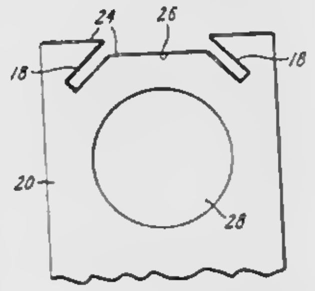
4,109,706
THERMALLY CONDUCTIVE CERAMIC ATTACHMENT

Michael J. Noone, Wayne, Pa., assignor to General Electric Company, Fairfield, Conn.

Filed Mar. 10, 1977, Ser. No. 776,271

Int. Cl.^{2} G05D *23/00;* F28F *13/18, 21/00*

U.S. Cl. 165—32 **4 Claims**



1. A male element for mating with a female element to make a thermally conductive connection between

a. a cooling element for receiving heat flux from

b. the cooled end of a structure having an opposed hot end which receives heat flux from a source at a temperature greater than the permissible operating temperature of the cooled end:

comprising:

c. a male metal face adapted to mate with a female metal face on a female element;

d. two metal legs extending from the said male metal face, adapted to enter two slots in the said female metal face;

e. a coating on the said male metal face and the said metal legs of a fusible metal having a melting point less than the maximum permissible operating temperature of the said cooled end, and adapted, when molten, to wet the said male metal face and the said metal legs and the said female metal face.

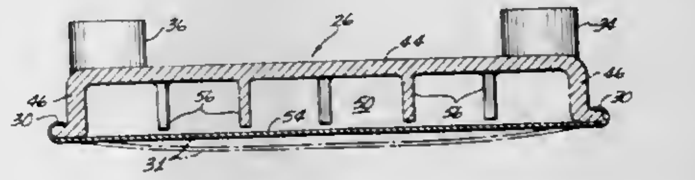
4,109,707
FLUID COOLING SYSTEMS FOR ELECTRONIC SYSTEMS

Edward A. Wilson, and James D. Fredenberg, both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Division of Ser. No. 592,578, Jul. 2, 1975. This application Mar. 16, 1977, Ser. No. 778,308

Int. Cl.^{2} F28F *21/00, 7/00*

U.S. Cl. 165—46 **6 Claims**



5. A heat exchanger comprising:

means forming a chamber adapted to contain a liquid, a portion of sid means being a substantially planar flexible thin wall having an area substantially in the range of from 25 to 64 square centimetersand made of a good thermal conductor,

inlet means and outlet means formed in said chamber for permitting a liquid having a pressure substantially in the range of from 1 to 10 pounds per square inch to flow through said chamber, and

means within said chamber for causing said liquid to flow substantially uniformly over the flexible thin wall of said chamber means, said means within said chamber being spaced from said flexible thin wall.

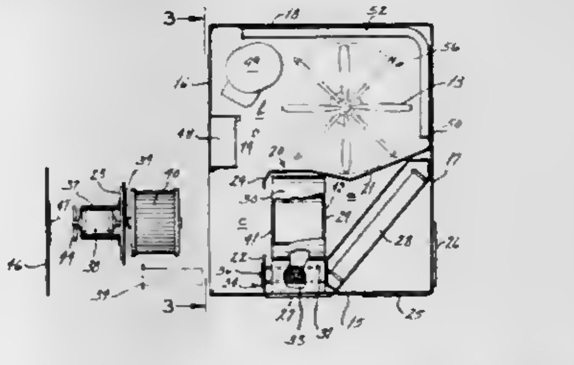
4,109,708
AIR CONDITIONER UNIT HAVING COMPARTMENT PROVISIONS FOR ACCESS AND MOTOR COOLING

Sadik S. Imral, St. Louis, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Continuation of Ser. No. 606,538, Ang. 21, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,008

Int. Cl.^{2} F24F *1/02*

U.S. Cl. 165—48 R **5 Claims**



1. A self-contained air conditioner unit of the type having a motor for blowing cooled air separate from the motor for cooling the condenser, comprising

a housing having an angled divider extending top to bottom, whereby to divide the housing into an evaporator compartment bounded on two adjacent sides by a condenser compartment,

the evaporator compartment having a return air inlet, an evaporator coil, and a blower whose scroll leads to a cooled air outlet,

the condenser compartment having a compressor, a main outside air inlet having a condenser coil thereadjacent, and a warm air outlet having an exhaust fan thereat mounted on the vertical shaft of a first motor,

the condenser compartment further including an air corridor portion along one side of the evaporator compartment, said air condenser portion including an auxiliary air inlet spaced from the main outside air inlet, and

a second motor powering said evaporator compartment blower positioned within said air corridor portion of the condenser compartment in the path of air flow between said auxiliary air inlet and the exhaust fan,

said second motor having a horizontal shaft passing through a portion of said divider to mount the wheel within the scroll of said blower,

whereby the heat from the evaporator motor is carried by air from the auxiiliary air inlet through the air corridor portion to the condenser exhaust fan without entering the evaporator compartment.

4,109,709

HEAT PIPES, PROCESS AND APPARATUS FOR MANUFACTURING SAME

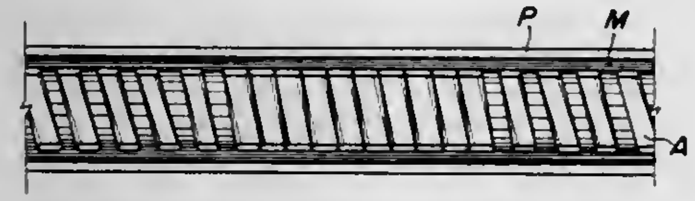
Ichiro Honda; Shigetoshi Takasu, both of Tokyo, and Yoshio Onuki, Yachiyo, all of Japan, assignors to Suzuki Metal Industrial Co, Ltd., Tokyo, Japan

Division of Ser. No. 468,033, May 8, 1974, Pat. No. 4,018,269. This application May 17, 1976, Ser. No. 686,983

Claims priority, application Japan, Sep. 12, 1973, 48-103494; Nov. 8, 1973, 48-129393[U]; Nov. 8, 1973, 48-129394[U]

Int. Cl.² F28D *15/00*

U.S. Cl. 165—105 **6 Claims**



1. In a wick-secured inner tubular material for a heat pipe, the combination comprising an elongated metal tubular material, a wick of metal fibers in tow form disposed about said metal tubular material, an oxidized film on the surface of said metal fibers to provide a rough surface on said metal fibers to increase the wettability thereof, and a binding material disposed about said wick to secure the wick to said metal tubular material, said metal tubular material with the wick of metal fibers secured hereto by said binding material being adapted to be disposed within an elongated outer tubular means to form said heat pipe with the metal fibers of said wick holding a heat transfer liquid by capillary action.

4,109,710

HEAT EXCHANGER

Siegfried Förster, Alsdorf, and Manfred Kleemann, Quadrath, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. nf Germany

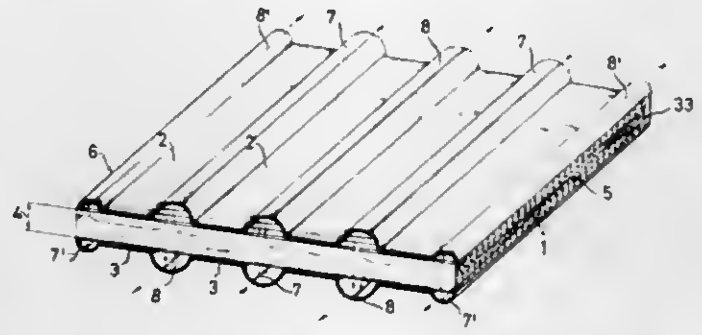
Continuation of Ser. No. 572,759, Apr. 29, 1975, abandoned. This applicatioo Oct. 12, 1976, Ser. No. 731,672

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1974, 2420827

Int. Cl.² F28F *3/12*

U.S. Cl. 165—165 **5 Claims**

1. A double channel counter flow heat exchanger means having an independently removable matrix construction with cold free sides and a hot middle range subjected to high temperature differences at up to 450 psi; that normally would lead to undesired deformation for effecting heat exchange between first and second fluid mediums comprising in combination spaced walls forming said spaced sides, chamber-forming means including pleated means between said walls with the folds of said pleated means extending between and secured to said walls to form a chamber between each side of said pleated member and the adjacent wall, closure means between the sides of said walls to close the sides of said chamber, closure means connected to the ends of the pleated means to close the ends of said folds and the ends of said chambers between the ends of said walls, a plurality of channel means in each of said walls extending between the ends of said walls and across said folds and opening into the chamber formed by said folds, said channel means in each wall having inlets and outlets for a fluid medium at one end of the wall, so that one medium may flow through inlet channel means and between the folds to outlet channel means in each chamber to emerge from the same end of said wall, the inlets and outlets of each wall being at the end opposite the inlets and outlets of the other wall collectively in a mirror image as to guidance of fluid medium flow therewith.



4,109,711

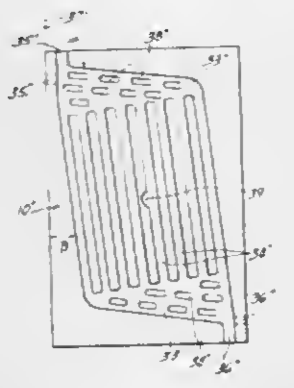
HEAT EXCHANGE PANEL

Charles A. Kleine, Florissant, Mo., and Verne L. Middleton, East Alton, Ill., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 573,953, May 2, 1975. This application Nov. 17, 1975, Ser. No. 632,502

Int. Cl.² F28F *3/14;* **F24J** *3/02;* **F28F** *9/22*

U.S. Cl. 165—170 **9 Claims**



1. A hollow sheet metal plate for use in a solar energy collector system having a system of fluid passageways for a heat exchange medium extending internally therein including opposed headers and passageways of substantially uniform cross section extending longitudinally in said plate in a direction transverse to and interconnecting said headers, including entry and exit portions extending from opposite ends of said headers to opposed edges of said panel to provide ingress and egress openings for a heat exchange medium, said headers possessing outer boundaries defining the perimeter thereof, wherein at least one of said boundaries lying adjacent the apex of said perimeter defines an external angle of at least 91° with respect to a longitudinal edge of said metal plate, and said longitudinally extending passageways are disposed at an angle of at least 1° with respect to said longitudinal edge along substantially the entire length thereof, said plate being characterized by efficient drainage of said heat exchange medium, wherein said angles define inclined headers and inclined connecting portions for uniform fluid distribution regardless of whether said longitudinal edge is located in a horizontal or a vertical plane.

4,109,712

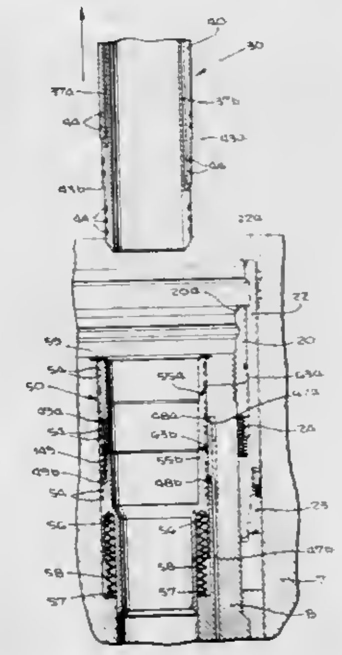
SAFETY APPARATUS FOR AUTOMATICALLY SEALING HYDRAULIC LINES WITHIN A SUB-SEA WELL CASING

A. Michael Regan, Huntington Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Filed Aug. 1, 1977, Ser. No. 820,829

Int. Cl.² E21B *33/035*

U.S. Cl. 166—340 **15 Claims**



1. An improved safety apparatus for automatically sealing hydraulic lines within a sub-sea well casing when said casing is disconnected from an associated well head connector, comprising the provision of:

mandrel means associated with a well head connector assembly;

valve means generally coaxially aligned within said casing head for receiving said mandrel means and for controlling fluid flow through associated hydraulic lines, said valve means being urged into a valve-opened position by said mandrel means as said well head connector assembly is secured to said well casing head; and

bias means associated with said valve means for urging said valve means into a valve-closed position to seal said hydraulic lines when said mandrel means is withdrawn from said valve means.

4,109,713

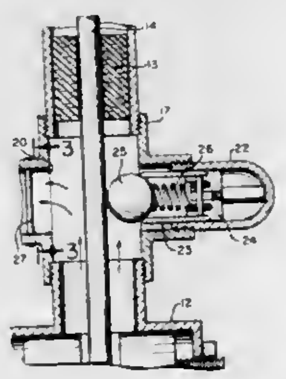
PUMPING WELL BLOW-OUT PREVENTER

Joseph Kenton Clow, 12745 Tree Ranch Rd., Ojai, Calif. 93023

Filed Mar. 25, 1977, Ser. No. 781,214

Int. Cl.² E21B *33/06, 17/00*

U.S. Cl. 166—53 **2 Claims**



1. In a pumping well including a three-way well head fitting with a lower coupling to the lower end of a pipe string, an axially aligned upper coupling for receiving a stuffing box through which a polished rod in said pipe string passes and a lateral outlet connecting to an oil flow line for collecting pumped oil, an improved blow-out preventer for blocking oil from passing out said stuffing box from said pipe string in the event said polished rod should break or otherwise be ejected from said stuffing box, said blow-out preventer comprising, in combination:

(a) a four-way well heat fitting dimensioned to be substituted for said three way well head fitting so that the overall height of the well head structure is not increased, said four way well head fitting having a lower coupling for coupling to the upper end of said pipe string, an axially aligned upper coupling for receiving said stuffing box through which said polished rod extends, a lateral outlet connecting to said oil flow line and an opposite lateral outlet;

(b) a housing connected to said opposite lateral outlet;

(c) a sleeve received in said housing;

(d) a seat bushing secured to the inner end of said sleeve;

(e) a ball positioned at the outer end of said sleeve;

(f) a coiled compression spring in said sleeve with one end seated in said seat bushing and its other end bearing against said ball; and

(g) a pipe section of given length secured to the end of said seat bushing opposite the end on which said spring seats and extending axially to engage the end wall of said housing and position said seat bushing at said given length from said end wall,

whereby should said polished rod break or otherwise be ejected from said stuffing box, said ball is ejected into the central portion of said four-way fitting and urged against the lower entrance opening of said stuffing box by oil pressure to thereby block oil from passing through the stuffing box to the exterior of said well head and whereby said given length can be changed by cutting off the extending end portion of said pipe so that said seat bushing and sleeve can be positioned further in said housing closer to said end wall to accommodate the blow-out preventer to a pumping well having a larger diameter polished rod.

4,109,714

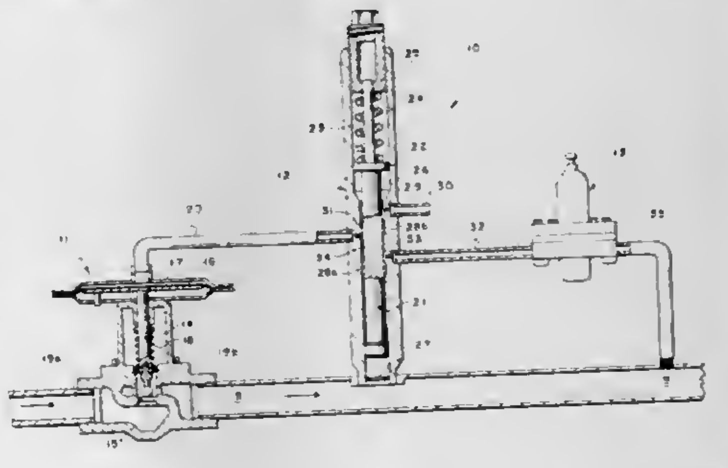
SHUTDOWN SYSTEM FOR HIGH PRESSURE WELL

Donald Roy Greenlee, Dallas, and Milton Wayne Burns, Abilene, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 16, 1977, Ser. No. 825,017

Int. Cl.² E21B *43/12*

U.S. Cl. 166—53 **6 Claims**



1. A high pressure well shutdown system for preventing high pressure fluids from entering the flowline of a wellhead, said shutdown system comprising:

a pressure actuated, normally open, flow valve connectable in fluid communication with a well fluid outlet of a wellhead;

a pressure sensor assembly fluidically connectable to a wellhead fluid conduit downstream of said flow·valve and having pressure responsive means in fluid communication with said wellhead fluid conduit;

said pressure responsive valve means has a slidable piston having a biasing spring abutting thereon, a lower peripherial seal and an upper peripherial seal defining an undersized flow area around said piston, and a pressure response area at one end of said piston adapted to respond to pressure in said wellhead fluid conduit;

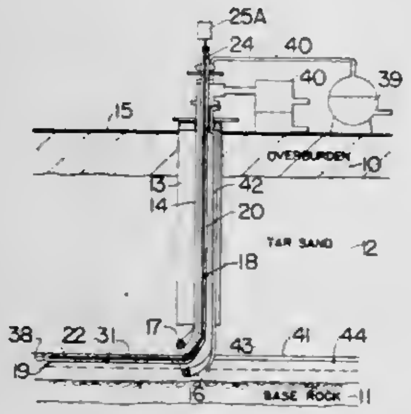
a pressure transmission conduit in fluid communication with the wellhead fluid conduit downstream of said pressure sensor assembly and adapted to transmit fluid pressure from the wellhead fluid conduit through said pressure responsive valve means; and

closing pressure conduit means connecting said pressure responsive valve means to said flow valve.

4,109,715
SYSTEM AND APPARATUS FOR EXTRACTING OIL AND THE LIKE FROM TAR SANDS IN SITU

James Sidney Adamson, 539-47th Ave. SW., Calgary, Canada (T2S1C5)

Filed Nov. 29, 1976, Ser. No. 745,691
Claims priority, application Canada, Dec. 5, 1975, 241290
Int. Cl.² E21B *43/00;* E21C *41/00*
U.S. Cl. 166—177 **22 Claims**



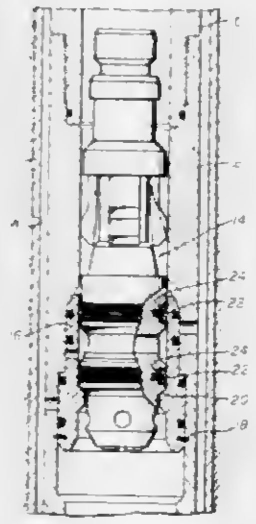
1. Apparatus for the separation of oil and the like from tar sands comprising in combination with a source of power, a substantially cylindrical directional casing, adapted to be placed within a well bore in said tar sands, a vibrating probe assembly engaged within said casing, means at the lower end of said casing to control the radial direction of the lower end portion of said probe assembly exiting therefrom, means to provide vibration to said lower end portion and means to convey an oil-from-sand separating fluid to said lower end portion and to discharge same therefrom into the tar sand immediately adjacent said lower end portion, said lower end portion having a configuration whereby the vibration thereof moves said lower end portion in a circle around the vertical axis of said directional casing, said lower end portion, when viewed in cross section, including a front surface portion which is substantially semi-circular and a tapered streamlined rear surface portion having a greater surface area than said front surface portion whereby said front surface portion presents less frictional resistance to the sand so that said probe, when vibrated, moves in a direction parallel to the transverse horizontal axis of said probe.

4,109,716
SEAL

Carlos R. Canalizo, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 597,962, Jul. 21, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,263
Int. Cl.² E21B *33/12*
U.S. Cl. 166—191 **6 Claims**

1. Apparatus comprising:
(a) a nipple having an interior cylindrical surface;
(b) a well tool having an exterior cylindrical surface and adapted to be run in a well and adapted to be landed and sealed in said nipple so that fluid flow in the annulus between said interior cylindrical surface and said exterior cylindrical surface is blocked at the sealing location; and
(c) at least one annular sealing system comprising:
  (i) said exterior cylindrical surface having an annular recess located at the site where it is desired to block the fluid flow, and said exterior cylindrical surface being located so that it is exposed to flowing well fluids during the running of said well tool in a well, and
  (ii) an annular sealing unit associated with said recess and including a portion which is exposed to flowing well fluids when said well tool is being run in a well and including
    (A) ring support means received entirely within said recess,



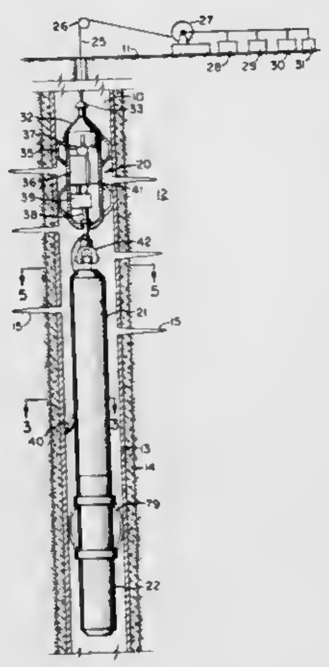
    (B) annular deformable sealing means secured to said ring support means and having a portion received within said recess and a portion projecting from said recess for sealing with said interior cylindrical surface,
    (C) said sealing means including a pair of spaced sealing members with each sealing member having an outer convex curved sealing face projecting from said recess and with said sealing means being contoured to provide a space between the sealing faces into which the sealing members may flow when deformed and with each sealing member sized so that said portion projecting from said recess provides an interference fit with said interior cylindrical surface when said well tool is landed in said nipple.

4,109,717
METHOD OF DETERMINING THE ORIENTATION OF HYDRAULIC FRACTURES IN THE EARTH

Claude E. Cooke, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 3, 1977, Ser. No. 848,067
Int. Cl.² E21B *47/06*
U.S. Cl. 166—250 **12 Claims**

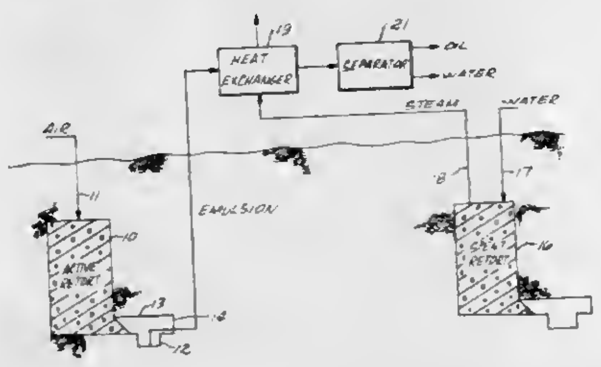
1. In a method of stimulating a subterranean formation surrounding a cased wellbore wherein a fluid having a temperature different from the normal temperature of the formation is injected into said formation at a pressure sufficient to form a vertical fracture therein, an improved method for determining the orientation of said fracture which comprises, prior to complete dissipation of the thermal effects created by the injection of the fluid into the formation (a) measuring the circumferential temperature of the interior of the well casing at an elevation proximate said formation and (b) determining direction of temperature extremes so measured, the diametrically opposed temperature extremes indicating the orientation of said fracture.



4,109,718
METHOD OF BREAKING SHALE OIL-WATER EMULSION

Robert S. Burton, III, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 644,513, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 481,975, Jun. 24, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,556
Int. Cl.² E21B *43/24*
U.S. Cl. 166—256 **16 Claims**



1. A process for recovering shale oil from an in situ oil shale retort in a subterranean formation containing oil shale, said in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale, comprising the steps of:

advancing a retorting zone through the fragmented permeable mass for retorting oil shale in the fragmented permeable mass and producing liquid and gaseous products including shale oil, water vapor being present in the retorting zone;

condensing at least a portion of such water vapor on unretorted particles in the fragmented mass on the advancing side of the retorting zone whereby an emulsion of shale oil and water is produced;

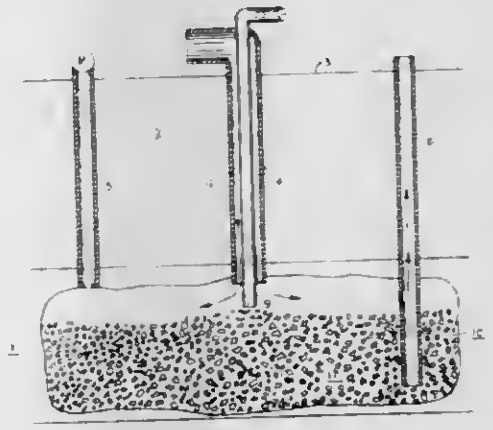
withdrawing liquid and gaseous products including such emulsion of shale oil and water from the fragmented mass; and

holding the shale oil and water at a temperature of at least about 120° F for at least about one day for separating shale oil and water.

4,109,719
METHOD FOR CREATING A PERMEABLE FRAGMENTED ZONE WITHIN A SUBTERRANEAN CARBONACEOUS DEPOSIT FOR IN SITU COAL GASIFICATION

William L. Martin; Harry A. Wahl, both of Ponca City, Okla., and Gary C. Young, Pinole, Calif., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 673,566, Apr. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 582,063, May 29, 1975, abandoned. This application Dec. 5, 1977, Ser. No. 857,634
Int. Cl.² E21B *43/24, 43/26*
U.S. Cl. 166—259 **7 Claims**



1. A method for producing gasification products from a subterranean coal stratum comprising the sequential steps of:
a. vertically traversing the coal stratum with a first wellbore and a second wellbore;
b. hydraulically fracturing and propping the coal between the first wellbore and the second wellbore in the lower vertical portion of the coal stratum therebetween;
c. igniting the coal at a locus near the first wellbore and near the propped fracture in the presence of a free oxygen-containing gas;
d. introducing through the first wellbore a free oxygen-containing gas to the ignited locus of the coal to effect gasification of the coal and propagate a gasification zone through the coal along the fractured and propped zone between the first wellbore and the second wellbore to form a horizontally elongated combustion cavity between the first wellbore and the second wellbore with production of the gasified products of the combustion through the second wellbore;
e. positioning conventional explosives in the coal laterally adjacent to the horizontally elongated cavity and at least partially above the horizontal axis of the horizontally elongated cavity such that energy generated upon detonation of the explosives extends into the cavity;
f. detonating the explosives thereby causing the coal above and to the sides of the horizontally elongated cavity to be fragmented and to collapse into the cavity, thus creating a horizontally elongated rubblized zone of coal of relatively high permeability and porosity;
g. introducing a free oxygen-containing gas to the horizontally elongated rubblized zone by way of the first wellbore to combust the rubblized coal, with production of gasified production products through the second wellbore.

4,109,720
COMBINATION SOLVENT-NONCONDENSIBLE GAS INJECTION METHOD FOR RECOVERING PETROLEUM FROM VISCOUS PETROLEUM-CONTAINING FORMATIONS INCLUDING TAR SAND DEPOSITS

Joseph C. Allen, Bellaire, Tex., and David A. Redford, Fort Saskatchewan, Canada, assignors to Texaco Inc., New York, N.Y. and Texaco Exploration Canada, Ltd., Calgary, Canada
Continuation-in-part of Ser. No. 406,409, Oct. 15, 1973, abandoned. This application Nov. 9, 1976, Ser. No. 740,281
Int. Cl.^{2} E21B *43/22, 43/24*

U.S. Cl. 166—269 **39 Claims**

20. A method for recovering petroleum including bitumen from a subterranean, viscous petroleum-containing formation including a tar sand deposit penetrated by at least one injection well and by at least one production well, said wells being in fluid communication with the formation, comprising:

a. injecting a solvent for the formation petroleum into the formation, the solvent being entirely in the liquid phase at formation temperature and pressure, and
b. injecting a gas into the formation, which is entirely in the gaseous phase at the temperature and pressure of the formation, wherein
c. the ratio of noncondensible gas to solvent is from about 0.5 to about 35 standard cubic feet of gas per gallon of solvent, and
d. the ratio of gas to solvent is initially at or near the maximum value of the stated range and is decreased with time.

4,109,721
METHOD OF PROPPANT PLACEMENT IN HYDRAULIC FRACTURING TREATMENT

Marion L. Slusser, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 12, 1977, Ser. No. 832,699
Int. Cl.^{2} E21B *43/26*

U.S. Cl. 166—280 **8 Claims**

5. In a method of hydraulically fracturing a subterranean formation penetrated by a well wherein said formation has previously been treated to form a vertical fracture therein and a proppant pack deposited in the lower portion thereof, the improvement comprising:

(a) injecting via said well into said formation a slug of liquid containing fluid loss additives to deposit said fluid loss additives along the upper surface of said proppant pack and seal said upper surface of said proppant pack; and
(b) injecting via said well into said formation a high fluid loss fracturing fluid having proppants suspended therein at a pressure and in an amount sufficient to extend said fracture further into said formation and prop said extended portion of said fracture.

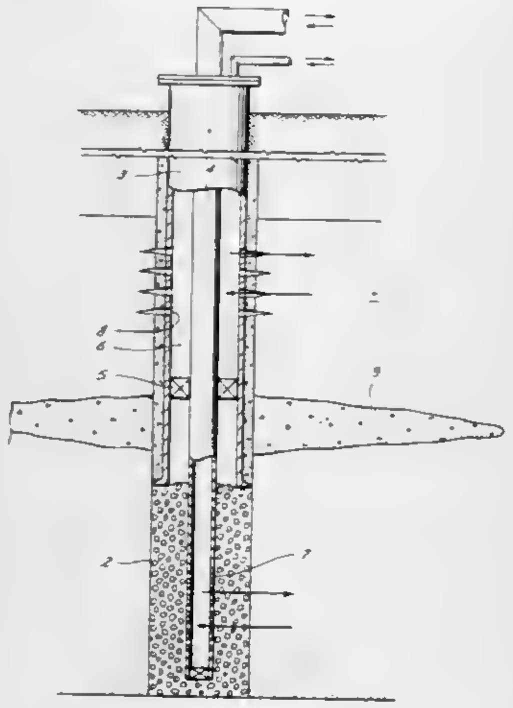
4,109,722
THERMAL OIL RECOVERY METHOD

Richard H. Widmyer, and Jack H. Park, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Apr. 28, 1977, Ser. No. 791,802
Int. Cl.^{2} E21B *43/24*

U.S. Cl. 166—281 **12 Claims**

1. A method for recovering viscous petroleum from a subterranean, permeable, viscous petroleum-containing formation comprising:

(a) penetrating the formation with at least one well and forming a relatively impermeable barrier adjacent the well and extending outwardly from the well into the formation;
(b) establishing within the well two separate fluid flow paths from the surface of the earth, the first path being in fluid communication with at least a portion of the part of the petroleum formation above the barrier and the second flow path being in fluid communication with at least a portion of the part of the formation below the barrier;
(c) injecting a heated thermal recovery fluid comprising steam into both the upper and lower portions of the formation via both communication paths for a predetermined period of time;
(d) producing heated petroleum from both the upper and lower portions of the formation via both of the communication paths;
(e) thereafter injecting the heated thermal recovery fluid comprising steam into one portion of the formation by means of one of the fluid communication paths at a known or determinable rate and pressure;
(f) simultaneously recovering petroleum at a predetermined rate which is substantially less than the injection rate of step (e) from the other part of the formation by means of the other communication path until the pressure adjacent the production zone rises to a value which is from 50 to 90 percent of the pressure at which the thermal fluid is being injected in step (e);



(g) continuing producing petroleum until production of steam or steam condensate occurs at the zone from which petroleum production is occurring in step (f);
(h) thereafter discontinuing step (g);
(i) thereafter injecting heated thermal recovery fluid into the interval from which petroleum production was taken in step (f) at a known or determinable rate and pressure;
(j) recovering petroleum from the zone into which thermal recovery fluid was injected in step (e) at a restricted rate which is less than the injection rate of step (i) until the pressure adjacent the production zone reaches a value from 50 to 90 percent of the heated thermal recovery fluid injection pressure; and
(k) continuing producing petroleum from the formation in step (i) until steam or steam condensate is being produced with petroleum.

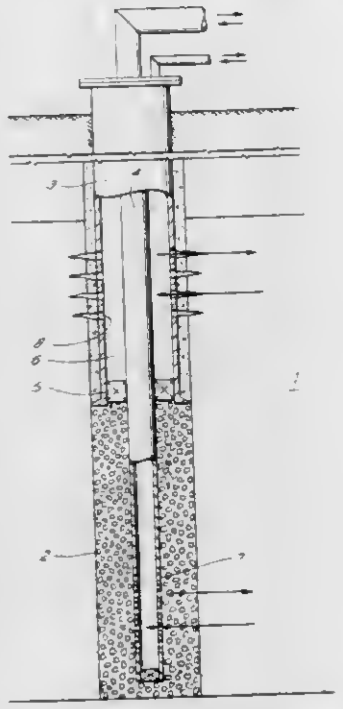
4,109,723
THERMAL OIL RECOVERY METHOD

Richard H. Widmyer, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
Filed Apr. 28, 1977, Ser. No. 791,801
Int. Cl.^{2} E21B *43/24*

U.S. Cl. 166—303 **10 Claims**

1. A method for recovering viscous petroleum from a subterranean, permeable, viscous petroleum-containing formation comprising:

(a) penetrating the formation with at least one well and establishing within the well two separate fluid flow paths from the surface of the earth, the first path being in fluid communication with at least a portion of the upper part of the oil formation and the second flow path being in fluid communication with at least a portion of the lower part of the formation;
(b) injecting a heated thermal recovery fluid comprising steam into both the upper and lower portions of the formation via both communication paths for a predetermined period of time;
(c) producing heated petroleum from both the upper and lower portions of the formation via both of the communication paths;
(d) thereafter injecting the heated thermal recovery fluid comprising steam into one portion of the formation by means of one of the fluid communication paths at a known or determinable rate and pressure;
(e) simultaneously recovering petroleum at a predetermined rate which is substantially less than the injection rate of step (d) from the other part of the formation by means of the other communication path until the pressure adjacent the production zone rises to a value which is from 50 to 90 percent of the pressure at which the thermal fluid is being injected in step (d);



(f) continuing producing petroleum and injecting steam until steam or steam condensate production occurs at the part of the formation from which petroleum is being produced in step (e);
(g) thereafter discontinuing step (f);
(h) thereafter injecting the heated thermal recovery fluid into the interval from which oil production was taken in step (e) at a known or determinable rate and pressure; and
(i) recovering petroleum from the zone into which steam was injected in step (d) at a restricted rate which is less than the injection rate of step (h) until the pressure adjacent the production zone reaches a value from 50 to 90 percent of the heated thermal recovery fluid injection pressure; and
(j) continuing producing petroleum in step (i) until steam or steam condensate is produced with petroleum.

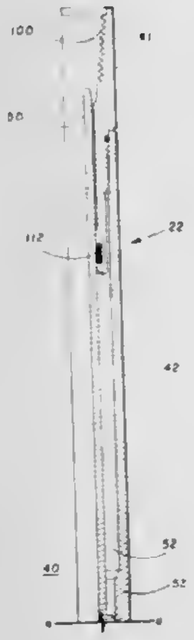
4,109,724
OIL WELL TESTING VALVE WITH LIQUID SPRING

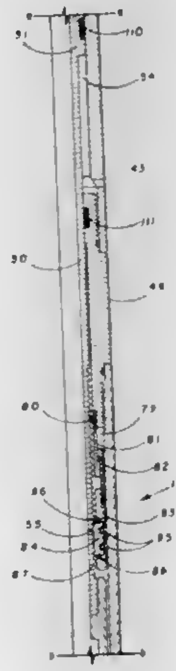
Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Oct. 27, 1977, Ser. No. 846,075
Int. Cl.^{2} E21B *43/12*

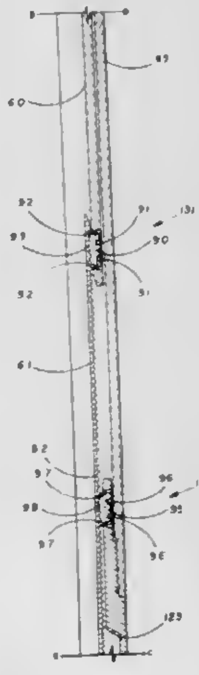
U.S. Cl. 166—315 **15 Claims**

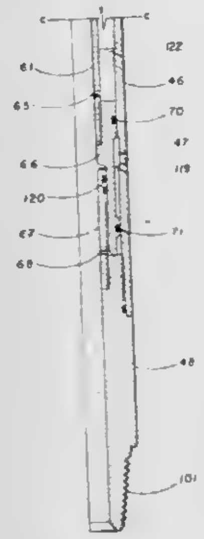
1. A valve apparatus for use in an oil well having pressure and temperature gradients from the surface to a formation intersected by the well bore comprising:

a housing having a power port through the walls thereof and









a central bore longitudinally therethrough;
a power mandrel assembly in said central bore and arranged

in said housing for forming a sealed chamber between said housing and said power mandrel assembly;

a power piston dividing said chamber and exposed to pressure in said chamber on one side and the well bore pressure transmitted through said power port on the other side;

compressible liquid in said sealed chamber for providing operating spring force to said power piston, the volume of said liquid changeable with the pressure and temperature gradients as the apparatus is lowered into a well bore;

first means between said housing and said power mandrel assembly for allowing the volume of said compressible liquid to change as the apparatus is lowered into said well bore; and

valve operating means in said first means and operably connected to said power mandrel assembly for operating a valve in the oil well responsive to pressure changes in the well annulus after said apparatus has been lowered into said well bore.

7. A method of operating a valve apparatus in an oil well having temperature and pressure gradients from the surface to a formation intersected by a well bore comprising:

providing the apparatus with a compressible liquid whose volume is changeable with the pressure and temperature gradients from the surface to the well formation;

subjecting the liquid to a piston exposed on one side to the liquid and on the other side to the pressure external from the valve apparatus;

lowering the apparatus into a well bore;

allowing the piston to move with a change in the volume of the liquid as the apparatus is lowered into the well bore;

after the apparatus has reached a desired depth, exerting a pressure increase on fluid in the well bore;

moving said piston and compressing said liquid responsive to said pressure increase;

transferring movement of said piston responsive to the pressure increase to means for operating a valve in the well bore.

4,109,725

SELF ADJUSTING LIQUID SPRING OPERATING APPARATUS AND METHOD FOR USE IN AN OIL WELL VALVE

Jim R. Williamson, Carrollton, Tex., and Floyd A. Gonzalez, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 27, 1977, Ser. No. 846,076

Int. Cl.² E21B *43/12*

U.S. Cl. 166—315 **8 Claims**

1. An oil well valve operating apparatus containing a volume of compressible liquid comprising:

a housing having a chamber in the walls thereof for containing said compressible liquid volume;

piston means dividing the liquid filled chamber and arranged to move responsive to a pressure differential across said piston means;

metering means through said piston means for relieving a pressure differential across said piston means at a metered rate;

spring means arranged to work in conjunction with said piston means for returning said piston means to a predetermined position as a pressure differential is metered through said piston means by said metering means;

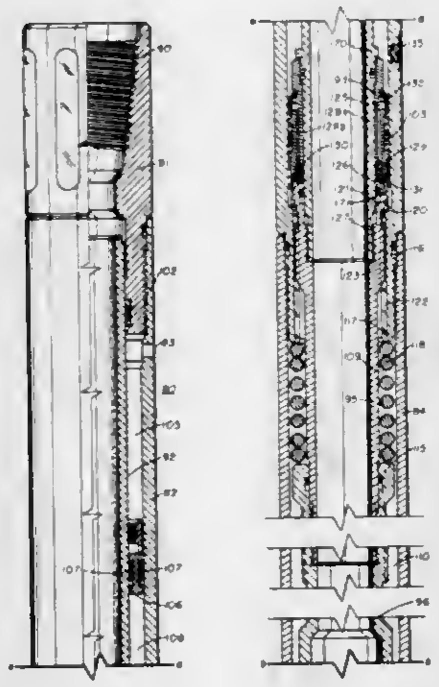
pressure transmitting means for transmitting pressure to one end of said liquid chamber responsive to the well annulus pressure; and

a power mandrel connected to said piston means for transmitting movement of said piston means to a valve which is activated by movement of said power mandrel responsive to a pressure change in the well annulus, which pressure change is imparted to the well annulus faster than the pressure change is relievable by said metering means.

8. A method of operating a valve in an oil well comprising:

providing a volume of compressible liquid in a chamber in an oil well apparatus;

dividing the compressible oil chamber with a piston having a metering means therethrough;



urging the piston in a first longitudinal direction to an initial position with a spring means;

transmitting pressure exterior of the apparatus to one side of the piston;

lowering the apparatus into the oil well to a predetermined depth;

metering changes in pressure and volume of the compressible oil through said metering means from one side of the piston to the other side;

changing the pressure in the well bore exterior of the apparatus at a rate faster than relievable by said metering means;

moving the piston in a second longitudinal direction against said spring means responsive to the pressure differential across said piston;

metering compressible oil through said metering means and moving said piston by said spring means in the first longitudinal direction back to its initial position; and

responsive to said motions of said piston, activating a valve in said oil well.

4,109,726

GAS FIRE EXTINGUISHING SYSTEM

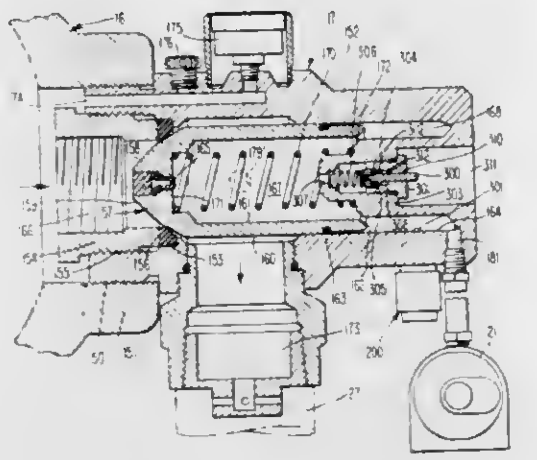
Arne Hansen, New City, N.Y., and George Troup, Hatboro, Pa., assignors to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 717,279, Aug. 24, 1976, Pat. No. 4,073,464. This application Sep. 26, 1977, Ser. No. 836,575

The portion of the term of this patent subsequent to Feb. 14, 1978, has been disclaimed.

Int. Cl.² A62C *35/00*

U.S. Cl. 169—11 **2 Claims**



1. In a fire extinguishing system of the fluid distribution type, comprising at least one container of fire extinguishing fluid, a container valve connected to said container for controlling discharge of fluid therefrom, a first fluid conduit line connecting said container valve to a plurality of line valves, second fluid conduit lines connecting the line valves to gas dissemination points located in zones to be protected, sensing devices located in said zones for sensing a predetermined phenomenon in any of said zones and operating an actuator associated with said container valve for opening thereof and delivery of fluid to said first fluid conduit line, and second sensing devices located in the zones to be protected and operatively connected to respectively associated line valves for opening respectively associated said line valves in response to one or more second phenomenon sensing devices for delivery of fluid from the first fluid conduit line through associated said second fluid conduit lines in response to a predetermined phenomena level in associated said zones, and including means for maintaining said container valve in open condition after actuation thereof for continued flow of fluid therethrough irrespective of de-actuation of the actuator associated with said container valve, wherein said means for maintaining said container valve in open condition comprises a vent valve carried by the valve housing, and located for automatic actuation by a container valve piston in said container valve upon initial opening of the container valve by movement of the container valve by movement of the piston off its valve seat, an improvement wherein the vent valve comprises a plunger extending partially into the path of said piston for operative engagement by said piston upon its movement off its valve seat for outward movement of said plunger, said vent valve being automatically openable by said movement of said plunger

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4,109,727

DUAL-SEAL SPRINKLER SYSTEM

Eduard J. Job, Schimmelmannstrasse 25, 2070 Ahrensburg b., Hamburg, Germany

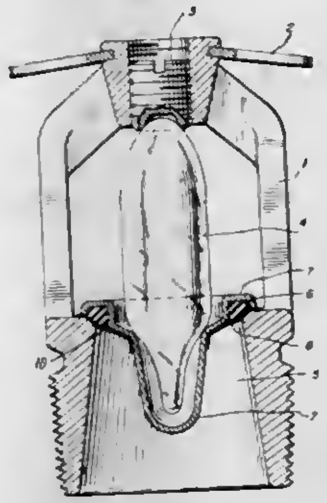
Filed Aug. 30, 1976, Ser. No. 718,401

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1975, 2539703

Int. Cl.² A62C *37/14*

U.S. Cl. 169—41 **7 Claims**

1. In a sprinkler comprising a frame formed at one portion with a fluid passage terminating at an annular seat, a closure disposed across said passage adjacent said seat, an annular seal having a pressure-impacted side and another side exposed to ambient pressure and being disposed between said closure and said seat, and means disposed between another portion of said frame and said closure so as to hold said closure with said seal when said means is at ambient temperature and adapted to release said closure and said seal when said means is at elevated temperature, an improvement wherein said seal comprises a sealing membrane of deformable sheet-like film material and having its periphery lying against said seat and also having an annular portion adjacent the periphery trasversing a portion of the passage and lying against the closure, and a compressibly



elastic sealing ring disposed between a portion of said closure and the periphery of said sealing membrane, the closure bearing against said elastic sealing ring which resiliently presses the periphery of said annular sealing membrane against said seat to require the film material of the membrane to conform to the contour of the seat and seal thereagainst, said sealing membrane forming the pressure-impacted side of the seal and the annular portion of the membrane also traversing the elastic sealing ring and isolating the ring from the passage and the fluid therein.

4,109,728

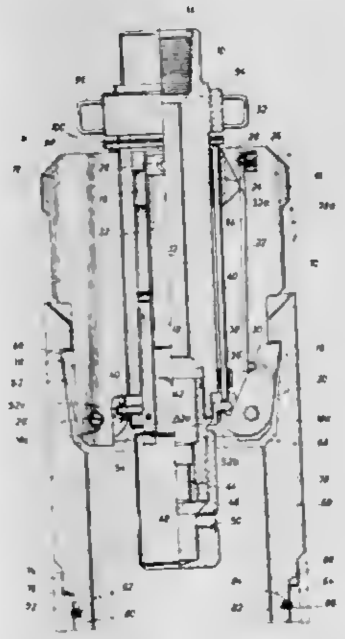
APPARATUS AND METHOD FOR PROTECTING WELL BORE

Lawrence Sanford, 4047 Hollister, Houston, Tex. 77055

Filed Mar. 18, 1977, Ser. No. 778,956

Int. Cl.² E21B *23/00, 23/04*

U.S. Cl. 166—315 **29 Claims**



1. Apparatus for protecting a bore section formed by a well head assembly defining a generally upwardly facing landing therein, said protecting apparatus comprising:

a tubular bore protector body having external shoulder means for seating on said landing and being configured to be disposed at least partially within and lining said bore section when said shoulder means is seated on said landing, said tubular body having an external annular groove therein, and said protecting apparatus further comprising a generally annular elastomeric body disposed in said groove and lock means comprised of substantially incompressible material disposed at least partially in said groove radially outwardly of said elastomeric body and having engagement surfaces lockingly engageable with the interior of said well head assembly, said engagement surfaces being configured to permit translation of upward forces on said tubular body to radially inward forces on said lock means, and said elastomeric body being operative to resist radially inward movement of said lock means in the presence of upward forces on said tubular body below a given magnitude but yieldable to permit radially inward movement of said lock means responsive to upward forces on said tubular body greater than or equal to said given magnitude.

24. A method of protecting a bore section in a well head assembly comprising the steps of:

inserting a running in tool into a tubular body, said body having internal latch engaging formations;
engaging laterally extendable latch means on said tool with said latch engaging formations to suspend said tubular body from said tool;
lowering said tool and said tubular body into said well head assembly;
seating said tubular body in said well head assembly;
landing a plug member on a plug seat in a tubular piston member in said tool;
laterally retracting said latch means from said latch engaging formations by exerting fluid pressure on said piston member;
raising said tool out of said tubular body.

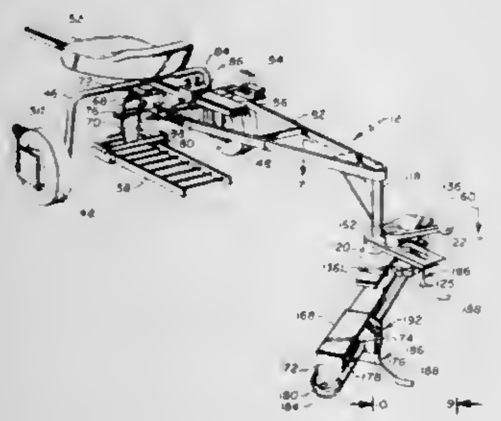
4,109,729
DEVICE AND METHOD FOR DIVERTING ROLLS OF SOD DELIVERED FROM CONVENTIONAL SOD CUTTING APPARATUS

William C. Kaercher, Jr., 3615 Zenith Ave. N., Minneapolis, Minn. 55422

Filed Mar. 9, 1976, Ser. No. 665,211

Int. Cl.² A01B *45/04, 49/04*

U.S. Cl. 172—1 **15 Claims**



2. A device for diverting sod rolls successively discharged from sod cutting apparatus when transversing a field of turf comprising a roller, means mounting said roller at an acute angle with respect to the direction of travel across the field, ground engaging means attached to said mounting means for elevating said roller above the ground, said mounting means being adjustable through an angular range sufficient to change the more forwardly disposed end of the roller to a more rearwardly disposed position and the more rearwardly disposed end of the roller to a more forwardly disposed position so that various roller angles can be achieved in order to divert sod rolls either to the left or to the right, and stop means for determining the more forwardly and rearwardly disposed end positions of the roller, said angle maintaining means including upper and lower tubular members, a horizontal plate element affixed to the lower end of said upper tube, a horizontal plate element affixed to the upper end of said lower tube, and means for clamping said plate elements in various angular relationships to maintain said roller in any of a number of selected angles, whereby the more forwardly disposed end of said roller successively engages one end of each sod roll, causing each of said rolls to be shifted into an angle corresponding to that of said roller and move relatively along said roller to a location beyond its other or more rearwardly disposed end.

12. A method of diverting sod rolls successively discharged from sod cutting apparatus when traversing a field of turf comprising the steps of engaging each roll of sod as it is discharged from the sod cutting apparatus, shifting each roll from its discharged position in which it resides transversely with respect to the direction of travel across the field into an angular position and causing each roll to roll while in its angular position to one side of the path traversed by the sod cutting apparatus.

4,109,730
SOIL TILLING MACHINES

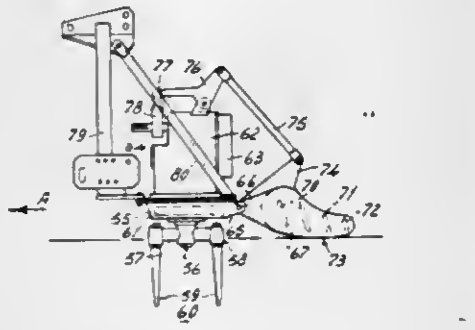
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Oct. 6, 1976, Ser. No. 730,258

Claims priority, application Netherlands, Oct. 8, 1975, 7511788

Int. Cl.² A01B *27/00, 35/18, 33/08*

U.S. Cl. 172—54 **12 Claims**



1. A rotary harrow comprising a number of soil working members arranged in a row and mounted on a transverse frame portion, said members having tines that are rotatable about upwardly extending shafts, an elongated soil tilling member positioned to the rear of said row of soil working members and extending substantially throughout the working width of said row of soil working members, said soil tilling member comprising a support and at least one elongated element that extends substantially horizontal and transverse to the normal direction of travel of the machine, said tilling member being pivoted to the said frame, driving means being connected to rotate said soil working members, and said driving means comprising eccentric means that is connected to rock said tilling member about a substantially horizontal pivot axis during operation, said support together with element being moved upwardly and downwardly to repeatedly contact and crumble the upper surface of the ground worked by said members.

4,109,731
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Jul. 21, 1976, Ser. No. 707,346

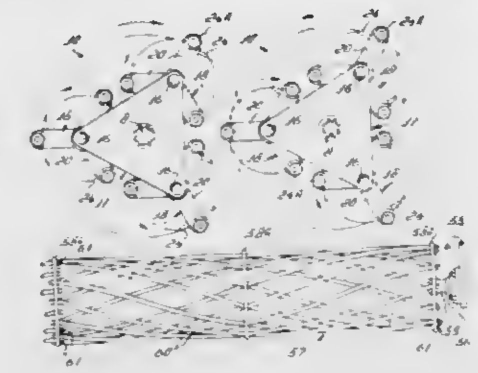
Claims priority, application Netherlands, Jul. 24, 1975, 7508821

Int. Cl.² A01B *33/06, 49/02, 27/00*

U.S. Cl. 172—59 **15 Claims**

1. A soil cultivating implement comprising a frame and a plurality of soil working members supported on said frame,

said members being rotatable about upwardly extending axes and driving means connected to rotate neighboring members in relative opposite directions, said members each comprising arm means and arms of said arm means including at least one cultivating tool with soil working means that is freely rotatable about a respective upwardly extending axis and spaced therefrom, the rotating paths of the tools of neighboring members overlapping to work a continuous strip of soil, a roller attached to said frame and positioned to the rear of said soil working members, soil engaging means on said roller that engages broken soil worked by said soil working members during operation, said engaging means displacing the soil into different directions from a location in register with a vertical plane that passes substantially midway between the axes of rotation of two adjacent soil working members and in a direction parallel to the direction of implement travel, said soil engaging means comprising a number of rod-like elements, which define a soil contacting periphery of said roller, said elements having bends located between opposite ends thereof and said bends positioned in substantial register with adjacent path regions that are worked by neighboring soil working members when viewed in the direction of implement travel, said elements being supported on spaced apart supporting members and at least one of said supporting members being located adjacent said bends.



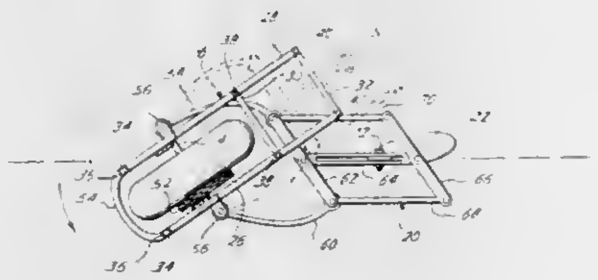
4,109,732
SOIL TILLING APPARATUS WITH PIVOTAL DRAW FRAME

Jesse F. Wright, Rte. 5, Box 284-X, Lufkin, Tex. 75901

Filed May 2, 1977, Ser. No. 792,927

Int. Cl.² B62D *51/06;* A01B *69/00*

U.S. Cl. 172—258 **4 Claims**



1. A soil tilling apparatus, comprising

a traction wheel having an axle,
a traction frame supported from said traction wheel,
an engine mounted on said traction frame,
means connecting said engine to drive said traction wheel,
a draw frame including a longitudinally extending axis therethrough,
a pair of first hinges, each of which is mounted at one end of said axle,
a first arm and a second arm, each of which is pivotally mounted at one end thereof to one of said first hinges,
a pair of second hinges, each of which is mounted to the other end of one of said first and second arms,
a parallelogram linkage mounted on said pair of second hinges and pivotally connected thereby to said first and second arms,
one link of said parallelogram linkage extending between said pair of second hinges,
a second link of said parallelogram linkage opposite to said one link,
said draw frame pivotally connected to said one link and said second link and extending therebetween, said longitudinal axis of said draw frame continuing to point toward said traction wheel as said draw frame pivots with respect to said traction frame.

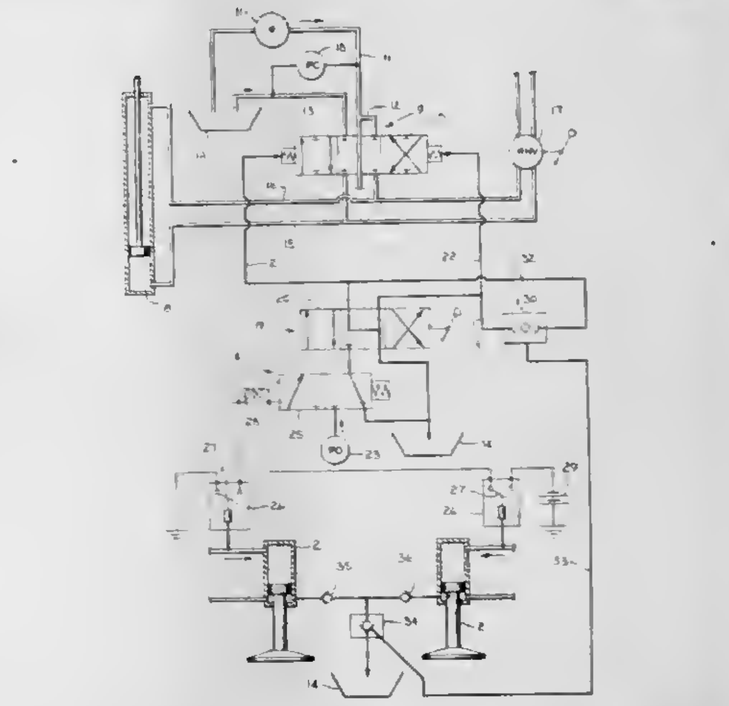
4,109,733
TILT PREVENTING SYSTEM FOR DRILLS

Robert E. Dummer, Milwaukee, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 29, 1977, Ser. No. 828,746

Int. Cl.² B23Q *5/027;* E21C *11/02*

U.S. Cl. 173—4 **5 Claims**



1. In a tilt control for a drilling machine having hydraulic supporting jacks for the machine, a hydraulic drill feed motor, and a source of pressurized fluid, the combination comprising:

(a) a feed control valve between said source of pressurized fluid and said drill feed motor having one position for admitting fluid to said drill feed motor, and having a second position for isolating said drill feed motor from said fluid source with fluid entrapped within the motor;
(b) a control circuit for said feed control valve that sets the valve in a selected one of its positions, and
(c) pressure responsive means in pressure sensing connection with said hydraulic jacks that is joined in said control circuit to shift said feed control valve to its second position in response to a pressure change within said hydraulic jacks.

4,109,734
PERCUSSION MACHINE

Roger Montabert, 19 avenue des Colonnes, Bron (Rhone), France

Filed Nov. 3, 1976, Ser. No. 738,455

Claims priority, application France, Nov. 4, 1975, 75 34373

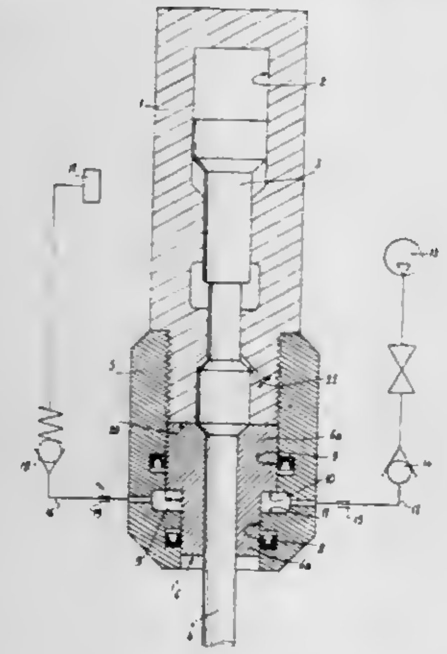
Int. Cl.² B25D *9/00*

U.S. Cl. 173—114 **8 Claims**

1. A percussion machine comprising:

a solid housing body forming a cylinder;

a double-acting piston reciprocatable in said cylinder and forming a striking mass;
a tool aligned with and receiving impact from said striking mass;
means for retaining said tool on said body, said retaining means including:
  a casing fixed to said body and forming a further cylinder;
  a further piston surrounding said tool and slidable with said tool and relative thereto in said casing; and
  an annular chamber defined within said casing between a face of said further piston turned away from said striking mass and a confronting face of said casing;
a source of an incompressible fluid under pressure connected to said chamber;

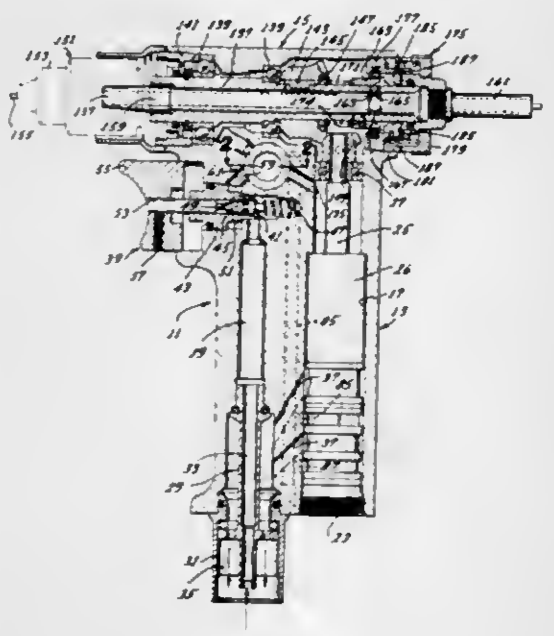


a check valve between said source and said chamber;
a reservoir connected to said chamber; and
a pressure-relief valve connected between said chamber and said reservoir, said further cylinder being coaxial with said tool and formed with a portion of large cross-section on a side of said casing turned toward said piston and a portion of small cross-section on a side of said casing turned away from said piston, said face of said casing being disposed between said portions, said further piston being stepped and having large and small cross-section portions respectively slidable in corresponding portions of said further cylinder and separated by said face of said further piston.

4,109,735
ROTARY SURGICAL DRIVER

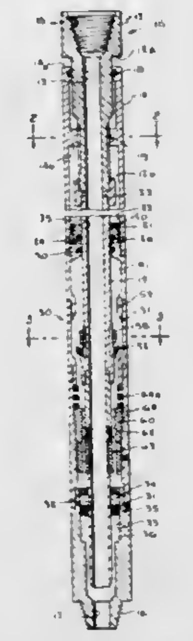
John H. Bent, Carpenteria, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 541,197, Jan. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 366,316, Jun. 4, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,784
Int. Cl.^{2} A61B *17/18*
U.S. Cl. 173—163 **5 Claims**

1. A driver for driving a surgical tool comprising:
a hand piece adapted to be held in the hand of a surgeon;
a barrel coupled to the hand piece and supporting a rotatable hollow shaft having a passage extending therethrough, the axis of said passage being generally transverse to the hand piece;
a reversible air motor mounted within said hand piece;
a drive shaft in said hand piece rotatably driven by said motor;
means interconnecting the drive shaft in driving relation to the hollow shaft;
said hollow shaft being adapted to receive and drive a surgical tool;
conduit means including first and second conduit sections for supplying air to the air motor to drive the air motor, the supply of air through the first conduit section to the air motor driving the air motor in a first direction and the supply of air through the second conduit section to the air motor driving the air motor in a second direction;
a reversing valve mounted on the hand piece, said reversing valve including a valve body having an inlet port connectible to air at supply pressure and an exhaust port for exhausting air at a pressure less than supply pressure;
said reversing valve providing a passage between supply air and said first conduit section in a first position and between supply air and said second conduit section in a second position, a valve element including an outer member and an inner member spaced from each other along at least a portion of the peripheries thereof to define an opening, said passage including said opening;
a chamber into which all of said ports and conduits open;
a sleeve fixed in said chamber of said valve body and having air passage means therein;
said valve element mounted for axial movement in said sleeve between said first position in which the valve element ports air from the inlet port to said first conduit section and from said second conduit section to said exhaust port and said second position in which the valve element ports air from the inlet port to said second conduit section and from said first conduit section to said exhaust port whereby the motor can be reversed by moving said valve element from one of said positions to the other of said positions;
said valve element being manually slidably movable between said positions thereof;
said valve element having first surface means against which air substantially at supply pressure can act when the valve element is in said first position to tend to hold the valve element in said first position;
said valve element having second surface means against which air substantially at supply pressure can act when the valve element is in said second position to tend to hold the valve element in said second position;
means in said hand piece to control the flow of air to said reversing valve;
detent means cooperating with said hollow member to receive and hold the shaft of a surgical tool; and
means located to the rear of said hollow member and cooperating with said detent to effect locking and release of the tool assembled to said driver.



4,109,736
DOUBLE ACTING JAR

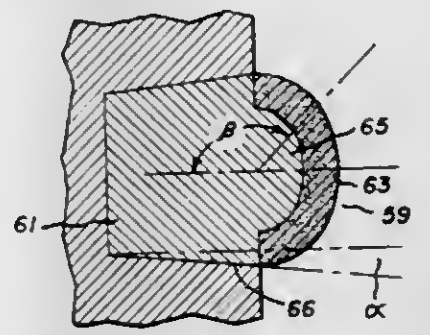
Derrel D. Webb, 802 Axilda, Houston, Tex. 77017, and Edwin A. Anderson, 1104 Chimney Rock Rd., Houston, Tex. 77056
Continuation-in-part of Ser. No. 694,911, Jun. 11, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 782,011
Int. Cl.^{2} E21B *1/10*
U.S. Cl. 175—297 **33 Claims**



1. A hydraulic jar for incorporating in a drill string for use in a well bore comprising:
a. inner and outer telescopically arranged tubular members movable longitudinally relative to each other;
b. spaced seal means between said inner and outer tubular members forming separate first and second chambers for confining hydraulic operating fluid within each chamber;
c. jarring surfaces on said tubular members for jarring contact with each other to deliver an upward jar to the drill string;
d. longitudinally extending, annular first restriction means on one of said tubular members within the first chamber means;
e. first piston means on the other of said tubular members within the first chamber means;
f. said first piston means including fluid meter means operable when said first piston means is between the ends of said first restriction means for restraining relative longitudinal movement of said tubular members to an extended position, said fluid meter means operable after a predetermined relative longitudinal movement between said tubular members to release said tubular members for subsequent unrestrained relative longitudinal movement therebetween until said jarring surfaces engage and deliver an upward jar to the drill string;
g. additional jarring surfaces on said tubular members for jarring contact with each other to deliver a downward jar to the well string;
h. longitudinally extending, annular second restriction means on one of said tubular members spaced from said first restriction means within the first chamber means;
i. second piston means on the other of said tubular member within the second chamber means; and
j. said second piston means including fluid meter means operable when said second piston means is between the ends of said second restriction means for restraining relative longitudinal movement of said tubular members to a telescoped position, said fluid meter means operable after a predetermined relative longitudinal movement between said tubular members to release said tubular members for subsequent unrestrained relative longitudinal movement therebetween until said additional jarring surfaces engage and deliver a downward jar to the drill string.

4,109,737
ROTARY DRILL BIT

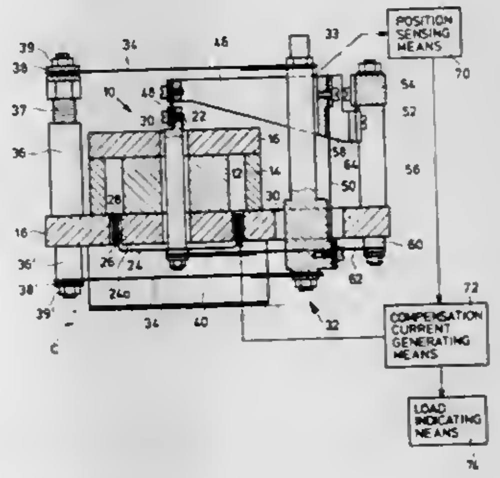
Harold P. Bovenkerk, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio
Filed Jun. 24, 1976, Ser. No. 699,411
Int. Cl.^{2} E21B *9/36*
U.S. Cl. 175—329 **56 Claims**



1. A drill bit comprising:
(a) a shaft;
(b) a crown fixed to one end of said shaft having a plurality of inwardly tapered recesses formed therein; and
(c) a plurality of cutting element, each element comprising
  (1) a tapered, integral pin having a smaller one of the two ends disposed in one of said recesses, and the tapers of said pin and said one recess sized such that said pin is in a state of radial compression and is retained in said one recess by a self-locking friction-fit, and
  (2) a thin polycrystalline layer of self-bonded diamond crystals directly bonded to the other end of said pin at an interface consisting of the material of said pin and said crystals.

4,109,738
WEIGHING APPARATUS INCLUDING LEVER-CONNECTED COMPENSATION COIL MEANS

Peter Kunz, Tann-Ruti, Switzerland, assignor to Mettler Instrument AG, Greifensee, Switzerland
Filed Feb. 8, 1977, Ser. No. 766,760
Claims priority, application Switzerland, Apr. 1, 1976, 4054/76; Apr. 1, 1976, 4055/76
Int. Cl.^{2} G01G *7/00, 1/18*
U.S. Cl. 177—212 **17 Claims**



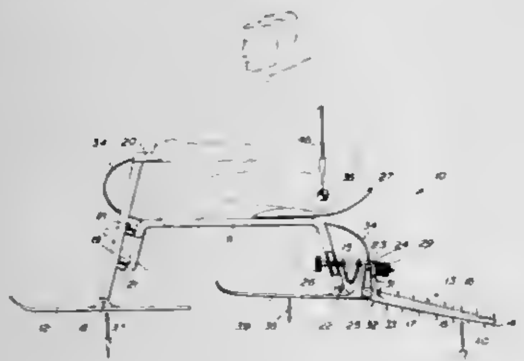
1. In a weighing apparatus of the electromagnetic load compensation type including stationary pot-type permanent magnet means containing at one end an annular air gap, a pan carrier member connected for vertical displacement relative to said permanent magnet means, an annular compensation coil concentrically arranged for coaxial displacement within said air gap, means connecting said compensation coil with said pan carrier member, and means operable when said pan carrier member is displaced from a normal no-load position relative to said coil to generate an electromagnetic force for returning the

pan carrier member to its no-load position; the improvement wherein said means connecting said compensation coil with said pan carrier member comprises

(a) coil carrier means connected with said compensation coil;
(b) a horizontal lever connected at one end with said coil carrier means;
(c) means including first bearing means connecting said lever with said permanent magnet means;
(d) means including second bearing means connecting said pan carrier member with said lever; and
(e) spacer means for adjusting the position of at least one of said bearing means longitudinally of said lever, thereby to adjust the effective operating length of said lever.

4,109,739
POWER DRIVEN SKI-BOB

Royce Hill Husted, Wheaton, Ill., assignor to Saroy Engineering, Wheaton, Ill.
Filed Jan. 6, 1977, Ser. No. 757,457
Int. Cl.² B62M *27/00*
U.S. Cl. 180—5 R **1 Claim**

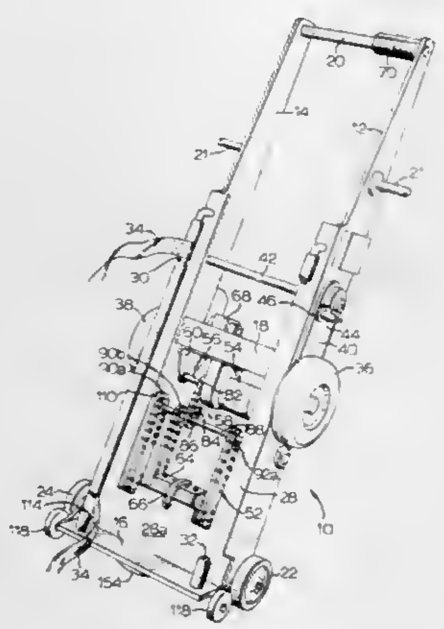


1. A power driven ski-bob having a frame supported by a front steerable ski and a rear power driven ski sub-assembly, said sub-assembly having an anterior ski portion and a posterior tread carrying portion and being pivoted to the frame, the improvement wherein spring means, supported between said frame and said sub-assembly, are located and arranged so as to forcibly bias said posterior portion downwards and said anterior portion upwards in order to improve traction and bias load to the front steerable ski, thereby also improving steerability of said ski-bob.

4,109,740
STAIR CLIMBING DEVICE

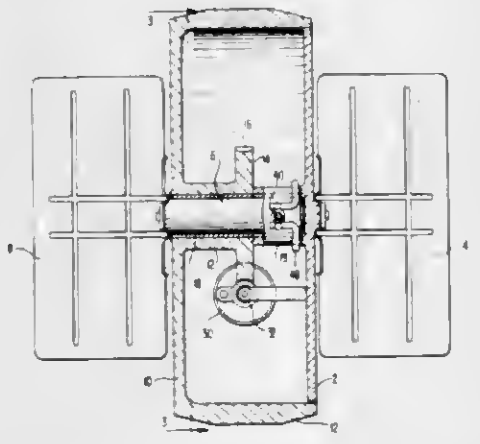
Roman Andruchiw, Willowdale, Canada, assignor to Step-Rite Limited, Willowdale, Canada
Continuation-in-part of Ser. No. 686,270, May 14, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,290
Claims priority, application Canada, May 22, 1975, 227504
Int. Cl.² B62B *5/02*
U.S. Cl. 180—8 A **12 Claims**

1. A stair-climbing device comprising: a frame; wheel means rotatably mounted to support said frame; a prime mover; means operatively connected to the prime mover for engaging successive steps in a flight of steps to produce displacement of the device along the flight of steps; and arm means pivotally connected to the frame and having a downwardly extending sensing head disposed forward of the wheel means, said sensing head, as the wheel means rolls forward on a tread of a step toward the forward edge thereof, being adapted to contact said tread until said sensing head is beyond said forward edge whereuon said sensing head descends with resulting pivotal movement of said arm means, said arm means further having a downwardly facing friction surface disposed to the rear of said sensing head, said surface being spaced above said tread when said sensing head is in contact therewith and descending into contact with said tread upon said pivotal arm movement to frictionally retard further forward movement of said wheel means.



4,109,741
MOTORIZED UNICYCLE WHEEL

Charles L. Gabriel, P.O. Box 346, Mims, Fla. 32754
Filed Jul. 29, 1977, Ser. No. 820,377
Int. Cl.² B62K *1/00;* **B62M** *7/12*
U.S. Cl. 180—21 **3 Claims**

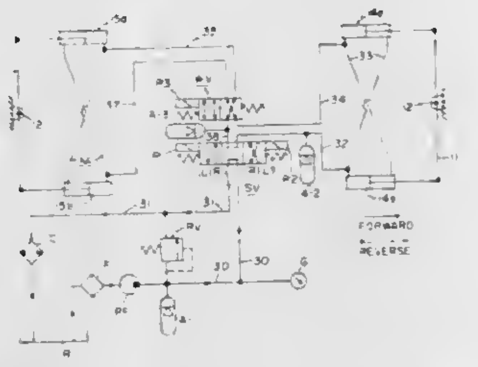


1. A power operated unicycle wheel, comprising a fixed member, foot supporting pedals mounted on the fixed member for angular rocking movement with the fixed member, a rotatable member comprising a cup shaped body rotatably mounted on the fixed member and forming a hollow body therewith, power operated means within the hollow body connected to the rotatable member to cause rotation thereof, and means controlled by rocking movement of the foot pedals for energizing the power operated means and controlling the direction and speed of rotation thereof.

4,109,742
STEERING AND WIDTH CONTROLS FOR EXPANDABLE TANDEM ROLLERS

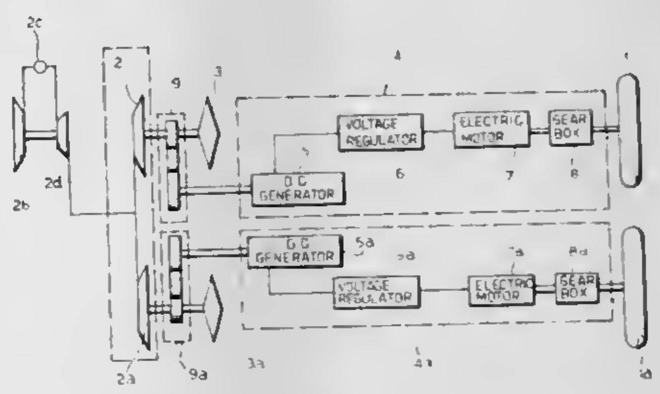
Louis F. Fairchild, Cedar Rapids, and Robert R. Brecht, Keystone, both of Iowa, assignors to Iowa Manufacturing Company, Cedar Rapids Iowa
Filed Feb. 24, 1977, Ser. No. 771,437
Int. Cl.² B62D *57/00*
U.S. Cl. 180—20 **10 Claims**

1. In a self-propelled road machine having a body and a pair of rollers disposed at spaced locations longitudinally of the body, each roller being articulated about an upright axis with respect to the body for dirigible movement and providing a substantially continuous ground engaging surface laterally of the machine, at least one of the rollers being driven for propulsion of the machine in either of two opposite directions along a road, and hydraulic circuit means to provide said dirigible movement both for lateral steering of the machine and for selectively adjusting the two rollers between tandem and echelon positions with respect to each other during travel of the machine along the road in either of said directions, said means including first and second hydraulic means operatively associated with respective ones of the rollers to provide said dirigible movement and a source providing flow of hydraulic fluid under pressure, the improvement in said hydraulic circuit means comprising: first valve means; first conduit means interconnecting said source and the first valve means for supply of presurized hydraulic fluid to the first valve means; second conduit means interconnecting the first valve means and the first hydraulic means; second valve means; third conduit means interconnecting the first hydraulic means and the second valve means; fourth conduit means interconnecting the second valve means and the second hydraulic means; fifth conduit means interconnecting the second hydraulic means and the second valve means; sixth conduit means interconnecting the first and second valve means; the first valve means selectively providing either an interconnection of the first conduit means with the second conduit means for circulating presurized hydraulic fluid from the first valve means serially to the first hydraulic means, the second valve means, the second hydraulic means, the second valve means and back to the first valve means effective to provide for dirigible movement of the two rollers in opposite directions about said axes for steering of the machine in one lateral direction, or alternately an interconnection of the first valve means with the sixth conduit means for circulating presurized hydraulic fluid from the first valve means serially to the second valve means, the second hydraulic means, the second valve means, the first hydraulic means and back to the first valve means effective to provide for dirigible movement of the two rollers in opposite directions about said axes for steering of the machine in the other lateral direction; the second valve means selectively providing either an interconnection of the third with the fifth conduit means and the fourth with the sixth conduit means or alternately an interconnection of the third with the fourth conduit means and the fifth with the sixth conduit means, one of said second valve means interconnections being effective substantially immediately to cause the aforesaid dirigible movements of the rollers for steering of the machine in said lateral directions when the first valve means is also providing either one of its said interconnections, the other of said second valve means interconnections being effective substantially immediately to cause dirigible movement of the two rollers in the same direction about said axes for adjustment of the rollers between tandem and echelon positions when the first valve means is also providing either one of its said interconnections, the second valve means normally providing said one of its interconnections and optionally providing said other of its interconnections.



4,109,743
PROPULSION UNIT FOR VEHICLES

Giampiero Brusaglino, Turin, and Giovanni Savonuzzi, Moncalieri (Turin), both of Italy, assignors to FIAT Societa per Azioni, Turin, Italy
Filed Feb. 9, 1977, Ser. No. 767,191
Claims priority, application Italy, Feb. 24, 1976, 67411 A/76
Int. Cl.² B60L *11/16, 11/04*
U.S. Cl. 180—65 C **4 Claims**



1. In a propulsion unit for motor vehicles comprising:
a biaxial turbine unit,
an electric generator connection to said turbine unit to be driven thereby and
an electric motor connected to at least one of the wheels of said vehicle,
a flywheel system interposed between said biaxial turbine unit and said electric generator to store kinetic energy from the rotation of said turbine unit, and
control means for controlling the excitation of the field windings of said electric generator and said electric motor, said control means comprising:
first and second control circuits each having first and second inputs thereto,
means for generating a first control signal the value of which depends on the position of the accelerator of said vehicle,
means feeding said first control signal to said first input of each of said first and second control circuits,
first and second sawtooth waveform generators producing first and second waveform signals having a descending ramp and an ascending ramp respectively, the instantaneous value of said first sawtooth waveform signal being at all times lower than the instantaneous value of said second sawtooth waveform signal,
means connecting the input of said first sawtooth waveform generator with said second input of said first control circuit, and means connecting the output of said second sawtooth waveform generator with said second input of said second control circuit,
first and second chopper circuits,
means connecting the outputs of said first and second control circuits to the inputs of said first and second chopper circuits,
means connecting the outputs of said first and second chopper circuits to the field windings of said electric generator and said electric motor respectively,
each of said control circuits producing an output pulse signal for the control of the conduction period of the associated one of said first and said second choppers commencing, in relation to the associate sawtooth waveform signal, at the instant when the sawtooth waveform signal has the same value as the signal present at said first input thereto, whereby to control the excitation of said field windings in dependence on the value of said control signal.

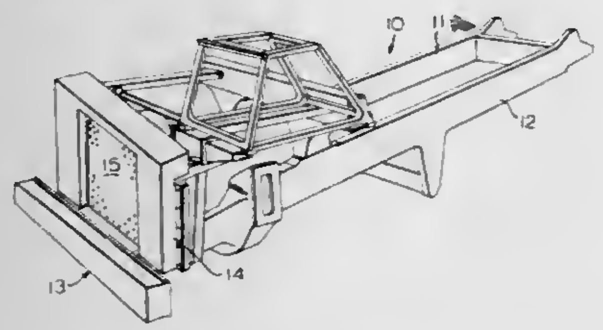
4,109,744
FLEXIBLE ENGINE COWLING FOR CONSTRUCTION VEHICLES

David T. Ping, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 1, 1977, Ser. No. 812,092

Int. Cl.^{2} B60K *11/04*

U.S. Cl. 180—68 P **8 Claims**



1. A vehicle comprising

a frame comprising a pair of laterally spaced and longitudinally extending frame members, a pair of laterally spaced and vertically extending side frame members and an upper horizontal cross frame member,

a radiator mounted on said frame,

an inverted U-shaped cowl assembly mounted adjacent to said radiator, including only a pair of laterally spaced and vertically disposed side members and a horizontally disposed upper member secured between upper ends of said side members,

means securing each of the side members to a respective one of the side frame members and the upper member of said cowl assembly to the upper cross frame member of said frame directly whereby the lower end of said cowl assembly remains in unsecured relationship with respect to said longitudinally extending frame members, and

a perforated guard assembly secured on said cowl assembly and disposed in covering relationship on a frontal side of said radiator.

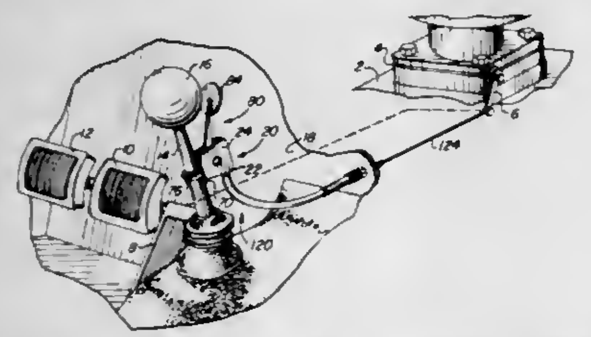
4,109,745
MANUALLY OPERATED THROTTLE CONTROL FOR FOUR WHEEL DRIVE VEHICLE

Carl J. Hveem, 3221 N. 27th St., Phoenix, Ariz. 85016

Filed Mar. 10, 1977, Ser. No. 776,239

Int. Cl.^{2} B60K *41/06*

U.S. Cl. 180—77 H **9 Claims**



1. In an automotive vehicle having an engine compartment and driver's compartment separated by a firewall, a carburetor located in the engine compartment, and a gearshift lever in the driver's compartment, throttle control apparatus for controlling the carburetor throttle, comprising, in combination:

bracket means secured to the gearshift lever and including
- a pair of plates spaced apart from each other,
- a block disposed between the plates, and
- bore means extending through the block;

lever means pivotally secured to the bracket means and including
- a first arm disposed between the plates,
- a second arm extending outwardly from the first arm and outwardly of the bracket means,
- a first aperture extending through the lever means at the juncture of the first and second arms,
- fastening means extending through the first aperture for securing the lever means to the bracket means and comprising means about which the lever means pivots with respect to the bracket means;

a cable housing extending between, and secured to, the firewall and the bore means of the bracket means;

a cable having a first end and a second end and secured at the first end to the carburetor throttle and extending through the cable housing and secured at the second end to the first arm of the lever means for controlling the throttle in response to movement of the second arm of the lever means; and

means for securing the cable to the first arm, including
- a first slot on the first arm for receiving the cable,
- a second aperture extending through the first arm and communicating with the slot, and
- a button secured to the cable and extending into the second aperture.

4,109,746
DEVICE FOR BLOCKING THE STARTING OF VEHICLE ENGINES WITH ELECTRIC STARTER

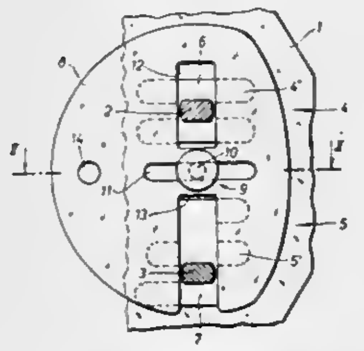
Bert Breuer, Troisdorf, Fed. Rep. of Germany, assignnr to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. nf Germany

Filed Oct. 18, 1976, Ser. No. 733,082

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546286

Int. Cl.^{2} B60K *28/00*

U.S. Cl. 180—82 A **3 Claims**



1. A vehicle engine having an electric starter, and a transmission including at least one speed range shift lever and one group shift lever and two gear shifting gates spaced from each other respectively guiding said levers and arranged along substantially the same plane, said gear shifting gates including spaced slots for said at least one speed range shift lever and said at least one group shift lever, said transmission also including neutral control slots extending in one and the same direction, and said spaced slots for said at least one speed range shift lever and said at least one group shift lever extending at a substantially right angle to said neutral control slots, in combination with a shift plate covering said two gear shifting gates and provided with slot-shaped openings for the passage therethrough of said two shift levers, said slot-shaped openings extending in the longitudinal direction of and at least over the length of said neutral control slots, journalling means about which said shift plate is pivotable in a vertical axis and comprising a fixed vertical pivot pin, means defining an oblong opening extending transverse to said slot-shaped openings also to permit shifting of said shift plate and having said pivot pin journalled therein, and electric control switch means operatively connected to said shift plate and operable in response to said shift plate moving into a first position relative to said control switch means corresponding to positioning of each of said levers in a neutral control slot to deactivate said starter.

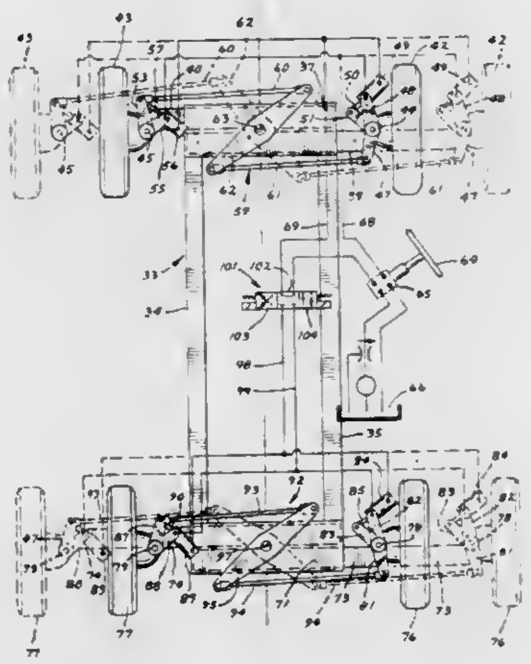
4,109,747
STEERING MECHANISM

John T. Hornagold, Arden Hills; Gary H. Beckley, Roseville, and Ram N. Rathi, New Brighton, all of Minn., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Division of Ser. No. 686,058, May 13, 1976, Pat. No. 4,079,807. This application Apr. 21, 1977, Ser. No. 789,640

Int. Cl.^{2} B62D *5/08*

U.S. Cl. 180—140 **18 Claims**



1. A steering mechanism for a vehicle of the type wherein at least one of a pair of steerable wheels is laterally extendible and retractable relative to the center line of the vehicle frame, each steerable wheel having a steering arm rotatable with the wheel for steering rotation of the wheel, said steering mechanism including:

a flexible, extendible and retractable steering linkage;

a first steering arm associated with a first of said pair of steerable wheels and oriented to extend forward and outward relative to said vehicle center line;

a second steering arm associated with the second of said pair of steerable wheels and oriented to extend rearwardly and inward relative to said vehicle center line;

said steering linkage including a first rigid steering rod pivotally connected at one end of said first steering arm, a second rigid steering rod pivotally connected at one end to said second steering arm, a pivoted link member pivotally connected to said frame, the other end of said first steering rod pivotally connected to one end of said pivot link member and the other end of said second steering rod being pivotally connected to the other end of said pivoted link member to maintain controlled spatial relationship between the outer ends of the steering arms whereby in the execution of a turn, the inside of said pair of steerable wheels turns at a sharper angle relative to the center line of said vehicle frame than the outside wheel of said pair of steerable wheels.

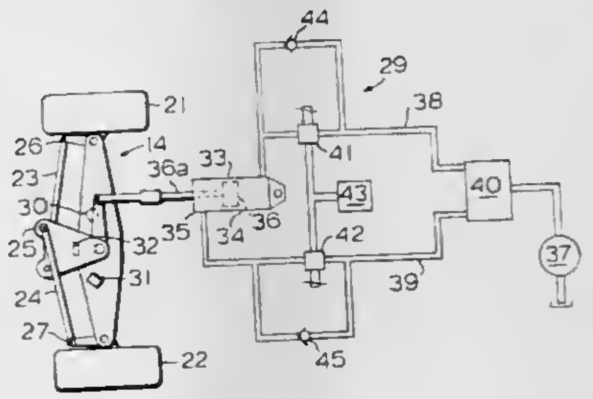
4,109,748
STEERING APPARATUS

Dafydd W. Evans, Euclid, Ohio, assignor to Tnwmotor Corporation, Mentor, Ohio

Filed Feb. 28, 1977, Ser. No. 773,104

Int. Cl.^{2} B62D *5/00*

U.S. Cl. 180—141 **12 Claims**



1. Steering override apparatus for a vehicle having a steering axle assembly movable between a first position at which the turning radius in a first direction of said vehicle is at a preselected minimum value, a second position at which the turning radius of said vehicle is infinite, and a third position at which the turning radius in a second direction of said vehicle is at a preselected minimum value, said second position being intermediate said first and third positions comprising:

means for controlling the turning radius of said vehicle in response to a predetermined operational rate by automatically restricting the movement of said steering axle assembly towards said first and third positions while leaving said steering axle assembly free for movement towards said second position, said control means including

a double acting cylinder having an actuator arm and left and right chamber portions and being pivotally connected to said steering axle assembly.

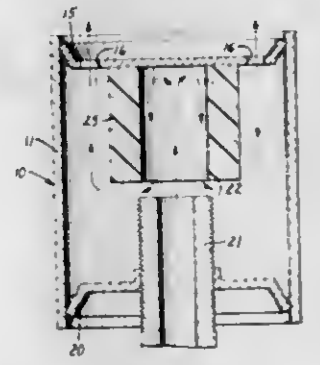
4,109,749
MUFFLER

Lawrence A. Sweet, Lakeland, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nnv. 9, 1976, Ser. No. 740,302

Int. Cl.^{2} G10K *11/04;* F01N *1/08*

U.S. Cl. 181—230 **4 Claims**



1. A muffler for a compressed air tube heater comprising a cylindrical housing, an inlet cap fixed to one end of said housing and an air inlet nipple connected to and extending through said cap, an exhaust cap fixed on the other end of said housing and having a plurality of apertures adjacent its periphery and a cylindrical muffler pad for attenuating sound therein, said muffler pad being affixed at one end to the interior of said exhaust cap such that said plurality of apertures is outside the area of said muffler pad, the path through said muffler being serpentine in that air is directed through the center of said cylindrical muffler pad onto the exhaust cap, thence returned

back along the inner periphery of said muffler pad, through a gap formed by the free edge of said muffler pad and the top edge of said air inlet nipple, thence to atmosphere along the outer periphery of said muffler pad and the interior of said muffler housing through said plurality of apertures along the peripheral edge of said exhaust cap.

4,109,750

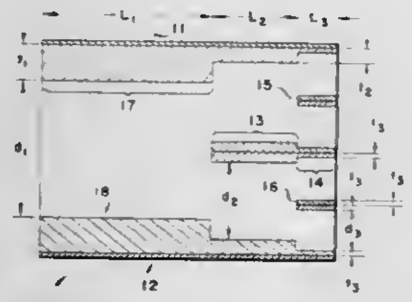
ZENO DUCT SOUND ATTENUATING MEANS

Leslie Spencer Wirt, Newhall, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 24, 1977, Ser. No. 799,953

Int. Cl.² F01N *1/04*

U.S. Cl. 181—224 **22 Claims**



1. A sound attenuating duct operable over a frequency band spanning a given intermediate frequency, comprising:

boundary means defining a fluid passage having a substantially uniform cross-sectional area of the flow path therethrough, and further having a first dimension transverse of the flow path at a first location, which first dimension is that which provides optimum sound attenuation at said given intermediate frequency, and having second and third dimensions transverse of the flow path at respective second and third locations spaced apart from said first location, said second and third dimensions differing from said first dimension so as to provide effective sound attenuation over said absorption band; and,

sound absorbing liner means on at least a portion of an interior wall of said boundary means at said first, second, and third locations, said liner means having an essentially constant acoustic resistance over said absorption band, and the ratio of the effective depth of said liner means at each of said locations to their respective transverse duct dimensions, being substantially constant.

4,109,751

NOISE SILENCER

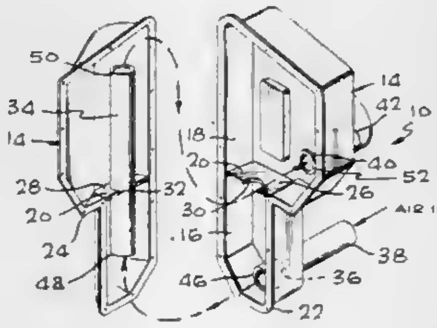
Dennis Frederick Kabele, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 26, 1976, Ser. No. 718,091

Int. Cl.² F01N *1/00;* **F02M** *35/00;* **G10K** *11/00*

U.S. Cl. 181—247 **9 Claims**

1. A silencer for use with an engine having an air intake and an exhaust comprising the combination of a first hollow pipe coupled to the air intake or the exhaust of the engine, a second hollow pipe having a length which is an even submultiple of the wavelength of noise at the lowest frequency of a range of frequencies to be attenuated, and a plurality of expansion chamber inlets and outlets coupled between the first hollow pipe and the second hollow pipe, each of the plurality of expansion chamber inlets and outlets having a length which is an even submultiple of the length of the second hollow pipe and which is different from the lengths of the other inlets and outlets.



4,109,752

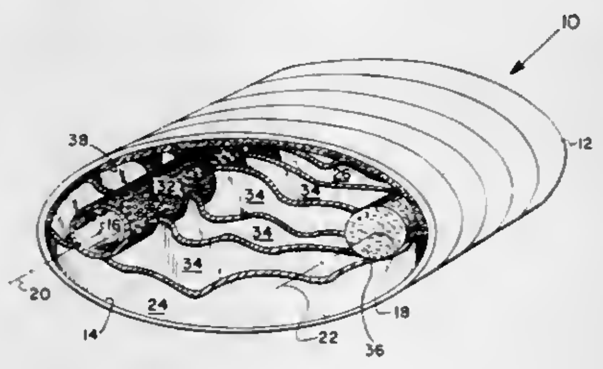
MUFFLER

Michael W. Ferralli, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jun. 22, 1976, Ser. No. 698,648

Int. Cl.² F01N *1/04, 1/00, 7/16*

U.S. Cl. 181—252 **18 Claims**



1. A muffler comprising:

(a) a tubular shell having an interior circumferential surface which is acoustically reflective and which is successive sections taken transversely through the shell has at least a portion of its circumference shaped substantially to define at least part of an ellipse;

(b) means defining a fluid inlet into the shell;

(c) means defining a fluid outlet from the shell;

(d) means defining a fluid flow path that extends lengthwise through the shell between the inlet and the outlet along a first axis; and

(e) a sound absorptive treatment disposed within the shell along a second axis extending lengthwise through the shell,

the fluid flow path being defined such that communication is afforded between the flow path and the sound absorptive treatment, the treatment being spaced from the fluid flow path and spaced from at least a portion of the interior circumferential surface of the shell, the treatment also occupying within the shell a volume that is less than the total volume enclosed by the shell minus total volumes occupied within the shell by the fluid flow path and the means defining the fluid flow path,

at least one of said first and second axes being defined by corresponding focal points of successive transverse sections taken through said portions of the circumference of the acoustically reflective shell surface, said axes being disposed relative to each other such that at least a portion of any sound emitted from fluid flowing along the flow path is reflected by said reflective shell surface to said sound absorptive treatment.

4,109,753

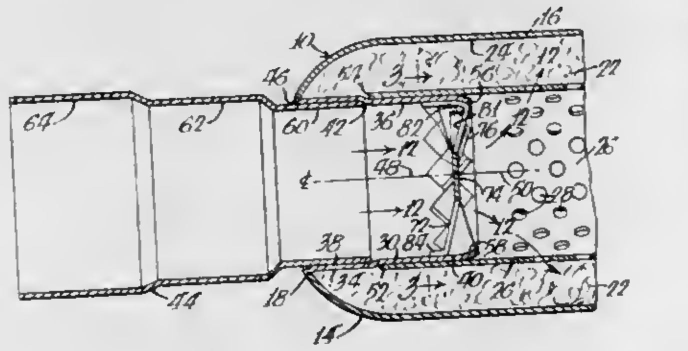
MUFFLER ASSEMBLY

Steven P. Lyman, Palos Hills, Ill., assignor to Midas-International Corporation, Chicago, Ill.

Filed Nov. 19, 1976, Ser. No. 743,136

Int. Cl.² F01N *1/10*

U.S. Cl. 181—252 **22 Claims**



1. A muffler assembly for substantially limiting the acoustical level of engine exhaust gases, comprising:

a muffler having an elongated tubular housing, an elongated foraminous louver tube disposed within and circumscribed by said tubular housing, said louver tube cooperating with and spaced from said housing to define a tubular chamber therebetween, sound attenuating means disposed in said chamber to define a primary sound attenuating zone for substantially limiting the noise level of engine exhaust gases in response to the axial velocity of said exhaust gases, and said louver tube having an inlet and an outlet and defining a longitudinal axis and a plurality of apertures communicating with sound attenuating means;

a diffuser positioned in communication with said louver tube for reducing the axial velocity of said exhaust gases passing through said muffler and for substantially creating a generally turbulent flow pattern in said muffler, said diffuser being of fluid impervious material and having a centrally-disposed imperforate baffle positioned about said longitudinal axis for substantially blocking and restricting the axial flow of said exhaust gases along portions of said longitudinal axis and including a plurality of deflector vanes extending generally radially outward from said centrally-disposed baffle and spaced from each other to define a plurality of generally radially extending apertures communicating with said louver tube, said vanes deflecting the flow of exhaust gases through said apertures and each vane having a gas contact surface facing generally toward said sound attenuating means for directing the flow of gases passing through said apertures into said sound attenuating means.

4,109,754

NOISE ABSORBER FOR AIR OR GAS FLOWS

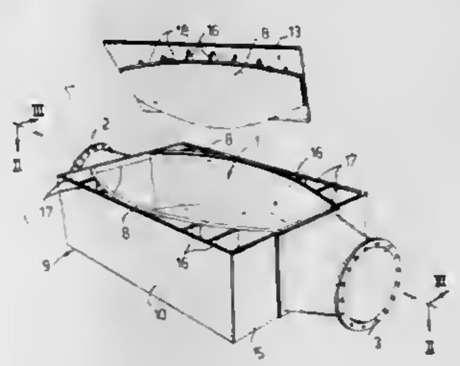
Matti Purhonen, Helsinki, Finland, assignor to Temet OY., Helsinki, Finland

Filed Jan. 14, 1977, Ser. No. 759,520

Claims priority, application Finland, Jan. 21, 1976, 760137

Int. Cl.² F01N *1/04*

U.S. Cl. 181—252 **7 Claims**



1. A noise absorber for an air or gas flow, including wall means defining a flow channel and inlet and outlet connections at opposite ends of said flow channel, said flow channel being substantially rectangular in cross-section and said wall means comprising two pair of opposed, curved walls, said walls extending from the inlet connection to the outlet connection and defining respective sides of said substantially rectangular corss-section, the opposed walls of one pair being concave towards each other and the opposed walls of the other pair being convex towards each otehr, and the noise absorber also comprising means defining compartments externally of said walls and functioning as resonator and/or absorption mufflers.

4,109,755

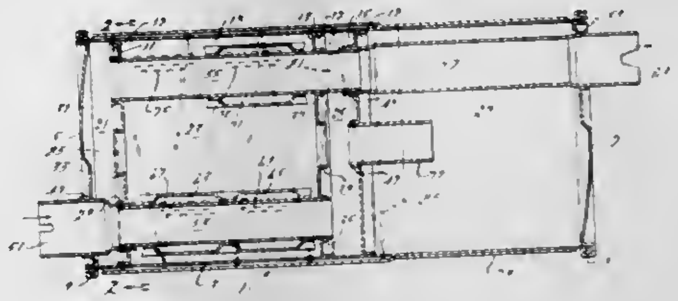
NOISE ATTENUATOR

Gary L. Grueneberg, Jerome, Mich., assignor to Tenneco, Inc., Racine, Wis.

Filed Oct. 4, 1976, Ser. No. 729,435

Int. Cl.² F01N *7/14, 7/16;* **F28D** *7/00*

U.S. Cl. 181—256 **4 Claims**



1. An exhaust gas sound attenuating device such as a muffler for combustion engines comprising an elongated metal housing having an outer wall with an outer metal surface and also having an inlet and an outlet for gas, gas passage and sound attenuating means in the housing for the passage of gas inside said housing from said inlet to said outlet and attenuating sound associated therewith, said outer wall being in heat and sound transfer relationship with gas flowing through the housing, a plurality of spaced sections of high temperature withstanding cordage extending around and against the outer metal surface of the outer wall, and an elongated outer cover layer of metal wrapped around and against the cordage and housing and engaging the cordage to hold it against the outer metal surface, said outer cover layer being spaced from said outer surface by said cordage and acting with the cordage to provide heat and sound insulation for said outer wall.

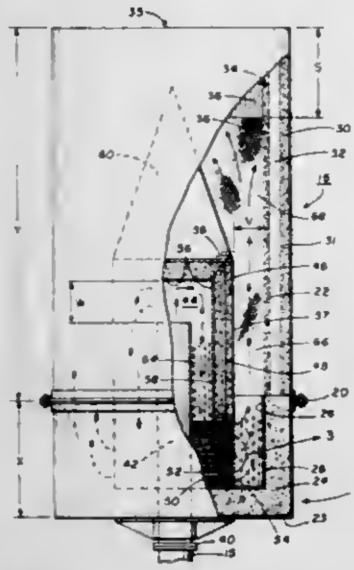
4,109,756
HIGH FREQUENCY DIFFUSION MUFFLER FOR GAS JETS

Gerald Adrian Miller, Fountain Valley, and John Mitchell Zabsky, Santa Ana, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 17, 1976, Ser. No. 742,726

Int. Cl.² F01N *1/08*

U.S. Cl. 181—266 12 Claims



5. Muffler apparatus for attenuating sound of a high velocity compressible fluid jet comprising in combination:

(a) a housing having a jet inlet and outlet;

(b) means defining a flow path internally of said housing between said inlet and said outlet including a plurality of diffusion stages series arranged therein for successively reducing the velocity of a jet received at said inlet;

(c) said flow path defining means being operatively effective to maintain a jet flow in a condition of substantially laminar flow absent of large scale turbulence substantially throughout at least the flow path past said diffusion stages; and

(d) an acoustical absorbing composition of high frequency noise absorption properties exposed in said flow path in at least one of said diffusion stages.

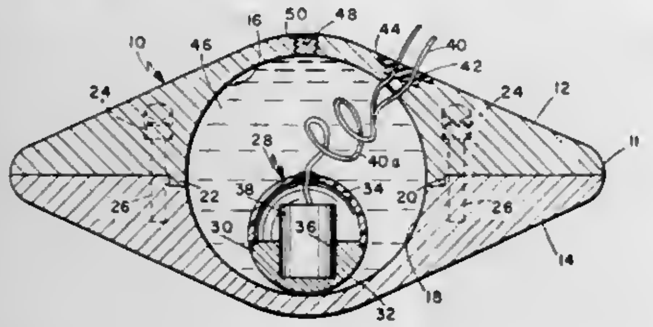
4,109,757
SELF-ERECTING GEOPHONE UNIT AND METHOD AND SYSTEM FOR USING SAME

Harry Clinton Hebberd, Aurora, Colo., assignor to Pacific West Exploration Company, Denver, Colo.

Filed Feb. 9, 1977, Ser. No. 767,057

Int. Cl.² G01V *1/16*

U.S. Cl. 181—401 18 Claims



1. A self righting seismic detector assembly, said assembly comprising:

a sensing instrument having means defining a sensing axis having a preferred vertical orientation;

an outer housing having curved wall means defining a chamber; and

an inner housing for mounting said instrument in said preferred vertical orientation independent of the orientation of said outer housing, said inner housing having a high density curved base for defining a low center of gravity and the lower end of said inner housing when said vertical orientation is defined, said inner housing being supported at rest solely by said base normally slidably engaging said curved wall means and sliding to the lowermost point on said wall for assuming said vertical orientation.

4,109,758
LUBRICATING APPARATUS

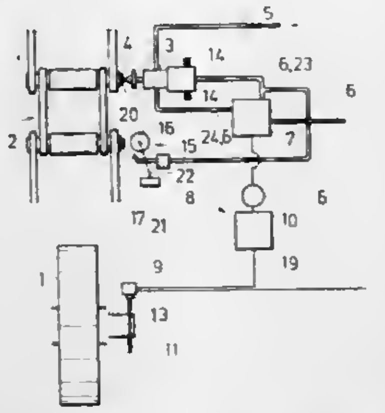
Kalle Kolmonen, Nurmijärvi, and Esko Muukka, Kuopio, both of Finland, assignors to Kevotek Oy, Helsinki, Finland

Filed Dec. 28, 1976, Ser. No. 755,008

Claims priority, application Finland, Dec. 29, 1975, 753685

Int. Cl.² F01M *1/00;* F16N *29/00*

U.S. Cl. 184—15 A 7 Claims



1. Apparatus for lubrication of a chain element which travels around a transmission member comprising:

controlled nozzle means for successively dispensing a lubricant to parts of said chain element;

lubricating control means communicating with said nozzle for controlling the dispensing of the lubricant, said control means including pulse generator means, first means coupled to said pulse generator means and responsive to the position of the chain element to produce pulses to operate said control means and cause the nozzle to dispense the lubricant; and

cleaning means responsive to said first means to clean a part of said chain element prior to said part receiving lubricant from said nozzle means.

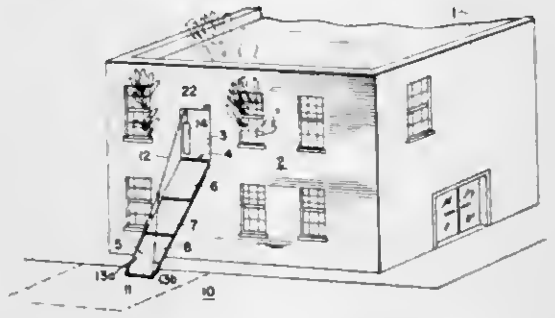
4,109,759
EMERGENCY EXIT DEVICE

Otha G. Cundiff, Jr., Pontiac, Mich., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 4, 1977, Ser. No. 765,734

Int. Cl.² A62B *1/20*

U.S. Cl. 182—19 3 Claims



1. An emergency exit device for a building having an outside wall and at least two floor levels, said exit device comprising

a doorway type opening formed through the outside wall on an upper floor level of the building, said opening having a lower edge;

door means hingedly affixed to the building at the lower edge of the opening, said door means having a plurality of telescoping sections substantially juxtaposed when said door means is closed and forming an extended substantially planar incline when said door means is opened whereby said door means when open supports people leaving the building via the opening and functions as to slide to conduct them to the ground; and

door control means affixed to the door means and the building for lowering one end of the door means to the ground supporting the door means in its extended open condition from the lower edge of the opening to the ground and for supporting the door means in its closed condition as a door openable only from inside the building, said door control means comprising a cable affixed at one end to the door means, pulley means inside the building supporting the cable, said pulley means including a lockable pulley supporting the cable and lockable in position to prevent movement of said cable, and a weight affixed to the other end of the cable and functioning as a counterbalance to said door means.

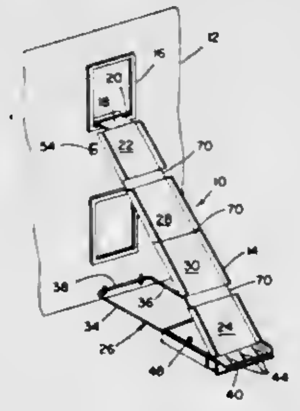
4,109,760
EMERGENCY ESCAPE DEVICE

Aldo Marra, 11 Wood St., San Francisco, Calif. 94118

Filed May 2, 1977, Ser. No. 792,703

Int. Cl.² A62B *1/20*

U.S. Cl. 182—48 10 Claims



1. An escape device for emergency escape from an elevated position in a structure comprising:

elongated frame means rigidly associatable at a first end to said structure adjacent to ground level and removeably fixable in a first position at the second opposite end of said frame means to said structure adjacent said elevated position;

elongated collapsible-extensible slide means rigidly affixed at one end with said second end of said frame means and fixable adjacent said elevated position to said structure independent of said elongated frame means at the other second end of said collapsible-extensible slide means:

lock means operable from said elevated position for lockingly engaging said second end of said collapsible-extensible slide means with said structure immediately adjacent said elevated position and for releasing said second end of said elongated frame means so that said frame means is allowed to rotate through an arc to lie adjacent the ground level in a second position and extend said collapsible-extensible slide means whereby human escape may occur from said elevated position by sliding down the extended collapsible-extensible slide means;

and further wherein the collapsible-extensible slide means comprises a plurality of rigid members each hinged in an accordian fashion in an end-to-end relationship one with the next.

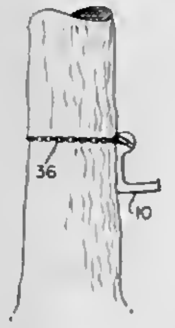
4,109,761
PORTABLE CLIMBING DEVICE

Selden W. Matlock, 3312 Breaux Dr., Louisville, Ky. 40220

Filed Dec. 4, 1975, Ser. No. 637,573

Int. Cl.² E06C *7/08*

U.S. Cl. 182—92 25 Claims



1. A climbing device for facilitating the climbing of a vertical structure, such as a tree, pole or the like, comprising:

a bracket, and

flexible, elongated structure-engaging means for wrapping around said structure and for securing said bracket to said vertical structure,

said bracket having a structure-engaging portion, a foot-supporting portion extending from one end of said structure-engaging portion, a camming surface for engaging said structure located at the other end of said structure-engaging portion, and means for releasably attaching said bracket to said flexible means, said camming surface and said attaching means operatively cooperating to increase the tension exerted by said bracket on said flexible means when said flexible means is wrapped around said structure and connected to said attaching means and said bracket is moved from a first position in which the camming surface engages said structure to a second position in which said structure-engaging portion engages said vertical structure, said attaching means including at least one positioning flange arranged at opposite lateral sides of said camming surface, each of said flanges extending laterally outwardly from said camming surface and being arranged at a predetermined angle with respect to a longitudinal axis of said structure-engaging portion, means for securing free ends of said flexible means to a respective flange and means being provided at each of the flanges for accomodating said securing means.

4,109,762
BRAKE DEVICE FOR A BICYCLE AND THE LIKE

Philip Wood, 17818 W. Vineland Ave., Monte Sereno, Calif. 95030

Filed Feb. 17, 1977, Ser. No. 769,778

Int. Cl.² B62L *1/00*

U.S. Cl. 188—26 8 Claims

1. A brake device for a vehicle having a hub rotatably mounted on the vehicle frame for supporting a wheel, said brake comprising, in combination:

an annular backing plate having a center opening;

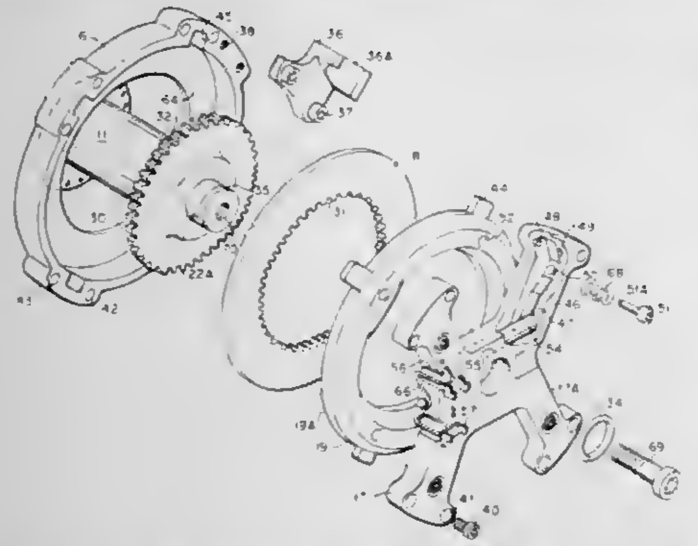
an annular pressure plate having a center opening and being mounted on said backing plate for movement towards and away from said backing plate;

means mounting said backing plate and pressure plate concentric to said hub in a position stationary to the vehicle frame;

an annular brake disc having a center opening and being positioned between said backing plate and said pressure plate;

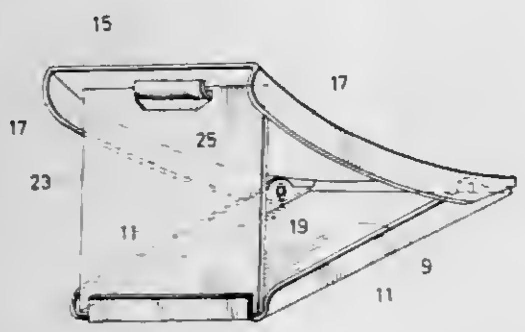
means mounting said brake disc concentric to said hub for rotation therewith while permitting movement in the axial direction relative to the hub; and

actuating means mounted on the backing plate in contact with said pressure plate for moving the pressure plate and brake disc towards the backing plate to squeeze the brake disc therebetween and effect a braking action on the brake disc and the attached hub which when no braking action



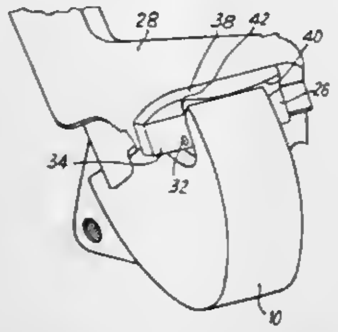
is effected, the brake disc will move axially to seek a position out of contact with the backing plate and pressure plate.

4,109,763
WHEEL STOP APPARATUS
Takayuki Sugino, 52 Murauchishimo, Karasumori-cho, Nakamura-ku, Nagoya-shi, Aichi-ken, Japan
Filed May 2, 1977, Ser. No. 792,665
Claims priority, application Japan, Feb. 14, 1977, 52-15689
Int. Cl.² B60T *3/00*
U.S. Cl. 188—32 **3 Claims**



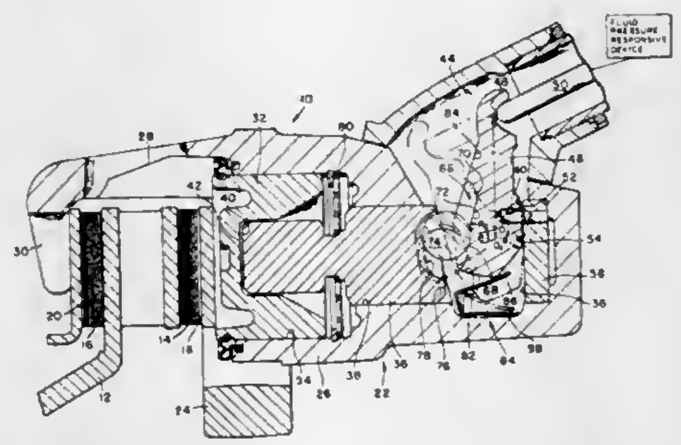
1. A foldable wheel stop apparatus comprising a bottom plate of plate material approximately rectangular in shape, which includes side flanges bent up along both its opposite sides of nearly constant width and an end flange bent up along its intermediate side of nearly constant width; a stopper plate of plate material approximately rectangular in shape, which includes side flanges bent down along its opposite sides of nearly constant width the adjacent ends of said side flanges of one of said plates being formed with punched out holes, and the adjacent ends of said side flanges of the other of said plates being formed with projections extending toward said holes, said projections being inserted into said holes whereby said stopper plate is pivotally attached to said bottom plate; a bearing member punched from the surface of said stopper plate at the end of said stopper plate remote from said projections and holes oriented parallel to the pivot axis of said bottom plate with said stopper plate, and a support plate of plate material approximately rectangular in shape and slightly smaller in width and length than the width and length of said stopper plate rotatably attached at one of its ends to the bearing member of said stopper plate, said bearing member characterized by having been formed by cutting a lip from the plate material of said support plate and curved and projected downwardly, and said support plate defining an opening adjacent one of its edges with the curved portion of said bearing member extending through said opening to form a hinge between said support plate and stopper plate.

4,109,764
FLOATING CALIPER DISC BRAKE AND A GUIDE KEY FOR THE SAME
Jean-Jacques Carre, Montreuil, France, assignor to Societe Anonyme D.B.A., Paris, France
Filed Feb. 10, 1977, Ser. No. 767,581
Claims priority, application France, Mar. 12, 1976, 76 07118
Int. Cl.² F16D *55/224*
U.S. Cl. 188—72.4 **1 Claim**



1. In a disc brake having a caliper straddling a rotary disc and sliding relative to a fixed member by means of two circumferentially spaced guide keys and an actuating means cooperating with the caliper to urge directly a first friction pad and, by reaction, a second friction pad into engagement with the rotary disc, the improvement in which said keys include guiding surfaces slidably engaging said caliper, said keys also including means facing and cooperating with said fixed member to provide for pivoting of said caliper and said keys together relative to said fixed member in a plane perpendicular to said rotary disc, and said means comprising cylindrical surfaces which engage said fixed member at a location substantially in alignment with said rotary disc.

4,109,765
MECHANICALLY ACTUATED DISC BRAKE
Donald Dixon Johannesen, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Continuation of Ser. No. 564,507, Apr. 2, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,655
Int. Cl.² F16D *55/08*
U.S. Cl. 188—72.7 **7 Claims**



1. In a disc brake:

a rotor having a pair of friction faces;

a pair of friction elements, one of said elements being disposed adjacent each of said friction faces;

a fixed support;

a caliper slidably mounted on said fixed support and straddling said rotor, said caliper engaging each of said friction elements for urging the latter into braking engagement with their corresponding friction faces when a brake application is effected;

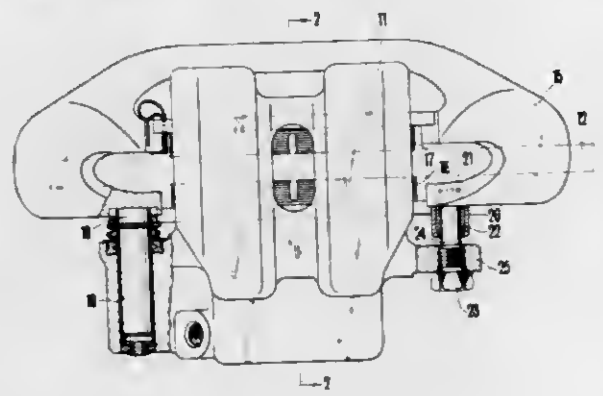
said caliper including a housing and actuating means for effecting a brake application, said actuating means including a force transmitting member slidably mounted in said housing and adapted to engage one of said friction elements, a lever disposed within said housing and having a pair of camming surfaces, said camming surfaces being non-rotatable with respect to said lever, one of said camming surfaces being in rolling contact with a wall of said housing so that said one camming surface rolls relative to said housing and said lever pivots about a pivot point on said one camming surface, the position of said pivot point moving with respect to said housing as said one camming surface rolls on said wall of said housing, means operably connecting the other camming surface to said force transmitting member to urge the latter toward said rotor upon rolling of said one camming surface relative to said housing whereby said force transmitting member drives said friction elements into braking engagement with their corresponding friction faces to thereby effect a brake application, and means to actuate said lever;

said lever being actuable from a brake-released to a brake-applied condition, said camming surfaces being defined on opposite edges of one end of the lever;

said one camming surface defined on one edge of said lever being an arcuate curve adapted to engage the wall of said caliper;

said other camming surface being defined on the other edge of said lever and being disposed adjacent an arcuate depression, said means operably connecting said other camming surface to the force transmitting member including an element engaging said force transmitting member, said lever forcing said element out of said depression and against said other camming surface when the lever is actuated to thereby urge the force transmitting member toward the rotor.

4,109,766
DISC BRAKE
Takehisa Inoue, Iwatsuki; Yutaka Ogawa, Tokyo; Hiroaki Sugita, Gyoda, and Namio Watanabe, Kuki, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan
Filed Jun. 29, 1977, Ser. No. 811,301
Claims priority, application Japan, Jul. 6, 1976, 51-89758[U]; Jul. 6, 1976, 51-89759[U]; Sep. 17, 1976, 51-125093[U]
Int. Cl.² F16D *55/224*
U.S. Cl. 188—73.4 **6 Claims**



1. A disc brake comrising;

a rotor to which the brake is to be applied;

a caliper having a thrusting device disposed on one side of said rotor and a reaction member disposed on the other side of the rotor;

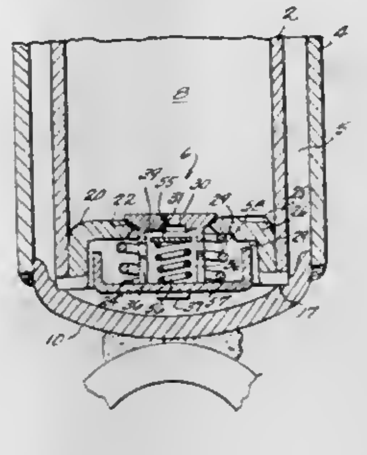
a pair of friction pads which are to be pressed against both sides of the rotor by said thrusting device and said reaction member of the caliper;

a support for supporting said pair of friction pads;

a main guide pin which guides said caliper in the axial direction of said rotor, the main guide pin being secured to said support; and

an auxiliary guide pin which slidably engages with said support, the auxiliary guide pin being removably screwed to said caliper.

4,109,767
COMPRESSION HEAD ASSEMBLY
Srinath Nandyal, Bloomingdale, Ill., and Sellers B. McNally, Scottsdale, Ariz., assignors to Maremont Corporation, Chicago, Ill.
Filed Mar. 4, 1977, Ser. No. 774,499
Int. Cl.² F16F *9/06*
U.S. Cl. 188—315 **1 Claim**



1. A shock absorber comprising an inner cylinder member, an outer tubular member surrounding said cylinder member, first and second end closure means for the opposite adjacent ends of said cylinder member and said tubular member defining between the exterior periphery of said cylinder member and the interior periphery of the outer tubular member an annular replenishing chamber, a piston slidably mounted within said cylinder member and having a piston rod extending therefrom outwardly in slidably sealed relation to said first end closure means, first and second mounting means on the outer end of said piston rod and the exterior of said second end closure means, a body of hydraulic fluid filling variable volume chambers within said cylinder member on opposite sides of said piston and partially filling said replenishing chamber, means in said piston for controlling the flow of hydraulic fluid between said variable volume chambers, and a compression head assembly for controlling the flow of fluid between said replenishing chamber and the variable volume chamber having an end defined by said second end closure means, the improvement which comprises said compression head assembly comprising a cup-shaped compression head of substantially uniform wall thickness mounted adjacent said second end closure means, said compression head including a cylindrical wall portion disposed in sealingly engaged relation to the interior periphery of said cylinder member, annularly spaced flange portions extending radially outwardly from the end of said cylindrical wall portion adjacent said second end closure means into engaged relation to the adjacent end of said cylinder member so as to prevent axial movement of said compression head, and a circular wall portion extending radially inwardly from the opposite end of said cylindrical wall portion, said circular wall portion having a central replenishing opening therein and an axially inwardly facing replenishing valve seat surrounding said replenishing opening, a replenishing valve member having a disk portion movable axially into and out of sealing relation with said replenishing valve seat, said disk portion having a central compression opening therein and a compression valve seat extending around the same which faces in an opposite axial direction from said replenishing valve seat, a compression valve member mounted for axial movement into and out of engagement with said compression valve seat, said replenishing valve member including a pair of valve stem portions extending from said disk portion through said replenishing opening, a spring retaining member abuttingly engaged with said valve stem portions, said valve stem portions including free end extensions bent over said spring retaining member to

secure the same in said abuttingly engaged relation, first spring means between said spring retaining member and said compression valve member resiliently urging the same into engagement with said compression valve seat and second spring means between said circular wall portion and said spring retaining member resiliently urging the latter and the replenishing valve member secured thereto in a direction to engage the disk portion thereof with said replenishing valve seat.

4,109,768

CURRENT COLLECTOR LINE

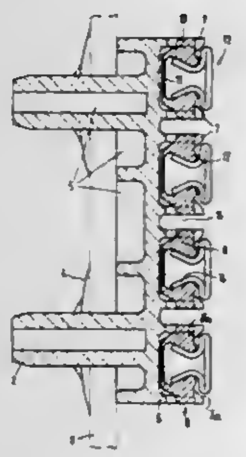
Hans-Georg Fromme, Stuttgart, and Guckenhan Dieter, Sindelfingen, both of Fed. Rep. of Germany, assignors to Thyssen Aufzüge GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,250

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 2629215

Int. Cl.² B60M *1/00*

U.S. Cl. 191—22 R **13 Claims**



1. A current collector line for electric trolley systems and the like and including assembly parts form-locking with a bus bar for clamp attachment of the bus bar to a guide rail for moving users comprising:

a support member having a plurality of cutouts defined by a rear wall and flexible locking blades,

adapter members positioned in said cutouts and retained therein by means of said locking blades, said adapter members being of generally C-shaped cross-section and having an outer shape conforming generally to the shape of said cutouts and an inner configuration wherein the open side is of reduced width and enlarges progressively inwardly,

a bus bar having a sliding contact surface and a pair of depending legs positioned in each of said adapter members, said legs each being progressively inwardly then outwardly turned with respect to said contact surface so as to have a shape conplementary to the inner configuration of said adapter members and be form-locked therein.

4,109,769

BRAKE ACTUATING MECHANISMS FOR BICYCLES

Donald R. Darden, 519 Corday St. Lot 3, Pensacola, Fla. 32503

Filed Jan. 26, 1977, Ser. No. 762,681

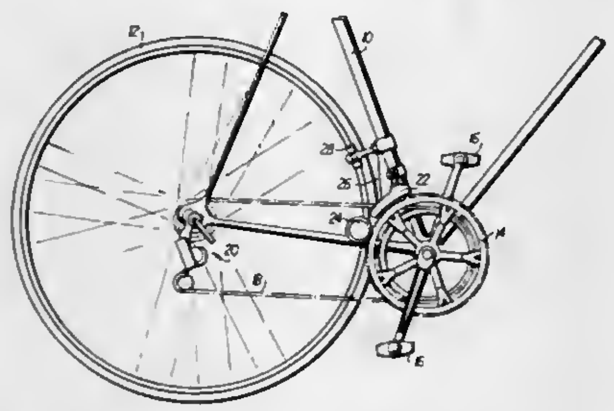
Int. Cl.² B62L *5/00*

U.S. Cl. 192—5 **16 Claims**

1. In combination with a bicycle having a frame, at least two wheels, at least one chain sprocket gear for meshing with a chain operatively associated with at least one of said wheels to rotate said at least one wheel, and at least one brake mechanism operatively associated with at least one of said wheels, an improved brake actuator comprising:

over-running clutch means attached to said frame in position to mesh with said at least one chain sprocket gear, for transmitting rotational motion from said at least one chain sprocket gear only when said at least one chain sprocket gear is rotating in the direction opposite to that required to rotate said at least one wheel to move said bicycle in the forward direction;

cable storage drum means adapted to be rotated by said over-running clutch means, said cable storage drum means having a cable wound thereon, said cable being operatively connected to said at least one brake mechanism to actuate said at least one brake mechanism when said over-running clutch means transmits rotational motion from said at least one chain sprocket gear.



4,109,770

CLUTCH DEVICES

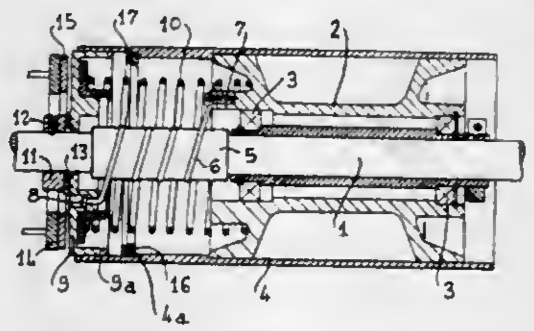
René Perles, Rillieux-la-Pape, France, assignor to Verdol S.A., Caluire, France

Filed Mar. 17, 1977, Ser. No. 778,524

Claims priority, application France, Mar. 19, 1976, 76 08614

Int. Cl.² B60K *41/24*

U.S. Cl. 192—12 BA **9 Claims**



1. A clutch device to connect a first and a second co-axially rotatable parts, more particularly for the actuation of the drums which drive frictionally the winding bobbins in spinning, twisting and doubling frames, of the kind comprising:

a substantially cylindrical portion co-axial to said first rotatable part and angularly connected therewith;

an elongated deformable member wound on said cylindrical portion, said elongated member having a first and a second ends, with said first end being attached to said second rotatable part;

and means to act on the second end of said elongated member to cause same either to wind tightly on said cylindrical portion or to become loose thereon; the improvement which consists in said means comprising:

an intermediate member to which the second end of said elongated member is attached, said intermediate member being co-axial to said first and second rotatable parts, and freely rotatable and longitudinally displaceable with respect to same;

a main frictional abutment co-axial to said first rotatable part and angularly and longitudinally connected therewith;

spring means to resilient press said intermediate member against said main frictional abutment to cause said intermediate member to be frictionally driven by said first rotatable part and to tightly wind seid elongated member on said cylindrical portion to clutch said second rotatable part with said first rotatable part;

and pusher means to displace longitudinally said intermediate member to disengage same from said main frictional abutment to release said elongated member and to declutch said second rotatable part from said first rotatable part.

4,109,771

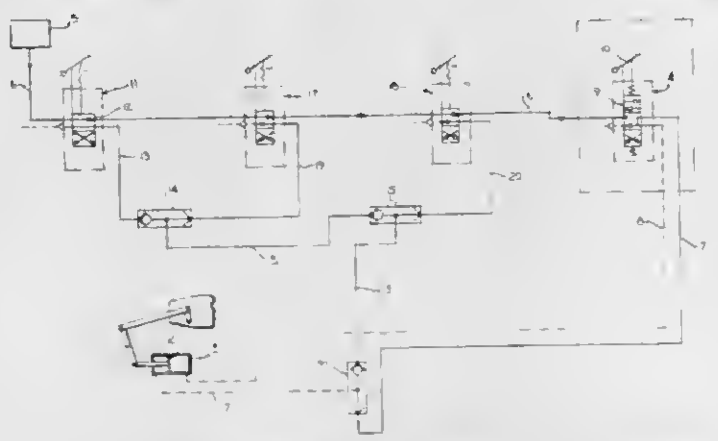
SAFETY LOCKOUT FOR ENGINE CLUTCH

Richard I. Strong, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Jun. 8, 1977, Ser. No. 804,637

Int. Cl.² F16D *25/00*

U.S. Cl. 192—83 **4 Claims**



1. In combination with a mechanical drive clutch of the over-center type actuated by a double acting pneumatic piston-cylinder means supplied with pneumatic pressure from a source of such pressure through a main control valve selectively pressurizing either end of the cylinder, a remote safety lockout valve connected in the supply line from the source to the main control valve to provide for selective interruption of the pneumatic pressure to said main control valve, conduit means from said lockout valve to supply pneumatic pressure to the end of the power cylinder actuating the piston therein in a direction to disengage the clutch during said interruption of pneumatic pressure to said main control valve, means assuring exhaust of pneumatic pressure from the opposite end of the power cylinder during said selective actuation of said lockout valve, and means responsive to the pneumatic pressure from said lockout valve to prevent exhaust of pneumatic pressure through said control valve from said first named cylinder end.

4,109,772

VEHICULAR SINGLE SHAFT GAS TURBINE ENGINE POWER SYSTEM

Bernard Brandt Poore, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 17, 1975, Ser. No. 623,319

Int. Cl.² B60K *29/00*

U.S. Cl. 192—0.092 **9 Claims**

1. A vehicular single shaft gas turbine engine power system comprising:

a single shaft gas turbine engine operating in response to an engine speed error signal provided by a vehicle control system and providing an engine velocity signal N1 in response to engine rotational velocity;

a fixed ratio reduction gear assembly coupled to receive rotational energy from the engine and output rotational energy with an increased torque and a decreased rotational velocity;

an automatic clutch coupled to receive rotational energy from the gear assembly and output the energy only when selectively engaged in response to a clutch control signal;

a first accessory gear drive assembly coupled between the reduction gear assembly and the automatic clutch to drive essential vehicle accessories in response to energy received from the reduction gear assembly;

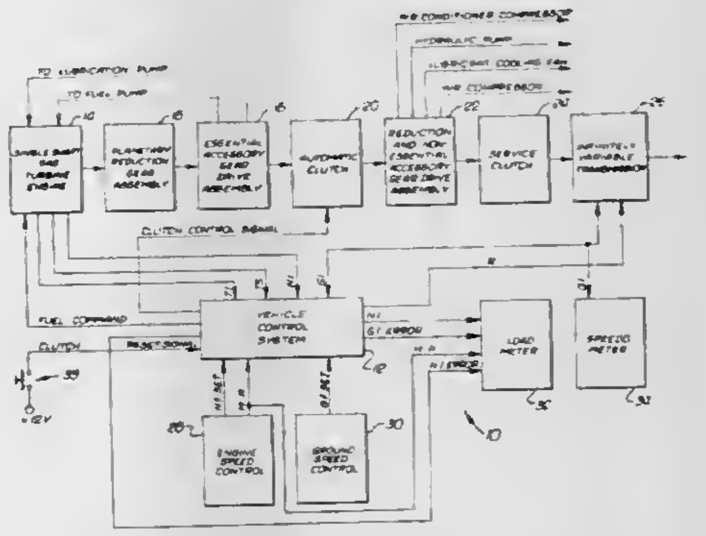
a service clutch coupled to receive rotational energy from the automatic clutch and output the energy only when selectively engaged by a vehicle operator;

a second accessory gear drive assembly coupled between the automatic clutch and the service clutch to drive nonessential vehicle accessories in response to energy received from the output of the automatic clutch;

an infinitely variable transmission coupled to receive a ratio control signal and to receive rotational energy from the output of the service clutch, the transmission providing a rotational energy output for moving a vehicle at a rotational velocity ratio relative to the received energy in accordance with the ratio control signal and generating a ground speed signal G1 indicative of energy output rotational velocity;

a vehicle control system coupled to receive signal N1, signal G1, engine exhaust gas temperature information, an engine speed set signal (N1 SET), a ground speed set signal (G1 SET) and a manual-automatic select signal, the control system being operable in a manual mode commanded by the manual-automatic select signal to generate an engine speed error signal of sufficient magnitude to cause an engine speed indicated by the engine speed set signal, the control system being operative in an automatic mode commanded by the manual-automatic select signal to generate an engine speed error signal in response to engine exhaust gas temperature causing an engine speed at which exhaust gas temperature is increased toward a desired maximum temperature as load increases, the control system being operable in response to a difference between commanded and actual engine speed and the ground speed set signal to generate a transmission ratio control signal indicative of the magnitude of the ground speed set signal less the difference between commanded and actual engine speed ($R \approx$ G1 SET $-$ N1 ERROR), and the control system being operable in response to engine velocity signal N1 to generate a clutch control signal commanding engagement and disengagement of the automatic clutch when engine velocity is greater than and less than predetermined engagement and disengagement engine velocities respectively; and

a load meter operable in a manual mode to indicate actual engine speed in response to signal N1, the load meter being further operable in an automatic mode to indicate actual engine speed in response to signal N1 in a low magnitude range of indication, to indicate actual engine speed plus ground speed cutback in response to signal N1 and a G1 ERROR signal equal to G1 SET $-$ G1 in an intermediate magnitude range of indication, and to indicate a load induced reduction of engine speed below a maximum torque engine speed in response to the engine speed error signal in a high range of indication.



4,109,773
RELEASE BEARING ASSEMBLIES FOR VEHICLE CLUTCHES

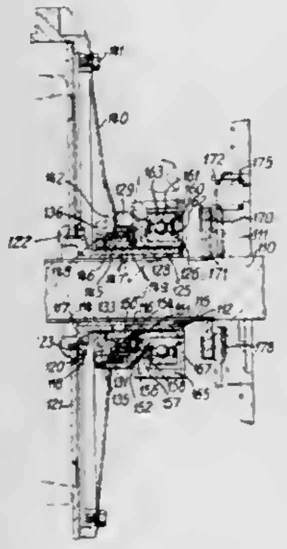
Raymond Higgerson, and David Parsons, both of Leamington Spa, England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Nov. 18, 1976, Ser. No. 742,741

Claims priority, application United Kingdom, Nov. 21, 1975, 48017/75; Jan. 27, 1976, 3122/76

Int. Cl.² F16D *13/75, 13/54*

U.S. Cl. 192—111 A **15 Claims**



1. In a vehicle clutch release mechanism comprising a clutch operating lever and a clutch release fork, a release bearing assembly comprising inner and outer sleeves arranged to slide axially relative to each other and located around the shaft of the gear box of the vehicle, the inner sleeve being operatively connectable with the operating lever of the clutch, the outer sleeve being connectable with the release fork of the clutch and being arranged to assume a predetermined position relative to said gear box when the clutch is engaged and being movable axially away from said position when the clutch is released, a nut threadably engaging the exterior of the inner sleeve, abutment means carried by said outer sleeve and arranged in use to act on said nut so that said inner sleeve moves axially with the outer sleeve when the clutch is released, clamping means arranged to engage said nut to hold said nut against rotation when the sleeves are moved axially during clutch release, and release means for releasing the clamping means from engagement with said nut as said outer sleeve approaches the predetermined position under the influence of the operating lever of the clutch, so that the nut can rotate, under the influence of an axially force derived from the operating lever, about the inner sleeve to allow the inner sleeve to move axially relative to the outer sleeve when the outer sleeve is in its predetermined position.

4,109,774
CONTROL SYSTEM FOR A VENDING MACHINE

Yukichi Hayashi, Sakado, Japan, assignor to Nippon Coinco Co., Ltd., Japan

Filed Dec. 2, 1976, Ser. No. 746,804

Claims priority, application Japan, Dec. 5, 1975, 50/145277

Int. Cl.² G07F *1/02*

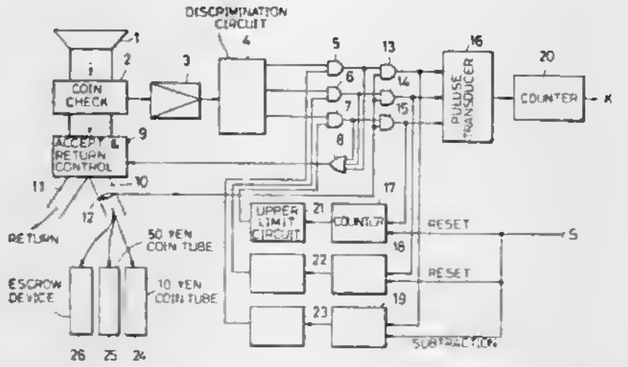
U.S. Cl. 194—1 C **5 Claims**

1. In a vending machine capable of vending plural pieces of one or more articles in a single series of vending operations,

means for separately accepting coins of plural denominations and a control system, said control system comprising:

a plurality of counter means for counting the number of inserted coins by denomination;

a plurality of upper limit number detection means for detecting whether or not the number of coins counted by said counter means of the corresponding denomination has reached an upper limit number which is greater than one and is predetermined for respective coin denominations, and



acceptance inhibit means for inhibiting acceptance of a subsequently inserted coin of a specific one of said coin denominations when the number of the coins counted by the respective counter means has reached said preset upper limit number.

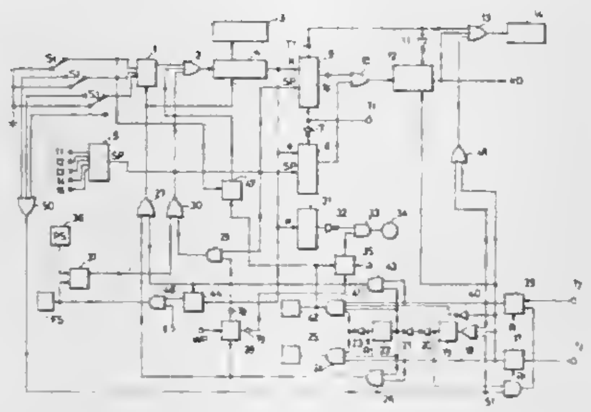
4,109,775
COIN CONTROL CIRCUITRY FOR A VENDING MACHINE

Yukichi Hayashi, Sakado, Japan, assignor to Nippon Coinco Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 735,968

Int. Cl.² G07F *5/16*

U.S. Cl. 194—10 **5 Claims**



1. In a vending machine including coin control means for controlling the counting of inserted coins, calculation of change coin, payout of change coin and return of coin, and vender means for dispensing articles based on the signal from said coin control means, the improvement wherein;

said vender means comprises:

setting means for individually setting vend prices of respective articles; and

means for generating, upon depression of an article selection switch, a binary coded set vend price signal corresponding to said article selection switch: wherein

said coin control means comprises:

inserted coin encoding means for counting inserted coins and for producing binary coded signals indicative thereof,

a binary addition/subtraction circuit conditioned during coin insertion to add the binary coded signals indicative of inserted coins so as to produce a binary sum corresponding to the total value of said inserted coins,

comparator means for producing, upon comparison of said binary coded set vend price signal from said vender means with the binary sum from said addition/subtraction circuit corresponding to the value of inserted coins, a vend signal when vending is possible: and wherein;

said vender means further comprises:

means for starting dispensing of the article when said selection switch has been depressed and said vend signal has been received, and

subtraction enabling means, actuated when dispensing of said article has started, for conditioning said addition/subtraction circuit to subtract from the binary sum corresponding to the value of inserted coins the binary coded vend price signal, said comparator means thereafter producing a change enabling signal if the difference is greater than zero, indicating that change must be dispensed.

4,109,776
APPARATUS FOR MARKING AN INFORMATION CARRYING MEDIUM

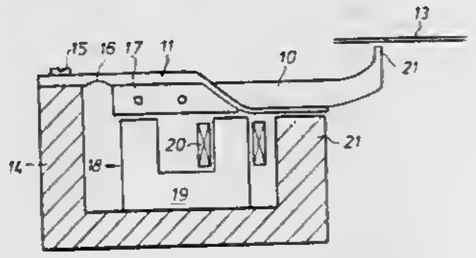
Birger Henrik Ek, Sundbyberg, and Sven Gunnar Valter Stenndd, Lidingo, both of Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

Filed Nov. 9, 1977, Ser. No. 849,861

Claims priority, application Sweden, Nov. 10, 1976, 7612496

Int. Cl.² B41J *9/00*

U.S. Cl. 400—124 **14 Claims**



1. In an apparatus for marking an information carrying medium wherein an elongated arm extends generally parallel to said information carrying medium and carries a marking device on one end thereof positioned to engage said information carrying medium, the arm is affixed to a leaf spring for resiliently biasing the arm in a first direction substantially normal to the surface of the information carrying medium, and a drive means is provided for moving the arm in a second direction opposite said first direction; the improvement wherein said leaf spring is bent, with one portion thereof being affixed to a first side of said arm facing said information carrying medium, and another portion of said leaf spring is affixed to the second side of said arm away from said information carrying medium.

4,109,777
TICKET PRINTER

Allan S. Ottenstein, and John A. Callahan, both of Houston, Tex., assignors to Research Fuels, Inc., Houston, Tex.

Filed Aug. 2, 1976, Ser. No. 710,712

Int. Cl.² B41J *7/70*

U.S. Cl. 400—124 **6 Claims**

1. A ticket printer apparatus for printing numbers on a ticket comprising:

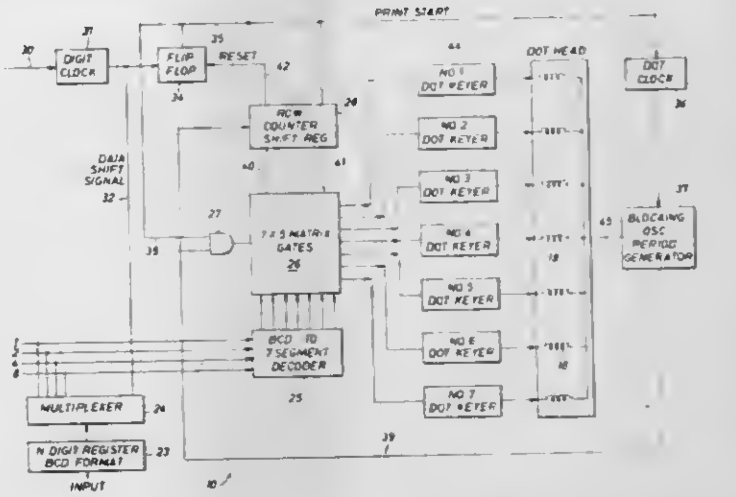
a ticket transport mechanism for receiving a ticket therein;

a plurality of solenoid operated impact imprinters aligned relative to said ticket transport mechanism, said imprinters forming dots on a ticket in a pattern to form a visually readable number;

motor means for advancing the ticket to enable said imprinter to form dots sequentially on the ticket to define a number;

an input for receiving a sequence of numbers to be printed which numbers are supplied as electrically encoded values;

circuit means connected to said input means for forming a set of dot signals which signals are applied to said imprinters in timed sequence to form the number on the ticket out of a set of dots in an X by Y pattern to form dots therein selected by the signals; and



power means furnishing power to said imprinters under control of said circuit means to operate said imprinters and which power means comprises a voltage flyback power source to drive said imprinters.

4,109,778
TRANSMISSION MECHANISM, NOTABLY FOR TYPEWRITERS

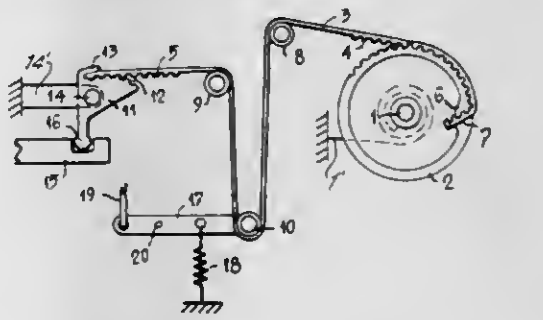
Raymond Clavel, Oulens, and Ulrich Menzi, Yverdon, both of Switzerland, assignors to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Dec. 1, 1976, Ser. No. 746,207

Claims priority, application Switzerland, Dec. 8, 1975, 15901/75

Int. Cl.² B41J *23/02*

U.S. Cl. 400—154.2 **5 Claims**



1. A transmission mechanism, notably for a typewriter, comprising a rotary member provided with a pulley, a flexible elongate connection fixed to the pulley and to an attachment piece, and a movable member bearing against the flexible connection between the attachment piece and the pulley to modify the path of the flexible connection and produce a corresponding angular displacement of the rotary member, wherein the pulley is formed of an at least partially toothed wheel, and the flexible connection is formed of a notched belt whose notches form a toothing engaging in teeth of the toothed wheel, the toothed wheel having means defining a discontinuity in its periphery, said discontinuity means being formed by a toothed lip extending towards the center of the toothed wheel and disposed facing a bearing surface, the distance between the bearing surface and the toothed lip corresponding to the thickness of the notched belt, whereby said toothed lip and notched belt may be readily engaged and disengaged in different relative positions for adjustment.

4,109,779

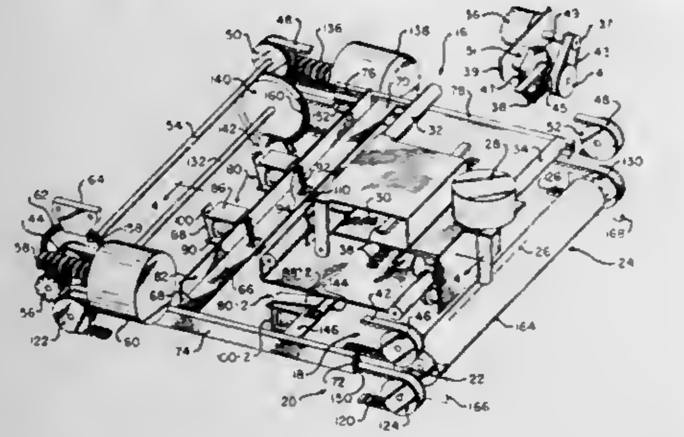
MEDIA POSITIONING MEANS FOR A PRINTER

Karl A. Bauer; Peter F. Baur; Horst H. Biedermann; Andreas Madel; Friedrich Nitsch, all of Augsburg; Ernst Pechinger, Herbertshofen; Walter Koenig; Armin Ipfelkofer, both of Augsburg; Johann J. Rindsfuesser, Neusaess, and Helmut Weber, Augsburg, all of Fed. Rep. of Germany, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 13, 1976, Ser. No. 714,069

Int. Cl.^{2} B41J *11/50*

U.S. Cl. 400—584 **17 Claims**



1. A media positioning means comprising:

first and second transport means positioned in opposed relation to each other and forming a common throat therebetween and having a reference line associated therewith for independently moving first and second media respectively, in said common throat towards and away from said reference line, said common throat having an open end to enable said first and second media to be inserted therein, and said reference line being located adjacent to said open end.

4,109,780

CONVEYOR SYSTEMS WITH GATING ARRANGEMENT

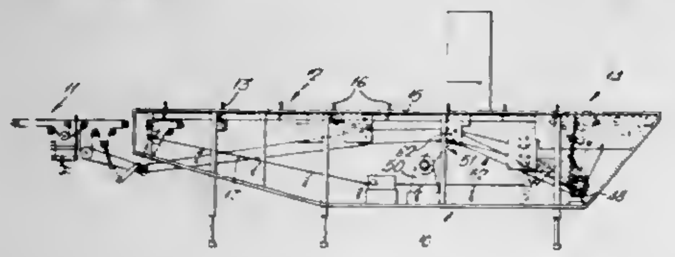
Arthur Ernest Halsey, Horsham, England, assignor to Vacuumatic Limited, Harwichm Essex, England

Filed Jul. 21, 1976, Ser. No. 707,389

Claims priority, application United Kingdom, Jul. 31, 1975, 32096/75

Int. Cl.^{2} B65G *37/00, 21/14*

U.S. Cl. 198—466 **20 Claims**



1. A conveying apparatus comprising:

a first conveyor system; comprising an endless conveyor loop, means to guide the conveyor loop around a closed path including a horizontally extending run having an upstream end and a downstream end, means to drive the endless conveyor loop and move the horizontally extending run, means for cyclically extending and retracting the horizontal run of the path at one of said ends into and out of an article discharging position; and gating means located adjacent the upstream end of the horizontal run for providing a sequential flow of articles to the horizontal run;

a second conveyor system defining an article support surface;

a third conveyor system having a horizontally extending article support surface, article displacement elements, means for mounting the article displacement elements around an endless path part of which extends along the horizontally extending article support surface, and means for driving the article displacement elements around the closed path to sweep over the horizontally extending article support surface to displace articles along the horizontally extending article support surface;

the first conveyor system being located between the downstream end of the second conveyor system and the upstream end of the third conveyor system with its horizontally extending run in general alignment with the article support surfaces of the second and third conveyor systems, the upstream end of the article support surface of the third conveyor system and the one end of the horizontally extending run defining a space in their common plane, when said one end is in its retracted position; and means for coupling the cyclically operating means in timed relation with the drive means of the third conveyor system whereby the one end of the horizontally extending run is retracted to permit an article displacement member on the third conveyor system to pass through the space and then extend across the space to lie adjacent the third conveyor system until the next article displacement member approaches.

4,109,781

DEVICE FOR ROTATING BY 90° THE MOVEMENT DIRECTION OF PALLETS AND SIMILAR BETWEEN TWO CONVEYING TRACKS

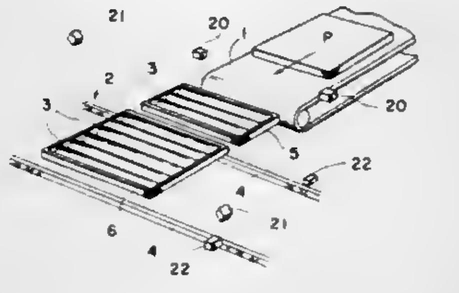
Hugo Moons, Bonheiden, Belgium, assignor to Alvey, Inc., St. Louis, Mo.

Filed Mar. 16, 1977, Ser. No. 777,958

Claims priority, application Belgium, Mar. 22, 1976, 016544

Int. Cl.^{2} B65G *47/52*

U.S. Cl. 198—485 **5 Claims**



1. Device for changing the direction of movement by 90° of a pallet supported on conveying means which device comprises: a pallet delivery conveyor having a discharge end at a first level; roller conveyor means having conveying rollers forming a surface to receive a pallet from the discharge end of said delivery conveyor; support means for said roller conveyor means, said support means including slanting surfaces adapted to position said roller conveyor means at said first level and to permit said roller conveyor to descend to a lower level and in a direction at 90° to the direction of pallet delivery from said delivery conveyor first motor means operatively connected to said support means for moving said roller conveyor means between said first and lower levels; other conveyor means operatively disposed at said lower level and movable in a direction at 90° to the direction of pallet movement from said delivery conveyor; second motor means operatively connected to said conveying rollers in said roller conveyor means; a source of motive power connected to said first and second motor means, and including controllable means in the connection; and sensor means in control of said controllable means whereby said conveying rollers are driven at a first speed when a pallet is delivered thereto, are driven at a lower speed when a pallet comes close to being fully on said roller receiving surface, and are stopped when a pallet has reached a position fully on said roller receiving surface; and said roller conveying means is moved along said slanting surfaces by said first motor means from said first level toward said lower level and in a direction to move with said other conveyor means.

4,109,782

ACCUMULATING ROLLER CONVEYOR

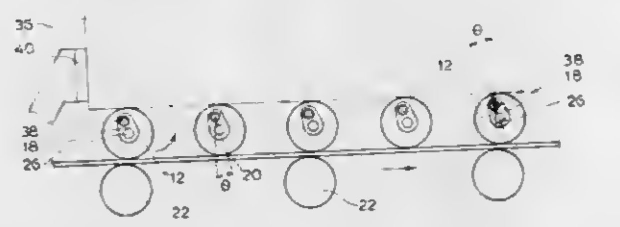
Isao Nakai, Nagoya, Japan, assignor to Rain Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 7, 1976, Ser. No. 730,324

Claims priority, application Japan, Jun. 6, 1976, 51-66360

Int. Cl.^{2} B65G *13/07*

U.S. Cl. 198—781 **4 Claims**



1. a roller conveyor for conveying an object comprising:

a frame;

a plurality of free rollers having a first axis of rotation;

a first pin aligned along said first axis of rotation and extending from each end of each free roller;

linkage means rotatably coupled each of said plurality of free rollers to said frame about a second axis of rotation substantially parallel and offset from said first axis of rotation of said free rollers and located between said first axis and said object, said linkage means including an eccentric member having one end rotatably coupled to said first pin and the other end of said eccentric member formed into a second pin aligned along said second axis of rotation and rotatably coupled to said frame; and

means for selectively imparting rotational force to each of said free rollers disposed on said frame, said means frictionally coupled to said plurality of free rollers.

4,109,783

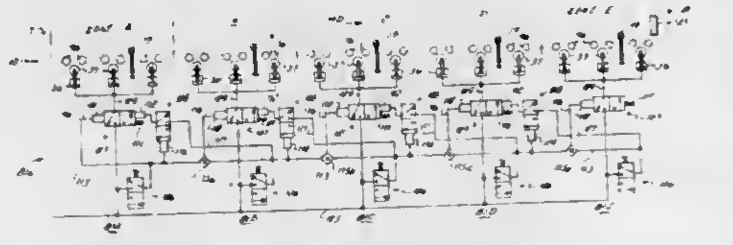
FLUID CONTROL CIRCUIT AND METHOD FOR AN ACCUMULATOR CONVEYOR

Robert K. Vogt, Cincinnati, Ohio, assignor to The E. W. Buschman Company, Cincinnati, Ohio

Filed Aug. 2, 1976, Ser. No. 710,903

Int. Cl.^{2} B65G *13/071*

U.S. Cl. 198—781 **17 Claims**



1. A control circuit for an accumulator conveyor of the type having a plurality of zones between the inlet end and the discharge end, each zone including at least one selectively operable article propelling member for transferring an article on said conveyor through said zone, said control circuit comprising

a respective sensor means associated with each zone, each said sensor means being adapted to sense the presence or absence of an article in a respective zone on said conveyor,

a sub-circuit means for each zone, each sub-circuit means being activateable in response to an article sensed by the sensor means associated with said zone or the immediately upstream zone and operable to make live said article propelling member within said zone, and each sub-circuit means being deactivateable in response to the absence of an article to be sensed by said sensor means for said zone and by presence of an article in an immediately downstream zone to be sensed by a sensor means of the immediately downstream zone to make dead said article propelling member within said zone, thereby causing all of said zones to go dead when no article is on said conveyor and causing at least a subject zone to go live when an article is within that zone with no article in an immediately downstream zone.

4,109,784

CONVEYOR BELT WITH CORRUGATED SIDEWALLS

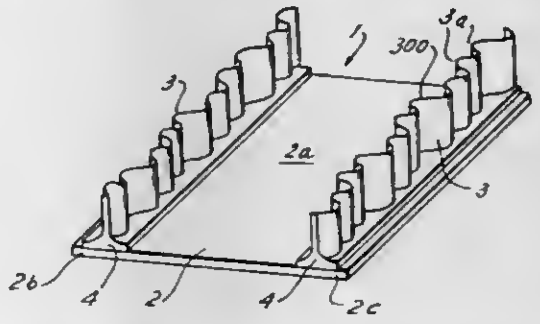
Karl Hartmann, Baerler Strasse 17, 4130 Moers, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,536

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602613

Int. Cl.^{2} B65G *15/40*

U.S. Cl. 198—821 **11 Claims**



1. An endless flexible conveyor belt, comprising an elongated bottom wall; and a pair of elongated sidewalls projecting from said bottom wall inclined thereto and having longitudinal edges remote therefrom said sidewalls defining with said bottom wall a material-accommodating cavity extending lengthwise of the belt, said sidewalls being laterally corrugated and each having a plurality of longitudinally spaced major folds, at least some of said major folds having at least one minor fold incorporated therewithin, each of said minor and major folds having a substantially constant cross-sectional shape and size over their height intermediate said bottom wall and said edges and said minor folds having cross-sectional dimensions which differ from those of said major folds, the presence of said minor folds reinforcing said sidewalls against lateral deflection and also enhancing the ability of said sidewalls to undergo longitudinal compression and expansion during movement of the belt from one into another plane of travel.

4,109,785

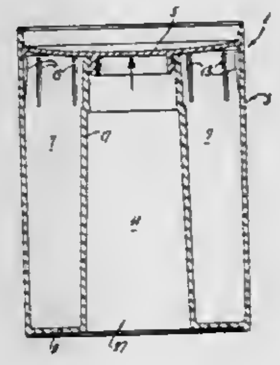
CHILD RESISTANT PACKAGE

Walter G. Berghahn, and Martha L. Berghahn, both of Scotch Plains, N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,609

Int. Cl.^{2} A45C *13/10, 13/18*

U.S. Cl. 206—1.5 **13 Claims**



1. A child resistant package comprising in combination a

container body and removable cap means; said container body being open at the top and being provided with a closed bottom and outer side wall;

support means on said container body for supporting said cap means when positioned on said container body;

a passageway through said body having an opening to the outside of said container body and extending from a point on an outside wall thereof remote from said cap to a point adjacent said cap means whereby access may be had to said cap means from outside said container body through said passageway;

said passageway being wide enough to just about accommodate an average adult finger but longer than the average child's finger;

the distance from said passage opening to the point on the cap means on which pressure may be applied to pop the cap means off the container being longer than the average child's finger but about as long as an average adult finger.

4,109,786

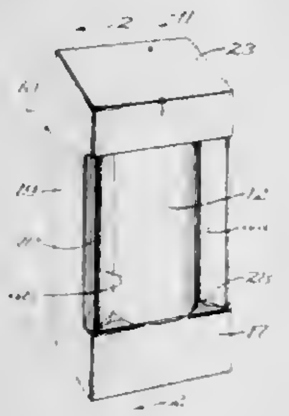
CARTON FOR ROUND ARTICLES

Harry I. Roccaforte, Western Springs, and William D. Pasquale, Downers Grove, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Jan. 10, 1977, Ser. No. 758,033

Int. Cl.^{2} B65D *5/50*

U.S. Cl. 206—45.14 **3 Claims**



1. A combination comprising: a rectangular display carton having a front and back panel, said front panel having an aperture formed therein to display the contents of said carton; and an insert adapted to contact and provide restraint for a smooth cylindrical object to prevent rotation thereof out of registration with said opening in said carton, said insert comprising

a central panel,

a series of at least three panels connected by parallel vertical hinge lines on each side of said central panel and eloongated offset strut panels formed in the second of said series of panels, said strut panels having article engaging edges, and

friction means applied to said inner surface of said central panel for contacting said cylindrical article to prevent rotation thereof.

4,109,787

MULTIPACKAGE AND CARRIER DEVICE

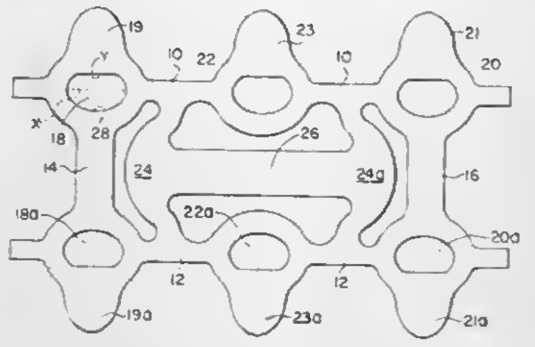
Mindaugas Julius Klygis, Barrington, and Robert Charles Olsen, Streamwood, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 602,619, Aug. 11, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,275

Int. Cl.^{2} A45C *11/00*

U.S. Cl. 206—150 **8 Claims**

1. A package of closely spaced containers each of the type having a reduced generally cylindrical neck portion with outward shoulder means below the dispensing opening: and a carrier sheet of resilient deformable plastic material with apertures spaced in accordance with the number and spacing of the packaged containers and providing encircling bands receiving the neck portions of corresponding containers with edge portions of the apertures deflected upwardly and engaged beneath the shoulder means of included containers; each aperture having at least one portion of the periphery thereof of substantial length generally approaching a straight line and at least approximating the maximum length of an included aperture; the material of the carrier sheet adjacent said one portion of the periphery of each aperture extending transversely outwardly into a finger gripping tab including a base portion as part of the encircling band; each tab having a width along the base portion



thereof substantially coextensively spanning said one portion of the periphery of an adjacent aperture and an outwardly extending length dimension from said base portion relative to other portions of the carrier sheet material making up the encircling bands surrounding each aperture such as to provide increased transverse extent of material outwardly from said base portion for maximum resistance to stretching of each said one portion of the periphery of each aperture with a sharp downward deflection of each tab in external contiguous surface continuation of the upwardly deflected base portion against the neck portion of an adjacent container in the package of containers.

4,109,788

COMPONENT CONTAINER

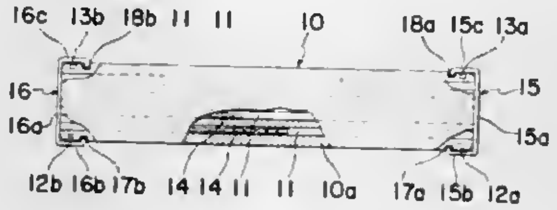
Fuminori Hirose, Hirakata, and Teruo Shimizu, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 15, 1977, Ser. No. 816,198

Claims priority, application Japan, Jul. 16, 1976, 51-95419[U]

Int. Cl.^{2} B65D *85/30*

U.S. Cl. 206—329 **6 Claims**



1. A container for accommodating a plurality of wireless components, said container comprising:

casing means having a plurality of elongated parallel storage chambers therein for holding rows of said wireless components, said casing means having first and second opposing ends and said storage chambers extending between and opening at said first and second ends;

barrier means pivotably mounted across said first and second ends for alternatively closing and opening said openings into said storage chambers at said ends, each of said barrier means being comprised of an elastic wire member having a gate body extending across the end of said means in front of said storage chamber openings and an L-shaped arm extending from each end of said gate body along the sides of said casing means and pivotably connected to said

casing means, whereby pivoting said L-shaped arms upward swings said gate body away from said end openings to said storage chambers and allows said components to be inserted thereinto or withdrawn therefrom;

detent means at said ends of said casing means for engaging and holding said wire member in position across said storage chamber openings; and

said casing means further having guide grooves in the edges thereof adjacent said L-shaped arms and perpendicular to the direction of said arms when said gate body is across the end of said casing means, said guide groves shaped so that the insertion of a rod member into said guide grooves will force against said arms and cause said wire member to pivot.

4,109,789

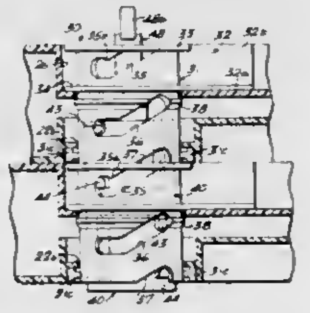
SELF-CONTAINED LATCH CONSTRUCTIONS FOR INTERLOCKING CONTAINERS IN STACKED RELATION

Lazzaro A. Fattori, and Joseph E. Fattori, both of Woodcliff Lake, N.J., assignors to Plastic Reel Corporation of America, Carlstadt, N.J.

Filed Sep. 28, 1977, Ser. No. 837,550

Int. Cl.^{2} B65D *85/87, 21/02*

U.S. Cl. 206—404 **18 Claims**



1. A locking unit for a container having a bottom and a separable fitted cover which is designed for nested stacking with other like containers, an opening formed in said container bottom, said locking unit being mounted in said cover and extending into said bottom opening when said cover is in a closed position on said bottom, said locking unit comprising an outer tubular member having a hollow bore formed as upper and lower chambers, cam means formed in the walls of the lower chamber, an extendable combination cam follower and latch means housed in said lower chamber and engaging said cam means, said upper chamber having companion elements for engagement by said latch means, and a finger manipulatable actuator accessible from the top surface of said cover, said actuator engaging said combination cam follower and latch means to impart movement thereto which, under control of said cam means engagement, extends the combination cam follower and latch means from said lower chamber and into the upper chamber of an underlying stacked container, wherein said latch means engage said companion elements, interlocking the two containers into a shipping unit.

4,109,790

SUPPORTING COVER FOR AN INK ROLL MEANS

James A. Gottschlich, Bellbrook, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 13, 1977, Ser. No. 806,226

Int. Cl.^{2} B65D *85/54, 13/00*

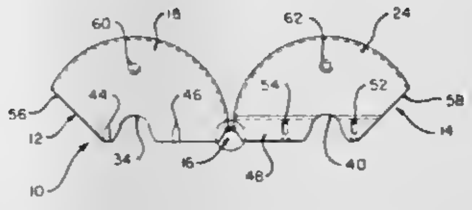
U.S. Cl. 206—446 **11 Claims**

1. A supporting cover for an ink roll means comprising:

first and second sections and a hinge means to enable said first and second sections to be moved relative to each other to form a generally hollow container when in assembled relationship, to receive said ink roll means therein;

at least one of said first and second sections having means enabling said ink roll means to be rotatably supported in said supporting cover;

at least one of said first and second sections having a portion removed therefrom to expose a portion of said ink roll means when mounted in said supporting cover; and



said supporting cover having thereon means for restraining movement thereof when installed on a cooperating utilization device.

4,109,791

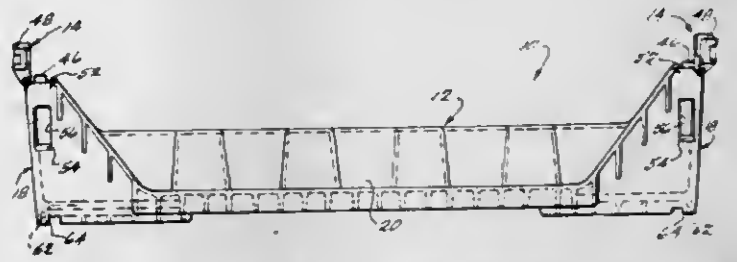
NESTABLE AND STACKABLE CONTAINER ASSEMBLY WITH IMPROVED BAIL STRUCTURES OF MOLDED PLASTIC

Stuart A. Clipson, Glendale, and Ralph H. Herolzer, Cincinnati, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 22, 1974, Ser. No. 444,967

Int. Cl.^{2} B65D *21/06*

U.S. Cl. 206—506 **12 Claims**



1. A nestable and stackable container assembly comprising a unitary container body of molded plastic material having a bottom wall and two pairs of opposed side walls integrally joined together and extending upwardly from the periphery of said bottom wall, said side walls being shaped to permit said container body to be nested within a like container body or the latter to be nested therein when disposed in vertically aligned relation therewith, one pair of said opposed side walls including a plurality of horizontally spaced vertically inclined sections extending above said bottom wall, each of said sections defining upwardly facing bail supporting surfaces disposed between the other pair of side walls, a pair of bail structures of molded plastic material mounted along the upper portion of said one pair of opposed side walls for movement between a stacking position wherein each extends inwardly of the adjacent interior surface of the associated side wall toward the opposed side wall in supported relation on the upwardly facing surfaces of said sections and a nesting position wherein each is disposed outwardly of the adjacent interior surface of the associated side wall, said bail structures when in said stacking position defining upwardly facing stacking surfaces for supporting a like container assembly when the container body thereof is disposed in vertically aligned relation above said container body, each side wall of said one pair including a plurality of horizontally spaced upwardly diverging panels extending upwardly and outwardly from said bottom wall between the aforesaid sections provided therein, each of said panels having inwardly directed flanges along the diverging edges thereof forming a part of the aforesaid sections which include a horizontally disposed ledge extending between the upper edges of adjacent flanges of adjacent panels to define said upwardly facing bail supporting surfaces, the aforesaid

sections of each side wall of said one pair including a plurality of horizontal elements, each extending horizontally between a pair of adjacent flanges in vertically aligned and spaced relation to the ledge associated therewith, the vertical spacing between said elements and said ledges being less than the nesting height of said container body, and a substantially vertically extending panel integrally interconnecting the inner edges of each associated ledge and horizontal element and the associated flanges extending therebetween, the portions of each of said one pair of side walls extending vertically below said horizontal elements between the associated flanges being open, said horizontal elements defining downwardly facing nesting stop surfaces and the aligned ledges defining upwardly facing nesting stop surfaces.

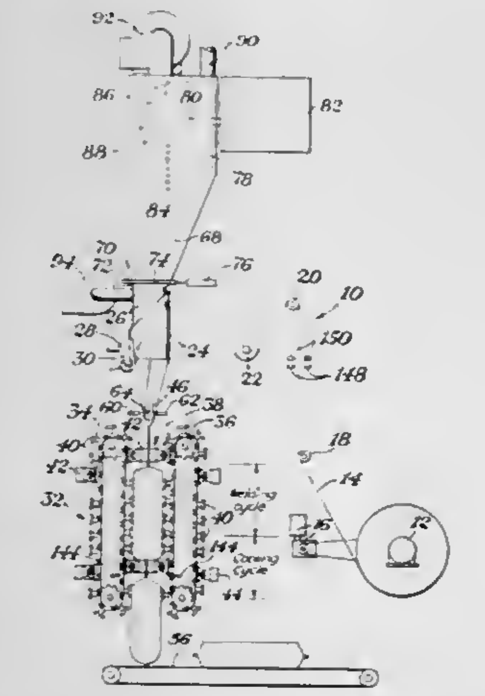
4,109,792
METHOD OF PACKAGING AND PRODUCT MADE THEREBY

Eddie Lee Greenawalt, and Lorenzo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 572,602, Apr. 28, 1975, abandoned, which is a division of Ser. No. 460,864, Apr. 15, 1974, Pat. No. 3,925,963, which is a continuation-in-part of Ser. No. 347,923, Apr. 4, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,746

Int. Cl.² B65D *77/12;* **B65B** *1/02, 9/12*

U.S. Cl. 206—525 **35 Claims**



1. In the method of producing bags by providing a flexible, generally vertical tube of thermally sealable material, periodically introducing product into the tube, and collapsing and transversely sealing the tube at spaced intervals to form a bag structure about each successive product load, the steps comprising: clamping the tube along first and second zones spaced in the vertical direction, the clamping pressure effecting a generally gas-tight closure of the tube along said zones, leaving the tube essentially free of mechanical clamping pressures between said zones, transversely parting the tube along a line between and remote from said clamped zones, separating the resultant parted edges to provide a space therebetween, preferentially bathing the parted edges, remote from said clamped zones, in gas streams, and venting said streams through the space between said edges, said streams imparting sufficient velocity pressure to the edges to urge the plies of the tube into intimate sealing contact, and simultaneously heating the streams to at least assist in raising the tube to sealing temperatures.

8. Form, fill and seal industrial size bags prepared according to the method of claim 1, and which are further characterized by side gussets, and at least a two ply construction.

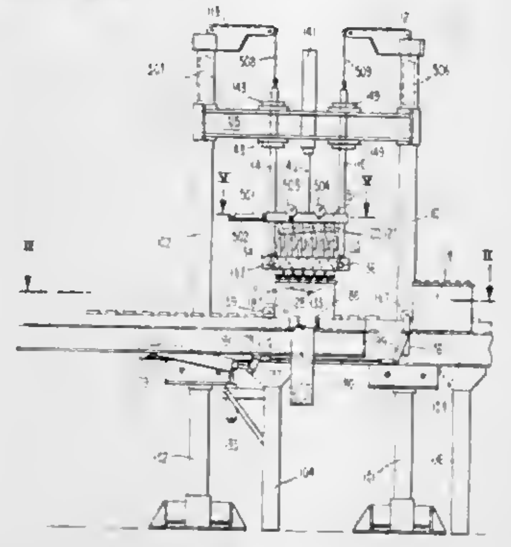
4,109,793
AUTOMATIC AIR LEAK TESTING APPARATUS AND METHOD

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 600,840, Jul. 31, 1975, Pat. No. 4,027,797, which is a division of Ser. No. 475,273, May 31, 1974, Pat. No. 3,938,368. This application Feb. 22, 1977, Ser. No. 770,889

Int. Cl.² B07C *9/00*

U.S. Cl. 209—74 R **5 Claims**



1. In an automotive battery production system, apparatus for selectively isolating automotive batteries comprising:

(a) a first conveyor means for advancing batteries and having defined thereon a battery processing position at which each battery is to be subjected to a preselected process;

(b) means for sequentially isolating and positioning each of said batteries at said battery processing position for a predetermined length of time; said means including means located at said battery processing position for positioniog at said battery processing position each of said batteries in a first direction along a path which is transverse to the direction of advancement of said batteries;

(c) a second conveyor means for advancing select ones of said batteries, said second conveyor means communicating with said first conveyor means adjacent said battery processing position; and

(d) reject means responsive to results of said processes, for selectively moving batteries from said battery processing position along said path in the opposite direction with respect to said first direction to move said batteries from said first conveyor means to said second conveyor means.

4,109,794
NECKTIE RACK

Stanley C. Samuel, and Esta Samuel, both of 26 Wellsley Rd., Rockville Centre, N.Y. 11570

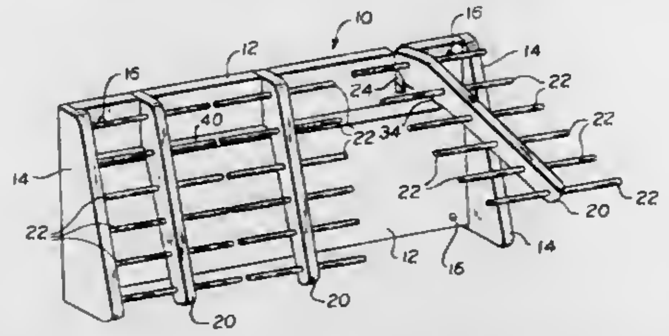
Filed Sep. 13, 1976, Ser. No. 722,528

Int. Cl.² A47F *7/12*

U.S. Cl. 211—13 **4 Claims**

1. A necktie rack including in combination a back element, an arm supported at its upper end from the back element, a pivot connection between the top of the arm and the back element on which the arm swings about a horizontal axis to move angularly with respect to the back element toward and from a horizontal position in which the arm extends forward, tie hangers carried by the arm and extending generally horizontally from both sides of the arm at spaced locations lengthwise of the arm, and bumper surfaces at the upper part of the arm and limiting downward angular movement of the arm to a position of rest extending outward at an acute angle to the back

element in a position where each of the spaced tie hangers is at a different horizontal spacing forward from the back element with the lowermost tie hanger furthest from the back element so that ties on the hangers have space below them, when the arm is against the back element bumper surface, into which each tie can hang freely and vertically with its front and back inside surfaces in direct confrontation with one another and without substantial interference from other ties on other tie hangers, characterized by the back element having a channel opening through the top of the back element and extending for the full front-to-back thickness of the back element at the upper part of the back element, the upper end of the arm extending into the channel, and the pivot connection between the arm and the back element being pins extending from opposite sides of the arm and into bearing surfaces in the opposite sides of said channel and characterized by the back element being a board of substantial front-to-back thickness, and the channel extending for a substantial distance downward from a top of the board, the upper end of the arm being of a width that fits into the channel with a running clearance so that the arm is held against transverse movement by the sides of the channel, the pins that extend from the arm to the sides of the channel being a pin that extends from both sides of the arm and into the sides of the channel on opposite sides of the arm, the board having a groove in a rearward face thereof and of a width for receiving the portions of the pin that extend beyond the sides of the arm, said groove being of a depth less than the front-to-back thickness of the back board whereby the end of the groove provides a bearing surface that limits forward movement of the pivot pin and the arm when the arm is in its downwardly and forwardly extending position with said bumper surfaces in contact with one another, one of the bumper surfaces being on the back of the arm immediately below the lower limit of the channel when the arm is in contact with the other bumper surface which is part of the front surface of the back element below the bottom of said channel, the portion of the arm extending below the channel and pressing against the forward surface of the back board being in position to hold the pivot from moving rearwardly in the groove and the force exerted by a person swinging the arm outward at its lower end serving to hold the pins at the forward end of the groove whereby the axes of the pin remains at the forward end of the groove for all working positions of the arm.



4,109,795
DISPLAY RACK AND ASSEMBLY OF ARTICLES ON THE RACK

Barry S. Koenigsford, Mount Prospect; Kenneth Davidson, Libertyville, and Howard J. Marschak, Evanston, all of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

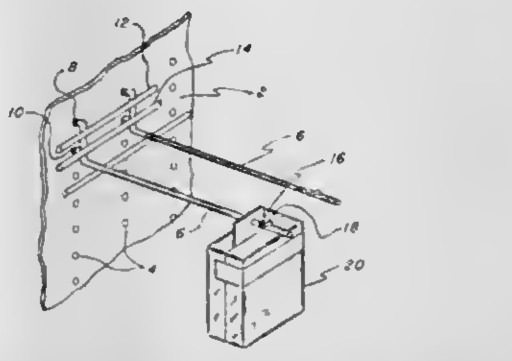
Filed Jul. 14, 1975, Ser. No. 595,736

Int. Cl.² A47F *7/00*

U.S. Cl. 211—57.1 **7 Claims**

1. An arrangement comprising a bracket having first and second means supporting said bracket at a first end, said bracket being formed as a substantially straight element having a given cross-sectional area, said bracket incorporating detent means at the second end, said detent means including a stop-notch of reduced cross-sectional area, cooperative with an adjacent protuberance of increased cross-sectional area, the latter facing toward the second end of the bracket, and a mounting member supporting a plurality of articles, said mounting member including an end telescopically engageable with the second end of said bracket to enable said articles to be slid along a linear path from said mounting member over the detent means onto the bracket.

7. A bracket for displaying and dispensing a plurality of articles, each of which is supported on a card having an opening, said bracket having spaced hooking members at the rear thereof for detachable securement to a pegboard to form a display rack, said bracket having a forwardly and longitudinally extending metal rod which is circular in cross-section with said metal rod having a depressed portion having a downwardly and angularly sloping surface terminating with the front thereof well into the rod body, a raised portion at the front of said depressed portion and rearward of the rod end, said raised portion having a wall surface extending from the juncture thereof with the depressed portion substantially perpendicular to the longitudinal axis of the rod and with said wall surface extending upwardly of the top plane of the rod, both said depressed and raised portions thereby forming a detent adjacent the forward end of the metal rod but spaced rearwardly from the front end of said rod, so that the cards which are hung on said metal rod through said card openings will be retained on said metal rod solely by said detent but will permit ready removal of the article and its card from the metal rod by lifting such article and card vertically upwardly of the metal rod, the most forward of said plurality of cards adapted to be received in said depressed portion of said rod when said card engages said detent while said card is supported on said rod, the longitudinal axis of the front end of said rod coinciding with the longitudinal axis of the major portion of the rod so that each of the cards may be inserted on said rod in a linear direction.



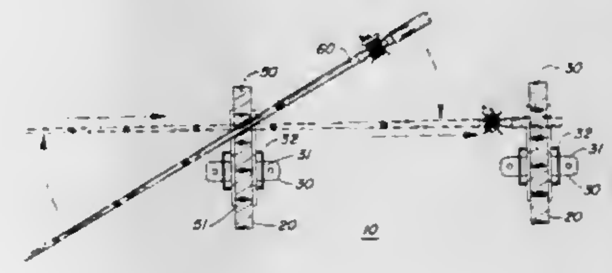
4,109,796
ROD AND REEL STORAGE APPARATUS

Robert C. Mitchell, 485 El Blanco Dr., Boise, Id. 83705

Filed May 20, 1977, Ser. No. 798,748

Int. Cl.² A01H *91/00*

U.S. Cl. 211—60 R **7 Claims**



1. Rod and reel holding apparatus comprising a pair of holders, each holder including;

a mounting bracket;

an upwardly extending arm rotatable about its longitudinal axis and removably attached to said bracket;

a loop assembly attached to the uppermost terminal free end of said arm, said loop assembly including at least one loop having an obliquely located slot at substantially the uppermost end thereof, said loop adapted to receive a rod inserted downwardly in alignment with said slot and adapted to prevent upward removal of the rod unless aligned with said slot.

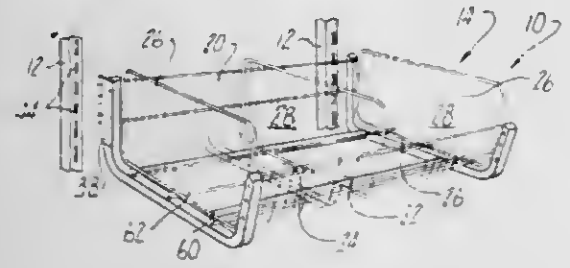
4,109,797
DISPLAY ASSEMBLY

Frederick F. Brunette, Farmington, Mich., assignor to Bobbie Brunette, Grand Haven, Mich., a part interest

Filed Mar. 22, 1976, Ser. No. 669,259

Int. Cl.^{2} A47F *3/14*

U.S. Cl. 211—126 **10 Claims**



1. A display assembly adapted to be secured to a pair of spaced and parallel upright supports, said assembly comprising:
- a basket portion;
- an end support bar secured adjacent each lateral end of said basket portion, and
- means for removably securing each end of said display assembly to one of said upright supports, said means further comprising a first member having an elongated portion extending normal to said lateral ends which is laterally slidably disposed through one of said end support bars whereby said elongated portion supports said end support bar, and means extending normal to said elongated portion for securing said first member to one of said upright supports whereby the laterally slidable elongated portion compensates for lateral misalignment between the upright supports.

4,109,798
CRANE HAVING OVERLOAD RELEASE MEANS

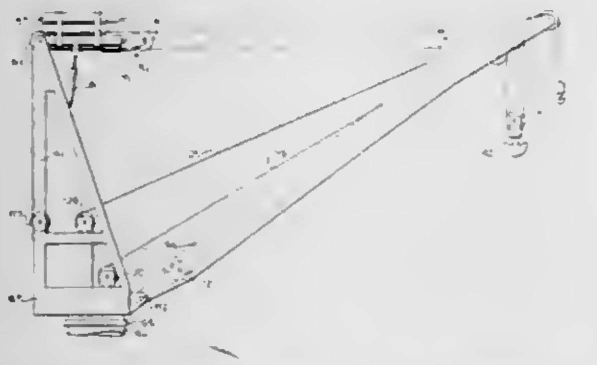
Cecil Alastair Comyns-Carr, Lansdown, England, assignor to Stothert & Pitt Limited, England

Filed Sep. 22, 1977, Ser. No. 835,743

Claims priority, application United Kingdom, Sep. 30, 1976, 40621/76

Int. Cl.^{2} B66C *13/48*

U.S. Cl. 212—39 R **6 Claims**



1. In a crane having a superstructure and comprising at least one hoist winch having a barrel on which a hoist cable is stored, said hoist cable being connected to the barrel of the hoist winch by link means which parts at a predetermined tension, a jib over which said cable is reeved for connection to a load, and a derricking system including a derricking winch and pivotally mounted pulley means, a derricking cable winch is reeved over the derricking winch, the pulley means and the jib for luffing the jib, the improvement wherein the derricking system comprises hydraulic ram means and preloaded hydropneumatic accumulator means connected to said hydraulic ram means, said ram means and said accumulator means being mounted on said crane superstructure, said ram means having rod means connected to said pulley means for pivoting said pulley means, the gas pressure in said accumulator means being set to cause said ram means to react against a predetermined overload in said derricking system, and including release means for said hoist winch, said release means being responsive to movement of said ram means due to exceeding said predetermined overload whereby said hoist winch, when released, pays out said hoist cable to enable parting of said link means.

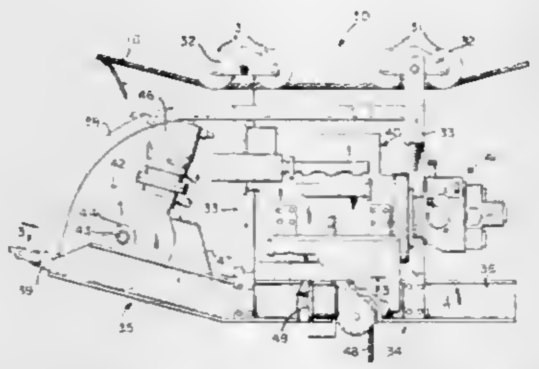
4,109,799
SKYLINE LOGGING CARRIAGE

Leo Arnold Munn, P.O. Box 636, Granite Falls, Wash. 98252

Filed Aug. 6, 1975, Ser. No. 602,380

Int. Cl.^{2} B66C *21/00*

U.S. Cl. 212—83 **2 Claims**



1. A skyline logging carriage adapted to travel along a suspended skyline cable in a logging operation comprising:
- a suspended skyline cable,
- a pair of spaced, vertical carriage yoke supports, each having skyline cable rider sheaves rotatably mounted on one end thereof for flexible suspension of the yoke supports from the skyline cable, the cable extending between the skyline rider sheaves,
- a carriage frame secured to the other end of the pair of yoke supports, the carriage frame including a first frame portion extending parallel to the portion of the skyline between the skyline cable rider sheaves and a second angled frame portion tilted upwardly toward the skyline cable at an angle of about 15° relative to the first portion,
- a fairlead mounted on the first portion of the carriage frame intermediate the skyline cable rider sheaves and in the plane formed by the first frame portion,
- a cable-winding drum rotatably mounted on the angled frame portion of the carriage to provide proper level winding around the winding drum and to prevent lifting of the skyline carriage from the skyline cable when a heavy load is being lifted, the axis of the cable-winding drum elevated above the fairlead and laterally offset therefrom,
- a load cable extending vertically through the fair-lead and leading onto the cable-winding drum at a materially different angle from the vertical or horizontal,
- an internal combustion engine having a power output shaft, the engine mounted on the first frame portion directly above the fairlead and adjacent the cable-winding drum,
- a reversible, variable displacement fluid pump providing a source of high-pressure fluid output connected to the output shaft of the engine,
- a fluid motor having a worm gear output shaft, the motor driven by the high-pressure fluid output of the variable displacement pump,

- a circular gear operatively connected to the cable-winding drum and engaging the worm gear,
- means for controlling travel of the skyline carriage along the skyline including a yarder having a cable-winding drum, and a mainline cable secured at one end to the angled frame portion and wound around the cable-winding drum of the yarder at the other end,
- control means, including a hydraulic system with radio controlled solenoid valves on the carriage frame, for starting and stopping rotation of the winch drum, either to payout or haul in on the load cable,
- a brake system mounted on the carriage frame adjacent the skyline cable adapted to grip the skyline cable, and
- remote controlled means for operating the brake system.

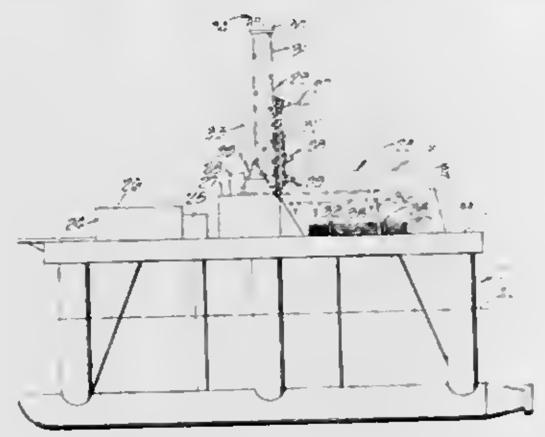
4,109,800
MULTI-STAGE WELL-DRILLING MAST ASSEMBLY

James A. Howard, and Roger Smith, Jr., both of Houston, Tex., assignors to BJ-Hughes Inc., Long Beach, Calif.

Filed Oct. 10, 1973, Ser. No. 404,943

Int. Cl.^{2} E21B *19/00*

U.S. Cl. 214—2.5 **20 Claims**



1. A multi-stage, well-drilling mast assembly comprising: a platform; a first stage mast; means pivotally mounting said first stage mast on said platform for swinging movements between horizontal and upright positions; means for locking said first stage mast in upright position; a second stage mast; means pivotally mounting said second stage mast on said platform for swinging movements between an upright position adjacent to said first stage mast in its upright position and a horizontal position; and means for locking said second stage mast in upright position; including means for vertically racking a plurality of stands of well pipe in said mast assembly; and power operated racker means carried by said second stage mast for moving a selected stand of well pipe between a position in said racking means and a position on the center line of said mast assembly.

4,109,801
STEEL SHAPE STACKING APPARATUS

Tsutomu Uchida, Matsudo; Zenichi Ono, Kawaguchi; Makoto Nagashima, Ageo; Eiji Tasaka; Shigeo Mitsui, both of Kawaguchi, and Keiichi Nomura, Urawa, all of Japan, assignors to Toshin Seiko Kabushiki Kaisha, Japan

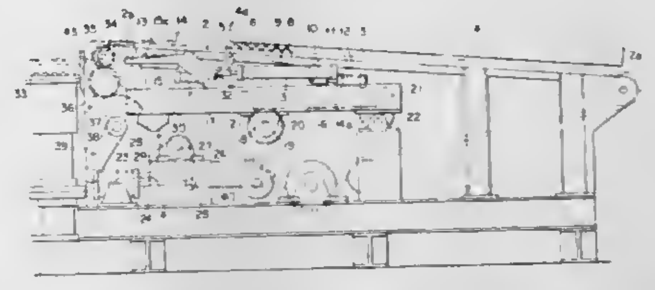
Filed Sep. 8, 1976, Ser. No. 721,585

Claims priority, application Japan, Sep. 10, 1975, 50-108873

Int. Cl.^{2} B65G *57/04*

U.S. Cl. 214—6 FS **2 Claims**

1. An apparatus for automatically stacking steel shapes: which comprises, in combination, an endless conveyor driven by driving means for conveying steel shapes transversely placed thereon; an overlapping member disposed above and along said conveyor to form a passage therebetween for permitting steel shapes to pass without being overlapped; a stand-by stop member adapted to project into said passage for stopping said conveyed steel shapes at an intermediate part of said passage and then to retract from said passage for advancing said stopped steel shapes; assorting stop means adapted to project into said passage at a position upstream of said stand-by stop member and then to retract from said passage, timing of the projection and retraction of said assorting stop means being correlated to timing of the projection and retraction of said stand-by stop member so that upon aligned-stop of a group of steel shapes of a predetermined number by projection of said stand-by stop member said assorting stop means is projected to stop the steel shape just succeeding to said group of steel shapes and said stand-by stop member is retracted to advance said group of steel shapes, and upon completion of advancement of said group of steel shapes said assorting stop means is retracted and said stand-by stop member is projected; a take-out stop member for stopping temporarily said advanced group of the steel shapes at a take-out position; stacking lifter means disposed at a position downstream from said conveyor; stacking lever means adapted to lift said group of steel shapes stopped by said take-out stop member from said conveyor to a level above said stacking lifter, said lever means being adapted to carry out quick retraction and lowering to its original position after lifting of said group of the steel shapes on the stacking lifter means; and driving means for correlating and synchronously driving said stand-by stop member, assorting stop means and said stacking lever means so as to repeat their correlated foregoing operations; said stacking lever means comprising magnetic lever means for stacking said steel shapes of a group in an inverted state on said stacking lifter, said magnetic lever means being used at certain intervals in place of said stacking lever; and said assorting stop means being defined by two switchable stop members adapted to have but one of said members in an actuated state, one of said members corresponding to the number of steel shapes in a group to be stacked by said stacking lever means and the other corresponding to the number of steel shapes in a group to be stacked by said magnetic lever means.



4,109,802
DEPALLETIZING APPARATUS

Alan James Fishwick, Bolton, England, assignor to Metal Box Limited, Reading, England

Filed Mar. 17, 1977, Ser. No. 778,538

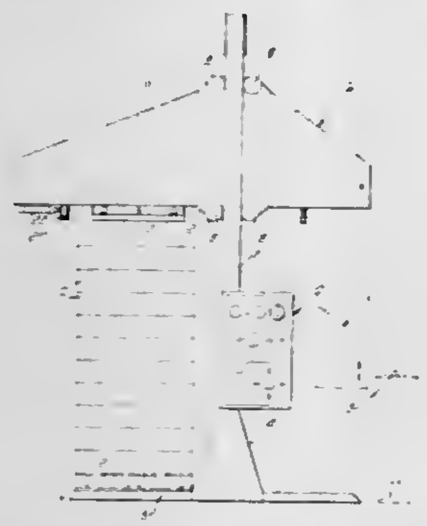
Int. Cl.^{2} B65G *59/02*

U.S. Cl. 214—8.5 F **9 Claims**

1. In apparatus for transferring layers of articles, one layer at a time, from a pile of superimposed layers, of the kind comprising a bottom support for a pile of layers of articles; a transfer head positioned above said bottom support, which transfer head includes a transfer table; and support means for said transfer head including means for lowering and raising said transfer head relative to said bottom support first to align the transfer table with the top layer of the pile and then to align the transfer table with a layer-receiving means; the improvement wherein said transfer head includes:
- transfer means for engaging the top layer of the pile;
- operating means connected to the transfer means for reciprocating said transfer means lengthwise said transfer table to move the top layer of the pile on to the transfer table and to move a layer from said transfer table on to said layer-receiving means;
- opposed clamp members arranged for engaging the sides of

a lower layer immediately below the top layer when said transfer means is aligned with the top layer, to clamp said lower layer preparatory to moving the top layer on to the transfer table; and

individual actuating means for each of said clamp members, each operable to move its clamp member inwardly only

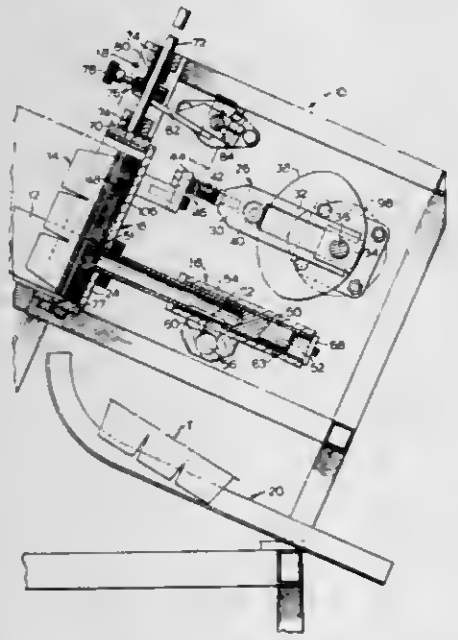


until that clamp member engages said next lower layer irrespective of the position of alignment of said next lower layer in the pile, whereby said next lower layer is stabilized in the position in which it is presented in the pile during movement of the top layer on to said transfer table by said transfer means.

4,109,803

METHOD AND APPARATUS FOR DE-STACKING TRAYS

Alan Ralph Quelch, 16 George St., North, Cambridge (Galt), Ontario, Canada (N1S 2M8)
Filed Feb. 14, 1977, Ser. No. 768,757
Int. Cl.² B65G *59/06*
U.S. Cl. 214—8.5 D **13 Claims**



1. A method of removing trays individually from a inverted stack of nested trays, comprising the steps of:

releasing the inverted stack to allow it to move and bear against a plate means so that the lowermost tray forms a closed chamber therewith;

clamping the inverted stack, except the lowermost tray, against movement thereof;

applying negative pressure through the plate means to the closed chamber;

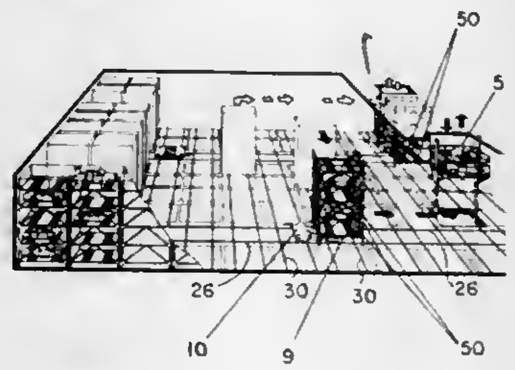
withdrawing the plate means from the stack with the lowermost tray adhering thereto by suction;

releasing the negative pressure from the closed chamber whereby the adhering tray is released from the plate means.

4,109,804

VEHICLE PARKING SYSTEM WITH A PLURALITY OF MOVABLE COLUMS HAVING VEHICLE SUPPORTING FLOORS

Rafael Leon Moyano, Obispo Mardone, 78, Cordoba, Spain
Filed Jan. 30, 1976, Ser. No. 653,889
Claims priority, application Spain, Jan. 30, 1975, 434.295
Int. Cl.² E04H *6/06*
U.S. Cl. 214—16.1 CB **9 Claims**



4. A vehicle parking system comprising:

a vehicle parking area having a floor and a ceiling;

a plurality of vehicle supporting columns within said vehicle parking area, each said column having a plurality of vertically aligned vehicle supporting floors, each said supporting floor being formed by a plurality of spaced parallel slats;

at least one vehicle entrance and exit area located above said ceiling of said parking area, said entrance and exit area being defined by a plurality of spaced parallel slats;

at least one cargo hoist unit supported in a fixed horizontal position on said floor of said parking area, said cargo hoist unit having at least one vertically movable elevator means, selectively alignable with said entrance and exit area and said floors of said columns, for vertically moving vehicles between said entrance and exit area and selected column floor levels;

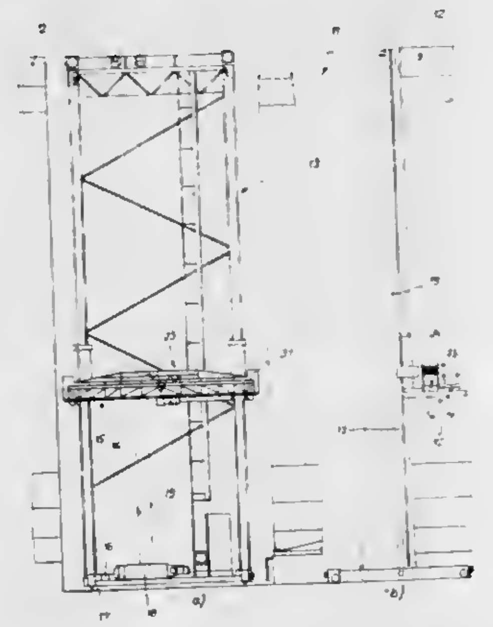
transfer carriage means, mounted on said cargo hoist unit elevator means, for transferring a vehicle between said entrance and exit area and said cargo hoist unit and between said cargo hoist unit and a selected floor of a column positioned adjacent said cargo hoist unit, said transfer carriage comprising a frame, a plurality of spaced parallel bars supported by said frame, means for moving said bars horizontally between said cargo hoist unit and said entrance and exit area or a selected column floor, said bars being dimensioned to fit between said spaced slats of said entrance and exit area or said selected column floor, and means for moving said bars vertically between said spaced slats to pick up a vehicle from or deposit a vehicle on said entrance and exit area or said selected column floor; and

means, positioned within said parking area, for horizontally moving selected of said columns between a position confronting said cargo hoist unit and selected storage positions within said parking area, said column moving means comprising a first plurality of parallel tracks extending in a first direction on said parking area floor, a lower platform movable along said first tracks, a second plurality of tracks extending in directions transverse to said first tracks, said second tracks comprising first track portions on said parking area floor and second track portions on the top of said lower platform and alignable with said first track portions, an upper platform movable along said second tracks between a position above and supported on said lower platform and a position beneath a selected said column, and means on said upper platform for vertically lifting and supporting said selected column when said upper platform is positioned thereunder, whereby when said upper platform then moves to a position above said lower platform, said selected column and said upper platform are supported by said lower platform, said column lifting means comprising vertically movable jacks, and concave elements on said column to receive said jacks.

4,109,805

DEVICE FOR INSERTING AND/OR WITHDRAWING PARTICULARLY LONG AND/OR HEAVY MATERIAL IN A STORAGE CONTAINER

Hans Wagner, Esslingen, Fed. Rep. of Germany, assignor to Hans Fehr GmbH, Fed. Rep. of Germany
Filed Dec. 7, 1976, Ser. No. 748,163
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555712
Int. Cl.² B65G *1/06*
U.S. Cl. 214—16.4 A **26 Claims**

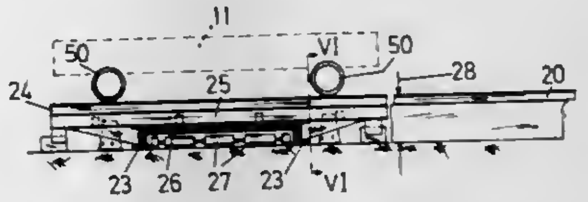


1. In a device for inserting and/or withdrawing particularly long and/or heavy material in and/or from a storage container having several horizontal and vertical shelves, the improvement wherein said device includes an elevating table; a column means, said elevating table being vertically movably attached to said column means; at least one gripper support means mounted on said elevating table; an endless chain mounted for circulating movement on said gripper support means, said endless chain having two parallel and horizontal runs; a gripper means mounted on said endless chain for horizontal movement to-and-fro along the gripper support means, said gripper means including at least two gripper arms whose relative movement for picking up and releasing the material in said storage container is derived solely from the movement of said endless chain, said gripper means also including a link means connecting said gripper arms to said endless chain, said link means causing said gripper arms to move together when said endless chain causes said gripper means to move along a horizontal run thereof and then move apart and finally downwardly relative to said gripper means and thus away from said material when the horizontal movement of said gripper means is temporarily stopped and when the mounting point between said gripper means and said endless chain circulates from one of the horizontal runs of said endless chain to the other.

4,109,806

DEVICE FOR MOVING RAILWAY WAGGONS

Anders Johansson, Bobus Björkö, and Per Strömbeck, Lindome, both of Sweden, assignors to Salen & Wicander Terminalsystem AB, Gothenburg, Sweden
Filed Feb. 25, 1977, Ser. No. 772,244
Claims priority, application Sweden, Feb. 27, 1976, 7602613
Int. Cl.² B60P *1/16;* **B65G** *67/02*
U.S. Cl. 214—38 CC **5 Claims**



1. A device for moving a railway waggon outside a railway yard where tracks terminate blindly at track heads which define a pocket and include a fixed stop, comprising

(a) a framework carrier having a length corresponding to about the length of a railway waggon,

(b) a detachable transporting member for moving said carrier along the ground, outside the yard, said transporting member having a superstructure which engages said transverse beams, supporting wheel means, and means for raising and lowering said superstructure with respect to said wheel means,

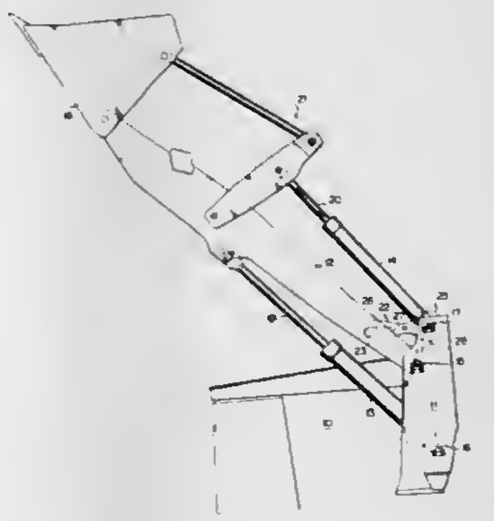
(c) said carrier including a pair of transverse beams adapted for co-operation with said transporting member, a pair of longitudinal beams carried on said transverse beams and spaced apart at normal track gauge, and a length of rail on each said longitudinal beam,

(d) said transverse beams having projecting portions adapted, when brought into contact with the fixed stop at the track head, to position said lengths of rails into alignment with rails at a track.

4,109,807

SUPPORT FOR LOADER LIFT ARM

Yasuhiko Yoshida, Teraimachi, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Nov. 5, 1976, Ser. No. 739,350
Claims priority, application Japan, Nov. 6, 1975, 50-150214[U]
Int. Cl.² E02F *3/36*
U.S. Cl. 214—131 R **3 Claims**

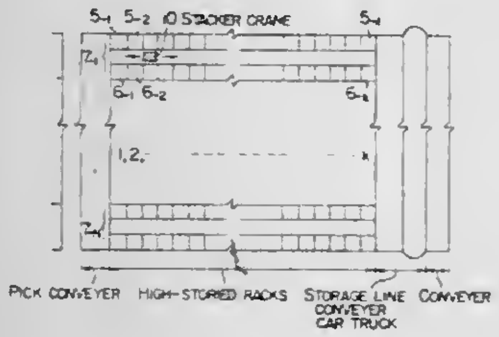


1. A support for lift arms of a tractor mounted loader comprising a tractor frame, lift arms for supporting a loader bucket, said lift arms being pivotally mounted on said tractor frame, a pin embedded in said lift arm, a link pivotally mounted on said tractor frame at a point above the pivotal mount of said lift arm

on said tractor frame, said link having an elongated first hole to facilitate engagement with said pin when said lift arms are raised and a relatively small second hole formed therein, and means provided on said frame for selectively engageable with said second hole for the accomodation of said link when said lift arms are lowered.

4,109,808
METHOD OF STORING ARTICLES IN A WAREHOUSE TO FORM AN IMAGINARY LINK OF ARTICLES

Nobuhiro Hamada; Kotaro Hirasawa, both of Hitachi; Minoru Hatada, Koknbunji, and Hiroshi Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan
Continuation-in-part of Ser. No. 461,431, Apr. 16, 1974, abandoned. This application Jun. 8, 1976, Ser. No. 693,980
Claims priority, application Japan, Apr. 18, 1973, 48-43127
Int. Cl.² B65G *1/06*
U.S. Cl. 214—152 **8 Claims**


5-1 5-2 10 STACKER CRANE 5-4
6-1 6-2 6-4
1,2
PICK CONVEYER HIGH-STORED RACKS STORAGE LINE CONVEYER
CONVEYER CAR TRUCK

1. A method of storing articles in a warehouse that comprises a plurality of storage blocks arranged adjacent each other, each of the storing blocks having a plurality of spaced racks for storing articles, linearly extending aisles between said racks, article transfer means arranged for movement in respective aisles to transfer articles relative to a given location within a respective storage block, control means for operating said article transfer means in accordance with a predetermined mode to transfer articles relative to said storage blocks, comprising the steps of:

storing a plurality of different articles in said storage blocks with at least two different articles in each storage block;

storing in a first storage block at least one and another different articles;

storing in a second storage block at least one article common to the one different article in said first storage block and at least one additional different article;

storing in a third and any succeeding storage block at least one article common to said at least one additional different article of the immediately preceding storage block and at least one furber different article; and

storing in the last storage block as said at least one further different article an article common to said another different article of said first storage block to form an imaginary loop of articles in said warehouse.

4,109,809
MULTIPLE POSITION VEHICLE CARRYING TRAILER

Bobby Dean Clark, Shoshoni, Wyo., assignor to Chair-E-Yacht, Inc., Shoshoni, Wyo.
Filed Dec. 23, 1976, Ser. No. 753,668
Int. Cl.² B60P *1/28*
U.S. Cl. 214—505 **8 Claims**

1. A trailer adapted to carry a plurality of vehicles, comprising:

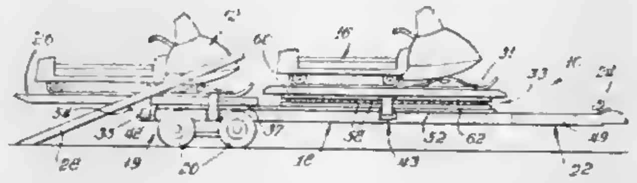
a frame means;

a plurality of wheels rotatably mounted on said frame means to support it rollably above the ground;

a pair of vehicle supporting trailer beds normally disposed in a use position in side-by-side relationship in a common horizontal plane on said frame means for each supporting individually from below one of said vehicles;

pivoting means disposed at the rear edge of said frame means for mounting individually and tiltably said beds on said frame means forwardly of the mid-point of said beds to enable them to tilt individually and independently backwardly until their rear edges contact the ground and to enable the loaded beds to tilt back to their horizontal use position under the weight of the vehicles;

latching means for holding said beds releasably in their use positions;



a turntable:

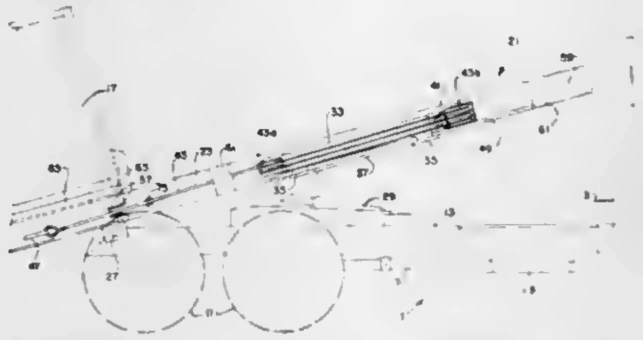
means for mounting said turntable on said frame means forwardly of said beds to enable said turntable to rotate about a centrally-disposed vertical axis independently of said beds;

means on said turntable supporting at least another one of said vehicles to enable it to be driven from said turntable onto one of said beds; and

latching and detent means for holding said turntable in a given position.

4,109,810
APPARATUS FOR MOUNTING AND DEMOUNTING A VEHICLE BODY

Eldon D. Jones, R.R. 2, Lake Crystal, Minn. 56055
Filed May 11, 1977, Ser. No. 795,981
Int. Cl.² B60P *1/28*
U.S. Cl. 214—505 **29 Claims**

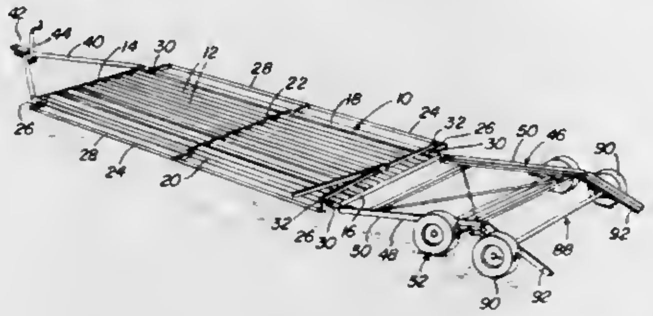


1. An apparatus for mounting or demounting a vehicle body onto or from a vehicle chassis comprising a platform for supporting said body, means for pivotally connecting said platform to the vehicle chassis, means for rotating said platform about said pivotal connection means, a winch means for controllable moving a vehicle body off of or onto said platform and means for securing the said body to the platform,

said winch means comprising a hydraulic cylinder winch having an extendable cylinder shaft and having at either end a set of multiwrap sheaves, and a cable multiwrapped about said sheaves, one end of said cable being secured and the other end being secured and attached to means for removably securing it to the body and wherein said platform comprises a pair of longitudinal beams in spaced relationship, each of said beams being provided along its side with a support means having located therein in substantially parallel and proximal relationship with its respective beam a said hydraulic cylinder winch thereby defining a relatively small longitudinal cavity extending between said beam, support and winch, one of the sets of sheaves being stationary and the other set of said sheaves being connected to the extendable cylinder shaft, each of said cylinder winches having its own cable, a substantial portion of the last length of the cable being located within said cavity thereby to act as a protective shield in the event of cable breakage.

4,109,811
TRAILER WITH LOWERABLE BED

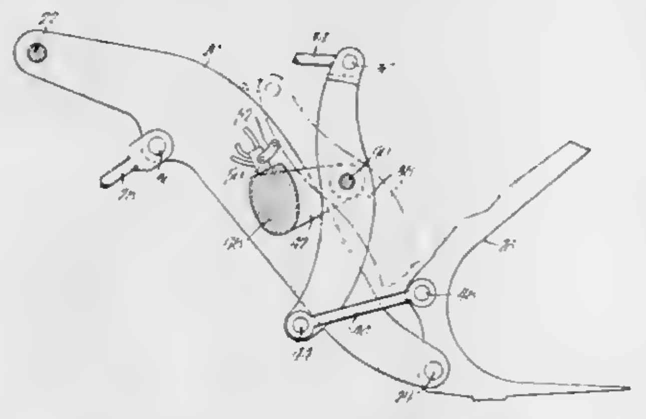
James L. Stucky, P.O. Box 673, Moundridge, Kans. 67107
Filed Mar. 1, 1977, Ser. No. 773,152
Int. Cl.² B62D *21/14*
U.S. Cl. 214—506 **4 Claims**



1. A farm implement carrier comprising an elongated load bed having front and rear ends, the front end of said load bed including means for hitching to a draft vehicle, a rear frame section including a pair of opposite side elongated longitudinal members, wheeled transverse axle means supported beneath said frame and supporting the latter intermediate the opposite ends of said longitudinal members, the rear end of said load bed including follower means guidingly engaged with and supported from said longitudinal members for shifting therealong from the front ends thereof, when the latter are inclined downwardly for engagement with the ground, to the rear ends thereof behind said axle means and the fulcrum defined thereby, whereby to over-balance the rear ends of said longitudinal members and cause the front ends thereof to swing upwardly into engagement with the opposite sides of said load bed, said opposite side elongated longitudinal members each including an elongated rearwardly projecting extension pivotally mounted from the rear end thereof for oscillation between a rearwardly and downwardly inclined position and a generally horizontal position at least substantially longitudinally aligned with the corresponding longitudinal member, a transverse axle member having wheels jounaled from its opposite ends extending between and supported from said extensions, said follower means being guidingly engageable with, shiftable rearwardly along and displaceable rearwardly off the rear ends of said extensions.

4,109,812
DUMP CONTROL FOR LOADERS

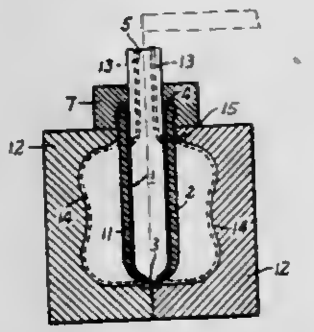
Stanley B. Adams, Yorkville, and Michael P. Morge, Oswego, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 25, 1977, Ser. No. 781,265
Int. Cl.² E02F *3/84*
U.S. Cl. 214—762 **4 Claims**



1. A vehicle having a frame, a load lifter, a pair of arms each having one end pivoted to the frame and the other end pivoted to the load lifter, at least one tilt cylinder carried by the arms and having an extendable rod, a first link pivoted intermediate its ends to an arm and at its ends to said rod and to a second link, said second link being pivoted to said load lifter, a hydraulic system including a manual actuator for controlling the cylinder to pivot the load lifter between forward and rearward positions on the arms, means for sensing the position of said load lifter and for halting the flow of hydraulic fluid to and from said cylinder when said load lifter is moving forwardly on said arms just short of said forward position to trap hydraulic fluid within said cylinder to act as a hydraulic cushion halting further forward movement of said load lifter, and a cross member extending between said arms, said sensing means comprises a sensing valve mounted on said cross member and having an actuator positioned to be engaged by said first link.

4,109,813
COMPOSITE PLASTIC CONTAINER

Emery 1. Valyi, 5200 Sycamore Ave., New York, N.Y. 10471
Continuation of Ser. No. 343,498, Mar. 21, 1973, abandoned, whicb is a division of Ser. No. 186,984, Oct. 6, 1971, Pat. No. 3,787,157, whicb is a continuation-in-part of Ser. No. 71,734, Jul. 14, 1970, Pat. No. 3,717,544, and Ser. No. 100,050, Dec. 21, 1970, Pat. No. 3,719,735. This application Jul. 2, 1975, Ser. No. 592,551
Int. Cl.² B65D *25/34, 47/10*
U.S. Cl. 215—1 C **8 Claims**



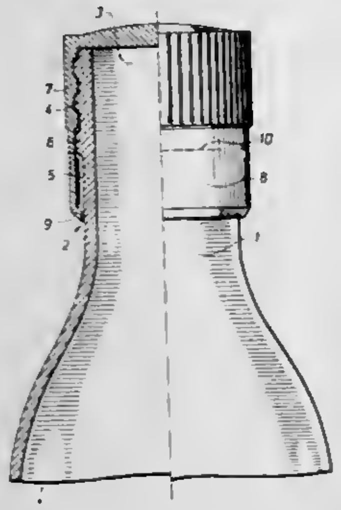
1. A blown, seamless multilayered, hollow plastic container defining a dispensing container having bottom portion and an opposed dispensing mouth portion, said container having a bottom portion comprising at least a rim and wall portions integral therewith comprising side walls extending from said rim and terminating in an end wall opposite said rim defining a dispensing mouth, said container having an inner thermoplastic layer, and an outer seamless pressure molded layer, the two layers being adhered one to the other substantially throughout their contacting surfaces, wherein the end wall portion of one of said layers has a discontinuity, said discontinuity being completely filled by the material of the other of said layers which completely covers said mouth, and wherein the inner and outer layers are continuous throughout the extent thereof and are co-extensive with each otber except for said discontinuity, whereby a dispensing opening is formed when said end wall discontinuity is broken.

4,109,814
CONTAINER CLOSURE

Hans A. Rausing, Lund, Sweden, assignor to AB Ziristor, Lund, Sweden
Filed Nov. 8, 1976, Ser. No. 739,788
Claims priority, application Sweden, Nov. 19, 1975, 7512983
Int. Cl.² B65D *55/02*
U.S. Cl. 215—217 **3 Claims**

1. A closure for a container having a neck portion provided with a pouring opening and with outer screw threads about and an annular outwardly projecting bulge at the lower end of the screw threads, said closure comprising a cap member having an upper internally threaded portion for engagement

with the screw threads of the neck portion of the container and a cylindrical sealing portion therebelow, the inner diameter of the cylindrical sealing portion being not less than the outer diameter of the annular bulge of the neck portion of the container and further having an inwardly directed annular flange at the lower end of the cylindrical portion, the inner diameter of the flange being less than the outer diameter of the annular bulge of the neck portion of the container, the length of the upper threaded portion of said cap member being greater than the length of the cylindrical sealing portion between the annular flange and the annular bulge of the neck portion of the container when said cap member is completely screwed onto the neck portion of the container, said cap member being further provided with a breakable kerf extending a major distance around the circumference thereof and disposed opposite the annular bulge of the neck portion of the container, whereby when said cap member is being unscrewed for opening the container, the annular flange abuts the annular bulge causing the breakable kerf to break leaving the upper threaded portion of said cap member attached to the cylindrical sealing portion thereof by that portion of said cap member between the two ends of the kerf.

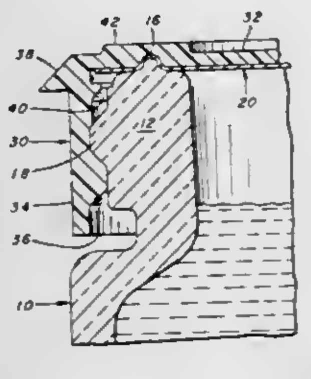


4,109,815
INDUCTION HEAT SEALED CONTAINERS
John W. Collins, III, Allegheny Township, Westmoreland County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1976, Ser. No. 748,694

Int. Cl.² B65D *41/18*

U.S. Cl. 215—232 **5 Claims**



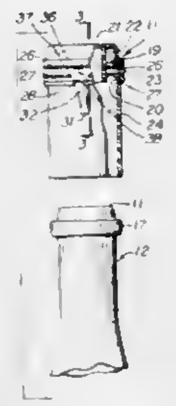
1. A sealed container comprising a glass jar having a mouth with an upwardly facing surface and a raised bead thereon continuous around said mouth and having an upwardly convex narrow cross-sectional configuration, said bead having a height approximating the commercially acceptable dimensional tolerance for said upwardly facing surface on said container mouth, a metal foil membrane spanning said container mouth heat sealed to said bead and a plastic snap cap over said container mouth and foil membrane, said snap cap being made of heat and pressure-deformable plastic having a thickness over said upwardly facing surface on the container of at least twice the height of said bead, and with said bead providing a unit force against said membrane and cap sufficient to permit the generation of permanent plastic flow in the cap at induction heat temperatures below the melting point of said heat and pressure-deformable plastic, and with said foil membrane and said plastic snap cap at least partially conforming to the cross-sectional contour of said bead.

4,109,816
PLASTIC CAP FOR BOTTLE
George W. Faulstich, San Carlos, Calif., assignor to Three Sisters Ranch Enterprise, San Carlos, Calif.

Filed Nov. 1, 1976, Ser. No. 737,384

Int. Cl.² B65D *41/32*

U.S. Cl. 215—256 **10 Claims**



1. In combination a wine bottle having a neck formed with an annular finish at the upper end of said neck, the outside of said neck shaped with a short, cylindrical outside upper surface below said finish, a first bead below said upper surface and an elongated cylindrical outside lower surface below said first bead, said upper and lower surfaces being of about the same diameter, said neck being formed with a cylindrical inner surface below said finish and a thin-walled, flexible plastic cap for closing said bottle, said cap being deformable to stretch over said bead, said cap comprising a top disk having a diameter about equal to said finish, a thin-walled outer skirt depending from said disk, said outer skirt having a top portion shaped to fit tightly around said upper surface, a pair of internal beads shaped to fit tightly around the edges of said first bead, a bottom portion shaped to fit around at least a portion of said lower surface and a pull tab depending below said pair of internal beads, vertically spaced apart under and lower score lines being located between said pair of internal beads which weaken said outer skirt when said tab is pulled so that a circumferential band may be torn off between said score lines, permitting removal of the portion of said cap above said upper score line.

4,109,817
STRAW ASSEMBLY FOR A LIQUID CONTAINER
Larry E. Payne, 3224 Wesley Chapel Rd., Decatur, Ga. 30034, and Kenneth D. Lancaster, Jr., 965-C Clubhouse Cir., W., Decatur, Ga. 30032

Filed Sep. 23, 1976, Ser. No. 725,880

Int. Cl.² A47G *19/22*

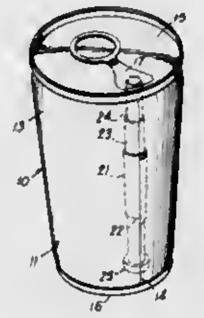
U.S. Cl. 220—90.2 **2 Claims**

1. A straw assembly within a liquid container having an interior wall surface, a flat top and a closure over an opening through said top, comprising

(a) a collapsible straw for sucking up the liquid within said container;

(b) buoyant means on said straw; and

(c) means secured on said interior wall surface of said container for retaining said straw within said container in alignment with said opening, said retaining means comprising a ring, means for supporting said ring above the bottom of said container, a hollow post concentrically disposed through said ring and being of sufficient diameter



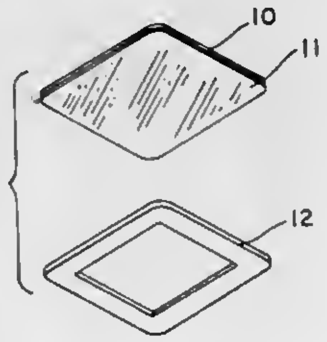
to slidably receive said straw therein and at least two radially extending ribs interconnecting said ring and post to support said post in vertical registry with said opening.

4,109,818
HERMETIC SEALING COVER FOR A CONTAINER FOR SEMICONDUCTOR DEVICES
Norman Hascoe, Larchmont, and Samuel W. Levine, Roslyn, both of N.Y., assignors to Semi-Alloys, Inc., Mount Vernon, N.Y.

Filed Jun. 3, 1975, Ser. No. 583,463

Int. Cl.² B65D *39/00*

U.S. Cl. 220—200 **3 Claims**



1. A prefabricated hermetic sealing-cover unit for a heat-sealable container having a semiconductor device therein comprising:

a cover element having upper and lower surfaces and being of a material impervious to moisture and air;

a thin coating of substantially chemically unreacted thermosetting plastic matter adhered to the lower surface of said cover element without heat;

and a preformed sealing ring of substantially chemically unreacted thermosetting plastic material adhered to the coated surface of, and in registry with periphery of, said cover element without heat, said prefabricated hermetic sealing-cover unit being responsive to heat to fuse the sealing ring and coating to the cover element.

4,109,819
EXPLOSION VENT AND METHOD OF VENTING
Robert L. Kushman, Mason, and Sumy H. C. Ling, Cincinnati, both of Ohio, assignors to The Stacey Manufacturing Co., Cincinnati, Ohio

Filed May 16, 1977, Ser. No. 797,352

Int. Cl.² B65D *51/16*

U.S. Cl. 220—208 **12 Claims**

1. In an explosion vent for rapidly releasing pressure buildup within a vessel, wherein the vent is of the type including,

a framework mountable to said vessel and defining a series of vent openings,

a series of vent covers releasably seatable on the respective vent openings to close the same,

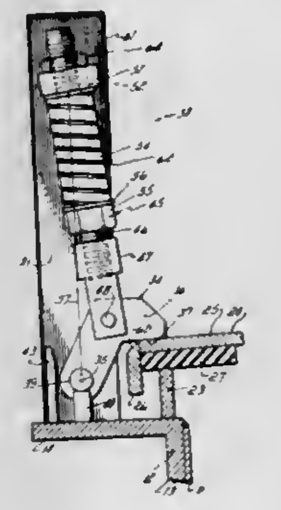
each vent cover being associated with a series of quick-release clamp mechanisms engaging it around its periphery for releasably holding the cover in place on the respective vent opening,

the improvement in the clamp mechanism comprising,

a latch member connected at one end thereof to said framework by a pivot, said latch member presenting at an opposite end thereof a bearing surface engageable on an edge portion of the respective cover to apply a vent closing force thereon,

said latch member being swingable about said pivot between a closed position, in which said bearing surface bears upon said cover to press the same toward said framework, and an open position in which said latch member is clear of said cover,

a shaft swingably connected at a first point to said latch member between said pivot and said bearing surface, said shaft movably attached at a second point to a support on said framework, the shaft being so mounted that when said latch member is in said closed position said shaft lies on one side of an imaginary line between said pivot and said



second point, and on an opposite side of said imaginary line when said latch member is in said open position,

a spring in compression on said shaft and biasing said latch member away from said second point,

the cover being connected to said framework for lineal movement away from the opening,

said spring exerting a biasing force that changes as said cover is lifted from said vent opening by gas pressure in the vessel, said spring yielding in response to gas pressure below said cover, up to a predetermined pressure, without releasing any of the clamp mechanisms, whereby said cover lifts lineally from said vent opening, such lineal movement establishing an annular gap between said cover and vent opening through which gas pressure can vent uniformly around said periphery, said clamp mechanisms remaining engaged with said cover for reseating the cover if said pressure drops,

said spring yielding further to a pressure rise above said predetermined pressure and said latching member moving clear of said cover, to release the same.

4,109,820
SELF-THREADING CONTAINER CLOSURE AND METHOD THEREOF
Joseph Michael Stifano, Middleton, N.Y., assignor to International Paper Company, New York, N.Y.

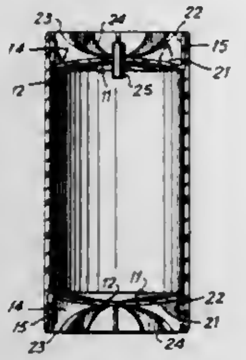
Filed Jun. 9, 1977, Ser. No. 805,071

Int. Cl.² B65B *1/04;* B65D *41/04, 41/10*

U.S. Cl. 220—240 **9 Claims**

1. A container closure comprising a concave spherical face; an inverted annular flange depending therefrom, the outer surface of said flange being threaded; and a plurality of radial support members underlying said flange and a major portion of

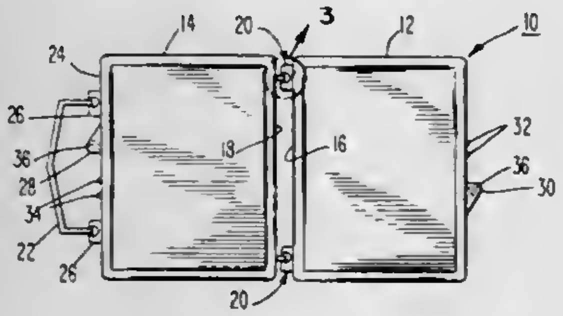
said face, said major portion excluding the central area of said face, said radial support members including horizontal feet portions extending inwardly from the base of said flange to the interior of said closure, and said radial support members and the unsupported central portion of the concave face defining an arch of lesser diameter than that of the concave spherical face, said arch being of a size and shape sufficient to transform a major portion of forces vertical to the concave face into force components more horizontal to said face to strengthen the seal between the closure and the walls of the container.



4,109,821

ARTICLE INCLUDING AN INTEGRALLY MOLDED BALL AND SOCKET TYPE HINGE

Michael Lutz, 226 High Tor Dr., Watchung, N.J. 07060
Division of Ser. No. 647,088, Jan. 7, 1976, Pat. No. 4,049,231.
This application Aug. 15, 1977, Ser. No. 824,627
Int. Cl.^{2} B65D *43/14, 51/04*
U.S. Cl. 220—337 **18 Claims**



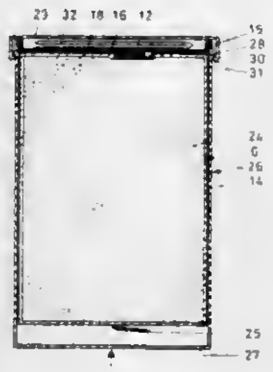
1. An article including two sections articulated to one another by at least one hinge that includes a substantially spherical male hinge member disposed within a recess of a female hinge member and retaining means for confining the male hinge member within the recess of the female hinge member, the improvement wherein said retaining means of said at least one hinge member forms molded junctions with adjacent surfaces of the male hinge member and the recess of the female hinge member, said retaining means being fracturable at or adjacent the molded junction of the male hinge members to confine the male hinge member for rotational motion within said recess.

4,109,822

PACKAGE COMPOSED OF AN INNER BAG ENCLOSED BY AN OUTER CONTAINER

Alwin Egli, Beringen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed Sep. 15, 1976, Ser. No. 723,491
Claims priority, application Switzerland, Sep. 23, 1975, 12348/75
Int. Cl.^{2} B65D *5/60*
U.S. Cl. 220—404 **4 Claims**

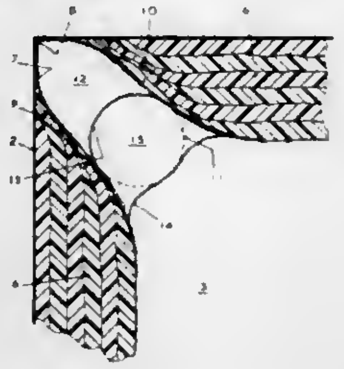
1. A package arranged to be opened at its top and comprising: an inner bag having a flat top which is sealed, said inner bag being made of a sealable, flexible foil; an outer container of rectangular cross section enclosing said inner bag, said container including a jacket of stiff sheet material having an open end corresponding to the top of said package, and protruding beyond said flat top of said inner bag, and a lid insert of stiff sheet material positioned in such open end, said insert having a flat portion which bears against said flat top of said inner bag, said flat portion of said insert being coextensive with said flat top of said inner bag in order to completely cover said flat top, and edge strips located at the edges of said flat portion and extending away from said flat top of said inner bag at an angle to said flat central portion and bearing against the inner surfaces of the open end of said jacket; and adhesive means securing a peripheral region of said flat portion of said lid to said flat top of said inner bag and said edge strips to said protruding open end of said jacket, and wherein said flat portion of said lid insert is provided, inwardly of said peripheral zone, with at least one weakened line for permitting removal of an interior region of said flat portion.



4,109,823

INSULATION SYSTEM FOR LIQUEFIED GAS TANKS

Roger Cambridge Ffooks, Tittlesfold Farm, near Billingshurst, England, and Hiroshi Komada, Kobe, Japan, assignors to Conch LNG, Moorestown, N.J.
Filed Nov. 11, 1976, Ser. No. 740,818
Claims priority, application United Kingdom, Nov. 22, 1975, 48119/75
Int. Cl.^{2} B65D *87/24, 87/34*
U.S. Cl. 220—446 **6 Claims**

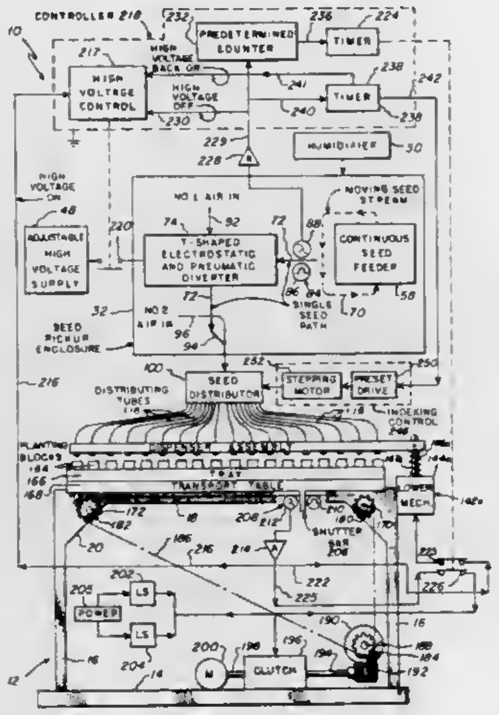


1. A thermally-insulated container of the type comprising (1) an outer prismatic rigid shell having (2) at least one layer of foam plastic thermal insulation material (a) sprayed in situ onto the vertical inside wall surfaces of said shell, (b) at least one of said at least one layers of foam plastic insulation material extending vertically upward to a level which defines the top edges of said container, and (3) flexible reinforcing sheet material (a) rigidly adhered to the side wall surface areas of said foam plastic insulation material, portions of said flexible reinforcing sheet material (b) projecting beyond said top edges, and (c) rigidly affixed directly to said rigid shell above said top edges.

4,109,824

PRECISION SEEDER AND METHOD

Noel Bryant Davis, Wayzata, Minn., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Sep. 1, 1976, Ser. No. 719,625
Int. Cl.^{2} B65B *57/20*
U.S. Cl. 221—7 **34 Claims**



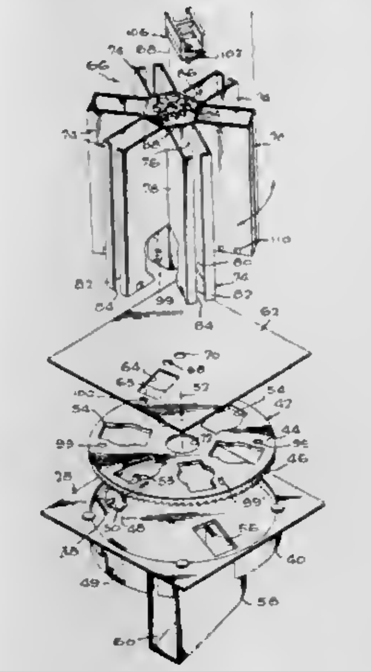
2. Seeding apparatus comprising means providing a supply of moving seeds, means for diverting seeds from said moving supply, means for applying a voltage to said diverting means to develop an electrostatic field sufficient to effect the diversion of a seed, means responsive to the entry of said diverted seed into said diverting means for removing said voltage from said diverting means, a plurality of seed dispensers, and means for receiving seeds from said diverting means and delivering the diverted seeds to said dispensers.

4,109,825

ROTATABLE COMPARTMENTALIZED VENDING APPARATUS

Barry Sheldon Weitzman, 23875 Park Del Monte, Calabasas Park, Calif. 91302
Filed Dec. 8, 1976, Ser. No. 748,408
Int. Cl.^{2} G07F *11/54*
U.S. Cl. 221—14 **9 Claims**

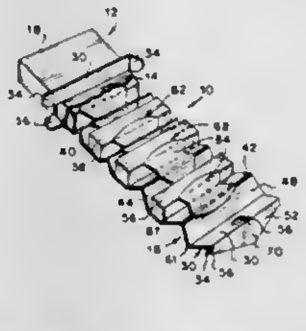
1. A compartmental vending machine apparatus comprising:
(a) a compartmental member, said compartmental member comprising at least one item holding compartment having at least one open end;
(b) a carrying plate, said carrying plate having at least one opening for receiving an item to be dispensed, said opening being relatively movable with respect to said compartmental member from a first position not in alignment with said at least one opening in said item holding compartment to a second position in alignment with said at least one opening in said item holding compartment;
(c) a separation plate separating said compartment member from said carrying plate, said separation plate having an opening therein at least the size of the item to be dispensed, said separation plate opening being alignable with said openings in said carrying plate and said item holding compartment;
(d) a dispensing chute opening, said dispensing chute opening being alignable with said carrying plate opening;
(e) said carrying plate being movable relative said dispensing opening responsive to a first activation means external to the vending machine for dispensing an item received by said carrying plate opening into said dispensing opening.



4,109,826

CONTAINER AND DISPENSING PACKAGE

Leo V. Maisonneuve, 4480 N. 40th St., St. Petersburg, Fla. 33714
Filed Oct. 8, 1976, Ser. No. 730,846
Int. Cl.^{2} B65D *5/38*
U.S. Cl. 221—72 **6 Claims**



3. A container and dispensing package for storing and dispensing contents therefrom comprising an outer carton having an opening therein and an expandable tray for holding the contents of the package removably disposed within said outer carton, said expandable tray comprising a plurality of adjacent compartments each comprising a forward and a rear partition each movable between a first and second position, said forward and rear partitions disposed to engage the contents when in said first position and to disengage the contents when in said second position, a floor extending between said forward and rear partitions upon which the contents are placed, and means for at least partially removing said expandable tray from said outer carton, each said compartment further comprises a retainer means formed thereon to retain the contents secure therein as each said corresponding compartment of said expandable tray is removed from said outer carton, said retainer means comprises a guard flap disposed between the top of the contents and the top of said package to prevent the contents from engaging the top of said package and a spring member extending from said expandable tray, said spring member being attached to said guard flap to maintain said guard flap between the top of the contents and the top of said package.

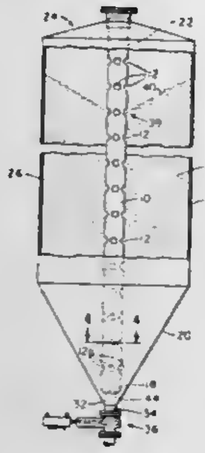
4,109,827
METHOD OF DISCHARGING PARTICULATE MATERIAL FROM A HOPPER

James H. Leonard, Jr., Houston, Tex., assignor to Allied Industries Inc., Houston, Tex.

Filed May 9, 1977, Ser. No. 795,122

Int. Cl.² B65G *3/12, 65/70*

U.S. Cl. 222—1 **2 Claims**



1. A method of discharging particulate material from a hopper while minimizing vibration of the hopper and impact loading imparted thereto by said particulate material, said method comprising the steps of:

positioning a generally annular mass of particulate material within the hopper, surrounding a generally centrally located discharge column;

providing a series of vertically spaced discharge openings in said discharge column, with said series extending generally vertically and centrally of said annular mass of particulate material;

discharging said particulate material from said generally annular mass through said openings of said discharge column into a central interior portion of said column and downwardly through said central discharge column to a material outlet;

supporting said central discharge column with said hopper, with its lower end resting directly on a downwardly converging, generally conical hopper base and with its upper end telescopingly received by an upper hopper portion;

providing said lower end of said central discharge column with a generally scalloped opening pattern in a cooperative relation to said base to provide a discharge path for residual particulate material passing downwardly around the lower end of said central discharge column;

restricting the flow of particulate material from said material outlet to an extent sufficient to prevent a gravity induced rate of flow of particulate material outwardly therefrom but to permit a choked flow of particulate material outwardly therefrom;

maintaining a single, downwardly and centrally converging, generally conical portion at the top of said generally annular mass of particulate material, extending between said central dischage column and said hopper;

substantially preventing a discharge of particulate material from said annular mass into openings of said central discharge column below a level generally contiguous with an intersection of said generally conical portion with said central discharge column;

substantially continuously preventing a reduction in density of said annular mass of particulate material below said generally conical portion and within said annular mass;

substantially continuously preventing vibration of said hopper and impact loading of said annular mass on said hopper during said discharging by substantially preventing concurrent discharging, into said interior portion of said central discharge column, of particulate material from materially different levels of said annular mass and from the interior thereof;

substantially continuously emptying said hopper sequentially from the top thereof, progressively downwardly, while substantially continuously blocking discharging of particulate material from hopper portions below said generally conical portion;

substantially continuously preventing the formation of cavities internally of said annular mass; and

substantially continuously preventing a discharge of particulate material from said annular mass at locations radially outwardly of said central column.

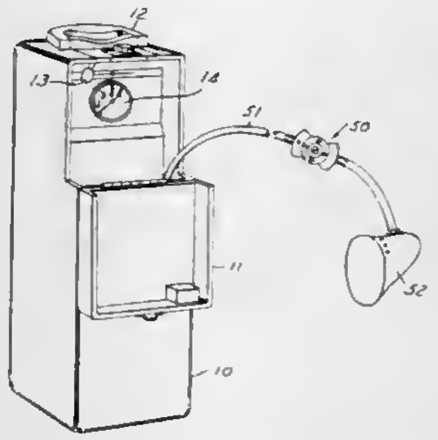
4,109,828
INHALATION APPARATUS

Maurice M. Stewart, West Bloomfield, Mich., assignor to Oxygen Therapy Institute, Inc., Oak Park, Mich.

Filed Jan. 24, 1977, Ser. No. 761,802

Int. Cl.² A61M *15/00*

U.S. Cl. 222—3 **11 Claims**



1. In an inhalation apparatus, the combination comprising

an automatic pressure regulator including a body,

said body having an opening for receiving a valve of an oxygen tank,

said body having an outlet,

said body including walls defining two chambers,

a connecting passage extending from one chamber to the other,

an inlet passage extending to one said chamber,

each said chamber having a diaphragm closing one wall thereof,

spring means yieldingly urging said diaphragm in one direction,

an orifice associated with said inlet,

an orifice associated with said passage,

an orifice member for each said orifice,

a lever for each said chamber,

means for pivoting one end of each said lever to its respective diaphragm,

the other end of each said lever engaging its respective orifice member,

a pressure relief valve in the wall of said body defining said first chamber and operable independently of said lever in said first chamber and its respective orifice member to vent the oxygen from said first chamber directly to the atmosphere when the pressure in said first chamber exceeds a predetermined value.

4,109,829
CONTAINER FOR METERED DISPENSING OF LIQUID

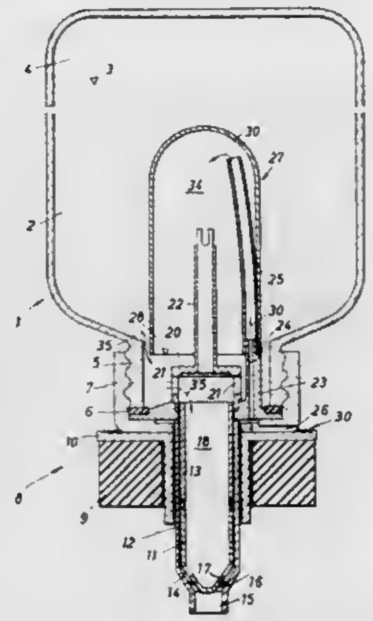
Alexander Kuckens, Hamburg, and Horst Kohl, Reinfeld, both of Fed. Rep. of Germany, assignors to DAGMA Deutsche Automaten- und Getränkemaschinen- Gesellschaft mit beschrankter Haftung & Co., Reinfeld, Fed. Rep. of Germany

Filed Sep. 24, 1976, Ser. No. 726,455

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1975, 2544671

Int. Cl.² B67B *7/24*

U.S. Cl. 222—81 **8 Claims**



8. A container for metered dispensing of liquids, in particular for freezable or self-preserving liquids, including a withdrawal and venting opening which in operation is directed downwards in a dispensing position, an inverted cup-shaped pressure compensating vessel which has its rim situated close to the withdrawal and venting aperture and is open only towards this aperture incorporated within the container, the vessel simultaneously forming the closure of the container and having its rim sealingly connected to the rim of the withdrawal and venting aperture of the container, the interior of the pressure compensating vessel being in constant unobstructed communication with an atmosphere external of the container as well as being in communication with the material inside of the container, said pressure compensating vessel having at least one wall portion which is deformable under differential pressure, a withdrawal valve including a metering chamber connected to the inside of the container and to the pressure compensating vessel via an upwardly extending passage, which withdrawal valve is electromagnetically actuated and equipped with a movable valve element constructed as an armature, characterized in that the valve element conjointly with a sleeve guiding it delimits the metering chamber and that the guiding sleeve is constructed with individual openings for the liquid which is to be metered opening into the inside of the container at its upper extremity, and that the valve sleeve is constructed as a valve slider for alternating uncovering or covering the entry openings.

4,109,830
TILTABLE TRAP CHAMBER WITH STACK AIDING FEATURE

James Richard Zeigler, 245 W. 107th St., New York, N.Y. 10025, and Daniel S. Sauter, 19 Fairview Ave., Montvale, N.J. 07645

Filed Apr. 6, 1977, Ser. No. 785,198

Int. Cl.² G01F *11/28*

U.S. Cl. 222—143 **1 Claim**

1. A measuring dispenser comprising,

a container, and

a top for said container,

said top comprising a cover for the mouth of said container and having a threaded flange for securing the top to the container,

a measuring and dispensing means on said top comprising an upper wall and side walls and together with the cover of said container top forming a generally rectangular shaped receptacle having a closed end with one end thereof open to form a discharge port,

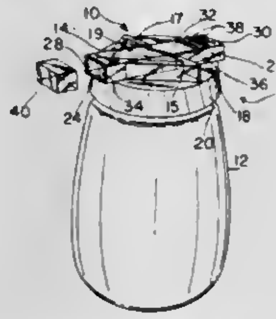
at least a portion of the upper wall of said measuring means being transparent and having measuring indicia thereon,

a charging port in said cover spaced inwardly, from the peripheral edge of the mouth of the container and said charging port being relatively small in relation to the size of the mouth of the container,

said charging port being disposed within that portion of the cover forming the rectangular shaped measuring and dispensing receptacle and being spaced from the closed end of said receptacle to form a measuring volume of said receptacle between the closed end and the charging port,

supporting members on said top extending outwardly from the receptacle, across the cover and being of the same height as the receptacle for providing a flat surface whereby measuring dispensers may be supported in stacked relation,

wherein the material is dispensed from the container through said apparatus by initially tilting the container so that said discharge port points upwardly and material is allowed to flow from the container through said charging port into said measuring volume of said receptacle until the material fills said measuring volume up to a preselected indicia, and then rotating the container so that the measured material falls through said discharge port.



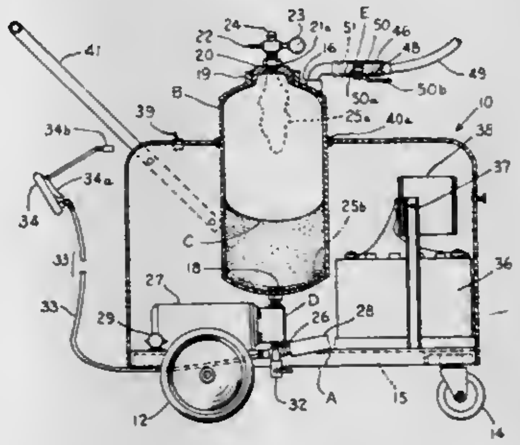
4,109,831
PORTABLE SELF-CONTAINED LUBRICATING APPARATUS

William F. Culpepper, and Charles G. Hinkle, both of Greer, S.C., assignors to General Enterprises, Inc., Greer, S.C.

Filed Mar. 31, 1977, Ser. No. 783,328

Int. Cl.² B67D *5/52*

U.S. Cl. 222—254 **14 Claims**



1. An improved portable lubricating apparatus of the type having a wheeled frame member, a lubricant container carried on said frame member for containing a lubricant, a pump

means carried on said frame connected to said container for receiving said lubricant having a dispensing outlet for dispensing said lubricant at an elevated pressure, said dispensing outlet adapted for connection to a lubricant delivery hose having a dispensing valve connected to a remote end for controlling the dispensing valve connected to a remote end for controlling the dispensing valve connected to a remote end for controlling the dispensing of pressurized lubricant, and power means for driving said pump means the improvement comprising:

said container including a bottom portion having a discharge outlet connected to an inlet of said pump means,

a coupling member carried by said container communicating with an interior space thereof adapted for connection to a closed lubricant source for filling said container with lubricant,

a flexible bladder member carried within said container interior space having an inlet for receiving a pressurized gas to cause said bladder member to expand and pressurize said lubricant, and

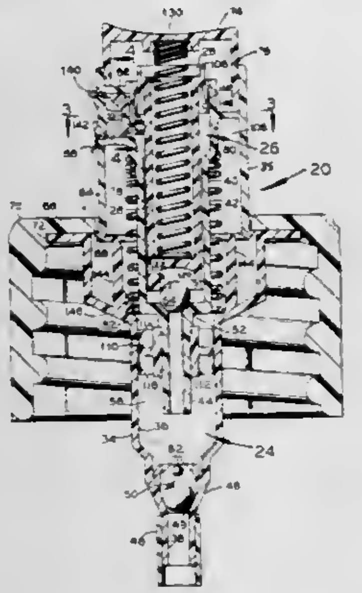
said coupling member and bladder member enabling said container to operate as a generally closed container during filling and dispensing operations under pressure affording total safety to the operator thereof.

4,109,832

PUMPING SYSTEM HAVING A PRESSURE RELEASE

Louis F. Kutik, Ft. Lauderdale, and Howard E. Cecil, Miami, both of Fla., assignors to Security Plastics, Inc., Miami Lakes, Fla.

Filed May 9, 1977, Ser. No. 795,090
Int. Cl.² B67D *5/42*
U.S. Cl. 222—318 12 Claims



1. In a manually operated pumping system for dispensing a fluent product from a container in a substantially non-pulsating discharge, said system having mounting means for attaching it to the container and comprising:

means providing a pressurizing compartment for receiving product from the container;

manually reciprocable actuator means movable in one direction in an intake stroke to withdraw product from the container into said pressurizing compartment and movable in the opposite direction in a pressure stroke to pressurize the product in said pressurizing compartment;

means providing a storage compartment for receiving pressurized product from said pressurizing compartment upon said movement of said actuator means in its pressure stroke;

and an outlet passageway leading from said storage compartment for dispensing pressurized product therefrom;

the improvement which comprises the combination of:

an accumulator piston slidably reciprocable in said storage compartment and operable to open and close said outlet passageway,

spring means biasing said piston to a rest position closing said outlet passageway, said piston being movable by the pressure of product in said storage compartment against the bias of said spring means to open said outlet passageway;

a check valve acting between said pressurizing compartment and said storage compartment, said check valve being operative to pass pressurized product from said pressurizing compartment into said storage compartment for moving said piston to open said outlet passageway upon movement of said actuator means in its pressure stroke, said check valve being operative to block return flow of product from said storage compartment back into said pressurizing compartment upon the following intake stroke of said actuator means whereby to maintain the dispensing of product through said outlet passageway as long as the pressure of product in said storage compartment maintains said piston positioned to open said outlet passageway;

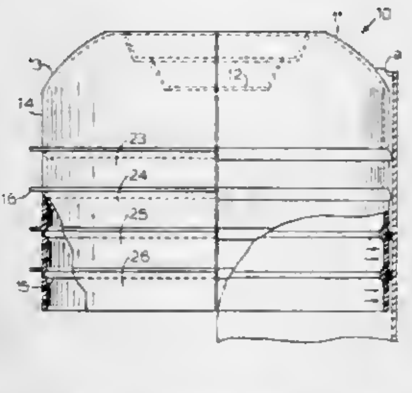
and means on said accumulator piston operable to open said check valve just prior to the closing of said outlet passageway by said accumulator piston during the reciprocation of said piston for relieving pressure in said storage compartment to facilitate closing of said outlet passageway by said piston.

4,109,833

PISTON FOR PRESSURE DISPENSERS OF THE BARRIER PISTON TYPE

Jerome A. Gross, 6304 S. Rosebury, St. Louis County, Mo. 63105

Filed Dec. 17, 1976, Ser. No. 751,396
Int. Cl.² B67D *5/54*
U.S. Cl. 222—386.5 2 Claims



1. For use in a pressure dispensing can of generally cylindrical cross-section,

a barrier pack piston, comprising

an inverted cup-like shell molded of a bendable plastic and having an imperforate top portion and a generally cylindrical wall of generally constant thickness joining the top portion, the diameter of the outer surface of said cylindrical wall being sufficiently smaller in diameter than the interior diameter of such can to permit sliding therein, said wall having spaced between its top and bottom extremities

a circumferential sealing provision comprising

a circumferential groove defining a hinge line,

constant thickness perimetrical portions of said wall above and below said groove and there adjoining each other, and

a circumferential wiping rib molded to project perpendicularly from the outer surface of the upper of said perimetrical portions immediately adjacent to said groove to a diameter which exceeds that of the interior of such can,

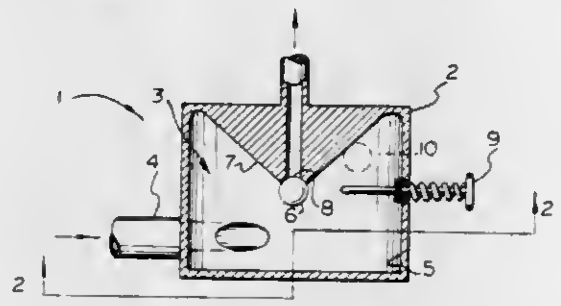
whereby when the piston is in place within such can the wiping rib is pressed inward by its contact with the inner can wall, causing said perimetrical portions to deflect inward at said groove, the said upper perimetrical portion adjacent said hinge line thereby assuming an inward and downward slope and thus positioning the wiping rib slopingly outward and downward.

4,109,834

CONSTANT VOLUME FLUID DISCHARGING DEVICE

Clyde C. K. Kwok, Montreal, and Essam A. Farag, Pointe Claire, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 7, 1977, Ser. No. 766,126
Claims priority, application Canada, Mar. 15, 1976, 247879
Int. Cl.² G01F *11/28*
U.S. Cl. 222—448 2 Claims



1. A constant volume fluid discharging device comprising:

a. a housing having a cylindrical cavity with a substantially vertical oriented longitudinal axis, said cavity having an upper and lower end, the upper end having a convex surface with a downwardly directed vertex;
b. an inlet connected substantially tangentially to a cylindrical wall of the cavity operative to effect vortical motion of fluid in the cavity;
c. a spherical valve member having a specific gravity less than that of the fluid disposed in the cavity;
d. an outlet at the vertex of the convex surface adapted to be blocked by the valve member; and
e. means for displacing the valve member from the outlet for initiating a discharge cycle.

2. A constant volume fluid discharging device comprising:

a. a housing having a cylindrical cavity with a substantially vertical oriented longitudinal axis, said cavity having an upper and lower end, the lower end having a concave surface, with a downwardly directed vertex;
b. an inlet connected substantially tangentially to a cylindrical wall of the cavity operative to effect vortical motion of fluid in the cavity;
c. a spherical valve member having a specific gravity greater than that of the fluid disposed in the cavity;
d. an outlet at the vertex of the concave surface adapted to be blocked by the valve member;
e. an obstacle disposed on an upper outer portion of the concave surface in front of the inlet; and
f. means for displacing the valve member from the outlet.

4,109,835

DEVICE FOR DISPENSING MEASURED QUANTITIES OF MATERIAL

Genaro Afalla Castro, 68 Stuyvesant Ave., Newark, N.J. 07106

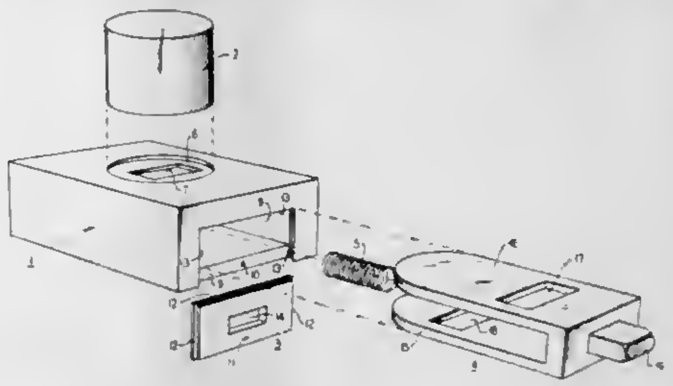
Filed Aug. 12, 1976, Ser. No. 713,980
Int. Cl.² G01F *11/40*
U.S. Cl. 222—449 2 Claims

1. A dispenser comprising a support body having interior walls therein defining a first passage through said body and a channel, a portion of said first passage being closed off to define a measuring cavity, and the remaining portion of said first passage providing ingress to and egress from said measuring cavity,

a container mounted on said support body adjacent to the portion of said first passage providing ingress to said cavity,

a first valve plate and a second valve plate slidably mounted in said channel and protruding into said first passage to define a top and bottom of said measuring cavity, said plates cooperating such that said second plate closes the bottom of said cavity while said first plate opens the top of said cavity permitting ingress of material from said container into said cavity, and the top of said cavity is closed by said first plate before said second plate opens the the bottom of said cavity to permit egress of said material in said cavity from said dispenser,

an actuator connected to said first and said second valve plates for operating both said plates, a spring functioning with said actuator, a retainer having an aperture therethrough and being slidably engaged in slots in the side of said support body to permit assembly of said dispenser, said actuator with both said valve plates connected thereto and said spring being inserted into said channel, a force being applied to said actuator to compress said spring to permit said actuator and said valve plates connected thereto to be completely inserted within said support body before said retainer is slidably engaged in said slots, upon the release of the force applied to said actuator said spring decompresses causing a nose portion of said actuator to protrude through said retainer aperture in a normal first position in which said first valve plate opens the top of said measuring cavity while said second valve plate closes the bottom of said cavity and a force is applied to said actuator nose portion to place said actuator in a second position where said first plate closes the top of said cavity while said second plate opens the bottom of said cavity.

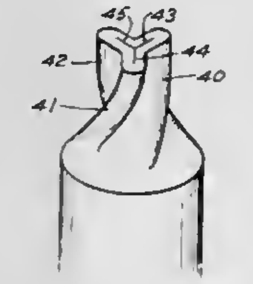


4,109,836

SELF-SEALING PASTE DISPENSING DEVICE

Anna Falarde, 56 Malvern St., Providence, R.I. 02904

Filed Feb. 10, 1977, Ser. No. 767,359
Int. Cl.² B65D *25/42*
U.S. Cl. 222—494 4 Claims



1. A self-sealing paste discharge device comprising a body portion with a neck extending therefrom, said neck having sufficient elasticity for tortional movement under pressure and a closed end with a laterally extending slit to permit the portions on either side of the slit to separate, said neck extending from said closed end presenting a portion of an internal helical path along its longitudinal axis so that as paste is forced through the path there will be a pressure brought to bear on the sides of the path to turn the neck a portion of a revolution about its axis to separate the sides of the path and spread the portion of the closure end on either side of said slit to permit discharge of the paste therethrough, the elasticity of the neck

bringing the portions on either side of the slit together when the pressure of the paste is released.

4,109,837

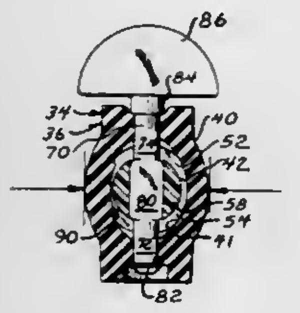
LIQUID SAMPLING DEVICE

Glean N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 22, 1976, Ser. No. 753,112

Int. Cl.² B65D *47/22;* **F16K** *31/14*

U.S. Cl. 222—556 **13 Claims**



13. A liquid sampling device comprising:

a tubular section of flexible material having a wall defining a lumen for passage of liquid and defining an outer surface adapted to be pressed by a user's fingers;

a flow control element comprising, a generally circular rigid disc positioned in said lumen, said disc having a larger diameter than the internal diameter of said lumen, said disc having a peripheral edge sealingly engaging against an inner surface of the tubular section at a first angular position of the disc, said tubular section surface being pressed from opposed sides in the vicinity of the disc to deform said wall and permit passage of a liquid sample between the disc and the inner surface of the wall; and

means for rotating said disc to a second angular position with at least a portion of said disc edge spaced from the inner surface of the tubular section to permit rapid passage of liquid through the control element.

4,109,838

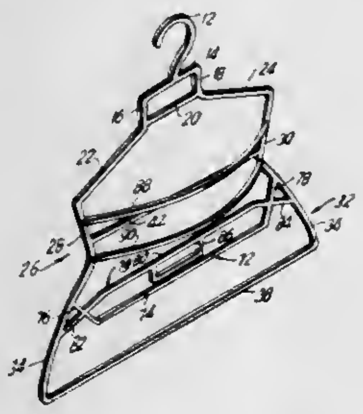
GARMENT HANGER

Abraham Dwek, 718 Avenue R, Brooklyn, N.Y. 11223

Filed Aug. 1, 1977, Ser. No. 820,764

Int. Cl.² A47J *51/14*

U.S. Cl. 223—91 **7 Claims**



1. A garment hanger comprising a pair of transversely extending shoulders, a hook coupled between said transversely extending shoulders to suspend the garment hanger, sidewalls extending downwardly from said transversely extending shoulders, said transversely extending shoulders and said sidewalls lying in a common plane, rib means connected between the sidewalls and being bowed outwardly in a lateral direction from said common plane to provide form and shape to a garment placed on the hanger, said rib means including at least one arcuate rib, said sidewalls having an upper portion and a lower portion, said upper portion including first arms downwardly depending from an end of each of said transversely extending shoulders, said lower portion including second arms downwardly depending and transversely extending from an end of each of said first arms, a first reinforcing rib being connected between said sidewalls and lying in said common plane, said first reinforcing rib being for supporting a garment folded thereover, a second reinforcing rib being connected between said sidewalls and lying in said common plane, said second reinforcing rib being spaced above said first reinforcing rib, a tongue portion downwardly depending in said common plane from said second rib, said tongue portion terminating adjacent to said first reinforcing rib for pressing onto the garment folded over said first reinforcing rib and preventing slippage of the folded garment therefrom.

4,109,839

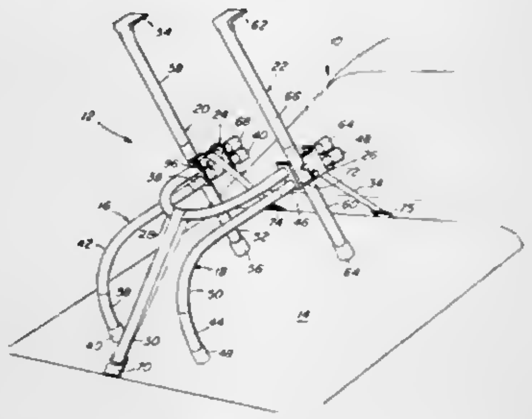
FOLDABLE CARRIER

Richard A. Allen, Bowles Ter., Lincoln, Mass. 01773

Filed Jun. 24, 1976, Ser. No. 699,495

Int. Cl.² B60R *9/10*

U.S. Cl. 224—29 R **12 Claims**



1. A foldable carrier mountable on automobiles or the like, said carrier comprising:

(a) a pair of side members;

(b) a pair of carrying members; and

(c) means for interconnecting said side members and said carrying members, one of said side members and one of said carrying members held in spaced relationship to the other one of said side members and the other one of said carrying members by said interconnecting means, one of said side members and one of said carrying members constrained by said interconnecting means for both relative limited rotational movement about and limited slidable movement along a first axis, the other of said side members and the other of said carrying members constrained by said interconnecting means for both relative limited rotational movement about and limited slidable movement along a second axis, each said side members and each said carrying members relatively movable between an extended locked position and a folded collapsed position, said carrying members and said side members disposed in substantially parallel planes when in said folded collapsed position;

(d) said interlocking means including a pair of brackets, each said bracket formed with a notch having an opened portion and a closed portion, each said side member including a latch, said latch of one of said side members received in said opened portion of one of said notches when said one side member is rotated, said latch of the other of said side members received in said opened portion of the other of said notches when said other side member is rotated, said latch of said one side member slid into said closed portion of said one notch when said one side member is slid, said latch of said other side member slid into said closed portion of said other notch when said other said member is slid, said one side member fixed against rotation when said latch of said one side member is slid into said closed portion of said one notch and said other side member fixed against rotation when said latch of said other side member is slid into said closed portion of said other notch.

4,109,840

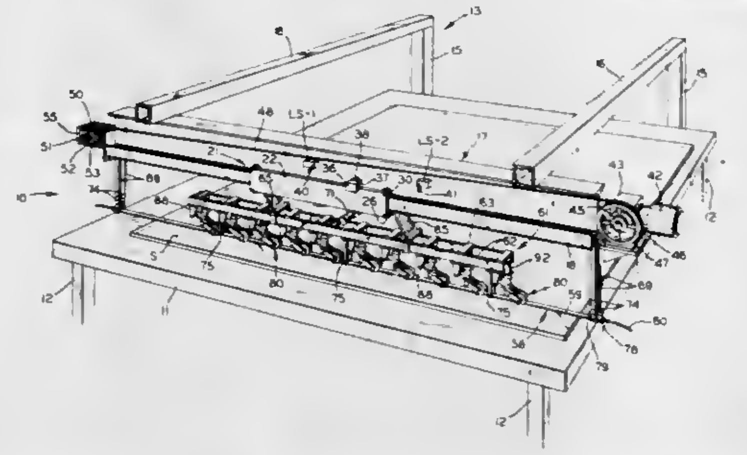
METHOD OF AND APPARATUS FOR THERMALLY SEVERING GLASS

Waldemar W. Oelke, Rossford; Hans W. Boehm, Toledo, and Richard A. Herrington, Walbridge, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Apr. 19, 1976, Ser. No. 677,977

Int. Cl.² B26F *3/08*

U.S. Cl. 225—2 **4 Claims**



1. A method of cutting relatively thick glass along a desired straight line of cut comprising: providing an elongated hollow heat conductor in the form of a cylindrical rod, placing said heat conductor on an at least one non-scored surface of a relatively thick glass sheet to provide linear line contact therewith coincident with and along a desired straight line of cut, applying heat uniformly to said conductor, transmitting said heat through said conductor via said linear line contact onto said glass surface along said desired straight line of cut, and maintaining continuous linear line contact between said conductor and said non-scored glass surface throughout the entire length of said desired line of cut by applying a moderate, uniform pressure to said conductor with a series of longitudinally aligned rollers reciprocably movable along said conductor in bearing engagement thereagainst to concentrate said heat along said desired line of cut and sever said glass sheet into portions having smooth and even severed edges through and which are truly perpendicular to the major surfaces of the severed glass portions.

4,109,841

APPARATUS FOR OPENING SCORE LINES IN GLASS SHEETS

Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 26, 1976, Ser. No. 690,337

Int. Cl.² C03B *33/02*

U.S. Cl. 225—96.5 **20 Claims**

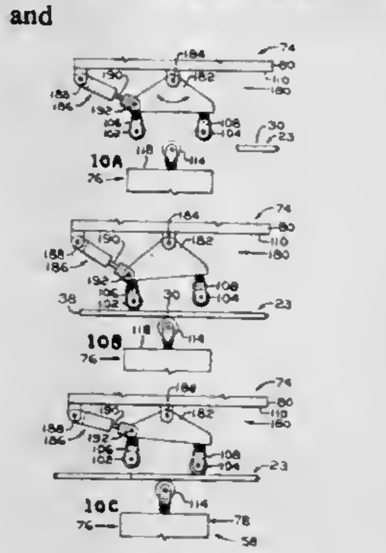
3. An apparatus for severing a sheet of a fracturable material, the sheet having at least one score line extending between a first and a second opposite edge which edges are transverse to a direction of advance, comprising:

means for advancing the sheet to be severed along an article movement path into a severing station;

a rotatably mounted wheel biased toward one side of the article movement path;

a pair of spaced rotatably mounted wheels each biased toward the opposite side of the article movement path;

means mounting said wheel and said pair of wheels for synchronously moving said wheel and said pair of wheels along a path transverse to the article movement path with said wheel spaced from the spaced distance between said pair of wheels; and



means responsive to the movement of the sheet to be severed and acting on said moving means for displacing said wheel and said pair of wheels along their respective path.

4,109,842

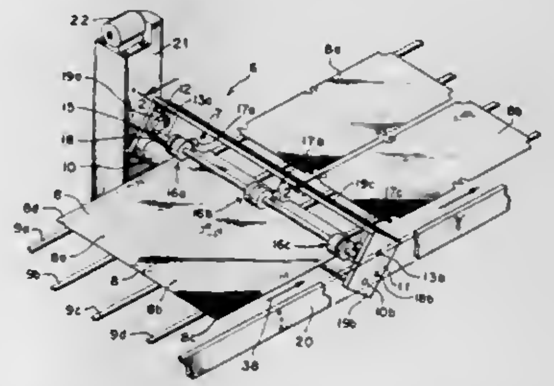
SHEET STRIPPING DEVICE

John J. Aquilla, c/o Converted Paper Prod., 1529 Dean St., Brooklyn, N.Y. 11213

Filed Feb. 13, 1975, Ser. No. 549,517

Int. Cl.² B65H *35/10;* **B26F** *3/02*

U.S. Cl. 225—98 **4 Claims**



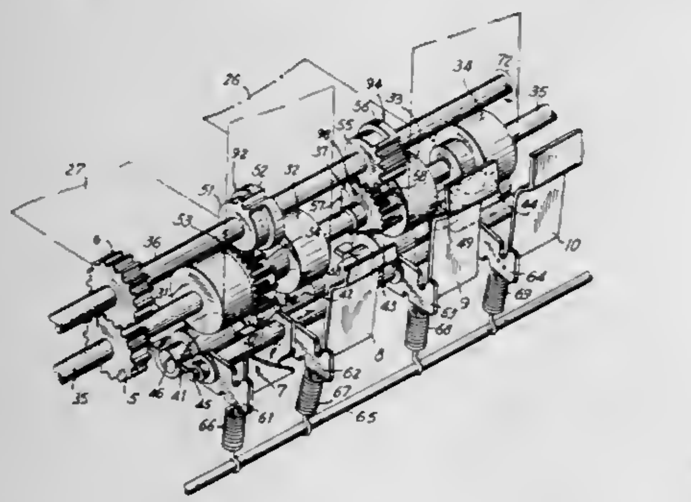
1. A stripping device comprising in combination: conveyor means for transporting a sheet structure along a first plane in a predetermined direction, where said sheet structure has a major section connected intermittently to a minor section of lesser surface area extending along said major section in a direction substantially parallel to said first direction; a projection structure having sides thereof extending in a substantially upright plane substantially parallel to said first direction and positioned at a predetermined laterally located position relative to said conveyor means adapted such that when said conveyor means transports said sheet structure in said first direction, said projection structure is positioned such that a forward face thereof intercepts a leading edge of said minor section to result in a stripping of the minor section from the major section and adapted such that the major section is thereafter conveyed continually by conveyor means to a predetermined point beyond said projection structure, and pincher surfaces in opposing relationship to oneanother positioned above and below said first plane and adapted such that during transport of said sheet structure, said pincher surfaces anchor said major section of the sheet structure during movement of said minor section against said projection structure, said projection structure being laterally adjacent said pincher surfaces and adapted such that stripping away of the minor section from the major section is facilitated thereby, said pincher surfaces

comprising opposing roller surfaces mounted such that adjacent surfaces move in a common direction.

4,109,843
WEB FEEDING MECHANISM FOR COMPACT PRINTER

Kiyofumi Usui; Shigeyoshi Hirabayashi, and Hiroshi Hosogaya, all of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha, Suwa, Japan

Filed Apr. 4, 1977, Ser. No. 784,393
Claims priority, application Japan, Apr. 2, 1976, 51-37555
Int. Cl.^{2} B65H *17/42*
U.S. Cl. 226—109 19 Claims

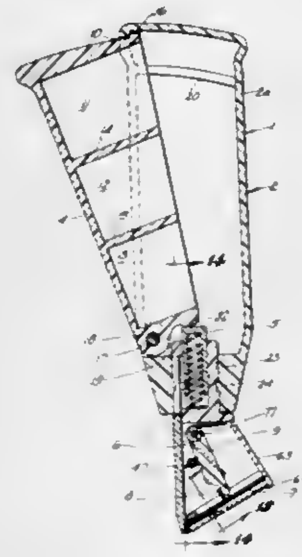


1. A web feeding mechanism for feeding at least one web comprising first web feeding roller means and second web feeding roller means, each of said web feeding roller means being adapted to engage one side of a web, first idler means and second idler means, said first idler means being adapted to be displaceably positioned between an engaging position on another side of a web at which said first idler means engages the associated web against said first feeding roller means and a non-engaging position wherein said first idler means is disposed out of engagement with the associated web, said second idler means being adapted to be displaceably positioned between an engaging position on another side of a web at which said second idler means engages the associated web against said second feeding roller means and a non-engaging position wherein said second idler means is out of engagement with the associated web, first drive gear means coupled to said first web feeding roller means for driving said first web feeding roller means to advance the associated web at a first predetermined rate when said first idler means is disposed in said engaging position, second drive gear means coupled to said second web feeding roller means for driving said second web feeding roller means to advance the associated web at a second predetermined rate when said second idler means is displaced in said engaging position, each of said first and second drive gear means comprising a first driving gear having n teeth, a first driven gear having m teeth cooperatively engageable with said first driving gear, a second driving gear having n-1 notches disposed in the periphery thereof and mounted for rotation with said first driving gear, a second driven gear having m/2 teeth and mounted for rotation with said first driven gear, said n-1 notches in said second driving gear engaging said m/2 teeth on said second driven gear when said n teeth on said first driving gear are in engagement with said m teeth of said first driven wheel, each said second driving gears including a peripheral region outside of the region of said *n*-1 notches for abutting intermediate two of said *m/2* teeth on said second driven gear for preventing said second driven gear from rotating when said *n* teeth of said first driving gear are out of engagement with said m teeth of said first driven gear, and idler displacement means for selectively displacing said first and second idler means between their respective engaging positions and non-engaging positions.

4,109,844
SURGICAL STAPLING INSTRUMENT

Carl T. Becht, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Nov. 18, 1976, Ser. No. 742,843
Int. Cl.^{2} B25C *5/02*
U.S. Cl. 227—120 14 Claims

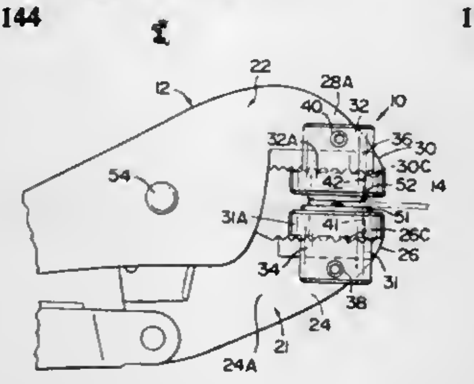


1. A surgical stapling instrument for forming and implanting a staple in the skin or fascia of a patient, said instrument comprising a handle portion incorporating a nose portion, said nose portion having an anvil plate at the bottom end thereof, said anvil plate terminating at its forward end in a coextensive anvil surface, said anvil plate being adapted to slidably mount a row of staples, means to constantly urge and advance said row of staples along said anvil plate to place a forwardmost staple of said row on said anvil surface, a staple driver mounted in said nose portion and shiftable vertically between a normal upper position closely adjacent said forwardmost staple on said anvil surface and a lower position wherein it forms and implants said forwardmost staple about said anvil surface, and means to shift said staple driver between said upper and lower positions thereof.

4,109,845
SNAP DIES

Donald G. Wedge, 2008 Riverside Dr. E., Bradenton, Fla. 33508, and Albert W. Zirkelbach, 2819 62nd Ave. East, Bradenton, Fla. 33505

Filed Aug. 22, 1977, Ser. No. 826,415
Int. Cl.^{2} B25C *7/00*
U.S. Cl. 227—144 10 Claims



1. A device for attaching a snap fastener having a first and a second snap fastener portion to a material, the device being adapted for use with pliers, having a first and a second plier jaw, comprising in combination:

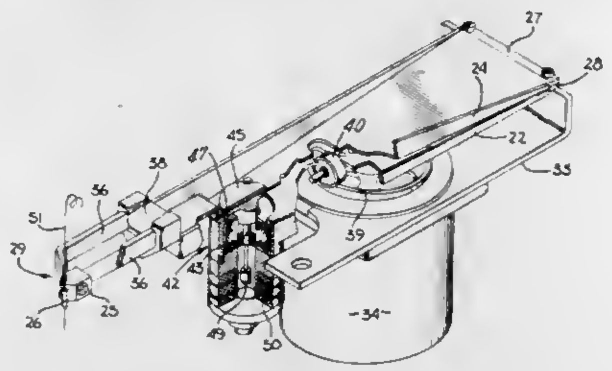
- a first and a second support unit capable of mounting to the first and the second plier jaws, respectively;
- first and second threaded fastening means for respectively securing said first and said second support units to the first and the second plier jaws;

- first die insert means including a projection for locating the first snap fastener portion of the snap fastener relative to said first die insert means;
- second die insert means including internal resilient means for locating the second snap fastener portion of the snap fastener relative to said second die insert means; and
- first and second aperture means in said first and said second support units for respectively receiving said first and said second die insert means enabling the materal to be interposed between said first and said second die insert means when the first and the second plier jaws are in an open position and for attaching the first and the second snap fastener portions to the material when the first and the second plier jaws are moved to a closed position.

4,109,846
AUTOMATIC HEIGHT SENSOR FOR SEMICONDUCTOR BONDING TOOL, WAFER PROBE OR THE LIKE

Matheus D. Pennings, Los Altos Hills, and Billy B. Tippin, Saratoga, both of Calif., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed May 17, 1977, Ser. No. 797,622
Int. Cl.^{2} H01L *21/68*
U.S. Cl. 228—4.5 13 Claims



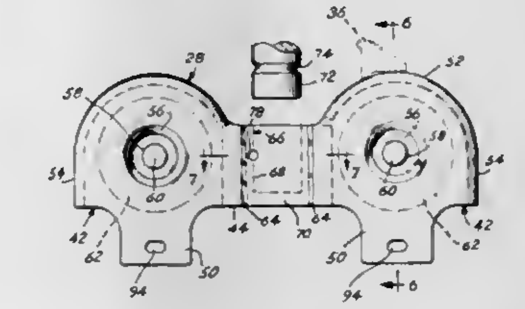
1. In an automatic semiconductor bonder or prober employing a bonding or probing tool, an apparatus for controlling the movement of said bonding or probing tool generally transverse to a surface comprising:

- a first arm mounted for transverse movement relative to said surface, said first arm including said bonding or probing tool;
- a second arm mounted for movement with said first arm;
- coupling means for coupling said first arm to said second arm, said coupling means decoupling said first arm from said second arm when said tool contacts a bonding pad, lead frame or the like;
- sensing means for sensing relative movement between said first and second arms;
- recording means responsive to said sensing means for recording a parameter which is a function of the position of said tool when said relative movement occurs; and
- drive means coupled to said second arm for driving said second arm and said first arm when said first arm is coupled to said second arm by said coupling means;
- whereby when said tool engages said bonding pad, lead frame, or the like which is on said surface, said first and second arms separate and said recording means records a parameter which is a function of the position of said tool, thereby allowing a height determination of such bonding pad, lead frame, or the like.

4,109,847
METHOD FOR REPLACING DIFFERENT RAILROAD CAR DOOR ROLLER ASSEMBLIES

John D. Bailey, Orland Park, Ill., assignor to Railway Engineering & Supply Company, Inc., Oak Lawn, Ill.

Filed May 3, 1976, Ser. No. 682,462
Int. Cl.^{2} E05D *13/02;* B61D *19/00*
U.S. Cl. 228—119 5 Claims

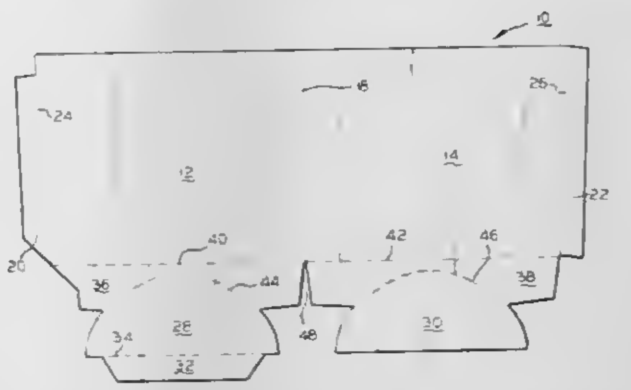


1. A method for selectively replacing any of a plurality of different types of railroad car door roller assemblies, used with different types of railroad car door tracks, said method comprising the steps of supplying a roller assembly replacement kit which includes a housing having a pair of spaced end sections, each of said end sections being constructed and arranged to rotatably support a roller member for movement on a cooperating one of said tracks, each of said end sections having a pair of opposed side walls with downwardly projecting feet, an intermediate section for rigidly interconnecting said end sections, an upright aperture in said intermediate section, said kit also including separate guide members, a hook member, and at least one separate threaded member, said method further comprising the steps of threading said upright aperture of said housing, and threadably securing one of said threaded members into said threaded aperture, said housing with said threaded member thereby being a replacement for one of said types of said roller assemblies for use in connection with one of said tracks.

4,109,848
TUBULAR CARTON

Michael A. Kipp, Phoenixville, Pa., and Arne H. Brauner, Greensboro, N.C., assignors to Container Corporation of America, Chicago, Ill.

Continuation-in-part of Ser. No. 654,889, Feb. 3, 1976, abandoned. This application Feb. 3, 1977, Ser. No. 765,241
Int. Cl.^{2} B65D *3/04*
U.S. Cl. 229—21 1 Claim



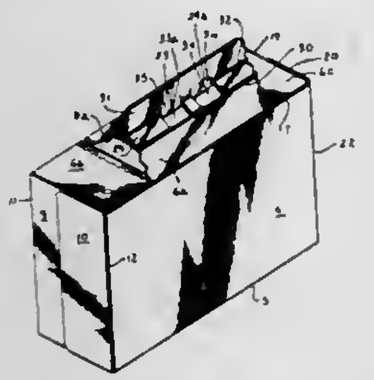
1. A tubular carton formed from a cut and scored blank of paperboard, or the like, comprising:

- (a) a side wall formed from a plurality of body panels arranged in a side-by-side relation, with adjoining panels being foldably connected to each other along a score line;
- (b) a recessed, concavely depressed bottom wall formed from at least two ovelapping bottom panel portions secured to each other;

(c) each of said body panels being connected to a corresponding one of said bottom panel portions by an intermediate panel;
(d) said intermediate panel and said body panel being substantially of equal length and being foldably connected along the entire length of their adjacent edges;
(e) said intermediate panel being foldably connected to a bottom panel portion along a concave/convex fold line;
(f) said side wall having remote side edges secured to each other in an overlapped relation to form a tubular structure collapsible into a substantially flat configuration.

4,109,849
ARTICLE CARRIER

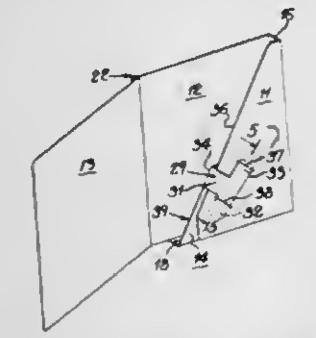
Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Dec. 12, 1977, Ser. No. 859,336
Int. Cl.² B65D *5/46*
U.S. Cl. 229—52 B **11 Claims**



1. In a hexagonal article carrier, lifting means comprises a pair of face contacting handle panels, a pair of stress relieving panels foldably joined respectively to said handle panels, an outer top wall foldably joined to one of said stress relieving panels remote from said handle panel, an inner top wall foldably joined to the other of said stress relieving panels remote from said handle panel, and each of said stress relieving panels being adapted to shift from a position in substantially the same plane as the associated handle panel to a position in substantially the same plane as the associated top wall when said lifting means is manipulated.

4,109,850
FILE FOLDER WITH EXPANDABLE POCKET

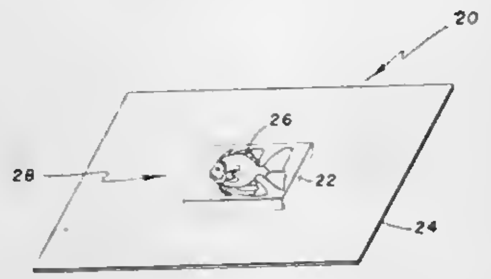
Vincent D. Meenan, 25 Millbrook Dr., Middletown, N.J. 07748, and Thomas P. Meenan, 3309 164th St., Flushing, N.Y. 11358
Filed Nov. 16, 1976, Ser. No. 742,300
The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.
Int. Cl.² B65D *27/08*
U.S. Cl. 229—72 **9 Claims**



1. In a file folder formed from a single flat sheet having a front leaf, a back leaf, a side leaf and a bottom leaf extending from said back leaf in which a pocket for containing filing material is formed by the back, side and bottom leaves and in which upper edges of said front, back, side and bottom leaves are open and exposed for permitting ready insertion and withdrawal of papers, the improvement which comprises slidable means including a T shaped tab on said bottom leaf, said bottom leaf being folded over said back leaf, and guiding means having spaced slits for said sliding means on said side leaf for adjustably arranging said pocket, said side leaf being folded over said bottom leaf and also over said back leaf, said T shaped tab being folded over a side edge of said side leaf for mesh engagement of said tab with said slits whereby, when said tab and slits are interconnected, said pocket can be expanded or contracted as filing material is added to or removed from said pocket.

4,109,851
NOVELTY POSTCARD AND METHOD

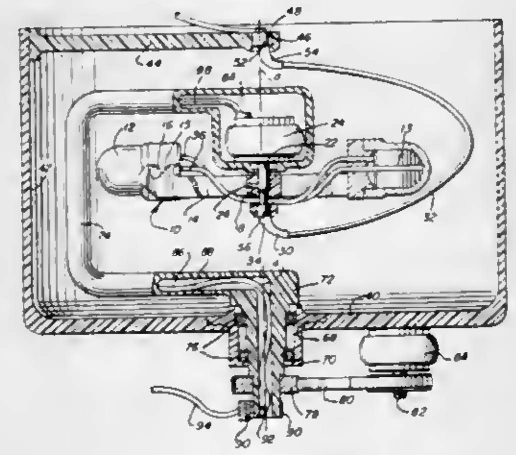
Delbert T. Goates, 1275 Chandler Dr., Salt Lake City, Utah 84103
Continuation-in-part of Ser. No. 426,774, Dec. 20, 1973, abandoned. This application Jul. 21, 1975, Ser. No. 597,728
Int. Cl.² B32B *31/26;* **B29G** *27/20;* **B42D** *15/02*
U.S. Cl. 229—92.8 **5 Claims**



1. A novelty postcard comprising:
an imprinted heat-shrinkable thermoplastic plate which shrinks in size at temperatures in the range of 200°–400° F;
a backing sheet for carrying a message or other information and of substantially the same size as the thermoplastic plate; and
adhesive means distributed between the thermoplastic plate and the backing sheet releasing the sheets from one another in the temperature range of 200°–400° F.

4,109,852
CENTRIFUGAL STRAIN RELIEF SHEATH FOR PROCESSING APPARATUS

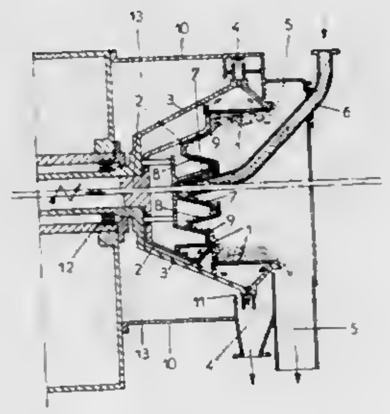
Richard I. Brown, Northbrook, and Daniel R. Boggs, Vernon Hills, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Oct. 21, 1977, Ser. No. 844,225
Int. Cl.² B04B *5/02*
U.S. Cl. 233—1 R **10 Claims**



1. Centrifugal processing apparatus, including:
a stationary base;
a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;
a flexible umbilical cable segment for establishing communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of the processing chamber, the other end of the cable segment being attached substantially on said axis in rotationally locked engagement to the processing chamber, the improvement comprising, in combination:
a flexible sheath member carried by said umbilical cable segment,
means connecting said flexible sheath member to said axis,
said flexible sheath member having a shank portion which extends from said axis and along a portion of said cable segment, and
said shank portion having a thickness which decreases along said cable segment in the direction away from said connecting means.

4,109,853
CENTRIFUGAL FILTER PRESS

Ernst Rüegg, Kusnacht, Switzerland, assignor to De Dietrich & Cie, S.A., Niederbronn-les-Bains, France
Filed Apr. 26, 1977, Ser. No. 790,995
Int. Cl.² B04B *1/12, 7/04, 15/06*
U.S. Cl. 233—2 **3 Claims**

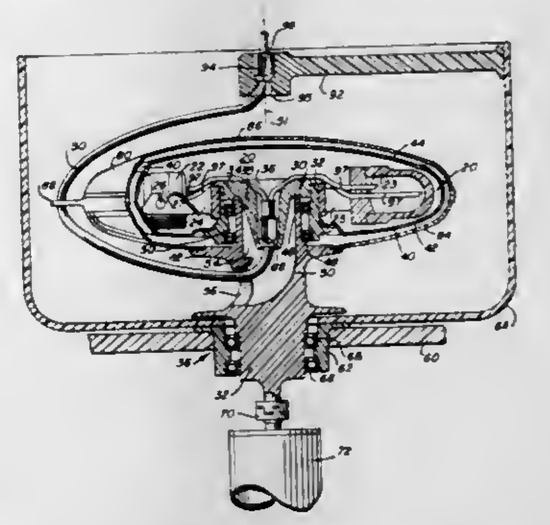


1. In a pusher-type centrifuge comprising a rotary filter drum, means for rotating said drum about its axis, means for feeding material to be filtered centrally of said drum, said drum having a cone along which said material moves radially outwardly and a cylindrical filter coaxial with the drum that subsequently receives said material and separates solids in said material from liquids in said material, the liquids passing radially outwardly through the filter and the solids leaving the filter axially endwise; the improvement in which there are a plurality of said cones concentric with each other and opening in alternately opposite axial directions along the path of said material between said feeding means and said filter, the radially outermost of said cones feeding said material directly to said filter, means to separately remove liquid and solids from adjacent the periphery of said drum, a shaft on which said drum is mounted for rotation, bearings supporting said shaft for rotation, and a fixed casing surrounding and enclosing said drum and bearings, said removing means for liquid filtrate comprising venturi means for educting vapor from within said casing but outside said drum thereby to remove vapor from the vicinity of said bearings.

4,109,854
CENTRIFUGAL APPARATUS WITH OUTER ENCLOSURE

Richard I. Brown, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jun. 13, 1977, Ser. No. 805,950
Int. Cl.² B04B *5/02, 9/00*
U.S. Cl. 233—25 **9 Claims**

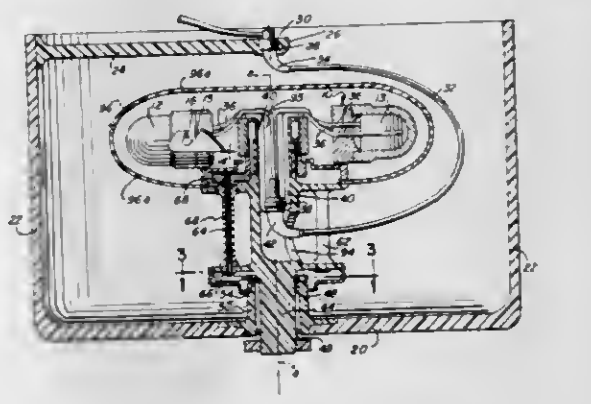
1. Centrifugal processing apparatus, which comprises:
a stationary base;
a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;
a flexible umbilical cable segment for establishing fluid communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of said processing chamber, the other end of said cable segment being attached substantially on said axis in rotationally locked engagement to said processing chamber;



means for rotating said processing chamber and said cable segment in the same direction with a speed ratio of 2:1, respectively;
an outer enclosure positioned about said processing chamber and being symmetrically dimensioned about said axis, said outer enclosure being positioned intermediate said processing chamber and said cable segment; and
said rotating means coupling said outer enclosure to said processing chamber, permitting said outer enclosure to rotate at one-half the speed of said processing chamber.

4,109,855
DRIVE SYSTEM FOR CENTRIFUGAL PROCESSING APPARATUS

Richard I. Brown, Northbrook, and Joseph Kevin Duffy, Buffalo Grove, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Oct. 25, 1977, Ser. No. 844,607
Int. Cl.² B04B *5/02, 9/08*
U.S. Cl. 233—25 **13 Claims**



1. Centrifugal processing apparatus, including:
a stationary base;
a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;
a flexible umbilical cable segment for establishing communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of the processing chamber, the other end of the cable segment being attached substantially on said axis in rotationally locked engagement to the

processing chamber, the improvement comprising, in combination:

a main drive shaft connected to said processing chamber, said main drive shaft being coaxial with said predetermined axis;

means for driving said main drive shaft at one ω;

said main drive shaft defining a central bore and an opening extending radially from said central bore to the outside of said main drive shaft, said cable segment extending from said other end through said central bore and said radially extending opening, and out of said main drive shaft;

a transmission countershaft coupled to said base and main drive shaft adjacent one end thereof, said transmission countershaft coupled to said processing chamber and main drive shaft adjacent the other end thereof, said countershaft being parallely located with respect to said main drive shaft;

first means coupling said countershaft to said base and main drive shaft to cause rotation of said countershaft in response to rotation of said main drive shaft;

second means coupling said countershaft to said processing chamber and main drive shaft to transmit one ω rotation to said processing chamber during rotation of said countershaft with said transmitted one ω rotation being added to said one ω rotation of said main drive shaft to result in a total of two ω rotation of said processing chamber during one ω rotation of said main drive shaft.

4,109,856

METHOD FOR TRANSMITTING BINARY SIGNALS

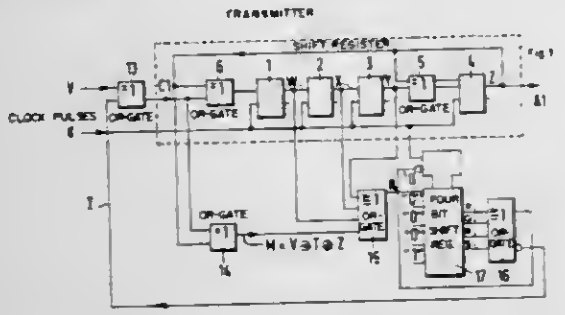
Marius van Beveren, Leidschendam, and Peerke Jan Nuhoff, Alphen aan de Rijn, both of Netherlands, assignors to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed May 10, 1976, Ser. No. 684,565

Claims priority, application Netherlands, May 14, 1975, 7505680

Int. Cl.^{2} G06F *11/00*

U.S. Cl. 235—308 **10 Claims**



3. Device for ending a predetermined repetition of a degenerative condition in a scrambler at a transmitter, said device comprising: a feedback shift register (1–6) of storage elements (1–4) for producing a maximum length series, an exclusive input OR-gate (13) connected to said feedback shift register, an OR-gate (15) connected to said elements, a second shift register (17) connected to the output of said OR-gate (15) whereby after the fixed number of clock periods a degenerative condition can be detected, a second OR-gate (16) connected to said second shift-register, which second OR-gate (16) is connected on the one side to said exclusive input OR-gate (13), and on the other side to the parallel read input (U) of said second shift register (17), which has such a read condition that only one bit of the input signal can be inverted.

4,109,857

AUTOMATIC UNIT PRICE SETTING APPARATUS OF ELECTRONIC DIGITAL DISPLAY SCALE WITH PRINTING DEVICE

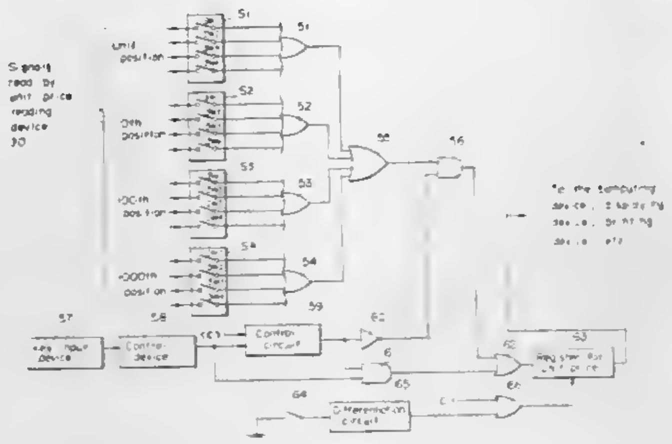
Kazuharu Teraoka; Mitsuru Sato, and Masao Mineo, all of Tokyo, Japan, assignors to Teraoka Seikosho Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,932

Claims priority, application Japan, Jul. 1, 1975, 50-77916

Int. Cl.^{2} G06K *15/02;* G01G *23/38, 19/04*

U.S. Cl. 235—378 **14 Claims**



1. For use in an electronic digital display scale of the kind including:

(a) a unit price setting section, and

(b) a printing device adapted to compute and display a price of an article by multiplying the weight of the article by a unit price inserted in a scale, and adapted to print a name, weight, unit price, and price of the article;

the improvement which comprises an automatic unit price setting apparatus incorporating:

(i) a stamp for printing the name of an article, said stamp having means carrying information appertaining to a unit price for the article

(ii) detecting means for reading said information means of a stamp presented to it, and passing the unit price to the printing device.

4,109,858

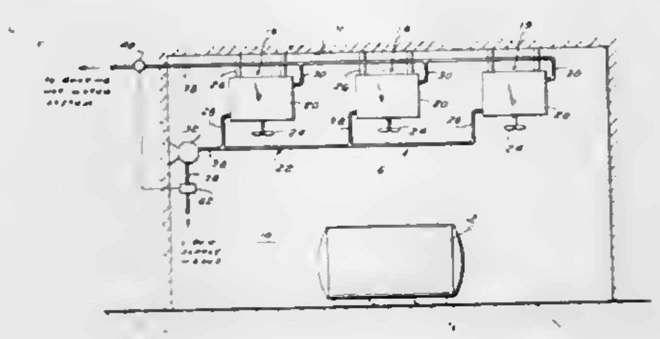
SYSTEM FOR THE UTILIZATION OF WASTE HEAT FROM A BOILER ROOM TO HEAT A FLUID MEDIUM AND LOWER THE AMBIENT TEMPERATURE OF A BOILER ROOM

Manfred Moses, 29 Huntley Rd., Eastchester, N.Y. 10709

Continuation-in-part of Ser. No. 666,444, Mar. 12, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 803,540

Int. Cl.^{2} F24D *3/02, 9/00*

U.S. Cl. 237—8 R **7 Claims**



1. A heat recovery system, in combination with a boiler room for the removal and utilization of waste heat from said boiler room by passing a liquid in heat exchange relation with heated boiler room air and thereafter removing the heated liquid from the system, comprising:

heat exchange means mounted in said boiler room and including at least one heat exchanger operable to maintain liquid flowing therethrough in heat exchange relation with the air in said boiler room;

liquid distribution system including conduit means operable to conduct liquid into said heat exchanger, outlet means operable to conduct liquid away from said heat exchanger and externally of said boiler room; pump means to pump or move the liquid through the heat recovery system whereby liquid may be pumped through said heat exchanger and thereafter externally of said boiler room, thereby to remove heat from the boiler room air and from said boiler room, lowering the ambient temperature in said boiler room while simultaneously utilizing the heat to raise the temperature of the liquid; and

a liquid supply operably connected to said pump means through an inlet to said pump, whereby liquid may be supplied to said pump and consequently to the system to replenish liquid which is continuously exhausted from the system;

said liquid distribution system further comprising a temperature sensor operably mounted on said outlet means to sense the temperature of the liquid flowing through said outlet means, and a heat responsive control valve operably mounted in the inlet to said pump and operably connected to said temperature sensor whereby the temperature of the liquid flowing through said outlet means controls the flow of liquid into said system.

4,109,859

HOT WATER FLOOR HEATER

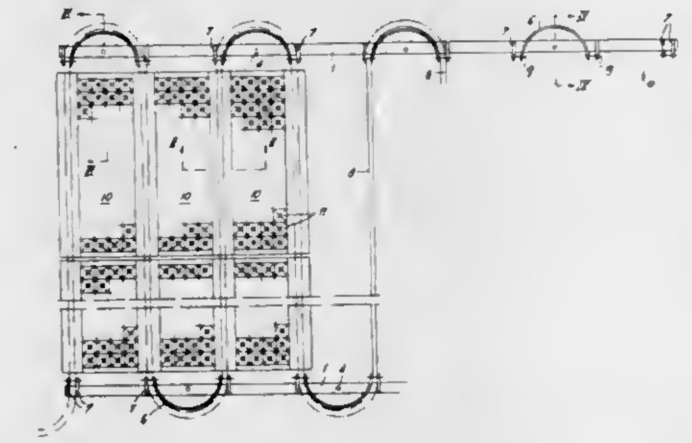
Felix Dürst, CH-8165 Oberweningen-Schöfflisdorf, Switzerland

Filed Jun. 7, 1976, Ser. No. 693,155

Claims priority, application Switzerland, Jun. 9, 1975, 7393/75; Nov. 12, 1975, 14628/75; Apr. 23, 1976, 5108/76

Int. Cl.^{2} F24H *9/08*

U.S. Cl. 237—69 **23 Claims**



1. In floor hot water heater in the form of a hot water-carrying pipe coil for support on a base and having spaced substantially rectilinear parallel pipe ducts interconnected by pipe bends, the improvement comprising, in combination, a plurality of horizontally curved members spaced longitudinally in two rows at fixed distances from each other substantially equal to the distance between two adjacent pipe ducts, with the rows being spaced laterally by a distance of the order of the length of said pipe ducts and the curved members of each row facing those in the other row and staggered relative to the curved members in such other row; and a pair of relatively elongated laths extending transversely of said pipe ducts and secured on the support base; said horizontally curved members being fixedly secured on the upper surfaces of said laths to extend upwardly therefrom; the pipe forming said pipe coil being bent around said horizontally curved members, and said horizontally curved members serving as gauges for the bending of the pipe to form the coil and for accurate parallel spacing of said pipe ducts.

4,109,860

RAIL SPRING CLIP WITH TENSION LIMITING FEATURE

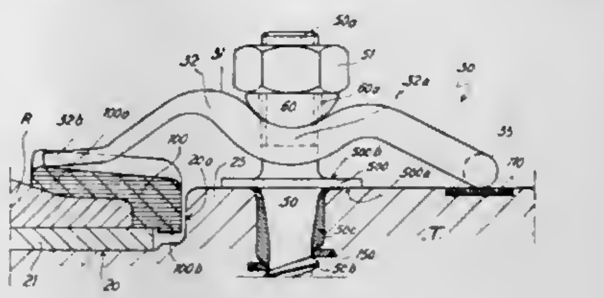
Marian A. Serafin, Paris, and Maurice Decubber, Beaumont S. Oise, both of France, assignors to Societe Anonyme de Traverses en Beton Arme - Systeme Vagneux, France

Filed Mar. 22, 1976, Ser. No. 669,230

Claims priority, application France, Mar. 26, 1975, 75 09486

Int. Cl.^{2} E01B *9/34*

U.S. Cl. 238—349 **6 Claims**



1. An assembly for fixing a rail to a railway track sleeper, comprising a bolt having its lower portion embedded in the sleeper and threads on the upper portion thereof, a nut having threads in engagement with the threads of said bolt, a deformable resilient clip disposed around the bolt below said nut, said clip being an elongated member, one end of which engages the rail flange and the other end of which engages said sleeper, whereby tightening of said nut results in the downward deformation of said clip placing same under clamping stress and in the application of force on the rail by said clip to clamp said rail to said sleeper, a rigid shoulder on said bolt which serves as an abutment, said shoulder being of a size and positioned relative to said clip, rail and sleeper so that tightening of the nut results in said clip and shoulder contacting at a point which prevents any possibility of excess tightening able to create inopportune deformations of the clip or excessive extraction forces on said bolt while the clip provides sufficient clamping force.

4,109,861

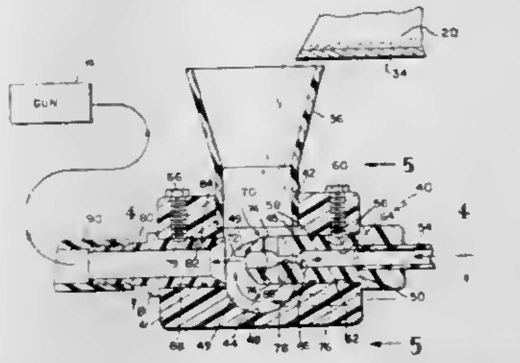
ELECTROSTATIC FLOCKING SYSTEM

John P. McHugh, Indianapolis, Ind., assignor to Solar Suede Corporation, Lexington, Ky.

Filed Sep. 16, 1976, Ser. No. 724,029

Int. Cl.^{2} B05B *5/02*

U.S. Cl. 239—15 **8 Claims**

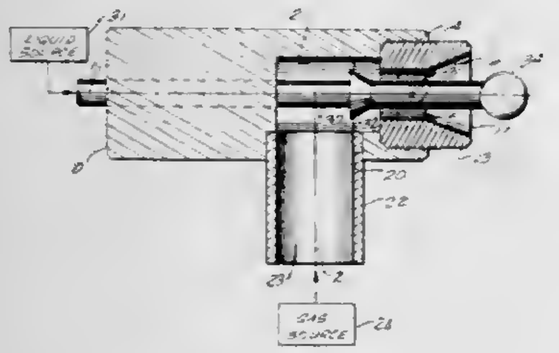


1. An electrostatic flocking system comprising an air flow pump having a central chamber with an air inlet and, a flock inlet, opening into said chamber and a chamber outlet connected with said chamber; said air inlet having a forwardly directed channel and a plurality of angularly disposed channels opening into said chamber and means in said inlet for accelerating air passing through said air inlet into said chamber; air supply means for supplying air through said air inlet into said chamber; flock supply means for supplying flock fibers through said flock inlet into said chamber; said chamber having an arcuately recessed bottom wall; an auxiliary air inlet

port spaced from said air inlet and opening into the recessed portion of the bottom wall of the chamber; said flock fibers being entrained with the air in said chamber and exiting the chamber with the air through said outlet; an applicator gun having a barrel opening formed therethrough; means interconnecting said outlet and said gun at one end of the barrel opening of that the air and entrained flock fibers pass through the barrel opening; and charging means on said gun for electrostatically charging the flock fibers passing through the barrel opening.

4,109,862
SONIC ENERGY TRANSDUCER

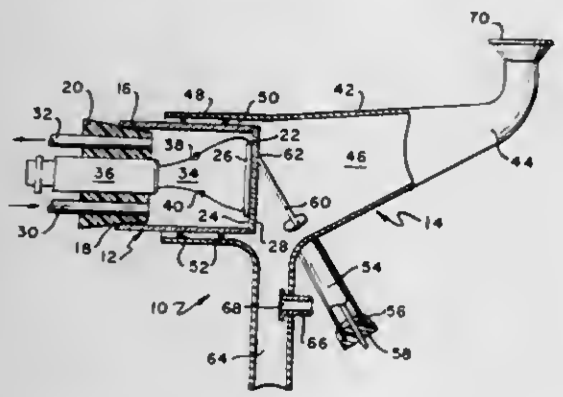
Nathaniel Hughes, 1934 Sonora Rd., Palm Springs, Calif. 92262
Filed Apr. 8, 1977, Ser. No. 785,838
Int. Cl.² B05B *17/06*
U.S. Cl. 239—102 **25 Claims**



1. A sonic energy transducer comprising:
a fluid inlet;
a fluid outlet;
a flow passage having a restriction between the inlet and the outlet;
a hollow rod extending along the passage, the rod having one or more holes near the restriction;
a frustum mounted on the rod in the flow passage between the inlet and the restriction, the frustum having a base facing away from the restriction and an apex facing toward the restriction; and
a source of liquid to be atomized connected to the rod to feed the liquid to the restriction.

4,109,863
APPARATUS FOR ULTRASONIC NEBULIZATION

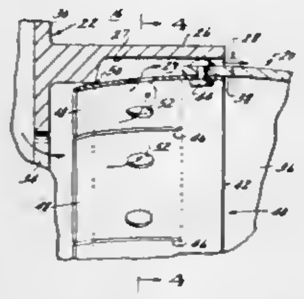
Kenneth W. Olson; William J. Haas, Jr., and Velmer A. Fassel, all of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 17, 1977, Ser. No. 825,519
Int. Cl.² B05B *3/14, 17/06*
U.S. Cl. 239—102 **5 Claims**



1. A sample nebulizing system for nebulizing a liquid sample or suspension into a carrier gas to form an aerosol comprising:
a. a first hollow body having a first open end and a second end enclosed by a flat plate selected from the group consisting of glass and fused quartz, the plate having an inner face within the body and an outer nebulizing face;
b. ultrasonic transducer means bonded to the inner face of the plate for transmitting ultrasonic vibrations to the nebulizing face;
c. sealing means in the open end of the first body for enclosing a cooling chamber;
d. coolant circulating means in the sealing means for passing a coolant through the chamber for cooling the transducer means;
e. a second hollow body enclosing an aerosol mixing chamber, the body having an opening for receiving the enclosed end of the first body including means for sealing the first body in the opening;
f. sample delivery means in the second body for delivering a sample to the nebulizing face to be nebulized into the mixing chamber;
g. carrier gas inlet means in the second body for introducing a carrier gas into the mixing chamber to transport an aerosol of the nebulized sample;
h. an aerosol outlet in the second body for removing the aerosol from the mixing chamber; and
i. drain means in the second body for removing condensed aerosol and unnebulized sample from the mixing chamber.

4,109,864
COOLANT FLOW METERING DEVICE

Thomas S. Clayton, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Dec. 23, 1976, Ser. No. 753,950
Int. Cl.² B64D *33/04*
U.S. Cl. 239—127.3 **11 Claims**

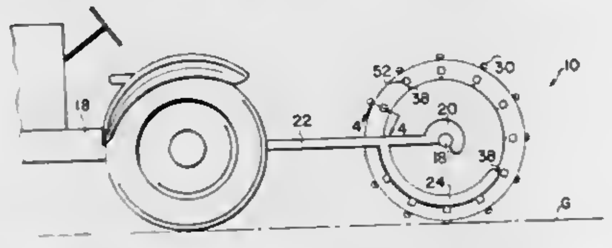


1. A device for metering a fluid flow between two overlapping members subject to relative displacement and separated by a gap for spreading the fluid as a film over the overlapped member, said metering device comprising a flexible seal having one end which is connected to one of said members with the other end being free, said seal being of such length that said free end will engage in sealing contact with the other of said members when urged outwardly by the fluid, said seal further including orifice means for providing an essentially constant flow area through which the flow passes irrespective of the size of the gap due to differences in relative displacement of said members.

4,109,865
TRACTOR SPRAY CYLINDER ATTACHMENT

Jorge E. Hurtado T, 43-72 35th St., Barranquilla -Atl., Colombia, and Diogenes A. Arrieta, 34-47 90th St.-53H, Jackson Heights, N.Y. 11372
Filed Apr. 7, 1977, Ser. No. 785,419
Int. Cl.² B05B *9/06*
U.S. Cl. 239—147 **4 Claims**

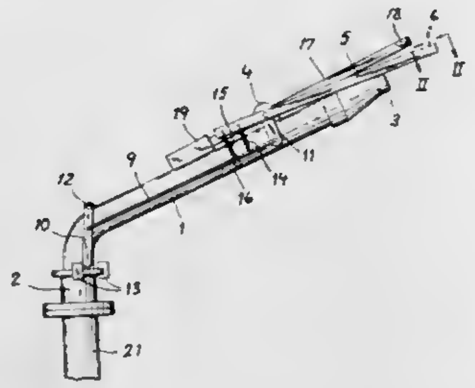
1. A spray attachment for a tractor comprising:
a tank adapted to receive liquids to be sprayed onto an agricultural field,
a wheel secured to each end of said tank having a hollow interior in communication with the interior of said tank,
a plurality of pistons mounted about the circumference of each wheel in a cylinder having an opening in the bottom thereof in communication with the interior of each of said wheels,
each of said pistons including a piston rod having a head for engagement with the ground sequentially as said wheel rotates along said ground to pressurize the interior of each of said wheels and said tank,



a series of spray orifices spaced about a side wall of each of said wheels in communication with the interior of each of said wheels for dispensing liquid from the interior of each of said wheels to an exterior field under cultivation, and
valve means selectively operable to open and close said orifices in response to the position of said orifice on said wheel.

4,109,866
RECIPROCABLE SPRINKLER

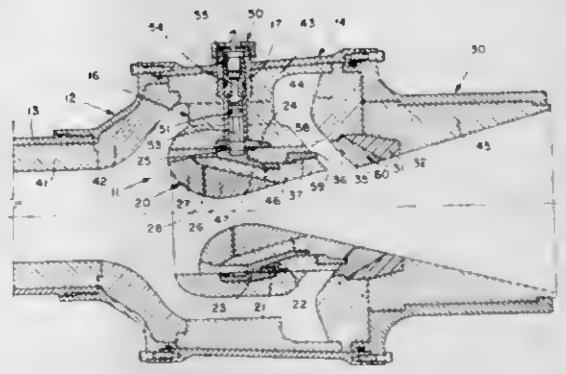
Gerhard Brandl, Leonhardstrasse 79, A-8010 Graz, Austria
Filed Apr. 11, 1977, Ser. No. 786,395
Claims priority, application Austria, Apr. 9, 1976, 2607/76
Int. Cl.² B05B *3/08*
U.S. Cl. 239—233 **9 Claims**



1. A sprinkler comprising:
a standpipe rising from the ground;
a barrel journaled on said standpipe for limited rotation about a substantially vertical axis, said barrel terminating in a spray nozzle remote from its axis of rotation;
a forward-driving arm and a reverse-driving arm vertically oscillatable on said barrel, said arms having outer extremities terminating in deflecting heads remote from said axis of rotation with surfaces intercepting a water spray from said nozzle for displacing said barrel in a respective direction of rotation upon a lowering of the respective deflecting head from a retracted position above the water spray into operative alignment with said nozzle;
stop means on said standpipe coacting with said arms for retracting the deflecting head of said reverse-driving arm in an initial rotary position while operatively aligning the deflecting head of said forward-driving arm and for upwardly retracting the deflecting head of said forward-driving arm in a terminal rotary position while operatively aligning the deflecting head of said reverse-driving arm, the deflecting head of said reverse-driving arm having a plurality of lands differently inclined to the nozzle axis, said lands including a reaction face and a ramp face adapted to lower said reaction face into a position of confrontation with said nozzle upon being struck by the water spray; and
biasing means with a nonlinear characteristic on said barrel engaging said reverse-driving arm for yieldably arresting said reaction face in line with said nozzle, against a deflecting force of said water spray, by a restoring force intensifying in said position of confrontation.

4,109,867
TWO-POSITION NOZZLE

Charles E. Ebeling, Jr., Ridgeley, W. Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 14, 1977, Ser. No. 759,593
Int. Cl.² B64D *33/04*
U.S. Cl. 239—265.15 **10 Claims**

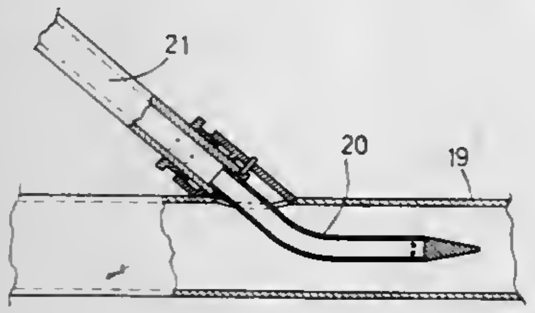


1. A dual-position assembly for a dual-thrust rocket motor nozzle having a stationary outer support structure and throat support means extending radially into the combustion chamber from said outer support structure comprising:
- a combined boost and sustain nozzle throat assembly and means slidably securing said combined assembly to said throat support means,
  - said combined assembly held in the forward position to form an enlarged throat area during boost phase operation of said rocket motor;
- means remotely operated for selectively releasing said combined assembly substantially at the termination of boost phase operation,
  - said combined assembly movable upon the urging of exhaust gases from said boost phase position aft to a sustain phase position upon actuation of said remotely operated means;
- stationary throat means in said nozzle for joining with said combined assembly at the termination of transition between boost phase and sustain phase operation,
  - said throat support means including at least three equally spaced struts;
- annular support means secured to said struts for receiving in sliding relationship said combined assembly,
  - said means remotely operated including restraining means preventing aft movement of said combined assembly in the presence of exhaust gases and means for selectively releasing said combined assembly to permit aft movement thereof to form said sustain nozzle; and
- an inner metal ring in said annular support means secured to said struts and a sustain nozzle support ring slidably conforming to at least a portion of the inner surface of said inner metal ring, and said restraining means including a groove in said inner metal ring and a retaining ring releasably engaged in said groove when said combined assembly is in the initial or boost phase position.

4,109,868

FUEL SUPPLY GOVERNING DEVICE

Hans Stenlund, Mölndal, Sweden, assignor to Gotaverken Angteknik AB, Gothenburg, Sweden
Filed Jan. 6, 1977, Ser. No. 757,327
Claims priority, application Sweden, Feb. 3, 1976, 7601106
Int. Cl.^{2} B05B *7/04*
U.S. Cl. 239—413 **1 Claim**



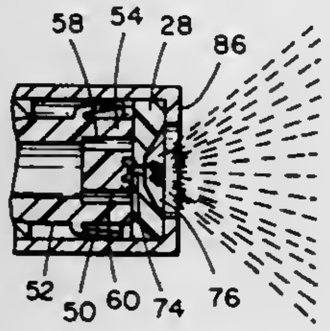
1. In a device for governing the supply of liquid fuel to a spray nozzle while maintaining an atomizing pressure at a predetermined level;

- (A) means for supplying said liquid fuel at a substantially constant pressure,
- (B) a first conduit for connecting said supply means with the spray nozzle,
- (C) a throttle valve in said conduit and first means to operate said throttle valve,
- (D) a source of pressurized gaseous fluid,
- (E) a jet nozzle fitted in said first conduit,
- (F) a secood conduit to connect said source of gaseous fluid with said jet nozzle,
- (G) governing means in said second conduit for metering the supply of said gaseous fluid, and
- (H) further means for monitoring the pressure in said first conduit, downstream of said throttle valve but upstream of said jet nozzle, and to maintain the combined pressures of said fuel and said gaseous fluid at said predetermined level by actuating the operating means at said throttle valve
- (I) whereby the pressure of said fuel is affected responsive to the pressure of said gaseous fluid to thereby actuate said monitoring means which consequently causes said throttle valve to adjust the amount of fuel delivered to said nozzle resulting in constant pressure at the same.

4,109,869

OILER WITH ADJUSTABLE SPRAY NOZZLE

Norman D. Brockelsby, Grand Island, and Reinhold A. Haase, Hastings, both of Nebr., assignors to Dutton-Lainson Company, Hastings, Nebr.
Filed Jun. 16, 1977, Ser. No. 807,255
Int. Cl.^{2} B05B *1/12*
U.S. Cl. 239—491 **1 Claim**

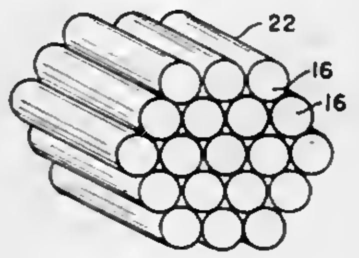


1. An improved oiler comprising, in combination:
an oil can;
a removable top;
a substantially uniform diameter tube leading from inside the can and terminating in a spout outside the can, said tube having a pump mechanism incorporated at the end of the tube inside the can, said tube being mounted in the top;
a pump handle also mounted on the top and connected by a linkage to the pump for driving the pump in response to actuation of the handle; and
a variable spray nozzle attached to the outside end of the spout, said nozzle including
an annular cylindrical mounting member threaded internally for attachment to the end of the spout and threaded externally at the outer end for receipt of a compression fitting, the internal passage of said outer end being frustoconically shaped and diverging outwardly,
a cylindrical channel member fabricated from an elastic material, said channel member including a central passage extending partially therethrough from an inside end toward an outside end, the inside end being complementary with the frustoconical portion of the mounting member and press fit therein, the outside end including an Integrally molded passage block having an outside flat surface, first and second small diameter openings therethrough, each opening being spaced from the centerline axis of the passage, each opening being connected by a separate channel in the end flat face of the block, said channels intersecting at the centerline axis of the passage to define a depression with a center hub therein, said center hub terminating beneath the plane of the flat face surface, the outside surface including an integral circumferential lip seal projecting therefrom;
a cylindrical disc having a center passage of an area substantially less than the area of the channel member openings, said center passage at the centerline axis of the channel member opposed to the depression and center hub, said disc having a flat inside surface in opposed relation to the flat face of the channel member; and
a compression fitting comprising an open ended cylindrical cup with the sealing flange of the channel member engaging the inside surface of the compression fitting, said cylindrical cup threadably attached to the mounting member and including a passage through the bottom of the cup defining an annular flange for retaining the disc and relatively positioning the disc and channel member surface in spaced relation, whereby the compression fitting may be adjusted to adjust the spacing of the disc face relative to the channel member face and thereby provide an adjustable spray pattern, said pattern being a fine line when said face and surface are spaced becoming a mist pattern upon approach and contact of the face and surface in response to the effective increase of the angular momentum of fluid through the channels and depression of the channel member.

4,109,870

MULTIORIFICE STRUCTURE AND METHOD OF MAKING SAME

William George Wolber, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed Apr. 29, 1977, Ser. No. 792,426
Int. Cl.^{2} B05B *1/14*
U.S. Cl. 239—558 **12 Claims**

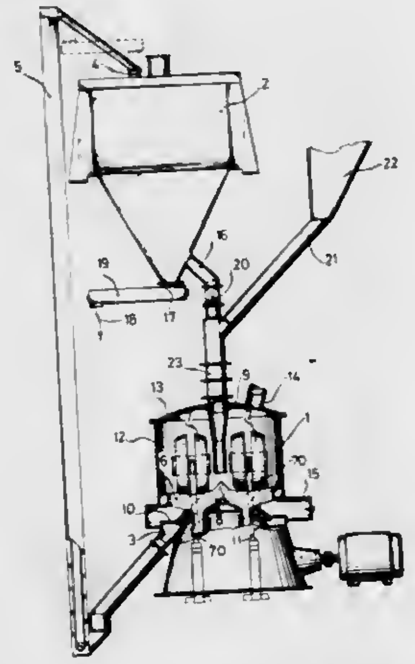


1. A multi aperture fuel atomizer plate for a fuel injector valve comprising a plurality of parallel solid rods disposed in a predetermined geometrical pattern wherein each rod is fused to each adjacent rod and the interstices formed between the fused adjacent rods form a plurality of orifices, said multiorifice structure having a first surface and a second surface and said plurality of orifices pass through said structure from said first surface to said second surface and wherein said first and second surfaces are separated by a distance small compared to the dimensions of said first and second surfaces.

4,109,871

METHOD AND APPARATUS FOR PROCESSING ABRASIVE MATERIAL

Ludger Lohnherr, Oelde, Fed. Rep. of Germany, assignor to Polysius AG, Neubeckum, Fed. Rep. of Germany
Filed Dec. 20, 1976, Ser. No. 752,139
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1976, 2600499
Int. Cl.^{2} B02C *23/12*
U.S. Cl. 241—24 **4 Claims**



1. A continuous method of treating abrasive material comprising feeding the material from a supply to a roller mill, grinding the material in the roller mill, discharging both the fine material and coarse material in a downward direction under the influence of gravity from the roller mill, mechanically lifting all of the material discharged downwardly from the roller mill to an air separator, separating fine material from the coarse material in the air separator, discharging the fine material from the air separator and feeding the coarse material from the air separator back to the roller mill while continuing to feed the material from the supply to the roller mill.

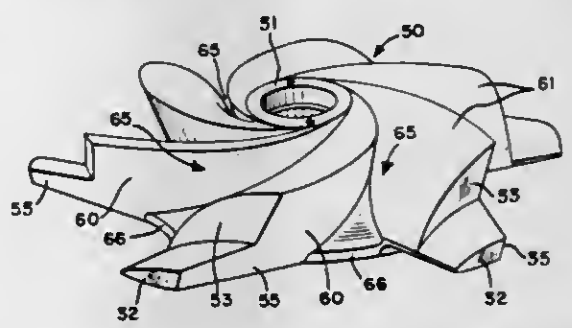
4,109,872

PULPING APPARATUS FOR LIQUID SLURRY STOCK

Joseph Walter Couture, Dorval, Canada, assignor to The Black Clawson Company, Middletown, Ohio
Filed Jul. 29, 1977, Ser. No. 820,089
Int. Cl.^{2} B02C *23/36*
U.S. Cl. 241—46.11 **10 Claims**

1. A rotor for use in pulping apparatus of the character described for liquid slurry stock including a tub for receiving a quantity of the stock and a perforated annular extraction plate forming a portion of a wall of the tub, comprising:

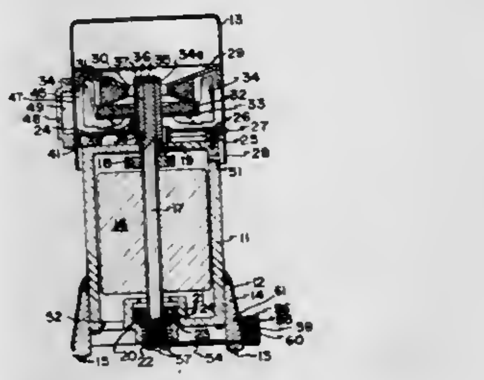
- (a) a rotor body adapted to be mounted for rotation on the central axis thereof in predetermined direction in the tub in cooperative centered relation with the extraction plate and including a hub portion and a plurality of composite vanes projecting generally radially from said hub portion in circumferentially spaced relation,
- (b) each of said composite vanes including a defibering portion and a pumping portion,
- (c) said defibering portion constituting the radially outer end portion of said vane and having substantially smaller axial dimensions than said hub portion,
- (d) means forming an essentially plane leading face on each said defibering vane portion extending tangentially of said rotor body in said direction of rotation from a radius to the radially outer end thereof and defining with said radius an angle *a* of substantially less than 45°,
- (e) said pumping portion constituting the radially inner portion of each said composite vane but being of substantially lesser radial dimensions and substantially greater axial dimensions than said defibering portion,
- (f) means forming a leading face on each said pumping portion of such configuration as viewed axially of said rotor body that the angle *b* defined by a radius and a tangent to the outer end thereof is sufficiently larger than said angle *a* to promote efficient vortical circulation of the stock, and
- (g) said leading face on each of said pumping portions being plane in axial section and forwardly inclined into partially overhanging relation with the forwardly adjacent said pumping portion to define therewith a groove in the upper surface of said body.



4,109,873

GRINDING MILL

William H. Lichfield, P.O. Box 112, Corinne, Utah 84307
Filed Jul. 29, 1976, Ser. No. 709,812
Int. Cl.^{2} B02C *23/28*
U.S. Cl. 241—56 **9 Claims**



1. A grinding mill having
a hopper;
a hopper plate in the hopper, said hopper plate having an opening through which grain or the like is fed from the hopper;
a fixed grinding stone beneath the hopper plate and having a downwardly facing grinding surface;
a motor housing;
a motor in said housing;
a motor shaft driven by said motor and extending upwardly therefrom;
a rotating grinding stone having an upwardly facing grinding surface carried by said motor shaft, said grinding surfaces of said fixed and rotating grinding stones being in

face-to-face relationship, with a grinding chamber therebetween;

turbine blades rotatable with said rotating grinding stone;

means including a baffle plate in the hopper and spaced from the hopper plate and a wall projecting downwardly from said baffle plate to direct air from between the motor housing and hopper centrally to the rotating grinding stone for supplying cooling air across the bottom of said rotating grinding stone to said turbine blades at the peripheries of said stones;

means mounting the hopper above the motor housing;

a discharge spout extending tangentially from said hopper beneath the hopper plate to receive said air and entrained flour ground between and discharged peripherally from said stones; and

openings through the motor housing whereby air is circulated from outside the housing around the motor.

4,109,874

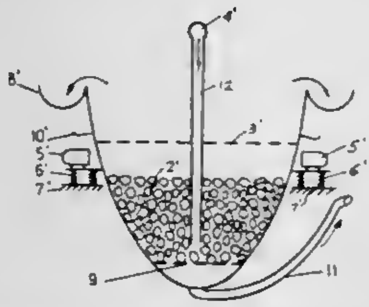
APPARATUS FOR MINERAL PROCESSING

Stoycho Mitrev Stoev; Ivan Mitrev Sapunarov, and Emil Nikolov Manov, all of Sofia, Bulgaria, assignors to Vish Minno-Geloshki Institute-Nis Darvenitza, Darvenitza, Bulgaria

Continuation-in-part of Ser. No. 572,456, Apr. 28, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,635

Int. Cl.^{2} B02C *23/36*

U.S. Cl. 241—69 **2 Claims**



1. In a combined milling, flotation and size classifying apparatus for a graded-size particulate charge, the apparatus including a milling chamber containing a flotation liquid and a particulate milling medium, means for selectively introducing the charge into the chamber, means for selectively introducing air into the chamber below the level of the flotation liquid to form, with small-size particles of the charge released when the chamber is agitated, a froth that floats to the top of the liquid, and means for agitating the chamber; the improvement for more efficiently milling and classifying a brittle-type charge, wherein the milling medium comprises elastomeric bodies, and in which the agitating means comprises means for imparting a rapid vertical vibration to the chamber to uniformly disperse the air introduced therethrough throughout the chamber and to thereby increase the efficiency of the froth-production process, and comprising first outlet means on said milling chamber for removing a froth having floatable component particles of said particulate charge, whereby said vibrating milling chamber causes said elastic milling bodies to mill said particulate material, the floatable particles of said milled charge thereafter being removed from said milling chamber with said froth to which they adhere through said first outlet, a second outlet in the bottom portion of said milling chamber for removing the coarser component particles of said mineral ore from said milling chamber, and a first screen mounted in said working cell below said mass of elastic milling bodies and above said second outlet.

4,109,875

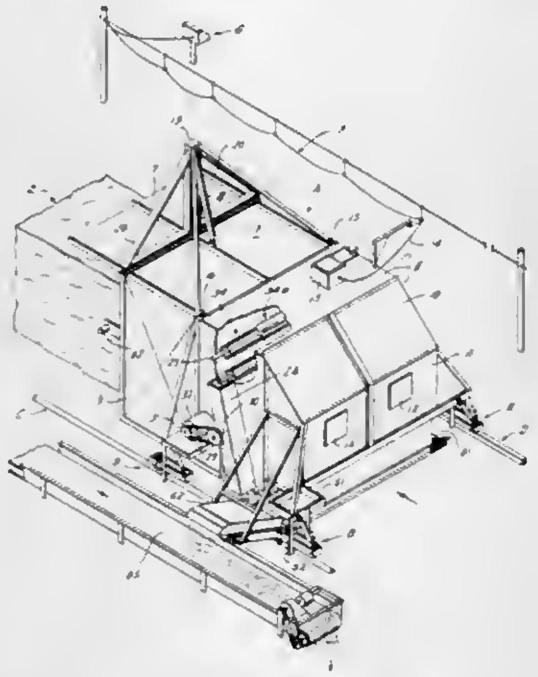
MODULE FEEDING APPARATUS

Jose G. Condarco; John E. McClesky; Pedro Condarco, all of Gaines County, Tex., and Charles V. Brown, New York, N.Y., assignors to Continental Conveyor and Equipment Company, Sherman, Tex.

Filed Jun. 21, 1976, Ser. No. 697,938

Int. Cl.^{2} B02C *13/286*

U.S. Cl. 241—101.7 **5 Claims**



1. Apparatus for releasing fibrous material from modules, bales, or the like thereof comprising movably mounted framing with transversely spaced transport elements, a top member, a plurality of powered, rotary fiber release bodies depending below said top member, means for transporting the apparatus against and through a module in its path to cause said bodies to progressively remove fibers from said module, a module back-up member normally carried by said top member in position to clear said module, and means to shift said back-up member against the end of said module opposite said release bodies, as said bodies approach said end, to support the module remnant.

4,109,876

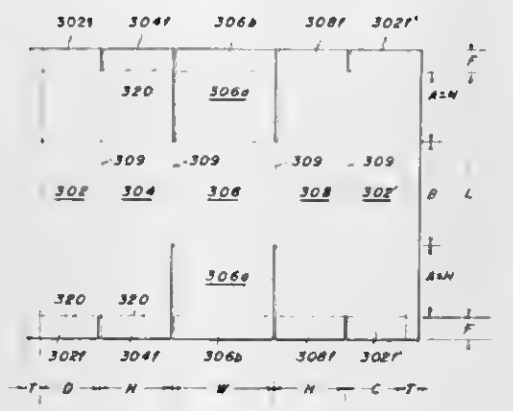
SUSPENSION MEANS FOR FURNITURE SHIPPING PACKAGE

John R. Kratochvil, Jr., Newton, N.C., assignor to Boise Cascade Corporation, Boise, Id.

Filed Jul. 13, 1976, Ser. No. 704,943

Int. Cl.^{2} B65D *85/00*

U.S. Cl. 206—326 **2 Claims**



1. Carton blank means for shipping articles of furniture having frame and depending leg portions, comprising

(a) a unitary rectangular blank formed of fibrous material and including successive bottom, first side, top and second side panels foldably connected by parallel first fold lines, respectively;

(b) the first fold lines between said top and side panels having at their free ends slot means which define top flaps foldably connected with said top panel for hinged movement about second fold lines normal to said first fold lines, said side and bottom panels being foldable about said first fold lines to define a hollow tube of rectangular cross-sectional configuration in which the free edges of a pair of said panels are adjacent each other when folded;

(c) means for securing together said free adjacent panel edges, said top flaps being foldable downwardly about said second fold lines toward vertical positions between and normal to said bottom and side panels, respectively, whereby said top panel and top flaps define an erected carton for supporting the article of furniture with the frame portion thereof seated on the top panel and with the leg portions thereof extending in pairs downwardly on opposite sides of the top flaps between said side panels;

(d) the height of each top flap when in the folded vertical position being equal to the height (H) of the side panels, the length of each top flap being equal to the width (W) of the bottom panel

(e) supporting tabs foldably connected with the bottom edges of said top flaps by third fold lines parallel with said second fold lines, said supporting flaps being foldable to horizontal positions in contiguous secured engagement with the upper surface of the bottom panel, the height of each top flap being greater than the length of the leg portion of the article of furniture, whereby when the frame portion of the article is seated on the top panel of the erected carton, the lower extremities of the leg portions are spaced from the bottom panel; and

(f) end tabs foldably connected with the remaining pairs of opposite edges of said bottom panel and said first and second side wall panels, respectively, by fourth fold lines normal to said first fold lines, respectively, said end tabs being foldable inwardly toward positions normal to their respective panels, the bottom panel end tabs to be secured at opposite ends with the associated side wall end tabs, respectively.

4,109,877

WINDING APPARATUS

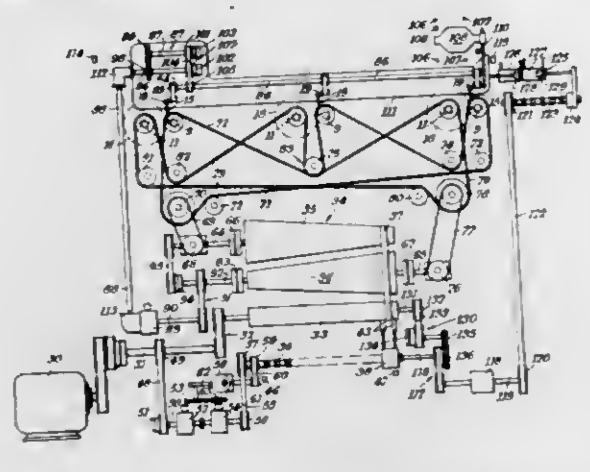
Stephen William Yates, Bolton, England, assignor to Platt Saco Lowell, Helmsbore Rossendale, England

Filed Apr. 1, 1977, Ser. No. 783,949

Claims priority, application United Kingdom, Apr. 7, 1976, 14050/76

Int. Cl.^{2} B65H *75/16*

U.S. Cl. 242—54.4 **9 Claims**



1. Apparatus for winding an elongate fibrous material, comprising, package tube mounting means to support first and second package tubes in winding positions, a material delivery means for delivering material first to one of the package tubes to form a first package and then to the other of the package tubes to form a second package, and variable speed drive means for rotating the package tubes, said variable speed drive means comprising a first output drive member for driving one of the package tubes, a second output drive member for driving the other of the package tubes, a constant speed input member, a drive transfer mechanism for transmitting drive from said input member to the output drive members throughout a predetermined range of complementary drive ratios and control means responsive to a predetermined control input progressively to adjust the drive transfer mechanism to vary the complementary drive ratios in said range to produce a gradual reduction in speed of one of the two output drive members with a corresponding increase in the speed of the other output drive member followed by a gradual reduction in speed of the said other of the two output drive members with a corresponding increase in the speed of the said one of the output drive members.

4,109,878

CASSETTE TAPE WINDING APPARATUS

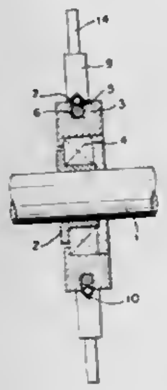
Masayuki Osawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 790,936

Claims priority, application Japan, Jun. 22, 1976, 51-82040[U]

Int. Cl.^{2} B65H *17/02*

U.S. Cl. 242—68.3 **8 Claims**



1. A cassette tape winding apparatus which comprises:

an annular wheel, for mounting said tape, having an annular groove provided therein on an inner circular surface of said annular wheel;

a rotary shaft having a circular groove provided therein;

an elastic member disposed within said circular groove; and

a spring member mounted on said elastic member such that the upper half portion of said spring member projects outside of said circular groove and wherein said annular groove firmly engages said upper half portion of said spring member with said annular groove so as to prevent axial displacement of said annular wheel with respect to said rotary shaft.

4,109,879

METHOD AND APPARATUS FOR COLLECTING WIRE ROD OR THE LIKE AT THE OUTLET OF A ROLLING MILL

Giulio Properzi, Via Pietro Cossa, 1, Milano, Italy

Filed Mar. 25, 1977, Ser. No. 781,384

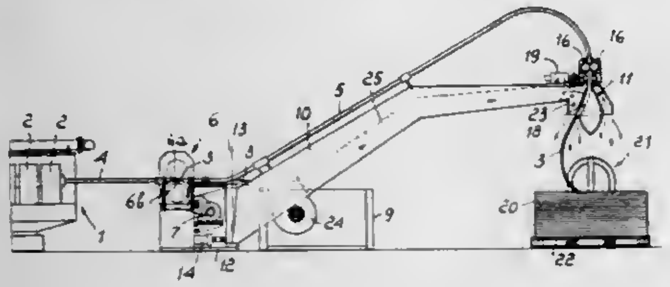
Claims priority, application Italy, Mar. 26, 1976, 21611 A/76

Int. Cl.^{2} B21C *47/00*

U.S. Cl. 242—82 **3 Claims**

1. A method of collecting wire rod and the like at the outlet of a rolling mill, wherein the wire rod is deposited in substantially horizontal coils by means of a rotating guide, said rotating guide being rotated at a rotational speed controllably variable between two limit values, such as to obtain continuously concentrical coils having continuously and alternately increasing and decreasing radii variable between a maximum limit value and a minimum limit value, said rotational speed of said

rotating guide being controlled to vary between said two limit values according to the law

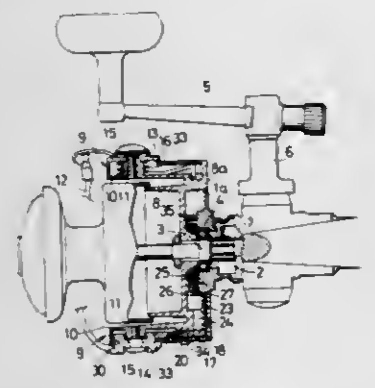


$$N(t) = \frac{V \cdot 60}{2} \cdot \frac{1}{\sqrt{R_E^2 - \frac{\phi V t}{\pi \epsilon}}}$$

periodically repeating, where N is the rotational speed in rpm of said rotating guide, V is the linear velocity of delivery of the wire rod from said rolling mill, R_E is the maximum outside radius of the formed coils, ϕ is the diameter of the wire rod, t is the generic time, ϵ is the filling factor of the coil arrangement.

4,109,880
SPINNING REEL HAVING OVERRIDEABLE FRICTION BRAKE FOR PREVENTING BAIL RELEASE

Tatuya Yamasaki, Fuchu, and Kounin Sazaki, Fukuyama, both of Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Jun. 6, 1977, Ser. No. 803,921
Claims priority, application Japan, Jun. 11, 1976, 51-76510[U]
Int. Cl.² A01K *89/01*
U.S. Cl. 242—84.21 R **4 Claims**

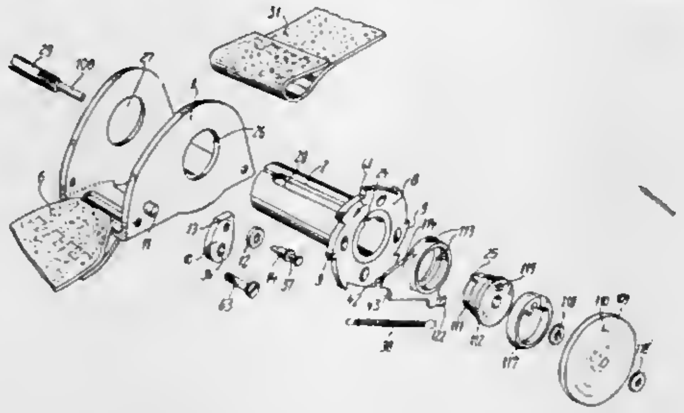


1. In a spinning reel including a bail arm **12** pivotally mounted at both ends on diametrically opposite sides of a rotor **8** for swinging movement thereacross between a cocked and a rewind position, a torsion spring **16** biasing the bail arm toward the rewind position, an L-shaped kick lever **19**, a C-shaped pivot cam **14** mounted on one end of the bail arm, the kick lever and the pivot cam being slidably and pivotally mounted, respectively, on a support housing **9** of the rotor, a spring **20** biasing the kick lever toward the pivot cam and into engagement therewith, and a key plate **25** mounted to a reel body **1** and having a trip tab **26** disposed in the rotational path of a projection **39** on the kick lever when the bail arm is cocked, the kick lever locking the pivot cam and bail arm in the cocked position, and adapted to be cammed toward the reel body to a retracted position, following rotation of the rotor, to thereby release the bail arm and pivot cam; the improvement characterized by:

- brake means disposed in the path of travel of the kick lever projection when the bail arm is cocked for frictionally engaging said projection before it reaches the trip tab to thereby arrest the rotation of the rotor and prevent the premature and inadvertent release of the cocked bail arm.

4,109,881
WINDING-UP DEVICE WITH AUTOMATIC LOCK INITIATED BY FRICTION FOR A SAFETY BELT

Artur Föhl, Schelmeawasenstrasse 68, 7061-Haubersbroan, Fed. Rep. of Germany
Division of Ser. No. 343,887, Mar. 22, 1973, Pat. No. 3,921,930. This application Apr. 21, 1975, Ser. No. 570,199
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1972, 2214307; Jun. 19, 1972, 2229662; Aug. 23, 1972, 2241357
Int. Cl.² A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **12 Claims**



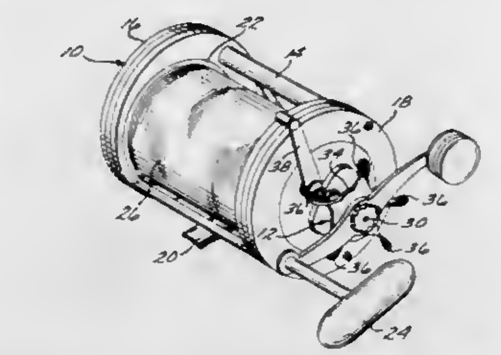
1. In combination with a winding-up device for a vehicle safety belt including a pawl member, a housing pivotally journalling said pawl member, an inertia disc separate from the pawl member and a winding-up shaft normally freely rotatable in the housing in both pay-out and take up directions and adapted for connection to one end of a safety belt said winding-up shaft having means thereon engageable with said pawl member for blocking rotation of said shaft, said pawl member being moveable between disengaged and engaged blocking positions with said shaft, spring means engaging said pawl member to bias said pawl member toward its blocking position, the inertia disc being journalled rotatably though axially unshiftable upon the shaft, a return spring biasing said shaft in take up direction said inertia disc rotating relative to said shaft in one direction when said shaft is accelerated in a belt pay-out direction, a braking member responsive to vehicle acceleration and movable out of rest position thereof to effect braking of the inertia disc a coupling means controlled by the inertia disc during said relative rotation with respect to the shaft, a single-lever-arm-release control part securely coupled with the shaft by said coupling means, said single-lever-arm-release control part normally holding said pawl member in disengaged position, said coupling means having a rest position wherein said coupling means is free of connection with said single-lever-arm-release control part, and a control cam means connected with said inertia disc, said control cam means functioning to transfer said coupling means into coupling position during said relative rotation of said inertia disc wherein said coupling means is rigidly connected with said single-lever-arm-release control part to effect rigid connection between said winding-up shaft and said single-lever-arm-release control part to effect release of said pawl member and consequent blocking of said shaft.

4,109,882
FISHING REEL DRAG WHEEL

Kunio Kawakami, Torrance, Calif., assignor to Kencor Sports, Inc., Torrance, Calif.
Filed May 17, 1976, Ser. No. 687,401
Int. Cl.² A01K *89/02*
U.S. Cl. 242—217 **1 Claim**

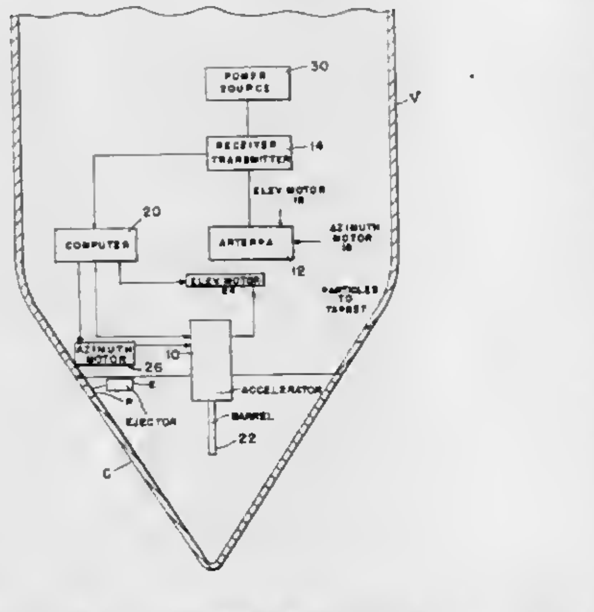
1. In a fishing reel having a spool, gear means coupled to said spool and rotatable to rotate said spool, a shaft, a handle mounted to said shaft for rotation of said shaft, and clutch means operative to frictionally couple said gear means and said shaft for rotation of said spool by said handle, the improvement comprising:

a drag wheel formed of flat metal plate and including a flat hub portion rotatable upon said shaft for engagement with and operation of said clutch means to adjust the frictional resistance of said spool to rotation by said handle, said drag wheel further including a plurality of spokes radiating outwardly of said hub portion and terminating in enlarged tap portions having opposite flat faces, said spokes being twisted through approximately 90° relative to said hub portion and thereby disposing said tab portions in approximately right angular relation to the plane of said flat hub portions whereby only said opposite flat faces are normally engaged by the fisherman in rotating said drag wheel in opposite directions.



4,109,883
ANTI-MISSILE MISSILE

Abraham L. Korr, and David B. Rosenblatt, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 29, 1965, Ser. No. 444,515
Int. Cl.² F41G *9/00*
U.S. Cl. 244—3.1 **3 Claims**

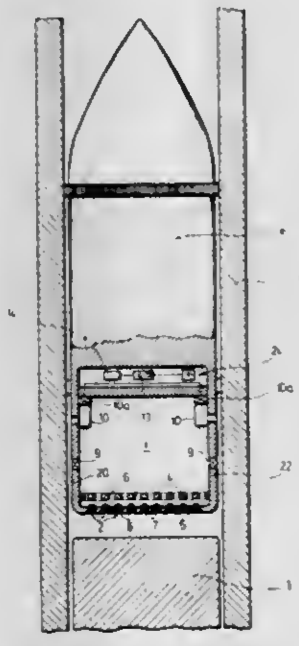


1. In a carrier system traveling at altitudes of about 100 miles above the surface of the earth, an orbiting missile having a charge of fine particles therein for destroying an enemy target moving in a trajectory outside the earth's atmosphere, an apparatus for directing said charge into a collision course with said target; comprising:

- a nose portion on said carrier system,
- means for ejecting said nose at certain altitudes,
- means for electrically charging particles prior to acceleration,
- said particles consisting essentially
- of gamma aluminum oxide having a size ranging between about 10^{-2} to 10^{-7} cm in diameter,
- an accelerator within said carrier system for propelling said particles therefrom at hypervelocities,
- means for detecting said target above the earth's atmosphere, and
- means for compensatingly directing said accelerator to propel said particles at said moving target.

4,109,884
APPARATUS AND METHOD FOR STORING PRESSURE GAS IN A RESERVOIR OF A PROJECTILE

Walter Kranz, Taufkireben, and Lynn Hohnecker, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany
Filed Feb. 2, 1977, Ser. No. 764,801
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605428
Int. Cl.² F42B *15/18*
U.S. Cl. 244—3.22 **3 Claims**



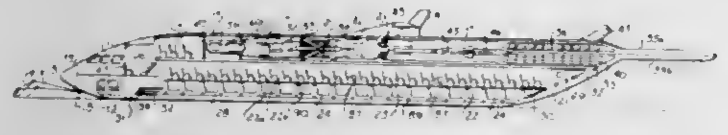
1. A pressure gas reservoir for supplying pressure gas to control mechanisms of a projectile to be discharged from a gun tube by means of a propellant charge, comprising a projectile body having wall means defining a reservoir within said projectile body with a wall portion adapted to be exposed to the pressure gases of the propellant charge, check valve means in said wall portion permitting inflow of pressure gas into said reservoir during firing for the storage of the gases in the reservoir for use in operating the control mechanism, said wall portion comprising a bottom having an inner wall and an outer wall spaced from said inner wall, said inner and outer walls being substantially parallel and each wall having a plurality of apertures which are offset in respect to the apertures of the other wall, said check valve means comprising a closing body disposed in each of said apertures of the outer one of said walls of a size to be movable between said walls to open the apertures but having a diameter which is larger than the spacing between the walls, a control nozzle mounted on said wall means, and a pressure operated control device connected to said control nozzle for opening and closing said control nozzle.

4,109,885
VERTICAL TAKE-OFF AND LANDING AIRCRAFT

David R. Pender, 1018 Marion St., Columbia, S.C. 29201
Filed Oct. 21, 1976, Ser. No. 735,130
Int. Cl.² B64C *27/30, 27/50*
U.S. Cl. 244—7 R **8 Claims**

1. In an airplane with a retractable rotor system, a pressure jet rotor, a stowage tube for the rotor in the fuselage of the airplane into which the rotor can be retracted and from which it can be deployed, the rotor stowage tube opening through the rear of the airplane fuselage and extending longitudinally forwardly in the fuselage for a major portion of its length, means forming lateral suction slots around the mouth of said stowage

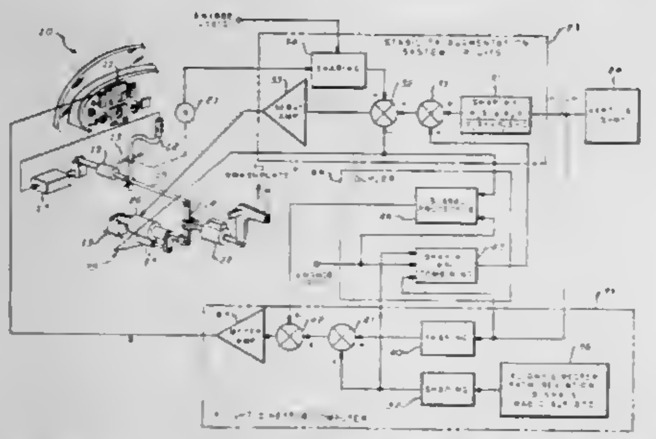
tube and operable during fixed wing flight to maintain laminar flow in the area where the rotor blades extend rearwardly of and outside of said stowage tube, said jet rotor having rotor blade nozzles which substantially plug and seal the mouth of the stowage tube when the rotor is retracted therein, and rotor blade end portions then projecting in folded opposed relationship longitudinally rearwardly of and outside of said rotor stowage tube.



4,109,886
SEMI-AUTOMATIC FLIGHT CONTROL SYSTEM UTILIZING LIMITED AUTHORITY STABILIZATION SYSTEM

Everett R. Tribken, Scottsdale; Ronald J. Miller, Glendale, and Carl D. Griffith, Phoenix, all of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 534,326, Dec. 19, 1974, abandoned.
This application Jan. 12, 1976, Ser. No. 648,238
Int. Cl.² G05D *1/10*
U.S. Cl. 244—178 **10 Claims**



1. A flight control system for aircraft having an attitude controlling element for controlling the attitude of said craft about an axis thereof and a manual controller for controlling said attitude controlling element, comprising

a stability augmentation system having sensor means for sensing short term attitude changes of said craft about said axis and providing short term stabilization signals in response thereto and actuator means coupled to said attitude controlling element and responsive to said short term stabilization signals for suppressing said short term attitude changes, said actuator means having a limited displacement capacity from a reference position and tending to reach the limit of said displacement capacity in response to long term reference signals,

position sensing means coupled to said actuator means for providing an actuator position signal representative of the position of said actuator with respect to said reference position,

reference means for providing a long term reference signal,

first coupling means for coupling said long term reference signal to said stability augmentation system for providing corresponding long term control of said craft through said limited displacement capacity actuator means,

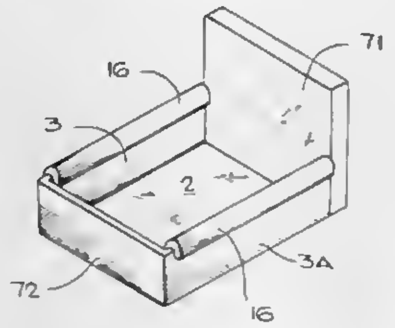
indicator means coupled to said position sensing means for displaying a visual command to the pilot in response to said actuator position signal to manipulate said manual controller to return said actuator means to said reference position when said actuator means approaches the limit of its displacement capacity in its response to said long term reference signal, and

second coupling means coupling said position sensing means to said indicator means for providing a trim demand signal to said indicator means in response to said actuator position signal when said position signal exceeds a threshold representative of an actuator position near said limit of said displacement capacity and after said threshold has been exceeded a trim demand signal that diminishes toward zero as said manual controller is manipulated to return said actuator means to said reference position, thereby providing said visual command to said pilot.

4,109,887
WATERBED RETAINER CAP

William E. Wakeland, Jr., 1606 W. Flora St., Stockton, Calif. 95203

Filed Dec. 16, 1976, Ser. No. 751,540
Int. Cl.² A47B *96/00*
U.S. Cl. 248—345.1 **18 Claims**

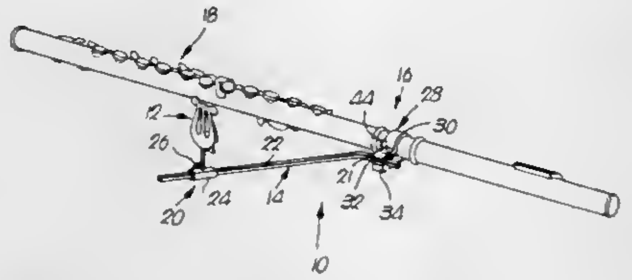


1. A railcap for a waterbed frame rail comprising an inverted generally U-shaped piece foam member having both a central passage at the open end thereof to receive a waterbed frame rail of similar configuration therein, and of a size slightly larger than said rail, and a pressure inhibiting member selected from the group consisting of retainer receiving means, a drape secured at least to one wall of the inside of said cap defining said central passage, and combinations thereof, and an engaging insert.

4,109,888
FLUTE LYRE HOLDER

James D. Hayes, 2011 W. 6th St., Topeka, Kans. 66606

Filed Apr. 1, 1977, Ser. No. 783,710
Int. Cl.² E01B *7/02*
U.S. Cl. 248—443 **2 Claims**



1. A flute lyre holder assembly, comprising:

a lyre for holding a sheet of music or the like;

an elongated support rod having at least a portion thereof presenting, in cross section, at least one planar outer surface;

coupling means connecting said lyre to said rod; and

structure for connecting said rod to said flute for preventing undesired axial rotation and axial shifting of the rod in order to continuously maintain said lyre and sheet of music in a disposition facilitating reading of the latter by a flute player,

said connecting structure including

a unitary, resilient, ring-like element for substantially completely circumscribing and gripping said flute intermediate the ends thereof,

a pair of outwardly projecting arms extending from the proximal ends of said element, there being means defining respective, axially aligned bores through said arms, one of said bores being threaded;

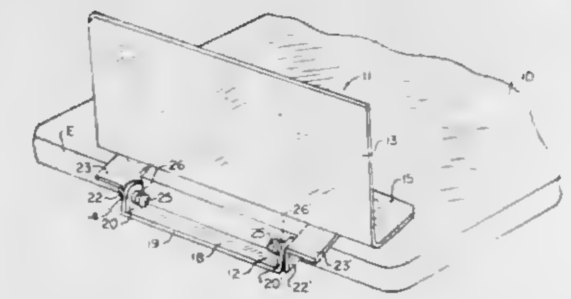
means defining a transversely extending opening in at least one of said arms which is complemental with at least a part of the cross sectional shape of said portion of said support rod for receiving the latter and, in cooperation with said other arm, preventing axial rotation of the rod relative to said element and arms when the latter are drawn together and in engagement with the rod; and

releasable securing means for simultaneously drawing said arms together to clamp said element about said flute, and for causing said arms to grip said rod and prevent axial rotation and axial shifting of the latter, said securing means consisting of a thumbscrew located within and bridging said arms and threaded into said one bore, said thumbscrew being the sole securing means provided with said assembly.

4,109,889
BOOK HOLDER FOR STUDENT'S DESK

Michael P. Durket, 20701 Leonard Rd., Saratoga, Calif. 95070

Filed Apr. 27, 1977, Ser. No. 791,311
Int. Cl.² A47B *97/04*
U.S. Cl. 248—447 **4 Claims**



1. A book holder for a student type desk forming one arm of a classroom chair, the combination therewith of:

(1) a back support for a book and having a forwardly extending ledge at its lower edge for supporting an open book thereon;

(2) a flat plate base disposed beneath said back support and extending laterally the width of an open book on the ledge thereof;

(3) said flat plate base having a back edge;

(4) a pair of upwardly extending ears at each end of said flat plate base adjacent the back edge thereof;

(5) a pair of downwardly extending ears secured to the underside of the ledge on said back support and extending rearwardly therefrom for embracing said pair of ears on said flat plate base; and

(6) means for pivotally connecting each of said downwardly extending ears on said ledge of the back support to a respective one of the upstanding ears on said base flat plate base for hingedly mounting said ledge and back support thereto.

4,109,890
TELEPHONE SUPPORTED DIRECTORY INFORMATION SUPPORT RACK

Elford Barnett Breitbard, San Diego, Calif., assignor to Tele-Quik, Inc., San Diego, Calif.

Continuation of Ser. No. 677,373, Apr. 15, 1977, abandoned.
This application Mar. 30, 1977, Ser. No. 783,020
Int. Cl.² A47B *19/00*
U.S. Cl. 248—452 **4 Claims**

1. A telephone supported directory information support rack comprising:

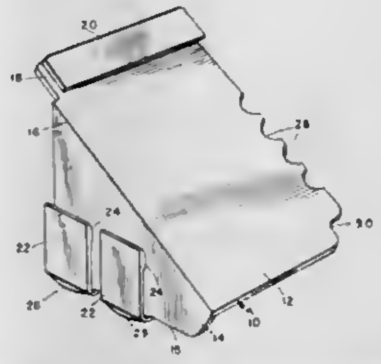
a first planar member for supporting telephone directory information,

a second planar member joined at one of its side edges to one of the side edges of said first planar member,

the opposite side edge of said second planar member having an acute angle with the line of intersection of the intersecting side edges of said first and second planar members,

said second planar member being at a normal angle with said first planar member,

said opposite side edge of said second planar member having securing means for securing said planar members to the side of the telephone with said opposite side edge being substantially horizontal and said first plate member presenting a flat, upwardly inclined surface for presenting directory information to telephone users,



retainer means positioned at the upper inclined end portion of said first planar member for retaining telephone directory information in visible position on said first planar member,

said securing means comprising at least one upwardly directed leg member that is secured to said opposite side edge,

the upper end of said leg member having an enlarged end portion inwardly directed toward said second planar member,

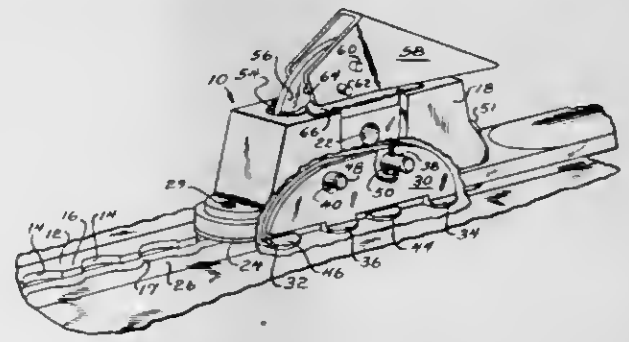
a second spaced upwardly directed leg member that is connected to said opposite side edge and which second leg member has an inwardly directed end portion,

and a U-shaped clasp member with one side portion being projected between said upwardly directed leg portions and said second planar member and the other side portion having an enlarged edge portion.

4,109,891
LOAD DISTRIBUTING TRACK FITTING

Bernard E. Grendahl, Litchfield, Conn., assignor to UOP Inc., Des Plaines, Ill.

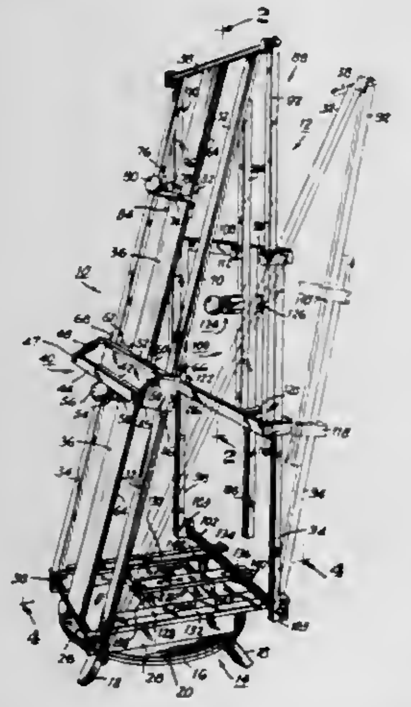
Continuation-in-part of Ser. No. 706,641, Jul. 19, 1976, Pat. No. 4,047,689. This application Apr. 1, 1977, Ser. No. 783,922
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.² B60N *1/00*
U.S. Cl. 248—503.1 **9 Claims**



1. A track fitting for use with a slotted floor track of the type

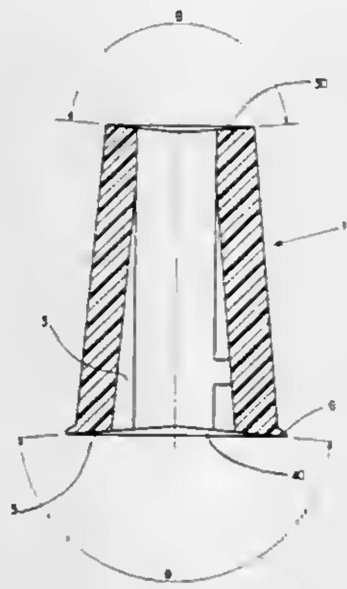
used in aircraft wherein said track has a bottom portion, vertical side portions, and top portions carried by each of said side portions and defining the side edges of a longitudinal slot which overlies the bottom and is spaced therefrom, so as to define an open channel, said top portions on each side of said slot being formed so as to define a plurality of alternately spaced retaining lip portions and concave relieved portions, said track fitting comprising an elongated housing having a length at least as great as the axial distance between four of said spaced retaining lip portions, aperture means in an upper portion of said housing for anchoring a load to said fitting, a plurality of lobe members mounted within said housing, said lobe members being shaped so as to be capable of being dropped vertically through a plurality of said concave relieved portions in said track and then moved axially with said housing along the track to bring said lobe members under the retaining lip portions, a pair of spring loaded shear pins mounted in said housing, said shear pins being capable of being moved downwardly into two of said plurality of concave relieved portions in said track when said lobes underlie said retaining lip portions to contact the edges of said concave relieved portions and restrict horizontal movement of said fitting in said track while said lobe members contact the underside of said retaining lip portions to restrict upward movement, a pair of horizontal, transverse pivot members mounted in said housing at spaced locations along the length thereof, the first of said pivot members providing the support for first pivoted support plate means which carry the lobe members which are adapted to engage the first and third of any four consecutively axially spaced lip portions in said track and the second of said pivot members providing the support for second pivoted support plate means which carry the lobe members which are adapted to engage the second and fourth of said four consecutively axially spaced lip portions in said track, and adjustment means for pivoting one of said support plate means to cause one of the lobe members thereon to bind against the underside of a retaining lip portion on the track and prevent relative movement between the fitting and track except under high loading conditions.

4,109,892
ADJUSTABLE EASEL
John P. Hartung, 1557 Merry Ave., Bronx, N.Y. 10461
Filed Jun. 30, 1977, Ser. No. 811,726
Int. Cl.² A47B *97/04*
U.S. Cl. 248—449 **14 Claims**



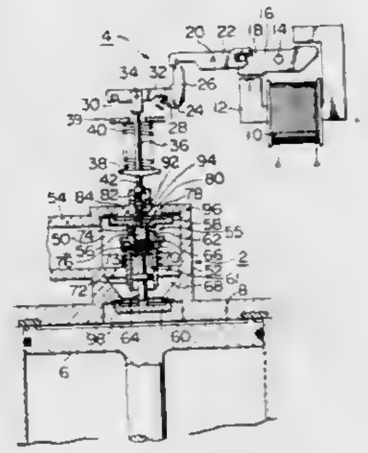
1. An adjustable easel which comprises a substantially horizontal base platform, a flat substantially horizontal movable platform pivotally mounted on said base platform, so that said movable platform may be at least partially rotated relative to said base platform, a first substantially horizontal rod, means mounting said first rod on said movable platform, so that said first rod may be partially rotated about its central longitudinal axis, first and second opposed inclined linear frame members, said first and second frame members being substantially parallel, the lower end of each of said first and second frame members being mounted on said first rod adjacent to an end of said first rod, an inclined linear support member, said support member being substantially centrally disposed between and parallel to said first and second frame members, the lower end of said support member being mounted substantially centrally on said first rod, a second substantially horizontal rod, the upper ends of said first and second frame members and said support member being attached to said second rod, substantially horizontal means to support the lower edge of a substantially flat object, said support means being slidably mounted on said support member by attachment means, said attachment means being adjustable so that said support means may be slid along said support member to a desired position and thereafter maintained in the desired position by manipulation of said attachment means, third and fourth opposed inclined linear frame members, said third and fourth frame members being substantially parallel, each of said third and fourth frame members pivotally depending from adjacent an end of said second rod, a third substantially horizontal rod, said third rod extending between and being pivotally attached to the lower ends of said third and fourth frame members, said third rod being mounted on said means mounting said first rod on said movable platform, and integral means to adjust the inclination of said first and second frame members and said support member.

4,109,893
FORM PANEL SPACING DEVICE
Jean Pierre Laroche, Mazion, Saint-Paul, (Gironde), France
Filed Jul. 19, 1976, Ser. No. 706,205
Claims priority, application France, Jul. 22, 1975, 75 22883; Dec. 4, 1975, 75 37168
Int. Cl.² E04G *17/06*
U.S. Cl. 249—175 **4 Claims**



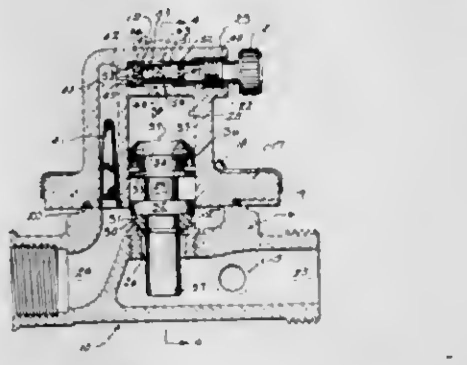
1. A spacing device to be held in position between two form panels by a conventional tightening rod extending between the panels for ensuring the proper spacing of the form panels during the pouring and curing of concrete walls comprising a body member in the shape of a frustum of a cone having a larger base and a smaller base, said body member having an outwardly extending flange around the larger base and a bore extending through the center of the body member with the bore opening into the centers of the bases and sized to fit closely around a tightening rod when the tightening rod is inserted therethrough, said larger and smaller bases spaced apart by a distance equal to the desired thickness of concrete walls to be poured and said body member having an outer wall provided with inwardly directed longitudinal ribs with at least two continuous longitudinal ribs which create said bore to permit the centering of the device on a tightening rod during the installation thereof between the panels and wherein at least one rib is interrupted to permit the engagement of an extracting tool thereby providing a strong spacing device which accurately spaces the form panels, remains properly aligned with the form panels and the tightening rod during installation and is easily removed from one side of the wall after the form panels have been removed.

4,109,894
PILOT VALVE DEVICE FOR REGULATING THE FLOW OF A FLUID
Haruo Honda, and Hiroshi Itoh, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Jun. 4, 1976, Ser. No. 692,637
Claims priority, application Japan, Jun. 18, 1975, 50-73865
Int. Cl.² F16K *31/143*
U.S. Cl. 251—30 **8 Claims**



1. A pilot valve device for regulating the flow of a fluid adapted to be brought to an open position in response to a mechanical signal and to cause the fluid to actuate an operating valve, comprising a housing defining a pilot valve chamber, a main valve located in said housing and formed therein with a daughter valve chamber, and a daughter valve located in said daughter valve chamber in said main valve, and arranged substantially coaxially therewith, wherein said daughter valve is brought to an open position in response to the mechanical signal and causes a compressed fluid to act on said main valve to bring the same to an open position whereby the compressed fluid can be made to act on the operating valve, further comprising a push rod slidably fitted in an orifice formed in a top wall of said housing, said mechanical signal being applied to said daughter valve through said push rod, further comprising a first spring supported by an internal support plate formed integrally with said housing to urge said main valve by its biasing force to move to a closed position, a second spring mounted in said daughter valve chamber in said main valve to urge the daughter valve by its biasing force to move to a closed position, and a guide affixed to said support plate for slidably supporting said main valve, wherein said main valve comprises an upper valve seat, a lower valve seat and a daughter valve housing interposed between said upper and lower valve seats, said upper valve seat and the top wall of said housing defining therebetween, when said main valve and said daughter valve are both in the closed position, a main valve actuating chamber which is not in communication with said pilot valve chamber, said lower valve seat performing a valving action when said main valve is in the closed position to block communication between said pilot valve chamber and an operating valve actuating chamber, said daughter valve being brought to an open position when said mechanical signal is applied thereto through said push rod to open communication between the pilot valve chamber and said main valve actuating chamber, whereby the upper valve seat is moved downwardly to thereby move the lower valve seat downwardly so as to bring the main valve to an open position.

4,109,895
REMOTE ACTUATED METERING VALVE
William A. Smart, Jr., Pewaukee, and Scott H. Gumm, West Bend, both of Wis., assignors to Bradley Corporation, Menomonee Falls, Wis.
Filed Nov. 3, 1976, Ser. No. 738,597
Int. Cl.² F16K *31/383*
U.S. Cl. 251—41 **1 Claim**



1. In a remote actuated timed metering valve system for controlling the flow of water which valve system includes a main metering valve, and a remote actuated, normally closed, relief valve connected to the main valve by flexible tubing, the improved main valve which includes a lower body portion having an inlet and an outlet connected by a port surrounded by a valve seat; a cover portion secured to the lower body portion, said cover portion including a piston receiving cavity, a movable piston positioned in said cavity, said piston having a front face adapted to seat on said valve seat and a rear face, a pressure chamber located behind said rear face of the piston which chamber is filled with water when the metering valve is closed; a bypass circuit for the flow of water and the transfer of supply line pressure from the inlet to the pressure chamber where the pressure can be sensed by the rear face of the piston; a timing mechanism located in said bypass circuit and a filter located in said bypass circuit between the inlet and the timing mechanism, in which:

(a) the front face of the piston has an elongated nose which projects below the valve seat even when the valve is open and clearance between the piston nose and the valve seat results in a pressure drop across the seat at normal flow so that a reduced pressure acts on the front face of the piston while substantially full supply line pressure acts upon the rear face of the piston and the sense of the force is to move the piston towards a seated position;

(b) the timing mechanism includes in series in a bore in the bypass circuit an O-ring, a disc-like member of deformable elastomeric material completely contained about its periphery by said bore and aligned with and in contact with said O-ring, said member having an axial opening about 0.01 inches to 0.02 inches in diameter through which water must pass to reach the pressure chamber and a timing adjustment screw having an axial passageway which is aligned with the axial opening in the disc member and a radial passage which leads from the axial passageway to the pressure chamber of the valve, which timing adjustment screw can be adjusted to exert an axially directed force upon the disc-like member to deform the elastomeric material of the disc-like member into the axial opening thereby reducing its effective diameter and thus controlling the time required for water to fill the pressure chamber and close the valve; and

(c) the main valve has an outlet port leading from the pressure chamber and an inlet port which communicates with the outlet of the main valve downstream of the valve seat, whereby the remoted actuated, normally closed, relief valve may be connected to the outlet port of the main valve by a first length of flexible tubing and to the inlet port by a second length of flexible tubing so that when the normally closed valve is opened the water present in the pressure chamber of the main valve leaves by flowing through the first length of tubing to the remote valve thus relieving the pressure on the rear face of the piston of the main valve permitting the piston to be moved to an opened position by the force of supply line pressure on its front face and the water leaves the relief valve via the second length of tubing and enters the main valve downstream of the valve seat.

4,109,896

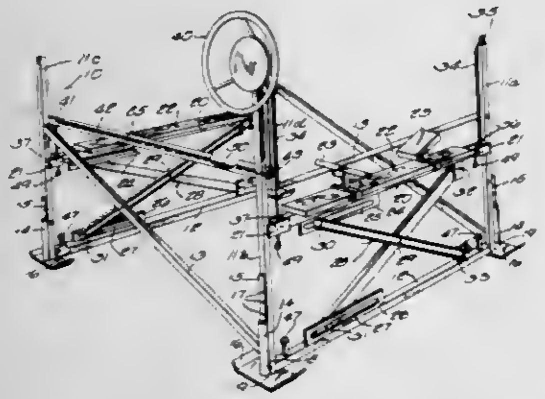
BOAT HOISTS

Peter D. Ragen, 921 S. 102nd St., Milwaukee, Wis. 53214

Filed Jan. 18, 1977, Ser. No. 760,317

Int. Cl.² B63C *23/60*

U.S. Cl. 254—144 **3 Claims**



3. In a boat hoist having a frame provided with longitudinally spaced first and second pairs of uprights and having a horizontal lift beam movably supported adjacent each pair, the improvement comprising a base beam connecting the lower ends of each pair of uprights, each lift beam having a pulley at each end, an upright of the first pair having a winch drum supported near its upper end on a first side of the frame, a first cable deadended to the upper end of the opposite upright of said first pair and then extending downwardly beneath the pulley at one end of the lift beam of said first pair of uprights, along the lift beam and beneath the pulley at the opposite end, and then upwardly to the winch drum; a second cable deadended to the upper end of the other upright on a second side of the frame, extending downwardly beneath the pulley at one end of the lift beam for the second pair of uprights, along the beam and beneath the pulley at the other end of said beam, upwardly along the adjacent upright on said first side of the frame, there being an auxiliary pulley spaced upwardly on said last upright and a corresponding auxiliary pulley on the upright having the winch, and said second cable having a length passing from one of said auxiliary pulleys to the other and then up to said winch drum whereby when the winch is operated both cables will be acted on to move both lift beams simultaneously.

4,109,897

SALT RECLAMATION SYSTEM

Quentin D. Mehrkam, Bryn Mawr, Pa., assignor to Ajax Electric Company, Huntingdon Valley, Pa.

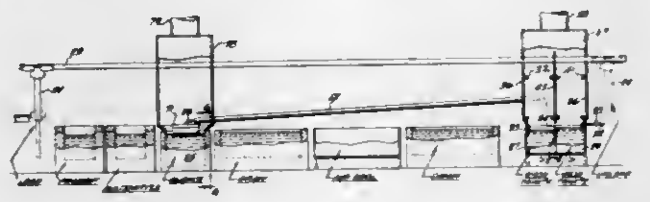
Filed Apr. 5, 1976, Ser. No. 673,462

Int. Cl.² C21D *1/46*

U.S. Cl. 266—120 **4 Claims**

1. A facility for heat treatment of articles comprising a sequence of molten salt baths including a quenching bath and a draw bath downstream of the quenching bath, means for immersing the articles sequentially in said baths, and means for water washing drag-out salt from the articles after removal from the draw bath, the washing means comprising at least two water washing stages, the first of which is maintained at a salt concentration providing for maintenance of a temperature on the order of about 200° to 300° F.

2. A facility for heat treatment of articles comprising a sequence of molten salt baths including a quenching bath and a draw bath downstream of the quenching bath, means for immersing the articles sequentially in said baths, and means for water washing drag-out salt from the articles after removal from the draw bath, the washing means including a water washing bath and a water spray, and means for preheating the spray water by heat exchange with the water of the washing bath.



4,109,898

METHOD AND A DEVICE FOR ADDING SOLID, POWDERED OR GRAINED MATERIAL TO MELTED METAL

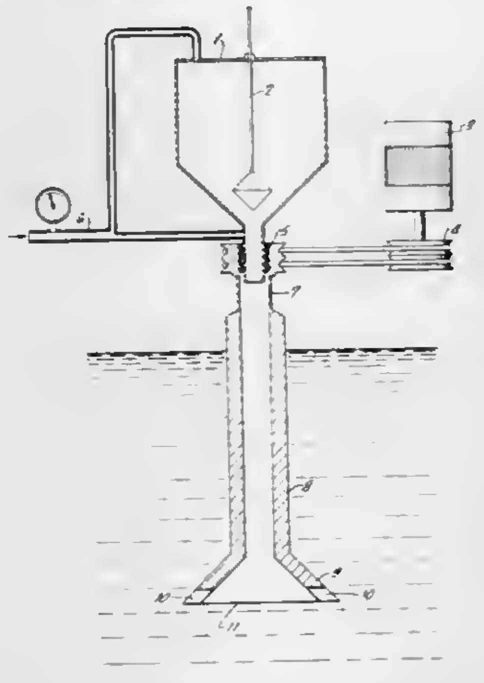
Jaakko Lautjärvi, Kuljunniemi B, and Raimo Eriksson, Kuljunniemi A, both of 92160 Saloinen, Finland

Filed May 20, 1976, Ser. No. 688,432

Claims priority, application Finland, May 21, 1975, 751479

Int. Cl.² C21C *7/00*

U.S. Cl. 266—217 **1 Claim**



1. A device for adding solid, granular or powdered material to melted metal, comprising:

(a) a container for containing material to be added to the melted metal,

(b) a tube having an upper end and a lower portion, the lower portion being formed in diverging conical shape and having means defining an open lower end,
the upper end of the tube being connected to the material container to enable material to flow downwardly through the tube, the tube being adapted for having the lower end portion immersed into melted metal,

(c) gas pressurizing means for pressurizing the tube to a pressure substantially equal to that pressure just preventing flow of melted metal up into the tube when the lower portion is immersed into melted metal,

(d) rotating means for axially rotating the tube at a speed causing material flowed downwardly through the tube to be slung outwardly through the open lower end into the melted metal in which the lower end is immersed and causing dispersion therein without substantial outflow of gas from the pressurizing means, and

(e) means defining openings in the tube lower portion at the open lower end thereof, whereby slinging action of the rotating tube and dispersion of the material into the melted metal is enhanced.

4,109,899

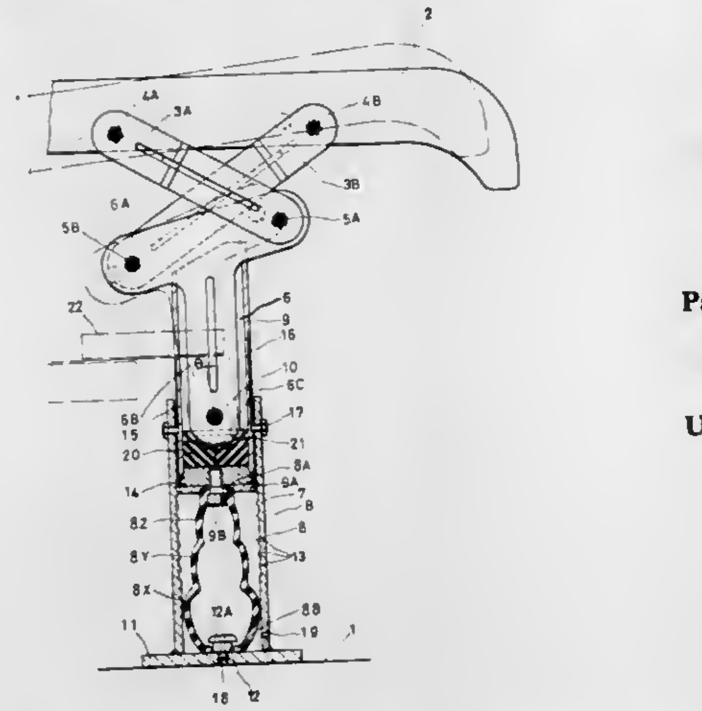
SHOCK ABSORBING DEVICE WITH RESTORING INHIBITING MEANS

Suehiro Takatsu, 3-21-6,, Marunouchi, Naka-ku, Nagoya-shi, Aichi-ken, Japan

Filed Apr. 19, 1977, Ser. No. 788,770

Int. Cl.² F16F *1/36*

U.S. Cl. 267—140 **6 Claims**



1. A shock absorber comprising a pair of crossed links each adapted at one end thereof for attachment to an automobile bumper, an arm fitted to the other end of each link, a plunger pivotally supporting the arm, a closed cylinder movably holding the plunger, one end of the cylinder adapted for attachment to an automobile body, a flexible cushion internally positioned within the cylinder whereby depending on bumper displacement corresponding to the direction of a shock imparted thereto the arm displaces the plunger and such displacement of the plunger into the cylinder causes buckling of the cushion to thereby absorb the shock, and means for inhibiting, but not preventing return movement between the cylinder and the plunger comprising saw-teeth arranged longitudinally along the inside wall of the cylinder and at least one elastic ring on the plunger projecting outwardly therefrom into engaging relationship with the saw-teeth as the plunger and cylinder move relative to one another, each saw-tooth having an inwardly and downwardly sloping upper surface and a lower surface at substantially right angles to the inside wall of the cylinder.

4,109,900

CHAINSAW VISE

Kenneth E. Vandecoevering, Rte. 4, Box 189, Hillsboro, Oreg. 97123

Filed Sep. 20, 1977, Ser. No. 835,034

Int. Cl.² B25B *1/24*

U.S. Cl. 269—102 **7 Claims**

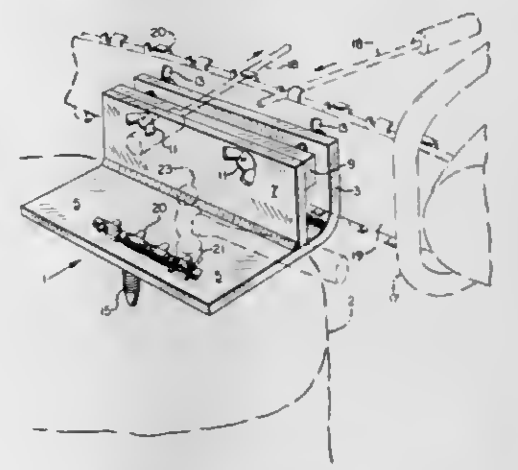
1. A vise for clamping chainsaw parts comprising:

a frame;

first and second vertical fixed jaws mounted on the frame in spaced apart relation;

plural clamping means on the second fixed jaw; a moveable jaw operatively connected to the first fixed jaw, the moveable jaw positioned at least partly within the space between the fixed jaws and independently moveable against the first jaw to clamp a part;

and a horizontal anvil adjacent the vertical fixed jaws.



4,109,901

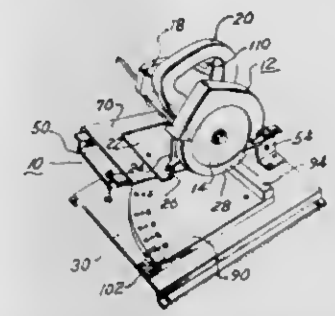
MITER TABLE FOR PORTABLE CIRCULAR SAW

Paul A. Akin, 25808 County Rd. 6, Elkhart, Ind. 46514

Continuation-in-part of Ser. No. 686,253, May 13, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,094

Int. Cl.² B27B *9/04, 5/20*

U.S. Cl. 269—290 **9 Claims**



1. A miter table for portable circular saws, comprising a base having a forward and rearward end, an arm pivoted to said base near the rearward end thereof and movable angularly on a vertical plane toward and away from said base, a carriage for supporting the saw on said arm in cutting position and being movable forwardly and rearwardly on said arm, a means for securing the saw rigidly to said carriage, a fence pivotally connected on a fixed vertical axis to said base and movable to various angular positions relative to said arm for holding material while being cut, a platform mounted on said base forwardly of said fence and rigidly attached to said fence for pivotal movement therewith, means disposed near the forward edge of said platform for retaining said fence and said platform in an adjusted position, and an adjustable stop means for determining the lowermost position of said arm with respect to said base.

4,109,902

APPARATUS FOR THE CONTINUOUS ZIGZAG FOLDING OF A MATERIAL WEB

Robert Barrer, Muri, Switzerland, assignor to Faltex Handels AG, Hergiswil, Switzerland

Filed Apr. 4, 1977, Ser. No. 784,282

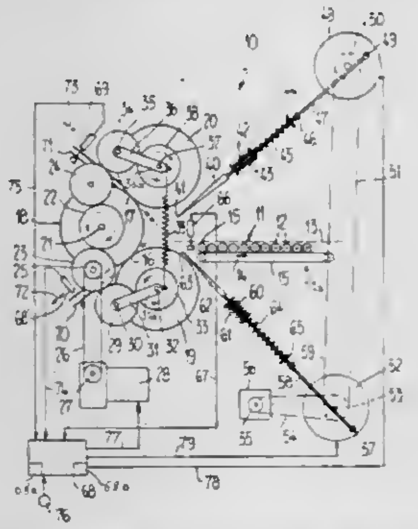
Claims priority, application Switzerland, Apr. 22, 1976, 5041/76

Int. Cl.² B65H *45/20*

U.S. Cl. 270—79 **8 Claims**

1. An apparatus for the continuous, substantially zigzag-shaped folding of a material web, comprising:

means defining an infeed station for the material web for feeding the material web thereat in a given conveying direction;
said infeed station including an outfeed portion for said material web;
means defining a pair of conveying gaps, each arranged to a predetermined side of said infeed station following said outfeed portion;
each conveying gap being positioned to receive the material web supplied by said infeed station;
means provided for said means defining said pair of conveying gaps for imparting a predetermined conveying direction to the material web received in each conveying gap;
each conveying gap conveying the material web received therein in its predetermined conveying direction;
the predetermined conveying direction of any one conveying gap being opposite to the predetermined conveying direction of the other conveying gap;
means for reversing the predetermined conveying directions of both conveying gaps relative to one another;

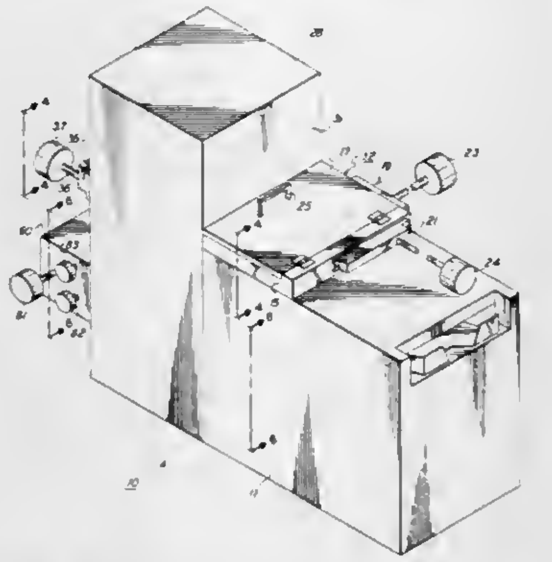


a respective folding blade operatively associated with each conveying gap;
drive means for displacing each folding blade from a rest position removed from its associated conveying gap into a work position adjacent such conveying gap;
said drive means alternately driving each such folding blade through a work stroke into said work position and back again into said rest position at that moment in time when the conveying direction of the associated conveying gap reverses so as to be in synchronism with said given conveying direction of the infeed station;
said means defining said conveying gaps comprises a first roll and two second rolls;
said first roll being paired with each one of said second rolls;
spring means for pre-biasing said second rolls in the direction of said first roll;
said second rolls being raisable from said first roll against the action of said pre-biasing spring means.

4,109,903
FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 649,371, Jan. 15, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,885
Int. Cl.^{2} B65H *5/22, 29/00*
U.S. Cl. 271—3 **1 Claim**

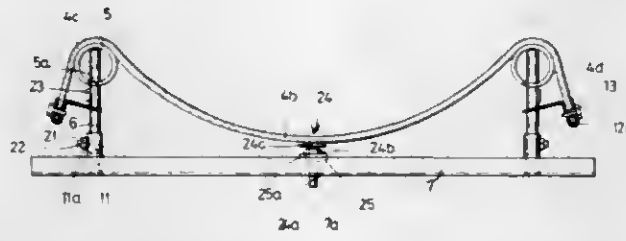
1. Apparatus for storing and feeding selected sides of selected documents to and from an exposure station for copying the selected documents comprising:
(a) xerographic reproduction apparatus having an exposure station including a document exposure platen and liftable platen cover means for covering said platen and for providing a document exposure pocket over said platen;
(b) a rack having a plurality of superposed storage pockets for individually storing documents;
(c) means for moving a selected one of said storage pockets to a predetermined location adjacent said document exposure station;
(d) fluidic means for fluidicly moving a selected document into and out of one side of a selected said storage pocket into and out of said document exposure pocket over said platen for copying without lifting said platen cover means; and
(e) inverting means for inverting documents in any selected one of said plurality of storage pockets;



(f) wherein said inverting means for fluidicly moving a selected document in and out of a selected storage pocket at a different side of said storage pocket than the side thereof utilized in said movement into and out of said document exposure pocket, and for inverting the document so moved so as to allow said document copying and inverting operations to be executed at about the same time, thereby expediting the production of duplex copies, and so that both sides of a selected document may be copied on said platen within said document exposure pocket formed by said platen cover means without lifting said platen cover means.

4,109,904
PASSENGER SLIDE

Klaus Becker; Jürgen Cittrich, and Karl-Ernst Kaufmann, all of Wetter (Ruhr), Fed. Rep. of Germany, assignors to Demag A.G., Duisburg, Fed. Rep. of Germany
Filed Sep. 9, 1976, Ser. No. 722,065
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1975, 2540044
Int. Cl.^{2} A63G *21/00*
U.S. Cl. 272—56.5 R **9 Claims**

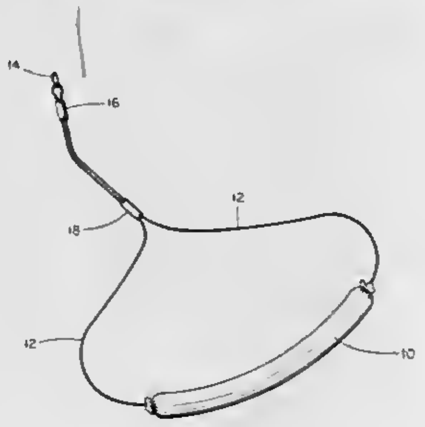


1. An artificial downhill run, comprising
(a) a plurality of prefabricated elongated slide segments placed end to end to form said run;
(b) a plurality of anchored spaced apart transverse bearings positioned along said run;

(c) each of said segments including integral flanges along each side edge thereof;
(d) tube-shaped rail means extending longitudinally along each side edge of said run for supporting said flanges;
(e) strut means extending between each of said bearings and said rail means on each side of said run; the improvement characterized by
(f) each of said strut means being rigidly attached to said bearings;
(g) said rail means including a bore hole in the bottom surface thereof adjacent each strut means;
(h) each of said strut means extending through its adjacent bore hole in said rail means;
(i) butt straps extending between each said strut means and the adjacent integral flange of said segments;
(j) a butt strap extension on each said butt strap; and
(k) a lift-off guard fixed to each strut means and engaging the top surface of each butt strap extension.

4,109,905
DEVICE FOR IN PLACE SWIMMING

Ernst Johann Meier, Mutschellen, Switzerland, assignor to Elvira Quadri, Mutschellen, Switzerland
Filed Apr. 25, 1977, Ser. No. 790,193
Int. Cl.^{2} A63B *69/12*
U.S. Cl. 272—71 **1 Claim**

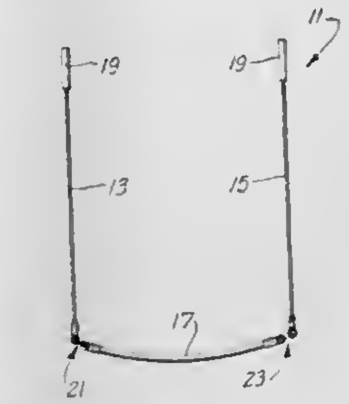


1. A device for in place swimming wherein a swimmer is tethered to the side of a swimming pool in a manner that permits unrestrained swimming strokes comprising:
a water absorbent foam rubber belt member to be placed against a portion of the body of the swimmer to prevent excessive pressure on the swimmer's body and to reduce slipping,
an elastic cord attached to each end of said belt member,
means for securing said cord to said pool side, and
a slide member concentrically mounted on said cord for conforming the cord and belt member to the swimmer's body,
whereby attachment of said securing means to the side of the pool permits a swimmer who has placed the belt member about his body to swim in place against the tension exerted by the secured cord.

4,109,906
SKIP ROPE

Bradford W. Wilson, 1642-A Coriander, Costa Mesa, Calif. 90626
Filed Jan. 15, 1976, Ser. No. 649,471
Int. Cl.^{2} A63B *5/20, 21/02*
U.S. Cl. 272—75 **7 Claims**

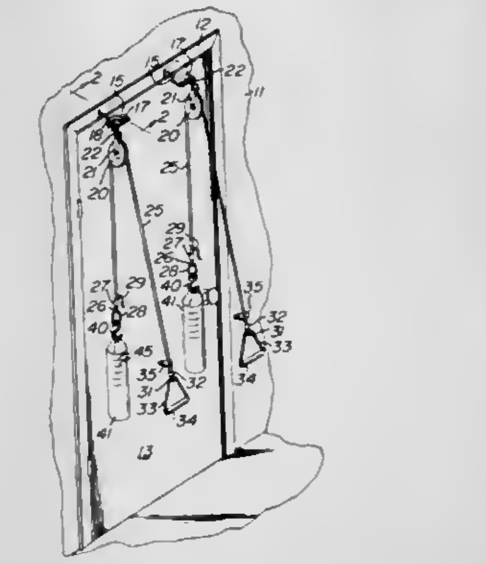
1. A skip rope comprising:
an elongated flexible member;
said elongated flexible member including first and second flexible end sections and a flexible first central section intermediate the first and second end sections whereby when the elongated flexible member is put in a generally U-shaped configuration for skipping the first and second end sections form at least substantial segments of the sides of the U and the first central section forms at least a substantial segment of the bottom of the U;
each of said end sections having an outer end and an inner end;
first and second handles coupled respectively to the outer ends of the first and second end sections;
a second flexible central section having at least one characteristic which is different from said first central section;
means releasably connecting the inner ends of the first and second end sections to the opposite ends, respectively, of the first central section whereby the first central section can be replaced with the second central section;



at least a portion of the first central section being resilient in the axial direction whereby the first central section can be used for exercises other than skipping rope; and
said first central section being heavier per unit of length than either of said first and second end sections whereby when the elongated flexible member is put in the U-shaped configuration and swung the relatively heavy bottom of the U tends to get beneath the feet of the user, said end sections being of a different material than said first central section.

4,109,907
WEIGHT LIFTING APPARATUS

Anthony A. Zito, Haya Mill Rd., Atco, N.J. 08004
Filed Sep. 20, 1976, Ser. No. 725,047
Int. Cl.^{2} A63B *21/06*
U.S. Cl. 272—117 **2 Claims**



1. A home exercise device comprising clip means for removable engagement over the upper edge of a door, flange means outstanding from said clip means and having at least a pair of holes, a pair of hooks for removable engagement through the holes of said flange means, a pair of pulleys suspended from respective hooks, a flexible cord trained over each pulley, a load containing bag removably connected to one end of each cord, a hand loop connected to the other end of each cord for hand manipulation of said loops against the weight of said bags,

and a head support extending removably between said hand loops for supporting the user's head in various body movement, said bags each being fabricated of flexible sheet material and including an upper end flap swingable into and out of overlying relation with its respective bag, and releasable fastener means on each bag and its flap to releasably retain the latter in its overlying relation to define an eye for detachable connection to the associated cord, additional hooks connecting each bag to its associated cord, and a retaining eye on each cord adjacent to its hand loop for releasable connection to the additional book of the associated cord for convenient storage and portability.

4,109,908

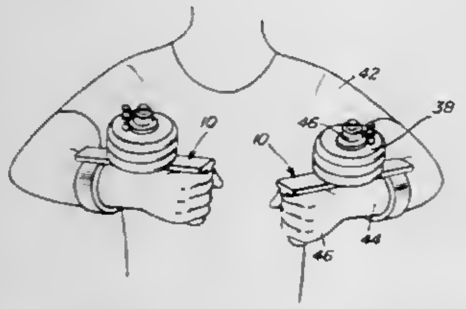
FOREARM MOUNTED SUPPORT FOR LIFT WEIGHTS

Daniel B. Pugh, 40 Highland St., Medway, Mass. 02053, and Thomas M. Cataldo, 59 Highwood Dr., Franklin, Mass. 02038

Filed Feb. 9, 1976, Ser. No. 656,697

Int. Cl.^{2} A63B *23/00*

U.S. Cl. 272—119 **1 Claim**



1. An exercise weight supportive assembly, said assembly including a single one-piece elongated body having a pair of opposite side longitudinal sides, said body including only one elongated plate-like member, only one elongated weight supporting shank supported from only one of said longitudinal sides of said body with one end of said shank abutted against and permanently anchored relative to said one side centrally intermediate the opposite ends of said body and the other end of said shank projecting endwise outwardly from said one longitudinal side and adapted to have annular weights removably telescoped thereover, an elongated hand grip having one end abutted against and permanently anchored relative to one end portion of the other longitudinal side of said body with the other end of said hand grip projecting endwise outwardly from said other longitudinal side, an annular forearm receiving and engaging frame member including a peripheral portion thereof permanently anchored to said other longitudinal side adjacent the other end of said body with said annular frame member disposed in a plane substantially normal to said elongated body, the portions of said hand grip and annular frame member remote from said elongated body member being free of connecting members extending and secured therebetween, said frame and hand grip each having the exposed surfaces thereof covered by means of resilient covering material.

4,109,909

TRAINING AND PRACTICE AIR OF THE TURNTABLE TYPE, FOR USE BY ICE SKATERS

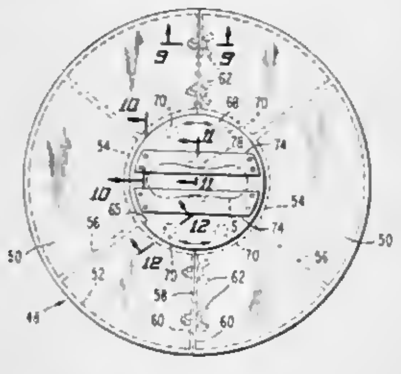
Frank Csutor, 408 Jefferson Ave., Bristol, Pa. 19007

Division of Ser. No. 567,588, Apr. 14, 1975, Pat. No. 4,021,054. This application Dec. 17, 1976, Ser. No. 751,939

Int. Cl.^{2} A63B *23/04*

U.S. Cl. 272—146 **8 Claims**

1. A device for off-ice use by an ice skater in practicing spins on one ice skate, comprising means affording a flat surface adapted for supporting a single ice skate boot, said surface being interrupted by an elongated slot extending generally centrally thereof to receive the blade of said ice skate, including a stationary platform having a center opening, a turntable rotatably mounted in said opening, and a pair of blocks removably positioned upon said turntable for rotation therewith, said blocks cooperating to provide said flat surface, the blocks being transversely spaced a predetermined stationary distance apart such as to define an elongated slot the width of which is greater than the thickness of an ice skate blade but less than the width of a single ice skate boot, said blocks being in supporting relation to the opposite sides of the boot of a single ice skate the blade of which extends within the slot longitudinally thereof.



4,109,910

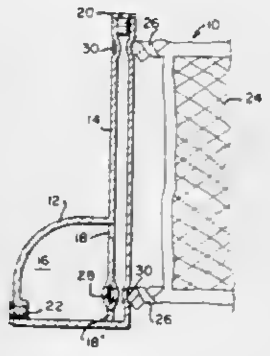
WEIGHTED TENNIS NET SUPPORT POST

Theodore J. Gleason, 2 Sanders Pl., Pompton Plains, N.J. 07444

Filed Jul. 14, 1976, Ser. No. 705,347

Int. Cl.^{2} A63B *71/02*

U.S. Cl. 273—29 BB **3 Claims**



1. Apparatus, for use in a game employing a missile and an obstacle therefor, comprising:
a mounting base having a flat bottom surface;
said mounting base comprising a hollow container defining a fluent material reservoir therewithin; and
upright means for supporting a missile obstacle;
said upright means being integral with said mounting base, and extending from said mounting base at an angle normal to said bottom surface;
said upright means having first and second opposite sides; and wherein
said mounting base is integrally fixed to said upright means at only one of said first and second sides, to render the other of said sides unobsructed;
said upright means comprises an elongate, hollow element;
said hollow element opens into said hollow container to effect a communication of the interior of said hollow element with the interior of said hollow container;
said elongate, hollow element has inlet means for introducing fluent material thereinto to fill said hollow container and said elongate, hollow element with such fluent material;
said hollow container and said elongate, hollow element define an interface therebetween along said one side; and
said hollow container and said elongate, hollow element have a walled void formed therebetween, at said one side, to facilitate an attachment thereat of a missile obstacle.

4,109,911

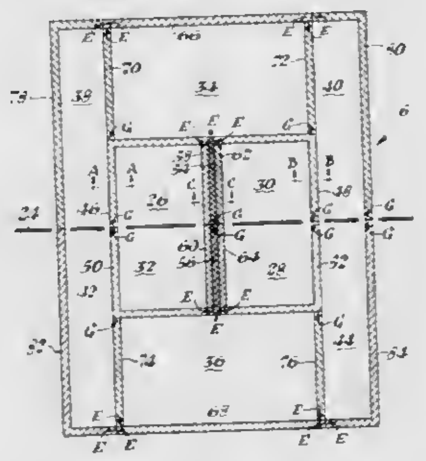
GAMING SURFACE CONTACT DETECTING SYSTEMS

John A. Van Auken, 16 La Gorce Cir., Miami Beach, Fla. 33141

Continuation of Ser. No. 570,766, Apr. 23, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,474

Int. Cl.^{2} A63B *19/06*

U.S. Cl. 273—31 **6 Claims**



2. An electrical in-ball indicator system for indicating touchdown of a ball in one or more selected zones on a tennis court playing surface or other playing surface having one or more court lines wherein the court lines bound a playing surface area, wherein each court line has a pre-selected width, and wherein said ball is provided with electrically conductive means on its outer periphery, said electrical in-ball indicator system comprising at least one electrically operated indicator, a sensing circuit having a group of exposed, spaced apart, generally parallel conductors disposed on said playing surface in at least one of said zones and extending lengthwise of at least one of said court lines, and electrical circuit means connected to said sensing circuit and said indicator to operate said indicator in response to touchdown of said ball at a place where the electrically conductive means on said ball completes a current-conducting circuit across adjacently disposed ones of said conductors in said sensing circuit, only one of said conductors in said sensing circuit being disposed out bounds of the playing surface area delimited by the outer edge of said one of said court lines, and the remainder of said conductors in said sensing circuit being disposed in bounds of the playing surface area delimited by the outer edge of said one of said court lines.

4,109,912

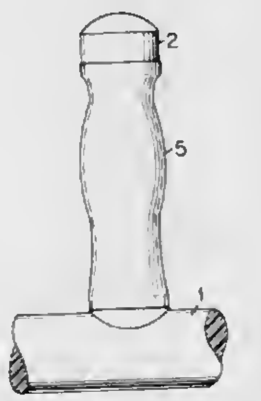
NIGHT STICK STRUCTURE

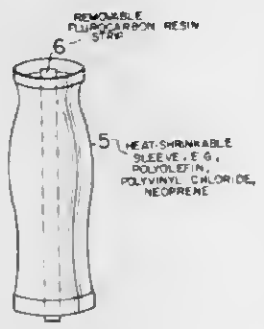
John Hobart Zentmyer, 124-F N. Brighton St., Burbank, Calif. 91506

Filed Mar. 17, 1977, Ser. No. 778,393

Int. Cl.^{2} F41B *15/02*

U.S. Cl. 273—84 R **10 Claims**




REMOVABLE FLUROCARBON RESIN STRIP
6
5
HEAT-SHRINKABLE SLEEVE, E.G., POLYOLEFIN, POLYVINYL CHLORIDE, NEOPRENE

1. The method of making a baton having an auxiliary handle that includes the steps of;
(a) providing a baton having an elongated shaft and an upstanding auxiliary handle,
(b) placing a sleeve over the auxiliary handle,
(c) placing at least one strip between the sleeve and the auxiliary handle,
(d) applying heat locally and relatively evenly to the sleeve until the sleeve is shrunk to approximately the size of the auxiliary handle plus the strip, and
(e) removing the strip.

2. The method of making the baton of claim 1 in which;
(a) said strip is formed of the fluorocarbon resin polytetrafluoroethylene.

4,109,913

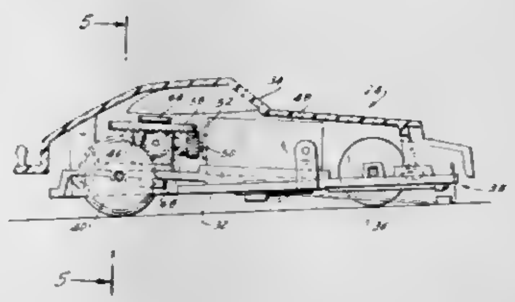
TOY VEHICLE

Edwin A. Nielsen, Oceanside, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 747,441, Dec. 6, 1976, abandoned. This application Apr. 1, 1977, Ser. No. 783,849

Int. Cl.^{2} A63F *9/14*

U.S. Cl. 273—86 B **13 Claims**



5. In a toy vehicle game including a guide track having a pair of upstanding laterally spaced side walls, at least one toy vehicle on said track including a frame, a body mounted on said frame, a plurality of ground engaging wheels mounted in said frame and including a pair of combination steering and drive wheels; means for mounting said drive wheels in said frame for independent rotation in laterally spaced fixed vertical planes; and a reversible rotary electric drive motor mounted in said frame in a fixed position, the improvement comprising drive transmission means mounted in said vehicle frame for selectively drivingly connecting said motor to the respective drive wheels to selectively drive said wheels in the forward direction of movement of the vehicle; said drive transmission means including at least one transmission element movably mounted in the frame for limited reciprocal movement between first and second predetermined positions in response to the direction of rotation of the elctric motor, and a pair of direct drive transmission trains respectively directly drivingly engaged with said drive wheels for rotation with the drive wheels regardless of the direction of rotation of the drive wheels; each of said transmission trains including one transmission element located at said first and second predetermined positions respectively for selective engagement and operation by said movable transmission element in response to the direction of rotation of the drive motor to respectively drive one or the other of said drive wheels in the forward direction of movement of the vehicle when engaged with said movably mounted transmission element while producing a biasing force on the vehicle urging it into guiding engagement with one of said side walls of the track for movement therealong in said forward direction; said transmission elements at said first and second position being located to block movement of said movably mounted transmission element beyond said first and second predetermined positions to limit said movably mounted transmission element to reciprocal movement therebetween in response to reversals of the direction of rotation of said motor.

4,109,914

→ GAME STRUCTURE EMPLOYING A REVOLVING TARGET

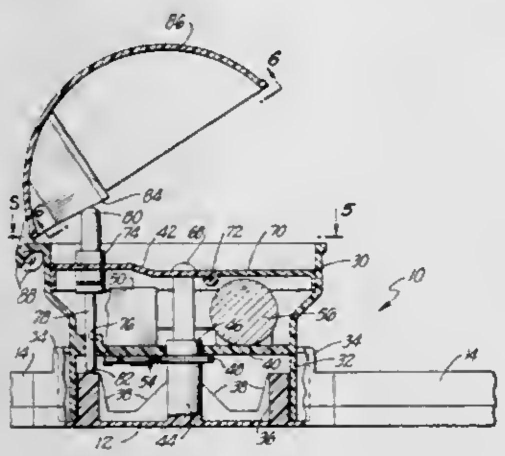
Takao Matsumoto, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jun. 23, 1976, Ser. No. 698,917

Claims priority, application Japan, Jul. 4, 1976, 50-93481[U]

Int. Cl.^{2} A63B *63/06*

U.S. Cl. 273—101 9 Claims



2. A game structure which comprises:

a base member,

a receptacle having an open top rotatably mounted on said base member,

a lid pivotally mounted on said receptacle adjacent to an edge thereof so as to be capable of being moved between an open position in which said open top of said receptacle is exposed and a closed position in which said open top of said receptacle is covered,

rotating means for rotating said receptacle on said base member about a vertical axis extending through said top connecting said receptacle and said base member, and

lid lifting means for periodically moving said lid between said open and closed positions as said receptacle is rotated,

an arm attached to said base member so as to extend outwardly from said receptacle,

a propulsion means for propelling a game piece toward said receptacle, said propulsion means being mounted on said arm remote from said receptacle.

4,109,915

BREAKAWAY DART

Walter Edward Bottelsen, 255 Brentwood Way, Goleta, Calif. 93017

Filed Sep. 20, 1976, Ser. No. 724,758

Int. Cl.^{2} A63B *65/02*

U.S. Cl. 273—106.5 R 4 Claims

1. A dart having a body that breaks away from a point upon impact with a target, comprising:

(a) an elongated dart point having a transverse dimension and having a base that has a transverse dimension and a longitudinal dimension;

(b) a dart body elongated along an axis;

(c) a pair of resilient fingers formed on one end of the body defining an axial slit having a transverse dimension greater than the point transverse dimension and less than the base transverse dimension, said fingers resiliently gripping the point base to yieldingly hold the point;

(d) and said body having a radial slot rearwardly of the base-gripping place of the fingers and intersecting the slit and having a dimension transverse of the body greater than the point base transverse dimension and having a longitudinal dimension greater than the longitudinal dimension of the base;

whereby the fingers frictionally hold the point during acceleration and flight and allow the body to move over the point upon impact with a target, so that the body falls free of the point.

2. A dart having flights that break away upon impact of the dart with a target, comprising

(a) an elongated dart body having an axial bore, a point end and a flight end

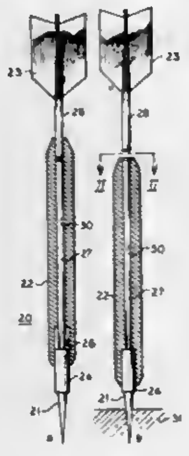
(b) flights yieldingly held to said flight end of said body and having a part projecting into the bore;

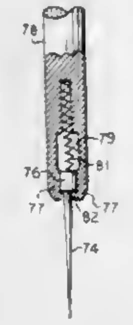
(c) said point end of said body being radially slotted to form collet fingers

(d) a point yieldingly held to said point end of said body in said axial bore, but projecting therefrom, and between said fingers;

(e) an adjustable collet secured to the exterior of said body in the region of the fingers to cause the fingers to adjustably grip the point to hold the point in said projecting position during flight and to allow the body to move over the point upon impact with a target; and

(f) a stem disposed in said bore with one end engaged by the point and the other end engaged by the flights; whereby impact of the dart on a target causes the body to overside the point, moving the stem rearwardly in the body to eject the flights from the body.





3. A dart that has a breakaway body upon impact with a target, comprising:

(a) a dart body having a bore in one end;

(b) a removable point disposed in the outer end of the bore and reciprocable in the bore and normally projecting from the body;

(c) a compressed spring disposed in the inner end of the bore and having expansion in a free state to contact the point to push the point and body apart;

(d) and trigger means engaging the spring and the dart body for retaining the spring in a compressed condition and having a part extending into the bore to be contacted by the inner end of the point;

said trigger being operated by the reciprocation of the point when the dart strikes a target to disconnect the trigger means from the body by the movement of the body toward the point, which allows the inner end of the point to contact the trigger means to operate the trigger.

4,109,916

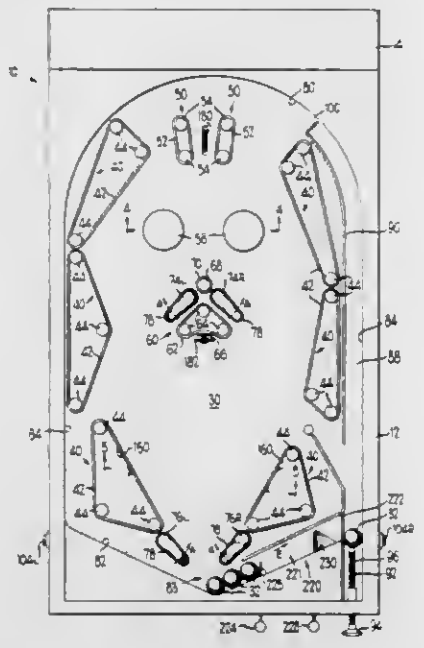
PINBALL GAME WITH SIMULTANEOUS PROJECTORS

Jeffrey D. Breslow, Highland Park, and Engene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed May 17, 1976, Ser. No. 687,402

Int. Cl.^{2} A63D *3/02, 13/00*

U.S. Cl. 273—121 A 2 Claims



1. A pinball game apparatus, comprising:

an inclined playing board having a ball exit opening formed in the lower portion thereof and a ball entrance opening formed in the upper portion thereof;

means for propelling a ball through said entrance opening so that the ball may gravitate downwardly over the playing board;

two pairs of transversely aligned actuatable flippers pivotally mounted on the playing board for contacting the ball rolling thereover to change the direction of travel of the ball;

mechanical linkage means for simultaneously actuating said pairs of flippers for pivotal movement, said linkage means including gear means between an upper pair of said flippers and crank means between a lower pair of said flippers to rotate the flippers of each pair in opposite directions;

a plurality of player operable switches electrically connected in parallel between a power supply and a first single solenoid for operating said linkage means for simultaneous actuation of all of said flippers in response to manual operation of any of said switches;

a plurality of rocking wafer-type ball bumpers mounted on the playing board for engagement by a ball rolling thereon, each bumper including a vertically movable ball projecting ring movable between a first retracted position and a second ball engaging position;

bumper drive means connected to said ball projecting ring for simultaneously moving the ball projecting rings of all of the bumpers from their first position to their second position in response to engagement of a ball with any one of said bumpers, said bumper drive means including a second single solenoid connected to all of said ball projection rings, said second solenoid being energized in response to engagement of a ball with any one of said bumpers;

a plurality of slingshot cushions, each including a resiliently flexible band mounted above the playing board by a plurality of stationary posts mounted on the playing board;

at least one actuator in proximity with each of the bands to detect the engagement of a ball with a band;

ball propulsion means adjacent each of said bands and operatively associated with the actuators for simultaneously sharply moving the same to propel a ball back over the playing board;

cushion drive means comprising a third single solenoid connected to each of said ball propulsion means for simultaneous operation of said plurality of cushions in response to engagement of any band by a ball rolling on the playing board engaging one of said bands as detected by one of said plurality of actuators; and

scoring means for registering a score whenever said first, second or third solenoids are energized by engagement of a ball with any one of said solenoid energizers.

4,109,917

TRUCKING GAME

Sheila Starr Hatcher, 9434 Palmetto La., Shreveport, La. 71108

Filed Feb. 19, 1976, Ser. No. 659,282

Int. Cl.^{2} A63F *3/04*

U.S. Cl. 273—254 6 Claims

1. A trucking game comprising:

(a) a game board having a map of the continental United States outlined thereon and selected highway routes located on said map;

(b) a first set of symbols characterized by emergency locations, truckers' luck locations and deadhead locations and a second set of symbols characterized by rest locations, fuel stop locations, and "let the hammer down" locations applied to selected locations along said routes, said second set of symbols being keyed to general instructions for the players of said game;

(c) a set of instruction cards keyed to said first set of symbols whereby when one of said players locates on any one of said first set of symbols pursuant to playing said game, one of said instruction cards keyed to said one of said first set of symbols is taken and the instructions thereon followed by said one of said players;

(d) a set of load cards for determining departure and destination locations for travel along said routes;

(e) a plurality of tokens for marking the progress of said players sequentially traversing said routes pursuant to chance; and

(f) means for advancing said tokens along said routes according to chance.

4,109,918

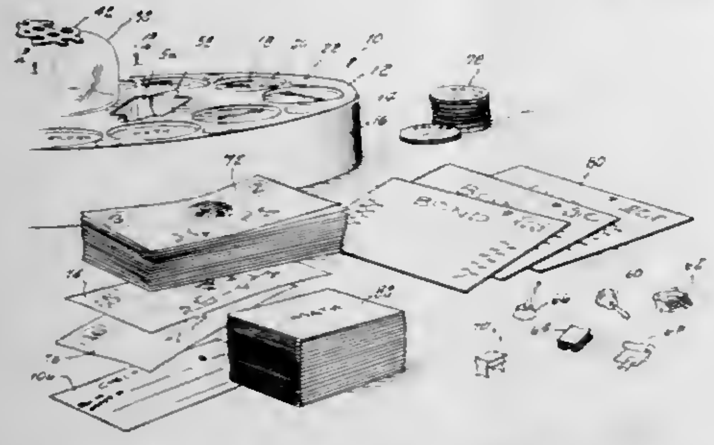
LEARNING AND EARNING EDUCATIONAL GAME

Frank Mele, and Margaret Mele, both of 607-90th St., North Bergen, N.J. 07047

Filed Dec. 16, 1976, Ser. No. 751,102

Int. Cl.² A63F *3/00*

U.S. Cl. 273—256 **10 Claims**



1. A game apparatus comprising, in combination:

(a) a game board having provided thereon a sequence of playing zones defining a path of travel on the game board, first identification means for designating disciplines of learning being provided in random association with respect to each of said playing zones;

(b) a plurality of playing pieces for use by the participants, said playing pieces being positionable on said playing zones;

(c) a roulette-type spinning wheel supported on said game board and including a dial face, radial ribs dividing said dial face into a plurality of sectors, a spinner for rotating said dial face relative to said game board, a single ball for bounding between said sectors and reaching a rest position in one of said sectors, numeric designation means provided on said dial face in association with each sector representing a direction and magnitude of movement of said playing pieces along said path of travel, second identification means for designating game instructions provided on said dial face also in association with each of the same sectors;

(d) groups of cards, each group correspondingly identified with said first identification means, each card containing thereon a question and answer;

(e) additional groups of cards, each of said additional groups correspondingly identified with said second identification means, and

(f) play money for distribution among the game participants.

4,109,919

PACKAGE ACTUATED RECORD EXTRACTING MECHANISM FOR A VIDEO DISC PLAYER

Charles Anthony Elliott, and Larry Dean Huff, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,602

Claims priority, application United Kingdom, Dec. 20, 1976, 53176/76

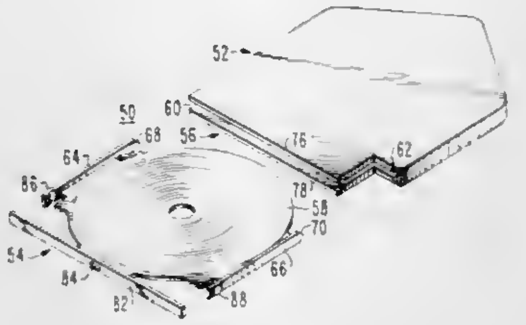
Int. Cl.² G11B *3/00*

U.S. Cl. 274—9 B **6 Claims**

5. In a player for recovering prerecorded signals from a disc record removably subject to occupancy of a protective cover; said player including a housing having an input slot dimensioned to permit an insertion of a cover into said player and its removal therefrom; and means mounted in said player for protruding into a cover during arrival thereof at a fully inserted position in said player; said protruding means being subject to operation in a first condition and a second condition; said protruding means, while disposed in said first condition, permitting cover arrival at said fully inserted position; said protruding means, while disposed in said second condition, precluding a removal from said player of a record during a cover withdrawal from said fully inserted position after an occupied cover arrival, whereby said record is retained in said player upon completion of said cover withdrawal; an apparatus responsive to cover arrival at said fully inserted position in said player for alternating the condition of said protruding means between said first condition and said second condition; said alternating apparatus comprising:

(A) a toothed wheel rotatably mounted in said housing;

(B) an actuating arm mounted in said housing for motion from a first position to a second position in response to cover arrival at said fully inserted position in said player;



(C) means coupled to said actuating arm and responsive to motion of said actuating arm to said second position for causing said toothed wheel to advance;

(D) means mounted in said housing for urging said actuating arm to return to said first position;

(E) means mounted in said housing for preventing a reversal of motion of said toothed wheel during motion of said actuating arm to said first position; and

(F) means responsive to each advancement of said toothed wheel for causing said protruding means to alternate between said first condition and said second condition.

4,109,920

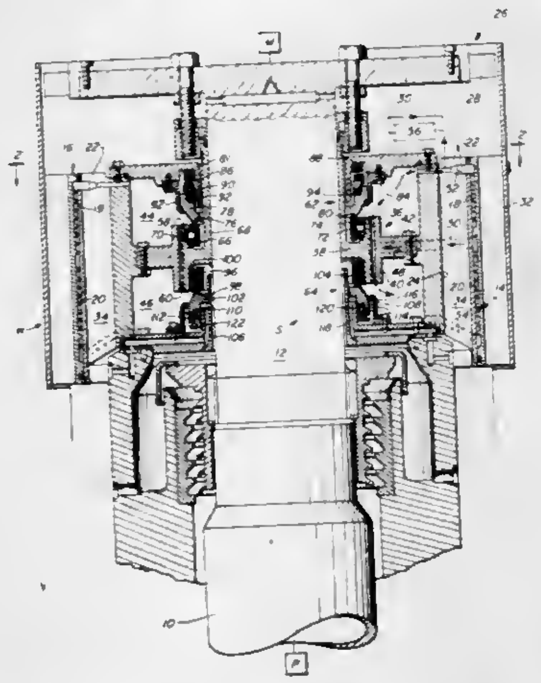
HEAT EXCHANGER FOR SHAFT SEAL CARTRIDGE

Winfred John Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,519

Int. Cl.² F16J *15/40*

U.S. Cl. 277—17 **7 Claims**



1. A seal assembly for use with a rotary shaft and a case comprising:

a housing connected to said case;

a seal chamber defined by said housing and said shaft;

mechanical seal means in said seal chamber for preventing leakage between said shaft and said case;

cooling fluid chambers defined by said seal means and said housing;

cooling fluid impelling means between said cooling fluid chambers and further defining said chambers for causing cooling fluid to flow from said impelling means to each of said chambers;

said impelling means comprising rotor and stator means;

inlet means to said impeller means for the flow of cooling fluid thereto;

an outlet from each chamber for the flow of cooling fluid therefrom; and

heat exchanger means connected to said outlets and to said inlet means for cooling said cooling fluid which flows from said outlets to said inlet means.

4,109,921

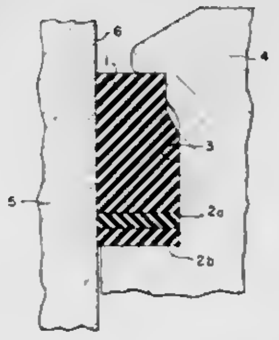
SEAL FOR PISTONS AND PISTON RODS OF CYLINDER-TYPE ACTUATORS

Herbert Urbascbek, Weilrod, Fed. Rep. of Germany, assignor to Taunus-Armaturen GmbH, Camberg, Fed. Rep. of Germany

Filed May 27, 1976, Ser. No. 690,630

Int. Cl.² F16J *15/20*

U.S. Cl. 277—24 **9 Claims**



1. An annular sliding seal for axially guided concentrically paired elements, particularly for piston and cylinder pairings and piston rod and piston rod guide bore pairings of cylinder-type hydraulic actuators, the seal comprising in combination:

a cylindrical sliding surface defined by one of the two concentric elements, said sliding surface being a bore, if defined by the outer element, and a cylindrical outer surface, if defined by the inner element;

an annular groove in the other one of the two concentric elements, the groove being radially open towards the sliding surface and having axially spaced groove flanks and a groove bottom;

a first sealing ring of highly elastic, highly resilient material received within said annular groove; said sealing ring having a quadrangular cross section circumscribed by a pressure-side substantially radial flank, a pressureless flank, a received periphery in contact with the groove bottom, and a sliding periphery; said cross section having a sharp sliding edge on at least the corner between the pressure-side flank and the sliding periphery of the sealing ring; and the radial height of the sealing ring on said sharp sliding edge in relation to the diameter of the sliding surface being such that, while moving along the sliding surface, the sealing ring portion which includes that edge is radially compressed between the sliding surface and the groove bottom to such an extent that the sharp sliding edge of the ring removes any hydraulic fluid from the sliding surface and engages said surface under dry friction; and

a second sealing ring of plastically yielding material likewise received within said annular groove and axially confined between the pressureless flank of the first sealing ring and the respective flank of the groove, the second sealing ring holding a dry lubricant in such a way that said lubricant is released against the sliding surface under motion.

4,109,922

SEALING DEVICE FOR A VACUUM ENCLOSURE

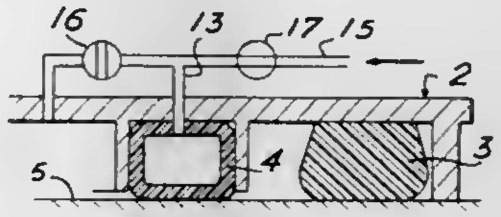
Philippe Martin, Orsay, France, assignor to Soodure Autogene Francaise, Paris, France

Filed Apr. 26, 1977, Ser. No. 790,884

Claims priority, application France, Apr. 28, 1976, 76 12571

Int. Cl.² F16J *15/10*

U.S. Cl. 277—34.3 **3 Claims**



1. A sealing device for a vacuum enclosure which can be applied against a bearing surface comprising at least two concentric annular seals mounted in a support rigidly fixed to said enclosure and extending parallel to said bearing surface, one of said annular seals being near the exterior of said enclosure and being a solid seal of flexible material, the other of said annular seals being near the interior of said enclosure and being a hollow inflatable seal, a closable duct connecting said inflatable seal to a source of fluid under pressure, said solid seal having a portion having the shape of a dihedron and directed towards said bearing surface to facilitate compression of said seal when a vacuum is drawn within said enclosure, a lateral abutment member carried by said support and disposed at right angles to said bearing surface limiting compression of said solid seal, an open housing for said inflatable seal in said support opposite said bearing surface, said duct connecting to two branch pipes and a shut-off valve for each of said pipes for communication respectively with the interior of said enclosure and with said source of fluid under pressure.

4,109,923

PIPE JOINT

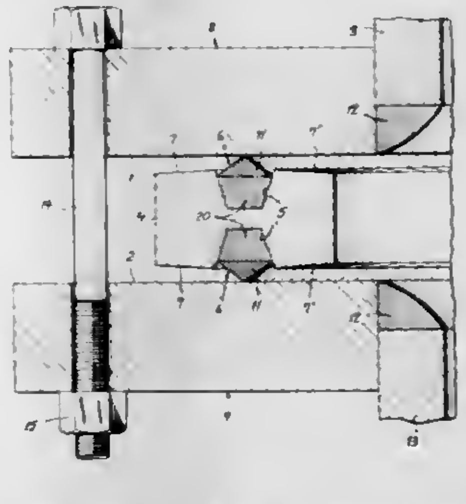
Hans-Joachim Tückmantel, Mülheim (Ruhr), Fed. Rep. of Germany, assignor to Kempchen & Co. GmbH, Oberhausen, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,209

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616512

Int. Cl.² F16J *15/10*

U.S. Cl. 277—101 **9 Claims**



1. In a joint between two coaxial conduits having peripheral flanges with parallel confronting surfaces transverse to the conduit axis,

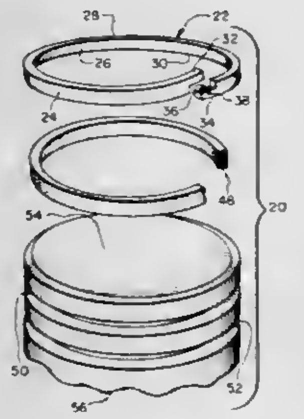
the combination therewith of:

a solid annular spacer centered on said axis and inserted between said flanges, said spacer having two substantially

flat faces respectively adjoining said surfaces and being provided on each of said faces with an annular groove of outwardly diverging cross-section open toward the adjoining flange surface;
a deformable sealing ring in each groove projecting toward the adjoining flange surface, each sealing ring having a cross-section substantially in the shape of a regular pentagon which forms a flattenable gable-shaped ridge protruding from the respective groove and contacting the corresponding flange surface in an initial stage of assembly along a zone substantially narrower than said groove; and
fastening means engaging said flanges radially outwardly of said spacer for axially clamping said flanges together against said spacer with resulting flattening of said ridge of each sealing ring, the faces of said spacer converging from their annular grooves outwardly at a small angle facilitating such flattening.

4,109,924
STEPPED JOINT PISTON RING

Charles G. Stucke, Lexington, Ky., assignor to Chemprene, Inc., Alden, N.Y.
Filed Jul. 12, 1976, Ser. No. 704,463
Int. Cl.² F16J *9/14*
U.S. Cl. 277—165 **8 Claims**

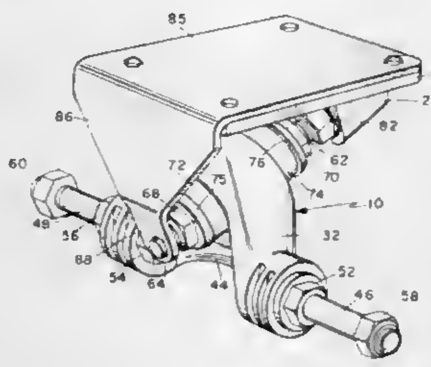


1. A sealing assembly comprising, in combination, a relatively stiff but resilient first seal ring having at least one surface for engaging a counterpart surface to be sealed, said first seal ring having axial end surfaces, a second, resilient back up seal adapted to act radially on said first ring to urge it toward said counterpart surface to be sealed, said first ring having an end seal assembly comprised of circumferentially overlapping end portions of reduced axial extent, said overlapping end portions defining first and second axially opposed seal ring surfaces, one of said circumferentially overlapping end portions including a generally axially directed pocket, a third seal element of a resilient material, said third seal element being in said pocket and engaged between said first and second axially opposed seal ring surfaces, thereby providing a secondary seal between said first and second axially opposed seal ring surfaces of said first seal ring.

4,109,925
SKATEBOARD CHASSIS

Michael Patrick Williams, San Diego, and William Howard Brawner, El Cajon, both of Calif., assignors to H.P.G. IV, Inc., El Cajon, Calif.
Continuation-in-part of Ser. No. 732,649, Oct. 15, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,624
Int. Cl.² A63C *17/02*
U.S. Cl. 280—11.28 **18 Claims**

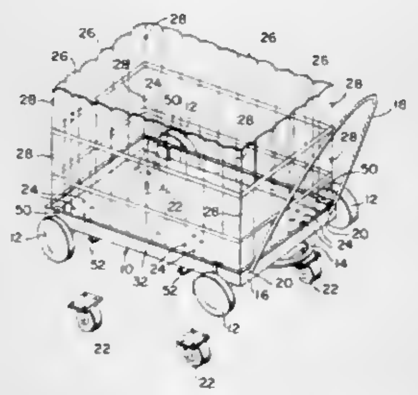
1. A skateboard truck assembly comprising in combination:
a mounting member for mounting to the underside of a skateboard, and including a pivot bearing socket and a tension bolt mounting means for mounting a tension bolt,
an axle assembly including a central axle member having a pivot arm having a bearing end supported in said bearing socket for pivotal movement about a pivot point,
a tension bolt extending through an aperature in said central axle and secured to said axle by means of a pair of tension compression pads and detachably secured in said tension bolt mounting means, and



adjusting means for adjusting the position of the axle with respect to the pivot point independently of the tension in said tension pads and for adjusting the tension in said tension pads independently of the position of the axle with respect to the pivot point.

4,109,926
UTILITY CART

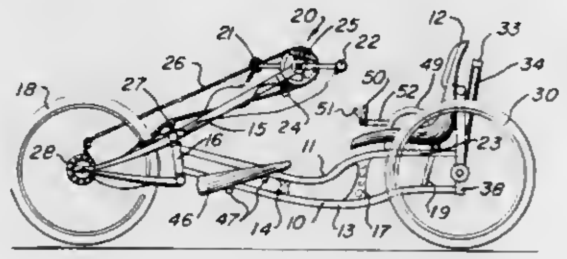
Gilbert M. Lane, 4017 Secor Ave., Bronx, N.Y. 10466
Filed Apr. 9, 1976, Ser. No. 675,606
Int. Cl.² B62B *3/02*
U.S. Cl. 280—39 **1 Claim**



1. A utility cart comprising a rectangular rigid base portion, four rotatable wheels, four axles, each of said four axles having one of said four wheels rotatably secured thereto, axle pivot means for pivoting said each of said four axles about a pivot line transverse to the longitudinal axis of said each of said four axles, said axle pivot means pivotably securing said each of said four axles to said base portion, retaining means for selectively preventing said each of said four axles from pivoting about said pivot line, a base surface coextensive with said rigid base portion, at least four removable foraminous, wall-like elements for erecting the lateral surfaces thereof in rectangular relationship perpendicular to said base surface, securing means for interlocking the marginal adjacent edges of said foraminous, wall-like elements to each other, disengagement means enabling said foraminous, wall-like elements to disengage from said rigid base portion and from each other at said adjacent marginal edges thereof, a rigid handle portion pivotably secured to said rigid base portion, a flexible handle portion fixedly secured to said rigid base portion, said axle pivot means comprising, four first rods, one end of each of said four first rods fixedly secured to a lower surface of said base portion, four second rods, one end of each of said four second rods pivotally secured to the other end of an adjacent said each of said four first rods, four collars, said four collars having a plurality of female threads disposed on an inner surface thereof, said each of said four second rods having a plurality of male threads disposed on an external surface thereof adjacent said one end thereof, each of said four collars being disposed rotatably secured to said plurality of male threads, wherein said plurality of female threads have a greater internal diameter than the outside diameter of said each of said four first rods at a location adjacent said other end thereof, said each of said four axles being disposed fixedly secured to an adjacent said each of said four second rods and extending radially outwardly therefrom.

4,109,927
HAND POWERED AND CONTROLLED TRICYCLE

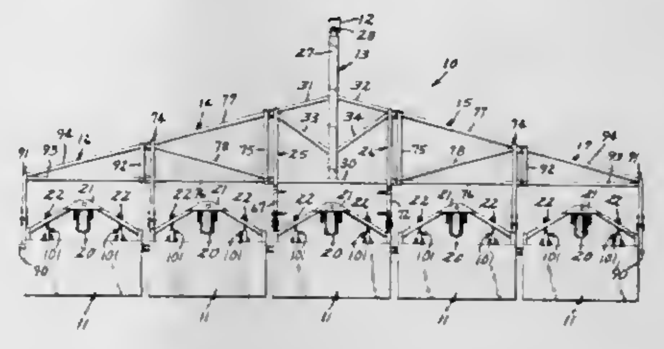
Randall L. Harper, 1347 Lamar, Lakewood, Colo. 80215
Filed Aug. 28, 1975, Ser. No. 608,662
Int. Cl.² B62M *1/14*
U.S. Cl. 280—250 **14 Claims**



1. In a hand-operated tricycle having a substantially horizontal frame disposed between a forward wheel and a pair of rearward wheels with each wheel having a central rotational axis, a seat mounted on said frame, and braking means for braking said tricycle, a manual control apparatus comprising:
a steering column having one end connected to said forward wheel and inclined upwardly and rearwardly at an acute angle less than 45° with respect to said horizontal frame, said horizontal frame disposed substantially in the plane of the rotational axes of said forward and rearward wheels,
pivot means located at the forward end of said horizontal frame for pivotally connecting an intermediate portion of said steering column in laterally pivotal relation to said horizontal frame at a position substantially planar with the rotational axes of said wheels,
drive means including a crank assembly rotatably connected to the end of said steering column opposite to said one end whereby said drive means is operative to drive said front wheel by rotary motion of said crank assembly, said crank assembly having a pair of elongated arms one on either side of said steering column,
a sleeve rotatably attached to each said elongated arm in outwardly disposed relation thereto adapted to be gripped by the hands of the operator of said tricycle,
a first manually actuable means attached to one of said sleeves being selectively actuable to control the braking of said tricycle, said manually actuable means having a flexible control means interconnecting said manually actuatable means and said braking means for operating said braking means by actuation of said manually actuable means, and
a first rigid arcuate guide channel mounted in fixed relation to said one of said sleeves and adapted for receiving a portion of said flexible control means, said guide channel curving outwardly from its associated said elongated arm for a distance sufficient to prevent said flexible control means from contacting said sleeve when the associated said elongated arm is rotated through a 360° arc.

4,109,928
SECTIONAL GRAIN DRILL HITCH

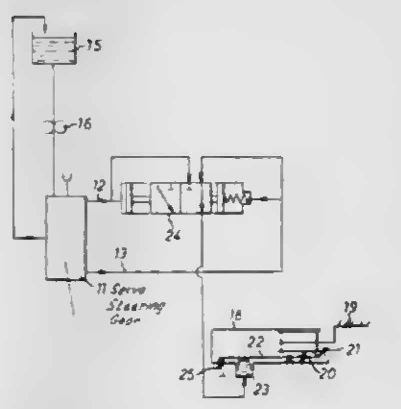
James F. Watkins, Alexandria, Minn., assignor to Clyde Machines, Inc., Glenwood, Minn.
Filed Nov. 1, 1976, Ser. No. 737,521
Int. Cl.² B60D *1/14*
U.S. Cl. 280—411 R **17 Claims**



17. A modular hitch for connecting a traction vehicle in draft relation to a plurality of independently wheeled implements in general side-by-side relationship, comprising, in combination:
a center module, a primary lateral module, and a secondary lateral module, each of said modules including a front portion, a rear portion, articulating means interconnecting said portions for relative pivotal movement about a transverse axis, and releasable means normally disabling said articulating means and locking said portions in a generally flat relative configuration;
means for connecting the front portion of said center module in supported relation to a traction vehicle;
means interconnecting said modules laterally along adjacent edges thereof, with said transverse axes lying in a common plane transverse to said hitch, for relative pivotal movement about longitudinal axes normal to said plane;
and means for connecting wheeled vehicles in supporting relation to the rear portions of said lateral modules for pivotal movement with respect thereto about further transverse axes.

4,109,929
ANTI-JACK-KNIFING APPARATUS FOR ARTICULATED VEHICLES

László Koroknay, and István Ratskó, both of Budapest, Hungary, assignors to Autóipari Kutató Intézet, Budapest, Hungary
Filed Jul. 2, 1976, Ser. No. 702,233
Int. Cl.² B62D *53/06*
U.S. Cl. 280—432 **1 Claim**



1. An articulated vehicle comprising a tractor (1) which has a hydraulic servo-steering gear (11), and a trailer (2) connected to said tractor by a king-pin (3) through a coupling mechanism (4); the vehicle further comprising an anti-jack-knifing apparatus which includes a clutch having a housing (18) that is connected to said tractor; at least one disc plate (5, 19) that is fixed

to said trailer; at least one pressure plate (21) in and connected to said housing for engaging said disc plate; means (20) for pressing said pressure plate toward said disc plate; a linkage (22) between said pressure plate and said housing; a lifting cylinder (23) also in said housing, serving to disengage said disc plate by way of said linkage; and a two-position hydraulic control valve (24) responsive to the position of said steering gear, connected by way of ducting (12, 13; 23/24) to the working spaces of said steering gear and to said cylinder, for normally blocking fluid flow to said cylinder, being movable to a position to introduce the fluid flow to said cylinder by an increase in the pressure in said working spaces.

4,109,930

TOWING DEVICE FOR MOTOR VEHICLES

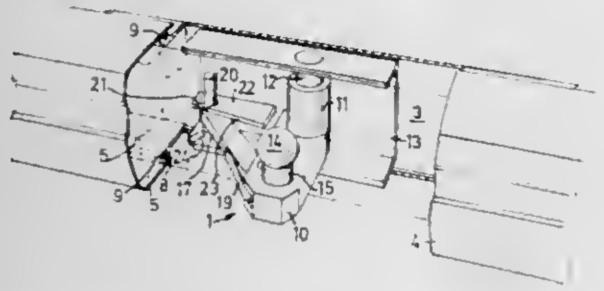
Stig Tore Lennart Pilhall, Trollhättan, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed May 4, 1976, Ser. No. 683,030

Claims priority, application Sweden, May 6, 1975, 7505233

Int. Cl.² B60D *1/06*

U.S. Cl. 280—491 B **4 Claims**



1. In combination a towing device and a rear bumper for vehicles, said bumper comprising a rigid beam attached to the vehicle and a soft, elongated energy-absorbing member attached to a rearwardly facing side of the rigid beam, said energy-absorbing member being formed with a storage space having a cover which is movable to uncover said storage space, said towing device comprising an upwardly-directed ball-shaped portion attached to one end of a towbar whose opposite end is pivotably connected to a mounting means attached to said rigid beam within said storage space in such a manner that the towbar is pivotable between an uncovered backwardly-directed towing position in which the ball-shaped portion is positioned completely outside said storage space, and a covered side-directed storage position within said storage space, and a locking arm pivotably journalled at one end in one of said towbar and said rigid beam for swinging movement around a vertical axle, said locking arm at the other end having a locking member that removably engages in means connected to the other of said towbar and said rigid beam so as to provide a rigid connection between the rigid beam and the towbar when the towbar is in said towing position.

4,109,931

SKI BRAKE

Hans Woitschätzke, Grunwald, and Heanoch Geyer, Munich, both of Fed. Rep. of Germany, assignors to Trak Sportartikel GmbH, Grunwald, Fed. Rep. of Germany

Filed Oct. 27, 1976, Ser. No. 735,984

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548667

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **2 Claims**

1. A ski braking means for a ski having a running surface, an upper surface, and a body, said body having a recess, said ski braking means comprising:

two downwardly extending braking bolts positioned and guided in said recess,

said bolts, when no load is applied by a foot through a boot, protruding from the plane of said ski running surface, and, upon application of a load by a foot through a boot, lying substantially within said recess of said ski body, said ski braking means further comprising:

a pair of posts extending transversely in said recess and connected to said ski body,

a pair of connecting arms extending longitudinally of said ski in said recess,

said arms being respectively pivotable about said posts,

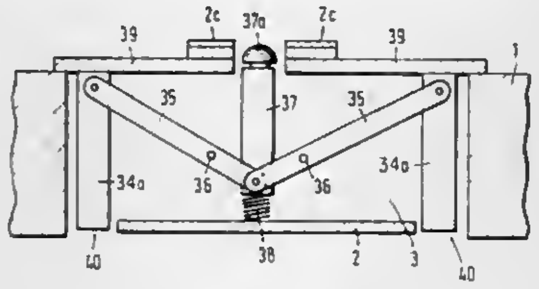
a thrust bolt extending upwardly within said recess, and

a spring positioned to bias said thrust bolt upwardly,

said ski upper surface having an opening therethrough communicating with said recess for permitting said thrust bolt to extend above said ski upper surface for contacting a boot, whereby a load applied by a foot through said boot will depress said thrust bolt against the bias of said spring,

each of said arms being pivotally connected to said thrust bolt at one end of each of said arms and being connected to a respective said braking bolt at the opposite end of each said arms,

said running surface of said ski having at least two openings therethrough for permitting said braking bolts to extend below said ski running surface when no load is applied downwardly on said thrust bolt whereby said spring moves said thrust bolt upwardly, thereby pulling up the ends of said arms connected to said thrust bolt and causing said arms to pivot about said posts and, because said arms are connected to said braking bolts, to drive said braking bolts through said openings in said ski running surface.



4,109,932

SKI BINDING OF THE TOE BINDING TYPE

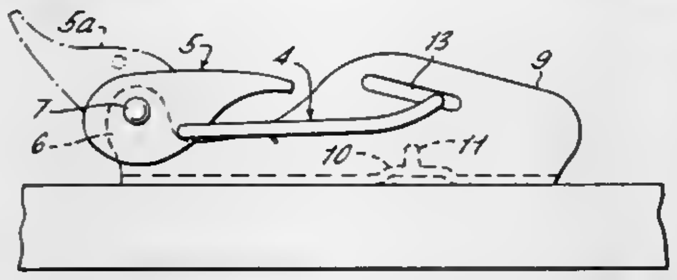
Bror With, Oslo, Norway, assignor to Witco A/S, Oslo, Norway

Filed Apr. 4, 1977, Ser. No. 784,646

Claims priority, application Norway, Apr. 6, 1976, 761171; Nov. 15, 1976, 763895

Int. Cl.² A63C *9/10*

U.S. Cl. 280—615 **7 Claims**



1. A ski binding for fastening to a ski a ski boot having an upper boot portion and a lower frontal sole portion extending ahead of said upper portion, including in combination:

a toe iron positioned on the ski and adapted to receive the ski boot and having forwardly converging lateral lugs thereon, said toe iron including a base plate adapted to engage the frontal sole portion of the boot and each of said lateral lugs formed with an inclined slotted opening therein positioned ahead of the upper boot portion to be fastened to the ski,

arresting means engageable with the sole portion of the ski boot to prevent the boot from being longitudinally retracted from the ski binding,

a toggle lever mounted to a fixed support positioned on the ski for cooperating with said toe iron, said toggle lever being pivotally movable in a vertical longitudinal plane between a clamping position and an open position, and

a clamping bail cooperating with said toggle lever and movable thereby, said clamping bail including a rear transverse portion extending through said inclined slotted opening in each of said lateral lugs and engageable with the upper surface of the frontal sole portion of the boot when the ski boot is inserted into the toe iron and said toggle lever is pivotally moved to the clamping position, a frontal transverse portion pivotally engageable with said toggle lever and leg portions interconnecting said rear transverse portion with said frontal transverse portion, with one of said transverse portions being interrupted between its ends.

4,109,933

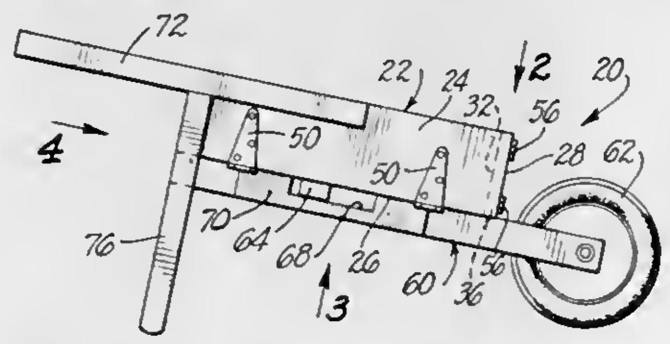
FOLDING WHEELBARROWS

Edward D. O'Brian, 910 Iroquois, Anaheim, Calif. 92801, and William M. Plachy, 3353 San Marcos Blvd., San Marcos, Calif. 92069

Filed Apr. 12, 1977, Ser. No. 786,833

Int. Cl. B62b *1/20*

U.S. Cl. 280—653 **10 Claims**



1. A wheelbarrow having a body, a wheel support, a wheel and handle means,

said body including a bottom wall having front and rear ends and side edges, side walls extending upwardly from said side edges of said bottom wall, a front wall extending upwardly from said front end of said bottom wall and extending between said side walls,

said wheel support being attached to said body so as to extend to the front of said body, said wheel being rotatably mounted on said wheel support, said handle means being attached to said body so as to extend to the rear of said body

in which the improvement comprises:

said bottom wall including at least two identical bottom wall panels having adjacent edges which are located next to one another between said side edges of said bottom wall,

said front wall comprising at least two identical front wall panels having adjacent edges located next to one another between said side edges of said front wall,

a plurality of separate hinge means connecting said panels of said bottom wall to one another, connecting said panels of said bottom wall to said side walls and connecting said side walls to said panels of said front wall and connecting said panels of said front wall together,

said separate hinge means being located with respect to each other and said panels being dimensioned so as to permit Sarrus motion of said panels of said bottom and front walls and said side walls so that said body may be manipulated from a normal position into a folded position in which said side walls are located adjacent to one another, and

manually operable latched means for securing parts connected by at least one of said hinge means against folding so as to prevent said body from being folded from said normal position into said folded position.

4,109,934

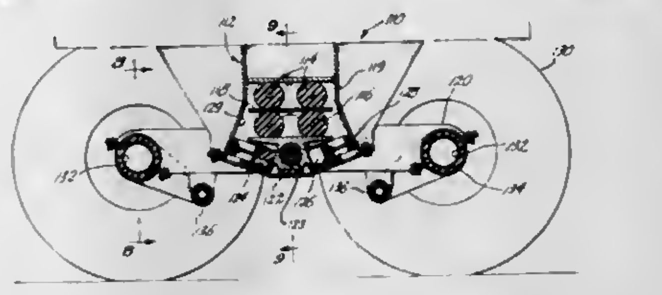
SELF-CONTAINED FRICTIONALLY DAMPED RESILIENT SUSPENSION SYSTEM

Hamilton Neil King Paton, 2521 W. Montlake Pl. East, Seattle, Wash. 98112; John B. Skilling, 3000 Webster Point Rd., Wash. 98105, and Frank F. Smith, Albuquerque, N. Mex., assignors to Hamilton Neil King Paton and John B. Skilling, both of Seattle, Wash.

Continuation-in-part of Ser. No. 457,425, Apr. 3, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,995

Int. Cl.² B60G *11/24*

U.S. Cl. 280—716 **3 Claims**



1. A rubber tired vehicle suspension for transmitting a load between an axle and a body of a rubber tired vehicle, which suspension comprises load bearing spring means comprising at least one resilient rod spring composed of an elongated body of elastomeric material having an elliptical cross-section and opposed elongated longitudinal load bearing surfaces; and mounting means for attachment between the body and axle of a rubber tired vehicle, said mounting means carrying said rod spring in a position such that load bearing compressive forces only are transmitted to said load bearing surfaces transversely of the rod spring longitudinal axis with respect to said mounting means, while simultaneously therewith permitting the unloaded rod spring surfaces to bulge freely.

4,109,935

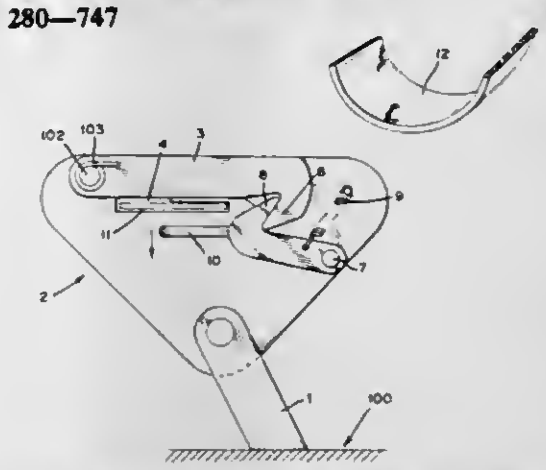
FLAP BUCKLE

Per Olof Weman, Hasloh, Fed. Rep. of Germany, assignor to Sigmatex, A.G., Geneva, Switzerland

Continuation of Ser. No. 589,990, Jun. 24, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,211

Int. Cl.² A44B *13/02;* A47C *31/00*

U.S. Cl. 280—747 **4 Claims**



1. A buckle for holding a vehicle seat belt comprising:

a. means connected to a floor of said vehicle for providing rigid support to the buckle at one end;

b. clasp means pivotally mounted at one of its terminal ends to one side of said buckle forming with said buckle a slot with a bottom edge, and located at the opposite end and having a structural configuration to receive the width of the belt, said clasp means, in closed position, extending laterally across said opposite buckle end and terminating at its opposite terminal end by a hook means directed generally toward said one end of said buckle;

c. means for biasing said clasp means to a predetermined open position;

d. said slot being open at one end to permit entrance of the belt into the structural configuration of the slot;

e. said hook means being connected to said clasp means for pivotal movement therewith to a position adjacent to the open end of the slot;

f. catch means pivotally mounted at one of its ends to the other side of said buckle for engaging said hook means when said clasp is moved to a locking position to retain the webbing said catch means being a generally elongated member extending laterally across said buckle between said clasp means and the said one end of said buckle, an intermediate portion thereof having a catch shoulder extending toward said hook means, and the engagement between said hook shoulder and said catch means being adjacent to said slot;

g. push button release means connected to said catch means at its other end for releasing said hook means from said catch means on depression of said push button means;

h. biasing means urging said push button means to its non-depression position; and

i. said push button means located below said clasp means and retained belt between said bottom edge of said slot and said one end of said buckle and positioned so that motion depressing it is substantially perpendicular to the vehicle floor.

4,109,936

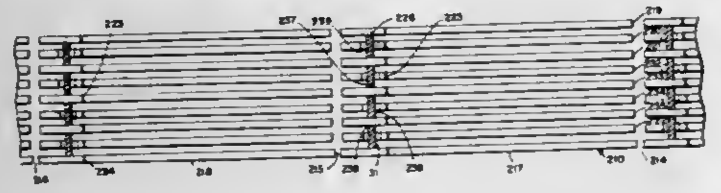
METHOD OF PRODUCING FORM SUITABLE FOR AIRLINE TICKETING

Donald J. Steldinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 453,556, Mar. 21, 1974, abandoned, which is a continuation of Ser. No. 374,274, Jun. 27, 1973, abandoned. This application Jun. 28, 1974, Ser. No. 483,952

Int. Cl.^{2} B41L *1/12, 1/26*

U.S. Cl. 282—11.5 A **3 Claims**



1. A method of producing forms suitable for airline ticketing comprising:

continuously advancing a bottom continuous web equipped with margins along the longitudinal edges thereof and having control openings in said margins,

superposing at least one narrow continuous web on said first web between the margins thereof,

superposing a top continuous web on the uppermost of said narrow webs,

adhering said webs together at equally longitudinally spaced apart areas,

each of said webs being equipped with register openings between said margins and generally in said adhering areas, said webs being simultaneously advanced with said register openings positively aligned, at least some of said webs prior to advancement being printed, equipped with lines of perforation and carbon coating and punched for register openings,

and slitting all of said webs simultaneously along continuous straight transverse lines between said margins and adjacent said adhering areas whereby said superposed webs are suited for zigzag folding and thereafter simultaneous printing of ticket information thereon and ultimate separation into discrete tickets between said slits after slit removal of said margins, at least said narrower and top webs being transversely perforated along lines adjacent said slits but spaced therefrom sufficiently to accommodate an adhering area between each set of a slit and its associated transverse line of perforation to provide a stub.

4,109,937

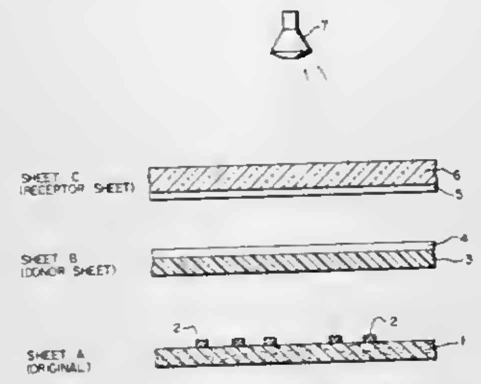
DONOR SHEET FOR THERMOGRAPHIC IMAGING PROCESS

Morgan E. Gager, Warwick, R.I., assignor to Trans World Technology Laboratories, Inc. (TWT Labs Inc.), Fiskeville, R.I.

Filed Jan. 30, 1976, Ser. No. 653,955

Int. Cl.^{2} B41L *1/20;* **B41M** *5/18;* **G03C** *5/16*

U.S. Cl. 282—27.5 **22 Claims**



11. An infrared radiation transmitting assembly for producing an imaged transparency corresponding to an imaged original sheet in a thermographic process, which comprises an acid donor sheet and a receptor sheet which is receptive to the acid in said donor sheet and reactive therewith to form colored images corresponding to the images on the original sheet, said acid donor sheet comprising a substrate sheet material which is transparent to infrared radiation having a coating thereon comprising an organic acid having a pK_a of from 2 to 5 and which is volatilizable at thermal imaging temperatures of up to about 175° C., a fatty acid additive having from 10 to 26 carbon atoms or a metal salt thereof, and a polymeric binder for said organic acid, and said receptor sheet comprising a clear, infrared-transmitting plastic film carrying a coating comprising a substantially colorless acid-sensitive dye precursor which develops an intense color upon reaction with said acid.

4,109,938

SYSTEM FOR ARRANGING AND RETRIEVING INFORMATION

James A. H. Mitchell, London, and Edward J. Day, Kingston Surry, both of England, assignors to Mitchell Beazley Encyclopedias, Ltd., London, England

Filed Sep. 25, 1975, Ser. No. 616,865

Int. Cl.^{2} B42F *21/00*

U.S. Cl. 283—43 **10 Claims**

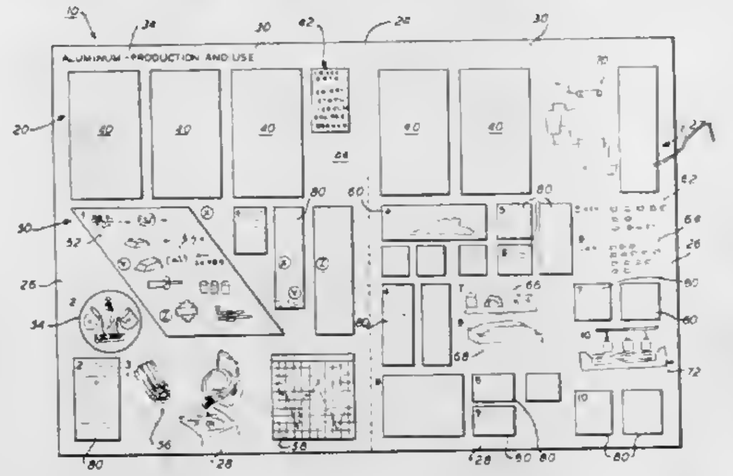
1. An information system comprising:

(a) first information means consisting of a plurality of graphic displays each concerning a particular selected subject:

(b) each of said graphic displays including a main word text and a pictorialized description each sufficient to describe its particular related subject with reference to the other and each disposed in a separate and distinct location within its graphic display;

(c) each pictorialized description including a key illustration and a plurality of ancillary illustrations arranged in a sequence; and

(d) second information means constituting a graphic arrangement of alphabetically set out word descriptions of a plurality of selected topics and a reproduction of a selected illustration from said graphic displays of said first information means, such illustrations pertaining to said topics; wherein each such graphic display includes ancillary word text related to said key illustration and ancillary illustrations, displayed in close proximity to its respective illustration and arranged in numbered sequence corresponding thereto, and wherein each illustration reproduced in said graphic arrangement of said second information means includes a reference to its respective topic as described in said second information means, and a reference to the graphic display in said first information means from which the illustration was taken, and wherein one of said graphic displays includes a reference to a selected topic of said second information means which is pertinent to the information of the adjacent graphic display, and wherein another of said graphic displays includes listings including references to other selected grahic displays of said first information means which are pertinent to the information of the respective adjacent graphic display.



4,109,939

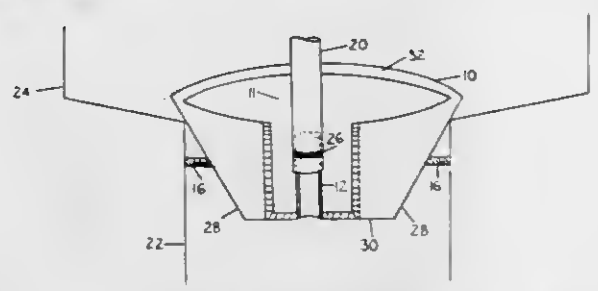
DEVICE FOR ATTACHING A FLUID CARRYING HOSE TO A RECEPTACLE DRAIN

Richard Steven Roberts, 1039-66th St., Brooklyn, N.Y. 11219

Filed May 28, 1976, Ser. No. 690,966

Int. Cl.^{2} F16L *55/00*

U.S. Cl. 285—8 **5 Claims**



1. A device for retaining and fixing a fluid carrying hose to the drain of a sink receptacle which comprises:

(a) a cup shaped frame having side walls and a floor connected thereto, a plurality of drain holes in the floor, a hollow pipe portion through the floor; and

(b) a plurality of manually turnable screws for holding said frame in said drain which protrude through holes in the frame side walls and are capable of forming a frictional adhesion with the inside of the sink drain walls; and

(c) an adjustable band clamp capable of fixing a fluid carrying hose around the pipe portion.

4,109,940

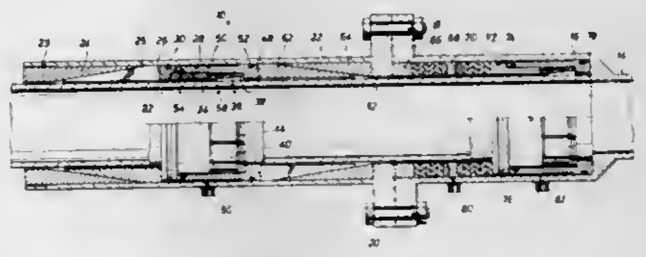
COUPLING APPARATUS

Bobby J. Reneau, Rte. 11, Box 380-B, Houston, Tex. 77039

Filed Jan. 27, 1975, Ser. No. 544,051

Int. Cl.^{2} F16L *35/00*

U.S. Cl. 285—18 **10 Claims**



1. A pipe coupling device for leak-proof connection of two pipes comprising

a tubular sleeve adapted to be telescoped about a first pipe which extends into said sleeve;

an expandable pipe gripping means within said sleeve for selectively gripping the first pipe therein;

a housing which is connected to said sleeve and receives the first pipe therein, said housing incorporating an opening adapted to be connected into a second pipe and which pipe is to be connected to the first pipe;

an encircling fluid seal means within said housing having an outer surface which seals against said housing and an inner surface which seals against the outer surface of the first pipe on its insertion into said seal means;

first means for actuating said gripping means to grip the first pipe to hold said sleeve relative to the pipe; and wherein said pipe gripping means and said first means include

a pair of fluid actuated movable pistons;

a chamber means for said pistons which is adapted to receive fluid under pressure to force said pistons apart;

a pair of oppositely facing slips and co-acting tapered surfaces for wedging said slips toward the first pipe to grip and hold the first pipe, said slips working against each other to hold said tubular sleeve relative to the first pipe; and,

means for securing and holding said pistons apart after movement and,

second means for actuating said fluid seal means to sealing operation.

4,109,941

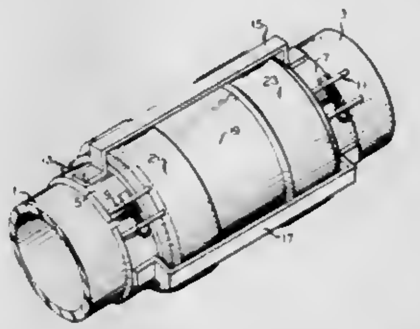
COUPLING FOR PLASTIC PIPE

Roy F. Wood, and Ralph A. Wynne, both of Dallas, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 8, 1976, Ser. No. 693,981

Int. Cl.^{2} F16L *17/04, 19/08*

U.S. Cl. 285—111 **6 Claims**



1. An apparatus for connecting conduits of equal external dimensions aligned end-to-end comprising:

(a) a first section of tubing of internal dimensions to slide over juxtaposed conduits of equal external dimensions at the juxtaposition of the conduits, said first section of tubing having two grooves, one spaced from each end of the internal surface of the section;

(b) resilient gasket material for encircling said conduits and substantially filling said two grooves;

(c) encasing tubing overlying said first section of tubing at least surrounding each of said grooves; and

(d) a pair of split metal clamping rings, each ring comprising as a clamping surface on its inner surface a plurality of interspaced grooves adapted to receive the deformed surface of a conduit compressed by the clamping ring positioned with one ring adjacent each end of said first tubular section with spacer bars joining said clamping rings, said spacer bars fitting over the encasing tubing in relation to apply pressure on the encasing tubing with the split rings in clamped position.

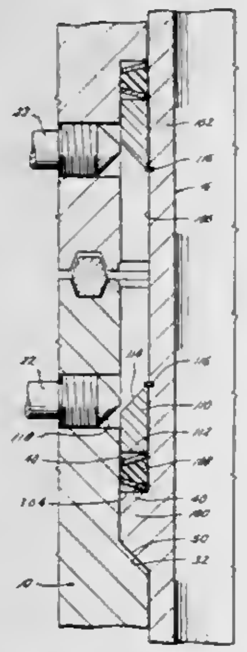
4,109,942
SEAL

Charles Donovan Morrill, Bellaire, Tex., assignor to McEvoy Oilfield Equipment Company, Houston, Tex.

Division of Ser. No. 611,860, Sep. 10, 1975, Pat. No. 4,056,272, which is a continuation-in-part of Ser. No. 447,141, Mar. 1, 1974, abandoned. This application Apr. 7, 1977, Ser. No. 785,435

Int. Cl.² E21B *9/10*

U.S. Cl. 285—140 **14 Claims**



1. In a wellhead sealing structure comprising two members having opposed adjacent substantially parallel frusto-conical surfaces, said surfaces being movable from a spaced-apart non-sealable position to a closer spaced-apart sealable position, inner and outer confining sealing surfaces positioned to enclose a space between the frusto-conical surfaces, and an annular resilient frusto-conical gasket between said surfaces and tapering in the same direction as the frusto-conical surfaces, but having a smaller cone angle whereby when the frusto-conical surfaces are in the non-sealable position the inner periphery of said gasket bears against one frusto-conical surface and the outer periphery bears against the other, and in which, upon movement of said frusto-conical surfaces to said sealable position the gasket is deformed to conform to the cone angle of said frusto-conical surfaces and sealingly engages the inner and outer confining sealing surfaces, the improvement wherein said inner and outer confining sealing surfaces are substantially vertical.

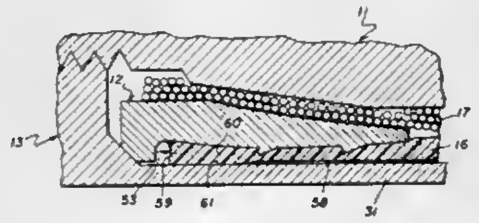
4,109,943
HOSE FITTING ASSEMBLY

Horise M. Cooke, Weatherford, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Continuation of Ser. No. 712,785, Aug. 9, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,596

Int. Cl.² F16L *39/02*

U.S. Cl. 285—149 **4 Claims**



1. A field attachable fitting for use with a hose having an inner tube and an outer wire reinforcement, the hose and fitting being adapted to conduct a fluid under pressure, comprising a nipple including a tubular portion, an annular sleeve positioned coaxially with and around said tubular portion and including an insert portion, said tubular portion and said insert portion being radially spaced and forming a pocket therebetween, a socket positioned around said tubular portion and said sleeve, said socket being threadedly connected to said nipple, said fitting having a rearward end where said socket threadedly connects with said nipple and a forward end where the hose extends into said fitting, said socket and said insert portion having closely adjacent tapered surfaces, and said annular sleeve being made of a material which is permanently deformable under the pressure exerted by said socket during assembly, said insert portion being adapted to be positioned between said inner tube and said reinforcement whereby the end portion of said inner tube is received in said pocket and the end portion of said wire reinforcement extends between and is gripped by said tapered surfaces, the radial width of said pocket being slightly less than the normal thickness of said inner tube, whereby said end portion of said inner tube is placed under initial compression, said tapered surface of said insert portion extending from approximately the forward end of said sleeve to an annular break line located substantially midway along the length of said sleeve, the planes of said tapered surfaces converging in the direction of movement of said socket as said socket is threaded onto said nipple, said tapered surface of said socket overlying said break line and applying a highly compressive force through said reinforcement on said break line during the time that said socket is tightened onto said nipple, said force on said insert portion being sufficient to permanently deform the break line area of said insert portion radially inwardly and to reduce said radial width of said pocket as said socket is threaded onto said nipple and to place said end portion of said tube under higher compression, said area being displaced from the inner end of said pocket and the cross-sectional area of said pocket gradually reducing in the direction from said inner end toward said area, whereby any fluid under pressure entering said inner end of said pocket forces said end portion of said tube toward said reduced cross-sectional area, and said end portion is pressed against and forms a seal with both said tubular portion and said insert portion.

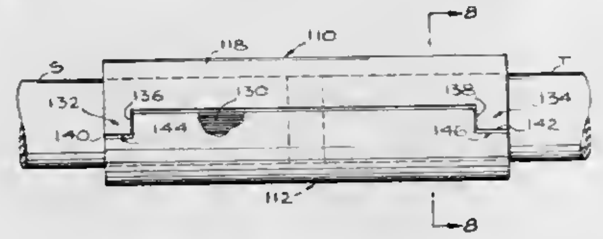
4,109,944
PIPE COUPLING

Hoyt S. Curtin, 3706 Capstan Cir., Westlake, Calif. 91361

Continuation-in-part of Ser. No. 537,093, Dec. 30, 1974, Pat. No. 3,971,574, which is a continuation-in-part of Ser. No. 329,727, Feb. 5, 1973, Pat. No. 3,857,588. This application Jun. 14, 1976, Ser. No. 695,462

Int. Cl.² F16L *13/10, 47/02*

U.S. Cl. 285—373 **7 Claims**



1. A device suitable for being adhered directly to first and second pipes of predetermined diameter having open ends spaced by less than a predetermined distance to form a water tight seal therebetween, said device comprising:

first and second pipe sections each comprised of a substantially semi-cylindrically shaped wall having first and second longitudinal edges and an outer circumferential surface extending from said first edge to a first shoulder extending parallel to and spaced from said second edge and an inner circumferential surface for adhesion directly to said pipes extending from said second edge to a second shoulder extending parallel to and spaced from said first edge, said wall being of substantially uniform thickness between said first and second shoulders and of reduced thickness between said first shoulder and said second edge and between said second shoulder and said first edge;

each of said pipe sections further including at least two longitudinally spaced lugs formed integral with said wall and extending circumferentially beyond one of the longitudinal edges thereof, and at least two notches formed in said wall extending circumferentially inwardly from the other longitudinal edge thereof;

said lugs and notches being longitudinally aligned whereby said first and second pipe sections can be mated to one another and around said pipes with the lugs of each section received in the notches of the other section and with the reduced thickness wall portions of each section overlapping the reduced thickness wall portions of the other section, the degree of overlapping being dependent upon the extent to which the diameters of said pipes differ from said predetermined diameter, each of said lugs having a mating surface projecting circumferentially beyond the longitudinal edge from which the lug extends and each of said notches having a mating surface projecting circumferentially inwardly from the longitudinal edge from which the notch extends, said lug and notch mating surfaces being oriented so as to remain substantially in contact with one another for varying degrees of said overlapping whereby said mating surfaces can be adhered to one another.

4,109,945
APPARATUS FOR CONNECTING TOGETHER FLOWLINE END PORTIONS

Lother L. Manchester, 810 Woodstock, Bellaire, Tex. 77401, and Bobby J. Reneau, 15527 Morales, Houston, Tex. 77032

Filed Feb. 7, 1977, Ser. No. 765,940

Int. Cl.² F16L *21/04*

U.S. Cl. 285—323 **15 Claims**

1. Grip-seal apparatus for connecting first and second flowline members for fluid flow therethrough, comprising:

a first housing having a bore therethrough for receiving a first flowline member;

a second housing having a bore therethrough adapted for partly receiving such first flowline member extending through said first housing section bore;

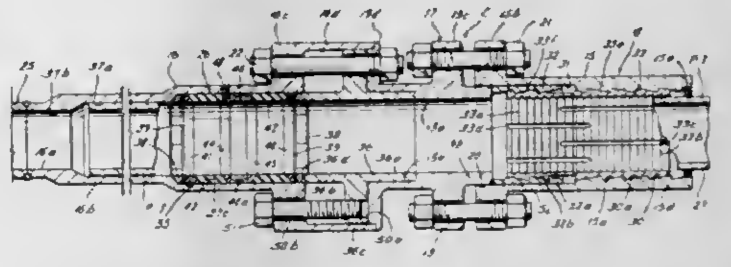
housing interconnection means for attachment to said first and second housings to interconnect same;

gripper means mounted in said first housing bore for moving radially inwardly into gripping engagement with such first flowline member simultaneously with connection of said housing interconnection means to said first housing;

sealing means mounted in said second housing bore for movement radially inwardly into sealing engagement with said first flowline member, said sealing means includes:

a resilient annular sealing assembly mounted in said second housing section bore adapted for receiving said first flowline member;

a sealing assembly activating sleeve mounted in said second housing bore for movement longitudinally into engagement with said sealing assembly for urging said sealing assembly into sealing engagement with said first flowline member;



said second housing including second housing connector means for connecting said second housing section to a second flowline member in order to establish fluid flow between said first and second flowline member; and

said housing interconnection means including an intermediate housing section having a bore therethrough and being mounted between said first and second housings and including a first housing section connection means for connecting said first housing section with said intermediate housing section and a second housing section connection means for connecting said second housing section with said intermediate housing section, said intermediate housing section including means mounted in operative engagement with said gripper means and for longitudinal movement in said first housing bore in response to said first housing connection means connecting said first housing and intermediate housing section together, said gripper means moving radially inwardly into gripping engagement with such first flowline member in response to connection of said intermediate housing section and said first housing.

4,109,946
MACRAME STAND

Edward Lee Williams, 965 Avenue of the Pines, Grenada, Miss. 38901

Filed Feb. 14, 1977, Ser. No. 768,269

Int. Cl.² B65H *69/04;* **D04G** *5/00*

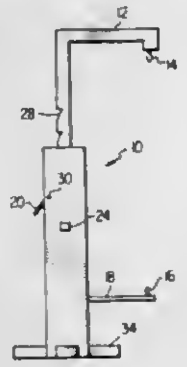
U.S. Cl. 289—18 **10 Claims**

1. A stand for use in macrame wherein said stand comprises:

a first vertical member;

a second vertical member disposed partly within said first vertical member and vertically adjustable relative thereto, said second member having a horizontally extending portion adapted to secure macrame thereto; and

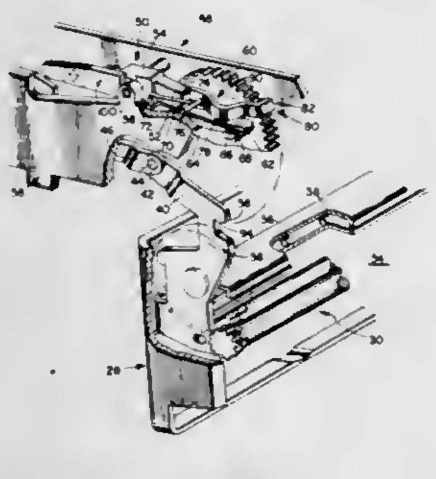
a horizontally extending member secured to said first vertical member and adapted to secure macrame thereto, said horizontally extending member and the horizontally ex-



tending portion of said second member being generally horizontal and extending in the same direction.

4,109,947
LATCH ASSEMBLY FOR FILM LOADING DOOR

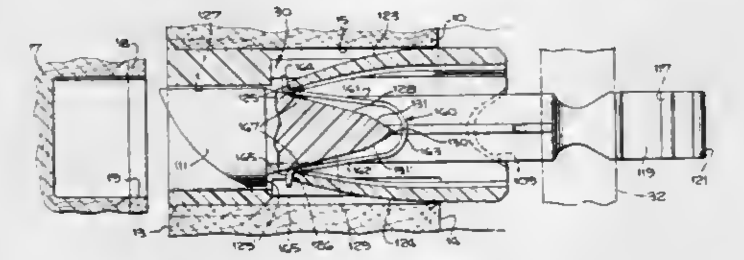
Robert D. Leduc, Marlborough, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed May 2, 1977, Ser. No. 793,075
Int. Cl.² E05C *19/02*
U.S. Cl. 292—76 **4 Claims**



1. Photographic apparatus comprising:
- a housing including means for defining a chamber having an opening through which an object is adapted to be inserted;
- a door coupled to said housing for movement in a first plane between a first position wherein said door is in closed relation with said opening and a second position wherein said door is in open relation with said opening such that the object may be inserted into said chamber via said opening;
- a latch assembly actuator;
- a latch assembly for securing said door in said first position, said latch assembly including first means mounted on said housing and including a surface being inclined in first and second directions relative to said first plane, and second means mounted on said door so as to be in latching engagement with each other when said door is in said first position thereby latching said door to said housing in closing relation to said opening, said first means being movable out of latching engagement with said second means in response to manual actuation of said latch assembly actuator to permit movement of said door toward said second position, and said second means being movable out of latching engagement with said first means when a predetermined force is exerted upon said door during an attempt to move said door out of said first position and toward said second position prior to manually actuating said latch assembly actuator by camming said surface so as to move said first means in a plane which defines an angle with said first plane thereby preventing damage to said latch assembly or said door; and
- means for resiliently urging said first means into latching engagement with said second means when said door is in said first position.

4,109,948
PLASTIC LATCH BOLT FOR DOOR LOCK

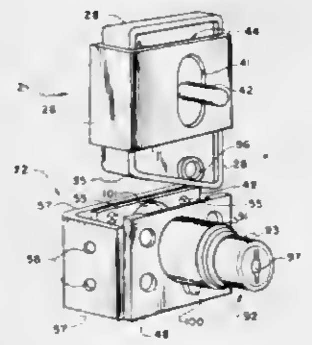
Dennis G. Potter; Hagen Dietrich, both of Delta, and Joseph Potschka, Vancouver, all of Canada, assignors to Norris Industries, South Gate, Calif.
Continuation-in-part of Ser. No. 712,898, Aug. 9, 1976, abandoned. This application Aug. 9, 1976, Ser. No. 712,896
Int. Cl.² E05B *3/08;* E05C *1/12*
U.S. Cl. 292—169.15 **13 Claims**



1. A latch bolt sub-assembly for operation with a spindle having edge means rotatable about an axis of rotation, said sub-assembly comprising a tubular case member of synthetic plastic resin material having an outwardly facing opening, an inwardly facing opening, and a cylindrical guide bore therethrough between said openings, and a latch bolt member having a shaft slidably mounted in said case member, said shaft having roll back means at one end for engagement by the spindle and a latch bolt head at the other end, said latch bolt member comprising a cam track having an incline relative to the long axis of the latch bolt member extending from the bolt head radially inwardly toward the long axis of the latch bolt member, said tubular case member having resilient finger means comprising a cut out portion of the wall of said case member with one end anchored and an opposite free end extending toward said outwardly facing opening and biased normally into the interior of said case member and in sliding engagement with said cam track, whereby to provide a resilient force acting in a direction urging said shaft to an extended position.

4,109,949
EXTERNALLY MOUNTABLE, HIGH STRENGTH, SECURITY LOCK FOR DOORS AND THE LIKE

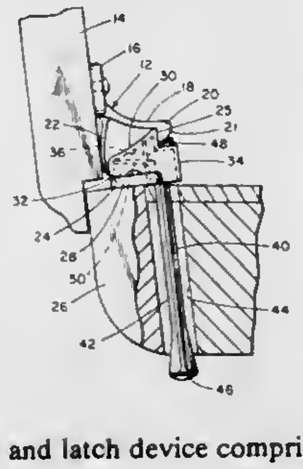
Donald V. Smith, 101 Conastoga Dr. #74, Carson City, Nev. 89701
Continuation-in-part of Ser. No. 640,885, Dec. 15, 1975, abandoned, which is a continuation of Ser. No. 487,997, Jul. 12, 1974, Pat. No. 3,938,836. This application Apr. 7, 1977, Ser. No. 785,553
Int. Cl.² E05C *1/10;* E05B *65/06*
U.S. Cl. 292—189 **6 Claims**



1. A reversibly mountable, gravity biased, security lock for external attachment to a right or left opening door or the like in order to enable securement of said door to a door frame, said security lock including a bolt assembly having bolt assembly mounting means formed for mounting said bolt assembly to one of said door and said door frame and having a bolt member mounted thereto for movement to and from a latched and an unlatched position, and a latch assembly having latch assembly mounting means formed for mounting said latch assembly to a remainder of said door and said door frame proximate said bolt assembly, said bolt member being formed with a tapered lower surface and being formed for removal from said bolt assembly and remounting therein with said tapered lower surface in a reversed position, wherein the improvement in said security lock is comprised of:
- said latch assembly is formed with a pair of striker plate surfaces positioned on oppositely facing sides of said latch assembly;
- said latch assembly mounting means is formed for mounting of said latch assembly proximate a right and a left opening door with one of said striker plate surfaces positioned for cooperative engagement with said tapered lower surface of said bolt member;
- said bolt member being mounted in said bolt assembly for automatic, unimpeded, upward displacement of said bolt member upon engagement of said tapered lower surface with one of said striker plate surfaces as said door is moved to a closed position and for automatic gravity biased downward displacement of said bolt member to said latched position to effect latching of said bolt member with said latch assembly when said bolt member passes beyond said one of said striker plate surfaces;
- lock means formed and mounted to said latch assembly for selective locking of said bolt member directly to said latch assembly in said latched position; and
- said bolt assembly, latch assembly, bolt assembly mounting means and latch assembly mounting means being formed to prevent removal of said bolt assembly and said latch assembly from said door and door frame when said bolt member is locked to said latch assembly.

4,109,950
DOOR OPENER AND LATCH

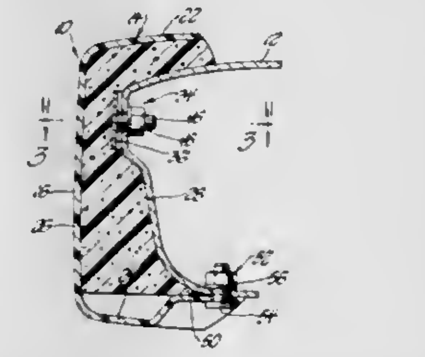
Dagfinn O. Amdal, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Jan. 31, 1977, Ser. No. 763,827
Int. Cl.² E05C *13/00*
U.S. Cl. 292—254 **6 Claims**



1. A door opener and latch device comprising, in combination:
- a unitary, flexible latch bolt for attachment to a door panel,
- a strike for attachment to a frame, and
- a semi-concealed plunger member for mounting in the frame with the strike and for engaging and operating the bolt, said bolt including a first flexible arm projecting substantially transverse to the plane of the panel, said arm including a strike engaging projection biased in a first sense by the flexible arm into locking engagement with the strike when the panel is in a closed position on the frame, said strike being affixed to the frame to receive the projection, and said plunger including a first manual actuation end projecting on the outside of the frame and a second projection engaging portion on the inside of the frame, said plunger being mounted on the strike for reciprocal movement of the projection engaging portion into and out of engagement with the projection, said projection being disengaged from the strike by manual movement of the plunger to release the projection from the strike against the biasing force of the flexible arm by displacing the projecting from the strike, the biasing force of the flexible arm thereby providing a spring force which substantially simultaneously displaces the projection in the first sense from the strike and separates the panel from the frame, said plunger including a flexible biasing arm integrally molded with the plunger, said flexible biasing arm engaging the strike and continuously biasing the plunger toward the position out of engagement with the bolt.

4,109,951
LIGHTWEIGHT BUMPER GUARDS

Peter A. Weller, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.
Filed Aug. 18, 1977, Ser. No. 825,568
Int. Cl.² B60R *19/00*
U.S. Cl. 293—65 **11 Claims**



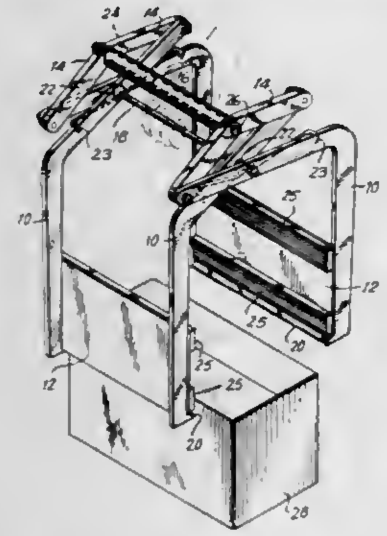
1. A bumper guard assembly for a vehicle bumper comprising; a flexible, decorative outer skin member of predetermined shape including a front wall, side walls and upper and lower walls for defining a cavity opening to the rear of the assembly; a core element located within the cavity of said outer skin member for supporting said outer skin member so that it is not easily collapsible, said core element including a rear surface generally conforms to the exterior of the vehicle bumper and is adapted to engage the vehicle bumper; said outer skin member including integral flanges extending inwardly across the opening of the cavity and overlapping said core element to hold said outer skin member on said core element; and a fastener member for attaching the assembly to a vehicle bumper such that said flanges are captured between said fastener member and the vehicle bumper.

4,109,952
PACKAGE LIFTER

Michel Monzain, 674 White Plains Rd., Scarsdale, N.Y. 10583
Filed Feb. 9, 1977, Ser. No. 767,227
Int. Cl.² B66C *1/30*
U.S. Cl. 294—16 **2 Claims**

1. A tong apparatus employing two laterally spaced pairs of jaw levers having first and second ends, respectively whereby said levers are pivotally connected intermediately of said respective first and second lever ends, cross-members rigidly connecting the levers of said pairs at points below the lever-pivotal connections for pivotal movements in unison, first and second links pivotably connected to one another joining the first ends of the levers of each pair for opening and closing said apparatus, a first handle extending between the connected links at the link pivotal connection, a second handle substantially coextensive with said first handle and extending between, and

connected to said lever-pivotal connections, said apparatus including: gripping means provided on an inner side of each of the cross-members, spring means wrappable around said second handle and having its ends in gripping contact with the jaw levers, respectively, of one of the lever pairs, for urging said jaw levers to occupy a first position causing said second jaw lever ends to be positioned closest to one another, each of said levers being substantially V-shaped and said gripping means being defined by a plurality of metal teeth disposed on each of said cross-members in the vicinity of said second ends of said levers, and a plastic pad having a serrated surface disposed on each of said cross-members remote from second ends of said levers, respectively, said first and second handes being jointly grippable and pullable towards one another for said jaw levers to occupy a second position causing said second lever ends to be positioned furtbest apart from one another, the gripping means being adapted to grip an article interposed between said jaw levers in said second position upon said first and second handles being released from the joint grip.



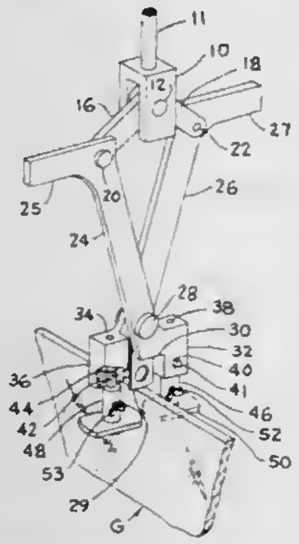
4,109,953
TONGS FOR GRIPPING GLASS SHEETS

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 18, 1977, Ser. No. 788,493

Int. Cl.² B66C *1/48*

U.S. Cl. 294—118 **7 Claims**



1. Self-closing tongs for gripping a glass sheet during thermal processing comprising a pair of tong arms, each tong arm comprising an upper tong arm portion and a lower tong arm portion, means pivotally connecting said tong arms together intermediate said upper tong arm portions and said lower tong arm portions, a pair of glass engaging elements carried by said tongs and movable into glass engaging positions against the opposite major surfaces of said glass sheet when said tongs are freely suspended, each of said glass engaging elements being of modified disc-like configuration comprising a convexly rounded, smoothly surfaced, peripheral portion that moves toward a convexly rounded, smoothly surfaced, peripheral portion of the other glass engaging element of said pair and at least one peripheral portion having a segmental portion missing therefrom, and element supporting means for each said element including pin means about which said element is eccentrically mounted for supporting said glass engaging elements on said tongs in pivotable relation thereto, means to limit the freedom of said pivoting so that said element is supported in such an orientation relative to said tongs so that said convexly rounded peripheral portions of said glass engaging elements oppose one another to engage said gripped glass sheet therebetween and the peripheral portion having said segmental portion missing is out of contact with said gripped glass sheet and means for supporting one of said glass engaging elements in its said orientation relative to one of said lower tong arm portions and means for supporting the other of said glass engaging elements in its said orientation relative to the other of said lower tong arm portions.

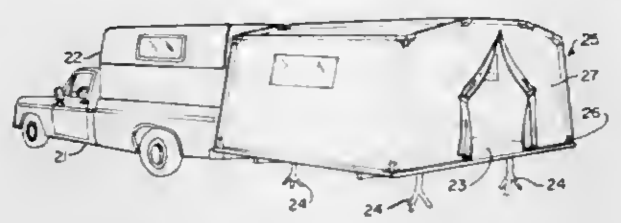
4,109,954
EXPANDABLE CAMPER APPARATUS

Richard E. Wall, 3701 E. Poinsettia Dr., Phoenix, Ariz. 85028

Filed Nov. 24, 1976, Ser. No. 744,731

Int. Cl.² B60P *3/30*

U.S. Cl. 296—23 A **3 Claims**



1. Apparatus for use with a pick-up truck having a pick-up bed, said apparatus including:

(a) a platform constructed and arranged to extend above and parallel to said pick-up bed and having a storage space therebelow and above said pick-up bed;

(b) a foldable floor member constructed and arranged for storage in said storage space in its folded state and being slidably mounted for entry and exit from said storage space from the rear of said pick-up truck;

(c) said foldable floor member comprising three panels, a middle one of said panels having hinges on both of its sides connected and arranged with the others of said panels so that a second of said panels folds flat against said middle panel and the third of said panels folds flat against said second panel on axes in the direction of the long axis of said pick-up bed, all of said panels presenting a flat floor when unfolded; and

(d) tent frame members constructed and arranged for placement upon said foldable floor member and adapted to receive tenting materials when said foldable floor member is in its unfolded state.

4,109,955
GLOVE COMPARTMENT FOR MOTOR VEHICLES

Rolf Amann, Renningen, and Horst Seidl, Boeblingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

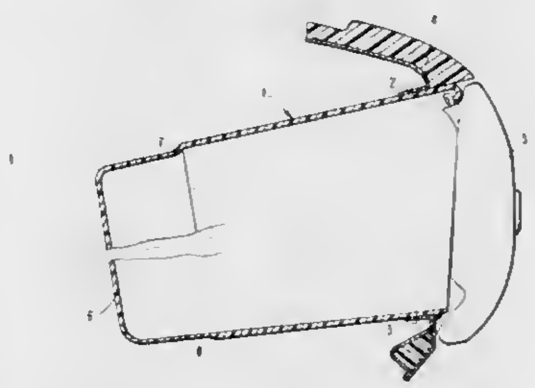
Filed Oct. 28, 1976, Ser. No. 736,493

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549071

Int. Cl.² B60R *5/02*

U.S. Cl. 296—37.1 **14 Claims**

1. A glove compartment for motor vehicles, which comprises a housing means retained within the area of the instrument panel, characterized in that the housing means is provided with at least one circumferential weakening means which effects a reduction of the depth of the housing means in case of a force interaction on the glove compartment directed opposite the driving direction.



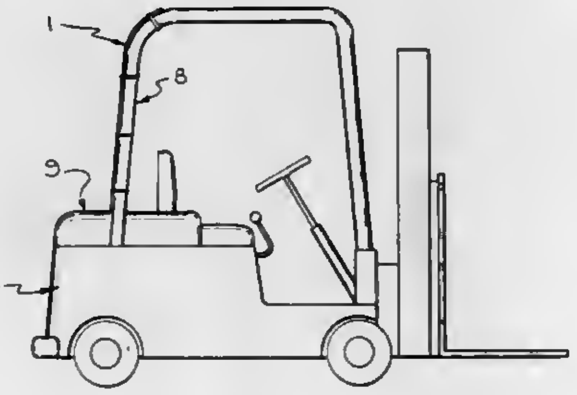
4,109,956
FORKLIFT EXHAUST DEFLECTION SHIELD AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Ronald S. Roman, Novi, Mich., assignor to Faygo Beverages, Inc., Detroit, Mich.

Filed Jun. 4, 1976, Ser. No. 692,922

Int. Cl.² B60J *9/00*

U.S. Cl. 296—78 R **6 Claims**



1. A protection apparatus for a vehicle, comprising, in combination:

a transparent continuous sheet shield which is removably connected to said vehicle;

said vehicle comprising a substantially open forklift truck with inverted U-shaped guard rails disposed thereon and having rearward legs and including a portion for bearing occupants and a rearward portion from which exhaust fumes emanate;

said shield having a width dimension substantially equal to the width dimension of said forklift truck and a height dimension substantially equal to the height dimension of said occupant-bearing portion of said forklift truck;

said transparent shield being removably connected to said forklift truck and being substantially disposed in a vertical plane rearwardly of said occupant-bearing portion and forwardly of said rearward exhaust-emanating portion so as to deflect exhaust gases away from said occupant-bearing portion of said forklift truck;

said shield having its lowermost edge disposed adjacent the engine compartment cover of said forklift truck;

said shield having its uppermost edge disposed adjacent the uppermost rearward portions of said guard rails; and

means for mounting the shield on the guard rails of said forklift truck.

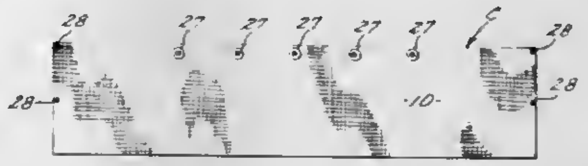
4,109,957
QUICKLY REMOVABLE WINDSHIELD CURTAIN

Joseph R. Polizzi, 5431 Pageantry, Long Beach, Calif. 90808, and Richard K. Hart, 11422 Yearling Cr., Cerritos, Calif. 90701

Filed Jun. 13, 1977, Ser. No. 805,721

Int. Cl.² B62D *25/00*

U.S. Cl. 296—95 C **4 Claims**



1. A quickly removable curtain assembly for covering the inside of a vehicle windshield, and front side windows forwardly of the door jamb posts of said vehicle, said curtain assembly comprising:

an opaque generally rectangular cloth panel having outer dimensions sufficient to cover the interior of said windows and extend rearwardly over the front portion of said door jamb posts;

a plurality of first snap fastener halves secured along the top edges of said panel;

a plurality of second snap fastener halves secured along the rear edges of said panel;

a plurality of suction cups, each supporting a snap fastener half removably engageable with one of said first snap fastener halves, said suction cups being removably applicable to the upper interior surface of said windshield; and

additional snap fastener halves secured to said door jamb posts and removably engageable with one of said second snap fastener halves positioned along the rear edges of said door jamb posts.

4,109,958
MEDICAL TREATMENT CHAIR

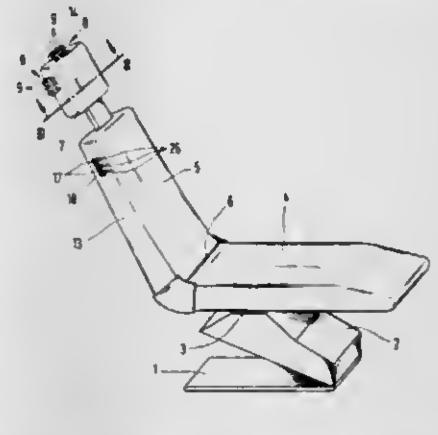
Renato Grupelli, Genoa (Quarto), Italy, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Germany

Filed May 23, 1977, Ser. No. 799,691

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 7617190[U]

Int. Cl.² A47C *1/02*

U.S. Cl. 297—191 **9 Claims**



1. A medical treatment chair with a seating portion and a back portion having a backrest or a backrest with headrest, comprising;

manually actuated switches, located on said back portion, for electrically controlling operation of part of said chair;

a plurality of mounting locations on said back portion having said switches;

chair surface sections enclosing said locations;

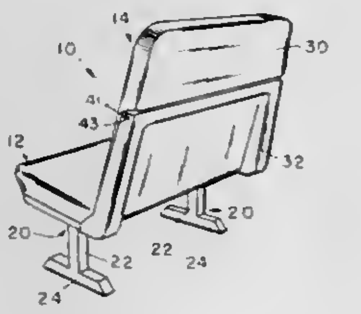
an actuating element located pivotally in each of said switches for movement about a pivot axis between two end switch positions and one neutral switch position between said end positions;

and a convex surface for each actuating element, said convex surface extending outside surface portions surrounding said mounting locations of the switch, said convex surface extending outside a plane containing said pivot axis and parallel to said surface portions.

4,109,959
TRANSPORTATION SEAT WITH ENERGY ABSORPTION

Chester J. Barecki; Donald R. Lewis, both of Grand Rapids, and Terry L. Camp, Hudsonville, all of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Apr. 14, 1977, Ser. No. 787,449
Int. Cl.² B60R ***21/10***
U.S. Cl. 297—216 **18 Claims**



1. An improved transportation device for a vehicle capable of absorbing impact energy during a crash or rapid maneuver to thereby reduce or eliminate the severity of and occurence of injury to a passenger impacting the rear of the device, said device being of the type including a support frame fixedly supported in a position spaced from the floor of the vehicle, the improvement comprising:

an upper rigid frame having a generally U-shaped portion including a front stretcher and parallel side legs extending rearwardly from the ends of said front stretcher;

a rear stretcher extending transversely between said tubular frame side legs;

a slide rod extending between said front stretcher and said rear stretcher;

side uprights joining said side legs adjacent said rear stretcher to define bend areas and connected to a top cross member;

internal, tubular reinforcing members positioned within said side legs and side uprights in the bend areas of said seat frame; and

energy absorption means operatively connecting said upper rigid frame to said support frame for absorbing energy imparted to said upper rigid frame by a passenger impacting the rear of said upper rigid frame, said energy absorption means including:

a guide secured to said support frame and slidably receiving said slide rod of said upper frame; and

resilient means positioned between said support frame and said upper frame for biasing said upper frame in a rearward direction, said resilient means absorbing impact energy as said upper frame slides forward under impact.

4,109,960
LEGLESS ROCKER-RECLINER CHAIR

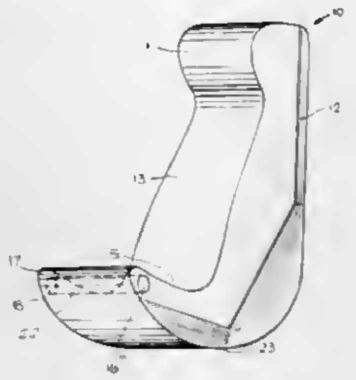
Lawrence M. Stinchfield, 539 Beverly Ave., Paso Robles, Calif. 93446

Continuation-in-part of Ser. No. 746,476, Dec. 1, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,649
Int. Cl.² A47C ***3/02***
U.S. Cl. 297—258 **6 Claims**

1. A legless rocking and reclining chair comprising,

an inner chair surface having a contour for supporting the back and seat of a seated person,

an arcuate outer surface having a length generally coextensive with said inner surface, but spaced apart from the inner surface, and connected thereto forming a closed chair body, said inner and outer chair surfaces having a smooth curvature along the length thereof, said surfaces defined by a generally upright portion generally corresponding in length, width and curvature to the back of a seated person and a smoothly curved seat portion connected to the upright portion corresponding in length, width and curvature to the seat of a seated person, for reclining to an angle such that the back of a seated person may exceed 60° with respect to the vertical,



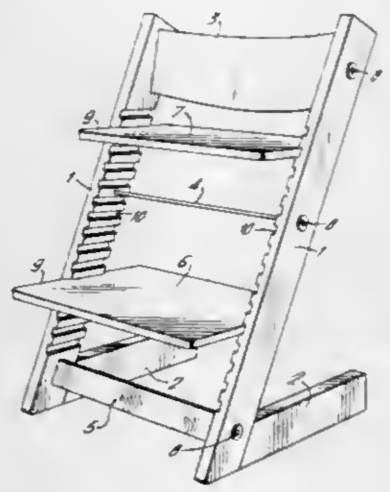
frame means for spacing said inner surface from said outer surface with maximum spacing at opposite sides of the width of the chair surfaces at least in the seat portion, said chair surfaces having a forward section defining a nose and a rearward section defining a chair back, and

balancing means in the nose of said chair body for maintaining said chair in a stable upright position when not in use.

4,109,961
ADJUSTABLE CHAIR

Peter Opsvik, Oslo, Norway, assignor to Stokke Fabrikker A/S, Spjelkavik, Norway

Continuation of Ser. No. 411,654, Nov. 1, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,999
Claims priority, application Norway, Nov. 1, 1972, 3953/72
Int. Cl.² A47C ***3/20, 3/38***
U.S. Cl. 297—338 **4 Claims**

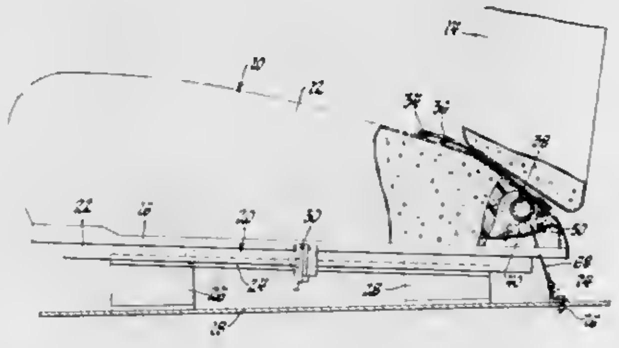


1. An individual chair adjustable to accommodate persons of any age and size, comprising: a pair of upwardly extending spaced uprights having ground supporting members at their lower ends; a chair back rest interconnecting said uprights at their upper ends; a seat bottom plate member; and a foot rest plate; said uprights having a plurality of horizontally extending guides provided along a portion of its length at the inner surfaces of said uprights facing each other, said seat bottom plate member and said foot rest plate each having opposite ends respectively disposed in opposite ones of said guides of said uprights at desirable locations between said ends of said uprights, said seat bottom plate member and said foot rest plate being interchangeable in dependence upon the size of the chair occupant so that when said seat bottom plate member constitutes a foot rest, said seat bottom plate member is capable of extending in a forward direction further than said foot rest plate.

4,109,962
ANCHORAGE SYSTEM FOR A SEAT BELT

Joseph J. Magyar, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1977, Ser. No. 810,504
Int. Cl.² A62B ***35/00***
U.S. Cl. 297—385 **3 Claims**



3. In a motor vehicle body occupant seat having a seat frame and seat adjusting means acting between the vehicle floor and the seat frame to permit adjusting movement of the seat, a seat belt system for restraining the occupant in the seat comprising: an occupant restraining seat belt associated with the seat and having one portion mounted on the vehicle body by a retractor outboard the seated occupant and another portion adapted for detachable connection inboard the seated occupant; a reel frame attached to the seat frame inboard the occupant; a reel rotatably mounted on the reel frame; a flexible element having one end attached to the reel and the other end attached to the vehicle floor rearwardly of the reel; a windup spring acting on the reel to wind and unwind the flexible element during adjusting movement of the seat frame and maintaining the flexible element in taut condition when the seat attains a desired adjusted position; a pawl pivotally mounted on the reel frame for selective locking engagement with the reel to block unwinding rotation thereof; a seat belt connecting element attached to the pawl for detachable connection with the seat belt to position the belt about the seat occupant; and spring means normally poising the pawl in an unlocking position away from locking engagement with the reel and maintaining the unlocking position upon tensioning of the seat belt about the occupant by the effort of the retractor and yielding upon imposition of seat belt loads during restraint of a seated occupant to allow movement of the pawl into locking engagement whereby the seat frame, the reel frame, and the connecting element are anchored by the flexible element against forward movement relative the vehicle floor independently of the load-sustaining capability of the seat adjusting means.

4,109,963
DUMP BODY GATE LATCH CONTROL SYSTEM

Alfred W. Sleving, Venedy, and James M. Stanley, Oreana, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

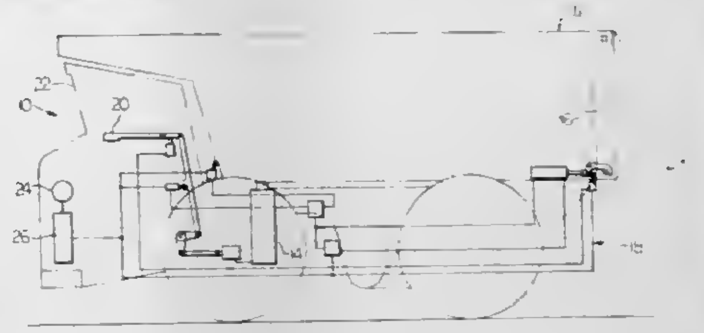
Filed Mar. 30, 1977, Ser. No. 782,669
Int. Cl.² B60P ***1/00***
U.S. Cl. 298—23 M **12 Claims**

1. A gate latch control system comprising:

a gate latch control assembly controllably connectable to an associated movable dump body gate, said latch control assembly being movable between a latched position at which said associated gate is maintainable at a closed position and an unlatched position at which said gate is freed to move to an open position;

latch position sensing means for sensing the position of the gate latch control assembly;

hoist control means movable between lower, hold and raise positions; and

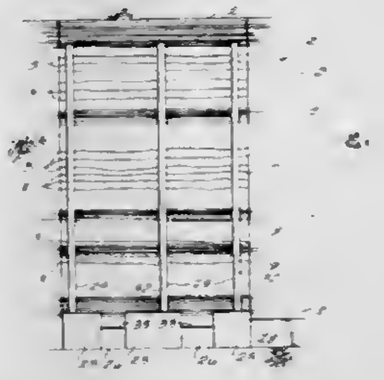


hoist lock means for maintaining the hoist control means against movement to the raise position in response to the latch position sensing means sensing the gate latch control assembly at the latched position and for freeing the hoist control means for movement to the raise position in response to the latch position sensing means sensing the gate latch control assembly at the unlatched position.

4,109,964
METHOD FOR PRECONDITIONING OIL SHALE PRELIMINARY TO EXPLOSIVE EXPANSION AND IN SITU RETORTING THEREOF

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 651,288, Jan. 22, 1976, abandoned, which is a continuation of Ser. No. 447,240, Mar. 1, 1974, abandoned. This application Jan. 3, 1977, Ser. No. 756,112
Int. Cl.² E21B ***43/26***
U.S. Cl. 299—2 **24 Claims**



1. A method of producing liquid and gaseous products including shale oil from an in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale and having boundaries of subterranean deposit containing deposition layers of oil shale, wherein at least a portion of the deposition layers are bonded together as at least one competent bed, which comprises the steps of:

excavating a first portion of the deposit from within the boundaries of the in situ oil shale retort being formed to form at least one void within said boundaries, the surface of the deposit defining such a void providing at least one free face extending through the deposit within said boundaries and leaving a second portion of the deposit within said boundaries extending away from such a free face, said second portion including at least one competent bed;

fracturing such a competent bed in the second portion substantially parallel to the deposition layers for reducing the effective thickness of such competent bed;

explosively expanding the second portion, including such a fractured bed, toward such a free face for forming a fragmented permeable mass of particles containing oil shale in an in situ oil shale retort being formed; and

retorting the fragmented permeable mass containing oil shale in the in situ shale retort for producing liquid and gaseous products including shale oil.

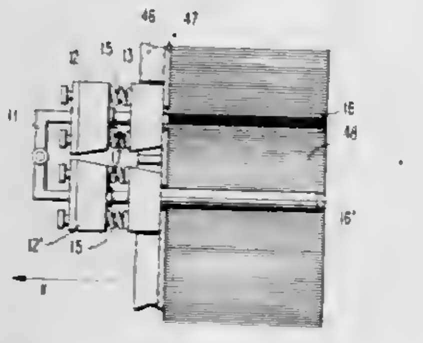
4,109,965
PICKING DEVICE

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.

Continuation-in-part of Ser. No. 618,284, Oct. 10, 1975, Pat. No. 4,009,910. This application Jan. 7, 1977, Ser. No. 757,564

Int. Cl.² A46D *1/08*

U.S. Cl. 300—7 **7 Claims**



1. In an apparatus for making tufted constructions including a stock box for supporting parallel cut-to-length synthetic filament, means for picking a plurality of said filament to form a plurality of tufts thereof, and means for heat sealing and fusing the non-working ends of said tufts, the improvement comprising:

means for supporting said tufts in a mutually spaced relationship while the ends of said tufts are individually heat sealed and fused, simultaneously;

means for subsequently orienting said tufts so that said tufts converge whereby said oriented tufts may be mounted simultaneously on a synthetic support to form a tufted construction wherein the working ends of said tufts diverge.

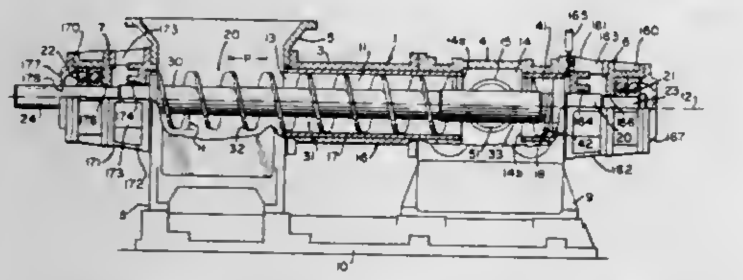
4,109,966
PNEUMATIC CONVEYING DEVICE

Donald S. Boyhont, Nazareth, and Paul E. Solt, Allentown, both of Pa., assignors to Fuller Company, Catasauqua, Pa.

Filed Nov. 23, 1976, Ser. No. 744,586

Int. Cl.² B65G *53/48*

U.S. Cl. 302—50 **8 Claims**



1. Apparatus for conveying pulverulent material comprising:

a casing having a forward end and a rear end, a bore therethrough and an inlet for pulverulent material to be conveyed and an outlet for discharging pulverulent material;

a screw impeller rotatably mounted in the bore in said casing for advancing pulverulent material from said inlet to said outlet;

a pair of bearing means including a forward bearing means and a rear bearing means, each operatively connected to one end of said casing for mounting said screw impeller in the bore of said casing whereby the screw impeller is rotatably supported near both ends;

said outlet having forward and rear edges and being located intermediate the forward bearing means and the rear bearing means and being at an angle to the longitudinal axis of the bore in the casing;

said screw impeller including a shaft, a feed section which extends forwardly from said inlet and terminating at approximately the rear edge of said outlet for advancing pulverulent material from said inlet to said outlet and a reversing section extending rearwardly from near said forward bearing means and terminating at approximately the forward edge of said outlet and spaced from the feed section of the screw impeller;

means for substantially preventing pulverulent material from entering said forward bearing means;

a forward support means mounted on the forward end of said casing for operatively connecting the forward bearing means to the forward end of the casing and including a forward bearing housing for housing the forward bearing means and an intermediate section positioned between the forward end of the casing and said forward bearing housing;

said means for substantially preventing pulverulent material from entering said forward bearing means including said reversing section of the screw impeller, a material seal surrounding said screw impeller and confined by said intermediate section adjacent to the forward end of said casing and said intermediate section defines at least one opening between said screw impeller and atmosphere for allowing pulverulent material which may escape from the bore of said casing past said material seal to be discharged to atmosphere;

said outlet being spaced laterally from said shaft; and

means mounted on said shaft adjacent said outlet having a height less than the height of the feed section for reducing the effective distance between said shaft and said outlet whereby a material seal is formed having a length equal to approximately the distance between the outlet and the means for reducing the effective distance.

4,109,967
BRAKE-FORCE DISTRIBUTOR FOR DUAL-CIRCUIT BRAKE SYSTEMS

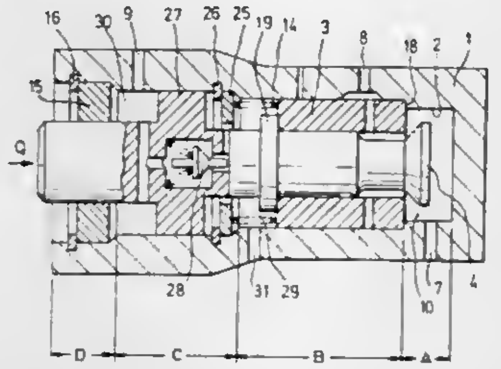
Bernd Schopper, Frankfurt, Fed. Rep. of Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,007

Claims priority, appilcation Fed. Rep. of Germany, Aug. 26, 1976, 2638377

Int. Cl.² B60T *11/34*

U.S. Cl. 303—6 C **32 Claims**



1. A first brake-force distributor for dual-circuit brake systems which includes a housing and is adapted to influence a connection of a first brake circuit between a brake-pressure source and wheel-brake cylinders and a piston to make said connection adapted to be acted upon in the closing direction by the pressure of said first brake circuit in opposition to a control force, said piston having a valve member adapted to close said connection at a valve seat, said first distributor further comprising

- an arrangement preventing closing of said connection in the event of failure of a second brake circuit including
  - a sleeve disposed in a slidable coaxial relationship with said piston;
  - said sleeve having said valve seat;
  - said sleeve being acted upon by the pressure of said second brake circuit in the direction of said valve member and in opposition to the pressure of said first brake circuit;
- said sleeve being supported by a first stop provided on said piston in opposition to said control force, and
- said piston being supported by a second stop rigidly connected to said housing.

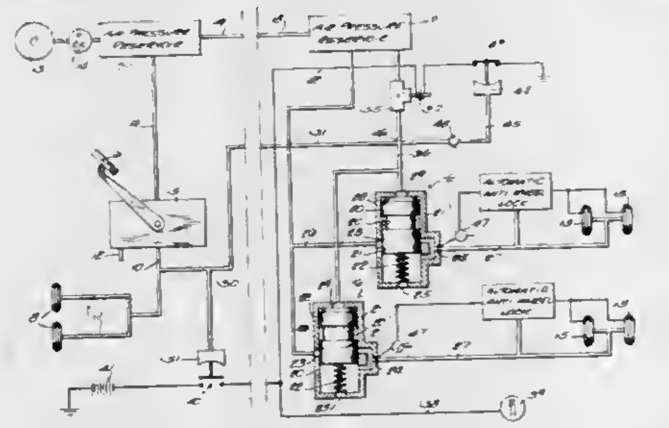
4,109,968
TRACTOR-TRAILER BRAKE SYSTEM WITH IMPROVED MEANS FOR ASSURING APPLICATION OF TRAILER BRAKES CONCOMITANTLY WITH TRACTOR BRAKES

Leo A. Wood, Milwaukee, Wis., assignor to Rollin L. Wood, Derby, Conn., a part interest

Filed Jul. 28, 1977, Ser. No. 819,706

Int. Cl.² B60T *15/02*

U.S. Cl. 303—7 **3 Claims**



1. In a brake system for vehicles consisting of a tractor and a trailer, said brake system having tractor brakes and trailer brakes, separate fluid pressure responsive actuators for the tractor brakes and for the trailer brakes, two fluid pressure reservoirs, one on the tractor and the other on the trailer, means for pressurizing said fluid pressure reservoirs, manually operable brake-applying control valve means on the tractor having an inlet connected with the fluid pressure reservoir on the tractor and outlet means connected with the fluid pressure responsive actuators of the tractor brakes and with a service line that leads to and has an end on the trailer, electric circuit means having a part thereof on the tractor and another part thereof on the trailer, and means activated concomitantly with brake-applying actuation of said control valve means for energizing said electric circuit means by connecting it with a source of current,

improved means for reducing lag in the application of the trailer brakes to an inconsequential time interval after brake-applying actuation of said manually operable control valve means, comprising the combination of:

A. a relay valve on the trailer having an inlet port connected with the fluid pressure reservoir on the trailer, and outlet port means connected with the fluid pressure responsive actuators for the trailer brakes,

said relay valve having a pressure chamber with a service intake port at all times unrestrictedly connected with said end of the service line, one wall of said pressure chamber being movable and biased to a position communicating the outlet port means of the relay valve with atmosphere, and movable away from said position in response to fluid pressure of a predetermined magnitude in said pressure chamber to disrupt communication of said outlet port means with atmosphere and establish communication between the outlet port means and the inlet port of the relay valve and hence with the fluid pressure reservoir on the trailer sufficient to cause the fluid pressure responsive actuators for the trailer brakes to take up the slack in the trailer brakes;

B. duct means communicating the service intake port of the pressure chamber and the end of the service line that is at all times unrestrictedly connected thereto with the fluid pressure reservoir on the trailer;

C. a normally closed valve in said duct means so placed therein that upon the opening of said valve both said pressure chamber and said end of the service line are directly connected with the fluid pressure reservoir on the trailer;

D. solenoid means operatively connected with said normally closed valve operable upon being energized to effect opening of said valve;

E. electrically conductive means including a normally closed switch for connecting said solenoid means with said electric circuit means so that the instant said electric circuit means is connected with its source of current said normally closed valve is opened and by such opening the pressure chamber of the relay valve and the adjacent portion of the service line is pressurized;

F. fluid pressure responsive switch actuating means operatively connected with said normally closed switch to open the same when the pressure at said switch actuating means exceeds a predetermined magnitude; and

G. fluid conducting means communicating said fluid pressure responsive switch actuating means with said duct means at a point therein that lies between said normally closed valve and the service intake port of said relay valve so that the pressure to which said fluid pressure responsive switch responds is that which obtains in the pressure chamber of the relay valve and said end of the service line.

4,109,969
AUTOMATIC LOAD-DEPENDENT BRAKE POWER REGULATOR FOR VEHICLES

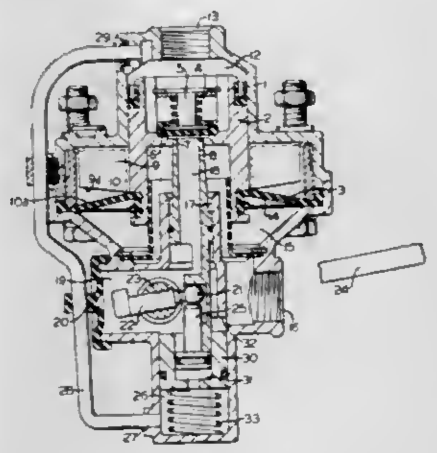
Erich Reinecke, Beinhorn, Fed. Rep. of Germany, assignor to WABCO Westinghouse GmbH Hannover, Fed. Rep. of Germany

Filed May 18, 1977, Ser. No. 798,418

Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622797

Int. Cl.² B60T *8/18*

U.S. Cl. 303—22 R **6 Claims**



1. Automatic load-dependent brake power regulator for motor vehicles and trailers having a stepped piston disposed in the upper part of the regulator housing and having a two-way valve body which is freely coxially movable in the hollow space of the stepped piston and forms, in conjunction with a valve seat fixed to the piston, an inlet valve and which is operatively connected with a valve stem coaxially disposed thereunder whose upper end face forming the operative connection forms, in conjunction with the two-way valve body, an outlet

valve and whose lower end is tensionally connected with the ball end of a rotatably supported control lever whose position is determined by the load of the vehicle, as well as having a compensating piston (25) which, disposed in the lower part of the regulator housing, supports the ball end of the control lever and is acted upon by the brake pressure controlled by the motor-vehicle brake valve or by the trailer control valve, characterized in that in the lower part of the regulator housing (1) there is provided beneath the compensating piston (25) an annular piston (30) which is provided with a slip connection (31) and can be acted upon by compressed air in the direction of movement of the compensating piston (25).

4,109,970

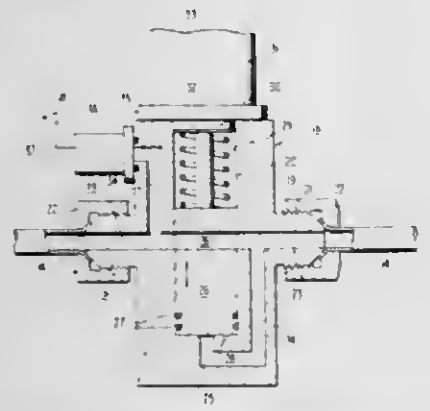
ANTI-SKID BRAKE CONTROL SYSTEM

Edward P. Ashby, Jr., P.O. Box #81470, Fairbanks, Ak. 99708

Filed May 5, 1977, Ser. No. 794,014

Int. Cl.² B60T *13/70*

U.S. Cl. 303—116 **7 Claims**



1. In an anti-skid brake control system, a brake master cylinder for pressurizing the system responsive to brake pedal pressure, wheel brake cylinders, fluid conduit means interconnecting said master cylinder and wheel brake cylinders, and a pulsator unit connected in said conduit means between said master cylinder and said wheel brake cylinders, said pulsator unit comprising a casing having a bore and a passage intersecting the bore and connected in said conduit means, said casing having a second passage interconnecting one end of the bore with the first-named passage on one side of the bore, said casing having a third passage communicating with the first-named passage on the other side of said bore and extending to the exterior of the casing, a piston in said bore and having a cross port adapted in one position of the piston to register with the first-named passage on both sides of the bore, drive means connected with the piston to reciprocate it in said bore, the piston when retracted by the drive means having said cross port out of registration with the first-named passage and a solid part of the piston then blocking the first-named passage, the piston then creating suction in the second passage to relieve pressure in said wheel brake cylinders, and a control device for said drive means connected with the casing in communication with said third passage and responding to pressure in such passage to activate the drive means.

4,109,971

DETACHABLE ROAD PROTECTING DEVICES FOR TRACKED VEHICLES

Chester A. Black, 6303 W. 159th St. Rte. #1, Stilwell, Kans. 66085, and Lester A. Black, 1106 Second St., Alva, Okla. 73717

Filed Oct. 12, 1976, Ser. No. 731,725

Int. Cl.² B62D *55/28*

U.S. Cl. 305—51 **20 Claims**

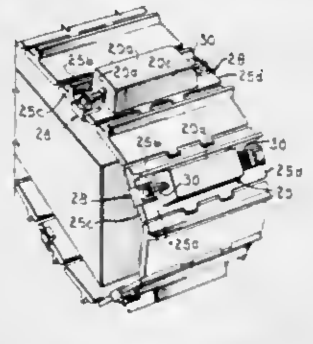
1. Track and road protecting means for use with individual track elements of an endless tracked vehicle, successive track elements of said endless track having a transverse cleat on the outboard surface thereof adjacent one end thereof, comprising, in combination:

a resilient, flexible and deformable block, shape-retaining under load and adapted to fit on the outboard face of a single track element of an endless track and positioned thereon,

said block substantially rectangular in plan, side and end views and having substantially rectangular, paired and parallel sets of side faces, end faces and inboard-outboard load bearing faces,

the length of said block a substantial part of the distance from cleat to cleat of successive elements,

the height of the block substantially greater than the cleat height from the clean outboard surface of the track element, and the width of the block at least a substantial part of the width of the track,



an elongate, non-extensible element received substantially centrally thereof and secured within said block and extending transversely thereof from side to side of the block,

an inwardly facing socket member integrally fixed to each other of said non-extensible member and positioned substantially within the body of the block,

each said socket member perforated substantially centrally thereof to receive therewithin, longitudinally axially of the block, a threaded member, said socket member internally configured to loosely fit over and cooperate with a nut member in such manner as to permit limited rocking action of the nut in the socket, but no rotation thereof,

the underside of the block relieved centrally adjacent each end thereof for access to the socket member,

a hook member on each side of said block to removably engage the side edge of a track element, and

nut and bolt means on each side of said block to removably engage the socket member with the hook members and removably fix the block on a track element.

4,109,972

MOUNTING ASSEMBLY FOR ROLLING MILL GUIDE BOX

Holton C. Easter, Munster; Frank F. Matrinetz, Hammond, and Ted L. Myers, Chesterton, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Dec. 14, 1976, Ser. No. 750,406

Int. Cl.² F16C *19/14, 29/00*

U.S. Cl. 308—3 R **10 Claims**

1. A mounting assembly for a guide box in a bar-rolling mill including rolling mill rolls wherein a bar moves along a straight, linear path portion through said guide box and the rolling mill rolls, said mounting assembly comprising:

a base;

a horizontally disposed bridge member located above said base;

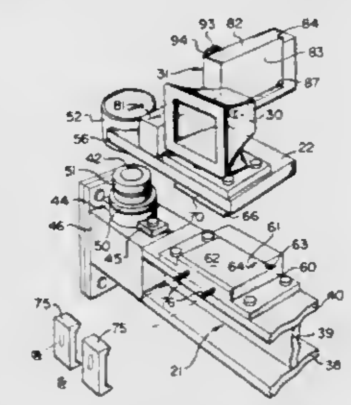
means mounting said bridge member for pivotal movement about a vertical pivotal axis, between an operative position and a position displaced from said operative position;

means on said base for supporting said bridge member at a first location on the latter adjacent said vertical pivotal axis thereof;

means on said base for supporting said bridge member, at a second location thereon remote from its vertical pivotal axis, when the bridge member is in its operative position;

said second location being spaced from said first location in a direction transverse to the direction of said straight linear path portion;

first disengageable means for engaging said bridge member when the latter is in its operative position and for securely holding it there;



means, at a third location on said bridge member, for removably mounting said guide box on the bridge member;

and second disengageable means for engaging said guide box when the latter is mounted on the bridge member and for securely holding the guide box there.

4,109,973

VEHICLE SEAT SLIDE ADJUSTER INCLUDING INTEGRALLY FORMED PAWL AND PAWL LEVER

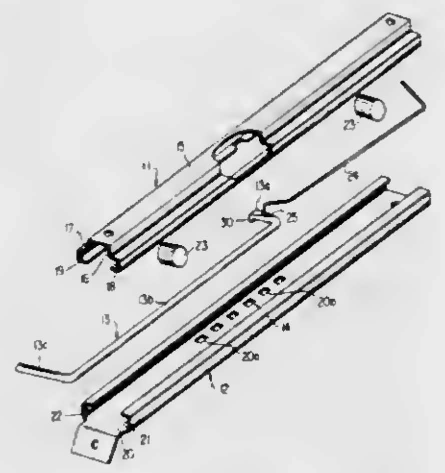
Takami Terada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 2, 1977, Ser. No. 792,884

Claims priority, application Japan, May 3, 1976, 51-55613

Int. Cl.² F16C *29/02*

U.S. Cl. 308—3 R **10 Claims**



1. A vehicle seat slide adjuster comprising:

a first moving guide rail means adapted to be secured to a vehicle seat and having a substantially inverted U-shape in section;

a second stationary guide rail means adapted to be secured to a stationary part of the vehicle and having a substantially U-shape in section, said first movable guide rail means being slidable with respect to said second stationary guide rail means;

a manually operable means including a round shaft portion longitudinally disposed within one inside section of said first guide rail means and rotatably supported thereby and a lever portion integrally formed at one end of said shaft portion of manual operation;

a pawl means integrally formed at the other end of said shaft portion for limiting the relative slidable movement between said first and second guide rail means; and

a plurality of latch holes provided on said second guide rail and aligned longitudinally thereto, each being engageable with said pawl means.

4,109,974

PLAIN AND THRUST BEARING DEVICE

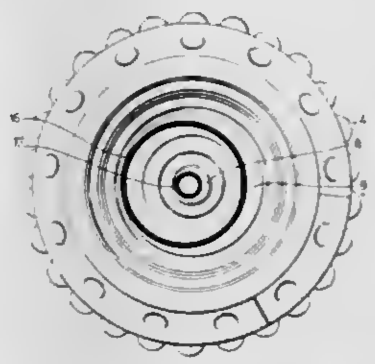
Alf Henrik Svanstrom, and Karl-Erik Kangas, both of Fagersta, Sweden, assignors to Fagersta Secoroc AB, Fagersta, Sweden

Filed Jan. 25, 1977, Ser. No. 765,620

Claims priority, application Sweden, Feb. 16, 1976, 7601661

Int. Cl.² F16C *19/00*

U.S. Cl. 308—8.2 **16 Claims**



1. A rotary roller bit comprising a shaft end and a roller, said roller operatively connected to the shaft end to rotate relative thereto about an axis, said roller and shaft end including plane surfaces facing and sliding against each other and forming axial thrust bearing surfaces between the shaft end and the roller, and including a friction reducing device for reducing friction at said sliding surfaces, said device including at least one groove formed in at least one of said sliding surfaces and located eccentrically relative to said axis, and including a material filling the groove and having a friction reducing effect relative to the material forming the remainder of the said facing sliding plane surfaces.

4,109,975

METHOD OF BEARING A PIVOTING MEMBER INTENDED TO TRANSMIT GREAT FORCES AND A BEARING OF SUCH A PIVOTING MEMBER

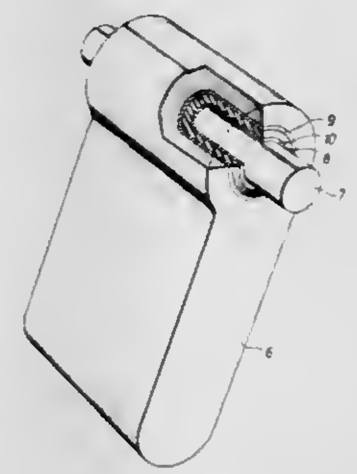
Arne J. Mattson, Vasteras, Sweden, assignor to Paul Anderson Industrier AB, Vasteras, Sweden

Filed Sep. 28, 1976, Ser. No. 727,567

Claims priority, application Sweden, Oct. 7, 1975, 7511230

Int. Cl.² B66F *1/06;* F16C *11/02*

U.S. Cl. 308—26 **14 Claims**



1. A method of pivotably bearing a first member on a second member by means of an axle, said first member intended to transmit great forces between said second member and a third member, and wherein said first member may constitute a load transmitting latch pivotal between an operative and an inoperative position, said method comprising the steps of:

providing opposed complementary surfaces on said first and second members which face each other but have only a small clearance therebetween when said first member is in an operative position with respect to said third member, and

pivoting said first member on said second member by an axle bearing which permits displacement of said first member with respect to said second member upon load engagement in operative position such that a load transmitting engagement is obtained between said complementary surfaces.

7. In a load transmitting assembly including a first member pivotably mounted on an axle to a second member with said first member pivotable between an operative and an inoperative position, and wherein in the operative position said first member transmits great forces between said second member and a third member, the improvement wherein: said first member has a surface portion which when in the operative position is spaced from a complementary surface of said second member through a small clearance and means for mounting said first member through said axle on said second member such that upon load engagement with said first member in said operative position said first member is displaceable through a distance to effect load transmitting engagement between said complementary surfaces.

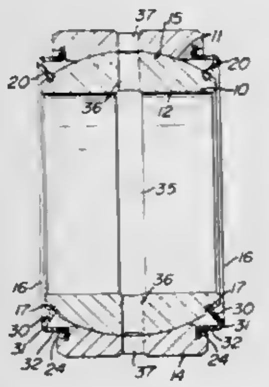
4,109,976
SELF-ALIGNING BUSHING

Hans W. Koch, Levittown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Apr. 11, 1977, Ser. No. 786,137

Int. Cl.² F16C *33/72, 23/00*

U.S. Cl. 308—36.1 **2 Claims**



1. A self-aligning bushing comprising

an inner ring having an outer spherical surface with spaced grooves curved in transverse cross section and shaped for seal end retention,

an outer ring having an inner spherical surface in engagement with the outer surface of said inner ring and having spaced grooves beyond its spherical surface for seal end retention,

sealing members of elastomeric material for said rings for retaining lubricant and preventing access of dirt and water to the engaging surfaces of said rings,

each of said sealing members having

a first enlarged end portion complemental in cross section to and movably mounted in and retained in one of said grooves in said outer spherical surface of said inner ring, and

a second enlarged end portion in compressed frictional engagement in an adjoining one of said grooves in the outer ring,

said second end portion having a metallic ring insert L-shaped in cross section with a first leg portion extending toward said groove in said outer ring and a second leg portion extending outwardly from said first leg portion,

said sealing members each further comprising a connecting wall between said end portions and providing a hinge,

said connecting wall extending outwardly from the grooves of each of said rings,

said second leg portion of said metallic ring insert stiffening said connecting wall,

said sealing members upon relative movement of said spherical surfaces being compressed at one portion thereof while being expanded at an opposite portion thereof.

4,109,977
RESILIENTLY MOUNTED RADIAL AND AXIAL BEARINGS

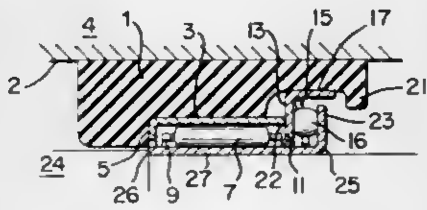
Gerard Staphan, Croissy, France, assignor to Nadella, Rueil-Malmaison, France

Filed Apr. 20, 1977, Ser. No. 789,241

Claims priority, appilcation France, Apr. 30, 1976, 76 12915

Int. Cl.² F16C *19/14*

U.S. Cl. 308—174 **18 Claims**



1. A bearing assembly for supporting a rotating member in a bore, comprising a resilient sleeve of elastomeric material having an axially extending peripheral surface to be received in said bore, a radial bearing having a bush fixed within said sleeve and cylindrical rolling elements rotatable within said bush, and an axial thrust bearing within said sleeve radially inwardly of said peripheral surface having a radial plate and rolling elements rotatable on said radial plate, said plate abutting one end of said bush within said sleeve.

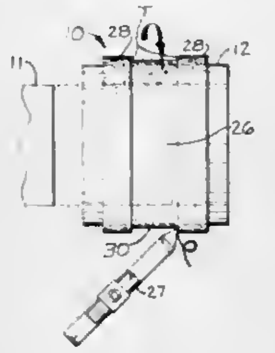
4,109,978
ELECTRICALLY INSULATED SLEEVE BEARING AND METHOD OF MAKING SAME

Richard G. Ernst, Anoka, and Charles W. Medved, Minneapolis, both of Minn., assignors to Electric Machinery Mfg. Co., Minneapolis, Minn.

Filed Oct. 14, 1976, Ser. No. 732,506

Int. Cl.² F16C *33/04*

U.S. Cl. 308—237 R **9 Claims**



1. A method of applying an electrical insulating layer to a tubular bearing having a machined inner surface and an as-cast outer surface comprising the steps of:

wrapping said as-cast outer surface with an epoxy resin-impregnated fibrous material; and

subjecting the wrapped tubular bearing to a heat curing cycle.

7. An electrically insulated sleeve bearing for a rotating shaft of a large electrical machine comprising:

(a) a tubular metal member having a machined inner surface providing a wear surface for the rotating shaft and an as-cast outer surface; and

(b) an electrical insulating layer wrapped about said as-cast outer surface and adhered to, said insulating layer comprising an epoxy resin-impregnated fibrous material subjected to a heat curing cycle.

4,109,979
ELASTIC COUPLING

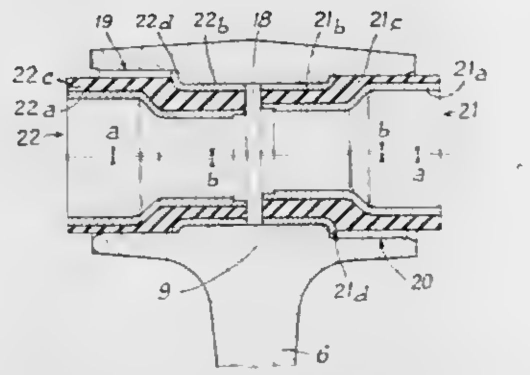
André Fernand Estaque, Bagneux, France, assignor to Societe Anonyme Automobile Citroen, France

Filed Dec. 9, 1976, Ser. No. 748,876

Claims priority, application France, Dec. 15, 1975, 75 38286

Int. Cl.² F16C *33/22;* **F16F** *1/16*

U.S. Cl. 308—238 **4 Claims**



1. An elastic coupling for two elements with different characteristics of rigidity, said coupling comprising: two interfitting inner and outer parts with parallel axes, between which parts is interposed an elastic connective sleeve, said inner and outer parts being subjected to alternate stresses of relative pivoting about a theoretical axis perpendicular to a plane containing their axis, wherein said coupling has two zones of reduced radial rigidity provided at its axial ends, said zones being symmetrical with each other with respect to the theoretical pivot axis and being constituted by free spaces arranged between said outer part and said elastic sleeve, said free spaces resulting from recesses being formed in said outer part, said elastic sleeve being constituted by two half-sleeves, each being provided with an inner recess for housing said inner part which is offset in the free state with respect to its final position in the finished coupling, wherein said half-sleeves are so disposed in said outer part that their greatest radial thickness constituting thick zones are placed on the free spaces side and said inner part is force fitted in the recesses in false alignment thus constituting a precompression of said thick zones.

4,109,980
HOME BATTERY STORAGE AND DISPENSER

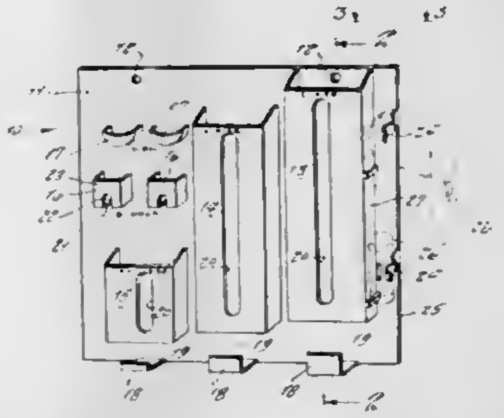
Gary Brockman; Hubert J. McFadden, and George Spector, all c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jun. 21, 1976, Ser. No. 698,074

Int. Cl.² A47F *1/00*

U.S. Cl. 312—35 **1 Claim**

1. In a home battery storgae dispenser, the combination of an intergral flat panel with a plurality of compartments projecting from a front side of said panel, said compartments being of different sizes for holding a plurality of varying sized and shaped batteries, said compartments having top openings and means at the bottom to support the bottom battery, wherein certain of said compartments are tubular with rectangular cross-section, said means comprising a forward extending lug vertically spaced from and aligned with said compartment forming a battery stop and rest, a front side of said compartment having a vertical slot for viewing batteries in said compartment, wherein other of said comparements include a bottom wall with finger receiving opening to push said batteries upward and out a top opening, and still other compartments are semi-circular in shape, further including clips are formed on a side edge of said panel spaced laterally from a compartment for holding flashlights therebetween and a side of one said compartments provided with vertically spaced cleats to support the bottom of said flashlights wherein pneumatic cushion is provided longitudinally on said compartments having rectangular cross-section, said cushion comprising a vertical flexible strip of material sealingly mounted on said rear wall having a front portion spaced from said panel for engaging said batteries the full length of said compartment, including a lowermost portion of said strip sealingly attached to said lug forming an L-shaped bottom cushion to receive the lowermost battery, wherein said batteries are resiliently engaged by a front wall of the compartment and said cushion.



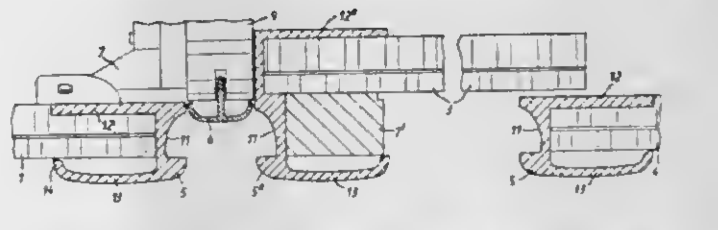
4,109,981
CABINET-LIKE FURNITURE UNIT OF CELLULAR STRUCTURE

Josephine Pfaehler, Frauenstrasse 9-11, 7900 Ulm, Fed. Rep. of Germany

Filed Nov. 11, 1976, Ser. No. 740,796

Int. Cl.² A47B *87/00*

U.S. Cl. 312—107 **7 Claims**



1. A cabinet-like furniture unit of cellular structure, comprising

(a) cell walls separating the furniture cells from each other and having forwardly directed front edges;

(b) large-area door arrangements covering the forward open faces of said furniture cells, said door arrangements consisting of at least one pair of sliding doors and at least one pivotable door;

(c) handling ledges mounted at the edges of said doors;

(d) finger grooves provided in outer surfaces of said handling ledges and extending along the respective door edge and opening in a direction extending parallel to the main surface of the respective door and away from the respective door;

(e) profiled bands having substantially T-shaped cross-section and being inserted with their T-web portions into longitudinal grooves of said front edges of said cell walls for sheathing said front edges;

(f) said handling ledges and said profiled bands being arranged in such a manner that in the closed condition of the doors the inner longitudinal edge of said outer surface of each handling ledge is in close proximity to one longitudinal edge of the crossbar of the associated T-profiled band, whereby — viewed from the front — said handling ledge and said T-profiled band form a homogeneous whole.

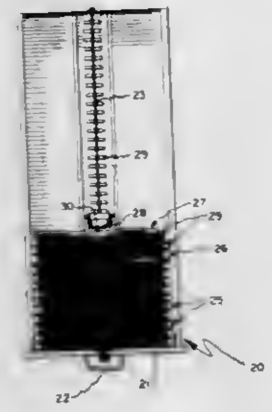
4,109,982

FOLDERS/DIVIDERS AND COMPARTMENTED FILING SYSTEM

Kenneth D. Schreyer, 5130 Brookhaven Dr., Clarence, N.Y. 14031

Filed Dec. 6, 1976, Ser. No. 747,499
Int. Cl.² B42F *15/00;* A47B *63/00*

U.S. Cl. 312—183 **14 Claima**



1. A separator intended to rest on its vertically lower edge, for keeping classified correspondence, literature and the like segregated when installed vertically in a filing cabinet or the like, said separator including:

a vertically standing panel portion formed of characteristically thin and limp stock sheet material and having vertically extending means extending over substantially the entire vertical extent of said separator and integral therewith for deforming at least one widthwise section thereof into a permanent, resiliently set, vertically extending, corrugated configuration, whereby said separator is provided with inherent resilient stiffness in the vertical direction so as to resist downward slumping and so as to maintain an upright standing condition, wherein said separator comprises a filing folder fabricated of initially flat sheet material said folder having a front and rear panel portion integrally interconnected hingedly across the bottom of the folder in a straight line fold, and wherein at least one of said panel portions is pressed into a resiliently set vertically corrugated configuration.

4,109,983

SPEAKER CABINET

Shouzo Kinoshita, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 606,894, Aug. 22, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,016

Claims priority, application Japan, Aug. 22, 1974, 49-99663[U]; May 28, 1975, 50-63020

Int. Cl.² A47B *81/00*

U.S. Cl. 312—214 **4 Claims**

1. An acoustically improved speaker cabinet for housing a speaker and having a plurality of walls each having an inner surface and an outer surface, and wherein each wall comprises a rigid, sound-absorbing open-cell foamed place containing communicating bubbles and forming said inner surface, and a surface plate intimately bonded to said foamed plate and forming the outer surface of the wall, said surface plate being relatively impermeable to air, whereby the effective acoustical interior volume of said cabinet is substantially larger than the actual physical volume thereof, and whereby resonant vibration of the cabinet is eliminated.

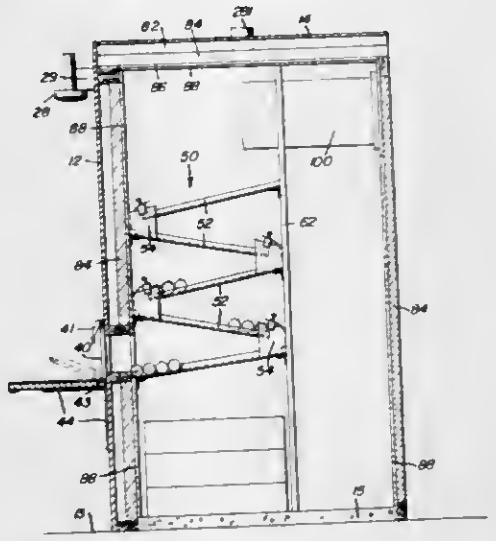
4,109,984

WALK-IN COOLER CONSTRUCTION

Nemesio N. Gandara, El Paso, Tex.

Filed Dec. 27, 1976, Ser. No. 754,882
Int. Cl.² H01J *1/00*

U.S. Cl. 312—236 **4 Claims**



1. In a walk-in refrigerator having insulated walls, at least one of the walls having entry door therein for entry into the interior of the refrigerator, the improvement comprising:

at least one access door provided in a wall of the refrigerator, the access door being operable from exteriorly of the refrigerator; and,

dispensing means for storing and sequentially dispensing cans maintained within the refrigerator, the cans being dispensed through the access door on opening of said access door, the dispensing means comprising a plurality of at least partially enclosed guide members having curved surfaces on which the cans are adapted to roll, support members to which the ends of the guide members are mounted, and direction-reversing means for guiding the cans from an upper guide member onto a lower guide member at adjacent ends of said guide members, said guide members comprising adjusting means at the respective ends of said guide members for adjusting the flow of cans therethrough, the direction-reversing means being mounted to the adjacent ends of said guide members and to one of the support members, the dispensing means having an exit end formed of the lowermost end of the lowermost guide member, the exit end being located adjacent the opening in the wall of the refrigerator covered by the access door whereby cans are dispensed through said access door.

4,109,985

PROTECTIVE CABINET

A. Calvin Lieb, Jr., 25 W. 9th St., Shoemakersville, Pa. 19555

Filed Mar. 9, 1977, Ser. No. 776,030
Int. Cl.² A47B *43/00*

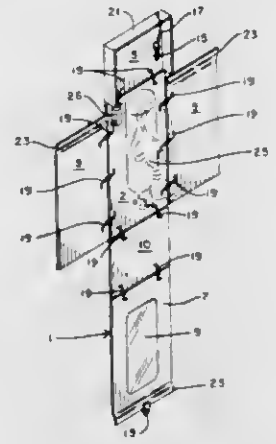
U.S. Cl. 312—262 **15 Claims**

1. A protective enclosure adapted to provide immediate and unencumbered access to its contents defined by a plurality of

cooperative panels that are configured to seat in mating relationship with each other, comprising:

a base panel having a plurality of rectilinear edges, each edge of which hingedly secures a dependent panel for rotation about an axis defined by the edge of the base panel to which the dependent panel is attached;

one of the dependent panels having a rectilinear edge parallel to and spaced from the edge of the base panel from which it depends;



a closure panel hingedly secured to and mounted for rotation about the axis defined by the rectilinear edge of the one of the dependent panels;

spring means mounted between the base panel and the dependent panels and between the one of the dependent panels and the closure panel biased to urge the hinged panels away from each other and into the plane of the base panel; and

releasable locking means which, when engaged, secures the panels in mating relationship with each other against the bias of the spring means.

4,109,986

ELECTRICAL CONNECTOR AND CONTACT

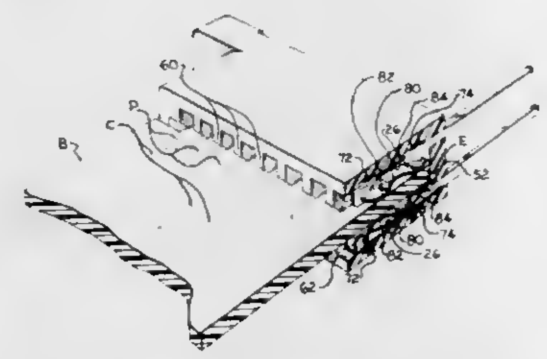
Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1976, Ser. No. 755,128

Claims priority, application Netherlands, Dec. 31, 1975, 7515251

Int. Cl.² H05K *1/07*

U.S. Cl. 339—17 L **4 Claims**



1. A printed circuit board connector comprising a dielectric housing having a slot extending along a length thereof and a plurality of opposed pairs of contacts mounted in said housing, each contact comprising a U-shaped support and plate spring, said support including a spaced pair of upstanding walls, each wall having a pair of oppositely inclinded notches, the ends of said spring being fixed in said notches, said spring being restrained in an arcuately stressed condition when so fixed and thereby being adapted to deflect and resiliently flex at its midpoint during insertion of a board into the slot and to engage the board on both sides of the midpoint, each wall being recessed to clear said midpoint.

4,109,987

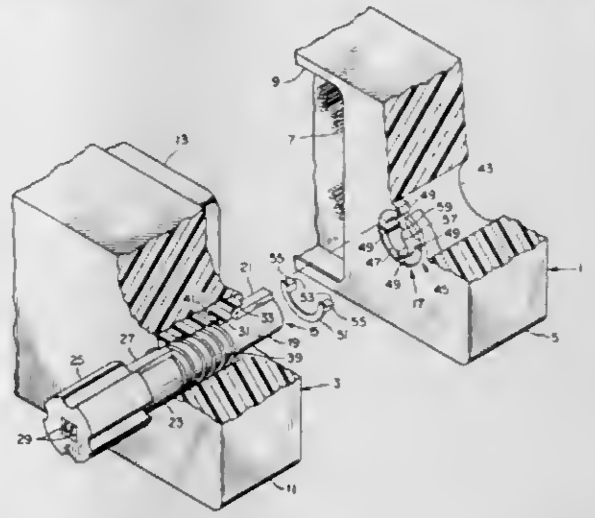
POLARIZING AND LOCKING MEANS FOR MATEABLE UNITS SUCH AS ELECTRICAL CONNECTORS

Normand Charles Bourdon, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 679,296, Apr. 22, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,510

Int. Cl.² H01R *13/54, 13/64*

U.S. Cl. 339—75 M **8 Claims**



1. A pair of separable connectors including polarizing means which comprises a first member mounted for rotational movement through a predetermined arc on one of said units, rotational limiting means at each end of said predetermined arc, said first member having an extension with predetermined shape including a projection on the extension, said projection located at a first radial location and being rotatable with the member through the predetermined arc; and a second member associated with the other unit and having a passage with an opening located at a second radial location chosen from a plurality of radial locations disposed about the passage, all of said locations including openings formed for receiving said projection, means for blocking such reception selectively located at certain of said openings other than the one at said second radial location, said plurality of locations separated by an angular distance greater than said arc, said passage having a predetermined complementary shape for receiving the first member when the units are in mating position with the projection located at the first radial location corresponding to the second radial location and for preventing mating when the first and second radial locations do not correspond; and locking means including means on one of the members for engaging means on the other member after assembling the units to lock the members and prevent their accidental separation.

4,109,988

DUPLEX OUTLET DEVICE

Ernest E. Olson, 911 S. Owen, Mount Prospect, Ill. 60056

Filed Jul. 15, 1977, Ser. No. 815,937
Int. Cl.² H01R *13/59, 33/04*

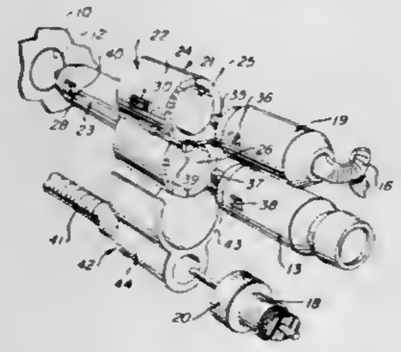
U.S. Cl. 339—91 R **9 Claims**

1. In an automotive vehicle having a cigarette lighter means defined by a cup-shaped first socket having an outer open end, and spaced electrical power terminals exposed within the shell, an improved duplex outlet device comprising:

housing means defining an inner plug portion arranged to be removably received in said socket, and an outer portion defining a pair of juxtaposed outwardly opening second and third sockets;

means for releasably locking said plug portion within said first socket;

electrical connection means having first contacts carried by said plug portion for engaging said power terminals as an incident of the plug portion being disposed within said first socket, second contacts exposed within said second socket for electrical connection to an auxiliary plug inserted into said second socket, third contacts exposed within said third socket for electrical connection to a cigarette lighter plug portion inserted into said third socket, and conductor means for electrically connecting said first contacts to said second and third contacts;



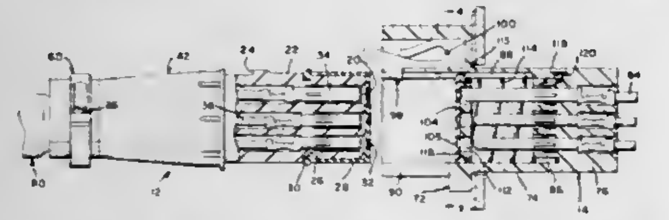
fuse means carried by said outlet device for limiting current flow through said conductor means to said second contacts; and

switch means carried by said outlet device for selectively controlling delivery of current through said conductor means to said second contacts, said housing plug portion and second and third sockets being cylindrical and disposed in axially parallel relationship.

4,109,989
ENVIRONMENTALLY SEALED ELECTRICAL CONNECTOR

Clair Wilson Snyder, Jr., Hellam, and Paul Birchard Derr, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 10, 1975, Ser. No. 585,622
Int. Cl.^{2} H01R *13/52*
U.S. Cl. 339—94 M **28 Claims**



11. A sealed plug member for an electrical connector, said plug member comprising:

a housing having a mating face on one end and at least one contact receiving bore leading to said face and, a groove about the periphery of said housing spaced from said mating face,

a like number of contacts each connected to a respective conductor and received in a respective one of said bores directed toward said mating face,

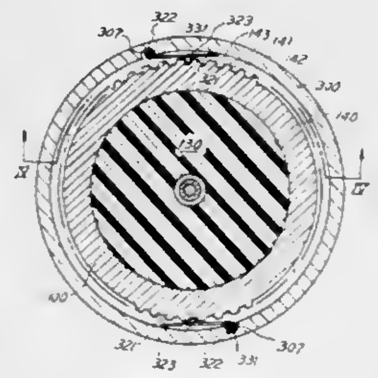
first sealing means enclosing said mating face, said first sealing means including a diaphragm portion extending across said mating face and an integral flange portion having an inwardly directed lip engaging in said groove, said first sealing means having a normally closed slot disposed over each said bore, said normally closed slot being in said diaphragm portion, and

second sealing means at the other end of said housing effecting a fluid tight seal between said conductors and said housing.

4,109,990
ELECTRICAL CONNECTOR ASSEMBLY HAVING ANTI-DECOUPLING MECHANISM

Clifford Robert Waldron, Unadilla, and Carl Lee Knapp, Oneonta, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 26, 1977, Ser. No. 800,667
Int. Cl.^{2} F16B *39/32;* H01R *13/54*
U.S. Cl. 339—89 M **11 Claims**



1. An electrical connector assembly comprising:

a first shell having an insert with a plurality of axial passages;

a second shell having an insert with a plurality of axial passages, said second shell having thread means of a portion of the outside of said second shell;

a plurality of pin-type electrical contacts, each mounted in a respective axial passage of one of said inserts;

a plurality of socket-type electrical contacts, each mounted in a respective axial passage of the other of said inserts, said socket-type electrical contacts arranged in the other insert in the same manner as the pin-type electrical contacts are arranged in the first insert and mateable with said pin-type electrical contacts;

a coupling nut for selectively connecting and maintaining said first and second shells together and holding said pin-type and socket-type electrical contacts together in a mated position, said coupling nut mounted for rotational movement on said first shell with thread means connectable with the thread means on the second shell for connecting the first and second shells together with the pin-type and socket-type electrical contacts held in mated relationship; and

means for retarding the rotational movement for the coupling nut in one direction relative to the first and second shells, said retarding comprising:

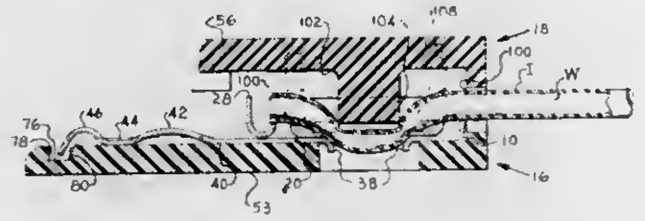
a leaf spring assembly mounted to the coupling nut, said assembly including an enlarged portion that extends inwardly in a radial direction from the coupling nut toward the shells;

an annular shoulder mounted on one of the shells and extending radially outwardly from the one shell toward the coupling nut, said annular shoulder provided with teeth on the outside surface thereof and extending radially inwardly therefrom each of said teeth having a first and second sides, one of said sides inclined at a greated angle than the other side, said spring element and said teeth positioned relative to each other so as to engage a portion of said spring element within the notched recesses to retard rotational movement in one rotational direction compared to rotational movement in the other rotational direction.

4,109,991
SELF-STRIPPING ELECTRICAL CONNECTOR AND TERMINAL

Robert Franklin Evans, New Cumberland, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 468,689, May 10, 1974, abandoned. This application Sep. 18, 1975, Ser. No. 614,427
Claims priority, application Japan, May 8, 1975, 50-54335; United Kingdom, May 8, 1975, 19484/75
Int. Cl.^{2} H01R *13/38*
U.S. Cl. 339—99 R **10 Claims**

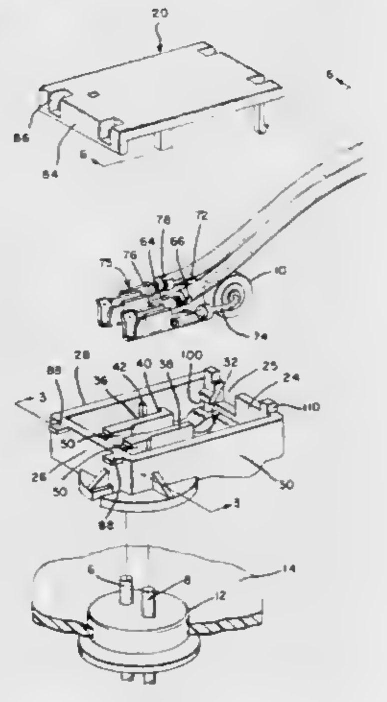


1. An electrical connector for insulated wires comprising, a terminal for each wire comprising a flat member having an opening therein including a pair of spaced opposing contact lips extending in said opening, and a pair of insulation-skiving blades, each insulation skiving blade substantially parallel with said flat member and overlying a contact lip; and an insulated housing comprising a base and a cover engageable with the base, said base having a surface for receiving each terminal and an opening in the surface for receiving a wire inserted between said contact lips, and the cover having a surface with means projecting toward said base for engaging an insulated wire positioned in the connector bridging said insulation skiving blades and forcing the wire between said blades, skiving the insulation to expose the wire, and engaging the wire with said contact lips, when the cover is engaged with the base.

4,109,992
CONNECTOR FOR COMPRESSOR HEADER

Donald Wayne Kent Hughes, Mechanicsburg, and Gary Douglas Porta, Shiremanstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 5, 1977, Ser. No. 822,167
Int. Cl.^{2} H01R *19/34*
U.S. Cl. 339—147 R **14 Claims**



1. The combination of two wires, a diode in series with one of said wires, and an electrical connector for connecting said wires to terminal posts;

said connector comprising an insulating housing having a base and sidewalls surrounding said base, said wires extending through one of said sidewalls,

said diode being contained in said housing and having two leads extending therefrom, a splice terminal in said housing, said splice terminal being crimped onto one of said wires and one of said leads,

two socket terminals in said housing, one of said socket terminals being crimped onto the other one of said wires, the other one of said socket terminals being crimped onto the other one of said diode leads,

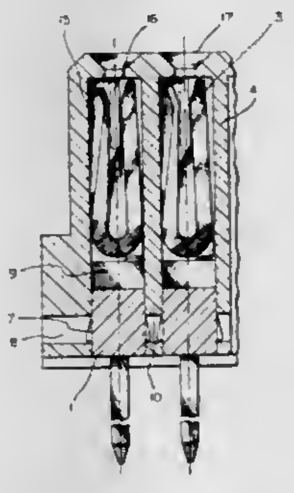
openings in said housing for reception of said terminal posts whereby said connector can be mated with said terminal posts and said socket terminals will receive said posts, and

strain relief means in said housing in engagement with said splice terminal for preventing transmission of tensile forces applied to said wire to said one diode lead.

4,109,993
PLUG-TYPE ELECTRICAL CONNECTORS

Gerhard Bauerle, Willsbach, Fed. Rep. of Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 675,329, Apr. 9, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 789,954
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515813
Int. Cl.^{2} H01R *13/42*
U.S. Cl. 339—176 M **3 Claims**



1. A plug-type connector comprising:

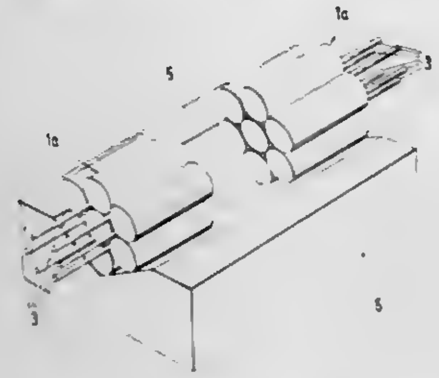
a housing including a contact receiving opening having a stop shoulder adjacent thereto and an insulating strip receiving chamber communicating with said opening and being of substantially greater dimension than said opening, and having a locking shoulder portion;

a contact comprising a terminal post at each end thereof and a U-shaped portionintermedite said ends, said U-shaped portion extending laterally of the contact axis from one side of said contact; and

an insulating strip having a first recess, said first recess being dimensioned for receiving said U-shaped portion, and a protrusion within said first recess dimensioned for being received within said U-shaped contact portion for locking said contact within said insulating strip, said insulating strip also being dimensioned for being received within said insulating strip receiving chamber in abutment with said stop shoulder and having a second recess for engaging said locking shoulder portion for locking said insulating strip and said contact within said housing.

4,109,994
SINGLE OPTICAL FIBER CONNECTOR

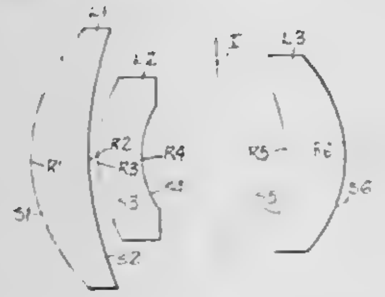
Martin Chown, Harlow, England, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Feb. 17, 1977, Ser. No. 769,555
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.21 **3 Claims**



1. An optical fiber termination for a single optical fiber cable comprising:
- a set of at least three cylinders closely packed side-by-side to provide at least one interstitial aperture therebetween;
- said cylinders terminating in a mating end face;
- a single optical fiber individually inserted into said aperture from the rear of said cylinders and extending forwardly to a position adjacent to said mating end face;
- said fiber being positioned in the center of said aperture by three additional cylinders spaced from each other and each of which abuts against two of said first-mentioned cylinders and said fiber; and
- said additional cylinders all having the same diameter, said diameter being less than that of each said cylinder of said set.

4,109,995
TRIPLET WITH ASPHERIC SURFACES

Ellis I. Betensky, Toronto, Canada, assignor to Opcon Associates of Canada, Ltd., Toronto, Canada
Filed Jun. 3, 1976, Ser. No. 692,551
Int. Cl.^{2} G02B *9/16, 3/02*
U.S. Cl. 350—189 **22 Claims**



1. A lens consisting of first, second and third elements, said first and third elements being meniscuses of positive power with facing concave surfaces, said second element being a meniscus of negative power between said first and third elements, an aperture defining means between the concave surface of said second element and the concave surface of one of said other elements, the elements commencing with the positive element removed from the aperture defining means have equivalent focal lengths F1, F2 and F3, and:

$$F_o > F_1$$

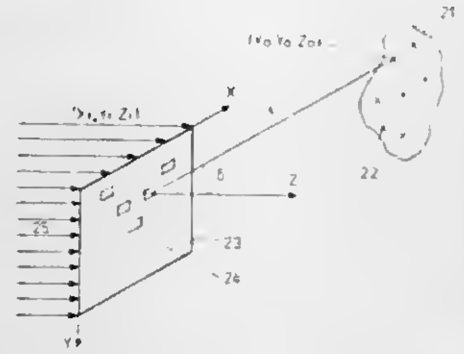
$$F_o > |F_2|$$

$$0.5F_o \leqq F_3 \leqq 2.1F_o$$

where F_o is the equivalent focal length of the overall lens.

4,109,996
METHOD FOR PRODUCING A SYNTHETIC HOLOGRAM

Kadri Okan Ersoy, Li, Norway, assignor to Sentralinstitutt for Industriell Forskning, Oslo, Norway
Filed Jan. 3, 1976, Ser. No. 692,576
Claims priority, application Norway, Jun. 3, 1975, 751942
Int. Cl.^{2} G02B *27/00*
U.S. Cl. 350—3.66 **2 Claims**



1. A method for directing a recording device to produce a synthetic hologram comprised of a plurality of quantized hologram spots in a modulating medium, said quantized hologram spots representing points on a wavefront defined by a plurality of geometrical points in space, said method comprising:
- selecting a point of said wavefront to be represented in said modulating medium;
- arbitrarily selecting positions for a number of quantized hologram spots allocated for the selected point of said wavefront to be represented in said hologram;
- determining the number of hologram spots for the selected point to be proportional to the wave amplitude at the point;
- adjusting the arbitrarily selected position of each of said hologram spots such that the length of the radius vector from the selected point to the center of the spot in its adjusted position satisfies the equation:

$$r_{oi} = n\lambda + (\phi - \phi_R)(\lambda/2\pi)$$

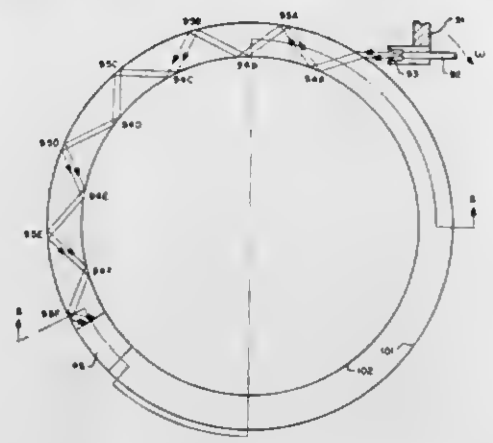
in which
- r_{oi} is the radius vector length
- n is an integer
- ϕ is the phase at the geometrical point,
- ϕ_R is the phase of the reference wave at the center of said hologram spot, and
- λ is the wavelength; and
- driving said recording device to expose said modulating medium according to the determined number of hologram spots and the adjusted positions thereof.

4,109,997
OPTICAL SLIPRINGS

Myren L. Iverson, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Division of Ser. No. 663,889, Mar. 4, 1976, Pat. No. 4,027,945. This application Feb. 28, 1977, Ser. No. 772,395
Int. Cl.^{2} G02B *23/02, 5/14*
U.S. Cl. 350—23 **8 Claims**

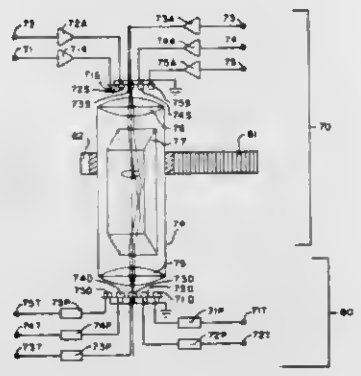
1. An apparatus for transferring light signals between a first body and a second body, wherein said second body is mounted for rotation about an axis, and said first body is mounted to be stationary relative to said axis, comprising:
- a first light carrying member attached to said first body;
- a second light carrying member attached to said second body, wherein said second light carrying member has a toroidal shape, an annular central cavity, at least one reflective surface within said annular central cavity defining concentric annular mirrors, and at least one annular transparent window;

- means attached to said first body for projecting a light signal from said first light carrying member through said transparent window to the annular central cavity of said second light carrying member; and
- means attached to said second body for removing a light signal from said second light carrying member.



4,109,998
OPTICAL SLIPRINGS

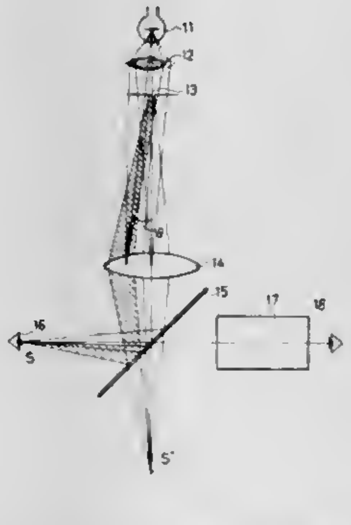
Myren L. Iverson, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Division of Ser. No. 663,889, Mar. 4, 1976, Pat. No. 4,027,945. This application Feb. 28, 1977, Ser. No. 772,396
Int. Cl.^{2} G02B *23/02*
U.S. Cl. 350—23 **6 Claims**



1. Apparatus for communicating a plurality of separate signals between a first body and a second body wherein one of said bodies is mounted for rotation about an axis relative to the other body, comprising:
- a plurality of independent signal responsive light sources arranged in a fixed array and attached to one of said bodies, wherein each separate source is configured to emit a separate light signal in response to a separate electrical input signal;
- first focusing means positioned to receive said separate light signals for projecting said separate light signals in the form of a plurality of separate beams;
- a derotating prism positioned in the path of said separate beams and mounted for rotation about said axis relative to each of said first and second bodies at a rate equal to one-half the relative rotational rate between said first and second bodies for derotating said beams;
- second focusing means positioned to receive said derotated beams for projecting said plurality of separate beams in the form of a plurality of separate corresponding images; and
- a corresponding plurality of light responsive electrical transducers, each attached to the other of said bodies and positioned to receive a preselected one of said plurality of separate images, and each transducer being configured to emit an electrical output signal in response to actuation by a light signal in the form of a lighted preselected corresponding image.

4,109,999
ILLUMINATING DEVICE FOR SLIT LAMP MICROSCOPES

Yutaka Kiyono; Shigeaki Nagata; Shuichiro Shigemori; Tadashi Kishimoto, all of Tokyo; Sadao Maruyama, Koshigaya, and Katsuyoshi Arisawa, Tokyo, all of Japan, assignors to Mamiya Camera Co., Ltd., Japan
Filed Nov. 1, 1976, Ser. No. 737,796
Int. Cl.^{2} G02B *21/06*
U.S. Cl. 350—91 **17 Claims**



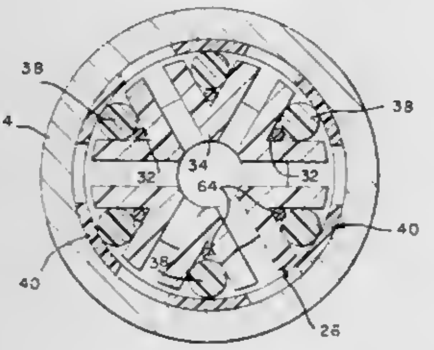
1. An illuminating device for slit lamp microscopes comprising a light source, a slit provided in front of said light source, an objective which is provided in front of said slit and can produce the image of said slit on an object to examined, a first reflector which is provided in front of said objective and is arranged diagonally to the optical axis of said objective and can direct rays from said objective to said object to be examined, said objective comprising a first lens group arranged near said first reflector and consisting of at least three groups including at least one convex lens of a ν -value of more than 45 and a second lens group formed as at least one concave lens arranged in a position separated by more than 1/5 the distance between said slit and said first lens group from the surface nearest to said slit of said first lens group between said slit and first lens group, a condenser lens which is provided between said light source and slit and can produce the image of said light source near either one of said objective and reflector, and a means for inclining the rays incident upon said objective from said light source through said condenser lens and slit with respect to the optical axis of said objective, said rays being able to be incident upon said object to be examined diagonally from above or below through said first reflector.

4,110,000
FIBER OPTIC CONNECTOR

Jerry Hench Bogar, and Tore Rudolf Johnson, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 1, 1976, Ser. No. 662,294
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.21 **11 Claims**

1. A fiber optic connector having mating plug and receptacle members for detachably joining fiber optics cables having a plurality of optical fibers, with said fibers mating on a one-to-one basis, each said member comprising:
- a spreader member adapted to receive the fibers of the bundle in a closely bunched alignment at a first end of the member and cause them to diverge to a spread configuration at the opposite end of the member with said fibers generally defining a cone;

- a fiber support member including a body having a first end matable with the opposite end of said spreader member and a second end defined by a like plurality of resilient cantilever arms with a like plurality of V-shaped channels extending longitudinally along said fiber support member and adapted to receive therein a fiber from said spreader member;

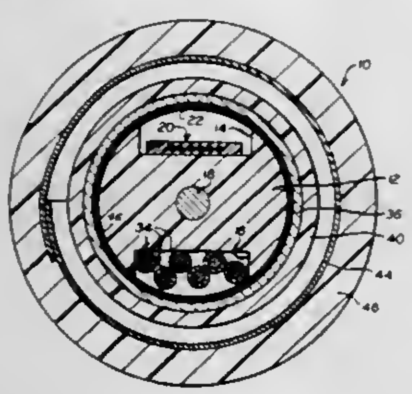


- a like plurality of elongated pin members each lying longitudinally in a respective one of said V-shaped channels and adapted to hold said fibers against the bottom thereof; and
- cam means acting against said pins to bias them against said fibers and into said V-shaped channels.

4,110,001
OPTICAL FIBER CABLE CONSTRUCTION

Jerzy A. Olszewski, Edison, and Arnab Sarkar, Fords, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Jan. 5, 1977, Ser. No. 756,979
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96.23 **18 Claims**



1. An optical fiber cable including in combination an axially extending core element having a channel in the perimeter surface thereof, said channel following a generally helical path along the length of the cable, a fiber assembly including a tape having an inner face confronting a bottom surface of the channel nearest to axis of the core and resting on said bottom surface of the channel along part of the length of the cable, and a fiber carried by the tape and adhered to the surface of the tape that faces away from the bottom of the channel, the fiber being spaced from the bottom of the channel by the thickness of the tape, the radial depth of the channel being enough greater than the thickness of the fiber assembly to prevent the fiber assembly from reaching to the top of the channel, as the result of any bending of the cable, and also to prevent compressing the optical fiber against any structure of the cable extending across the top of said channel.

4,110,002
OPTICAL FIBERS FORMED OF ALUMINUM BOROPHOSPHATE GLASS COMPOSITIONS

Richard M. Klein, Framingham; Carr Lane W. Quackenbush, Lexington, and Andrew G. Kolbeck, Beverly, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

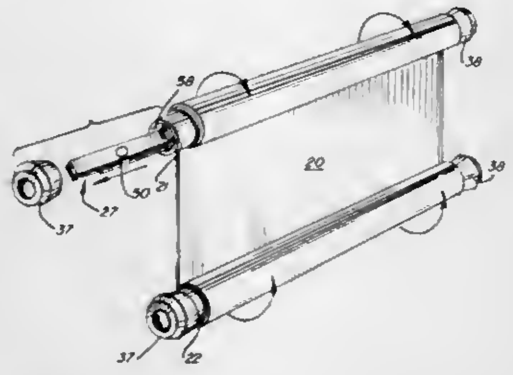
Filed Mar. 2, 1977, Ser. No. 773,527
Int. Cl.² C03C *13/00, 25/02*
U.S. Cl. 350—96.29 **7 Claims**

1. An optical fiber comprising:
- a core having a refractive index of between 1.47 and 1.58 and formed from a glass composition selected from the group consisting of:
  - a. a high phosphate glass of a composition lying within the region of a ternary Al_2O_3-P_2O_5-B_2O_3 composition diagram wherein said region is bounded by lines connecting the compositions 28 mole percent Al_2O_3-72 mole percent P_2O_5-0 mole percent B_2O_3; 5 mole percent Al_2O_3-45 mole percent P_2O_5-50 mole percent B_2O_3; 10 mole percent Al_2O_3-30 mole percent P_2O_5-60 mole percent B_2O_3; and 42 mole percent Al_2O_3-58 mole percent P_2O_5-0 mole percent B_2O_3, and
  - b. a low phosphate glass of a composition lying within the region of a ternary Al_2O_3-P_2O_5-B_2O_3 composition diagram wherein said region is bounded by the isocomposition lines 2 and 18 mole percent P_2O_5, 30 and 70 mole percent Al_2O_3, and 20 and 60 mole percent B_2O_3; and
- a cladding formed from a glass composition selected from the group consisting of said high phosphate glass and said low phosphate glass and having a refractive index at least 0.007 less than that of the central portion of the core.

4,110,003
PORTABLE MOVIE SCREEN DEVICE

Robert W. Zinn, Addison, Ill., assignor to Knox Manufacturing Company, Wood Dale, Ill.

Filed Dec. 27, 1975, Ser. No. 754,889
Int. Cl.² G03B *21/56*
U.S. Cl. 350—117 **11 Claims**

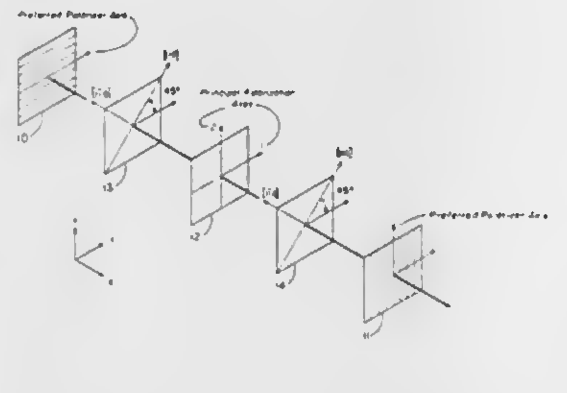


1. A portable movie screen device, comprising: a flexible screen for viewing a projected image; a first elongate stiffening member and a second elongate stiffening member each secured to an opposite marginal edge portion of said screen, the screen being rolled upon one of the stiffening members in closed storage position and extending in planar fashion between the members in open viewing position; a pair of elongate resilient tension elements having interengaging means on adjacent inner end portions for releasably holding said tension elements in aligned extended position, disengagement of the interengaging means permitting said tension elements to be placed in juxtaposed collapsed position; anchoring means in the midportion of each stiffening member spaced to receive the opposite outer end portions of each resilient tension element when the tension elements are flexed and bowed to tensioning position, the resiliency of said tension elements urging the stiffening members in opposite directions to stretch the screen tautly therebetween; and support means for holding the screen upright on a surface when stretched between the stiffening members.

4,110,004
COMPLEX PHOTODICHROIC SPATIAL FILTER

Richard P. Bocker, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,624
Int. Cl.² G02B *5/20*
U.S. Cl. 350—162 SF **7 Claims**



1. A complex spatial filter for reversibly recording a filter function F(*x*,*y*) having a real component $F_r(x,y)$ and an imaginary component $F_i(x,y)$ and contained in the information in a beam of coherent light energy comprising:
- a first linear polarizer positioned to receive said beam of coherent light for transmitting only its light energy components of predetermined polarization;
- a first dichroic crystal plate positioned contiguous and parallel to said first linear polarizer and responsive to the absorption of light energy of a known first bandwidth and a first determinable polarization of said beam of coherent light for causing a difference in the fraction of its M-centers oriented along the [110] and [110] directions at each point (*x*,*y*) defined by

$$f_1(x,y) - f_2(x,y) = (\tfrac{1}{2}k)$$

- a quarter waveplate element positioned contiguous and parallel to said first dichroic crystal plate for causing a 90° phase change between the two orthogonally polarized components of coherent light energy emerging from said first dichroic crystal plate;
- a second dichroic crystal plate positioned contiguous and parallel to said quarter waveplate element and responsive to the absorption of light energy of said known first bandwidth and a second determinable polarization of said beam of coherent light for causing a difference in the fraction of its M-centers oriented along the [110] and [110] directions at each point (*x*,*y*) defined by

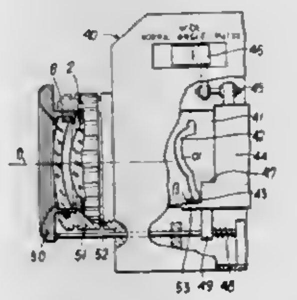
$$f_1'(x,y) - f_2'(x,y) = (\tfrac{1}{2}k)$$

where *k* is a real positive constant of proportionality,
- said first and second dichroic crystal plates having their principal polarization axes oriented at 45° relative to the principal polarization axis of said quarter waveplate element;
- a second linear polarizer positioned contiguous and parallel to said second dichroic crystal plate for transmitting light energy components orthogonally polarized relative to said components of predetermined polarization; and
- a source of light energy of said known first bandwidth and non-polarized state disposed to irradiate said first and second dichroic crystal plates for restoring their M-centers to substantially random orientation.

4,110,005
WIDE-ANGLE ATTACHMENT FOR VARIFOCAL OBJECTIVE

Kurt Böhm, Vienna; Leopold Rollenitz, Totzenbach, both of Austria, and Francois Laurent, Yverdon, Switzerland, assignors to Bolex International SA, Ste-Croix, Switzerland

Filed Aug. 5, 1976, Ser. No. 711,835
Claims priority, application Austria, Aug. 6, 1975, 6079/75
Int. Cl.² G02B *15/18, 7/02*
U.S. Cl. 350—184 **8 Claims**

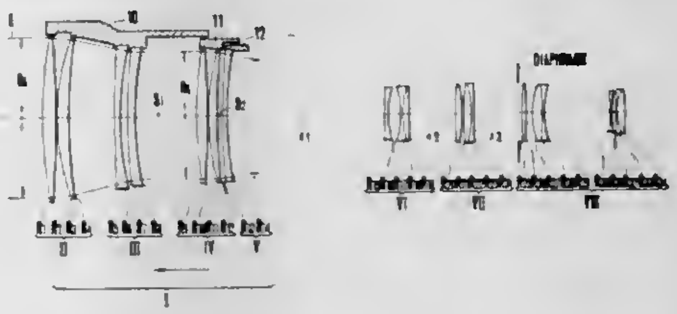


1. In a camera including a housing, a varifocal objective in said housing provided with movable lens means and with a control element for displacing said movable lens means from a normal operating range into a macro position, and supplemental lens means emplaceable on a seat formed by said housing in line with said objective for focusing same on nearby objects in a closeup range upon displacement of said movable lens means into said macro position,
- the combination therewith of blocking means normally extending into the path of said control element for preventing the displacement of said movable lens means into said macro position, and a contact member on said housing coupled with said blocking means and engageable by said supplemental lens means upon emplacement thereof on said seat for removing said blocking means from the path of said control element.

4,110,006
TELEPHOTO TYPE ZOOM LENS

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,667
Claims priority, application Japan, Mar. 11, 1976, 51/26580
Int. Cl.² G02B *15/18*
U.S. Cl. 350—186 **12 Claims**



1. A telephoto zoom lens comprising:
- a convergent front lens group, a zooming lens part and an image forming lens group positioned in said order from an object side, wherein said convergent front lens group consists of a convergent first sub-group, a divergent second sub-group, a convergent third sub-group and a divergent fourth sub-group, further wherein said convergent third sub-group can be shifted for focusing and the ratio between the focal length (f_{II}) of said convergent first sub-group and the absolute value ($|f_{III}|$) of the focal length of said divergent second sub-group lies between 1 : 0.65 and 1 : 0.9, and the absolute value ($|f_V|$) of the focal length of said divergent fourth sub-group is greater than the focal length (f_{IV}) of said convergent third sub-group,

said zooming lens part consisting of at least two movable lens groups.

4,110,007
LARGE APERTURE PHOTOGRAPHIC LENS SYSTEM

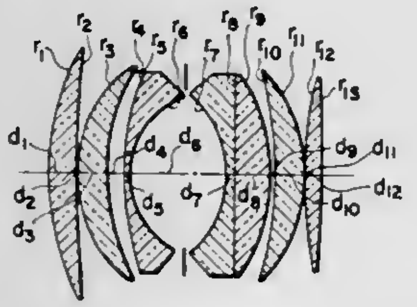
Yoshitsugi Ikeda, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Feb. 23, 1976, Ser. No. 660,119

Claims priority, application Japan, Feb. 25, 1975, 50/23204

Int. Cl.^{2} G02B ***9/62***

U.S. Cl. 350—215 **5 Claims**



1. A large-aperture photographic lens system comprising a first positive meniscus lens component, a second positive meniscus lens component, a third negative meniscus lens component, a fourth cemented doublet lens component, a fifth positive meniscus lens component and a sixth positive lens component having the following numerical data:

f = 100, F/1.2,	2ω = 43°	$f_B = 69.71$	
$r_1 = 89.502$			
	$d_1 = 10.04$	$n_1 = 1.8061$	$\nu_1 = 40.9$
$r_2 = 402.60$			
	$d_2 = 0.23$		
$r_3 = 46.938$			
	$d_3 = 10.57$	$n_2 = 1.8061$	$\nu_2 = 40.9$
$r_4 = 78.859$			
	$d_4 = 4.30$		
$r_5 = 95.186$			
	$d_5 = 2.64$	$n_3 = 1.7847$	$\nu_3 = 26.2$
$r_6 = 30.963$			
	$d_6 = 33.58$		
$r_7 = -34.820$			
	$d_7 = 2.20$	$n_4 = 1.78472$	$\nu_4 = 25.7$
$r_8 = 892.90$			
	$d_8 = 12.78$	$n_5 = 1.79952$	$\nu_5 = 42.2$
$r_9 = -59.776$			
	$d_9 = 0.18$		
$r_{10} = -147.16$			
	$d_{10} = 10.39$	$n_6 = 1.7859$	$\nu_6 = 44.1$
$r_{11} = -55.823$			
	$d_{11} = 0.23$		
$r_{12} = 169.635$			
	$d_{12} = 6.16$	$n_7 = 1.7859$	$\nu_7 = 44.1$
$r_{13} = -395.38$			

wherein the symbols r_1 through r_{13} represent radii of curvature of the surfaces of the respective lenses, d_1 through d_{12} designate thicknesses of the respective lenses and airspaces there between, n_1 through n_7 denote refractive indicies of the respective lenses, ν_1 through ν_7 represent Abbe's numbers of the respective lenses, f is the overall focal length of the lens system, $2w$ is the angular field of view, F is the aperture, and fB is the back focal length.

4,110,008
CUSHIONED OBJECTIVE LENS

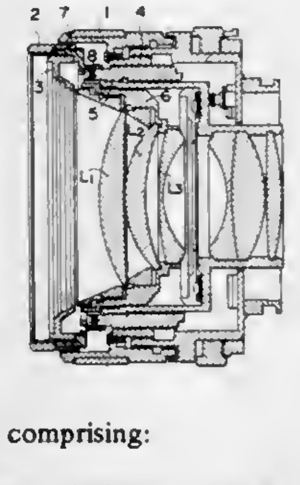
Kyozo Uesugi, Izumi; Tsuneyo Metabi, and Ryuzo Hachiken, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 22, 1977, Ser. No. 770,959

Claims priority, application Japan, Mar. 2, 1976, 51-22806

Int. Cl.^{2} G02B ***7/02***

U.S. Cl. 350—255 **13 Claims**



1. A lens device comprising:
a lens barrel;
a lens unit disposed within said lens barrel;
an external component including a barrel head sleeve disposed at a forwardmost portion of said lens barrel and exposed to the exterior of said lens barrel so as to receive an impact applied from the front of said lens barrel;
an internal mechanism disposed between said lens unit and said external component; and
a buffer coupled to and interposed between said barrel head sleeve and said internal mechanism.

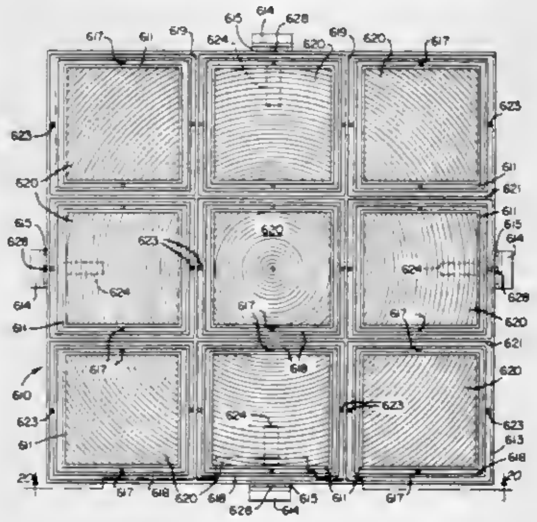
4,110,009
HELIOSTAT APPARATUS

Jesse C. Bunch, 1008 Kerwin Rd., Silver Spring, Md. 20901

Filed Dec. 19, 1975, Ser. No. 642,473

Int. Cl.^{2} G02B ***5/08***

U.S. Cl. 350—292 **5 Claims**



1. Heliostat apparatus for concentrating solar energy comprising support means disposed in a first plane and supporting a plurality of mirror units having freedom of substantial universal articulation thereon,
each of said plurality of mirror units carrying at an upper portion thereof reflective means trained to receive incident rays of the sun and to maintain reflection thereof in a desired substantially fixed direction,
adjustment means operatively connected to said plurality of mirror units and disposed in a plane generally parallel to said first plane in which said support means are disposed, said adjustment means being shiftable in linear displacement to additional planes adjacent and generally parallel thereto to effect substantially universal displacement of each of said mirror units responsive to said linear displacement of said adjustment means at said support means thereby conjointly retrain the reflective means of each of said mirror units to receive incident rays of the sun and maintain reflection thereof in said substantially fixed direction over the course of any day.

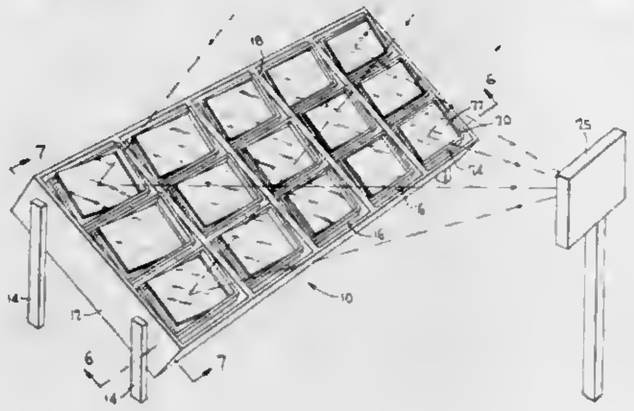
4,110,010
GANGED HELIOSTAT

Richard D. Hilton, Rte. 2, Box 381-A, King George, Va. 22485

Filed Jul. 7, 1977, Ser. No. 813,658

Int. Cl.^{2} G02B ***5/08, 7/18***

U.S. Cl. 350—292 **10 Claims**



1. A device adapted for tracking the apparent motion of the sun and reflecting and thereby concentrating rays of the sun to a fixed target area comprising at least two members each having a reflective surface and being rotatably mounted in a frame on an axis which passes through the center point of the member, each frame being rotatably mounted in a common support on an axis which passes through the center point of the member and which is at a right angle to the axis of the member, a control rod having a longitudinal axis attached to the member such that the axis of the rod is normal to the reflective surface and passes through the center point of the member, guide frame means in engagement with each control rod, driving means for moving the guide frame such that each member rotates about one axis and adjusting means for moving the guide frame means such that each member rotates about the other axis.

4,110,011
PERISCOPE CONSTRUCTION

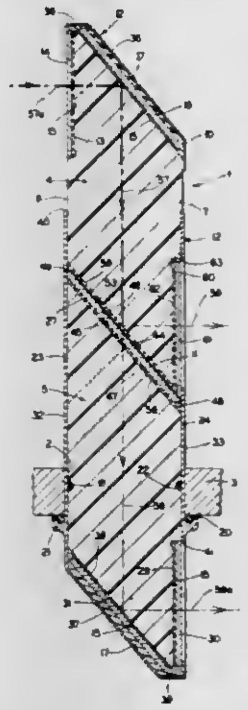
Gerald Tausch, Salem, Ohio, assignor to Miller-Holzwarth, Inc., Salem, Ohio

Filed Feb. 22, 1977, Ser. No. 770,641

Int. Cl.^{2} G02B ***5/08***

U.S. Cl. 350—301 **7 Claims**

1. A periscope construction of the type having a protective housing with at least front and rear walls, and an optical system mounted within the housing, in which the optical system includes:
(a) a first block of optical material having an object viewing surface, a first reflective surface, a first eyepiece viewing surface, and a first end surface;
(b) a second block of optical material having a second eyepiece viewing surface, a second reflective surface, and a second end surface;
(c) the first and second blocks of optical material being mounted at and bonded to generally opposite ends of the protective housing and forming a parallelogram in cross section with the first and second reflective surfaces and the object and second eyepiece viewing surfaces, respectively, being generally parallel with respect to each other, and with the first and second end surfaces being spaced from each other and forming a void therebetween;
(d) beam splitting means mounted within the void between the first and second end surfaces of the first and second blocks, with said beam splitting means reflecting a predetermined portion of a light beam entering the housing through the object viewing surface and reflected from the first reflective surface out of the housing means through the first eyepiece viewing surface, with a remaining unreflected portion of the light beam passing through said beam splitting means and being reflected from the second reflective surface out of the housing means through the second eyepiece viewing surface; and
(e) optical adhesive means bonding the beam splitting means to the first and second end surfaces of the blocks to form an integrally joined compact optical system mounted within and bonded to the protective housing.



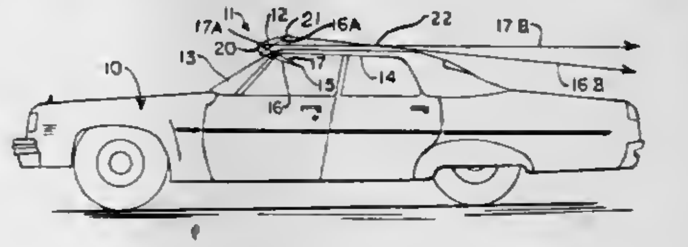
4,110,012
REAR VIEW MIRROR SYSTEM WITH ELLIPTICALLY CURVED MIRROR AND FLAT MIRROR

Kenneth W. Jarvis, 5900 Columbus Ave. South, Minneapolis, Minn. 55417

Filed Aug. 11, 1977, Ser. No. 823,718

Int. Cl.^{2} G02B ***5/08***

U.S. Cl. 350—302 **23 Claims**



1. A rear view mirror system for vehicles comprising support means mounted on the exterior of the vehicle above the upper edge of the windshield, said mirror system including a first generally elliptically curved mirror surface mounted by said support means at a location generally above the roof line of the vehicle, said curved mirror surface being curved in fore and aft direction and downwardly concave, and a second substantially flat mirror mounted by said support means below and forwardly of said elliptically curved mirror surface, said second substantially flat mirror being visible by a driver of the vehicle and positioned so that a line of sight reflected from the lower portion of the substantially flat mirror is reflected to an upper and rearwardly positioned portion of the elliptically curved mirror surface, and a line of sight reflected from the upper portion of the substantially flat mirror is reflected to the most forwardly portion of the elliptically curved mirror to

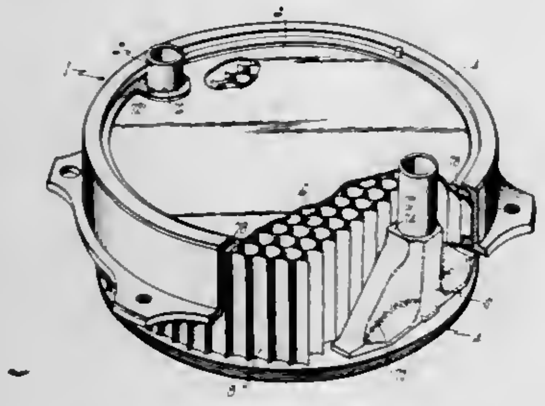
provide a properly oriented image for a viewer to the rear and below the substantially flat mirror.

4,110,013
LIGHTWEIGHT COOLED LASER MIRROR

Fredrick G. Eitel, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 13, 1977, Ser. No. 787,243
Int. Cl.^{2} G02B *5/08*

U.S. Cl. 350—310 **5 Claims**



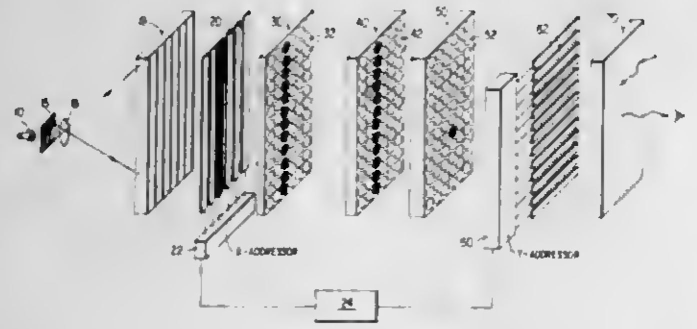
1. In combination in a coolant laser mirror, a face plate assembly, a rear closure plate, metal substrate fixed between said face plate assembly and closure plate, said metal substrate being comprised of a lightweight metal core, spaces being located between said face plate assembly and closure plate at opposite sides thereof, manifold means connected between said closure plate and face plate assembly, passageway means through said manifold means connecting the exterior of said laser mirror to said face plate assembly, said face plate assembly being of a sandwich construction having a plurality of plates, including a last plate, said last plate having a reflecting surface thereon for use in a laser device, said plates permitting many passes of a coolant fluid through the face plate assembly.

4,110,014
PARALLEL AND SERIES ELECTRO-OPTIC VIEWING AND RECORDING APPARATUS

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Filed Oct. 22, 1976, Ser. No. 735,030
Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—342 **34 Claims**



1. An electro-optic device of the type having a photoconductive sheet and an electro-optic sheet both generally planar, the improvement comprising, generally planar X and Y sets of transparent and conductive addressor strips, the X and Y sets sandwiching the photoconductive sheet and the electro-optic sheet.

4,110,015
ELECTROLYTES FOR USE IN ELECTROCHROMIC DEVICES

Thomas B. Reddy, Pound Ridge, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 25, 1977, Ser. No. 800,362
Int. Cl.^{2} G02F *1/36*

U.S. Cl. 350—357 **7 Claims**

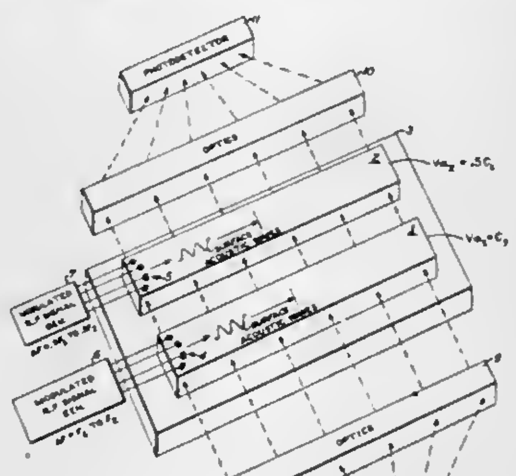
1. In an electrochromic device which comprises a layer of persistent electrochromic material on an electrode surface in contact with an electrolyte solution, a counter-electrode also contacting said solution and electrical means for selectively applying electrical fields of opposite polarity across said electrodes, the improvement wherein said electrolyte solution comprises a lithium salt dissolved in a solvent selected from the group consisting of dimethylsulfite, nitromethane, and sulfolane.

4,110,016
ACOUSTO-OPTIC REAL TIME CORRELATOR

Norman J. Berg, Baltimore, Md.; Bob Lorin Smith, deceased, late of Huntsville, Ala., and by Allen B. Adams, legal representative, Cupertino, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 7, 1977, Ser. No. 804,203
Int. Cl.^{2} H03H *9/26*

U.S. Cl. 350—358 **5 Claims**



1. An acousto-optic apparatus for providing the correlation of first and second electrical signals without the necessity of time inversion, comprising

first and second acousto-optic interaction media disposed adjacent each other, said second interaction medium having a lower acoustic velocity than said first medium, each of said media having an acoustic transducer means disposed thereon,

means for applying a high frequency A.C. signal to said transducer means on said first medium, the envelope of which corresponds to said first electrical signal,

means for applying a high frequency A.C. signal to said transducer means on said second medium, the envelope of which corresponds to said second electrical signal,

laser means directed to transmit a laser beam across both said media, and

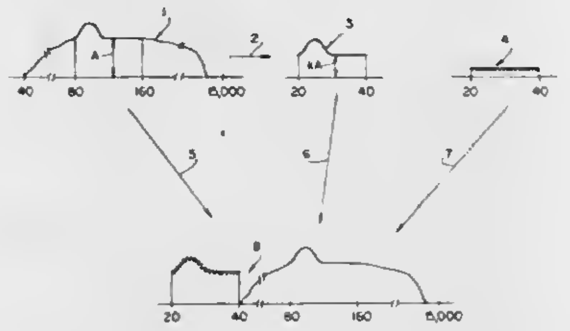
detector means for detecting said laser beam after it traverses said first and second acousto-optic interaction media.

4,110,017
LOW-FREQUENCY SOUND PROGRAM GENERATION

Thomas L. McCormack, Arleta, and Albert P. Green, Los Angeles, both of Calif., assignors to Warner Bros. Inc., Burbank, Calif.

Filed Jun. 3, 1977, Ser. No. 803,212
Int. Cl.^{2} G03B *31/00*

U.S. Cl. 352—5 **14 Claims**



1. A method for producing a sound program for a sound motion picture capable of simulating a physiological and psychological sensation in an audience viewing said motion picture comprising the steps of:

(a) generating at least a portion of the audible sound program for said motion picture,

(b) processing said generated audible sound program to produce a low-frequency sound program capable, during subsequent synchronous playback with the projection of said motion picture, for simulating said physiological and psychological sensation, and

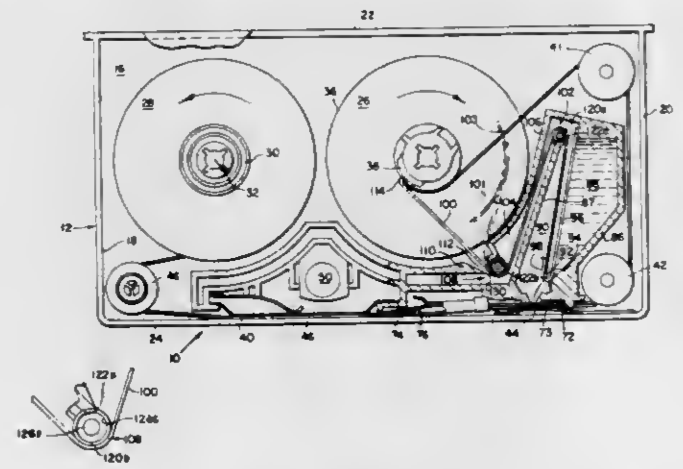
(c) recording synchronously said generated audible sound program and said produced low-frequency sound program for subsequent playback synchronously with the projection of said motion picture.

4,110,018
PULL STRIP GUIDE FOR MULTIPURPOSE FILM CASSETTES

Fred M. Finnemore, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 26, 1977, Ser. No. 791,035
Int. Cl.^{2} G03C *11/00*

U.S. Cl. 352—130 **10 Claims**



1. A film cassette containing a strip of photographic film to be exposed and processed without removal from the cassette, comprising:

a housing;

means contained within said housing for processing the exposed film strip, said processing means including a processing fluid reservoir initially sealed by a tear tab closure to be removed by advancement of the tear tab upon completion of film exposure to release reservoir contained processing fluid for deposit on the film strip;

a pull strip joined at one end to said tear tab; and

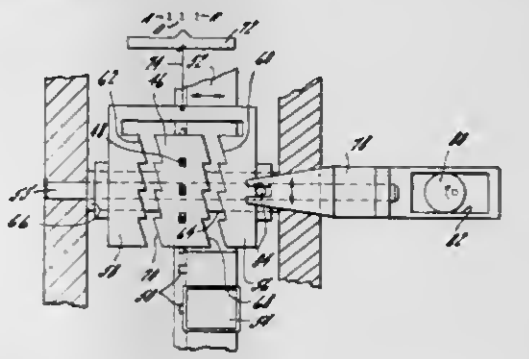
means for guiding said pull strip along a predetermined path to advance said tear tab and release the processing fluid from said reservoir, said guiding means including at least one turning point and means for supporting the inner surface of said pull strip at said turning point, said supporting means comprising a cylindrical element having a first arcuate portion of its outer surface in contact with said inner surface of said pull strip and means for contacting and supporting at least the arcuate portion of said outer surface of said cylindrical element diametrically opposed from said first arcuate portion for rotational movement of said cylindrical element relative thereto as said pull strip is advanced thereby.

4,110,019
INTERMITTENT DRIVE MECHANISM FOR FILM

Marcel Jules Helene Staar, Brussels, Belgium, assignor to Staar S.A., Belgium

Filed Jun. 1, 1976, Ser. No. 691,605
Claims priority, application Belgium, Jun. 5, 1975, 829918
Int. Cl.^{2} G03B *1/24*

U.S. Cl. 352—188 **7 Claims**



1. In an intermittent drive mechanism for film,

a driven ratchet wheel having a ring of ratchet teeth on one face,

exterior sprocket teeth carried by said ratchet wheel and engageable in perforations in film to move said film when said wheel is turned,

a driving wheel having a ring of teeth on one face,

a shaft for supporting said driving wheel and said ratchet wheel face to face and to turn about the axis of said shaft,

means for resiliently urging said wheel axially toward each other and said teeth into contact,

said teeth on both said sheels having asymmetrical complementary saw-toothed shape, said teeth meshing to turn said ratchet wheel when said driving wheel is turned in one direction and ratcheting to lift said driving wheel away from said ratchet wheel against the resistance of said resilient means and idle said ratchet wheel when said driving wheel is turned in the other direction,

an arm supported for swinging movement on said shaft and connected to turn said driving wheel,

and rotary cam means for oscillating said arm and for turning said driving wheel first in one direction and then in the other at a constant frequency and amplitude, the amplitude of the oscillations of said arm and the turning movements of said driving wheel being equal to the pitch of said teeth and the distance between said film perforations so that said driving wheel turns said ratchet wheel and moves said film the pitch distance upon each oscillation of said arm,

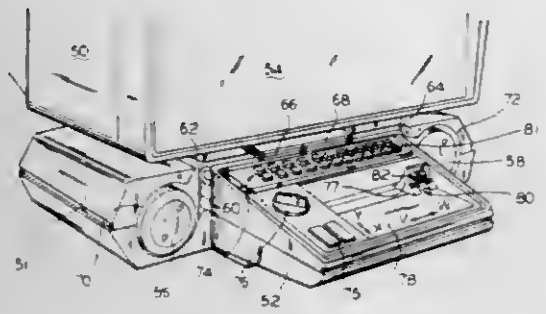
said ratchet wheel having a series of indentations adjacent said sprocket teeth, and

a pawl engageable in said indentations for holding said ratchet wheel idle during the ratcheting of said driving wheel and released from said indentations when said driving wheel is turned in said one direction to turn said ratchet wheel and move said film.

4,110,020
ELECTRONICALLY CONTROLLED MICROFILM PHOTOGRAPHIC IMAGE UTILIZATION DEVICE

Delmar R. Johnson; John R. Flint, both of Barrington; Thomas R. Wells, Des Plaines; Rolf B. Erikson, Lincolnwood, and Bruce A. Rady, Palatine, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 3, 1976, Ser. No. 711,180
Int. Cl.^{2} G03B *23/12, 23/08;* **G06K** *7/10, 19/00*
U.S. Cl. 353—26 A **25 Claims**



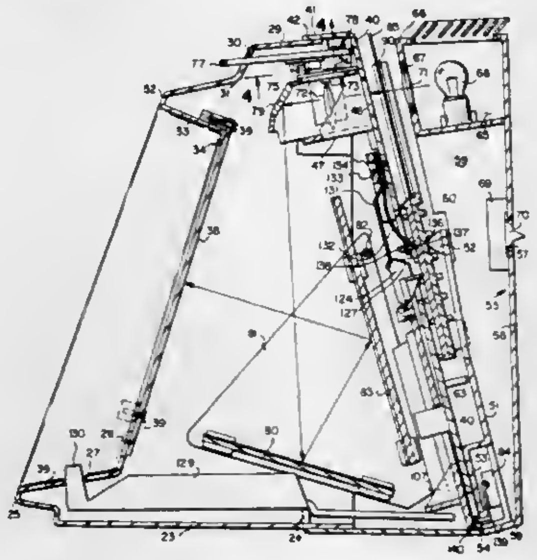
1. A microfilm photographic image utilization device for projecting images onto a viewing area, said device comprising means for transporting a roll of film in either of two directions, said film having a plurality of images printed thereon in discrete photographic areas, each photographic area having a plurality of individual images arranged in an orthogonal array, each of said photographic areas having an individually associated bar code printed on the film at a point having a precise geometrical location with respect to the individually identified photographic area, each of said bar codes comprising an aligned series of wide and narrow marks separated by spaces, each narrow mark having the same width, each of said wide marks being twice as wide as said narrow marks, the width of each of said spaces being equal to the width of said narrow marks, two sensors means for reading said aligned series of marks, said sensor means being separated by a distance equal to one-and-one-half times the width of said narrow marks, control means for selecting said one photographic area responsive to movement of at least one control switch to issue a command code, means responsive to said command code for starting said transport means in search of one of said bar codes corresponding to said command code, means for automatically driving said transport to reel said film in either of said two directions to position a selected one of said photographic areas in a reading location, means for detecting whether said transport means is searching in the correct one of said two directions for said one bar code, means for reversing said transport means if said transport means detects bar codes which indicate that searching is in the incorrect one of said two directions, and means comprising a movable lens for projecting a selected image from the photographic area which is then positioned within said viewing area.

25. A bar code reading system comprising a web having a plurality of said bar codes formed thereon wherein each of a plurality of bar codes comprises an aligned series of wide and narrow marks separated by spaces, each narrow mark having the same width, each of said wide marks being twice as wide as said narrow marks, the width of each of said spaces being equal to the width of said narrow marks, sensor means comprising means for sequentially reading each of said aligned series of marks at each of two locations separated by a distance equal to one-and-one-half of said narrow marks, one of said reading locations acting as a strobe for the other of said locations, and means responsive to the strobing for indicating an encoded "1" or "0" depending upon the reading then being received at the strobed location.

4,110,021
MICRO FICHE INDEXER

Jody L. Numbers, Scottsdale, Ariz., assignor to Ralph A. Sickles and Doris E. Sickles, both of Tempe, Ariz., Co-Trustees of the Ralph A. Sickles Family Estate

Filed Sep. 19, 1977, Ser. No. 834,391
Int. Cl.^{2} G03B *23/08*
U.S. Cl. 353—27 R **14 Claims**



1. In a micro fiche indexer for shifting a fiche having a plurality of images arranged in a plurality of vertically spaced horizontal rows:

(a) a cabinet having a screen mounted in the front thereof;
(b) a fiche holder in which a fiche is removably positioned and having front and rear faces;
(c) a plurality of horizontally ribs on said rear face defining horizontal grooves, said fiche holder being positioned in said cabinet opposite said screen;
(d) an optical system including an electric light, lenses and reflectors for projecting an enlarged image on the fiche onto said screen;
(e) a pushbutton mounted in the front portion of said cabinet;
(f) an actuating panel vertically movable in said cabinet and having a portion disposed in front of the front face of said fiche holder;
(g) a spring having one end connected to said cabinet and its other end to said actuating panel and biasing said panel into its lowermost position;
(h) operating connections between said pushbutton and said actuating panel for raising the panel against the influence of said spring;
(i) cooperating indexing elements on said front face of said fiche holder and said actuating panel for shifting said panel horizontally with a step-by-step motion through all of the images in a horizontal row and then vertically from one row to the next-adjacent row by successive operation of said pushbutton; and
(j) a guide bar received in one of said horizontal grooves and movable upon vertical movement of the fiche holder to be received in the next-adjacent horizontal groove.

4,110,022
DOUBLET LENS MICROFICHE CONSTRUCTION

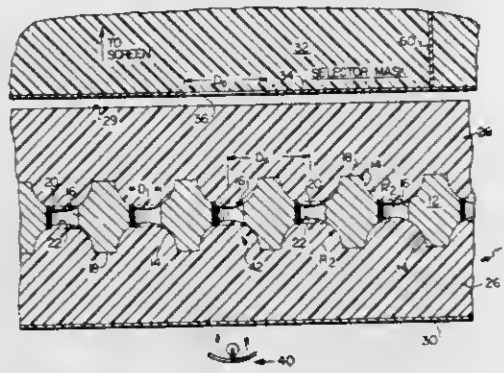
George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Filed Jan. 8, 1975, Ser. No. 539,458
Int. Cl.^{2} G03B *21/11, 21/00*
U.S. Cl. 353—120 **3 Claims**

1. A microfiche adapted for use on a micro optical viewer, said microfiche including:

(a) two transparent sheets,
(b) one of said sheets carrying stored micro optical information distributed over its area,

(c) said sheets sandwiching an apertured opaque unitary web, portions of said transparent sheets extending into each of the apertures of the opaque web from opposite sides of the web, said portions, for each aperture of said bed, being convex towards each other, said convex portions together with their corresponding areas on the sides of said transparent sheets, defining two optically aligned plano-convex lenses to thereby define an optical doublet for each aperture,
(d) said optical doublets being spaced parallel from said stored micro optical information,



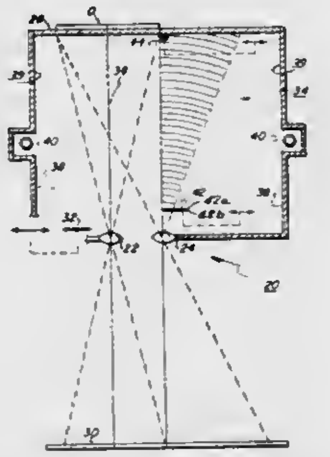
(e) said micro optical information defined by a plurality of information sets, each information set corresponding to a unique macro scene, each information set occupying dispersed areas interlaced with but distinct from the dispersed areas occupied by any other information, each unique macro scene corresponding to a unique set of said optical doublets, each of the dispersed areas of an information set having its own optical doublet and being in optical correspondence therewith,

wherein said transparent sheets have different indices of refraction.

4,110,023
OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE IMAGES OF A SINGLE OBJECT

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,864
Int. Cl.^{2} G03B *21/00*
U.S. Cl. 353—122 **1 Claim**



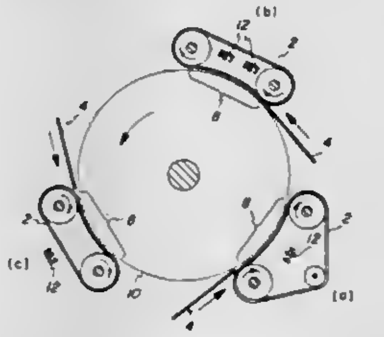
1. An optical system for alternatively projecting an image of a full object field in a first mode of operation and projecting a plurality of images of a partial object field in a second mode of operation, including:

an object station defining an object field, said object field disposed within an integrating illumination cavity defined by an enclosure having a diffuse reflective inner member
an image station defining an image field
a first projection lens disposed on a first optical axis between said object and image stations;
said object and image fields being respectively in object and image conjugate relationship to said first projection lens
pl a second projection lens disposed on a second optical axis between said object and image stations
a first part of said object field and a first part of said image field being respectively in object and image conjugate relationship to said first projection lens
said first part of said object field and a second part of said image field being respectively in object and image conjugate relationship to said second projection lens
a shutter operatively disposed relative to said second projection lens to close optical communication through said second projection lens in said first mode of operation and to open optical communication through said second projection lens in said second mode of operation, and
a field stop operatively disposed in said object field and movable between a clear position to permit unobstructed optical communication between said object station and said image station in said first mode of operation and a masking position to mask out a second part of said object field in said second mode of operation, said field stop having a diffuse reflective surface on its object side and a matte black surface on its image side.

4,110,024
TRANSFER ASSEMBLY FOR ELECTROSTATIC TRANSFER OF A TONER IMAGE FROM A CURVILINEAR RECORDING SURFACE

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 14, 1976, Ser. No. 686,353
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 355—3 TR **8 Claims**



1. In an electrostatographic copying system having means for forming a latent electrostatic image, means for development of said latent electrostatic image with electrostatically attractable developer material, and means for electrostatic transfer of the developed image of said developer materials from a curvilinear surface upon which the developed image is electrostatically adherent to a receiving sheet by applying transfer corona charges from a corona discharge device to the rear surface of the receiving sheet while the front surface of the receiving sheet is held in intimate engagement with said curvilinear surface over a transfer area thereof; the improvement comprising:

a highly corona pervious continuous web having a porosity of greater than 30%, the solid area of said web consisting of strand-like filamentous material in an open integral dimensionally stable open mesh configuration,
said filamentous material having a filament diameter of about 10 mills or less and a bulk resistivity of at least 10^6ohm-cm to allow a substantially uniform application of said transfer corona charges through said corona pervious web,
support means for arcuately deforming said corona pervious web over said transfer area of said curvilinear surface to hold a receiving sheet between said web and said transfer area of said curvilinear surface,
means for moving said corona pervious web in registration with the movement of said curvilinear surface, and

corona discharge means spaced from said curvilinear surface, with said corona pervious web interposed therebetween, for applying said transfer corona charges through the openings in said corona pervious web to the receiving sheet concurrently with the passage of the receiving sheet through the transfer area.

4,110,025
DUPLEX ELECTROSTATIC COPYING MACHINE

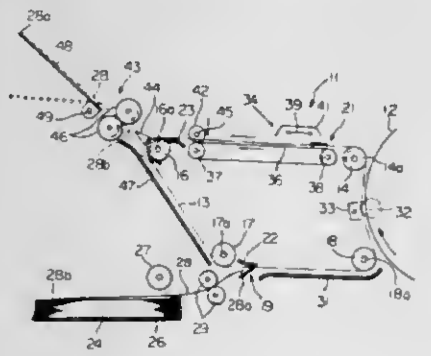
Yasuhiro Tabata, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,274

Claims priority, application Japan, Sep. 22, 1975, 50-114554

Int. Cl.² G03G *15/00;* **G03B** *27/32, 27/52*

U.S. Cl. 355—3 SH **8 Claims**



1. In a duplex electrostatic copying apparatus comprising a moving photoconductive member, means for forming toner images on the photoconductive member, conveyor means for moving a rectangular copy sheet into synchronized engagement with the photoconductive member to transfer toner images thereto, and turnover means associated with the conveyor means in such a manner as to detach the copy sheet from the conveyor means after a toner image is formed on a front side of the copy sheet, turn over the copy sheet and reattach the copy sheet to the conveyor means for transfer of a toner image to a back side of the copy sheet, the improvement wherein the conveyor means comprises:

a moving endless chain; and

first and second spaced releasable clamps fixed to the chain for movement therewith, the first clamp clamping a first edge of the copy sheet to the chain to form the toner image on the front side of the copy sheet, the second clamp clamping a second edge of the copy sheet which is opposite to the first edge to the chain to form the toner image on the back side of the copy sheet;

the turnover means comprising:

actuator means having an actuator member engageable with the first and second clamps to cause the first clamp to release the first edge of the copy sheet to detach the copy sheet from the chain and the second clamp to clamp the second edge of the copy sheet to reattach the copy sheet to the chain; and

feed means to engage with and move the copy sheet, when the first clamp engages with the actuator member and is actuated thereby to release the first edge of the copy sheet, away from the chain to a position in which the second edge of the copy sheet is clear of the chain and to move the copy sheet back toward the chain when the second clamp engages with the actuator member so that the second edge of the copy sheet is clamped by the second clamp when the second clamp disengages from the actuator member.

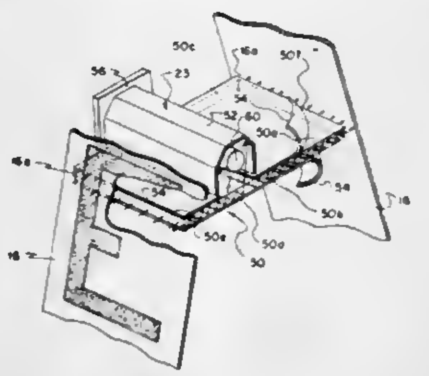
4,110,026
DISCHARGER APPARATUS FOR PHOTOCONDUCTORS

Ronald William Farley, and Donald Luke Smith, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1977, Ser. No. 776,081

Int. Cl.² G03B *27/00*

U.S. Cl. 355—3 R **8 Claims**



1. For use with an electrographic apparatus which includes a charged photoconductor which is dischargable by light and is more sensitive to light in a first portion of the light spectrum than in a second portion of the light spectrum, discharging apparatus for efficiently discharging the charged photoconductor, comprising: a fluorescent concentrator for producing light which floods the photoconductor at a predetermined location and wherein such concentrator includes dye which produces light that has substantial components in the first portion of the light spectrum.

4,110,027
IMAGE TRANSFER MECHANISM

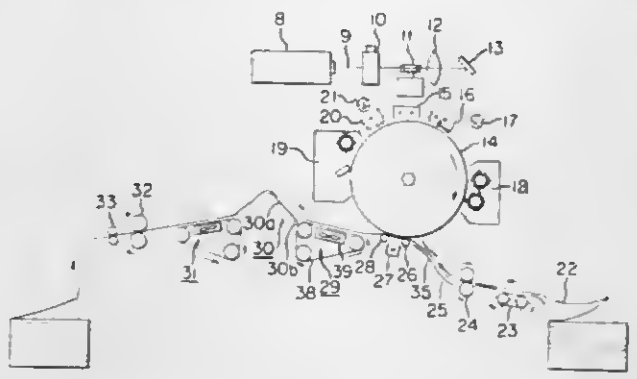
Yasushi Sato, Kawasaki, and Hiroo Ichihashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,741

Claims priority, application Japan, Jul. 12, 1976, 51-82643

Int. Cl.² G03B *15/00*

U.S. Cl. 355—3 TR **6 Claims**



1. An image transfer mechanism for transferring the image on an image-bearing member onto a continuous transfer medium by bringing said transfer medium into contact with the image on said image-bearing member wherein said transfer medium is conveyed along a path past a transfer section, said mechanism comprising first conveyor means disposed upstream of the image transfer section in the transfer medium conveyance path for intermittently conveying the transfer medium at a constant velocity, second conveyor means disposed downstream of said image transfer section for conveying said transfer medium while slidably holding the non-image-bearing surface thereof, and image transfer means disposed at the image transfer section between said two conveyor means.

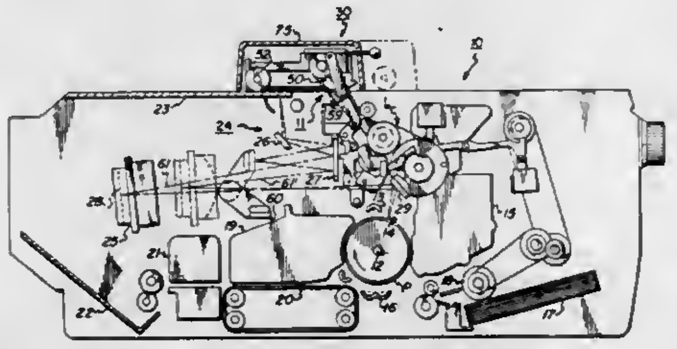
4,110,028
DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS

Louis Schneider, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 601,553, Aug. 4, 1975, abandoned. This application Apr. 2, 1976, Ser. No. 673,228

Int. Cl.² G03G *15/28*

U.S. Cl. 355—8 **27 Claims**



22. In a reproducing apparatus for producing copies of a document comprising:

a transparent viewing platen;

means for advancing said document selectively at one of a plurality of desired speeds, including a base speed, the improvement wherein said apparatus further includes:

means for supporting said document advancing means for movement between an operative position over said platen and a stored position away from said platen;

means for automatically conditioning said document advancing means to operate at said base speed after it has finished operation at a speed different from said base speed, said automatic conditioning means being responsive to the movement of said document advancing means between said positions.

4,110,029
LIQUID DEVELOPER FOR AN ELECTROSTATIC COPYING DEVICE

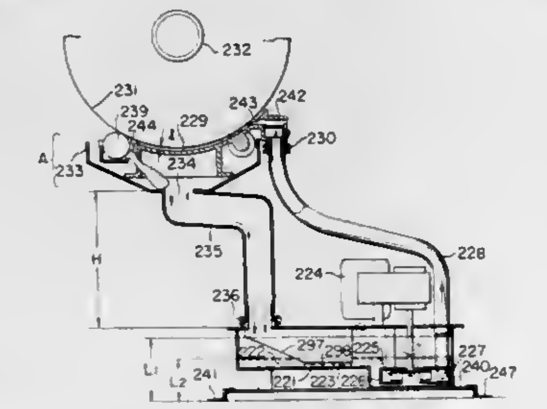
Yoshitomo Goshima, Yokohama; Hiroyuki Hattori, Mitaka; Shiro Komaha, Kawasaki, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 509,744, Sep. 26, 1974, Pat. No. 3,957,368. This application Jun. 10, 1975, Ser. No. 585,602

Claims priority, application Japan, Sep. 27, 1973, 48-108677; Oct. 1, 1973, 48-111249; Nov. 30, 1973, 48-135155; Dec. 13, 1973, 48-140956; Jan. 8, 1974, 49-5503; Jan. 8, 1974, 49-5504; Feb. 12, 1974, 49-16988; Oct. 5, 1973, 48-116829[U]; Oct. 5, 1973, 48-116830[U]; Dec. 20, 1973, 48-146414[U]

Int. Cl.² G03G *15/10*

U.S. Cl. 355—10 **16 Claims**



1. In a machine embodying a liquid developing device, the improvement comprising:

a member for bearing thereon a latent image;

means disposed in opposition to said image bearing member for applying developer liquid thereto;

a container disposed at a lower position than said developer liquid applying means for holding developer liquid to be applied to said latent image bearing member;

means for circulating the developer liquid from said container to said developer liquid applying means and back into said container; and

filter means disposed at a position where the developer liquid flows back into said container, said filter means having a developer liquid impinging portion which is angularly disposed with respect to said flow of the developer liquid and is disposed above the surface of the developer liquid contained in said container during the operation of said device, and a toner accumulating portion which is immersed in the developer liquid in said container at least when said pump means is not in operation to thereby soften and disperse any coagulated toner particles from the developer liquid accumulated thereon.

4,110,030
ELECTROSTATIC COPYING APPARATUS

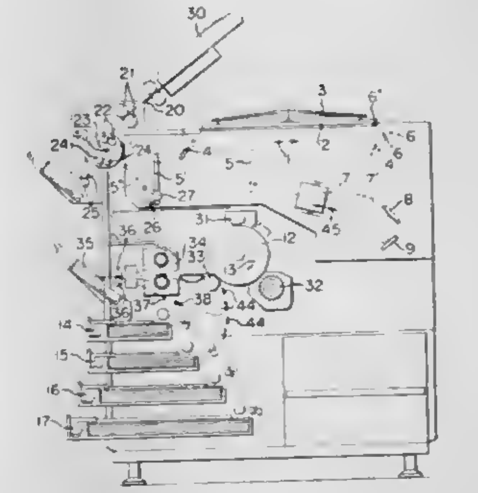
Wilhelm Knechtel, Biebertal, Fed. Rep. of Germany, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,361

Claims priority, application Fed. Rep. of Germany, May 20, 1975, 2522264

Int. Cl.² G03G *15/00;* **B65H** *29/66*

U.S. Cl. 355—11 **5 Claims**



1. A copying apparatus comprising in combination:

sheet original transport unit for moving a sheet original from a sheet original inlet to a sheet original outlet, and having a scanning section disposed between said inlet and outlet;

optical means including a lens and a mirror for projecting a scanned image of the original onto a photosensitive member to form a latent image thereon;

means for revolving said sheet original transport unit with the trailing end portion of the sheet original being held therein downstream of said scanning section, wherein said revolving movement is effected so as to return the trailing end portion of the sheet original to a position adjacent said sheet original inlet through which the sheet original has been transported;

means for reversely transporting the sheet original through said transport unit, with the trailing end portion thereof forward, from said sheet original inlet, past said scanning section, to said sheet original outlet; and

means for visualizing the latent image projected on the photosensitive member.

4,110,031

ELECTROSTATIC COPYING APPARATUS

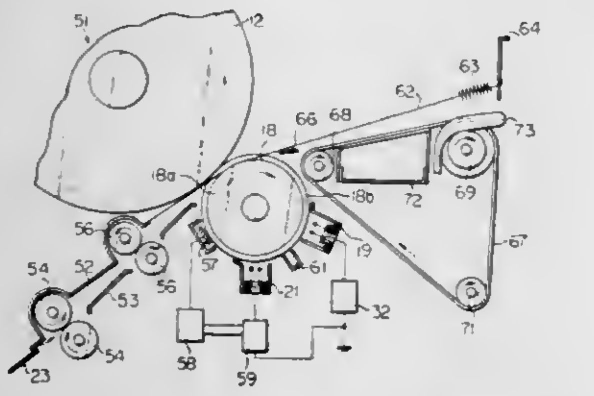
Yutaka Ebi, and Masatoshi Saitou, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 28, 1976, Ser. No. 727,501

Claims priority, application Japan, Sep. 30, 1975, 50-117994

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **9 Claims**



1. An electrostatic copying apparatus comprising:
- a rotary photoconductive member rotatable in a predetermined direction;
- a rotary transfer member formed with a dielectric peripheral surface and being rotatable in close proximity to a surface of the photoconductive member in a direction opposite to the predetermined direction so that the adjacent surfaces thereof move in the same direction and at the same surface speed which is selectively changeable between a first predetermined value and a second predetermined value;
- charging means for applying an electrostatic potential to the dielectric surface of the transfer member;
- sensing means for determining the value of the electrostatic potential on the transfer member; and
- control means responsive to the sensing means for controlling the charging means to adjust the value of the electrostatic potential to first and second predetermined values corresponding to the first and second predetermined values of surface speed respectively.

4,110,032

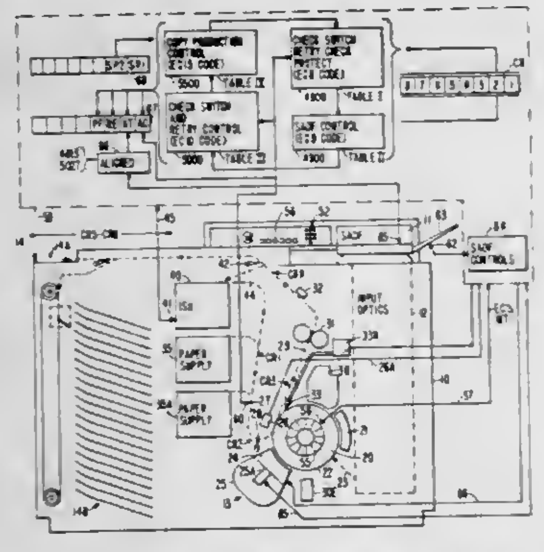
COPY PRODUCTION MACHINES HAVING SUPPLY SHEET PICK RETRY

James Henry Hubbard, Boulder; Wallace Lloyd Hubert, Broomfield, and Paul Richard Spivey, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,774

Int. Cl.² G03G *21/00*

U.S. Cl. 355—14 **5 Claims**



1. A copy production machine having a cut sheet copy supply, means to pick a sheet from said supply, an image transfer station for receiving a picked sheet for transferring an image thereto, means for removing an imaged sheet from said transfer station,
- the improvement including in combination:
- sense means for sensing a picked sheet ready to enter said image transfer station,
- timing means indicating timed operation of said transfer station as ready to receive a copy sheet within a first time period and not ready in a second time period,
- computer means programmed to have:
- coincidence means jointly responsive to said sense means and said timing means to indicate sheet pick failure,
- control means responsive to said failure indication to inhibit transfer of an image for one cycle of said image transfer station,
- counter means indicating a number of successive pick failures, and
- control means responsive to said counter means to turn off the copy production machine after a predetermined number greater than one of said pick failures.

4,110,033

CONTROL SYSTEM FOR COPYING APPARATUS

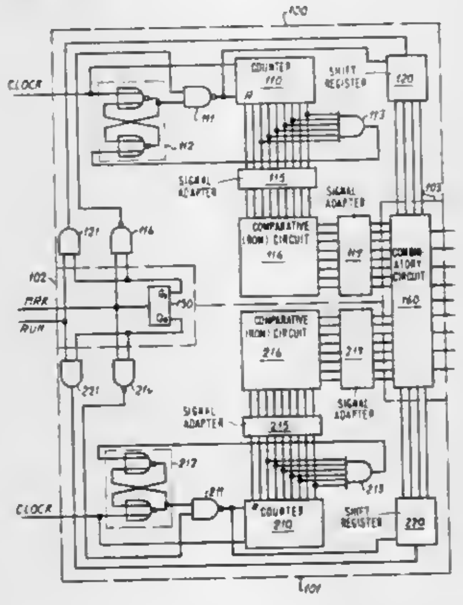
Petrus J. M. Opbey, Grubbenvorst, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Jan. 21, 1977, Ser. No. 761,284

Claims priority, application Netherlands, Jan. 30, 1976, 7600943

Int. Cl.² G03G *21/00*

U.S. Cl. 355—14 **6 Claims**



1. In copying apparatus comprising an endless photoconductive belt movable through a number of processing stations which together form a processing zone in which images of originals are formed on portions of the belt and are subsequently transferred to receiving material, which belt portions have predetermined locations relative to at least one marking on said belt, and a control circuit which emits control signals for activating or inactivating said processing stations in synchronization with the movement of said belt portions through said zone, the combination which comprises a detector installed beside the path of said belt and operative to emit a signal pulse upon being passed by a said marking and a said control circuit which comprises two partial circuits, each equivalent to the other and each operable to emit such control signals, and a switching circuit operative in response to said signal pulse to start the operation of one of said partial circuits for the emission of such control signals while the other of said partial circuits is operating for the emission of such control signals so that said other partial circuit will continue so operating until the last of the said belt portions which entered into said processing zone before the emission of said signal pulse has passed entirely through said zone.

4,110,034

DRUM CLEANING APPARATUS FOR ELECTROSTATIC COPYING MACHINE

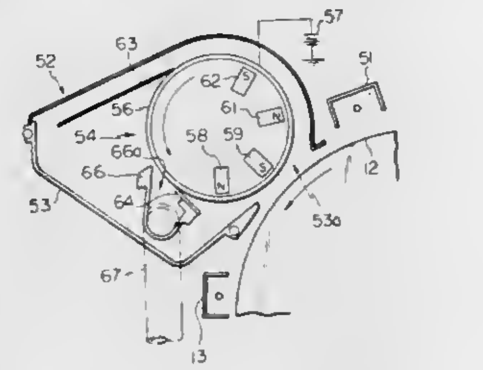
Minoru Suzuki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 25, 1977, Ser. No. 800,262

Claims priority, application Japan, Jun. 24, 1976, 51/74884

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **9 Claims**



1. In an electrostatic copying machine including a photoconductive member, a cleaning apparatus for removing residual toner particles from the photoconductive member, said cleaning apparatus comprising:
- a hollow rotary cylinder disposed closely adjacent to the photoconductive member;
- means for producing relative movement between the photoconductive member and the cylinder;
- a magnet means disposed inside the cylinder;
- a carrier particle container, a lower portion of the cylinder being immersed in ferromagnetic carrier particles provided in the container, the carrier particles adhering to the cylinder due to the force of the magnet means to form a magnetic brush which brushingly engages with the photoconductive member to remove the residual toner particles therefrom;
- attraction means for attracting the toner particles to a periphery of the cylinder;
- carrier removal means for removing carrier particles from the cylinder; and
- toner removal means for removing toner particles from the cylinder.

4,110,035

CLEANING SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

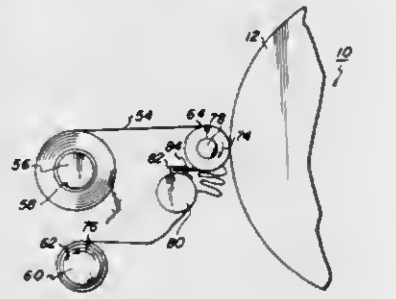
Akira Kamata, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Sep. 18, 1976, Ser. No. 722,928

Claims priority, application Japan, Sep. 29, 1975, 50/131901[U]

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **6 Claims**



4. An electrophotographic printing machine of the type having toner particles developing a latent image recorded on a photoconductive member with the toner powder image being transferred from the photoconductive member to a copy sheet, wherein the apparatus for cleaning untransferred toner particles from the photoconductive member includes:
- a flexible web;
- a pressure member arranged to hold a portion of said web in engagement with the photoconductive member to remove toner particles therefrom;
- a supply station storing an unused supply of said web therein;
- a receiving station housing a used supply of said web therein having thereon toner particles removed from the photoconductive member;
- means for advancing said web from said supply station to said receiving station so that successive portions of said web engage the photoconductive member;
- a guide shaft engaging an intermediate portion of said web to maintain a preselected tension therein;
- a bracket mounted on said guide shaft; and
- a blade having one marginal edge portion thereof secured to said bracket and the other marginal portion thereof engaging said pressure member to prevent said web from being wound about said pressure member.

4,110,036

UNIT FOR MAKING COLOR COMPONENT RECORDS OF COLOR TRANSPARENCIES

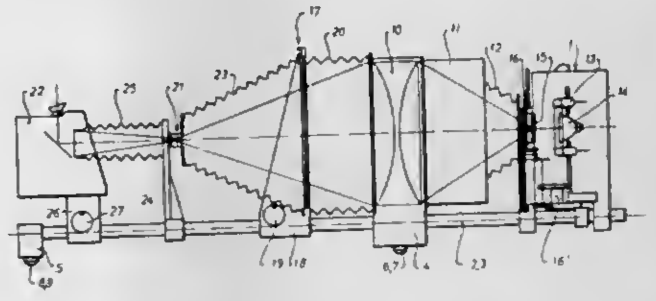
Emile Armand Henri Guillaume, Ballaigues, Switzerland, assignor to Zelacolor Systems Establishment, Vadux, Liechtenstein

Filed Dec. 1, 1976, Ser. No. 746,301

Claims priority, application Switzerland, Dec. 2, 1975, 15625/75

Int. Cl.² G03B *27/32, 27/52*

U.S. Cl. 355—32 **20 Claims**



1. A unit for making selected color-component records of color transparencies for use in color printing, comprising:
- a light generator for producing a diverging beam of light,
- a plurality of different color filters to be placed in the light beam; filter placing means for selectively placing a respective different one of said color filters in the light beam;
- a light condenser for converging the light beam to a point of convergence, and which point of convergence varies in distance from the light generator as each different color filter is in the light beam;
- a camera, including an objective for receiving the converging light beam substantially at the point of convergence thereof;
- means for supporting a transparency in the converging light beam between said condenser and said camera objective;
- adjusting means for adjusting the point of convergence of the light beam in its distance from said light generator and said adjusting means being coordinated with said filter placing means such that as said filter placing means places a different filter in the light beam, said adjusting means adjusts the point of convergence of the converging light beam so that the point of convergence of each light beam colored by a respective said filter into said camera coincides with the optical center of said camera objective.

4,110,037
DOCUMENT RECORDING MACHINES

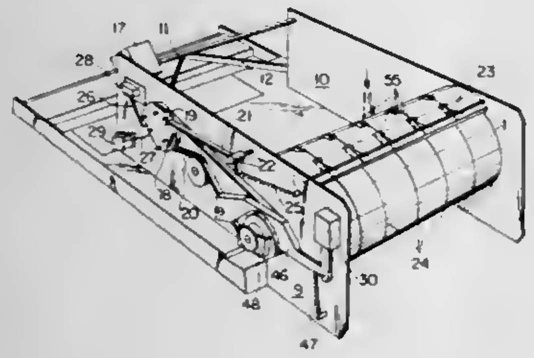
Peter Arthur Harrison; Anthony John Parks; Malcolm Dennis Southgate, all of Bury St. Edmunds; William Derek Sleath, Thetford, and Richard Keith Hills, Bury St. Edmunds, all of England, assignors to W. Vinten Limited, Bury St. Edmunds, England

Filed Dec. 16, 1976, Ser. No. 751,017

Claims priority, application United Kingdom, Dec. 17, 1975, 51678/75

Int. Cl.² G03B *27/48, 27/50*

U.S. Cl. 355—48 **9 Claims**



1. A machine for photographing a document, or a series of documents or a continuous document onto a continuous film said machine comprising:

- a rotatable drum for reception and transportation of said document, series of documents or continuous document, through a photographing station,
- one or more finger bars operable by said document, series of documents or continuous document to actuate sequencing means,
- clutch means engageable with drive means of said rotatable drum and operable by said sequencing means,
- a co-axial shaft on, and drivable from said rotatable drum via said clutch means,
- a securely attached film magazine, removable from said machine, having a feed spool and take-up spool, wherein the take-up spool is driven from a friction drive coupled to said co-axial shaft,
- a capstan fixedly attached to said co-axial shaft and co-operable with the film of said film magazine to drive said film in co-operation with said take-up spool past an exposure station,
- means for illuminating said document, series of documents or continuous document, and,
- an optical system for transferring and reducing an image of said document, series of documents or continuous document from said photographing station to said exposure station, wherein the reduction of image is directly related to the reduction in peripheral movement of said rotatable drum and said capstan.

4,110,038
DOCUMENT FEEDER FOR A COPIER

Robert Irvine, Riverside; Harry E. Luperti, Wilton, and Robert E. Manna, Newtown, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

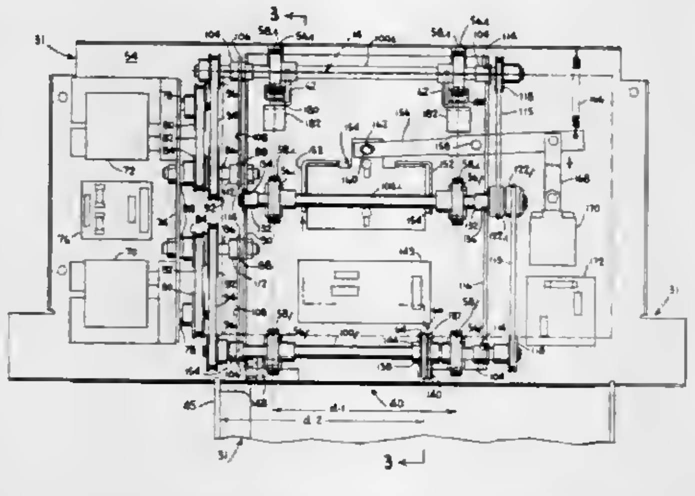
Filed Jun. 13, 1977, Ser. No. 805,801

Int. Cl.² G03B *27/48, 27/50*

U.S. Cl. 355—50 **11 Claims**

1. A document feeder adapted for use with a copier having a document illuminating station, a platen at the illuminating station and means for flash illuminating respective documents at the illuminating station, the document feeder comprising:

- (a) first document feeding means for feeding respective documents to the illuminating station;
- (b) second document feeding means for feeding respective documents from the illuminating station;
- (c) third document feeding means cooperative with the first and second document feeding means for feeding respective documents to and from the illuminating station, said third document feeding means including means for engaging respective documents for feeding purposes;
- (d) means for holding a portion of each of the respective documents fed to the illuminating station in document feeding relationship with respect to the second document feeding means;
- (e) means for temporarily disengaging the document engagement means from engagement with respective documents fed to the illuminating station prior to illumination of the respective documents, whereby the respective documents fed to the illuminating station settle on the platen prior to illumination thereof; and
- (f) said first document feeding means including a rotatable drive shaft and at least one roller mounted thereon for rotation therewith and in document feeding engagement with respective documents, and said drive shaft mounted for elevation in response to respective documents of different thickness being fed into document feeding engagement with said at least one roller whereby said at least one roller elevates to accommodate respective documents of different thickness.



4,110,039
MICROFILM ENLARGING APPARATUS

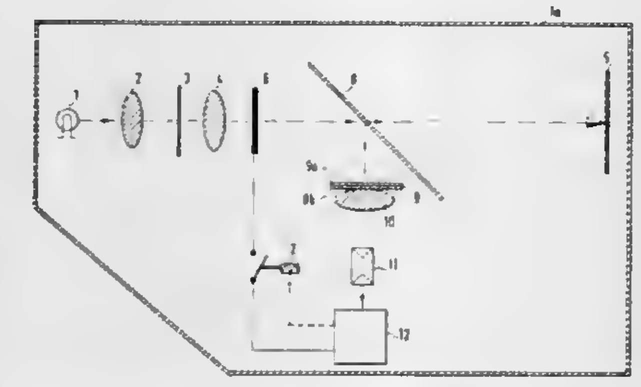
Edgar Röder; Fritz Merk, both of Wiesbaden, and Lüto Röhrig, Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1976, Ser. No. 753,629

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 7541572[U]

Int. Cl.² G03B *27/74, 27/76*

U.S. Cl. 355—68 **10 Claims**



1. Electrophotographic microfilm-enlarging apparatus comprising means adapted to provide a source of light to expose photosensitive material through a microfilm to be enlarged,

- sensing means adapted to sense the intensity of the light transmitted, in use of the apparatus, by the entire area of the microfilm to be enlarged, substantially only within a wavelength range of from 360 to 560 nm,
- a filter in the light path to the sensing means, said filter being capable of transmitting substantially only light having a wavelength of from 360 to 560 nm,
- and control means adapted to control the total amount of light to which the photosensitive material is exposed in an enlargement step in dependence upon the value of the intensity sensed by the sensing means.

4,110,040
EXPOSURE SYSTEM FOR ELECTROPHOTOGRAPHIC COPIER

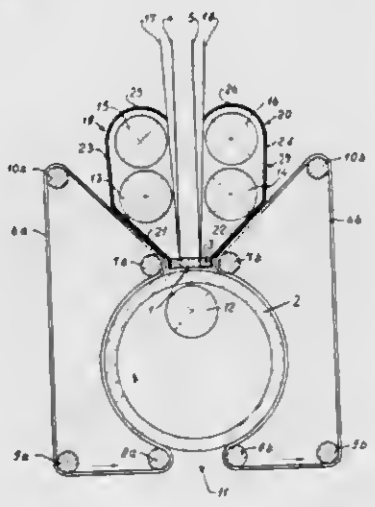
Albert Jan Wittenberg, Velden, and Guido J. M. van der Velden, Valkenswaard, both of Netherlands, assignors to Océ-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 29, 1976, Ser. No. 737,048

Claims priority, application Netherlands, Apr. 20, 1976, 7604118

Int. Cl.² G03B *27/54, 27/32;* G03G *15/00*

U.S. Cl. 355—70 **5 Claims**



1. In an exposure device for an electrographic copier, including means defining a slot-shaped zone for stripwise exposure of an original or a portion thereof, light sources for illuminating the exposure zone, and an optical system for projecting an image from said exposure zone into an image plane, there being at the object side of the optical system an object space occupied by the beams of light that participate in the formation of the image and a reflection object space, inclusive of the object space, in which an object or a portion thereof in the exposure zone is imagable directly or by specular reflection, the improvement which comprises

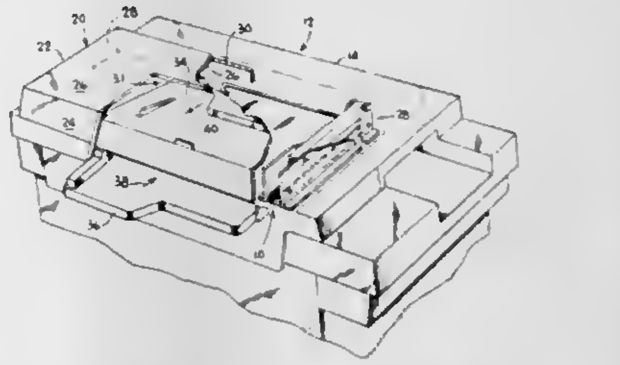
- (a) at the side of said exposure zone facing away from said optical system, a first exposure system comprising a tubular light source disposed parallel to the longitudinal axis of said exposure zone;
- (b) at the side of said exposure zone directed toward said optical system, a second exposure system comprising at least four tubular light sources which are disposed parallel to the longitudinal axis of said exposure zone in two equal groups opposite to one another, all these light sources lying outside but adjacent to the reflection object space; and
- (c) a diffusely reflecting wall disposed about the light sources of each said group of light sources, each said wall having the form of a surface generated by a straight line moving parallel to said light sources, and extending at one end thereof at least to the vicinity of said exposure zone, and extending at the opposite end thereof, at the side of the related group of light sources toward said optical system, at least as far as the reflection object space and at most as far as the object space.

4,110,041
MEANS FOR SELF-POSITIONING PLATEN COVERS

Harry E. Luperti, Wilton, and Robert E. Manna, Newtown, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn. Continuation-in-part of Ser. No. 756,348, Jan. 3, 1977. This application Jun. 13, 1977, Ser. No. 805,634

Int. Cl.² G03B *27/62*

U.S. Cl. 355—75 **9 Claims**



1. In a copier including framework and a platen on which respective documents of different thickness may be placed for copying purposes, and means for covering said platen, self-positioning apparatus comprising:

- a. linkage means for movably supporting said covering means, said linkage means adapted to permit movement of said covering means between a predetermined position adjacent to said platen for holding respective documents of minimal thickness in contact with said platen and respective positions away from said platen for holding respective documents of greater thickness in contact with said platen;
- b. resilient means for urging said covering means away from said platen;
- c. means for maintaining said covering means in said predetermined and respective positions; and
- d. said linkage means including at least four links, one of said links including a portion of said covering means, another of said links including a portion of said framework, two other of said links being movable links, said maintaining means including spring means, said maintaining means including roller means extending from one of said movable links and into contact with said spring means, and said roller means and spring means coacting to resist movement of said covering means.

4,110,042
METHOD AND APPARATUS FOR PHOTOELECTRICALLY DETERMINING THE POSITION OF AT LEAST ONE FOCAL PLANE OF AN IMAGE

Ludwig Leitz, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Marl, Fed. Rep. of Germany Continuation of Ser. No. 671,103, Mar. 29, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,585

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1975, 2518209

Int. Cl.² G01C *3/08*

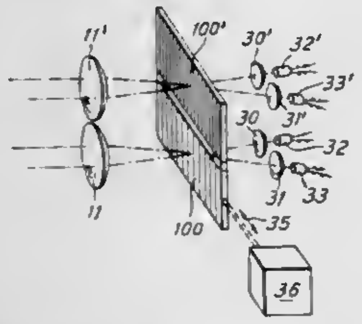
U.S. Cl. 356—4 **14 Claims**

1. In a method for measuring the relative distance between an object emanating light fluxes and a reference system using an optical correlator system containing at least one imaging optic having at least an image plane and at least an image space, at least one screen provided with at least one optically active structure and at least one photoelectric detector system associated with said optically active structure for determining unambiguously distance and range, the improvement comprising:

- (a) utilizing at least two optically active structures provided with optically effective properties differing from structure to structure, to form a plurality of beam guiding systems;
- (b) locating said structures within said image space for guid-

ing said light fluxes into a plurality of directions and for generating distinct modulation characteristic light fluxes;

(c) associating with each of said beam guiding systems one of said photoelectric detector systems, each of which generates at least one output signal in response to a relative axial motion between an image of said object and said structure, and in dependence upon the distance between said object and said structure of said reference system according to said distinct modulation characteristic light fluxes impinging upon said photoelectric detector systems according to



said differing optically effective properties of said structures, said output signals differing from one another in frequency and phase and having each a maximum in signal amplitude at the focusing of said object in said image plane of said imaging optic; at the defocusing of said object, said signal amplitudes diminishing; and

(d) comparing said output signals with respect to their phases and determining from said comparison the position of said structure with respect to said imaging optic characterized by said maxima of said signal amplitudes.

4,110,043

APPARATUS FOR COUNTING AND CLASSIFYING PARTICLES

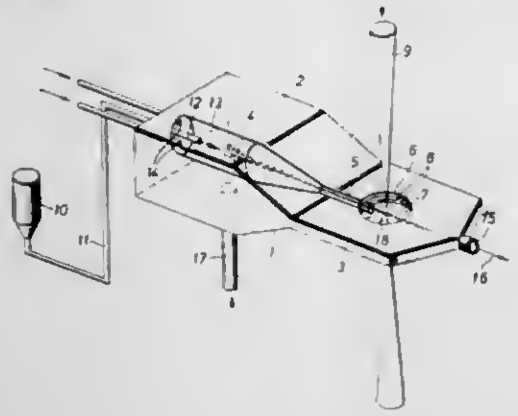
Wolfgang Günter Eisert, Hannover, Germany, assignor to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen, Neuherberg, Germany

Filed Sep. 24, 1976, Ser. No. 726,275

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543310

Int. Cl.² G01N *15/02;* G01D *21/04;* G01N *21/00*

U.S. Cl. 356—102 **7 Claims**



1. In apparatus for counting and measuring the major dimension of particles of nonspherical shape and including a laser for producing a laser beam and a laser radiation detector, the improvement wherein: said apparatus comprises a flow nozzle having a tapered outlet end which terminates in a capillary nozzle, means delivering a stream of such particles to said flow nozzle, means delivering a fluid into said flow nozzle upstream of said outlet end to form a first entraining stream which entrains the stream of particles and hydrodynamically focusses the particle stream into a thin stream in the first entraining stream, with the major axes of the particles aligned with the axis of the thin stream in said capillary nozzle, the hydrodynamically focussed stream being directed from said capillary nozzle to intersect the laser beam, a jacket pipe disposed around said flow nozzle and providing a second entraining stream for the entrained stream of particles leaving said capillary nozzle, and means giving the laser beam a diameter which, at the point of intersection with the particle stream, is no greater than the width of the particles; and said detector is disposed to receive the laser radiation transmitted by the particles as they pass through the laser beam.

4,110,044

METHOD FOR DETERMINATION OF CONCENTRATION

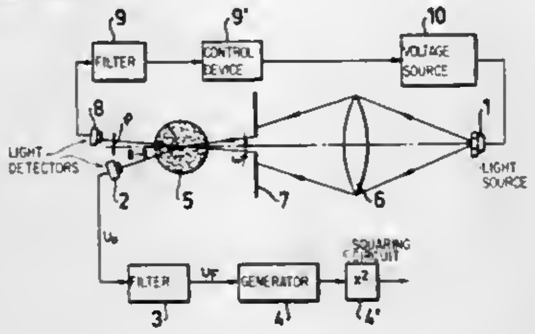
Torulf Pettersson, Stockholm; Gerdt Fladda, Täby, and Lennart Eriksson, Vallentuna, all of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Nov. 23, 1976, Ser. No. 744,362

Claims priority, application Sweden, Dec. 1, 1975, 7513524

Int. Cl.² G01N *21/26, 33/46*

U.S. Cl. 356—103 **12 Claims**



1. A method for indicating the percentage of suspended substances in a flowing medium, said medium being illuminated with light perpendicularly to the direction of flow with an intensity that is mainly constant and predetermined during measuring, the light radiated from the medium in a predetermined direction being detected by a first light detector transforming the detected light into an electrical signal varying in dependence on the light intensity, characterized in forming the square of the effective value of that portion of the signal which is within a predetermined frequency range, and deriving the percentage by means of said square of the effective value.

4,110,045

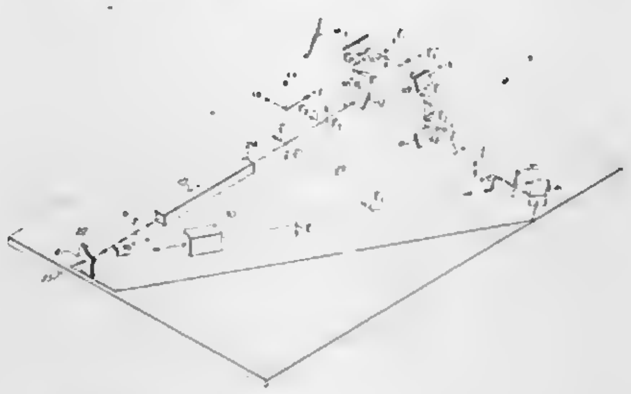
ELECTROMAGNETIC WAVE RING RESONATOR

Irl Wilson Smith, Jr., Newton, and Terry A. Dorschner, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 2, 1976, Ser. No. 646,308

Int. Cl.² G01B *9/02*

U.S. Cl. 356—106 LR **24 Claims**



1. In combination:

(a) an electromagnetic wave ring resonator wherein resonant electromagnetic waves propagate through a nonsolid medium;

(b) means, included in such ring resonator, for spatially rotating the electromagnetic field distribution of the resonant electromagnetic waves as such waves pass through the nonsolid medium about the direction of propagation of such waves to enable the electromagnetic waves in such resonator to resonate with different frequencies; and

(c) means for producing different phase delays to the electromagnetic waves having the same polarization state propagating in the resonator in opposite directions.

4,110,046

OPTICAL APPARATUS AND METHOD

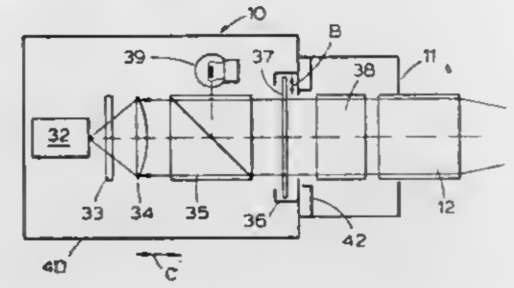
Linnel Richard Baker, Orpington, and Tadeusz Wojtowicz, London, both of England, assignors to National Research Development Corporation, London, England

Filed Nov. 10, 1976, Ser. No. 740,542

Claims priority, application United Kingdom, Nov. 14, 1975, 47058/75

Int. Cl.² G01B *9/00*

U.S. Cl. 356—124 **21 Claims**



1. A method of measuring a predetermined parameter of an optical component comprising inserting the optical component under test in an analyser means, aligning a light generator means in a desired position relative to the optical axis of the optical component under test by utilizing a selected screen of a set of screens including an indication of a predetermined position relative to the optical axis of the light generator means by projecting light from a subsidiary light source within the analyser means along the optical axis of the analyser means through the screen during the setting up operation, and by aligning the light generator means with the image of the indication, the light generator means including a light source and the analyser means including a light detector, selecting one of the set of screens which includes a pattern which pertains to said predetermined parameter, mounting the selected screen between the light detector and the light generator means, and processing the signal detected by the light detector to measure the desired parameter.

4,110,047

INSPECTION APPARATUS FOR AUTOMATICALLY DETECTING THE UNEVENNESS OR THE FLAWS OF A COATING

Tokuji Takahashi, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1976, Ser. No. 667,966

Claims priority, application Japan, Mar. 18, 1975, 50-33322

Int. Cl.² G01N *21/32*

U.S. Cl. 356—200 **10 Claims**

1. A scanning inspection apparatus comprising:

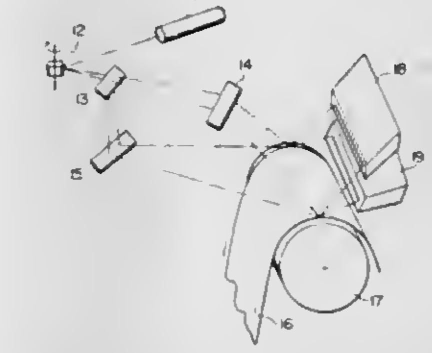
a means for supporting and moving an object to be scanned;

a light beam generating means including a laser oscillator;

a rotating mirror for directing a light beam radiated by said light beam generating means to the object;

a semitransparent mirror for dividing a light beam reflected by the rotating mirror into two light beams;

plural mirrors for reflecting each of said two light beams divided by the semitransparent mirror, said plural mirrors being so arranged that the light path length of one light beam from the semitransparent mirror to the object is the same as that of the other light beam from the semitransparent mirror to the object and the divided two light beams impinge on a point on the object, each of the light beams having a different angle of incidence with respect to the said point on the surface of the object, with the angle of incidence of one of the light beams being larger than 70° and the angle of incidence of the other light beam being smaller than 45°; and



light detecting means for receiving the light beams reflected by the surface of the object; wherein a plane including a light path of the light beam radiated by the light beam generating means and a light path of the light beam reflected by the rotating mirror is arranged to be perpendicular to the reflecting face of the rotating mirror.

4,110,048

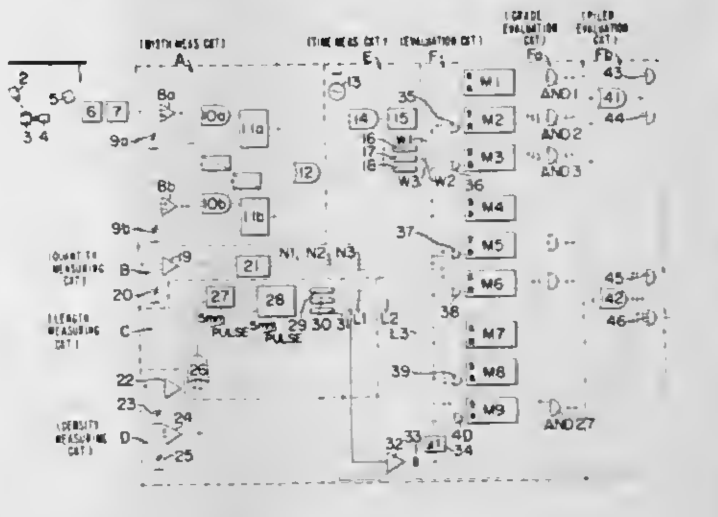
METHOD OF AND AN APPARATUS FOR INSPECTING A TRAVELING SHEET MATERIAL

Shoji Akutsu; Yasumasa Watanabe; Yasuhiko Mashino, all of Chiba; Tomohiro Chaki, and Masakazu Fujita, both of Tokyo, all of Japan, assignors to Kawasaki Steel Corporation and Toei Denshi Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 521,159, Nov. 5, 1974, abandoned. This application Jul. 16, 1976, Ser. No. 705,826

Int. Cl.² G01N *21/16*

U.S. Cl. 356—200 **15 Claims**



1. Apparatus for inspecting a traveling sheet material for determining characteristics of defects in said material, said apparatus comprising a light source and a means for scanning a beam of said light source across said traveling sheet material, photodetector means arranged to receive light reflected from said sheet material, and wave shaping means connected to said photodetector means for shaping the signal received from said photodetector means, said photodetector means receiving scattered light as said beam intersects the boundaries of a defect, said wave shaping means providing a positive pulse as said scanning light beam crosses one side boundary of said defect and providing a negative pulse as said scanning light beam completes its traversement of the defect and crosses the other side of said defect, said apparatus further comprising;

first pulse forming means connected to said wave shaping means responsive to said pulse of one polarity to generate a step pulse and responsive to the next pulse of an opposite polarity to terminate said step pulse, whereby the length of said step pulse corresponds to the width of said defect,

second pulse forming means connected to said wave shaping means for generating a pulse each time a pulse of one polarity is generated by said wave shaping means, first counter means connected to count the number of pulses generated by said second pulse forming means, and means to read said count each time a scan is completed, the number counted by said first counter means equalling the number of defects sensed by said scanning light beam each time it traverses said sheet of material, and

third pulse forming means connected to said wave shaping means for generating a pulse each time a pulse of one polarity is generated by said wave shaping means, a second counter, counting pulses supplied to said second counter, said counting pulses being synchronized with said scanning light, first logic circuit means connected between said third pulse forming means and said second counter for enabling said second counter to increment its count each time a counting pulse is provided and said third pulse forming means successively produces a pulse, whereby said second counter keeps counting for each scan so long as a defect is present to provide a count corresponding to the length of said defect.

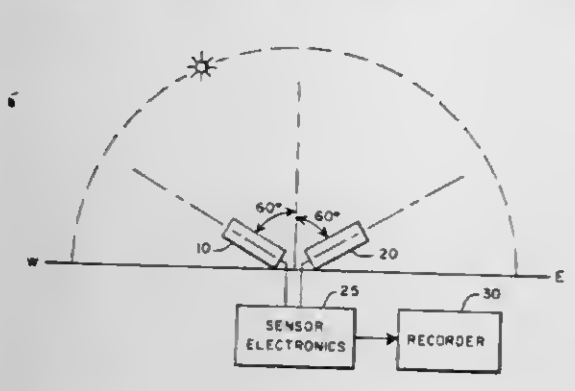
4,110,049
SUN METER

Robert E. Younskevicius, Largo, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 8, 1977, Ser. No. 775,493

Int. Cl.² G01J *1/42;* H01J *39/12*

U.S. Cl. 356—222 **5 Claims**



1. Apparatus for measuring energy received from the sun at a particular location, said apparatus comprising:

a first radiant energy sensor, sensitive along a first axis, for producing a first electrical signal responsive to radiant energy impinging on said first sensor;

a second radiant energy sensor, sensitive along a second axis displaced 120° from said first axis, for producing a second electrical signal responsive to radiant energy impinging on said second sensor; and

summing means for receiving said first and second electrical signals and for providing an output signal which is the sum of the two.

4,110,050
PRINT RIBBON HANDLER

James Carlos Wood, Houston, and Francis Adolph Felcman, Richmond, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

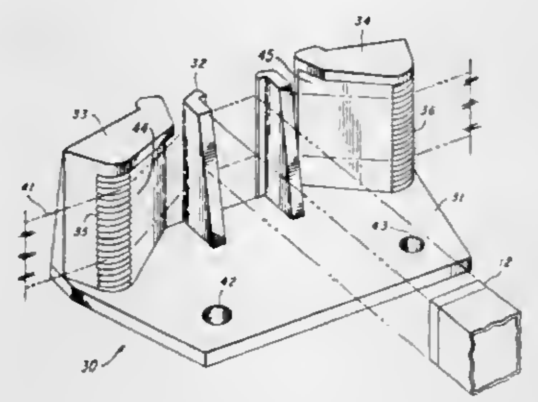
Filed Apr. 4, 1977, Ser. No. 784,498

Int. Cl.² B41J *35/04*

U.S. Cl. 400—248 **7 Claims**

1. A printer assembly of the type having a constant slant angle print ribbon with a constant vertical rate of change with respect to the horizontal movement of a carriage as the carriage moves back and forth across a printing span, comprising:

(a) a printhead, having an inpact end, mounted on the carriage; and



(b) a print ribbon handler mounted on the carriage for receiving the print ribbon and for guiding the print ribbon between the printhead and a medium to be printed, including a guide surface having threads formed thereon at a pitch to provide the desired print ribbon slant angle.

4,110,051
APPARATUS FOR PRODUCING A NON-RELEASABLE CONNECTION AND NON-RELEASABLE CONNECTION PRODUCED WITH SUCH APPARATUS

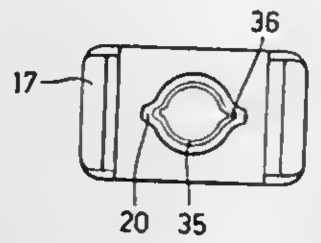
Karl Mettler, Buchs, Switzerland; Paul Marxer, Eschen, Liechtenstein, and Arthur Tiefenthaler, Frastanz, Austria, assignors to Press- und Stanzwerk AG, Eschen, Liechtenstein

Filed May 20, 1977, Ser. No. 799,100

Claims priority, application Switzerland, Jun. 3, 1976, 6998/76

Int. Cl.² F16C *11/06*

U.S. Cl. 403—157 **1 Claim**



1. A non-releasable connection comprising the combination of:

(I) a shaft having a lengthwise axis and a shaft end, said shaft end possessing:
  (a) an end surface having a substantially ring-shaped groove;
  (b) a shoulder spaced in the direction of the lengthwise axis of said shaft from said end surface;
  (c) a flange extending substantially over the entire periphery of said shaft end and formed of one-piece with such shaft end;
  (d) a pair of wedges formed of one-piece with said shaft end and extending substantially parallel to said lengthwise axis of said shaft, said wedges being located essentially diametrically opposite one another at said shaft end; and
  (e) said end surface having a substantially ring-shaped groove provided with two essentially diametrically oppositely situated protuberances located at said wedges;

(II) a fork member secured to said shaft end and possessing:

  (a) a bore into which extends such shaft end;
  (b) two grooves provided in said bore arranged diametrically opposite one another and into which extend said wedges, in order to thereby secure the fork member against rotation relative to such shaft end; and
  (c) two bore edges, said shoulder bearing against one of said bore edges and said flange bearing against the other bore edge, in order to secure the fork member against axial displacement relative to the shaft end.

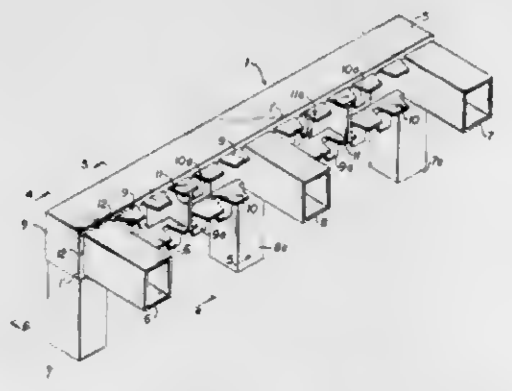
4,110,052
MULTIPLE ELEMENT FOR FORMING VARIOUS STRUCTURES WHEN CONNECTED TO BOX-FORM PANELS FOR FURNITURE OR THE LIKE

Giulio Polvara, Milan, Italy, assignor to Beylerian Limited, New York, N.Y. and Kartell, S.p.A., Milan, Italy

Filed Jun. 30, 1975, Ser. No. 591,829

Int. Cl.² A47B *47/04*

U.S. Cl. 403—295 **4 Claims**



1. A connecting element for use in assembling furniture, shelves and the like comprising an elongated tubular body of square section including a pair of exposable walls and further having oppositely disposed closed end walls and at least three equally spaced opposed pairs of right angularly extending tubular jointing means of square section each of said jointing means projecting outwardly from said elongated tubular body from zones spaced inwardly of said end wall and further spaced inwardly from at least one of said exposable walls, said jointing means serving to support plurally perforated planar elements arranged to receive said outwardly projecting jointing means and further including oppositely disposed walls and additional frustum-shaped support means which lie in planes coplanar with said walls.

4,110,053
ARRANGEMENT FOR FASTENING A STEEL DOWEL

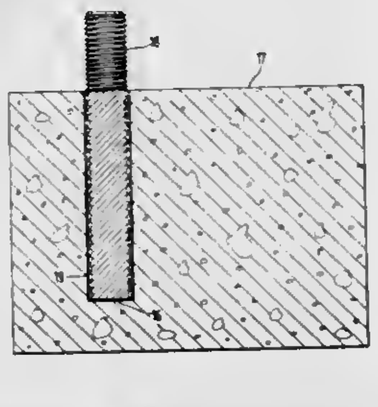
Josef Buchholz, Birkenweg 5, 5581 Liesenich, Fed. Rep. of Germany

Filed Oct. 13, 1976, Ser. No. 732,131

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1975, 25461103; Jan. 9, 1976, 2600610

Int. Cl.² B25G *3/02*

U.S. Cl. 403—361 **1 Claim**



1. An arrangement for fastening a steel dowel in a dowel hole of a structural member, particularly a concrete or wood structural member comprising: a synthetic resin layer on the wall of the dowel hole; a synthetic resin-filler mixture coated on said steel dowel, the surface of said coating of said steel dowel being roughened, the surface of said steel dowel being ribbed; and hardener means on the roughened synthetic coating of said steel dowel, said synthetic resin layer comprising a single-component resin, said synthetic resin mixture being free of a filler; and sleeve means with an internal thread connected to said steel dowel.

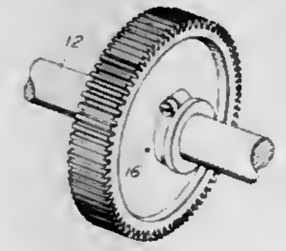
4,110,054
CLAMPABLE PLASTIC GEAR AND THE LIKE

Carl A. Moeller, Jr., Duxbury, Mass., assignor to Flexothane Corporation, Randolph, Mass.

Filed Oct. 4, 1976, Ser. No. 729,115

Int. Cl.² F16B *2/08*

U.S. Cl. 403—373 **1 Claim**



1. An annular part such as a gear for clamping engagement with a cylindrical shaft, comprising in combination
  (a) an annular body portion formed of a hard and slightly resilient polyurethane plastic material having a durometer hardness of approximately 75° on the Shore "A" scale, and
  (b) a flexible metal band,
  (c) said body portion being formed with an integral cylindrical hub portion extending coaxially to one side thereof and terminating in an outer annular collar providing a shoulder, said hub being formed with an opening therethrough coaxial with an opening in said gear and defining a smooth, continuous, inner cylindrical wall from end to end of said gear and hub openings,
  (d) said band mountable about said hub inwardly of said shoulder,
  (e) screw and nut means connecting the ends of said band in tangential relation to said hub portion for tensioning said band and applying clamping pressure thereto uniformly about said hub,
  (f) the periphery of said body portion being formed with an integral annular wide rim formed with integral gear teeth and an integral thin annular web defining said body portion and connecting said rim to said hub portion, said hub and collar extending axially beyond an end of said rim a distance sufficient to allow access to said screw by a tool oriented parallel to said web portion.

4,110,055
TOOL ASSEMBLY AND INSERTED-TOOTH CUTTER FOR MILLING CYLINDRICAL SURFACES ON A WORKPIECE

Gottfried Blaimschein, and Otto Marzy, both of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Jul. 14, 1977, Ser. No. 815,647

Claims priority, application Austria, Jul. 26, 1976, 5465/76

Int. Cl.² B23B *51/00;* B26D *1/12*

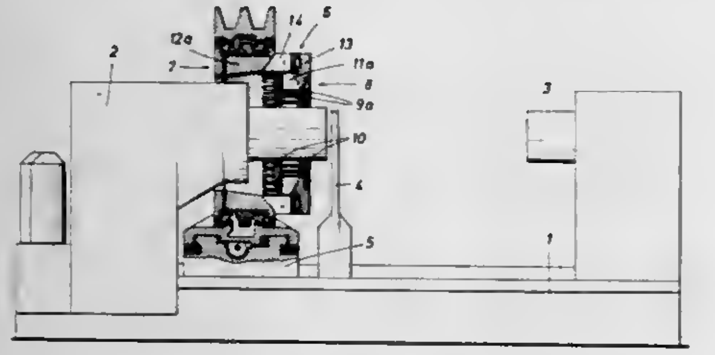
U.S. Cl. 408—203.5 **7 Claims**

1. A tool assembly for milling cylindrical surfaces on a workpiece, comprising

a carrying drum which has an end face and is adapted to be rotatably mounted and to be rotationally driven, and

an inserted-tooth cutter which comprises an adapter ring detachably flanged to said end face and provided with at least two retainers which are axially spaced from each other and from said end face, and with radial through openings between adjacent ones of said fixing means and between said retainers and said end face,

said inserted-tooth cutter further comprising at least two axially spaced apart, coaxial toothholders, which are adapted to surround said workpiece and are secured to respective ones of said retainers and carry teeth having radially inwardly facing cutting edges.



4,110,056
FIBRE REINFORCED PLASTICS STRUCTURE

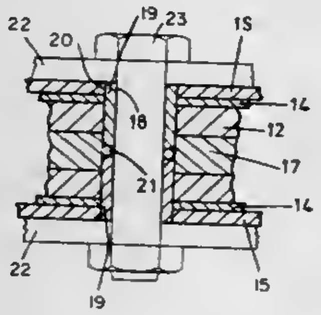
Basil Charles James Stevenson, Corton Denham, Nr. Sherborne, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed May 2, 1977, Ser. No. 792,574

Claims priority, application United Kingdom, May 6, 1976, 18513/76

Int. Cl.² B64C *27/46*

U.S. Cl. 416—230 **2 Claims**



1. A helicopter rotor blade including a root end structure comprising composite materials and having opposed generally parallel surfaces for clamping between fork members extending from a rotor hub,

at least one attachment hole extending through the root end structure between opposed surfaces, and mating holes in the fork members,

two bushes disposed in each attachment hole, said bushes having a combined length less than a thickness of the root end structure,

said bushes being secured within the structure so that outer ends of the outermost bushes are flush with respective surfaces of the structure and so that said bushes are spaced-apart axially within the structure,

a resilient washer located in the space between the bushes,

and bolt means extending through the holes in the fork members and the attachment holes in the root end structure so as to clamp the structure between the fork members.

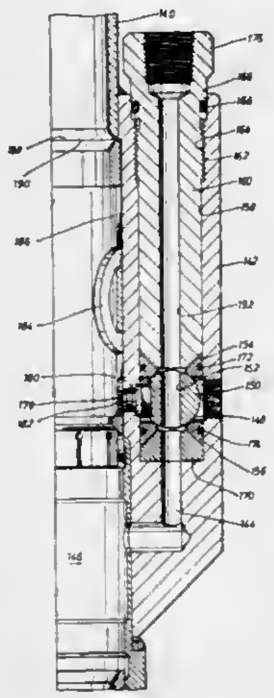
4,110,057
GAS LIFT MANDREL VALVE MECHANISM

Everett D. McMurry, and Bolling A. Abercrombie, both of Houston, Tex., assignors to McMurry Oil Tools, Inc., Houston, Tex.

Division of Ser. No. 571,905, Apr. 28, 1975, Pat. No. 4,035,103. This application Jun. 7, 1977, Ser. No. 804,445

Int. Cl.² F04F *1/18*

U.S. Cl. 417—109 **4 Claims**



1. A mandrel valve mechanism for controlling the flow of gas through the gas lift valve mechanism that achieves gas induced production of fluid from wells, said mandrel valve mechanism comprising:

a tubular mandrel having a production passage therethrough adapted to be interconnected between sections of production tubing, said tubular mandrel being formed to define opening means intermediate the extremities thereof;

a valve housing being carried by said mandrel, said valve housing defining an internal valve chamber having an inlet opening and having an outlet opening disposed in registry with said opening means of said tubular mandrel, said valve housing being formed to define a valve stem passage communicating said valve chamber with said production passage of said tubular mandrel;

a valve element being disposed within said valve chamber and being movable from a closed position where said valve element blocks communication between said inlet and said outlet to an open position where communication between said inlet and outlet is defined through said valve element;

said valve element comprises a ball type valve element being disposed within said valve chamber and being rotatably movable for controlling flow through said valve mechanism and valve stem means being disposed in operative engagement with said ball type valve element and extending from said valve chamber through said valve stem passage and into said tubular mandrel, said valve stem means having cam follower means formed thereon; and

valve actuating means being movably disposed within said mandrel and having mechanical interconnection with said valve element, said valve actuating means having cam means formed thereon with said cam means being disposed in receiving relation with said cam follower means, upon linear movement of said valve actuator means within said tubular mandrel said cam follower means being induced by said cam means to cause substantially 90° rotation of said valve stem means, thus causing substantially 90° rotation of said ball type valve element within said valve chamber said valve actuating means being controllably movable responsive to manipulation thereof by a valve actuating tool that is movable within said production tubing of said well.

4,110,058
VACUUM-OPERATED LIQUID PUMP

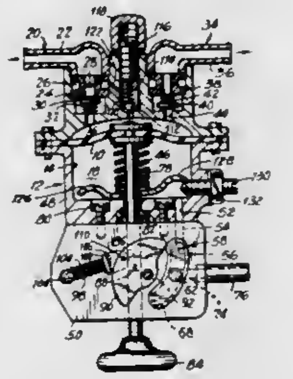
Juan Pedro Langle, and Miguel Juan Langle, both of Campichuelo 1539-Avellaneda-Pcia, Buenos Aires, Argentina

Filed Dec. 8, 1976, Ser. No. 748,754

Claims priority, application Argentina, Dec. 9, 1975, 205772

Int. Cl.² F04B *43/06, 45/00;* **F01L** *31/18*

U.S. Cl. 417—395 **9 Claims**



1. In a vacuum-operated liquid pump, a pumping member and pump housing means defining in its interior a pump chamber in which said pumping member is movable along suction inlet and pressure discharge strokes, said pumping member dividing said chamber into a liquid space on one side of said pumping member and a gas space on the other side of said pumping member, supply means commuicating with said liquid space for supplying liquid thereto in response to movement of said pumping member along said suction inlet stroke thereof, discharge means communicating with said liquid space for discharging liquid under pressure out of the latter during movement of said pumping member along said pressure discharge stroke thereof, passage means formed at least in part in said housing means and communicating with said gas space for placing the latter in communication with a source of vacuum, spring means operatively connected with said pumping member for urging the latter along said pressure discharge stroke thereof, and valve means cooperating with said passage means for placing the latter alternately in communication with the outer atmosphere and through means in said valve means in communication with the source of vacuum, said valve means being operatively connected with said pumping member to be operated thereby for placing said passage means in communication with the source of vacuum when said pumping member reaches the end of said pressure discharge stroke thereof and in communication with the outer atmosphere when said pumping member reaches the end of said suction inlet stroke thereof, the operative connection of said valve means to said pumping member including a rod fixed to said pumping member to reciprocate therewith, and a rocking member turnably carried by said housing means, said rod being formed with a recess and said rocking member having a projection fixed thereto and extending into said recess for transmitting movement between said rod and rocking member, the latter being rocked in opposed directions during the suction inlet and pressure discharge strokes of said pumping member, and said valve means responding to rocking of said rocking member in one direction to place said passage means in communication with the source of vacuum and in the opposite direction to place the passage means in communication with the outer atmosphere, said passage means terminating in an open end which when uncovered by said valve means communicates with the outer atmosphere and which when covered by said valve means communicates through said valve means with said source of vacuum, said valve means itself being carried by said housing means for rocking movement between positions covering and uncovering said open end of said passage means, and said valve means being situated in the path of rocking movement of said rocking member to be engaged and turned thereby to said position covering said open end of said passage means when said pumping member reaches the end of its pressure-discharge stroke and to a position uncovering said open end of said passage means when said pumping member reaches the end of its suction inlet stroke, said valve means having no mechanical connection to said rocking member and being moved only by being situated in the path of movement of said rocking member, with said valve means remaining stationary in one or the other of said positions thereof until said valve means is engaged and moved by said rocking member.

4,110,059
PUMPING DEVICE

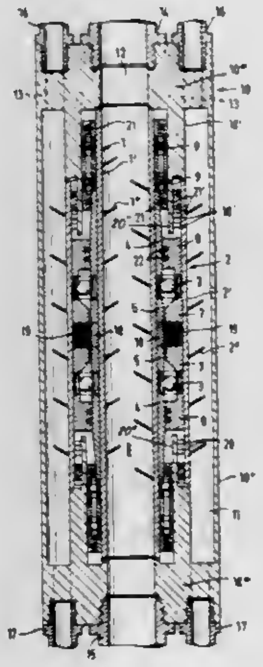
Miguel Kling, Am Hugel 14, 8136 Percha, Fed. Rep. of Germany

Filed Aug. 19, 1976, Ser. No. 715,660

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557202

Int. Cl.² F04B *17/00*

U.S. Cl. 417—424 **15 Claims**



1. An electrical pumping device comprising at least two coaxially rotatable pump impellers, at least two coaxial separate passageways, one impeller positioned within each passageway, pole support parts attached to each of said impellers, said pole support parts forming a part of at least one electromotor and distributed about the axis of rotation in a radially spaced relation, each pump impeller together with adjacent pump impeller forming the counter-rotating parts of an electromotor by cooperation of the pole support parts connected with these pump impellers.

4,110,060
HIGH DISPLACEMENT-TO-SIZE RATIO ORBITING FLUID MECHANISM

Frederick L. Erickson, 2610 Bosworth Dr., Fort Wayne, Ind. 46805

Filed Jun. 14, 1976, Ser. No. 695,722

Int. Cl.² F04B *19/22, 29/00*

U.S. Cl. 417—462 **10 Claims**

1. An orbiting piston fluid mechanism comprising:

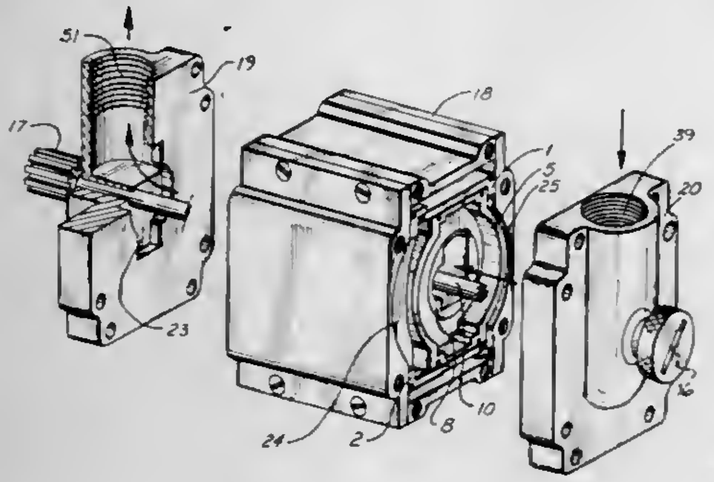
a stationary mechanism housing;

an axially extending power transfer shaft supported in the housing for rotation about the shaft axis, at least part of the shaft being selectively axially movable;

an axially extending eccentric member coupled to the shaft for rotation therewith, the eccentric member axis displaced from and extending generally parallel to the shaft axis;

chamber means confined within the housing interior for reciprocating motion in a direction generally perpendicular to the shaft axis;

piston means supported on and rotatable relative to the eccentric member, and confined within and reciprocable within and relative to the chamber means in a direction generally perpendicular to the direction of chamber means reciprocation within and relative to the housing; and



means including an inclined member movable axially in response to axial movement of the axially movable part of the power transfer shaft for selectively varying the distance between the eccentric member axis and the shaft axis to thereby also vary simultaneously the extent of reciprocating motion of the chamber means within the housing and the extent of reciprocating motion of the piston means within the chamber means.

4,110,061
PERISTALTIC PUMP HAVING PARTICULARLY REINFORCED HOSE

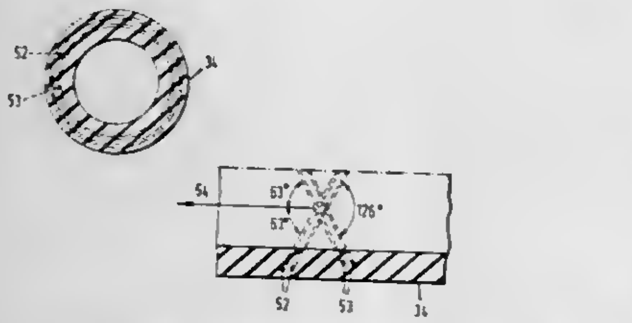
Jan Willem Gerritsen, Raadhuisstraat 75a, Alphen an der Rijn, Netherlands

Filed Jan. 31, 1977, Ser. No. 764,407

Claims priority, application Netherlands, Feb. 24, 1976, 7601867

Int. Cl.² F04B *43/18, 43/12, 45/06*

U.S. Cl. 417—477 9 Claims



1. In a peristaltic pump comprising a support track curved according to an arc of a circle located concentrically about a central shaft, a pump hose curved into contact with said support track and fastened at one end, and compression members arranged to be driven in successive spaced relationship in a circular path located around, and concentric with, said central shaft, said compression members being spaced radially inwardly from said arcuate support track so as to be capable of locally squeezing the pump hose shut, said pump hose having at least two layers of reinforcing threads consisting of windings extending in the peripheral direction of the hose and embedded in the wall thereof, the windings in the two layers extending obliquely to the longitudinal direction of the pump hose, so that the reinforcing threads of one layer cross those of the other, the improvement which comprises that the angle of crossing between the windings of the two layers of reinforcing threads is larger than the equilibrium angle, so that the pump hose tends to be elongated under the influence of internal delivery pressure, and that the pump hose is fastened at the end to which said compression members move along said support track.

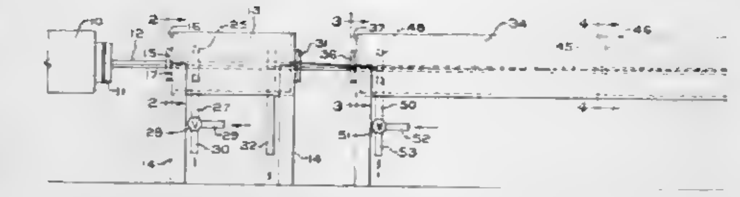
4,110,062
PROCESSING EXTRUDED VINYL SIDING

James William Summers, Bay Village, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 7, 1977, Ser. No. 757,702

Int. Cl.² B29C *25/00*

U.S. Cl. 425—71 1 Claim



1. An apparatus for manufacturing thermoplastic house siding comprising an extruder for extruding an elongated cross-sectioned house siding panel with L-shaped end portions, a cooling tank mounted adjacent to said extruder, said cooling tank having a forward end and a rear end portion, a sizing die located at said forward end portion and said rear end portion of said cooling tank, and annealing tank, said annealing tank having a forward portion and a rearward portion, said forward portion of said annealing tank mounted closely adjacent to said rear end portion of said cooling tank, a sizing die mounted in said forward portion of said annealing tank, a sizing die mounted in said rear end portion of said annealing tank, a sizing die mounted in the intermediate portion of said annealing tank, a quenching tank, said quenching tank having a forward portion and a rear end portion, said forward portion of said quenching tank mounted adjacent to said rear end portion of said annealing tank, a sizing die mounted in said forward portion of said quenching tank, a sizing die mounted in said rear end portion of said quenching tank, means connected to each of said tanks for controlling the flow of fluids into and out of said tanks, temperature control means connected to said cooling tank to maintain the temperature range therein to between 50° F. and 212° F., and temperature control means connected to said annealing tank to maintain the temperature therein from 160° F. to 212° F.

4,110,063
GAS FIRE

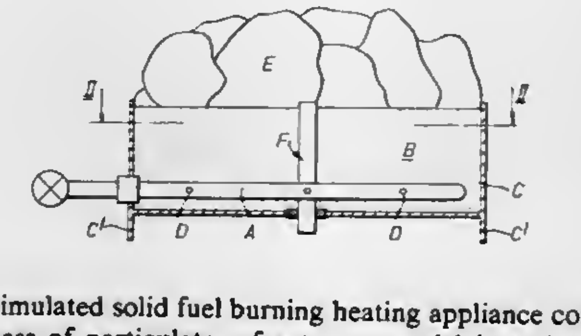
Douglas Allison Mitchell, 7, Clifton Gardens, Eaglescliffe, Stockton-on-Tees, Cleveland, United Kingdom (TS16 9BB)

Filed Jul. 1, 1976, Ser. No. 701,607

Claims priority, application United Kingdom, Jul. 3, 1975, 28021/75

Int. Cl.² F24L *3/04*

U.S. Cl. 431—125 5 Claims



1. A simulated solid fuel burning heating appliance comprising a mass of particulate refractory material in at least one open-topped tray, a plurality of refractory bodies shaped and colored to simulate solid fuel mounted on the top of the mass of particulate refractory material with spaces between the bodies, a perforated tube embedded in said mass of refractory material with an end of the tube extending out of the tray, means for supplying gaseous fuel to said end of the tube to cause said gaseous fuel to flow upwardly through the mass of particulate refractory material to the spaces between the bodies and burn wth a luminous flame causing the refractory bodies to glow, and tube means defining at least one air passage which extends upwardly through the mass of particulate refractory material for providing combustion air to the gaseous fuel flowing to only some of said spaces between the bodies so that said gaseous fuel provided with combustion air from said passage burns with a higher temperature flame than the temperature of said luminous flame to cause the refractory bodies heated by the higher temperature flame to glow more brightly than the bodies heated by the luminous flame, thereby realistically simulating a solid fuel fire.

4,110,064
AIR-JET FURNACE

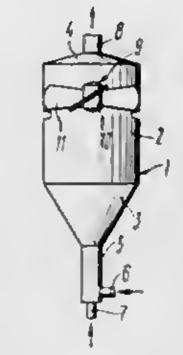
Dmitry Afanasievich Vorona, ulitsa Dm. Ulyanova, 4, korpus 2, kv. 8; Vitaly Ivanovich Chikul, ulitsa Panferova, 8, kv. 170; Alexandr Stepanovich Smirnov, Leninsky prospekt, 73/8, kv. 149, all of Moscow; Olga Semenovna Chikul, ulitsa Uus, 13, kv. 5, Kiviyli, Estonskoi SSR; Boris Ivanovich Tygunov, ulitsa Panferova, 8, kv. 22, Moscow; Semen Alexandrovich Tager, ulitsa Dm. Ulyanova, 4, korpus 2, kv. 361, Moscow; Nikolai Nikolaevich Shipkov, ulitsa Magdagulovoi, 18, korpus 2, kv. 157, Moscow; Arkady Vitalievich Perepelkin, Kantemirovskaya ulitsa, 5-3, kv. 503, Moscow; Elizaveta Alexeevna Grigorieva, ulitsa Dm. Ulyanova, 4, korpus 2, kv. 8, Moscow, all of U.S.S.R.; Gennady Alexeevich Krasnovsky, deceased, late of Moscow, U.S.S.R., and Tatyana Sergeevna Krasnovskaya, administratrix, 1 Babiegorodsky pereulok, 15/17, kv. 13, Moscow, U.S.S.R.

Filed Jul. 2, 1976, Ser. No. 702,085

Claims priority, application U.S.S.R., Jul. 17, 1975, 2155002

Int. Cl.² F23M *9/06*

U.S. Cl. 431—171 5 Claims



1. An air-jet furnace comprising: a vertical chamber having a conical bottom part which narrows downwards, an inlet-pipe means for admitting fuel and air to said chamber, means for connecting said inlet pipe means to said narrowing conical bottom part of said chamber, an outlet pipe means for removal of combustion products from said chamber at the top part of said chamber; a combustion stabilizer means stationarily mounted in the inner space of said chamber for repeated recirculation of said fuel in said vertical chamber, said stabilizer means comprising a blade-type mechanical swirling device, the blades of said swirling device being arranged across the chamber in the top part thereof upstream of said outlet pipe in the path flow of combustion products wherein said swirling device comprises a multiblade propeller having a hub closed at both ends thereof said closed-end hub adapted to deflect the flow of combustion products upward.

4,110,065
COCK APPARATUS OF AUTOMATIC IGNITION TYPE FOR GAS APPLIANCE

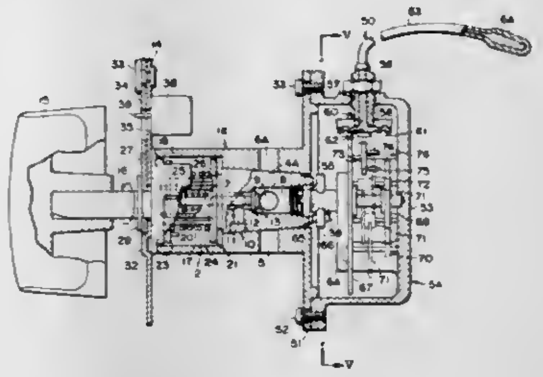
Yasuo Fujiwara, Yokohama, Japan, assignor to Aero-Spec Products Co., Ltd., Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,645

Claims priority, application Japan, Jul. 25, 1976, 51-102131

Int. Cl.² F23Q *7/12*

U.S. Cl. 431—255 9 Claims



1. A cock apparatus of automatic ignition type for use in a gas appliance comprising:

a frame member;

a cock body mounted on one side of said frame member and having an internal space;

an ignition handle having a shaft extending at one end portion thereof into the internal space of said cock body and at the other end portion thereof toward the exterior through said frame member;

a valve member disposed within the internal space of said cock body for rotation with the turning movement of said ignition handle thereby permitting supply and shut-off of the flow of combustible gas toward a main burner and a pilot burner;

a spark generator generating sparks for igniting said pilot burner in response to the turning movement of said ignition handle; and

a device affixed to said cock body for preventing leakage of live combustible gas;

said live gas leakage preventive device comprising a casing mounted on the end face of said cock body, a rotary shaft journaled in said casing and capable of free rotation and restrained rotation relative to said valve member, spring means mounted on said rotary shaft for normally urging said rotary shaft in the closing direction of said valve member, heat sensor means mounted on said casing for sensing ignition and non-ignition of said burner, engaging means for forcedly interrupting the operation of said spring means by cooperating with said heat sensor means when said main burner is properly ignited, and means for releasing said engaging means thereby permitting said spring means to exert its resilient returning force at a constant speed when said heat sensor means does not operate or ceases to operate due to ignition failure or accidental flame extinction of said main burner.

4,110,066
FLOATING ILLUMINATING DEVICE

Philip Joseph Murphy, San Mateo, Calif., assignor to Lancaster Colony Corporation, Columbus, Ohio

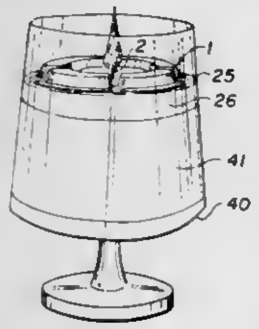
Filed Feb. 28, 1977, Ser. No. 772,381

Int. Cl.² F23D *3/24*

U.S. Cl. 431—320 12 Claims

1. An illuminating device of unitary construction comprising in combination a wick and a thin, formed member of oil impervious material for floating on a body of combustible fluid, the member comprising a central depending generally frusto-conical well portion and a plurality of annularly spaced elongate buoyancy imparting segmental cavities opening to the under-

side of the member and surrounding the well portion, channel means extending radially between the cavities from the outer edge of the well portion to the periphery of the member to allow combustible fluid to flow into the well portion, the well portion including a bottom wall with at least one wick retaining recess having the wick mounted therein in an upstanding position with the upper portion of the wick projecting above the bottom wall to allow the wick to become impregnated with combustible fluid, and wherein the cavities are spaced a substantial distance from the wick so that they do not suffer heat distortion when the wick is ignited.



4,110,067

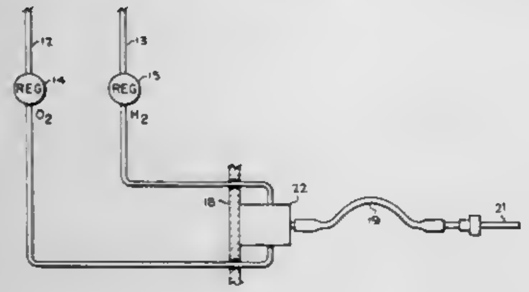
GAS MIXER

Harold G. Anderson, Kirtland, and Jeuel E. Guess, Willoughby Hills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1976, Ser. No. 719,290

Int. Cl.² F23D *13/46*

U.S. Cl. 431—346 **10 Claims**



1. A flashback tolerant mixer for gases comprising:
a block having at least two bores therein; and
pressure sensitive, flexible means, having a single bore and non-threadedly engaging said block, for enclosing the region wherein said bores emerge from said block and wherein said gases mix and for releasing from said block due to the pressure of a flashback.

4,110,068

HOT ROLLER FUSER HAVING MANUALLY OPERABLE JAM CLEARANCE MECHANISM

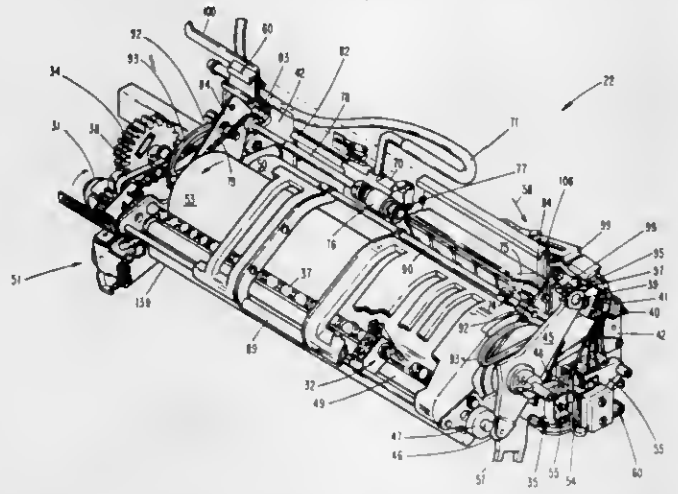
Leon Calvin Brown; Earl Garland Edwards; Charles Edwin Peterson; Peter George Robinson, and Clement Card Wilson, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 22, 1977, Ser. No. 771,126

Int. Cl.² B65H *29/56*

U.S. Cl. 432—60 **14 Claims**

1. In an electrophotographic device wherein toner carried by a sheet of transfer material is fused to said sheet by the fusing nip of a hot roll fuser assembly, the improvement comprising:
sheet guide means movably supported on said fuser assembly and positioned upstream of said fusing nip, said sheet guide means being operative in a first position to receive and guide a sheet away from said fusing nip as the sheet's leading edge emerges therefrom;
manually operable means supported on said fuser assembly, said manually operable means having a first and a second position, and being connected to move said sheet guide means to a second position away from said fusing nip upon operation of said manually operable means to its second position, to thereby allow access to said fusing nip for purpose of sheet jam clearance and the like; and
locking means controlled by said manually operable means when in its first position to lock said sheet guide means in its first position.



4,110,069

SUPPORT STRUCTURE FOR CERAMIC WARE

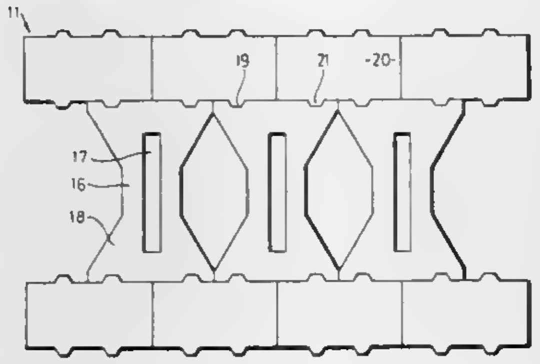
William John Lovatt, Stoke on Trent, England, assignor to Acme Marls Limited, Stoke on Trent, England

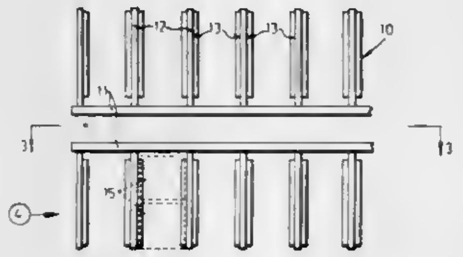
Filed Jan. 26, 1977, Ser. No. 762,527

Claims priority, application United Kingdom, Jan. 31, 1976, 3880/76

Int. Cl.² F27D *5/00*

U.S. Cl. 432—258 **1 Claim**





1. A support structure for generally flat ceramic ware, the support structure comprising a plurality of generally planar components, all of which are die pressed and have precisely controlled dimensions in the plane of the components, said plurality of generally planar components comprising first such components including generally vertically disposed elongate posts and generally horizontally disposed elongate link members disposed in relatively staggered courses, the posts and link members having inter-fitting formations whereby they are

detachably connected together to provide an upright linear back wall of the support structure; second such components being secured to said first components generally perpendicular thereto and in generally parallel upright planes to form transverse walls; and a plurality of third such components secured to the transverse walls on one or both faces thereof to form fins extending laterally from the transverse walls in equally spaced generally horizontal planes.

4,110,070

HEAT TRANSFER PRINTING ON ACIDIC MODIFIED SYNTHETIC FIBER

Takeo Kurahashi; Shigeo Maeda; Sanai Seki; Nobuo Suzuki, and Takayuki Sakai, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,562

Claims priority, application Japan, Mar. 17, 1976, 51-28193; May 24, 1976, 51-59067; Jun. 11, 1976, 51-67767

Int. Cl.^{2} D06P *1/38, 3/10, 3/52*

U.S. Cl. 8—2.5 R **6 Claims**

1. A heat transfer printing which comprises quaternizing an indolenine methine compound on an acidic modified synthetic fiber to form the corresponding cationic indolenine methine dye with the acidic groups of said acidic modified synthetic fiber.

4,110,071

PROCESS FOR THE TONE-IN-TONE PRINTING AND PAD-DYEING OF TEXTILE MATERIAL MADE FROM FIBRE MIXTURES

Andres Schaub, Biel-Benken, and Gerhard Kögel, Reinach, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 26, 1976, Ser. No. 689,986

Claims priority, application Switzerland, May 26, 1975, 6715/75

Int. Cl.^{2} D06P *3/82*

U.S. Cl. 8—21 R **19 Claims**

1. In a process for the tone-in-tone printing and pad-dyeing of textile material made from fiber mixtures of cellulose and at least one synthetic material from the group of polyamide, polyester and cellulose acetate with the use of solvents having swelling properties selected from the group of glycols and glycol derivatives which process comprises printing or impregnating the textile material with a printing paste or padding liquor, subsequently subjecting the printing or the dyeing, after intermediate drying, to a heat treatment and subjecting the resultant material to a finishing process, the improvement according to which the dyestuff contained in the printing paste or padding liquor is at least one disperse dyestuff said dyestuff being produced in the printing paste or padding liquor itself by reaction of a coupling component with a diazo component.

4,110,072

COMPOSITION OF MIXED BENZENSULFONAMIDO ANTHRAQUINONE DYES AND LINEAR POLYESTER MATERIAL DYED THEREWITH

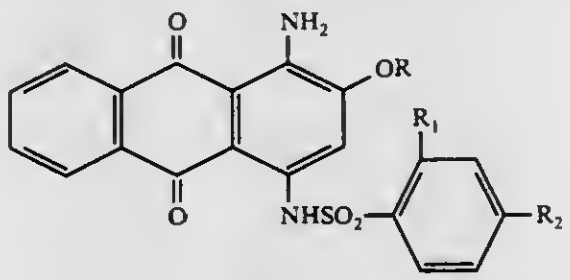
Joseph W. Fitzpatrick, Toms River, and Arthur D. Olin, Lakewood, both of N.J., assignors to Toms River Chemical Corporation, Toms River, N.J.

Filed May 31, 1977, Ser. No. 801,706

Int. Cl.^{2} D06P *1/00;* **C09B** *1/00*

U.S. Cl. 8—25 **10 Claims**

1. A dyestuff composition consisting essentially of two or more dyes selected from the group of the formula



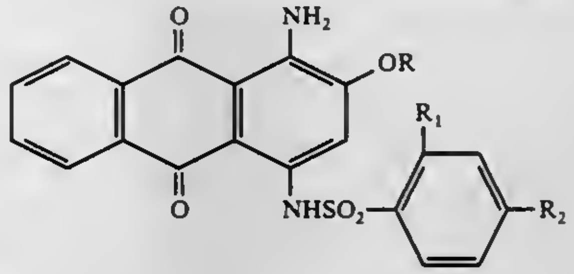
wherein

R is methyl, ethyl, hydroxyethyl, β-methoxyethyl or β-ethoxyethyl,

R_1 is hydrogen or methyl and

R_2 is hydrogen, methyl or methoxy, provided that R_1 and R_2 are both hydrogen in one of the elected dyes and provided that the dye present as the minor component is present to the extent of at least about 10% by weight.

4. A process of dyeing linear polyester material comprising the step of applying thereto an aqueous dispersion of a mixture of two or more dyes selected from the group of the formula



wherein

R is methyl, ethyl, hydroxyethyl, β-methoxyethyl or β-ethoxyethyl,

R_1 is hydrogen or methyl and

R_2 is hydrogen, methyl or methoxy, provided that R_1 and R_2 are both hydrogen in one of the elected dyes and provided that the dye present as the minor component is present to the extent of at least about 10% by weight.

4,110,073

FLUID AND STABLE DISPERSIONS OF ANIONIC DYESTUFFS

Hans Mollet, Reinach, and Wolfgang Rehmann, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Switzerland

Continuation of Ser. No. 441,625, Feb. 11, 1974, abandoned, which is a continuation of Ser. No. 285,666, Sep. 1, 1972, abandoned. This application May 10, 1976, Ser. No. 684,736

Claims priority, application Switzerland, Sep. 10, 1971, 013314

Int. Cl.^{2} C09B *67/00;* **D06P** *1/645*

U.S. Cl. 8—85 R **7 Claims**

1. A fluid and stable anionic dyestuff dispersion having a viscosity of 3 to 500 centipoise comprising as essential components

(a) 10 to 50% by weight of at least one dispersed anionic dyestuff having a particle size below 5μ;

(b) 5 to 80%, relative to the amount of dyestuff, as a dispersing agent a mixture selected from the group consisting of:

  (1) sodium lignin sulphonate and disodiumdinaphthylmethane-disulphonate,

  (2) sodium lignin sulphonate and decyloxyacetic acid monoethanolamide, and

  (3) disodiumdinaphthylmethanedisulphonate and sodiumdioctylsulphosuccinate; and

(c) 20 to 80% by weight of the dispersion of water.

4,110,074

MIXED CARBOXYLIC/SULFONIC ANHYDRIDES IN PEROXYGEN BLEACHING

Joseph H. Finley, Metuchen; John H. Blumbergs, Highland Park, and Clifford A. Erickson, Princeton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,902

Int. Cl.^{2} D06I *3/02, 3/04*

U.S. Cl. 8—111 **7 Claims**

1. A process of removing soil and/or stains from fabrics by immersing the fabrics in a peroxygen bleach bath containing as a peroxygen activator, an anhydride of a carboxylic acid with a sulfonic acid selected from the formulae consisting of

$$R_1\text{—}(SO_2OC(O)\text{—}R_2)_n \text{ and } (R_1\text{—}SO_2OC(O))_n\text{—}R_2$$

wherein n is an integer of 1 to 3; each of R_1 and R_2, which may be alike or different, is selected from the class consisting of a 1 to 3 valent hydrocarbon radical derived from an alkane of 1 to 16 carbon atoms, a cycloalkane of 3 to 7 carbon atoms and an arene of 6 to 12 aromatic carbon atoms while taken together R_1 and R_2 can complete an o-phenylene or an o-naphthalene ring, said hydrocarbon radicals optionally bearing 1 to 3 substituents selected from the class consisting of alkoxy of 1 to 16 carbon atoms on the arene, aliphatic carboxamido of 1 to 16 carbon atoms on the arene, alkyl of 1 to 16 carbon atoms on the arene, benzamido on the arene, nitro, chlorine, bromine and fluorine.

4,110,075
PROCESS FOR WASHING TEXTILES IN AN AUTOMATIC WASHING MACHINE, WORKING SUBSTANCES AND APPARATUS FOR ITS PERFORMANCE

Richard Graf; Lieselotte Brodzina, both of Berlin; Rudolf Strobele, and Helmut Stache, both of Marl, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Munich and Chemische Werke Huls A.G., Marl, both of, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,420

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1975, 2554592

Int. Cl.^{2} B08B *3/00*

U.S. Cl. 8—137 **22 Claims**

1. In a washing process for textiles in an automatic washing machine with loading of the textiles in the machine, adding of water, application of active washing substances, structural substances and bleaching agents, agitation of the textiles in the washing solution, pumping off the washing solution, and sequential rinse cycles, the combination therewith of adding the water after loading the textiles in the ratio of 1:4 to 1:30 kg textile to liters water, maintaining said active washing substances in pumpable form, each in a separate container in the washing machine, adding 0.5 to 3.5 g of active washing substances and 2 to 6.5 g of structural substances per liter of washing water, agitating the textiles at a predetermined temperature for a wash period of up to 50 minutes, pumping off the washing solution, and subjecting the textiles to two to five rinse cycles.

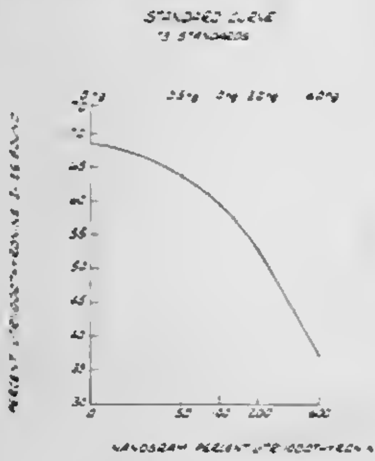
4,110,076
RADIOIMMUNOASSAY METHODS FOR THE DETERMINATION OF L-TRIIODOTHYRONINE AND THYROXINE

Salvatore S. Margherita, Manchester, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 590,671, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,345, Apr. 26, 1974, abandoned. This application Aug. 11, 1976, Ser. No. 713,447

Int. Cl.^{2} G01N *33/16;* G21H *5/00*

U.S. Cl. 23—230.6 **16 Claims**



1. A radioimmunoassay method for the in vitro determination of L-triiodothyronine in unextracted blood serum which comprises the steps of

mixing a sample of blood serum whose L-triiodothyronine content is to be determined with a reagent consisting essentially of a buffered solution containing radioactive L-triiodothyronine and an inhibitor for inhibiting binding of L-triiodothyronine to thyroxine-binding globulin, said inhibitor being selected from the group consisting of the magnesium, calcium and alkali metal salts of 8-anilino-1-naphthalene sulfonic acid;

adding to the mixture an antiserum containing antibody capable of immunoreactivity with L-triiodothyronine;

incubating the resultant mixture at a temperature and for a sufficient period of time to produce substantial equilibration of the antibody bound L-triiodothyronine and unbound L-triiodothyronine;

separating the unbound L-triiodothyronine from the antibody bound L-triiodothyronine; and

determining the relative amounts of antibody bound radioactive L-triiodothyronine and unbound radioactive L-triiodothyronine.

4,110,077
DETERMINATION OF β-LIPOPROTEINS IN BLOOD SERUM WITH POLYANETHOLE SULFONATE

Bernard Klein, New Hyde Park, N.Y., and James Arthur Foreman, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 8, 1976, Ser. No. 731,057

Int. Cl.^{2} G01N *33/16, 31/02, 21/22*

U.S. Cl. 23—230 B **3 Claims**

1. In a process of isolating beta-lipoproteins from blood serum by contacting serum with a polyanion in the presence of a divalent cation, the improvement which comprises obtaining said beta-lipoproteins in about 99% purity and substantially free of chylomicrons by:

(a) contacting blood serum with a sufficient amount of a solution containing about 0.5% by weight polyanethole sulfonate and from about 0.05 to about 0.15 mole per liter of a divalent cation to precipitate the beta-lipoproteins therein substantially free of chylomicrons;

(b) forming a solution of said beta-lipoproteins and reprecipitating them with said divalent cation to further purify them; and

(c) passing a solution of said beta-lipoproteins through a DEAE-cellulose column to effect immunochemical purification thereof.

4,110,078
BINARY REAGENT SYSTEM FOR DETECTING DRUGS OF ABUSE

Paul Thomas Zelonis, 7926 Peak Point Ave., San Diego, Calif. 92126

Filed Nov. 26, 1976, Ser. No. 745,083

Int. Cl.^{2} G01N *21/06, 31/02, 33/16*

U.S. Cl. 23—230 R **22 Claims**

1. A highly specific binary reagent system for detecting the presence, in a sample, of a drug of abuse selected from the group consisting of opium, heroin, phencyclidine, phencyclidine analogues, methadone and cocaine, comprising:

(a) a first reagent comprising chloroplatinic acid in aqueous solution;

(b) a second reagent comprising cobaltous thiocyanate in aqueous solution, and

(c) a hydrocarbon liquid.

4,110,079
ANALYTICAL ELEMENT FOR CLINICAL ANALYSIS

James R. Schaeffer, Penfield; Louis M. Minsk, Rochester, and Richard E. Stevens, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,215

Int. Cl.^{2} G01N *31/22*

U.S. Cl. 23—253 TP **10 Claims**

1. An analytical element for the assay of an aqueous liquid sample, said element comprising

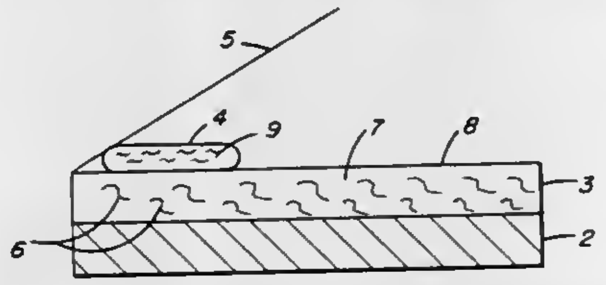
(a) a porous layer structure in which said assay is carried out, said structure being one or more layer compositions selected from the group consisting of porous paper or fabric compostions, permeable polymer film compositions, particle-containing compositions having interconnected open spaces between said particles, and mixtures of the foregoing compositions; said porous layer structure comprising

(i) a porous layer bearing a substantially planar sample receiving surface to receive said liquid sample from an external source, said porous layer having a layer composition selected from the group defined in (a) hereinabove.

(ii) at least one dry reagent material for use in said assay, said reagent material being contained in said porous layer or in a separate porous reagent layer having a layer composition selected from the group set forth in (a) hereinabove, and

(iii) at least one reaction zone comprising a portion of said porous layer, or said porous reagent layer, or a separate porous layer having a composition selected from the group set forth in (a) hereinabove, at least one reaction employed in said assay being carried out in said reaction zone, each of said porous layer, said porous reagent layer, and said reaction zone being in fluid contact with one another; and

(b) a rupturable pod-like member containing a liquid reagent for said assay, said member being associated with said reaction zone whereby said liquid reagent, upon rupture of said member, is released into said reaction zone.



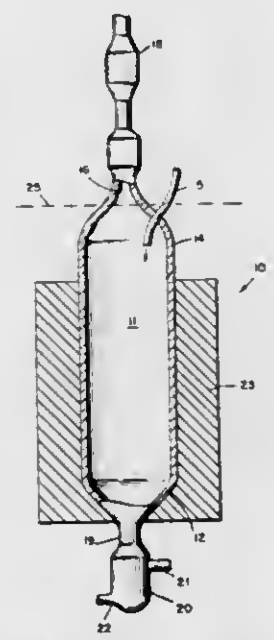
4,110,080
REACTIVE ATMOSPHERIC PROCESSING CRYSTAL GROWTH APPARATUS

Antonio C. Pastor, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 19, 1976, Ser. No. 743,263

Int. Cl.^{2} B01J *17/20*

U.S. Cl. 23—273 SP **4 Claims**



1. Crystal growth apparatus comprising:

an ampoule having a vertically elongated wall defining a chamber for receiving a crystal growth source material wherein said chamber converges at its lower end to form a seeding cavity at its bottom characterized by a conical first section and a capillary second lower section;

said wall being integrally joined at the bottom end to a heat sink having an inlet and an outlet means adapted for receiving a coolant and being integrally joined at the upper end to a passageway for introducing gases and a passageway for removing gases from said chamber; said passageway for removing gases including first and second series connected traps of a diameter larger than the portions of said passageway leading to, from and interconnecting same, whereby liquid and solid condensates are precluded from re-entering said chamber;

and insulation means surrounding said wall intermediate said ends adapted for controlling heat losses occasioned by convection and radiation upon the removal of said crucible from within a furnace during a crystal growth operation.

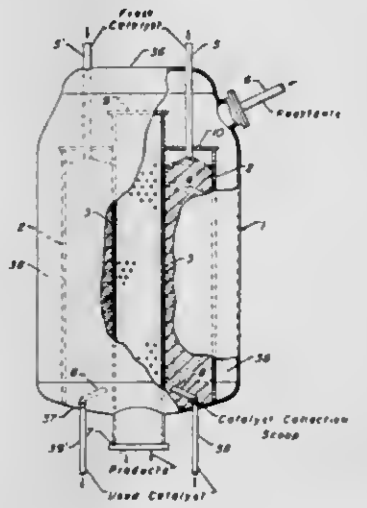
4,110,081
MOVING-BED RADIAL FLOW SOLIDS-FLUID CONTACTING APPARATUS

Robert F. Millar, McCook; Paul J. Persico, Bolingbrook, and Robert H. Jensen, Clarendon Hills, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 9, 1977, Ser. No. 805,062

Int. Cl.^{2} B01J *8/12;* B65G *65/30*

U.S. Cl. 23—288 G **6 Claims**



1. A radial flow moving bed contact apparatus which comprises:

(a) a vertically oriented vessel having an internal volume located within a cylindrical side wall having an inner surface, the outer vessel having upper and lower sections;

(b) a first vertically oriented particle retaining screen located within the outer vessel a distance radially inward from the inner surface of the outer vessel and defining a fluid distribution volume between the first particle retaining screen and the outer vessel;

(c) a second vertically oriented particle retaining screen located within the first particle retaining screen a distance radially inward from the first particle retaining screen and defining an annular particle retention volume having an upper and a lower end and located between the first and the second particle retaining screens and also defining a cylindrical fluid collection volume located within the second particle retaining screen;

(d) a plurality of particle inlet conduits located in the upper section of the outer vessel and communicating with the upper end of the annular particle retention volume;

(e) a fluid inlet means communicating with the fluid distribution volume;

(f) a fluid outlet means communicating with the cylindrical fluid collection volume; and,

(g) a particle withdrawal means located between the first and the second particle retention screens at the lower end of the annular particle retention volume, the particle withdrawal means comprising:

(i) a plurality of vertical tubular particle withdrawal conduits distributed in a circular pattern encircling the second particle retention screen, each particle withdrawal conduit having an unsealed upper end which communicates with the annular particle retention volume; and,

(ii) a plurality of particle collection scoops, each scoop having an open upper first end which faces the second particle retention screen and a lower second end which is attached to the upper end of a particle withdrawal conduit, the upper first end of each particle collection scoop being located between the lower second end of the particle collection scoop and the second particle-retaining screen, with one particle collection scoop being positioned over each of the particle withdrawal conduits, each particle collection scoop having a greater cross-sectional area at the upper first end than at the lower second end, and with each particle collection scoop comprising vertically spaced apart upper and lower planar panels reposing at an angle of from about 50°-60° above horizontal.

4,110,082

REFORMED HYDROCARBONS AND ALCOHOLS FROM FUEL ALLOYS AND REFORMING AGENTS

Van Michaels-Christopher, 1817½ N. Las Palmas Ave., Hollywood, Calif. 90028

Continuation-in-part of Ser. No. 552,802, Feb. 25, 1975, abandoned, Continuation-in-part of Ser. No. 655,275, Feb. 4, 1976, abandoned, Continuation-in-part of Ser. No. 735,110, Oct. 22, 1976, Continuation-in-part of Ser. No. 445,792, Feb. 25, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 764,283

Int. Cl.^{2} C10L *1/10*

U.S. Cl. 44—50 **4 Claims**

1. A process for manufacturing liquid hydrocarbons from repeatedly quenched hydrogenating fuel alloys which comprises the introducing into a reactor having a temperature of 500° C. to 1000° C. a feed stock including a powdered mixture of iron halides, oxides, and hydroxides, 50–60% powdered manganese oxides, 3 to 5% chromium and molybdenium oxides introducing air into said reactor to ignite and fluidize said mixture including sufficient carbon to produce carbon monoxide, which CO attacks said metal compounds below their melting points converting them catalytically to fuel alloys at atmospheric pressure through the evolved catalysing and self-catalyzing iron halide steam and the obtained CO_2 serving to increase the efficiency of the CO by reducing its partial pressure favouring faster and better yield of hydrocarbonides (liquid hydrocarbon evolving carbides) said fuel alloy being only primary one composed of different low yield manganese and iron hydrocarbonides and no hydrocarbons evolving carbides not containing cementite, the best hydrocarbonide the primary powder alloys being then passed into a cooling oil bed for repeated quenching below 50° C. to convert all of the above mentioned carbides into high yield liquid hydrocarbon evolving cementite Fe_3C and manganese tritacarbide Mn_3C then passing this secondary alloy composed of Mn_3C, Fe_3C, carbon unreacted chromium and molybdenium oxides and some zinc oxide into a reactor together with a hydrolyzing liquid to evolve liquid and gaseous hydrocarbons accompanied with by product hydrogen some carbonyls and reduced Iron attained at self pressure of 200 to 300 atmospheres favouring a higher percentage of the liquid hydrocarbons then increasing at the end of the hydrolysis the reactor's temperature up to 250° C. to partially react the obtained hydrogen with previously unreacted CO gas stored for that purpose in order to obtain additional Hydrocarbons then again increasing the temperature of the reactor up to 400° C. to catalytically hydrogenate the remaining Carbon constituent of the alloy into another additional yield of liquid hydrocarbons stimulated by the Cr and Mo doping then separating the obtained gasoline fraction mixing it with 0.5 to 5% anti-micelle forming agents 10 to 30 percent Methanol and 1 to 8 percent water to reform the gasoline into high grade isothermic engine fuel for which the required methanol is obtained by the same process essentially by the same kind of fuel alloy by decreasing its Cr and Mo doping and increasing its promoted zinc doping and finally recycling the Halides the hydroxides and the metal oxides obtained with the hydrolysis into the original feed stock by drying them and by mixing them with fresh carbon powder ready to be used for a new cycle of hydrocarbon synthesis.

4,110,083

ABRASIVE COMPOSITION

James John Benedict, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 471,941, May 21, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,592

Int. Cl.^{2} A61K *7/16;* B24D *3/30*

U.S. Cl. 51—295 **7 Claims**

1. A coated abrasive composition consisting essentially of:

(A) A hard mineral substance having a hardness on the Mohs' scale of 2 or more and a particle size of from about 1 to about 30 microns; and as a coating for said hard mineral substance,

(B) from about 2 to about 25% by weight, based on the weight of said hard mineral substance, of a cationic water-soluble polymer having a cationic charge density of at least 0.003 and a molecular weight of from about 500 to about 1,000,000, said polymer being selected from the group consisting of:

(a) polyacryloxyalkyl ammonium salts;
(b) polymethacryloxyalkyl ammonium salts;
(c) polyacryloamido alkyl ammonium salts;
(d) polyalkenyl ammonium salts;
(e) polyvinyloxy ammonium salts;
(f) polyvinylbenzyl ammonium salts;
(g) polydiallyl ammonium salts;
(h) polyvinyl pyridinium ammonium salts;
(i) polyvinylimidazolium salts;
(j) polyalkylation quaternaries; and
(k) poly condensation quaternaries.

4,110,084

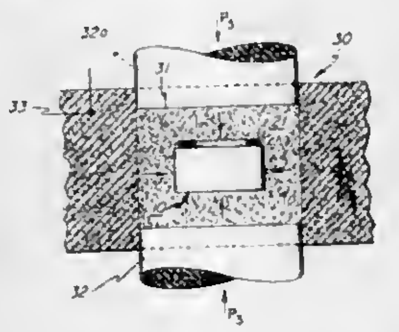
COMPOSITE OF BONDED CUBIC BORON NITRIDE CRYSTALS ON A SILICON CARBIDE SUBSTRATE

Minyoung Lee, Schenectady, and Lawrence E. Szala, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,858

Int. Cl.^{2} B24D *3/06*

U.S. Cl. 51—307 **10 Claims**



1. A process for preparing an abrasive composite consisting essentially of the steps of:

a. placing within a metal container a layer of metal selected from the group consisting of aluminum, aluminum alloy, or alloying metals for providing said aluminum alloy, a layer of a mass of cubic boron nitride crystals, and a silicon carbide substrate, said substrate being disposed with one face or one side facing said layers and in contact with said layer of cubic boron nitride crystals, said aluminum alloy containing aluminum in an amount of at least about 85% by weight of the alloy, said aluminum and aluminum alloy having a critical wetting temperature of less than about 1400° C., being capable of reducing B_2O_3 and exhibiting a limited finite reactivity with cubic boron nitride, the amount of said aluminum or aluminum alloy ranging from about 25% to about 60% by volume of said mass of cubic boron nitride crystals, said substrate consisting essentially of a hot-pressed or sintered polycrystalline silicon carbide body wherein the silicon carbide grains are bonded directly to each other by fusion only having a density ranging from about 85% to about 98% of the theoretical density of silicon carbide and containing silicon carbide in an amount of at least 90% by weight of said substrate body and being free of constituents which have a significantly deteriorating effect on any of the materials forming the present abrasive composite;

b. disposing said container and the contents thereof within a pressure-transmitting powder medium that remains at least substantially unsintered under the operating conditions of temperature and pressure and that transmits applied pressure substantially undiminished;

c. applying substantially isostatic pressure to said container and said contents via said pressure transmitting medium, said applied pressure ranging from about 20,000 psi to about 200,000 psi, the application of pressure being maintained at least long enough to substantially stabilize the dimensions of said container and said contents at least in planes through said container parallel to the interface between the layers of metal and cubic boron nitride crystals producing a substantially isostatic system of powder-enveloped container and contents wherein the density of cubic boron nitride crystals is higher than 70% by volume of the volume of said mass of cubic boron nitride crystals,

d. substantially evacuating said isostatic system including said container;

e. introducing a nitrogen gas atmosphere into said evacuated system including said container;

f. simultaneously applying pressure and heat to the resulting isostatic system of powder enveloped container to pass said aluminum and aluminum alloy through the voids in said mass of CBN crystals and into the contacting face or side of said silicon carbide substrate to a depth at least about twice the thickness of said layer of cubic boron nitride crystals, said pressure ranging from about 500 psi to about 100,000 psi and said heating being to a temperature ranging from the critical wetting temperature of said aluminum and aluminum alloy to about 1450° C.;

g. maintaining sufficient pressure on the resulting isostatic system during cooling thereof to maintain the dimensions of said container and

h. recovering the resulting abrasive composite.

6. A cubic boron nitride abrasive composite consisting of a layer of a mass of cubic boron nitride crystals bonded to each other and to a substrate of a polycrystalline silicon carbide body with an aluminum atom-containing phase infiltrated at least substantially and usually completely through said layer of crystals and diffused as an aluminum atom-containing phase rich in aluminum through the contacting surface of said silicon carbide body around the grains and through the pores therein to a depth of at least about twice the thickness of said layer of bonded cubic boron nitride crystals, said layer of bonded cubic boron nitride crystals consisting essentially of cubic boron nitride crystals wherein the density of said crystals ranges from higher than 70% by volume to about 90% by volume of said layer and said aluminum atom-containing phase in an amount less than 30% by volume of said layer with at least a significant portion of said aluminum atom-containing phase in said layer being aluminum nitride present in sufficient amount to at least bond said cubic boron nitride crystals together, said layer of bonded cubic boron nitride crystals containing voids up to less then 2% by volume of said layer, said voids having no significant deteriorating effect on the mechanical properties of said layer, said polycrystalline silicon carbide body being a hot-pressed or sintered body wherein the silicon carbide grains are bonded directly to each other by fusion only ranging in density from about 85% to about 98% of the theoretical density of silicon carbide and containing silicon carbide in an amount of at least 90% by weight of said body and being free of constituents which have a significantly deteriorating effect on the mechanical properties of said composite.

4,110,085

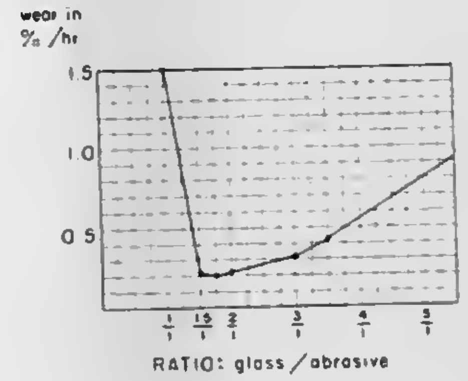
GLASS BONDED FINISHING MEDIA

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Filed Jul. 12, 1976, Ser. No. 704,390

Int. Cl.^{2} B24D *3/14*

U.S. Cl. 51—308 **23 Claims**



1. An abrasive finishing chip suitable for use as an abrasive medium in finishing processes and apparatus for the finishing of parts and workpieces, comprising abrasive grains dispersed in a matrix of sintered ground glass having a working point below about 1950° F. with a glass to abrasive weight ratio of about 1:1 to about 3.5:1 and of a shape suitable for employment as an abrasive media chip.

4,110,086

METHOD FOR IONIZING GASES, ELECTROSTATICALLY CHARGING PARTICLES, AND ELECTROSTATICALLY CHARGING PARTICLES OR IONIZING GASES FOR REMOVING CONTAMINANTS FROM GAS STREAMS

James J. Schwab, Seattle, and David B. Goodson, Renton, both of Wash., assignors to Air Pollution Systems, Inc., Kent, Wash.

Continuation-in-part of Ser. No. 498,409, Aug. 19, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,494

Int. Cl.^{2} B03C *3/14*

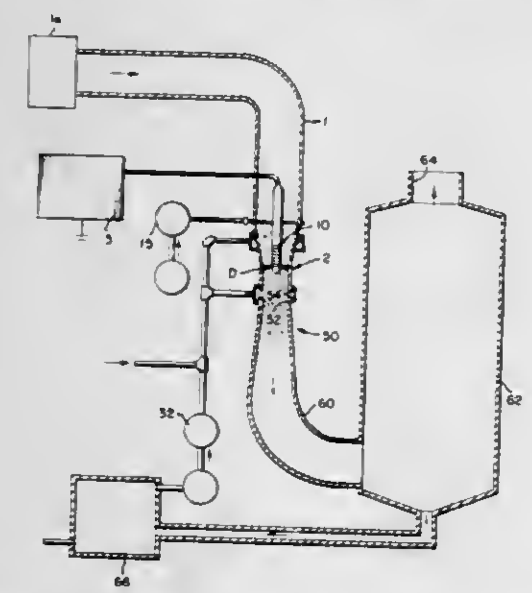
U.S. Cl. 55—7 **30 Claims**

1. A method of removing contaminants from gases, comprising:

directing the contaminated gases through a tubular outer electrode;

placing an inner electrode with said outer electrode thereby forming an electrode gap between said electrodes;

generating an electrostatic field between said electrodes, the intensity of said field being approximately equal to the intensity of the average applied field throughout a distance from said outer electrode at least to about fifty percent of the electrode gap toward said inner electrode such that said field is substantially uniform and is generally wedge shaped diverging outwardly in a direction perpendicular to the flow of gases through said outer electrode, thereby charging the contaminants in said gases; and collecting the charged contaminants.



4,110,087

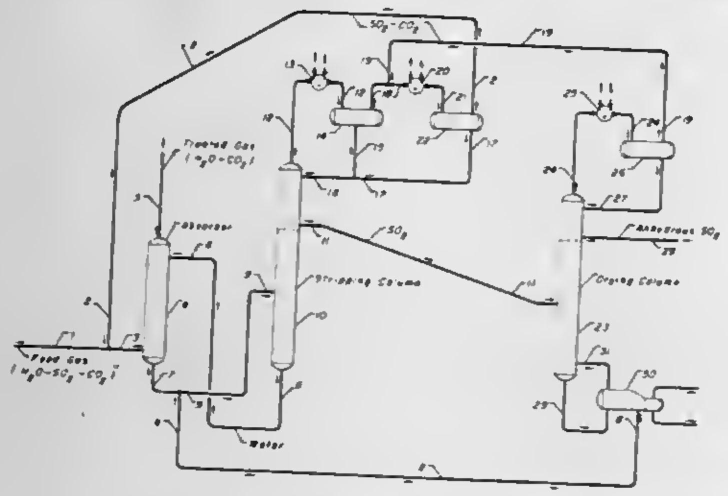
SULFUR DIOXIDE REMOVAL BY ABSORPTION AND FRACTIONATION

John P. Nolley, Jr., Glendale Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 738,407, Nov. 2, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,486

Int. Cl.² F25J *3/08;* **B01D** *53/14, 3/14*

U.S. Cl. 55—73 **10 Claims**



1. A process for removing sulfur dioxide from a gaseous feed stream comprising water, sulfur dioxide and carbon dioxide which comprises the steps of:

(a) contacting the gaseous feed stream with a sulfur dioxide lean absorbent stream comprising water in an absorption zone operated at conditions effective to produce a sulfur dioxide rich absorbent stream comprising carbon dioxide and an off-gas stream containing less sulfur dioxide than the gaseous feed stream;

(b) passing the sulfur dioxide rich absorbent stream into a first intermediate point of a first fractionation column having a rectification section and a stripping section and operated at conditions effective to cause the separation of water and sulfur dioxide by fractionation including (1) a bottom temperature within 20 Fahrenheit degrees of the boiling point of water at the pressure imposed at the bottom of the first fractionation column, and (2) the retention of liquid sulfur dioxide on fractionation trays located above the first intermediate point and the retention of liquid water on fractionation trays located below the first intermediate point;

(c) passing at least a portion of a sulfur dioxide lean water stream removed as a bottoms product of the first fractionation column into the absorption zone as the sulfur dioxide lean absorbent stream;

(d) removing a first liquid sidecut stream comprising sulfur dioxide from the first fractionation column at a second, higher intermediate point;

(e) partially condensing an overhead vapor stream comprising sulfur dioxide and carbon dioxide withdrawn from the first fractionation column to form a first condensate stream comprising sulfur dioxide and a first vapor stream comprising carbon dioxide and sulfur dioxide;

(f) admixing the first vapor stream with a hereinafter described second vapor stream and partially condensing the resultant admixture to form a third vapor stream comprising sulfur dioxide and carbon dioxide and a second condensate stream comprising sulfur dioxide;

(g) passing the first and the second condensate streams into the first fractionation column as reflux liquid;

(h) passing the third vapor stream into the absorption zone and contacting the third vapor stream .with the sulfur dioxide lean absorbent stream;

(i) passing the first liquid sidecut stream into a first intermediate point of a second fractionation column having a rectification section and a stripping section and operated at conditions effective to cause the separation of water and sulfur dioxide by fractionation including the retention of liquid sulfur dioxide on fractionation trays located above the first intermediate point;

(j) removing a second liquid sidecut stream comprising anhydrous sulfur dioxide from the second fractionation column at a second, higher intermediate point;

(k) passing a bottoms liquid product stream comprising water and sulfur dioxide and removed as a bottoms product of the second fractionation column into the first fractionation column;

(l) partially condensing an overhead vapor stream comprising sulfur dioxide and carbon dioxide and removed from the second fractionation column to form reflux liquid .returned to the second fractionation column and a fourth vapor stream comprising sulfur dioxide and carbon dioxide; and,

(m) admixing the fourth vapor stream with the first vapor stream as the previously specified second vapor stream.

4,110,088

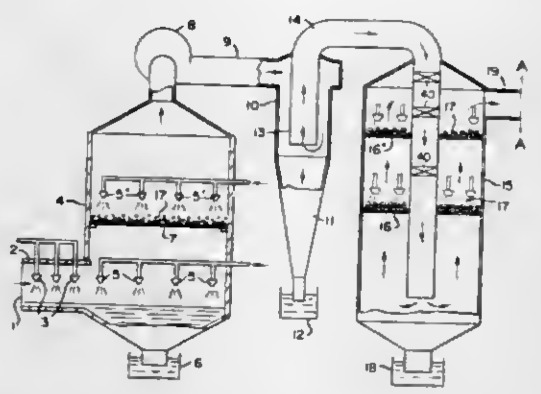
APPARATUS AND METHOD FOR REMOVAL OF POLLUTANTS FROM FLUE GAS

David M. Cold, 18610 Hanna Rd., Lutz, Fla. 33549, and Larry A. Bean, 100 Irwin St., Safety Harbor, Fla. 33572

Filed Jun. 18, 1976, Ser. No. 697,622

Int. Cl.² B01D *50/00*

U.S. Cl. 55—90 **6 Claims**



1. A combination of apparatus for the removal of pollutants from flue gas comprising:

(a) a prequencher embodying a series of water sprays adapted to impart a water spray for preliminary cooling and quenching of hot flue gas passing therethrough, said prequencher having an inlet adapted to receive said flue gas and an exit for said flue gas;

(b) a primary spray chamber having two series of sprayheads, each series being adapted to spray water through the entire horizontal cross-sectional area of said chamber with one series of sprayheads being positioned vertically above the second series, said chamber having an inlet means for receiving prequenched flue gas from said prequencher and and outlet means;

(c) a first pump positioned at and communicating with the outlet means of said chamber and adapted to provide a negative pressure in said primary spray chamber thereby to induce gas flow in said chamber and to provide a positive pressure on the downstream side of said pump;

(d) a first conduit means connected to the downstream side of said first pump;

(e) a cyclone separator having an inlet connected to said first conduit means and designed to induce centrifugal force and a downward path in the flow of gas therethrough, said separator having a bottom adapted to receive water and particulate matter depositing out of said gas and adapted to exit such material without releasing the gas pressure maintained therein, and said separator having an exit for the gas flowing therethrough, said exit being positioned at a point substantially lower than the inlet to said separator;

(f) a second conduit means for leading exit gas from said cyclone separator;

(g) a partially packed tower having a gas inlet means near the bottom thereof communicating with said second conduit means and adapted to receive said exit gas from said cyclone separator in a lower region of said partially packed tower, said tower having a gas outlet means in an upward region of said tower and having at least two porous trays vertically interposed between said gas inlet means and said gas outlet means and each said tray occupying the entire cross-sectional horizontal area of said tower so that said gas passes through the pores of said trays, and each said tray having a layer of packing thereon having a height of at least one inch,

(h) a demister having a gas inlet means communicating with and adapted to receive exit gas from said tower, said demister comprising a closed compartment having a gas outlet means remote from said gas inlet means and having interposed between said gas inlet means and said gas outlet means a series of baffle plates adapted to cause the gas passing therethrough to reverse direction a number of times thereby to induce repeated impingement of said gas on the baffles and walls of said compartment and said demister having a means for removing water and particulate matter collected at the bottom of said compartment without releasing gas pressure in said compartment;

(i) a second pump positioned at and communicating with said demister gas outlet means and thereby adapted to receive gas exiting from said outlet means and to impart a positive pressure on the downstream side of said pump and also to induce gas flow from the upstream side into said demister;

(j) a third conduit means communicating with the downstream side of said second pump;

(k) a venturi connected to and communicating with said third conduit and adapted to receive gas from the downstream side of said pump, said venturi having an outlet means and adapted to deliver gas through said outlet means at a much greater linear velocity than the linear velocity at which said gas enters said venturi; and

(l) a vertical stack positioned above said venturi and adapted to receive gas exiting from said venturi, said stack having an opening therein adjacent to said venturi outlet with said opening adapted to have air drawn into said stack by virtue of the aspirating effect of the velocity of gas emanating from said venturi.

4,110,089

APPARATUS WITH FOAM BREAKER

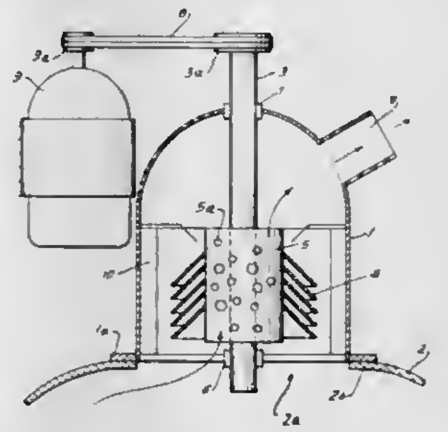
Hans Müller, Erlenbach, Switzerland

Continuation of Ser. No. 573,527, May 1, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,093

Claims priority, application Switzerland, May 13, 1974, 6530/74

Int. Cl.² B01D *19/02*

U.S. Cl. 55—178 **6 Claims**



1. In an apparatus in which mixing of gaseous and liquid phases results in the formation of foam, a combination comprising a vessel in which the foam is formed, said vessel having an opening and an inlet and outlet; foam-breaking means for breaking up the foam into its constituent liquid and gaseous components, comprising an upright housing straddling said opening and communicating through the same with said vessel, said housing being dome-shaped and having an upper domed part and a lower cylindrical part, rotatable foam breakers located within said cylindrical part of said housing and having an upright axis of rotation, said foam breakers being upwardly convergent coaxial members axially spaced from and axially overlapping one another, and stationary vertical baffles mounted in said cylindrical part of said housing and having longitudinal edges facing toward but spaced from said members parallel thereto, said baffles being integral plates extending over the entire length of said members and outwardly surrounding and adjacent the same so that the foam entering said lower cylindrical part of said housing from said vessel and through said opening in an upward direction is prevented from smooth circulation further in said direction and into said domed part of said housing, and is forced to contact said foam breakers which separate the liquid phase of the foam from the gaseous phase thereof, and the liquid phase is flung against said baffles to thereafter run back in an opposite direction downwardly into said vessel through said opening whereas the gaseous phase of the foam is evacuated out of said housing; and means for rotating said foam breakers about said axis including a shaft extending in the interior of the housing and carrying said foam breakers, said shaft having at least a portion which is hollow and perforated, bearings journalling said shaft at axially spaced locations, and drive means for rotating said shaft about said axis.

4,110,090

METHOD OF FORMING OPTICAL FIBERS

Richard M. Klein, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 2, 1977, Ser. No. 773,526

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **3 Claims**

1. The process for forming an optical fiber which comprises heating a melt of a glass composition to selectively volatilize at least one component of said composition from the surface region of said melt to reduce the refractive index at said surface, and drawing the heated glass composition into an optical fiber comprising a cladding formed of material from said selectively volatilized surface region and a core comprising said

glass composition wherein said heating is carried out at a temperature of between about 1400° C. and about 1800° C. for a period of time sufficient to reduce the refractive index of said surface region by an amount of at least 0.02.

4,110,091

PROCESS FOR THE SEPARATION OF A GASEOUS MIXTURE CONSISTING OF WATER VAPOR, HYDROCARBONS, AND AIR

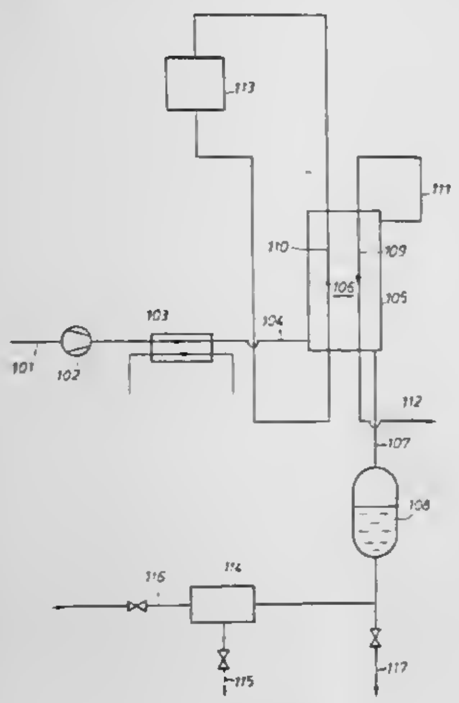
Werner Daeschler, and Hans Rainer, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Division of Ser. No. 490,876, Jul. 22, 1974, Pat. No. 3,967,938. This application Mar. 18, 1976, Ser. No. 667,998

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1973, 2337055; Oct. 5, 1973, 2350115; Oct. 5, 1973, 2350114; Dec. 20, 1973, 2363504

Int. Cl.² F17C *7/02*

U.S. Cl. 62—54 **6 Claims**



1. A process for the separation of components having a higher boiling point than air from a gaseous mixture consisting essentially of air, hydrocarbons and water vapor, comprising the steps of:

(a) passing said gaseous mixture to a heat exchanger provided with cooling tubes containing refrigerant cooled by a closed refrigeration cycle, said cooling of said gaseous mixture being conducted in a first stage within said heat exchanger to form a liquid condensate of water and hydrocarbons, and in a second stage within said heat exchanger to freeze out residual hydrocarbons and water to form solid deposits on the cooling tube surfaces;

(b) withdrawing cold, extensively purified air from the heat exchanger proximate the coldest zone thereof;

(c) recycling said cold, extensively purified air to said heat exchanger in a separate tube provided therein to cool, by indirect heat exchange, the entering gaseous mixture and warm said cold, extensively purified air;

(d) recovering the condensate water and hydrocarbons, and separating water therefrom to recover said hydrocarbons.

4,110,092

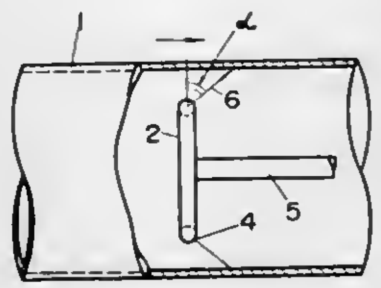
METHOD OF APPARATUS FOR COOLING INNER SURFACE OF METAL PIPE

Kazuo Kunioka; Takao Noguchi, both of Yokohama, and Hiroaki Sato, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,954

Int. Cl.² F25B *17/02*

U.S. Cl. 62—64 **6 Claims**



1. An improved method of cooling the inner surface of a metal pipe whereby in the process of continuously hardening said metal pipe by heating said metal pipe while travelling and then cooling the inner surface of said metal pipe, including the steps of: cooling said metal pipe by spraying a cooling fluid from a large number of nozzle openings formed in an annular cooling nozzle disposed in said metal pipe, selecting a spray direction of said cooling fluid from said nozzle openings for maintaining a dip angle in the range between 30° and 70° formed with the radial direction of the metal pipe on the side of the direction of travel of said metal pipe, said improvement comprising: directing said nozzle openings at a transverse angle in the range between 30° and 90° with respect to the radial direction of said metal pipe in a plane transverse to the direction of said pipe travel and imparting to said cooling fluid a jet velocity of greater than 5 meters per second for impingement onto a large number of points on the circumference of the inner wall of said metal pipe.

4,110,093

METHOD FOR PRODUCING AN IMPREGNATED WAVEGUIDE

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034, and Theodore A. Litovitz, 904 Devere Dr., Silver Spring, Md. 20903

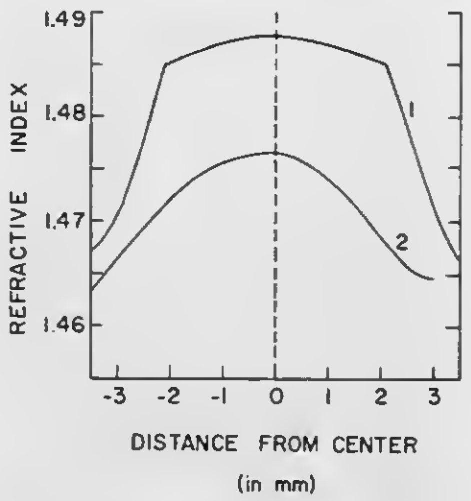
Continuation-in-part of Ser. No. 462,481, Apr. 22, 1974, Pat. No. 3,938,974, and Ser. No. 559,512, Mar. 18, 1975, abandoned. This application Nov. 26, 1975, Ser. No. 635,728

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² C03C *17/02, 15/00;* G02B *5/14*

U.S. Cl. 65—3 R **43 Claims**

1. In a method of producing an optical glass waveguide comprising adding at least one dopant capable of varying the index of refraction to a porous glass matrix with interconnective pores by immersing the porous glass matrix in a liquid/solution of the dopant to impregnate the porous glass matrix with the solution, precipitating the dopant from the solution within the porous glass matrix in the porous glass matrix, removing solvent from the porous glass matrix and collapsing the porous glass matrix to a solid form, the improvement which comprises precipitating the dopant within the matrix before substantial evaporation of solvent, drying to remove solvent from the pores to obtain after the steps of collapsing the porous glass matrix to a solid form an optical glass waveguide.



4,110,094

METHOD OF FORMING GLASS FIBER

Donald L. Motsinger, Forest City, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 513,208, Oct. 9, 1974, abandoned. This application May 10, 1977, Ser. No. 795,471

Int. Cl.² C03C *25/02*

U.S. Cl. 65—3 C **6 Claims**

1. In the method of forming glass fiber strands useful for the reinforcement of resinous articles which comprises drawing glass streams through orifices in a bushing to form individual glass fibers, moving the fibers away from the bushing at a high rate of speed, applying an aqueous sizing solution thereto while they are moving at this speed and gathering the fibers into the form of the strand the improvement comprising:

applying as the aqueous sizing solution an aqueous sizing composition comprising a phenolic epoxy resin; the reaction product of a partial ester of a polycarboxylic acid containing one or more unesterified carboxyl groups with a compound containing more than one epoxy group;

a dual component emulsifier system having therein a polyethylene glycol emulsifier and a second emulsifier consisting essentially of the reaction product of propylene glycols and ethylene oxide;

a silane coupling agent and a saturated fatty triglyceride.

4,110,095

MANUFACTURE OF GLASS WHEREIN HOT METAL MOLDS ARE PROVIDED WITH A SOLID FILM LUBRICANT LAYER

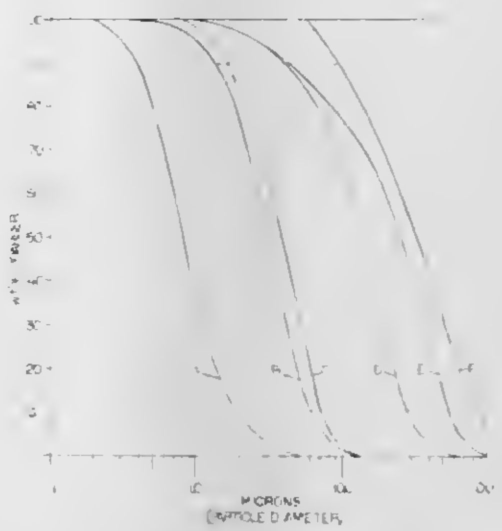
Edward J. Stengle, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 562,554, Mar. 27, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,322

Int. Cl.² C03C *39/00*

U.S. Cl. 65—26 **15 Claims**

1. In a process of forming a glass article wherein formable hot glass is formed into a blank by contact with a glass-forming, cavity-defining surface of a hot metal blank mold and said blank is then converted into said article by contact with a glass-forming, cavity-defining surface of a blow mold, and wherein said blank formation and said article formation is done without relative rotation of the glass and said molds, and wherein one of said glass-forming, cavity-defining surfaces is a solid layer comprising a solid lubricant dispersed in an organopolysiloxane binder, the improvement wherein said glass-forming, cavity-defining surface of said blank mold carries said solid layer and wherein said layer consists essentially of non-colloidal graphite, present in an amount sufficient to provide a glass releasing quality to said layer, an organopolysiloxane and up to 15% by weight, based on the organopolysiloxane, of a siloxane cure promoter.



4,110,096

METHOD OF PRECIPITATION OF A DOPANT IN A POROUS SILICATE GLASS

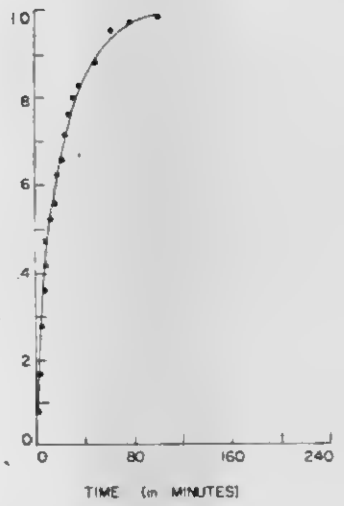
Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034, and Theodore A. Litovitz, 904 Devere Dr., Silver Spring, Md. 20903

Continuation-in-part of Ser. No. 559,512, Mar. 18, 1975, abandoned, and Ser. No. 462,481, Apr. 22, 1974, Pat. No. 3,938,974. This application Nov. 26, 1975, Ser. No. 635,727

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² C03C *15/00, 17/00*

U.S. Cl. 65—30 R **25 Claims**



1. A process for producing a rigid glass product which comprises immersing a porous silicate glass having interconnected pores in a liquid solution of dopant in a liquid solvent therefor to stuff the pores of said glass with said solution, said dopant being precipitatable from said solution, precipitating the dopant to provide a distribution of precipitated dopant within the pores of said glass, subsequently removing solvent from said pores while avoiding destruction of the integrity of the porous glass and avoiding upsetting said distribution of said dopant in said pores, and heating to collapse said pores containing said dopant.

4,110,097
METHOD FOR THE MANUFACTURE OF GLASS

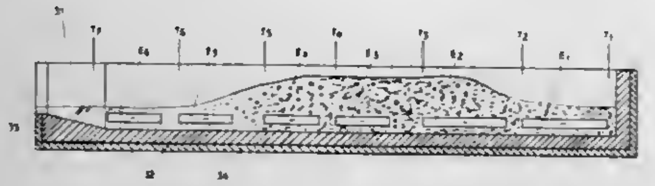
François Edmond Chevalier, Levallois-Perret, and Jean Marc Pierre Fenouillet, Paris, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 602,670, Aug. 7, 1975, abandooed. This application Mar. 28, 1977, Ser. No. 781,962

Claims priority, application France, Aug. 14, 1974, 74 28188

Int. Cl.^{2} C03B *5/02*

U.S. Cl. 65—136 **22 Claims**



1. A process for the manufacture of glass from a foamable vitrifiable material which comprises:

(a) melting the vitrifiable material to form a molten mass having a viscosity below about 1000 poises;

(b) heating at an increased rate to rapidly foam the molten mass throughout its volume to at least 1.5 times its initial molten volume while maintaining its viscosity below about 1000 poises;

(c) controlling the heating until the foamed mass subsides to dissipate the foam while maintaining it at a viscosity below about 1000 poises; and

(d) recovering the fused liquid glass.

4,110,098
MOLTEN GLASS REFINING APPARATUS

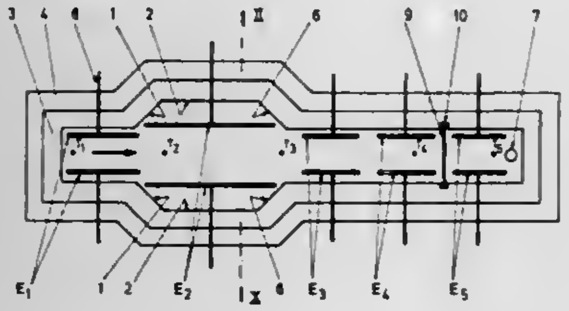
René Mattmuiier, Malakoff, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 602,670, Aug. 7, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,390

Claims priority, application France, Feb. 12, 1976, 76 03813; Aug. 14, 1974, 74 28188

Int. Cl.^{2} C03C *5/02*

U.S. Cl. 65—141 **17 Claims**



1. The improvement in an apparatus for refining glass comprising:

(a) an elongated continuous flow refining channel in which a molten vitreous mass is introduced at one end thereof and flowed horizontally therethrough to an exit at its other end;

(b) a localized foaming zone extending along a predetermined length of said channel and spaced from the one end thereof, said foaming zone having a width appreciably wider than the channel upstream of said foaming zone; and

(c) heating means submerged along the length of said channel for subjecting the flowing molten mass in said foaming zone to an expansion of at least 50% of its initial molten volume by foaming the flowing molten mass in said foaming zone throughout its entire volume as the mass moves along the channel from its one end to the other end.

4,110,099
NOVEL FLUOROALKOXYPHENYL-SUBSTITUTED NITROGEN HETEROCYCLES

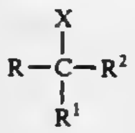
Robert Lee Benefiel, Manila, and Eriks Viktors Krumkalns, Indianapolis, both of Ind. assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 641,403, Dec. 17, 1975, Pat. No. 4,002,628, which is a division of Ser. No. 371,106, Jun. 18, 1973, Pat. No. 3,967,949. This application Oct. 26, 1976, Ser. No. 735,659

Int. Cl.^{2} A01N *5/00*

U.S. Cl. 71—76 **12 Claims**

1. A compound of the formula



$$R-\overset{\overset{X}{|}}{\underset{\underset{R^1}{|}}{C}}-R^2$$

wherein

R is 3-pyridyl,

R^1 is phenyl, pyridyl, C_1–C_{12} alkyl or C_3–C_8 cycloalkyl;

R^2 is trifluoromethoxyphenyl, tetrafluoroethoxyphenyl, or pentafluoroethoxyphenyl;

X is hydroxy and lower alkoxy;

and the nonphytotoxic acid addition salts thereof.

4,110,100
PHOSPHINYLMETHYLIMINO-ACETIC ACID N-OXIDE COMPOUNDS AND THE SUCROSE INCREASING USE THEREOF

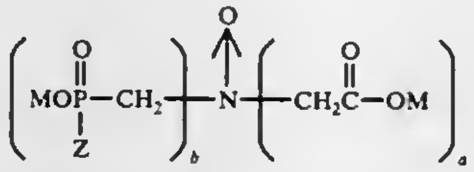
John E. Franz, Crestwood, Mo., and Reuven M. Sacher, Kraainem, Belgium, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 12, 1977, Ser. No. 823,908

Int. Cl.^{2} C07F *9/30, 9/48;* **A01N** *9/36*

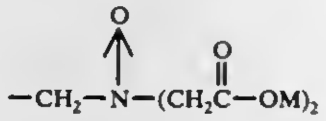
U.S. Cl. 71—86 **23 Claims**

1. A compound of the formula



$$\left(\mathrm{MO}\overset{\overset{O}{\|}}{\underset{\underset{Z}{|}}{P}}-CH_2\right)_b \overset{\overset{O}{\uparrow}}{N} \left(CH_2\overset{\overset{O}{\|}}{C}-OM\right)_a$$

wherein Z is hydrogen, lower alkyl, phenyl or a



$$-CH_2-\overset{\overset{O}{\uparrow}}{N}-(CH_2\overset{\overset{O}{\|}}{C}-OM)_2$$

and M is hydrogen or an agriculturally acceptable salt-forming cation, *a* and *b* are the integers 1 or 2, the sum of $a + b$ being 3, provided that when Z is other than hydrogen, lower alkyl or phenyl, *a* is equal to 2.

9. A method for increasing the sucrose content of sugar cane plants which comprises applying to said plants, from about 2 to 10 weeks prior to harvest, an effective amount of a compound of claim 1.

4,110,101
DIOXEPANE SUBSTITUTED AMIDES

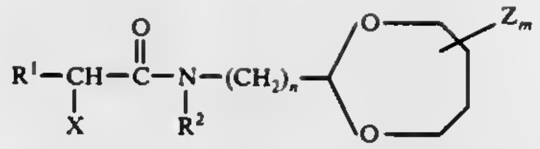
Leonard J. Stach, Riverside; Roger D. Hotz, Evanston, both of Ill., and Sidney B. Richter, Barberton, Oblo, assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 6, 1977, Ser. No. 785,007

Int. Cl.^{2} C07D *321/06*

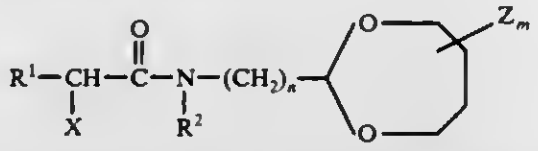
U.S. Cl. 71—88 **6 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen and lower alkyl; X is chlorine or bromine; R^2 is, lower alkenyl; *n* is the integer 1 or 2; Z is lower alkyl; and *m* is an integer from 0 to 4.

4. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen and lower alkyl; X is chlorine or bromine; R^2 is lower alkynyl; *n* is the integer 1 or 2; Z is lower alkyl; and *m* is an integer from 0 to 4.

4,110,102
METHOD AND COMPOSITION FOR TREATING TREES

Richard Persons Pharis, c/o University of Calgary, Calgary, Alberta, Canada

Filed Mar. 18, 1976, Ser. No. 667,977

Claims priority, application United Kingdom, Apr. 3, 1975, 13742

Int. Cl.^{2} A01N *9/02, 5/00, 9/24*

U.S. Cl. 71—89 **27 Claims**

1. A method of inducing the formation of strobili in trees of the family Pinaceae which comprises applying thereto a strobili-formation-inducing effective amount of an auxin and one or more gibberellins selected from gibberellins A_3, A_4, A_5, A_7, A_9 and A_{14}, the auxin being applied in a non-toxic amount and in a weight ratio to the gibberellin or gibberellins of at least 1 part by weight of auxin per 250 parts by weight of gibberellin, said auxin being selected from the group consisting of indolyl acetic acid, naphthalene acetic acid; phenoxyacetic acids; phenoxypropionic acids; phenoxybutyric acids; chlorine-substituted benzoic acids; salts thereof selected from sodium, potassium, ammonium, dimethylamine and ethanolamine salts and esters thereof selected from methyl, ethyl, propyl and butyl esters.

4,110,103
DIHYDROIMIDAZOISOINDOLEDIONES AND THE USE THEREOF AS HERBICIDAL AGENTS

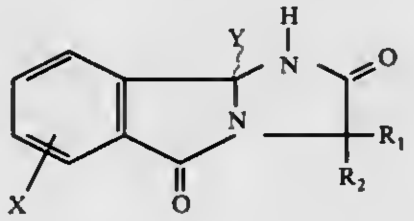
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 631,356, Nov. 12, 1975, Pat. No. 4,041,045. This application Mar. 25, 1977, Ser. No. 781,234

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—92 **12 Claims**

1. A method for the control of undesirable plant species comprising applying to the foliage of the undesirable plants or the soil in which they are planted or growing, a herbicidally effective amount of a compound of the formula:



wherein X is H, CH_3, NO_2, Cl, OCH_3 or SCH_3; R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, phenyl, halophenyl, or benzyl; and when R_1 and R_2 are taken together with the carbon to which they are attached. They may form cycloalkyl C_3–C_6 optionally substituted with methyl; Y is hydrogen, $-NR_3R_4$, $-OR_5$ or $-SR_6$; R_3, R_4, R_5 and R_6 are each hydrogen or alkyl C_1–C_4; and the optical and stereo isomers thereof.

4,110,104
HERBICIDAL USE OF AMINOHALOPYRIDYLOXY ACIDS AND DERIVATIVES THEREOF

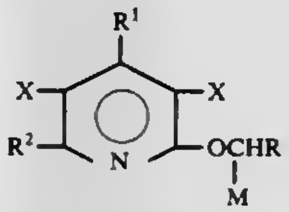
Stanley D. McGregor, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 342,783, Mar. 19, 1973, abandoned, which is a division of Ser. No. 166,257, Jul. 26, 1971, Pat. No. 3,761,486. This application Dec. 23, 1976, Ser. No. 753,753

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—94 **6 Claims**

1. A method for controlling the growth of undesirable plant species which comprises applying to plants, plant parts or their habitats a herbicidally effective amount of a compound corresponding to the formula



wherein X represents chloro or bromo; R represents carbamoyl ($-CONR^3R^4$) or carboxy ($-COOH$) or the carboxylic acid salts thereof; each of R^3 and R^4 independently represents hydrogen or alkyl of 1 to 8 carbon atoms; M represents hydrogen or loweralkyl; R^1 represents hydrogen, loweralkyl, amino or loweralkylamino of 1 to 4 carbon atoms; and R^2 represents hydrogen, X, loweralkyl, amino or loweralkylamino, with the proviso that one of R^1 or R^2 is amino or loweralkylamino and the other of R^1 or R^2 is always other than amino or loweralkylamino.

4,110,105
AROMATIC N-SUBSTITUTED HALO-SUBSTITUTED-2-PYRROLIDINONES AND THEIR UTILITY AS HERBICIDES

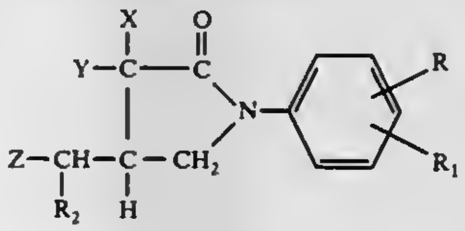
Eugene G. Teach, Ei Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 563,279, Mar. 28, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,963

Int. Cl.^{2} C07D *207/26;* **A01N** *9/22, 9/12, 9/14*

U.S. Cl. 71—95 **98 Claims**

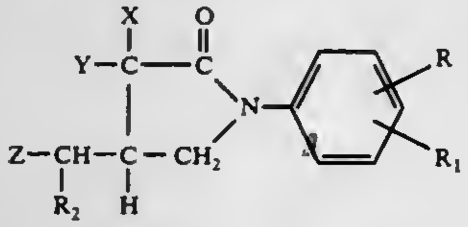
1. A compound having the formula



in which X is hydrogen, chlorine or methyl; Y is hydrogen, chlorine or bromine, Z is chlorine or bromine; R_2 is alkyl having from 1 to 4 carbon atoms, inclusive, or hydrogen; R is hydrogen, alkyl, acetyl, chlorine, bromine, fluorine, iodine, trifluoromethyl, nitro, cyano, alkoxy having from 1 to 4 carbon atoms, inclusive, alkylthio having from 1 to 4 carbon atoms, inclusive, alkylsulfinyl having from 1 to 4 carbon atoms, inclusive, alkylsulfonyl having from 1 to 4 carbon atoms, inclusive, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, penta fluoropropionamido or 3-methylureido; and R_1

is hydrogen, alkyl having from 1 to 4 carbon atoms, inclusive, chlorine or trifluoromethyl.

51. A method for controlling the growth of undesirable vegetation which comprises applying to at least one of (a) such undesirable vegetation and (b) their habitat, an herbicidally effective amount of a compound having the formula



in which X is hydrogen, chlorine or methyl; Y is hydrogen, chlorine or bromine, Z is chlorine or bromine; R_2 is alkyl having from 1 to 4 carbon atoms, inclusive, or hydrogen; R is hydrogen, alkyl, acetyl, chlorine, bromine, fluorine, iodine, trifluoromethyl, nitro, cyano, alkoxy having from 1 to 4 carbon atoms, inclusive, alkylthio having from 1 to 4 carbon atoms, inclusive, alkylsulfinyl having from 1 to 4 carbon atoms, inclusive, alkylsulfonyl having from 1 to 4 carbon atoms, inclusive, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, pentafluoroproprionamido, or 3-methylureido; and R_1 is hydrogen, alkyl having from 1 to 4 carbon atoms, inclusive, chlorine or trifluoromethyl.

4,110,106

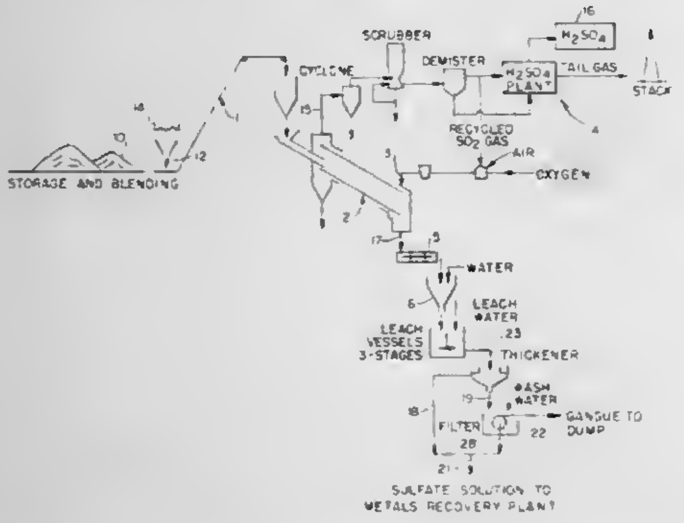
SELECTIVE SULFATION PROCESS FOR PARTITIONING FERROUS AND NON-FERROUS VALUES IN AN ORE

Theodore C. Frankiewicz, Littleton, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation of Ser. No. 657,849, Feb. 13, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,493

Int. Cl.^{2} C22B *1/06*

U.S. Cl. 75—1 R **28 Claims**



1. A process for separating non-ferrous metal values from ferrous metal values in an ore containing iron and at least one metal selected from the group consisting of copper, nickel cobalt, vanadium, and manganese, said process comprising the steps of:

mixing the ore, in particulate sulfide form, with a mixture of inorganic salts, which mixture has a melting point below the roasting temperature of the ore the ratio of salt mixture to ore being at least 0.05;

heating the ore and salt mixture to melt the salt mixture and to form a liquid salt coating on the ore;

contacting the ore coated with the liquid salt coating with a roaster gas comprising at least 1% SO_2 and O_2, the amount of O_2 being sufficient to convert non-ferrous metals to sulfates and the ferrous metals to Fe_2O_3, said contacting being conducted at a temperature above 650° C. and for a sufficient amount of time to produce non-ferrous metal sulfates and iron oxide; and

separating the non-ferrous metal sulfates from the iron oxide.

4,110,107

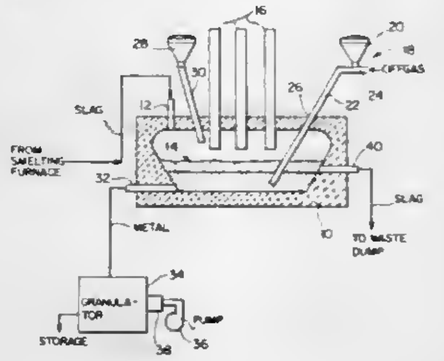
PROCESS FOR REDUCING MOLTEN FURNACE SLAGS BY CARBON INJECTION

Danton L. Paulson, Rolla, Mo., and Willard L. Hunter, Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 806,989, Jun. 16, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 848,851

Int. Cl.^{2} C21B *3/04;* C22B *7/04*

U.S. Cl. 75—24 **7 Claims**



1. A process for recovering metals from a molten slag by reducing the slag with carbon, said process comprising:

feeding the metal-containing molten slag to an electric furnace at a rate so as to maintain the slag in a molten state;

providing a molten metal bath beneath, and in contact with, the molten slag;

inserting an injector tube of a carbon injecting device into said furnace and injecting carbon through said injector tube into the bottom of the molten metal bath;

feeding a flux, as needed, to the molten slag;

tapping off the metal product; and

tapping off the residual slag.

4,110,108

METHOD OF PRODUCING CAST IRON

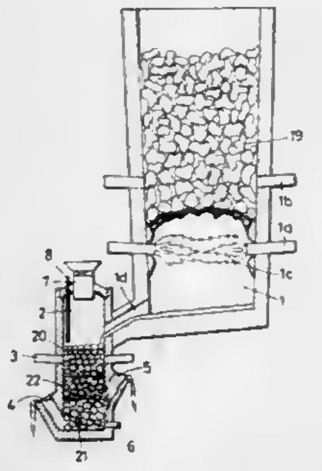
Hans Günter Geck, Hagen, and Fritz Kruse, Dortmund-Brechten, both of Fed. Rep. of Germany, assignors to Klöckner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Mar. 16, 1977, Ser. No. 778,139

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611458

Int. Cl.^{2} C21C *7/00*

U.S. Cl. 75—48 **11 Claims**



1. A method of producing cast iron from scrap, sponge iron and similar iron-containing metallic substances, comprising the steps of accommodating a metallic substance in a first zone to form a column therein having an exposed lower surface which upwardly bounds an empty burning chamber in the first zone; confining a body of solid carbonaceous material only in a second zone separate from said first zone; melting the melallic substance only in the first zone, including combusting a fuel-oxygen mixture in the burning chamber of the first zone to form an oxidizing flame therein which acts from below on the exposed lower surface of the column; conducting the molten metallic substance through said burning chamber of said first zone and into said second zone; passing the molten metallic substance in the second zone through the body of solid carbonaceous material for the molten metallic substance to become enriched with carbon; and maintaining a bath of the enriched metallic substance and a layer of slag above the latter at the bottom of the second zone.

4,110,109

OXIDATION INHIBITION OF STEEL WOOL IN SILVER RECOVERY

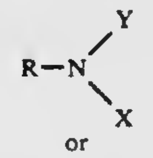
Michael Golben, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 27, 1977, Ser. No. 845,911

Int. Cl.^{2} C22B *11/04*

U.S. Cl. 75—109 **3 Claims**

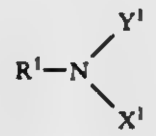
1. In the process of reducing silver ions from a silver rich solution by contacting said silver rich solution with iron, the improvement which comprises contacting said silver rich solutions with said iron in the presence of a material which inhibits corrosion and hydrogen embrittlement of said iron, said material having no more than 50 carbon atoms and being represented by either of the formulae:



$$\mathrm{R-N}\begin{array}{l}\diagup\,\mathrm{Y}\\ \diagdown\,\mathrm{X}\end{array}$$

I)

or



$$\mathrm{R^1-N}\begin{array}{l}\diagup\,\mathrm{Y^1}\\ \diagdown\,\mathrm{X^1}\end{array}$$

II)

wherein

R and R^1 are abietyl, hydroabietyl, dehydroabietyl, or C_4-C_{20} alkyl,

X is H or $-CH_2A$

Y is $-CH_2A$, and

A is an alpha ketonyl group

X^1 and Y^1 are $-\!\!\!+CH_2CH_2O)_mH$ and $-\!\!\!+CH_2CH_2O)_nH$ respectively wherein $m+n$ is at least 1 and m and n may each be 0 to 15.

4,110,110

NICKEL-BASE ALLOY EXCELLENT IN CORROSION RESISTANCE AT HIGH TEMPERATURES

Tatsuo Kondo, Mito; Masami Shindo, Tokai; Taizo Ohmura; Noboru Yonezawa, both of Ohmiya; Akira Kawagoe, Kitamoto, and Toshio Kojima, Okegawa, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Otemachi, Japan

Filed Aug. 9, 1976, Ser. No. 712,760

Claims priority, application Japan, Aug. 27, 1975, 50-103047; Aug. 27, 1975, 50-103048

Int. Cl.^{2} C22C *19/05*

U.S. Cl. 75—122 **10 Claims**

1. A nickel-base alloy excellent in corrosion resistance at high temperatures, which consists essentially of, in weight percentage:

Carbon — 0.04 to 0.25%,

Chromium — 10.0 to 25.0%,

at least one element selected from the group consisting of 0.1 to 30.0% iron, 0.1 to 25.0% tungsten, 0.1 to 10.0% molybdenum and 0.05 to 30.0% cobalt, the maximum thereof being 50%,

Manganese — 0.4 to 1.5%,

Silicon — 0.05 to 0.5%,

Aluminium — 0.001 to 0.2%,

Titanium — 0.001 to 0.05%, and

Nickel and inevitable impurities — balance;

said alloy having excellent corrosion resistance at high temperatures in an atmosphere of a low oxidizing potential.

4,110,111

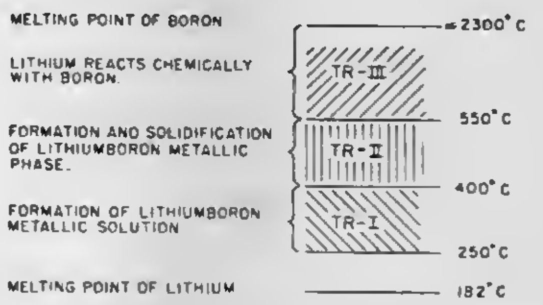
METAL ALLOY AND METHOD OF PREPARATION THEREOF

Frederick E. Wang. Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 377,671, Jul. 5, 1973, abandoned. This application Jul. 28, 1976, Ser. No. 710,055

Int. Cl.^{2} C22C *24/00*

U.S. Cl. 75—134 A **2 Claims**


MELTING POINT OF BORON
≈2300° C
LITHIUM REACTS CHEMICALLY WITH BORON.
TR-III
550° C
FORMATION AND SOLIDIFICATION OF LITHIUMBORON METALLIC PHASE.
TR-II
400° C
FORMATION OF LITHIUMBORON METALLIC SOLUTION
TR-I
250° C
MELTING POINT OF LITHIUM
182° C

1. A metallic alloy of the formula Li_xB_{1-x} where $0.30<x<0.90$ and x is the atomic fraction of lithium.

2. A method of preparing the alloy of claim 1 comprising:

(a) heating a mixture of elemental lithium and some crystalline boron to a temperature between about 250° C. and about 400° C.;

(b) maintaining said temperature for a time sufficient to effect complete dissolution of boron in the liquid lithium;

(c) raising the temperature of said solution to about 400° C. to about 550° C. to effect total solidification of the liquid solution; and

(d) keeping the temperature between about 530° C. and about 550° C. until an exotherm is observed;

provided that all of the steps are carried out in an inert atmosphere.

4,110,112

PHOTOSENSITIVE MATERIAL CONTAINING 2,3-DI(2,3-DIIODOPROPOXY)-PROPYL CELLULOSE AND USES THEREOF

Alain Roman, Bossey; Jean-Pierre Sachetto, St. Julien-en-Genevois, both of France; Manfred Wust, Dardagny, and Sergio Cuccolo, Geneva, both of Switzerland, assignors to Neste Oy, Espoo, Finland

Filed Jun. 23, 1977, Ser. No. 809,452

Int. Cl.^{2} G03C *5/24, 1/00*

U.S. Cl. 96—1 PC **20 Claims**

1. Photosensitive material comprising a substrate at least one surface portion of which contains uniformly distributed 2,3-di-(2,3-diiodopropoxy)-propyl cellulose.

4,110,113

SULFONAMIDO DYE RELEASER IN PHOTOGRAPHIC DYE DIFFUSION TRANSFER

Arnfried Melzer; Paul Marx, both of Cologne, and Walter Püschel, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

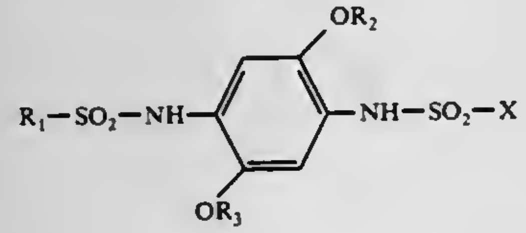
Continuation of Ser. No. 547,433, Feb. 6, 1975, abandoned. This application Jun. 16, 1977, Ser. No. 807,078

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1974, 2406664

Int. Cl.^{2} G03C *7/00, 5/54, 1/40, 1/10*

U.S. Cl. 96—29 D **3 Claims**

2. A photographic material comprising on a support at least one photosensitive silver halide emulsion layer and, associated with that layer, a non-diffusible dye-giving sulfonamidoaryl compound which, on oxidation by the oxidation product of a photographic developer compound, is split by developer alkali to release a diffusible dye or dye precursor carrying a sulfonamide group, the non-diffusible sulfonamidoaryl compound corresponding to the following formula:



in which

X represents the radical of a dye or dye precursor;

R_1 represents a diffusion-inhibiting radical or the radical of a dye or dye precursor; and

R_2 and R_3 represent identical or different alkyl radicals with up to 20 carbon atoms.

4,110,114

IMAGE FORMING METHOD

Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Oct. 14, 1975, Ser. No. 622,330

Claims priority, application Japan, Oct. 11, 1974, 49-117280

Int. Cl.^{2} G03C *5/00, 7/00*

U.S. Cl. 96—36 **33 Claims**

1. A method for producing an image comprising forming silver image and non-silver image areas on a photographic material which comprises a substrate having thereon at least one silver halide emulsion layer, either directly or at least one subbing layer on the substrate, by exposing and developing said photographic material, heating the material at 150° to 600° C and then ion bombarding said material to imagewise ion-etch away the layer or layers above the substrate to remove the non-silver image areas of the emulsion layer without completely removing the silver image areas.

8. The method of claim 7, wherein said silver halide emulsion is an emulsion containing about 90 mole% or more silver bromide and not more than about 5 mole% silver iodide, where the mean grain size of the silver halide grains is not more than about 0.1 micron, and wherein the weight ratio of the silver halide to the water-soluble binder of the emusion is about 1:4 to about 6:1.

4,110,115

PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT HAVING DYED LAYER

Masatoshi Sugiyama, and Eiichi Kato, both of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

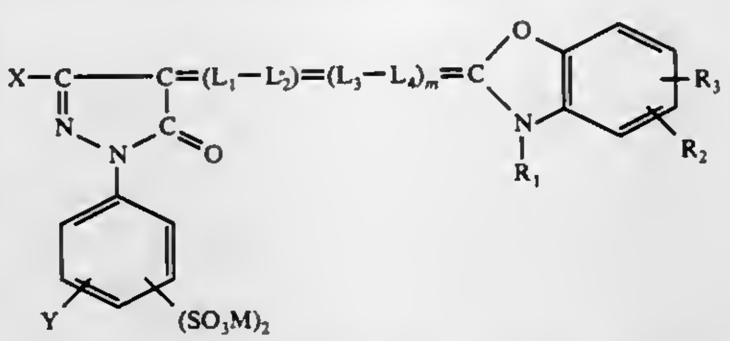
Filed May 5, 1977, Ser. No. 794,186

Claims priority, application Japan, May 6, 1976, 51-51452

Int. Cl.^{2} G03C *1/84*

U.S. Cl. 96—84 A **21 Claims**

1. A silver halide photographic light-sensitive element containing at least one hydrophilic colloid layer containing at least one basic polymer and at least one merocyanine dye represented by the following general formula (I):



(I)

wherein X represents an alkyl group, an aralkyl group, an aryl group, an alkoxy group, a hydroxy group, an amino group, a carboxy group or an alkoxycarbonyl group; Y represents a hydrogen atom, a halogen atom, a lower alkyl group, a hydroxy group or a sulfo group; R_1 represents an alkyl group; R_2 and R_3, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an alkoxycarbonyl group; L_1, L_2, L_3 and L_4 each represents a methine group; *m* represents 0 or 1; and M represents a cation.

4,110,116

FOGGED DIRECT POSITIVE SILVER HALIDE EMULSION CONTAINING A CYANINE DYE HAVING AT LEAST ONE BENZOXAZOLE OR BENZOTHIAZOLE NUCLEUS SUBSTITUTED WITH HALOGEN ATOMS

Paolo Beretta, Savona, and Luigi Valbusa, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

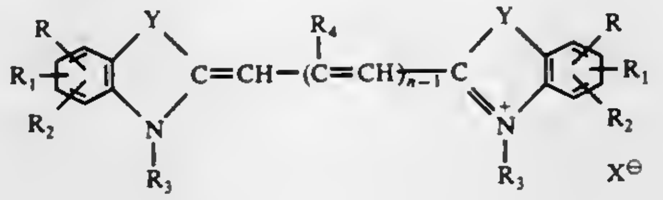
Continuation-in-part of Ser. No. 478,616, Jun. 12, 1974, abandoned. This application Mar. 16, 1977, Ser. No. 778,135

Claims priority, application Italy, Jun. 18, 1973, 50883 A/73

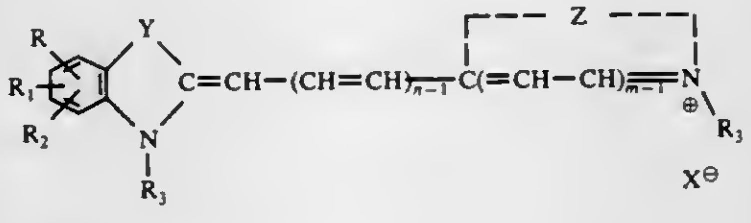
Int. Cl.^{2} G03C *1/36, 1/28, 1/18*

U.S. Cl. 96—101 **13 Claims**

1. A light-sensitive fogged direct positive silver halide emulsion containing a sensitizing amount of at least one cyanine dye selected from the formulae:



or



wherein

Y is an oxygen or sulfur atom,

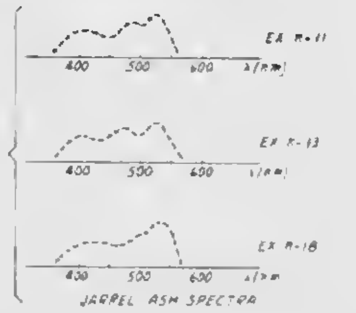
n is 2, 3, or 4,

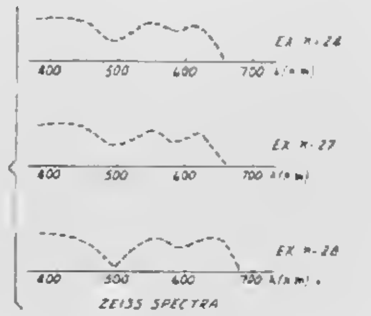
m is 1 or 2,

R and R_1 are independently halogen atoms,

R_2 is H or an alkyl group of 1 to 4 carbon atoms,

R_3 is selected from the group consisting of acylic hydrocarbon, alkyl-aryl, or aryl groups,





R_4 is H or alkyl of 1 to 3 carbon atoms,

Z represents the non-metallic atoms required to complete a 5 or 6 membered desensitizing heterocyclic nucleus, and

X is an acid anion.

4,110,117

COATING COMPOSITION

Gordon D. McLeod, Adrian, Mich., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 559,750, Mar. 19, 1975, Ser. No. 542,837, Jan. 21, 1975, Ser. No. 532,152, Dec. 12, 1974, Ser. No. 409,067, Oct. 24, 1973, Ser. No. 284,099, Aug. 28, 1972, Ser. No. 283,964, Aug. 28, 1972, Ser. No. 107,578, Jan. 18, 1971, abandoned, and Ser. No. 75,306, Sep. 24, 1970, abandoned, said Ser. No. 409,067, is a continuation-in-part of Ser. No. 107,578, , which is a continuation-in-part of Ser. No. 75,306, , said Ser. No. 284,099, is a continuation-in-part of Ser. No. 107,578, , and Ser. No. 75,306,. This application Oct. 29, 1975, Ser. No. 626,624

Int. Cl.^{2} C09D *5/10*

U.S. Cl. 106—1.17 **10 Claims**

1. A coating composition containing:

(1) metallic zinc in particulate form;

(2) a corrosion inhibitive composition selected from the group consisting of a mixture of zinc chromate and a finely divided magnesium silicate, a mixture of zinc chromate and a finely divided calcium silicate, a mixture of zinc chromate and a finely divided magnesium carbonate, and a mixture of zinc chromate and a finely divided calcium carbonate;

(3) an aliphatic polyol silicate; and

(4) a liquid organic vehicle;

said coating composition containing from about 4 to about 95% by weight of said metallic zinc, from about 1 to about 80% by weight of said corrosion inhibitive composition, and from 1% to about 70% by weight of said aliphatic polyol silicate, said weight percentages being based on the coating composition without said liquid organic vehicle;

said aliphatic polyol silicate being a solvent soluble, ester-exchanged reaction product of (1) an organic silicate consisting essentially of ortho silicates having ester-exchangeable groups 1 to 6 carbon atoms, said ester-exchangeable groups selected from the group consisting of alkyl, hydroxy alkyl, alkoxy alkyl, and hydroxyalkoxy alkyl; siloxanes thereof, and their mixtures and (2) an aliphatic polyol that is ester-exchangeable with (1), said aliphatic polyol silicate reactants present in amounts providing a ratio of about 0.05 to about 1.9 moles of hydroxyl groups of (2) per mole of ester-exchangeable group of (1).

4,110,118

PROCESS FOR ACCELERATING THE DRYING OF OFFSET INKS

Juan Salvat Dalmau, and Manuel Julián Lecha, both of Barcelona, Spain, assignors to Salvat Editores, S. A., Barcelona, Spain

Filed Jan. 31, 1977, Ser. No. 764,456

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645550

Int. Cl.^{2} C09D *11/14*

U.S. Cl. 106—25 **7 Claims**

1. In the process for offset printing employing an offset printing ink, the improvement according to which the offset printing ink contains from 0.5 to 8 percent by weight of an additive composition comprising

(a) 15 to 85 percent functional amino polydimethylsiloxane, and

(b) 85 to 15 percent of a mixture of ethylene oxide and propylene oxide wherein the ethylene oxide is present in said mixture in an amount of from 15 to 85 percent with respect to the propylene oxide.

4,110,119

RELEASE AGENTS

Günther Boehmke, Leverkusen; Hermann Fries, Bergisch-Gladbach, and Erich, Esch, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 16, 1976, Ser. No. 742,201

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552283

Int. Cl.^{2} B28B *7/38*

U.S. Cl. 106—38.24 **7 Claims**

1. A process for reducing the adhesion of molded articles of rubber compounds and plastics to the mold surfaces and for preventing sheet-form mixtures from sticking together which comprises applying to a mold surface a release agent consisting essentially of a compound having the formula

$$R—CO—NH—CH_2—CH_2—SO_3M$$

wherein R is alkyl or alkenyl of 7 to 21 carbon atoms and having up to two hydroxyl groups, and M is a member selected from the group consisting of alkali metal cation, alklaline earth metal cation, ammonium, mono-alkanolammonium, di-alkanolammonium, and tri-alkanolammonium, each said alkanol moiety being ethanol or propanol.

4,110,120

ANTICORROSION TREATMENT OF GALVANIZED REBARS

Arnold Morry Rosenberg, Potomac, and James Michael Gaidis, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 28, 1976, Ser. No. 699,679

Int. Cl.^{2} C04B *7/02*

U.S. Cl. 106—99 **2 Claims**

1. An article of manufacture comprising an alite cement matrix containing galvanized reinforcing bars treated by contacting the galvanized reinforcing bars with a composition consisting essentially of calcium chromate.

4,110,121
PROCESS FOR PRODUCING CEMENT CLINKER

Helmoth Rechmeier, Balingen, and Gerhard Rohrbach, Dotternhausen, both of Fed. Rep. of Germany, assignors to Portlandzementwerk Dotternhausen Rudolf Rohbach Kommanditgesellschaft, Balingen, Fed. Rep. of Germany

Filed Jan. 8, 1977, Ser. No. 804,816

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2627056

Int. Cl.² C04B *7/02*

U.S. Cl. 106—100 **18 Claims**

1. In a process for producing cement clinker wherein raw meal is fed to a heat exchanger, heat is supplied to the heat exchanger from a downstream kiln, the raw meal is heated in the heat exchanger and the heated raw meal is conveyed to the kiln and sintered therein by use of a fuel to form the cement clinker, the improvement which comprises using high grade waste fuel formed from organic waste in the form of motor vehicle tires, rubber scrap, or plastics scrap and wherein the waste fuel is processed before combustion by pyrolysis to form pyrolysis gases and a pyrolyzed residue and said pyrolyzed residue is comminuted or gasified.

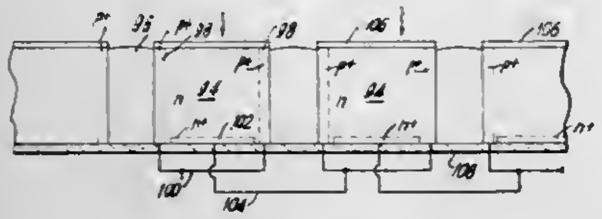
4,110,122
HIGH-INTENSITY, SOLID-STATE-SOLAR CELL DEVICE

Roy Kaplow, Newton, and Robert I. Frank, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 26, 1976, Ser. No. 689,989

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 P **22 Claims**



1. A semiconductor solar cell device comprising plural, spaced, elongate, parallel semiconductor units formed from a common substrate and comprised of a first conductivity type, the body material of each of said units having the same spaced relation to the body material of other of said units as in the original substrate from which they are formed, each unit having spaced elongate upstanding sidewalls and having therebetween an elongate surface adapted for exposure to receive incident radiation, each unit further comprising separate and independent regions of second, opposite conductivity type in the respective side walls of each unit, whereby in each unit said sidewall regions of second conductivity type are separated by body material of said first conductivity type, separate conductive connections establishing ohmic contact between the second-conductivity-type regions of one unit and the first-conductivity-type region of another unit, and means fixedly retaining the material of said parallel units in the same spacial relation as in the common substrate from which they were formed.

4,110,123
APPARATUS FOR CONVERTING LIGHT ENERGY INTO ELECTRICAL ENERGY

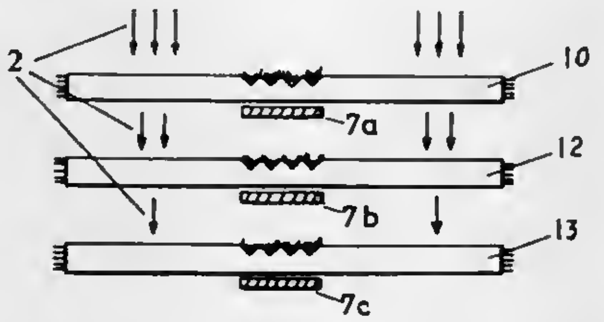
Adolf Goetzberger, Merzhausen, and Waldemar Greubel, Denzlingen, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,816

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620115; Jun. 24, 1976, 2628291

Int. Cl.² H01L *31/04*

U.S. Cl. 136—89 HY **20 Claims**



1. An apparatus for converting solar energy into electrical energy, wherein light is collected in a light concentrator comprising a transparent layer, the refraction coefficient of which is greater than that of the ambient medium and which contains fluorescent centers and is fed to a solar cell, characterized in that more than one concentrator/solar cell combination is stacked on top of another through the intermediary of a medium having a smaller refraction coefficient than that of the concentrators, each concentrator being adapted to convert a portion of the incident spectrum into fluorescent light and supply it to a solar cell.

2. An apparatus according to claim 1, wherein the concentrators are so arranged that the concentrator upon which radiation strikes first absorbs the shortest wavelengths, the next to follow absorbs a somewhat longer wavelength range and the last absorbs the longest wavelength range.

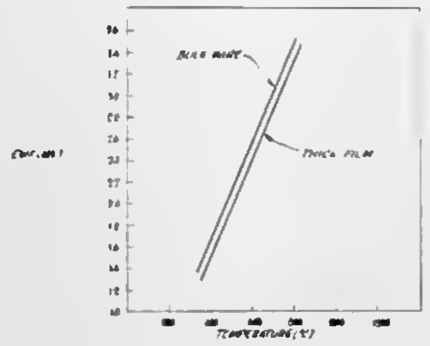
4,110,124
THICK FILM THERMOCOUPLES

Allen R. Robertson, Edison, and James S. Hill, Cranford, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Sep. 22, 1975, Ser. No. 615,583

Int. Cl.² H01V *1/14;* **H01B** *1/02*

U.S. Cl. 136—236 R **20 Claims**



1. A two-component system for use in forming by thick film techniques a thermocouple having joined positive and negative elements on a common electrically nonconductive surface, comprising:
- a first paste and a second paste for application individually to said surface and firing thereon to form two films overlapping only at a thermoelectric junction area;
- each of said pastes consisting essentially of (a) a powdered metal component consisting of at least one metal selected from the group consisting of platinum, palladium, iridium, rhodium, ruthenium, gold, and silver, (b) a frit in amount by weight equal to between about 5–35 percent of the combined weight of metal and frit, said frit containing constituents neutral with respect to said metal components and a total of less than one weight percent of constituents capable of causing a significant detrimental effect on the thermoelectric EMF produced at said junction whereby the thermoelectric EMF of said thermocouple is stablized and drift of said EMF during operation is minimized, and (c) an organic liquid vehicle;
- the composition of said powdered metal components in said first and second pastes being sufficiently different to provide said thermoelectric EMF across said junction; and
- said powdered metal component and said frit being admixed and suspended in said vehicle in each of said pastes.

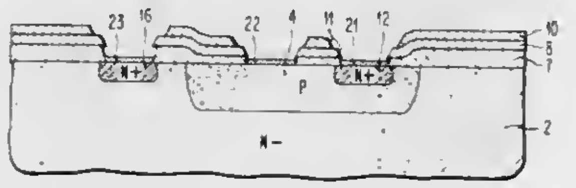
4,110,125
METHOD FOR FABRICATING SEMICONDUCTOR DEVICES

Klaus Dietrich Beyer, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1977, Ser. No. 773,885

Int. Cl.² H01L *21/95, 21/74, 21/76*

U.S. Cl. 148—1.5 **22 Claims**



1. In the method of forming a planar, silicon semiconductor device which includes a first region of a first conductivity type, a second region of a second conductivity type formed in said first region and a third region of said first conductivity type formed within said second region, and wherein a composite silicon nitride-silicon dioxide layer is used as a mask during the formation of said third region,
- the improvement, for reducing the number of pipes extending between said first and third regions, comprising:
  - forming said silicon dioxide layer on the surface of said semiconductor to a thickness of not more than around 3000A and not less than around 800A;
  - forming said silicon nitride layer atop said silicon oxide layer to a thickness of not more than around 600A and not less than a thickness of around 250A so as to provide effective masking properties;
  - forming a window in said composite layer to define said third region; and
  - forming said third region through said window.

4,110,126
NPN/PNP FABRICATION PROCESS WITH IMPROVED ALIGNMENT

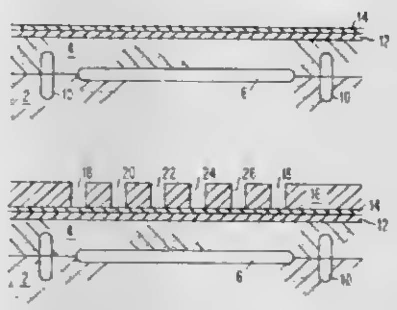
David Leo Bergeron, Manassas; Zimri Congdon Putney, Fairfax, and Geoffrey Brownell Stephens, Catlett, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,302

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **6 Claims**

1. A process for forming a double diffused lateral PNP transistor in a semiconductor substrate of a first conductivity type having a buried diffusion of said first conductivity type, comprising the steps of:
- forming a silicon oxide passivation layer on the surface of said substrate;
- forming a silicon nitride masking layer on the surface of said silicon oxide layer;
- forming a first window for the emitter and base, a second window the collector contact, and a third window for the base contact by etching through said silicon nitride and silicon oxide layers above said buried region, employing a single masking step;
- selectively covering said second window with a blocking layer and ion-implanting a base region of said first conductivity type through said first window and a base contact of said first conductivity type through said third window, to contact said buried region;
- reforming an oxide layer in said first, second and third windows;



- selectively covering said third window with a blocking layer having an opening over said first and second windows and ion-implanting a collector region of a second conductivity type opposite to said first conductivity type in the substrate beneath said opening in said second blocking layer;
- selectively covering with a third blocking layer said third window and forming an emitter region of said second conductivity type through said first window within said base region, and a collector contact of said second conductivity type through said second window, in said collector region;
- whereby a minimum size double diffused lateral PNP device is formed with a minimum number of hot processing steps.

4,110,127
PROCEDURE FOR DEPOSITING A PROTECTIVE PRECOATING ON SURFACES OF ZINC-COATED FERROUS METAL PARTS AGAINST CORROSION IN PRESENCE OF WATER

Michel Longuepee, Cantin, and Noél Dreulle, Auby-lez-Douai, both of France, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Division of Ser. No. 541,513, Jan. 16, 1975, abandoned. This application Jan. 21, 1976, Ser. No. 697,761

Claims priority, application France, Jan. 23, 1974, 74 02178

Int. Cl.² C23F *7/08*

U.S. Cl. 148—6.15 Z **20 Claims**

1. A process for depositing a protective coating on the surface of an article having a zinc surface, comprising contacting with said surface an aqueous solution containing, per liter of solution, metasilicate equivalent to 1 to 40 grams of sodium metasilicate, phosphate equivalent to 14 to 40 milliliters of phosphoric acid having a density of 1.71 g/ml, nitrate equivalent to 1 to 40 grams of sodium nitrate, and zinc equivalent to 10 to 50 grams of anhydrous zinc chloride, said solution having a pH between 2.3 and 3.8, and a temperature between 15° and 75° C., for between 20 and 72 hours at the aforesaid temperature, and rinsing said surface with water.

4,110,128

SOLUTION AND PROCEDURE FOR DEPOSITING A PROTECTIVE COATING ON GALVANIZED STEEL PARTS, AND SOLUTION REGENERATION PROCEDURE

Paule Dreulle, Douai; Michel Longuépée, Cantin, and Dominique Dhaussy, Auby Lez Douai, all of France, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Continuation of Ser. No. 681,545, Apr. 29, 1976, abandoned. This application Jan. 12, 1977, Ser. No. 758,868

Claims priority, application Canada, Dec. 17, 1975, 241973

Int. Cl.^{2} C23F *7/08*

U.S. Cl. 148—6.15 Z **50 Claims**

1. An aqueous solution for rapidly depositing a protective coating on the surface of galvanized parts, consisting essentially of per liter of final solution, an amount of hexametaphosphate equivalent to 10 to 70 grams of sodium hexametaphosphate, an amount of metasilicate equivalent to 1 to 40 grams of sodium metasilicate, an amount of orthophosphoric acid equivalent to 15 to 40 milliliters of orthophosphoric acid having a density of 1.71 g/ml, zinc chloride in an amount equivalent to 10 to 50 grams of anhydrous zinc chloride, and sufficient calcium carbonate to adjust the pH of said solution to a value between 2.0 and 3.0.

4,110,129

POST TREATMENT OF CONVERSION-COATED ZINC SURFACES

Yasunobu Matsushima, Kawasaki; Kunijl Yashiro, Yokohama; Hideaki Kaneko, and Masanori Suzuki, both of Tokyo, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 3, 1977, Ser. No. 765,335

Int. Cl.^{2} C23F *7/12*

U.S. Cl. 148—6.15 R **7 Claims**

1. A chromium-free process for treating an oxide or phosphate conversion coated zinc or zinc alloy surface comprising contacting the surface with an aqueous post-treatment solution comprising at least 0.02 g/l of titanium ion and at least 0.1 g/l of at least one adjuvant selected from the group consisting of phosphoric acid, phytic acid, tannin, the salts or esters of the foregoing and hydrogen peroxide.

4,110,130

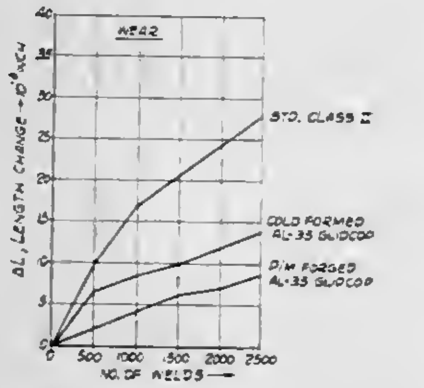
FORGING POWDERED DISPERSION STRENGTHENED METAL

Anil Vasant Nadkarni, Pasadena, Md., assignor to SCM Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,890

Int. Cl.^{2} B22F *3/12*

U.S. Cl. 148—11.5 P **1 Claim**



1. A two-step process for producing a dispersion strengthened metal product having substantially an isotropic grain structure and produced from dispersion strengthened metal powder having an average particle size less than about 300 microns, the process comprising:

cold forming from said metal powder a preform having a density of between 80% to 90% of the theoretical full density of said product;

coating the preform with graphite lubricant and hot forging said preform at temperatures above about 1400° F. to form substantially a full density product having a density of at least 98% of the theoretical density, said product having substantially an isotropic grain structure.

4,110,131

METHOD FOR POWDER-METALLURGIC PRODUCTION OF A WORKPIECE FROM A HIGH TEMPERATURE ALLOY

Gernot Gessinger, Bublikon, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 15, 1976, Ser. No. 732,753

Claims priority, application Switzerland, Oct. 20, 1975, 13558/75

Int. Cl.^{2} C22F *1/10*

U.S. Cl. 148—11.5 N **9 Claims**

1. A method for powder metallurgical production of a high temperature alloy body which consists of mixing powdered alloy components or pre-alloys in the desired proportions; cold working the mix under a protective atmosphere; canning the cold-worked powder mixture; compressing the canned powder by extrusion or hot isostatic pressing to form a dense blank; cutting said blank into slices; forging them at a constant temperature within the range of from 700-800° C. at a strain rate of from 10^{-3} to 10^{-2} S^{-1}; and thereafter subjecting the forged body to a coarse-grain annealing between 1230° and 1300° C. for up to 3 hours.

4,110,132

IMPROVED COPPER BASE ALLOYS

Prakash D. Parikh, and Eugene Shapiro, both of Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 727,728, Sep. 29, 1976, Pat. No. 4,047,978, which is a continuation of Ser. No. 568,870, Apr. 17, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,879

Int. Cl.^{2} C22C *9/01;* **C22F** *1/08*

U.S. Cl. 148—32 **6 Claims**

1. An annealed copper base alloy having a high bend ductility, said alloy having a stacking fault energy of less than 30 ergs per square centimeter, said alloy consisting essentially of a first element selected from the group consisting of about 2 to 12% aluminum, about 2 to 6% germanium, about 2 to 10% gallium, about 3 to 12% indium, about 1 to 5% silicon, about 4 to 12% tin, about 8 to 37% zinc, balance essentially copper, said alloy having a non-random texture with a plastic strain ratio measured 90° to the rolling direction of less than about 0.75, wherein the grain structure is either unrecrystallized or partially recrystallized.

4,110,133

GROWTH OF SEMICONDUCTOR COMPOUNDS BY LIQUID PHASE EPITAXY

Ian Garrett, Watford, and Michael Rivers Taylor, London, both of England, assignors to The Post Office, London, England

Filed Apr. 21, 1977, Ser. No. 789,714

Claims priority, application United Kingdom, Apr. 29, 1976, 17512/76; Sep. 2, 1976, 36428/76

Int. Cl.^{2} H01L *21/208*

U.S. Cl. 148—171 **5 Claims**

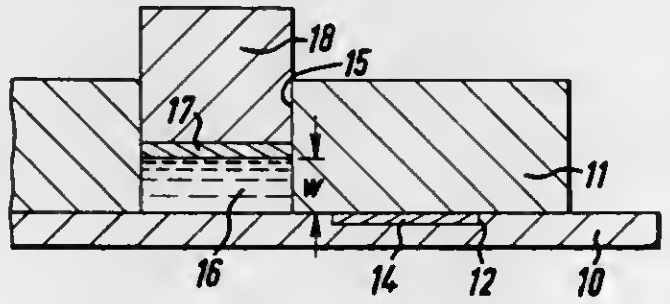
1. A method of growing a semiconductor compound by liquid phase epitaxy which comprises:

(a) providing a suitable solvent and providing a source of a compound to be grown in contact with the upper surface of the solvent;

(b) heating the solvent and the source of the compound to a predetermined first temperature and allowing the solute to form a solution and to come to equilibrium with the solvent;

(c) subjecting the solution formed in (b) to a rapid relatively small decrease in temperature to a second temperature to produce a supersaturated solution;

(d) keeping the source of the compound in contact with the thus-supersaturated solution and maintaining the temperature substantially constant for a predetermined first period of time at the second temperature; and



(e) bringing the solution with the source in contact with the upper surface thereof into contact with a substrate on which the compound is to be grown for a predetermined second period of time at the second temperature.

4,110,134

WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Charles G. Wade, Lehighton, Pa., assignor to Atlas Powder Company, Tamaqua, Pa.

Continuation-in-part of Ser. No. 740,094, Nov. 9, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,333

Int. Cl.^{2} G06B *45/00*

U.S. Cl. 149—2 **41 Claims**

1. A water-in-oil explosive composition that is detonable by a No. 6 cap in cartridge diameters of about 1.25 inches and less consisting of:

(a) a continuous phase of a carbonaceous fuel;

(b) a discontinuous aqueous phase containing an inorganic oxidizer composed principally of ammonium nitrate;

(c) from about 0.5% to about 2% by weight of the composition of an emulsifier selected from the group consisting of sorbitan fatty esters, glycerides of fat-forming fatty acids, polyoxyethylene sorbitol esters, polyoxyethylene ethers, polyoxyalkylene oleate, polyoxyalkylene laurate, oleyl acid phosphate, substituted oxazolines and phosphate esters thereof;

(d) up to about 15% by weight thereof of an auxiliary fuel; and

(e) sufficient closed cell void containing material to yield a density of said explosive composition in the range of from about 0.90 g/cc to about 1.35 g/cc.

4,110,135

CONTROL OF CURE RATE OF POLYURETHANE RESIN BASED PROPELLANTS

William Hardin Graham, and Inella Gatlin Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Nov. 11, 1976, Ser. No. 740,994

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.4 **2 Claims**

1. A process for the control of the pot life and curing rate of a hydroxy terminated polybutadiene based polyurethane bound propellant grain which comprises, admixing with a propellant grain containing an uncured binder based upon a hydroxy terminated polybutadiene and a polyisocyanate, a catalyst, said catalyst comprising a metallo organic compound and either a carboxylic acid or a compound convertible to a carboxylic acid by reaction with Zerewitinoff active hydrogen.

4,110,136

EXPLOSIVES CONTAINING AMMONIUM NITRATE AND NITRATED AMINES

Joseph Hershkowitz, West Caldwell, N.J., and Irving B. Akst, Pampa, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 17, 1977, Ser. No. 769,607

Int. Cl.^{2} C06B *31/32*

U.S. Cl. 149—47 **8 Claims**

1. An explosive composition consisting essentially of a mixture of

15 to 45% by weight of a particulate high explosive selected from the group consisting of 1,3,5-trinitro-1,3,5-triazacyclohexane and 1,3,5,7-tetranitro-1,3,5,7-tetraazacyclooctane, and mixtures thereof;

15 to 50% by weight of ammonium nitrate; and

20 to 60% by weight of ethylenediamine dinitrate; wherein the ammonium nitrate and the ethylenediamine dinitrate are present in the weight ratio of from 1:2.5 to 1.5:1, respectively, as an intimate mixture of which the major portion is obtained by cosolidification.

4,110,137

COMPOSITION FOR FILLING CABLES

Shirley Beach, North Vancouver, Canada, assignor to Phillips Cable Limited, Brockville, Canada

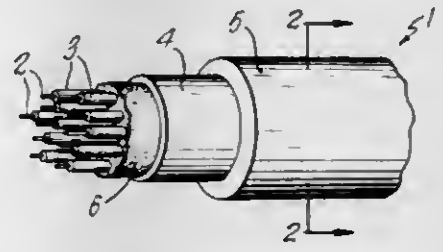
Continuation-in-part of Ser. No. 428,757, Dec. 27, 1973, Pat. No. 3,961,128. This application Apr. 14, 1976, Ser. No. 676,991

Claims priority, application Canada, Dec. 29, 1972, 160290

The portion of the term of this patent subsequent to Jun. 1, 1993, has been disclaimed.

Int. Cl.^{2} H02G *15/20*

U.S. Cl. 156—48 **14 Claims**



1. In a method of making a communication cable the improvement comprising:

a. providing a plurality of conductors surrounded by a sheath, and

b. filling the interstices between individual conductors and between the conductors and the sheath with a composition comprising petroleum jelly and siliceous material in an amount effective to render the petroleum jelly viscous at elevated temperatures, the siliceous material being substantially uniformly distributed throughout the petroleum jelly.

4,110,138

HAND CRAFT YARN ART MATERIALS AND STRUCTURE AND METHODS OF MANUFACTURE AND USE THEREOF

Junichi Nomura, 10-4 Mitsuya-cho, Nagahama, and Masashi Kanai, 1854-23, Ooka-machi, Yokohama, both of Japan

Filed Mar. 17, 1977, Ser. No. 778,676

Int. Cl.^{2} B32B *5/08*

U.S. Cl. 156—63 **21 Claims**

1. A backing material for handcraft yarn acts comprising:

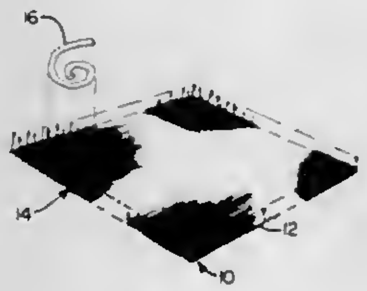
a foundation fabric having a regular woven pattern of a first thread material including warps and woofs and having interwoven therewith a warp of thermo plastic pile threads interlocked by the warps and woofs, said thermo plastic pile warps being initially formed as elongated pile loops,

said pile loops being cut in the upper arcuate portions thereof to form individual pile threads extending from said surface of said foundation fabric in substantially upright relation and having free ends, adjacent such individual threads having a common central portion remaining interlocked in the foundation fabric by the warps and woofs of said first material thereof,

said individual pile threads being of a height relative to said foundation fabric corresponding to the same order of magnitude of the thickest diameter yarn to be applied to the backing material, and

the free ends of said thermo plastic threads being deformed by application of heat thereto in an irregular random pattern to form an irregular random pattern of enlarged deformations on the ends thereof.

13. A method of manufacture of a backing material for handcraft yarn arts from a foundation fabric having plural thermo plastic pile loops anchored within the foundation fabric and extending from one surface thereof in substantially upright relation with respect thereto, the loops having respective arcuate portions displaced from said one surface of the foundation fabric at substantially equal height of the order of magnitude of the thickest diameter yarn to be applied to the backing material, comprising:



cutting the loops to form separate threads having individual free ends of the said order of magnitude in height, the threads remaining in substantially upright relation extending from said one surface of said foundation fabric by virtue of the rigidity of the thermo plastic pile thread material,

applying heat in an irregular pattern to the free ends of the said upright threads of the material to produce an irregular, random pattern of enlarged ends of said threads resulting from deformation of the thread material due to the heat.

4,110,139

PROCESS FOR PREPARING BANDS OR BELTS, PARTICULARLY SUITABLE FOR USE AS WATCH BANDS

Toru Mashida; Sumeo Matsushita, both of Tokyo, and Iwao Ikegami, Ichikawa, all of Japan, assignors to NCO Works Ltd., Tokyo, Japan

Filed Mar. 13, 1975, Ser. No. 558,085

Claims priority, application Japan, Mar. 13, 1974, 49-29456; Apr. 22, 1974, 49-45676; Apr. 23, 1974, 49-46296

Int. Cl.^{2} B29D *27/00;* **B32B** *5/18, 5/24, 5/30*

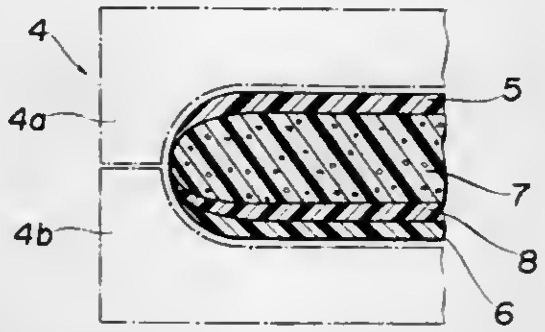
U.S. Cl. 156—79 **26 Claims**

1. A process for preparing bands of belts, particularly those suitable for use as watch bands comprising steps of:

(a) manufacturing a substantially air tight press mold comprising at least two parts adapted to form a recess between said two parts and bearing complementary patterns of a prototype on at least one surface of said recess by setting liquid silicone rubber of slowly setting type poured onto the prototype,

(b) preparing a half-finished product of a laminated sheet and sealing the periphery of said laminated sheet by a high frequency dielectric heating means, said laminated sheet comprising at least one layer of an expandable thermoplastic material with a foaming agent having a large dielectric loss and at least one surface layer of a material substantially capable of being embossed by said press mold into a pattern similar to said prototype pattern in the recess, a peripheral contour of said laminated sheet being substantially similar to the inner peripheral contour of said recess,

(c) inserting said half-finished product into said recess of the press mold and maintaining the press mold air tight under pressure, and



(d) heating said half-finished product in said press mold in a high frequency dielectric device to permit said expandable thermoplastic material to expand by foaming so that the resulting inner pressure pressed the top back surface layers of the half-finished product against the inner surface of said recess to emboss at least the one surface layer.

4,110,140

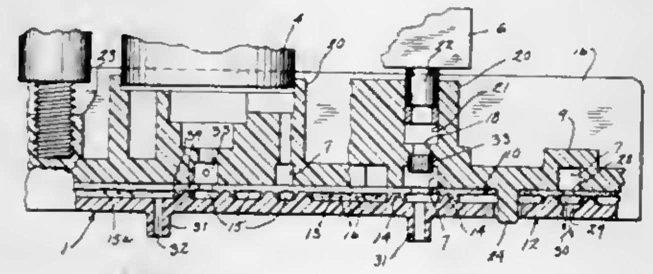
METHOD OF MAKING FLUID SYSTEM CIRCUIT BOARD

Richard N. Laakaniemi; Leon C. Ploszaj, and Bruce R. Schultz, all of Milwaukee, Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed Dec. 15, 1976, Ser. No. 750,650

Int. Cl.^{2} B32B *31/04*

U.S. Cl. 156—87 **22 Claims**



1. The method of forming a multiple member circuit board unit for a fluid system comprising forming first and second board members located in stacked relation and said board members having opposed surfaces, said first member having a recess in the opposed surface and said second member forming a closure for said recess in said first member, providing spacing means interposed between the opposed surfaces of the first member having the recess and the second member, said spacing means defining separating walls extending generally parallel to the recess, locating a sheet like adhesive member adjacent said surface having said recess of the first member with said spacing means engaging the opposite side of the adhesive member from the first member and engaging the surface of the closure member to form a circuit board assembly, said spacing means defining chambers aligned with the recesses and located on the opposite side of the adhesive member, said board members and adhesive member being formed of bondably compatible materials, and activating said adhesive member to intimately bond the adhesive member to the adjacent surfaces and thereby cover said recess to form fluid tight passageways with said chambers forming a space into which gaseous medium generated in the activating of the adhesive member move to prevent disruption of the adhesive.

4,110,141

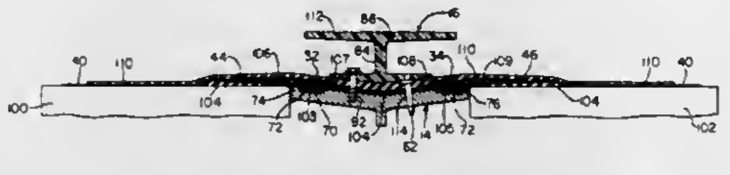
METHOD OF MAKING AN INTEGRALLY BUILT AND CURED CLOSED TORUS TIRE AND WHEEL ASSEMBLY

Vito A. Caravito, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 633,534, Nov. 19, 1975, Pat. No. 4,085,786. This application Mar. 11, 1977, Ser. No. 777,239

Int. Cl.^{2} B29H *17/02, 17/14*

U.S. Cl. 156—123 R **2 Claims**



1. A method of manufacturing an integral pneumatic tire and rim assembly wherein said rim is of an annular unitary type construction comprising wrapping at least one carcass ply circumferentially about said rim with the axially outer ends extending axially outwardly beyond the axially outer edges of said rim, helically winding at least one inextensible member about said rim to form an annular bead core about said carcass ply to said rim, providing a circumferentially extending rigid clamping means about the radially outer wall of said carcass ply adjacent the central portion of the area engaging said rim and drawing said rigid means tightly against said carcass ply to clamp said carcass ply to said rim, folding the axially outer ends of said ply axially across said rim to form a circumferentially extending splice, providing a circumferentially extending tread structure about said ply and placing said tire and rim assembly in a curing apparatus including a mold and curing said tire.

4,110,142

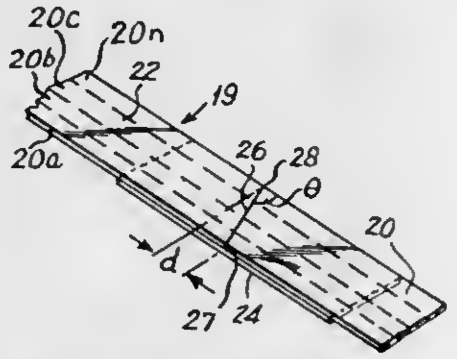
METHOD OF SPLICING MULTITRACK SOUND RECORDING TAPE

Joel Tall, Washington, D.C., assignor to Joel Tall, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 737,101, Oct. 29, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,875

Int. Cl.^{2} G11B *27/06*

U.S. Cl. 156—159 **1 Claim**



1. A method of splicing magnetic sound recording tape with a splicing block in order to edit the tape by joining two pieces of the tape, wherein the tape is multitrack tape having two or more synchronized audio frequency tracks extending there along, comprising the steps of:

(a) using a standard editing speed of fifteen inches per second for recording and playing the multitrack tape;

(b) selecting a portion of the multitrack tape having wide-band noise;

(c) selecting a splicing block with a groove therein having a width approximately the width of the multitrack tape and a straight slit which intersects and traverses the groove at an angle θ therewith, wherein the angle θ is selected so that the distance between the leading point of cut at one edge of the multitrack tape and the lagging point of cut at the other edge of the multitrack tape is approximately 0.150 inch regardless of the width of the multitrack tape and the number of synchronized tracks on the tape;

(d) placing the pieces of multitrack tape in the groove, one at a time, with the selected portion of the tape having wide-band noise aligned with the slit;

(e) cutting the pieces of multitrack tape by passing an instrument with a straight sharp blade through the slit and through the wide band noise portion of the multitrack tape, across all tracks of the tape, wherein by virture of the blade following the slit, the distance between the leading point of cut at one edge of the tape and the lagging point of cut at the other edge of the tape is approximately 0.150 inch regardless of the width of the tape and the number of synchronized tracks on the tape;

(f) aligning the edges of the cuts of the pieces to be spliced so as to align the tracks with one another;

(g) joining the two pieces of tape cut in accordance with step e) by adhering a length of splice tape in overlapping relationship with the two pieces so that when the multitrack tape is played at a speed of fifteen inches per second, the time segment between the leading and lagging points of cut will be approximately 0.01 second regardless of the width of the tape and number of synchronized tracks on the tape.

4,110,143

PROCESS FOR MAKING A WETTABLE POLYOLEFIN BATTERY SEPARATOR

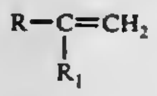
Joseph A. Cogliano, Baltimore, and Nelson S. Marans, Silver Springs, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,224

Int. Cl.^{2} H01M *2/16*

U.S. Cl. 156—167 **4 Claims**

1. The process of forming a wettable battery separator from a polyolefin which comprises extruding a heated polyolefin through multiple die openings into a gas stream which attenuates the polyolefin into fibers having an average diameter between 1 to about 10 microns, collecting said fibers as a self-supporting mat on a collecting device, compacting the thus formed mat to a thickness between 10 and 40 mils and pore sizes less than 40 microns, contacting the mat with an aqueous solution of a water-soluble, peroxy compound at a temperature below 70° C. without the introduction of oxygen, rinsing the thus contacted mat in a water bath and thereafter at a temperature below 70° C. immersing the thus rinsed mat in an aqueous solution of a hydrophilic vinyl monomer of the formula



$$\underset{\displaystyle R_1}{\overset{}{R-\underset{|}{C}=CH_2}}$$

wherein at least one of R and R_1 are hydrophilic radicals, said solution containing a redox catalyst, thereby causing a graft polymerization of said hydrophilic vinyl monomer onto said polyolefin mat to form a wettable polyolefin battery separator.

4,110,144

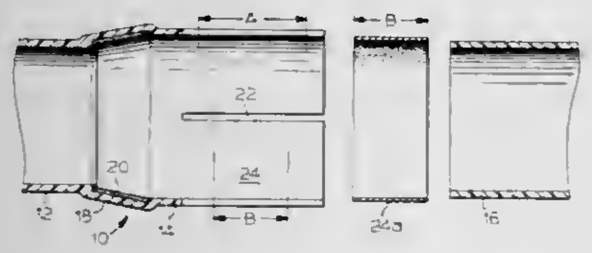
MECHANICALLY LOCKED BELL AND SPIGOT COUPLING FOR DUCTS AND METHOD OF FORMING

Amsey Boehler, and Kirk Thomas Butcher, both of Cobourg, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Division of Ser. No. 389,780, Aug. 20, 1973, abandoned. This application Mar. 28, 1977, Ser. No. 781,919

Int. Cl.^{2} B65H *81/00;* F16L *37/08*

U.S. Cl. 156—173 **6 Claims**



1. The method of manufacturing a plastic duct having a bell coupling formation integral therewith comprising the steps of:

(a) providing a mandrel having a duct forming section; a bell forming section; and a neck section interconnecting said duct and bell forming sections;
(b) locating an elastomeric sealing means around said neck section;
(c) providing abrasive means around at least a portion of said bell forming section;
(d) winding glass fiber roving coated with uncured epoxy resin around said mandrel sections to form a predetermined wall thickness;
(e) curing the epoxy resin,
(f) removing the duct and bell coupling formation with the integral elastomer sealing means and abrasive means, and
(g) forming at least one axially aligned slot in the wall of the bell coupling formation.

4,110,145

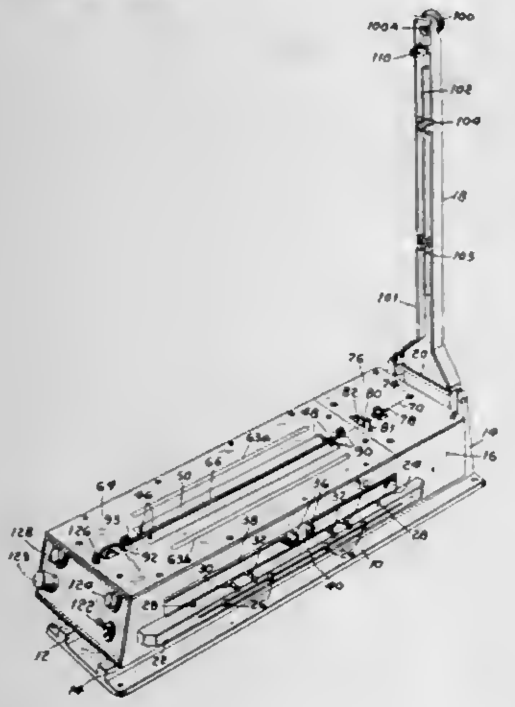
METHOD FOR SEALING PLASTIC FILMS AND THE LIKE

Anthony Joseph Lombardi, Flanders, N.J., assignor to Barney Knitting Machinery Co., Inc., Brooklyn, N.Y.

Division of Ser. No. 698,189, Jun. 21, 1976, Pat. No. 4,045,272. This application Jun. 16, 1977, Ser. No. 807,012

Int. Cl.^{2} B29D *23/10;* B29C *19/06*

U.S. Cl. 156—218 **10 Claims**



1. A method of forming a tubular pattern control card using a sealing apparatus having a tubular housing containing a reel of wire and a pressure member mounted to selectively exert pressure along one surface of said housing, the method comprising:

preparing a length of flexible plastic film with a predetermined array of punched holes;
fixing one end of said length of film on the one surface of the sealing apparatus;
withdrawing a length of wire from said reel and positioning and retaining it along said fixed one end of film in conducting means on said surface;
looping and fixing the other end of said film to sandwich the retained wire between the overlapping interfaces of the film ends;
pressing the overlapping interfaces together with said pressure member and at the same time applying a voltage to the retained wire and severing the length of wire from said reel;
maintaining the pressure on the overlapping interfaces and wire for a period of time longer than the period of voltage application, whereby the interfacing surfaces of the film adhere along the length of wire; and
releasing the pressure member and removing the formed tubular pattern control card from the sealing apparatus.

4,110,146

METHOD OF PRODUCING A PACKING BLANK

Niels Bro, Ballerup, Denmark, assignor to Bantex A/S, Allerod, Denmark

Filed Aug. 3, 1977, Ser. No. 821,578

Int. Cl.^{2} B32B *7/10*

U.S. Cl. 156—291 **2 Claims**

1. A method of producing a packing blank consisting of a rigid plate material, e.g. cardboard, and a cover of foil material enclosing the plate material, said cover consisting of two pieces of foil peripherally larger than the plate material, each being glued to its respective large surface of the plate material and subsequently welded together along the edge areas protruding beyond the plate material, said method comprising the steps of extruding an adhesive onto a first foil material over an area corresponding to the large surface of the plate material, positioning the large outer surface of the plate material onto that area of said first foil carrying the adhesive, extruding an adhesive onto the other large, free outer surface of the plate material, and placing a second foil material on said free outer surface, leaving the edges free from adhesive and thereafter welding the edge areas of both foils together to enclose said plate material.

4,110,147

PROCESS OF PREPARING THERMOSET RESIN SUBSTRATES TO IMPROVE ADHERENCE OF ELECTROLESSLY PLATED METAL DEPOSITS

John J. Grunwald, New Haven; Eugene D. D'Ottavio, Thomaston; Harold L. Rhodenizer, Bethlehem, and Michael S. Lombardo, Waterbury, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Continuation-in-part of Ser. No. 669,909, Mar. 24, 1976, abandoned, which is a continuation of Ser. No. 197,165, Nov. 9, 1971, abandoned, which is a division of Ser. No. 889,472, Dec. 31, 1969, Pat. No. 3,620,933. This application Jan. 3, 1977, Ser. No. 756,428

Int. Cl.^{2} C09J *5/00*

U.S. Cl. 156—306 **5 Claims**

1. In a process of preparing an intermediate article of commerce comprising a laminate of aluminum foil and a thermoset resin substrate, which article is particularly adapted for use in producing printed circuit boards by additive electroless plating techniques after the aluminum foil has been chemically stripped from said resin substrate, the steps which comprise

anodizing said aluminum foil in a phosphoric electrolyte to develop an aluminum oxide film on the surface of the foil which is to confront the surface of the substrate in said article;
placing said aluminum foil with its anodized surface confronting the surface of a substrate comprising a plurality of glass fiber reinforced, B-stage epoxy resin prepregs; and
applying sufficient heat and pressure to complete the cure of said substrate and bond said foil thereto to produce said laminate.

4,110,148

APPARATUS FOR RAPIDLY PRODUCING CEMENTED PANES OF INSULATING GLASS

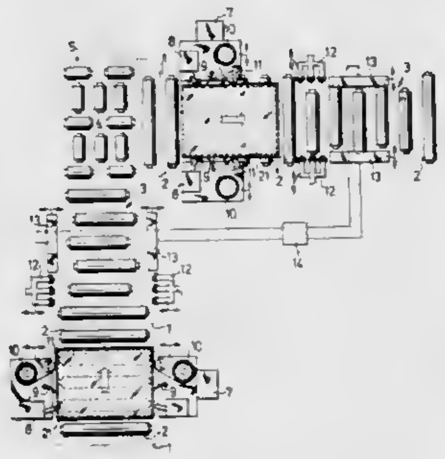
Martin-Gottfried Rocholl, Heidelberg, Fed. Rep. of Germany, assignor to Teroson G.m.b.H., Heidelberg, Fed. Rep. of Germany

Division of Ser. No. 508,637, Sep. 23, 1974. This application Aug. 18, 1977, Ser. No. 825,620

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1973, 2352294

Int. Cl.^{2} C03C *27/10*

U.S. Cl. 156—359 **4 Claims**



1. An apparatus for producing sealed panes of insulating glass employing capacitive high frequency heating to cure the sealant, said apparatus comprising:

(a) a plurality of rollers for supporting and conveying at least two horizontally positioned superposed panes of glass, said panes having first and second pairs of opposed lateral edges and being separated by a spacer located near but back fron said lateral edges and creating therewith an open continuous channel defined by said lateral edges and said spacer for receiving sealant;
(b) a first means for applying sealant into the portions of said channel defined by said first pair of opposed lateral edges;
(c) two first pairs of separated electrodes, said pairs being spaced from one another and connected to a high frequency generator and adapted to impart heat capacitively to said sealant, one each of said pairs of electrodes being located generally adjacent a pair of opposed lateral edges of said panes making up said first pair of such edges and laterally movable in relation thereto in order that the separated electrodes of each of said pairs are positionable such that substantially only the said sealant receiving channel defined by said lateral edges is located between the electrodes;
(d) first means for optically scanning and determining the distance between said first pair of lateral edges defining said sealant-receiving portions of said channel and positioning the said first pair of electrodes in accordance with said determined distance such that substantially only the sealant receiving portions of said channel defined by said first pair of lateral edges is located between said electrodes;
(e) a second means for applying sealant into the portions of said channel defined by said second pair of lateral edges of said panes and said separator;
(f) two second pairs of separated electrodes, said second pairs also being spaced from another and connected to a high frequency gnerator and adapted to impart heat capacitively to said sealant, one each of said second pairs being located generally adjacent a pair of opposed lateral edges of said panes making up said second such pair and laterally movable in relation thereto in order that the separated electrodes of each of said second pairs is positionable such that substantially only the said sealant receiving channel defined by said second pair of lateral edges is located between the electrodes of said second pairs; and
(g) second means for optically scanning and determining the distance between said second pair of lateral edges defining said sealant receiving channel portions and positioning the said second pair of electrodes in accordance with said determined distance such that substantially only the said sealant receiving channel portions defined by said second pair of lateral edges is located between the electrodes of said two second pairs of electrodes.

4,110,149

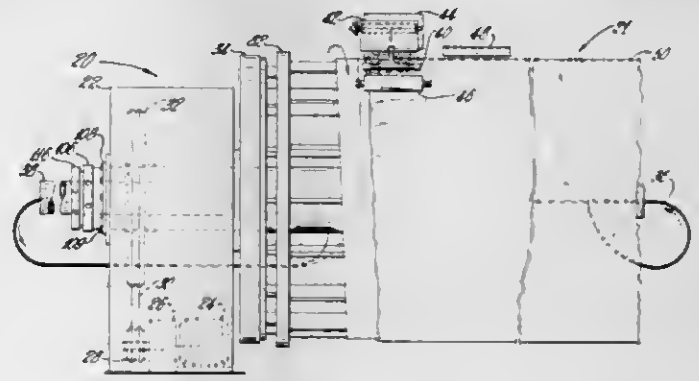
ROTATABLY DRIVEN MANDREL HAVING OUTER WALL FORMED BY CONTINUOUSLY CIRCULATING ENDLESS HELICAL BAND AND RADIALLY ADJUSTABLE SUPPORT MEMBERS FOR THE BAND

Peder Ulrik Poulsen, Fredensborg, Denmark, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 7, 1977, Ser. No. 813,579

Int. Cl.^{2} B65H *81/00*

U.S. Cl. 156—429 **10 Claims**



1. A rotatably driveable mandrel for continuous production of pipe, the mandrel comprising a horizontally extending tubular shaft forming a central structural support member of the mandrel, means rotatably mounting an end portion of the tubular shaft, means for rotatably driving the tubular shaft, an outer mandrel wall spaced from and surrounding a free end portion of the tubular shaft, the outer wall being formed of an endless helical band which continuously circulates as the mandrel is rotatably driven, the band being wound helically toward the free end portion of the tubular shaft with a pitch corresponding to the band width whereby the convolutions are disposed in edge-to-edge relationship and being returned through the tubular shaft from the free end portion toward the mounted end portion thereof and back to the point where the winding starts, a plurality of elongated support members for the helical windings of the band, the band support members being circularly disposed and spaced equally apart about the tubular shaft, each band support member being supported by a plurality of parallel pivotable arms of equal length spaced from each other axially of the tubular shaft and having outer end portions pivotally connected to the band support member and inner end portions pivotally connected to the tubular shaft, means for preventing movement of the band support members axially of the tubular shaft while accommodating movement thereof radially of the tubular shaft, and shaft adjusting means

for moving the tubular shaft axially in its mounting means to move the band support members radially.

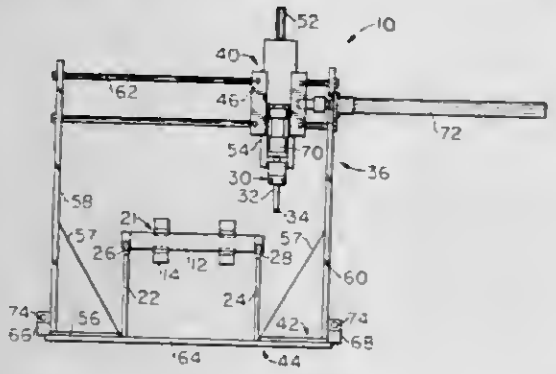
4,110,150
APPARATUS FOR JOINING FUSIBLE ELEMENTS

Richard C. Ostrowski, and John Styfhoorn, both of Dunlap, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 25, 1977, Ser. No. 800,507

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—499 **4 Claims**



1. Apparatus for joining a first fusable element defining a preselected pathway and a second fusable element along the pathway, comprising:

first means for supporting the first fusable element;

means for controllably heating selected portions of said first element about the pathway to a temperature sufficient for forming a bond with said second element;

second means for supporting the heating means, said second support means including a first support assembly, said heating means being connected to and movable along said first assembly in a first direction; a second support assembly connected to said first assembly, said first assembly being movable along said second assembly in a second direction, said heating means moving with said first assembly in said second direction, said second direction being substantialy perpendicular to said first direction; and a third support assembly connected to said second assembly, said second assembly being movable along the third assembly in a third direction, said first and second assemblies being movable relative to said third assembly in the third direction, said heating means moving with said first and second assemblies in said third direction, said third direction being substantially perpendicular to said first and second directions;

first motor means for moving the heating means along the first assembly in the first direction;

second motor means for moving the first assembly and the heating means therewith in the second direction; and

third motor means for moving the second assembly and the first assembly and heating means therewith in the third direction.

4,110,151
APPARATUS FOR THE PREPARATION OF RESIN IMPREGNATED GLASS FIBER SHEETS

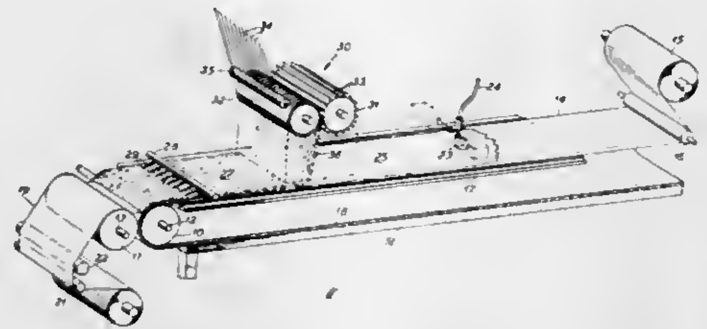
Donald B. Morse, Joliet, Ill., assignor to Kemlite Corporation, Joliet, Ill.

Division of Ser. No. 259,846, Jun. 5, 1972, Pat. No. 3,888,716. This application Dec. 12, 1974, Ser. No. 532,206

Int. Cl.^{2} B32B *31/12*

U.S. Cl. 156—519 **5 Claims**

1. Apparatus for preparing a resin impregnated glass fiber sheet comprising a pair of spaced rolls, having a nip therebetween, a cover film extending over one of said rolls and into the nip of said rolls, a second cover film extending over the other of said rolls and into the nip of said rolls, one of said films having thereon a layer of thermosetting resin, means for depositing resin on said one film, said means including a pump, and power means for driving said pump and said rolls at synchronized speeds whereby said pump is caused to deliver sufficient resins to fill the nip between said films and to form a pool therebetween above the nip of said rolls so as to maintain said pool as the operation proceeds, means for cutting glass fiber strands into individual fibers and for distributing the cut fibers at a location above said resin layer to cause the cut fibers to fall and form a layer of glass fibers on said resin layer, said films forming between said rolls a pocket, and a pool of resin in said pocket whereby upon rotation of said rolls toward each other said pool is fed by said resin layer and resin from said pool is pressed in the nip of said rolls into said glass fiber layer.



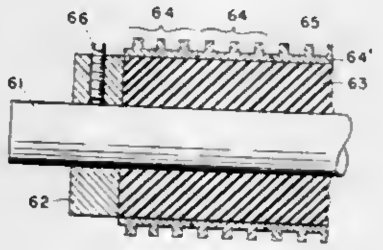
4,110,152
EMBOSSING ROLLER AND APPARATUS

Richard E. Dunning, Munster, Ind., and Marshall A. Nelson, Lansing, Ill., assignors to Avery Products Corporation, San Marino, Calif.

Continuation of Ser. No. 588,853, Jun. 20, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,529

Int. Cl.^{2} B32B *31/20;* **B21B** *27/02*

U.S. Cl. 156—553 **17 Claims**



1. Apparatus for embossing and coating a plastically deformable surface comprising:

a web of film carrying a thermally transferable coating;

means for disposing over the plastically deformable surface a portion of the web;

means for heating the surface, film, and coating;

an embossing roller comprising resiliently supported, separate, independently movable rings disposed adjacent one another across the width of the roller, the rings extending concentrically around the roller and being resiliently movable radially relative to the rotational axis of the roller; and

a plurality of discrete mutually spaced apart rigid lands protruding radially from each ring around the circumference of the ring for being resiliently movable with corresponding movement of the ring;

means for urging the roller against the film and surface with the axis of the roller extending across the width of the film and surface; and

means for rolling the roller over the film and the surface to thereby roll the film and coating against the surface while the roller is so urged to emboss a plurality of discrete spaced apart three-dimensional indentations across the width of the film and the surface;

the lands on each ring being resiliently movable independently of lands on a separate ring as well as lands on each ring being resiliently movable in response to irregularities in the surface for embossing a substantially uniform pattern of indentations across the width and along the length of the surface.

4,110,153
METHOD OF FORMING A MICROPOROUS DIAPHRAGM

Thomas A. Rechlicz, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 8, 1977, Ser. No. 831,573

Int. Cl.^{2} B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—633 **9 Claims**

1. A method of forming an unsintered, wettable, microporous polyfluorocarbon diaphragm comprising:

maintaining a nonwoven mat of a leachable fibrous material in contact with the external surfaces of a polyfluorocarbon film while hot pressing the polyfluorocarbon film above the flow temperature thereof but below the thermal decomposition temperature thereof; and

thereafter leaching out the fibrous material.

4,110,154
METHOD FOR MAKING A SOLUBLE SULFITE ADDITIVE FOR USE IN A PULP MAKING PROCESS

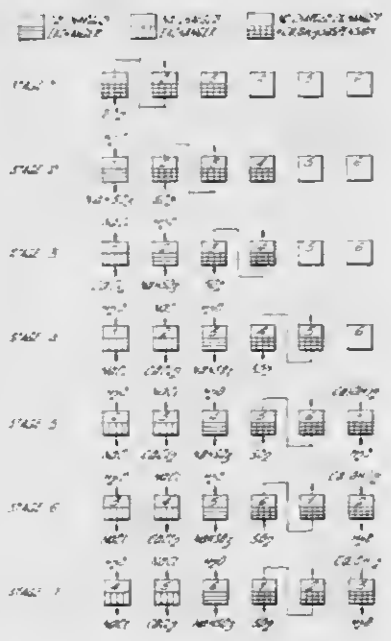
Alpo Ora, Rauma, Finland, assignor to Rauma-Repola OY, Finland

Continuation of Ser. No. 660,232, Feb. 23, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 814,021

Claims priority, application Finland, Mar. 20, 1975, 750831

Int. Cl.^{2} D21C *11/02*

U.S. Cl. 162—36 **8 Claims**



1. In a process for manufacturing pulp by the sodium base sulfite digestion of wood wherein waste liquor from the digestion stage is evaporated, burned, and recovered as sodium carbonate and sodium sulfide, in which process there occur losses of sodium, the improvement which comprises making up said losses of sodium by:

(a) passing a solution of calcium bisulfite free from organic substance through a strongly acidic cation exchange resin in the sodium form having sulfonic acid groups as the exchange centers to obtain a sodium bisulfite effluent;

(b) adding said obtained sodium bisulite effluent as makeup to the digestion stage of the pulp manufacturing process;

(c) regenerating said cation exchange resin by passing therethrough a solution of sodium chloride;

(d) washing the resin with water; and

(e) cyclically repeating steps (a), (b), (c), and (d).

4,110,155
METHOD OF MANUFACTURING SYNTHETIC RESIN COATED PAPERS

Nobuhiko Minagawa, and Tomoaki Ozaki, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation of Ser. No. 272,509, Jul. 17, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,360

Claims priority, application Japan, Jul. 17, 1971, 46-53317

Int. Cl.^{2} D21H *1/10*

U.S. Cl. 162—135 **8 Claims**

1. In a method of manufacturing a laminate paper having a synthetic resin film coated on both surfaces of the paper substrate which comprises manufacturing a paper substrate and applying said resin film to both surfaces of said substrate, the same synthetic resin being applied to each surface, the improvement comprising preventing the occurrence of wavy deformations at or near the edge portions of the laminate paper by incorporating during manufacturing of said paper substrate a deliquescent salt in an amount of from about 0.5 to 5% by weight based on the weight of said paper substrate, and adjusting the water content of said paper substrate to 6 to 10% by weight during said manufacturing and applying said resin film while said substrate has said water content.

7. A laminate paper having synthetic resin films coated on both surfaces of a paper substrate, the same synthetic resin being applied to each surface, said paper substrate containing a deliquescent salt at a level sufficient to adjust the water content of said paper substrate from about 6 to 10% by weight, said level being 0.5 to 5% by weight based on the weight of said paper substrate.

4,110,156
COMPACT PRESS AT THE WEB TRANSFER POSITION OF A PAPER MAKING MACHINE

Wolf-Gunter Stotz, Ravensburg, and Helmut Hund, Vorberg, both of Fed. Rep. of Germany, assignors to Escher Wyss Limited, Zürich, Switzerland

Filed Jun. 6, 1977, Ser. No. 803,537

Claims priority, application Switzerland, Jun. 14, 1976, 7492/76

Int. Cl.^{2} D21F *3/04, 3/06, 3/08, 3/10*

U.S. Cl. 162—305 **6 Claims**

6. A paper-making machine roll press comprising:

wire means over which passes a web of paper containing water in a predetermined direction of travel;

a suction press roll positioned to cooperate with said wire;

a press felt trained about said suction press roll;

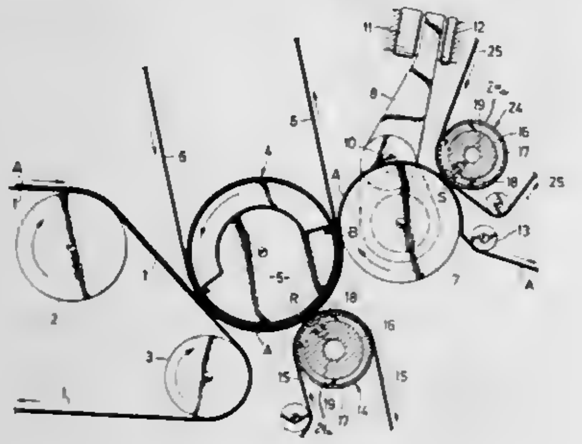
a take-off press roll cooperating with the suction press roll to form a press station;

said take-off press roll serving for the transfer of the web of paper from the suction press roll and for delivering the same downstream of the paper-making machine with respect to said predetermined direction of travel of said web of paper;

means cooperating with said suction press roll for providing an additional press station at the region of the suction press roll in advance of the press station with the take-off press roll;

said means defining said additional press station comprising a contact-pressure roll;

a press felt trained about said contact-pressure roll, to thereby impart to said additional press station a greater water drainage effect for the web of paper than at said press station at the take-off press roll;



said contact-pressure roll comprising a hydrostatic controlled deflection roll embodying a shell and a fixed support; and

means mounting said shell to be rotatable about its lengthwise axis and displaceable in the press direction relative to said fixed support.

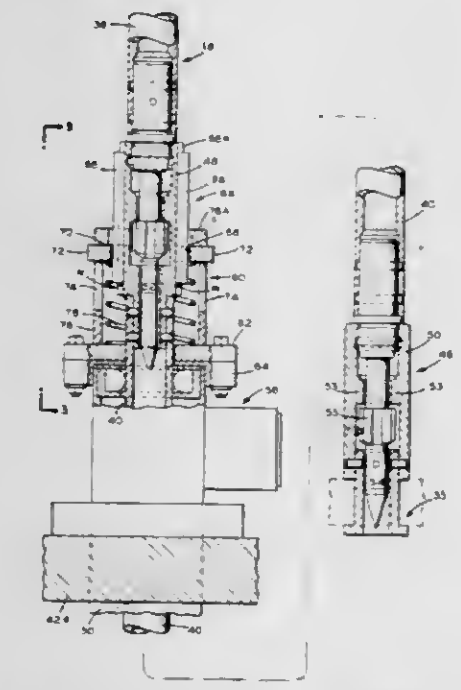
4,110,157
INDUSTRIAL TECHNIQUE

Felix Stanley Jabsen, Lyncbburg, Va., assignor to The Babcock & Wilcox Co., New York, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,637

Int. Cl.² G21C *7/08*

U.S. Cl. 176—36 C **6 Claims**



1. An apparatus for coupling and rotatably securing a control rod system in a nuclear reactor of the type having at least one control rod assembly, a fuel assembly and drive means that longitudinally translates the control rod assembly within the fuel assembly, which comprises: a shaft disposed in axial alignment with and releasably coupled at one end to the control rod assembly, the shaft being releasably coupled at its other end to the drive means; a locking device surrounding the shaft including a housing having a longitudinally aligned slot and, a ring member having an inner slot and an outer ear portion extending through the housing slot for guided translational movement of the ring member; a key member axially aligned and outwardly extending on the shaft; the inner seat of the ring member cooperating with the key member of the shaft to permit the reciprocal movements of the control rod assembly and to secure the control rod system from rotation.

4,110,158
CORE REACTOR AND METHOD OF OPERATING SAME

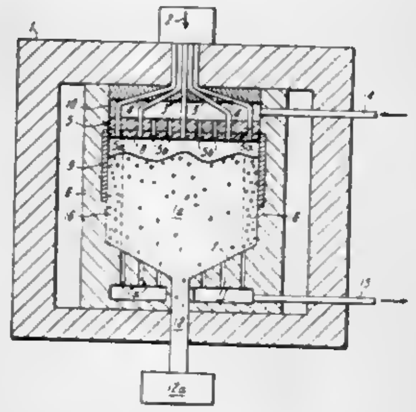
Vladimir Maly, and Eberhard Teuchert, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Continuation of Ser. No. 508,407, Sep. 23, 1974. This application Oct. 19, 1976, Ser. No. 733,698

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1973, 2347817

Int. Cl.² G21C *15/02*

U.S. Cl. 176—58 PB **7 Claims**



1. A gas-cooled nuclear reactor comprising

(a) a generally cylindrical container,

(b) a layer of graphite approximately one meter in thickness lining the inside walls of the container and forming a ceiling reflector, a side reflector and a bottom reflector, the graphite reflectors encompassing a single reaction chamber,

(c) means introducing a cooling gas through the ceiling reflector into the reaction chamber and withdrawing the gas from the reaction chamber through the bottom reflector for maintaining the reaction chamber at a desired operating temperature,

(d) a first multitude of ball-shaped elements substantially filling the reaction chamber, the multitude of ball-shaped elements comprising an advantageous mixture of fissionable material, fertile material and moderator material which will sustain a nuclear reaction,

(e) a second multitude of ball-shaped elements containing a higher concentration of neutron absorbing substance than is contained by said first multitude of ball-shaped elements in the reaction chamber, said neutron absorbing substance being selected from the group consisting of; boron, Gadolinium, Hafnium, Iron, Manganese, Nickel, Plutonium and Thorium,

(f) a plurality of passages through the ceiling reflector for introducing additional ball-shaped elements into the reaction chamber and at least one passage through the bottom reflector for withdrawing ball-shaped elements from the reaction chamber, the ball-shaped elements being introduced through the ceiling reflector and withdrawn through the bottom reflector a such a rate as to maintain said nuclear chain reaction,

(g) at least two sets of feeding means connected to said plurality of passages through the ceiling reflector for feeding said ball-shaped elements through the passages into the reaction chamber, a first of the two sets of feeding means being arranged to only feed said second multitude of ball-shaped elements to an outer marginal zone of the reaction chamber.

4,110,159
METHOD OF FABRICATING NUCLEAR FUEL

Harvey Robert Lee, Georgetown, Canada, assignor to Canadian General Electric Company Limited, Ontario, Canada

Filed Mar. 7, 1977, Ser. No. 774,928

Claims priority, application Canada, Mar. 12, 1976, 247800

Int. Cl.² G21C *5/18*

U.S. Cl. 176—68 **6 Claims**

1. A nuclear fuel form based on an initially porous body comprising at least one material selected from the group consisting of uranium, thorium and plutonium and the oxides thereof having at least one solid additive impregnated therein to a predetermined extent, selected from the group consisting of nuclear fissile material and burnable poisons providing a controlled variation of additive as an additive concentration gradient having maximum additive concentration at an outer face of said form and diminishing in value with increase in distance from said outer face, extending through a portion of the form.

4,110,160
FUEL ASSEMBLY SPACER WITHIN THE COOLANT DUCT

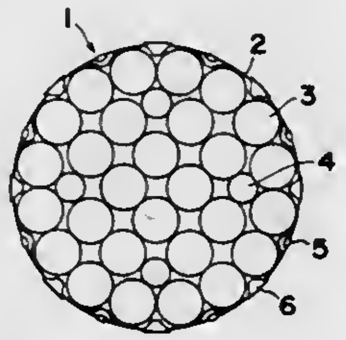
Kiyozumi Hayashi, Toride; Takeo Ohta, Sagamihara, and Tetsuo Kobori, Mito, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,147

Claims priority, application Japan, Apr. 26, 1976, 51-52279

Int. Cl.² G21C *3/30*

U.S. Cl. 176—78 **7 Claims**



1. A spacer for a nuclear fuel assembly for positioning in a coolant duct through which coolant flows to remove heat generated in nuclear fuel elements during the operation of a nuclear reactor, said spacer comprising a structure for holding a plurality of fuel elements and a plurality of projecting springs having uniform spring strengths disposed symmetrically around the outer periphery of said spacer structure, said springs in their fully expanded condition extending beyond the peripheral dimension of the maximum inner diameter of said coolant duct reached during the course of reactor operation, whereby as uniform a gap as possible is formed between the inner wall of the coolant duct and the outer surface of the spacer structure when the spacer structure with fuel elements therein is positioned in the coolant duct and symmetry of the flow of the coolant in the section of the coolant duct is maintained even if there is an eventual increase of the inner diameter of the coolant duct during the course of reactor operation.

4,110,161
PROCESS FOR INHIBITING PLATELET AGGREGATION

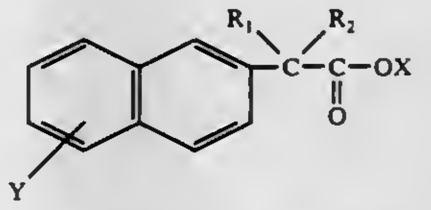
Neel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 514,839, Oct. 15, 1974, Pat. No. 4,033,816, which is a continuation of Ser. No. 370,990, Jan. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,714, Jul. 3, 1972, abandoned. This application Mar. 7, 1977, Ser. No. 775,420

Int. Cl.² C12B *3/00, 9/00;* **A61K** *35/14, 31/235*

U.S. Cl. 195—1.8 **2 Claims**

1. A process for inhibiting platelet aggregation in vitro comprising the addition of an effective amount for inhibiting platelet aggregation of a compound of the formula:



wherein Y is lower alkyl of 1 to 8 carbon atoms, cyclopropyl, ethinyl, $—CF_3$, —F, —Cl, $—OCH_3$, $—OCH_2OCH_3$, $—SCH_3$, $—SCHF_2$, $—SCH_2OCH_3$, acetyl; R_1 and R_2 are H, CH_3, CHF_2, or taken together are $=CH_2$ or $=CF_2$; and X is lower alkyl of 1 to 8 carbon atoms, to whole blood or platelet-rich concentrates.

4,110,162
PRODUCTION OF A POLYSACCHARIDE UNDER CARBON LIMITING CONDITIONS

Renton Clive Righelato, and Trevor Rodney Jarman, both of Reading, England, assignors to Tate & Lyle Limited, London, England

Filed May 20, 1977, Ser. No. 798,761

Claims priority, application United Kingdom, May 28, 1976, 22319/76

Int. Cl.² C12D *13/04*

U.S. Cl. 195—31 P **6 Claims**

1. In a process for the production of a polysaccharide comprising subjecting to continuous cultivation a bacterium of the species *Azotobacter vinelandii* under aerobic conditions in an aqueous culture medium containing as essential ingredients at least one monosaccharide or disaccharide as carbon source and sources of phosphate, molybdenum, iron, magnesium, potassium, sodium, calcium and sulphate, said medium containing a source of nitrogen selected from the group consisting of a fixed source of nitrogen and gaseous nitrogen, oxygen being supplied during cultivation, the pH in the medium during cultivation being maintained within the range of about 6.0, to about 8.2 and recovering said polysaccharide, the improvement comprising maintaining the concentration of the saccharide carbon source in the medium so that it is limiting the growth nutrient.

4,110,163
BETA-GLUCANASE

Kirsten Hjortshoj, Vaerloese, and Knud Aunstrup, Farum, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 443,324, Feb. 19, 1974, abandoned. This application Oct. 6, 1976, Ser. No. 730,014

Claims priority, application United Kingdom, Feb. 28, 1973, 09844/73

Int. Cl.² C07G *7/02;* **C12C** *7/00, 9/02*

U.S. Cl. 195—62 **5 Claims**

1. A process for the production of an endo-beta-glucanase preparation, which will hydrolyze the beta-glucan in barley and related glucans, which comprises cultivating *Aspergillus phoenicis* at between 25° and 30° C in a submerged culture in a

nutrient medium containing assimilable sources of carbon and nitrogen together with other essential nutrients under aerobic conditions, thereafter recovering endo-beta-glucanase from the broth.

4,110,164
AGGLOMERATED FIBROUS CELLULOSE

Robert F. Sutthoff; Robert V. MacAllister, and Khaja Khaleeluddin, all of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Apr. 19, 1977, Ser. No. 788,728
Int. Cl.^{2} C07G *7/02*
U.S. Cl. 195—63 **18 Claims**

1. An agglomerated fibrous ion exchange cellulose composite wherein the cellulose is embedded in a hydrophobic polymer and relatively large portions of the cellulose have enzymes adsorbed thereon.

4,110,165
PROCESS FOR THE PRODUCTION OF CLAVULANIC ACID

Martin Cole, Dorking; Thomas Trevor Howarth, Rudwick, and Christopher Reading, Southwater, all of England, assignors to Beecham Group Limited, Great Britain

Division of Ser. No. 569,007, Apr. 17, 1975. This application Sep. 24, 1976, Ser. No. 726,061
Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Jan. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74; Dec. 11, 1974, 53525/74
Int. Cl.^{2} C12D *9/14*
U.S. Cl. 195—80 R **19 Claims**

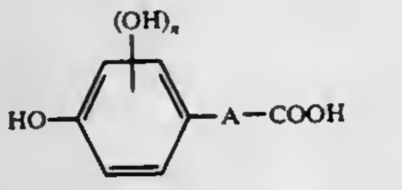
1. A process for the production of clavulanic acid or a salt thereof which comprises cultivating a strain of *Streptomyces clavuligerus* in a suitable medium containing assimilable sources of carbon, nitrogen and mineral salt and isolating the clavulanic acid or salt thereof from the culture medium.

4,110,166
PROCESS FOR THE PRODUCTION OF NOCARDICIN A

Shigeru Mori, Nishinomiya; Shigeyoshi Ohsawa, Takatsuki; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 15, 1976, Ser. No. 742,013
Claims priority, application Japan, Nov. 19, 1975, 50-139405
Int. Cl.^{2} C12D *9/14*
U.S. Cl. 195—96 **29 Claims**

1. In the process for preparing Nocardicin A by culturing *Nocardia uniformis* subsp. tsuyamanensis in a fermentation medium, the improvement which comprises, to the fermentation medium, adding at least one additive selected from shikimic acid, a carboxylic acid of the formula:



(I)

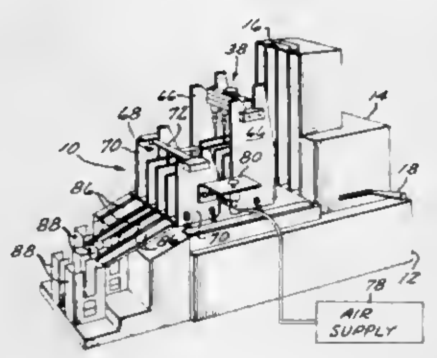
wherein
- A is alkylene group having hydroxy, amino, acylamino or oxo group, and
- *n* is an integer of 0–4;

glycine, alanine, serine, homoserine, α-aminobutyric acid and α,β-diaminopropionic acid; and their ester, acid amide and hydrazide derivatives at the carboxy in a concentration of 2–0.001% by weight.

4,110,167
SEMI-AUTOMATED SLIDE PROCESSOR DEVICE

John Melnyk, 1316 Cerritos Dr., Laguna Beach, Calif. 92651

Filed Jul. 12, 1977, Ser. No. 814,854
Int. Cl.^{2} C12K *1/00*
U.S. Cl. 195—127 **6 Claims**



1. A semi-automated slide processor device for preparing simultaneously a plurality of slides of cell cultures for cytogenetic analysis, comprising:
- stacking means for stacking a supply of slides; including a plurality of stacks of said slides;
- cell dispensing means for releasing a suspension of cells simultaneously on each of a plurality of slides, said cell dispensing means including a manifold means having a plurality of openings covered by an elastomeric membrane, and including plunger means for producing pressure on said manifold means to release said suspension of cells;
- cell dispersal means for spreading a suspension of cells into a film on each of said slides simultaneously; and
- means for moving slides from said stacking means to a location beneath said cell dispensing means and then to a location beneath said cell despersal means, said means for moving slides including a plurality of longitudinal channels for passage of slides.

4,110,168
PROCESS FOR THE SEPARATION OF TARRY DUSTS FROM COKE OVEN GAS

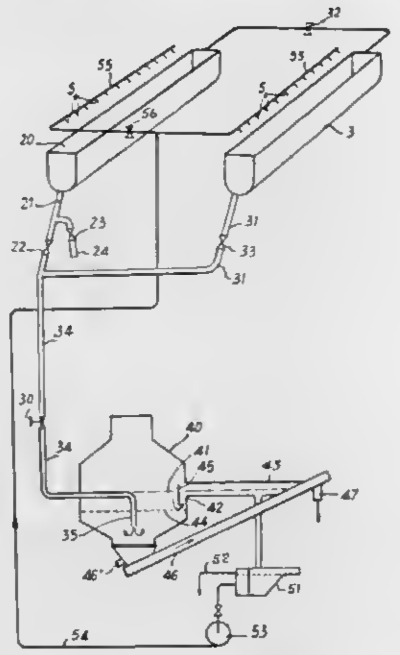
Henri Brice, Saint-Avold Moselle, France, assignor to Houilleres du Bassin de Lorraine, Freyming-Merlebach, France

Filed Dec. 29, 1976, Ser. No. 755,450
Claims priority, application France, Jan. 22, 1976, 76 01648
Int. Cl.^{2} C10B *27/00, 27/04*
U.S. Cl. 201—4 **5 Claims**

1. In a process of treating a mixture of by-products resulting during charging and distilling bituminous coal, for the production of coke, chambers of a horizontal coke oven battery comprising a hydraulic gas collecting main for offtake of the distillation gas denoted as charging gas main and a principal crude-gas collecting main,
- wherein opening and closing means providing substantially fluid-tight closure are disposed at least between each chamber and said charging gas main,
- wherein said mixture comprises gases, dusts, tar and water vapor, the temperature of said mixture being in the range from 600° to 800° C.,
- wherein ammoniacal water is employed in said charging gas and crude-gas collecting mains to cool said mixture, which ammoniacal water-containing mixture is denoted as a mix,
- wherein said mix which is discharged from the charging gas and crude-gas collecting mains is subjected to a step of decantation to obtain clarified ammoniacal water and a product containing tar and dusts separated from said ammoniacal waters, and wherein said clarified ammoniacal water is recycled to the mains,

the improvement consisting of adjusting, at any time during the process up to and during the step of decantation, the

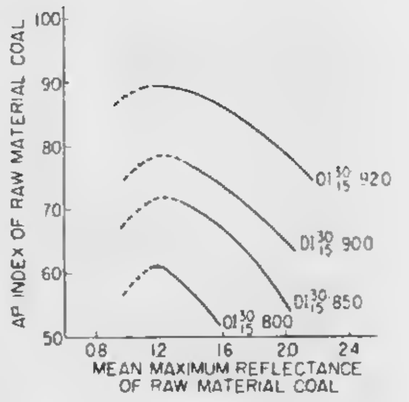
weight ratio of said dusts to said tar to a range substantially between 1.3 and 1.6, whereby in the step of decantation said product of tar and dusts is in substantially solid form.



4,110,169
METHOD FOR MANUFACTURING HIGH-STRENGTH FORMED COKE IN SLIGHT MUTUAL AGGLOMERATION USING HORIZONTAL TYPE COKE OVEN BATTERY

Gyoichi Suzuki, Tokyo; Sanseki Moriguchi, Yokohama; Takashi Miyazu, Tokyo; Yasuo Okuyama, Yokohama; Masahiro Muroya, Yokohama; Mamoru Yanagiuchi, Yokohama; Takashi Mori, Yokohama, and Mitsutoshi Miura, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 665,051, Mar. 8, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,897
Claims priority, application Japan, Apr. 1, 1975, 50-38562
Int. Cl.^{2} C10B *53/08, 57/04*
U.S. Cl. 201—6 **2 Claims**



1. In a method for manufacturing a high-strenght formed coke in a slight mutual agglomeration solely from formed coal in a conventional horizontal type coke oven battery, which comprises sieving a plurality of different types of raw material coal fines to a size not exceeding 1.5 mm., mixing said plurality of different types of raw material coal fines thus sieved with a binder, forming same to produce a formed coal, charging only said formed coal into said coke oven battery, and then carbonizing said formed coal in said coke oven battery under conventional carburizing conditions to produce a formed coke, the improvement characterized by:

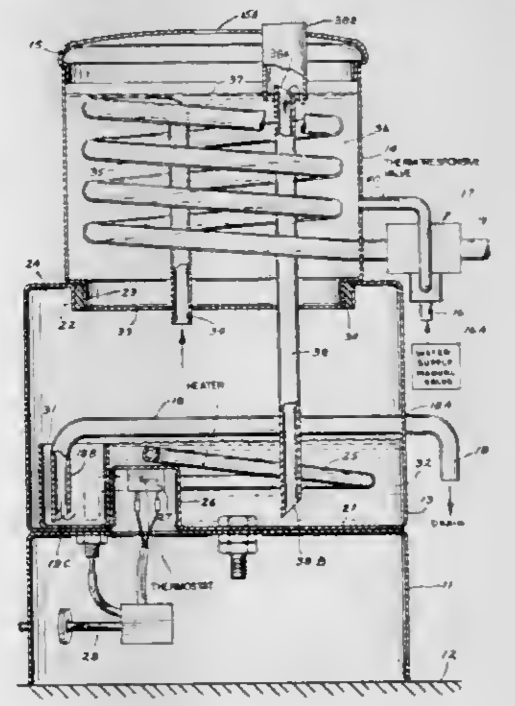
blending said plurality of different types of coal fines after said sieving step to form a mixture of coal fines so as to satisfy the following conditions:
(a) AP index: 75 at the minimum,
(b) Mean maximum reflectance: 1.20% at the minimum, and
(c) A [dilatation]-[contraction] value of from −2 to +5% when carbonized under conventional conditions in said coke oven battery at a heating rate of 5° C./min. (350° – 600° C.);

whereby said formed coke has a percentage of co-agglomeration within a range of from 40 to 90%.

4,110,170
HOME WATER DISTILLER

Fred C. Kirschman, Briardale Rte. 2, Bismarck, N. Dak. 58501, and Wallace B. Bolte, Box 204, Regent, N. Dak. 58650

Filed Apr. 28, 1976, Ser. No. 681,051
Int. Cl.^{2} B01D *3/42*
U.S. Cl. 202—160 **8 Claims**

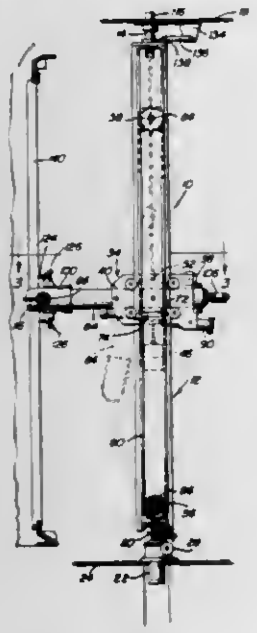


1. A home water distilling apparatus comprising a housing defining a boiling chamber, heating means to heat and evaporate water in said boiling chamber, a water level control in said boiling chamber comprising drain means opening to said boiling chamber and permitting flow of excess water from said boiling chamber over a weir when the water level exceeds the control level of said weir in said boiling chamber, means associated with said housing defining a preheat water chamber having an inlet and a supply passageway forming an outlet from said preheat chamber to said boiling chamber and permitting free flow of water from said preheat chamber to said boiling chamber when the water level in the preheat chamber is above a desired level, said supply passageway opening to said boiling chamber below the control level of said weir, valve means to control flow of input water from a source to said preheat water chamber at the inlet to the preheat water chamber, means forming a condenser passageway having an inlet operatively connected to receive water vapor from said boiling chamber and having an outlet for distilled water, said means forming a condenser passageway being positioned to provide heat transfer from water vapor in the condenser passageway to water in said preheat water chamber, said valve means including a thermo responsive portion operable as a function of the temperature of distilled water in the condenser passageway to open said valve means to admit inlet water from a source to said preheat water chamber and permit flow through said supply passageway to said boiling chamber when the thermo responsive portion senses a temperature greater than a desired level.

4,110,171
MECHANICAL JAMB CLEANER

William R. Baird, Sturgis; Kenneth O. Sutton, Morganfield, and Billy C. Baird, Sullivan, all of Ky., assignors to Saturn Machine & Welding Co., Inc., Sturgis, Ky.

Filed May 20, 1977, Ser. No. 798,869
Int. Cl.^{2} C10B *43/04*
U.S. Cl. 202—241 **16 Claims**



1. A coke oven jamb cleaner including an upstanding support, a carriage mounted on said support for vertical reciprocation between predetermined upper and lower limit positions on said support, a jamb cleaning head mounted on said carriage for cleaning engagement with and vertical reciprocation along an adjacent upstanding jamb portion, a support structure, means supporting said support from said support structure for vertical shifting relative thereto, first drive means connected between said support and carriage for driving the latter along the former to and between said limit positions, reversible second drive means connected between said support structure and said support for reversibly variably shifting said support relative to said support structure, actuator means for said second drive means operative to sense upper and lower limits of an upstanding jamb portion with which said cleaning head is operatively associated and to actuate said second drive means to lower and raise said support relative to said support structure in response to sensing upper and lower limits, respectively, of said jamb, whereby the upper and lower limit positions of movement of said carriage relative to said support may be achieved by upward and downward shifting, respectively, of said support relative to said support structure when the vertical spacing between upper and lower limits of said jamb is less than the vertical spacing between upper and lower limit positions of vertical reciprocation of said carriage relative to said support.

4,110,172
SOLAR ENERGY COLLECTING POND

John F. Spears, Jr., Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

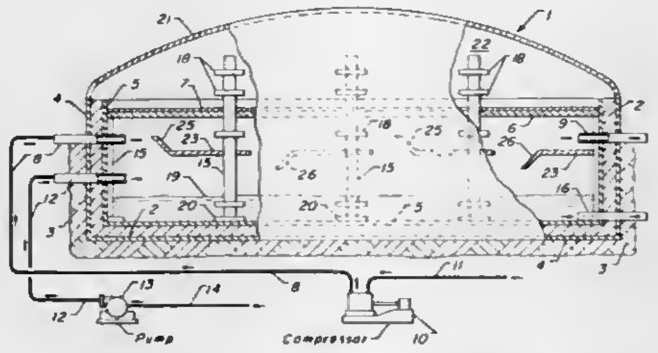
Continuation-in-part of Ser. No. 764,255, Jan. 31, 1977, and Ser. No. 764,256, Jan. 31, 1977. This application Mar. 28, 1977, Ser. No. 782,147
Int. Cl.^{2} B01D *1/14*
U.S. Cl. 202—234 **10 Claims**

1. A solar energy collecing pond which comprises, in cooperative combination:

(a) a water-containing reservoir having bottom and vertical walls with an interior surface and said reservoir further having (i) at least one water inlet conduit communicating with water supply means, (ii) at least one water outlet conduit, (iii) at least one air inlet conduit communicating with air supply means and, (iv) at least one air outlet conduit, said air conduits being disposed above said water conduits;

(b) a layer of insulating material contacting the interior surface of the bottom and vertical walls of said reservoir;

(c) a horizontal plate disposed above said air and water conduits, and having (i) substantially the same area as said reservoir and, (ii) a coating of spectrally-selective material contiguous with the upper surface thereof;



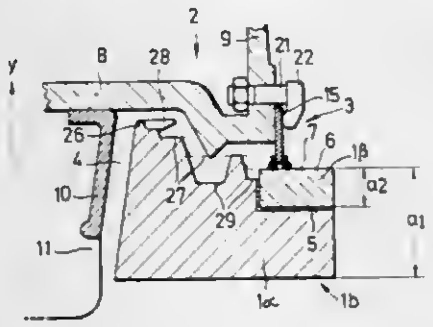
(d) a plurality of spaced-apart vertical support standards attached to said horizontal plate and in contact with the bottom of said reservoir; and,

(e) a transparent cover attached to the upper peripheral edges of said reservoir, and forming a dead air space above said horizontal plate.

4,110,173
SEALING CLOSURE FOR AN OPENING OF A COKING OVEN

Kürt Dix, Bochum, Fed. Rep. of Germany, assignor to G. Wolf Jr. Kommanditgesellschaft, Bochum-Linden, Fed. Rep. of Germany

Filed Jan. 17, 1977, Ser. No. 759,852
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1976, 2601707
Int. Cl.^{2} C10B *25/06, 25/16*
U.S. Cl. 202—248 **30 Claims**

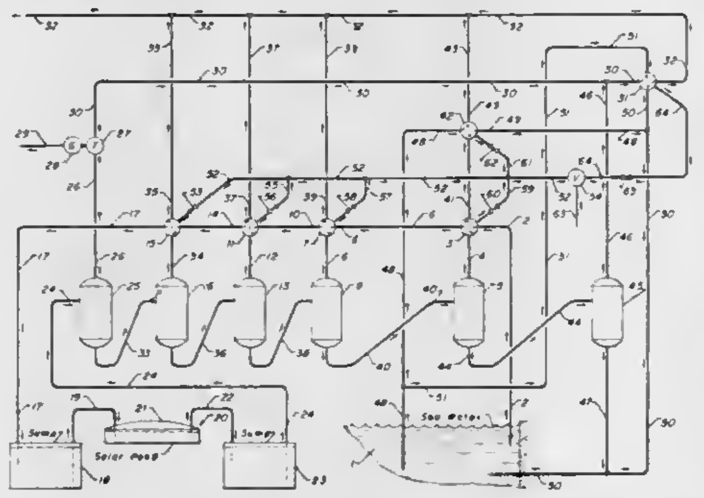


1. A closure for an opening of a coking oven, comprising a circumferentially complete frame mounted on the coking oven, bounding at least an outwardly open end of the opening and having a contact surface surrounding the open end of the opening with a spacing therefrom; a door receivable in the opening with a clearance from said frame; means for removably holding said door in a closing position thereof with respect to said frame for closing the opening; means for sealing said clearance, including at least one sealing member which includes an elongated rigid support element having a marginal portion juxtaposable with said contact surface and having longitudinally distributed projections, and a sealing element of resiliently yieldable material having an elongated recess in which said marginal portion of said support element is received to mount said sealing element on said support element, a sealing surface parallel to said recess and juxtaposable with said contact surface of said frame, and a plurality of cutouts communicating said recess with said sealing surface and adapted to accommodate said projections of said support element; and means for connecting said support element to said door for an adjustment of the position of said support element relative to said door and for retaining said support element in an adjusted position thereof relative to said door in which said sealing surface of said sealing element sealingly contacts said contact surface of said frame in said closing position of said door.

4,110,174
POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 16, 1976, Ser. No. 751,424
Int. Cl.^{2} B01D *3/06*
U.S. Cl. 203—11 **11 Claims**



1. A process for simultaneously recovering potable water and generating power from a source of salinous water, which process comprises the sequential steps of:

(a) increasing the temperature of a first portion of said salinous water via indirect successive contact with a plurality of non-salinous vaporous phases which are (i) derived from said first salinous water portion and, (ii) obtained therefrom at elevated temperature and subatmospheric pressure;

(b) introducing said first salinous water portion into a solar radiation heat sink, and therein exposing said first portion to radiant solar energy for a time sufficient to raise its temperature to a level of at least about 135° F.;

(c) introducing the thus-heated first salinous water portion into the first of a series of flash separation zones, each succeeding one of which is maintained at a lower subatmospheric pressure, to provide a plurality of non-salinous vaporous phases, and through which the salinous liquid phase passes in series flow;

(d) introducing at least one of said vaporous phases into a turbine, and generating power from the resulting motion thereof;

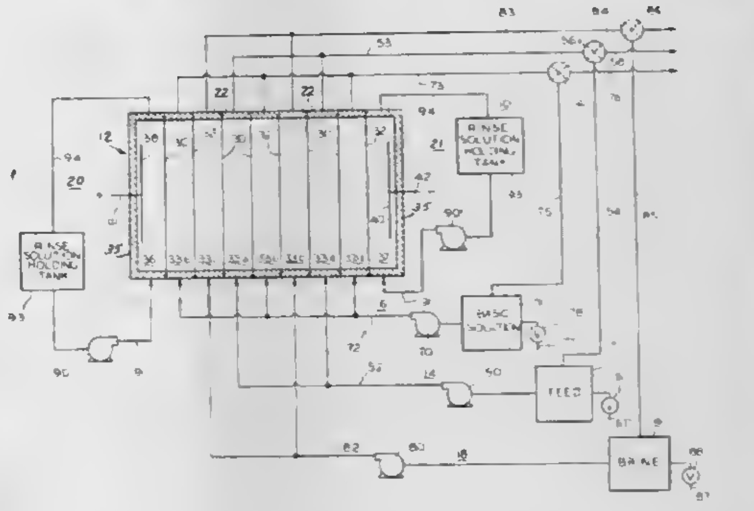
(e) indirectly contacting said first salinous water portion, prior to the introduction thereof into said solar radiation heat sink, with each of the remaining vaporous phases in said plurality, and in the order of increasing temperatures, and recovering potable water from said remaining plurality of non-salinous vaporous phases; and,

(f) indirectly contacting the exit vapors from said turbine with a second portion of said salinous water to recover additional potable water.

4,110,175
ELECTRODIALYSIS METHOD

Richard M. Ahlgren, Waukesha, and Burnett M. Schneider, Wind Lake, both of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 701,111, Jun. 30, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 742,360
Int. Cl.^{2} B01D *13/02;* A23C *21/00, 9/14*
U.S. Cl. 204—180 P **6 Claims**



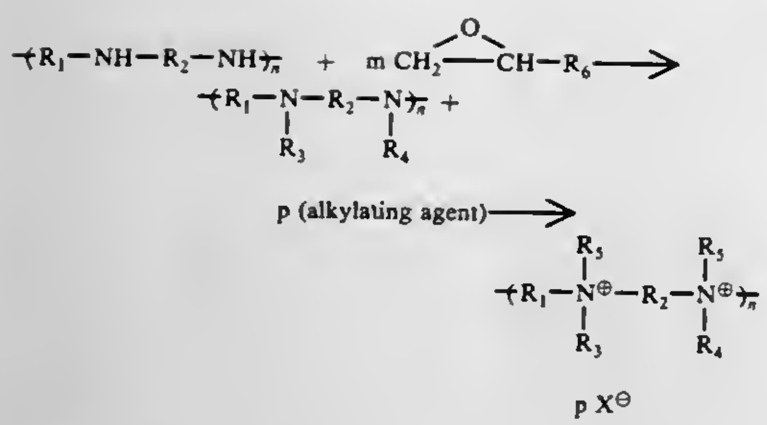
1. A permeation separation process comprising providing an enclosure, a plurality of ion-selective membranes disposed in spaced relation to define a plurality of permeation cells within said enclosure wherein first and second ones of said membranes are anion-selective and are disposed in side-by-side relation to define a first one of said cells, and third and fourth ones of said membranes being cationselective membranes each disposed adjacent one of said first and second membranes and on the opposite sides thereof to define second and third cells adjacent said first cell, and an anode disposed on the side of said membranes most proximate to said third cell and a cathode on the side of said membranes most proximate to said second cell, passing a whey solution including lactate anions and hydrogen cations into said first cell, a basic solution containing metallic cations and hydroxyl anions into said second cell, and a carrier solution into said third cell, applying an electric field across said cells and between the anode and cathode, passing lactate anions through said first membrane and from said first cell into said third cell, passing hydroxyl anions from said second cell into said first cell for combination with the hydrogen cations therein to form water whereby the ionic concentration of said first cell is decreased, withdrawing from said first cell a whey solution having an acid concentration less than that of said first solution, withdrawing from said second cell a basic solution which is less concentrated than that passed into said cell and substantially uncontaminated by said lactate anions, and withdrawing from said third cell the lactate anions along with said carrier solution.

4,110,176
ELECTRODEPOSITION OF COPPER

Hans-Gerhard Creutz, deceased, late of Yale, Mich. (by Katharina A. Creutz, administratrix), and Roy Wilbur Herr, Troy, Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

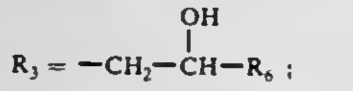
Continuation-in-part of Ser. No. 557,443, Mar. 11, 1975, abandoned. This application May 4, 1977, Ser. No. 793,701
Int. Cl.^{2} C25D *3/38*
U.S. Cl. 204—52 R **6 Claims**

1. A bath for electrodepositing copper comprising an aqueous acidic copper plating bath having dissolved therein about 0.04 to 1000 mg/l of a reaction product of an alkoxylated polyalkylenimine with an alkylating agent as defined below:

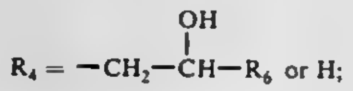


wherein:

R_1 = alkylene group of 1–6 carbon atoms;
R_2 = alkylene group of 1–6 carbon atoms;



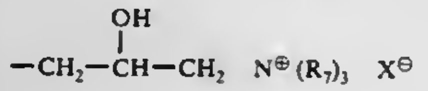
$$R_3 = -CH_2-\overset{\displaystyle OH}{\overset{|}{C}H}-R_6\ ;$$



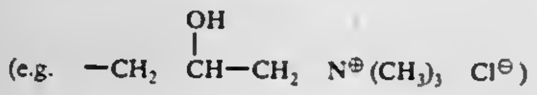
$$R_4 = -CH_2-\overset{\displaystyle OH}{\overset{|}{C}H}-R_6 \text{ or } H;$$

R_5 =

alkyl group of 1–4 carbon atoms;
aralkyl;
alkenyl group of 2–4 carbon atoms;
alkynyl group of 2–4 carbon atoms;
alkylene sulfonate group of 1–4 carbon atoms (e.g. $-CH_2CH_2CH_2SO_3^{\ominus}$); and



$$-CH_2-\overset{\displaystyle OH}{\overset{|}{C}H}-CH_2\quad N^{\oplus}(R_7)_3\quad X^{\ominus}$$



$$\text{(e.g.}\quad -CH_2\quad \overset{\displaystyle OH}{\overset{|}{C}H}-CH_2\quad N^{\oplus}(CH_3)_3\quad Cl^{\ominus}\text{)}$$

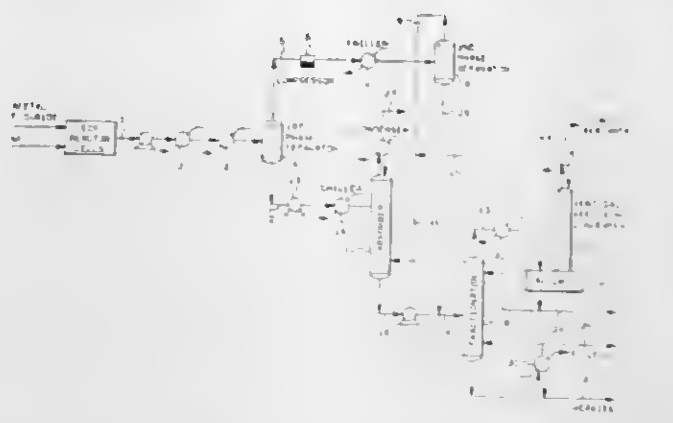
R_6 = H, $-CH_3$, $-CH_2OH$;
R_7 = alkyl group of 1–4 carbon atoms;
m = 1 to 2;
$X^{\ominus}$ = $Cl^{\ominus}$, $Br^{\ominus}$, $CH_3SO_4^{\ominus}$;
p = 1 to 2 and
n = 7.0 to 23,500.

4,110,177

PROCESS FOR RECOVERY AND PURIFICATION OF A PERFLUOROCARBOXYLIC ACID FLUORIDE FROM ELECTROCHEMICAL CELL FLUORINATION EFFLUENT

Franklin T. Barber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 16, 1977, Ser. No. 852,162
Int. Cl.² C25B *3/08*
U.S. Cl. 204—59 F **10 Claims**

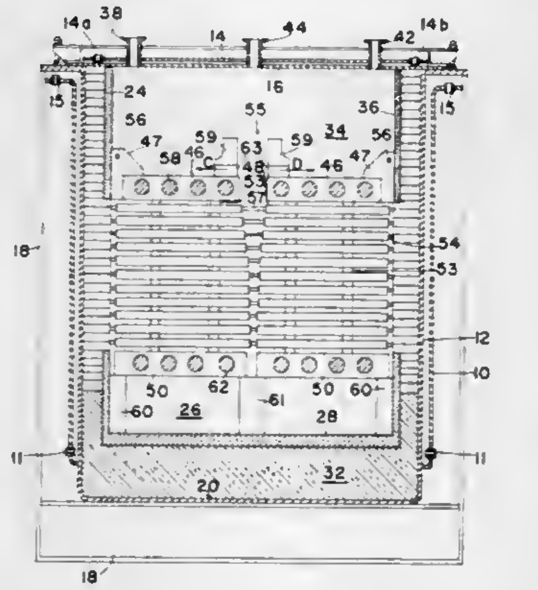
1. The recovery of trifluoroacetylfluoride from a reaction mass stream obtained from an electrochemical fluorination zone in which electrochemical fluorination of acetylfluoride to produce trifluoroacetylfluoride is effected which comprises: chilling said stream under pressure to condense a substantial portion of the constituents thereof, passing the chill stream into a phase separation zone, in said phase separation zone separating said stream into at least a first vapor stream and a first liquid stream, removing vapors from said zone, further chilling and passing the same into a second zone, in said second zone separating at least one further vaporous stream from at least one further liquid stream, pumping and chilling said first liquid stream to subcool the same and then passing it into an absorption zone as an absorption medium therefore, passing said further vaporous stream from said second zone into said absorption zone into absorption contact with said first liquid stream therein to recover into said medium substantial quantities of trifluoroacetylfluoride, other reaction products and HF therefrom, removing thus enriched absorption medium from said absorption zone and subjecting the same to fractionation in a fractionation zone to recover the trifluoroacetylfluoride therefrom.



4,110,178

FLOW CONTROL BAFFLES FOR MOLTEN SALT ELECTROLYSIS

Alfred F. LaCamera, Level Green; Thomas A. Trzeciak, Lower Burrell, and Donald E. Kinosz, Tarentum, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed May 17, 1977, Ser. No. 797,746
Int. Cl.² C25C *3/00, 3/06*
U.S. Cl. 204—64 R **4 Claims**



1. An electrolytic cell for producing metal in a bath of molten salt, said bath being capable of flowing in the cell to remove molten metal from spaces provided between superposed electrodes of the cell, said cell including

a bath of molten salt having an upper level within the cell,

at least one vertical stack of superposed electrodes located in the bath, the uppermost electrode of the stack being located beneath the upper level of the bath, the vertical stack being arranged to provide spaces between adjacent electrodes for the production of metal, and passages within the cell that extend vertically between upper and lower regions of the cell, said vertical passages permitting respective upward and downward flow of the bath, and

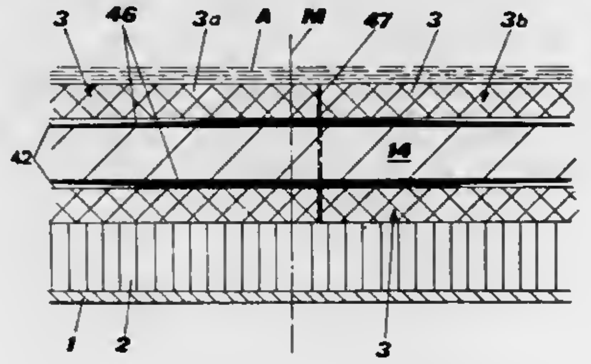
a baffle located adjacent the passage for the upward flow of the bath and extending vertically above the uppermost electrode of the vertical stack, said baffle being effective to increase the flow of the bath and molten metal in the spaces between adjacent superposed electrodes of the vertical stack, and to direct the upward flow of the bath

that occurs in the upward flow passage laterally over the uppermost electrode but beneath the upper level of the bath, the lateral direction of the bath beneath its upper level being effective to substantially reduce opportunity for molten metal to break through the upper level of the bath.

4,110,179

PROCESS AND DEVICE FOR THE PRODUCTION OF ALUMINIUM BY THE ELECTROLYSIS OF A MOLTEN CHARGE

Theodor Tschopp, Zollikon, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Apr. 28, 1977, Ser. No. 791,973
Claims priority, application Switzerland, May 13, 1976, 6015/76
Int. Cl.² C25C *3/08, 3/06*
U.S. Cl. 204—67 **15 Claims**



1. In a process for the production of aluminum from an aluminum compound by electrolysis in an electrolytic cell, the cell having a center, at least two edges, a predetermined width and a containing molten electrolyte, and including a plurality of anodes immersed in the electrolyte, a carbon layer lining the cell, a plurality of cathode bars embedded in the carbon lining, and disposed at a predetermined distance from the anodes, the aluminum compound being disposed between the anodes and the cathodes, the steps comprising:

passing a current through the cell,

precipitating aluminum from the aluminum compound, the aluminum serving as a cathode, and

reducing progressively the area of electrical contact between the cathode bars and the carbon lining from the center of the cell to the edges thereof, so that the carbon lining draws operatively substantially the same current per unit area from the precipitated aluminum over approximately the whole width of the cell.

4,110,180

PROCESS FOR ELECTROLYSIS OF BROMIDE CONTAINING ELECTROLYTES

Antonio Nidola, Milan, Italy; Vittorio De Nora, Nassau, The Bahamas, and Placido M. Spaziante, Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland
Continuation-in-part of Ser. No. 680,984, Apr. 28, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,216
Int. Cl.² C25B *1/24*
U.S. Cl. 204—128 **10 Claims**

1. In the method of electrolyzing an aqueous electrolyte containing bromide ions to form bromine in an electrolysis cell equipped with a cathode and an anode comprising at least a valve metal base, the improvement comprising the valve metal base being titanium alloyed with at least one member of the group consisting of tantalum, niobium, hafnium, vanadium and zinc in an amount effective to maintain in the electrolyte a breakdown voltage at the anode base in excess of 2 volts (NHE).

4,110,181

METHOD OF HANDLING AQUEOUS SOLUTIONS OF ALKALI METAL HYDROXIDES THAT ARE CONCENTRATED IN RESPECT OF ALKALI METAL HALIDES

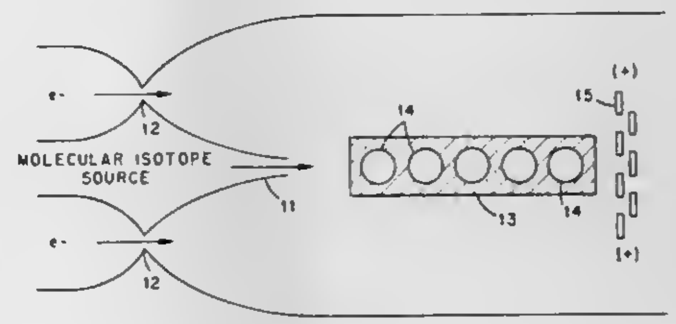
Guy Sluse, Rixensart, and Francois Dujardin, Brussels, both of Belgium, assignors to Solvay & Cie, Belgium
Filed Sep. 27, 1976, Ser. No. 727,011
Claims priority, application France, Oct. 8, 1975, 75 31214
Int. Cl.² C23F *13/00*
U.S. Cl. 204—147 **5 Claims**

1. A method of handling hot aqueous solutions of caustic soda or caustic potash which are concentrated with respect to sodium or potassium chloride, in metallic equipment made of ordinary mild steel, comprising: controlling the concentration of the solution so that it contains less than 500g of alkali metal hydroxide per kg, maintaining the temperature of the solution below 130° C, and maintaining the equipment at an anodic potential lying substantially between −1,000 mV and −200 mV with respect to the potential of the saturated calomel electrode.

4,110,182

ISOTOPE SEPARATION BY PHOTOSELECTIVE DISSOCIATIVE ELECTRON

Charles G. Stevens, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 17, 1976, Ser. No. 696,997
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **13 Claims**



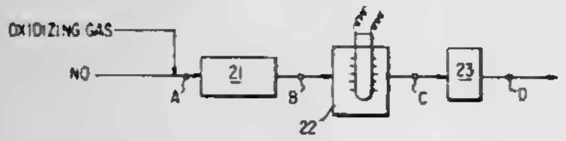
1. A method for separating isotopes by photoselective dissociative electron attachment to molecular species in which an element is present in a plurality of isotopes, those molecules containing a first such isotope being capable of absorbing radiation at a given frequency corresponding to a predetermined vibrationally excited state having associated therewith an electron capture energy region substantially non-overlapping with the electron capture energy ranges associated with the lowest vibrational states of the molecular species to a substantially greater degree than those molecules containing a second such isotope, said molecular species being in the gaseous phase, which method comprises:

cooling the molecular species to a temperature at which substantially all the molecules contained therein reside in the lowest vibrational states thereof;

subjecting the molecular species to radiation at the given frequency, thereby exciting those molecules containing said first isotope to said predetermined vibrationally excited state without substantially vibrationally exciting those molecules containing a second such isotope;

dissociating the vibrationally excited molecules by electron capture dissociation into a neutral product and a negatively charged product without substantially dissociating the unexcited by contacting the molecular stream with electrons having an energy range corresponding to said electron capture energy region associated with said predetermined vibrationally excited state, one of the dissociation products being enriched in said first isotope; and separating the dissociation product enriched in said first isotope from the reaction system.

4,110,183
PROCESS FOR DENITRATION OF EXHAUST GAS
Isao Furuta, and Yoshimi Takiguchi, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan
Filed Jul. 29, 1977, Ser. No. 820,316
Claims priority, application Japan, Jul. 31, 1976, 51-91760
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **9 Claims**



1. A process for removing nitrogen oxides from exhaust gases which comprises:

introducing an oxidizing gas into the exhaust gas to oxidize the nitrogen monoxide contained therein to nitrogen dioxide and thereby form a first oxidized exhaust gas;

irradiating said first oxidized gas with actinic light to oxidize said nitrogen dioxide to nitric acid and thereby form a second oxidized exhaust gas; and

removing said nitric acid from said second oxidized exhaust gas.

4,110,184
PHOTOCURABLE DENTAL FILLING COMPOSITIONS
Edward Charles Dart; John Burnett Cantwell; James Rodney Traynor; Joseph Franciszek Jaworzyn, and Jozef Nemcek, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
Continuation-in-part of Ser. No. 463,145, Apr. 22, 1974, abandoned. This application Oct. 11, 1974, Ser. No. 514,289
Claims priority, application United Kingdom, Apr. 24, 1973, 19270/73
Int. Cl.² C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **1 Claim**

1. A dental filling composition comprising

(a) from 60 to 80% by weight of the composition of an inorganic particulate filler selected from glass, quartz of silica of which at least 50% of the particles have a maximum dimension of not greater than 300 microns, and

(b) a polymerisable material comprising:

a polymerisable prepolymer being the reaction product of a urethane prepolymer and 2-hydroxyethyl methacrylate; the said urethane prepolymer being the reaction product of a di-isocyanate selected from the group consisting of 4,4'-diisocyanatodiphenylmethane, hexamethylene di-isocyanate, 4,4'-dicyclohexylmethane di-isocyanate and 2,4-tolylene di-isocyanate, and a diol being the condensate obtained by reacting 2,2-bis-(p-hydroxyphenyl)propane and propylene oxide in a molar ratio of 1:2;

up to 100% by weight of the polymerisable prepolymer of methacrylic acid or an ester of methacrylic acid selected from the group consisting of methyl methacrylate, ethylene glycol dimethacrylate, hydroxyethyl methacrylate, triethylene glycol dimethacrylate and allyl methacrylate;

and from 0.01 to 10% by weight of the polymerisable material of a photosensitive catalyst comprising a photosensitiser selected from the group consisting of fluorenone, benzil, camphorquinone and α-naphthil, and a reducing agent being dimethylaminoethyl methacrylate.

4,110,185
IRRADIATION STERILIZATION OF SEMI-CRYSTALLINE POLYMERS
Joel Williams, Cary; Terry Dunn, and Vivian Stannett, both of Raleigh, all of N.C., assignors to Becton, Dickinson and Company, Rotherford, N.J.
Filed Nov. 10, 1976, Ser. No. 740,618
Int. Cl.² C08F *2/54, 8/18;* A61L *1/00;* C083 *3/28*
U.S. Cl. 204—159.2 **19 Claims**

1. A process for sterilizing a semi-crystalline polymer, comprising:

subjecting to a sterilizing amount of high energy radiation a semi-crystalline polymer having a crystalline content of from 20-90% and having incorporated therein a mobilizing amount of a non-crystalline liquid mobilizing additive which increases the free volume of the polymer and retains the flexibility thereof to thereby produce a sterilized polymer which retains its flexibility.

4,110,186
FLUORINATED ETHYLENE-PROPYLENE COPOLYMER POWDERS HAVING IMPROVED ADHESION TO SUBSTRATES AND METHOD
Barry C. Arkles, Oreland, and Stephen Gerakaris, Havertown, both of Pa., assignors to Beatrice Foods Co., Chicago, Ill.
Filed May 13, 1975, Ser. No. 577,128
Int. Cl.² C08F *2/54*
U.S. Cl. 204—159.20 **13 Claims**

1. A method of improving the adhesion of a melt-processible fluorinated ethylene-propylene copolymer to metal substrates, comprising irradiating a dry powder consisting essentially of melt-processible tetrafluoroethylene-hexafluoropropylene copolymer with about 0.5 to 6 megarads of radiation in a gaseous oxygen-containing atmosphere to increase the melt index of the copolymer.

4,110,187
ULTRAVIOLET CURABLE POLYESTER BINDER AND COATING FORMULATION
Cephas H. Sloan, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 2, 1977, Ser. No. 830,298
Int. Cl.² C08G *18/00, 63/00*
U.S. Cl. 204—159.19 **12 Claims**

1. A radiation curable composition comprising a solution of

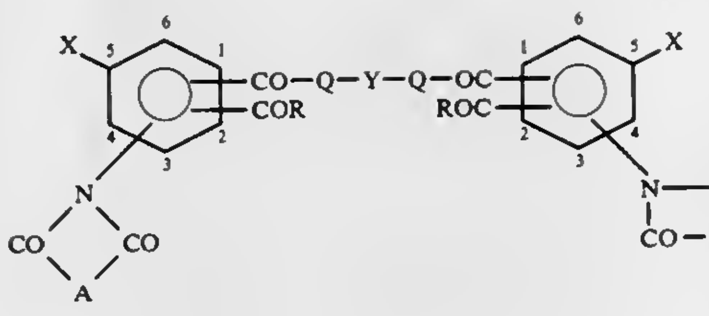
(A) from 5 to about 50 percent by weight of a polyester of terephthalic acid esters and a glycol of from about 60 mole percent to 100 mole percent 1,2-propylene glycol and from 0 to about 40 mole percent ethylene glycol; said polyester having an inherent viscosity of from about 0.05 to about 0.60 in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. at a concentration of 0.5 g. of polyester in 100 ml. of said solvent;

(B) from 95 to 50 percent by weight of an ethylenically unsaturated photopolymerizable compound; and

(C) An effective amount of a photoinitiator.

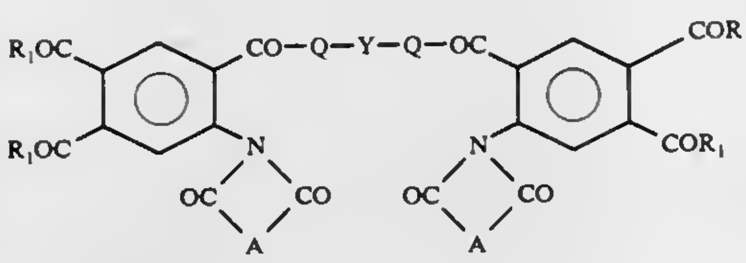
4,110,188
CROSSLINKABLE MIXTURES OF BIS-IMIDYL DERIVATIVES
Roland Darms, Therwil; Vratislav Kvita, Muttenz, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Dec. 6, 1976, Ser. No. 748,015
Claims priority, application Switzerland, Dec. 19, 1975, 16511/75
Int. Cl.² C08G *73/12*
U.S. Cl. 204—159.22 **22 Claims**

1. A crosslinkable mixture, essentially unpolymerized and stable at temperatures up to about 100° C, consisting of at least one compound of the formula I*a* or I*b*



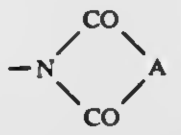
(Ia)

or



(Ib)

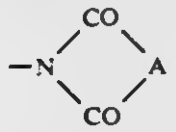
where in formula I*a* the



groups independently of each other are linked to the benzene rings in the 3- or 4- position; and a carbonyl of the —COQYQOC— moiety and a -COR group are attached in pairs to adjacent carbon atoms at the 1- and 2-positions of the benzene rings, whereby on each benzene ring one of said carbonyl and —COR groups can be in the 1-position and the other in the 2-position; or of a corresponding cyclised derivative, and of at least one diamine of the formula II

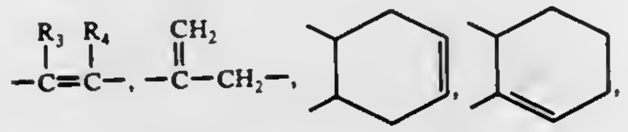
HQ-Z-QH (II);

whereby the molar ratio of the compound of the formula I*a* and/or I*b*, or of a corresponding cyclised derivative, to diamine of the formula II is between about 1.2: 1 to 50: 1, and wherein the X's independently of one another represent hydrogen or, if the radical



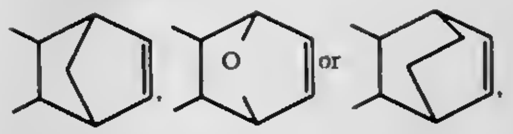
is in the 4-position of the benzene ring, also —COR₂, the R's and R₂'s independently of one another represent a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy of 1 to 18 carbon atoms or an O^-M^+ group,

the R_1's independently of one another represent a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one or two alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy of 1 to 18 carbon atoms or an O^-M^+ group, or two adjacent R_1's together represent the —O— grouping, the A's independently of one another represent a radical of the formula



$$-\overset{R_3}{\overset{|}{C}}=\overset{R_4}{\overset{|}{C}}-,\quad -\overset{CH_2}{\overset{\|}{C}}-CH_2-,$$

-continued

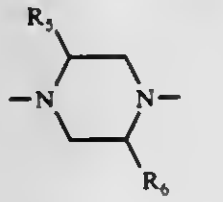


R_3 and R_4 independently of one another represent hydrogen, chlorine, bromine or methyl,

M^+ represents an alkali metal cation, a trialkylammonium cation having 3-24 carbon atoms, or a quaternary ammonium cation,

Y and Z independently of one another represent an aliphatic radical having at least two carbon atoms, a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical,

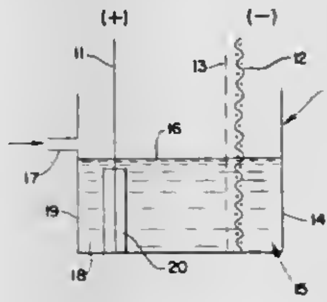
Q represents —NH—, or —Q—Y—Q— and/or —Q—Z—Q— represents the grouping



and

R_5 and R_6 independently of one another represent hydrogen, methyl or phenyl.

4,110,189
ELECTRO-OSMOTIC/PHORETIC PROCESS FOR CONCENTRATING CLAY
Albert C. Kunkle; William Floyd Abercrombie, Jr., and Charles John Akins, Jr., all of Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.
Continuation of Ser. No. 541,031, Jan. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 397,508, Sep. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,382, Jun. 5, 1972, abandoned. This application Jun. 16, 1976, Ser. No. 696,578
Int. Cl.² B01D *13/02*
U.S. Cl. 204—180 R **18 Claims**



1. A method of processing crude clay to obtain a refined clay filter cake of about 70% solids without spray drying comprising the sequential steps of

blunging and dispersing crude clay forming a slurry,

degritting, classifying and leaching the crude clay slurry flocculating said slurry and removing undesirable foreign materials to form a refined slurry,

filtering the refined slurry, and

simultaneously electro-phoretically separating suspended solid clay particles from the slurry and electroosmotically separating aqueous medium from the slurry to obtain a refined clay cake having a solids content in excess of about 70% solids.

4,110,190

APPARATUS FOR MACHINING ELECTRICALLY CONDUCTING SUBSTANCES BY ELECTROCHEMICAL ATTACK

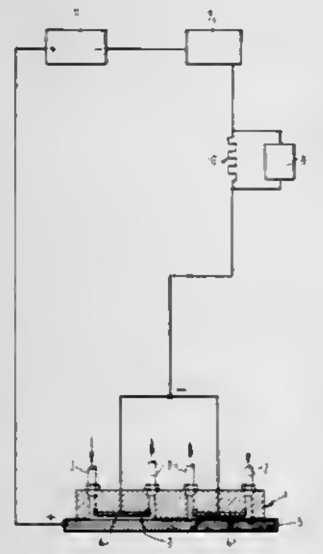
Kommer Visser, Amsterdam-Bijlmermeer, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Division of Ser. No. 705,174, Jul. 14, 1976, Pat. No. 4,073,710. This application Dec. 7, 1977, Ser. No. 858,408

Claims priority, application Netherlands, Aug. 11, 1975, 7509529

Int. Cl.² B23P *1/02;* **C25F** *3/02, 3/14*

U.S. Cl. 204—224 M **2 Claims**



1. In an apparatus for removing material from an electrically conducting workpiece by electrochemical attack of the kind including an electrically insulating flow-guiding template having afflux channels in a surface of the template, said channels being in communication with at least one liquid inlet and at least one liquid outlet and said template surface being adapted to engage the surface of the workpiece, the improvement which comprises electrodes disposed in said channels and embedded in the template, means for connecting the electrodes to the negative pole of a direct current source via a series-connected pulse generator and resistor, a current integrator connected in parallel to the resistor, and means for connecting the positive pole of the direct current source to the workpiece.

4,110,191

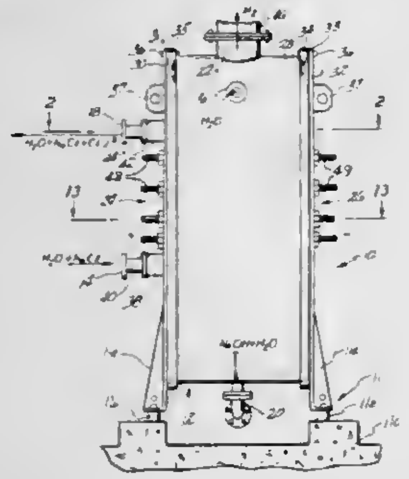
SEPARATOR-ELECTRODE UNIT FOR ELECTROLYTIC CELLS

Steven J. Specht, Cleveland, and John O. Adams, Englewood, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 16, 1977, Ser. No. 824,999

Int. Cl.² C25B *9/00, 13/02*

U.S. Cl. 204—266 **67 Claims**



1. A method of assembling a combination electrode separator unit for use in an electrolytic cell having a housing and interleaved parallel planar cathodes and anodes, which comprises the steps of:

(a) enveloping an electrode with a layer of separator material to create a first electrolyte chamber within said layer containing said electrode, and

(b) providing for passage of an electrical conductor, a supply fluid conduit and a product fluid conduit through said housing and layer into said created first electrolyte chamber.

4,110,192

PROCESS FOR LIQUEFYING COAL EMPLOYING A VENTED DISSOLVER

Richard Emil Hildebrand, Glenshaw; John Angelo Paraskos, and Herman Taylor, Jr., both of Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 30, 1976, Ser. No. 746,181

Int. Cl.² C10G *1/04*

U.S. Cl. 208—8 **14 Claims**

1. A process for liquefying coal at a hydrogen pressure above about 3,100 psi comprising passing a feed coal-solvent slurry and hydrogen through a tubular preheater zone to increase the temperature of the slurry to a maximum temperature from about 710° to about 800° F., passing effluent slurry from said preheater zone and hydrogen to a dissolver zone maintained at a temperature at least 10° F. higher than the maximum temperature in the preheater zone and in the range between about 750° and 900° F., the residence time in the dissolver zone being longer than in the preheater zone, venting a gaseous stream comprising carbon oxide gas, hydrogen and low boiling hydrocarbons from said dissolver zone, separately removing a liquid stream from said dissolver zone, and passing said removed liquid stream without a distillation step and hydrogen through a catalytic hydrogenation zone maintained at a temperature in the range 700° to 825° F.

4,110,193

PROCESS FOR PRODUCTION OF HYDROCARBONACEOUS FLUIDS FROM SOLIDS SUCH AS COAL AND OIL SHALE

John E. Gwyn, Katy, and Scott C. Roberts, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 593,403, Jul. 7, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,808

Int. Cl.² C10G *1/02*

U.S. Cl. 208—11 R **30 Claims**

1. A retorting process for recovery of hydrocarbonaceous fluids from solid material containing non-volatile carbonaceous materials comprising:

(a) countercurrently contacting said solid material subdivided to a particle size fluidizable in gas in the form of a relatively cool, upwardly moving fluidized mass in a vertically-oriented preheating zone with an inert relatively hot first particulate heat carrier thereby transferring sensible heat from the heat carrier to the subdivided solid material and heating said solid material to an elevated temperature below that required for retorting, said subdivided solid material being fluidized in gas in a manner to create a dilute-phase fluidized mass in the preheating zone and said particulate heat carrier being introduced in the upper portion of the preheating zone and having a particle size and density such that it falls through the dilute-phase fluidized mass at a substantially uniform rate and collects in the lower portion of the vertical preheating zone as a relatively cool first particulate heat carrier;

(b) recovering the bulk of said subdivided solid material at elevated temperature in the upper portion of said preheating zone and passing said recovered solid material to a retorting zone;

(c) recovering said relatively cool first particulate heat carrier in the lower portion of said preheating zone, and passing said recovered heat carrier to a heat recovery zone;

(d) introducing said subdivided solid material at elevated temperature into a vertically-oriented retorting zone as a dense phase, fluidized mass, and countercurrently contacting said fluidized mass in gas with a second inert particulate heat carrier heated to a temperature above that required for retorting to transfer sensible heat from the heat carrier to the subdivided solid material to obtain a vapor phase containing hydrocarbonaceous fluids and a solid particulate phase comprising a solid carbonaceous material-containing residue, said second particulate heat carrier being preheated in a separate heating zone and introduced in the upper portion of the retorting zone wherein its particle size and density are such that it falls at a substantially uniform rate and collects in the lower portion of the vertical retorting zone along with a minor amount of entrained solid material and solid carbonaceous material-containing residue;

(e) recovering said hydrocarbonaceous fluids from the upper portion of said retorting zone;

(f) separating said second particulate heat carrier in the lower portion of said retorting zone from solid carbonaceous material-containing residue and passing said separated heat carrier to a carrier heating zone wherein the carrier's temperature is raised to a level above that required for retorting, and returning said second particulate heat carrier after heating to the upper portion of the retorting zone;

(g) removing solid carbonaceous material-containing residue from the upper portion of the dense fluidized phase in the retorting zone and passing the residue to a heat recovery zone;

(h) introducing the solid carbonaceous material-containing residue from the retorting zone into a heat recovery zone, and countercurrently contacting said residue in gas with the relatively cool, first particulate heat carrier from the preheating zone to transfer sensible heat from the residue to the first particulate heat carrier and form a relatively hot first particulate heat carrier, and returning said relatively hot first particulate heat carrier to the preheating zone;

(i) recovering said relatively cool particulate residue from the heat recovery zone.

4,110,194

PROCESS AND APPARATUS FOR EXTRACTING BITUMINOUS OIL FROM TAR SANDS

Glenn R. Peterson, Idaho Falls; Marvin C. Hicks, Shelley, and Peter W. Schwartz, Idaho Falls, all of Id., assignors to Intermountain Oil Research, Inc., Idaho Falls, Id.

Filed Apr. 16, 1976, Ser. No. 677,523

Int. Cl.² C10G *1/04*

U.S. Cl. 208—11 LE **15 Claims**

1. A process for treating tar sands to recover the bituminous oil therefrom, comprising intimately mixing tar sands with a hydrocarbon solvent which has a specific gravity less than that of water and is capable of dissolving the bituminous oil contained in the tar sands; continuing said mixing for a time sufficient for the solvent to extract said bituminous oil from the tar sands, thereby producing a slurry of solid particles suspended in a solution of bituminous oil dissolved in said hydrocarbon solvent; feeding the slurry into a body of water beneath the surface thereof; allowing the solid particles in the slurry to settle to the bottom of the body of water and said solvent solution and dissolved bituminous oil to rise to the surface of the body of water to form a separate liquid phase above the surface of the body of water; removing water-wet solid particles from the bottom of the body of water; removing said solution of hydrocarbon solvent and dissolved bituminous oil from the surface of the body of water; and recovering the dissolved bituminous oil from the hydrocarbon solvent.

4,110,195

APPARATUS AND PROCESS FOR EXTRACTING OIL OR BITUMEN FROM TAR SANDS

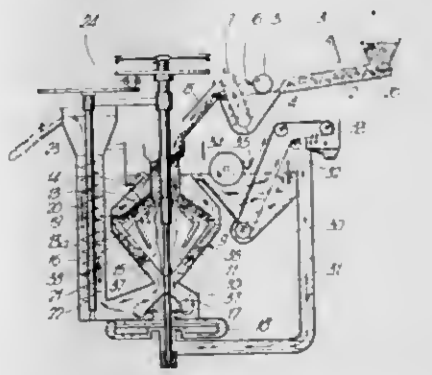
Dukecal Jenner Harding, Jackson Point, Canada, assignor to Magna International Inc., Downsview, Canada

Continuation-in-part of Ser. No. 542,985, Jan. 22, 1975, abandoned. This application May 31, 1977, Ser. No. 802,099

Claims priority, application United Kingdom, Jan. 24, 1974, 3395/74; Canada, Mar. 11, 1974, 194555

Int. Cl.² C10G *1/04*

U.S. Cl. 208—11 LE **42 Claims**



1. A method for the separation of bitumen from tar sands comprising the steps of:

mixing the tar sands with water to make a slurry, agitating this slurry and diluting the slurry with water to form a pulp having a water content at least equal in weight to the weight of tar sand and having a temperature in the range of about 35° to 120° F.,

moving said pulp primarily horizontally around an annular separating zone at a controlled speed which is low enough to allow gravity settling of bitumen free sand particles within said zone to form a rotationally static sand bed in contact with said horizontally moving pulp, the speed being high enough, having regard to any flow of back wash water, to prevent permanent settling of bitumen coated sand particles,

withdrawing sand from the bottom of said separating zone at a rate suitable for maintaining said bed of sand within said zone so that bitumen coated sand particles can be freed from bitumen by tumbling along the upper surface of said bed,

removing water containing fines and bitumen from an upper portion of said separating zone,

separating bitumen from the water, and

separating fines from said water to provide substantially bitumen-and-fines-free-water said bitumen-and-fines-free-water being returned to said separating zone while said fines are mixed with the bitumen free sand.

4,110,196

CONVERSION OF SULFONIC ACIDS INTO A HYDROCARBON OIL OF SUPERIOR OXIDATION STABILITY

David S. Bosniack, and Paul F. Korbach, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

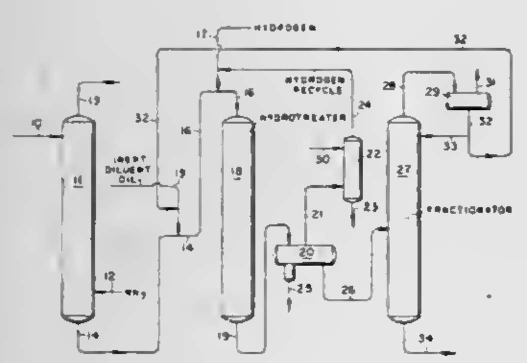
Filed Dec. 10, 1976, Ser. No. 749,595

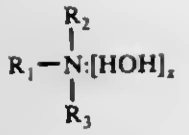
Int. Cl.² C10G *23/00*

U.S. Cl. 208—13 **8 Claims**

1. A process for converting a sulfonic acid or a mixture of sulfonic acids into a hydrocarbon oil of superior oxidation stability comprising:

(a) forming sulfonates by reacting said sulfonic acid or mixture of acids with a nitrogen-containing compound of the formula




$$R_1-\overset{\overset{\displaystyle R_2}{|}}{\underset{\underset{\displaystyle R_3}{|}}{N}}:[HOH]_x$$

wherein x is 0 or 1 and R_1, R_2, and R_3 are selected from the group consisting of hydrogen atoms, straight and branched chain aliphatic and substituted aliphatic radicals having from 1 to about 16 carbon atoms, cycloaliphatic radicals having from 3 to about 10 carbon atoms, and aryl radicals having from 6 to about 12 carbon atoms;

(b) reacting said sulfonates with hydrogen in the presence of a hydrotreating catalyst to cleave the carbon-sulfur bonds of said sulfonates; and

(c) recovering a hydrocarbon oil of superior oxidation stability from the reaction products of step (b).

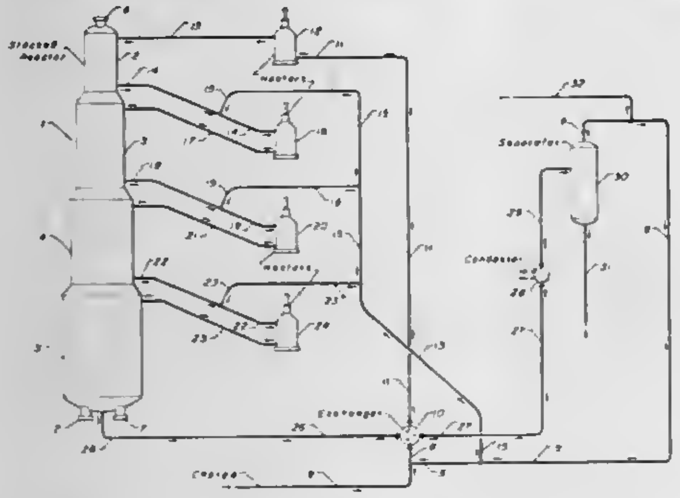
4,110,197
HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Joel G. Herning, and James B. Shelton, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 650,471, Jan. 19, 1976, abandoned. This application May 12, 1977, Ser. No. 796,276

Int. Cl.² C10G *23/08, 35/12*

U.S. Cl. 208—64 **10 Claims**



1. In a multiple-stage catalytic conversion system, wherein (1) heated hydrocarbonaceous charge stock and hydrogen flow serially through a plurality of catalytic reaction zones; (2) the reaction product effluent from each zone is heated prior to the introduction thereof into the next succeeding reaction zone; (3) catalyst particles move as an annular bed through each reaction zone via gravity-flow; and, (4) catalyst distribution, by volume increases in the direction of charge stock flow through said reaction zones, the method of converting said charge stock which comprises the steps of:

(a) heating said charge stock and hydrogen and introducing the heated mixture into a first reaction zone maintained at hydrocarbon conversion conditions;

(b) heating the resulting first reaction zone effluent in admixture with added hydrogen and introducing the total heated mixture into a succeeding reaction zone containing a greater amount of catalyst volume than said first reaction zone maintained at hydrocarbon conversion conditions;

(c) separating the effluent from the last reaction zone in said plurality to provide (i) a normally liquid product stream and, (ii) a hydrogen-rich vaporous phase;

(d) admixing a first portion of said hydrogen-rich phase with said charge stock prior to heating, and admixing a second portion of said hydrogen-rich phase with said first reaction zone effluent prior to heating, the ratio of said first and second portions of said hydrogen-rich phase selected to provide (i) decreasing vapor density, and, (ii) increasing lateral pressure drop, in the direction of charge stock flow through said reaction zones;

(e) at least periodically withdrawing catalyst particles from one of said reaction zones; and,

(f) at least periodically introducing fresh, or regenerated catalyst particles into another of said reaction zones.

4,110,198
PROCESS FOR HYDROCRACKING HYDROCARBONS

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 765,177, Feb. 3, 1977, Pat. No. 4,079,092, which is a continuation-in-part of Ser. No. 687,135, May 17, 1976, Pat. No. 4,018,669, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Oct. 31, 1977, Ser. No. 846,856

Int. Cl.² C10G *13/04;* **B01J** *27/06, 29/12*

U.S. Cl. 208—111 **10 Claims**

1. A process for hydrocracking a hydrocarbonaceous charge stock into lower molecular weight hydrocarbons, which process comprises reacting said charge stock with hydrogen at hydrocracking conditions, and in contact with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.05 to about 5 wt. % cobalt and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, rhodium, and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states, and separating the resulting reaction zone effluent to recover said lower molecular weight hydrocarbons.

4,110,199
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John F. Flagg, Rosemont, and George J. Antos, Arlington Heights, both of Ill., assignors to UDP Inc., Des Plaines, Ill.

Filed Jan. 10, 1977, Ser. No. 758,285

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **20 Claims**

1. In a process for converting a hydrocarbon which comprises contacting said hydrocarbon in a substantially water-free environment at hydrocarbon conversion conditions with an acidic catalytic component comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal and catalytically available cobalt are uniformly dispersed throughout said porous carrier material; wherein substantially all of said platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental state or in a state which is reducible to the elemental metallic state under said hydrocarbon conversion conditions, or in a mixture of these states, the improvement which comprises the addition to the composite of about 0.1 to about 10 wt. % uranium uniformly throughout said composite wherein substantially all of said uranium is present in an oxidation state above that of the elemental metal.

4,110,200
HYDROCARBON CONVERSION WITH AN ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 713,020, Aug. 9, 1976, Pat. No. 4,036,742, which is a continuation-in-part of Ser. No. 656,925, Feb. 10, 1976, Pat. No. 4,025,418, which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,059. This application Jun. 27, 1977, Ser. No. 810,321

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² C01G *35/08*

U.S. Cl. 208—139 **24 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion condition with an acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.01 to about 5 wt. % indium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and indium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the indium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,110,201
HYDROCARBON CONVERSION WITH AN ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 621,718, Oct. 14, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,744

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **18 Claims**

1. In a process for converting a hydrocarbon which comprises contacting said hydrocarbon in a substantially water-free environment at hydrocarbon conversion conditions with an acidic substantially sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt.% platinum group metal, about 0.05 to about 5 wt.% cobalt, and about 0.1 to about 3.5 wt.% halogen; wherein the platinum group metal and catalytically available cobalt are uniformly dispersed throughout said porous carrier material; wherein substantially all of said platinum group metal is present in the elemental state; and wherein substantially all of the catalytically available cobalt is present in the elemental state or in a state which is reducible to the elemental state under said hydrocarbon conversion conditions, or in a mixture of these states, the improvement which comprises the addition to the composite of about 0.01 to about 5 wt.% cadmium uniformly throughout said porous carrier material.

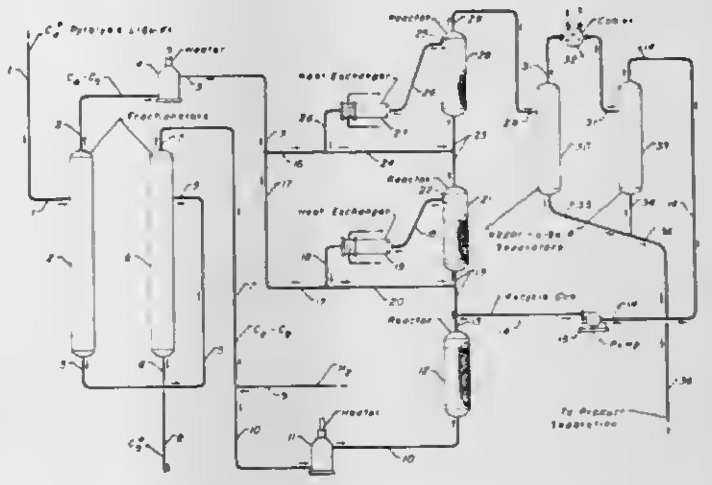
4,110,202
HYDROGENATION PROCESS FOR PYROLYSIS LIQUIDS

George R. Winter, III, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 18, 1977, Ser. No. 852,653

Int. Cl.² C10G *23/00*

U.S. Cl. 208—144 **6 Claims**



1. A hydroconversion process which comprises the steps of:

(a) fractionating a feed stream which comprises C_5 diolefins and other olefinic hydrocarbons having between 4 and 8 carbon atoms per molecule to form a light fraction comprising hydrocarbons having 4 and 5 carbon atoms per molecule and a heavy fraction comprising hydrocarbons having 6 to 8 carbon atoms per molecule;

(b) admixing said heavy fraction with a stream comprising hydrogen at the rate of from 500 to 5000 SCFB and contacting the mixed-phase admixture with a first bed of catalyst by passage through a first reaction zone maintained at hydrogenation-promoting conditions and forming a first catalyst bed effluent stream;

(c) admixing a first portion of said light fraction with: (1) a hereinafter described first recycle liquid stream; (2) said first catalyst bed effluent stream and (3) a recycle gas stream comprising hydrogen and thereby forming a mixed-phase first reactant stream;

(d) contacting said first reactant stream from step (c) with a second bed of catalyst by passage through a second reaction zone maintained at hydrogenation-promoting conditions and forming a second catalyst bed effluent stream;

(e) admixing a liquid-phase first portion of said second catalyst bed effluent stream from step (d) with said first portion of said light fraction of step (c) as the previously specified first recycle liquid stream of step (c);

(f) admixing a mixed-phase second portion of said second catalyst bed effluent stream, which includes hydrogen, from step (d) with: (1) a second portion of said light fraction; and (2) a hereinafter described second recycle liquid stream and thereby forming a mixed-phase second reactant stream;

(g) contacting said second reactant stream from step (f) with a third bed of catalyst by passage through a third reaction zone maintained at hydrogenation-promoting conditions and forming a third catalyst bed effluent stream;

(b) admixing a liquid-phase first portion of said third catalyst bed effluent stream from step (g) with said second portion of said light fraction of step (f) as the previously specified second recycle liquid stream of step (f); and,

(i) separating a mixed-phase second portion of said third catalyst bed effluent stream from step (g) into a liquid-phase product and a vapor stream, and recycling at least a portion of said vapor stream as said recycle gas stream in step (c).

4,110,203

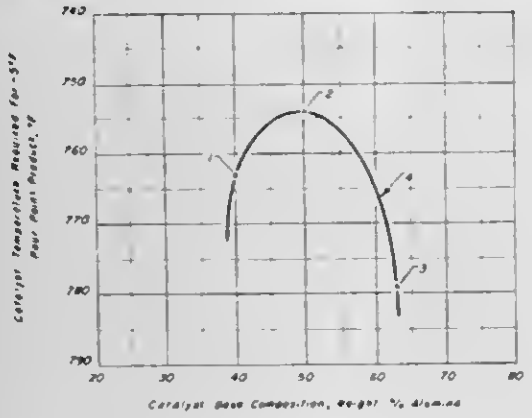
DESULFURIZATION PROCESS OF A HYDROCARBON DISTILLATE CONTAINING MONO-OLEFINS AND AROMATICS

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 716,922, Aug. 23, 1976, Pat. No. 4,061,563, which is a division of Ser. No. 599,561, Jul. 28, 1975, Pat. No. 4,003,956, which is a continuation-in-part of Ser. No. 466,759, May 3, 1974, Pat. No. 3,931,048. This application Sep. 30, 1977, Ser. No. 838,267

Int. Cl.^{2} C10G *23/02*

U.S. Cl. 208—216 5 Claims



1. A process for desulfurizing a sulfurous hydrocarbon distillate containing mono-olefinic hydrocarbons and aromatics, which process comprises reacting said distillate with hydrogen in contact with a catalytic composite comprising a combination of a nickel component and a tungsten component with a silica-alumina carrier material wherein said carrier material is co-gelled silica-alumina consisting of from about 43 percent to about 57 percent by weight alumina and from about 57 to about 43 percent by weight silica and wherein said components are present in amounts sufficient to result in the composite containing, on an elemental basis, about 2 to about 10 percent by weight of the nickel component and about 8 to about 20 percent by weight of the tungsten component.

4,110,204

PROCESS FOR REMOVING POLONIUM FROM NATURAL GAS CONDENSATES CONTAINING THE SAME

Thomas Henry Farmer, Hatfield, England, assignor to Carless, Capel & Leonard Limited, London, England

Filed Feb. 28, 1977, Ser. No. 772,958

Claims priority, application United Kingdom, Mar. 2, 1976, 8347/76

Int. Cl.^{2} C10G *25/02*

U.S. Cl. 208—251 R 8 Claims

1. A process for removing polonium from natural gas condensates which process comprises contacting fluid polonium containing natural gas condensates with an ion exchange resin having a dry surface area of at least 1 m^2/g and containing exchange groups selected from the group consisting of acidic and strongly basic exchange groups.

4,110,205

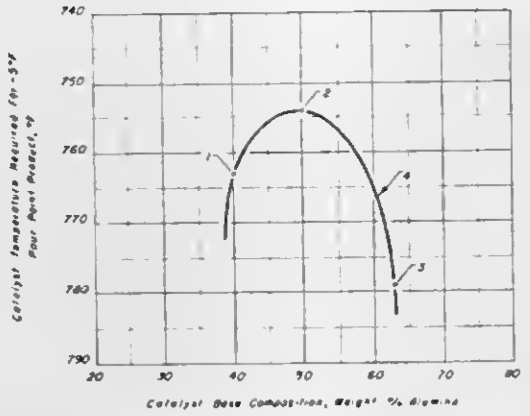
PROCESS FOR HYDROGENATING A COKE-FORMING HYDROCARBON DISTILLATE

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 716,922, Aug. 23, 1976, Pat. No. 4,061,563, which is a division of Ser. No. 599,561, Jul. 28, 1975, Pat. No. 4,003,956, which is a continuation-in-part of Ser. No. 466,759, May 3, 1974, Pat. No. 3,931,048. This application Sep. 30, 1977, Ser. No. 838,272

Int. Cl.^{2} C10G *23/02*

U.S. Cl. 208—255 5 Claims



1. A process for hydrogenating a coke-forming hydrocarbon distillate containing conjugated di-olefinic and mono-olefinic hydrocarbons, and aromatics, which process comprises reacting said distillate with hydrogen at a temperature below about 500° F. in contact with a catalytic composite comprising a combination of a nickel component, and a tungsten component with a silica-alumina carrier material wherein said carrier material is co-gelled silica-alumina consisting of from about 43 percent to about 57 percent by weight alumina and from about 57 to about 43 percent by weight silica and wherein said components are present in amounts sufficient to result in the composite containing, on an elemental basis, about 2 to about 10 percent by weight of the nickel component and about 8 to about 20 percent by weight of the tungsten component and an alkali metal component, and recovering an aromatic/mono-olefinic hydrocarbon concentrate substantially free from conjugated di-olefinic hydrocarbons.

4,110,206

METAL SEPARATING PROCESS AND APPARATUS

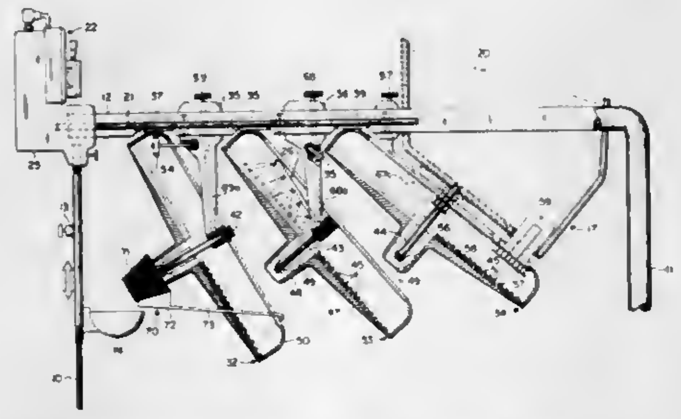
Jonny Hilmer Kleven, 1325 N. Fairview, Burbank, Calif. 91505

Continuation-in-part of Ser. No. 613,366, Sep. 15, 1975, Pat. No. 4,008,152. This application Feb. 3, 1977, Ser. No. 765,268

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.^{2} B03B *5/74;* C22B *11/12*

U.S. Cl. 209—43 14 Claims



1. An apparatus for separating metals in the free state from ore which comprises:

(a) a plurality of from two to six downwardly inclined, serially mounted, flat, pan-shaped separating wheels including a common shaft means for driving said wheels, each wheel providing (i) a peripheral retaining rim; (ii) a central annulus, and (iii) a plurality of spiral grooves disposed on the upper surface of each wheel and directed from the wheel periphery upwardly and inwardly to the annulus, each of said wheels being concentrically rotatable about its central annulus;

(b) means to form a water slurry with the ore on each wheel; and

(c) a funnel positioned around the annulus of each wheel for forwarding upgraded ore along the spiral grooves from the annulus to a succeeding wheel.

4,110,207

PROCESS FOR FLOTATION OF NON-SULFIDE ORES

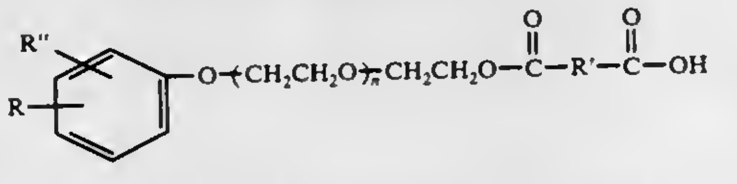
Samuel Shan Ning Wang, Cheshire, and Eugene Leroy Smith, Jr., Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1976, Ser. No. 646,450

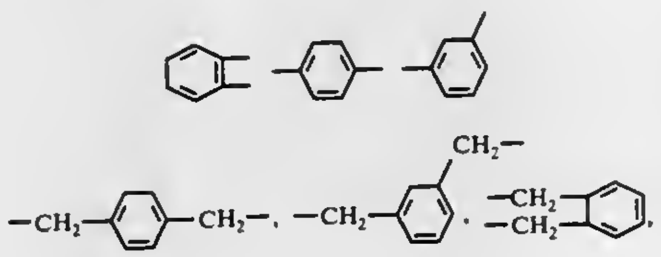
Int. Cl.^{2} B03D *1/02*

U.S. Cl. 209—166 5 Claims

1. A process for recovering non-sulfide minerals which comprises classifying the mineral to provide particles of flotation size, slurrying the sized mineral in aqueous medium, conditioning the slurry with effective amounts of fuel oil, alkali, and a partial ester of a polycarboxylic acid having at least one free carboxylic acid group, and floating the desired mineral values by froth flotation, said partial ester having the structure



wherein R is an alkyl group of about 8 to 12 carbon atoms, R'' is hydrogen or an alkyl group of up to about 12 carbon atoms, *n* is a number 0-3, and R' is a bivalent grouping selected from $—CH_2)_m$ wherein *m* is an integer of 1-6, —CH=CH—, $—CHOHCH_2—$, —CHOHCHOH—, $—CH_2C(OH)(COOH)CH_2—$,



and cyclohexyl.

4,110,208

CLARIFICATION PROCESS

John A. Neal, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Division of Ser. No. 634,832, Nov. 24, 1975. This application Jun. 24, 1977, Ser. No. 809,640

Int. Cl.^{2} C02B *1/20*

U.S. Cl. 210—425 8 Claims

1. A flocculating agent for flocculation of finely dispersed particles in an aqueous medium comprising mixture of a water-soluble salt of aluminum, or iron, or mixture thereof with a ferromagnetic organic composition selected from the group consisting essentially of ferromagnetic lignosulfonate, ferromagnetic sulfonated tannin, and ferromagnetic sulfonated phenol condensed with an aldehyde, said ferromagnetic organic composition being present in the mixture in an amount such that the metal content of the ferromagnetic organic composition is in the range of from 0.5 to 20% of the metal content of the water-soluble salt.

4,110,209

METHOD FOR TREATING A MEDIUM CONTAINING WATER WITH COAGULANTS

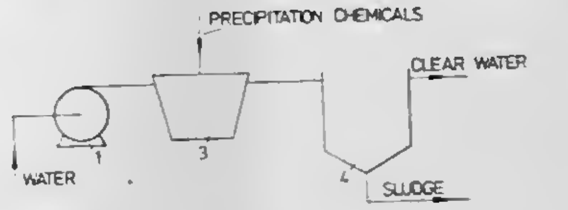
Walter vogel, Max-Plank-strasse 7a, D-6700 Waldsee, Germany, Assignor to Egon Cherdron, Limburgerhof; Otto Helmboldt, Ludwigshafen am Rhein and Walter Vogel, Waldsee, all of Germany

Filed Jun. 1, 1976, Ser. No. 691,717

Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524172

Int. Cl.^{2} C02B *1/20*

U.S. Cl. 210—44 5 Claims



1. A method for increasing the chemical efficiency of a precipitating agent having a metal base in the treatment of a medium containing water, comprising: initially conducting, by pressure the medium to be treated into a mixing cell and mixing it in the mixing cell in free turbulence with a precipitant solution containing the precipitating agent to form a reaction mixture containing flocs, conducting the reaction mixture into a separating basin and removing the flocs from clear water in the separating basin.

4,110,210

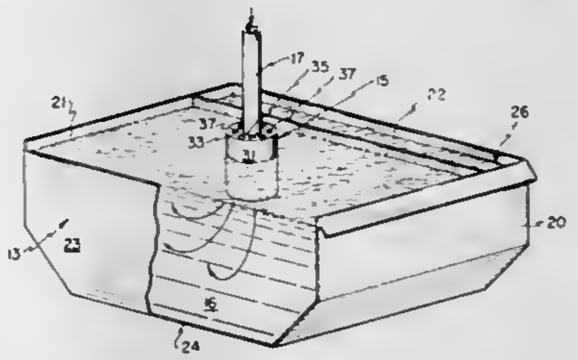
DISPERSED GAS FLOTATION PROCESS

Vernon R. Degner, Citrus Heights, and William V. Colbert, Lodi, both of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Continuation of Ser. No. 583,072, Jun. 2, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 791,102

Int. Cl.^{2} B03D *1/02, 1/24*

U.S. Cl. 210—44 24 Claims

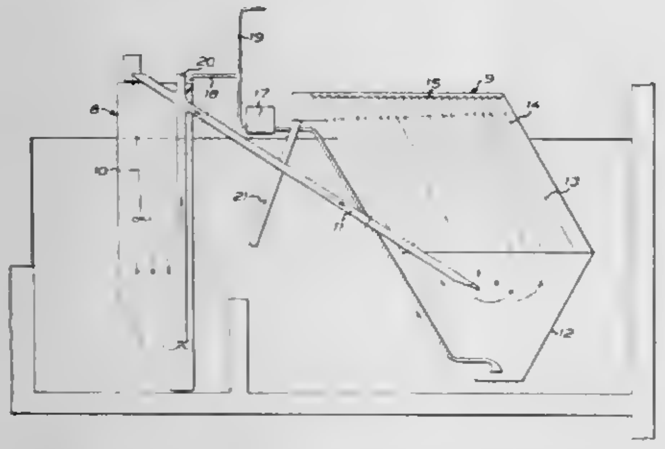


1. A dispersed gas flotation process wherein hydraulic effects are used to disperse gas bubbles throughout a contained liquid body with a free surface, said process comprising: pumping a two-phase fluid into the liquid body through an ejection device with the density and the kinetic energy rate of the ejected fluid per unit volume of the contained body at the point of ejection being defined by a point on the graph of FIG. 2 within the area encompassed by Region I.

18. A dispersed gas flotation process wherein hydraulic effects are used to disperse gas bubbles throughout a contained liquid body with a free surface, said process comprising: pumping a two-phase fluid into the liquid body through an ejection device with the density and the kinetic energy rate at the point of ejection of the ejected fluid per unit volume of the contained

body being defined by any point on the graph of FIG. 2 within the area encompassed by Region I and maintaining the density and kinetic energy rate within said Region I, thereby to achieve a relatively quiet but frothy surface on the liquid body and to fill the liquid body with gas bubbles.

4,110,211
PROCESS FOR THE PREPARATION OF A SUBSTANTIALLY HOMOGENEOUS LIME WATER SOLUTION
Stig Arvid Henrikson, 103 Grönviksvagen S-161, 40 Bromma, Sweden
Filed Jul. 7, 1977, Ser. No. 813,773
Int. Cl.^{2} B01D ***21/02;*** **C02B** ***1/20***
U.S. Cl. 210—47 **5 Claims**



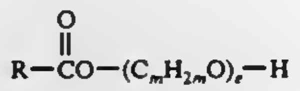
1. A process for the preparation of a substantially homogeneous lime water solution intended for use in the purification of waste water and like liquids, the starting material for the homogeneous lime water solution consisting of a lime suspension, comprising introducing the lime suspension at the bottom of a compartment in which it is caused to rise in order to leave at the top thereof, said lime suspension during its upward flow being caused to pass lamellas which create a sludge zone at their lower end in the compartment, in which zone the rising lime suspension is filtered, while said lamellas create at their upper end in the compartment a clarification zone in which fine particles are separated.

4,110,212
METHOD OF TREATING A WASTE LIQUID CONTAINING POLLUTING COMPOUNDS
David Krofchak, 470 Collier MacMillan Dr., P.O. Box 1060, Cambridge, Ontario, Canada (N1R 5Y7)
Filed Apr. 21, 1977, Ser. No. 789,750
Int. Cl.^{2} C02B ***1/20;*** **C02C** ***5/02***
U.S. Cl. 210—53 **8 Claims**

1. A method of treating a waste liquid containing polluting compounds, including reacting the waste liquid with an acidic ferrous salt solution to adjust the pH of the liquid to a value within the range of from about 2 to about 5 and to reduce polluting compounds in the waste liquid to a form capable of reacting with an alkali to produce a precipitate, reacting the adjusted waste liquid with an alkali to raise the pH of the liquid to a value within the range of from about 9 to about 12.5 and to produce said precipitate, and reacting the alkaline waste liquid with a silicic compound to form large complex silicate molecules with the precipitate and consequent solidification of the waste liquid into a stable, non-polluting solid.

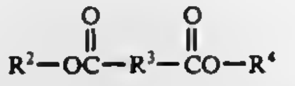
4,110,213
COMPOSITIONS AND PROCESSES FOR THE DISPERSING OF OIL SPILLAGES
David John Tennant; Geoffrey Philip Sheridan, both of Manchester, and Alistair James Steel, Stockport, all of England, assignors to Lankro Chemicals Group Limited, Manchester, England
Filed Nov. 8, 1976, Ser. No. 739,993
Claims priority, application United Kingdom, Nov. 7, 1975, 46255/75
Int. Cl.^{2} B01D ***17/02;*** **C02B** ***1/18;*** **B01F** ***17/36***
U.S. Cl. 210—59 **27 Claims**

1. A concentrate for use in the dispersion of oil spillages, which concentrate is substantially free from hydrocarbon solvent and consists of:- from 20 to 75% by weight of an emulsifying agent, which is a mono-ester of an aliphatic carboxylic acid and a polyoxyalkylene glycol and has the general formula



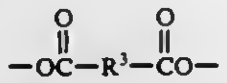
$$R-\overset{O}{\overset{\|}{C}}O-(C_mH_{2m}O)_e-H \qquad \text{I}$$

wherein R is the aliphatic hydrocarbyl radical of a fatty acid containing from 10 to 22 carbon atoms, *m* is an integer from 2 to 4, there being at least one (C_2H_4O) group per molecule, and e is an integer of at least 2; from 77 to 15% by weight of a solvent which is a diester of an acid selected from the group consisting of aryl and alkyl dicarboxylic acids, with at least one monohydric aliphatic alcohol, and has the general formula



$$R^2-O\overset{O}{\overset{\|}{C}}-R^3-\overset{O}{\overset{\|}{C}}O-R^4 \qquad \text{II}$$

wherein R^2 and R^4 are independently aliphatic hydrocarbyl radicals containing from 5 to 13 carbon atoms, and



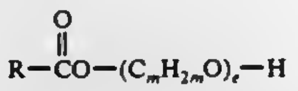
$$-O\overset{O}{\overset{\|}{C}}-R^3-\overset{O}{\overset{\|}{C}}O-$$

is the diacyloxy radical of an acid selected from the group consisting of aromatic and aliphatic carboxylic acids and from 3 to 15% by weight of a pour point depressant which is a monoalkyl ether of a glycol selected from the group consisting of alkylene glycol and polyoxyalkylene glycols and has the general formula:

$$HO-(C_nH_{2n}O)_f-R^5 \qquad \text{III}$$

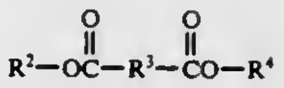
wherein *n* is an integer of from 2 to 4, *f* is an integer of from 1 to 5, and R^5 is an alkyl radical containing from 1 to 6 carbon atoms.

13. A process for the dispersal of an oil spillage, which process comprises diluting a concentrate composition which is substantially free from hydrocarbon solvent and consists of:- from 20 to 75% by weight of an emulsifying agent, which is a mono-ester of an aliphatic carboxylic acid and a polyoxy-alkylene glycol and has the general formula



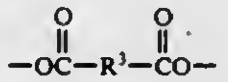
$$R-\overset{O}{\overset{\|}{C}}O-(C_mH_{2m}O)_e-H \qquad \text{I}$$

wherein R is the aliphatic hydrocarbyl radical of a fatty acid containing from 10 to 22 carbon atoms, *m* is an integer from 2 to 4, there being at least one (C_2H_4O) group per molecule, and e is an integer of at least 2; from 77 to 15% by weight of a solvent which is a diester of an acid selected from the group consisting of aryl and alkyl dicarboxylic acids, with at least one monohydric aliphatic alcohol, and has the general formula



$$R^2-O\overset{O}{\overset{\|}{C}}-R^3-\overset{O}{\overset{\|}{C}}O-R^4 \qquad \text{II}$$

wherein R^2 and R^4 are independently aliphatic hydrocarbyl radicals containing from 5 to 13 carbon atoms, and



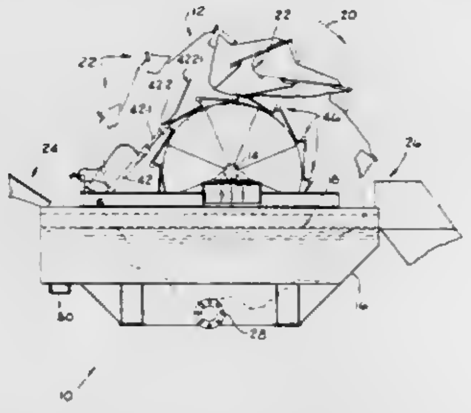
$$-O\overset{O}{\overset{\|}{C}}-R^3-\overset{O}{\overset{\|}{C}}O-$$

is the diacyloxy radical of an acid selected from the group consisting or aromatic and aliphatic carboxylic acids and from 3 to 15% by weight of a pour point depressant which is a monoalkyl ether of a glycol selected from the group consisting of alkylene glycol and polyoxyalkylene glycols and has the general formula

$$HO-(C_nH_{2n}O)_f-R^5 \qquad \text{III}$$

wherein *n* is an integer of from 2 to 4, *f* is an integer of from 1 to 5, and R^5 is an alkyl radical containing from 1 to 6 carbon atoms, with water, and applying the diluted concentrate to, and mixing the diluted concentrate with the oil spillage.

4,110,214
DRAINAGE DEVICE FOR PARTICULATE MATERIAL
Johann Baptist Pfeffer, Johannesburg, South Africa, assignor to S.A. Block & Concrete (Proprietary) Limited, Alberton, South Africa
Filed Nov. 29, 1976, Ser. No. 745,768
Claims priority, application South Africa, Dec. 1, 1975, 75/7534
Int. Cl.^{2} B01D ***33/00***
U.S. Cl. 210—77 **10 Claims**



1. A drainage device for scooping liquids and solids in suspension and separating the solids from the liquid by drainage of the liquid comprising

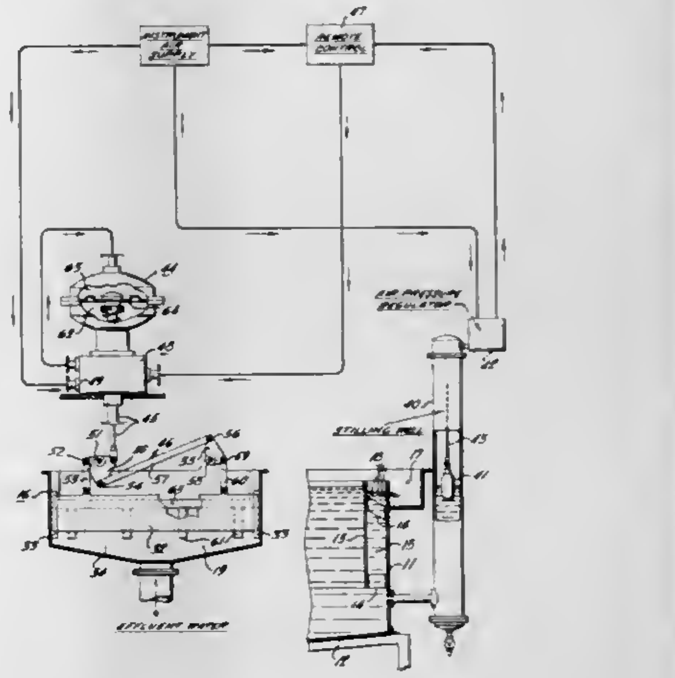
a bucket wheel having a plurality of foraminous buckets through which the liquid can drain, spaced circumferentially about its axis;

drive means to rotate said bucket wheel in a plurality of successive arcuate steps with high torque moments applied cyclically in succession on said bucket wheel at positions about and radially spaced from its axis, said drive means including

a pair of axially spaced plunger and cylinder assemblies, each having a head arranged to engage cyclically on working strokes by means of up thrust high torque moments with mating formations which are fast with said bucket wheel and spaced circumferentially about the axis of said bucket wheel,

and means to thrust each plunger of said plunger and cylinder assembly on its working stroke, interconnected with the operation of the other of said plunger and cylinder assemblies in alternate successive movements of said plungers.

4,110,215
LIQUID LEVEL CONTROL SYSTEM FOR SEPARATION TANK
David A. Bramlett, Tulsa, Okla., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Filed Mar. 22, 1976, Ser. No. 668,871
Int. Cl.^{2} B01D ***33/38***
U.S. Cl. 210—114 **9 Claims**



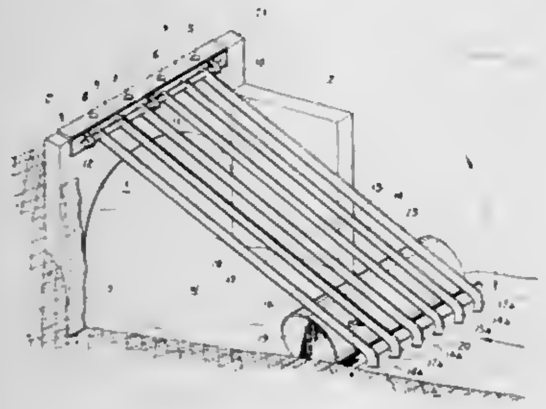
1. In a separation tank for separating pollutants from influent water and having:
- (a) an inlet for the influent water to flow into the tank;
- (b) means for removing the pollutants floating to the upper surface of the liquid enclosed in the tank;
- (c) means for removing the pollutants settling on the bottom of the tank;
- (d) means for collecting pollutant free water from the tank; and
- (e) a weir box for receiving the pollutant free water for discharge from the tank, the weir box having a weir gate system for controlling the liquid level within the air flotation tank; an automatic liquid level control system for operating the weir gate so that the liquid level within the tank is maintained at a predetermined level, said level control system comprising:
- (f) a stilling well located on the sidewall of the tank so that the liquid level within the stilling well is the same as that in the tank;
- (g) means for sensing the liquid level within the stilling well;
- (h) means, responsive to the sensing means, for producing an output air pressure signal with the pressure related to the liquid level within the stilling well;
- (i) means for producing a linear displacement related to the air pressure produced by the air pressure producing means; and
- (j) means for linking the weir gate to the means for producing a linear displacement so that the weir gate is moved to vary the flow of water from the tank in response to the liquid level changing in the tank, for maintaining a predetermined liquid level within the tank.

4,110,216

APPARATUS FOR COLLECTING DEBRIS FLOATING IN A STREAM

Albert Lloyd Wagnon, 2167 Capehart Pl. NE., Atlanta, Ga. 30345, and Alexandros James Janoulis, 1957 Kilburn Dr., Atlanta, Ga. 30324

Filed Apr. 22, 1976, Ser. No. 679,168
Int. Cl.² B01D *33/22*
U.S. Cl. 210—156 **4 Claims**



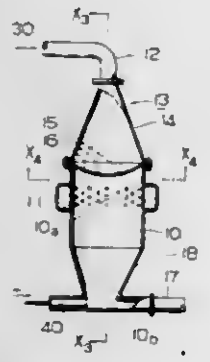
1. Apparatus for collecting solid debris floating in a stream comprising, in combination, a stream defined by a bottom with banks defining sidewalls for the bottom, collector means consisting of elongate bars horizontally spaced apart in the direction of the width of the stream and arranged vertically above the bottom thereof, an elongate member horizontally arranged above the bottom of the stream with its axis extending across the width thereof defined by the spaced apart sidewalls of the stream, support means for each end of said member located on each sidewall of the stream, first upper ends of the elongate bars defining the collector means pivotally connected to said horizontal member for pivotal movement around the longitudinal axis of said member, second lower ends of the elongate bars connected by float means with a planar surface extending in the direction of the width of the collector surface, said direction being at right angles to the longitudinal axis of said elongate bars whereby the velocity of water flowing against the planar surface of said float means raises the second lower end of the collector means for pivotal movement around said horizontal member.

4,110,217

CONTINUOUS SEWAGE SLUDGE HEAT TREATMENT APPARATUS

Gichi Nakamura, 21-9, Gamo 4-chome, Jotoku, Osaka, Japan

Filed Apr. 11, 1977, Ser. No. 786,467
Int. Cl.² F26B *17/12*
U.S. Cl. 210—175 **3 Claims**



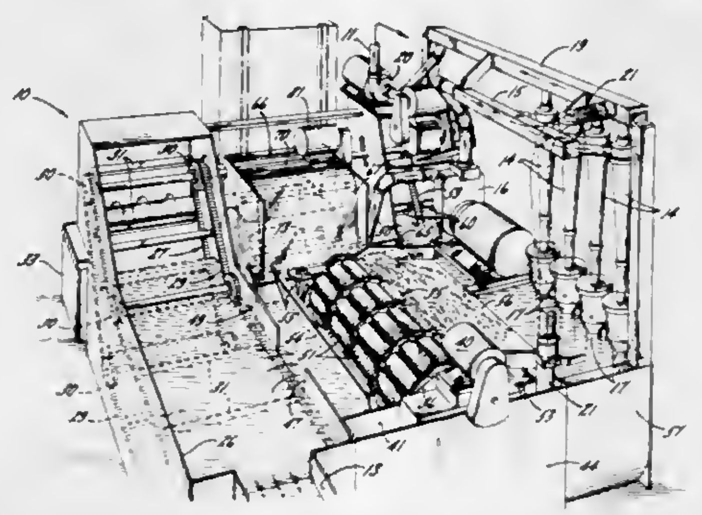
1. In an apparatus for the heat treatment of a sludge mass delivered from a final settling tank of a sewage disposal system having a feed pipe (12), a discharge pipe (17), a vertical cylindrical vessel (19) with a side wall (10), a substantially vertical conical head portion (14) connected to the upper edge of said vertical cylindrical vessel, said head portion having an upper end connected to said feed pipe (12), the improvement in said apparatus to continuously treat the sludge with steam of relatively low pressure and temperature by converting the sludge mass into thin strings of sludge, and steam treating these strings, said improvement comprising: a lower end to said head portion (14) and a round member thereat with a plurality of axial pores (15) through which the sludge mass must pass and be converted into individual vertical strings of sludge axially disposed in said vertical cylindrical vessel (19), a steam feeding jacket (11) surrounding said side wall (10) with a plurality of radial apertures in said side wall to allow steam from said jacket to enter into said cylindrical vessel (19) and heat the vertical sludge strings therein; a conical tail portion connected to the lower end of said cylindrical vessel with its lower end in substantial opposite relationship to said head portion to receive the treated sludge-steam mixture, said lower end being coupled to said discharge pipe (17) and means to facilitate discharge of said treated sludge.

4,110,218

LIQUID CLEANING APPARATUS HAVING CYCLONIC SEPARATORS

Roger Marriott, and Mark R. Estabrook, both of Rockford, Ill., assignors to Barnes Drill Co., Rockford, Ill.

Filed Feb. 7, 1977, Ser. No. 766,012
Int. Cl.² B01D *35/06;* B03C *1/02, 1/30*
U.S. Cl. 210—223 **5 Claims**



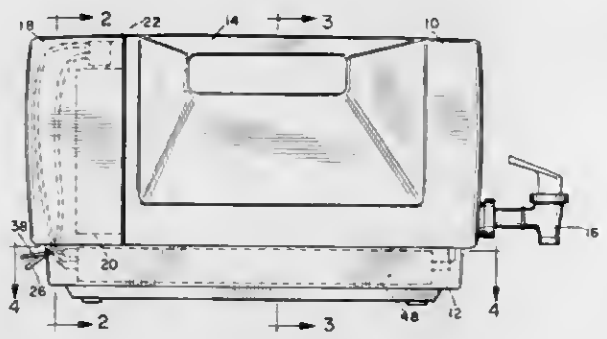
1. Apparatus for separating particles from liquid, said apparatus comprising first and second drag tanks located in spaced side-by-side relation, said first tank receiving a flow of dirty liquid from a using system, means within said first tank for picking up particles which settle to the bottom of the first tank and for discharging such particles out of one end of the first tank to a collection area at one end of said apparatus, a rotary magnetic separator located between said tanks, means defining a flow path from said first tank, thence beneath said separator and thence toward said one end of said apparatus whereby liquid in said first tank flows beneath and is partially cleaned by said separator by virtue of particles in such liquid being picked up by said separator, a reservoir for partially cleaned liquid located adjacent said one end of said apparatus and receiving the liquid cleaned by said separator and discharged from said flow path, means for scraping off the particles on said separator and for discharging said particles into said second tank, a cyclonic separator operable to receive a flow of partially cleaned liquid and to produce a flow of cleaner liquid and a dirty underflow, means for pumping partially cleaned liquid from said reservoir to said cyclonic separator, means for returning to said reservoir part of the liquid cleaned by said cyclonic separator and for delivering another part of such liquid to said using system, the underflow from said cyclonic separator being discharged into said second drag tank, means within said second tank for picking up particles which settle to the bottom of said second tank and for discharging such particles to said collection area at said one end of said apparatus, a web of porous filter media located between said tanks and adjacent said one end of said apparatus, said filter media being located above said reservoir, means defining a flow path from said second tank to the upper side of said filter media whereby liquid in said second tank flows to and then through said filter media and then flows to said reservoir while particles in such liquid are caught by said filter media, and means for periodically advancing said filter media toward said one end of said apparatus and into said collection area.

4,110,219

REVERSE OSMOSIS WATER UNIT

Paul Douglas Maples, 772 S. Sierra Ave., Solana Beach, Calif. 92075

Filed Feb. 2, 1977, Ser. No. 764,828
Int. Cl.² B01D *31/00;* C02B *1/82*
U.S. Cl. 210—245 **8 Claims**



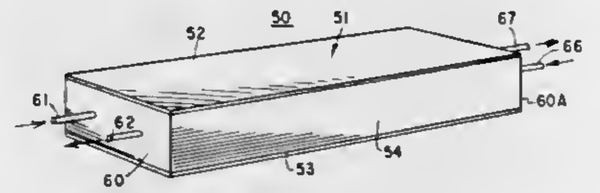
1. A reverse osmosis water unit comprising:
a portable water container for receiving and dispensing treated water,
base means for supporting said water container,
said base means having a recessed volume with end walls,
reverse osmosis water treating means for being laid lengthwise in said recess between said spaced walls,
water conduit means for conducting water to said reverse osmosis means and for conducting treated water from said reverse osmosis means to said water container,
removable stopper type end connector means for connecting the ends of said reverse osmosis means to said water conduit means by a slip connection,
sealing means for sealing the connection of said end connector means to said reverse osmosis means against water leakage,
and the composite length of said reverse osmosis means and the connected end connector means being slightly less than the distance between said end walls of said base means, whereby said walls prevent outward sliding movement of said end connectors when said reverse osmosis means are positioned in the recess volume of said base means.

4,110,220

MASS TRANSFER DEVICE

Ardis R. Lavender, 6 Starlight Dr., Clarks Summit, Pa. 18411

Filed Oct. 18, 1976, Ser. No. 733,445
Int. Cl.² B01D *13/00*
U.S. Cl. 210—321 R **21 Claims**



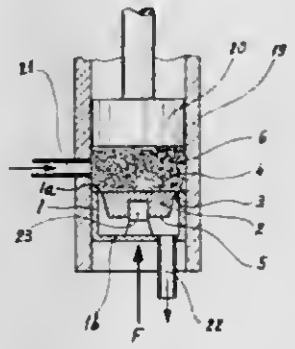
1. A parallel flow device for effecting mass transfer between first and second fluids, said device comprising a first fluid inlet and outlet and a second fluid inlet and outlet, a plurality of plates forming a stack, a membrane positioned between adjacent plates and cooperating therewith to form on opposite sides of each membrane a first fluid channel and a second fluid channel, said first and second fluid inlets and outlets being connected respectively to said first and second fluid channels to introduce fluid into and remove fluid from said channels in a direction coplanar with each of said plates. said membranes being effective to permit mass transfer between a first fluid in said first fluid channels and a second fluid in said fluid channels, manifold means associated with each plate for receiving a first fluid stream from said first fluid inlet and dividing the inlet stream into only two identical streams a plurality of times to provide an even number of streams evenly and uniformly spaced across the plate thereby distributing the first fluid stream transversely across the associated plate at one end of said first fluid channel, manifold means associated with each plate for transporting fluid to said first fluid outlet by evenly and uniformly collecting the first fluid transversely across the associated plate from the other end of said first fluid channel, manifold means associated with each plate for receiving a second fluid stream from said second fluid inlet and dividing the second inlet stream into only two identical streams a plurality of times to provide an even number of streams evenly and uniformly spaced across the plate thereby distributing the second fluid stream transversely across the associated plate at one end of said second fluid channel, and manifold means associated with each plate for transporting fluid to said second fluid outlet by evenly and uniformly collecting the second fluid transversely across the associated plate from the other end of said second fluid channel, each manifold containing the identical even number of branches to provide substantially identical flow resistance through all corresponding branches.

4,110,221

LIQUID FILTRATION DEVICE

Fernand Moser, Corgemont, Switzerland, assignor to Louis Moser, Switzerland

Filed Apr. 6, 1977, Ser. No. 785,222
Claims priority, application Switzerland, Apr. 12, 1976, 4604/76
Int. Cl.² B01D *23/00*
U.S. Cl. 210—481 **9 Claims**



1. A coffee filter, comprising; a cup-shaped member having a bottom, a bottom outlet for coffee, a wall upstanding from the bottom, and an inner edge on the wall, remote from the bottom, defining an aperture, the cup-shaped member being, in use, insertable in a coffee-making device with slidable engagement of the wall with an inner surface of the device to define a chamber for particles of ground coffee by said inner surface above said edge, and with an inlet for water to said chamber; and a circular member generally disposed in the aperture to generally close it, the circular member having an upper, outer edge to define a slot-like gap between the outer and inner edges for filtering a liquid through the slot to the bottom outlet to separate the liquid from particles of ground coffee contained therein; one of the members having wall surface of a generally frusto-conical configuration disposed opposite a wall surface of the other member so that the surfaces diverge from one another from the slot-like gap toward the bottom of the cup-

shaped member, and so that the slot-like gap has a width defining a size of solid particles to be filtered through the gap.

4,110,222
APPARATUS FOR SEPARATING MAGNETIZABLE PARTICLES FROM A FLUID

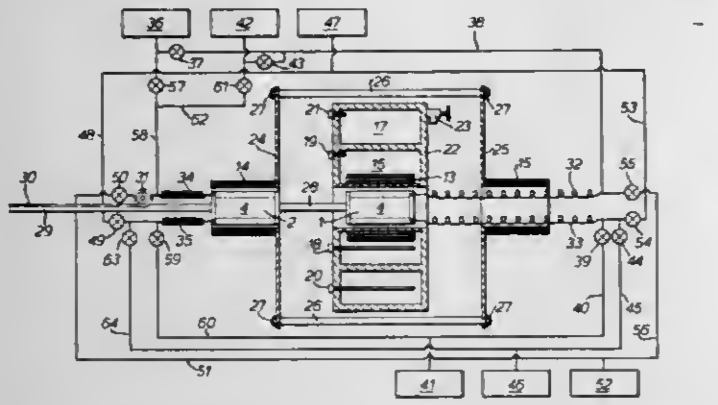
James Henry Peter Watson, St. Austell, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England

Filed Apr. 12, 1976, Ser. No. 675,885

Claims priority, application United Kingdom, Apr. 11, 1975, 15079/75

Int. Cl.^{2} B01D *35/06*

U.S. Cl. 210—222 **17 Claims**



1. Moving matrix apparatus for separating magnetisable particles from a fluid in which they are suspended, which apparatus comprises:

(a) a magnet for establishing a magnetic field in a first zone remote from a second zone;
(b) at least one elongate separating chamber having a fluid inlet and a fluid outlet therein, the separating chamber having at least portions thereof near each end each comprising a magnetic field concentrating element of ferromagnetic material;
(c) a fluid permeable packing of magnetisable material disposed in the separating chamber between the inlet and outlet thereof;
(d) means for moving the separating chamber including the field concentrating elements into, and out of, the first zone;
(e) means for passing fluid having magnetisable particles suspended therein through the separating chamber through the inlet thereof, when it is positioned within the first zone and a magnetic field is established in the first zone, so that magnetisable particles are magnetised by the magnetic field and attracted to, and retained in, the packing, whilst the fluid passes through the packing and exits through the outlet, and
(f) means for removing the magnetisable particles retained in the packing, when the separating chamber is positioned in the second zone remote from the first zone.

4,110,223
APPARATUS FOR RECOVERING EMBRYOS FROM EMBRYONATED EGGS

William J. McAleer, Ambler, and William M. Hurni, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 572,584, Apr. 28, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,228

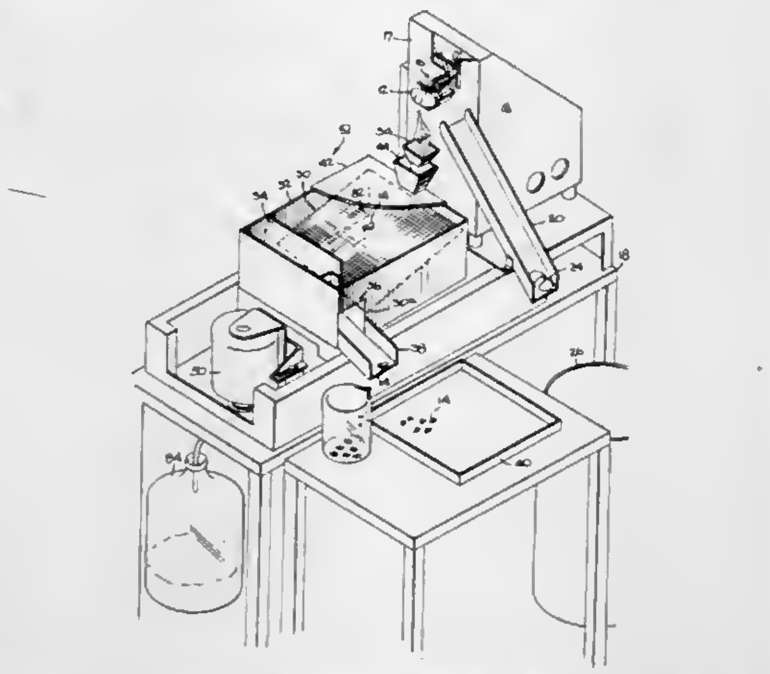
Int. Cl.^{2} B01D *33/22;* **A23J** *1/09*

U.S. Cl. 210—388 **11 Claims**

1. Apparatus for recovering embryos from embryonated eggs comprising

an egg cracking and opening mechanism operative to crack open an egg and release the contents thereof to a predetermined area of a flat screen positioned under the mechanism, the screen having an edge farthest from the egg cracking and opening mechanism and the screen being tilted at a compound angle from horizontal whereby one portion of the screen is uppermost and the diagonally opposite portion is lowermost,

a partition extending along part of the edge of the screen furthest from the egg cracking and opening mechanism and terminating before the lowermost portion of the screen, the lowermost portion of the screen communicating with a tilted embryo discharge chute,



means operative to produce continual shaking of the screen and in cooperation with the screen tilted at a compound angle from the horizontal to move the contents of the egg in a random path away from the predetermined area of the screen to the embryo discharge chute and to provide separation of the more fluid portions of the contents from the more solid embryo portion, said more fluid portion passing through said screen and said embryo portion passing down said screen to said embryo discharge chute.

4,110,224
SECONDARY RECOVERY PROCESS UTILIZING WATER SATURATED WITH GAS

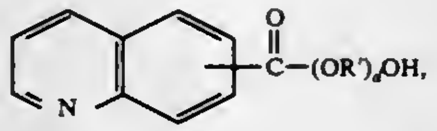
Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 724,894, Sep. 20, 1976, abandoned, which is a division of Ser. No. 564,390, Apr. 2, 1975, Pat. No. 4,044,831. This application May 27, 1977, Ser. No. 801,186

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 252—8.55 D **6 Claims**

1. A fluid comprising water saturated with a gas selected from the group consisting of natural gas, carbon dioxide, ammonia, flue gas and mixtures thereof containing a minor amount of a solubilizing agent consisting of a compound of the formula:



wherein R′ is alkylene of from about 2 to 5 carbon atoms and *d* is an integer of from about 5 to about 50, wherein said fluid is made alkaline through the addition of an alkaline agent selected from the group consisting of sodium hydroxide, potassium hydroxide and sodium hypochlorite.

4,110,225
SEALING WELLS

William S. Cagle, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 3, 1975, Ser. No. 554,845

Int. Cl.^{2} C09K *7/00*

U.S. Cl. 252—8.5 LC **7 Claims**

1. A method of sealing wellbores against lost circulation and the like comprising

(a) preparing an aqueous pumpable slurry of at least about 25 barrels containing per barrel at least 35 pounds of oil well cement, from about 5 to 50 pounds of diatomaceous earth, at least 5 pounds of lost-circulation agent other than diatomaceous earth;
(b) isolating a zone in said well so that hydraulic pressure above formation pressure at said zone may be applied; and
(c) pumping said slurry into said zone and maintaining a pressure thereon slightly above formation pressure for a period of at least about eight hours and until said slurry has at least an initial set.

4,110,226
STABILIZED AQUEOUS GELS AND USES THEREOF

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1977, Ser. No. 764,924

Int. Cl.^{2} C09K *7/02;* **E21B** *43/22, 43/26*

U.S. Cl. 252—8.5 C **14 Claims**

8. An aqueous gel, suitable for use as at least a portion of a fluid medium in a process wherein a said fluid medium is introduced into a borehole in the earth and into contact with a subterranean formation penetrated by said borehole, said gel comprising an aqueous brine having incorporated therein:

a water-thickening amount of a water-soluble cellulose ether;

a water-soluble compound of a polyvalent metal, wherein said compound of a polyvalent metal is a compound of chromium or manganese wherein the valence of the chromium therein is +6 and the valence of at least a portion of said chromium is reduced to +3 and wherein the valence of the manganese therein is +7 and the valence of at least a portion of said manganese is reduced to +4, in an amount which is sufficient to cause gelation of said aqueous brine containing said cellulose ether when the valence of at least a portion of said metal is reduced to said lower valence state;

a water-soluble reducing agent in an amount which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation with the formation of said gel wherein said reducing agent is selected from the group consisting of sodium or potassium sulfite, sodium or potassium hydrosulfite, sodium or potassium metabisulfite, sodium or potassium bisulfite, sodium or potassium sulfide, sodium or potassium thiosulfate, hydrogen sulfide, thioacetamide, hydroquinone, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dichloride, and mixtures thereof;

a water-soluble sulfoalkylated tannin capable of, and in an amount sufficient for, increasing the stability of said gel to decomposition, with said amount being sufficient to provide a weight ratio of the amount of said sulfoalkylated tannin to the amount of said polyvalent metal compound which is effective to cause said sulfoalkylated tannin to be effective in increasing the stability of said gel wherein the tannin molecule in said sulfoalkylated tannin is alkylated with a significant amount of $—C(R)_2—SO_3M$ side chains wherein each R is selected from the group consisting of hydrogen and alkyl radicals containing from 1 to 5 carbon atoms, and M is selected from the group consisting of ammonium and the alkali metals, and said tannin is selected from the group consisting of the gallotannins and the flavotannins;

wherein said amount of said cellulose ether is sufficient to provide a weight ratio of the amount of said cellulose ether to the amount of said polyvalent metal compound which is also effective to cause said sulfoalkylated tannin to be effective in increasing the stability of said gel and wherein

said weight ratio of the amount of said sulfoalkylated tannin to the amount of said polyvalent metal compound is within the range of from about 6.5:1 to about 27.5:1 and wherein

said weight ratio of the amount of said cellulose ether to the amount of said polyvalent metal compound is at least about 20:1.

4,110,227
OXIDATION STABLE POLYOXYALKYLENE FIBER LUBRICANTS

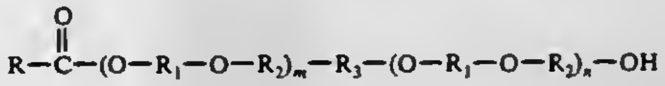
David Dudley Newkirk; Robert Bernard Login, both of Woodhaven, and Basil Thir, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 19, 1977, Ser. No. 834,721

Int. Cl.^{2} D06M *13/10*

U.S. Cl. 252—8.9 **21 Claims**

1. A lubricant for synthetic fibers comprising a polyoxyalkylene lubricant compound having the formula:



$$R-\overset{\overset{\large O}{\|}}{C}-(O-R_1-O-R_2)_m-R_3-(O-R_1-O-R_2)_n-OH$$

wherein R is an alkyl group having 1 to about 21 carbon atoms, $m + n$ has a value to produce a molecular weight of about 300 to about 2000, R_1 and R_2 are the residues of the same or different alkylene units derived from alkylene oxides individually selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and an aromatic glycidyl ether and R_3 is the residue of a difunctional phenol.

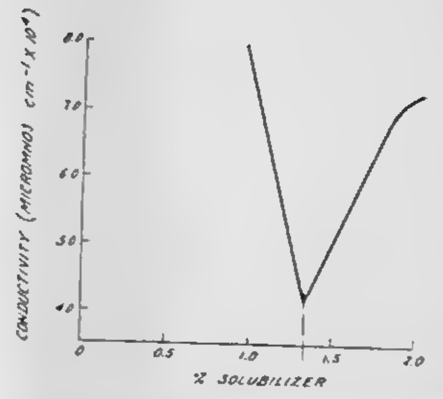
4,110,228
SALINITY TOLERANT SURFACTANT OIL RECOVERY PROCESS

Timothy N. Tyler, Houston, Tex.; Melvin E. Mills, Jr., Salem, Ill.; John A. Wells, and Joseph T. Carlin, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,643

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 252—8.55 D **7 Claims**



1. In a method of recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by least two wells in fluid communication with the formation, said formation also containing water of known or determinable salinity and divalent ion concentration, comprising injecting an aqueous surfactant-containing fluid into the formation by means of at least one of the wells to displace petroleum toward at least one other well from which it is recovered to the surface of the earth, said surfactant fluid comprising an aqueous fluid having salinity and divalent ion concentration about equal to the formation water, containing an organic sulfonate primary anionic surfactant and at least one solubilizing co-surfactant

selected from the group consisting of ethoxylated aliphatic alcohols, ethoxylated alkylphenols, ethoxylated alkylthiols, ethoxylated alkylarylthiols, alkylpolyethoxyalkyl sulfonates having from 8 to 22 carbon atoms in the first alkyl chain and the second alkyl is ethyl, propyl or hydroxypropyl and from 2 to 12 ethoxy groups per molecule, alkylarylpolyethoxyalkyl sulfonates having from 8 to 15 carbon atoms in the first alkyl chain and the second alkyl is ethyl, propyl or hydroxypropyl and from 2 to 12 ethoxy groups per molecule, alkylpolyethoxy sulfates having from 8 to 22 carbon atoms in the alkyl chain and from 2 to 12 ethoxy groups per molecule, alkylarylpolyethoxy sulfates having from 8 to 15 carbon atoms in the alkyl chain and from 2 to 12 ethoxy groups per molecule, wherein the improvement comprises

(a) identifying the ratio of solubilizing co-surfactant and primary anionic surfactant at which the above mixture of surfactants is borderline soluble in the fluid by a method comprising:

(1) preparing a series of at least four samples having a total surfactant concentration between 1.0 and 4.0 percent by weight and weight ratios of solubilizing co-surfactant to primary surfactant from 0.1 to 4.0;

(2) measuring the electrical conductivities of the samples creating a graphical plot of electrical conductivity versus weight ratio of solubilizing co-surfactant to organic sulfonate primary anionic surfactant, and identifying the ratio of surfactant concentration corresponding to the first inflection in the function of electrical conductivity versus concentration of solubilizing co-surfactant as the concentration of solubilizing co-surfactant is increased from a value insufficient to render the surfactants soluble in the fluid;

(b) blending the anionic primary surfactant and the solubilizing co-surfactant in a ratio at which they are borderline soluble as determined above.

4,110,229

SALINITY TOLERANT SURFACTANT OIL RECOVERY PROCESS

Joseph T. Carlin; Timothy N. Tyler, both of Houston, Tex.; Melvin E. Mills, Jr., Salem, Ill., and James W. Ware, Tulsa, Okla., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,646

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 252—8.55 D **5 Claims**

1. In a method of recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by at least two wells in fluid communication with the formation, said formation also containing water of know or determinable salinity and divalent ion concentration, comprising injecting an aqueous, saline, surfactant-containing fluid into the formation by means of at least one of the wells to displace petroleum toward at least one other well from which it is recovered to the surface of the earth, said surfactant fluid having salinity and divalent ion concentration about equal to the formation water and containing an organic sulfonate primary anionic surfactant and at least one solubilizing co-surfactant selected from the group consisting of ethoxylated alkylthiols, ethoxylated alkylarylthiols, alkylpolyethoxyalkyl sulfonates having from 8 to 22 carbon atoms in the first alkyl chain and the second alkyl is ethyl, propyl or hydroxypropyl and from to 2 to 12 ethoxy groups per molecule, alkylarylpolyethoxyalkyl sulfonates having from 8 to 15 carbon atoms in the first alkyl chain and the second alkyl is ethyl, propyl or hydroxypropyl, and from 2 to 12 ethoxy groups per molecule, alkylpolyethoxy sulfates having from 8 to 22 carbon atoms and from 2 to 12 ethoxy groups per molecule, alkylaryl polyethoxy sulfates having from 8 to 15 carbon atoms in the alkyl chain and from 2 to 12 ethoxy groups per molecule, wherein the improvement comprises

(a) determining the ratio of primary anionic surfactant to solubilizing co-surfactant which results in the surfactant mixture exhibiting borderline solubility in the fluid by a method comprising:

(1) preparing a series of at least four samples having total surfactant concentration between 1.0 and 4.0 percent by weight and weight ratios of solubilizing co-surfactant to primary anionic surfactant from 0.1 to 4.0;

(2) mixing the samples and allowing them to stand for at least 12 hours; and

(3) identifying the minimum ratio of solubilizing co-surfactant to primary anionic surfactant which exhibits a single phase condition; and

(b) blending the organic sulfonate primary anionic surfactant and a solubilizing co-surfactant in the minimum ratio determined above which achieves borderline solubility of the surfactants in the aqueous surfactant fluid.

4,110,230

AQUEOUS GELABLE COMPOSITIONS HAVING EXTENDED GELATION TIME AND METHODS OF PREPARING SAME

James E. Hessert, and Chester C. Johnston, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 441,848, Feb. 12, 1974, Pat. No. 3,926,258, which is a continuation-in-part of Ser. No. 318,847, Dec. 27, 1972, abandoned. This application Oct. 6, 1975, Ser. No. 620,082

Int. Cl.^{2} C09K *3/00*

U.S. Cl. 252—855 R **14 Claims**

1. An aqueous gelable composition having an extended or increased time of gelation, said composition comprising water to which there has been added:

a water-thickening amount of a water-dispersible polymer selected from the group consisting of (a) water-soluble cellulose ethers; (b) polyacrylamides and polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; crosslinked polyacrylamides and cross-linked polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; polyacrylic acid and ppolymethacrylic acid; polyacrylates; polymers of N-substituted acrylamides wherein the nitrogen atoms in the carboxamide groups can have from 1 to 2 alkyl substituents which contain from 1 to 4 carbon atoms; copolymers of acrylamide or methacrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide or methacrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups, and mixtures thereof; and (c) a bipolysaccharide produced by the action of bacteria of the genus Xanthomonas on carbohydrates;

an amount of a water-soluble compound of a polyvalent metal selected from the group consisting of water soluble compounds of chromium and manganese wherein the metal is present in a first valence state and is capable of being reduced to metal ions having a lower polyvalent valence state, which amount is sufficient to cause gelation of said water containing said polymer when the valence of at least a portion of said metal is reduced to produce said metal ions having said lower valence state as described hereinafter;

an amount of a complexing agent capable of complexing with said ions of said metal having said reduced valence state, wherein said complexing agent is selected from the group consisting of citrates, tartarates, acetates, phosphates, hydrophosphates and arsenates, wherein said amount is sufficient to complex with at least a portion of said ions and cause said extended gelation time when said ions are produced as described hereinafter; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said metal ions having said lower valence state, with said reducing agent being added to said water after said complexing agent has been added thereto.

4,110,231

STABILIZED AQUEOUS GELS AND USES THEREOF

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1977, Ser. No. 764,925

Int. Cl.^{2} C09K *7/02;* **E21B** *43/22, 43/26*

U.S. Cl. 252—8.5 C **14 Claims**

8. An aqueous gel, suitable for use as at least a portion of a fluid medium in a process wherein a said fluid medium is introduced into a borehole in the earth and into contact with a subterranean formation penetrated by said borehole, said gel comprising an aqueous brine having incorporated therein:

a water-thickening amount of a water-soluble cellulose ether;

a water-soluble compound of a polyvalent metal, wherein said compound of a polyvalent metal is a compound of chromium or manganese wherein the valence of the chromium therein is +6 and the valence of at least a portion of said chromium is reduced to +3 and wherein the valence of the manganese therein is +7 and the valence of at least a portion of said manganese is reduced to +4 valence state, in an amount which is sufficient to cause gelation of said aqueous brine containing said cellulose ether when the valence of at least a portion of said metal is reduced to said lower valence state;

a water-soluble reducing agent in an amount which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation with the formation of said gel wherein

said reducing agent is selected from the group consisting of sodium or potassium sulfite, sodium or potassium hydrosulfite, sodium or potassium metabisulfite, sodium or potassium bisulfite, sodium or potassium sulfide, sodium or potassium thiosulfate, hydrogen sulfide, thioacetamide, hydroquinone, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dichloride, and mixtures thereof; and

a water-soluble lignosulfonate capable of, and in an amount sufficient for, increasing the stability of said gel to decomposition, with said amount being sufficient to provide a weight ratio of the amount of said lignosulfonate to the amount of said polyvalent metal compound which is effective to cause said lignosulfonate to be effective in increasing the stability of said gel wherein said weight ratio of the amount of said lignosulfonate to the amount of said polyvalent metal compound is within the range of from about 3.5:1 to about 8.5:1.

4,110,232

WATERFLOODING PROCESS EMPLOYING CATIONIC-NONIONIC COPOLYMERS

Frederick C. Schwab, Metuchen; Edward W. Sheppard, Lambertville, and Catherine S. H. Chen, Berkeley Heights, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

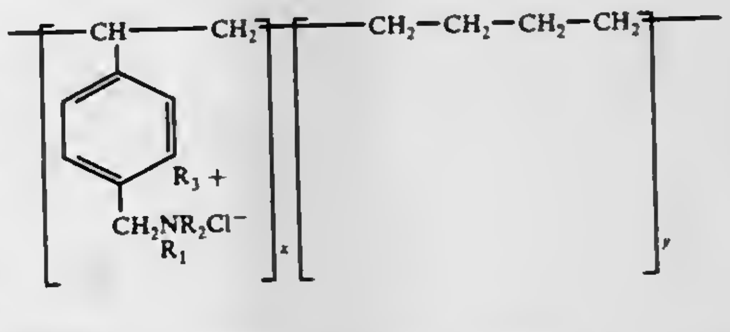
Filed Apr. 15, 1977, Ser. No. 787,807

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 252—8.55 B **6 Claims**

1. In a method of recovering oil from an oil-containing subterranean formation penetrated by an injection well and a production well and wherein an aqueous fluid is injected via said injection well into said formation to displace said oil to said production well, the improvement comprising:

employing in at least a portion of said aqueous fluid injected via said injection well into said formation a water soluble copolymer having a molecular weight within the range of 50,000 to 500,000, said copolymer being employed in a sufficient amount to thicken said portion of said aqueous fluid and provide improved efficiency in displacing said oil to said production well, said water soluble copolymer being formed of hydrogenated polybutadiene segments and polystyrene segments chemically modified to strong polyelectrolytes with cationic sites fixed onto the polymer backbone, said polystyrene segments having been first chloromethylated by reacting with chloromethyl ether or formaldehyde and hydrogen chloride and then quaterized by reacting with a tertiary amine to form strong polyelectrolytes with cationic sites fixed onto the polymer backbone, said copolymer having the following structural formula:



wherein:

R_1, R_2, and R_3 are alkyl groups containing 1 to 18 carbon atoms, and

x to *y* is a ratio that is equal to or greater than about 1.

4,110,233

LITHIUM BASE GREASE CONTAINING POLYISOBUTYLENE

Wayne W. Bailey, and Brian W. Taylor, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 27, 1976, Ser. No. 754,250

Int. Cl.^{2} C10M *1/24, 3/18, 5/14, 7/20*

U.S. Cl. 252—41 **9 Claims**

1. A lubricating grease composition specially suitable for the lubrication of heavy steel processing equipment and having improved resistance of removal by water, improved pumpability over a wide range of ambient temperatures, and the ability to float on water consisting essentially of:

(1) a petroleum base of lubricating viscosity ranging from about 7 to about 13 centristokes as measured by ASTM D-445 at 98.9° C and having a specific gravity ranging from about 0.9279 to about 0.8654 at 15.6° C;

(2) a lithium soap of a fatty acid having from about 10 to about 30 carbon atoms as a thickener in an amount from about 3 to about 20 percent by weight of the lubricating grease composition; and

(3) a polyisobutylene in an amount from about 5 to about 12.5 percent by weight of the lubricating grease composition and of a molecular weight from about 75,000 to about 125,000 as measured by the Staudinger method, to confer said improved water resistance and pumpability on the composition.

4,110,234

ANTIOXIDANT STABILIZED LUBRICATING OILS

Frederick C. Loveless, Cheshire, and Walter Nudenberg, Newtown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,162

Int. Cl.^{2} C10M *1/38*

U.S. Cl. 252—47.5 **82 Claims**

1. An antioxidant stabilized oil comprising:

(a) a hydrocarbon oil selected from synthetic hydrocarbon oils prepared from an alpha-olefin having 3 to 14 carbon atoms, having an average molecular weight between about 280 and 1000, and less than about 0.25 mole of $C{=}C$ per 1000 grams of oil, and hydrocarbon based mineral oils which are substantially acid free and which possess less than 0.15 mole of $C{=}C$ per 1000 grams of oil; and

(b) a phenylated naphthylamine;

(c) a sulfur-containing compound being selected from compounds of the formulae R—S—R and R—SS—R wherein the R groups are the same or different and are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, alkanoate, thiazole, imidazole, phosphorothionate, and β-ketoalkyl radicals, and where applicable, said sulfur containing compound contains no more than one phenyl to sulfur bond; and

(d) a metal selected from the Groups VIII, Ib and IIb of the Periodic Table and having an atomic number greater than 26 with the exception of silver (47); wherein (b) is present in from about 0.15 to 1.25 parts, and (c) is present in from about 0.05 to 4 parts, both by weight per 100 parts of (a), and (d) is present in .01 to 25 parts per million of (a).

57. An antioxidant additive system for use in a hydrocarbon oil selected from synthetic hydrocarbon oils prepared from an alpha-olefin having from 3 to 14 carbon atoms, an average molecular weight between about 280 and 1000 and less than about 0.25 mole of $C{=}C$ per 1000 grams of oil, and hydrocarbon based mineral oils which are substantially acid free and which possess less than about 0.15 mole of $C{=}C$ per 1000 grams of oil, comprising:

(a) a phenylated naphthylamine;

(b) a sulfur-containing compound being selected from compounds of the formulae R—S—R and R—SS—R wherein the R groups are the same or different and are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, alkanoate, thiazole, imidazole, phosphorothionate and β-ketoalkyl radicals, and where applicable with the proviso that said sulfur-containing compound contains no more than one phenyl to sulfur bond; and

(c) a metal selected from Groups VIII, Ib and IIb of the Periodic Table and having an atomic number greater than 26 with the exception of silver; and wherein (a) is present in about 0.15 to 1.25 parts and (b) is present in from about 0.05 to 4 parts, both by weight, per 100 parts of oil, and (c) is present in from 0.01 to 25 parts per million of the oil.

68. A method of stabilizing a hydrocarbon oil selected from synthetic hydrocarbon oils prepared from an alpha-olefin having from 3 to 14 carbon atoms, an average molecular weight between about 280 and 1000 and less than about 0.25 mole of $C{=}C$ per 1000 grams of oil, and hydrocarbon based mineral oils which are substantially acid free and which possess less than 0.15 mole of $C{=}C$ per 1000 grams of oil comprising combining therewith

(a) a phenylated naphthylamine,

(b) a sulfide compound selected from compounds of the formulae R—S—R and R—SS—R wherein the R groups are the same or different and are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, alkanoate, thiazole, imidazole, phosphorothionate, and β-ketoalkyl radicals, and where applicable said sulfur-containing compound contains no more than one phenyl to sulfur bond; and

(c) a metal selected from Groups VIII, Ib and IIb of the Periodic Table and having an atomic number greater than 26, with the exception of silver; and wherein (a) is present in from about 0.15 to 1.25 parts, and (b) is present in from about 0.05 to 4 parts, both by weight per 100 parts of oil, and (c) is present in from about 0.01 to 25 parts per million of the oil.

4,110,235

ETHYLENE-HYDROCARBON COPOLYMERIC VISCOSITY IMPROVERS CONTAINING COLOR AND STABILITY IMPROVERS

James O. Waldbillig, Wappingers Falls; Carmen M. Cusano, Poughkeepsie, both of N.Y.; David D. Reed, Tokyo, Japan, and Richard L. Winstead, Hopewell Junction, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,862

Int. Cl.² C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 R **8 Claims**

1. A color and viscosity stabilized, viscosity index improving additive package for a lubricating oil comprising a copolymeric ethylene-α-olefin viscosity index improver and from 0.005 to 5.0 weight percent of a stabilizer consisting of at least one compound of the group of N,N′-bis(2-hydroxy-5-alkylbenzyl)α,Ω-diaminoethane wherein said alkyl group contains from 4 to 30 carbon atoms and the calcium, barium, magnesium and zinc salts thereof.

4,110,236

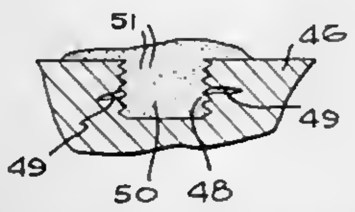
NONDESTRUCTIVE MAGNETIC RECORDING MEDIUM

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 420,327, Nov. 29, 1973, Pat. No. 3,978,398. This application Apr. 19, 1976, Ser. No. 678,279

Int. Cl.² H01F *1/117*

U.S. Cl. 252—62.54 **5 Claims**



1. A magnetizable putty-like recording medium for magnetic particle inspection of an object, comprising a material selected from the group of polymers and resins consisting essentially of silicone polymers, urethane polymers, natural rubber, neoprene, carboxyl terminated polybutadiene, and guar gum, said polymers and resins having a viscosity such that said polymers have putty-like characteristics, and including magnetic particles distributed therein, said material being highly pliable and moldable so that it can be applied to a part surface and pressed by light pressure against the surface to fill any gaps between the putty-like material and the surface of the part, said recording medium being demagnetizable following magnetization, and reuseable, said magnetic particles being present in an amount of about 5 to about 60%, by weight of said polymers and resins.

4,110,237

COMPOSITIONS CONTAINING A DIAZINE AND A HALOGEN COMPOUND FOR CATALYZING COPPER ETCHING SOLUTIONS

Akira Matsumoto, and Katsutoshi Itani, both of Fuji, Japan, assignors to Tokai Denka Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,429, Oct. 1, 1975, abandoned, which is a division of Ser. No. 510,535, Sep. 30, 1974, Pat. No. 3,936,332. This application Jun. 28, 1977, Ser. No. 810,730

Claims priority, application Japan, Nov. 19, 1973, 48-129156

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.² C09K *13/04*

U.S. Cl. 252—79.4 **24 Claims**

1. A composition for catalyzing peroxysulfate solutions for etching copper and copper alloys comprising from 50 to 2000 parts by weight of a diazine and from 5 to 2000 parts by weight of a halogen compound which liberates halogen in an aqueous solution, said diazine being selected from the group consisting of pyrimidine, aminopyrimidine, methylpyrimidine, pyrazine, pyrazinecarboxamide, quinoxaline, pyridazine, phthalazine and cinnoline, and said halogen compound is a member selected from the group consisting of an alkali metal salt of a halogen acid, dichloroisocyanuric acid and salts thereof, and 1-chlorodiethylether.

4,110,238

REDUCED-STAINING COLORANT SYSTEM

Robert J. Lala, River Edge, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 574,487, May 5, 1975, Pat. No. 3,958,928. This application Feb. 5, 1976, Ser. No. 655,346

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² C11D *3/42, 3/40;* **C09B** *1/28, 1/32*

U.S. Cl. 252—89 B **3 Claims**

1. A method for producing a synthetic liquid detergent having a Gardner Reflectometer "*b*" color value of about −5 to −15 whereby said liquid detergent exhibits reduced staining characteristics while still retaining the ability to impart bluing to fabrics comprising admixing with said detergent a sufficient amount to produce said color value of a dye mixture consisting essentially of about 0.0005% to about 0.0030% by weight of 1,4-bis (2 ethylhexylamino)anthraquinone and at least one water soluble anthraquinone dye selected from the group consisting of 1-amino-2-sulfo, 4-(2-sulfo-para toluidino) anthraquinone sodium salt, 1,4-bis(3-sodium sulfonate-mesitylidino)anthraquinone and mixtures thereof.

4,110,239

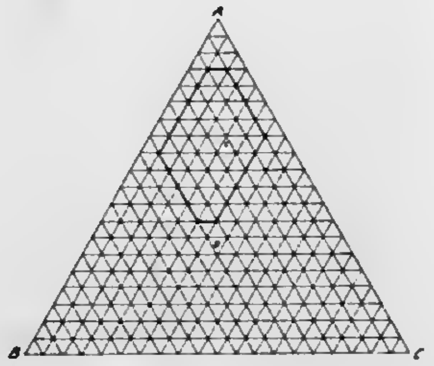
QUICK LATHERING TOILET BARS AND METHOD OF MAKING SAME

Leon M. Prince, Westfield, N.J., assignor to Lever Bros. Co., New York, N.Y.

Division of Ser. No. 419,558, Nov. 28, 1973, Pat. No. 3,989,647, which is a continuation of Ser. No. 137,228, Apr. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 54,008, Jul. 10, 1970, abandoned. This application Jun. 14, 1976, Ser. No. 695,707

Int. Cl.² C11D *1/02*

U.S. Cl. 252—135 **8 Claims**



1. A non-mushing high lathering synthetic toilet bar having a pH of about 4.5–9.5 and consisting essentially of based on the total weight of the actives:

i. 40% to about 85% of a primary alkane sulfonate or a mixture of alkane sulfonates wherein the carbon chain contains 12 carbon atoms or averages 12 carbon atoms;

ii. 5% to about 35% of a natural or synthetic fatty acid or mixtures thereof wherein the carbon chain contains or averages 12 carbon atoms;

iii. 5% to about 30% of a binder modifier selected from the group consisting of: alkali metal, magnesium or ammonium salts of C_{12}–C_{16} primary alkyl phosphonates and alkali metal, magnesium or ammonium salts of C_{12}–C_{16} primary alkyl phosphates; and

iv. based on the total weight of the bar, 5–25% water.

4,110,240

COPRECIPITATION PROCESS

Thomas J. Leo, and Anders H. Johansson, both of Yardley, Pa., assignors to Wyrough and Loser, Inc., Trenton, N.J.

Filed Jul. 29, 1977, Ser. No. 820,557

Int. Cl.² C08C *1/14;* **C08J** *3/20*

U.S. Cl. 252—182 **66 Claims**

1. A process for improving the clarity of the serum produced during coprecipitation of a rubber or plastic compounding chemical and a binder, comprising

(a) intimately mixing at least one finely divided rubber or plastic compounding chemical, wherein substantially all of the particles thereof are at least about 0.05 micron in size, with a film-forming binder emulsion comprising a latex of a rubber or plastic polymer in the presence of an amount of water which permits intimate mixture thereof, wherein no compounding chemical used is a reinforcing agent or diluent for rubber or plastic stock,

(b) adding a stoichiometric excess of a coagulating agent during further intimate mixing of the chemical and the binder emulsion to cause complete coagulation thereof, and

(c) physically separating the substantially clear serum produced upon coagulation from the homogeneous, essentially non-tacky, dustless, friable particles of predispersed chemical which comprise from about 80 to about 99.5 percent by weight of said chemical and from about 0.5 to about 20 percent by weight of said binder.

4,110,241

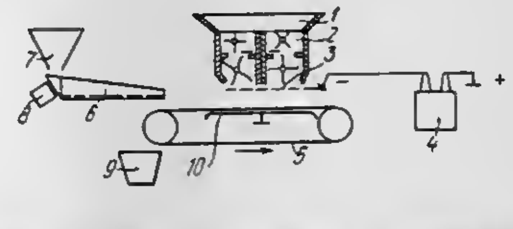
METHOD OF MANUFACTURING ACTIVE MATERIAL FOR LEAD BATTERIES

Vladimir Georgievich Pirkulov, prospekt A. Tsereteli, 101, kv. 27; Mikhail Arkadievich Askarov, ulitsa Makashvili, 1, and Avtandil Vladimirovich Dzhasbi, ulitsa Ioseliani, 20ᵃ, all of Tbilisi, U.S.S.R.

Filed May 12, 1977, Ser. No. 796,066

Int. Cl.² H01M *4/62, 4/56, 4/57*

U.S. Cl. 252—182.1 **2 Claims**



1. A method of manufacturing an active material for lead batteries consisting in that a synthetic acid-resistant fibres are uniformly settled in an electric field on a continuously moving horizontal band of a semiconductor material, said fibres being oriented perpendicularly to said moving band; then said moving band is covered with lead powder which fills the gaps between the fibres in a quantity sufficient for creating a layer whose thickness corresponds to the length of said synthetic fibres; the obtained mixture of fibres with lead powder is removed from the band and mixed with sulphuric acid and water.

4,110,242

COMPOSITIONS AND METHOD FOR ACTIVATING OXYGEN UTILIZING N-ACYLATED URACILS AND BENZOURACILS

Christian Hase, and Brigitte Hase, both of Erkrath-Unterbach, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

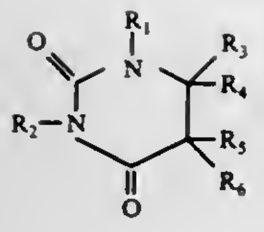
Filed Mar. 29, 1977, Ser. No. 782,334

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614148

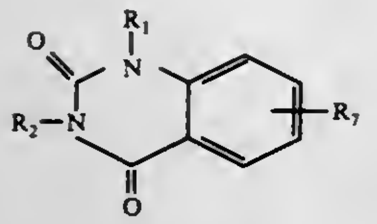
Int. Cl.² A61L *13/00*

U.S. Cl. 252—186 **20 Claims**

1. The method of activating aqueous solutions of percompounds selected from the group consisting of hydrogen peroxide and water-soluble inorganic peroxyhydrates containing from 20 mg to 500 mg per liter of active oxygen, said solution having a pH of 4 to 12 and a temperature of from 10° C. to 70° C. which consists essentially of adding to said aqueous solution as an activator, an acylated uracil of the formula selected from the group consisting of



and



wherein at least one of R_1 and R_2 is an acyl of an acid selected from the group consisting of alkanoic acids having 2 to 4 carbon atoms and benzoic acid, and the other of R_1 or R_2 is a member selected from the group consisting of alkanoyl having 2 to 4 carbon atoms, benzoyl, and R_3; R_3, R_4, R_5 and R_6 are independently members selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, haloalkyl having 1 to 4 carbon atoms, alkoxyalkyl having 2 to 6 carbon atoms, carboxyalkyl having 2 to 4 carbon atoms, and alkoxycarbalkyl having 3 to 6 carbon atoms, and R_7 is a member selected from the group consisting of hydrogen, halogen, alkyl having 1 to 4 carbon atoms, $—CO_2Me$, $—SO_3Me$, amido, cyano, sulfamido and nitro, where Me is an alkali metal or ammonium.

4,110,243
ALKYLPHENYL 3-CYANO OR FLUORO-4-ALKYLOXYBENZOATES AND MESOMORPHIC MIXTURES THEREOF

Marie Annick Abert-Mellah; Jean Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

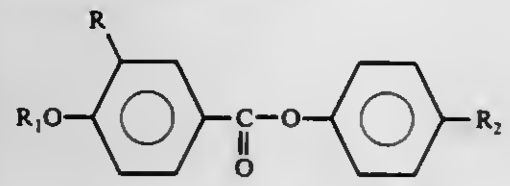
Filed Apr. 27, 1976, Ser. No. 680,772

Claims priority, application France, Apr. 30, 1975, 75 13617

Int. Cl.^{2} C07C *69/84, 121/75;* **C09K** *3/34*

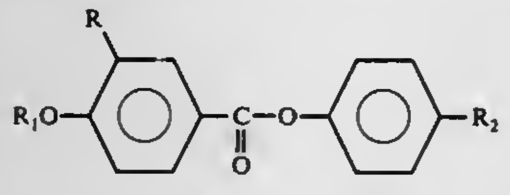
U.S. Cl. 252—299 **4 Claims**

1. A compound of the formula:



in which R is a fluoro or a nitrile radical, and wherein R_1 and R_2 are alkyl radicals (C_nH_{2n+1}) with n being an integer of 1 to 9.

2. A mesomorphic mixture comprising (a) an organic compound of the formula:



wherein R is a fluoro or a nitrile radical, and wherein R_1 and R_2 are alkyl radicals (C_nH_{2n+1}) with n being an integer of 1 to 9; and (b) a liquid nematic crystal; wherein said organic compound (a) is present in an amount effective for improving the scattering effect of said liquid nematic crystal in said mesomorphic mixture; and wherein said liquid nematic crystal is 4'-pentylphenyl 4-methoxybenzoate.

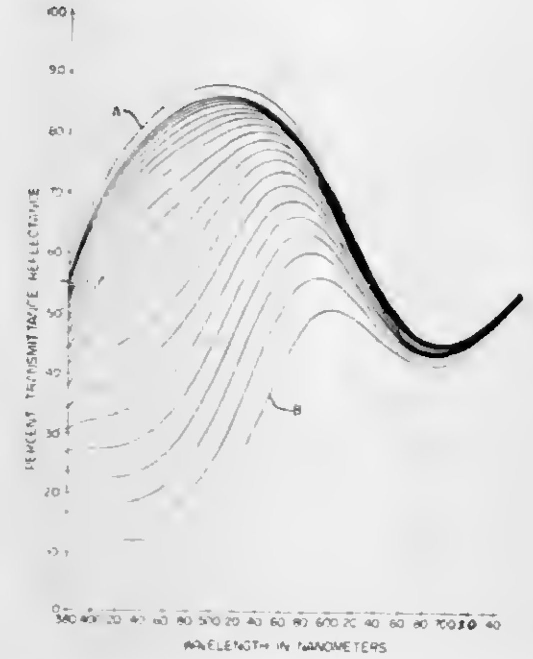
4,110,244
PHOTOCHROMIC PLASTIC MATERIAL

Richard J. Hnvey, Sturbridge, Mass., assignor to American Optical Corporation, Southhridge, Mass.

Division of Ser. No. 694,963, Jun. 11, 1976, Pat. Nn. 4,049,846. This application May 4, 1977, Ser. No. 793,574

Int. Cl.^{2} G02B *5/23*

U.S. Cl. 252—300 **8 Claims**



1. A photochromic material comprising a transparent cured polymer having micro-porous surface channels, said channels containing a photochromically effective amount of a silver halide crystallized in situ and having a crystal size in the range of 30 to 500A wherein said polymer consists essentially of a cross polymerized mixture of at least one unsaturated polyester resin produced by esterification of a polybasic, unsaturated organic acid with a polyhydric alcohol and a polar vinyl monomer, said polyester resin and polar vinyl monomer being present in a ratio between about 0.1:1 and 100:1.

4,110,245
GREEN COLORED FILTER GLASS

Toshiharu Yamashita, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,896

Claims priority, application Japan, Dec. 2, 1976, 51-145151

Int. Cl.^{2} C03C *3/16, 3/30;* **F21V** *9/08;* **G02B** *5/22*

U.S. Cl. 252—300 **1 Claim**

1. A green colored filter glass which absorbs light with wavelengths both in the range of about 400 to about 500 mμ and in the range of about 600 to 700 mμ and which has a high light transmittance at the wavelength region of about 500 to about 600 mμ, consisting essentially of

(a) 100 parts by weight of a base glass consisting of, by weight, 40 to 85% of P_2O_5; 2 to 10% of Al_2O_3; 0 to 53% of BaO, 0 to 15% of Li_2O, with the total proportion of 3 to 53% BaO + Li_2O; 0 to 15% of NaO and/or K_2O; 0 to 10% of MgO, CaO, ZnO and/or PbO; 0 to 20% of SrO and 0 to 5% of B_2O_3, ZrO_2, TiO_2 and/or La_2O_3;

(b) 0.01 to 3.0 parts by weight of NiO; and

(c) 0.02 to 3.0 parts by weight of CuO.

4,110,246
MIXTURE OF BENZOXAZOLE DERIVATIVES

Hans Frischkorn, Hofheim am Taunus, and Günter Rösch, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 794,960, May 9, 1977, abandoned. This applicatioo Nov. 7, 1977, Ser. Nn. 849,090

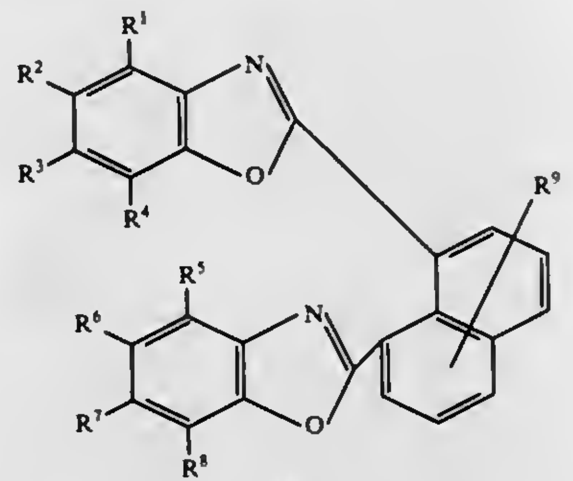
Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621169

Int. Cl.^{2} C09K *11/06;* **C07D** *263/56*

U.S. Cl. 252—301.28 **6 Claims**

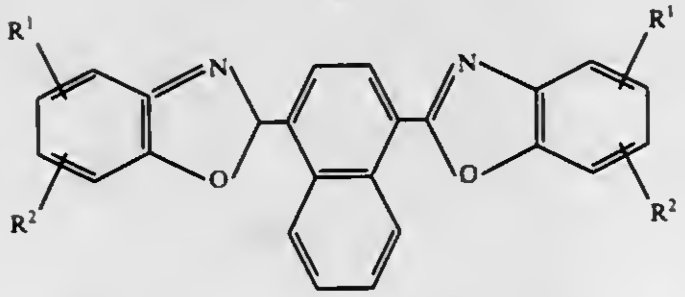
1. A composition consisting essentially of 60–10% 1,7-bis-benzooxazolyl-naphthalenes and 40–90% of 1,4-bis-benzoxazolyl naphthalenes of the formulas I and II

I



and

II



wherein R^1 to R^8 each are, independent from one another, hydrogen, alkyl of 1 to 18 carbons, C_2–C_4 alkenyl, phenyl, C_1–C_4alkylphenyl, carboxy, $—COOR^{10}$, or $—SO_2R^{10}$, wherein R^{10} is a straight chain or branched alkyl of 1 to 18 carbons, C_1–C_4-hydroxyalkyl, C_1–C_4-alkoxy, C_1–C_4-alkyl, N,N-di-C_1–C_4-alkylamino-C_1–C_4-alkyl or the corresponding quaternary trialkylammoniumalkyl or C_1–C_4-alkylphenyl, or wherein two adjacent groups can form together a C_4-alkylene group or a fused benzo ring and R^9 is hydrogen, C_1–C_4-alkyl, chlorine, cyano or $—COOR^{11}$ or $—SO_2OR^{11}$, wherein R^{11} is hydrogen, C_1–C_4-alkyl, phenyl or C_1–C_4-alkylphenyl.

4,110,247
METHOD OF PREPARING COLLOIDAL SOL OF ANTIMONY OXIDE

Reginald Price Gower, II, South Euclid, and John Gilbert Richardson, Brook Park, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

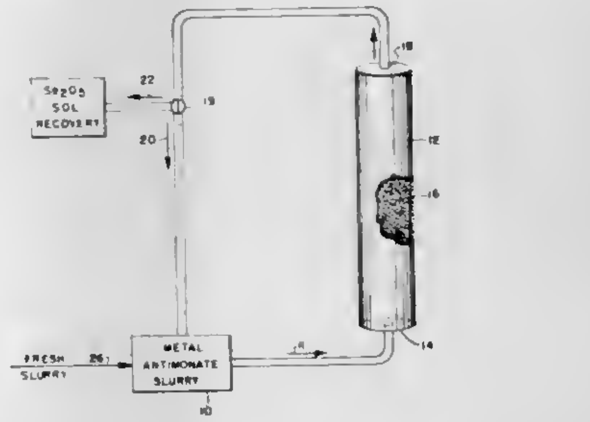
Filed Apr. 7, 1977, Ser. No. 785,375

Int. Cl.^{2} B01J *13/00*

U.S. Cl. 252—313 R **4 Claims**

1. A method of preparing a colloidal aqueous sol of antimony pentoxide from a water-insoluble metal antimonate comprising:

(a) preparing an aqueous slurry of a water-insoluble metal antimonate, and



(b) passing the aqueous slurry through a fluidized bed containing a cation exchange resin whereby metal antimonate is converted to colloidal antimony pentoxide.

4,110,248
MANUFACTURE OF CATALYSTS FOR POLYMERIZATION OF OLEFINS

Stylianos Sandis, Lavera, and Jean Claude Bailly, Martigues, both of France, assignors to Naphtachimie Societe Anonyme, Paris, France

Filed Feb. 1, 1977, Ser. No. 764,566

Claims priority, application France, Feb. 3, 1976, 76 02898

Int. Cl.^{2} C08F *4/64*

U.S. Cl. 252—429 B **8 Claims**

1. In a process for the production of solid catalysts based on titanium trichloride used in the polymerization of alpha-olefins wherein titanium tetrachloride is reduced by an organoaluminum compound to form a precipitate, and then the precipitate is aged in the presence of its formation media, the improvement comprising reducing the titanium tetrachloride with the organoaluminum compound such that the ratio of the number of titanium tetrachloride moles to the number of organic gram equivalents of the organoaluminum compound is at least equal to 1.8, with the organoaluminum compound being a compound having the general formula AlR_nX_{3-n} in which R is an alkyl, cycloalkyl, aryl or aralkyl group containing 1 to 12 carbon atoms, X is a hydrogen or halogen atom, and n is an integer or fraction which can assume any value between 1 and 3, the process being performed in the presence of 2 to 5 moles, per mole of organoaluminum compound, of one or several aliphatic ethers of formula R'—O—R" in which R' and R" are alkyl groups containing 1 to 5 carbon atoms, at least a portion of said ether being mixed with the organoaluminum compound in the absence of the titanium tetrachloride, the ratio of the number of moles of ether to the number of moles of the organoaluminum compound in said mixture being between 0.3 and 5, the reduction of the titanium tetrachloride is performed between −10° and +60° C, and the aging of the precipitate is performed between 20° and 100° C, for a period between 15 minutes and 24 hours, and recovering the solid catalyst.

4,110,249
PREPARATION OF BISMUTH MODIFIED SPHEROIDAL MALACHITE

Joseph Melvin Fremont, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 711,724, Aug. 5, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 803,261

Int. Cl.^{2} B01J *27/20*

U.S. Cl. 252—431 R **8 Claims**

1. A process for producing spheroidal agglomerates of basic copper carbonate crystals, at least about 80% of the agglomerates being 5 to 12 microns in the longest dimension, the ag-

glomerates containing 1 to 4% by weight of bismuth oxycarbonate, the process consisting essentially of

- (A) forming amorphous gel-like hydrated copper carbonate by bringing together in aqueous solution with mixing, at a temperature less than about 55° C, enough of
  - (1) a cupric salt,
  - (2) a bismuth salt, and
  - (3) an alkali metal carbonate or an alkali metal bicarbonate, to yield a mixture with a pH value of 5.5 to 7.5; and then
- (B) holding the mixture of (A), without agitation, at a temperature less than about 55° C, until the spheroidal agglomerates are formed.

4. A spheroidal agglomerate of basic copper carbonate crystals, produced by the process of claim 1.

6. A process for the formation of a copper acetylide complex, the process consisting essentially of subjecting the product of claim 4, as a slurry in an aqueous medium, to the action of formaldehyde and acetylene.

4,110,250
AMMOXIDATION PROCESS AND CATALYST

Howard P. Angstadt, Media, Pa., assignor to Suntecb, Inc., Wayne, Pa.

Division of Ser. No. 750,092, Dec. 13, 1976, Pat. No. 4,044,042. This application Apr. 19, 1977, Ser. No. 788,864

Int. Cl.^{2} B01J *21/02, 27/02, 23/16*

U.S. Cl. 252—432 **7 Claims**

1. A catalyst consisting essentially of an alkali metal vanadium bronze supported on α-alumina and promoted with about 2 to about 3% of tellurium, about 2 to about 3% of titanium and about 0.15 to about 0.3% of boron, said percentages being by weight of the total catalyst and its support and wherein said promoters are in the form of their oxides.

4,110,251
METAL OXYHALIDE CATALYTIC COMPOSITIONS

Alan Lauder, Newark, and Elrey L. McCann, III, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 566,107, Apr. 8, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,584

Int. Cl.^{2} B01J *27/12, 27/10*

U.S. Cl. 252—442 **21 Claims**

1. A catalytic composition of the general formula $ABO_{3-f}X_f$ and having a perovskite crystal structure, wherein

- the Type A cations are cations of at least one metal selected from the Groups IA, IB, IIA, IIB, IIIB, IVA, VA, the lanthanide rare earth metals and the actinide rare earth metals, said cations having ionic radii between about 0.8 to 1.65 Angstroms;
- the Type B cations are cations of at least one metal selected from Groups IA, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, VB, VIB, VIIB, the metals of atomic numbers 24 to 30, and the platinum metals, said cations having ionic radii between about 0.4 to 1.4 Angstroms;
- with the proviso that at least 1% of the Type B cations are cations of at least one metal selected from the metals having atomic numbers 24 to 30,and the platinum metals;

O is oxide;
X is fluoride or chloride; and
f is about 0.01 to 1.0.

4,110,252
CATALYTICALLY ACTIVE ALCL$_3$-GRAPHITE INTERCALATE

Clifford E. Smith, and Hans D. Holtz, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1976, Ser. No. 748,085

Int. Cl.^{2} B01J *27/10, 27/08*

U.S. Cl. 252—442 **9 Claims**

1. A method for preparing an intercalate composition comprising graphite and aluminum halide comprising:

- (1) contacting graphite with a Group VA metal halide at a temperature below the decomposition temperature of the Group V halide and pressure sufficient and for a time sufficient to form a first intercalate composition,
- (2) treating said first intercalate composition at a temperature sufficiently elevated and at a pressure sufficient to remove at least a portion of Group VA metal halide from the first intercalate composition, and
- (3) contacting said intercalate composition from which Group VA metal halide has been at least partially removed with aluminum halide at a temperature below the decomposition temperature of the aluminum halide and pressure sufficient to form a second intercalated structure comprising aluminum halide, graphite, and a Group VA metal halide present in a molar ratio of Group VA metal halide to aluminum halide of about 1.4:1 to 0:1.

4,110,253
METHOD FOR THE DISPROPORTIONATION OF HIGHLY ALKYLATED PHENOLS WITH PHENOL

Bruce E. Leach, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 24, 1977, Ser. No. 762,083

Int. Cl.^{2} B01J *29/00*

U.S. Cl. 252—457 **3 Claims**

1. An improved catalyst for phenolic disproportionation and methylation comprising adding to a magnesium oxide base catalyst from about 0.5 to about 15% by weight of tungsten oxide, from about 1 to about 5% by weight of $SiO_2{:}XH_2O$, and from about 1 to about 5% by weight of Na_2SiO_3, based on the total weight of the final catalyst.

3. A catalyst as described in claim 1 wherein about 5 weight percent tungsten oxide, 3 weight percent sodium silicate and about 3 weight percent silica sol are present.

4,110,254
METAL OXIDE CATALYTIC COMPOSITIONS

Alan Lauder, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 463,985, Apr. 25, 1974, abandoned. This application Jun. 3, 1976, Ser. No. 692,500

Int. Cl.^{2} B01J *21/04, 23/10, 23/58, 23/64*

U.S. Cl. 252—462 **17 Claims**

1. Catalytic compounds having the perovskite-type ABO_3 crystal structure wherein the Type A cation sites are substantially fully occupied by ions of one metal having an atomic number of 11 to 51, 57 to 71, or 89 to 103; about 1 to 20% of the Type B cation sites are occupied by ions of at least one platinum group metal selected from ruthenium, osmium, rhodium, iridium, palladium, and platinum and the remainder of the Type B cation sites are occupied by ions of at least one nonplatinum group metal having an ionic radius between 0.4 and 1.4 Angstroms, and wherein a major portion of the nonplatinum group B site metals have a single fixed valence of three.

4,110,255
BEVERAGE CARBONATION DEVICE

Alexander L. Liepa, Wyoming, and Cornelis H. Japikse, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 489,292, Jul. 7, 1974, Pat. No. 4,007,134, which is a continuation-in-part of Ser. No. 445,200, Feb. 25, 1974, abandoned. This application Nov. 8, 1976, Ser. No. 739,663

Int. Cl.^{2} B01J *29/06*

U.S. Cl. 252—455 Z **26 Claims**

1. A rigid composite body comprising crystalline zeolite molecular sieves in an amount of at least 40% of the body weight, said body having a surface area to mass ratio of from about 4 cm^2/g. to about 200 cm^2/g. and having at least 6 g. of crystalline zeolite molecular sieves distributed substantially uniformly throughout said body wherein said body has adsorbed therein a releasable amount of carbon dioxide which is sufficient to carbonate an aqueous beverage when said body is immersed therein, and; wherein said body has a plurality of substantially parallel elongated channels extending from one surface of said body to the interior of said body with the longitudinal axis of said elongated channels substantially parallel to the axis of the vertical dimension of said body.

4,110,256
CATALYST FOR REFORMING FUEL AND METHOD FOR PRODUCING SAME

Yukihisa Takeuchi, Aichi, and Masao Wakayama, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Japan

Filed Jun. 10, 1977, Ser. No. 805,439

Claims priority, application Japan, Jun. 22, 1976, 51-73718; Jul. 15, 1976, 51-84234

Int. Cl.^{2} B01J *21/04, 23/72, 23/86*

U.S. Cl. 252—465 **16 Claims**

1. A catalyst for reforming a fuel, comprising a catalyst carrier consisting essentially of γ-Al_2O_3 and a catalyst metal mixture containing Cu, Ni and Cr supported on said carrier, said catalyst metal mixture having the following composition:

$Cu = 36–62\%$ by weight,
$Ni = 8–32\%$ by weight, and
$Cr = 18–41\%$ by weight,

provided that $Cu + Ni + Cr = 100\%$ by weight.

4,110,257
RANEY NICKEL CATALYTIC DEVICE

Stephen A. O'Hare, Vienna, Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 1, 1977, Ser. No. 812,303

Int. Cl.^{2} B01J *21/04, 23/74*

U.S. Cl. 252—466 J **6 Claims**

1. The method of making a tubular-shaped catalytic device comprising:

- (a) inserting a tubular-shaped catalytic element into a tubular-shaped substrate, and
- (b) heat-treating the resulting composite to cause the tubular-shaped catalytic element to irreversibly expand and become secured to the inside surface of said substrate.

4,110,258
BARIUM METAL OXIDE CATALYTIC COMPOSITIONS

Alan Lauder, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation of Ser. No. 463,986, Apr. 25, 1974, abandoned. This application May 14, 1976, Ser. No. 686,640

Int. Cl.^{2} B01J *21/04, 23/58, 23/62, 23/64*

U.S. Cl. 252—468 **14 Claims**

1. Catalytic compounds having perovskite-type ABO_3 crystal structure wherein the sites of Type A are substantially fully occupied by barium ions; about 1% to 20% of the Type B cation sites are occupied by ions of at least one platinum group metal selected from ruthenium, osmium, rhodium, iridium, palladium, and platinum; and the remainder of the Type B cation sites are occupied by ions of at least one nonplatinum group metal having a single fixed valence of three and an ionic radius between 0.4 and 1.4 Angstroms.

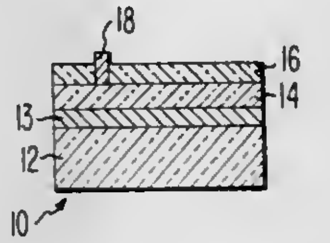
4,110,259
ELECTROCHROMIC CERMET MATERIAL AND DEVICE INCLUDING THE SAME

Enid Keil Sicbel, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 783,653, Apr. 1, 1977. This application Jun. 15, 1977, Ser. No. 806,716

Int. Cl.^{2} H01B *1/02*

U.S. Cl. 252—514 **18 Claims**



1. An electrochromic cermet material, which consisting essentially of

- an electrically insulating electrochromic material, and
- particles of a noble metal which are greater than about 10Å in diameter.

4,110,260
ELECTROCONDUCTIVE COMPOSITE CERAMICS

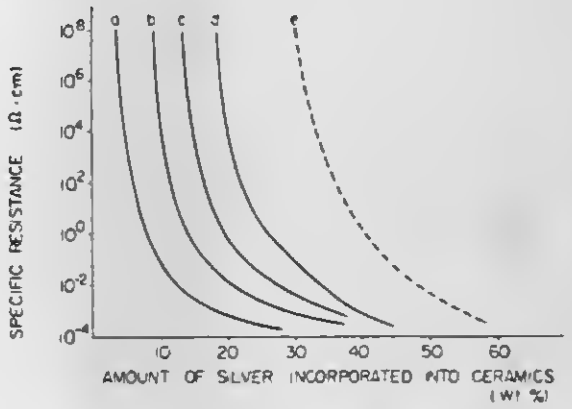
Hirotaka Yamamoto; Satoshi Sendai, and Hideaki Nioomiya, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (TDK Electronics Co., Ltd.), Tokyo, Japan

Filed Sep. 22, 1976, Ser. No. 725,457

Claims priority, application Japan, Sep. 25, 1975, 50/115904; Jun. 11, 1976, 51/68307

Int. Cl.^{2} H01B *1/08*

U.S. Cl. 252—519 **17 Claims**



1. Electroconductive composite ceramics composed of (A) 50–98% by weight of an independent phase which is conglomerates having a particle diameter of at least 20μ and consisting essentially of insulating or semiconductive ceramics having a high melting point or a mixture thereof selected from the group consisting of alumina, magnesia, spinel and zirconia and (B) 50–2% by weight of a continuous phase which is at least one electroconductive substance and connects said independent phase mutually selected from the group consisting of metals, carbon, cermets, nitrides, borides, carbides and silicides of metals, and metal oxides.

4,110,261

FRAGRANCE-EMITTING ARTICLE HAVING A POLYMER-PETROLEUM WAX COMPOSITION

John W. Newland, Hamburg, N.Y., assignor to W & F Mfg. Co., Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 614,493, Sep. 18, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,245

Int. Cl.^{2} A61K *7/46;* **C11B** *9/00;* **C10L** *5/00*

U.S. Cl. 252—522 **2 Claims**

1. A fragrance-emitting article having a composition, suitable for flush molding, comprising essentially about 75% by weight of petroleum wax; about 10% by weight of polymer selected from the group which consists of ethylene vinyl acetate, ethylene vinyl acetate acid terpolymer, ethylene ethyl acrylate, ethylene isobutyl acrylate, polyethylene and polypropylene, each of such members of said group having a weight average molecular weight below about 10,000; and about 15% by weight of a perfume fragrance.

4,110,262

LIQUID DETERGENT COMPOSITION

José Luis Arnau, Wemmel; Christian Roland Barrat, Meise, and Jean Wevers, Brussels, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 7, 1977, Ser. No. 775,214

Claims priority, application United Kingdom, Mar. 8, 1976, 09257/76

Int. Cl.^{2} C11D *1/825, 1/831, 7/50*

U.S. Cl. 252—545 **4 Claims**

1. A liquid, concentrated homogenous stable heavy duty liquid detergent comprising:

- (a) from about 20% to about 70% by weight of the composition of a soluble ethoxylated nonionic surfactant selected from the group consisting of ethoxylated alcohols containing from about 2 to about 24 moles of ethylene oxide wherein the alcohol is selected from the group consisting of:
  - (i) straight and branched chain primary and secondary, saturated and unsaturated, aliphatic alcohols having from about 8 to about 24 carbon atoms in the hydrocarbyl group thereof, and
  - (ii) alkyl phenols wherein the alkyl group or groups have from about 1 to about 12 carbon atoms, wherein at least one alkyl group has at least 6 carbon atoms and wherein the total number of carbon atoms in the alkyl groups is at most about 15; and mixtures thereof;
- (b) from about 0.10% to about 1.25% by weight of the composition of a polyacid selected from the group consisting of : ethylenediamine tetramethylene phosphonic acid, hexamethylene diamine tetramethylene phosphonic acid, diethylene triamine pentamethylene phosphonic acid and aminotrimethylene phosphonic acid; and
- (c) the balance of the composition being a liquid carrier; wherein the pH of the product is from 6.0 to 7.5.

4,110,263

MILD CLEANSING COMPOSITIONS CONTAINING ALKYLENEOXYLATED BISQUATERNARY AMMONIUM COMPOUNDS

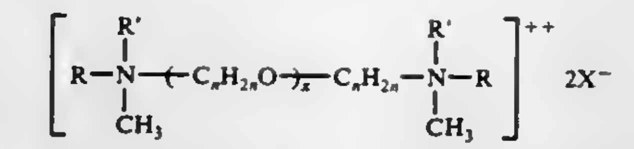
Martin K. O. Lindemann, Freebold; Robert R. Kennedy, Parlin, and Robert J. Verdicchio, Succasunna, all of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jun. 17, 1977, Ser. No. 807,768

Int. Cl.^{2} C11D *1/94, 1/65, 1/62*

U.S. Cl. 252—545 **15 Claims**

15. A method for reducing ocular irritancy in cosmetic cleansing compositions containing anionic or amphoteric detergents which comprises adding to the detergent composition an alkyleneoxylated bisquaternary ammonium compound represented by the formula



$$\left[R-\overset{R'}{\underset{CH_3}{N}}-(C_nH_{2n}O)_x-C_nH_{2n}-\overset{R'}{\underset{CH_3}{N}}-R \right]^{++} 2X^-$$

wherein R is an aliphatic radical of from about 10 to about 26 carbon atoms, R′ is methyl, ethyl, propyl or R, X is an anion, *n* is 2 or 3, and *x* is an integer of from 1 to about 30;

wherein said alkyleneoxylated bisquaternary ammonium compound is added in an amount sufficient to provide a weight ratio of bisquaternary ammonium compound to detergent of from 0.1:1 to about 0.3:1.

4,110,264

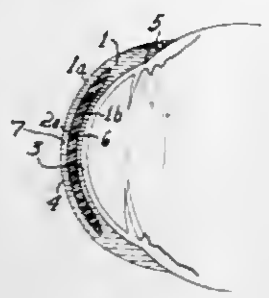
PERMEABLE POLYMETHYLMETHACRYLATE CONTACT LENS

Charles W. Neefe, P. O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 737,045, Oct. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 663,095, Mar. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,796, May 22, 1976, Pat. No. 3,957,049, which is a continuation-in-part of Ser. No. 404,352, Oct. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 233,408, Mar. 10, 1972, Pat. No. 3,786,812, which is a continuation-in-part of Ser. No. 562,022, May 16, 1966, abandoned. This application Nov. 9, 1977, Ser. No. 849,764

Int. Cl.^{2} C08J *9/26*

U.S. Cl. 521—63 **5 Claims**



1. A permeable contact lens concave-convex in form of an optically clear material made by the steps of adding to monomeric methylmethacrylate 2% to 40% by weight of a soluble material which does not react with monomeric methyl methacrylate during polymerization, polymerizing the methyl methacrylate solution to form a solid mass and extracting said soluble material from the solid polymethyl methacrylate.

4,110,265

ION EXCHANGE MEMBRANES BASED UPON POLYPHENYLENE SULFIDE

Russell B. Hodgdon, Sudbury, Mass., assignor to Ionics Inc., Watertown, Mass.

Filed Mar. 1, 1977, Ser. No. 773,371

Int. Cl.^{2} C08G *75/14;* **C08F** *28/00, 8/36*

U.S. Cl. 521—30 **4 Claims**

1. A method of preparing a cross-linked, substantially insoluble cation exchange polyelectrolyte resin having improved stability to oxidation comprising reacting polyphenylene sulfide with oleum containing between about 10 to 65% by weight of sulfur trioxide.

4,110,266

PROCESS FOR CONVERTING THE DECOMPOSITION PRODUCTS OF POLYURETHANE AND NOVEL COMPOSITIONS THEREBY OBTAINED

Martin B. Sheratte, Canoga Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 9, 1976, Ser. No. 703,807

Int. Cl.^{2} C08J *11/00;* **C08G** *18/00*

U.S. Cl. 260—2.3 **33 Claims**

1. A process for decomposing polyurethane and converting the depolymerized decomposition mixture into a product substantially free of primary and secondary amines and containing an increased amount of polyols suitable for reaction with polyisocyanate for producing fresh polyurethane foam, which comprises reacting a polyurethane foam with a decomposing agent at elevated temperature, and forming a depolymerized decomposition mixture containing polyols, ureas and a member selected from the group consisting of primary and secondary amines, and mixtures thereof, and reacting said decomposition mixture with alkylene oxide, employing an excess of alkylene oxide with respect to active hydrogen atoms of the amines, at elevated temperature ranging from about 100° to about 180° C and at elevated pressure, for a period sufficient to convert said amines to polyols, and forming a product mixture having an increased amount of polyols, as compared to said decomposition mixture, and substantially free of primary and secondary amines.

4,110,267

EXPANDABLE ETHYLENICALLY UNSATURATED POLYMER PARTICLE COMPOSITIONS

Tosbiki Ikeda, and Yoshitsugu Beppu, both of Shiga, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jul. 17, 1975, Ser. No. 596,854

Claims priority, application Japan, Aug. 23, 1974, 49-97282; Oct. 19, 1974, 49-120560

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 521—57 **16 Claims**

1. Expandable ethylenically unsaturated polymer particle compositions which can be pre-expanded and molded to form cellular shaped articles, which comprises ethylenically unsaturated polymer particles containing an expanding agent, said particles having the surfaces thereof coated with a layer of a compound comprising calcium carbonate, said compound having a particle size of from 0.02 to 0.2 microns and the surfaces of said calcium carbonate particles having chemically attached thereto an organic compound selected from the group consisting of higher fatty acids, resin acid, lignin sulfonic acid and alkaline metal salts thereof and mixtures thereof, said organic compound being present in an amount of from 0.5 to 6 parts by weight per 100 parts by weight of calcium carbonate, and said calcium carbonate compound being present in the amount of from 0.005% to 0.3% by weight of said polymer particles, whereby said polymer particles are substantially free of lumping or agglomerating during pre-expansion and are capable of being easily fused when molded.

4,110,268

POLYETHER POLYOLS AND POLYURETHANE FOAMS MADE THEREFROM

Kermit D. Longley, Park Forest, Ill.; Robert Herke, Missouri City, Tex., and Robert J. Kufrin, Hinsdale, Ill., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 726,861

Int. Cl.^{2} C08G *18/14;* **C07C** *41/12;* **C09K** *3/00*

U.S. Cl. 521—177 **24 Claims**

1. In that process for the preparation of normally liquid polyether polyols which are useful in the production of polyurethane foams, and wherein a di- or polyhydric alcohol is reacted with an alkylene oxide or α-epoxide in the presence of a basic catalyst, the improvement which comprises, after completion of the reaction to produce the polyether polyol, and without otherwise removing said basic catalyst, neutralizing said basic catalyst with at least one member of the group consisting of oleic acid and tall oil fatty acids alone, or in conjunction with a sulfonic acid which is a higher molecular weight alkylbenzene or alkyltoluene, or a butyl- or amylnaphthalene, sulfonic acid.

17. A polyurethane foam composition comprising the reaction product of an organic polyisocyanate and a normally liquid polyether polyol, said polyether polyol being the neutralization product resulting from the neutralization of a basic catalyst, previously used in and unremoved from the preparation of said polyether polyol, with oleic acid or tall oil fatty acids alone or in conjunction with a sulfonic acid which is a higher molecular weight alkylbenzene or alkyltoluene sulfonic acid, or a butyl- or amylnaphthalene sulfonic acid.

4,110,269

METHOD OF MAKING POLYETHYLENE FOAM

Herbert A. Ehrenfruend, Madison, Conn., assignor to Olefoam Corporation, Madison, Conn.

Filed Jan. 31, 1977, Ser. No. 764,181

Int. Cl.^{2} C08J *9/14*

U.S. Cl. 521—81 **4 Claims**

1. A method of producing a low density polyethylene foam comprising charging an extruder with a polyethylene resin, from about 5% to 30% by weight of an ionomer resin selected from the group consisting of ionically crosslinked copolymers of ethylene/methacrylic acid and ethylene/vinyl acetate, and a nucleating agent, heating said charge so as to melt said resins, injecting an expanding agent mixture consisting of dichlorodifluoromethane and dichlorotetrafluoroethane into said melt charge in an amount of 8% or less by weight and said mixture comprises approximately a 2:1 ratio of dichlorotetrafluoroethane to dichlorodifluorourethane and extruding said melt charge to form said foam.

4,110,270

PROCESS FOR THE PREPARATION OF FOAMS CHARACTERIZED BY ISOCYANURATE AND URETHANE LINKAGES

Thirumurti Narayan, Riverview, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 5, 1977, Ser. No. 794,174

Int. Cl.^{2} C08G *18/22, 18/14, 18/48*

U.S. Cl. 521—121 **8 Claims**

1. In a process for the preparation of a pour-in-place urethane-modified isocyanurate foam by the reaction of an organic polyisocyanate with a primary hydroxyterminated polyol in the presence of a blowing agent and a trimerization catalyst the improvement which comprises employing as catalyst for the reaction an alkali metal salt of toluene- or benzenesulfinic acid.

4,110,271

FORMATION OF POLYURETHANE FOAM IN THE PRESENCE OF SULFOLANYL-BEARING POLYSILOXANE-POLYOXYALKYLENE POLYMERS

Bernard Kanner, West Nyack, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

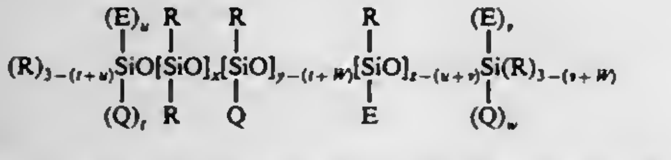
Division of Ser. No. 592,129, Jun. 30, 1975, Pat. No. 4,049,674. This application May 26, 1977, Ser. No. 800,891

Int. Cl.^{2} C08K *5/54;* **C08G** *18/42, 18/48*

U.S. Cl. 521—111 **10 Claims**

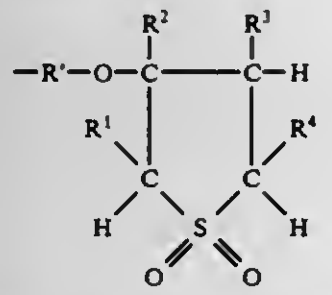
1. A process for producing polyurethane foam which comprises reacting and foaming a reaction mixture containing: (a) an organic polyol reactant comprising a polyether polyol or a polyester polyol having an average of at least two hydroxyl groups per molecule; (b) an organic polyisocyanate reactant having at least two isocyanato groups per molecule; (c) a blowing agent; (d) a catalyst comprising an amine; and (e) a

foam stabilizer comprising a polysiloxanepolyoxyalkylene copolymer having the average composition,



$$(R)_{3-(t+u)}\overset{(E)_u}{\underset{(Q)_t}{Si}}O[\overset{R}{\underset{R}{Si}}O]_x[\overset{R}{\underset{Q}{Si}}O]_{y-(t+w)}[\overset{R}{\underset{E}{Si}}O]_{z-(u+v)}\overset{(E)_v}{\underset{(Q)_w}{Si}}(R)_{3-(v+w)}$$

wherein: R is alkyl having from one to ten carbon atoms; each of *t, u, v, w,* the sum $t+u$ and the sum $v+w$ is independently zero or one, and each of the sums $t+w$ and $u+v$ is independently zero, one or two; Q is a sulfolanyloxyalkyl group having the formula,



where —R'— is a bivalent alkylene group having from two to eight carbon atoms, and R^1, R^2, R^3 and R^4 are independently hydrogen or alkyl having from one to four carbon atoms;

and, when reactant (a) comprises a polyether polyol, *x* has an average value from about 10 to about 200, *y* has an average value from about 2 to about 100, *z* has an average value from about 2 to about 30, and E is a polyoxyalkylene block the average polyoxyalkylene content of which is constituted of from about 20 to about 75 weight percent of oxyethylene units; and, when reactant (a) comprises a polyester polyol, *x* is zero or a positive number having an average value up to about 20, *y* has an average value from about 2 to about 20, *z* has an average value from about 2 to about 30, and E is a polyoxyalkylene block the average polyoxyalkylene content of which is constituted of at least 75 weight percent oxyethylene units.

2. A process as defined in claim 1 in which said reaction mixture contains an organic flame-retardant as an additional component thereof.

3. A flame-retardant-containing flexible polyurethane foam produced by the process of claim 2.

4,110,272
FORMATION OF HIGH-RESILIENCE URETHANE FOAM IN THE PRESENCE OF SULFOLANYLOXY ALKYL-POLYALKYLSILOXANES

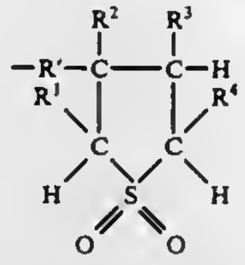
Bernard Kanner, West Nyack, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 592,128, Jun. 30, 1975, Pat. No. 4,049,675. This application Jul. 12, 1977, Ser. No. 815,010

Int. Cl.^{2} C08G ***18/14***

U.S. Cl. 521—111 **16 Claims**

1. A method for producing polyurethane foam which comprises reacting and foaming a reaction mixture containing (1) an organic polyol reactant comprising a polyether polyol having an average hydroxyl functionality from 2.1 to about 5 and an average primary hydroxyl content from about 35 to about 90 mole percent, based on the total moles of hydroxyl groups contained in the polyether polyol, 2) an organic polyisocyanate (3) a tertiary-amine catalyst, (4) a blowing agent, and (5) a surfactant component comprising a sulfolanyloxyalkyl-polyalkylsiloxane consisting essentially of (a) monofunctional siloxy units, M*, the respective silicon atoms of which have two alkyls bonded thereto, the third silicon-bonded organic group being alkyl or sulfolanyloxyalkyl, (b) an average from about 0.5 to about 10 moles of difunctional dialkylsiloxy units for every two moles of M*, and (c) from 0 up to an average of about 10 moles, for every two moles of M*, of difunctional monoalkylsiloxy units in which the second organic group bonded to silicon is sulfolanyloxyalkyl, provided the said sulfolanyloxyalkyl-polyalkylsiloxane contains an average of at least about 0.5 and no more than about 10 moles of sulfolanyloxyalkyl groups for every two moles of M*, and wherein the silicon-bonded alkyls have from one to four carbon atoms and the silicon-bonded sulfolanyloxyalkyl groups have the formula,



where R' is bivalent alkylene having from two to eight carbon atoms, and R^1, R^2, R^3 and R^4 are independently hydrogen or alkyl having from one to four carbon atoms.

4,110,273
BLOWING AGENT MIXTURE

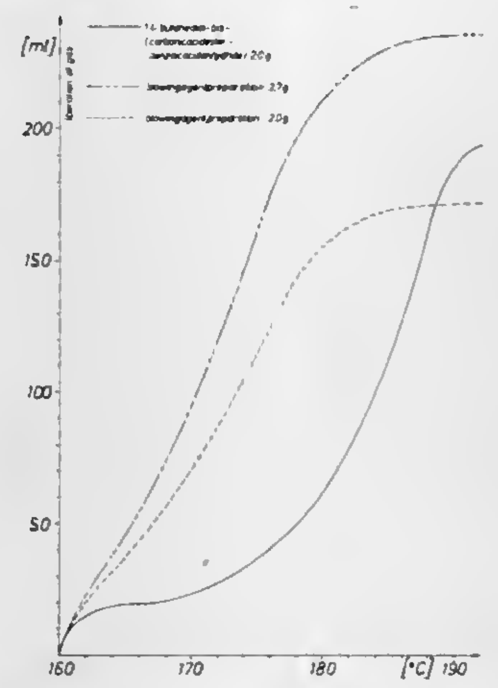
Wolfgang Cohnen, Leverkusen, and Gerhard Apel, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 606,913, Aug. 22, 1975. This application Sep. 12, 1977, Ser. No. 832,307

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1974, 2441418

Int. Cl.^{2} C08J ***9/08***

U.S. Cl. 521—59 **2 Claims**



1. A process for the production of foams from thermoplastic resins comprising

(A) mixing
  - (i) granules of a thermoplastic resin selected from the group consisting of a polycarbonate, a polyamide, a polyester and a thermoplastic composition of polyphenylene ether and impact resistant polystyrene, with
  - (ii) 0.1 to 15% by weight based on the weight of the total mixture of a blowing agent mixture comprising
    - (a) 85 to 60 wt.% of 1,4-butane diol-bis-(carbonic acid ester benzoic acid anhydride), and
    - (b) 15 to 40 wt.% of silicon dioxide having a surface area according to B.E.T. of from 50 to 400 m^2/g and a water loss at 1000° C. for 2 hours of less than 2.5% by weight, and

(B) heating the mixture of (A) to a temperature of 160° to 300° C.

4,110,274
METHOD FOR MAKING CROSSLINKED RESIN FOAMS FROM AN ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID ANHYDRIDE AND A POLYISOCYANATE

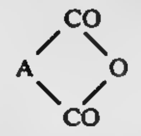
John M. Corbett, Newark, and Frederick J. Dechow, Thornville, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1977, Ser. No. 842,720

Int. Cl.^{2} C08J ***9/00, 9/08***

U.S. Cl. 521—157 **10 Claims**

1. A method for making crosslinked ethylenic resin foams which comprises admixing and inter-reacting in a reaction mixture at least one ethylenically unsaturated dicarboxylic acid anhydride having the general formula:



wherein A is a divalent radical containing ethylenic unsaturation and having the carbonyl groups attached to vicinal carbon atoms, at least one polyisocyanate having the general formula:

$R—(NCO)_x$

wherein R is an organic radical having at least 4 carbon atoms and its valence bonds on different carbon atoms and *x* is a small number at least 2, and water, in proportions of from about 0.6 to about 2 equivalents of polyisocyanate per mole of anhydride and from about 0.6 to about 2 moles of water per mole of anhydride, at reaction temperature below about 150° C. to form a flowable reaction mixture, subsequently admixing a foam-stabilizing amount of surfactant into the resulting flowable reaction mixture and completing the resin-forming and foaming reactions by heating the reaction mixture at temperatures above about 150° C. to form a cellular resin body having apparent density less than about 30 pounds per cubic foot.

4,110,275
CONTROL OF INCOMPETENT FORMATIONS WITH THICKENED ACID-SETTABLE RESIN COMPOSITIONS

Thomas R. Sifferman, and Derry D. Sparlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 739,216, Nov. 5, 1976, Pat. No. 4,085,801. This application Jul. 14, 1977, Ser. No. 815,623

Int. Cl.^{2} C08L ***1/16;*** **E21B** ***33/13***

U.S. Cl. 260—14 **10 Claims**

1. A composition for positioning an acid-settable polymeric material having particulate matter disposed therein in contact with a subterranean formation penetrated by a wellbore, said composition consisting essentially of:
  - (a) a substantially neutral hydrocarbon oil;
  - (b) a quaternary ammonium salt of cellulose sulfate, the quaternary ammonium group of said quaternary salt of cellulose sulfate containing at least 16 carbon atoms and being present in said composition in an amount sufficient to produce a minimum apparent viscosity in said composition of at least 50 cps, but less than 5000 cps at the injection temperature and pressure and an apparent minimum viscosity at bottom hole conditions of at least 25 cps;
  - (c) finely-divided solid particulate material in an amount equal to from about 0.25 to about 22 pounds of particulate matter per gallon of said oil; and,
  - (d) an acid-settable liquid thermosetting resin in an amount equal to from about 0.1 to about 5.0 gallons per ft^3 of said particulate material.

4,110,276
POLYESTER FOAM MATERIALS

Thomas A. DesMarais, Norwood, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 737,930, Nov. 2, 1976, abandoned. This application Oct. 19, 1977, Ser. No. 843,606

Int. Cl.^{2} C08J ***9/00***

U.S. Cl. 521—123 **30 Claims**

1. A stable, resilient polyester foam comprising a three-dimensional condensate of:
  - (a) at least one polyol having at least two hydroxyl groups and an equivalent weight of at least about 1,000;
  - (b) at least one propylene oxide-based polyhydroxy cross-linking agent having at least three hydroxyl groups and an equivalent weight of less than about 250 said equivalent weight based hydroxy groups; and
  - (c) at least one acyl halide having at least two —COX radicals wherein X is a halogen atom.

4,110,277
NYLON MODIFIED PHENOLIC RESIN FIBERS

James Economy, Eggertsville; Francis J. Frechette, Tonawanda, and Luis C. Wohrer, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 149,046, Jun. 1, 1971, abandoned. This application Feb. 9, 1977, Ser. No. 767,005

Int. Cl.^{2} C08L ***61/10, 77/10, 77/04***

U.S. Cl. 260—841 **18 Claims**

1. A fiber produced by melt spinning and consisting essentially of a homogeneous physical mixture of an uncured phenolic resin and from about 5% to about 30% of an aliphatic nylon, said phenolic resin being a condensation product of a phenol and an aldehyde selected from the group consisting of formaldehyde and paraformaldehyde.

4,110,278
MANUFACTURE OF MOLDING COMPOSITIONS BASED ON UNSATURATED POLYESTER RESINS

Kurt Demmler, Ludwigshafen; Horst Lawonn, Limburgerhof, and Anton Hesse, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 11, 1975, Ser. No. 631,195

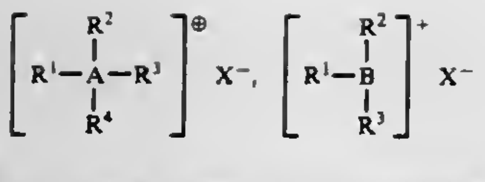
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1974, 2454773

Int. Cl.^{2} C08K ***3/28;*** **C08L** ***1/00, 67/06***

U.S. Cl. 260—17 A **5 Claims**

1. In an unsaturated polyester molding composition which is curable in the presence of polymerization initiators and which composition includes a mixture of
  - (a) an unsaturated polyester,
  - (b) at least one copolymerizable olefinic monomeric compound,
  - (c) an alkaline earth metal oxide or hydroxide selected from the group consisting of calcium oxide, calcium hydroxide, magnesium oxide, magnesium hydroxide and mixtures thereof, and an
  - (d) inhibitor selected from the group consisting of hydroquinone, tert.-butyl pyrocatechol, p-benzoquinone, chloranil, nitrobenzenes, thiodiphenylamine, salts of N-nitroso-N-cyclohexylhydroxylamine and mixtures thereof;

the improvements comprising a composition wherein the content of component (c) is from 0.5 to 5 percent by weight based on the mixture of components (a) and (b), and said composition contains from 0.1 to 2 percent by weight, based on the mixture of components (a) and (b) of an onium salt selected from the group consisting of the formula



$$\left[\begin{matrix} & R^2 & \\ & | & \\ R^1- & A & -R^3 \\ & | & \\ & R^4 & \end{matrix}\right]^{\oplus} X^-, \quad \left[\begin{matrix} & R^2 \\ & | \\ R^1- & B \\ & | \\ & R^3 \end{matrix}\right]^{+} X^-$$

and mixtures thereof where A is selected from the group consisting of nitrogen, phosphorus, arsenic and antiomony; B is selected from the group consisting of oxygen, sulfur and selenium; R^1, R^2, R^3 and R^4 are, each independently, selected from the group consisting of hydrogen, unsubstituted alkyl, unsubstituted aryl, substituted alkyl and substituted aryl, wherein at least one of R^1 to $R^4$is selected from the group consisting of unsubstituted alkyl, unsubstituted aryl, substituted alkyl and substituted aryl; two of R^1 to R^4 are linked to form a heterocyclic ring which contains from 5 to 7 ring members which are unsubstituted or substituted; X^- is selected from the group consisting of F⊖, Cl⊖, Br⊖, I⊖and SCN⊖; or such onium salt groups are built into a polymer molecule via one of R^1 to R^4.

4,110,279

HIGH TEMPERATURE POLYMERS FROM METHOXY FUNCTIONAL ETHER AROMATIC MONOMERS

Donald L. Nelson, Lake Jackson, Tex., and Norman T. Herbert, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 445,513, Feb. 25, 1974. This application Feb. 3, 1977, Ser. No. 765,143

Int. Cl.² C08L *91/00;* C08G *16/02*

U.S. Cl. 260—19 R **18 Claims**

1. A polymer derived by heating in the presence of an acid catalyst at between about 65° C and 260° C

I. a cogeneric mixture of alkoxy functional compounds, having an average equivalent weight in the range from about 220 to about 1200, obtained by heating together in the presence of a strong acid at about 50° C to about 250° C;

(A) a diaryl compound selected from naphthalene, diphenyl oxide, diphenyl sulfide, their alkylated or halogenated derivatives or mixtures thereof,

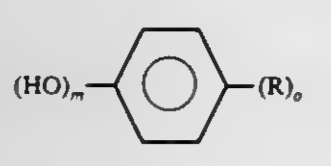
(B) formaldehyde or formaldehyde-yielding derivative,

(C) water, and

(D) a hydroxy aliphatic hydrocarbon compound having at least one free hydroxyl group and from 1 to 4 carbon atoms,

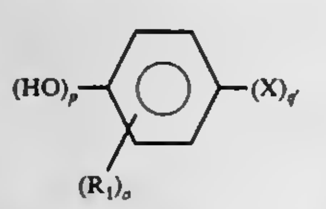
which mixture contains 0 to 50 percent by weight unreacted (A); with

II. up to one monomeric phenolic reactant per equivalent of I selected from the group



(i)

wherein R is selected from the group consisting of



(ii)

hydrogen, alkyl radical of 1 to 20 carbon atoms, aryl radical of 6 to 20 carbon atoms, R_1 represents hydrogen, alkyl or aryl, *m* represents an integer from 1 to 3, o represents an integer from 1 to 5; p represents an integer from 0 to 3; X represents oxygen, sulfur or C_1 to C_3 alkylidene; and, *q'* represents an integer from 0 to 1.

4,110,280

METHOD FOR PREPARING EXTRUDED FASTENERS

William C. Hedges, Hampton, N.J., assignor to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.

Filed Jan. 19, 1976, Ser. No. 649,963

Int. Cl.² B29G *2/02*

U.S. Cl. 264—22 **8 Claims**

1. A method for forming tongue and groove fastener components comprising the steps of:

(a) mixing together rubbery, chlorosulfonated polyethylene, at least one stable polymer extender, at least one fire retardant compound and at least one processing aid compound to form a blend; and

(b) thereafter extruding said blend to form said fastener components.

4,110,281

PROCESS FOR THE MANUFACTURE OF FILLERS FROM SOLID WASTE

Gottfried Dreer, Krawehlstrasse 34, 4300 Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 674,431, Apr. 7, 1976, abandoned, and a continuation-in-part of Ser. No. 597,120, Jul. 18, 1975, abandoned, and a continuation-in-part of Ser. No. 593,386, Jul. 7, 1975, abandoned, and a continuation-in-part of Ser. No. 550,585, Feb. 18, 1975, Pat. No. 4,012,231. This application Mar. 14, 1977, Ser. No. 777,431

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407383; Jul. 6, 1974, 2432606; Jul. 18, 1974, 2434487; Apr. 8, 1975, 2515179

Int. Cl.² C04B *31/40;* C09D *3/66, 5/18*

U.S. Cl. 260—22 A **15 Claims**

1. A process for producing a compost which comprises grounding municipal waste, magnetically freeing from iron contained therein, separating said mixture into components of various sizes by fractionation and, treating said mixture in a tank in a fermentation process at a temperature of about 65° C. by continuously passing air thereto and mixing a solvent with said mixture and heating said tank until the contents of the tank are dried, thereby forming a compost.

4,110,282

PROCESS FOR PREPARING A COLD-SET LACQUER

Dietrich Pirck, Seevetal, and Gündolf Füchs, Hemmingstedt, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,878

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1976, 2608579

Int. Cl.² C09D *3/81*

U.S. Cl. 260—23 AR **16 Claims**

1. The process for preparing a cold-set lacquer for a glossy, water-proof coating which comprises

forming a reaction mixture containing an aqueous emulsion including (i) 1–30 parts of emulsifier, (ii) 100–1000 parts of acrylate monomers, and (iii) 1–100 parts of cold-cross-linkable co-monomers;

adding 0.5–5 parts of polymerization initiator to said reaction mixture and heating to about 75° C.;

adding to said mixture, at a temperature of from about 75° to 80° C., an aqueous pre-emulsion including further (i) emulsifier, (ii) acrylate monomers, and (iii) cold-cross-linkable co-monomers;

a total of 1 to 10 percent by weight of cold-cross-linkable co-monomers, based on the total amount of acrylate monomers, being employed;

and further polymerization initiator;

and adding after completion of polymerization to the resultant polymer dispersion from 3 to 15 percent by weight, based on the solids content of the polymer dispersion, of a polyaminoamide colloidally soluble in water.

4,110,283

CRYSTALLIZATION INHIBITOR FOR PARAFFIN

Anthony Capelle, Stad-Delden, Netherlands, assignor to Chemische Fabriek Servo B.V., Delden, Netherlands

Filed May 10, 1977, Ser. No. 795,633

Int. Cl.² C09K *3/00*

U.S. Cl. 260—23 AR **8 Claims**

1. A crystallization inhibitor for paraffin, which contains as the active component a copolymer of 4-vinyl pyridine with esters of alcohols having at least 10 carbon atoms and acrylic acid in a mole ratio between 5:1 and 1:20 and having a molecular weight not greater than 100,000, wherein the agent consists essentially of an aqueous emulsion containing

(a) the copolymer or a solution thereof in a hydrocarbon, said copolymer being present in an amount sufficient to inhibit crystallization of paraffin in petroleum;

(b) a mixture of water with an organic solvent, which mixture has a freezing point of at most −15° C.;

(c) a mixture of (1) an ethoxylated fatty acid emulsifier having 10–24 carbon atoms in the fatty acid radical and 4–22 ethoxyl groups, and (2) an alkylol amide emulsifier obtained by condensing fatty acids having 10–24 carbon atoms with 1–2 moles of a dialkylol amine having 2–4 carbon atoms per alkylol group, said emulsifiers being present in admixture in an amount sufficient to provide an emulsion at freezing to room temperatures; and

(d) as neutralizing agent an amount sufficient of fatty acids from tall oil to neutralize the mixture.

4,110,284

POLYURETHANE LATEXES FROM SULFONATE PREPOLYMER, AQUEOUS CHAIN EXTENSION PROCESS, AND COATED SUPPORT

Robert Violland, and Jean Neel, both of Lyons, France, assignors to Rhone-Progil, Courbevoie, France

Filed Oct. 11, 1974, Ser. No. 514,151

Claims priority, application France, Oct. 12, 1973, 73 37140

Int. Cl.² C08L *75/08;* C08G *71/02*

U.S. Cl. 260—29.2 TN **14 Claims**

1. A process for preparing an auto-emulsified, highly disperse, film-forming and storage stable anionic polyurethane latex comprising charging an auto-emulsified and water propagable isocyanato chain terminated, anionic polyurethane prepolymer into an aqueous medium, and thence agitating the resulting dispersion to auto-emulsify and chain propagate said prepolymer, said prepolymer having a molecular weight between about 2000 and 10,000 and being formed from the reaction of at least:

(a) a member selected from the group consisting of an anionic sulfonated polyester, an anionic sulfonated polyether and admixtures thereof, having a molecular weight between about 1000 and 4000 and a sulfur content between about 0.5 and 3% by weight, wherein said polyester is prepared by condensing at least:

(i) a dicarboxylic acid or its lower alkyl diester

(ii) a polyol

(iii) and a sulfonated diacid, its sulfonated diester or the alkali metal salt thereof, said diacid being selected from the group consisting of isosulfophthalic and sulfosuccinic acid, and wherein said polyether is prepared from a bifunctional molecule selected from the group consisting of a sulfonated diacid, its sulfonated diester or the alkali metal salt thereof, said diacid being selected from the group consisting of isosulfophthalic and sulfosuccinic acid;

(b) with an amount of at least one diisocyanate sufficient to produce a prepolymer having only terminal isocyanate groups;

(c) and, a chain extending agent.

4,110,285

PROCESS FOR THE PREPARATION OF STABLE AQUEOUS EMULSIONS OF ADDITION POLYMERS AND COPOLYMERS

Dick A. Pons, Maassluis, and Anno Bijker, Spijkenisse, both of Netherlands, assignors to Synres International B.V., Hoek Van Holland, Netherlands

Filed Sep. 20, 1976, Ser. No. 725,118

Claims priority, application Netherlands, Sep. 25, 1975, 7511276

Int. Cl.² C08L *33/08*

U.S. Cl. 260—29.6 MP **11 Claims**

1. In a process for preparing an emulsion of an addition polymer in water by co-polymerizing at least one olefinically unsaturated monomer dispersed in water, in the presence of a suitable catalyst system, with at least one emulsion stabilizer, the improvement wherein a mixture, in an amount of between 0.1 and 15% by weight calculated to the total amount of polymerizable compounds, of phosphate esters of the formulae $(RO)_2PO(OH)$ and $(RO)PO(OH)_2$, is used as an emulsion stabilizer,

and wherein

R0 represents the residue remaining after the removal of the hydroxyl hydrogen from an unsaturated polymerizable alcohol of 2 to 12 carbon atoms, or an A-B-O group,

in which

A represents the residue remaining after the removal of the acid hydrogen from an unsaturated polymerizable carboxylic acid having 3 to 25 carbon atoms and,

B is an alkylene or cycloalkylene radical of from 2 to 20 carbon atoms, or a polyoxyalkylene radical having from 2 to 100 units

the bonding between A and B being a carbon-oxygen-carbon bonding.

4,110,286

STABLE POLYURETHANE LATICES, EMULSIFIABLE PREPOLYMERS THEREFOR AND METHODS OF MAKING THE SAME

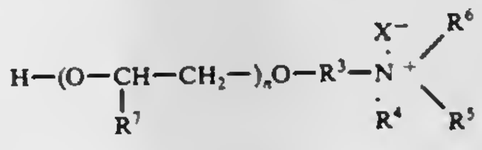
Jan E. Vandegaer, Pasadena, and John W. Calentine, Glen Burnie, both of Md., assignors to Alcolac Inc., Baltimore, Md.

Filed Feb. 7, 1977, Ser. No. 766,257

Int. Cl.² C08L *75/12;* C08G *18/32*

U.S. Cl. 260—29.2 TN **52 Claims**

1. In a process for preparing a polyurethane prepolymer wherein a reaction mixture consisting essentially of a mixture of (i) a stoichiometric excess of a polyisocyanate and (ii) a polyol are reacted under anhydrous conditions to form an isocyanate terminated prepolymer; the improvement which comprises incorporating into said reaction mixture, at any time while it is under anhydrous conditions, a small amount equivalent to from about 1% to about 5% by weight of the total weight of said polyisocyanate and said polyol of a quaternized tertiary amino alcohol of the formula:



wherein

R^3 represents an alkylene group of from 2 to about 10 carbon atoms;

R^4, R^5 and R^6, each of which may be the same or different, each represents alkyl, aryl, alkaryl or R^5 and R^6, taken together, represent a divalent aliphatic group of 4 to 5 atoms which jointly with the amino nitrogen form a five to six membered heterocyclic amino group;

R^7 represents H, methyl or ethyl;

X represents the anion of a quaternary ammonium group; and

n represents an integer, including 0, of from 0 to about 10;

heating the thus obtained mixture to a temperature of about 25° to about 110° C. to effect reaction between the hydroxyl group of said quaternized tertiary amino alcohol and some of the free isocyanate groups to form a carbamyl ester; whereby a self emulsifiable polyurethane prepolymer is obtained.

4,110,287

CATAPHORETIC N-HETEROCYCLIC-CONTAINING RESINS FOR ELECTRODEPOSITION

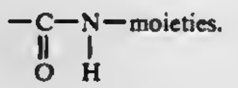
Joseph F. Bosso, Lower Burrell, and Nicholas T. Castellucci, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 561,012, Mar. 21, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,757

Int. Cl.^{2} C08L *63/02*

U.S. Cl. 260—29.2 EP **11 Claims**

1. A water-dispersible resin which is electrodepositable on a cathode and which contains in the resin molecule cationic salt groups selected from the class consisting of amine salt groups, onium salt groups and mixtures thereof, said resin being prepared from polyglycidyl ethers of polyphenols which contain in the resin molecule N-heterocyclic moieties obtained by reacting said polyglycidyl ether of a polyphenol with an N-heterocyclic material containing a 5 or 6-membered ring and containing



$$-\underset{O}{\underset{\|}{C}}-\underset{H}{\underset{|}{N}}-\text{moieties.}$$

4,110,288

AQUEOUS VINYL POLYMERIC EMULSION SYSTEM AND PROCESS OF PREPARING THE SAME USING AMINOPLAST RESIN

Peter Jude Schirmann, Fairfield, and Werner Josef Blank, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 1, 1976, Ser. No. 719,879

Int. Cl.^{2} C08L *61/22, 61/24. 61/28, 61/32*

U.S. Cl. 260—29.4 UA **14 Claims**

1. A process for preparing an aqueous emulsion of a vinyl polymer comprising polymerizing at least one polymerizable vinyl monomer in an aqueous emulsion system in the presence of an emulsifying agent, a polymerization catalyst and from about 0.1% to about 5%, by weight, based on the weight of the monomer being polymerized, of a non-copolymerizable aminoplast resin which is water-soluble or water-dispersible in the presence of the emulsifying agent and which has been prepared from an amino compound, formaldehyde and a C_1–C_4 monohydric alcohol.

4,110,289

THERMOSETTING VINYL ESTER EMULSION COPOLYMERS

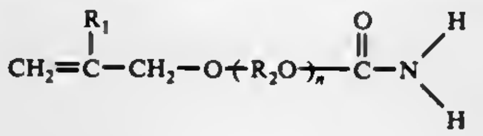
Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Continuation of Ser. No. 340,535, Mar. 12, 1973, which is a continuation-in-part of Ser. No. 142,406, May 11, 1971. This application Jun. 30, 1976, Ser. No. 701,171

Int. Cl.^{2} C08L *31/04*

U.S. Cl. 260—29.6 TA **7 Claims**

1. An aqueous emulsion comprising an aqueous medium having colloidally suspended therein by means of a surfactant an aqueous emulsion copolymer consisting essentially of at least 85% of the copolymer of vinyl ester with a saturated aliphatic monocarboxylic acid containing up to 18 carbon atoms, and from 0.5–15% of the copolymer of monomers providing thermosetting characteristics and consisting essentially of an adduct of an allyl carbamate having one or both of its amino hydrogen atoms replaced by C_1–C_8 alcohol etherified methylol groups, said allyl carbamate having the formula:



$$CH_2{=}\overset{R_1}{\overset{|}{C}}-CH_2-O\!\left(R_2O\right)_n-\overset{O}{\overset{\|}{C}}-N\begin{smallmatrix}H\\ \\ H\end{smallmatrix}$$

in which R_1 is hydrogen or methyl, R_2 is an alkylidene group containing from 2–4 carbon atoms, and *n* is an integer from 0–10.

4,110,290

PRESSURE-SENSITIVE ADHESIVES

Masatoshi Mori, and Ryoji Fukata, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Japan

Filed Feb. 28, 1977, Ser. No. 773,008

Claims priority, application Japan, Jun. 10, 1976, 51-67140

Int. Cl.^{2} C09J *3/12*

U.S. Cl. 260—29.6 RW **4 Claims**

1. An aqueous dispersion of a pressure-sensitive adhesive of improved binding power towards polyolefins comprising, by weight,

(A) 60 – 95 parts as solid matter of a 30–60% aqueous copolymer dispersion obtained by emulsion polymerization in water of a mixture of the following monomers (1), (2) and (3):

(1) 60–99 parts of at least one monomeric acylate having a C_4 – C_{12} alkyl group,

(2) 1 – 7 parts of at least one monomer selected from the group consisting of α,β-unsaturated carboxylic acids, acrylate and methacrylate containing a hydroxyl group, acrylamide, N-methylolacrylamide and N-butoxymethylacrylamide, each monomer being copolymerizable with the monomer (1), and

(3) 0 ∝ 39 parts of at least one monomer selected from the group consisting of vinylic copolymerizable monomers other than the monomers (1) and (2), and vinylidenic copolymerizable monomers and

(B) 5 – 40 parts as solid matter of a 40–60% aqueous dispersin of an ethylene-vinyl acetate copolymer.

4,110,291

COPOLYMER EMULSIONS FOR THICKENING ACRYLIC POLYMER LATICES

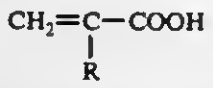
Eugene S. Barabas, Watchung; Andrew Klein, Somerville, and Dru W. Alwani, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 18, 1977, Ser. No. 773,503

Int. Cl.^{2} C08L *33/06*

U.S. Cl. 260—29.6 RW **6 Claims**

1. A method for thickening acrylic polymer latices which comprises blending therewith a copolymer latex prepared by inducing, at a temperature of about 5° C. to about 80° C, a redox-initiated polymerization in an aqueous dispersion of, as monomers, (1) from about 30 to about 75 wt. % of an α,β-unsaturated carboxylic acid of the formula



$$CH_2{=}\underset{R}{\underset{|}{C}}-COOH$$

in which R is methyl or ethyl, and (2) from about 25 to about 70 wt. % of methylacrylate.

4,110,292

PIGMENTED AIR DRYING LATEX PAINTS HAVING SUPERIOR GLOSS

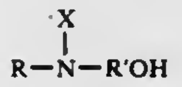
Kazys Sekmakas, Chicago, and Kenneth K. Hesler, W. Chicago, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 589,876, Jun. 24, 1975, Pat. No. 4,058,499. This application Jun. 6, 1977, Ser. No. 804,009

Int. Cl.^{2} C08L *33/02*

U.S. Cl. 260—29.6 RW **9 Claims**

1. A method of producing a high gloss, air drying water base, pigmented latex paint comprising, grinding 3–12 parts of pigment into a water-free solution containing 1 part of an at least partially neutralized carboxyl-functional addition solution copolymerized copolymer of 10% to 40% of monoethylenically unsaturated carboxylic acid, the major proportion of said pigment being titanium dioxide and said solution containing 40% to 70% of alcoholic organic solvent based on the weight of the solution copolymer, said copolymer being at least partially neutralized with an hydroxy amine having the formula:



$$R-\overset{X}{\overset{|}{N}}-R'OH$$

in which R is hydrogen or an alkyl group, R' is an alkylene group, and X is either R or R'OH, to render the said copolymer dispersible in water, and thereby form a nonaqueous pigment paste, and then mixing the nonaqueous pigment paste with an air drying aqueous latex consisting essentially of emulsified aqueous emulsion copolymer particles having a T_g below 20° C., the copolymer of said latex containing less than about 4% of reactive monomers.

4,110,293

PROCESS FOR STABILIZING LATEX AND STABLE LATICES PRODUCED THEREBY

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 22, 1977, Ser. No. 790,113

Int. Cl.^{2} C08L *9/04*

U.S. Cl. 260—29.7 R **9 Claims**

1. In a process for synthesizing an emulsion polymer, the improvement which comprises incorporating from approximately 0.025 to 2.5 parts per 100 parts monomer of a salt selected from the group consisting of salts of alpha-methylstyrene/maleic anhydride adduct and salts of alpha-methylstyrene dimer/maleic anhydride adduct into the emulsifier solution.

4,110,294

PROCESSING AIDS FOR HIGH TEMPERATURE POLYMERS

Timothy L. Pickering, Blauvelt, and James I. Hendrickson, New Windsor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 458,495, Apr. 8, 1974, abandoned, which is a continuation of Ser. No. 303,193, Nov. 2, 1972, abandoned. This application Apr. 9, 1976, Ser. No. 675,425

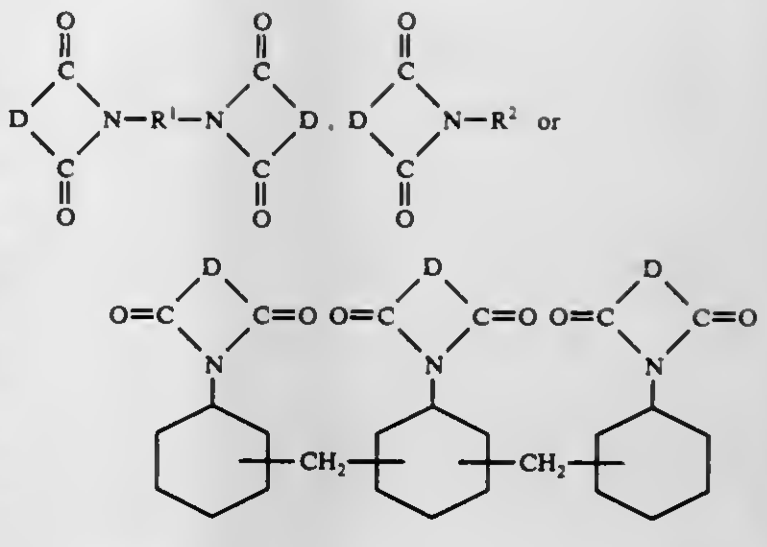
Int. Cl.^{2} C08K *5/34;* **C08L** *79/08*

U.S. Cl. 260—30.2 **10 Claims**

1. A composition of matter comprising

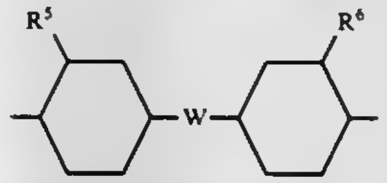
(a) a polyimide resin containing olefinic unsaturated end groups, and

(b) from about 10% to about 35% by weight based on the weight of (a) of an olefinic unsaturated imide compound of the formula

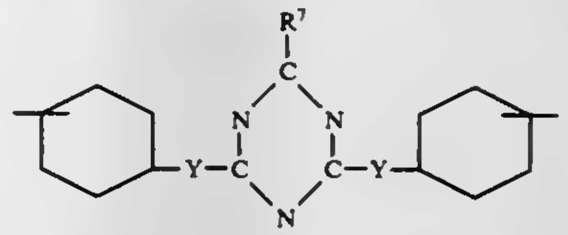


wherein

R^1 is an alkylene group containing from 2 to 12 carbon atoms; a cycloalkylene group containing from 4 to 6 carbon atoms, an arylene group selected from phenylene, xylylene, tolylene, biphenylene, naphthylene, a substituted arylene group of the formula



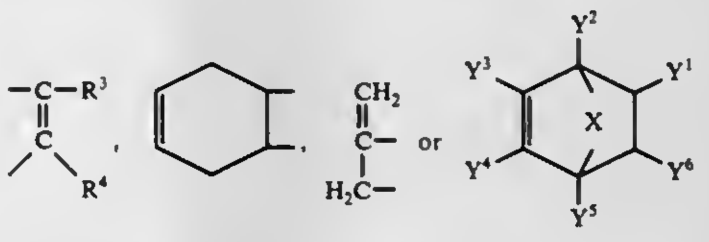
wherein W is sulfur, carbonyl, —SS—, O, sulfonyl, R^5 and R^6 are independent and each is hydrogen, chloro, bromo, a (lower)alkyl group containing from 1 to 5 carbon atoms, or a (lower) alkoxy group containing from 1 to 5 carbon atoms; or a group having the formula



where Y is a covalent bond or —NH—, and R^7 is phenyl, piperidino, H, diphenylamino or di(lower)alkyl amino;

R^2 is an alkyl group of from 1 to 8 carbon atoms, an alkenyl group of from 3 to 18 carbon atoms, an aryl group, an alkaryl group, nitrophenyl and aminophenyl;

D is a divalent radical containing olefinic unsaturation having the formula



wherein

R^3 is hydrogen, methyl, bromo or chloro;

R^4 is hydrogen, bromo or chloro;

Y^1-Y^6 inclusive is selected from the group consisting of hydrogen, bromine, chlorine, nitro, phenyl, alkyl of from 1 to 6 carbon atoms;

X is carbonyl, oxygen, sulfur, chloro or bromo substituted methylene, alkylidene of from 1 to 6 carbon atoms, and benzylidene.

4,110,295

STORAGE-STABLE, MOISTURE CURABLE MIXTURES CONTAINING MERCAPTO-TERMINATED LIQUID, OLIGOMER, LIQUID POLYMER OR LIQUID MONOMER, LIQUID OLIGOMER AND LIQUID POLYMER WITH SODIUM CHROMATE

Gerhard Wilhelm, Viernheim; Lothar Hockenberger, Ludwigshafen; Manfred Soyka, Duisburg, and Peter Endruschelt, Lamperthelm, all of Fed Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 4, 1976, Ser. No. 683,137
Int. Cl.^{2} C08K *5/15, 5/20, 5/05*
U.S. Cl. 260—30.4 R **26 Claims**

8. A mixture capable of hardening when exposed to atmospheric moisture, but stable when stored in the absence of moisture, said mixture comprising a liquid polymer, a liquid oligomer or a mixture of a liquid monomer, oligomer and polymer having at least one terminal mercapto group and a latent hardener comprised of a paste containing anhydrous sodium chromate and a water-soluble organic solvent.

14. Mixture according to claim **8** wherein said solvent is selected from the group consisting of dimethyl formamide, dimethyl sulfoxide, methanol, ethanol, glycol, glycerin and dioxane.

4,110,296

FIRE RETARDANT ACRYLIC TERPOLYMER COMPOSITION AND FILMS THEREOF

Jin Liang Wang, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 17, 1976, Ser. No. 751,935
Int. Cl.^{2} C08K *3/16, 3/32, 5/49;* **C08F** *120/00*
U.S. Cl. 260—30.6 R **4 Claims**

1. A flame retardant polymer film comprising a terpolymer and a fire retardant plasticizer, said terpolymer being a reaction product of (1) 20–60 weight percent 2-ethylhexyl acrylate, (2) 10 to 40 weight percent acrylonitrile, and (3) 20 to 70 weight percent halogenated monomer selected from the class consisting of vinylidene chloride, halogenated phenyl acrylate, halogenated phenyl methacrylate and the fire retardant plasticizer being selected from the class consisting of a triorgano phosphate, alone or in combination with decabromodiphenyl oxide and metal oxides of antimony and zinc.

4,110,297

WIRE ENAMEL WITH LOW SOLDERING TEMPERATURE

Thomas A. Shelby, and Shelby W. Gaillien, both of Fort Wayne, Ind., assignors to Rea Magnet Wire Co., Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 531,458, Dec. 11, 1974, Pat. No. 3,988,251. This application Sep. 13, 1976, Ser. No. 722,823
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.^{2} C08K *5/01, 5/13;* **C08L** *75/04;* **H01B** *3/20*
U.S. Cl. 260—33.4 P **10 Claims**

1. A wire enamel coating composition capable of forming an insulative coating on a wire characterized by a solderability of less than 1 second at a temperature of about 285°–315° C and a thermoplastic flow temperature of at least 230° C and comprising:

(a) 25–27 parts by weight of a polyurethane ester resin containing 4–10% by weight free hydroxyl content;
(b) 23–25 parts by weight of a blocked isocyanate;
(c) about 48–52 parts by weight of a solvent capable of dissolving said resin and said blocked isocyanate and containing at least 45% by weight of cresylic acid, with the balance of the solvent having a boiling point of less than 200° C; and
(d) 0.1 to 10.0% by weight of solids of a catalyst.

4,110,298

TRIOXANE PRODUCTION

William J. Wells, III, Houston, and Adin Lee Stautzenberger, Corpus Christi, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 718,638, Aug. 30, 1976, abandoned. This application May 31, 1977, Ser. No. 801,690
Int. Cl.^{2} C07D *323/06*
U.S. Cl. 260—340 **6 Claims**

1. In a process for manufacturing trioxane which comprises distilling an aqueous formaldehyde solution intimately mixed with a substantially immiscible oily liquid phase in the presence of an acid catalyst, the improvement which comprises using as said oily liquid phase a monobutyl ether of polyoxypropylene glycol having an average molecular weight of from about 2050 to about 2500.

4,110,299

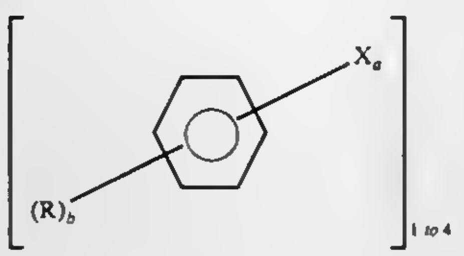
FLAME-RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,016
Int. Cl.^{2} C08K *5/45, 5/34, 5/15*
U.S. Cl. 260—37 PC **14 Claims**

1. An improved flame-retardant polycarbonate composition of an aromatic carbonate polymer in admixture with 0.01 to about 5.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of organic alkali metal salts of aromatic sulfonic acids, organic alkaline earth metal salts of aromatic sulfonic acids or mixtures thereof, the improvement which comprises having in admixture with the flame retardant aromatic carbonate polymer an additive which is an inorganic halide selected from alkali metal and alkaline earth metal halides wherein the halide substituent is bromine, chlorine or iodine, and an organic monomeric, polymeric aromatic and heterocyclic halide or mixtures thereof; said inorganic halide being present in amounts of from 0.01 to about 5.0 parts per hundred parts of the aromatic carbonate polymer; said monomer aromatic halide is present in amounts of from 0.10 to about 10.0 parts per hundred parts of aromatic carbonate polymer and is selected from the following formulae:

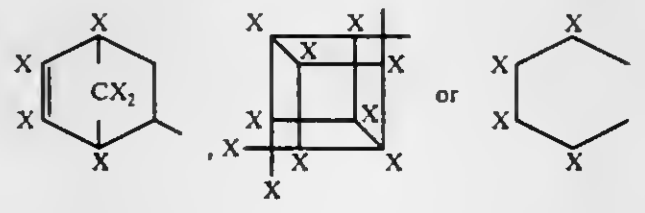
a.



wherein R is either hydrogen, alkyl, aryl, alkoxy, aryloxy, alkylthio, arylthio, alkysulfonyl, arylsufonyl of 1 to 20 carbon atoms or an electron withdrawing radical; X is independently chlorine or bromine; *a* is integer of 1 1 to 6 and *b* is 6 and *b* is 6-*a* and wherein R can be substituted by electron withdrawing substituents;

b. $R'_cR''_d$

wherein R′ may be either:



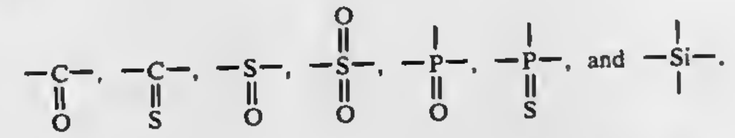
wherein X is independently chlorine or bromine; R″ is an aryl radical of 1–4 aromatic rings; *c* is an integer of 1–2; and *d* is an integer of 1–2; said polymeric aromatic halide is present in amounts of from 0.10 to about 10.0 parts per hundred parts of aromatic carbonate polymer and has the following formula:

$$([R_1]_e\{[Y]_f[A]_{1-3}\})_g\text{—}([R_1]_e\{[Y]_f[A]_{1-3}\})_h$$

wherein [A] is selected from the following formula:

$$(O)_iR_2(X)_j$$

wherein (O) is oxygen; *i* is an integer of 0 to 4; R$_2$ is an aromatic radical of one to four aromatic rings; X is chlorine or bromine; *j* is an integer of 0 to 10; R$_1$ is an organic radical of 1–20 carbon atoms and is either alkyl, aralkyl, alkenyl, aralkenyl, aryl, arylene, alkylene, aralkylene, alkenylene, aralkenylene, alkylidene, aralkylidene, alkenylidene or aralkenylidene, and the group [A] , as well as a trivalent and tetravalent aromatic nucleus and R$_1$ can contain an electron withdrawing radical; [Y] is a di-, tri- or tetravalent radical selected from the following:



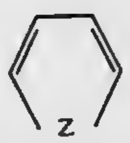
$$\underset{\underset{O}{\|}}{-C-},\ \underset{\underset{S}{\|}}{-C-},\ \underset{\underset{O}{\|}}{-S-},\ \overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{-S-}},\ \overset{|}{\underset{\underset{O}{\|}}{-P-}},\ \overset{|}{\underset{\underset{S}{\|}}{-P-}},\ \text{and}\ \overset{|}{\underset{|}{-Si-}}.$$

e is an integer of 0–3; *f* is an integer of 0–2; *g* is an integer of 0–2000 and *h* is an integer of from 0–2000; provided, however, that the sum of *g* and *h* must be at least 4 and can be as high as 2000; and, said heterocyclic halide is present in amounts of from 0.10 to about 10.0 parts per hundred parts of aromatic carbonate polymer and has the following formula:

$X_{0\text{-}15}R_4$

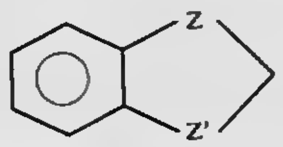
wherein X is independently chlorine or bromine and R is an organic nucleus selected from the group of organic heterocyclic nuclei consisting of

A.



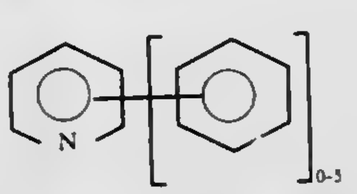
wherein Z is selected from the hetero atoms considering of sulfur, oxygen and nitrogen,

B.



wherein Z and Z′ are independently selected from the group consisting of carbon and the hetero atoms, nitrogen, sulfur and oxygen, providing that at least one Z is a hetero atom,

C.



11. The composition of claim **1** which contains a flame-retardant additive selected from the group consisting of a siloxane, a fluorinated polyolefin and fibrous glass in an amount sufficient to render the aromatic carbonate polymer composition non-dripping in the proximity of a flame.

4,110,300

SELF-EXTINGUISHING SILICONE RUBBER COMPOSITIONS

Takao Matsushita, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 4, 1977, Ser. No. 849,114
Claims priority, application Japan, Nov. 12, 1976, 51-135410; Nov. 12, 1976, 51-135411; Nov. 12, 1976, 51-135412; Mar. 25, 1977, 52-32073
Int. Cl.^{2} C08K *3/36, 3/26, 3/22*
U.S. Cl. 260—37 SB **16 Claims**

1. A self-extinguishing silicone rubber composition comprising:

(a) 100 parts by weight of an organopolysiloxane having the average unit of the formula $R_aSiO_{4-a/2}$ (wherein R is a substituted or unsubstituted univalent hydrocarbon radical, and $a = 1.98 \sim 2.05$);
(b) 10 to 150 parts by weight of finely powdered silica;
(c) 10^{-4} to 10^{-2} part by weight of platinum or an amount of a platinum compound containing the same amount of platinum, and
(d) 0.5 to 30 parts by weight of finely powdered γ-type iron sesquioxide.

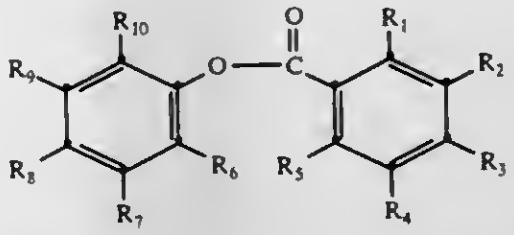
4,110,301

POLYESTER FIBER DYE STABILIZATION

Joseph S. Zannucci, and David G. Hedberg, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1976, Ser. No. 709,680
Int. Cl.^{2} C08K *5/10*
U.S. Cl. 260—40 P **4 Claims**

1. The composition comprising poly(1,4-cyclohexlenedimethylene terephthalate) containing one or more of from about 3–12 weight percent based on total polymer weight of poly(oxyethylene glycol) having a molecular weight of from about 300 to about 800, from about 5 to about 15 mole percent of isophthalic acid and from about 0.5 to about 5.0 mole percent of 5-sodiosulfoisophthalic acid based on total acid moles, blended with from about 0.01 to about 5.0% by weight based on total polymer weight of one or more rearrangeable compounds of the formula



where R$_1$–R$_{10}$ may be the same or different and selected from straight or branched alkyl or alkoxy of 1–6 carbons, hydrogen, and hydroxyl, and in all cases either R$_6$ or R$_{10}$ must be hydrogen.

4,110,302

REINFORCED POLYCARBODIIMIDE MODIFIED POLYALKYLENE TEREPHTHALATE

Norman W. Thomas, Warren; Frank M. Berardinelli, Millington, both of N.J., and Robert Edelman, Staten Island, N.Y., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 616,348, Sep. 24, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,124
Int. Cl.^{2} C08G *63/46, 63/76*
U.S. Cl. 260—40 R **19 Claims**

1. In a process for producing a reinforced polyalkylene terephthalate molding resin composition comprising intimately mixing in the molten state a reinforcing agent with a polyalkylene terephthalate polymer which is the reaction product of terephthalic acid or a dialkyl ester of terephthalic acid and a glycol selected from the group consisting of trimethylene

glycol, tetramethylene glycol, and mixtures thereof, said polyglycol, tetramethylene glycol, and mixtures thereof, said polyalkylene terephthalate having an intrinsic viscosity of from about 0.2 to about 1.2 deciliters per gram, the improvement comprising

modifying said polyalkylene terephthalate polymer by reacting the polyalkylene terephthalate polymer in the molten state with at least one polycarbodiimide, which polycarbodiimide both

(1) is derived from at least one aromatic diisocyanate which is either unsubstituted or contains up to one methyl substituent on each aromatic ring, and

(2) contains at least two carbodiimide units per polycarbodiimide molecule,

whereby said resulting molding resin composition exhibits a substantially improved impact strength.

4,110,303

MULTICOMPONENT POLYOLEFIN-BLOCK COPOLYMER-POLYAMIDE BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,174, Feb. 7, 1977, Pat. No. 4,081,424, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,382

Int. Cl.^{2} C08K *7/14*

U.S. Cl. 260—42.18 **31 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of a polyamide, and a polyolefin in a weight ratio of polyolefin to polyamide of at least 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene/polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

(b) said polyolefin has a molecular weight in excess of about 10,000 and an apparent crystalline melting point of between about 100° C and about 250° C.

4,110,304

STABILIZER SYSTEM AND ITS USE FOR STABILIZING STYRENE POLYMERS

Bernard Gilg, Saint-Louis, France; Helmut Muller, Binningen, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

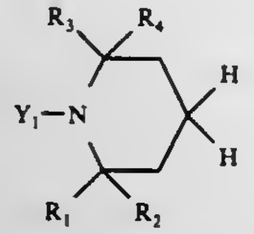
Continuation-in-part of Ser. No. 461,188, Apr. 12, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 638,226

Claims priority, application Switzerland, Apr. 19, 1973, 5753/73

Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—45.8 N **7 Claims**

1. A stabilizer system consisting essentially of a) at least one sterically hindered cyclic amine selected from the group consisting of



(1)

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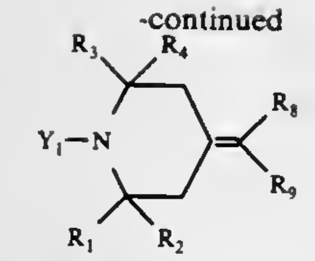

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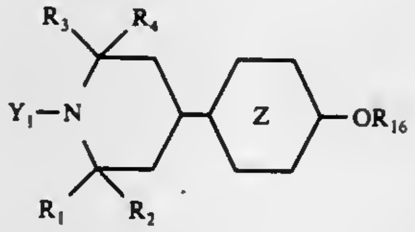
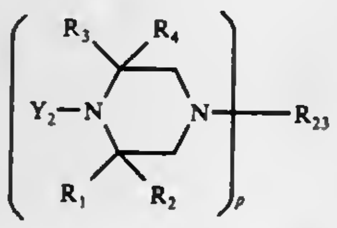
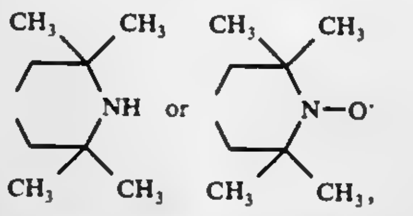


(3)



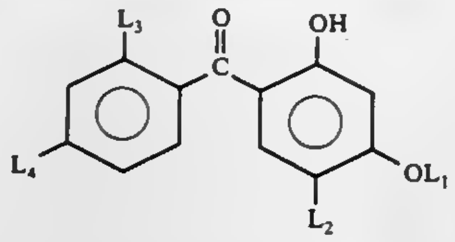
(4)

wherein Y_1 denotes hydrogen, —O·, is alkyl with 1–8 carbon atoms, halogenoalkyl with 1–5 carbon atoms, cyanoalkyl with 1–5 carbon atoms, epoxylalkyl with 3–4 carbon atoms, hydroxyaralkyl with 8–12 carbon atoms, acyloxyalkyl with 4–20 carbon atoms, aminoalkyl with 2–4 carbon atoms, acylamine with 2–18 carbon atoms, alkoxycarbonyalkyl with 3–21 carbon atoms, alkoxyalkyl with 3–20 carbon atoms, aralkyl with 7–20 carbon atoms, alkenyl with 3–6 carbon atoms or alkinyl with 3–6 carbon atoms, R_1 and R_2 represent methyl or together represent $—(CH_2)_5—$, R_3 represents methyl, R_4 represents alkyl with 1–5 carbon atoms or together with R_3 represents the radicals $—(CH_2)_4—$, $—(CH_2)_5$,



R_8 and R_9 independently of one another denote alkoxycarbonyl with 2–6 carbon atoms, benzoyl, nitrile or phenyl, R_{16} denotes hydrogen or the radical of an acyl group which is derived from an aliphatic carboxylic acid with 2–18 carbon atoms, from an aromatic carboxylic acid with 7–10 carbon atoms or from a carbamic acid substituted at the nitrogen by alkyl with 1–12 carbon atoms, benzyl or phenyl, with the ring Z representing a benzene or cyclohexane ring which is not substituted further or is substituted further by 1–2 alkyl groups with 1–5 carbon atoms, R_{23} denotes hydrogen, alkyl with 1–20 carbon atoms, benzyl, alkylene with 1–20 carbon atoms, or alkoxycarbonyalkyl with 2–26 carbon atoms, or an acyl group which is derived from an aliphatic carboxylic acid with 2–20 carbon atoms, from benzoic acid or from a carbamic acid substituted at the nitrogen by alkyl with 1–24 carbon atoms or phenyl, Y_2 denotes hydrogen, —O· or methyl and *p* represents an integer of 1 to 3 and

b) at least one co-stabilizer of the formulae



(II)

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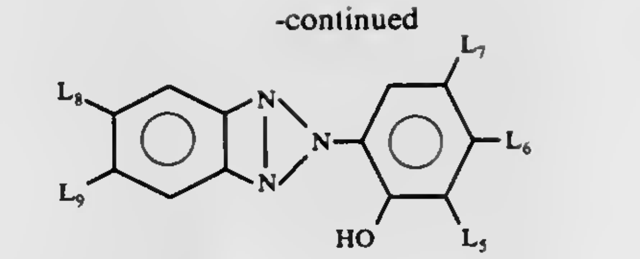
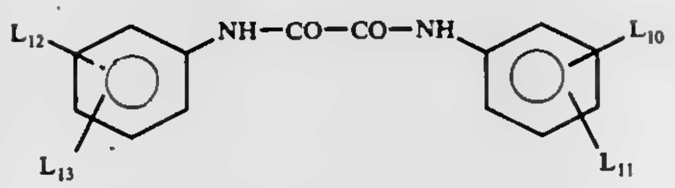


(III)



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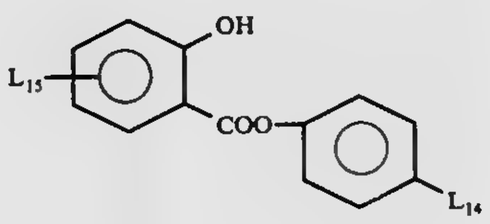

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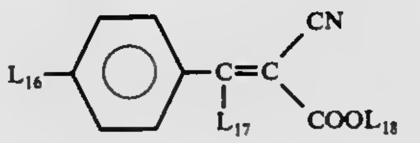
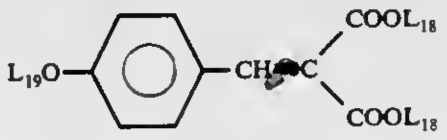
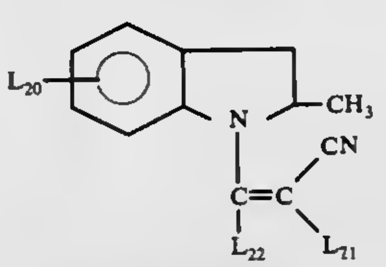


(VI)



(VII)



(VIII)

in which L_1 denotes hydrogen alkyl with 1–18 carbon atoms, allyl, methallyl or benzyl, L_2 denotes hydrogen, L_3 denotes hydrogen or hydroxyl, L_4 denotes hydrogen, hydroxyl alkoxy with 1–20 carbon atoms, allyloxy, methallyloxy or benzyloxy, L_5 denotes hydrogen, alkyl with 1–12 carbon atoms, alkenyl with 3–12 carbon atoms, cyclohexyl, aralkyl with 7–11 carbon atoms, phenyl, acylamino with 2–12 carbon atoms, acylaminomethyl with 3–13 carbon atoms, chlorine or bromine, L_6 denotes hydrogen, methyl, hydroxyl, alkoxy with 1–12 carbon atoms or acylamino with 2–12 carbon atoms, L_7 denotes hydrogen, alkyl with 1–12 carbon atoms, aralkyl with 7–11 carbon atoms, cyclohexyl, phenyl, alkoxycarbonylethyl with 4–15 carbon atoms, alkoxy with 1–12 carbon atoms, chlorine, bromine, carboxyl, alkoxycarbonyl with 2–13 carbon atoms or acylamino with 2–12 carbon atoms, L_8 denotes hydrogen, alkyl with 1–8 carbon atoms, alkoxy with 1–12 carbon atoms, chlorine, bromine, acylamino with 2–12 carbon atoms, carboxyl, alkoxycarbonyl with 2–13 carbon atoms, acyloxy with 2–12 carbon atoms, carbamoyl with 3–17 carbon atoms, alkoxysulphonyl with 1–12 carbon atoms, phenoxysulphonyl or sulphonamido with 2–16 carbon atoms, L_9 denotes hydrogen, methyl, chlorine or bromine, L_{10} and L_{12} independently of one another denote alkyl with 1–8 carbon atoms, alkoxy with 1–12 carbon atoms, allyloxy, methallyloxy, phenoxy, benzyloxy, chlorine, bromine or alkoxycarbonyl with 2–13 carbon atoms, L_{11} and L_{13} independently of one another denote hydrogen or alkyl with 1–8 carbon atoms, L_{14} and L_{15} independently of one another denote hydrogen or alkyl with 1–12 carbon atoms, L_{16} denotes alkoxy with 1–12 carbon atoms, L_{17} denotes alkyl with 1–3 carbon atoms or phenyl, L_{18} denotes alkyl with 1–12 carbon atoms, L_{19} denotes alkyl with 1–12 carbon atoms, L_{20} denotes hydrogen, alkyl with 1–8 carbon atoms, alkoxy with 1–8 carbon atoms or chlorine, L_{21} denotes nitrile or alkoxycarbonyl with 2–20 carbon atoms and L_{22} denotes hydrogen or alkyl with 1–3 carbon atoms, the ratio of stabilizer (a) to co-stabilizer (b) being from 1:10 to 10:1.

6. Polystyrene or styrene copolymers containing a stabilizer system according to claim 1.

4,110,305

POLYMERS STABILIZED BY ESTERS OF PIPERIDINOLS

Brian Holt, Oldham, and Donald Richard Randell, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

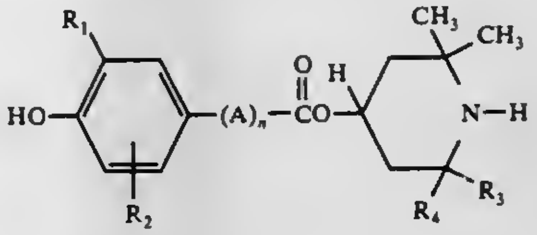
Division of Ser. No. 475,718, Jun. 3, 1974, Pat. No. 3,992,390, which is a continuation-in-part of Ser. No. 309,853, Nov. 27, 1972, abandoned. This application Nov. 15, 1976, Ser. No. 741,813

Claims priority, application United Kingdom, Nov. 30, 1971, 55486/71

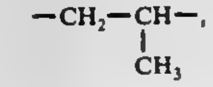
Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—45.8 N **7 Claims**

1. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.1% to 2% by weight of the polymer of a stabilizing compound of the formula



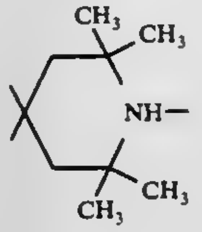
wherein A is $—CH_2—$, $—CH_2CH_2—$ or



$$-CH_2-\underset{\substack{| \\ CH_3}}{CH}-,$$

R_1 and R_2 are the same or different and each is a straight- or branched-chain alkyl group having from 1 to 6 carbon atoms, or 1-methylcyclohexyl or α,α-dimethylbenzyl,

R_3 and R_4 ar the same or different and each is an alkyl group having from 1 to 12 carbon atoms or R_3 and R_4 together with the carbon atom to which they are bound form a saturated alicyclic residue having from 5 to 8 carbon atoms or the group of formula:



and *n* is 0 or 1.

4,110,306

STABILIZERS FOR SYNTHETIC POLYMERS COMPRISING 2,2,6,6-TETRAMETHYL-4-PIPERIDYL CARBOXYLIC ACID ESTER, A TRIPHOSPHITE, AND AN ACID PHOSPHITE OR SALT THEREOF

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

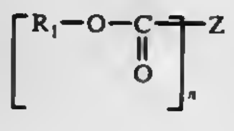
Filed Nov. 22, 1976, Ser. No. 744,053

Claims priority, application Japan, Dec. 1, 1975, 50-144,357

Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—45.8 N **30 Claims**

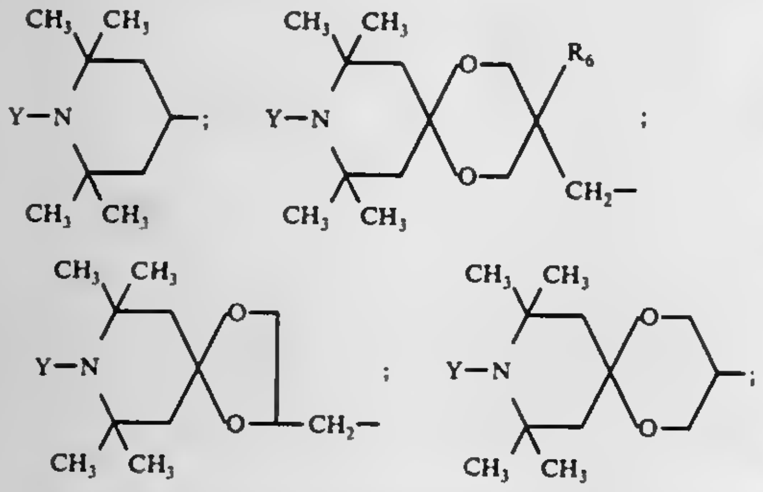
1. A stabilizer composition for organic polymeric materials comprising an amount with the range from about 69.5 to about 10% of a triphosphite, an amount within the range from about 10 to about 0.5% of an acid phosphite, the acid phosphite being selected from the group consisting of acid phosphites, acid phosphite metal salts and acid phosphite ammonium salts, and an amount within the range from about 89.5 to about 30% of a 2,2,6,6-tetramethyl-4-piperidyl carboxylic acid ester having the general formula:



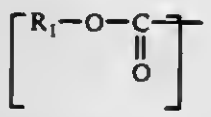
$$\left[R_1-O-\underset{O}{\underset{\|}{C}}-\right]_n Z$$

wherein:

R$_1$ is selected from the group consisting of



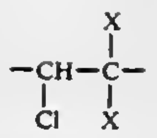
Y is selected from the group consisting of hydrogen and O;
R$_6$ is lower alkyl having from one to six carbon atoms;
n is selected from the group consisting of 1, 2, 3 and 4; and
Z is an organic radical having a valence from 1 to 4, the valence positions being taken by



$$\left[R_1-O-\underset{O}{\underset{\|}{C}}-\right]$$

groups, and from one to about twenty carbon atoms, and selected from the group consisting of alkyl, alkenyl, alkylene, alkenylene, alkylidene; aryl, arylene, aralkyl, aralkylene, aralkylidene, alkaryl, alkarylene, alkarylidene; heterocycloalkyl, heterocycloalkylene, heterocycloalkylidene; cycloalkyl, cycloalkenyl, cycloalkylene, cycloalkenylene, cycloalkylidene, alkcycloalkyl, alkcycloalkenyl, alkcycloalkenylene, alkcycloalkylene, cycloalkalkylene, cycloalkalkyl, cycloalkalkenyl, and cycloalkalkenylene, and amino- and hydroxy-substituted such radicals.

21. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group



$$-\underset{Cl}{\underset{|}{CH}}-\overset{X}{\overset{|}{\underset{X}{\underset{|}{C}}}}-$$

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and an amount to improve resistance to deterioration of the resin of a stabilizer composition in accordance with claim 1.

4,110,307

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,014

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.^{2} C08K *5/42*

U.S. Cl. 260—45.9 KA **17 Claims**

1. In a flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of monomeric and polymeric aromatic ethers and mixtures thereof, wherein said metal salts are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic ethers is selected from the group consisting of alkyl, aryl, alkoxy, and aryloxy of 1 to 12 carbon atoms and electron withdrawing radicals and mixtures thereof; the improvement comprising including said additive in said admixture in an amount of from 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer, said aromatic carbonate polymer and said additive each having a refractive index in the range of 1.54 to 1.65 such that said composition is non-opaque.

4,110,308

STABILIZED ETHYLENE-TETRAFLUOROETHYLENE COPOLYMER COMPOSITION

Takeshi Abe; Masahiko Ichimura; Makoto Noshiro; Nobuaki Kunii, and Yasumichi Ito, all of Yokohama, Japan, assignors to Ashai Glass Company Ltd., Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,688

Claims priority, application Japan, Aug. 25, 1975, 50-102096

Int. Cl.^{2} C08K *3/22, 3/06*

U.S. Cl. 260—45.75 C **10 Claims**

1. An ethylene-tetrafluoroethylene copolymer composition having improved thermal stability which comprises an ethylene-tetrafluoroethylene copolymer wherein said copolymer comprises from 30 to 60 mole % of tetrafluoroethylene units, and from 0.1 ppm to 10 wt.% of a copper compound based on the weight of the copolymer and wherein said copper compound is copper, copper oxide, or a compound which is converted to copper oxide by heating in air at the molding temperature of said copolymer.

4,110,309

POLYETHER DIUREIDE EPOXY ADDITIVES

Heinz Schulze, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

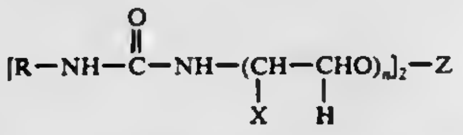
Filed Nov. 22, 1976, Ser. No. 743,814

Int. Cl.^{2} C08G *59/56*

U.S. Cl. 528—119 **22 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:

a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;
a curing amount of a polyamine curing agent having at least 3 reactive amino hydrogens; and,
an effective amount of an additive consisting essentially of a polyether diureide of the formula:



$$[R-NH-\overset{O}{\overset{\|}{C}}-NH-(\underset{X}{\underset{|}{CH}}-\underset{H}{\underset{|}{C}}HO)_n]_2-Z$$

wherein R is hydrogen; or, a branched or straight chain alkyl radical of from 1 to about 10 carbon atoms, or a monocyclic aryl, alkaryl or aralkyl radical having from 6 to about 12 carbon atoms; or, are branched or straight chain alkenyl or alkadienyl radical of from 2 to about 10 carbon atoms; X is hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms and n is a number selected such that the molecule of the above formula has a molecular weight of from about 2000 to about 3000.

4,110,310

POLYETHER DIAMIDE EPOXY ADDITIVES

Heinz Schulze, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

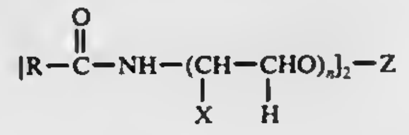
Filed Nov. 22, 1976, Ser. No. 743,817

Int. Cl.^{2} C08G *59/50*

U.S. Cl. 528—119 **28 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:

a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;
a curing amount of a polyamine curing agent having at least 3 reactive amino hydrogens; and,
an effective amount of an additive consisting essentially of a polyether diamide of the formula:



$$[R-\overset{O}{\overset{\|}{C}}-NH-(\underset{X}{\underset{|}{CH}}-\underset{H}{\underset{|}{C}}HO)_n]_2-Z$$

wherein R is hydrogen; or, a branched or straight chain alkyl radical of from 1 to about 10 carbon atoms, or a monocyclic aryl, alkaryl or aralkyl radical having from 6 to about 12 carbon atoms; or, is a branched or straight chain alkenyl or alkadienyl radical of from 2 to about 10 carbon atoms; X is hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms and n is a number selected such that the molecule of the above formula has a molecular weight of from about 2000 to about 3000.

4,110,311

MOLECULAR WEIGHT CONTROL OF POLYPHENYLENE ETHERS

Glean Dale Cooper, Delmar, and Daniel Edwin Floryan, Glenmont, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 13, 1976, Ser. No. 749,762

Int. Cl.^{2} C08G *65/44*

U.S. Cl. 528—215 **22 Claims**

1. In a process for forming a polyphenylene ether by an oxidative coupling reaction in the presence of a chelatable metal ion-amine complex catalyst comprising passing an oxygen containing gas through a reaction solution of a phenol and said catalyst, the improvement which comprises terminating the reaction and stabilizing the polymer against degradation by contacting the reaction solution with (i) a chelating agent for such ion in combination with (ii) a dihydric phenol and a reducing agent, and recovering the polyphenylene ether from the reaction solution.

4,110,312

METHOD FOR PREPARING POLYPHENYLENE OXIDES WITH MANGANESE-VINYL RESIN COMPLEXES

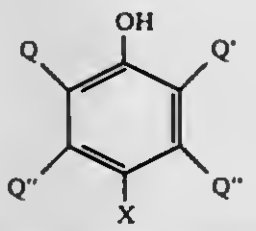
Eugene George Banucci, Scotia, and Walter Karl Olander, Clifton Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Flied Dec. 21, 1976, Ser. No. 753,562

Int. Cl.^{2} C08G *61/00, 61/10, 65/00*

U.S. Cl. 528—215 **19 Claims**

1. A method for the preparation of polyphenylene oxide resin which comprises oxidatively coupling a phenolic monomer of the formula:



wherein X is a substituent selected from the group consisting of hydrogen, chlorine, bromine and iodine, Q is a monovalent substituent selected from the group consisting of hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenol nucleus; hydrocarbonoxy radicals, halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenol nucleus and Q' is as defined for Q and in addition may be halogen and Q'' are each as defined for Q' and in addition hydrogen, with the proviso that Q, Q' and Q'' are all free of a tertiary carbon atom; under polymer forming reaction conditions to form a polyphenylene oxide resin in the presence of an organic solvent, base, and a heterogeneous polymer-bound catalyst which comprises a manganese (II) complex that is formed from a manganese (II) compound and a crosslinked vinyl resin having units that contain a benzoin oxime group.

4,110,313

EPOXY CURING AGENT

Heinz Schulze, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,558

Int. Cl.^{2} C08G *59/50, 59/56*

U.S. Cl. 528—90 **6 Claims**

1. A method for acclerating the curing of an epoxy resin with at least a stoichiometric amount of a polyoxyalkylenepolyamine curing component wherein the curing component comprises a polyoxyalkylene-polyamine having a molecular weight of from about 230 to about 2000 and a dithiocarbamate salt of the polyoxyalkylene polyamine, wherein about 50 wt% to about 100 wt% of said polyoxyalkylenepolyamine is replaced by the dithiocarbamate salt of said polyoxyalkylenepolyamine.

4,110,314

PROCESS FOR PREPARING AN AROMATIC POLYMER IN THE PRESENCE OF AN INERT NONPOLAR AROMATIC REACTION LUBRICANT

Norio Yagi; Hideki Matsumura; Tatsuhiro Aoyagi, and Ikuji Kishi, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

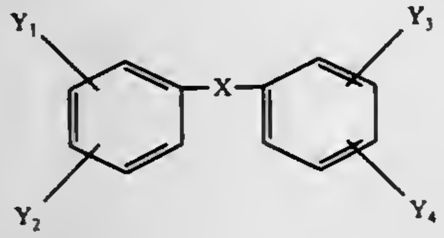
Filed Dec. 16, 1976, Ser. No. 751,479

Claims priority, application Japan, Dec. 19, 1975, 50-151301

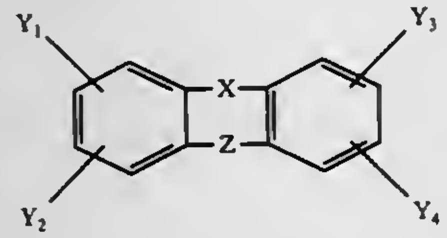
Int. Cl.² C08G *65/40, 75/23*

U.S. Cl. 528—26 **6 Claims**

1. A process for preparing an aromatic polymer which comprises polymerizing a dialkali metal salt of a diphenol with a dihalodiphenyl compound, having an electron withdrawing group in at least one of the positions ortho or para to each of the halogen atoms, at 200° C to 400° C, in an inert gas atmosphere, in the presence of from 0.1 to 30% by weight of an inert nonpolar aromatic reaction lubricant selected from the group consisting of anthracene, phenanthrene and a compound of the formula



(1)



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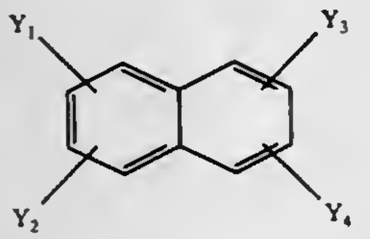


(3)

wherein

X represents a single bond or methylene, ethylene, propylene or propylidene group or oxygen or sulfur atom;

Y_1, Y_2, Y_3 and Y_4 respectively represent hydrogen atom or methyl, ethyl, methoxy, ethoxy, aryl or benzyl group and

Z represents methylene group or oxygen or sulfur atom;

wherein said dialkali metal salt of a diphenol and said dihalodiphenyl compound are polycondensed in the molar ratio of from 1:0.95 to 1:1.10.

4,110,315

MOLDED CONTAINER OF POLYESTER PREPARED FROM A BIS(HYDROXYETHOXYPHENYL)SULFONE

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 690,483, May 27, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,921

Int. Cl.² C08G *63/66, 63/68*

U.S. Cl. 528—294 **8 Claims**

1. A molded container formed from materials which comprise a linear copolyester consisting essentially of the polymeric reaction product of

(A) isophthalic acid and, optionally, terephthalic acid, and

(B) bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene glycol

the amount of said A reactants, in mole percent, being between about 15% to 100% isophthalic acid and 85% to 0% terephthalic acid, the amount of said bis(4-beta-hydroxyethoxyphenyl) sulfone being at least 15 and up to 90 mole percent of the combined amounts of said A reactants and the combined amounts of said B reactants being about 110% to about 300% of the combined amount of said A reactants, said polyester having an O_2 and CO_2 permeabilities which are, respectively, less than 8 and less than 58 cc.mil/100 in^2.day.atm. on an unoriented basis and a glass transition temperature greater than 75° C.

4,110,316

PROCESS FOR PREPARING POLY(ETHYLENE TEREPHTHALATE)

Robert Ray Edging, Kinston, and Lien-Mow Lee, Greenville, both of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 14, 1977, Ser. No. 787,605

Int. Cl.² C08G *63/18*

U.S. Cl. 526—68 **5 Claims**

1. In a continuous direct esterification and polymerization process wherein a feed of ethylene glycol and terephthalic acid in molar proportions of 1.5 to 4.0 glycol to 1.0 terephthalic acid is heated in reaction product at about 280° to 315° C and about atmospheric pressure to esterify the terephthalic acid and form an ester reaction product having an average degree of polymerization of 2 to 10, the ester product is heated at 250° to 300° C and low absolute pressure in a continuous polymerizer to form a prepolymer, and the prepolymer is heated at 270° to 305° C and substantially lower absolute pressure in a finisher polymerizer to form a polymer for spinning into filaments; the improvement for continuously recovering and reusing ethylene glycol from vapors formed in the polymerizers which comprises,

(a) conducting vapors of ethylene glycol and water from the continuous polymerizer into a spray condenser at the pressure in the polymerizer, spraying the vapors with ethylene glycol liquid containing less than 10 weight percent water to condense substantially all of the vapors, combining the condensate with ethylene glycol liquid containing less than 3 weight percent water to form ethylene glycol liquid containing less than 10 weight percent water for use in spraying the vapors and for reacting with terephthalic acid to form ester reaction product;

(b) conducting vapors of ethylene glycol and water from the finisher polymerizer into a spray condenser at the pressure in the finisher polymerizer, spraying the vapors with ethylene glycol liquid containing less than 3 weight percent water to condense substantially all of the vapors, combining the condensate with ethylene glycol liquid containing less than 1 weight percent water to form ethylene glycol liquid containing less than 3 weight percent water for use in spraying the vapors and for combining with the condensate produced in condenser system (a), the glycol containing less than 1 weight percent water being added at a rate of about 0.4 to 1.15 mole of glycol per mole of ethylene terephthalate in the polymer produced; and

(c) continuously transferring ethylene glycol liquid from finisher condenser system (b) to system (a), and from system (a) to the esterification reaction, at rates determined by the rate at which ethylene glycol is used in the esterification reaction.

4,110,317

URETHANE COATING COMPOSITION AND PROCESS

James F. Moraveck, Shelton, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 235,800, Mar. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 33,101, Apr. 29, 1970, abandoned, and Ser. No. 685,309, Nov. 24, 1967, abandoned. This application Jan. 10, 1974, Ser. No. 432,273

Int. Cl.² C08G *18/48*

U.S. Cl. 528—77 **7 Claims**

1. A flexible urethane coating composition comprising a solvent and an isocyanate-terminated prepolymer comprising the reaction product of

(a) a polytetramethylene ether glycol having an average molecular weight between about 500 and about 700,

(b) an oxyalkylated triol having an average molecular weight between about 400 and about 1000, in an amount between about 8 and about 12 percent by weight based on the combined weight of said oxyalkylated triol and said polytetramethylene ether glycol, and

(c) an organic diisocyanate in a proportion sufficient to provide between about 1.2 and about 1.8 -NCO groups for each -OH group in said polytetramethylene ether glycol and said oxyalkylated triol.

4,110,318

POLYPARABANIC ACID DERIVATIVES

Henning Giesecke, Cologne; Jürgen Hocker, Bergisch Gladbach, and Rudolf Merten, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

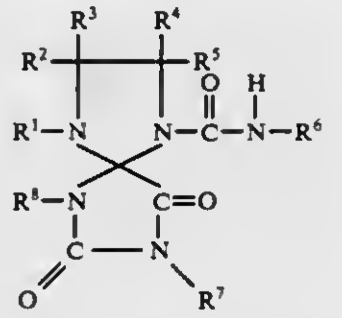
Filed Jun. 8, 1977, Ser. No. 804,606

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654347

Int. Cl.² C08L *39/04*

U.S. Cl. 528—73 **7 Claims**

1. Polyparabanic acid derivatives which contain the following recurring structural unit from 2 to 100 times



wherein R^1, R^6, R^7 and R^8 may be the same or different, and each represents an optionally substituted aliphatic, aliphatic-aromatic or aromatic radical, and R^2, R^3, R^4 and R^5 may be the same or different, and each represents hydrogen or an optionally substituted aliphatic, aliphatic-aromatic or aromatic radical.

4,110,319

THIOCARBAMATE ADDITIVES FOR SULFUR VULCANIZABLE POLYMERS

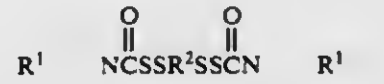
John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 1, 1976, Ser. No. 728,692

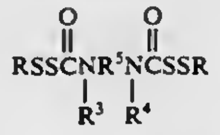
Int. Cl.² C08C *19/20*

U.S. Cl. 526—17 **8 Claims**

1. A sulfur vulcanizable diene polymer selected from the group consisting of natural rubber and synthetic diene polymers prepared from a monomer system containing diene monomer, said sulfur vulcanizable diene polymer having incorporated therein at least one thiocarbamate having the following structural formula



$$R^1 \quad N\overset{O}{\overset{\|}{C}}SSR^2SS\overset{O}{\overset{\|}{C}}N \quad R^1 \tag{II}$$



$$RSS\overset{O}{\overset{\|}{C}}\underset{\underset{R^3}{|}}{N}R^5\underset{\underset{R^4}{|}}{N}\overset{O}{\overset{\|}{C}}SSR \tag{III}$$

wherein R is selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, monochloroalkyl radicals having 3 to 20 carbon atoms, cycloalkyl radicals having 5 to 10 carbon atoms, monochlorocycloalkyl radicals having 5 to 10 carbon atoms, aralkyl radicals having 7 to 11 carbon atoms and aryl radicals having 6 to 10 carbon atoms, said aryl radicals optionally substituted with 1 or 2 radicals selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms and the chloro radical, wherein the symbol

$$N \qquad R^1$$

denotes a heterocyclic amino radical selected from the group consisting of pyrrolidino, piperidino, hexamethyleneimino, morpholino, 2,6-dimethylmorpholino, 2-methylpiperidino, 3-methylpiperidino, 4-methylpiperidino, 2,6-dimethylpiperidino, and 4-methylpiperazino, R^2 is selected from the group consisting of alkylene radicals conforming to the following structural formula

$$—(C_mH_{2m}) — (R^6)_X — (C_nH_{2n}) —$$

and arylene radicals having 6 to 10 carbon atoms, wherein X is 0 or 1, wherein R^6 is selected from the group consisting of —0—, —S— and phenylene, wherein when R^6 is phenylene or X is 0, *m* and *n* are positive whole numbers from 1 to 5 and wherein when R^6 is —0— or —S—, *m* and *n* are positive whole numbers from 2 to 5; R^3 and R^4 are selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cyclohexyl radical; aralkyl radicals having 7 to 12 carbon atoms and aryl radicals having 6 to 10 carbon atoms; R^5 is selected from the group consisting of alkylene radicals having 2 to 6 carbon atoms and p-phenylene and wherein R^3 and R^4 can be joined to constitute with the bridging R^5 group and the attached nitrogen atoms, a heterocyclic diamino radical selected from the group consisting of piperazino, 2,5-dimethylpiperazino, homopiperazino, and 4,4′-trimethylenediperidino.

4,110,320

METHOD OF FRACTIONATING AND SEPARATING PROTEINS

Friedrich von der Haar, Bovenden, Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften E.V., Göttingen, Germany

Filed May 11, 1977, Ser. No. 796,050

Claims priority, application Fed. Rep. of Germany, May 24, 1976, 2623276

Int. Cl.² A23J *1/00*

U.S. Cl. 260—112 R **4 Claims**

1. In a method for the fractionation and separation of proteins by adsorption on an organic gel and elution with a descending ammonium sulfate gradient, the improvement comprising treating a solution of the proteins with ammonium sulfate down to a concentration which is from 5 to 15% below the concentration normally required for precipitation of said proteins, mixing the solution obtained with unsubstituted agarose gel, whereby the proteins are precipitated onto the agarose gel, and then fractionally eluting the latter.

4,110,321

SYNTHETIC TRIDECAPEPTIDE [Gln^{9}]-NEUTROTENSIN HAVING HORMONAL ACTIVITY

Karl A. Folkers, 6406 Mesa Dr., Austin, Tex. 78746

Continuation-in-part of Ser. No. 704,309, Jul. 12, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,208

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. A synthetic tridecapeptide having the structure pGlu-Leu-Tyr-Gln-Asn-Lys-Pro-Arg-Arg-Pro-Tyr-Ile-Leu-OH wherein all 13 amino acids are of the L-configuration.

4,110,322
PEPTIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Hendrik Marie Greven, Heesch, and David de Wied, Bilthoven, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 27, 1977, Ser. No. 810,277

Claims priority, application Netherlands, Jul. 12, 1976, 7607683

Int. Cl.^{2} C07C *103/51;* **A61K** *37/00;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **34 Claims**

1. Compounds of the formula: A-L-B-D-Lys-L-Phe-Gly-(L or D)Lys-L-Pro-L-Val-Gly-L-Lys-L-Lys-X and their functional derivatives, wherein:

A is an N-terminal chain prolongation selected from the group consisting of:
  (1) hydrogen, and
  (2) the N-acyl radicals derived from:
    (a) alkyl carboxylic acids having from one to about six carbon atoms,
    (b) aralkyl carboxylic acids having from seven to about ten carbon atoms,
    (c) amino acids selected from the group consisting of Met, Met(→ O), Met (→ O_2), Glu, Ser, His, Phe, Arg, Lys, Trp, Gly, Val, Leu, Ala, Ileu, β-Ala, (α-Me) Ala, Pro, Tyr, and Thr,
    (d) peptides comprising two or three α-amino acids,
    (e) the N-alkylcarbonyl or N-aralkylcarbonyl derivatives of said amino acids, and
    (f) the N-alkylcarbonyl or N-aralkylcarbonyl derivatives of said peptides,

wherein the alkyl moiety in (e) and (f) has from one to about six carbon atoms, and wherein the aralkyl moiety in (e) and (f) has from seven to about ten carbon atoms;

B is an amino acid residue selected from the group consisting of Phe, Trp, Tyr and —NH—CHR_1—CO—, wherein R_1 is hydrogen or alkyl from one to about six carbon atoms; and

X is a member selected from the group consisting of hydroxy, esterified hydroxy radicals of from one to eighteen carbon atoms, unsubstituted amino radicals, and substituted amino radicals selected from the group consisting of mono-alkyl (one to six carbons) amino, dialkyl-(one to six carbons) amino radicals, and radicals derived from amino acids or peptides having the sequence 17, 17-18, 17–19, up to and including 17-24 of the ACTH molcule, or a C-terminal ester o amide thereof, with the proviso that Arg may be replaced by Lys.

4,110,323
CONVERSION OF 2-DIALKYLAMINO-3H-AZEPINES INTO EPSILON CAPROLACTAMS

Sylvain A. R. Dewaele, Evergem, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Filed Nov. 15, 1976, Ser. No. 741,838

Claims priority, application United Kingdom, Nov. 19, 1975 [GB] 47581/75

Int. Cl.^{2} C07D *201/02*

U.S. Cl. 260—239.3 A **2 Claims**

1. A process for preparing epsilon caprolactams from 2-N,N-dialkylamino-3H azepines wherein the alkyl substituents contain from 1 to 6 carbon atoms, by the steps of:

(a) mixing each mole of said azepine to be hydrogenated, at 20°–30° C, with a solubilizing amount of 95% by weight of deoxygenated alkanol, to form a hydrogenation mixture.
(b) in the presence of between 0.1 to 5% by weight of a Group VIII (a) metal catalyst, said catalyst being selected from the group consisting of Raney nickel, Adam's catalyst and platinum or palladium on a solid-inert support.
(c) passing hydrogen gas through said hydrogenation mixture at 0° to 75° C, at atmospheric to 200 atmospheres of hydrogen until epsilon caprolactam is formed.

4,110,324
NICOTINIC DERIVATIVES OF ESTRIOL

Nicolas Guéritée, 65, rue des Vignes, 75016 Paris, France

Continuation-in-part of Ser. No. 551,151, Feb. 19, 1975, Pat. No. 4,042,581. This application Oct. 29, 1976, Ser. No. 736,931

Claims priority, application United Kingdom, Feb. 26, 1974, 08712/74

Int. Cl.^{2} C07J *43/00*

U.S. Cl. 260—239.5 **3 Claims**

1. The compound 3-methoxy-16α,17β-dinicotinoyloxy-1,3,5(10)-estratriene.

4,110,325
21-(ACETYLOXY)-3-OXO-24-NORCHOLA-4,20(22)-DIENE-23-NITRILE AND INTERMEDIATES THERETO

George R. Lenz, Evanston, and John A. Schulz, Waukegan, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 10, 1977, Ser. No. 823,372

Int. Cl.^{2} C07J *21/00, 9/00*

U.S. Cl. 260—239.55 C **4 Claims**

1. 21-(Acetyloxy)-3-oxo-24-norchola-4,20(22)-diene-23-nitrile.

3. 21-(Acetyloxy)-3-[1,2-ethanediylbis(oxy)]-24-norchola-5,20(22)-diene-23-nitrile.

4,110,326
ACYLATED DIEPOXY-ANDROSTANE AND A PROCESS FOR THE PREPARATION THEREOF

Zoltan Tuba, and Maria Marsai, both of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

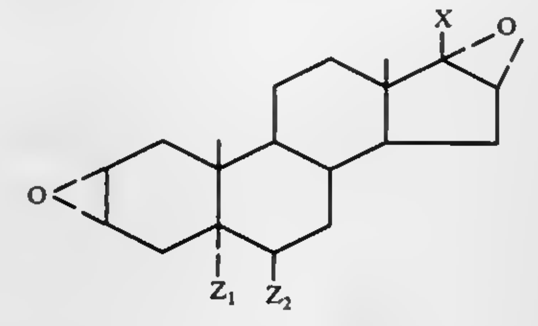
Continuation-in-part of Ser. No. 702,050, Jul. 2, 1976, abandoned, and a continuation-in-part of Ser. No. 702,051, Jul. 2, 1976, abandoned, and a continuation-in-part of Ser. No. 709,325, Jul. 28, 1976, Pat. No. 4,071,515, and a continuation-in-part of Ser. No. 709,323, Jul. 28, 1976, Pat. No. 4,071,515. This application Jan. 25, 1977, Ser. No. 762,233

Claims priority, application Hungary, Jul. 15, 1975, 572

Int. Cl.^{2} C07J *71/00, 43/00*

U.S. Cl. 260—239.55 R **24 Claims**

1. A compound of the formula



wherein

X is halogen,

Z_1 and Z_2 are both hydrogen, or Z_1 is hydroxy and Z_2 is chlorine, or

Z_1 and Z_2 together stand for an α-epoxy group.

4,110,327
2,3 DIKETO-PIPERAZINO CARBONYLAMINO ALKANOIC ACIDS AND DERIVATIVES

Isamu Saikawa; Shuntaro Takano, both of Toyama; Chosaku Yoshida, Takaoka; Okuta Takashima, Toyama; Kaishu Momonoi, Shinminato; Seletsu Kuroda, Toyama; Miwako Komatsu, Toyama; Takashi Yasuda, Toyama, and Yutaka Kodama, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

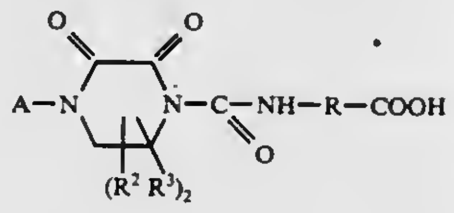
Division of Ser. No. 571,479, Apr. 24, 1975. This application Oct. 15, 1976, Ser. No. 732,860

Claims priority, application Japan, May 9, 1974, 49-50663; May 13, 1974, 49-52254; May 31, 1974, 49-60787; Aug. 13, 1974, 49-91996; Sep. 26, 1974, 49-109954; Dec. 3, 1974, 49-142499; Mar. 27, 1975, 50-37027

Int. Cl.^{2} C07D *241/08, 401/12, 401/14, 413/12*

U.S. Cl. 544—385 **8 Claims**

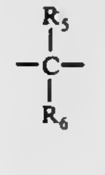
1. A compound of the formula,



wherein

A is a hydrogen atom or a C_{1-12} alkyl, C_{2-4} alkenyl, phenyl, naphthyl, benzyl or phenethyl group alone or substituted by halogen, hydroxyl, nitro, cyano, pyrrolidino, piperidino, morpholino and acetoxy;

R^2 and R^3 are linked to the same carbon atom, and R^2 and R^3 individually are hydrogen, methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, or octyl, and R is



$$-\underset{R_6}{\underset{|}{\overset{R_5}{\overset{|}{C}}}}-$$

wherein

R_5 is C_{1-8} alkyl, C_{5-7} cycloalkyl, C_{5-6} cycloalkenyl, C_{5-6} cycloalkadienyl, phenyl, naphthyl, benzyl, phenethyl, phenoxy, naphthoxy, C_{1-2} alkylthio- C_{1-2} alkyl, furyl, thienyl, oxazolyl, thiazolyl, isoxazolyl, isothiazolyl, imidazolyl, pyrazolyl, pyridyl, pyrazyl, pyrimidinyl, pyridazinyl, quinolyl, isoquinolyl, quinazolinyl, indolyl, indazolyl, 1, 3, 4-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,4-thiadiazolyl or 1,2,4-thiadiazolyl alone or substituted by halogen, hydroxy and nitro; R_6 is hydrogen and R_5 and R_6 together with the common carbon atom to which they are attached may form a C_{6-7} cycloalkyl, C_{5-6} cycloalkenyl or C_{5-6} cycloalkadienyl ring;

a salt thereof selected from the group consisting of alkali metal salts, alkaline earth metal salts, ammonium salts, and salts with trimethylamine or dicyclohexylamine, or

a reactive derivative of the carboxyl group thereof, said derivative being conventional in the field of pencillins and cephalosporins for forming acid amides therewith, and said derivative being selected from the group consisting of acid halides, acid anhydrides, mixed acid anhydrides with organic or inorganic acids, active acid amides, acid cyanides and active esters.

4,110,328
BIS-CARBAMYLGUANIDINOAZAALKANE ANTIMICROBIAL COMPOUNDS

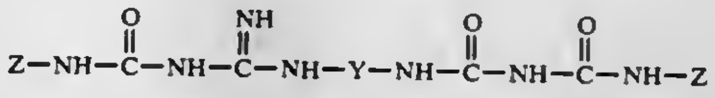
Julius Diamond, Morris Plains, N.J., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 627,139, Oct. 30, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,319

Int. Cl.^{2} C07D *295/12, 241/06, 403/06, 413/14*

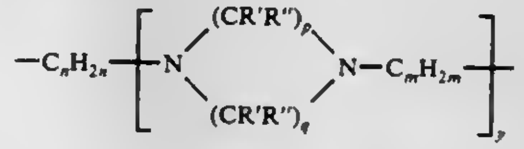
U.S. Cl. 544—380 **26 Claims**

1. A compound having the formula



$$Z-NH-\overset{O}{\overset{\|}{C}}-NH-\overset{NH}{\overset{\|}{C}}-NH-Y-NH-\overset{O}{\overset{\|}{C}}-NH-\overset{O}{\overset{\|}{C}}-NH-Z$$

wherein Y is a nitrogen-containing alkylene group having the structural formula



wherein:
$n = 2–4$
$m = 2–4$
$p = 2$
$q = 2$
$y = 1–2$

R' and R'' are each hydrogen or C_1–C_4 alkyl and may be the same or different; and Z is selected from the group consisting of C_1–C_{12} alkyl; di(C_1–C_{10} alkylamino)-C_{10}–C_2 alkyl, (1-piperidino)alkyl and (1-morpholino)alkyl having a total carbon content of C_4–C_{12}; C_3–C_{12} alkenyl; C_3–C_{12} alkynyl, C_3–C_{12} cycloalkyl, C_4–C_{12} cycloalkylalkyl, C_6–C_{12} cycloalkenyl, C_7–C_{14} cycloalkenylalkyl, C_7–C_{12} polycycloalkyl, C_8–C_{14} polycycloalkylalkyl, C_7–C_{12} polycycloalkenyl, C_8–C_{14} polycycloalkenylalkyl, C_1–C_{10} alkoxy-C_{10}–C_2 alkyl having a total carbon content of C_3–C_{14}; C_1–C_{10} alkylthio-C_{10}–C_2 alkyl having a total carbon content of C_3–C_{14}; phenoxy C_2–C_6 alkyl; phenylthio C_2–C_6 alkyl; C_6–C_{14} aryl; C_7–C_{14} aralkyl and C_9–C_{14} arylcycloalkyl; C_9–C_{12} benzocycloalkyl, and C_6–C_{14} aryl and aralkyl substituted with one or more radicals selected from the group consisting of lower alkyl, trifluoromethyl, loweralkoxy, trifluoromethoxy, phenoxy, loweralkylthio, halo, nitro, cyano, C_2–C_6 alkanoyl, benzoyl, loweralkoxycarbonyl, diloweralkylamino, loweralkylsulfonyl, fluorosulfonyl and loweralkylsulfinyl; and pharmacologically acceptable addition salts of these compounds with acids.

4,110,329
METALLIC DERIVATIVES OF NEOPINONE KETAL

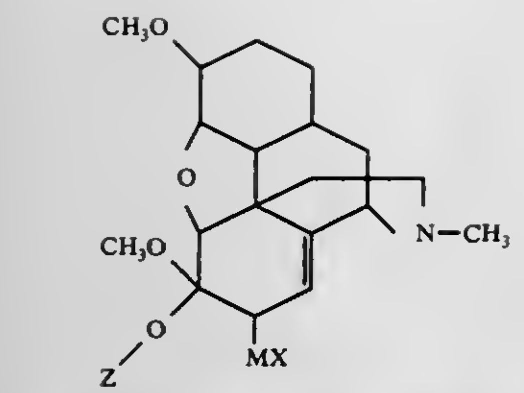
Henry Rapoport, and Randy B. Barber, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 10, 1976, Ser. No. 665,601

Int. Cl.^{2} C07F *15/00, 3/14, 5/00;* **C07D** *489/02*

U.S. Cl. 260—270 A **9 Claims**

1. A compound represented by the following formula



where M is mercuric, platinum (II) or palladium (II), X is a suitable anion, selected from the group consisting of acetate, acetyllide, benzoate, bromate, bromide, carbonate, chlorate, chloride, chromate, cyanide, fluoride, fluorosilicate, iodate, iodide, nitrate, oxalate, oxide, sulfate, sulfide, thiocyanate perchlorate hydroxide, trichloroacetate, and trifluoroacetate, Z is lower alkyl, cycloalkyl, or monocarbocyclic aralkyl.

4,110,330

5′-ACETONYLVINCRISTINE AND RELATED COMPOUNDS

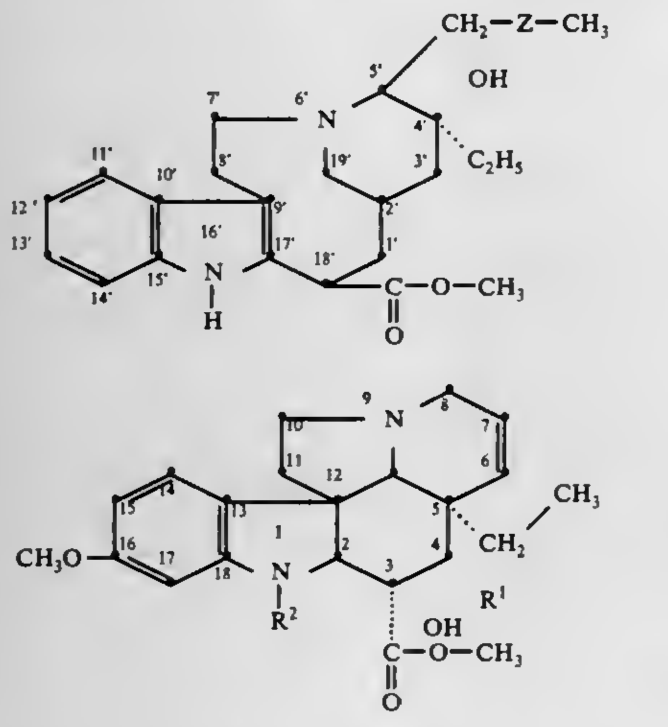
Charles J. Barnett; Richard A. Bimm, both of Indianapolis, and George C. Cullinan, Trafalgar, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 27, 1977, Ser. No. 801,132

Int. Cl.² C07D *519/04*

U.S. Cl. 260—287 B **7 Claims**

1. Compounds of the formula



wherein Z is CO or CHOH, R^2 is H or CHO and R^1 is OH or acetoxy and pharmaceutically-acceptable salts thereof.

4,110,331

METHOD OF PRODUCING THE HYDROCHLORIDE OF N-METHYL PIPERIDINE-2-CARBOXYLIC ACID-2,6-XYLIDIDE

Bror Gösta Pettersson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

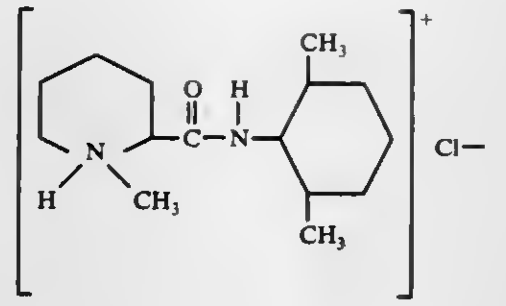
Filed Jun. 15, 1977, Ser. No. 806,632

Claims priority, application Sweden, Jun. 22, 1976, 7607114

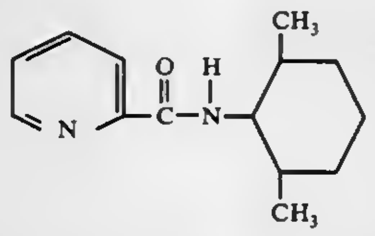
Int. Cl.² C07D *211/60, 211/02*

U.S. Cl. 260—293.77 **18 Claims**

1. A method of producing the hydrochloride of N-methyl piperidine-2-carboxylic acid-2,6-xylidide of the formula:



which comprises hydrogenating picolinic acid-2,6-xylidide of the formula:



in the pyridine ring in the presence of hydrochloric acid to provide the hydrochloride of piperidine carboxylic acid xylidide which thereafter using formaldehyde is subjected to catalytic reductive methylation.

4,110,332

1-TRIORGANOSTANNYL-3-ORGANOTHIO-4-SUBSTITUTED-1,2,4-DELTA²-TRIAZOLIDIN-5-ONES

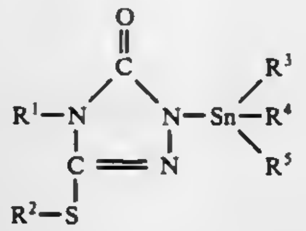
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 5, 1977, Ser. No. 794,324

Int. Cl.² C07F *7/22;* A01N *9/12*

U.S. Cl. 260—299 **6 Claims**

1. A compound of the formula



wherein R^1 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 3 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or benzyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo and alkyl of 1 to 4 carbon atoms; R^2 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 3 carbon atoms, benzyl or benzyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo and alkyl of 1 to 4 carbon atoms; and R^3, R^4 and R^5 individually are alkyl of 1 to 6 carbon atoms, phenyl or benzyl.

4,110,333

1,3-DIHYDRO-1-[3-(1-PIPERIDINYL)PROPYL]-2H-BENZIMIDAZOL-2-ONES AND RELATED COMPOUNDS

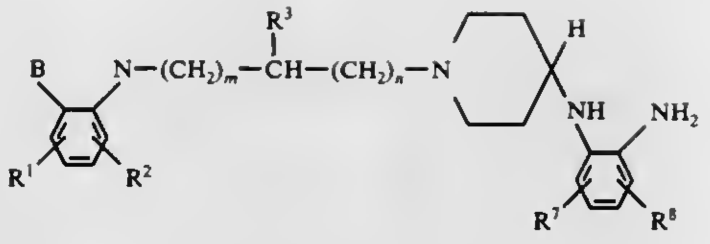
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 687,139, May 17, 1976, Pat. No. 4,066,772, which is a continuation-in-part of Ser. No. 597,793, Jul. 21, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,400

Int. Cl.² C07D *417/06*

U.S. Cl. 260—293.57 **1 Claim**

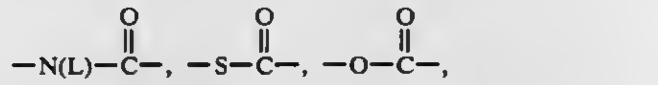
1. A chemical compound having the formula:



wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

B is a member selected from the group consisting of the bivalent radicals



$$-N(L)-\overset{\overset{O}{\|}}{C}-,\quad -S-\overset{\overset{O}{\|}}{C}-,\quad -O-\overset{\overset{O}{\|}}{C}-,$$

—N=N— and —N=CH—, said L being a member selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl and lower alkenyl, and said bivalent radicals being attached to the benzene nucleus with their heteroatom;

R^3 is a member selected from the group consisting of hydrogen and methyl;

m and *n* are each an integer of from 1 to 2 inclusive; and

R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl.

4,110,334

DERIVATIVES OF 1-OXA-3,8-DIAZA-SPIRO-[4,5]-DECANES

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen; all of Germany, assignors to Hoechst Aktiengesellschaft, Frankurt am Main, Germany

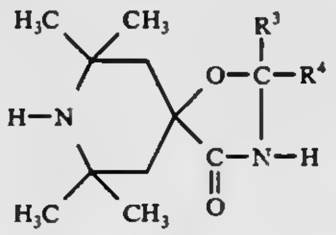
Filed Feb. 9, 1977, Ser. No. 766,948

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2606026

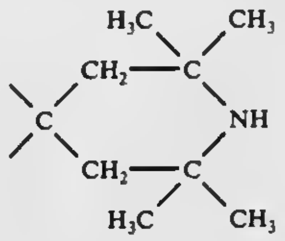
Int. Cl.² C07D *498/10, 498/20*

U.S. Cl. 260—293.66 **6 Claims**

1. A compound of the formula



wherein R^3 and R^4 each are identical or different substituents selected from the group consisting of hydrogen, alkyl- or isoalkyl of from 1–30 carbons, aryl of 6 or 10 carbons, unsubstituted or substituted by halogen or alkyl of 1–4 carbons, phenylalkyl of 7–10 carbons, or R^3 and R^4 are, together with the attached carbon, cycloalkyl of 4–15 carbons, unsubstituted or substituted by C_1-C_4 alkyl, or a group of the formula



4,110,335

PROCESS FOR PREPARING DISALTS OF 3,4-DIMERCAPTOISOTHIAZOLE-5-CARBONITRILE [AND RELATED PRODUCTS THEREFROM]

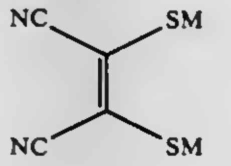
Susan Anne Vladuchick, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 704,973, Jul. 13, 1976, Pat. No. 4,066,656. This application Apr. 25, 1977, Ser. No. 790,856

Int. Cl.² C07D *275/02*

U.S. Cl. 260—302 S **8 Claims**

1. A process for preparing a disalt of the 3,4-dimercaptoisothiazole-5-carbonitrile comprising the step of contacting a 1,2-dimercaptomaleonitrile salt of the formula



where M is an alkali metal or bis[tetra (lower alkyl ammonium)], with sulfur in a solvent selected from the group consisting of alkanols, aqueous alkanols, and mixtures of alkanols with a dipolar aprotic solvent at a temperature of at least 50° C.

4,110,336

MONO-, DI- AND TRI-ESTERS OF THIOPHOSPHONIC ACID AND THEIR USE AS PESTICIDES

Hilmar Mildenberger, Kelkheim, Taunus; Gerhard Stahler, Frankfurt am Main, and Ludwig Emmel, Bergen-Enkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

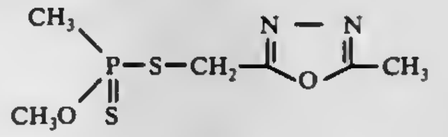
Continuation of Ser. No. 411,748, Nov. 1, 1973, abandoned. This application Jul. 19, 1977, Ser. No. 816,968

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1972, 2254042

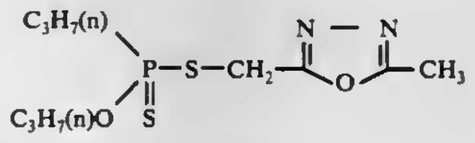
Int. Cl.² C07F *9/40*

U.S. Cl. 260—307 G **4 Claims**

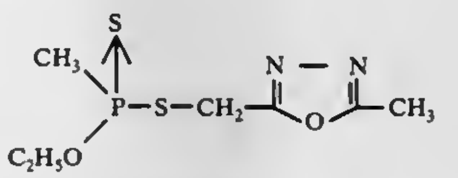
1. A compound of the formula



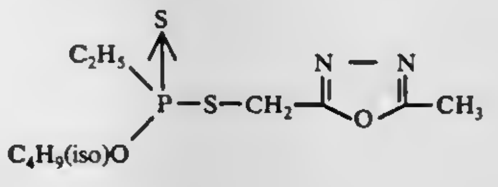
2. A compound of the formula



3. A compound of the formula



4. A compound of the formula



4,110,337

TRIAZOLOBENZODIAZEPINES

Etienne Szarvasi, Charbonnieres-les-Bains, France, assignor to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

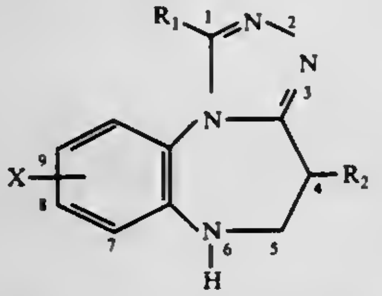
Filed Mar. 8, 1974, Ser. No. 449,477

Claims priority, application France, Mar. 9, 1973, 73.08510; Oct. 4, 1973, 73 35522; Nov. 22, 1973, 73 41583

Int. Cl.^{2} C07D ***243/12, 487/04***

U.S. Cl. 260—308 R **19 Claims**

1. 4H-5,6-dihydro-[4,3-a]-s-triazolo-1,5-benzodiazepines represented by the general formula:



and pharmaceutically acceptable acid addition salts thereof, wherein X is hydrogen, a halogen atom in the 8- or 9-position, or a lower alkoxy group; R_1 is a phenyl radical optionally substituted by a halogen atom or lower alkyl group in the para position or by a lower alkoxy group in the para or ortho position, a naphthyl radical, or a 2-furyl or 2-thienyl radical; and R_2 is hydrogen or a lower alkyl group.

4,110,338

PRODUCT AND PREPARATION OF 1H-TETRAZOLE-5-THIOL DERIVATIVES

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka, and Youichi Shiokawa, Takatsuki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,956

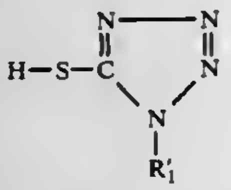
Claims priority, applicatioo Japan, Oct. 31, 1973, 48-123118; Jun. 19, 1974, 49-70440

Int. Cl.^{2} C07D ***257/04;*** **A61K** ***31/54***

U.S. Cl. 260—308 D **7 Claims**

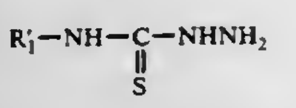
1. A process for the preparation of a 1-substituted 1H-tetrazole-5-thiol of the formula:

(I)



which comprises reacting at elevated temperature a substituted thiosemicarbazide of the formula:

(II)



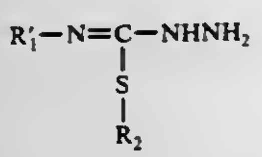
$$R'_1-NH-\underset{\underset{S}{\parallel}}{C}-NHNH_2$$

with a compound of the formula:

$$R_2-X \qquad \text{(III)}$$

to give a N,S-disubstituted thiosemicarbazine of the formula:

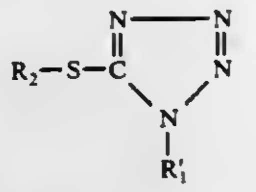
(IV)



$$R'_1-N=\underset{\underset{\underset{R_2}{|}}{\underset{S}{|}}}{C}-NHNH_2$$

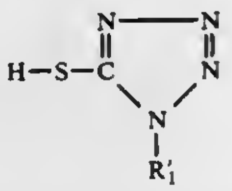
subjecting at lower temperature the resultant compound (IV) to diazotization to give a 5-aralkylthio-1H-tetrazole of the formula:

(V)



and reacting at elevated temperature the resultant compound (V) with a slightly molar excess of Friedel Crafts' catalyst to give a compound of the formula:

(I')



and when desired, converting the resultant compound (I') into its salt, wherein

R_1' is alkyl of 1-6 carbon atoms

R_2 is aralkyl, and

X is a residue of an acid.

4,110,339

4-(DI-n-PROPYL)AMINO-1,3,4,5-TETRAHYDROBENZ[cd]INDOLE

Nicbolas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 25, 1977, Ser. No. 854,878

Int. Cl.^{2} C07D ***209/90***

U.S. Cl. 260—326.9 **3 Claims**

1. 4-(Di-n-propyl)amino-1,3,4,5-tetrahydrobenz[cd]indole and pharmaceutically-acceptable acid addition salts thereof.

4,110,340

PROCESS FOR PREPARING LOWER LACTAMS FROM ALLYLIC HALIDE SUBSTRATES

John F. Knifton, Austin, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,019

Int. Cl.^{2} C07D ***201/02, 207/26***

U.S. Cl. 260—326.5 FL **18 Claims**

1. The process of preparing γ-butyrolactam or an alkyl-substituted-γ-butyrolactam by the carbonylation of allylic halides having three to 10 carbon atoms, said halides selected from the group consisting of chlorides, bromides and iodides by the procedure of:

(a) Admixing said allylic halides to be carbonylated to γ-butyrolactam or an alkyl-substituted-γ-butyrolactam with at least a stoichiometric amount of amine coreactant selected from the group consisting of ammonia and primary amines having 1 to 12 carbon, with at least a catalytic amount of rhodium catalyst selected from the group consisting of:

Chlorobis (ethylene) rhodium(I) dimer
Chlorotris (triphenylphosphine) rhodium(I)
Chlorocarbonylbis (triphenylphosphine) rhodium(I)
Rhodium tris (acetylacetonate)
Rhodium chloride plus triphenylphosphine and
Rhodium chloride

to form a reaction mixture;

(b) Pressurizing said reaction mixture with at least sufficient carbon monoxide to satisfy the stoichiometry of the carbonylation to the γ-butyrolactam or an alkyl-substituted-γ-butyrolactam;

(c) Heating said pressurized reaction mixture between about 20° C. and 250° C. and higher, until said allylic halide is carbonylated and γ-butyrolactam or an alkyl-substituted-γ-butyrolactam is prepared, and isolating said lactams contained therein.

4,110,341

DITHIO PROSTAGLANDIN DERIVATIVES

Masaki Hayashi; Seiji Kori, both of Takatsuki, and Hajimu Miyake, Suita, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Feb. 4, 1977, Ser. No. 765,580

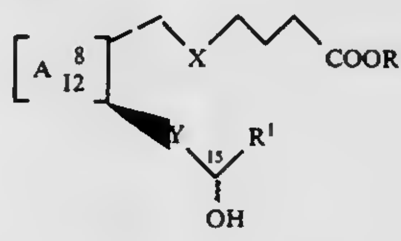
Claims priority, application United Kingdom, Feb. 10, 1976, 05145/76

Int. Cl.^{2} C07D ***339/04***

U.S. Cl. 260—327 C **11 Claims**

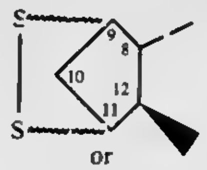
1. A compound of the formula:

(IV)



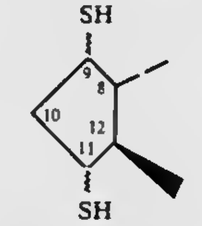
wherein A represents a grouping of the formula:

(VA)



or

(VB)



X represents ethylene or cis-vinylene, Y represents ethylene or trans-vinylene, R^1 represents a straight- or branched-chain alkyl group containing from 4 to 10 carbon atoms, and R^2 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms and cyclodextrin clathrates of such acids and esters and, when R^2 represents a hydrogen atom, non-toxic salts thereof, the bonds attaching the epidithio radical to the carbon atoms in the 9- and 11-positions in the grouping of formula VA being either both in α-configuration or both in β-configuration.

4,110,342

AZIDOMETHYLARYLACETIC ACIDS AND ESTERS THEREOF

Eric C. Bigham, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

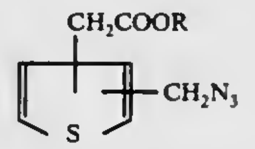
Filed Sep. 16, 1977, Ser. No. 833,906

Int. Cl.^{2} C07D ***333/24;*** **A01N** ***9/00***

U.S. Cl. 260—332.2 A **4 Claims**

1. A compound of the formula

(I)



wherein R is hydrogen or R^O where R^O is methyl or ethyl.

4,110,343

BISFLUORAN CHROMOGENIC COMPOUNDS, PREPARATION THEREOF, AND PRESSURE-SENSITIVE COPY SYSTEMS EMPLOYING SAME

David N. Vincent, Glenview, and Cheng Hsiung Chang, Chicago, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 430,141, Jan. 2, 1974, Pat. No. 4,012,419, which is a division of Ser. No. 329,294, Feb. 5, 1973, Pat. No. 3,821,010. This application Feb. 4, 1977, Ser. No. 765,693

Int. Cl.^{2} C07D ***493/22***

U.S. Cl. 260—335 **8 Claims**

1. 7,7'-methylene-bis(3-diethylaminofluoran).

4,110,344

ADSORBENT FOR POLYNUCLEAR AROMATIC COMPOUNDS

David L. Stalling; James N. Huckins, and William Allen Smith, all of Columbia, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 733,500, Oct. 18, 1976. This application Oct. 18, 1977, Ser. No. 843,193

Int. Cl.^{2} C07D ***319/08***

U.S. Cl. 260—340.3 **2 Claims**

1. A process for separation of polynuclear aromatic compounds selected from the group consisting of chlorinated dibenzodioxins, chlorinated naphthalenes, chlorinated dibenzofurans, and mixtures thereof from mixtures containing said compounds comprising contacting said mixtures with an adsorbent consisting essentially of powdered charcoal coated on a support material consisting of polyurethane foam.

4,110,345

2,2-DIFLUORO-1,3-BENZODIOXOLE-5-(α-ALKYL)-ACETIC ACIDS, AND THEIR USE FOR THE PREPARATION OF INSECTICIDES AND ACARICIDES

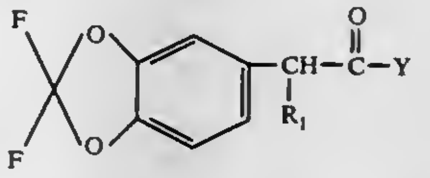
Gerald Berkelhammer, Princeton, N.J., and Venkatamaran Kameswaran, Levittown, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 3, 1977, Ser. No. 774,088

Int. Cl.^{2} C07D ***317/44***

U.S. Cl. 260—340.5 R **9 Claims**

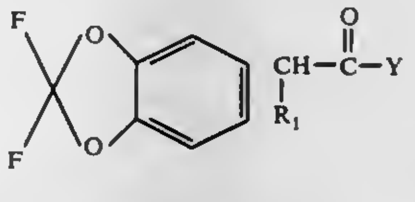
1. A compound having the formula:



wherein R_1 is lower alkyl and Y is hydroxyl or halogen, and the optical isomers thereof.

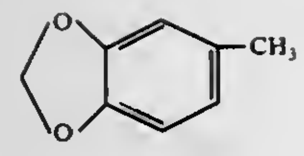
6. A method for the preparation of a compound having the formula (I)

(I)



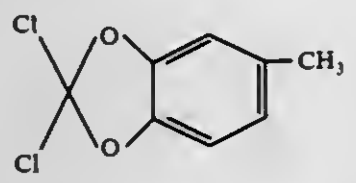
wherein R_1 is lower alkyl, Y is hydroxy, chlorine or bromine, and the optical isomers thereof, comprising

reacting a compound of formula (II)



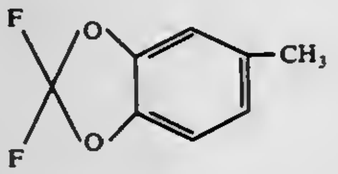
(II)

with a chlorinating agent in the presence of an inert solvent to obtain a compound of formula (III)



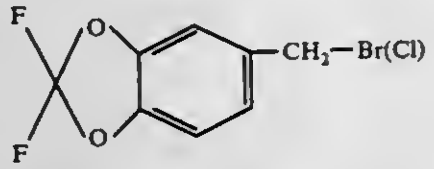
(III)

reacting the compound of formula (III) with antimony trifluoride in the presence of an inert solvent to obtain a compound of formula (IV)



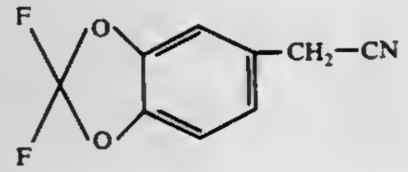
(IV)

reacting the formula (IV) compound with bromine, chlorine or N-bromosuccinimide in the presence of an inert solvent and a free radical initiator to obtain a compound of formula (V)



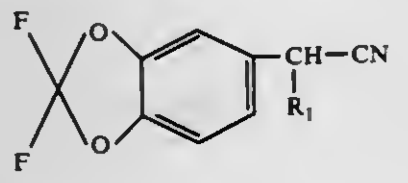
(V)

converting the above formula (V) compound with an alkali metal cyanide to the corresponding acetonitrile of formula (VI)



(VI)

alkylating the above nitrile with a lower alkyl halide in the presence of a base and an inert solvent to a compound of formula (VII)



(VII)

wherein R_1 is lower alkyl,

hydrolyzing formula (VII) compound with an alkali metal hydroxide in the presence of water and a glycol at an elevated temperature to obtain the formula I compound wherein Y is hydroxyl or

reacting the formula I product of the reaction with thionyl chloride or thionyl bromide in the presence of an inert solvent to produce a formula I compound wherein Y is chlorine or bromine.

4,110,346

TETRAMETHYL CHROMANYL PENTANE DERIVATIVES

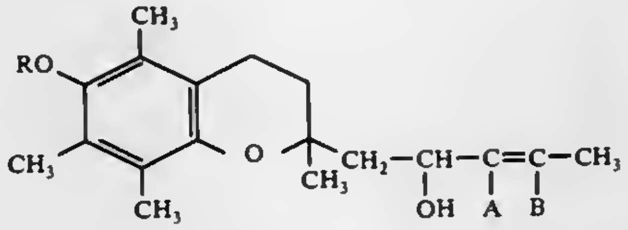
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 587,570, Jun. 17, 1975, Pat. No. 4,016,178. This application Dec. 8, 1976, Ser. No. 746,982

Int. Cl.² C07D *311/72*

U.S. Cl. 260—345.5 **7 Claims**

1. A compound of the formula



wherein A and B are hydrogen or taken together form a carbon to carbon bond and R is selected from the group consisting of benzyl, benzhydryl, trityl, t-butyl, tetrahydropyranyl, trimethylsilyl, dimethyl-tertiary-butylsilyl,alpha-loweralkoxy-lower alkyl, and 4-methyl-5,6-dihydro-2H-pyranyl.

4,110,347

CHROMAN DERIVATIVES

Eric Alfred Watts, Harlow, England, assignor to Beecham Group Limited, Great Britain

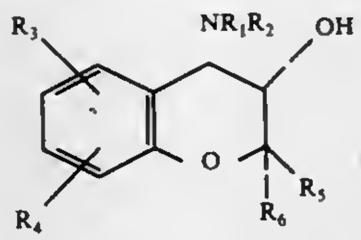
Division of Ser. No. 577,614, May 14, 1975, Pat. No. 4,048,317. This application Jan. 6, 1977, Ser. No. 757,353

Claims priority, application United Kingdom, May 31, 1974, 24348/74

Int. Cl.² C07D *311/02;* **A01K** *31/35*

U.S. Cl. 260—345.2 **18 Claims**

1. A compound of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein

R_1 is hydrogen or a hydrocarbon of 1 to 9 carbon atoms unsubstituted or substituted by hydroxyl or alkoxyl of 1 to 6 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R_3 together with R_4 form a —CH═CH—CH═CH— or —CH_2—CH_2—CH_2—CH_2— ring system;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R_6 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl.

4,110,348

7,7'-DIAMINO DERIVATIVES OF 2,2'-SPIRODIBENZOPYRANES

Hans Baumann, Wachenheim, and Andreas Oberlinner, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

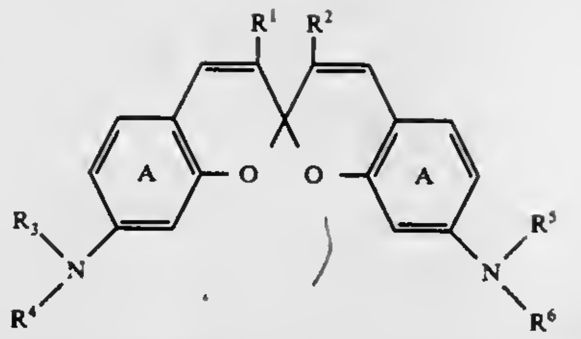
Filed Mar. 1, 1977, Ser. No. 773,337

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611600

Int. Cl.² C07D *311/02*

U.S. Cl. 260—345.2 **8 Claims**

1. A dye intermediate of the formula



where R^1 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, methoxy, ethoxy, chlorine or bromine, or phenylalkyl of 7 to 10 carbon atoms, R^2 is hydrogen or R^1 and R^2 together are dimethylene, trimethylene or tetramethylene, which are unsubstituted or substituted by alkyl of 1 to 12 carbon atoms, R^3 and R^5 each are hydrogen, alkyl of 1 to 12 carbon atoms, cyano-, chlorine-, methoxy- or ethoxy-substituted alkyl of 2 to 4 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, phenylalkyl of 7 to 10 carbon atoms, R^4 and R^6 each are alkyl of 1 to 12 carbon atoms, cyano-, chlorine-, methoxy- or ethoxy-substituted alkyl of 2 to 4 carbon atoms, phenylalkyl of 7 to 10 carbon atoms, phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, chlorine or bromine, and the substituents R^3, R^4, R^5 and R^6 may be identical or different and the rings A and A' are unsubstituted or substituted by alkyl of 1 to 3 carbon atoms.

4,110,349

TWO-STEP METHOD FOR THE ALKENYLATION OF MALEIC ANHYDRIDE AND RELATED COMPOUNDS

Jermone Martin Cohen, University Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 11, 1976, Ser. No. 695,234

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.74 **8 Claims**

1. In a method for preparing a substituted carboxylic acid or derivative thereof which comprises reacting (A) at least one substantially aliphatic hydrocarbon having about 30–300 carbon atoms and containing on olefinic bond but being otherwise substantially saturated with (B) about 0.3–2.0 moles, per mole of reagent A, of at least one of maleic acid, fumaric acid, itaconic acid, and anhydrides and esters of any of these acids, at least a part of the reaction taking place in the presence of chlorine, the improvement which comprises:

(I) Reacting reagent A with an amount of reagent B equal to about 30–90% of the amount required to afford the desired product, at a temperature within the range of about 100°–250° C. and in the presence of about 0–0.4 mole of chlorine per mole of reagent B; and subsequently

(II) Introducing additional reagent B sufficient to afford the desired product and continuing the reaction at a temperature within the range of about 170°–225° C. and in the presence of about 0.9–4 moles of added chlorine per mole of said additional reagent B;

the total amount of chlorine used in said method being substantially less than one mole per mole of reagent B.

4,110,350

CATALYTIC OXIDATIVE PROCESS FOR PRODUCING MALEIC ANHYDRIDE

Sumio Umemura; Kyoji Ohdan; Fumihiko Sakai; Yasuo Bando, and Harumi Ikezawa, all of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Continuation of Ser. No. 623,448, Oct. 17, 1975, abandoned. This application Jul. 19, 1977, Ser. No. 816,916

Claims priority, application Japan, Oct. 22, 1974, 49-121009; Jul. 1, 1975, 50-80527

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **11 Claims**

1. A process for producing maleic anhydride by catalytic oxidation of an aliphatic straight chain unsaturated hydrocarbon having 4 to 6 carbon atoms, which comprises the step of contacting a feed-gas mixture comprising said unsaturated hydrocarbon and oxygen in the vapor phase with a catalyst consisting essentially of oxides defined by the following formula:

$$VP_aTi_bX_cO_d$$

wherein X is at least one element selected from the group consisting of sodium, calcium, magnesium, iron, zirconium, boron, maganese, silver and molybdenum, *a* is 1.0 to 5.0, *b* is 2.0 to 12.0 and c is 0 to 1.0 and wherein d is a positive number within the range of 8 to 40 satisfying the average valency of the vanadium, phosphorus, titanium and element "X;" said catalyst being prepared by the steps of calcining a mixture of a vanadium-containing compound and titanium dioxide at a temperature of 650° C to 1,500° C, incorporating into the calcined mixture a phosphorus-containing compound or both a phosphorus-containing compound and a compound containing the element "X" set forth above, and, then, heating the resulting mixture at a temperature of 300° C to 600° C.

4,110,351

HYPOLIPIDEMIC AGENTS RO- OR RS- SUBSTITUTED FUROIC ACIDS, ESTERS AND SALTS

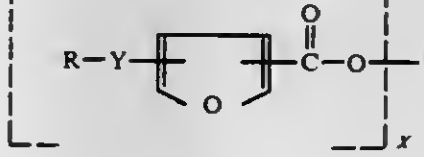
Roger Alan Parker, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 2, 1973, Ser. No. 347,064

Int. Cl.² C07D *307/68*

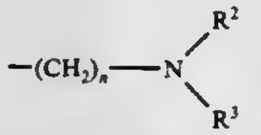
U.S. Cl. 260—347.2 **12 Claims**

1. A compound of the formula



wherein Y is selected from oxygen or divalent sulfur; R is selected from a straight or branched alkyl chain containing from 10 to 20 carbon atoms which may be saturated or may be unsaturated containing from 1 to 4 double bonds; R^1 is selected from hydrogen, a straight or branched lower alkyl group of from 1 to 6 carbon atoms, benzyl, phenethyl, pyridylmethyl, alkan-poly-yl containing from 3 to 6 carbon atoms and from 2 to 6 univalent bonds, 1,2,3,4,5,6-cyclohexanehexayl or Z; Z is selected from:

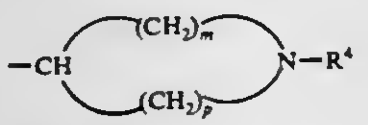
(A) the group:



$$-(CH_2)_n-N\begin{matrix}R^2\\ \\R^3\end{matrix}$$

wherein *n* is an integer of 2 or 3; R^2 is selected from a straight or branched lower alkyl group of from 1 to 4 carbon atoms or an alkylcarbonyl radical wherein the alkyl moiety contains from 1 to 4 carbon atoms; R^3 is selected from hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms with the proviso that when R^3 is hydrogen, R^2 is alkylcarbonyl; or when R^2 is other than alkylcarbonyl, R^2 and R^3 taken together with the nitrogen atom to which each is attached from a monocyclic heterocyclic group selected from pyrrolidino, piperidino, morpholino and piperazino; or

(B) the group:



wherein the sum of the integers as represented by *m* and *p* is equal to from 3 to 5; R^4 is selected from a straight or branched lower alkyl chain of from 1 to 4 carbon atoms; X is an integer of from 1 to 6 with the proviso that when R^1 is selected from alkan-poly-yl, X is equal to from 2 to 6 and when R^1 is 1,2,3,4,5,6-cyclohexanehexayl, X is equal to 6, and when R^1 is selected from other than alkan-poly-yl and 1,2,3,4,5,6-cyclohexanehexayl, X is equal to 1; or a pharmaceutically acceptable salt thereof.

4,110,352
BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, Apr. 4, 1975, Pat. No. 4,038,290. This application Jan. 21, 1977, Ser. No. 761,159

Int. Cl.² C07D *301/20*

U.S. Cl. 260—348.29 **2 Claims**

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° to about 200° C. and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride of boron and uranium.

4,110,353
PROCESS FOR THE PRODUCTION OF TETRAHYDROANTHRAQUINONES

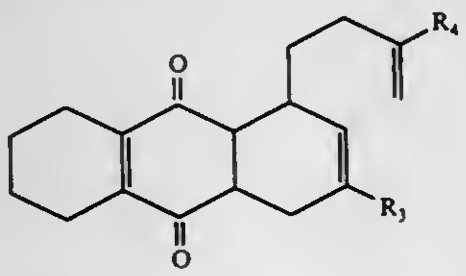
Lawrence G. Vaughan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 417,804, Nov. 21, 1973. This application Dec. 8, 1977, Ser. No. 858,664

Int. Cl.² C07C *49/68*

U.S. Cl. 260—369 **16 Claims**

1. A process for the preparation of a 5,6,7,8-tetrahydro-1-alkenyl-9,10-anthraquinone which comprises oxidizing a starting compound of the formula



where R_3 is an alkyl group of 1 to 8 carbon atoms or hydrogen and R_4 is an alkyl group of 1 to 8 carbon atoms or hydrogen at from 20° to 100° C. in the presence of molecular oxygen, from 0.1% to 25% by weight based on the starting compound of a strong organic base and optionally a solvent.

4,110,354
WATER-SOLUBLE EPOXY RESINS AND PROCESS FOR THEIR PREPARATION

James L. Bertram, Lake Jackson, and Pong Su Shih, College Station, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 67,234, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 852,061, Aug. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,611, Dec. 10, 1968, abandoned. This application Sep. 28, 1973, Ser. No. 401,915

Int. Cl.² C07D *301/28, 303/24*

U.S. Cl. 260—348.14 **2 Claims**

1. A process for the preparation of a water-soluble mixture of glycidyl ethers of glycerine wherein

(A) glycerine is reacted in a vessel with from about 2.0 to about 2.6 moles of epichlorohydrin per mole of glycerine in the presence of a catalyzing amount of a Lewis Acid catalyst wherein the reaction is conducted in an organic solvent in which the glycerine is at least partially soluble and in which the chlorohydrin ether reaction product will form a single phase, said solvent being present in a quantity of from about 20% to about 90% by weight of the quantity of glycerine employed, the reaction being conducted at a temperature of from 0° C to the reflux temperature of the solvent phase;

(B) dehydrohalogenating, at a temperature below about 110° C, the chlorohydrin ether reaction product with from about 70 to about 95% of the theoretical amount of NaOH in the presence of ethylene dichloride in a quantity of 50–95% by weight based upon the initial weight of glycerine employed plus the total quantity of solvent employed in this dehydrohalogenation step;

(C) separating the water resulting from the dehydrohalogenation reaction and caustic addition by azeotropic distillation, and

(D) separating the salt from the resulting solution;

with the proviso that when the solvents employed in steps (A) and (B) are different, the solvent in (A) is removed before performing step (B); wherein said mixture of glycidyl ethers of glycerine contains less than 2% by volume of insolubles as determined by placing 9 ml of the resin in water to a total volume of 100 ml, agitating until no more resin is apparently going into solution, thereafter centrifuging to remove the insolubles and calculating the percent insolubles by the following equation:

$$\frac{\text{milliliters of insolubles}}{9} \times 100 = \%\ \text{insolubles by volume}$$

and wherein said mixture contains from about 1.5 to about 8% organic chloride and an epoxide content of from about 28.4% to about 33% by weight.

4,110,355
ANTHRAQUINONE COMPOUNDS USEFUL IN PHOTOGRAPHIC PROCESSES

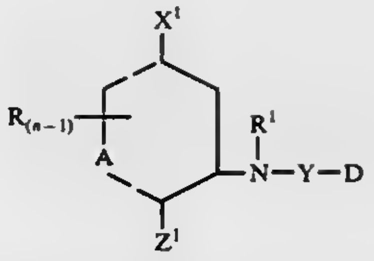
Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 318,227, Dec. 26, 1972, abandoned, which is a division of Ser. No. 655,338, Jul. 24, 1967, Pat. No. 3,751,406. This application May 23, 1973, Ser. No. 363,354

Int. Cl.² C09B *1/50*

U.S. Cl. 260—372 **11 Claims**

1. A compound of the formula



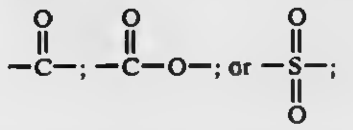
wherein:

A represents the atoms necessary to complete a benzene or naphthalene radical;

D is an anthraquinone dye moiety;

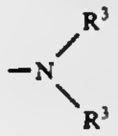
Z^1 is hydrogen or a substituent replaceable by an oxidized aromatic amino color developer in elimination-coupling reactions; said substituent being selected from the group consisting of chloro, bromo, carboxy, sulfo, hydroxy, alkoxy and hydroxyalkyl;

Y is the residue of an acid forming an amide with and reducing the basic character of the nitrogen atom to which it is bonded and is selected from the group consisting



$$-\overset{O}{\overset{\|}{C}}-;\ -\overset{O}{\overset{\|}{C}}-O-;\ \text{or}\ -\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-;$$

X^1 is hydroxy or a primary, secondary or tertiary amino of the formula



wherein each R^3 is hydrogen, alkyl, phenyl, naphthyl, or each R^3 may be alkylene so that the R^3's together with the nitrogen atom provide a heterocyclic ring having 5 or 6 carbon atoms or each R^3 may be a lower alkyl having a substituent chosen from the group consisting of a hydroxy substituent, a methoxyethoxy substituent, a polyglycoloxy substituent, a carboxy substituent, an ethoxycarboxy substituent, a benzyl substituent, a phenyl substituent, a sulfophenyl substituent, an acetylaminophenyl substituent, a succinylaminophenyl substituent or a furane substituent;

R is an anchoring substituent rendering the compound non diffusible said substituent containing a higher alkyl radical bonded to a single carbon atom of said aromatic nucleus formed by said A moiety;

R^1 is hydrogen or alkyl; and

n is 2 or *n* may be 1 when X^1 is a secondary or tertiary amino comprising an anchoring moiety rendering said compound non diffusible or R^1 is an alkyl radical providing such an anchoring moiety.

4,110,356
RECOVERY OF DOMESTIC OIL FROM SPENT CLAY

Allan S. Hodgson, Berea, and Jerry F. P. Red, Cleveland, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,958

Int. Cl.² C11B *13/04*

U.S. Cl. 260—412.5 **4 Claims**

1. A process for treating crystalline clay that has been spent in the bleaching of domestic glyceride esters, said process comprising:

forming a dispersion of said spent clay and aqueous alkali,

the temperature of said dispersion being at least about 80° C.,

the weight ratio of water to original spent clay in said dispersion being about 2–6:1,

the pH of said dispersion being in the range of about 10.5–10.8 for removal of glyceride ester as such from said spent clay; and

recovering resulting separated glyceride ester from said dispersion.

4. The process of claim 1 wherein said aqueous dispersion is saline, and it contains about 10% to 17% by weight sodium sulfate.

4,110,357
INTERMEDIATES FOR PREPARATION OF UNSATURATED ALCOHOLS

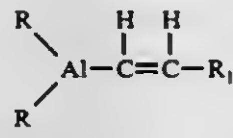
Spencer C. Watson; Dennis B. Malpass, and G. Scott Yeargin, all of La Porte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Division of Ser. No. 665,836, Mar. 11, 1976. This application Nov. 8, 1976, Ser. No. 739,777

Int. Cl.² C07F *5/06*

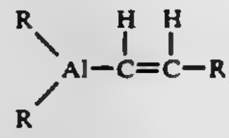
U.S. Cl. 260—448 A **7 Claims**

1. A coordinated complex comprising predominantly the cis-isomer of a compound having the generic formula:



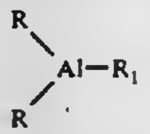
wherein R can be the same or different and is selected from a straight or branched chain alkyl group having from 1 to 6 carbon atoms; R_1 is selected from a straight or branched chain alkyl group having from 1 to 20 carbon atoms; and at least a molar equivalent of a stabilizing Lewis base coordinating agent selected from ether, diether or polyether.

5. A process of preparing a stabilized predominantly cis-isomer compound having the following formula:



wherein R can be the same or different and is selected from a straight or branched chain alkyl group having 1 to 6 carbon atoms and R_1 is selected from a straight or branched chain alkyl group having from 1 to 20 carbon atoms, comprising the steps of:

(a) reacting a compound having the following formula:



wherein R and R_1 have been previously defined; with

(b) acetylene at a pressure of between 0 and 15 psig and at a temperature of between −80° C. and ca. 110° C.

(c) coordinating the reaction product of steps a) and b) with at least a molar equivalent of a Lewis base coordinating agent selected from ether, diether or polyether.

4,110,358
AMPHOLYTIC QUATERNARY AMMONIUM COMPOUNDS AND METHODS FOR THEIR PREPARATION

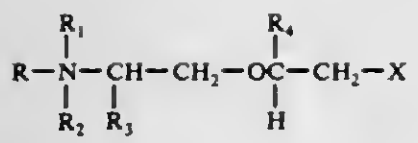
John B. Braunwarth, Janesville, Wis., assignor to Armstrong Chemical Co., Inc., Janesville, Wis.

Filed May 24, 1976, Ser. No. 688,950

Int. Cl.² C09F *5/00*

U.S. Cl. 260—404.5 **21 Claims**

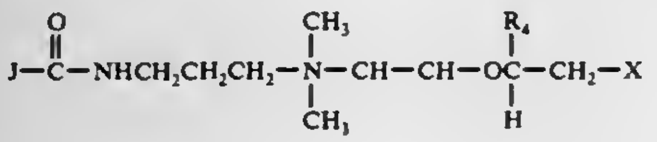
1. An ampholytic quaternary ammonium compound having the structure:



$$R-\overset{R_1}{\underset{R_2}{N}}-\underset{R_3}{CH}-CH_2-O\overset{R_4}{\underset{H}{C}}-CH_2-X$$

where R, R_1 and R_2 each is an alkyl group containing a carbon chain of from 1 to 22 carbon atoms, R_3 is H, CH_3 or CH_3CH_2, R_4 is H or CH_3, and X is COOH, CN, CHO, or $COOCH_3$.

21. An ampholytic quaternary ammonium compound having the structure:



$$J-\overset{O}{\overset{\|}{C}}-NHCH_2CH_2CH_2-\overset{CH_3}{\underset{CH_3}{N}}-CH-CH-O\overset{R_4}{\underset{H}{C}}-CH_2-X$$

where

R_3 is H, CH_3 or CH_3CH_2,
R_4 is H or CH_3,
X is COOH, CN, CHO or $COOCH_3$, and
J is an alkyl group having a chain of 1–22 carbon atoms and is derived from coconut oil.

4,110,359

PRODUCTION OF CLEANED AND PURIFIED SYNTHESIS GAS AND CARBON MONOXIDE

Charles P. Marion, Mamaroneck, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,657

Int. Cl.² C07C ***27/06, 29/16, 51/10;*** **C01B** ***2/16***

U.S. Cl. 260—449.5 **28 Claims**

1. Process for the simultaneous production of a product stream of cleaned and purified synthesis gas and a CO-rich product-gas stream comprising:

(1) reacting a hydrocarbonaceous or oxygenated hydrocarbonaceous organic material with a free-oxygen containing gas, optionally in the presence of a temperature moderator in the reaction zone of a free-flow noncatalytic partial-oxidation gas generator at a temperature in the range of about 1300° to 3000° F and at a pressure in the range of about 1 to 250 atmospheres to produce an effluent gas stream comprising H_2, CO, H_2O, solid particles of carbon and ash and at least one gas from the group consisting of CO_2, H_2S, COS, Ch_4, NH_3, N_2, and A;

(2) splitting the effluent gas stream from (1) into first and second gas streams, and simultaneously processing said first and second gas streams in separate first and second trains;

(3) cooling said first gas stream from (2) in said first train by indirect heat exchange in a separate heat-exchange zone; cleaning to remove any entrained solids, and removing water;

(4) purifying at least a portion of the gas stream from (3) in a first gas-purification zone and separating therefrom at least one gas from the group CO_2, H_2S, COS, CH_4, and NH_3, to produce a cleaned and purified stream of synthesis gas free-from gaseous sulfur compounds;

(5) dividing the cleaned and purified stream of synthesis gas from (4) into two streams and introducing the first of these streams into a CO-separation zone from which said product stream of CO-rich gas and a separte stream of H_2-rich gas are removed;

(6) cooling and cleaning said second gas stream from (2) by direct contact with water thereby removing the solid particles entrained therein and increasing the H_2O/CO mole ratio of said gas stream to a value in the range of about 2 to 5;

(7) reacting together CO and H_2O in the gas streams from (6) in a water-gas shift conversion zone to produce a H_2-rich gas stream;

(8) removing H_2O and purifying at least a portion of the H_2-rich gas stream from (7) in a second-gas purification zone and separating therefrom at lest one gas from the group CO_2, H_2S, COS, CH_4, and NH_3 to produce a cleaned and purified H_2-rich gas stream free from gaseous sulfur compounds; and

(9) mixing at least a portion of said second divided stream of cleaned and purified synthesis gas from **(5)** with from 0 to 100% of said H_2-rich gas stream from **(5)** and at least a portion of said cleaned and pruified H_2-rich gas stream from **(8)** to produce said product stream of cleaned and purified synthesis gas.

18. A process for producing substantially pure methanol and a by-product stream of CO-rich gas comprising:

(1) reacting a hydrocarbonaceous and oxygen-containing hydrocarbonaceous organic material with substantially pure oxygen optionally in the presence of H_2O in a reaction zone of a free-flow noncatalytic partial oxidation gas generator at a temperature in the range of about 1300° to 3000° F and at a pressure in the range of about 1 to 250 atmospheres to produce an effluent gas stream comprising H_2, CO, H_2O, solid particles of carbon and ash and at least one gas from the group consisting of CO_2, H_2S, COS, CH_4, NH_3, N_2, and A; and wherein said effluent gas stream has a mole ratio H_2/CO in the range of about 0.5 to 1.9;

(2) splitting the efflucent gas stream from (1) into first and second gas streams, wherein said second split stream contains about **20** to 70 volume % of the effluent gas stream from **(1)**, and the remainder of which comprising said first split stream, and simultaneously processing said first and second gas streams in separate first and second trains;

(3) cooling said first gas stream from (2) in said first train by indirect heat exchange in a separate heat-exchange zone, cleaning to remove any entrained solids, and removing water;

(4) purifying at least a portion of the gas stream from **(3)** in a first gas-purification zone and separating therefrom at least one gas from the group CO_2, H_2S, COS, CH_4, and NH_3, to produce a cleaned and purified stream of synthesis gas free-from gaseous sulfur-compounds and having a mole ratio H_2/CO in the range of about 0.5 to 1.9;

(5) dividing the cleaned and purified stream of synthesis gas from **(4)** into a first stream containing 5 to 50 volume percent and into a second stream containing the remainder of said cleaned and purified stream of synthesis gas, and introducing the first of these streams into a CO-separation zone from which said by-product stream of CO-rich gas and a separate stream of H_2-rich gas are removed;

(6) cooling and cleaning said second gas stream from (2) by direct contact with water thereby removing the solid particles entrained therein and increasing the H_2O/CO mole ratio of said gas stream to a value in the range of about 2 to 5;

(7) reacting together CO and H_2O in the gas stream from **(6)** in a water-gas shift conversion zone to produce a H_2-rich gas stream;

(8) removing H_2O and purifying at least a portion of the H_2-rich gas stream from (7) in a second-gas purification zone and separating therefrom at least one gas from the group CO_2, H_2S, COS, CH_4, and NH_3 to produce a cleaned and purified H_2-rich gas steam freefrom gaseous sulfur-compounds;

(9) mixing at least a portion of said second divided stream of cleaned and purified synthesis gas from **(5)** with from 0 to 100% of said H_2-rich gas stream from **(5)** and at least a portion of said cleaned and purified H_2-rich gas stream from **(8)** to produce a stream of cleaned and purified methanol synthesis gas having a mole ratio H_2/CO in the range of about 2–4;

(10) reacting at least a portion of said methanol synthesis gas in the presence of a methanol catalyst in a methanol-synthesis zone at a temperature in the range of about 400° to 750° F and at a pressure in the range of about 40 to 350 atm. to produce crude methanol, and purifying said crude methanol to oxygen-containing substantially pure methanol and by-product oxygen-contaning organic materials; and

(11) introducing at least a portion of said by-product oxygen-containing organic materials into the reaction zone of the partial oxidation gas generator in **(1)** as at least a portion of said oxygen-containing hydrocarbonaceous organic material.

24. A process for producing acetic acid comprising:

(1) reacting hydrocarbonaceous and oxygen-containing hydrocarbonaceous organic material with substantially pure oxygen optionally in the presence of H_2O in a reaction zone of a free-flow noncatalytic partial-oxidation gas generator at a temperature in the range of about 1300° to 3000° F and at a pressure in the range of about 1 to 250 atmospheres to produce an effluent gas stream comprising H_2, CO, H_2O, solid particles of carbon and ash and at least one gas from the group consisting of CO_2, H_2S, COS, CH_4, NH_3, N_2, and A; and wherein said effluent gas stream has a mole ratio H_2/CO in the range of about 0.5 to 1.9;

(2) splitting the effluent gas stream from **(1)** into first and second gas streams, wherein said second split stream contains about 20 to 70 volume % of the effluent gas stream from **(1)**, and the remainder of which comprising said first split stream, and simultaneously processing said first and second gas streams in separate first and second trains;

(3) cooling said first gas stream from **(2)** in said first train by indirect heat exchange in a separate heat-exchange zone, cleaning to remove any entrained solids, and removing water;

(4) purifying at least a portion of the gas stream from **(3)** in a first gas-purification zone and separating therefrom at least one gas from the group CO_2, H_2S, COS, CH_4, and NH_3, to produce a cleaned and purified stream of synthesis gas free-from gaseous sulfur-compounds and having a mole ratio H_2/CO in the range of about 0.5 to 1.9;

(5) dividing the cleaned and purified stream of synthesis gas from **(4)** into a first stream containing 5 to 50 volume percent and into a second stream containing the remainder of said cleaned and purified stream of synthesis gas, and introducing the first of these stream into a CO-separation zone from which a stream of substantially pure CO gas and a separate stream of H_2-rich gas are removed;

(6) cooling and cleaning said second gas stream from (2) by direct contact with water thereby removing the solid particles entrained therein and increasing the H_2O/CO mole ratio of said gas stream to a value in the range of about 2 to 5;

(7) reacting together CO and H_2O in the gas stream from **(6)** in a water-gas shift conversion zone to produce a H_2-rich gas stream;

(8) removing H_2O and purifying at least a portion of the H_2-rich gas stream from (7) in a second-gas purification zone and separating therefrom at least one gas from the group CO_2, H_2S, COS, CH_4, and NH_3 to produce a cleaned and purified H_2-rich gas stream free-form gaseous sulfur-compunds;

(9) mixing at least a portion of said second divided stream of cleaned and purified synthesis gas from **(5)** with from 0 to 100% of said H_2-rich gas stream from **(5)** and at least a portion of said cleaned and purified H_2-rich gas stream from **(8)** to produce a stream of cleaned and purified methanol synthesis gas having a mole ratio H_2/CO in the range of about 2–4;

(10) reacting at least a portion of said methanol synthesis gas in the presence of a methanol catalyst in a methanol-synthesis zone at a temperature in the range of about 400° to 750° F and at a pressure in the range of about 40 to 350 atm. to produce crude methanol, and purifying said crude methanol to produce substantially pure methanol and by-product oxygen-containing organic materials;

(11) reacting at least a portion of said substantially pure methanol with at least a portion of said substantially pure carbon monoxide in the presence of a carbonylation catalyst in an acetic acid-synthesis zone at a temperature in the range of about 302° to 608° F and at a pressure in the range of about 1 to 700 atmospheres to produce impure acetic acid, and purifying said impure acetic acid to produce substantially pure acetic acid and by-product oxygen-containing organic materials; and

(12) introducing at least a portion of said by-product oxygen-containing organic materials from **(10)**, or **(11)**, or both into the reaction zone of the partial oxidation gas generator in **(1)** as at least a portion of said oxygen-containing hydrocarbonaceous organic material.

4,110,360

PREPARATION OF ESTERS

Roger A. Sheldon; Peter Been, both of Amsterdam, Netherlands; Derek A. Wood, Sittingbourne, and Ronald F. Mason, Ashford, both of England, assignors to Shell Oil Company, Houston, Tex.

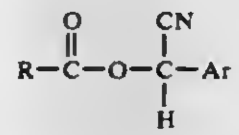
Filed Feb. 3, 1977, Ser. No. 765,184

Claims priority, application United Kingdom, Mar. 1, 1976, 8044/76

Int. Cl.² C07C ***120/00, 121/66***

U.S. Cl. 260—465 D **14 Claims**

1. A process for the preparation of an ester of the formula I



$$R-\overset{O}{\overset{\|}{C}}-O-\overset{CN}{\underset{H}{C}}-Ar \qquad (I)$$

wherein Ar represents a phenoxy substituted phenyl group and R represents a branched-chain alkyl group substituted by a halophenyl group, which process comprises contacting an aromatic aldehyde of the formula ArC(O)H and an acyl halide of the formula RC(O)Hal, in which formulas Ar and R have the same meaning as in the formula I and Hal represents a halogen atom, in the presence of a substantially water-immiscible aprotic solvent comprising an alkane or cycloalkane containing 6 to 10 carbon atoms or a mixture thereof, with water and solid water-soluble cyanide in which the molar ratio of the amount of water to the total amount of water-soluble cyanide is in the range of 0.05 to 1 and recovering the desired ester product from the reaction mixture.

4,110,361

PREPARATION OF ESTERS

Roger A. Sheldon, and Peter Been, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

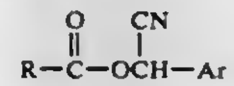
Filed Feb. 3, 1977, Ser. No. 765,185

Claims priority, application United Kingdom, Mar. 1, 1976, 8045/76; Mar. 1, 1976, 8046/76

Int. Cl.² C07C ***120/00, 121/66***

U.S. Cl. 260—465 D **30 Claims**

1. A process for the preparation of an ester of formula I



$$R-\overset{O}{\overset{\|}{C}}-O\overset{CN}{CH}-Ar \qquad (I)$$

wherein Ar represents a phenoxy substituted phenyl group and R an alkyl group optionally substituted by halophenyl or alkylphenyl or a cyclopropyl group optionally substituted by alkyl, halogen, isobutenyl, dichlorovinyl or dibromovinyl, which process comprises contacting an aromatic aldehyde of the formula ArC(O)H and a (cyclo)aliphatic acyl halide of the formula RC(O)Hal, in which formulas Ar and R have the same meaning as in the formula I and Hal represents a halogen atom, with water, a water-soluble cyanide, a substantially water-immiscible aprotic solvent and a poly(alkyleneoxy)-derivative containing from 1 to 50 alkyleneoxy units formed by reacting an alkanol containing 8 to 20 carbon atoms with ethylene oxide or propylene oxide as catalyst and recovering the desired ester product from the reaction mixture.

4,110,362
PREPARATION OF ESTERS

Roger A. Sheldon, and Peter Been, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

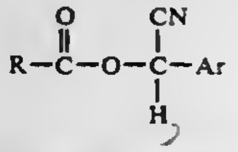
Filed Feb. 3, 1977, Ser. No. 765,186

Claims priority, application United Kingdom, Mar. 1, 1976, 8045/76; Mar. 1, 1976, 8046/76

Int. Cl.² C07C *120/00, 121/66*

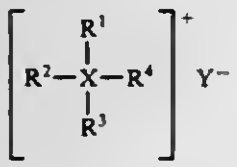
U.S. Cl. 260—465 D **31 Claims**

1. A process for the preparation of an ester of formula I



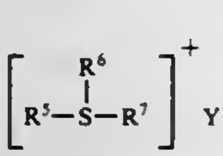
$$R-\overset{\overset{O}{\|}}{C}-O-\underset{\underset{H}{|}}{\overset{\overset{CN}{|}}{C}}-Ar \qquad (I)$$

wherein Ar represents a phenoxy substituted phenyl group and R is an alkyl group optionally substituted by halophenyl or alkylphenyl or a cyclopropyl group optionally substituted by alkyl, halogen, isobutenyl, dichlorovinyl or dibromovinyl, which process comprises contacting an aromatic aldehyde of the formula ArC(O)H and a (cyclo)aliphatic acyl halide of the general formula RC(O)Hal, in which formulas Ar and R have the same meaning as in formula I and Hal represents a halogen atom having an atomic number of from 9 to 53, inclusive, with water, a water-soluble cyanide, a substantially water-immiscible aprotic solvent and a quaternary onium phase transfer catalyst of the formula II



$$\left[\begin{array}{c} R^1 \\ | \\ R^2-X-R^4 \\ | \\ R^3 \end{array}\right]^+ Y^- \qquad (II)$$

wherein X represents a nitrogen, phosphorus or arsenic atom, R^1, R^2, R^3 and R^4 each an alkyl, aralkyl, alkaryl or aryl group and Y a monovalent ion, or a sulfonium compound of the formula III



$$\left[\begin{array}{c} R^6 \\ | \\ R^5-S-R^7 \end{array}\right]^+ Y^- \qquad (III)$$

wherein R^5 R^6 and R^7 each represents an alkyl group and Y a monovalent ion and recovering the desired ester product from the reaction mixture.

4,110,363
PREPARATION OF ESTERS

Roger A. Sheldon, and Peter Been, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

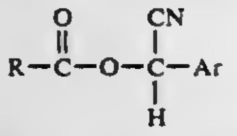
Filed Feb. 3, 1977, Ser. No. 765,187

Claims priority, application United Kingdom, Mar. 1, 1976, 8045/76; Mar. 1, 1976, 8046/76

Int. Cl.² C07C *120/00, 121/66*

U.S. Cl. 260—465 D **29 Claims**

1. A process for the preparation of an ester of the formula



$$R-\overset{\overset{O}{\|}}{C}-O-\underset{\underset{H}{|}}{\overset{\overset{CN}{|}}{C}}-Ar \qquad (I)$$

wherein Ar represents a phenoxy substituted phenyl group and R an alkyl group optionally substituted by halophenyl or alkylphenyl or a cyclopropyl group optionally substituted by alkyl, halogen, isobutenyl, dichlorovinyl or dibromovinyl, which process comprises contacting an aromatic aldehyde of the formula ArC(O)H and a (cyclo)aliphatic aryl halide of the formula RC(O)Hal, in which formulas Ar and R have the same meaning as in the formula I and Hal represents a halogen atom having an atomic number from 9 to 53, inclusive, with water, a water-soluble cyanide, a substantially water-immiscible aprotic solvent and a macrocyclic polyether phase transfer catalyst containing a total of from 4 to 80 atoms and 14 to 28 ring atoms at least 4 of which are oxygen atoms and recovering the desired ester from the reaction mixture.

4,110,364
CURABLE RESIN COMPOSITIONS OF CYANATE ESTERS

Morio Gaku; Kazuhiro Suzuki, and Kazuyuki Nakamichi, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Mar. 18, 1975, Ser. No. 559,650

Claims priority, application Japan, Mar. 19, 1974, 49-30636; Apr. 8, 1974, 49-38915

Int. Cl.² C08G *73/00, 73/112*

U.S. Cl. 528—170 **11 Claims**

1. A curable resin composition comprising:

(a) a cyanate ester component selected from the group consisting of:

(i) polyfunctional aromatic cyanate ester monomers having the formula:

$R-O-C\equiv N)_n$

wherein *n* is at least 2 and not more than 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(ii) homoprepolymers of (i) and

(iii) coprepolymers of (i) and an amine, said amine being a diamine of the formula $H_2N - R^2 - NH_2$, wherein R^2 is a divalent aromatic or alicyclic organic group, or a member selected from the group consisting of hexamethylenetetramine, polyethyleneimine, polyamino styrene, polyvinyl imidazole, triethylene diamine, 2-methylimidazole, 2-undecyclimidazole, 2-heptadecylimidazole, 2-phenylimidazole, 2-ethyl-4-methylimidazole, 1-benzyl-2-methylimidazole, 1-propyl-2-methylimidazole, 1-cyanoethyl-2-methylimidazole, 1-cyanoethyl-2-ethyl-4-methylimidazole, 1-cyanoethyl-2-undecylimidazole, 1-cyanoethyl-2-phenylimidazole, 1-guanaminoethyl-2-methylimidazole, and adducts formed between these imidazoles and trimellitic acid and

(b) a bismaleimide component selected from the group consisting of (i) bismaleimides, (ii) bismaleimide homoprepolymers and (iii) bismaleimide coprepolymers of (i) and amines as above-defined,

the weight ratio of component (a) to (b) being 1:99 to 99:1.

4,110,365
PROCESS FOR THE MANUFACTURE OF NAPHTHALENE-MONOSULFONIC ACIDS

Siegfried Bildstein; Rudolf Lademann; Siegfried Pietzsch, all of Kelkheim, Taunus, and Georg Schaeffer, Hofheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 417,755, Nov. 21, 1973, abandoned. This application Jun. 26, 1975, Ser. No. 590,498

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1972, 2257676; Jan. 20, 1973, 2302869

Int. Cl.² C07C *143/24*

U.S. Cl. 260—505 C **8 Claims**

1. A process for the manufacture of naphthalene-monosulfonic acids by reacting naphthalene and sulfuric acid at elevated temperature, which comprises: intensely mixing a portion of the said reaction components at a temperature in the range of from 140° to 185° C. until a homogeneous phase has formed; and thereafter introducing further portions of said reaction components into said homogeneous phase and completing the reaction of said components in said homogeneous phase.

4,110,366
PROCESS FOR PRODUCING ALKALI METAL STYRENESULFONATE

Hanzo Tamabayashi; Tatsuo Hattori; Tetsuo Tanaka; Yasuhiro Oda, and Keiichi Kihara, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Dec. 1, 1976, Ser. No. 746,531

Claims priority, application Japan, Dec. 17, 1975, 50-149539

Int. Cl.² C07C *143/24*

U.S. Cl. 260—505 N **5 Claims**

1. A process for producing an alkali metal styrenesulfonate, which comprises:

preferentially extracting styrenesulfonate acid anions from an aqueous solution containing an alkali metal halide and an alkali metal styrenesulfonate in a concentration of 2 wt% to the limit of solubility of the styrenesulfonate with an organic solvent containing a protonic acid salt of an inorganic acid and an amine having more than 7 carbon atoms, which is an ion-exchange liquid and which contains an alkyl, alkenyl, aryl or aralkyl group, wherein the salt is present in an amount of 5–40% to total mixture, as an extracting reagent; and

then back extracting styrenesulfonic acid anions with an aqueous solution of an alkali metal hydroxide.

4,110,367
SULFONATED ALKYLPHENOXY ACETONES

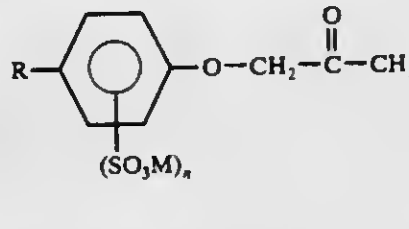
John George Papalos, Ledgewood, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 2, 1976, Ser. No. 654,068

Int. Cl.² C07C *143/24;* **D06P** *5/04*

U.S. Cl. 260—511 **5 Claims**

1. A compound having the formula



wherein:

R is an alkyl group having 8-20 carbon atoms;

M is hydrogen, sodium, potassium, ammonium, ethyl ammonium, dimethyl ammonium, or diethanol ammonium; and

n is a number of from 1 to 2 inclusive.

4,110,368
HYDRO SUBSTITUTED PROSTANOIC ACIDS AND ESTERS

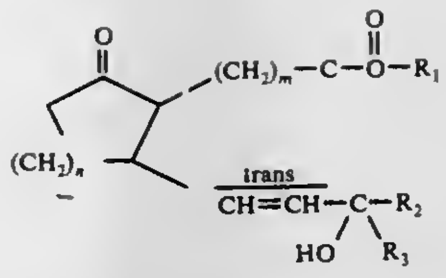
Middleton Brawner Floyd, Jr., Suffern, N.Y.; Martin Joseph Weiss, Oradell, N.J.; John Frank Poletto, Nanuet, N.Y.; Robert Eugene Schaub, Upper Saddle River, and Karel Francis Bernady, Belle Mead, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 540,052, Jan. 10, 1975, abandoned, which is a division of Ser. No. 355,349, Apr. 27, 1973, Pat. No. 3,875,607, which is a division of Ser. No. 274,768, Jul. 24, 1972, abandoned. This application Jun. 15, 1977, Ser. No. 806,871

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **8 Claims**

1. A racemic mixture of the formula:



wherein *n* is the integer 1 or 2, *m* is the integer 5 or 6, R_1 is hydrogen or alkyl having up to 3 carbon atoms, R_2 is 2-cis-pentenyl or 1,1-dimethyl-n-pentyl, and R_3 is hydrogen or methyl with the proviso that when R_2 is 1,1-dimethyl-n-pentyl then R_3 must be hydrogen; and the pharmaceutically acceptable cationic salts thereof when R_1 is hydrogen.

4,110,369
PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron, and Wilfrid G. Shaw, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,736

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **13 Claims**

1. In the process for the preparation of acrylic acid or methacrylic acid by the oxidation of acrolein or methacrolein in the vapor phase with molecular oxygen in the presence of an oxide or oxide complex active catalyst of the formula

$Mo_{12}P_bAs_cCu_dO_f$

wherein

b, *c* and *d* are numbers from 0.001 to 10;

f is the number of oxygens required by the valence states of the other elements present,

at an elevated temperature of about 200° to about 500° C., the improvement comprising:

using a coated catalyst consisting essentially of an inert support material having a diameter of at least 20 microns and an outer surface and a continuous coating of said active catalyst on said inert support strongly adhering to the outer surface of said support wherein said coated catalyst is prepared by partially wetting the support with water and rolling the partially wet support in a powder of the active catalyst.

4,110,370
METHOD OF SEPARATING HIGH-BOILING OR NON-VOLATILE MATERIALS

Heinz Engelbach, Limburgerhof; Richard Krabetz, Kirchheim; Gerd Duembgen, Dannstadt-Schauernheim; Carl-Heinz Willersinn, Ludwigshafen; Walter Frey, Ludwigshafen; Ulrich Lebert, Ludwigshafen, and Fritz Thiessen, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 7, 1975, Ser. No. 620,252

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1974, 2449780

Int. Cl.² C07C *57/04;* **B01D** *1/14*

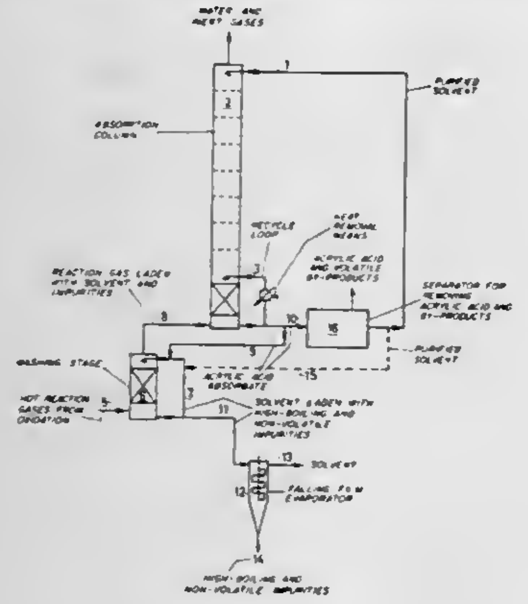
U.S. Cl. 260—530 N **5 Claims**

1. In a process for separating acrylic acid from the hot reaction gas obtained from the manufacture of acrylic acid by catalytic oxidation of propylene and/or acrolein with molecular oxygen, said hot reaction gas containing acrylic acid and low-boiling impurities, wherein the acrylic acid and low-boiling impurities are absorbed with a solvent in a means for absorbing gases into solvents and high-boiling and non-volatile impurities are formed in said means, the solvent boiling in the range from about 200° to 360° C., and the solvent is re-used for

absorption after being separated from the acrylic acid and low-boiling impurities, the improvment comprising:

(a) taking a portion of the solvent containing acrylic acid and high-boiling and non-volatile impurities,

(b) contacting said portion of solvent with the hot reaction gas containing acrylic acid and low-boiling impurities in a means for gas-liquid exchange at such a rate that between about 90 and 99.9% of the solvent evaporates thereby producing a gas containing vaporized solvent, acrylic acid and low-boiling impurities and a residual solvent, the residual solvent containing the high-boiling and non-volatile impurities,


WATER AND INERT GASES
7
PURIFIED SOLVENT
2
ABSORPTION COLUMN
RECYCLE LOOP
HEAT REMOVAL MEANS
ACRYLIC ACID AND VOLATILE BY-PRODUCTS
REACTION GAS LADEN WITH SOLVENT AND IMPURITIES
SEPARATOR FOR REMOVING ACRYLIC ACID AND BY-PRODUCTS
8
10
16
9
PURIFIED SOLVENT
WASHING STAGE
ACRYLIC ACID ABSORBATE
15
HOT REACTION GASES FROM OXIDATION
3
11
SOLVENT LADEN WITH HIGH-BOILING AND NON-VOLATILE IMPURITIES
13
SOLVENT
12
FALLING FILM EVAPORATOR
14
HIGH-BOILING AND NON-VOLATILE IMPURITIES

(c) conducting the gas containing vaporized solvent, acrylic acid and low-boiling impurities to said means for absorbing gases into solvents with a means for conducting gas, and

(d) separating the residual solvent from said means for gas-liquid exchange.

4,110,371
PREPARATION OF OXYDICARBOXYLIC ACID SALTS

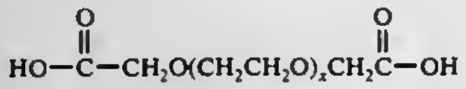
Heinz Schulze, and Edward T. Marquis, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 632,034, Nov. 4, 1975, abandoned. This application Jun. 16, 1977, Ser. No. 806,981

Int. Cl.² C07C *59/12*

U.S. Cl. 260—531 C **9 Claims**

1. A process for producing metal salts of dicarboxylic acids having the formula:



$$HO-\overset{\overset{\displaystyle O}{\|}}{C}-CH_2O(CH_2CH_2O)_xCH_2\overset{\overset{\displaystyle O}{\|}}{C}-OH$$

wherein *x* is from 0 to about 4, directly from the corresponding oxyethylene diol comprising the step of:

heating said oxyethylene diol with an alkali metal hydroxide in the presence of a catalytically effective amount of a nickel-copper-chromia catalyst at temperatures in the range of from about 200° C. to about 300° C. and at pressures sufficient to maintain the reactants and products substantially in liquid phase.

4,110,372
PROCESS FOR THE PURIFICATION OF CARBOXYLIC ACIDS

Hansjorg Hey, Hofheim, Taunus; Helmut Schaum, Bad Soden am Taunus, and Hans-Jurgen Arpe, Fischbach, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 419,291, Nov. 27, 1973, abandoned. This application Aug. 12, 1975, Ser. No. 603,940

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1972, 2258441

Int. Cl.² C07C *51/42*

U.S. Cl. 260—540 **11 Claims**

1. In a process for removing formic acid from a crude mixture thereof with a carboxylic acid selected from the group consisting of lower fatty acids other than formic acid by reacting the formic acid component of the mixture with a carboxylic anhydride, a compound forming an anhydride with a carboxylic acid, or a mixture thereof, the improvement which comprises carrying out the reaction at a temperature of from about 20° C. to 300° C. in the presence of an acid catalyst which is a mineral acid, a sulfonic acid, an acidic salt of a mineral acid or a heterogeneous acid catalyst selected from the group consisting of acidic ion exchange resins in the H^+ form and acid-activated bentonites and zeolites.

4,110,373
PROCESS FOR THE PREPARATION OF BENZOYL HALIDE AND HALOSULFONYLBENZOYL HALIDE

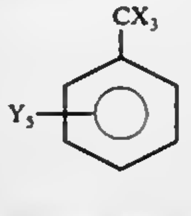
F. Howard Day, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,045

Int. Cl.² C07C *51/58, 63/10, 143/38, 143/40*

U.S. Cl. 260—543 R **11 Claims**

1. A process for the co-production of benzoyl halide and meta-halosulfonylbenzoyl halide by the reaction of benzotrihalide with oleum which comprises gradually adding to oleum, a benzotrihalide of the formula:



wherein X is bromine or chlorine and Y is individually selected from the group consisting of fluorine, chlorine, bromine, iodine, alkyl, halosubstituted alkyl, aryl, and hydrogen, with the proviso that at least one Y substitutent at a meta-position is hydrogen.

4,110,374
PROCESS FOR SEPARATING AND RECOVERING UNREACTED MATERIALS IN UREA SYNTHESIS

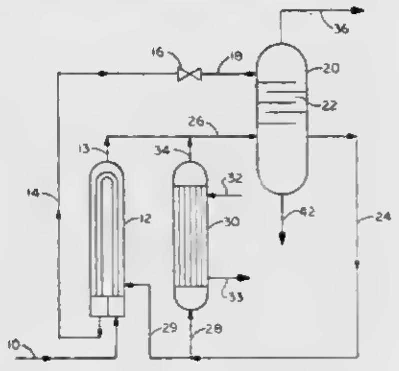
Shigeru Inoue, Kamakura, Japan, assignor to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 736,551, Oct. 28, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,689

Int. Cl.² C07C *126/02*

U.S. Cl. 260—555 A **17 Claims**

1. In a process for recovering unreacted materials and heat from a urea synthesis effluent including-the steps of reacting in a urea synthesis zone carbon dioxide with ammonia under urea synthesis temperature and pressure conditions to obtain said urea synthesis effluent containing urea, an excess of ammonia, unreacted ammonium carbamate and water, subjecting said urea synthesis effluent to at least two ammonium carbamate decomposition stages including at least one high pressure steps at a gauge pressure above 10 kg/cm² and a low pressure stage at a gauge pressure below 5 kg/cm² to separate from said urea synthesis effluent gaseous mixtures each composed of ammonia, carbon dioxide and water vapor in the respective separation zones of said high pressure and low pressure decomposition stages, at least a portion of the separation zone of the low pressure stage being a rectification zone having a top zone and a bottom zone, contacting each of said gaseous mixtures with an absorbent in absorption zones each of which has substantially the same pressure as that of each of the corresponding separation zones to absorb said gaseous mixtures in said absorbent successively, and recycling the thus-obtained absorbate to the urea synthesis zone, the improvement which comprises cooling the urea synthesis effluent from the separation zone of said high pressure stage to a temperature of 105° – 170° C. by indirect heat exchange in a heat exchange zone with the urea synthesis effluent present in said bottom zone of the rectification zone of said low pressure stage, reducing the pressure of said cooled urea synthesis effluent to that of the low pressure stage, introducing the thus pressure reduced effluent into the top zone of the rectification zone and at the same time heating said urea synthesis effluent present in the bottom zone of said rectification zone by said indirect heat exchange in said heat exchange zone and in an additional heating zone to maintain the temperature of the top zone of the rectification zone at 60° – 120° C. and the temperature of the bottom zone of the rectification zone at 100° – 140° C.



4,110,375
NOVEL 2-HYDROXYNAPHTHALENE-1-ALDEHYDES, PROCESS FOR PREPARING THEM AND THEIR USE

Theodor Papenfuhs, Frankfurt am Main, and Heinrich Volk, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

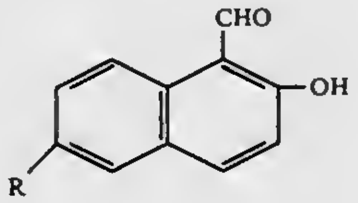
Division of Ser. No. 707,751, Jul. 22, 1976, Pat. No. 4,064,349. This application Sep. 21, 1977, Ser. No. 835,299

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2533960

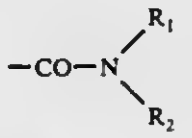
Int. Cl.² C07C *103/22*

U.S. Cl. 260—559 R **3 Claims**

1. A compound of the formula



in which R is the group



wherein R_1 is hydrogen or alkyl of 1 to 4 carbon atoms, and R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl.

4,110,376
CYCLOPROPYLMETHYLAMINE DERIVATIVES

Atsuyuki Kojima, Nishinomiya; Junki Katsube, Toyonaka; Yoshito Kameno, Mino; Shigebo Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

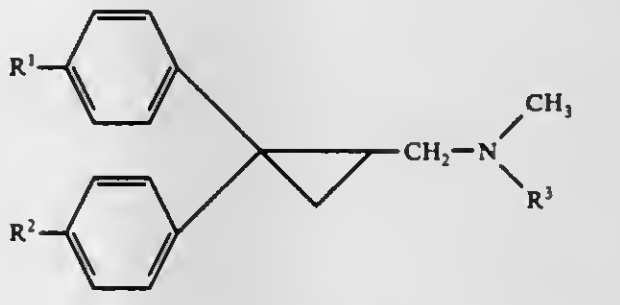
Filed Aug. 15, 1975, Ser. No. 605,012

Claims priority, application Japan, Aug. 15, 1974, 49-93881

Int. Cl.² C07C *87/32*

U.S. Cl. 260—570 R **5 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are hydrogen or halogen and R^3 is hydrogen or methyl, or a non-toxic salt thereof.

4,110,377
PROCESS FOR THE ALKYLATION OF SECONDARY ALIPHATIC AMINES IN THE PRESENCE OF AN AMIDE OF A TRANSITION METAL

Mario Gabriele Clerici, San Donato Milanese (Milan); Federico Maspero, Milan, and Alfonso D'Alfonso, San Donato Milanese (Milan), all of Italy, assignors to ANIC S.p.A., Italy

Filed Sep. 7, 1977, Ser. No. 831,241

Claims priority, application Italy, Oct. 28, 1976, 28778 A/76

Int. Cl.² C07C *85/22, 85/24*

U.S. Cl. 260—583 R **4 Claims**

1. A process for the alkylation of secondary aliphatic amines consisting of reacting a secondary aliphatic amine containing at least one hydrogen on an alpha carbon atom with an olefine in the presence of an amide of a transition metal.

4,110,378
METHOD OF REDUCTION EMPLOYING RESIN ADSORBENTS

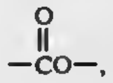
Wolfgang G. Geyer, Glassboro, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 583,821; Jun. 4, 1975, Pat. No. 3,975,155. This application Jun. 1, 1976, Ser. No. 691,273

Int. Cl.² C07B *1/00;* C07C *103/22*

U.S. Cl. 260—558 S **1 Claim**

1. A method for the reduction of a reducible functional group selected from —S—N—, —S—S—, >C═O, >C═NHNH—, —CHO,



$$-\overset{\overset{\displaystyle O}{\|}}{C}O-,$$

and $—N_3$ which comprises adsorbing the organic compound containing said reducible functional group on a polymeric macroreticular resin adsorbent and reducing the adsorbed functional group with an aqueous solution of sodium borohydride.

4,110,379

NOVEL HALOGENATED ORGANIC COMPOUNDS, PROCESS FOR THE PRODUCTION OF SAME, AND POLYURETHANES CONTAINING SAME

David Aelony, Beer-Sheva, and David Vofsi, Rehovot, both of Israel, assignors to Makhteshim Chemical Works Ltd., Beer Sheva, Israel

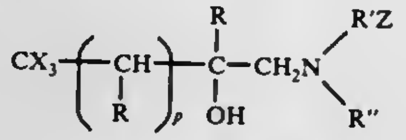
Filed Mar. 11, 1977, Ser. No. 776,899

Claims priority, application Israel, Mar. 12, 1976, 49209

Int. Cl.^{2} C07C *91/06, 91/08, 93/04*

U.S. Cl. 260—584 R **15 Claims**

1. Compounds of the formula



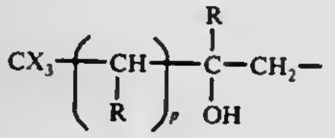
wherein:

R designates hydrogen or an alkyl group of 1 to 6 carbon atoms, inclusive;

R' designates an alkylene group of 2 to 10 carbon atoms, inclusive, or alkylene substituted by a methyl or by a halomethyl group;

R" designates hydrogen, an alkyl group of 1 to 4 carbon atoms, inclusive,

—R'Z,

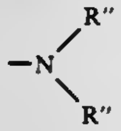
$\leftarrow R'O)_nH$, 

$$CX_3\left(\begin{matrix}CH\\|\\R\end{matrix}\right)_p\begin{matrix}R\\|\\C\\|\\OH\end{matrix}-CH_2-$$

or $C(CH_2OH)_3$;

X designates chlorine or bromine;

Z designates —OH,



or $\leftarrow OR')_nH$;

n is an integer from 1 to 5 (R' not necessarily being identical); and

p is an integer from 0 to 4.

4,110,380

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

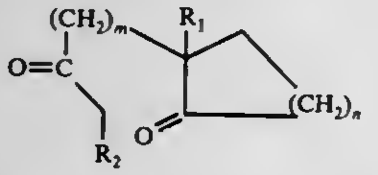
Division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 14, 1976, Ser. No. 723,129

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.^{2} C07C *45/00*

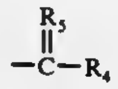
U.S. Cl. 260—586 C **3 Claims**

1. A process wherein two mole equivalents of a racemic mixture of a compound of the formula



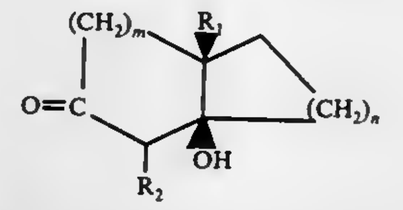
IX

where R_1 is lower alkyl, aryl, aralkyl, lower alkenyl or lower alkynyl; R_2 is hydrogen, lower alkyl, aryl, aralkyl and $(-CH_2)_pR_3$ where p is an integer between 0 and 2 inclusive and R_3 is



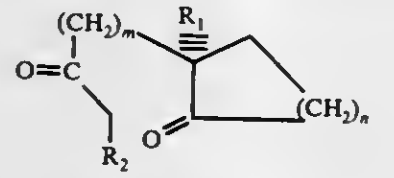
$$-\overset{\overset{\displaystyle R_5}{\|}}{C}-R_4$$

where R_4 is hydrogen or lower alkyl and R_5 is lower alkylenedioxy or arylenedioxy; *n* is an integer between 1 and 5 inclusive and *m* is an integer between 1 and 4 inclusive is cyclized in the presence of an optically active l-amino acid in an aprotic solvent to produce one mole equivalent of an optically active product of the following formula



X

where R_1, R_2, *m* and *n* are as above and one mole equivalent of an optically active compound of the formula



I-a

where R_1, R_2, *m* and *n* are as above.

4,110,381

2-DECARBOXY-2-HYDROXY-METHYL-3,7-INTER-M-PHENYLENE-ω-PHENOXY-PGF$_1$ COMPOUNDS

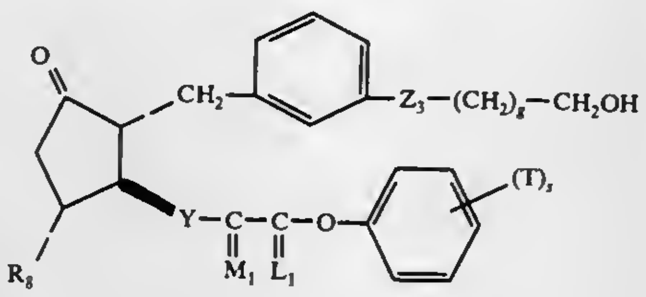
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,026

Int. Cl.^{2} C07C *49/82, 49/84*

U.S. Cl. 260—590 C **29 Claims**

1. A prostaglandin analog of the formula



wherein

Z_3 is oxa or methylene;

wherein

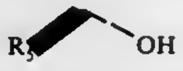
R_8 is hydrogen or hydroxy;

wherein

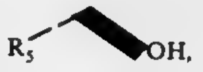
Y is a trans-CH=CH—;

wherein

M_1 is

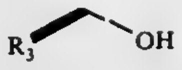


or

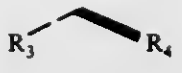


wherein R_5 is hydrogen or methyl;

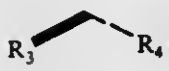
wherein L_1 is



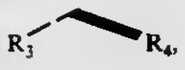
,



or a mixture of



and



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein *g* is one, 2, or 3; and

wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,110,382

2-DECARBOXY-2-HYDROXY-METHYL-ω-PHENYL-PGE ANALOGS

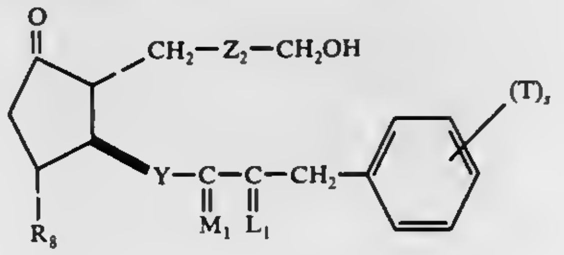
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Divisioo of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,035

Int. Cl.^{2} C07C *49/82*

U.S. Cl. 260—590 C **119 Claims**

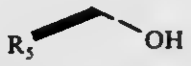
1. A prostaglandin analog of the formula



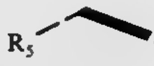
wherein R_8 is hydrogen or hydroxy;

wherein Y is trans-CH=CH—;

wherein M_1 is

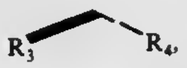


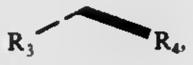
or



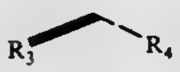
wherein R_5 is hydrogen or methyl;

wherein L_1 is

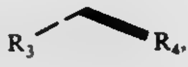




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein Z_2 is

cis-$CH{=}CH{-}CH_2{-}(CH_2)_g{-}CF_2{-}$;

cis-$CH_2{-}CH{=}CH{-}(CH_2)_g{-}CH_2{-}$; or

$-(CH_2)_3-(CH_2)_g-CF_2-$;

wherein *g* is one, 2, or 3; and

wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,110,383

2-DECARBOXY-2-HYDROXYMETHYL-3-7-INTER-M-PHENYLENE-ω-PHENYL-PGA$_1$ OR 9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

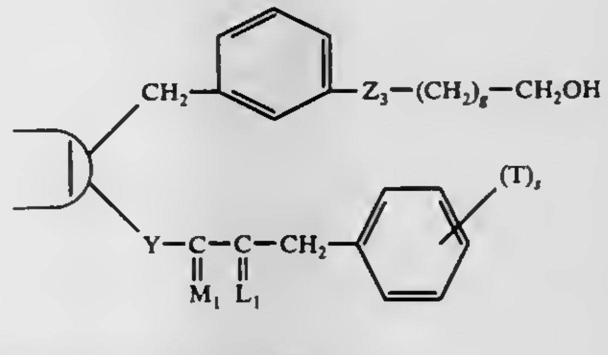
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Divislon of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,038

Int. Cl.^{2} C07C *49/82, 49/84*

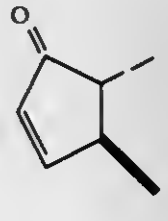
U.S. Cl. 260—590 C **39 Claims**

1. A prostaglandin analog of the formula

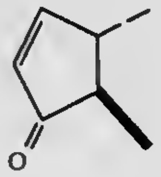


wherein Z_3 is oxa or methylene;

wherein D is



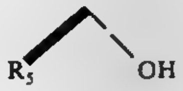
or



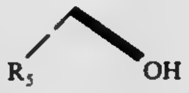
;

wherein Y is trans—CH=CH—;

wherein M_1 is

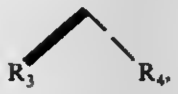


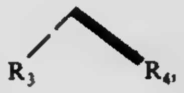
or



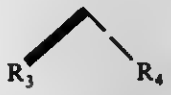
wherein R_5 is hydrogen or methyl;

wherein L_1 is

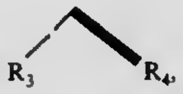




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein *g* is one, 2, or 3; and

wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,110,384
2-DECARBOXY-2-HYDROXYMETHYL-5-OXA-ωPHENOXY-PGA$_1$ OR 9-DEOXY-9,10-DIDEHYDRO-PGD$_1$COMPOUNDS

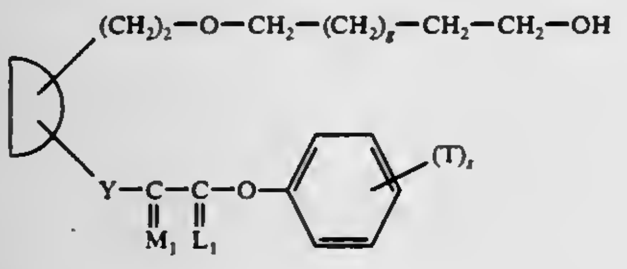
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,301

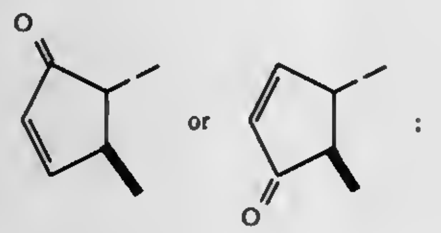
Int. Cl.^{2} C07C *49/84*

U.S. Cl. 260—590 C **29 Claims**

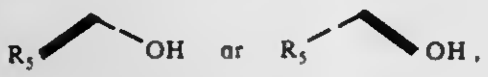
1. A prostaglandin analog of the formula



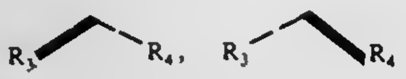
wherein D is



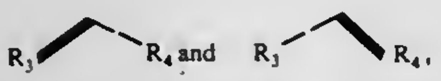
wherein Y is trans—CH═CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein *g* is one, 2, or 3; and

wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,110,385
MANUFACTURE OF FIBRIDS OF POLYOLEFINS

Bruno Sander, Ludwigshafen; Eckhard Bonitz, Frankenthal, and Kurt Scherling, Hemsbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 532,193, Dec. 12, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,404

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1973, 2363672

Int. Cl.^{2} D21F *11/00*

U.S. Cl. 264—13 **4 Claims**

1. A process for the manufacture of discrete fibrids of polyethylene having lengths of 1 to 50 mm and thicknesses between 2 and 30 μm which comprises

(a) dissolving in a pressure vessel polyethylene, obtained by low-pressure polymerization of ethylene, in a solvent which is a mixture of pentanes and a naphtha cut boiling at 25° to 140° C. and containing pentanes in an amount of from 5 to 50% by weight, said pentanes being selected from the group consisting of n-pentane, isopentane, cyclopentane and neopentane,

(b) maintaining the vapor pressure in said pressure vessel at 4 to 60 atmospheres and maintaining the temperature of the polyolefin solution in said pressure vessel at temperature of 80° 250° C and above the boiling point of said solvent at standard pressure,

(c) passing said polyethylene solution from said pressure vessel through an orifice into a space maintained at lower temperature and pressure than those in said pressure vessel,

(d) flashing off said solvent in said space from the solution passed through said orifice to produce a tangled mass of said fibrids, said amount of said pentanes in said solvent further being sufficient to cause the polyethylene to separate in form of discrete fibrids upon the flashing off of said solvent in said space, and

(e) drying the resultant polyethylene fibrids.

4,110,386
SILICON CARBIDE SINTERED MOLDINGS AND A METHOD FOR PRODUCING SAID MOLDINGS

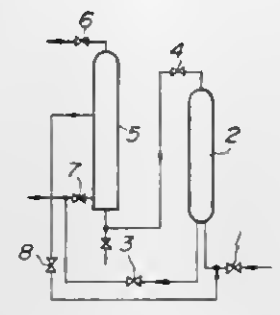
Seishi Yajima; Josaburo Hayashi; Mamoru Omori; Masaaki Hamano, and Toetsu Shishido, all of Oharai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Filed Oct. 28, 1976, Ser. No. 736,659

Claims priority, application Japan, Nov. 10, 1975, 50-134122

Int. Cl.^{2} C04B *35/56*

U.S. Cl. 264—29.5 **8 Claims**



1. In a method for producing compact SiC sintered moldings, which comprises

(a) mixing SiC powder with 0.3–30% by weight of binder consisting essentially of organosilicon high molecular weight compounds in which Si and C are main skeleton components and which are produced through polycondensation reaction of polysilane compounds having Si-Si bond,

(b) molding the mixture under a pressure into a desired shape, and

(c) heating the formed molding at a temperature of 800–2,200° C. under at least one atmosphere selected from the group consisting of vacuum, inert gas, CO gas and hydrogen gas to product an SiC sintered molding, the improvement which comprises subjecting said SiC sintered molding to at least one treatment which comprises impregnating the SiC sintered molding with said organosilicon high molecular weight compound used as the binder in step (a) above, and heat treating the resulting impregnated SiC sintered molding at a temperature of 700°–1,400° C. under at least one atmosphere selected from the group consisting of vacuum, an inert gas, CO gas and hydrogen gas.

4,110,387
METHOD OF CONTROLLING OPERATION OF A MULTI-ROLL CALENDER

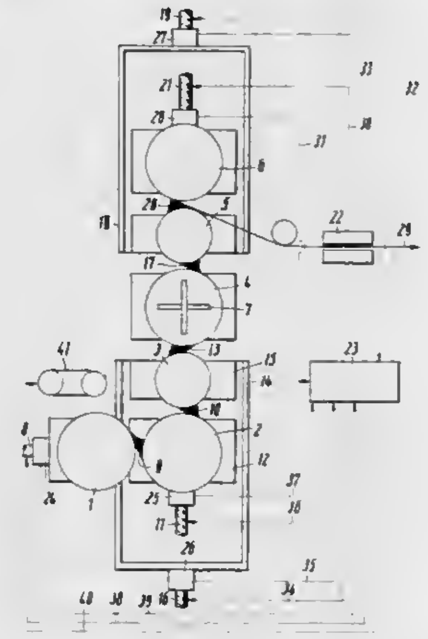
Willi Wöckener; Werner Pawelczyk, and Klaus-Dieter Marquardt, all of Hanover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Fed. Rep. of Germany

Filed Sep. 28, 1976, Ser. No. 727,529

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543738

Int. Cl.^{2} B29D *7/14*

U.S. Cl. 264—40.5 **5 Claims**



1. A method of controlling a multi-roll calender for producing a sheet of elastomeric material, in which a series of rolls are mounted in a calender frame and controllably spaced from one another to provide a series of variable gaps through which the material is sequentially passed, comprising the steps of:

(a) sensing the pressure of material being calendered in the roll gaps of the calender.

(b) adjusting the width of the gaps on opposite sides of certain of said rolls which are subjected to roll gap pressures at substantially diametrically opposite sides thereof so as to make the difference in pressure in the gaps on said opposite sides as small as possible, thereby reducing the flexion on those rolls, and

(c) maintaining such pressures substantially constant.

4,110,388
METHOD AND A MOULD FOR PRODUCING AN INSULATING UNIT, IN PARTICULAR A BUILDING UNIT

Ole Wiene, Farum, Denmark, assignor to Permataet Kobenhavn A/S, Bagsvaerd, Denmark

Filed Mar. 25, 1977, Ser. No. 781,518

Claims priority, application Denmark, Mar. 31, 1976, 1495/76

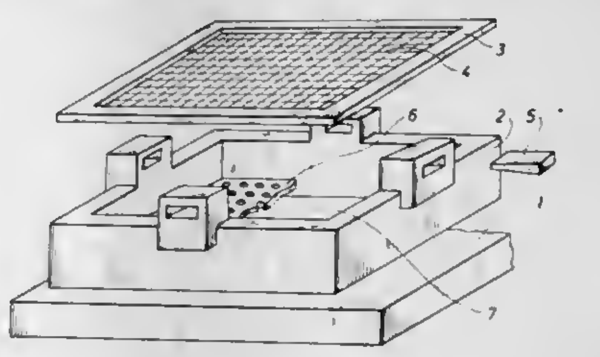
Int. Cl.^{2} B28B *1/08*

U.S. Cl. 264—71 **25 Claims**

1. A method of producing an insulating unit which is a matrix of a hydraulic binding material in which is embedded expanded, polymeric granules, comprising

disposing said granules of a size of 0.5 to 15 mm and of a density of 0.01 to 0.04 grams per cubic centimeter into a mold to fill at least a part of the mold and densely packing the granules therein;

maintaining said granules in a densely packed state in said mold by disposing over the top of said granules a net or a screen plate which is secured to the mold; and, while said granules are maintained in said densely packed state, pouring said binding material, having a thin creamy consistency into the mold to produce a closed-cell matrix about said granules.



4,110,389
METHOD AND APPARATUS FOR ROTATIONAL MOLDING WITH EVACUATED GUARD CHAMBER IN MOLD FLANGES

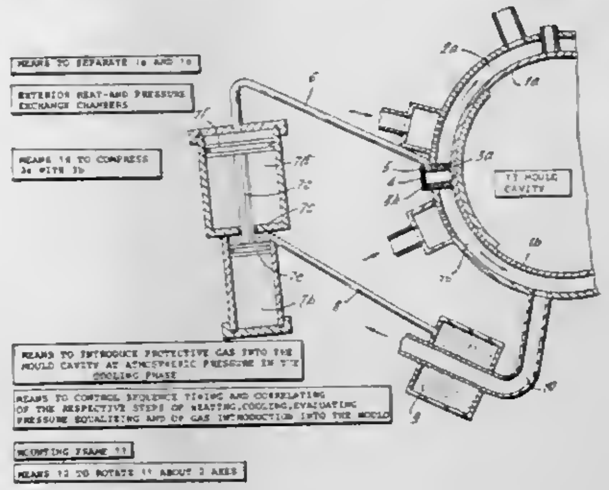
Herbert Giehler, Dautphe-Willhelmshutte, and Wilfried Grau, Wolfgruben, both of Fed. Rep. of Germany, assignors to Elkamet/Lahn Kunststoff GmbH/Werk, Biedenkopf, Fed. Rep. of Germany

Filed Jul. 7, 1976, Ser. No. 703,204

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1975, 2530211

Int. Cl.^{2} B29C *5/04;* **B29D** *23/08*

U.S. Cl. 264—89 **20 Claims**


MEANS TO SEPARATE 1a AND 1b
EXTERIOR HEAT-AND PRESSURE EXCHANGE CHAMBERS
MEANS 14 TO COMPRESS 3a WITH 3b
MEANS TO INTRODUCE PROTECTIVE GAS INTO THE MOULD CAVITY AT ATMOSPHERIC PRESSURE IN THE COOLING PHASE
MEANS TO CONTROL SEQUENCE TIMING AND CORRELATING OF THE RESPECTIVE STEPS OF HEATING, COOLING, EVACUATING PRESSURE EQUALISING AND OF GAS INTRODUCTION INTO THE MOULD
MOUNTING FRAME 11
MEANS 12 TO ROTATE 11 ABOUT 2 AXES
MOULD CAVITY
2a
1a
6
5
4
3a
7b
7c
8
9
10

1. In a method of rotationally moulding a hollow article from a hardenable moulding material, said method including the steps of heating and cooling said moulding material during rotation of said mould, the improvement comprising:

A. providing a rotational mould having two mould halves defining a mould cavity therebetween, each of said mould halves having a jacket thereabout and spaced therefrom to define a jacket space;
   - each of said mould halves having mating flanges extending therefrom;
   - said flanges cooperating with a sealing member to define a pressure chamber therebetween;

B. placig said moulding material in said mould cavity;

C. passing a heating fluid through said jacket space to perform said heating step;

D. passing a cooling fluid through said jacket to perform said cooling step;

E. evacuating vapors from said mould cavity during said heating step;

F. pressuring said mould cavity during said cooling step;

G. continuously maintaining a pressure in said pressure chamber, during said heating and cooling at least as low as pressure in said mould cavity;

H. passing said heating fluid leaving said jacket space through a steam generator, generating steam thereby, and
I. actuating a vacuum means by said steam to perform said evacuating:
J. passing said cooling fluid leaving said jacket through said steam generator and condensing steam in said steam generator, to reverse said vacuum means and raise pressure in said pressure chamber.

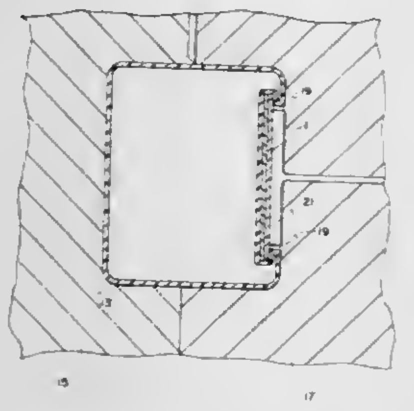
4,110,390
PROCESS FOR FORMING A MOLDED PLASTIC ARTICLE HAVING AN INSERT THEREIN

Tyler Keith Olcott, Valentines, Va., and Robert M. Miller, Lakeland, Fla., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Oct. 18, 1976, Ser. No. 733,549

Int. Cl.² B29C *17/07;* **B29D** *3/00*

U.S. Cl. 264—90 **8 Claims**



1. A process for forming a molded hardened plastic article having an insert of a thermally shockable material said thermally shockable material being a material which fractures when subjected to sufficient thermal stress comprising the steps of:
(a) disposing said thermally shockable insert so as to expose a surface of said insert to a molding environment;
(b) placing a layer of insulating material in contiguous relationship with said surface;
(c) covering said layer of insulation with a plastic mass which is at a higher temperature than said thermally shockable insert, said layer of insulating material being effective to prevent said higher temperature from creating sufficient thermal stress to fracture said insert; and
(d) cooling said hardenable plastic mass to harden said mass into a gripping relationship partially encompassing said thermally shockable insert.

4,110,391
PROCESS FOR THE MANUFACTURE OF MOLDED ARTICLES FROM POLYOLEFINS WITH MOLECULAR WEIGHTS OF AT LEAST ONE MILLION

Josef Berzen, Oberhausen, and Johannes Theyssen, Duisburg, both of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jul. 27, 1977, Ser. No. 819,536

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634537

Int. Cl.² B29C *3/00*

U.S. Cl. 264—120 **13 Claims**

1. A process for the manufacture of a molded article from a powder form of a polyolefin of molecular weight of at least one million which comprises introducing a homopolymer of ethylene or a copolymer of ethylene with an α-olefin of 3-10 carbon atoms having a molecular weight of at least one million into a mold loosely closed with a plug, heating the same in said mold in an inert atmosphere at a temperature of 150° to 250° C whereby said polyolefin is transformed into a rubbery-elastic state, thereafter compressing said polyolefin in said mold for at least two minutes at a pressure of 2.5 to 25 N/mm² and thereafter compressing said polyolefin for at least one minute at a pressure of 40 to 100 N/mm².

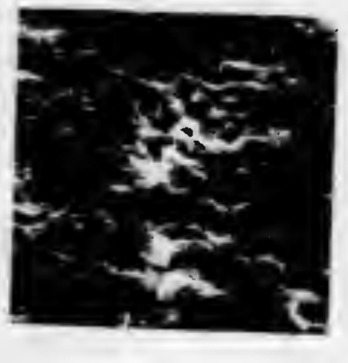
4,110,392
PRODUCTION OF POROUS SINTERED PTFE PRODUCTS

Etsuo Yamazaki, Iruma, Japan, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 17, 1976, Ser. No. 751,675

Int. Cl.² B29D *7/24, 27/00*

U.S. Cl. 264—127 **6 Claims**



1. A process for producing a porous product of sintered polytetrafluoroethylene, having a pore size of less than 2000Å, which comprises the following steps performed in sequence:
(a) shaping an unsintered polytetrafluoroethylene mixture, containing a liquid lubricant, by extrusion, below the crystalline melt point of the polytetrafluoroethylene, to form a shaped extrudate;
(b) a first stretching of said shaped extrudate in at least one direction at a temperature below about 327° C;
(c) free sintering by heating said stretched shaped extrudate to a temperature above 327° C, said stretched shaped article being unrestrained and allowed to shrink to almost the same size it had been before stretching; and
(d) a second stretching of said sintered, stretched, shaped extrudate at a temperature below the crystalline melt point at a speed in the range of about 1×10^2 to about 2×10^6 mm/min.

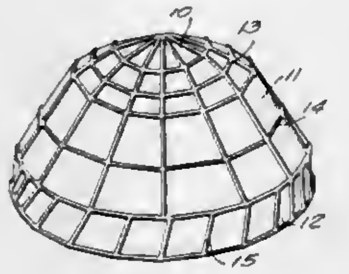
4,110,393
METHOD OF MAKING SIMULATED THREE-DIMENSIONAL STAINED GLASS OBJECTS

Charles Edward Trame, Mequon, Wis., assignor to Everbrite Electric Signs, Inc., South Milwaukee, Wis.

Filed Jan. 23, 1978, Ser. No. 871,302

Int. Cl.² B29C *5/00;* **B29F** *1/00*

U.S. Cl. 264—132 **7 Claims**



1. A method for making three-dimensional, non-planar contoured simulated stained glass articles composed of an array of simulated stained glass facets at least some of which are disposed in different planes than others, said facets being bounded by simulated solder joints between them which joints are in relief relative to said facets, said method comprising the steps of:

providing a model of said article which has facets and relieved solder joints that are to correspond with the true shape of the finished article formed thereon, said facets on the model being textured similar to stained glass,
providing a first mold made with said model in which planar areas and grooves are formed corresponding with said facets and said relieved solder joints, respectively,
preforming a sheet of resin with said mold to produce an object corresponding with said model,
projecting points on the three-dimensional preform, that delineate said facets and said solder joints, onto a plane sheet having coordinates and connecting coordinate points to form outlines of said facets and joints that are variously distorted in accordance with the amount by which zones on said preform distort during preforming from a planar to a non-planar object,
applying a coating on said planar sheet for coloring said facets and solder joints in correspondence with the colors desired in the simulated article,
reproducing the colored pattern of variously distorted and undistorted facets and solder joints from said planar sheet on a plurality of individual resin sheets for making additional preforms,
shaping one of said individual resin sheets under the influence of heat and pressure in a mold corresponding with said first mold for said individual sheet and the colored patterns thereon to distort to their true shapes in substantially exact coincidence with the corresponding facets and grooves in said mold, and then
molding a layer of hot fluid resin to bond to said preformed individual sheet and form a relatively thick and rigid article when said resin cools and solidifies.

4,110,394
PROCESS FOR EXTRUSION FORMING OF RESIN FORMED BODY HAVING DIFFERENT THICKNESS

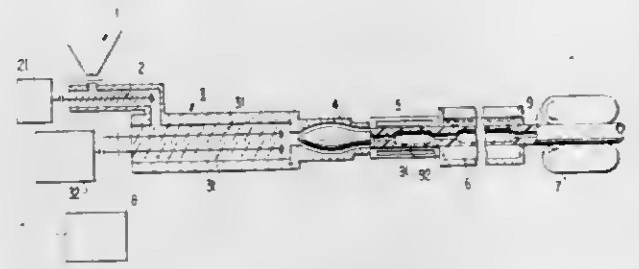
Teizo Shimada, Takatsuki; Takeshi Kita, Asaka; Kiyoshi Mochizuki, Joyo, and Takahiro Komiya, Kamifukuoka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1976, Ser. No. 685,604

Claims priority, application Japan, May 16, 1975, 50-59032

Int. Cl.² B29D *23/04*

U.S. Cl. 264—167 **5 Claims**



1. In a resin body extrusion process of the type wherein resin raw material is fed into an extruder wherein an extruder screw means mixes, melts and moves said resin therethrough to a shape forming means, and wherein said body is pulled by a take-up means, an improved process for altering the thickness of said resin body comprising,
altering the feed rate of resin raw material into said extruder, and altering the screw rotation rate of said extruder by amounts to maintain the quantity of resin within the extruder substantially constant while varying significantly the quantity extrusion rate leaving said extruder.

4,110,395
PROCESS FOR PRODUCING POLYMERIC FILMS FROM CRYSTALLIZABLE POLYESTERS

Modest Sergeevich Akutin, Bolshoi Tishinsky pereulok, 26, korpus 16, kv. 16, and Tamara Grigorievna Levina, Ljusinovskaya ulitsa, 66, kv. 242a, both of Moscow, U.S.S.R.

Continuation of Ser. No. 551,850, Feb. 21, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 733,944

Int. Cl.² B29D *7/24*

U.S. Cl. 264—210 R **4 Claims**

1. A process for producing polymeric polyethyleneterephthalate films, comprising the extrusion of molten polyethyleneterephthalate polymer onto a receiving surface; cooling said polymer on said receiving surface to a temperature of 20°–80° C. to obtain an amorphous polymeric film; heat treating said film at 130°–190° C. to obtain a degree of crystallinity of the film of from 5 to 50%; biaxially orienting said film at 130°–250° C.; thermal fixation thereof at 170°–250° C. and cooling to 20°–30° C.

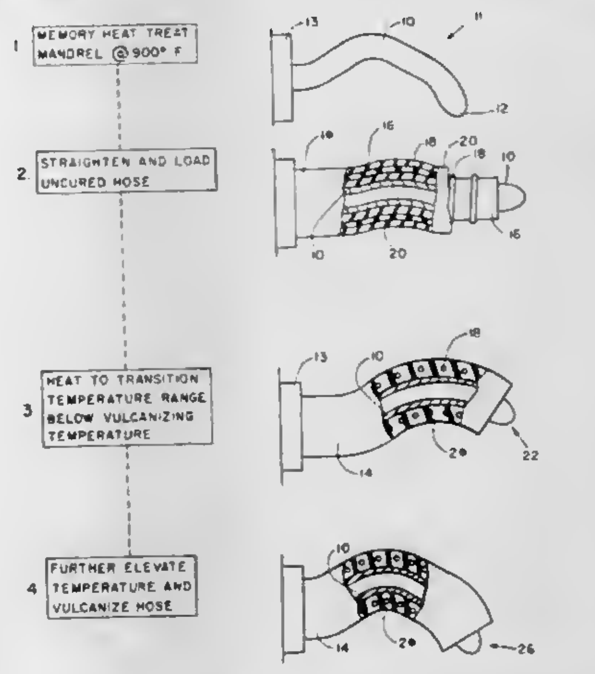
4,110,396
CURVED TUBULAR ARTICLES AND METHOD

Linda M. Reynolds, Goleta, Calif., assignor to The Gates Rubber Company, Denver, Colo.

Filed May 15, 1974, Ser. No. 470,249

Int. Cl.² B29C *25/00*

U.S. Cl. 264—236 **17 Claims**


1 MEMORY HEAT TREAT MANDREL @ 900° F
2 STRAIGHTEN AND LOAD UNCURED HOSE
3 HEAT TO TRANSITION TEMPERATURE RANGE BELOW VULCANIZING TEMPERATURE
4 FURTHER ELEVATE TEMPERATURE AND VULCANIZE HOSE
13
10
11
12
16
18
20
14
22
26

1. A method for producing curved tubular elastomeric articles utilizing a heat recoverable mandrel which has been memory heat treated at a temperature well above the vulcanizing temperature of the elastomeric article and at a preselected curvilinear configuration, comprising sequentially the steps of:
deforming the mandrel from its preselected curvilinear configuration;
loading the tubular article in at least a partially uncured state on to the mandrel to form a loaded mandrel, said mandrel having a transition temperature range whose lower value is above the softening point of the elastomeric article;
heating the loaded mandrel up through the transition temperature range of the mandrel which is below the vulcanizing temperature, whereby the mandrel takes on a configuration substantially that of said preselected curvilinear configuration during which said elastomeric article is in an uncured, softened state; and
vulcanizing the elastomeric article.

9. A method for producing curved hose utilizing a heat recoverable metal alloy mandrel which has been memory heat treated at a temperature well above the vulcanizing temperature of the hose and at a preselected curvilinear configuration, comprising sequentially the steps of:

deforming the mandrel from its preselected curvilinear configuration to a shape having lesser curvature than the preselected curvilinear configuration;

loading the hose in at least a partially uncured state on to the mandrel to form a loaded mandrel, said mandrel having a transition temperature range which is below the vulcanizing temperature of the hose article, and above the softening temperature of the rubber;

heating the loaded mandrel up through its transition temperature range whereby the rubber is rendered flowable and in a plastic state, whereby the mandrel takes on a configuration substantially that of said preselected curvilinear configuration;

vulcanizing the elastomeric article;

cooling the loaded mandrel to below its transition temperature range;

plastically deforming the loaded mandrel to a desired configuration of lesser curvature than the preselected curvilinear configuration; and

unloading the curved hose article.

4,110,397

COMPOSITE BODIES OR SHEETS

Alan Metcalf Wooler, Manchester, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed Mar. 25, 1977, Ser. No. 781,416

Claims priority, application United Kingdom, Apr. 6, 1976, 13967/76

Int. Cl.^{2} B29C *1/04*

U.S. Cl. 264—338 **14 Claims**

1. In a process for the manufacture of composite bodies or sheets comprising the steps of

(a) mixing together a filler material and an isocyanate-based binding agent to form a mouldable composition;

(b) introducing said composition to a mould and shaping said composition therein; and

(c) thereafter releasing said shaped composition from said mould;

the improvement which comprises providing a film of a metallic soap between said composition and said mould to assist release.

4,110,398

METAL SEPARATION FROM DRAGSTREAM MATERIAL OF REFINING PROCESS

Charles W. Selvidge, Westmont; Kenneth A. Morgan, Hoffman Estates, and Robert R. Frame, Glenview, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 8, 1977, Ser. No. 785,900

Int. Cl.^{2} C01G *31/00, 49/00, 53/00*

U.S. Cl. 423—62 **8 Claims**

1. A process which comprises agitating a dragstream resulting from the refining of a crude feed stock containing vanadium and nickel with naphtha at a temperature of from about 100° to about 250° C., a pressure of from about 1 to about 50 atmospheres, and a time period of from about 0.5 to about 10 hours, the solids content of the dragstream being present in a range of from about 5% to about 20% by weight of said naphtha, separating liquid from solid, calcining the latter at a temperature of from about 300° to about 900° C. for a time period of at least about 1 hour, and recovering the calcined solid material containing vanadium and nickel.

4,110,399

PROCESS FOR THE EXTRACTION OF ALUMINA FROM ALUMINUM-CONTAINING SILICATES

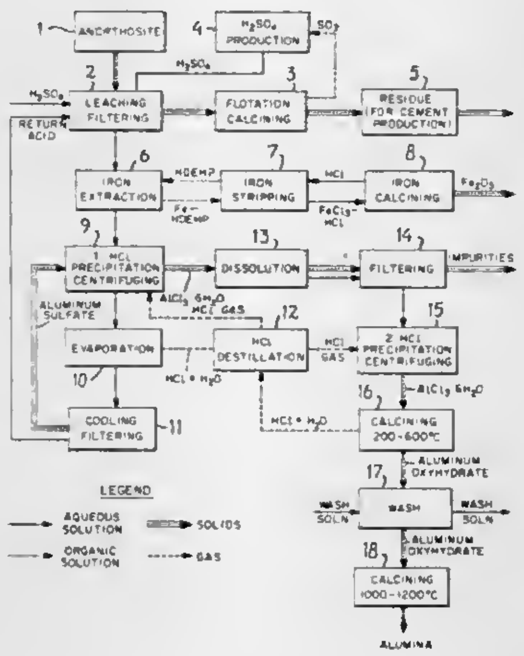
Bjorn Gaudernack; Norvald Gjelsvik, both of Oslo, and Leif Farbu, Strommen, all of Norway, assignors to Institutt for Atomenergi, Kjeller, Norway

Filed Mar. 30, 1977, Ser. No. 782,826

Claims priority, application Norway, Apr. 2, 1976, 761136

Int. Cl.^{2} C01F *7/22, 7/26*

U.S. Cl. 423—112 **12 Claims**



1. A process for the extraction of alumina from aluminum-containing silicates comprising:

(a) treating an aluminum-containing silicate with an aqueous solution comprising sulfuric acid whereby a substantial portion of the aluminum is dissolved;

(b) separating the solids of step (a) from the liquid portion;

(c) treating at least a part of the aqueous liquid portion from step (b) with an organic liquid substantially immiscible with the aqueous solution and containing an organic extractant capable of preferential extraction of iron over aluminum whereby iron is extracted into the organic liquid phase;

(d) separating the aqueous liquid phase from the organic liquid phase and treating the aqueous liquid phase with gaseous hydrogen chloride whereby aluminum chloride hexahydrate is precipitated;

(e) separating the aluminum chloride hexahydrate precipitate from the aqueous liquid phase;

(f) subjecting the aqueous liquid phase from step (e) to heat whereby hydrochloric acid is evaporated therefrom and recovering the hydrochloric acid and recycling at least a portion of it to step (d);

(g) recycling at least a portion of the remaining aqueous liquid phase of step (f) to step (a);

(h) calcining the aluminum chloride hexahydrate from step (e) at a temperature of from about 200° C to about 600° C whereby the aluminum chloride hexahydrate is converted to aluminum oxyhydrate and hydrochloric acid;

(i) separating the hydrochloric acid from the aluminum oxyhydrate;

(j) washing the aluminum oxyhydrate with water or dilute hydrochloric acid whereby any alkali metal chlorides and magnesium chlorides are removed; and

(k) calcining the aluminum oxyhydrate to alumina at a temperature above about 1000° C.

4,110,400

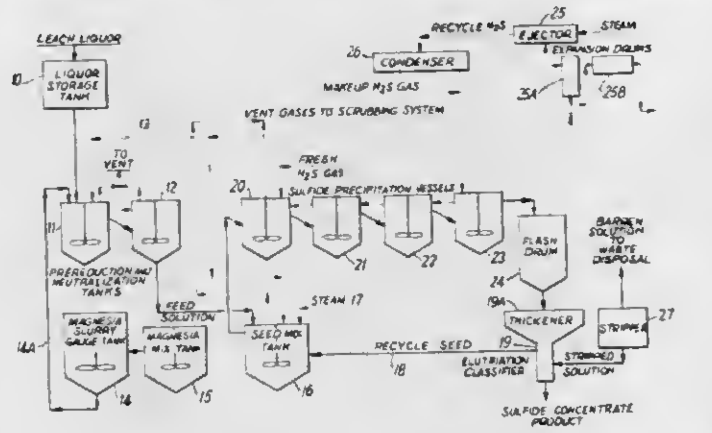
SELECTIVE PRECIPITATION OF NICKEL AND COBALT SULFIDES FROM ACIDIC SULFATE SOLUTION

Mahesh C. Jha, Arvada; Gordon R. Wicker, Lakewood, and Gustavo A. Meyer, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Aug. 1, 1977, Ser. No. 820,595

Int. Cl.^{2} C01G *53/00*

U.S. Cl. 423—141 **17 Claims**



1. A method of efficiently precipitating nickel as nickel sulfide from an acidic nickel sulfate solution containing up to 15 gpl nickel having a pH in the range of about 1.5 to 4 and a soluble inert sulfate salt which provide sulfate ions in an amount ranging from about 30 to 400 gpl as an acid buffer by combining with hydrogen ions formed during precipitation of nickel sulfide to form HSO_4^{-1} which comprises,

adding a slurry of finely divided nickel sulfide to said solution to provide a seed concentration of at least about 75 gpl,

and then subjecting said solution to sulfide precipitation with H_2S under pressure at a temperature of about 65° C to less than 100° C while vigorously agitating said solution until substantially complete sulfide precipitation of nickel obtains.

4,110,401

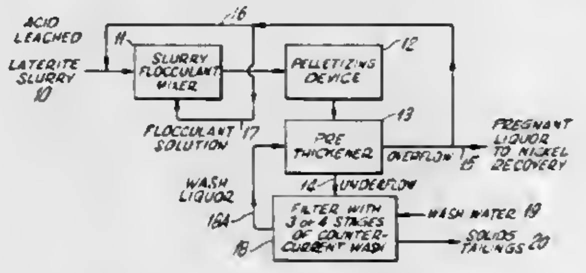
SOLID-LIQUID SEPARATION OF LATERITE SLURRIES

Raul M. Hoover, Arvada; Guy W. Lussiez, Broomfield, both of Colo., and Hugh F. Reid, Pittsburgh, Calif., assignors to Amax Inc., Greenwich, Conn.

Filed Jul, 11, 1977, Ser. No. 814,203

Int. Cl.^{2} C01G *53/10*

U.S. Cl. 423—150 **10 Claims**



1. A method of leaching a finely divided nickel lateritic ore which comprises,

forming a slurry of said ore in an acid solution containing sulfuric acid in an amount ranging from about 0.1 to 0.5 pound of acid per pound of ore taken on the dry basis, said ore being less than about 270 mesh in size,

leaching said ore at a temperature of about 150° C. to 300° C. and a pressure of about 225 psig to 1750 psig to effect substantially complete solution of the nickel in said ore and form a pregnant liquor thereof and leave a slurry of fine tailings particles,

releasing the pressure on said leached slurry and passing said slurry to a flocculant mixer,

adding a small but effective amount of a flocculant to said slurry while mixing said slurry and continuing said mixing to effect flocculation of said tailings,

passing said flocculated slurry to a pre-thickener and thereby produce an overflow of said pregnant liquor and a thickened underflow of flocculated tailings, a portion of said pregnant liquor being removed and sent to nickel recovery with the remainder portion being recycled to the flocculant mixer,

passing said thickened flocculated slurry to a rotating pelletizing drum and subjecting said slurry to the rotational action of said drum to pelletize said tailings at a rotational speed ranging from over 20% to about 40% of the critical speed of said drum,

filtering said pelletized tailings and subjecting said filtered pellets to countercurrent washing to provide washed tailings and provide recycle wash liquor,

recycling said wash liquor to said pre-thickener,

and disposing of said washed pelletized tailings.

4,110,402

RECOVERY OF STRONTIUM FROM BRINE THAT CONTAINS STRONTIUM AND CALCIUM

William C. Bauman; John M. Lee, and John D. Watson, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 24, 1976, Ser. No. 689,309

Int. Cl.^{2} C01F *11/46*

U.S. Cl. 423—166 **9 Claims**

1. A method of recovering strontium as a sulfate from a brine that contains strontium and calcium in a Ca^{++}/Sr^{++} molar ratio of greater than 20/1 which comprises mixing, with the brine, strontium sulfate seed and a sulfate that is more soluble in water than is strontium sulfate and recovering the strontium sulfate that is thereby produced.

4,110,403

PROCESS FOR PREPARING β,γ-UNSATURATED ALDEHYDES

Yataro Ichikawa; Osamu Kobayashi, both of Iwakuni; Kazuhiko Soma, Kawasaki; Tatuyuki Naruchi, Iwakuni; Yoshiyuki Yamanaka, Iwakuni, and Nobuo Suzuki, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

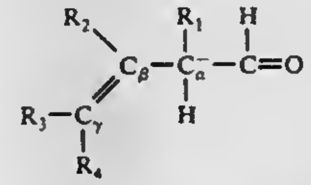
Filed Apr. 21, 1975, Ser. No. 569,686

Claims priority, application Japan, Apr. 22, 1974, 49-44402; Apr. 22, 1974, 49-44403; Sep. 30, 1974, 49-111643

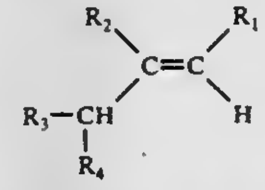
Int. Cl.^{2} C07C *45/00*

U.S. Cl. 260—603 R **19 Claims**

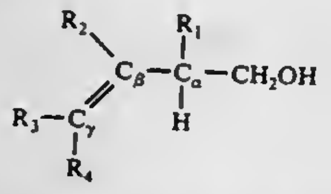
9. A process for preparing β,γ-unsaturated aldehydes of the formula



wherein R_1, R_2 and R_3 are identical or different and represent a hydrogen atom or a methyl group, and R_4 is a hydrogen atom or a linear or cyclic saturated or unsaturated hydrocarbon residue containing 1 to 6 carbon atoms, which comprises (1) reacting an olefin of the formula



wherein R_1, R_2, R_3 and R_4 are the same as defined above, with formaldehyde or a derivative capable of forming formaldehyde at the reaction temperature, at a reaction temperature of 200° to 340° C. in the absence of a solvent or in the presence of a non-aqueous organic solvent selected from the group consisting of halogenated hydrocarbons, diethyl ether, tetrahydrofuran, paradioxane, tetrahydropyran, aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons and dioxanes after pre-heating said formaldehyde or derivative to a temperature of 85° to 150° C. thereby to form a β, γ-unsaturated alcohol of the formula



wherein R_1, R_2, R_3 and R_4 are the same as defined above, and (2) contacting the β,γ-unsaturated alcohol in the vapor phase with metallic copper prepared by reduction of copper oxide having a specific surface area of 0.10 to 0.92 m^2/g as a catalyst at a temperature of 200° to 280° C. in the presence of a carrier gas and in the substantial absence of oxygen.

4,110,404

HYDROCARBONYLATION

William D. Schaeffer, Pomona, and Frank B. Booth, Placentia, both of Calif., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 518,562, Jan. 4, 1966, abandoned. This application Jul. 10, 1969, Ser. No. 840,815
Int. Cl.^{2} C07C *45/08*
U.S. Cl. 260—604 HF **2 Claims**

1. In a method for the hydroformylation of an olefin by adding carbon monoxide and hydrogen to the olefin, reacting said mixture in the presence of a hydroformylation catalyst and recovering the aldehyde product, the improvement which comprises conducting the reaction in the presence of a complex catalyst consisting essentially of rhodium and triethylenediamine the molar ratio of triethylenediamine to rhodium metal being within the range of from 0.023 to 2280.

2. The method of claim 1 wherein a reaction residue containing the complex catalyst is recovered and recycled to the hydroformylation reaction.

4,110,405

ONE STEP PROCESS FOR PREPARING 2,6-DINITRO-4-TRIFLUOROMETHYLCHLOROBENZENE BY NITRATION OF 4-TRIFLUOROMETHYLCHLOROBENZENE

Mario Bornengo, Massa, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Oct. 21, 1977, Ser. No. 844,410
Claims priority, application Italy, Oct. 22, 1976, 28606 A/76
Int. Cl.^{2} C07C *79/12*
U.S. Cl. 260—646 **2 Claims**

1. A one-step process for preparing 2,6-dinitro-4-trifluorochlorobenzene from 4-trifluoromethylchlorobenzene which comprises adding 4-trifluoromethylchlorobenzene to a 1:5 to 1:6 mixture of about 90% HNO_3 and H_2SO_4 at 20% of SO_3, at a molar ratio of nitric acid to 4-trifluorochlorobenzene of 4.5:1, heating the resulting mixture to about 100° C for 3 hours and thereafter to about 110° C for 1 hour, with continued stirring, allowing the temperature of the mass to decrease to about 60° C to 70° C over a period of about 3 hours without stirring, and mixing the slurry thus obtained with ice and water to precipitate the 2,6-dinitro-4-trifluorochlorobenzene.

4,110,406

PREPARATION OF 1-CHLORO-2-TRIFLUOROMETHYL-3,3,3-TRIFLUOROPROPENE FROM ISOBUTYLENE

Louis G. Anello, Hamburg, and Richard F. Sweeney, Elma, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 21, 1976, Ser. No. 753,065
Int. Cl.^{2} C07C *17/20*
U.S. Cl. 260—653.4 **18 Claims**

1. A process for the preparation of 1-chloro-2-trifluoromethyl-3,3,3-trifluoropropene in high yield, comprising catalytically chlorofluorinating isobutylene in a reaction zone by passing a mixture of hydrogen fluoride, chlorine and the isobutylene over a chlorofluorination catalyst selected from the group consisting of a chromium oxide and a metal fluoride chlorofluorination catalyst.

4,110,407

PREPARATION OF 1-CHLORO-2-TRIFLUOROMETHYL-3,3,3-TRIFLUOROPROPENE FROM ISOBUTANE

Louis G. Anello, Hamburg; Richard F. Sweeney, Elma, and Bernard Sukornick, Williamsville, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 754,386, Dec. 27, 1976, Pat. No. 4,081,487. This application Nov. 21, 1977, Ser. No. 853,363
Int. Cl.^{2} C07C *17/20*
U.S. Cl. 260—653.4 **17 Claims**

1. A process for the preparation of 1-chloro-2-trifluoromethyl-3,3,3-trifluoropropene in high yield, comprising prechlorinating an isobutane feed to such extent that the product of chlorination attains an average chlorine content of at least 4 chlorine atoms per molecule, and thence fluorinating said product of chlorination in a reaction zone by passing said product, together with hydrogen fluoride and chlorine, over a dehydro/chlorofluorination catalyst selected from the group consisting of a chromium oxide and a metal fluoride dehydro/chlorofluorination catalyst.

4,110,408

PREPARATION OF 1-CHLORO-2-TRIFLUOROMETHYL-3,3,3-TRIFLUOROPROPENE FROM ISOBUTYLENE

Louis G. Anello, Hamburg, and Richard F. Sweeney, Elma, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 753,065, Dec. 21, 1976. This application Dec. 7, 1977, Ser. No. 858,131
Int. Cl.^{2} C07C *17/20*
U.S. Cl. 260—653.4 **17 Claims**

1. A process for the preparation of 1-chloro-2-trifluoromethyl-3,3,3-trifluoropropene in high yield, comprising prechlorinating an isobutylene feed to such extent that the product of chlorination attains an average chlorine content of at least 4 chlorine atoms per molecule, and thence fluorinating said product of chlorination in a reaction zone by passing said product, together with hydrogen fluoride and chlorine, over a chlorofluorination catalyst selected from the group consisting of a chromium oxide and a metal fluoride chlorofluorination catalyst.

4,110,409

PROCESS FOR MAKING CODIMERS OF NORBORNADIENE AND ALKYNES USING A COBALT CATALYST

Harry K. Myers, Jr., Aston; James E. Lyons, Wallingford, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Oct. 17, 1977, Ser. No. 842,812
Int. Cl.^{2} C07C *13/28, 15/12*
U.S. Cl. 260—666 PY **11 Claims**

1. Process for the catalytic codimerization of norbornadiene with an alkyne comprising:

- (a) contacting norbornadiene and an acetone free alkyne containing no more than 12 carbons in the presence of a catalytic amount of a homogeneous catalytic system of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;
- (b) having the contacting occurring at a temperature within the range from between about −20° C to about 100° C; and
- (c) continuing the contacting until the codimer of norbornadiene and the alkyne is prepared.

4,110,410

OLIGOMERIZATION OF OLEFINS

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 645,118, Dec. 29, 1975, Pat. No. 4,048,109. This application Jun. 22, 1977, Ser. No. 808,932
Int. Cl.^{2} C07C *3/18*
U.S. Cl. 260—683.15 B **10 Claims**

1. A process for the oligomerization of an olefinic hydrocarbon which contains from 2 to about 6 carbon atoms which comprises oligomerizing said hydrocarbon at oligomerization conditions in the presence of a catalyst which has been prepared by heating a metal oxide which possesses surface hydroxyl groups at a temperature in the range of from about 400° C. to about 600° C., contacting said metal oxide with titanium tetrachloride vapor in a series of steps at progressively higher temperatures within the range of from about 50° C. to about 600° C. to deposit titanium tetrachloride on the metal oxide, and thereafter heating the impregnated metal oxide in contact with hydrogen gas at a temperature in the range of from about 300° C. to about 700° C. to reduce the titanium to a valence state of less than +4, and recovering the resultant oligomer.

4,110,411

POLYESTER COPOLYMER COMPOSITIONS

Hiroshi Imanaka; Yoshihiko Kijima; Chikara Sugitawa, and Misao Sumoto, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1976, Ser. No. 662,283
Claims priority, application Japan, Feb. 27, 1975, 50-24738
Int. Cl.^{2} C08L *67/06*
U.S. Cl. 260—873 **10 Claims**

1. A composition comprising an intimate mixture of an elastomer from a segmented thermoplastic polyester copolymer, and at least one polyolefin, wherein said segmented thermoplastic polyester copolymer consists essentially of (1) high-melting polyester segments, a component of which can singly form a high polymer having a melting point greater than 150° C and (2) low-melting polymer segments having a molecular weight between 400 and 6,000, a component of which has a melting or softening point of less than 80° C.

4,110,412

DIFUNCTIONAL TERMINATED MACROMOLECULAR MONOMERS AND CONDENSATION COPOLYMERS PRODUCED THEREFROM

Morris J. Danzig, Skokie, and Mutong T. Chiang, Palos Heights, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Division of Ser. No. 686,776, May 17, 1976, Pat. No. 4,068,050. This application Dec. 27, 1977, Ser. No. 864,830
Int. Cl.^{2} C08F *8/08, 289/00*
U.S. Cl. 260—873 **12 Claims**

1. Chemically joined, phase separated graft copolymers comprising copolymers of:

- (1) from about 1% to about 95% by weight of copolymerizable macromolecular monomers having a substantially uniform molecular weight distribution and having a copolymerizable terminal moiety containing two functional groups of substantially equivalent reactivity in participating in a condersation copolymerization reaction; and
- (2) from about 99% to about 5% by weight of at least two different copolymerizable condensible comonomers or the prepolymer prepared from the condensation of such comonomers, the copolymerizable condensible comonomers forming the polymeric backbones of said graft copolymers and the copolymerizable macromolecular monomers forming linear polymeric sidechains of said graft copolymers, wherein:
  - (a) the polymeric backbones of the graft copolymer are comprised of polymerized units of at least two different condensible difunctional comonomers, said condensible comonomers being comprised of at least one comonomer of the formula:

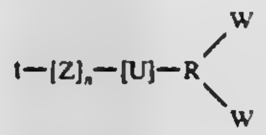
(i) X-L-X

wherein X is selected from the group consisting of $-CO_2H$, $-COCl$, $-CO_2R''$, $-NCO$, $-SO_2Cl$ and $-OCOCl$, wherein R″ is an alkyl group; and L is an aliphatic, aryl or aralkyl group; and at least one other comonomer of the formula:

(ii) Y-M-Y

wherein Y is selected from the group consisting of $-OH$, $-NH_2$, and $-SH$, and M is an aliphatic, aryl or aralkyl group; and

- (b) the linear polymeric sidechains of the graft copolymer are comprised of macromolecular monomers having a substantially uniform molecular weight distribution such that the the ratio of Mw/Mn is less than about 1.1, said macromolecular monomers being represented by the formula



$$\mathrm{I}-[\mathrm{Z}]_n-[\mathrm{U}]-\mathrm{R}\begin{matrix}\diagup \mathrm{W}\\ \diagdown \mathrm{W}\end{matrix} \qquad \text{(iii)}$$

wherein I is the residue of an alkali metal alkyl or alkali metal alkoxide monofunctional anionic initiator; Z represents a polymerized unit of at least one anionically polymerizable monomer; U is a capping agent which is the reaction product of a compound that is capable of reacting with the carbanion of a living polymer to produce an anion of sufficiently lower basicity than the carbanion of the original living polymer so as not to substantially react with the difunctional groups, W, of a halogen containing terminating agent, from which the terminal moiety is formed, but sufficiently reactive to react with the halogen on the terminating agent; R is an aliphatic, aryl or aralkyl group; W is a member selected from the group consisting of $-CO_2H$, $-COCl$, $-CO_2R'$, $-NCO$, $-SO_2Cl$, $-OCOCl$, $-OH$, $-NH_2$ and $-SH$, wherein R′ is an alkyl group; and *n* is a positive integer such that the molecular weight of the macromolecular monomers is in the range of from about 2,000 to about 50,000; said macromolecular monomers being chemically joined to the backbone copolymer by condensation copolymerization of the W groups on said macromolecular monomers and the two different difunctional comonomers.

4,110,413
THERMOPLASTIC HIGH ACRYLONITRILE RESINS

George A. Kuhar, Greensburg, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 553,776, Feb. 27, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,360

Int. Cl.^{2} C08L *33/20*

U.S. Cl. 260—879 **6 Claims**

1. In a method of polymerizing high acrylonitrile resins in suspension polymerization systems wherein the polymerization system contains acrylonitrile in a concentration of from 90 to 100 parts, water in a concentration of from 150 to 300 parts, and a comonomer in a concentration of from 0 to 10 parts, the improvement comprising the addition of a finely divided resin to said polymerization system having a particle size in the range of about 50 to about 200 U.S. Standard mesh selected from the group consisting of acrylonitrile/butadiene/styrene resins, and styrene/acrylonitrile resins in a concentration of from 1.5 to 90 parts by weight to act as a suspending agent during the polymerization and as a processing aid in the finished high acrylonitrile resin.

4,110,414
THERMOPLASTIC POLYMER BLENDS OF ETHYLENE-PROPYLENE (EP) COPOLYMER WITH POLYETHYLENE

Geoffrey Andrew Lindsay, Hudson, and Paul Thomas Stricharczuk, Solon, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 1, 1976, Ser. No. 719,487

Int. Cl.^{2} C08L *23/16*

U.S. Cl. 260—897 A **6 Claims**

1. A thermoplastic polymer blend comprising (1) an EP copolymer consisting essentially of interpolymerized units of about 65 to about 75 percent by weight of ethylene and about 25 percent to about 35 percent by weight of propylene, said polymer having a Mooney Viscosity (ML-4 at 150° C.) of from about 30 to about 80 and a methylene run index of over about 20/1 and (2) from about 5 parts to about 200 parts by weight per 100 parts by weight of the EP copolymer of a polyethylene polymer having a density of about 0.91 to 0.94 grams/cc.

4,110,415
METHYLOL PHOSPHONATES AND PROCESS FOR MAKING SAME

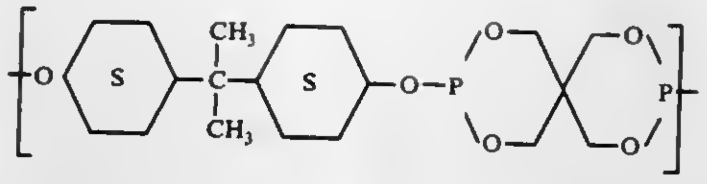
Eugene Joseph Boros, South Charleston, and Anthony Joseph Papa, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 645,133

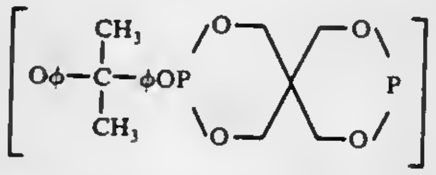
Int. Cl.^{2} C07F *9/40;* **C08J** *9/00*

U.S. Cl. 260—953 **10 Claims**

4. A process for producing polymethylol polyphosphonates which comprises reacting formaldehyde with a trisubstituted phosphite selected from the group consisting of heptakis (dipropylene glycol) triphosphite; tris (dipropylene glycol) phosphite; diisodecyl pentaerythritol diphosphite; distearyl pentaerythritol diphosphite; bis (neopentylglycol)1,4-cyclohexanedimethylene phosphite; dineodyl pentaerythritol diphosphite; bis neopentylglycol triethyleneglycol diphosphite; diphenylpentaerythritol diphosphite; tetra (diphenylphosphite) pentaerylthritol tetrakis (nonylphenyl) polypropyleneglycol diphosphite; a polyphosphite characterized by the following repeating units:



a polyphosphite characterized by the following repeating units:



and mixtures thereof, the reaction being carried out in the presence of a polyol as a protic solvent when the trisubstituted phosphite does not contain polyhydroxyl functionality.

8. The process of claim 4 wherein the polyol is present in an amount sufficient to introduce at least two hydroxyl groups per molecule of the trisubstituted phosphite.

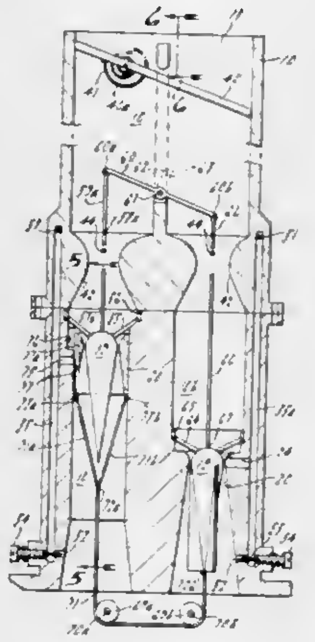
4,110,416
SONIC THROTTLE FOR AUTOMOBILE

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 16, 1977, Ser. No. 807,099

Int. Cl.^{2} F02M *9/14*

U.S. Cl. 261—23 A **15 Claims**



1. In a fuel supply means for an automobile engine, inlet induction passage means, fuel supply means for supplying fuel to said passage means, said passage means having upstream inlet means for receiving air and having two downstream outlet conduits for discharging a fuel-air mixture, means defining a part of each outlet conduit downstream of said fuel supply means comprising an orifice member and an associated closure member arranged for relative movement with respect to each other axially of their associated conduit, each orifice member having an orifice for conducting the flow of said mixture therethrough, each closure member being cooperable with its associated orifice member to effect a variable restriction for the associated orifice in accordance with the relative axial positions of said members, and means for effecting said relative movement to decrease or increase the restrictions of the two orifices in unison comprising means for connecting the orifice member in one outlet conduit with the closure member in the other outlet conduit for moving one of the last named

two members in the direction of the mixture flow in the associated outlet conduit and for simultaneously moving the other of the last named two members oppositely to the direction of the mixture flow in the associated outlet conduit.

4,110,417
VARIABLE VENTURI TYPE CARBURETOR

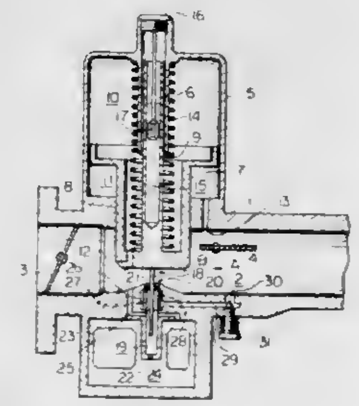
Masami Konishi, Toyota; Norihiko Nakamura, Mishima; Takaaki Itou, and Kazuo Kikuchi, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 18, 1977, Ser. No. 778,964

Claims priority, application Japan, Dec. 29, 1976, 51-159469

Int. Cl.^{2} F02M *9/06*

U.S. Cl. 261—39 A **14 Claims**



1. A variable venturi type carburetor of an internal combustion engine, comprising:
- a housing;
- a bore extending through said housing and having an inner wall defining an intake passage;
- a suction piston movably mounted in said housing and having a bottom end face projecting into said intake passage, said bottom end face of said suction piston and said inner wall of said intake passage defining a venturi, said suction piston moving up and down in response to a change in the vacuum produced in said intake passage downstream of said venturi for maintaining the velocity of air flowing into said venturi at a constant value;
- a jet disposed on the inner wall of said intake passage at a position facing said bottom end face of said suction piston;
- a needle fixed into said bottom end face of said suction piston and entering into said jet, said jet and said needle defining an annular opening through which fuel is injected into said intake passage;
- a fuel reservoir in said housing;
- a fuel supply passage disposed in said housing and communicating said fuel reservoir with said jet;
- a vacuum passage communicating said fuel reservoir with said venturi downstream of said needle for producing a vacuum in said fuel supply passage;
- an air bleed passage communicating said fuel supply passage with the atmosphere; and
- a bubble generating pipe made of sintered metal being disposed in said fuel supply passage at a position in which said air bleed passage opens into said fuel supply passage for creating fine bubbles of air in the fuel contained in said fuel supply passage.

4,110,418
COIL PACKING

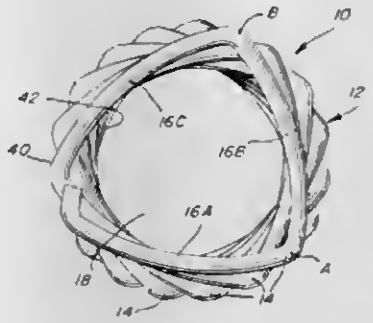
Ted Martin, 927 Castlewood Ter., Chicago, Ill. 60640

Filed May 13, 1977, Ser. No. 796,558

Int. Cl.^{2} B01D *53/20, 47/14*

U.S. Cl. 261—98 **7 Claims**

1. The combination of a tower for bringing about contact between a liquid and a gas, said tower having a first inlet and a first outlet for said liquid and a second inlet and a second outlet for said gas, and a packing comprising a continuous coil having at least three turns, each of said turns having at least three sides, each turn of said packing being rotatably offset relative to each adjacent turn, and said coil defining an opening between the sides of each turn.



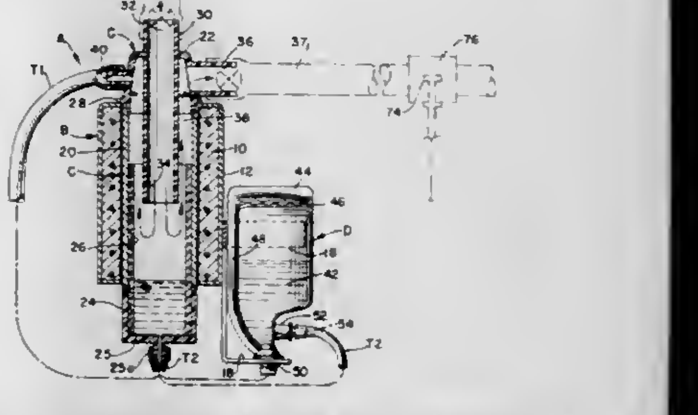
4,110,419
HIGH-VOLUME DISPOSABLE AND SEMI-DISPOSABLE CARTRIDGE HUMIDIFIER WITH SELF-CONTAINED CARTRIDGE STERILIZING MEANS, AND RELATED METHOD

Kenneth G. Miller, Elk Grove Village, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 569,490, Apr. 18, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 826,119

Int. Cl.^{2} A61M *15/00*

U.S. Cl. 261—142 **4 Claims**



1. Cartridge type humidifying apparatus for use with a heating means for humidifying and heating a breathable gas to be inhaled by a patient undergoing inhalation thereapy, said apparatus comprising in combination:
- (a) humidifier cartridge module means embodying a tubular cartridge main body portion with an inner peripheral wall;
- (b) said humidifier cartridge module means also including an upper end portion with cap means attached to said main body;
- (c) said humidifier cartridge module means including a lower end portion terminating in a transverse wall and adapted and constructed to retain a humidifying liquid, said transverse wall having liquid inlet means adapted to be fluidly connected via conduit means with a liquid outlet means of an external liquid source;
- (d) said humidifier cartridge module means further comprising liquid absorption means including an open center generally tubular liquid-absorption column member with an inner peripheral face constituting an evaporating surface for humidifying liquid disposed generally contiguously and coextensive with a substantial part of said cartridge main body and said lower end portion adapted and constructed to be wetted directly by the humidifying liquid when liquid is in said lower end portion, and to convey by capillary action the liquid upwardly of said absorpting means and onto said evaporating surface;
- (e) said upper end portion cap means of said humidifier

cartridge module means of paragraph (b) together with a portion of said main body providing an air space above the humidifying liquid level in said lower end portion of said paragraph (c) when liquid is in said lower end portion;

(f) said cap means including a breathable gas inlet feed pipe for directing gas to be humidified into said module and terminating in said main body;

(g) said cap means further including an outwardly projecting humidified breathable gas outlet delivery pipe in fluid communication with said air space, said delivery pipe adapted to be connected with an output delivery tube leading to a patient.

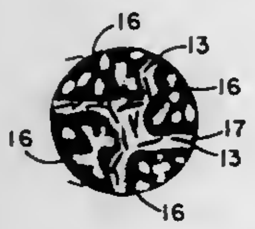
4,110,420
METHOD FOR EXTRUDING POROUS IRRIGATION PIPE

James E. Turner, Southlake, Tex., assignor to Cry Baby, Inc., Houston, Tex.

Division of Ser. No. 445,866, Feb. 26, 1974, Pat. No. 4,003,408. This application Jun. 25, 1976, Ser. No. 699,885

Int. Cl.^{2} B29D *27/00;* **B29H** *1/10*

U.S. Cl. 264—41 **3 Claims**



1. A method of extruding porous irrigation pipe and the like comprising:

forming a mixture of granular elastomeric material having residual moisture therein and a plasticizable binder material,

feeding the mixture into and through an extruder to plasticize said binder material,

extruding said pipe from said extruder with said residual moisture being vaporized and with said binder material interlocking the granules of said elastomeric material to form labyrinth-type channel-like apertures in said pipe as said mixture is extruded, and

maintaining said elastomeric material in granular form during the extrusion of said pipe.

4,110,421
CATALYTIC PROCESS FOR THE PREPARATION OF PHOSPHAZENE POLYMERS

Ronald L. Dieck, and Alan B. Magnusson, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 12, 1976, Ser. No. 731,745

Int. Cl.^{2} C01B *25/10*

U.S. Cl. 423—300 **5 Claims**

1. The process for preparing a phosphazene polymer which comprises heating a cyclic compound of the formula $(NPCl_2)_y$, where y is 3, 4, or mixtures thereof at 140°-250° in an inert atmosphere with a catalytically sufficient amount of a compound having the formula $N_3P_3Cl_z(OR')_{6-z}$ wherein R' is C_1 to C_{10} linear or branched alkyl, C_1 to C_{10} substituted linear or branched alkyl, the substituent selected from the group consisting of halogen, nitro, C_1 to C_{10} alkyl, C_1 to C_{10} alkoxy, C_6 to C_{10} aryl and C_6 to C_{10} aryloxy radicals and z equals 0 to 5.

4,110,422
PRODUCTION OF STABILIZED WET PROCESS PHOSPHORIC ACID

Richard Newton Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 683,756, May 6, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,319

Int. Cl.^{2} C01B *25/16*

U.S. Cl. 423—317 **16 Claims**

1. The method of preparing a wet process phosphoric acid substantially free from post-precipitation that includes the steps:

(a) to a wet process phosphoric acid having a P_2O_5 content of 22 to 35 weight percent from which the suspended solids have been removed, adding 0.05 to 2.0 weight percent of an aluminum silicate material based on the contained weight of P_2O_5 in the acid to provide an aluminum silicate material-acid mix; said aluminum silicate material being finely divided so as to be soluble in the phosphoric acid as the concentration of the acid is increased from 22-35 weight percent P_2O_5 to 42-52 weight percent P_2O_5;

(b) concentrating the aluminum silicate material-acid mix to said 42-52 weight percent P_2O_5 in an evaporation zone thereby to provide an aluminum silicate material/acid solution;

(c) transferring the concentrated solution to a crystallizing zone having an overflow stream and an underflow stream;

(d) recovering the overflow stream as wet-process phosphoric acid substantially free of post precipitation.

4,110,423
PRODUCTION OF CHLORINE AND AMMONIA

Roger Jean Botton, Saint-Fons, France, assignor to Societe RHONE-PROGIL, Paris, France

Continuation of Ser. No. 294,386, Oct. 2, 1972, abandoned. This application Feb. 14, 1975, Ser. No. 549,871

Claims priority, application France, Oct. 4, 1971, 71.35662

Int. Cl.^{2} C01C *1/02*

U.S. Cl. 423—356 **7 Claims**

1. A solid reaction mass for the preparation of chlorine and ammonia by contact with ammonium chloride comprising iron oxide which is capable of chemically combining with chlorine during contact of the reaction mass with ammonium chloride and sodium chloride, with the ratio of the iron oxide and sodium chloride being such that the ratio of the chlorine chemically combined with the iron to the chlorine chemically combined with the sodium is less than 1.

4,110,424
PROCESS FOR THE PRODUCTION OF CYANIC ACID AND CARBOXAMIDES

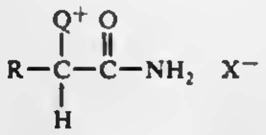
Howard C. Haas, Arlington, Mass., and Robert D. Moreau, Nashua, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 627,373, Oct. 30, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,571

Int. Cl.^{2} C01B *21/12;* **C01C** *3/14;* **C07D** *211/00, 401/00*

U.S. Cl. 423—365 **18 Claims**

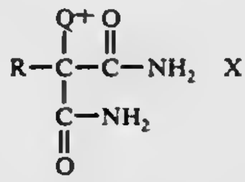
1. A process for producing cyanic acid and a carboxamide of the following structure



$$R-\underset{\displaystyle H}{\overset{\displaystyle Q^+}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-NH_2 \quad X^-$$

where R is selected from the group consisting of hydrogen and n-alkyl groups containing from one to twenty carbon atoms inclusive, Q is selected from the group consisting of tertiary aliphatic substituted ammonium groups, pyridinium, substituted pyridinium, quinolium, isoquinolinium and polymeric substituted pyridinium when R is hydrogen and from the group consisting of pyridinium, substituted pyridinium, isoquinolinium, and polymeric substituted pyridinium groups when R is alkyl, and X is selected from the group consisting of bromide, chloride and iodide

which comprises heating a compound of the structure



$$R-\underset{\displaystyle \underset{\displaystyle \overset{\|}{O}}{C}-NH_2}{\overset{\displaystyle Q^+}{C}}-\overset{\displaystyle O}{\overset{\|}{C}}-NH_2 \quad X^-$$

at a temperature where cyanic acid is produced.

4,110,425
FORM RETAINING HYDROGEN-STORING MATERIAL

Horst Bühl, Weinstadt, and Susanne Will, Esslingen, both of Germany, assignors to Deutsche Automobilgesellschaft GmbH, Hanover, Germany

Filed Nov. 8, 1976, Ser. No. 740,069

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550584

Int. Cl.^{2} C01B *1/32, 1/35*

U.S. Cl. 423—648 R **20 Claims**

1. In a hydrogen-storing composition including hydrogen-storing material consisting of metals or alloys which are comminuted when used reversibly as a hydrogen-storing medium by alternating absorption and desorption with hydrogen gas, the improvement whereby the composition is made from retaining, wherein:

said hydrogen-storing material in the form of granules having a grain size of 5-200 microns is bound in a shaped form with a plastic having a desired adhesion or binding strength said plastic being present in an amount sufficient to bind said granules with sufficient strength without significantly affecting the hydrogen absorbing and desorbing properties thereof.

4,110,426
METHOD OF TREATING SKIN AND HAIR WITH A SELF-HEATED COSMETIC

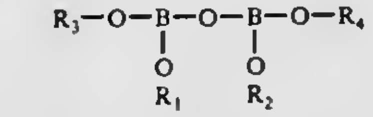
James Douglas Barnhurst, Millington, and Durland Karl Shumway, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 382,066, Jul. 24, 1973, abandoned, which is a continuation of Ser. No. 56,244, Jul. 17, 1970, abandoned, which is a continuation of Ser. No. 560,055, Jun. 24, 1966, abandoned. This application Mar. 4, 1976, Ser. No. 663,941

Int. Cl.^{2} A61K *9/14, 7/15, 7/48*

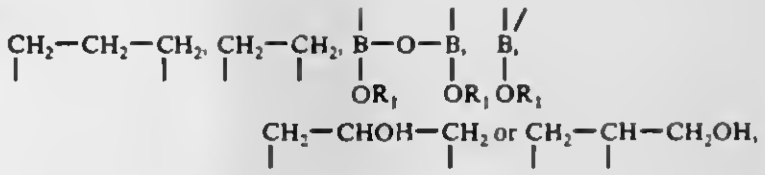
U.S. Cl. 424—46 **8 Claims**

1. A method of treating skin and hair with a self-heated cosmetic composition devoid of any substance capable of reaction with the boron compound defined below and selected from the group consisting of skin cleaner, skin cream, skin lotion, shampoo, shaving preparation and after-shave preparation comprising contacting the skin and hair, in the presence of water, with said composition containing about 20 to about 80% by weight of a boron compound of the formula:



$$R_3-O-\underset{\underset{\displaystyle R_1}{\displaystyle O}}{\underset{|}{B}}-O-\underset{\underset{\displaystyle R_2}{\displaystyle O}}{\underset{|}{B}}-O-R_4$$

wherein R_1, R_2, R_3 and R_4 are individually C_{2-8} alkyl, acetyl, mononuclear aryl, mononuclear aralkyl, mononuclear aroyl, cycloalkyl, or an ethoxylated derivative thereof, or R_1 and R_3 collectively or R_2 and R_4 collectively are:



$$\underset{|}{CH_2}-CH_2-\underset{|}{CH_2},\ \underset{|}{CH_2}-\underset{|}{CH_2},\ \underset{\displaystyle OR_1}{\overset{|}{\underset{|}{B}}}-O-\underset{\displaystyle OR_1}{\overset{|}{\underset{|}{B}}},\ \underset{\displaystyle OR_1}{\overset{|/}{\underset{|}{B}}},$$

$$\underset{|}{CH_2}-CHOH-\underset{|}{CH_2} \text{ or } \underset{|}{CH_2}-\underset{|}{CH}-CH_2OH,$$

to collectively form cyclic compounds.

4,110,427
POWDERED SOLID AEROSOL COMPOSITION AND METHOD OF MANUFACTURE

Edwin F. Kalat, Thomaston, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Apr. 14, 1976, Ser. No. 677,075

Int. Cl.^{2} A61K *9/14*

U.S. Cl. 424—46 **13 Claims**

1. A water-based composition for carrying a powdered particulate solid, which is insoluble in both water and a carrier liquid, to be dispensed from a pressurized aerosol container as a spray, said composition comprising:

A. at least 20 percent water measured by the weight of the composition;

B. at least 15 percent powdered particulate solid, measured by the weight of the composition;

C. an anhydrous carrier liquid including a condensed aerosol hydrocarbon propellant gas that constitutes at most 50 percent of the composition measured by the weight thereof; and

D. an emulsifying agent for forming an emulsion of said water and said carrier liquid in which the powdered particulate solid particles are dispersed.

4,110,428
ANTIPERSPIRANT COMPOSITION

Johannes Andries Kuhn, Illovo Beach, and Randolph James Wilkinson, Durban North, both of Natal, South Africa, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 525,267, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 124,453, Mar. 15, 1971, abandoned. This application Aug. 12, 1976, Ser. No. 713,775

Claims priority, application United Kingdom, Mar. 23, 1970, 13827/70

Int. Cl.^{2} A61K *9/14, 7/32*

U.S. Cl. 424—46 **1 Claim**

1. In an antiperspirant composition comprising a suspension of from 0.1 to 10% by weight of a finely divided aluminium chlorhydrate in a solution containing isopropyl myristate and a halogenated hydrocarbon aerosol propellant selected from the group consisting of difluorodichloromethane, fluorotrichloromethane, tetrafluorodichloroethane, trifluorotrichloroethane and mixtures thereof, the improvement which comprises replacing the isopropyl myristate with a colorless, water- and propellant-miscible compound having the general formula

$$C_4H_9(OC_nH_{2n})_xOH$$

wherein n is 2 or 3 and x represents the number of moles of ethylene oxide and 1,2-propyleneoxide respectively such that the viscosity of the compound is from about 660 to about 3520 Saybolt Universal Seconds at 100° F, wherein the ratio of the colorless water- and propellant- miscible compound to the aluminium chlorhydrate is such that when the amount of the colorless water- and propellant- miscible compound is from about 2.5 to about 7.5% by weight, the amount of the aluminium chlorhydrate is about 3.5% by weight.

4,110,429

ANTIBACTERIAL ORAL COMPOSITION

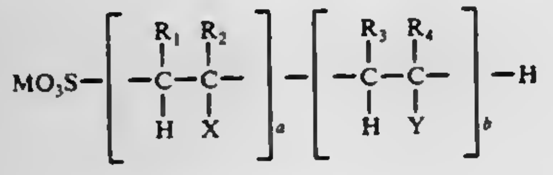
Abdul Gaffar, Somerset, and Stuart D. Friedman, Bound Brook, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,895

Int. Cl.^{2} A61K *17/22*

U.S. Cl. 424—54 **16 Claims**

1. An oral composition comprising an oral vehicle, at least one nitrogen-containing antibacterial antiplaque agent, whose use has been observed to lead to staining or discoloration of dental surfaces, selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of about 12 to 18 carbon atoms and as an anti-staining additive, present in a molar ratio, relative to said agent, of about 0.2:1 to about 6:1, of at least one water soluble oligomer of the formula



$$\mathrm{MO_3S}-\left[-\underset{H}{\overset{R_1}{C}}-\underset{X}{\overset{R_2}{C}}-\right]_a-\left[-\underset{H}{\overset{R_3}{C}}-\underset{Y}{\overset{R_4}{C}}-\right]_b-H$$

wherein

- M is a water soluble orally acceptable cation;
- R_1,R_2,R_3 and R_4 are independently H, methyl or ethyl;
- Y is at least one hydrophilic member of the group consisting of —$COOM_1$, —$CONH_2$, and —CH_2OH;
- X is at least one hydrophobic member of the group consisting of —CN, —$COOR_5OR$, —CONHR, —$COONHR_5$-COR, and —OOCR;
- M_1 is H or M;
- R is C_{1-8} alkyl;
- R_5 is C_{1-4} alkylene;
- a is 0–7; and
- $a+b$ is about 4–15.

4,110,430

A METHOD OF DEODORIZING

Rudolf Hopp; Wolfgang Sturm, both of Holzminden, and Fritz Steinfatt, Opladen, all of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Germany

Filed Jan. 22, 1975, Ser. No. 543,201

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1974, 2405004

Int. Cl.^{2} A61K *7/32*

U.S. Cl. 424—65 **5 Claims**

1. Method of deodorizing which comprises applying to the place to be deodorized an effective deodorising amount of a deodorising ingredient selected from the group consisting of p-isopropyl-α-methyl hydrocinnamic alcohol, p-tert. butyl-α-methyl hydrocinnamic alcohol and mixtures thereof.

4,110,431

WET WEATHER RESISTANT BINDER COMPOSITION FOR ADHERING A PLANT TREATMENT ADDITIVE POWDER FORMULATION TO PLANT FOLIAGE

Katashi Oita, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 12, 1976, Ser. No. 741,185

Int. Cl.^{2} A01N *9/10*

U.S. Cl. 424—78 **1 Claim**

1. A method for adhering an insoluble active formulation to plant surfaces comprising:

- applying to said surfaces, being wetted by rainfall of less than one inch per hour, a uniformly mixed dry powder combination of an effective amount of the water-insoluble formulation and a binder composition, said binder comprising,
- an inorganic metal salt that is water-soluble, selected from the group consisting of borax, chromic nitrate, cupric dichromate and cuprammonium hydroxide, and a polymer that is cold water-soluble having a cis diol structure selected from the group consisting of polyvinyl alcohol, quaternary ammonium derivative of guar gum and carboxymethylhydroxypropyl guar gum,
- whereupon the cis diol polymer and metal salt components of the binder dissolve in water on said plant surfaces and then react to form an insoluble matrix of the binder composition and insoluble formulation, which matrix adheres to said plant surfaces resistant to subsequent rainfall, said polymer and said metal salt being present in an amount to form said insoluble matrix upon contact with water.

4,110,432

CONJUGATES OF PROSTAGLANDINS, ANALOGS, FORMULATIONS AND THEIR USE

Samuel Wilkinson, Beckenham; Roderick John Flower, London, both of England, and Sergio Henrique Ferreira, Sao Paulo, Brazil, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

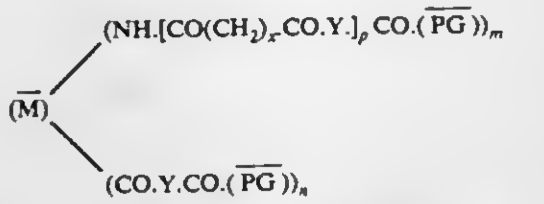
Filed Jun. 3, 1975, Ser. No. 583,458

Claims priority, application United Kingdom, Jun. 4, 1974, 24660/74; Dec. 13, 1974, 53986/74

Int. Cl.^{2} A61K *39/00, 31/215*

U.S. Cl. 424—85 **22 Claims**

1. A conjugate of formula (I)



(I)

wherein (M) is that part of the macromolecule other than the reactive free amino group of an immunogenic macromolecule of the formula (M)—NH_2:

- (PG) is the residue of a prostaglandin or analogue thereof of the formula (PG)-COOH selected from prostaglandins of the A, B, D and E series and those analogues thereof wherein there is retained the characteristic cyclopentane or cyclopentene group or wherein this group is replaced by a cyclohexane group;
- Y is selected from
  - (i) —$NH(CH_2)_aNH$— where a is 2 to 6;
  - (ii) —$NH(CH_2)_b1.Z.(CH_2)_b2.NH$— where $_b1$ and $_b2$ are the same or different and each is 1 to 4 and Z is —O—, —NH— or —CH(OH)—;
  - (iii) —$W.CO.CH_2.W^1$— where W and W^1 are the same or different and each is a group defined in (i) or (ii) above; or
  - (iv) —$NH.CH_2.CONH.CH_2.CO.W^2$ — where W^2 is a group defined in (i) or (ii) above;
- x is 2 to 4;
- m is at least 1 and is not greater than the number of free amino groups in the parent macromolecule of the group (M) available for acylation;
- p is 1; and
- n is 0 or an integer not greater than the number of carboxyl groups in the parent macromolecule of the group (M) available for reaction with the bis-amine H-Y-H;
- and where, when the sum of m and n is greater than 1 the groups (PG) may be the same or different.

4,110,433

EQUINE RHINOPNEUMONITIS VIRUS

Charles W. Purdy, III, St. Joseph, Mo., assignor to Philips Roxane, Inc., St. Joseph, Mo.

Filed Apr. 23, 1976, Ser. No. 679,840

Int. Cl.^{2} A61K *39/12;* **C12K** *7/00*

U.S. Cl. 424—89 **15 Claims**

1. A process for the production of an immunogenically active attenuated live equine rhinopneumonitis virus which comprises the steps of:

- (a) introducing a live virulent equine rhinopneumonitis virus into a Vero cell culture;
- (b) incubating the culture until the cellular cytopathology becomes evident;
- (c) harvesting a portion of the virus so produced and reintroducing the harvested virus into fresh tissue cultures;
- (d) repeating serial passage of the virus in tissue culture a sufficient number of times at a temperature within the range of from about 23° to about 33° C; to produce an immunogenically active live avirulent virus; and
- (e) recovering said virus from said tissue culture medium.

4,110,434

NOVEL IMMUNOLOGICAL ADJUVANTS, PROCESS FOR THEIR PRODUCTION AND COMPOSITIONS CONTAINING THEM

Pierre Jolles, Paris, and Daniéle Migliore-Samour, Kremlin-Bicetre, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

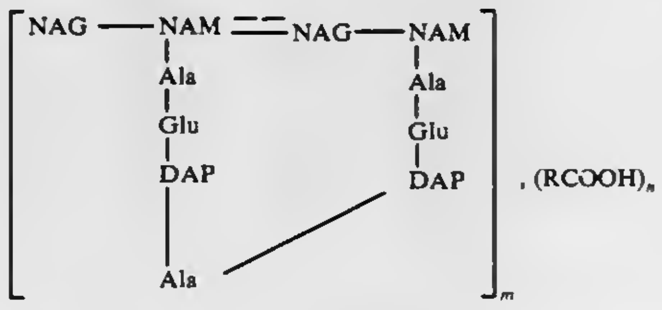
Filed Aug. 3, 1976, Ser. No. 711,193

Claims priority, application France, Aug. 5, 1975, 75 24440

Int. Cl.^{2} A61K *39/02;* **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 424—92 **18 Claims**

1. A novel derivative with immunological adjuvant activity obtained from hydrosoluble extracts of mycobacteria, with or without non-amino reducing sugars associated therewith, said derivative having the formula:



in which m is a whole number between 1 and 4 inclusive, n is a whole number at least 1 and R is an alkyl radical containing 9 to 17 carbon atoms.

4,110,435

ANTIBIOTIC A-28086 FACTOR D AND PROCESS FOR PRODUCTION THEREOF

Walter M. Nakatsukasa, Indianapolis, and Robert L. Hamill, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 661,185, Feb. 25, 1976, abandoned, which is a continuation of Ser. No. 569,719, Apr. 21, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,535

Int. Cl.^{2} A61K *35/00*

U.S. Cl. 424—122 **5 Claims**

1. A compound selected from the group consisting of (1) antibiotic A-28086 factor D which is a white crystalline compound when crystallized from acetone-water; which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone and benzene; but which is only slightly soluble in hexane; and which is insoluble in water; which melts at about 96°–98° C., and which has:

- (a) a molecular weight of 778, as determined by high-resolution mass spectrometry;
- (b) an approximate elemental composition of 67.59 percent carbon; 9.38 percent hydrogen, and 22.77 percent oxygen;
- (c) an empirical formula of $C_{44}H_{74}O_{11}$, as determined by high-resolution mass spectrometry;
- (d) a specific rotation of −56° (c = 0.1, methanol) when determined at 25° C;
- (e) an infrared absorption spectrum in chloroform with the following observable absorption maxima: 2.89, 3.39, 3.43, 3.50, 5.88 6.90, 7.27, 7.60, 7.84, 9.00, 9.26, 9.62, 10.31, 10,58, 11.10, and 11.49 microns;
- (f) no observable ultraviolet absorption in 95 percent aqueous ethanol;
- (g) a nuclear magnetic resonance spectrum in chloroform with the following characteristics: δ 6.00, 4.20, 4.10, 4.00, 3.98, 3.92, 3.86, 3.83, 3.79, 3.67, 3.64, 3.57, 3.54, 2.88, 2.81, 2.71, 2.62, 2.58, 2.48, 2.43, 2.37, 2.29, 2.21, 2.15, 2.10, 2.04, 1.97, 1.89, 1.83, 1.76, 1.68, 1.61, 1.58, 1.55, 1.47, 1.39, 1.30, 1.25, 1.18, 0.95, 0.90, 0.88, 0.84, 0.74, and 0.68 ppm;
- (h) a titratable group with a pK_a value of 8.67 in 80% aqueous dimethylformamide;
- (i) a characterisitic X-ray powder-diffraction pattern (Cu^{++} radiation, 1.5405 λ, nickel filter) having the following interplanar spacing in angstroms (d):

d	Relative Intensity
12.40	100
10.20	70
8.85	90
7.80	30
6.80	10
6.30	100
5.70	20
5.35	20
5.10	20
4.90	10
4.65	20
4.45	40
4.20	30
3.30	10
3.15	10
2.99	05
2.77	05
2.28	05

- (j) the following R_f values in the silica-gel thin-layer chromatographic systems indicated below, using Bacillus subtilis ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.26	Benzene-ethyl acetate (3:2)
0.66	Ethyl acetate-diethylamine (95:5)

- (k) the following R_f values in the paper chromatographic systems indicated below, using Bacillus subtilis ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.10	Water saturated with methyl isobutyl ketone (MIBK)
0.26	Water saturated with MIBK plus 2% p-toluenesulfonic acid and 1% piperidine
0.36	Water:methanol:acetone (12:3:1)-adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.29	1% MIBK, 0.5% NH_4OH in water
0.25	17.4 g. K_2HPO_4, 30 ml. ethanol per liter of water
0.26	Benzene saturated with water
0.09	Water
0.64	Water:MIBK:ethyl acetate

-continued

R_f Value	Solvent System
	(98:1:1)

(l) an acid function capable of forming salts and ester derivatives; and

(m) at least one hydroxyl group capable of esterification;

(2) the acetyl ester derivative of A-28086 factor D, which has a molecular weight of about 820, as determined by electron-impact mass spectrometry, an empirical formula of $C_{46}H_{76}O_{12}$, an elemental composition of approximately 67.32 percent carbon, 9.27 percent hydrogen, and 23.41 percent oxygen, an approximate R_f value of 0.54 on silica-gel thin-layer chromatography in ethyl acetate, and an infrared absorption spectrum as shown in FIG. 2 of the drawings; (3) the n-butyryl ester derivative of A-28086 factor D which has a molecular weight of about 848, as determined by electron-impact mass spectrometry, an empirical formula of $C_{48}H_{80}O_{12}$, an elemental composition of approximately 67.93 percent carbon, 9.43 percent hydrogen, and 22.44 percent oxygen, an approximately R_f value of 0.61 on silica-gel thin-layer chromatography in ethyl acetate, and an infrared absorption spectrum as shown in FIG. 3 of the drawings; (4) the physiologically-acceptable salts of A-28086 factor D; and (5) the physiologically-acceptable salts of the acetyl and n-butyryl ester derivatives of A-28086 factor D.

4,110,436

ANTIBIOTIC A-28086 FACTOR D AND PROCESS FOR PRODUCTION THEREOF

Walter M. Nakatsukasa, Indianapolis, and Robert L. Hamill, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 657,423, Feb. 12, 1976, abandoned, which is a division of Ser. No. 569,719, Apr. 21, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,536

Int. Cl.^{2} A61K *35/00*

U.S. Cl. 424—122 **10 Claims**

1. A method of preventing or treating coccidiosis in poultry which comprises administering to poultry an effective anticoccidial amount of a composition comprising: (1) a compound selected from the group consisting of antibiotic A-28086 factor D which is a white crystalline compound when crystallized from acetone-water; which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone and benzene; but which is only slightly soluble in hexane; and which is insoluble in water; which melts at about 96°-98° C., and which has:

(a) a molecular weight of 778, as determined by high-resolution mass spectrometry;

(b) an approximate elemental composition of 67.59 percent carbon; 9.38 percent hydrogen, and 22.77 percent oxygen;

(c) an empirical formula of $C_{44}H_{74}O_{11}$, as determined by high-resolution mass spectrometry;

(d) a specific rotation of −56° ($c = 0.1$, methanol) when determined at 25° C.;

(e) an infrared absorption spectrum in chloroform with the following observable absorption maxima: 2.89, 3.39, 3.43, 3.50, 5.88, 6.90, 7.27, 7.60, 7.84, 9.00, 9.26, 9.62, 10.31, 10.58, 11.10, and 11.49 microns;

(f) no observable ultraviolet absorption in 95 percent aqueous ethanol;

(g) a nuclear magnetic resonance spectrum in chloroform with the following characteristics: δ 6.00, 4.20, 4.10, 4.00, 3.98, 3.92, 3.86, 3.83, 3.79, 3.67, 3.64, 3.57, 3.54, 2.88, 2.81, 2.71, 2.62, 2.58, 2.48, 2.43, 2.37, 2.29, 2.21, 2.15, 2.10, 2.04, 1.97, 1.89, 1.83, 1.76, 1.68, 1.61, 1.58, 1.55, 1.47, 1.39, 1.30, 1.25, 1.18, 0.95, 0.90, 0.88, 0.84, 0.74, and 0.68 ppm;

(h) a titratable group with a pK_a value of 8.67 in 80% aqueous dimethylformamide;

(i) a characteristic X-ray powder-diffraction pattern (Cu^{++} radiation, 1.5405 λ, nickel filter) having the following interplanar spacings in angstroms (d):

d	Relative Intensity
12.40	100
10.20	70
8.85	90
7.80	30
6.80	10
6.30	100
5.70	20
5.35	20
5.10	20
4.90	10
4.65	20
4.45	40
4.20	30
3.30	10
3.15	10
2.99	05
2.77	05
2.28	05

(j) the following R_f values in the silica-gel thin-layer chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.26	Benzene-ethyl acetate (3:2)
0.66	Ethyl acetate-diethylamine (95:5)

(k) the following R_f values in the paper chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.10	Water saturated with methyl isobutyl ketone (MIBK)
0.26	Water saturated with MIBK plus 2% p-toluenesulfonic acid and 1% piperidine
0.36	Water:methanol:acetone (12:3:1)-adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.29	1% MIBK, 0.5% NH_4OH in water
0.25	17.4 g. K_2HPO_4, 30 ml. ethanol per liter of water
0.26	Benzene saturated with water
0.09	Water
0.64	Water:MIBK:ethyl acetate (98:1:1)

(l) an acid function capable of forming salts and ester derivatives; and

(m) at least one hydroxyl group capable of esterification;

the acetyl ester derivative of A-28086 factor D which has a molecular weight of about 820, as determined by electron-impact mass spectrometry, an empirical formula of $C_{46}H_{76}O_{12}$, an elemental composition of approximately 67.32 percent carbon, 9.27 percent hydrogen, and 23.41 percent oxygen, an approximate R_f value of 0.54 on silica-gel thin-layer chromatography in ethyl acetate, and an infrared absorption spectrum as shown in FIG. 2 of the drawings; the n-butyryl ester derivative of A-28086 factor D which has a molecular weight of about 848, as determined by electron-impact mass spectrometry, an empirical formula of $C_{48}H_{80}O_{12}$, an elemental composition of approximately 67.93 percent carbon, 9.43 percent hydrogen, and 22.44 percent oxygen, an approximate R_f value of 0.61 on silica-gel thin-layer chromatography in ethyl acetate, and an infrared absorption spectrum as shown in FIG. 3 of the drawings; the physiologically-acceptable salts of A-28086 factor D; and the physiologically-acceptable salts of the acetyl and n-butyryl ester derivatives of A-28086 factor D; and (2) a physiologically-acceptable carrier.

4,110,437

METHOD OF TREATING CANCEROUS CACHEXIA IN HUMANS WITH HYDRAZINE SULFATE

Joseph Gold, 127 Edgemont Dr., Syracuse, N.Y. 13214

Continuation-in-part of Ser. No. 558,255, Mar. 14, 1975, abandoned, which is a continuation of Ser. No. 413,036, Nov. 5, 1973, abandoned, which is a division of Ser. No. 372,097, Jun. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 198,995, Sep. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 861,176, Sep. 25, 1969, abandoned. This application Feb. 3, 1977, Ser. No. 765,362

Int. Cl.^{2} A61K *33/02*

U.S. Cl. 424—166 **6 Claims**

1. A method of retarding and reducing cancerous cachexia in a human so afflicted which comprises internally administering to said human hydrazine sulfate in an effective dosage sufficient to retard and reduce the cachexia and continuing its use in the absence of tumor reduction.

4,110,438

METHOD OF TREATING DEPRESSION

Max Gahwyler, Darien, Conn., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,373

Int. Cl.^{2} A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 **5 Claims**

1. A method of treating a patient suffering from stress induced depression comprising administering to said patient a therapeutically effective amount of luteinizing hormone-releasing hormone, or a therapeutically acceptable salt thereof.

4,110,439

AMINO GLYCOSIDE ANTIBIOTICS HAVING ANTIPROTOZOAL ACTIVITY

David J. Cooper, Downingtown, Pa.; Jay Allan Waitz, Fairfield, N.J.; Mae Counelis, New York, N.Y., and Jay Weinstein, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 618,647, Oct. 1, 1975, Pat. No. 4,049,796, which is a division of Ser. No. 389,774, Aug. 20, 1973, Pat. No. 3,915,955, which is a continuation-in-part of Ser. No. 48,017, Jun., 1970, abandoned. This application Dec. 20, 1976, Ser. No. 752,375

Int. Cl.^{2} A61K *31/71, 31/70*

U.S. Cl. 424—181 **6 Claims**

1. A method of treating protozoal infections which comprises administering to an animal having a protozoal infection a therapeutically effective quantity of a member selected from the group consisting of gentamicin A, gentamicin B, gentamicin B_1, gentamicin X, their non-toxic acid addition salts and mixtures thereof.

4,110,440

PESTICIDAL ORGANOPHOSPHORIC ACID ESTER ANHYDRIDES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, Tokyo; Kozo Shiokawa, Kanagawa, and Shinichi Tsuboi, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

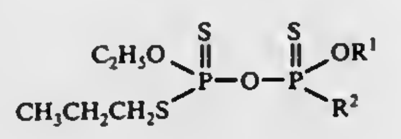
Filed Nov. 3, 1977, Ser. No. 848,415

Claims priority, application Japan, Nov. 5, 1976, 51/132478

Int. Cl.^{2} A01N *9/36;* C07F *9/165*

U.S. Cl. 424—207 **11 Claims**

1. An organophosphoric acid ester anhydride of the formula



in which

R^1 is alkyl with 1–6 carbon atoms, and

R^2 is alkoxy, alkylthio, alkylamino or dialkylamino.

2. A method of combating arthropods or nematodes, or to a habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

4,110,441

GAMMA-L-GLUTAMYL CHOLAMINE PHOSPHATE

Laszlo Feuer; Arpad Furka; Ferenc Sebestyen; Jolan Hercsel nee Szepespataky, and Erzsebet Bendefy nee Dobay, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 571,766, Apr. 25, 1975, abandoned. This application Jun. 16, 1976, Ser. No. 696,762

Claims priority, application Hungary, Apŕ. 29, 1974, FE 928; Mar. 26, 1975, CI 1558

Int. Cl.^{2} A01N *9/36;* C07F *9/09*

U.S. Cl. 424—211 **6 Claims**

1. A method of reducing the blood-sugar level and increasing the serum vitamin A level which comprises administering an effective amount of gamma-L-glutamyl cholamine phosphate.

3. A compound selected from the group which consists of gamma-L-glutamyl cholamine phosphate, beta-aspartyl cholamine phosphate and pharmaceutically effective salts thereof.

4,110,442

2-PHOSPHONOXY-4-TRIFLUOROMETHYLBENZOIC ACID DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

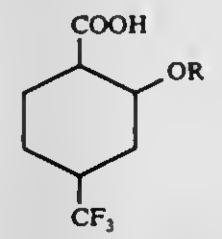
Emilia Francia Barra, and Antonio Carmelo Marin Moga, both of Barcelona, Spain, assignors to J. Uriach & Cia S.A., Barcelona, Spain

Division of Ser. No. 694,523, Jun. 10, 1976. This application Dec. 30, 1976, Ser. No. 755,851

Int. Cl.^{2} A01N *9/36;* C07F *9/09*

U.S. Cl. 424—212 **5 Claims**

1. The compound of the formula



in which R is phosphonoxy, and pharmaceutically acceptable salts thereof.

2. The method for the treatment and prophylaxis of a cardiovascular condition due to platelet aggregation, coagulation and fibrinolysis, the said method comprising the by oral administration per day of 200-300 mg of tbe effective agent of claim 1.

4,110,443

INSECTICIDAL O,S-DIHYDROCARBYL-N-HALOACYLPHOSPHOROAMIDOTHIOATES AND S,S-DIHYDROCARBYL-N-HALOACYLPHOSPHOROAMIDODITHIOATES

Philip S. Magee, Ignacio, Calif., assignor to Chevron Research Company, San Francisco, Calif.

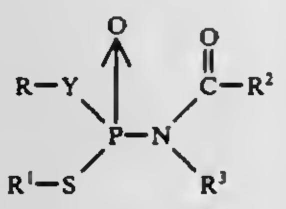
Division of Ser. No. 317,316, Dec. 21, 1972, Pat. No. 4,049,679, which is a continuation-in-part of Ser. No. 13,846, Feb. 24, 1972, Pat. No. 3,716,600, which is a continuation-in-part of Ser. No. 810,383, Mar. 25, 1969, abandoned. This application Jun. 10, 1977, Ser. No. 805,494

Int. Cl.^{2} A01N *9/36*

U.S. Cl. 424—212 **16 Claims**

1. A method for killing insects which comprises applying to

said insects an insecticidal amount of the compound of the formula



wherein R and R^1 individually are alkyl, alkenyl or alkynyl of up to 6 carbon atoms and R^2 is haloalkyl of 1 to 18 carbon atoms and of 1 to 4 fluorine, chlorine or bromine atoms, R^3 is hydrogen or alkyl of 1 to carbon atoms and Y is oxygen or sulfur.

4,110,444

THIOCARBAMATES

Hewitt G. Wight; Tracey G. Call, both of San Luis Obispo, and Marvin L. Mortensen, Altascadero, all of Calif., assignors to The California Polytechnic State University Foundation, San Luis Obispo, Calif.

Continuation-in-part of Ser. No. 579,449, May 21, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 773,064

Int. Cl.^{2} A61K *31/655;* **C09B** *25/00*

U.S. Cl. 424—226 **34 Claims**

1. A thiocarbamate of the formula: RNHCXSR'COOR" wherein

R is paraphenylazophenyl,

X is oxygen

R' is an alkylene radical, and

R" is hydrogen or an alkyl radical.

29. A method for increasing the resistance of erythrocytes in a mammal to hemolysis, which comprises:

systemically administering to said mammal an amount of a thiocarbamate of the formula: RNHCXSR'COOR" wherein

R is paraphenylazophenyl,

X is oxygen,

R' is an alkylene radical having from 1 to about 5 carbon atoms, and

R" is an alkyl radical having from 1 to about 10 carbon atoms, effective to increase the resistance of erythrocytes in said mammal to hemolysis.

4,110,445

METHOD FOR ANTAGONIZING ALDOSTERONIC ACTION AND INDUCING DIURESIS BY ADMINISTERING A TETRASUBSTITUTED IMIDAZOLIDINE

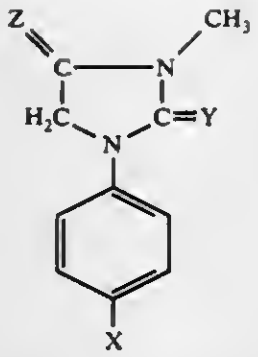
John William Hanifin, Jr.; Robert Zalmon Gussin, both of Suffern, and Elliott Cohen, Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 293,874, Oct. 2, 1972, Pat. No. 4,044,021, which is a continuation-in-part of Ser. No. 191,470, Oct. 21, 1971, abandoned. This application Apr. 20, 1977, Ser. No. 789,034

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—229 **9 Claims**

1. A method for antagonizing renal aldosteronic action and inducing diuresis in mammals by administering internally to said mammals an effective amount of a tetrasubstituted imidazolidine of the formula:



wherein X is selected from the group consisting of hydrogen and chlorine; Y and Z are each selected from the group consisting of NH, NCH_3 and O, with the proviso that both Y and Z are not O in the same compound; and the pharmaceutically acceptable salts thereof.

2. The method according to claim 1 wherein the tetrasubstituted imidazolidine is 1-(p-chlorophenyl)-2-imino-3-methyl-4-oxoimidazolidine.

9. The method according to claim 2 wherein said tetrasubstituted imidazolidine is administered in combination with another diuretic agent selected from the group consisting of bumetanide, thiazides, ethacrynic acid, furosemide and quinethazone.

4,110,446

METHOD OF TREATING MILK FEVER IN DAIRY CATTLE WITH 1,25-DIHYDROXYCHOLECALCIFEROL

Hector F. DeLuca, Madison, and Neal A. Jorgensen, Middleton, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 14, 1977, Ser. No. 815,587

Int. Cl.^{2} A61K *31/59*

U.S. Cl. 424—236 **6 Claims**

1. The method of treatment and prophylaxsis for milk fever disease in cattle which comprises administering to the cattle 1,25-dihydroxycholecalciferol in an amount sufficient to induce said treatment and prophylaxsis.

6. The method of treatment and prophylaxis for downer cow syndrome in cattle which comprises administering to the cattle 1,25-dihydroxycholecalciferol in an amount sufficient to induce said treatment and prophylaxis.

4,110,447

ANTI-INFLAMMATORY (HOLO-4-BIPHENYLYL)-ALKANOLAMINES

Joachim Gante; Hans-Adolf Kurmeier; Erich Schacht; Werner Mehrhof; Dieter Orth; Albrecht Wild, and Zdenek Simane, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 22, 1975, Ser. No. 624,762

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1974, 2450989; May 28, 1975, 2523565

Int. Cl.^{2} C07D *295/08;* **C07C** *91/06*

U.S. Cl. 424—244 **17 Claims**

1. An araliphatic nitrogen compound of the formula

$$R—C(OH)\,(CH_3)—CH_2—(CH_2)_n\text{-}Z$$

wherein R is 4-biphenylyl monosubstituted or polysubstituted by F, Cl and/or Br; Z is $—NR^1R^2$, R^1 and R^2 each are H or alkyl of 1–6 carbon atoms, or, collectively, are alkylene of 4–7 carbon atoms; and *n* is 0, 1 or 2, and their physiologically acceptable acid addition salts.

15. A method of treating inflammatory conditions which comprises administering systemically to the affected patient an anti-inflammatorily effective amount of a compound of claim 1.

4,110,448

TRICYCLIC SULPHOXIMIDES IN PHARMACEUTICAL COMPOSITIONS AND METHODS

Peter Stoss, Wildtal; Gerhard Satzinger, Denzlingen, and Manfred Herrmann, St. Peter, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

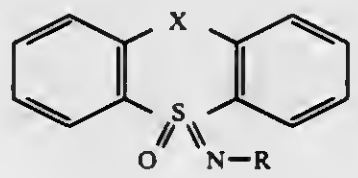
Division of Ser. No. 496,618, Aug. 12, 1974, Pat. No. 3,992,376. This application Aug. 31, 1976, Ser. No. 719,317

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1974, 2417063

Int. Cl.^{2} A61K *31/54, 31/38, 31/39, 31/385*

U.S. Cl. 424—247 **12 Claims**

1. A pharmaceutical composition for producing an anti-histaminic, anti-tussive, anti-inflammatory sedative, or diuretic effect in a mammal comprising a pharmaceutical carrier and a pharmaceutically effective amount sufficient for producing an anti-histaminic, anti-tussive, anti-inflammatory sedative or diuretic effect in a mammal of a tricyclic sulphoximide or pharmaceutical salt thereof of the formula:



wherein X is

$N—CH_3$,

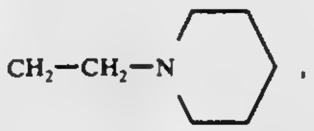
$N—CO—CH_3$, or

$N—H$;

wherein R is

$CH_2—CH_2—N(C_2H_5)_2$,

$CH_2—CH_2—CH_2—N(CH_3)_2$,



$CO—CH_2—CH_2—N(C_2H_5)_2$,

$CO—O—C_2H_5$,

$CO—NH—C_6H_{11}$,

$CS—NH—CH_2—CH{=}CH_2$, or

$CO—NH—SO_2—C_6H_4CH_3(p)$

4,110,449

2-SUBSTITUTED BENZISOTHIAZOL-3-ONES

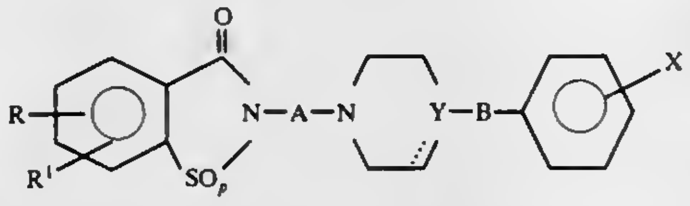
Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 23, 1977, Ser. No. 799,871

Int. Cl.^{2} A61K *31/495;* **C07D** *417/06*

U.S. Cl. 424—250 **23 Claims**

1. A compound of the structure



wherein R is hydrogen, halogen, lower alkyl, lower alkoxy, or nitro; R^1 is hydrogen, lower alkoxy or halogen, with the proviso that R^1 can be lower alkoxy or halogen only when R is lower alkoxy or halogen, respectively; X is hydrogen, halogen, lower alkyl, lower alkoxy, or trifluoromethyl; Y is C or N, where Y is C, represents a double bond, and when Y is N, represents a single bond, A is an alkylene group containing 2 to 5 carbons; and B is a single bond or an alkylene group containing from 1 to 3 carbons, and physiologically acceptable acid-addition salts thereof.

18. A composition which comprises a compound of claim 1 in a physiologically acceptable vehicle, said compound being present in an effective amount for treating an inflammatory condition.

4,110,450

1,2-DITHIOLE DERIVATIVES

Michel Barreau; Claude Cotrel, both of Paris, and Claude Jeanmart, Brunoy, all of France, assignors to Rhone-Poulenc Industries, Paris, France

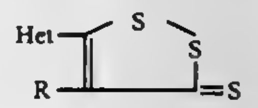
Filed Feb. 9, 1977, Ser. No. 766,966

Claims priority, application France, Feb. 10, 1976, 76 03604; Dec. 23, 1976, 76 38901

Int. Cl.^{2} A61K *31/495, 31/50, 31/505;* **C07D** *241/02*

U.S. Cl. 424—250 **7 Claims**

1. A 1,2-dithiole derivative of the formula:



wherein Het represents a pyrazin-2-yl radical, or a said pyrazin-2-yl radical substituted by a halogen atom, an alkyl radical of 1 through 4 carbon atoms, an alkoxy radical of 1 though 4 carbon atoms, the mercapto radical, an alkylthio radical of 1 through 4 carbon atoms, a dialkylamino group having 1 through 4 carbon atoms in each alkyl radical, or a pyrrolidin-1-yl, piperidino or morpholino radical, and R represents a halogen atom or an alkyl radical of 1 through 4 carbon atoms, an alkyl radical of 1 through 4 carbon atoms substituted by an alkoxycarbonyl group having 1 through 4 carbon atoms in the alkoxy radical, the carboxy radical, an alkoxycarbonyl group having 1 through 4 carbon atoms in the alkoxy radical, the carbamoyl radical, an N-alkylcarbamoyl group having 1 through 4 carbon atoms in the alkyl radical, or a group R_1-CH(OH)— in which R_1 represents hydrogen or an alkyl radical of 1 through 3 carbon atoms.

7. An antibiharzia pharmaceutical composition which comprises a 1,2-dithiole derivative as claimed in claim 1 in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,110,451

ANTIINFLAMMATORY IMIDAZOTHIAZOLES AND THIAZOLOPYRIMIDINES

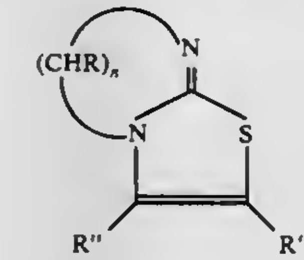
Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 650,318, Jan. 19, 1976, Pat. No. 4,041,167. This application Dec. 29, 1976, Ser. No. 755,276

Int. Cl.^{2} A61K *31/425, 31/505*

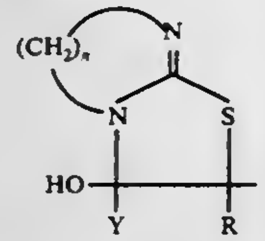
U.S. Cl. 424—251 **7 Claims**

1. A method of treating inflammation in an animal subject comprising administering to said subject a nontoxic antiinflammatory amount of a compound of the formula:



wherein *n* is 3; R is hydrogen or methyl; R' is hydrogen, C_1–C_3 alkyl or thioalkyl, phenyl, or carboxy methyl; and R" is C_1–C_4 alkyl, 2-benzofuranyl, naphthyl, phenyl, or mono- or disubstituted phenyl, or an acid addition or quaternary salt thereof.

5. A method of treating inflammation in an animal subject comprising administering to said subject a nontoxic antiinflammatory amount of a compound of the formula:



wherein *n* is 3; R is hydrogen or methyl; and Y is phenyl or p-chloro- or p-methoxyphenyl, or an acid addition or quaternary salt thereof.

4,110,452

PYRAZOLO (1,5-C) QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

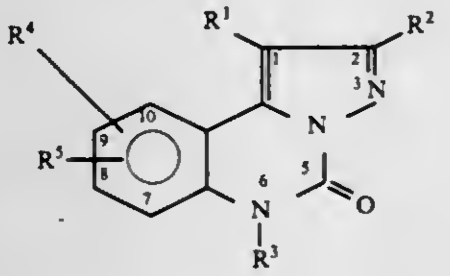
George C. Rovnyak, Hopewell, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 17, 1977, Ser. No. 842,776

Int. Cl.² C07D *487/04;* A61K *31/415, 31/505*

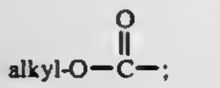
U.S. Cl. 424—251 **13 Claims**

1. Compounds of the structure



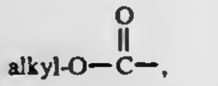
wherein

R¹ is alkylamino, dialkylamino, or



$$\text{alkyl-O}-\overset{O}{\overset{\|}{C}}-;$$

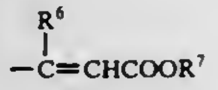
R² is alkylamino, dialkylamino, or



$$\text{alkyl-O}-\overset{O}{\overset{\|}{C}}-,$$

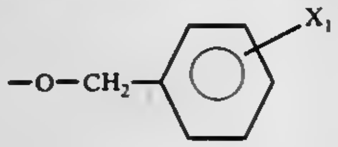
the alkyl moiety in the above R¹ and R² groups having from 1 to 8 carbons;

R³ is hydrogen, lower alkyl, benzyl, phenyl or phenyl substituted by a single R⁸ radical,



$$-\overset{R^6}{\overset{|}{C}}=CHCOOR^7$$

(wherein R⁶ is amino, alkylamino having 1 to 4 carbons, or dialkylamino having 1 to 4 carbons in each alkyl, and R⁷ is alkyl of 1 to 4 carbons), with the proviso that at least one of R¹ or R² is alkylamino or dialkylamino; p1 R⁴, R⁵ and R⁸ may be the same or different and are hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, hydroxy, alkanoyloxy of 2 to 5 carbons,



(wherein X_1 is hydrogen, lower alkoxy of 1 to 4 carbons), hydroxy, Cl, F, Br, CF_3 or NO_2,

and physiologically acceptable salts thereof.

13. A method for treating allergic conditions in mammals, which comprises administering to the mammalian host a therapeutic amount of a compound as defined in claim 1.

4,110,453

N-(2-PYRIMIDINYL)1H-(OR 2H)TETRAZOLE-5-CARBOXAMIDE DERIVATIVES FOR THE PREVENTION OF IMMEDIATE TYPE HYPERSENSITIVITY REACTIONS

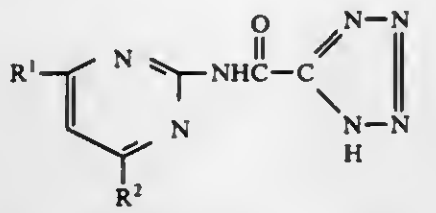
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,562, Mar. 23, 1976, Pat. No. 4,044,144, which is a continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Jul. 15, 1977, Ser. No. 815,973

Int. Cl.² A61K *31/505;* C07D *403/02*

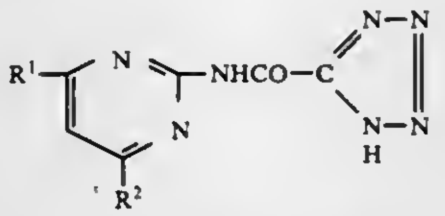
U.S. Cl. 424—251 **6 Claims**

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



in which R¹ and R² are independently hydrogen, cyano, lower alkyl, carbamyl, halo, (lower) alkylamino or di(lower) alkylamino, or a pharmaceutically acceptable salt thereof.

3. A compound of the formula:



in which R¹ and R² are independently hydrogen, cyano, lower alkyl, carbamyl, halo, (lower)alkylamino or di(lower) alkylamino, or a pharmaceutically acceptable salt thereof.

4,110,454

8H-PYRAZOLO[4',3':5,6]PYRIDO [3,4-E][1,2,4]TRIAZOLO-[1,5-A]PYRIMIDINES

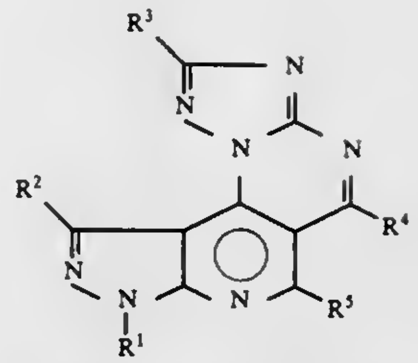
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 715,599, Aug. 18, 1976, Pat. No. 4,078,064. This application Jan. 9, 1978, Ser. No. 867,740

Int. Cl.² A61K *31/415;* C07D *471/22*

U.S. Cl. 424—251 **13 Claims**

1. A compound of the formula



wherein R¹ is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, benzoyl or substituted benzoyl wherein the benzoyl substituent is one or two halogens, lower alkyl or trifluoromethyl groups;

R² is hydrogen, lower alkyl or phenyl;

R³ is hydrogen, lower alkyl, phenyl, lower alkylthio or lower alkylsulfinyl;

R⁴ is halo, —S—R⁸, phenyl-lower alkoxy, lower alkoxy, phenyloxy, or substituted phenyloxy wherein the phenyl ring bears one or two halogen, lower alkyl or trifluoromethyl groups;

R⁵ and R⁸ each is hydrogen or lower alkyl;

and physiologically acceptable acid addition salts thereof.

12. A composition comprising about 10 to 300 mg. of a compound of claim 1 and a physiologically acceptable carrier therefor.

4,110,455

6-ARYL-S-TRIAZOLO-(4,3-A)-PYRIDO-(2,3-F)-1,4-DIAZEPINES

Walter von Bebenburg, Buchschlag; Norbert Schulmeyer, Morfelden, and Vladimir Jakovlev, Maintal, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

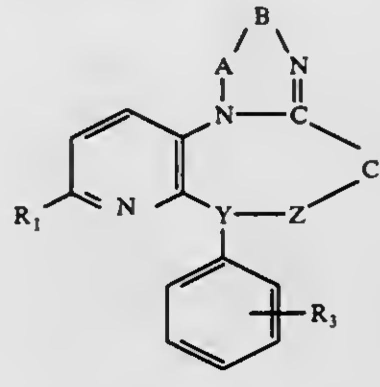
Filed Oct. 26, 1976, Ser. No. 735,894

Claims priority, application Austria, Nov. 4, 1975, 8372/75

Int. Cl.² A61K *31/44;* C07D *471/04*

U.S. Cl. 424—256 **14 Claims**

1. A 6-aryl-s-triazolo-(4,3-a)-pyrido-(2,3-f)-(1,4)-diazepine compound of the formula:



wherein R_1 is hydrogen, a halogen atom, an alkyl group with 1 to 6 carbon atoms, a hydroxy group, an alkoxy group with 1 to 6 carbon atoms, an amino group, an aliphatic acylamino group with 2 to 6 carbon atoms, a monoalkylamino group with 1 to 6 carbon atoms or a dialkylamino group with 1 to 6 carbon atoms in each alkyl group,

R_2 is hydrogen, an alkyl group with 1 to 6 carbon atoms, a hydroxy group, an acyloxy group with 2 to 6 carbon atoms, an alkoxy group with 1 to 6 carbon atoms a halogen atom, an amino group, an aliphatic acylamino group with 2 to 6 carbon atoms, a monoalkylamino group with 1 to 6 carbon atoms or a dialkylamino group with 1 to 6 carbon atoms in each alkyl group,

R_3 is hydrogen, an alkyl group with 1 to 6 carbon atoms, an alkoxy group with 1 to 6 carbon atoms or a halogen atom, the structural part A-B is the group —CO—NR_4,

wherein R_4 is hydrogen, an alkenyl group with 2 to 6 carbon atoms, an alkinyl group with 2 to 6 carbon atoms, a hydroxy-alkyl group with 1 to 6 carbon atoms, a ketoalkyl group with 1 to 6 atoms in the alkyl group, a cyanoalkyl group with 1 to 6 carbon atoms, an alkyl group with 1 to 6 carbon atoms, or an alkyl group of 1 to 6 carbon atoms substituted by an alkoxy group with 1 to 6 carbon atoms or a dialkylamino group with 1 to 6 carbon atoms in each alkyl group,

and Y-Z is the group >CH=N—, >C=N(→O), >CH—NH— or >CH—N(OH)—, their optical isomers and their pharmaceutically acceptable salts.

7. A method of relieving stress in a mammal comprising administering orally or parenterally to the mammal an amount of the composition of claim 1 sufficient to relieve stress.

4,110,456

4-SUBSTITUTED-2-ARYLIMIDAZOLES

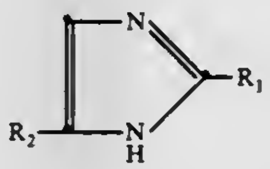
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 1, 1977, Ser. No. 773,248

Int. Cl.² C07D *471/02;* A61K *31/34*

U.S. Cl. 424—263 **4 Claims**

1. A compound having the formula:



wherein

R_1 is pyridyl,

R_2 is selected from the group consisting of C_1–C_5alkyl-S—, C_1–C_5alkyl-SO—, C_1–C_5alkyl-SO_2— and R_3R_4N-SO_2—, and

R_3 and R_4 are independently selected from H, C_1–C_5alkyl and hydroxy substituted C_2–C_5alkyl.

4. An antihypertensive composition comprising an effective amount of a compound selected from the group consisting of 2-(3-pyridyl)-4-methylsulfamoylimidazole and 2-(3-pyridyl)-4(5)-diethylsulfamoylimidazole.

4,110,457

BIS-ARYLALKYLAMINO-ARALKANES

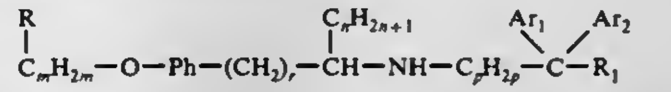
John Elsworth Francis, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 699,017, Jun. 23, 1976. This application Apr. 25, 1977, Ser. No. 790,530

Int. Cl.² A61K *31/44;* C07D *213/36*

U.S. Cl. 424—263 **8 Claims**

1. A 1-(azacyclic aralkoxyphenyl)-2 or 3-(bisarylalkylamino)-alkane of the formula



$$\overset{R}{\overset{|}{C_mH_{2m}}}-O-Ph-(CH_2)_r-\overset{C_nH_{2n+1}}{\overset{|}{CH}}-NH-C_pH_{2p}-\overset{Ar_1\ \ Ar_2}{\overset{\diagdown\ \diagup}{C}}-R_1$$

wherein R is unsubstituted 2-,3- or 4-pyridyl, or such radicals substituted by up to two members of lower alkyl, lower alkoxy or halogen, Ph is 1,3-or 1,4-phenylene, (lower alkyl)- 1,3- or 1,4-phenylene, (lower alkoxy)-1,3- or 1,4-phenylene, (halogeno)-1,3- or 1,4-phenylene or (trifluoromethyl)-1,3- or 1,4-phenylene, each of Ar_1 and Ar_2 is phenyl, (lower alkyl)-phenyl, (lower alkoxy)-phenyl, (halogeno)-phenyl or (trifluoromethyl)- phenyl, each of *m, n* and *p* is an integer from 1 to 4, *r* is the integer 1 or 2 and R_1 is hydrogen or hydroxy; or a therapeutically useful acid addition salt thereof.

4,110,458

N-(PYRIDYL) OXAMIC ACID DERIVATIVES

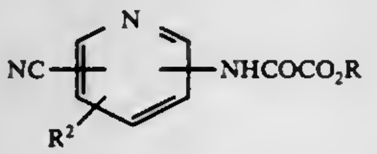
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,569, Mar. 23, 1976, Pat. No. 4,054,661, which is a division of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,615

Int. Cl.^{2} A61K *31/34;* C07D *213/57*

U.S. Cl. 424—263 **17 Claims**

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:

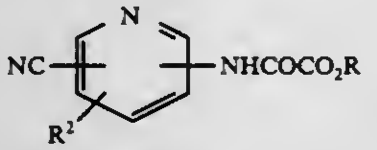


in which R is —H or lower alkyl;

R^2 is —H, lower alkoxy, lower halo or polyhalo(lower) alkyl;

or a pharmaceutically acceptable salt thereof.

3. A compound of the formula:



in which R is —H or lower alkyl;

R^2 is —H, lower alkoxy, lower alkyl, halo or polyhalo (lower)alkyl;

or a pharmaceutically acceptable salt thereof.

4,110,459

BENZOYLPIPERIDYLALKYLINDOLES IN ALLEVIATING PAIN

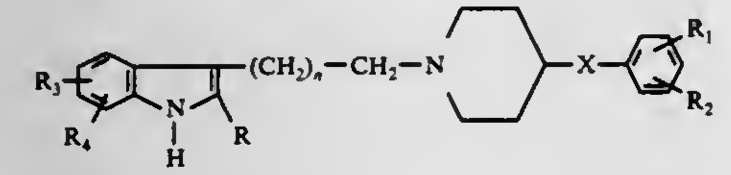
Grover C. Helsley, Pottersville; Joseph T. Strupczewski, Flemington, and Beth Ann Gardner, Stanhope, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 663,820, Mar. 4, 1976, Pat. No. 4,046,900, which is a continuation-in-part of Ser. No. 594,042, Jul. 8, 1975. This application Jan. 21, 1977, Ser. No. 808,513

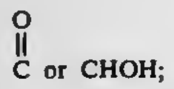
Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 **1 Claim**

1. A method of alleviating pain which comprises adminsitering to a patient an amount pharmaceutically effective for relieving pain of a compound of the formula



wherein X is



$\overset{O}{\overset{\|}{C}}$ or CHOH;

R is hydrogen or methyl; R_1 and R_2 are the same or different and stand for hydrogen, halogen, straight or branched chain alkyl of up to 5 carbon atoms, alkoxy of up to 5 carbon atoms, trifluoromethyl, hydroxy, phenoxy or phenyl; R_3 and R_4 are hydrogen or methoxy; *n* is the integer 1 or 2, or an acid addition salt thereof prepared from a pharmaceutically acceptable acid.

4,110,460

2,3-DIHYDRO-IMIDAZO[2,1-B]-THIAZOLE DERIVATIVES AND APPLICATIONS THEREOF

Jacques Louis Edouard Baetz, La Gareane, France, assignor to Metablo, France

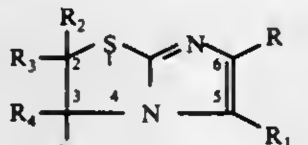
Filed Mar. 4, 1977, Ser. No. 774,497

Claims priority, application United Kingdom, Mar. 10, 1976, 9517/76

Int. Cl.^{2} C07D *277/60*

U.S. Cl. 424—270 **10 Claims**

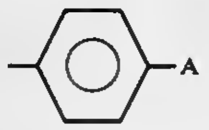
1. A compound selected from the group consisting of compounds of the formula:



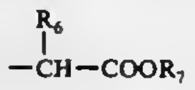
(I)

in which:

R represents a radical having the formula



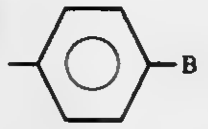
in which A is selected from a hydrogen atom; a chlorine atom; a bromine atom; a nitro group; a $C_{1\text{-}4}$ alkoxy group; a $C_{1\text{-}6}$ alkyl group; a phenyl group; a phenyl group substituted with a substituent selected from chlorine, bromine, nitro and $C_{1\text{-}4}$ alkoxy; and a group of the formula:



$-\overset{R_6}{\overset{|}{C}}H-COOR_7$

in which R_6 is selected from hydrogen and methyl, and R_7 is selected from hydrogen and $C_{1\text{-}6}$ alkyl;

R_1 is a group of the formula:



in which B is selected from chlorine, bromine and $C_{1\text{-}4}$ alkoxy,

R_2 is selected from hydrogen, methyl and phenyl,

R_3 is selected from hydrogen and methyl,

R_4 is selected from hydrogen and methyl,

R_5 is selected from hydrogen, methyl and ethyl,

and a pharmaceutically acceptable addition salt thereof.

4,110,461

EFFECT OF DIPHENYLHYDANTOIN AND RELATED COMPOUNDS ON GLAUCOMA

Bernard Becker; Robert L. Stamper, both of St. Louis, Mo.; Carl F. Asseff, Cleveland, Ohio, and Steven M. Podos, St. Louis, Mo., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Mar. 19, 1973, Ser. No. 342,703

Int. Cl.^{2} A61K *31/415*

U.S. Cl. 424—273 R **2 Claims**

1. A method of alleviating visual field loss associated with open-angle glaucoma in humans which comprises orally treating said humans suffering from glaucoma with diphenylhydantoin (DPH) administered in an oral daily dose of 200–900 mg in divided doses for 2–5 months.

4,110,462

N'-SULFENYL-N''-DIHALOPHENYLIMIDAZOLIDINEDIONES

Chiyozo Takayama, Toyonaka; Shigeo Yamamoto, Sanda; Toshiro Kato, Ibaraki; Yoshio Hisada, Kawanishi, and Akira Fujinami, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

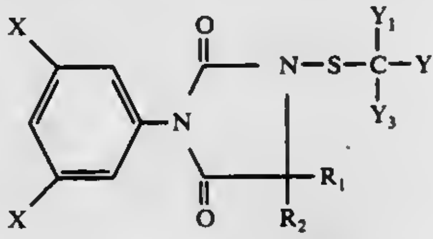
Filed Dec. 3, 1976, Ser. No. 747,109

Claims priority, application Japan, Dec. 22, 1975, 50-154513

Int. Cl.^{2} C07D *233/80;* A01N *9/12*

U.S. Cl. 424—273 R **5 Claims**

1. A microbicidal composition which comprises a microbicidally effective amount of a compound of the formula:



wherein X is a chlorine atom or a bromine atom, Y_1, Y_2 and Y_3 are each a chlorine atom or a fluorine atom and R_1 and R_2 are individually a hydrogen atom or a methyl group, and an inert carrier.

4,110,463

IMIDAZOLE-2-CARBAMATES

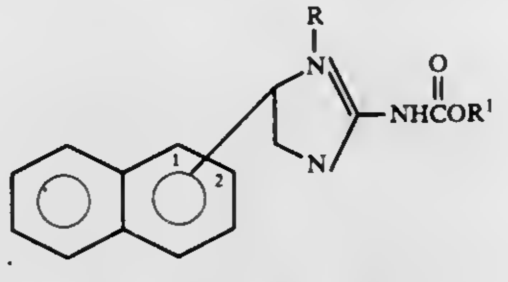
Colin C. Beard, Saratoga; Marshall B. Wallach, Mountain View, and Klaus Weinhardt, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 3, 1977, Ser. No. 803,016

Int. Cl.^{2} A61K *31/415;* C07D *233/46. 233/48*

U.S. Cl. 424—273 R **28 Claims**

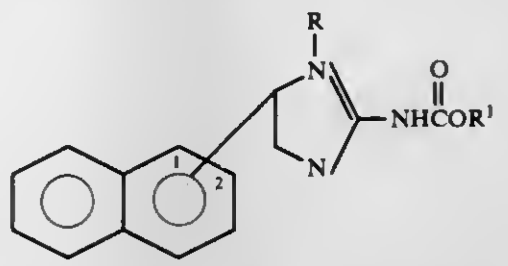
1. A compound chosen from those represented by the formula



(I)

wherein R is hydrogen or alkyl of 1 through 4 carbon atoms R^1 is alkyl of 1 through 6 carbon atoms, and the naphthyl group is attached at the 1- or 2- position of the naphthyl structure and the hydrogen anion addition salts thereof.

14. A method of producing a muscle relaxant effect in mammals which comprises administering an effective amount of at least one compound chosen from those represented by the formula



(I)

wherein R is hydrogen or alkyl of 1 through 4 carbon atoms, R^1 is alkyl of 1 through 6 carbon atoms, and the naphthyl group is attached at the 1- or 2- position of the naphthyl structure and the pharmaceutically acceptable salts thereof.

4,110,464

INDOLOPYRONES HAVING ANTIALLERGIC ACTIVITY

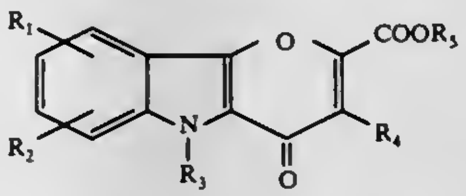
Richard E. Brown, Hanover, and Paul C. Unangst, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 611,453, Sep. 8, 1975, Pat. No. 4,028,383. This application Feb. 25, 1977, Ser. No. 772,036

Int. Cl.^{2} A61K *31/40*

U.S. Cl. 424—274 **6 Claims**

1. A method for the prevention of allergic and asthmatic reactions in mammals which comprises parenterally administering to said mammals an effective amount sufficient to prevent allergic and asthmatic reactions in mammals of a compound of the formula:



I

wherein R_1 and R_2 may be hydrogen, hydroxy, lower alkoxy or lower alkyl of 1 to 6 carbon atoms, halogen, trifluoromethyl, or taken together to form a methylenedioxy group; R_3 may be hydrogen, lower alkyl of 1 to 6 carbon atoms or phenyl; R_4 may be hydrogen, lower alkyl of 1 to 6 carbon atoms or halogen; and R_5 may be hydrogen or lower alkyl of 1 to 6 carbon atoms.

4,110,465

7-AMINO AND 7-ALKANOYLAMINO 2-OXO-3-PHENYLINDOLINES

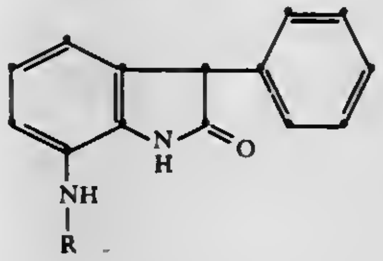
Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 25, 1977, Ser. No. 854,879

Int. Cl.^{2} A61K *31/40;* C07D *209/34*

U.S. Cl. 424—274 **6 Claims**

1. A compound of the formula



wherein R is H or $(C_1–C_3)$alkyl-CO.

4. A method of treating inflammation in a warm-blooded mammal which comprises administering to a warm-blooded mammal suffering from an inflammatory process an anti-

inflammatorially effective amount of a compound according to claim 1.

5. A method of treating vascular thrombosis in mammals which comprises administering to a mammal in need of such treatment an amount of a compound according to claim 1 effective for treating vascular thrombosis.

4,110,466

OXYINDOLE COMPOUND

Satoru Iooue, Nishinomiya; Tamon Uematsu, Toyonaka, and Norihisa Yamashita, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

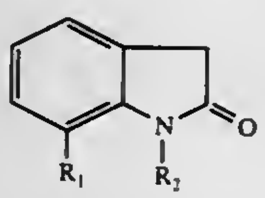
Filed Aug. 1, 1977, Ser. No. 820,942

Claims priority, application Japan, Aug. 10, 1976, 51-95877; Oct. 14, 1976, 51-123628

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—274 **6 Claims**

1. A method for controlling or preventing plant diseases caused by phytopathogenic fungi, which comprises applying to said fungi a fungicidally effective amount of a fungicidal composition which comprises a compound represented by the formula:



wherein R_1 is methyl, ethyl, chlorine, bromine or methoxy and R_2 is methyl or ethyl, and an inert carrier therefor.

4,110,467

PROPHYLACTIC, THERAPEUTIC OR HYGIENICAL AGENT AGAINST VIRUS DISEASES IN FISH AND USE THEREFOR

Tokuo Sano, Numazu; Takeo Oshima, Habikino, and Tokio Kamata, Hikooe, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 13, 1976, Ser. No. 751,327

Int. Cl.^{2} A61K *31/335, 33/34;* A01K *61/00*

U.S. Cl. 424—280 **4 Claims**

1. A method for preventing virus disease selected from the group consisting of Infectious Haematopoietic Necrosis, Viral haemorrhagic Septicemia, Infectious Pancreatic Necrosis, Nerka virus disease and viral epizootics in fish selected from the group consisting of Salmonid and eels, which comprises bathing said fish in 20 to 10,000 ppm aqueous solution of erythorbic acid or its sodium salt and a water-soluble salt yielding 0.0001 to 10 ppm Cu^{++} in said solution.

4,110,468

TROPONE DERIVATIVES AND THERAPUTIC USE THEREFOR

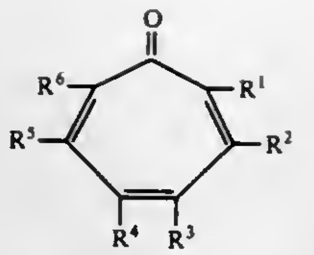
Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst, McKeana & Harrison Limited, Montreal, Canada

Division of Ser. No. 697,295, Jan. 17, 1976, Pat. No. 4,066,784. This application Oct. 7, 1977, Ser. No. 840,351

Int. Cl.^{2} C07C *153/09;* A61K *31/265*

U.S. Cl. 424—301 **6 Claims**

1. A compound of formula



(1)

in which R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different selected from the group consisting of hydrogen; halo, trifluoromethyl; lower alkoxy; lower alkyl; phenyl; hydroxy; phenoxy; mercapto; NR^7R^8 wherein each of R^7 and R^8 is hydrogen or lower alkyl; and a radical of formula $Y—CR^9R^{10}—COOR^{11}$ wherein Y is S, R^9 and R^{10} together are oxo and R^{11} is hydrogen or lower alkyl, with the proviso that one, two or three of R^1, R^2, R^3, R^4, R^5 and R^6 must be a radical of formula $Y—CR^9R^{10}—COOR^{11}$ wherein Y, R^9, R^{10} and R^{11} are as defined in each instance herein; or a therapeutically acceptable salt thereof.

5. A method for preventing or treating allergic conditions in a mammal which comprises administering to said mammal an allergy alleviating effective amount of a compound of claim 1, or a therapeutically acceptable salt thereof.

4,110,469

INSECTICIDAL N-(2,6-DICHLOROBENZOYL)-N'-(4-CYANOPHENYL) UREA

Kobus Wellinga, and Rudolf Mulder, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 625,126, Oct. 23, 1975, Pat. No. 4,013,717, which is a division of Ser. No. 354,393, Apr. 25, 1973, Pat. No. 3,933,908, which is a division of Ser. No. 143,668, May 14, 1971, Pat. No. 3,748,356. This application Dec. 29, 1976, Ser. No. 755,432

Claims priority, application Netherlands, May 15, 1970, 7007040

Int. Cl.^{2} A01N *9/20;* C07C *127/22*

U.S. Cl. 424—304 **3 Claims**

1. N-(2,6-dichlorobenzoyl)-N'-(4-cyanophenyl)urea.

2. An insecticidal composition comprising a finely divided inert carrier and an insecticidally effective amount of N-(2,6dichlorobenzoyl)-N'-(4-cyanophenyl) urea.

4,110,470

PHARMACEUTICAL COMPOSITION COMPRISING D,L-α-METHYL-THYROXINE ETHYL ESTER AND THE SALTS THEREOF AND THE CONTROL OF CHOLESTEROL AND TRIGLYCERIDE BLOOD LEVEL THEREWITH

Horst Kummer, Rheioecke 14, 67 Ludwigshafen am Rhein, and Ruediger Beckmann, Elsa-Brandstroem-Strasse 10, 51 Aacheo, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 38,647, May 22, 1970, Pat. No. 3,930,017, and Ser. No. 77,744, Oct. 2, 1970, abandoned, said Ser. No. 38,647, is a division of Ser. No. 584,089, Oct. 4, 1966, which is a continuation of Ser. No. 584,089,. This application Sep. 8, 1971, Ser. No. 178,780

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1965, 1493567

The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.

Int. Cl.^{2} A61K *31/24*

U.S. Cl. 424—309 **19 Claims**

1. A pharmaceutical composition suitable for controlling the cholesterol and triglyceride blood level in a human comprising D, L-alpha-methyl-thyroxine ethyl ester in a pharmaceutically acceptable carrier said ester being present in an amount sufficient to control the cholesterol and triglyceride blood level.

4,110,471

N-VINYLOXYETHYL-α-METHYL-β-PHENETHYLAMINES AS ALCOHOL INTAKE SUPPRESSING AGENTS

Bruce Wayne Horrom, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

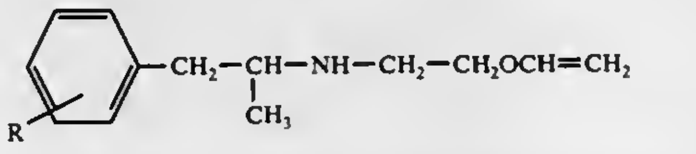
Filed Sep. 8, 1976, Ser. No. 721,614

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.^{2} A61K *31/135*

U.S. Cl. 424—330 **3 Claims**

1. A method of suppressing alcohol intake in mammals comprising administering a therapeutically effective amount of a compound of the formula



where R is H, halo, or CF_3 and acid addition salts thereof to said mammal.

4,110,472

DERIVATIVES OF 1-(DISUBSTITUTED PHENOXY)-3-AMINO-2-HYDROXYPROPANES

Rudolf Hiltmann; Arend Heise; Stanislav Kazda, and Friedrich Hoffmeister, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

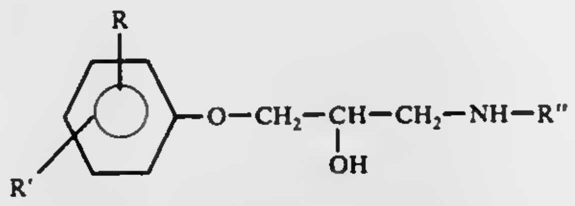
Filed Oct. 13, 1976, Ser. No. 732,118

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547524

Int. Cl.^{2} A01N *9/24;* C07C *93/06*

U.S. Cl. 424—330 **20 Claims**

1. A compound selected from the group consisting of a 1-(disubstituted phenoxy)-2-hydroxypropylamine derivative of the formula:



wherein

R is lower alkyl, lower alkenyl, lower alkoxy, or chloro;
R' is lower alkyl, lower alkenyl, lower alkoxy, or chloro;
R" is diphenylmethyl or fluoren-9-yl; and
the pharmaceutically acceptable acid addition salts thereof.

19. The method of combatting cerebrovascular insufficiency and producing psychostimulation in humans and other animals which comprises administering thereto an effective amount of a compound according to claim 1.

4,110,473

MITICIDAL ETHERS

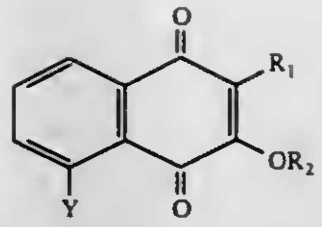
Robert Bensoo Fugitt, Newark, Del., and Gregory Wayne Schwing, Lincoln University, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 14, 1977, Ser. No. 815,763

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 424—331 **5 Claims**

1. A method for protecting plants from mites which comprises applying to the plant a miticidally effective amount of a compound of the Formula I



wherein Y is hydrogen, fluorine, chlorine, or bromine;
R_1 is alkyl of 8–14 carbon atoms either branched, cyclic, or straight chain;
R_2 is saturated alkyl of 1–12 carbon atoms or unsaturated alkyl of 3–12 carbon atoms either branched or straight chain, optionally substituted with one or two chlorine, bromine, methoxy or ethoxy substituents, or cycloalkyl of 3–6 carbon atoms.

4,110,474

TETRAMETHYLPENTANE BLOOD SUBSTITUTES

Richard J. Lagow, Austin, Tex.; Lawrence A. Shimp, Hinsdale, Ill., and Leland C. Clark, Jr., Cincinnati, Ohio, assignors to Suntech, Inc., Philadelphia, Pa. and Children's Hospital Medical Center, Cincinnati, Ohio

Filed Aug. 26, 1977, Ser. No. 827,999

Int. Cl.^{2} A61K *31/02*

U.S. Cl. 424—350 **17 Claims**

1. An artificial blood comprising an emulsion of a mixture comprising perfluoro 2,2,4,4-tetramethylpentane and 3-hydrononadecafluro 2,2,4,4-tetramethylpentane in water, said emulsion containing a non-toxic emulsifier.

17. A mixture comprising perfluoro-2,2,4,4-tetramethylpentane and 3-hydro-nonadecafluro-2,2,4,4-tetramethylpentane.

4,110,475

CELLULOSE FERMENTATION PROCESS

Malcolm S. Singer, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 11, 1977, Ser. No. 795,680

Int. Cl.^{2} A23K *1/16*

U.S. Cl. 426—2 **8 Claims**

1. A method for accelerating the rate of cellulose fermentation by cellulose-digesting rumen microorganisms which comprises conducting said fermentation in the presence of a rate-accelerating amount of a compound selected from 2-(chloromethyldithio)acetic acid, 2-(dichloromethyldithio)acetic acid or 2-(trichloromethyldithio)acetic acid.

4,110,476

PREPARATION OF LIQUID AND FROZEN YOGURT PRODUCTS

Kenneth H. Rhodes, San Jose, Calif., assignor to Johnson/-Rhodes Cultured Foods, Inc., Calif.

Filed Jan. 10, 1977, Ser. No. 758,045

Int. Cl.^{2} A23C *9/12, 21/00;* A23G *5/00*

U.S. Cl. 426—41 **19 Claims**

1. A process for the preparation of a liquid yogurt containing a high population of live organisms comprising the steps of:

a. combining sources of fat and milk derived solids with relatively undenatured whey protein concentrate to form a mixture in the ratio of no more than 2 parts casein to 1 part whey protein, the source of whey protein being whey protein concentrate having all of the casein coagulant enzyme inactivated, the whey protein concentrate having from 22 to 52% protein, 0.1 to 6% fat, 32 to 73% of the material selected from the group consisting of lactose and reduced milk sugars, and from 3 to 11% ash, all percentages being on a dry weight basis;

b. maintaining said mixture at a temperature to accomplish pasteurization and form a protein complex;

c. thereafter cooling said mixture to an optimum fermentation temperature;
d. innoculating said mixture after said cooling with a yogurt culture producing lactic acid; and
e. fermenting said mixture after said innoculation sufficiently to develop a titratable acidity and cooling to arrest fermentation upon the mixture reaching the desired acidity to produce said liquid yogurt.

4,110,477

METHOD FOR PRODUCING NATTO CONTAINING LACTIC ACID BACTERIA

Kintaro Naruse, and Wataru Naruse, both of Tokyo, Japan, assignors to Kabushiki Kaisha Naruse Fermentation Laboratory, Tokyo, Japan

Filed May 13, 1977, Ser. No. 796,706
Int. Cl.^{2} A23L *1/20*
U.S. Cl. 426—46 **14 Claims**

1. A method for producing *natto* containing lactic acid bacteria, which comprises growing *Bacillus natto* and lactic acid bacteria on steamed soybeans in the presence of a nutritive medium containing a homogenized aqueous mushroom suspension.

4,110,478

PRODUCTION OF POTATO GRANULES

Buncha Ooraikul, Edmonton, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 476,053, Jun. 3, 1974, Pat. No. 4,007,286. This application Dec. 13, 1976, Ser. No. 750,164
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.^{2} A23B *7/14*
U.S. Cl. 426—262 **24 Claims**

1. A method for the preparation of dehydrated potato granules which comprises subjecting potatoes to the following steps in order:
(a) preparing the potatoes for cooking;
(b) cooking the prepared potatoes;
(c) immediately mashing the cooked potatoes at a temperature of at least 160° F;
(d) cooling and freezing the resulting material;
(e) thawing the material;
(f) immediately predrying the thawed material by evaporation to reduce the moisture content to a range of about 35 to 46%, thereby producing potato cells which are separated into single units or cell aggregates;
(g) thereafter granulating the predryed material under conditions such that the moisture content remains within the range specified in step (f) during the entire granulating operation; and
(h) drying the potato granules at a temperature and for a period of time to reduce the moisture content to not more than about 7%.

4,110,479

METHOD OF PREPARING COLLAGEN STRUCTURES

Thomas Engel Higgins, Brookfield, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,426
Int. Cl.^{2} A22C *13/00*
U.S. Cl. 426—277 **24 Claims**

1. In a method of producting a shaped collagen structure the improvment comprises treating a shaped collagen structure prior to the final drying thereof with a dewatering solution comprising at least about 0.01% by weight of sodium alginate.

4,110,480

TREATMENT OF MALT TO REDUCE STALE FLAVOR IN BEER

James Richard Allan Pollock, Reading, and Anthony Richard Dale, Mortimer, near Reading, England, assignors to Pollock International Limited, Reading, England

Filed Jul. 23, 1975, Ser. No. 598,421
Claims priority, application United Kingdom, Jul. 24, 1974, 32704/74
Int. Cl.^{2} C12C *1/16, 1/18*
U.S. Cl. 426—436 **7 Claims**

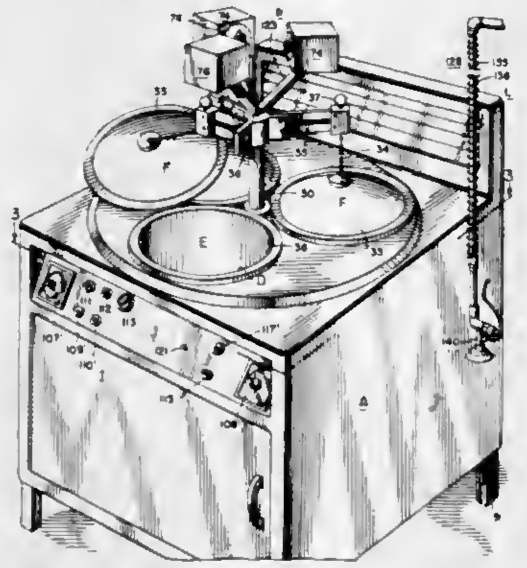
1. In a method of producing a wort for use in brewing which comprises extracting a ground malt with hot water to orm a wort and separating the wort from insolublematter, the improvement which comprises reducing the tendency of beers made from such worts to give stale flavors of the type characterized by 2-trans-nonenal by contacting, prior to extracting the ground malt with hot water, malt or ground malt with an organic substance selected from the group consisting of methanol, ethanol, 1-propanol, 2-propanol, 2-butanol, isoamyl alcohol, 2-phenylethanol, dimethylsulfoxide, acetic acid, and propylene glycol to reduce the amount of precursors of 2-trans-nonenal present in said malt or ground malt.

4,110,481

METHOD OF COOKING FOOD IN HOT NON-AQUEOUS LIQUIDS UNDER AIR PRESSURE

Charles Jere Albright, 919 No. Michigan Ave., Chicago, Ill. 60611; Clifford E. Fitch, Sr., and Clifford E. Fitch, Jr., both of P.O. Box 219, South Holland, Ill. 60473

Continuation of Ser. No. 412,624, Nov. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 881,230, Dec. 1, 1969, Pat. No. 3,793,940. This application Aug. 9, 1976, Ser. No. 712,747
Int. Cl.^{2} A23L *1/00*
U.S. Cl. 426—438 **26 Claims**



1. The method of cooking food in hot, non-aqueous liquid under pressure, comprising the steps of: providing a plurality of pressurizable, sealable cooking receptacles each having an opening therein for the insertion and removal of food; interconnecting the plurality of receptacles via valve-controlled, fluid conducting conduits; placing cooking liquid in at least one but not all of said plurality of receptacles and closing and sealing said at least one receptacle and heating the liquid therein to a temperature sufficient to cook food; placing food to be cooked in another of said plurality of receptacles substantially free of cooking liquid therein; closing and sealing said another receptacle; pressurizing with mechanical means the liquid in said one receptacle to a pressure sufficient to substantially prevent vaporization of juices from the food at said temperature and transferring said liquid under said pressure from said at least one receptacle to said another receptacle; maintaining said pressure and temperature in said another

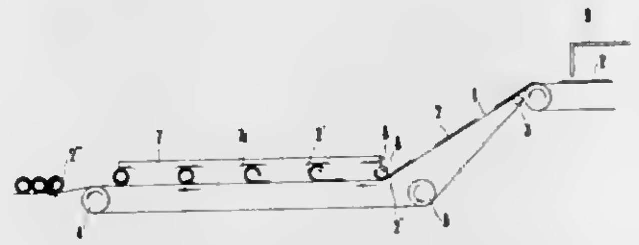
receptacle for a predetermined time sufficient to cook the food therein; draining the cooking liquid from said another receptacle at the end of said predetermined time while maintaining said pressure therein; thereafter venting the pressure from said another receptacle; opening said another receptacle and removing the cooked food therefrom.

4,110,482

METHOD FOR CONTINUOUSLY ROLLING UP SHEETS OF BAKED COOKIES

Fumio Sato, Zama, Japan, assignor to Morinaga & Co., Ltd., Japan

Division of Ser. No. 704,552, Jul. 12, 1976, Pat. No. 4,043,259. This application Mar. 30, 1977, Ser. No. 782,731
Claims priority, application Japan, Jul. 19, 1975, 50-88955; May 19, 1976, 51-58429
Int. Cl.^{2} A21C *3/06*
U.S. Cl. 426—497 **5 Claims**



1. A method of forming sheets of cookie material into rolls, comprising heating the cookie sheet material until it is relatively soft, advancing the sheets in order to feed them and bring them tangentially into association with a roll-up roller, rotating the roll-up roller at a slower speed than the speed of advance of the sheet material so as to cause the continuous rolling up of the sheet material onto the surface of the roll-up roller, interrupting the rolling up of the sheet material by deflecting its surface away from the roll-up roller while continuing to feed it in a direction away from said roll-up roller, continuing to feed the sheet material away from the roll-up roller while a portion of its periphery which has already been rolled is held so that it does not move as fast as the remaining portion of the sheet material which is being fed so as to cause a continuous rolling thereof in order to complete the rolling up of the sheet material into a rolled up form.

4,110,483

METHOD OF STABILIZING FOODS WITH AN ANTIOXIDANT

Solomon J. Bishov, Framingham, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1977, Ser. No. 820,473
Int. Cl.^{2} A23L *3/34*
U.S. Cl. 426—542 **4 Claims**

1. A process for the stabilization against oxidation of an oxidation susceptible oil or fat containing food, which comprises adding to said food an antioxidative amount of an antioxidant composition comprising (a) butylated hydroxyanisole and (b) an antioxidant-containing material selected from the group consisting of whole sage, mace, rosemary, Comptonia peregrina, and Tilia hrezentia, or alcohol extracts thereof, or residue recovered from said extracts, said antioxidant-containing material being present in said antioxidant composition in an amount which is effective as a synergist for the anti-oxidant action of said butylated hydroxyanisole.

4,110,484

FLOW PROCESS FOR PRODUCTION OF IMITATION CHEESE

Charles E. Rule, Lakewood; Juan B. Ilagan, and Donald E. Miller, both of Strongsville, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Sep. 10, 1976, Ser. No. 721,972
Int. Cl.^{2} A23C *19/02, 19/12*
U.S. Cl. 426—582 **16 Claims**

11. A process for the continuous manufacture of acid-set imitation cheese products from a plurality of dry and liquid cheese making edible ingredients comprising the steps of
preparing a dry blend of said ingredients which are dry including an edible protein;
preparing a liquid blend of said ingredients which are liquid including oil, water and acidulant;
the proportions of said ingredients being those necessary for the manufacture of imitation cheese;
continuously introducing said dry blend into an elongated, confined mixing zone of small cross-sectional areas;
continuously introducing said liquid blend into said mixing zone;
continuously subjecting said blends to medium high intensity mixing while conveying the resulting mixture of said mixing through said zone until a substantially homogeneous mixture is obtained;
maintaining said mixture at an elevated temperature of at least about 100° F during said mixing;
continuously withdrawing imitation cheese products from said elongated, confined mixing zone;
said mixing zone including radial and axial flow, the proportions of said dry blend and liquid blend ingredients producing a substantially incompressible mixture of high viscosity; said mixing being carried out at a net horsepower input at the rate of about 2–5 per 40 pounds of edible ingredients.

4,110,485

HIGH-SHEEN ROAST AND GROUND COFFEE FLAKES OF IMPROVED EXTRACTABILITY

Dennis Robert Grubbs, Cincinnati; Timothy Andrew Lubsen, Springfield Township, Hamilton County, and George Leroy Roseberry, Jr., Colerain Township, Hamilton County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 529,652, Dec. 4, 1974, abandoned. This application May 6, 1976, Ser. No. 683,583
Int. Cl.^{2} A23F *1/00*
U.S. Cl. 426—595 **10 Claims**

1. A roast and ground coffee composition comprising from 10 to 80% by weight of the composition of roast and ground coffee in the form of flakes of high sheen and extractability, said roasted and ground flaked having a flake thickness of between 0.008 and 0.025 in. and having a reflectance value of at least 35 reflectance units, said reflectance units representing reflectance by coffee flakes of light from 0.88 helium/neon gas laser beam of 6328 Angstrom wavelength, calibrated against reflectance values of 2 and 89 units, respectively, for the Federal Bureau of Standards Paint Chips 15042 and 11670; and from 20 to 90% of non-flaked roast and ground coffee.

4. A process for preparing roast and ground coffee flakes of high sheen and extractability which comprises: passing roast and ground coffee through a roll mill having a first roll operating at a peripheral surface speed of from 30 to 850 feet per minute and at a surface temperature of from 0° to 140° F and having a second roll operating at a peripheral surface speed of from 2 to 8 times that of the first roll and a surface temperature of from 150° to 300° F; and removing from said roll mill said roast and ground coffee flakes.

4,110,486
ELECTROSTATIC POWDER COATING METHOD

Adrien Lacchia, 10 Impasse des Lecheres, 38240 Meylan, France
Continuation-in-part of Ser. No. 640,924, Dec. 15, 1975, abandoned. This application Sep. 24, 1976, Ser. No. 726,105
Claims priority, application France, Jan. 16, 1975, 75 02009
Int. Cl.^{2} B05D *1/06*
U.S. Cl. 427—27 **3 Claims**

1. Method of forming and directing a homogeneous flat fan-spray of electrically charged particles derived from an incident stream containing a mixture of particles and carrier gas toward an article which is to be electrostatically coated with particles, which method comprises the steps of:

deflecting said incident stream outwardly in a direction substantially perpendicular to its incident direction,

driving said deflected stream against the internal walls of a duct shaped to form the stream into a substantially homogeneous flat fan-spray, and

then electrically charging the particles of said spray.

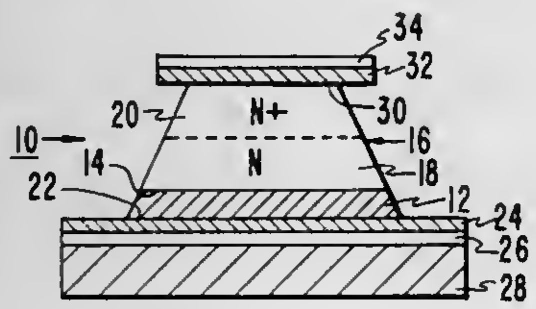
4,110,487
DUAL COAT CERAMIC LAYER PREPARED BY SINGLE FIRING

Richard G. Rion, Parma, Ohio, assignor to Ferro Corporation, Cleveland, Ohio
Filed Oct. 28, 1976, Ser. No. 736,569
Int. Cl.^{2} B05D *1/04, 3/02, 1/36*
U.S. Cl. 427—27 **16 Claims**

1. A process for applying a dual coat ceramic layer to a substrate in a single firing operation, comprising applying to the substrate a first coat of an essentially dry powder of a first frit composition adapted to form a glass adherent to said substrate, applying to said first coat a second coat of an essentially dry powder of a second frit composition normally not adapted as a glass to adhere to said substrate, subjecting said substrate and coats to a single firing operation, initially fusing and completely stabilizing said first frit composition within a temperature range below that at which said second frit composition first fuses and stabilizes, then fusing and stabilizing said second frit composition within a temperature range higher than said first temperature range, whereby said first coat reaches a state of neither tension nor compression at a temperature below that at which said second coat first reaches a state of neither tension nor compression, and finally cooling to form a coherent ceramic layer of two substantially continuous coats on said substrate from the two frit compositions.

4,110,488
METHOD FOR MAKING SCHOTTKY BARRIER DIODES

John Joseph Risko, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Apr. 9, 1976, Ser. No. 675,638
Int. Cl.^{2} H01L *21/66, 29/48*
U.S. Cl. 427—84 **9 Claims**



1. A method for making a Schottky barrier device comprising the steps of:

forming a thin layer of a natural oxide of silicon adjacent the principal surface of a substrate of silicon;

forming a layer of a Schottky metal adjacent said oxide layer; and

heating the Schottky metal layer and the substrate at a selected temperature, the temperature being sufficient to form a metal silicide whereby a metal silicide layer is formed between said substrate and said oxide layer, and thereafter removing said oxide layer whereby said metal silicide layer is exposed.

4,110,489
PREPARATION OF LOW ABSORPTION TRANSPARENT THALLIUM IODIDE FILMS ON POTASSIUM CHLORIDE

John H. Chaffin, III, Minnetonka, and Richard A. Skogman, Inver Grove Hts., both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 8, 1977, Ser. No. 804,665
Int. Cl.^{2} G02B *1/10*
U.S. Cl. 427—164 **9 Claims**

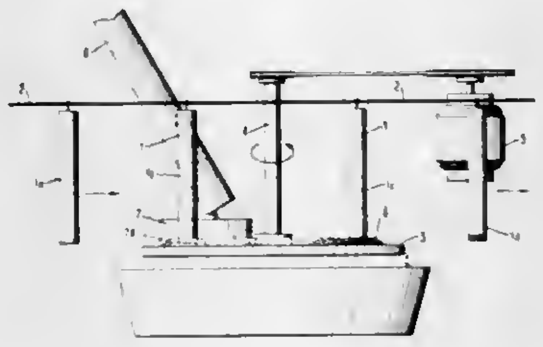
1. A method of depositing an optical film of thallium iodine in its cubic phase on potassium chloride optical elements and thereafter allowing the thallium iodide film to transform to its stable orthorhombic phase to thereby provide a clear, polycrystalline, randomly oriented film the improved method comprising:

heating in an evacuated chamber an optical substrate of potassium chloride to about between 140° C. and about 170° C.; and,

heating in the same chamber an evaporation source of thallium iodide to a sufficiently high temperature to provide a deposition rate of at least 500Å per minute onto said potassium chloride substrate, the thallium iodide being deposited in its cubic phase.

4,110,490
METHODS FOR APPLYING MATERIAL TO THE END OF ELONGATE OBJECTS

Erik Westberg, Lidingo, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden
Filed Apr. 13, 1976, Ser. No. 676,624
Claims priority, application Sweden, Apr. 23, 1975, 7504727
Int. Cl.^{2} B23K *31/02*
U.S. Cl. 427—180 **5 Claims**



1. A method of applying a flowable material to the ends of a series of elongate objects comprising the steps of:

spreading the material onto a carrier in the form of an endless field,

continuously rotating the carrier and material,

moving said end of each object through the material field by:

passing said object end through said material field at a first location in a direction laterally of a first direction of travel of said material at said first location, such that said material approaches one side of said object end,

passing said object out of said material field, and

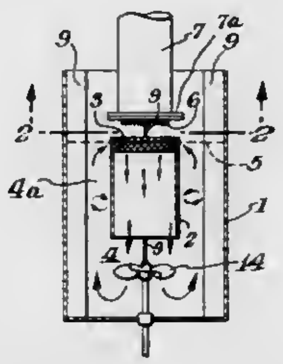
passing said object end through said material field at a second location in a direction laterally of a second direction of travel of said material at said second location, said second direction of travel of said material being different than said first direction of travel in relation to said object so that said material approaches another side of said object end;

supporting each object completely independently of said carrier during travel of said object through said material to maintain the end of said object a substantially constant distance from said carrier during travel of said object through said material at said first and second locations,

regulating the relative rate of travel between said object and said carrier so that a track formed in said field of material by said object passing therethrough at said first location is spaced from said second location during passage therethrough of said object.

4,110,491
METHOD AND APPARATUS FOR ENCAPSULATING AND COAGULATING ELASTOMERS

Robert Miller Secor, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jun. 29, 1976, Ser. No. 700,966
Int. Cl.^{2} B05B *7/02, 7/24;* **C08C** *1/14*
U.S. Cl. 427—212 **2 Claims**



1. A method for encapsulating and coagulating elastomer latices comprising, in sequence, supplying said latices as multiple streams of separate drops by gravity fall through the surface of an encapsulating-coagulating liquid, followed by liquid-impelled generally linear transit of the particles through a vertically oriented flow-constrained zone to which encapsulating-coagulating liquid is supplied continuously at the top end and suspending the particles outside said flow-constrained zone while recycling said encapsulating-coagulating liquid from the lower end of said flow-constrained zone into said top end free of solid product particles.

4,110,492
METHOD FOR ENCAPSULATING WATER-INSOLUBLE PARTICLES

Clifford C. Hayman, Mentor, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio
Filed Nov. 11, 1976, Ser. No. 740,905
Int. Cl.^{2} B32B *9/00, 15/02*
U.S. Cl. 427—214 **10 Claims**

1. The method for encapsulating a solid particulate substrate comprising continuously adding to an aqueous dispersion of a water-insoluble particulate substrate at 70° to 100° C. separate aqueous solutions of:

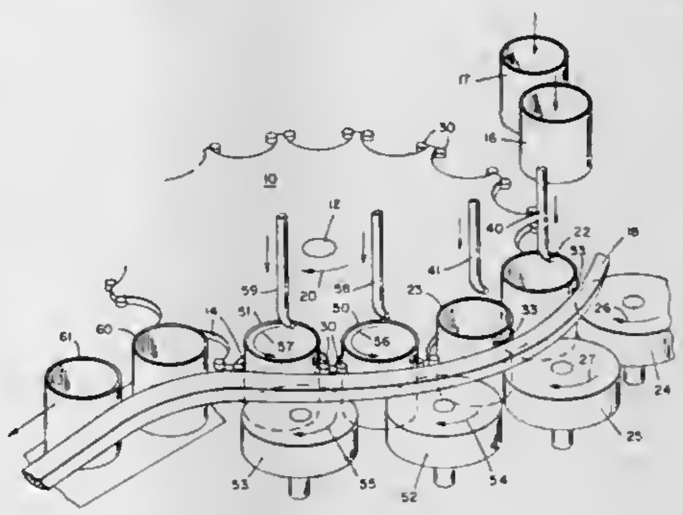
(a) metal ions selected from the group consisting of aluminum and magnesium, said ions being added as lower alkyl carboxylates and/or halogen-substituted lower alkyl carboxylates,

(b) phosphate anions added as acids selected from the group consisting of orthophosphoric acid, monofluorophosphoric acid and difluorophosphoric acid, at least some of the phosphate present in the form of a hydroxy aluminum phosphate boric acid complex, and, optionally,

(c) anions selected from the group consisting of boric acid, fluoride, fluoborate and hexafluorophosphate anions, the molar proportions of (a), (b) and (c) being in the range of 0.8:1.0:0.0 to 1.4:1.0:10.0, and other anions and cations in or added to said dispersion being such as not to react with said substrate and not to interfere with the formulation of insoluble metal phosphate complexes of (a) and (b).

4,110,493
SYSTEM AND METHOD FOR COATING CONTAINER SEAMS

John H. Loveless, and Claude T. Phillips, both of Arden, N.C., assignors to Gerber Products Company, Fremont, Mich.
Filed Oct. 6, 1975, Ser. No. 619,875
Int. Cl.^{2} B21D *51/00;* **B05D** *7/22*
U.S. Cl. 427—233 **4 Claims**



1. A method of coating the inside surface of a metal container during its continuous advance along a series of processing stations, comprising the steps of:

rotating the container about an axis generally parallel to the soldered side seam;

engaging the seam of the container at a first station with seam engaging means to temporarily stop the container from rotating;

coating the interior of the container along the seam while the container is temporarily stopped from rotating to provide a protective coat overlying said seam;

disengaging said engaging means to allow the container to resume its rotation advancing the rotating container to a second station; and

coating substantially the entire inside of the container including the seam with a second protective coat while the container is rotating.

4,110,494
PROCESS FOR THE MANUFACTURE OF FILMS AND COATINGS CONTAINING POLYVINYL ALCOHOL AND HAVING A REDUCED SOLUBILITY IN WATER

Hermann Schindler, Wallau, Taunus, and Wolfgang Zimmermann, Kelkheim, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 16, 1976, Ser. No. 751,167
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557557
Int. Cl.^{2} C08F *45/04*
U.S. Cl. 427—385 R **8 Claims**

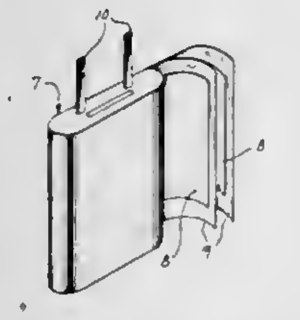
1. A process for the manufacture of films and coatings containing polyvinyl alcohol and having a reduced solubility in water, which comprises submitting polyvinyl alcohol having an ester number of at most 200 mg of KOH/g in aqueous phase to an after-saponification with alkali metal or alkaline earth metal hydroxide at elevated temperature, precipitating the alkali metal or alkaline earth metal ions of said hydroxide by addition of a substance containing anions that form therewith a compound that is difficulty soluble in water, said compound constituting an inert filler that remains in the polyvinyl alco-

hol, applying the suspension of polyvinyl alcohol thus prepared to a substrate in the form of a film or coating and drying it.

4,110,495
IMPROVEMENTS IN SHOE MANUFACTURE
Alan Reginald Carter, Kettering; Donald Pettit, Isham, both of England, and Josephus Sychbertus Langerwerf, Waalwijk, Netherlands, assignors to The Shoe and Allied Trades Research Association, Kettering, Great Britain
Filed Sep. 13, 1976, Ser. No. 722,692
Claims priority, application United Kingdom, Sep. 16, 1975, 38084/75
Int. Cl.^{2} B05D *5/00*
U.S. Cl. 427—400 **9 Claims**

1. A method of pre-treating a natural or synthetic rubber surface prior to applying an adhesive to the rubber comprising contacting said surface with a solution in an organic solvent of a halogen substituted isocyanuric acid and a non N-halogenated sulfonamide, each of said isocyanuric acid and said sulfonamide being present in said solution in an amount of from 1 - 10% wt/vol.

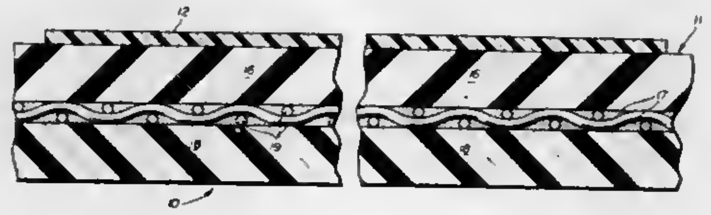
4,110,496
DIELECTRIC SYSTEM FOR AN ELECTRICAL APPARATUS
John Lapp, Franklin, and Fred S. Sadler, Racine, both of Wis., assignors to McGraw-Edison Company, Milwaukee, Wis.
Division of Ser. No. 494,767, Aug. 5, 1974, Pat. No. 3,996,505. This application Oct. 22, 1976, Ser. No. 735,020
Int. Cl.^{2} B32B *27/08*
U.S. Cl. 428—500 **2 Claims**



1. A dielectric system for use in an electrical apparatus, comprising a layer of polymeric material, and a liquid dielectric impregnated into said polymeric material, said liquid dielectric comprising polybutene having an average number molecular weight in the range of 300 to 500 and containing from 0.01 to 10% by weight of a cyclohexylamine and from 0.05 to 15% by weight of a compound selected from the group consisting of butylated hydroxy toluene and di-tert-butyl-p-cresol.

4,110,497
STRIPED LAMINATE AND METHOD AND APPARATUS FOR MAKING SAME
Steven Michael Hoel, Bolivar, Ohio, assignor to Snyder Manufacturing Co., Ltd., New Philadelphia, Ohio
Filed Jul. 2, 1976, Ser. No. 702,226
Int. Cl.^{2} B32B *3/16*
U.S. Cl. 428—190 **5 Claims**

1. A striped laminate material comprising a first polyvinyl chloride sheet having a thickness on the order of 6 mils, an open, flexible scrim sheet of serpentine interlaced strands, a second polyvinyl chloride flexible sheet having a thickness on the order of 6 mils, a plastisol bonding agent bonding the scrim between the first and second sheets, and at least one flexible stripe of polyvinyl chloride film having a thickness on the order of 2½ mils and heat-bonded to the first sheet, the stripe being of a width less than the sheet to which the stripe is heat-bonded, and the stripe being impressed onto the sheet and into the laminate to provide a material having a striped surface of substantial planarity, and an embossed surface on the second sheet on a sheet side opposite the side upon which the stripe is heat-bonded.



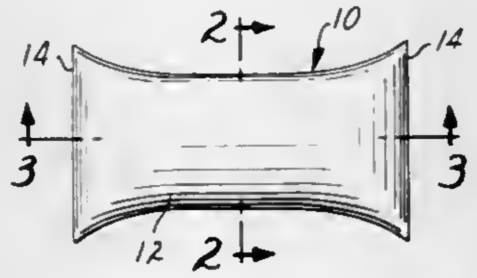
4,110,498
FABRIC TREATMENT COMPOSITIONS
Lawrence Benjamin, Springfield Township, Hamilton County, and Michael Andrew Walsh, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 8, 1976, Ser. No. 664,837
Int. Cl.^{2} D06M *13/00*
U.S. Cl. 428—35 **18 Claims**

1. An article of manufacture adapted for providing fabric softening within an automatic laundry dryer, said article comprising:

(a) a fabric softening amount of a softening composition, said composition having a melting point above about 38° C. and being flowable at fabric dryer operating temperature, said composition comprising:
  (i) from about 50% to about 95% by weight of the composition of a quaternary ammonium fabric softener material; and
  (ii) from about 5% up to about 50% by weight of the composition of lanolin alcohol component selected from the group consisting of lanolin alcohols, the aliphatic carboxylic acid esters of lanolin alcohols wherein the acid moieties of said esters contain from about 2 to about 22 carbon atoms and the propylene oxide adducts of lanolin alcohols wherein said adducts are the reaction product of from about 2 to about 20 moles of propylene oxide per mole of lanolin alcohols; and

(b) a dispensing means which provides for release of said softening composition within an automatic laundry dryer at dryer operating temperatures.

4,110,499
FIRED CLAY PILLOWS AND STRUCTURES MADE THEREWITH
George C. Harrison, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation of Ser. No. 649,546, Jan. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 546,708, Feb. 3, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,265
Int. Cl.^{2} B32B *1/08, 5/16*
U.S. Cl. 428—35 **39 Claims**

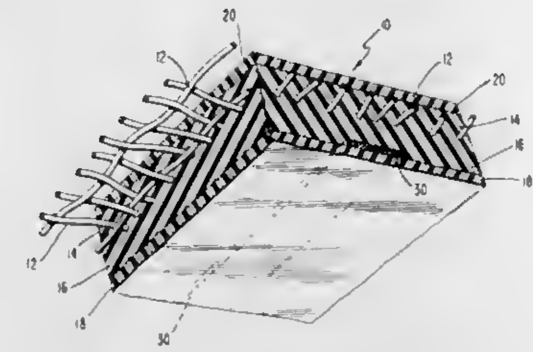


35. An article comprising a fired clay pillow, having a tubular-shaped body section whose ends are flattened closed; wherein the wall thickness of said body section is not greater than three millimeters; wherein the length of said pillow is about 2.5 to 4 times as great as the outside diameter of said body section, and wherein said flattened ends are flared outwardly so as to project beyond said body section.

4,110,500
PACKAGED ARTICLES
Theodore A. Evans, and William A. Watts, both of Uniontown, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 728,483, Sep. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 618,301, Sep. 29, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,259
Int. Cl.^{2} B32B *7/02;* **B65D** *71/00;* **C08L** *51/00*
U.S. Cl. 428—35 **23 Claims**

1. A packaging film composite having a thickness in the range of about 0.5 to about 10 mils comprised of an admixture of (1) about 80 to about 45 weight percent, based on 100 weight percent, of a unvulcanized elastomeric block copolymer having the general configuration A—B—A wherein each A is an independently selected nonelastomeric monovinyl aromatic hydrocarbon polymer block selected from styrene, α-methylstyrene and vinyl toluene having an average molecular weight of about 7,000 to about 25,000 and a glass transition temperature above about 25° C., the total block A content being from about 20 to about 40 percent by weight of the copolymer, and B is an elastomeric conjugated diene polymer block selected from 1,3-butadiene and isoprene having an average molecular weight from about 30,000 to about 100,000 and a glass transition temperature below about 10° C., said block copolymer being further characterized by having a melt viscosity in the range of about 0.1 to about 10 grams/10 minutes according to ASTM No. D-1238, (2) about 20 to about 55 weight percent of a thermoplastic resin selected from at least one polymer of styrene, α-methylstyrene, styrene/α-methylstyrene, vinyl toluene, vinyl toluene/α-methylstyrene, indene resins, alkyl phenolic resins, petroleum and coal tar resins, said resins characterized by being soluble in styrene and by having an intrinsic viscosity of about 0.02 to about 0.50 as determined in toluene at 30° C. and (3) a sufficient amount of an antiblocking agent.

4,110,501
SPLICING STRIP
Harlan E. Tarbell, Torrance, Calif., and Paul J. Raabe, Lombard, Ill., assignors to Grefco, Inc., Bala Cynwyd, Pa.
Filed Apr. 5, 1977, Ser. No. 784,779
Int. Cl.^{2} B32B *11/02, 11/10*
U.S. Cl. 428—40 **19 Claims**



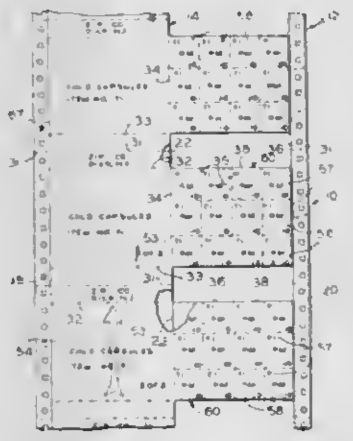
1. A splicing strip, comprising:

(a) a flexible, elongated reinforcing sheet of fibers with openings having a largest diameter of approximately 0.05 to 0.50 inches;

(b) a pair of tacky, mastic layers of material comprising by weight 10 to 50 parts of butyl rubber, 10 to 50 parts polybutene and 10 to 80 parts of filler selected from the group consisting of calcium carbonate, mineral fillers, asbestos, carbon black, shredded rubber and mixtures thereof, one of said mastic layers being disposed on each side of said flexible sheet, said mastic layers being in adherent contact with each other across the openings in said flexible sheet; and

(c) a stress distribution ribbon having a width substantially less than said splicing strip and being adhesively attached to and substantially on the longitudinal center line of the exposed face of at least one of said mastic layers, said ribbon being impermeable to said mastic.

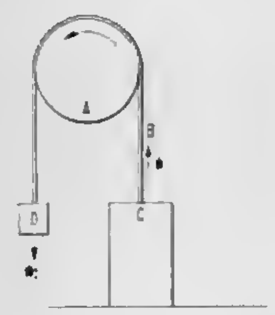
4,110,502
LABELING
James Baer, Aurora, Oreg., assignor to Pay Less Drug Stores Northwest, Inc., Beaverton, Oreg.
Continuation of Ser. No. 601,546, Aug. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 568,842, Apr. 17, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,159
Int. Cl.^{2} G09F *3/00*
U.S. Cl. 428—40 **16 Claims**



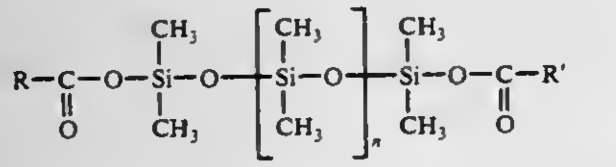
16. In a computer strip form construction of a non-adhesive carrier strip having a pair of perforated feed portions along the side edges thereof and a central cut line paralleling the side edges and dividing the strip into a label portion and a price tag portion,
  and a label-price tag strip having a label section and a price tag section side-by-side,
  the label section comprising a series of labels separable from each other,
  the label-price tag strip having on the back thereof a pressure sensitive adhesive adhered to the carrier strip and holding the label portion and the price tag portion of the carrier strip together with the label section adhered to the label portion and the price tag section adhered to the price tag portion,
  the price tag section and price tag portion having cut-out portions to separate the price tag portion into a series of separated segments secured together only by one of the perforated feed portions so that when the price tag section and portion are folded back under the label section, they leave exposed at least part of the back side of each label,
  the edge of each price tag section adjacent its associated label section being secured to that label section along the entire length of that edge so that folding of the price tag sheet transversely of that edge is prevented,
  each cutout portion extending below the upper edge of the adjacent label and also extending above the lower edge of the label just above the adjacent label.

4,110,503
MAGNETIC RECORDING MEMBERS

Hiroshi Ogawa; Masashi Aonuma; Matsuaki Nakamura, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan
Filed Dec. 3, 1976, Ser. No. 747,146
Claims priority, application Japan, Dec. 10, 1975, 50-147173
Int. Cl.^{2} H01F *10/02*
U.S. Cl. 428—64 **10 Claims**



1. A magnetic recording member comprising a non-magnetic support having thereon a magnetic layer with a ferromagnetic powder dispersed in a binder, wherein the magnetic layer contains at least one organic silicone compound represented by the formula (I):

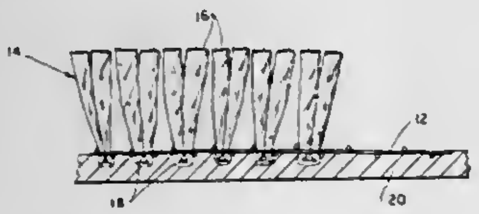


$$R-\underset{\underset{O}{\|}}{C}-O-\overset{CH_3}{\underset{CH_3}{Si}}-O-\left[\overset{CH_3}{\underset{CH_3}{Si}}-O\right]_n-\overset{CH_3}{\underset{CH_3}{Si}}-O-\underset{\underset{O}{\|}}{C}-R' \qquad (I)$$

wherein R and R', which may be the same or different, each is an alkyl or alkenyl group containing 7 to 21 carbon atoms, and *n* is an integer of 0 to 50, in an amount of about 0.1 to about 5 parts by weight per 100 parts by weight of the ferromagnetic powder.

4,110,504
SELF-SANITIZING CARPET CONSTRUCTION COMPOSITION

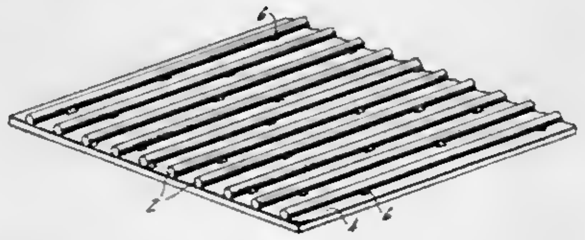
Ezekiel H. Hull, and Robert H. McIntosh, both of Greensboro, N.C., assignors to Anthony B. Askew, Atlanta, Ga.
Continuation of Ser. No. 571,717, Apr. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 478,109, Jun. 10, 1974, Pat. No. 3,919,410, which is a continuation of Ser. No. 292,792, Sep. 27, 1972, abandoned, which is a division of Ser. No. 139,265, Apr. 30, 1971, Pat. No. 3,705,235. This application Jun. 15, 1976, Ser. No. 696,219
The portion of the term of this patent subsequent to Dec. 5, 1989, has been disclaimed.
Int. Cl.^{2} D03D *27/00*
U.S. Cl. 428—97 **3 Claims**



1. In a tufted carpet product including a primary backing sheet material, rows of carpet yarn stitched into the primary backing material to produce a face of yarn on one side of the backing and tuft loop backs of yarn on the opposite underside of the backing, and a layer of carpet construction adhesive on the tuft loop backs and on the underside of the backing, the improvement comprising a sanitizing additive blended with the carpet construction adhesive, said additive comprising a mixture of a nonionic trialkyl amine and a Group II-A or Group II-B metal salt of a monocarboxylic acid having a carbon chain length of 1 to 4.

4,110,505
QUICK BOND COMPOSITE AND PROCESS

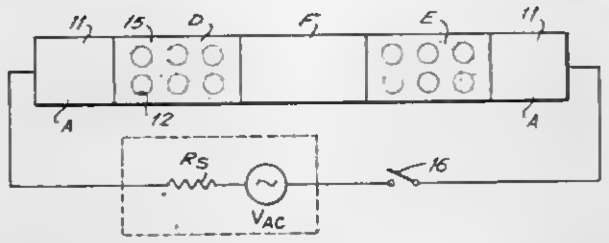
Karl M. Prewo, Vernon, Conn., assignor to United Technologies Corp., Hartford, Conn.
Filed Dec. 17, 1976, Ser. No. 751,577
Int. Cl.^{2} B32B *5/00, 15/04*
U.S. Cl. 428—114 **7 Claims**



5. A composite compacted in air comprising a plurality of tapes, each consisting of:
- a single sheet aluminum foil substrate,
- a collimated single layer of filaments on one side of said substrate, and
- a resin binder securing the filaments to the substrate,
- said plurality of tapes being stacked, one on another to form a stack consisting of alternate layers of foil with single layers of filaments therebetween, there being a single layer of foil between adjacent layers of filaments,
- said stack being heated and compacted in air, being heated to oxidize and eliminate the binder, and compacted to break up any carbonaceous remnants of the binder and to cause bonding of the adjacent foil layers to one another between the filaments to produce the composite.

4,110,506
THERMOPLASTIC CONTROL COMPLEX

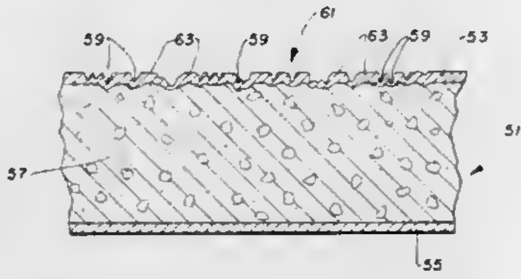
Hugh V. Cottingham, Upper Montclair, and Joseph Scrocco, West Orange, both of N.J., assignors to BHN Corporation, Upper Montclair, N.J.
Filed Sep. 8, 1976, Ser. No. 721,652
Int. Cl.^{2} B29C *27/00;* **B32B** *15/08;* **E04B** *1/38*
U.S. Cl. 428—138 **16 Claims**



1. A thermoplastic control complex for releasably securably bonding at least two distinct elements together comprising in combination, an elongated electrically conductive exothermic carrier having a predetermined resistivity for each lengthwise unit thereof, said conductive carrier including at least one discrete high resistance zone, each said high resistance zone being disposed at a predetermined position along the lengthwise extent thereof, each said high resistance zone being adapted in response to a current flow being effected through said conductive exothermic carrier to be heated to an elevated temperature level relative to the temperature level of those portions of said exothermic carrier that are free of heating zones formed therein, and a thermoplastic resin selectively positioned at each of said high resistance zones along the length of said exothermic carrier, said complex being adapted to be disposed between two distinct elements so that thermoplastic resin disposed at said high resistance zones is selectively transformable from a non-sticky substantially solid state to a sticky substantially liquid state in response to said high resistance zone being heated to said elevated temperature level whereby said resin, in substantially sticky liquid state, effects wetting of the distinct elements for effecting subsequent releasable bonding of the elements together.

4,110,507
BRANDED PLASTERBOARD PRODUCT

Gary C. Colledge, P.O. Box 2178, Newport Beach, Calif. 92663
Continuation-in-part of Ser. No. 598,772, Jul. 24, 1975, Pat. No. 4,007,767, which is a continuation-in-part of Ser. No. 440,481, Feb. 7, 1974, abandoned, which is a division of Ser. No. 216,061, Jan. 7, 1972, Pat. No. 3,730,081. This application Feb. 14, 1977, Ser. No. 768,032
Int. Cl.^{2} B32B *21/06*
U.S. Cl. 428—151 **4 Claims**



1. A decorative plasterboard product including a sheet having at least one outwardly facing paper-like layer bonded to a gypsum-based core, wherein the improvement in said plasterboard product is comprised of:
- said paper-like layer being formed with a decorative pattern of recesses therein provided by a plurality of permanently compressed areas, said compressed areas of said paper-like layer being further charred to discolor their appearance to make said recesses forming said pattern visually perceptible, and said paper-like layer being formed as a continuous unbroken sheet over said pattern including said recesses.

4,110,508
FOAM SHEET AND METHOD

Irving E. Isgur, Framingham; Andrew B. Holmstrem, Burlington, and Norman J. Hayes, Bedford, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.
Filed Feb. 9, 1976, Ser. No. 656,674
Int. Cl.^{2} B32B *5/02, 5/16, 5/30*
U.S. Cl. 428—240 **21 Claims**

1. A composite which comprises in combination, a fabric consisting essentially of a porous woven or non-woven fibrous web and a hydrophilic crosslinked polyurethane layered thereon having a three-dimensional network, said polyurethane comprising shredded foam particles, said foam being the reaction product of a resin component and an aqueous reactant, said resin component comprising isocyanate-capped polyoxyethylene polyol having a reaction functionality greater than two, and a second component comprising aqueous reactant, the water index value being about 1,300 to about 78,000 H_20 and wherein the capped polyoxyethylene polyol is present in the first component in an amount from about 3% by weight up to 100% by weight, wherein the capped polyoxyethylene polyol having a terminal member with an isocyanate functionality of two is present in an amount from 0% up to about 97% by weight, wherein the polyoxyethylene polyol moiety of the isocyanate capped member has a weight average molecular weight of about 200 to about 20,000 and a hydroxyl functionality of about 2 to about 8, and wherein the average particle size of the foam particles is about 0.02 inch mesh to about 0.12 inch mesh.

4,110,509
PROCESS FOR IMPARTING FLAME RESISTANCE TO CELLULOSIC TEXTILE MATERIALS AND CELLULOSIC MATERIALS OBTAINED THEREBY

Philip B. Roth, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Mar. 23, 1977, Ser. No. 780,376
Int. Cl.^{2} B05D *3/10, 3/12*
U.S. Cl. 428—276 **14 Claims**

1. A process for rendering a cellulosic textile material flame-resistant comprising;
- impregnating the material with an aqueous solution of a partially polymerized methylolated phosphorus compound, prepared by reacting from about 4.0 to about 9.0 parts by weight of tetrakis(hydroxymethyl)phosphonium sulfate with about 1.0 part by weight of urea, to deposit thereon about 3.0–7.0 weight % phosphorus based on the weight of the untreated textile material;
- partially drying the impregnated textile material;
- impregnating the partially dried textile material with a thickened aqueous solution of ammonium hydroxide containing about 17–29% by weight of ammonia and sufficient water soluble thickening agent to provide a solution viscosity of about 500–10,000 centipoises at 25° C to deposit thereon about 2–6 gram-moles of ammonia per gram-atom of phosphorus present thereon, the temperature of the thickened ammonium hydroxide ranging from about 20° C. to about 60° C;
- rolling the ammonium hydroxide-impregnated textile material;
- storing the rolled material in a suitable sealed container for about ½-60 minutes at ambient temperature to allow the formation of an unsoluble polymer within the rolled material from the reaction of said phosphorous compound and ammonium hydroxide impregnated therein;
- recovering and unrolling the stored textile material; rinsing the unrolled textile material with water; and drying the treated textile material.

4,110,510
SOUND BARRIER MATERIAL

Paul Edward Oliveira, New Bedford, Mass., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 23, 1977, Ser. No. 827,036
Int. Cl.^{2} B32B *17/04*
U.S. Cl. 428—285 **5 Claims**

1. A sound barrier material composed of a foam of about 1.5 to 2.5 pounds per cubic foot laminated to a polyvinyl chloride impregnated fiber sheet or mat, said sheet or mat having a coating of 0.02 to 3.2 inch gauge, said coating being chlorinated polyethylene containing barium sulfate.

4,110,511
PROCESS FOR THE PRODUCTION OF A PRESSURE-SENSITIVE CARBONLESS COPY SHEET USING MICROCAPSULES FORMED IN SITU IN A RADIATION CURABLE BINDER

Yu-Sun Lee, Parma Heights, and Dale Richard Shackle, Chillicothe, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed May 25, 1977, Ser. No. 800,561
Int. Cl.^{2} B05D *3/06*
U.S. Cl. 428—307 **25 Claims**

1. A process for producing a liquid substantially solvent-free coating composition for use in the manufacture of pressure-sensitive carbonless transfer papers, said liquid coating composition being characterized by being radiation curable by polymerization to a dry, solid, tack-free resin substantially without the removal of solvents and other liquids and being further characterized by containing microcapsules having a hydrophilic core material, comprising the steps of:

(a) preparing a liquid hydrophilic emulsion component by dispersing at least one chromogenic material in a hydrophilic liquid, said chromogenic material being soluble in said hydrophilic liquid;

(b) preparing a liquid hydrophobic emulsion component by dispersing an emulsifier in a radiation curable hydrophobic liquid;

(c) adding to said liquid hydrophobic emulsion component, with mixing, a first wall-forming material and second wall-forming material, said first and second wall-forming materials being soluble in said liquid hydrophobic emulsion component, said first wall-forming material being reactive with said second wall-forming material to form a polymeric capsule wall, said polymeric capsule wall being substantially insoluble in said liquid hydrophilic and said liquid hydrophobic emulsion components;

(d) mixing said liquid hydrophobic emulsion component with said liquid hydrophilic emulsion component to form an emulsion containing droplets of said liquid hydrophilic emulsion component dispersed in said liquid hydrophobic emulsion component; and

(e) maintaining said mixing for a period of time sufficient to allow said first and second wall-forming materials to react to form a dispersion of microcapsules in said liquid hydrophobic emulsion component, said microcapsules having capsule walls substantially impermeable to said liquid hydrophobic and said liquid hydrophilic emulsion components.

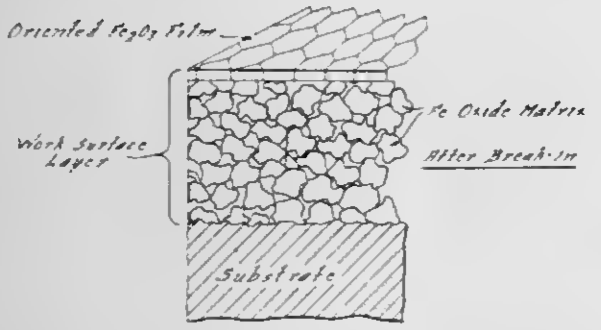
4,110,512

IRON OXIDE MATERIAL AND MEMBERS FOR DRY LUBRICATED SYSTEMS INCLUDING THE METHOD OF PREPARATION THEREFOR

Amedee Roy; Claude Bellean, both of Troy, and James M. Geyman, Harper Woods, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 27, 1971, Ser. No. 212,249
Int. Cl.^{2} B32B *15/16*

U.S. Cl. 428—469 **14 Claims**



1. A member having a substrate and a working surface layer carried thereon, the working surface layer comprising:

a matrix consisting substantially of Fe_3O_4, the matrix containing an interspersed particle and debris trapping material therein, and

a substantially continuous film made up substantially of oriented Fe_2O_3 overlaying the matrix.

4,110,513

FIRE RESISTANT PLYWOOD

Glenn Alvin Heitmann, Morrison, and Milton French Trosper, Jr., Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 4, 1976, Ser. No. 729,500
Int. Cl.^{2} B32B *21/08, 27/42*

U.S. Cl. 428—528 **3 Claims**

1. A plywood body comprising at least two plies of wood bonded together by a phenolic resin adhesive, said adhesive having incorporated therethrough platey talc in an amount of 5 to 200 parts by weight per 100 parts by weight of said resin.

4,110,514

WELD METAL DEPOSIT COATED TOOL STEEL

Frederick Nicholson, Floda, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Gothenburg, Sweden

Continuation-in-part of Ser. No. 702,469, Jul. 6, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,453
Claims priority, application Sweden, Jul. 10, 1975, 7507899
Int. Cl.^{2} B32B *15/18*

U.S. Cl. 428—683 **13 Claims**

1. A weld metal deposit applied as a coating on a hot working tool, said deposit consisting essentially of 0.55% to 2.0% C, 0.2% to 4.0% Si, 0.2% to 3.0% Mn, 4.0% to 6.5% Cr, 2.5% to 15.0% Nb, 0% to 0.5% Ni, 0% to 3.5% strong carbide formers other than niobium selected from the group consisting of tungsten, molybdenum, vanadium, and titanium, the remainder being substantially iron, and the carbon and niobium content being in a ratio of one to the other as defined by the shaded area in FIG. 1 of the accompanying drawings.

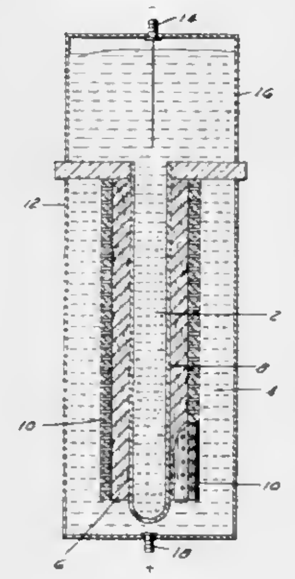
4,110,515

METHOD OF PREPARING COMPOSITE BODY AND SECONDARY BATTERY OR CELL INCORPORATING SUCH COMPOSITE BODY

Nirmal K. Gupta, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 28, 1977, Ser. No. 772,617
Int. Cl.^{2} C04B *37/00*

U.S. Cl. 429—104 **11 Claims**



1. A method of preparing a composite body comprising a substrate having a felt prepared from materials selected from the group consisting of metal, carbon and graphite, bonded to a major surface thereof, wherein said method comprises:

(A) forming and curing a branched polyphenylene prepolymer having a number average molecular weight of between about 500 and about 800 and bearing terminal acetylene functionality to form a shaped, crosslinked body;

(B) preparing a solution of said branched polyphenylene prepolymer in an organic solvent in an amount ranging from about 1 to about 60 parts by weight of said prepolymer per 100 parts of said solution;

(C) preparing a composite of said shaped body and said felt to be bonded to a major surface thereof with said solution interposed between said shaped body and said felt;

(D) firing said composite in an inert atmosphere at a temperature of at least 800° C until the polymer in said solution and said shaped body is converted to vitreous carbon and said shaped body is integrally bonded to said felt.

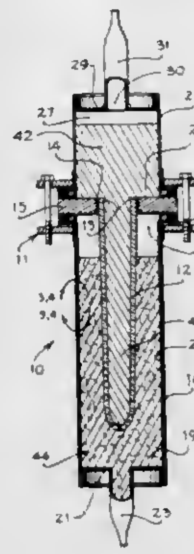
4,110,516

SODIUM-SULFUR CELL CASING

Manfred W. Breiter, Schenectady, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 15, 1977, Ser. No. 806,723
Int. Cl.^{2} H01M *4/36*

U.S. Cl. 429—104 **4 Claims**



1. In a sodium-sulfur cell assembly a hermetically sealed sulfur cell casing comprising a container of aluminum, the interior side wall of said container being pre-etched and characterized by an electrically conducting corrosion resistant electrolytically applied layer of chromium overlying the pre-etched aluminum wall.

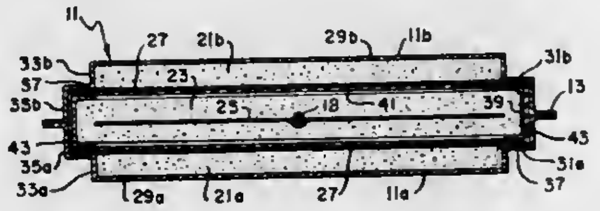
4,110,517

ELECTROCHEMICAL CELL DESIGN

John D. Arntzen, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,585
Int. Cl.^{2} H01M *10/38*

U.S. Cl. 429—133 **10 Claims**



1. An electrochemical cell including an array of three electrodes with a central electrode of opposite polarity to two outer electrodes, comprising in combination:

first and second housing halves adapted to engage together to define a cell containment volume, each housing half having side and edge walls, the side walls having a major central portion raised above offset perimetric margins, the edge walls including inward sections circumscribing the raised side-wall portions and including outward sections adapted to engage corresponding outward sections of a matching housing half;

means for fixedly attaching said first and second housing halves together;

outer electrodes of same polarity nested within the cell containment volume defined in each housing half by the raised central portion of the housing side walls;

a central electrode nested in the containment volume circumscribed by the outward sections of the edge walls, said central electrode having perimetric margins on opposing side surfaces facing the corresponding, internal surfaces of the side-wall perimetric margins; and

an electrically insulative separator, penetrable by liquid electrolyte, disposed between the central and each of the two outer electrodes and sealingly engaged between the perimetric margins of the center electrode and internal side-wall surfaces of the housing.

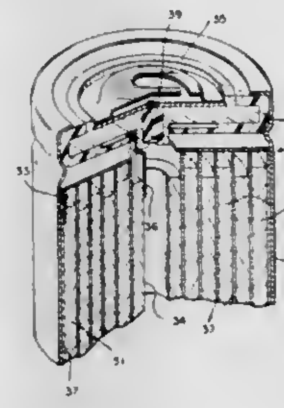
4,110,518

FLUOROCARBON SEAL

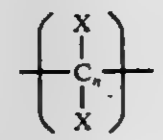
Alexander Gilmour, Ewell Surrey, England, and Henry Rodgers Mallory, Greenwich, Conn., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 1, 1976, Ser. No. 728,673
Int. Cl.^{2} H01M *2/08;* C09J *5/00*

U.S. Cl. 429—174 **12 Claims**



1. An electrochemical device including electrically conductive elements and a single element separating and electrically insulating one of the electrically conductive elements from the other electrically conductive element, said electrically insulating element being formed of a material comprising a polymeric, fluorocarbon with repeating units having the formula:



$$\left(\begin{array}{c} X \\ | \\ -C_n- \\ | \\ X \end{array}\right)$$

wherein *n* is a whole number equal to or greater than 2 and wherein *x* represents radicals, at least one of which within each repeating unit is a radical other than fluorine, and wherein the polymeric material comprises a coalesced material dielectrically separating and directly adhered to said electrically conductive elements.

4,110,519

METHOD FOR THE PRODUCTION OF ELECTRODES FOR LEAD STORAGE BATTERIES

Ove Nilsson, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Continuation-in-part of Ser. No. 751,885, Dec. 17, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,688
Claims priority, application Sweden, Dec. 29, 1975, 7514663
Int. Cl.^{2} H01M *4/56*

U.S. Cl. 429—217 **8 Claims**

1. A method for the production of a plate-type electrode for a lead storage battery comprising forming a mixture of lead powder which normally is at least 70% oxidized and from 0.1 to 3 percent by weight of polytetrafluoroethylene, heating the mixture, applying shear stresses to said powder mixture sufficient to convert substantially all of the polytetrafluoroethylene into fibrous form and applying the heated mixture to an electrode grid under conditions whereby a unitary, coherent structure is formed.

4,110,520
MODIFICATION OF WATER-SOLUBLE ACRYLIC POLYMER

Tohru Miyajima, Ebina, Japan, assignor to Kyoritsu Yuki Co., Ltd. and Mitsubishi Chemical Industries Limited, both of Tokyo, Japan

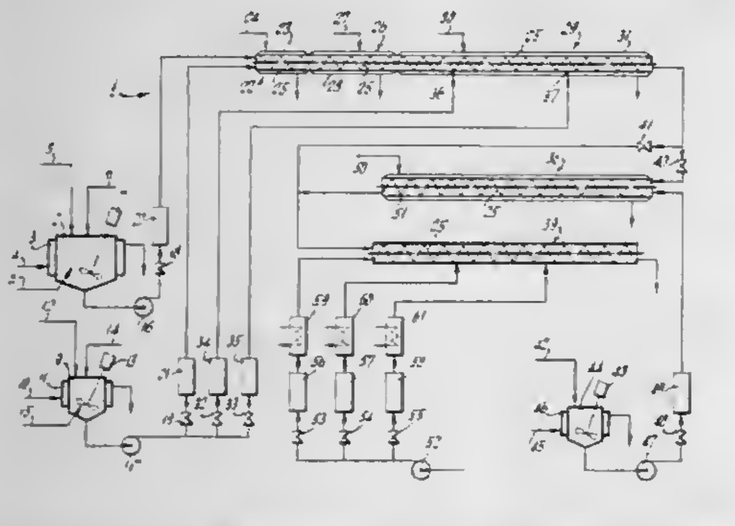
Filed Dec. 17, 1976, Ser. No. 751,671
Int. Cl.² C08F *8/10, 8/12, 8/50, 8/34*
U.S. Cl. 526—27 **12 Claims**

1. A process for the modification of a water-soluble high polymer, which comprises: dispersing at least one water-soluble high polymer selected from the group consisting of polyacrylamide, polymethacrylamide, copolymers composed mainly of acrylamide, and copolymers composed mainly of methacrylamide in an aqueous solution of a water-soluble salt, said salt selected from the group consisting of alkali metal and magnesium salts of dibasic and more basic inorganic acids, wherein the concentration of said salt in said aqueous solution is sufficient to prevent the elution of said polymer from said solution and is not less than 15 wt. % based on the amount of salt in water; and contacting said water-soluble high polymer dispersed in the aqueous solution with a modifier to modify said high polymer.

4,110,521
CONTINUOUS POLYMERIZATION APPARATUS AND PROCESS

Richard Earl Barnett, Pittsburgh, Pa., and Guy Thomas Woodrum, Blacksburg, Va., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Sep. 21, 1977, Ser. No. 835,091
Int. Cl.² C08F *2/10*
U.S. Cl. 526—64 **7 Claims**



1. A device for the production of water soluble polymers which comprises a tubular premixer which is surrounded by a jacket in which a heated or cooled fluid is circulated to control the temperature of fluids being passed through the premixer, means to feed a monomer solution to the premixer, means to feed an initiator solution to the premixer, static mixers disposed inside the tubular premixer to provide thorough mixing of the monomer solution and the initiator solution, a tubular preheater into which the monomer-initiator mixture is passed said tubular preheater being surrounded by a jacket in which a heated fluid is circulated to increase the temperature of the monomer-initiator mixture, static mixers disposed inside the tubular preheater to provide mixing for uniform heat transfer to the monomer-initiator mixture, a tubular polymerizer which contains static mixers and a jacket which surrounds the tubular polymerizer through which fluid is pumped to control the temperature of the monomer-initiator mixture being polymerized, and means to dispense the polymer solution from the tubular polymerizer.

4,110,522
MANUFACTURE OF OLEFIN POLYMERS

Hans Frielingsdorf, Bad Duerkheim; Wolfgang Gruber, Frankenthal, and Heinz Mueller-Tamm, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,258
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604550
Int. Cl.² C08F *4/02, 4/24, 10/00*
U.S. Cl. 526—105 **7 Claims**

1. A process for the manufacture of an olefin polymer by polymerizing one or more α-monoolefins 2 to 8 carbon atoms at from 60° to 160° C. and an olefin pressure of from 0.5 to 40 bars, by means of a catalyst obtained from a silicate carrier (component a), an organo-metallic compound containing alkoxide groups (component b) and a chromium compound (component c), wherein the catalyst employed is obtained by

(1) first charging
  (1.1) a finely divided xerogel (component a) which has a particle diameter of from 20 to 2,000 μm, a pore volume of from 0.7 to 2.6 cm³/g and a surface area of from 150 to 600 m²/g, and which the formula

$$SiO_2 . m\ Al_2O_3$$

  where *m* is a number from 0 to 2, with
  (1.2) an aluminum compound containing alkoxide groups (component b) of the general formula

$$R'_pAl(OR'')_{3-p}$$

  where R′ is alkyl of 1 to 8 carbon atoms, R″ is open-chain alkyl of 1 to 8 carbon atoms or cyclic alkyl of 5 to 8 carbon atoms and *p* is a number from 0 to 2,
(2) then charging
  (2.1) the product obtained from stage (1) with
  (2.2) a chromium compound (component c), which compound is chromium trioxide or a chromium compound which is converted to chromium trioxide under the conditions of stage (3), by treatment with a solution of the chromium compound, with intimate mixing and evaporation of the solvent, and
(3) finally keeping the product, obtained from stage (2), in an anhydrous stream of gas, containing oxygen at a concentration of more than 10 percent by volume, for from 10 to 400 minutes at from 600° to 1,000° C., with the proviso that the catalyst contains from 0.1 to 10 parts by weight of component (b) (calculated as aluminum) and from 0.3 to 10 parts by weight of component (c) (calculated as chromium trioxide) per 100 parts by weight of component (a) (calculated as silicon dioxide).

4,110,523
MANUFACTURE OF HOMOPOLYMERS AND COPOLYMERS OF α-MONOOLEFINS

Günther Schweier, Ludwigshafen; Erich Kolk, Bad Durkheim; Heinz Mueller-Tamm, Ludwigshafen; Hans Frielingsdorf, Bad Durkheim; Robert Bachl, Worms, and Wolfgang Gruber, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 27, 1977, Ser. No. 762,856
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603920
Int. Cl.² C08F *4/02, 10/02*
U.S. Cl. 526—124 **14 Claims**

1. A process for the manufacture of a homopolymer or copolymer of one or more α-monoolefins of 2 to 6 carbon atoms by polymerizing the monomer or monomers at from 30 to 200° C and from 0.1 to 200 bars by means of a Ziegler catalyst system comprising

(1) a titanium-containing catalyst component and
(2) a metal compound of the general formula

$$Me\ A_{m-n}X_n$$

where Me is aluminum, magnesium or zinc, A is a hydrocarbon radical of 1 to 12 carbon atoms, X is chlorine, bromine, iodine or hydrogen, *m* is the valency of the metal Me and *n* is a number from 0 to m−1, with the proviso that the atomic ratio of titanium from catalyst component (1) to metal (Me) from catalyst component (2) is from 1:0.1 to 1:500, wherein the titanium-containing catalyst component (1) employed is the solid-phase product (IV) obtained by bringing into contact

(1.1) a finely divided, porous, inorganic oxidic material (I) which has a particle diameter of from 1 to 1,000 μm, a pore volume of from 0.3 to 3 cm³/g, and a surface area of from 100 to 1,000 m²/g, and which has the formula $SiO_2.aAl_2O_3$, where *a* is a number from 0 to 2, and
(1.2) a solution (II) obtained by bringing together
  (IIa) 100 parts by weight of an alcohol of the general formula

$$Z—OH$$

  where Z is a saturated hydrocarbon radical of 1 to 8 carbon atoms,
  (IIb) from 0.01 to 6 parts by weight (calculated as titanium) of a titanium trihalide, where the halogen may be chlorine and/or bromine, and
  (IIc) from 0.01 to 4 parts by weight (calculated as magnesium) of a magnesium compound which is soluble in the alcohol (IIa), to form a dispersion (III), with the proviso that the weight ratio of inorganic oxidic material (I) to titanium in the titanium trihalide (IIb) is from 1:0.01 to 1:0.2, and the weight ratio of inorganic oxidic material (I) to magnesium in the magnesium compound (IIc) is from 1:0.01 to 1:0.25, and the dispersion (III) is evaporated at below 200° C, and above the melting point of the alcohol (IIa) used, the evaporation being substantially complete in about 1 to 10 hours, until it reaches a dry consistency, i.e. until the solid-phase product (IV) is formed, any residual alcohol being left in said solid-phase product (IV).

4,110,524
DIRECT PRODUCTION OF POLYMORPH III OF ISOTACTIC POLYBUTENE-1

Albert Frese, Marl, Germany, assignor to Chemische Werks Huls A.G., Marl, Germany

Continuation of Ser. No. 257,979, May 30, 1972, abandoned, and Ser. No. 799,972, Feb. 17, 1969, abandoned. This application Apr. 24, 1974, Ser. No. 464,186
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1968, 1720442
Int. Cl.² C08F *2/06, 10/08*
U.S. Cl. 526—158 **11 Claims**

1. A process for the direct production of polybutene-1 containing about 70 to 100% of modification III, 0 to 20% of modification II, and 0 to 15% of modification I, and having a bulk density of 180–240 g/l, said process comprising polymerizing butene-1 at a polymerization temperature of 140°-200° C in the liquid phase in an inert hydrocarbon diluent in the presence of a catalyst consisting essentially of: (a) a titanium trichloride selected from the group consisting of violet $TiCl_3$ and $TiCl_3 . 1/3\ AlCl_3$, and (b) an alkyl aluminum compound selected from the group consisting of an alkyl aluminum halogenide, a trialkyl aluminum, and an alkyl aluminum hydride, the molar ratio of (a) to (b) being about 1 : 0.5 to 1 : 3, said polymerizing being conducted substantially entirely at said polymerization temperature for a sufficient time to produce said polybutene-1 having a molecular weight of 50,000 to 5,000,000 measured by reduced viscosities, and then precipitating said polybutene-1 from said liquid phase.

4,110,525
POLYMERIZATION PROCESS

Yves de Zarauz, Le Cendre, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 788,031, Apr. 15, 1977, and a continuation-in-part of Ser. No. 659,905, Feb. 20, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 792,325
Claims priority, application France, Feb. 27, 1975, 75 06239
Int. Cl.² C08F *4/52, 4/54*
U.S. Cl. 526—177 **8 Claims**

1. A process of producing homopolymers of conjugated dienes or copolymers of conjugated dienes with other conjugated dienes or with vinyl aromatic compounds to form elastomeric products which comprises reacting the monomers at a temperature between 50° C. and 120° C. in the presence of a catalytic system formed of the reaction product of

(a) an organometallic compound of a metal of Group IIIA of the Medeleev periodic table of elements having the formula $Me^1OMe^3R^1R^2$ in which Me^1 represents an alkali metal, Me^3 represents aluminum or boron, R^1 and R^2 represent an alkyl or aralkyl radical; with
(b) at least one electron-donor compound containing at least one hetero-atom formed of the reaction product of a protic polar compound with an alkali metal or with an alkaline earth metal.

4,110,526
METHOD FOR PRODUCTION OF CASTING SYRUPS

Takaki Hamada; Hiroyuki Kanazawa, and Masataka Yanase, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Jan. 31, 1977, Ser. No. 764,021
Claims priority, application Japan, Feb. 6, 1976, 51-12713
Int. Cl.² C08F *20/14*
U.S. Cl. 526—214 **9 Claims**

1. In the production of a casting syrup, useful in a continuous casting process for the production of cast plates, by partial polymerization of methyl methacrylate or a mixture thereof with at least one unsaturated vinyl compound copolymerizable therewith in an amount of less than 20% by weight based upon methyl methacrylate, the improvement which comprises conducting the partial polymerization in the presence of from about 0.005 to 1% by weight based on the total amount of the monomers of a thiodicarboxylic acid ester of the formula:

$$R_3OOCR_1—S—R_2COOR_4$$

wherein R_1 and R_2 are each an alkylene group having 1 to 6 carbon atoms and R_3 and R_4 are each an alkyl group having 1 to 24 carbon atoms as a stabilizer and using an azo compound as a polymerization initiator.

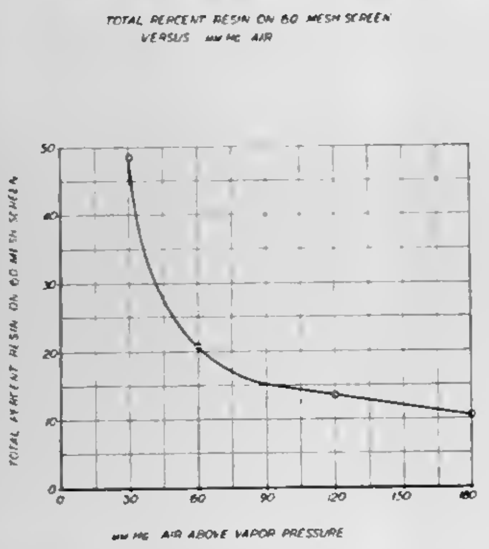
4,110,527
VINYL CHLORIDE POLYMERIZATION USING SELECTED AMOUNTS OF AIR, OXYGEN OR NITROGEN

Edwin T. Chesler, Riverside, R.I.; Donald Goodman, Flemington, N.J., and Milton Lapkin, Barrington, R.I., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 30, 1973, Ser. No. 355,834
Int. Cl.² C08F *4/32, 4/28, 14/06*
U.S. Cl. 526—235 **1 Claim**

1. In the method for preparing vinyl chloride polymers by suspension polymerization in which a vinyl chloride monomer is suspended in an aqueous medium which contains an initiator and a suspending agent, the improvement comprising maintaining a limited amount of oxygen gas in the reactor by placing

said reactor under an atmosphere of said gas of from about 60 to about 120 mm Hg of absolute pressure above the water vapor pressure prior to charging the vinyl chloride monomer to the reactor.



4,110,528

RING-OPENED COPOLYMERS OF AT LEAST ONE NORBORNENE-TYPE MONOMER WITH DICYCLOPENTADIENE

Robert John Minchak, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

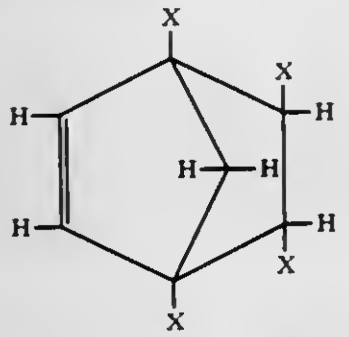
Continuation-in-part of Ser. No. 568,898, Apr. 17, 1975, Pat. No. 4,069,376. This application Mar. 28, 1977, Ser. No. 782,103

The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.

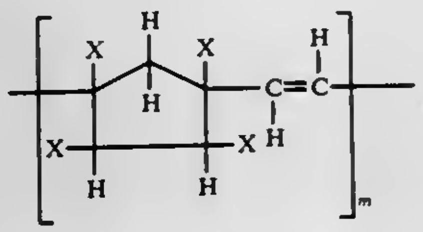
Int. Cl.^{2} C08F *32/08, 232/08, 36/00*

U.S. Cl. 526—283 **9 Claims**

1. A ring-opening polymerized copolymer comprising polymerized units derived from (a) at least one norbornene-type monomer having the formula



wherein any X may be hydrogen or an alkyl group containing from 1 to 20 carbon atoms, (b) dicyclopentadiene in an amount from about 40% to 95% by weight of the total weight of copolymer, and (c) from about 0.0001 to about 0.3 mole of at least one nonconjugated acyclic olefin per mole of total norbornene-type monomer and dicyclopentadiene, said acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atom, said copolymer having repeating linkages primarily of the following types in random order, where *m* and *n* are numbers which are proportional to the concentrations of norbornene-type monomer and dicyclopentadiene used, and X is as defined heretofore:



and

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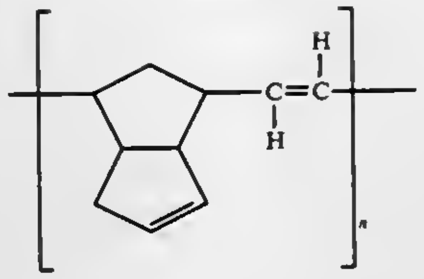


4,110,529

METHOD OF MANUFACTURING SPHERICAL POLYMER PARTICLES FROM POLYMER SOLUTIONS

Vladimir Stoy, Prague, Czechoslovakia, assignor to Ceschoslovak akademie ved, Prague, Czechoslovakia

Filed Nov. 20, 1975, Ser. No. 633,787

Claims priority, application Czechoslovakia, Nov. 26, 1974, 8071/74

Int. Cl.^{2} C08J *3/16, 9/28*

U.S. Cl. 528—491 **12 Claims**

1. A method of forming a polymeric material into spherical particles or beads, which comprises providing a solution of the polymeric material in a solvent that dissolves the polymeric material without any chemical transformation of the latter; dispersing the resulting polymeric material solution in a liquid dispersing medium that is a non-solvent for the polymeric material and is immiscible with the solvent, the volume ratio of the resulting dispersed phase to the dispersing medium varying from 1:1 to 30:1, the viscosity of the dispersing medium being no more than about one order less than the viscosity of the dispersed phase; adding the resulting emulsion with stirring into an excess of a coagulating liquid that coagulates the polymeric material without any chemical transformation of the latter and that is a non-solvent for the polymeric material, is miscible with the solvent, and is immiscible with the dispersing medium; whereupon the mixture is transformed directly into a three phase system of coagulated polymer, the coagulating liquid and the dispersing medium, and thereafter separating the liquid phases and resulting coagulated polymeric material particles or beads.

4,110,530

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES - C_8 MODIFICATIONS

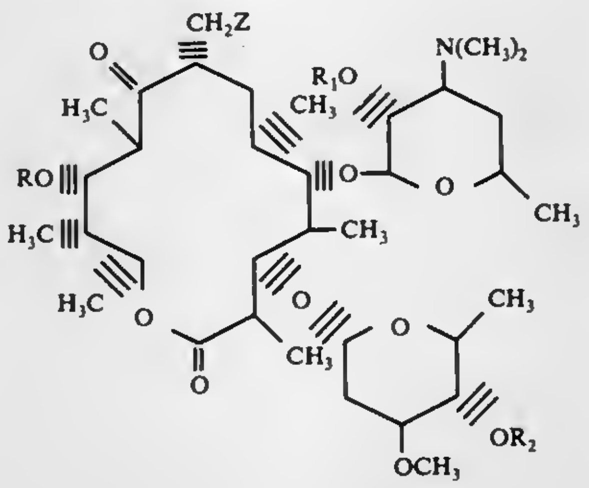
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Feb. 7, 1977, Ser. No. 766,219

Int. Cl.^{2} A61K *31/71;* **C07H** *17/08*

U.S. Cl. 536—9 **3 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms; and

Z is $—N_3$, —Cl and imidazol-1-yl.

4,110,531

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES - C_8 MODIFICATIONS

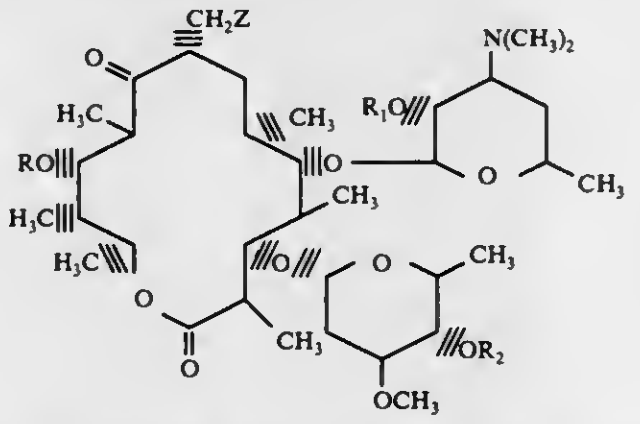
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Feb. 7, 1977, Ser. No. 766,260

Int. Cl.^{2} A61K *31/71;* **C07H** *17/08*

U.S. Cl. 536—9 **4 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

Z is selected from the group consisting of $—N{=}CHN(R_3)_2$, $—N(R_3)_2$ and NH_2 and;

R_3 is alkyl having from one to three carbon atoms.

4,110,532

5-HYDROXY-PGI_1 COMPOUNDS

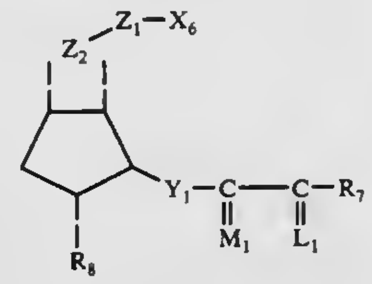
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 14, 1977, Ser. No. 815,648

Int. Cl.^{2} C07D *307/93*

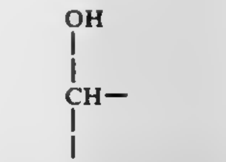
U.S. Cl. 542—426 **53 Claims**

1. A prostacyclin analog of the formula

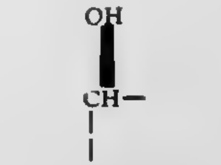


wherein Z_2 is

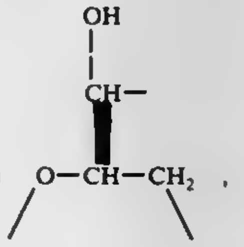
(1)



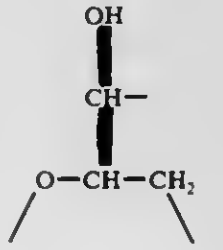
, (2)



, (3)

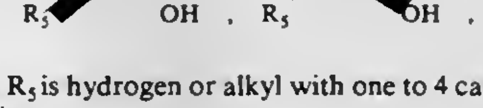


, (4)



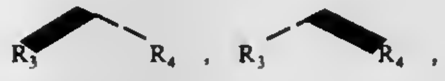
,

wherein Z_1 is
(1) $—(CH_2)_g—CH_2—CH_2—$,
(2) $—(CH_2)_g—CH_2—CF_2—$, or
(3) trans$—(CH_2)_g—CH{=}CH—$,
wherein *g* is the integer one, 2, or 3;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) $—CH_2CH_2—$,
(4) trans-CH=C(Hal)—, or
(5) —C≡C—
wherein Hal is chloro ol bromo:
wherein M_1 is

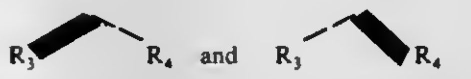


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein X_6 is

(1) $—COOR_1$; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation,

(2) $—CH_2OH$,

(3) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or $—COOR_1$, wherein R_1 is as defined above;

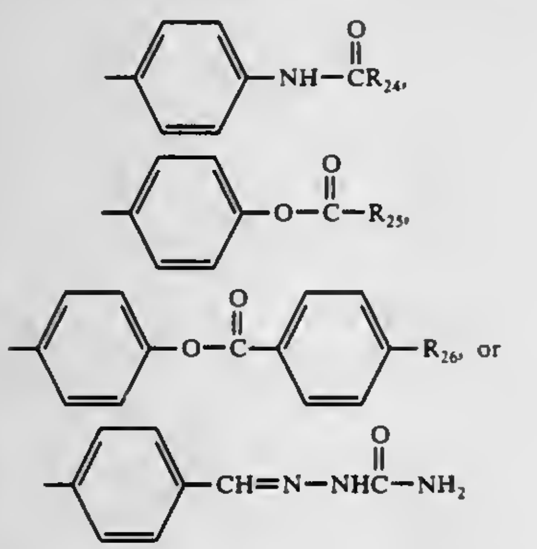
(4) $—COL_4$, wherein L_4 is

(a) amido of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;

(b) carbonylamido of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above; or

(c) sulphonylamide of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

(5) $—COOL_5$, wherein L_5 is p-substituted phenyl selected from the group consisting of



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{25} is methyl, phenyl, $—NH_2$, or methoxy; and R_{26} is hydrogen or acetamido, and the 1,5— and 1,1 5-lactones thereof.

4,110,533

PROCESS FOR THE MANUFACTURE OF ENOL DERIVATIVES

Robert Burns Woodward, Cambridge, Mass., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

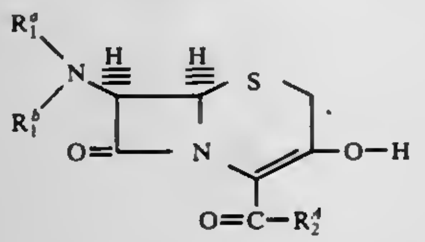
Filed Feb. 10, 1976, Ser. No. 671,193

Claims priority, application Switzerland, Feb. 20, 1975, 2157/75; Aug. 25, 1975, 10962/75

Int. Cl.^{2} C07D *501/08, 501/20*

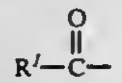
U.S. Cl. 544—16 **12 Claims**

1. Process for the manufacture of a 7β-amino-3-cephem-3-ol-4-carboxylic acid compound of the formula



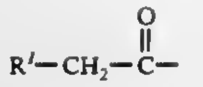
(1A)

wherein $R_1{}^a$ represents an acyl group of the formula



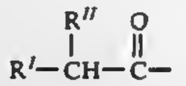
$$R^{I}-\overset{O}{\overset{\|}{C}}- \quad (A_1),$$

wherein R^I represents hydrogen, cyclopentyl, cyclohexyl or cycloheptyl, or such cycloalkyl which is substituted in the 1-position by amino protected amino, sulphoamino or sulphoamino in the form of an alkali metal salt, or R^I represents phenyl, naphthyl or tetrahydronaphthyl group or phenyl, naphthyl or tetrahydronaphthyl substituted by hydroxyl, protected hydroxyl, and/or by halogen
or R^I represents 4-isoxazolyl, or R^I represents an amino group which is N-substituted by lower alkyl or halogen substituted lower alkyl, or $R_1{}^a$ represents an acyl group of the formula



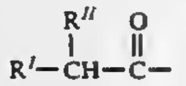
$$R^{I}-CH_2-\overset{O}{\overset{\|}{C}}- \quad (A_2),$$

wherein R^I represents lower alkyl, halogeno-lower alkyl, phenyloxy-lower alkyl, hydroxyphenyloxy-lower alkyl, protected hydroxyphenyloxy-lower alkyl, halogeno-phenyloxy-lower alkyl, or lower alkyl substituted by amino and/or carboxyl, wherein amino is free or protected and carboxyl is free or protected, or R^I represents lower alkenyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, amino-lower alkyl-phenyl, protected amino-lower alkyl-phenyl, phenyloxyphenyl, or R^I represents pyridyl, pyridinium, thienyl, furyl, imidazolyl or tetrazolyl, or these heterocyclic groups substituted by lower alkyl, amino, protected amino, aminomethyl or protected aminomethyl, or R^I represents lower alkoxy, phenyloxy, hydroxy-phenyloxy, protected hydroxyphenyloxy, halogeno-phenyloxy, lower alkylthio, lower alkenylthio, phenylthio, pyridylthio, 2-imidazolythio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio, or 5-tetrazolylthio, and these heterocyclylthio groups, substituted by lower alkyl, or R^I represents halogeno, lower alkoxycarbonyl, cyano, carbamoyl, N-lower alkyl-carbamoyl, N-phenylcarbamoyl, lower alkanoyl, benzoyl, or azido, or $R_1{}^a$ represents an acyl group of the formula



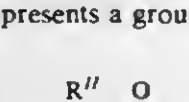
$$R^{I}-\overset{R^{II}}{\overset{|}{C}}H-\overset{O}{\overset{\|}{C}}- \quad (A_3),$$

wherein R^I represents lower alkyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, or isothiazolyl, and also represents 1,4-cyclohexadienyl, and R^{II} represents amino, protected amino, guanidinocarbonyl-amino, sulphoamino, sulphoamino in alkali-metal salt-form, azido, carboxyl, carboxyl in alkali-metal salt-form, protected carboxyl, cyano, sulpho, hydroxyl, protected hydroxyl, O-lower alkyl-phosphono, O,O'-di-lower alkyl-phosphono or halogeno or $R_1{}^a$ represents a group of the formula



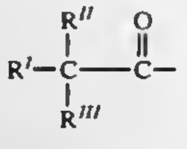
$$R^{I}-\overset{R^{II}}{\overset{|}{C}}H-\overset{O}{\overset{\|}{C}}- \quad (A_4),$$

wherein R^I and R^{II} each represent halogeno, or lower alkoxycarbonyl, or $R_1{}^a$ represents a group of the formula



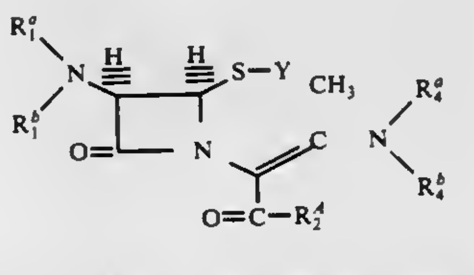
$$R^{I}-\overset{R^{II}}{\overset{|}{C}}H-\overset{O}{\overset{\|}{C}}- \quad (A_5)$$

wherein R^I represents phenyl, hydroxyphenyl, protected hydroxyphenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, isothiazolyl or 1,4-cyclohexadienyl, and R^{II} represents aminomethyl or protected aminomethyl or $R_1{}^a$ represents a group of the formula



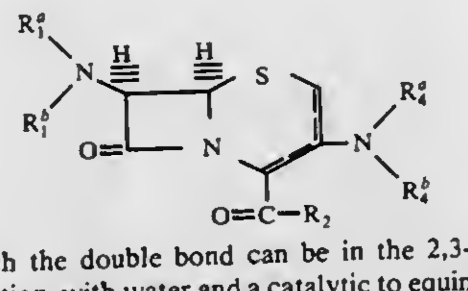
$$R^{I}-\underset{\underset{R^{III}}{|}}{\overset{\overset{R^{II}}{|}}{C}}-\overset{O}{\overset{\|}{C}}- \quad (A_6),$$

wherein each of the groups R^I, R^{II} and R^{III} represents lower alkyl, and $R_1{}^b$ represents hydrogen, or $R_1{}^a$ and $R_1{}^b$ together represent 1-oxo-3-aza-1,4-butylen, such group substituted in the 2-position by a group R^I as defined under formula (A_3) and such group substituted in the 4-position by lower alkyl, and $R_2{}^A$ represents a group which together with the carbonyl grouping —C(=O)— forms a protected esterified carboxyl group, characterised in that a compound of the formula



(It)

wherein $R_1{}^a$, $R_1{}^b$ and $R_2{}^A$ have the meanings mentioned under formula 1A, the group $—N(R_4{}^a)\ (R_4{}^b)$ denotes a secondary amino group, wherein one of the substituents $R_4{}^a$ and $R_4{}^b$ represents hydrogen and the other represents lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein $—N(R_4{}^a)\ (R_4{}^b)$ denotes a tertiary amino group, wherein each of the substituents $R_4{}^a$ and $R_4{}^b$, independent of each other is lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein $—N(R_4{}^a)\ (R_4{}^b)$ is 1-aziridinyl, 1-pyrrolidinyl, 1-piperidyl , 1H-2,3,4,5,6,7-hexahydroazepinyl, 4-morpholinyl, 4-thio-morpholinyl, 1-piperazinyl, or 4-methyl-1-piperazinyl, and Y represents a leaving group of the formula $—S—R_4$, wherein R_4 is a diazacyclyl, oxazacyclyl, thiazacyclyl, thiadiazacyclyl, Thiatriazacyclyl, oxadiazacyclyl, oxatriazacyclyl, benzdiazacyclyl, benzoxazacyclyl or benzthiazacyclyl radical of aromatic character which radical is bonded to the thio group —S— by one of its ring carbon atoms, which is bonded to a ring nitrogen atom by a double bond, or such group substituted by lower alkyl, lower alkoxy, halogen or phenyl, or wherein R_4 denotes lower alkanoyl, lower thioalkanoyl, cycloalkane carbonyl, cycloalkanethiocarbonyl, benzoyl, thiobenzoyl, naphthylcarbonyl, naphthylthiocarbonyl, pyridylcarbonyl, thenoyl, furoyl, pyridylthiocarbonyl, thiothenoyl or thiofuroyl, or represents such an acyl or thioacyl group which is monosubstituted or polysubstituted by lower alkyl, halogen, lower alkoxy, phenyl or phenyloxy, which groups R_4 have up to 18 carbon atoms, or Y represents a leaving group of the formula $—SO_2—R_5$, wherein R_5 represents unsubstituted or lower alkoxy-, halogeno, phenyl-, or phenyloxy-monosubstituted or -polysubstituted lower alkyl, lower alkenyl, cyclopentyl or cyclohexyl or R_5 represents naphthyl, or phenyl, or naphthyl or phenyl monosubstituted or polysubstituted by lower alkyl, lower alkoxy, halogen, phenyl, phenyloxy, or nitro, which groups R_5 have up to 18 carbon atoms, is heated in an inert solvent at a temperature of between about 80° to about 100°. H—Y being eliminated, and treating the enamine, which is formed as the intermediate product, of the formula (III)



(III)

in which the double bond can be in the 2,3-position or the 3,4-position, with water and a catalytic to equimolar amount of a carboxylic, sulphonic or mineral acid, at a temperature of −10° C to +40°C.

4,110,534

PROCESS FOR THE PREPARATION OF 3-VINYL AND SUBSTITUTED VINYL CEPHALOSPORINS

John Colin Clark, Gerrards Cross, England; James Kennedy, Angus, Scotland; Alan Gibson Long, Greenford, and Niall Galbraith Weir, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

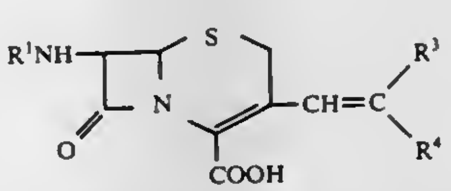
Division of Ser. No. 486,633, Jul. 8, 1974, which is a continuation of Ser. No. 108,136, Jan. 20, 1971, abandoned. This application Apr. 21, 1976, Ser. No. 679,073

Claims priority, application United Kingdom, Jan. 23, 1970, 3464/70; Jan. 23, 1970, 21907/70; Jan. 23, 1970, 28194/70

Int. Cl.^{2} C07D *501/02, 501/04*

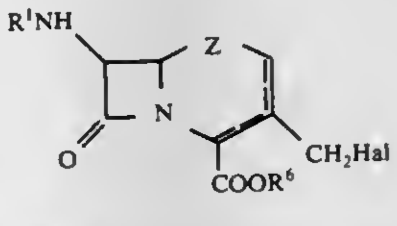
U.S. Cl. 544—16 **10 Claims**

1. In a process for the preparation of a compound of the formula



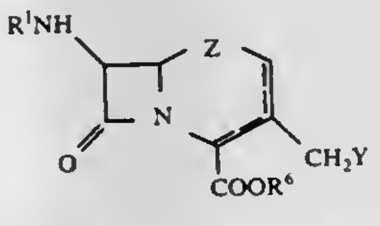
t

wherein R^1 is carboxylic acyl of from 1–20 carbon atoms and each of R^3 and R^4 is a member selected from the group consisting of a hydrogen atom; lower alkyl; cyclopentyl; cyclohexyl; phenyl; phenyl substituted by halogen, lower alkyl or nitro; lower alkoxycarbonyl; lower alkylcarbonyl; cyano; carboxy; phenylloweralkoxycarbonyl; diphenylloweralkoxycarbonyl; benzyl and phenylethyl, the steps of (A) reacting a cephalosporin of the formula



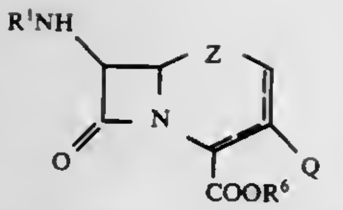
II

wherein R^1 has the above defined meaning, R^6 is hydrogen or a carboxyl-blocking group, Z is > S or > S → O, Hal is a chlorine, bromine or iodine atom, and the dotted line between positions 2, 3 and 4 represents a double bond at position 3, 4 or 2, 3 with a compound of the formula PR_3 or $P(OR)_3$ where R is lower alkyl, phenyl or benzyl or lower alkyl, phenyl or benzyl substituted by at least one of a halogen atom, nitro, cyano, or amino to produce a compound of the formula



III

wherein R^1, R^b, Z and dotted line are as defined above and Y is a group $—P^+R_3$ or $—PO(OR)_2$ where R is as defined above, (B) reacting the compound obtained in Step (A) with a base selected from the group consisting of an alkali metal of an alkaline earth hydroxide, carbonate, or hydrogen carbonate; ethoxycarbonylmethylenediphenylphosphorane; the conjugate base of dimethylsulphoxide, dimethylacetamide or dimethylformamide; pyridine; triethylamine; a sodio or lithio derivative of hexamethyldisilazane; an alkali metal alkoxide; ethylene oxide and propylene oxide to abstract therefrom a proton to produce a compound of the formula

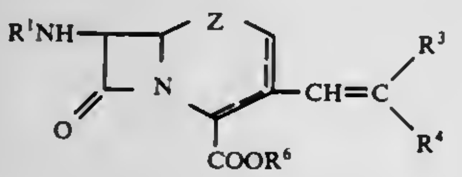


IV

where R^1, R^6, Z and the dotted line are as defined above and Q is a group $—CH{=}PR_3$ or $—\ominus CH—PO(OR)_2$ where R has the above defined meaning, and (C) reacting the compound obtained in step (B) with a carbonyl compound of the formula

$R^3.CO.R^4$

wherein R^3 and R^4 are as defined above to produce a compound of the formula



V

wherein R^1, Z, R^3, R^4, R^6 and the dotted line are as defined above.

4,110,535
3-OXOPYRIDAZINYLTHIOMETHYL DERIVATIVES OF UREIDOCEPHALOSPORINS

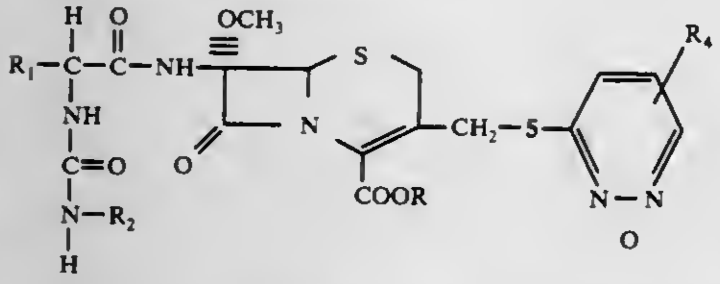
Hermann Breuer, and Uwe Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 611,041, Sep. 8, 1975, Pat. No. 3,996,218. This application Aug. 16, 1976, Ser. No. 715,018

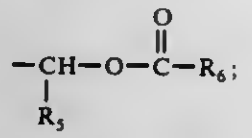
Int. Cl.² C07D *501/36*

U.S. Cl. 544—21 **12 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyllower alkyl, tri(lower alkyl)silyl, trihaloethyl, aluminum, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, lower alkylamine, N-lower alkylpiperidines, or



$$—\underset{R_5}{\underset{|}{CH}}—O—\overset{O}{\overset{\|}{C}}—R_6;$$

R_1 is monosubstituted or unsubstituted heterocyclic wherein said substituent is Cl, Br, or lower alkyl of 1–4 carbons and said heterocyclic is attached by way of an available carbon atom and is selected from the group consisting of thienyl, furyl, and pyrryl; R_2 is hydrogen or lower alkyl; R_4 is hydrogen, halogen, lower alkyl of 1–4 carbons, or lower alkoxy of 1–4 carbons, R_5 is hydrogen or lower alkyl; and R_6 is lower alkyl, phenyl, or phenyl-lower alkyl.

4,110,536
DERIVATIVES OF 5-(INDOL-3-YL)HYDANTOIN

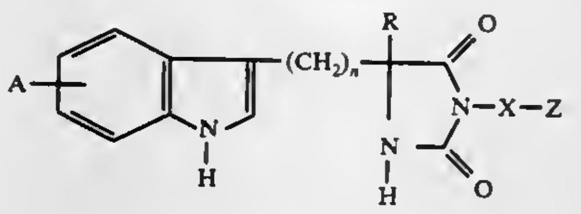
Herbert J. Havera, Edwardsburg, Mich., and Wallace G. Strycker, Goshen, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 18, 1977, Ser. No. 788,154

Int. Cl.² C07D *413/14;* **A61K** *31/535*

U.S. Cl. 544—139 **21 Claims**

1. A compound having the formula,



or a nontoxic, pharmacologically compatible salt thereof, in which:

- A is a hydrogen atom, a halogeno, a hydroxyl, an alkyl, or an alkoxyl radical, the latter two of which contain 1–4 carbon atoms;
- *n* is 0 or 1;
- R is a hydrogen atom or a phenyl radical;
- X is a methylene, ethylene, trimethylene, or 2-hydroxytrimethylene radical; and
- Z is a morpholino, piperid-1-yl, 4-phenylpiperid-1-yl or 4-hydroxy-4-phenylpiperid-1-yl.

4,110,537
METHOD OF PRODUCING N^1-(2-TETRAHYDROFURYL)-5-FLUOROURACIL

Isao Minami, Suita; Yoshio Yoshioka, and Hiroaki Nomura, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,541

Claims priority, application Japan, Dec. 25, 1975, 50-156800

Int. Cl.² C07D *405/04*

U.S. Cl. 544—313 **9 Claims**

1. A method for producing N^1-(2-tetrahydrofuryl)-5-fluorouracil which comprises reacting a ratio of 1 mol of 5-fluorouracil with about 1.2 to 2.0 mols of 2,3-dihydrofuran in the presence of about 2 mols of trimethylsilyl chloride and about 1 mol of a tertiary amine in an aprotic anhydrous organic solvent, and treating the resultant mixture with an aqueous alkaline solution.

4,110,538
PROCESS FOR THE PREPARATION OF ACETAL SULPHONES

Jean-Pierre Decor, Thurins, France, assignor to Rhone-Poulenc Industries, Paris, France

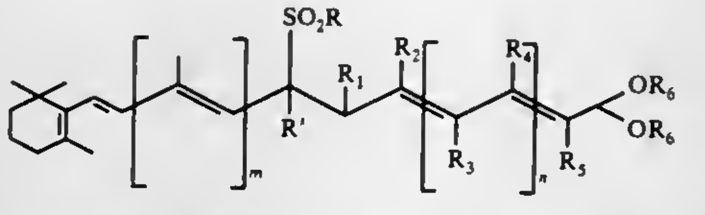
Filed Feb. 23, 1977, Ser. No. 771,815

Claims priority, application France, Feb. 25, 1976, 76 05244

Int. Cl.² C07C *147/06*

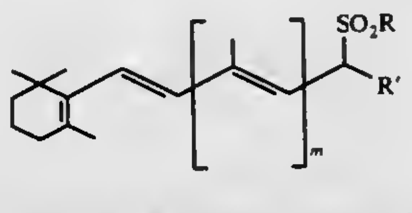
U.S. Cl. 560—11 **3 Claims**

1. Process for the preparation of a sulphone of the formula:

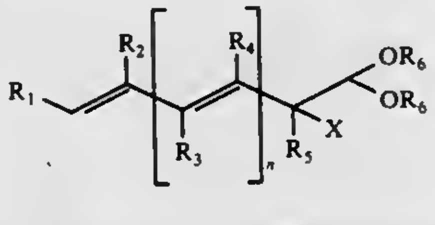


(1)

in which *m* and *n* each represent zero or 1 and are such that $m + n = 1$, R_1, R_2, R_3, R_4 and R_5, which may be identical or different, represent hydrogen or straight or branched alkyl radical of 1 to 6 carbon atoms, R_6 represents straight or branched alkyl of 1 to 6 carbon atoms, R represents straight or branched alkyl of 1 to 6 carbon atoms or arylalkyl containing a straight or branched alkyl of from 1 to 6 carbon atoms or aryl, the aryl or the aryl moiety of the aralkyl being unsubstituted or substituted by alkyl, alkoxy, alkylthio, alkoxycarbonyl, hydroxyl or halogen, and R' represents hydrogen or, if *m* is zero, straight or branched alkyl of 1 to 6 carbon atoms, which comprises reacting a sulphone of the formula:



in which R and R' are as defined above and *m* is zero or 1, in a basic polar aprotic solvent and in the presence of a basic agent having sufficient activity to anionise the said sulphone, with an α-halogeno-acetal of an ethylenically unsaturated aldehyde of the formula:



in which R_1, R_2, R_3, R_4, R_5 and R_6 are as defined above, and *n* is zero or 1 and such that $m + n = 1$.

4,110,539
PROCESS FOR THE PREPARATION OF 2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE

Kenneth H. Albers, Houston, and Howard N. Wright, Jr., Longview, both of Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,135

Int. Cl.² C07C *67/24*

U.S. Cl. 560—240 **11 Claims**

1. A process for the synthesis of 2,2,4-trimethyl-1,3-pentanediol diisobutyrate wherein a mixture of 2,4-diisopropyl-5,5-dimethylmetadioxane and isobutyric acid is reacted in the presence of a strong acid catalyst at a temperature of from about 80° C. to about 200° C.

4,110,540
PROCESS FOR THE PREPARATION OF MULTINUCLEAR PHENOLS WHICH ARE ALKYLATED IN THE NUCLEUS

Dieter Freitag; Erhard Tresper; Rolf Kuchenmeister, and Wolfgang Beer, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

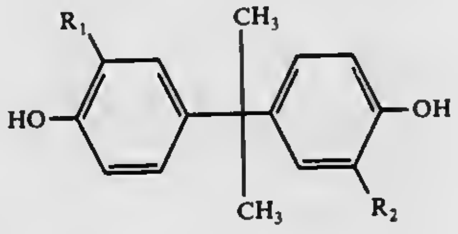
Filed Jul. 27, 1976, Ser. No. 708,942

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1975, 2534559

Int. Cl.² C07C *37/00, 37/14, 39/12, 39/16*

U.S. Cl. 568—718 **12 Claims**

1. A process for the preparation of a multinuclear phenol alkylated in the nucleus, of the general formula I

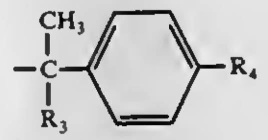


I

in which

R_1 and R_2 are different from each other and represent a hydrogen atom or a group of formula II or

R_1 and R_2 are equal and both represent a group of formula II

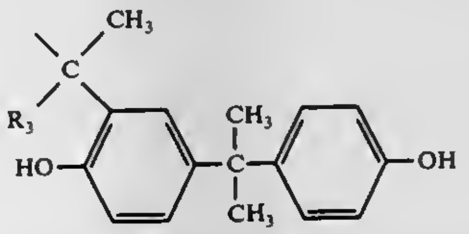


II

in which

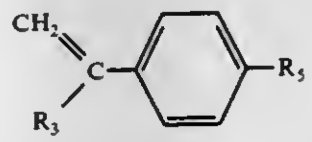
R_3 represents a hydrogen atom or a methyl group and

R_4 represents a hydrogen atom, an alkyl group or a group of formula III



III

in which R_3 has the meaning specified above or mixtures of the multinuclear phenols represented by the general formula I which may contain from 0 to 80% by weight of bisphenol A, wherein bisphenol A is reacted with a phenyl alkenyl compound of the formula IV

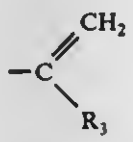


IV

in which

R_3 has the meaning specified above and

R_5 represents hydrogen, an alkyl group or a group of formula V



V

in which R_3 has the meaning specified above, in the presence of a catalytic quantity of aluminium phenolate.

4,110,541
METHOD FOR PURIFYING A DEHYDROCHLORINATION MIXTURE

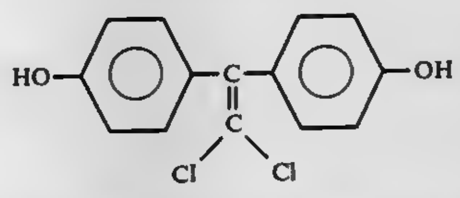
Philip L. Kinson, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 9, 1977, Ser. No. 767,046

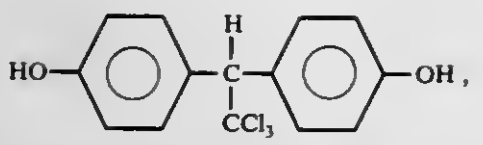
Int. Cl.² C07C *37/24*

U.S. Cl. 568—725 **8 Claims**

1. In a method for making a dichloride of the formula,



by the dehydrochlorination of a trichloride of the formula,



in a potassium hydroxide-methanol medium, whereby a contaminated dichloride dehydrochlorination reaction product is obtained, the improvement which comprises

(1) dissolving the contaminated dehydrochlorination reaction product of the trichloride in an aromatic organic solvent selected from the class consisting of xylene, toluene, benzene, chlorobenzene and mixtures thereof at a temperature of at least 70° C.,
(2) filtering the solution of (1),
(3) adding to the filtrate of (2) up to 25% by weight of a polar solvent, selected from the class consisting of methanol, ethanol, acetone, $C_{(3-8)}$ aliphatic alcohols, diols, water, aliphatic organic nitriles and mixtures thereof, based on the weight of the aromatic organic solvent,
(4) effecting the separation of dichloride crystals from the resulting mixture of (3) at a temperature in the range of from at least 10° below the temperature used to dissolve the dehydrochlorination reaction solids in step (1) to about 20° C.,
(5) collecting the resulting dichloride crystals formed in step (4) and
(6) drying the dichloride crystals at a temperature in the range of up to about 105° C.

4,110,542
PREPARATION OF DIHYDROXYDIPHENYL ALKANES

James C. Drummond, Bridgeton, and Lawrence J. Hughes, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1976, Ser. No. 755,706
Int. Cl.^{2} C07C *37/18, 39/16*
U.S. Cl. 568—729 **9 Claims**

1. The process for producing 4,4′-dihydroxydiphenylethane which comprises alkylating phenol with a 1,2-dihaloethane in which the halogen is chlorine, bromine, or iodine in at least the stoichiometric proportions of 2:1 in contact with a catalyst comprising lanthanum oxide supported on an inorganic material at a temperature from about 125° to about 225° C. in the presence of a hydrogen halide selected from the group consisting of hydrogen bromide and hydrogen iodide as promoter for the reaction.

4,110,543
METHOD OF PREPARING HYDROCARBYL-SUBSTITUTED CRESOLS

Thomas E. Goodwin, College Station, Tex., and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 24, 1977, Ser. No. 771,508
Int. Cl.^{2} C07C *39/06*
U.S. Cl. 568—781 **3 Claims**

1. A method for preparing a product containing predominantly m-cresol and thymol said method comprising heating, at a temperature in the range of about 200° to about 500° C., a mixture of di-t-butyl-m-cresol and isopropanol in the presence of a catalytic amount of activated alumina.

4,110,544
PREPARATION OF CRESOLS

Thomas E. Goodwin, College Station, Tex., and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 13, 1977, Ser. No. 758,980
Int. Cl.^{2} C07C *37/00, 39/00*
U.S. Cl. 568—805 **5 Claims**

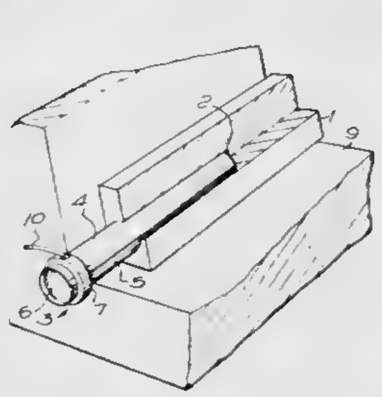
1. A process for preparing m-cresols from di-t-butyl-m-cresol, said process comprising (1) contacting the di-t-butyl-m-cresol with an effective amount of a catalyst, which is selected from the group consisting of activated alumina and synthetic silica-alumina, in liquid phase at a temperature in the range of about 200° to about 600° C., a pressure in the range of about 6 to about 70 atmospheres, a reaction time of about 1 to about 75 minutes and the amount of catalyst, as feedstock to catalyst, is in a LHSV range of about 0.05 to about 50, and (b) recovering the m-cresols from the reaction mixture by fractional distillation.

ELECTRICAL

4,110,545
ELECTRODES FOR GLASS FURNACES

Gordon Brian Shaw, Sheffield, and Richard John Brinkman, Wolverhampton, both of Great Britain, assignors to Pickford Holland & Company Limited, Sheffield, England

Filed Dec. 3, 1976, Ser. No. 747,177
Claims priority, application United Kingdom, Dec. 5, 1975, 50118/75
Int. Cl.^{2} C03B *5/02;* F27D *11/04*
U.S. Cl. 13—6 **11 Claims**

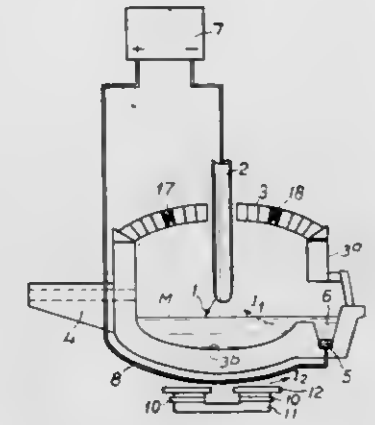


1. A ceramic electrode comprising an electrode body having at least one longitudinal hole, an elongated, thin-walled hollow connector member of a noble metal having a cross-sectional shape corresponding to that of the hole and being a close fit in the hole, and a plug member having a cross-sectional shape corresponding to that of the connector member, and being a close fit within the connector member, the plug being formed from a material having subtantially the same expansion characteristics as the electrode material.

4,110,546
DC ARC FURNACE HAVING A ROTATING ARC

Sven-Einar Stenkvist, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 5, 1976, Ser. No. 739,048
Claims priority, application Sweden, Nov. 6, 1975, 7512428
Int. Cl.^{2} H05B *7/20*
U.S. Cl. 13—11 **2 Claims**

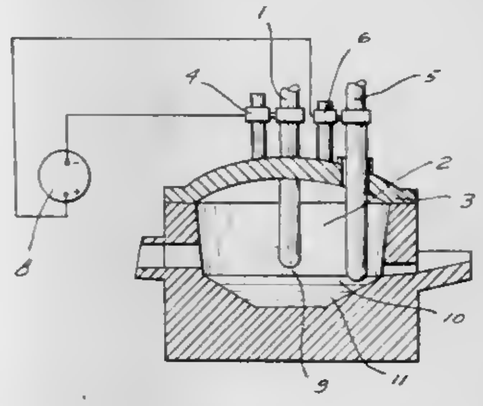


1. A DC electric arc furnace comprising a furnace enclosure having a hearth for containing a melt, an arcing electrode positioned in the enclosure above the melt and forming an arc therewith when the electrode and melt are placed in circuit with a source of DC, magnetic means for forming a rotating magnetic field in the enclosure causing the arc to rotatively deflect, and means for varying the rotative speed of said arc while the arc rotates through any one complete rotation so as to cause said speed to be relatively fast when said arc is deflected towards relatively hot portions of said enclosure and said speed to be relatively slow when said arc is deflected towards relatively cold portions of the enclosure.

4,110,547
METHOD OF STEELMAKING WITH DIRECT CURRENT

Vassil Georgiev Peev; Alexander Yordanov Valchev, and Nikolay Georgiev Bakalov, all of Sofia, Bulgaria, assignors to DSO "Cherna Metalurgia", Sofia, Bulgaria

Filed Apr. 20, 1976, Ser. No. 678,664
Claims priority, application Bulgaria, Apr. 25, 1975, 29783
Int. Cl.^{2} H05B *7/144, 7/20*
U.S. Cl. 13—11 **3 Claims**

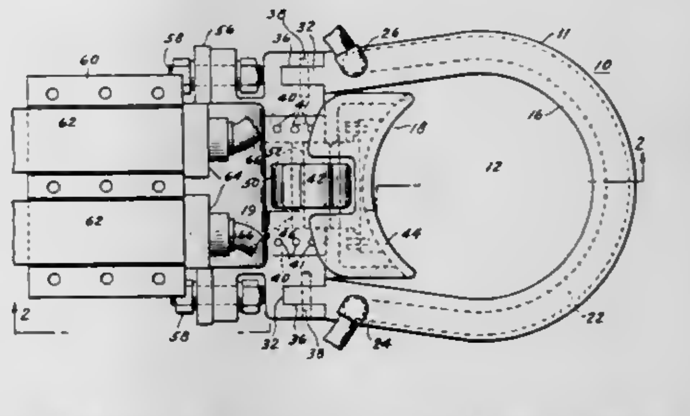


1. A steel-making method which comprises the steps of:
(a) introducing at least one charge of solid iron material into an electric arc furnace;
(b) engaging said charge with a contact electrode while advancing an arc electrode toward said charge and passing a direct electric current between said electrodes to generate an arc between said arcing electrode and said material to melt said material and forming a bath of molten material overlain by a slag layer;
(c) maintaining said contact electrode in engagement with said material during the arc melting thereof and at least until all of said material is melted;
(d) immersing said contact electrode only into said slag layer while spacing said contact electrode from the bath below said slag layer; and
(e) subjecting a molten material in said furnace to a further metallurgical process in the presence of an arc passing between said arcing electrode and said slag layer.

4,110,548
WATER-COOLED ELECTRODE HOLDER

Charles D. Dresch, Annville, and Robert A. Yohe, Steelton, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 29, 1976, Ser. No. 755,411
Int. Cl.^{2} H05B *7/105*
U.S. Cl. 13—16 **2 Claims**



1. In apparatus for use with cylindrical electric furnace electrodes including a water cooled electrode holder, the improvement comprising:
(a) a flat single element having a plurality of connected recesses machined therein and bent to form a U-shape metal sleeve having an opening forming an arc of more

than 180°, with the plurality of connected recesses provided in the outer wall of the metal sleeve,

(b) a pair of ports in the U-shaped metal sleeve leading to opposite ends of the connected recesses whereby a coolant may be circulated through the connected recesses, and

(c) means to seal the plurality of connected recesses against leakage.

4,110,549

ENVIRONMENTALLY PROTECTED ELECTRONIC HOUSING AND HEAT SINK STRUCTURE, PARTICULARLY FOR AUTOMOTIVE USE

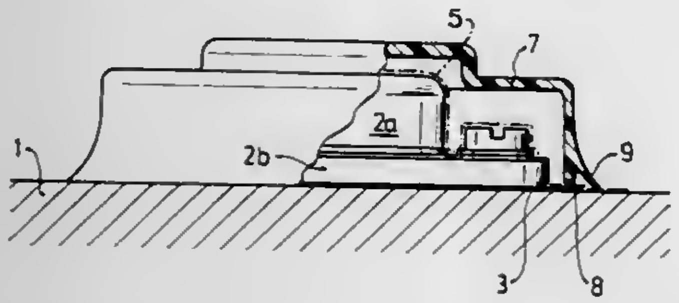
Siegfried Goetzke, Hemmingen, and Gert Jakob, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 628,225, Nov. 3, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 773,057

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456802

Int. Cl.² H05K *5/03*

U.S. Cl. 174—16 HS **18 Claims**



1. Environmentally protected electronic housing structure comprising

a housing having an end wall (1) forming a heat sink;

a power semiconductor (2) secured to the housing end wall in good heat-conductive relation;

and protective means (5, 7) covering both said power semiconductor (2) and at least a portion of the housing end wall (1) surrounding the power semiconductor, and being dimensioned to offer little resistance to radiation of heat by said end wall, said protective means comprising

a cover cap or hood (7) covering the free surface of the housing (2) of the power semiconductor, the free surface of attachment means (3, 4) to attach the power semiconductor to the housing end wall (1) and the adjacent region of the housing end wall surrounding the power semiconductor, the cap or hood (7) being formed with a circumferential elastic sealing lip (9) and with an abutment shoulder (8) to limit engagement of the cap or hood towards the housing end wall, and to provide for resilient engagement pressure of the sealing lip (9) against the end wall (1) of the housing.

4,110,550

ELECTRICAL CONNECTOR WITH ADAPTOR FOR PAPER-INSULATED, LEAD-JACKETED ELECTRICAL CABLES AND METHOD

Francis M. Di Pietro, Mountain Lakes, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,421

Int. Cl.² H02G *15/22, 1/14*

U.S. Cl. 174—19 **28 Claims**

1. An adaptor for placement at the terminus of a high voltage electrical cable of the oil-filled type including a conductor, a paper insulator and a lead jacket, each having a terminal end adjacent the cable terminus, to seal the terminus and enable installation of an electrical connector of the type employing a pre-molded elastomeric component part for use in an electrical power distribution system, the adaptor comprising:

a sleeve portion of insulating material extending axially between a first end and a second end, the sleeve portion having an axially extending outer surface and an axially extending opening, said insulating material being essentially impervious to water and to the oil in the cable;

a conductor-sealing portion integral with the first end of the sleeve portion and sealing the opening in the sleeve portion adjacent the first end thereof, the conductor-sealing portion having an axially extending, electrically conductive sheath including an internal passage communicating with the opening in the sleeve portion, and a closed end remote from the first end of the sleeve portion;

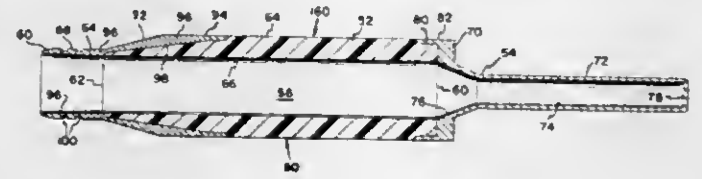
a jacket-sealing portion integral with the second end of the sleeve portion, the jacekt-sealing portion including an axially extending tubular-walled portion having a sealing surface for being juxtaposed with the lead jacket to seal the juncture between the lead jacket and the adaptor; and

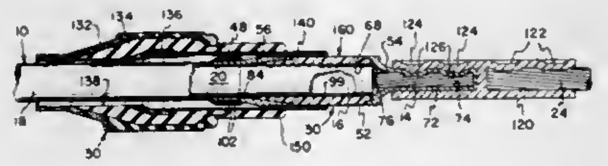
sealing means for providing an oil seal and a water seal along the sealing surface of the tubular-walled portion of the jacket-sealing portion,

wherein the tubular-walled portion includes an outer surface and is to be received between the lead jacket and the insulator of the cable, and the sealing surface is located upon the outer surface of the tubular-walled portion, and

wherein the sealing means includes a sealing member retained upon the sealing surface of the tubular-walled portion of the jacket-sealing portion.

21. An electrical connector kit for establishing a connection in the field at the terminus of a high voltage cable of the oil-filled, paper-insulated, lead-sheatbed type, said kit comprising a sleeve-like adaptor member and a sleeve-like elastomeric stress-grading element,





said adaptor member having a first conductive closed end portion, a second conductive open end portion, and an insulative intermediate portion therebetween, said adaptor member being adapted to be fitted over the terminus of said high voltage cable with the core of the cable being received in the first conductive closed end portion, the insulation of the cable being received in the insulative intermediate portion and said second conductive open end portion being in sealing engagement with the lead sheath of said cable,

said elastomeric stress-grading element having an opening at one end thereof extending interiorly of said element toward another end thereof to define a resilient bore of predetermined size sufficient to cause said element to tightly grip the exterior surface of said adaptor member when said stress grading element is fitted over said adaptor with said first conductive closed end and at least a portion of said intermediate portion being received within said resilient bore of said element.

27. A method of establishing a connection in the field at the terminus of a high voltage cable of the oil-filled, paper-insulated, lead-sheathed type, with the aid of a sleeve-like adaptor member and a sleeve-like elastomeric stress-grading element, said adaptor member having a first conductive closed end portion, a second conductive open end portion, and an insulative intermediate portion therebetween, said elastomeric stress grading element having an opening at one end thereof extending interiorly of said element toward another end thereof to define a resilient bore of predetermined size, said method comprising the following steps: fitting said adaptor member over the terminus of said high-voltage cable with the core of the cable being received in the first conductive closed end portion, the insulation of the cable being received in the insulative intermediate portion, and the second conductive open end portion being in sealing engagement with the lead sheath of said cable,

establishing a seal between said second conductive end portion of said adaptor member and the lead sheath of said cable, and

fitting said elastomeric stress-grading element over said adaptor member with the resilient bore portion thereof tightly gripping the exterior surface of said adaptor, and with said first conductive closed end portion and at least a portion of said intermediate portion of said adaptor being received within said resilient bore of said stress-grading element.

4,110,551

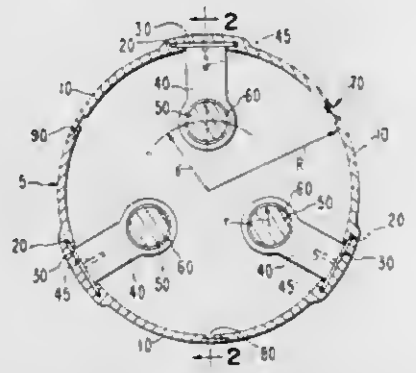
EXTRUDED SHEATH SECTION FOR COMPRESSED GAS INSULATED TRANSMISSION LINES

Alan H. Cookson, Southborough, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 14, 1976, Ser. No. 732,227

Int. Cl.² H01B *9/06*

U.S. Cl. 174—27 **18 Claims**



1. A three-phase compressed gas insulated transmission line system comprising:

a gas-tight elongated hollow aluminum sheath fabricated in three elongated sections and adapted to contain a pressurized gas;

three elongated conductors positionable longitudinally within said sheath, each conductor associated with a single sheath section;

a plurality of insulated spacers each associated with one of said sections, each said spacer having at an inner end a sleeve with conductor apertures to embrace and support one said conductor, and having an outer end for mounting to said associated elongated sheath section, said sheath section including a groove extruded longitudinally along the inner wall of said sheath section and adapted to receive said outer end of said speacers; and

a plurality of metal plates, mounted to each said spacer outer end and slidably mounted within said elongated groove for affixing said associated conductor at a preselected distance from said elongated section, said metal plates being further provided with a plurality of apertures of such size as to entrap conductive particles in the space between the underside of said plate and said groove;

said spacers being mounted at selected longitudinal positions along said sheath and longitudinally separated from spacers mounted to adjacent sheath sections.

4,110,552

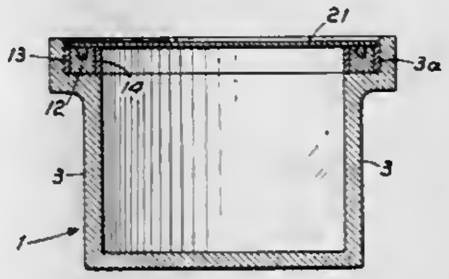
ELECTRO/MECHANICAL ENCLOSURE WITH MAGNETIC COVER MEANS

Anthony Joseph Lombardi, Flanders, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 593,581, Jul. 7, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,195

Int. Cl.² H05K *5/04*

U.S. Cl. 174—35 MS **33 Claims**



1. An enclosure to ensure electromagnetic interference (EMI) and radio frequency interference (RFI) shielding for electronic components and/or protective shielding for mechanical components comprising:

a housing for said components having at least a bottom, side walls connected to said bottom in a shielding relationship to said components and at least a top opening opposite said bottom;

at least a top cover for said top opening;

first rigid continuous magnetic means completely surrounding said top opening and conforming to the configuration of said side walls to detachably secure at least said top cover to said side walls adjacent said top opening to close said top opening to complete said shielding of said components, said magnetic means having a north pole and a south pole disposed in the same plane as said top opening with one of said north and south poles being disposed adjacent the opening of said top opening and the other of said north and south poles being disposed remote from the opening of said top opening, said first magnetic means having disposed therein at least a first continuous recess coextensive therewith; and

a continuous non-magnetic, metallic mesh rope-like member disposed in and coextensive with said first recess, said rope-like member being compressed by the magnetic attraction of said top cover and said first magnetic means to provide an environmental seal for said top opening and to enhance said EMI and RFI shielding of said components.

4,110,553

SPRING FRICTION DAMPER

Ronald G. Hawkins, Massena, N.Y.; Paul D. Tuttle, Marshall, Tex., and Mark A. Baker, Massena, N.Y., assignors to Aluminum Company of America, Pittsburgh, Pa.

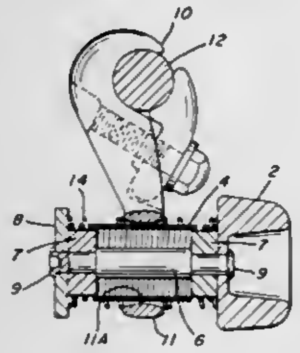
Filed Jan. 17, 1977, Ser. No. 760,180

Int. Cl.² H02G *7/14*

U.S. Cl. 174—42 **27 Claims**

1. A device for damping vibration of a single, suspended conductor, the device comprising at least one helical spring, at least a portion of the turns of which are close wound, means for attaching said spring to a suspended conductor in spaced relation thereto, and, at least one inertial weight connected to said spring and adapted to be resiliently suspended from a conductor by said spring and attaching means in spaced relation thereto, the inertial weight when suspended from the conductor being effective to relatively translate and thereby provide sliding friction between the close wound turns of the spring in a direction perpendicular to the longitudinal axis of

the spring when the conductor undergoes vibration above a given magnitude, the sliding friction of the turns of the spring



being effective to dissipate energy of the vibration of the conductor in the form of heat.

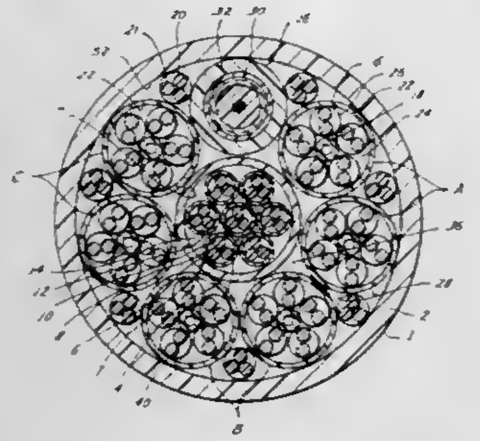
4,110,554
BUOYANT TETHER CABLE

Boyd B. Moore, and Clarence E. Kendall, Jr., both of Houston, Tex., assignors to Custom Cable Company, Houston, Tex.

Filed Feb. 8, 1978, Ser. No. 875,953

Int. Cl.² H01B *7/12, 11/18*

U.S. Cl. 174—101.5 14 Claims



1. A high tensile strength electrically conductive buoyant tether cable comprising:

(a) a center stress core having,

- (i) a plurality of cabled stress-bearing elements having a low density, high strength plastic-like jacket circumferentially defining each stress-bearing element;
- (ii) a core tape binder circumferentially enclosing the plurality of inner stress-bearing elements (i);
- (iii) a plurality of inner interstices formed by the exterior surfaces of the stress-bearing elements (i) and the core tape binder (ii); and
- (iv) microspheres substantially occupying the plurality of inner interstices (iii);

(b) a plurality of conductor elements cabled around the center stress core (*a*) including:

- (i) a first pair of conductor elements each composed of a plastic-like conductor core, a plurality of twisted insulated wires cabled around said plastic-like conductor core, a conductor tape binder enclosing the plurality of twisted pairs of wires whereby interstices are formed among the twisted pairs of wires, the plastic-like core and the plastic-like conductor tape binder, and a quantity of microspheres substantially occupying said interstices;
- (ii) a second pair of conductor elements each substantially identical to the first pair of conductor elements (i);
- (iii) a third pair of conductor elements each substantially identical to the first pair of conductor elements (i); and
- (iv) a coaxial cable having a plastic-like external jacket circumferentially enclosing said coaxial cable;

(c) mid interstices formed by the center stress core (*a*) and the plurality of conductor elements (*b*), said mid interstices substantially filled with microspheres;

(d) an outer plastic-like tape binder circumferentially surrounding and in close proximity to the plurality of conductor elements (*b*) cabled around the core (*a*) such that outer interstices are formed between the conductor elements and the outer tape binder;

(e) at least one interstitial stress member located within and partially occupying each of the outer interstices (*d*);

(f) an outer jacket circumferentially surrounding the outer tape binder (*d*); and

(g) a quantity of microspheres occupying the volume of each outer interstices not occupied by an interstitial stress member (*e*) thereby forming a flexible, tensional load bearing, electrically conductive buoyant tether cable suitable for underwater operations.

4,110,555
CIRCUIT ARRANGEMENT FOR IDENTIFICATION AND ADDRESSING

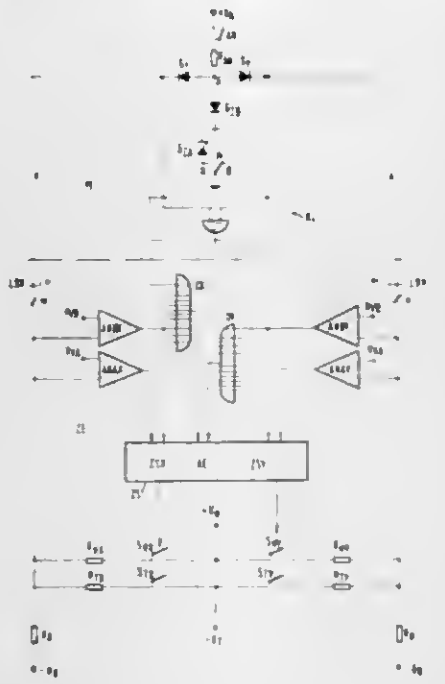
Bernhard Heine, Leonberg; Wolfgang Arndt, Ludwigsburg, and Hartmut Löwer, Weissach, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,654

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619608

Int. Cl.² H04Q *3/42*

U.S. Cl. 178—3 6 Claims



1. A circuit for detecting a change of condition at one of a plurality of units peripheral to a central control and for coupling said one unit to an output terminal, in which the units are arrayed in a coordinate matrix comprised of a first plurality of coordinate conductors coupled to respective coordinates of the matrix and a second plurality of coordinate conductors coupled to respective second coordinates of the matrix, means in one peripheral unit responsive to a change of condition therein for initiating marking potential to the coordinate conductors coupled to the one peripheral unit, said central control comprising a first sensing circuit common to conductors of said one coordinate, and a second sensing circuit common to conductors of said second coordinates, said sensing circuits individually responsive to marking potential to close a source of potential to the coordinate conductors of the one unit, a switching circuit in said one unit responsive to potential from said source over both of the coordinate conductors for switching said one unit through to an output terminal.

4,110,556
GRAPHICAL INPUT DEVICES

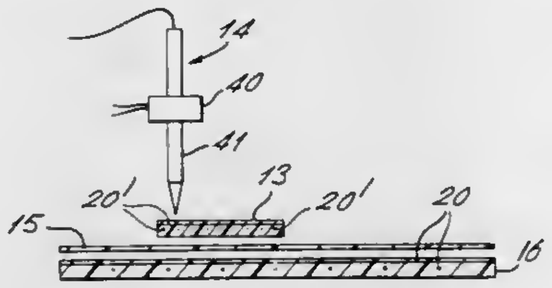
Peter Louis Hawkes, Harlow, England, assignor to National Research Development Corporation, London, England

Filed Mar. 28, 1977, Ser. No. 781,967

Claims priority, application United Kingdom, Apr. 2, 1976, 13521/76

Int. Cl.² G08C *21/00*

U.S. Cl. 178—19 22 Claims



1. Apparatus for generating signals representative of the position of a point on a surface indicated by stylus means, including:

a member having a working surface suitable for use with stylus means to allow the stylus means to be used to indicate points in the working surface;

first sensing means for sensing the position of an indicating portion of the stylus means in relation to the working surface to sense the position of points therein indicated by the stylus means;

cursor means which may be positioned on the working surface over any point therein without materially affecting the operation of the first sensing means even when between the stylus means and the working surface, the cursor means having a working area which is small in relation to the working surface; and

second sensing means for sensing the position of the indicating portion of the stylus means in relation to the working area of the cursor means to sense the position of points therein indicated by the stylus means, the resolution of the second sensing means being high relative to that of the first sensing means.

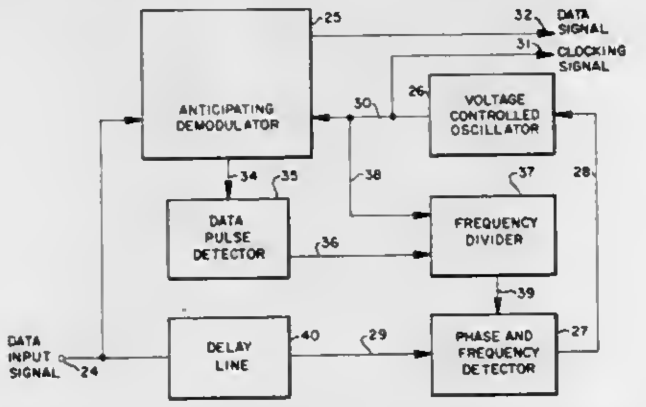
4,110,557
PHASE LOCK OSCILLATOR FOR USE IN DATA PROCESSING SYSTEM

W. Donald Huber, San Jose, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,849

Int. Cl.² H04L *7/02*

U.S. Cl. 178—69.1 7 Claims



1. A system for generating clocking signal responsive in phase and frequency to a data signal having intermittent pulses indicating data, said system comprising:

an oscillator for providing a clocking signal responsive in frequency and phase to an error signal;

a phase and frequency detector for receiving and comparing the data signal pulses to said clocking signal for generating an error signal for regulating the oscillator so the phase and frequency of the clocking signal equals that of the data signal; and

means to prevent the transmission of the clocking signal to the phase and frequency detector when no data pulse exists in the data signal.

4,110,558
DATA TRANSMISSION SYSTEM

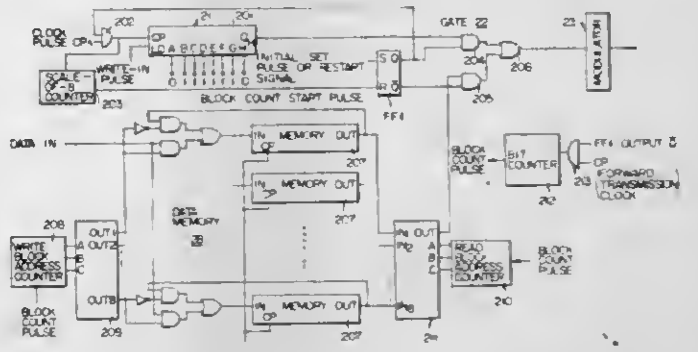
Satoshi Kageyama, and Kunihiko Sekiya, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 31, 1977, Ser. No. 764,073

Claims priority, application Japan, Jan. 30, 1976, 51-8390

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.1 3 Claims



1. A data-transmission system in which forward signals including synchronization codes and data blocks are transmitted from a transmitter to a receiver and backward signals including a synchronization code detection signal are transmitted from the receiver to the transmitter, both signals being carried through a transmission channel subject to variations in transmissions delay, the improvement comprising:

means for transmitting synchronization codes repeatedly at constant time interval from said transmitter to said receiver, until said transmitter detects a synchronization code detection signal from said receiver;

means responsive to detection of an error-free synchronization code at said receiver for transmitting a synchronization code detection signal from said receiver to said transmitter; and

means responsive to detection of the synchronization code detection signal at said transmitter for commencing data transmission to said receiver starting with the point of time at which the succeeding synchronization code is to be transmitted.

4,110,559
LOUD-SPEAKER OUTPUT CIRCUIT

Kazuo Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 629,223, Nov. 6, 1975, abandoned. This application May 6, 1977, Ser. No. 794,341

Claims priority, application Japan, Nov. 7, 1974, 49-127486

Int. Cl.² H03F *3/181*

U.S. Cl. 179—1 D 2 Claims

1. A very low noise loud-speaker output circuit comprising:

a loud-speaker circuit means for driving a loud-speaker;

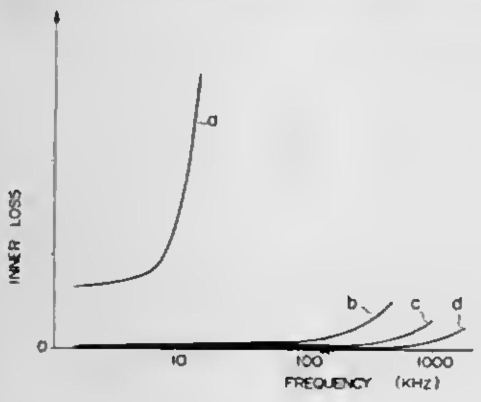
a transistor series circuit including at least one pair of series connected transistors connected in parallel to said loud-speaker circuit;

a sound signal source for delivering audio frequency signals to input electrodes of said transistors;

a bias circuit connected to said transistors;

at least one electrolytic capacitor having input and output terminals and connected between said transistor series circuit and a reference potential point, said electrolytic capacitor having a non-linear, frequency dependent inner loss characteristic whereby the fidelity of said loud-speaker output circuit is reduced in the audio frequency range; and,

nonpolar capacitor means taken from the group consisting of metallized paper, polyethylene terephthalate and polystyrene film capacitors connected directly across said input and output terminals and in parallel with said electrolytic capacitor, said nonpolar capacitor means having a capacitance which is small relative to that of said electrolytic capacitor but which is sufficiently large to allow passage of signals having desired frequencies falling within the audible range, and including inner loss sufficiently smaller than that of said electrolytic capacitor for collectively providing an inner loss frequency characteristic which improves the fidelity of said loud-speaker output circuit.



4,110,560

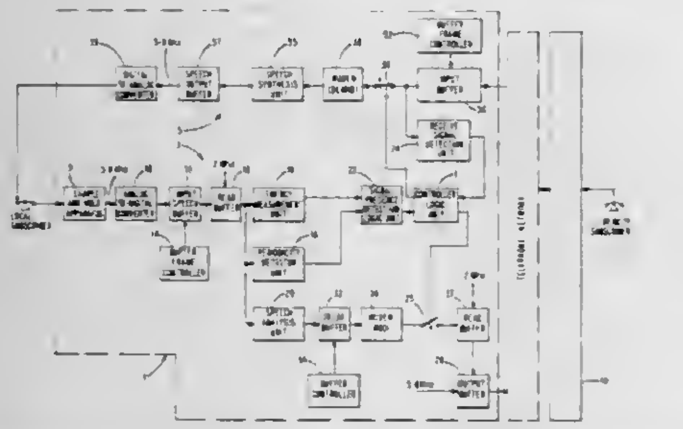
COMMUNICATION APPARATUS

Patrick John Leary, Waltham, and Harry Leonard Shaffer, Lynnfield, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 23, 1977, Ser. No. 854,463

Int. Cl.^{2} H04M *1/00*

U.S. Cl. 179—1 VC **15 Claims**



1. Communication apparatus for bidirectional communication over a transmission network comprising:

a first, local source of digital data representative of speech;

real-time processing means coupled to the first source of data and operative to detect and examine in real time the data from the first source and to produce an output signal when the data is determined to represent voice data as opposed to noise;

modulator means;

speech analysis means coupled to the first source of digital data and operative to compress the data from the first source to a rate usable by the modulator means;

delay means coupled to the speech analysis means and to the modulator means and operative to delay the data from the speech analysis means by a predetermined amount and to apply the delayed data to the modulator means, the amount of the delay provided by the delay means being selected to compensate for delays inherent in the detection of data by the real-time processing means;

said modulator means being operable in response to the delayed data received thereby to match the data to the transmission network;

first switch means coupled to the modulator means and having a first operating state during which data from the modulator means may pass therethrough and a second operating state during which data from the modulator means may not pass therethrough;

output means coupled to the first switch means and operative to apply data passing through the first switch means to the transmission network;

a second, remote source of digital data operable to originate and transmit digital data representative of speech over the transmission network;

receiver means adapted to examine data from the second source and operative in the absence of digital data originating with the second source to produce an output signal;

controller means coupled to the real-time processing means, to the receiver means and to the first switch means and operative in response to the output signal produced by the real-time processing means and the output signal produced by the receiver means to cause the first switch means to operate in its first operating state thereby to allow data from the modulator means to be applied via the first switch means to the output means forapplication to the transmission network, said controller means being operative to cause the first switch means to operate in its first operating state for a period of time coincident with and also extending beyond the delay provided by the delay means by an additional amount, and further operative at the cessation of data from the first source and the termination of the output signal of the real-time processing means to cause the first switch means to switch to its second operating state at the termination of said period of time, the duration of said period of time being selected to prevent the first switch means from switching to its second operating state during a pause in the speech data from the first source.

4,110,561

COMMUNICATION UNIT FOR CODE GENERATION AND VOICE COMMUNICATION

Joe F. Guess, Cedar Rapids, Iowa, assignor to Conrac Corporation, Stamford, Conn.

Filed Jul. 20, 1977, Ser. No. 817,266

Int. Cl.^{2} H04M *1/50*

U.S. Cl. 179—2 EA **5 Claims**

1. In a tone code generating and voice communication unit, the combination of

a microphone,

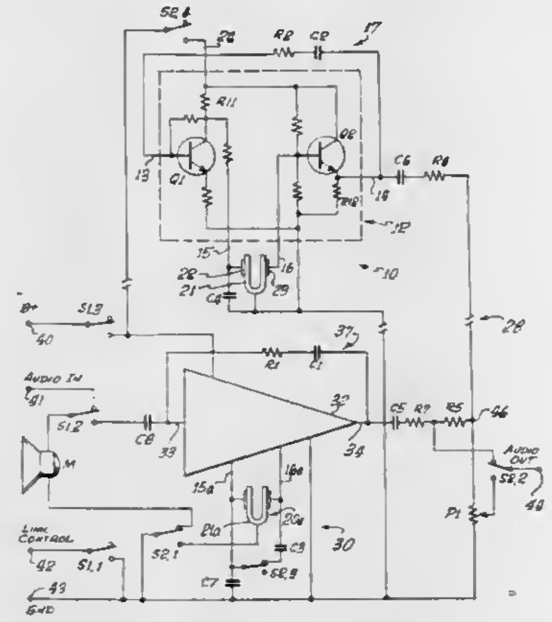
a plurality of tone generating means, each comprising an amplifier, resonant means, and coupling means for coupling the amplifier in regenerative mode to the resonant means to produce oscillations of stable frequency,

output terminal means,

manual switching means having first and second operating positions,

and circuit means coupled to the switching means for enabling the tone generating means and coupling the same to the output terminal means in response to one operating position of the switching means,

said circuit means being responsive to the other operating position of the switching means for converting one of said amplifiers to stable operating mode and coupling the converted amplifier between the microphone and the output terminal means.



4,110,562

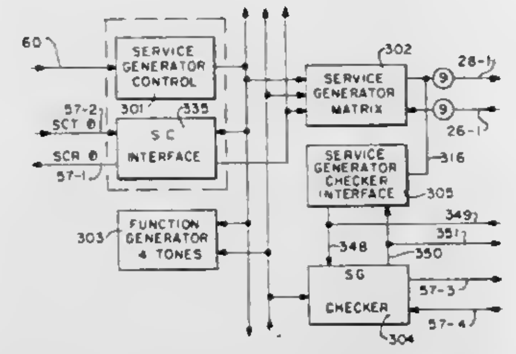
SERVICE GENERATOR FOR GENERATING A PLURALITY OF TONES

Johannes A. R. Moed, San Jose, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Jan. 26, 1977, Ser. No. 762,810

Int. Cl.^{2} H04J *3/12*

U.S. Cl. 179—15 BY **17 Claims**



1. In a telephone system having an interface including an input portion connected to an input bus for receiving input telephone signals, an output portion connected to an output bus for transmitting output telephone signals, and time slot interchanger means for connecting said input bus to said output bus whereby said input signals become output signals, said system operating with the telephone signals in time frames each consisting of a plurality of time slots, a service generator comprising:

tone generator means for generating, each time frame, pulse code modulated tone samples for a plurality of tones,

tone multiplexer means for multiplexing said tone samples onto a common bus each time frame,

service generator matrix means connected directly from said common bus to said output bus so as to bypass said time slot interchanger means to connect selected ones of said tone samples to said time slots in each frame on said output bus, and

service generator control means, connected to control said matrix means, for specifying said selected ones of said tone samples and for specifying said selected time slots on said output bus.

4,110,563

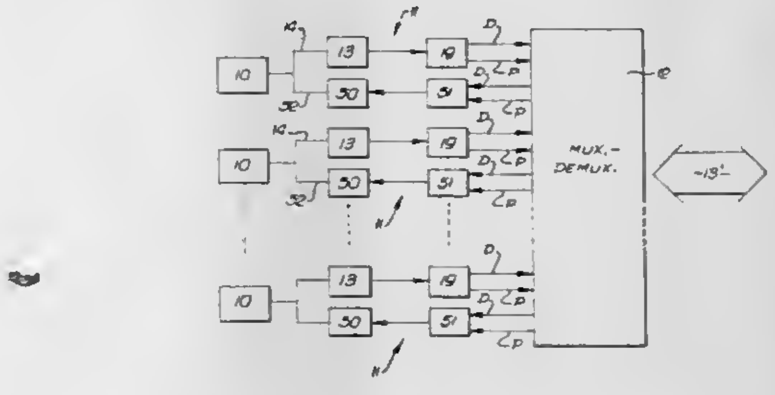
TRAFFIC SENSITIVE MODULATION SYSTEM

Peter J. May, Yorba Linda, and Theodore M. Stump, Costa Mesa, both of Calif., assignors to The Anaconda Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,500

Int. Cl.^{2} H04J *3/04*

U.S. Cl. 179—15 BW **11 Claims**



1. In a modulation system for use in analog signal transmission, in which input information in multiple analog communication channels is processed for asynchronous multiplexing onto a data channel, the combination comprising

a. first means for sampling the input analog signal in one of said communication channels, and to produce addressed asynchronous output pulse transmission in said channel in correspondence with said sampling, and

b. other means operatively connected with said first means to signal activation of pulse transmission for multiplexing onto the data channel only when the output of said first means is indicative of active transmission of information in the communication channel, whereby output pulse transmission derived from another communication channel may be multiplexed onto the data channel when there is an absence of information transmission in the one communication channel,

c. said first means including a delta modulator operable to transmit an alternating sequence of 1's and 0's during absence of information transmission in said one channel, and said other means includes logic circuitry means connected to the delta modulator to detect a successive sequence of at least two 1's or at least two 0's transmitted by the modulator as indicating said active transmission of information.

4,110,564

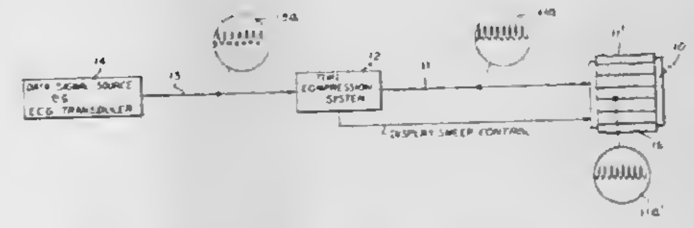
TIME-COMPRESSION SYSTEM

Richard Paul Andresen, Arlington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1976, Ser. No. 679,963

Int. Cl.^{2} G06F *3/14;* **G11B** *5/44;* **H04N** *1/22*

U.S. Cl. 179—15.55 T **9 Claims**



1. A system for the cyclical timecompression of a signal waveform comprising:

means for periodically sampling the signal waveform to provide sequential waveform data samples;

random access memory means having a predetermined plural number of storage locations, each said storage location storing a respective said data sample for respectively differing periods of time unitl respective readout;

means for entering a plurality of said data samples sequentially into said memory at a first rate throughout a time-compression cycle of predetermined duration; and

means for interrogating said memory throughout only a predetermined latter portion of the duration of each time-compression cycle at a second uniform repetition rate having the same ratio to said first rate as the duration of said time-compression cycle has to the duration of said latter portion thereof to read respective said data samples out of memory in the same sequence as entered whereby data samples are read out of memory at a uniform rate faster than said entry rate to substantially represent said waveform in time-compression, said predetermined number of memory storage locations corresponding with the number of said data samples entered in said memory during that former portion of each time-compression cycle which complements said latter portion thereof.

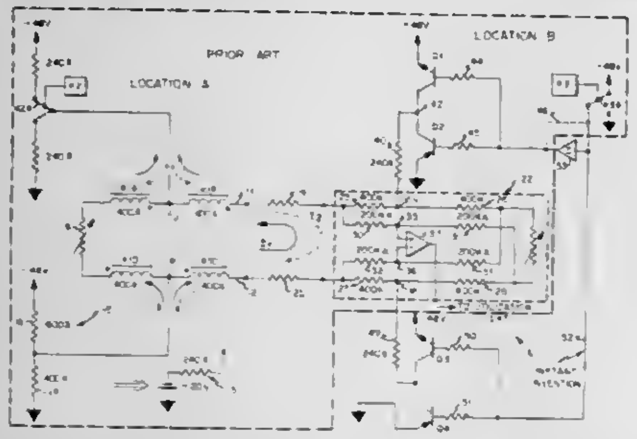
4,110,565
DUPLEX TELEPHONE SIGNALLING SYSTEM

Mauro Luigi Gaetano, Woodbridge, Va., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Jul. 27, 1977, Ser. No. 819,434

Int. Cl.^{2} H04M *7/02*

U.S. Cl. 179—18 AH **3 Claims**



1. A duplex telephone signalling system comprising:

plural conductors for both transmitting and receiving D.C. signals between two locations,

first and second devices each having a control input terminal and an output terminal, said devices producing signals at the output terminals thereof in response to control signals at the inputs thereof,

a switching device responsive to a change of state of telephone equipment at one location for producing the control signal for said first device,

said first device producing a first D.C. output signal of one polarity at the output terminal thereof in response to said control signal,

means coupling the control input terminal of said second device to said switching device for inverting the polarity of the control signal received by the inverting means,

said second device responsive to the inverted control signal for producing a second D.C. output signal at the output terminal thereof of substantially the same absolute magnitude as, but of opposite polarity to, the first D.C. output signal,

differential means having plural inputs connected to different ones of said two conductors for detecting the direction of net direct current flow in the conductors at the one location, said differential means producing D.C. outputs representing changes in current direction in said two conductors, and

first and second resistors of substantially equal resistance value for connecting each of the outputs of said first and second devices to a different one of the differential means inputs, whereby said differential means rejects said first and second output signals at the one location while such output signals are transmitted by said two conductors to another location.

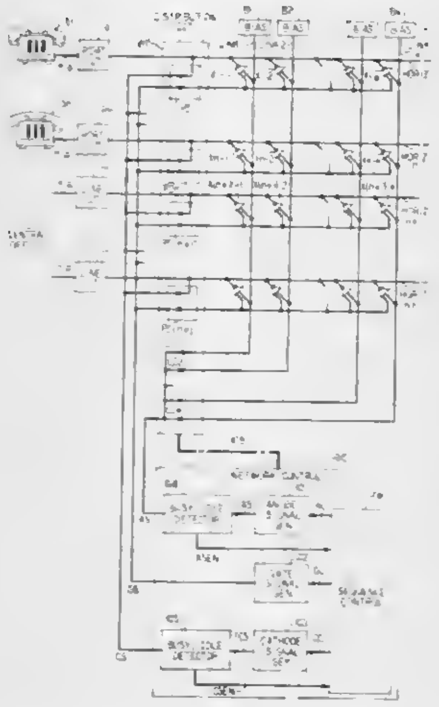
4,110,566
SWITCHING NETWORK CONTROL ARRANGEMENT

James Joseph Shanley, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1977, Ser. No. 846,162

Int. Cl.^{2} H04Q *3/50;* H03K *17/72*

U.S. Cl. 179—18 GF **11 Claims**



1. In a telephone switching network comprising a plurality of thyristor crosspoint elements operation of each said thyristor crosspoint element has an anode, a cathode, and a gate terminal, a switching network control arrangement comprising:

network control means for generating a first and a second control signal to activate a selected one of said thyristor crosspoint elements;

signal control means responsive to said first control signal for generating crosspoint activation signals wherein said signal control means includes:

anode signal generating means responsive to said first control signal for generating an anode activation signal,

cathode signal generating means responsive to said first control signal for generating a cathode activation signal,

gate signal generating means responsive to said first control signal for generating a gate activation signal; and

distribution means responsive to said second control signal for switching said anode, cathode and gate activation signals to said selected thyristor crosspoint element.

4,110,567
MULTI-FREQUENCY GENERATOR USING DIGITAL TECHNIQUE

Donald Joseph Boucher, Guelph, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

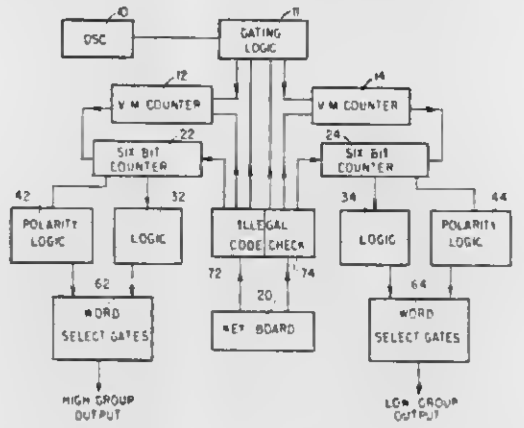
Filed Mar. 14, 1977, Ser. No. 777,040

Int. Cl.^{2} H04M *1/50*

U.S. Cl. 179—84 VF **10 Claims**

1. A telephone signaling circuit for generating an output tone frequency in response to selection of one of a plurality of signal controllers with each controller representing at least one tone frequency, said circuit including a base frequency generator, a variable modulo counter circuit for dividing the base frequency generated by a selected modulus responsive to the controller selected for emitting pulse signals, a further counter serially disposed to receive said pulse signals, said further

counter operative to divide the frequency of received pulses by a predetermined number for emitting a stream of pulses at a rate determined by said base frequency and said predetermined number, a programmable logic array for coding said pulses at said rate into a programmed digital binary word, said word being comprised of binary digital bits of either of two types to approximate the changes in the sine curve of a tone signal being generated, said array normally biased to transmit one type of bit responsive to each successive pulse of said stream and transmitting the other type at predetermined locations in said word, responsive to a stored pattern within said array.



4,110,568
DUAL TONE MULTIFREQUENCY GENERATOR

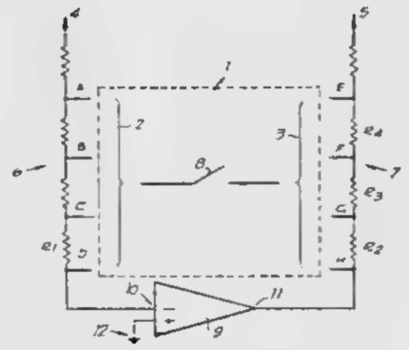
Michael G. C. Taylor, Grobbendonk, Belgium, assignor to GTE ATEA, S.A., Herentals, Belgium

Filed Jul. 15, 1977, Ser. No. 816,121

Claims priority, application Belgium, Oct. 8, 1976, 55355

Int. Cl.^{2} H04Q *9/12*

U.S. Cl. 179—84 VF **5 Claims**



1. A dual tone multifrequency generator for use in a telephone set, comprising:

a high gain differential amplifier having a noninverting input, an inverting input, and an output;

a source of reference ground potential connected to said noninverting input;

a first oscillator means connected to said inverting amplifier input via a first plurality of series connected frequency determining components, said oscillator generating a first output signal when a path to ground potential is established through said frequency determining components, and said first output signal having a frequency determined by the impedance from said first oscillator to ground potential;

a second oscillator means connected to said amplifier output via a second plurality of series connected frequency determining components, said oscillator generating a second output signal when a path to ground potential is established through said second plurality of frequency determining components, and said second output signal having a frequency determined by the impedance from said second oscillator to ground potential; and

a plurality of single-pole single-throw switches interconnecting said first and second plurality of frequency determining components such that when any particular switch is closed a unique feedback path is established from said amplifier output to said amplifier inverting input causing a ground potential to exist at said particular switch and thereby causing both first and second oscillators to operate.

4,110,569
METHOD AND APPARATUS FOR MONITORING THE ON/OFF-HOOK STATUS OF A TELEPHONE SET

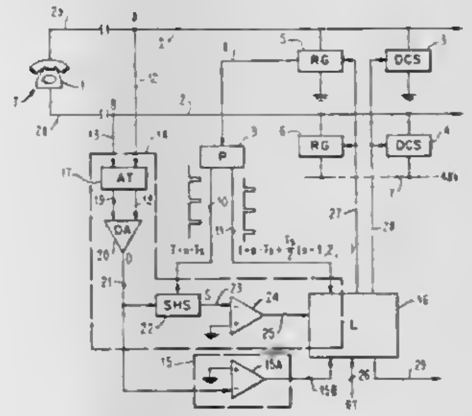
Hans Rudolf Schindler, Langnau, and Peter Vettiger, Thalwil, both of Switzerland, assignors to International Business Machines Corporation, Armouk, N.J.

Filed May 27, 1977, Ser. No. 801,278

Claims priority, application Switzerland, Jun. 25, 1976, 8144/76

Int. Cl.^{2} H04M *3/04*

U.S. Cl. 179—84 A **7 Claims**



1. A method for signalling the ON/OFF-HOOK status of a telephone set connected by a pair of extension wires to a telephone system during the time an AC ringing signal and a DC operating voltage are applied from sources thereof to the extension wires of said telephone set, said method comprising the steps of:

generating an AC signal having an instantaneous magnitude proportional to the difference between the instantaneous magnitude of the voltage on one of said extension wires with reference to one pole of said source of said DC operating voltage and the instantaneous magnitude of the voltage on the other of said extension wires with reference to said other pole of the source of said DC operating voltage;

using said ringing signal to control generation of a sequence of equidistantly spaced pulses at a frequency twice that of said ringing signal;

using alternative ones of said pulses to control a sampling of said generated AC signal;

storing said samples of said generated AC signal during the interval between the taking of said samples;

summing said stored sample with said generated AC signal to generate a sum signal;

comparing said sum signal with a reference value;

changing the magnitude of the DC voltage between said pair of extension wires when said telephone set goes OFF-HOOK; and

providing an OFF-HOOK detection signal if said sum signal exceeds said reference value at the time of occurrence of one of the remaining ones of said pulses.

4,110,570

SURGE PROTECTION DEVICE FOR REPEATER

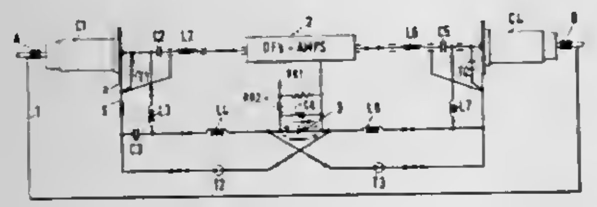
Basil Bernard Foster, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,675

Claims priority, appilcatinn United Kingdom, May 25, 1976, 21637/76

Int. Cl.² H04B *3/44*

U.S. Cl. 179—170 J **5 Claims**



1. A repeater for a transmission system, the repeater comprising a signal transmission path and a separate d.c. power transmission path, an amplifier in said transmission path, a voltage-developing-device in the power transmission path for developing a unidirectional voltage to power the amplifier, a power separating filter for separating power applied to said repeater and signals transmitted to the repeater into the respective separate paths, at least part of the power separating filter and the voltage developing device comprising a series combination, a surge protection device connected across the series combination, whereby a power surge through the repeater will be carried by the surge protection device, and said device includes at least one gas discharge tube responsive to voltage associated with a power surge for switching said voltage to oppose said unidirectional voltage, whereby the unidirectional voltage is lowered to a value at which the amplifier will be switched off.

4,110,571

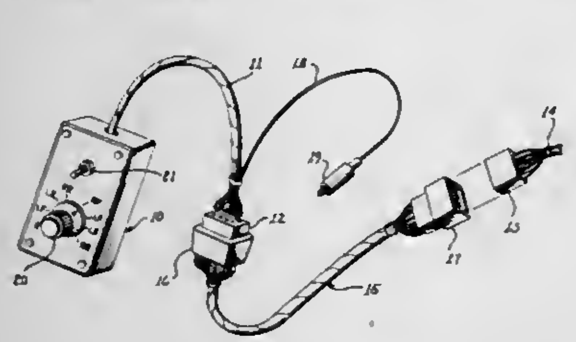
TEST UNIT FOR STEREOPHONIC SPEAKER SYSTEMS

Joseph F. Hills, Scottsdale, Ariz., assignor to Jimmy's Radio & Television Corporation, Phoenix, Ariz.

Filed Nov. 25, 1977, Ser. No. 854,761

Int. Cl.² H04R *29/00*

U.S. Cl. 179—175.1 A **10 Claims**



1. A test unit for providing an audible indication of both the existence and location of open and short circuit conditions within a multiple speaker system having a multi-terminal plug electrically connected to individual leads of first and second groups of leads extending from respective first and second sides of the coils of the speakers and including a power lead extending from a source of electrical power and a grounded lead, said test unit comprising in combination:

(a) a multi-position break before make switch, said multi-position switch including a center terminal, a first series of terminals, a second series of terminals and means for selectively electrically connecting said center terminal to any terminal of said first or second series of terminals;

(b) means for electrically connecting each terminal of said first series of terminals to one lead of the first group of leads and for electrically connecting each terminal of said second series of terminals to one lead of the second group of leads;

(c) means for interconnecting said center terminal with the power lead, said interconnecting means including a buzzer; and

(d) a multi-pole double throw break before make switch for selectively disconnecting the second group of leads from said second series of terminals and grounding the second group of leads.

4,110,572

METHOD AND APPARATUS FOR TESTING TRANSMISSION LINES

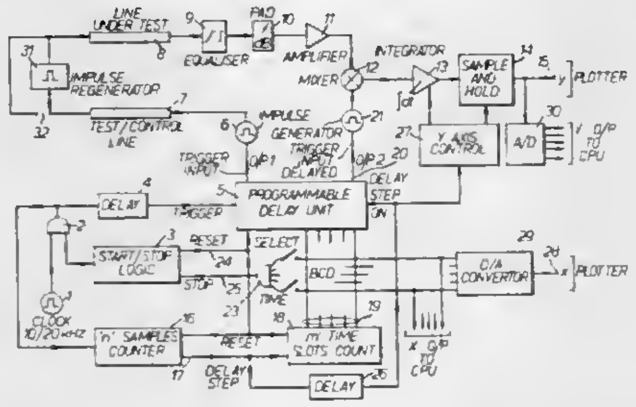
Peter Cochrane, Ipswich, England, assignor to The Post Office, London, England

Filed Jun. 6, 1977, Ser. No. 803,964

Claims priority, application United Kingdom, Juo. 8, 1976, 23599/76

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 R **18 Claims**



7. Apparatus for testing a section of transmission line including means for connection to one end of the section for generating a succession of impulses of very short duration relative to the interval between the impulses, means for connection to an end of the section for deriving therefrom a succession of output signals corresponding respectively to the impulses, the interval between the impulses being such that substantially all of the output signals resulting from one impulse will have occurred before the next impulse is applied to the section of the line, means for producing replicas of the impulses applied to the section of line subject to an adjustable time delay, means for forming the products of the replicas of the impulses with corresponding output signals, means for integrating the products arising from a plurality of replicas subject to the same delay time to produce a smoothed correlation of the output signals with the delayed replicas of the impulses corresponding to each of a plurality of different time delays, and means for producing output indications representing the smoothed correlations.

4,110,573

SNAP ACTION SWITCH

Scott S. Doi, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 30, 1976, Ser. No. 718,500

Int. Cl.² H01H *5/22*

U.S. Cl. 200—67 DA **10 Claims**

1. A snap action switch comprising:

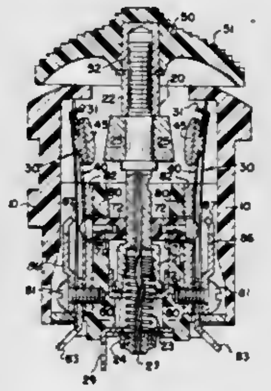
a housing having an upper end;

a shaft movably mounted within the housing;

a first contact mounted on said shaft;

a snap action blade mounted within said housing generally parallel to said shaft, said blade having an upper end that terminates in a latch that extends in the direction toward said shaft;

a leaf spring member mounted between said shaft and said snap action blade and generally parallel to said shaft and said blade, said leaf spring member having an upper end that includes a notch that mates with the latch on said blade;



a second contact mounted on said leaf spring member;

a button mounted at one end of said shaft, said button adapted to move said shaft in the direction of said leaf spring member and cause engagement of said first and second contacts.

4,110,574

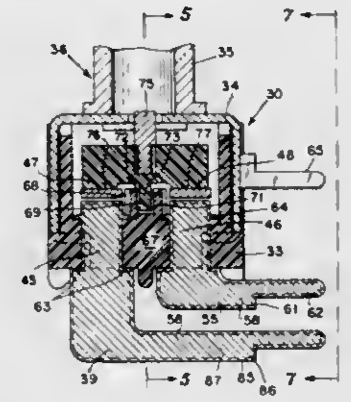
SUB-MINIATURE, TWO POSITION DOUBLE POLE SWITCH

Francis D. Kirchoff, Waban, Mass., assignor to Alco Electronic Products, Inc., North Andover, Mass.

Filed Mar. 30, 1977, Ser. No. 782,992

Int. Cl.² H01H *13/28, 21/40*

U.S. Cl. 200—67 G **10 Claims**



1. A sub-miniature, two position, double pole switch of the type having a case with six projecting conductive terminals, a pair of spaced rockers and a handle with a spring pressed plunger and insulated tip for actuating the rockers characterized by:

an insulator member in the space between said rockers, within said case, said member having an elongated tongue groove extending in parallelism with said rockers and,

an elongated integral tongue on the insulated tip of said plunger, said tongue being slidably received in said tongue groove of said member during actuation of said rockers to prevent twisting of said rockers and uneven closing of the circuits to said terminals,

said insulator member forming a barrier between said double pole terminals and said rockers to prevent arcing therebetween.

4,110,575

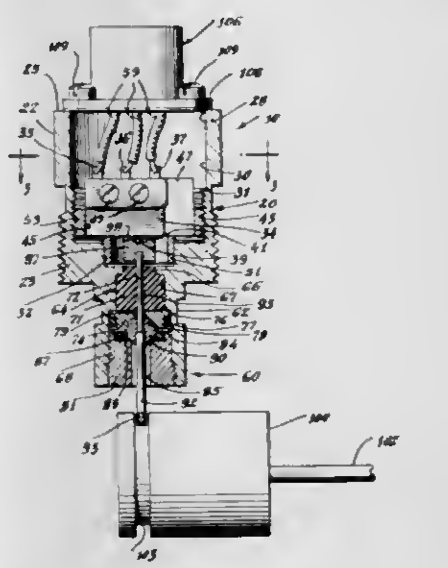
SPOOL DEFLECTION INDICATOR

Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn. 06477

Filed Jun. 28, 1976, Ser. No. 700,391

Int. Cl.² H01H *35/00*

U.S. Cl. 200—81.9 R **13 Claims**



1. An indicator for sensing deflection of a spool or the like comprising:

(A) a housing adapted for mounting adjacent to a deflectable spool or the like, said housing defining an opening disposed toward the spool;

(B) signal producing means including an axially depressible actuating member thereof, said signal producing means mounted in said housing with the actuating member disposed toward said housing opening and said spool;

(C) a rod pivotally mounted at a point intermediate its ends and in said housing, one end of said rod extending from said housing through said housing opening for engagement with said spool whereby deflection of said spool pivots said rod, and the other end of said rod extending toward and generally aligned with the actuating member of said signal producing means; and

(D) a cam mounted on the end of said rod extending toward said actuating member of said signal producing means, said cam defining a cam surface which is positioned adjacent to and engages and acts on said actuating member of said signal producing means, whereby pivoting of said rod by deflection of said spool moves said cam surface with respect to said actuating member and causes said signal producing means to produce a signal in response to deflection of said spool.

4,110,576

PRESSURE RESPONSIVE SWITCH

Richard T. Cusick, Laurel, and Wilbur J. Fleagle, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1977, Ser. No. 833,799

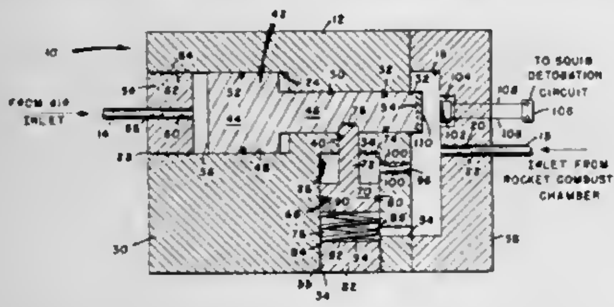
Int. Cl.² H01H *35/38*

U.S. Cl. 200—82 E **9 Claims**

1. A pressure responsive switch apparatus which is precluded from activation when a first source of pressure producing forces acting thereon is stabilized and which is activated when said first source of pressure produces a change of forces acting thereon followed by said first source of pressure and a second source of pressure producing forces acting on said apparatus in a preselected relationship, said apparatus comprising:

a housing having a chamber disposed therein, a first bore being disposed in said housing and communicating with said chamber, a second bore being disposed in said housing and communicating with said first bore;

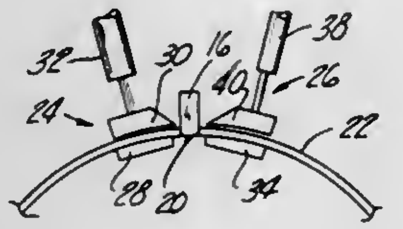
a first elongated piston slidably disposed within said first bore, a first end of said first piston movable in said chamber;
a second elongated piston slidably disposed within said second bore;
means extendible into said first bore and responsive to movement of said second piston for positively engaging and locking said first piston in a preselected position;
means for disengaging and unlocking said engaging and locking means, said disengaging and unlocking means acting in response to movement of said second piston caused by a change of pressure within said chamber delivered thereto by said first source of pressure;


10
12
42
FROM AIR INLET
TO SQUIB DETONATION CIRCUIT
INLET FROM ROCKET COMBUSTION CHAMBER
30
58
106
108
100
34

switch means disposed within said housing adjacent to said first end of said first piston; and
means for urging said first piston from said preselected position to a position for activating said switch means responsive to said forces produced by said second source of pressure acting upon the second end of said first piston and said forces produced by said first source of pressure acting simultaneously upon said first end thereof in said preselected relationship.

4,110,577
WELDING MACHINE

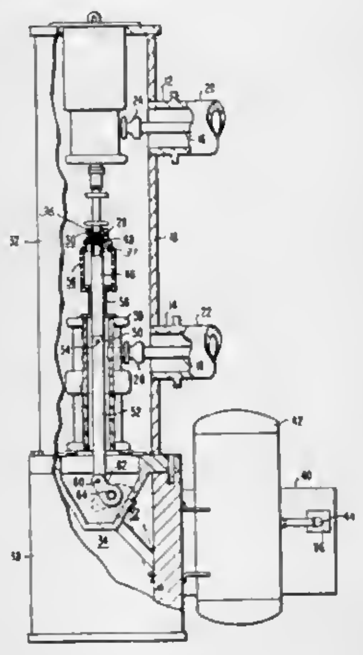
Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185
Continuation-in-part of Ser. No. 639,398, Dec. 10, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,586
Int. Cl.² B23K *11/08*
U.S. Cl. 219—101 **14 Claims**



1. In a machine for welding adjoining workpiece portions together comprising; a gauge means movable between first and second positions, clamp means for each of said workpiece portions disposed at opposite sides of said gauge means and being operable to grip said portions and hold said portions in engagement with said gauge means when the latter is in said first position, means to move said clamp means toward each other when said gauge means is in its said second position to move said workpiece portions into abutting relationship to each other, a welding head movably supported for movement in close proximity to the abutting workpiece portions, means to move said welding head for welding said workpiece portions to each other to form a finished workpice, said clamp means being releasable from said workpiece portions and movable away from each other in response to movement of said welding head to a position completing the weld, said gauge means being movable to its first position and between said clamp means upon movement of said clamp means away from each other to engage said workpiece and eject it from said machine, said clamp means each comprising a support member and a clamp element movable relative to said support member, said clamp element and support member at one side of said gauge means being movable to grip one workpiece portion and being movable therewith as a unit relative to the other of said clamp elements, support members and workpiece portions upon movement of said gauge bar to said second position, said support member and clamp element at one side of said gauge means gripping one portion of said workpiece with a given force and the other of said clamp elements and support members gripping the other portion of said workpiece with a lesser force to permit sliding movement of said other portion in said clamp means when said portions are brought into abutting engagement with each other upon movement of said clamp means toward each other.

4,110,578
CIRCUIT BREAKER

Willie B. Freeman, Monroeville; Russell N. Yeckley, Murrysville; Otto H. Soles, N. Huntingdon, and James M. Telford, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 31, 1975, Ser. No. 645,867
Int. Cl.² H01H *33/42*
U.S. Cl. 200—148 F **9 Claims**

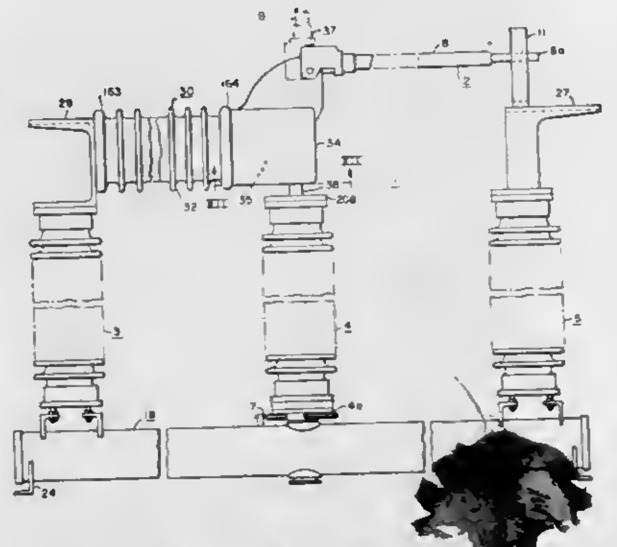


1. A circuit breaker for use in compressed-gas insulated systems comprising:
an elongated sealed gas housing containing a compressed insulating gas and including two spaced-apart electrical conductors;
a stationary contact disposed within said housing and electrically connected to one of said electrical conductors;
a longitudinally movable contact disposed within said housing and electrically connected to the other of said electrical conductors, said movable contact capable of electrically contacting said stationary contact and capable of being spaced-apart from said stationary contact;
a contact rod secured at one end to said movable contact and having a free end;
guide means disposed within said housing and positioned adjacent to said contact rod, said guide means permitting said contact rod longitudinal movement;
a connecting rod pivotally coupled to said free end of said contact rod,
a rotatable positioning shaft having a pair of arms fixedly secured thereto and extending radially outwardly therefrom, said positioning shaft extending outwardly beyond said housing, said connecting rod being pivotally coupled to one of said arms;
a drive rod pivotally coupled at one end directly to one of said arms and having a free end;

a centrally rotatable drive latch having a first end section and a second end section, said drive rod free end being pivotally coupled directly to said first end section; and
means for rotating said drive latch comprising:
a sealed cylinder;
a rigid disc disposed within said cylinder and movable with respect thereto, said disc having a diameter substantially the same as said cylinder;
a latch rod secured to said disc and extending outwardly beyond said cylinder, said latch rod being secured directly to said drive latch second end section; and
means for inserting a driving fluid within said cylinder and against said disc, said driving fluid causing movement of said disc and said latch rod, movement of said latch rod causing rotation of said drive latch.

4,110,579
IMPROVED ENERGY-STORAGE OPERATING MECHANISMS FOR CIRCUIT-INTERRUPTING STRUCTURES UTILIZING SERIALLY-RELATED DISCONNECTING SWITCH STRUCTURES THEREWITH

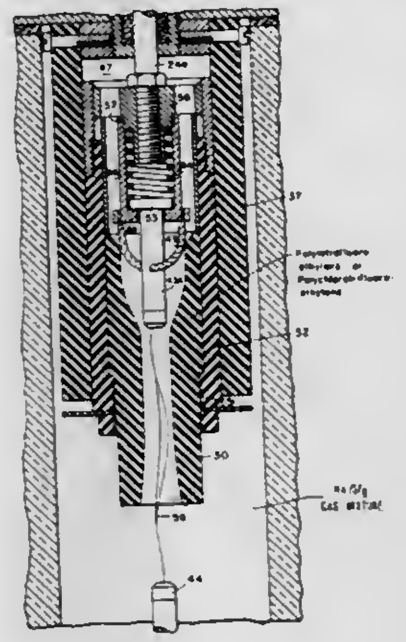
Russell E. Frink, Pittsburgh, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 469,931, May 14, 1974. This application Mar. 4, 1975, Ser. No. 555,212
Int. Cl.² H01H *33/12, 33/14*
U.S. Cl. 200—146 R **30 Claims**



1. A circuit-interrupter and a serially-related disconnecting-switch structure, said circuit-interrupter including separable arcing contact means separable to establish arcing between the contacts, a common operating mechanism including a rotatable shaft for effecting the opening and closing movements of said separable arcing contact means and also said disconnecting-switch structure comprising additionally releasable closing energy-storing means, means for translating the rotative closing only during the closing operation of the circuit interrupter motion of said rotatable shaft into an increase of the energy-content stored within said closing energy-storing means during said closing operation, a toggle-linkage having a pair of interconnected toggle-links and a releasable knee-pin interconnecting said toggle-links, said toggle-linkage interconnecting said releasable closing energy-storing means with said separable arcing contact means, means for biasing the separable arcing contacts to the open-circuit position, first releasing means for said releasable knee-pin, tripping means responsive to reverse opening rotation of said shaft or effecting the release of said first releasing means to release the releasable knee-pin to thereby effect collapse of the toggle-linkage and thereby effect the opening of the separable arcing contacts, second releasing means for discharging the stored energy of said closing energy-storing means to effect the straightening of said toggle-linkage and consequent closing of the separable arcing contacts during the closing operation, means whereby the operation of said rotatable shaft-member additionally effects the closing and opening operations of said serially-related disconnecting-switch structure, and the separable arcing contacts remaining open in the fully-open-circuit position of the circuit-interrupter and disconnecting switch structure.

4,110,580
GAS-TYPE CIRCUIT-INTERRUPTERS HAVING ADMIXTURES OF HELIUM WITH SMALL CONCENTRATIONS OF SULFUR-HEXAFLUORIDE (SF_6) GAS

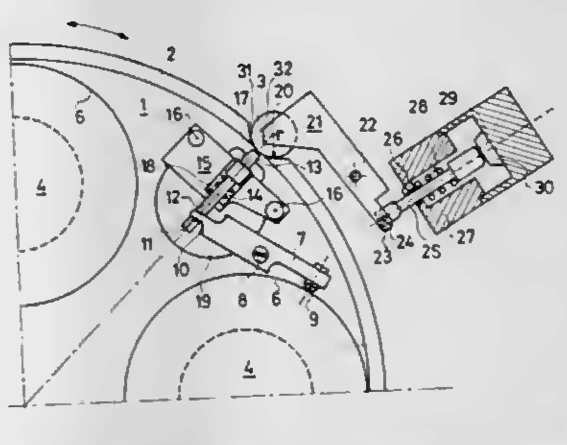
Owen Farish, Glasgow, Scotland, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 30, 1976, Ser. No. 719,203
Int. Cl.² H01H *33/22*
U.S. Cl. 200—148 G **22 Claims**



1. A circuit-interrupter including as an arc-extinguishing medium an admixture of helium and sulfur-hexafluoride gases, the concentration of the sulfur-hexafluoride (SF_6) gas being in the order of one percent up to 10 percent, by volume.

4,110,581
DEVICE FOR MONITORING THE FITTING IN POSITION OF DETACHABLE ELEMENTS IN THEIR SUPPORT

Jacques Meunier, Paris, France, assignor to C.G.R. MeV, Paris, France
Filed Mar. 12, 1976, Ser. No. 666,266
Claims priority, application France, Mar. 14, 1975, 75 08074
Int. Cl.² H01H *3/42, 3/16*
U.S. Cl. 200—153 LA **10 Claims**



1. A device for monitoring the positioning of detachable elements in their mountings comprising
a mounting plate with *n* openings known as "locations", designed to receive said detachable elements,

said mounting plate being provided at its periphery with a thick rim provided with *n* slots and a safety system for monitoring the positioning of said elements, said safety system comprising *n* obturating-studs associated with said *n* slots;

means being provided to enable each of said obturating-studs to be retracted from its slot when the detachable element is appropriately positioned in its corresponding location;

said mounting plate being immobilizable in a given position by means of a safety locking system comprising an index which can be introduced into said slot corresponding to the selected location, after the retraction of said obturating-stud from said slot when said selected location is equipped with its detachable element;

means being provided for positioning said selected slot opposite said index, and said index actuating a safety electrical switch.

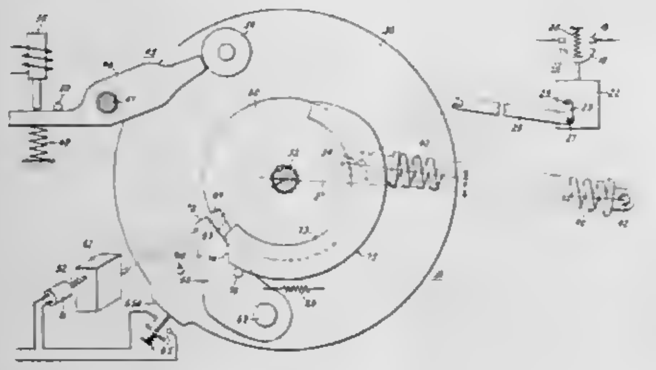
4,110,582
STORED-ENERGY OPERATING DEVICE FOR AN ELECTRIC CIRCUIT BREAKER

Philip Barkan, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Jul. 2, 1976, Ser. No. 702,328

Int. Cl.² H01H *3/00*

U.S. Cl. 200—153 SC **12 Claims**



1. In a stored-energy operating device,

(a) a spring,

(b) a rotatable spring-controller mounted for rotation between first and second angularly spaced dead-center positions with respect to said spring,

(c) means for transmitting charging forces to said spring in response to rotation of said spring-controller in a forward direction toward said first dead-center position,

(d) said spring acting to discharge and thereby further to rotate said spring-controller in a forward direction when said spring-controller has been rotated in a forward direction past said first dead-center position,

(e) releasable stop means coacting with said spring-controller for blocking said further forward rotation of said spring-controller, said stop means being releasable to permit said spring to rapidly discharge and continue forward rotation of said spring-controller into said second dead-center position,

(f) said spring-controller oscillating about said second dead-center position immediately following said rapid discharge of said spring,

(g) means for forwardly rotating said spring-controller from said second to said first dead-center position, thereby charging said spring, comprising:

  (g1) a rotatable driving member for said spring-controller having an abutment thereon,

  (g2) a pawl mounted on said spring-controller and arranged to be driven by said abutment when said driving member is driving said spring-controller in a forward direction toward said first dead-center position,

(h) and cam means effective after said spring-controller has passed in a forward direction through said first dead-center position but before said stop means has become effective to block forward rotational movement of said spring-controller for releasing said pawl from driven relationship with said abutment so that said driving member is not imparting driving force to said pawl when said stop is blocking said spring-controller,

(i) said cam means normally acting during the oscillations immediately following spring-discharge to hold said pawl out of a path that will permit a collision between said pawl and said abutment even if said spring-controller, in oscillating about said second dead-center position, should travel through as much as 90° in a reverse rotational direction from said second toward said first dead-center position.

4,110,583
EARPHONE CONSTRUCTION

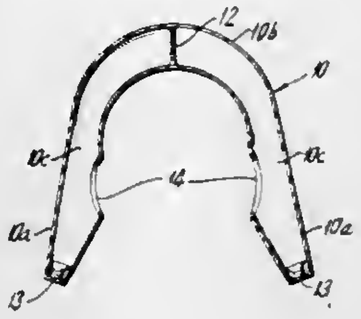
Wilhelm Lepper, Berghaus Heckenfels, 5340 Bad Honnef a. Rhein, Fed. Rep. of Germany

Filed Feb. 3, 1976, Ser. No. 654,906

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1975, 2504362; Feb. 4, 1975, 2504540; Feb. 19, 1975, 2507043; Mar. 11, 1975, 2510459; Mar. 25, 1975, 2513053; Apr. 9, 1975, 2515442

Int. Cl.² H04M *1/05;* **H04R** *5/00*

U.S. Cl. 179—156 R **25 Claims**



1. Earphone construction to be worn on the head of the listener comprising a tubular shaped member forming an axially extending passageway having a first end and a second end spaced apart in the axial direction of said passageway, a first opening formed in the tubular member into said passageway and spaced between and from said first and second ends, said first opening arranged to be placed next to the listener's ear, and a sound source located in said passageway and spaced in the axial direction thereof from said first opening, said sound source being positioned in said passageway for directing the sound in the general direction of the axis of the passageway so that the sound travels across said first opening into said passageway.

4,110,584
LOAD BREAK SWITCH WITH TRANSPARENT INTERNAL SHIELD

John W. Erickson, and James A. Erickson, both of Crystal Lake, Ill., assignors to Boltswitch, Inc., Crystal Lake, Ill.

Continuation-in-part of Ser. No. 607,352, Aug. 25, 1975, Pat. No. 4,020,432. This application Feb. 14, 1977, Ser. No. 768,167

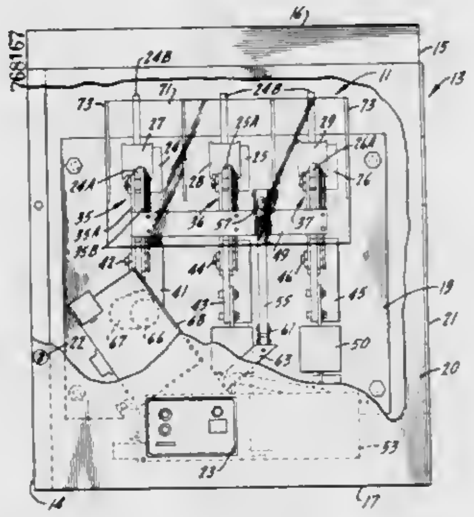
Int. Cl.² H01H *9/02, 13/04, 19/04, 21/04*

U.S. Cl. 200—304 **3 Claims**

1. In a high-current, low-voltage load-break switch of the type which is installed in a housing having an access door,

said switch comprising a fixed contact, a movable contact movable between a closed position in bolted pressure contact with the fixed contact and an open position displaced from the fixed contact, and means for rapidly opening and closing the switch by driving the movable contact to its closed position and to its open position, and

a transparent shield supported in a fixed position across the front of the switch contacts in both their open and closed positions to visually expose the switch contacts when the access door to the housing is open while providing protection in the event of electrical arcing and mechanical failure of the switch contacts.



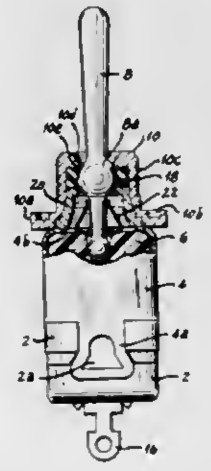
4,110,585
GROUNDED LEVER TOGGLE SWITCH

Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 21, 1977, Ser. No. 789,546

Int. Cl.² H01H *21/22*

U.S. Cl. 200—305 **12 Claims**



1. An electric switch comprising:

a switch housing composed at least partly of metal having an opening therein and normally being grounded in use;

a switch operating mechanism within said housing;

a metal switch actuator extending out through said opening so as to be accessible for operation to actuate said operating mechanism;

means mounting said actuator to said housing to allow selective movement thereof to actuate said operating mechanism;

and means electrically connecting said actuator to the metal part of said housing to prevent electromagnetic radiation therefrom while allowing relatively unimpeded movement of said actuator comprising:

an electrically conductive grounding element in contact with the metal part of said housing and having an aperture through which said actuator extends and a pair of arms extending up from the outer edges of said grounding element and toward one another to resiliently grip said switch actuator therebetween for good electrical contact to electrically connect said actuator to said grounded metal part of said housing.

4,110,586
MANUFACTURE OF DOPED SEMICONDUCTOR RODS

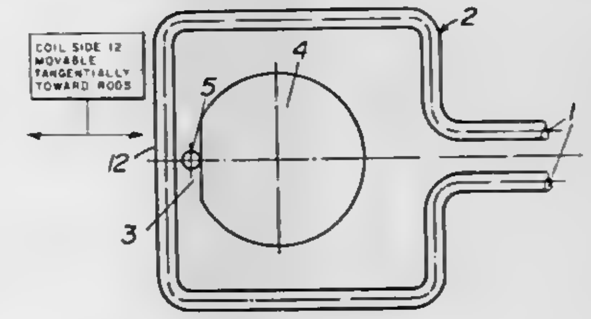
Franz Köhl, Burghausen, Fed. Rep. of Germany, and Walter Hoch, Neukirchen, Enknach, Austria, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Aug. 26, 1976, Ser. No. 717,959

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538812

Int. Cl.² H05B *5/08*

U.S. Cl. 219—10.43 **11 Claims**



1. A process for doping a semiconductor rod, which comprises securing a semiconductor rod containing a dopant and having a substantially smaller cross-section than the rod to be doped against the rod to be doped with the axes of the two rods substantially parallel to one another, both rods consisting of the same semiconductor materials, fusing the two rods into a single rod, and subjecting the rod so formed to a crucible-free zone melting process.

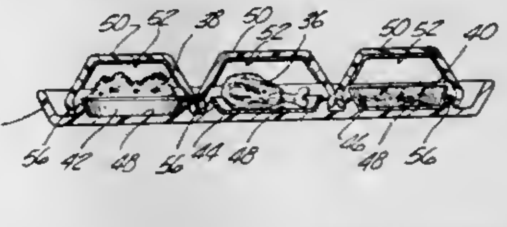
4,110,587
METHOD AND APPARATUS FOR HEATING FOOD

James J. Souder, Jr., and Lindsey E. Waldorf, both of Ann Arbor, Mich., assignors to Patents Licensing International, Ltd., Southfield, Mich.

Division of Ser. No. 560,396, Mar. 20, 1975, Pat. No. 4,020,310. This application Jan. 10, 1977, Ser. No. 758,083

Int. Cl.² H05B *5/08*

U.S. Cl. 219—10.49 R **5 Claims**

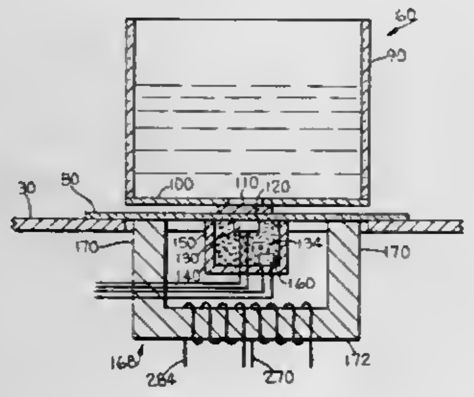


1. Apparatus for inductively heating a plurality of food portions to different temperatures comprising: a carrier having a plurality of food container receiving sections; a heating compartment with a planar surface adapted to be supported in alignment with the carrier and having a plurality of induction heating coils supported so as to be positioned in alignment with at least some of the plurality of food container receiving sections formed on the carrier; means for passing alternating electric currents through said induction heating coils; a plurality of food containers, each enclosing a food portion, the containers having surface configurations adapting them to be supported in the food container receiving sections of the carrier, each food container including an electrically conductive section whereby electric currents will be induced in the conducting sections to heat the food portions and means varying the heating response of at least some of said containers from one another to said alternating electric currents passed through said induction heating coils, whereby the amount of heat passed into a food portion within a particular food container when disposed on the carrier and in the compartment will vary between at least some of the containers.

4,110,588

INDIRECT INDUCTION APPARATUS FOR HEATING FLUIDS

George E. Holz, 97 Grandview Ave., N. Plainfield, N.J. 07060
Filed Aug. 23, 1976, Ser. No. 716,954
Int. Cl.^{2} H05B *5/04*
U.S. Cl. 219—10.49 R **9 Claims**



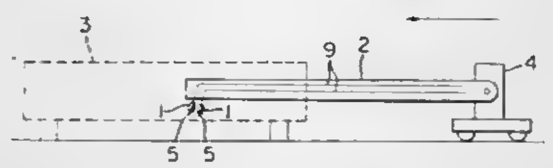
1. Fluid heating apparatus comprising
a housing having a top surface,
an aperture in said top surface,
an electrically insulating sheet covering said aperture and having a top surface and a bottom surface,
a container of a conductive material, filled with a thermally insulating material, secured to the bottom surface of said insulating sheet,
a first temperature sensor in said container and disposed adjacent to said insulating sheet,
a second ambient temperature sensor adjacent to the wall of said container, spaced from said first temperature sensor,
a U-shaped magnetic core having legs engaging the bottom surface of said insulating sheet with said container disposed between said legs,
electrical windings on said core for coupling to an oscillating power source,
a fluid-containing cup having a bottom wall which has at least one electrically conductive portion and which can be inductively heated and which is positioned over said magnetic core,
an aperture at about the center of said bottom wall of said cup,
a thin electrically insulating disk secured to the bottom surface of said bottom wall and covering the aperture in said bottom wall, and
means for coupling said temperature sensors to electrical circuitry for controlling said power source.

4,110,589

METHOD FOR LONGITUDINALLY SEAM-WELDING PIPE-BLANK FOR WELDED STEEL PIPE FROM THE INSIDE ALONG A GROOVE

Fusao Koshiga, Kawasaki; Jinkichi Tanaka, Yokohama; Itaru Watanabe, Yokohama; Motoaki Suzuki, Yokohama; Toshifumi Kojima, Yokohama; Hiroyoshi Matsubara, Fukuyama; Tatsumi Osuka, Fukuyama; Kenji Takeshige, Fukuyama; Takashi Nagamine, Fukuyama, and Osamu Hirano, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1977, Ser. No. 771,841
Claims priority, application Japan, Mar. 24, 1976, 51-31392
Int. Cl.^{2} B23K *9/08*
U.S. Cl. 219—66 **3 Claims**

1. In a method for longitudinally seam welding a pipe-blank from the inside thereof using the reverse-polarity GMA welding process comprising: supplying direct electric current to a consumable welding electrode through a cable as the welding current, with said consumable electrode being maintained positive in polarity; and longitudinally seam-welding a pipe-blank for welded steel pipe from the inside along a cleft or groove by feeding said consumable electrode through a welding torch while moving a boom carrying said welding torch through said pipe-blank relative to said pipe-blank in the same direction as that of welding, said boom having a free end which carries said welding torch and having a length at least equal to that of said pipe-blank;
the improvement comprising the steps of:
arranging said cable in said pipe-blank in a predetermined direction; and

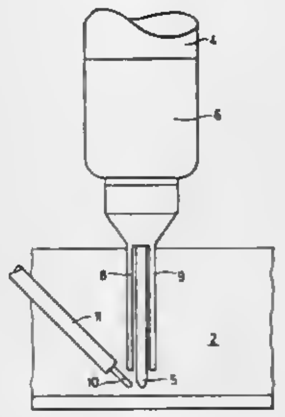


supplying said direct electric welding current in such a direction that the welding current flowing through said cable flows in the same direction as the direction of welding, thereby preventing occurrence of a magnetic arc blow of the welding arc from said consumable electrode toward the upstream side of the welding direction, i.e., in the opposite direction to that of welding.

4,110,590

INERT GAS WELDING

John Walter Batey, Chester-le-Street, and Anthony Charles Potter, Whitley Bay, both of England, assignors to Reyrolle Parsons Limited, England
Division of Ser. No. 487,208, Jul. 9, 1974, abandoned. This application Feb. 24, 1976, Ser. No. 660,921
Int. Cl.^{2} B23K *9/16*
U.S. Cl. 219—75 **12 Claims**

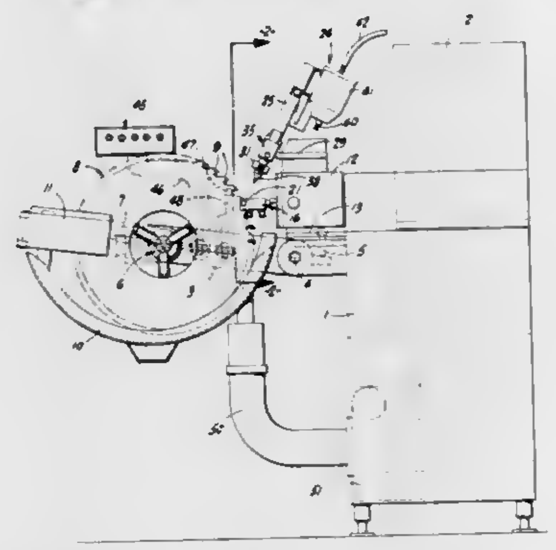


1. Welding apparatus for inert gas shielded arc welding comprising:
a non-consumable electrode having a longitudinal axis, a welding gun for holding and controlling said non-consumable electrode and including means for supplying inert gas to the welding arc region by way of a gas cup surrounding but spaced from such an electrode when positioned in the gun, the welding gun being further provided with an extended gas shielding wall arrangement having at least two end portions, each of said end portions having a longitudinal axis parallel with said electrode longitudinal axis, protruding a distance beyond the gas cup and capable, either by themselves or in combination with a narrow gap weld preparation, of substantially enclosing an electrode in the gun, except for its tip, when the electrode is protruding for a similar distance beyond the gas cup, said tip protruding through a plane which includes said end portions of said shielding wall.

4,110,591

APPARATUS AND METHOD FOR BRAZING TIPS ON CIRCULAR SAW TEETH

Luigi Trincbera, Stockton, Calif., assignor to California Cedar Products Company, Stockton, Calif.
Filed Apr. 19, 1976, Ser. No. 678,160
Int. Cl.^{2} B23K *1/04*
U.S. Cl. 219—85 CA **9 Claims**

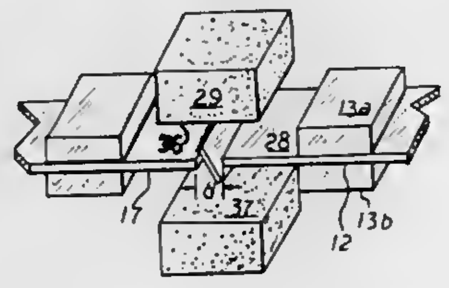


1. An apparatus, for brazing a tip on a tooth of a circular saw blade, comprising, in connection with a supporting structure, a pair of opposed, initially spaced electrodes, means mounting the electrodes for approaching movement, means including an upwardly facing anvil to support and to pre-position an initially separate tip between the electrodes, means operative to cause such approaching movement of the electrodes whereby to clamp the anvil-supported prepositioned tip therebetween, a brazing paste applicator adapted to deliver brazing paste on the clamped-in-place tip, a switchcontrolled electrical resistance circuit connected to and including the electrodes, and a mount adapted to support a circular saw blade for movement to dispose a selected tooth in engagement from above with the clamped-in-place tip; said tip being resistance-heated, in response to closing of the circuit, to effect brazing of the tip on the tooth.

4,110,592

METHOD OF SPLICING TAPE BY SOLDERING

Sigmund Ege, Oslo, Norway, assignor to Kløften & Kløften A/S, Oslo, Norway
Filed Jun. 3, 1976, Ser. No. 692,454
Int. Cl.^{2} B23K *1/04*
U.S. Cl. 219—85 M **10 Claims**

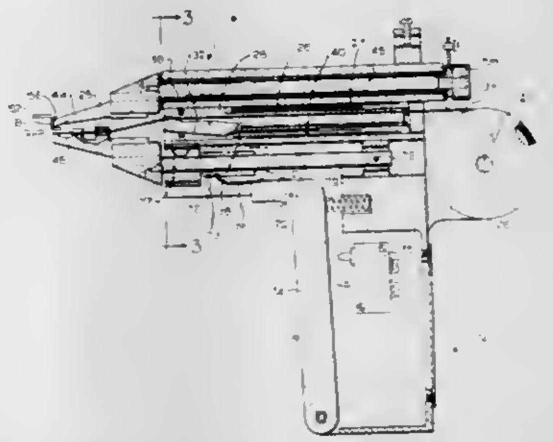


1. The method of splicing comprising the steps of:
A. cutting substantially straight first and second edges respectively in first and second lengths of metallic tape, said second edge being substantially parallel to said first edge, said lengths being aligned,
B. positioning said first length and said second length of tape with their broad surfaces coplanar or in substantially parallel planes,
C. advancing at least one of said edges close to the other of said edges with no portion of either of said lengths overlapping any portion of the other of said lengths so as to leave a small gap in the lengthwise distance between said edges,
D. introducing a thin strip of silver solder through said gap between said edges, said strip having a width substantially exceeding the thickness of said tape, substantial portions of the width of said strip overlapping one surface of said first length and the opposite surface of said second length,
E. pressing said edges between substantially flat surfaces of processing means thereby pressing said strip against one surface of said first length and the opposite surface of said second length,
F. heating said strip sufficiently to cause silver solder to flowingly fill said gap and fuse to said edges.
G. cooling said lengths and the silver solder at said edges so as to butt splice said lengths.

4,110,593

WELDING GUN ADAPTED TO WELD MOVABLE CONTACTS ON WIRE SPRING RELAYS

Basil D. Crooks, and R. Brian P. Bennett, both of Toronto, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Apr. 28, 1977, Ser. No. 791,861
Int. Cl.^{2} B23K *11/10*
U.S. Cl. 219—90 **4 Claims**



1. In a welding gun,
a casing,
a pair of jaws of electrically conducting, nonweldable material defining mutually facing surfaces,
means on one of said surfaces to seat a wire of a relay leaving a surface of the wire displaced therefrom toward the surface of the other jaw,
the other of said jaw surfaces being designed to seat a strip of material embodying the contact to be welded to said wire in a location to be clamped against said wire on the relative approach of said jaws,
one of said jaws being mounted on a jaw mounting member,
the other of said jaws being mounted for movement with said casing,
said one jaw mounting member being mounted on said casing to move in a direction to cause said one jaw to move between a position to clamp said wire against said contact material between the two jaws, and a position more widely spaced from the other jaw,
means releasably biassing said jaw mounting member toward the more spaced position,
a control member manually movable over a range of movement,
said control member and said jaw mounting member being arranged and directed so that on movement over said range in one direction said control member causes said jaw mounting member to move the jaw mounted thereon toward clamping relationship with the other jaw,
a spring connection between said control member and said jaw mounting member whereby on movement of said control member in said one direction said control member causes said jaw mounting member movement over said

spring until said clamping is achieved and thereafter movement of said control member a further distance in said one direction causes stress of said spring resulting in pressure of the jaw, which is mounted on the jaw mounting member, on the other jaw,

and a switch for electrically energizing said welding jaws located and designed to be actuated on movement of said control member over said further range of movement.

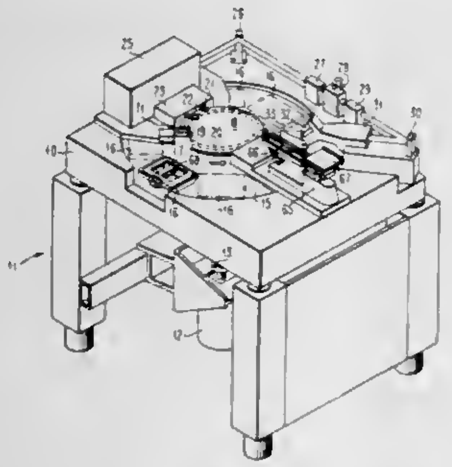
4,110,594
PATTERN MASK GENERATING METHOD AND APPARATUS

Gordon Herbert May, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,292

Int. Cl.^{2} G02F *1/29*

U.S. Cl. 219—121 LM **7 Claims**



1. A method for generating a set of photomasks for a multilayered integrated circuit, comprising the steps of:

supporting a plurality of substrates with photosensitive coatings on a turntable at substantially equal radial and circumferential distances relative to the axis of rotation;

rotating the turntable at substantially a preselected constant velocity;

providing an input medium having encoded indicia thereon representing that necessary to make all the masks for the different layers of the multilayered circuit;

directing a fine resolution energy medium toward the turntable and moving the medium incrementally in a radial direction relative to the turntable to scan successive contiguous bands of each substrate coating sequentially during successive rotations of the turntable;

modulating the fine resolution energy medium under control of the encoded indicia so as to control selective exposure of incremental portions of the coating on each substrate in a series of contiguous narrow scans as the energy medium is incremented radially relative to the rotating turntable, to provide a unique image pattern on each substrate corresponding to that required for a respective one of the masks necessary for fabricating a different layer of the multilayered integrated circuit, so that the masks for all requisite layers will be completely imaged substantially concurrently under identical environmental conditions and with minimal misregistration during a series of continuous successive rotations of the turntable; and

controlling the incremental radial movement of the medium and frequency of modulation with a continuous high frequency clocking system having a closed loop feedback.

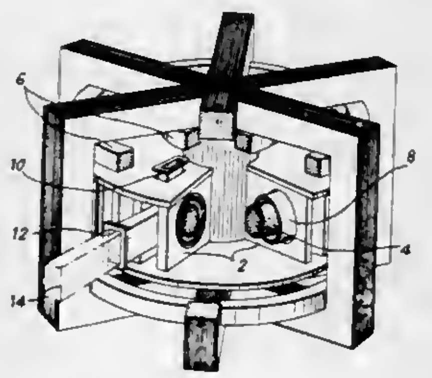
4,110,595
HIGH-FREQUENCY PLASMA-HEATING APPARATUS

Marco Brambilla, St. Egreve, and Pascal Lallia, Grenoble, both of France, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 19, 1975, Ser. No. 588,583

Int. Cl.^{2} G21B *1/00*

U.S. Cl. 219—121 P **7 Claims**



1. Apparatus for high-frequency heating of a plasma confined by a magnetic field (Bϕ) and traversed by a current (I ϕ), characterized in that it comprises at least one array of adjacent wave guides opening into a vacuum chamber containing said plasma, means for exciting in each guide of said array a high-frequency wave so that the waves respectively propagate inside each guide and relative phase-shift producing means such that at least at and near the output end of said guides there is a phase shift between the waves in successive adjacent guides of said array, the phase shifts between successive pairs of guides together producing progressive steps of phase shift across a dimension of the array which is essentially parallel to the direction of said plasma-confining magnetic field where said guides open into said vacuum chamber.

4,110,596
APPARATUS FOR TRANSPORTING AND COLLECTING SELF-PROPELLED WELDING CARRIAGES

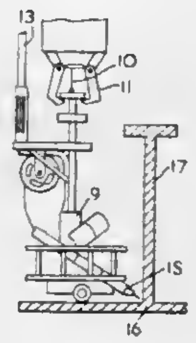
Jiro Okamoto, Akashi; Mamoru Hirose, Ashiya; Katsuji Miyamoto, Jobe, and Shinichiro Kuroki, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 613,019, Sep. 12, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,509

Claims priority, application Japan, Oct. 3, 1974, 49-11335

Int. Cl.^{2} B23K *9/12*

U.S. Cl. 219—124.4 **1 Claim**



1. Apparatus for welding upon material from above, at a work station having a plurality of longitudinally-spaced work sites, comprising:

at least one travelling means;

a travelling means support structure disposed over the work station and providing for longitudinal and transverse movement of the travelling means in a horizontal plane over the work station;

at least one self-propelled welder that is separate from the travelling means, the self-propelled welder having structure providing the capability of rotating and travelling freely upon the material to be welded;

a control cable extending upwards from the self-propelled welder to the vicinity of the travelling means support structure;

a hoist mounted on the travelling means, and including upper sheave means, suspended lower sheave means, cable means entrained about the upper and lower sheave means, and cable payout and take-up means associated with the cable means for raising and lowering the lower sheave means relative to the upper sheave means;

at least one clamping means for clamping and holding the self-propelled welder, the clamping means being mounted on the lower sheave;

the clamping means including two legs associated with one another for movement relatively toward and away from one another for grasping and releasing the self-propelled welder;

a motor mounted on the lower sheave means and having an output shaft means provided with two screw-threaded sections of opposite-hand threading relative to one another;

each screw-threaded section being threaded to a respective clamp leg, so that operation of the motor in one sense moves both clamp legs to grasp the self-propelled welder and operation of the motor in another sense moves both clamp legs to release the self-propelled welder;

a limit switch mounted on the lower sheave means, the limit switch being disposed, when the clamping means is to grasp the self-propelled welder, for contact with the self-propelled welder when the limit switch becomes lowered with the lower sheave means until the limit switch is in operative contact with the self-propelled welder;

the limit switch being connected with the motor for activating the motor upon making said operative contact, to cause the clamp legs to grasp the self-propelled welder;

extensible, contractible anti-rotation means suspending the clamping means from the travelling means while permitting vertical movement of the clamping means due to operation of the hoist; and

swivelling means operatively interposed between the clamp legs and the travelling means support structure, the swivelling means having structure providing the capability of swivelling the self-propelled welder, while the self-propelled welder remains grasped by the clamping means, for untwisting the control cable when the same has become twisted due to net rotation of the self-propelled welder in one angular sense during self-propulsion thereof.

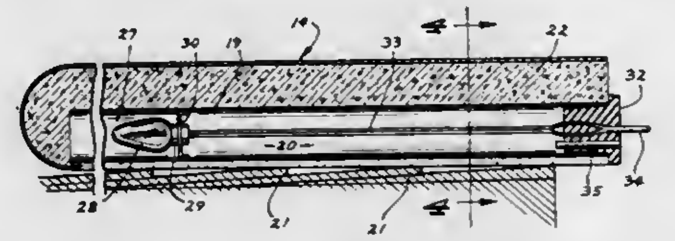
4,110,597
HEATING DEVICE

Theodore V. Elmore, 7570 Highway 65 NE., Fridley, Minn. 55432

Filed May 5, 1976, Ser. No. 683,462

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—200 **16 Claims**



1. A heating device for installation on the pitched roof of a heated building to permit drainage of ice-blocked water from the roof of the building, comprising:

an elongate tubular housing defining a substantially closed chamber and having an end extendible over the roof edge of a building;

heating means located in the chamber;

a heat insulative jacket surrounding said housing to retard heat loss from the chamber;

said housing and jacket configured to be installable on a roof substantially parallel to the pitch thereof with a side of the housing in facing relationship to the surface of the roof;

means securing the housing to a roof with said side of the housing in facing relationship to the roof;

said jacket having a heat conductive channel on said side of the housing in facing relationship to said surface of the roof when the housing and jacket are installed on the roof substantially coextensive with the length of the housing and open through the jacket to the housing and to the roof for transfer of heat from the housing whereby heat generated by the heating means is transferred from the chamber toward the roof surface to form a heated passageway for drainage of water past an ice blockage.

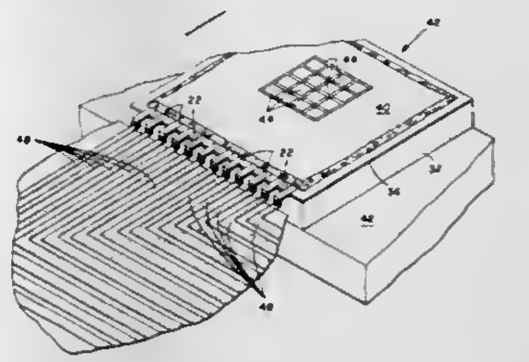
4,110,598
THERMAL PRINTHEAD ASSEMBLY

Richard B. Small, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 609,655, Sep. 2, 1975, abandoned, which is a continuation of Ser. No. 363,432, May 24, 1973, abandoned, which is a division of Ser. No. 52,320, Jul. 6, 1970, Pat. No. 3,750,269. This application Apr. 21, 1977, Ser. No. 789,462

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—216 **8 Claims**



1. A thermal printhead assembly comprising:

a semiconductor wafer having a plurality of semiconductor heater elements therein including bonding pads positioned on one side thereof,

a wafer receiving member secured to one surface of said semiconductor wafer; and

a plurality of heater element leads mounted between said semiconductor wafer and said wafer receiving member and extending outwardly therefrom, said heater element leads being connected to said bonding pads and terminating beyond the periphery of said semiconductor wafer providing means for connecting electrical conductors thereto.

4,110,599

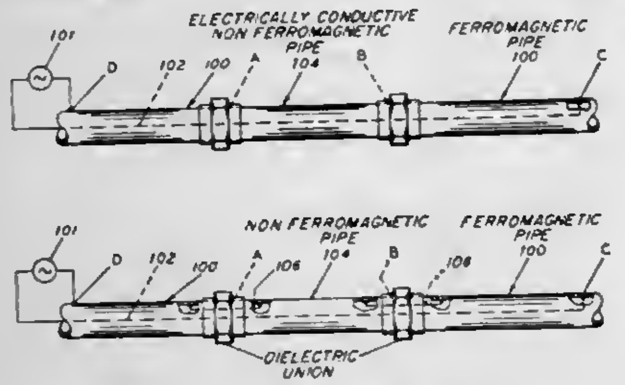
METHOD AND MEANS FOR DECREASING THE HEAT OUTPUT OF A SEGMENT OF A HEAT GENERATING PIPE

Paul F. Offermann, Redwood City, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 520,815, Nov. 4, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,343

Int. Cl.² H05B ***3/00;*** **F16L** ***53/00***

U.S. Cl. 219—301 **3 Claims**



1. A method for reducing the heat output of a segment of heat generating pipe, comprising the steps of:

electrically connecting one end of an insulated conductor means to a first terminal of an alternating current power source;

extending the opposite end of said insulated conductor means into a ferromagnetic pipe up to an extreme point of said ferromagnetic pipe where heat is desired and electrically connecting said opposite end to said pipe at said extreme point;

electrically connecting a second terminal of said power source to said pipe at a preselected point on said pipe spaced apart from said extreme point; and

electrically connecting in place of a segment of ferromagnetic pipe located between said extreme point and said preselected point an electrically conductive non-ferromagnetic section of pipe to reduce the magnetic field and head output produced within said segment of pipe.

2. In a system for reducing the heat output of a heat generation pipe, said heat generating pipe including a ferromagnetic pipe having an insulated electrical conductor means extending into said ferromagnetic pipe up to an extreme point of said ferromagnetic pipe where heat is desired, one end of said conductor means being connected to said ferromagnetic pipe at said extreme point, the other end of said conductor means being connected to a first terminal of an alternating current power source, a second terminal of said alternating current power source being connected to a preselected point on said ferromagnetic pipe spaced apart from said extreme point, the improvement comprising:

a non-ferromagnetic electrically conductive section of pipe electrically connected in place of a segment of ferromagnetic pipe located between said extreme point and said preselected point to reduce the magnetic field and heat output produced within said segment of pipe.

4,110,600

THERMOSTATICALLY CONTROLLED PLURAL HEAT OUTPUT PORTABLE ELECTRIC SPACE HEATER

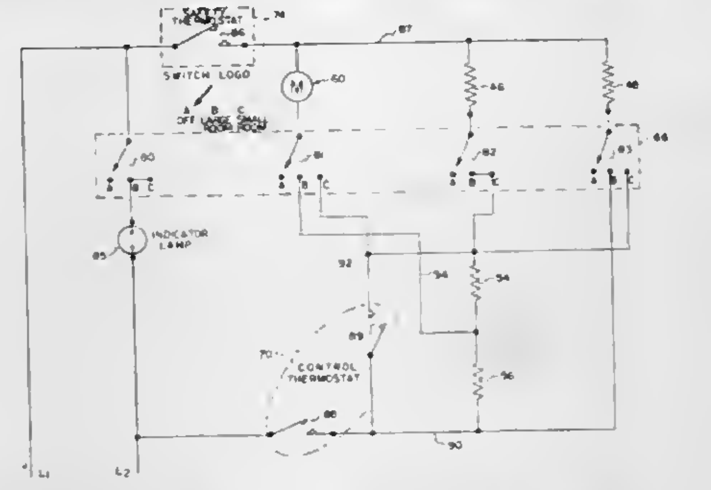
Willard J. Spotts, Boonville, and Peter E. Huggler, Columbia, both of Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Jun. 24, 1976, Ser. No. 699,436

Int. Cl.² F24H ***3/04;*** **H05B** ***1/02***

U.S. Cl. 219—364 **15 Claims**

1. A portable electric heater, comprising a case defining an enclosure having separated air flow openings adjacent the opposite upper and lower ends thereof, a support frame secured to the case inside the enclosure between the upper and lower openings, a motor powered fan assembly mounted on the support frame, heating element means mounted on the support frame between the upper and lower openings, a control switch having high heat and low heat operative settings, a thermostat for sensing ambient air passing through the heater enclosure and having a set of control contacts closed during a heat demand situation and opened during a heat satisfied situation, control circuit means including the control switch and the thermostat for connecting electrically the heating element means and fan assembly in selective modes of operation and operable in the high heat operation control switch setting and in a heat demand situation to connect the heating element means in a first predetermined operating mode for providing high heat output and to connect the fan assembly motor for high speed operation and in a heat satisfied situation to connect said heating element means in a second predetermined mode of operation for providing a generally lower heat output approximately 60-70% of said high heat output and to connect the fan assembly motor for operation at a slower speed, and the circuit means further being operable in the low heat operative control switch setting and in a heat demand situation to connect the heating element means in said first predetermined mode of operation for providing said high heat output and to connect the fan assembly motor for high speed operation and operable in a heat satisfied situation to connect said heating element means in a third predetermined mode of operation for providing a substantially lower heat output, approximately 20 to 30% of said high heat output and to connect the fan assembly motor in a manner whereby said fan assembly is energized insufficiently for operation thereof, said fan assembly when operated, causing air to flow into the heater casing through the upper opening, over the energized heating element means and out the lower opening and when unoperated permitting a convective air flow only through the case enclosure from the lower opening, over the energized heating element means and out the upper opening.



4,110,601

CONTROL SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR

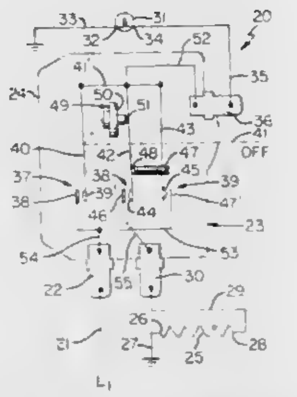
Cloyd E. Decker, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 550,456, Feb. 18, 1975, abandoned. This application May 9, 1977, Ser. No. 795,403

Int. Cl.² H05B ***1/02***

U.S. Cl. 219—506 **17 Claims**

1. A control system comprising a source of energy means, heater means, indicator means, and thermostatically operated control means having selector means for setting said control means in a heater means non-temperature producing "off" setting or in a heater means temperature producing "on" setting, said control means having a single temperature responsive device operatively interconnected to said means to interconnect said heater means to said energy means when the output effect of said heater means is below a predetermined "on" setting of said control means and to disconnect said heater means from said energy means when the output effect of said heater means is above said predetermined "on" setting of said control means, said single temperature responsive device of said control means operating said indicating means to indicate that the output effect of said heater means is above a certain value when said control means is in said "off" setting thereof.



4,110,602

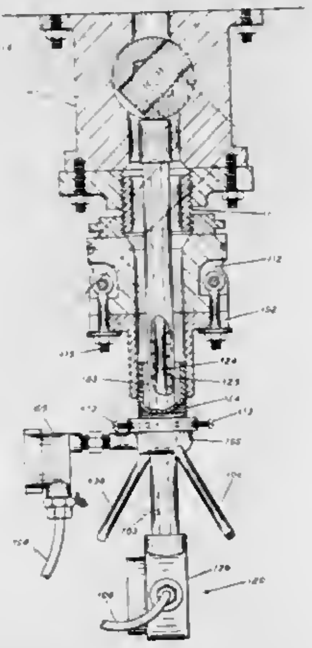
METHOD AND APPARATUS FOR FREEING A RAILROAD TANK CAR BOTTOM UNLOADING VALVE MADE INOPERABLE BY SOLIDIFIED FLUIDS WITHIN IT

George Harold McDade, Calgary, Canada, assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 6, 1976, Ser. No. 703,046

Int. Cl.² H05B ***3/06***

U.S. Cl. 219—523 **1 Claim**



1. A portable steamless heating apparatus for use with a bottom unloading valve of a railroad tank car, said valve having a central vertical fluid passageway for the unloading of liquids transported in said tank car and a stop member movable to open and close said passageway through which liquids are unloaded, said valve being manually inoperable due to solidification of liquids in said fluid passageway and said stop member, said valve further including a lever for manual operation of the valve and said fluid passageway terminating in a flange member having a central opening forming an axial extension of said fluid passageway, and an external flange member for connecting flow from said valve to a fluid unloading system, said heating apparatus comprising:

an elongated cylindrical electrical heating unit axially insertable through said central opening in said flange member into said fluid passageway of said valve, one end of said unit being adapted to contact said stop member so as to be in direct heat transmitting relationship with said fluid passageway of said valve when a heating element of said heating unit is energized to liquefy solidified fluid which may be contained therein to make said stop member of said valve operable;

an externally threaded tubular member having an opening therethrough surrounding the other end of said heating unit for threadably securing said unit to said flange member,

a cap member having an opening therein slidably engaging the cylindrical surface of said heating unit, said cap member joined to the external end of said tubular member forming a closure for the external end of said tubular member,

retaining means mounted on said cap member for slidably holding said heating unit in said tubular member so that said one end of said heating unit is adjustably positionable relative to said stop member of said valve;

drain means formed in said cap member for draining the fluid from said valve passageway and around said heating unit, and

electrical power control means mounted on said other end of said heating unit for regulating the heat output of said heating unit to liquefy said solidified fluid, said control means including means for electrically connecting the heater element of said heating unit to an external source of electrical power.

4,110,603

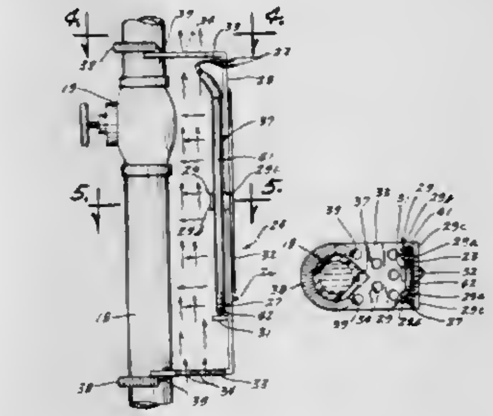
PLASTIC PIPE HEATER

Jerry D. Peterson, Conrad, and Gerald L. Knief, Grundy Center, both of Iowa, assignors to Ritchie Industries, Inc., Conrad, Iowa

Filed Jul. 19, 1976, Ser. No. 706,392

Int. Cl.² E03B ***7/10;*** **F16L** ***53/00;*** **H05B** ***3/06***

U.S. Cl. 219—535 **5 Claims**



1. A heater for use with plastic pipe, said heater comprising:

a heating element; and

support means for reducing conduction of heat, said support means including a back portion and ear portions, said heating element being attached to said back portion, said ear portions extending from said back portion and being disposed on the same side of said back portion, each ear portion at the extended free end thereof having a V-shaped recess formed therein, the pipe being received within said recesses when said support means is affixed to the pipe, said heating element being held in spaced relationship to the pipe by said support means, said heating element upon actuation radiating heat, each ear portion intermediate the ends thereof having a plurality of perforations formed therethrough whereby conduction of heat from said heating element to the pipe is reduced and the pipe is warmed by radiated heat.

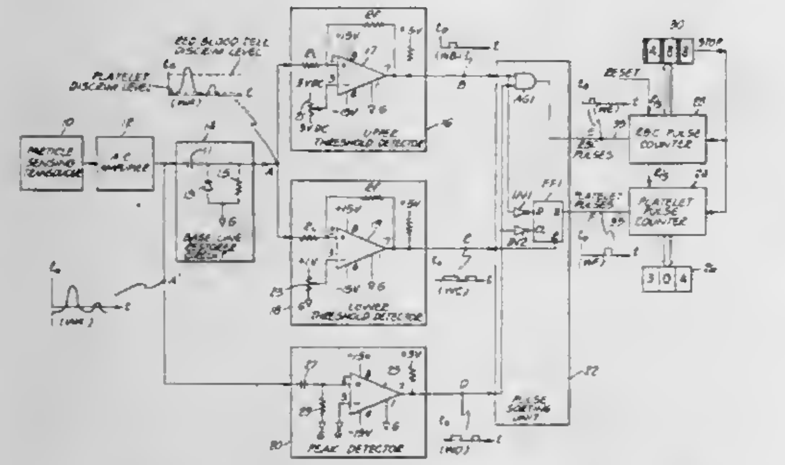
4,110,604
PARTICLE DENSITY MEASURING SYSTEM

John L. Haynes, Redwood City, and Bernard A. Shoor, Atherton, both of Calif., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Continuation-in-part of Ser. No. 738,896, Nov. 4, 1976, abandoned. This application Sep. 13, 1977, Ser. No. 832,893

Int. Cl.^{2} G06M *11/00*

U.S. Cl. 235—92 PC **25 Claims**



1. In apparatus for measuring the concentration of particles of a first type in a fluid in which first and second types of particles are suspended, the first and second types of particles generally differing in a detectable physical characteristic, in which apparatus particles suspended in such fluid are sensed as said fluid is flowed through sensing means, and electrical pulses corresponding to said sensed particles are generated, the pulses having an electrical characteristic that corresponds to said physical characteristic,

the combination that comprises:

(a) means responsive to such electrical characteristics of said pulses for discriminating between types of particles in a specimen having different characteristics;

(b) means controlled by said discriminating means for generating separate signals corresponding to pulses generated by the particles in the specimen having the respective characteristics; and

(c) a register and means for setting said register in accordance with the concentration of said second type of particle in said specimen and means controlled by the setting of said register as well as said separate signals for producing an output signal representative of the concentration of particles of said first type in said specimen.

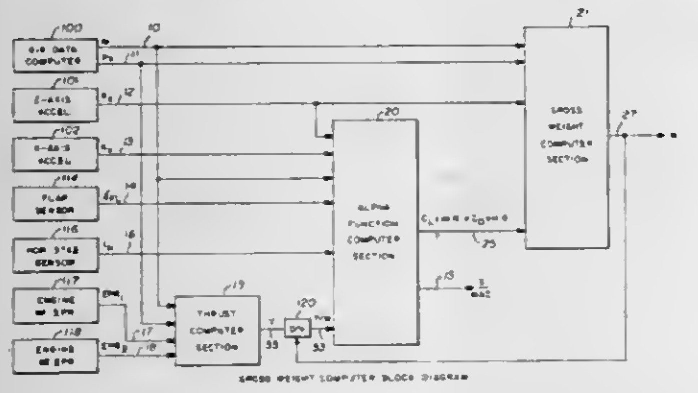
4,110,605
WEIGHT AND BALANCE COMPUTER APPARATUS FOR AIRCRAFT

Harry Miller, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,186

Int. Cl.^{2} G06G *7/78*

U.S. Cl. 364—463 **28 Claims**


GROSS WEIGHT COMPUTER SECTION
ALPHA FUNCTION COMPUTER SECTION
THRUST COMPUTER SECTION
GROSS WEIGHT COMPUTER BLOCK DIAGRAM

1. Apparatus for providing a measure of the gross weight of an aircraft having engines for providing propelling thrust therefor comprising

a. means responsive to an operating characteristic of the engines for providing a measure of the thrust thereof,

b. means responsive to aerodynamic forces acting on said aircraft and said measure of thrust for providing a measure of a function of the angle of attack of said aircraft, and

c. means responsive to said angle of attack function measure for providing an output measure of the gross weight of said aircraft.

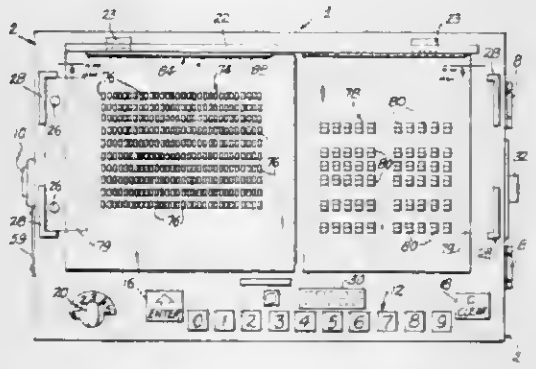
4,110,606
UTILITY METER READOUT SYSTEM

Leland S. Prince, 9014 Charloma Dr., Downey, Calif. 90240, and Neil K. Yarnell, 238 N. Broadoaks, Monrovia, Calif. 91016

Filed Oct. 15, 1975, Ser. No. 622,523

Int. Cl.^{2} G06K *15/02*

U.S. Cl. 235—432 **18 Claims**



1. A calculating and printing apparatus for preparing a printout on a customer card, said apparatus having electronic computing means for calculating output data signals from information on a customer card and stored predetermined data, said apparatus comprising:

a. means for securing said customer card,

b. operator controlled input means for providing first input signals representative of input data,

c. means for automatically sensing information on said customer card and for providing second input signals corresponding hereto,

d. means for feeding said first and second input signals to said computing means,

e. memory storage means connected to said computing means for storing predetermined data,

f. means for printing output data on said customer card corresponding to calculated output data signals from said computing means,

g. recording memory storage means for recording at least some of said calculated output data signals, at least some of said first input data signals and at least some of said second input data signals,

h. wherein said customer card is a utility customer card, at least some of said first input signals corresponds to a present meter reading, at least some of said second input signals correspond to a prior meter reading, said predetermined data stored in said memory storage means corresponds to rate data and said memory storage means comprises two memory locations for respective rate data stored, one memory location containing rate data applicable over a portion of a billing period and the other memory location containing rate data applicable over the remaining portion of the billing period, and

i. wherein said apparatus further comprises wrong day billing control means for providing an additional signal to said computing means applicable for billing on a day other than the one for which said customer card was prepared.

4,110,607
SYSTEM FOR DETECTING HEIGHT FLUCTUATIONS OF A SURFACE ON A RECORDING MEDIUM IN AN OPTICAL RECORDING OR REPRODUCING APPARATUS

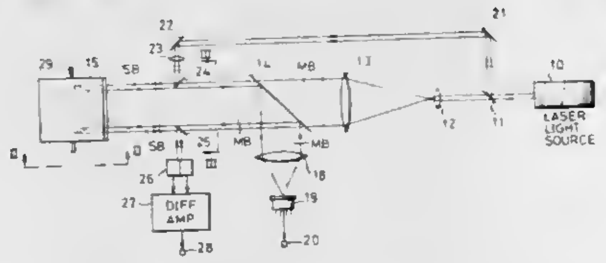
Yoshihiko Honjo, Ayase, and Junji Kuroda, Zama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 21, 1976, Ser. No. 753,005

Claims priority, application Japan, Dec. 22, 1975, 50-151999; Dec. 22, 1975, 50-171975[U]

Int. Cl.^{2} G01J *1/20*

U.S. Cl. 250—201 **8 Claims**



1. A system for detecting height fluctuations of a recording surface in an optical recording or reproducing apparatus,

said recording or reproducing apparatus comprising a light source means for emitting a main light beam for recording or reproducing, an optical system means including an objective lens for focusing said main light beam in a spot on said surface, and control means responsive to control signals for maintaining a constant distance between said objective lens and said recording surface,

said detection system comprising:

means for producing a sub-light beam;

means for introducing said sub-light beam into a peripheral part of said main light beam at one position in the light path thereof, said sub-light beam thus introduced advancing in a forward path through said objective lens to said recording surface to be reflected thereby and returning in a return path through said objective lens and along another peripheral part of said main light beam which is opposite to said one position;

means for extracting said sub-light beam passing through said return path from the light path of said main light beam; and

light detection means having a pair of light detecting surfaces with a common boundary line therebetween to receive said extracted sub-light beam, said light detection means responding to a deviation of the center of said extracted sub-light beam on the light detecting surfaces to a point away from the boundary line for detecting fluctuations in said distance between said objective lens and said recording surface and for producing said control signals responsive thereto.

4,110,608
TWO-TERMINAL PHOTODETECTORS WITH INHERENT AC AMPLIFICATION PROPERTIES

Elihu Craig Thomson, Wellesley, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Nov. 4, 1976, Ser. No. 738,950

Int. Cl.^{2} H01J *39/12*

U.S. Cl. 250—214 A **12 Claims**

1. A two terminal photoresponsive device comprising:

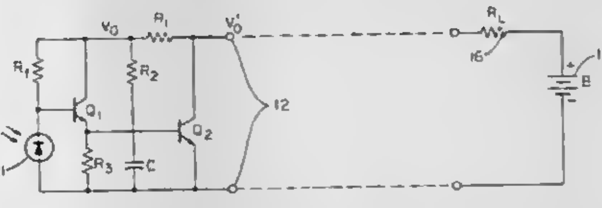
a pair of terminals;

an output transistor having its collector-emitter path connected across said terminals;

a voltage divider incuding two resistors and a capacitor in series connected across said terminals;

photosensing means having a device responsive to incident radiation and including current to voltage conversion means for producing a voltage signal in accordance with incident radiation; and

circuit means interconnecting said conversion means and said voltage divider to drive said output transistor for



amplifying the time varying components of said voltage signal relative to the average value thereof as applied by said output transistor to a load connected to said terminals.

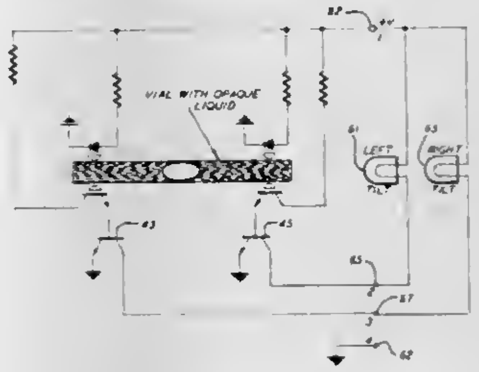
4,110,609
TILT LIMITING DETECTING APPARATUS

Emmanuel Emil Beer, Eastchester, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 22, 1976, Ser. No. 734,906

Int. Cl.^{2} G01D *5/34*

U.S. Cl. 250—231 R **12 Claims**



1. A tilt detecting apparatus comprising:

(a) a base;

(b) an elongated vial of rectangular cross-section, said vial containing an opaque liquid filling said vial except for an air bubble remaining in the upper portion of said vial, horizontally supported on said base, said air bubble remaining in the upper portion of said vial;

(c) a first light source photo transistor combination near one end of said vial, said light source and photo transistor arranged so as to define an optical axis intersecting said vial in its upper portion; and

(d) a second light source photo transistor combination near the other end of said vial, defining a second optical axis intersecting said vial in its upper portion near said other end, whereby the respective photo transistors of said respective first and second combinations will provide an output when said base is tilted so as to move said bubble into a position where it intersects said first or second optical axis, said vial having a shape such that said optical axis intersect said vial at an angle which is approximately 90°.

4,110,610
DIGITAL ELECTRICAL POSITION TRANSDUCER

William L. Mueller, Utica, and Robert J. Winkel, Royal Oak, both of Mich., assignors to Candid Logic, Inc., Hazel Park, Mich.

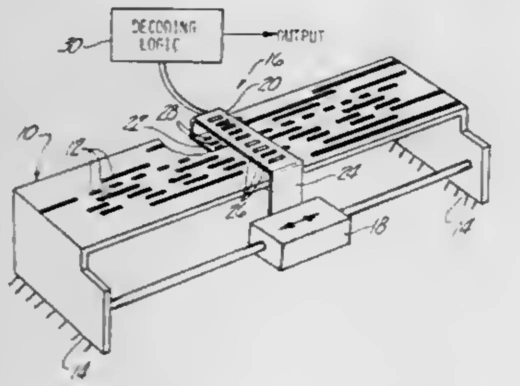
Continuation-in-part of Ser. No. 641,630, Dec. 17, 1975. This application Jun. 27, 1977, Ser. No. 809,997

Int. Cl.^{2} G01D *5/34*

U.S. Cl. 250—231 SE **12 Claims**

1. A position transducer operative to generate an M bit,

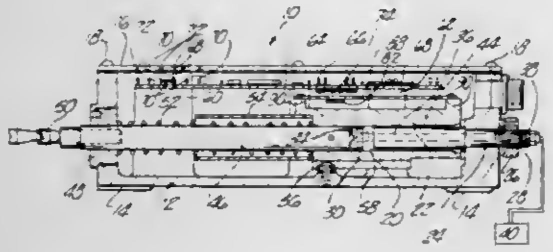
parallel, digital signal representative of the position of a first member relative to a second member along an elongate path, comprising: an elongate scale fixed to the first member so as to extend along the path, said scale having 2M-1 elongate channels extending alongside one another along the length of the scale, each channel having a digital coded characteristic which varies along the length of the scale, all of the channels, except one, belonging to a pair of channels, with both members of the pair having the same coding configuration and with one member of the pair being displaced along the length of the scale relative to the other member, and each such channel pair being operative to encode a single binary digit of a binary output signal, and the stand alone channel being coded to represent the least significant digit; 2M-1 detectors supported on the second member so as to extend transversely to the length of the scale with each detector in operative positional relationship with one of the scale channels, each detector being operative to provide an electrical output signal dependent upon the coding of the scale channel with which it is associated at the instantaneous detector position; and decoder means operative to receive the outputs of the detectors and to generate the output signals of the transducer, with transitions between the binary states of each digit in the code.



4,110,611
OPTICAL POSITION TRANSDUCER

Lewis H. Tann; William L. Mueller, both of Troy, and Arthur D. Vis, Warren, all of Mich., assignors to Candid Logic, Inc., Hazel Park, Mich.

Filed Dec. 17, 1975, Ser. No. 641,630
Int. Cl.² H01J *3/14*
U.S. Cl. 250—237 R **13 Claims**

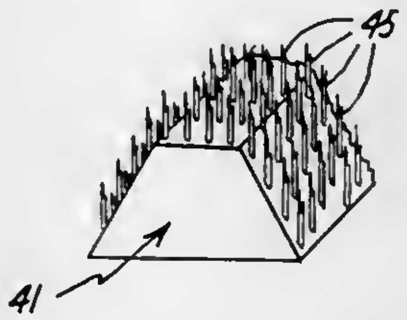


1. A transducer for generating a binary, parallel, multi-digit electrical output signal proportional to the position of a part relative to tooling comprising: a housing, fixed with respect to the tooling; an elongated rod supported for motion with respect to the housing; means within the housing for urging motion of the rod to cause one end of the rod to contact the part; a substantially planar printed circuit board fixed in the housing and supporting a plurality of electronic components interconnected to electronic circuitry; an optical source supported on the board and adapted to generate a line of optical radiation, the line extending parallel to the board and normally to the motion of the rod; a plurality of optical detectors arrayed in a line extending parallel to the line of optical radiation and separated from said line of optical radiation in a direction normal to said line and to the plane of said circuit board, said detectors being interconnected with said electronic circuitry; an optical mask having opaque and transparent sections arranged in a binary code with successive parallel binary digits arrayed transverse to an elongate axis of the mask, the optical mask being supported between said line of radiation and said line of radiation detectors; and a connection between the rod and the mask causing motion of the mask along its elongated axis upon motion of the rod whereby the radiation reaching the detectors is a function of the position of the rod.

4,110,612
MASS SPECTROMETER DESORPTION DEVICE INCLUDING FIELD ANODE EUTECTIC ALLOY WIRE AND AUXILIARY ELECTRICAL RESISTANCE HEATING MEANS

Woodfin V. Ligon, Jr., Schenectady, and Eric Lifshin, Loudonville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,569
Int. Cl.² B01D *59/44*
U.S. Cl. 250—281 **10 Claims**



1. In a field desorption device useful in mass spectrometry including a field emitter insertion rod, a field ion emitter carrier affixed to an end of the insertion rod and comprising a base and two spaced electrodes projecting from the base, and conductor means to connect the carrier with an electric power source, the combination of a field anode in the form of directionally-solidified eutectic alloy wire bridging between and electrically coupled to one of the free ends of the emitter electrodes, said wire consisting of a metal matrix and a second phase in the form of substantially parallel rods in the matrix and projecting a substantially uniform distance from the matrix surface away from the carrier base, said rods being of substantially uniform diameter from 1,000 Angstroms to 10 microns and of population density from 10^9 to 10^5 rods per square centimeter.

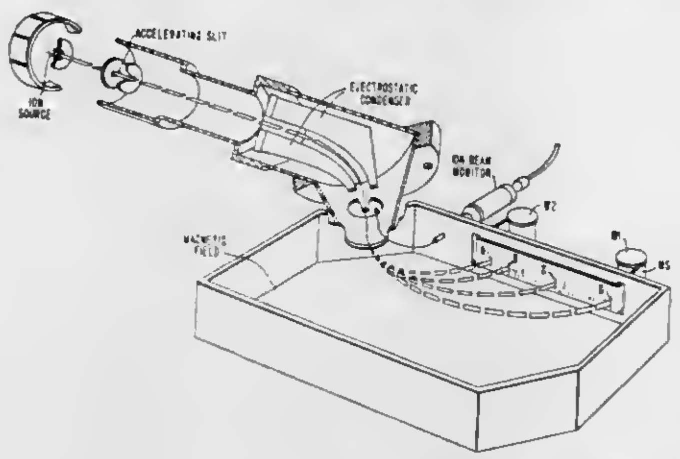
4,110,613
MAGNETIC TAPE TYPE SENSORS, METHOD AND APPARATUS USING SUCH MAGNETIC TAPE SENSORS

William M. Hickam, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 655,349, Feb. 5, 1976. This application Jul. 18, 1977, Ser. No. 816,557
Int. Cl.² B01D *59/44*
U.S. Cl. 250—282 **2 Claims**

1. A mass spectrometer comprising a source of ions of different mass characteristics, a field for deflecting said ions toward a spectrum recording surface, said spectrum recording surface

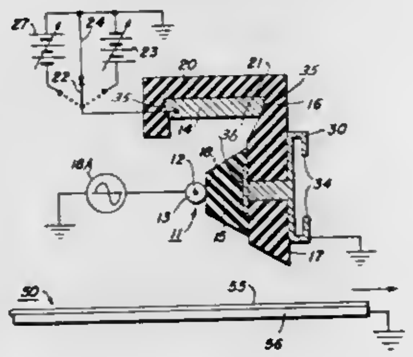
consisting in magnetic material exposed to local alteration under sputtering by said deflected ions, and means for sensing the magnetic alterations in said magnetic material along a general measuring axis.



4,110,614
CORONA DEVICE

Dror Sarid, Rochester, and Thomas G. Davis, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1976, Ser. No. 751,826
Int. Cl.² H01T *19/04*
U.S. Cl. 250—324 **10 Claims**



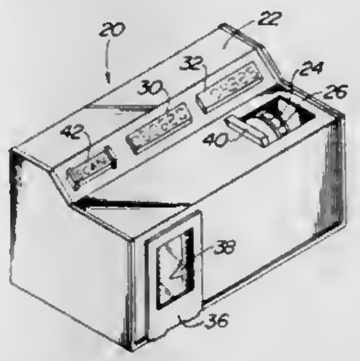
1. In combination;
a dielectric support having two spaced upstanding legs,
a imaging surface oriented in a plane generally parallel to the planes containing said legs,
the leg closest to said surface supporting an insulated wire,
an a.c. corona generating potential coupled to said wire, and
the other of said legs carrying a conductive member facing said wire and coupled to a reference potential.

4,110,615
AUTOMATIC RADIOCHROMATAGRAM STRIP SCANNER

Robert L. McCann, 27 Thornton Pl., Mount Holly, N.J. 08060

Filed Nov. 16, 1977, Ser. No. 851,926
Int. Cl.² G01T *1/00*
U.S. Cl. 250—328 **13 Claims**

1. Apparatus for automatically scanning processed chromatagrams of radiopharmaceuticals to provide an indication of the biological behavior thereof, comprising: sample carrier means for receiving a processed chromatagram, radioactivity detecting means for counting radioactive emissions of samples disposed adjacent thereto, said carrier means being moved relative to said radioactivity detector so that said detector traverses said chromatagram to count the radioactive emissions thereof and provide output signals indicative of the spectral distribution of the radioactivity along the chromatagram, display means responsive to said output signal to provide a digital readout of the number of emissions detected in the entire chromatagram as well as the number of emissions detected within a preselected portion thereof.



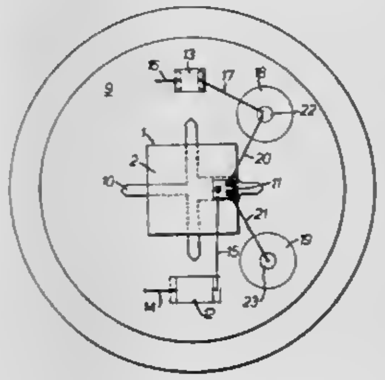
4,110,616
PYROELECTRIC DETECTORS

Stephen George Porter, Towcester, and David Appleby, Northampton, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Jan. 14, 1977, Ser. No. 759,478

Claims priority, application United Kingdom, Jan. 16, 1976, 01681/76

Int. Cl.² G01J *5/20*
U.S. Cl. 250—338 **24 Claims**



1. A pyroelectric detector which includes at least one pyroelectric element consisting of a pyroelectric material sandwiched between first and second electrodes, and a semiconductor chip having a field effect transistor formed on one surface thereof and having an electrical contact for the gate electrode of the transistor formed on the surface thereof, opposite to said one surface, the gate electrode contact of the chip being mechanically secured to and in electrical contact with the first one of the electrodes of the pyroelectric element, the size of the chip being such that a portion of the first electrode is not covered by the chip.

4,110,617
INFRA-RED PROFILOMETER

Edouard Legille, 165, rte de Treves, Luxembourg, Luxembourg, assignor to S.A. des Anciens Establissements Paul Wurth, Luxembourg

Filed Mar. 14, 1977, Ser. No. 777,443

Claims priority, application Luxembourg, Mar. 17, 1976, 74579

Int. Cl.² G01J *1/00*; G01F *23/00*
U.S. Cl. 250—342 **25 Claims**

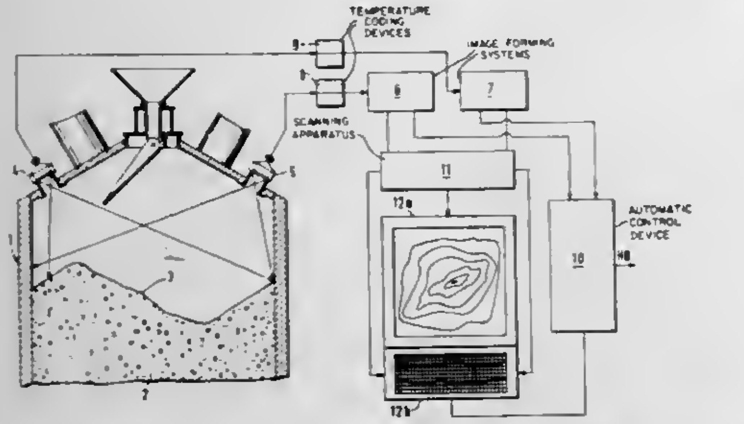
1. A method for determining the three-dimensional surface profile of the charge or burden in a furnace without physically contacting the charge or burden or interrupting the charging of the furnace, which comprises the steps of:

(a) generating a first set of temperature-position signals from a first infra-red radiation measuring instrument, said first instrument being located over the charge or burden, said first set of signals corresponding to infra-red rays emitted from a series of temperature-characterized points on the surface of the charge or burden;

(b) generating a second set of temperature-position signals from a second infra-red radiation measuring instrument, said second instrument being located over the charge or burden in a known position and orientation relative to said first instrument, said second set of signals corresponding to infra-red rays emitted from said series of points;

(c) pairing individual signals in said first set of signals with individual signals in said second set of signals that represent infra-red rays corresponding to identical temperature-characterized points;

(d) determining the position in space for each temperature-characterized point that is defined by each pair of signals, to provide multiple positions representing the three-dimensional profile.



4,110,618

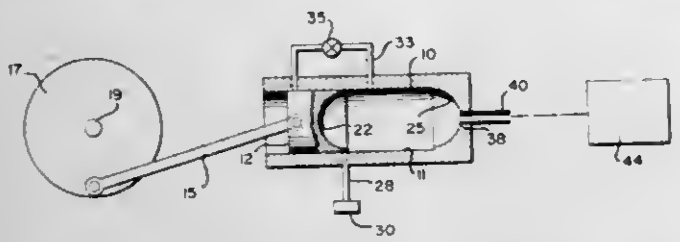
ADIABATIC COMPRESSION INFRARED EMISSION VAPOR DETECTOR

Mark Schuman, Arlington, Va., assignor to American Standard Inc., New York, N.Y.

Filed Jun. 8, 1965, Ser. No. 462,380

Int. Cl.² G01N *21/26*

U.S. Cl. 250—343 **9 Claims**



1. Apparatus for the detection of contaminants in a gaseous medium by observation of the characteristic infrared spectral emissions of said contaminants, comprising a variable volume opaque optical cavity of at least partly spherical shape and having highly reflective walls, means for varying the volume of said cavity for periodic adiabatic compression of a sample of said gaseous medium within said cavity, whereby the temperature of said sample varies in accordance with $TV^{\gamma-1} = K$, where T is the temperature, V the volume, and γ the ratio of specific heats at constant pressure and constant volume for said sample, and K is a constant, said emissions occurring upon increase in temperature of said sample concurrent with compression thereof if said contaminants are present therein, said highly reflective walls and at least partly spherical shape of said cavity providing random optical paths for said emissions and high amplitude spectral radiance, and means responsive to said emissions for absorbing infrared therefrom to detect the presence of said contaminants, or any one of them, in said sample.

4,110,619

METHOD OF COMPENSATING FOR CARRIER-GAS-COMPOSITION DEPENDENCE DUE TO THE COLLISION-BROADENING EFFECT IN NON-DISPERSIVE INFRARED PHOTOMETERS HAVING A DETECTOR COMPRISED OF TWO ABSORPTION CHAMBERS ARRANGED ONE BEHIND THE OTHER

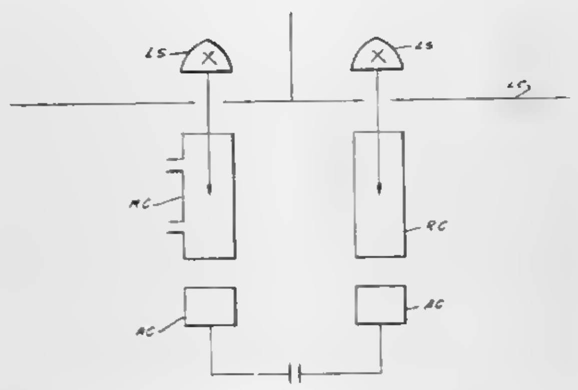
Karl-Heinz Zörner, Norderstedt, Fed. Rep. of Germany, assignor to H. Maihak AG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 744,175, Nov. 22, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,585

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552165

Int. Cl.² G01N *21/26*

U.S. Cl. 250—344 **10 Claims**



1. A method of setting up a non-dispersive infrared photometer of the type comprised of a light source, a reference cuvette containing a reference gas, a measurement cuvette containing an infrared-active gas component whose concentration is to be measured accompanied by a carrier gas, the carrier gas comprising at least one component which is infrared-inactive, a light modulator for effecting antiphase modulation of the light passing through the two cuvettes, and a detector arrangement comprised of two gas-filled absorption chambers arranged one behind the other and a transducer for converting pressure changes induced in the absorption chambers into a measurement signal, the method comprising the step of adjusting the photometer to render the measurement signal substantially independent of the composition of the carrier gas in the measurement cuvette.

4,110,620

FUEL ROD LEAK DETECTOR

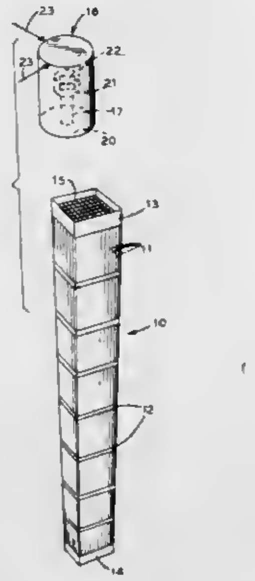
Robert Edward Womack, Lynchburg, Va., assignor to The Babcock & Wilcox Co., New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,762

Int. Cl.² G01T *1/20*

U.S. Cl. 250—361 R **3 Claims**

1. Apparatus for inspecting the structural integrity of radioactive fuel rods comprising a radiation shield having a radiation collimator formed therein in alignment with one of the fuel rods for the transmission of fuel rod radiation therethrough, a radiation energy sensitive detector within said shield and in alignment with said collimator and said transmitted fuel rod radiation for producing a signal that characterizes at least one radioactive material within the fuel rod, means for determining if the radioactive material has been retained within the rod, and means for aligning said collimator and said detector with the fuel rod.



4,110,621

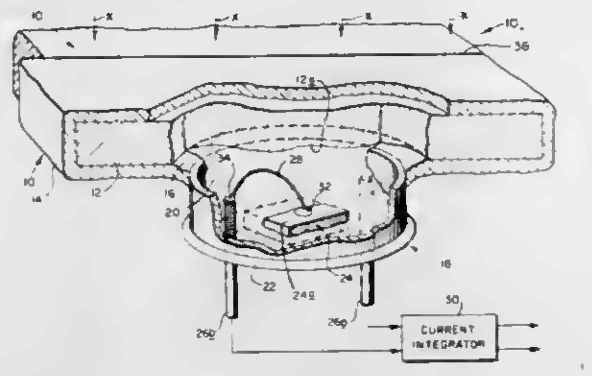
TOMOGRAPHY X-RAY DETECTOR

Berthold K. P. Horn, Concord, Mass., assignor to Butler-Newton, Inc., Newton, Mass.

Filed Mar. 23, 1977, Ser. No. 780,284

Int. Cl.² G01T *1/20, 1/22*

U.S. Cl. 250—361 R **11 Claims**



1. An X-ray detector for use in integrating mode in high speed tomography apparatus comprising:

A. a scintillator that emits light in response to incident X-rays, said scintillator having a surface of a selected total area,

B. a coating that reflects said light emitted by the scintillator covering the entire surface area of said scintillator except for a window in one surface,

c. a photo-diode whose output current is substantially linearly related to the light incident on the diode, said diode having one surface positioned directly opposite said window, the ratio of the active area of the diode to the area of the scintillator covered by said coating being appreciably less than unity, and

D. means for bonding said diode to said one scinitiallator surface in said window, said bonding means being transparent to the light emitted by the scintillator in response to the incident X-rays.

4,110,622

DEVICE WHICH MAKES IT POSSIBLE TO EFFECT THE PROGRAMMED TRACING OF FIGURES WHICH HAVE DIFFERENT SHAPES

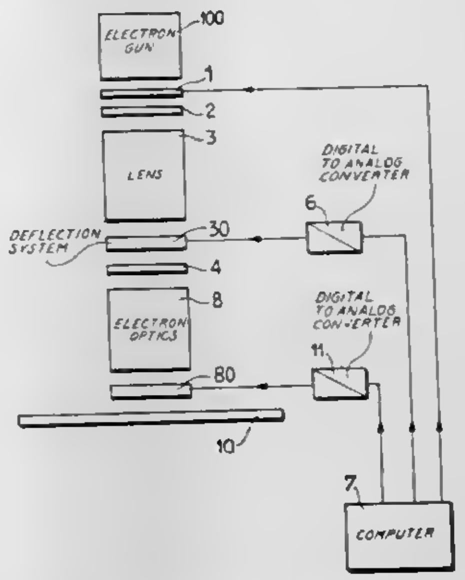
Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 13, 1977, Ser. No. 796,708

Claims priority, application France, May 14, 1976, 76 14719; Jan. 31, 1977, 77 02600

Int. Cl.² G21K *1/08*

U.S. Cl. 250—396 R **13 Claims**



1. A device of the kind in which a particle optical beam projects on to an object an image formed by a successive programmed traces of elementary images, comprising in a first plane a first diaphragm eliminating part of the beam formed by said optical system, a first optical system being provided in order to form a real image of said diaphragm with a given magnification, in a second object plane, said second object plane containing a second diaphragm, said real image and said diaphragm forming an apparent diaphragm, first electrically controlled deflection means being provided and arranged between the first and second object planes in order in programmed fashion to displace said real image in said first object plane and to vary the shape of said apparent diaphragm, a second optical system being provided in order to form the real image of said apparent diaphragm upon the object, and second electrically controlled deflection means being provided in order to displace said real image on said object.

4,110,623

DEVICE FOR SCANNING A TARGET WITH A BEAM OF CHARGED PARTICLES

Guy Azam, and Claude Perraudio, both of Buc, France, assignors to CGR-MeV, Paris, France

Filed Feb. 15, 1977, Ser. No. 768,907

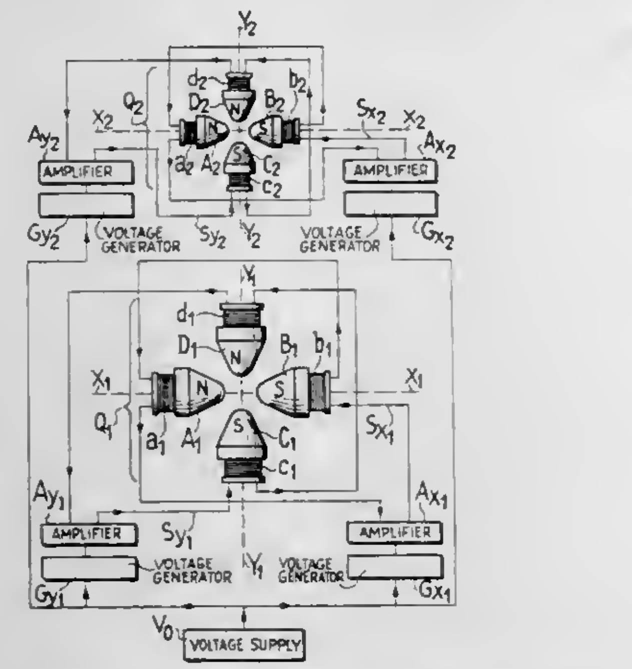
Claims priority, application France, Feb. 17, 1976, 76 04346

Int. Cl.² G01K *1/08*

U.S. Cl. 250—398 **10 Claims**

1. A device for scanning a target with a beam of charged particles on both sides of an axis ZZ, said device comprising a main magnetic scanning system of axis ZZ, having a plurality of polepieces, each of said polepieces being associated with a coil, said main scanning system being associated with a secondary magnetic system located upstream of said main system along the axis ZZ and intended for variably offsetting said beam in relation to said axis ZZ before entering said main system, said secondary magnetic system having a plurality of

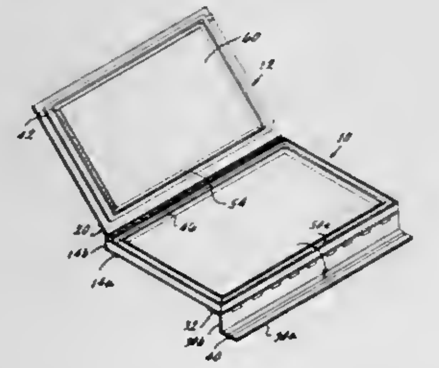
polepieces, each of said polepieces being associated with a coil, means being provided for applying to said coils of the main and secondary multi-polar systems, electrical signals which have predetermined characteristics.



4,110,624
X-RAY FILM HOLDER OR CASSETTE

Alexander P. Conteas, 16690 Glass Mountain St., Fountain Valley, Calif. 92708

Continuation-in-part of Ser. No. 663,960, Mar. 4, 1976, abandoned. This application Feb. 10, 1977, Ser. No. 767,528
Int. Cl.² G03C *5/16*
U.S. Cl. 250—481 17 Claims

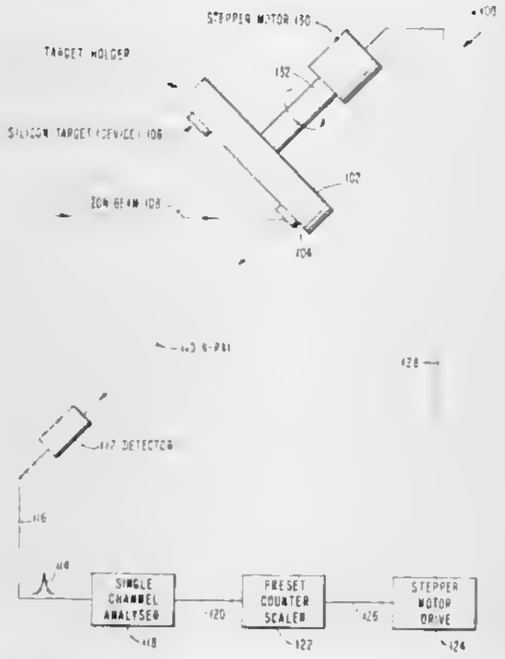


15. A cassette construction comprising a flat plate front member, a flat plate back member, a hinge construction at one side of said members, the hinge construction having hinge leaves having attachment to the front plate back plate, one of said leaves forming a side wall for the cassette, and a catch construction at opposite edges of the front and back plates, the catch construction having hinge means having attachment to one of said plates and forming another opposite side wall of the cassette, the plate members, hinge construction, and catch construction being free from portions forming additional cassette side or end walls.

4,110,625
METHOD AND APPARATUS FOR MONITORING THE DOSE OF ION IMPLANTED INTO A TARGET BY COUNTING EMITTED X-RAYS

James Anthony Cairns, Wantage, England; Allen Lurio, Dobbs Ferry, and James Francis Ziegler, Putnam Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,779
Int. Cl.² A61K *27/02*
U.S. Cl. 250—492 A 12 Claims



1. Method of monitoring dose of ions implanted into a target comprising the steps of:

providing a target for ion implantation;
providing a beam of ions to said target;
selecting x-rays emitted from said target for counting;
wherein said selected x-rays are from the spectrum which includes low energy soft x-rays; and
counting said selected X-rays as a measure of the dose of ions implanted therein.

4,110,626
METHOD FOR IMPROVING THE QUALITY OF THE FRAGRANCE OF PERFUMES USING ALIPHATIC DIBASIC ACID DIESTERS

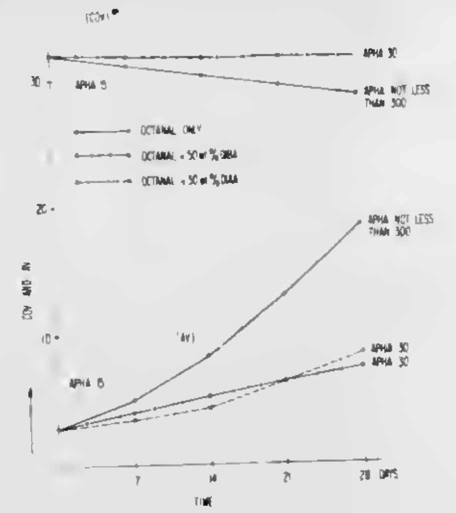
Michihisa Katada; Katsutake Hayashi, both of Tokyo; Hakuji Katsura, Yokohama; Kenichi Tomita, Tokyo; Hideo Morohoshi; Keiichi Uehara, both of Yokohama, and Hiroshi Tanaka, Ebina, all of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1977, Ser. No. 763,214
Claims priority, application Japan, Jan. 30, 1976, 51-9674
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 7 Claims

1. A method for improving the quality of the fragrance of a natural or synthetic perfume, which comprises formulating a perfume containing at least one aliphatic dibasic acid diester of the general formula:

$$R_1OCOR_2COOR_3$$

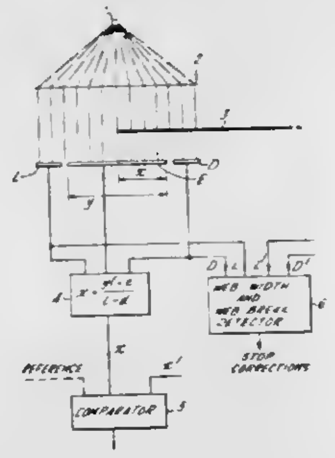
wherein R_1 and R_3, which can be the same or different, each represents a saturated branched chain alkyl group containing 4 or 5 carbon atoms, and R_2 represents a saturated straight chain alkylene group containing 4 carbon atoms, as an active ingredient.



4,110,627
DETECTING LATERAL POSITION OF WEBS

Jeffrey Isberwood, Enfield, England, assignor to Crosfield Electronics Limited, United Kingdom

Filed Mar. 30, 1977, Ser. No. 782,830
Claims priority, application United Kingdom, Apr. 1, 1976, 13285/76
Int. Cl.² G01N *21/30*
U.S. Cl. 250—561 7 Claims



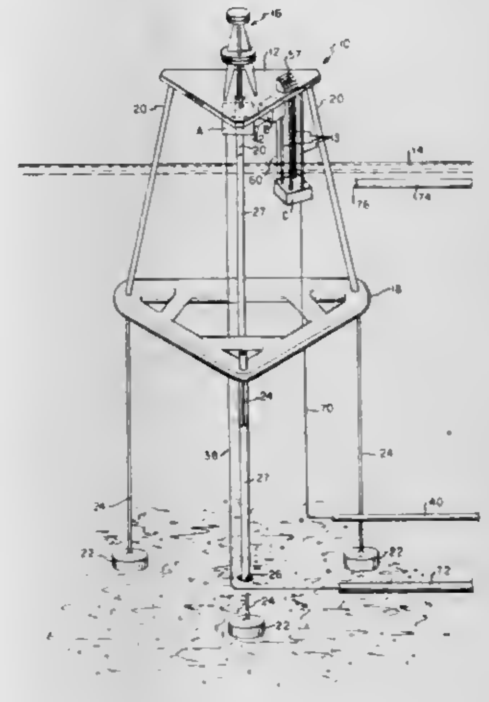
1. Apparatus for measuring the lateral position of a web as the web is fed along a predetermined path, comprising:

- a position-detecting means located at a margin of the said web path and including a single light source on one side of the web plane and further including on the other side of the web plane
- an innermost photoelectric detector positioned so that when the lateral position of the edge of the web is within a predetermined range of adjustment the path from the light source to the innermost detector is interrupted by the web,
- a central photoelectric detector positioned so that when the web edge is within the said predetermined range of adjustment the path from the light source to the central detector is partly interrupted by the web,
- and an outermost photoelectric detector positioned so that when the web edge is within the said predetermined range of adjustment the path from the light source to the outermost detector is uninterrupted;
- and means jointly responsive to the detector signals to provide an output signal representing the lateral position of the web corrected in accordance with the outputs of the outermost and innermost detectors for light source intensity variations and for web translucence, respectively.

4,110,628
SOLAR SEA POWER SYSTEM

Peter L. Paull, Weston, Conn., and Henry W. Archer, New York, N.Y., assignors to Texaco Development Corporation, New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,838
Int. Cl.² H02P *9/04*
U.S. Cl. 290—1 R 10 Claims

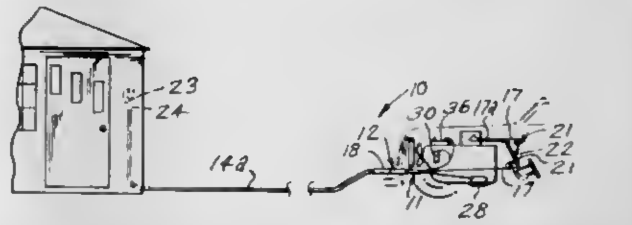


1. A solar sea power system comprising, a platform installed offshore over an undersea well hole for exploration and/or production of gaseous and liquid hydrocarbons; means on said platform for extracting gaseous and liquid hydrocarbons from said well hole; gas-liquid separating means for separating said gaseous hydrocarbons from said liquid hydrocarbons; first turbine means communicating with said separating means and actuated by the semi-adiabatic expansion of said gaseous hydrocarbons which are thereby cooled; first electricity-producing generating means driven by said first turbine; a heat exchanger receiving said cooled gaseous hydrocarbons; pump means for bringing solar heated surface water to said heat exchanger to heat said gaseous hydrocarbons; second turbine means actuated by the thus heated gaseous hydrocarbons and second electricity-producing generating means driven by said second turbine means.

4,110,629
INDOOR AUTOMOBILE STARTING SYSTEM

James D. Dotson, and Annette Jones, both of 2630 Bissonnet, #96, Houston, Tex. 77098

Filed Jul. 16, 1976, Ser. No. 706,054
Int. Cl.² B60R *25/10*
U.S. Cl. 290—38 R 4 Claims



1. A remote control automobile starting system, comprising a hand-held and key operated control device,

electrical cable means and throttle control means secured to said control device, and

first disconnect plug means secured to said cable means,

second disconnect plug means secured to telescoping pipe and cable means secured to said automobile,

pulley means secured to said automobile, providing wire guide means for said throttle control to actuate the carburetor throttle, and

electrical connection means connecting said second disconnect plug to the battery of said automobile, the starter, the ignition coil, the alternator, and the transmission neutral switch, for starting said car by operation of said key operated control device.

4,110,630

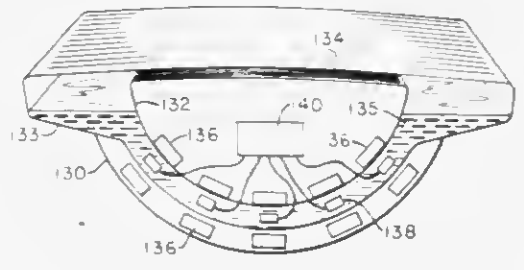
WAVE POWERED ELECTRIC GENERATOR

Frank J. Hendel, 721 Johnson Ave. #83, San Luis Obispo, Calif. 93401

Filed Apr. 1, 1977, Ser. No. 783,549

Int. Cl.^{2} F03B *13/12*

U.S. Cl. 290—53 **6 Claims**



1. A wave-powered electric generator comprising:

a buoyant envelope which is fully water tight and air tight;

a container within the buoyant envelope shaped to permit liquid within it to move relative to the walls of the container as the buoyant envelope is subjected to wave motion;

a conductive liquid received within the container;

means applying a concentrated magnetic field to at least some of the conductive liquid received within the container;

electrode means positioned to receive at least some of the electrical energy generated as the conductive liquid passes through the concentrated magnetic field;

means connected to the electrode means for rectifying the electrical energy generated by relative motion of the conductive liquid within the magnetic field; and

power transmission means for supplying the generated, rectified electric energy to a power distribution station.

4,110,631

WIND-DRIVEN GENERATOR

Edmund L. Salter, San Diego, Calif., assignor to Wind Power Systems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 489,190, Jul. 17, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,605

Int. Cl.^{2} F03D *9/00*

U.S. Cl. 290—55 **30 Claims**

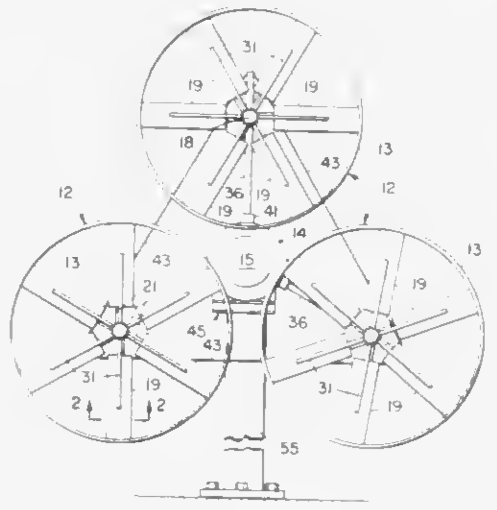
1. In a wind-driven generator:

(a) a frame;

(b) a plurality of forwardly-facing wind-intercepting rotors, each having a hub, a circular rim coaxial with said hub and a plurality of blades extending radially from said hub to said rim;

(c) a power take-off drum rotationally mounted on said frame, said drum having a peripheral surface, the rims of all of said rotors being in frictional engagement with said peripheral surface at points spaced equidistantly therearound;

(d) means for rotatably mounting said rotors on said frame and for pressing the rotor rims against said drum in response to presence of force exerted upon the upwind side of said rotors and with a reduced force that varies as a positive function of said wind force.



4,110,632

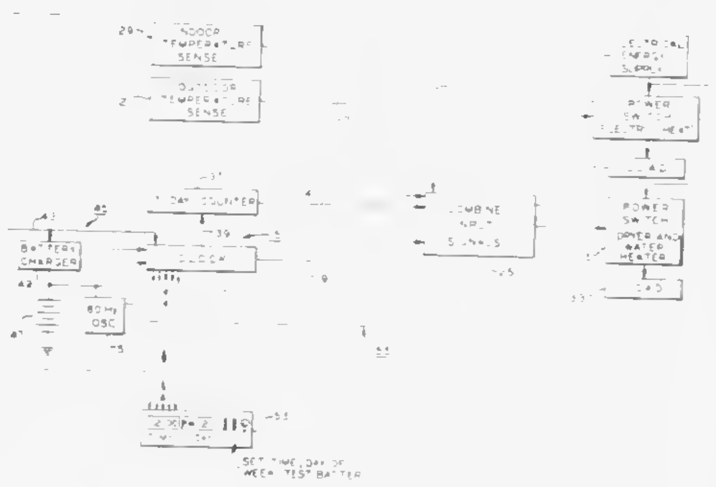
DEVICE, METHOD AND SYSTEM FOR CONTROLLING THE SUPPLY OF POWER TO AN ELECTRICAL LOAD

Alvin D. Wyland, Williamsburg, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 711,703, Aug. 5, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,481

Int. Cl.^{2} H01H *37/00*

U.S. Cl. 307—117 **27 Claims**


INDOOR TEMPERATURE SENSE
OUTDOOR TEMPERATURE SENSE
ELECTRICAL ENERGY SUPPLY
POWER SWITCH ELECTRIC HEAT
LOAD
DAY COUNTER
39
BATTERY CHARGER
CLOCK
60 Hz OSC
COMBINE INPUT SIGNALS
POWER SWITCH DRYER AND WATER HEATER
LOAD
SET TIME, DAY OF WEEK TEST BATTERY

18. A method of controlling the supply of power to an electrical load comprising the steps of:

counting timing signals through a predetermined time period with the timing signals comprising alternating current of source thereof and establishing a preselected range of time within at least a portion of the predetermined time period;

monitoring an ambient condition during the predetermined time period; and

inhibiting the supply of power to the load when the monitored condition attains preselected criteria therefor only during the preselected time range.

4,110,633

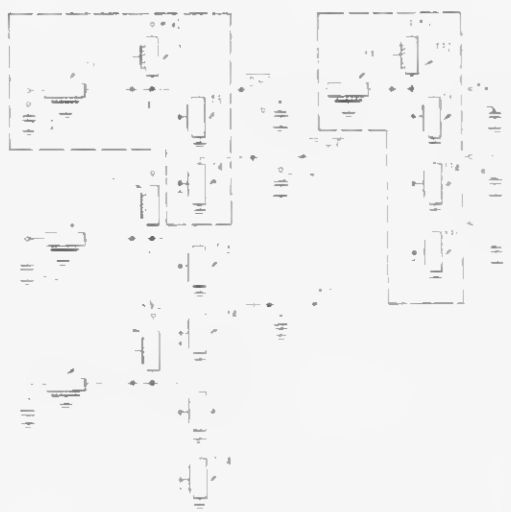
DEPLETION/ENHANCEMENT MODE FET LOGIC CIRCUIT

Eugene Martin Blaser, Hopewell Junction, and Donald Adelbert Conrad, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,737

Int. Cl.^{2} H03K *19/08, 19/34, 19/32, 17/60*

U.S. Cl. 307—205 **11 Claims**



1. An improved field effect transistor logic circuit comprising:

a first depletion mode input field effect transistor having its drain to source path connected between an input node and a first intermediate node and its gate electrode connected to a first fixed potential;

a self biased second depletion mode field effect transistor connected as a load between a second fixed potential and said first intermediate node;

at least one enhancement mode output field effect transistor having its gate electrode connected to said first intermediate node, its source electrode connected to said first fixed potential and its drain electrode connected to an output node having a substantial load capacitance associated therewith; and

a third depletion mode field effect transistor having its drain to source path connected between a second intermediate node and the drain of said at least one enhancement mode output field effect transistor and its gate electrode connected to said first fixed potential; and

a fourth depletion mode field effect transistor connected between said second fixed potential and said second intermediate node;

whereby said output node connected to the drain electrode of said at least one enhancement mode output field effect transistor has a potential variable between said first fixed potential and another potential which is a function of the threshold voltage of said third depletion mode field effect transistor.

4,110,634

GATE CIRCUIT

Yukuya Tokumaru, and Masanori Nakai, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,668

Claims priority, application Japan, Aug. 9, 1976, 51-96786; Aug. 9, 1975, 50-96787

Int. Cl.^{2} H03K *19/08, 19/20*

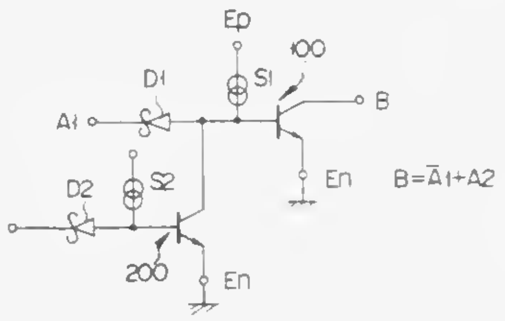
U.S. Cl. 307—213 **10 Claims**

1. A gate circuit having a plurality of logic elements formed on a single semiconductor substrate,

each of said plurality of logic elements comprising at least one Schottky diode having a cathode and an anode, the cathode operating as an input to the logic element; a transistor having a base connected to an anode of said at least one Schottky diode, at least one collector, at least one emitter, and operating as an inverter; and a current source circuit element connected to said base of said transistor and said anode of said at least one Schottky diode,

one of said plurality of logic elements being the output of said gate circuit at the said at least one collector of its transistor, the base of its transistor being connected to the said at least one collector of the transistor of another one of said plurality of logic elements,

the emitters of the transistors of said plurality of logic elements being connected directly to a common potential point.



4,110,635

AMPLIFYING CIRCUIT

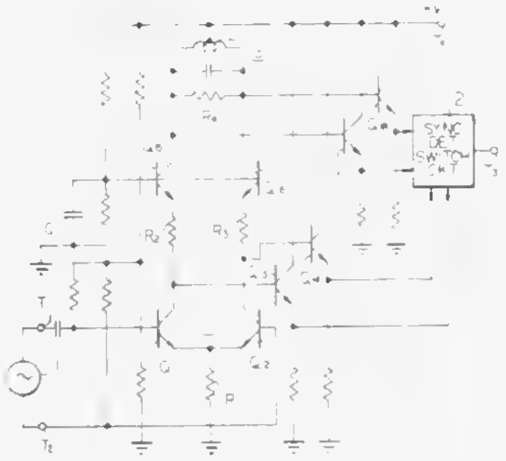
Masayuki Hongu, Komae; Masaharu Tokuhara, Tokyo, and Hiromi Kawakami, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,630

Claims priority, application Japan, Aug. 19, 1975, 50-100291

Int. Cl.^{2} H03K *5/00, 9/06*

U.S. Cl. 307—233 R **7 Claims**



1. An amplifier arrangement comprising:

an amplifier stage including at least a common emitter transistor and first collector load means connected to the collector of said transistor;

an input signal source connected to the base of said transistor;

a grounded base stage including a common base transistor having its emitter connected to said first collector load means, and second collector load means connected to the collector of said common base transistor; and

first and second output means connected with the collector of said common emitter transistor and the collector of said common base transistor, respectively.

4,110,636
FEEDING BRIDGE

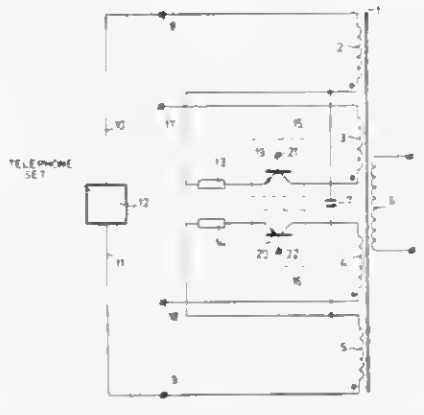
Eise Carel Dijkmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,809

Claims priority, application Netherlands, Mar. 5, 1976, 7602292

Int. Cl.^{2} H03K *1/02*

U.S. Cl. 307—237 **6 Claims**



1. A bridge circuit comprising, a pair of terminals for connection to a transmission line, an isolation transformer having four primary windings with equal numbers of turns and a secondary winding, an isolation capacitor, means connecting one end of the capacitor to the beginning of the first winding and via a first transistor circuit to the beginning of the second winding, means connecting the other end of the capacitor to the end of the fourth winding and to the end of the third winding via a second transistor circuit complementary to the first transistor circuit, means connecting the end of the first winding and the beginning of the fourth winding respectively to the pair of terminals, means coupling the end of the second winding to a first terminal of a voltage source and the beginning of the third winding to a second terminal of the voltage source, the transistor circuits each comprising a main current path which has a high impedance at one end and a low impedance at the other end and a control terminal, means connecting the high-impedance end of the first transistor to the beginning of the second winding and the low-impedance end via a first supply resistor to the beginning of the first winding and the control terminal to a third terminal of the voltage source, and means connecting the high-impedance end of the second transistor circuit to the end of the third winding and the low-impedance end via a second supply resistor to the end of the fourth winding and the control terminal to a fourth terminal of the voltage source.

4,110,637
ELECTRONIC SYSTEM FOR CAPACITIVELY STORING A SIGNAL VOLTAGE OF PREDETERMINED LEVEL

Andreas Rusznyak, Chene-Bougeries, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Continuation-in-part of Ser. No. 711,879, Aug. 5, 1976, abandoned. This application Jul. 12, 1977, Ser. No. 815,016

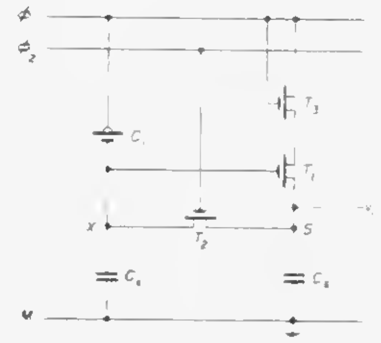
Claims priority, application Switzerland, Aug. 8, 1975, 10363/75

Int. Cl.^{2} H03K *17/60;* **G11C** *11/24*

U.S. Cl. 307—238 **7 Claims**

1. A circuit arrangement for the storage of a signal voltage of predetermined level, comprising:

- two conductors connected across a source of recurrent unipolar clock pulses, one of said conductors being grounded;
- a main storage capacitor and an ancillary storage capacitor both connected to said one of said conductors;
- supply means including at least said one of said conductors for charging said main storage capacitor with a voltage having the same polarity as said clock pulses;
- a normally nonconductive first semiconductor element inserted between said supply means and said main storage capacitor on the side opposite said one of said conductors, said first semiconductor element forming a first junction with said main storage capacitor and being provided with a control electrode;
- a binary capacitor of the same conductivity type as said first semiconductor element inserted between said ancillary storage capacitor and the other of said conductors, said binary capacitor forming with said ancillary storage capacitor a second junction tied to said control electrode, at least one of said junctions being temporarily connectable to an external signaling circuit for the selective charging and discharging of the respective storage capacitor, the capacitance of said binary capacitor in the presence of a clock pulse having a relatively low value in the discharged state of said ancillary storage capacitor and having a relatively high value upon said ancillary storage capacitor carrying a predetermined minimum charge, said high value enabling conduction of said first semiconductor element for the duration of a driving pulse whereby said main storage capacitor is charged from said supply means; and



- a second semiconductor element inserted between said junctions for enabling the transfer of charges from said main storage capacitor to said ancillary storage capacitor between clock pulses while preventing a reverse charge transfer in the presence of a clock pulse;
- said supply means including a third semiconductor element inserted between said other of said conductors and said first semiconductor element for transmitting said clock pulses to said main storage capacitor in the conductive condition of said first semiconductor element.

4,110,638
CONFIGURATION FOR REDUCING THE TURN-OFF TIME OF A THYRISTOR

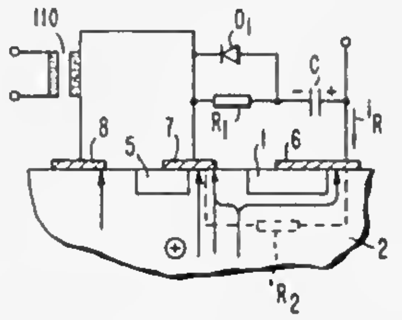
Peter Voss, Munich, Germany, assignor to Patent-Treuband-Gesellschaft fur Elektrische Gluhlampen m.b.H., Munich, Germany

Filed Feb. 23, 1977, Ser. No. 771,278

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607678

Int. Cl.^{2} H03K *17/72*

U.S. Cl. 307—252 C **4 Claims**



1. An arrangement for reducing turn-off time of a thyristor having a main emitter electrode affixed to a main emitter region, a control electrode affixed to a base region, and including an auxiliary thyristor which is adapted to amplify a control current and has an auxiliary emitter electrode affixed to an emitter region of the auxiliary thyristor, said arrangement including a voltage source electrically connected to the auxiliary thyristor and adapted to supply to said auxiliary emitter an electrical current opposite in direction to the control current supplied to the thyristor, said voltage source being interposed between the main emitter electrode and the auxiliary emitter electrode and being connected electrically in series with an electrical resistance.

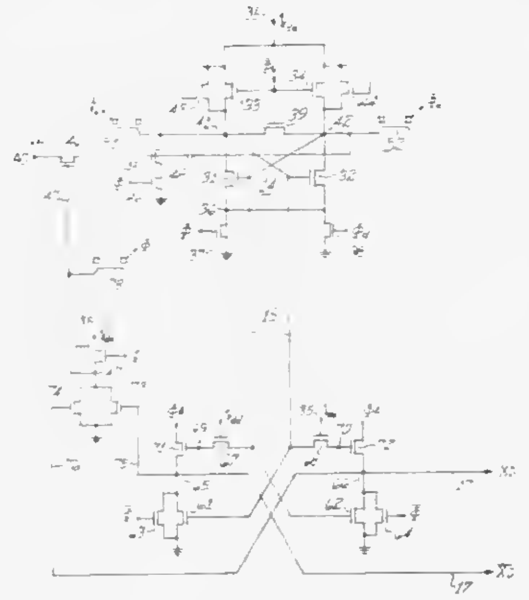
4,110,639
ADDRESS BUFFER CIRCUIT FOR HIGH SPEED SEMICONDUCTOR MEMORY

Donald J. Redwine, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1976, Ser. No. 748,790

Int. Cl.^{2} H03K *3/286, 3/353;* **G11C** *8/00*

U.S. Cl. 307—279 **19 Claims**



1. An input buffer circuit for an address input of a semiconductor memory device, comprising:

- a pair of driver transistors substantially unbalanced in size and characteristic, each driver transistor having a control electrode and two output electrodes, the driver transistors being cross coupled by connection of the control electrode of each to an output electrode of the other;
- a pair of precharge transistors, one for each of the driver transistors, the precharge transistors being substantially balanced in size and characteristic, each of the precharge transistors being connected in series with one of the driver transistors and a supply voltage;
- means connected to turn on the pair of precharge transistors and to turn off the precharge transistors at a preselected time in an operating cycle;
- means to short output electrodes of the pair of cross coupled driver transistors together to equalize the voltages on such output electrodes prior to said preselected time in an operating cycle;
- means connected to one of the output electrodes of one of said pair of cross coupled driver transistors to couple said one of the output electrodes to a reference potential when said address input is present beginning at said preselected time;
- means for applying a charge to each of the output electrodes a short delay time after said preselected time to retard discharge of one of the output electrodes; and
- a pair of address signal output circuits, each of which has an input connected to an output electrode of a different one of the pair of cross coupled driver transistors and responsive to the voltage level thereof beginning at a time after said short delay time during an operating cycle, one of the pair of address signal output circuits producing an address signal and the other producing the complement of the address signal.

4,110,640
STANDARD SIGNAL GENERATING APPARATUS

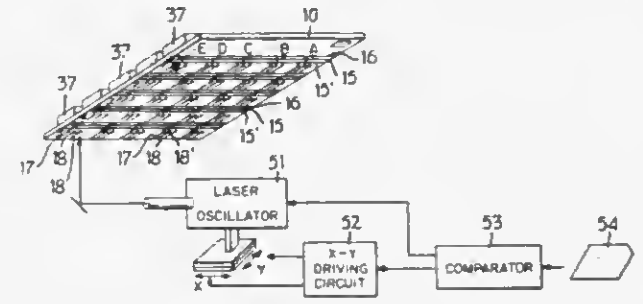
Kazuo Ito, Komae, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 26, 1976, Ser. No. 679,937

Claims priority, application Japan, Apr. 28, 1975, 50-51935

Int. Cl.^{2} H03K *17/00;* **G04C** *3/00;* **B23K** *9/00*

U.S. Cl. 307—303 **3 Claims**



1. In combination: a transparent substrate having a pair of opposed major surfaces; and a plurality of standard signal generating circuits each comprising a mechanical vibrator disposed on one of said major surfaces, an oscillator circuit for driving said mechanical vibrator to vibrate and for developing an oscillatory output signal determined by said mechanical vibrator, a metallic thin film disposed on said one major surface and defining thereon a frame of metallic thin film surrounding said mechanical vibrator and said oscillator circuit, a metallic, cover disposed on said major surface and covering said mechanical vibrator and said oscillator circuit and joined to said frame to peripherally seal said cover to said substrate, a divider circuit disposed within said cover and connected to receive the oscillatory output signal of said oscillator for developing a lower frequency oscillatory standard frequency signal having a standard frequency determined by the oscillator frequency and a dividing ratio of said dividing circuit, and said dividing circuit having at least one adjusting lead for receiving a power signal for setting the dividing ratio of said divider circuit according to whether said at least one adjusting lead is connected to a positive potential lead or a negative potential lead of the power signal and thereby setting the value of said standard frequency, said positive potential lead and said negative potential lead comprising polished conductive pins extending through said transparent substrate, and said at least one adjusting lead being connected to said positive potential lead and said negative potential lead and being disposed on one of the major surfaces of said substrate to permit breaking of the connection of said at least one adjusting lead with a respective one of said positive and negative potential leads by irradiating the same with laser light in order to set the value of said standard frequency.

4,110,641
CMOS VOLTAGE COMPARATOR WITH INTERNAL HYSTERESIS

Robert L. Payne, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1977, Ser. No. 810,226

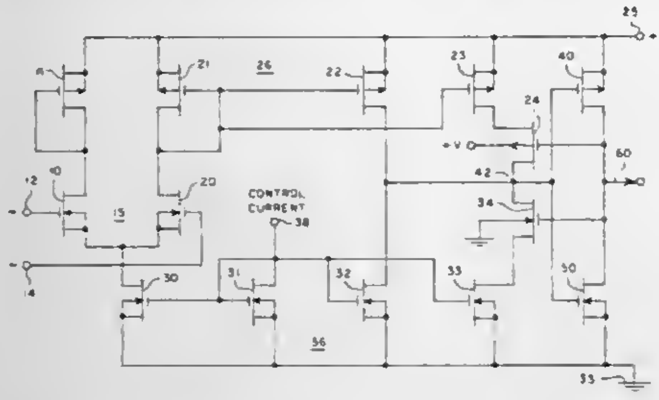
Int. Cl.^{2} H03K *5/20;* **H03F** *3/185, 3/16, 3/45*

U.S. Cl. 307—355 **8 Claims**

1. A CMOS comparator with internal positive current feedback for generating hysteresis in the switching of the output voltage signal as a function of the input voltage signal, said comparator comprising:

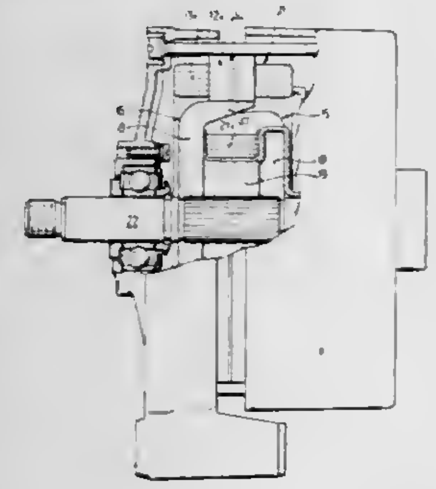
- a transconductance amplifier for generating a current through a first insulated gate field effect transistor which is a function of voltage at its input, said first insulated gate field effect transistor having its source connected to a first

potential terminal and having its drain connected to a common junction terminal;
a second insulated gate field effect transistor having its source to drain conduction path connected between said common junction terminal and a second potential terminal;
a source of control current;
means for generating a first feedback current as a function of said control current;
an output terminal;
an output inverter comprised of third and fourth insulated gate field effect transistors, said third transistor having its source to drain conductive path connected between said output terminal and said first potential terminal and said fourth transistor having its source to drain conductive path connected between said output terminal and said second potential terminal, said third and fourth transistors further having their gate electrodes connected to said common junction terminal; and
switching means connected to said means for generating said first feedback current and to said output terminal for connecting said first feedback current in parallel with said first transistor as a function of voltage at said output terminal.



4,110,642
NOISE REDUCTION ARRANGEMENT IN A CLAW-TYPE DYNAMO ELECTRIC MACHINE, PARTICULARLY MULTI-PHASE AUTOMOTIVE-TYPE A-C GENERATOR

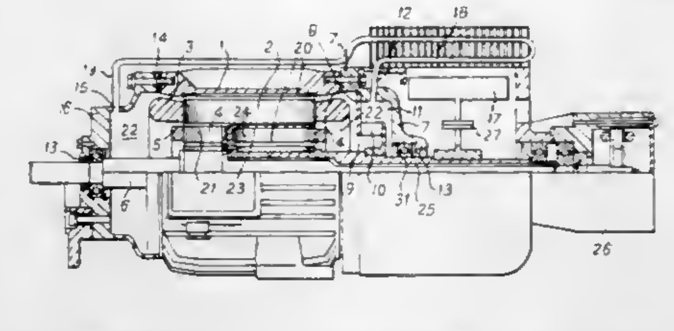
Hubertus Thiele, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 24, 1977, Ser. No. 771,805
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1976, 2608689
Int. Cl.^{2} H02K *5/24*
U.S. Cl. 310—51 **6 Claims**



1. Claw pole-type dynamo electric machine having
a stack of stator laminations (**12**) formed of dynamo electric machine lamination steel sheet material;
armature windings (**13**) located on the stator stack;
and a claw pole-type field structure (**15**) rotatably supported within the stator stack,
comprising,
means decreasing the axial stator flux concentration flowing through the stator laminations including an intermediate lamella (**14**) of a material different from said dynamo electric lamination steel sheet material positioned centrally within said stack forming the laminations thus decreasing the magnetic flux concentration in the stator structure, thereby decreasing the flux concentration at a central zone of the stack to reduce the noise level of the machine in operation by decreasing cyclically recurring attraction forces upon rotation of the claw pole-type field structure.

4,110,643
INDUCTION MOTOR

Arnold Müller, Lichtensteinstr. 31, 7312 Kirchheim, Teck, Fed. Rep. of Germany
Filed Aug. 24, 1976, Ser. No. 717,733
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1975, 2538561
Int. Cl.^{2} H02K *9/19*
U.S. Cl. 310—54 **6 Claims**

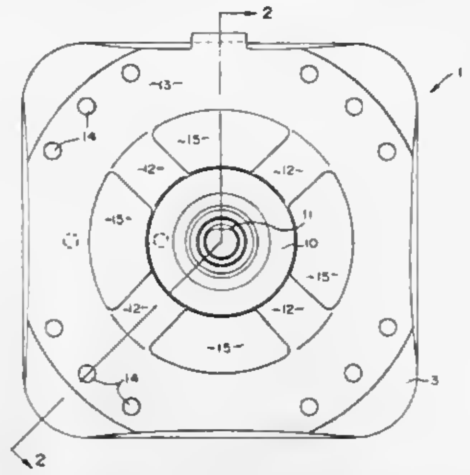


1. In a variable-speed electric induction motor, of that kind having a stator and a rotor, and means defining a hermetically sealed liquid flow circuit including internal space of the motor, a coolant liquid in said liquid flow circuit, and a pump located in said liquid flow circuit for pumping said coolant liquid in said liquid flow circuit, the improvement which comprises a free-running ancillary shaft, and drive means independent of the rotor of the motor for rotating said ancillary shaft at constant speed, said pump being coupled for driving to said ancillary shaft.

4,110,644
DYNAMOELECTRIC MACHINE END SHIELD ARRANGEMENT

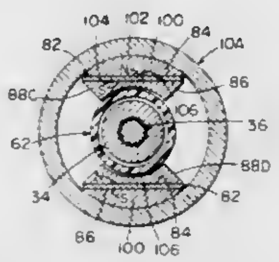
Joseph T. Roddy, Ballwin, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 2, 1976, Ser. No. 710,604
Int. Cl.^{2} H02K *5/00*
U.S. Cl. 310—91 **11 Claims**

1. In a dynamoelectric machine having a laminated stator core, a pair of end shields positioned on opposite ends of said laminated core, and a cementing composition bonding said end shields to said laminated core, the improvement comprising axially projecting mounting tabs connected to said end shields, said mounting tabs being adapted to encompass laminations of said laminated core, said tabs having a first end integrally formed with said end shield, a free second end, and an axial length therebetween, said axial length having a stepped construction including a first surface area, a second surface area, and a lateral edge between said first and said second surface areas, said first and said second surface areas being displaced from one another by a distance equal to the length of said lateral edge, oppositely opposed pairs of tabs of said end shields mating with one another, the lateral edges of said mating tabs lying approximately adjacent one another, said tabs defining an aperture extending through said tab pair to a radially inner face of said tab pair when said end shields are in their mated position, said aperture forming a passageway through the mated tabs.



4,110,645
ELECTRIC MOTOR

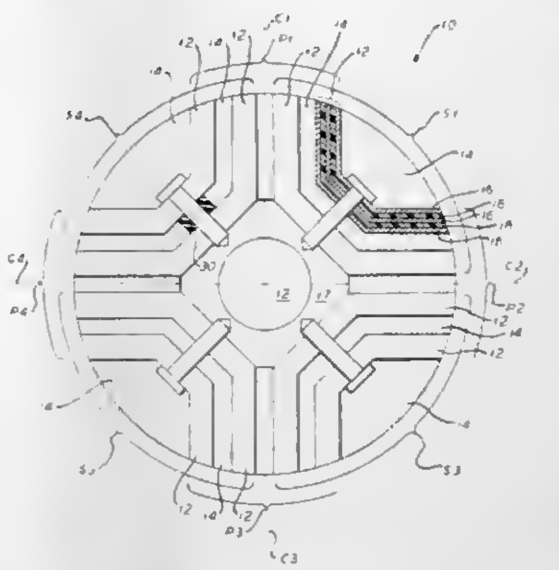
James R. Hendersbot, Jr., Amherst, N.H., assignor to Vibrac Corporation, Chelmsford, Mass.
Filed Feb. 23, 1976, Ser. No. 660,237
Int. Cl.^{2} H02K *21/26*
U.S. Cl. 310—154 **3 Claims**



1. In a dynamo-electric machine of the type comprising a housing having a cross-section such that at least two oppositely disposed portions of the interior surfaces of said housing are curved in cross-section; a rotatable shaft mounted in said housing; a hollow armature concentrically mounted on said shaft so that a least a portion of said armature is radially spaced from said shaft; a stationary, magnetically-conductive core member extending into the space provided between said armature and said shaft; at least two substantially flat mutually spaced magnets secured within said housing and spaced radially from said armature; and at least two pole pieces of magnetically-conductive material, each of said pole pieces being secured to a different one of said magnets, said pole pieces extending toward and terminating short of said armature; wherein the improvement comprises:
at least two magnetically-conductive adaptors for securing said magnets to said housing, said adaptors being disposed between said magnets and said housing, each of said adaptors having a curved surface secured to and mating with a respective one of said interior surfaces of said housing and a substantially flat surface secured to and supporting at least one of said magnets.

4,110,646
AC SYNCHRONOUS MOTOR HAVING AN AXIALLY LAMINATED ROTOR

S. Chandrasekhara Rao, Fairlawn, N.J., assignor to Bogue Electric Manufacturing Company, Paterson, N.J.
Filed Oct. 5, 1976, Ser. No. 730,260
Int. Cl.^{2} H02K *19/00*
U.S. Cl. 310—163 **4 Claims**



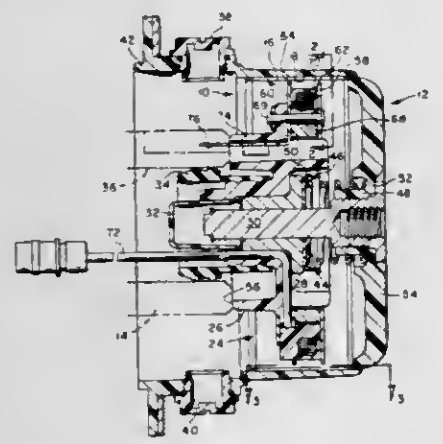
1. In an ac synchronous reluctance motor provided with a rotor having a central shaft along its axis of rotation and having a plurality of even-numbered rotor poles with each rotor pole having a pole center, wherein the pull-in torque, pull-out torque, power factor and efficiency of the motor are related to the ratio of direct axis reactance to the quadrature axis reactance of the motor, said ratio being predetermined for each such motor, the improvement comprising:
- (a) a plurality of rotor segments with each rotor segment extending axially parallel to said axis of rotation and extending angularly from a pole center to an adjacent center and adjacent portions of adjacent rotor segments comprising one-half of a rotor pole;
- (b) each of said rotor segments comprised of
  - (i) a plurality of magnetic sub-segments, and
  - (ii) a plurality of electrically conductive sub-segments interspersed with said magnetic sub-segments;
- (c) each of said magnetic sub-segments comprised of
  - (i) a plurality of laminations of soft magnetic material extending axially parallel to the axis of said shaft, and
  - (ii) non-magnetic material extending axially parallel to the axis of said shaft and positioned intermediate the laminations of soft magnetic material,
- (d) said laminations of soft magnetic material of said magnetic sub-segments providing decreased direct axis reluctance thereby increasing the direct axis reactance and said non-magnetic material of said magnetic sub-segments providing increased quadrature reluctance thereby decreasing quadrature axis reactance whereby the ratio of direct axis reactance to quadrature axis reactance is increased and the pull-in torque, pull-out torque, power factor and efficiency of the ac synchronous reluctance motor are improved.

4,110,647
WHEEL SPEED SENSOR

Ralph Gilbert Eslinger, and John Millar Nicolson, both of Elyria, Ohio, assignors to The Bendix Corporation, Southfield, Mich.
Filed Jan. 13, 1977, Ser. No. 759,170
Int. Cl.^{2} H02K *19/20*
U.S. Cl. 310—168 **15 Claims**

1. In a vehicle having an axle and a wheel rotatably mounted on said axle, a hub cap covering the end of said axle, a speed sensor assembly comprising a rotor mounted for rotation with

said hub cap and a stator carried by said hub cap and including sensing means responsive to relative rotation between the rotor and the stator for generating a signal proportional to the rate of relative rotation between the rotor and the stator, a spindle carried by the hub cap and rotatable therewith, a bearing carried by the stator rotatably receiving said spindle so that the stator is supported by the hub cap and the speed sensor assembly can be installed on the hub cap before the hub cap and speed sensor unit is installed on said vehicle as an assembly, said axle having a slot, said stator carrying a tang received within the slot in the axle to prevent relative rotation between the stator and the axle.

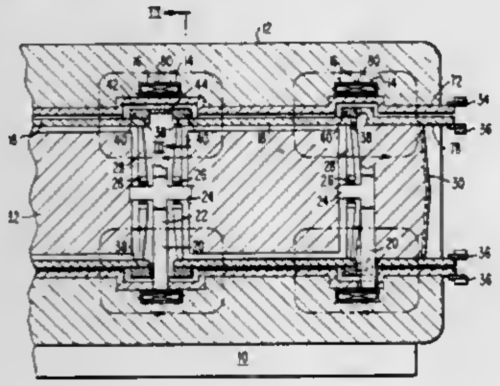


4,110,648

HOMOPOLAR MACHINE FOR REVERSIBLE ENERGY STORAGE AND TRANSFER SYSTEMS

Roy E. Stillwagon, South Huntington Township, Huntington County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1975, Ser. No. 585,642
Int. Cl.^{2} H02K ***11/00***
U.S. Cl. 310—178 **14 Claims**



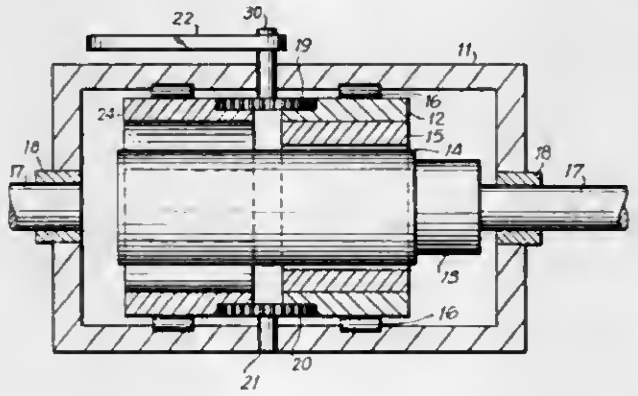
1. A homopolar generator-motor comprising:
a base supporting a stator and a rotor arranged to rotate therein;
stationary excitation winding means on said stator which provides flux linking said rotor;
said rotor comprising a rotatable hollow sleeve supported at its opposite ends from pedestals extending upwardly from said base;
a stationary iron core in said hollow sleeve, the ends of said core being mounted on said pedestals;
slip rings on the opposite ends of said sleeve;
current collecting means supported from said stator and positioned to contact said slip rings for collecting current generated in said sleeve;
stationary conductor means mounted on but insulated from the stator, and means connecting said conductor means to the current collecting means;
means connecting said current collecting means and stationary conductor means to a load for transferring current from said sleeve to said load.

4,110,649

VARIABLE SPEED DC MOTOR

Joseph A. Mas, Woodbury, N.Y., assignor to Electric Vehicle Corporation of America, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 744,074
Int. Cl.^{2} H02K ***1/12***
U.S. Cl. 310—191 **7 Claims**



1. A variable speed DC motor contained within a housing having bearing openings at each end, an armature disposed in the housing and pivoted in the bearing openings, the improvement comprising:
first cylindrical field shell means surrounding the armature and having at least a pair of oppositely disposed magnetic field pole segments mounted in said shell means facing the armature;
second cylindrical field shell means surrounding the armature and having at least a pair of oppositely disposed magnetic field pole segments mounted in said shell means facing the armature;
means mounting to each of said shell means for independent rotation within said housing and around said armature;
gear means coupling said shell means for rotation of the latter in opposite directions, whereby to vary the angular spacing between the magnetic field pole segments of the first shell means and the magnetic field pole segments of the second shell means;
and control means for selectively rotating said shell means, said control means having an actuating portion located outside of said motor housing for control of said shell means exteriorly of said motor.

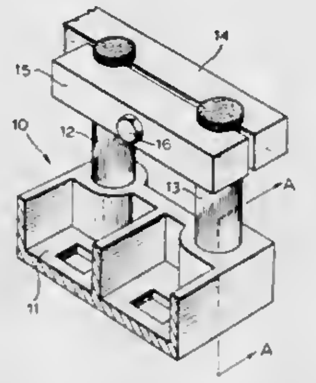
4,110,650

BRUSHHOLDER SUPPORTING STRUCTURE

Grey Charles Kemp, and Eion Murray Spence, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Feb. 25, 1976, Ser. No. 661,303
Claims priority, application Canada, May 14, 1975, 226877
Int. Cl.^{2} H02K ***13/00***
U.S. Cl. 310—239 **6 Claims**

1. A brushholder adapted to be secured to the frame of a dynamoelectric machine and insulated therefrom by means of cylindrical studs said brushholder having a frame containing at least two round holes spaced apart in parallel relation, each of said holes being defined by a wall surface of said frame having a predetermined diameter that is smaller than the outside diameter of one end of an insulated steel stud so that said wall surface is adapted to capture such a steel stud in an interference fit, groove means comprising a course pitch helical groove of shallow rectangular form in the wall surface defining each of said holes, a generally cylindrical resin bonded fiber glass stud one end of which has an outside diameter slightly less than said predetermined diameter, said one end of the fiber glass stud being disposed in a first one of said holes, and an adhesive for bonding said fiber glass stud to the remaining wall surface and to the groove means of said first one of said holes, said groove means being of a size that takes away just enough area of the wall surface defining each of said holes to provide a good adhesive bond between a fiber glass stud and the brushholder frame without detracting significantly from the interference fit of an insulated steel stud that can alternatively be installed in any of said holes.

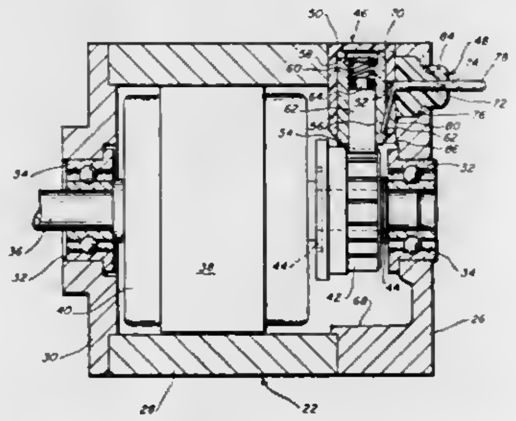


4,110,651

BRUSH BLOCK ASSEMBLY

Louis E. Fagan, Broomall, Pa., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 17, 1977, Ser. No. 778,573
Int. Cl.^{2} H02K ***13/00***
U.S. Cl. 310—239 **4 Claims**



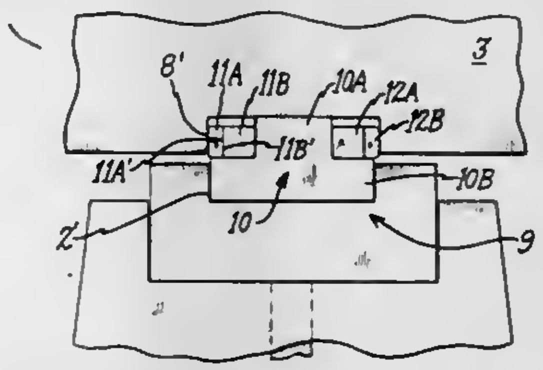
1. In a miniaturized electric motor having a commutator, the improvement comprising:
a passageway in said motor between the exterior thereof and said commutator, said passageway being quadrilateral in cross section;
a cartridge subassembly having a quadrilateral cross section slideably mounted in said passageway;
a latching terminal subassembly mounted between said passageway and the exterior of said motor;
said cartridge subassembly including a conductive brush having a quadrilateral cross section, a conductive cartridge formed as a quadrilateral tube for slideably receiving said brush, said cartridge having a surface with a notch therein, and an insulated housing formed as a quadrilateral tube for receiving said cartridge, said housing having a side with a slotted aperture therein;
said latching terminal subassembly including an insulated bushing, and a terminal mounted within said bushing having a terminal portion on the exterior of said motor and a flattened latch portion offset at an angle to the axis thereof extending into said passageway;
said flattened latch portion extending through said slotted aperture in said insulated housing and engaging said notch in said conductive cartridge to locate and prevent withdrawal of said cartridge subassembly from said motor passageway with said brush engaging said commutator to establish electrical contact between said brush and said exterior portion of said terminal.

4,110,652

MOUNTING ASSEMBLY FOR LAMINATED ROTOR RIM OF DYNAMOELECTRIC GENERATOR ROTATABLE ABOUT INCLINED SHAFT

William J. McGahern, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,096
Int. Cl.^{2} H02K ***1/22***
U.S. Cl. 310—261 **7 Claims**



1. A rotor for a dynamoelectric generator comprising a spider sub-assembly that is rotatable around a non-vertical axis, a first plurality of axial keyways formed at spaced points around the circumference of said spider sub-assembly, a laminated rim disposed around said spider, a second plurality of axial keyways formed at spaced points around the inner circumferential surface of said laminated rim, each keyway of said second plurality being positioned generally in axial alignment, respectively, with each keyway of said first plurality, and a plurality of articulated key assemblies positioned with a portion of each key assembly respectively in each of said generally aligned pairs of keyways to prevent relative tangential movement of the laminated rim relative to the spider, each of said key assemblies comprising a generally T-shaped base member and two pairs of tapered wedge keys, each of the T-shaped base members being mounted in radial compression between the spider sub-assembly and said laminated rim, and each of said pairs of wedge keys being mounted in wedging relationship, respectively, on opposite sides of the neck of a respective one of said T-shaped base members, between it and the rim laminations, with the thickest portions of each wedge key positioned respectively adjacent opposite sides of the rotor rim, thereby to hold the rim laminations in alignment along the keyways in the rim and to fix said laminations in position relative to the spider.

4,110,653

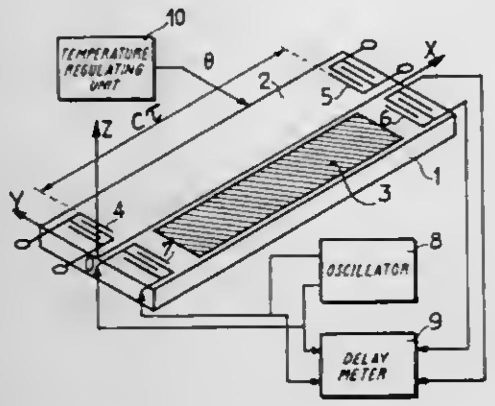
METHOD OF MODIFYING THE TEMPERATURE DRIFT OF THE PROPAGATION TIME OF SURFACE ELASTIC WAVES AND A DEVICE OBTAINED BY SAID METHOD

Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 25, 1977, Ser. No. 781,451
Claims priority, application France, Mar. 30, 1976, 76 09210
Int. Cl.^{2} H01L ***41/10***
U.S. Cl. 310—313 **7 Claims**

1. A method of reducing the differences in propagation time of surface elastic waves ascribed to variations in temperature of a crystalline substrate propagating said surface elastic waves, said method comprising the steps of cutting the crystalline substrate in accordance with a predetermined crystal cut, and in subjecting at least one superficial zone of the substrate, located in the trajectory of said waves, to an ion bombardment; said ion bombardment permanently altering the regular lattice

arrangement of the atoms of said crystalline substrate; the intensity and the extent of said ion bombardment being adjusted for substantially reducing within given temperature and frequency ranges, said differences in propagation time.



4,110,654

DEVICE FOR MONITORING THE TRAVEL OF YARN-LIKE STRUCTURES AT A TEXTILE MACHINE

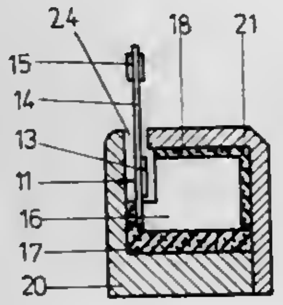
Andreas Paul, Uetikon am See, Switzerland, assignor to Gebr. Loepfe AG, Zurich, Switzerland

Filed Jun. 23, 1975, Ser. No. 589,627

Claims priority, application Switzerland, Jul. 12, 1974, 9630/74

Int. Cl.² H01L *41/10*

U.S. Cl. 310—323 **3 Claims**



1. A device for monitoring the travel of yarn-like structures at a textile machine, comprising:

a yarn scanning structure including a plate-shaped cantilever member which can be excited into oscillation by the traveling yarn-like structure, and mechano-electrical transducing means responsive to such oscillation;

said plate-shaped cantilever member having an upper edge and opposite thereto a lower edge, yarn guiding means provided adjacent said upper edge;

a rigid base structure having a mass greater than the mass of said yarn scanning structure, said lower edge of the plate-shaped cantilever member being rigidly connected with said rigid base structure;

a hollow casing receiving said rigid base structure and said lower edge of the plate-shaped cantilever member, said hollow casing having a slot for exposing said yarn guiding means to the traveling yarn-like structure;

soft elastic means arranged between and adjacent said hollow casing and the rigid base structure for preventing transfer of mechanical shock and vibration from the textile machine to the yarn scanning structure; and

said cantilever member is a piezoelectric transducer element and said yarn guiding means is an elongated body made of hard material and fixedly attached to the free upper end of said piezoelectric transducer element.

4,110,655

PIEZO ELECTRIC VIBRATOR UNIT SEALED WITH 90SN-10AU SOLDER

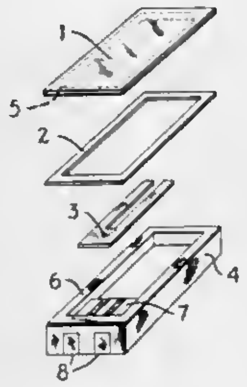
Morinaka Hata, and Isao Shinoda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 23, 1976, Ser. No. 753,847

Claims priority, application Japan, Dec. 26, 1975, 50-157588

Int. Cl.² H01L *41/10*

U.S. Cl. 310—344 **7 Claims**



1. A vibrator unit for use in a timepiece and the like comprising: a ceramic case having closed bottom and sidewall portions and an open top portion; a vibrator mounted to undergo vibration within said ceramic case; a lid disposed over the open top portion of said ceramic case; and means airtightly sealing together said lid and ceramic case, said means consisting of a soldering washer soldered between opposing surface portions of said lid and ceramic case and consisting essentially of 90Sn–10Au solder alloy.

4,110,656

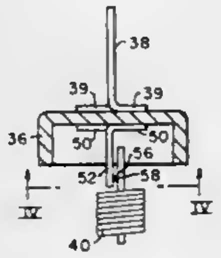
METHOD FOR MOUNTING ELECTRODES IN HIGH PRESSURE SODIUM LAMPS AND RESULTING ARTICLE

Daniel A. Larson, Cedar Grove, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1977, Ser. No. 758,978

Int. Cl.² H01J *5/50*

U.S. Cl. 313—331 **4 Claims**



1. An electrode mount for a high pressure sodium discharge lamp comprising:

an electrode support having a flattened end portion,

a thin niobium wire welded to said flattened end portion of said electrode support, and

a discharge sustaining electrode including an electrode rod, said electrode rod being welded to said electrode support through said thin metal wire with the axis of said electrode rod positioned perpendicular to the axis of said thin metal wire with said thin metal wire partially surrounding said electrode rod.

4,110,657

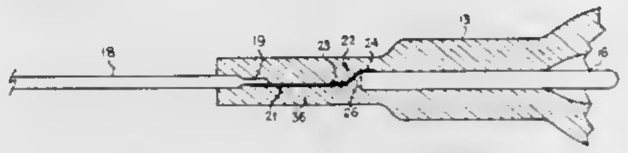
LEAD-IN SEAL AND LAMP UTILIZING SAME

John C. Sobleski, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1977, Ser. No. 776,850

Int. Cl.² H01J *5/36*

U.S. Cl. 313—332 **13 Claims**



7. A lamp comprising an envelope of vitreous material, a conductive foil seal member, and first and second elongated electrical conductors, said foil seal member and conductors being aligned substantially axially with the foil seal member between the conductors, and means connecting the conductors to the foil seal member at opposed ends thereof, at least one of said means comprising an axial spacing between the foil seal member and one of said conductors, a conductive foil tab member extending substantially axially between the foil seal member and the last-mentioned conductor and connected thereto at respective opposed ends of the tab member, said foil seal member being hermetically sealed in said material of the envelope, said first elongated conductor extending within said envelope and said second elongated conductor extending out of said envelope.

4,110,658

ELECTRIC INCANDESCENT LAMP

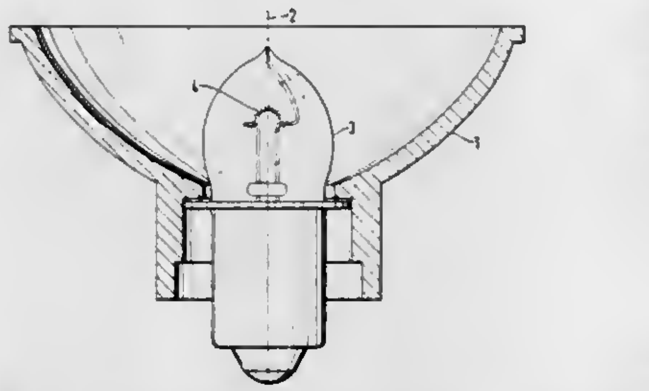
Knut Otto Sassmannshausen, 5, Pinewood Estate, Wexford, Ireland

Filed Dec. 9, 1976, Ser. No. 749,061

Claims priority, application Ireland, Dec. 17, 1975, 2749/75

Int. Cl.² H01J *1/16;* H01K *1/14;* H01J *19/10*

U.S. Cl. 313—344 **14 Claims**



1. In an electric incandescent lamp, having a rotational axis, a filament formed with a coil disposed in bowed form across the axis of the lamp, the length CL of said coil, measured along the mean curvature ML of said coil, being 3.6 to 6.2 times greater than the outside diameter OD of said coil and the height H of said coil, measured in the direction of the axis of said lamp, being 1.2 to 2.5 times greater than the outside diameter of said coil, and the distance A between each of the windings of the filament of said coil, measured along the mean curature ML of said coil, being 0.3 to 1.2 times as great as the diameter WD of the filament of said coil.

4,110,659

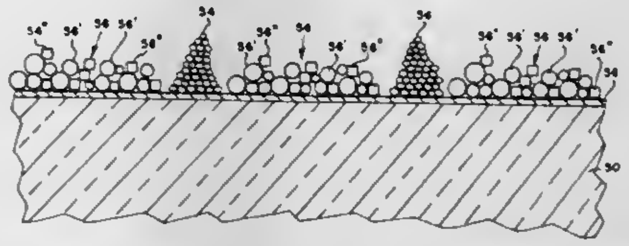
CATHODE RAY TUBE STORAGE TARGET HAVING INCREASE LIFE

William Miller Mason, Sherwood, and Gerald Emmett McTeague, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 18, 1976, Ser. No. 658,977

Int. Cl.² H01J *29/39, 29/41*

U.S. Cl. 313—398 **16 Claims**



1. A storage target for storing an electron image, comprising:

a nonconducting support member of electrical insulative material;

collector electrode means provided on one surface of said support member; and

a storage dielectric layer extending along said collector electrode means and containing a mixture including storage dielectric material and rare earth material selected from the group consisting of a rare earth oxide, a rare earth oxysulfide and a rare earth activated rare earth oxide or oxysulfide.

4,110,660

LUMINESCENT BARIUM-LITHIUM ALUMINATE PHOSPHORS AND LAMP CONTAINING THE SAME

Robert W. Wolfe, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 559,692, Mar. 19, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,231

Int. Cl.² C09K *11/46*

U.S. Cl. 313—486 **7 Claims**

1. A luminescent composition consisting essentially of (a) host consisting essentially of from about 2 to about 8 mole percent of barium oxide, from about 0.5 to about 20 mole percent of lithium oxide, and from about 80 to about 97.5 mole percent of aluminum oxide, said oxides being calculated on the basis of BaO, $\frac{1}{2}Li_2O$, and $\frac{1}{2}Al_2O_3$ respectively, and (b) as an activator from an effective amount to about 0.2 moles per mole of host of divalent europium and from an effective amount to about 0.45 moles per mole of host of divalent manganese, said effective amounts being sufficient to yield a green luminescence at about 515±2nm when said composition is excited by ultraviolet light and wherein lithium is present in an amount not greater than 1% by weight.

4,110,661

LIGHT EMITTING DEVICE FOR OPTICAL COMMUNICATIONS

James S. Harris, Jr.; Richard C. Eden, both of Thousand Oaks; Earl S. Cory, Camarillo, and Fred W. Scholl, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1977, Ser. No. 783,882

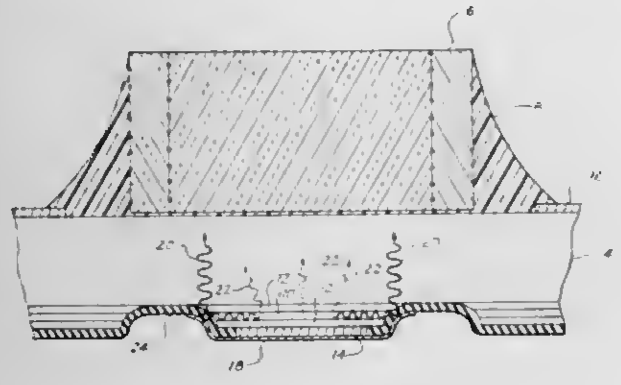
Int. Cl.² H05B *33/16, 33/24*

U.S. Cl. 313—499 **5 Claims**

2. A light emitting device comprising:

a mesa formed on a semiconductive substrate, said mesa having a top layer of semiconductive material of one conductivity type, a light emitting active layer of semiconductive material of said one conductivity type forming a first heterojunction with said top layer, a third layer of semiconductive material of opposite conductivity type forming a second heterojunction with said active layer opposite said first heterojunction, and wherein said substrate is of opposite conductivity type and forms a junction with said third layer, the semiconductive material of said active layer having a bandgap smaller than the bandgap of the semiconductive material of the other layers and having a refractive index different than the refractive index of the adjacent layers so that some light is confined to travel within said active layer toward the wall of said mesa, said mesa having walls which encircle it and which traverse said active layer at an angle of substantially 45°;

a transparent insulating layer deposited on at least said walls;



contacts coupled to said top layer and said substrate for applying an electrical signal across said active layer so that light is emitted from said active layer;

a top mirror adjacent said top layer for reflecting light toward said substrate;

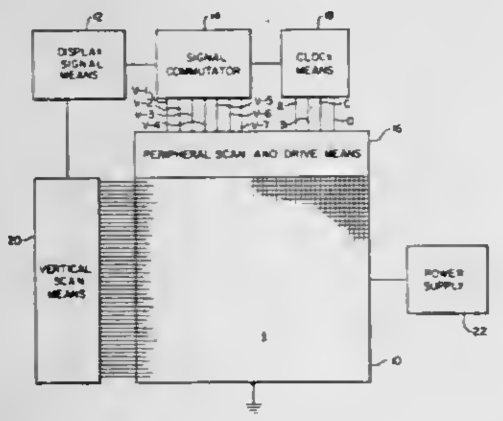
a side mirror deposited on said insulating layer, said side mirror intersecting the plane of said active layer at substantially 45° so that light from said active layer striking said side mirror is reflected toward said substrate; and

an optical fiber having an end coupled to said substrate opposite said active layer, the area of said end being substantially the same or larger than the area of said active layer, whereby the light reflected by said side reflecting mirror is received by said fiber.

4,110,662
THIN-FILM ANALOG VIDEO SCAN AND DRIVER CIRCUIT FOR SOLID STATE DISPLAYS

Edwin W. Greeneich, Plum Borough, and Juris A. Asars, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1976, Ser. No. 695,676
Int. Cl.^{2} H05B *33/12, 39/06;* G06F *3/14;* H04N *5/66*
U.S. Cl. 315—169 TV **4 Claims**

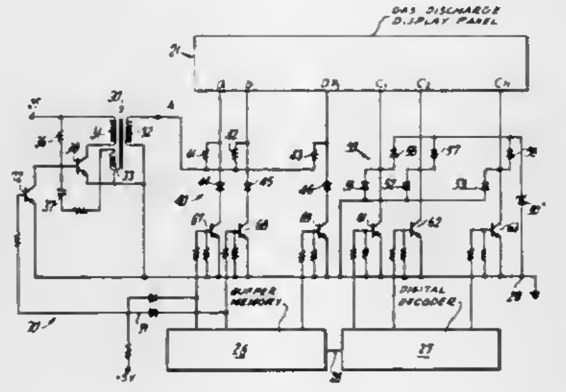


1. A display information signal scan and drive means for processing line-at-a-time display signals for an X-Y matrix coincidence addressable display panel in which "*n*" information signal inputs are connected to the scan and drive means having "*m*" information signal outputs which are connected to respective X or Y panel buses and wherein $m>>n$, which scan and drive means comprises parallel networks of decoding means and switching transistor means, with individual information storage means being associated with each switching transistor means, which scan and drive means effects conversion of serial format information signals to parallel format information signals by sequential activation of switching transistor networks with "*n*" switching transistors present in each network being simultaneously actuated to transfer the information signal to the respective associated storage means, so that an entire line of information signals may be assembled and stored prior to line-at-a-time transfer to the display panel.

4,110,663
PLASMA DISPLAY PANEL DRIVING CIRCUIT INCLUDING APPARATUS FOR PRODUCING HIGH FREQUENCY PULSES WITHOUT THE USE OF CLOCK PULSES

Togo Miyazaki, and Masatoshi Shimizu, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,420
Claims priority, application Japan, Oct. 22, 1975, 50-127188
Int. Cl.^{2} H05B *41/14*
U.S. Cl. 315—169 TV **16 Claims**

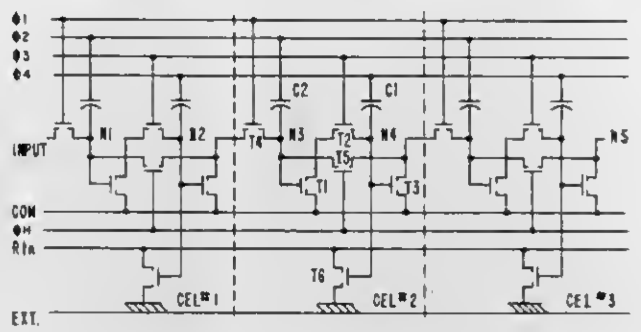


1. A circuit responsive to d.c. power and first and second control voltages variable with respect to a reference potential for driving an external electrode gas discharge display panel comprising first and second electrode pluralities, each first electrode spatially opposing said second electrodes with a gas discharge cell interposed therebetween together with an insulating layer between said gas discharge cell and at least one of said opposed first and second electrodes, said circuit comprising a point to be supplied with said reference potential, a transformer comprising a primary and a secondary winding, pulse producing means connected between said primary winding and said point for producing a sequence of pulses having positive and negative components reaching a first and a second predetermined voltage which are positive and negative with respect to said reference potential, first means connected to said point and responsive to said first control voltages for supplying said first electrodes substantially with said pulses or with a preselected ones of said positive or negative components of said pulses dependent upon said first control voltages, and second means connected to said point and responsive to said second control voltages for selectively supplying said second electrodes with a third predetermined voltage and said reference potential.

4,110,664
ELECTROLUMINESCENT BARGRAPH WITH INTEGRAL THIN-FILM TRANSISTOR CONTROL CIRCUITRY

Juris A. Asars, Murrysville; David H. Davies, Wilkins Township, Allegheny County, and Thomas P. Brody, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1977, Ser. No. 787,801
Int. Cl.^{2} H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **6 Claims**



1. An electroluminescent bargraph comprising

(a) an insulating elongated rectangular substrate;

(b) an elongated rectangular array of a plurality of electroluminescent display elements disposed upon the substrate, which display elements comprise an individual display element electrode, a layer of electroluminescent phosphor, and a common light transmissive electrode extending over the area of the entire array;

(c) a thin-film transistor multi-stage dynamic shift register addressing means disposed upon the substrate adjacent to and interconnected with the display elements, with the number of stages of the shift register equal to the number of display elements and an individual stage operatively connected to an individual display element, wherein each stage of the multi-stage dynamic shift register has a refresh-hold transistor interconnecting a first and second half stage, and each stage is connected to a switching transistor with the stage output connected to the gate of the switching transistor, and wherein one switching transistor contact is connected to an individual display element electrode of the display element and the other contact is connected to the display medium power supply, whereby the output signal of the shift register stage controls the actuation of the display element; and

(d) drive signal input buses disposed at a peripheral side of the substrate connected to the shift register addressing means.

4,110,665
CONTROL CIRCUIT FOR BAR GRAPH DISPLAY PANEL

James O. Moore, Worcester Township, Montgomery County, Pa., assignor to Moore Products Co., Spring House, Pa.

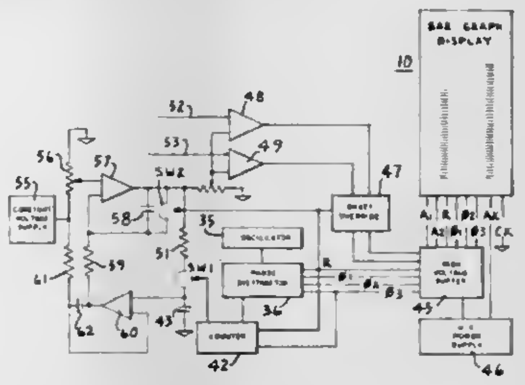
Filed Jul. 13, 1977, Ser. No. 815,101
Int. Cl.^{2} H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **8 Claims**

1. An electronic circuit for controlling a bar graph display comprising

generating means for producing a ramp voltage that increases at a constant rate,

restoring means for periodically terminating said voltage increase and reducing said voltage to a predetermined initial value,

timing means for controlling the period of said reducing action, and

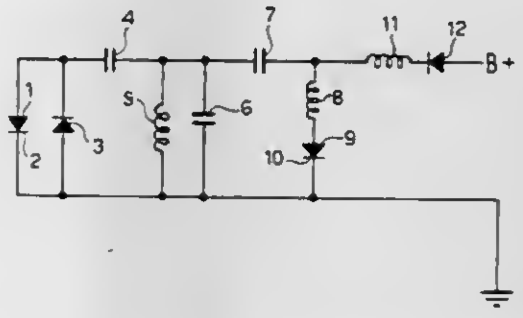


control means responsive to the peak value of said voltage for adjusting said rate to maintain said peak value at a predetermined magnitude.

4,110,666
CIRCUIT FOR GENERATING A SAW TOOTH WAVEFORM

Attilio Farina, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Filed Dec. 3, 1976, Ser. No. 747,145
Claims priority, application Italy, Dec. 11, 1975, 70041 A/75
Int. Cl.^{2} H01J *29/70*
U.S. Cl. 315—408 **9 Claims**



1. A circuit for generating a periodic saw-tooth waveform in a coil, such as the deflection coil of a television picture tube, comprising:

a first circuit branch across which said deflection coil is connected, said first circuit branch including an energy storing current source, and a first electronic switch having a control electrode to which are fed control pulses which make said switch conductive during a part of the ramp portion of the saw-tooth waveform,

a second branch of the circuit across which said deflection coil is also connected, said second circuit branch comprising:

a second current source,

a first reactance connected in series between said deflection coil and said second current source,

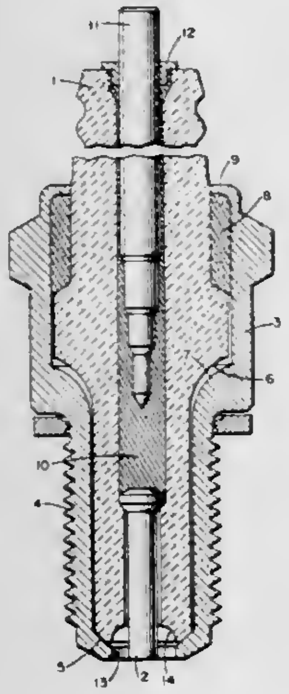
a second electronic switch, and

a second reactance connected in series with said second electronic switch between said second current source and said second electronic switch and also between said first reactance and said second electronic switch, said second electronic switch being fed with pulses which initiate the flyback portion of said saw-tooth waveform by turning on said second electronic switch towards the end of the ramp portion of said saw-tooth waveform to connect said first and second reactances to form a resonant circuit.

4,110,667

PROCESS FOR CLEANING SPARK PLUGS ON INTERNAL COMBUSTION ENGINES

Siegbert Graf Vom Hagen, Bensheim, Fed. Rep. of Germany, assignor to Kyberna GmbH, Bensheim, Fed. Rep. of Germany
Filed Jul. 28, 1975, Ser. No. 599,667
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1974, 2437257
Int. Cl.² H01T *13/20*
U.S. Cl. 313—143 **10 Claims**



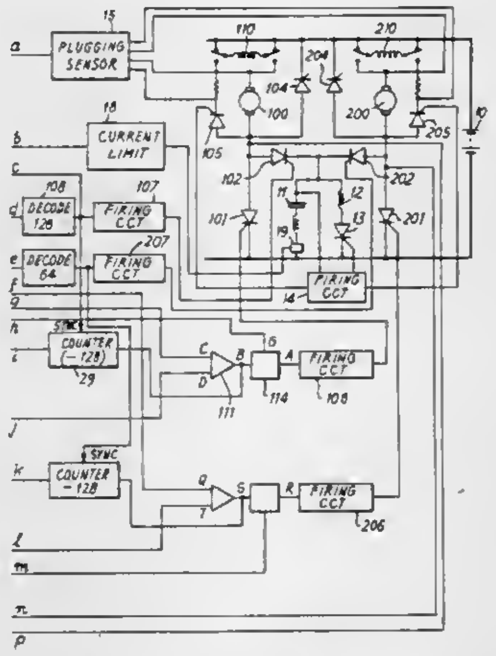
1. A spark plug comprising:
(a) an elongated insulator body having a center electrode passing therethrough and a metal sleeve surrounding the insulator body over a major portion of its length and in good heat conducting relationship therewith, said metal sleeve contacting the outside of the insulated body;
(b) an outside annular electrode spaced from the end of the center electrode to define a spark gap therebetween; and
(c) a depression in said insulator body between the electrodes, said depression having a concave shape in a cross-section parallel to the longitudinal axis of the center electrode, said depression located solely within the limits of said insulator body and said metal sleeve having a shape other than one forming a contiguous line with said depression, the surface of said depression being below the line directly connecting the center electrode and the outside annular electrode.

10. A process for removing deposits of combustion residues from the ceramic insulator body of a spark plug located in an engine cylinder during operation of the engine comprising:
(a) producing a spark across a gap of at least one mm with a current of at least 70 mA and a voltage of 20 kV;
(b) deflecting said spark by means of a flow of gas in the engine cylinder combustion space against the end of said insulator body; and
(c) maintaining said insulator body at approximately the engine coolant temperature by a sleeve which surrounds it, said sleeve having threads on the outer periphery thereof for securing said spark plug in place, said spark plug further comprising:
  (1) an elongated insulator body having a center electrode passing therethrough and a metal sleeve surrounding the insulator body over a major portion of its length and in good heat conducting relationship therewith, said metal sleeve contacting the outside of the insulated body;
  (2) an outside annular electrode spaced from the end of the center electrode to define a spark gap therebetween; and
  (3) a depression in said insulator body between the electrodes, said depression having a concave shape in a cross-section parallel to the longitudinal axis of the center electrode, said depression located solely within the limits of said insulator body and said metal sleeve having a shape other than one forming a contiguous line with said depression, the surface of said depression being below the line directly connecting the center electrode and the outside annular electrode.

4,110,668

THYRISTOR PULSE CONTROLLER FOR PLURAL LOADS

David Gurwicz; Albert Everett Sloan; Barry Moss; Arthur Wild, and William Robert Ord, all of Gatesbead, England, assignors to Sevcon Limited, Gatesbead, England
Filed Jan. 24, 1977, Ser. No. 761,725
Int. Cl.² H03K *3/00*
U.S. Cl. 318—78 **10 Claims**

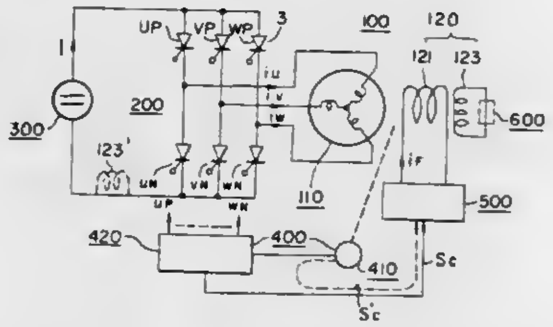


1. A pulse controller for controlling the mean current supplied to each of a plurality of d.c. loads, comprising a plurality of main thyristors for connection in series between respective loads and a d.c. supply, respective firing circuits for the main thyristors and commutation circuit means for commutating the main thyristors, a clock pulse generator adapted to provide a series of clock pulses at a basic clock rate, commutation control circuit means including counting means arranged to count the clock pulses and to effect commutation of each main thyristor at successive instants separated by a time interval corresponding to a predetermined count of the counting means, firing control circuit means adapted to provide for each main thyristor a control signal at a preset time in each time interval between successive commutations of the thyristor, further counting means associated with at least one of the main thyristors and arranged to provide an output signal at a count equal to the said predetermined count, and differential control circuit means adapted to cause the further counting means to begin counting at the basic clock rate at the start of each time interval and on receipt of a control signal from the firing control circuit means to stop counting at the basic rate and to continue counting at a rate higher than the basic clock rate by a factor determined by the differential control circuit means, the said output signal being provided when the total count equals the said predetermined count, the main thyristor associated with the further counting means being fired into conduction on receipt by the associated firing circuit of the said output signal from the further counting means.

4,110,669

SYNCHRONOUS MACHINE CONTROL SYSTEM

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Amagasaki, Japan
Filed Nov. 24, 1976, Ser. No. 744,593
Claims priority, application Japan, Jan. 28, 1976, 51-8145
Int. Cl.² H02K *29/00*
U.S. Cl. 318/175 **13 Claims**

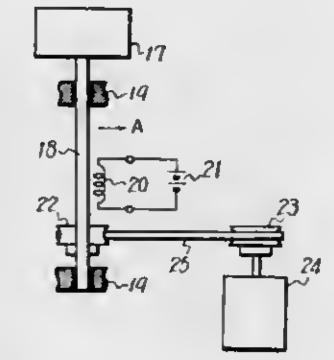


1. A synchronous machine control apparatus comprising:
a synchronous machine having a polyphase armature winding and a first DC excitation winding;
a static switch converter having a plurality of AC output terminals connected to said armature winding and a plurality of DC input terminals for connection to a power source, and consisting of a plurality of static switches, each static switch connected between one of said AC output terminals and one of said DC input terminals;
commutation control means for changing current flow from at least one of said static switches to at least one of the others of said static switches to provide commutation for a part of said armature winding;
DC power supply means for supplying a DC current to said first DC excitation winding;
said DC power supply means including current increment means for incrementing the current in said first DC excitation winding in synchronous relationship with said commutation to induce an auxiliary electromotive force in the part of said armature winding engaging in said commutation;
whereby said commutation is assisted by said current increment means.

4,110,670

BRAKING APPARATUS

Tetsuro Araki, and Hideaki Hayashi, both of Mitaka, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan
Filed May 19, 1977, Ser. No. 798,343
Claims priority, application Japan, May 20, 1976, 51-63413
Int. Cl.² D01H *7/22*
U.S. Cl. 318—212 **8 Claims**

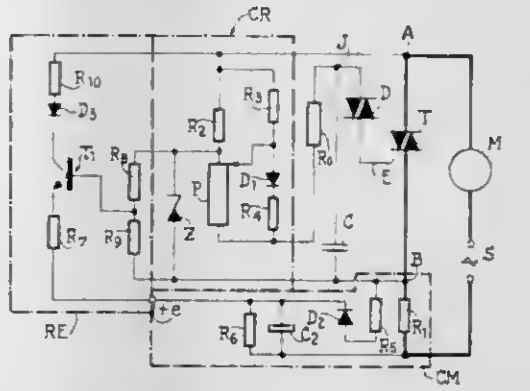


1. A brake apparatus for rotating body comprising:
a. bearing means for rotatably supporting a rotary shaft to which a load to be rotated is fixed; and
b. biasing means located near said shaft for biasing said shaft in the direction to said bearing means to cause frictional force between said shaft and bearing means so as to brake said load.

4,110,671

SPEED VARIATOR FOR A UNIVERSAL ELECTRIC MOTOR

Jean Roger, Conflans Ste Honorine, France, assignor to Aciers et Outillage Peugeot, Audincourt, France
Filed May 18, 1977, Ser. No. 797,958
Claims priority, application France, May 18, 1976, 76 14942
Int. Cl.² H02P *5/40*
U.S. Cl. 318—227 **8 Claims**



1. A speed variator for a single-phase a.c. motor comprising a triggerable silicon-controlled rectifier component having a control electrode and terminals for connection in series with said motor to an a.c. current source, a phase-shifting circuit having terminals and connected to the terminals of said rectifier component and comprising a capacitive branch and a resistive branch having a part and a regulating potentiometer having a slide and inserted in said part, said two branches having a junction connected to the control electrode of said rectifier component, a unidirectional semiconductor component responsive to voltage connected in parallel with said capacitive branch and said part of said resistive branch in which said potentiometer is inserted, said resistive branch comprising connected in parallel a first branch comprising a first resistor and said potentiometer interconnected at a junction point and a second branch comprising a second resistor and a third resistor, said second resistor and said third resistor having a point of junction connected to the slide of said potentiometer, said voltage responsive unidirectional component being connected to the point of junction between said potentiometer and said first resistor.

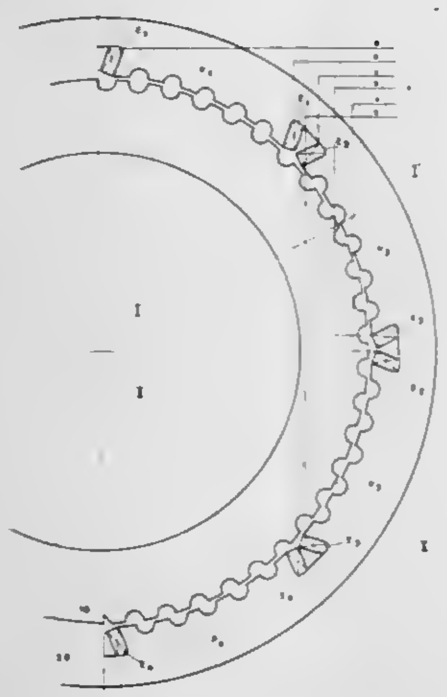
4,110,672

POSITION CODER USED WITH A MACHINE OF VARIABLE RELUCTANCE

Michel Deplante, Paris, and Didier Minesi, Saint Fargeau-Ponthierry, both of France, assignors to Engins Matra, Paris, France
Filed Apr. 9, 1976, Ser. No. 675,623
Claims priority, application France, Apr. 14, 1975, 75 11585
Int. Cl.² H02K *23/00*
U.S. Cl. 318—254 **9 Claims**

1. A shaft position coder comprising:
a stator having disposed thereon first and second exciter coils and a detector coil magnetically coupled to said first and second exciter coils;
means for applying an alternating current voltage to said first and second exciter coils electrically coupled to said exciter coils for causing said first exciter coil to induce a first polarity alternating current voltage in said detector coil and for causing said second exciter coil to induce a second opposite polarity alternating current voltage in said detector coil;
a rotor disposed in proximity to said exciter and detector coils and operative to alter the magnetic coupling between

each exciter coil and the detector coil in response to the angular position of said rotor with respect to said stator to vary the relative amplitudes of the first and second polarity voltages induced in said detector coil; and



means electrically coupled to said detector coil and responsive to the voltages induced in said detector coil for determining the relative position of said rotor and said stator.

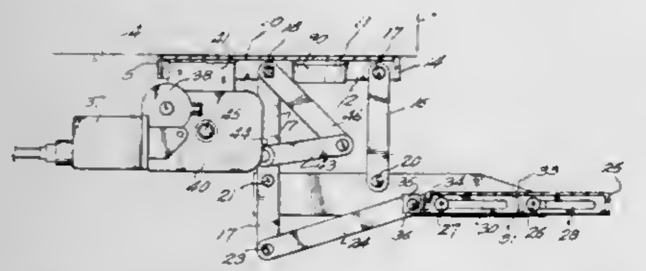
4,110,673
EXTENDABLE VEHICLE STEP AND STEP MOTOR CONTROL SYSTEM

Emery James Nagy, Yoncalla, Oreg., and Rodney A. MacDonald, Palos Verdes Est., Calif., assignors to Kwikee Enterprises, Inc., Drain, Oreg.

Filed Jul. 19, 1976, Ser. No. 706,539

Int. Cl.^{2} H02P *3/08*

U.S. Cl. 318—466 **4 Claims**



1. A positionable step for vehicles, said step comprising,
a base adapted for attachment to the vehicle,
a step extensible from a stowed position beneath the base to an extended position whereat the step is downwardly and outwardly offset from the vehicle,
step support members swingably postionable from a stowed position beneath the base,
cooperating means carried by said step and said support members and slidably supporting the step for lengthwise travel along said support members during step extension and retraction,
front and rear pairs of links coupling said step support members and said step to the base so as to permit swinging movement of the step and step support members, said rear pair of links each including lowermost arm portions imparting sliding motion to said step for travel lengthwise along said support members, and
step actuating means carried by said base including a reversible electric motor in driving connection with the rear pair of links and a motor control system operable to determine fixed intervals of motor operation constituting step extension and retraction regardless of stalling of the motor by a step obstruction, said motor control system includes semiconductor controlled rectifiers, one of said rectifiers having its cathode in a switch controlled circuit with said motor, capacitor means in circuit with said cathode of said one rectifier, said capacitor means discharging after a predetermined period to momentarily change the charge on said cathode to a negative charge thereby terminating said one rectifier operation to open said circuit to the motor after the predetermined period.

4,110,674
PROGRAMMABLE FEED CONTROL APPARATUS FOR A MACHINE TOOL

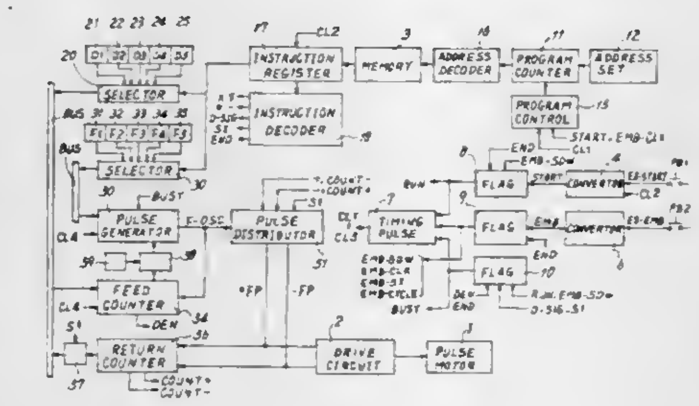
Minoru Enomoto, Handa, Japan, assignor to Toyoda-Koki Kabushiki Kaisha, Japan

Filed Dec. 7, 1976, Ser. No. 748,272

Claims priority, application Japan, Jan. 30, 1976, 51-9499

Int. Cl.^{2} G05B *19/24*

U.S. Cl. 318—571 **9 Claims**



1. A programmable feed control apparatus for moving a machine member of a machine tool comprising:
a program memory for memorizing a plurality of control data for control of a feed movement of the machine member at memory addresses thereof;
a program counter operatively connected to the program memory for reading out the control data stored in the program memory;
an instruction register operatively connected to the program memory for registering the control data designated by the program counter;
first presetting means for digitally presetting feed amounts through which the machine member is to be moved;
second presetting means for digitally presetting feed speeds of the machine member;
a feed pulse generating circuit for generating a train of feed pulses;
a first selector operatively connected to the instruction register to select one of the feed amounts designated by control data registered in the instruction register;
a second selector operatively connected to the instruction register to select one of the feed speeds designated by control data registered in the instruction register and operatively connected to the feed pulse generating circuit to load the selected feed speed thereinto to determine a frequency of the train of pulses generated from the feed pulse generating circuit;
a feed control counter operatively connected to the first selector to be loaded with the selected feed amount and operatively connected to the feed pulse generating circuit to receive the train of feed pulses to subtract the content thereof;
the feed control counter generating a signal when the content thereof becomes zero;
a drive circuit operatively connected to the feed pulse generating circuit to receive the train of feed pulses;

a servo motor operatively connected to the drive circuit for moving the machine member;
a timing pulse generating circuit for generating a set of timing pulses to enable control data stored in the program memory to be transferred;
a first flip flop set by completion of generation of a set of timing pulses from the timing pulse generating circuit to enable the feed pulse generating circuit to generate a train of feed pulses to perform a feed movement of the machine member and reset by the signal from the feed control counter upon completion of the feed movement of the machine member; and
means responsive to the operation of the first flip flop for inhibiting the timing pulse generating circuit from generating another set of timing pulses while the first flip flop is set and for enabling the timing pulse generating circuit to generate the another set of timing pulses immediately after the first flip flop is reset.

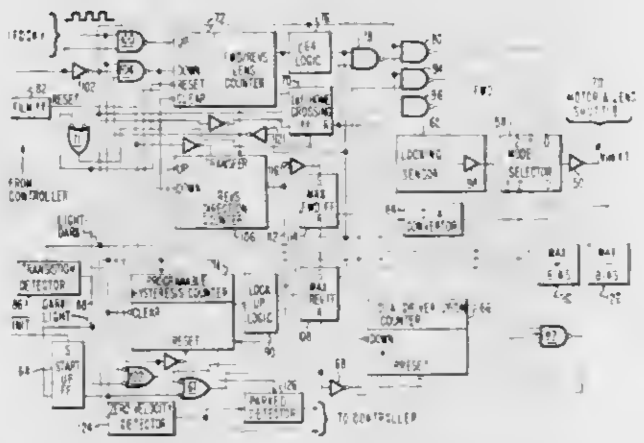
4,110,675
RETURN AND POSITION CONTROL FOR A DC SERVO SYSTEM

Daniel A. Wisner, Milan, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1977, Ser. No. 804,552

Int. Cl.^{2} G05B *1/01*

U.S. Cl. 318—606 **15 Claims**



1. An apparatus for controllably moving a load in a return mode back to a first position after being controllably moved toward a second position from the first position in a forward mode by a motor controlled by a forward control circuit to track a moving object field, the load having a displacement resulting from moving from the first position toward the second position, said apparatus comprising:
sensing means for sensing the displacement of the load by generating a feedback signal at predetermined intervals along said displacement in both of said forward and return modes;
detecting means for detecting the passage of said moving object field to provide a return signal after the object field has passed a predetermined position;
driving means for controllably moving the load back towards the first position in the return mode in response to said return signal, said driving means including the motor for supplying said moving force, the motor moving the load to the second position in the return mode after responding to said return signal to define an overshoot displacement; and
return home circuit means repsonsive to the difference in the number of feedback signals in the forward mode and the current number of feedback signals in the return mode for providing an energizing bias signal to said driving means to cause said driving means to move the load back to the first position.

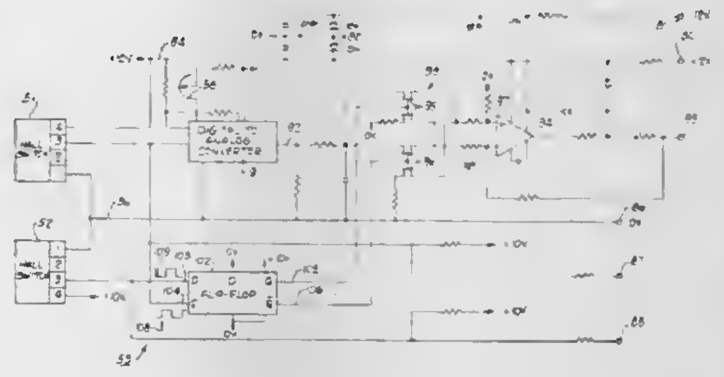
4,110,676
DYNAMOELECTRIC MACHINE AND TACHOMETER

John D. Edick, Wickliffe, and Kenneth A. Ostrander, Columbus, both of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 30, 1976, Ser. No. 718,798

Int. Cl.^{2} G01P *3/42;* H02K *21/12, 16/00*

U.S. Cl. 322—31 **13 Claims**



1. A combined dynamoelectric machine and tachometer enclosed within a single frame, comprising in combination,
an end bracket forming a part of said frame and surrounding a rotatable shaft of the machine,
wall means defining recess means in said end bracket,
a tachometer rotor mounted within said recess means and connected to be rotated in accordance with rotation of said shaft of the machine,
said tachometer rotor having a plurality of magnetic poles,
magnetically responsive first and second transducer means having an electrical output,
means mounting both said transducer means in said recess means close to said magnetic poles of said rotor to be magnetically actuated by rotation of said tachometer rotor,
means including said rotor and both said transducer means to sense direction as well as rotational speed of said tachometer rotor,
said second transducer means being mounted in a position spaced from said first transducer means by a distance $p(n + \frac{1}{2})$, where n is any integer and p is the pole pitch between adjacent north and south poles,
said direction sensing means including a D flip-flop,
one transducer means being connected to the clock input of said flip-flop and the other transducer means being connected to the data input of said flip-flop,
and amplifier means connected to the Q and Q outputs of said flip-flop to establish a negative or a positive output from said amplifier in accordance with first and second directions of rotation of the machine, respectively.

3. A tachometer stator for use with a tachometer rotor having a given radius and having magnetic poles, said stator comprising, in combination,
a base,
a transducer having an operating surface and mounted on said base,
speed signal processing circuitry mounted on said base and having an input connected to said transducer,
terminal means on said base for a speed signal output from said processing circuitry and for power supply input to said processing circuitry,
a calibration device on said base connected to calibrate said speed signal output,
and an externally accessible adjustment on said calibration device.

4,110,677

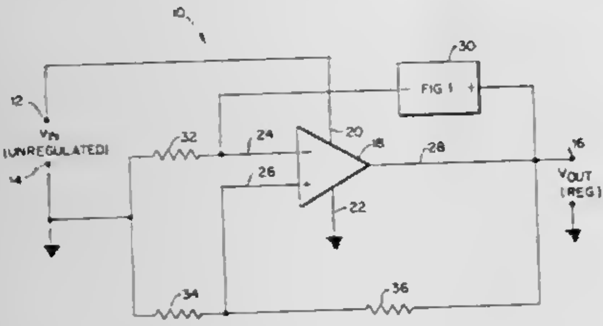
OPERATIONAL AMPLIFIER WITH POSITIVE AND NEGATIVE FEEDBACK PATHS FOR SUPPLYING CONSTANT CURRENT TO A BANDGAP VOLTAGE REFERENCE CIRCUIT

Attila D. Boronkay, Santa Ana, and Charles G. Axen, Irvine, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 772,371, Feb. 25, 1977, abandoned. This application Oct. 12, 1977, Ser. No. 841,411

Int. Cl.^{2} G05F *1/58*

U.S. Cl. 323—19 **2 Claims**



2. A voltage regulating circuit comprising:

an operational amplifier having an inverting input terminal, a noninverting input terminal, an output terminal, and a pair of supply voltage receiving terminals;

means for connecting said supply voltage receiving terminals to a source of unregulated supply voltage;

a two terminal, essentially zero temperature coefficient, bandgap voltage reference circuit;

means for connecting said voltage reference circuit in a negative feedback path between said output terminal and said inverting input terminal;

a voltage divider network having first and second resistive sections;

means for connecting said network between said output terminal and one of said supply voltage receiving terminals for establishing a voltage thereacross;

means connecting a junction of said resistive sections to said noninverting input terminal for establishing a positive feedback path between said output terminal and said noninverting input terminal, the relative resistance values of said resistive sections establishing a regulated output voltage level at said output terminal; and

resistance means connected between said one supply voltage terminal and a junction of said voltage reference circuit and said inverting input terminal for establishing a constant current flow in said negative feedback path through said voltage reference circuit.

4,110,678

ELECTRONIC MONITORING SYSTEM

Robert Buck, Kirchbühlweg 128, 7995 Neukirch, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,400

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613423

Int. Cl.^{2} G05F *1/56;* **H01H** *36/00*

U.S. Cl. 323—22 SC **7 Claims**

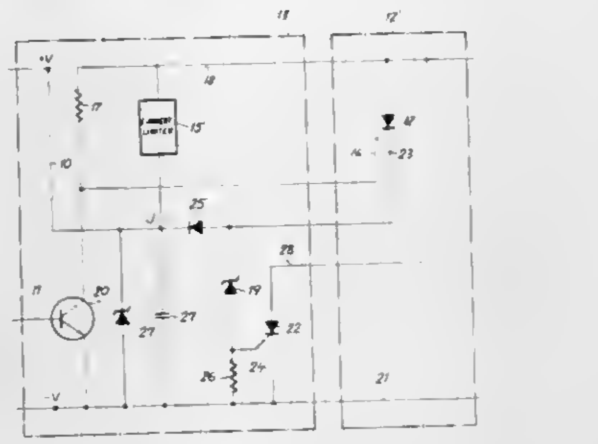
1. An electronic monitoring system comprising:

detector means sensitive to an ambient condition for generating an output signal varying with a change in said condition, said detector means being provided with a pair of power-input terminals;

a supply network including a storage capacitor connected across said power-input terminals, a pair of leads connected across a source of direct current in series with a load, and a current-limiting device connected across said leads in series with said storage capacitor;

a first binary electronic three-electrode switch having a pair of main electrodes respectively connected directly to said leads and further having an input electrode; and

an operating circuit for said first binary switch inserted between one main electrode and said input electrode thereof, said operating circuit including a second binary electronic three-electrode switch with input circuitry connected to said detector means for changing the conductivity of said first binary switch in response to variations in said output signal, thereby modifying the energization of said load, said operating circuit further including a Zener diode inserted in series with said second binary switch between one of said main electrodes and said input electrode of said first binary switch, said Zener diode becoming conductive upon a triggering of said second binary switch by said detector means to fire said first binary switch.



4,110,679

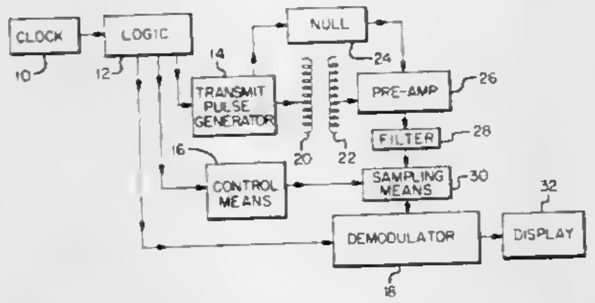
FERROUS/NON-FERROUS METAL DETECTOR USING SAMPLING

George C. Payne, Tempe, Ariz., assignor to White's Electronics, Inc., Sweet Home, Oreg.

Continuation-in-part of Ser. No. 526,678, Nov. 25, 1974, Pat. No. 4,030,026. This application Jun. 9, 1977, Ser. No. 805,025

Int. Cl.^{2} G01V *3/10*

U.S. Cl. 324—3 **15 Claims**



1. A metal detector for detecting and distinguishing between ferrous and non-ferrous metal objects in an area which may contain ferrous mineralized soil comprising:

transmit coil means;

receive coil means electromagnetically coupled to said transmit coil means by said area such that a current central flowing in said transmit coil means causes a corresponding voltage to be induced in said receive coil means;

transmit pulse generator means electrically connected to said transmit coil means for generating transmit current pulses and applying said current pulses to said transmit coil means, said transmit pulses being provided as groups of pulses, each group including a pulse of a first polarity followed by at least two pulses of a second and opposite polarity;

sampling means electrically connected to the output of said receive coil means, for sampling two receive voltage pulses corresponding to the voltage pulses induced in said receive coil means by the application of said two current pulses to said transmit coil means;

control means electrically connected to said sampling means for adjusting the time of sampling of each of the two receive voltage pulses such that when no metal objects are present in said area, the two sampled voltage levels of said two voltage pulses are substantially equal; and

output means electrically connected to the output of said sampling means for determining from the two sampled voltage levels of said two receive signals when a ferrous metal object is present in said area and indicating the presence of such ferrous metal object.

4,110,680

METHOD AND APPARATUS FOR MEASURING THE QUANTITY OF A FLUID FLOWING THROUGH A PIPE BY MEANS OF NUCLEAR MAGNETIC SPIN RESONANCE

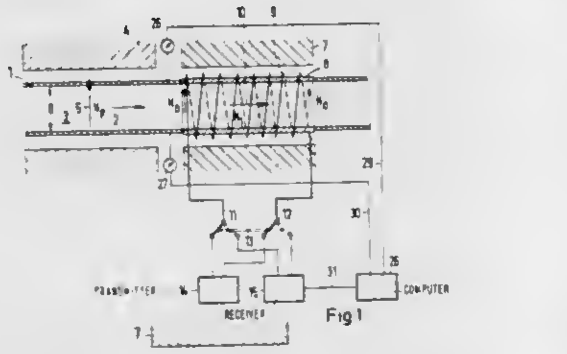
Wilfried Bergmann, Erlangen, and Berthold Knüttel, Rheinstetten-Mörsch, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Jan. 9, 1976, Ser. No. 647,703

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1975, 2501794

Int. Cl.^{2} G01R *33/08*

U.S. Cl. 324—0.5 B **11 Claims**



1. A method of measuring the quantity of a flowing fluid through the use of nuclear magnetic spin resonance which comprises passing a fluid containing magnetizable nuclei and having portions of different flow velocities through a pipe of at least partially non-magnetic electrically insulating material; applying a direct-current magnetic field to the fluid at one given location of the pipe to align the nuclei spin axes thereof; applying an alternating-current magnetic field to the fluid at the one given location of the pipe to synchronize the nuclei; and determining the course in time of the nuclear magnetization at the one given location of the pipe, correlating the differential of the course in time to the flow velocity of isochronous flow groups which, together, fill the entire flow cross section of the pipe at the beginning of the determined course in time, the sum of the products of the flow velocity and the corresponding instantaneous values of the course in time of the nuclear magnetization providing a measure for the mass flow density of the fluid.

4,110,681

NMR FIELD FREQUENCY LOCK SYSTEM

Donald C. Hofer; Vincent N. Kahwaty, both of Poughkeepsie, and Carl R. Valentino, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,142

Int. Cl.^{2} G01R *33/08*

U.S. Cl. 324—0.5 A **9 Claims**

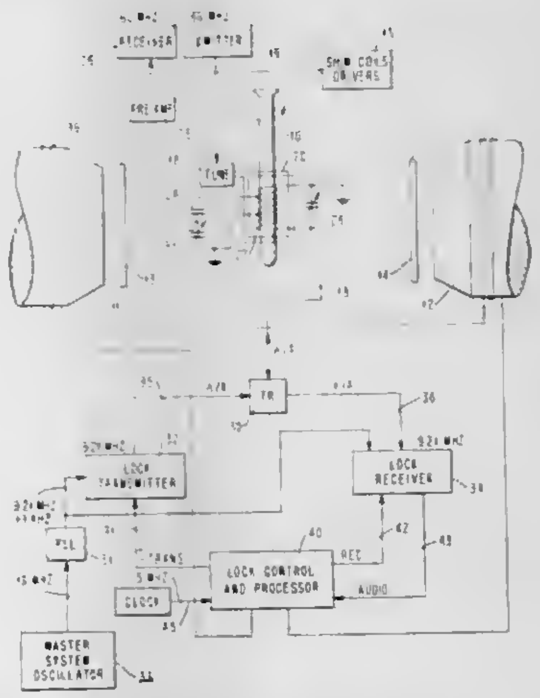
1. In an NMR spectrometer comprising a permanent magnet providing a magnetic field for polarizing a control sample and a test sample, and a field coil for varying the intensity of the magnetic field, the combination comprising:

means for periodically applying a pulse modulated RF magnetic field to excite said control sample at a resonant frequency, said pulse modulated RF magnetic field having a frequency offset from said resonant frequency of said control sample to periodically produce free induction decay signals each having a period of oscillation;

means for detecting said free induction decay signals;

means for measuring said period of each of said decay signals comprising

means for converting each said decay signal into digital representations thereof including values that cyclically cross a zero axis,



digital means for detecting when said values have crossed said zero axis a predetermined number of times,

and digital timing means operable concurrently with operation of said last mentioned detecting means for providing digital indications of the amount of time it takes to cross said zero axis said predetermined number of times, said indications being proportional to the length of said periods;

and means responsive to said indications for varying said current in said field coil, when each said indication differs from a predetermined value, so as to tend to maintain said periods at a predetermined constant value.

4,110,682

WELL LOGGING APPARATUS WITH PAD-MOUNTED ARRAY OF VERTICAL ELECTRODES OF DIFFERENT LENGTHS FOR MEASURING THE RESISTIVITY OF THE FLUSHED ZONE

Jacques Rene Tabanou, Chevreuse, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

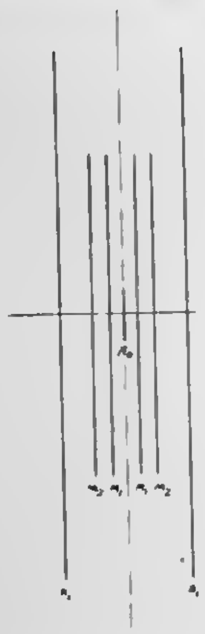
Filed Jun. 10, 1977, Ser. No. 805,240

Int. Cl.^{2} G01V *3/18, 3/06*

U.S. Cl. 324—10 **3 Claims**

1. An electrode-carrying pad member suitable for engaging the wall of a borehole to investigate the adjacent formations, comprising an array of linear electrodes substantially parallel to each other, with a central electrode and first, second and third pairs of electrodes respectively short-circuited and symmetrically located with respect to the central electrode at respecting increasing distances from the central electrode, the central electrode being substantially shorter than the elec-

trodes of the third pair, and the electrodes of the first and second pairs having substantially the same length comprised between the length of the central electrode and that of the electrodes of the third pair.



4,110,683

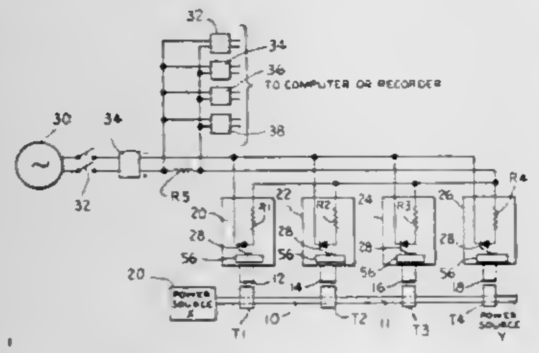
APPARATUS INCLUDING A PLURALITY OF SPACED TRANSFORMERS FOR LOCATING SHORT CIRCUITS IN CABLES

Robert L. Cason, Cape Canaveral, and John J. McStay, Titusville, both of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 8, 1977, Ser. No. 814,004

Int. Cl.^{2} G01R ***31/08, 19/16***

U.S. Cl. 324—52 **4 Claims**



1. An apparatus for monitoring faults such as grounding in an electrical power cable which produce an abnormally high current in that portion of said cable extending between a power supply connected to one end of said cable and the point where said cable is grounded, said apparatus comprising:

(a) a power supply,
(b) a resistive element connected to said power supply,
(c) a plurality of current transformers spaced at predetermined points along said cable and coupled thereto for sensing current flowing through said cable,
(d) trigger circuit means connected to each of said current transformers for increasing the voltage drop across said resistive element a predetermined amount responsive to an abnormally high current flowing through the current transformer that it is connected to,
(e) said trigger circuit means including,
  (i) a resistor, and
  (ii) means for placing said resistor in series with said resistive element responsive to an abnormally high current flowing through the respective transformer to which the respective trigger circuit is connected, and
(f) means for measuring the voltage drop across said resistive element for determining the number of current transformers said abnormally high current flows through,

whereby the location of said grounded point of said cable can be determined from the magnitude of said voltage drop across said resistive element.

4,110,684

METHOD OF DETECTING FAULTS ON LOW VOLTAGE DISTRIBUTION ELECTRIC CABLES UTILIZING A PLURALITY OF TRANSIENT RECORDERS

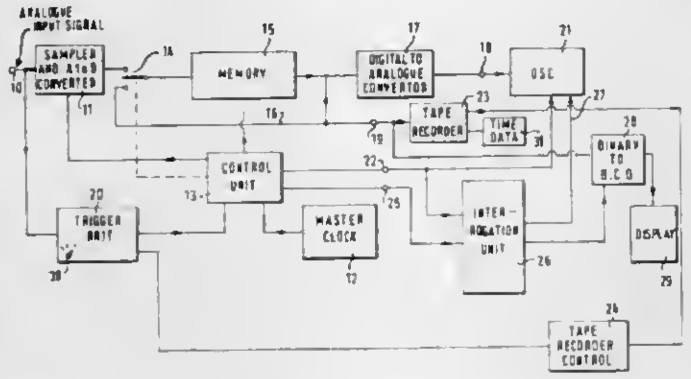
Philip Franklin Gale, Mold, Wales, assignor to The Electricity Council, England

Filed Mar. 21, 1977, Ser. No. 779,435

Claims priority, application United Kingdom, Mar. 22, 1976, 11484/76

Int. Cl.^{2} G01R ***31/08, 19/16***

U.S. Cl. 324—52 **3 Claims**



1. A method of detecting a transitory or non-persistent fault in an electric cable carrying a low frequency electric current comprising, at each of a number of spaced points along the cable, sensing the transient changes in the voltage waveform between a pair of conductors using a filter for rejecting said low frequency, utilising the sensed transient at each of said second points to trigger a transient recorder at that point to record the voltage on said cable over a predetermined period having a duration of a few cycles at said low frequency both immediately before and immediately after the sensing of said transient changes, each of the recorders including an analogue-to-digital converter and having means for holding the digital output, and simultaneously recording time reference data in each recorder whereby the information recorded by the separate recorders is correlatable, and subsequently interrogating the recorded data to determine the amplitudes of the waveforms at corresponding time instants at the various spaced points, and determining the location of the fault on the cable from the voltage gradient.

4,110,685

STANDING WAVE RATIO MEASUREMENT INSTRUMENT

Virgil G. Leenerts, 1007 W. 30th St., Loveland, Colo. 80537

Filed Nov. 1, 1976, Ser. No. 738,163

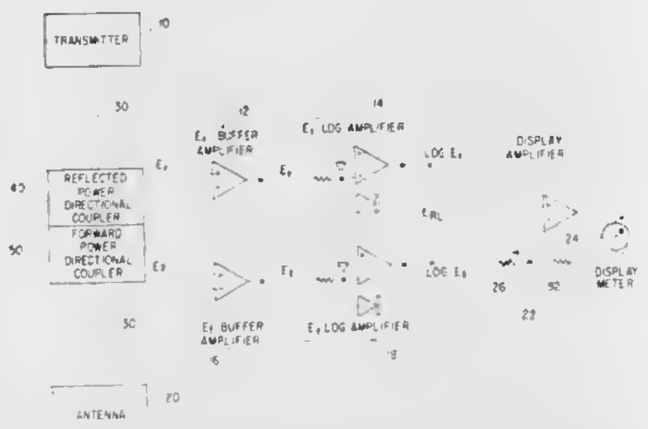
Int. Cl.^{2} G01R ***27/04***

U.S. Cl. 324—58 B **8 Claims**

1. In a radio frequency power transmission system in which radio frequency power is transferred from a source to a load via a transmission line, the combination comprising:

directional coupler means connected along the transmission line for producing a first voltage indicative of the forward power conveyed by the transmission line and for producing a second voltage indicative of the reflected power conveyed by the transmission line;

logarithmic amplifier means for receiving the first and second voltages and for producing a third voltage that is proportional to the difference between the logarithm of the first voltage and the logarithm of the second voltage; and



analog display means connected to the logarithmic amplifier means for receiving the third voltage and for providing a visual indication of return loss to the user.

4,110,686

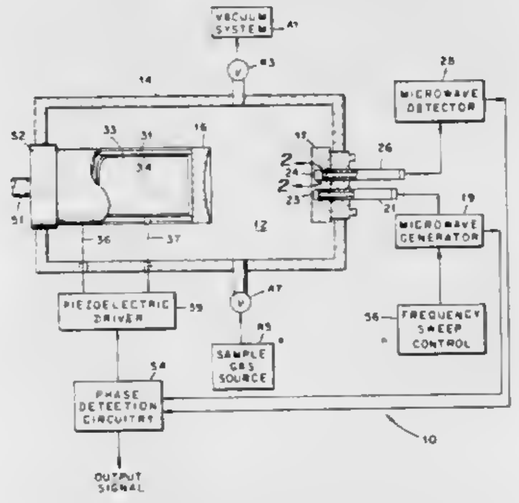
PIEZOELECTRIC-TUNED MICROWAVE CAVITY FOR ABSORPTION SPECTROMETRY

Branko Leskovar, Moraga, Calif.; Harold T. Buscher, Orlando, Fla., and William F. Kolbe, Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1977, Ser. No. 825,503

Int. Cl.^{2} G01R ***27/04***

U.S. Cl. 324—58.5 C **9 Claims**



1. A tuning device including a microwave cavity for continuously and rapidly tuning the cavity over a wide range of frequencies in synchronism with frequency modulations of microwave energy applied to the cavity, for detecting the presence of a particular gas in a gas sample in the cavity by absorption of microwave energy by the particular gas at its absorption frequency, said tuning device including:

first and second opposing walls defining the cavity; and

a piezoelectric transducer for moving said first wall with respect to said second wall to maintain the cavity in continuous resonance with the applied microwave energy during frequency modulation of the microwave energy.

4,110,687

DUAL THRESHOLD LOGIC PROBE

James W. Sneed, Jr, c/o Kurz-Kasch, Inc., 1501 Webster St., P. O. Box 1246, Dayton, Ohio 45401

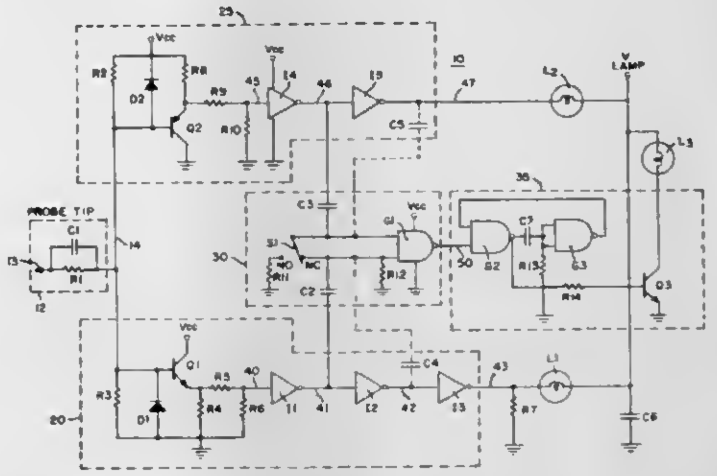
Filed Aug. 24, 1977, Ser. No. 827,301

Int. Cl.^{2} G01R ***19/16, 31/02***

U.S. Cl. 324—133 **6 Claims**

1. In a logic probe having circuit means for energizing a first lamp to indicate a logic high condition when the voltage applied to an input tip of the probe is above a first predetermined level, for energizing a second lamp to indicate a logic low condition when the voltage on the probe is below a second predetermined level, and for energizing a third lamp to indicate a pulse or transition of voltage from one logic condition to another,

wherein the improvement comprises



means responsive to the voltage on said input tip for providing an output only when the voltage on said tip transitions from one logic condition to another through both of said predetermined voltage levels within a predetermined period of time, and

means responsive to said output for controlling the operation of said third lamp to indicate said transition across both predetermined voltage levels.

4,110,688

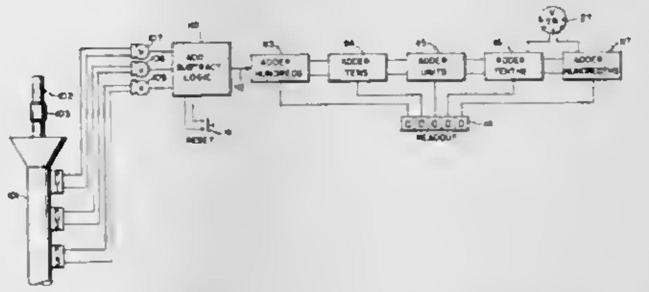
METHOD AND APPARATUS FOR PIPE JOINT LOCATOR, COUNTER AND DISPLACEMENT CALCULATOR

John M. Bailey, Houston, Tex., assignor to Monitoring Systems, Inc., Thibodaux, La.

Filed Sep. 20, 1976, Ser. No. 724,729

Int. Cl.^{2} G01R ***33/12***

U.S. Cl. 324—208 **11 Claims**



1. Apparatus for counting pipe joints passing through a drill hole bell nipple going either downhole or uphole comprising in combination:

a. a plurality of sensor means for sensing at spaced apart positions along and externally of said bell nipple the passage of pipe joints downhole and uphole past said sensor means,
b. logical means for logically determining the direction of pipe joint travel in circuit with and triggered by signals from said sensor means spaced along said bell nipple to develop plus signal counts for downhole going joints and minus signal counts for uphole going joints,
c. joint counter means in circuit with said logical means for adding a plus signal each time a joint is sensed going downhole, and
d. means in circuit with said logical means for subtracting a count from said joint counter means each time a joint is

sensed coming uphole in response to said minus signal count, and

e. stand counter means in circuit with said logical means for converting the joint count to a stand count using said plus and minus signal counts.

4,110,689

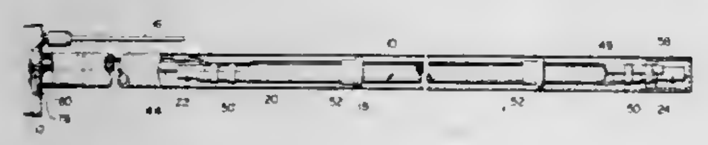
MAGNETIC DETECTING APPARATUS WITH NOVEL MEANS FOR POSITIONING SENSOR ASSEMBLY IN A HOUSING

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Continuation of Ser. No. 542,084, Jan. 17, 1975, abandoned, which is a division of Ser. No. 303,598, Nov. 3, 1972, Pat. No. 3,894,283. This application Jan. 4, 1977, Ser. No. 757,124

Int. Cl.^{2} G01R *33/04*

U.S. Cl. 324—254 **4 Claims**



1. Magnetic detecting apparatus comprising housing means having a first portion containing a circuit chassis fixed therein and having an elongated tubular portion extending from said first portion, a sensor assembly in said tubular portion and including an elongated tubular support extending along said tubular portion and first and second magnetic sensor units, each sensor unit including a tubular housing with first and second end discs and a hollow magnetic core extending between the first and second end discs of the sensor unit, said elongated tubular support having a notch extending longitudinally at each end of the support and open laterally of the support, each sensor unit being fitted into a corresponding notch with its tubular housing and its core extending longitudinally of the support and being fixed to the support, and a stiff excitation conductor extending from said first portion of said housing means successively through the first end disc, the core, and the second end disc of the first sensor unit and the first end disc, the core, and the second end disc of the second sensor unit, and then back to said first portion of said housing means, said stiff excitation conductor being fixed to said sensor assembly by a first bend in said conductor externally adjacent to a first end disc of a sensor unit and a second bend in said conductor externally adjacent to a second end disc of a sensor unit, the position of said sensor assembly in said tubular portion of said housing means being fixed by positioning means between said assembly and said tubular portion and by connection of said stiff excitation conductor to said chassis.

4,110,690

CHANNEL SELECTING DEVICE

Takao Kakigi, Inagi, Japan, assignor to Cybernet Electronic Corporation, Kanagawa, Japan

Filed Jan. 7, 1977, Ser. No. 757,671

Claims priority, application Japan, Jan. 16, 1976, 51/4127; Feb. 4, 1976, 51/12348; Feb. 14, 1976, 51/16535

Int. Cl.^{2} H04B *1/40*

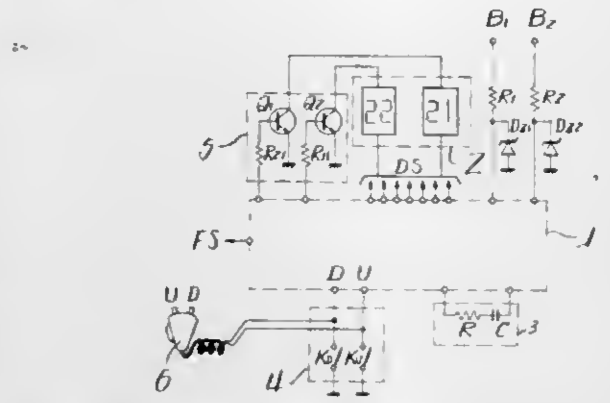
U.S. Cl. 325—25 **3 Claims**

1. In a transceiver for transmission and reception over a radio channel, a channel selecting device comprising:

display means for indicating a selected channel number;

actuatable logic means for shifting the channel number at a variable rate during a first time interval and at a fixed rate thereafter and generating instruction signals to control the display means;

channel selection means for actuating the logic means and controlling the shifting rate during the first time interval; and



time constant means for establishing the length of the first time interval.

4,110,691

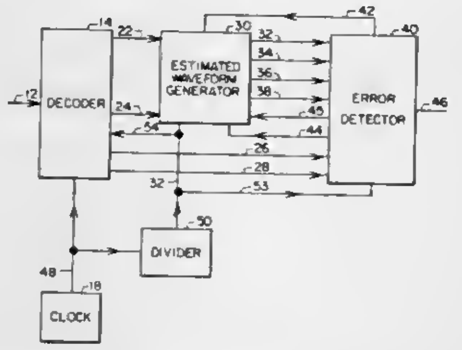
APPARATUS AND METHOD FOR DETECTING ERRORS IN A 7-LEVEL CORRELATIVE SIGNAL

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Mar. 14, 1977, Ser. No. 777,485

Int. Cl.^{2} H04L *1/10*

U.S. Cl. 325—41 **8 Claims**



1. At a receiver, apparatus for detecting errors in a 7-level correlative signal, C, which comprises:

means for deriving from the 7-level signal a pair of binary signals in parallel form;

means for operating on said pair of binary signals to derive in binary form an estimate, $\hat{C}$, of a correlative 7-level signal in accordance with the following relation:

$$\hat{C} = \hat{B} - \Delta^2 \hat{B} \text{ (algebraic)}$$

where $\hat{B}$ represents the present digits in binary form;

$\Delta^2 \hat{B}$ represents the past digits in binary form; and

Δ represents a delay of 2 T seconds and 1/T is the digit rate in digits/second;

means for determining if the top and bottom levels of C and $\hat{C}$ occur at the same time; and

means for providing an error output signal when $C \neq \hat{C}$ during the occurence of a top or bottom level of C.

4,110,692

AUDIO SIGNAL PROCESSOR

Bortolo Mario Pradal, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,404

Int. Cl.^{2} H04B *1/66*

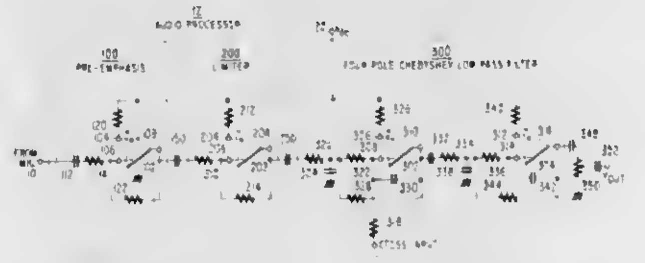
U.S. Cl. 325—147 **6 Claims**

1. In an audio processor for use in a direct frequency modulation system responsive to an input signal having components at a plurality of frequencies within a predetermined band of audio frequencies, said audio processor being of the type including preemphasis means, responsive to said input signal, for shaping the magnitude of preselected ones of said input signal frequency components in accordance with a predetermined transfer function, said transfer function having a predetermined upper cut off frequency of preemphasis; limiting means, responsive to said shaped audio signal for limiting the maximum voltage swing of said shaped audio signal; and filter means, responsive to said limited signal for attenuating components of said limited signal having frequencies outside of a predetermined range of frequencies; the improvement wherein;

said preemphasis means comprises a shaping network having a transfer function with an upper cut off frequency of preemphasis above the highest frequency of said predetermined band of audio frequencies to provide an attenuation characteristic that decreases substantially at a constant logarithmic rate with increasing frequency across said predetermined audio frequency band,

said limiting means including a Norton type of operational amplifier characterized by inventing and non-inverting current responsive inputs biased by a single source using the current mirror type operation and by the collector load of a difference current amplifier being a constant current source, said operational amplifier having a value of feedback resistance and bias resistance selected to provide symmetrical clipping,

said filter means being a Chebychev type filter having a generally equal amplitude but ripple response over said predetermined band with a steep slope cut off with one of the response peaks being located near the highest frequency of said predetermined band.



4,110,693

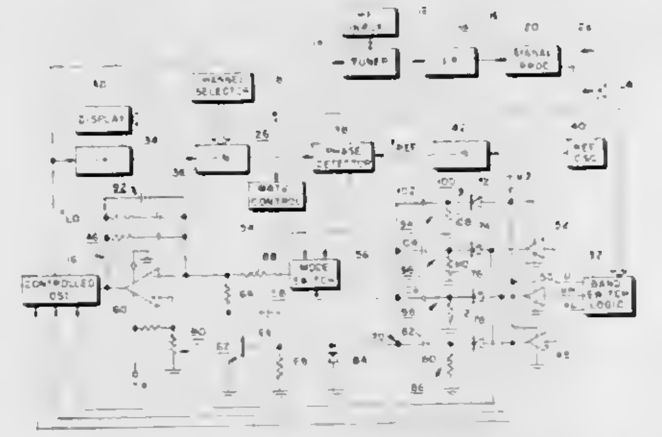
LOCKUP INHIBITING ARRANGEMENT FOR A PHASE LOCKED LOOP TUNING SYSTEM

Wayne Wheeler Evans, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,107

Int. Cl.^{2} H04N *5/50;* H04B *1/26*

U.S. Cl. 325—419 **16 Claims**



1. Apparatus for tuning a receiver to various tuning positions comprising:

controlled oscillator means for generating a local oscillator signal having its frequency controlled in response to a control signal, said local oscillator signal having an amplitude also controlled in response to said control signal;

first divider means for dividing the frequency of said local oscillator signal to generate a first frequency divided local oscillator signal, said first divider means being susceptible to oscillating and thereby generating a spurious signal;

phase locked loop means including second divider means for dividing the frequency of said first frequency divided local oscillator signal by a factor determined by a selected one of said tuning positions to generate a second frequency divided local oscillator signal and for generating said control signal in response to the phase and frequency relationship between said second frequency divided signal and a reference frequency signal, said phase locked loop means undesirably responding to said spurious signal rather than to said first frequency divided local oscillator signal when the amplitude of said local oscillator signal falls below a predetermined amplitude; and

lockup inhibiting means for temporarily presetting said control signal to a predetermined level to cause the amplitude of said local oscillator signal to exceed said predetermined amplitude in response to an occurrence of at least one predetermined operating condition of said tuning apparatus during which the operation of said controlled oscillator means is initiated and during which the amplitude of said local oscillator signal would otherwise be below said predetermined amplitude and thereafter permitting said control signal to be normally controlled by said phase locked loop means.

4,110,694

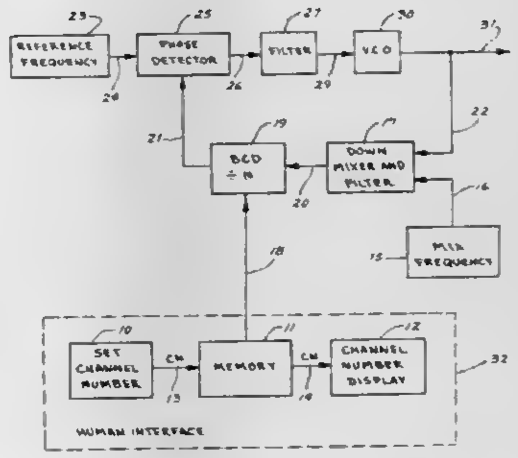
CHANNEL NUMBER INTERFACE

Gary L. Wilhelm, Waseca, Minn., assignor to Warren A. Sturm, Minneapolis, Minn.

Filed Oct. 10, 1975, Ser. No. 621,364

Int. Cl.^{2} H04B *1/06;* H03B *3/04*

U.S. Cl. 325—464 **3 Claims**



1. Digital synthesizer for providing a frequency reference in communications apparatus of the class wherein the nominal frequency of operation is expressed in terms of numbers for the synthesized frequencies of operation comprising:

a. a source of reference frequency;

b. phase detecting means connected to said source of reference frequency;

c. means including a filter and a voltage controlled oscillator connecting an output of said phase detecting means to an output terminal;

d. a down mixer and filter means connected to said output terminal;

e. a mix frequency source means connected to said down mixer;

f. a binary coded decimal divide by N divider means connected between said down mixer and filter means and said phase detecting means;

g. a memory means connected to said BCD divide by N divider means, and;

h. a source of number input means connected to an input of said BCD divide by N means whereby such particular numbered input of said numbered input means corresponds to a particular channel related frequency number, and the down mixer and filter means in addition to said source of mix frequency permits the choice of N for said BCD divide by N divider means so that the lower order bits of said BCD divide by N divider means are equal to said channel numbers.

4,110,695
TUNING CIRCUIT FOR HIGH FREQUENCY RECEIVERS

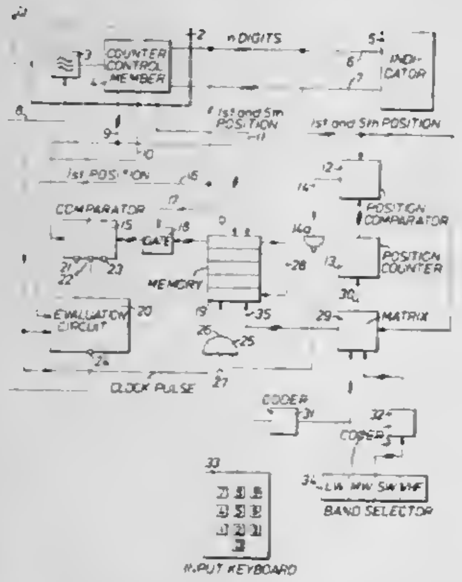
Otto Klank, Arpke; Dieter Rottmann, Hanover, and Stephan Wuttke, Laatzen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 26, 1976, Ser. No. 708,754

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533072

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—464 **38 Claims**



1. In a tuning circuit for a high frequency receiver, which circuit includes a voltage controllable superheterodyne oscillator arranged to receive a control voltage and to produce an oscillation whose frequency is determined by the value of the control voltage and determines the broadcast frequency to which the receiver is tuned, a counter connected to sense the frequency of the oscillations being generated by the oscillator and to produce therefrom, at an output of the counter, a count state in the form of representations of the digits of a first decimal number identifying the broadcast frequency to which the receiver is currently tuned, input means for generating representations of the digits of a second decimal number identifying the broadcast frequency to which it is desired to tune the receiver, the input means having an output at which the representations of the second decimal number digits appear, and a comparison circuit for comparing the decimal number representations being produced by the counter and the input means to vary the control voltage in a direction to cause the number representation produced by the counter to coincide with the number representation generated by the input means, the improvement wherein said comparison circuit comprises: a single comparator having first and second inputs and capable of comparing, at one time, only the representations of one digit of each of two numbers; and time multiplex means interconnecting the output of said counter, the output of said input means and said comparator inputs, for delivering to said first comparator input, in succession, each digit representation produced by said counter, starting with the most significant digit, and for delivering, simultaneously therewith to said second comparator input, each digit representation of corresponding significance generated by said input means.

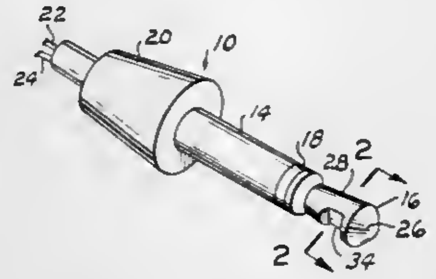
4,110,696
AUDIO ECCENTRIC CONNECTOR PLUG

Emett O. Meeks, P.O. Box 10493 Oklahoma City, Okla. 73110

Filed Jan. 10, 1977, Ser. No. 758,362

Int. Cl.^{2} H04B *1/10;* H01R *13/20, 13/54*

U.S. Cl. 325—480 **5 Claims**



1. An audio signal connector plug for use with a mating jack having separable contacts, comprising:

a plug body;
a cylindrical contact connected at one end with said body;
a tip end contact coaxially connected longitudinally with the other end of said cylindrical contact,
  said tip end contact having a circumferential surface converging toward the longitudinal axis of said cylindrical contact,
  said tip end contact having a longitudinal and transverse recess formed in its converging surface, the depth of the recess being no greater than the radius of the tip end contact whereby when said plug is inserted into said mating jack, said cylindrical contact and said tip end contact engage said jack contacts without separating the latter by the recess nesting one of said jack contacts when said plug body is in one angular position and separates said separable jack contacts when rotated to another angular position;
electrical insulating means separating said contacts;
a pair of conductors extending through said body and connected with the contacts and,
an audio signal filter connected with said conductors opposite said contacts.

4,110,697
DIGITAL BYPASSABLE REGISTER INTERFACE

Dwight R. Wilcox, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

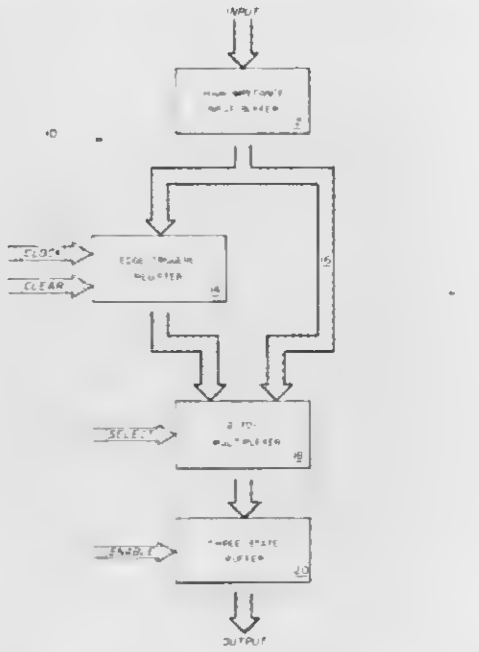
Filed Feb. 22, 1977, Ser. No. 770,333

Int. Cl.^{2} H03K *17/02*

U.S. Cl. 328—154 **9 Claims**

1. An interface for transmitting data in either a clock edge triggered synchronous transmission mode or an asynchronous tranmission mode comprising:

input means for receiving a series of digital data;
an edge triggered register connected to said input means and including an input for receiving clock pulses;
conducting means connected to said input means for providing a bypass path around said edge triggered register;
output means for outputting digital pulses;
a two-to-one multiplexer means having inputs connected to said edge triggered register and to said conducting means for selectively connecting the output of either said edge triggered register or said conducting means to said output means.



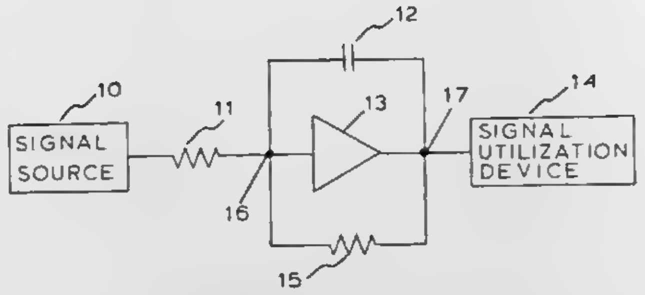
4,110,698
DIGITAL WAVEFORM CONDITIONING CIRCUIT

Adelore F. Petrie, 7 W. Lillian, Arlington Heights, Ill. 60004

Filed Jan. 21, 1977, Ser. No. 761,470

Int. Cl.^{2} H03K *5/01*

U.S. Cl. 328—164 **4 Claims**



1. A digital waveform conditioning circuit for removing extraneous noise and switching transients for use in a digital electronic system in which information is conveyed as signals having predetermined logic states, said signals being subjected to extraneous noise and switching transients which tend to produce undesired reactions within said system, said circuit comprising:

signal buffer amplifier means having a gain of more than one, responsive to applied signals, producing output signals having the same polarity as the applied signals, said signal buffer amplifier means including a noninverting buffer amplifier having an input terminal and an output terminal; and
feedback means, coupled to said signal buffer amplifier means, combining the functions of integrating said applied signals and adding a portion of said output signal to said applied signals, said feedback means including a capacitor coupled between said input and output terminals, said feedback means including a series resistor coupling said input terminal to said information system;
whereby said amplifier means is operating in the switching mode with said feedback means ensuring abrupt changes between logic states in said output signals.

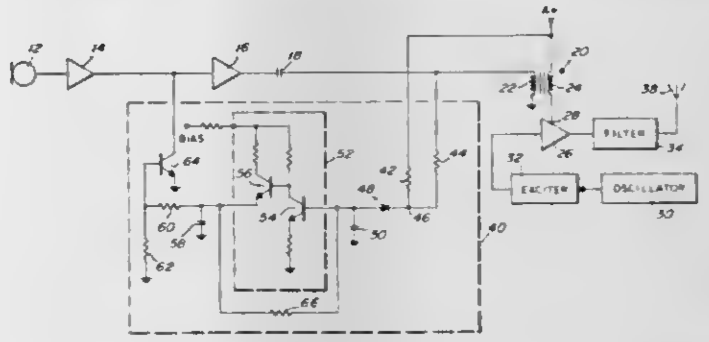
4,110,699
ADAPTIVE AUDIO COMPRESSOR

Charles William Bethards, Schaumburg, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,505

Int. Cl.^{2} H03B *3/02;* H03K *1/14*

U.S. Cl. 328—168 **7 Claims**



1. A signal processing means, responsive to a DC voltage, for processing AC signals comprising:

an amplifier means having an input, for receiving the AC signals, and an output, the amplifier producing amplified input signals at its output;
attenuator means for controlling the level of AC signals at the amplifier input responsive to a control signal;
a first sensing means for sensing the DC voltage and developing a signal representative thereof;
a second sensing means for sensing the level of the AC signal produced at the amplifier output and developing a signal representative thereof;
a control signal means for sensing the signals developed by the first and second means and producing a predetermined control signal in response thereto, said control signal means including an amplifier, having a predetermined reference bias voltage, coupled between the first and second sensing means and the attenuator means, the amplifier controlling the attenuator means to provide minimal attenuation of the amplifier means input signals for control signals having a first predetermined relationship to said reference bias voltage, the amplifier increasing the attenuation of the amplifier means input signals for control signals having a second predetermined relationship to said reference bias voltage; and
means for coupling the produced control signal to the attenuator means,
said control signal causing predetermined attenuation of the input AC signal such that the ratio of the amplitude of the AC signal at the amplifier output to the DC voltage level is maintained at a substantially constant level.

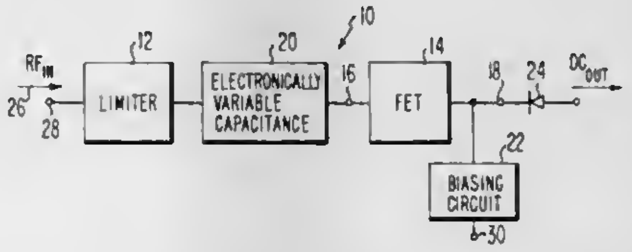
4,110,700
ELECTRONICALLY TUNABLE MICROWAVE FREQUENCY FET DISCRIMINATOR

Arye Rosen, Cherry Hill, and Edward Mykietyn, West Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,211

Int. Cl.^{2} H03D *3/26*

U.S. Cl. 329—103 **14 Claims**

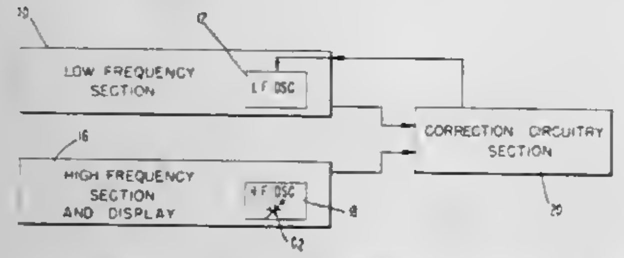


1. A microwave frequency discriminator comprising:

a transistor amplifier including a field effect transistor having first, second and third electrodes, said transistor amplifier having an output port, and an input port for receiving an input RF signal of substantially constant power level, said transistor being biased an amount for generating in response to said input RF signal an output RF signal having a predetermined frequency vs. gain roll-off characteristic within a predetermined frequency bandwidth;
electronically variable capacitive means connected to said input port for providing a predetermined impedance condition at said transistor input port to augment said transistor frequency vs. gain roll-off characteristic;
detector means responsive to said output RF signal for generating a dc signal; and
biasing means responsive to a predetermined bias voltage for matching the output impedance of said transistor with the input impedance of said detector means,
whereby at said conditions of matched impedances the voltage of said dc signal varies substantially linearly as a function of the frequency of said input RF signal.

4,110,701
METHOD AND APPARATUS FOR NEAR-SYNCHRONIZATION OF A PAIR OF OSCILLATORS, AND MEASURING THEREBY

Albert H. Medwin, Princeton, N.J., assignor to CGS Systems, Inc., Princeton, N.J.
Filed Mar. 14, 1977, Ser. No. 776,841
Int. Cl.^{2} G01R *27/26;* **H03B** *3/04*
U.S. Cl. 331—1 A **27 Claims**

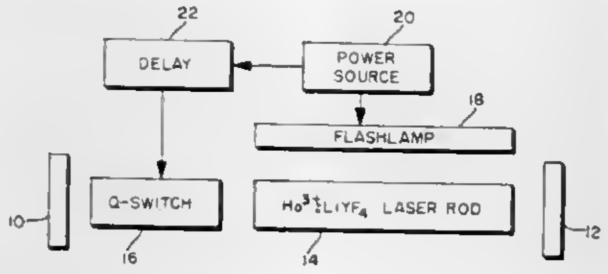

10
12
LOW FREQUENCY SECTION
LF OSC
CORRECTION CIRCUITRY SECTION
16
HIGH FREQUENCY SECTION AND DISPLAY
HF OSC
18
20
62

1. In combination, a low frequency oscillator, a high frequency oscillator gated by said low frequency oscillator for a selected portion of a period of said low frequency oscillator, one of said oscillators being correctible in increments, a plurality of electrical elements, a counter counting the oscillations of said high frequency oscillator during said selected gated portions, means, including means for selectively individually connecting or disconnecting said elements from said correctible oscillator, and responsive to the count in said counter during said portion in excess or in deficiency of a selected count for said selected gated portion to increase or decrease and thereby correct the frequency of the correctible oscillator by an increment, whereby the high frequency oscillator is brought into near synchronism after a number of such corrections with said low frequency oscillator to within a high frequency period during said portion of a low frequency period.

4,110,702
DEEP RED LASER

Evan P. Chicklis, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Nov. 24, 1976, Ser. No. 744,671
Int. Cl.^{2} H01S *3/16*
U.S. Cl. 331—94.5 F **5 Claims**

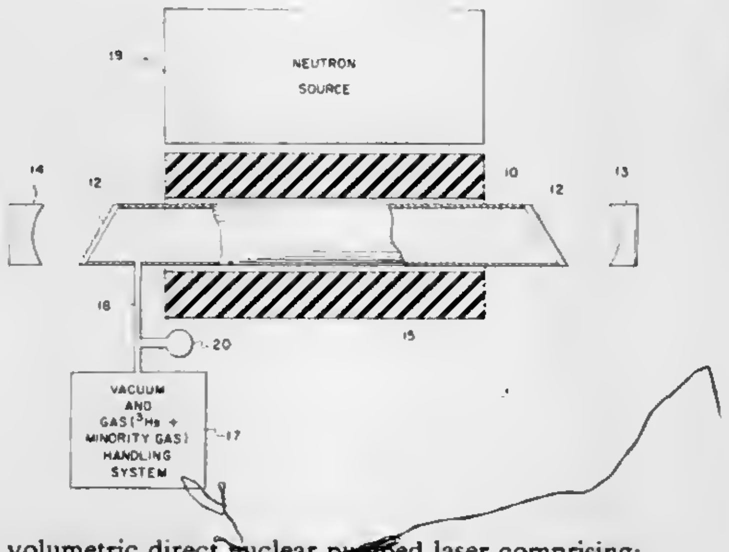
1. An optically pumped solid state laser, comprising:
a laser cavity;
a laser medium which lases at 0.75 micrometers disposed in said cavity; and



means for supplying pump energy to said laser medium to cause 0.75 micrometers radiation to be emitted from said cavity.

4,110,703
VOLUMETRIC DIRECT NUCLEAR PUMPED LASER

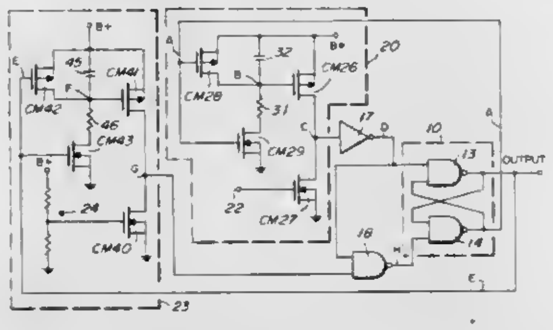
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Nelson W. Jalufka, Yorktown; Frank Hohl, Newport News; Russell J. DeYoung, and Michael D. Williams, both of Hampton, all of Va.
Filed Apr. 19, 1977, Ser. No. 788,704
Int. Cl.^{2} H01S *3/09*
U.S. Cl. 331—94.5 P **12 Claims**



1. A volumetric direct nuclear pumped laser comprising:
a gas laser cell located between two mirrors to form a resonant cavity, one of said two mirrors having a transmission greater than the other of said two mirrors and being the output mirror of said nuclear pumped laser;
a gas mixture consisting of ^{3}He and a minority gas from the group of argon, krypton, xenon, chlorine and fluorine;
a gas-handling system for introducing said gas mixture into said laser cell and for maintaining the proper pressure of the gas mixture;
a neutron source for applying a neutron flux of sufficient density to the gas mixture in said laser cell to pump the gas mixture; and
a moderator surrounding said laser cell for thermalizing the neutrons produced by the neutron source to take advantage of the large thermal neutron capture cross section of the ^{3}He.

4,110,704
ASTABLE MULTIVIBRATOR WITH TEMPERATURE COMPENSATION AND REQUIRING A SINGLE SUPPLY VOLTAGE

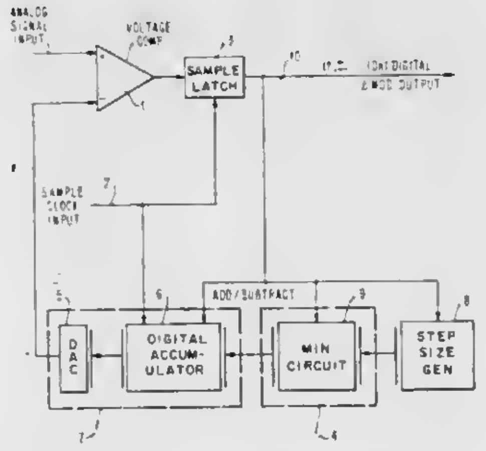
James Stuart Irwin, and Merle Lee Gilmore, both of Ft. Lauderdale, Fla., assignors to Motorola Inc., Schaumburg, Ill.
Filed Sep. 19, 1977, Ser. No. 834,076
Int. Cl.^{2} H03K *3/282*
U.S. Cl. 331—113 R **10 Claims**



1. An astable multivibrator comprising in combination:
first input means for providing a control signal;
first semiconductor means coupled for being controlled by the control signal;
second semiconductor means coupled in series with the first semiconductor means;
first switching means coupled to control the second semiconductor means;
supply means for supplying a reference signal;
third semiconductor means coupled for being controlled by the reference signal;
fourth semiconductor means coupled in series with the third semiconductor means;
second switching means coupled to control the fourth semiconductor means; and
multivibrator means coupled to receive the outputs of the series connected semiconductor pairs for being triggered by said outputs, the outputs of the multivibrator being coupled to enable the first and second switching means, and at least one output of the multivibrator means being coupled to an output terminal.

4,110,705
NOISE REDUCTION METHOD AND APPARATUS FOR COMPANDED DELTA MODULATORS

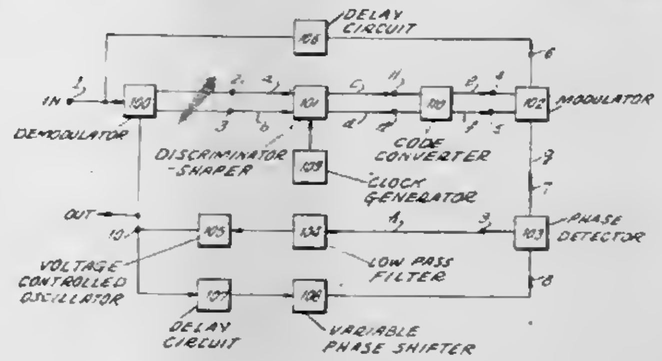
William George Crouse, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 17, 1977, Ser. No. 842,710
Int. Cl.^{2} H03K *7/02*
U.S. Cl. 332—11 D **2 Claims**



1. In a delta modulation digital signal transmission system having a voltage step size generator operating under a simulation algorithm for controlling the generation of 1 and 0 bits in the transmission system for later demodulation and reconstruction of an analog waveform, the method of reducing random or low level noise production during low level or quiet passages of the analog input signal comprising steps of:
detecting the minimum step size calculation at the output of the step size generator;
comparing the presently modulated digital bit to be transmitted with the previously transmitted digital bit; and
when said bits do not compare and said minimum step size has been detected, modifying the calculated step size by forcing the step size for the bit next transmitted to be greater than the minimum step size used in the modulation system.

4,110,706
PHASE SYNCHRONIZING CIRCUIT

Youichi Matsumoto; Yoshimi Tagashira, and Seijiro Yokoyama, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan
Filed Oct. 6, 1976, Ser. No. 730,292
Claims priority, application Japan, Oct. 7, 1975, 50-120914
Int. Cl.^{2} H03C *3/00*
U.S. Cl. 332—19 **5 Claims**



1. A phase synchronizing circuit for reproducing a synchronizing carrier wave from an N-phase ($N = 2^n$, n being a positive integer) PSK modulated signal supplied thereto, comprising: a voltage controlled oscillator; an N-phase demodulator receiving said modulated signal and the output signal of said voltage controlled oscillator; an N-ary code converter coupled to the output of said demodulator; an N-phase modulator having a first input terminal coupled to the output of said N-ary code converter; a first delay circuit being provided between the modulated signal input terminal of said demodulator and a second input terminal of said modulator; a phase detector having a first input terminal supplied with the output of said modulator; a second delay circuit installed between the output terminal of said voltage controlled oscillator and a second input terminal of said phase detector; a low-pass filter installed between the output terminal of said phase detector and the input terminal of said voltage controlled oscillator; and a variable phase shifter installed at least in one of a plurality of possible paths said paths being respectively: between said modulated signal input terminal and the second input terminal of said modulator; between the output terminal of said voltage controlled oscillator and the second input terminal of said phase detector, and between the output terminal of said phase modulator and the first input terminal of said phase detector; wherein carrier wave phases in the said phase synchronizing circuit are made variable by changing the conversion states of said code converter.

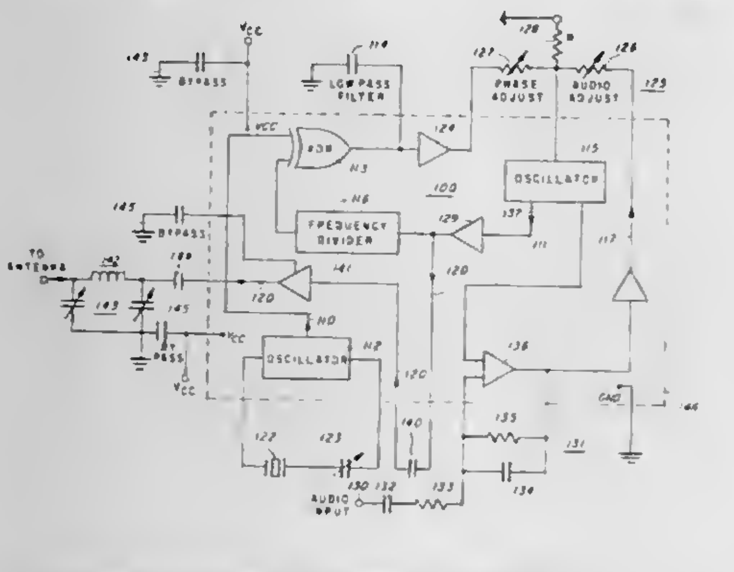
4,110,707
INDIRECT FM MODULATION SCHEME USING PHASE LOCKED LOOP

William Henry Gloima, Garland, and Bernhard Hans Andresen, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 13, 1976, Ser. No. 750,059

Int. Cl.² H03C *3/10*

U.S. Cl. 332—19 **8 Claims**



1. An indirect frequency modulator comprising:

first oscillator means for providing a continuous periodic input reference signal;

a phase locked loop connected to said first oscillator means including:
  - second oscillator means for voltage to frequency conversion,
  - phase detector means disposed within said phase locked loop and connected to said first oscillator means for comparing the phase of the input reference signal and the signal generated by said second oscillator means and generating an error signal proportional to any phase difference of the two signals,
  - low-pass filter means disposed within said phase locked loop and located between said phase detector means and said second oscillator means for receiving, filtering and delivering said error signal to said second oscillator means,
  - a feedback loop from said second oscillator means to said phase detector means, and
  - a frequency divider disposed within said phase locked loop and located in said feedback loop for delivering said signal generated by said second oscillator means to said phase detector means;
  - modulating signal generating means connected through integrating means to said phase locked loop between said low-pass filter means and said second oscillator means for indirect frequency modulating said input reference signal.

4,110,708
MULTICHANNEL MODULATION SYSTEM INCLUDING AUTOMATIC GAIN SHIFTER

Geoffrey N. Mendenhall, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Mar. 25, 1977, Ser. No. 781,160

Int. Cl.² H03C *3/00*

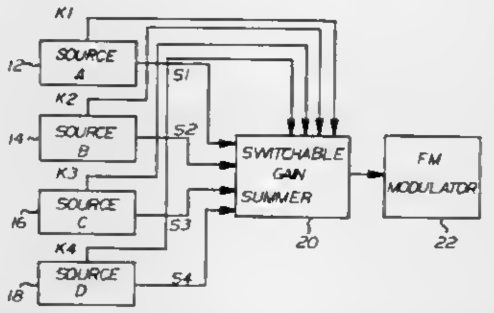
U.S. Cl. 332—21 **4 Claims**

1. A multichannel modulating system comprising:

a modulator for modulating a carrier signal in accordance with a composite signal comprised of a plurality of component signals, wherein the modulation of said carrier must be controlled by controlling the amplitude of said composite signal;

a plurality of component signal sources for each generating one of said component signals, including means associated with each of said sources for selectively providing or not providing the associated said signal to a signal summer means, and for generating a control signal concurrently therewith having a binary state indicating whether the associated component signal is or is not being provided; and,

signal summer means for combining said component signals to form said composite signal which is supplied to said modulator and having a gain control input responsive to said binary control signals for automatically selecting the gain of said signal summer so that the peak amplitude of said composite signal will remain constant regardless of the use or non-use of said component signal sources, thereby automatically controlling modulation of said carrier.



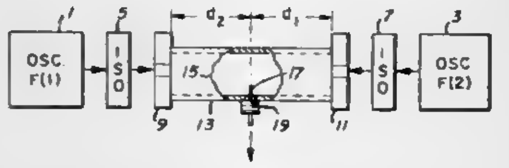
4,110,709
APPARATUS FOR COUPLING MICROWAVE ENERGY FROM TWO OSCILLATORS TO A COMMON TRANSMISSION LINE

Walter Ransom Day, Jr., Menlo Park, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Jan. 31, 1977, Ser. No. 764,008

Int. Cl.² H01P *5/12;* **H03H** *7/46*

U.S. Cl. 333—6 **8 Claims**



1. A microwave system which includes:

a first oscillator having a waveguide type output for generating a microwave frequency signal of frequency $F_{(1)}$;

a second oscillator having a waveguide type output for generating a microwave frequency signal of frequency $F_{(2)}$; said first frequency $F_{(1)}$ being different from said second frequency $F_{(2)}$ by a difference ΔF;

a rectangular waveguide having first and second ends for receiving microwave frequency signals, said waveguide being of a predetermined length L extending between said ends; said predetermined length being different from a one-half guide wavelength or multiple thereof at either of the frequencies $F_{(1)}$ and $F_{(2)}$ for making said line non-resonant at such frequencies;

first means associated with said first oscillator for coupling the output of said first oscillator means to the first end of said waveguide;

second means associated with said second oscillator for coupling the output of said second oscillator to the second end of said waveguide;

said first means possessing the characteristic of passing microwave frequency signals $F_{(1)}$ between said waveguide and said first oscillator and essentially reflecting microwave signals of frequency $F_{(2)}$ between said waveguide and said first oscillator at said first waveguide end;

said second means possessing the characteristic of passing microwave signals of frequency $F_{(2)}$ between said waveguide and said second oscillator and essentially reflecting microwave signals of frequency $F_{(1)}$ between said waveguide and said second oscillator at said second waveguide end; and

a microwave energy coupling probe for coupling microwave energy from within the waveguide, said probe being positioned at a predetermined location along said waveguides between the first and second ends; said location being defined by a distance of $(2N_a+1)\,\lambda g_1/4$ at frequency $F_{(1)}$ from said second waveguide end and $(2N_b+1)\,\lambda g_2/4$ at frequency $F_{(2)}$ from said first waveguide end, where N_a is zero or an integer 1, 2 . . . *n,* N_b is zero or an integer 1, 2 . . . *n,* λg_1 is the in-the-guide wavelength of signals of frequency $F_{(1)}$ and λg_2 is the in-the-guide wavelength of frequencies $F_{(2)}$; and

coaxial type ferrite isolator means having a pass band characteristic which includes signals of frequency $F_{(1)}$ and $F_{(2)}$; and wherein said microwave frequency coupling probe is coupled to an input of said isolator means; and coaxial type connector means coupled to an output of said isolator means for permitting signals to be coupled to a coaxial type transmission line.

4,110,710
MICROWAVE BANK BRANCHING ARRANGEMENTS

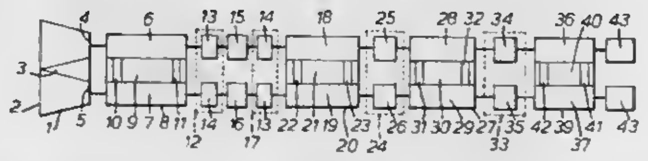
Barry Kenneth Watson, Witham, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jan. 7, 1977, Ser. No. 757,558

Claims priority, application United Kingdom, Jan. 20, 1976, 2223/76

Int. Cl.² H01P *5/18*

U.S. Cl. 333—10 **8 Claims**



5. A microwave band branching arrangement for successively coupling out frequency sub-bands germane to a broad frequency band, comprising bifurcation means for dividing applied microwave energy into two parallel paths and a series of successive center excited coupler means for sequentially coupling out different frequency sub-bands of said energy, each coupler means comprising two outer waveguide sections, each forming part of one of said two parallel paths, and an inner waveguide section coupled with said outer waveguide sections and being provided for taking off the energy of a respective frequency sub-band, that one coupler means which is provided for coupling out the highest frequency sub-band being disposed directly behind said bifurcation means and ahead of the remaining coupler means, one of said parallel paths including a reflection low pass filter connected to one outer waveguide of said one coupler means and a 90° phase shifter connected to such filter, and the other parallel path including a second 90° phase shifter connected to the other outer waveguide section of said one coupler means and a second reflection low pass filter connected to said second phase shifter.

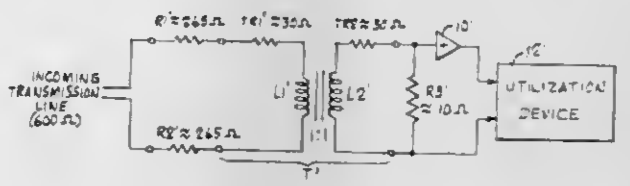
4,110,711
VOICE/DATA RECEIVER COUPLED WITH A TRANSMISSION LINE THROUGH AN INPUT TRANSFORMER WORKING INTO AN IMPEDANCE APPROACHING A SHORT CIRCUIT

Mauro Luigi Gaetano, Woodbridge, Va., and Ambroz Karol Skrovanek, Bethesda, Md., assignors to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Feb. 8, 1977, Ser. No. 766,588

Int. Cl.² H03H *7/38*

U.S. Cl. 333—32 **10 Claims**



1. A device for receiving voice/data communication transmitted over a transmission line which has a selected characteristic impedance comprising:

an input transformer having a primary and a secondary winding inductively coupled to each other, each winding having resistive impedance which is substantially less than the characteristic impedance of the transmission line;

a first impedance network connected in series with the resistive impedance of the primary winding of the input transformer and having resistive impedance of the order of the characteristic impedance of the transmission line, said first impedance network being connected to the transmission line;

a second impedance network connected to the secondary winding of the input transformer and having resistive impedance which is a small fraction of the characteristic impedance of the transmission line;

the combined impedance of the first and second impedance networks and the resistive impedances of the windings being the impedance in which the transmission line is terminated and said combined impedance being approximately equal to the characteristic impedance of the transmission line; and

a utilization network connected to the second impedance network to receive signals transmitted over said transmission line.

4,110,712
MICROSTRIP CIRCUIT HAVING COPLANAR WAVEGUIDE PORT

Ronald George Morris, Worcester, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 682,861, May 3, 1976, abandoned. This application May 18, 1977, Ser. No. 798,210

Claims priority, application United Kingdom, May 14, 1975, 20470/75

Int. Cl.² H01P *3/08*

U.S. Cl. 333—33 **5 Claims**

1. A microstrip component comprising:

a closed box,

a microstrip circuit mounted entirely within the box,

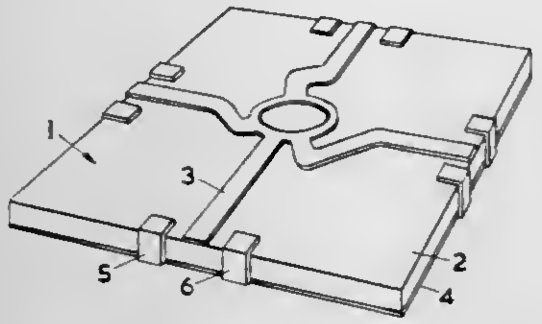
at least one electrical coaxial connector having a central electrode which extends through a hole in a side wall of the box for making electrical connection to the circuit from the exterior of the box,

the microstrip circuit comprising:
  - a dielectric substrate,
  - an electrically conducting circuit including at least one port section which extends on one surface of said sub-

strate to an edge of said substrate for connection with said central electrode,

an electrically conducting ground plane electrode on the other surface of said substrate, and

two thin electrically conducting strips extending integrally from said ground plane electrode around an edge of said substrate and onto said one surface at positions either side of, but electrically isolated from said port section with the minimum distance between said strips being substantially equal to the diameter of said hole,



the dimensions of the connector, central electrode, hole, and microstrip circuit being arranged to provide substantially the same characteristic impedance throughout with minimal reflecting discontinuities.

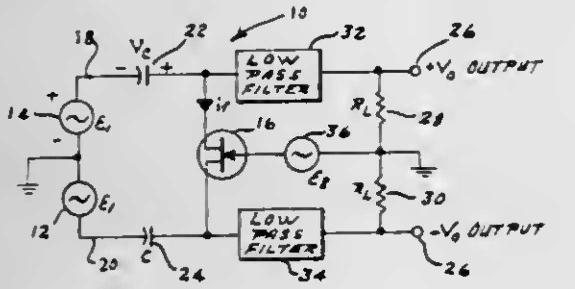
4,110,713
LOW OFFSET FIELD EFFECT TRANSISTOR CORRELATOR CIRCUIT

Gayle Patrick Martin, Indialantic, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 19, 1976, Ser. No. 743,386

Int. Cl.^{2} H03H *7/02, 7/48;* **G06F** *15/34;* **H03H** *7/46*

U.S. Cl. 333—70 R **1 Claim**



1. A low offset field effect transistor correlator circuit for adaptive processors comprising: a field effect transistor means so constructed as to include interchangeable source and drain terminals and gate means for controlling the resistivity in the transistor means; a first signal input means connected to the source and drain terminals; capacitor means connected between the first signal means and the source and drain terminal means; a second signal input means connected to the said transistor gate means; signal output means; low pass filter means connecting the said transistor source and drain terminals and the signal output means, and load resistor means connected between the output from the source and output from the drain terminals.

4,110,714
SURFACE ACOUSTIC WAVE FILTER

Oberdan W. Otto, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 5, 1977, Ser. No. 756,929

Int. Cl.^{2} H03H *9/26, 9/04, 9/30, 9/32*

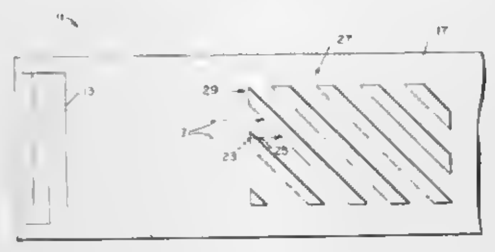
U.S. Cl. 333—72 **4 Claims**

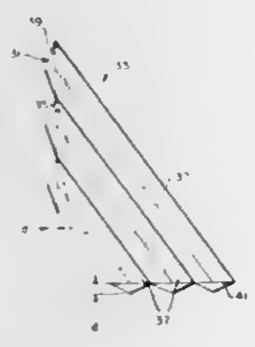
1. A surface acoustic wave filter comprising:

a substrate of material capable of supporting propagating surface acoustic wave energy;

transducer means including an input transducer disposed on said surface for converting electromagnetic energy to surface acoustic wave energy in said substrate with normal mode straight crested phase fronts propagating along a beam path in said surface in a predetermined direction;

reflective means including a surface acoustic wave reflective array disposed on said surface in said path and including spaced parallel elements having longitudinal axes angularly oriented with respect to said predetermined direction, and supporting normal mode, sawtooth-shaped phase fronts within the reflective array region; and





wavefront matching means including matching structures disposed adjacent the leading and trailing ends of said elements of said reflective array for respectively converting the normal mode phasefront shape of said propagating energy outside said reflective array region to the normal mode phasefront shape of said propagating energy inside said reflective array region, and the reverse thereof.

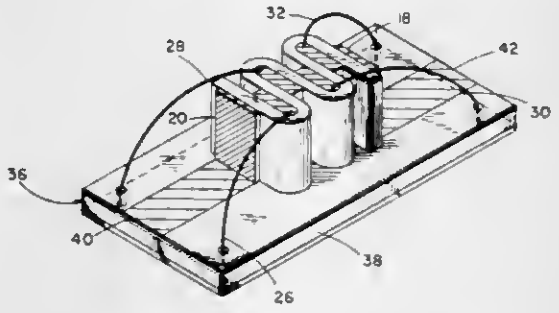
4,110,715
BROADBAND HIGH PASS MICROWAVE FILTER

John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1977, Ser. No. 819,637

Int. Cl.^{2} H01P *1/20*

U.S. Cl. 333—73 S **6 Claims**



1. A broadband high pass microwave filter comprising:

a thin strip of dielectric material having first and second surfaces on opposite sides thereof;

a first series of spaced metallic capacitor plates disposed on said first surface;

a second series of spaced metallic capacitor plates disposed on said second surface;

one plate of said first and second series of plates being a first end plate positioned at one end of said dielectric strip and another plate of said first and second series of plates being a second end plate positioned at the other end of said dielectric strip and all other plates being intermediate plates;

each intermediate plate of said first series of plates overlapping at least a portion of two adjacent plates of said second series of plates and each end plate overlapping at least a portion of one intermediate plate on the opposite side of said dielectric strip therefrom;

said dielectric strip being folded over and compressed in accordian-like fashion such that each intermediate plate is also folded over;

a plurality of electrical wires mechanically and electrically connected to selected ones of said intermediate plates; and

a substrate on which said folded-over dielectric strip is supported.

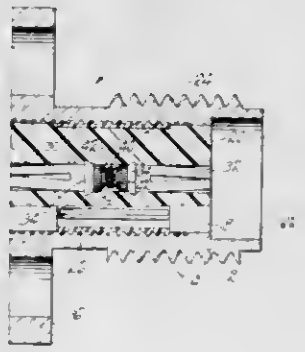
4,110,716
D.C. BLOCK CONNECTORS

Nick C. Nikitas, 41 Choate St., Danvers, Mass. 01923

Filed Nov. 1, 1976, Ser. No. 737,478

Int. Cl.^{2} H01P *1/00;* **H01R** *5/00*

U.S. Cl. 333—97 R **8 Claims**



1. A D.C. block connector for microwave applications comprising an outer conductive shell, a pair of aligned inner conductors each formed with a flat inner end and mounted co-axially with the shell, an insulator between the shell and the inner conductors fixedly retained in the shell and formed with a longitudinal perforation into which the inner conductors are interference fitted and secured with their inner ends in facing relation, a ceramic capacitor smaller than the ends of the inner conductors, mounted in the perforation between the inner ends of the conductors and an axially compressible electrically conductive spring member loosely fitted in the perforation between the capacitor and the end surface of the adjacent inner conductor.

4,110,717
CIRCUIT BREAKER

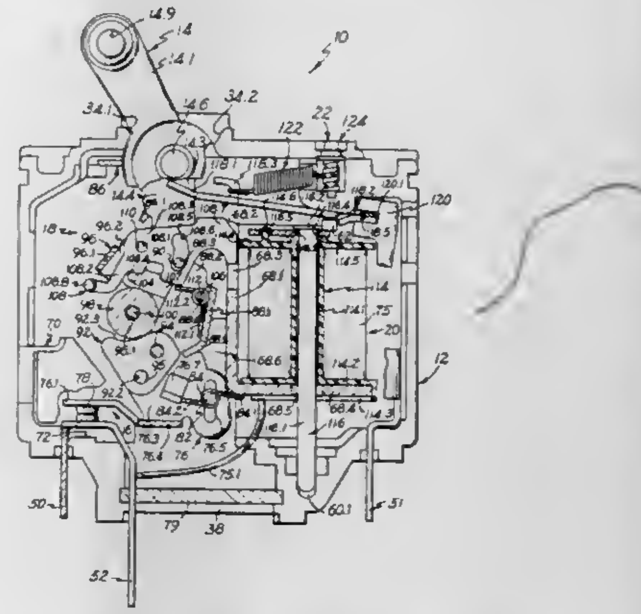
Aime J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1976, Ser. No. 755,514

Int. Cl.^{2} H01H *73/00, 77/00, 3/00*

U.S. Cl. 335—22 **50 Claims**

1. A circuit breaker comprising a housing, contact means movable in the housing between an open circuit position and a closed circuit position, means biasing the contact means to open circuit position, operating means extending from the housing to be manually movable between corresponding open and closed circuit positions, circuit responsive means movable from a rest position to an actuating position on the occurence of a predetermined condition in said circuit, and a linkage connecting the operating means to the contact means, said linkage biasing a first link pivotally connected to the operating means, first latch means engaged with the contact means and pivotally connected to the first link means for movement between a latching position permitting the contact means to be moved between open and closed circuit positions in response to manual movement of the operating means between corresponding open and closed circuit positions and an unlatching position permitting the contact means to move to open circuit position in response to the biasing means, independently of the position of the operating means, said first latch means having cam mean to be engaged for holding the first latch means in the latching position thereof, second link means having cam follower means, said second link means being pivotally connected to the first link means for movement between a first position engaging the cam follower means with said cam means for holding the first latch means in its latching position and a second position permitting the first latch means to move to its unlatching position, second latch means detachably latching the second link means in the first position thereof, and trip means responsive to movement of the circuit responsive means to said actuating position for unlatching the second link means to permit the contact means to move to said open circuit position in response to the biasing means on the occurrence of said predetermined condition in said circuit.



4,110,718
MAGNETIC STRUCTURE, PARTICULARLY PERMANENT MAGNET FOR MOTOR FIELDS, AND METHOD

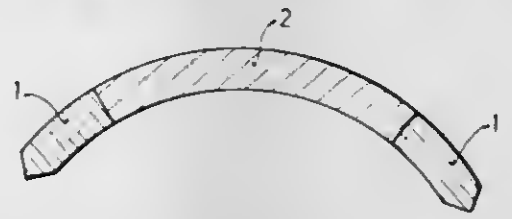
Frank Odor, Bietigheim; Adolf Mohr, Buhlertal, and Klaus Bolenz, Buhl, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 1, 1975, Ser. No. 618,574

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527461

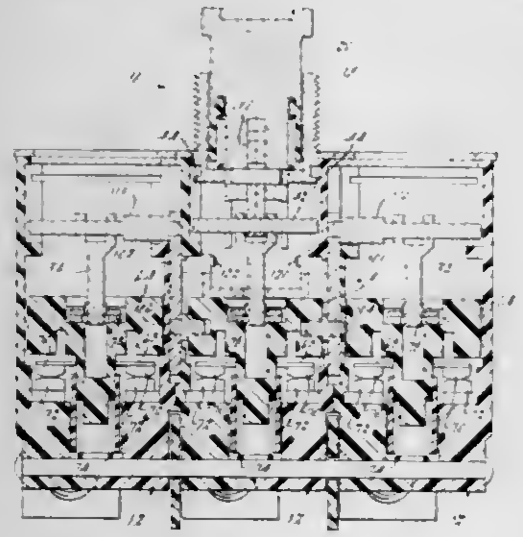
Int. Cl.^{2} H01F *1/08*

U.S. Cl. 335—296 **17 Claims**



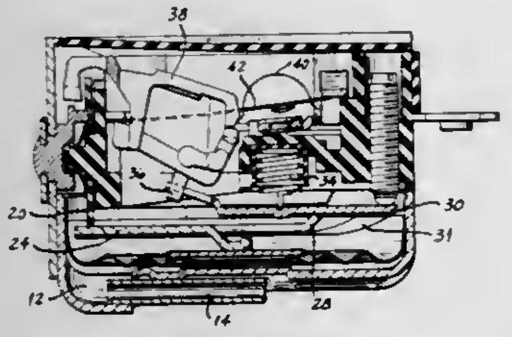
1. Magnet structure having a ferrite body forming an extended surface and which is characterized in that it consists, along its surface extent, of at least two zones which are, each, made of a permanently magnetizable ferrite material having magnetic characteristics which differ from each other, one material (2) having a higher remanence, or retentivity (B_r) and the other material (1) having a higher coercive force, or coercivity ($_IH_c$) to form a magnet structure, the magnetic characteristics of which differ along a surface dimension thereof.

4,110,719
THREE PHASE CIRCUIT BREAKER
Joseph F. Kirkup, Parma, Mich., assignor to Mechanical Products, Jackson, Mich.
Filed Apr. 11, 1977, Ser. No. 786,062
Int. Cl.^{2} H01H *71/16*
U.S. Cl. 337—46 **6 Claims**



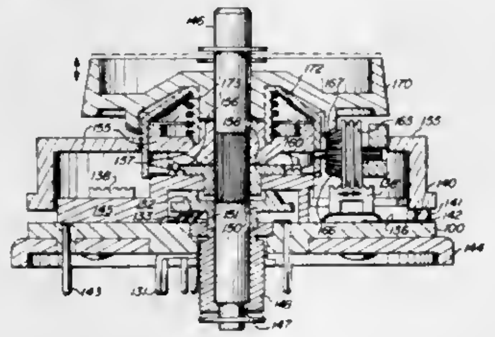
1. A three phase electrical circuit breaker comprising:
a pair of external terminals for each of said poles for connection to a source of electrical current,
a fixed internal contact in each of said poles connected to one of said terminals,
current responsive means in each of said poles electrically connected to the other of said terminals,
a contact carrier in each of said poles having a movable contact thereon and movable between a closed and open condition with respect to said fixed internal contact to make or break an electrical circuit through said poles, and
a thermal latch element in each of said poles for maintaining the contact carrier therein in the closed condition, said thermal latch being controlled by said current responsive means so as to effect release of said latch permitting said contact carrier to move to the contact's open condition, and
a common trip linkage carried by the contact carrier in one of said poles, said common trip linkage comprising means for supporting the thermal latch element in the other poles of said circuit breaker.

4,110,720
THERMOSTATIC CONTROL
Charles R. Smith, West Allis, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Dec. 22, 1976, Ser. No. 753,416
Int. Cl.^{2} H01H *37/22*
U.S. Cl. 337—319 **4 Claims**



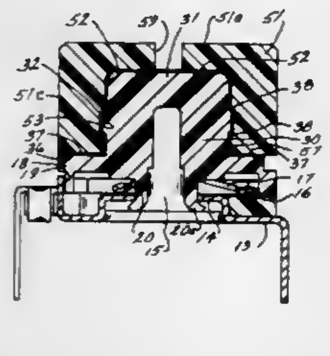
1. A thermostatic control having a calibrated thermal responsive power element, a toggle and snap switch mechanism operated by said element, a drive lever engaged with said mechanism, an adjustable range lever associated with said lever, and a flexible leaf member to connect said range lever to said drive lever; said control characterized in that said range and drive levers are the only force multiplying transmission means between said power element and said toggle and snap switch mechanism.

4,110,721
ADJUSTABLE POTENTIOMETER ASSEMBLY
Mutsuo Nakanishi, Villa Park, and Hans Schmidt, Schiller Park, both of Ill., assignors to Quasar Electronics Corporation, Franklin Park, Ill.
Division of Ser. No. 580,541, May 27, 1975, Pat. No. 4,050,050.
This application Jan. 14, 1977, Ser. No. 759,346
Int. Cl.^{2} H01C *10/16*
U.S. Cl. 338—128 2 Claims



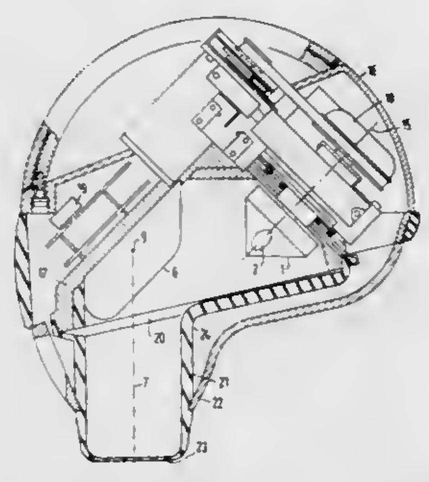
1. A resistive element for a potentiometer assembly particularly suited for use in deriving a tuning voltage for a multiband, wave-signal receiver, such as a television receiver, comprising in combination:
a flat non-conductive base member having a central reference point thereon;
a plurality of arcuate resistive segments arranged in a circle about said reference point and attached to said base member, said resistive segments each having a predetermined width and a predetermined arcuate length and located at the same radius from said reference point;
first conductive means on said base member coupled with a first end of each of said segments for connection with a first voltage supply terminal; and
second conductive means on said base member coupled with the second end of each of said arcuate resistive elements for connection with a second voltage supply terminal.

4,110,722
VARIABLE RESISTANCE CONTROL
Paul C. Brendle, Streetsville, and Brian B. Clarkson, Brampton, both of Canada, assignors to CTS Corporation, Elkhart, Ind.
Filed Jul. 18, 1977, Ser. No. 816,314
Int. Cl.^{2} H01C *10/34*
U.S. Cl. 338—174 10 Claims



1. A variable resistance control comprising a resistance element and a collector, a contactor wipably engaging the collector and the resistance element intermediate the ends thereof, a driver constrained to rotate with the contactor, a first member integral with the driver and defined by an outwardly extending cylindrical coaxial hub, an annular ring disposed on the hub in spaced relationship to the driver and having a diameter larger than the diameter of the hub, a first clutch face defined by a plurality of axial knurls disposed about the periphery of the first member, a second member having an axially extending cylindrical bore, a second clutch face defined by a plurality of knurls disposed within the bore, the second member having an annular recess provided within the bore and having an inner diameter larger than the inner diameter of the bore, the hub being received within the bore, the first and second clutch faces clutchingly engaging each other, the annular ring nesting within the annular recess and rotatably interlocking the second member to the first member.

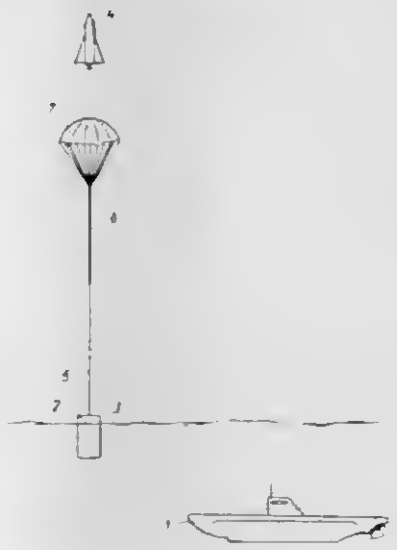
4,110,723
ULTRASONIC APPARATUS FOR MEDICAL DIAGNOSIS
Walter Hetz, Adam-Kraftstr. 17, and Richard Soldner, Hedenusstr. 31, both of 8520 Erlangen, Germany
Filed Mar. 11, 1975, Ser. No. 557,384
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1974, 2414777
Int. Cl.^{2} G01S *9/66*
U.S. Cl. 340—1 R **4 Claims**



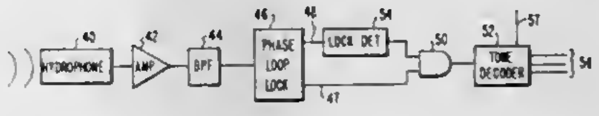
1. In an ultrasonic apparatus for medical diagnosis operating pursuant to the impulse-echo method, including a cylindrical parabola reflector; at least one ultrasonic transducer rotatably positioned in the focal line of said reflector for the transmission and receipt of ultrasonic signals; and means for displacing the ultrasonic beam transmitted from said transducer upon rotation thereof in a parallel plane after reflection by said reflector in the context of a line-by-line image build-up, wherein the current receiving direction coincides with the transmission direction, the improvement comprising: means supporting said parabola reflector and said ultrasonic transducer for pivotable motion about a transverse axis, said transverse axis being oriented to facilitate the scanning of different object sectional planes responsive to tilting of said reflector; a housing having an inlet and outlet aperture for the ultrasonic radiation, said reflector being located in said housing, said ultrasonic transducer being rotatably supported on said housing; a further housing encompassing said ultrasonic apparatus, said reflector housing being pivotably supported within said further housing.

4,110,724
APPARATUS FOR TRANSMISSION OF MESSAGES BY MEANS OF ELECTROMAGNETIC WAVES
Johannes Peters, Deisenhofen near Munich, Fed. Rep. of Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, Fed. Rep. of Germany
Filed Jun. 25, 1964, Ser. No. 378,077
Int. Cl.^{2} H04B *1/034*
U.S. Cl. 340—4 A **7 Claims**

1. Apparatus for long-range transmissions of messages by means of electromagnetic waves, comprising a long-wave transmitting plant including a message-storing unit, a transmitter, an antenna whose length equals a quarter length of the emitted waves or a multiple thereof, and a missile for hoisting said antenna, a parachute detachably connected to said missile, an elastic cord, said parachute being connected to said antenna by means of said elastic cord, said elastic cord being dimensioned in accordance with the required antenna dimensions and transmission time.



4,110,725
SEQUENTIAL TONE ACOUSTIC COMMAND LINK
Kenneth J. Petrosky, Glen Burnie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 14, 1977, Ser. No. 787,633
Int. Cl.^{2} H04B *11/00*; H04Q *9/02*
U.S. Cl. 340—5 R **9 Claims**



I. A receiver for an acoustic transmission system wherein a multi-tone code signal is acoustically transmitted, comprising:
(A) transducer means responsive to said acoustically transmitted multi-tone code signal for providing a corresponding electrical multi-tone code input signal;
(B) a phase lock loop circuit including a VCO and a phase comparator adapted to receive said input signal and the output signal of said VCO;
(C) said phase comparator being of the type to provide, in response to its two input signals,
  (i) an output control signal for governing the frequency of said VCO output signal, and
  (ii) a phase output signal indicative of the degree of lock between said input signal and said VCO output signal, said degree of lock being indicative of the signal-to-noise ratio of said input signal;
(D) gating means operable, when enabled, to pass said VCO output signal;
(E) means for enabling said gating means when said signal-to-noise ratio is above a predetermined level; and
(F) a multi-tone code decoder responsive to said passed output signal for providing control signals in accordance with said code signal.

4,110,726

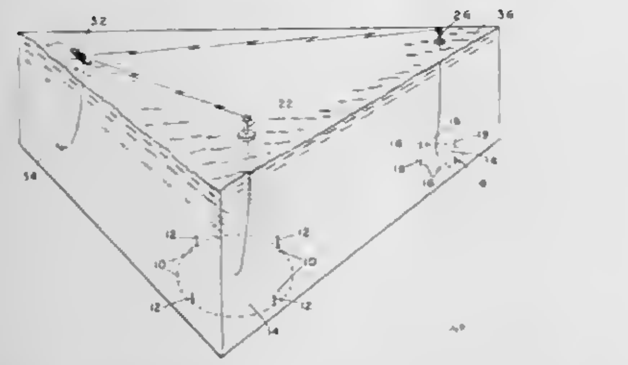
NAVIGATION SYSTEM AND METHOD FOR DETERMINING THE POSITION OF AN OCEAN MINING SHIP

William Thomas Dorrance, and William Richard Wilson, both of El Cajon, Calif., assignors to General Dynamics Corporation Electronics Division, San Diego, Calif.

Filed Jul. 22, 1977, Ser. No. 818,145

Int. Cl.^{2} G01S *5/18*

U.S. Cl. 340—6 R **4 Claims**



1. A system for determining the position of a ship in relation to predetermined positions on the ocean floor, comprising

- a plurality of first acoustic addressable transponders respectively located at a first set of predetermined positions on the ocean floor, wherein each of the first acoustic transponders transmits an acoustic ranging response and identification signal in response to receipt of an acoustic ranging interrogation signal;
- a plurality of second acoustic addressable transponders respectively located at a second set of predetermined positions on the ocean floor, wherein each of the second acoustic transponders transmits an acoustic ranging response and identification signal in response to receipt of an acoustic ranging interrogation signal;
- a first buoy communications system located on a first buoy moored to the ocean floor in the vicinity of the first acoustic transponders, including
  - a first acoustic communications device for transmitting an acoustic ranging interrogation signal to the first acoustic transponders and for receiving said acoustic ranging response and identification signals from the first acoustic transponders in response thereto,
  - a first buoy RF communications device for transmitting RF signals containing information representative of the respective propagation delays between transmission of said acoustic ranging response and identification signals from the first acoustic transponders, and
  - a first buoy RF addressable transponder for transmitting a first RF buoy ranging response and identification signal in response to receipt of an RF ranging interrogation signal;
- a second buoy communications system located on a second buoy moored to the ocean floor in the vicinity of the second acoustic transponders, including
  - a second acoustic communications device for transmitting an acoustic ranging interrogation signal to the second acoustic transponders and for receiving said acoustic ranging response and identification signals from the second acoustic transponders in response thereto,
  - a second buoy RF communications device for transmitting RF signals containing information representative of the respective propagation delays between transmission of said acoustic ranging interrogation signal and receipt of said acoustic ranging response and identification signals from the second acoustic transponders, and
  - a second buoy RF addressable transponder for transmitting a second RF buoy ranging response and identification signal in response to receipt of an RF ranging interrogation signal;
- a ship communications system located on said ship for transmitting said RF ranging interrogation signals and for receiving said RF buoy ranging response and identification signals in response thereto, and for receiving said RF signals containing said acoustic propagation delay information; and
- a data processing system for processing said received RF signals in relation to said RF ranging interrogation signals to determine the position of said ship in relation to said first and second sets of predetermined positions on the ocean floor, including processing means for determining by multilateralization (a) the position of said first buoy in relation to said first set of predetermined positions in response to said received RF signals containing said acoustic propagation delay information respective to the first acoustic transponders, (b) the position of said second buoy in relation to said second set of predetermined positions in response to said received RF signals containing said acoustic propagation delay information respective to the second acoustic transponders, and (c) the position of said ship in relation to said first and second buoys in response to said received RF buoy ranging response and identification signals.

4,110,727

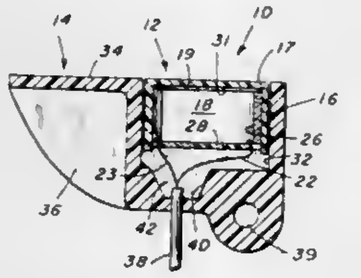
METHOD OF MANUFACTURING TRANSDUCER

Richard P. Kriege, Skiatook, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Continuation of Ser. No. 573,315, Apr. 30, 1975, abandoned. This application Jul. 29, 1976, Ser. No. 709,891

Int. Cl.^{2} H04B *13/00*

U.S. Cl. 340—10 **4 Claims**



1. A sonic transducer, comprising:

(a) a transducer housing having an exposed planar face, a cylindrical cavity in the face of selected diameter A, a small diameter opening opposite the face communicating between the bottom of the cavity and the exterior of the housing and a mounting opening through the housing adjacent the side opposite said planar face and in a plane perpendicular to the axis of said cylindrical cavity;

(b) a thin walled cylindrical thermoplastic cup having a planar base having an outer diameter less than A, and an inner diameter B, and having a base of selected thickness T;

(c) a piezoelectric crystal in the form of a shallow circular cylinder, having leads attached to each face, the back face being covered with a thin sheet or cork, the circumferential surface being covered with a thin sheet of cork, the outer diameter of the crystal plus the cork being less than B;

(d) said crystal with the said cork coverings being cemented into said cup with suitable cement, with a thin layer of said cement between the exposed face of said crystal and the inner surface of the bottom of said cup, the cup, crystal, cork and cement forming an integral subassembly;

(e) said cup subassembly being inserted and cemented into said cavity in said housing, with the base of said cup flush with said front face of said housing, and said leads extending through said small diameter opening; and

(f) epoxy material filling all areas of said housing cavity between said cup subassembly and the bottom of said cavity and sealing said small diameter opening having said leads therein.

4,110,728

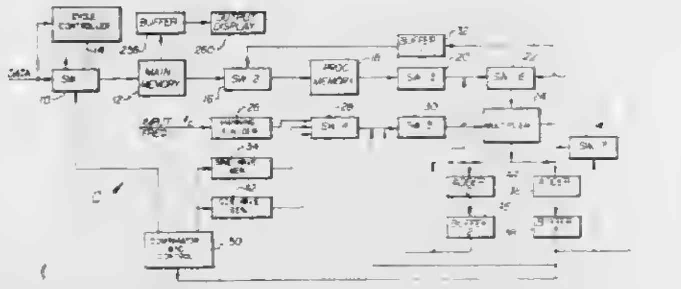
SEISMIC DATA PROCESSING APPARATUS FOR OBTAINING ALPHA VALUES FROM SEISMIC DATA

Lester R. Fuller, Pasadena, and Herbert J. Meyer, Bellaire, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,358

Int. Cl.^{2} G01V *1/28*

U.S. Cl. 340—15.5 DP **21 Claims**



1. A calculator for processing seismic data to obtain alpha values for subsurface earth layers, comprising:

(a) means for obtaining a measure of the frequency-amplitude spectrum for a seismic trace in the seismic data;

(b) means for determining half-power frequencies of the frequency-amplitude spectrum measure;

(c) means for obtaining the alpha value from the half-power frequencies; and

(d) means for forming an output record of the alpha values obtained.

4,110,729

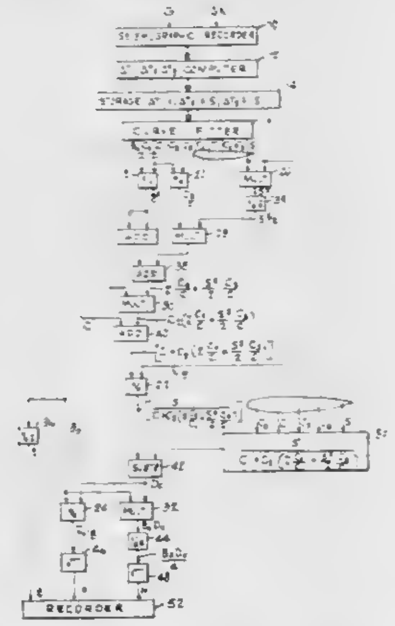
REFLECTION SEISMIC EXPLORATION: DETERMINING INTERVAL VELOCITY IN A SUBSURFACE LAYER

Theodorus L. J. Vreugde, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 549,638, Feb. 13, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 735,935

Int. Cl.^{2} G01V *1/28*

U.S. Cl. 340—15.5 MC **2 Claims**



1. A reflection seismic system for obtaining the interval velocity of seismic signals in a subsurface layer in an earth formation bound by a shallower and deeper reflector, the normal travel time in the layer and the layer thickness comprising:

- first means for generating a first downwardly propagating seismic signal at a first location,
- second means for generating a second downwardly propagating seismic signal at a second location, a known distance from said first location, and at a different time,
- a plurality of means for detecting reflections of the seismic signals and providing corresponding signals, and
- V, T and H analog computing means connnected to the detecting means for providing signals V, T and H corresponding to the interval velocity, to the normal travel time and to the layer's thickness H, respectively, in accordance with the signals from the detecting means, in which the analog computing means includes means receiving the signals from the detecting means for providing a signal S corresponding to the distance between the generating means and for providing signals corresponding to coefficients B_0, C_0, C_1, C_2, C_3, C_0', C_1'; C_2', C_3' for each detecting means in accordance with the signals from the detecting means and the following equations:

$$T_1 = B_0 + B_2 x^2 + B_3 x^3, \tag{1}$$

$$T_2 = C_0 + C_1 x + C_2 x^2 + C_3 x^3 \text{ and} \tag{2}$$

$$T_3 = C_0' + C_1' x + C_2' x C_3' x^3 \text{ where} \tag{3}$$

T_1, T_2 and t_3 are the time differences of reflection signals from the reflectors at the detecting means, X as used in equation (1) is the distance from the first generating means to the detecting means, and X as used in equations **2** and **3** is the distance from a mid-point between the two generating means to the detecting means, and signal means for providing signals V, T and H in accordance with signals S, B_0, C_0, C_1, C_2, C_3, C_0', C_1', C_2' and C_3'.

4,110,730

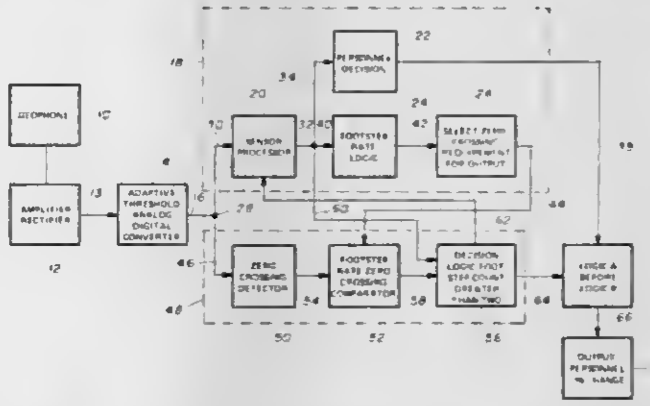
RATE SENSITIVE SYSTEM FOR A SEISMIC SENSING RANGE CONTAINMENT APPARATUS

Charles P. Varecka, Bloomington, and Donald M. Merhar, Shorewood, both of Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 681,104, Apr. 28, 1976, abandoned. This application Jun. 23, 1977, Ser. No. 809,270

Int. Cl.^{2} H04B *11/00;* **G08B** *13/22*

U.S. Cl. 340—16 R **4 Claims**



1. A rate sensitive system for a seismic sensing range containment device to detect the presence of pedestrian intruders which comprises:

- transducer means for receiving seismic vibrations in response to footsteps of a pedestrian and for generating an electrical footstep output signal in response to said seismic vibrations;
- amplifier-rectifier means electrically coupled to said transducer means for amplifying and rectifiying said footstep output pulse;
- an adaptive threshold analog-digital converter means, electrically coupled to said amplifier-rectifier means having a

threshold value responsive to the amplitude of an ambient seismic background noise level and for being responsive to said footstep output signal generated by said seismic vibrations of said pedestrian intruders, and for generating a digital output signal foot-step signature in response thereto;

personnel classification logic means, electrically coupled to said adaptive threshold analog-digital converter means, for recognizing, counting, and classifying said digital output signals generated in response to individual footsteps of said intruders and for generating an output logic A signal in response to said footsteps;

energy detector loic means, electrically to said adaptive threshold analog-digital converter means and to said personnel classification logic means, for measuring the relative energy contained in said seismic vibrations of said footsteps in terms of a number of "zero crossings" contained within said seismic vibrations of said individual footsteps, said pedestrian intruders being defined as being within a specified sensing range of said range containment device when a number of zero crossings is greater than a zero crossing requirement selected as a function of a footstep rate, and for generating an output logic B signal when said number of zero crossings is greater than said zero crossing requirement selected as a function of said footstep rate; and

logic A before logic B circuit means, electrically coupled to said personnel classification logic means and said energy detector logic means, for generating an "in range" output signal when said personnel classification logic means has identified a personnel seismic signature within said speicified sensing range of said containment device prior to said energy detector means generating said logic B signal.

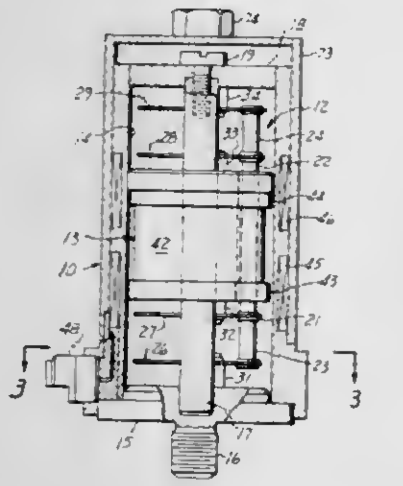
4,110,731
VIBRATION TRANSDUCER WITH IMPROVED VISCOUS DAMPING

Ebbert Lee Elswood, Sierra Madre, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 30, 1976, Ser. No. 755,536

Int. Cl.² G01V *1/16*

U.S. Cl. 340—17 R **13 Claims**



1. A vibration transducer comprising in combination:

cylinder means for enclosing a viscous damping medium;

piston means in said cylinder means having an outside diameter smaller than the inside diameter of said cylinder means and having a seismic mass;

means for mounting said piston means for axial oscillation in said cylinder means;

means for damping said oscillation of the piston means with said viscous damping medium, including a piston ring having an outside diameter larger than the outside diameter of said piston means to impede flow of said viscous damping medium relative to said oscillating piston means, but smaller than the inside diameter of said cylinder means to provide clearance between said piston ring and said cylinder means; and

means operatively associated with said piston means for sensing said damped oscillation.

4,110,732
TIRE PRESSURE MONITOR

William M. Jarocha, Farmington, and Walter K. O'Neil, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 15, 1977, Ser. No. 768,911

Int. Cl.² B60C *23/00*

U.S. Cl. 340—58 **8 Claims**

1. An electronic system for detecting rotation and a change in condition of a pneumatic tire mounted for rotation about an axis, said system comprising:

means for producing a first cyclic signal;

a resonant circuit including reactive means and having an effective impedance, said resonant circuit excited by said first cyclic signal and operative to produce a second cyclic signal shiftable in phase relative to said first signal in response to changes in the effective impedance of said resonant circuit;

first and second means disposed to pass in close proximity of said reactive means in response to rotation of said tire, said first and second means respectively operative when passing said reactive means to momentarily change the effective impedance of said resonant circuit in opposite directions for effecting a momentary phase shift of said second signal in one direction and then in the other direction;

means for rendering said first means ineffective to change said effective impedance, and thereby terminate the phase shifts in said one direction, in response to said change in condition of said tire; and

control means operative to activate a warning device indicating said change in condition in response to termination of said phase shifts in said one direction and continuation of said phase shifts in said other direction.

4,110,733
TRANSMISSION FLUID PRESSURE INDICATOR

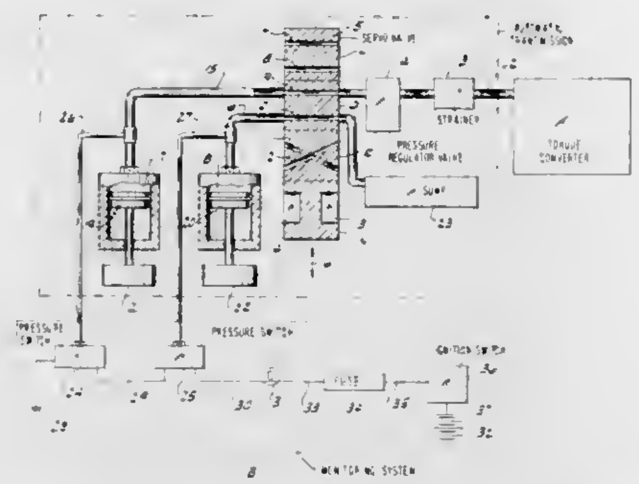
Eddie C. Williams, 65 Labelle St., Jackson, Tenn. 38301

Filed Feb. 18, 1976, Ser. No. 659,049

Int. Cl.² G08B *21/00*

U.S. Cl. 340—60 **8 Claims**

1. In a vehicle having an automatic transmission with a pressurized fluid inlet connected to a source of pressurized fluid, a first fluid-operated piston chamber and piston connected to a front band, a second fluid operated piston chamber and piston engaged to a rear clutch, a first conduit connected at one end to said first chamber, a second conduit connected at one end to said second chamber, a valve member disposed between said first and second conduits and said pressurized fluid inlet, and means for selectedly positioning said valve member for connecting said first and second conduits with said pressurized fluid inlet, the improvement comprising a monitor for indicating the fluid pressure within said transmission to demonstrate the fluid level comprising a first fluid pressure-responsive switch, means connecting said first switch and said first conduit, a second fluid pressure responsive switch, means connecting said second switch and said second conduit, a source of electrical power, a signaling device, and circuit-forming means interconnecting said source of electrical power, said signaling device and said first and second switches whereby when the fluid pressure within both of said first and second conduits descends below a predetermined level both said first and second switches are affected for causing responding indicating action of said signaling device.



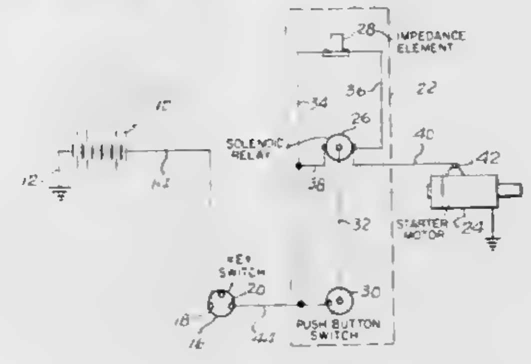
4,110,734
ANTI-THEFT STARTING SYSTEM

Henry D. Lepore, 26 South St., Marlboro, Mass. 01752, and Perry J. Saidman, Potomac, Md., assignors to Henry D. Lepore, Marlboro, Mass.

Filed Mar. 26, 1976, Ser. No. 670,676

Int. Cl.² B60R *25/04*

U.S. Cl. 340—64 **8 Claims**



1. In an electric starting system having a voltage source, a starter, and a starter switch connected in series intermediate said voltage source and said starter, the improvement which comprises impedance means connected intermediate said starter switch and said starter for preventing full actuation of said starter, and means connected in series between said starter switch and said starter for selectively bypassing said impedance means.

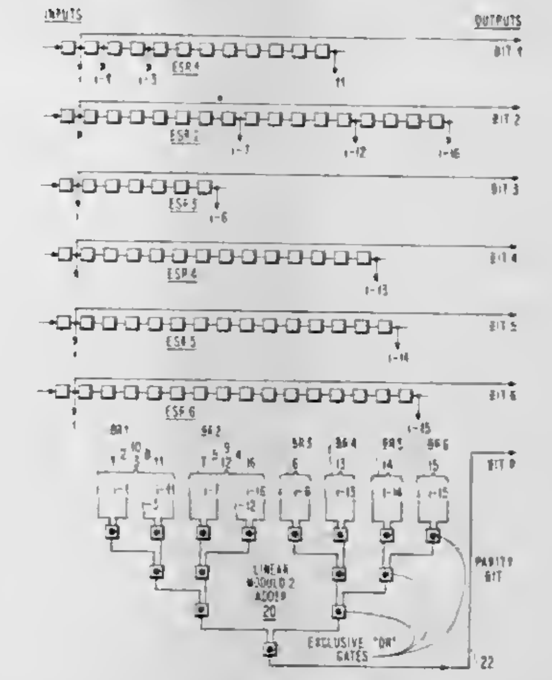
4,110,735
ERROR DETECTION AND CORRECTION

Nicholas Frank Maxemchuk, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,339

Int. Cl.² G06F *11/12*

U.S. Cl. 340—146.1 AQ **6 Claims**



1. In an error detection and correction system for transmitting data words together with parity bits in a manner providing relatively greater protection for at least the highest order bit of the data word:

an encoder receptive to the bits of each data word for generating a parity bit according to a self-orthogonal convolutional code constructed by the use of base elements of a difference triangle for each of the bits of the data word, the difference triangles being disjoint, the triangle associated with the highest order bit having a largest number of base elements and the triangle associated with lowest order bit consisting of a single base element, said encoder including:

an encoder shift register for each bit of the data word, each shift register having outputs from the first stage and from stages displaced from the first stage by amounts equal to the values of the base elements of the triangle associated with the respective data bit, and

a first parity generating logic which computes the linear modulo 2 sum of said outputs of said encoder shift registers and provides a parity bit output for each data word.

4,110,736
SHAPE RECOGNITION SYSTEM

Hidehiko Kono, Akishima, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 560,190, Mar. 20, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 757,971

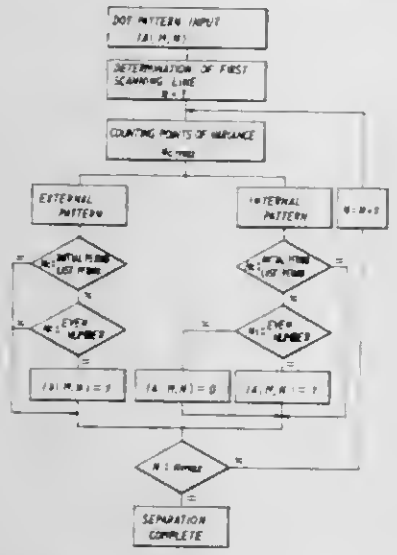
Claims priority, application Japan, Apr. 24, 1974, 49-46291

Int. Cl.² G06K *9/12*

U.S. Cl. 340—146.3 AE **3 Claims**

1. In a shape recognition system comprising pattern input means for describing shape outline data in terms of binary signals representative of the light intensity of each scanned mesh point; recognition means for converting said binary signals into pattern marking signals of horizontal, right diagonal, vertical, left diagonal, body, space and edge based on adjacent signals in mask logic mesh points; means for recognizing the shape of said pattern marking signals; means for tracking a contour line of said patterns by the use of said pattern marking signals which detect edges in said contour line; means for sequentially recording the number and mesh coordinate of said edges; and means for recognizing the shape of said pat-

terns by comparison of the number of angular turns in said contour line and shape parameters obtained from the number and coordinates of detected edges, the improvement which comprises:

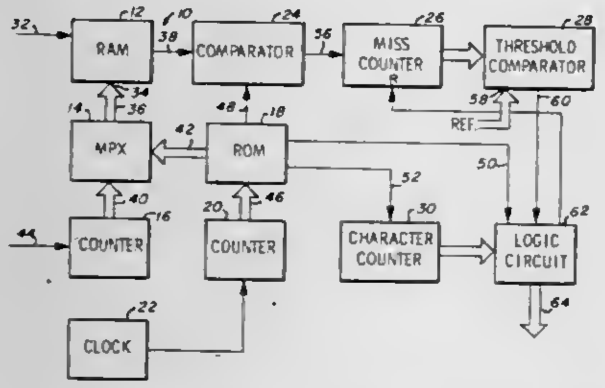


means for physically separating signals of an internal shape and signals of an external shape from the shape to be recognized.

4,110,737
CHARACTER RECOGNITION APPARATUS FOR SERIALLY COMPARING AN UNKNOWN CHARACTER WITH A PLURALITY OF REFERENCE CHARACTERS

William David Fahey, Cupertino, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,588
Int. Cl.² G06K ***9/12***
U.S. Cl. 340—146.3 Q **15 Claims**



1. A character recognition apparatus for recognizing an unknown character having a value at a matrix of discrete locations, said apparatus comprising:

first memory means having at least a first plurality of storage locations each containing an address storing location and a reference storing location and storing information relative to a reference character, said first means being responsive to a count signal and operative to provide a first address signal corresponding to the information stored in a selected one of said address storing locations and a reference signal corresponding to the information stored at the selected reference storing location;

second memory means including a second plurality of storage locations each storing a value of an unknown character at a discrete matrix location, said second plurality of storage locations being greater than said first plurality of storage locations, said second means being responsive to said first address signal and operative to provide a data signal corresponding to the value of the unknown character at the address location;

third means for producing said count signal;

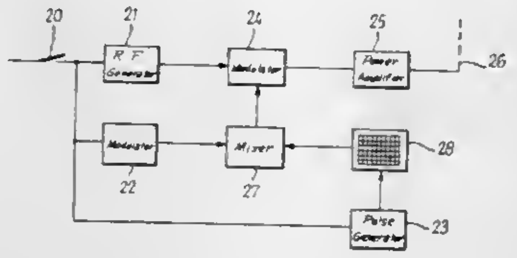
fourth means for applying said count signal to said first means; and

fifth means responsive to said data signal and said reference signal and being operative to provide an output signal when said signals are unlike, said output signal serving as an indication that said unknown character is not said reference character.

4,110,738
ANTI-THEFT ALARM WITH CODED RADIO LINK

Leone Glicerio Sattin, Rome, Italy, assignor to Voxon S.p.A., Italy

Filed Jan. 5, 1977, Ser. No. 757,126
Claims priority, application Italy, Jan. 13, 1976, 47623/76
Int. Cl.² G08B ***13/00***
U.S. Cl. 340—539 **7 Claims**



1. A remote signalling system for indicating unauthorized access to a protected area comprising:

A transmitting unit adapted for stationary location at the protected area and including a clock signal generator; first code matrix means connected to said clock signal generator and adapted to be programmed according to a predetermined code and responsive to clock signals from said clock signal generator for supplying a pulse signal sequence indicative of the predetermined code; a radio transmitter connected to said first code matrix means for transmitting radio signals of the pulse signal sequence; and activating means responsive to unauthororized access to the protected area for activating said clock signal generator; and

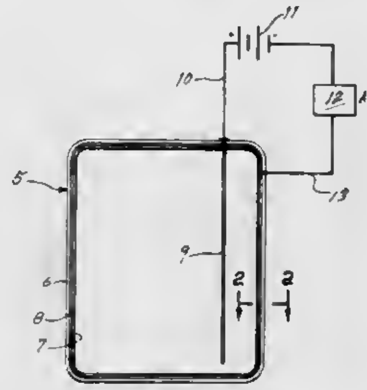
a receiving unit including a radio receiver for receiving radio signals transmitted by said radio transmitter; and second code matrix means connected to said radio receiver and adapted to be programmed according to the same predetermined code and responsive to receipt of radio signals of the pulse signal sequence for generating an alarm indication.

4,110,739
MEANS FOR DETECTING LEAKAGE IN THE INNER LINING OF TANKS AND PIPING

John A. Kidd, 9961 Plaza Blvd., Montreal, Quebec, Canada (H1H 4L5)

Filed Aug. 2, 1976, Ser. No. 710,419
Int. Cl.² G08B ***21/00***
U.S. Cl. 340—605 **2 Claims**

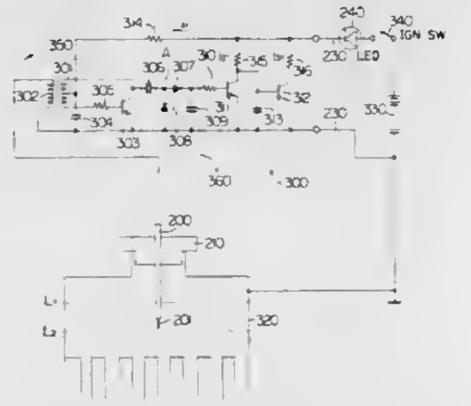
1. A vessel for containing liquid chemicals, the said vessel having a laminate wall structure, including an outer structural wall of fibreglass reinforced polyester, an inner corrosion resistant thermoplastic barrier and an electrical conductive layer constructed of finely divided particles contained in a glass mat, said finely divided particles being selected from the group consisting of metals, carbon and graphite, the said conductive layer positioned between the said outer structural wall and the said inner corrosion resistant barrier, an electrical conductive probe extending into the liquid containing interior of the vessel, and an alarm means electrically connected between the probe and the conductive layer and adapted to be activated when the inner corrosion resistant barrier of the vessel is penetrated by the liquid chemical stored within the vessel.



4,110,740
LIQUID LEVEL DETECTING APPARATUS

Sigeyuki Akita, Aichi, and Junji Kitagawa, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 31, 1977, Ser. No. 764,458
Claims priority, application Japan, Feb. 9, 1976, 51-13776[U]; Feb. 13, 1976, 51-16155[U]
Int. Cl.² G08B ***21/00***
U.S. Cl. 340—620 **10 Claims**



1. A liquid level detecting apparatus for detecting the level of a conductive liquid comprising:

a battery;

a pair of electrodes positioned to be electrically connected through said liquid with each other when the level of said liquid is higher than a predetermined level and electrically disconnected from each other when the level of said liquid is lower than said predetermined level;

an oscillation circuit connected across said battery and including a primary coil and a secondary coil magnetically coupled to each other and a transistor connected to said primary coil, said secondary coil being connected to said pair of electrodes, and said oscillation circuit being adapted to produce from a collector of said transistor an oscillation signal only when said pair of electrodes are disconnected from each other;

a coupling capacitor connected to the collector of said transistor;

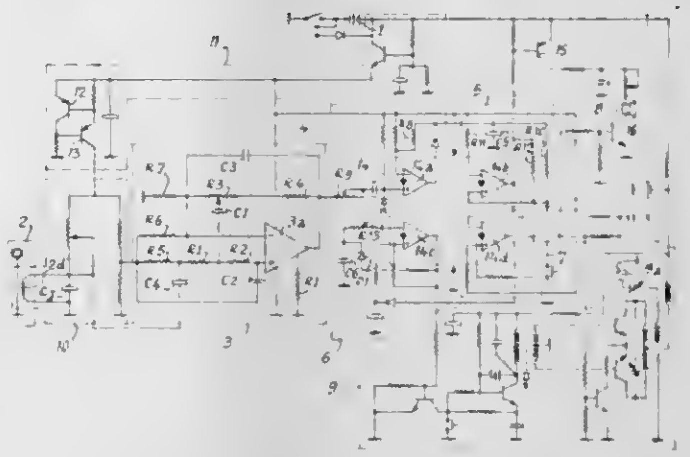
a discriminator circuit connected across said battery and to said oscillation circuit via said coupling capacitor, said dicriminator circuit receiving said oscillation signal through said coupling capacitor for converting said oscillator signal into a direct current voltage signal which is higher than a lower voltage side of said battery, and

a display means connected to said discriminator circuit for indicating whether or not the level of said liquid is higher than said predetermined level.

4,110,741
DEVICE FOR MONITORING PHYSICAL ACTIVITY OF PERSONS

Jacques Hubert, Saint-Avold; Jean-Marie Ory, Heillecourt; Jean Bottin, Nancy, and Claude Humbert, Heillecourt, all of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Jan. 21, 1977, Ser. No. 761,483
Claims priority, application France, Jan. 20, 1976, 76 01419
Int. Cl.² G08B ***21/00***
U.S. Cl. 340—573 **9 Claims**

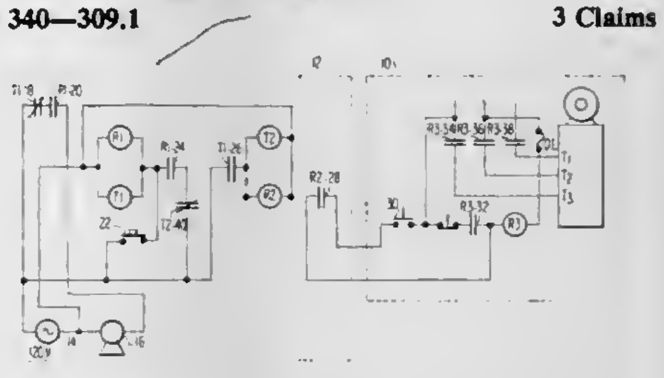


1. Apparatus for monitoring the movements of a person, comprising an individual monitoring device to be carried by the person whose movements are to be monitored, said device comprising a displacement detector, the displacement detector being arranged to supply a continuously variable signal dependent on the positional changes of the device, signal processing means receiving said signal, the signal processing means comprising a band pass filter for receiving the signals supplied by the displacement detector, the pass band of the filter being such that the said filter will only allow signals due to changes in position of the device consequent upon the monitored person's "normal" movements to pass, and at least one alarm device operatively connected to the signal processing means to provide an alarm in the absence of said signals due to the monitored person's "normal" movements.

4,110,742
ALARM CIRCUIT

J. C. Hawkins, Wise, Va. 24293

Filed Jul. 11, 1977, Ser. No. 814,724
Int. Cl.² G08B ***1/00***
U.S. Cl. 340—309.1 **3 Claims**



1. A safety circuit for use in connection with power driven industrial machinery comprising:

a start circuit for the machinery;

alarm means;

means interlocked with said start circuit disabling operation thereof until said alarm means has been energized for a predetermined time;

manual means for energizing said alarm;

means in circuit with said alarm for terminating said alarm after a predetermined time;

means responsive to termination of said alarm for enabling said start circuit; and

means for disabling said start circuit in the event that the equipment with which it is associated does not start within a predetermined time following termination of said alarm.

4,110,743

WIRELESS PAGING RECEIVER

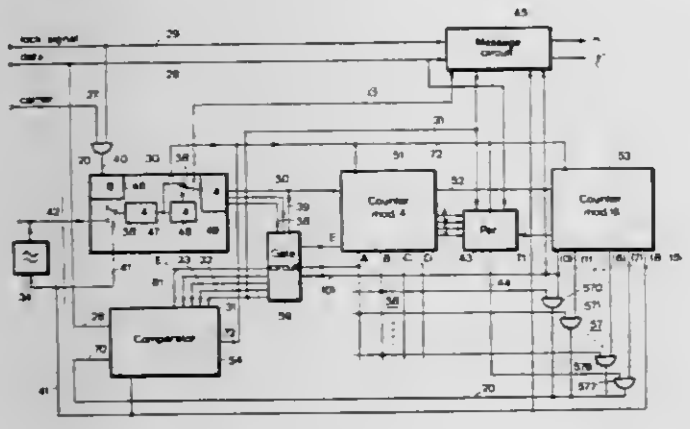
Hans Zahnd, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

Continuation-in-part of Ser. No. 595,290, Jul. 11, 1975, abandoned. This application Sep. 14, 1976, Ser. No. 723,297

Claims priority, application Switzerland, Jul. 11, 1974, 9497/74

Int. Cl.² H04B *7/00*

U.S. Cl. 340—311 **6 Claims**



1. In a wireless paging system, receivers for carrier frequency call telegrams,

each call telegram (**13-16**) consisting of p code words, each code word consisting of *n* bits,

each call telegram including an address (**15**) composed of *m* code words (w_1-w_6) which are selected from a plurality of code words including selective call code words (A, B, C, D) and one group call word (E);

call telegrams for calling an individually selected receiver have an address (ADABBA) which is individually assigned to the respective receiver and consists only of selective call code words;

group call telegrams for simultaneously calling a selected group of receivers have an address containing those selective call code words which are identical in the addresses of all receivers of the selected group, each code word which is not the same in the addresses of all of these receivers of the selected group is replaced by said group call code word (E);

each receiver including:

demodulator means (**26**) supplied by the carrier frequency call telegrams and delivering for each telegram the bit sequence

corresponding thereto;

clock pulses generating means (**30**) controlled by said demodulator means (**26**) and generating a clock pulse sequence in synchronism with the bits of the received telegram;

bit sequences generating means (**51, 53, 56, 57**) controlled by said clock pulse sequence for generating synchronously to the reception of the bits of the code words of the received telegram a first and a second bit sequence, said first bit sequence is equal to the bit sequence of the individual address (ADABBA) of the receiver, and said second bit sequence (EEEEEE) consists of *m* group call code words (E)

means (**54, 53**) for comparing bit by bit and code word by code word the address of the received code telegram with said first and with said second bit sequence and delivering an output signal at the end of the reception of the address if each code word of the received address has matched with either the respective code word of the first or with that of the second bit sequence; and

signalling means (**34, 35, 36**) supplied by said output signal and delivering an acoustical signal.

4,110,744

PASSIVE ELECTRO-OPTIC DISPLAY CELL

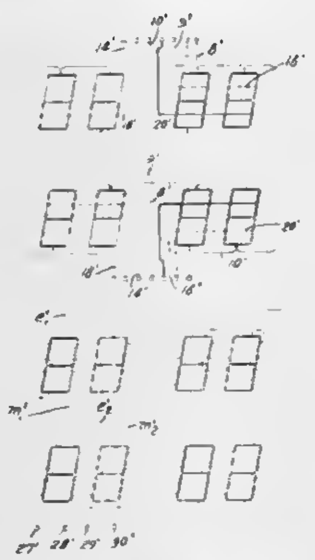
Claude Laesser, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Feb. 3, 1976, Ser. No. 654,941

Claims priority, application Switzerland, Feb. 10, 1975, 1590/75

Int. Cl.² G09F *9/32*

U.S. Cl. 340—336 **3 Claims**



1. A passive electro-optic display cell formed of a plurality of digits, each digit being formed of a plurality of electrodes arranged in a figure eight pattern and at least a pair of counter-electrodes in registration with the electrodes, the improvement comprising

a pattern of non-crossing conductor leads selectively interconnecting like electrodes of the respective digits;

said digits being arranged in first and second groups, with at least several of the conductor leads connecting like electrodes in each group and selected ones of said conductor leads interconnecting different electrodes of the group having digit positions in mirror-like image relationships with each other; and

with selected ones of counter-electrodes of each digit in one group being electrically coupled to each other and to corresponding counter-electrodes of a digit in the other group.

4,110,745

ANALOG TO DIGITAL CONVERTER

Yuichi Ninomiya, Kawasaki, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Oct. 28, 1975, Ser. No. 626,099

Claims priority, application Japan, Nov. 6, 1974, 49-127219

Int. Cl.² H03K *13/175*

U.S. Cl. 340—347 AD **6 Claims**

1. An analog to digital converter wherein an input analog signal having periodically appearing reference dc levels to be converted to a digital signal is compared with at least one reference voltage to produce at least one digital output signal, said analog to digital converter comprising:

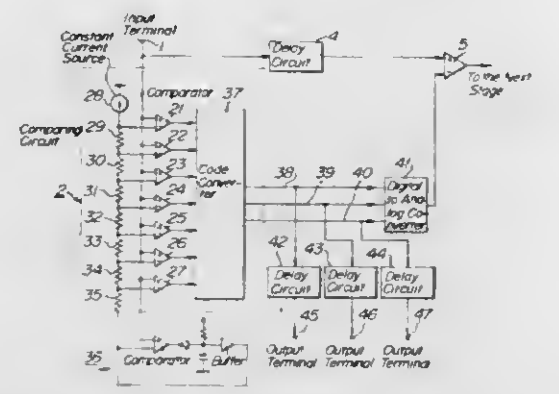
comparator means having at least one signal comparator for comparing said input analog signal with said reference voltage to form said digital output signal,

a series circuit having at least one constant current source and at least one resistor connected in series therewith for supplying said reference voltage to said signal comparator, and

dc clamping means receiving said input analog signal for periodically clamping the level of said reference voltage at a constant dc voltage level related to said reference dc level in the input analog signal, said dc clamping means including

a clamper comparator for receiving said input analog signal and a clamper reference signal corresponding to said reference voltage for comparing said clamper reference signal with said reference dc level in said input analog signal,

switching means having a first terminal connected to an output terminal of said clamper comparator,



a capacitor connected between a second terminal of said switching means and ground, said capacitor being charged or discharged in accordance with the output signal derived from said clamper comparator, and

a buffer connected between the junction between said capacitor and said switching means and an input terminal of said clamper comparator for supplying said clamper reference signal, said switching means being opened or closed in accordance with the level difference between the output signal derived from said clamper comparator and the voltage at said junction.

4,110,746

A-D CONVERTER HAVING NONLINEAR CHARACTERISTICS

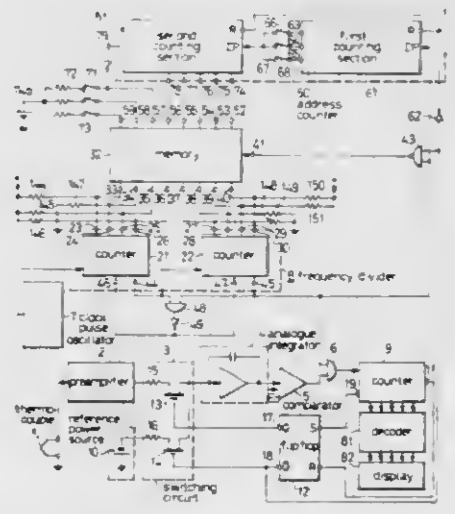
Hikaru Furukawa; Masakazu Mitamura, both of Gyoda, and Keoji Higuchi, Ageo, all of Japan, assignors to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Jun. 21, 1976, Ser. No. 697,897

Claims priority, application Japan, Jun. 23, 1975, 50-77205

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 NT **5 Claims**



1. An A-D converter response to an input voltage comprising:

integrating means;

a source of input voltage;

a source of a reference signal opposite in polarity to the input voltage;

a reference clock pulse source;

a counter;

a control logical circuit controlled by the output from the counter to supply the input voltage to the integrating means so that it achieves a first integration until the count value of the counter reaches a preset value from a predetermined one whereafter the integrating means then achieves second integration of the reference signal;

a variable frequency divider circuit for frequency dividing the clock pulses from the reference clock pulse source and connected to supply the frequency divided pulses to the counter during the periods of said first and second integrations;

an address counter for counting the frequency divided pulses from the frequency divider circuit;

a memory having stored therein signals for determining the frequency dividing ratio of the variable frequency divider and addressed in accordance with the count value of the address counter;

means for setting in the variable frequency divider one of the frequency dividing ratio determining signals stored in the memory each time a certain number of output pulses are delivered from the variable frequency divider circuit;

and means for setting the variable frequency dividing ratio at a fixed frequency dividing ratio other than unity in the period of the first integration.

4,110,747

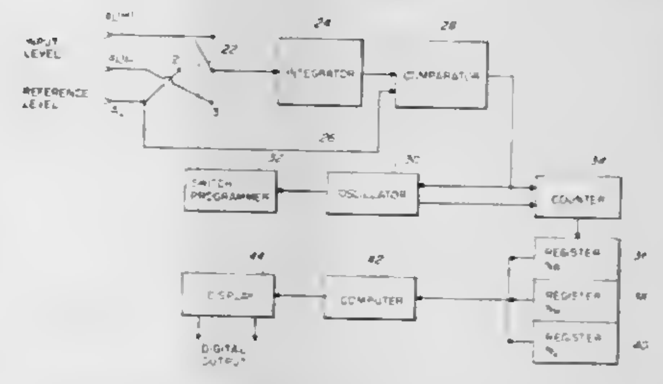
APPARATUS FOR PRODUCING ANALOG-TO-DIGITAL CONVERSIONS

Paul J. LaBrie, 11 Hemenway Rd., Salem, Mass. 01970

Filed Feb. 2, 1976, Ser. No. 654,298

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 NT **6 Claims**



1. Apparatus for converting an unknown analog electronic signal having high and low levels to a digital electronic signal representing a digital measurement of said unknown analog signal, comprising:

(a) three input signal terminals for providing a high level of an unknown signal to be measured, a low level of an unknown signal to be measured and a reference signal,

(b) timed switch means adapted to connect sequentially to said terminals to produce chopped signals therefrom in predetermined pair combinations, a first pair combination comprised of the high level of the unknown signal and the reference signal, a second pair combination comprised of the low level of the unknown signal and the reference signal, and a third pair combination comprised of the reference signal and the reference signal,

(c) electronic integrating means connected to receive signals from said terminals exclusively through said timed switch means, said integrating means being adapted to combine said chopped signals in said predetermined pair combinations, said integrating means generating an integrated signal for each of said pairs, said timed switch means applying said pairs to said integrating means in a predetermined sequence, said timed switch means alternately applying to said integrating means for predetermined periods each signal of each said pair in said predetermined sequence, and

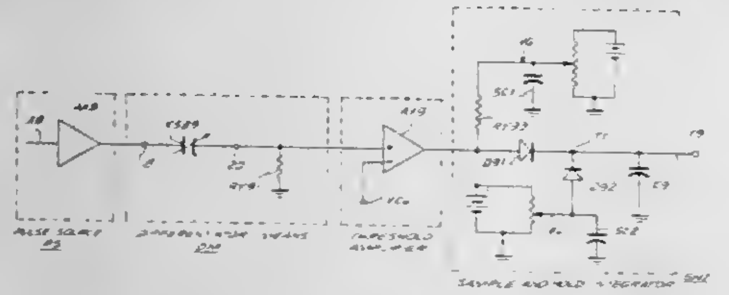
(d) comparator means connected to said integrating means and to said reference signal terminal and adapted to provide an output pulse when the amplitude of said integrated signal for each said pair equals said reference signal,

(e) counter means connected to said comparator means, said counter means having enabled and disabled states and plural storage means being selectively accessed to store the output of said counter means.

(f) pulse means for generating a series of clock pulses, said pulse means connected to said counter means, said counter means counting and storing the number of pulses generated by said pulse means during the integration period for each said pair when enabled, said counter means disabled by said comparator means output pulse, and

(g) computer means for processing said counts stored in said storage means, said computer means generating a digital signal representing said unknown analog signal in digital form.

4,110,748
KEYSWITCH WITH HYSTERESIS
Francis C. Marino, Dix Hills, N.Y., assignor to Burroughs Corporation, Detroit, Mich.
Filed Apr. 6, 1976, Ser. No. 674,215
Int. Cl.² H01G *5/01;* G08C *25/00*
U.S. Cl. 340—365 C **10 Claims**



9. Capacitive key switch assemblage comprising: a source of packets of electrical pulses, each of the pulses in the packet being of a fixed duration; an electrical signal differentiator means, including a resistor and a controllably variable capacitor connected to a keystem and having an input connected to said source and an output for transmitting from said output for each pulse received at said input a pulse having a trailing edge whose slope is a function of the travel of the keystem; a threshold amplifier means having an input connected to the output of said differentiator means and an output, said threshold amplifier means accepting those portions of each pulse with a variable trailing edge which fall between two signal levels whereby a pulse is transmitted from the output of said threshold amplifier means having a width which is a function of the trailing edge of the pulse received from said differentiating means; and a sample and hold electrical signal integrator means connected to the output of said threshold amplifier means, for emitting an integrated signal whose amplitude is a function of the duration of the signals emitted by said threshold amplifier means.

4,110,749
TOUCH DISPLAY TO DIGITAL ENCODING SYSTEM
Bozidar Janko, and Aris Silzars, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed May 6, 1977, Ser. No. 794,438
Int. Cl.² G08B *5/36*
U.S. Cl. 340—365 C **4 Claims**

1. A touch display to digital encoding system, comprising:
display means including means for providing light images;
means associated with said display means for inputting N data units thereto, said means including touch contact means sensitive to touching by a human body for providing N data units;
electronic recognition circuitry responsive to said N data units for synchronously converting said N data units to discrete elements of information to digitally encode said N data units said circuitry comprising

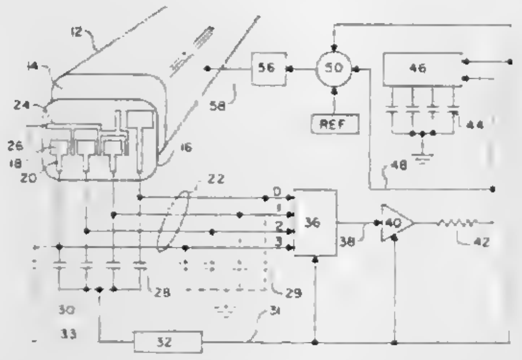
(a) first means for selecting one out of said N data units and transmitting the selected data unit to a single channel, said first means including means for synchronously selecting said data unit;

(b) second means responsive to said data unit for providing a signal which is a synchronous rectified version of said data unit, said second means including unity gain amplifier means for rectifying said data unit;

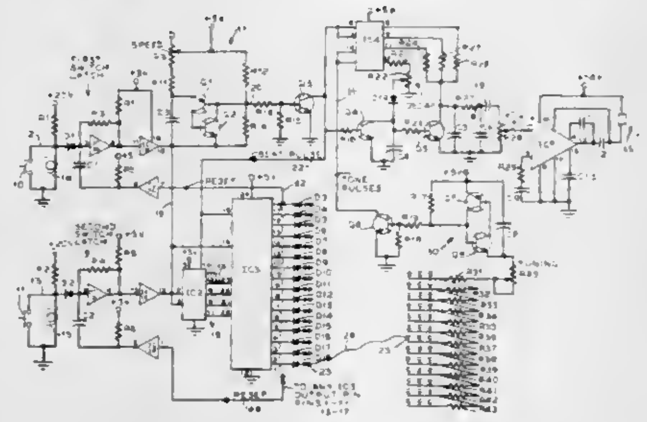
(c) third means responsive to said signal for sychronously providing a filtered signal, said third means including synchronously switched means for filtering said signal;

(d) means for comparing said filtered signal and a reference signal to provide said discrete elements of information; and

means responsive to said discrete elements of information for providing control data, said means also being operatively associated with said display means for inputting said N data units thereto.

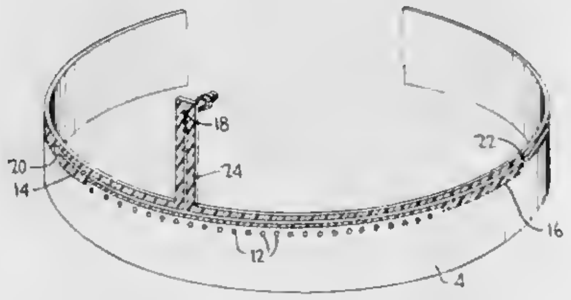


4,110,750
PROGRAMMABLE ELECTRONIC DOOR CHIME
Bjorn Heyning, Saint Joseph, Mich., and Dennis D. Tremblay, La Salle, Ill., assignors to Heath Company, Benton Harbor, Mich.
Filed Oct. 1, 1976, Ser. No. 728,807
Int. Cl.² G08B *3/00*
U.S. Cl. 340—384 E **8 Claims**



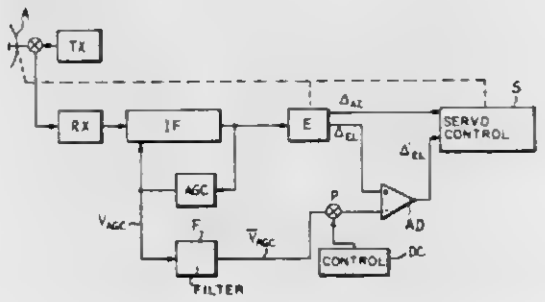
1. A programmable electronic door chime comprising:
means for generating an actuating signal;
resettable circuit means responsive to said actuating signal for generating a first signal;
identification circuit means, having a plurality of output terminals, responsive to said first signal to generate a series of clock pulse signals for sequentially energizing said plurality of output terminals, a selected one of said output terminals being connected to said resettable circuit for providing a reset signal thereto when said selected terminal is energized to terminate said first signal; and
an RC controlled tone generator, for producing output tone signals comprising, in combination, a multivibrator, a capacitance element and a plurality of series connected resistance elements, said generator having a plurality of different tone determining inputs, each comprising a junction point between a different pair of said series connected resistance elements for selective connection to said output terminals and for varying the RC constant controlling said multivibrator to generate a desired sequence of output tone signals in direct response to said clock pulse signals energizing the ones of said terminals connected to said tone determining inputs.

4,110,751
VERY THIN (WRAP-AROUND) CONFORMAL ANTENNA
Frank Reggia, Bethesda, Md., and Howard S. Jones, Jr., Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 10, 1977, Ser. No. 776,161
Int. Cl.² H01Q *13/18, 1/38*
U.S. Cl. 343—700 MS **12 Claims**



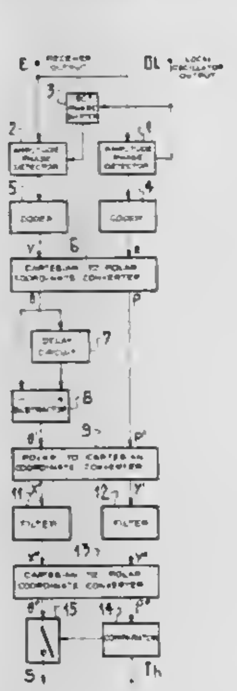
1. A thin wrap-around, conformal antenna comprising:
a conformal dielectric substrate;
conductive plating on the interior surface of the substrate;
conductive plating on the exterior surface of the substrate, the plating defining a cavity region for a pair of radiating elements;
shorting means for forming the boundaries of the cavity-backed radiating elements placed along the periphery of the elements except for a single cavity radiating region on each element; and
a stripline feed network for nonsymmetrically coupling energy to the individual radiating elements at selected points along the radiating region whereby microwave energy may be received or transmitted.

4,110,752
SYSTEMS FOR REDUCING THE ELEVATION ERROR FOR TRACKING RADARS OF LOW HEIGHT TARGETS
Filippo Neri, Rome, Italy, assignor to Selenia-Industrie Elettroniche Associate S.p.A., Italy
Filed Apr. 5, 1977, Ser. No. 784,871
Claims priority, application Italy, Feb. 16, 1976, 51311 A/76
Int. Cl.² G01S *9/02*
U.S. Cl. 343—7.4 **12 Claims**



1. In a system for the automatic correction of nodding elevation errors of radars tracking targets at low heights, including an antenna, a radar transmitter coupled to the antenna for transmitting radar signals therefrom, a radar receiver coupled to the antenna for receiving radar signals therefrom, intermediate frequency channel circuitry, azimuth error detection circuitry for generating an azimuth error signal, elevation error detection circuitry for generating an elevation error signal, an antenna servo, and coupling means for coupling the antenna servo to the azimuth error detection circuitry, to the elevation error detection circuitry and to the antenna for controlling positioning of the antenna in accordance with the azimuth error signal and the elevation error signal, the improvement in which the coupling means includes elevation error correction circuitry comprising first circuit means for detecting variations of the amplitude of the received radar signals due to the reflection effect at low height and for generating a variation signal indicative thereof, second circuit means for subtracting the variation signal from the elevation error signal to provide a corrected elevation error signal, and third circuit means for applying the corrected elevation error signal to the antenna servo to control the antenna elevation in accordance therewith.

4,110,753
DEVICE FOR PROCESSING SIGNALS FROM A COHERENT PULSE RADAR
Jacques Sirven, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Jan. 31, 1977, Ser. No. 764,518
Claims priority, application France, Feb. 3, 1976, 76.02938
Int. Cl.² G01S *9/44*
U.S. Cl. 343—8 **7 Claims**



1. A device for processing signals received by a coherent pulse radar, said device containing two amplitude-phase detectors for demodulating in quadrature said radar signals and for delivering respective video signals (X, Y), means for coding the said (X, Y) video signals, first means for converting (X, Y) coded signals representing cartesian coordinates into (ρ, θ) signals representing respectively the polar coordinates corresponding to the cartesian coordinates (X, Y), means for delaying and subtracting the signals (θ) received from at least two consecutive repetition periods, delivering a signal (θ'), second means for converting (ρ, θ') signals into (X', Y') signals representing the corresponding cartesian coordinates, means for filtering the said (X', Y') signals and third means for converting the filtered (X", Y") signals into (ρ'', θ'') signals which are the corresponding polar coordinates, for delivering the signal ρ'' representing the amplitude of the echoes received by the radar

and the signal θ'' representing the Doppler speed of the said echoes.

4,110,754

DETECTION OF ANGULAR DISPLACEMENT TO AN OBJECT FROM THE MOVING VEHICLE

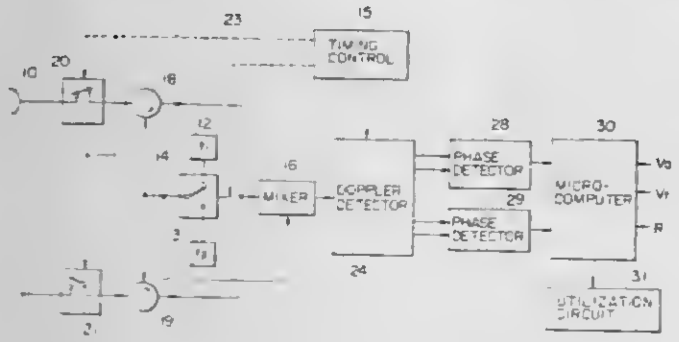
Hiroshi Endō, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 27, 1977, Ser. No. 801,315

Claims priority, application Japan, May 29, 1976, 51-61787

Int. Cl.² G01S *9/02, 9/44*

U.S. Cl. 343—16 R **14 Claims**



1. A method for determining the angular displacement of an object in front of a motor vehicle from the center axis of said vehicle, comprising the steps of:

transmitting a first sequence of alternately occurring bursts of energy at first and second frequencies from a first antenna and a second sequence of alternately occurring bursts of energy at first and second frequencies from a second antenna at alternate intervals with the bursts of said first sequence, said first and second antennas being mounted equally spaced from said center axis of said vehicle;

receiving the signals reflected from said object;

deriving first and second Doppler signals from the received signals resulting from the reflection of the bursts transmitted from said first antenna and deriving third and fourth Doppler signals from the received signal resulting from the reflection of the bursts transmitted from said second antenna;

generating a first signal representing the phase difference between said first and second Doppler signals and a second signal representing the phase difference between said third and fourth Doppler signals; and

computing said angular displacement using said first and second phase difference representative signals.

4,110,755

PULSE RADAR DEVICE WITH PHASE- OR FREQUENCY-MODULATION

Anton Zottl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

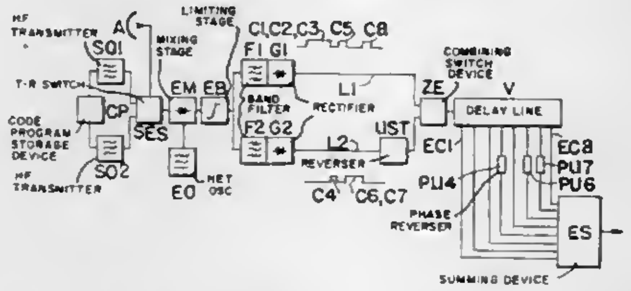
Filed Sep. 22, 1970, Ser. No. 74,893

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1969, 1948758

Int. Cl.² G01S *9/233*

U.S. Cl. 343—17.2 PC **1 Claim**

1. A pulse-radar device with phase-or frequency-modulation of the transmitting pulses and pulse compression at the receiver, comprising means for the suppression of interference pulses prior to the compression including means providing a hard limitation of the received pulses, means for summing the limited signals and means providing a predetermined threshold level so that only such received signals are released for evaluation which when summed up after compression exceed said predetermined threshold level, said pulses being binary frequency-coded, means for separating the received signals interposed between said means providing a hard limitation and said means for summing the limited signals including two band filters, means interposed at the output of one of said band filters for additionally pole-or phase-reversing the corresponding signals, and a delay device connected to receive signals from said band filters, said delay device having a plurality of distributed taps and operable to provide said binary pulses individually at said taps, and a plurality of 180° phase advancers connected between those taps for one of the two types of binary pulses and said means for summing the limited signals so that those pulses belonging to a reflecting pulse of a modulated transmitting pulse are added at the same time.



4,110,756

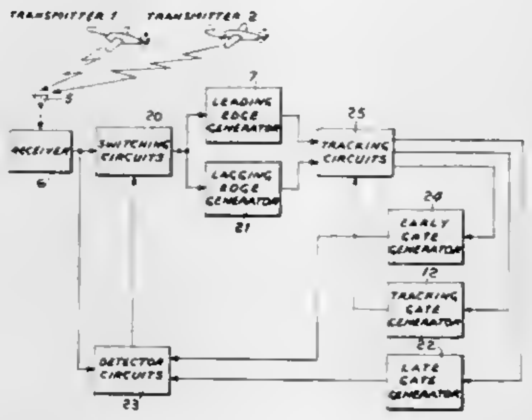
CAPTURE PROTECTION FOR PULSE SIGNAL TRACKING SYSTEM

Philip Kaszerman, West Orange, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Jan. 10, 1972, Ser. No. 216,518

Int. Cl.² G01S *9/14*

U.S. Cl. 343—7.3 **3 Claims**



1. A method of separating pulses of a particular signal source from the total signal environment of the type wherein pulses are received in a receiver which passes only the leading or lagging edge of said pulses and a primary tracking gate is generated by a tracking system which allows passage of those leading or lagging edges received during the time of said tracking gate, wherein the improvement comprises:

generating secondary tracking gates on either side of said primary tracking gate for detecting interferring pulses before they coincide with pulses being tracked;

switching said tracking system from a leading edge tracking mode to a lagging edge tracking mode when an interferring pulse is detected by a first secondary tracking gate occurring after said primary tracking gate;

switching said tracking system from a lagging edge tracking mode to a leading edge tracking mode when an interferring pulse is detected by a second secondary tracking gate occurring before said primary tracking gate.

4,110,757

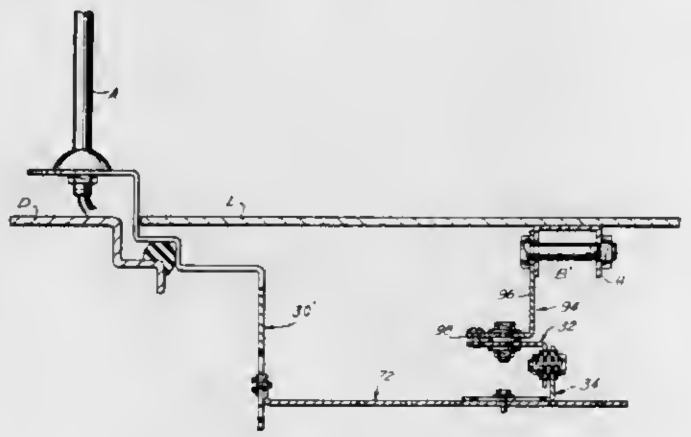
BRACKET ASSEMBLY FOR MOUNTING A CB ANTENNA

Felix P. Sieber, Union, N.J., assignor to BCS Mach. & Mfg. Corp., South Plainfield, N.J.

Filed Dec. 13, 1976, Ser. No. 749,661

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—715 **14 Claims**



1. An assembly for mounting a CB antenna to a bolt that is used for securing a hinge to a trunk lid of an automobile, said assembly comprising:

(a) a first bracket having a single opening therein for receiving the bolt that secures the hinge to the trunk lid whereby said first bracket is adapted to be coupled to the automobile body without forming any holes therein;

(b) a second bracket having means for mounting the antenna thereon; and

(c) pivotable joint means coupling said first and said second brackets to each other whereby with the trunk lid closed and with said first bracket secured to the hinge by means of the bolt, a portion of said second bracket with the antenna mounted thereon will be exposed and whereby after manipulation of said joint means about different first and second axes said second bracket with the antenna mounted thereon will be completely contained within the trunk compartment without removing said first bracket from the hinge.

4,110,758

HIGH QUALITY PRINTING SYSTEM WITH CONSTANT INTERMITTENT TAPE DRIVE

Alfred N. Nelson, and David L. Davis, both of Los Angeles, Calif., assignors to Addressograph Multigraph Corporation, Los Angeles, Calif.

Filed Dec. 22, 1976, Ser. No. 753,440

Int. Cl.² G03G *19/00;* B65H *17/42*

U.S. Cl. 346—74.1 **11 Claims**

1. Printer apparatus for printing on a print medium comprising:

a tape having a layer of magnetizable images on said tape;

a toning device for applying toner to the magnetic images on said tape;

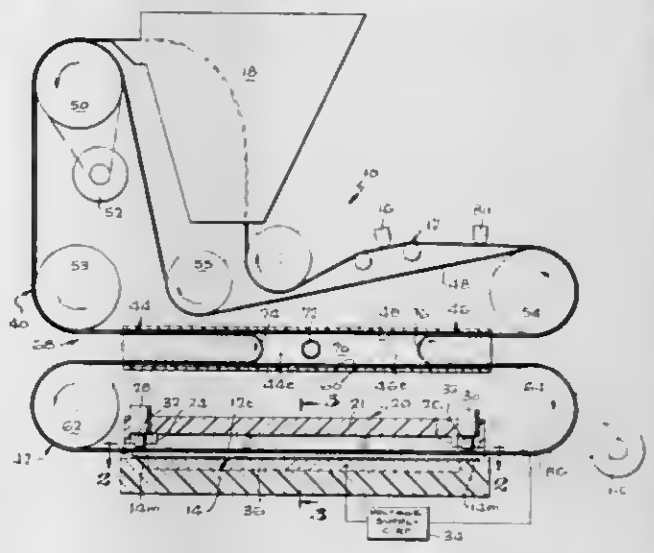
a print medium transport for moving a print medium along a predetermined print medium path that passes adjacent to said tape path at a predetermined transfer location;

transfer means disposed at said transfer location for transferring toner from said tape to said print medium during a time when the tape portion thereat is stationary;

a first transport means for moving said tape substantially continuously along a first tape path portion which extends past said recording head and said toning device;

a second transport means for moving said tape intermittently along a second tape path portion which extends past said transfer location; and

first and second buffers disposed between said first and second transport means, said first buffer positioned to receive tape from said first transport means and said second buffer positioned to receive tape from said second transport means.



4,110,759

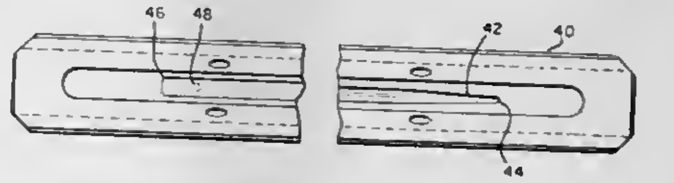
ORIFICE PLATE HOLDER FOR A FLUID JET PRINTING APPARATUS

Leonard G. Stoneburner, Fairborn, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 3, 1977, Ser. No. 765,116

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **11 Claims**



1. An orifice plate holder for use in a jet drop printing apparatus wherein an orifice plate having a plurality of orifices is secured thereto for controlled vibrational stimulation of a plurality of filaments of fluid flowing from said orifices, comprising:

a generally rectangular cross sectioned plate, substantially co-extensive with said orifice plate and having an elongated central opening with two end portions defined therein, the walls of said opening being co-extensive with and abutting a vibrating portion of said orifice plate containing said plurality of orifices, said opening being further defined with at least one of said end portions formed by convergingly tapered portions of said walls, said one end portion extending for substantially less than one half of the length of said opening and so configured as to dampen vibration of said orifice plate at a position corresponding to said at least one end portion so as to suppress backwardly directed reflections of waves traveling through said vibrating portion of said orifice plate.

4,110,760

METHOD OF MANUFACTURING A CATHODE RAY TUBE FOR DISPLAYING COLORED PICTURES

Johannes Cornelis Adrianus van Nes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,075

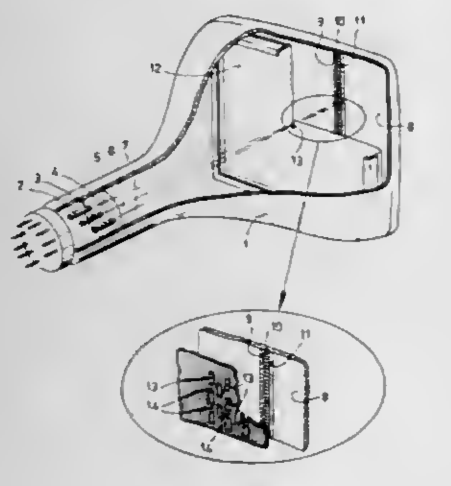
Claims priority, application Netherlands, Mar. 27, 1975, 7503665

Int. Cl.² G03C *5/00*

U.S. Cl. 354—1 **3 Claims**

1. In the method of manufacturing a color cathode-ray tube comprisng a fluorescent screen and a support surface and a shadow mask spaced a distance *q* from said screen and having

parallel rows of elongate apertures, the proximal ends of each pair of adjacent apertures in each of said rows being separated by a solid bridge and the centers of each of said pairs of apertures being spaced apart by a distance *a*, said screen being divided into strips of phosphors, each of said strips having substantially uniform width throughout its length, the steps comprising: exposing photosensitive material on the entire said surface to illumination passing through said apertures from a light source elongated in the direction parallel to said rows of apertures and spaced a distance L from said support surface, the length l of said light source being



$$l = a \cdot n \cdot (L\text{-}q/q)$$

wherein *n* is an integer; and moving the source of light longitudinally during exposure of said photosensitive material by a distance *k*, where

$$k = a\ m\ (L\text{-}q/q)$$

and *m* is an integer at least as great as 1 and not larger than *n*.

4,110,761
COLOR SIGNAL PROCESSING APPARATUS FOR VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

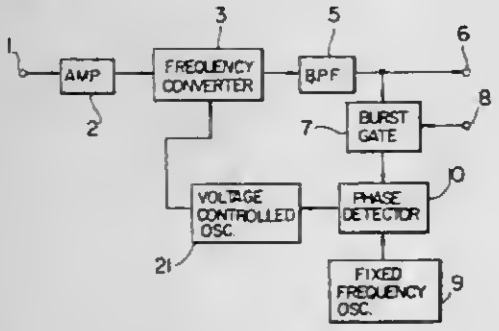
Yoshizumi Watatani, Machida, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 9, 1976, Ser. No. 748,906

Claims priority, application Japan, Dec. 12, 1975, 50-147337; Dec. 12, 1975, 50-147338; Dec. 12, 1975, 50-147340

Int. Cl.^{2} H04N *5/76*

U.S. Cl. 358—4 **6 Claims**



1. A recording and reproducing apparatus for recording a color television signal on a recording medium after having frequency shifted a carrier color signal of a color video signal to a low frequency band signal and reproducing the color television signal by frequency shifting the low frequency band carrier color signal read from the recording medium to an original high frequency band signal, comprising:

voltage controlled oscillator means having a center frequency which is equal to a frequency which differs from a carrier wave frequency of the carrier color signal of said color television signal by a carrier wave frequency of the carrier color signal which has been frequency shifted to said low frequency band signal, and including a resonance circuit with a crystal resonator and means for damping a quality factor Q of said resonance circuit;

fixed frequency oscillator means for oscillating at a frequency which is equal to the carrier wave frequency of the carrier color signal of said color television signal;

frequency shifting means for mixing the low frequency band carrier color signal read from said recording medium with an output of said voltage controlled oscillator to produce the carrier color signal having the carrier wave frequency of the unshifted carrier color signal; and

means for detecting a phase difference between a color burst signal of the carrier color signal derived from said frequency shifting means and an output of said fixed frequency oscillator to control an oscillation frequency of said voltage controlled oscillator in accordance with the detected phase difference.

4,110,762
DRAWING MACHINES ESPECIALLY FOR INTEGRATED CIRCUIT MASKS

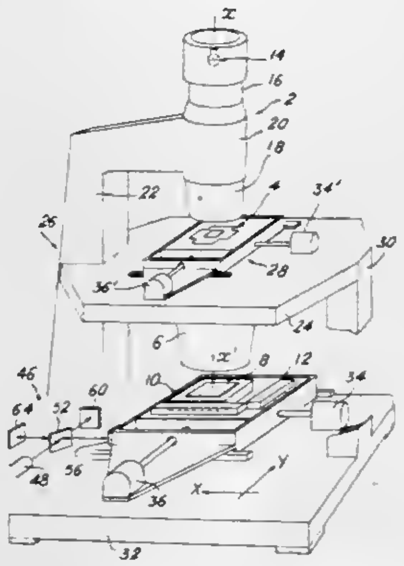
Paul Tigreat, Meylan, France, assignor to Commissariat a l'Energie Atomique, Paris and Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux, Grenoble, both of, France

Continuation of Ser. No. 572,096, Apr. 28, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,883

Claims priority, application France, May 10, 1974, 74 16288

Int. Cl.^{2} G02B *5/23;* **G03B** *41/00, 27/42*

U.S. Cl. 354—4 **7 Claims**



1. A machine for drawing on a photosensitive plate, comprising:

an electro-optical imager having an optic axis x–x', the imager including a plurality of fixed image points arranged in a preselected array,

means for selectively controlling the optical state of each point of the imager at the same time for forming a pattern of a number of points which have an optical state different from the remaining points,

photosensitive plate means aligned with the optic axis of the imager,

the dimensions of each point of the imager corresponding to the smallest detail drawing to be formed on the plate,

means for selectively transmitting a beam of light along the optic axis x–x' when said pattern is formed on the imager,

an objective located on the side of the imager opposite the means for transmitting for providing a magnification n and having the axis x–x', said objective being capable of receiving the entire light beam which passes out of said imager,

means for displacing said imager and said photosensitive plate means with respect to each other in a plane at right

angles to the axis x–x' and in the two orthogonal directions X and Y,

means for measuring the relative displacement of said imager and of said photosensitive plate in the directions aforesaid,

means for controlling the means which produce the relative displacement of said imager and of said photosensitive plate as a function of the indication of said means for measuring the relative displacement of said imager and of the photosensitive plate.

4,110,763
CHARACTER HOLDER

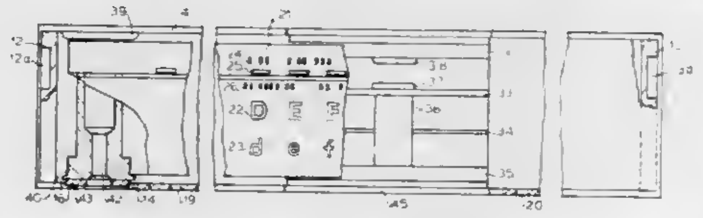
René Kerfante, Dietzenbach-Steinberg, Fed. Rep. of Germany, assignor to Eltra Corporation, Toledo, Ohio

Filed Apr. 26, 1977, Ser. No. 791,078

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 7613449[U]

Int. Cl.^{2} B41B *15/06*

U.S. Cl. 354—14 **10 Claims**



1. A character holder for photocomposing machines having characters and position markings, comprising:

a cassette (3),

two separately positioned rollers (27) and (29), and a continuous film tape (21) which leads around said rollers wherein, at least one of said rollers (27) and (29) includes a coupling part accessible from outside of said cassette for rotating said roller, and said one roller is loosely positioned in said cassette so that said one roller can be moved with respect to the other roller through said part to tension said film strip.

4,110,764
CAMERA SHUTTER

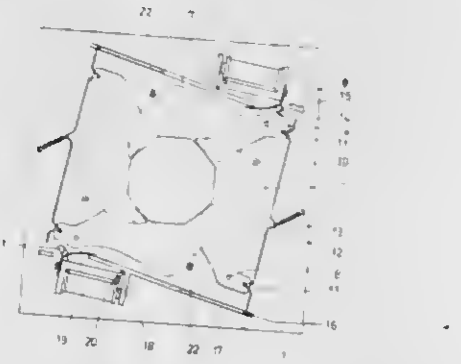
Martin Heinze, 5 Rütger-Von-Scheven, Duren, and Walter Heinze, 14 Gruner Weg, Hürtgenwald-Gey, both of Germany

Filed Dec. 22, 1976, Ser. No. 753,515

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557885

Int. Cl.^{2} G03B *7/08, 9/22*

U.S. Cl. 354—51 **15 Claims**



1. Electro-mechanically operated control shutter for photographic cameras including a lens and comprising:

(a) at least two shutter lamellae, each lamellae including a shutter portion and a lever portion and being pivotally mounted intermediate said shutter portion and said lever portion, so that said lamellae are swingable in parallel planes for occupying a primary position, wherein such shutter portions overlap each other to block light rays from the lens and occupy an open position wherein said shutter portions move out of the light rays from the lens to define an opening,

(b) means for biasing said lamellae in to said closed position,

(c) at least two pusher rods, each respectively connected at one of their ends to respective lever portions of said lamellae,

(d) a pivoted adjusting lever for each of said pusher rods, one end of each lever being operatively connected to the other end of its corresponding pusher rod,

(e) an electro-magnet for each adjusting lever for controlling the opposite end thereof, wherein said lamellae is moved to said open position in opposition to said biasing means upon energization of said electro-magnet, and

(f) electrical control means for energizing said electro-magnets for a predetermined time period whereby said lamellae maintain their open position during said time period.

4,110,765
LIGHT-MEASURING SYSTEMS FOR SINGLE LENS REFLEX CAMERAS

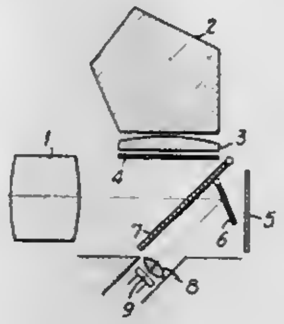
Katsuhiko Miyata, Saitama; Fumio Urano, Omiya, and Akihiro Arai, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Jun. 18, 1976, Ser. No. 698,469

Claims priority, application Japan, Jul. 3, 1975, 50-82399

Int. Cl.^{2} G03B *7/00*

U.S. Cl. 354—59 **7 Claims**



1. In a single lens reflex camera, objective means forming one of a plurality of objective means respectively having different focal lengths and adapted to be used interchangeably, said objective means having an optical axis along which light travels through said objective means into the camera, main mirror means situated behind said objective means and viewfinder means situated above said main mirror means, said main mirror means reflecting light which has traveled through said objective means to said viewfinder means, and said main mirror means having a semitransparent portion through which part of the light which has traveled through said objective means passes, auxiliary mirror means situated behind said semitransparent portion of said main mirror means for receiving the part of the light which passes through said semitransparent portion of said main mirror means, said auxiliary mirror means reflecting the light received thereby along a predetermined path, and photosensitive means situated along said path for receiving the light reflected by said auxiliary mirror means and for participating in the measurement thereof, said main mirror means having at said semitransparent portion thereof a front surface from which light is reflected to said viewfinder means and an opposed rear surface beyond which light travels to said auxiliary mirror means and said auxiliary mirror means having a reflecting surface which directs the light along said predetermined path to said photosensitive means, said rear surface of said main mirror means and said reflecting surface of said auxiliary mirror means forming a pair of surfaces one of which has the property of diffusing light, so that said photosensitive means receives diffused light, reflected from said auxiliary mirror means, for reducing the difference in the operation of said photosensitive means with respect to a plurality of objective means of different focal lengths.

4,110,766
SUPERIMPOSING DEVICE FOR USE IN A DATA-RECORDING CAMERA

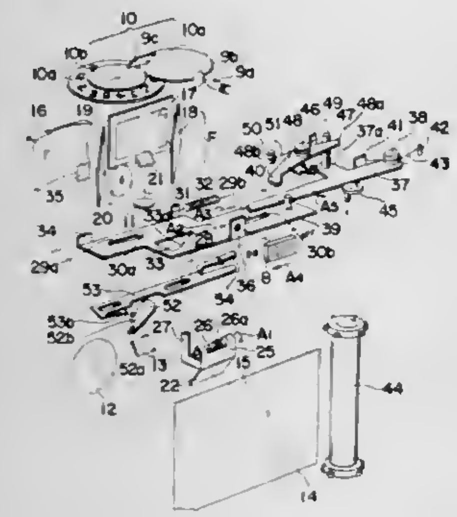
Susumu Fujita; Yoichi Hamada, both of Kobe, and Makoto Kuboshima, Sagamihara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Nov. 17, 1977, Ser. No. 852,261

Claims priority, application Japan, Nov. 19, 1976, 51-139667

Int. Cl.^{2} G03B *17/24, 13/02*

U.S. Cl. 354—106 **7 Claims**



1. A superimposing device for use in a data-recording camera for interposing data on a film over an image of an object and for producing said data in a viewfinder having a view-taking window for receiving therein a light image of the object and an eye-piece, said superimposing device comprising:

a source of light which produces light image of data;

means for defining a first optical path for projecting said light image of the object onto the eye-piece;

means for defining a second optical path for projecting said light image of the data onto the eye-piece at a predetermined portion thereof;

first blocking means provided adjacent said viewtaking window, means for changing the condition thereof between a blocking condition, in which said first blocking means intercepts said first optical path to block the light directed to said predetermined portion of said eye-piece and an open condition, in which said first blocking means is released from blocking said first optical path; and

first actuating means for actuating said changing means to shift said first blocking means between said blocking condition and said open condition,

whereby upon actuation of said first actuating means, said first blocking means changes from open condition to said blocking condition and said first blocking means prevents said predetermined portion of the eye-piece which is constituting a background of the data from being lighted by the light image of the object and thus the data is clearly formed in said predetermined portion of the eye-piece.

4,110,767
SHUTTER AND VIEW FINDER FOR SINGLE LENSE REFLEX CAMERA

Eiichi Onda; Mitsuo Koyama; Ichiro Nemoto; Tadashi Nakagawa, and Masanori Watanabe, all of Yotsukaido Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

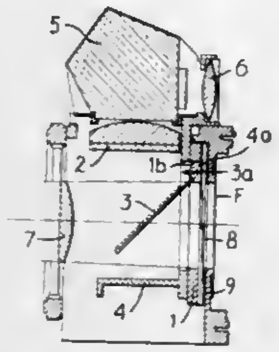
Filed Jan. 21, 1977, Ser. No. 760,980

Claims priority, application Japan, Jan. 22, 1976, 51/5958[U]

Int. Cl.^{2} G03B *19/12*

U.S. Cl. 354—152 **3 Claims**

1. In a single lens reflex camera, the combination of a shutter assembly comprising a shutter base plate, a cover plate rearwardly of the shutter base plate and in front of the film plane of the camera and shutter between said shutter base plate and said cover plate, said shutter base plate being thick to provide a robust construction, a mirror box in front of said shutter base plate, a reflection mirror hingedly supported in said mirror box, an imaging plane above said mirror in conjugate relation to the film plane of the camera, a viewing lens and a prism for reflecting an image on said imaging plane to said viewing lens, the front face of said shutter base plate being recessed within the thickness of said shutter base plate, the rear face of said shutter base plate being plane, and the hinge axis of said mirror being in the thus formed recessing and being located rearwardly of the front face of said shutter base plate and within the thickness of said shutter base plate, whereby the mirror is positioned closer to said film plane, and said imaging plane, prism and viewing lens are positioned closer to the optical axis of the camera to reduce the overall height and thickness of the camera.



4,110,768
AUTOMATIC FILM WIND UP DEVICE FOR A CAMERA

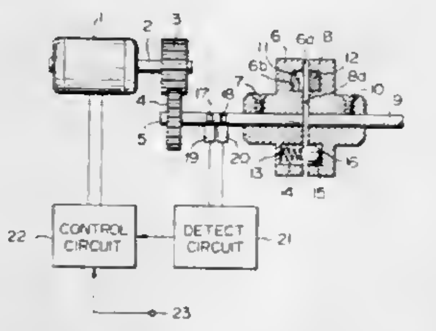
Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sep. 23, 1976, Ser. No. 725,734

Claims priority, application Japan, Sep. 23, 1975, 50-131143[U]

Int. Cl.^{2} G03B *1/18*

U.S. Cl. 354—173 **6 Claims**



1. An automatic film wind up device for automatically winding a film loaded in a camera when a frame of the film has been exposed comprising:

an electric motor which is started upon completion of exposure of one frame of a film in a camera,

a drive disc connected with said electric motor to be rotated thereby,

a driven disc connected with a film wind up shaft for rotating the same when driven to rotate, the film wind up shaft being stopped when a predetermined length of film has been wound up thereby, said driven disc having an end face facing to an end face of said drive disc,

means for coupling said driven disc to said drive disc with a coupling force which is overcome by a force with which said film wind up shaft is stopped,

a position detecting means comprised of two elements one of which is mounted on the end face of said drive disc and the other of which is mounted on the end face of said driven disc at such positions that the two elements are aligned with each other only when the driven disc is in a predetermined relative position with respect to the drive disc, in said predetermined relative position said driven disc being coupled to said drive disc by means of said coupling means, said position detecting means generating an electric signal when said two elements are moved out of alignment with each other, and

means connected with said position detecting means and said electric motor for stopping the electric motor upon receipt of said signal from the position detecting means.

4,110,769
COUPLING MECHANISM FOR THE ALTERNATE MANUAL AND AUTOMATIC ADJUSTMENT OF A VARIFOCAL OBJECTIVE

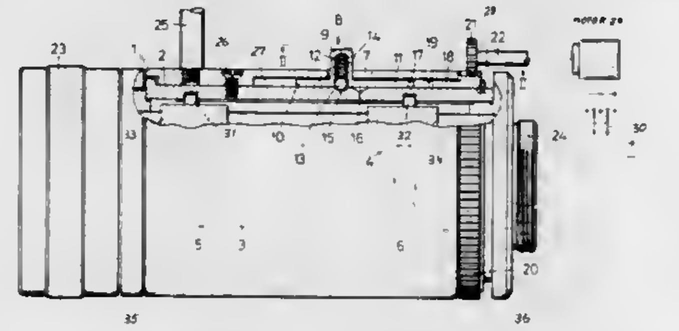
Karl-Heinz Schütz, and Karl Tesch, both of Bad Kreuznach, Fed. Rep. of Germany, assignors to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,228

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617464

Int. Cl.^{2} G02B *7/10;* **G03B** *3/02*

U.S. Cl. 354—195 **4 Claims**



1. In a camera provided with a varifocal objective having components shiftable along an optical axis with the aid of a camming sleeve centered on said axis,

the combination therewith of:

a control ring surrounding said sleeve, said control ring being partly separated from said sleeve by an intervening clearance and having an axially extending slot communicating with said clearance;

a slider axially displaceable in said clearance and provided with indexing means for yieldably arresting it in either of two axially spaced positions, said slider having an extension passing outwardly through said slot for manipulation by a user;

a coupling ring coaxial with said sleeve having a toothed surface confronting said slider, the latter having a toothed edge engageable with said toothed face in one of said positions but disengaged therefrom in the other of said positions; and

automatic drive means operatively connected with said coupling ring for reversibly rotating said sleeve through the intermediary of said slider in said one of said positions, said control ring being provided with handle means enabling manual rotation of said sleeve in said other of said positions.

4,110,770
SYSTEM FOR MOUNTING ACCESSORIES ON A CAMERA

Karl-Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,444

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635370

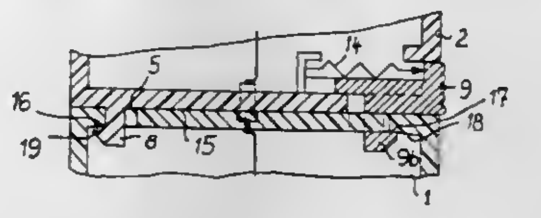
Int. Cl.^{2} G03B *17/00*

U.S. Cl. 354—202 **15 Claims**

1. A system for mounting an accessory unit on a camera housing, which comprises:

(a) a camera housing having apertures therethrough disposed adjacent the ends of the plane of contact between the accessory unit and the camera housing, and an inner surface provided with opposed inclined surfaces leading from each aperture, and

(b) an accessory unit comprising at least one stationary hook-shaped bolt means and at least one movable hook-shaped bolt means disposed to fit into said apertures, said bolt means having inclined faces corresponding to the inclined faces in the camera housing inner surface such that when the accessory unit is mounted on the camera housing with the bolt means in the apertures, the inclined faces of the bolt means are in contact with the inclined faces of the camera housing inner surface, and spring means urging said bolt means into contact with said inclined surfaces.



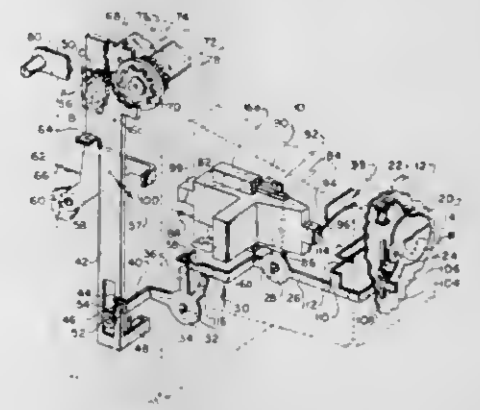
4,110,771
DOUBLE EXPOSURE PREVENTION MECHANISM

Guilford Edwin Kindig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1977, Ser. No. 780,151

Int. Cl.^{2} G03B *19/02*

U.S. Cl. 354—207 **3 Claims**



1. In a photographic camera having a shutter, the combination comprising:

shutter actuating means adapted to move from a first position to a second position for opening the shutter;

body release means, biased toward a first position and movable to a second position for initiating a photographic operation, said body release means cooperating with said shutter actuating means to move said shutter actuating means to its first position in response to movement of said body release means from its second position to its first position;

film advance means releasably held in a first position and movable from said first position through an intermediate position to a second position preparatory to advancing film and movable from said second position toward said first position for advancing film, said film advance means being adapted to be released from said first position to move to said intermediate position in response to movement of said body release means to its second position and adapted to move from said intermediate position to said second position in response to movement of said body release means from its second position toward its first position; and

latch means coupled to said film advance means and cooperating with said shutter actuating means for releasably retaining said shutter actuating means for releasably retaining said shutter actuating means in its first position when said film advance means is in its first position or its second position and for releasing said shutter actuating means in response to movement of said film advance means from its first position to its intermediate position.

4,110,772
CAMERA SHUTTER HAVING BOUND PREVENTION DEVICE

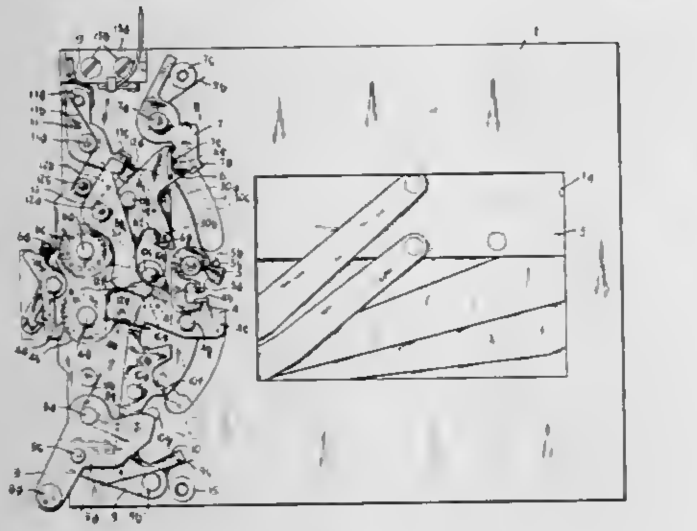
Tadashi Nakagawa; Mitsuo Koyama, and Eiichi Onda, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 685,443, May 11, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,866

Claims priority, application Japan, May 14, 1975, 50-63772[U]

Int. Cl.^{2} G03B *9/08, 9/40*

U.S. Cl. 354—246 **4 Claims**



1. In a camera shutter having an exposure aperture; shutter blades operable from an initial closed position closing said exposure aperture to an open position opening said exposure aperture and then to a final closed position to effect an exposure; operating means including relatively displaceable opening and closing driving members for sequentially driving said shutter blades from said initial closed position to said open position and then to said final closed position; cocking means coacting with said operating means for cocking the camera shutter and effecting movement of said shutter blades from said final closed position to said initial closed position; and rebound preventing means for preventing rebound of said shutter blades after reaching their final closed position, said rebound preventing means comprising means on said cocking means for engaging and releasably interlocking with said closing driving member during driving movement of said closing driving member to move said shutter blades to their final closed position to thereby prevent rebounding of said shutter blades.

4,110,773
BRAKE SYSTEM FOR FOCAL PLANE SHUTTERS OF PHOTOGRAPHIC CAMERAS

Erwin Scholz, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Jul. 13, 1977, Ser. No. 815,368

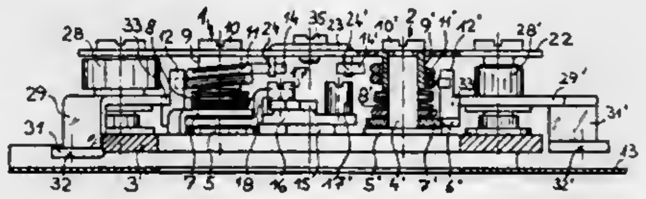
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632944

Int. Cl.^{2} G03B *9/08*

U.S. Cl. 354—252 **15 Claims**

1. A focal plane shutter for a photographic camera having a brake system for braking the movement of elements of said shutter, said braking system being effective during a braking portion of said movement of said elements, said braking portion occurring just before said shutter elements reach their stop positions, and said braking system being characterized by the fact that:

a. at least one first brake element having a nearly constant braking torque throughout said braking portion of said movement;



b. at least one second brake element having a braking torque that increases over said braking portion of said movement;

c. means for combining said constant and increasing braking torques of said first and second brake elements; and

d. means for adjusting and setting said constant and increasing braking torques of said first and second brake elements independently of each other.

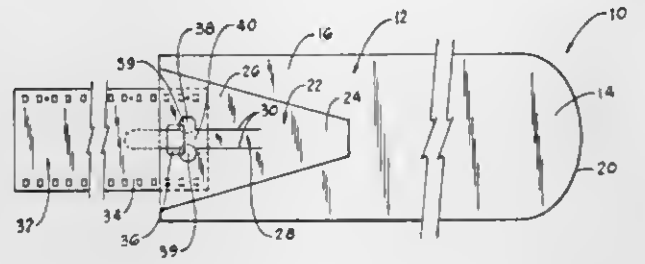
4,110,774
FILM GUIDE FOR FILM PROCESSING EQUIPMENT

Vivian D. Krebbiel, and Ralph L. Haas, both of Wichita, Kans., assignors to Kreonite, Inc., Wichita, Kans.

Filed Nov. 8, 1976, Ser. No. 739,434

Int. Cl.^{2} G03D *13/10*

U.S. Cl. 354—345 **2 Claims**



1. A film guide for film processing equipment, the guide comprising:

an elongated flexible leader having a flat surface, said leader having a front portion and a rear portion;

an aperture disposed in the rear portion of said leader and therethrough;

a flat flexible keeper having a front portion and a rear portion, the front portion of said keeper attached to the top of said leader; and

an elongated tongue intergrally formed in the rear portion of said keeper by cutting a pair of parallel lines therethrough;

the end of a roll of film having an aperture therethrough is received between the rear portion of said keeper and the rear portion of said leader, the film held in place by threading said tongue through the aperture in the film and through the aperture in the rear portion of said leader.

4,110,775
SCHOTTKY DIODE WITH VOLTAGE LIMITING GUARD BAND

Thomas A. Festa, 5250 Round Meadow Rd., Hidden Hills, Calif. 91302

Continuation of Ser. No. 716,427, Aug. 23, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,848

Int. Cl.^{2} H01L *29/48*

U.S. Cl. 357—15 **3 Claims**

1. A metal-semiconductor diode comprising:

a semiconductor body of a first conductivity type including a silicon substrate having an epitaxial layer disposed thereon;

a metal layer in contact with said epitaxial layer, said metal layer and epitaxial layer forming a metal-semiconductor barrier; and

integral circuit protection means for protecting said metal-semiconductor barrier from large reverse potentials by voltage clamping said barrier to a predetermined potential, said circuit protection means comprising a region of a second conductivity type disposed in said epitaxial layer in contact with said metal layer, said region and epitaxial layer forming a junction, the breakdown voltage of said junction being approximately equal to or lower than the breakdown voltage of said barrier.

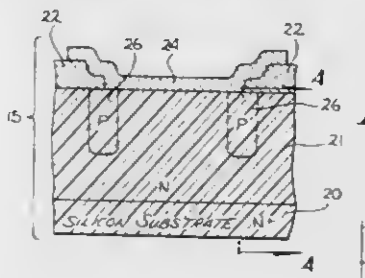


Fig. 2

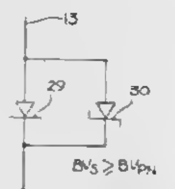


Fig. 5

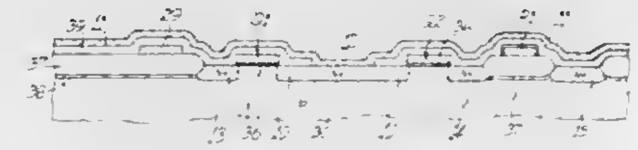
4,110,776
SEMICONDUCTOR INTEGRATED CIRCUIT WITH IMPLANTED RESISTOR ELEMENT IN POLYCRYSTALLINE SILICON LAYER

G. R. Mohan Rao; John S. Stanczak; Jih-Chang Lien, and Shyam Bhatia, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 27, 1976, Ser. No. 727,116

Int. Cl.^{2} H01L *29/78, 27/02, 29/04*

U.S. Cl. 357—23 **21 Claims**



1. A resistor element for an N-channel, silicon-gate MOS integrated circuit of the type having field oxide surrounding transistor areas on the face of a semiconductor substrate, the transistor areas having gate oxide much thinner than the field oxide, comprising:

a. an elongated strip of polycrystalline silicon extending across the field oxide and contacting at least one of the transistor areas,

b. a resistor region in the elongated strip implanted with conductivity determining impurity to provide a selected resistivity less than that of undoped polycrystalline silicon,

c. conductive regions in the elongated strip on both ends of the resistor regions, the conductive regions being doped at a level much higher than the resistor region.

4,110,777
CHARGE-COUPLED DEVICE

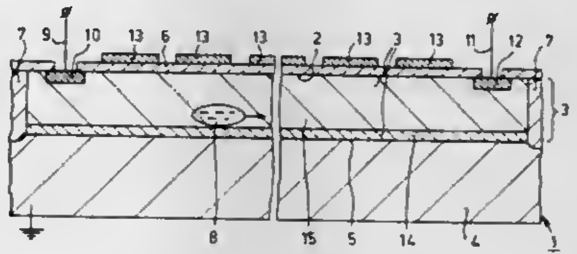
Leonard Jan Maria Esser, and Matthias Johannes Joseph Theunissen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,408

Claims priority, application Netherlands, Feb. 13, 1974, 7401939

Int. Cl.^{2} H01L *29/78*

U.S. Cl. 357—24 **12 Claims**



1. A charge-coupled device having a semiconductor body portion comprising a semiconductor layer of a first type conductivity, an adjoining substrate of a second type conductivity below said semiconductor layer which forms a p-n junction with the layer, means for electrically isolating the layer from its surroundings, said layer a thickness and a doping concentration such that a depletion zone is obtainable throughout the thickness thereof by applying a suitable electric field thereto, input means for locally introducing into the semiconductor layer information in the form of charge consisting of majority charge carriers, output means spaced apart from said input means for reading out said information, electrode means above the upper surface of the layer and electrically insulated therefrom for capacitively generating electric fields in the semiconductor layer upon application of a suitable signal to said electrode means to cause charge to be transported through the layer to the output means in a direction parallel to the layer, and a buried zone of said first type conductivity in said semiconductor layer and adjoining the p-n junction between the substrate and the semiconductor layer, which buried zone extends upwardly from the p-n junction up through only a minor part of the total thickness of the semiconcuctor layer and has a higher doping concentration than the adjoining remainder of the semiconductor layer which is present above the buried zone.

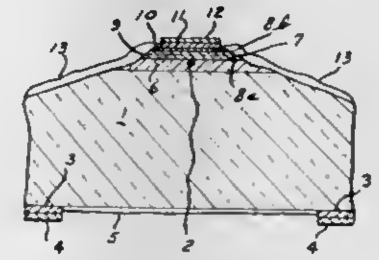
4,110,778
NARROW-BAND INVERTED HOMO-HETEROJUNCTION AVALANCHE PHOTODIODE

Richard C. Eden, Thousand Oaks, and Kenichi Nakano, N. Hollywood, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,496

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **3 Claims**



1. An avalanche type photodiode device comprising:

a. a semiconductor substrate transparent to a selected band of light energy having first and second major surfaces on opposite sides thereof;

b. an electrical contact ohmically connected to the first major surface;

c. a doped semiconductor material buffer layer formed on the second surface, having the same conductivity type as the substrate, being composed of a material transparent to selected wavelengths of light energy, having a lattice structure matching a succeeding actve layer, and etched to form the lower-most segment of a mesa having the substrate as its base;

d. a semiconductor material active layer formed on the top of the buffer layer, having a lower region highly doped to absorb selected energy wavelengths and of the same conductivity type as the buffer layer, having an upper region of a conductivity type opposite that of the buffer region, the active layer being the middle segment of the mesa;

e. a highly doped semiconductor material contact layer formed on top of the active layer, being of the same conductivity type as the material upon which it is formed, the contact layer being the uppermost segment of the mesa, the mesa having smooth edges where the layers join together to form a sloped surface;

f. a passivation material deposited upon the sloped mesa surface, being of a material that induces opposite conductivity type surface channels at the lower region of the active layer; and

g. an ohmic contact connected to the contact layer.

4,110,779
HIGH FREQUENCY TRANSISTOR

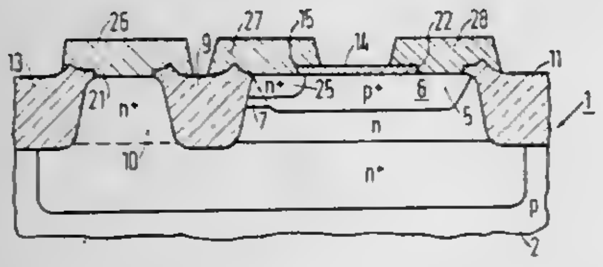
Ronald Rathbone, Taukfirchen, and Ulrich Schwabe, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 13, 1976, Ser. No. 749,609

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605641

Int. Cl.² H01L *29/72*

U.S. Cl. 357—34 **6 Claims**



1. A high-frequency transistor structure adapted for providing a small effective emitter width and a low base bulk resistance, comprising:

a semiconductor body of first conductivity type;

a collector zone of second conductivity type formed on the semiconductor body;

a base zone of first conductivity type above the collector zone;

an emitter zone of second conductivity type above a portion of the base zone;

insulating material to one side of the emitter and base zones;

said base zone comprising a first ion implanted doped zone and a second diffused doped zone, said first zone having a doping concentration lower than said second zone, said first zone establishing the effective emitter width and being formed between the emitter and collector zones and also between said insulating material on one side and the base second zone on the entire opposite side; and

said emitter zone overlies and is in contact with the base first zone and overlies and is in contact with a portion of the base second zone.

4,110,780
SEMICONDUCTOR POWER COMPONENT

Jozef Cornu, Stekene, Belgium, and Erich Weisshaar, Baden, Switzerland, assignors to BBC Brown Boveri & Company, Limited, Baden, Switzerland

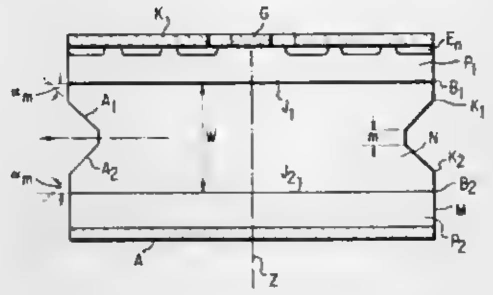
Continuation of Ser. No. 483,813, Jun. 27, 1974, Pat. No. 3,987,479. This application Apr. 8, 1976, Ser. No. 675,143

Claims priority, application Switzerland, Jul. 6, 1973, 9867/73

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **6 Claims**



1. A semiconductor power element comprising two successive opposed polarity planar pn junctions, the element being positively tapered on its lateral surface in the regions of both pn junctions to form an average angle of both tapers of between 30° and 60°, the pn junctions appearing on the lateral surface of the semiconductor element outside of the tapers wherein the doping of the zone between the two pn junctions is lower than $3.5 \times 10^{13}\mathrm{cm}^{-3}$ and its thickness is equal to the thickness of the space charge region found in it at maximal voltage-blocking plus at least two minority carrier diffusion lengths and wherein the circumferential groove formed by the two tapers forms angles of inclination with respect to the pn junctions between 40° and 45° with the bottom of the groove being longer than 40 μm.

4,110,781
BIDIRECTIONAL GROOVED THYRISTOR FIRED BY ACTIVATION OF THE BEVELED SURFACES

Nobutake Konishi; Takeshi Yokota; Yoshitaka Sugawara; Tsutomu Yatsuo, and Masahiro Okamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 5, 1976, Ser. No. 730,183

Claims priority, application Japan, Oct. 11, 1975, 50-121859

Int. Cl.² H01L *29/747*

U.S. Cl. 357—39 **21 Claims**

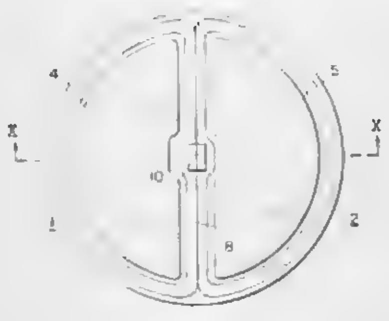
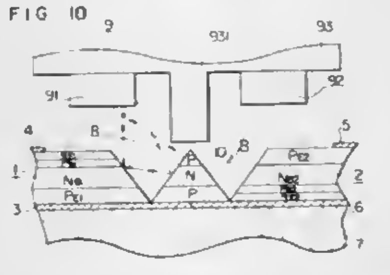


FIG 10



5. A bidirectional light-activated thyristor comprising:

a first semiconductor section including four contiguous

PNPN layers of alternately opposite conductivites arranged so as to form a PN junction between each adjacent one of said layers,

a second semiconductor section including four contiguous PNPN layers of alternately opposite conductivities arranged so as to form a PN junction between each adjacent one of said layers,

a groove formed between said first semiconductor section and said second semiconductor section for electrically isolating said first semiconductor section and said second semiconductor section from each other,

said first semiconductor section including a first end surface defining its boundary with said groove,

said second semiconductor section including a second end surface defining its boundary with said groove,

means for maintaining said first semiconductor section and said second semiconductor section in a predetermined positional relation,

first connecting means for electrically connecting an N-type end layer of said first semiconductor section to a P-type end layer of said second semiconductor section,

second connecting means for electrically connecting a P-type end layer of said first semiconductor section to an N-type end layer of said second semiconductor section,

first trigger means for applying a light signal to a light-receiving end surface of said first semiconductor section for triggering said first semiconductor section,

second trigger means for applying a light signal to a light-receiving end surface of said second semiconductor section for triggering said second semiconductor section,

means for blocking the passage of a light signal from said first trigger means to said second semiconductor section and the passage of a light signal from said second trigger means to said first semiconductor section, and

an island member formed on the bottom of said groove, said island member acting as said light signal-blocking means.

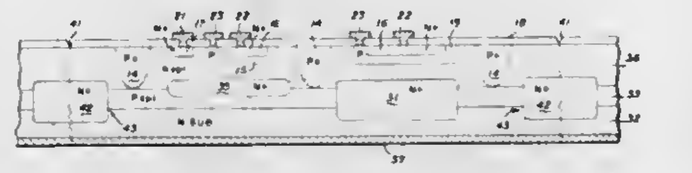
4,110,782
MONOLITHIC INTEGRATED CIRCUIT TRANSISTOR HAVING VERY LOW COLLECTOR RESISTANCE

Carl T. Nelson, Sunnyvale, and Brian E. Hollins, Los Altos, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 600,814, Jul. 31, 1975, Pat. No. 4,046,605, and a continuation-in-part of Ser. No. 432,853, Jan. 14, 1974, abandoned. This application Apr. 21, 1977, Ser. No. 789,394

Int. Cl.² H01L *27/04*

U.S. Cl. 357—48 **4 Claims**



1. A monolithic circuit structure including a low collector resistance transistor, said structure comprising:

a substrate of a first conductivity type material,

a first layer of a second conductivity type material on said substrate,

a second layer of said first conductivity type material on said first layer,

a subsurface region of said first conductivity type material extending down from within the lower portion of said second layer and through said first layer into said substrate,

a base region of said second conductivity type material in said second layer over said subsurface region,

an emitter region of said first conductivity type material in said base region,

an emitter contact contacting said emitter region,

a base contact contacting said base region,

a collector contact contacting said substrate, and

a frame-shaped region of said first conductivity type material disposed in and extending vertically through said first layer of second conductivity type material on said substrate, said frame-shaped layer region extending around the periphery of an integrated circuit in said monolithic circuit structure in vertical registration with a predetermined boundary line to be used for separating the individual integrated circuit chips one from the other in the wafer in which they are formed such that upon separating the individual integrated circuit chips along said boundary lines the boundary passes vertically through said framed-shaped region.

4,110,783
SOLDER LAYER FOR A SEMI-CONDUCTOR DEVICE CONSISTING OF AT LEAST ONE GROUP V ELEMENT, AT LEAST ONE RARE ELEMENT AND ALUMINUM

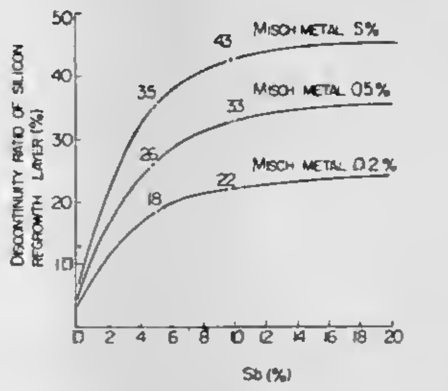
Hisakichi Onodera; Masateru Suwa; Jin Onuki, and Yoshiteru Shimizu, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 7, 1977, Ser. No. 766,503

Claims priority, application Japan, Feb. 9, 1976, 51-12320

Int. Cl.² H01L *23/48, 29/46, 29/62*

U.S. Cl. 357—67 **4 Claims**



1. A semi-conductor device, which comprises a silicon body having an exposed surface of N-type conductivity layer, and a substrate bonded to the exposed surface by means of a layer of solder material, the solder material being an alloy consisting essentially of 2 to 12% by weight of at least one element of Group V of the periodic table, 0.01 to 5% of at least one of rare earth elements and aluminum being balance.

4,110,784
NOISE REDUCTION APPARATUS

John Gordon Amery, Quincy, Ill., and Thomas William Burrus, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,804

Int. Cl.² H04N *5/14, 5/78, 9/535;* H04B *15/00*

U.S. Cl. 358—8 **7 Claims**

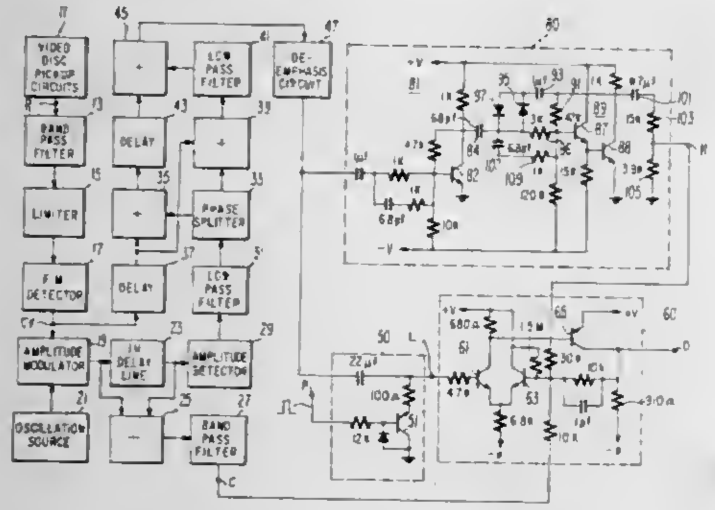
1. Noise reduction apparatus, for use with a source of signals, said signals being subject to occupancy of a given band of frequencies and undesirably subject to accompaniment by noise; said apparatus comprising:

means, coupled to the output of said source of signals, for selectively passing signal components of said signal falling within a band of frequencies restricted to a high frequency portion of said given band;

means, having an input terminal coupled to the output of said selective signal passing means, and having an output terminal, for amplifying and inverting the phase of signals applied to said input terminal;

a signal path coupling said output terminal to said input terminal of said signal amplifying means;

means, interposed in said signal path, for permitting negative feedback via said signal path only during amplitude excursions of the output signal of said amplifying means which exceed selected limits; and



combining means, coupled to said source of signals and to the output terminal of said signal amplifying means, for subtracting the output of said signal amplifying means from the output of said source of signals.

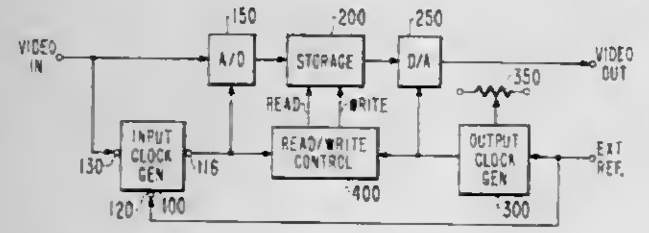
4,110,785
CLOCK GENERATOR FOR VIDEO SIGNAL PROCESSING

Robert Adams Dischert, Burlington, and James Morgan Walter, Columbus, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 3, 1977, Ser. No. 793,412

Int. Cl.² H04N *5/795, 9/46*

U.S. Cl. 358—19 **5 Claims**



1. A signal processing system for generating a clock signal synchronized to a video signal containing at least a subcarrier burst signal component, comprising:

means for separating said subcarrier burst signal from said video signal;

a source of external reference signals at the subcarrier frequency;

first and second demodulating means coupled to said separating means and to said reference signals for demodulating said burst signal to provide quadrature control signals indicative of said burst signal phasing relative to said reference signals;

first and second modulating means responsive to said quadrature control signals and to said source of reference signals for rephasing said source of reference signals relative to the burst phasing of said video signal; and

means responsive to said rephased reference signals for generating said synchronized clock signal.

5. A signal processing system for removing time base errors from video information signals in which incoming video signals having synchronizing, subcarrier burst and image information signal components are sampled and read into memory storage means by clocking signals established by an input clock generator having a variable rate dependent on said time base errors, said stored video information being read out of said memory storage means at a constant clocking rate established by an output clock locked to an external subcarrier reference wherein said input clock generator comprises:

means for separating said subcarrier burst signal from said video signal;

first and second demodulating means coupled to said separating means and to said external reference signals for demodulating said burst signal to provide quadrature control signals indicative of said burst signal phasing relative to said external reference signals;

first and second modulating means responsive to said quadrature control signals and to said source of external reference signals for rephasing said source of external reference signals relative to the burst phasing of said video signal; and

means responsive to said rephased reference signals for generating said synchronized clock signal.

4,110,786
DEVICE GENERATING SPECIAL EFFECTS ON COLOR TELEVISION PICTURES

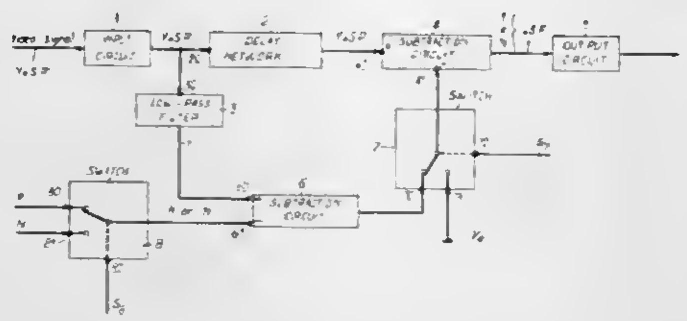
Lucien F. Mignot, St-Mande, and Guy R. Macheboeuf, Vintry-sur-Seine, both of France, assignors to Telediffusion de France, Montrouge, France

Filed Mar. 21, 1977, Ser. No. 779,552

Claims priority, application France, Mar. 26, 1976, 76 08796

Int. Cl.² H04N *9/535*

U.S. Cl. 358—22 **5 Claims**



1. In a device for generating black and white titles on color television pictures transmitted by the SECAM type system using a composite video signal made up of a luminance signal and a chrominance signal in which an input stage, a delay network and a single low pass filter with input and output terminals are placed in the main video channel to delay the input video signal for a time duration depending upon the filtering characteristics of the low pass filter, said input stage, delay network and low pass filter being connected to a first summing means and a phase inverter for inverting by 180° the luminance signal with thhe input of the first summing means being connected to the output terminal of said delay line, that improvement comprising:

said input stage having its impedance matched to a single filter;

said low pass filter having its input terminals connected to the output terminals of said input stage and subtracting a constant amount from said luminance signal;

said inpedance matched input stage, delay network and filter providing an output signal from said low pass filter which is approximately the same in magnitude as the luminance signal of the chrominance subcarrier without requiring any modification of the composite input signal;

said first summing means having a first input terminal connected to the output terminal of said delay network;

a second summing means having a first input terminal which is supplied with a predetermined reference luminance signal at a reference voltage;

said second summing means having a second input terminal connected to the output terminal of said low pass filter;

a first switching means controlled by a predetermined switching signal having a first input terminal connected to the output terminal of said second summing means;

a source of reference voltage for said second summing means adjusted for cut off of said second input terminal connected to said reference voltage;

selecting means for selecting said reference voltage under the control of said predetermined switching signal;

said predetermined switching signal being emmitted from a titled picture under conditions where said predetermined luminance signal is a direct signal and said first summing means transmits said colored picture titled with said predetermined luminance;

a second switching means connected to said first input terminal of said second summing means; and

said first summing means having a second input terminal connected to the output terminal of said first switching means and its output terminal transmitting said video signal corresponding to said color pictures wherein part of said picture is made up by color pictures having said predetermined luminance.

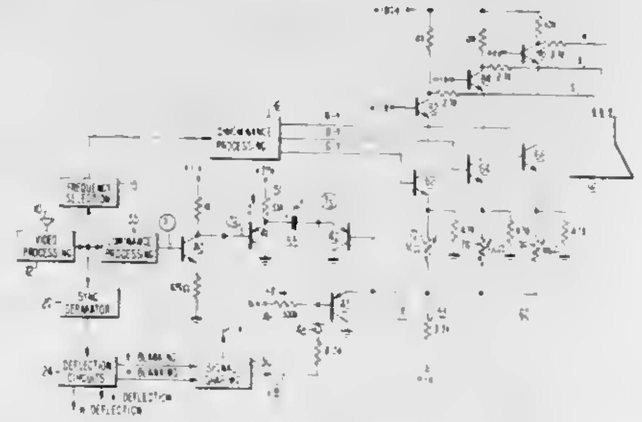
4,110,787
COMBINED BLANKING LEVEL AND KINESCOPE BIAS CLAMP FOR A TELEVISION SIGNAL PROCESSING SYSTEM

Robert Preston Parker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,935

Int. Cl.² H04N *9/535, 9/18, 5/18*

U.S. Cl. 358—34 **17 Claims**



1. In a video signal processing system including a kinescope for reproducing an image in response to an image representative video signal, said video signal including periodic image blanking intervals disposed between periodic image intervals containing image information signals, said blanking intervals containing a sync pulse superimposed on a pedestal blanking level during a sync interval, apparatus comprising:

means for clamping said video signal to a reference voltage during said blanking intervals;

means, having a threshold conduction level different from said reference voltage, for coupling said clamped video signal to said kinescope when said threshold level is exceeded;

means for providing periodic blanking reference pulses coincident with said blanking intervals, said reference pulses being of a magnitude substantially equal to the difference between said reference voltage and said threshold conduction level of said coupling means; and

means for combining said reference pulses with said video signal prior to clamping.

4,110,788
MULTIPLE WAVELENGTH ACOUSTOOPTIC DEFLECTION

J. Bradford Merry, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 670,771, Mar. 26, 1976, abandoned. This application Feb. 22, 1977, Ser. No. 785,281

Int. Cl.² H04N *9/14;* **G02F** *1/24*

U.S. Cl. 358—63 **7 Claims**

1. Acoustooptic apparatus for deflecting a plurality of separate monochromatic beams of differing wavelengths through a predetermined angular range, said apparatus comprising:

(a) an acoustoopic diffraction cell which exhibits an anisotropic mode of diffraction wherein the angle-of-incidence versus acoustic frequency characteristic exhibits an inflection point, for each of said wavelengths, repsectively, at a different, predetermined incidence angle and acoustic frequency;

(b) electromechanical transducer means operatively coupled to said cell;

(c) means for generating a plurality of periodic signals, one such signal for each monochromatic beam, the frequency of each such signal being variable over a bandwidth which is outside the bandwidth of the other of said signals, the bandwidth of each such signal having a center frequency approximately equal to the predetermined acoustic frequency for one of said wavelengths;

(d) means for operatively coupling said signal generating means to said transducer means to vibrate said transducer means and thereby cause acoustic waves to propagate through said cell, said acoustic waves having frequency components proportional the respective frequencies of said periodic signals; and

(e) means for directing said plurality of monochromatic beams at said cell in a manner such that each beam is incident at its predetermined incidence angle with respect to a plane normal to the direction of acoustic wave propagation.

4,110,789
PROCESS AND APPARATUS FOR THE EXACT DETERMINATION OF THE PERIODIC POSITION OF A TELEVISION VERTICAL SYNCHRONIZING SIGNAL

Hans-Peter Maly, Darmstadt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 31, 1977, Ser. No. 764,071

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2604523

Int. Cl.² H04N *5/04*

U.S. Cl. 358—148 **6 Claims**

1. A method for exact determination of the periodic position of the vertical component of a television synchronizing signal by using the expression:

$$\Delta N_v = n_R + \frac{1}{k} \sum_{i=1}^{k-1} i(n_R - \Delta n_i)$$

wherein

ΔN_V = the number of periods of a reference signal (f_{Ref}) counted from the $k-1$ negative synchronizing pulse edge after the characteristic pulse is generated until the position of the vertical component,

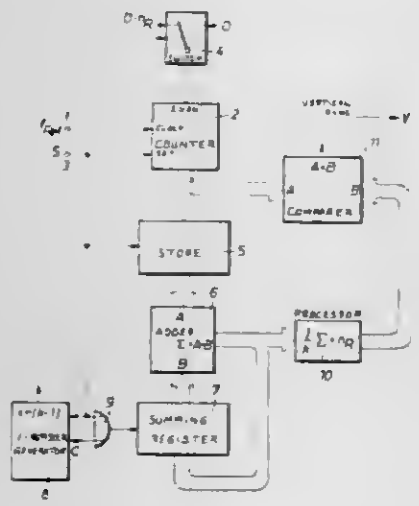
n_R = the number of periods of the reference signal during the time interval between two successive synchronizing pulses,

k = the number of negative synchronizing pulse edges which are brought up for evaluation,

i = functional variable, $i = 1, 2, \ldots, k-1$, and

Δn_i = the number of periods of the reference signal in the time interval from the $i-1$ to the i-th negative synchronizing pulse edge,

comprising the steps of:



A. counting the period of the reference signal with a counter for determining in the time interval the frequency of the two synchronizing pulses relative to the number of correct preset periods of the reference signal in the same time interval,

B. storing the value of the period number thus determined in a storage unit for the duration of the time interval of the two synchronizing pulses,

C. providing said value to an addition unit to sum up the corresponding i periodic numbers after the functional variable i has gone i times, the output value at an output terminal of the addition unit being

$$\sum_{i=1}^{k-1} i(n_R - \Delta n_i)$$

D. dividing said output in a subsequent processing stage by the number k of evaluated time intervals between the synchronizing pulses and increasing the quotient by the number n_R of correct preset periods of the reference signal in a time interval between two synchronizing pulses, and

E. comparing the value obtainable at the outlet of the processing unit, which is

$$\Delta N_v = n_R + \frac{1}{k} \sum_{i=1}^{k-1} i(n_R - \Delta n_i)$$

in a comparer with the value at the outlet of the counter (which is loaded at the time $k-1$ with a value of zero) to derive the time position of a characteristic pulse of the vertical sync component by means of comparison.

4,110,790

VIDEO PROCESSING SYSTEM PROVIDING GAIN CONTROL, APERTURE CONTROL, AND BLACK LEVEL CONTROL

Robert C. Wheeler, Elba, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 19, 1977, Ser. No. 760,284

Int. Cl.² H04N *5/14, 5/18, 5/52*

U.S. Cl. 358—162 **15 Claims**

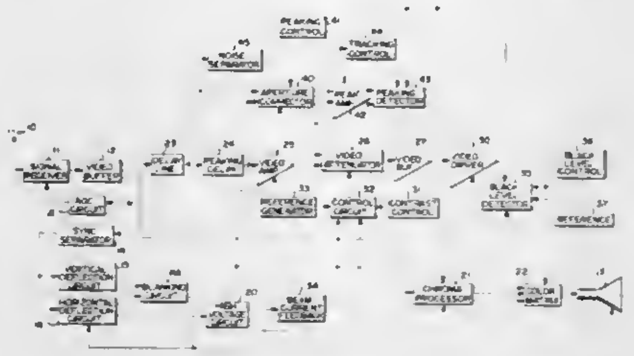
7. A video processing system for a television receiver comprising:

a video amplifier for amplifying a video signal having video intervals and blanking intervals, said blanking intervals having a signal level corresponding to the black level of the video intervals;

a blanking circuit for providing blanking pulses during said blanking intervals of said video signal;

comparing means connected to receive a reference voltage and a portion of the video signal from said video amplifier, and further connected to a control input of said video amplifier for providing a black level control signal to said control input in response to the relative amplitudes of said reference voltage and said portion of the video signal; and

means connecting said blanking circuit to said comparing means for disabling said comparing means during said blanking intervals except for residual portions of said blanking intervals, said comparing means averaging said residual portions of said blanking intervals with video signals occurring during said video intervals.



4,110,791

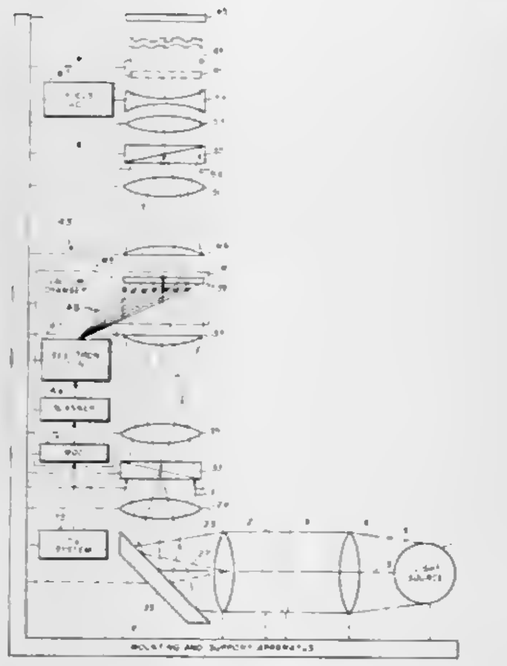
TELEVISION PROJECTOR SYSTEM

Gottfried R. Rosendahl, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1977, Ser. No. 788,383

Int. Cl.² H04N *5/66;* **G02F** *1/01*

U.S. Cl. 358—233 **18 Claims**



1. A television projection system having a plurality of optical elements disposed along a predetermined optical path for projecting an image onto a reflective screen, comprising in combination:

a light relay image generator disposed on a predetermined optical path;

a first field lens spatially disposed upstream from said light relay image generator on said predetermined optical path;

a second field lens spatially disposed downstream from said light relay image generator on said predetermined optical path;

a first Wollaston prism spatially disposed upstream from first field lens on said predetermined optical path;

a pair of condenser lenses respectively spatially disposed from but adjacent to the opposite sides of said first Wollaston prism on said predetermined optical path;

a second Wollaston prism spatially disposed downstream from said second field lens on said predetermined optical path;

a pair of projector lenses respectively spatially disposed from but adjacent to opposite sides of said second Wollaston prism on said predetermined optical path;

a first predetermined light polarizer disposed downstream from said pair of projector lenses on said predetermined optical path;

a radiant energy source located upstream of the aforesaid pair of condenser lenses on said predetermined optical path;

means including a second predetermined light polarizer located on said predetermined optical path between said radiant energy source and the upstream projector lens of the aforesaid pair of projector lenses for the illumination thereof thereby and, thus, causing predetermined portions of the radiant energy from said radiant energy source to be projected downstream along the entire length of said predetermined optical path;

a viewing screen disposed downstream of the downstream lens of the aforesaid pair of projector lenses on said predetermined optical path; and

means effectively connected to the downstream lens of the aforesaid pair of projector lenses for effecting the adjustment thereof in such manner that the radiant energy projected downstream from said radiant energy source is focused on said viewing screen after passing through each of the aforesaid optical elements, including any image generated by the aforesaid light relay image generator.

4,110,792

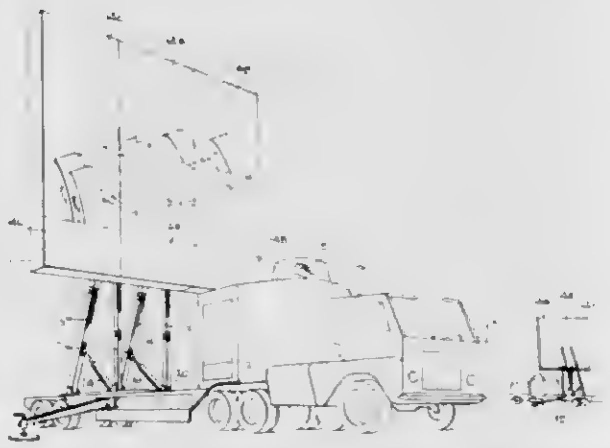
MOBILE INFORMATION DISPLAY SYSTEM

Douglas A. Long, 94 Sturgis Ridge Rd., Wilton, Conn. 06897, and Frederick A. Burke, 40 Riverside Ave., Riverside, Conn. 06878

Filed Apr. 22, 1977, Ser. No. 789,833

Int. Cl.² H04N *3/12;* **G08B** *23/00*

U.S. Cl. 358—240 **10 Claims**



1. A mobile information display system transportable to the site of an event to afford a large screen display of video images derived from a live camera so that the audience may be presented with an enlarged view of the activity, said system comprising:

(A) a lamp matrix screen board having an array of individually-controllable lamps, said board being sectioned into a central panel and a pair of side wings hinged thereto which are foldable thereover to form a compact stack;

(B) a computer responsive to signals derived from said live camera and coupled to said lamps to cause said matrix to produce black-and-white images of said activity; and

(C) transport means for carrying said stack and said computer to said site, said transport means including a turntable and a lifting assembly thereon coupled to the rear of said center panel and adapted to raise said stack from a horizontal position to vertical viewing position at which said wings may be unfolded to render said screen effective, said turntable functioning to orient said screen in the direction of the audience.

4,110,793

DEFLECTION YOKE

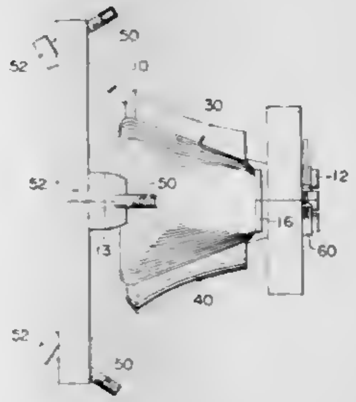
Atsufumi Tajiri, Yokohama, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,729

Claims priority, application Japan, Dec. 17, 1975, 50/171174

Int. Cl.² H04N *5/64*

U.S. Cl. 358—248 **7 Claims**



1. A deflection yoke comprising a horizontal deflection coil of a saddle configuration, a vertical deflection coil having an annular core carrying a toroidal winding thereon, a coil separator interposed between the deflection coils and having a plurality of tongues formed at the rear end thereof, the tongues being adapted to surround a neck of a cathode ray tube, a band for clamping the tongues against the neck, at least three threaded bores formed in a front portion of the coil separator at a given interval about the axis of the deflection yoke and extending in a direction toward the wall of the cathode ray tube, and adjusting bolt means having a threaded portion threadably engaging the threaded bores and a head portion directly contacting the tube, the bolt means being turned to adjust the inclination of the deflection yoke with respect to the cathode ray tube.

4,110,794

ELECTRONIC TYPEWRITER USING A SOLID STATE DISPLAY TO PRINT

Robert W. Lester, Manhasset, and Robert Hotto, New York, both of N.Y., assignors to Static Systems Corporation, New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,339

Int. Cl.² B41B *19/00;* **H04N** *1/00*

U.S. Cl. 358—256 **18 Claims**

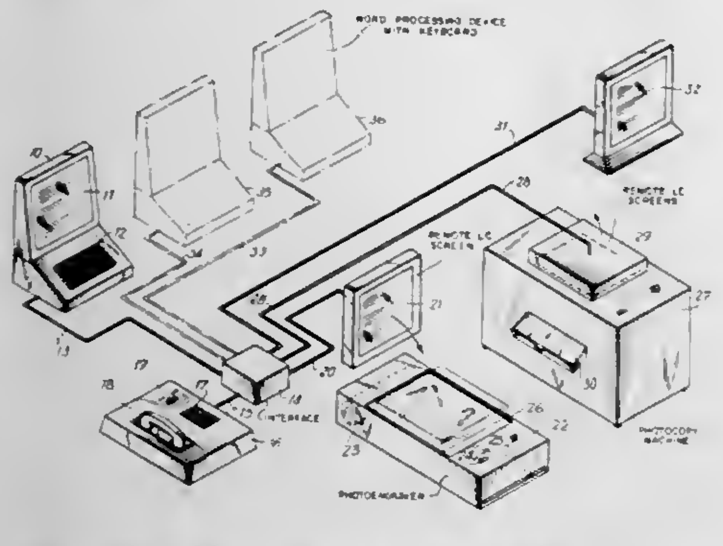
1. A word processing system for displaying and reproducing alphanumeric characters comprising:

a housing including an electronic keyboard with keys representing individual alphanumeric characters;

at least one solid state reflective display for

logic means connected to said keyboard and solid state reflective display for scanning said keyboard upon the depression of one or more keys;

solid state memory means having stored coded character information and coupled to said logic means for sequencing said logic means for each of the keyed characters depressed and for generating a displayed character on said solid state display screen responsive to the character keyed; and



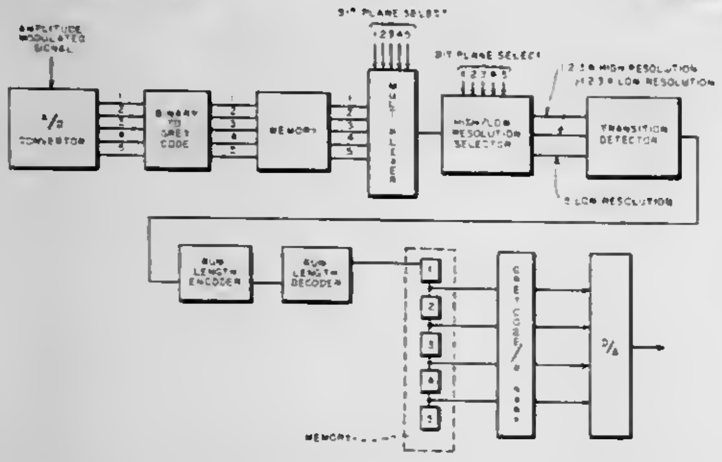
print means coupled to said solid state display for reprinting the characters appearing on said display.

4,110,795
METHOD OF GRAPHIC DATA REDUNDANCY REDUCTION IN AN OPTICAL FACSIMILE SYSTEM

David R. Spencer, Melville, N.Y., assignor to Litton Systems, Inc., Melville, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,331
Int. Cl.² H04N ***7/12***

U.S. Cl. 358—260 **8 Claims**



1. A method of graphic data redundancy reduction in an optical facsimile system wherein picture elements are optically represented by a grey coded number having N digits where N is at least 5 comprising

evaluating at least the first N−2 bit planes to determine whether these bit planes should be processed in high or low resolution, and

arbitrarily processing the remaining at least one bit plane at low resolution.

4,110,796
HALF-TONE IMAGE RECORDING SYSTEM

John E. Aughton, London, England, assignor to Crosfield Electronics Limited, London, England

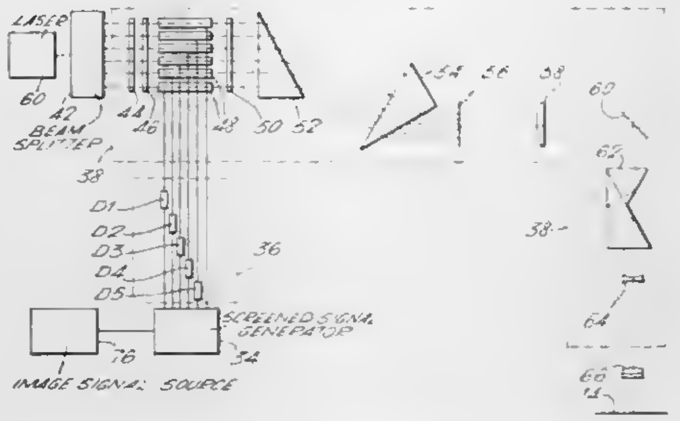
Filed Mar. 1, 1977, Ser. No. 773,193

Claims priority, application United Kingdom, Mar. 3, 1976, 8518/76

Int. Cl.² H04N ***1/24***

U.S. Cl. 358—298 **6 Claims**

1. A half-tone image recording system comprising: means for generating a number of separate beams of radiation which, in cross section, form a line of spaced beams; a support for a recording surface to be treated by exposure to the beams of radiation; means producing relative movement of the recording surface on the one hand and the beams on the other hand, whereby the recording surface is scanned by the beams; modulating means for individually modulating the beams incident at points on the recording surface in accordance with the image density to be reproduced and with the screen density variations required to produce a half tone image, the modulation being such that some or all of the modulated beams contribute towards a recording of a single half-tone image dot; and, positioned in the beam path, means for rotating the line of beams about an axis parallel to their direction of travel to alter the angle of the line of beams incident on the recording surface relative to the direction of beam scanning over the recording surface.



4,110,797
MAGNETIC RECORDING REPRODUCING APPARATUS WITH FIELD GENERATING MEANS WITHIN THE COPY MEDIUM

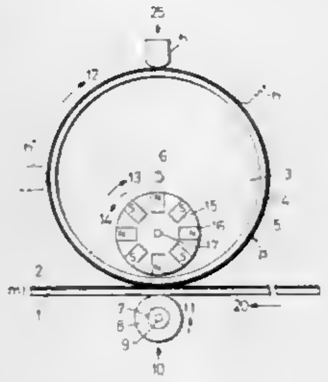
Yasushi Hoshino, c/o Tokyo Jiki Insatsu Kabushiki Kaisha 5-1, Taito 1-chome, Taito-ku, Tokyo, Japan, and Mamoru Namikawa, Machida, Japan, assignors to Tokyo Jiki InsatsuKabushiki Kaisha and Yasushi Hoshino, both of Tokyo, Japan, part interest to each

Filed Apr. 19, 1977, Ser. No. 788,709

Claims priority, application Japan, Apr. 23, 1976, 51-45409

Int. Cl.² G11B ***5/86***

U.S. Cl. 360—17 **10 Claims**



1. A magnetic recording reproducing apparatus comprising:

a predetermined length of master medium having a magnetic surface with recorded information thereon and adapted to be inserted in the apparatus;

an endless copy medium having a magnetic surface for temporarily storing the recorded informations from said master medium;

guide means for bringing the master medium and the copy medium into contact at their magnetic surfaces;

field generating means positioned within said copy medium for applying at the contact area an alternate magnetic transfer field, said field generating means consisting essentially of an arrangement of alternate N and S pole pieces of at least one permanent or DC magnet which is mechanically oscillated or rotated;

means for selectively moving said field generating means into a first position capable of applying the magnetic transfer field to the area of contact upon insertion of said master medium into the apparatus whereby said recorded information is transferred to said copy medium and for moving said field generating means from said first position to a second position at which recorded information is not transferred to said copy medium; and

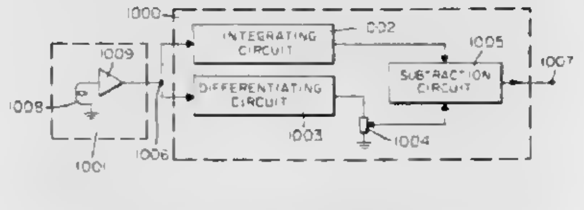
reproducing head means for repeatedly reading out the temporarily recorded informations of the copy medium.

4,110,798
FREQUENCY RESPONSE EQUALIZER

Jerry W. Miller, Menlo Park, and Luigi C. Gallo, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jan. 26, 1977, Ser. No. 762,902
Int. Cl.² G11B ***5/45***

U.S. Cl. 360—65 **8 Claims**



1. A frequency response equalization circuit in an apparatus having a circuit for axis crossing detection of signals transmitted through a digital magnetic recording/reproducing channel, said channel having a non-constant amplitude response and a non-linear phase response, where the signal provided by a magnetic reproduce head is a time differential of the recorded flux, comprising:

a parallel combination of a low-pass integrating circuit and of a high-pass differentiating circuit, both said circuits having inputs coupled to an output of said magnetic reproduce head, each said circuit having respective outputs providing output signals having respective phase shifts of substantially 90°, equal in magnitude and opposite in sense with respect to said signal provided by said reproduce head;

a first means having respective inputs coupled to respective outputs of said integrating circuit and differentiating circuit, said first means providing a difference signal of said respective output signals, said difference signal being amplitude and phase equalized with respect to said signal provided by said reproduce head, the resulting equalized channel having a constant amplitude response and a linear phase response for all signal frequencies transmitted therethrough; and

a second means for coupling the difference signal provided by said first means to an input of said circuit for axis crossing detection.

4,110,799
SERVO SYSTEM FOR CONTROLLING THE POSITION OF A MAGNETIC HEAD RELATIVE TO A TRACK TO BE FOLLOWED USING PERIODICALLY INTERRUPTED LONG-WAVE POSITIONING SIGNALS

Hendrik Jan Bergmans, Eindhoven, Netherlands, and Rudolf Drabek, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

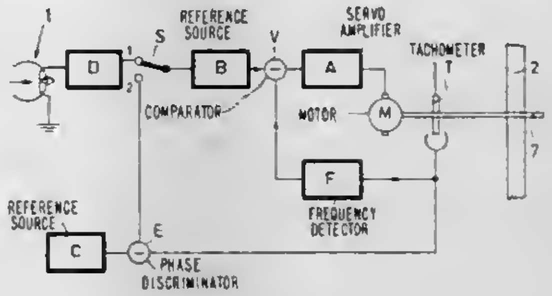
Filed Jan. 13, 1977, Ser. No. 759,103

Claims priority, application Netherlands, Jan. 17, 1976, 7600470

Int. Cl.² G11B ***5/00***

U.S. Cl. 360—70 **5 Claims**

1. A servo system for controlling the position of a magnetic reading head, comprising means for writing information signals and periodically interrupted long-wave track sensing signals coinciding with said information signals along the same track in a plurality of juxtaposed tracks, the interrupted portion of each long-wave track sensing signal in any given track being adjacent uninterrupted portions of said long-wave track sensing signals in adjacent tracks, the wavelength of the track sensing signals being at least of the same magnitude as the distance between adjacent tracks, said track sensing signals being distinguishable from each other, a reading head means for reading both said information signals in a selected track and said long-wave sensing signals in adjacent tracks as a composite signal, circuit means for separating said track sensing signals and said information signal from said composite signal and for deriving a servo signal from said track sensing signals, and means for correcting the position of said magnetic reading head in response to said servo signal.

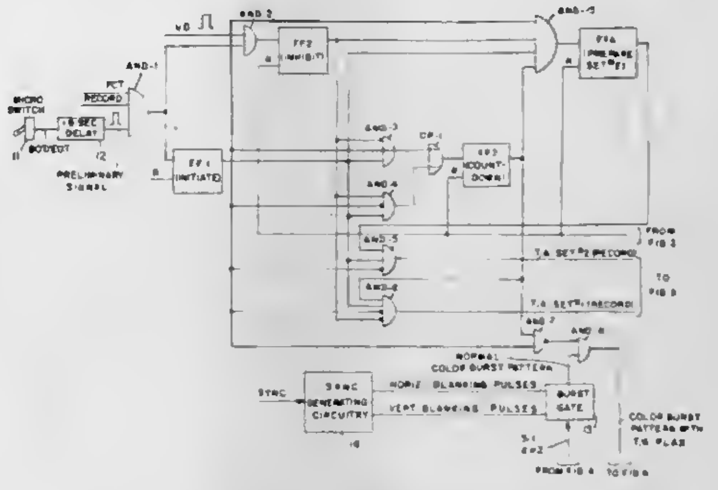


4,110,800
TURNAROUND SYSTEM

Gerhard Rotter, Mission Viejo, and Harold Ernest Arns, Chino, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Oct. 1, 1976, Ser. No. 728,549
Int. Cl.² G11B ***15/48***

U.S. Cl. 360—74 **15 Claims**



1. In a color video tape recording and playback system,

a turnaround control method

comprising in the recording mode:

recording, during at least a part of each horizontal blanking interval, a color burst having a frequency which is only a fraction of the white frequency of the modulated video signal, and

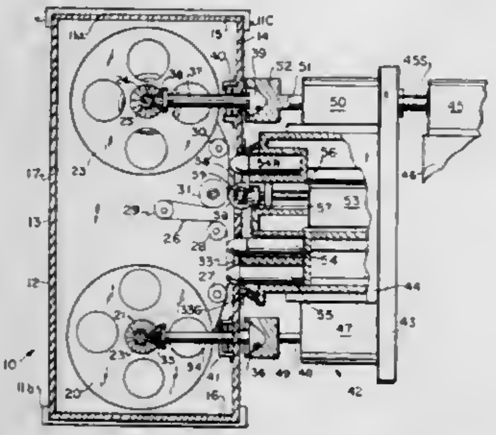
recording said color burst frequency during at least one predetermined vertical blanking interval at turnaround time to provide a turnaround control signal; and

comprising in the playback mode:

detecting said recorded turnaround control signal and initiating a tape reversal operation at least partially under the control of the detection of said signal.

4,110,801
MAGNETIC TAPE TRANSDUCING APPARATUS

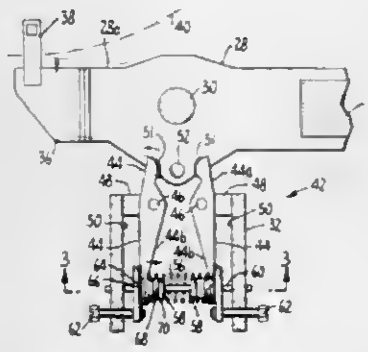
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation of Ser. No. 474,974, May 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 295,807, Oct. 10, 1972, Pat. No. 3,881,053, which is a continuation-in-part of Ser. No. 224,131, Feb. 7, 1972, Pat. No. 3,699,266, which is a continuation-in-part of Ser. No. 142,748, Aug. 28, 1961, Pat. No. 3,646,258, which is a division of Ser. No. 515,417, Jun. 14, 1955, Pat. No. 3,003,109. This application Dec. 2, 1977, Ser. No. 856,914
Int. Cl.^{2} G11B *5/54, 23/08*
U.S. Cl. 360—96 **15 Claims**



1. A tape transport apparatus comprising in combination:
- a cartridge containing record tape,
- a first support,
- means for receiving and predeterminately locating said cartridge on said first support,
- said cartridge having a supply means for flexible record tape containing information recorded along its length and a take-up reel for receiving and winding tape fed thereto from said supply means,
- means for guiding said tape in a predetermined path in said cartridge which path defines a free length of said tape within said cartridge,
- said cartridge having a wall portion with an opening therein aligned with at least a portion of said free length of said tape in said cartridge,
- means for rotationally supporting said take-up reel in said cartridge,
- a first cylindrical member rotationally supported behind said free length of tape and aligned with said opening in said cartridge wall,
- a second support,
- transducing means supported by said second support and operable for generating electrical signals representative of recordings on said tape when operatively positioned with respect to said tape and scanning said tape,
- a second cylindrical member rotationally supported on said second support adjacent said transducing means,
- first means for effecting first predetermined relative movement between said second support and said first support in a first direction when said cartridge is predeterminately located on said first support to first cause said end wall of said cartridge containing said opening to be aligned with said transducing means, and
- second means for effecting further relative movement between said cartridge and said transducing means in a second direction to bring said transducing means and cartridge into operative relation wherein that portion of said tape aligned with said opening in said cartridge wall will be operatively disposed with respect to said second cylindrical member for engaging said tape against said first cylindrical member,
- motor means operable for power rotating one of said first and second cylindrical members while said tape is engaged therebetween to drive said tape towards said take-up reel,
- drive means for said take-up reel,
- coupling means connected to said take-up reel drive means for connecting said drive means to drive said reel,
- means for effecting relative movement between at least part of said coupling means and a cartridge when said cartridge is predeterminately disposed on said first support to cause said coupling means to become operatively engaged for driving said take-up reel, and
- third means for simultaneously operating said motor means to effect the driving movement of said tape and said take-up reel drive means to rotate said take-up reel and to thereby operate for taking up tape fed thereto.

4,110,802
CRASH STOP FOR DISC DRIVE ACTUATOR

Bin-Lun Ho, and Geoffrey M. Lee, both of Los Gatos, Calif., assignors to Memorex Corporation, Santa Clara, Calif.
Filed May 26, 1977, Ser. No. 800,717
Int. Cl.^{2} G11B *21/08;* **G05G** *1/04*
U.S. Cl. 360—106 **10 Claims**

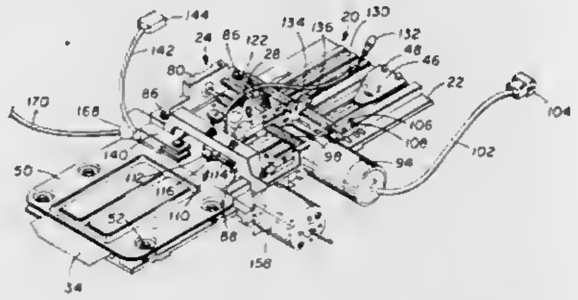


1. In a disc file having an accessing mechanism including an actuator having a reciprocal movable member with connected recording heads for accessing the surface of a magnetic disc, a crash stop for restraining the reciprocal displacement of the moving member of the actuator comprising:
- a contact element mounted on the movable member of the actuator and movable in a generally reciprocal course with the movable member;
- contact means having first and second opposed contact faces;
- pivot means mounted to a stationary structure in said disc file for pivotally mounting said contact means to said structure with said contact faces positioned on the course of said contact element displaced from opposite sides of said contact element; and,
- bias means attached to said contact means co-acting with said contact faces for restraining displacement of said contact faces, whereby displacement of the actuator moving member may be restrained.

4,110,803
MAGNETIC HEAD ASSEMBLY ADJUSTABLE RELATIVE TO ROLL, PITCH AND AZIMUTH

Robert H. Townsend, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 28, 1977, Ser. No. 763,471
Int. Cl.^{2} G11B *5/55, 5/80, 21/08*
U.S. Cl. 360—109 **16 Claims**

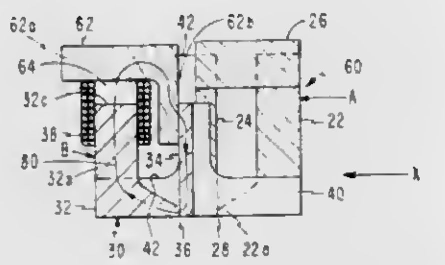
1. A magnetic card transport system comprising:
- a card support member having a top surface and a card guide surface thereon,
- a frame supported on said card support member,
- a lead screw supported from said frame and alignable relative to said card guide surface,
- a guide shaft supported from said frame and aligned along an axis parallel to the longitudinal axis of said lead screw,
- a magnetic head support,
- a magnetic head attached to said magnetic head support,
- a thread receiving structure formed in said magnetic head support and aligned along an axis transverse to the longitudinal axis of said magnetic head,
- a guide shaft receiving structure formed in said magnetic head support and aligned along an axis transverse to the longitudinal axis of said magnetic head, and



- a clamp member attached to said magnetic head support, said clamp member having a shaft extending from said magnetic head support, a biasing spring positioned between said shaft and said magnetic head support for biasing said shaft towards said magnetic head support, and a foot member pivotally attached to the end of said shaft remote from said magnetic head support and positionable to engage said thread receiving structure against the threads of said lead screw and said guide shaft receiving structure against said guide shaft whereby said magnetic head is aligned relative to the card guide surface of said card support member.

4,110,804
READ/WRITE AND TUNNEL ERASE MAGNETIC HEAD ASSEMBLY

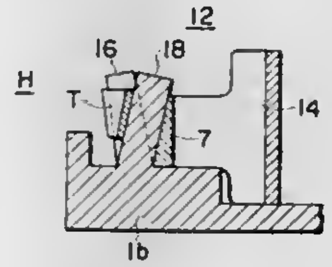
Daniel Owen Castrodale; Jeffrey Lynn Lovgren; Ralph Arthur Russell, and Karl Allen Shidler, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 21, 1977, Ser. No. 817,755
Int. Cl.^{2} G11B *5/26*
U.S. Cl. 360—118 **7 Claims**



7. A magnetic head assembly for recording or reading data and for erasing edge portions of newly recorded data and previously recorded data comprising:
- a center read/write layer and a pair of outer erase layers on opposite sides of the center layer for recording or reading and erasing data associated with a single data track,
- said center layer including a core of magnetically permeable material which is closed except for a transducing gap provided in the core on an active surface of said head assembly, each of said outer layers including first and second core portions of magnetically permeable material having ends of these portions at said active surface providing an erasing gap on said active surface spaced longitudinally of said center and erasing layers with respect to said read/write gap and said first and second core portions having remote ends that are remote from said active surface, said second core portions being opposite to each other transversely of said center and erase layers and extending normally to said active surface and said first core portions of said outer layers being opposite to each other transversely of said center and erase layers and extending slantwise with respect to said active surface and longitudinally of said erase and center layers and away from said second core portions so as to provide a spacing of said first core portions with respect to said second core portions at their said remote ends;
- a read/write electrical coil disposed about said core of said center layer;
- a single erase electrical coil disposed about both of said first core portions of said outer layers and extending in a direction away from said active surface and beyond said remote ends of said first core portions; and
- an L-shaped bar of magnetically permeable material having one leg thereof in face to face contact with said second core portions and having its other leg in contact with an end of said single erase electrical coil so as to thereby provide gaps between said bar and said remote ends of said first core portions and within said single erase electrical coil.

4,110,805
MAGNETIC TAPE CASSETTE WITH OPPOSITELY INCLINED GUIDE MEMBERS FLANKING THE RECORDING/REPRODUCING STATION

Kengo Oishi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Jun. 24, 1977, Ser. No. 809,815
Claims priority, application Japan, Jul. 1, 1976, 85812[U]
Int. Cl.^{2} G11B *23/02*
U.S. Cl. 360—132 **4 Claims**



1. In a magnetic tape cassette including a generally flat, hollow, rectangular case member (1), a windowed recording and reproducing station (12) defined at one edge of the case member and including a spring biased pressing pad (7) for urging a magnetic tape (T) against a recording and reproducing head insert through the window, and a plurality of fixed and rotary guide members (4, 5, 9, 10) disposed within the case member to guide a magnetic tape through the recording and reproducing station along a defined path of travel and including a pair of fixed guide members (6, 8) positioned in the same horizontal plane and disposed on opposite sides of the recording and reproducing station upstream and downstream thereof, respectively, relative to the forward direction of tape travel, the improvement characterized by:
- the tape contacting surfaces of said pair of fixed guide members (16, 18, 26, 28, 36, 38) being oppositely inclined relative to the tape-contacting surface of an inserted magnetic recording and reproducing head at an angle of from 0.5° to 5.0°, whereby a travelling tape rides up on and is tilted toward the tape head by one of said pair of fixed guide members and rides down on and is tilted away from the tape head by the other of said pair of fixed guide members so that the tape assumes a stable position at which the upward and downward forces of the oppositely inclined fixed guide members are balanced, and wherein the intermediate transitional orientation of said tape between said pair of fixed guide members at the recording and reproducing station is therefore always central and vertical

relative to said head, to thereby correct and control any lateral tape displacement or misinclination due to cassette deformations, deck orientation, and the like.

4,110,806
CIRCUIT INTERRUPTING APPARATUS FOR USE IN DIRECT CURRENT CIRCUITS

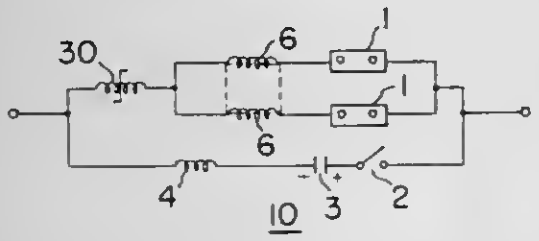
Minoru Murano, Tokyo; Satoru Yanabu; Toboru Tamagawa, both of Yokohama, and Hisatoshi Ikeda, Zushi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 3, 1977, Ser. No. 756,345

Claims priority, application Japan, Jan. 8, 1976, 51-1127; Jan. 20, 1976, 51-4635; Jan. 20, 1976, 51-4637

Int. Cl.² H02H *7/22*

U.S. Cl. 361—4 **5 Claims**



1. In current interrupting apparatus for use in a direct current circuit comprising parallelly connected branch circuits, each of said branch circuits including a circuit interrupter and a saturable reactor having a coil connected in series with said circuit interrupter and a magnetic core which saturates at a predetermined value of the current flowing through said coil; and, a commutating circuit including a capacitor and a switch connected in parallel with said branch circuits, the improvement wherein said saturable reactor comprises

- a first annular coil provided with a plurality of saturable magnetic cores, and
- a second annular coil encircling said first annular coil and said saturable magnetic cores, said first and second annular coils being connected in series, said switch being closed when said circuit interrupters are opened to pass commutating current through said branch circuits from said capacitor.

4,110,807
CONTINUITY MONITORING SYSTEM

Donald Eugene Neuhouser, Huntington, W. Va., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

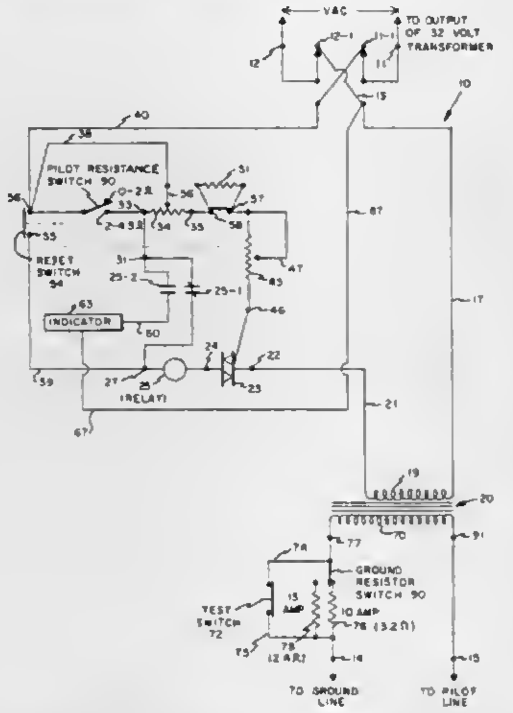
Filed May 2, 1977, Ser. No. 793,112

Int. Cl.² H02H *1/02*

U.S. Cl. 361—42 **11 Claims**

3. A system for monitoring the resistance of the pilot and ground conductors in an electrical cable, comprising,

- transformer means having a primary winding and a secondary winding,
- the secondary winding having the pilot and ground conductors connected thereto,
- a relay in series with said primary winding for interrupting power in the cable, said relay having drop-out and pick-up states and interrupting power in the cable when in the drop-out state and allowing restoration of power in the cable when in the picked up state, the voltage required to pick-up said relay being of a predetermined greater amplitude than the drop-out voltage,
- first and second series circuits, said relay connected in parallel with said circuits,
- said first series circuit including a switching device for controlling the states of said relay, said first circuit additionally including a first resistive portion of a variable resistor for calibrating said relay to drop-out with certain values of resistance in the pilot and ground conductors,
- said second series circuit including a second resistive portion of said variable resistor, and
- switch means for selectively connecting said second portion of said variable resistor into said second circuit to change the loading of said relay.



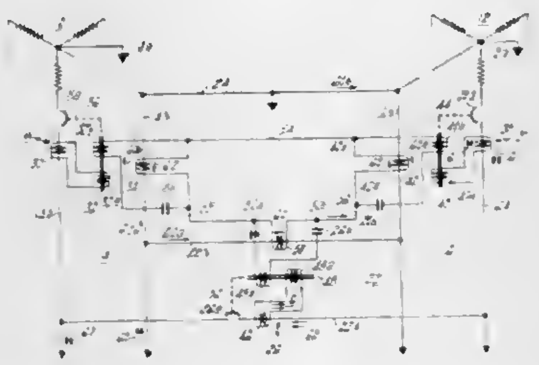
4,110,808
GROUND FAULT PROTECTION SYSTEM FOR MULTIPLE SOURCE DISTRIBUTION NETWORKS

Charles F. Hobson, Jr., Southington, and John D. Hamilton, Farmington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,265

Int. Cl.² H02H *3/28*

U.S. Cl. 361—44 **11 Claims**



7. A ground fault protection system for an electrical power distribution network including at least first and second polyphase sources with the neutral point of at least one source solidly connected to ground, the source neutral points being interconnected by a ground circuit path, each source capable of feeding associated first and second polyphase main buses interconnected by a polyphase tie bus, and each main bus including a neutral bus conductor connected to the neutral point of its associated source and connected together by a neutral bus conductor included in the tie bus, said system comprising, in combination:

- A. first and second main circuit interrupters, each including
  - (1) main contacts respectively connecting the first and second sources to the first and second main buses,
  - (2) a separate phase current transformer coupled with each phase bus conductor of the first and second main buses, each phase current transformer having a secondary winding in which is developed a current signal proportional to the current flowing in the coupled phase bus conductor,
  - (3) first and second neutral current transformers respectively coupled with the neutral bus conductors of the first and second main buses, each said neutral current transformer having a secondary winding in which is developed a current signal proportional to the current flowing in the coupled neutral bus conductor, and
  - (4) current differential circuit means including said secondary windings of the associated phase and neutral current transformers and operating to develop a ground fault signal for tripping the associated main circuit interrupter in response to an imbalance in the secondary winding current signals received thereby, and
  - (5) auxiliary contacts operating to connect the first and second neutral current transformer secondary windings into their associated differential circuit means only while the main contacts of the associated main circuit interrupter are closed;
- B. a tie circuit interrupter including main contacts operating in the tie bus and a third neutral current transformer coupled with the neutral bus conductor of the tie bus and having a secondary winding in which is developed a current signal proportional to the current flowing in the tie neutral bus conductor; and
- C. means connecting said first, second and third neutral current transformer secondary windings in a first circuit loop;
- D. whereby, with the main contacts of any two of the first main, second main and tie circuit interrupters closed and one of said main contacts of the above circuit interrupters being open,
  - (1) under normal neutral loading conditions, neutral current returning to one of the sources through the tie neutral bus conductor and the neutral bus conductor of the main bus associated with the other source induces, via the associated neutral current transformers, a current in said circuit loop which circulates through appropriate current differential circuit means such as to maintain overall current signal balances therein, and
  - (2) under ground fault conditions, any ground fault current returning to the one of the sources feeding the fault through the neutral bus conductors of the main and tie buses induces, via said neutral current transformers, a current which circulates in said circuit loop exclusive of said current differential circuit means to insure overall current signal imbalances therein indicative of the ground fault current magnitude.

4,110,809
SOLID STATE POWER CONTROLLER WITH LOW LEVEL SIGNAL CONTROL

Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

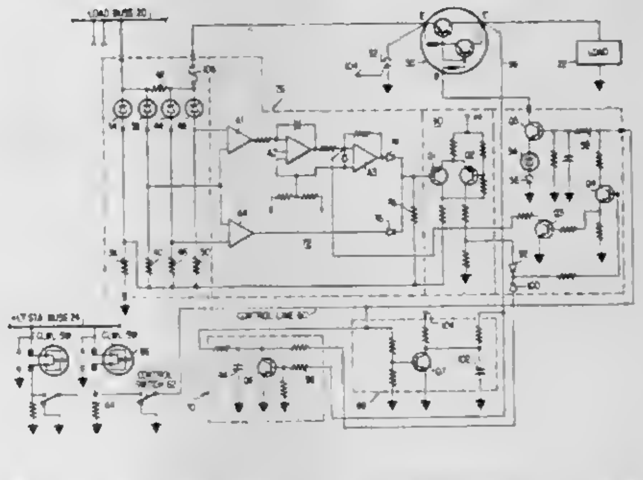
Filed Dec. 30, 1976, Ser. No. 755,560

Int. Cl.² H02H *3/08*

U.S. Cl. 361—95 **11 Claims**

3. A power controller circuit for a load circuit comprising:

- a power darlington circuit including an emitter and collector for connection between a power supply and a load, and a base for controlling conductivity between said emitter and collector;
- a solid state switching means including first means responsive to impression of an activating positive potential thereon to impress a conducting bias on said darlington base;
- a positive supply voltage source displaced from said darlington and said first switching circuit;
- a control circuit comprising:
  - current limiting lamp means connecting to said voltage source;
  - a control switch having a first terminal connected to said lamp means; and
  - a control conductor connected to a second terminal of said control switch, whereby closure of said control switch will impress an activating positive potential on said solid state means without lighting said lamp means and imposition of ground potential on said control conductor with said control switch closed will cause said lamp to light while limiting current through the control circuit; and



- a load current responsive device including logic means connected to said first switching circuit to render said solid state means ineffective to impress a conducting bias on said darlington base upon the load current attaining an overload current having at least one preselected overload amplitude for at least one corresponding preselected period of time.

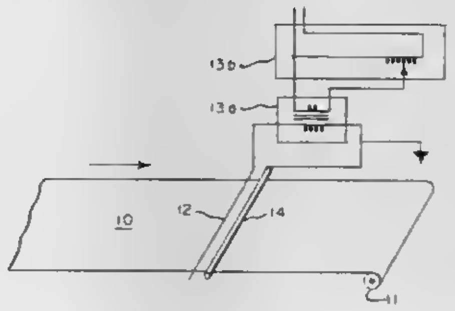
4,110,810
STATIC CHARGE NEUTRALIZER AND PROCESS

Edward Joseph Moore, Florence, S.C., and John Edward Owens, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1977, Ser. No. 776,231

Int. Cl.² H05F *3/04*

U.S. Cl. 361—213 **24 Claims**



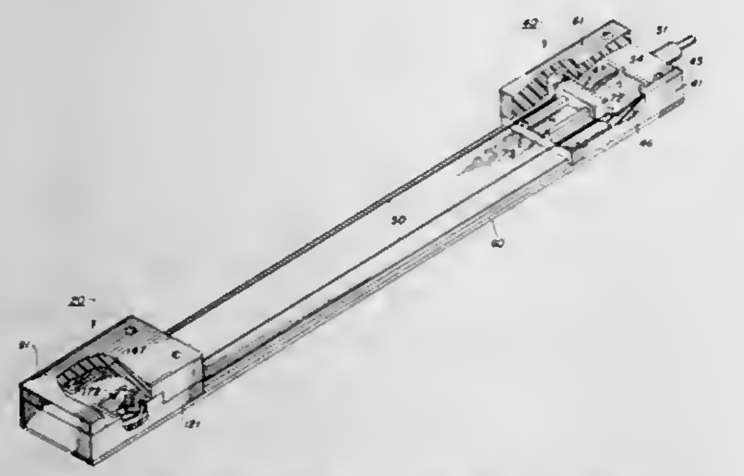
1. A web winding device for a dielectric web material comprising:

- a driven winding roll onto which the web is wound;
- a nip roll in pressure contact with the web wound on the winding roll and at which pressure contact the web is first laid onto the winding roll;
- a conductive bare wire less than 0.03 cm in diameter extending across and parallel with the web and located 0.6 to 8 cm from the web on the winding roll in an arc of 0° to 90° after contact by the web with the winding roll; and
- means for impressing an AC voltage on the wire of 3000 to 10,000 volts at 40 to 70 Hertz.

4,110,811
SUPPORT STRUCTURE FOR A CORONA GENERATING DEVICE

Fred F. Hubble, III, Rochester, and John B. Tasseff, II, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,165
Int. Cl.^{2} H05F *3/00;* H01T *19/00*
U.S. Cl. 361—225 32 Claims

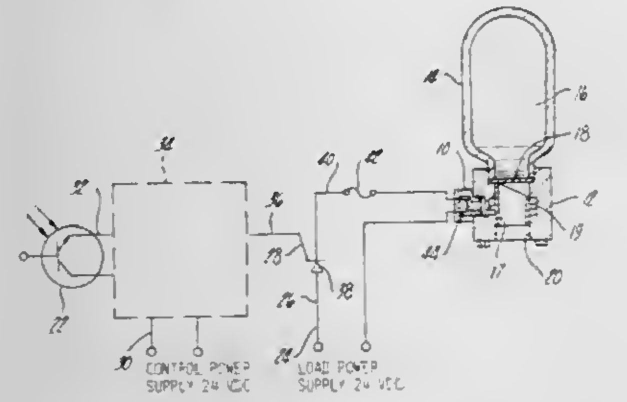


26. A corona discharge device having a plurality of coronodes, a pair of insulating assemblies for supporting said coronodes, a first of said assemblies including a first open volume conductive insert and a first cavity lined in part by said insert, the second of said assemblies having a plurality of second open volume conductive inserts and a plurality of second cavities lined in part by said inserts, each said coronodes terminating within said first insert on one end thereof and within said second inserts on the other end thereof.

4,110,812
NON-RECURRENT PULSE GENERATOR

Gregory Arutunian, Detroit, and Anthony J. Monte, Utica, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 16, 1976, Ser. No. 723,837
Int. Cl.^{2} A62C *35/08*
U.S. Cl. 361—248 1 Claim



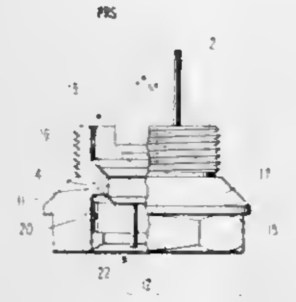
1. In a fire suppressant system comprising a bottle (**14**) charged with pressurized suppressant; a valve (**18**) controlling the discharge of suppressant from the bottle; a pyro-technic explosive squib (10) for operating said valve, said squib including a resistive heating element (**44**) having an activating current of about 6 amperes; a high amperage load voltage source (**24**); a gated power switch (**38**) connected to said voltage source for delivering high amperage current to the aforementioned resistive heating element; a low amperage control voltage source (**30**) for delivering a control signal to the gate of the aforementioned power switch; and a flame responsive detector switch (**22**) connected to the control voltage source for initiating the control signal:

the improvement comprising a time delay fuse (**42**) connected in series with the power switch and resistive heating element for limiting the time interval during which the resistive heating element is subjected to current flows appreciably higher than the aforementioned activating current; said fuse having a time-current decay curve wherein the initial current is in excess of 25 amperes and the current after 1 second is about 9 amperes.

4,110,813
IGNITION DEVICE FOR PASSIVE RETENTION SYSTEM

Peter-Matthias Hoheisel, Esslingen, and Gerhard Komander, Altbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 17, 1975, Ser. No. 641,772
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2460427
Int. Cl.^{2} F42C *19/02*
U.S. Cl. 361—248 18 Claims



1. An ignition device for a passive retention system, characterized in that an ignition unit for being coupled into a housing means includes two connecting pins having free ends projecting out of a coupling means of the ignition unit, the connecting pins being operatively connected in the region of the opposite ends thereof with a filament means, the filament means being surrounded by an ignitable ignition composition arranged within a casing means, the coupling means including a socket member having a predetermined configuration prior to coupling with the housing means, the socket member being provided with a portion having a first cross section adjoining a conical chamfered portion, the conical chamfered portion adjoining an adapter portion having a smaller cross section than the first cross section, the coupling means enabling a rapid installation and tight seal of the ignition unit with the housing means upon coupling.

4,110,814
WATTHOUR METER ENCLOSURE FOR USE IN REMOTE METER READING PACKAGES

James S. Britton, Raleigh, and David W. Morgan, Zebulon, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,375
Int. Cl.^{2} H02B *9/00*
U.S. Cl. 361—371 6 Claims

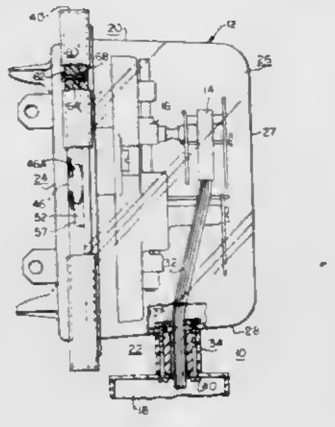
1. A watthour meter enclosure comprising:

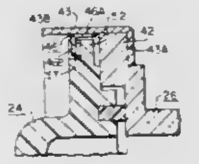
a cup-shaped cover including a closed forward end, a side portion extending to an open end, a side portion including an opening, and a circular mounting flange extending radially outward at said open end along front and rear radial surfaces;

a circular locking rim having a forward portion overlapping said front radial surface of the cover flange and an integral cylindrical body extending rearward from said front portion so that the inner wall of said cylindrical body extends over and beyond the outer periphery of the cover flange, said locking rim including a plurality of locking tab members carried on said inner wall of said cylindrical body and extending from said inner wall in separately spaced relationships from each other and from the cover flange so that the cover flange is freely rotatable within said locking rim;

a base assembly supporting a watthour meter movement and a meter data sending unit responsive to said movement, said sending unit including plural conductors intended for connection externally of said cover, said base assembly including plural arcuate attachment lugs extending radially at the outer periphery thereof in a spaced apart relationship, said attachment lugs having forward and rear radial surfaces thereon, said attachment lugs rotationally receiving said plurality of locking tabs in engagement with the rear radial surfaces thereof and attaching said cover to said base assembly so as to be rotatable to a predetermined position relative to said locking rim and said base assembly, the side opening of said cover having a desired arcuate position and receiving said plural conductors with said cover being at said predetermined position; and

a rotational locking arrangement including at least one recess extending into said rear radial surface of the cover flange at a predetermined arcuate position relative to the side opening, a hole in said base assembly aligned with said recess in said cover flange with said cover opening being in said desired arcuate position, and fastener means extending within both the aligned hole and recess to retain said cover in the predetermined rotated position thereof.

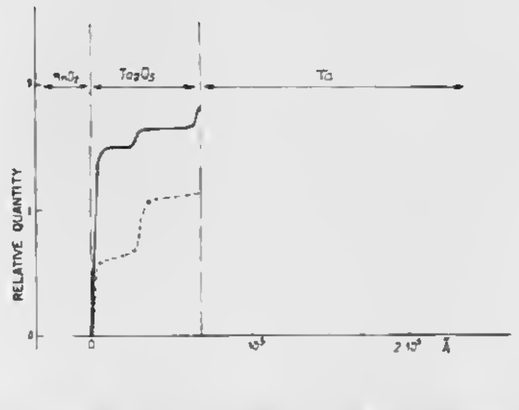




4,110,815
SOLID ELECTROLYTIC CAPACITOR

Gilbert Frade; Balint Escher, and Dominique Prince, all of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Sep. 28, 1976, Ser. No. 727,429
Claims priority, application France, Oct. 6, 1975, 75 30491
Int. Cl.^{2} H01G *9/00*
U.S. Cl. 361—433 8 Claims

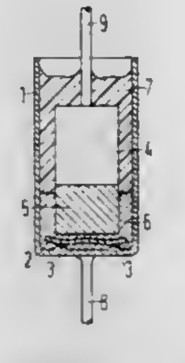


1. In a solid electrolyte capacitor made of a sintered tantalum anode, a dielectric consisting of a tantalum oxide layer obtained through anodic oxidation of said tantalum anode and a cathode comprising manganese dioxide which covers said tantalum oxide layer and a conductive layer deposited on said manganese dioxide, the improvement which comprises an impurity selected from the group consisting of trivalent impurities and hexavalent impurities distributed non-uniformly through the thickness of said tantalum oxide layer.

4,110,816
INSTALLATION OF ELECTRICAL COMPONENTS, PARTICULARLY SOLID ELECTROLYTIC CAPACITORS IN METAL HOUSINGS

Andreas Deckert, Ellwangen-Schrezheim, and Hans Wolscheck, Hermaringen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 28, 1976, Ser. No. 736,422
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557201
Int. Cl.^{2} H01G *9/00*
U.S. Cl. 361—433 7 Claims



1. In an electrical component comprising: an electrical component element mounted in a cup shaped housing, said component element having an electrical terminal which is electrically connected to said housing via a soft solder, the improvement which comprises providing a soft-solderable metal part welded to the inside of said housing and electrically connected by said soft solder to said electrical terminal, said housing comprising a non-soft-solderable metal having at least some aluminum therein, and a terminal lead separate from said soft-solderable metal part, said terminal lead connected to the outside of said housing.

4,110,817
ELECTROLYTIC CAPACITOR WITH AN ELECTROLYTE INCLUDING DIBASIC ACID COMPOUNDS

Sidney D. Ross, and Franz S. Dunkl, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 16, 1976, Ser. No. 705,861
Int. Cl.^{2} H01G *9/02*
U.S. Cl. 361—433 2 Claims

1. An electrolytic capacitor having at least one aluminum electrode coated with a dielectric oxide layer, an electrolyte contiguous with said electrode, said electrolyte consisting essentially of ammonium adipate in combination with a member from the group consisting of ammonium succinamate, succinamic acid, succinamide and succinimide, dissolved in a solvent consisting essentially of ethylene glycol and a minor amount of water, said member being in an amount sufficient to reduce the percent increase in resistivity with time at the operating temperature of the capacitor.

4,110,818
ILLUMINATED FLAG OR PENNANT

Raymond Hempsey, 248 Watkins St., Philadelphia, Pa. 19148

Filed Aug. 29, 1977, Ser. No. 828,623
Int. Cl.^{2} F21V *7/04*
U.S. Cl. 362—32 10 Claims

1. An illuminated flag comprising a flexible sheet-like flag

having opposed lateral surfaces, means for attachment of said flag to an existing radio antenna having a source of electrical energy approximate thereto, an electrically operated light source, means for coupling said light source to said source of electrical energy, fiber optic cable means, one end of said fiber optic cable means being disposed receiving light energy generated by said source of light, the other end of said fiber optic cable means being distributed such that the free ends of the individual fiber optic filaments of said fiber optic cable means are disposed along at least one said lateral surface so as to be visually accessable tc a user and arranged such that said free ends form indicia.

4,110,819

HEADLIGHT TILTING CONTROL DEVICE OF MOTOR VEHICLE

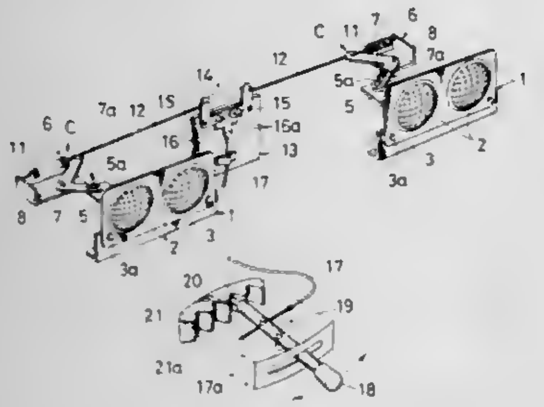
Masao Ishikawa, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Nov. 10, 1976, Ser. No. 740,711

Claims priority, application Japan, Nov. 13, 1975, 50-153439[U]

Int. Cl.² B60Q *1/06*

U.S. Cl. 362—40 **2 Claims**



1. Headlight tilting control device of a motor vehicle comprising, in combination:

two headlight frames arranged on the opposite lateral ends of the vehicle body front portion, each said frame having one end pivotally mounted on a fixed part of the vehicle body and the other end constantly loaded by spring means to maintain said headlight frame in a predetermined tilted position;

tilt adjusting means for providing tilting movement of said headlight frames against the load of said spring means;

manually operating means located on a fixed part of the vehicle body accessible to an operator comprising a manually moveable lever pivotally mounted on a fixed part of the vehicle body, a positioning plate having a plurality of grooves in any of which said manually moveable lever is received and held in position upon pivotal movement of said lever; and

intermediate linkage means linked between said tilt adjusting means and said manually operating means for transferring the manually operating effort applied to a positioning plate having a plurality of grooves in any of which said manually moveable lever is received and held in position upon pivotal movement of the manually moveable lever, said intermediate linkage means comprising

a linkage frame located intermediate of said two headlight frames and extending substantially in parallel with the headlight frames,

a moveable plate mounted on said linkage frame to be moveable relative thereto,

two oppositely directed L-shaped levers pivotally carried on said linkage frame, each said L-shaped lever having one end connected with said moveable plate and an opposite end,

two connecting cables each interconnecting said opposite end of the angled arm and said opposite end of the L-shaped lever, and

a drive transferring cable having one end connected with said moveable plate and the other end length-adjustably connected with said manually moveable lever.

4,110,820

SPARE LAMP HOLDING DEVICE FOR A LIGHT SUPPLY DEVICE FOR ENDOSCOPE

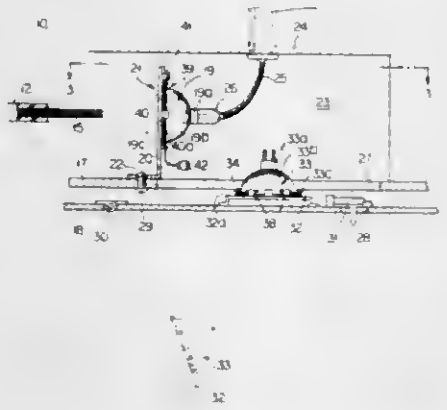
Katunaga Konoshima, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,018

Claims priority, application Japan, Dec. 24, 1975, 50-173691[U]

Int. Cl.² F21V *19/04*

U.S. Cl. 362—207 **3 Claims**



1. In a light supply device for an endoscope including

a casing;

a chamber formed in said casing;

a light guide bundle, one end of which is mounted in one side wall of the casing to be disposed in the chamber; and

a first holding means for holding a lamp in use to cause the lamp to be disposed adjacent to said one side wall of the casing in the chamber and emit light to said one end of the bundle;

a spare lamp holding device comprising a cover hinged to another side wall of the casing, and normally covering an opening formed in said other side wall of the chamber to communicate with the chamber; and

a second holding means provided on the inner surface of the cover and holding a spare lamp at that portion of the chamber which is located opposite to said one side wall with respect to the first holding means and where the spare lamp is not brought into contact with the lamp in use when the cover is closed, said spare lamp being pulled out of the chamber when the cover is opened.

4,110,821

SEMICONDUCTOR DEVICE HAVING A SEMICONDUCTOR ACCOMMODATED IN A SEALED VESSEL

Hiroshi Hisano, Fuchu, and Kyoichi Sato, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 19, 1977, Ser. No. 760,739

Claims priority, application Japan, Jan. 20, 1976, 51-5300

Int. Cl.² H02M *7/00*

U.S. Cl. 363—141 **7 Claims**

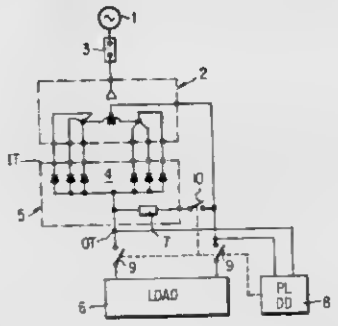
1. A semiconductor device for converting electric power flowing between an A.C. power supply and a load comprising:

a sealed vessel filled with a cooling medium;

a rectifier unit accommodated in the sealed vessel and adapted to be energized by the A.C. power supply for applying rectified power to the load;

means for detecting deenergization of the rectifier unit and providing an output signifying the same;

a heating unit accommodated in the sealed vessel; and



means responsive to the output of the detecting means for applying rectified power from the rectifier unit to the heating unit.

4,110,822

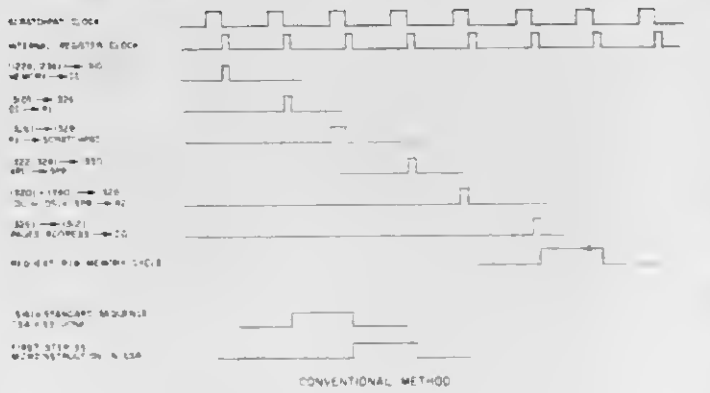
INSTRUCTION LOOK AHEAD HAVING PREFETCH CONCURRENCY AND PIPELINE FEATURES

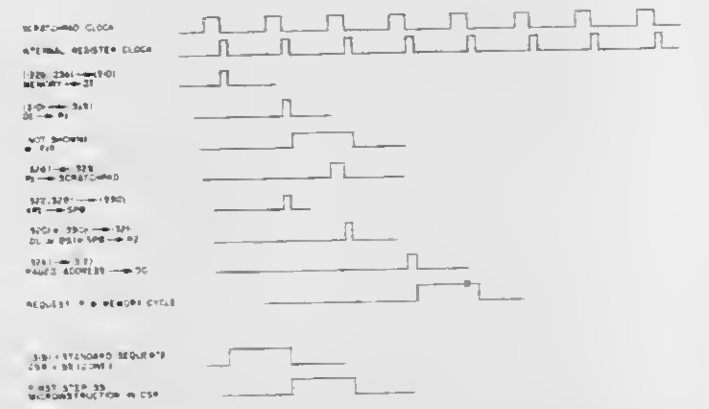
Marion G. Porter, Phoenix, and Garvin Wesley Patterson, Glendale, both of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Continuation of Ser. No. 562,272, Mar. 26, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,599

Int. Cl.² G06F *9/18*

U.S. Cl. 364—200 **7 Claims**


CONVENTIONAL METHOD


LOOK AHEAD METHOD

1. A data processing unit coupled to a memory and including general registers within a scratchpad memory for storing operands, an instruction buffer for storing a number of program instructions fetched from said memory and an instruction fetch and execution apparatus for executing instruction fetch and instruction execusion operations under microprogram control during minor and major clock pulse cycles wherein each program instruction requires execution of a predetermined number of microinstructions during a corresponding number of minor clock pulse cycles which comprise a major clock pulse cycle, said apparatus comprising:

an addressable control memory having a plurality of locations for storing a plurality of microinstructions, a first one of said microinstructions being coded to specify a number of microoperations, one required to terminate the execution of a first one of said program instructions and another microoperation for beginning the processing of next one of said program instructions and a last one of said microinstructions being coded to specify a number of microoperations, one microoperation required for execution of said first one of said program instructions and another microoperation for initiating the processing of a next instruction;

first means coupled to said control memory and operative in response to said last one of said microinstruction read out during a last minor clock pulse cycle of said first instruction to execute said one microoperation for completing the major cycle of operation of said first one of said program instructions;

second means coupled to said control memory and operative in response to said last one of said microinstructions during said last minor clock pulse cycle to execute said another microoperation for initiating the processing of said next instruction in parallel with the execution of microoperations of said first one of said program instructions;

third means coupled to said control memory and operative in response to said first one of said microinstructions during a first minor clock pulse cycle of beginning of a major clock pulse cycle of said next one of said program instructions to execute said another microoperation for completing an operation required in the execution of said second one of said program instructions; and,

fourth means coupled to said control memory and operative in response to said first one of said microinstruction during said first minor clock pulse cycle to execute said one microoperation for terminating the execution of said first one of said program instructions in parallel with the execution of said next one of said program instructions.

4,110,823

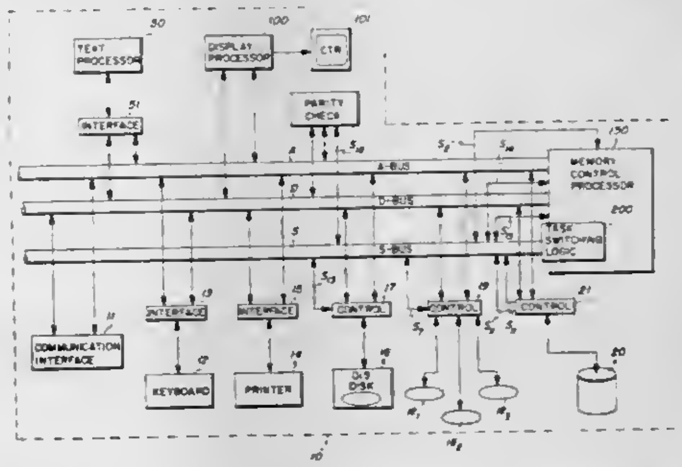
SOFT DISPLAY WORD PROCESSING SYSTEM WITH MULTIPLE AUTONOMOUS PROCESSORS

David Cronshaw, Torrance; Jack E. Shemer, Los Angeles; William D. Turner, San Marino; David Hartke, Pasadena; James R. Keddy, Huntington Beach; Wilbur E. DuVall, Victorville, and Warren M. Sterling, Hermosa Beach, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1977, Ser. No. 769,594

Int. Cl.² G06F *15/20, 3/14, 13/00*

U.S. Cl. 364—200 **1 Claim**



1. A data processing system adapted for text editing comprising:

an external bus system;

a text processor including a memory portion, said text processor being coupled to said bus system, said text processor receiving input signals from said bus system and producing at a first cyclic rate predetermined command signals in response to said input signals;

a semi-autonomous memory control processor coupled to said bus system, said memory control processor including a main memory and an accelerator memory for storing data signals and instruction signals, said main memory periodically advancing at a second cyclic rate data therefrom to said accelerator memory in response to receipt by said memory control processor of selected ones of said command signals;

isolating means connected between said text processor and said bus system and responsive to signals received from said memory control processor for decoupling said text processor from the communications on said bus system during the times when said memory control processor is advancing said data signals and instruction signals from said main memory of said memory control processor to said accelerator memory of said memory control processor;

a semi-autonomous display processor coupled to said bus system, said display processor including a video display means and a list of memory means independent of said memory portion of said text processor, said list memory having signals stored therein and being responsive to selected other ones of said command signals and said video display means being rendered cyclically operative independent of said selected other ones of said command signals for producing images of characters and graphics at a third cyclic rate according to the signals stored in said list memory; and

at least one data input device coupled to said bus system, said data input device being coupled through said external bus system to said memory portion of said text processor and utilizing as its memory said memory portion of said text processor.

4,110,824

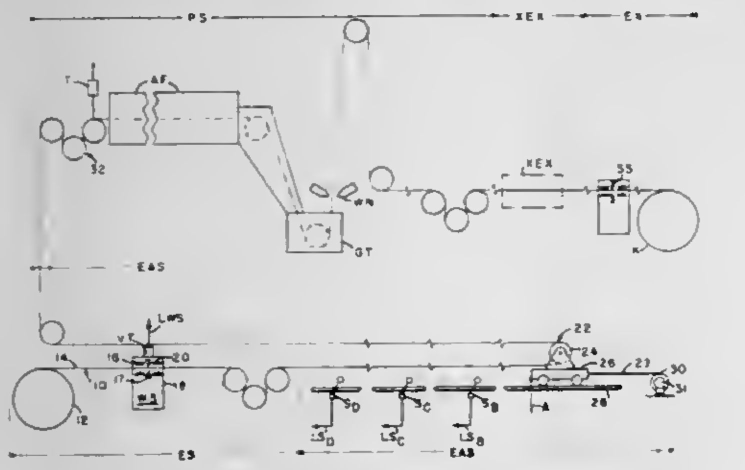
METHOD AND APPARATUS FOR CONTINUOUSLY PROCESSING STRAND

Homer P. Halsey; Lowell E. Reed, both of Poland Township, Mahoning County, and David C. Hildebrand, Boardman Township, Mahoning County, all of Ohio, assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed May 18, 1977, Ser. No. 798,146

Int. Cl.² B65H *25/20;* G06F *15/20*

U.S. Cl. 364—472 **15 Claims**



1. Apparatus for use in conjunction with a continuous strand processing line wherein movement of the strand is continued in one section of the line despite halting movement of the strand in another section to permit work to be performed on the strand in said other section, said line including a work station, an accumulator section having an accumulator movable along a path, and a processing section downstream of said accumulator section, said apparatus comprising:

(1) work signal means issuing a work signal when work is performed at said work station;

(2) accumulator position signal means issuing a position signal representative of the position of said accumulator along its path; and

(3) strand signal means for providing a signal for ascertaining the strand length passing into said processing section;

(4) computation circuit means for receiving said work signal and said position signal and including comparison means for comparing a preset value representing the strand path distance between said work station and a preselected position in said processing section, with the length of strand passing into said processing section and issuing a new signal when the length of strand passing into said processing section corresponds to the length of said strand path distance, said comparison means being initiated by a position signal only at such time that said work signal is present.

4,110,825

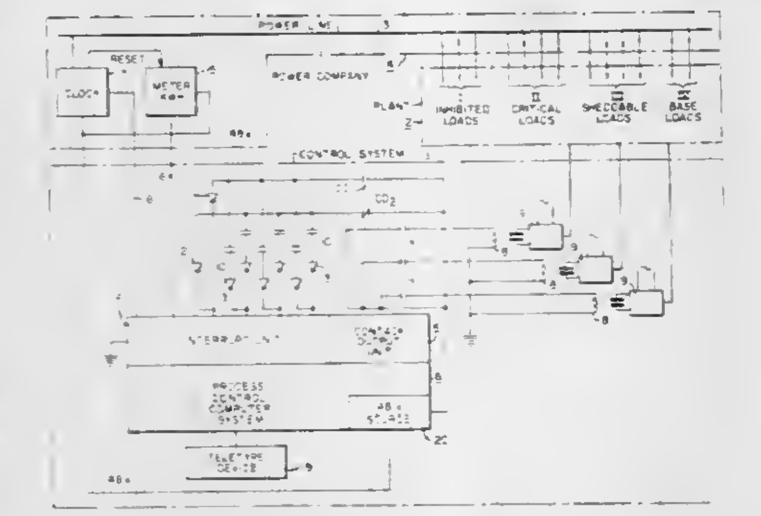
CONTROL METHOD FOR OPTIMIZING THE POWER DEMAND OF AN INDUSTRIAL PLANT

Richard Q. Fox, Orlando, Fla.; Donald E. Sigut, Herminie, and John H. McWhirter, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1977, Ser. No. 791,827

Int. Cl.² G06F *15/06;* G05B *15/00*

U.S. Cl. 364—492 **4 Claims**



1. A method of limiting the power demand of a plant facility having controllable and non-controllable loads by switching said controllable loads during demand periods and selectively in accordance with a pre-established priority list, comprising the steps of:

assigning at the beginning of each demand period a demand limit to be met at the end of such demand limit;

deriving an indication of the actual demand of power by said plant facility at the end of a demand period;

establishing said demand limit at the beginning of a given demand period by reference to the indication of an actual demand recorded during one demand period preceding such given demand period;

predicting a demand at the end of said given demand;

deriving a demand error by reference to said established demand limit and with said predicted demand; and

switching said controllable loads selectively during said given demand period to minimize said error.

4,110,826

APPARATUS AND PROCESS FOR COLOR-IDENTIFICATION

Klaus Möllgaard; Hans Keller; Ulrich Sendtko, all of Kiel, and Rüdiger Sommer, Raisdorf, all of Germany, assignors to Dr. - Ing. Rudolf Hell GmbH., Kiel, Germany

Filed Oct. 1, 1976, Ser. No. 728,956

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544703

Int. Cl.² G01J *3/50;* G06G *7/75*

U.S. Cl. 364—526 **21 Claims**

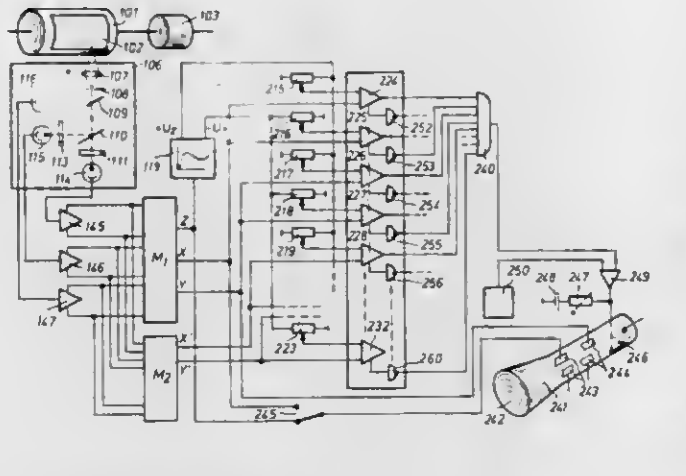
17. A circuit-arrangement for the identification of a predetermined color from a plurality of colors in an object, comprising, in combination:

photo-electrical transducer means for obtaining of trichromatic color - measuring signals;

threshold-value circuit-means and coincidence-circuits connected to said threshold-value circuit-means for delineating a color-identification-region within said plurality of colors, said signals being defined by a set of coordinates, said threshold value-circuit-means including a plurality of threshold-value circuits corresponding to predetermined color-identification regions, each coincidence circuit being connected to a corresponding threshold-value circuit, transforming means connected to the output of said transducer means for transforming the coordinates and having the following transformation properties:

$$x = 0.789\,R - 0.211\,G - 0.578\,B$$

$$y = -0.211\,R + 0.789\,G - 0.578\,B$$



$$z = 0.578\,R + 0.578\,G + 0.578\,B.$$

wherein

R, G, B, represent the coordinates corresponding to said trichromatic color-measuring signals,

x, y, represent chrominance signals, and

z represents a luminance-signal, said transforming means including a matrix providing

the chrominance signals (x), and the luminance signal (z), subtracting-units connected to the chrominance signal output of said matrix, and a function generator connected to the luminance-signal output of said matrix, for generating a signal which is dependent on the luminance (z), said subtracting units subtracting the luminance-dependent signal (z) from the chrominance signals (x, y), said luminance-dependent signal having a constant value in the $((z/2) - c_1) < z < (z/2 + c_2)$ region and decreasing linearly in the region $z < ((z/2)$, and $z > ((z/2) + c_2)$, wherein c_1 and c_2 are predetermined constants.

4,110,827

LOAD CYCLING WITH SPACE TEMPERATURE FEEDBACK

Gideon Shavit, Highland Park, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 29, 1976, Ser. No. 737,621

Int. Cl.² F24F *3/00;* G05B *11/32;* G05D *23/19;* G06F *15/20*

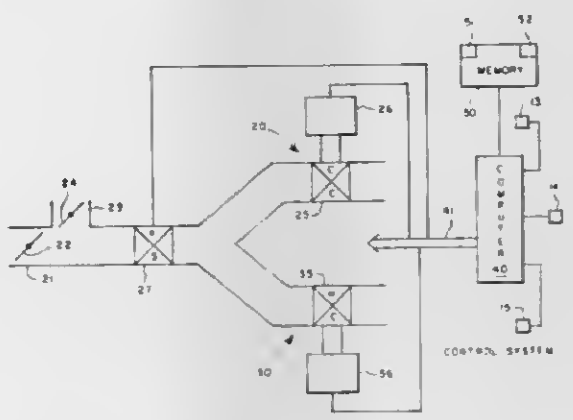
U.S. Cl. 364—550 **24 Claims**

1. A system for cycling loads in a building comprising:

physical condition responsive means adapted to be mounted internally in said building for sensing a physical condition;

control means for cycling said loads on and off according to a predetermined cycle rate, each load having an on time and an off time within a cycle, said control means being connected to said physical condition responsive means for resetting said off time according to said physical condition; and,

connecting means connected to said control means and adapted to be connected to said loads for cycling said loads whereby said off time of said loads are reset by said physical condition responsive means.



4,110,828

ERROR PREVENTING INCREMENTAL MEASURING SYSTEM

Alfons Baumgartner, Grassau; Walter Berg, Balingen; Horst Burkhardt, Stein an der Traun; Jürgen Läubin, Rosenfeld, and Helmut Schlick, Traunreut, all of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

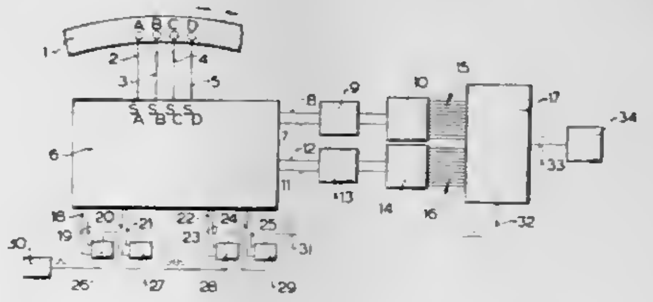
Filed Feb. 20, 1973, Ser. No. 334,036

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1972, 2207224

The portion of the term of this patent subsequent to Feb. 29, 1992, has been disclaimed.

Int. Cl.² G06F *11/10*

U.S. Cl. 364—562 **14 Claims**

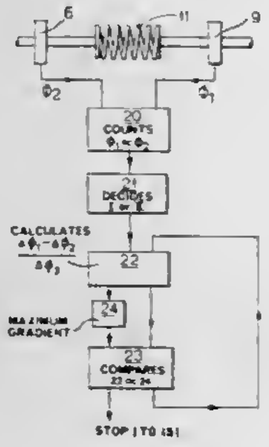


1. An incremental measuring system for lengths or angles, comprising a divided scale and a plurality of scanning elements, every scanning element delivering a signal changing between two binary values upon motion of the divided scale relatively to the scanning elements, the arrangement being such that some combinations of binary values of the various signals from the scanning elements do not occur in the case of faultless operation of all scanning elements (in the following called forbidden combinations contrary to permitted combinations), further comprising a logical network fed by the signals from the scanning elements, the logical network producing a binary output signal which is equal to a predetermined one of the signals from the scanning elements as long as a permitted combination of binary values is fed to the logical network, and which binary output signal is different from the said predetermined one of the signals from the scanning elements as long as a forbidden combination of binary values is fed to the logical network, further comprising at least two counters one of them being fed by the output signal of the logical network and an other of them being fed directly by the said predetermined one of the signals from the scanning elements, and further comprising a comparison circuit having a plurality of comparators for

comparing the respective individual positions of the said counters.

4,110,829
APPARATUS FOR AND METHOD OF DETERMINING ROTATIONAL AND LINEAR STIFFNESS

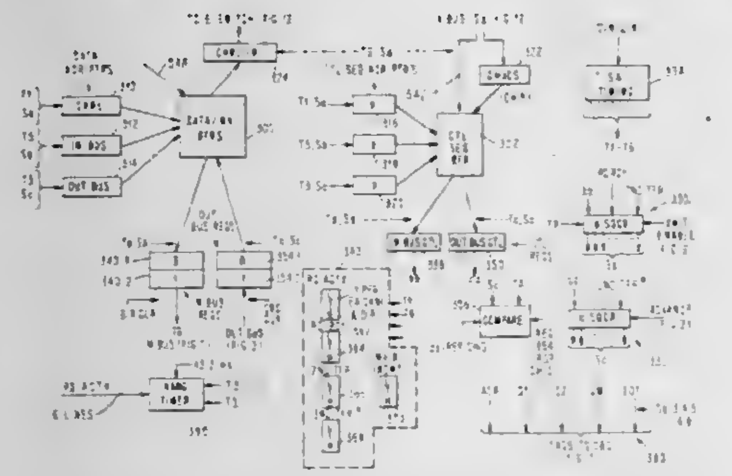
John T. Boys, Auckland, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.
Division of Ser. No. 507,417, Sep. 19, 1974, Pat. No. 3,982,419, and a continuation-in-part of Ser. No. 357,920, May 7, 1973, abandoned. This application Sep. 16, 1976, Ser. No. 723,866
Int. Cl.^{2} G06F *15/20;* B23P *19/06*
U.S. Cl. 364—577 **6 Claims**



1. Apparatus for sensing a desired point on a curve representing the variation of two related inputs, generated by an external source, wherein said curve has a generally linear portion and said desired point lies beyong said generally linear portion, said apparatus comprising:
first means for developing a signal representative of the instantaneous gradient of said curve, and
second means responsive to said gradient signal for determining a change in slope of said curve containing said desired point, said second means including means for storing a signal representative of the gradient of said curve being encountered in the generally linear portion thereof and for developing a signal indicative of having reached the desired point on the curve when said instantaneous gradient signal has a predetermined relationship relative to said stored signal.

4,110,830
CHANNEL STORAGE ADAPTER

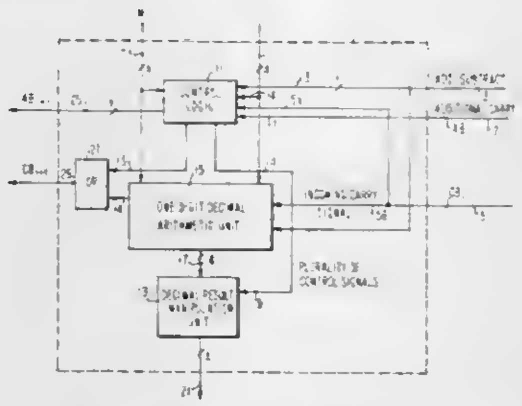
Matthew A. Krygowski, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 5, 1977, Ser. No. 813,408
Int. Cl.^{2} G06F *3/06;* H04J *3/00*
U.S. Cl. 364—200 **6 Claims**



1. In association with an input/output processing subsystem of a data processing system and a storage access subsystem of said data processing system, said storage access subsystem including means for generating responses associated with storage access requests, and adapter for linking said subsystems comprising:
a buffer storage array;
first means for transferring fetch and store requests for access to said storage access subsystem from said input/output processing subsystem to said buffer storage array;
second means for transferring said requests from said array to said storage access subsystem;
third means for transferring responses associated with said requests from said storage access subsystem to said array;
fourth means for transferring said responses from said array to said input/output processing subsystem; and
sequence control means, coupled to said input/output subsystem and operating in a time division mode, for enabling concurrent operation of said first, second, third and fourth means on a time division basis for handling multiple requests and responses concurrently through said array; said sequence control means including means for providing maximum potential time adjacency between the operations of said first and second means relative to any request.

4,110,831
METHOD AND MEANS FOR TRACKING DIGIT SIGNIFICANCE IN ARITHMETIC OPERATIONS EXECUTED ON DECIMAL COMPUTERS

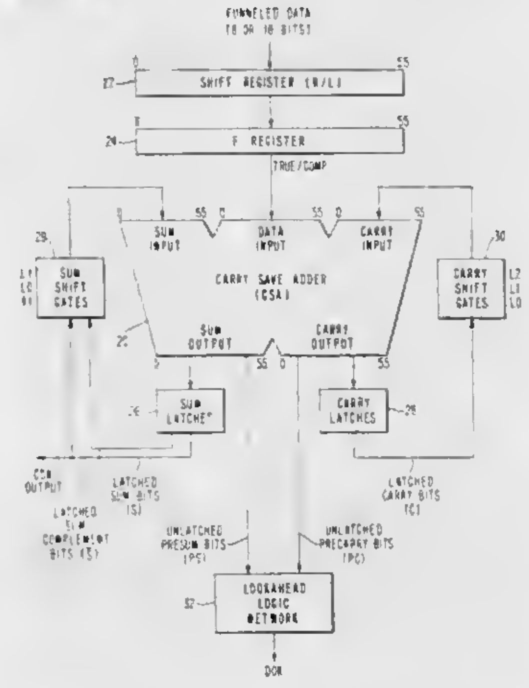
Glen George Langdon, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 29, 1977, Ser. No. 811,214
Int. Cl.^{2} G06F *7/50*
U.S. Cl. 364—745 **5 Claims**



1. In combination with a multistage decimal adder/subtractor, an apparatus for rounding up the more precise one of two BCD encoded numbers to the least significant digit position of the less precise number, pairs of digits of like order being applied to corresponding stages, nonsignificant digits 1 being uniquely coded, said apparatus comprising:
means for comparing the significance of the digits of each pair and for causing the resultant digit of the corresponding adder/subtractor stage to be changed to 1 if at least one digit of the pair was of value 1;
means for causing a first carry to be applied to the adder/-subtractor stage next in higher order than a given stage when one digit of the pair applied to the given stage is significant and has a value $>b$, b being sent by a rounding rule, the other digit having the value 1; and
means for causing a second carry to be applied to the stage next in higher order than the given stage when the digit pair values and carries incident upon the given stage exceed an amount K and for causing the corresponding resultant digit to be changed to 0, said means including means also for generating a second carry in the event the given stage subtracts one digit from another and either the minuend digit has value 1 and the subtrahend digit $<b$ or the subtrahend digit has value 1.

4,110,832
CARRY SAVE ADDER

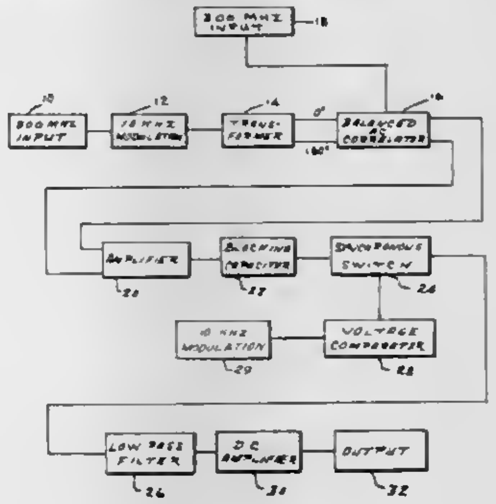
Joel Calvin Leininger, and George Phillips Taylor, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 28, 1977, Ser. No. 792,082
Int. Cl.^{2} G06F *7/50*
U.S. Cl. 364—786 **9 Claims**



1. In an arithmetic processing apparatus which can perform various operations including addition and column shifting in response to control signals selectively applied thereto, said apparatus containing a source of gated clock pulses for timing such operations and a binary register for storing the bits of an operand to be used in certain of said operations,
a carry save adder for use in said apparatus comprising an ordered set of bit positions each capable of receiving at least three binary inputs and producing sum and carry output bits as logical functions thereof, each of said adder bit positions including as output elements thereof a pair of edge triggers which are respectively adapted to manifest sum and carry bits produced by the respective bit position,
each of said triggers including a latch which is settable in response to adder inputs that coincide with a gated clock pulse and being capable of retaining such setting during the interval between successive clock pulses irrespective of input values that may be received by said adder during such interval, each latch thereby storing and manifesting as its output a clocked sum bit or a clocked carry bit as the case may be, and
input controls operable in response to applied control signals for conditioning each of said adder bit positions to receive inputs which include selected ones of the sum and carry bits manifested by the latches at the same adder bit position and/or another or others of said adder bit positions according to the particular operation selected by the applied control signal, the arrangement of said input controls being such that one of the output sum and carry bits manifested by the latches at the bit position in any given order of said ordered set is applied directly as input to a bit position in an adjacent order, if any, of the same ordered set, while the other of said output bits is applied directly as input to a bit position in an order, if any, which is adjacent to the first-mentioned adjacent order of said set, whereby the next subsequently applied clock pulse will cause the sum and carry latches of each adder bit position to be set in accordance with inputs then being applied to such bit position including one or more inputs from bit positions in the same ordered set.

4,110,833
BALANCED AC CORRELATOR SYSTEM

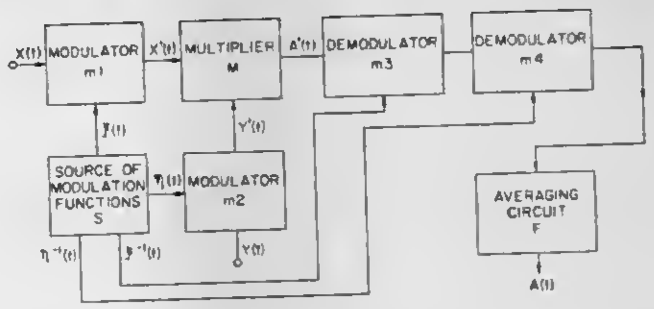
Mark R. Williams, West Melbourne, and Gayle Patrick Martin, Indialantic, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 19, 1976, Ser. No. 743,361
Int. Cl.^{2} G06G *7/19;* H04B *1/12*
U.S. Cl. 364—819 **4 Claims**



1. A balanced AC correlation system comprising: a first and second signal input means; modulator means connected to said first input means for modulating a signal; means connected to said modulator means for establishing two balanced signals; correlator means adapted to receive said balanced signals and said second input signal whereby said second input signal causes said balanced signals to vary in amplitude; amplifier means for amplifying the output of the correlator means; means for inhibiting the flow of a direct current signal from the amplifying means; switch means connected to the said means for inhibiting for causing a change in signal from AC to DC; filter means connected to the switch means for enhancing the quality of the DC signal, and means for amplifying the DC output signal.

4,110,834
METHOD AND CIRCUIT ARRANGEMENT FOR THE MULTIPLICATION OF ELECTRICAL SIGNALS

Michael Altwein, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany
Filed Jun. 13, 1977, Ser. No. 805,850
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627586
Int. Cl.^{2} G06G *7/16*
U.S. Cl. 364—841 **19 Claims**



1. A method for multiplying electrical signals comprising modulating each signal to be multiplied with a different modulation function, said modulation functions each having positive and negative values, multiplying said modulated signals together to form a product signal, demodulating said product signal of the modulated signals with demodulation functions which are the reciprocal of said modulation functions to pro-

duce a demodulated signal, and averaging said demodulated signal to produce an output signal.

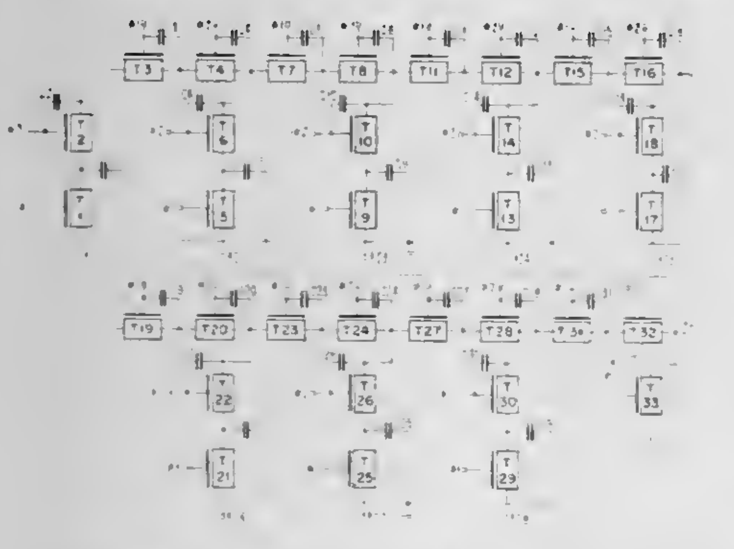
4,110,835
BUCKET BRIGADE CIRCUIT FOR SIGNAL SCALING

James F. Dubil, Warrenton, Va.; Howard N. Leighton, Rockville, Md., and Raymond J. Wilfinger, Lagrangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,418

Int. Cl.^{2} G06G *7/16*

U.S. Cl. 364—844 **2 Claims**



1. In a charge transfer device, a capacitive ratio multiplier which avoids DC bias offset, comprising:

a first input branch having a first characteristic capacitance, an input node and an output node, with a first signal having an information component to be multiplied and a DC bias component, being applied at its input node;

an output branch having a second characteristic capacitance with its input node connected to said output node of said first input branch, the ratio of said first characteristic capacitance to said second characteristic capacitance providing an information component multiplication of said first signal as it propagates from said first input branch to said output branch;

a second input branch having a third characteristic capacitance with its output node connected to said input node of said output branch, the sum of said first and third characteristic capacitances equalling said second characteristic capacitance, said second input branch having an input node with a DC bias component;

whereby if the DC bias components in said first and said second input branches are equal, then they will equal the DC bias component in said output branch.

4,110,836
PROGRAM CONTROL AND DISPLAY APPARATUS

John Peter Bennett, Banstead, and Graham Robin Scott Jones, Bristol, both of England, assignors to Masson Scott Thrissell Engineering Ltd., London, England

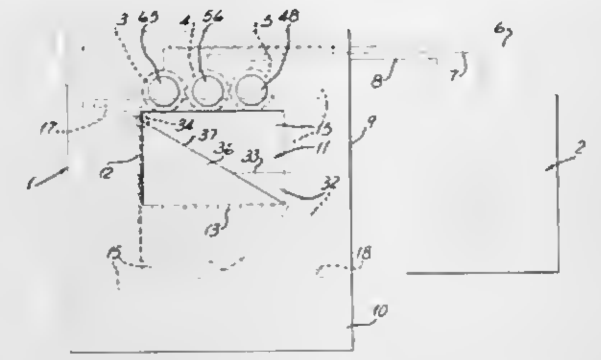
Filed Feb. 10, 1977, Ser. No. 767,702

Claims priority, application United Kingdom, Feb. 19, 1976, 06689/76

Int. Cl.^{2} G06G *7/16*

U.S. Cl. 364—860 **5 Claims**

1. A program control and display apparatus for setting a plurality of values of a variable defining a program of operation for a controlled apparatus, comprising a display device adapted to display a graphic representation of said program, three setting devices, each comprising a variable potentiometer for a different one of three values of said variable, and for connection to the controlled apparatus so as to govern the respective value of said variable and means connected to said display device so as to produce a corresponding indication in said graphic representation, said potentiometers including a first potentiometer for setting said variable to a first predetermined value at one stage in said program, a second potentiometer for setting said variable to a second predetermined value at a further stage in said program, and a third potentiometer for setting the rate at which said variable changes from said first to said second value.



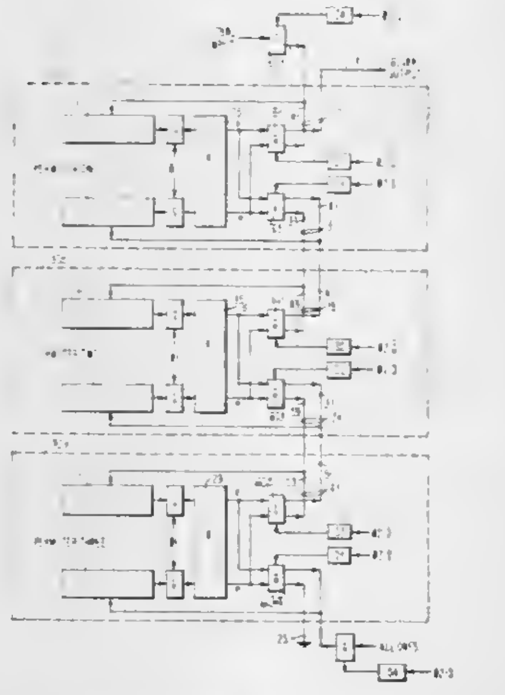
4,110,837
APPARATUS FOR THE SORTING OF RECORDS OVERLAPPED WITH LOADING AND UNLOADING OF RECORDS INTO A STORAGE APPARATUS

Tien Chi Chen, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,910

Int. Cl.^{2} G06F *7/24*

U.S. Cl. 364—900 **4 Claims**



2. A sorting apparatus comprising:

an ordered plurality of permuters each permuter including higher and lower ordered storage means for storing information records having ordering indicia associated therewith, each permuter further including comparison means coupled to said storage means for comparing the relative magnitude of the ordering indicia of said records and generating output signals indicating the relative order of said ordering indicia whereby each record of a pair of records is ascribed a relative order,

the higher ordered storage means of a given permuter coupled to the lower ordered storage means of the next higher ordered permuters and the lower ordered storage means of said given permuter coupled to the higher ordered storage means of the next lower ordered permuter;

an input terminal coupled to the highest ordered permuter and an output terminal coupled to said highest ordered permuter;

timing means coupled to said permuters for sequentially generating a first set of signals ($\phi 2 \cdot D$) indicative of an input mode of operation and second set of signals ($\phi 2 \cdot \bar{D}$) indicative of an output mode of operation;

first gating means in each permuter coupled to said comparison means and responsive to certain of said output signals and to said first signals for sequentially gating a record from said input into said highest ordered permuter and for gating the higher order record in each permuter to said higher ordered storage means of the next lower ordered permuter; and

second gating means in each permuter coupled to said comparison means and responsive to certain other of said output signals and to said second signals for sequentially gating a record to said output from said highest ordered permuter and gating the lower ordered record in each permuter to the lower ordered storage means of the next higher ordered permuter whereby all records are gated out of said highest order permuter in sorted order.

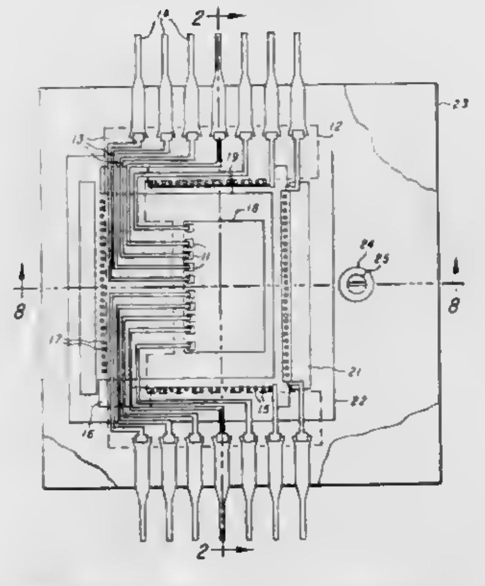
4,110,838
MAGNETIC BUBBLE MEMORY PACKAGE

Terry Wayne Noe, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 30, 1976, Ser. No. 710,763

Int. Cl.^{2} G11C *19/08*

U.S. Cl. 365—2 **7 Claims**



1. In a packaging assembly for magnetic bubble domain chips, the combination comprising:

a film of insulating material having a pattern of metal conductors disposed thereon, said film of insulating material comprising a pair of parallel arm extensions and a cross member extending between said arm extensions at one end thereof and connecting said arm extensions,

magnetic bubble domain chip means in mechanical and electrical contact with said film of insulating material and said metal conductors disposed thereon,

a coil carrier member of non-conductive material, said coil carrier member having parallel side walls and top and bottom plates defining an enclosure therewithin in which said magnetic bubble domain chip means is received,

said parallel side walls of said coil carrier member being respectively provided with guide slots disposed in substantially parallel relation with respect to said top and bottom plates,

said film of insulating material being mounted externally of said coil carrier member with said arm extensions being respectively received by the guide slots in the side walls of said coil carrier member,

at least some of said metal conductors on said film of insulating material extending into the enclosure defined by said coil carrier member at one end thereof and into electrical contact with said magnetic bubble domain chip means, and

first and second magnetic field coils wound about said coil carrier member in orthogonal relationship with respect to each other and operable to produce an in-plane rotary magnetic field at the surface of said magnetic bubble domain chip means in response to electrical energization thereof.

4,110,839
NON-VOLATILE LONG MEMORY FOR FAST SIGNALS

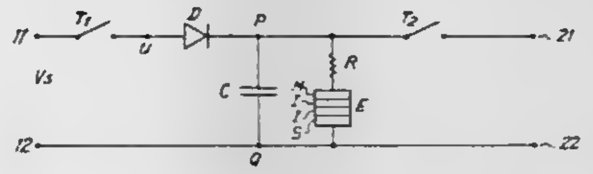
Alain Bert, and Gerard Kantorowicz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 20, 1977, Ser. No. 835,010

Claims priority, application France, Sep. 24, 1976, 76 28765

Int. Cl.^{2} G11C *13/00, 11/40*

U.S. Cl. 365—180 **19 Claims**



1. A non-volatile, long memory for fast signals, comprising at least a first storage stage, comprising a capacitor (C) with two terminals (P and Q) and a diode (D) having two terminals (U and P); a second storage stage with an MIIS element (E); means for storing said fast signal in said first stage by the accumulation of a quantity of electric charges which are a function of said fast signal during a time at least equal to the time for storing a signal in said second stage, said storage in said second stage being done by means of the accumulation at least of a fraction of said quantity of charges at the terminals of the MIIS element.

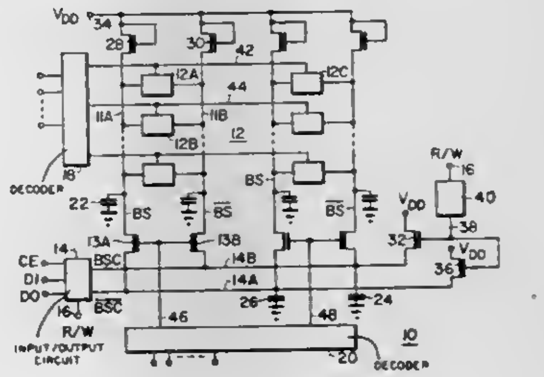
4,110,840
SENSE LINE CHARGING SYSTEM FOR RANDOM ACCESS MEMORY

Kichio Abe, Yokohama, Japan, and William L. Martino, Jr., Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 22, 1976, Ser. No. 753,235

Int. Cl.^{2} G11C *7/00*

U.S. Cl. 365—203 **6 Claims**



1. A memory system comprising:

a plurality of storage cells:

first and second sense-write conductors coupled to a plurality of said storage cells for writing information into and sensing information out of a selected one of said storage cells;

first means coupled to said storage cells for selecting one of said storage cells;

read/write means coupled to said first and second sense-write conductors responsive to a read/write input of said memory system for controlling reading and writing operations in said memory system; and

means responsive to said read/write input coupled to said first and second sense-write conductors for charging said first and second sense-write conductors to substantially equal voltages in response to a transition of said read/write input prior to sensing one of said storage cells.

4,110,841

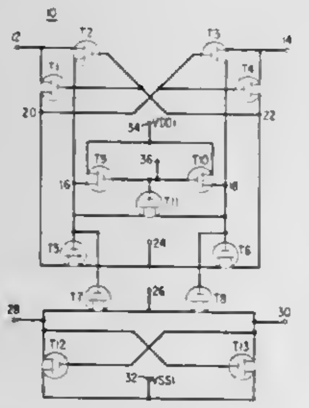
LEVEL SHIFTER AND SENSE REFRESH DETECTOR

Paul Robert Schroeder, Dallas, Tex., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1977, Ser. No. 857,935

Int. Cl.² G11C *7/00*

U.S. Cl. 365—205 **7 Claims**



1. Circuit means comprising:

first, second, third, fourth, fifth, and sixth switching devices (T1, T2, T3, T4, T5, and T6) which each comprise a control terminal and first and second output terminals;

voltage equalization circuit means;

the first output terminals of T1 and T2 being coupled together to a first input circuit terminal, the control terminals of T1 and T2 being coupled together to the second output terminals of T4 and T6, the second output terminal of T2 being coupled to the control terminal of T5 and to the voltage equalization circuit means;

the first output terminals of T3 and T4 being coupled together to a second circuit terminal, the control terminals of T3 and T4 being coupled to the second output terminals of T1 and T5, the second output terminal of T3 being coupled to the voltage equalization circuit means and to the control terminal of T6; and

the first output terminals of T5 and T6 being coupled to a third circuit terminal.

4,110,842

RANDOM ACCESS MEMORY WITH MEMORY STATUS FOR IMPROVED ACCESS AND CYCLE TIMES

Vahe A. Sarkissian, Saratoga; Nagab Jayakumar; Joseph H. Kroeger, both of Sunnyvale, and Jeffrey M. Schlageter, Saratoga, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 15, 1976, Ser. No. 741,971

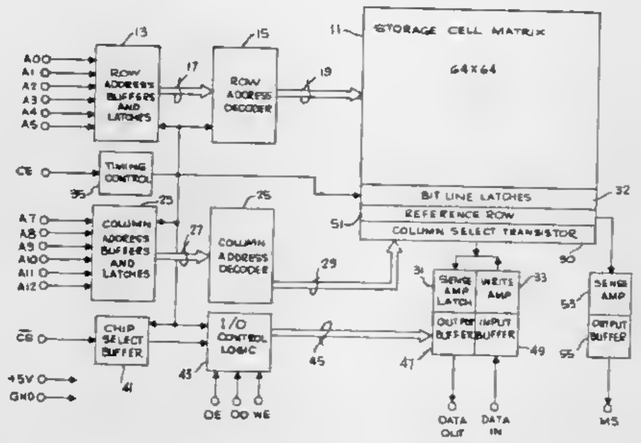
Int. Cl.² G11C *7/04*

U.S. Cl. 365—233 **11 Claims**

5. The method of providing a memory status signal in semiconductor random access chip memories of the type having rows and columns of data bit storage cells comprising,

providing a reference row of cells in a static random access memory in parallel with rows of data bit storage cells, said reference row of cells matched in performance to said other rows,

propagating a signal derived from a chip enable signal through said reference row,



receiving the propagated signal through said reference row and forming a memory status signal therefrom indicating data availability for reading.

4,110,843

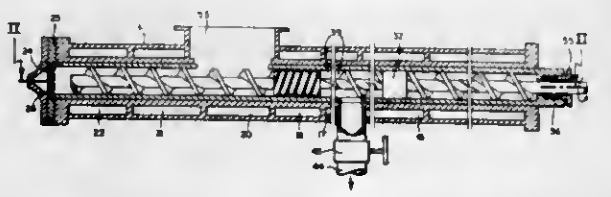
PRESSURE RESTRICTING MEANS FOR A LIQUID OUTLET OF AN EXTRUDER

Richard H. Skidmore, Strafford, Pa., assignor to Welding Engineers, Inc., King of Prussia, Pa.

Continuation of Ser. No. 335,059, Feb. 23, 1973, abandoned, which is a division of Ser. No. 26,622, Apr. 8, 1970, abandoned. This application Feb. 27, 1976, Ser. No. 662,095

Int. Cl.² B01F *15/02*

U.S. Cl. 366—83 **2 Claims**



1. In an apparatus, wherein volatile liquid-containing plastic material is mixed and worked and said volatile liquid is separated therefrom, said plastic material being substantially insoluble in said volatile liquid, said apparatus comprising an elongated barrel, feed means including a worm rotatable within said barrel and having flights constructed and arranged for mixing, working, heating and conveying said mixture and separating said liquid therefrom, upstream restrictor means connected to and rotating with said worm means, downstream restrictor means connected to and rotating with said worm means at a location spaced downstream of said upstream restrictor means for providing a high pressure region in the mixture between said upstream restrictor means and said downstream restrictor means, said liquid having the property of volatilizing at the temperature at which said material is treated, but having the property of remaining in the liquid state at said temperature and pressure existing in said high pressure region, means associated with said worm means for forming a feed section spaced upstream from said high pressure region, inlet means for said liquid-containing material in said region of lower pressure upstream of said high pressure region, a high pressure liquid outlet extending from the inside to the outside of said barrel located in said high pressure region for removing from said barrel a significant portion of said liquid separated under said high pressure from said mixture, conveying means associated with said worm means and positioned downstream of said high pressure region for conveying said mixture, and pressure restricting means connected to said liquid outlet for maintaining said separated liquid removed from said high pressure region at a pressure lower than that in said high pressure region but sufficiently high to prevent vaporization of said liquid in said barrel, and for removing said separated liquid from said barrel while in the liquid state.

4,110,844

VENT TYPE EXTRUDER

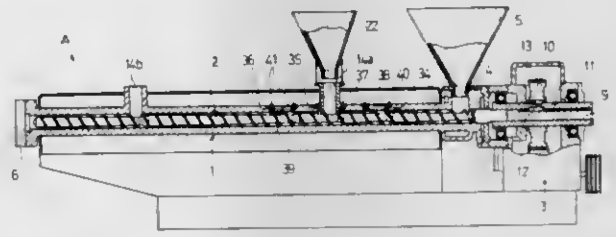
Kensaku Nakamura, 272-1, Bessbo-Cho, Matsubara-Shi, Osaka, Japan (580)

Filed May 16, 1977, Ser. No. 797,388

Int. Cl.² B29B *1/06*

U.S. Cl. 366—76 **6 Claims**

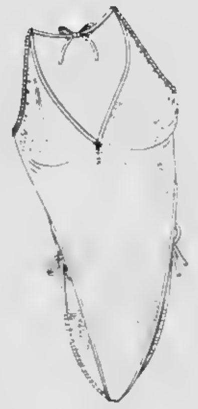
1. A vent type extruder comprising a raw material feeding port in a heating cylinder and provided on the uppermost edge portion thereof with a hopper means, said heating cylinder being provided in the foremost end thereof with an extruding mouth, a rotatable extruding screw in said heating cylinder, and means defining a vent on said heating cylinder adjacent to said extruding screw and venting-casting port means in a portion of said cylinder positioned between said vent and said raw material feeding port, said venting-casting port means being positioned and arranged on said cylinder whereby additional material may be introduced into said cylinder at selected positions axially thereof, depending upon the kind of materials to be cast into the cylinder, said venting-casting port being provided on the upper portion thereof with auxiliary hopper means.



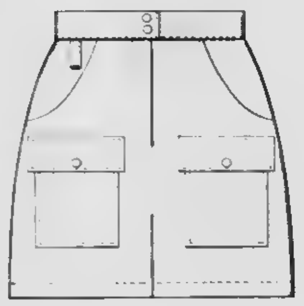
DESIGNS

AUGUST 29, 1978

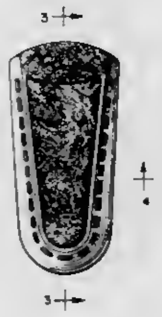
249,096
BATHING SUIT
Catalina Fowler, 2828 Bellwood Ave., Brandon, Fla. 33511
Filed Jul. 12, 1976, Ser. No. 704,430
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—40



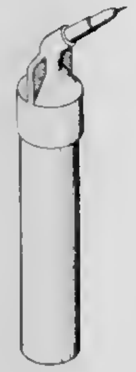
249,097
CONVERTIBLE SKIRT AND SHORT PANTS GARMENT OR THE LIKE
Sarah E. Rahaim, 3300 Atlantic Blvd., Jacksonville, Fla. 32207
Filed Mar. 1, 1976, Ser. No. 662,351
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28



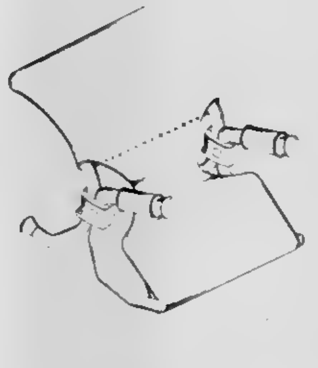
249,098
SHOE CLOSURE DEVICE
Thomas D. Nickerson, and Edwin L. Lombard, both of Meadville, Pa., assignors to Textron Inc., Providence, R.I.
Filed Jun. 28, 1976, Ser. No. 700,661
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—315



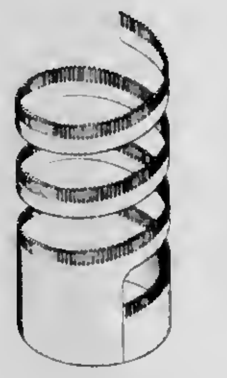
249,099
LIQUID COSMETIC APPLICATOR
Charles H. Taylor, 165 Front St., Chicopee, Mass. 01013
Filed Oct. 29, 1976, Ser. No. 737,081
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—20



249,100
SAFETY CHAIR FOR A CHILD FOR USE IN MOTOR VEHICLES
Kunio Nanba, and Taro Ogawa, both of Kurashiki, Japan, assignors to Namba Press Yogyo Kabushiki Kaisha, Kurashiki, Japan
Filed Sep. 17, 1976, Ser. No. 724,358
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



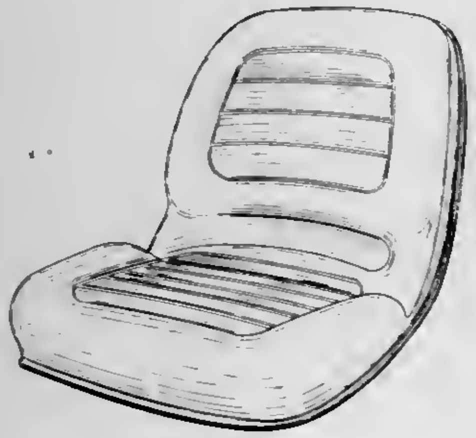
249,101
JEWELRY DISPLAY STAND
Rose L. Struble, 3298 Montieth Ave., Cincinnati, Ohio 45208, and Adele S. Katz, 8770 Arborcrest, Cincinnati, Ohio 45236
Filed Sep. 2, 1976, Ser. No. 719,786
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—20



249,102
VEHICLE SEAT

Charles W. Pelly, Calabasas, Calif., assignor to Sears Manufacturing Company, Davenport, Iowa
Filed Sep. 17, 1976, Ser. No. 724,163
Term of patent 14 years
Int. Cl. D6—*01*

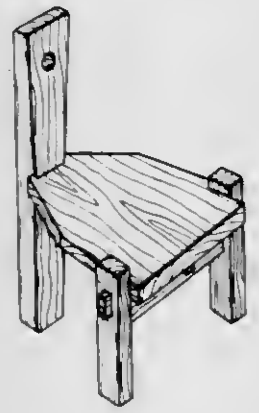
U.S. Cl. D6—48



249,103
CHAIR

Sergio Rodriguez, Chihuahua, Mexico, assignor to Nortexport, S.A. de C.V.
Filed Sep. 13, 1976, Ser. No. 723,183
Term of patent 14 years
Int. Cl. D6—*01*

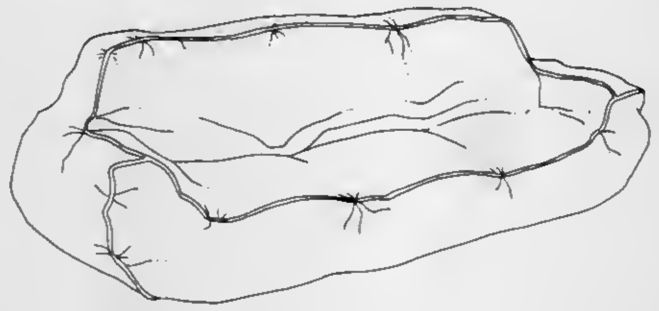
U.S. Cl. D6—55



249,104
SOFA

Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 7, 1976, Ser. No. 720,545
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*

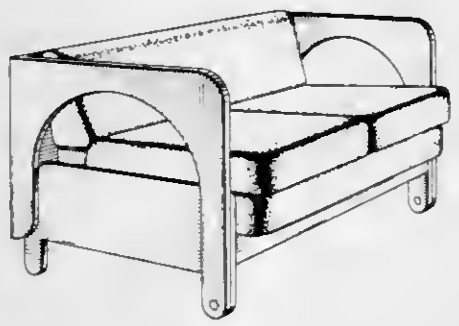
U.S. Cl. D6—63



249,105
CONVERTIBLE SEAT

Giuseppe Infanti, Calle La Guaira, Ed. Piaroa - Piso 10, Apto. 101, Las Palmas, Caracas, Venezuela
Division of Ser. No. 707,467, Jul. 21, 1976. This application Aug. 31, 1977, Ser. No. 829,429
Term of patent 14 years
Int. Cl. D6—*05*

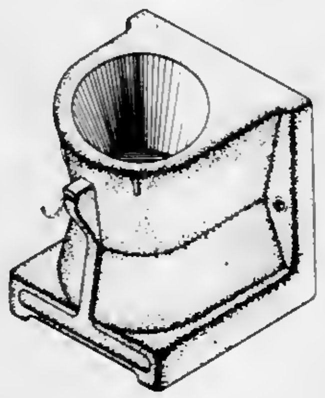
U.S. Cl. D6—64



249,106
COMBINED SPRAY CAN HOLDER AND SWITCH FOR AN AIR FILTERING SYSTEM

Dominic J. Zimbardi, 122 Thompson Ave., and Teddar S. Brooks, 207 Court St., both of Little Valley, N.Y. 14755
Filed Sep. 29, 1976, Ser. No. 727,420
Term of patent 14 years
Int. Cl. D6—*06*

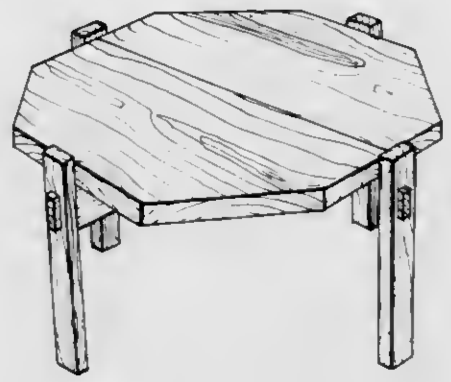
U.S. Cl. D6—86



249,107
TABLE

Sergio Rodriguez, Chihuahua, Mexico, assignor to Nortexport, S.A. de C.V.
Filed Sep. 13, 1976, Ser. No. 723,184
Term of patent 14 years
Int. Cl. D6—*03*

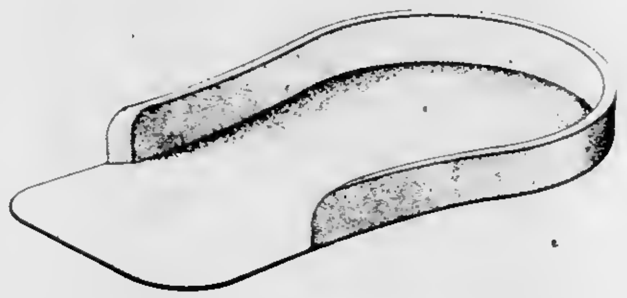
U.S. Cl. D6—146



249,108
TABLE TRAY ATTACHMENT

Thomas C. Cannon, Jr., 5244 Lake Springs Dr., Dunwoody, Ga. 30338
Filed Sep. 17, 1976, Ser. No. 724,597
Term of patent 14 years
Int. Cl. D6—*99*

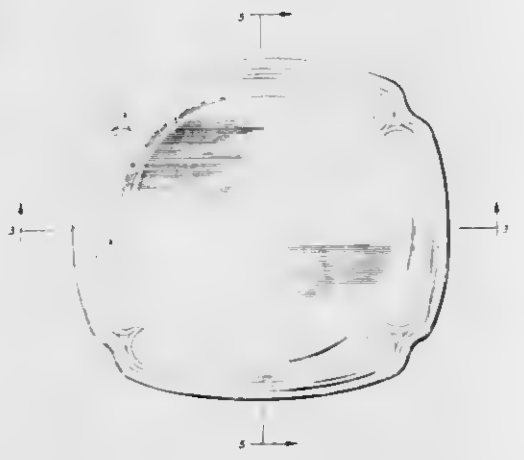
U.S. Cl. D6—199



249,109
DINNER PLATE OR SIMILAR ARTICLE

George B. Jensen, Syracuse, N.Y., assignor to Syracuse China Corp., Syracuse, N.Y.
Filed Sep. 15, 1976, Ser. No. 723,526
Term of patent 14 years
Int. Cl. D7—*01*

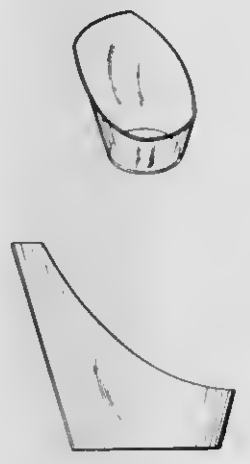
U.S. Cl. D7—1



249,110
CUP FOR ADMINISTERING MEDICINE OR THE LIKE

Edward H. Newmark, 2 Grove St., New York, N.Y. 10014
Filed Aug. 22, 1977, Ser. No. 826,875
Term of patent 14 years
Int. Cl.^{2} D7—*01*

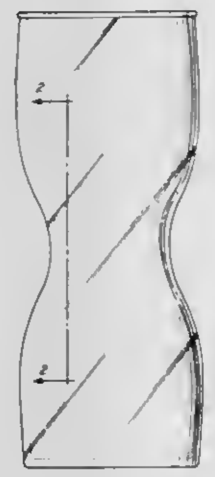
U.S. Cl. D7—6



249,111
BEVERAGE TUMBLER

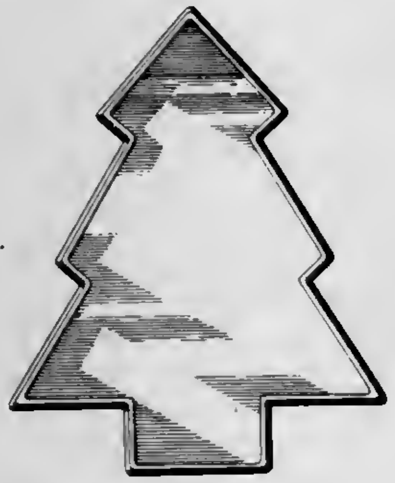
Gary Geyer, New York, N.Y., assignor to The Coca-Cola Company
Filed Jun. 18, 1976, Ser. No. 697,607
Term of patent 14 years
Int. Cl. D7—*01*

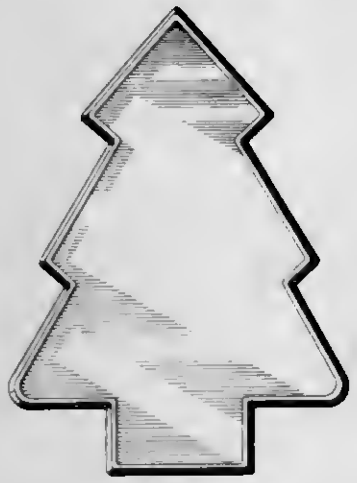
U.S. Cl. D7—15



249,112
CAKE MOLD

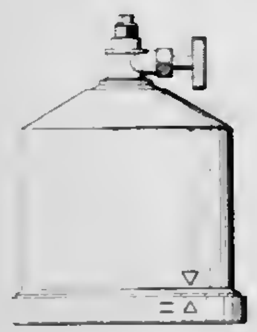
Howard P. Garson, 15211 Preston Rd., Apt. 2004, Dallas, Tex. 75240, and Henry J. Crowley, 3941 Circle Bluff Ct., Dallas, Tex. 75234
Filed Aug. 25, 1976, Ser. No. 717,864
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—43





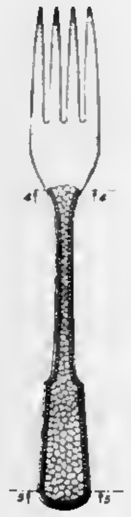
249,113
BASE FOR A CAMP STOVE

William Albert Folke, Upplands Vasby, Sweden, assignor to Aktiebolaget Optimus, Upplands Vashy, Sweden
Division of Ser. No. 555,252, Mar. 4, 1975, Pat. No. Des. 244,985. This application Nov. 18, 1976, Ser. No. 742,865
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



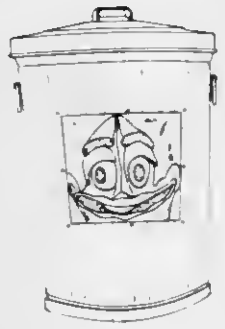
249,114
ARTICLE OF FLATWARE

William J. Knope, and Frank K. Guodace, both of Meriden, Conn., assignors to International Silver Company, Meriden, Conn.
Filed May 3, 1976, Ser. No. 682,367
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



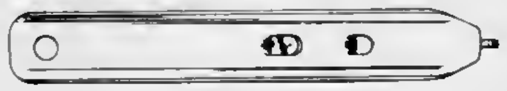
249,115
GARBAGE CAN OR SIMILAR ARTICLE

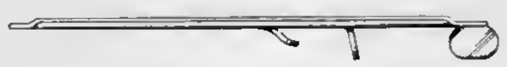
Robert D. Waldron, Sandusky, Ohio, assignor to Sandusky City-Erie County Department of Health, Sandusky, Ohin
Filed Jul. 1, 1976, Ser. No. 701,546
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—192



249,116
CAN OPENER FOR OPENING DUAL APERTURE POP-TOP CANS

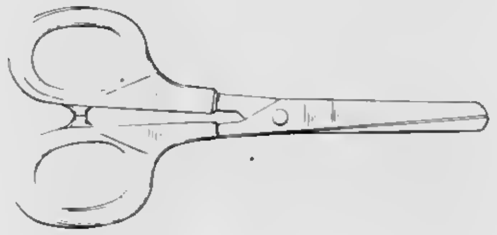
Clement J. Vanderbloemen, 2431 W. Butler Dr., Phoenix, Ariz. 85021
Filed Nov. 18, 1976, Ser. No. 742,838
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18

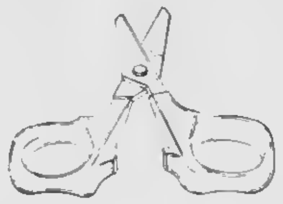




249,117
SCISSORS

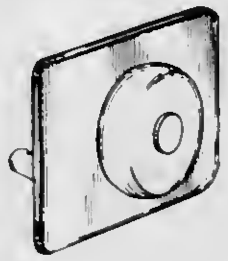
Olof Bäckström, Tammisaari, Finland, assignor to Oy Fiskars AB, Helsinki, Flnland
Filed Apr. 6, 1976, Ser. No. 674,248
Claims priority, application Finland, Mar. 16, 1976, 76138
The portion of the term of this patent subsequent to Nov. 23, 1990, has been disclaimed.
Term of pateot 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57





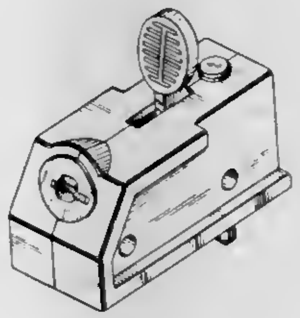
249,118
COMBINED FURNITURE PULL AND ESCUTCHEON

Emil J. Bocade, 135 Lemyra, SE., Wyoming, Mich. 49508, assignor to Keeler Corporation, Grand Rapids, Mich.
Filed Nov. 16, 1976, Ser. No. 742,330
Term of patent 14 years
lot. Cl. D8—*06*
U.S. Cl. D8—301



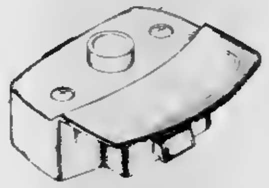
249,119
DOOR OR WINDOW LOCK

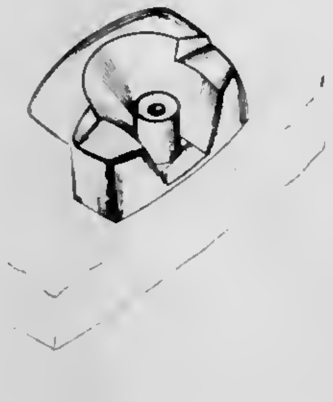
Howard Byron Gorton, San Gabriel, Calif., assignor to Ajax Hardware Corporation, City of Industry, Calif.
Filed Nov. 10, 1976, Ser. No. 740,362
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—341



249,120
DOOR LATCH

Torsti T. T. Jerila, Rowland Heights, Calif., assignor to Acme General Corporation
Filed Feb. 14, 1977, Ser. No. 768,215
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—341

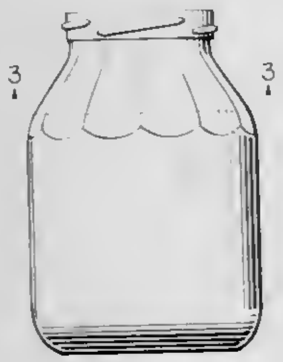




249,121

JAR

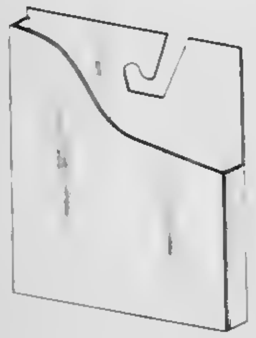
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Aug. 30, 1976, Ser. No. 719,205
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—101



249,122

HOLDER FOR HANGING STOCKINGS AND SOCKS

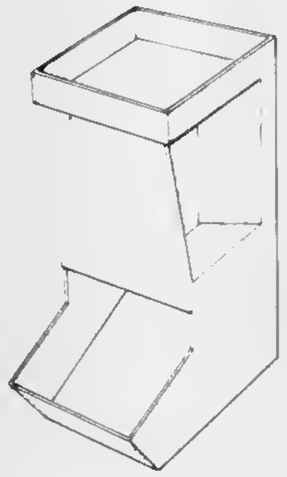
Sturlaugur Bjornsson, Karastig 9, Reykjavik, Iceland
Filed Mar. 29, 1976, Ser. No. 671,440
Claims priority, application Denmark, Sep. 30, 1975, 765/75
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—191



249,123

DISPLAY CARTON

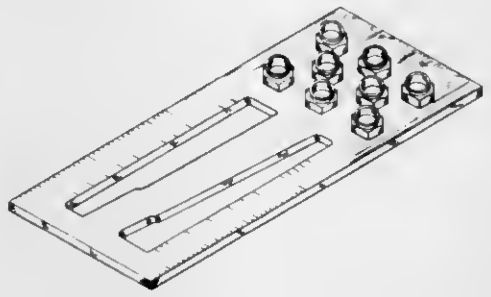
Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy
Filed Jul. 15, 1976, Ser. No. 705,496
Claims priority, application Italy, Jan. 26, 1976, 52881 B/76
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



249,124

STUD CHECKER TOOL

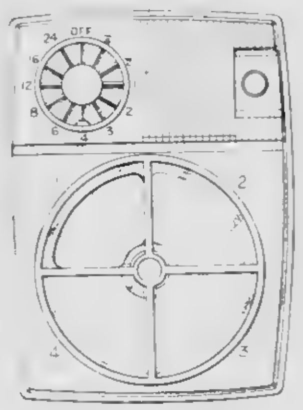
Gustave Albert Oberg, Jackson, Tenn., assignor to The Bendix Corporation, Southfield, Mich.
Filed Sep. 15, 1976, Ser. No. 723,382
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



249,125

AUTOMATIC PILL REMINDER OR SIMILAR ARTICLE

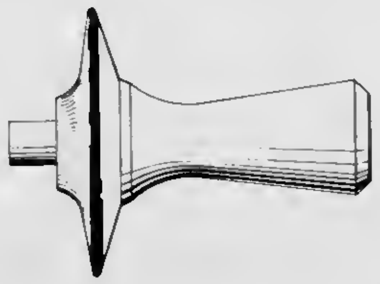
Irvin E. Wright, Temecula, and Robert O. Magnussen, Jr., Walnut, both of Calif., assignors to Caltime Products Corp., Temecula, Calif.
Filed Apr. 29, 1976, Ser. No. 681,607
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—40



249,126

FOOD PROBE HANDLE

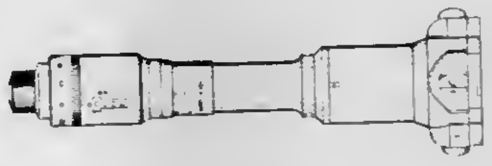
Martin H. Pitstick, Cleves, Ohio, and Charles H. Schmitt, Louisville, Ky., assignors to General Electric Company
Filed Oct. 26, 1976, Ser. No. 735,374
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—60



249,127

INSIDE MICROMETER

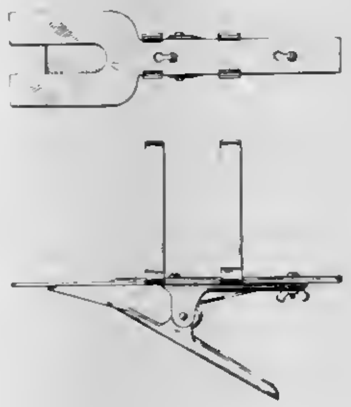
Takeshi Yamamoto, Kawasaki, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Oct. 18, 1976, Ser. No. 733,481
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



249,128

MEASURING TAPE REEL HOLDER

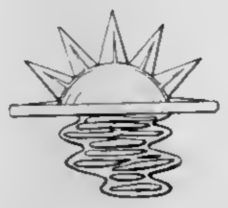
David M. Stookey, 408 Oak Grove Cir., Anaheim, Calif. 92807
Filed Jul. 2, 1976, Ser. No. 702,224
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—74



249,129

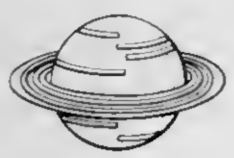
EARRING

Martin B. Fishman, 765 Massachusetts Ave., Cambridge, Mass. 02139
Filed May 5, 1977, Ser. No. 793,963
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—48



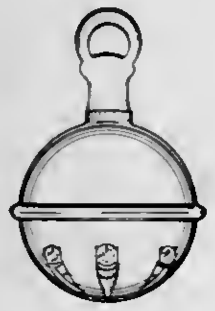
249,130
EARRING

Martin B. Fishman, 765 Massachusetts Ave., Cambridge, Mass. 02139
Filed May 5, 1977, Ser. No. 793,962
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—62



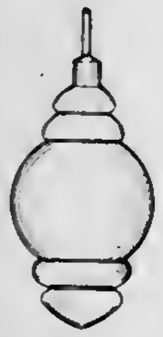
249,131
PENDANT OR SIMILAR ARTICLE

Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,472
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81



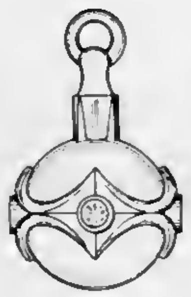
249,132
PENDANT OR SIMILAR ARTICLE

Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,473
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81



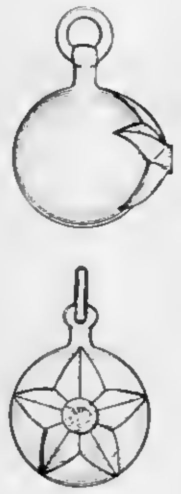
249,133
PENDANT OR SIMILAR ARTICLE

Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,475
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81



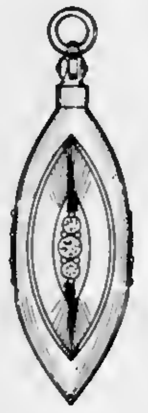
249,134
PENDANT OR SIMILAR ARTICLE

Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,476
Term of patent 14 years
Int. Cl. D11—*01, 05*
U.S. Cl. D11—81



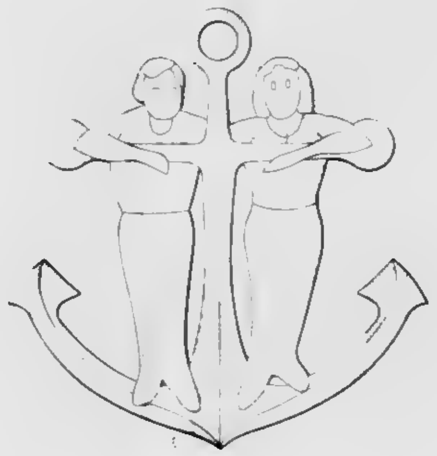
249,135
PENDANT OR SIMILAR ARTICLE

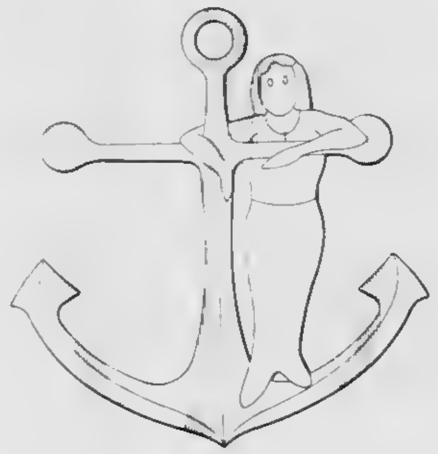
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,477
Term of patent 14 years
Int. Cl. D11—*01, 05*
U.S. Cl. D11—81

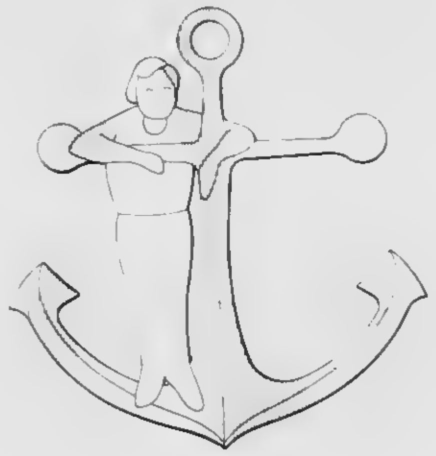


249,136
EMBLEM

John O. McElroy, Jr., 1859 Kepler Rd., Pottstown, Pa. 19464
Filed Nov. 1, 1976, Ser. No. 737,857
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—105

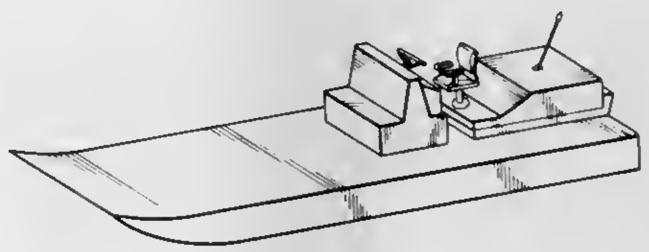






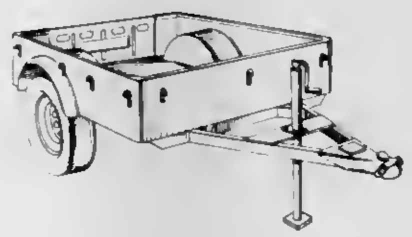
249,137
SHALLOW WATER CRAFT

Charles F. Hoyt, P.O. Box 638, Katy, Tex. 77450
Filed Feb. 25, 1976, Ser. No. 661,364
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



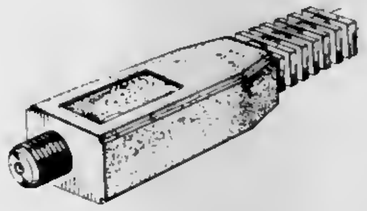
249,138
UTILITY TRAILER

Jimmie L. Butler, P.O. Box 486, Kingman, Ariz. 86401
Filed Nov. 12, 1976, Ser. No. 741,198
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—105



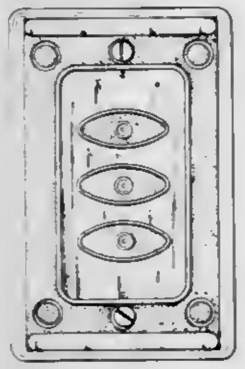
249,139
MATCHING TRANSFORMER

Jing-Jong Lin, Tai Chung, Taiwan, assignor to Fulet Enterprise Co., Ltd., Taipei Hsien, Taiwan
Filed Sep. 13, 1976, Ser. No. 722,373
Term of patent 14 years
Int. Cl. D13—*02;* D14—*03*
U.S. Cl. D13—4



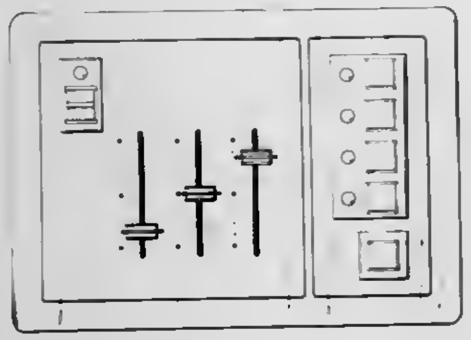
249,140
PUSH BUTTON CONTROL STATION

Neil J. Driscoll, 20980 Castanso St., Woodland Hills, Calif. 91364
Continuation-in-part of Ser. No. 509,714, Sep. 26, 1974, abandoned. This application May 7, 1976, Ser. No. 684,091
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



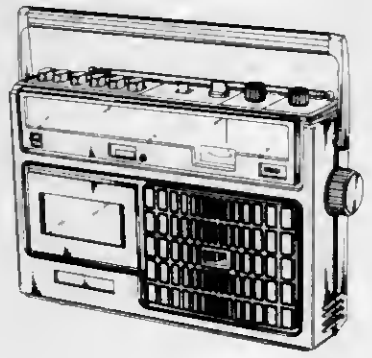
249,141
REMOTE DIMMING CONTROL

Noel Mayo, Philadelphia, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Sep. 27, 1976, Ser. No. 726,524
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



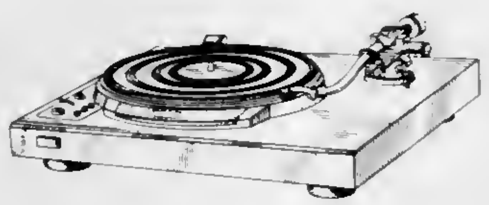
249,142
COMBINED PORTABLE CASSETTE RECORDER AND RADIO

Takao Okada, Kyoto; Tsutomu Murakami, Neyagawa, and Hironosuke Koda, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 18, 1976, Ser. No. 697,658
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—5



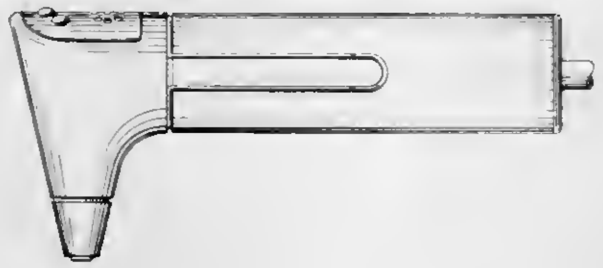
249,143
RECORD PLAYER

Kazuhito Ohtomo, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Jun. 16, 1976, Ser. No. 696,660
Claims priority, application Japan, Dec. 19, 1975, 50-50263
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17



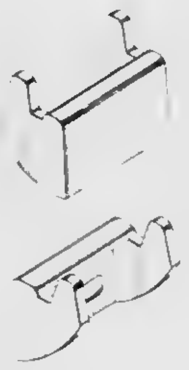
249,144
SCANNER UNIT

Charles Dennis Flanigan, San Jose, Calif.; Randall John Mazzei, Boise, Id., and Howard Strudwick Noel, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 6, 1977, Ser. No. 785,160
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



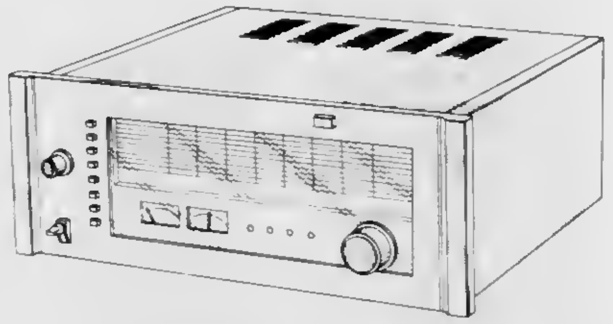
249,145
TELEPHONE ACCESSORY ADAPTER

Paul H. Landau, and Harolyn S. Landau, both of 8632 W. Olympic Blvd., Los Angeles, Calif. 90035
Filed Nov. 8, 1976, Ser. No. 740,045
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D14—59



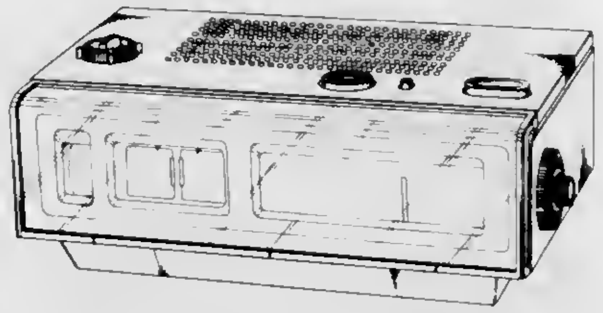
249,146
TUNER

Hiroshi Tahata, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Jun. 30, 1976, Ser. No. 701,278
Claims priority, application Japan, Apr. 5, 1976, 51-12386
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71



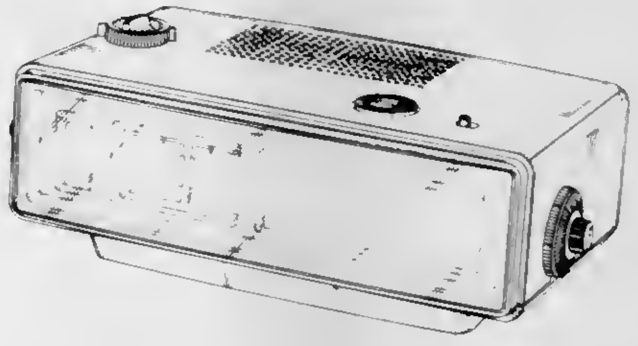
249,147
DIGITAL CLOCK RADIO

Isshin Miyamoto, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 22, 1976, Ser. No. 707,800
Claims priority, application Japan, Feb. 9, 1976, 51-4108
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73



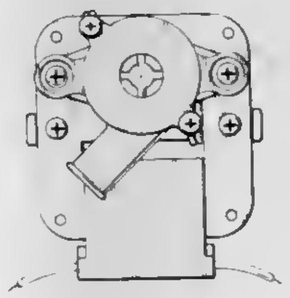
249,148
DIGITAL CLOCK RADIO

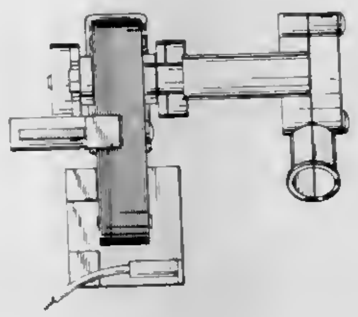
Isshin Miyamoto, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 22, 1976, Ser. No. 707,928
Claims priority, application Japan, Feb. 9, 1976, 51-4107
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73



249,149
SUSPENDED PUMP

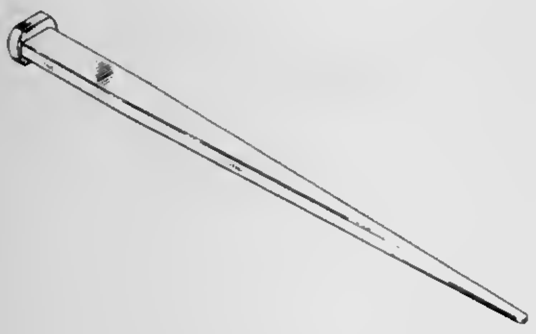
Kenneth Lynn Doughty, Oklahoma City; Lee W. Davis, Del City, and Gary R. Yost, Oklahoma City, all of Okla., assignors to Little Giant Corporation, Oklahoma City, Okla.
Filed May 16, 1975, Ser. No. 578,156
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7





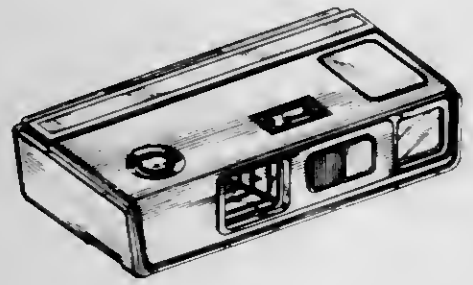
249,150
CUTTER PIN FOR MOWER

Joseph E. Scanland, Savannah, Ga., and Gerald C. Fisher, Shelby, Ohio, assignors to Roper Corporation, Kankakee, Ill.
Filed Oct. 29, 1976, Ser. No. 736,846
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—17



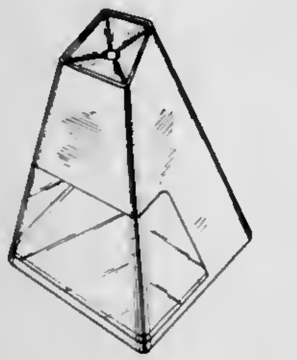
249,151
STILL CAMERA OR SIMILAR ARTICLE

Samuel Franklin Swayze, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 21, 1977, Ser. No. 761,154
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



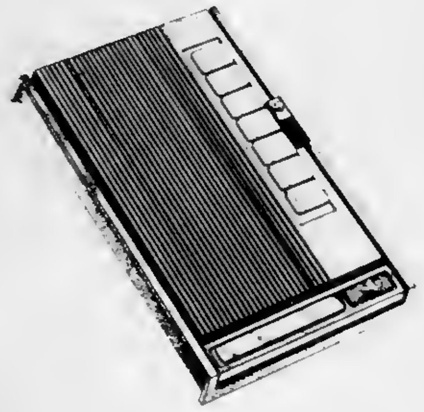
249,152
PENCIL SHARPENER

William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Feb. 7, 1977, Ser. No. 766,226
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73



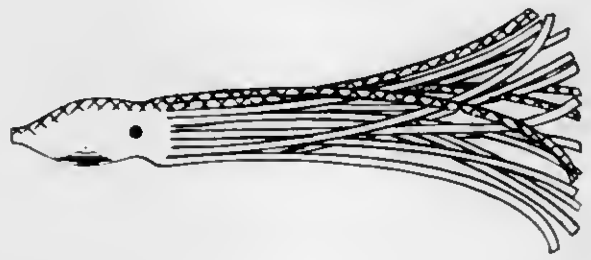
249,153
TELEPHONE LIST FINDER

Martin Glaubinger, Teaneck, N.J., and John Wilson, Upper Nyack, N.Y., assignors to Rolodex Corporation
Filed Nov. 10, 1975, Ser. No. 630,334
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



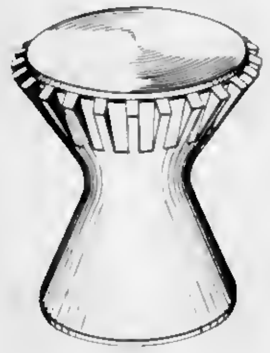
249,154
LURE

June Furukawa, 9640 Desmond Rd., Richmond, British Columbia, Canada (V7E 1R2)
Filed Feb. 10, 1977, Ser. No. 767,560
Claims priority, application Canada, Aug. 25, 1976, 2508762
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



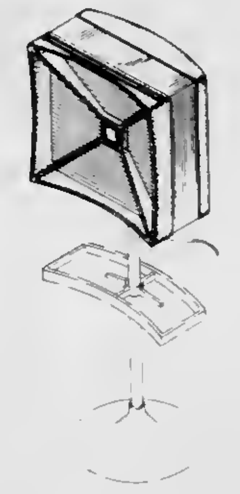
249,155
FAUCET HANDLE

Donald W. Doman, Janesville, Wis., assignor to Kohler Co.
Filed Mar. 21, 1977, Ser. No. 779,923
Term of patent 14 years
Int. Cl. D23—*01*; D8—*06*
U.S. Cl. D23—28



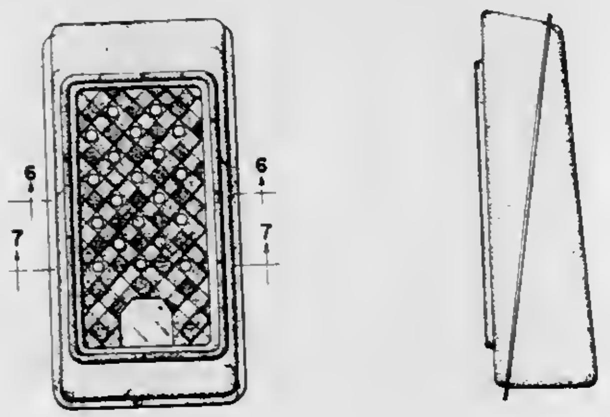
249,156
COMBINED FAN AND FILTER FOR AN AIR FILTERING SYSTEM

Dominic J. Zimbardi, 122 Thompson Ave., and Teddar S. Brooks, 207 Court St., both of Little Valley, N.Y. 14755
Filed Sep. 29, 1976, Ser. No. 727,419
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—140



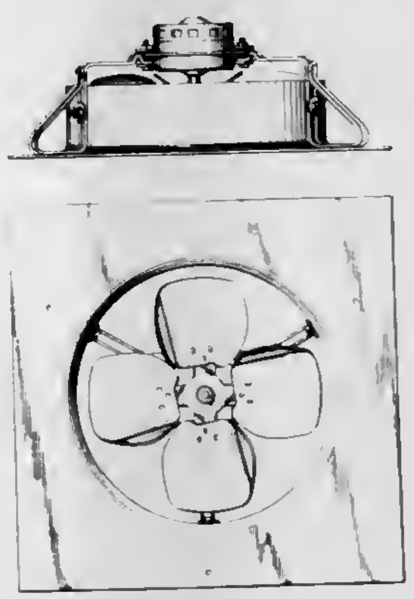
249,157
DEODORANT CONTAINER OR THE LIKE

Raymond P. Stoy, Westport, Conn., assignor to American Home Products Corp. (Del.), New York, N.Y.
Division of Ser. No. 604,288, Aug. 13, 1975, Pat. No. 242,460. This application Aug. 2, 1976, Ser. No. 710,515
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



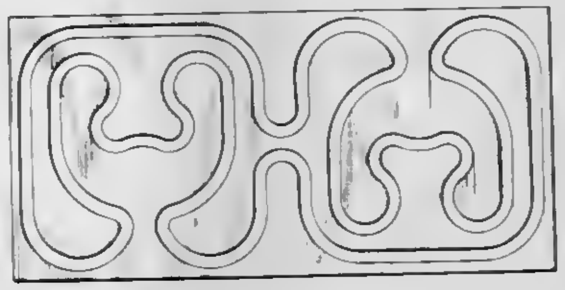
249,158
ATTIC VENTILATOR

William B. Morrow, P.O. Box N-4, Winston-Salem, N.C. 27105, assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed May 10, 1976, Ser. No. 684,863
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—158



249,159
MODULAR TRACK ASSEMBLY FOR A 200-UNIT BIOLOGICAL SAMPLE CHANGER

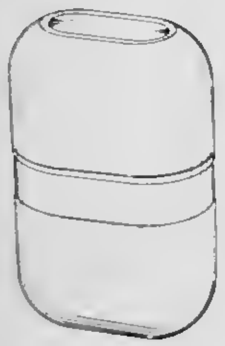
Anthony A. Mueller, Florence, Ky., assignor to Actus, Inc., Florence, Ky.
Filed Jul. 12, 1977, Ser. No. 815,007
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—7



249,160
FACE MASSAGER

Hiroshi Toyoda, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 19, 1976, Ser. No. 743,255
Claims priority, application Japan, May 20, 1976, 51-187610
Term of patent 14 years
Int. Cl. D28—*03*

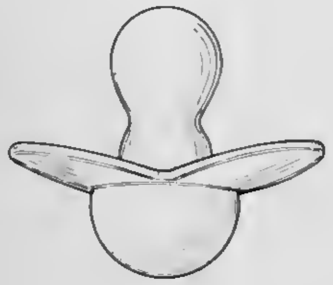
U.S. Cl. D24—36



249,161
INFANT PACIFIER

Peter Röhrig, Fabriksgelande 1, A-7201 Neudorfl, Austria
Filed Jun. 17, 1976, Ser. No. 697,160
Claims priority, application Austria, Dec. 22, 1975, 505439; Dec. 22, 1975, 505440; Dec. 22, 1975, 505441; Dec. 22, 1975, 505442; Dec. 22, 1975, 505443; Dec. 22, 1975, 505444; Dec. 22, 1975, 505445
Term of patent 14 years
Int. Cl. D24—*04*

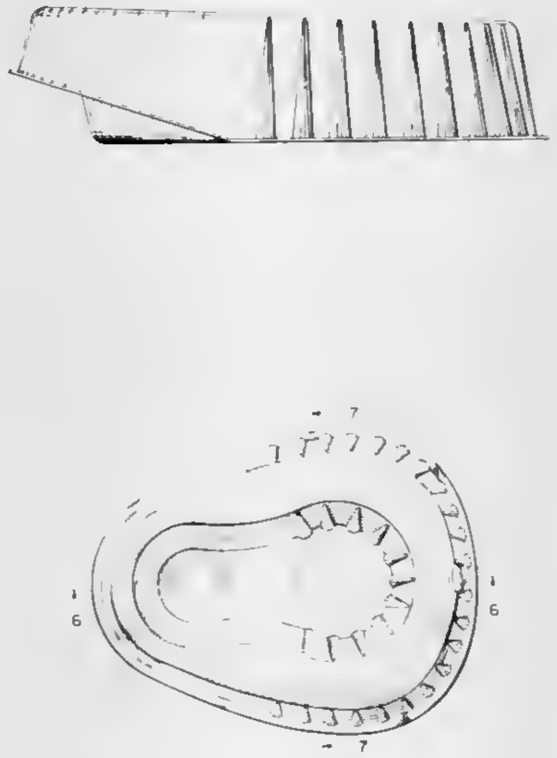
U.S. Cl. D24—45



249,162
DISPOSABLE BEDPAN

Kenneth Wilson Mills, Bolton, England, assignor to Vernon & Co. (Pulp Products) Ltd., England
Filed Apr. 1, 1976, Ser. No. 672,685
Claims priority, application United Kingdom, Aug. 2, 1975, 972059/75
Term of patent 14 years
Int. Cl. D24—*04*

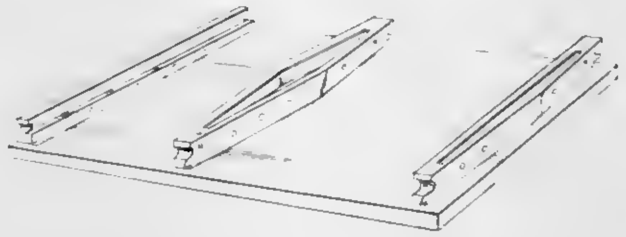
U.S. Cl. D24—57



249,163
INTERLOCKING WALL UNIT

Milton A. Wallace, Bell Haven Park, 3200 NW. 79th St., Apt. 1925, Miami, Fla. 33147
Filed Jun. 28, 1976, Ser. No. 700,718
Term of patent 14 years
Int. Cl. D25—*01*

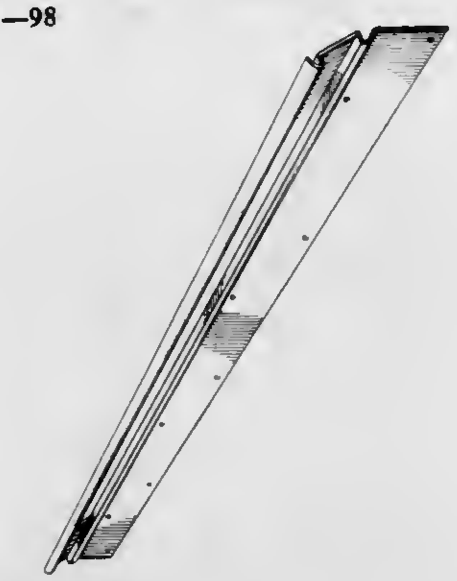
U.S. Cl. D25—80



249,164
SWIMMING POOL FORM

Paul E. Grant, 2625 SE. Bonita St., Stuart, Fla. 33494
Filed Aug. 19, 1976, Ser. No. 715,913
Term of patent 14 years
Int. Cl. D25—99

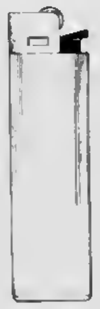
U.S. Cl. D25—98



249,165
LIGHTER FOR SMOKERS

Lars-Erik Halldeo, Geneva, Switzerland, assignor to Interfeudor S.A., Geneva, Switzerland
Filed Dec. 8, 1976, Ser. No. 749,032
Term of patent 14 years
Int. Cl. D27—*05*

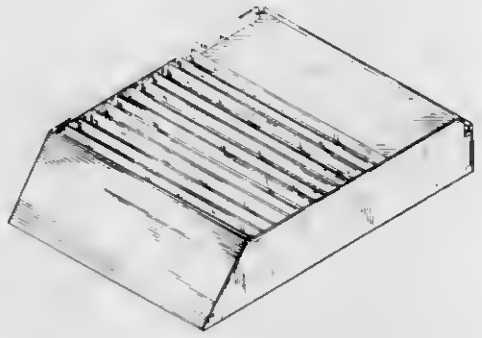
U.S. Cl. D27—42



249,166
SEED SEPARATOR

Arthur Strathman, 701 W. Hampden, Englewood, Colo. 80110
Filed Jan. 10, 1977, Ser. No. 757,941
Term of patent 14 years
Int. Cl. D27—*99*

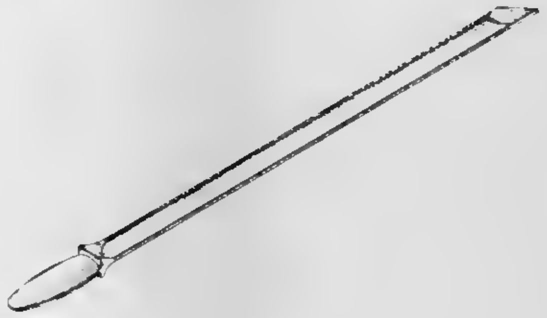
U.S. Cl. D27—51



249,167
FINGERNAIL FILE

Peggy L. Hovda, and Paul F. Hauptman, both of Lakewood, Colo., assignors to Unique Industries, Inc., Lakewood, Colo.
Filed Oct. 18, 1976, Ser. No. 733,511
Term of patent 14 years
Int. Cl. D28—*03*

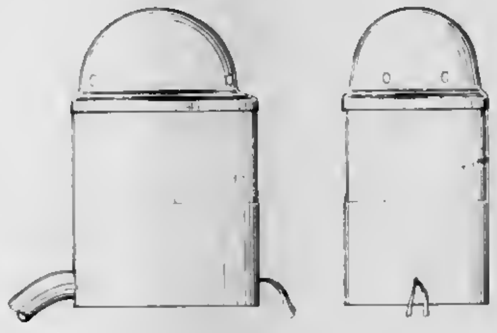
U.S. Cl. D28—57



249,168
SOFTCAP RESPIRATOR HOOD

Lawrence A. Sweet, Lakeland, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
Filed Jul. 7, 1976, Ser. No. 703,211
Term of patent 14 years
Int. Cl. D29—*02;* D2—*03*

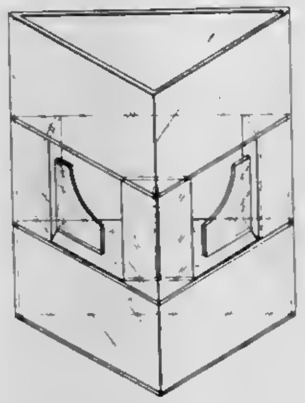
U.S. Cl. D29—7



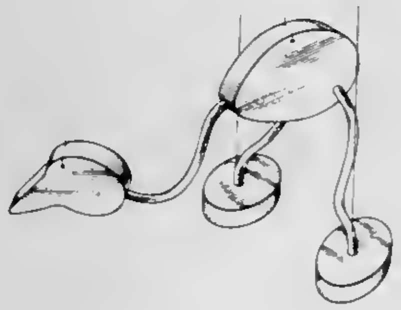
249,169
AQUARIUM TANK

Gentle James Walker, Detroit, Mich., assignor to Paul C. Harvey, a part interest
Filed Apr. 18, 1977, Ser. No. 788,631
Term of patent 14 years
Int. Cl. D30—*02*

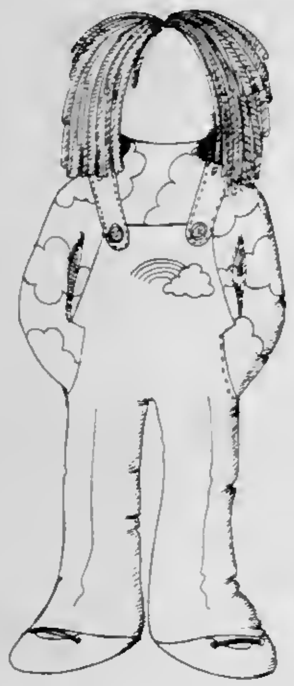
U.S. Cl. D30—6



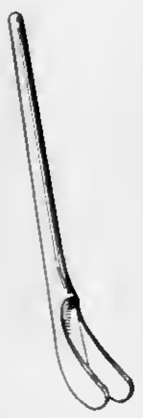
249,170
PUPPET BIRD
Irvin Enns, 8800 W. Virginia Ave., Lakewood, Colo. 80226
Filed Jul. 26, 1976, Ser. No. 708,764
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 A



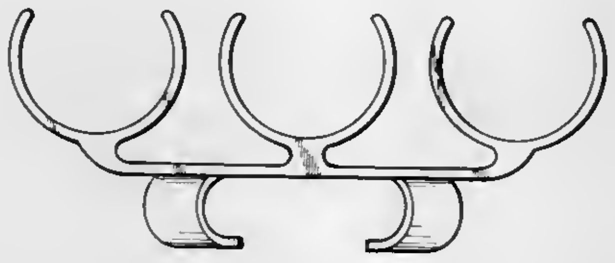
249,171
DOLL
Suzann Audrey Rubin, New York, N.Y., assignor to Be A Doll, Inc., New York, N.Y.
Filed Nov. 16, 1976, Ser. No. 742,509
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



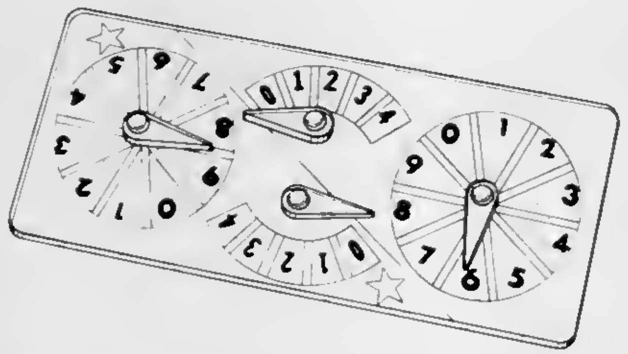
249,172
WHEEL GUIDE
Dale E. Upshaw, 1669 Ham Ave., Santa Clara, Calif. 95051
Filed May 11, 1976, Ser. No. 685,439
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 HP



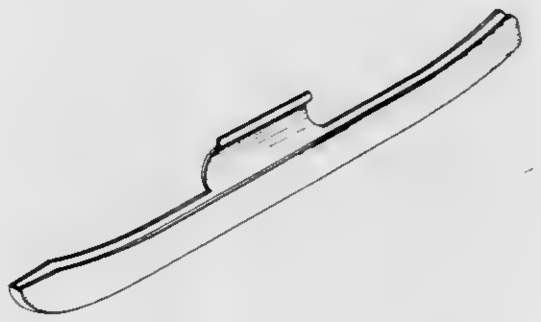
249,173
HOLDER FOR ATTACHING TO A TENNIS RACKET OR SIMILAR ARTICLE
David L. Coleman, 7341 Freeman Pl., Goleta, Calif. 93017
Filed Jul. 14, 1976, Ser. No. 705,001
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



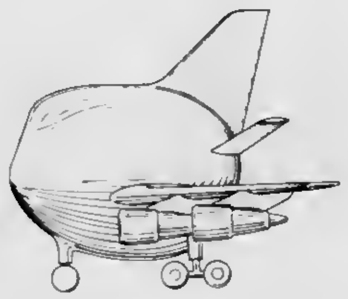
249,174
GAME COUNTER
Donald E. Meredith, 539 E. Washington St., Dimondale, Mich. 48821
Filed Dec. 8, 1976, Ser. No. 748,568
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



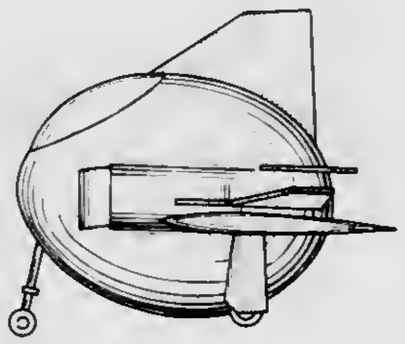
249,175
SKATE GUARD
Jan Fardigs, Leksand, Sweden, assignor to Joons Plastprodukter, Leksand, Sweden
Filed Aug. 3, 1976, Ser. No. 711,380
Claims priority, application Sweden, Feb. 25, 1976, 76-0444
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 B



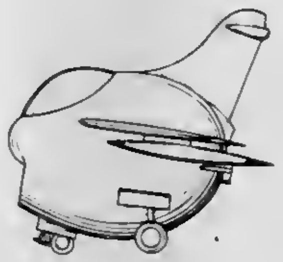
249,176
TOY AIRPLANE
James F. Loomis, Seattle, Wash., assignor to Industrial Promotional Toys, Inc.
Filed Nov. 28, 1975, Ser. No. 635,973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



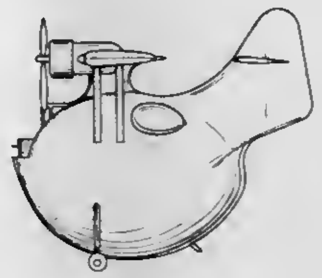
249,177
TOY AIRPLANE
James F. Loomis, Seattle, Wash., assignor to Industrial Promotional Toys, Inc.
Filed Jan. 21, 1976, Ser. No. 651,023
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



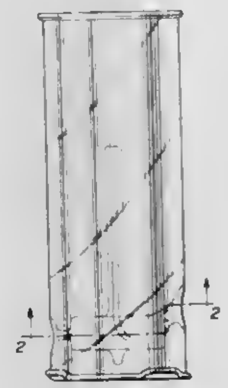
249,178
TOY AIRPLANE
James F. Loomis, Seattle, Wash., assignor to Industrial Promotional Toys, Inc.
Filed Jan. 21, 1976, Ser. No. 651,024
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



249,179
TOY AIRPLANE
James F. Loomis, Seattle, Wash., assignor to Industrial Promotional Toys, Inc.
Filed Jan. 21, 1976, Ser. No. 651,025
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



249,180
COMBINED CANDLES AND CONTAINER THEREFOR
Willy H. Vanbragt, 111 Rengstorff #92, Mountain View, Calif. 94040
Filed Feb. 10, 1977, Ser. No. 767,283
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



249,181
BICYCLE LAMP

Werner Glasenapp, and Jörg Glasenapp, both of Essen, Fed. Rep. of Germany, assignors to Union Sils, van de Loo & Co., Frondenberg, Fed. Rep. of Germany

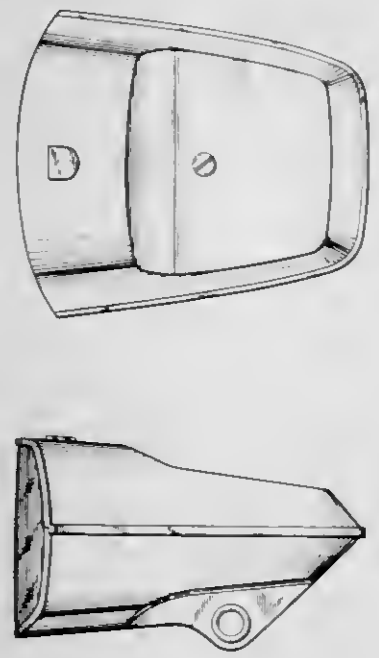
Filed Feb. 25, 1977, Ser. No. 771,950

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, MR 82

Term of patent 14 years

Int. Cl. D26—*03, 06*

U.S. Cl. D48—24 A



249,182
POCKET FINGER EXERCISE BOARD

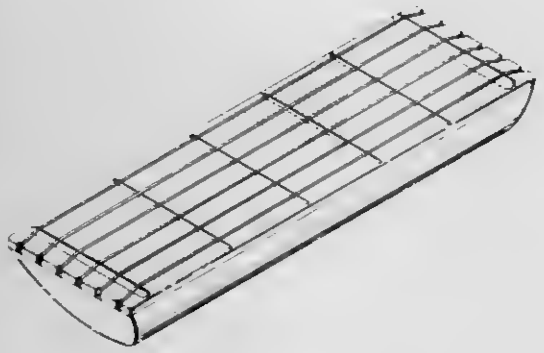
Michael M. Greer, Box 22, McGrath, Ak. 99627

Filed Oct. 8, 1976, Ser. No. 730,761

Term of patent 14 years

Int. Cl. D17—*99, 03*

U.S. Cl. D56—1 R



249,183
HARP

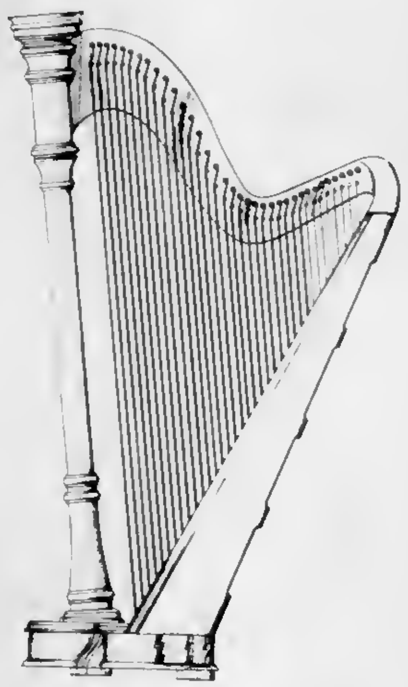
Walter Krasicki, 5810 W. Schubert, Chicago, Ill. 60039

Filed Dec. 27, 1976, Ser. No. 754,884

Term of patent 14 years

Int. Cl. D17—*03*

U.S. Cl. D56—1 A



249,184
BOX FOR SCHOOL SUPPLIES

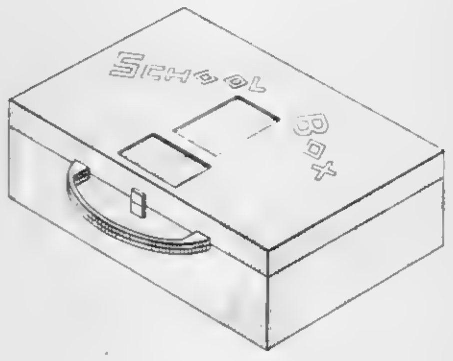
Wilma Rae Hargrove, 1132 Livingston St., Hurst, Tex. 76053

Filed Jan. 19, 1976, Ser. No. 650,112

Term of patent 7 years

Int. Cl. D3—*01*

U.S. Cl. D87—1 R



249,185
BAKERY CONTAINER OR THE LIKE

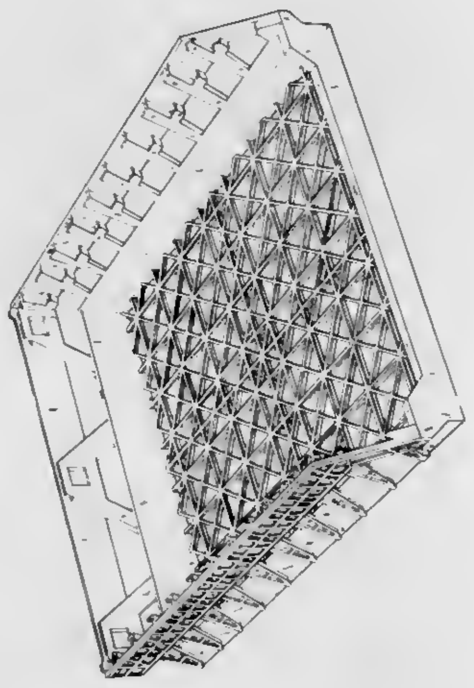
James C. Carroll, and Lewis T. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1976, Ser. No. 700,436

Term of patent 14 years

Int. Cl. D9—*04*

U.S. Cl. D87—1 R



249,186
HANDBAG

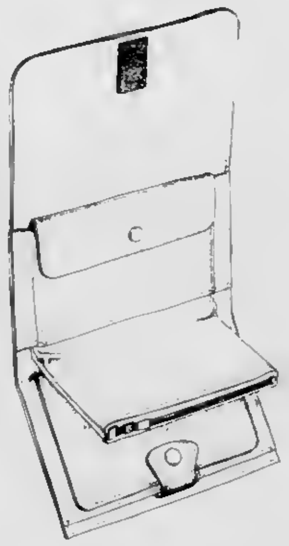
Milton I. Siegel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.

Filed Aug. 23, 1976, Ser. No. 716,421

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D87—3 D



249,187
BACK PACK

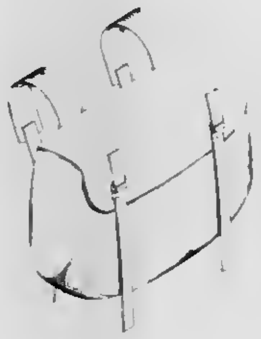
Scott Stewart, c/o Stewart Designs, Inc., 901 Watson St., Madison, Wis. 53713

Filed Dec. 3, 1976, Ser. No. 747,291

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D87—5 R



249,188
BACK PACK

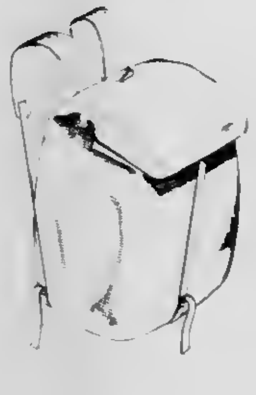
Scott Stewart, c/o Stewart Designs, Inc., 901 Watson St., Madison, Wis. 53713

Filed Dec. 3, 1976, Ser. No. 747,292

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D87—5 R



249,189
BACK PACK

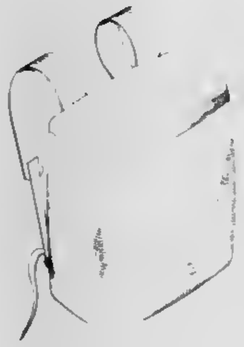
Scott Stewart, c/o Stewart Designs, Inc., 901 Watson St., Madison, Wis. 53713

Filed Dec. 3, 1976, Ser. No. 747,294

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D87—5 R



249,190

BACK PACK

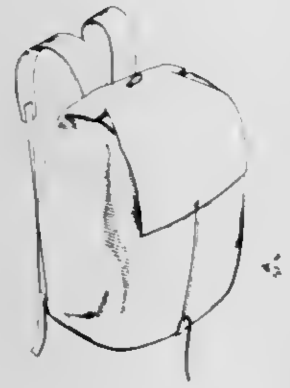
Scott Stewart, c/o Stewart Designs, Inc. 901 Watson St., Madison, Wis. 53713

Filed Dec. 6, 1976, Ser. No. 747,888

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D87—5 R



249,191

HOLDER FOR CARDS OR THE LIKE

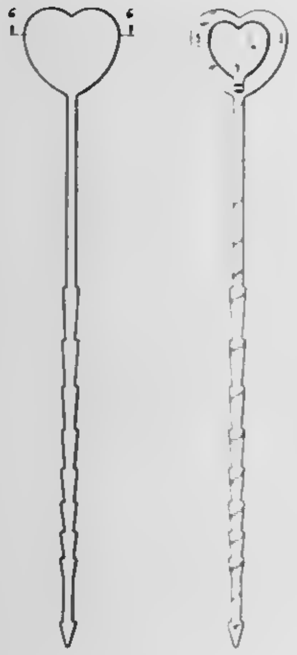
Walter Boecher, Jr., P.O. Box 3455, Lantana, Fla. 33462

Filed Jan. 24, 1977, Ser. No. 761,673

Term of patent 14 years

Int. Cl. D20—*99*

U.S. Cl. D96—12 A



249,192

HOLDER FOR CARDS OR THE LIKE

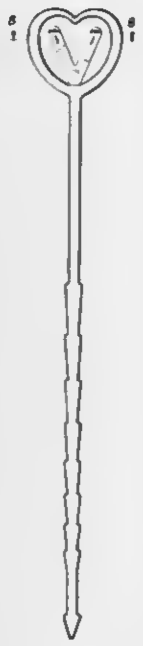
Walter Boecher, Jr., P.O. Box 3455, Lantana, Fla. 33462

Filed Feb. 14, 1977, Ser. No. 768,261

Term of patent 14 years

Int. Cl. D20—*99*

U.S. Cl. D96—12 A



249,193

HOLDER FOR CARDS OR THE LIKE

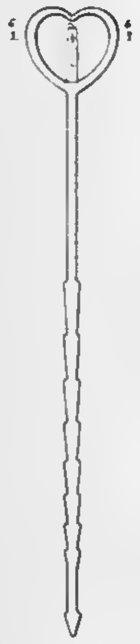
Walter Boecher, Jr., P.O. Box 3455, Lantana, Fla. 33462

Filed Feb. 14, 1977, Ser. No. 768,270

Term of patent 14 years

Int. Cl. D20—*99*

U.S. Cl. D96—12 A



249,194

MOVABLE LETTERING ADVERTISING DISPLAY

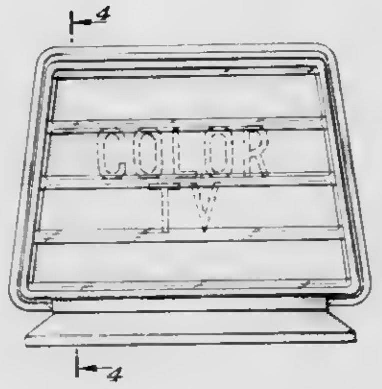
Robert C. Carlson, Long Beach, Calif., assignor to Gulf Development, Inc., Torrance, Calif.

Filed Jun. 28, 1976, Ser. No. 700,092

Term of patent 14 years

Int. Cl. D20—*03*

U.S. Cl. D96—12 R



249,195

VISUAL DISPLAY HOLDER FOR ATTACHMENT TO THE SHAFTS OF MECHANICAL SKI-TOW EQUIPMENT AND ON THE SAFETY BARS OF SKI CHAIR-LIFT EQUIPMENT

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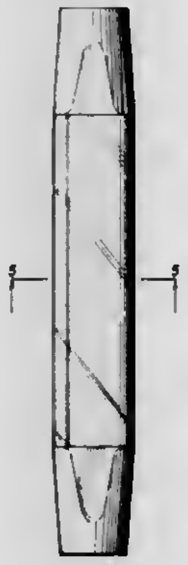

LIST OF PATENTEES

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PATENTS WERE ISSUED ON THE 29TH DAY OF AUGUST, 1978

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- Abe, Kichio; and Martino, William L., Jr., to Motorola Inc. Sense line charging system for random access memory. 4,110,840, Cl. 365-203.000.
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- Acar, Ali, to International Telephone and Telegraph Corporation. Relief valve. 4,109,675, Cl. 137-494.000.
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- Adams, Kenneth D., to Singer Company, The. Electro-mechanical actuator. 4,109,597, Cl. 112-158.00E.
- Adams, Stanley B.; and Morge, Michael P., to Caterpillar Tractor Co. Dump control for loaders. 4,109,812, Cl. 214-762.000.
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- Akins, Charles John, Jr.: *See—*
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- Akita, Sigeyuki; and Kitagawa, Junji, to Nippon Soken, Inc. Liquid level detecting apparatus. 4,110,740, Cl. 340-620.000.
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- Akutin, Modest Sergeevich; and Levina, Tamara Grigorievna. Process for producing polymeric films from crystallizable polyesters. 4,110,395, Cl. 264-210.00R.
- Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, to Kawasaki Steel Corporation; and Toei Denshi Kogyo Kabushiki Kaisha. Method of and an apparatus for inspecting a traveling sheet material. 4,110,048, Cl. 356-200.000.
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- Albert, William Charles, to Singer Company, The. Apparatus for monitoring acceleration. 4,109,534, Cl. 73-503.000.
- Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr. Method of cooking food in hot non-aqueous liquids under air pressure. 4,110,481, Cl. 426-438.000.
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- Allen, Joseph C.; and Redford, David A., to Texaco Inc.; and Texaco Exploration Canada, Ltd. Combination solvent-noncondensible gas injection method for recovering petroleum from viscous petroleum-containing formations including tar sand deposits. 4,109,720, Cl. 166-269.000.
- Allen, Joseph C., to Texaco Inc. Secondary recovery process utilizing water saturated with gas. 4,110,224, Cl. 252-8.55D.
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Womack, Robert Edward, 4,110,620, Cl. 250-361.00R.

Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., to Wynn Oil Company. Engine cooling system flushing apparatus and method. 4,109,703, Cl. 165-1.000.

Bacchelli, Sancio. Development of instruments measuring body resistance to ion and ionophoresis applications. 4,109,645, Cl. 128-2.10Z.

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. 4-(Di-n-propyl)amino-1,3,4,5-tetrahydrobenz[cd]indole. 4,110,339, Cl. 260-326.900.

Bachl, Robert: *See—*

Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Fricklingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,110,523, Cl. 526-124.000.

Bachli, Emil. Scarecrow system. 4,109,605, Cl. 116-22.00A.

Badali, Joseph A., to Browning Arms Company. Detachable barrel for hand guns. 4,109,403, Cl. 42-75.00B.

Baer, James, to Pay Less Drug Stores Northwest, Inc. Labeling. 4,110,502, Cl. 428-40.000.

Baetz, Jacques Louis Edouard, to Metabio. 2,3-Dihydro-imidazo[2,1-b]-thiazole derivatives and applications thereof. 4,110,460, Cl. 424-270.000.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison Limited. Tropone derivatives and theraputic use therefor. 4,110,468, Cl. 424-301.000.

Bahr, Donald W.: *See—*

Ekstedt, Edward E.; Beck, Edwin J., Jr.; Bahr, Donald W.; and Weinstein, Barry, 4,109,459, Cl. 60-39.660.

Bailey, John D., to Railway Engineering & Supply Company, Inc. Method for replacing different railroad car door roller assemblies. 4,109,847, Cl. 228-119.000.

Bailey, John M., to Monitoring Systems, Inc. Method and apparatus for pipe joint locator, counter and displacement calculator. 4,110,688, Cl. 324-208.000.

Bailey, Wayne W.; and Taylor, Brian W., to Gulf Research & Development Company. Lithium base grease containing polyisobutylene. 4,110,233, Cl. 252-41.000.

Bailly, Jean Claude: *See—*

Sandis, Stylianos; and Bailly, Jean Claude, 4,110,248, Cl. 252-429.00B.

Baird, Billy C.: *See—*

Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., 4,110,171, Cl. 202-241.000.

Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., to Saturn Machine & Welding Co., Inc. Mechanical jamb cleaner. 4,110,171, Cl. 202-241.000.

Bakalov, Nikolay Georgiev: *See—*

Peev, Vassil Georgiev; Valchev, Alexander Yordanov; and Bakalov, Nikolay Georgiev, 4,110,547, Cl. 13-11.000.

Baker, Lionel Richard; and Wojtowicz, Tadeusz, to National Research Development Corporation. Optical apparatus and method. 4,110,046, Cl. 356-124.000.

Baker, Mark A.: *See—*

Hawkins, Ronald G.; Tuttle, Paul D.; and Baker, Mark A., 4,110,553, Cl. 174-42.000.

Balcom, Orville R.; Hildebrand, Cleve R.; and Pollard, Edward L., to Cetec Corporation. Shaft angle transducer. 4,109,389, Cl. 33-363.00K.

Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG: *See—*

Lange, Karl-Heinz, 4,110,770, Cl. 354-202.000.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 4-Substituted-2-arylimidazoles. 4,110,456, Cl. 424-263.000.

Balz, Gunther W., to Roto-Finish Company. Glass bonded finishing media. 4,110,085, Cl. 51-308.000.

Bando, Yasuo: *See—*

Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,110,350, Cl. 260-346.750.

Bantex A/S: *See—*

Bro, Niels, 4,110,146, Cl. 156-291.000.

Banucci, Eugene George; and Olander, Walter Karl, to General Electric Company. Method for preparing polyphenylene oxides with manganese-vinyl resin complexes. 4,110,312, Cl. 528-215.000.

Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., to GAF Corporation. Copolymer emulsions for thickening acrylic polymer latices. 4,110,291, Cl. 260-29.6RW.

Barber, Colin: *See—*

Larke, John Reginald; Barber, Colin; and Cotterill, David John, 4,109,648, Cl. 128-2.06E.

Barber, Franklin T., to Phillips Petroleum Company. Process for recovery and purification of a perfluorocarboxylic acid fluoride from electrochemical cell fluorination effluent. 4,110,177, Cl. 204-59.00F.

Barber, Randy B.: *See—*

Rapoport, Henry; and Barber, Randy B., 4,110,329, Cl. 260-270.00A.

Barecki, Chester J.; Lewis, Donald R.; and Camp, Terry L., to American Seating Company. Transportation seat with energy absorption. 4,109,959, Cl. 297-216.000.

Barkan, Philip, to General Electric Company. Stored-energy operating device for an electric circuit breaker. 4,110,582, Cl. 200-153.0SC.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*

Burow, Burghard; and Klinkert, Norbert, 4,109,357, Cl. 28-289.000.

Barnes Drill Co.: *See—*

Marriott, Roger; and Estabrook, Mark R., 4,110,218, Cl. 210-223.000.

Barnes, William John; Belcher, Barry John; and Harvey, John Kenneth, to Newroyd Limited. Machine for making a textile product. 4,109,593, Cl. 112-79.00A.

Barnett, Charles J.; Bimm, Richard A.; and Cullinan, George C., to Eli Lilly and Company. 5'-Acetonylvincristine and related compounds. 4,110,330, Cl. 260-287.00B.

Barnett, Richard Earl; and Woodrum, Guy Thomas, to Calgon Corporation. Continuous polymerization apparatus and process. 4,110,521, Cl. 526-64.000.

Barney Knitting Machinery Co., Inc.: *See—*

Lombardi, Anthony Joseph, 4,110,145, Cl. 156-218.000.

Barnhurst, James Douglas; and Shumway, Durland Karl, to Colgate-Palmolive Company. Method of treating skin and hair with a self-heated cosmetic. 4,110,426, Cl. 424-46.000.

Barra, Emilia Francia; and Moga, Antonio Carmelo Marin, to J. Uriach & Cia S.A. 2-Phosphonoxy-4-trifluoromethylbenzoic acid derivatives and pharmaceutical compositions containing same. 4,110,442, Cl. 424-212.000.

Barrat, Christian Roland: *See—*

Arnau, Jose Luis; Barrat, Christian Roland; and Wevers, Jean, 4,110,262, Cl. 252-545.000.

Barreau, Michel; Cotrel, Claude; and Jeanman, Claude, to Rhone-Poulenc Industries. 1,2-Dithiole derivatives. 4,110,450, Cl. 424-250.000.

Barrer, Robert, to Faltex Handels AG. Apparatus for the continuous zigzag folding of a material web. 4,109,902, Cl. 270-79.000.

Barrington, Burchus Q., to Halliburton Company. Oil well testing valve with liquid spring. 4,109,724, Cl. 166-315.000.

Bartlett, Harold H.; Herr, Charles H., Jr.; and Lamport, Ivan R., to Caterpillar Tractor Co. Dynamometer employing multiple disc brake assemblies. 4,109,519, Cl. 73-135.000.

Barton, Forris W., Jr.: *See—*
- Player, Wayne H.; and Barton, Forris W., Jr., 4,109,437, Cl. 52-536.000.

BASF Aktiengesellschaft: *See—*
- Baumann, Hans; and Oberlinner, Andreas, 4,110,348, Cl. 260-345.200.
- Demmler, Kurt; Lawonn, Horst; and Hesse, Anton, 4,110,278, Cl. 260-17.00A.
- Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.
- Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,110,522, Cl. 526-105.000.
- Rotter, Gerhard; and Arns, Harold Ernest, 4,110,800, Cl. 360-74.000.
- Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,110,385, Cl. 264-13.000.
- Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,110,523, Cl. 526-124.000.

BASF Wyandotte Corporation: *See—*
- Narayan, Thirumurti, 4,110,270, Cl. 521-121.000.
- Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, 4,110,227, Cl. 252-8.900.

Bassoli, Cesare; and Cornetti, Giorgio, to FIAT Societa per Azioni. Device for monitoring the lubrication of the crankshaft of a reciprocating internal combustion engine. 4,109,506, Cl. 73-10.000.

Bates, Leonard Eugene. Truck mounted carpet cleaning machine. 4,109,340, Cl. 15-321.000.

Batey, John Walter; and Potter, Anthony Charles, to Reyrolle Parsons Limited. Inert gas welding. 4,110,590, Cl. 219-75.000.

Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, to NCR Corporation. Media positioning means for a printer. 4,109,779, Cl. 400-584.000.

Bauerle, Gerhard, to Bunker Ramo Corporation. Plug-type electrical connectors. 4,109,993, Cl. 339-176.00M.

Bauman, William C.; Lee, John M.; and Watson, John D., to Dow Chemical Company, The. Recovery of strontium from brine that contains strontium and calcium. 4,110,402, Cl. 423-166.000.

Baumann, Gunther: *See—*
- Zechnall, Richard; and Baumann, Gunther, 4,109,616, Cl. 123-32.0EA.

Baumann, Hans; and Oberlinner, Andreas, to BASF Aktiengesellschaft. 7,7'-Diamino derivatives of 2,2'-spirodibenzopyranes. 4,110,348, Cl. 260-345.200.

Baumgartner, Alfons; Berg, Walter; Burkhardt, Horst; Laubin, Jurgen; and Schlick, Helmut, to Dr. Johannes Heidenhain GmbH. Error preventing incremental measuring system. 4,110,828, Cl. 364-562.000.

Baur, Peter F.: *See—*
- Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.

Baxter Travenol Laboratories, Inc.: *See—*
- Brown, Richard I.; and Boggs, Daniel R., 4,109,852, Cl. 233-1.00R.
- Brown, Richard I., 4,109,854, Cl. 233-25.000.
- Brown, Richard I.; and Duffy, Joseph Kevin, 4,109,855, Cl. 233-25.000.

Bayer Aktiengesellschaft: *See—*
- Boehmke, Gunther; Fries, Hermann; and Esch, Erich, 4,110,119, Cl. 106-38.240.
- Cohnen, Wolfgang; and Apel, Gerhard, 4,110,273, Cl. 521-59.000.
- Freitag, Dieter; Tresper, Erhard; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,110,540, Cl. 568-718.000.
- Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,110,318, Cl. 528-73.000.
- Hiltmann, Rudolf; Heise, Arend; Kazda, Stanislav; and Hoffmeister, Friedrich, 4,110,472, Cl. 424-330.000.

BBC Brown Boveri & Company, Limited: *See—*
- Cornu, Jozef; and Weisshaar, Erich, 4,110,780, Cl. 357-38.000.
- Gessinger, Gernot, 4,110,131, Cl. 148-11.50N.

BCS Mach. & Mfg. Corp.: *See—*
- Sieber, Felix P., 4,110,757, Cl. 343-715.000.

Beach, Shirley, to Phillips Cable Limited. Composition for filling cables. 4,110,137, Cl. 156-48.000.

Beale, David A., to General Motors Corporation. Pressure and vacuum relief valve assembly. 4,109,674, Cl. 137-493.900.

Bean, Larry A.: *See—*
- Cold, David M.; and Bean, Larry A., 4,110,088, Cl. 55-90.000.

Beard, Colin C.; Wallach, Marshall B.; and Weinhardt, Klaus, to Syntex (U.S.A.) Inc. Imidazole-2-carbamates. 4,110,463, Cl. 424-273.00R.

Beatrice Foods Co.: *See—*
- Arkles, Barry C.; and Gerakaris, Stephen, 4,110,186, Cl. 204-159.200.

Becht, Carl T., to Senco Products, Inc. Surgical stapling instrument. 4,109,844, Cl. 227-120.000.

Beck, Edwin J., Jr.: *See—*
- Ekstedt, Edward E.; Beck, Edwin J., Jr.; Bahr, Donald W.; and Weinstein, Barry, 4,109,459, Cl. 60-39.660.

Becker, Bernard; Stamper, Robert L.; Asseff, Carl F.; and Podos, Steven M., to United States of America, Health, Education and Welfare. Effect of diphenylhydantoin and related compounds on glaucoma. 4,110,461, Cl. 424-273.00R.

Becker, Klaus; Cittrich, Jurgen; and Kaufmann, Karl-Ernst, to Demag A.G. Passenger slide. 4,109,904, Cl. 272-56.50R.

Beckley, Gary H.: *See—*
- Hornagold, John T.; Beckley, Gary H.; and Rathi, Ram N., 4,109,747, Cl. 180-140.000.

Beckman Instruments, Inc.: *See—*
- Boronkay, Attila D.; and Axen, Charles G., 4,110,677, Cl. 323-19.000.

Beckmann, Ruediger: *See—*
- Kummer, Horst; and Beckmann, Ruediger, 4,110,470, Cl. 424-309.000.

Becton, Dickinson and Company: *See—*
- Haynes, John L.; and Shoor, Bernard A., 4,110,604, Cl. 235-92.0PC.
- Williams, Joel; Dunn, Terry; and Stannett, Vivian, 4,110,185, Cl. 204-159.200.

Beecham Group Limited: *See—*
- Cole, Martin; Howarth, Thomas Trevor; and Reading, Christopher, 4,110,165, Cl. 195-80.00R.
- Watts, Eric Alfred, 4,110,347, Cl. 260-345.200.

Been, Peter: *See—*
- Sheldon, Roger A.; Been, Peter; Wood, Derek A.; and Mason, Ronald F., 4,110,360, Cl. 260-465.00D.
- Sheldon, Roger A.; and Been, Peter, 4,110,361, Cl. 260-465.00D.
- Sheldon, Roger A.; and Been, Peter, 4,110,362, Cl. 260-465.00D.
- Sheldon, Roger A.; and Been, Peter, 4,110,363, Cl. 260-465.00D.

Beer, Emmanuel Emil, to Singer Company, The. Tilt limiting detecting apparatus. 4,110,609, Cl. 250-231.00R.

Beer, Wolfgang: *See—*
- Freitag, Dieter; Tresper, Erhard; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,110,540, Cl. 568-718.000.

Begany, Albert J.: *See—*
- Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,110,453, Cl. 424-251.000.
- Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,110,458, Cl. 424-263.000.

Belcher, Barry John: *See—*
- Barnes, William John; Belcher, Barry John; and Harvey, John Kenneth, 4,109,593, Cl. 112-79.00A.

Bell, Alan: *See—*
- Hayden, Robert Leslie James; and Bell, Alan, 4,109,613, Cl. 122-1.00R.

Bell & Howell Company: *See—*
- Elswood, Ebbert Lee, 4,110,731, Cl. 340-17.00R.
- Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,110,020, Cl. 353-26.00A.

Bell Telephone Laboratories, Incorporated: *See—*
- Schroeder, Paul Robert, 4,110,841, Cl. 365-205.000.
- Shanley, James Joseph, 4,110,566, Cl. 179-18.0GF.

Belleau, Claude: *See—*
- Roy, Amedee; Belleau, Claude; and Geyman, James M., 4,110,512, Cl. 428-469.000.

Bendefy nee Dobay, Erzsebet: *See—*
- Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,110,441, Cl. 424-211.000.

Bendix Corporation, The: *See—*
- Bourdon, Normand Charles, 4,109,987, Cl. 339-75.00M.
- Cramer, Robert L.; and Henneman, John W., 4,109,509, Cl. 73-23.000.
- Doi, Scott S., 4,110,573, Cl. 200-67.0DA.
- Eslinger, Ralph Gilbert; and Nicolson, John Millar, 4,110,647, Cl. 310-168.000.
- Johannesen, Donald Dixon, 4,109,765, Cl. 188-72.700.
- Waldron, Clifford Robert; and Knapp, Carl Lee, 4,109,990, Cl. 339-89.00M.
- Wolber, William George, 4,109,870, Cl. 239-558.000.

Benedict, James John, to Procter & Gamble Company, The. Abrasive composition. 4,110,083, Cl. 51-295.000.

Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, to Eli Lilly and Company. Novel fluoroalkoxyphenyl-substituted nitrogen heterocycles. 4,110,099, Cl. 71-76.000.

Benjamin, Lawrence; and Walsh, Michael Andrew, to Procter & Gamble Company, The. Fabric treatment compositions. 4,110,498, Cl. 428-35.000.

Bennett, John Peter; and Jones, Graham Robin Scott, to Masson Scott Thrissell Engineering Ltd. Program control and display apparatus. 4,110,836, Cl. 364-860.000.

Bennett, R. Brian P.: *See—*
- Crooks, Basil D.; and Bennett, R. Brian P., 4,110,593, Cl. 219-90.000.

Bent, John H., to Minnesota Mining and Manufacturing Company. Rotary surgical driver. 4,109,735, Cl. 173-163.000.

Beppu, Yoshitsugu: *See—*
- Ikeda, Toshiki; and Beppu, Yoshitsugu, 4,110,267, Cl. 521-59.000.

Berardinelli, Frank M.: *See—*
- Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,110,302, Cl. 260-40.00R.

Beretta, Paolo; and Valbusa, Luigi, to Minnesota Mining and Manufacturing Company. Fogged direct positive silver halide emulsion containing a cyanine dye having at least one benzoxazole or benzothiazole nucleus substituted with halogen atoms. 4,110,116, Cl. 96-101.000.

Berg, Niilo Nikodemus, to Rauma-Repola OY. Chipper. 4,109,690, Cl. 144-163.000.

Berg, Norman J.; Smith, Bob Lorin, deceased; and by Adams, Allen B., legal representative, to United States of America, Army. Acousto-optic real time correlator. 4,110,016, Cl. 350-358.000.

Berg, Walter: *See—*
- Baumgartner, Alfons; Berg, Walter; Burkhardt, Horst; Laubin, Jurgen; and Schlick, Helmut, 4,110,828, Cl. 364-562.000.

Bergdahl, Knut. Heat exchange in ventilation installation. 4,109,705, Cl. 165-17.000.

Bergeron, David Leo; Putney, Zimri Congdon; and Stephens, Geoffrey Brownell, to International Business Machines Corporation. NPN/PNP Fabrication process with improved alignment. 4,110,126, Cl. 148-1.500.

Berghahn, Martha L.: *See—*
- Berghahn, Walter G.; and Berghahn, Martha L., 4,109,785, Cl. 206-1.500.

Berghahn, Walter G.; and Berghahn, Martha L., to Bristol-Myers Company. Child resistant package. 4,109,785, Cl. 206-1.500.

Bergmann, Wilfried; and Knuttel, Berthold, to Kraftwerk Union Aktiengesellschaft. Method and apparatus for measuring the quantity of a fluid flowing through a pipe by means of nuclear magnetic spin resonance. 4,110,680, Cl. 324-0.50B.

Bergmans, Hendrik Jan; and Drabek, Rudolf, to U.S. Philips Corporation. Servo system for controlling the position of a magnetic head relative to a track to be followed using periodically interrupted long-wave positioning signals. 4,110,799, Cl. 360-70.000.

Berkelhammer, Gerald; and Kameswaran, Venkatamaran, to American Cyanamid Company. 2,2-Difluoro-1,3-benzodioxole-5-(α-alkyl)-acetic acids, and their use for the preparation of insecticides and acaricides. 4,110,345, Cl. 260-340.50R.

Berloty, Adrien. Reinforced foam building panel element. 4,109,436, Cl. 52-309.200.

Bernady, Karel Francis: *See—*
- Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Poletto, John Frank; Schaub, Robert Eugene; and Bernady, Karel Francis, 4,110,368, Cl. 260-514.00D.

Bert, Alain; and Kantorowicz, Gerard, to Thomson-CSF. Non-volatile long memory for fast signals. 4,110,839, Cl. 365-180.000.

Bertram, James L.; and Shih, Pong Su, to Dow Chemical Company, The. Water-soluble epoxy resins and process for their preparation. 4,110,354, Cl. 260-348.140.

Berzen, Josef; and Theyssen, Johannes, to Ruhrchemie Aktiengesellschaft. Process for the manufacture of molded articles from polyolefins with molecular weights of at least one million. 4,110,391, Cl. 264-120.000.

Betensky, Ellis I., to Opcon Associates of Canada, Ltd. Triplet with aspheric surfaces. 4,109,995, Cl. 350-189.000.

Bethards, Charles William, to Motorola Inc. Adaptive audio compressor. 4,110,699, Cl. 328-168.000.

Bethlehem Steel Corporation: *See—*
- Dresch, Charles D.; and Yohe, Robert A., 4,110,548, Cl. 13-16.000.

Beyer, Klaus Dietrich, to International Business Machines Corporation. Method for fabricating semiconductor devices. 4,110,125, Cl. 148-1.500.

Beylerian Limited: *See—*
- Polvara, Giulio, 4,110,052, Cl. 403-295.000.

Bhatia, Shyam: *See—*
- Rao, G. R. Mohan; Stanczak, John S.; Lien, Jih-Chang; and Bhatia, Shyam, 4,110,776, Cl. 357-23.000.

BHN Corporation: *See—*
- Cottingham, Hugh V.; and Scrocco, Joseph, 4,110,506, Cl. 428-138.000.

BICC Limited: *See—*
- Taylor, John Edward, 4,109,369, Cl. 29-467.000.

Bickel, Hans: *See—*
- Woodward, Robert Burns; and Bickel, Hans, 4,110,533, Cl. 544-16.000.

Biedermann, Horst H.: *See—*
- Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.

Bigham, Eric C., to Pfizer Inc. Azidomethylarylacetic acids and esters thereof. 4,110,342, Cl. 260-332.20A.

Bijker, Anno: *See—*
- Pons, Dick A.; and Bijker, Anno, 4,110,285, Cl. 260-29.6MP.

Bildstein, Siegfried; Lademann, Rudolf; Pietzsch, Siegfried; and Schaefer, Georg, to Hoechst Aktiengesellschaft. Process for the manufacture of naphthalene-monosulfonic acids. 4,110,365, Cl. 260-505.00C.

Bill, David Hewitt. Structural section. 4,109,440, Cl. 52-721.000.

Bimm, Richard A.: *See—*
- Barnett, Charles J.; Bimm, Richard A.; and Cullinan, George C., 4,110,330, Cl. 260-287.00B.

Bishov, Solomon J., to United States of America, Army. Method of stabilizing foods with an antioxidant. 4,110,483, Cl. 426-542.000.

BJ-Hughes Inc.: *See—*
- Howard, James A.; and Smith, Roger, Jr., 4,109,800, Cl. 214-2.500.
- Work, John Thompson, 4,109,488, Cl. 64-11.00R.

Bjorkqvist, Nils Gunnar; Franzen, Hans Arne Edgar; and Johansson, Karl Ingmar Wenzel, to AB Bofors. Device for bottom unit for projectile. 4,109,577, Cl. 102-35.600.

Black, Chester A.; and Black, Lester A. Detachable road protecting devices for tracked vehicles. 4,109,971, Cl. 305-51.000.

Black Clawson Company, The: *See—*
- Couture, Joseph Walter, 4,109,872, Cl. 241-46.110.

Black, Lester A.: *See—*
- Black, Chester A.; and Black, Lester A., 4,109,971, Cl. 305-51.000.

Blaimschein, Gottfried; and Marzy, Otto, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Tool assembly and inserted-tooth cutter for milling cylindrical surfaces on a workpiece. 4,110,055, Cl. 408-203.500.

Blank, Cecil G.: *See—*
- Glenday, Martin J.; and Blank, Cecil G., 4,109,538, Cl. 74-6.000.

Blank, Werner Josef: *See—*
- Schirmann, Peter Jude; and Blank, Werner Josef, 4,110,288, Cl. 260-29.4UA.

Blaser, Eugene Martin; and Conrad, Donald Adelbert, to International Business Machines Corporation. Depletion/enhancement mode FET logic circuit. 4,110,633, Cl. 307-205.000.

Blazick, Linda Ann; and Miller, Lewis Franklin, to International Business Machines Corporation. Method for preparing a multilayer ceramic. 4,109,377, Cl. 29-626.000.

Blessing, Hubert, to Levi Strauss & Co. Automatic stitching pattern control system for a sewing machine. 4,109,596, Cl. 112-121.110.

Block, Gerald H. Lightweight and compactible tent structure. 4,109,424, Cl. 52-2.000.

Bloom, Stanley M., to Polaroid Corporation. Anthraquinone compounds useful in photographic processes. 4,110,355, Cl. 260-372.000.

Blumbergs, John H.: *See—*
- Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., 4,110,074, Cl. 8-111.000.

Bocker, Richard P., to United States of America, Navy. Complex photodichroic spatial filter. 4,110,004, Cl. 350-162.0SF.

Boehm, Hans W.: *See—*
- Oelke, Waldemar W.; Boehm, Hans W.; and Herrington, Richard A., 4,109,840, Cl. 225-2.000.

Boehmke, Gunther; Fries, Hermann; and Esch, Erich, to Bayer Aktiengesellschaft. Release agents. 4,110,119, Cl. 106-38.240.

Bogar, Jerry Hench; and Johnson, Tore Rudolf, to AMP Incorporated. Fiber optic connector. 4,110,000, Cl. 350-96.210.

Boggs, Daniel R.: *See—*
- Brown, Richard I.; and Boggs, Daniel R., 4,109,852, Cl. 233-1.00R.

Bogri, Tibor: *See—*
- Bagli, Jehan F.; and Bogri, Tibor, 4,110,468, Cl. 424-301.000.

Bogue Electric Manufacturing Company: *See—*
- Rao, S. Chandrasekhara, 4,110,646, Cl. 310-163.000.

Bohm, Kurt; Rollenitz, Leopold; and Laurent, Francois, to Bolex International SA. Wide-angle attachment for varifocal objective. 4,110,005, Cl. 350-184.000.

Boise Cascade Corporation: *See—*
- Kratochvil, John R., Jr., 4,109,876, Cl. 206-326.000.

Bolduc, Lee R.; and Dickhudt, Eugene A., to Population Research, Inc. Single stroke dispensing apparatus. 4,109,654, Cl. 128-235.000.

Bolenz, Klaus: *See—*
- Odor, Frank; Mohr, Adolf; and Bolenz, Klaus, 4,110,718, Cl. 335-296.000.

Bolex International SA: *See—*
- Bohm, Kurt; Rollenitz, Leopold; and Laurent, Francois, 4,110,005, Cl. 350-184.000.

Bolkow Gesellschaft mit beschrankter Haftung: *See—*
- Peters, Johannes, 4,110,724, Cl. 340-4.00A.

Bolte, Wallace B.: *See—*
- Kirschman, Fred C.; and Bolte, Wallace B., 4,110,170, Cl. 202-160.000.

Boltswitch, Inc.: *See—*
- Erickson, John W.; and Erickson, James A., 4,110,584, Cl. 200-304.000.

Bond, Albert K.; Merrick, Edwin B.; and Nielsen, Larry Lee, to Hewlett-Packard Company. Perfusion meter. 4,109,643, Cl. 128-2.00L.

Bonitz, Eckhard: *See—*
- Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,110,385, Cl. 264-13.000.

Booth, Frank B.: *See—*
- Schaeffer, William D.; and Booth, Frank B., 4,110,404, Cl. 260-604.0HF.

Borg-Warner Corporation: *See—*
- Wiese, Winfred John, 4,109,920, Cl. 277-17.000.

Bornengo, Mario, to Montedison S.p.A. One step process for preparing 2,6-dinitro-4-trifluoromethylchlorobenzene by nitration of 4-trifluoromethylchlorobenzene. 4,110,405, Cl. 260-646.000.

Boronkay, Attila D.; and Axen, Charles G., to Beckman Instruments, Inc. Operational amplifier with positive and negative feedback paths for supplying constant current to a bandgap voltage reference circuit. 4,110,677, Cl. 323-19.000.

Boros, Eugene Joseph; and Papa, Anthony Joseph, to Union Carbide Corporation. Methylol phosphonates and process for making same. 4,110,415, Cl. 260-953.000.

Borzym, Alexander, to Alpha Industries, Inc. Universal double cut die set. 4,109,555, Cl. 83-700.000.

Bosch, Juan, to Tecnologia Industrial, Proyectos Y Promociones, S.A. Sliding latch needle. 4,109,490, Cl. 66-120.000.

Bosch-Siemens Hausgerate GmbH: *See—*
- Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,110,075, Cl. 8-137.000.

Bosniack, David S.; and Korbach, Paul F., to Exxon Research & Engineering Co. Conversion of sulfonic acids into a hydrocarbon oil of superior oxidation stability. 4,110,196, Cl. 208-13.000.

Bosso, Joseph F.; and Castellucci, Nicholas T., to PPG Industries, Inc. Cataphoretic N-heterocyclic-containing resins for electrodeposition. 4,110,287, Cl. 260-29.2EP.

Bottelsen, Walter Edward. Breakaway dart. 4,109,915, Cl. 273-106.50R.

Bottin, Jean: *See—*
- Hubert, Jacques; Ory, Jean-Marie; Bottin, Jean; and Humbert, Claude, 4,110,741, Cl. 340-573.000.

Botton, Roger Jean, to Societe RHONE-PROGIL. Production of chlorine and ammonia. 4,110,423, Cl. 423-356.000.
Boucher, Donald Joseph, to International Standard Electric Corporation. Multi-frequency generator using digital technique. 4,110,567, Cl. 179-84.0VF.
Bourdon, Normand Charles, to Bendix Corporation, The. Polarizing and locking means for mateable units such as electrical connectors. 4,109,987, Cl. 339-75.00M.
Bovenkerk, Harold P., to General Electric Company. Rotary drill bit. 4,109,737, Cl. 175-329.000.
Bowser, George H.: *See—*
Mazzoni, Renato J.; and Bowser, George H., 4,109,431, Cl. 52-172.000.
Boyhont, Donald S.; and Solt, Paul E., to Fuller Company. Pneumatic conveying device. 4,109,966, Cl. 302-50.000.
Boys, John T., to Standard Pressed Steel Co. Apparatus for and method of determining rotational and linear stiffness. 4,110,829, Cl. 364-577.000.
Bradley Corporation: *See—*
Smart, William A., Jr.; and Gumm, Scott H., 4,109,895, Cl. 251-41.000.
Brambilla, Marco; and Lallia, Pascal, to United States of America, Energy. High-frequency plasma-heating apparatus. 4,110,595, Cl. 219-121.00P.
Bramlett, David A., to Sun Oil Company of Pennsylvania. Liquid level control system for separation tank. 4,110,215, Cl. 210-114.000.
Brandl, Gerhard. Reciprocable sprinkler. 4,109,866, Cl. 239-233.000.
Brauner, Arne H.: *See—*
Kipp, Michael A.; and Brauner, Arne H., 4,109,848, Cl. 229-21.000.
Braunwarth, John B., to Armstrong Chemical Co., Inc. Ampholytic quaternary ammonium compounds and methods for their preparation. 4,110,358, Cl. 260-404.500.
Brawner, William Howard: *See—*
Williams, Michael Patrick; and Brawner, William Howard, 4,109,925, Cl. 280-11.280.
Brecht, Robert R.: *See—*
Fairchild, Louis F.; and Brecht, Robert R., 4,109,742, Cl. 180-20.000.
Breitbard, Elford Barnett, to Tele-Quik, Inc. Telephone supported directory information support rack. 4,109,890, Cl. 248-452.000.
Breiter, Manfred W., to Electric Power Research Institute, Inc. Sodium-sulfur cell casing. 4,110,516, Cl. 429-104.000.
Brendle, Paul C.; and Clarkson, Brian B., to CTS Corporation. Variable resistance control. 4,110,722, Cl. 338-174.000.
Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Pinball game with simultaneous projectors. 4,109,916, Cl. 273-121.00A.
Breuer, Bert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for blocking the starting of vehicle engines with electric starter. 4,109,746, Cl. 180-82.00A.
Breuer, Hermann; and Treuner, Uwe, to E. R. Squibb & Sons, Inc. 3-Oxopyridazinylthiomethyl derivatives of ureidocephalosporins. 4,110,535, Cl. 544-21.000.
Brice, Henri, to Houilleres du Bassin de Lorraine. Process for the separation of tarry dusts from coke oven gas. 4,110,168, Cl. 201-4.000.
Briggs, Alan H.; and Timmons, Eric, to British Steel Corporation. Universally suspended snubbing railway axle truck. 4,109,586, Cl. 105-224.00A.
Brinkman, Richard John: *See—*
Shaw, Gordon Brian; and Brinkman, Richard John, 4,110,545, Cl. 13-6.000.
Bristol-Myers Company: *See—*
Berghahn, Walter G.; and Berghahn, Martha L., 4,109,785, Cl. 206-1.500.
British Gas Corporation: *See—*
Burge, Donald Richard, 4,109,636, Cl. 126-21.00A.
British Steel Corporation: *See—*
Briggs, Alan H.; and Timmons, Eric, 4,109,586, Cl. 105-224.00A.
Britton, James S.; and Morgan, David W., to Westinghouse Electric Corp. Watthour meter enclosure for use in remote meter reading packages. 4,110,814, Cl. 361-371.000.
Bro, Niels, to Bantex A/S. Method of producing a packing blank. 4,110,146, Cl. 156-291.000.
Broadbent, Sidney. Ice skate sharpening devices. 4,109,419, Cl. 51-94.00R.
Broadman, Richard J.; and May, Richard D., to Jones Instrument Corporation. Tachometer. 4,109,533, Cl. 73-498.000.
Brockelsby, Norman D.; and Haase, Reinhold A., to Dutton-Lainson Company. Oiler with adjustable spray nozzle. 4,109,869, Cl. 239-491.000.
Brockman, Gary; McFadden, Hubert J.; and Spector, George. Home battery storage and dispenser. 4,109,980, Cl. 312-35.000.
Brody, Thomas P.: *See—*
Asars, Juris A.; Davies, David H.; and Brody, Thomas P., 4,110,664, Cl. 315-169.0TV.
Brodzina, Lieselotte: *See—*
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,110,075, Cl. 8-137.000.
Broerman, William E.: *See—*
Hughes, James L.; and Broerman, William E., 4,109,671, Cl. 137-282.000.
Brooks, Barlow W.; and Brooks, Barlow W., Jr., to Roll Forming Corporation. Roll forming apparatus and method. 4,109,499, Cl. 72-181.000.
Brooks, Barlow W., Jr.: *See—*
Brooks, Barlow W.; and Brooks, Barlow W., Jr., 4,109,499, Cl. 72-181.000.
Brooks, Ronald Robert, to RCA Corporation. GTO Ignition circuit. 4,109,632, Cl. 123-148.00E.
Brose, Albert F., to AMSTED Industries Incorporated. Frictionally snubbed railway car truck. 4,109,585, Cl. 105-197.0DB.
Brown, Charles V.: *See—*
Condarco, Jose G.; McClesky, John E.; Condarco, Pedro; and Brown, Charles V., 4,109,875, Cl. 241-101.700.
Brown, Harry W., to Cutler-Hammer, Inc. Grounded lever toggle switch. 4,110,585, Cl. 200-305.000.
Brown, Leon Calvin; Edwards, Earl Garland; Peterson, Charles Edwin; Robinson, Peter George; and Wilson, Clement Card, to International Business Machines Corporation. Hot roller fuser having manually operable jam clearance mechanism. 4,110,068, Cl. 432-60.000.
Brown, Paul L. Levitation toy and method of operation thereof. 4,109,413, Cl. 46-233.000.
Brown, Richard E.; and Unangst, Paul C., to Warner-Lambert Company. Indolopyrones having antiallergic activity. 4,110,464, Cl. 424-274.000.
Brown, Richard I.; and Boggs, Daniel R., to Baxter Travenol Laboratories, Inc. Centrifugal strain relief sheath for processing apparatus. 4,109,852, Cl. 233-1.00R.
Brown, Richard I., to Baxter Travenol Laboratories, Inc. Centrifugal apparatus with outer enclosure. 4,109,854, Cl. 233-25.000.
Brown, Richard I.; and Duffy, Joseph Kevin, to Baxter Travenol Laboratories, Inc. Drive system for centrifugal processing apparatus. 4,109,855, Cl. 233-25.000.
Brown, Roland H. Encapsulating device for gas cylinder. 4,109,692, Cl. 150-52.00R.
Brown & Root, Inc.: *See—*
Gracia, Bert E., 4,109,476, Cl. 61-87.000.
Gracia, Bert E., 4,109,478, Cl. 61-86.000.
Brown & Williamson Tobacco Corporation: *See—*
Hedge, Roger W., 4,109,664, Cl. 131-2.000.
Browning Arms Company: *See—*
Badali, Joseph A., 4,109,403, Cl. 42-75.00B.
Brunette, Bobbie: *See—*
Brunette, Frederick F., 4,109,797, Cl. 211-126.000.
Brunette, Frederick F., to Brunette, Bobbie, a part interest. Display assembly. 4,109,797, Cl. 211-126.000.
Brusaglino, Giampiero; and Savonuzzi, Giovanni, to FIAT Societa per Azioni. Propulsion unit for vehicles. 4,109,743, Cl. 180-65.00C.
Bryant, Clifford Aldene, to West Point-Pepperell, Inc. Mending yarn in the selvedge of tufted carpeting. 4,109,592, Cl. 112-79.00A.
Bryant, Nelson H.: *See—*
Powers, Whitney S., Jr.; Hobler, Ross L.; Bryant, Nelson H.; and Allen, Wilbur J., 4,109,511, Cl. 73-37.600.
Buchholz, Josef. Arrangement for fastening a steel dowel. 4,110,053, Cl. 403-361.000.
Buck, Robert. Electronic monitoring system. 4,110,678, Cl. 323-22.0SC.
Bucyrus-Erie Company: *See—*
Dummer, Robert E., 4,109,733, Cl. 173-4.000.
Buehler, Amsey; and Butcher, Kirk Thomas, to Canadian General Electric Company Limited. Mechanically locked bell and spigot coupling for ducts and method of forming. 4,110,144, Cl. 156-173.000.
Buehler, David W.: *See—*
Ruckriegel, Alfred E.; and Buehler, David W., 4,109,589, Cl. 108-63.000.
Buhl, Horst; and Will, Susanne, to Deutsche Automobilgesellschaft GmbH. Form retaining hydrogen-storing material. 4,110,425, Cl. 423-648.00R.
Bunch, Jesse C. Heliostat apparatus. 4,110,009, Cl. 350-292.000.
Bungert, Heinrich; Wenz, Herbert; and Wentz, Klaus, to Pfaff Industriemaschinen GmbH. Smoothing machine for stitch seams. 4,109,334, Cl. 12-59.500.
Bunker Ramo Corporation: *See—*
Bauerle, Gerhard, 4,109,993, Cl. 339-176.00M.
Burge, Donald Richard, to British Gas Corporation. Forced convection ovens. 4,109,636, Cl. 126-21.00A.
Burke, Frederick A.: *See—*
Long, Douglas A.; and Burke, Frederick A., 4,110,792, Cl. 358-240.000.
Burkhardt, Horst: *See—*
Baumgartner, Alfons; Berg, Walter; Burkhardt, Horst; Laubin, Jurgen; and Schlick, Helmut, 4,110,828, Cl. 364-562.000.
Burlington Industries, Inc.: *See—*
Roberts, Fred B., 4,109,492, Cl. 66-172.00E.
Burns, Milton Wayne: *See—*
Greenlee, Donald Roy; and Burns, Milton Wayne, 4,109,714, Cl. 166-53.000.
Burnside, Richard E. Protective device for storage tanks. 4,109,677, Cl. 137-586.000.
Burow, Burghard; and Klinkert, Norbert, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Yarn severing and holding apparatus. 4,109,357, Cl. 28-289.000.
Burroughs Corporation: *See—*
Drinkard, John Halmer, Jr.; and Walton, Charles Eugene, II, 4,109,553, Cl. 81-9.510.
Marino, Francis C., 4,110,748, Cl. 340-365.00C.
Wisner, Daniel A., 4,110,675, Cl. 318-606.000.
Burroughs Wellcome Co.: *See—*
Wilkinson, Samuel; Flower, Roderick John; and Ferreira, Sergio Henrique, 4,110,432, Cl. 424-85.000.

Burrus, Thomas William: *See—*
Amery, John Gordon; and Burrus, Thomas William, 4,110,784, Cl. 358-8.000.
Burton, Robert S., III, to Occidental Oil Shale, Inc. Method of breaking shale oil-water emulsion. 4,109,718, Cl. 166-256.000.
Buscher, Harold T.: *See—*
Leskovar, Branko; Buscher, Harold T.; and Kolbe, William F., 4,110,686, Cl. 324-58.50C.
Butcher, Kirk Thomas: *See—*
Buehler, Amsey; and Butcher, Kirk Thomas, 4,110,144, Cl. 156-173.000.
Buthe, Fritz, to Johannes Menschner Textilmaschinenfabrik. Fabric cropping machine. 4,109,352, Cl. 26-15.00R.
Butler-Newton, Inc.: *See—*
Horn, Berthold K. P., 4,110,621, Cl. 250-361.00R.
C.A.V. Limited: *See—*
Potter, James Charles, 4,109,629, Cl. 123-140.00R.
C.G.R. MeV: *See—*
Meunier, Jacques, 4,110,581, Cl. 200-153.0LA.
C. L. Frost & Son, Inc.: *See—*
Weis, Siegfried K.; and Van der Meulen, 4,109,343, Cl. 16-98.000.
CAF Industries: *See—*
Reed, Richard E., 4,109,604, Cl. 114-270.000.
Cagle, William S., to Standard Oil Company (Indiana). Sealing wells. 4,110,225, Cl. 252-8.5LC.
Cairns, James Anthony; Lurio, Allen; and Ziegler, James Francis, to International Business Machines Corporation. Method and apparatus for monitoring the dose of ion implanted into a target by counting emitted X-rays. 4,110,625, Cl. 250-492.00A.
Calentine, John W.: *See—*
Vandegaer, Jan E.; and Calentine, John W., 4,110,286, Cl. 260-29.2TN.
Calgon Corporation: *See—*
Barnett, Richard Earl; and Woodrum, Guy Thomas, 4,110,521, Cl. 526-64.000.
California Cedar Products Company: *See—*
Trinchera, Luigi, 4,110,591, Cl. 219-85.0CA.
California Polytechnic State University Foundation, The: *See—*
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,110,444, Cl. 424-226.000.
California Processing Machinery: *See—*
Silvestrini, Jesus Antonio, 4,109,570, Cl. 99-551.000.
Call, Tracey G.: *See—*
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,110,444, Cl. 424-226.000.
Callahan, John A.: *See—*
Ottenstein, Allan S.; and Callahan, John A., 4,109,777, Cl. 400-124.000.
Calland, John P.: *See—*
Parbhoo, Kantilal R.; Klink, Jerome P.; Calland, John P.; and White, Gerald L., 4,109,610, Cl. 118-202.000.
Camp, Terry L.: *See—*
Barecki, Chester J.; Lewis, Donald R.; and Camp, Terry L., 4,109,959, Cl. 297-216.000.
Canadian General Electric Company Limited: *See—*
Buehler, Amsey; and Butcher, Kirk Thomas, 4,110,144, Cl. 156-173.000.
Kemp, Grey Charles; and Spence, Eion Murray, 4,110,650, Cl. 310-239.000.
Lee, Harvey Robert, 4,110,159, Cl. 176-68.000.
Canadian Patents and Development Limited: *See—*
Kwok, Clyde C. K.; and Farag, Essam A., 4,109,834, Cl. 222-448.000.
Ooraikul, Buncha, 4,110,478, Cl. 426-262.000.
Canalizo, Carlos R., to Otis Engineering Corporation. Seal. 4,109,716, Cl. 166-191.000.
Candid Logic, Inc.: *See—*
Mueller, William L.; and Winkel, Robert J., 4,110,610, Cl. 250-231.0SE.
Tann, Lewis H.; Mueller, William L.; and Vis, Arthur D., 4,110,611, Cl. 250-237.00R.
Canon Kabushiki Kaisha: *See—*
Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 4,110,029, Cl. 355-10.000.
Ikemori, Keiji, 4,110,006, Cl. 350-186.000.
Knechtel, Wilhelm, 4,110,030, Cl. 355-11.000.
Sato, Yasushi; and Ichihashi, Hiroo, 4,110,027, Cl. 355-3.0TR.
Canron, Inc.: *See—*
Stewart, John K., 4,109,388, Cl. 33-287.000.
Cantwell, John Burnett: *See—*
Dart, Edward Charles; Cantwell, John Burnett; Traynor, James Rodney; Jaworzyn, Joseph Franciszek; and Nemcek, Jozef, 4,110,184, Cl. 204-159.230.
Capelle, Anthony, to Chemische Fabriek Servo B.V. Crystallization inhibitor for paraffin. 4,110,283, Cl. 260-23.0AR.
Caravito, Vito A., to Goodyear Tire & Rubber Company, The. Method of making an integrally built and cured closed torus tire and wheel assembly. 4,110,141, Cl. 156-123.00R.
Carborundum Company, The: *See—*
Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 4,110,277, Cl. 260-841.000.
Carl Schenck AG: *See—*
Altwein, Michael, 4,110,834, Cl. 364-841.000.
Carless, Capel & Leonard Limited: *See—*
Farmer, Thomas Henry, 4,110,204, Cl. 208-251.00R.
Carlessimo, John J. Circular type manholes. 4,109,425, Cl. 52-21.000.
Carlin, Joseph T.; Tyler, Timothy N.; Mills, Melvin E., Jr.; and Ware, James W., to Texaco Inc. Salinity tolerant surfactant oil recovery process. 4,110,229, Cl. 252-8.55D.
Carlin, Joseph T.: *See—*
Tyler, Timothy N.; Mills, Melvin E., Jr.; Wells, John A.; and Carlin, Joseph T., 4,110,228, Cl. 252-8.55D.
Carmet Company: *See—*
Schaffer, Dennis A., 4,109,502, Cl. 72-349.000.
Carpin, George E.: *See—*
Reed, Gerald M.; and Carpin, George E., 4,109,383, Cl. 32-10.00A.
Carr, Herbert, to General Motors Corporation. Moisture extractor. 4,109,487, Cl. 62-474.000.
Carre, Jean-Jacques, to Societe Anonyme D.B.A. Floating caliper disc brake and a guide key for the same. 4,109,764, Cl. 188-72.400.
Carrington, Russell Settle. Body profiled surgical drainage appliance. 4,109,657, Cl. 128-283.000.
Carson, Don B., to UOP Inc. Power generation from refinery waste heat streams. 4,109,469, Cl. 60-676.000.
Carson, Don B., to UOP Inc. Power generation and potable water recovery from salinous water. 4,110,174, Cl. 203-11.000.
Carter, Alan Reginald; Pettit, Donald; and Langerwerf, Josephus Sychbertus, to Shoe and Allied Trades Research Association, The. Improvements in shoe manufacture. 4,110,495, Cl. 427-400.000.
Carter, Harry R., to Carter Pol Development Corp. Practice ammunition device. 4,109,579, Cl. 102-41.000.
Carter Pol Development Corp.: *See—*
Carter, Harry R., 4,109,579, Cl. 102-41.000.
Casa Herrera, Inc.: *See—*
Herrera, Frank J.; and Ponce, Rodger G., 4,109,568, Cl. 99-477.000.
Cason, Robert L.; and McStay, John J., to United States of America, National Aeronautics and Space Administration. Apparatus including a plurality of spaced transformers for locating short circuits in cables. 4,110,683, Cl. 324-52.000.
Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,109,903, Cl. 271-3.000.
Cassidy, James Lawrence. Method and means for reclaiming mechanical energy and hot condensate from exhaust steam. 4,109,470, Cl. 60-685.000.
Castellucci, Nicholas T.: *See—*
Bosso, Joseph F.; and Castellucci, Nicholas T., 4,110,287, Cl. 260-29.2EP.
Castine, Donald G., to Eaton Yale Ltd. Apparatus for processing trees. 4,109,689, Cl. 144-2.00Z.
Castro, Genaro Afalla. Device for dispensing measured quantities of material. 4,109,835, Cl. 222-449.000.
Castrodale, Daniel Owen; Lovgren, Jeffrey Lynn; Russell, Ralph Arthur; and Shidler, Karl Allen, to International Business Machines Corporation. Read/write and tunnel erase magnetic head assembly. 4,110,804, Cl. 360-118.000.
Cataldo, Thomas M.: *See—*
Pugh, Daniel B.; and Cataldo, Thomas M., 4,109,908, Cl. 272-119.000.
Caterpillar Tractor Co.: *See—*
Adams, Stanley B.; and Morge, Michael P., 4,109,812, Cl. 214-762.000.
Bartlett, Harold H.; Herr, Charles H., Jr.; and Lamport, Ivan R., 4,109,519, Cl. 73-135.000.
Habiger, Cyril W., 4,109,540, Cl. 74-96.000.
Jacobson, Paul D., 4,109,547, Cl. 74-526.000.
Junck, John A.; and Lorimor, Larry W., 4,109,561, Cl. 91-451.000.
Miller, Robert H.; and Davidson, Harold C., 4,109,628, Cl. 123-140.00R.
Ostrowski, Richard C.; and Styfhoorn, John, 4,110,150, Cl. 156-499.000.
Ping, David T., 4,109,744, Cl. 180-68.00P.
Richardson, Warner G., 4,109,400, Cl. 37-126.0AC.
Sieving, Alfred W.; and Stanley, James M., 4,109,963, Cl. 298-23.00M.
Cecil, Howard E.: *See—*
Kutik, Louis F.; and Cecil, Howard E., 4,109,832, Cl. 222-318.000.
Celanese Corporation: *See—*
Schaeffer, William D.; and Booth, Frank B., 4,110,404, Cl. 260-604.0HF.
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,110,302, Cl. 260-40.00R.
Wells, William J., III; and Stautzenberger, Adin Lee, 4,110,298, Cl. 260-340.000.
Ceschoslovak akademie ved: *See—*
Stoy, Vladimir, 4,110,529, Cl. 528-491.000.
Cetec Corporation: *See—*
Balcom, Orville R.; Hildebrand, Cleve R.; and Pollard, Edward L., 4,109,389, Cl. 33-363.00K.
CGR-MeV: *See—*
Azam, Guy; and Perraudin, Claude, 4,110,623, Cl. 250-398.000.
CGS Systems, Inc.: *See—*
Medwin, Albert H., 4,110,701, Cl. 331-1.00A.
Chacornac, Georges, to Manufacture Francaise d'Armes et Cycles de Saint-Etienne Manufrance; and Institut Pasteur. Multi-penetration vaccination apparatus. 4,109,655, Cl. 128-253.000.
Chaffin, John H., III; and Skogman, Richard A., to Honeywell Inc. Preparation of low absorption transparent thallium iodide films on potassium chloride. 4,110,489, Cl. 427-164.000.
Chair-E-Yacht, Inc.: *See—*
Clark, Bobby Dean, 4,109,809, Cl. 214-505.000.

Chaki, Tomohiro: *See—*
  Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 4,110,048, Cl. 356-200.000.
Champeau, Andre. Bed having acoustical isolation. 4,109,331, Cl. 5-284.000.
Champion International Corporation: *See—*
  Roccaforte, Harry I.; and Pasquale, William D., 4,109,786, Cl. 206-45.140.
  Vincent, David N.; and Chang, Cheng Hsiung, 4,110,343, Cl. 260-335.000.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Tetramethyl chromanyl pentane derivatives. 4,110,346, Cl. 260-345.500.
Chang, Cheng Hsiung: *See—*
  Vincent, David N.; and Chang, Cheng Hsiung, 4,110,343, Cl. 260-335.000.
Chapman, Leonard. Fluid control valve assembly. 4,109,678, Cl. 137-596.200.
Charbonnages de France: *See—*
  Valantin, Alfred A., 4,109,473, Cl. 61-45.00D.
Chas. S. Tanner Co.: *See—*
  Lindemann, Martin K., 4,110,289, Cl. 260-29.6TA.
Chemetron Corporation: *See—*
  Hansen, Arne; and Troup, George, 4,109,726, Cl. 169-11.000.
Chemische Fabriek Servo B.V.: *See—*
  Capelle, Anthony, 4,110,283, Cl. 260-23.0AR.
Chemische Werke Huls A.G.: *See—*
  Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,110,075, Cl. 8-137.000.
Chemische Werks Huls A.G.: *See—*
  Frese, Albert, 4,110,524, Cl. 526-158.000.
Chemprene, Inc.: *See—*
  Stucke, Charles G., 4,109,924, Cl. 277-165.000.
Chen, Catherine S. H.: *See—*
  Schwab, Frederick C.; Sheppard, Edward W.; and Chen, Catherine S. H., 4,110,232, Cl. 252-8.55B.
Chen, Tien Chi, to International Business Machines Corporation. Apparatus for the sorting of records overlapped with loading and unloading of records into a storage apparatus. 4,110,837, Cl. 364-900.000.
Cherdron, Egon: *See—*
  Vogel, Walter, 4,110,209, Cl. 210-44.000.
Chesler, Edwin T.; Goodman, Donald; and Lapkin, Milton, to Olin Corporation. Vinyl chloride polymerization using selected amounts of air, oxygen or nitrogen. 4,110,527, Cl. 526-235.000.
Chevallier, Francois Edmond; and Fenouillet, Jean Marc Pierre, to Saint-Gobain Industries. Method for the manufacture of glass. 4,110,097, Cl. 65-136.000.
Chevron Research Company: *See—*
  Edwards, Laroy H., 4,110,332, Cl. 260-299.000.
  Magee, Philip S., 4,110,443, Cl. 424-212.000.
  McDade, George Harold, 4,110,602, Cl. 219-523.000.
  Offermann, Paul F., 4,110,599, Cl. 219-301.000.
  Singer, Malcolm S., 4,110,475, Cl. 426-2.000.
  Thompson, Don D., 4,109,522, Cl. 73-154.000.
Chiang, Mutong T.: *See—*
  Danzig, Morris J.; and Chiang, Mutong T., 4,110,412, Cl. 260-873.000.
Chiba, Kunji: *See—*
  Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,452, Cl. 57-58.890.
  Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,453, Cl. 57-58.910.
Chicklis, Evan P., to Sanders Associates, Inc. Deep red laser. 4,110,702, Cl. 331-94.50F.
Chikul, Olga Semenovna: *See—*
  Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
Chikul, Vitaly Ivanovich: *See—*
  Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
Children's Hospital Medical Center: *See—*
  Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,110,474, Cl. 424-350.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
  Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,110,441, Cl. 424-211.000.
Chown, Martin, to International Telephone and Telegraph Corporation. Single optical fiber connector. 4,109,994, Cl. 350-96.210.
Chrysler Corporation: *See—*
  Roy, Amedee; Belleau, Claude; and Geyman, James M., 4,110,512, Cl. 428-469.000.
  Sarto, Jorma O., 4,110,416, Cl. 261-23.00A.
  Swenson, Willard E., Jr., 4,109,515, Cl. 73-88.00A.
Ciba-Geigy: *See—*
  Mollet, Hans; and Rehmann, Wolfgang, 4,110,073, Cl. 8-85.00R.
Ciba-Geigy AG: *See—*
  Fahrni, Fritz; and Zimmermann, Anton, 4,109,611, Cl. 118-325.000.
  Schaub, Andres; and Kogel, Gerhard, 4,110,071, Cl. 8-21.00R.
Ciba-Geigy Corporation: *See—*
  Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,110,188, Cl. 204-159.220.
  Francis, John Elsworth, 4,110,457, Cl. 424-263.000.
  Gilg, Bernard; Muller, Helmut; and Rody, Jean, 4,110,304, Cl. 260-45.80N.
  Holt, Brian; and Randell, Donald Richard, 4,110,305, Cl. 260-45.80N.
  Pickering, Timothy L.; and Hendrickson, James I., 4,110,294, Cl. 260-30.200.
  Woodward, Robert Burns; and Bickel, Hans, 4,110,533, Cl. 544-16.000.
Cittrich, Jurgen: *See—*
  Becker, Klaus; Cittrich, Jurgen; and Kaufmann, Karl-Ernst, 4,109,904, Cl. 272-56.50R.
Clark, Bobby Dean, to Chair-E-Yacht, Inc. Multiple position vehicle carrying trailer. 4,109,809, Cl. 214-505.000.
Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, to Glaxo Laboratories Limited. Process for the preparation of 3-vinyl and substituted vinyl cephalosporins. 4,110,534, Cl. 544-16.000.
Clark, Justin S.; and Veasy, Lloyd George, to Primary Children's Hospital. Automated blood analysis system. 4,109,505, Cl. 73-1.00R.
Clark, Leland C., Jr.: *See—*
  Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,110,474, Cl. 424-350.000.
Clark, Robert E., to Thexton Manufacturing Company. V-belt manipulating tool. 4,109,544, Cl. 74-242.700.
Clarkson, Brian B.: *See—*
  Brendle, Paul C.; and Clarkson, Brian B., 4,110,722, Cl. 338-174.000.
Clavel, Raymond; and Menzi, Ulrich, to Hermes Precisa International S.A. Transmission mechanism, notably for typewriters. 4,109,778, Cl. 400-154.200.
Clayton, Thomas S., to General Electric Company. Coolant flow metering device. 4,109,864, Cl. 239-127.300.
Clerici, Mario Gabriele; Maspero, Federico; and D'Alfonso, Alfonso, to ANIC S.p.A. Process for the alkylation of secondary aliphatic amines in the presence of an amide of a transition metal. 4,110,377, Cl. 260-583.00R.
Clipson, Stuart A.; and Herolzer, Ralph H., to Midland-Ross Corporation. Nestable and stackable container assembly with improved bail structures of molded plastic. 4,109,791, Cl. 206-506.000.
Clow, Joseph Kenton. Pumping well blow-out preventer. 4,109,713, Cl. 166-53.000.
Clyde Machines, Inc.: *See—*
  Watkins, James F., 4,109,928, Cl. 280-411.00R.
Cochrane, Peter, to Post Office, The. Method and apparatus for testing transmission lines. 4,110,572, Cl. 179-175.30R.
Coffey, Darius A. Sealing clamp for milk cartons and similar containers. 4,109,351, Cl. 24-258.000.
Cogliano, Joseph A.; and Marans, Nelson S., to W. R. Grace & Co. Process for making a wettable polyolefin battery separator. 4,110,143, Cl. 156-167.000.
Cohen, Elliott: *See—*
  Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, 4,110,445, Cl. 424-229.000.
Cohen, Jerome Martin, to Lubrizol Corporation, The. Two-step method for the alkenylation of maleic anhydride and related compounds. 4,110,349, Cl. 260-346.740.
Cohnen, Wolfgang; and Apel, Gerhard, to Bayer Aktiengesellschaft. Blowing agent mixture. 4,110,273, Cl. 521-59.000.
Colbert, William V.: *See—*
  Degner, Vernon R.; and Colbert, William V., 4,110,210, Cl. 210-44.000.
Cold, David M.; and Bean, Larry A. Apparatus and method for removal of pollutants from flue gas. 4,110,088, Cl. 55-90.000.
Cole, Martin; Howarth, Thomas Trevor; and Reading, Christopher, to Beecham Group Limited. Process for the production of clavulanic acid. 4,110,165, Cl. 195-80.00R.
Colgate-Palmolive Company: *See—*
  Barnhurst, James Douglas; and Shumway, Durland Karl, 4,110,426, Cl. 424-46.000.
  Gaffar, Abdul; and Friedman, Stuart D., 4,110,429, Cl. 424-54.000.
Colledge, Gary C. Branded plasterboard product. 4,110,507, Cl. 428-151.000.
Collins, John W., III, to Aluminum Company of America. Induction heat sealed containers. 4,109,815, Cl. 215-232.000.
Combustion Engineering, Inc.: *See—*
  Rosso, John B., 4,109,526, Cl. 73-231.00R.
Commissariat a l'Energie Atomique: *See—*
  Tigreat, Paul, 4,110,762, Cl. 354-4.000.
Compagnie Generale des Etablissements Michelin: *See—*
  de Zarauz, Yves, 4,110,525, Cl. 526-177.000.
Comyns-Carr, Cecil Alastair, to Stothert & Pitt Limited. Crane having overload release means. 4,109,798, Cl. 212-39.00R.
Conch LNG: *See—*
  Ffooks, Roger Cambridge; and Komada, Hiroshi, 4,109,823, Cl. 220-446.000.
Condarco, Jose G.; McClesky, John E.; Condarco, Pedro; and Brown, Charles V., to Continental Conveyor and Equipment Company. Module feeding apparatus. 4,109,875, Cl. 241-101.700.

Condarco, Pedro: *See—*
  Condarco, Jose G.; McClesky, John E.; Condarco, Pedro; and Brown, Charles V., 4,109,875, Cl. 241-101.700.
Conrac Corporation: *See—*
  Guess, Joe F., 4,110,561, Cl. 179-2.0EA.
Conrad, Donald Adelbert: *See—*
  Blaser, Eugene Martin; and Conrad, Donald Adelbert, 4,110,633, Cl. 307-205.000.
Consolidated Cigar Corporation: *See—*
  Godfrey, Frederick D., Jr.; Fedro, John J.; and Sinclair, Robert I., 4,109,665, Cl. 131-15.00C.
Container Corporation of America: *See—*
  Kipp, Michael A.; and Brauner, Arne H., 4,109,848, Cl. 229-21.000.
Conteas, Alexander P. X-ray film holder or cassette. 4,110,624, Cl. 250-481.000.
Continental Can Company, Inc.: *See—*
  Shaw, Fred B., 4,109,441, Cl. 53-11.000.
Continental Conveyor and Equipment Company: *See—*
  Condarco, Jose G.; McClesky, John E.; Condarco, Pedro; and Brown, Charles V., 4,109,875, Cl. 241-101.700.
Continental Oil Company: *See—*
  Goodwin, Thomas E.; and Starks, Charles M., 4,110,543, Cl. 568-781.000.
  Goodwin, Thomas E.; and Starks, Charles M., 4,110,544, Cl. 568-805.000.
  Leach, Bruce E., 4,110,253, Cl. 252-457.000.
  Martin, William L.; Wahl, Harry A.; and Young, Gary C., 4,109,719, Cl. 166-259.000.
  Sifferman, Thomas R.; and Sparlin, Derry D., 4,110,275, Cl. 260-14.000.
Cook, Claren K.: *See—*
  Reed, Charles J.; and Cook, Claren K., 4,109,535, Cl. 73-706.000.
Cooke, Claude E., Jr., to Exxon Production Research Company. Method of determining the orientation of hydraulic fractures in the earth. 4,109,717, Cl. 166-250.000.
Cooke, Horise M., to Stratoflex, Inc. Hose fitting assembly. 4,109,943, Cl. 285-149.000.
Cookson, Alan H., to Electric Power Research Institute, Inc. Extruded sheath section for compressed gas insulated transmission lines. 4,110,551, Cl. 174-27.000.
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, to Schering Corporation. Amino glycoside antibiotics having antiprotozoal activity. 4,110,439, Cl. 424-181.000.
Cooper, Glenn Dale; and Floryan, Daniel Edwin, to General Electric Company. Molecular weight control of polyphenylene ethers. 4,110,311, Cl. 528-215.000.
Cooper Laboratories, Inc.: *See—*
  Diamond, Julius, 4,110,328, Cl. 544-380.000.
Corbett, John M.; and Dechow, Frederick J., to Dow Chemical Company, The. Method for making crosslinked resin foams from an ethylenically unsaturated dicarboxylic acid anhydride and a polyisocyanate. 4,110,274, Cl. 521-157.000.
Cornelius, Kerry J. Plastic wall pool system. 4,109,324, Cl. 4-172.190.
Cornetti, Giorgio: *See—*
  Bassoli, Cesare; and Cornetti, Giorgio, 4,109,506, Cl. 73-10.000.
Cornu, Jozef; and Weisshaar, Erich, to BBC Brown Boveri & Company, Limited. Semiconductor power component. 4,110,780, Cl. 357-38.000.
Cory, Earl S.: *See—*
  Harris, James S., Jr.; Eden, Richard C.; Cory, Earl S.; and Scholl, Fred W., 4,110,661, Cl. 313-499.000.
Cotrel, Claude: *See—*
  Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,110,450, Cl. 424-250.000.
Cotterill, David John: *See—*
  Larke, John Reginald; Barber, Colin; and Cotterill, David John, 4,109,648, Cl. 128-2.06E.
Cottingham, Hugh V.; and Scrocco, Joseph, to BHN Corporation. Thermoplastic control complex. 4,110,506, Cl. 428-138.000.
Counelis, Mae: *See—*
  Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,110,439, Cl. 424-181.000.
Couture, Joseph Walter, to Black Clawson Company, The. Pulping apparatus for liquid slurry stock. 4,109,872, Cl. 241-46.110.
CPC International Inc.: *See—*
  Danzig, Morris J.; and Chiang, Mutong T., 4,110,412, Cl. 260-873.000.
Cramer, Robert L.; and Henneman, John W., to Bendix Corporation, The. Oxygen monitor and warning device for an aircraft breathing system. 4,109,509, Cl. 73-23.000.
Crawford, Peter Frederick: *See—*
  Hubbard, William Ernest; Hyde, Robert; and Crawford, Peter Frederick, 4,109,368, Cl. 29-446.000.
Creative Tool Company: *See—*
  Dooley, Joseph L.; and Yelke, Edward, 4,109,518, Cl. 73-119.00A.
Creutz, Hans-Gerhard, deceased (by Creutz, Katharina A., administratrix); and Herr, Roy Wilbur, to Oxy Metal Industries Corporation. Electrodeposition of copper. 4,110,176, Cl. 204-52.00R.
Creutz, Katharina A., administratrix: *See—*
  Creutz, Hans-Gerbard, deceased; and Herr, Roy Wilbur, 4,110,176, Cl. 204-52.00R.
Cronin, Michael Joseph, to Lockheed Aircraft Corporation. Solid state power controller with low level signal control. 4,110,809, Cl. 361-95.000.
Cronshaw, David; Shemer, Jack E.; Turner, William D.; Hartke, David; Keddy, James R.; DuVall, Wilbur E.; and Sterling, Warren M., to Xerox Corporation. Soft display word processing system with multiple autonomous processors. 4,110,823, Cl. 364-200.000.
Crooks, Basil D.; and Bennett, R. Brian P., to Northern Telecom Limited. Welding gun adapted to weld movable contacts on wire spring relays. 4,110,593, Cl. 219-90.000.
Crosfield Electronics Limited: *See—*
  Aughton, John E., 4,110,796, Cl. 358-298.000.
  Isherwood, Jeffrey, 4,110,627, Cl. 250-561.000.
Cross, Leslie E.; and Newnham, Robert E., to United States of America, Navy. Method of making ferroelectric crystals having tailored domain patterns. 4,109,359, Cl. 29-25.350.
Crouse, William George, to International Business Machines Corporation. Noise reduction method and apparatus for companded delta modulators. 4,110,705, Cl. 332-11.00D.
Cry Baby, Inc.: *See—*
  Turner, James E., 4,110,420, Cl. 264-41.000.
Csutor, Frank. Training and practice air of the turntable type, for use by ice skaters. 4,109,909, Cl. 272-146.000.
CTS Corporation: *See—*
  Brendle, Paul C.; and Clarkson, Brian B., 4,110,722, Cl. 338-174.000.
Cuccolo, Sergio: *See—*
  Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Cuccolo, Sergio, 4,110,112, Cl. 96-1.0PC.
Cullinan, George C.: *See—*
  Barnett, Charles J.; Bimm, Richard A.; and Cullinan, George C., 4,110,330, Cl. 260-287.00B.
Culpepper, William F.; and Hinkle, Charles G., to General Enterprises, Inc. Portable self-contained lubricating apparatus. 4,109,831, Cl. 222-254.000.
Cundiff, Otha G., Jr., to Raymond Lee Organization, Inc., The, a part interest. Emergency exit device. 4,109,759, Cl. 182-19.000.
Cunningham, William E., to Sullivan Company. Thermal protective barrier for open refrigerated compartment. 4,109,484, Cl. 62-256.000.
Curtin, Hoyt S. Pipe coupling. 4,109,944, Cl. 285-373.000.
Cusano, Carmen M.: *See—*
  Waldbillig, James O.; Cusano, Carmen M.; Reed, David D.; and Winstead, Richard L., 4,110,235, Cl. 252-51.50R.
Cusick, Richard T.; and Fleagle, Wilbur J., to United States of America, Navy. Pressure responsive switch. 4,110,576, Cl. 200-82.00E.
Custom Cable Company: *See—*
  Moore, Boyd B.; and Kendall, Clarence E., Jr., 4,110,554, Cl. 174-101.500.
Cutler-Hammer, Inc.: *See—*
  Brown, Harry W., 4,110,585, Cl. 200-305.000.
  Smith, Charles R., 4,110,720, Cl. 337-319.000.
Cybernet Electronic Corporation: *See—*
  Kakigi, Takao, 4,110,690, Cl. 325-25.000.
Daeschler, Werner; and Rainer, Hans, to Linde Aktiengesellschaft. Process for the separation of a gaseous mixture consisting of water vapor, hydrocarbons, and air. 4,110,091, Cl. 62-54.000.
DAGMA Deutsche Automaten- und Getrankemaschinen- Gesellschaft mit beschrankter Haftung & Co.: *See—*
  Kuckens, Alexander; and Kohl, Horst, 4,109,829, Cl. 222-81.000.
Dahl, Terence W.: *See—*
  Kucher, Robert C.; and Dahl, Terence W., 4,109,598, Cl. 113-116.0HH.
Daily, Thomas Edward, to Fedders Corporation. Rotatable, non-tumbling drying rack. 4,109,397, Cl. 34-239.000.
Daimler-Benz Aktiengesellschaft: *See—*
  Amann, Rolf; and Seidl, Horst, 4,109,955, Cl. 296-37.100.
  Dyballa, Manfred; and Schutzenauer, Dieter, 4,109,517, Cl. 73-119.00A.
  Hoheisel, Peter-Matthias; and Komander, Gerhard, 4,110,813, Cl. 361-248.000.
Dale, Anthony Richard: *See—*
  Pollock, James Richard Allan; and Dale, Anthony Richard, 4,110,480, Cl. 426-436.000.
D'Alfonso, Alfonso: *See—*
  Clerici, Mario Gabriele; Maspero, Federico; and D'Alfonso, Alfonso, 4,110,377, Cl. 260-583.00R.
D'Amore, Emanuele: *See—*
  Ratti, Franco; Vivarelli, Gianantonio; Maganza, Dario; and D'Amore, Emanuele, 4,109,379, Cl. 29-747.000.
Daniels, Leslie E., to Rotary Power Development Limited. Rotary piston power converting devices. 4,109,618, Cl. 123-43.00C.
Danzig, Morris J.; and Chiang, Mutong T., to CPC International Inc. Difunctional terminated macromolecular monomers and condensation copolymers produced therefrom. 4,110,412, Cl. 260-873.000.
Darden, Donald R. Brake actuating mechanisms for bicycles. 4,109,769, Cl. 192-5.000.
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, to Ciba-Geigy Corporation. Crosslinkable mixtures of bis-imidyl derivatives. 4,110,188, Cl. 204-159.220.
Dart, Edward Charles; Cantwell, John Burnett; Traynor, James Rodney; Jaworzyn, Joseph Franciszek; and Nemcek, Jozef, to Imperial Chemical Industries Limited. Photocurable dental filling compositions. 4,110,184, Cl. 204-159.230.
Davidson, Harold C.: *See—*
  Miller, Robert H.; and Davidson, Harold C., 4,109,628, Cl. 123-140.00R.
Davidson, Kenneth: *See—*
  Konigsford, Barry S.; Davidson, Kenneth; and Marschak, Howard J., 4,109,795, Cl. 211-57.100.

- Davies, David H.: *See—*
  - Asars, Juris A.; Davies, David H.; and Brody, Thomas P., 4,110,664, Cl. 315-169.0TV.
- Davies, Dennis, to International Computers Limited. Method of making an electrical connector. 4,109,378, Cl. 29-629.000.
- Davis, David L.: *See—*
  - Nelson, Alfred N.; and Davis, David L., 4,110,758, Cl. 346-74.100.
- Davis, Floyd William. Pistol structure. 4,109,559, Cl. 89-195.000.
- Davis, Noel Bryant, to General Mills, Inc. Precision seeder and method. 4,109,824, Cl. 221-7.000.
- Davis, Thomas G.: *See—*
  - Sarid, Dror; and Davis, Thomas G., 4,110,614, Cl. 250-324.000.
- Davison, Sol: *See—*
  - Gergen, William P.; and Davison, Sol, 4,110,303, Cl. 260-42.180.
- Davitian, Edward. Weaving system, method of weaving and apparatus. 4,109,355, Cl. 28-151.000.
- Day, Edward J.: *See—*
  - Mitchell, James A. H.; and Day, Edward J., 4,109,938, Cl. 283-43.000.
- Day, F. Howard, to Hooker Chemicals & Plastics Corp. Process for the preparation of benzoyl halide and halosulfonylbenzoyl halide. 4,110,373, Cl. 260-543.00R.
- Day, Walter Ransom, Jr., to Litton Systems, Inc. Apparatus for coupling microwave energy from two oscillators to a common transmission line. 4,110,709, Cl. 333-6.000.
- De Dietrich & Cie, S.A.: *See—*
  - Ruegg, Ernst, 4,109,853, Cl. 233-2.000.
- De la Concha, Francisco. Reinforced separable sectional hermetic protective covering. 4,109,438, Cl. 52-630.000.
- De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See—*
  - van Beveren, Marius; and Nuhoff, Peerke Jan, 4,109,856, Cl. 235-308.000.
- Dechow, Frederick J.: *See—*
  - Corbett, John M.; and Dechow, Frederick J., 4,110,274, Cl. 521-157.000.
- Decker, Cloyd E., to Robertshaw Controls Company. Control system and method and control device therefor. 4,110,601, Cl. 219-506.000.
- Deckert, Andreas; and Wolscheck, Hans, to Siemens Aktiengesellschaft. Installation of electrical components, particularly solid electrolytic capacitors in metal housings. 4,110,816, Cl. 361-433.000.
- Decor, Jean-Pierre, to Rhone-Poulenc Industries. Process for the preparation of acetal sulphones. 4,110,538, Cl. 560-11.000.
- Decubber, Maurice: *See—*
  - Serafin, Marian A.; and Decubber, Maurice, 4,109,860, Cl. 238-349.000.
- Deere & Company: *See—*
  - Kabele, Dennis Frederick, 4,109,751, Cl. 181-247.000.
  - Poore, Bernard Brandt, 4,109,772, Cl. 192-0.092.
- Degner, Vernon R.; and Colbert, William V., to Envirotech Corporation. Dispersed gas flotation process. 4,110,210, Cl. 210-44.000.
- DeLuca, Hector F.; and Jorgensen, Neal A., to Wisconsin Alumni Research Foundation. Method of treating milk fever in dairy cattle with 1,25-dihydroxycholecalciferol. 4,110,446, Cl. 424-236.000.
- Demag A.G.: *See—*
  - Becker, Klaus; Cittrich, Jurgen; and Kaufmann, Karl-Ernst, 4,109,904, Cl. 272-56.50R.
- Demmler, Kurt; Lawonn, Horst; and Hesse, Anton, to BASF Aktiengesellschaft. Manufacture of molding compositions based on unsaturated polyester resins. 4,110,278, Cl. 260-17.00A.
- Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Yagi, Norio; Matsumura, Hideki; Aoyagi, Tatsuhiro; and Kishi, Ikuji, 4,110,314, Cl. 528-26.000.
- Denki Onkyo Co., Ltd.: *See—*
  - Tajiri, Atsufumi, 4,110,793, Cl. 358-248.000.
- Denninger, Claude, to Sogemaric, Societe de Gestion et de Marketing pour Industries de Consommation; and Societe E. Lacroix. Pyrotechnical mole trap. 4,109,406, Cl. 43-84.000.
- De Nora, Vittorio: *See—*
  - Nidola, Antonio; De Nora, Vittorio; and Spaziante, Placido M., 4,110,180, Cl. 204-128.000.
- Denzel, Theodor, and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 8H-pyrazolo[4',3':5,6]pyrido [3,4-e][1,2,4]triazolo-[1,5-a]pyrimidines. 4,110,454, Cl. 424-251.000.
- Deplante, Michel; and Minesi, Didier, to Engins Matra. Position coder used with a machine of variable reluctance. 4,110,672, Cl. 318-254.000.
- Derr, Paul Birchard: *See—*
  - Snyder, Clair Wilson, Jr.; and Derr, Paul Birchard, 4,109,989, Cl. 339-94.00M.
- DesMarais, Thomas A., to Procter & Gamble Company, The. Polyester foam materials. 4,110,276, Cl. 521-123.000.
- DeSoto, Inc.: *See—*
  - Sekmakas, Kazys; and Hesler, Kenneth K., 4,110,292, Cl. 260-29.6RW.
- DeTorre, Robert P., to PPG Industries, Inc. Apparatus for opening score lines in glass sheets. 4,109,841, Cl. 225-96.500.
- Deubel, Hans D.: *See—*
  - Krohn, Hans Guenther; Rademacher, Friedrich; Petri, Ulrich; and Deubel, Hans D., 4,109,446, Cl. 53-282.000.
- Deutsche Automobilgesellschaft GmbH: *See—*
  - Buhl, Horst; and Will, Susanne, 4,110,425, Cl. 423-648.00R.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
  - von Bebenburg, Walter; Schulmeyer, Norbert; and Jakovlev, Vladimir, 4,110,455, Cl. 424-256.000.
- Deutsche Texaco Aktiengesellschaft: *See—*
  - Pirck, Dietrich; and Fuchs, Gundolf, 4,110,282, Cl. 260-23.0AR.
  - Sebald, Franz X.; and Hagemann, Hans-Dieter, 4,109,471, Cl. 61-0.500.
- Devico, Michael: *See—*
  - Hillman, Gary; and Devico, Michael, 4,109,337, Cl. 15-21.00D.
- Devine, Patrick J., to United States of America, Army. Armor plate penetrator. 4,109,580, Cl. 102-52.000.
- Dewaele, Sylvain A. R., to s.a. Texaco Belgium n.v. Conversion of 2-dialkylamino-3H-azepines into epsilon caprolactams. 4,110,323, Cl. 260-239.30A.
- de Wied, David: *See—*
  - Greven, Hendrik Marie; and de Wied, David, 4,110,322, Cl. 260-112.50R.
- DeYoung, Russell J.: *See—*
  - United States of America, National Aeronautics and Space Administration; Jalufka, Nelson W.; Hohl, Frank; DeYoung, Russell J.; and Williams, Michael D., 4,110,703, Cl. 331-94.50P.
- de Zarauz, Yves, to Compagnie Generale des Etablissements Michelin. Polymerization process. 4,110,525, Cl. 526-177.000.
- Dhaussy, Dominique: *See—*
  - Dreulle, Paule; Longuepee, Michel; and Dhaussy, Dominique, 4,110,128, Cl. 148-6.15Z.
- Diamond, Julius, to Cooper Laboratories, Inc. Bis-carbamylguanidinoazaalkane antimicrobial compounds. 4,110,328, Cl. 544-380.000.
- Diamond Shamrock Corporation: *See—*
  - Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,110,451, Cl. 424-251.000.
  - Papalos, John George, 4,110,367, Cl. 260-511.000.
- Diamond Shamrock Technologies S.A.: *See—*
  - Nidola, Antonio; De Nora, Vittorio; and Spaziante, Placido M., 4,110,180, Cl. 204-128.000.
- Diamond, Steven M.: *See—*
  - Kim, Hyun Jung, 4,109,530, Cl. 73-427.000.
- Dickhudt, Eugene A.: *See—*
  - Bolduc, Lee R.; and Dickhudt, Eugene A., 4,109,654, Cl. 128-235.000.
- Dieck, Ronald L.; and Magnusson, Alan B., to Armstrong Cork Company. Catalytic process for the preparation of phosphazene polymers. 4,110,421, Cl. 423-300.000.
- Dieckman, Harry E.: *See—*
  - Kinley, John C.; Anderson, Clifford E.; Agee, Charles W.; and Dieckman, Harry E., 4,109,386, Cl. 33-178.00F.
- Diesel Kiki Co., Ltd.: *See—*
  - Uchino, Mitsuo; and Takahashi, Seizi, 4,109,627, Cl. 123-140.00R.
- Dieter, Guckenhan: *See—*
  - Fromme, Hans-Georg; and Dieter, Guckenhan, 4,109,768, Cl. 191-22.00R.
- Dietrich, Hagen, to Norris Industries. Fire sleeve for tubular locks. 4,109,498, Cl. 70-449.000.
- Dietrich, Hagen: *See—*
  - Potter, Dennis G.; Dietrich, Hagen; and Potschka, Joseph, 4,109,948, Cl. 292-169.150.
- Dietrich, Ursula. Toothbrush with curved handle. 4,109,339, Cl. 15-167.00R.
- Difley, Charles Rogers; and McDonald, William Roy, to Whirlpool Corporation. Refuse compaction method. 4,109,571, Cl. 100-35.000.
- Digby, James Baden: *See—*
  - Newson, John Chase; Tregoning, Geoffrey Robinson; and Digby, James Baden, 4,109,416, Cl. 49-316.000.
- Dijkmans, Eise Carel, to U.S. Philips Corporation. Feeding bridge. 4,110,636, Cl. 307-237.000.
- DiLiddo, Ronald C.; and King, Dallas E., to General Motors Corporation. Method of manufacturing a circuit breaker assembly or the like. 4,109,376, Cl. 29-622.000.
- Di Pietro, Francis M., to Amerace Corporation. Electrical connector with adaptor for paper-insulated, lead-jacketed electrical cables and method. 4,110,550, Cl. 174-19.000.
- Dischert, Robert Adams; and Walter, James Morgan, to RCA Corporation. Clock generator for video signal processing. 4,110,785, Cl. 358-19.000.
- Dix, Kurt, to G. Wolf Jr. Kommanditgesellschaft. Sealing closure for an opening of a coking oven. 4,110,173, Cl. 202-248.000.
- Dobija, Michael J., to Masonite Corporation. Tub surround. 4,109,426, Cl. 52-35.000.
- Dr. Ernst Fehrer Gesellschaft m.b.H. & Co. K.G. Textilmaschinenfabrik u. Stahlbau: *See—*
  - Fehrer, Ernst; and Konig, Franz, 4,109,454, Cl. 57-58.950.
- Dr. -Ing. Rudolf Hell GmbH.: *See—*
  - Mollgaard, Klaus; Keller, Hans; Sendtko, Ulrich; and Sommer, Rudiger, 4,110,826, Cl. 364-526.000.
- Dr. Johannes Heidenhain GmbH: *See—*
  - Baumgartner, Alfons; Berg, Walter; Burkhardt, Horst; Laubin, Jurgen; and Schlick, Helmut, 4,110,828, Cl. 364-562.000.
- Doi, Scott S., to Bendix Corporation, The. Snap action switch. 4,110,573, Cl. 200-67.0DA.
- Donato, Giuseppe. Apparatus for determining the amount and location of unbalance in a rotating wheel of a vehicle. 4,109,532, Cl. 73-457.000.
- Dooley, Joseph L.; and Yelke, Edward, to Creative Tool Company. Engine monitoring apparatus. 4,109,518, Cl. 73-119.00A.
- Dorian, Hubert J. Dental tools. 4,109,384, Cl. 32-40.00R.
- Dorrance, William Thomas; and Wilson, William Richard, to General Dynamics Corporation Electronics Division. Navigation system and method for determining the position of an ocean mining ship. 4,110,726, Cl. 340-6.00R.

- Dorschner, Terry A.: *See—*
  - Smith, Irl Wilson, Jr.; and Dorschner, Terry A., 4,110,045, Cl. 356-106.0LR.
- Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
  - Hayashi, Kiyozumi; Ohta, Takeo; and Kobori, Tetsuo, 4,110,160, Cl. 176-78.000.
- Dotson, James D.; and Jones, Annette. Indoor automobile starting system. 4,110,629, Cl. 290-38.00R.
- D'Ottavio, Eugene D.: *See—*
  - Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S., 4,110,147, Cl. 156-306.000.
- Dow Chemical Company, The: *See—*
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  - Bertram, James L.; and Shih, Pong Su, 4,110,354, Cl. 260-348.140.
  - Corbett, John M.; and Dechow, Frederick J., 4,110,274, Cl. 521-157.000.
  - Goode, John V., Jr., 4,109,527, Cl. 73-343.500.
  - Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,109,792, Cl. 206-525.000.
  - McGregor, Stanley D., 4,110,104, Cl. 71-94.000.
  - Nelson, Donald L.; and Herbert, Norman T., 4,110,279, Cl. 260-19.00R.
- Dowd, James D.: *See—*
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- Dowty Mining Equipment Limited: *See—*
  - Harris, Robert Graham, 4,109,472, Cl. 61-45.00D.
- Drabek, Rudolf: *See—*
  - Bergmans, Hendrik Jan; and Drabek, Rudolf, 4,110,799, Cl. 360-70.000.
- Dreer, Gottfried. Process for the manufacture of fillers from solid waste. 4,110,281, Cl. 260-22.00A.
- Dresch, Charles D.; and Yohe, Robert A., to Bethlehem Steel Corporation. Water-cooled electrode holder. 4,110,548, Cl. 13-16.000.
- Dresser Industries, Inc.: *See—*
  - Gorgens, Joseph E.; and Morris, Matthew Gerald, Jr., 4,109,537, Cl. 73-756.000.
  - Greenlee, Donald Roy; and Burns, Milton Wayne, 4,109,714, Cl. 166-53.000.
  - Miller, Gerald Adrian; and Zabsky, John Mitchell, 4,109,756, Cl. 181-266.000.
  - Youmans, Arthur H., 4,109,521, Cl. 73-151.000.
- Dreulle, Noel: *See—*
  - Longuepee, Michel; and Dreulle, Noel, 4,110,127, Cl. 148-6.15Z.
- Dreulle, Paule; Longuepee, Michel; and Dhaussy, Dominique, to International Lead Zinc Research Organization, Inc. Solution and procedure for depositing a protective coating on galvanized steel parts, and solution regeneration procedure. 4,110,128, Cl. 148-6.15Z.
- Drinkard, John Halmer, Jr.; and Walton, Charles Eugene, II, to Burroughs Corporation. Semiautomatic twisted wire cable stripper. 4,109,553, Cl. 81-9.510.
- Drouin, Claude, to Les Industries BFG Limitee. Latch mechanism for pyrolytic range. 4,109,637, Cl. 126-197.000.
- Drummond, James C.; and Hughes, Lawrence J., to Monsanto Company. Preparation of dihydroxydiphenyl alkanes. 4,110,542, Cl. 568-729.000.
- DSO "Cherna Metalurgia": *See—*
  - Peev, Vassil Georgiev; Valchev, Alexander Yordanov; and Bakalov, Nikolay Georgiev, 4,110,547, Cl. 13-11.000.
- Dubil, James F.; Leighton, Howard N.; and Wilfinger, Raymond J., to International Business Machines Corporation. Bucket brigade circuit for signal scaling. 4,110,835, Cl. 364-844.000.
- Dubois, Jean Claude: *See—*
  - Abert-Mellah, Marie Annick; Dubois, Jean Claude; and Zann, Annie, 4,110,243, Cl. 252-299.000.
- Ducol, Jean-Paul; Gobry, Dominique; Raisin, Jean-Pierre; and Agence Nationale de Valorisation de la Recherche (ANVAR), to Institut Textile de France. Multidifferential device. 4,109,595, Cl. 112-121.110.
- Duddy, Joseph C.; and Hein, Edward R., to ESB Ray-O-Vac Management Corporation. Method for making storage battery grid from lead-tin-zinc alloy. 4,109,358, Cl. 29-2.000.
- Duembgen, Gerd: *See—*
  - Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.
- Duffy, Joseph Kevin: *See—*
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- Dujardin, Francois: *See—*
  - Sluse, Guy; and Dujardin, Francois, 4,110,181, Cl. 204-147.000.
- Dummer, Robert E., to Bucyrus-Erie Company. Tilt preventing system for drills. 4,109,733, Cl. 173-4.000.
- Dunkl, Franz S.: *See—*
  - Ross, Sidney D.; and Dunkl, Franz S., 4,110,817, Cl. 361-433.000.
- Dunn, Terry: *See—*
  - Williams, Joel; Dunn, Terry; and Stannett, Vivian, 4,110,185, Cl. 204-159.200.
- Dunning, Richard E.; and Nelson, Marshall A., to Avery Products Corporation. Embossing roller and apparatus. 4,110,152, Cl. 156-553.000.
- Du Pont de Nemours, E. I., and Company: *See—*
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  - Fremont, Joseph Melvin, 4,110,249, Cl. 252-431.00R.
  - Fugitt, Robert Benson; and Schwing, Gregory Wayne, 4,110,473, Cl. 424-331.000.
  - Lauder, Alan; and McCann, Elrey L., III, 4,110,251, Cl. 252-442.000.
  - Lauder, Alan, 4,110,254, Cl. 252-462.000.
  - Lauder, Alan, 4,110,258, Cl. 252-468.000.
  - Moore, Edward Joseph; and Owens, John Edward, 4,110,810, Cl. 361-213.000.
  - Mouissie, Bob, 4,109,986, Cl. 339-17.00L.
  - Secor, Robert Miller, 4,110,491, Cl. 427-212.000.
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  - Vladuchick, Susan Anne, 4,110,335, Cl. 260-302.00S.
- Durket, Michael P. Book holder for student's desk. 4,109,889, Cl. 248-447.000.
- Durst, Felix. Hot water floor heater. 4,109,859, Cl. 237-69.000.
- Dutton-Lainson Company: *See—*
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- DuVall, Wilbur E.: *See—*
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- Dwek, Abraham. Garment hanger. 4,109,838, Cl. 223-91.000.
- Dyballa, Manfred; and Schutzenauer, Dieter, to Daimler-Benz Aktiengesellschaft. Method and apparatus for controlling the correct angular adjustment of periodic injection operations. 4,109,517, Cl. 73-119.00A.
- Dzhashi, Avtandil Vladimirovich: *See—*
  - Pirkulov, Vladimir Georgievich; Askarov, Mikhail Arkadievich; and Dzhashi, Avtandil Vladimirovich, 4,110,241, Cl. 252-182.100.
- E. J. Price (Developments) Limited: *See—*
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- E. R. Squibb & Sons, Inc.: *See—*
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  - Denzel, Theodor; and Hoehn, Hans, 4,110,454, Cl. 424-251.000.
  - Rovnyak, George C.; and Vogt, B. Richard, 4,110,452, Cl. 424-251.000.
  - Wade, Peter C.; and Vogt, B. Richard, 4,110,449, Cl. 424-250.000.
- E. W. Buschman Company, The: *See—*
  - Vogt, Robert K., 4,109,783, Cl. 198-781.000.
- Easter, Holton C.; Matrinetz, Frank F.; and Myers, Ted L., to Inland Steel Company. Mounting assembly for rolling mill guide box. 4,109,972, Cl. 308-3.00R.
- Eastman Kodak Company: *See—*
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  - Farley, Ronald William; and Smith, Donald Luke, 4,110,026, Cl. 355-3.00R.
  - Kindig, Guilford Edwin, 4,110,771, Cl. 354-207.000.
  - Merry, J. Bradford, 4,110,788, Cl. 358-63.000.
  - Schaeffer, James R.; Minsk, Louis M.; and Stevens, Richard E., 4,110,079, Cl. 23-253.0TP.
  - Sloan, Cephas H.; and Pacifici, James G., 4,110,187, Cl. 204-159.190.
  - Tygart, Robert Carl, 4,109,365, Cl. 29-421.00R.
  - Zannucci, Joseph S.; and Hedberg, David G., Jr., 4,110,301, Cl. 260-40.00P.
- Eaton Corporation: *See—*
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  - Johnson, Oliver Wendell, 4,109,679, Cl. 137-596.130.
  - Paskert, Joseph H., 4,109,693, Cl. 151-41.750.
- Eaton Yale Ltd.: *See—*
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- Ebauches S.A.: *See—*
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  - Laesser, Claude, 4,110,744, Cl. 340-336.000.
  - Rusznyak, Andreas, 4,110,637, Cl. 307-238.000.
- Ebeling, Charles E., Jr., to United States of America, Navy. Two-position nozzle. 4,109,867, Cl. 239-265.150.
- Ebelt, Gunter, to Maschinenfabrik Gluckauf Beukenberg G.m.b.H. Automatic honing machine and method. 4,109,418, Cl. 51-34.00F.
- Eberle, William J., to General Battery Corporation. Automatic air leak testing apparatus and method. 4,109,793, Cl. 209-74.00R.
- Ebi, Yutaka; and Saitou, Masatoshi, to Ricoh Company, Ltd. Electrostatic copying apparatus. 4,110,031, Cl. 355-14.000.
- Eckels, Robert E. Shaped charge with enhanced penetration. 4,109,576, Cl. 102-24.0HC.
- Economy, James; Frechette, Francis J.; and Wobrer, Luis C., to Carborundum Company, The. Nylon modified phenolic resin fibers. 4,110,277, Cl. 260-841.000.
- Edelman, Robert: *See—*
  - Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,110,302, Cl. 260-40.00R.
- Eden, Richard C.; and Nakano, Kenichi, to United States of America, Air Force. Narrow-band inverted homo-heterojunction avalanche photodiode. 4,110,778, Cl. 357-30.000.

- Eden, Richard C.: *See—*
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- Edging, Robert Ray; and Lee, Lien-Mow, to Du Pont de Nemours, E. I., and Company. Process for preparing poly(ethylene terephthalate). 4,110,316, Cl. 526-68.000.
- Edick, John D.; and Ostrander, Kenneth A., to Reliance Electric Company. Dynamoelectric machine and tachometer. 4,110,676, Cl. 322-31.000.
- Edwards, Earl Garland: *See—*
  - Brown, Leon Calvin; Edwards, Earl Garland; Peterson, Charles Edwin; Robinson, Peter George; and Wilson, Clement Card, 4,110,068, Cl. 432-60.000.
- Edwards, Laroy H., to Chevron Research Company. 1-Triorganostannyl-3-organothio-4-substituted-1,2,4-delta^2-triazolidin-5-ones. 4,110,332, Cl. 260-299.000.
- Ege, Sigmund, to Kloften & Kloften A/S. Method of splicing tape by soldering. 4,110,592, Cl. 219-85.00M.
- Egli, Alwin, to SIG Schweizerische Industrie-Gesellschaft. Package composed of an inner bag enclosed by an outer container. 4,109,822, Cl. 220-404.000.
- Ehrenfruend, Herbert A., to Olefoam Corporation. Method of making polyethylene foam. 4,110,269, Cl. 521-81.000.
- Eiland, P. Frank: *See—*
  - Spanel, Abram N.; Eiland, P. Frank; Jacobs, David R.; and Ziegler, Geza C., 4,109,594, Cl. 112-79.00R.
- Eilerman, Robert G.: *See—*
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- Eisert, Wolfgang, to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen. Apparatus for counting and classifying particles. 4,110,043, Cl. 356-102.000.
- Eitel, Fredrick G., to United Technologies Corporation. Lightweight cooled·laser mirror. 4,110,013, Cl. 350-310.000.
- Ek, Birger Henrik; and Stenudd, Sven Gunnar Valter, to Facit Aktiebolag. Apparatus for marking an information carrying medium. 4,109,776, Cl. 400-124.000.
- Ekstedt, Edward E.; Beck, Edwin J., Jr.; Bahr, Donald W.; and Weinstein, Barry, to General Electric Company. Double walled impingement cooled combustor. 4,109,459, Cl. 60-39.660.
- Electric Machinery Mfg. Co.: *See—*
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- Electric Power Research Institute, Inc.: *See—*
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- Electronics Corporation of America: *See—*
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- Eli Lilly and Company: *See—*
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  - Barnett, Charles J.; Bimm, Richard A.; and Cullinan, George C., 4,110,330, Cl. 260-287.00B.
  - Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, 4,110,099, Cl. 71-76.000.
  - Holmes, Richard E., 4,110,465, Cl. 424-274.000.
  - Nakatsukasa, Walter M.; and Hamill, Robert L., 4,110,435, Cl. 424-122.000.
  - Nakatsukasa, Walter M.; and Hamill, Robert L., 4,110,436, Cl. 424-122.000.
- Elkamet/Lahn Kunststoff GmbH/Werk: *See—*
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- Elliott, Charles Anthony; and Huff, Larry Dean, to RCA Corporation. Package actuated record extracting mechanism for a video disc player. 4,109,919, Cl. 274-9.00B.
- Elmore, Theodore V. Heating device. 4,110,597, Cl. 219-200.000.
- Elswood, Ebbert Lee, to Bell & Howell Company. Vibration transducer with improved viscous damping. 4,110,731, Cl. 340-17.00R.
- Eltra Corporation: *See—*
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- Emerson Electric Co.: *See—*
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- Emmel, Ludwig: *See—*
  - Mildenberger, Hilmar; Stahler, Gerhard; and Emmel, Ludwig, 4,110,336, Cl. 260-307.00G.
- Endo, Hiroshi, to Nissan Motor Company, Limited. Detection of angular displacement to an object from the moving vehicle. 4,110,754, Cl. 343-16.00R.
- Endruscheit, Peter: *See—*
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- Eneman, Melvin, to United States of America, Army. Projectile fuze. 4,109,583, Cl. 102-244.000.
- Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, to BASF Aktiengesellschaft. Method of separating high-boiling or non-volatile materials. 4,110,370, Cl. 260-530.00N.
- Engelhard Minerals & Chemicals Corporation: *See—*
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- Engins Matra: *See—*
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- Enomoto, Minoru, to Toyoda-Koki Kabushiki Kaisha. Programmable feed control apparatus for a machine tool. 4,110,674, Cl. 318-571.000.
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- Erickson, Clifford A.: *See—*
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- Erickson, Frederick L. High displacement-to-size ratio orbiting fluid mechanism. 4,110,060, Cl. 417-462.000.
- Erickson, James A.: *See—*
  - Erickson, John W.; and Erickson, James A., 4,110,584, Cl. 200-304.000.
- Erickson, John W.; and Erickson, James A., to Boltswitch, Inc. Load break switch with transparent internal shield. 4,110,584, Cl. 200-304.000.
- Erikson, Rolf B.: *See—*
  - Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,110,020, Cl. 353-26.00A.
- Eriksson, Leif, to Svenska Traforskningsinstitutet. Method and means for measuring web tension in paper or foils. 4,109,520, Cl. 73-143.000.
- Eriksson, Lennart: *See—*
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- Eriksson, Raimo: *See—*
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- Ernest, Robert P., to Ford Motor Company. Controlled flow cooling system for low weight reciprocating engine. 4,109,617, Cl. 123-41.740.
- Ernst Leitz Wetzlar GmbH: *See—*
  - Leitz, Ludwig, 4,110,042, Cl. 356-4.000.
- Ernst, Richard G.; and Medved, Charles W., to Electric Machinery Mfg. Co. Electrically insulated sleeve bearing and method of making same. 4,109,978, Cl. 308-237.00R.
- Ersoy, Kadri Okan, to Sentralinstitutt for Industriell Forskning. Method for producing a synthetic hologram. 4,109,996, Cl. 350-3.660.
- ESB Ray-O-Vac Management Corporation: *See—*
  - Duddy, Joseph C.; and Hein, Edward R., 4,109,358, Cl. 29-2.000.
- Esch, Erich: *See—*
  - Boehmke, Gunther; Fries, Hermann; and Esch, Erich, 4,110,119, Cl. 106-38.240.
- Escher, Balint: *See—*
  - Frade, Gilbert; Escher, Balint; and Prince, Dominique, 4,110,815, Cl. 361-433.000.
- Escher Wyss Limited: *See—*
  - Stotz, Wolf-Gunter; and Hund, Helmut, 4,110,156, Cl. 162-305.000.
- Eslinger, Ralph Gilbert; and Nicolson, John Millar, to Bendix Corporation, The. Wheel speed sensor. 4,110,647, Cl. 310-168.000.
- Esser, Gustav, to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH. Horizontal external broaching machine. 4,109,560, Cl. 90-96.000.
- Esser, Leonard Jan Maria; and Theunissen, Matthias Johannes Joseph, to U.S. Philips Corporation. Charge-coupled device. 4,110,777, Cl. 357-24.000.
- Estabrook, Mark R.: *See—*
  - Marriott, Roger; and Estabrook, Mark R., 4,110,218, Cl. 210-223.000.
- Estaque, Andre Fernand, to Societe Anonyme Automobile Citroen. Elastic coupling. 4,109,979, Cl. 308-238.000.
- Evans, Dafydd W., to Towmotor Corporation. Steering apparatus. 4,109,748, Cl. 180-141.000.
- Evans, Robert Franklin, to Du Pont de Nemours, E. I., and Company. Self-stripping electrical connector and terminal. 4,109,991, Cl. 339-99.00R.
- Evans, Theodore A.; and Watts, William A., to Goodyear Tire & Rubber Company, The. Packaged articles. 4,110,500, Cl. 428-35.000.
- Evans, Wayne Wheeler, to RCA Corporation. Lockup inhibiting arrangement for a phase locked loop tuning system. 4,110,693, Cl. 325-419.000.
- Everbrite Electric Signs, Inc.: *See—*
  - Trame, Charles Edward, 4,110,393, Cl. 264-132.000.
- Exxon Production Research Company: *See—*
  - Cooke, Claude E., Jr., 4,109,717, Cl. 166-250.000.
- Exxon Research & Engineering Co.: *See—*
  - Bosniàck, David S.; and Korbach, Paul F., 4,110,196, Cl. 208-13.000.
- Facit Aktiebolag: *See—*
  - Ek, Birger Henrik; and Stenudd, Sven Gunnar Valter, 4,109,776, Cl. 400-124.000.
- Fagan, Louis E., to Litton Systems, Inc. Brush block assembly. 4,110,651, Cl. 310-239.000.
- Fagersta Secoroc AB: *See—*
  - Svanstrom, Alf Henrik; and Kangas, Karl-Erik, 4,109,974, Cl. 308-8.200.
- Fahey, William David, to Singer Company, The. Character recognition apparatus for serially comparing an unknown character with a plurality of reference characters. 4,110,737, Cl. 340-146.30Q.
- Fahrni, Fritz; and Zimmermann, Anton, to Ciba-Geigy AG. Coating device. 4,109,611, Cl. 118-325.000.
- Fairchild, Louis F.; and Brecht, Robert R., to Iowa Manufacturing

Comapny. Steering and width controls for expandable tandem rollers. 4,109,742, Cl. 180-20.000.

- Falarde, Anna. Self-sealing paste dispensing device. 4,109,836, Cl. 222-494.000.
- Faltex Handels AG: *See—*
  - Barrer, Robert, 4,109,902, Cl. 270-79.000.
- Famir International S.p.A.: *See—*
  - Giaccherino, Renzo Rossetto, 4,109,420, Cl. 51-105.00R.
- Farag, Essam A.: *See—*
  - Kwok, Clyde C. K.; and Farag, Essam A., 4,109,834, Cl. 222-448.000.
- Farbu, Leif: *See—*
  - Gaudernack, Bjorn; Gjelsvik, Norvald; and Farbu, Leif, 4,110,399, Cl. 423-112.000.
- Farina, Attilio, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit for generating a saw tooth waveform. 4,110,666, Cl. 315-408.000.
- Farish, Owen, to Westinghouse Electric Corp. Gas-type circuit-interrupters having admixtures of helium with small concentrations of sulfur-hexafluoride (SF$_6$) gas. 4,110,580, Cl. 200-148.00G.
- Farley, Ronald William; and Smith, Donald Luke, to Eastman Kodak Company. Discharger apparatus for photoconductors. 4,110,026, Cl. 355-3.00R.
- Farmer, Thomas Henry, to Carless, Capel & Leonard Limited. Process for removing polonium from natural gas condensates containing the same. 4,110,204, Cl. 208-251.00R.
- Fassel, Velmer A.: *See—*
  - Olson, Kenneth W.; Haas, William J., Jr.; and Fassel, Velmer A., 4,109,863, Cl. 239-102.000.
- Fattori, Joseph E.: *See—*
  - Fattori, Lazzaro A.; and Fattori, Joseph E., 4,109,789, Cl. 206-404.000.
- Fattori, Lazzaro A.; and Fattori, Joseph E., to Plastic Reel Corporation of America. Self-contained latch constructions for interlocking containers in stacked relation. 4,109,789, Cl. 206-404.000.
- Faulstich, George W., to Three Sisters Ranch Enterprise. Plastic cap for bottle. 4,109,816, Cl. 215-256.000.
- Faygo Beverages, Inc.: *See—*
  - Roman, Ronald S., 4,109,956, Cl. 296-78.00R.
- Feasel, James E., to Airomat Corporation, The. Floor mat having interchangeable design elements. 4,109,439, Cl. 52-667.000.
- Fedders Corporation: *See—*
  - Daily, Thomas Edward, 4,109,397, Cl. 34-239.000.
- Fedro, John J.: *See—*
  - Godfrey, Frederick D., Jr.; Fedro, John J.; and Sinclair, Robert I., 4,109,665, Cl. 131-15.00C.
- Fehrer, Ernst; and Konig, Franz, to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co. K.G. Textilmaschinenfabrik u. Stahlbau. Apparatus for twisting textile fibers. 4,109,454, Cl. 57-58.950.
- Felcman, Francis Adolph: *See—*
  - Wood, James Carlos; and Felcman, Francis Adolph, 4,110,050, Cl. 400-248.000.
- Feleus, Christiaan Cornelis. Dynamic power booster. 4,109,539, Cl. 74-36.000.
- Fennessy, Donald W.; and Schmitz, Harry W., to General Electric Company. Method for manufacturing semiconductor devices. 4,109,373, Cl. 29-588.000.
- Fenouillet, Jean Marc Pierre: *See—*
  - Chevallier, Francois Edmond; and Fenouillet, Jean Marc Pierre, 4,110,097, Cl. 65-136.000.
- Ferguson, Hugo S. Mower of the cross-flow blower type with blades of opposite helix angle. 4,109,447, Cl. 56-13.300.
- Fernandez, Robert R. Method and apparatus for repairing leaks in water heaters. 4,109,684, Cl. 138-97.000.
- Ferralli, Michael W., to Lord Corporation. Muffler. 4,109,752, Cl. 181-252.000.
- Ferreira, Sergio Henrique: *See—*
  - Wilkinson, Samuel; Flower, Roderick John; and Ferreira, Sergio Henrique, 4,110,432, Cl. 424-85.000.
- Ferro Corporation: *See—*
  - Rion, Richard G., 4,110,487, Cl. 427-27.000.
- Festa, Thomas A. Schottky diode with voltage limiting guard band. 4,110,775, Cl. 357-15.000.
- Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Gamma-L-glutamyl cholamine phosphate. 4,110,441, Cl. 424-211.000.
- Ffooks, Roger Cambridge; and Komada, Hiroshi, to Conch LNG. Insulation system for liquefied gas tanks. 4,109,823, Cl. 220-446.000.
- FIAT Societa per Azinni: *See—*
  - Bassoli, Cesare; and Cornetti, Giorgio, 4,109,506, Cl. 73-10.000.
  - Brusaglino, Giampiero; and Savonuzzi, Giovanni, 4,109,743, Cl. 180-65.00C.
- Files, James H.; Montague, John M.; and Thomerson, Clarence T., to Regal Tool & Rubber Co., Inc. Bumper assembly shock cell system. 4,109,474, Cl. 61-48.000.
- Findlay, Allen Cameron, to Reeves Brothers, Inc. Method and apparatus for forming convolute foam package. 4,109,443, Cl. 53-118.000.
- Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., to FMC Corporation. Mixed carboxylic/sulfonic anhydrides in peroxygen bleaching. 4,110,074, Cl. 8-111.000.
- Finnemore, Fred M., to Polaroid Corporation. Pull strip guide for multipurpose film cassettes. 4,110,018, Cl. 352-130.000.
- Fischer, Artur. Structural element for construction kits and method of making the element. 4,109,409, Cl. 46-25.000.
- Fischetti, Frank, Jr.: *See—*
  - Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., 4,109,662, Cl. 131-2.000.
- Fishwick, Alan James, to Metal Box Limited. Depalletizing apparatus. 4,109,802, Cl. 214-8.50F.
- Fitch, Clifford E., Jr.: *See—*
  - Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr., 4,110,481, Cl. 426-438.000.
- Fitch, Clifford E., Sr.: *See—*
  - Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr., 4,110,481, Cl. 426-438.000.
- Fitzpatrick, Joseph W.; and Olin, Arthur D., to Toms River Chemical Corporation. Composition of mixed benzensulfonamido anthraquinone dyes and linear polyester material dyed therewith. 4,110,072, Cl. 8-25.000.
- Fladda, Gerdt: *See—*
  - Pettersson, Torulf; Fladda, Gerdt; and Eriksson, Lennart, 4,110,044, Cl. 356-103.000.
- Flagg, John F.; and Antos, George J., to UDP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,110,199, Cl. 208-139.000.
- Fleagle, Wilbur J.: *See—*
  - Cusick, Richard T.; and Fleagle, Wilbur J., 4,110,576, Cl. 200-82.00E.
- Flexothane Corporation: *See—*
  - Moeller, Carl A., Jr., 4,110,054, Cl. 403-373.000.
- Flint, John R.: *See—*
  - Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,110,020, Cl. 353-26.00A.
- Floryan, Daniel Edwin: *See—*
  - Cooper, Glenn Dale; and Floryan, Daniel Edwin, 4,110,311, Cl. 528-215.000.
- Flower, Roderick John: *See—*
  - Wilkinson, Samuel; Flower, Roderick John; and Ferreira, Sergio Henrique, 4,110,432, Cl. 424-85.000.
- Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Poletto, John Frank; Schaub, Robert Eugene; and Bernady, Karel Francis, to American Cyanamid Company. Hydro substituted prostanoic acids and esters. 4,110,368, Cl. 260-514.00D.
- FMC Corporation: *See—*
  - Finley, Joseph H.; Blumbergs, John H.; and Erickson, Clifford A., 4,110,074, Cl. 8-111.000.
  - Jameson, Neal E., 4,109,688, Cl. 141-387.000.
  - Larsen, Gregory J.; and Hiszpanski, Jan A., 4,109,341, Cl. 15-340.000.
- Fogarollo, Pier Paolo, to Lames Societa per Azioni. Guide device for a slidable window of a vehicle. 4,109,417, Cl. 49-352.000.
- Fogarty, A. Edward: *See—*
  - Wetherell, Joseph J.; Fogarty, A. Edward; and Fogarty, Bonnie Rose, 4,109,411, Cl. 46-79.000.
- Fogarty, Bonnie Rose: *See—*
  - Wetherell, Joseph J.; Fogarty, A. Edward; and Fogarty, Bonnie Rose, 4,109,411, Cl. 46-79.000.
- Fohl, Artur. Winding-up device with automatic lock initiated by friction for a safety belt. 4,109,881, Cl. 242-107.40A.
- Folkers, Karl. Synthetic tridecapeptide [Gln^4]-neurotensin baving hormonal activity. 4,110,321, Cl. 260-112.50R.
- Ford, Donald E. Automated machinery to clean debris from roadside ditches, collect it and then transport the debris to a major collecting area for disposing. 4,109,336, Cl. 15-3.000.
- Ford Motor Company: *See—*
  - Ernest, Robert P., 4,109,617, Cl. 123-41.740.
  - Gupta, Nirmal K., 4,110,515, Cl. 429-104.000.
- Foreman, James Arthur: *See—*
  - Klein, Bernard; and Foreman, James Arthur, 4,110,077, Cl. 23-230.00B.
- Forster, Karl-Heinz; Lein, Werner; and Heiber, Hartmut, to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Control system for positioning units exhibiting dead times. 4,109,574, Cl. 101-216.000.
- Forster, Siegfried; and Kleemann, Manfred, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Heat exchanger. 4,109,710, Cl. 165-165.000.
- Foster, Basil Bernard, to International Standard Electric Corporation. Surge protection device for repeater. 4,110,570, Cl. 179-170.00J.
- Foster Wheeler Energy Corporation: *See—*
  - Hayden, Robert Leslie James; and Bell, Alan, 4,109,613, Cl. 122-1.00R.
- Foti, Anthony J., to Goodyear Tire & Rubber Company, The. Flexible composite laminate of woven fabric and thermoplastic material and method of making said laminate. 4,109,543, Cl. 74-231.00P.
- Fox, Richard Q.; Sigut, Donald E.; and McWhirter, John H., to Westinghouse Electric Corp. Control method for optimizing the power demand of an industrial plant. 4,110,825, Cl. 364-492.000.
- Frade, Gilbert; Escher, Balint; and Prince, Dominique, to Societe Lignes Telegraphiques et Telephoniques. Solid electrolytic capacitor. 4,110,815, Cl. 361-433.000.
- Frame, Robert R.: *See—*
  - Selvidge, Charles W.; Morgan, Kenneth A.; and Frame, Robert R., 4,110,398, Cl. 423-62.000.
- Francis, John Elsworth, to Ciba-Geigy Corporation. Bis-arylalkylamino-aralkanes. 4,110,457, Cl. 424-263.000.
- Francon, Francis: *See—*
  - Francon, Jean; and Francon, Francis, 4,109,503, Cl. 72-352.000.
- Francon, Jean; and Francon, Francis. Method for manufacturing metallic ribs on sheet stock. 4,109,503, Cl. 72-352.000.

Franek, Jozef T., to Metal Box Limited. Creating lines of weakness in sheet material. 4,109,500, Cl. 72-203.000.

Frank, Dudley B.: *See—*
Garabedian, Arthur, 4,109,634, Cl. 123-198.00F.

Frank, Robert I.: *See—*
Kaplow, Roy; and Frank, Robert I., 4,110,122, Cl. 136-89.00P.

Frankiewicz, Theodore C., to Kennecott Copper Corporation. Selective sulfation process for partitioning ferrous and non-ferrous values in an ore. 4,110,106, Cl. 75-1.00R.

Franz, John E.; and Sacher, Reuven M., to Monsanto Company. Phosphinylmethylimino-acetic acid N-oxide compounds and the sucrose increasing use thereof. 4,110,100, Cl. 71-86.000.

Franzen, Hans Arne Edgar: *See—*
Bjorkqvist, Nils Gunnar; Franzen, Hans Arne Edgar; and Johansson, Karl Ingmar Wenzel, 4,109,577, Cl. 102-35.600.

Fraser, Douglas S., to FTS Systems, Inc. Method and apparatus for an improved shelf and tray assembly for a freeze dryer. 4,109,396, Cl. 34-192.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Goetzberger, Adolf; and Greubel, Waldemar, 4,110,123, Cl. 136-89.0HY.

Frechette, Francis J.: *See—*
Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 4,110,277, Cl. 260-841.000.

Fredenberg, James D.: *See—*
Wilson, Edward A.; and Fredenberg, James D., 4,109,707, Cl. 165-46.000.

Freeman, Willie B.; Yeckley, Russell N.; Soles, Otto H.; and Telford, James M., to Westinghouse Electric Corp. Circuit breaker. 4,110,578, Cl. 200-148.00F.

Freitag, Dieter; Tresper, Erhard; Kuchenmeister, Rolf; and Beer, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of multinuclear phenols which are alkylated in the nucleus. 4,110,540, Cl. 568-718.000.

Fremont, Joseph Melvin, to Du Pont de Nemours, E. I., and Company. Preparation of bismuth modified spheroidal malachite. 4,110,249, Cl. 252-431.00R.

Frese, Albert, to Chemische Werks Huls A.G. Direct production of polymorph III of isotactic polybutene-1. 4,110,524, Cl. 526-158.000.

Frey, Walter: *See—*
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.

Friedman, Stuart D.: *See—*
Gaffar, Abdul; and Friedman, Stuart D., 4,110,429, Cl. 424-54.000.

Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, to BASF Aktiengesellschaft. Manufacture of olefin polymers. 4,110,522, Cl. 526-105.000.

Frielingsdorf, Hans: *See—*
Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,110,523, Cl. 526-124.000.

Fries, Hermann: *See—*
Boehmke, Gunther; Fries, Hermann; and Esch, Erich, 4,110,119, Cl. 106-38.240.

Frink, Russell E.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Improved energy-storage operating mechanisms for circuit-interrupting structures utilizing serially-related disconnecting switch structures therewith. 4,110,579, Cl. 200-146.00R.

Frischkorn, Hans; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Mixture of benzoxazole derivatives. 4,110,246, Cl. 252-301.280.

Fritzsche Dodge & Olcott Inc.: *See—*
Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., 4,109,662, Cl. 131-2.000.

Fromme, Hans-Georg; and Dieter, Guckenhan, to Thyssen Aufzuge GmbH. Current collector line. 4,109,768, Cl. 191-22.00R.

FTS Systems, Inc.: *See—*
Fraser, Douglas S., 4,109,396, Cl. 34-192.000.

Fuchs, Gundolf: *See—*
Pirck, Dietrich; and Fuchs, Gundolf, 4,110,282, Cl. 260-23.0AR.

Fugitt, Robert Benson; and Schwing, Gregory Wayne, to Du Pont de Nemours, E. I., and Company. Miticidal ethers. 4,110,473, Cl. 424-331.000.

Fuji Photo Film Co., Ltd.: *See—*
Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,110,766, Cl. 354-106.000.
Minagawa, Nobuhiko; and Ozaki, Tomoaki, 4,110,155, Cl. 162-135.000.
Ogawa, Hiroshi; Aonuma, Masashi; Nakamura, Matsuaki; and Tamai, Yasuo, 4,110,503, Cl. 428-64.000.
Oishi, Kengo, 4,110,805, Cl. 360-132.000.
Sato, Masamichi, 4,110,114, Cl. 96-36.000.
Sugiyama, Masatoshi; and Kato, Eiichi, 4,110,115, Cl. 96-84.00A.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo, 4,110,768, Cl. 354-173.000.

Fujii, Noriaki: *See—*
Fujikawa, Tetsuzo; and Fujii, Noriaki, 4,109,622, Cl. 123-73.00A.

Fujikawa, Tetsuzo; and Fujii, Noriaki, to Kawasaki Jukogyo Kabushiki Kaisha. Two stroke engines. 4,109,622, Cl. 123-73.00A.

Fujinami, Akira: *See—*
Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; and Fujinami, Akira, 4,110,462, Cl. 424-273.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; and Shiokawa, Youichi, 4,110,338, Cl. 260-308.00D.
Mori, Shigeru; Ohsawa, Shigeyoshi; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,110,166, Cl. 195-96.000.
Sano, Tokuo; Oshima, Takeo; and Kamata, Tokio, 4,110,467, Cl. 424-280.000.

Fujita, Masakazu: *See—*
Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 4,110,048, Cl. 356-200.000.

Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Superimposing device for use in a data-recording camera. 4,110,766, Cl. 354-106.000.

Fujitani, Yoshiyasu; and Muraki, Hideaki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for operating internal combustion engine. 4,109,461, Cl. 60-274.000.

Fujiwara, Yasuo, to Aero-Spec Products Co., Ltd. Cock apparatus of automatic ignition type for gas appliance. 4,110,065, Cl. 431-255.000.

Fukata, Ryoji: *See—*
Mori, Masatoshi; and Fukata, Ryoji, 4,110,290, Cl. 260-29.6RW.

Fukuoka, Tatsuo. Footwear. 4,109,661, Cl. 128-582.000.

Fukuyama, Masaru, to Nipponn Steel Corporation. Method of detecting a surface flaw of metallic material. 4,109,508, Cl. 73-15.0FD.

Fuller Company: *See—*
Boyhont, Donald S.; and Solt, Paul E., 4,109,966, Cl. 302-50.000.

Fuller, Lester R.; and Meyer, Herbert J., to Texaco Inc. Seismic data processing apparatus for obtaining alpha values from seismic data. 4,110,728, Cl. 340-15.5DP.

Fuller, Ronald George. Demountable partition wall. 4,109,430, Cl. 52-127.000.

Furka, Arpad: *See—*
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,110,441, Cl. 424-211.000.

Furukawa, Hikaru; Mitamura, Masakazu; and Higuchi, Kenji, to Takeda Rikeo Kogyo Kabushikikaisha. A-D converter having non-linear characteristics. 4,110,746, Cl. 340-347.0NT.

Furukawa, Naotake: *See—*
Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,452, Cl. 57-58.890.
Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,453, Cl. 57-58.910.

Furuta, Isao; and Takiguchi, Yoshimi, to Kobe Steel, Ltd. Process for denitration of exhaust gas. 4,110,183, Cl. 204-157.10R.

Fuxa, Jan, to Vyzkumny ustav hutnictvi zeleza. Cam plastometer. 4,109,516, Cl. 73-93.000.

G. D. Searle & Co.: *See—*
Lenz, George R.; and Schulz, John A., 4,110,325, Cl. 260-239.55C.

G. Wolf Jr. Kommanditgesellschaft: *See—*,
Dix, Kurt, 4,110,173, Cl. 202-248.000.

Gabriel, Charles L. Motorized unicycle wheel. 4,109,741, Cl. 180-21.000.

Gaetano, Mauro Luigi, to Harvey Hubbell, Incorporated. Duplex telephone signalling system. 4,110,565, Cl. 179-18.0AH.

Gaetano, Mauro Luigi; and Skrovanek, Ambroz Karol, to Harvey Hubbell, Incorporated. Voice/data receiver coupled with a transmission line through an input transformer working into an impedance approaching a short circuit. 4,110,711, Cl. 333-32.000.

GAF Corporation: *See—*
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,110,291, Cl. 260-29.6RW.

Gaffar, Abdul; and Friedman, Stuart D., to Colgate-Palmolive Company. Antibacterial oral composition. 4,110,429, Cl. 424-54.000.

Gage, Michael H.; and Zacks, Phillip H. Camp grill. 4,109,567, Cl. 99-450.000.

Gager, Morgan E., to Trans World Technology Laboratories, Inc. (TWT Labs Inc.). Donor sheet for thermographic imaging process. 4,109,937, Cl. 282-27.500.

Gahwyler, Max, to American Home Products Corporation. Method of treating depression. 4,110,438, Cl. 424-177.000.

Gaidis, James Michael: *See—*
Rosenberg, Arnold Morry; and Gaidis, James Michael, 4,110,120, Cl. 106-99.000.

Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, to Mitsubishi Gas Chemical Company, Inc. Curable resin compositions of cyanate esters. 4,110,364, Cl. 528-170.000.

Gale, Philip Franklin, to Electricity Council, The. Method of detecting faults on low voltage distribution electric cables utilizing a plurality of transient recorders. 4,110,684, Cl. 324-52.000.

Gallien, Shelby W.: *See—*
Shelby, Thomas A.; and Gallien, Shelby W., 4,110,297, Cl. 260-33.40P.

Gallo, Luigi C.: *See—*
Miller, Jerry W.; and Gallo, Luigi C., 4,110,798, Cl. 360-65.000.

Gandara, Nemesio N. Walk-in cooler construction. 4,109,984, Cl. 312-236.000.

Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, to Merck Patent Gesellschaft mit beschraenkter Haftung. Anti-inflammatory (holo-4-biphenylyl)-alkanolamines. 4,110,447, Cl. 424-244.000.

Garabedian, Arthur, to Frank, Dudley B.; and Garabedian, Arthur. Apparatus for modifying an internal combustion engine. 4,109,634, Cl. 123-198.00F.

Gardner, Beth Ann: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,110,459, Cl. 424-267.000.

Garrett, Ian; and Taylor, Michael Rivers, to Post Office, The. Growth of semiconductor compounds by liquid phase epitaxy. 4,110,133, Cl. 148-171.000.

Gates Rubber Company, The: *See—*
Reynolds, Linda M., 4,110,396, Cl. 264-236.000.

Gaudernack, Bjorn; Gjelsvik, Norvald; and Farbu, Leif, to Institutt for Atomenergi. Process for the extraction of alumina from aluminum-containing silicates. 4,110,399, Cl. 423-112.000.

Gebr. Loepfe AG: *See—*
Paul, Andreas, 4,110,654, Cl. 310-323.000.

Geck, Hans Gunter; and Kruse, Fritz, to Klockner-Werke AG. Method of producing cast iron. 4,110,108, Cl. 75-48.000.

Geffken, Robert Michael, to International Business Machines Corporation. Method for making an insulated gate field effect transistor utilizing a silicon gate and silicide interconnection vias. 4,109,372, Cl. 29-571.000.

General Battery Corporation: *See—*
Eberle, William J., 4,109,793, Cl. 209-74.00R.

General Cable Corporation: *See—*
Olszewski, Jerzy A.; and Sarkar, Arnab, 4,110,001, Cl. 350-96.230.

General Dynamics Corporation Electronics Division: *See—*
Dorrance, William Thomas; and Wilson, William Richard, 4,110,726, Cl. 340-6.00R.

General Electric Company: *See—*
Anderson, Harold G.; and Guess, Jeuel E., 4,110,067, Cl. 431-346.000.
Banucci, Eugene George; and Olander, Walter Karl, 4,110,312, Cl. 528-215.000.
Barkan, Philip, 4,110,582, Cl. 200-153.0SC.
Bovenkerk, Harold P., 4,109,737, Cl. 175-329.000.
Clayton, Thomas S., 4,109,864, Cl. 239-127.300.
Cooper, Glenn Dale; and Floryan, Daniel Edwin, 4,110,311, Cl. 528-215.000.
Ekstedt, Edward E.; Beck, Edwin J., Jr.; Bahr, Donald W.; and Weinstein, Barry, 4,109,459, Cl. 60-39.660.
Fennessy, Donald W.; and Schmitz, Harry W., 4,109,373, Cl. 29-588.000.
Hobson, Charles F., Jr.; and Hamilton, John D., 4,110,808, Cl. 361-44.000.
Kinson, Philip L., 4,110,541, Cl. 568-725.000.
Lee, Minyoung; and Szala, Lawrence E., 4,110,084, Cl. 51-307.000.
Ligon, Woodfin V., Jr.; and Lifshin, Eric, 4,110,612, Cl. 250-281.000.
Mark, Victor, 4,110,299, Cl. 260-37.0PC.
Mark, Victor, 4,110,307, Cl. 260-45.9KA.
McGahern, William J., 4,110,652, Cl. 310-261.000.
Noone, Michael J., 4,109,706, Cl. 165-32.000.
Sobieski, John C., 4,110,657, Cl. 313-332.000.
Wyland, Alvin D., 4,110,632, Cl. 307-117.000.

General Enterprises, Inc.: *See—*
Culpepper, William F.; and Hinkle, Charles G., 4,109,831, Cl. 222-254.000.

General Mills, Inc.: *See—*
Davis, Noel Bryant, 4,109,824, Cl. 221-7.000.

General Motors Corporation: *See—*
Beale, David A., 4,109,674, Cl. 137-493.900.
Carr, Herbert, 4,109,487, Cl. 62-474.000.
DiLiddo, Ronald C.; and King, Dallas E., 4,109,376, Cl. 29-622.000.
King, Jack B., 4,109,687, Cl. 141-5.000.
Magyar, Joseph J., 4,109,962, Cl. 297-385.000.
Richard, Raymond L., Jr., 4,109,367, Cl. 29-436.000.
Wickland, Warren A., 4,109,464, Cl. 60-397.000.

Georgia-Pacific Corporation: *See—*
Neal, John A., 4,110,208, Cl. 210-425.000.

Gerakaris, Stephen: *See—*
Arkles, Barry C.; and Gerakaris, Stephen, 4,110,186, Cl. 204-159.200.

Gerber Products Company: *See—*
Loveless, John H.; and Phillips, Claude T., 4,110,493, Cl. 427-233.000.

Geren, Lorenzo Dow: *See—*
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,109,792, Cl. 206-525.000.

Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyolefin-block copolymer-polyamide blends. 4,110,303, Cl. 260-42.180.

Gerritsen, Jan Willem. Peristaltic pump having particularly reinforced hose. 4,110,061, Cl. 417-477.000.

Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen: *See—*
Eisert, Wolfgang, 4,110,043, Cl. 356-102.000.

Gessinger, Gernot, to BBC Brown Boveri & Company, Limited. Method for powder-metallurgic production of a workpiece from a high temperature alloy. 4,110,131, Cl. 148-11.50N.

Gestra-KSB Vertriebsgesellschaft: *See—*
Strache, Wilhelm, 4,109,683, Cl. 137-625.300.

Geyer, Hennoch: *See—*
Woitschatzke, Hans; and Geyer, Hennoch, 4,109,931, Cl. 280-605.000.

Geyer, Wolfgang G., to Rohm and Haas Company. Method of reduction employing resin adsorbents. 4,110,378, Cl. 260-558.00S.

Geyman, James M.: *See—*
Roy, Amedee; Belleau, Claude; and Geyman, James M., 4,110,512, Cl. 428-469.000.

GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft: *See—*
Blaimschein, Gottfried; and Marzy, Otto, 4,110,055, Cl. 408-203.500.

Giaccherino, Renzo Rossetto, to Famir International S.p.A. Grinding machine, particularly for rollers of rolling element bearings. 4,109,420, Cl. 51-105.00R.

Gibson, Otto L. Fruit picking apparatus. 4,109,449, Cl. 56-328.00R.

Giehler, Herbert; and Grau, Wilfried, to Elkamet/Lahn Kunststoff GmbH/Werk. Method and aparatus for rotational moldiflanges. 4,110,389, Cl. 264-89.000.

Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, to Bayer Aktiengesellschaft. Polyparabanic acid derivatives. 4,110,318, Cl. 528-73.000.

Gilg, Bernard; Muller, Helmut; and Rody, Jean, to Ciba-Geigy Corporation. Stabilizer system and its use for stabilizing styrene polymers. 4,110,304, Cl. 260-45.80N.

Gilmore, Merle Lee: *See—*
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Gilmour, Alexander; and Mallory, Henry Rodgers, to P.R. Mallory & Co. Inc. Fluorocarbon seal. 4,110,518, Cl. 429-174.000.

Giolma, William Henry; and Andresen, Bernhard Hans, to Texas Instruments Incorporated. Indirect FM modulation scheme using phase locked loop. 4,110,707, Cl. 332-19.000.

Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,110,352, Cl. 260-348.290.

Gjelsvik, Norvald: *See—*
Gaudernack, Bjorn; Gjelsvik, Norvald; and Farbu, Leif, 4,110,399, Cl. 423-112.000.

Glaxo Laboratories Limited: *See—*
Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,110,534, Cl. 544-16.000.

Gleason, Theodore J. Weighted tennis net support post. 4,109,910, Cl. 273-29.0BB.

Glenday, Martin J.; and Blank, Cecil G. Starter bracket for lawn mowers. 4,109,538, Cl. 74-6.000.

Go, Santos W., to Owens-Illinois, Inc. Molded container of polyester prepared from a bis(hydroxyethoxyphenyl)sulfone. 4,110,315, Cl. 528-294.000.

Goates, Delbert T. Novelty postcard and method. 4,109,851, Cl. 229-92.800.

Gobry, Dominique: *See—*
Ducol, Jean-Paul; Gobry, Dominique; Raisin, Jean-Pierre; and Agence Nationale de Valorisation de la Recherche (ANVAR), 4,109,595, Cl. 112-121.110.

Godeau, Alain; and Heas, Jean-Yves, to Societe Nationale Elf Aquitaine (Production). Method and apparatus for tensioning anchor lines. 4,109,479, Cl. 61-94.000.

Godfrey, Frederick D., Jr.; Fedro, John J.; and Sinclair, Robert I., to Consolidated Cigar Corporation. Decorated cigar wrappers. 4,109,665, Cl. 131-15.00C.

Goethel, James Herbert; and Sohngen, Edwin Lowe, to Sybron Corporation. Apparatus for use with insufflators. 4,109,656, Cl. 128-266.000.

Goetz, George W., to Eaton Corporation. Fluid generator. 4,109,578, Cl. 102-39.000.

Goetzberger, Adolf; and Greubel, Waldemar, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Apparatus for converting light energy into electrical energy. 4,110,123, Cl. 136-89.0HY.

Goetzke, Siegfried; and Jakob, Gert, to Robert Bosch GmbH. Environmentally protected-electronic housing and heat sink structure, particularly for automotive use. 4,110,549, Cl. 174-16.0HS.

Golben, Michael, to Minnesota Mining and Manufacturing Company. Oxidation inhibition of steel wool in silver recovery. 4,110,109, Cl. 75-109.000.

Gold, Joseph. Method of treating cancerous cachexia in humans with hydrazine sulfate. 4,110,437, Cl. 424-166.000.

Gonzalez, Floyd A.: *See—*
Williamson, Jim R.; and Gonzalez, Floyd A., 4,109,725, Cl. 166-315.000.

Goode, John V., Jr., to Dow Chemical Company, The. Device for measuring pH and temperature of a liquid, which includes a memory. 4,109,527, Cl. 73-343.500.

Gooden, Alan L. Method for regulating characteristics of a gas stream. 4,109,652, Cl. 128-212.000.

Goodman, Donald: *See—*
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Goodson, David B.: *See—*
Schwab, James J.; and Goodson, David B., 4,110,086, Cl. 55-7.000.

Goodwin, Thomas E.; and Starks, Charles M., to Continental Oil Company. Method of preparing hydrocarbyl-substituted cresols. 4,110,543, Cl. 568-781.000.

Goodwin, Thomas E.; and Starks, Charles M., to Continental Oil Company. Preparation of cresols. 4,110,544, Cl. 568-805.000.

Goodyear Tire & Rubber Company, The: *See—*
Caravito, Vito A., 4,110,141, Cl. 156-123.00R.
Evans, Theodore A.; and Watts, William A., 4,110,500, Cl. 428-35.000.
Foti, Anthony J., 4,109,543, Cl. 74-231.00P.
Hunter, Edward E., 4,109,609, Cl. 118-50.000.
Kuhar, George A., 4,110,413, Cl. 260-879.000.
Lawrence, John P., 4,110,319, Cl. 526-17.000.
Oliveira, Paul Edward, 4,110,510, Cl. 428-285.000.
Sandstrom, Paul H., 4,110,293, Cl. 260-29.70R.
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Wolfe, Merritt W., 4,109,697, Cl. 152-367.000.

Gorgens, Joseph E.; and Morris, Matthew Gerald, Jr., to Dresser

Industries, Inc. Movement construction for a pressure responsive instrument. 4,109,537, Cl. 73-756.000.
Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Liquid developer for an electrostatic copying device. 4,110,029, Cl. 355-10.000.
Gotaverken Angteknik AB: *See—*
Stenlund, Hans, 4,109,868, Cl. 239-413.000.
Gottschlich, James A., to NCR Corporation. Supporting cover for an ink roll means. 4,109,790, Cl. 206-446.000.
Gower, Reginald Price, II; and Richardson, John Gilbert, to Harshaw Chemical Company, The. Method of preparing colloidal sol of antimony oxide. 4,110,247, Cl. 252-313.00R.
Gracia, Bert E., to Brown & Root, Inc. Docking an offshore structure with a submerged fixture. 4,109,476, Cl. 61-87.000.
Gracia, Bert E., to Brown & Root, Inc. Unitized conductor guide and frame for offshore drilling and production. 4,109,478, Cl. 61-86.000.
Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, to Bosch-Siemens Hausgerate GmbH; and Chemische Werke Huls A.G. Process for washing textiles in an automatic washing machine, working substances and apparatus for its performance. 4,110,075, Cl. 8-137.000.
Graf Vom Hagen, Siegbert, to Kyberna GmbH. Process for cleaning spark plugs on internal combustion engines. 4,110,667, Cl. 313-143.000.
Graham, William Hardin; and Shepard, Inella Gatlin, to Thiokol Corporation. Control of cure rate of polyurethane resin based propellants. 4,110,135, Cl. 149-19.400.
Grau, Wilfried: *See—*
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Greber, Gerd: *See—*
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Green, Albert P.: *See—*
McCormack, Thomas L.; and Green, Albert P., 4,110,017, Cl. 352-5.000.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, to Dow Chemical Company, The. Method of packaging and product made thereby. 4,109,792, Cl. 206-525.000.
Greene, Norman Donald. Energy storage and retrieval as heat. 4,109,702, Cl. 165-1.000.
Greeneich, Edwin W.; and Asars, Juris A., to Westinghouse Electric Corp. Thin-film analog video scan and driver circuit for solid state displays. 4,110,662, Cl. 315-169.0TV.
Greenlee, Donald Roy; and Burns, Milton Wayne, to Dresser Industries, Inc. Shutdown system for high pressure well. 4,109,714, Cl. 166-53.000.
Grefco, Inc.: *See—*
Tarbell, Harlan E.; and Raabe, Paul J., 4,110,501, Cl. 428-40.000.
Grendahl, Bernard E., to UOP Inc. Load distributing track fitting. 4,109,891, Cl. 248-503.100.
Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. 4,110,717, Cl. 335-22.000.
Greubel, Waldemar: *See—*
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Greven, Hendrik Marie; and de Wied, David, to Akzona Incorporated. Peptide derivatives and pharmaceutical compositions containing same. 4,110,322, Cl. 260-112.50R.
Grey, Michael W.: *See—*
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Gross, Jerome A. Piston for pressure dispensers of the barrier piston type. 4,109,833, Cl. 222-386.500.
Grosskopf, Peter Volker. Refrigerator truck including a refrigerating machine in unit construction. 4,109,485, Cl. 62-298.000.
Grubbs, Dennis Robert; Lubsen, Timothy Andrew; and Roseberry, George Leroy, Jr., to Procter & Gamble Company, The. High-sheen roast and ground coffee flakes of improved extractability. 4,110,485, Cl. 426-595.000.
Gruber, Wolfgang: *See—*
Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,110,522, Cl. 526-105.000.
Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,110,523, Cl. 526-124.000.
Grueneberg, Gary L., to Tenneco, Inc. Noise attenuator. 4,109,755, Cl. 181-256.000.
Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S., to MacDermid Incorporated. Process of preparing thermoset resin substrates to improve adherence of electrolessly plated metal deposits. 4,110,147, Cl. 156-306.000.
Grupelli, Renato, to Kaltenbach & Voigt GmbH & Co. Medical treatment chair. 4,109,958, Cl. 297-191.000.
GTE ATEA, S.A.: *See—*
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GTE Automatic Electric Laboratories, Incorporated: *See—*
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GTE Laboratories Incorporated: *See—*
Kadkade, Prakash G., 4,109,414, Cl. 47-58.000.
Klein, Richard M.; Quackenbush, Carr Lane W.; and Kolbeck, Andrew G., 4,110,002, Cl. 350-96.290.
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GTE Sylvania Incorporated: *See—*
Leary, Patrick John; and Shaffer, Harry Leonard, 4,110,560, Cl. 179-1.0VC.
Peek, S. Christopher, 4,109,481, Cl. 62-140.000.
Wheeler, Robert C., 4,110,790, Cl. 358-162.000.
Wolfe, Robert W., 4,110,660, Cl. 313-486.000.
Guardamino, Inigo Diaz. Device for regulating the pressure to be applied to the trigger on firearms. 4,109,402, Cl. 42-65.000.
Gudjonsson, Ellidi N. Directional control valve. 4,109,682, Cl. 137-625.230.
Gueritee, Nicolas. Nicotinic derivatives of estriol. 4,110,324, Cl. 260-239.500.
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Guess, Joe F., to Conrac Corporation. Communication unit for code generation and voice communication. 4,110,561, Cl. 179-2.0EA.
Guillaume, Emile Armand Henri, to Zelacolor Systems Establishment. Unit for making color component records of color transparencies. 4,110,036, Cl. 355-32.000.
Guinosso, Charles J.: *See—*
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Gundlach, Robert W., to Xerox Corporation. Transfer assembly for electrostatic transfer of a toner image from a curvilinear recording surface. 4,110,024, Cl. 355-3.0TR.
Gupta, Nirmal K., to Ford Motor Company. Method of preparing composite body and secondary battery or cell incorporating such composite body. 4,110,515, Cl. 429-104.000.
Gurwicz, David; Sloan, Albert Everett; Moss, Barry; Wild, Arthur; and Ord, William Robert, to Sevcon Limited. Thyristor pulse controller for plural loads. 4,110,668, Cl. 318-78.000.
Gussin, Robert Zalmon: *See—*
Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, 4,110,445, Cl. 424-229.000.
Guthmann, Stephen Franklin. Boat mooring apparatus. 4,109,603, Cl. 114-230.000.
Gwyn, John E.; and Roberts, Scott C., to Shell Oil Company. Process for production of hydrocarbonaceous fluids from solids such as coal and oil shale. 4,110,193, Cl. 208-11.00R.
H & K, Inc.: *See—*
Krohn, Hans Guenther; Rademacher, Friedrich; Petri, Ulrich; and Deubel, Hans D., 4,109,446, Cl. 53-282.000.
H. Maihak AG: *See—*
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Williams, Michael Patrick; and Brawner, William Howard, 4,109,925, Cl. 280-11.280.
Haarmann & Reimer GmbH: *See—*
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Haas, Howard C.; and Moreau, Robert D., to Polaroid Corporation. Process for the production of cyanic acid and carboxamides. 4,110,424, Cl. 423-365.000.
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Haase, Reinhold A.: *See—*
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Habiger, Cyril W., to Caterpillar Tractor Co. Overtravel control mechanism for hydrostatic transmissions. 4,109,540, Cl. 74-96.000.
Hachiken, Ryuzo: *See—*
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Haep, Heinz; and Schumacher, Georg, to Rheinmetall GmbH. Twist-reducing rings for stabilized projectiles. 4,109,582, Cl. 102-93.000.
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Hagen, Albert; Kaiser, Theodor; and Pohler, Heinz, to Hoesch Werke Aktiengesellschaft. Method and arrangement for the production of annular articles. 4,109,361, Cl. 29-148.40C.
Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,110,380, Cl. 260-586.00C.
Hall, Bruce John. Plant care apparatus. 4,109,415, Cl. 47-67.000.

Halliburton Company: *See—*
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Williamson, Jim R.; and Gonzalez, Floyd A., 4,109,725, Cl. 166-315.000.
Halsey, Arthur Ernest, to Vacuumatic Limited. Conveyor systems with gating arrangement. 4,109,780, Cl. 198-466.000.
Halsey, Homer P.; Reed, Lowell E.; and Hildebrand, David C., to Youngstown Sheet and Tube Company. Method and apparatus for continuously processing strand. 4,110,824, Cl. 364-472.000.
Hamada, Nobuhiro; Hirasawa, Kotaro; Hatada, Minoru; and Tamura, Hiroshi, to Hitachi, Ltd. Method of storing articles in a warehouse to form an imaginary link of articles. 4,109,808, Cl. 214-152.000.
Hamada, Takaki; Kanazawa, Hiroyuki; and Yanase, Masataka, to Sumitomo Chemical Company, Limited. Method for production of casting syrups. 4,110,526, Cl. 526-214.000.
Hamada, Yoichi: *See—*
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Nakatsukasa, Walter M.; and Hamill, Robert L., 4,110,436, Cl. 424-122.000.
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Hamlin, Thomas J.: *See—*
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Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, to American Cyanamid Company. Method for antagonizing aldosteronic action and inducing diuresis by administering a tetrasubstituted imidazolidine. 4,110,445, Cl. 424-229.000.
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Hansen, Arne; and Troup, George, to Chemetron Corporation. Gas fire extinguishing system. 4,109,726, Cl. 169-11.000.
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Suzuki, Keiichi; Takahashi, Keikichi; Matsuura, Eiichi; and Harada, Akinobu, 4,109,458, Cl. 58-63.000.
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Harding, Dukecal Jenner, to Magna International Inc. Apparatus and process for extracting oil or bitumen from tar sands. 4,110,195, Cl. 208-11.0LE.
Harper, Randall L. Hand powered and controlled tricycle. 4,109,927, Cl. 280-250.000.
Harris Corporation: *See—*
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Harris, James S., Jr.; Eden, Richard C.; Cory, Earl S.; and Scholl, Fred W., to Rockwell International Corporation. Light emitting device for optical communications. 4,110,661, Cl. 313-499.000.
Harris, Robert Graham, to Dowty Mining Equipment Limited. Longwall mining apparatus. 4,109,472, Cl. 61-45.00D.
Harrison, George C., to Minnesota Mining and Manufacturing Company. Fired clay pillows and structures made therewith. 4,110,499, Cl. 428-35.000.
Harrison, Peter Arthur; Parks, Anthony John; Southgate, Malcolm Dennis; Sleath, William Derek; and Hills, Richard Keith, to W. Vinten Limited. Document recording machines. 4,110,037, Cl. 355-48.000.
Harshaw Chemical Company, The: *See—*
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Hayman, Clifford C., 4,110,492, Cl. 427-214.000.
Hart, Richard K.: *See—*
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Hartemann, Pierre, to Thomson-CSF. Method of modifying the temperature drift of the propagation time of surface elastic waves and a device obtained by said method. 4,110,653, Cl. 310-313.000.
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Hartmann, Karl. Conveyor belt with corrugated sidewalls. 4,109,784, Cl. 198-821.000.
Hartung, John P. Adjustable easel. 4,109,892, Cl. 248-449.000.
Harvey Hubbell, Incorporated: *See—*
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Harvey, John Kenneth: *See—*
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Hascoe, Norman; and Levine, Samuel W., to Semi-Alloys, Inc. Hermetic sealing cover for a container for semiconductor devices. 4,109,818, Cl. 220-200.000.
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Hase, Christian; and Hase, Brigitte, to Henkel Kommanditgesellschaft auf Aktien. Compositions and method for activating oxygen utilizing N-acylated uracils and benzouracils. 4,110,242, Cl. 252-186.000.
Hashimoto, Hiroshi, to Tobishima Kensetsu Kabushiki Kaisha. Blasting method and device. 4,109,575, Cl. 102-22.00R.
Hashimoto, Hiroshi; and Kimura, Kyozo, to Mitsubishi Jukogyo Kabushiki Kaisha. Internal combustion type pile driver. 4,109,621, Cl. 123-65.0SP.
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Hata, Morinaka; and Shinoda, Isao, to Kabushiki Kaisha Daini Seikosha. Piezo electric vibrator unit sealed with 90Sn-10Au solder. 4,110,655, Cl. 310-344.000.
Hatada, Minoru: *See—*
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Hatcher, Sheila Starr. Trucking game. 4,109,917, Cl. 273-254.000.
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Havera, Herbert J.; and Strycker, Wallace G., to Miles Laboratories, Inc. Derivatives of 5-(indol-3-yl)hydantoin. 4,110,536, Cl. 544-139.000.
Hawkes, Peter Louis, to National Research Development Corporation. Graphical input devices. 4,110,556, Cl. 178-19.000.
Hawkins, J. C. Alarm circuit. 4,110,742, Cl. 340-309.100.
Hawkins, Ronald G.; Tuttle, Paul D.; and Baker, Mark A., to Aluminum Company of America. Spring friction damper. 4,110,553, Cl. 174-42.000.
Hayasaka, Enakichi. Noiseless spur gears. 4,109,545, Cl. 74-447.000.
Hayashi, Hideaki: *See—*
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Hayashi, Kiyozumi; Ohta, Takeo; and Kobori, Tetsuo, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Fuel assembly spacer within the coolant duct. 4,110,160, Cl. 176-78.000.
Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, to Ono Pharmaceutical Company. Dithio prostaglandin derivatives. 4,110,341, Cl. 260-327.00C.
Hayashi, Yukichi, to Nippon Coinco Co., Ltd. Control system for a vending machine. 4,109,774, Cl. 194-1.00C.
Hayashi, Yukichi, to Nippon Coinco Co., Ltd. Coin control circuitry for a vending machine. 4,109,775, Cl. 194-10.000.
Hayden, Robert Leslie James; and Bell, Alan, to Foster Wheeler Energy Corporation. Steam boilers. 4,109,613, Cl. 122-1.00R.
Hayes, James D. Flute lyre holder. 4,109,888, Cl. 248-443.000.
Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Process for hydrocracking hydrocarbons. 4,110,198, Cl. 208-111.000.
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Hayman, Clifford C., to Harshaw Chemical Company, The. Method for encapsulating water-insoluble particles. 4,110,492, Cl. 427-214.000.
Haynes, John L.; and Shoor, Bernard A., to Becton, Dickinson and Company. Particle density measuring system. 4,110,604, Cl. 235-92.0PC.
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Heath, Willie L. Heat engine. 4,109,468, Cl. 60-670.000.
Hebberd, Harry Clinton, to Pacific West Exploration Company. Self-erecting geophone unit and method and system for using same. 4,109,757, Cl. 181-401.000.
Hedberg, David G., Jr.: *See—*
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Hedges, William C., to Star Manufacturing Company of Oklahoma. Method for preparing extruded fasteners. 4,110,280, Cl. 264-22.000.
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Heine, Bernhard; Arndt, Wolfgang; and Lower, Hartmut, to International Standard Electric Corporation. Circuit arrangement for identification and addressing. 4,110,555, Cl. 178-3.000.
Heinze, Martin; and Heinze, Walter. Camera shutter. 4,110,764, Cl. 354-51.000.
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Heitmann, Glenn Alvin; and Trosper, Milton French, Jr., to Johns-

Manville Corporation. Fire resistant plywood. 4,110,513, Cl. 428-528.000.
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Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, to American Hoechst Corporation. Benzoylpiperidylalkylindoles in alleviating pain. 4,110,459, Cl. 424-267.000.
Hempsey, Raymond. Illuminated flag or pennant. 4,110,818, Cl. 362-32.000.
Hendel, Frank J. Wave powered electric generator. 4,110,630, Cl. 290-53.000.
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Henrikson, Stig Arvid. Process for the preparation of a substantially homogeneous lime water solution. 4,110,211, Cl. 210-47.000.
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Hermes Precisa International S.A.: *See—*
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Hershkowitz, Joseph; and Akst, Irving B., to United States of America, Army. Explosives containing ammonium nitrate and nitrated amines. 4,110,136, Cl. 149-47.000.
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Hessert, James E.; and Johnston, Chester C., Jr., to Phillips Petroleum Company. Aqueous gelable compositions having extended gelation time and methods of preparing same. 4,110,230, Cl. 252-855.00R.
Hetz, Walter; and Soldner, Richard. Ultrasonic apparatus for medical diagnosis. 4,110,723, Cl. 340-1.00R.
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Hey, Hansjorg; Schaum, Helmut; and Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Process for the purification of carboxylic acids. 4,110,372, Cl. 260-540.000.
Heyning, Bjorn; and Tremblay, Dennis D., to Heath Company. Programmable electronic door chime. 4,110,750, Cl. 340-384.00E.
Hickam, William M., to Westinghouse Electric Corp. Magnetic tape type sensors, method and apparatus using such magnetic tape sensors. 4,110,613, Cl. 250-282.000.
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Hildebrand, Cleve R.: *See—*
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Hildebrand, David C.: *See—*
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Hildebrand, Richard Emil; Paraskos, John Angelo; and Taylor, Herman, Jr., to Gulf Research & Development Company. Process for liquefying coal employing a vented dissolver. 4,110,192, Cl. 208-8.000.
Hilfman, Lee, to UOP Inc. Desulfurization process of a hydrocarbon distillate containing mono-olefins and aromatics. 4,110,203, Cl. 208-216.000.
Hilfman, Lee, to UOP Inc. Process for hydrogenating a coke-forming hydrocarbon distillate. 4,110,205, Cl. 208-255.000.
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Hillman, Gary; and Devico, Michael, to Machine Technology, Inc. Automated two-sided cleaning apparatus. 4,109,337, Cl. 15-21.00D.
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Hiltmann, Rudolf; Heise, Arend; Kazda, Stanislav; and Hoffmeister, Friedrich, to Bayer Aktiengesellschaft. Derivatives of 1-(disubstituted phenoxy)-3-amino-2-hydroxypropanes. 4,110,472, Cl. 424-330.000.
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Hobson, Charles F., Jr.; and Hamilton, John D., to General Electric Company. Ground fault protection system for multiple source distribution networks. 4,110,808, Cl. 361-44.000.
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Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., to International Business Machines Corporation. NMR field frequency lock system. 4,110,681, Cl. 324-0.50A.
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Honda, Haruo; and Itoh, Hiroshi, to Hitachi, Ltd. Pilot valve device for regulating the flow of a fluid. 4,109,894, Cl. 251-30.000.
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Honjo, Yoshihiko; and Kuroda, Junji, to Victor Company of Japan, Ltd. System for detecting height fluctuations of a surface on a recording medium in an optical recording or reproducing apparatus. 4,110,607, Cl. 250-201.000.
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Hopp, Rudolf; Sturm, Wolfgang; and Steinfatt, Fritz, to Haarmann & Reimer GmbH. A method of deodorizing. 4,110,430, Cl. 424-65.000.
Horikawa, Shigeo. Sound producing device. 4,109,608, Cl. 116-137.00R.
Horn, Berthold K. P., to Butler-Newton, Inc. Tomography X-ray detector. 4,110,621, Cl. 250-361.00R.
Hornagold, John T.; Beckley, Gary H.; and Rathi, Ram N., to American Hoist & Derrick Company. Steering mechanism. 4,109,747, Cl. 180-140.000.
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Hoyt, Charles W., to Wolverine Corporation. Material treatment system. 4,109,394, Cl. 34-57.00B.
Huang, Barney K. Greenhouse, drying, storing nursery system. 4,109,395, Cl. 34-93.000.
Hubbard, James Henry; Hubert, Wallace Lloyd; and Spivey, Paul Richard, to International Business Machines Corporation. Copy production machines having supply sheet pick retry. 4,110,032, Cl. 355-14.000.
Hubbard, William Ernest; Hyde, Robert; and Crawford, Peter Frederick, to Automotive Products Limited. Method of assembling a subassembly of a diaphragm spring friction clutch. 4,109,368, Cl. 29-446.000.
Hubble, Fred F., III; and Tasseff, John B., II, to Xerox Corporation. Support structure for a corona generating device. 4,110,811, Cl. 361-225.000.
Huber, W. Donald, to Sperry Rand Corporation. Phase lock oscillator for use in data processing system. 4,110,557, Cl. 178-69.100.
Hubert, Jacques; Ory, Jean-Marie; Bottin, Jean; and Humbert, Claude, to Societe Chimique des Charbonnages. Device for monitoring physical activity of persons. 4,110,741, Cl. 340-573.000.
Hubert, Wallace Lloyd: *See—*
Hubbard, James Henry; Hubert, Wallace Lloyd; and Spivey, Paul Richard, 4,110,032, Cl. 355-14.000.
Huckins, James N.: *See—*
Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,110,344, Cl. 260-340.300.
Huff, Larry Dean: *See—*
Elliott, Charles Anthony; and Huff, Larry Dean, 4,109,919, Cl. 274-9.00B.
Hugenbruch, Ernst. Drum-type machine for the treatment of textile material. 4,109,493, Cl. 68-27.000.
Huggler, Peter E.: *See—*
Spotts, Willard J.; and Huggler, Peter E., 4,110,600, Cl. 219-364.000.
Hughes Aircraft Company: *See—*
Otto, Oberdan W., 4,110,714, Cl. 333-72.000.
Pastor, Antonio C., 4,110,080, Cl. 23-273.0SP.
Hughes, Donald Wayne Kent; and Porta, Gary Douglas, to AMP Incorporated. Connector for compressor header. 4,109,992, Cl. 339-147.00R.
Hughes, James L.; and Broerman, William E., to Industrial Value Analysis Inc. Sanitary yard hydrant. 4,109,671, Cl. 137-282.000.
Hughes, Joe L. Needle holding device with pick-up means. 4,109,658, Cl. 128-340.000.
Hughes, Lawrence J.: *See—*
Drummond, James C.; and Hughes, Lawrence J., 4,110,542, Cl. 568-729.000.

- Hughes, Nathaniel. Sonic energy transducer. 4,109,862, Cl. 239-102.000.
- Hull, Ezekiel H.; and McIntosh, Robert H., to Askew, Anthony B. Self-sanitizing carpet construction composition. 4,110,504, Cl. 428-97.000.
- Humbert, Claude: *See—*
  - Hubert, Jacques; Ory, Jean-Marie; Bottin, Jean; and Humbert, Claude, 4,110,741, Cl. 340-573.000.
- Hund, Helmut: *See—*
  - Stotz, Wolf-Gunter; and Hund, Helmut, 4,110,156, Cl. 162-305.000.
- Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Vacuum-pressurized immersion coater. 4,109,609, Cl. 118-50.000.
- Hunter, Willard L.: *See—*
  - Paulson, Danton L.; and Hunter, Willard L., 4,110,107, Cl. 75-24.000.
- Hunzicker, Dean L., to Air Master Systems, Inc. Adapter manifold for ventilation hood. 4,109,641, Cl. 126-299.00D.
- Hurni, William M.: *See—*
  - McAleer, William J.; and Hurni, William M., 4,110,223, Cl. 210-388.000.
- Hurtado T, Jorge E.; and Arrieta, Diogenes A. Tractor spray cylinder attachment. 4,109,865, Cl. 239-147.000.
- Husted, Royce Hill, to Saroy Engineering. Power driven ski-bob. 4,109,739, Cl. 180-5.00R.
- Hveem, Carl J. Manually operated throttle control for four wheel drive vehicle. 4,109,745, Cl. 180-77.00H.
- Hyde, Robert: *See—*
  - Hubbard, William Ernest; Hyde, Robert; and Crawford, Peter Frederick, 4,109,368, Cl. 29-446.000.
- Ichihashi, Hiroo: *See—*
  - Sato, Yasushi; and Ichihashi, Hiroo, 4,110,027, Cl. 355-3.0TR.
- Ichikawa, Yataro; Kobayashi, Osamu; Soma, Kazuhiko; Naruchi, Tatuyuki; Yamanaka, Yoshiyuki; and Suzuki, Nobuo, to Teijin Limited. Process for preparing $\beta.\gamma$-unsaturated aldehydes. 4,110,403, Cl. 260-603.00R.
- Ichimura, Masahiko: *See—*
  - Abe, Takeshi; Ichimura, Masahiko; Noshiro, Makoto; Kunii, Nobuaki; and Ito, Yasumichi, 4,110,308, Cl. 260-45.75C.
- Ideal Toy Corporation: *See—*
  - Nielsen, Edwin A., 4,109,913, Cl. 273-86.00B.
- Ikeda, Hisatoshi: *See—*
  - Murano, Minoru; Yanabu, Satoru; Tamagawa, Tohoru; and Ikeda, Hisatoshi, 4,110,806, Cl. 361-4.000.
- Ikeda, Toshiki; and Beppu, Yoshitsugu, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Expandable ethylenically unsaturated polymer particle compositions. 4,110,267, Cl. 521-59.000.
- Ikeda, Yoshitsugi, to Olympus Optical Co., Ltd. Large aperture photographic lens system. 4,110,007, Cl. 350-215.000.
- Ikegami, Iwao: *See—*
  - Mashida, Toru; Matsushita, Sumeo; and Ikegami, Iwao, 4,110,139, Cl. 156-79.000.
- Ikemori, Keiji, to Canon Kabushiki Kaisha. Telephoto type zoom lens. 4,110,006, Cl. 350-186.000.
- Ikezawa, Harumi: *See—*
  - Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,110,350, Cl. 260-346.750.
- Ilagan, Juan B.: *See—*
  - Rule, Charles E.; Ilagan, Juan B.; and Miller, Donald E., 4,110,484, Cl. 426-582.000.
- Illinois Tool Works Inc.: *See—*
  - Klygis, Mindaugas Julius; and Olsen, Robert Charles, 4,109,787, Cl. 206-150.000.
- Imanaka, Hiroshi; Kijima, Yoshihiko; Sugitawa, Chikara; and Sumoto, Misao, to Toyo Boseki Kabushiki Kaisha. Polyester copolymer compositions. 4,110,411, Cl. 260-873.000.
- Imanaka, Hiroshi: *See—*
  - Mori, Shigeru; Ohsawa, Shigeyoshi; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,110,166, Cl. 195-96.000.
- Imoberdorf & Co.: *See—*
  - Imoberdorf, Markus, 4,109,552, Cl. 74-813.00L.
- Imoberdorf, Markus, to Imoberdorf & Co. Indexing mechanism for rotatable element of machine-tool. 4,109,552, Cl. 74-813.00L.
- Imperial Chemical Industries Limited: *See—*
  - Dart, Edward Charles; Cantwell, John Burnett; Traynor, James Rodney; Jaworzyn, Joseph Franciszek; and Nemcek, Jozef, 4,110,184, Cl. 204-159.230.
  - Thomas, David Hamilton, 4,109,514, Cl. 73-58.000.
  - Wooler, Alan Metcalf, 4,110,397, Cl. 264-338.000.
- Imral, Sadik S., to Intertherm, Inc. Air conditioner unit having compartment provisions for access and motor cooling. 4,109,708, Cl. 165-48.00R.
- Inaba, Shigebo: *See—*
  - Kojima, Atsuyuki; Katsube, Junki; Kameno, Yoshito; Inaba, Shigeho; and Yamamoto, Hisao, 4,110,376, Cl. 260-570.00R.
- Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
  - Farina, Attilio, 4,110,666, Cl. 315-408.000.
- Industrial Value Analysis Inc.: *See—*
  - Hughes, James L.; and Broerman, William E., 4,109,671, Cl. 137-282.000.
- Ingalls, Robert A., to Joy Manufacturing Company. Method of making screw rotor machine rotors. 4,109,362, Cl. 29-156.40R.
- Inland Steel Company: *See—*
  - Easter, Holton C.; Matrinetz, Frank F.; and Myers, Ted L., 4,109,972, Cl. 308-3.00R.
- Inoue, Satoru; Uematsu, Tamon; and Yamashita, Norihisa, to Sumitomo Chemical Company, Limited. Oxyindole compound. 4,110,466, Cl. 424-274.000.
- Inoue, Shigeru, to Mitsui Toatsu Chemicals Inc. Process for separating and recovering unreacted materials in urea synthesis. 4,110,374, Cl. 260-555.00A.
- Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, to Akebono Brake Industry Co., Ltd. Disc brake. 4,109,766, Cl. 188-73.400.
- Institut Pasteur: *See—*
  - Chacornac, Georges, 4,109,655, Cl. 128-253.000.
- Institut Textile de France: *See—*
  - Ducol, Jean-Paul; Gobry, Dominique; Raisin, Jean-Pierre; and Agence Nationale de Valorisation de la Recherche (ANVAR), 4,109,595, Cl. 112-121.110.
- Institute of Applied Physiology & Medicine: *See—*
  - Reid, John M.; and Spencer, Merrill P., 4,109,642, Cl. 128-2.00V.
- Institutt for Atomenergi: *See—*
  - Gaudernack, Bjorn; Gjelsvik, Norvald; and Farbu, Leif, 4,110,399, Cl. 423-112.000.
- Intermountain Oil Research, Inc.: *See—*
  - Peterson, Glenn R.; Hicks, Marvin C.; and Schwartz, Peter W., 4,110,194, Cl. 208-11.0LE.
- International Business Machines Corporation: *See—*
  - Bergeron, David Leo; Putney, Zimri Congdon; and Stephens, Geoffrey Brownell, 4,110,126, Cl. 148-1.500.
  - Beyer, Klaus Dietrich, 4,110,125, Cl. 148-1.500.
  - Blaser, Eugene Martin; and Conrad, Donald Adelbert, 4,110,633, Cl. 307-205.000.
  - Blazick, Linda Ann; and Miller, Lewis Franklin, 4,109,377, Cl. 29-626.000.
  - Brown, Leon Calvin; Edwards, Earl Garland; Peterson, Charles Edwin; Robinson, Peter George; and Wilson, Clement Card, 4,110,068, Cl. 432-60.000.
  - Cairns, James Anthony; Lurio, Allen; and Ziegler, James Francis, 4,110,625, Cl. 250-492.00A.
  - Castrodale, Daniel Owen; Lovgren, Jeffrey Lynn; Russell, Ralph Arthur; and Shidler, Karl Allen, 4,110,804, Cl. 360-118.000.
  - Chen, Tien Chi, 4,110,837, Cl. 364-900.000.
  - Crouse, William George, 4,110,705, Cl. 332-11.00D.
  - Dubil, James F.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,110,835, Cl. 364-844.000.
  - Geffken, Robert Michael, 4,109,372, Cl. 29-571.000.
  - Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., 4,110,681, Cl. 324-0.50A.
  - Hubbard, James Henry; Hubert, Wallace Lloyd; and Spivey, Paul Richard, 4,110,032, Cl. 355-14.000.
  - Krygowski, Matthew A., 4,110,830, Cl. 364-200.000.
  - Langdon, Glen George, Jr., 4,110,831, Cl. 364-745.000.
  - Leininger, Joel Calvin; and Taylor, George Phillips, 4,110,832, Cl. 364-786.000.
  - May, Gordon Herbert, 4,110,594, Cl. 219-121.0LM.
  - Schindler, Hans Rudolf; and Vettiger, Peter, 4,110,569, Cl. 179-84.00A.
- International Computers Limited: *See—*
  - Davies, Dennis, 4,109,378, Cl. 29-629.000.
- International Lead Zinc Research Organization, Inc.: *See—*
  - Dreulle, Paule; Longuepee, Michel; and Dhaussy, Dominique, 4,110,128, Cl. 148-6.15Z.
  - Longuepee, Michel; and Dreulle, Noel, 4,110,127, Cl. 148-6.15Z.
- International Paper Company: *See—*
  - Stifano, Joseph Michael, 4,109,820, Cl. 220-240.000.
- International Standard Electric Corporation: *See—*
  - Boucher, Donald Joseph, 4,110,567, Cl. 179-84.0VF.
  - Foster, Basil Bernard, 4,110,570, Cl. 179-170.00J.
  - Heine, Bernhard; Arndt, Wolfgang; and Lower, Hartmut, 4,110,555, Cl. 178-3.000.
- International Telephone and Telegraph Corporation: *See—*
  - Acar, Ali, 4,109,675, Cl. 137-494.000.
  - Chown, Martin, 4,109,994, Cl. 350-96.210.
  - Kaszerman, Philip, 4,110,756, Cl. 343-7.300.
  - Konigsford, Barry S.; Davidson, Kenneth; and Marschak, Howard J., 4,109,795, Cl. 211-57.100.
  - Lawford, Victor N.; and Sacarisen, David F., 4,109,531, Cl. 73-438.000.
  - Lombardi, Anthony Joseph, 4,110,552, Cl. 174-35.0MS.
- Intertherm, Inc.: *See—*
  - Imral, Sadik S., 4,109,708, Cl. 165-48.00R.
- Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich. Method of dismantling units. 4,109,366, Cl. 29-427.000.
- Ionics Inc.: *See—*
  - Hodgdon, Russell B., 4,110,265, Cl. 521-30.000.
- Iowa Manufacturing Comapny: *See—*
  - Fairchild, Louis F.; and Brecht, Robert R., 4,109,742, Cl. 180-20.000.
- Ipfelkofer, Armin: *See—*
  - Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.
- Irvine, Robert; Luperti, Harry E.; and Manna, Robert E., to Pitney-Bowes, Inc. Document feeder for a copier. 4,110,038, Cl. 355-50.000.
- Irwin, James Stuart; and Gilmore, Merle Lee, to Motorola Inc. Astable multivibrator with temperature compensation and requiring a single supply voltage. 4,110,704, Cl. 331-113.00R.
- Isgur, Irving E.; Holmstrem, Andrew B.; and Hayes, Norman J., to W. R. Grace & Co. Foam sheet and method. 4,110,508, Cl. 428-240.000.
- Isherwood, Jeffrey, to Crosfield Electronics Limited. Detecting lateral position of webs. 4,110,627, Cl. 250-561.000.

- Ishii, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Loud-speaker output circuit. 4,110,559, Cl. 179-1.00D.
- Ishii, Yohji: *See—*
  - Itakura, Kiyoyuki; Ishii, Yohji; Ohata, Satoru; and Watanabe, Masao, 4,109,463, Cl. 60-282.000.
- Ishikawa, Masao, to Nissan Motor Company, Ltd. Headlight tilting control device of motor vehicle. 4,110,819, Cl. 362-40.000.
- Isuzu Motors Limited: *See—*
  - Kawamura, Hideo; and Kubota, Kimi, 4,109,625, Cl. 123-119.00A.
- Itakura, Kiyoyuki; Ishii, Yohji; Ohata, Satoru; and Watanabe, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust reaction chamber for internal combustion engine. 4,109,463, Cl. 60-282.000.
- Itani, Katsutoshi: *See—*
  - Matsumoto, Akira; and Itani, Katsutoshi, 4,110,237, Cl. 252-79.400.
- Ito, Kazuo, to Kabushiki Kaisha Daini Seikosha. Standard signal generating apparatus. 4,110,640, Cl. 307-303.000.
- Ito, Kiyomatsu. Capsule lamp as a fishing tackle. 4,109,405, Cl. 43-17.500.
- Ito, Yasumichi: *See—*
  - Abe, Takeshi; Ichimura, Masahiko; Noshiro, Makoto; Kunii, Nobuaki; and Ito, Yasumichi, 4,110,308, Cl. 260-45.75C.
- Itoh, Hiroshi: *See—*
  - Honda, Haruo; and Itoh, Hiroshi, 4,109,894, Cl. 251-30.000.
- Itou, Takaaki: *See—*
  - Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,110,417, Cl. 261-39.00A.
- ITT Industries, Incorporated: *See—*
  - Schopper, Bernd, 4,109,967, Cl. 303-6.00C.
- Ivancevich, Marko. Paint - by - rainbow - ring art kit with prestroked panel. 4,109,399, Cl. 35-26.000.
- Iverson, Myren L., to United States of America, Navy. Optical slip-rings. 4,109,997, Cl. 350-23.000.
- Iverson, Myren L., to United States of America, Navy. Optical slip-rings. 4,109,998, Cl. 350-23.000.
- Iwasaki, Yasuhiro, to Silver Seiko Ltd. Electrical connecting device for a hand-operated knitting machine. 4,109,489, Cl. 66-75.200.
- Iyomasa, Arthur N. Foot massager. 4,109,649, Cl. 128-57.000.
- Izon Corporation: *See—*
  - Yevick, George J., 4,110,014, Cl. 350-342.000.
  - Yevick, George J., 4,110,022, Cl. 353-120.000.
- J. M. Huber Corporation: *See—*
  - Kunkle, Albert C.; Abercrombie, William Floyd, Jr.; and Akins, Charles John, Jr., 4,110,189, Cl. 204-180.00R.
- J. P. Stevens & Co., Inc.: *See—*
  - Mazzone, Charles P., 4,109,356, Cl. 28-279.000.
- J. Uriach & Cia S.A.: *See—*
  - Barra, Emilia Francia; and Moga, Antonio Carmelo Marin, 4,110,442, Cl. 424-212.000.
- Jabsen, Felix Stanley, to Babcock & Wilcox Co., The. Industrial technique. 4,110,157, Cl. 176-36.00C.
- Jacobs, David R.: *See—*
  - Spanel, Abram N.; Eiland, P. Frank; Jacobs, David R.; and Ziegler, Geza C., 4,109,594, Cl. 112-79.00R.
- Jacobson, Paul D., to Caterpillar Tractor Co. Detent mechanism. 4,109,547, Cl. 74-526.000.
- Jakob, Gert: *See—*
  - Goetzke, Siegfried; and Jakob, Gert, 4,110,549, Cl. 174-16.0HS.
- Jakovlev, Vladimir: *See—*
  - von Bebenburg, Walter; Schulmeyer, Norbert; and Jakovlev, Vladimir, 4,110,455, Cl. 424-256.000.
- Jalufka, Nelson W.: *See—*
  - United States of America, National Aeronautics and Space Administration; Jalufka, Nelson W.; Hohl, Frank; DeYoung, Russell J.; and Williams, Michael D., 4,110,703, Cl. 331-94.50P.
- Jameson, Neal E., to FMC Corporation. Attitude maintaining mechanism for a marine loading arm. 4,109,688, Cl. 141-387.000.
- Janko, Bozidar; and Silzars, Aris, to Tektronix, Inc. Touch display to digital encoding system. 4,110,749, Cl. 340-365.00C.
- Janoulis, Alexandros James: *See—*
  - Wagnon, Albert Lloyd; and Janoulis, Alexandros James, 4,110,216, Cl. 210-156.000.
- Jansen, Bernard George, Jr., to Narad, Inc. Load spacer support. 4,109,587, Cl. 105-490.000.
- Janssen Pharmaceutica N.V.: *See—*
  - Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,110,333, Cl. 260-293.570.
- Japan Airlines Co., Limited: *See—*
  - Mihirogi, Kiyoshi, 4,109,584, Cl. 104-130.000.
- Japikse, Cornelis H.: *See—*
  - Liepa, Alexander L.; and Japikse, Cornelis H., 4,110,255, Cl. 252-455.00Z.
- Jarman, Trevor Rodney: *See—*
  - Righelato, Renton Clive; and Jarman, Trevor Rodney, 4,110,162, Cl. 195-31.00P.
- Jarocha, William M.; and O'Neil, Walter K., to Eaton Corporation. Tire pressure monitor. 4,110,732, Cl. 340-58.000.
- Jarvis, Kenneth W. Rear view mirror system with elliptically curved mirror and flat mirror. 4,110,012, Cl. 350-302.000.
- Jaworski, Eugene: *See—*
  - Breslow, Jeffrey D.; and Jaworski, Eugene, 4,109,916, Cl. 273-121.00A.
- Jaworzyn, Joseph Franciszek: *See—*
  - Dart, Edward Charles; Cantwell, John Burnett; Traynor, James Rodney; Jaworzyn, Joseph Franciszek; and Nemcek, Jozef, 4,110,184, Cl. 204-159.230.
- Jayakumar, Nagab: *See—*
  - Sarkissian, Vahe A.; Jayakumar, Nagab; Kroeger, Joseph H.; and Schlageter, Jeffrey M., 4,110,842, Cl. 365-233.000.
- Jeanmart, Claude: *See—*
  - Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,110,450, Cl. 424-250.000.
- Jensen, Robert H.: *See—*
  - Millar, Robert F.; Persico, Paul J.; and Jensen, Robert H., 4,110,081, Cl. 23-288.00G.
- Jesse, Gerhard. Friction gear. 4,109,541, Cl. 74-194.000.
- Jha, Mahesh C.; Wicker, Gordon R.; and Meyer, Gustavo A., to Amax Inc. Selective precipitation of nickel and cobalt sulfides from acidic sulfate solution. 4,110,400, Cl. 423-141.000.
- Jimmy's Radio & Television Corporation: *See—*
  - Hills, Joseph F., 4,110,571, Cl. 179-175.10A.
- Job, Eduard J. Dual-seal sprinkler system. 4,109,727, Cl. 169-41.000.
- Joel Tall, Inc.: *See—*
  - Tall, Joel, 4,110,142, Cl. 156-159.000.
- Johannes Menschner Textilmaschinenfabrik: *See—*
  - Buthe, Fritz, 4,109,352, Cl. 26-15.00R.
- Johannesen, Donald Dixon, to Bendix Corporation, The. Mechanically actuated disc brake. 4,109,765, Cl. 188-72.700.
- Johansson, Anders; and Strombeck, Per, to Salen & Wicander Terminalsystem AB. Device for moving railway waggons. 4,109,806, Cl. 214-38.0CC.
- Johansson, Anders H.: *See—*
  - Leo, Thomas J.; and Johansson, Anders H., 4,110,240, Cl. 252-182.000.
- Johansson, Karl Ingmar Wenzel: *See—*
  - Bjorkqvist, Nils Gunnar; Franzen, Hans Arne Edgar; and Johansson, Karl Ingmar Wenzel, 4,109,577, Cl. 102-35.600.
- Johns-Manville Corporation: *See—*
  - Heitmann, Glenn Alvin; and Trosper, Milton French, Jr., 4,110,513, Cl. 428-528.000.
- Johnson Controls, Inc.: *See—*
  - Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,110,140, Cl. 156-87.000.
- Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., to Bell & Howell Company. Electronically controlled microfilm photographic image utilization device. 4,110,020, Cl. 353-26.00A.
- Johnson & Johnson Baby Products Company: *See—*
  - Lindemann, Martin K. O.; Kennedy, Robert R.; and Verdicchio, Robert J., 4,110,263, Cl. 252-545.000.
- Johnson, Oliver Wendell, to Eaton Corporation. Controller for fluid pressure operated devices. 4,109,679, Cl. 137-596.130.
- Johnson, Oscar F. Animal trap. 4,109,407, Cl. 43-85.000.
- Johnson/Rhodes Cultured Foods, Inc.: *See—*
  - Rhodes, Kenneth H., 4,110,476, Cl. 426-41.000.
- Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PGI$_1$ compounds. 4,110,532, Cl. 542-426.000.
- Johnson, Tore Rudolf: *See—*
  - Bogar, Jerry Hench; and Johnson, Tore Rudolf, 4,110,000, Cl. 350-96.210.
- Johnston, Chester C., Jr.: *See—*
  - Hessert, James E.; and Johnston, Chester C., Jr., 4,110,230, Cl. 252-855.00R.
- Jolin, Andre, to Micarna AG Fleischwarenfabrik. Power operated apparatus for splitting carcasses of slaughtered animals. 4,109,347, Cl. 17-23.000.
- Jolles, Pierre; and Migliore-Samour, Daniele, to Agence Nationale de Valorisation de la Recherche (ANVAR). Novel immunological adjuvants, process for their production and compositions containing them. 4,110,434, Cl. 424-92.000.
- Jones, Annette: *See—*
  - Dotson, James D.; and Jones, Annette, 4,110,629, Cl. 290-38.00R.
- Jones, Basil B. Water closet flange with continuous bolt slot. 4,109,327, Cl. 4-252.00R.
- Jones, Eldon D. Apparatus for mounting and demounting a vehicle body. 4,109,810, Cl. 214-505.000.
- Jones, Graham Robin Scott: *See—*
  - Bennett, John Peter; and Jones, Graham Robin Scott, 4,110,836, Cl. 364-860.000.
- Jones, Howard S., Jr.: *See—*
  - Reggia, Frank; and Jones, Howard S., Jr., 4,110,751, Cl. 343-700.0MS.
- Jones Instrument Corporation: *See—*
  - Broadman, Richard J.; and May, Richard D., 4,109,533, Cl. 73-498.000.
- Jones, Raymond. Clamp repair unit. 4,109,694, Cl. 151-69.000.
- Jorgensen, Clarence W., deceased; and by Jorgensen, Elva Mae, executrix. Self-energized alarm device. 4,109,606, Cl. 116-94.000.
- Jorgensen, Elva Mae, executrix: *See—*
  - Jorgensen, Clarence W., deceased; and Jorgensen, Elva Mae, executrix, 4,109,606, Cl. 116-94.000.
- Jorgensen, Neal A.: *See—*
  - DeLuca, Hector F.; and Jorgensen, Neal A., 4,110,446, Cl. 424-236.000.
- Jos. Schneider & Co. Optische Werke Kreuznach: *See—*
  - Schutz, Karl-Heinz; and Tesch, Karl, 4,110,769, Cl. 354-195.000.
- Joy Manufacturing Company: *See—*
  - Ingalls, Robert A., 4,109,362, Cl. 29-156.40R.
- Julius Blum Gesellschaft m.b.H.: *See—*
  - Rock, Erich; and Mages, Bernhard, 4,109,344, Cl. 16-144.000.
- Junck, John A.; and Lorimor, Larry W., to Caterpillar Tractor Co.

Control valve arrangement with a preconditioned relief valve and a flow force compensated valve spool. 4,109,561, Cl. 91-451.000.

Kabele, Dennis Frederick, to Deere & Company. Noise silencer. 4,109,751, Cl. 181-247.000.

Kabushiki Kaisha Daini Seikosha: *See—*

Hata, Morinaka; and Shinoda, Isao, 4,110,655, Cl. 310-344.000.

Ito, Kazuo, 4,110,640, Cl. 307-303.000.

Suzuki, Keiichi; Takahashi, Keikichi; Matsuura, Eüchi; and Harada, Akinobu, 4,109,458, Cl. 58-63.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*

Yoshida, Yasuhiko, 4,109,807, Cl. 214-131.00R.

Kabushiki Kaisha Naruse Fermentation Laboratory: *See—*

Naruse, Kintaro; and Naruse, Wataru, 4,110,477, Cl. 426-46.000.

Kabushiki Kaisha Suwa Seikosha: *See—*

Yamada, Kuniharu; and Teraishi, Katsuhiro, 4,109,456, Cl. 58-23.0AC.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*

Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,452, Cl. 57-58.890.

Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,453, Cl. 57-58.910.

Yamada, Yasuo; Kamiya, Kazuo; Katayama, Iwao; Motobayashi, Kozo; and Yonemura, Yoshiaki, 4,109,451, Cl. 57-56.000.

Yoshida, Yoshiaki; Suzuki, Osamu; and Onoue, Keizi, 4,109,450, Cl. 57-34.00R.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*

Fujitani, Yoshiyasu; and Muraki, Hideaki, 4,109,461, Cl. 60-274.000.

Kadkade, Prakash G., to GTE Laboratories Incorporated. Control of plants abscission processes by using specific light sources. 4,109,414, Cl. 47-58.000.

Kaercher, William C., Jr. Device and method for diverting rolls of sod delivered from conventional sod cutting apparatus. 4,109,729, Cl. 172-1.000.

Kageyama, Satoshi; and Sekiya, Kunihiko, to Tokyo Shibaura Electric Co., Ltd. Data transmission system. 4,110,558, Cl. 178-69.100.

Kahwaty, Vincent N.: *See—*

Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., 4,110,681, Cl. 324-0.50A.

Kaiser, Theodor: *See—*

Hagen, Albert; Kaiser, Theodor; and Pohler, Heinz, 4,109,361, Cl. 29-148.40C.

Kakigi, Takao, to Cybernet Electronic Corporation. Channel selecting device. 4,110,690, Cl. 325-25.000.

Kalat, Edwin F., to Risdon Manufacturing Company, The. Powdered solid aerosol composition and method of manufacture. 4,110,427, Cl. 424-46.000.

Kalnin, Robert Karlovich: *See—*

Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, 4,109,366, Cl. 29-427.000.

Kaltenbach & Voigt GmbH & Co.: *See—*

Grupelli, Renato, 4,109,958, Cl. 297-191.000.

Kamata, Akira, to Rank Xerox, Ltd. Cleaning system for an electrophotographic printing machine. 4,110,035, Cl. 355-15.000.

Kamata, Tokio: *See—*

Sano, Tokuo; Oshima, Takeo; and Kamata, Tokio, 4,110,467, Cl. 424-280.000.

Kameno, Yoshito: *See—*

Kojima, Atsuyuki; Katsube, Junki; Kameno, Yoshito; Inaba, Shigeho; and Yamamoto, Hisao, 4,110,376, Cl. 260-570.00R.

Kameswaran, Venkatamaran: *See—*

Berkelhammer, Gerald; and Kameswaran, Venkatamaran, 4,110,345, Cl. 260-340.50R.

Kamiya, Kazuo: *See—*

Yamada, Yasuo; Kamiya, Kazuo; Katayama, Iwao; Motobayashi, Kozo; and Yonemura, Yoshiaki, 4,109,451, Cl. 57-56.000.

Kamiya, Takashi; Tanaka, Kunihiko; and Shiokawa, Youichi, to Fujisawa Pharmaceutical Co., Ltd. Product and preparation of 1H-tetrazole-5-thiol derivatives. 4,110,338, Cl. 260-308.00D.

Kammann, Wilfried: *See—*

Strauch, Karl; and Kammann, Wilfried, 4,109,573, Cl. 101-38.00R.

Kanai, Masashi: *See—*

Nomura, Junichi; and Kanai, Masashi, 4,110,138, Cl. 156-63.000.

Kanazawa, Hiroyuki: *See—*

Hamada, Takaki; Kanazawa, Hiroyuki; and Yanase, Masataka, 4,110,526, Cl. 526-214.000.

Kaneko, Hideaki: *See—*

Matsushima, Yasunobu; Yashiro, Kuniji; Kaneko, Hideaki; and Suzuki, Masanori, 4,110,129, Cl. 148-6.15R.

Kangas, Karl-Erik: *See—*

Svanstrom, Alf Henrik; and Kangas, Karl-Erik, 4,109,974, Cl. 308-8.200.

Kanner, Bernard; and Prokai, Bela, to Union Carbide Corporation. Formation of polyurethane foam in the presence of sulfolanyl-bearing polysiloxane-polyoxyalkylene polymers. 4,110,271, Cl. 521-111.000.

Kanner, Bernard; and Prokai, Bela, to Union Carbide Corporation. Formation of high-resilience urethane foam in the presence of sulfolanyloxy alkyl-polyalkylsiloxanes. 4,110,272, Cl. 521-111.000.

Kantorowicz, Gerard: *See—*

Bert, Alain; and Kantorowicz, Gerard, 4,110,839, Cl. 365-180.000.

Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. High-intensity, solid-state-solar cell device. 4,110,122, Cl. 136-89.00P.

Karl Ruggli AG: *See—*

Rooc, Marcel, 4,109,354, Cl. 28-119.000.

Kartell, S.p.A.: *See—*

Polvara, Giulio, 4,110,052, Cl. 403-295.000.

Kaszerman, Philip, to International Telephone & Telegraph Corporation. Capture protection for pulse signal tracking system. 4,110,756, Cl. 343-7.300.

Katada, Michihisa; Hayashi, Katsutake; Katsura, Hakuji; Tomita, Kenichi; Morohoshi, Hideo; Uehara, Keiichi; and Tanaka, Hiroshi, to Shiseido Co., Ltd. Method for improving the quality of the fragrance of perfumes using aliphatic dibasic acid diesters. 4,110,626, Cl. 252-522.000.

Katayama, Iwao: *See—*

Yamada, Yasuo; Kamiya, Kazuo; Katayama, Iwao; Motobayashi, Kozo; and Yonemura, Yoshiaki, 4,109,451, Cl. 57-56.000.

Kato, Eüchi: *See—*

Sugiyama, Masatoshi; and Kato, Eüchi, 4,110,115, Cl. 96-84.00A.

Kato, Toshiro: *See—*

Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; and Fujinami, Akira, 4,110,462, Cl. 424-273.00R.

Katsube, Junki: *See—*

Kojima, Atsuyuki; Katsube, Junki; Kameno, Yoshito; Inaba, Shigeho; and Yamamoto, Hisao, 4,110,376, Cl. 260-570.00R.

Katsura, Hakuji: *See—*

Katada, Michihisa; Hayashi, Katsutake; Katsura, Hakuji; Tomita, Kenichi; Morohoshi, Hideo; Uehara, Keiichi; and Tanaka, Hiroshi, 4,110,626, Cl. 252-522.000.

Katzin, Lawrence F. Modular baseboard molding. 4,109,434, Cl. 52-287.000.

Kaufmann, Karl-Ernst: *See—*

Becker, Klaus; Cittrich, Jurgen; and Kaufmann, Karl-Ernst, 4,109,904, Cl. 272-56.50R.

Kawabata, Masuo: *See—*

Maeda, Kazuo; Noguchi, Katuichi; Kawabata, Masuo; Sato, Shigehiko; and Sato, Yukio, 4,109,663, Cl. 131-2.000.

Kawagoe, Akira: *See—*

Kondo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, 4,110,110, Cl. 75-122.000.

Kawakami, Hiromi: *See—*

Hongu, Masayuki; Tokuhara, Masaharu; and Kawakami, Hiromi, 4,110,635, Cl. 307-233.00R.

Kawakami, Kunio, to Kencor Sports, Inc. Fishing reel drag wheel. 4,109,882, Cl. 242-217.000.

Kawamura, Hideo; and Kubota, Kimi, to Isuzu Motors Limited. Exhaust gas purifying device for internal combustion engine with auxiliary combustion chambers. 4,109,625, Cl. 123-119.00A.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*

Fujikawa, Tetsuzo; and Fujü, Noriaki, 4,109,622, Cl. 123-73.00A.

Kawasaki Steel Corporation: *See—*

Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 4,110,048, Cl. 356-200.000.

Kazda, Stanislav: *See—*

Hiltmann, Rudolf; Heise, Arend; Kazda, Stanislav; and Hoffmeister, Friedrich, 4,110,472, Cl. 424-330.000.

Keddy, James R.: *See—*

Cronshaw, David; Shemer, Jack E.; Turner, William D.; Hartke, David; Keddy, James R.; DuVall, Wilbur E.; and Sterling, Warren M., 4,110,823, Cl. 364-200.000.

Keech, Dana E.: *See—*

Keech, Roger A., 4,109,466, Cl. 60-487.000.

Keech, Roger A., to Keech, Dana E.; and Mullisen, Ronald S., part interest to each. Hydraulic transmission. 4,109,466, Cl. 60-487.000.

Keegan, Partick J., to Rho Sigma. Solar heating system. 4,109,639, Cl. 126-271.000.

Keller, Hans: *See—*

Mollgaard, Klaus; Keller, Hans; Sendtko, Ulrich; and Sommer, Rudiger, 4,110,826, Cl. 364-526.000.

Keller, Robert B., to Weisman & Allen. Automatic blood pressure cuff applicator. 4,109,646, Cl. 128-2.05C.

Kemlite Corporation: *See—*

Morse, Donald B., 4,110,151, Cl. 156-519.000.

Kemp, Grey Charles; and Spence, Eion Murray, to Canadian General Electric Company Limited. Brushholder supporting structure. 4,110,650, Cl. 310-239.000.

Kempcheo & Co. GmbH: *See—*

Tuckmantel, Hans-Joachim, 4,109,923, Cl. 277-101.000.

Kemper, Kate. Dough makeup line for the selective production of different kinds of bread. 4,109,569, Cl. 99-483.000.

Kencor Sports, Inc.: *See—*

Kawakami, Kunio, 4,109,882, Cl. 242-217.000.

Kendall, Clarence E., Jr.: *See—*

Moore, Boyd B.; and Kendall, Clarence E., Jr., 4,110,554, Cl. 174-101.500.

Kendall Company, The: *See—*

Taylor, Glenn N., 4,109,837, Cl. 222-556.000.

Kennecott Copper Corporation: *See—*

Frankiewicz, Theodore C., 4,110,106, Cl. 75-1.00R.

Kennedy, James: *See—*

Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,110,534, Cl. 544-16.000.

Kennedy, Jesse: *See—*

West, Vallie D.; and Kennedy, Jesse, 4,109,698, Cl. 157-1.200.

Kennedy, Robert R.: *See—*

Lindemann, Martin K. O.; Kennedy, Robert R.; and Verdicchio, Robert J., 4,110,263, Cl. 252-545.000.

Kennis, Ludo E. J.: *See—*

Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,110,333, Cl. 260-293.570.

Kerfante, Rene, to Eltra Corporation. Character holder. 4,110,763, Cl. 354-14.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*

Forster, Siegfried; and Kleemann, Manfred, 4,109,710, Cl. 165-165.000.

Maly, Vladimir; and Teuchert, Eberhard, 4,110,158, Cl. 176-58.0PB.

Kevotek Oy: *See—*

Kolmonen, Kalle; and Muukka, Esko, 4,109,758, Cl. 184-15.00A.

Keystone Consolidated Industries, Inc.: *See—*

Amdal, Dagfinn O., 4,109,950, Cl. 292-254.000.

Khaleeluddin, Khaja: *See—*

Sutthoff, Robert F.; MacAllister, Robert V.; and Khaleeluddin, Khaja, 4,110,164, Cl. 195-63.000.

Kidd, John A. Means for detecting leakage in the inner lining of tanks and piping. 4,110,739, Cl. 340-605.000.

Kihara, Keiichi: *See—*

Tamabayashi, Hanzo; Hattori, Tatsuo; Tanaka, Tetsuo; Oda, Yasuhiro; and Kihara, Keiichi, 4,110,366, Cl. 260-505.00N.

Kijima, Yoshihiko: *See—*

Imanaka, Hiroshi; Kijima, Yoshihiko; Sugitawa, Chikara; and Sumoto, Misao, 4,110,411, Cl. 260-873.000.

Kikuchi, Kazuo: *See—*

Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,110,417, Cl. 261-39.00A.

Kim, Hyun Jung, to Diamond, Steven M., a part interest. Specimen transfer container. 4,109,530, Cl. 73-427.000.

Kimberly-Clark Corporation: *See—*

Mitchell, Kenneth J.; and Ostermeier, Kurt W., 4,109,353, Cl. 28-104.000.

Kimura, Kyozo: *See—*

Hashimoto, Hiroshi; and Kimura, Kyozo, 4,109,621, Cl. 123-65.0SP.

Kindig, Guilford Edwin, to Eastman Kodak Company. Double exposure prevention mechanism. 4,110,771, Cl. 354-207.000.

King, Dallas E.: *See—*

DiLiddo, Ronald C.; and King, Dallas E., 4,109,376, Cl. 29-622.000.

King, Jack B., to General Motors Corporation. Vehicle assembly-line fueling emission control method. 4,109,687, Cl. 141-5.000.

Kinley, John C.; Anderson, Clifford E.; Agee, Charles W.; and Dieckman, Harry E., to Kinley, John C. Signal-producing pipe caliper. 4,109,386, Cl. 33-178.00F.

Kinoshita, Shouzo, to Pioneer Electronic Corporation. Speaker cabinet. 4,109,983, Cl. 312-214.000.

Kinosz, Donald L.: *See—*

LaCamera, Alfred F.; Trzeciak, Thomas A.; and Kinosz, Donald L., 4,110,178, Cl. 204-64.00R.

Kinson, Philip L., to General Electric Company. Method for purifying a dehydrochlorination mixture. 4,110,541, Cl. 568-725.000.

Kipp, Michael A.; and Brauner, Arne H., to Container Corporation of America. Tubular carton. 4,109,848, Cl. 229-21.000.

Kirchoff, Francis D., to Alco Electronic Products, Inc. Sub-miniature, two position double pole switch. 4,110,574, Cl. 200-67.00G.

Kirkup, Joseph F., to Mechanical Products. Three phase circuit breaker. 4,110,719, Cl. 337-46.000.

Kirschman, Fred C.; and Bolte, Wallace B. Home water distiller. 4,110,170, Cl. 202-160.000.

Kishi, Ikuji: *See—*

Yagi, Norio; Matsumura, Hideki; Aoyagi, Tatsuhiro; and Kishi, Ikuji, 4,110,314, Cl. 528-26.000.

Kishimoto, Tadashi: *See—*

Kiyono, Yutaka; Nagata, Shigeaki; Shigemori, Shuichiro; Kishimoto, Tadashi; Maruyama, Sadao; and Arisawa, Katsuyoshi, 4,109,999, Cl. 350-91.000.

Kita, Takeshi: *See—*

Shimada, Teizo; Kita, Takeshi; Mochizuki, Kiyoshi; and Komiya, Takahiro, 4,110,394, Cl. 264-167.000.

Kitagawa, Junji: *See—*

Akita, Sigeyuki; and Kitagawa, Junji, 4,110,740, Cl. 340-620.000.

Kiyono, Yutaka; Nagata, Shigeaki; Shigemori, Shuichiro; Kishimoto, Tadashi; Maruyama, Sadao; and Arisawa, Katsuyoshi, to Mamiya Camera Co., Ltd. Illuminating device for slit lamp microscopes. 4,109,999, Cl. 350-91.000.

Klancnik, Alvin R., to Sealy, Incorporated. Innerspring construction. 4,109,330, Cl. 5-267.000.

Klank, Otto; Rottmann, Dieter; and Wuttke, Stephan, to Licentia Patent-Verwaltungs-G.m.b.H. Tuning circuit for high frequency receivers. 4,110,695, Cl. 325-464.000.

Kleemann, Manfred: *See—*

Forster, Siegfried; and Kleemann, Manfred, 4,109,710, Cl. 165-165.000.

Klein, Andrew: *See—*

Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,110,291, Cl. 260-29.6RW.

Klein, Bernard; and Foreman, James Arthur, to Hoffmann-La Roche Inc. Determination of β-lipoproteins in blood serum with polyanethole sulfonate. 4,110,077, Cl. 23-230.00B.

Klein, Richard M.; Quackenbush, Carr Lane W.; and Kolbeck, Andrew G., to GTE Laboratories Incorporated. Optical fibers formed of aluminum borophosphate glass compositions. 4,110,002, Cl. 350-96.290.

Klein, Richard M., to GTE Laboratories Incorporated. Method of forming optical fibers. 4,110,090, Cl. 65-2.000.

Kleine, Charles A.; and Middleton, Verne L., to Olin Corporation. Heat exchange panel. 4,109,711, Cl. 165-170.000.

Kleven, Jonny Hilmer. Metal separating process and apparatus. 4,110,206, Cl. 209-43.000.

Kline, Donald C., to Schoeneck Farms, Inc. Method and apparatus for in-field processing of vegetation. 4,109,448, Cl. 56-13.500.

Kling, Miguel. Pumping device. 4,110,059, Cl. 417-424.000.

Klink, Jerome P.: *See—*

Parbhoo, Kantilal R.; Klink, Jerome P.; Calland, John P.; and White, Gerald L., 4,109,610, Cl. 118-202.000.

Klinkert, Norbert: *See—*

Burow, Burghard; and Klinkert, Norbert, 4,109,357, Cl. 28-289.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*

Breuer, Bert, 4,109,746, Cl. 180-82.00A.

Klockner-Werke AG: *See—*

Geck, Hans Gunter; and Kruse, Fritz, 4,110,108, Cl. 75-48.000.

Kloften & Kloften A/S: *See—*

Ege, Sigmund, 4,110,592, Cl. 219-85.00M.

Klygis, Mindaugas Julius; and Olsen, Robert Charles, to Illinois Tool Works Inc. Multipackage and carrier device. 4,109,787, Cl. 206-150.000.

Knapp, Carl Lee: *See—*

Waldron, Clifford Robert; and Knapp, Carl Lee, 4,109,990, Cl. 339-89.00M.

Knechtel, Wilhelm, to Canon Kabushiki Kaisha. Electrostatic copying apparatus. 4,110,030, Cl. 355-11.000.

Knief, Gerald L.: *See—*

Peterson, Jerry D.; and Knief, Gerald L., 4,110,603, Cl. 219-535.000.

Knifton, John F., to Texaco Inc. Process for preparing lower lactams from allylic halide substrates. 4,110,340, Cl. 260-326.5FL.

Knox Manufacturing Company: *See—*

Zinn, Robert W., 4,110,003, Cl. 350-117.000.

Knuttel, Berthold: *See—*

Bergmann, Wilfried; and Knuttel, Berthold, 4,110,680, Cl. 324-0.50B.

Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Spinning rotor utilized for an open-end spinning apparatus. 4,109,452, Cl. 57-58.890.

Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Fiber separating device of an open-end spinning apparatus. 4,109,453, Cl. 57-58.910.

Kobayashi, Osamu: *See—*

Ichikawa, Yataro; Kobayashi, Osamu; Soma, Kazuhiko; Naruchi, Tatuyuki; Yamanaka, Yoshiyuki; and Suzuki, Nobuo, 4,110,403, Cl. 260-603.00R.

Kobe Steel, Ltd.: *See—*

Furuta, Isao; and Takiguchi, Yoshimi, 4,110,183, Cl. 204-157.10R.

Kobori, Tetsuo: *See—*

Hayashi, Kiyozumi; Ohta, Takeo; and Kobori, Tetsuo, 4,110,160, Cl. 176-78.000.

Koch, Hans W., to Roller Bearing Company of America. Self-aligning bushing. 4,109,976, Cl. 308-36.100.

Koch, Werner Lutz. Enossal implant. 4,109,382, Cl. 32-10.00A.

Kodama, Yutaka: *See—*

Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.

Koenig, Walter: *See—*

Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.

Kogel, Gerhard: *See—*

Schaub, Andres; and Kogel, Gerhard, 4,110,071, Cl. 8-21.00R.

Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Device for purifying exhaust gas discharged from internal combustion engine. 4,109,462, Cl. 60-278.000.

Kohl, Franz; and Hoch, Walter, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Manufacture of doped semiconductor rods. 4,110,586, Cl. 219-10.430.

Kohl, Horst: *See—*

Kuckens, Alexander; and Kohl, Horst, 4,109,829, Cl. 222-81.000.

Kojima, Atsuyuki; Katsube, Junki; Kameno, Yoshito; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Cyclopropylmethylamine derivatives. 4,110,376, Cl. 260-570.00R.

Kojima, Gilbert K., to United States of America, National Aeronautics and Space Administration. Miniature implantable ultrasonic echosonometer. 4,109,644, Cl. 128-2.00V.

Kojima, Toshifumi: *See—*

Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.

Kojima, Toshio: *See—*

Kondo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, 4,110,110, Cl. 75-122.000.

Kolb, William Jordan, III; and Laurel, Karl Otto, to Liquid Controls Corporation. Maximum strength/weight fluid metering device. 4,109,525, Cl. 73-201.000.

Kolbe, William F.: *See—*

Leskovar, Branko; Buscher, Harold T.; and Kolbe, William F., 4,110,686, Cl. 324-58.50C.

- Kolbeck, Andrew G.: *See—*
  - Klein, Richard M.; Quackenbush, Carr Lane W.; and Kolbeck, Andrew G., 4,110,002, Cl. 350-96.290.
- Kolk, Erich: *See—*
  - Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,110,523, Cl. 526-124.000.
- Kolmonen, Kalle; and Muukka, Esko, to Kevotek Oy. Lubricating apparatus. 4,109,758, Cl. 184-15.00A.
- Komaba, Shiro: *See—*
  - Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 4,110,029, Cl. 355-10.000.
- Komada, Hiroshi: *See—*
  - Ffooks, Roger Cambridge; and Komada, Hiroshi, 4,109,823, Cl. 220-446.000.
- Komander, Gerhard: *See—*
  - Hoheisel, Peter-Matthias; and Komander, Gerhard, 4,110,813, Cl. 361-248.000.
- Komatsu, Miwako: *See—*
  - Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
- Komiya, Takahiro: *See—*
  - Shimada, Teizo; Kita, Takeshi; Mochizuki, Kiyoshi; and Komiya, Takahiro, 4,110,394, Cl. 264-167.000.
- Kondo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, to Mitsubishi Kinzoku Kabushiki Kaisha. Nickel-base alloy excellent in corrosion resistance at high temperatures. 4,110,110, Cl. 75-122.000.
- Konig, Franz: *See—*
  - Fehrer, Ernst; and Konig, Franz, 4,109,454, Cl. 57-58.950.
- Konigsford, Barry S.; Davidson, Kenneth; and Marschak, Howard J., to International Telephone and Telegraph Corporation. Display rack and assembly of articles on the rack. 4,109,795, Cl. 211-57.100.
- Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Variable venturi type carburetor. 4,110,417, Cl. 261-39.00A.
- Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, to Hitachi, Ltd. Bidirectional grooved thyristor fired by activation of the beveled surfaces. 4,110,781, Cl. 357-39.000.
- Konishiroku Photo Industry Co., Ltd.: *See—*
  - Takahashi, Tokuji, 4,110,047, Cl. 356-200.000.
- Kono, Hidehiko, to Agency of Industrial Science & Technology. Shape recognition system. 4,110,736, Cl. 340-146.3AE.
- Konoshima, Katunaga, to Olympus Optical Co., Ltd. Spare lamp holding device for a light supply device for endoscope. 4,110,820, Cl. 362-207.000.
- Koop, Douglas A.: *See—*
  - Whetstone, Clayton N.; Koop, Douglas A.; and Dowd, James D., 4,109,374, Cl. 29-599.000.
- Korbach, Paul F.: *See—*
  - Bosniack, David S.; and Korbach, Paul F., 4,110,196, Cl. 208-13.000.
- Kori, Seiji: *See—*
  - Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, 4,110,341, Cl. 260-327.00C.
- Kornfeld, Edmund C.: *See—*
  - Bach, Nicholas J.; and Kornfeld, Edmund C., 4,110,339, Cl. 260-326.900.
- Koroknay, Laszlo; and Ratsko, Istvan, to Autoipari Kutato Intezet. Anti-jack-knifing apparatus for articulated vehicles. 4,109,929, Cl. 280-432.000.
- Korr, Abraham L.; and Rosenblatt, David B., to United States of America, Army. Anti-missile missile. 4,109,883, Cl. 244-3.100.
- Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, to Nippon Kokan Kabushiki Kaisha. Method for longitudinally seam-welding pipe-blank for welded steel pipe from the inside along a groove. 4,110,589, Cl. 219-66.000.
- Koyama, Mitsuo: *See—*
  - Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,110,772, Cl. 354-246.000.
  - Onda, Eiichi; Koyama, Mitsuo; Nemoto, Ichiro; Nokagawa, Tadashi; and Watanabe, Masanori, 4,110,767, Cl. 354-152.000.
- Kozam, George; and Romanelli, Pat. Successive delivery multiple barrel syringe. 4,109,653, Cl. 128-218.00R.
- Kozima, Toyoo, to Hidaka Engineering Co., Ltd. Method for the production of heat exchanger fins. 4,109,501, Cl. 72-327.000.
- Krabetz, Richard: *See—*
  - Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.
- Kraft, Derald H., to Aspro, Inc. Spun V-grooved sheet pulley with thick hub wall integral with thin side wall. 4,109,542, Cl. 74-230.800.
- Kraftwerk Union Aktiengesellschaft: *See—*
  - Bergmann, Wilfried; and Knuttel, Bertbold, 4,110,680, Cl. 324-0.50B.
- Kranz, Walter; and Hohnecker, Lynn, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus and method for storing pressure gas in a reservoir of a projectile. 4,109,884, Cl. 244-3.220.
- Krasnovskaya, Tatyana Sergeevna, administratrix: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Krasnovsky, Gennady Alexeevich, deceased: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Kratochvil, John R., Jr., to Boise Cascade Corporation. Suspension means for furniture shipping package. 4,109,876, Cl. 206-326.000.
- Kray, Gerald L.: *See—*
  - Richeson, William E., Jr.; and Kray, Gerald L., 4,109,630, Cl. 123-148.00E.
- Krehbiel, Vivian D.; and Haas, Ralph L., to Kreonite, Inc. Film guide for film processing equipment. 4,110,774, Cl. 354-345.000.
- Kreonite, Inc.: *See—*
  - Krehbiel, Vivian D.; and Haas, Ralph L., 4,110,774, Cl. 354-345.000.
- Kriege, Richard P., to Lowrance Electronics, Inc. Method of manufacturing transducer. 4,110,727, Cl. 340-10.000.
- Kroeger, Joseph H.: *See—*
  - Sarkissian, Vahe A.; Jayakumar, Nagab; Kroeger, Joseph H.; and Schlageter, Jeffrey M., 4,110,842, Cl. 365-233.000.
- Krofchak, David. Method of treating a waste liquid containing polluting compounds. 4,110,212, Cl. 210-53.000.
- Krohn, Hans Guenther; Rademacher, Friedrich; Petri, Ulrich; and Deubel, Hans D., to H & K, Inc. Apparatus for filling and crowning bottles. 4,109,446, Cl. 53-282.000.
- Krumkalns, Eriks Viktors: *See—*
  - Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, 4,110,099, Cl. 71-76.000.
- Kruse, Fritz: *See—*
  - Geck, Hans Gunter; and Kruse, Fritz, 4,110,108, Cl. 75-48.000.
- Krygowski, Matthew A., to International Business Machines Corporation. Channel storage adapter. 4,110,830, Cl. 364-200.000.
- Kuboshima, Makoto: *See—*
  - Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,110,766, Cl. 354-106.000.
- Kubota, Kimi: *See—*
  - Kawamura, Hideo; and Kubota, Kimi, 4,109,625, Cl. 123-119.00A.
- Kubota Ltd.: *See—*
  - Murayama, Yoshinobu, 4,109,550, Cl. 74-691.000.
- Kubota, Naohiro: *See—*
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,110,306, Cl. 260-45.80N.
- Kuchenmeister, Rolf: *See—*
  - Freitag, Dieter; Tresper, Erhard; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,110,540, Cl. 568-718.000.
- Kucher, Robert C.; and Dahl, Terence W. Method of making a unitary frame for a winch. 4,109,598, Cl. 113-116.0HH.
- Kuckens, Alexander; and Kohl, Horst, to DAGMA Deutsche Automaten- und Getrankemaschinen- Gesellschaft mit beschrankter Haftung & Co. Container for metered dispensing of liquid. 4,109,829, Cl. 222-81.000.
- Kudamatsu, Akio: *See—*
  - Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; Shiokawa, Kozo; and Tsuboi, Shinichi, 4,110,440, Cl. 424-207.000.
- Kufrin, Robert J.: *See—*
  - Longley, Kermit D.; Herke, Robert; and Kufrin, Robert J., 4,110,268, Cl. 521-177.000.
- Kuhar, George A., to Goodyear Tire & Rubber Company, The. Thermoplastic high acrylonitrile resins. 4,110,413, Cl. 260-879.000.
- Kuhn, Johannes Andries; and Wilkinson, Randolph James, to Lever Brothers Company. Antiperspirant composition. 4,110,428, Cl. 424-46.000.
- Kume, Toyohiko: *See—*
  - Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; Shiokawa, Kozo; and Tsuboi, Shinichi, 4,110,440, Cl. 424-207.000.
- Kummer, Horst; and Beckmann, Ruediger. Pharmaceutical composition comprising d,l-α-methyl-thyroxine ethyl ester and the salts thereof and the control of cholesterol and triglyceride blood level therewith. 4,110,470, Cl. 424-309.000.
- Kunii, Nobuaki: *See—*
  - Abe, Takeshi; Ichimura, Masahiko; Noshiro, Makoto; Kunii, Nobuaki; and Ito, Yasumichi, 4,110,308, Cl. 260-45.75C.
- Kunioka, Kazuo; Noguchi, Takao; and Sato, Hiroaki, to Nippon Kokan Kabushiki Kaisha. Method of apparatus for cooling inner surface of metal pipe. 4,110,092, Cl. 62-64.000.
- Kunkle, Albert C.; Abercrombie, William Floyd, Jr.; and Akins, Charles John, Jr., to J. M. Huber Corporation. Electro-osmotic/phoretic process for concentrating clay. 4,110,189, Cl. 204-180.00R.
- Kunz, Peter, to Mettler Instrument AG. Weighing apparatus including lever-connected compensation coil means. 4,109,738, Cl. 177-212.000.
- Kurahashi, Takeo; Maeda, Shigeo; Seki, Sanai; Suzuki, Nobuo; and Sakai, Takayuki, to Hodogaya Chemical Co., Ltd. Heat transfer printing on acidic modified synthetic fiber. 4,110,070, Cl. 8-2.50R.
- Kurmeier, Hans-Adolf: *See—*
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Kuroda, Junji: *See—*
  - Honjo, Yoshihiko; and Kuroda, Junji, 4,110,607, Cl. 250-201.000.

- Kuroda, Seietsu: *See—*
  - Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
- Kuroki, Shinichiro: *See—*
  - Okamoto, Jiro; Hirose, Mamoru; Miyamoto, Katsuji; and Kuroki, Shinichiro, 4,110,596, Cl. 219-124.400.
- Kushman, Robert L.; and Ling, Sumy H. C., to Stacey Manufacturing Co., The. Explosion vent and method of venting. 4,109,819, Cl. 220-208.000.
- Kutik, Louis F.; and Cecil, Howard E., to Security Plastics, Inc. Pumping system having a pressure release. 4,109,832, Cl. 222-318.000.
- Kvita, Vratislav: *See—*
  - Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,110,188, Cl. 204-159.220.
- Kwikee Enterprises, Inc.: *See—*
  - Nagy, Emery James; and MacDonald, Rodney A., 4,110,673, Cl. 318-466.000.
- Kwok, Clyde C. K.; and Farag, Essam A., to Canadian Patents and Development Limited. Constant volume fluid discharging device. 4,109,834, Cl. 222-448.000.
- Kyberna GmbH: *See—*
  - Graf Vom Hagen, Siegbert, 4,110,667, Cl. 313-143.000.
- Kyoritsu Yuki Co., Ltd.: *See—*
  - Miyajima, Tohru, 4,110,520, Cl. 526-27.000.
- Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., to Johnson Controls, Inc. Method of making fluid system circuit board. 4,110,140, Cl. 156-87.000.
- LaBrie, Paul J. Apparatus for producing analog-to-digital conversions. 4,110,747, Cl. 340-347.0NT.
- LaCamera, Alfred F.; Trzeciak, Thomas A.; and Kinosz, Donald L., to Aluminum Company of America. Flow control baffles for molten salt electrolysis. 4,110,178, Cl. 204-64.00R.
- Lacchia, Adrien. Electrostatic powder coating method. 4,110,486, Cl. 427-27.000.
- Lademann, Rudolf: *See—*
  - Bildstein, Siegfried; Lademann, Rudolf; Pietzsch, Siegfried; and Schaeffer, Georg, 4,110,365, Cl. 260-505.00C.
- Laesser, Claude; and Portmann, Hubert, to Ebauches S.A. Universal electronic timepiece. 4,109,457, Cl. 58-43.000.
- Laesser, Claude, to Ebauches S.A. Passive electro-optic display cell. 4,110,744, Cl. 340-336.000.
- Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., to Suntech, Inc.; and Children's Hospital Medical Center. Tetramethylpentane blood substitutes. 4,110,474, Cl. 424-350.000.
- Lala, Robert J., to Lever Brothers Company. Reduced-staining colorant system. 4,110,238, Cl. 252-89.00B.
- Lallia, Pascal: *See—*
  - Brambilla, Marco; and Lallia, Pascal, 4,110,595, Cl. 219-121.00P.
- Lames Societa per Azioni: *See—*
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- Lamport, Ivan R.: *See—*
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- Lancaster Colony Corporation: *See—*
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- Lancaster, Kenneth D., Jr.: *See—*
  - Payne, Larry E.; and Lancaster, Kenneth D., Jr., 4,109,817, Cl. 220-90.200.
- Lane, Gilbert M. Utility cart. 4,109,926, Cl. 280-39.000.
- Langdon, Glen George, Jr., to International Business Machines Corporation. Method and means for tracking digit significance in arithmetic operations executed on decimal computers. 4,110,831, Cl. 364-745.000.
- Lange, Karl-Heinz, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG. System for mounting accessories on a camera. 4,110,770, Cl. 354-202.000.
- Langerwerf, Josephus Sychbertus: *See—*
  - Carter, Alan Reginald; Pettit, Donald; and Langerwerf, Josephus Sychbertus, 4,110,495, Cl. 427-400.000.
- Langle, Juan Pedro; and Langle, Miguel Juan. Vacuum-operated liquid pump. 4,110,058, Cl. 417-395.000.
- Langle, Miguel Juan: *See—*
  - Langle, Juan Pedro; and Langle, Miguel Juan, 4,110,058, Cl. 417-395.000.
- Lankro Chemicals Group Limited: *See—*
  - Tennant, David John; Sheridan, Geoffrey Philip; and Steel, Alistair James, 4,110,213, Cl. 210-59.000.
- Lapkin, Milton: *See—*
  - Chesler, Edwin T.; Goodman, Donald; and Lapkin, Milton, 4,110,527, Cl. 526-235.000.
- Lapp, John; and Sadler, Fred S., to McGraw-Edison Company. Dielectric system for an electrical apparatus. 4,110,496, Cl. 428-500.000.
- Lappe, Donald L.: *See—*
  - Stern, Michael D.; and Lappe, Donald L., 4,109,647, Cl. 128-2.05F.
- Larke, John Reginald; Barber, Colin; and Cotterill, David John, to National Research Development Corporation. Electrode assemblies. 4,109,648, Cl. 128-2.06E.
- Laroche, Jean Pierre. Form panel spacing device. 4,109,893, Cl. 249-175.000.
- Larsen, Gregory J.; and Hiszpanski, Jan A., to FMC Corporation. Unidirectional flow pickup hood for street sweepers. 4,109,341, Cl. 15-340.000.
- Larson, Daniel A., to Westinghouse Electric Corp. Method for mounting electrodes in high pressure sodium lamps and resulting article. 4,110,656, Cl. 313-331.000.
- Laubin, Jurgen: *See—*
  - Baumgartner, Alfons; Berg, Walter; Burkhardt, Horst; Laubin, Jurgen; and Schlick, Helmut, 4,110,828, Cl. 364-562.000.
- Lauder, Alan; and McCann, Elrey L., III, to Du Pont de Nemours, E. I., and Company. Metal oxyhalide catalytic compositions. 4,110,251, Cl. 252-442.000.
- Lauder, Alan, to Du Pont de Nemours, E. I., and Company. Metal oxide catalytic compositions. 4,110,254, Cl. 252-462.000.
- Lauder, Alan, to Du Pont de Nemours, E. I., and Company. Barium metal oxide catalytic compositions. 4,110,258, Cl. 252-468.000.
- Laurel, Karl Otto: *See—*
  - Kolb, William Jordan, III; and Laurel, Karl Otto, 4,109,525, Cl. 73-201.000.
- Laurent, Francois: *See—*
  - Bohm, Kurt; Rollenitz, Leopold; and Laurent, Francois, 4,110,005, Cl. 350-184.000.
- Lautjarvi, Jaakko; and Eriksson, Raimo. Method and a device for adding solid, powdered or grained material to melted metal. 4,109,898, Cl. 266-217.000.
- Lavender, Ardis R. Plate type fluid distributing device. 4,109,680, Cl. 137-599.000.
- Lavender, Ardis R. Mass transfer device. 4,110,220, Cl. 210-321.00R.
- Lawford, Victor N.; and Sacarisen, David F., to International Telephone and Telegraph Corporation. Fluid sensing systems. 4,109,531, Cl. 73-438.000.
- Lawonn, Horst: *See—*
  - Demmler, Kurt; Lawonn, Horst; and Hesse, Anton, 4,110,278, Cl. 260-17.00A.
- Lawrence Brothers, Inc.: *See—*
  - Strozier, Robert E., 4,109,346, Cl. 16-151.000.
- Lawrence, John P., to Goodyear Tire & Rubber Company, The. Thiocarbamate additives for sulfur vulcanizable polymers. 4,110,319, Cl. 526-17.000.
- Leach, Bruce E., to Continental Oil Company. Method for the disproportionation of highly alkylated phenols with phenol. 4,110,253, Cl. 252-457.000.
- Leary, Patrick John; and Shaffer, Harry Leonard, to GTE Sylvania Incorporated. Communication apparatus. 4,110,560, Cl. 179-1.0VC.
- Lebert, Ulrich: *See—*
  - Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.
- Lecha, Manuel Julian: *See—*
  - Salvat Dalmau, Juan; and Lecha, Manuel Julian, 4,110,118, Cl. 106-25.000.
- Ledeen Flow Control Systems: *See—*
  - Ledeen, Howard L.; and Schmon, Franz, 4,109,512, Cl. 73-40.50R.
- Ledeen, Howard L., and Schmon, Franz, to Ledeen Flow Control Systems. Linebreak detection system. 4,109,512, Cl. 73-40.50R.
- Leduc, Robert D., to Polaroid Corporation. Latch assembly for film loading door. 4,109,947, Cl. 292-76.000.
- Lee, Geoffrey M.: *See—*
  - Ho, Bin-Lun; and Lee, Geoffrey M., 4,110,802, Cl. 360-106.000.
- Lee, Harvey Robert, to Canadian General Electric Company Limited. Method of fabricating nuclear fuel. 4,110,159, Cl. 176-68.000.
- Lee, John M.: *See—*
  - Bauman, William C.; Lee, John M.; and Watson, John D., 4,110,402, Cl. 423-166.000.
- Lee, Lien-Mow: *See—*
  - Edging, Robert Ray; and Lee, Lien-Mow, 4,110,316, Cl. 526-68.000.
- Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Composite of bonded cubic boron nitride crystals on a silicon carbide substrate. 4,110,084, Cl. 51-307.000.
- Lee, Richard G. Horizontal cartoning machine. 4,109,444, Cl. 53-186.000.
- Lee, Yu-Sun; and Shackle, Dale Richard, to Mead Corporation, The. Process for the production of a pressure-sensitive carbonless copy sheet using microcapsules formed in situ in a radiation curable binder. 4,110,511, Cl. 428-307.000.
- Leenerts, Virgil G. Standing wave ratio measurement instrument. 4,110,685, Cl. 324-58.00B.
- Legille, Edouard, to S.A. des Anciens Establissements Paul Wurth. Infra-red profilometer. 4,110,617, Cl. 250-342.000.
- Leighton, Howard N.: *See—*
  - Dubil, James F.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,110,835, Cl. 364-844.000.
- Lein, Werner: *See—*
  - Forster, Karl-Heinz; Lein, Werner; and Heiber, Hartmut, 4,109,574, Cl. 101-216.000.
- Leininger, Joel Calvin; and Taylor, George Phillips, to International Business Machines Corporation. Carry save adder. 4,110,832, Cl. 364-786.000.
- Leitz, Ludwig, to Ernst Leitz Wetzlar GmbH. Method and apparatus for photoelectrically determining the position of at least one focal plane of an image. 4,110,042, Cl. 356-4.000.
- Lemelson, Jerome H. Magnetic tape transducing apparatus. 4,110,801, Cl. 360-96.000.
- Lender, Adam, to GTE Automatic Electric Laboratories, Incorporated. Apparatus and method for detecting errors in a 7-level correlative signal. 4,110,691, Cl. 325-41.000.
- Lenz, George R.; and Schulz, John A., to G. D. Searle & Co. 21-(Acetyloxy)-3-oxo-24-norchola-4,20(22)-diene-23-nitrile and intermediates thereto. 4,110,325, Cl. 260-239.55C.

- Leo, Thomas J.; and Johansson, Anders H., to Wyrough and Loser, Inc. Coprecipitation process. 4,110,240, Cl. 252-182.000.
- Leon Moyano, Rafael. Vehicle parking system with a plurality of movable colums having vehicle supporting floors. 4,109,804, Cl. 214-16.1CB.
- Leonard, James H., Jr., to Allied Industries Inc. Method of discharging particulate material from a hopper. 4,109,827, Cl. 222-1.000.
- Lepore, Henry D.; and Saidman, Perry J., to Lepore, Henry D. Anti-theft starting system. 4,110,734, Cl. 340-64.000.
- Lepper, Wilhelm. Earphone construction. 4,110,583, Cl. 179-156.00R.
- Les Industries BFG Limitee: *See—*
  - Drouin, Claude, 4,109,637, Cl. 126-197.000.
- Les Products Associes LPA SA: *See—*
  - Peclard, Michel, 4,109,650, Cl. 128-66.000.
- Leskovar, Branko; Buscher, Harold T.; and Kolbe, William F., to United States of America, Energy. Piezoelectric-tuned microwave cavity for absorption spectrometry. 4,110,686, Cl. 324-58.50C.
- Lester, Robert W.; and Hotto, Robert, to Static Systems Corporation. Electronic typewriter using a solid state display to print. 4,110,794, Cl. 358-256.000.
- Lever Bros. Co.: *See—*
  - Prince, Leon M., 4,110,239, Cl. 252-135.000.
- Lever Brothers Company: *See—*
  - Kuhn, Johannes Andries; and Wilkinson, Randolph James, 4,110,428, Cl. 424-46.000.
  - Lala, Robert J., 4,110,238, Cl. 252-89.00B.
- Levi Strauss & Co.: *See—*
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- Levina, Tamara Grigorievna: *See—*
  - Akutin, Modest Sergeevich; and Levina, Tamara Grigorievna, 4,110,395, Cl. 264-210.00R.
- Levine, Samuel W.: *See—*
  - Hascoe, Norman; and Levine, Samuel W., 4,109,818, Cl. 220-200.000.
- Lewis, Donald R.: *See—*
  - Barecki, Chester J.; Lewis, Donald R.; and Camp, Terry L., 4,109,959, Cl. 297-216.000.
- Lewis, John C., Jr., to Tucel Industries, Inc. Picking device. 4,109,965, Cl. 300-7.000.
- Libbey-Owens-Ford Company: *See—*
  - Oelke, Waldemar W.; Boehm, Hans W.; and Herrington, Richard A., 4,109,840, Cl. 225-2.000.
- Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
  - Klank, Otto; Rottmann, Dieter; and Wuttke, Stephan, 4,110,695, Cl. 325-464.000.
- Lichfield, William H. Grinding mill. 4,109,873, Cl. 241-56.000.
- Lieb, A. Calvin, Jr. Protective cabinet. 4,109,985, Cl. 312-262.000.
- Lien, Jih-Chang: *See—*
  - Rao, G. R. Mohan; Stanczak, John S.; Lien, Jih-Chang; and Bhatia, Shyam, 4,110,776, Cl. 357-23.000.
- Liepa, Alexander L.; and Japikse, Cornelis H., to Procter & Gamble Company, The. Beverage carbonation device. 4,110,255, Cl. 252-455.00Z.
- Lifshin, Eric: *See—*
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- Ligett Group Inc.: *See—*
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- Ligon, Woodfin V., Jr.; and Lifshin, Eric, to General Electric Company. Mass spectrometer desorption device including field anode eutectic alloy wire and auxiliary electrical resistance heating means. 4,110,612, Cl. 250-281.000.
- Lin, Kou Chi; and Woods, Edmund E., to Westinghouse Electric Corp. Method of making adhesive coated electrical conductors. 4,109,375, Cl. 29-605.000.
- Linde Aktiengesellschaft: *See—*
  - Daeschler, Werner; and Rainer, Hans, 4,110,091, Cl. 62-54.000.
- Lindemann, Martin K., to Chas. S. Tanner Co. Thermosetting vinyl ester emulsion copolymers. 4,110,289, Cl. 260-29.6TA.
- Lindemann, Martin K. O.; Kennedy, Robert R.; and Verdicchio, Robert J., to Johnson & Johnson Baby Products Company. Mild cleansing compositions containing alkyleneoxylated bisquaternary ammonium compounds. 4,110,263, Cl. 252-545.000.
- Lindsay, Geoffrey Andrew; and Stricharczuk, Paul Thomas, to B. F. Goodrich Company, The. Thermoplastic polymer blends of ethylene-propylene (EP) copolymer with polyethylene. 4,110,414, Cl. 260-897.00A.
- Ling, Sumy H. C.: *See—*
  - Kushman, Robert L.; and Ling, Sumy H. C., 4,109,819, Cl. 220-208.000.
- Lipha, Lyonnaise Industrielle Pharmaceutique: *See—*
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- Liquid Controls Corporation: *See—*
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- Lissau, Frederic: *See—*
  - Horowitz, Charles; and Lissau, Frederic, 4,109,673, Cl. 137-381.000.
- Litovitz, Theodore A.: *See—*
  - Macedo, Pedro B.; and Litovitz, Theodore A., 4,110,093, Cl. 65-3.00R.
  - Macedo, Pedro B.; and Litovitz, Theodore A., 4,110,096, Cl. 65-30.00R.
- Litton Systems, Inc.: *See—*
  - Day, Walter Ransom, Jr., 4,110,709, Cl. 333-6.000.
  - Fagan, Louis E., 4,110,651, Cl. 310-239.000.
  - Spencer, David R., 4,110,795, Cl. 358-260.000.
- Lockheed Aircraft Corporation: *See—*
  - Cronin, Michael Joseph, 4,110,809, Cl. 361-95.000.
  - Wirt, Leslie Spencer, 4,109,750, Cl. 181-224.000.
- Login, Robert Bernard: *See—*
  - Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, 4,110,227, Cl. 252-8.900.
- Lohnherr, Ludger, to Polysius AG. Method and apparatus for processing abrasive material. 4,109,871, Cl. 241-24.000.
- Lombardi, Anthony Joseph, to Barney Knitting Machinery Co., Inc. Method for sealing plastic films and the like. 4,110,145, Cl. 156-218.000.
- Lombardi, Anthony Joseph, to International Telephone & Telegraph Corporation. Electro/mechanical enclosure with magnetic cover means. 4,110,552, Cl. 174-35.0MS.
- Lombardo, Michael S.: *See—*
  - Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S., 4,110,147, Cl. 156-306.000.
- Long, Alan Gibson: *See—*
  - Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,110,534, Cl. 544-16.000.
- Long, Douglas A.; and Burke, Frederick A. Mobile information display system. 4,110,792, Cl. 358-240.000.
- Longley, Kermit D.; Herke, Robert; and Kufrin, Robert J., to Witco Chemical Corporation. Polyether polyols and polyurethane foams made therefrom. 4,110,268, Cl. 521-177.000.
- Longuepee, Michel; and Dreulle, Noel, to International Lead Zinc Research Organization, Inc. Procedure for depositing a protective precoating on surfaces of zinc-coated ferrous metal parts against corrosion in presence of water. 4,110,127, Cl. 148-6.15Z.
- Longuepee, Michel: *See—*
  - Dreulle, Paule; Longuepee, Michel; and Dhaussy, Dominique, 4,110,128, Cl. 148-6.15Z.
- Lord Corporation: *See—*
  - Ferralli, Michael W., 4,109,752, Cl. 181-252.000.
- Lorimor, Larry W.: *See—*
  - Junck, John A.; and Lorimor, Larry W., 4,109,561, Cl. 91-451.000.
- Los, Marinus, to American Cyanamid Company. Dihydroimidazoisoindolediones and the use thereof as herbicidal agents. 4,110,103, Cl. 71-92.000.
- Lovatt, William John, to Acme Marls Limited. Support structure for ceramic ware. 4,110,069, Cl. 432-258.000.
- Loveless, Frederick C.; and Nudenberg, Walter, to Uniroyal, Inc. Antioxidant stabilized lubricating oils. 4,110,234, Cl. 252-47.500.
- Loveless, John H.; and Phillips, Claude T., to Gerber Products Company. System and method for coating container seams. 4,110,493, Cl. 427-233.000.
- Lovgren, Jeffrey Lynn: *See—*
  - Castrodale, Daniel Owen; Lovgren, Jeffrey Lynn; Russell, Ralph Arthur; and Shidler, Karl Allen, 4,110,804, Cl. 360-118.000.
- Lower, Hartmut: *See—*
  - Heine, Bernhard; Arndt, Wolfgang; and Lower, Hartmut, 4,110,555, Cl. 178-3.000.
- Lowrance Electronics, Inc.: *See—*
  - Kriege, Richard P., 4,110,727, Cl. 340-10.000.
- Loyd, Morris S., to Rockwell International Corporation. Composite structural joint and method of fabrication thereof. 4,109,435, Cl. 52-309.100.
- Lubrizol Corporation, The: *See—*
  - Cohen, Jerome Martin, 4,110,349, Cl. 260-346.740.
- Lubsen, Timothy Andrew: *See—*
  - Grubbs, Dennis Robert; Lubsen, Timothy Andrew; and Roseberry, George Leroy, Jr., 4,110,485, Cl. 426-595.000.
- Luck, Werner. Polygonal body, consisting of plastics soft foam, as filling material for cushions or the like. 4,109,332, Cl. 5-337.000.
- Luigi Franchi S.p.A.: *See—*
  - Panigoni, Giannantonio, 4,109,558, Cl. 89-191.00A.
- Lukas, George N. Hydraulic booster system. 4,109,467, Cl. 60-534.000.
- Luperti, Harry E.; and Manna, Robert E., to Pitney-Bowes, Inc. Means for self-positioning platen covers. 4,110,041, Cl. 355-75.000.
- Luperti, Harry E.: *See—*
  - Irvine, Robert; Luperti, Harry E.; and Manna, Robert E., 4,110,038, Cl. 355-50.000.
- Lurio, Allen: *See—*
  - Cairns, James Anthony; Lurio, Allen; and Ziegler, James Francis, 4,110,625, Cl. 250-492.00A.
- Lussiez, Guy W.: *See—*
  - Hoover, Raul M.; Lussiez, Guy W.; and Reid, Hugh F., 4,110,401, Cl. 423-150.000.
- Lutz, Michael. Article including an integrally molded ball and socket type hinge. 4,109,821, Cl. 220-337.000.
- Lyman, Steven P., to Midas-International Corporation. Muffler assembly. 4,109,753, Cl. 181-252.000.
- Lyons, James E.: *See—*
  - Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,110,409, Cl. 260-666.0PY.
- M & S Industries, Inc.: *See—*
  - Mason, Lewis M., 4,109,328, Cl. 5-2.00R.
- Maasbach, Pieter Cornelis. Method of treating plants and means to be used in this connection. 4,109,442, Cl. 53-29.000.
- MacAllister, Robert V.: *See—*
  - Sutthoff, Robert F.; MacAllister, Robert V.; and Khaleeluddin, Khaja, 4,110,164, Cl. 195-63.000.

- MacDermid Incorporated: *See—*
  - Grunwald, John J.; D'Ottavio, Eugene D.; Rhodenizer, Harold L.; and Lombardo, Michael S., 4,110,147, Cl. 156-306.000.
- MacDonald, Carl D. Defogging device. 4,109,562, Cl. 98-2.190.
- MacDonald, Rodney A.: *See—*
  - Nagy, Emery James; and MacDonald, Rodney A., 4,110,673, Cl. 318-466.000.
- Macedo, Pedro B.; and Litovitz, Theodore A. Method for producing an impregnated waveguide. 4,110,093, Cl. 65-3.00R.
- Macedo, Pedro B.; and Litovitz, Theodore A. Method of precipitation of a dopant in a porous silicate glass. 4,110,096, Cl. 65-30.00R.
- Macheboeuf, Guy R.: *See—*
  - Mignot, Lucien F.; and Macheboeuf, Guy R., 4,110,786, Cl. 358-22.000.
- Machine Technology; Inc.: *See—*
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- Madel, Andreas: *See—*
  - Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.
- Maeda, Kazuo; Noguchi, Katuichi; Kawabata, Masuo; Sato, Shigehiko; and Sato, Yukio, to Takeda Chemical Industries, Ltd. Tobacco product containing a thermo-gelable β-1,3-glucan-type polysaccharide. 4,109,663, Cl. 131-2.000.
- Maeda, Shigeo: *See—*
  - Kurahashi, Takeo; Maeda, Shigeo; Seki, Sanai; Suzuki, Nobuo; and Sakai, Takayuki, 4,110,070, Cl. 8-2.50R.
- Maganza, Dario: *See—*
  - Ratti, Franco; Vivarelli, Gianantonio; Maganza, Dario; and D'Amore, Emanuele, 4,109,379, Cl. 29-747.000.
- Magee, Philip S., to Chevron Research Company. Insecticidal O,S-dihydrocarbyl-N-haloacylphosphoroamidothioates and S,S-dihydrocarbyl-N-haloacylphosphoroamidodithioates. 4,110,443, Cl. 424-212.000.
- Mages, Bernhard: *See—*
  - Rock, Erich; and Mages, Bernhard, 4,109,344, Cl. 16-144.000.
- Magna International Inc.: *See—*
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- Magnavox Company, The: *See—*
  - Richeson, William E., Jr.; and Kray, Gerald L., 4,109,630, Cl. 123-148.00E.
- Magnusson, Alan B.: *See—*
  - Dieck, Ronald L.; and Magnusson, Alan B., 4,110,421, Cl. 423-300.000.
- Magyar, Joseph J., to General Motors Corporation. Anchorage system for a seat belt. 4,109,962, Cl. 297-385.000.
- Maisonneuve, Leo V. Container and dispensing package. 4,109,826, Cl. 221-72.000.
- Makhteshim Chemical Works Ltd.: *See—*
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- Makino, Hiroshi: *See—*
  - Shinohara, Shigeyuki; and Makino, Hiroshi, 4,109,548, Cl. 74-569.000.
- Malacheski, Joseph J. Coin counter. 4,109,668, Cl. 133-8.00R.
- Mallinckrodt, Inc.: *See—*
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  - Sheridan, David S., 4,109,659, Cl. 128-349.00R.
- Mallory, Henry Rodgers: *See—*
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- Malpass, Dennis B.: *See—*
  - Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,110,357, Cl. 260-448.00A.
- Maly, Hans-Peter, to Robert Bosch GmbH. Process and apparatus for the exact determination of the periodic position of a television vertical synchronizing signal. 4,110,789, Cl. 358-148.000.
- Maly, Vladimir; and Teuchert, Eberhard, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Core reactor and method of operating same. 4,110,158, Cl. 176-58.0PB.
- Mamiya Camera Co., Ltd.: *See—*
  - Kiyono, Yutaka; Nagata, Shigeaki; Shigemori, Shuichiro; Kishimoto, Tadashi; Maruyama, Sadao; and Arisawa, Katsuyoshi, 4,109,999, Cl. 350-91.000.
- Manchester, Luther L.; and Reneau, Bobby J. Apparatus for connecting together flowline end portions. 4,109,945, Cl. 285-323.000.
- Manna, Robert E.: *See—*
  - Irvine, Robert; Luperti, Harry E.; and Manna, Robert E., 4,110,038, Cl. 355-50.000.
  - Luperti, Harry E.; and Manna, Robert E., 4,110,041, Cl. 355-75.000.
- Manov, Emil Nikolov: *See—*
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- Mansfield Carbon Products, Inc.: *See—*
  - Mansfield, Vaughn, 4,109,590, Cl. 110-235.000.
- Mansfield, Vaughn, to Mansfield Carbon Products, Inc. Apparatus and method for producing gas. 4,109,590, Cl. 110-235.000.
- Manufacture Francaise d'Armes et Cycles de Saint-Etienne Manufrance: *See—*
  - Chacornac, Georges, 4,109,655, Cl. 128-253.000.
- Maples, Paul Douglas. Reverse osmosis water unit. 4,110,219, Cl. 210-245.000.
- Marans, Nelson S.: *See—*
  - Cogliano, Joseph A.; and Marans, Nelson S., 4,110,143, Cl. 156-167.000.
- Marconi Company Limited, The: *See—*
  - Watson, Barry Kenneth, 4,110,710, Cl. 333-10.000.
- Maremont Corporation: *See—*
  - Nandyal, Srinath; and McNally, Sellers B., 4,109,767, Cl. 188-315.000.
- Margherita, Salvatore S., to Mallinckrodt, Inc. Radioimmunoassay methods for the determination of L-triiodothyronine and thyroxine. 4,110,076, Cl. 23-230.600.
- Marino, Francis C., to Burroughs Corporation. Keyswitch with hysteresis. 4,110,748, Cl. 340-365.00C.
- Marion, Charles P., to Texaco Development Corporation. Production of cleaned and purified synthesis gas and carbon monoxide. 4,110,359, Cl. 260-449.500.
- Mark, Victor, to General Electric Company. Flame-retardant polycarbonate composition. 4,110,299, Cl. 260-37.0PC.
- Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,110,307, Cl. 260-45.9KA.
- Marquardt, Klaus-Dieter: *See—*
  - Woeckener, Willi; Pawelczyk, Werner; and Marquardt, Klaus-Dieter, 4,110,387, Cl. 264-40.500.
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  - Schulze, Heinz; and Marquis, Edward T., 4,110,371, Cl. 260-531.00C.
- Marra, Aldo. Emergency escape device. 4,109,760, Cl. 182-48.000.
- Marriott, Roger; and Estabrook, Mark R., to Barnes Drill Co. Liquid cleaning apparatus having cyclonic separators. 4,110,218, Cl. 210-223.000.
- Marsai, Maria: *See—*
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- Marschak, Howard J.: *See—*
  - Konigsford, Barry S.; Davidson, Kenneth; and Marschak, Howard J., 4,109,795, Cl. 211-57.100.
- Martin, Gayle Patrick, to United States of America, Air Force. Low offset field effect transistor correlator circuit. 4,110,713, Cl. 333-70.00R.
- Martin, Gayle Patrick: *See—*
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- Martin, Philip W.: *See—*
  - Zahn, Eric H.; and Martin, Philip W., 4,109,385, Cl. 32-59.000.
- Martin, Philippe, to Soudure Autogene Francaise. Sealing device for a vacuum enclosure. 4,109,922, Cl. 277-34.300.
- Martin, Ted. Coil packing. 4,110,418, Cl. 261-98.000.
- Martin, William L.; Wahl, Harry A.; and Young, Gary C., to Continental Oil Company. Method for creating a permeable fragmented zone within a subterranean carbonaceous deposit for in situ coal gasification. 4,109,719, Cl. 166-259.000.
- Martino, William L., Jr.: *See—*
  - Abe, Kichio; and Martino, William L., Jr., 4,110,840, Cl. 365-203.000.
- Maruyama, Sadao: *See—*
  - Kiyono, Yutaka; Nagata, Shigeaki; Shigemori, Shuichiro; Kishimoto, Tadashi; Maruyama, Sadao; and Arisawa, Katsuyoshi, 4,109,999, Cl. 350-91.000.
- Marvin Glass & Associates: *See—*
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- Marx, Paul: *See—*
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- Marzy, Otto: *See—*
  - Blaimschein, Gottfried; and Marzy, Otto, 4,110,055, Cl. 408-203.500.
- Mas, Joseph A., to Electric Vehicle Corporation of America. Variable speed DC motor. 4,110,649, Cl. 310-191.000.
- Maschinenfabrik Gluckauf Beukenberg G.m.b.H.: *See—*
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- Mashida, Toru; Matsushita, Sumeo; and Ikegami, Iwao, to NCO Works Ltd. Process for preparing bands or belts, particularly suitable for use as watch bands. 4,110,139, Cl. 156-79.000.
- Mashino, Yasuhiko: *See—*
  - Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 4,110,048, Cl. 356-200.000.
- Mason, Lewis M., to M & S Industries, Inc. Modular furniture system. 4,109,328, Cl. 5-2.00R.
- Mason, Ronald F.: *See—*
  - Sheldon, Roger A.; Been, Peter; Wood, Derek A.; and Mason, Ronald F., 4,110,360, Cl. 260-465.00D.
- Mason, William Miller; and McTeague, Gerald Emmett, to Tektronix, Inc. Cathode ray tube storage target having increase life. 4,110,659, Cl. 313-398.000.
- Masonite Corporation: *See—*
  - Dobija, Michael J., 4,109,426, Cl. 52-35.000.
- Maspero, Federico: *See—*
  - Clerici, Mario Gabriele; Maspero, Federico; and D'Alfonso, Alfonso, 4,110,377, Cl. 260-583.00R.
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- Masson Scott Thrissell Engineering Ltd.: *See—*
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- Matlock, Patricia: *See—*
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- Matlock, Selden W. Portable climbing device. 4,109,761, Cl. 182-92.000.
- Matlock, William C.; and Matlock, Patricia. Solar energy converter carousel. 4,109,638, Cl. 126-271.000.
- Matrinetz, Frank F.: *See—*
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- Matsubara, Hiroyoshi: *See—*
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- Matsumoto, Akira; and Itani, Katsutoshi, to Tokai Denka Kabushiki Kaisha. Compositions containing a diazine and a halogen compound for catalyzing copper etching solutions. 4,110,237, Cl. 252-79.400.
- Matsumoto, Takao, to Tomy Kogyo Co., Inc. Game structure employing a revolving target. 4,109,914, Cl. 273-101.000.
- Matsumoto, Youichi; Tagashira, Yoshimi; and Yokoyama, Seijiro, to Nippon Electric Company, Ltd. Phase synchronizing circuit. 4,110,706, Cl. 332-19.000.
- Matsumura, Hideki: *See—*
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- Matsuoka, Noboru; and Sugiyama, Kengo, to Hitachi, Ltd. Position detecting apparatus. 4,109,387, Cl. 33-185.00V.
- Matsushima, Yasunobu; Yashiro, Kuniji; Kaneko, Hideaki; and Suzuki, Masanori, to Oxy Metal Industries Corporation. Post treatment of conversion-coated zinc surfaces. 4,110,129, Cl. 148-6.15R.
- Matsushita Electric Industrial Co., Ltd.: *See—*
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- Matsushita, Sumeo: *See—*
  - Mashida, Toru; Matsushita, Sumeo; and Ikegami, Iwao, 4,110,139, Cl. 156-79.000.
- Matsushita, Takao, to Toray Silicone Company, Ltd. Self-extinguishing silicone rubber compositions. 4,110,300, Cl. 260-37.0SB.
- Matsuura, Eiichi: *See—*
  - Suzuki, Keiichi; Takahashi, Keikichi; Matsuura, Eiichi; and Harada, Akinobu, 4,109,458, Cl. 58-63.000.
- Matthias, Jan Henner, to Porsche Design Ferdinand A. Porsche. Protective helmet. 4,109,323, Cl. 2-410.000.
- Mattmuller, Rene, to Saint-Gobain Industries. Molten glass refining apparatus. 4,110,098, Cl. 65-141.000.
- Mattson, Arne J., to Paul Andersoo Industrier AB. Method of bearing a pivoting member intended to transmit great forces and a bearing of such a pivoting member. 4,109,975, Cl. 308-26.000.
- Mauser-Werke Aktiengesellschaft: *See—*
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- Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.: *See—*
  - von der Haar, Friedrich, 4,110,320, Cl. 260-112.00R.
- Maxemchuk, Nicholas Frank, to RCA Corporation. Error detection and correction. 4,110,735, Cl. 340-146.1AQ.
- May, Gordon Herbert, to International Business Machines Corporation. Pattern mask generating method and apparatus. 4,110,594, Cl. 219-121.0LM.
- May, Peter J.; and Stump, Theodore M., to Anaconda Company, The. Traffic sensitive modulation system. 4,110,563, Cl. 179-15.0BW.
- May, Richard D.: *See—*
  - Broadman, Richard J.; and May, Richard D., 4,109,533, Cl. 73-498.000.
- Mayer, Anton, to United States of America, Energy. Electroless plating apparatus for discrete microsized particles. 4,109,612, Cl. 118-417.000.
- Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Derivatives of 1-oxa-3,8-diaza-spiro-[4,5]-decanes. 4,110,334, Cl. 260-293.660.
- Mayes Brothers Tool Manufacturing Co.: *See—*
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- Maze, Perry V. Below roof ventilator. 4,109,433, Cl. 52-199.000.
- Mazzone, Charles P., to J. P. Stevens & Co., Inc. Process for texturing synthetic fibrous material. 4,109,356, Cl. 28-279.000.
- Mazzoni, Renato J.; and Bowser, George H., to PPG Industries, Inc. Sealing and spacing unit for multiple glazed windows. 4,109,431, Cl. 52-172.000.
- McAleer, William J.; and Hurni, William M., to Merck & Co., Inc. Apparatus for recovering embryos from embryonated eggs. 4,110,223, Cl. 210-388.000.
- McCann, Elrey L., III: *See—*
  - Lauder, Alan; and McCann, Elrey L., III, 4,110,251, Cl. 252-442.000.
- McCann, Robert L. Automatic radiochromatagram strip scanner. 4,110,615, Cl. 250-328.000.
- McClesky, John E.: *See—*
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- McCord Corporation: *See—*
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- McCormack, Thomas L.; and Green, Albert P., to Warner Bros. Inc. Low-frequency sound program generation. 4,110,017, Cl. 352-5.000.
- McDade, George Harold, to Chevron Research Company. Method and apparatus for freeing a railroad tank car bottom unloading valve made inoperable by solidified fluids within it. 4,110,602, Cl. 219-523.000.
- McDonald, William Roy: *See—*
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- McDonnell Douglas Corporation: *See—*
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- McEvoy Oilfield Equipment Company: *See—*
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- McFadden, Hubert J.: *See—*
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- McGahern, William J., to General Electric Company. Mounting assembly for laminated rotor rim of dynamoelectric generator rotatable about inclined shaft. 4,110,652, Cl. 310-261.000.
- McGraw-Edison Company: *See—*
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  - Spotts, Willard J.; and Huggler, Peter E., 4,110,600, Cl. 219-364.000.
- McGregor, Stanley D., to Dow Chemical Company, The. Herbicidal use of aminohalopyridyloxy acids and derivatives thereof. 4,110,104, Cl. 71-94.000.
- McHugh, John P., to Solar Suede Corporation. Electrostatic flocking system. 4,109,861, Cl. 239-15.000.
- McIntosh, Robert H.: *See—*
  - Hull, Ezekiel H.; and McIntosh, Robert H., 4,110,504, Cl. 428-97.000.
- McLeod, Gordon D., to Mobil Oil Corporation. Coating composition. 4,110,117, Cl. 106-1.170.
- McMurry, Everett D.; and Abercrombie, Bolling A., to McMurry Oil Tools, Inc. Gas lift mandrel valve mechanism. 4,110,057, Cl. 417-109.000.
- McMurry Oil Tools, Inc.: *See—*
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- McNally, Sellers B.: *See—*
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- McStay, John J.: *See—*
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- McTeague, Gerald Emmett: *See—*
  - Mason, William Miller; and McTeague, Gerald Emmett, 4,110,659, Cl. 313-398.000.
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- Mead Corporation, The: *See—*
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  - Stoneburner, Leonard G., 4,110,759, Cl. 346-75.000.
  - Wood, Prentice J., 4,109,849, Cl. 229-52.00B.
- Mechanical Products: *See—*
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- Medved, Charles W.: *See—*
  - Ernst, Richard G.; and Medved, Charles W., 4,109,978, Cl. 308-237.00R.
- Medwin, Albert H., to CGS Systems, Inc. Method and apparatus for near-synchronization of a pair of oscillators, and measuring thereby. 4,110,701, Cl. 331-1.00A.
- Meeks, Emett O. Audio eccentric connector plug. 4,110,696, Cl. 325-480.000.
- Meenan, Thomas P.: *See—*
  - Meenan, Vincent D.; and Meenan, Thomas P., 4,109,850, Cl. 229-72.000.
- Meenan, Vincent D.; and Meenan, Thomas P. File folder with expandable pocket. 4,109,850, Cl. 229-72.000.
- Mehrhof, Werner: *See—*
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Mehrkam, Quentin D., to Ajax Electric Company. Salt reclamation system. 4,109,897, Cl. 266-120.000.
- Meier, Ernst Johann, to Quadri, Elvira. Device for in place swimming. 4,109,905, Cl. 272-71.000.
- Meisenheimer, Daniel T., Jr. Spool deflection indicator. 4,110,575, Cl. 200-81.90R.
- Mele, Frank; and Mele, Margaret. Learning and earning educational game. 4,109,918, Cl. 273-256.000.
- Mele, Margaret: *See—*
  - Mele, Frank; and Mele, Margaret, 4,109,918, Cl. 273-256.000.
- Melnyk, John. Semi-automated slide processor device. 4,110,167, Cl. 195-127.000.
- Melzer, Arnfried; Marx, Paul; and Puschel, Walter, to AGFA-Gevaert Aktiengesellschaft. Sulfonamido dye releaser in photographic dye diffusion transfer. 4,110,113, Cl. 96-29.00D.
- Memorex Corporation: *See—*
  - Ho, Bin-Lun; and Lee, Geoffrey M., 4,110,802, Cl. 360-106.000.
- Mendenhall, Geoffrey N., to Harris Corporation. Multichannel modulation system including automatic gain shifter. 4,110,708, Cl. 332-21.000.
- Menzi, Ulrich: *See—*
  - Clavel, Raymond; and Menzi, Ulrich, 4,109,778, Cl. 400-154.200.
- Merck & Co., Inc.: *See—*
  - Baldwin, John J.; and Novello, Frederick C., 4,110,456, Cl. 424-263.000.
  - McAleer, William J.; and Hurni, William M., 4,110,223, Cl. 210-388.000.

- Merck Patent Gesellschaft mit beschraenkter Haftung: *See—*
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Merhar, Donald M.: *See—*
  - Varecka, Charles P.; and Merhar, Donald M., 4,110,730, Cl. 340-16.00R.
- Merk, Fritz: *See—*
  - Roder, Edgar; Merk, Fritz; and Rohrig, Luto, 4,110,039, Cl. 355-68.000.
- Merrick, Edwin B.: *See—*
  - Bond, Albert K.; Merrick, Edwin B.; and Nielsen, Larry Lee, 4,109,643, Cl. 128-2.00L.
- Merry, J. Bradford, to Eastman Kodak Company. Multiple wavelength acoustooptic deflection. 4,110,788, Cl. 358-63.000.
- Merten, Rudolf: *See—*
  - Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,110,318, Cl. 528-73.000.
- Mertes, Richard H. Broom and dustpan combination. 4,109,338, Cl. 15-105.000.
- Messerschmitt-Bolkow-Blohm GmbH: *See—*
  - Kranz, Walter; and Hohnecker, Lynn, 4,109,884, Cl. 244-3.220.
  - Schmidt, Gunther, 4,109,460, Cl. 60-204.000.
- Metabi, Tsuneyo: *See—*
  - Uesugi, Kyozo; Metabi, Tsuneyo; and Hachiken, Ryuzo, 4,110,008, Cl. 350-255.000.
- Metabio: *See—*
  - Baetz, Jacques Louis Edouard, 4,110,460, Cl. 424-270.000.
- Metal Box Limited: *See—*
  - Fishwick, Alan James, 4,109,802, Cl. 214-8.50F.
  - Franek, Jozef T., 4,109,500, Cl. 72-203.000.
- Mettler Instrument AG: *See—*
  - Kunz, Peter, 4,109,738, Cl. 177-212.000.
- Mettler, Karl; Marxer, Paul; and Tiefenthaler, Arthur, to Press- und Stanzwerk AG. Apparatus for producing a non-releasable connection and non-releasable connection produced with such apparatus. 4,110,051, Cl. 403-157.000.
- Meunier, Jacques, to C.G.R. MeV. Device for monitoring the fitting in position of detachable elements in their support. 4,110,581, Cl. 200-153.0LA.
- Meyer, Gustavo A.: *See—*
  - Jha, Mahesh C.; Wicker, Gordon R.; and Meyer, Gustavo A., 4,110,400, Cl. 423-141.000.
- Meyer, Herbert J.: *See—*
  - Fuller, Lester R.; and Meyer, Herbert J., 4,110,728, Cl. 340-15.5DP.
- Micarna AG Fleischwarenfabrik: *See—*
  - Jolin, Andre, 4,109,347, Cl. 17-23.000.
- Michaels-Christopher, Van. Reformed hydrocarbons and alcohols from fuel alloys and reforming agents. 4,110,082, Cl. 44-50.000.
- Midas-International Corporation: *See—*
  - Lyman, Steven P., 4,109,753, Cl. 181-252.000.
- Middleton, Verne L.: *See—*
  - Kleine, Charles A.; and Middleton, Verne L., 4,109,711, Cl. 165-170.000.
- Midland-Ross Corporation: *See—*
  - Acre, Leon R., 4,109,350, Cl. 24-249.0LS.
  - Clipson, Stuart A.; and Herolzer, Ralph H., 4,109,791, Cl. 206-506.000.
- Migliore-Samour, Daniele: *See—*
  - Jolles, Pierre; and Migliore-Samour, Daniele, 4,110,434, Cl. 424-92.000.
- Mignot, Lucien F.; and Macheboeuf, Guy R., to Telediffusion de France. Device generating special effects on color television pictures. 4,110,786, Cl. 358-22.000.
- Mihirogi, Kiyoshi, to Japan Airlines Co., Limited. Track switching device for two-rail type tracks. 4,109,584, Cl. 104-130.000.
- Mildenberger, Hilmar; Stahler, Gerhard; and Emmel, Ludwig, to Hoechst Aktiengesellschaft. Mono-, di- and tri-esters of thiophosphonic acid and their use as pesticides. 4,110,336, Cl. 260-307.00G.
- Miles Laboratories, Inc.: *See—*
  - Havera, Herbert J.; and Strycker, Wallace G., 4,110,536, Cl. 544-139.000.
- Milianowicz, Stanislaw A.: *See—*
  - Frink, Russell E.; and Milianowicz, Stanislaw A., 4,110,579, Cl. 200-146.00R.
- Millar, Robert F.; Persico, Paul J.; and Jensen, Robert H., to UOP Inc. Moving-bed radial flow solids-fluid contacting apparatus. 4,110,081, Cl. 23-288.00G.
- Miller, Donald E.: *See—*
  - Rule, Charles E.; Ilagan, Juan B.; and Miller, Donald E., 4,110,484, Cl. 426-582.000.
- Miller, Gerald Adrian; and Zabsky, John Mitchell, to Dresser Industries, Inc. High frequency diffusion muffler for gas jets. 4,109,756, Cl. 181-266.000.
- Miller, Harry, to Sperry Rand Corporation. Weight and balance computer apparatus for aircraft. 4,110,605, Cl. 364-463.000.
- Miller-Holzwarth, Inc.: *See—*
  - Tausch, Gerald, 4,110,011, Cl. 350-301.000.
- Miller, Jerry W.; and Gallo, Luigi C., to Ampex Corporation. Frequency response equalizer. 4,110,798, Cl. 360-65.000.
- Miller, Kenneth G., to Respiratory Care, Inc. High-volume disposable and semi-disposable cartridge humidifier with self-contained cartridge sterilizing means, and related method. 4,110,419, Cl. 261-142.000.
- Miller, Lewis Franklin: *See—*
  - Blazick, Linda Ann; and Miller, Lewis Franklin, 4,109,377, Cl. 29-626.000.
- Miller, Robert H.; and Davidson, Harold C., to Caterpillar Tractor Co. Adjustable regulation governor. 4,109,628, Cl. 123-140.00R.
- Miller, Robert M.: *See—*
  - Olcott, Tyler Keith; and Miller, Robert M., 4,110,390, Cl. 264-90.000.
- Miller, Robert R.; and Horton, Robert A., to Precision Metalsmiths, Inc. Pattern assembly. 4,109,699, Cl. 164-244.000.
- Miller, Ronald J.: *See—*
  - Tribken, Everett R.; Miller, Ronald J.; and Griffith, Carl D., 4,109,886, Cl. 244-178.000.
- Mills, Melvin E., Jr.: *See—*
  - Carlin, Joseph T.; Tyler, Timothy N.; Mills, Melvin E., Jr.; and Ware, James W., 4,110,229, Cl. 252-8.55D.
  - Tyler, Timothy N.; Mills, Melvin E., Jr.; Wells, John A.; and Carlin, Joseph T., 4,110,228, Cl. 252-8.55D.
- Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. Stabilizers for synthetic polymers comprising 2,2,6,6-tetramethyl-4-piperidyl carboxylic acid ester, a triphosphite, and an acid phosphite or salt thereof. 4,110,306, Cl. 260-45.80N.
- Minagawa, Nobuhiko; and Ozaki, Tomoaki, to Fuji Photo Film Co., Ltd. Method of manufacturing synthetic resin coated papers. 4,110,155, Cl. 162-135.000.
- Minami, Isao; Yoshioka, Yoshio; and Nomura, Hiroaki, to Takeda Chemical Industries, Ltd. Method of producing N^1-(2-tetrahydrofuryl)-5-fluorouracil. 4,110,537, Cl. 544-313.000.
- Minchak, Robert John, to B. F. Goodrich Company, The. Ring-opened copolymers of at least one norbornene-type monomer with dicyclopentadiene. 4,110,528, Cl. 526-283.000.
- Mineo, Masao: *See—*
  - Teraoka, Kazuharu; Sato, Mitsuru; and Mineo, Masao, 4,109,857, Cl. 235-378.000.
- Minesi, Didier: *See—*
  - Deplante, Michel; and Minesi, Didier, 4,110,672, Cl. 318-254.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Bent, John H., 4,109,735, Cl. 173-163.000.
  - Beretta, Paolo; and Valbusa, Luigi, 4,110,116, Cl. 96-101.000.
  - Golben, Michael, 4,110,109, Cl. 75-109.000.
  - Harrison, George C., 4,110,499, Cl. 428-35.000.
  - Sweet, Lawrence A., 4,109,749, Cl. 181-230.000.
- Minolta Camera Kabushiki Kaisha: *See—*
  - Uesugi, Kyozo; Metabi, Tsuneyo; and Hachiken, Ryuzo, 4,110,008, Cl. 350-255.000.
- Minsk, Louis M.: *See—*
  - Schaeffer, James R.; Minsk, Louis M.; and Stevens, Richard E., 4,110,079, Cl. 23-253.0TP.
- Mitamura, Masakazu: *See—*
  - Furukawa, Hikaru; Mitamura, Masakazu; and Higuchi, Kenji, 4,110,746, Cl. 340-347.0NT.
- Mitchell Beazley Encyclopedias, Ltd.: *See—*
  - Mitchell, James A. H.; and Day, Edward J., 4,109,938, Cl. 283-43.000.
- Mitchell, Douglas Allison. Gas fire. 4,110,063, Cl. 431-125.000.
- Mitchell, James A. H.; and Day, Edward J., to Mitchell Beazley Encyclopedias, Ltd. System for arranging and retrieving information. 4,109,938, Cl. 283-43.000.
- Mitchell, Kenneth J.; and Ostermeier, Kurt W., to Kimberly-Clark Corporation. Apparatus for forming nonwoven web. 4,109,353, Cl. 28-104.000.
- Mitchell, Robert C. Rod and reel storage apparatus. 4,109,796, Cl. 211-60.00R.
- Mitsubishi Chemical Industries Limited: *See—*
  - Miyajima, Tohru, 4,110,520, Cl. 526-27.000.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Akamatsu, Masahiko, 4,110,669, Cl. 318175-.
  - Shibata, Hiroshi; and Yoshihara, Tsutomu, 4,109,371, Cl. 29-571.000.
- Mitsubishi Gas Chemical Company, Inc.: *See—*
  - Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, 4,110,364, Cl. 528-170.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Hashimoto, Hiroshi; and Kimura, Kyozo, 4,109,621, Cl. 123-65.0SP.
  - Okamoto, Jiro; Hirose, Mamoru; Miyamoto, Katsuji; and Kuroki, Shinichiro, 4,110,596, Cl. 219-124.400.
- Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
  - Kondo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, 4,110,110, Cl. 75-122.000.
- Mitsubishi Pencil Co. Ltd.: *See—*
  - Hida, Hiroyuki, 4,109,398, Cl. 35-13.000.
- Mitsudo, Hiroyuki; and Yoshida, Masazumi, to New Cosmos Electric Company Limited. Spark-plug for automobile internal combustion engine. 4,109,633, Cl. 123-169.0EL.
- Mitsui, Shigeo: *See—*
  - Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
- Mitsui Toatsu Chemicals Inc.: *See—*
  - Inoue, Shigeru, 4,110,374, Cl. 260-555.00A.
- Mitter, Mathias. Apparatus for printing webs. 4,109,483, Cl. 68-200.000.

Miura, Mitsutoshi: *See—*
Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
Miyajima, Tohru, to Kyoritsu Yuki Co., Ltd.; and Mitsubishi Chemical Industries Limited. Modification of water-soluble acrylic polymer. 4,110,520, Cl. 526-27.000.
Miyake, Hajimu: *See—*
Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, 4,110,341, Cl. 260-327.00C.
Miyamoto, Katsuji: *See—*
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Miyamoto, Noriaki: *See—*
Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,452, Cl. 57-58.890.
Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,453, Cl. 57-58.910.
Miyao, Hiroyasu, to Yamaha Hatsudoki Kabushiki Kaisha. Ignition systems of internal combustion engines. 4,109,631, Cl. 123-148.0CA.
Miyata, Katsuhiko; Urano, Fumio; and Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light-measuring systems for single lens reflex cameras. 4,110,765, Cl. 354-59.000.
Miyazaki, Togo; and Shimizu, Masatoshi, to Nippon Electric Company, Ltd. Plasma display panel driving circuit including apparatus for producing high frequency pulses without the use of clock pulses. 4,110,663, Cl. 315-169.0TV.
Miyazato, Teruhiko. Puncture-proof tubeless tires. 4,109,695, Cl. 152-347.000.
Miyazu, Takashi: *See—*
Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
Mobil Oil Corporation: *See—*
McLeod, Gordon D., 4,110,117, Cl. 106-1.170.
Schwab, Frederick C.; Sheppard, Edward W.; and Chen, Catherine S. H., 4,110,232, Cl. 252-8.55B.
Slusser, Marion L., 4,109,721, Cl. 166-280.000.
Mochizuki, Kiyoshi: *See—*
Shimada, Teizo; Kita, Takeshi; Mochizuki, Kiyoshi; and Komiya, Takahiro, 4,110,394, Cl. 264-167.000.
Moed, Johannes A. R., to TRW Inc. Service generator for generating a plurality of tones. 4,110,562, Cl. 179-15.0BY.
Moeller, Carl A., Jr., to Flexothane Corporation. Clampable plastic gear and the like. 4,110,054, Cl. 403-373.000.
Moga, Antonio Carmelo Marin: *See—*
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Mohr, Adolf: *See—*
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Molina, Orlando G., to Rockwell International Corporation. Nondestructive magnetic recording medium. 4,110,236, Cl. 252-62.540.
Mollet, Hans; and Rehmann, Wolfgang, to Ciba-Geigy. Fluid and stable dispersions of anionic dyestuffs. 4,110,073, Cl. 8-85.00R.
Mollgaard, Klaus; Keller, Hans; Sendtko, Ulrich; and Sommer, Rudiger, to Dr. -Ing. Rudolf Hell GmbH. Apparatus and process for color-identification. 4,110,826, Cl. 364-526.000.
Momonoi, Kaishu: *See—*
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
Monier Colourtile Pty. Ltd.: *See—*
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Monitoring Systems, Inc.: *See—*
Bailey, John M., 4,110,688, Cl. 324-208.000.
Monsanto Company: *See—*
Drummond, James C.; and Hughes, Lawrence J., 4,110,542, Cl. 568-729.000.
Franz, John E.; and Sacher, Reuven M., 4,110,100, Cl. 71-86.000.
Montabert, Roger. Percussion machine. 4,109,734, Cl. 173-114.000.
Montague, John M.: *See—*
Files, James H.; Montague, John M.; and Thomerson, Clarence T., 4,109,474, Cl. 61-48.000.
Monte, Anthony J.: *See—*
Arutunian, Gregory; and Monte, Anthony J., 4,110,812, Cl. 361-248.000.
Montedison S.p.A.: *See—*
Bornengo, Mario, 4,110,405, Cl. 260-646.000.
Monzain, Michel. Package lifter. 4,109,952, Cl. 294-16.000.
Moogalian, Charles M.: *See—*
Norman, Vello; and Moogalian, Charles M., 4,109,666, Cl. 131-261.00B.
Moons, Hugo, to Alvey, Inc. Device for rotating by 90° the movement direction of pallets and similar between two conveying tracks. 4,109,781, Cl. 198-485.000.
Moore, Boyd B.; and Kendall, Clarence E., Jr., to Custom Cable Company. Buoyant tether cable. 4,110,554, Cl. 174-101.500.
Moore, Edward Joseph; and Owens, John Edward, to Du Pont de Nemours, E. I., and Company. Static charge neutralizer and process. 4,110,810, Cl. 361-213.000.
Moore, James O., to Moore Products Co. Control circuit for bar graph display panel. 4,110,665, Cl. 315-169.0TV.
Moore Products Co.: *See—*
Moore, James O., 4,110,665, Cl. 315-169.0TV.
Moraveck, James F., to Olin Corporation. Urethane coating composition and process. 4,110,317, Cl. 528-77.000.
Moreau, Robert D.: *See—*
Haas, Howard C.; and Moreau, Robert D., 4,110,424, Cl. 423-365.000.
Morgan, David W.: *See—*
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Morgan, Kenneth A.: *See—*
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Morge, Michael P.: *See—*
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Mori, Masatoshi; and Fukata, Ryoji, to Toyo Ink Manufacturing Co., Ltd. Pressure-sensitive adhesives. 4,110,290, Cl. 260-29.6RW.
Mori, Shigeru; Ohsawa, Shigeyoshi; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Process for the production of nocardicin A. 4,110,166, Cl. 195-96.000.
Mori, Takashi: *See—*
Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
Moriguchi, Sanseki: *See—*
Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
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Morohoshi, Hideo: *See—*
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Morrill, Charles Donovan, to McEvoy Oilfield Equipment Company. Seal. 4,109,942, Cl. 285-140.000.
Morris, George O., to Offenhauser, Fred C., a part interest. Flow control insert for internal combustion engine intake manifolds. 4,109,619, Cl. 123-52.00R.
Morris, Matthew Gerald, Jr.: *See—*
Gorgens, Joseph E.; and Morris, Matthew Gerald, Jr., 4,109,537, Cl. 73-756.000.
Morris, Ronald George, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Microstrip circuit having coplanar waveguide port. 4,110,712, Cl. 333-33.000.
Morse, Donald B., to Kemlite Corporation. Apparatus for the preparation of resin impregnated glass fiber sheets. 4,110,151, Cl. 156-519.000.
Mortensen, Marvin L.: *See—*
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,110,444, Cl. 424-226.000.
Moser, Fernand, to Moser, Louis. Liquid filtration device. 4,110,221, Cl. 210-481.000.
Moser, Louis: *See—*
Moser, Fernand, 4,110,221, Cl. 210-481.000.
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., to Diamond Shamrock Corporation. Antiinflammatory imidazothiazoles and thiazolopyrimidines. 4,110,451, Cl. 424-251.000.
Moses, Manfred. System for the utilization of waste heat from a boiler room to beat a fluid medium and lower the ambient temperature of a boiler room. 4,109,858, Cl. 237-8.00R.
Moss, Barry: *See—*
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Motobayashi, Kozo: *See—*
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Motorola Inc.: *See—*
Abe, Kichio; and Martino, William L., Jr., 4,110,840, Cl. 365-203.000.
Bethards, Charles William, 4,110,699, Cl. 328-168.000.
Irwin, James Stuart; and Gilmore, Merle Lee, 4,110,704, Cl. 331-113.00R.
Motsinger, Donald L., to PPG Industries, Inc. Method of forming glass fiber. 4,110,094, Cl. 65-3.00C.
Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Electrical connector and contact. 4,109,986, Cl. 339-17.00L.
Mueller-Tamm, Heinz: *See—*
Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,110,522, Cl. 526-105.000.
Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,110,523, Cl. 526-124.000.
Mueller, William L.; and Winkel, Robert J., to Candid Logic, Inc. Digital electrical position transducer. 4,110,610, Cl. 250-231.0SE.
Mueller, William L.: *See—*
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Mulder, Rudolf: *See—*
Wellinga, Kobus; and Mulder, Rudolf, 4,110,469, Cl. 424-304.000.
Muller, Arnold. Induction motor. 4,110,643, Cl. 310-54.000.
Muller, Hans. Apparatus with foam breaker. 4,110,089, Cl. 55-178.000.
Muller, Helmut: *See—*
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Mullisen, Ronald S.: *See—*
Keech, Roger A., 4,109,466, Cl. 60-487.000.
Munn, Leo Arnold. Skyline logging carriage. 4,109,799, Cl. 212-83.000.
Muraki, Hideaki: *See—*
Fujitani, Yoshiyasu; and Muraki, Hideaki, 4,109,461, Cl. 60-274.000.
Murano, Minoru; Yanabu, Satoru; Tamagawa, Tohoru; and Ikeda, Hisatoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit interrupting apparatus for use in direct current circuits. 4,110,806, Cl. 361-4.000.
Murayama, Yoshinobu, to Kubota Ltd. Stepless speed change systems. 4,109,550, Cl. 74-691.000.
Muroya, Masahiro: *See—*
Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
Murphy, Philip Joseph, to Lancaster Colony Corporation. Floating illuminating device. 4,110,066, Cl. 431-320.000.
Musgrave, Daniel Dennis. Magazine contents indicators. 4,109,401, Cl. 42-50.000.
Muukka, Esko: *See—*
Kolmonen, Kalle; and Muukka, Esko, 4,109,758, Cl. 184-15.00A.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, to Suntech, Inc. Process for making codimers of norbornadiene and alkynes using a cobalt catalyst. 4,110,409, Cl. 260-666.0PY.
Myers, Ted L.: *See—*
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Mykietyn, Edward: *See—*
Rosen, Arye; and Mykietyn, Edward, 4,110,700, Cl. 329-103.000.
Nadella: *See—*
Stephan, Gerard, 4,109,977, Cl. 308-174.000.
Nadkarni, Anil Vasant, to SCM Corporation. Forging powdered dispersion strengthened metal. 4,110,130, Cl. 148-11.50P.
Nagamine, Takashi: *See—*
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
Nagashima, Makoto: *See—*
Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
Nagata, Shigeaki: *See—*
Kiyono, Yutaka; Nagata, Shigeaki; Shigemori, Shuichiro; Kishimoto, Tadashi; Maruyama, Sadao; and Arisawa, Katsuyoshi, 4,109,999, Cl. 350-91.000.
Nagy, Emery James; and MacDonald, Rodney A., to Kwikee Enterprises, Inc. Extendable vehicle step and step motor control system. 4,110,673, Cl. 318-466.000.
Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, to Seiko Koki Kabushiki Kaisha. Camera shutter having bound prevention device. 4,110,772, Cl. 354-246.000.
Nakai, Isao, to Rain Kogyo Kabushiki Kaisha. Accumulating roller conveyor. 4,109,782, Cl. 198-781.000.
Nakai, Masanori: *See—*
Tokumaru, Yukuya; and Nakai, Masanori, 4,110,634, Cl. 307-213.000.
Nakamichi, Kazuyuki: *See—*
Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, 4,110,364, Cl. 528-170.000.
Nakamura, Gichi. Continuous sewage sludge heat treatment apparatus. 4,110,217, Cl. 210-175.000.
Nakamura, Kensaku. Vent type extruder. 4,110,844, Cl. 366-76.000.
Nakamura, Matsuaki: *See—*
Ogawa, Hiroshi; Aonuma, Masashi; Nakamura, Matsuaki; and Tamai, Yasuo, 4,110,503, Cl. 428-64.000.
Nakamura, Norihiko: *See—*
Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,110,417, Cl. 261-39.00A.
Nakanishi, Mutsuo; and Schmidt, Hans, to Quasar Electronics Corporation. Adjustable potentiometer assembly. 4,110,721, Cl. 338-128.000.
Nakano, Kenichi: *See—*
Eden, Richard C.; and Nakano, Kenichi, 4,110,778, Cl. 357-30.000.
Nakasaki, Eiji; and Shirashoji, Hishashi, to Sumitomo Rubber Industries, Ltd. Pneumatic tire for motorcycle. 4,109,696, Cl. 152-354.00R.
Nakatsukasa, Walter M.; and Hamill, Robert L., to Eli Lilly and Company. Antibiotic A-28086 factor D and process for production thereof. 4,110,435, Cl. 424-122.000.
Nakatsukasa, Walter M.; and Hamill, Robert L., to Eli Lilly and Company. Antibiotic A-28086 factor D and process for production thereof. 4,110,436, Cl. 424-122.000.
Namikawa, Mamoru: *See—*
Hoshino, Yasushi; and Namikawa, Mamoru, 4,110,797, Cl. 360-17.000.
Nandyal, Srinath; and McNally, Sellers B., to Maremont Corporation. Compression head assembly. 4,109,767, Cl. 188-315.000.
Naphtachimie Societe Anonyme: *See—*
Sandis, Stylianos; and Bailly, Jean Claude, 4,110,248, Cl. 252-429.00B.
Narad, Inc.: *See—*
Jansen, Bernard George, Jr., 4,109,587, Cl. 105-490.000.
Narayan, Thirumurti, to BASF Wyandotte Corporation. Process for the preparation of foams characterized by isocyanurate and urethane linkages. 4,110,270, Cl. 521-121.000.
Naruchi, Tatuyuki: *See—*
Ichikawa, Yataro; Kobayashi, Osamu; Soma, Kazuhiko; Naruchi, Tatuyuki; Yamanaka, Yoshiyuki; and Suzuki, Nobuo, 4,110,403, Cl. 260-603.00R.
Naruse, Kintaro; and Naruse, Wataru, to Kabushiki Kaisha Naruse Fermentation Laboratory. Method for producing natto containing lactic acid bacteria. 4,110,477, Cl. 426-46.000.
Naruse, Wataru: *See—*
Naruse, Kintaro; and Naruse, Wataru, 4,110,477, Cl. 426-46.000.
National Research Development Corporation: *See—*
Baker, Lionel Richard; and Wojtowicz, Tadeusz, 4,110,046, Cl. 356-124.000.
Hawkes, Peter Louis, 4,110,556, Cl. 178-19.000.
Larke, John Reginald; Barber, Colin; and Cotterill, David John, 4,109,648, Cl. 128-2.06E.
National Semiconductor Corporation: *See—*
Nelson, Carl T.; and Hollins, Brian E., 4,110,782, Cl. 357-48.000.
NCO Works Ltd.: *See—*
Mashida, Toru; Matsushita, Sumeo; and Ikegami, Iwao, 4,110,139, Cl. 156-79.000.
NCR Corporation: *See—*
Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.
Gottschlich, James A., 4,109,790, Cl. 206-446.000.
Neal, John A., to Georgia-Pacific Corporation. Clarification process. 4,110,208, Cl. 210-425.000.
Ned Strongin Associates, Inc.: *See—*
Wetherell, Joseph J.; Fogarty, A. Edward; and Fogarty, Bonnie Rose, 4,109,411, Cl. 46-79.000.
Neefe, Charles W. Permeable polymethylmethacrylate contact lens. 4,110,264, Cl. 521-63.000.
Neel, Jean: *See—*
Violland, Robert; and Neel, Jean, 4,110,284, Cl. 260-29.2TN.
Neidigh, Robert J., to Wheelabrator-Frye Inc. Recirculating shot testing device. 4,109,507, Cl. 73-12.000.
Nelson, Alfred N.; and Davis, David L., to Addressograph Multigraph Corporation. High quality printing system with constant intermittent tape drive. 4,110,758, Cl. 346-74.100.
Nelson, Carl T.; and Hollins, Brian E., to National Semiconductor Corporation. Monolithic integrated circuit transistor having very low collector resistance. 4,110,782, Cl. 357-48.000.
Nelson, Donald L.; and Herbert, Norman T., to Dow Chemical Company, The. High temperature polymers from methoxy functional ether aromatic monomers. 4,110,279, Cl. 260-19.00R.
Nelson, Marshall A.: *See—*
Dunning, Richard E.; and Nelson, Marshall A., 4,110,152, Cl. 156-553.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-3,7-inter-m-phenylene-ω-phenoxy-PGF$_1$ compounds. 4,110,381, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-ω-phenyl-PGE analogs. 4,110,382, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3-7-inter-m-phenylene-w-phenyl-PGA$_1$ or 9-deoxy-9,10-didehydro-PGD$_1$ compounds. 4,110,383, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-5-oxa-ωphenoxy-PGA$_1$ or 9-deoxy-9,10-didehydro-PGD$_1$compounds. 4,110,384, Cl. 260-590.00C.
Nemcek, Jozef: *See—*
Dart, Edward Charles; Cantwell, John Burnett; Traynor, James Rodney; Jaworzyn, Joseph Franciszek; and Nemcek, Jozef, 4,110,184, Cl. 204-159.230.
Nemec, Allen R. Variable speed gear ratio transmission apparatus. 4,109,551, Cl. 74-705.000.
Nemoto, Ichiro: *See—*
Onda, Eiichi; Koyama, Mitsuo; Nemoto, Ichiro; Nokagawa, Tadashi; and Watanabe, Masanori, 4,110,767, Cl. 354-152.000.
Neri, Filippo, to Selenia-Industrie Elettroniche Associate S.p.A. Systems for reducing the elevation error for tracking radars of low height targets. 4,110,752, Cl. 343-7.400.
Nesmeyanov, Anatoly Alexandrovich: *See—*
Nesmeyanov, Nikolai Alexandrovich; Nesmeyanov, Ivan Alexandrovich; and Nesmeyanov, Anatoly Alexandrovich, 4,109,660, Cl. 128-419.00R.
Nesmeyanov, Ivan Alexandrovich: *See—*
Nesmeyanov, Nikolai Alexandrovich; Nesmeyanov, Ivan Alexandrovich; and Nesmeyanov, Anatoly Alexandrovich, 4,109,660, Cl. 128-419.00R.
Nesmeyanov, Nikolai Alexandrovich; Nesmeyanov, Ivan Alexandrovich; and Nesmeyanov, Anatoly Alexandrovich. Method of tooth anesthetizing during dental treatment and device for effecting same. 4,109,660, Cl. 128-419.00R.
Neste Oy: *See—*
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Cuccolo, Sergio, 4,110,112, Cl. 96-1.0PC.
Neuhouser, Donald Eugene, to Harvey Hubbell, Incorporated. Continuity monitoring system. 4,110,807, Cl. 361-42.000.
New Cosmos Electric Company Limited: *See—*
Mitsudo, Hiroyuki; and Yoshida, Masazumi, 4,109,633, Cl. 123-169.0EL.
Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, to BASF Wyandotte Corporation. Oxidation stable polyoxyalkylene fiber lubricants. 4,110,227, Cl. 252-8.900.
Newland, John W., to W & F Mfg. Co., Inc. Fragrance-emitting article

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having a polymer-petroleum wax composition. 4,110,261, Cl. 252-522.000.
Newnham, Robert E.: *See—*
Cross, Leslie E.; and Newnham, Robert E., 4,109,359, Cl. 29-25.350.
Newroyd Limited: *See—*
Barnes, William John; Belcher, Barry John; and Harvey, John Kenneth, 4,109,593, Cl. 112-79.00A.
Newson, John Chase; Tregoning, Geoffrey Robinson; and Digby, James Baden, to Westinghouse Brake & Signal Co. Ltd. Vehicle door arrangements. 4,109,416, Cl. 49-316.000.
Nicholson, Frederick, to Elektriska Svetsningsaktiebolaget. Weld metal deposit coated tool steel. 4,110,514, Cl. 428-683.000.
Nicolson, John Millar: *See—*
[illegible], Ralph Gilbert; and Nicolson, John Millar, 4,110,647, Cl.
Nolley, John P., Jr., to UOP Inc. Sulfur dioxide removal by absorption and fractionation. 4,110,087, Cl. 55-73.000.
Nomura, Hiroaki: *See—*
Minami, Isao; Yoshioka, Yoshio; and Nomura, Hiroaki, 4,110,537, Cl. 544-313.000.
Nomura, Junichi; and Kanai, Masashi. Hand craft yarn art materials and structure and methods of manufacture and use thereof. 4,110,138, Cl. 156-63.000.
Nomura, Keiichi: *See—*
Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
Noone, Michael J., to General Electric Company. Thermally conductive ceramic attachment. 4,109,706, Cl. 165-32.000.
Norman, Vello; and Moogalian, Charles M., to Ligett Group Inc. Cigarette filter. 4,109,666, Cl. 131-261.00B.

Ohmura, Taizo: *See—*
Kondo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, 4,110,110, Cl. 75-122.000.
Ohsawa, Shigeyoshi: *See—*
Mori, Shigeru; Ohsawa, Shigeyoshi; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,110,166, Cl. 195-96.000.
Ohta, Takeo: *See—*
Hayashi, Kiyozumi; Ohta, Takeo; and Kobori, Tetsuo, 4,110,160, Cl. 176-78.000.
Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette with oppositely inclined guide members flanking the recording/reproducing station. 4,110,805, Cl. 360-132.000.
Oita, Katashi, to Weyerhaeuser Company. Wet weather resistant binder
Opcon Associates of Canada, Ltd.: *See—*
Betensky, Ellis I., 4,109,995, Cl. 350-189.000.
Ophey, Petrus J. M., to Oce-van der Grinten N.V. Control system for copying apparatus. 4,110,033, Cl. 355-14.000.
Opsvik, Peter, to Stokke Fabrikker A/S. Adjustable chair. 4,109,961, Cl. 297-338.000.
Ora, Alpo, to Rauma-Repola OY. Method for making a soluble sulfite additive for use in a pulp making process. 4,110,154, Cl. 162-36.000.
Ord, William Robert: *See—*
Gurwicz, David; Sloan, Albert Everett; Moss, Barry; Wild, Arthur; and Ord, William Robert, 4,110,668, Cl. 318-78.000.
Orth, Dieter: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek,

having a polymer-petroleum wax composition. 4,110,261, Cl. 252-522.000.

- Newnham, Robert E.: *See*—
  - Cross, Leslie E.; and Newnham, Robert E., 4,109,359, Cl. 29-25.350.
- Newroyd Limited: *See*—
  - Barnes, William John; Belcher, Barry John; and Harvey, John Kenneth, 4,109,593, Cl. 112-79.00A.
- Newson, John Chase; Tregoning, Geoffrey Robinson; and Digby, James Baden, to Westinghouse Brake & Signal Co. Ltd. Vehicle door arrangements. 4,109,416, Cl. 49-316.000.
- Nicholson, Frederick, to Elektriska Svetsningsaktiebolaget. Weld metal deposit coated tool steel. 4,110,514, Cl. 428-683.000.
- Nicolson, John Millar: *See*—
  - Eslinger, Ralph Gilbert; and Nicolson, John Millar, 4,110,647, Cl. 310-168.000.
- Nidola, Antonio; De Nora, Vittorio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Process for electrolysis of bromide containing electrolytes. 4,110,180, Cl. 204-128.000.
- Nielsen, Edwin A., to Ideal Toy Corporation. Toy vehicle. 4,109,913, Cl. 273-86.00B.
- Nielsen, Larry Lee: *See*—
  - Bond, Albert K.; Merrick, Edwin B.; and Nielsen, Larry Lee, 4,109,643, Cl. 128-2.00L.
- Nihon Tokushu Noyaku Seizo K.K.: *See*—
  - Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; Shiokawa, Kozo; and Tsuboi, Shinichi, 4,110,440, Cl. 424-207.000.
- Nikitas, Nick C. D.C. block connectors. 4,110,716, Cl. 333-97.00R.
- Niklaus, Bernd, to Robert Bosch GmbH. Servo arrangement. 4,109,529, Cl. 74-388.00R.
- Nikolaou, Pavlos. Method for the production of electrodes for lead-acid storage batteries. 4,109,393, Cl. 34-22.000.
- Nilsson, Ove, to Aktiebolaget Tudor. Method for the production of electrodes for lead storage batteries. 4,110,519, Cl. 429-217.000.
- Ninomiya, Hideaki: *See*—
  - Yamamoto, Hirotaka; Sendai, Satoshi; and Ninomiya, Hideaki, 4,110,260, Cl. 252-519.000.
- Ninomiya, Yuichi, to Nippon Hoso Kyokai. Analog to digital converter. 4,110,745, Cl. 340-347.0AD.
- Nippon Coinco Co., Ltd.: *See*—
  - Hayashi, Yukichi, 4,109,774, Cl. 194-1.00C.
  - Hayashi, Yukichi, 4,109,775, Cl. 194-10.000.
- Nippon Columbia Kabushikikaisha: *See*—
  - Araki, Tetsuro; and Hayashi, Hideaki, 4,110,670, Cl. 318-212.000.
- Nippon Electric Company, Ltd.: *See*—
  - Matsumoto, Youichi; Tagashira, Yoshimi; and Yokoyama, Seijiro, 4,110,706, Cl. 332-19.000.
  - Miyazaki, Togo; and Shimizu, Masatoshi, 4,110,663, Cl. 315-169.0TV.
- Nippon Hoso Kyokai: *See*—
  - Ninomiya, Yuichi, 4,110,745, Cl. 340-347.0AD.
- Nippon Kokan Kabushiki Kaisha: *See*—
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
  - Kunioka, Kazuo; Noguchi, Takao; and Sato, Hiroaki, 4,110,092, Cl. 62-64.000.
  - Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
- Nippon Soken, Inc.: *See*—
  - Akita, Sigeyuki; and Kitagawa, Junji, 4,110,740, Cl. 340-620.000.
  - Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,109,462, Cl. 60-278.000.
  - Takeuchi, Yukihisa; and Wakayama, Masao, 4,110,256, Cl. 252-465.000.
- Nipponn Steel Corporation: *See*—
  - Fukuyama, Masaru, 4,109,508, Cl. 73-15.0FD.
- Nissan Motor Company, Limited: *See*—
  - Aono, Shigeo; and Anzai, Makoto, 4,109,626, Cl. 123-139.0AW.
  - Asano, Masaharu, 4,109,615, Cl. 123-32.0EE.
  - Endo, Hiroshi, 4,110,754, Cl. 343-16.00R.
  - Ishikawa, Masao, 4,110,819, Cl. 362-40.000.
  - Washio, Masayuki; and Harada, Tetsuya, 4,109,624, Cl. 123-119.00A.
- Nitsch, Friedrich: *See*—
  - Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Riodsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.
- Noe, Terry Wayne, to Texas Instruments Incorporated. Magnetic bubble memory package. 4,110,838, Cl. 365-2.000.
- Noguchi, Katuichi: *See*—
  - Maeda, Kazuo; Noguchi, Katuichi; Kawabata, Masuo; Sato, Shigehiko; and Sato, Yukio, 4,109,663, Cl. 131-2.000.
- Noguchi, Takao: *See*—
  - Kunioka, Kazuo; Noguchi, Takao; and Sato, Hiroaki, 4,110,092, Cl. 62-64.000.
- Nohira, Hidetaka: *See*—
  - Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,109,462, Cl. 60-278.000.
- Nokagawa, Tadashi: *See*—
  - Onda, Eiichi; Koyama, Mitsuo; Nemoto, Ichiro; Nokagawa, Tadashi; and Watanabe, Masanori, 4,110,767, Cl. 354-152.000.
- Nolley, John P., Jr., to UOP Inc. Sulfur dioxide removal by absorption and fractionation. 4,110,087, Cl. 55-73.000.
- Nomura, Hiroaki: *See*—
  - Minami, Isao; Yoshioka, Yoshio; and Nomura, Hiroaki, 4,110,537, Cl. 544-313.000.
- Nomura, Junichi; and Kanai, Masashi. Hand craft yarn art materials and structure and methods of manufacture and use thereof. 4,110,138, Cl. 156-63.000.
- Nomura, Keiichi: *See*—
  - Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
- Noone, Michael J., to General Electric Company. Thermally conductive ceramic attachment. 4,109,706, Cl. 165-32.000.
- Norman, Vello; and Moogalian, Charles M., to Ligett Group Inc. Cigarette filter. 4,109,666, Cl. 131-261.00B.
- Norris Industries: *See*—
  - Allemann, James G., 4,109,494, Cl. 70-107.000.
  - Allemann, James G.; and Grey, Michael W., 4,109,496, Cl. 70-380.000.
  - Dietrich, Hagen, 4,109,498, Cl. 70-449.000.
  - Potter, Dennis G.; Dietrich, Hagen; and Potschka, Joseph, 4,109,948, Cl. 292-169.150.
- Northern Telecom Limited: *See*—
  - Crooks, Basil D.; and Bennett, R. Brian P., 4,110,593, Cl. 219-90.000.
- Northwest Engineering Company: *See*—
  - Strong, Richard I., 4,109,771, Cl. 192-83.000.
- Noshiro, Makoto: *See*—
  - Abe, Takeshi; Ichimura, Masahiko; Noshiro, Makoto; Kunii, Nobuaki; and Ito, Yasumichi, 4,110,308, Cl. 260-45.75C.
- Novello, Frederick C.: *See*—
  - Baldwin, John J.; and Novello, Frederick C., 4,110,456, Cl. 424-263.000.
- Novo Industri A/S: *See*—
  - Hjortshoj, Kirsten; and Aunstrup, Knud, 4,110,163, Cl. 195-62.000.
- Nudenberg, Walter: *See*—
  - Loveless, Frederick C.; and Nudenberg, Walter, 4,110,234, Cl. 252-47.500.
- Nuhoff, Peerke Jan: *See*—
  - van Beveren, Marius; and Nuhoff, Peerke Jan, 4,109,856, Cl. 235-308.000.
- Numata, Saburo, to Fuji Photo Optical Co., Ltd. Automatic film wind up device for a camera. 4,110,768, Cl. 354-173.000.
- Numbers, Jody L., to Sickles, Ralph A.; and Sickles, Doris E., Co-Trustees of the Ralph A. Sickles Family Estate. Micro fiche indexer. 4,110,021, Cl. 353-27.00R.
- Obayashi, Hideki: *See*—
  - Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,109,462, Cl. 60-278.000.
- Oberlinner, Andreas: *See*—
  - Baumann, Hans; and Oberlinner, Andreas, 4,110,348, Cl. 260-345.200.
- O'Brian, Edward D.; and Plachy, William M. Foldable structures considered to be primarily useful as doghouses. 4,109,427, Cl. 52-58.00R.
- O'Brian, Edward D.; and Plachy, William M. Folding wheelbarrows. 4,109,933, Cl. 280-653.000.
- Occidental Oil Shale, Inc.: *See*—
  - Burton, Robert S., III, 4,109,718, Cl. 166-256.000.
  - Ridley, Richard D., 4,109,964, Cl. 299-2.000.
- Oce-van der Grinten N.V.: *See*—
  - Ophey, Petrus J. M., 4,110,033, Cl. 355-14.000.
  - Wittenberg, Albert Jan; and van der Velden, Guido J. M., 4,110,040, Cl. 355-70.000.
- Oda, Yasuhiro: *See*—
  - Tamabayashi, Hanzo; Hattori, Tatsuo; Tanaka, Tetsuo; Oda, Yasuhiro; and Kihara, Keiichi, 4,110,366, Cl. 260-505.00N.
- Odor, Frank; Mohr, Adolf; and Bolenz, Klaus, to Robert Bosch GmbH. Magnetic structure, particularly permanent magnet for motor fields, and method. 4,110,718, Cl. 335-296.000.
- Oechsle, Hans: *See*—
  - Vollmer, Helmut; Udert, Karl Ernst; and Oechsle, Hans, 4,109,556, Cl. 85-84.000.
- Oelke, Waldemar W.; Boehm, Hans W.; and Herrington, Richard A., to Libbey-Owens-Ford Company. Method of and apparatus for thermally severing glass. 4,109,840, Cl. 225-2.000.
- Offenhauser, Fred C.: *See*—
  - Morris, George O., 4,109,619, Cl. 123-52.00R.
- Offermann, Paul F., to Chevron Research Company. Method and means for decreasing the heat output of a segment of a heat generating pipe. 4,110,599, Cl. 219-301.000.
- Ogawa, Hiroshi; Aonuma, Masashi; Nakamura, Matsuaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording members. 4,110,503, Cl. 428-64.000.
- Ogawa, Yutaka: *See*—
  - Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,109,766, Cl. 188-73.400.
- O'Hare, Stephen A., to United States of America, Energy. Raney nickel catalytic device. 4,110,257, Cl. 252-466.00J.
- Ohata, Satoru: *See*—
  - Itakura, Kiyoyuki; Ishii, Yohji; Ohata, Satoru; and Watanabe, Masao, 4,109,463, Cl. 60-282.000.
- Ohdan, Kyoji: *See*—
  - Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,110,350, Cl. 260-346.750.

- Ohmura, Taizo: *See*—
  - Kondo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, 4,110,110, Cl. 75-122.000.
- Ohsawa, Shigeyoshi: *See*—
  - Mori, Shigeru; Ohsawa, Shigeyoshi; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,110,166, Cl. 195-96.000.
- Ohta, Takeo: *See*—
  - Hayashi, Kiyozumi; Ohta, Takeo; and Kobori, Tetsuo, 4,110,160, Cl. 176-78.000.
- Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette with oppositely inclined guide members flanking the recording/reproducing station. 4,110,805, Cl. 360-132.000.
- Oita, Katashi, to Weyerhaeuser Company. Wet weather resistant binder composition for adhering a plant treatment additive powder formulation to plant foliage. 4,110,431, Cl. 424-78.000.
- Okamoto, Jiro; Hirose, Mamoru; Miyamoto, Katsuji; and Kuroki, Shinichiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for transporting and collecting self-propelled welding carriages. 4,110,596, Cl. 219-124.400.
- Okamura, Masahiro: *See*—
  - Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,110,781, Cl. 357-39.000.
- Okuyama, Yasuo: *See*—
  - Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, 4,110,169, Cl. 201-6.000.
- Olander, Walter Karl: *See*—
  - Banucci, Eugene George; and Olander, Walter Karl, 4,110,312, Cl. 528-215.000.
- Olcott, Tyler Keith; and Miller, Robert M., to W. R. Grace & Co. Process for forming a molded plastic article having an insert therein. 4,110,390, Cl. 264-90.000.
- Olefoam Corporation: *See*—
  - Ehrenfruend, Herbert A., 4,110,269, Cl. 521-81.000.
- Olin, Arthur D.: *See*—
  - Fitzpatrick, Joseph W.; and Olin, Arthur D., 4,110,072, Cl. 8-25.000.
- Olin Corporation: *See*—
  - Chesler, Edwin T.; Goodman, Donald; and Lapkin, Milton, 4,110,527, Cl. 526-235.000.
  - Kleine, Charles A.; and Middleton, Verne L., 4,109,711, Cl. 165-170.000.
  - Moraveck, James F., 4,110,317, Cl. 528-77.000.
  - Parikh, Prakash D.; and Shapiro, Eugene, 4,110,132, Cl. 148-32.000.
  - Specht, Steven J.; and Adams, John O., 4,110,191, Cl. 204-266.000.
- Oliveira, Paul Edward, to Goodyear Tire & Rubber Company, The. Sound barrier material. 4,110,510, Cl. 428-285.000.
- Olsen, Robert Charles: *See*—
  - Klygis, Mindaugas Julius; and Olsen, Robert Charles, 4,109,787, Cl. 206-150.000.
- Olson, Ernest E. Duplex outlet device. 4,109,988, Cl. 339-91.00R.
- Olson, Kenneth W.; Haas, William J., Jr.; and Fassel, Velmer A., to United States of America, Energy. Apparatus for ultrasonic nebulization. 4,109,863, Cl. 239-102.000.
- Olsson, Rune, to Produnik AB. Safety clips. 4,109,348, Cl. 24-153.000.
- Olszewski, Jerzy A.; and Sarkar, Arnab, to General Cable Corporation. Optical fiber cable construction. 4,110,001, Cl. 350-96.230.
- Olympus Optical Co., Ltd.: *See*—
  - Ikeda, Yoshitsugi, 4,110,007, Cl. 350-215.000.
  - Konoshima, Katunaga, 4,110,820, Cl. 362-207.000.
- Omori, Mamoru: *See*—
  - Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Hamano, Masaaki; and Shishido, Toetsu, 4,110,386, Cl. 264-29.500.
- Onda, Eiichi; Koyama, Mitsuo; Nemoto, Ichiro; Nokagawa, Tadashi; and Watanabe, Masanori, to Seiko Koki Kabushiki Kaisha. Shutter and view finder for single lense reflex camera. 4,110,767, Cl. 354-152.000.
- Onda, Eiichi: *See*—
  - Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,110,772, Cl. 354-246.000.
- O'Neil, Walter K.: *See*—
  - Jarocha, William M.; and O'Neil, Walter K., 4,110,732, Cl. 340-58.000.
- Ono Pharmaceutical Company: *See*—
  - Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, 4,110,341, Cl. 260-327.00C.
- Ono, Zenichi: *See*—
  - Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
- Onodera, Hisakichi; Suwa, Masateru; Onuki, Jin; and Shimizu, Yoshiteru, to Hitachi, Ltd. Solder layer for a semi-conductor device consisting of at least one group V element, at least one rare element and aluminum. 4,110,783, Cl. 357-67.000.
- Onoue, Keizi: *See*—
  - Yoshida, Yoshiaki; Suzuki, Osamu; and Onoue, Keizi, 4,109,450, Cl. 57-34.00R.
- Onuki, Jin: *See*—
  - Onodera, Hisakichi; Suwa, Masateru; Onuki, Jin; and Shimizu, Yoshiteru, 4,110,783, Cl. 357-67.000.
- Onuki, Yoshio: *See*—
  - Honda, Ichiro; Takasu, Shigetoshi; and Onuki, Yoshio, 4,109,709, Cl. 165-105.000.
- Ooraikul, Buncha, to Canadian Patents and Development Limited. Production of potato granules. 4,110,478, Cl. 426-262.000.
- Opcon Associates of Canada, Ltd.: *See*—
  - Betensky, Ellis I., 4,109,995, Cl. 350-189.000.
- Ophey, Petrus J. M., to Oce-van der Grinten N.V. Control system for copying apparatus. 4,110,033, Cl. 355-14.000.
- Opsvik, Peter, to Stokke Fabrikker A/S. Adjustable chair. 4,109,961, Cl. 297-338.000.
- Ora, Alpo, to Rauma-Repola OY. Method for making a soluble sulfite additive for use in a pulp making process. 4,110,154, Cl. 162-36.000.
- Ord, William Robert: *See*—
  - Gurwicz, David; Sloan, Albert Everett; Moss, Barry; Wild, Arthur; and Ord, William Robert, 4,110,668, Cl. 318-78.000.
- Orth, Dieter: *See*—
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Ory, Jean-Marie: *See*—
  - Hubert, Jacques; Ory, Jean-Marie; Bottin, Jean; and Humbert, Claude, 4,110,741, Cl. 340-573.000.
- Osawa, Masayuki, to TDK Electronics Co., Ltd. Cassette tape winding apparatus. 4,109,878, Cl. 242-68.300.
- Oshima, Takeo: *See*—
  - Sano, Tokuo; Oshima, Takeo; and Kamata, Tokio, 4,110,467, Cl. 424-280.000.
- Ostermeier, Kurt W.: *See*—
  - Mitchell, Kenneth J.; and Ostermeier, Kurt W., 4,109,353, Cl. 28-104.000.
- Ostrander, Kenneth A.: *See*—
  - Edick, John D.; and Ostrander, Kenneth A., 4,110,676, Cl. 322-31.000.
- Ostrowski, Richard C.; and Styfhoorn, John, to Caterpillar Tractor Co. Apparatus for joining fusible elements. 4,110,150, Cl. 156-499.000.
- Osuka, Tatsumi: *See*—
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
- Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH: *See*—
  - Esser, Gustav, 4,109,560, Cl. 90-96.000.
- Otis Engineering Corporation: *See*—
  - Canalizo, Carlos R., 4,109,716, Cl. 166-191.000.
- Ott, Charlotte A. Sun shield. 4,109,322, Cl. 2-177.000.
- Ottenstein, Allan S.; and Callahan, John A., to Research Fuels, Inc. Ticket printer. 4,109,777, Cl. 400-124.000.
- Otto, Oberdan W., to Hughes Aircraft Company. Surface acoustic wave filter. 4,110,714, Cl. 333-72.000.
- Owens-Corning Fiberglas Corporation: *See*—
  - Parbhoo, Kantilal R.; Klink, Jerome P.; Calland, John P.; and White, Gerald L., 4,109,610, Cl. 118-202.000.
  - Poulsen, Peder Ulrik, 4,110,149, Cl. 156-429.000.
- Owens-Illinois, Inc.: *See*—
  - Go, Santos W., 4,110,315, Cl. 528-294.000.
  - Stengle, Edward J., Jr., 4,110,095, Cl. 65-26.000.
- Owens, John Edward: *See*—
  - Moore, Edward Joseph; and Owens, John Edward, 4,110,810, Cl. 361-213.000.
- Oxy Metal Industries Corporation: *See*—
  - Creutz, Hans-Gerhard, deceased; and Herr, Roy Wilbur, 4,110,176, Cl. 204-52.00R.
  - Matsushima, Yasunobu; Yashiro, Kuniji; Kaneko, Hideaki; and Suzuki, Masanori, 4,110,129, Cl. 148-6.15R.
- Oxygen Therapy Institute, Inc.: *See*—
  - Stewart, Maurice M., 4,109,828, Cl. 222-3.000.
- Ozaki, Tadashi: *See*—
  - Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,109,462, Cl. 60-278.000.
- Ozaki, Tomoaki: *See*—
  - Minagawa, Nobuhiko; and Ozaki, Tomoaki, 4,110,155, Cl. 162-135.000.
- P.R. Mallory & Co. Inc.: *See*—
  - Gilmour, Alexander; and Mallory, Henry Rodgers, 4,110,518, Cl. 429-174.000.
- Pacific West Exploration Company: *See*—
  - Hebberd, Harry Clinton, 4,109,757, Cl. 181-401.000.
- Pacifici, James G.: *See*—
  - Sloan, Cephas H.; and Pacifici, James G., 4,110,187, Cl. 204-159.190.
- Panigoni, Giannantonio, to Luigi Franchi S.p.A. Semi-automatic gun. 4,109,558, Cl. 89-191.00A.
- Papa, Anthony Joseph: *See*—
  - Boros, Eugene Joseph; and Papa, Anthony Joseph, 4,110,415, Cl. 260-953.000.
- Papalos, John George, to Diamond Shamrock Corporation. Sulfonated alkylphenoxy acetones. 4,110,367, Cl. 260-511.000.
- Papenfuhs, Theodor; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Novel 2-hydroxynaphthalene-1-aldehydes, process for preparing them and their use. 4,110,375, Cl. 260-559.00R.
- Paraskos, John Angelo: *See*—
  - Hildebrand, Richard Emil; Paraskos, John Angelo; and Taylor, Herman, Jr., 4,110,192, Cl. 208-8.000.
- Parbhoo, Kantilal R.; Klink, Jerome P.; Calland, John P.; and White, Gerald L., to Owens-Corning Fiberglas Corporation. Textile size applicator with a temperature controlling fluid. 4,109,610, Cl. 118-202.000.
- Parikh, Prakash D.; and Shapiro, Eugene, to Olin Corporation. Improved copper base alloys. 4,110,132, Cl. 148-32.000.

- Park, Jack H.: *See—*
  - Widmyer, Richard H.; and Park, Jack H., 4,109,722, Cl. 166-281.000.
- Parker, Robert Preston, to RCA Corporation. Combined blanking level and kinescope bias clamp for a television signal processing system. 4,110,787, Cl. 358-34.000.
- Parker, Roger Alan, to Richardson-Merrell Inc. Hypolipidemic agents RO- or RS- substituted furoic acids, esters and salts. 4,110,351, Cl. 260-347.200.
- Parks, Anthony John: *See—*
  - Harrison, Peter Arthur; Parks, Anthony John; Southgate, Malcolm Dennis; Sleath, William Derek; and Hills, Richard Keith, 4,110,037, Cl. 355-48.000.
- Parrish, David Richard: *See—*
  - Hajos, Zoltan George; and Parrish, David Richard, 4,110,380, Cl. 260-586.00C.
- Parsons, David: *See—*
  - Higgerson, Raymond; and Parsons, David, 4,109,773, Cl. 192-111.00A.
- Parsons Enterprises, Inc.: *See—*
  - Parsons, James W., 4,109,422, Cl. 51-325.000.
- Parsons, James W., to Parsons Enterprises, Inc. Sander cleaning process. 4,109,422, Cl. 51-325.000.
- Paskert, Joseph H., to Eaton Corporation. Fastener. 4,109,693, Cl. 151-41.750.
- Pasquale, William D.: *See—*
  - Roccaforte, Harry I.; and Pasquale, William D., 4,109,786, Cl. 206-45.140.
- Pastor, Antonio C., to Hughes Aircraft Company. Reactive atmospheric processing crystal growth apparatus. 4,110,080, Cl. 23-273.0SP.
- Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H.: *See—*
  - Voss, Peter, 4,110,638, Cl. 307-252.00C.
- Patents Licensing International, Ltd.: *See—*
  - Souder, James J., Jr.; and Waldorf, Lindsey E., 4,110,587, Cl. 219-10.49R.
- Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F., to Paton, Hamilton Neil King; and Skilling, John B. Self-contained frictionally damped resilient suspension system. 4,109,934, Cl. 280-716.000.
- Patterson, Garvin Wesley: *See—*
  - Porter, Marion G.; and Patterson, Garvin Wesley, 4,110,822, Cl. 364-200.000.
- Paul Anderson Industrier AB: *See—*
  - Mattson, Arne J., 4,109,975, Cl. 308-26.000.
- Paul, Andreas, to Gebr. Loepfe AG. Device for monitoring the travel of yarn-like structures at a textile machine. 4,110,654, Cl. 310-323.000.
- Paull, Peter L.; and Archer, Henry W., to Texaco Development Corporation. Solar sea power system. 4,110,628, Cl. 290-1.00R.
- Paulson, Danton L.; and Hunter, Willard L., to United States of America, Interior. Process for reducing molten furnace slags by carbon injection. 4,110,107, Cl. 75-24.000.
- Pawelczyk, Werner: *See—*
  - Woeckener, Willi; Pawelczyk, Werner; and Marquardt, Klaus-Dieter, 4,110,387, Cl. 264-40.500.
- Pay Less Drug Stores Northwest, Inc.: *See—*
  - Baer, James, 4,110,502, Cl. 428-40.000.
- Payne, George C., to White's Electronics, Inc. Ferrous/non-ferrous metal detector using sampling. 4,110,679, Cl. 324-3.000.
- Payne, Larry E.; and Lancaster, Kenneth D., Jr. Straw assembly for a liquid container. 4,109,817, Cl. 220-90.200.
- Payne, Robert L., to Honeywell Inc. CMOS voltage comparator with internal hysteresis. 4,110,641, Cl. 307-355.000.
- Pearson, Samuel Joseph, to Whirlpool Corporation. Fan control circuit for air conditioner. 4,109,482, Cl. 62-180.000.
- Pechinger, Ernst: *See—*
  - Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.
- Peclard, Michel, to Les Products Associes LPA SA. Reservoir with handle and cover. 4,109,650, Cl. 128-66.000.
- Peck, S. Christopher, to GTE Sylvania Incorporated. Frost detector. 4,109,481, Cl. 62-140.000.
- Peev, Vassil Georgiev; Valchev, Alexander Yordanov; and Bakalov, Nikolay Georgiev, to DSO "Cherna Metalurgia". Method of steelmaking with direct current. 4,110,547, Cl. 13-11.000.
- Pellenc, Roger Joseph. Hydraulic secateurs. 4,109,381, Cl. 30-228.000.
- Pender, David R. Vertical take-off and landing aircraft. 4,109,885, Cl. 244-7.00R.
- Pennings, Matheus D.; and Tippin, Billy B., to Sola Basic Industries, Inc. Automatic height sensor for semiconductor bonding tool, wafer probe or the like. 4,109,846, Cl. 228-4.500.
- Perepelkin, Arkady Vitalievich: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Perles, Rene, to Verdol S.A. Clutch devices. 4,109,770, Cl. 192-12.0BA.
- Permataet Kobenhavn A/S: *See—*
  - Wiene, Ole, 4,110,388, Cl. 264-71.000.
- Perrain, Maurice Eugene, to Pont-a-Mousson S.A. Fire-proof device for a tube of fusible material which extends through a wall. 4,109,423, Cl. 52-1.000.
- Perraudin, Claude: *See—*
  - Azam, Guy; and Perraudin, Claude, 4,110,623, Cl. 250-398.000.
- Persico, Paul J.: *See—*
  - Millar, Robert F.; Persico, Paul J.; and Jensen, Robert H., 4,110,081, Cl. 23-288.00G.
- Peters, Johannes, to Bolkow Gesellschaft mit beschrankter Haftung. Apparatus for transmission of messages by means of electromagnetic waves. 4,110,724, Cl. 340-4.00A.
- Peterson, Charles Edwin: *See—*
  - Brown, Leon Calvin; Edwards, Earl Garland; Peterson, Charles Edwin; Robinson, Peter George; and Wilson, Clement Card, 4,110,068, Cl. 432-60.000.
- Peterson, Glenn R.; Hicks, Marvin C.; and Schwartz, Peter W., to Intermountain Oil Research, Inc. Process and apparatus for extracting bituminous oil from tar sands. 4,110,194, Cl. 208-11.0LE.
- Peterson, Jerry D.; and Knief, Gerald L., to Ritchie Industries, Inc. Plastic pipe heater. 4,110,603, Cl. 219-535.000.
- Petri, Ulrich: *See—*
  - Krohn, Hans Guenther; Rademacher, Friedrich; Petri, Ulrich; and Deubel, Hans D., 4,109,446, Cl. 53-282.000.
- Petrie, Adelore F. Digital waveform conditioning circuit. 4,110,698, Cl. 328-164.000.
- Petrosky, Kenneth J., to Westinghouse Electric Corp. Sequential tone acoustic command link. 4,110,725, Cl. 340-5.00R.
- Pettersson, Bror Gosta, to AB Bofors. Method of producing the hydrochloride of N-methyl piperidine-2-carboxylic acid-2,6-xylidide. 4,110,331, Cl. 260-293.770.
- Pettersson, Torulf; Fladda, Gerdt; and Eriksson, Lennart, to Svenska Traforskningsinstitutet. Method for determination of concentration. 4,110,044, Cl. 356-103.000.
- Pettit, Donald: *See—*
  - Carter, Alan Reginald; Pettit, Donald; and Langerwerf, Josephus Sychbertus, 4,110,495, Cl. 427-400.000.
- Pfaehler, Josephine. Cabinet-like furniture unit of cellular structure. 4,109,981, Cl. 312-107.000.
- Pfaff Industriemaschinen GmbH: *See—*
  - Bungert, Heinrich; Wenz, Herbert; and Wentz, Klaus, 4,109,334, Cl. 12-59.500.
- Pfahler, Gerhard: *See—*
  - Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,110,334, Cl. 260-293.660.
- Pfeffer, Johann Baptist, to S.A. Block & Concrete (Proprietary) Limited. Drainage device for particulate material. 4,110,214, Cl. 210-77.000.
- Pfizer Inc.: *See—*
  - Bigham, Eric C., 4,110,342, Cl. 260-332.20A.
  - Sciavolino, Frank C., 4,110,530, Cl. 536-9.000.
  - Sciavolino, Frank C., 4,110,531, Cl. 536-9.000.
- Pharis, Richard Persons. Method and composition for treating trees. 4,110,102, Cl. 71-89.000.
- Philips Roxane, Inc.: *See—*
  - Purdy, Charles W., III, 4,110,433, Cl. 424-89.000.
- Phillips Cable Limited: *See—*
  - Beach, Shirley, 4,110,137, Cl. 156-48.000.
- Phillips, Claude T.: *See—*
  - Loveless, John H.; and Phillips, Claude T., 4,110,493, Cl. 427-233.000.
- Phillips, Jacque R. Tax adjusting vehicle gasoline filler equipment. 4,109,686, Cl. 141-1.000.
- Phillips Petroleum Company: *See—*
  - Barber, Franklin T., 4,110,177, Cl. 204-59.00F.
  - Hessert, James E.; and Johnston, Chester C., Jr., 4,110,230, Cl. 252-855.00R.
  - Smith, Clifford E.; and Holtz, Hans D., 4,110,252, Cl. 252-442.000.
  - Swanson, Billy L., 4,110,226, Cl. 252-8.50C.
  - Swanson, Billy L., 4,110,231, Cl. 252-8.50C.
  - Wood, Roy F.; and Wynne, Ralph A., 4,109,941, Cl. 285-111.000.
- Pickering, Timothy L.; and Hendrickson, James I., to Ciba-Geigy Corporation. Processing aids for high temperature polymers. 4,110,294, Cl. 260-30.200.
- Pickford Holland & Company Limited: *See—*
  - Shaw, Gordon Brian; and Brinkman, Richard John, 4,110,545, Cl. 13-6.000.
- Pietzsch, Siegfried: *See—*
  - Bildstein, Siegfried; Lademann, Rudolf; Pietzsch, Siegfried; and Schaeffer, Georg, 4,110,365, Cl. 260-505.00C.
- Pilhall, Stig Tore Lennart, to AB Volvo. Towing device for motor vehicles. 4,109,930, Cl. 280-491.00B.
- Pilz, Reiner. Multipane insulating glass process and rim strip. 4,109,432, Cl. 52-172.000.
- Ping, David T., to Caterpillar Tractor Co. Flexible engine cowling for construction vehicles. 4,109,744, Cl. 180-68.00P.
- Pioneer Electronic Corporation: *See—*
  - Kinoshita, Shouzo, 4,109,983, Cl. 312-214.000.
- Pirck, Dietrich; and Fuchs, Gundolf, to Deutsche Texaco Aktiengesellschaft. Process for preparing a cold-set lacquer. 4,110,282, Cl. 260-23.0AR.
- Pirkulov, Vladimir Georgievich; Askarov, Mikhail Arkadievich; and Dzhashi, Avtandil Vladimirovich. Method of manufacturing active material for lead batteries. 4,110,241, Cl. 252-182.100.
- Pitney-Bowes, Inc.: *See—*
  - Irvine, Robert; Luperti, Harry E.; and Manna, Robert E., 4,110,038, Cl. 355-50.000.
  - Luperti, Harry E.; and Manna, Robert E., 4,110,041, Cl. 355-75.000.

- Plachy, William M.: *See—*
  - O'Brian, Edward D.; and Plachy, William M., 4,109,427, Cl. 52-58.00R.
  - O'Brian, Edward D.; and Plachy, William M., 4,109,933, Cl. 280-653.000.
- Plastic Reel Corporation of America: *See—*
  - Fattori, Lazzaro A.; and Fattori, Joseph E., 4,109,789, Cl. 206-404.000.
- Platt Saco Lowell: *See—*
  - Yates, Stephen William, 4,109,877, Cl. 242-54.400.
- Player, Wayne H.; and Barton, Forris W., Jr., to Howmet Corporation. Building panel. 4,109,437, Cl. 52-536.000.
- Plen, Abraham. Wind energy accumulator. 4,109,465, Cl. 60-398.000.
- Plessey Handel und Investments A.G.: *See—*
  - Porter, Stephen George; and Appleby, David, 4,110,616, Cl. 250-338.000.
- Ploszaj, Leon C.: *See—*
  - Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,110,140, Cl. 156-87.000.
- Podos, Steven M.: *See—*
  - Becker, Bernard; Stamper, Robert L.; Asseff, Carl F.; and Podos, Steven M., 4,110,461, Cl. 424-273.00R.
- Pohler, Heinz: *See—*
  - Hagen, Albert; Kaiser, Theodor; and Pohler, Heinz, 4,109,361, Cl. 29-148.40C.
- Polaroid Corporation: *See—*
  - Bloom, Stanley M., 4,110,355, Cl. 260-372.000.
  - Finnemore, Fred M., 4,110,018, Cl. 352-130.000.
  - Haas, Howard C.; and Moreau, Robert D., 4,110,424, Cl. 423-365.000.
  - Leduc, Robert D., 4,109,947, Cl. 292-76.000.
- Poletto, John Frank: *See—*
  - Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Poletto, John Frank; Schaub, Robert Eugene; and Bernady, Karel Francis, 4,110,368, Cl. 260-514.00D.
- Polizzi, Joseph R.; and Hart, Richard K. Quickly removable windshield curtain. 4,109,957, Cl. 296-95.00C.
- Pollard, Edward L.: *See—*
  - Balcom, Orville R.; Hildebrand, Cleve R.; and Pollard, Edward L., 4,109,389, Cl. 33-363.00K.
- Pollitzer, Ernest L.: *See—*
  - Hayes, John C.; and Pollitzer, Ernest L., 4,110,198, Cl. 208-111.000.
- Pollock International Limited: *See—*
  - Pollock, James Richard Allan; and Dale, Anthony Richard, 4,110,480, Cl. 426-436.000.
- Pollock, James Richard Allan; and Dale, Anthony Richard, to Pollock International Limited. Treatment of malt to reduce stale flavor in beer. 4,110,480, Cl. 426-436.000.
- Polvara, Giulio, to Beylerian Limited; and Kartell, S.p.A. Multiple element for forming various structures when connected to box-form panels for furniture or the like. 4,110,052, Cl. 403-295.000.
- Polysius AG: *See—*
  - Lohnherr, Ludger, 4,109,871, Cl. 241-24.000.
- Ponce, Rodger G.: *See—*
  - Herrera, Frank J.; and Ponce, Rodger G., 4,109,568, Cl. 99-477.000.
- Pons, Dick A.; and Bijker, Anno, to Synres International B.V. Process for the preparation of stable aqueous emulsions of addition polymers and copolymers. 4,110,285, Cl. 260-29.6MP.
- Pont-a-Mousson S.A.: *See—*
  - Perrain, Maurice Eugene, 4,109,423, Cl. 52-1.000.
- Poore, Bernard Brandt, to Deere & Company. Vehicular single shaft gas turbine engine power system. 4,109,772, Cl. 192-0.092.
- Population Research, Inc.: *See—*
  - Bolduc, Lee R.; and Dickhudt, Eugene A., 4,109,654, Cl. 128-235.000.
- Porsche Design Ferdinand A. Porsche: *See—*
  - Matthias, Jan Henner, 4,109,323, Cl. 2-410.000.
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  - Hughes, Donald Wayne Kent; and Porta, Gary Douglas, 4,109,992, Cl. 339-147.00R.
- Porter, Marion G.; and Patterson, Garvin Wesley, to Honeywell Information Systems, Inc. Instruction look ahead having prefetch concurrency and pipeline features. 4,110,822, Cl. 364-200.000.
- Porter, Stephen George; and Appleby, David, to Plessey Handel und Investments A.G. Pyroelectric detectors. 4,110,616, Cl. 250-338.000.
- Portlandzementwerk Dotternhausen Rudolf Rohbach Kommanditgesellschaft: *See—*
  - Rechmeier, Helmuth; and Rohrbach, Gerhard, 4,110,121, Cl. 106-100.000.
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  - Garrett, Ian; and Taylor, Michael Rivers, 4,110,133, Cl. 148-171.000.
- Post, Willem Pieter. Process for applying a threaded seat in a metal plate. 4,109,600, Cl. 113-121.00R.
- Potschka, Joseph: *See—*
  - Potter, Dennis G.; Dietrich, Hagen; and Potschka, Joseph, 4,109,948, Cl. 292-169.150.
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- Potter, Dennis G.; Dietrich, Hagen; and Potschka, Joseph, to Norris Industries. Plastic latch bolt for door lock. 4,109,948, Cl. 292-169.150.
- Potter, James Charles, to C.A.V. Limited. Fuel injection pumping apparatus. 4,109,629, Cl. 123-140.00R.
- Poulsen, Peder Ulrik, to Owens-Corning Fiberglas Corporation. Rotatably driven mandrel having outer wall formed by continuously circulating endless helical band and radially adjustable support members for the band. 4,110,149, Cl. 156-429.000.
- Povejsil, James H., to Towmotor Corporation. Combined throttle and transmission system. 4,109,546, Cl. 74-474.000.
- Powers, Larry J.: *See—*
  - Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,110,451, Cl. 424-251.000.
- Powers Manufacturing, Inc.: *See—*
  - Powers, Whitney S., Jr.; Hobler, Ross L.; Bryant, Nelson H.; and Allen, Wilbur J., 4,109,511, Cl. 73-37.600.
- Powers, Richard J. Adjustable height table. 4,109,588, Cl. 108-12.000.
- Powers, Whitney S., Jr.; Hobler, Ross L.; Bryant, Nelson H.; and Allen, Wilbur J., to Powers Manufacturing, Inc. Method and apparatus for statistically testing frangible containers. 4,109,511, Cl. 73-37.600.
- PPG Industries, Inc.: *See—*
  - Bosso, Joseph F.; and Castellucci, Nicholas T., 4,110,287, Cl. 260-29.2EP.
  - DeTorre, Robert P., 4,109,841, Cl. 225-96.500.
  - Mazzoni, Renato J.; and Bowser, George H., 4,109,431, Cl. 52-172.000.
  - Motsinger, Donald L., 4,110,094, Cl. 65-3.00C.
  - Rechlicz, Thomas A., 4,110,153, Cl. 156-633.000.
  - Seymour, Samuel L., 4,109,953, Cl. 294-118.000.
- Pradal, Bortolo Mario, to RCA Corporation. Audio signal processor. 4,110,692, Cl. 325-147.000.
- Precision Metalsmiths, Inc.: *See—*
  - Miller, Robert R.; and Horton, Robert A., 4,109,699, Cl. 164-244.000.
- Preeschl, Raymond C. Bite signalling fishing bobber with flexible housing. 4,109,404, Cl. 43-17.000.
- Press- und Stanzwerk AG: *See—*
  - Mettler, Karl; Marxer, Paul; and Tiefenthaler, Arthur, 4,110,051, Cl. 403-157.000.
- Prewo, Karl M., to United Technologies Corp. Quick bond composite and process. 4,110,505, Cl. 428-114.000.
- Price, Ernest James, to E. J. Price (Developments) Limited. Filters. 4,109,676, Cl. 137-550.000.
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  - Szemeredi, Robert S., 4,109,672, Cl. 137-315.000.
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- Prince, Leland S.; and Yarnell, Neil K. Utility meter readout system. 4,110,606, Cl. 235-432.000.
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  - Benjamin, Lawrence; and Walsh, Michael Andrew, 4,110,498, Cl. 428-35.000.
  - DesMarais, Thomas A., 4,110,276, Cl. 521-123.000.
  - Grubbs, Dennis Robert; Lubsen, Timothy Andrew; and Roseberry, George Leroy, Jr., 4,110,485, Cl. 426-595.000.
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  - Kanner, Bernard; and Prokai, Bela, 4,110,272, Cl. 521-111.000.
- Properzi, Giulio. Method and apparatus for collecting wire rod or the like at the outlet of a rolling mill. 4,109,879, Cl. 242-82.000.
- Pugh, Daniel B.; and Cataldo, Thomas M. Forearm mounted support for lift weights. 4,109,908, Cl. 272-119.000.
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- Quirk, Virgil P., to Stackpole Carbon Company. Hair setting roller. 4,109,667, Cl. 132-33.00R.

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- Reed, Richard E., to CAF Industries. Fresh water supply and waste water retention system. 4,109,604, Cl. 114-270.000.
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- Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Cuccolo, Sergio, to Neste Oy. Photosensitive material containing 2,3-di(2,3-diiodopropoxy)-propyl cellulose and uses thereof. 4,110,112, Cl. 96-

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Rao, S. Chandrasekhara, to Bogue Electric Manufacturing Company. AC synchronous motor having an axially laminated rotor. 4,110,646, Cl. 310-163.000.
Rapoport, Henry; and Barber, Randy B., to University of California, The Regents of the. Metallic derivatives of neopinone ketal. 4,110,329, Cl. 260-270.00A.
Rathbone, Ronald; and Schwabe, Ulrich, to Siemens Aktiengesellschaft. High frequency transistor. 4,110,779, Cl. 357-34.000.
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Ratti, Franco; Vivarelli, Gianantonio; Maganza, Dario; and D'Amore, Emanuele, to Societa Italiana Telecommunicazioni Siemens S.p.A. Manipulator for the insertion and extraction of printed-circuit boards into and from a holder therefor. 4,109,379, Cl. 29-747.000.
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Rivere, Jean Pierre, to Regie Nationale des Usines Renault; and Societe dite Automobiles Peugeot. Electronic fuel injection system for internal combustion engines. 4,109,669, Cl. 137-101.190.
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Roberts, Marvin E. Key construction. 4,109,497, Cl. 70-403.000.
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Decker, Cloyd E., 4,110,601, Cl. 219-506.000.
Robertson, Allen R.; and Hill, James S., to Engelhard Minerals & Chemicals Corporation. Thick film thermocouples. 4,110,124, Cl. 136-236.00R.
Robinson, Peter George: *See—*
Brown, Leon Calvin; Edwards, Earl Garland; Peterson, Charles Edwin; Robinson, Peter George; and Wilson, Clement Card, 4,110,068, Cl. 432-60.000.
Roccafone, Harry I.; and Pasquale, William D., to Champion International Corporation. Carton for round articles. 4,109,786, Cl. 206-45.140.
Rocholl, Martin-Gottfried, to Teroson G.m.b.H. Apparatus for rapidly producing cemented panes of insulating glass. 4,110,148, Cl. 156-359.000.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Hinge with closing means. 4,109,344, Cl. 16-144.000.
Rockwell International Corporation: *See—*
Harris, James S., Jr.; Eden, Richard C.; Cory, Earl S.; and Scholl, Fred W., 4,110,661, Cl. 313-499.000.
Loyd, Morris S., 4,109,435, Cl. 52-309.100.
Molina, Orlando G., 4,110,236, Cl. 252-62.540.
Rodder, Jerome A. Fluid measuring apparatus. 4,109,510, Cl. 73-27.00R.
Roddy, Joseph T., to Emerson Electric Co. Dynamoelectric machine end shield arrangement. 4,110,644, Cl. 310-91.000.
Roder, Edgar; Merk, Fritz; and Rohrig, Luto, to Hoechst Aktiengesellschaft. Microfilm enlarging apparatus. 4,110,039, Cl. 355-68.000.
Rody, Jean: *See—*
Gilg, Bernard; Muller, Helmut; and Rody, Jean, 4,110,304, Cl. 260-45.80N.
Roger, Jean, to Aciers et Outillage Peugeot. Speed variator for a universal electric motor. 4,110,671, Cl. 318-227.000.
Rohm and Haas Company: *See—*
Geyer, Wolfgang G., 4,110,378, Cl. 260-558.00S.
Rohrbach, Gerhard: *See—*
Rechmeier, Helmuth; and Rohrbach, Gerhard, 4,110,121, Cl. 106-100.000.
Rohrig, Luto: *See—*
Roder, Edgar; Merk, Fritz; and Rohrig, Luto, 4,110,039, Cl. 355-68.000.
Roll Forming Corporation: *See—*
Brooks, Barlow W.; and Brooks, Barlow W., Jr., 4,109,499, Cl. 72-181.000.
Rollei-Werke Franke & Heidecke: *See—*
Scholz, Erwin, 4,110,773, Cl. 354-252.000.
Rollenitz, Leopold: *See—*
Bohm, Kurt; Rollenitz, Leopold; and Laurent, Francois, 4,110,005, Cl. 350-184.000.
Roller Bearing Company of America: *See—*
Koch, Hans W., 4,109,976, Cl. 308-36.100.
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Cuccolo, Sergio, to Neste Oy. Photosensitive material containing 2,3-di(2,3-diiodopropoxy)-propyl cellulose and uses thereof. 4,110,112, Cl. 96-1.0PC.
Roman, Ronald S., to Faygo Beverages, Inc. Forklift exhaust deflection shield and methods of constructing and utilizing same. 4,109,956, Cl. 296-78.00R.
Romanelli, Pat: *See—*
Kozam, George; and Romanelli, Pat, 4,109,653, Cl. 128-218.00R.
Rommel, Reiner. Crimping tool for producing solderless permanent electrical connections. 4,109,504, Cl. 72-407.000.
Ronc, Marcel, to Karl Ruggli AG. Manufacture of tampons. 4,109,354, Cl. 28-119.000.
Ronnevig, Carl M., to Skipsaksjeselskapet Suderoy. Vessel for working under water. 4,109,601, Cl. 114-314.000.
Rosch, Gunter: *See—*
Frischkorn, Hans; and Rosch, Gunter, 4,110,246, Cl. 252-301.280.
Roseberry, George Leroy, Jr.: *See—*
Grubbs, Dennis Robert; Lubsen, Timothy Andrew; and Roseberry, George Leroy, Jr., 4,110,485, Cl. 426-595.000.
Rosen, Arye; and Mykietyn, Edward, to RCA Corporation. Electronically tunable microwave frequency FET discriminator. 4,110,700, Cl. 329-103.000.
Rosenberg, Arnold Morry; and Gaidis, James Michael, to W. R. Grace & Co. Anticorrosion treatment of galvanized rebars. 4,110,120, Cl. 106-99.000.
Rosenblatt, David B.: *See—*
Korr, Abraham L.; and Rosenblatt, David B., 4,109,883, Cl. 244-3.100.
Rosendahl, Gottfried R., to United States of America, Navy. Television projector system. 4,110,791, Cl. 358-233.000.
Ross, Sidney D.; and Dunkl, Franz S., to Sprague Electric Company. Electrolytic capacitor with an electrolyte including dibasic acid compounds. 4,110,817, Cl. 361-433.000.
Rossborough, John C. Machine grooved joint on hollow concrete cylinders. 4,109,635, Cl. 125-10.000.
Rosso, John B., to Combustion Engineering, Inc. Turbine meter for bi-directional measurement of fluid flow. 4,109,526, Cl. 73-231.00R.
Rotary Power Development Limited: *See—*
Daniels, Leslie E., 4,109,618, Cl. 123-43.00C.
Roth, Philip B., to American Cyanamid Company. Process for imparting flame resistance to cellulosic textile materials and cellulosic materials obtained thereby. 4,110,509, Cl. 428-276.000.
Roto-Finish Company: *See—*
Balz, Gunther W., 4,110,085, Cl. 51-308.000.
Rotter, Gerhard; and Arns, Harold Ernest, to BASF Aktiengesellschaft. Turnaround system. 4,110,800, Cl. 360-74.000.
Rottmann, Dieter: *See—*
Klank, Otto; Rottmann, Dieter; and Wuttke, Stephan, 4,110,695, Cl. 325-464.000.
Roulleau, Pierre. Printing machine for flat articles. 4,109,572, Cl. 101-37.000.
Rovnyak, George C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Pyrazolo (1,5-c) quinazoline derivatives and related compounds. 4,110,452, Cl. 424-251.000.
Roy, Amedee; Belleau, Claude; and Geyman, James M., to Chrysler Corporation. Iron oxide material and members for dry lubricated systems including the method of preparation therefor. 4,110,512, Cl. 428-469.000.
Ruckriegel, Alfred E.; and Buehler, David W., to Winzeler Stamping Company. End leaf table. 4,109,589, Cl. 108-63.000.
Ruegg, Ernst, to De Dietrich & Cie, S.A. Centrifugal filter press. 4,109,853, Cl. 233-2.000.
Ruhrchemie Aktiengesellschaft: *See—*
Berzen, Josef; and Theyssen, Johannes, 4,110,391, Cl. 264-120.000.
Rule, Charles E.; Ilagan, Juan B.; and Miller, Donald E., to SCM Corporation. Flow process for production of imitation cheese. 4,110,484, Cl. 426-582.000.
Russell, Ralph Arthur: *See—*
Castrodale, Daniel Owen; Lovgren, Jeffrey Lynn; Russell, Ralph Arthur; and Shidler, Karl Allen, 4,110,804, Cl. 360-118.000.
Rusznyak, Andreas, to Ebauches S.A. Electronic system for capacitively storing a signal voltage of predetermined level. 4,110,637, Cl. 307-238.000.
Rutgerskwerke Aktiengesellschaft: *See—*
Wilhelm, Gerhard; Hockenberger, Lothar; Soyka, Manfred; and Endruscheit, Peter, 4,110,295, Cl. 260-30.40R.
Ryobi Ltd.: *See—*
Yamasaki, Tatuya; and Sazaki, Kounin, 4,109,880, Cl. 242-84.21R.
Ryu, Ji-Yong, to UOP Inc. Oligomerization of olefins. 4,110,410, Cl. 260-683.15B.
S & F Associates: *See—*
Smith, James E., 4,109,524, Cl. 73-194.00B.

- Sacarisen, David F.: *See—*
  - Lawford, Victor N.; and Sacarisen, David F., 4,109,531, Cl. 73-438.000.
- Sacher, Reuven M.: *See—*
  - Franz, John E.; and Sacher, Reuven M., 4,110,100, Cl. 71-86.000.
- Sachetto, Jean-Pierre: *See—*
  - Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Cuccolo, Sergio, 4,110,112, Cl. 96-1.0PC.
- Sadler, Fred S.: *See—*
  - Lapp, John; and Sadler, Fred S., 4,110,496, Cl. 428-500.000.
- Saidman, Perry J.: *See—*
  - Lepore, Henry D.; and Saidman, Perry J., 4,110,734, Cl. 340-64.000.
- Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. 2,3 Diketo-piperazinocarbonylamino alkanoic acids and derivatives. 4,110,327, Cl. 544-385.000.
- St. Denis, Joseph F. Method for grinding thread cutting tools. 4,109,421, Cl. 51-288.000.
- Saint-Gobain Industries: *See—*
  - Chevallier, Francois Edmond; and Fenouillet, Jean Marc Pierre, 4,110,097, Cl. 65-136.000.
  - Mattmuller, Rene, 4,110,098, Cl. 65-141.000.
- Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; Shiokawa, Kozo; and Tsuboi, Shinichi, to Nihon Tokushu Noyaku Seizo K.K. Pesticidal organophosphoric acid ester anhydrides. 4,110,440, Cl. 424-207.000.
- Saito, Makoto, to Tomy Kogyo Co., Inc. Trackway and powered vehicle with changeable covers. 4,109,412, Cl. 46-216.000.
- Saito, Shigeru. Toy motor car circuit. 4,109,410, Cl. 46-44.000.
- Saitou, Masatoshi: *See—*
  - Ebi, Yutaka; and Saitou, Masatoshi, 4,110,031, Cl. 355-14.000.
- Sakai, Fumihiko: *See—*
  - Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,110,350, Cl. 260-346.750.
- Sakai, Takayuki: *See—*
  - Kurahashi, Takeo; Maeda, Shigeo; Seki, Sanai; Suzuki, Nobuo; and Sakai, Takayuki, 4,110,070, Cl. 8-2.50R.
- Salen & Wicander Terminalsystem AB: *See—*
  - Johansson, Anders; and Strombeck, Per, 4,109,806, Cl. 214-38.0CC.
- Salter, Edmund L., to Wind Power Systems, Inc. Wind-driven generator. 4,110,631, Cl. 290-55.000.
- Salvat Dalmau, Juan; and Lecha, Manuel Julian, to Salvat Editores, S. A. Process for accelerating the drying of offset inks. 4,110,118, Cl. 106-25.000.
- Salvat Editores, S. A.: *See—*
  - Salvat Dalmau, Juan; and Lecha, Manuel Julian, 4,110,118, Cl. 106-25.000.
- Salzgitter Maschinen AG: *See—*
  - Vogel, Rudolf, 4,109,477, Cl. 61-87.000.
- Samuel, Esta: *See—*
  - Samuel, Stanley C.; and Samuel, Esta, 4,109,794, Cl. 211-13.000.
- Samuel, Stanley C.; and Samuel, Esta. Necktie rack. 4,109,794, Cl. 211-13.000.
- Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, to BASF Aktiengesellschaft. Manufacture of fibrids of polyolefins. 4,110,385, Cl. 264-13.000.
- Sanders Associates, Inc.: *See—*
  - Chicklis, Evan P., 4,110,702, Cl. 331-94.50F.
- Sandis, Stylianos; and Bailly, Jean Claude, to Naphtachimie Societe Anonyme. Manufacture of catalysts for polymerization of olefins. 4,110,248, Cl. 252-429.00B.
- Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Process for stabilizing latex and stable latices produced thereby. 4,110,293, Cl. 260-29.70R.
- Sanford, Lawrence. Apparatus and method for protecting well bore. 4,109,728, Cl. 166-315.000.
- Sano, Tokuo; Oshima, Takeo; and Kamata, Tokio, to Fujisawa Pharmaceutical Co., Ltd. Prophylactic, therapeutic or hygienical agent against virus diseases in fish and use therefor. 4,110,467, Cl. 424-280.000.
- Sapunarov, Ivan Mitrev: *See—*
  - Stoev, Stoycho Mitrev; Sapunarov, Ivan Mitrev; and Manov, Emil Nikolov, 4,109,874, Cl. 241-69.000.
- Sargent, Harry; and Spiegel, Si, to American Technical Institute, Inc. Hinged branch holder. 4,109,345, Cl. 16-149.000.
- Sarid, Dror; and Davis, Thomas G., to Xerox Corporation. Corona device. 4,110,614, Cl. 250-324.000.
- Sarkar, Arnab: *See—*
  - Olszewski, Jerzy A.; and Sarkar, Arnab, 4,110,001, Cl. 350-96.230.
- Sarkissian, Vahe A.; Jayakumar, Nagab; Kroeger, Joseph H.; and Schlageter, Jeffrey M., to Advanced Micro Devices, Inc. Random access memory with memory status for improved access and cycle times. 4,110,842, Cl. 365-233.000.
- Saroy Engineering: *See—*
  - Husted, Royce Hill, 4,109,739, Cl. 180-5.00R.
- Sarto, Jorma O., to Chrysler Corporation. Sonic throttle for automobile. 4,110,416, Cl. 261-23.00A.
- Sassmannshausen, Knut Otto. Electric incandescent lamp. 4,110,658, Cl. 313-344.000.
- Sato, Fumio, to Morinaga & Co., Ltd. Method for continuously rolling up sheets of baked cookies. 4,110,482, Cl. 426-497.000.
- Sato, Hiroaki: *See—*
  - Kunioka, Kazuo; Noguchi, Takao; and Sato, Hiroaki, 4,110,092, Cl. 62-64.000.
- Sato, Kyoichi: *See—*
  - Hisano, Hiroshi; and Sato, Kyoichi, 4,110,821, Cl. 363-141.000.
- Sato, Masamichi, to Fuji Photo Film Co., Ltd. Image forming method. 4,110,114, Cl. 96-36.000.
- Sato, Mitsuru: *See—*
  - Teraoka, Kazuharu; Sato, Mitsuru; and Mineo, Masao, 4,109,857, Cl. 235-378.000.
- Sato, Shigehiko: *See—*
  - Maeda, Kazuo; Noguchi, Katuichi; Kawabata, Masuo; Sato, Shigehiko; and Sato, Yukio, 4,109,663, Cl. 131-2.000.
- Sato, Yasushi; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Image transfer mechanism. 4,110,027, Cl. 355-3.0TR.
- Sato, Yukio: *See—*
  - Maeda, Kazuo; Noguchi, Katuichi; Kawabata, Masuo; Sato, Shigehiko; and Sato, Yukio, 4,109,663, Cl. 131-2.000.
- Sattin, Leone Glicerio, to Voxon S.p.A. Anti-theft alarm with coded radio link. 4,110,738, Cl. 340-539.000.
- Saturn Machine & Welding Co., Inc.: *See—*
  - Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., 4,110,171, Cl. 202-241.000.
- Satzinger, Gerhard: *See—*
  - Stoss, Peter; Satzinger, Gerhard; and Herrmann, Manfred, 4,110,448, Cl. 424-247.000.
- Saucy, Gabriel: *See—*
  - Chan, Ka-Kong; and Saucy, Gabriel, 4,110,346, Cl. 260-345.500.
- Sauter, Daniel S.: *See—*
  - Zeigler, James Richard; and Sauter, Daniel S., 4,109,830, Cl. 222-143.000.
- Savonuzzi, Giovanni: *See—*
  - Brusaglino, Giampiero; and Savonuzzi, Giovanni, 4,109,743, Cl. 180-65.00C.
- Sazaki, Kounin: *See—*
  - Yamasaki, Tatuya; and Sazaki, Kounin, 4,109,880, Cl. 242-84.21R.
- Schacht, Erich: *See—*
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Schaeffer, Georg: *See—*
  - Bildstein, Siegfried; Lademann, Rudolf; Pietzsch, Siegfried; and Schaeffer, Georg, 4,110,365, Cl. 260-505.00C.
- Schaeffer, James R.; Minsk, Louis M.; and Stevens, Richard E., to Eastman Kodak Company. Analytical element for clinical analysis. 4,110,079, Cl. 23-253.0TP.
- Schaeffer, William D.; and Booth, Frank B., to Celanese Corporation. Hydrocarbonylation. 4,110,404, Cl. 260-604.0HF.
- Schaffer, Dennis A., to Carmet Company. Can making. 4,109,502, Cl. 72-349.000.
- Schaub, Andres; and Kogel, Gerhard, to Ciba-Geigy AG. Process for the tone-in-tone printing and pad-dyeing of textile material made from fibre mixtures. 4,110,071, Cl. 8-21.00R.
- Schaub, Robert Eugene: *See—*
  - Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Poletto, John Frank; Schaub, Robert Eugene; and Bernady, Karel Francis, 4,110,368, Cl. 260-514.00D.
- Schaum, Helmut: *See—*
  - Hey, Hansjorg; Schaum, Helmut; and Arpe, Hans-Jurgen, 4,110,372, Cl. 260-540.000.
- Schering Corporation: *See—*
  - Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,110,439, Cl. 424-181.000.
- Scherling, Kurt: *See—*
  - Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,110,385, Cl. 264-13.000.
- Scheurecker, Werner, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Arrangement for introducing a flexible starter bar into a continuous casting plant. 4,109,700, Cl. 164-426.000.
- Schindler, Hans Rudolf; and Vettiger, Peter, to International Business Machines Corporation. Method and apparatus for monitoring the on/off-hook status of a telephone set. 4,110,569, Cl. 179-84.00A.
- Schindler, Hermann; and Zimmermann, Wolfgang, to Hoechst Aktiengesellschaft. Process for the manufacture of films and coatings containing polyvinyl alcohol and having a reduced solubility in water. 4,110,494, Cl. 427-385.00R.
- Schirmann, Peter Jude; and Blank, Werner Josef, to American Cyanamid Company. Aqueous vinyl polymeric emulsion system and process of preparing the same using aminoplast resin. 4,110,288, Cl. 260-29.4UA.
- Schlageter, Jeffrey M.: *See—*
  - Sarkissian, Vahe A.; Jayakumar, Nagab; Kroeger, Joseph H.; and Schlageter, Jeffrey M., 4,110,842, Cl. 365-233.000.
- Schleicher, George W., to Vapor Corporation. Low noise fluid distributor. 4,109,563, Cl. 98-40.00C.
- Schlick, Helmut: *See—*
  - Baumgartner, Alfons; Berg, Walter; Burkhardt, Horst; Laubin, Jurgen; and Schlick, Helmut, 4,110,828, Cl. 364-562.000.
- Schlumberger Technology Corporation: *See—*
  - Tabanou, Jacques Rene, 4,110,682, Cl. 324-10.000.
- Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius. Thread guidance in mesh-forming machines with rotating thread guides. 4,109,491, Cl. 66-125.00R.
- Schmidt, Gunther, to Messerschmitt-Bolkow-Blohm GmbH. Liquid fuel rocket engine having adjustable nozzle throat section. 4,109,460, Cl. 60-204.000.
- Schmidt, Hans: *See—*
  - Nakanishi, Mutsuo; and Schmidt, Hans, 4,110,721, Cl. 338-128.000.

- Schmitz, Harry W.: *See—*
  - Fennessy, Donald W.; and Schmitz, Harry W., 4,109,373, Cl. 29-588.000.
- Schmon, Franz: *See—*
  - Ledeen, Howard L.; and Schmon, Franz, 4,109,512, Cl. 73-40.50R.
- Schneider, Abraham: *See—*
  - Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,110,409, Cl. 260-666.0PY.
- Schneider, Burnett M.: *See—*
  - Ahlgren, Richard M.; and Schneider, Burnett M., 4,110,175, Cl. 204-180.00P.
- Schneider, George William, Jr., to Singer Company, The. Spider bearing support for a meter rotor. 4,109,528, Cl. 73-253.000.
- Schneider, Louis, to Xerox Corporation. Drive system for multi-mode reproducing apparatus. 4,110,028, Cl. 355-8.000.
- Schnell, Hans Gunther, to Van Kooten B.V. Pile-driving ram and method of controlling the same. 4,109,475, Cl. 61-53.500.
- Schoeneck Farms, Inc.: *See—*
  - Kline, Donald C., 4,109,448, Cl. 56-13.500.
- Scholl, Fred W.: *See—*
  - Harris, James S., Jr.; Eden, Richard C.; Cory, Earl S.; and Scholl, Fred W., 4,110,661, Cl. 313-499.000.
- Scholz, Erwin, to Rollei-Werke Franke & Heidecke. Brake system for focal plane shutters of photographic cameras. 4,110,773, Cl. 354-252.000.
- Schonstedt, Erick O., to Schonstedt Instrument Company. Magnetic detecting apparatus with novel means for positioning sensor assembly in a housing. 4,110,689, Cl. 324-254.000.
- Schonstedt Instrument Company: *See—*
  - Schonstedt, Erick O., 4,110,689, Cl. 324-254.000.
- Schopper, Bernd, to ITT Industries, Incorporated. Brake-force distributor for dual-circuit brake systems. 4,109,967, Cl. 303-6.00C.
- Schott, Donald E., to Thomas C. Wilson, Inc. Leak detector apparatus. 4,109,513, Cl. 73-49.100.
- Schreyer, Kenneth D. Folders/dividers and compartmented filing system. 4,109,982, Cl. 312-183.000.
- Schroeder, Paul Robert, to Bell Telephone Laboratories, Incorporated. Level shifter and sense refresh detector. 4,110,841, Cl. 365-205.000.
- Schulmeyer, Norbert: *See—*
  - von Bebenburg, Walter; Schulmeyer, Norbert; and Jakovlev, Vladimir, 4,110,455, Cl. 424-256.000.
- Schultz, Bruce R.: *See—*
  - Laakaniemi, Richard N.; Ploszaj, Leon C.; and Schultz, Bruce R., 4,110,140, Cl. 156-87.000.
- Schultz, Freddy R., to Aluminum Company of America. Method of forming a pressure resistant end shell for a container. 4,109,599, Cl. 113-121.00C.
- Schulz, John A.: *See—*
  - Lenz, George R.; and Schulz, John A., 4,110,325, Cl. 260-239.55C.
- Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corporation. Polyether diureide epoxy additives. 4,110,309, Cl. 528-119.000.
- Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corporation. Polyether diamide epoxy additives. 4,110,310, Cl. 528-119.000.
- Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corporation. Epoxy curing agent. 4,110,313, Cl. 528-90.000.
- Schulze, Heinz; and Marquis, Edward T., to Texaco Development Corporation. Preparation of oxydicarboxylic acid salts. 4,110,371, Cl. 260-531.00C.
- Schumacher, Georg: *See—*
  - Haep, Heinz; and Schumacher, Georg, 4,109,582, Cl. 102-93.000.
- Schuman, Mark, to American Standard Inc. Adiabatic compression infrared emission vapor detector. 4,110,618, Cl. 250-343.000.
- Schutz, Karl-Heinz; and Tesch, Karl, to Jos. Schneider & Co. Optische Werke Kreuznach. Coupling mechanism for the alternate manual and automatic adjustment of a varifocal objective. 4,110,769, Cl. 354-195.000.
- Schutzenauer, Dieter: *See—*
  - Dyballa, Manfred; and Schutzenauer, Dieter, 4,109,517, Cl. 73-119.00A.
- Schwab, Frederick C.; Sheppard, Edward W.; and Chen, Catherine S. H., to Mobil Oil Corporation. Waterflooding process employing cationic-nonionic copolymers. 4,110,232, Cl. 252-8.55B.
- Schwab, James J.; and Goodson, David B., to Air Pollution Systems, Inc. Method for ionizing gases, electrostatically charging particles, and electrostatically charging particles or ionizing gases for removing contaminants from gas streams. 4,110,086, Cl. 55-7.000.
- Schwabe, Ulrich: *See—*
  - Rathbone, Ronald; and Schwabe, Ulrich, 4,110,779, Cl. 357-34.000.
- Schwartz, Peter W.: *See—*
  - Peterson, Glenn R.; Hicks, Marvin C.; and Schwartz, Peter W., 4,110,194, Cl. 208-11.0LE.
- Schweier, Guenther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, to BASF Aktiengesellschaft. Manufacture of homopolymers and copolymers of α-monoolefins. 4,110,523, Cl. 526-124.000.
- Schwing, Gregory Wayne: *See—*
  - Fugitt, Robert Benson; and Schwing, Gregory Wayne, 4,110,473, Cl. 424-331.000.
- Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives - C_8 modifications. 4,110,530, Cl. 536-9.000.
- Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives - C_8 modifications. 4,110,531, Cl. 536-9.000.
- SCM Corporation: *See—*
  - Hodgson, Allan S.; and Red, Jerry F. P., 4,110,356, Cl. 260-412.500.
  - Nadkarni, Anil Vasant, 4,110,130, Cl. 148-11.50P.
  - Rule, Charles E.; Ilagan, Juan B.; and Miller, Donald E., 4,110,484, Cl. 426-582.000.
- Scrocco, Joseph: *See—*
  - Cottingham, Hugh V.; and Scrocco, Joseph, 4,110,506, Cl. 428-138.000.
- Sea Horse Corporation, The: *See—*
  - Sumner, Maurice N., 4,109,480, Cl. 61-114.000.
- Sealy, Incorporated: *See—*
  - Klancnik, Alvin R., 4,109,330, Cl. 5-267.000.
- Sebald, Franz X.; and Hagemann, Hans-Dieter, to Deutsche Texaco Aktiengesellschaft. Method of covering the bottom surface in a gas cavern. 4,109,471, Cl. 61-0.500.
- Sebestyen, Ferenc: *See—*
  - Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Hercsel nee Szepespataky, Jolan; and Bendefy nee Dobay, Erzsebet, 4,110,441, Cl. 424-211.000.
- Secor, Robert Miller, to Du Pont de Nemours, E. I., and Company. Method and apparatus for encapsulating and coagulating elastomers. 4,110,491, Cl. 427-212.000.
- Security Plastics, Inc.: *See—*
  - Kutik, Louis F.; and Cecil, Howard E., 4,109,832, Cl. 222-318.000.
- Seidl, Horst: *See—*
  - Amann, Rolf; and Seidl, Horst, 4,109,955, Cl. 296-37.100.
- Seiko Koki Kabushiki Kaisha: *See—*
  - Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,110,772, Cl. 354-246.000.
  - Onda, Eiichi; Koyama, Mitsuo; Nemoto, Ichiro; Nokagawa, Tadashi; and Watanabe, Masanori, 4,110,767, Cl. 354-152.000.
- Sekhar, Neel C., to Upjohn Company, The. Process for inhibiting platelet aggregation. 4,110,161, Cl. 195-1.800.
- Seki, Sanai: *See—*
  - Kurahashi, Takeo; Maeda, Shigeo; Seki, Sanai; Suzuki, Nobuo; and Sakai, Takayuki, 4,110,070, Cl. 8-2.50R.
- Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Shimada, Teizo; Kita, Takeshi; Mochizuki, Kiyoshi; and Komiya, Takahiro, 4,110,394, Cl. 264-167.000.
- Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
  - Ikeda, Toshiki; and Beppu, Yoshitsugu, 4,110,267, Cl. 521-59.000.
- Sekiya, Kunihiko: *See—*
  - Kageyama, Satoshi; and Sekiya, Kunihiko, 4,110,558, Cl. 178-69.100.
- Sekmakas, Kazys; and Hesler, Kenneth K., to DeSoto, Inc. Pigmented air drying latex paints having superior gloss. 4,110,292, Cl. 260-29.6RW.
- Selenia-Industrie Elettroniche Associate S.p.A.: *See—*
  - Neri, Filippo, 4,110,752, Cl. 343-7.400.
- Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. N-(2-pyrimidinyl)1H-(or 2H)tetrazole-5-carboxamide derivatives for the prevention of immediate type hypersensitivity reactions. 4,110,453, Cl. 424-251.000.
- Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. N-(pyridyl) oxamic acid derivatives. 4,110,458, Cl. 424-263.000.
- Sellstrom Manufacturing Company: *See—*
  - Anderson, Marshall N., 4,109,320, Cl. 2-10.000.
- Selvidge, Charles W.; Morgan, Kenneth A.; and Frame, Robert R., to UOP Inc. Metal separation from dragstream material of refining process. 4,110,398, Cl. 423-62.000.
- Semi-Alloys, Inc.: *See—*
  - Hascoe, Norman; and Levine, Samuel W., 4,109,818, Cl. 220-200.000.
- Senco Products, Inc.: *See—*
  - Becht, Carl T., 4,109,844, Cl. 227-120.000.
- Sendai, Satoshi: *See—*
  - Yamamoto, Hirotaka; Sendai, Satoshi; and Ninomiya, Hideaki, 4,110,260, Cl. 252-519.000.
- Sendtko, Ulrich: *See—*
  - Mollgaard, Klaus; Keller, Hans; Sendtko, Ulrich; and Sommer, Rudiger, 4,110,826, Cl. 364-526.000.
- Sentralinstitutt for Industriell Forskning: *See—*
  - Ersoy, Kadri Okan, 4,109,996, Cl. 350-3.660.
- Serafin, Marian A.; and Decubber, Maurice, to Societe Anonyme de Traverses en Beton Arme - Systeme Vagneux. Rail spring clip with tension limiting feature. 4,109,860, Cl. 238-349.000.
- Sevcon Limited: *See—*
  - Gurwicz, David; Sloan, Albert Everett; Moss, Barry; Wild, Arthur; and Ord, William Robert, 4,110,668, Cl. 318-78.000.
- Seymour, Samuel L., to PPG Industries, Inc. Tongs for gripping glass sheets. 4,109,953, Cl. 294-118.000.
- Shackle, Dale Richard: *See—*
  - Lee, Yu-Sun; and Shackle, Dale Richard, 4,110,511, Cl. 428-307.000.
- Shaffer, Harry Leonard: *See—*
  - Leary, Patrick John; and Shaffer, Harry Leonard, 4,110,560, Cl. 179-1.0VC.
- Shanley, James Joseph to Bell Telephone Laboratories, Incorporated. Switching network control arrangement. 4,110,566, Cl. 179-18.0GF.
- Shapiro, Eugene: *See—*
  - Parikh, Prakash D.; and Shapiro, Eugene, 4,110,132, Cl. 148-32.000.
- Shapiro, Rosella. Scarf constructions having a substantially concealable pocket therein, and methods of producing same. 4,109,321, Cl. 2-91.000.
- Shavit, Gideon, to Honeywell Inc. Load cycling with space temperature feedback. 4,110,827, Cl. 364-550.000.

- Shaw, Fred B., to Continental Can Company, Inc. Sealing unit for autoclave sterilization of flexible packages. 4,109,441, Cl. 53-11.000.
- Shaw, Gordon Brian; and Brinkman, Richard John, to Pickford Holland & Company Limited. Electrodes for glass furnaces. 4,110,545, Cl. 13-6.000.
- Shaw, Wilfrid G.: *See—*
  - White, James F.; and Shaw, Wilfrid G., 4,110,369, Cl. 260-530.00N.
- Shelby, Thomas A.; and Gallien, Shelby W., to Rea Magnet Wire Co., Inc. Wire enamel with low soldering temperature. 4,110,297, Cl. 260-33.40P.
- Sheldon, Roger A.; Been, Peter; Wood, Derek A.; and Mason, Ronald F., to Shell Oil Company. Preparation of esters. 4,110,360, Cl. 260-465.00D.
- Sheldon, Roger A.; and Been, Peter, to Shell Oil Company. Preparation of esters. 4,110,361, Cl. 260-465.00D.
- Sheldon, Roger A.; and Been, Peter, to Shell Oil Company. Preparation of esters. 4,110,362, Cl. 260-465.00D.
- Sheldon, Roger A.; and Been, Peter, to Shell Oil Company. Preparation of esters. 4,110,363, Cl. 260-465.00D.
- Shell Oil Company: *See—*
  - Gergen, William P.; and Davison, Sol, 4,110,303, Cl. 260-42.180.
  - Gwyn, John E.; and Roberts, Scott C., 4,110,193, Cl. 208-11.00R.
  - Sheldon, Roger A.; Been, Peter; Wood, Derek A.; and Mason, Ronald F., 4,110,360, Cl. 260-465.00D.
  - Sheldon, Roger A.; and Been, Peter, 4,110,361, Cl. 260-465.00D.
  - Sheldon, Roger A.; and Been, Peter, 4,110,362, Cl. 260-465.00D.
  - Sheldon, Roger A.; and Been, Peter, 4,110,363, Cl. 260-465.00D.
- Shelton, James B.: *See—*
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- Shemer, Jack E.: *See—*
  - Cronshaw, David; Shemer, Jack E.; Turner, William D.; Hartke, David; Keddy, James R.; DuVall, Wilbur E.; and Sterling, Warren M., 4,110,823, Cl. 364-200.000.
- Shepard, Inella Gatlin: *See—*
  - Graham, William Hardin; and Shepard, Inella Gatlin, 4,110,135, Cl. 149-19.400.
- Sheppard, Edward W.: *See—*
  - Schwab, Frederick C.; Sheppard, Edward W.; and Chen, Catherine S. H., 4,110,232, Cl. 252-8.55B.
- Sheratte, Martin B., to McDonnell Douglas Corporation. Process for converting the decomposition products of polyurethane and novel compositions thereby obtained. 4,110,266, Cl. 260-2.300.
- Sheridan, David S., to Mallinckrodt, Inc. Evagination catheters. 4,109,659, Cl. 128-349.00R.
- Sheridan, Geoffrey Philip: *See—*
  - Tennant, David John; Sheridan, Geoffrey Philip; and Steel, Alistair James, 4,110,213, Cl. 210-59.000.
- Shibata, Hiroshi; and Yoshihara, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing insulated gate semiconductor. 4,109,371, Cl. 29-571.000.
- Shibata, Toshihiro: *See—*
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,110,306, Cl. 260-45.80N.
- Shidler, Karl Allen: *See—*
  - Castrodale, Daniel Owen; Lovgren, Jeffrey Lynn; Russell, Ralph Arthur; and Shidler, Karl Allen, 4,110,804, Cl. 360-118.000.
- Shigemori, Shuichiro: *See—*
  - Kiyono, Yutaka; Nagata, Shigeaki; Shigemori, Shuichiro; Kishimoto, Tadashi; Maruyama, Sadao; and Arisawa, Katsuyoshi, 4,109,999, Cl. 350-91.000.
- Shih, Pong Su: *See—*
  - Bertram, James L.; and Shih, Pong Su, 4,110,354, Cl. 260-348.140.
- Shimada, Teizo; Kita, Takeshi; Mochizuki, Kiyoshi; and Komiya, Takahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for extrusion forming of resin formed body having different thickness. 4,110,394, Cl. 264-167.000.
- Shimizu, Masatoshi: *See—*
  - Miyazaki, Togo; and Shimizu, Masatoshi, 4,110,663, Cl. 315-169.0TV.
- Shimizu, Teruo: *See—*
  - Hirose, Fuminori; and Shimizu, Teruo, 4,109,788, Cl. 206-329.000.
- Shimizu, Yoshiteru: *See—*
  - Onodera, Hisakichi; Suwa, Masateru; Oouki, Jin; and Shimizu, Yoshiteru, 4,110,783, Cl. 357-67.000.
- Shimp, Lawrence A.: *See—*
  - Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,110,474, Cl. 424-350.000.
- Shindo, Masami: *See—*
  - Koodo, Tatsuo; Shindo, Masami; Ohmura, Taizo; Yonezawa, Noboru; Kawagoe, Akira; and Kojima, Toshio, 4,110,110, Cl. 75-122.000.
- Shinoda, Isao: *See—*
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- Shinohara, Shigeyuki; and Makino, Hiroshi. Parallel indexing cam structure. 4,109,548, Cl. 74-569.000.
- Shinshu Seiki Kabushiki Kaisha: *See—*
  - Usui, Kiyofumi; Hirahayashi, Shigeyoshi; and Hosogaya, Hiroshi, 4,109,843, Cl. 226-109.000.
- Shiokawa, Kozo: *See—*
  - Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; Shiokawa, Kozo; and Tsuboi, Shinichi, 4,110,440, Cl. 424-207.000.
- Shiokawa, Youichi: *See—*
  - Kamiya, Takashi; Tanaka, Kunihiko; and Shiokawa, Youichi, 4,110,338, Cl. 260-308.00D.
- Shipkov, Nikolai Nikolaevich: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Shiraki, Masao: *See—*
  - Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,452, Cl. 57-58.890.
  - Kobayashi, Akira; Chiba, Kunji; Miyamoto, Noriaki; Shiraki, Masao; and Furukawa, Naotake, 4,109,453, Cl. 57-58.910.
- Shirashoji, Hishashi: *See—*
  - Nakasaki, Eiji; and Shirashoji, Hishashi, 4,109,696, Cl. 152-354.00R.
- Shiseido Co., Ltd.: *See—*
  - Katada, Michihisa; Hayashi, Katsutake; Katsura, Hakuji; Tomita, Kenichi; Morohoshi, Hideo; Uehara, Keiichi; and Tanaka, Hiroshi, 4,110,626, Cl. 252-522.000.
- Shishido, Toetsu: *See—*
  - Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Hamano, Masaaki; and Shishido, Toetsu, 4,110,386, Cl. 264-29.500.
- Shoe and Allied Trades Research Association, The: *See—*
  - Carter, Alan Reginald; Pettit, Donald; and Langerwerf, Josephus Sychbertus, 4,110,495, Cl. 427-400.000.
- Shoor, Bernard A.: *See—*
  - Haynes, John L.; and Shoor, Bernard A., 4,110,604, Cl. 235-92.0PC.
- Shuff, Gregory Douglas. Inflatable swimming pool cover system. 4,109,325, Cl. 4-172.120.
- Shulman, Michael H. Overhead load-wrapping apparatus. 4,109,445, Cl. 53-198.00R.
- Shumway, Durland Karl: *See—*
  - Barnhurst, James Douglas; and Shumway, Durland Karl, 4,110,426, Cl. 424-46.000.
- Sichel, Enid Keil, to RCA Corporation. Electrochromic cermet material and device including the same. 4,110,259, Cl. 252-514.000.
- Sickles, Doris E.: *See—*
  - Numbers, Jody L., 4,110,021, Cl. 353-27.00R.
- Sickles, Ralph A.: *See—*
  - Numbers, Jody L., 4,110,021, Cl. 353-27.00R.
- Sieber, Felix P., to BCS Mach. & Mfg. Corp. Bracket assembly for mounting a CB antenna. 4,110,757, Cl. 343-715.000.
- Sieck, Charles A. Heating system. 4,109,486, Cl. 62-402.000.
- Siemens Aktiengesellschaft: *See—*
  - Deckert, Andreas; and Wolscheck, Hans, 4,110,816, Cl. 361-433.000.
  - Rathbone, Ronald; and Schwabe, Ulrich, 4,110,779, Cl. 357-34.000.
  - Zottl, Anton, 4,110,755, Cl. 343-17.2PC.
- Sieving, Alfred W.; and Stanley, James M., to Caterpillar Tractor Co. Dump body gate latch control system. 4,109,963, Cl. 298-23.00M.
- Sifferman, Thomas R.; and Sparlin, Derry D., to Continental Oil Company. Control of incompetent formations with thickened acid-settable resin compositions. 4,110,275, Cl. 260-14.000.
- SIG Schweizerische Industrie-Gesellschaft: *See—*
  - Egli, Alwin, 4,109,822, Cl. 220-404.000.
- Sigmatex, A.G.: *See—*
  - Weman, Per Olof, 4,109,935, Cl. 280-747.000.
- Sigut, Donald E.: *See—*
  - Fox, Richard Q.; Sigut, Donald E.; and McWhirter, John H., 4,110,825, Cl. 364-492.000.
- Sih, John C.: *See—*
  - Johnson, Roy A.; and Sih, John C., 4,110,532, Cl. 542-426.000.
- Silver Seiko Ltd.: *See—*
  - Iwasaki, Yasuhiro, 4,109,489, Cl. 66-75.200.
- Silverberg, Morton, to Xerox Corporation. Optical system for alternatively projecting adjacent images of adjacent objects or double images of a single object. 4,110,023, Cl. 353-122.000.
- Silvestrini, Jesus Antonio, to California Processing Machinery. Apparatus for pitting peaches. 4,109,570, Cl. 99-551.000.
- Silzars, Aris: *See—*
  - Janko, Bozidar; and Silzars, Aris, 4,110,749, Cl. 340-365.00C.
- Simane, Zdenek: *See—*
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Sinclair, Robert I.: *See—*
  - Godfrey, Frederick D., Jr.; Fedro, John J.; and Sinclair, Robert I., 4,109,665, Cl. 131-15.00C.
- Singer Company, The: *See—*
  - Adams, Kenneth D., 4,109,597, Cl. 112-158.00E.
  - Albert, William Charles, 4,109,534, Cl. 73-503.000.
  - Beer, Emmanuel Emil, 4,110,609, Cl. 250-231.00R.
  - Fahey, William David, 4,110,737, Cl. 340-146.30Q.
  - Rakacs, Joseph G., 4,109,591, Cl. 112-76.000.
  - Schneider, George William, Jr., 4,109,528, Cl. 73-253.000.
  - Vermillion, Don W., 4,109,342, Cl. 15-373.000.
- Singer, Malcolm S., to Chevron Research Company. Cellulose fermentation process. 4,110,475, Cl. 426-2.000.
- Sirven, Jacques, to Thomson-CSF. Device for processing signals from a coherent pulse radar. 4,110,753, Cl. 343-8.000.
- Six, Ludwig, to Mauser-Werke Aktiengesellschaft. Projectile for an infantry rifle. 4,109,581, Cl. 102-92.100.
- Skidmore, Richard H., to Welding Engineers, Inc. Pressure restricting means for a liquid outlet of an extruder. 4,110,843, Cl. 366-83.000.
- Skilling, John B.: *See—*
  - Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F., 4,109,934, Cl. 280-716.000.
- Skipsaksjeselskapet Suderoy: *See—*
  - Ronnevig, Carl M., 4,109,601, Cl. 114-314.000.

- Skogman, Richard A.: *See—*
  - Chaffin, John H., III; and Skogman, Richard A., 4,110,489, Cl. 427-164.000.
- Skrovanek, Ambroz Karol: *See—*
  - Gaetano, Mauro Luigi; and Skrovanek, Ambroz Karol, 4,110,711, Cl. 333-32.000.
- Slagel, Roger D. Combination check flow control and selector valve. 4,109,670, Cl. 137-119.000.
- Sleath, William Derek: *See—*
  - Harrison, Peter Arthur; Parks, Anthony John; Southgate, Malcolm Dennis; Sleath, William Derek; and Hills, Richard Keith, 4,110,037, Cl. 355-48.000.
- Sloan, Albert Everett: *See—*
  - Gurwicz, David; Sloan, Albert Everett; Moss, Barry; Wild, Arthur; and Ord, William Robert, 4,110,668, Cl. 318-78.000.
- Sloan, Cephas H.; and Pacifici, James G., to Eastman Kodak Company. Ultraviolet curable polyester binder and coating formulation. 4,110,187, Cl. 204-159.190.
- Sloan Valve Company: *See—*
  - Horowitz, Charles; and Lissau, Frederic, 4,109,673, Cl. 137-381.000.
- Sluse, Guy; and Dujardin, Francois, to Solvay & Cie. Method of handling aqueous solutions of alkali metal hydroxides that are concentrated in respect of alkali metal halides. 4,110,181, Cl. 204-147.000.
- Slusser, Marion L., to Mobil Oil Corporation. Method of proppant placement in hydraulic fracturing treatment. 4,109,721, Cl. 166-280.000.
- Small, Richard B., to Texas Instruments Incorporated. Thermal printhead assembly. 4,110,598, Cl. 219-216.000.
- Smart, William A., Jr.; and Gumm, Scott H., to Bradley Corporation. Remote actuated metering valve. 4,109,895, Cl. 251-41.000.
- Smirnov, Alexandr Stepanovich: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Smith, Bob Lorin, deceased: *See—*
  - Berg, Norman J.; Smith, Bob Lorin, deceased; and Adams, Allen B., legal representative, 4,110,016, Cl. 350-358.000.
- Smith, Charles R., to Cutler-Hammer, Inc. Thermostatic control. 4,110,720, Cl. 337-319.000.
- Smith, Clifford E.; and Holtz, Hans D., to Phillips Petroleum Company. Catalytically active $AlCl_3$-graphite intercalate. 4,110,252, Cl. 252-442.000.
- Smith, Donald Luke: *See—*
  - Farley, Ronald William; and Smith, Donald Luke, 4,110,026, Cl. 355-3.00R.
- Smith, Donald V. Externally mountable, high strength, security lock for doors and the like. 4,109,949, Cl. 292-189.000.
- Smith, Eugene Leroy, Jr.: *See—*
  - Wang, Samuel Shan Ning; and Smith, Eugene Leroy, Jr., 4,110,207, Cl. 209-166.000.
- Smith, Frank F.: *See—*
  - Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F., 4,109,934, Cl. 280-716.000.
- Smith, Irl Wilson, Jr.; and Dorschner, Terry A., to Raytheon Company. Electromagnetic wave ring resonator. 4,110,045, Cl. 356-106.0LR.
- Smith, James E., to S & F Associates. Method and apparatus for mass flow rate measurement. 4,109,524, Cl. 73-194.00B.
- Smith, Kenneth J.; and Anderson, Jerry F. Bow sight. 4,109,390, Cl. 33-265.000.
- Smith, Lynwood L. Solar heating system. 4,109,640, Cl. 126-271.000.
- Smith, Richard E.: *See—*
  - Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,109,903, Cl. 271-3.000.
- Smith, Roger, Jr.: *See—*
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- Smith, William Allen: *See—*
  - Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,110,344, Cl. 260-340.300.
- Sneed, James W., Jr. Dual threshold logic probe. 4,110,687, Cl. 324-133.000.
- Snyder, Clair Wilson, Jr.; and Derr, Paul Birchard, to AMP Incorporated. Environmentally sealed electrical connector. 4,109,989, Cl. 339-94.00M.
- Snyder Manufacturing Co., Ltd.: *See—*
  - Hoel, Steven Michael, 4,110,497, Cl. 428-190.000.
- Sobieski, John C., to General Electric Company. Lead-in seal and lamp utilizing same. 4,110,657, Cl. 313-332.000.
- Societa Italiana Telecommunicazioni Siemens S.p.A.: *See—*
  - Ratti, Franco; Vivarelli, Gianantonio; Maganza, Dario; and D'Amore, Emanuele, 4,109,379, Cl. 29-747.000.
- Societe Anonyme Automobile Citroen: *See—*
  - Estaque, Andre Fernand, 4,109,979, Cl. 308-238.000.
- S.A. Block & Concrete (Proprietary) Limited: *See—*
  - Pfeffer, Johann Baptist, 4,110,214, Cl. 210-77.000.
- Societe Anonyme D.B.A.: *See—*
  - Carre, Jean-Jacques, 4,109,764, Cl. 188-72.400.
- Societe Anonyme de Traverses en Beton Arme - Systeme Vagneux: *See—*
  - Serafin, Marian A.; and Decubber, Maurice, 4,109,860, Cl. 238-349.000.
- S.A. des Anciens Establissements Paul Wurth: *See—*
  - Legille, Edouard, 4,110,617, Cl. 250-342.000.
- s.a. Texaco Belgium n.v.: *See—*
  - Dewaele, Sylvain A. R., 4,110,323, Cl. 260-239.30A.
- Societe Chimique des Charbonnages: *See—*
  - Hubert, Jacques; Ory, Jean-Marie; Bottin, Jean; and Humbert, Claude, 4,110,741, Cl. 340-573.000.
- Societe dite Automobiles Peugeot: *See—*
  - Rivere, Jean Pierre, 4,109,669, Cl. 137-101.190.
- Societe E. Lacroix: *See—*
  - Denninger, Claude, 4,109,406, Cl. 43-84.000.
- Societe Lignes Telegraphiques et Telephoniques: *See—*
  - Frade, Gilbert; Escher, Balint; and Prince, Dominique, 4,110,815, Cl. 361-433.000.
- Societe Nationale Elf Aquitaine (Production): *See—*
  - Godeau, Alain; and Heas, Jean-Yves, 4,109,479, Cl. 61-94.000.
- Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux: *See—*
  - Tigreat, Paul, 4,110,762, Cl. 354-4.000.
- Societe RHONE-PROGIL: *See—*
  - Botton, Roger Jean, 4,110,423, Cl. 423-356.000.
- Sogemaric, Societe de Gestion et de Marketing pour Industries de Consommation: *See—*
  - Denninger, Claude, 4,109,406, Cl. 43-84.000.
- Sohngen, Edwin Lowe: *See—*
  - Goethel, James Herbert; and Sohngen, Edwin Lowe, 4,109,656, Cl. 128-266.000.
- Sola Basic Industries, Inc.: *See—*
  - Pennings, Matheus D.; and Tippin, Billy B., 4,109,846, Cl. 228-4.500.
- Solar Suede Corporation: *See—*
  - McHugh, John P., 4,109,861, Cl. 239-15.000.
- Soldner, Richard: *See—*
  - Hetz, Walter; and Soldner, Richard, 4,110,723, Cl. 340-1.00R.
- Soles, Otto H.: *See—*
  - Freeman, Willie B.; Yeckley, Russell N.; Soles, Otto H.; and Telford, James M., 4,110,578, Cl. 200-148.00F.
- Solt, Paul E.: *See—*
  - Boyhont, Donald S.; and Solt, Paul E., 4,109,966, Cl. 302-50.000.
- Solvay & Cie: *See—*
  - Sluse, Guy; and Dujardin, Francois, 4,110,181, Cl. 204-147.000.
- Soma, Kazuhiko: *See—*
  - Ichikawa, Yataro; Kobayashi, Osamu; Soma, Kazuhiko; Naruchi, Tatuyuki; Yamanaka, Yoshiyuki; and Suzuki, Nobuo, 4,110,403, Cl. 260-603.00R.
- Sommer, Rudiger: *See—*
  - Mollgaard, Klaus; Keller, Hans; Sendtko, Ulrich; and Sommer, Rudiger, 4,110,826, Cl. 364-526.000.
- Sommer, Werner: *See—*
  - Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,109,491, Cl. 66-125.00R.
- Sony Corporation: *See—*
  - Hongu, Masayuki; Tokuhara, Masaharu; and Kawakami, Hiromi, 4,110,635, Cl. 307-233.00R.
- Souder, James J., Jr.; and Waldorf, Lindsey E., to Patents Licensing International, Ltd. Method and apparatus for heating food. 4,110,587, Cl. 219-10.49R.
- Soudure Autogene Francaise: *See—*
  - Martin, Philippe, 4,109,922, Cl. 277-34.300.
- Southgate, Malcolm Dennis: *See—*
  - Harrison, Peter Arthur; Parks, Anthony John; Southgate, Malcolm Dennis; Sleath, William Derek; and Hills, Richard Keith, 4,110,037, Cl. 355-48.000.
- Soyka, Manfred: *See—*
  - Wilhelm, Gerhard; Hockenberger, Lothar; Soyka, Manfred; and Endruscheit, Peter, 4,110,295, Cl. 260-30.40R.
- Spanel, Abram N.; Eiland, P. Frank; Jacobs, David R.; and Ziegler, Geza C., to Spanel, Abram N. Tufting machine malfunction detection device. 4,109,594, Cl. 112-79.00R.
- Sparlin, Derry D.: *See—*
  - Sifferman, Thomas R.; and Sparlin, Derry D., 4,110,275, Cl. 260-14.000.
- Spaziante, Placido M.: *See—*
  - Nidola, Antonio; De Nora, Vittorio; and Spaziante, Placido M., 4,110,180, Cl. 204-128.000.
- Spears, John F., Jr., to UOP Inc. Solar energy collecting pond. 4,110,172, Cl. 202-234.000.
- Specht, Steven J.; and Adams, John O., to Olin Corporation. Separator-electrode unit for electrolytic cells. 4,110,191, Cl. 204-266.000.
- Spector, George: *See—*
  - Brockman, Gary; McFadden, Hubert J.; and Spector, George, 4,109,980, Cl. 312-35.000.
- Spence, Eion Murray: *See—*
  - Kemp, Grey Charles; and Spence, Eion Murray, 4,110,650, Cl. 310-239.000.
- Spencer, David R., to Litton Systems, Inc. Method of graphic data redundancy reduction in an optical facsimile system. 4,110,795, Cl. 358-260.000.
- Spencer, Merrill P.: *See—*
  - Reid, John M.; and Spencer, Merrill P., 4,109,642, Cl. 128-2.00V.
- Sperry Rand Corporation: *See—*
  - Huber, W. Donald, 4,110,557, Cl. 178-69.100.
  - Miller, Harry, 4,110,605, Cl. 364-463.000.
  - Tribken, Everett R.; Miller, Ronald J.; and Griffith, Carl D., 4,109,886, Cl. 244-178.000.
  - Wing, Willis G., 4,109,391, Cl. 33-275.00G.

- Spethmann, Donald H., to Honeywell Inc. Heating and cooling cost minimization. 4,109,704, Cl. 165-16.000.
- Spiegel, Si: *See—*
  - Sargent, Harry; and Spiegel, Si, 4,109,345, Cl. 16-149.000.
- Spisak, Edward G. Welding machine. 4,110,577, Cl. 219-101.000.
- Spivey, Paul Richard: *See—*
  - Hubbard, James Henry; Hubert, Wallace Lloyd; and Spivey, Paul Richard, 4,110,032, Cl. 355-14.000.
- Spotts, Willard J.; and Huggler, Peter E., to McGraw-Edison Company. Thermostatically controlled plural heat output portable electric space heater. 4,110,600, Cl. 219-364.000.
- Sprague Electric Company: *See—*
  - Ross, Sidney D.; and Dunkl, Franz S., 4,110,817, Cl. 361-433.000.
- Staar, Marcel Jules Helene, to Staar S.A. Intermittent drive mechanism for film. 4,110,019, Cl. 352-188.000.
- Staar S.A.: *See—*
  - Staar, Marcel Jules Helene, 4,110,019, Cl. 352-188.000.
- Stacey Manufacturing Co., The: *See—*
  - Kushman, Robert L.; and Ling, Sumy H. C., 4,109,819, Cl. 220-208.000.
- Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., to Velsicol Chemical Corporation. Dioxepane substituted amides. 4,110,101, Cl. 71-88.000.
- Stache, Helmut: *See—*
  - Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,110,075, Cl. 8-137.000.
- Stackpole Carbon Company: *See—*
  - Quirk, Virgil P., 4,109,667, Cl. 132-33.00R.
- Stahl, John Edvard Lennart, to Tornborg & Lundberg AB. Hoisting crane for building purposes. 4,109,681, Cl. 137-615.000.
- Stahler, Gerhard: *See—*
  - Mildenberger, Hilmar; Stahler, Gerhard; and Emmel, Ludwig, 4,110,336, Cl. 260-307.00G.
- Stalling, David L.; Huckins, James N.; and Smith, William Allen, to United States of America, Interior. Adsorbent for polynuclear aromatic compounds. 4,110,344, Cl. 260-340.300.
- Stamper, Robert L.: *See—*
  - Becker, Bernard; Stamper, Robert L.; Asseff, Carl F.; and Podos, Steven M., 4,110,461, Cl. 424-273.00R.
- Stanczak, John S.: *See—*
  - Rao, G. R. Mohan; Stanczak, John S.; Lien, Jih-Chang; and Bhatia, Shyam, 4,110,776, Cl. 357-23.000.
- Standard Brands Incorporated: *See—*
  - Sutthoff, Robert F.; MacAllister, Robert V.; and Khaleeluddin, Khaja, 4,110,164, Cl. 195-63.000.
- Standard Oil Company, The: *See—*
  - White, James F.; and Shaw, Wilfrid G., 4,110,369, Cl. 260-530.00N.
- Standard Oil Company (Indiana): *See—*
  - Cagle, William S., 4,110,225, Cl. 252-8.5LC.
- Standard Pressed Steel Co.: *See—*
  - Boys, John T., 4,110,829, Cl. 364-577.000.
- Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Fluidic feeding of documents to an exposure station. 4,109,903, Cl. 271-3.000.
- Stanley, James M.: *See—*
  - Sieving, Alfred W.; and Stanley, James M., 4,109,963, Cl. 298-23.00M.
- Stannett, Vivian: *See—*
  - Williams, Joel; Dunn, Terry; and Stannett, Vivian, 4,110,185, Cl. 204-159.200.
- Star Manufacturing Company of Oklahoma: *See—*
  - Hedges, William C., 4,110,280, Cl. 264-22.000.
- Starks, Charles M.: *See—*
  - Goodwin, Thomas E.; and Starks, Charles M., 4,110,543, Cl. 568-781.000.
  - Goodwin, Thomas E.; and Starks, Charles M., 4,110,544, Cl. 568-805.000.
- Static Systems Corporation: *See—*
  - Lester, Robert W.; and Hotto, Robert, 4,110,794, Cl. 358-256.000.
- Stauffer Chemical Company: *See—*
  - Teach, Eugene G., 4,110,105, Cl. 71-95.000.
- Stautzenberger, Adin Lee: *See—*
  - Wells, William J., III; and Stautzenberger, Adin Lee, 4,110,298, Cl. 260-340.000.
- Steel, Alistair James: *See—*
  - Tennant, David John; Sheridan, Geoffrey Philip; and Steel, Alistair James, 4,110,213, Cl. 210-59.000.
- Steidinger, Donald J., to Wallace Business Forms, Inc. Method of producing form suitable for airline ticketing. 4,109,936, Cl. 282-11.50A.
- Steigerwald, Allan M. Anesthetic gas exhaust system. 4,109,651, Cl. 128-145.800.
- Steinfatt, Fritz: *See—*
  - Hopp, Rudolf; Sturm, Wolfgang; and Steinfatt, Fritz, 4,110,430, Cl. 424-65.000.
- Stengle, Edward J., Jr., to Owens-Illinois, Inc. Manufacture of glass wherein hot metal molds are provided with a solid film lubricant layer. 4,110,095, Cl. 65-26.000.
- Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC arc furnace having a rotating arc. 4,110,546, Cl. 13-11.000.
- Stenlund, Hans, to Gotaverken Angteknik AB. Fuel supply governing device. 4,109,868, Cl. 239-413.000.
- Stenudd, Sven Gunnar Valter: *See—*
  - Ek, Birger Henrik; and Stenudd, Sven Gunnar Valter, 4,109,776, Cl. 400-124.000.
- Step-Rite Limited: *See—*
  - Andruchiw, Roman, 4,109,740, Cl. 180-8.00A.
- Stephan, Gerard, to Nadella. Resiliently mounted radial and axial bearings. 4,109,977, Cl. 308-174.000.
- Stephens, Geoffrey Brownell: *See—*
  - Bergeron, David Leo; Putney, Zimri Congdon; and Stephens, Geoffrey Brownell, 4,110,126, Cl. 148-1.500.
- Sterling, Warren M.: *See—*
  - Cronshaw, David; Shemer, Jack E.; Turner, William D.; Hartke, David; Keddy, James R.; DuVall, Wilbur E.; and Sterling, Warren M., 4,110,823, Cl. 364-200.000.
- Stern, Michael D.; and Lappe, Donald L., to United States of America, Health, Education and Welfare. Method of and apparatus for measurement of blood flow using coherent light. 4,109,647, Cl. 128-2.05F.
- Sterndent Corp.: *See—*
  - Zahn, Eric H.; and Martin, Philip W., 4,109,385, Cl. 32-59.000.
- Stevens, Charles G., to United States of America, Energy. Isotope separation by photoselective dissociative electron. 4,110,182, Cl. 204-157.10R.
- Stevens, Richard E.: *See—*
  - Schaeffer, James R.; Minsk, Louis M.; and Stevens, Richard E., 4,110,079, Cl. 23-253.0TP.
- Stevenson, Basil Charles James, to Westland Aircraft Limited. Fibre reinforced plastics structure. 4,110,056, Cl. 416-230.000.
- Stewart, John K., to Canron, Inc. Needle indicator for rail liner. 4,109,388, Cl. 33-287.000.
- Stewart, Maurice M., to Oxygen Therapy Institute, Inc. Inhalation apparatus. 4,109,828, Cl. 222-3.000.
- Stifano, Joseph Michael, to International Paper Company. Self-threading container closure and method thereof. 4,109,820, Cl. 220-240.000.
- Stillwagon, Roy E., to United States of America, Energy. Homopolar machine for reversible energy storage and transfer systems. 4,110,648, Cl. 310-178.000.
- Stinchfield, Lawrence M. Legless rocker-recliner chair. 4,109,960, Cl. 297-258.000.
- Stoev, Stoycho Mitrev; Sapunarov, Ivan Mitrev; and Manov, Emil Nikolov, to Vish Minno-Geloshki Institute-Nis Darvenitza. Apparatus for mineral processing. 4,109,874, Cl. 241-69.000.
- Stokke Fabrikker A/S: *See—*
  - Opsvik, Peter, 4,109,961, Cl. 297-338.000.
- Stoneburner, Leonard G., to Mead Corporation, The. Orifice plate holder for a fluid jet printing apparatus. 4,110,759, Cl. 346-75.000.
- Stoss, Peter; Satzinger, Gerhard; and Herrmann, Manfred, to Warner-Lambert Company. Tricyclic sulphoximides in pharmaceutical compositions and methods. 4,110,448, Cl. 424-247.000.
- Stothert & Pitt Limited: *See—*
  - Comyns-Carr, Cecil Alastair, 4,109,798, Cl. 212-39.00R.
- Stotz, Wolf-Gunter; and Hund, Helmut, to Escher Wyss Limited. Compact press at the web transfer position of a paper making machine. 4,110,156, Cl. 162-305.000.
- Stoy, Vladimir, to Ceschoslovak akademie ved. Method of manufacturing spherical polymer particles from polymer solutions. 4,110,529, Cl. 528-491.000.
- Strache, Wilhelm, to Gestra-KSB Vertriebsgesellschaft. Throttle valve. 4,109,683, Cl. 137-625.300.
- Stratoflex, Inc.: *See—*
  - Cooke, Horise M., 4,109,943, Cl. 285-149.000.
- Strauch, Karl; and Kammann, Wilfried, to Werner Kamman Maschinenfabrik. Article, screen and squeegee drive for screenprinter. 4,109,573, Cl. 101-38.00R.
- Streeter, Walter E., to Mayes Brothers Tool Manufacturing Co. Pocket level. 4,109,392, Cl. 33-381.000.
- Stricharczuk, Paul Thomas: *See—*
  - Lindsay, Geoffrey Andrew; and Stricharczuk, Paul Thomas, 4,110,414, Cl. 260-897.00A.
- Strobele, Rudolf: *See—*
  - Graf, Richard; Brodzina, Lieselotte; Strobele, Rudolf; and Stache, Helmut, 4,110,075, Cl. 8-137.000.
- Strombeck, Per: *See—*
  - Johansson, Anders; and Strombeck, Per, 4,109,806, Cl. 214-38.0CC.
- Strong, Richard I., to Northwest Engineering Company. Safety lockout for engine clutch. 4,109,771, Cl. 192-83.000.
- Strozier, Robert E., to Lawrence Brothers, Inc. Pivot and support mounting assembly. 4,109,346, Cl. 16-151.000.
- Strupczewski, Joseph T.: *See—*
  - Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,110,459, Cl. 424-267.000.
- Strybel, Richard V. Fluid test device. 4,109,536, Cl. 73-756.000.
- Strycker, Wallace G.: *See—*
  - Havera, Herbert J.; and Strycker, Wallace G., 4,110,536, Cl. 544-139.000.
- Stucke, Charles G., to Chemprene, Inc. Stepped joint piston ring. 4,109,924, Cl. 277-165.000.
- Stucky, James L. Trailer with lowerable bed. 4,109,811, Cl. 214-506.000.
- Stump, Theodore M.: *See—*
  - May, Peter J.; and Stump, Theodore M., 4,110,563, Cl. 179-15.0BW.
- Sturm, Warren A.: *See—*
  - Wilhelm, Gary L., 4,110,694, Cl. 325-464.000.
- Sturm, Wolfgang: *See—*
  - Hopp, Rudolf; Sturm, Wolfgang; and Steinfatt, Fritz, 4,110,430, Cl. 424-65.000.
- Styfhoorn, John: *See—*
  - Ostrowski, Richard C.; and Styfhoorn, John, 4,110,150, Cl. 156-499.000.

- Sugawara, Yoshitaka: *See—*
  - Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,110,781, Cl. 357-39.000.
- Sugino, Takayuki. Wheel stop apparatus. 4,109,763, Cl. 188-32.000.
- Sugita, Hiroaki: *See—*
  - Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,109,766, Cl. 188-73.400.
- Sugitawa, Chikara: *See—*
  - Imanaka, Hiroshi; Kijima, Yoshihiko; Sugitawa, Chikara; and Sumoto, Misao, 4,110,411, Cl. 260-873.000.
- Sugiyama, Kengo: *See—*
  - Matsuoka, Noboru; and Sugiyama, Kengo, 4,109,387, Cl. 33-185.00V.
- Sugiyama, Masatoshi; and Kato, Eiichi, to Fuji Photo Film Co., Ltd. Photographic light-sensitive element having dyed layer. 4,110,115, Cl. 96-84.00A.
- Sukornick, Bernard: *See—*
  - Anello, Louis G.; Sweeney, Richard F.; and Sukornick, Bernard, 4,110,407, Cl. 260-653.400.
- Sullivan Company: *See—*
  - Cunningham, William E., 4,109,484, Cl. 62-256.000.
- Sumitomo Chemical Company, Limited: *See—*
  - Hamada, Takaki; Kanazawa, Hiroyuki; and Yanase, Masataka, 4,110,526, Cl. 526-214.000.
  - Inoue, Satoru; Uematsu, Tamon; and Yamashita, Norihisa, 4,110,466, Cl. 424-274.000.
  - Kojima, Atsuyuki; Katsube, Junki; Kameno, Yoshito; Inaba, Shigeho; and Yamamoto, Hisao, 4,110,376, Cl. 260-570.00R.
  - Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; and Fujinami, Akira, 4,110,462, Cl. 424-273.00R.
- Sumitomo Rubber Industries, Ltd.: *See—*
  - Nakasaki, Eiji; and Shirashoji, Hishashi, 4,109,696, Cl. 152-354.00R.
- Summers, Charles Donovan. Reference index for instrument dials. 4,109,607, Cl. 116-129.00A.
- Summers, James William, to B. F. Goodrich Company, The. Processing extruded vinyl siding. 4,110,062, Cl. 425-71.000.
- Sumner, Maurice N., to Sea Horse Corporation, The. Under water crane. 4,109,480, Cl. 61-114.000.
- Sumoto, Misao: *See—*
  - Imanaka, Hiroshi; Kijima, Yoshihiko; Sugitawa, Chikara; and Sumoto, Misao, 4,110,411, Cl. 260-873.000.
- Sun Oil Company of Pennsylvania: *See—*
  - Bramlett, David A., 4,110,215, Cl. 210-114.000.
- Suntech, Inc.: *See—*
  - Angstadt, Howard P., 4,110,250, Cl. 252-432.000.
  - Lagow, Richard J.; Shimp, Lawrence A.; and Clark, Leland C., Jr., 4,110,474, Cl. 424-350.000.
  - Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,110,409, Cl. 260-666.0PY.
- Sutthoff, Robert F.; MacAllister, Robert V.; and Khaleeluddin, Khaja, to Standard Brands Incorporated. Agglomerated fibrous cellulose. 4,110,164, Cl. 195-63.000.
- Sutton, Kenneth O.: *See—*
  - Baird, William R.; Sutton, Kenneth O.; and Baird, Billy C., 4,110,171, Cl. 202-241.000.
- Suwa, Masateru: *See—*
  - Onodera, Hisakichi; Suwa, Masateru; Onuki, Jin; and Shimizu, Yoshiteru, 4,110,783, Cl. 357-67.000.
- Suzuki, Gyoichi; Moriguchi, Sanseki; Miyazu, Takashi; Okuyama, Yasuo; Muroya, Masahiro; Yanagiuchi, Mamoru; Mori, Takashi; and Miura, Mitsutoshi, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing high-strength formed coke in slight mutual agglomeration using horizontal type coke oven battery. 4,110,169, Cl. 201-6.000.
- Suzuki, Kazuhiro: *See—*
  - Gaku, Morio; Suzuki, Kazuhiro; and Nakamichi, Kazuyuki, 4,110,364, Cl. 528-170.000.
- Suzuki, Keiichi; Takahashi, Keikichi; Matsuura, Eiichi; and Harada, Akinobu, to Kabushiki Kaisha Daini Seikosha. Date and day correcting device of a timepiece. 4,109,458, Cl. 58-63.000.
- Suzuki, Masanori: *See—*
  - Matsushima, Yasunobu; Yashiro, Kuniji; Kaneko, Hideaki; and Suzuki, Masanori, 4,110,129, Cl. 148-6.15R.
- Suzuki Metal Industrial Co, Ltd.: *See—*
  - Honda, Ichiro; Takasu, Shigetoshi; and Onuki, Yoshio, 4,109,709, Cl. 165-105.000.
- Suzuki, Minoru, to Ricoh Company, Ltd. Drum cleaning apparatus for electrostatic copying machine. 4,110,034, Cl. 355-15.000.
- Suzuki, Motoaki: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
- Suzuki, Nobuo: *See—*
  - Ichikawa, Yataro; Kobayashi, Osamu; Soma, Kazuhiko; Naruchi, Tatuyuki; Yamanaka, Yoshiyuki; and Suzuki, Nobuo, 4,110,403, Cl. 260-603.00R.
  - Kurahashi, Takeo; Maeda, Shigeo; Seki, Sanai; Suzuki, Nobuo; and Sakai, Takayuki, 4,110,070, Cl. 8-2.50R.
- Suzuki, Osamu: *See—*
  - Yoshida, Yoshiaki; Suzuki, Osamu; and Onoue, Keizi, 4,109,450, Cl. 57-34.00R.
- Svanstrom, Alf Henrik; and Kangas, Karl-Erik, to Fagersta Secoroc AB. Plain and thrust bearing device. 4,109,974, Cl. 308-8.200.
- Svenska Traforskningsinstitutet: *See—*
  - Eriksson, Leif, 4,109,520, Cl. 73-143.000.
  - Pettersson, Torulf; Fladda, Gerdt; and Eriksson, Lennart, 4,110,044, Cl. 356-103.000.
- Swanson, Billy L., to Phillips Petroleum Company. Stabilized aqueous gels and uses thereof. 4,110,226, Cl. 252-8.50C.
- Swanson, Billy L., to Phillips Petroleum Company. Stabilized aqueous gels and uses thereof. 4,110,231, Cl. 252-8.50C.
- Sweeney, Richard F.: *See—*
  - Anello, Louis G.; and Sweeney, Richard F., 4,110,406, Cl. 260-653.400.
  - Anello, Louis G.; Sweeney, Richard F.; and Sukornick, Bernard, 4,110,407, Cl. 260-653.400.
  - Anello, Louis G.; and Sweeney, Richard F., 4,110,408, Cl. 260-653.400.
- Sweet, Lawrence A., to Minnesota Mining and Manufacturing Company. Muffler. 4,109,749, Cl. 181-230.000.
- Swenson, Willard E., Jr., to Chrysler Corporation. Photoelastic stamping analysis. 4,109,515, Cl. 73-88.00A.
- Swiss Aluminium Ltd.: *See—*
  - Tschopp, Theodor, 4,110,179, Cl. 204-67.000.
- Sybron Corporation: *See—*
  - Goethel, James Herbert; and Sohngen, Edwin Lowe, 4,109,656, Cl. 128-266.000.
- Synres International B.V.: *See—*
  - Pons, Dick A.; and Bijker, Anno, 4,110,285, Cl. 260-29.6MP.
- Syntex (U.S.A.) Inc.: *See—*
  - Beard, Colin C.; Wallach, Marshall B.; and Weinhardt, Klaus, 4,110,463, Cl. 424-273.00R.
- Szala, Lawrence E.: *See—*
  - Lee, Minyoung; and Szala, Lawrence E., 4,110,084, Cl. 51-307.000.
- Szarvasi, Etienne, to Lipha, Lyonnaise Industrielle Pharmaceutique. Triazolobenzodiazepines. 4,110,337, Cl. 260-308.00R.
- Szemeredi, Robert S., to Price-Pfister Brass Mfg. Co. Snap-in valve cartridge. 4,109,672, Cl. 137-315.000.
- Tabanou, Jacques Rene, to Schlumberger Technology Corporation. Well logging apparatus with pad-mounted array of vertical electrodes of different lengths for measuring the resistivity of the flushed zone. 4,110,682, Cl. 324-10.000.
- Tabata, Yasuhiro, to Ricoh Company, Ltd. Duplex electrostatic copying machine. 4,110,025, Cl. 355-3.0SH.
- Tagashira, Yoshimi: *See—*
  - Matsumoto, Youichi; Tagashira, Yoshimi; and Yokoyama, Seijiro, 4,110,706, Cl. 332-19.000.
- Tager, Semen Alexandrovich: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Tajiri, Atsufumi, to Denki Onkyo Co., Ltd. Deflection yoke. 4,110,793, Cl. 358-248.000.
- Takahashi, Keikichi: *See—*
  - Suzuki, Keiichi; Takahashi, Keikichi; Matsuura, Eiichi; and Harada, Akinobu, 4,109,458, Cl. 58-63.000.
- Takahashi, Seizi: *See—*
  - Uchino, Mitsuo; and Takahashi, Seizi, 4,109,627, Cl. 123-140.00R.
- Takahashi, Tokuji, to Konishiroku Photo Industry Co., Ltd. Inspection apparatus for automatically detecting the unevenness or the flaws of a coating. 4,110,047, Cl. 356-200.000.
- Takano, Shuntaro: *See—*
  - Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
- Takashima, Okuta: *See—*
  - Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
- Takasu, Shigetoshi: *See—*
  - Honda, Ichiro; Takasu, Shigetoshi; and Onuki, Yoshio, 4,109,709, Cl. 165-105.000.
- Takatsu, Suehiro. Shock absorbing device with restoring inhibiting means. 4,109,899, Cl. 267-140.000.
- Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; and Fujinami, Akira, to Sumitomo Chemical Company, Limited. N'-sulfenyl-N''-dihalophenylimidazolidinediones. 4,110,462, Cl. 424-273.00R.
- Takeda Chemical Industries, Ltd.: *See—*
  - Maeda, Kazuo; Noguchi, Katuichi; Kawabata, Masuo; Sato, Shigehiko; and Sato, Yukio, 4,109,663, Cl. 131-2.000.
  - Minami, Isao; Yoshioka, Yoshio; and Nomura, Hiroaki, 4,110,537, Cl. 544-313.000.
- Takeda Riken Kogyo Kabushikikaisha: *See—*
  - Furukawa, Hikaru; Mitamura, Masakazu; and Higuchi, Kenji, 4,110,746, Cl. 340-347.0NT.
- Takeshige, Kenji: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
- Takeuchi, Yukihisa; and Wakayama, Masao, to Nippon Soken, Inc. Catalyst for reforming fuel and method for producing same. 4,110,256, Cl. 252-465.000.

- Takiguchi, Yoshimi: *See—*
  - Furuta, Isao; and Takiguchi, Yoshimi, 4,110,183, Cl. 204-157.10R.
- Tall, Joel, to Joel Tall, Inc. Method of splicing multitrack sound recording tape. 4,110,142, Cl. 156-159.000.
- Tamabayashi, Hanzo; Hattori, Tatsuo; Tanaka, Tetsuo; Oda, Yasuhiro; and Kihara, Keiichi, to Toyo Soda Manufacturing Co., Ltd. Process for producing alkali metal styrenesulfonate. 4,110,366, Cl. 260-505.00N.
- Tamagawa, Tohoru: *See—*
  - Murano, Minoru; Yanabu, Satoru; Tamagawa, Tohoru; and Ikeda, Hisatoshi, 4,110,806, Cl. 361-4.000.
- Tamai, Yasuo: *See—*
  - Ogawa, Hiroshi; Aonuma, Masashi; Nakamura, Matsuaki; and Tamai, Yasuo, 4,110,503, Cl. 428-64.000.
- Tamura, Hiroshi: *See—*
  - Hamada, Nobuhiro; Hirasawa, Kotaro; Hatada, Minoru; and Tamura, Hiroshi, 4,109,808, Cl. 214-152.000.
- Tanaka, Akira, to Yoshida Kogyo K.K. Slide fastener. 4,109,349, Cl. 24-205.11R.
- Tanaka, Hiroshi: *See—*
  - Katada, Michihisa; Hayashi, Katsutake; Katsura, Hakuji; Tomita, Kenichi; Morohoshi, Hideo; Uehara, Keiichi; and Tanaka, Hiroshi, 4,110,626, Cl. 252-522.000.
- Tanaka, Jinkichi: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
- Tanaka, Kunihiko: *See—*
  - Kamiya, Takashi; Tanaka, Kunihiko; and Shiokawa, Youichi, 4,110,338, Cl. 260-308.00D.
- Tanaka, Tetsuo: *See—*
  - Tamabayashi, Hanzo; Hattori, Tatsuo; Tanaka, Tetsuo; Oda, Yasuhiro; and Kihara, Keiichi, 4,110,366, Cl. 260-505.00N.
- Tann, Lewis H.; Mueller, William L.; and Vis, Arthur D., to Candid Logic, Inc. Optical position transducer. 4,110,611, Cl. 250-237.00R.
- Tarbell, Harlan E.; and Raabe, Paul J., to Grefco, Inc. Splicing strip. 4,110,501, Cl. 428-40.000.
- Tasaka, Eiji: *See—*
  - Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
- Tasseff, John B., II: *See—*
  - Hubble, Fred F., III; and Tasseff, John B., II, 4,110,811, Cl. 361-225.000.
- Tate & Lyle Limited: *See—*
  - Righelato, Renton Clive; and Jarman, Trevor Rodney, 4,110,162, Cl. 195-31.00P.
- Taunus-Armaturen GmbH: *See—*
  - Urbaschek, Herbert, 4,109,921, Cl. 277-24.000.
- Tausch, Gerald, to Miller-Holzwarth, Inc. Periscope construction. 4,110,011, Cl. 350-301.000.
- Taylor, Brian W.: *See—*
  - Bailey, Wayne W.; and Taylor, Brian W., 4,110,233, Cl. 252-41.000.
- Taylor, George Phillips: *See—*
  - Leininger, Joel Calvin; and Taylor, George Phillips, 4,110,832, Cl. 364-786.000.
- Taylor, Glenn N., to Kendall Company, The. Liquid sampling device. 4,109,837, Cl. 222-556.000.
- Taylor, Herman, Jr.: *See—*
  - Hildebrand, Richard Emil; Paraskos, John Angelo; and Taylor, Herman, Jr., 4,110,192, Cl. 208-8.000.
- Taylor, John Edward, to BICC Limited. Methods of jointing optical fibres. 4,109,369, Cl. 29-467.000.
- Taylor, Michael G. C., to GTE ATEA, S.A. Dual tone multifrequency generator. 4,110,568, Cl. 179-84.0VF.
- Taylor, Michael Rivers: *See—*
  - Garrett, Ian; and Taylor, Michael Rivers, 4,110,133, Cl. 148-171.000.
- TDK Electronics Co., Ltd.: *See—*
  - Osawa, Masayuki, 4,109,878, Cl. 242-68.300.
- Teach, Eugene G., to Stauffer Chemical Company. Aromatic N-substituted halo-substituted-2-pyrrolidinones and their utility as herbicides. 4,110,105, Cl. 71-95.000.
- Tecnologia Industrial, Proyectos Y Promociones, S.A.: *See—*
  - Bosch, Juan, 4,109,490, Cl. 66-120.000.
- Tecumseh Products Company: *See—*
  - Wisner, Ronald R., 4,109,364, Cl. 29-156.50R.
- Teggers, Johannes: *See—*
  - Hilberath, Friedrich; and Teggers, Johannes, 4,109,701, Cl. 165-1.000.
- Teijin Limited: *See—*
  - Ichikawa, Yataro; Kobayashi, Osamu; Soma, Kazuhiko; Naruchi, Tatuyuki; Yamanaka, Yoshiyuki; and Suzuki, Nobuo, 4,110,403, Cl. 260-603.00R.
- Tektronix, Inc.: *See—*
  - Janko, Bozidar; and Silzars, Aris, 4,110,749, Cl. 340-365.00C.
  - Mason, William Miller; and McTeague, Gerald Emmett, 4,110,659, Cl. 313-398.000.
- Tele-Quik, Inc.: *See—*
  - Breitbard, Elford Barnett, 4,109,890, Cl. 248-452.000.
- Telediffusion de France: *See—*
  - Mignot, Lucien F.; and Macheboeuf, Guy R., 4,110,786, Cl. 358-22.000.
- Telford, James M.: *See—*
  - Freeman, Willie B.; Yeckley, Russell N.; Soles, Otto H.; and Telford, James M., 4,110,578, Cl. 200-148.00F.
- Temet OY.: *See—*
  - Purhonen, Matti, 4,109,754, Cl. 181-252.000.
- Tennant, David John; Sheridan, Geoffrey Philip; and Steel, Alistair James, to Lankro Chemicals Group Limited. Compositions and processes for the dispersing of oil spillages. 4,110,213, Cl. 210-59.000.
- Tenneco, Inc.: *See—*
  - Grueneberg, Gary L., 4,109,755, Cl. 181-256.000.
- Terada, Takami, to Aisin Seiki Kabushiki Kaisha. Vehicle seat slide adjuster including integrally formed pawl and pawl lever. 4,109,973, Cl. 308-3.00R.
- Teraishi, Katsuhiro: *See—*
  - Yamada, Kuniharu; and Teraishi, Katsuhiro, 4,109,456, Cl. 58-23.0AC.
- Teraoka, Kazuharu; Sato, Mitsuru; and Mineo, Masao, to Teraoka Seikosho Co., Ltd. Automatic unit price setting apparatus of electronic digital display scale with printing device. 4,109,857, Cl. 235-378.000.
- Teraoka Seikosho Co., Ltd.: *See—*
  - Teraoka, Kazuharu; Sato, Mitsuru; and Mineo, Masao, 4,109,857, Cl. 235-378.000.
- Teroson G.m.b.H.: *See—*
  - Rocholl, Martin-Gottfried, 4,110,148, Cl. 156-359.000.
- Tesch, Karl: *See—*
  - Schutz, Karl-Heinz; and Tesch, Karl, 4,110,769, Cl. 354-195.000.
- Teuchert, Eberhard: *See—*
  - Maly, Vladimir; and Teuchert, Eberhard, 4,110,158, Cl. 176-58.0PB.
- Texaco Development Corporation: *See—*
  - Gipson, Robert Malone, 4,110,352, Cl. 260-348.290.
  - Marion, Charles P., 4,110,359, Cl. 260-449.500.
  - Paull, Peter L.; and Archer, Henry W., 4,110,628, Cl. 290-1.00R.
  - Schulze, Heinz; and Waddill, Harold G., 4,110,309, Cl. 528-119.000.
  - Schulze, Heinz; and Waddill, Harold G., 4,110,310, Cl. 528-119.000.
  - Schulze, Heinz; and Waddill, Harold G., 4,110,313, Cl. 528-90.000.
  - Schulze, Heinz; and Marquis, Edward T., 4,110,371, Cl. 260-531.00C.
- Texaco Exploration Canada, Ltd.: *See—*
  - Allen, Joseph C.; and Redford, David A., 4,109,720, Cl. 166-269.000.
- Texaco Inc.: *See—*
  - Allen, Joseph C.; and Redford, David A., 4,109,720, Cl. 166-269.000.
  - Allen, Joseph C., 4,110,224, Cl. 252-8.55D.
  - Carlin, Joseph T.; Tyler, Timothy N.; Mills, Melvin E., Jr.; and Ware, James W., 4,110,229, Cl. 252-8.55D.
  - Fuller, Lester R.; and Meyer, Herbert J., 4,110,728, Cl. 340-15.5DP.
  - Knifton, John F., 4,110,340, Cl. 260-326.5FL.
  - Tyler, Timothy N.; Mills, Melvin E., Jr.; Wells, John A.; and Carlin, Joseph T., 4,110,228, Cl. 252-8.55D.
  - Vreugde, Theodorus L. J., 4,110,729, Cl. 340-15.5MC.
  - Waldbillig, James O.; Cusano, Carmen M.; Reed, David D.; and Winstead, Richard L., 4,110,235, Cl. 252-51.50R.
  - Widmyer, Richard H.; and Park, Jack H., 4,109,722, Cl. 166-281.000.
  - Widmyer, Richard H., 4,109,723, Cl. 166-303.000.
- Texas Alkyls, Inc.: *See—*
  - Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,110,357, Cl. 260-448.00A.
- Texas Instruments Incorporated: *See—*
  - Giolma, William Henry; and Andresen, Bernhard Hans, 4,110,707, Cl. 332-19.000.
  - Grenier, Aime J., 4,110,717, Cl. 335-22.000.
  - Noe, Terry Wayne, 4,110,838, Cl. 365-2.000.
  - Rao, G. R. Mohan; Stanczak, John S.; Lien, Jih-Chang; and Bhatia, Shyam, 4,110,776, Cl. 357-23.000.
  - Redwine, Donald J., 4,110,639, Cl. 307-279.000.
  - Small, Richard B., 4,110,598, Cl. 219-216.000.
  - Wood, James Carlos; and Felcman, Francis Adolph, 4,110,050, Cl. 400-248.000.
- Teyssandier, Raymond G., to Westinghouse Electric Corp. Method of determining acoustic flow meter correction factor. 4,109,523, Cl. 73-194.00A.
- Theunissen, Matthias Johannes Joseph: *See—*
  - Esser, Leonard Jan Maria; and Theunissen, Matthias Johannes Joseph, 4,110,777, Cl. 357-24.000.
- Thexton Manufacturing Company: *See—*
  - Clark, Robert E., 4,109,544, Cl. 74-242.700.
- Theyssen, Johannes: *See—*
  - Berzen, Josef; and Theyssen, Johannes, 4,110,391, Cl. 264-120.000.
- Thiele, Hubertus, to Robert Bosch GmbH. Noise reduction arrangement in a claw-type dynamo electric machine, particularly multiphase automotive-type a-c generator. 4,110,642, Cl. 310-51.000.
- Thiessen, Fritz: *See—*
  - Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.
- Thiokol Corporation: *See—*
  - Graham, William Hardin; and Shepard, Inella Gatlin, 4,110,135, Cl. 149-19.400.
- Thir, Basil: *See—*
  - Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, 4,110,227, Cl. 252-8.900.
- Thomas C. Wilson, Inc.: *See—*
  - Schott, Donald E., 4,109,513, Cl. 73-49.100.
- Thomas, David Hamilton, to Imperial Chemical Industries Limited. Rheometer and uses thereof. 4,109,514, Cl. 73-58.000.

- Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, to Celanese Corporation. Reinforced polycarbodiimide modified polyalkylene terephthalate. 4,110,302, Cl. 260-40.00R.
- Thomerson, Clarence T.: *See—*
  - Files, James H.; Montague, John M.; and Thomerson, Clarence T., 4,109,474, Cl. 61-48.000.
- Thompson, Don D., to Chevron Research Company. Method of borehole logging using passive Josephson current detector to directly determine the presence of hydrocarbons. 4,109,522, Cl. 73-154.000.
- Thomson-CSF: *See—*
  - Abert-Mellah, Marie Annick; Dubois, Jean Claude; and Zann, Annie, 4,110,243, Cl. 252-299.000.
  - Bert, Alain; and Kantorowicz, Gerard, 4,110,839, Cl. 365-180.000.
  - Hartemann, Pierre, 4,110,653, Cl. 310-313.000.
  - Sirven, Jacques, 4,110,753, Cl. 343-8.000.
  - Trotel, Jacques, 4,110,622, Cl. 250-396.00R.
- Thomson, Elihu Craig, to Electronics Corporation of America. Two-terminal photodetectors with inherent AC amplification properties. 4,110,608, Cl. 250-214.00A.
- Three Sisters Ranch Enterprise: *See—*
  - Faulstich, George W., 4,109,816, Cl. 215-256.000.
- Thyssen Aufzuge GmbH: *See—*
  - Fromme, Hans-Georg; and Dieter, Guckenhan, 4,109,768, Cl. 191-22.00R.
- Tiefenthaler, Arthur: *See—*
  - Mettler, Karl; Marxer, Paul; and Tiefenthaler, Arthur, 4,110,051, Cl. 403-157.000.
- Tigreat, Paul, to Commissariat a l'Energie Atomique; and Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux. Drawing machines especially for integrated circuit masks. 4,110,762, Cl. 354-4.000.
- Timmons, Eric: *See—*
  - Briggs, Alan H.; and Timmons, Eric, 4,109,586, Cl. 105-224.00A.
- Tippin, Billy B.: *See—*
  - Pennings, Matheus D.; and Tippin, Billy B., 4,109,846, Cl. 228-4.500.
- Tobishima Kensetsu Kabushiki Kaisha: *See—*
  - Hashimoto, Hiroshi, 4,109,575, Cl. 102-22.00R.
- Toei Denshi Kogyo Kabushiki Kaisha: *See—*
  - Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 4,110,048, Cl. 356-200.000.
- Tokai Denka Kabushiki Kaisha: *See—*
  - Matsumoto, Akira; and Itani, Katsutoshi, 4,110,237, Cl. 252-79.400.
- Tokuhara, Masaharu: *See—*
  - Hongu, Masayuki; Tokuhara, Masaharu; and Kawakami, Hiromi, 4,110,635, Cl. 307-233.00R.
- Tokumaru, Yukuya; and Nakai, Masanori, to Tokyo Shibaura Electric Co., Ltd. Gate circuit. 4,110,634, Cl. 307-213.000.
- Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (TDK Electronics Co., Ltd.): *See—*
  - Yamamoto, Hirotaka; Sendai, Satoshi; and Ninomiya, Hideaki, 4,110,260, Cl. 252-519.000.
- Tokyo Jiki InsatsuKabushiki Kaisha: *See—*
  - Hoshino, Yasushi; and Namikawa, Mamoru, 4,110,797, Cl. 360-17.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
  - Murano, Minoru; Yanabu, Satoru; Tamagawa, Tohoru; and Ikeda, Hisatoshi, 4,110,806, Cl. 361-4.000.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Hisano, Hiroshi; and Sato, Kyoichi, 4,110,821, Cl. 363-141.000.
  - Ishii, Kazuo, 4,110,559, Cl. 179-1.00D.
  - Kageyama, Satoshi; and Sekiya, Kunihiko, 4,110,558, Cl. 178-69.100.
  - Tokumaru, Yukuya; and Nakai, Masanori, 4,110,634, Cl. 307-213.000.
- Tomita, Kenichi: *See—*
  - Katada, Michihisa; Hayashi, Katsutake; Katsura, Hakuji; Tomita, Kenichi; Morohoshi, Hideo; Uehara, Keiichi; and Tanaka, Hiroshi, 4,110,626, Cl. 252-522.000.
- Toms River Chemical Corporation: *See—*
  - Fitzpatrick, Joseph W.; and Olin, Arthur D., 4,110,072, Cl. 8-25.000.
- Tomy Kogyo Co., Inc.: *See—*
  - Matsumoto, Takao, 4,109,914, Cl. 273-101.000.
  - Saito, Makoto, 4,109,412, Cl. 46-216.000.
- Toray Silicone Company, Ltd.: *See—*
  - Matsushita, Takao, 4,110,300, Cl. 260-37.0SB.
- Tornborg & Lundberg AB: *See—*
  - Stahl, John Edvard Lennart, 4,109,681, Cl. 137-615.000.
- Toshin Seiko Kabushiki Kaisha: *See—*
  - Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, 4,109,801, Cl. 214-6.0FS.
- Towmotor Corporation: *See—*
  - Evans, Dafydd W., 4,109,748, Cl. 180-141.000.
  - Povejsil, James H., 4,109,546, Cl. 74-474.000.
- Townsend, Robert H., to Xerox Corporation. Magnetic head assembly adjustable relative to roll, pitch and azimuth. 4,110,803, Cl. 360-109.000.
- Toyama Chemical Co., Ltd.: *See—*
  - Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Imanaka, Hiroshi; Kijima, Yoshihiko; Sugitawa, Chikara; and Sumoto, Misao, 4,110,411, Cl. 260-873.000.
- Toyo Ink Manufacturing Co., Ltd.: *See—*
  - Mori, Masatoshi; and Fukata, Ryoji, 4,110,290, Cl. 260-29.6RW.
- Toyo Soda Manufacturing Co., Ltd.: *See—*
  - Tamabayashi, Hanzo; Hattori, Tatsuo; Tanaka, Tetsuo; Oda, Yasuhiro; and Kihara, Keiichi, 4,110,366, Cl. 260-505.00N.
- Toyoda-Koki Kabushiki Kaisha: *See—*
  - Enomoto, Minoru, 4,110,674, Cl. 318-571.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,109,462, Cl. 60-278.000.
  - Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,110,417, Cl. 261-39.00A.
- Trak Sportartikel GmbH: *See—*
  - Woitschatzke, Hans; and Geyer, Hennoch, 4,109,931, Cl. 280-605.000.
- Trame, Charles Edward, to Everbrite Electric Signs, Inc. Method of making simulated three-dimensional stained glass objects. 4,110,393, Cl. 264-132.000.
- Trans World Technology Laboratories, Inc. (TWT Labs Inc.): *See—*
  - Gager, Morgan E., 4,109,937, Cl. 282-27.500.
- Traynor, James Rodney: *See—*
  - Dart, Edward Charles; Cantwell, John Burnett; Traynor, James Rodney; Jaworzyn, Joseph Franciszek; and Nemcek, Jozef, 4,110,184, Cl. 204-159.230.
- Tregoning, Geoffrey Robinson: *See—*
  - Newson, John Chase; Tregoning, Geoffrey Robinson; and Digby, James Baden, 4,109,416, Cl. 49-316.000.
- Tremblay, Dennis D.: *See—*
  - Heyning, Bjorn; and Tremblay, Dennis D., 4,110,750, Cl. 340-384.00E.
- Tresper, Erhard: *See—*
  - Freitag, Dieter; Tresper, Erhard; Kuchenmeister, Rolf; and Beer, Wolfgang, 4,110,540, Cl. 568-718.000.
- Treuner, Uwe: *See—*
  - Breuer, Hermann; and Treuner, Uwe, 4,110,535, Cl. 544-21.000.
- Tribken, Everett R.; Miller, Ronald J.; and Griffith, Carl D., to Sperry Rand Corporation. Semi-automatic flight control system utilizing limited authority stabilization system. 4,109,886, Cl. 244-178.000.
- Trinchera, Luigi, to California Cedar Products Company. Apparatus and method for brazing tips on circular saw teeth. 4,110,591, Cl. 219-85.0CA.
- Trosper, Milton French, Jr.: *See—*
  - Heitmann, Glenn Alvin; and Trosper, Milton French, Jr., 4,110,513, Cl. 428-528.000.
- Trotel, Jacques, to Thomson-CSF. Device which makes it possible to effect the programmed tracing of figures which have different shapes. 4,110,622, Cl. 250-396.00R.
- Troup, George: *See—*
  - Hansen, Arne; and Troup, George, 4,109,726, Cl. 169-11.000.
- TRW Inc.: *See—*
  - Moed, Johannes A. R., 4,110,562, Cl. 179-15.0BY.
  - Quigley, James R., 4,109,370, Cl. 29-566.300.
- Trzeciak, Thomas A.: *See—*
  - LaCamera, Alfred F.; Trzeciak, Thomas A.; and Kinosz, Donald L., 4,110,178, Cl. 204-54.00R.
- Tschopp, Theodor, to Swiss Aluminium Ltd. Process and device for the production of aluminium by the electrolysis of a molten charge. 4,110,179, Cl. 204-67.000.
- Tsuboi, Shinichi: *See—*
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- Tuba, Zoltan; and Marsai, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Acylated diepoxy-androstane and a process for the preparation thereof. 4,110,326, Cl. 260-239.55R.
- Tucel Industries, Inc.: *See—*
  - Lewis, John C., Jr., 4,109,965, Cl. 300-7.000.
- Tucker, Robert R. Coffee percolator. 4,109,565, Cl. 99-283.000.
- Tuckmantel, Hans-Joachim, to Kempchen & Co. GmbH. Pipe joint. 4,109,923, Cl. 277-101.000.
- TUP! (Panama) S.A.: *See—*
  - Tupper, Earl Silas, 4,109,329, Cl. 5-61.000.
- Tupper, Earl Silas, to TUP! (Panama) S.A. Invalid bed. 4,109,329, Cl. 5-61.000.
- Turner, James E., to Cry Baby, Inc. Method for extruding porous irrigation pipe. 4,110,420, Cl. 264-41.000.
- Turner, William D.: *See—*
  - Cronshaw, David; Shemer, Jack E.; Turner, William D.; Hartke, David; Keddy, James R.; DuVall, Wilbur E.; and Sterling, Warren M., 4,110,823, Cl. 364-200.000.
- Tuttle, Paul D.: *See—*
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- Tygart, Robert Carl, to Eastman Kodak Company. Method for forming contoured tubing. 4,109,365, Cl. 29-421.00R.
- Tyler, Timothy N.; Mills, Melvin E., Jr.; Wells, John A.; and Carlin, Joseph T., to Texaco Inc. Salinity tolerant surfactant oil recovery process. 4,110,228, Cl. 252-8.55D.
- Tyler, Timothy N.: *See—*
  - Carlin, Joseph T.; Tyler, Timothy N.; Mills, Melvin E., Jr.; and Ware, James W., 4,110,229, Cl. 252-8.55D.
- Ube Industries, Ltd.: *See—*
  - Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,110,350, Cl. 260-346.750.
- Uchida, Tsutomu; Ono, Zenichi; Nagashima, Makoto; Tasaka, Eiji; Mitsui, Shigeo; and Nomura, Keiichi, to Toshin Seiko Kabushiki Kaisha. Steel shape stacking apparatus. 4,109,801, Cl. 214-6.0FS.

Uchino, Mitsuo; and Takahashi, Seizi, to Diesel Kiki Co., Ltd. Two-speed fuel injection pump governor. 4,109,627, Cl. 123-140.00R.

Udert, Karl Ernst: *See—*

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UDP Inc.: *See—*

Flagg, John F.; and Antos, George J., 4,110,199, Cl. 208-139.000.

Uehara, Keiichi: *See—*

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Uesugi, Kyozo; Metabi, Tsuneyo; and Hachiken, Ryuzo, to Minolta Camera Kabushiki Kaisha. Cushioned objective lens. 4,110,008, Cl. 350-255.000.

Ultra Centrifuge Nederland N.V.: *See—*

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Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, to Ube Industries, Ltd. Catalytic oxidative process for producing maleic anhydride. 4,110,350, Cl. 260-346.750.

Umezawa, Kazumi: *See—*

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Unangst, Paul C.: *See—*

Brown, Richard E.; and Unangst, Paul C., 4,110,464, Cl. 424-274.000.

Union Carbide Corporation: *See—*

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Higgins, Thomas Engel, 4,110,479, Cl. 426-277.000.

Kanner, Bernard; and Prokai, Bela, 4,110,271, Cl. 521-111.000.

Kanner, Bernard; and Prokai, Bela, 4,110,272, Cl. 521-111.000.

Uniroyal, Inc.: *See—*

Loveless, Frederick C.; and Nudenberg, Walter, 4,110,234, Cl. 252-47.500.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*

Morris, Ronald George, 4,110,712, Cl. 333-33.000.

United States of America

Air Force: *See—*

Eden, Richard C.; and Nakano, Kenichi, 4,110,778, Cl. 357-30.000.

Martin, Gayle Patrick, 4,110,713, Cl. 333-70.00R.

Williams, Mark R.; and Martin, Gayle Patrick, 4,110,833, Cl. 364-819.000.

Army: *See—*

Arutunian, Gregory; and Monte, Anthony J., 4,110,812, Cl. 361-248.000.

Berg, Norman J.; Smith, Bob Lorin, deceased; and Adams, Allen B., legal representative, 4,110,016, Cl. 350-358.000.

Bishov, Solomon J., 4,110,483, Cl. 426-542.000.

Devine, Patrick J., 4,109,580, Cl. 102-52.000.

Eneman, Melvin, 4,109,583, Cl. 102-244.000.

Hershkowitz, Joseph; and Akst, Irving B., 4,110,136, Cl. 149-47.000.

Korr, Abraham L.; and Rosenblatt, David B., 4,109,883, Cl. 244-3.100.

Reggia, Frank; and Jones, Howard S., Jr., 4,110,751, Cl. 343-700.0MS.

Varecka, Charles P.; and Merhar, Donald M., 4,110,730, Cl. 340-16.00R.

Zacharin, Alexey T., 4,109,455, Cl. 58-1.00R.

Energy: *See—*

Arntzen, John D., 4,110,517, Cl. 429-133.000.

Brambilla, Marco; and Lallia, Pascal, 4,110,595, Cl. 219-121.00P.

Leskovar, Branko; Buscher, Harold T.; and Kolbe, William F., 4,110,686, Cl. 324-58.50C.

Mayer, Anton, 4,109,612, Cl. 118-417.000.

O'Hare, Stephen A., 4,110,257, Cl. 252-466.00J.

Olson, Kenneth W.; Haas, William J., Jr.; and Fassel, Velmer A., 4,109,863, Cl. 239-102.000.

Stevens, Charles G., 4,110,182, Cl. 204-157.10R.

Stillwagon, Roy E., 4,110,648, Cl. 310-178.000.

Younskevicius, Robert E., 4,110,049, Cl. 356-222.000.

Health, Education and Welfare: *See—*

Becker, Bernard; Stamper, Robert L.; Asseff, Carl F.; and Podos, Steven M., 4,110,461, Cl. 424-273.00R.

Stern, Michael D.; and Lappe, Donald L., 4,109,647, Cl. 128-2.05F.

Interior: *See—*

Paulson, Danton L.; and Hunter, Willard L., 4,110,107, Cl. 75-24.000.

Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,110,344, Cl. 260-340.300.

National Aeronautics and Space Administration; administrator; with respect to an invention of:

Jalufka, Nelson W.; Hohl, Frank; DeYoung, Russell J.; and Williams, Michael D. Volumetric direct nuclear pumped laser. 4,110,703, Cl. 331-94.50P.

National Aeronautics and Space Administration: *See—*

Cason, Robert L.; and McStay, John J., 4,110,683, Cl. 324-52.000.

Kojima, Gilbert K., 4,109,644, Cl. 128-2.00V.

Navy: *See—*

Bocker, Richard P., 4,110,004, Cl. 350-162.0SF.

Cross, Leslie E.; and Newnham, Robert E., 4,109,359, Cl. 29-25.350.

Cusick, Richard T.; and Fleagle, Wilbur J., 4,110,576, Cl. 200-82.00E.

Ebeling, Charles E., Jr., 4,109,867, Cl. 239-265.150.

Iverson, Myren L., 4,109,997, Cl. 350-23.000.

Iverson, Myren L., 4,109,998, Cl. 350-23.000.

Reindel, John, 4,110,715, Cl. 333-73.00S.

Rosendahl, Gottfried R., 4,110,791, Cl. 358-233.000.

Wang, Frederick E., 4,110,111, Cl. 75-134.00A.

Wilcox, Dwight R., 4,110,697, Cl. 328-154.000.

U.S. Philips Corporation: *See—*

Bergmans, Hendrik Jan; and Drabek, Rudolf, 4,110,799, Cl. 360-70.000.

Dijkmans, Eise Carel, 4,110,636, Cl. 307-237.000.

Esser, Leonard Jan Maria; and Theunissen, Matthias Johannes Joseph, 4,110,777, Cl. 357-24.000.

van Nes, Johannes Cornelis Adrianus, 4,110,760, Cl. 354-1.000.

Wellinga, Kobus; and Mulder, Rudolf, 4,110,469, Cl. 424-304.000.

United Technologies Corporation: *See—*

Eitel, Fredrick G., 4,110,013, Cl. 350-310.000.

Prewo, Karl M., 4,110,505, Cl. 428-114.000.

University of California, The Regents of the: *See—*

Rapoport, Henry; and Barber, Randy B., 4,110,329, Cl. 260-270.00A.

UOP Inc.: *See—*

Antos, George J., 4,110,200, Cl. 208-139.000.

Antos, George J., 4,110,201, Cl. 208-139.000.

Carson, Don B., 4,109,469, Cl. 60-676.000.

Carson, Don B., 4,110,174, Cl. 203-11.000.

Grendahl, Bernard E., 4,109,891, Cl. 248-503.100.

Hayes, John C.; and Pollitzer, Ernest L., 4,110,198, Cl. 208-111.000.

Herning, Joel G.; and Shelton, James B., 4,110,197, Cl. 208-64.000.

Hilfman, Lee, 4,110,203, Cl. 208-216.000.

Hilfman, Lee, 4,110,205, Cl. 208-255.000.

Millar, Robert F.; Persico, Paul J.; and Jensen, Robert H., 4,110,081, Cl. 23-288.00G.

Nolley, John P., Jr., 4,110,087, Cl. 55-73.000.

Ryu, Ji-Yong, 4,110,410, Cl. 260-683.15B.

Selvidge, Charles W.; Morgan, Kenneth A.; and Frame, Robert R., 4,110,398, Cl. 423-62.000.

Spears, John F., Jr., 4,110,172, Cl. 202-234.000.

Winter, George R., III, 4,110,202, Cl. 208-144.000.

Upjohn Company, The: *See—*

Johnson, Roy A.; and Sih, John C., 4,110,532, Cl. 542-426.000.

Nelson, Norman A., 4,110,381, Cl. 260-590.00C.

Nelson, Norman A., 4,110,382, Cl. 260-590.00C.

Nelson, Norman A., 4,110,383, Cl. 260-590.00C.

Nelson, Norman A., 4,110,384, Cl. 260-590.00C.

Sekhar, Neel C., 4,110,161, Cl. 195-1.800.

Urano, Fumio: *See—*

Miyata, Katsuhiko; Urano, Fumio; and Arai, Akihiro, 4,110,765, Cl. 354-59.000.

Urbaschek, Herbert, to Taunus-Armaturen GmbH. Seal for pistons and piston rods of cylinder-type actuators. 4,109,921, Cl. 277-24.000.

Usui, Kiyofumi; Hirabayashi, Shigeyoshi; and Hosogaya, Hiroshi, to Shinshu Seiki Kabushiki Kaisha. Web feeding mechanism for compact printer. 4,109,843, Cl. 226-109.000.

Vacuumatic Limited: *See—*

Halsey, Arthur Ernest, 4,109,780, Cl. 198-466.000.

Valantin, Alfred A., to Charbonnages de France. Roof supports. 4,109,473, Cl. 61-45.00D.

Valbusa, Luigi: *See—*

Beretta, Paolo; and Valbusa, Luigi, 4,110,116, Cl. 96-101.000.

Valchev, Alexander Yordanov: *See—*

Peev, Vassil Georgiev; Valchev, Alexander Yordanov; and Bakalov, Nikolay Georgiev, 4,110,547, Cl. 13-11.000.

Valentino, Carl R.: *See—*

Hofer, Donald C.; Kahwaty, Vincent N.; and Valentino, Carl R., 4,110,681, Cl. 324-0.50A.

Valyi, Emery I. Composite plastic container. 4,109,813, Cl. 215-1.00C.

Van der Meulen: *See—*

Weis, Siegfried K.; and Van der Meulen, 4,109,343, Cl. 16-98.000.

Van Kooten B.V.: *See—*

Schnell, Hans Gunther, 4,109,475, Cl. 61-53.500.

Van Auken, John A. Gaming surface contact detecting systems. 4,109,911, Cl. 273-31.000.

van Beveren, Marius; and Nuhoff, Peerke Jan, to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method for transmitting binary signals. 4,109,856, Cl. 235-308.000.

Vandecoevering, Kenneth E. Chainsaw vise. 4,109,900, Cl. 269-102.000.

Vandegaer, Jan E.; and Calentine, John W., to Alcolac Inc. Stable polyurethane latices, emulsifiable prepolymers therefor and methods of making the same. 4,110,286, Cl. 260-29.2TN.

Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., to Janssen Pharmaceutica N.V. 1,3-Dihydro-1-[3-(1-piperidinyl)propyl]-2H-benzimidazol-2-ones and related compounds. 4,110,333, Cl. 260-293.570.

Van der Aa, Marcel J. M. C.: *See—*

Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,110,333, Cl. 260-293.570.

van der Lely, Cornelis. Soil tilling machines. 4,109,730, Cl. 172-54.000.

van der Lely, Cornelis. Soil cultivating implements. 4,109,731, Cl. 172-59.000.

van der Velden, Guido J. M.: *See—*

Wittenberg, Albert Jan; and van der Velden, Guido J. M., 4,110,040, Cl. 355-70.000.

Van Heertum, Albert H. M. Th.: *See—*

Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,110,333, Cl. 260-293.570.

van Nes, Johannes Cornelis Adrianus, to U.S. Philips Corporation. Method of manufacturing a cathode ray tube for displaying colored pictures. 4,110,760, Cl. 354-1.000.

Vapor Corporation: *See—*

Schleicher, George W., 4,109,563, Cl. 98-40.00C.

Varecka, Charles P.; and Merhar, Donald M., to United States of America, Army. Rate sensitive system for a seismic sensing range containment apparatus. 4,110,730, Cl. 340-16.00R.

Vaughan, Lawrence G., to Du Pont de Nemours, E. I., and Company. Process for the production of tetrahydroanthraquinones. 4,110,353, Cl. 260-369.000.

Veasy, Lloyd George: *See—*

Clark, Justin S.; and Veasy, Lloyd George, 4,109,505, Cl. 73-1.00R.

Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*

Forster, Karl-Heinz; Lein, Werner; and Heiber, Hartmut, 4,109,574, Cl. 101-216.000.

Velarde, Clyde R., to Rheem Manufacturing Company. Single piston operated clip device. 4,109,363, Cl. 29-243.560.

Velsicol Chemical Corporation: *See—*

Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., 4,110,101, Cl. 71-88.000.

Verdicchio, Robert J.: *See—*

Lindemann, Martin K. O.; Kennedy, Robert R.; and Verdicchio, Robert J., 4,110,263, Cl. 252-545.000.

Verdol S.A.: *See—*

Perles, Rene, 4,109,770, Cl. 192-12.0BA.

Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*

Scheurecker, Werner, 4,109,700, Cl. 164-426.000.

Vermillion, Don W., to Singer Company, The. Vacuum cleaner with bare floor cleaning brush. 4,109,342, Cl. 15-373.000.

Vettiger, Peter: *See—*

Schindler, Hans Rudolf; and Vettiger, Peter, 4,110,569, Cl. 179-84.00A.

Vibrac Corporation: *See—*

Hendershot, James R., Jr., 4,110,645, Cl. 310-154.000.

Victor Company of Japan, Ltd.: *See—*

Honjo, Yoshihiko; and Kuroda, Junji, 4,110,607, Cl. 250-201.000.

Viessmann, Hans. Boiler for the combustion of liquid or gaseous fuels. 4,109,614, Cl. 122-149.000.

Vigerstrom, Knut Birger, to Electro-Food AB. Food container having electrode pockets. 4,109,566, Cl. 99-358.000.

Vincent, David N.; and Chang, Cheng Hsiung, to Champion International Corporation. Bisfluoran chromogenic compounds, preparation thereof, and pressure-sensitive copy systems employing same. 4,110,343, Cl. 260-335.000.

Vincent, Raymond A. Dynamic balancer for rotating bodies and method of manufacturing same. 4,109,549, Cl. 74-573.00F.

Vinnemann, Antonius: *See—*

Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,109,491, Cl. 66-125.00R.

Violland, Robert; and Neel, Jean, to Rhone-Progil. Polyurethane latexes from sulfonate prepolymer, aqueous chain extension process, and coated support. 4,110,284, Cl. 260-29.2TN.

Vis, Arthur D.: *See—*

Tann, Lewis H.; Mueller, William L.; and Vis, Arthur D., 4,110,611, Cl. 250-237.00R.

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Stoev, Stoycho Mitrev; Sapunarov, Ivan Mitrev; and Manov, Emil Nikolov, 4,109,874, Cl. 241-69.000.

Visser, Kommer, to Ultra Centrifuge Nederland N.V. Apparatus for machining electrically conducting substances by electrochemical attack. 4,110,190, Cl. 204-224.00M.

Vivarelli, Gianantonio: *See—*

Ratti, Franco; Vivarelli, Gianantonio; Maganza, Dario; and D'Amore, Emanuele, 4,109,379, Cl. 29-747.000.

Vladuchick, Susan Anne, to Du Pont de Nemours, E. I., and Company. Process for preparing disalts of 3,4-dimercaptoisothiazole-5-carbonitrile [and related products therefrom]. 4,110,335, Cl. 260-302.00S.

Vofsi, David: *See—*

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Vogel, Rudolf, to Salzgitter Maschinen AG. Offshore driller rig. 4,109,477, Cl. 61-87.000.

Vogel, Walter, to Cherdron, Egon; Helmboldt, Otto; and Vogel, Walter. Method for treating a medium containing water with coagulants. 4,110,209, Cl. 210-44.000.

Vogt, B. Richard: *See—*

Rovnyak, George C.; and Vogt, B. Richard, 4,110,452, Cl. 424-251.000.

Wade, Peter C.; and Vogt, B. Richard, 4,110,449, Cl. 424-250.000.

Vogt, Robert K., to E. W. Buschman Company, The. Fluid control circuit and method for an accumulator conveyor. 4,109,783, Cl. 198-781.000.

Volk, Heinrich: *See—*

Papenfuhs, Theodor; and Volk, Heinrich, 4,110,375, Cl. 260-559.00R.

Vollmer, Helmut; Udert, Karl Ernst; and Oechsle, Hans, to Hilti Aktiengesellschaft. Expansion dowel. 4,109,556, Cl. 85-84.000.

von Bebenburg, Walter; Schulmeyer, Norbert; and Jakovlev, Vladimir, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 6-Aryl-s-triazolo-(4,3-a)-pyrido-(2,3-f)-1,4-diazepines. 4,110,455, Cl. 424-256.000.

von der Haar, Friedrich, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V. Method of fractionating and separating proteins. 4,110,320, Cl. 260-112.00R.

Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix. Air-jet furnace. 4,110,064, Cl. 431-171.000.

Voss, Peter, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H. Configuration for reducing the turn-off time of a thyristor. 4,110,638, Cl. 307-252.00C.

Voss, Siegfried, to Aktien-Gesellschaft "Weser". Hawser hook. 4,109,602, Cl. 114-218.000.

Voxon S.p.A.: *See—*

Sattin, Leone Glicerio, 4,110,738, Cl. 340-539.000.

Vreugde, Theodorus L. J., to Texaco Inc. Reflection seismic exploration: determining interval velocity in a subsurface layer. 4,110,729, Cl. 340-15.5MC.

Vyzkumny ustav hutnictvi zeleza: *See—*

Fuxa, Jan, 4,109,516, Cl. 73-93.000.

W & F Mfg. Co., Inc.: *See—*

Newland, John W., 4,110,261, Cl. 252-522.000.

W. L. Gore & Associates, Inc.: *See—*

Yamazaki, Etsuo, 4,110,392, Cl. 264-127.000.

W. R. Grace & Co.: *See—*

Cogliano, Joseph A.; and Marans, Nelson S., 4,110,143, Cl. 156-167.000.

Hill, Richard Newton, 4,110,422, Cl. 423-317.000.

Isgur, Irving E.; Holmstrem, Andrew B.; and Hayes, Norman J., 4,110,508, Cl. 428-240.000.

Olcott, Tyler Keith; and Miller, Robert M., 4,110,390, Cl. 264-90.000.

Rosenberg, Arnold Morry; and Gaidis, James Michael, 4,110,120, Cl. 106-99.000.

W. Vinten Limited: *See—*

Harrison, Peter Arthur; Parks, Anthony John; Southgate, Malcolm Dennis; Sleath, William Derek; and Hills, Richard Keith, 4,110,037, Cl. 355-48.000.

WABCO Westinghouse GmbH: *See—*

Reinecke, Erich, 4,109,969, Cl. 303-22.00R.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*

Kohl, Franz; and Hoch, Walter, 4,110,586, Cl. 219-10.430.

Waddill, Harold G.: *See—*

Schulze, Heinz; and Waddill, Harold G., 4,110,309, Cl. 528-119.000.

Schulze, Heinz; and Waddill, Harold G., 4,110,310, Cl. 528-119.000.

Schulze, Heinz; and Waddill, Harold G., 4,110,313, Cl. 528-90.000.

Wade, Charles G., to Atlas Powder Company. Water-in-oil emulsion explosive composition. 4,110,134, Cl. 149-2.000.

Wade, Peter C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 2-Substituted benzisothiazol-3-ones. 4,110,449, Cl. 424-250.000.

Wagner, Hans, to Hans Fehr GmbH. Device for inserting and/or withdrawing particularly long and/or heavy material in a storage container. 4,109,805, Cl. 214-16.40A.

Wagnon, Albert Lloyd; and Janoulis, Alexandros James. Apparatus for collecting debris floating in a stream. 4,110,216, Cl. 210-156.000.

Wahl, Harry A.: *See—*

Martin, William L.; Wahl, Harry A.; and Young, Gary C., 4,109,719, Cl. 166-259.000.

Waitz, Jay Allan: *See—*

Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,110,439, Cl. 424-181.000.

Wakayama, Masao: *See—*

Takeuchi, Yukihisa; and Wakayama, Masao, 4,110,256, Cl. 252-465.000.

Wakeland, William E., Jr. Waterbed retainer cap. 4,109,887, Cl. 248-345.100.

Waldbillig, James O.; Cusano, Carmen M.; Reed, David D.; and Winstead, Richard L., to Texaco Inc. Ethylene-hydrocarbon copolymeric viscosity improvers containing color and stability improvers. 4,110,235, Cl. 252-51.50R.

Waldorf, Lindsey E.: *See—*

Souder, James J., Jr.; and Waldorf, Lindsey E., 4,110,587, Cl. 219-10.49R.

Waldron, Clifford Robert; and Knapp, Carl Lee, to Bendix Corporation, The. Electrical connector assembly having anti-decoupling mechanism. 4,109,990, Cl. 339-89.00M.

Wall, Richard E. Expandable camper apparatus. 4,109,954, Cl. 296-23.00A.

Wallace Business Forms, Inc.: *See—*

Steidinger, Donald J., 4,109,936, Cl. 282-11.50A.

Wallach, Marshall B.: *See—*

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Walsh, Michael Andrew: *See—*

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- Walton, Charles Eugene, II: *See—*
  - Drinkard, John Halmer, Jr.; and Walton, Charles Eugene, II, 4,109,553, Cl. 81-9.510.
- Wang, Frederick E., to United States of America, Navy. Metal alloy and method of preparation thereof. 4,110,111, Cl. 75-134.00A.
- Wang, Jin Liang, to Goodyear Tire & Rubber Company, The. Fire retardant acrylic terpolymer composition and films thereof. 4,110,296, Cl. 260-30.60R.
- Wang, Samuel Shan Niog; and Smith, Eugene Leroy, Jr., to American Cyanamid Company. Process for flotation of non-sulfide ores. 4,110,207, Cl. 209-166.000.
- Ware, James W.: *See—*
  - Carlin, Joseph T.; Tyler, Timothy N.; Mills, Melvin E., Jr.; and Ware, James W., 4,110,229, Cl. 252-8.55D.
- Warner Bros. Inc.: *See—*
  - McCormack, Thomas L.; and Green, Albert P., 4,110,017, Cl. 352-5.000.
- Warner-Lambert Company: *See—*
  - Brown, Richard E.; and Unangst, Paul C., 4,110,464, Cl. 424-274.000.
  - Stoss, Peter; Satzinger, Gerhard; and Herrmann, Manfred, 4,110,448, Cl. 424-247.000.
- Washio, Masayuki; and Harada, Tetsuya, to Nissan Motor Company, Limited; and Atsugi Motor Parts Company, Limited. Vacuum regulation valve in an exhaust gas recirculation system. 4,109,624, Cl. 123-119.00A.
- Watanabe, Itaru: *See—*
  - Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; Kojima, Toshifumi; Matsubara, Hiroyoshi; Osuka, Tatsumi; Takeshige, Kenji; Nagamine, Takashi; and Hirano, Osamu, 4,110,589, Cl. 219-66.000.
- Watanabe, Masanori: *See—*
  - Onda, Eiichi; Koyama, Mitsuo; Nemoto, Ichiro; Nokagawa, Tadashi; and Watanabe, Masanori, 4,110,767, Cl. 354-152.000.
- Watanabe, Masao: *See—*
  - Itakura, Kiyoyuki; Ishii, Yohji; Ohata, Satoru; and Watanabe, Masao, 4,109,463, Cl. 60-282.000.
- Watanabe, Namio: *See—*
  - Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,109,766, Cl. 188-73.400.
- Watanabe, Yasumasa: *See—*
  - Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 4,110,048, Cl. 356-200.000.
- Watatani, Yoshizumi, to Hitachi, Ltd. Color signal processing apparatus for video signal recording and reproducing system. 4,110,761, Cl. 358-4.000.
- Watkins, James F., to Clyde Machines, Inc. Sectional grain drill hitch. 4,109,928, Cl. 280-411.00R.
- Watson, Barry Kenneth, to Marconi Company Limited, The. Microwave bank branching arrangements. 4,110,710, Cl. 333-10.000.
- Watson, James Henry Peter, to English Clays Lovering Pochin & Company Limited. Apparatus for separating magnetizable particles from a fluid. 4,110,222, Cl. 210-222.000.
- Watson, John D.: *See—*
  - Bauman, William C.; Lee, John M.; and Watson, John D., 4,110,402, Cl. 423-166.000.
- Watson, Speocer C.; Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Intermediates for preparation of unsaturated alcohols. 4,110,357, Cl. 260-448.00A.
- Watts, Eric Alfred, to Beecham Group Limited. Chroman derivatives. 4,110,347, Cl. 260-345.200.
- Watts, William A.: *See—*
  - Evans, Theodore A.; and Watts, William A., 4,110,500, Cl. 428-35.000.
- Webb, Derrel D.; and Anderson, Edwin A. Double acting jar. 4,109,736, Cl. 175-297.000.
- Webb, George M. Carburetion modifying device. 4,109,620, Cl. 123-52.00M.
- Weber, Helmut: *See—*
  - Bauer, Karl A.; Baur, Peter F.; Biedermann, Horst H.; Madel, Andreas; Nitsch, Friedrich; Pechinger, Ernst; Koenig, Walter; Ipfelkofer, Armin; Rindsfuesser, Johann J.; and Weber, Helmut, 4,109,779, Cl. 400-584.000.
- Wedge, Donald G.; and Zirkelbach, Albert W. Snap dies. 4,109,845, Cl. 227-144.000.
- Weinhardt, Klaus: *See—*
  - Beard, Colin C.; Wallach, Marshall B.; and Weinhardt, Klaus, 4,110,463, Cl. 424-273.00R.
- Weinstein, Barry: *See—*
  - Ekstedt, Edward E.; Beck, Edwin J., Jr.; Bahr, Donald W.; and Weinstein, Barry, 4,109,459, Cl. 60-39.660.
- Weinstein, Jay: *See—*
  - Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,110,439, Cl. 424-181.000.
- Weir, Niall Galbraith: *See—*
  - Clark, John Colin; Kennedy, James; Long, Alan Gibson; and Weir, Niall Galbraith, 4,110,534, Cl. 544-16.000.
- Weis, Siegfried K.; and Van der Meuleo, to C. L. Frost & Son, Inc. Trolley wheel assembly. 4,109,343, Cl. 16-98.000.
- Weisman & Allen: *See—*
  - Keller, Robert B., 4,109,646, Cl. 128-2.05C.
- Weiss, Martin Joseph: *See—*
  - Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Poletto, John Frank; Schaub, Robert Eugene; and Bernady, Karel Francis, 4,110,368, Cl. 260-514.00D.
- Weisshaar, Erich: *See—*
  - Cornu, Jozef; and Weisshaar, Erich, 4,110,780, Cl. 357-38.000.
- Weitzman, Barry Sheldon. Rotatable compartmentalized vending apparatus. 4,109,825, Cl. 221-14.000.
- Welding Engineers, Inc.: *See—*
  - Skidmore, Richard H., 4,110,843, Cl. 366-83.000.
- Weller, Peter A., to McCord Corporation. Lightweight bumper guards. 4,109,951, Cl. 293-65.000.
- Wellinga, Kobus; and Mulder, Rudolf, to U.S. Philips Corporation. Insecticidal N-(2,6-dichlorobenzoyl)-N′-(4-cyanophenyl) urea. 4,110,469, Cl. 424-304.000.
- Wells, John A.: *See—*
  - Tyler, Timothy N.; Mills, Melvin E., Jr.; Wells, John A.; and Carlin, Joseph T., 4,110,228, Cl. 252-8.55D.
- Wells, Thomas R.: *See—*
  - Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,110,020, Cl. 353-26.00A.
- Wells, William J., III; and Stautzenberger, Adin Lee, to Celanese Corporation. Trioxane production. 4,110,298, Cl. 260-340.000.
- Weman, Per Olof, to Sigmatex, A.G. Flap buckle. 4,109,935, Cl. 280-747.000.
- Wentz, Klaus: *See—*
  - Bungert, Heinrich; Wenz, Herbert; and Wentz, Klaus, 4,109,334, Cl. 12-59.500.
- Wenz, Herbert: *See—*
  - Bungert, Heinrich; Wenz, Herbert; and Wentz, Klaus, 4,109,334, Cl. 12-59.500.
- Werner Kamman Maschinenfabrik: *See—*
  - Strauch, Karl; and Kammano, Wilfried, 4,109,573, Cl. 101-38.00R.
- West Point-Pepperell, Inc.: *See—*
  - Bryant, Clifford Aldene, 4,109,592, Cl. 112-79.00A.
- West, Vallie D.; and Kennedy, Jesse. Machine for installing giant tires on one-piece rims. 4,109,698, Cl. 157-1.200.
- Westberg, Erik, to Aktiebolaget Tudor. Methods for applying material to the end of elongate objects. 4,110,490, Cl. 427-180.000.
- Westin, J. Olle. Horizontal hand weaving loom. 4,109,685, Cl. 139-33.000.
- Westinghouse Brake & Signal Co. Ltd.: *See—*
  - Newson, John Chase; Tregoning, Geoffrey Robinson; and Digby, James Baden, 4,109,416, Cl. 49-316.000.
- Westinghouse Electric Corp.: *See—*
  - Asars, Juris A.; Davies, David H.; and Brody, Thomas P., 4,110,664, Cl. 315-169.0TV.
  - Britton, James S.; and Morgan, David W., 4,110,814, Cl. 361-371.000.
  - Farish, Owen, 4,110,580, Cl. 200-148.00G.
  - Fox, Richard Q.; Sigut, Donald E.; and McWhirter, John H., 4,110,825, Cl. 364-492.000.
  - Freeman, Willie B.; Yeckley, Russell N.; Soles, Otto H.; and Telford, James M., 4,110,578, Cl. 200-148.00F.
  - Frink, Russell E.; and Milianowicz, Stanislaw A., 4,110,579, Cl. 200-146.00R.
  - Greeneich, Edwin W.; and Asars, Juris A., 4,110,662, Cl. 315-169.0TV.
  - Hickam, William M., 4,110,613, Cl. 250-282.000.
  - Larson, Daniel A., 4,110,656, Cl. 313-331.000.
  - Lin, Kou Chi; and Woods, Edmund E., 4,109,375, Cl. 29-605.000.
  - Petrosky, Kenneth J., 4,110,725, Cl. 340-5.00R.
  - Teyssandier, Raymond G., 4,109,523, Cl. 73-194.00A.
- Westland Aircraft Limited: *See—*
  - Stevenson, Basil Charles James, 4,110,056, Cl. 416-230.000.
- Wetherell, Joseph J.; Fogarty, A. Edward; and Fogarty, Bonnie Rose, to Ned Strougin Associates, Inc. Toy figure glider. 4,109,411, Cl. 46-79.000.
- Wevers, Jean: *See—*
  - Arnau, Jose Luis; Barrat, Christian Roland; and Wevers, Jean, 4,110,262, Cl. 252-545.000.
- Weyerhaeuser Company: *See—*
  - Oita, Katashi, 4,110,431, Cl. 424-78.000.
- Wheelabrator-Frye Inc.: *See—*
  - Neidigh, Robert J., 4,109,507, Cl. 73-12.000.
- Wheeler, Robert C., to GTE Sylvania Incorporated. Video processing system providing gain control, aperture control, and black level control. 4,110,790, Cl. 358-162.000.
- Whetstone, Clayton N.; Koop, Douglas A.; and Dowd, James D., to Aluminum Company of America. Superconductor composite and method of making the same. 4,109,374, Cl. 29-599.000.
- Whirlpool Corporation: *See—*
  - Difley, Charles Rogers; and McDonald, William Roy, 4,109,571, Cl. 100-35.000.
  - Pearson, Samuel Joseph, 4,109,482, Cl. 62-180.000.
- Whisson, Hubert James. Panel erection. 4,109,429, Cl. 52-122.000.
- White, Gerald L.: *See—*
  - Parbhoo, Kantilal R.; Klink, Jerome P.; Calland, John P.; and White, Gerald L., 4,109,610, Cl. 118-202.000.
- White, James F.; and Shaw, Wilfrid G., to Standard Oil Company, The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,110,369, Cl. 260-530.00N.
- White's Electronics, Inc.: *See—*
  - Payne, George C., 4,110,679, Cl. 324-3.000.
- Wicker, Gordon R.: *See—*
  - Jha, Mahesh C.; Wicker, Gordon R.; and Meyer, Gustavo A., 4,110,400, Cl. 423-141.000.
- Wickland, Warren A., to General Motors Corporation. Vapor guard system. 4,109,464, Cl. 60-397.000.
- Widerby, Lennart, to AB Svenska Flaktfabriken. Ventilation element with tubular connector for insertion into an opening in a ceiling or a wall. 4,109,564, Cl. 98-40.00N.

- Widmyer, Richard H.; and Park, Jack H., to Texaco Inc. Thermal oil recovery method. 4,109,722, Cl. 166-281.000.
- Widmyer, Richard H., to Texaco Inc. Thermal oil recovery method. 4,109,723, Cl. 166-303.000.
- Wiene, Ole, to Permataet Kobenhavn A/S. Method and a mould for producing an insulating unit, in particular a building unit. 4,110,388, Cl. 264-71.000.
- Wiese, Winfred John, to Borg-Warner Corporation. Heat exchanger for shaft seal cartridge. 4,109,920, Cl. 277-17.000.
- Wiezer, Hartmut: *See—*
  - Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,110,334, Cl. 260-293.660.
- Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., to California Polytechnic State University Foundation, The. Thiocarbamates. 4,110,444, Cl. 424-226.000.
- Wilcox, Dwight R., to United States of America, Navy. Digital bypassable register interface. 4,110,697, Cl. 328-154.000.
- Wild, Albrecht: *See—*
  - Gante, Joachim; Kurmeier, Hans-Adolf; Schacht, Erich; Mehrhof, Werner; Orth, Dieter; Wild, Albrecht; and Simane, Zdenek, 4,110,447, Cl. 424-244.000.
- Wild, Arthur: *See—*
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- Wilfinger, Raymond J.: *See—*
  - Dubil, James F.; Leighton, Howard N.; and Wilfinger, Raymond J., 4,110,835, Cl. 364-844.000.
- Wilhelm, Gary L., to Sturm, Warren A. Channel number interface. 4,110,694, Cl. 325-464.000.
- Wilhelm, Gerhard; Hockenberger, Lothar; Soyka, Manfred; and Endruscheit, Peter, to Rutgerskwerke Aktiengesellschaft. Storage-stable, moisture curable mixtures containing mercapto-terminated liquid, oligomer, liquid polymer or liquid monomer, liquid oligomer and liquid polymer with sodium chromate. 4,110,295, Cl. 260-30.40R.
- Wilkinson, Randolph James: *See—*
  - Kuhn, Johannes Andries; and Wilkinson, Randolph James, 4,110,428, Cl. 424-46.000.
- Wilkinson, Samuel; Flower, Roderick John; and Ferreira, Sergio Henrique, to Burroughs Wellcome Co. Conjugates of prostaglandins, analogs, formulations and their use. 4,110,432, Cl. 424-85.000.
- Will, Susanne: *See—*
  - Buhl, Horst; and Will, Susanne, 4,110,425, Cl. 423-648.00R.
- Willersinn, Carl-Heinz: *See—*
  - Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Frey, Walter; Lebert, Ulrich; and Thiessen, Fritz, 4,110,370, Cl. 260-530.00N.
- Williams, Eddie C. Transmission fluid pressure indicator. 4,110,733, Cl. 340-60.000.
- Williams, Edward Lee. Macrame stand. 4,109,946, Cl. 289-18.000.
- Williams, Joel; Dunn, Terry; and Stannett, Vivian, to Becton, Dickinson and Company. Irradiation sterilization of semi-crystalline polymers. 4,110,185, Cl. 204-159.200.
- Williams, Mark R.; and Martin, Gayle Patrick, to United States of America, Air Force. Balanced AC correlator system. 4,110,833, Cl. 364-819.000.
- Williams, Michael D.: *See—*
  - United States of America, National Aeronautics and Space Administration; Jalufka, Nelson W.; Hohl, Frank; DeYoung, Russell J.; and Williams, Michael D., 4,110,703, Cl. 331-94.50P.
- Williams, Michael Patrick; and Brawner, William Howard, to H.P.G. IV, Inc. Skateboard chassis. 4,109,925, Cl. 280-11.280.
- Williamson, Jim R.; and Gonzalez, Floyd A., to Halliburton Company. Self adjusting liquid spring operating apparatus and method for use in an oil well valve. 4,109,725, Cl. 166-315.000.
- Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., to Fritzsche Dodge & Olcott Inc. Flavoring compositions containing alkyl-2,3-dihydro-3(1′-hydroxyalkylidene)-2-oxo-5-alkyl-furan-4-carboxylates. 4,109,662, Cl. 131-2.000.
- Wilson, Bradford W. Skip rope. 4,109,906, Cl. 272-75.000.
- Wilson, Clement Card: *See—*
  - Brown, Leon Calvin; Edwards, Earl Garland; Peterson, Charles Edwin; Robinson, Peter George; and Wilson, Clement Card, 4,110,068, Cl. 432-60.000.
- Wilson, Edward A.; and Fredenberg, James D., to Honeywell Information Systems, Inc. Fluid cooling systems for electronic systems. 4,109,707, Cl. 165-46.000.
- Wilson, Floyd Leroy. Combination torque release screw and screw driver. 4,109,691, Cl. 145-50.00D.
- Wilson, William Richard: *See—*
  - Dorrance, William Thomas; and Wilsoo, William Richard, 4,110,726, Cl. 340-6.00R.
- Wind Power Systems, Inc.: *See—*
  - Salter, Edmund L., 4,110,631, Cl. 290-55.000.
- Wiog, Willis G., to Sperry Rand Corporation. Portable surveying compass with flux valve and gyrocompass alignment modes. 4,109,391, Cl. 33-275.00G.
- Wiokel, Robert J.: *See—*
  - Mueller, William L.; and Winkel, Robert J., 4,110,610, Cl. 250-231.0SE.
- Winstead, Richard L.: *See—*
  - Waldbillig, James O.; Cusano, Carmen M.; Reed, David D.; and Winstead, Richard L., 4,110,235, Cl. 252-51.50R.
- Winter, George R., III, to UOP Inc. Hydrogenation process for pyrolysis liquids. 4,110,202, Cl. 208-144.000.
- Winzeler Stamping Company: *See—*
  - Ruckriegel, Alfred E.; and Buehler, David W., 4,109,589, Cl. 108-63.000.
- Wirt, Leslie Spencer, to Lockheed Aircraft Corporation. Zeno duct sound attenuating means. 4,109,750, Cl. 181-224.000.
- Wisconsin Alumni Research Foundation: *See—*
  - DeLuca, Hector F.; and Jorgensen, Neal A., 4,110,446, Cl. 424-236.000.
- Wisner, Daniel A., to Burroughs Corporation. Return and position control for a DC servo system. 4,110,675, Cl. 318-606.000.
- Wisner, Ronald R., to Tecumseh Products Company. Method of making ball and socket joint. 4,109,364, Cl. 29-156.50R.
- Witco A/S: *See—*
  - With, Bror, 4,109,932, Cl. 280-615.000.
- Witco Chemical Corporation: *See—*
  - Longley, Kermit D.; Herke, Robert; and Kufrin, Robert J., 4,110,268, Cl. 521-177.000.
- With, Bror, to Witco A/S. Ski binding of the toe binding type. 4,109,932, Cl. 280-615.000.
- Wittenberg, Albert Jan; and van der Velden, Guido J. M., to Oce-van der Grinten N.V. Exposure system for electrophotographic copier. 4,110,040, Cl. 355-70.000.
- Woeckener, Willi; Pawelczyk, Werner; and Marquardt, Klaus-Dieter, to Hermann Berstorff Maschinenbau GmbH. Method of controlling operation of a multi-roll calender. 4,110,387, Cl. 264-40.500.
- Wohrer, Luis C.: *See—*
  - Economy, James; Frechette, Francis J.; and Wohrer, Luis C., 4,110,277, Cl. 260-841.000.
- Woitschatzke, Hans; and Geyer, Hennoch, to Trak Sportartikel GmbH. Ski brake. 4,109,931, Cl. 280-605.000.
- Wojtowicz, Tadeusz: *See—*
  - Baker, Lionel Richard; and Wojtowicz, Tadeusz, 4,110,046, Cl. 356-124.000.
- Wolber, William George, to Bendix Corporation, The. Multiorifice structure and method of making same. 4,109,870, Cl. 239-558.000.
- Wolfe, Merritt W., to Goodyear Tire & Rubber Company, The. Method and patch used in the repair of a pneumatic tire. 4,109,697, Cl. 152-367.000.
- Wolfe, Robert W., to GTE Sylvania Incorporated. Luminescent barium-lithium aluminate phosphors and lamp containing the same. 4,110,660, Cl. 313-486.000.
- Wolscheck, Hans: *See—*
  - Deckert, Andreas; and Wolscheck, Hans, 4,110,816, Cl. 361-433.000.
- Wolverine Corporation: *See—*
  - Hoyt, Charles W., 4,109,394, Cl. 34-57.00B.
- Womack, Robert Edward, to Babcock & Wilcox Co., The. Fuel rod leak detector. 4,110,620, Cl. 250-361.00R.
- Wood, Derek A.: *See—*
  - Sheldon, Roger A.; Been, Peter; Wood, Derek A.; and Mason, Ronald F., 4,110,360, Cl. 260-465.00D.
- Wood, James Carlos; and Felcman, Francis Adolph, to Texas Instruments Incorporated. Print ribbon handler. 4,110,050, Cl. 400-248.000.
- Wood, Leo A., to Wood, Rollin L., a part interest. Tractor-trailer brake system with improved means for assuring application of trailer brakes concomitantly with tractor brakes. 4,109,968, Cl. 303-7.000.
- Wood, Philip. Brake device for a bicycle and the like. 4,109,762, Cl. 188-26.000.
- Wood, Prentice J., to Mead Corporation, The. Article carrier. 4,109,849, Cl. 229-52.00B.
- Wood, Rollin L.: *See—*
  - Wood, Leo A., 4,109,968, Cl. 303-7.000.
- Wood, Roy F.; and Wynne, Ralph A., to Phillips Petroleum Company. Coupling for plastic pipe. 4,109,941, Cl. 285-111.000.
- Woodrum, Guy Thomas: *See—*
  - Barnett, Richard Earl; and Woodrum, Guy Thomas, 4,110,521, Cl. 526-64.000.
- Woods, Edmund E.: *See—*
  - Lin, Kou Chi; and Woods, Edmund E., 4,109,375, Cl. 29-605.000.
- Woodward, Robert Burns; and Bickel, Hans, to Ciba-Geigy Corporation. Process for the manufacture of enol derivatives. 4,110,533, Cl. 544-16.000.
- Wooler, Alan Metcalf, to Imperial Chemical Industries Limited. Composite bodies or sheets. 4,110,397, Cl. 264-338.000.
- Work, John Thompson, to BJ-Hughes Inc. Shock absorbing rotary drive coupling. 4,109,488, Cl. 64-11.00R.
- Wright, Howard N., Jr.: *See—*
  - Albers, Kenneth H.; and Wright, Howard N., Jr., 4,110,539, Cl. 560-240.000.
- Wright, Jesse F. Soil tilling apparatus with pivotal draw frame. 4,109,732, Cl. 172-258.000.
- Wust, Manfred: *See—*
  - Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Cuccolo, Sergio, 4,110,112, Cl. 96-1.0PC.
- Wuttke, Stephan: *See—*
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- Wyland, Alvin D., to General Electric Company. Device, method and system for controlling the supply of power to an electrical load. 4,110,632, Cl. 307-117.000.
- Wynn Oil Company: *See—*
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- Wynne, Ralph A.: *See—*
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- Wyrough and Loser, Inc.: *See—*
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- Xerox Corporation: *See—*
  - Cronshaw, David; Shemer, Jack E.; Turner, William D.; Hartke, David; Keddy, James R.; DuVall, Wilbur E.; and Sterling, Warren M., 4,110,823, Cl. 364-200.000.
  - Gundlach, Robert W., 4,110,024, Cl. 355-3.0TR.
  - Hubble, Fred F., III; and Tasseff, John B., II, 4,110,811, Cl. 361-225.000.
  - Sarid, Dror; and Davis, Thomas G., 4,110,614, Cl. 250-324.000.
  - Schneider, Louis, 4,110,028, Cl. 355-8.000.
  - Silverberg, Morton, 4,110,023, Cl. 353-122.000.
  - Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,109,903, Cl. 271-3.000.
  - Townsend, Robert H., 4,110,803, Cl. 360-109.000.
- Yagi, Norio; Matsumura, Hideki; Aoyagi, Tatsuhiro; and Kishi, Ikuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for preparing an aromatic polymer in the presence of an inert nonpolar aromatic reaction lubricant. 4,110,314, Cl. 528-26.000.
- Yagunov, Boris Ivanovich: *See—*
  - Vorona, Dmitry Afanasievich; Chikul, Vitaly Ivanovich; Smirnov, Alexandr Stepanovich; Chikul, Olga Semenovna; Yagunov, Boris Ivanovich; Tager, Semen Alexandrovich; Shipkov, Nikolai Nikolaevich; Perepelkin, Arkady Vitalievich; Grigorieva, Elizaveta Alexeevna; Krasnovsky, Gennady Alexeevich, deceased; and Krasnovskaya, Tatyana Sergeevna, administratrix, 4,110,064, Cl. 431-171.000.
- Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Hamano, Masaaki; and Shishido, Toetsu, to Research Institute for Iron, Steel and Other Metals of the Tohoku University, The. Silicon carbide sintered moldings and a method for producing said moldings. 4,110,386, Cl. 264-29.500.
- Yamada, Kuniharu; and Teraishi, Katsuhiro, to Kabushiki Kaisha Suwa Seikosha. Ceramic capacitor. 4,109,456, Cl. 58-23.0AC.
- Yamada, Yasuo; Kamiya, Kazuo; Katayama, Iwao; Motobayashi, Kozo; and Yonemura, Yoshiaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakushó. Method and device for removing impurities from a spinning rotor of an open-end spinning apparatus. 4,109,451, Cl. 57-56.000.
- Yamaha Hatsudoki Kabushiki Kaisha: *See—*
  - Miyao, Hiroyasu, 4,109,631, Cl. 123-148.0CA.
- Yamamoto, Hirotaka; Sendai, Satoshi; and Ninomiya, Hideaki, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (TDK Electronics Co., Ltd.). Electroconductive composite ceramics. 4,110,260, Cl. 252-519.000.
- Yamamoto, Hisao: *See—*
  - Kojima, Atsuyuki; Katsube, Junki; Kameno, Yoshito; Inaba, Shigeho; and Yamamoto, Hisao, 4,110,376, Cl. 260-570.00R.
- Yamamoto, Shigeo: *See—*
  - Takayama, Chiyozo; Yamamoto, Shigeo; Kato, Toshiro; Hisada, Yoshio; and Fujinami, Akira, 4,110,462, Cl. 424-273.00R.
- Yamanaka, Yoshiyuki: *See—*
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- Yamasaki, Tatuya; and Sazaki, Kounin, to Ryobi Ltd. Spinning reel having overrideable friction brake for preventing bail release. 4,109,880, Cl. 242-84.21R.
- Yamashita, Norihisa: *See—*
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- Yamashita, Toshiharu, to Hoya Corporation. Green colored filter glass. 4,110,245, Cl. 252-300.000.
- Yamazaki, Etsuo, to W. L. Gore & Associates, Inc. Production of porous sintered PTFE products. 4,110,392, Cl. 264-127.000.
- Yanabu, Satoru: *See—*
  - Murano, Minoru; Yanabu, Satoru; Tamagawa, Toboru; and Ikeda, Hisatoshi, 4,110,806, Cl. 361-4.000.
- Yanagiuchi, Mamoru: *See—*
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- Yanase, Masataka: *See—*
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- Yashiro, Kuniji: *See—*
  - Matsushima, Yasunobu; Yashiro, Kuniji; Kaneko, Hideaki; and Suzuki, Masanori, 4,110,129, Cl. 148-6.15R.
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- Yates, Stephen William, to Platt Saco Lowell. Winding apparatus. 4,109,877, Cl. 242-54.400.
- Yatsuo, Tsutomu: *See—*
  - Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,110,781, Cl. 357-39.000.
- Yavnieli, Mordechai, to AMCOR Ltd. Insect electrocution device. 4,109,408, Cl. 43-112.000.
- Yeargin, G. Scott: *See—*
  - Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,110,357, Cl. 260-448.00A.
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  - Freeman, Willie B.; Yeckley, Russell N.; Soles, Otto H.; and Telford, James M., 4,110,578, Cl. 200-148.00F.
- Yelke, Edward: *See—*
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- Yevick, George J., to Izon Corporation. Parallel and series electro-optic viewing and recording apparatus. 4,110,014, Cl. 350-342.000.
- Yevick, George J., to Izon Corporation. Doublet lens microfiche construction. 4,110,022, Cl. 353-120.000.
- Yohe, Robert A.: *See—*
  - Dresch, Charles D.; and Yohe, Robert A., 4,110,548, Cl. 13-16.000.
- Yokota, Takeshi: *See—*
  - Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,110,781, Cl. 357-39.000.
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- Yonemura, Yoshiaki: *See—*
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- Yoshida, Chosaku: *See—*
  - Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,110,327, Cl. 544-385.000.
- Yoshida Kogyo K.K.: *See—*
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- Yoshida, Masazumi: *See—*
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- Yoshida, Yasuhiko, to Kabushiki Kaisha Komatsu Seisakusho. Support for loader lift arm. 4,109,807, Cl. 214-131.00R.
- Yoshida, Yoshiaki; Suzuki, Osamu; and Onoue, Keizi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Open-end spinning machine and a method of restarting the same. 4,109,450, Cl. 57-34.00R.
- Yoshihara, Tsutomu: *See—*
  - Shibata, Hiroshi; and Yoshihara, Tsutomu, 4,109,371, Cl. 29-571.000.
- Yoshioka, Yoshio: *See—*
  - Minami, Isao; Yoshioka, Yoshio; and Nomura, Hiroaki, 4,110,537, Cl. 544-313.000.
- Youmans, Arthur H., to Dresser Industries, Inc. Method and apparatus for logging inclined earth boreholes using the measured acceleration of the well logging instrument. 4,109,521, Cl. 73-151.000.
- Young, Gary C.: *See—*
  - Martin, William L.; Wahl, Harry A.; and Young, Gary C., 4,109,719, Cl. 166-259.000.
- Youngstown Sheet and Tube Company: *See—*
  - Halsey, Homer P.; Reed, Lowell E.; and Hildebrand, David C., 4,110,824, Cl. 364-472.000.
- Younskevicius, Robert E., to United States of America, Energy. Sun meter. 4,110,049, Cl. 356-222.000.
- Zabsky, John Mitchell: *See—*
  - Miller, Gerald Adrian; and Zabsky, John Mitchell, 4,109,756, Cl. 181-266.000.
- Zacharin, Alexey T., to United States of America, Army. Spiral orifice dashpot timer. 4,109,455, Cl. 58-1.00R.
- Zacks, Phillip H.: *See—*
  - Gage, Michael H.; and Zacks, Phillip H., 4,109,567, Cl. 99-450.000.
- Zahn, Eric H.; and Martin, Philip W., to Sterndent Corp. Method of stippling, and stippling mandrel therefor. 4,109,385, Cl. 32-59.000.
- Zahnd, Hans, to Hasler AG. Wireless paging receiver. 4,110,743, Cl. 340-311.000.
- Zann, Annie: *See—*
  - Abert-Mellah, Marie Annick; Dubois, Jean Claude; and Zann, Annie, 4,110,243, Cl. 252-299.000.
- Zannucci, Joseph S.; and Hedberg, David G., Jr., to Eastman Kodak Company. Polyester fiber dye stabilization. 4,110,301, Cl. 260-40.00P.
- Zaucha, Charles D. Gas rifle. 4,109,557, Cl. 89-7.000.
- Zechnall, Richard; and Baumann, Gunther, to Robert Bosch GmbH. Injection control system for an internal combustion engine. 4,109,616, Cl. 123-32.0EA.
- Zeigler, James Richard; and Sauter, Daniel S. Tiltable trap chamber with stack aiding feature. 4,109,830, Cl. 222-143.000.
- Zelacolor Systems Establishment: *See—*
  - Guillaume, Emile Armand Henri, 4,110,036, Cl. 355-32.000.
- Zelonis, Paul Thomas. Binary reagent system for detecting drugs of abuse. 4,110,078, Cl. 23-230.00R.
- Zentmyer, John Hobart. Night stick structure. 4,109,912, Cl. 273-84.00R.
- Ziegler, Geza C.: *See—*
  - Spanel, Abram N.; Eiland, P. Frank; Jacobs, David R.; and Ziegler, Geza C., 4,109,594, Cl. 112-79.00R.
- Ziegler, James Francis: *See—*
  - Cairns, James Anthony; Lurio, Allen; and Ziegler, James Francis, 4,110,625, Cl. 250-492.00A.
- Zimmermann, Anton: *See—*
  - Fahrni, Fritz; and Zimmermann, Anton, 4,109,611, Cl. 118-325.000.
- Zimmermann, Wolfgang: *See—*
  - Schindler, Hermann; and Zimmermann, Wolfgang, 4,110,494, Cl. 427-385.00R.

- Zinn, Robert W., to Knox Manufacturing Company. Portable movie screen device. 4,110,003, Cl. 350-117.000.
- Zirkelbach, Albert W.: *See—*
  - Wedge, Donald G.; and Zirkelbach, Albert W., 4,109,845, Cl. 227-144.000.
- Zito, Anthony A. Weight lifting apparatus. 4,109,907, Cl. 272-117.000.
- Zmiarovich, Thomas George, to Raymond Lee Organization, Inc., The. Air stabilized water mattress. 4,109,333, Cl. 5-368.000.
- Zorner, Karl-Heinz, to H. Maihak AG. Method of compensating for carrier-gas-composition dependence due to the collision-broadening effect in non-dispersive infrared photometers having a detector comprised of two absorption chambers arranged one behind the other. 4,110,619, Cl. 250-344.000.
- Zottl, Anton, to Siemens Aktiengesellschaft. Pulse radar device with phase- or frequency-modulation. 4,110,755, Cl. 343-17.2PC.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Albright & Wilson Ltd.: *See—*
  - Gyllenspetz, Jeffrey; and Renton, Stanley, Re. 29,749, Cl. 204-43.00T.
- Biram, Brian Edgar Lund, to C.C.L. Systems Limited. Cable attachments. Re. 29,743, Cl. 61-45.00B.
- Black Clawson Company, The: *See—*
  - Couture, Joseph Walter, Re. 29,746, Cl. 241-15.000.
- C.C.L. Systems Limited: *See—*
  - Biram, Brian Edgar Lund, Re. 29,743, Cl. 61-45.00B.
- Cooke, Robert E.: *See—*
  - Roe, Kenneth W.; Studwell, Ernest E.; and Cooke, Robert E., Re. 29,747, Cl. 417-54.000.
- Couture, Joseph Walter, to Black Clawson Company, The. Apparatus for pulping waste paper materials. Re. 29,746, Cl. 241-15.000.
- Fichter, Harry L., Jr.; and Lewis, James M., to Horizons Incorporated a division of Horizons Research Incorporated. Dry working black image compositions comprising organic halogen compounds and ethylene compounds. Re. 29,748, Cl. 96-27.00E.
- Gomi, Yoshifumi, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Printer. Re. 29,745, Cl. 101-93.290.
- Gyllenspetz, Jeffrey; and Renton, Stanley, to Albright & Wilson Ltd. Trivalent chromium electroplating baths and electroplating therefrom. Re. 29,749, Cl. 204-43.00T.
- Horizons Incorporated a division of Horizons Research Incorporated: *See—*
  - Fichter, Harry L., Jr.; and Lewis, James M., Re. 29,748, Cl. 96-27.00E.
- Kabushiki Kaisha Suwa Seikosha: *See—*
  - Gomi, Yoshifumi, Re. 29,745, Cl. 101-93.290.
- Lewis, James M.: *See—*
  - Fichter, Harry L., Jr.; and Lewis, James M., Re. 29,748, Cl. 96-27.00E.
- Minnesota Mining and Manufacturing Company: *See—*
  - Tung, Chi Fang, Re. 29,742, Cl. 2-412.000.
- Nash Engineering Company: *See—*
  - Roe, Kenneth W.; Studwell, Ernest E.; and Cooke, Robert E., Re. 29,747, Cl. 417-54.000.
- Patriquin, George P. Key controlled security apparatus. Re. 29,744, Cl. 70-364.00R.
- Renton, Stanley: *See—*
  - Gyllenspetz, Jeffrey; and Renton, Stanley, Re. 29,749, Cl. 204-43.00T.
- Roe, Kenneth W.; Studwell, Ernest E.; and Cooke, Robert E., to Nash Engineering Company. Liquid ring pump lobe purge. Re. 29,747, Cl. 417-54.000.
- Shinshu Seiki Kabushiki Kaisha: *See—*
  - Gomi, Yoshifumi, Re. 29,745, Cl. 101-93.290.
- Studwell, Ernest E.: *See—*
  - Roe, Kenneth W.; Studwell, Ernest E.; and Cooke, Robert E., Re. 29,747, Cl. 417-54.000.
- Tung, Chi Fang, to Minnesota Mining and Manufacturing Company. Retroreflective protective helmet. Re. 29,742, Cl. 2-412.000.

LIST OF PLANT PATENTEES

- Merrill, Grant, deceased; and by Merrill, Lucile B., executrix. Peach tree. 4,295, 8-29-78, Cl. 43.000.
- Merrill, Lucile B., executrix: *See—*
  - Merrill, Grant, deceased; and Merrill, Lucile B., executrix, 4,295, Cl. 43.000.

LIST OF DESIGN PATENTEES

- Acme General Corporation: *See—*
  - Jerila, Torsti T. T., 249,120, Cl. D8-341.000.
- Actus, Inc.: *See—*
  - Mueller, Anthony A., 249,159, Cl. D24-7.000.
- Ajax Hardware Corporation: *See—*
  - Gorton, Howard Byron, 249,119, Cl. D8-341.000.
- Aktiebolaget Optimus: *See—*
  - Folke, William Albert, 249,113, Cl. D7-110.000.
- Amba Marketing Systems, Inc.: *See—*
  - Siegel, Milton I., 249,186, Cl. D87-3.00D.
- American Home Products Corp. (Del.): *See—*
  - Stoy, Raymond P., 249,157, Cl. D23-150.000.
- Aqua-Mist, Inc.: *See—*
  - Morrow, William B., 249,158, Cl. D23-158.000.
- Backstrom, Olof, to Oy Fiskars AB. Scissors. 249,117, 8-29-78, Cl. D8-57.000.
- Barr, Josef J. Pendant or similar article. 249,131, 8-29-78, Cl. D11-81.000.
- Barr, Josef J. Pendant or similar article. 249,132, 8-29-78, Cl. D11-81.000.
- Barr, Josef J. Pendant or similar article. 249,133, 8-29-78, Cl. D11-81.000.
- Barr, Josef J. Pendant or similar article. 249,134, 8-29-78, Cl. D11-81.000.
- Barr, Josef J. Pendant or similar article. 249,135, 8-29-78, Cl. D11-81.000.
- Be A Doll, Inc.: *See—*
  - Rubin, Suzann Audrey, 249,171, Cl. D34-4.00R.
- Bendix Corporation, The: *See—*
  - Oberg, Gustave Albert, 249,124, Cl. D10-64.000.
- Bjornsson, Sturlaugur. Holder for hanging stockings and socks. 249,122, 8-29-78, Cl. D9-191.000.
- Bocade, Emil J., to Keeler Corporation. Combined furniture pull and escutcheon. 249,118, 8-29-78, Cl. D8-301.000.
- Boecher, Walter, Jr. Holder for cards or the like. 249,191, 8-29-78, Cl. D96-12.00A.
- Boecher, Walter, Jr. Holder for cards or the like. 249,192, 8-29-78, Cl. D96-12.00A.
- Boecher, Walter, Jr. Holder for cards or the like. 249,193, 8-29-78, Cl. D96-12.00A.
- Brooks, Teddar S.: *See—*
  - Zimbardi, Dominic J.; and Brooks, Teddar S., 249,106, Cl. D6-86.000.
  - Zimbardi, Dominic J.; and Brooks, Teddar S., 249,156, Cl. D23-140.000.
- Butler, Jimmie L. Utility trailer. 249,138, 8-29-78, Cl. D12-105.000.
- Caltime Products Corp.: *See—*
  - Wright, Irvin E.; and Magnussen, Robert O., Jr., 249,125, Cl. D10-40.000.
- Cannon, Thomas C., Jr. Table tray attachment. 249,108, 8-29-78, Cl. D6-199.000.
- Carlson, Robert C., to Gulf Development, Inc. Movable lettering advertising display. 249,194, 8-29-78, Cl. D96-12.00R.
- Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery container or the like. 249,185, 8-29-78, Cl. D87-1.00R.
- Coca-Cola Company, The: *See—*
  - Geyer, Gary, 249,111, Cl. D7-15.000.
- Coleman, David L. Holder for attaching to a tennis racket or similar article. 249,173, 8-29-78, Cl. D34-5.0ST.

- Crowley, Henry J.: *See—*
  - Garson, Howard P.; and Crowley, Henry J., 249,112, Cl. D7-43.000.
- Dart Industries Inc.: *See—*
  - Haynes, Rodney R., Sr., 249,104, Cl. D6-63.000.
- Davis, Lee W.: *See—*
  - Doughty, Kenneth Lynn; Davis, Lee W.; and Yost, Gary R., 249,149, Cl. D15-7.000.
- Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display carton. 249,123, 8-29-78, Cl. D9-224.000.
- Doman, Donald W., to Kohler Co. Faucet handle. 249,155, 8-29-78, Cl. D23-28.000.
- Doughty, Kenneth Lynn; Davis, Lee W.; and Yost, Gary R., to Little Giant Corporation. Suspended pump. 249,149, 8-29-78, Cl. D15-7.000.
- Driscoll, Neil J. Push button control station. 249,140, 8-29-78, Cl. D13-32.000.
- Eastman Kodak Company: *See—*
  - Swayze, Samuel Franklin, 249,151, Cl. D16-06.000.
- Enns, Irvin. Puppet bird. 249,170, 8-29-78, Cl. D34-2.00A.
- Fardigs, Jan, to Joons Plastprodukter. Skate guard. 249,175, 8-29-78, Cl. D34-14.00B.
- Fisher, Gerald C.: *See—*
  - Scanland, Joseph E.; and Fisher, Gerald C., 249,150, Cl. D15-17.000.
- Fishman, Martin B. Earring. 249,129, 8-29-78, Cl. D11-48.000.
- Fishman, Martin B. Earring. 249,130, 8-29-78, Cl. D11-62.000.
- Flanigan, Charles Dennis; Mazzei, Randall John; and Noel, Howard Strudwick, to International Business Machines Corporation. Scanner unit. 249,144, 8-29-78, Cl. D14-40.000.
- Folke, William Albert, to Aktiebolaget Optimus. Base for a camp stove. 249,113, 8-29-78, Cl. D7-110.000.
- Fowler, Catalina. Bathing suit. 249,096, 8-29-78, Cl. D2-40.000.
- Fulet Enterprise Co., Ltd.: *See—*
  - Lin, Jing-Jong, 249,139, Cl. D13-4.000.
- Furukawa, June. Lure. 249,154, 8-29-78, Cl. D22-27.000.
- Garson, Howard P.; and Crowley, Henry J. Cake mold. 249,112, 8-29-78, Cl. D7-43.000.
- General Electric Company: *See—*
  - Pitstick, Martin H.; and Schmitt, Charles H., 249,126, Cl. D10-60.000.
- Geyer, Gary, to Coca-Cola Company, The. Beverage tumbler. 249,111, 8-29-78, Cl. D7-15.000.
- Glasenapp, Jorg: *See—*
  - Glasenapp, Werner; and Glasenapp, Jorg, 249,181, Cl. D48-24.00A.
- Glasenapp, Werner; and Glasenapp, Jorg, to Union Sils, van de Loo & Co. Bicycle lamp. 249,181, 8-29-78, Cl. D48-24.00A.
- Glaubinger, Martin; and Wilson, John, to Rolodex Corporation. Telephone list finder. 249,153, 8-29-78, Cl. D19-76.000.
- Gorton, Howard Byron, to Ajax Hardware Corporation. Door or window lock. 249,119, 8-29-78, Cl. D8-341.000.
- Grant, Paul E. Swimming pool form. 249,164, 8-29-78, Cl. D25-98.000.
- Greer, Michael M. Pocket finger exercise board. 249,182, 8-29-78, Cl. D56-1.00R.
- Gulf Development, Inc.: *See—*
  - Carlson, Robert C., 249,194, Cl. D96-12.00R.
- Guodace, Frank K.: *See—*
  - Knope, William J.; and Guodace, Frank K., 249,114, Cl. D7-137.000.
- Hallden, Lars-Erik, to Interfeudor S.A. Lighter for smokers. 249,165, 8-29-78, Cl. D27-42.000.
- Hargrove, Wilma Rae. Box for school supplies. 249,184, 8-29-78, Cl. D87-1.00R.
- Harvey, Paul C.: *See—*
  - Walker, Gentle James, 249,169, Cl. D30-6.000.
- Hauptman, Paul F.: *See—*
  - Hovda, Peggy L.; and Hauptman, Paul F., 249,167, Cl. D28-57.000.
- Haynes, Rodney R., Sr., to Dart Industries Inc. Sofa. 249,104, 8-29-78, Cl. D6-63.000.
- Hovda, Peggy L.; and Hauptman, Paul F., to Unique Industries, Inc. Fingernail file. 249,167, 8-29-78, Cl. D28-57.000.
- Hoyt, Charles F. Shallow water craft. 249,137, 8-29-78, Cl. D12-62.000.
- Industrial Promotional Toys, Inc.: *See—*
  - Loomis, James F., 249,176, Cl. D34-15.0HH.
  - Loomis, James F., 249,177, Cl. D34-15.0HH.
  - Loomis, James F., 249,178, Cl. D34-15.0HH.
  - Loomis, James F., 249,179, Cl. D34-15.0HH.
- Infanti, Giuseppe. Convertible seat. 249,105, 8-29-78, Cl. D6-64.000.
- Interfeudor S.A.: *See—*
  - Hallden, Lars-Erik, 249,165, Cl. D27-42.000.
- International Business Machines Corporation: *See—*
  - Flanigan, Charles Dennis; Mazzei, Randall John; and Noel, Howard Strudwick, 249,144, Cl. D14-40.000.
- International Silver Company: *See—*
  - Knope, William J.; and Guodace, Frank K., 249,114, Cl. D7-137.000.
- Jensen, George B., to Syracuse China Corp. Dinner plate or similar article. 249,109, 8-29-78, Cl. D7-1.000.
- Jerila, Torsti T. T., to Acme General Corporation. Door latch. 249,120, 8-29-78, Cl. D8-341.000.
- Johnson, Lewis T.: *See—*
  - Carroll, James C.; and Johnson, Lewis T., 249,185. Cl. D87-1.00R.
- Joons Plastprodukter: *See—*
  - Fardigs, Jan, 249,175, Cl. D34-14.00B.
- Katz, Adele S.: *See—*
  - Struble, Rose L.; and Katz, Adele S., 249,101, Cl. D6-20.000.
- Keeler Corporation: *See—*
  - Bocade, Emil J., 249,118, Cl. D8-301.000.
- Ketcham & McDougall, Inc.: *See—*
  - Macowski, William, 249,152, Cl. D19-73.000.
- Knope, William J.; and Guodace, Frank K., to International Silver Company. Article of flatware. 249,114, 8-29-78, Cl. D7-137.000.
- Koda, Hironosuke: *See—*
  - Okada, Takao; Murakami, Tsutomu; and Koda, Hironosuke, 249,142, Cl. D14-5.000.
- Kohler Co.: *See—*
  - Doman, Donald W., 249,155, Cl. D23-28.000.
- Krasicki, Walter. Harp. 249,183, 8-29-78, Cl. D56-1.00A.
- Landau, Harolyn S.: *See—*
  - Landau, Paul H.; and Landau, Harolyn S., 249,145, Cl. D14-59.000.
- Landau, Paul H.; and Landau, Harolyn S. Telephone accessory adapter. 249,145, 8-29-78, Cl. D14-59.000.
- Lin, Jing-Jong, to Fulet Enterprise Co., Ltd. Matching transformer. 249,139, 8-29-78, Cl. D13-4.000.
- Little Giant Corporation: *See—*
  - Doughty, Kenneth Lynn; Davis, Lee W.; and Yost, Gary R., 249,149, Cl. D15-7.000.
- Lombard, Edwin L.: *See—*
  - Nickerson, Thomas D.; and Lombard, Edwin L., 249,098, Cl. D2-315.000.
- Loomis, James F., to Industrial Promotional Toys, Inc. Toy airplane. 249,176, 8-29-78, Cl. D34-15.0HH.
- Loomis, James F., to Industrial Promotional Toys, Inc. Toy airplane. 249,177, 8-29-78, Cl. D34-15.0HH.
- Loomis, James F., to Industrial Promotional Toys, Inc. Toy airplane. 249,178, 8-29-78, Cl. D34-15.0HH.
- Loomis, James F., to Industrial Promotional Toys, Inc. Toy airplane. 249,179, 8-29-78, Cl. D34-15.0HH.
- Lutron Electronics Co., Inc.: *See—*
  - Mayo, Noel, 249,141, Cl. D13-32.000.
- Macowski, William, to Ketcham & McDougall, Inc. Pencil sharpener. 249,152, 8-29-78, Cl. D19-73.000.
- Magnussen, Robert O., Jr.: *See—*
  - Wright, Irvin E.; and Magnussen, Robert O., Jr., 249,125, Cl. D10-40.000.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Miyamoto, Isshin, 249,147, Cl. D14-73.000.
  - Miyamoto, Isshin, 249,148, Cl. D14-73.000.
  - Okada, Takao; Murakami, Tsutomu; and Koda, Hironosuke, 249,142, Cl. D14-5.000.
  - Toyoda, Hiroshi, 249,160, Cl. D24-36.000.
- Mayo, Noel, to Lutron Electronics Co., Inc. Remote dimming control. 249,141, 8-29-78, Cl. D13-32.000.
- Mazzei, Randall John: *See—*
  - Flanigan, Charles Dennis; Mazzei, Randall John; and Noel, Howard Strudwick, 249,144, Cl. D14-40.000.
- McElroy, John O., Jr. Emblem. 249,136, 8-29-78, Cl. D11-105.000.
- Meredith, Donald E. Game counter. 249,174, 8-29-78, Cl. D34-5.0MM.
- Mills, Kenneth Wilson, to Vernon & Co. (Pulp Products) Ltd. Disposable bedpan. 249,162, 8-29-78, Cl. D24-57.000.
- Minnesota Mining & Manufacturing Company: *See—*
  - Sweet, Lawrence A., 249,168, Cl. D29-7.000.
- Mitutoyo Manufacturing Company, Ltd.: *See—*
  - Yamamoto, Takeshi, 249,127, Cl. D10-73.000.
- Miyamoto, Isshin, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 249,147, 8-29-78, Cl. D14-73.000.
- Miyamoto, Isshin, to Matsushita Electric Industrial Co., Ltd. Digital clock radio. 249,148, 8-29-78, Cl. D14-73.000.
- Morrow, William B., to Aqua-Mist, Inc. Attic ventilator. 249,158, 8-29-78, Cl. D23-158.000.
- Mueller, Anthony A., to Actus, Inc. Modular track assembly for 200-unit biological sample changer. 249,159, 8-29-78, Cl. D24-7.000.
- Murakami, Tsutomu: *See—*
  - Okada, Takao; Murakami, Tsutomu; and Koda, Hironosuke, 249,142, Cl. D14-5.000.
- Namba Press Yogyo Kabushiki Kaisha: *See—*
  - Nanba, Kunio; and Ogawa, Taro, 249,100, Cl. D6-9.000.
- Nanba, Kunio; and Ogawa, Taro, to Namba Press Yogyo Kabushiki Kaisha. Safety chair for a child for use in motor vehicles. 249,100, 8-29-78, Cl. D6-9.000.
- Newmark, Edward H. Cup for administering medicine or the like. 249,110, 8-29-78, Cl. D7-6.000.
- Nickerson, Thomas D.; and Lombard, Edwin L., to Textron Inc. Shoe closure device. 249,098, 8-29-78, Cl. D2-315.000.
- Noel, Howard Strudwick: *See—*
  - Flanigan, Charles Dennis; Mazzei, Randall John; and Noel, Howard Strudwick, 249,144, Cl. D14-40.000.
- Nortexport, S.A. de C.V.: *See—*
  - Rodriguez, Sergio, 249,103, Cl. D6-55.000.
  - Rodriguez, Sergio, 249,107, Cl. D6-146.000.
- Oberg, Gustave Albert, to Bendix Corporation, The. Stud checker tool. 249,124, 8-29-78, Cl. D10-64.000.
- Ogawa, Taro: *See—*
  - Nanba, Kunio; and Ogawa, Taro, 249,100, Cl. D6-9.000.
- Ohtomo, Kazuhito, to Sansui Electric Co., Ltd. Record player. 249,143, 8-29-78, Cl. D14-17.000.
- Okada, Takao; Murakami, Tsutomu; and Koda, Hironosuke, to Matsushita Electric Industrial Co., Ltd. Combined portable cassette recorder and radio. 249,142, 8-29-78, Cl. D14-5.000.
- Owens-Illinois, Inc.: *See—*
  - Strand, Gordon A., 249,121, Cl. D9-101.000.

Oy Fiskars AB: *See—*

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P. Ferrero & C. S.p.A.: *See—*

Dogliotti, Amilcare, 249,123, Cl. D9-224.000.

Pelly, Charles W., to Sears Manufacturing Company. Vehicle seat. 249,102, 8-29-78, Cl. D6-48.000.

Phillips Petroleum Company: *See—*

Carroll, James C.; and Johnson, Lewis T., 249,185, Cl. D87-1.00R.

Pitstick, Martin H.; and Schmitt, Charles H., to General Electric Company. Food probe handle. 249,126, 8-29-78, Cl. D10-60.000.

Rahaim, Sarah E. Convertible skirt and short pants garment or the like. 249,097, 8-29-78, Cl. D2-28.000.

Rodriguez, Sergio, to Nortexport, S.A. de C.V. Chair. 249,103, 8-29-78, Cl. D6-55.000.

Rodriguez, Sergio, to Nortexport, S.A. de C.V. Table. 249,107, 8-29-78, Cl. D6-146.000.

Rohrig, Peter. Infant pacifier. 249,161, 8-29-78, Cl. D24-45.000.

Rolodex Corporation: *See—*

Glaubinger, Martin; and Wilson, John, 249,153, Cl. D19-76.000.

Roper Corporation: *See—*

Scanland, Joseph E.; and Fisher, Gerald C., 249,150, Cl. D15-17.000.

Rubin, Suzann Audrey, to Be A Doll, Inc. Doll. 249,171, 8-29-78, Cl. D34-4.00R.

Sandusky City-Erie County Department of Health: *See—*

Waldron, Robert D., 249,115, Cl. D7-192.000.

Sansui Electric Co., Ltd.: *See—*

Ohtomo, Kazuhito, 249,143, Cl. D14-17.000.

Tabata, Hiroshi, 249,146, Cl. D14-71.000.

Scanland, Joseph E.; and Fisher, Gerald C., to Roper Corporation. Cutter pin for mower. 249,150, 8-29-78, Cl. D15-17.000.

Schmitt, Charles H.: *See—*

Pitstick, Martin H.; and Schmitt, Charles H., 249,126, Cl. D10-60.000.

Sears Manufacturing Company: *See—*

Pelly, Charles W., 249,102, Cl. D6-48.000.

Siegel, Milton I., to Amba Marketing Systems, Inc. Handbag. 249,186, 8-29-78, Cl. D87-3.00D.

Stewart, Scott. Back pack. 249,187, 8-29-78, Cl. D87-5.00R.

Stewart, Scott. Back pack. 249,188, 8-29-78, Cl. D87-5.00R.

Stewart, Scott. Back pack. 249,189, 8-29-78, Cl. D87-5.00R.

Stewart, Scott. Back pack. 249,190, 8-29-78, Cl. D87-5.00R.

Stookey, David M. Measuring tape reel holder. 249,128, 8-29-78, Cl. D10-74.000.

Stoy, Raymond P., to American Home Products Corp. (Del.). Deodorant container or the like. 249,157, 8-29-78, Cl. D23-150.000.

Strand, Gordon A., to Owens-Illinois, Inc. Jar. 249,121, 8-29-78, Cl. D9-101.000.

Strathman, Arthur. Seed separator. 249,166, 8-29-78, Cl. D27-51.000.

Struble, Rose L.; and Katz, Adele S. Jewelry display stand. 249,101, 8-29-78, Cl. D6-20.000.

Swayze, Samuel Franklin, to Eastman Kodak Company. Still camera. 249,151, 8-29-78, Cl. D16-06.000.

Sweet, Lawrence A., to Minnesota Mining & Manufacturing Company. Softcap respirator hood. 249,168, 8-29-78, Cl. D29-7.000.

Syracuse China Corp.: *See—*

Jensen, George B., 249,109, Cl. D7-1.000.

Tabata, Hiroshi, to Sansui Electric Co., Ltd. Tuner. 249,146, 8-29-78, Cl. D14-71.000.

Taylor, Charles H. Liquid cosmetic applicator. 249,099, 8-29-78, Cl. D4-20.000.

Textron Inc.: *See—*

Nickerson, Thomas D.; and Lombard, Edwin L., 249,098, Cl. D2-315.000.

Toyoda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Face massager. 249,160, 8-29-78, Cl. D24-36.000.

Union Sils, van de Loo & Co.: *See—*

Glasenapp, Werner; and Glasenapp, Jorg, 249,181, Cl. D48-24.00A.

Unique Industries, Inc.: *See—*

Hovda, Peggy L.; and Hauptman, Paul F., 249,167, Cl. D28-57.000.

Upshaw, Dale E. Wheel guide. 249,172, 8-29-78, Cl. D34-5.0HP.

Vanbragt, Willy H. Combined candles and container therefor. 249,180, 8-29-78, Cl. D48-2.000.

Vanderbloemen, Clement J. Can opener for opening dual aperture pop-top cans. 249,116, 8-29-78, Cl. D8-18.000.

Vernon & Co. (Pulp Products) Ltd.: *See—*

Mills, Kenneth Wilson, 249,162, Cl. D24-57.000.

Waldron, Robert D., to Sandusky City-Erie County Department of Health. Garbage can or similar article. 249,115, 8-29-78, Cl. D7-192.000.

Walker, Gentle James, to Harvey, Paul C., a part interest. Aquarium tank. 249,169, 8-29-78, Cl. D30-6.000.

Wallace, Milton A. Interlocking wall unit. 249,163, 8-29-78, Cl. D25-80.000.

Wilson, John: *See—*

Glaubinger, Martin; and Wilson, John, 249,153, Cl. D19-76.000.

Winckler, Patrick Marie. Visual display holder for attachment to the shafts of mechanical ski-tow equipment and on the safety bars of ski chair-lift equipment. 249,195, 8-29-78, Cl. D96-12.00R.

Wright, Irvin E.; and Magnussen, Robert O., Jr., to Caltime Products Corp. Automatic pill reminder or similar article. 249,125, 8-29-78, Cl. D10-40.000.

Yamamoto, Takeshi, to Mitutoyo Manufacturing Company, Ltd. Inside micrometer. 249,127, 8-29-78, Cl. D10-73.000.

Yost, Gary R.: *See—*

Doughty, Kenneth Lynn; Davis, Lee W.; and Yost, Gary R., 249,149, Cl. D15-7.000.

Zimbardi, Dominic J.; and Brooks, Teddar S. Combined spray can holder and switch for an air filtering system. 249,106, 8-29-78, Cl. D6-86.000.

Zimbardi, Dominic J.; and Brooks, Teddar S. Combined fan and filter for an air filtering system. 249,156, 8-29-78, Cl. D23-140.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 29, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
10	4,109,320
91	4,109,321
177	4,109,322
410	4,109,323
412	Re.29,742
CLASS 4	
172.12	4,109,325
172.19	4,109,324
173 R	4,109,326
252 R	4,109,327
CLASS 5	
2 R	4,109,328
61	4,109,329
267	4,109,330
284	4,109,331
337	4,109,332
368	4,109,333
CLASS 8	
2.5 R	4,110,070
21 R	4,110,071
25	4,110,072
85 R	4,110,073
111	4,110,074
137	4,110,075
CLASS 12	
59.5	4,109,334
123	4,109,335
CLASS 13	
6	4,110,545
11	4,110,546
	4,110,547
16	4,110,548
CLASS 15	
3	4,109,336
21 D	4,109,337
105	4,109,338
167 R	4,109,339
321	4,109,340
340	4,109,341
373	4,109,342
CLASS 16	
98	4,109,343
144	4,109,344
149	4,109,345
151	4,109,346
CLASS 17	
23	4,109,347
CLASS 23	
230 B	4,110,077
230 R	4,110,078
230.6	4,110,076
253 TP	4,110,079
273 SP	4,110,080
288 G	4,110,081
CLASS 24	
153	4,109,348
205.11 R	4,109,349
249 LS	4,109,350
258	4,109,351
CLASS 26	
15 R	4,109,352
CLASS 28	
104	4,109,353
119	4,109,354
151	4,109,355
279	4,109,356
289	4,109,357
CLASS 29	
2	4,109,358
25.35	4,109,359
26 A	4,109,360
148.4 C	4,109,361
156.4 R	4,109,362
156.5 R	4,109,364
243.56	4,109,363
421 R	4,109,365
427	4,109,366
436	4,109,367
446	4,109,368
467	4,109,369
566.3	4,109,370
571	4,109,371
	4,109,372
588	4,109,373
599	4,109,374
605	4,109,375
622	4,109,376
626	4,109,377
629	4,109,378
747	4,109,379
CLASS 30	
162	4,109,380
228	4,109,381
CLASS 32	
10 A	4,109,382
	4,109,383
40 R	4,109,384
59	4,109,385
CLASS 33	
178 F	4,109,386
185 V	4,109,387
265	4,109,390
275 G	4,109,391
287	4,109,388
363 K	4,109,389
381	4,109,392
CLASS 34	
22	4,109,393
57 B	4,109,394
93	4,109,395
192	4,109,396
239	4,109,397
CLASS 35	
13	4,109,398
26	4,109,399
CLASS 37	
126 AC	4,109,400
CLASS 42	
50	4,109,401
65	4,109,402
75 B	4,109,403
CLASS 43	
17	4,109,404
17.5	4,109,405
84	4,109,406
85	4,109,407
112	4,109,408
CLASS 44	
50	4,110,082
CLASS 46	
25	4,109,409
44	4,109,410
79	4,109,411
216	4,109,412
233	4,109,413
CLASS 47	
58	4,109,414
67	4,109,415
CLASS 49	
316	4,109,416
352	4,109,417
CLASS 51	
34 F	4,109,418
94 R	4,109,419
105 R	4,109,420
288	4,109,421
295	4,110,083
307	4,110,084
308	4,110,085
325	4,109,422
CLASS 52	
1	4,109,423
2	4,109,424
21	4,109,425
35	4,109,426
58 R	4,109,427
94	4,109,428
122	4,109,429
127	4,109,430
172	4,109,431
	4,109,432
199	4,109,433
287	4,109,434
309.1	4,109,435
309.2	4,109,436
536	4,109,437
630	4,109,438
667	4,109,439
721	4,109,440
CLASS 53	
11	4,109,441
29	4,109,442
118	4,109,443
186	4,109,444
198 R	4,109,445
282	4,109,446
CLASS 55	
7	4,110,086
73	4,110,087
90	4,110,088
178	4,110,089
CLASS 56	
13.3	4,109,447
13.5	4,109,448
328 R	4,109,449
CLASS 57	
34 R	4,109,450
56	4,109,451
58.89	4,109,452
58.91	4,109,453
58.95	4,109,454
CLASS 58	
1 R	4,109,455
23 AC	4,109,456
43	4,109,457
63	4,109,458
CLASS 60	
39.66	4,109,459
204	4,109,460
274	4,109,461
278	4,109,462
282	4,109,463
397	4,109,464
398	4,109,465
487	4,109,466
534	4,109,467
670	4,109,468
676	4,109,469
685	4,109,470
CLASS 61	
0.5	4,109,471
45 B	Re.29,743
45 D	4,109,472
	4,109,473
48	4,109,474
53.5	4,109,475
86	4,109,478
87	4,109,476
	4,109,477
94	4,109,479
114	4,109,480
CLASS 62	
54	4,110,091
64	4,110,092
140	4,109,481
180	4,109,482
256	4,109,484
298	4,109,485
402	4,109,486
474	4,109,487
CLASS 64	
11 R	4,109,488
CLASS 65	
2	4,110,090
3 C	4,110,094
3 R	4,110,093
26	4,110,095
30 R	4,110,096
136	4,110,097
141	4,110,098
CLASS 66	
75.2	4,109,489
120	4,109,490
125 R	4,109,491
172 E	4,109,492
CLASS 68	
27	4,109,493
200	4,109,483
CLASS 70	
107	4,109,494
364 R	Re.29,744
365	4,109,495
380	4,109,496
403	4,109,497
449	4,109,498
CLASS 71	
76	4,110,099
86	4,110,100
88	4,110,101
89	4,110,102
92	4,110,103
94	4,110,104
95	4,110,105
CLASS 72	
181	4,109,499
203	4,109,500
327	4,109,501
349	4,109,502
352	4,109,503
407	4,109,504
CLASS 73	
1 R	4,109,505
10	4,109,506
12	4,109,507
15 FD	4,109,508
23	4,109,509
27 R	4,109,510
37.6	4,109,511
40.5 R	4,109,512
49.1	4,109,513
58	4,109,514
88 A	4,109,515
93	4,109,516
119 A	4,109,517
	4,109,518
135	4,109,519
143	4,109,520
151	4,109,521
154	4,109,522
194 A	4,109,523
194 B	4,109,524
201	4,109,525
231 R	4,109,526
253	4,109,528
343.5	4,109,527
427	4,109,530
438	4,109,531
457	4,109,532
498	4,109,533
503	4,109,534
706	4,109,535
756	4,109,536
	4,109,537
CLASS 74	
6	4,109,538
36	4,109,539
96	4,109,540
194	4,109,541
230.8	4,109,542
231 P	4,109,543
242.7	4,109,544
388 R	4,109,529
447	4,109,545
474	4,109,546
526	4,109,547
569	4,109,548
573 F	4,109,549
691	4,109,550
705	4,109,551
813 L	4,109,552
CLASS 75	
1 R	4,110,106
24	4,110,107
48	4,110,108
109	4,110,109
122	4,110,110
134 A	4,110,111
CLASS 81	
9.51	4,109,553
CLASS 83	
565	4,109,554
700	4,109,555
CLASS 85	
84	4,109,556
CLASS 89	
7	4,109,557
191 A	4,109,558
195	4,109,559
CLASS 90	
96	4,109,560
CLASS 91	
451	4,109,561
CLASS 96	
1 PC	4,110,112
27 E	Re.29,748
29 D	4,110,113
36	4,110,114
84 A	4,110,115
101	4,110,116
CLASS 98	
2.19	4,109,562
40 C	4,109,563
40 N	4,109,564
CLASS 99	
283	4,109,565
358	4,109,566
450	4,109,567
477	4,109,568
483	4,109,569
551	4,109,570
CLASS 100	
35	4,109,571
CLASS 101	
37	4,109,572
38 R	4,109,573
93.29	Re.29,745
216	4,109,574
CLASS 102	
22 R	4,109,575
24 HC	4,109,576
35.6	4,109,577
39	4,109,578
41	4,109,579
52	4,109,580
92.1	4,109,581
93	4,109,582
244	4,109,583
CLASS 104	
130	4,109,584
CLASS 105	
197 DB	4,109,585
224 A	4,109,586
490	4,109,587
CLASS 106	
1.17	4,110,117
25	4,110,118
38.24	4,110,119
99	4,110,120
100	4,110,121
CLASS 108	
12	4,109,588
63	4,109,589
CLASS 110	
235	4,109,590
CLASS 112	
76	4,109,591
79 A	4,109,592
	4,109,593
79 R	4,109,594
121.11	4,109,595
	4,109,596
158 E	4,109,597
CLASS 113	
116 HH	4,109,598
121 C	4,109,599
121 R	4,109,600
CLASS 114	
218	4,109,602
230	4,109,603
270	4,109,604
314	4,109,601
CLASS 116	
22 A	4,109,605
94	4,109,606
129 A	4,109,607
137 R	4,109,608
CLASS 118	
50	4,109,609
202	4,109,610
325	4,109,611
417	4,109,612
CLASS 122	
1 R	4,109,613
149	4,109,614
CLASS 123	
32 EA	4,109,616
32 EE	4,109,615
41.74	4,109,617
43 C	4,109,618
52 M	4,109,620
52 R	4,109,619
65 SP	4,109,621
73 A	4,109,622
119 A	4,109,624
	4,109,625
119 EC	4,109,623
139 AW	4,109,626
140 R	4,109,627
	4,109,628
	4,109,629
148 CA	4,109,631
148 E	4,109,630
	4,109,632
169 EL	4,109,633
198 F	4,109,634
CLASS 125	
10	4,109,635
CLASS 126	
21 A	4,109,636
197	4,109,637
271	4,109,638
	4,109,639
	4,109,640
299 D	4,109,641
CLASS 128	
2 L	4,109,643
2 V	4,109,642
	4,109,644
2.05 C	4,109,646
2.05 F	4,109,647
2.06 E	4,109,648
2.1 Z	4,109,645
57	4,109,649
66	4,109,650
145.8	4,109,651
212	4,109,652
218 R	4,109,653
235	4,109,654
253	4,109,655
266	4,109,656
283	4,109,657
340	4,109,658
349 R	4,109,659
419 R	4,109,660
582	4,109,661
CLASS 131	
2	4,109,662
	4,109,663
	4,109,664
15 C	4,109,665
261 B	4,109,666
CLASS 132	
33 R	4,109,667
CLASS 133	
8 R	4,109,668
CLASS 136	
89 HY	4,110,123
89 P	4,110,122

236 R	4,110,124
CLASS 137	
101.19	4,109,669
119	4,109,670
282	4,109,671
315	4,109,672
381	4,109,673
493.9	4,109,674
494	4,109,675
550	4,109,676
586	4,109,677
596.13	4,109,679
596.2	4,109,678
599	4,109,680
615	4,109,681
625.23	4,109,682
625.3	4,109,683
CLASS 138	
97	4,109,684
CLASS 139	
33	4,109,685
CLASS 141	
1	4,109,686
5	4,109,687
387	4,109,688
CLASS 144	
2 Z	4,109,689
163	4,109,690
CLASS 145	
50 D	4,109,691
CLASS 148	
1.5	4,110,125
	4,110,126
6.15 R	4,110,129
6.15 Z	4,110,127
	4,110,128
11.5 N	4,110,131
11.5 P	4,110,130
32	4,110,132
171	4,110,133
CLASS 149	
2	4,110,134
19.4	4,110,135
47	4,110,136
CLASS 150	
52 R	4,109,692
CLASS 151	
41.75	4,109,693
69	4,109,694
CLASS 152	
347	4,109,695
354 R	4,109,696
367	4,109,697
CLASS 156	
48	4,110,137
63	4,110,138
79	4,110,139
87	4,110,140
123 R	4,110,141
159	4,110,142
167	4,110,143
173	4,110,144
218	4,110,145
291	4,110,146
306	4,110,147
359	4,110,148
429	4,110,149
499	4,110,150
519	4,110,151
553	4,110,152
633	4,110,153
CLASS 157	
1.2	4,109,698
CLASS 162	
36	4,110,154
135	4,110,155
305	4,110,156
CLASS 164	
244	4,109,699
426	4,109,700
CLASS 165	
1	4,109,701
	4,109,702
	4,109,703
16	4,109,704
17	4,109,705
32	4 109,706
46	4,109,707
48 R	4,109,708
105	4,109,709
165	4,109,710
170	4,109,711
CLASS 166	
53	4,109,713
	4,109,714
177	4,109,715
191	4,109,716
250	4,109,717
256	4,109,718
259	4,109,719
269	4,109,720
280	4,109,721
281	4,109,722
303	4,109,723
315	4,109,724
	4,109,725
	4,109,728
340	4,109,712
CLASS 169	
11	4,109,726
41	4,109,727
CLASS 172	
1	4,109,729
54	4,109,730
59	4,109,731
258	4,109,732
CLASS 173	
4	4,109,733
114	4,109,734
163	4,109,735
CLASS 174	
16 HS	4,110,549
19	4,110,550
27	4,110,551
35 MS	4,110,552
42	4,110,553
101.5	4,110,554
CLASS 175	
297	4,109,736
329	4,109,737
CLASS 176	
36 C	4,110,157
58 PB	4,110,158
68	4,110,159
78	4,110,160
CLASS 177	
212	4,109,738
CLASS 178	
3	4,110,555
19	4,110,556
69.1	4,110,557
	4,110,558
CLASS 179	
1 D	4,110,559
1 VC	4,110,560
2 EA	4,110,561
15 BW	4,110,563
15 BY	4,110,562
15.55 T	4,110,564
18 AH	4,110,565
18 GF	4,110,566
84 A	4,110,569
84 VF	4,110,567
	4,110,568
156 R	4,110,583
170 J	4,110,570
175.1 A	4,110,571
175.3 R	4,110,572
CLASS 180	
5 R	4,109,739
8 A	4,109,740
20	4,109,742
21	4,109,741
65 C	4,109,743
68 P	4,109,744
77 H	4,109,745
82 A	4,109,746
140	4,109,747
141	4,109,748
CLASS 181	
224	4,109,750
230	4,109,749
247	4,109,751
252	4,109,752
	4,109,753
	4,109,754
236	4,109,755
266	4,109,756
401	4,109,757
CLASS 182	
19	4,109,759
48	4,109,760
92	4,109,761
CLASS 184	
15 A	4,109,758
CLASS 188	
26	4,109,762
32	4,109,763
72.4	4,109,764
72.7	4,109,765
73.4	4,109,766
315	4,109,767
CLASS 191	
22 R	4,109,768
CLASS 192	
0.092	4,109,772
5	4,109,769
12 BA	4,109,770
83	4,109,771
111 A	4,109,773
CLASS 194	
1 C	4,109,774
10	4,109,775
CLASS 195	
1.8	4,110,161
31 P	4,110,162
62	4,110,163
63	4,110,164
80 R	4,110,165
96	4,110,166
127	4,110,167
CLASS 198	
466	4,109,780
485	4,109,781
781	4,109,782
	4,109,783
821	4,109,784
CLASS 200	
67 DA	4,110,573
67 G	4,110,574
81.9 R	4,110,575
82 E	4,110,576
146 R	4,110,579
148 F	4,110,578
148 G	4,110,580
153 LA	4,110,581
153 SC	4,110,582
304	4,110,584
305	4,110,585
CLASS 201	
4	4,110,168
6	4,110,169
CLASS 202	
160	4,110,170
234	4,110,172
241	4,110,171
248	4,110,173
CLASS 203	
11	4,110,174
CLASS 204	
43 T	Re.29,749
52 R	4,110,176
59 F	4,110,177
64 R	4,110,178
67	4,110,179
128	4,110,180
147	4,110,181
157.1 R	4,110,182
	4,110,183
159.19	4,110,187
159.2	4,110,185
159.20	4,110,186
159.22	4,110,188
159.23	4,110,184
180 P	4,110,175
180 R	4,110,189
224 M	4,110,190
266	4,110,191
CLASS 206	
1.5	4,109,785
45.14	4,109,786
150	4,109,787
326	4,109,876
329	4,109,788
404	4,109,789
446	4,109,790
506	4,109,791
525	4,109,792
CLASS 208	
8	4,110,192
11 LE	4,110,194
	4,110,195
11 R	4,110,193
13	4,110,196
64	4,110,197
111	4,110,198
139	4,110,199
	4,110,200
	4,110,201
144	4,110,202
216	4,110,203
251 R	4,110,204
255	4,110,205
CLASS 209	
43	4,110,206
74 R	4,109,793
166	4,110,207
CLASS 210	
44	4,110,209
	4,110,210
47	4,110,211
53	4,110,212
59	4,110,213
77	4,110,214
114	4,110,215
156	4,110,216
175	4,110,217
222	4,110,222
223	4,110,218
245	4,110,219
321 R	4,110,220
388	4,110,223
425	4,110,208
481	4,110,221
CLASS 211	
13	4,109,794
57.1	4,109,795
60 R	4,109,796
126	4,109,797
CLASS 212	
39 R	4,109,798
83	4,109,799
CLASS 214	
2.5	4,109,800
6 FS	4,109,801
8.5 D	4,109,803
8.5 F	4,109,802
16.1 CB	4,109,804
16.4 A	4,109,805
38 CC	4,109,806
131 R	4,109,807
152	4,109,808
505	4,109,809
	4,109,810
506	4,109,811
762	4,109,812
CLASS 215	
1 C	4,109,813
217	4,109,814
232	4,109,815
256	4,109,816
CLASS 219	
10.43	4,110,586
10.49 R	4,110,587
	4,110,588
66	4,110,589
75	4,110,590
85 CA	4,110,591
85 M	4,110,592
90	4,110,593
101	4,110,577
121 LM	4,110,594
121 P	4,110,595
124.4	4,110,596
200	4,110,597
216	4,110,598
301	4,110,599
364	4,110,600
506	4,110,601
523	4,110,602
535	4,110,603
CLASS 220	
90.2	4,109,817
200	4,109,818
208	4,109,819
240	4,109,820
337	4,109,821
404	4,109,822
446	4,109,823
CLASS 221	
7	4,109,824
14	4,109,825
72	4,109,826
CLASS 222	
1	4,109,827
3	4,109,828
81	4,109,829
143	4,109,830
254	4,109,831
318	4,109,832
386.5	4,109,833
448	4,109,834
449	4,109,835
494	4,109,836
556	4,109,837
CLASS 223	
91	4,109,838
CLASS 224	
29 R	4,109,839
CLASS 225	
2	4,109,840
96.5	4,109,841
98	4,109,842
CLASS 226	
109	4,109,843
CLASS 227	
120	4,109,844
144	4,109,845
CLASS 228	
4.5	4,109,846
119	4,109,847
CLASS 229	
21	4,109,848
52 B	4,109,849
72	4,109,850
92.8	4,109,851
CLASS 233	
1 R	4,109,852
2	4,109,853
25	4,109,854
	4,109,855
CLASS 235	
92 PC	4,110,604
308	4,109,856
378	4,109,857
432	4,110,606
CLASS 237	
8 R	4,109,858
69	4,109,859
CLASS 238	
349	4,109,860
CLASS 239	
15	4,109,861
102	4,109,862
	4,109,863
127.3	4,109,864
147	4,109,865
233	4,109,866
265.15	4,109,867
413	4,109,868
491	4,109,869
558	4,109,870
CLASS 241	
15	Re.29,746
24	4,109,871
46.11	4,109,872
56	4,109,873
69	4,109,874
101.7	4,109,875
CLASS 242	
54.4	4,109,877
68.3	4,109,878
82	4,109,879
84.21 R	4,109,880
107.4 A	4,109,881
217	4,109,882
CLASS 244	
3.1	4,109,883
3.22	4,109,884
7 R	4,109,885
178	4,109,886
CLASS 248	
345.1	4,109,887
443	4,109,888
447	4,109,889
449	4,109,892
452	4,109,890
503.1	4,109,891
CLASS 249	
175	4,109,893
CLASS 250	
201	4,110,607
214 A	4,110,608
231 R	4,110,609
231 SE	4,110,610
237 R	4,110,611
281	4,110,612
282	4,110,613
324	4,110,614
328	4,110,615
338	4,110,616
342	4,110,617
343	4,110,618
344	4,110,619
361 R	4,110,620
	4,110,621
396 R	4,110,622
398	4,110,623
481	4,110,624
492 A	4,110,625
561	4,110,627
CLASS 251	
30	4,109,894
41	4,109,895
CLASS 252	
8.5 C	4,110,226
	4,110,231
8.5 LC	4,110,225
8.55 B	4,110,232
8.55 D	4,110,224
	4,110,228
	4,110,229
8.9	4,110,227
41	4,110,233
47.5	4,110,234
51.5 R	4,110,235
62.54	4,110,236
79.4	4,110,237
89 B	4,110,238
135	4,110,239
182	4,110,240
182.1	4,110,241
186	4,110,242
299	4,110,243
300	4,110,244
	4,110,245
301.28	4,110,246
313 R	4,110,247
429 B	4,110,248
431 R	4,110,249
432	4,110,250
442	4,110,251
	4,110,252
455 Z	4,110,255
457	4,110,253
462	4,110,254
465	4,110,256
466 J	4,110,257
468	4,110,258
514	4,110,259
519	4,110,260
522	4,110,261
	4,110,626
545	4,110,262
	4,110,263
855 R	4,110,230
CLASS 254	
144	4,109,896
CLASS 260	
2.3	4,110,266
14	4,110,275
17 A	4,110,278
19 R	4,110,279
22 A	4,110,281
23 AR	4,110,282
	4,110,283
29.2 EP	4,110,287
29.2 TN	4,110,284
	4,110,286
29.4 UA	4,110,288
29.6 MP	4,110,285
29.6 RW	4,110,290
	4,110,291
	4,110,292
29.6 TA	4,110,289
29.7 R	4,110,293
30.2	4,110,294
30.4 R	4,110,295
30.6 R	4,110,296
33.4 P	4,110,297
37 PC	4,110,299
37 SB	4,110,300
40 P	4,110,301
40 R	4,110,302
42.18	4,110,303
45.75 C	4,110,308
45.8 N	4,110,304
	4,110,305
	4,110,306
45.9 KA	4,110,307
112 R	4,110,320
112.5 R	4,110,321
	4,110,322
239.3 A	4,110,323
239.5	4,110,324
239.55 C	4,110,325
239.55 R	4,110,326
270 A	4,110,329
287 B	4,110,330
293.57	4,110,333
293.66	4,110,334
293.77	4,110,331
299	4,110,332
302 S	4,110,335
307 G	4,110,336
308 D	4,110,338
308 R	4,110,337
326.5 FL	4,110,340
326.9	4,110,339
327 C	4,110,341
332.2 A	4,110,342

335	4,110,343
340	4,110,298
340.3	4,110,344
340.5 R	4,110,345
345.2	4,110,347
	4,110,348
345.5	4,110,346
346.74	4,110,349
346.75	4,110,350
347.2	4,110,351
348.14	4,110,354
348.29	4,110,352
369	4,110,353
372	4,110,355
404.5	4,110,358
412.5	4,110,356
448 A	4,110,357
449.5	4,110,359
465 D	4,110,360
	4,110,361
	4,110,362
	4,110,363
505 C	4,110,365
505 N	4,110,366
511	4,110,367
514 D	4,110,368
530 N	4,110,369
	4,110,370
531 C	4,110,371
540	4,110,372
543 R	4,110,373
555 A	4,110,374
558 S	4,110,378
559 R	4,110,375
570 R	4,110,376
583 R	4,110,377
584 R	4,110,379
586 C	4,110,380
590 C	4,110,381
	4,110,382
	4,110,383
	4,110,384
603 R	4,110,403
604 HF	4,110,404
646	4,110,405
653.4	4,110,406
	4,110,407
	4,110,408
666 PY	4,110,409
683.15 B	4,110,410
841	4,110,277
873	4,110,411
	4,110,412
879	4,110,413
897 A	4,110,414
953	4,110,415
CLASS 261	
23 A	4,110,416
39 A	4,110,417
98	4,110,418
142	4,110,419
CLASS 264	
13	4,110,385
22	4,110,280
29.5	4,110,386
40.5	4,110,387
41	4,110,420
71	4,110,388
89	4,110,389
90	4,110,390
120	4,110,391
127	4,110,392
132	4,110,393
167	4,110,394
210 R	4,110,395
236	4,110,396
338	4,110,397
CLASS 266	
120	4,109,897
217	4,109,898
CLASS 267	
140	4,109,899
CLASS 269	
102	4,109,900
290	4,109,901
CLASS 270	
79	4,109,902
CLASS 271	
3	4,109,903
CLASS 272	
56.5 R	4,109,904
71	4,109,905
75	4,109,906
117	4,109,907
119	4,109,908
146	4,109,909
CLASS 273	
29 BB	4,109,910
31	4,109,911
84 R	4,109,912
86 B	4,109,913
101	4,109,914
106.5 R	4,109,915
121 A	4,109,916
254	4,109,917
256	4,109,918
CLASS 274	
9 B	4,109,919
CLASS 277	
17	4,109,920
24	4,109,921
34.3	4,109,922
101	4,109,923
165	4,109,924
CLASS 280	
11.28	4,109,925
39	4,109,926
250	4,109,927
411 R	4,109,928
432	4,109,929
491 B	4,109,930
605	4,109,931
615	4,109,932
653	4,109,933
716	4,109,934
747	4,109,935
CLASS 282	
11.5 A	4,109,936
27.5	4,109,937
CLASS 283	
43	4,109,938
CLASS 285	
8	4,109,939
18	4,109,940
111	4,109,941
140	4,109,942
149	4,109,943
323	4,109,945
373	4,109,944
CLASS 289	
18	4,109,946
CLASS 290	
1 R	4,110,628
38 R	4,110,629
53	4,110,630
55	4,110,631
CLASS 292	
76	4,109,947
169.15	4,109,948
189	4,109,949
254	4,109,950
CLASS 293	
65	4,109,951
CLASS 294	
16	4,109,952
118	4,109,953
CLASS 296	
23 A	4,109,954
37.1	4,109,955
78 R	4,109,956
95 C	4,109,957
CLASS 297	
191	4,109,958
216	4,109,959
258	4,109,960
338	4,109,961
385	4,109,962
CLASS 298	
23 M	4,109,963
CLASS 299	
2	4,109,964
CLASS 300	
7	4,109,965
CLASS 302	
50	4,109,966
CLASS 303	
6 C	4,109,967
7	4,109,968
22 R	4,109,969
116	4,109,970
CLASS 305	
51	4,109,971
CLASS 307	
117	4,110,632
205	4,110,633
213	4,110,634
233 R	4,110,635
237	4,110,636
238	4,110,637
252 C	4,110,638
279	4,110,639
303	4,110,640
355	4,110,641
CLASS 308	
3 R	4,109,972
	4,109,973
8.2	4,109,974
26	4,109,975
36.1	4,109,976
174	4,109,977
237 R	4,109,978
238	4,109,979
CLASS 310	
51	4,110,642
54	4,110,643
91	4,110,644
154	4,110,645
163	4,110,646
168	4,110,647
178	4,110,648
191	4,110,649
239	4,110,650
	4,110,651
261	4,110,652
313	4,110,653
323	4,110,654
344	4,110,655
CLASS 312	
35	4,109,980
107	4,109,981
183	4,109,982
214	4,109,983
236	4,109,984
262	4,109,985
CLASS 313	
143	4,110,667
331	4,110,656
332	4,110,657
344	4,110,658
398	4,110,659
486	4,110,660
499	4,110,661
CLASS 315	
169 TV	4,110,662
	4,110,663
	4,110,664
	4,110,665
408	4,110,666
CLASS 318	
78	4,110,668
212	4,110,670
227	4,110,671
254	4,110,672
466	4,110,673
571	4,110,674
606	4,110,675
CLASS 322	
31	4,110,676
CLASS 323	
19	4,110,677
22 SC	4,110,678
CLASS 324	
0.5 A	4,110,681
0.5 B	4,110,680
3	4,110,679
10	4,110,682
52	4,110,683
	4,110,684
58 B	4,110,685
58.5 C	4,110,686
133	4,110,687
208	4,110,688
254	4,110,689
CLASS 325	
25	4,110,690
41	4,110,691
147	4,110,692
419	4,110,693
464	4,110,694
	4,110,695
480	4,110,696
CLASS 328	
154	4,110,697
164	4,110,698
168	4,110,699
CLASS 329	
103	4,110,700
CLASS 331	
1 A	4,110,701
94.5 F	4,110,702
94.5 P	4,110,703
113 R	4,110,704
CLASS 332	
11 D	4,110,705
19	4,110,706
	4,110,707
21	4,110,708
CLASS 333	
6	4,110,709
10	4,110,710
32	4,110,711
33	4,110,712
70 R	4,110,713
72	4,110,714
73 S	4,110,715
97 R	4,110,716
CLASS 335	
22	4,110,717
296	4,110,718
CLASS 337	
46	4,110,719
319	4,110,720
CLASS 338	
128	4,110,721
174	4,110,722
CLASS 339	
17 L	4,109,986
75 M	4,109,987
89 M	4,109,990
91 R	4,109,988
94 M	4,109,989
99 R	4,109,991
147 R	4,109,992
176 M	4,109,993
CLASS 340	
1 R	4,110,723
4 A	4,110,724
5 R	4,110,725
6 R	4,110,726
10	4,110,727
15.5 DP	4,110,728
15.5 MC	4,110,729
16 R	4,110,730
17 R	4,110,731
58	4,110,732
60	4,110,733
64	4,110,734
146.1 AQ	4,110,735
146.3 AE	4,110,736
146.3 Q	4,110,737
309.1	4,110,742
311	4,110,743
336	4,110,744
347 AD	4,110,745
347 NT	4,110,746
	4,110,747
365 C	4,110,748
	4,110,749
384 E	4,110,750
539	4,110,738
573	4,110,741
605	4,110,739
620	4,110,740
CLASS 343	
7.3	4,110,756
7.4	4,110,752
8	4,110,753
16 R	4,110,754
17.2 PC	4,110,755
700 MS	4,110,751
715	4,110,757
CLASS 346	
74.1	4,110,758
75	4,110,759
CLASS 350	
3.66	4,109,996
23	4,109,997
	4,109,998
91	4,109,999
96.21	4,109,994
	4,110,000
96.23	4,110,001
96.29	4,110,002
117	4,110,003
162 SF	4,110,004
184	4,110,005
186	4,110,006
189	4,109,995
215	4,110,007
255	4,110,008
292	4,110,009
	4,110,010
301	4,110,011
302	4,110,012
310	4,110,013
342	4,110,014
357	4,110,015
358	4,110,016
CLASS 352	
5	4,110,017
130	4,110,018
188	4,110,019
CLASS 353	
26 A	4,110,020
27 R	4,110,021
120	4,110,022
122	4,110,023
CLASS 354	
1	4,110,760
4	4,110,762
14	4,110,763
51	4,110,764
59	4,110,765
106	4,110,766
152	4,110,767
173	4,110,768
195	4,110,769
202	4,110,770
207	4,110,771
246	4,110,772
252	4,110,773
345	4,110,774
CLASS 355	
3 R	4,110,026
3 SH	4,110,025
3 TR	4,110,024
	4,110,027
8	4,110,028
10	4,110,029
11	4,110,030
14	4,110,031
	4,110,032
	4,110,033
15	4,110,034
	4,110,035
32	4,110,036
48	4,110,037
50	4,110,038
68	4,110,039
70	4,110,040
75	4,110,041
CLASS 356	
4	4,110,042
102	4,110,043
103	4,110,044
106 LR	4,110,045
124	4,110,046
200	4,110,047
	4,110,048
222	4,110,049
CLASS 357	
15	4,110,775
23	4,110,776
24	4,110,777
30	4,110,778
34	4,110,779
38	4,110,780
39	4,110,781
48	4,110,782
67	4,110,783
CLASS 358	
4	4,110,761
8	4,110,784
19	4,110,785
22	4,110,786
34	4,110,787
63	4,110,788
148	4,110,789
162	4,110,790
233	4,110,791
240	4,110,792
248	4,110,793
256	4,110,794
260	4,110,795
298	4,110,796
CLASS 360	
17	4,110,797
65	4,110,798
70	4,110,799
74	4,110,800
96	4,110,801
106	4,110,802
109	4,110,803
118	4,110,804
132	4,110,805
CLASS 361	
4	4,110,806
42	4,110,807
44	4,110,808
95	4,110,809
213	4,110,810
225	4,110,811
248	4,110,812
	4,110,813
371	4,110,814
433	4,110,815
	4,110,816
	4,110,817
CLASS 362	
32	4,110,818
40	4,110,819
207	4,110,820
CLASS 363	
141	4,110,821
CLASS 364	
200	4,110,822
	4,110,823
	4,110,830
463	4,110,605
472	4,110,824
492	4,110,825
526	4,110,826
550	4,110,827
562	4,110,828
577	4,110,829
745	4,110,831
786	4,110,832
819	4,110,833
841	4,110,834
844	4,110,835
860	4,110,836
900	4,110,837
CLASS 365	
2	4,110,838
180	4,110,839
203	4,110,840
205	4,110,841
233	4,110,842
CLASS 366	
76	4,110,844
83	4,110,843
CLASS 400	
124	4,109,776
	4,109,777
154.2	4,109,778
248	4,110,050
584	4,109,779
CLASS 403	
157	4,110,051
295	4,110,052
361	4,110,053
373	4,110,054
CLASS 408	
203.5	4,110,055
CLASS 416	
230	4,110,056
CLASS 417	
54	Re.29,747
109	4,110,057
395	4,110,058
424	4,110,059
462	4,110,060
477	4,110,061
CLASS 423	
62	4,110,398
112	4,110,399
141	4,110,400
150	4,110,401
166	4,110,402
300	4,110,421
317	4,110,422
356	4,110,423
365	4,110,424
648 R	4,110,425
CLASS 424	
46	4,110,426
	4,110,427
	4,110,428
54	4,110,429
65	4,110,430
78	4,110,431
85	4,110,432
89	4,110,433
92	4,110,434
122	4,110,435
	4,110,436
166	4,110,437
177	4,110,438
181	4,110,439
207	4,110,440
211	4,110,441
212	4,110,442
	4,110,443
226	4,110,444
229	4,110,445
236	4,110,446
244	4,110,447
247	4,110,448
250	4,110,449
	4,110,450
251	4,110,451
	4,110,452
	4,110,453
	4,110,454

CLASSIFICATION OF PATENTS

256	4,110,455
263	4,110,456
	4,110,457
	4,110,458
267	4,110,459
270	4,110,460
273 R	4,110,461
	4,110,462
	4,110,463
274	4,110,464
	4,110,465
	4,110,466
280	4,110,467
301	4,110,468
304	4,110,469
309	4,110,470
330	4,110,471
	4,110,472
331	4,110,473
350	4,110,474
CLASS 425	
71	4,110,062
CLASS 426	
2	4,110,475
41	4,110,476
46	4,110,477
262	4,110,478
277	4,110,479
436	4,110,480
438	4,110,481
497	4,110,482
542	4,110,483
582	4,110,484
595	4,110,485
CLASS 427	
27	4,110,486
	4,110,487
84	4,110,488
164	4,110,489
180	4,110,490
212	4,110,491
214	4,110,492
233	4,110,493
385 R	4,110,494
400	4,110,495
CLASS 428	
35	4,110,498
	4,110,499
	4,110,500
40	4,110,501
	4,110,502
64	4,110,503
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158	4,110,524
177	4,110,525
214	4,110,526
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283	4,110,528
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781	4,110,543
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D6—	9	249,100
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	64	249,105
	86	249,106
	146	249,107
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	6	249,110
	15	249,111
	43	249,112
	110	249,113
	137	249,114
	192	249,115
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	341	249,119
		249,120
D9—	101	249,121
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	224	249,123
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	73	249,127
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D13—	4	249,139
	32	249,140
		249,141
D14—	5	249,142
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	71	249,146
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